

PRICE
\$30.00

18TH EDITION

eem⁷⁵₇₆

electronic engineers master catalog

VOLUME 2

PASSIVE COMPONENTS

SWITCHES

MATERIALS / HARDWARE

DISPLAYS

WIRE & CABLE

DISTRIBUTOR DIRECTORY

4400 PAGES OF CATALOG DATA
FROM 700 MANUFACTURERS



18TH EDITION

eem⁷⁵₇₆

electronic engineers master catalog

VOLUME 2



INDUSTRIAL PRODUCTS SELECTION GUIDE

ALL HI-G PRODUCTS ARE
ADVANCED RESEARCH
CENTER DESIGNED

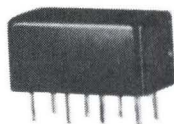
MINIATURE SEALED INDUSTRIAL RELAYS

Reduces Maintenance and Service Cost

The smallest physical size industrial relays available, providing the ultimate in reliable switching capability. Hermetic sealing prevents contamination — assures long life, trouble-free operation — sharply reduces maintenance and service cost. Ideal for data processing, communications, machine control, remote station, and power and low-level switching. ... in any environment containing dust, moisture, corrosive or explosive materials.



See Page 1-1722



See Page 1-1722

TO-5 SERIES

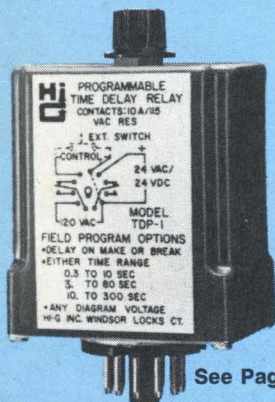
Hermetically sealed DPDT relays with switching capabilities from Dry Circuit to 1 ampere at coil sensitivities from 90 MW. available with and without internal diode coil suppression.

1/2 SIZE CRYSTAL CAN RELAYS

High speed hermetically sealed DPDT relays with switching capabilities from Dry Circuit to 2 amperes, at coil sensitivity of 350 MW.

TIME DELAY RELAYS

Series TD features CMOS digital circuitry; DPDT contacts — 10 amps resistive; no "false" operation on delay on make mode.



See Page 1-1723

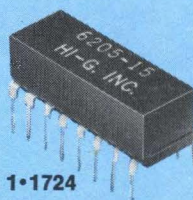
IN-LINE TIMER



See Page 1-1724

Low cost, series connected. Model 6400 has fixed delays of 1, 5, 10, 30 and 60 sec., inputs of 12, 24 or 48 VDC and 1/2 amp inductive output. Other options available.

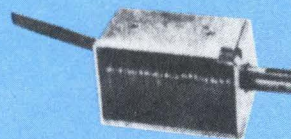
DIP PACKAGE TIMER



See Page 1-1724

No external components required for these Series 6200 & 6300 timers. Model 6200 for DELAY-ON-MAKE, 6300 for interval (one shot) applications. Choose from 5, 12, 24 or 48 VDC inputs. Use Model MCG-5 for 5 VDC master clear generator function.

INTERCHANGEABLE SOLENOIDS



See Page 1-1709

Low Cost Box Frame solenoid designs are completely INTERCHANGEABLE with popular industry standard sizes.

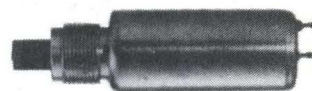
NEW "S" SERIES SOLENOIDS



See Page 1-1712

Unique Low Cost Standard Options feature 8 sizes in 2,304 combinations of voltage, duty cycle, clevis, pushrod, shock dampener, and return spring. Special Design Engineer's Solenoid Kit offering.

TUBULAR SOLENOIDS



See Page 1-1712

Standard and Custom designs are available utilizing the latest technology, materials, and manufacturing techniques for built in long-life performance.

CUSTOM SOLENOIDS



See Page 1-1713

A custom commercial high speed print head solenoid for Dot Matrix impact printers.

MODEL TDP-1 PROGRAMMABLE

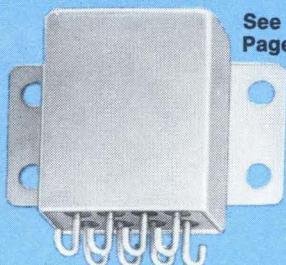
Easy to select for delay on make or break; 24VDC, 24VAC, or 120VAC; and for an adjustable delay range of 0.3 to 10, 3 to 80, or 10 to 300 seconds. Ideal for R & D and low volume production.

MODEL TDO & TDR

Conventional adjustable and fixed, single mode and voltage timers at competitive prices.

See Page 1-1723

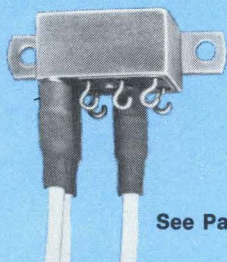
POWER RELAYS



See
Page 1•1718

Power switching up to 10 Amperes in accordance with Mil-R-5757/23-/28. Available in a full range of coil resistances and mounting configurations to provide versatility of this Qualified product.

RADIO FREQUENCY RELAYS



See Page 1•1716

A complete line of RF switching devices with 200 watt handling capabilities at coil sensitivities of 250 MW. RF VSWR characteristics of 1.1:1 to 500 MHz in cable impedances of 50 - 75 - 95 ohms.

DELAY ON RELEASE TIMERS



See Page 1•1728

Series 5600/5700 offers 2, 5 and 10 amp contacts, one or two pole, delays to 300 seconds, temperature ranges -55°C to +85°C or +125°C and are hermetically sealed.

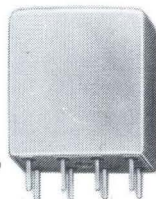
SENSORS



See Page 1•1729

Series 1300 for voltage, 1400 for phase and 7000 for frequency. Available with solid state or relay output; military or commercial applications/packaging.

CRYSTAL CAN RELAYS



See Pages 1•1717,
1•1718, 1•1719

Reliable switching in a full size crystal can relay qualified to Mil-R-5757/10. Coil sensitivity of 250 MW. and contact ratings from low level to 2.0 ampere.

1/2 SIZE CRYSTAL CAN RELAY



See Page 1•1717

A long established relay design providing reliability and switch performance to the qualified standards of Mil-R-5757/9 — Dry Circuit to 2 Amperes at switching sensitivities of 250 MW.

1/5 SIZE CRYSTAL CAN RELAYS



See Page 1•1717

The ultimate in relay design, size and capability — Dry Circuit to 2 Amperes in a package capable of withstanding today's environmental stresses — Qualified to Mil-R-5757/37.

TO-5 RELAYS



See Page 1•1714

The fully qualified TO-5 series with switching capabilities from Dry Circuit to 1 Ampere at coil sensitivities from 60 MW. Qualified to Mil-R-5757/38-/40-/69-/70.

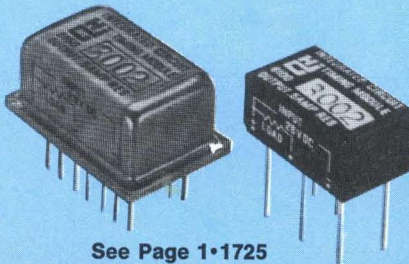
INTERVAL TIMER



See Page 1•1728

Series 4600/4700/4800 offer one shot function for 10 milliseconds to 100 seconds in relay or solid state output. Factory fixed or field adjustable. Hermetically sealed, AC or DC inputs and temperatures to 125°C.

THICK FILM HYBRID TIMERS



See Page 1•1725

Delay on operate solid state output in 5, 12 and 24 VDC inputs 0.3" wide x 0.1" grid pin spacing. Model 6100 is epoxy and 6150 hermetically sealed. Delays are set but field trimmable.

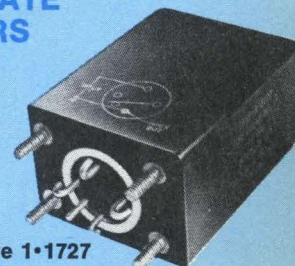
DELAY ON OPERATE TIMERS



See Page 1•1726

Series 2400-Crystal can (1.5" max.) factory fixed to 120 seconds, to DPDT, 2 amp contacts and temperatures -55°C to +125°C.

VERSATILE DELAY ON OPERATE TIMERS



See Page 1•1727

For loads to 10 amps delays to 300 sec. AC or DC input, up to 4 PDT output. Series 1600 factory set; 1700 resistor adjustable with temperatures to 125°C.

18TH EDITION

how to use EEM 75 76

This issue of EEM is the largest, most complete catalog ever published in the electronics field. The two volumes contain more than 5,000 pages of up-to-date information. New features have been added and you may find it helpful to scan this page as a guide to the easy use of EEM.

1. INDEX OF MANUFACTURERS' CATALOG PAGES

When you need data from particular manufacturers, just look them up alphabetically in the index beginning on page 3 (green pages). More than 700 manufacturers have catalog pages in EEM, and easy reference is given for all these pages in two-number figures. The first number in bold type indicates the volume (1 or 2); the second, the page number. Example: 1•141 means Vol. 1, page 141.

2. PRODUCT INDEX AND DIRECTORY

All products are indexed by basic type. Each product shows three groups of manufacturers:

1. **Boldface** listings with page references tell you that this manufacturer's catalog pages are right at hand in the white pages.
2. * the asterisk means that this manufacturer has catalog pages in the white section but not on this particular product.
3. Lightface listings, unmarked, means that the manufacturer has submitted a data sheet to verify that they do manufacture this product, but no further data is available in EEM.

New feature You'll find a handy Product Index and Directory in each volume. All product designations are in both volumes, but page references are given only for those products in that volume; you are referred to the other volume when the catalog pages are there.

New feature The letter "D" preceding the listing tells you that the product is available from distributors.

New feature The letter "M" preceding the listing tells you that the product is available in military specifications.

3. TRADE MARK DIRECTORY

If you have just a trade mark, this directory gives you the product it signifies and who makes it. We've black edgemarked the section for easy location. Beginning on page 2•301 (green pages), there are more than 2500 manufacturers' trade marks listed. Once you have the product and manufacturer, look in the Manufacturers and Sales Offices Directory for complete name and address.

4. MANUFACTURERS' CATALOG PAGES

Here is the greatest collection of detailed catalog pages on electronic products available anywhere. The section is indexed by product category, alphabetically. Manufacturers' catalog pages appear in each product category in alphabetical order. There is a handy guide to the product category in each volume of EEM on the page facing page 1. The great number of catalog pages were divided into the two volumes to facilitate handling.

5. MANUFACTURERS/SALES OFFICES DIRECTORY

Here is all the data on where they are — addresses and phone numbers of main offices, branch offices, local representatives, local distributors plus local contact names and phone numbers.

NEW DATA — Additional data included this year:

- | | |
|--|---|
| a. Minimum order accepted | f. Summary of categories of products manufactured by each company |
| b. Federal Supply Code (FSC) number | |
| c. Qualified Parts List (QPL) number | h. Corporate logos or trade marks for easy location of manufacturers. Manufacturers with catalog pages in EEM are indicated by boldface listings and page number references. |
| d. Individual contacts by name for price data, application information, customer service | |
| e. Free literature offerings | |

6. DISTRIBUTOR'S DIRECTORY

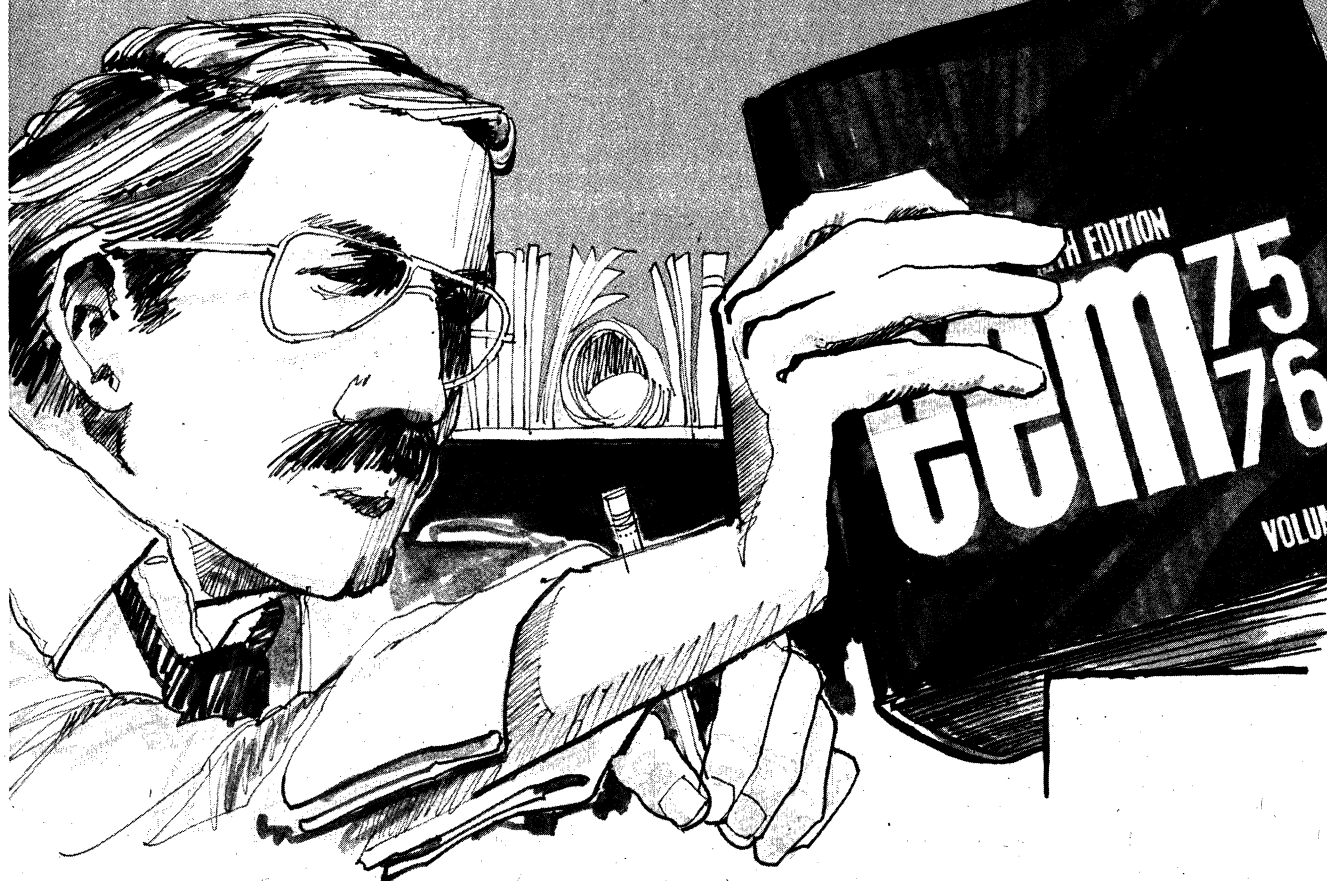
Yellow pages, black edgemarked for easy location, contain a geographic listing of electronic distributors offering name, address, phone number and sales manager. This section is to be found in Volume 2 following Manufacturers/Sales Offices Directory.

Your enthusiastic response and usage of EEM has helped make this edition the largest ever. Each year, we try to incorporate new features to make EEM better and easier to use. Your comments and ideas are sincerely welcomed. Please write Editorial Director, United Technical Publications, 645 Stewart Avenue, Garden City, N. Y. 11530.

EEM is published by United Technical Publications, div. of Cox Broadcasting Corp. Other publications serving the electronics industry are Electronic Products Magazine, O-T-S Catalog, IC Update Master, Electronic Marketing & Management (EM/M), Off the Shelf Magazine, Electronics Retailing and United's Cost and Pricing Service.

There is more catalog data
available to you at your fingertips
than ever before...when you

Reach for EEM



With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

18TH EDITION

75

76

COMPLETE INDEX OF MANUFACTURERS' CATALOG PAGES IN VOLUMES 1 & 2

This index provides an alphabetical listing of manufacturers' pages and where to find them. The volume number appears first, before the bullet; the page number is listed after it.

Mfr.	Vol.-Page	Mfr.	Vol.-Page	Mfr.	Vol.-Page	Mfr.	Vol.-Page
A							
Abacus Controls, Inc.	1-1026, 2-1731	All-Tronics, Inc.	1-538-1-543	Applied Electro Technology, Inc.	1-1578, 1-1579	Behlman Engineering Corp.	1-1114-1-1119
Abbott Transistor		Alpha Wire Corp.	1-44, 1-45, 2-1835-2-1880	Applied Fluidics, Inc.	1-601	Belden Corp.	2-1882-2-1909
1-1037-1-1056, 2-1720-2-1725		ALS Electronics Corp.	1-1087	Applied Microwave, Div. of EPSCO, Inc.	1-901-1-904	Bel Fuse, Inc.	1-432-1-442, 1-1966
Accutronics — Printed Circuits Div.	1-280, 1-281, 2-346, 2-347	Amatom Electronic Hardware	2-457, 2-1258	Applied Research, Inc.	2-1276, 2-1277	Bell, Inc., F. W.	1-614, 1-615, 1-2338, 1-2339
ACDC Electronics	1-1027-1-1036	Amco Engineering Co.	1-49-1-52	Arco Electronics, Inc.	1-1547, 2-32-2-39, 2-619	Bell Industries, Electronic Components Div.	2-104
Acopian Corp.	1-1057-1-1082	American Aerospace Controls, Inc.	1-230-1-232, 1-2330-1-2332	Arcoelectric Switch Corp.	1-1959, 2-1125	Bell Industries, J. W. Miller Div.	2-370-2-379
Active Control Instrumentation	1-228, 1-229	American Technical Ceramics	2-28-2-31	Arnold Engineering Co.	2-1212, 2-1213	Bendix Microwave Devices	2-1214, 2-1280
ADC Products	2-444-2-449	American Vector	1-1083	Arnold Magnetics Corp.	1-1093-1-1105	Sidney Div.	2-640-2-643
A.D. Data Systems	1-127	American Zettler, Inc.	1-1574-1-1577, 1-1932	Arnoux Corp.	1-604, 1-605	Berg Electronics	2-645-2-652
Advance Conversion Devices Co.	1-1084, 1-1085	AMF P&B (see Potter & Brumfield, Div. AMF)		ARRA, Inc.	2-1278, 2-1279	Berkeley Instr., Inc.	1-616, 1-617
Advance High Voltage Co. Inc.	1-1090-1-1092	AMF/UID (see UID Electronics, Div. AMF)		Arrow-Hart	1-233-1-236, 1-1580-1-1585, 1-1933-1-1958, 2-621-2-631	Bertan Associates, Inc.	1-1120, 1-1121
Ad-Vance Magnetics, Inc.	2-1210, 2-1211	AMP Capatron, Div. AMP Inc.	1-128, 1-129, 1-526, 1-527, 1-1088, 1-1089, 2-450, 2-451	Arrow-M Corp.	1-1586-1-1595	Bikar Corp.	1-1122, 1-1123
Aemco Div., Midtex	1-1548-1-1572	Amperex Electronic Corp.	1-2350-1-2353	Artronic Instr. Co.	1-430, 1-431	Biometrics Instr. Corp., Sub. Varo	1-1528-1-1531
Aeroflex Labs, Inc.	1-929-1-931	Amphenol	1-2334-1-2337, 2-1122, 2-1123, 2-1592-2-1609	Ashland Electric Prods., Inc.	1-486, 1-487, 1-934-1-937	Bird Electronic Corp.	1-618, 1-619
AirBorn, Inc.	2-452-2-455	Comp. Mktg.	1-472-1-485, 1-1106, 1-1107	Associated Research, Inc.	1-607	Bivar, Inc.	2-1259
Airco Electronics	2-368, 2-369, 2-1408, 2-1409	Cadre	2-464-2-467	Astrosystems, Inc.	1-142, 1-143	Bliley Electric Co.	1-282, 1-283
Airflyte Electronics Co.	1-932, 1-933	Connector	2-468-2-503	ATR Electronics, Inc.	1-1110, 1-1111	Bloc-Lite, Div. LVC Inds.	2-1137
Aladdin Electronics	2-1727-2-1730	Industrial	2-504-2-566	Augat, Inc.	2-632-2-639	Blue M Engineering	1-468, 1-469
Alberox Corp.	2-456	RF Div.	1-1928-1-1931, 2-567-2-618	Austron, Inc.	1-279	Bodine Electric Co.	1-938, 1-939
Alco Electronic Prods., Inc.	1-1926, 1-1927, 2-1076-2-1078	Sales	2-460-2-463	Autronics Corp.	1-237, 1-1113	Boonton Electronics Corp.	1-620-1-625
Alissa Mfg. Co.	2-24-2-27	RF Div.	1-1928-1-1931	Avtel, Div. Unitron, Inc.	1-1513	Borg-Warner Thermoelectrics	1-488-1-491
Allard Inst. Corp.	2-1121	Amplifier Research Corp.	1-2, 1-3	AVX Ceramics	1-530, 1-531, 2-2-2-23	Bourns, Inc., Trimpot	2-1420, 2-1623-2-1626
Allen Avionics, Inc.	1-422-1-427, 1-530, 1-531, 1-532-1-537	Anadyne	1-1108, 1-1109	Axel Electronics	1-525, 2-41	Bourns Pacific Magnetic Corp.	1-443, 2-381, 2-1732, 2-1733
Allen-Bradley Co.	2-1410-2-1417, 2-1584-2-1591	Analog Devices, Inc.	1-606	B			
Allied Control, Div. Gould	1-1686-1-1695	Analogic Corp.	1-130-1-133, 1-602, 1-603	B & K (see Dynascan Corp.)		Buchanan Crimp Tool Prods.	2-653
Allied Systems Corp.	2-458, 2-459	Andersen Laboratories, Inc.	1-428, 1-429	Baldwin Electronics'	1-144-1-146	Buckeye Stamping Co.	1-46-1-48, 2-1075
All-Shield Enclosures, Inc.	(see All-Tronics)	Ann Arbor Terminals	1-134-1-140	Beckman Instrs. Helipot Div.	1-880-1-883, 2-1126, 2-1127, 2-1418, 2-1419, 2-1610-2-1621	Bud Radio, Inc.	1-54, 1-55
		A.P. Circuit Corp.	1-528, 1-529	Beckman Instrs. Information Displays	2-1128-2-1135	Buiova Watch Co., American Time Prods.	1-4, 1-284-1-295, 1-1006, 1-1007, 1-1124, 1-1910-1-1913
		Applied Circuits, Inc.	2-345	Beede Electrical Instr. Co., Inc.	1-238, 1-239, 1-612, 1-613	Bussmann Manufacturing	1-1960-1-1965

Mfr.	Vol.-Page	Mfr.	Vol.-Page	Mfr.	Vol.-Page	Mfr.	Vol.-Page
C							
C & A Products, Inc.	1-148-1-151	Control Electronics Co., Inc.	1-110, 1-444	Eagle Picher Inds., Inc.	1-1208	Faria Meter Corp.	1-694
C & K Components	1-1968, 1-1969	Control Technology Co.	1-1914, 1-1915	Ectron Corp.	1-7, 1-162	Fenwal Electronics	1-2316
Cabtron Systems, Inc.	1-56, 1-57	Corcom	1-546, 1-547	Edison Electronics, Div. McGraw-Edison Co.	1-661	Ferrotran Electronics Co., Inc. 1-1209-1-1213, 2-1751	
Caddell-Burns Mfg. Co., Inc.	2-382-2-385	Corning Glass Works (Electronic Prod. Div.)	2-105-2-119, 2-1449-2-1451	Edsyn	2-1694, 2-1695	Ferroxcube Corp.	2-1218-2-1225
Caddock Electronics, Inc. 1-884-1-887, 2-1428-2-1443		Coto-Coil Co.	1-1618-1-1623	EG & G	1-1011-1-1013	Ferwalt, Inc., W. H.	1-318, 1-319
Calabro Plastics	1-98, 1-99	CPS	1-1162, 1-1163	Elec-Trol Inc.	1-1644-1-1647	Flite-Tronics Co. Inc.	1-1214, 1-1215
Calex Mfg. Co., Inc.	1-240, 1-1153	Cramer, Div. Conrac Corp.	1-147, 1-943	Eldec Corp.	1-1193-1-1196	Fluke Mfg. Co., John	1-695-1-715
California Instr. Co. 1-626-1-629, 1-1164, 1-1165		Crown, Ltd.	1-300, 1-301	Electro-Craft Corp.	1-946-1-949	Fork Standards, Inc.	1-320, 1-321
Canon USA Inc.	1-942	Crown International	1-14, 1-15	Electro Impulse, Inc.	1-492, 1-662-1-666	Formica Metal Prods. Co. Inc. 1-62, 1-1540	
Capitol Machine & Switch Co. 1-1970, 1-1971		CTS Corp. CTS of Berne	2-1421-2-1426	Electro-Mechanical Instr. Div., Sheller-Globe Corp.	1-668, 1-669	Freed Transformer Co. Inc. 1-716, 1-717, 2-1738-2-1747	
Carborundum Co. 1-2309-1-2315, 2-1445-2-1447		CTS Knights	1-303-1-311	Electro Motive Corp.	2-194, 2-195	Frequency Devices Inc. 1-322, 1-554, 1-555	
Carling Electric, Inc.	1-1972, 1-1973	CTS Microelectronics	1-888, 2-1622	Electro Packaging	2-672-2-675	Frequency Electronics, Inc.	1-323-1-326
Carlingswitch	1-1972, 1-1973	Cunningham (Sub. Gleason Works) 1-640, 1-641, 1-2012, 1-2013		Electro Switch Corp.	1-2028, 1-2029	G	
Carter Mfg. Corp.	2-1640, 2-1641	Curtis Inds. Inc.	2-666, 2-667	Electrokinetics Div. (see Varo, Inc.)		Gamble Inds., Charles T.	2-1492-2-1495
CEA, Div. of Berkleons, Inc. 1-1125-1-1152		Curtis Instruments, Inc.	1-642, 1-643	Electrocube, Inc.	1-553, 2-121-2-125, 2-1736, 2-1737	Gardner-Denver Co., Div. Grand Haven 1-1541, 2-1697	
CELCO Constantine Engrg. Labs. Co. 1-630, 1-631		Custom Electronics	2-102, 2-103	Electron Devices (see Varo Inc.)		Gates Electronic Co. Inc.	1-1216-1-1221
Channellock, Inc.	2-1693	CW Industries	1-1967, 2-656	Electronic Dev. Corp.	1-670-1-673	GC Electronics, Div. Hydrometals 2-341, 2-1696	
Chassis Trak, Div. General Devices 1-63-1-66		D		Electronic Applications Co. 1-1648-1-1659		Gemcor	1-956, 1-957
Cherry Electrical Prods. Corp. 1-1974-1-1985		Daburn Electronics & Cable Corp. 2-1973-2-1992		Electronic Engrg. Co. of Cal. 1-2030-1-2033		General Devices	1-66-1-70
Chesterfield Prods., Inc.	1-548	Daico Industries, Inc.	2-1281-2-1284	Electronic Hardware Corp. 2-1081, 2-1082		General Electric Co., Electronic Component Sales	1-958, 1-959, 1-1684, 1-1685, 2-134-2-137
Chicago Lock Co.	1-1986, 1-1987	Dale Electronics, Inc.	1-944, 1-2015, 2-386, 2-387, 2-668-2-670, 2-1452-2-1482, 2-1644-2-1653	Electronic Instr. & Specialty 1-1660-1-1667		General Electric Co., Miniature Lamp Dept. 2-1144, 2-1145, 2-1698, 2-1699	
Chicago Switch, Inc.	1-1988-1-2009	Damon, Electronics Div.	1-312, 1-313	Electronic Measurements 1-1187-1-1192		General Electro-Mechanical Corp. 1-956, 1-957	
Christie Elect.	1-1180, 1-1186	Dana Exact Electronics Inc.	1-644, 1-645	Electronic Molding Corp.	2-676-2-679	General Instr. Corp., Capacitor Div. 2-169-2-186	
Chronetics, Inc.	1-634, 2-1286	Data Delay Devices	1-445-1-451, 1-552	Electronic Navigation Inds., Inc. 1-674-1-676		General Instrument Corp., Semiconductor Prods. Group	1-1844
Chrono-Log Corp.	1-152, 1-153	Data Precision Corp.	1-646, 1-647	Electronic Research Co., A Tectron Div.	1-317, 1-677-1-684	General Magnetics, Inc.	1-242-1-251
Cimco Wire & Cable	2-1910, 2-2023	Data Technology Corp.	1-649-1-651, 1-863	Electrostatics Inc.	1-1184, 1-1185	General Microwave Corp.	1-718, 1-719
Cinch, Div. TRW	2-896-2-1031	Datak Corp.	2-354, 2-1079	Elfab Corp.	2-680, 2-681	General Radio	2-1748-2-1750
Clairax Electronics, Inc.	1-1008, 1-1009	Datel Systems, Inc.	1-156-1-161, 1-241, 1-648, 1-1166, 1-1167	Elgar Corporation	1-1197-1-1199	Georator Corp.	1-1222-1-1229
Clare & Co., C. P.	1-1596-1-1615	Dearborn Wire & Cable Co.	2-1993-2-2020	Elgenco Inc.	1-685-1-690	Gordos/Grisby Barton 1-1700-1-1706, 1-2053-1-2057	
Clarke-Hess Communications Research Corp.	1-636, 1-637	Defiance Circuit Corp., Sub. Hi-G 2-352, 2-353		El-Menco	2-194, 2-195	Gould Inc., Allied	

INDEX OF MANUFACTURERS' CATALOG PAGES

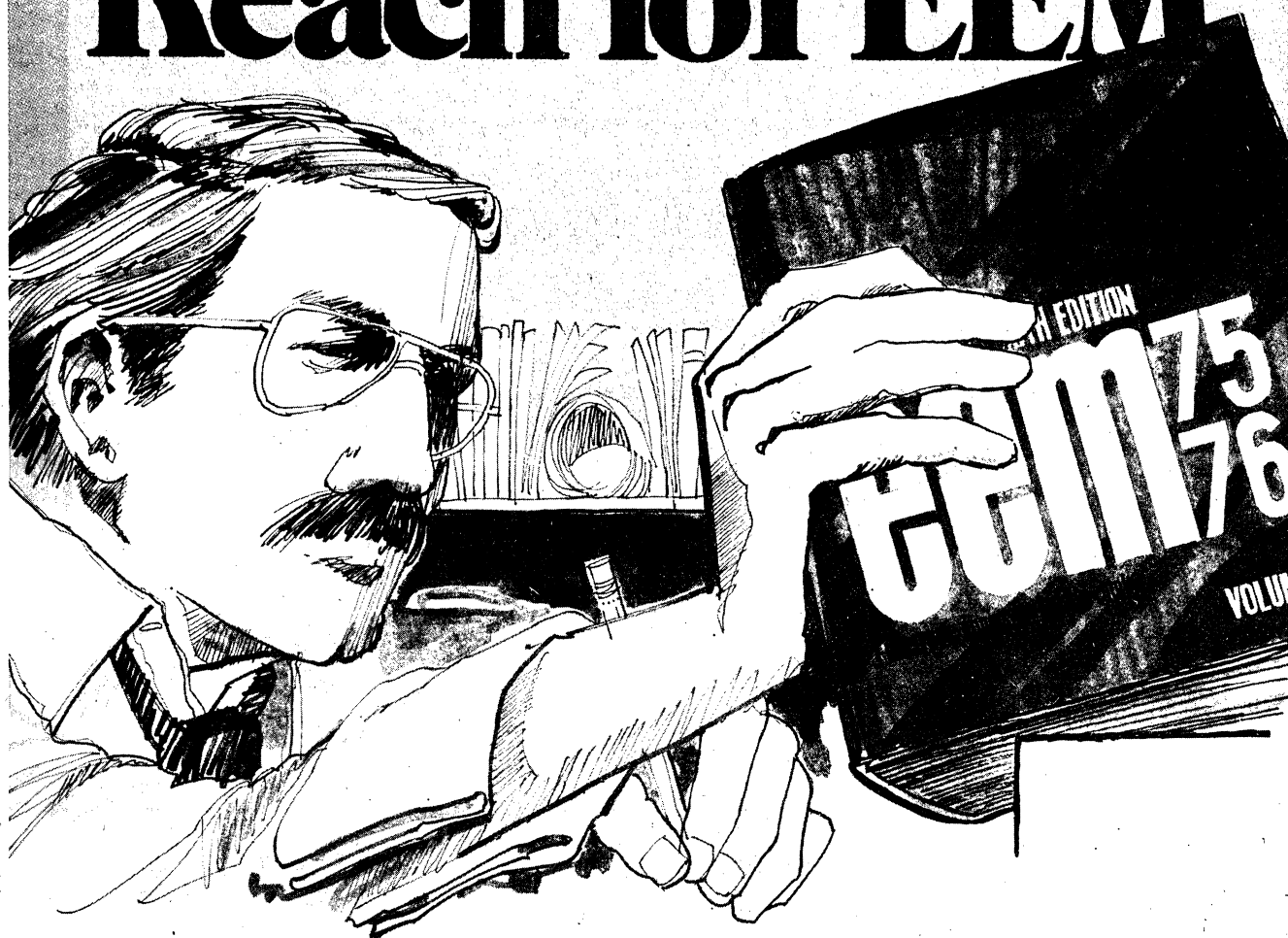
Mfr.	Vol.-Page	Mfr.	Vol.-Page	Mfr.	Vol.-Page	Mfr.	Vol.-Page
Hertz Filter Corp.	1-562, 1-563	International Electro Exch. Corp., (see IEE/Shadow)		Lipps Inc.	1-20-1-23	NL Inds. Inc.	1-2320-1-2323
Hewlett-Packard, HPA Div. 1-1014, 1-1015, 2-1150-2-1153		International Electro-Magnetics 1-16, 1-17		Litronix	2-1174-2-1179	NWL Transformers	1-1325-2-1772
Hexacon Elec. Co.	2-1700-2-1705	International Electronics Corp./I.E.C./ El-Menco Capacitors	2-194, 2-195	Littelfuse, Inc. 1-2098, 1-2099, 2-1180, 2-1181		Nano Pulse Industries Inc. 2-1773, 2-1774	
Hi-G, Inc.	1-1708-1-1729 plus Inside Cover Spread Vol. II	International Rectifier Corp. 1-1842, 1-1843		LogiMetrics	1-758, 1-759, 1-909	Natel Engineering Co.	1-184-1-187
Hickok Electrical Instr.	1-163, 1-728	Interstate Electronics	1-736, 1-737	London Co.	1-760-1-765	National Semiconductors 1-1018, 1-1019	
Hipotronics, Inc. 1-722, 1-723, 1-1230, 1-1231		Interswitch	1-2074, 1-2075	LVC Inds. Inc., Co-Ord Switch Bloc-Lite Divs.	1-2100, 2-1137	National Tel-Tronics	2-720-2-723
Hiram-Jones	2-682-2-685	Inter-Technical Group 1-19, 1-2356, 1-2357, 2-1230				National Wire & Cable Corp. 2-2026-2-2047	
Hisonic Inc. 1-564, 1-565, 1-1233, 2-1755		ISC Magnetics, Inst. Sys. Div.	1-252	M		Nationwide Electronic Systems, Inc. 1-182, 1-183	
Hoagland Inst. Co.	1-1731	Itoh Electronics, Inc., C.	1-176	M-Tron Inds., Inc.	1-383	Nelson-Ross Electronics	1-784, 1-785
Honeywell Inc., Test Instrs. Div. 1-724, 1-725		Itthaco, Inc.	1-8, 1-9, 1-568, 1-739	Magnecraft Electric Co.	1-1766-1-1798	Neshaminy Transformer, Div. Neshaminy Electronics 2-1775, 2-1776	
Hope Electronics	1-1234, 2-1287	ITT Cannon Electric	2-687-2-693	Magnetic, Div. Hi-G	1-1708-1-1713	New England Instr.	2-1666-2-1671
Hopkins Engineering Co.	1-566, 1-567	ITT Jennings Instrs. & Systems 1-740, 1-741		Magnetic Technology	1-971-1-974	Nicolet Instruments Corp.	1-780, 1-781
Horizons International Inc. 1-962, 1-963		ITT Jennings, Vacuum Electronic Prods.	1-1733-1-1738, 1-2077-1-2079, 2-198-2-200	Magnetico, Inc.	2-1770	North Atlantic Inds.	1-188, 1-772
Houston Instrument, Div. Bausch & Lomb	1-870-1-873	ITT Pomona Electronics Co.	2-727-2-787	Mallory Capacitor Co. 1-24, 1-25, 2-206-2-209		North Hills Electronics	1-189, 1-264, 1-265, 1-1332, 1-1333, 2-399, 2-1388, 2-1771
Hoyt Elec. Instr. Works, Burton- Rogers Co., Sls. Div.	1-726, 1-727	ITT Thermotech	2-1231-2-1233	Marconi Instrs., Div. Marconi Electronics, Inc.	1-766-1-771	Northern Engineering Labs., Inc.	1-399
Hughes Aircraft Co., Connecting Devices	2-686, 2-2022	J		Markel, L. Frank & Sons 2-1272, 2-1273, 2-2024, 2-2025		Nova Electric Mfg. Co.	1-1334-1-1337
Hughes Aircraft Co., Communication Prods. Dept.	1-889	Jackson Bros. (London Ltd) ..	2-196, 2-197	Master Appliance	2-1710-2-1713	Nytronics Comps. Group Inc.	2-212- 2-229, 2-400-2-421, 2-1504-2-1507
Hughes Aircraft Co., Microelectronics Prods. Div.	1-361	Jan Hardware Mfg. Co.	2-1088-2-1103	Matrix Corp.	1-178, 1-266		
Hutchinson Industrial Corp. 1-1542, 1-1543		J-B-T Instruments Inc. 1-742-1-745, 1-2080-1-2087		Matrix Systems Corp.	1-1800-1-1802	O	
Hybrid Systems Corp.	1-164-1-170, 1-890, 2-1496, 2-1497	Janco Corp.	1-2088-1-2091	Mauratron Inc.	1-1312, 1-1313	Oaktron Inds. Inc.	1-26, 1-27
I		Johanson Mfg. Corp.	2-204	Maxi-Switch Co.	1-2262-1-2265	Ohio Semitronics Inc.	1-782, 1-783, 1-1848, 1-1849, 1-2344-1-2346
ICI Midwec (see Midwec Div.)		Johanson/Monolithic Dielectrics Div. 2-205		McCoy Electronics Co.	1-367-1-382	Ohmite Mfg. Co.	1-1799, 1-2266, 2-1508-2-1515, 2-1673-2-1675, 2-1777
IEE/Shadow Inc.	1-2066-1-2073	Johnson Co., E. F.	2-201-2-203, 2-707-2-712	MCL Inc.	1-910-1-925	Omega Engrg. Inc.	1-2324-1-2327
ILC Data Device Corp.	1-171	Jonard Inds.	2-1706-2-1709	McLean Engrg. Labs. 1-499-1-503, 1-975		Omni Spectra, Inc.	2-724, 2-725
Illinois Capacitor Sls. Co.	2-191	K		Memcor Div. (see E-Systems/Memcor)		Omtronics Mfg. Inc.	2-1516-2-1525
Illuminated Products Inc. 1-2062-1-2065, 2-1154-2-1158		Kappa Networks, Inc.	1-461-1-464	MF Electronics Corp.	1-384-1-387	Opamp Labs., Inc.	1-10, 1-11
IMC Magnetics Corp., Eastern Div. 1-494-1-497, 1-964, 1-965		Kay Elemetrics Corp.	1-746-1-749	MFE Corp.	1-179-1-181, 1-876-1-879, 1-1016	Optima Enclosures, Div. Scientific Atlanta	1-78, 1-79
IMC Magnetics Corp., New Hampshire Div.	1-496, 1-497	Kepco, Inc.	1-1239-1-1301 plus Back Cover Vol. I	Micrite Metal Mfg. Inc.	2-1236-2-1239	Otto Controls, Div. Otto Eng. Inc. 1-1545, 1-2267	
Industrial Control Co.	1-1916, 1-1917	Kessler-Ellis Prods.	1-254-1-259	Micro-Circuits Co. Inc.	2-342, 2-343	Ovenaire, Div. Walter Kidde ..	1-400-1-403
Industrial Devices	2-1168-2-1171	Keystone Carbon Co., Thermistor Div.	1-2317, 1-2318	Micro Switch, Div. Honeywell Inc. 1-2101-1-2260		P	
Industrial Electronic Engineers, Inc. 2-1160-2-1167		Keystone Electronics	2-713-2-715	Microtran Co. Inc.	2-1756-2-1769	Pamotor Inc.	1-504-1-507
Industrial Test Equipment Co. 1-729, 1-1235		K.G.S. Electronics 1-1238, 2-1752-2-1754		Mid-Eastern Inds., Div. of Eanco Inc. 1-1315-1-1318		Panduit Corp.	2-2048-2-2051
Infodex Inc.	1-730-1-733	Kilovac Corp.	1-1740-1-1748	Midwec, Div. Independent Cable 2-187-2-190		Perfection Mica Co., Magnetic Shield Div.	2-1255-2-1257, 2-2055
Info-Lite Corp.	1-2076, 2-1159	Kilovolt Corp.	1-1302-1-1305	MIL Electronics	1-1319-1-1324	Philamon Data Inc.	1-190-1-193
Ingersoll Prods., Div. Borg-Warner Corp.	1-72, 1-73	Kratos	1-177, 1-253, 1-750, 1-751	Millen Mfg. Co., James	2-1240-2-1253	Pico Electronics	2-1778-2-1783
Inland Motor Div., Kollmorgen Corp. 1-966-1-969		KRL Electronics, Inc.	2-1498, 2-1499	Milwaukee Resistor Corp. 1-1017, 2-1500, 2-1501		Piezo Technology, Inc.	1-406, 1-407
Instruments for Industry, Inc. 1-734, 1-735		Krohn-Hite Corp.	1-569, 1-753-1-755	Minelco, Div. Gen. Time	2-1672	Pittman Corp., The	1-976, 1-977
Instrument Specialties Co. (Sticky Fingers)	2-1226-2-1229	Krystinel Corp.	2-1234, 2-1235	Mini-Circuits Lab.	2-1288-2-1387	Plessey Electro-Products	1-267
Integrated Circuits Inc.	1-891, 1-1236	Kurz-Kasch Inc.	2-1104	Mini-Systems Inc.	2-1502, 2-1503	Polarad Electronics Inst.	1-784, 1-785
Inter-Computer Electronics, sub. American Electronic Laboratories, Inc.	1-172, 1-173	L		Modutec Inc.	1-773-1-779, 1-2319	Pomona Electronics	2-727-2-787
Interelectronics Corp.	1-1237	La Marche Mfg. Co.	1-1308, 1-1309	Monitor Prods.	1-388-1-397	Positronic Inds., Inc.	2-788, 2-789
Interface Engineering Inc.	1-174, 1-175	Lambda Electronics Corp. 1-1310, 1-1311		Motorola Inc., Component Prods. Dept.	1-398	Potter Co., The 1-570, 1-571, 2-230, 2-231	
Interlok	1-74-1-77, 2-1084-2-1086	Landis & Gyr (see Sodeco Div.)		Moxon Inc.	1-752, 1-2343	Potter & Brumfield, Div. AMF	1-1803
Inter-Market Inc.	2-1173	Larson Instr. Co. Inc.	1-756, 1-757	MRC Alarm Systems & Devices	1-1017	Power Designs Inc.	1-1418-1-1425
International Comps. Corp.	2-192, 2-193	Leach Corp.	1-1749-1-1755	Mueller Electric Co.	2-718, 2-719	Power Inc., Marketing Div. 1-1339, 1-1340	
International Crystal Mfg. Co., Inc. 1-362-1-366, 1-738		Lear Siegler, Electronic Instr. Div. 2-716, 2-717		Multimetrics (See Comstron-SEG Multimetrics)		Power/Mate Corp.	1-1341-1-1412 plus Inside Cover Spread Vol. I
		Ledex Inc.	1-262, 1-263, 1-970, 1-1756-1-1759, 2-1092-2-1096	Murata Corp. of America	2-211	Power Monolithics	1-1845, 1-1846
		Leecraft Mfg. Inc.	2-1182, 2-1183			Power One	1-1414-1-1417
		LH Research, Inc.	1-1306, 1-1307	N		Power Technology, Inc.	1-119, 1-1338
		Liberty Controls Inc.	1-1760-1-1765	NEC America Inc., Nippon Electric Corp.	1-2261, 2-1184	Powertec Inc.	1-1426, 1-1427
		Lineac Corp.	1-2097	NEC Microsystems, Div. of North Electric	1-892		
				NES Inc.	1-182, 1-183		
				NJE Corp.	1-1326-1-1331		

INDEX OF MANUFACTURERS' CATALOG PAGES

Mfr.	Vol.-Page	Mfr.	Vol.-Page	Mfr.	Vol.-Page	Mfr.	Vol.-Page
PPM, Inc., Sub. of Torq	1-201, 1-786	Scientific Columbus	1-2348, 1-2349	T		Unitron Inc.	1-1516-1-1523, 1-1513
Precision Mechanism Corp.	1-200, 1-1919	Scientific Communications	1-926, 1-927, 2-1391	T-Bar Inc.	1-814, 1-1817, 2-2296, 1-2297	Universal Volttronics Corp.	1-1524-1-1527
Precision Monolithics Inc.	1-893-1-899	Seacor Inc.	1-2270, 1-2271, 2-238, 2-239	Tapeswitch Corp. of America	1-2300	USCC/Centralab	1-594, 1-595, 2-320-2-327
Precision Timer Co., Inc.	1-268, 1-269	Sealeator Corp.	1-206, 1-207, 1-2269, 2-800-2-811	Taurus Corp.	1-71, 1-219	Utah Electronic	1-31-1-43
Premier Metal Prods. Co., Div.		SEG, Sub. Comstron Corp.	1-544, 1-545, 1-638, 1-639	Tec, Inc.	2-1201-2-1204	V	
Sunshine Mining Co.	1-80-1-91	Semiconductor Circuits Inc.	1-1444-1-1459	Tech Labs. Inc.	1-2298, 1-2299	Vaco Products Co.	2-1056, 2-1057, 2-1714-2-1717
Preston Scientific Inc.	1-12, 1-13, 1-194-1-199	Semtech Corp.	1-1856-1-1857	Technipower Inc.	1-1478, 1-1479	Vactec Inc.	1-1022, 1-1023
Primo Co. Ltd.	1-30	Servo-Tek Prods.	1-980, 1-981	Technitrol Inc.	1-466, 1-467, 2-1810, 2-1811	Varadyne Industries, Inc.	2-328-2-333
Printact Relay, Div. Executone	1-1683	SGL Electronics	2-1254	Techmar Corp.	1-96, 1-97	Varflex Corp.	2-1274, 2-1275
Projects Unlimited	1-270, 1-271	SGL Homalite	2-1254	Tecnetics, Inc.	1-1491-1-1496	Vari-L Co.	1-600, 2-441-2-443, 2-1392-2-1407, 2-1831-2-1833
Promenco Inc.	1-1847, 2-1784	SGL Printed Circuits	2-356	TEK-Waves, Inc.	(see Frequency Electronics)	Varo Inc., Electrokinetics Div.	1-278, 1-1532
Pyrofilm Resistor Co.	2-1526-2-1528	SGL Waber	2-356	Tekelec Inc.	1-815, 2-1205	Varo Inc., Electron Devices	1-2360
Q		Shallco Inc.	1-28, 1-29, 1-2272-1-2275, 2-1543	Tel Labs Inc.	2-1688-2-1691	Varo Semiconductor	1-1881-1-1895
Q-Tech Corp.	1-408, 1-409	Sheldahl Co., GT/Electrical Prods. Div.	2-355	Telecommunications Inds. Inc.	1-2301	Vector Electronic Co.	1-100-1-103, 2-358-2-363, 2-1058-2-1061
Qualco	2-790, 2-791	Sheller-Globe Corp., Electro-Mechanical, Instr. Div.	1-668, 1-669	Tele Dynamics/Wanlass, Div. AMBAC	1-1480-1-1489	Vectron Labs., Inc.	1-420, 1-421
Quan-Tech, Div. Scientific Atlanta	1-787-1-790	Shelly Associates	2-1186-2-1189	Teledyne Geotech	1-470	Veeder-Root	1-274, 1-275
R		Shigoto Inds. Ltd.	2-2176, 2-2060	Teledyne Philbrick	1-208-1-217	Veetronix Inc.	1-2307
Raytheon Dist. Prods. Oper.	1-2283-1-2285, 2-1105-2-1113	Siemens Comp. Group	1-1858-1-1862	Teledyne Relays	1-1818-1-1824	Vega Precision	1-928
RBM Controls (see Essex Controls Div.)		Sierracin/Magnedyn Inc.	1-982, 1-983	Teletale	1-1017	Vent-Rak, Div. General Devices	1-67-1-70
RCL/Data (see Re-el Circuits)		Signal Transformer Co., Inc.	2-1791-2-1802	Texas Instruments Connector Systems	2-1032, 2-1033	Venus Scientific	1-1024, 1-1025, 1-1534, 1-1535
RCL Electronics/AMF	1-454-1-460, 1-465	Simpson Electric	1-802-1-805	Texcan Inc.	1-816, 1-817	Vernitech, Div. of Vernitron	1-220-1-227, 1-276, 1-277, 1-999-1-1003, 1-1920-1-1923, 2-1207
1-2286-1-2294, 2-1530-2-1542		Slaughter Co.	1-806-1-809	Thermalloy Inc.	1-1874-1-1880	Vernitron Corp., Control Comp. Div.	1-1004, 1-1924
RDI/Reed Devices	2-792-2-795	Sloan Company	2-1190-2-1197	Thomas & Skinner Inc.	1-818, 1-819	Vernitron Elec. Comp., Beau Prods.	2-1062-2-1064
Rectifier Components Corp.	1-1850, 1-1851	Smith Inc., Herman H.	2-812-2-894	3M Co., Elect. Prods. Div.	2-1034-2-1055	Vernitron Piezoelectric Div.	1-596-1-599
Re-el Circuits Inc.	1-123, 1-204	Sodeco, Div. Landis & Gyr	1-260, 1-261	TMC Systems (Ariz.) Inc.	1-418, 1-419	Vero Electronics, Inc.	2-364-2-366
Reeves-Hoffman, Div. DCA	1-410, 1-411	Solid State Devices Inc.	1-1864, 1-1865	Todd Products Corp.	1-1497-1-1502	Victor Wire & Cable Corp.	2-2066, 2-2067
Refac Electronics/Pinlites	2-1185	Solid State Electronics Corp.	1-126, 1-1816	Todd Systems	2-1812-2-1815	Victoreen Inst. Div.	1-2358, 1-2359, 2-1065, 2-1572-2-1581
Refac Electronics/Wild Rover	1-2268	Sorenson Co.	1-1433-1-1442	Topaz Electronics	1-592, 1-593, 1-1503-1-1506, 2-1816, 2-1817	Virginia Panel Corp.	2-1067
Regdon Corp.	1-1804, 1-1805	Sorenson Lighted Controls	2-1198, 2-1199	Torin Corp.	1-508-1-515	Vishay Intertechnology	2-1687
Regmo Data Corp.	1-272, 2-344	Southern Electronics	2-240, 2-241	Torotel Inc.	1-417, 2-430-2-439, 2-1819-2-1821	Vishay Resistive Sys. Group	2-1571, 2-1687
REI Sales Co.	1-796, 1-797	Spemco Specialties Mfg. Co.	1-2277	Torq PPM Inc.	1-201	Vu-Data Corp.	1-848-1-850
Reliability Inc.	1-1428, 1-1429	Spectra Strip Corp.	2-2056, 2-2057	Torque Systems Inc.	1-992-1-997	W	
Renco Corp.	1-202, 1-203	Spectrol Electronics Corp.	2-1676-2-1681	Torwico Electronics, Inc.	2-1818	Wabash Relay & Electronics	1-1825-1-1836
Rental Electronics	1-792-1-795	Spectronics Inc.	1-1021	Transmagnetics	1-124, 1-125	Waber Electric (see SGL Waber)	
Republic Electronics Corp.	2-232, 2-233	Spectrum Control Inc.	1-576-1-583	Transtector Systems	1-2302, 1-2303	Wagner Electric, Tung-Sol Div.	2-1208, 2-1209, 2-1582
Resistors Inc.	2-1544, 2-1545	Spellman High Voltage Elect.	1-1460-1-1471	Triad-Utrad (Litton)	2-1822-2-1829	Waldom Electronics Inc.	1-104, 1-105, 2-1068-2-1074, 2-1262-2-1266
RF Interonics	1-572, 1-573	Sprague Products Co.	1-585-1-587, 1-810, 1-811, 1-1866-1-1872, 1-2282, 2-242-2-301, 2-1546, 2-1547, 2-1790	Trim Inc.	2-895	Wall Lenk Mfg. Co.	2-1718, 2-1719
RFL Inds.	1-122, 1-791, 1-2328, 1-2329	Square D Co.	1-1273, 1-1814, 1-1815	Triplett Corp.	1-820-1-847 plus Inside Back Cover Spread Vol. I	Wavetek Indiana	1-852-1-855
RHG Electronics Labs.	2-1389	Staco Inc.	2-1808, 2-1809	TRW Capacitor	2-302-2-314	Wavetek San Diego	1-856-1-859
RO Associates	1-1430, 1-1431	Stacoswitch, Inc.	2-1114, 2-1115	TRW Cinch Connectors	2-896-2-1031	Wertronix	1-998
Rockland Sys. Corp.	1-416, 1-574, 1-798, 1-799	Stackpole Comp. Co.	1-2278-1-2281	TRW Cinch Graphik	2-357	Wesco Electrical Co.	2-334-2-337
RomarNetics Inc.	1-979, 2-422, 2-423, 2-1785	Standard Controls	1-2347	TRW/Globe Motor	1-988-1-991	Weston Instrument	2-1116-2-1120
Ross Engineering Corp.	1-1806, 1-1807	Standard Power Inc.	1-1472-1-1475	TRW, IRC Potentiometers	2-1682-2-1686	Westinghouse Elec. Corp.	1-1896-1-1909
Rotating Components	1-979	Standard Wire & Cable	2-2058, 2-2059	TRW Holyoke	2-2061-2-2063	Whitmore Wire & Cable	2-2072
Rotron Inc.	1-516-1-524	Stantron, Div. of Wyco Metal Prods.	1-92-1-95	TRW/IRC Resistors	2-1548-2-1570	Wilmore Electronics Co., Inc.	1-1536-1-1539
Rowe Inds. Inc.	2-796-2-798, 2-2052-2-2054	Statek Corp.	1-412-1-415	Trygon Elect.	(see Systron Donner Trygon)	Woven Electronics	2-2068-2-2071
RSM Sensitron, Semiconductor Div.	1-1852-1-1855	Staver Co., Inc.	2-1200	TT Electronics, Inc.	1-588-1-591	Y	
S		Sterling Transformer Corp.	1-575, 2-1803-2-1807	Tung-Sol (see Wagner Electric)		Yewtec Corp.	1-860-1-862, 1-875
S & EI	2-234, 2-235	Stevens Arnold Inc.	1-1476, 1-1477	U		Z	
Sanford Miller Corp.	1-1863	Superior Electric Co.	1-205, 1-984-1-987, 1-1443, 1-1546, 2-799, 2-1786-2-1789	UID Electronics, Div. AMF	1-2306	Zero Mfg. Co.	1-106-1-109
Sangamo Electric Co., Capacitor Div.	2-236, 2-237	Syston-Donner Corp.	1-812, 1-813	Unholtz-Dickie Corp.	1-471, 1-851		
Sangamo Electric Co., Data Sys. Div.	1-800, 1-801	Systron Donner Trygon		Uniform Tubes	2-2064, 2-2065		
Schlumberger (see Heath Co.)		Systron Donner Trygon Electronics Sub.	1-1507-1-1512	Unimax Switch, Sub. Riker Maxson	1-2304, 1-2305		
Schrack Electrical Sis. Corp.	1-1808-1-1813	Syntronic Instruments Inc.	2-424-2-429	Union Carbide, Battery Prods. Div.	1-1514, 1-1515		
				Union Carbide Corp., Comp. Dept.	2-316-2-319		
				Unitrack Div., Calabro Plastics	1-98, 1-99		

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



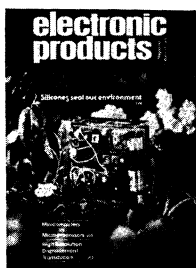
electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
845 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

**Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530**



electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.

18TH EDITION

EEM 75 76

PRODUCT INDEX AND DIRECTORY

The Product Index and Directory is designed to help locate manufacturers of specific types of electronic products. Products are listed alphabetically with many helpful cross references. The product categories are arranged in the following manner: general product type, specific description. For example, Microwave Generators is listed under Generators, Microwave; Solid State Lamps are found under Lamps, Solid State.

After each Product heading is an alphabetical listing of manufacturers who make that product. Those manufacturers appearing in boldface type with volume and page numbers have catalog data in the white pages of EEM. The volume number appears first, before the bullet, the page number is listed after it. Manufacturers who make the product but who may not have it listed among their catalog pages are in boldface with an asterisk. Manufacturers listed in lightface make the product but have not provided any catalog pages. Those manufacturers marketing the product through distributors have a "D" to the left of their names. Those who manufacture it to meet military specifications have an "M."

Abrasive Belts, Compounds, Cords, Powders, etc.

- Carborundum Co., Niagara Falls, N.Y.** *
- D Cratex Rubberized Abrasives, Burlingame, Cal.
- E.I. DuPont de Nemours & Co., Wilmington, Del.
- P. R. Hoffman Co., Carlisle, Pa.
- SGL Abrasives, Carlisle, Pa.
- Union Carbide Corp., New York, N.Y.

Accelerometers—See Volume 1

Actuators, Servo, Linear—See Volume 1

Actuators, Servo, Rotary—See Volume 1

Adapters—See Connector Adapters, Plug Adapters; Socket Adapters; Etc.

Adapters, Panoramic—See Volume 1

Adapters, Waveguide

- Arra Inc., Bay Shore, N.Y.** p. 2•1278,1279
- Bendix Corp., The, Sidney, N.Y.** p. 2•642
- MAmphenol RF Div., Danbury, Conn.** *
- Syston-Donner Microwave Div., Van Nuys, Cal.** *
- Aircom, Union, N.H.
- Alford Mfg. Co., Winchester, Mass.
- American Microwave Inds., Waltham, Mass.
- Coax Devices Inc., Chelsea, Mass.
- Maury Microwave Corp., Cucamonga, Calif.
- M Microlab/FXR, Livingston, N.J.
- Microwave Assocs., Burlington, Mass.
- D Microwave Development Labs., Needham Hgts., Mass.
- Narda Microwave Corp., Plainview, N.Y.
- M Norsal Industries, Brentwood, N.Y.
- D PRD Elctns., Syosset, N.Y.
- M Premier Microwave, Port Chester, N.Y.
- Reeve Electronics, Chicago, Ill.
- R L C Elctns., Mt. Kisco, N.Y.
- Sivers Lab, Corona del Mar, Cal.
- TRG., Woburn, Mass.
- Tucker Electronics Co., Garland, Tex.
- Varian Electron Tube & Device Grp., San Carlos, Cal.
- Waveline, W. Caldwell, N.J.

Adhesives (All Types)

- D GC Electronics, Rockford, Ill. p. 2•341

- SGL Homalite, Wilmington, Del.** p. 2•1254
- D Spectra-Strip Corp., Garden Grove, Cal.** p. 2•2057

- D Thermalloy, Dallas, Tex** p. 1•1877
- D Waldom Electronics, Chicago, Ill.** *

- Ablestik Laboratories, Gardena, Cal.
- Allaco Prods Div., Watertown, Mass.
- DM Allen Mfg. Co., Hartford, Conn.
- Ambroid Co., Brockton, Mass.
- D Aremcro Prods., Ossining, N.Y.
- M Armstrong Cork Co., Lancaster, Pa.
- Bacon Inds., Watertown, Mass.
- Cal-Metex Corp., Inglewood, Cal.
- D Chemtronics, Hauppauge, N.Y.
- Chomerics, Woburn, Mass.
- DM Conap, Allegany, N.Y.
- Cox & Co., New York, N.Y.
- D Dolph, John C. Co., Monmouth Junction, N.J.
- DM Dynaloy, Hanover, N.J.
- Eastman Chem. Prods., Kingsport, Tenn.
- Edmund Scientific Co., Barrington, N.J.
- E.I. DuPont de Nemours & Co., Wilmington, Del.
- Electro Mats. Corp. Amer., Mamaroneck, N.Y.
- D Electro-Science Labs., Pennsauken, N. J.
- Emerson & Cuming, Canton, Mass.
- Epoxy Technology, Watertown, Mass.
- Fenwal, Ashland, Mass.
- Formulated Resins Inc., Greenville, R.I.
- General Elec., Schenectady, N.Y.
- D General Elec. Co., Watford, N.Y.
- M Hardman Inc., Belleville, N.J.
- Hightemp Resins, Stamford, Conn.
- M Isochem Resins Co., Lincoln, R.I.
- Leepoxy Plastics, Ft. Wayne, Ind.
- M MacDonald & Co., Glendale, Calif.
- Mann, Henry Inc., Huntingdon Valley, Pa.
- DM Metex Corp., Edison, N.J.
- D Miller-Stephenson Chem. Co., Danbury, Conn.
- DM Oneida Electronics Mfg., Meadville, Pa.
- Packaged Resins Div., Watertown, Mass.
- Philadelphia Quartz Co., Valley Forge, Pa.
- D Randolph Prods. Co., Carlstadt, N.J.
- SermeTel Teleflex Inc., Limerick, Pa.
- SWS Silicones, Adrian, Mich.
- D Techni-Tool, Plymouth Meeting, Pa.
- 3M Co., St. Paul, Minn.
- Tra-Con, Medford, Mass.
- D Uniroyal, New York, N.Y.

- M Vigor Co., New York, N.Y.
- D Wakefield Engrg., Wakefield, Mass.
- D Workman Electronic Prods., Sarasota, Fla.

Air Cleaners & Filters (Shielded & Unshielded)—See Volume 1

Air Conditioners (For Equipment)—See Volume 1

Alarms & Alarm Systems—See Volume 1

Alarms, Controls, Photoelectric—See Volume 1

Alloys, Brazing

- D Alpha Metals, Jersey City, N.J.
- D The Anaconda Company Brass Division, Waterbury, Conn.
- Atomerig Chemetals Co., Carle Place, N.Y.
- Chemetron Corp., Chicago, Ill.
- Engelhard Minerals & Chem., Murray Hill, N.J.
- Gliddon Metals, Cleveland, Ohio
- Handy & Harman, New York, N.Y.
- M Kawecki Berylico Inds., New York, NY
- Plessey Inc., Melville, N.Y.
- Westinghouse Elec., Sykesville, Md.
- Wilkinson Co., Westlake Village, Cal.

Alloys, Metal - Ceramic

- MAd-Vance Magnetics, Rochester, Ind.** p. 2•1210
- Inter-Tech. Grp., Irvington-on-Hudson, N.Y.** ... *
- Alpha Metals, Jersey City, N.J.
- D Aremcro Prods., Ossining, N.Y.
- Atomerig Chemetals Co., Carle Place, N.Y.
- M Bram Metallurgical-Chem. Co., Phila., Pa.
- Engelhard Minerals & Chem., Murray Hill, N.J.
- GTE Sylvania, Towanda, Pa.
- GTE Sylvania Inc., Newark, N.J.
- M Kawecki Berylico Inds., New York, NY
- Leico Inds., New York, N.Y.
- M Magnetics, Butler, Pa.
- Materials Resch. Corp., Orangeburg, N.Y.
- National Beryllia Corp., Haskell, N.J.
- Plessey Inc., Melville, N.Y.
- Plessey Ceramic Div., Frenchtown, N.J.
- M Reynolds Metals Co., Richmond, VA.
- Tech Materials Inc., Lincoln, R.I.
- Union Carbide Corp., New York, N.Y.

D United Mineral & Chem. Corp., New York, N.Y.
United Refining & Smelting Co., Franklin Park, Ill.

Alphanumeric Readouts—See Display
Devices & Displays; Tubes, Readout

Alternators—See Volume 1

Aluminizers, Vacuum—See Volume 1

Amplifiers, A-F—See Volume 1

Amplifiers, Antenna—See Volume 1

Amplifiers, Charge—See Volume 1

Amplifiers, Compressor—See Volume 1

Amplifiers, Current—See Volume 1

Amplifiers, Data—See Volume 1

Amplifiers, D-C—See Volume 1

Amplifiers, Decade—See Volume 1

Amplifiers, Deflection—See Volume 1

Amplifiers, Delay Line—See Volume 1

Amplifiers, Differential—See Volume 1

Amplifiers, Distributed—See Volume 1

Amplifiers, Distribution—See Volume 1

Amplifiers, Equalization—See Volume 1

Amplifiers, I-F—See Volume 1

Amplifiers, Instrumentation—See
Volume 1

Amplifiers, Integrating—See Volume 1

Amplifiers, Isolation—See Volume 1

Amplifiers, Keying—See Volume 1

Amplifiers, Klystron—See Volume 1

Amplifiers, Limiting—See Volume 1

Amplifiers, Line—See Volume 1

Amplifiers, Lock-In—See Volume 1

Amplifiers, Logarithmic—See Volume 1

Amplifiers, Magnetic—See Volume 1

Amplifiers, Master Antenna—See
Volume 1

Amplifiers, Microphone—See Volume 1

Amplifiers, Microwave—See Volume 1

Amplifiers, Mixing—See Volume 1

Amplifiers, Narrow-Band—See Volume 1

Amplifiers, Null—See Volume 1

Amplifiers, Operational—See Volume 1

Amplifiers, Parametric—See Volume 1

Amplifiers, Peak-Limiting—See Volume 1

Amplifiers, Phase-Lock Loop—See
Volume 1

Amplifiers, Photocell—See Volume 1

Amplifiers, Power—See Volume 1

Amplifiers, Public Address—See Volume 1

Amplifiers, Pulse—See Volume 1

Amplifiers, Pulse-Limiting—See Volume 1

Amplifiers, Radar—See Volume 1

Amplifiers, Recording—See Volume 1

Amplifiers, Resolver—See Volume 1

Amplifiers, R-F—See Volume 1

Amplifiers, Sample & Hold—See Volume 1

Amplifiers, Servo—See Volume 1

Amplifiers, Single-Sideband—See
Volume 1

Amplifiers, Standing Wave—See
Volume 1

Amplifiers, Strain Gauge—See Volume 1

Amplifiers, Sweep—See Volume 1

Amplifiers, Synchro—See Volume 1

Amplifiers, Telemetry—See Volume 1

Amplifiers, Thermocouple—See Volume 1

Amplifiers, Thyatron—See Volume 1

**Amplifiers, Transducer-Also See Signal
Conditioners**—See Volume 1

Amplifiers, Traveling-Wave Tube—See
Volume 1

Amplifiers, Tunnel Diode—See Volume 1

Amplifiers, Ultrasonic—See Volume 1

Amplifiers, Vibration Pickup—See
Volume 1

Amplifiers, Video—See Volume 1

Amplifiers, Voltage Reference—See
Volume 1

Amplifiers, Wideband—See Volume 1

Analyzers, A-F—See Volume 1

Analyzers, Antenna Pattern—See
Volume 1

Analyzers, Coincidence—See Volume 1

Analyzers, Differential—See Volume 1

Analyzers, Dispersion—See Volume 1

Analyzers, Distortion—See Volume 1

Analyzers, Engine (Gas & Diesel)—See
Volume 1

Analyzers, Frequency—See Volume 1

Analyzers, Frequency Stability—See
Volume 1

Analyzers, Gas—See Volume 1

Analyzers, Harmonic—See Volume 1

Analyzers, Interference—See Volume 1

Analyzers, Intermodulation—See
Volume 1

Analyzers, Logic—See Volume 1

Analyzers, Magnetic—See Volume 1

Analyzers, Microwave—See Volume 1

Analyzers, Network—See Volume 1

Analyzers, Noise—See Volume 1

Analyzers, Phase & Voltage—See
Volume 1

**Analyzers, Probability Density,
Distribution**—See Volume 1

Analyzers, Pulse—See Volume 1

Analyzers, Radar—See Volume 1

Analyzers, SCR—See Volume 1

Analyzers, Servo—See Volume 1

Analyzers, Single-Sideband—See
Volume 1

Analyzers, Sonic & Subsonic—See
Volume 1

**Analyzers, Spectrum (Including
Oscilloscopes With Plug-Ins)**—See
Volume 1

Analyzers, Telemetric Data—See
Volume 1

Analyzers, Transfer Function—See
Volume 1

Analyzers, Ultrasonic—See Volume 1

Analyzers, Vibration—See Volume 1

Analyzers, Video—See Volume 1

Analyzers, Waveform—See Volume 1

Annunciators—See Volume 1

Antenna Dummy Loads—See Dummy
Loads

Antenna Feed Systems

DM Sealectro Corp., Mamaroneck, N.Y.

p. 2-807-809

D Millen Mfg. Co. Inc., James, Malden, Mass. *

Syston-Donner Microwave Div., Van Nuys,
Cal. *

M Adams-Russell Co., Waltham, Mass.

AEL, Colmar, Pa.

M Airtro, Morris Plains, N.J.

DM Anaren Microwave, Syracuse, N.Y.

Andrew Antenna Co. Ltd., Whitby, Ont., Can.

D Aixter-Mark, Skokie, Ill.

Antenna Research Associates, Beltsville, Md.

Cablewave Systems Inc., North Haven, Conn.

M Cubic Corp., San Diego, Cal.

D Cush Craft Corp., Manchester, N.H.

Datron Systems, Chatsworth, Cal.

Dynalab Corp., Van Nuys, Cal.

M E-Systems Inc., Dallas, Tex.

D Finney Co., Bedford, Ohio

Gabriel Elctns. Inc., Scarborough, Me.

GTE Lenkurt Inc., San Carlos, Calif.

GTE Sylvania Inc., Washington, D.C.

Hughes Aircraft Co., Culver City, Cal.

D Jerrold Electronics Corp., Horsham, Pa.

M Lorch Elctns. Corp., Englewood, N.J.

M Lorch Devices Inc., Englewood, N.J.

Maury Microwave Corp., Cucamonga, Calif.

M Nurad, Baltimore, Md.

M Premier Microwave, Port Chester, N.Y.

D Rantec Div., Calabasas, Calif.

M Sanders Associates, Nashua, N.H.

Sierra Elec., Gardena, Calif.

Tasker Systems, Chatsworth, Cal.

M Teledyne Micronetics, San Diego, Calif.

M Transco Prods., Venice, Cal.

D TRG., Woburn, Mass.

Antenna Rotators—See Volume 1

Antenna Switching Matrices—See
Volume 1

Antenna Towers & Supports—See
Volume 1

Antennas, Airborne—See Volume 1

Antennas, Direction Finding—See
Volume 1

Antennas, Ground Plane—See Volume 1

Antennas, Helical—See Volume 1

Antennas, Log-Periodic—See Volume 1

Antennas, Loop—See Volume 1

Antennas, Microwave—See Volume 1

Antennas, Phased Array—See Volume 1

Antennas, Rhombic—See Volume 1

Antennas, Spiral—See Volume 1

Antennas, Telemetry, Tracking—See
Volume 1

Antennas, Telescopic—See Volume 1

**Antennas, Whip & Accessories
(Including Marine & Mobile Types)**—
See Volume 1

Armatures—See Volume 1

Arms, Phono, Transcription—See
Volume 1

Arresters, Electrical Surge-Also See Suppressors, Arc; Protectors, Surge—
See Volume 1

Arresters, Lightning—See Volume 1

Attenuators, Audio—See Volume 1

Attenuators, Coaxial

- Applied Research Inc., Port Washington, N.Y. p. 2-1276,1277
 Arra Inc., Bay Shore, N.Y. p. 2-1278,1279
 Bird Electronic Corp., Solon, Ohio p. 1-619
 M Daico Industries Inc., Compton, Cal. p. 2-1284
 M General Microwave Corp., Farmingdale, NY p. 1-718
 Hope Elctns., Clifton, N.J. p. 2-1287
 Matrix Systems Corp., Chatsworth, Cal. p. 1-1800-1802
 D McGraw-Edison Co., Manchester, N.H. p. 1-661
 Mini-Circuits Lab., Brooklyn, N.Y. p. 2-1291
 D Omni Spectra, Farmington, Mich. p. 2-724
 D Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528
 D Sealectro Corp., Mamaroneck, N.Y. p. 2-811
 D Texscan Corp., Indianapolis, Ind. p. 1-817
 Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1571
 Wavetek, San Diego, Cal p. 1-852-859
 General Radio Co., Concord, Mass. p. 2-680,681
 Key Elemetrics Corp., Pine Brook, N.J. p. 2-680,681
 Systron-Donner Microwave Div., Van Nuys, Cal. p. 2-680,681
 AEL, Colmar, Pa.
 D Ailtech, Farmingdale, N.Y.
 Alan Industries Inc., Columbus, Ind.
 D Altec Div., Anaheim, Calif.
 American Microwave Inds., Waltham, Mass.
 D Astrolab, Rahway, N.J.
 Ava Elctns., Landsdowne, Pa.
 D Blonder-Tongue Labs., Old Bridge, N.J.
 D Channel Master Div. Avnet, Ellenville, N.Y.
 Coax Devices Inc., Chelsea, Mass.
 Delta-Benco-Cascade LTD., Rexdale, Ont. Can. M9W 1G1
 E-H Resch. Labs., Oakland, Cal.
 Elcom Systems, Deer Pk., N.Y.
 Engelmann Microwave, Montville, N.J.
 M GHZ Devices, So. Chelmsford, Mass.
 D Jerrold Electronics Corp., Horsham, Pa.
 DM Kings Electronics, Tuckahoe, N.Y.
 Maury Microwave Corp., Cucamonga, Calif.
 Metavac, Flushing, N.Y.
 M Microlab/FXR, Livingston, N.J.
 Microwave Assocs., Burlington, Mass.
 Mu-Del Elctns., Silver Spring, Md.
 Narda Microwave Corp., Plainview, N.Y.
 M Norsal Industries, Brentwood, N.Y.
 M Nurad, Baltimore, Md.
 D PRD Elctns., Syosset, N.Y.
 M Premier Microwave, Port Chester, N.Y.
 R L C Elctns., Mt. Kisco, N.Y.
 Rhode & Schwarz Sls., Fairfield, N.J.
 Special Microwave Devices Oper., Waltham, Mass.
 Telonic Altair, Laguna Beach, Calif.
 M Transco Prods., Venice, Cal.
 Trompeter Electronics, Chatsworth, Cal.
 Universal Ad-Yu Elctns., Milwaukee, Wisc.
 Waveline, W. Caldwell, N.J.
 Weinschel Engrg. Co., Gaithersburg, Md.
- Attenuators, Decade—**See Volume 1
- Attenuators, Fixed—**See Volume 1
- Attenuators, I-F—**See Volume 1
- Attenuators, Impedance Matching—**See Volume 1
- Attenuators, Logarithmic—**See Volume 1
- Attenuators, Microwave**
 Applied Research Inc., Port Washington, N.Y. p. 2-1276,1277
 Arra Inc., Bay Shore, N.Y. p. 2-1278,1279
 Bird Electronic Corp., Solon, Ohio p. 1-619
 M Daico Industries Inc., Compton, Cal. p. 2-1284
 M Electro Impulse, Red Bank, N.J. p. 1-492,662-666
 M General Microwave Corp., Farmingdale, NY p. 1-718
 D Omni Spectra, Farmington, Mich. p. 2-724
 D Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528
 D Texscan Corp., Indianapolis, Ind. p. 1-817
 Vari-L Co., Denver, Colo. p. 2-1407

- Wavetek, San Diego, Cal p. 1-852-859
 General Radio Co., Concord, Mass. p. 2-680,681
 Key Elemetrics Corp., Pine Brook, N.J. p. 2-680,681
 Systron-Donner Microwave Div., Van Nuys, Cal. p. 2-680,681
 AEL, Colmar, Pa.
 Aircor, Union, N.H.
 M Airtron, Morris Plains, N.J.
 Alpha Instr. Inc., Woburn, Mass.
 American Microwave Inds., Waltham, Mass.
 DM Anaren Microwave, Syracuse, N.Y.
 D Astrolab, Rahway, N.J.
 M AUL Instrs., Flushing, N.Y.
 M Cir-Q-Tel, Kensington, Md.
 Coax Devices Inc., Chelsea, Mass.
 Elcom Systems, Deer Pk., N.Y.
 Electronautics, Littleton, Mass.
 Engelmann Microwave, Montville, N.J.
 M Environmental Communications Inc., Costa Mesa, Cal.
 M GHZ Devices, So. Chelmsford, Mass.
 Hewlett-Packard Co., Palo Alto, Cal.
 Hughes Aircraft Co., Culver City, Cal.
 DM Kings Electronics, Tuckahoe, N.Y.
 M Lorch Devices Inc., Englewood, N.J.
 M LRC Inc., Hudson, N.H.
 Maury Microwave Corp., Cucamonga, Calif.
 M Merrimac Inds., West Caldwell, N.J.
 Metavac, Flushing, N.Y.
 M Microlab/FXR, Livingston, N.J.
 Microwave Assocs., Burlington, Mass.
 D Microwave Development Labs., Needham Hgts., Mass.
 Mu-Del Elctns., Silver Spring, Md.
 Narda Microwave Corp., Plainview, N.Y.
 M Norsal Industries, Brentwood, N.Y.
 D PRD Elctns., Syosset, N.Y.
 M Premier Microwave, Port Chester, N.Y.
 Reeve Electronics, Chicago, Ill.
 R L C Elctns., Mt. Kisco, N.Y.
 Rhode & Schwarz Sls., Fairfield, N.J.
 Sivers Lab, Corona del Mar, Cal.
 M Somerset Radiation Lab., Arlington, Va.
 M Technical Research & Mfg., Manchester, N.H.
 Telonic Altair, Laguna Beach, Calif.
 M Transco Prods., Venice, Cal.
 D TRG., Woburn, Mass.
 Tucker Electronics Co., Garland, Tex.
 Varian Assocs., Palo Alto, Cal.
 Varian Electron Tube & Device Grp., San Carlos, Cal.
 Varian Palo Alto Microwave Tube Div., Palo Alto, Cal.
 Waveline, W. Caldwell, N.J.
 Weinschel Engrg. Co., Gaithersburg, Md.
 D Wiltron Co., Palo Alto, Cal.

Attenuators, Programmable—See Volume 1

Attenuators, Ratio—See Volume 1

Attenuators, R-F—See Volume 1

Attenuators, Turret—See Volume 1

Attenuators, Variable—See Volume 1

Audio Equipment—See Volume 1

Awls—See Scribes

Backpanel Interconnect Systems

- Amphenol Cadre Div., Endicott, N.Y. p. 2-460,461
 D Augat Inc., Attleboro, Mass p. 2-637
 Elctn. Molding Corp., Woonsocket, R.I. p. 2-676-679
 Elfab Corp., Addison, Tex. p. 2-680,681
 Gardner-Denver, Grand Haven, Mich. p. 1-1541
 Connector Corp., Chicago, Ill. p. 1-1541
 Data Technology, Santa Ana, Cal. p. 1-1541
 Texas Instruments, Attleboro, Mass. p. 1-1541
 D 3M Company, St. Paul, Minn. p. 1-1541
 M Adcor Electronic Packaging Corp., New York, N.Y.
 Autosplce/Dv Gen Staple, New York City, N.Y.
 M Bussco Engrg., El Segundo, Cal.
 DM Dynatech Corp., Santa Ana, Cal.
 Icore Int'l., Sunnyvale, Cal.
 Methode Elctns., Chicago, Ill.
 Standard Logic Inc., Santa Ana, Cal.
 Western Electronic Systems, Palo Alto, Cal.

Baffles, Speaker—See Volume 1

Ballasts—See Resistors, Ballast

Baluns—See Transformers, Matching

Barrier Blocks & Strips—See Terminal Blocks; Terminal Strips

Bars, Shorting

- D ITT Pomona Electronics Div., Pomona, Cal. p. 2-729,730,751
 D Cambridge Thermionic Corp., Cambridge, Mass.
 Methode Elctns., Chicago, Ill.
 M Rogers Corp., Rogers, Conn.

Baths, Controlled Temperature (Air & Liquid)—See Volume 1

Baths, Ultrasonic—See Volume 1

Batteries, Carbon Zinc—See Volume 1

Batteries, Dry, Flashlight, Transistor, etc.—See Volume 1

Batteries, Gelled-Electrolyte—See Volume 1

Batteries, Lead-Acid—See Volume 1

Batteries, Lead-Dioxide—See Volume 1

Batteries, Lithium—See Volume 1

Batteries, Magnesium—See Volume 1

Batteries, Manganese Alkaline—See Volume 1

Batteries, Mercury—See Volume 1

Batteries, Nickel-Alkaline—See Volume 1

Batteries, Nickel-Cadmium—See Volume 1

Batteries, Nickel-Zinc—See Volume 1

Batteries, Photoflash—See Volume 1

Batteries, Silver-Cadmium—See Volume 1

Batteries, Silver Oxide—See Volume 1

Batteries, Silver-Zinc—See Volume 1

Batteries, Solar—See Volume 1

Batteries, Standard Cell—See Volume 1

Batteries, Storage—See Volume 1

Batteries, Transistor—See Volume 1

Batteries, Water Activated—See Volume 1

Batteries, Zinc-Air—See Volume 1

Battery Holders—See Retainers, Battery

Battery Plugs—See Connectors, Battery

Bearings

- Graphite Metallizing Corp., Yonkers, N.Y. p. 1-960
 Keystone Carbon Co., St. Marys, Pa. p. 1-2317,2318
 Shigoto Inds., Ltd., New York, N.Y. p. 1-2317,2318
 D Smith Inc., Herman H., Brooklyn, N.Y. p. 1-2317,2318
 M Sodoco Div., Elmsford, N.Y. p. 1-2317,2318
 Barden Corp., Danbury, Conn.
 D Bearing Inspection, Santa Fe Springs, Cal.
 Bird, Richard H. & Co., Waltham, Mass.
 M Bunting, Brass & Bronze Co., Toledo, Ohio
 Cadillac Plastic & Chemical, Detroit, Mich.
 D Carco Elctns., Menlo Park, Calif.
 Dixon Corp., Bristol, R.I.
 Emporium Specialties Co., Austin, Pa.
 M Lear Siegler, Santa Monica, Calif.
 MPB Corp., Keene, N.H.
 DM New Hampshire Ball Bearings, Peterborough, N.H.
 Ohio Carbon Co., Cleveland, Ohio
 Pageant/M.A. Miller Co., Chinchilla, Pa.
 M PIC Design Division, Ridgefield, Conn.
 D Pure Carbon Co., St. Marys, Pa.
 DM Raway Bearing Corp., Monsey, N.Y.
 Rogers Corp., Rogers, Conn.
 Sterling Instr., New Hyde Pk., NY
 DM Stock Drive Prods., New Hyde Pk., N.Y.
 Synthane Taylor Corp., Valley Forge, Pa.
 D Union Carbide Corp., New York, N.Y.

Bells, Buzzers, Gongs, Sirens & Aural Warning Devices—See Volume 1

Belts, Dial Drive—See Cords & Cable, Dial Drive

Benches, Consoles, Stools, Tables (Lab & Shop)-Also See Cabinets & Accessories, Metal—See Volume 1

Bends & Twists, Microwave

- Arre Inc., Bay Shore, N.Y.** p. 2-1278,1279
Syston-Donner Microwave Div., Van Nuys, Cal. *
- Aircorn, Union, N.H.
 American Microwave Inds., Waltham, Mass.
 Andrew Antenna Co. Ltd., Whitby, Ont., Can.
 M Co-Operative Inds., Chester, N.J.
 M Hughes Aircraft Co., Torrance, Cal.
 Maury Microwave Corp., Cucamonga, Calif.
 M Microlab/FXR, Livingston, N.J.
 Microwave Assocs., Burlington, Mass.
 D Microwave Development Labs., Needham Hgts., Mass.
 Narda Microwave Corp., Plainview, N.Y.
 M Premier Microwave, Port Chester, N.Y.
 Reeve Electronics, Chicago, Ill.
 Sivers Lab, Corona del Mar, Cal.
 D TRG., Woburn, Mass.
 Waveline, W. Caldwell, N.J.

Bezels, Shielded & Unshielded

- Jan Hardware Mfg. Co., Long Island City, N.Y.** p. 2-1097
- D Millen Mfg. Co. Inc., James, Malden, Mass.** p. 2-1240
- SGL Homalite, Wilmington, Del.** p. 2-1254
- M Shelly Assocs., Santa Ana, Cal.** p. 2-1189
- D Vector Electronic Co., Sylmar, Cal.** p. 1-103
- M Zero Mfg. Co., Burbank, Cal.** p. 1-106-109
- M Industrial Elctn. Engrs., Van Nuys, Cal.** *
- Staver Co., Bay Shore, N.Y.** *
- Abacus Elctns. Corp., Dobbs Ferry, N.Y.
 Cal-Metex Corp., Inglewood, Cal.
 D Drake Mfg. Co., Harwood Heights, Ill.
 Dura Plastics N.Y., Westport, Conn.
 DM Metex Corp., Edison, N.J.
 D NOBEX Div., Burlingame, Cal.
 South Shore Metal Prods., Farmingdale, N.Y.
 D Technical Wire Products, Cranford, N.J.

Bi-Metals, Thermostatic

- Inter-Tech. Grp., Irvington-on-Hudson, N.Y.** ... *
- NES, Streamwood, Ill.** *
- M Bram Metallurgical-Chem. Co., Phila., Pa.
 GTE Sylvania, Detroit, Mich.
 PSG Industries Inc., Perkasie, Pa.
 Texas Instruments, Attleboro, Mass.
 D United Mineral & Chem. Corp., New York, N.Y.

Bins, Part Storage—See Volume 1

Blowers & Fans & Accessories—See Volume 1

Boards, Circuit (Stamped without Components)

- Applied Circuits, Long Island City, N.Y.** p. 2-345
- D EECO, Santa Ana, Cal.** p. 1-2032
- D ITT Pomona Electronics Div., Pomona, Cal.** p. 2-770,771
- DM Keystone Elctns. Corp., New York, N.Y.** p. 2-713
- M SGL Printed Circuits, Wayne, N.J.** p. 2-356
- TRW/Cinch-Graphik, Elctn. Comps., City of Industry, Cal.** p. 2-896,897
- Vero Electronics, Hauppauge, N.Y.** p. 2-365
- Elctn. Molding Corp., Woonsocket, R.I.** *
- NES, Streamwood, Ill.** *
- Shigoto Inds., Ltd., New York, N.Y.** *
- Advanced Circuitry, Springfield, Mo.
 Avionics Ltd., Niagara-On-Lane, Ont., Can.
 BECO, Salem, Va.
 D Christiansen Radio Inc., Laguna Beach, Cal.
 Douglas Electronics, San Leandro, Cal.
 Dytronics Div., Leesburg, Ind.
 DM Excel Products Co., New Brunswick, N.J.
 GTE Sylvania, Muncy, Pa.
 M GTI Corporation, Pittsburgh, Pa.
 Hughes Aircraft Co., Culver City, Cal.
 Lockheed Elctns. Co., Watchung, N.J.
 Methode Elctns., Chicago, Ill.
 Metric Systems Corp., Ft. Walton Beach, Fla.
 Mid-West Metal Prods., Kansas City, Kans.
 D Power Control Corp., Pittsburgh, Pa.
 Rogers Corp., Rogers, Conn.
 Stanford Applied Engineering, Santa Clara, Cal.
 DM Techniques, Englewood, N.J.
 D Workman Electronic Prods., Sarasota, Fla.

Boards, IC—See Boards, Plug-In

Boards, Plug-In

- Applied Circuits, Long Island City, N.Y.** p. 2-345
- D Arco Electronics Inc., Great Neck, N.Y.** p. 2-619
- D EECO, Santa Ana, Cal.** p. 1-2032
- D Electro Packaging, Lowell, Mass.** p. 2-672-675
- Info-Lite Corp., Corona, N.Y.** p. 1-2076
- MLVC Inds. Inc., Flushing, N.Y.** p. 1-2010,2011,2100
- D Millen Mfg. Co. Inc., James, Malden, Mass.** p. 2-1251
- NES, Streamwood, Ill.** p. 1-182,183
- Texas Instruments, Attleboro, Mass.** p. 2-1033
- D Triad-Utrad, Huntington, Ind.** p. 2-1822-1829
- D TRW/Cinch Connectors, Elk Grove Village, Ill.** p. 2-896,897
- TRW/Cinch-Graphik, Elctn. Comps., City of Industry, Cal.** p. 2-896,897
- DM Vector Electronic Co., Sylmar, Cal.** p. 2-359-361
- D Vero Electronics, Hauppauge, N.Y.** p. 2-365
- D Augat Inc., Attleboro, Mass.** *
- DM Keystone Elctns. Corp., New York, N.Y.** *
- D Smith Inc., Herman H., Brooklyn, N.Y.** *
- M Virginia Panel Corp., Waynesboro, Va.** *
- M Adcor Electronic Packaging Corp., New York, N.Y.
 Aries Electronics, Frenchtown, N.J.
 M Ashman Industries (1966) Ltd., Greenville Dundas, Ont., Can.
 Avionics Ltd., Niagara-On-Lane, Ont., Can.
 BECO, Salem, Va.
 D Cambridge Thermionic Corp., Cambridge, Mass.
 Christiansen Radio Inc., Laguna Beach, Cal.
 Douglas Electronics, San Leandro, Cal.
 E & L Instruments, Derby, Conn.
 DM Excel Products Co., New Brunswick, N.J.
 Gary Mfg., New Brunswick, N.J.
 Hughes Aircraft Co., Culver City, Cal.
 D IFE Div., Rumford, R.I.
 Interdyne, Van Nuys, Cal.
 M Leighton Electronics, Leighton, Pa.
 Mac Panel Co., High Pt., N.C.
 Methode Elctns., Chicago, Ill.
 Mid-West Metal Prods., Kansas City, Kans.
 Mupac Corp., Brockton, Mass.
 D Robinson-Nugent, New Albany, Ind.
 DM Scanbe Canoga Industries, El Monte, Cal.
 Sensor Corp., Scottsdale, Pa.
 Standard Logic Inc., Santa Ana, Cal.
 Western Electronic Systems, Palo Alto, Cal.
 Wyle Computer Prods., El Segundo, Calif.

Boards, Printed Circuit (Additive Process Without Components)

- Hutchinson Industrial Corp., Hutchinson, Minn.** p. 1-1542,1543
- TRW/Cinch-Graphik, Elctn. Comps., City of Industry, Cal.** p. 2-896,897
- NES, Streamwood, Ill.** *
- Abacus Elctns. Corp., Dobbs Ferry, N.Y.
 Acme Model Engrg. Co., Ridgefield, N.J.
 Advanced Circuitry, Springfield, Mo.
 M Ashman Industries (1966) Ltd., Greenville Dundas, Ont., Can.
 Astrodata Inc., Anaheim, Cal.
 D Bishop Graphics, Chatsworth, Cal.
 Buckbee Mears Co., St. Paul, Minn.
 M Bureau Engraving, Minneapolis, Minn.
 M Cincinnati Elctns. Corp., Cincinnati, Ohio
 D Circuit-Stik, Torrance, Cal.
 D Electro-Science Labs., Pennsauken, N.J.
 M Electronic Support Systems, Villa Park, Ill.
 D Excel Products Co., New Brunswick, N.J.
 GTE Sylvania, Muncy, Pa.
 GTE Sylvania Inc., Waltham, Mass.
 Hughes Aircraft Co., Culver City, Cal.
 Interdyne, Van Nuys, Cal.
 Int'l. Elctn. Resch., Burbank, Cal.
 Lockheed Elctns. Co., Watchung, N.J.
 Methode Elctns., Chicago, Ill.
 North American Printed Circuit Div., Stafford, Conn.
 Nucleus Corp., Madison Hgts., Mich.
 M Photocircuits Div., Kollmorgen Corp., Glen Cove, N.Y.
 Reliance Electric Co., Cleveland, Ohio
 Scientific Scientific Components Co., Newport Beach, Cal.
 SermeTel Teleflex Inc., Limerick, Pa.
 Techniques, Englewood, N.J.

Boards, Printed Circuit (Etched Process Without Components)

- Accutronics-A Hammond Corp., Geneva, Ill.** p. 2-346
- Applied Circuits, Long Island City, N.Y.** p. 2-345

D Arco Electronics Inc., Great Neck, N.Y.

- p. 2-619
- Defiance Circuit Corp., Lawrence, Mass.** p. 2-252,253
- D EECO, Santa Ana, Cal.** p. 1-2032
- Hutchinson Industrial Corp., Hutchinson, Minn.** p. 1-1542,1543
- Re-el Circuits, Saddle Brook, N.J.** p. 1-204
- M SGL Printed Circuits, Wayne, N.J.** p. 2-356
- D Smith Inc., Herman H., Brooklyn, N.Y.** p. 2-851
- D Triad-Utrad, Huntington, Ind.** p. 2-1822-1829
- TRW/Cinch-Graphik, Elctn. Comps., City of Industry, Cal.** p. 2-896,897
- DM Vector Electronic Co., Sylmar, Cal.** p. 2-359-361
- Vero Electronics, Hauppauge, N.Y.** p. 2-365
- M Electro Packaging, Lowell, Mass.** *
- Elctn. Molding Corp., Woonsocket, R.I.** *
- Efab Corp., Addison, Tex.** *
- D GC Electronics, Rockford, Ill.** *
- NES, Streamwood, Ill.** *
- Shigoto Inds., Ltd., New York, N.Y.** *
- Abacus Elctns. Corp., Dobbs Ferry, N.Y.
 M Adcor Electronic Packaging Corp., New York, N.Y.
 Advanced Circuitry, Springfield, Mo.
 AEL, Colmar, Pa.
 M Ansley Elctns. Corp., Los Angeles, Cal.
 Aries Electronics, Frenchtown, N.J.
 M Artech Corp., Falls Church, Va.
 M Ashman Industries (1966) Ltd., Greenville Dundas, Ont., Can.
 Astrodata Inc., Anaheim, Cal.
 Avionics Ltd., Niagara-On-Lane, Ont., Can.
 BECO, Salem, Va.
 Bell Co., Trussville, Ala.
 Buckbee Mears Co., St. Paul, Minn.
 M Bureau Engraving, Minneapolis, Minn.
 D Cambridge Thermionic Corp., Cambridge, Mass.
 Chem Aero, Wilmington, Cal.
 Chemical Etching Equip. & Supply, Alexandria, Va.
 D Christiansen Radio Inc., Laguna Beach, Cal.
 M Cincinnati Elctns. Corp., Cincinnati, Ohio
 D Circuit-Stik, Torrance, Cal.
 Control Systems Research, Pittsburgh, Pa.
 Douglas Electronics, San Leandro, Cal.
 M Eagle-Picher Industries, Joplin, Mo.
 E.D.I. Inc., Cairo, Ill.
 M Electronic Support Systems, Villa Park, Ill.
 Elgin Elctns., Watford, PA.
 DM Excel Products Co., New Brunswick, N.J.
 Flexprint Div., Manchester, N.H.
 General Electrodynamics Corp., Garland, Tex.
 GTE Sylvania, Muncy, Pa.
 GTE Sylvania Inc., Waltham, Mass.
 Hughes Aircraft Co., Culver City, Cal.
 D Instant Instruments Inc., Haverhill, Mass.
 Int'l. Elctn. Resch., Burbank, Cal.
 D JPL, Santa Monica, Cal.
 M Leighton Electronics, Leighton, Pa.
 Methode Elctns., Chicago, Ill.
 Metropolitan Circuits Inc., Costa Mesa, Cal.
 Mid-West Metal Prods., Kansas City, Kans.
 D Mobil Electronics, Anderson, Ind.
 North American Printed Circuit Div., Stafford, Conn.
 Nucleus Corp., Madison Hgts., Mich.
 M Photocircuits Div., Kollmorgen Corp., Glen Cove, N.Y.
 P M C Electronics Co., Southampton, Pa.
 Polyflon Corp., New Rochelle, N.Y.
 D Power Control Corp., Pittsburgh, Pa.
 Ragen Precision Inds., N. Arlington, N.J.
 Reliance Electric Co., Cleveland, Ohio
 Stanford Applied Engineering, Santa Clara, Cal.
 Stanford Applied Engrg., Santa Ana, Cal.
 DM Techniques, Englewood, N.J.
 Waller Corp., Crystal Lake, Ill.
 D Zenrad Controls Co., Santa Barbara, Ca.

Boards, Printed Circuit (With Components)—See Cards, Linear Function

Boards, Printed Wiring, Universal

- Accutronics-A Hammond Corp., Geneva, Ill.** p. 2-347
- Amphenol Cadre Div., Endicott, N.Y.** p. 2-460,461
- Applied Circuits, Long Island City, N.Y.** p. 2-345
- D Arco Electronics Inc., Great Neck, N.Y.** p. 2-619
- D EECO, Santa Ana, Cal.** p. 1-2032
- D RDI/Reed Devices, Glen Ellyn, Ill.** p. 2-792,793
- M SGL Printed Circuits, Wayne, N.J.** p. 2-356
- D Triad-Utrad, Huntington, Ind.** p. 2-1822-1829
- TRW/Cinch-Graphik, Elctn. Comps., City of Industry, Cal.** p. 2-896,897

D Vector Electronic Co., Sylmar, Cal. p. 2-359,361
D Vero Electronics, Hauppauge, N.Y. p. 2-365
Electrn. Molding Corp., Woonsocket, R.I. *
NES, Streamwood, Ill. *
M Adcor Electronic Packaging Corp., New York, N.Y.
 Advanced Circuitry, Springfield, Mo.
 AEL, Colmar, Pa.
 Chemical Etching Equip. & Supply, Alexandria, Va.
D Christiansen Radio Inc., Laguna Beach, Cal.
 Douglas Electronics, San Leandro, Cal.
 E & L Instruments, Derby, Conn.
DM Excel Products Co., New Brunswick, N.J.
 Gary Mfg., New Brunswick, N.J.
 Hughes Aircraft Co., Culver City, Cal.
D IFE Div., Rumford, R.I.
D JPI, Santa Monica, Cal.
M Leighton Electronics, Leighton, Pa
 Masterite Corporation, Torrance, Cal.
 Methode Elctns., Chicago, Ill.
 Mid-West Metal Prods., Kansas City, Kans.
 Mupac Corp., Brockton, Mass.
 P M C Electronics Co., Southampton, Pa
 Reliance Electric Co., Cleveland, Ohio
DM Scanbe Canoga Industries, El Monte, Cal.
 Scientific Measurements, Evanston, Ill.
 Stanford Applied Engineering, Santa Clara, Cal.
 Western Electronic Systems, Palo Alto, Cal.
 Wyle Computer Prods., El Segundo, Calif.

Boards, Programming

Allied Systems Corp., Greensboro, N.C. p. 2-458,459
D Amphenol Ind'l Div., Chicago, Ill. p. 2-460,461
D Arco Electronics Inc., Great Neck, N.Y. p. 2-619
Info-Lite Corp., Corona, N.Y. p. 1-2076
Interswitch, Burlingame, Cal. p. 1-2075
MLVC Inds. Inc., Flushing, N.Y. p. 1-2010,2011,2100
Matrix Corp., Beech Grove, Ind. p. 1-266
North Hills Elctns., Glen Cove, N.Y. p. 1-189
Sealectro Corp., Mamaroneck, N.Y. p. 1-2269
D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
D Vector Electronic Co., Sylmar, Cal. p. 2-1061
M Virginia Panel Corp., Waynesboro, Va. p. 2-1067
NES, Streamwood, Ill. *
 Amp Inc., Harrisburg, Pa.
 AMP Special Industries, Valley Forge, Pa.
 Aries Electronics, Frenchtown, N.J.
D Cambridge Thermionic Corp., Cambridge, Mass.
M Cubic Corp., San Diego, Cal.
 E & L Instruments, Derby, Conn.
 Electrovert, Mt. Vernon, N.Y.
DM Excel Products Co., New Brunswick, N.J.
 Hughes Aircraft Co., Culver City, Cal.
D IFE Div., Rumford, R.I.
M Leighton Electronics, Leighton, Pa
 Mac Panel Co., High Pt., N.C.
 Masterite Corporation, Torrance, Cal.
 MillerTronics, Greenville, S.C.
M Norsal Industries, Brentwood, N.Y.
D Program Data Co., Carson, Cal.
 Sensor Corp., Scottsdale, Pa.
 Spectrum Dynamics, Burlington, Mass.

Bobbins, Winding, Coil & Transformer-Also See Coil Assemblies & Forms

Dale Elctns., Yankton, S.D. p. 2-1452
Endicott Coil Co., Binghamton, N.Y. p. 2-396
D Ferroxcube Corp., Saugerties, N.Y. p. 2-1218,1225
Harbison Ind'l Prods., Levittown, Pa. p. 2-397
ITT Thermotech, Hopkins, Minn. p. 2-1232,1233
Krystinel Corp., Port Chester, N. Y. p. 2-1234
Magneto, Holtsville, N.Y. p. 2-1770
Dia-Netics Inc., Northridge, Cal. *
Shigoto Inds., Ltd., New York, N.Y. *
 Accessories for Electronics, Bayside, N.Y.
 Cortec, Newport Beach, Cal.
 Cosmo Plastics Co., Cleveland, Ohio
M D & L Sales Co. Inc., Paterson, N.J.
 Electrical Plastics Corp., Long Branch, N.J.
 Form-It Products Inc., Chicago, Ill.
M Genisco Tech. Corp., Compton, Cal.
D Gries Reproducer Co., New Rochelle, N.Y.
D Mark Specialties, Costa Mesa, Cal.
M Moldtronics, Downers Grove, Ill.
 Precision Paper Tube Co., Wheeling, Ill.
 Pyroferic - N. Y., Bronx, N.Y.
 Resdel Corp., Rio Grande, N.J.
D Spec Plastics Inc., No. Hollywood, Cal.
DM Stevens Prods., E. Orange, N.J.

Synthane Taylor Corp., Valley Forge, Pa.
 Templine, Gardena, Cal.
 Tohoku Metal Inds., Ltd., Tokyo, Japan
Bolometers, Infrared—See Volume 1
Bolometers, Microwave—See Volume 1
Bolts—See Fasteners
Books—See Volume 1
Boosters, Low Line Voltage, Automatic—See Volume 1
Boxes, Decade—See Volume 1
Boxes, Junction, Outlets & Wall Plates—See Volume 1
Boxes, Metal & Plastic—See Volume 1
Boxes, Plug-In—See Enclosures, Module, Plug-In
Boxes, Power Outlet—See Volume 1
Boxes, Shipping (Reusable)—See Volume 1
Brackets, Antenna—See Volume 1
Braid, Cable - Also see Wire Shielding
DM Alpha Wire Corp., Elizabeth, N.J. p. 2-1847,1857
Amphenol Cadre Div., Endicott, N.Y. p. 2-460,461
M Amphenol Connector Div., SAMS Opers., Chatsworth, Cal. p. 2-460,461
D Belden Corp., Richmond, Ind. p. 2-1882,1909
D Columbia Elctn. Cables, New Bedford, Mass. p. 2-1911
DM Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1962
DM Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
M Rowe Industries, Toledo, Ohio p. 2-2052,2053
DM Whitmor Wire & Cable, No. Hollywood, Cal. p. 2-2072
DM Daburn Electronics & Cable Corp., Bronx, N.Y. *
 M Aircraft & Elex Spcltys, Plainfield, Ind
 M American Electric Cable Co., Holyoke, Mass.
 D Birnbach Co., Freeport, N.Y.
 Cal-Metex Corp., Inglewood, Cal.
 M Co-Operative Inds., Chester, N.J.
 D Custom Cable Co., Oceanside, N.Y.
 M Eagle-Picher Industries, Joplin, Mo.
 Estes Engrg. Co., Port Angeles, Wash.
 M Glenair, Glendale, Cal.
 Gulton Inds., Buena Park, Cal.
 Icore Int'l., Sunnyvale, Cal.
 M International Identifications, Timonium, Md.
 M Kates Scientific Instrs., Newton, Mass.
 M Manger Elec. Co., Stamford, Conn.
DM Manhattan Elec. Cable Corp., Rye, N.Y.
 D Metal Bellows Corp., Sharon, Mass.
DM Metex Corp., Edison, N.J.
 D Pace Wire & Cable Corp., Oceanside, N.Y.
 D Pacific Electricord Co., Gardena, Cal.
 Texas Instruments, Attleboro, Mass.
 M Thermax Wire Corp., Flushing, N.Y.
 TRW/Holyoke Wire & Cable, South Hadley, Mass.
 Wireflex Incorporated, Bourbon, Ind.
 D Zippertubing Co., Los Angeles, Calif.

Brakes, Magnetic—See Volume 1
Brakes, Mechanical—See Volume 1
Breadboards & Breadboard Kits—See Kits, Breadboarding
Bridges, Admittance—See Volume 1
Bridges, Antenna—See Volume 1
Bridges, Audio—See Volume 1
Bridges, Calorimeter—See Volume 1
Bridges, Capacitance—See Volume 1
Bridges, Deviation—See Volume 1
Bridges, Impedance—See Volume 1
Bridges, Inductance—See Volume 1
Bridges, Kelvin—See Volume 1
Bridges, Limit—See Volume 1

Bridges, Megohm—See Volume 1
Bridges, Power, R-F—See Volume 1
Bridges, Programmable—See Volume 1
Bridges, Q—See Volume 1
Bridges, Ratio—See Volume 1
Bridges, Resistance—See Volume 1
Bridges, R-F—See Volume 1
Bridges, Schering—See Volume 1
Bridges, Silicon Cell—See Volume 1
Bridges, Strain Gauge—See Volume 1
Bridges, Synchro & Resolver—See Volume 1
Bridges, Temperature—See Volume 1
Bridges, Wheatstone—See Volume 1
Brushes & Brush Assemblies—See Volume 1
Bulbs—See Lamps
Bumpers—See Volume 1
Burnishers, Contact
D Jonard Industries Corp., Tuckahoe, N.Y. p. 2-1707
D GC Electronics, Rockford, Ill. *
 D Adre Co., Milwaukee, Wisc.
 D Eraser Co., Syracuse, N.Y.
 Neuses, P.K., Rolling Meadows, Ill.
 D Techni-Tool, Plymouth Meeting, Pa.
Bus Bars & Systems
DM Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
M Janco Corp., Burbank, Cal. p. 1-2090
DM Lear Siegler, Anaheim, Cal. p. 2-716,717
M Rowe Industries, Toledo, Ohio p. 2-796,797
D SGL Waber Electric, Westville, NJ p. 2-356
M Zero Mfg. Co., Burbank, Cal. p. 1-106-109
Belden Corp., Richmond, Ind. *
D GC Electronics, Rockford, Ill. *
D Vector Electronic Co., Sylmar, Cal. *
DM The Anaconda Company Brass Division, Waterbury, Conn.
 Apahouser Corp. of N.E., Watertown, Mass.
 D Atlee Corp., Woburn, Mass.
 Burdette Buss Bars, Cherry Hill, N.J.
M Bussco Engrg., El Segundo, Cal.
M Chem Aero, Wilmington, Cal.
 Cutler-Hammer, Milwaukee, Wisc.
 Elco, Willow Grove, Pa.
D GTE Sylvania Inc., Waltham, Mass.
 GTI Corporation, Pittsburgh, Pa.
 D Lear Siegler, Santa Monica, Calif.
 Methode Elctns., Chicago, Ill.
M Reynolds Metals Co., Richmond, VA.
M Rogers Corp., Rogers, Conn.
 Seastrom Mfg. Co. Inc., Glendale, Cal.
 Standard Logic Inc., Santa Ana, Cal.
 Stanford Applied Engrg., Santa Ana, Cal.

Bushings, Glass, Plastic, Metal, Rubber, Etc.
D Amatorm Electronic Hardware, New Haven, Conn. p. 2-1258
D Bivar, Santa Ana, Cal. p. 2-1266
D Concord Elctns., New York, N.Y. p. 2-654,655
E-Systems, Huntington, Ind. p. 2-1490,1665
Graphite Metallizing Corp., Yonkers, N.Y. p. 1-961
Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1091,1092
D Jones Elctns., Hiram, No. Hollywood, Cal. p. 2-683
DM Keystone Elctns. Corp., New York, N.Y. p. 2-714
Sealectro Corp., Mamaroneck, N.Y. p. 2-804,806
D Thermalloy, Dallas, Tex p. 1-1877,1878
D Waldom Electronics, Chicago, Ill. p. 2-1262-1266
Alberox Corp., New Bedford, Mass. *
D Daburn Electronics & Cable Corp., Bronx, N.Y. *
Electrn. Molding Corp., Woonsocket, R.I. *
 Abacus Elctns. Corp., Dobbs Ferry, N.Y.
 D Accessories for Electronics, Bayside, N.Y.
 Acme Model Engrg. Co., Ridgefield, N.J.

D Adale Mfg. Co., Cleveland, Ohio
DM Amsco Inc., Seattle, Wash.
Anchor Plastics, Long Island City, N.Y.
M Atlantic Optical Moulding Co., Dudley, Mass.
M Atlas Fibre Co., Chicago, Ill.
Auburn Mfg., Middletown, Conn.
Auto-Swage Products Inc., Shelton, Conn.
M Avid Electronics Corp., Baldwin, Pl., N.Y.
Birnbach Co., Freeport, N.Y.
M Bunting, Brass & Bronze Co., Toledo, Ohio
Cadillac Plastic & Chemical, Detroit, Mich.
Carbone Lorraine Industries Corp., Boonton, N.J.
M Ceramaseal, New Lebanon Center, N.Y.
M Chemplast, Wayne, N.J.
Cherry Rivet & Boots Nut Divs., Santa Ana, Calif.
M Cleveland Mica Co., Lakewood, Ohio
Corning Glass Works, Corning, N.Y.
Corning Glass Works, Television Prods. Div., Corning, N.Y.
Delbert Blinn Co., Pomona, Calif.
D Deutsch Fastener Corp., Los Angeles, Cal.
Dixon Corp., Bristol, R.I.
Dura Plastics N.Y., Westport, Conn.
Emporium Specialties Co., Austin, Pa.
D Gries Reproductor Co., New Rochelle, N.Y.
M Groov-Pin Corp., Ridgefield, N.J.
D Heyman Mfg. Co., Kenilworth, N.J.
D ICO/Rally Corp., Palo Alto, Cal.
M Instru-Lec Corp., Mt. Vernon, N.Y.
M Laminated Fabricators, San Bruno, Calif.
M Lapp Insulator Div., Intertec Corp., LeRoy, N.Y.
Lear Siegler, Santa Monica, Calif.
M Moldtronics, Downers Grove, Ill.
MPB Corp., Keene, N.H.
Ohio Carbon Co., Cleveland, Ohio
D Penn Fibre & Specialty, Phila., Pa.
Precision Paper Tube Co., Wheeling, Ill.
D Pure Carbon Co., St. Marys, Pa.
Pylon Co., Attleboro, Mass.
Resdel Corp., Rio Grande, N.J.
Seastrom Mfg. Co. Inc., Glendale, Cal.
Sterling Instr., New Hyde Pk., NY
DM Stock Drive Prods., New Hyde Pk., N.Y.
D Uniroyal, New York, N.Y.
M U.S. Terminals, Cincinnati, Ohio
Vernay Laboratories, Yellow Springs, Ohio

Buzzers—See Volume 1

Cabinets & Accessories, Metal—See Volume 1

Cabinets, Plastic—See Volume 1

Cable Assemblies & Harnesses

Amphenol Cadre Div., Endicott, N.Y. p. 2-460,461
Amphenol RF Div., Danbury, Conn. p. 2-460,461
M Amphenol Sales Div., Broadview, Ill. p. 2-460,461
D Augat Inc., Attleboro, Mass. p. 2-636
D Belden Corp., Richmond, Ind. p. 2-1882-1909
Bendix Corp., The, Sidney, N.Y. p. 2-642
D Columbia Elctm. Cables, New Bedford, Mass. p. 2-1911
Connector Corp., Chicago, Ill. p. 2-657-660
Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-2022
ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
D ITT Pomona Electronics Div., Pomona, Cal. p. 2-740,781,783-787
D National Tel-Tronics, Meadville, Pa. p. 2-721
National Wire & Cable Corp., Los Angeles, Cal. p. 2-2042,2047
M Rowe Industries, Toledo, Ohio p. 2-796,797
D Sealectro Corp., Mamaroneck, N.Y. p. 2-805,807-811
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-849,866,875
D Spectra-Strip Corp., Garden Grove, Cal. p. 2-2057
D 3M Company, St. Paul, Minn. p. 2-1034-1055
M Uniform Tubes, Collegeville, Pa. p. 2-2065
DM Victor Wire & Cable Corp., Los Angeles, Cal. p. 2-2066,2067
M Zero Mfg. Co., Burbank, Cal. p. 1-106-109
Allied Systems Corp., Greensboro, N.C. p. 2-2068-2071
D E-Z-Hook, Arcadia, Cal. p. 2-2068-2071
D GC Electronics, Rockford, Ill. p. 2-2068-2071
Standard Wire & Cable Co., Los Angeles, Cal. p. 2-2068-2071
Syston-Donner Microwave Div., Van Nuys, Cal. p. 2-2068-2071

M Woven Elctm., Mauldin, S. C. p. 2-2068-2071
All Systems, Moorestown, N.J.
Able Cable Div., Barrington, Ill.
Access-Wire, Garnersville, N.Y.
Action Labs Inc., Minneapolis, Minn.
M Adams-Russell Co., Waltham, Mass.
M Aircraft & Elx Spclty, Plainfield, Ind.
American Electric Cable Co., Holyoke, Mass.
AMF Electrical Prods., Alexandria, Va.
American Microwave Inds., Waltham, Mass.
D Anixter-Mark, Skokie, Ill.
M Ansley Elctm. Corp., Los Angeles, Cal.
Arco Wire & Cable, N. Hollywood, Cal.
Arenberg Ultrasonic Lab. Inc., Jamaica Plain, Mass.
M Ashman Industries (1966) Ltd., Greensville Dundas, Ont., Can.
Astro Products Co., S. Burlington, Vt.
Beman Mfg., New Cumberland, Pa.
Boston Insulated Wire & Cable Co., Dorchester, Mass.
Cable Systems & Assembly Co., Everett, Mass.
California Avionics Labs., Palo Alto, Calif.
Caltron Industries, Berkeley, Cal.
Circuit Assembly Corp., Costa Mesa, Ca.
Climatronics Corp., Hauppauge, N.Y.
Collins Radio, Dallas, Tex.
Control Products Corp., Chicago, Ill.
Cross Electronics Inc., Warrendale, Pa.
D Electrovert, Mt. Vernon, N.Y.
Everett/Charles, Pomona, Cal.
M Glenair, Glendale, Cal.
D Great Western Aviation, Denver, Colo.
Gulton Inds., Buena Park, Cal.
Hughes Aircraft Co., Culver City, Cal.
D ICO/Rally Corp., Palo Alto, Cal.
Icore Int'l., Sunnyvale, Cal.
D International Data Sciences, Providence, R.I.
M International Identifications, Timonium, Md.
ITI Electronics, Clifton, N.J.
Jettron Prods., Hanover, N.J.
DM Kings Electronics, Tuckahoe, N.Y.
Leighton Electronics, Leighton, Pa.
D Linemaster Switch Corp., Woodstock, Conn.
D Malco, A Microdot Co., Chicago, Ill.
M Manger Elec. Co., Stamford, Conn.
D Masterite Corporation, Torrance, Cal.
M Mercury Electronics Corp., York, Pa.
Methode Elctm., Chicago, Ill.
Mid-West Metal Prods., Kansas City, Kans.
Morey Corp., Downers Grove, Ill.
D N T-T/Peerless, Leominster, Mass.
D Paraplegics Mfg., Bensenville, Ill.
Ronor Systems, Cheshire, Conn.
Standard Logic Inc., Santa Ana, Cal.
M Storm Products Co., Inglewood, Ca.
D Switchcraft, Chicago, Ill.
M Teledyne Aerospace Systems, Fairmont, Minn.
Templine, Gardena, Cal.
D Thomas & Betts Co., Elizabeth, N.J.
Times Wire & Cable, Wallingford, Conn.
Trompeter Electronics, Chatsworth, Cal.
TRW/Holyoke Wire & Cable, South Hadley, Mass.
Waterbury Pressed Metal Co., Waterbury, Conn.
D Workman Electronic Prods., Sarasota, Fla.

Cable, Audio

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1844-1846
D Belden Corp., Richmond, Ind. p. 2-1882-1909
Columbia Elctm. Cables, New Bedford, Mass. p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1938-1945,2-1956
D Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1983,1986,1987
M Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
D National Tel-Tronics, Meadville, Pa. p. 2-721
National Wire & Cable Corp., Los Angeles, Cal. p. 2-2040,2041,2046
D Rowe Industries, Toledo, Ohio p. 2-2052
Shigoto Inds., Ltd., New York, N.Y. p. 1-2276
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-879
DM Whitmor Wire & Cable, No. Hollywood, Cal. p. 2-2072
D GC Electronics, Rockford, Ill. p. 2-2068-2071
M McGraw-Edison Co., Manchester, N.H. p. 2-2068-2071
Standard Wire & Cable Co., Los Angeles, Cal. p. 2-2068-2071
D Victor Wire & Cable Corp., Los Angeles, Cal. p. 2-2068-2071
Access-Wire, Garnersville, N.Y.
American Electric Cable Co., Holyoke, Mass.
DM Arco Wire & Cable, N. Hollywood, Cal.
D Beman Mfg., New Cumberland, Pa.
D Birnbach Co., Freeport, N.Y.
Boston Insulated Wire & Cable Co., Dorchester, Mass.
Cable Systems & Assembly Co., Everett, Mass.

Caltron Industries, Berkeley, Cal.
D Cole-Flex Corp., W. Babylon, N.Y.
D Custom Cable Co., Oceanside, N.Y.
D Dragon Industries, Chatsworth, Cal.
D Ev-Game Inc., Freeport, N.Y.
General Elec., Bridgeport, Conn.
Gotham Audio Corp., New York, N.Y.
D Herald Electronics, Chicago, Ill.
Judd Wire Div., Burlington, Mass.
Lenz Electric Mfg. Co., Chicago, Ill.
D Manhattan Elec. Cable Corp., Rye, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
D Norelcom Electronics, Farmingdale, N.Y.
D N T-T/Peerless, Leominster, Mass.
Okonite Co., Ramsey, N.J.
D Pace Wire & Cable Corp., Oceanside, N.Y.
D Pacific Electricord Co., Gardena, Cal.
D Philmore Mfg. Co. Inc., Inwood, N.Y.
D Recoton Corp., Long Island City, N.Y.
D Rye Inds., Mamaroneck, N.Y.
Saxton Prods., Congers, N.Y.
Times Wire & Cable, Wallingford, Conn.
TRW/Holyoke Wire & Cable, South Hadley, Mass.
D Vidair Electronics Mfg., Freeport, N.Y.
D Wallace S. K. Assocs., Tampa, Fla.
D Workman Electronic Prods., Sarasota, Fla.

Cable, Battery Booster

D Columbia Elctm. Cables, New Bedford, Mass. p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1958
DM Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
D Mueller Electric Co., Cleveland, Ohio p. 2-718,719
D Rowe Industries, Toledo, Ohio p. 2-2052
Shigoto Inds., Ltd., New York, N.Y. p. 1-2276
D Belden Corp., Richmond, Ind. p. 2-1882-1909
Standard Wire & Cable Co., Los Angeles, Cal. p. 2-2068-2071
D Arco Wire & Cable, N. Hollywood, Cal.
D Custom Cable Co., Oceanside, N.Y.
D Essex International, Sycamore, Ill.
D Manhattan Elec. Cable Corp., Rye, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Motorola Comms. Div., Schaumburg, Ill.
Prestolite Wire Division, Port Huron, Mich.

Cable, Coaxial

DM Alpha Wire Corp., Elizabeth, N.J. p. 2-1855
D Belden Corp., Richmond, Ind. p. 2-1882-1909
DM Cimco Wire & Cable, Allendale, N.J. p. 2-1910,2023
D Columbia Elctm. Cables, New Bedford, Mass. p. 2-1911
DM Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1950-1954
DM Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1981
DM Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
DM Markel, L. Frank & Sons, Norristown, Pa. p. 2-2024,2025
M Rowe Industries, Toledo, Ohio p. 2-796,797,2054
Shigoto Inds., Ltd., New York, N.Y. p. 1-2276
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-879
DM Uniform Tubes, Collegeville, Pa. p. 2-2064
M Victor Wire & Cable Corp., Los Angeles, Cal. p. 2-2066
M Woven Elctm., Mauldin, S. C. p. 2-2068-2071
Amphenol RF Div., Danbury, Conn. p. 2-460,461
D GC Electronics, Rockford, Ill. p. 2-2068-2071
General Radio Co., Concord, Mass. p. 2-2068-2071
Heath Co., Benton Harbor, Mich. p. 2-2068-2071
National Wire & Cable Corp., Los Angeles, Cal. p. 2-2068-2071
Standard Wire & Cable Co., Los Angeles, Cal. p. 2-2068-2071
M Addington Labs, Santa Clara, Cal.
AEL, Colmar, Pa.
AEL Communications Corp., Sub. of Amer. Elctm. Labs. Inc., Lansdale, Pa.
American Electric Cable Co., Holyoke, Mass.
D The Anaconda Co., Greenwich, Conn.
Andrew Antenna Co. Ltd., Whitby, Ont., Can.
Andrew Corp., Orland Park, Ill.
D Antenna Corp. of America, Burlington, Iowa
DM Arco Wire & Cable, N. Hollywood, Cal.
DM Astrolab, Rahway, N.J.
Astro Products Co., S. Burlington, Vt.
Birnbach Co., Freeport, N.Y.
D Blonder-Tongue Labs., Old Bridge, N.J.
Boston Insulated Wire & Cable Co., Dorchester, Mass.
Brand-Rex Co., Willimantic, Conn.
M Cablewave Systems Inc., North Haven, Conn.
Caltron Industries, Berkeley, Cal.
D CCS Hatfield Wire & Cable Group, Cranford, N.J.

D Channel Master Div. Avnet, Ellenville, N.Y.
D Cole-Flex Corp., W. Babylon, N.Y.
Copperweld Bimetallics, Glassport, PA
D Custom Cable Co., Oceanside, N.Y.
M Eagle-Picher Industries, Joplin, Mo.
D Finney Co., Bedford, Ohio
D Great Western Aviation, Denver, Colo.
Gulton Inds., Buena Park, Cal.
Hughes Aircraft Co., Culver City, Cal.
D Jersey Specialty Co., Wayne, N.J.
M Judd Wire Div., Burlington, Mass.
Lenz Electric Mfg. Co., Chicago, Ill.
Leviton Mfg. Co., Little Neck, N.Y.
D Malco, A Microdot Co., Chicago, Ill.
DM Manhattan Elec. Cable Corp., Rye, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Motorola Comms. Div., Schaumburg, Ill.
Narda Microwave Corp., Plainville, N.Y.
D New-Tronics Corp., Brookpark, Ohio
D Norelcom Electronics, Farmingdale, N.Y.
Okonite Co., Ramsey, N.J.
Pasternack Enterprises, Huntington Beach, Cal.
M Precision Tube, No. Wales, Pa.
Raychem Corp., Menlo Park, Cal.
D Rye Inds., Mamaroneck, N.Y.
Saxton Prods., Congers, N.Y.
M Storm Products Co., Inglewood, Ca.
D Superior Cable Div., Hickory, N.C.
D Times Wire & Cable, Wallingford, Conn.
Trompeter Electronics, Chatsworth, Cal.
TRW/Holyoke Wire & Cable, South Hadley, Mass.
Weinschel Engrg. Co., Gaithersburg, Md.
D Workman Electronic Prods., Sarasota, Fla.
D Zippertubing Co., Los Angeles, Calif.

Cable, Control—See Cable, Multiconductor

Cable, Data—See Cable, Audio

Cable, Dial—See Cords & Cable, Dial Drive

Cable Fault Locators—See Volume 1

Cable, Flame Retardant

D Alpha Wire Corp., Elizabeth, N.J.
p. 2-1841-1845, 1847, 1848, 1852, 1854, 1855
D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
D Columbia Elctn. Cables, New Bedford, Mass.
p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill.
p. 2-1963
D Daburn Electronics & Cable Corp., Bronx, N.Y.
p. 2-1983, 1985
D Dearborn Wire & Cable Co., Rosemont, Ill.
p. 2-1993
M Rowe Industries, Toledo, Ohio p. 2-2053
M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
Standard Wire & Cable Co., Los Angeles, Cal. *
D Victor Wire & Cable Corp., Los Angeles, Cal. ... *
Acesso-Wire, Garnersville, N.Y.
American Electric Cable Co., Holyoke, Mass.
The Anaconda Co., Greenwich, Conn.
D Ansley Elctns. Corp., Los Angeles, Cal.
DM Arco Wire & Cable, N. Hollywood, Cal.
Boston Insulated Wire & Cable Co., Dorchester, Mass.
D Brand-Rex Co., Willimantic, Conn.
CCS Hatfield Wire & Cable Group, Cranford, N.J.
Cerro Wire & Cable Co., New Haven, Conn.
D Custom Cable Co., Oceanside, N.Y.
General Elec., Bridgeport, Conn.
Gulton Inds., Buena Park, Cal.
D Manhattan Elec. Cable Corp., Rye, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Okonite Co., Ramsey, N.J.
Raychem Corp., Menlo Park, Cal.
M Thermx Wire Corp., Flushing, N.Y.
TRW/Holyoke Wire & Cable, South Hadley, Mass.
Wireflex Incorporated, Bourbon, Ind.

Cable, Flat

D Columbia Elctn. Cables, New Bedford, Mass.
p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill.
p. 2-1955
DM Daburn Electronics & Cable Corp., Bronx, N.Y.
p. 2-1985
DM Dearborn Wire & Cable Co., Rosemont, Ill.
p. 2-1993
Hughes Aircraft Co., Connecting Devices,
Newport Beach, Cal. p. 2-2022
ITT Cannon Electric, Santa Ana, Cal.
p. 2-687-693
D Rowe Industries, Toledo, Ohio p. 2-2052
D Spectra-Strip Corp., Garden Grove, Cal.
p. 2-2056
D 3M Company, St. Paul, Minn. p. 2-1034-1055
M Woven Elctns., Mauldin, S. C. p. 2-2068-2071

D Alpha Wire Corp., Elizabeth, N.J. *

D Augat Inc., Attleboro, Mass. *

D GC Electronics, Rockford, Ill. *

Standard Wire & Cable Co., Los Angeles, Cal. *

Amp Inc., Harrisburg, Pa.
The Anaconda Co., Greenwich, Conn.
D Ansley Elctns. Corp., Los Angeles, Cal.
DM Arco Wire & Cable, N. Hollywood, Cal.
Assembled Products Co., St. Albans, Vt.
Boston Insulated Wire & Cable Co., Dorchester, Mass.
Brand-Rex Co., Willimantic, Conn.
D Burndy Corporation, Norwalk, Conn.
D Channel Master Div. Avnet, Ellenville, N.Y.
Circuit Assembly Corp., Costa Mesa, Ca.
D Custom Cable Co., Oceanside, N.Y.
M International Identifications, Timonium, Md.
Jermy, San Francisco, Cal.
D Jersey Specialty Co., Wayne, N.J.
Magnet Wire Inc., New York, NY
DM Manhattan Elec. Cable Corp., Rye, N.Y.
Methode Elctns., Chicago, Ill.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Mupac Corp., Brockton, Mass.
D Norelcom Electronics, Farmingdale, N.Y.
Okonite Co., Ramsey, N.J.
Phoenix Wire, S. Hero, Vt.
Raychem Corp., Menlo Park, Cal.
M Rogers Corp., Rogers, Conn.
Rye Inds., Mamaroneck, N.Y.
DM Saxton Prods., Congers, N.Y.
DM Storm Products Co., Inglewood, Ca.
TRW/Holyoke Wire & Cable, South Hadley, Mass.
D Zippertubing Co., Los Angeles, Calif.

Cable, Heater

D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
D Columbia Elctn. Cables, New Bedford, Mass.
p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill.
p. 2-1957
DM Markel, L. Frank & Sons, Norristown, Pa.
p. 2-2024, 2025
D Rowe Industries, Toledo, Ohio p. 2-2053
D Amperex Electronic Corp., Hicksville, N.Y. *

D Daburn Electronics & Cable Corp., Bronx, N.Y. *

Standard Wire & Cable Co., Los Angeles, Cal. *

Acme Elec. Heating Corp., Hialeah, Fla.
The Anaconda Co., Greenwich, Conn.
M Arco Wire & Cable, N. Hollywood, Cal.
M ARI Inds., Franklin Pk., Ill.
Birnbach Co., Freeport, N.Y.
D Cox & Co., New York, N.Y.
D Custom Cable Co., Oceanside, N.Y.
D Essex International, Sycamore, Ill.
General Elec., Bridgeport, Conn.
GTE Sylvania Inc., Newark, N.J.
Leviton Mfg. Co., Little Neck, N.Y.
D Manhattan Elec. Cable Corp., Rye, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Okonite Co., Ramsey, N.J.
D Thermx Wire Corp., Flushing, N.Y.
Wireflex Incorporated, Bourbon, Ind.

Cable, High Temperature (Over 125° C)

D Belden Corp., Richmond, Ind. p. 2-1882-1909
DM Cimco Wire & Cable, Allendale, N.J.
p. 2-1910, 2023
D Columbia Elctn. Cables, New Bedford, Mass.
p. 2-1911
DM Consolidated Wire & Assoc. Corps., Chicago, Ill.
p. 2-1936, 1952, 1953
DM Daburn Electronics & Cable Corp., Bronx, N.Y.
p. 2-1980-1984
DM Dearborn Wire & Cable Co., Rosemont, Ill.
p. 2-1993
DM Markel, L. Frank & Sons, Norristown, Pa.
p. 2-2024, 2025
National Wire & Cable Corp., Los Angeles, Cal.
p. 2-2039
M Rowe Industries, Toledo, Ohio p. 2-2053
D Spectra-Strip Corp., Garden Grove, Cal.
p. 2-2056
Victor Wire & Cable Corp., Los Angeles, Cal.
p. 2-2066
M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
DM Alpha Wire Corp., Elizabeth, N.J. *

D Amperex Electronic Corp., Hicksville, N.Y. *

Standard Wire & Cable Co., Los Angeles, Cal. *

The Anaconda Co., Greenwich, Conn.
M Arco Wire & Cable, N. Hollywood, Cal.
DM Astrolab, Rahway, N.J.
Boston Insulated Wire & Cable Co., Dorchester, Mass.
D Brand-Rex Co., Willimantic, Conn.
Caltron Industries, Berkeley, Cal.
Cerro Wire & Cable Co., New Haven, Conn.

D Custom Cable Co., Oceanside, N.Y.
General Elec., Bridgeport, Conn.
Gulton Inds., Buena Park, Cal.
Hughes Aircraft Co., Culver City, Cal.
Icore Int'l., Sunnyvale, Cal.
M Kaman Sciences Corp., Colorado Springs, Colo.
D Malco, A Microdot Co., Chicago, Ill.
D Manhattan Elec. Cable Corp., Rye, N.Y.
Masterite Corporation, Torrance, Cal.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
D Norelcom Electronics, Farmingdale, N.Y.
Okonite Co., Ramsey, N.J.
M Phoenix Wire, S. Hero, Vt.
Raychem Corp., Menlo Park, Cal.
M Reynolds Metals Co., Richmond, VA.
M Storm Products Co., Inglewood, Ca.
DM Thermx Wire Corp., Flushing, N.Y.
Westinghouse Elec. Corp., Elmira, N.Y.
Wireflex Incorporated, Bourbon, Ind.

Cable, High Voltage (1,000 Volts & Over)

M Amphenol Connector Div., SAMS Opers.,
Chatsworth, Cal. p. 2-460, 461
D Belden Corp., Richmond, Ind. p. 2-1882-1909
D Cimco Wire & Cable, Allendale, N.J.
p. 2-1910, 2023
D Columbia Elctn. Cables, New Bedford, Mass.
p. 2-1911
DM Consolidated Wire & Assoc. Corps., Chicago, Ill.
p. 2-1963
DM Daburn Electronics & Cable Corp., Bronx, N.Y.
p. 2-1980, 1981, 1984, 1985
DM Dearborn Wire & Cable Co., Rosemont, Ill.
p. 2-1993
DM Markel, L. Frank & Sons, Norristown, Pa.
p. 2-2024, 2025
National Wire & Cable Corp., Los Angeles, Cal.
p. 2-2031, 2032, 2045
M Rowe Industries, Toledo, Ohio p. 2-2052
Universal Voltronics Corp., Mt. Kisco, N.Y.
p. 1-1527
DM Whitmor Wire & Cable, No. Hollywood, Cal.
p. 2-2072
M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
D Alpha Wire Corp., Elizabeth, N.J. *

Standard Wire & Cable Co., Los Angeles, Cal. *

D Victor Wire & Cable Corp., Los Angeles, Cal. ... *

Acesso-Wire, Garnersville, N.Y.
Amp Inc., Harrisburg, Pa.
D The Anaconda Co., Greenwich, Conn.
M Arco Wire & Cable, N. Hollywood, Cal.
D Boston Insulated Wire & Cable Co., Dorchester, Mass.
D CCS Hatfield Wire & Cable Group, Cranford, N.J.
D Custom Cable Co., Oceanside, N.Y.
Dielectric Sciences, Burlington, Mass.
Estes Engrg. Co., Port Angeles, Wash.
General Elec., Bridgeport, Conn.
Gulton Inds., Buena Park, Cal.
M Judd Wire Div., Burlington, Mass.
Lenz Electric Mfg. Co., Chicago, Ill.
D Manhattan Elec. Cable Corp., Rye, N.Y.
Megavolt, New York, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
D Norelcom Electronics, Farmingdale, N.Y.
Okonite Co., Ramsey, N.J.
Prestolite Wire Division, Port Huron, Mich.
Raychem Corp., Menlo Park, Cal.
M Reynolds Metals Co., Richmond, VA.
DM Saxton Prods., Congers, N.Y.
Simmonds Precision, Norwich, N.Y.
Times Wire & Cable, Wallingford, Conn.
Torr Labs., Los Angeles, Cal.
TRW/Holyoke Wire & Cable, South Hadley, Mass.
Voltek Inc., Beverly Hills, Cal.

Cable, Intercommunication & Sound System—See Cable, Audio

Cable, Irradiated

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1854
M Amphenol Connector Div., SAMS Opers.,
Chatsworth, Cal. p. 2-460, 461
DM Dearborn Wire & Cable Co., Rosemont, Ill.
p. 2-1993
D Rowe Industries, Toledo, Ohio p. 2-2052
D Spectra-Strip Corp., Garden Grove, Cal.
p. 2-2056
M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
Standard Wire & Cable Co., Los Angeles, Cal. *

Acesso-Wire, Garnersville, N.Y.
M Addington Labs, Santa Clara, Cal.
M American Electric Cable Co., Holyoke, Mass.
M Arco Wire & Cable, N. Hollywood, Cal.
Boston Insulated Wire & Cable Co., Dorchester, Mass.
D Brand-Rex Co., Willimantic, Conn.

M Judd Wire Div., Burlington, Mass.
 D Manhattan Elec. Cable Corp., Rye, N.Y.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 D Norelcom Electronics, Farmingdale, N.Y.
 Raychem Corp., Menlo Park, Cal.
 M Storm Products Co., Inglewood, Ca.
 Times Wire & Cable, Wallingford, Conn.

Cable, Low-Capacitance

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1848
 D Belden Corp., Richmond, Ind. p. 2-1882-1909
 D Cimco Wire & Cable, Allendale, N.J.
 p. 2-1910,2023
 D Columbia Elctn. Cables, New Bedford, Mass.
 p. 2-1911
 D Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1941
 D Daburn Electronics & Cable Corp., Bronx, N.Y.
 p. 2-1987
 Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993
 National Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2037,2038
 M Rowe Industries, Toledo, Ohio p. 2-2053
 DM Uniform Tubes, Collegeville, Pa. p. 2-2064
 D Victor Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2066

DM Whitmor Wire & Cable, No. Hollywood, Cal.

M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
 D GC Electronics, Rockford, Ill. *

Hughes Aircraft Co., Connecting Devices,
 Newport Beach, Cal. *

Standard Wire & Cable Co., Los Angeles, Cal. *

D 3M Company, St. Paul, Minn. *

Acesso-Wire, Garnersville, N.Y.

M Addington Labs, Santa Clara, Cal.

American Electric Cable Co., Holyoke, Mass.

M Arco Wire & Cable, N. Hollywood, Cal.

DM Astrolab, Rahway, N.J.

Birnbach Co., Freeport, N.Y.

D Boston Insulated Wire & Cable Co., Dorchester,
 Mass.

Brand-Rex Co., Willimantic, Conn.

Cablewave Systems Inc., North Haven, Conn.

CCS Hatfield Wire & Cable Group, Cranford, N.J.

Gotham Audio Corp., New York, N.Y.

M Judd Wire Div., Burlington, Mass.

M Kaman Sciences Corp., Colorado Springs, Colo.

Lenz Electric Mfg. Co., Chicago, Ill.

D Manhattan Elec. Cable Corp., Rye, N.Y.

Mil Spec Wire & Cable Corp., Freeport, N.Y.

Okonite Co., Ramsey, N.J.

D Pace Wire & Cable Corp., Oceanside, N.Y.

D Pacific Electricord Co., Gardena, Cal.

Raychem Corp., Menlo Park, Cal.

D Rye Inds., Mamaroneck, N.Y.

D Superior Cable Div., Hickory, N.C.

D Thermax Wire Corp., Flushing, N.Y.

Times Wire & Cable, Wallingford, Conn.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

Cable, Microphone

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1848
 D Belden Corp., Richmond, Ind. p. 2-1882-1909
 Columbia Elctn. Cables, New Bedford, Mass.
 p. 2-1911
 D Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1940,1941
 D Daburn Electronics & Cable Corp., Bronx, N.Y.
 p. 2-1983,1987
 DM Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993

National Wire & Cable Corp., Los Angeles, Cal.

p. 2-2039-2041,2046

M Rowe Industries, Toledo, Ohio p. 2-2053

Shigoto Inds., Ltd., New York, N.Y. p. 1-2276

DM Whitmor Wire & Cable, No. Hollywood, Cal.
 p. 2-2072

D GC Electronics, Rockford, Ill. *

Standard Wire & Cable Co., Los Angeles, Cal. *

D Victor Wire & Cable Corp., Los Angeles, Cal. *

Acesso-Wire, Garnersville, N.Y.

American Electric Cable Co., Holyoke, Mass.

M Arco Wire & Cable, N. Hollywood, Cal.

D Birnbach Co., Freeport, N.Y.

Boston Insulated Wire & Cable Co., Dorchester,
 Mass.

D Cole-Flex Corp., W. Babylon, N.Y.

D Custom Cable Co., Oceanside, N.Y.

D Essex International, Sycamore, Ill.

General Elec., Bridgeport, Conn.

D Gotham Audio Corp., New York, N.Y.

D Jersey Specialty Co., Wayne, N.J.

Judd Wire Div., Burlington, Mass.

Lenz Electric Mfg. Co., Chicago, Ill.

D Manhattan Elec. Cable Corp., Rye, N.Y.

Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Motorola Comms. Div., Schaumburg, Ill.
 D Pace Wire & Cable Corp., Oceanside, N.Y.
 D Rye Inds., Mamaroneck, N.Y.
 Saxton Prods., Congers, N.Y.
 Times Wire & Cable, Wallingford, Conn.
 D Vidair Electronics Mfg., Freeport, N.Y.
 D Workman Electronic Prods., Sarasota, Fla.

Cable, Multiconductor

D Alpha Wire Corp., Elizabeth, N.J.
 p. 2-1853,1856
 M Amphenol Connector Div., SAMS Oper.,
 Chatsworth, Cal. p. 2-460,461
 D Belden Corp., Richmond, Ind. p. 2-1882-1909
 DM Cimco Wire & Cable, Allendale, N.J.
 p. 2-1910,2023

D Columbia Elctn. Cables, New Bedford, Mass.
 p. 2-1911

D Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1938,1943,1944,1946,1948,1949,1957

D Daburn Electronics & Cable Corp., Bronx, N.Y.
 p. 2-1981,1986,1987

DM Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993

Hughes Aircraft Co., Connecting Devices,
 Newport Beach, Cal. p. 2-2022

DM Markel, L. Frank & Sons, Norristown, Pa.
 p. 2-2024,2025

National Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2028-2042

M Rowe Industries, Toledo, Ohio p. 2-2052,2053

Shigoto Inds., Ltd., New York, N.Y. p. 1-2276

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-879

D Spectra-Strip Corp., Garden Grove, Cal.
 p. 2-2056

Standard Wire & Cable Co., Los Angeles, Cal.
 p. 2-2058,2059

D 3M Company, St. Paul, Minn. p. 2-1034-1055

Victor Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2066,2067

DM Whitmor Wire & Cable, No. Hollywood, Cal.
 p. 2-2072

M Woven Elctns., Mauldin, S. C. p. 2-2068-2071

D GC Electronics, Rockford, Ill. *

Acesso-Wire, Garnersville, N.Y.

M American Electric Cable Co., Holyoke, Mass.

D The Anaconda Co., Greenwich, Conn.

D Ansley Elctns. Corp., Los Angeles, Cal.

M Arco Wire & Cable, N. Hollywood, Cal.

Beman Mfg., New Cumberland, Pa.

D Birnbach Co., Freeport, N.Y.

D Boston Insulated Wire & Cable Co., Dorchester,
 Mass.

Brand-Rex Co., Willimantic, Conn.

D Cable Systems & Assembly Co., Everett, Mass.

Caltron Industries, Berkeley, Cal.

D CCS Hatfield Wire & Cable Group, Cranford, N.J.

Cerro Wire & Cable Co., New Haven, Conn.

D Channel Master Div., Avnet, Ellenville, N.Y.

D Cole-Flex Corp., W. Babylon, N.Y.

D Custom Cable Co., Oceanside, N.Y.

D Essex International, Sycamore, Ill.

General Elec., Bridgeport, Conn.

Gordon, Claud S. Co., Richmond, Ill.

Gotham Audio Corp., New York, N.Y.

GTE Automatic Electric Inc., Northlake, Ill.

Gulton Inds., Buena Park, Cal.

Jermyn, San Francisco, Cal.

M Judd Wire Div., Burlington, Mass.

Lenz Electric Mfg. Co., Chicago, Ill.

Leviton Mfg. Co., Little Neck, N.Y.

Magnet Wire Inc., New York, NY

D Malco, A Microdot Co., Chicago, Ill.

DM Manhattan Elec. Cable Corp., Rye, N.Y.

Mil Spec Wire & Cable Corp., Freeport, N.Y.

Motorola Comms. Div., Schaumburg, Ill.

D Norelcom Electronics, Farmingdale, N.Y.

Okonite Co., Ramsey, N.J.

D Pace Wire & Cable Corp., Oceanside, N.Y.

D Pacific Electricord Co., Gardena, Cal.

Phoenix Wire, S. Hero, Vt.

Raychem Corp., Menlo Park, Cal.

M Reynolds Metals Co., Richmond, VA.

Rockland Insulated Wire & Cable, Haverstraw, N.Y.

Rogers Corp., Rogers, Conn.

D Rye Inds., Mamaroneck, N.Y.

Saxton Prods., Congers, N.Y.

M Storm Products Co., Inglewood, Ca.

D Superior Cable Div., Hickory, N.C.

M Teledyne Aerospace Systems, Fairmont, Minn.

Telrex Labs., Asbury Park, N.J.

DM Thermax Wire Corp., Flushing, N.Y.

Thermo Elec. Co., Saddle Brook, N.J.

D Times Wire & Cable, Wallingford, Conn.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

D Zippertubing Co., Los Angeles, Calif.

Cable, Power

M Amphenol Connector Div., SAMS Oper.,
 Chatsworth, Cal. p. 2-460,461
 D Belden Corp., Richmond, Ind. p. 2-1882-1909
 D Cimco Wire & Cable, Allendale, N.J.
 p. 2-1910,2023

Columbia Elctn. Cables, New Bedford, Mass.
 p. 2-1911

D Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1957

D Daburn Electronics & Cable Corp., Bronx, N.Y.
 p. 2-1988

DM Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993

National Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2030,2032

DM Rowe Industries, Toledo, Ohio p. 2-2052,2053

D Victor Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2066

DM Whitmor Wire & Cable, No. Hollywood, Cal.
 p. 2-2072

M Woven Elctns., Mauldin, S. C. p. 2-2068-2071

D Alpha Wire Corp., Elizabeth, N.J. *

D GC Electronics, Rockford, Ill. *

Standard Wire & Cable Co., Los Angeles, Cal. *

American Electric Cable Co., Holyoke, Mass.

D The Anaconda Co., Greenwich, Conn.

M Anchor Specialty Mfg. Inc., Teterboro, N.J.

M Arco Wire & Cable, N. Hollywood, Cal.

D Birnbach Co., Freeport, N.Y.

D Boston Insulated Wire & Cable Co., Dorchester,
 Mass.

D CCS Hatfield Wire & Cable Group, Cranford, N.J.

Cerro Wire & Cable Co., New Haven, Conn.

D Custom Cable Co., Oceanside, N.Y.

D Essex International, Sycamore, Ill.

General Elec., Bridgeport, Conn.

Gulton Inds., Buena Park, Cal.

Leviton Mfg. Co., Little Neck, N.Y.

D Linemaster Switch Corp., Woodstock, Conn.

D Manhattan Elec. Cable Corp., Rye, N.Y.

Mil Spec Wire & Cable Corp., Freeport, N.Y.

Okonite Co., Ramsey, N.J.

D Pace Wire & Cable Corp., Oceanside, N.Y.

D Pacific Electricord Co., Gardena, Cal.

Raychem Corp., Menlo Park, Cal.

M Reynolds Metals Co., Richmond, VA.

Willco Sales, Mineola, N.Y.

D Workman Electronic Prods., Sarasota, Fla.

Cable, Retractable—See Cords, Retractable**Cable Retractors**

Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993
 General Devices Co., Indianapolis, Ind. p. 1-70
 Vent-Rak, Div., Indianapolis, Ind. p. 1-70
 M Zero Mfg. Co., Burbank, Cal. p. 1-106-109
 Accuride, Santa Fe Springs, Cal.
 Grant Hardware Co., W. Nyack, N.Y.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Morey Corp., Downers Grove, Ill.

Cable, Ribbon—See Cable, Flat**Cable, Rotator Antenna—See Cable, Multiconductor****Cable, Shielded**

D Alpha Wire Corp., Elizabeth, N.J.
 p. 2-1835,1841,1846-1852,1854,1855
 M Amphenol Connector Div., SAMS Oper.,
 Chatsworth, Cal. p. 2-460,461
 D Belden Corp., Richmond, Ind. p. 2-1882-1909
 DM Cimco Wire & Cable, Allendale, N.J.
 p. 2-1910,2023

D Columbia Elctn. Cables, New Bedford, Mass.
 p. 2-1911

DM Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1938,1942,1946

DM Daburn Electronics & Cable Corp., Bronx, N.Y.
 p. 2-1979,1981,1983,1987

DM Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993

DM Markel, L. Frank & Sons, Norristown, Pa.
 p. 2-2024,2025

National Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2038-2042

M Perfection Mica Co., Bensenville, Ill.
 p. 2-1257,2055

DM Rowe Industries, Toledo, Ohio p. 2-2052,2053

Shigoto Inds., Ltd., New York, N.Y. p. 1-2276

D Spectra-Strip Corp., Garden Grove, Cal.
 p. 2-2056

Standard Wire & Cable Co., Los Angeles, Cal.
 p. 2-2059

D 3M Company, St. Paul, Minn. p. 2-1034-1055

PRODUCT INDEX & DIRECTORY

Cable, Twisted Pair

DM Uniform Tubes, Collegeville, Pa.p. 2-2064
M Victor Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2066
DM Whitmor Wire & Cable, No. Hollywood, Cal.
 p. 2-2072
M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
D Augat Inc., Attleboro, Mass. *
D GC Electronics, Rockford, Ill. *
M McGraw-Edison Co., Manchester, N.H. *
 Access-Wire, Garnersville, N.Y.
 M Addington Labs, Santa Clara, Cal.
 M Aircraft & Elex Spcltys, Plainfield, Ind.
 M American Electric Cable Co., Holyoke, Mass.
 D The Anaconda Co., Greenwich, Conn.
 M Arco Wire & Cable, N. Hollywood, Cal.
DM Astrolab, Rahway, N.J.
 D Birnbach Co., Freeport, N.Y.
 D Boston Insulated Wire & Cable Co., Dorchester, Mass.
 D Brand-Rex Co., Willimantic, Conn.
 Cable Systems & Assembly Co., Everett, Mass.
 Caltron Industries, Berkeley, Cal.
 D CCS Hatfield Wire & Cable Group, Cranford, N.J.
 Cerro Wire & Cable Co., New Haven, Conn.
 D Channel Master Div. Avnet, Ellenville, N.Y.
 M Co-Operative Inds., Chester, N.J.
 D Cole-Flex Corp., W. Babylon, N.Y.
 D Custom Cable Co., Oceanside, N.Y.
 D Dracon Industries, Chatsworth, Cal.
 D Estes Engrg. Co., Port Angeles, Wash.
 General Elec., Bridgeport, Conn.
 M Glenair, Glendale, Cal.
 Gordon, Claud S. Co., Richmond, Ill.
 Gotham Audio Corp., New York, N.Y.
 Gulton Inds., Buena Park, Cal.
 Icore Int'l., Sunnyvale, Cal.
 D Jersey Specialty Co., Wayne, N.J.
 M Judd Wire Div., Burlington, Mass.
 Lenz Electric Mfg. Co., Chicago, Ill.
 M Lundy Elctns. & Sys., Glen Head, N.Y.
 D Malco, A Microdot Co., Chicago, Ill.
DM Manhattan Elec. Cable Corp., Rye, N.Y.
 Megavolt, New York, N.Y.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Motorola Comms. Div., Schaumburg, Ill.
 D Norelcom Electronics, Farmingdale, N.Y.
 Okonite-Co., Ramsey, N.J.
 D Pace Wire & Cable Corp., Oceanside, N.Y.
 D Pacific Electriccord Co., Gardena, Cal.
 M Precision Tube, No. Wales, Pa.
 Raychem Corp., Menlo Park, Cal.
 M Reynolds Metals Co., Richmond, VA.
 Rockland Insulated Wire & Cable, Haverstraw, N.Y.
 Saxton Prods., Congers, N.Y.
 M Storm Products Co., Inglewood, Ca.
 D Superior Cable Div., Hickory, N.C.
 M Teledyne Aerospace Systems, Fairmont, Minn.
 Thermo Elec. Co., Saddle Brook, N.J.
 Times Wire & Cable, Wallingford, Conn.
 Trompeter Electronics, Chatsworth, Cal.
 TRW/Holyoke Wire & Cable, South Hadley, Mass.
 D Zippertubing Co., Los Angeles, Calif.

Cable, Telephone

D Alpha Wire Corp., Elizabeth, N.J.p. 2-1849
Amphenol Cadre Div., Endicott, N.Y.
 p. 2-460,461
D Belden Corp., Richmond, Ind.p. 2-1882-1909
D Columbia Elctrn. Cables, New Bedford, Mass.
 p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1945
Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993
Shigoto Inds., Ltd., New York, N.Y. p. 1-2276
M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
D Daburn Electronics & Cable Corp., Bronx, N.Y. *
Standard Wire & Cable Co., Los Angeles, Cal. *
D 3M Company, St. Paul, Minn. *
Victor Wire & Cable Corp., Los Angeles, Cal. *
 Access-Wire, Garnersville, N.Y.
 D The Anaconda Co., Greenwich, Conn.
 M Arco Wire & Cable, N. Hollywood, Cal.
 D Birnbach Co., Freeport, N.Y.
 Brand-Rex Co., Willimantic, Conn.
 D CCS Hatfield Wire & Cable Group, Cranford, N.J.
 D Custom Cable Co., Oceanside, N.Y.
 D GTE Automatic Electric Inc., Northlake, Ill.
 Lenz Electric Mfg. Co., Chicago, Ill.
 D Manhattan Elec. Cable Corp., Rye, N.Y.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Okonite Co., Ramsey, N.J.
 D Pace Wire & Cable Corp., Oceanside, N.Y.
 D Pacific Electriccord Co., Gardena, Cal.
 Saxton Prods., Congers, N.Y.
 D Superior Cable Div., Hickory, N.C.
 TRW/Holyoke Wire & Cable, South Hadley, Mass.

Cable, TFE Insulated

D Alpha Wire Corp., Elizabeth, N.J.
 p. 2-1852,1880
Belden Corp., Richmond, Ind.
 p. 2-1882-1888,1890-1909
DM Cimco Wire & Cable, Allendale, N.J.
 p. 2-1910,2023
D Columbia Elctrn. Cables, New Bedford, Mass.
 p. 2-1911
DM Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1935,1936,1952,1953
DM Daburn Electronics & Cable Corp., Bronx, N.Y.
 p. 2-1980,1981,1984
DM Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993
DM Markel, L. Frank & Sons, Norristown, Pa.
 p. 2-2024,2025
National Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2039
DM Uniform Tubes, Collegeville, Pa.p. 2-2064
M Victor Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2066
M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
Standard Wire & Cable Co., Los Angeles, Cal. *
 M Addington Labs, Santa Clara, Cal.
 The Anaconda Co., Greenwich, Conn.
 M Arco Wire & Cable, N. Hollywood, Cal.
 D Astrolab, Rahway, N.J.
 Boston Insulated Wire & Cable Co., Dorchester, Mass.
 Caltron Industries, Berkeley, Cal.
 Cerro Wire & Cable Co., New Haven, Conn.
 D Custom Cable Co., Oceanside, N.Y.
 Magnet Wire Inc., New York, NY
DM Manhattan Elec. Cable Corp., Rye, N.Y.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 D Norelcom Electronics, Farmingdale, N.Y.
 M Phoenix Wire, S. Hero, Vt.
DM Thermax Wire Corp., Flushing, N.Y.
 Thermo Elec. Co., Saddle Brook, N.J.

Cable, Transmission Line

D Belden Corp., Richmond, Ind.p. 2-1882-1909
D Columbia Elctrn. Cables, New Bedford, Mass.
 p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1954,1955
Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993
Hughes Aircraft Co., Connecting Devices,
Newport Beach, Cal.p. 2-2022
DM Markel, L. Frank & Sons, Norristown, Pa.
 p. 2-2024,2025
National Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2037,2038
DM Rowe Industries, Toledo, Ohio p. 2-2052,2053
D Spectra-Strip Corp., Garden Grove, Cal.
 p. 2-2056
DM Uniform Tubes, Collegeville, Pa.p. 2-2064
M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
DM Alpha Wire Corp., Elizabeth, N.J. *
M Amphenol RF Div., Danbury, Conn. *
Standard Wire & Cable Co., Los Angeles, Cal. *
Victor Wire & Cable Corp., Los Angeles, Cal. *
 M Addington Labs, Santa Clara, Cal.
 D The Anaconda Co., Greenwich, Conn.
 Andrew Corp., Orland Park, Ill.
 Ansley Elctns. Corp., Los Angeles, Cal.
 M Arco Wire & Cable, N. Hollywood, Cal.
DM Astrolab, Rahway, N.J.
 Birnbach Co., Freeport, N.Y.
 Brand-Rex Co., Willimantic, Conn.
 DM Cablewave Systems Inc., North Haven, Conn.
 D CCS Hatfield Wire & Cable Group, Cranford, N.J.
 D Jerrold Electronics Corp., Horsham, Pa.
 D Jersey Specialty Co., Wayne, N.J.
 M Kaman Sciences Corp., Colorado Springs, Colo.
 D Malco, A Microdot Co., Chicago, Ill.
DM Manhattan Elec. Cable Corp., Rye, N.Y.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Motorola Comms. Div., Schaumburg, Ill.
 Okonite Co., Ramsey, N.J.
 D Pace Wire & Cable Corp., Oceanside, N.Y.
 D Pacific Electriccord Co., Gardena, Cal.
 Precision Tube, No. Wales, Pa.
 M Reynolds Metals Co., Richmond, VA.
 Saxton Prods., Congers, N.Y.
 D Times Wire & Cable, Wallingford, Conn.
 TRW/Holyoke Wire & Cable, South Hadley, Mass.

Cable, Triaxial

D Belden Corp., Richmond, Ind.p. 2-1882-1909
D Cimco Wire & Cable, Allendale, N.J.
 p. 2-1910,2023
D Columbia Elctrn. Cables, New Bedford, Mass.
 p. 2-1911

D Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1961
DM Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993
DM Markel, L. Frank & Sons, Norristown, Pa.
 p. 2-2024,2025
National Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2047
DM Rowe Industries, Toledo, Ohio p. 2-2052,2053
DM Whitmor Wire & Cable, No. Hollywood, Cal.
 p. 2-2072
DM Daburn Electronics & Cable Corp., Bronx, N.Y. *
Standard Wire & Cable Co., Los Angeles, Cal. *
Victor Wire & Cable Corp., Los Angeles, Cal. *
M Woven Elctns., Mauldin, S. C. *
 M Arco Wire & Cable, N. Hollywood, Cal.
 D Boston Insulated Wire & Cable Co., Dorchester, Mass.
 Brand-Rex Co., Willimantic, Conn.
 Caltron Industries, Berkeley, Cal.
 Gulton Inds., Buena Park, Cal.
 M Judd Wire Div., Burlington, Mass.
 M Kaman Sciences Corp., Colorado Springs, Colo.
 D Manhattan Elec. Cable Corp., Rye, N.Y.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Precision Tube, No. Wales, Pa.
 Raychem Corp., Menlo Park, Cal.
 M Thermax Wire Corp., Flushing, N.Y.
 Times Wire & Cable, Wallingford, Conn.
 Trompeter Electronics, Chatsworth, Cal.
 TRW/Holyoke Wire & Cable, South Hadley, Mass.

Cable, TV (Including Camera)

AMP Captron Div./AMP Inc., Elizabethtown,
Pa.p. 2-450,451
Belden Corp., Richmond, Ind.p. 2-1882-1909
D Columbia Elctrn. Cables, New Bedford, Mass.
 p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1947,1954,1955
National Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2047
DM Rowe Industries, Toledo, Ohio p. 2-2052,2053
Shigoto Inds., Ltd., New York, N.Y. p. 1-2276
DM Uniform Tubes, Collegeville, Pa.p. 2-2064
DM Whitmor Wire & Cable, No. Hollywood, Cal.
 p. 2-2072
D Alpha Wire Corp., Elizabeth, N.J. *
Standard Wire & Cable Co., Los Angeles, Cal. *
3M Company, St. Paul, Minn. *
Victor Wire & Cable Corp., Los Angeles, Cal. *
 M Arco Wire & Cable, N. Hollywood, Cal.
 Boston Insulated Wire & Cable Co., Dorchester, Mass.
 Brand-Rex Co., Willimantic, Conn.
 D GBC - Closed Circuit TV, New York, N.Y.
 General Elec., Bridgeport, Conn.
 General Electrodynamics Corp., Garland, Tex.
 D Jersey Specialty Co., Wayne, N.J.
 Lenz Electric Mfg. Co., Chicago, Ill.
 D Malco, A Microdot Co., Chicago, Ill.
 D Manhattan Elec. Cable Corp., Rye, N.Y.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 D Phone-Aid Co., Chicago, Ill.
 TRW/Holyoke Wire & Cable, South Hadley, Mass.

Cable, Twisted Pair

Belden Corp., Richmond, Ind.p. 2-1882-1909
DM Cimco Wire & Cable, Allendale, N.J.
 p. 2-1910,2023
D Columbia Elctrn. Cables, New Bedford, Mass.
 p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1942-1944
DM Daburn Electronics & Cable Corp., Bronx, N.Y.
 p. 2-1981,1986,1987
DM Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993
DM Markel, L. Frank & Sons, Norristown, Pa.
 p. 2-2024,2025
National Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2028,2031,2037,2038,2040,2041,2044
M Perfection Mica Co., Bensenville, Ill.
 p. 2-1257,2055
DM Rowe Industries, Toledo, Ohio p. 2-2052,2053
D Spectra-Strip Corp., Garden Grove, Cal.
 p. 2-2056
DM Whitmor Wire & Cable, No. Hollywood, Cal.
 p. 2-2072
M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
D Alpha Wire Corp., Elizabeth, N.J. *
D Augat Inc., Attleboro, Mass. *
Standard Wire & Cable Co., Los Angeles, Cal. *
Victor Wire & Cable Corp., Los Angeles, Cal. *
 Access-Wire, Garnersville, N.Y.
 American Electric Cable Co., Holyoke, Mass.
 The Anaconda Co., Greenwich, Conn.

M Arco Wire & Cable, N. Hollywood, Cal.
Boston Insulated Wire & Cable Co., Dorchester, Mass.

D Brand-Rex Co., Willimantic, Conn.
Cable Systems & Assembly Co., Everett, Mass.

D Custom Cable Co., Oceanside, N.Y.
Gordon, Claud S. Co., Richmond, Ill.
Gulton Inds., Buena Park, Cal.
Icore Int'l., Sunnysvale, Cal.
Interdyne, Van Nuys, Cal.
Lenz Electric Mfg. Co., Chicago, Ill.
Magnet Wire Inc., New York, NY

D Manhattan Elec. Cable Corp., Rye, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Motorola Comms. Div., Schaumburg, Ill.

D Norelcom Electronics, Farmingdale, N.Y.
Okonite Co., Ramsey, N.J.

D Protectowire Co., Hanover, Mass.
Raychem Corp., Menlo Park, Cal.
Saxton Prods., Congers, N.Y.

M Storm Products Co., Inglewood, Ca.

DM Thermo Wire Corp., Flushing, N.Y.
Thermo Elec. Co., Saddle Brook, N.J.
Trompeter Electronics, Chatsworth, Cal.
TRW/Holyoke Wire & Cable, South Hadley, Mass.

Cages, Circuit Board—See Volume 1

Calculators, Electrical & Electronic—Also See Computers, Desk Top—See Volume 1

Calibrators, Accelerometer—See Volume 1

Calibrators, Attenuation—See Volume 1

Calibrators, Crystal—See Volume 1

Calibrators, Current—See Volume 1

Calibrators, Frequency—See Volume 1

Calibrators, LVDT—See Volume 1

Calibrators, Magnetic Field—See Volume 1

Calibrators, Meter—See Volume 1

Calibrators, Oscilloscope—See Volume 1

Calibrators, Radar Range—See Volume 1

Calibrators, Sound Level—See Volume 1

Calibrators, Sweep—See Volume 1

Calibrators, Synchro—See Volume 1

Calibrators, Time-Base—See Volume 1

Calibrators, Voltage—See Volume 1

Calibrators, VSWR—See Volume 1

Calling Sytems—See Volume 1

Calorimeters, Microwave—See Volume 1

Cameras, Data Recording—See Volume 1

Cameras, Image Converter—See Volume 1

Cameras, Infrared—See Volume 1

Cameras, Oscilloscope—See Volume 1

Cams

A. M. W. Corp., Arlington, Mass.
The Anaconda Co., Greenwich, Conn.
Emporium Specialties Co., Austin, Pa.
Excel Products Co., New Brunswick, N.J.
Kahle Engrg. Co., Union City, N.J.
D Mechanical Engraving Co., Bronx, N.Y.
PIC Design Division, Ridgefield, Conn.
Sterling Instr., New Hyde Pk., NY

Cans, Capacitor, Relay, Semiconductor, Transformer, etc

Micrite Metal Mfg., Canoga Park, Cal.
p. 2-1236-1239

M Zero Mfg. Co., Burbank, Cal. p. 1-106-109

D GC Electronics, Rockford, Ill. *

DM Keystone Elctns. Corp., New York, N.Y. *

D Heeger Inc., Los Angeles, Cal.
Kentucky Electronics, Owensboro, Ky.
M Kinetron Corp., Asbury Park, N.J.

South Shore Metal Prods., Farmingdale, N.Y.
Universal Security Instrs., Baltimore, Md.

Cans & Flat Packs, Integrated Circuit—See Volume 1

Capacitance Comparators—See Volume 1

Capacitor, Hardware

D Bivar, Santa Ana, Cal. p. 2-1266

D Sprague Products Co., No. Adams, Mass. p. 2-300,301

D Waldom Electronics, Chicago, Ill. p. 2-1262-1266

D Accessories for Electronics, Bayside, N.Y.

DM Amrad Corporation, Paris, Tex.

M Hadley Components Div., Hadley, Pa.
National Electronic Supply, Garden Grove, Cal.
Sprague Elec. Co., No. Adams, Mass.

Capacitor Leakage Indicators—See Volume 1

Capacitors, Fixed for A-C Applications (Including Motor Start)

M Component Resch., Santa Monica, Cal. p. 2-42

Electrocube Inc., San Gabriel, Cal. p. 2-121-125

M F-Dyne Elctns., Bridgeport, Conn. p. 2-130-133

General Elec. Co., Schenectady, N.Y. p. 2-134-137

Gudeman Corp., Chicago, Ill. p. 2-138

D Mallory Capacitor Co., Indianapolis, Ind. p. 2-206,207

MRF Interonics, Bay Shore, N.Y. p. 1-572,573

DM Sangamo Elec. Co., Pickens, S.C. p. 2-236,237

M Southern Electronics Co., Burbank, Cal. p. 2-240,241

D Sprague Products Co., No. Adams, Mass. p. 2-299,300

Shigoto Inds., Ltd., New York, N.Y. *

TRW Capacitor Div., Ogallala, Neb. *

MUSCC/Centralab, Elec. Div., Los Angeles, Cal. *

Aerovox Inds., New Bedford, Mass.

D Baknor Industries Ltd., Port Credit, Ont.
Chicago Condenser Corp., Chicago, Ill.

D Cornell-Dubilier Electronics, Newark, N.J.
Elmag Corp., Newark, N.J.

D Film Capacitors, Passaic, N.J.
Filttron Company, Westbury, N.Y.
GTJ/Tensor Electronics, San Diego, Cal.
Industrial Condenser Corp., Chicago, Ill.

ITT Jennings, Monrovia, Cal.

D Mepeco/Electra, Morristown, N.J.
Motorola Comms. Div., Schaumburg, Ill.
Nichicon America Corp., Chicago, Ill.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

D Siemens Corp., Iselin, N.J.

D Sprague Elec. Co., No. Adams, Mass.
Triac Electronics, New York, N.Y.
United Chemicon, Syracuse, N.Y.
United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Air Cooled

M Del Electronics Corp., Mt. Vernon, N.Y. p. 2-120

ITT Jennings, Vacuum Elctn. Prods., San Jose, Cal. p. 2-198-200

Condenser Products Corp., Brooksville, Fla.
ITT Jennings, Monrovia, Cal.
Maxwell Labs., San Diego, Calif.
Nichicon America Corp., Chicago, Ill.
United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Chip (For Microcircuits)

American Technical Ceramics, Huntington Sta., N.Y. p. 2-28-31

DM AVX Ceramics, Myrtle Beach, S.C. p. 2-3-4

Corning Glass Works, Corning, N.Y. p. 2-105

Erie Technological Products, Erie, Pa. p. 2-127-129

DM Johanson Mfg. Corp., Boonton, N.J. p. 2-204

M Johanson/Monolithic Dielectrics Div., Burbank, Cal. p. 2-205

Murata Corp. of America, Rockmart, Ga. p. 2-211

M Republic Elctns. Corp., Paterson, NJ p. 2-232

D Union Carbide Corp., Greenville, S.C. p. 2-316-319

D USCC/Centralab, Elec. Div., Los Angeles, Cal. p. 2-320,321

Varadyne Industries, Santa Monica, Cal. p. 2-328,329

M Analog Devices, Norwood, Mass. *

Mini-Systems, North Attleboro, Mass. *

Promemco, Hauppauge, N.Y. *

Semtech Corp., Newbury Park, Cal. *

Spectrum Control, Fairview, Pa. *

Sprague Products Co., No. Adams, Mass. *

M Aertech Industries, Sunnysvale, Cal.
American Lava Corp., Chattanooga, Tenn.
Bell Industries, Electronic Components Div., Burbank, Cal.
Burr-Brown, Tucson, Ariz.
D Centralab, Milwaukee, Wisc.
Emcon Div., San Diego, Cal.
GTJ/Tensor Electronics, San Diego, Cal.
Hybrex, Tucson, Ariz.
ITT Jennings, Monrovia, Cal.

DM JFD Electronics Components Corp., Bklyn., N.Y.

D Mepeco/Electra, Morristown, N.J.

D Motorola Semiconductor Prods., Phoenix, Ariz.
Murata Mfg. Co. Ltd., Kyoto, Japan

D NCI, W. Palm Beach, Fla.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
Polyflon Corp., New Rochelle, N.Y.
Radio Materials Co., Chicago, Ill.

M San Fernando Elec. Mfg., San Fernando, Cal.

D Soshin Elec. Co., Tokyo, Japan

Sprague Elec. Co., No. Adams, Mass.

TDK Elctns. Corp., Long Island City, N.Y.

M Thincor, Hatboro, Pa.
Union Carbide Corp., New York, N.Y.
Varian Assoc., Beverly, Mass.
Varian Electron Tube & Device Grp., San Carlos, Cal.

Capacitors, Fixed, Air

Jackson Bros., (London) Ltd., New York, N.Y. p. 2-196,197

M Del Electronics Corp., Mt. Vernon, N.Y. *

General Radio Co., Concord, Mass. *

Shigoto Inds., Ltd., New York, N.Y. *

Leads & Northrup Co., North Wales, Pa.
Nichicon America Corp., Chicago, Ill.

D Norelcom Electronics, Farmingdale, N.Y.
Rhode & Schwarz Sis., Fairfield, N.J.

Capacitors, Fixed, Bathtub

Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39

Component Resch., Santa Monica, Cal. p. 2-42

Electrocube Inc., San Gabriel, Cal. p. 2-121-125

M F-Dyne Elctns., Bridgeport, Conn. p. 2-130-133

Gudeman Corp., Chicago, Ill. p. 2-138

D Nytronics Comps. Group Inc., Darlington, S.C. p. 2-212-229

MRF Interonics, Bay Shore, N.Y. p. 1-572,573

M Southern Electronics Co., Burbank, Cal. p. 2-240,241

DM Sprague Products Co., No. Adams, Mass. p. 2-285

Teledyne Philbrick, Dedham, Mass. p. 1-208-217

MS & El Mfg., Northridge, Cal. *

M Active & Passive Components, Syosset, N.Y.

DM Acushnet Capacitor Co., New Bedford, Mass.

D Balco Capacitors, Orange, N.J.
Chicago Condenser Corp., Chicago, Ill.
Condenser Products Corp., Brooksville, Fla.
Dearborn Elctns. Div., Longwood, Fla.
Elmag Corp., Newark, N.J.
Film Capacitors, Passaic, N.J.
Filttron Company, Westbury, N.Y.

D Industrial Condenser Corp., Chicago, Ill.

ITT Jennings, Monrovia, Cal.

D Norelcom Electronics, Farmingdale, N.Y.

DM Plastic Capacitors, Chicago, Ill.

DM San Fernando Elec. Mfg., San Fernando, Cal.

D Sprague Elec. Co., No. Adams, Mass.
Standard Condenser Corp., Chicago, Ill.

D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Ceramic

American Technical Ceramics, Huntington Sta., N.Y. p. 2-28-31

Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39

DM AVX Ceramics, Myrtle Beach, S.C. p. 2-2-23

D Bell Industries, Compton, Cal. p. 2-370-379

DM Corning Glass Works, Corning, N.Y. p. 2-105

Electro Motive Corp., Melville, New York p. 2-194,195

D Erie Technological Products, Erie, Pa. p. 2-127-129

Gudeman Corp., Chicago, Ill. p. 2-138

International Electronics Corp., Melville, N.Y. p. 2-194,195

DM Johanson Mfg. Corp., Boonton, N.J. p. 2-204

M Johanson/Monolithic Dielectrics Div., Burbank, Cal. p. 2-205

Murata Corp. of America, Rockmart, Ga. p. 2-211

D Nytronics Comps. Group Inc., Darlington, S.C. p. 2-212-229

PRODUCT INDEX & DIRECTORY

Capacitors, Fixed, Film

M Republic Elctns. Corp., Paterson, NJ p. 2-232,233
M Ross Engineering Corp., Campbell, Cal. p. 1-1807
DM Sprague Products Co., No. Adams, Mass. p. 2-286-293
Union Carbide Corp., Greenville, S.C. p. 2-316-319
DMUSCC/Centralab, Elec. Div., Los Angeles, Cal. p. 1-320; p. 2-327
D Varadyne Industries, Santa Monica, Cal. p. 2-328-333
D GC Electronics, Rockford, Ill. *
Promemco, Hauppauge, N.Y. *
Semtech Corp., Newbury Park, Cal. *
Shigoto Inds., Ltd., New York, N.Y. *
D Spectrum Control, Fairview, Pa. *
American Lava Corp., Chattanooga, Tenn.
Bell Industries, Electronic Components Div., Burbank, Cal.
DM Cal-R, Santa Monica, Cal.
D Cambridge Thermionic Corp., Cambridge, Mass.
D Centralab, Milwaukee, Wisc.
D Constanta Co. of Can., Montreal, Can.
Dilectron, Monrovia, Cal.
D Emcon Div., San Diego, Cal.
GTJ/Tensor Electronics, San Diego, Cal.
ITT Jennings, Monrovia, Cal.
DM JFD Electronics Components Corp., Bklyn., N.Y.
D KD Components, Santa Ana, Cal.
DM Mepeco/Electra, Morristown, N.J.
Murata Mfg. Co. Ltd., Kyoto, Japan
Nichicon America Corp., Chicago, Ill.
D Norelcom Electronics, Farmingdale, N.Y.
D Nucleonic Prods., Canoga Pk., Cal.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
D Radio Materials Co., Chicago, Ill.
DM San Fernando Elec. Mfg., San Fernando, Cal.
D Siemens Corp., Iselin, N.J.
DM Sprague Elec. Co., No. Adams, Mass.
Stettner-Trush Inc., Cazenovia, N.Y.
TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
TDK Elctns. Corp., Long Island City, N.Y.
Union Carbide Corp., New York, N.Y.
D United Mineral & Chem. Corp., New York, N.Y.
Viclan, San Diego, Cal.

Capacitors, Fixed, Ceramic Disc

D Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39
DM AVX Ceramics, Myrtle Beach, S.C. p. 2-17-21
Erie Technological Products, Erie, Pa. p. 2-127-129
D Illinois Capacitor Sls. Co., Morton Grove, Ill. p. 2-191
International Comps Corp., Melville, N.Y. p. 2-192
Johanson Mfg. Corp., Boonton, N.J. p. 2-204
Murata Corp. of America, Rockmart, Ga. p. 2-211
DM Sprague Products Co., No. Adams, Mass. p. 2-286-289,293
D GC Electronics, Rockford, Ill. *
Semtech Corp., Newbury Park, Cal. *
Shigoto Inds., Ltd., New York, N.Y. *
USCC/Centralab, Elec. Div., Los Angeles, Cal. *
American Lava Corp., Chattanooga, Tenn.
D Baknor Industries Ltd., Port Credit, Ont.
D Centralab, Milwaukee, Wisc.
D Cornell-Dubilier Electronics, Newark, N.J.
Dilectron, Monrovia, Cal.
DM JFD Electronics Components Corp., Bklyn., N.Y.
Kahgan Electronics Corp., Hempstead, NY
D M.I.A.L. U.S.A., Nutley, N.J.
Motorola Comms. Div., Schaumburg, Ill.
Murata Mfg. Co. Ltd., Kyoto, Japan
Nichicon America Corp., Chicago, Ill.
D Norelcom Electronics, Farmingdale, N.Y.
D Nucleonic Prods., Canoga Pk., Cal.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
D Radio Materials Co., Chicago, Ill.
D Sprague Elec. Co., No. Adams, Mass.
Stettner-Trush Inc., Cazenovia, N.Y.
TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
TDK Elctns. Corp., Long Island City, N.Y.
D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Decade

D Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39
Component Resch., Santa Monica, Cal. p. 2-42
Electrocube Inc., San Gabriel, Cal. p. 2-121-125
Erie Technological Products, Erie, Pa. p. 2-127-129

MF-Dyne Elctns., Bridgeport, Conn. p. 2-130-133
Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747
M Southern Electronics Co., Burbank, Cal. p. 2-240,241
DM Union Carbide Corp., Greenville, S.C. p. 2-316-319
General Radio Co., Concord, Mass. *
Interelectronics Corp., Congers, N.Y. *
MS & El Mfg., Northridge, Cal. *
Sprague Products Co., No. Adams, Mass. *
Chicago Condenser Corp., Chicago, Ill.
D Cornell-Dubilier Electronics, Newark, N.J.
Electro Sci. Inds., Portland, Ore.
Film Capacitors, Passaic, N.J.
Nichicon America Corp., Chicago, Ill.
RCA Electronic Comps., Harrison, N.J.
Rhode & Schwarz Sls., Fairfield, N.J.
D San Fernando Elec. Mfg., San Fernando, Cal.
Sprague Elec. Co., No. Adams, Mass.
Tucker Electronics Co., Garland, Tex.

Capacitors, Fixed, Electrolytic (All Types)

D Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39
D Corning Glass Works, Corning, N.Y. p. 2-105
Electro Motive Corp., Melville, New York p. 2-194,195
General Elec. Co., Schenectady, N.Y. p. 2-134-137
D General Instr. Corp., Semiconductor Prods Grp., Hicksville, N.Y. p. 2-169
D Illinois Capacitor Sls. Co., Morton Grove, Ill. p. 2-191
International Comps Corp., Melville, N.Y. p. 2-192
International Electronics Corp., Melville, N.Y. p. 2-194,195
D Mallory Capacitor Co., Indianapolis, Ind. p. 2-208,209
DM Sangamo Elec. Co., Pickens, S.C. p. 2-236,237
DM Sprague Products Co., No. Adams, Mass. p. 2-242-278,295,299
Union Carbide Corp., Greenville, S.C. p. 2-316-319
D GC Electronics, Rockford, Ill. *
Inter-Tech. Grp., Irvington-on-Hudson, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
D Baknor Industries Ltd., Port Credit, Ont.
D Callins Capacitors, Greenfield, Tenn.
DM Cornell-Dubilier Electronics, Newark, N.J.
Filttron Company, Westbury, N.Y.
Hilton Industries Inc., Glen Falls, N.Y.
D Industrial Condenser Corp., Chicago, Ill.
M International Importers, Chicago, Ill.
Kahgan Electronics Corp., Hempstead, NY
D Mepeco/Electra, Morristown, N.J.
Motorola Comms. Div., Schaumburg, Ill.
Nichicon America Corp., Chicago, Ill.
D Norelcom Electronics, Farmingdale, N.Y.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
D Philmore Mfg. Co. Inc., Inwood, N.Y.
Presin Co., Shelton, Conn.
D Siemens Corp., Iselin, N.J.
DM Sprague Elec. Co., No. Adams, Mass.
Stettner-Trush Inc., Cazenovia, N.Y.
Tran Spectra Inc., Greenfield, Tenn.
United Chemicon, Syracuse, N.Y.
D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Feedthru

DM AVX Ceramics, Myrtle Beach, S.C. p. 2-22,23
Component Resch., Santa Monica, Cal. p. 2-42
Electrocube Inc., San Gabriel, Cal. p. 2-121-125
D Erie Technological Products, Erie, Pa. p. 2-127-129
MF-Dyne Elctns., Bridgeport, Conn. p. 2-130-133
M Gudeman Corp., Chicago, Ill. p. 2-138
ITT Jennings, Vacuum Elctn. Prods., San Jose, Cal. p. 2-198-200
Johanson Mfg. Corp., Boonton, N.J. p. 2-204
M Johanson/Monolithic Dielectrics Div., Burbank, Cal. p. 2-205
MRF Interonics, Bay Shore, N.Y. p. 1-572,573
Seacor, Norwood, N.J. p. 2-238,239
M Southern Electronics Co., Burbank, Cal. p. 2-240,241
D Sprague Products Co., No. Adams, Mass. p. 1-585
All-Tronics Inc., Westbury, N.Y. *
Custom Elctns., Oneonta, N.Y. *
M Del Electronics Corp., Mt. Vernon, N.Y. *
MS & El Mfg., Northridge, Cal. *
D Spectrum Control, Fairview, Pa. *

MUSCC/Centralab, Elec. Div., Los Angeles, Cal. *
M Active & Passive Components, Syosset, N.Y.
D Acushnet Capacitor Co., New Bedford, Mass.
Captor Corp., Tipp City, Ohio
D Centralab, Milwaukee, Wisc.
Chicago Condenser Corp., Chicago, Ill.
D Cornell-Dubilier Electronics, Newark, N.J.
M Dearborn Elctns. Div., Longwood, Fla.
M DynaMagnetic Engrg., Santa Ana, Cal.
Elmag Corp., Newark, N.J.
Estes Engrg. Co., Port Angeles, Wash.
Film Capacitors, Passaic, N.J.
Filttron Company, Westbury, N.Y.
Genisco Technology Corp., Compton, Cal.
ITT Jennings, Monrovia, Cal.
D Mepeco/Electra, Morristown, N.J.
Motorola Comms. Div., Schaumburg, Ill.
Murata Mfg. Co. Ltd., Kyoto, Japan
D NCI, W. Palm Beach, Fla.
D Norelcom Electronics, Farmingdale, N.Y.
D Nucleonic Prods., Canoga Pk., Cal.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
Polyflon Corp., New Rochelle, N.Y.
M Rtron Corp., Skokie, Ill.
San Fernando Elec. Mfg., San Fernando, Cal.
DM Sprague Elec. Co., No. Adams, Mass.
Standard Condenser Corp., Chicago, Ill.
Stettner-Trush Inc., Cazenovia, N.Y.
TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
TDK Elctns. Corp., Long Island City, N.Y.
D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Film

D Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39
M Axel Elctns., Jamaica, N.Y. p. 2-41
M Component Resch., Santa Monica, Cal. p. 2-42
D Datak Corp., Guttenberg, N.J. p. 2-384,1079
M Del Electronics Corp., Mt. Vernon, N.Y. p. 2-120
Electro Motive Corp., Melville, New York p. 2-194,195
Electrocube Inc., San Gabriel, Cal. p. 2-121-125
Erie Technological Products, Erie, Pa. p. 2-127-129
MF-Dyne Elctns., Bridgeport, Conn. p. 2-130-133
General Elec. Co., Schenectady, N.Y. p. 2-134-137
D General Instr. Corp., Semiconductor Prods Grp., Hicksville, N.Y. p. 2-169
D Gudeman Corp., Chicago, Ill. p. 2-138
D Illinois Capacitor Sls. Co., Morton Grove, Ill. p. 2-191
International Comps Corp., Melville, N.Y. p. 2-192
International Electronics Corp., Melville, N.Y. p. 2-194,195
D Midwec Div., Scottsbluff, Neb. p. 2-187
Nytronics Comps. Group Inc., Darlington, S.C. p. 2-212-229
Potter Co., Wesson, Miss. p. 2-230
MRF Interonics, Bay Shore, N.Y. p. 1-572,573
MS & El Mfg., Northridge, Cal. p. 2-234,235
Seacor, Norwood, N.J. p. 2-238,239
M Southern Electronics Co., Burbank, Cal. p. 2-240,241
D Sprague Products Co., No. Adams, Mass. p. 2-279-284
DM Union Carbide Corp., Greenville, S.C. p. 2-316-319
M Wesco Electrical Co., Greenfield, Mass. p. 2-334,336,337
M Analog Devices, Norwood, Mass. *
D GC Electronics, Rockford, Ill. *
Inter-Tech. Grp., Irvington-on-Hudson, N.Y. *
Interelectronics Corp., Congers, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
DMTRW Capacitor Div., Ogallala, Neb. *
M Active & Passive Components, Syosset, N.Y.
DM Acushnet Capacitor Co., New Bedford, Mass.
Amp Inc., Harrisburg, Pa.
D Baknor Industries Ltd., Port Credit, Ont.
D Balco Capacitors, Orange, N.J.
D Callins Capacitors, Greenfield, Tenn.
Captor Corp., Tipp City, Ohio
D Centralab, Milwaukee, Wisc.
Chicago Condenser Corp., Chicago, Ill.
Condenser Products Corp., Brooksville, Fla.
DM Cornell-Dubilier Electronics, Newark, N.J.
M Dearborn Elctns. Div., Longwood, Fla.
D Electro-Science Labs., Pennsauken, N. J.
Elctn. Concepts, Eatontown, N.J.
Elmag Corp., Newark, N.J.
Engineered Components Co., San Luis Obispo, Cal.
Film Capacitors, Passaic, N.J.

Filtron Company, Westbury, N.Y.
 D Industrial Condenser Corp., Chicago, Ill.
 M International Importers, Chicago, Ill.
 ITT Jennings, Monrovia, Cal.
 Mepeco/Electra, Morristown, N.J.
 M.I.A.L. U.S.A., Nutley, N.J.
 Motorola Comms. Div., Schaumburg, Ill.
 Nichicon America Corp., Chicago, Ill.
 D Norelcom Electronics, Farmingdale, N.Y.
 D Paktron Div., Vienna, Va.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
 DM Plastic Capacitors, Chicago, Ill.
 DM San Fernando Elec. Mfg., San Fernando, Cal.
 D Siemens Corp., Iselin, N.J.
 DM Sprague Elec. Co., No. Adams, Mass.
 Standard Condenser Corp., Chicago, Ill.
 Stettner-Trush Inc., Cazenovia, N.Y.
 Union Carbide Corp., New York, N.Y.
 D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Glass

American Technical Ceramics, Huntington Sta., N.Y. p. 2-28-31
 DM Corning Glass Works, Corning, N.Y. p. 2-105
 Varadyne Industries, Santa Monica, Cal. p. 2-332,333
 M Del Electronics Corp., Mt. Vernon, N.Y. *
 D Electro-Science Labs., Pennsauken, N.J.
 Viclan, San Diego, Cal.

Capacitors, Fixed, High Capacitance-Low Voltage (50 Volts & Under)

American Technical Ceramics, Huntington Sta., N.Y. p. 2-28-31
 DM Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39
 M Component Resch., Santa Monica, Cal. p. 2-42
 D Corning Glass Works, Corning, N.Y. p. 2-105
 M Del Electronics Corp., Mt. Vernon, N.Y. p. 2-120
 D Electro Motive Corp., Melville, New York p. 2-194,195
 D Electrocube Inc., San Gabriel, Cal. p. 2-121-125
 D Erie Technological Products, Erie, Pa. p. 2-127-129
 M F-Dyne Elctns., Bridgeport, Conn. p. 2-130-133
 General Elec. Co., Schenectady, N.Y. p. 2-134-137
 D General Instr. Corp., Semiconductor Prods Grp., Hicksville, N.Y. p. 2-169
 Gudeman Corp., Chicago, Ill. p. 2-138
 D Illinois Capacitor Sls. Co., Morton Grove, Ill. p. 2-191
 International Comps Corp., Melville, N.Y. p. 2-192
 International Electronics Corp., Melville, N.Y. p. 2-194,195
 Johanson Mfg. Corp., Boonton, N.J. p. 2-204
 M Johanson/Monolithic Dielectrics Div., Burbank, Cal. p. 2-205
 D Mallory Capacitor Co., Indianapolis, Ind. p. 2-208,209
 Murata Corp. of America, Rockmart, Ga. p. 2-211
 D Nytronics Comps. Group Inc., Darlington, S.C. p. 2-212-229
 M Republic Elctns. Corp., Paterson, NJ p. 2-232
 MRF Interonics, Bay Shore, N.Y. p. 1-572,573
 MS & El Mfg., Northridge, Cal. p. 2-234,235
 DM Sangamo Elec. Co., Pickens, S.C. p. 2-238,237
 Seacor, Norwood, N.J. p. 2-238,239
 M Southern Electronics Co., Burbank, Cal. p. 2-240,241
 D Sprague Products Co., No. Adams, Mass. p. 2-242-278,280,282,295
 TRW Capacitor Div., Ogallala, Neb. p. 2-302-307,309
 M Union Carbide Corp., Greenville, S.C. p. 2-316-319
 D Varadyne Industries, Santa Monica, Cal. p. 2-330,331
 Wesco Electrical Co., Greenfield, Mass. p. 2-336

Interelectronics Corp., Congers, N.Y. *
 D Midvec Div., Scottsbluff, Neb. *
 Semtech Corp., Newbury Park, Cal. *
 Shigoto Inds., Ltd., New York, N.Y. *
 Spectrum Control, Fairview, Pa. *
 MUSCC/Centralab, Elec. Div., Los Angeles, Cal. *
 M Active & Passive Components, Syosset, N.Y.
 D Acushnet Capacitor Co., New Bedford, Mass.
 D Baknor Industries Ltd., Port Credit, Ont.
 D Callins Capacitors, Greenfield, Tenn.
 D Centralab, Milwaukee, Wisc.
 D Cornell-Dubilier Electronics, Newark, N.J.
 M Dearborn Elctns. Div., Longwood, Fla.

Diletron, Monrovia, Cal.
 Elmag Corp., Newark, N.J.
 Film Capacitors, Passaic, N.J.
 Filtron Company, Westbury, N.Y.
 GTJ/Tensor Electronics, San Diego, Cal.
 Hilton Industries Inc., Glen Falls, N.Y.
 D Industrial Condenser Corp., Chicago, Ill.
 ITT Jennings, Monrovia, Cal.
 DM JFD Electronics Components Corp., Bklyn., N.Y.
 Murata Mfg. Co. Ltd., Kyoto, Japan
 National Electronic Supply, Garden Grove, Cal.
 Nichicon America Corp., Chicago, Ill.
 D Norelcom Electronics, Farmingdale, N.Y.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
 D Radio Materials Co., Chicago, Ill.
 DM San Fernando Elec. Mfg., San Fernando, Cal.
 D Siemens Corp., Iselin, N.J.
 Soshin Elec. Co., Tokyo, Japan
 DM Sprague Elec. Co., No. Adams, Mass.
 Standard Condenser Corp., Chicago, Ill.
 D Tansitor Elctns., Bennington, Vt.
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
 TDK Elctns. Corp., Long Island City, N.Y.
 United Chemicon, Syracuse, N.Y.
 D United Mineral & Chem. Corp., New York, N.Y.
 Viclan, San Diego, Cal.

Capacitors, Fixed, High-Temperature (Over 125 C)

American Technical Ceramics, Huntington Sta., N.Y. p. 2-28-31
 DM Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39
 M Axcel Elctns., Jamaica, N.Y. p. 2-41
 Component Resch., Santa Monica, Cal. p. 2-42
 M Del Electronics Corp., Mt. Vernon, N.Y. p. 2-120
 D Electro Motive Corp., Melville, New York p. 2-194,195
 Electrocube Inc., San Gabriel, Cal. p. 2-121-125
 D Erie Technological Products, Erie, Pa. p. 2-127-129
 M F-Dyne Elctns., Bridgeport, Conn. p. 2-130-133
 General Elec. Co., Schenectady, N.Y. p. 2-134-137
 Gudeman Corp., Chicago, Ill. p. 2-138
 International Electronics Corp., Melville, N.Y. p. 2-194,195
 M Johanson/Monolithic Dielectrics Div., Burbank, Cal. p. 2-205
 DM Mallory Capacitor Co., Indianapolis, Ind. p. 2-209
 Murata Corp. of America, Rockmart, Ga. p. 2-211
 M Republic Elctns. Corp., Paterson, NJ p. 2-232,233
 MRF Interonics, Bay Shore, N.Y. p. 1-572,573
 M Southern Electronics Co., Burbank, Cal. p. 2-240,241
 D Sprague Products Co., No. Adams, Mass. p. 2-245-253,256-260,276,279,281,282,290-292,294
 M Analog Devices, Norwood, Mass. *
 Custom Elctns., Oneonta, N.Y. *
 Interelectronics Corp., Congers, N.Y. *
 Semtech Corp., Newbury Park, Cal. *
 TRW Capacitor Div., Ogallala, Neb. *
 MUSCC/Centralab, Elec. Div., Los Angeles, Cal. *
 Wesco Electrical Co., Greenfield, Mass. *
 Amp Inc., Harrisburg, Pa.
 D Balco Capacitors, Orange, N.J.
 Bell Industries, Electronic Components Div., Burbank, Cal.
 D Callins Capacitors, Greenfield, Tenn.
 D Centralab, Milwaukee, Wisc.
 Chicago Condenser Corp., Chicago, Ill.
 Condenser Products Corp., Brooksville, Fla.
 Cornell-Dubilier Electronics, Newark, N.J.
 M Dearborn Elctns. Div., Longwood, Fla.
 Elmag Corp., Newark, N.J.
 Film Capacitors, Passaic, N.J.
 Filtron Company, Westbury, N.Y.
 ITT Jennings, Monrovia, Cal.
 DM JFD Electronics Components Corp., Bklyn., N.Y.
 D KD Components, Santa Ana, Cal.
 Murata Mfg. Co. Ltd., Kyoto, Japan
 D Norelcom Electronics, Farmingdale, N.Y.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
 M Plastic Capacitors, Chicago, Ill.
 Polyflon Corp., New Rochelle, N.Y.
 DM San Fernando Elec. Mfg., San Fernando, Cal.
 Simmonds Precision, Norwich, N.Y.
 Soshin Elec. Co., Tokyo, Japan
 M Sprague Elec. Co., No. Adams, Mass.
 Viclan, San Diego, Cal.

Capacitors, Fixed, High Voltage (1,000 Volts or Over)

American Technical Ceramics, Huntington Sta., N.Y. p. 2-28-31
 D Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39
 M Axcel Elctns., Jamaica, N.Y. p. 2-41
 Component Resch., Santa Monica, Cal. p. 2-42
 Custom Elctns., Oneonta, N.Y. p. 2-102
 M Del Electronics Corp., Mt. Vernon, N.Y. p. 2-120
 D Electro Motive Corp., Melville, New York p. 2-194,195
 D Electrocube Inc., San Gabriel, Cal. p. 2-121-125
 D Erie Technological Products, Erie, Pa. p. 2-127-129
 M F-Dyne Elctns., Bridgeport, Conn. p. 2-130-133
 General Elec. Co., Schenectady, N.Y. p. 2-134-137
 General Instr. Corp., Semiconductor Prods Grp., Hicksville, N.Y. p. 2-169
 Gudeman Corp., Chicago, Ill. p. 2-138
 M Hipotronics, Brewster, N.Y. p. 1-722,723,1230,1231
 D Illinois Capacitor Sls. Co., Morton Grove, Ill. p. 2-191
 International Electronics Corp., Melville, N.Y. p. 2-194,195
 ITT Jennings, Vacuum Elctn. Prods., San Jose, Cal. p. 2-198-200
 Johanson Mfg. Corp., Boonton, N.J. p. 2-204
 M Johanson/Monolithic Dielectrics Div., Burbank, Cal. p. 2-205
 Kilovolt Corp., Hackensack, N.J. p. 1-1302-1305
 Murata Corp. of America, Rockmart, Ga. p. 2-211
 Nytronics Comps. Group Inc., Darlington, S.C. p. 2-212-229
 Potter Co., Wesson, Miss. p. 2-231
 MRF Interonics, Bay Shore, N.Y. p. 1-572,573
 M Ross Engineering Corp., Campbell, Cal. p. 1-1807
 Sangamo Elec. Co., Pickens, S.C. p. 2-236,237
 Seacor, Norwood, N.J. p. 2-238,239
 M Southern Electronics Co., Burbank, Cal. p. 2-240,241
 D Sprague Products Co., No. Adams, Mass. p. 2-283-289
 TRW Capacitor Div., Ogallala, Neb. p. 2-308,309
 Interelectronics Corp., Congers, N.Y. *
 International Comps Corp., Melville, N.Y. *
 Semtech Corp., Newbury Park, Cal. *
 Shigoto Inds., Ltd., New York, N.Y. *
 Wesco Electrical Co., Greenfield, Mass. *
 D Acushnet Capacitor Co., New Bedford, Mass.
 Aerovox Inds., New Bedford, Mass.
 Amp Inc., Harrisburg, Pa.
 D Balco Capacitors, Orange, N.J.
 D Centralab, Milwaukee, Wisc.
 Chicago Condenser Corp., Chicago, Ill.
 Condenser Products Corp., Brooksville, Fla.
 D Cornell-Dubilier Electronics, Newark, N.J.
 M Dearborn Elctns. Div., Longwood, Fla.
 Diletron, Monrovia, Cal.
 Elctn. Concepts, Eatontown, N.J.
 Elmag Corp., Newark, N.J.
 D Epic, New York, N.Y.
 Film Capacitors, Passaic, N.J.
 Filtron Company, Westbury, N.Y.
 GTJ/Tensor Electronics, San Diego, Cal.
 Hughes Aircraft Co., Culver City, Cal.
 D Industrial Condenser Corp., Chicago, Ill.
 ITT Jennings, Monrovia, Cal.
 D KD Components, Santa Ana, Cal.
 M Lapp Insulator Div., Interpace Corp., LeRoy, N.Y.
 Maxwell Labs., San Diego, Calif.
 M.I.A.L. U.S.A., Nutley, N.J.
 Murata Mfg. Co. Ltd., Kyoto, Japan
 Nichicon America Corp., Chicago, Ill.
 D Nucleonic Prods., Canoga Pk., Cal.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
 DM Plastic Capacitors, Chicago, Ill.
 Polyflon Corp., New Rochelle, N.Y.
 D Radio Materials Co., Chicago, Ill.
 Rhode & Schwarz Sls., Fairfield, N.J.
 DM San Fernando Elec. Mfg., San Fernando, Cal.
 D Siemens Corp., Iselin, N.J.
 Simmonds Precision, Norwich, N.Y.
 Sprague Elec. Co., No. Adams, Mass.
 Standard Condenser Corp., Chicago, Ill.
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
 TDK Elctns. Corp., Long Island City, N.Y.

PRODUCT INDEX & DIRECTORY

Capacitors, Fixed, Oil

D United Mineral & Chem. Corp., New York, N.Y.
 Viclan, San Diego, Cal.

Capacitors, Fixed, Laboratory Standard
D Arco Electronics Inc., Great Neck, N.Y.
 p. 2-32-39
 Component Resch., Santa Monica, Cal. p. 2-42
 Electro Motive Corp., Melville, New York
 p. 2-194,195
 Electrocube Inc., San Gabriel, Cal. p. 2-121-125
M F-Dyne Elctns., Bridgeport, Conn.
 p. 2-130-133
 International Electronics Corp., Melville, N.Y.
 p. 2-194,195
M Southern Electronics Co., Burbank, Cal.
 p. 2-240,241
 Wesco Electrical Co., Greenfield, Mass.
 p. 2-336
 General Radio Co., Concord, Mass.*
 Nytronics Comps. Group Inc., Darlington, S.C.
 Sprague Products Co., No. Adams, Mass.*
 TRW Capacitor Div., Ogallala, Neb.*
MUSCC/Centralab, Elec. Div., Los Angeles, Cal. *
 Chicago Condenser Corp., Chicago, Ill.
 Electro Sci. Inds., Portland, Ore.
 Film Capacitors, Passaic, N.J.
 Nichicon America Corp., Chicago, Ill.
 Rhode & Schwarz Sls., Fairfield, N.J.
 Rutherford Research Prods. Co., Rutherford, N.J.
 Sprague Elec. Co., No. Adams, Mass.
 Standard Condenser Corp., Chicago, Ill.
 Tucker Electronics Co., Garland, Tex.

Capacitors, Fixed, Mica
DM Arco Electronics Inc., Great Neck, N.Y.
 p. 2-32-39
M Axel Elctns., Jamaica, N.Y.p. 2-41
 Custom Elctns., Oneonta, N.Y.p. 2-103
M Del Electronics Corp., Mt. Vernon, N.Y.
 p. 2-120
D Electro Motive Corp., Melville, New York
 p. 2-194,195
D Erie Technological Products, Erie, Pa.
 p. 2-127-129
DM General Instr. Corp., Semiconductor Prods Grp.,
 Hicksville, N.Y.p. 2-169
 International Electronics Corp., Melville, N.Y.
 p. 2-194,195
DM Sangamo Elec. Co., Pickens, S.C. p. 2-236,237
DM Sprague Products Co., No. Adams, Mass.
 p. 2-293,294
D GC Electronics, Rockford, Ill.*
 Shigoto Inds., Ltd., New York, N.Y.*
DM Acushnet Capacitor Co., New Bedford, Mass.
DM Cornell-Dubilier Electronics, Newark, N.J.
 Kahgan Electronics Corp., Hempstead, NY
 Materials for Elctns., Jamaica, N.Y.
 Morey Corp., Downers Grove, Ill.
 Motorola Comms. Div., Schaumburg, Ill.
 National Electronic Supply, Garden Grove, Cal.
 Nichicon America Corp., Chicago, Ill.
 D Norelcom Electronics, Farmingdale, N.Y.
 D Nucleonic Prods., Canoga Pk., Cal.
 Simmonds Precision, Norwich, N.Y.
 Soshin Elec. Co., Tokyo, Japan
 Sprague Elec. Co., No. Adams, Mass.
 D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Molded Composition
Airco Elctns., Bradford, Pa.
 p. 2-368,369,1408,1409
D Arco Electronics Inc., Great Neck, N.Y.
 p. 2-32-39
 Electro Motive Corp., Melville, New York
 p. 2-194,195
D Electrocube Inc., San Gabriel, Cal. p. 2-121-125
 International Electronics Corp., Melville, N.Y.
 p. 2-194,195
D Mallory Capacitor Co., Indianapolis, Ind.
 p. 2-208
DM Sangamo Elec. Co., Pickens, S.C. p. 2-236,237
D Union Carbide Corp., Greenville, S.C.
 p. 2-316-319
 Inter-Tech. Grp., Irvington-on-Hudson, N.Y. ...*
 Motorola Comms. Div., Schaumburg, Ill.

Capacitors, Fixed, Monolithic
American Technical Ceramics, Huntington Sta.,
N.Y.p. 2-28-31
D Arco Electronics Inc., Great Neck, N.Y.
 p. 2-32-39
DM AVX Ceramics, Myrtle Beach, S.C. p. 2-2,5-16
DM Corning Glass Works, Corning, N.Y.p. 2-105
D Erie Technological Products, Erie, Pa.
 p. 2-127-129
 Gudeman Corp., Chicago, Ill.p. 2-138
 Johanson Mfg. Corp., Boonton, N.J.p. 2-204
 Murata Corp. of America, Rockmart, Ga.
 p. 2-211
M Republic Elctns. Corp., Paterson, NJ
 p. 2-232,233

M Ross Engineering Corp., Campbell, Cal.
 p. 1-1807
Seacor, Norwood, N.J.p. 2-238,239
DM Sprague Products Co., No. Adams, Mass.
 p. 2-290-292
D Union Carbide Corp., Greenville, S.C.
 p. 2-316-319
DMUSCC/Centralab, Elec. Div., Los Angeles, Cal.
 p. 2-320-327
 Varadyne Industries, Santa Monica, Cal.
 p. 2-328-333
M Analog Devices, Norwood, Mass.*
Semtech Corp., Newbury Park, Cal.*
Shigoto Inds., Ltd., New York, N.Y.*
Spectrum Control, Fairview, Pa.*
 Dilectron, Monrovia, Cal.
 D Emcon Div., San Diego, Cal.
 GJT/Tensor Electronics, San Diego, Cal.
 ITT Jennings, Monrovia, Cal.
DM JFD Electronics Components Corp., Bklyn., N.Y.
 D KD Components, Santa Ana, Cal.
 Mepco/Electra, Morristown, N.J.
 Motorola Comms. Div., Schaumburg, Ill.
 National Electronic Supply, Garden Grove, Cal.
DM Sprague Elec. Co., No. Adams, Mass.
 D United Mineral & Chem. Corp., New York, N.Y.
 Viclan, San Diego, Cal.

Capacitors, Fixed, Mylar
D Arco Electronics Inc., Great Neck, N.Y.
 p. 2-32-39
M Axel Elctns., Jamaica, N.Y.p. 2-41
M Del Electronics Corp., Mt. Vernon, N.Y.
 p. 2-120
 Electro Motive Corp., Melville, New York
 p. 2-194,195
D Electrocube Inc., San Gabriel, Cal. p. 2-121-125
 Erie Technological Products, Erie, Pa.
 p. 2-127-129
M F-Dyne Elctns., Bridgeport, Conn.
 p. 2-130-133
 General Elec. Co., Schenectady, N.Y.
 p. 2-134-137
 General Instr. Corp., Semiconductor Prods Grp.,
 Hicksville, N.Y.p. 2-169
 Gudeman Corp., Chicago, Ill.p. 2-138
D Illinois Capacitor Sls. Co., Morton Grove, Ill.
 p. 2-191
 International Comps Corp., Melville, N.Y.
 p. 2-192
 International Electronics Corp., Melville, N.Y.
 p. 2-194,195
D Midwec Div., Scottsbluff, Neb.p. 2-188
D Nytronics Comps. Group Inc., Darlington, S.C.
 p. 2-212-229
M RF Interonics, Bay Shore, N.Y.p. 1-572,573
MS & EI Mfg., Northridge, Cal.p. 2-234,235
 Seacor, Norwood, N.J.p. 2-238,239
M Southern Electronics Co., Burbank, Cal.
 p. 2-240,241
DM Sprague Products Co., No. Adams, Mass.
 p. 2-279-283
DM TRW Capacitor Div., Ogallala, Neb.
 p. 2-306,308-314
M Wesco Electrical Co., Greenfield, Mass.
 p. 2-334
D GC Electronics, Rockford, Ill.*
 Inter-Tech. Grp., Irvington-on-Hudson, N.Y. ...*
 Potter Co., Wesson, Miss.p. 2-230
Shigoto Inds., Ltd., New York, N.Y.*
DM Acushnet Capacitor Co., New Bedford, Mass.
 D Baknor Industries Ltd., Port Credit, Ont.
 D Balco Capacitors, Orange, N.J.
 D Callins Capacitors, Greenfield, Tenn.
 Condenser Products Corp., Brooksville, Fla.
 D Cornell-Dubilier Electronics, Newark, N.J.
 M Dearborn Elctns. Div., Longwood, Fla.
 Elctn. Concepts, Eatontown, N.J.
 Elmag Corp., Newark, N.J.
 Film Capacitors, Passaic, N.J.
 Filtron Company, Westbury, N.Y.
 Genisco Technology Corp., Compton, Cal.
 D Industrial Condenser Corp., Chicago, Ill.
 M International Importers, Chicago, Ill.
 ITT Jennings, Monrovia, Cal.
 ITT Semiconductors-Capacitors, No. Andover, Mass.
 D Lectro Magnetics, Los Angeles, Cal.
 Maxwell Labs., San Diego, Calif.
 M.I.A.L. U.S.A., Nutley, N.J.
 Motorola Comms. Div., Schaumburg, Ill.
 National Electronic Supply, Garden Grove, Cal.
 Nichicon America Corp., Chicago, Ill.
 D Nucleonic Prods., Canoga Pk., Cal.
 D Paktron Div., Vienna, Va.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
 DM Plastic Capacitors, Chicago, Ill.
 Presin Co., Shelton, Conn.
 DM San Fernando Elec. Mfg., San Fernando, Cal.

D Siemens Corp., Iselin, N.J.
 DM Sprague Elec. Co., No. Adams, Mass.
 Standard Condenser Corp., Chicago, Ill.
 Stettner-Trush Inc., Cazenovia, N.Y.
 D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Mylar, Metallized
D Arco Electronics Inc., Great Neck, N.Y.
 p. 2-32-39
M Del Electronics Corp., Mt. Vernon, N.Y.
 p. 2-120
 Electrocube Inc., San Gabriel, Cal. p. 2-121-125
 Erie Technological Products, Erie, Pa.
 p. 2-127-129
M F-Dyne Elctns., Bridgeport, Conn.
 p. 2-130-133
 General Elec. Co., Schenectady, N.Y.
 p. 2-134-137
D Gudeman Corp., Chicago, Ill.p. 2-138
D Illinois Capacitor Sls. Co., Morton Grove, Ill.
 p. 2-191
 International Comps Corp., Melville, N.Y.
 p. 2-192
 International Electronics Corp., Melville, N.Y.
 p. 2-194,195
 Nytronics Comps. Group Inc., Darlington, S.C.
 p. 2-212-229
 Potter Co., Wesson, Miss.p. 2-230
MRF Interonics, Bay Shore, N.Y.p. 1-572,573
MS & EI Mfg., Northridge, Cal.p. 2-234,235
 Seacor, Norwood, N.J.p. 2-238,239
M Southern Electronics Co., Burbank, Cal.
 p. 2-240,241
DM Sprague Products Co., No. Adams, Mass.
 p. 2-279,282
D TRW Capacitor Div., Ogallala, Neb.
 p. 2-305-307,310-314
M Wesco Electrical Co., Greenfield, Mass.
 p. 2-335
 Inter-Tech. Grp., Irvington-on-Hudson, N.Y. ...*
D Midwec Div., Scottsbluff, Neb.*
Shigoto Inds., Ltd., New York, N.Y.*
 M Active & Passive Components, Syosset, N.Y.
 DM Acushnet Capacitor Co., New Bedford, Mass.
 D Balco Capacitors, Orange, N.J.
 D Callins Capacitors, Greenfield, Tenn.
 Captor Corp., Tipp City, Ohio
 Chicago Condenser Corp., Chicago, Ill.
 Condenser Products Corp., Brooksville, Fla.
 D Cornell-Dubilier Electronics, Newark, N.J.
 M Dearborn Elctns. Div., Longwood, Fla.
 Elctn. Concepts, Eatontown, N.J.
 Elmag Corp., Newark, N.J.
 M Engineered Components Co., San Luis Obispo, Cal.
 Film Capacitors, Passaic, N.J.
 Filtron Company, Westbury, N.Y.
 D Industrial Condenser Corp., Chicago, Ill.
 M International Importers, Chicago, Ill.
 ITT Jennings, Monrovia, Cal.
 ITT Semiconductors-Capacitors, No. Andover, Mass.
 D Lectro Magnetics, Los Angeles, Cal.
 Motorola Comms. Div., Schaumburg, Ill.
 National Electronic Supply, Garden Grove, Cal.
 Nichicon America Corp., Chicago, Ill.
 D Nucleonic Prods., Canoga Pk., Cal.
 D Paktron Div., Vienna, Va.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
 DM Plastic Capacitors, Chicago, Ill.
 Polyflon Corp., New Rochelle, N.Y.
 Presin Co., Shelton, Conn.
 DM San Fernando Elec. Mfg., San Fernando, Cal.
 D Siemens Corp., Iselin, N.J.
 D Soshin Elec. Co., Tokyo, Japan
 DM Sprague Elec. Co., No. Adams, Mass.
 Standard Condenser Corp., Chicago, Ill.
 Stettner-Trush Inc., Cazenovia, N.Y.
 D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Oil
M Axel Elctns., Jamaica, N.Y.p. 2-41
Component Resch., Santa Monica, Cal. p. 2-42
M Del Electronics Corp., Mt. Vernon, N.Y.
 p. 2-120
 Gudeman Corp., Chicago, Ill.p. 2-138
 Hipotronics, Brewster, N.Y.
 p. 1-722,723,1230,1231
D Mallory Capacitor Co., Indianapolis, Ind.
 p. 2-207
D Nytronics Comps. Group Inc., Darlington, S.C.
 p. 2-212-229
MRF Interonics, Bay Shore, N.Y.p. 1-572,573
Sangamo Elec. Co., Pickens, S.C. p. 2-236,237
DM Sprague Products Co., No. Adams, Mass.
 p. 2-285,299,300
 Potter Co., Wesson, Miss.*
 Aerovox Inds., New Bedford, Mass.
 D Baknor Industries Ltd., Port Credit, Ont.
 Chicago Condenser Corp., Chicago, Ill.

D Components Specialties, Hempstead, N.Y.
Condenser Products Corp., Brooksville, Fla.
D Cornell-Dubilier Electronics, Newark, N.J.
M Dearborn Elctns. Div., Longwood, Fla.
Elmag Corp., Newark, N.J.
Film Capacitors, Passaic, N.J.
Filtron Company, Westbury, N.Y.
D Industrial Condenser Corp., Chicago, Ill.
ITT Jennings, Monrovia, Cal.
Maxwell Labs., San Diego, Calif.
National Electronic Supply, Garden Grove, Cal.
Nichicon America Corp., Chicago, Ill.
DM Plastic Capacitors, Chicago, Ill.
San Fernando Elec. Mfg., San Fernando, Cal.
DM Sprague Elec. Co., No. Adams, Mass.
D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Paper
D Arco Electronics Inc., Great Neck, N.Y.
p. 2-32-39
M Axel Elctns., Jamaica, N.Y. p. 2-41
M Del Electronics Corp., Mt. Vernon, N.Y.
p. 2-120
D Electro Motive Corp., Melville, New York
p. 2-194,195
General Elec. Co., Schenectady, N.Y.
p. 2-134-137
Gudeman Corp., Chicago, Ill. p. 2-138
International Comps Corp., Melville, N.Y.
p. 2-192
International Electronics Corp., Melville, N.Y.
p. 2-194,195
Nytronics Comps. Group Inc., Darlington, S.C.
p. 2-212-229
MRF Interonics, Bay Shore, N.Y. p. 1-572,573
Sangamo Elec. Co., Pickens, S.C. p. 2-236,237
DM Sprague Products Co., No. Adams, Mass.
p. 2-285

D GC Electronics, Rockford, Ill. *
Inter-Tech. Grp., Irvington-on-Hudson, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
Wesco Electrical Co., Greenfield, Mass. *

D Acushnet Capacitor Co., New Bedford, Mass.
Aerovox Inds., New Bedford, Mass.
Chicago Condenser Corp., Chicago, Ill.
Condenser Products Corp., Brooksville, Fla.
D Cornell-Dubilier Electronics, Newark, N.J.
M Dearborn Elctns. Div., Longwood, Fla.
Elmag Corp., Newark, N.J.
Film Capacitors, Passaic, N.J.
Filtron Company, Westbury, N.Y.
Genisco Technology Corp., Compton, Cal.
D Industrial Condenser Corp., Chicago, Ill.
ITT Jennings, Monrovia, Cal.
Maxwell Labs., San Diego, Calif.
Motorola Comms. Div., Schaumburg, Ill.
National Electronic Supply, Garden Grove, Cal.
Nichicon America Corp., Chicago, Ill.
D Norelcom Electronics, Farmingdale, N.Y.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
M Plastic Capacitors, Chicago, Ill.
DM San Fernando Elec. Mfg., San Fernando, Cal.
DM Sprague Elec. Co., No. Adams, Mass.
Standard Condenser Corp., Chicago, Ill.
United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Paper, Metallized
D Arco Electronics Inc., Great Neck, N.Y.
p. 2-32-39
M Del Electronics Corp., Mt. Vernon, N.Y.
p. 2-120
M F-Dyne Elctns., Bridgeport, Conn.
p. 2-130-133
General Elec. Co., Schenectady, N.Y.
p. 2-134-137
Gudeman Corp., Chicago, Ill. p. 2-138
International Electronics Corp., Melville, N.Y.
p. 2-194,195
D Nytronics Comps. Group Inc., Darlington, S.C.
p. 2-212-229
MRF Interonics, Bay Shore, N.Y. p. 1-572,573
D Sanford-Miller Corp., Brooklyn, N.Y. p. 1-1863
M Southern Electronics Co., Burbank, Cal.
p. 2-240,241
Inter-Tech. Grp., Irvington-on-Hudson, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
DM Sprague Products Co., No. Adams, Mass. *

D Acushnet Capacitor Co., New Bedford, Mass.
Aerovox Inds., New Bedford, Mass.
Chicago Condenser Corp., Chicago, Ill.
D Cornell-Dubilier Electronics, Newark, N.J.
M Dearborn Elctns. Div., Longwood, Fla.
Elmag Corp., Newark, N.J.
Film Capacitors, Passaic, N.J.
Filtron Company, Westbury, N.Y.
D Industrial Condenser Corp., Chicago, Ill.
ITT Jennings, Monrovia, Cal.
Mepco/Electra, Morristown, N.J.
M.I.A.L. U.S.A., Nutley, N.J.
D Nucleonic Prods., Canoga Pk., Cal.
D Paktron Div., Vienna, Va.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
D San Fernando Elec. Mfg., San Fernando, Cal.
D Siemens Corp., Iselin, N.J.
Soshin Elec. Co., Tokyo, Japan
D Sprague Elec. Co., No. Adams, Mass.
Standard Condenser Corp., Chicago, Ill.
Stettner-Trush Inc., Cazenovia, N.Y.
United Mineral & Chem. Corp., New York, N.Y.

Nichicon America Corp., Chicago, Ill.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
D San Fernando Elec. Mfg., San Fernando, Cal.
DM Sprague Elec. Co., No. Adams, Mass.

Capacitors, Fixed, Photoflash
Electrocube Inc., San Gabriel, Cal. p. 2-121-125
General Elec. Co., Schenectady, N.Y.
p. 2-134-137
Hipotronics, Brewster, N.Y.
p. 1-722,723,1230,1231
D Illinois Capacitor Sis. Co., Morton Grove, Ill.
p. 2-191

M Del Electronics Corp., Mt. Vernon, N.Y. *
Mallory Capacitor Co., Indianapolis, Ind. *
Shigoto Inds., Ltd., New York, N.Y. *
D Sprague Products Co., No. Adams, Mass. *

TRW Capacitor Div., Ogallala, Neb.
Aerovox Inds., New Bedford, Mass.
Anglo Corp., Rosemont, Ill.
D Baknor Industries Ltd., Port Credit, Ont.
Condenser Products Corp., Brooksville, Fla.
Elmag Corp., Newark, N.J.
Film Capacitors, Passaic, N.J.
D Industrial Condenser Corp., Chicago, Ill.
M International Importers, Chicago, Ill.
ITT Jennings, Monrovia, Cal.
Maxwell Labs., San Diego, Calif.
Nichicon America Corp., Chicago, Ill.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
Plastic Capacitors, Chicago, Ill.
D Siemens Corp., Iselin, N.J.
D Sprague Elec. Co., No. Adams, Mass.
United Chemicon, Syracuse, N.Y.

Capacitors, Fixed, Polycarbonate
D Arco Electronics Inc., Great Neck, N.Y.
p. 2-32-39
M Component Resch., Santa Monica, Cal. p. 2-42
M Del Electronics Corp., Mt. Vernon, N.Y.
p. 2-120
Electrocube Inc., San Gabriel, Cal. p. 2-121-125
Erie Technological Products, Erie, Pa.
p. 2-127-129
M F-Dyne Elctns., Bridgeport, Conn.
p. 2-130-133
General Elec. Co., Schenectady, N.Y.
p. 2-134-137
D Gudeman Corp., Chicago, Ill. p. 2-138
International Electronics Corp., Melville, N.Y.
p. 2-194,195
Seacor, Norwood, N.J. p. 2-238,239
M Southern Electronics Co., Burbank, Cal.
p. 2-240,241
D Sprague Products Co., No. Adams, Mass.
p. 2-280
Inter-Tech. Grp., Irvington-on-Hudson, N.Y. *
Interelectronics Corp., Congers, N.Y. *
D Midwec Div., Scottsbluff, Neb. *
Nytronics Comps. Group Inc., Darlington, S.C. *
Potter Co., Wesson, Miss. *
Shigoto Inds., Ltd., New York, N.Y. *
D TRW Capacitor Div., Ogallala, Neb. *

M Wesco Electrical Co., Greenfield, Mass. *

D Acushnet Capacitor Co., New Bedford, Mass.
D Baknor Industries Ltd., Port Credit, Ont.
D Balco Capacitors, Orange, N.J.
D Callins Capacitors, Greenfield, Tenn.
Condenser Products Corp., Brooksville, Fla.
D Cornell-Dubilier Electronics, Newark, N.J.
M Dearborn Elctns. Div., Longwood, Fla.
Elctn. Concepts, Eatontown, N.J.
Elmag Corp., Newark, N.J.
Film Capacitors, Passaic, N.J.
Filtron Company, Westbury, N.Y.
D Industrial Condenser Corp., Chicago, Ill.
ITT Jennings, Monrovia, Cal.
Mepco/Electra, Morristown, N.J.
M.I.A.L. U.S.A., Nutley, N.J.
D Nucleonic Prods., Canoga Pk., Cal.
D Paktron Div., Vienna, Va.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
D San Fernando Elec. Mfg., San Fernando, Cal.
D Siemens Corp., Iselin, N.J.
Soshin Elec. Co., Tokyo, Japan
D Sprague Elec. Co., No. Adams, Mass.
Standard Condenser Corp., Chicago, Ill.
Stettner-Trush Inc., Cazenovia, N.Y.
United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Polycarbonate, Metallized
D Arco Electronics Inc., Great Neck, N.Y.
p. 2-32-39
M Component Resch., Santa Monica, Cal. p. 2-42
M Del Electronics Corp., Mt. Vernon, N.Y.
p. 2-120
Electrocube Inc., San Gabriel, Cal. p. 2-121-125

Erie Technological Products, Erie, Pa.
p. 2-127-129
M F-Dyne Elctns., Bridgeport, Conn.
p. 2-130-133
General Elec. Co., Schenectady, N.Y.
p. 2-134-137
Gudeman Corp., Chicago, Ill. p. 2-138
D Illinois Capacitor Sis. Co., Morton Grove, Ill.
p. 2-191
International Electronics Corp., Melville, N.Y.
p. 2-194,195
MS & EI Mfg., Northridge, Cal. p. 2-234,235
Seacor, Norwood, N.J. p. 2-238,239
M Southern Electronics Co., Burbank, Cal.
p. 2-240,241
DM Sprague Products Co., No. Adams, Mass.
p. 2-280
TRW Capacitor Div., Ogallala, Neb.
p. 2-302-304
M Wesco Electrical Co., Greenfield, Mass.
p. 2-337
Inter-Tech. Grp., Irvington-on-Hudson, N.Y. *
Interelectronics Corp., Congers, N.Y. *
International Comps Corp., Melville, N.Y. *
D Midwec Div., Scottsbluff, Neb. *
D Nytronics Comps. Group Inc., Darlington, S.C. *
Potter Co., Wesson, Miss. *
Shigoto Inds., Ltd., New York, N.Y. *

M Active & Passive Components, Syosset, N.Y.
DM Acushnet Capacitor Co., New Bedford, Mass.
D Baknor Industries Ltd., Port Credit, Ont.
D Balco Capacitors, Orange, N.J.
D Callins Capacitors, Greenfield, Tenn.
Captor Corp., Tipp City, Ohio
Condenser Products Corp., Brooksville, Fla.
D Cornell-Dubilier Electronics, Newark, N.J.
M Dearborn Elctns. Div., Longwood, Fla.
Elctn. Concepts, Eatontown, N.J.
Elmag Corp., Newark, N.J.
Engineered Components Co., San Luis Obispo, Cal.
Film Capacitors, Passaic, N.J.
Filtron Company, Westbury, N.Y.
D Industrial Condenser Corp., Chicago, Ill.
ITT Jennings, Monrovia, Cal.
ITT Semiconductors-Capacitors, No. Andover, Mass.
Mepco/Electra, Morristown, N.J.
D Nucleonic Prods., Canoga Pk., Cal.
D Paktron Div., Vienna, Va.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
D San Fernando Elec. Mfg., San Fernando, Cal.
D Siemens Corp., Iselin, N.J.
DM Sprague Elec. Co., No. Adams, Mass.
Standard Condenser Corp., Chicago, Ill.
Stettner-Trush Inc., Cazenovia, N.Y.
United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Polyester—See
Capacitors, Fixed, Mylar
Capacitors, Fixed, Polyester, Metallized
—See Capacitors, Fixed, Mylar, Metallized
Capacitors, Fixed, Polypropylene
D Arco Electronics Inc., Great Neck, N.Y.
p. 2-32-39
M Axel Elctns., Jamaica, N.Y. p. 2-41
Component Resch., Santa Monica, Cal. p. 2-42
M Del Electronics Corp., Mt. Vernon, N.Y.
p. 2-120
Electro Motive Corp., Melville, New York
p. 2-194,195
Electrocube Inc., San Gabriel, Cal. p. 2-121-125
Erie Technological Products, Erie, Pa.
p. 2-127-129
M F-Dyne Elctns., Bridgeport, Conn.
p. 2-130-133
General Elec. Co., Schenectady, N.Y.
p. 2-134-137
Gudeman Corp., Chicago, Ill. p. 2-138
Hipotronics, Brewster, N.Y.
p. 1-722,723,1230,1231
International Comps Corp., Melville, N.Y.
p. 2-192
International Electronics Corp., Melville, N.Y.
p. 2-194,195
Midwec Div., Scottsbluff, Neb. p. 2-190
M Southern Electronics Co., Burbank, Cal.
p. 2-240,241
TRW Capacitor Div., Ogallala, Neb.
p. 2-310-314
Wesco Electrical Co., Greenfield, Mass.
p. 2-337
Inter-Tech. Grp., Irvington-on-Hudson, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
D Sprague Products Co., No. Adams, Mass. *

M Active & Passive Components, Syosset, N.Y.
D Acushnet Capacitor Co., New Bedford, Mass.
Aerovox Inds., New Bedford, Mass.
D Baknor Industries Ltd., Port Credit, Ont.

Chicago Condenser Corp., Chicago, Ill.
Condenser Products Corp., Brooksville, Fla.
Cornell-Dubilier Electronics, Newark, N.J.
Elmag Corp., Newark, N.J.
M Engineered Components Co., San Luis Obispo, Cal.
D Film Capacitors, Passaic, N.J.
Filtron Company, Westbury, N.Y.
ITT Jennings, Monrovia, Cal.
D Nucleonic Prods., Canoga Pk., Cal.
D Paktron Div., Vienna, Va.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
D Plastic Capacitors, Chicago, Ill.
D Siemens Corp., Iselin, N.J.
D Sprague Elec. Co., No. Adams, Mass.
Standard Condenser Corp., Chicago, Ill.
Stettner-Trush Inc., Cazenovia, N.Y.
United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Polystyrene

D Arco Electronics Inc., Great Neck, N.Y.
Component Resch., Santa Monica, Cal. p. 2-42
M Del Electronics Corp., Mt. Vernon, N.Y. p. 2-120
Electro Motive Corp., Melville, New York p. 2-194,195
D Electrocube Inc., San Gabriel, Cal. p. 2-121-125
M F-Dyne Elctns., Bridgeport, Conn. p. 2-130-133
General Elec. Co., Schenectady, N.Y. p. 2-134-137
Gudeman Corp., Chicago, Ill. p. 2-138
International Electronics Corp., Melville, N.Y. p. 2-194,195
D Midwec Div., Scottsbluff, Neb. p. 2-189
Nytronics Comps. Group Inc., Darlington, S.C. p. 2-212-229
M S & El Mfg., Northridge, Cal. p. 2-234,235
Seacor, Norwood, N.J. p. 2-238,239
M Southern Electronics Co., Burbank, Cal. p. 2-240,241
D Sprague Products Co., No. Adams, Mass. p. 2-283
D TRW Capacitor Div., Ogallala, Neb. p. 2-310-314
M Wesco Electrical Co., Greenfield, Mass. p. 2-336

Interelectronics Corp., Congers, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
M Active & Passive Components, Syosset, N.Y.
D Acushnet Capacitor Co., New Bedford, Mass.
D Baknor Industries Ltd., Port Credit, Ont.
D Balco Capacitors, Orange, N.J.
D Callins Capacitors, Greenfield, Tenn.
D Centralab, Milwaukee, Wisc.
Chicago Condenser Corp., Chicago, Ill.
Condenser Products Corp., Brooksville, Fla.
M Dearborn Elctns. Div., Longwood, Fla.
Elctn. Concepts, Eatontown, N.J.
Elmag Corp., Newark, N.J.
Engineered Components Co., San Luis Obispo, Cal.
Film Capacitors, Passaic, N.J.
Filtron Company, Westbury, N.Y.
Industrial Condenser Corp., Chicago, Ill.
ITT Jennings, Monrovia, Cal.
D Mecco/Electra, Morristown, N.J.
D M.I.A.L. U.S.A., Nutley, N.J.
D Nucleonic Prods., Canoga Pk., Cal.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
DM Plastic Capacitors, Chicago, Ill.
Presin Co., Shelton, Conn.
DM San Fernando Elec. Mfg., San Fernando, Cal.
D Siemens Corp., Iselin, N.J.
Sprague Elec. Co., No. Adams, Mass.
Standard Condenser Corp., Chicago, Ill.
D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Polysulfone

Component Resch., Santa Monica, Cal. p. 2-42
M F-Dyne Elctns., Bridgeport, Conn. p. 2-130-133
General Elec. Co., Schenectady, N.Y. p. 2-134-137
Gudeman Corp., Chicago, Ill. p. 2-138
M Southern Electronics Co., Burbank, Cal. p. 2-240,241
D Midwec Div., Scottsbluff, Neb. *
Shigoto Inds., Ltd., New York, N.Y. *
Sprague Products Co., No. Adams, Mass. *
TRW Capacitor Div., Ogallala, Neb. *
Wesco Electrical Co., Greenfield, Mass. *
M Active & Passive Components, Syosset, N.Y.
D Acushnet Capacitor Co., New Bedford, Mass.
Elmag Corp., Newark, N.J.
D Film Capacitors, Passaic, N.J.
Filtron Company, Westbury, N.Y.
Sprague Elec. Co., No. Adams, Mass.
Standard Condenser Corp., Chicago, Ill.

Capacitors, Fixed, Porcelain, Enamel

American Technical Ceramics, Huntington Sta., N.Y. p. 2-28-31
M Johanson/Monolithic Dielectrics Div., Burbank, Cal. p. 2-205
M Republic Elctns. Corp., Paterson, NJ p. 2-232
D Electro-Science Labs., Pennsauken, N.J.
ITT Jennings, Monrovia, Cal.
DM JFD Electronics Components Corp., Bklyn., N.Y.

Capacitors, Fixed, Power Factor Correction

M Del Electronics Corp., Mt. Vernon, N.Y. p. 2-120
Erie Technological Products, Erie, Pa. p. 2-127-129
MRF Interonics, Bay Shore, N.Y. p. 1-572,573
Sangamo Elec. Co., Pickens, S.C. p. 2-236,237
Interelectronics Corp., Congers, N.Y. *
Sprague Products Co., No. Adams, Mass. *
TRW Capacitor Div., Ogallala, Neb. *
Chicago Condenser Corp., Chicago, Ill.
D Cornell-Dubilier Electronics, Newark, N.J.
Engineered Components Co., San Luis Obispo, Cal.
Filtron Company, Westbury, N.Y.
ITT Jennings, Monrovia, Cal.
Nichicon America Corp., Chicago, Ill.
D Plastic Capacitors, Chicago, Ill.
D Sprague Elec. Co., No. Adams, Mass.
D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Pulse-Forming Network

D Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39
M Axel Elctns., Jamaica, N.Y. p. 2-41
M Del Electronics Corp., Mt. Vernon, N.Y. p. 2-120
M F-Dyne Elctns., Bridgeport, Conn. p. 2-130-133
General Elec. Co., Schenectady, N.Y. p. 2-134-137
Hipotronics, Brewster, N.Y. p. 1-722,723,1230,1231
M Southern Electronics Co., Burbank, Cal. p. 2-240,241
Custom Elctns., Oneonta, N.Y. *
Inter-Tech. Grp., Irvington-on-Hudson, N.Y. *
M Sprague Products Co., No. Adams, Mass. *
USCC/Centralab, Elec. Div., Los Angeles, Cal. *
Amp Inc., Harrisburg, Pa.
D Balco Capacitors, Orange, N.J.
Condenser Products Corp., Brooksville, Fla.
Cornell-Dubilier Electronics, Newark, N.J.
Engineered Components Co., San Luis Obispo, Cal.
Film Capacitors, Passaic, N.J.
Filtron Company, Westbury, N.Y.
ITT Jennings, Monrovia, Cal.
Maxwell Labs., San Diego, Calif.
Nichicon America Corp., Chicago, Ill.
D Nucleonic Prods., Canoga Pk., Cal.
M Plastic Capacitors, Chicago, Ill.
San Fernando Elec. Mfg., San Fernando, Cal.
Simmonds Precision, Norwich, N.Y.
Soshin Elec. Co., Tokyo, Japan
Sprague Elec. Co., No. Adams, Mass.

Capacitors, Fixed, Silvered Mica

DM Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39
D Electro Motive Corp., Melville, New York p. 2-194,195
D Erie Technological Products, Erie, Pa. p. 2-127-129
DM General Instr. Corp., Semiconductor Prods Grp., Hicksville, N.Y. p. 2-169
International Electronics Corp., Melville, N.Y. p. 2-194,195
DM Sangamo Elec. Co., Pickens, S.C. p. 2-236,237
DM Sprague Products Co., No. Adams, Mass. p. 2-293,294
Shigoto Inds., Ltd., New York, N.Y. *
DM Acushnet Capacitor Co., New Bedford, Mass.
DM Cornell-Dubilier Electronics, Newark, N.J.
Kahgan Electronics Corp., Hempstead, NY
Materials for Elctns., Jamaica, N.Y.
Motorola Comms. Div., Schaumburg, Ill.
National Electronic Supply, Garden Grove, Cal.
Nichicon America Corp., Chicago, Ill.
D Soshin Elec. Co., Tokyo, Japan
D Sprague Elec. Co., No. Adams, Mass.
D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, Tantalum

D Corning Glass Works, Corning, N.Y. p. 2-105
Electro Motive Corp., Melville, New York p. 2-194,195

General Elec. Co., Schenectady, N.Y. p. 2-134-137
D Illinois Capacitor Sis. Co., Morton Grove, Ill. p. 2-191
International Comps Corp., Melville, N.Y. p. 2-192
International Electronics Corp., Melville, N.Y. p. 2-194,195
D Mallory Capacitor Co., Indianapolis, Ind. p. 2-209
DM Sprague Products Co., No. Adams, Mass. p. 2-242-260
DM Union Carbide Corp., Greenville, S.C. p. 2-316-319
D NEC America, New York, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
D TRW Capacitor Div., Ogallala, Neb. *
D Baknor Industries Ltd., Port Credit, Ont.
DM Callins Capacitors, Greenfield, Tenn.
D Cornell-Dubilier Electronics, Newark, N.J.
Filtron Company, Westbury, N.Y.
Hilton Industries Inc., Glen Falls, N.Y.
M International Importers, Chicago, Ill.
D ITT Semiconductor, West Palm Beach, Fla.
ITT Semiconductors-Capacitors, No. Andover, Mass.
Kahgan Electronics Corp., Hempstead, NY
M.I.A.L. U.S.A., Nutley, N.J.
Motorola Comms. Div., Schaumburg, Ill.
National Electronic Supply, Garden Grove, Cal.
D NCI, W. Palm Beach, Fla.
D Norelcom Electronics, Farmingdale, N.Y.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
DM Siemens Corp., Iselin, N.J.
DM Sprague Elec. Co., No. Adams, Mass.
D Tansitor Elctns., Bennington, Vt.
Union Carbide Corp., New York, N.Y.
United Chemicon, Syracuse, N.Y.
D United Mineral & Chem. Corp., New York, N.Y.

Capacitors, Fixed, TFE

D Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39
Component Resch., Santa Monica, Cal. p. 2-42
M Del Electronics Corp., Mt. Vernon, N.Y. p. 2-120
M F-Dyne Elctns., Bridgeport, Conn. p. 2-130-133
Gudeman Corp., Chicago, Ill. p. 2-138
M Southern Electronics Co., Burbank, Cal. p. 2-240,241
Interelectronics Corp., Congers, N.Y. *
Sprague Products Co., No. Adams, Mass. *
TRW Capacitor Div., Ogallala, Neb. *
D Balco Capacitors, Orange, N.J.
Condenser Products Corp., Brooksville, Fla.
M Dearborn Elctns. Div., Longwood, Fla.
Film Capacitors, Passaic, N.J.
Filtron Company, Westbury, N.Y.
Polyflon Corp., New Rochelle, N.Y.
San Fernando Elec. Mfg., San Fernando, Cal.
Sprague Elec. Co., No. Adams, Mass.

Capacitors, Fixed, TFE, Metallized

Component Resch., Santa Monica, Cal. p. 2-42
M Del Electronics Corp., Mt. Vernon, N.Y. p. 2-120
M F-Dyne Elctns., Bridgeport, Conn. p. 2-130-133
Gudeman Corp., Chicago, Ill. p. 2-138
M Southern Electronics Co., Burbank, Cal. p. 2-240,241
Interelectronics Corp., Congers, N.Y. *
D Sprague Products Co., No. Adams, Mass. *
D Balco Capacitors, Orange, N.J.
M Dearborn Elctns. Div., Longwood, Fla.
Film Capacitors, Passaic, N.J.
Filtron Company, Westbury, N.Y.
Polyflon Corp., New Rochelle, N.Y.
San Fernando Elec. Mfg., San Fernando, Cal.
Sprague Elec. Co., No. Adams, Mass.

Capacitors, Fixed, Temperature Compensating

D Arco Electronics Inc., Great Neck, N.Y. p. 2-32-39
DMAVX Ceramics, Myrtle Beach, S.C. p. 2-17-19
D Erie Technological Products, Erie, Pa. p. 2-127-129
M F-Dyne Elctns., Bridgeport, Conn. p. 2-130-133
Gudeman Corp., Chicago, Ill. p. 2-138
D Illinois Capacitor Sis. Co., Morton Grove, Ill. p. 2-191
International Comps Corp., Melville, N.Y. p. 2-192
Johanson Mfg. Corp., Boonton, N.J. p. 2-204
Murata Corp. of America, Rockmart, Ga. p. 2-211

M Republic Elctns. Corp., Paterson, NJ
 p. 2-232,233
Seacor, Norwood, N.J. p. 2-238,239
M Southern Electronics Co., Burbank, Cal.
 p. 2-240,241
D Sprague Products Co., No. Adams, Mass.
 p. 2-289,291,292
DM USCC/Centralab, Elec. Div., Los Angeles, Cal.
 p. 2-320,321,323,328
Interelectronics Corp., Congers, N.Y. *
Nytronics Comps. Group Inc., Darlington, S.C. *
Semtech Corp., Newbury Park, Cal. *
Shigoto Inds., Ltd., New York, N.Y. *
TRW Capacitor Div., Ogallala, Neb. *
D Balco Capacitors, Orange, N.J.
D Cambridge Thermionic Corp., Cambridge, Mass.
D Centralab, Milwaukee, Wisc.
D Cornell-Dubilier Electronics, Newark, N.J.
 Dilectron, Monrovia, Cal.
 Engineered Components Co., San Luis Obispo, Cal.
 ITT Jennings, Monrovia, Cal.
 Motorola Comms. Div., Schaumburg, Ill.
 Murata Mfg. Co. Ltd., Kyoto, Japan
 Nichicon America Corp., Chicago, Ill.
D Nucleonic Prods., Canoga Pk., Cal.
D Radio Materials Co., Chicago, Ill.
D Soshin Elec. Co., Tokyo, Japan
D Sprague Elec. Co., No. Adams, Mass.
 Stettner-Trush Inc., Cazenovia, N.Y.
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
 TDK Elctns. Corp., Long Island City, N.Y.
D United Mineral & Chem. Corp., New York, N.Y.
 Viclan, San Diego, Cal.
 Voltronics Corp., E. Hanover, N.J.

Capacitors, Fixed, Vacuum
ITT Jennings, Vacuum Elctn. Prods., San Jose, Cal. p. 2-198-200
Amperex Electronic Corp., Slatersville, R.I. *
Inter-Tech. Grp., Irvington-on-Hudson, N.Y. *
 ITT Jennings, Monrovia, Cal.

Capacitors, Overvoltage Protected
D Arco Electronics Inc., Great Neck, N.Y.
 p. 2-32-39
M Del Electronics Corp., Mt. Vernon, N.Y.
 p. 2-120
Electro Motive Corp., Melville, New York
 p. 2-194,195
International Electronics Corp., Melville, N.Y.
 p. 2-194,195

USCC/Centralab, Elec. Div., Los Angeles, Cal. *
D Centralab, Milwaukee, Wisc.
 Dilectron, Monrovia, Cal.
 Engineered Components Co., San Luis Obispo, Cal.
D Film Capacitors, Passaic, N.J.
 ITT Jennings, Monrovia, Cal.
 Maxwell Labs., San Diego, Calif.
 Radio Materials Co., Chicago, Ill.

Capacitors, Variable, Air
D Erie Technological Products, Erie, Pa.
 p. 2-127-129
Jackson Bros., (London) Ltd., New York, N.Y.
 p. 2-196,197
DM Johanson Mfg. Corp., Boonton, N.J. p. 2-204
D Johnson Co., E.F., Waseca, Minn. p. 2-203
D Millen Mfg. Co. Inc., James, Malden, Mass.
 p. 2-1253
Seacor, Norwood, N.J. p. 2-238,239
General Radio Co., Concord, Mass. *
Shigoto Inds., Ltd., New York, N.Y. *

D Barker & Williamson, Bristol, Pa.
D Cambridge Thermionic Corp., Cambridge, Mass.
DM JFD Electronics Components Corp., Bklyn., N.Y.
 Leeds & Northrup Co., North Wales, Pa.
 Motorola Comms. Div., Schaumburg, Ill.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
D Sprague-Goodman Electronics, Mineola, N.Y.
 TRW Elec. Functions, Camden, N.J.
DM United Prods. Co., New Hyde Pk., N.Y.
DM Voltronics Corp., E. Hanover, N.J.

Capacitors, Variable, Ceramic
American Technical Ceramics, Huntington Sta., N.Y. p. 2-28-31
D Erie Technological Products, Erie, Pa.
 p. 2-127-129
DM Johanson Mfg. Corp., Boonton, N.J. p. 2-204
D Sprague Products Co., No. Adams, Mass.
 p. 2-298

D GC Electronics, Rockford, Ill. *
D Johnson Co., E.F., Waseca, Minn. *
Shigoto Inds., Ltd., New York, N.Y. *
D Cambridge Thermionic Corp., Cambridge, Mass.
D Centralab, Milwaukee, Wisc.
D JFD Electronics Components Corp., Bklyn., N.Y.
D Mepco/Electra, Morristown, N.J.

Murata Mfg. Co. Ltd., Kyoto, Japan
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
Sprague Elec. Co., No. Adams, Mass.
D Sprague-Goodman Electronics, Mineola, N.Y.
 Stettner-Trush Inc., Cazenovia, N.Y.
 TDK Elctns. Corp., Long Island City, N.Y.
D United Mineral & Chem. Corp., New York, N.Y.
DM United Prods. Co., New Hyde Pk., N.Y.

Capacitors, Variable, Film
Alissa Mfg. Co., Los Angeles, Cal. p. 2-24-27
M F-Dyne Elctns., Bridgeport, Conn.
 p. 2-130-133
Jackson Bros., (London) Ltd., New York, N.Y.
 p. 2-196,197

M Southern Electronics Co., Burbank, Cal.
 p. 2-240,241
M Del Electronics Corp., Mt. Vernon, N.Y. *
D Johnson Co., E.F., Waseca, Minn. *
 Film Capacitors, Passaic, N.J.
D Mepco/Electra, Morristown, N.J.
 Plastic Capacitors, Chicago, Ill.
D Sprague-Goodman Electronics, Mineola, N.Y.
 United Mineral & Chem. Corp., New York, N.Y.
D Voltronics Corp., E. Hanover, N.J.

Capacitors, Variable, Gas
ITT Jennings, Vacuum Elctn. Prods., San Jose, Cal. p. 2-198-200
M Lapp Insulator Div., Interpace Corp., LeRoy, N.Y.

Capacitors, Variable, Glass
D Erie Technological Products, Erie, Pa.
 p. 2-127-129
D Johanson Mfg. Corp., Boonton, N.J. p. 2-204
DM Sprague Products Co., No. Adams, Mass. *

D Cambridge Thermionic Corp., Cambridge, Mass.
DM JFD Electronics Components Corp., Bklyn., N.Y.
 Murata Mfg. Co. Ltd., Kyoto, Japan
DM Sprague-Goodman Electronics, Mineola, N.Y.
DM Voltronics Corp., E. Hanover, N.J.

Capacitors, Variable, High-Temperature (Over 125 C)
American Technical Ceramics, Huntington Sta., N.Y. p. 2-28-31
M F-Dyne Elctns., Bridgeport, Conn.
 p. 2-130-133
Johanson Mfg. Corp., Boonton, N.J. p. 2-204
Millen Mfg. Co. Inc., James, Malden, Mass.
 p. 2-1253
M Southern Electronics Co., Burbank, Cal.
 p. 2-240,241

D Film Capacitors, Passaic, N.J.
DM JFD Electronics Components Corp., Bklyn., N.Y.
D Mepco/Electra, Morristown, N.J.
 Polyflon Corp., New Rochelle, N.Y.
D Sprague-Goodman Electronics, Mineola, N.Y.
DM Voltronics Corp., E. Hanover, N.J.

Capacitors, Variable, H-V (Lab Type)
Also see Decade Boxes, Capacitance
M F-Dyne Elctns., Bridgeport, Conn.
 p. 2-130-133
ITT Jennings, Vacuum Elctn. Prods., San Jose, Cal. p. 2-198-200
Johanson Mfg. Corp., Boonton, N.J. p. 2-204
M Southern Electronics Co., Burbank, Cal.
 p. 2-240,241

M Del Electronics Corp., Mt. Vernon, N.Y. *
DM JFD Electronics Components Corp., Bklyn., N.Y.
 Polyflon Corp., New Rochelle, N.Y.
D Sprague-Goodman Electronics, Mineola, N.Y.

Capacitors, Variable, Motor Driven
ITT Jennings, Vacuum Elctn. Prods., San Jose, Cal. *

Capacitors, Variable, Mica
D Arco Electronics Inc., Great Neck, N.Y.
 p. 2-32-39
Electro Motive Corp., Melville, New York
 p. 2-194,195
International Electronics Corp., Melville, N.Y.
 p. 2-194,195
Shigoto Inds., Ltd., New York, N.Y. *
 Morey Corp., Downers Grove, Ill.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
D Voltronics Corp., E. Hanover, N.J.

Capacitors, Variable, Neutralizing
ITT Jennings, Vacuum Elctn. Prods., San Jose, Cal. p. 2-198-200
Jackson Bros., (London) Ltd., New York, N.Y.
 p. 2-196,197
D Millen Mfg. Co. Inc., James, Malden, Mass. *

DM JFD Electronics Components Corp., Bklyn., N.Y.
D Sprague-Goodman Electronics, Mineola, N.Y.
D Voltronics Corp., E. Hanover, N.J.

Capacitors, Variable, Padder
D Arco Electronics Inc., Great Neck, N.Y.
 p. 2-32-39
D Electro Motive Corp., Melville, New York
 p. 2-194,195
Erie Technological Products, Erie, Pa.
 p. 2-127-129
International Electronics Corp., Melville, N.Y.
 p. 2-194,195
Millen Mfg. Co. Inc., James, Malden, Mass.
 p. 2-1253

DM JFD Electronics Components Corp., Bklyn., N.Y.
D Sprague-Goodman Electronics, Mineola, N.Y.
 Stettner-Trush Inc., Cazenovia, N.Y.
D Voltronics Corp., E. Hanover, N.J.

Capacitors, Variable, Piston—See
Capacitors, Variable, Trimmer (All Types)

Capacitors, Variable, Quartz
D Erie Technological Products, Erie, Pa.
 p. 2-127-129
Johanson Mfg. Corp., Boonton, N.J. p. 2-204
D GC Electronics, Rockford, Ill. *
DM Sprague Products Co., No. Adams, Mass. *
D Cambridge Thermionic Corp., Cambridge, Mass.
DM JFD Electronics Components Corp., Bklyn., N.Y.
D Sprague-Goodman Electronics, Mineola, N.Y.
DM Voltronics Corp., E. Hanover, N.J.

Capacitors, Variable, TFE
M F-Dyne Elctns., Bridgeport, Conn.
 p. 2-130-133
Johanson Mfg. Corp., Boonton, N.J. p. 2-204
M Southern Electronics Co., Burbank, Cal.
 p. 2-240,241

D Johnson Co., E.F., Waseca, Minn. *
Sprague Products Co., No. Adams, Mass. *
 Film Capacitors, Passaic, N.J.
M Polyflon Corp., New Rochelle, N.Y.
D Sprague-Goodman Electronics, Mineola, N.Y.
DM Voltronics Corp., E. Hanover, N.J.

Capacitors, Variable, Temperature Compensating
D Erie Technological Products, Erie, Pa.
 p. 2-127-129
M F-Dyne Elctns., Bridgeport, Conn.
 p. 2-130-133
M Southern Electronics Co., Burbank, Cal.
 p. 2-240,241

Interelectronics Corp., Congers, N.Y. *
D Cambridge Thermionic Corp., Cambridge, Mass.
D Centralab, Milwaukee, Wisc.
 Murata Mfg. Co. Ltd., Kyoto, Japan
D Sprague-Goodman Electronics, Mineola, N.Y.
D Voltronics Corp., E. Hanover, N.J.

Capacitors, Variable, Trimmer (All Types)
American Technical Ceramics, Huntington Sta., N.Y. p. 2-28-31
D Electro Motive Corp., Melville, New York
 p. 2-194,195
D Erie Technological Products, Erie, Pa.
 p. 2-127-129

International Electronics Corp., Melville, N.Y.
 p. 2-194,195
Jackson Bros., (London) Ltd., New York, N.Y.
 p. 2-196,197
M Johanson Mfg. Corp., Boonton, N.J. p. 2-204
D Johnson Co., E.F., Waseca, Minn. p. 2-201,202
Millen Mfg. Co. Inc., James, Malden, Mass.
 p. 2-1253
D Sprague Products Co., No. Adams, Mass.
 p. 2-298-298

M Del Electronics Corp., Mt. Vernon, N.Y. *
D GC Electronics, Rockford, Ill. *
Shigoto Inds., Ltd., New York, N.Y. *
D Cambridge Thermionic Corp., Cambridge, Mass.
DM JFD Electronics Components Corp., Bklyn., N.Y.
 Mepco/Electra, Morristown, N.J.
 Murata Mfg. Co. Ltd., Kyoto, Japan
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
D Philmore Mfg. Co. Inc., Inwood, N.Y.
 Polyflon Corp., New Rochelle, N.Y.

DM Sprague Elec. Co., No. Adams, Mass.
DM Sprague-Goodman Electronics, Mineola, N.Y.
 Stettner-Trush Inc., Cazenovia, N.Y.
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
D United Mineral & Chem. Corp., New York, N.Y.
DM Voltronics Corp., E. Hanover, N.J.

Capacitors, Variable, Vacuum
ITT Jennings, Vacuum Elctn. Prods., San Jose, Cal. p. 2-198-200
D Amperex Electronic Corp., Hicksville, N.Y. *
 ITT Jennings, Monrovia, Cal.

Capacitors, Water Cooled

- M Del Electronics Corp., Mt. Vernon, N.Y.** p. 2-120
ITT Jennings, Vacuum Elctn. Prods., San Jose, Cal. p. 2-198-200
 Centralab, Milwaukee, Wisc.
 ITT Jennings, Monrovia, Cal.
 Murata Mfg. Co. Ltd., Kyoto, Japan
 D United Mineral & Chem. Corp., New York, N.Y.

Caps, Connector

- DM Amphenol Connector Div., Broadview, Ill.** p. 2-460,461
Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
DM Amphenol RF Div., Danbury, Conn. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
Arrow-Hart, Hartford, Conn. p. 2-621
DM Bendix Corp., The, Sidney, N.Y. p. 2-640
D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1247
M Rowe Industries, Toledo, Ohio p. 2-796,797
TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
D Waldom Electronics, Chicago, Ill. p. 2-1070-1074

- Sprague Products Co., No. Adams, Mass.** *
 American Microwave Inds., Waltham, Mass.
DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.
 Beman Mfg., New Cumberland, Pa.
 Communications Technology Corp., Los Angeles, Cal.
 M Glenair, Glendale, Cal.
 M GTI Corporation, Pittsburgh, Pa.
 D Ideal Industries Inc., Sycamore, Ill.
 D Javex Elctns., Cherry Valley, Cal.
 M Jettron Prods., Hanover, N.J.
 Kentucky Electronics, Owensboro, Ky.
 Leviton Mfg. Co., Little Neck, N.Y.
 D Rye Inds., Mamaroneck, N.Y.
 D Thomas & Betts Co., Elizabeth, N.J.
 Workman Electronic Prods., Sarasota, Fla.
 D Zippertubing Co., Los Angeles, Calif.

Caps, Forms & Tapes, Heat Shrinkable-Also See Tubing, Heat Shrinkable

- D Alpha Wire Corp., Elizabeth, N.J.** p. 2-1869,1870
D Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1975,1978

- DM Amrad Corporation, Paris, Tex.**
 D AMP Special Industries, Valley Forge, Pa.
 M M M Newman Corp., Marblehead, Mass.
 D Burlington Opers. Div., Burlington, Mass.
 M Chemplast, Wayne, N.J.
 D Cole-Flex Corp., W. Babylon, N.Y.
DM Newman Corp., M. M., Marblehead, Mass.
 Precision Paper Tube Co., Wheeling, Ill.
 Raychem Corp., Menlo Park, Cal.

Caps, Grid & Plate—See Clips & Caps, Grid & Plate

Caps, Lenses, Indicator Light

- D Amatom Electronic Hardware, New Haven, Conn.** p. 2-1258
D Arcoelectric Switch Corp., No. Hollywood, Cal. p. 2-1125
Display Devices, Encinitas, Cal. p. 2-1142
D GTE Sylvania Inc., Hillsboro, N.H. p. 2-1147
D IEE/Schadow, Eden Prairie, Minn. p. 1-2070,2072
DM Illuminated Products Inc., Anaheim, Cal. p. 2-1154,1155
D Industrial Devices, Edgewater, N.J. p. 2-1171
LVC Inds. Inc., Flushing, N.Y. p. 2-1137
D Micro Switch, Freeport, Ill. p. 1-2101
D Sloan Company, Sun Valley, Cal. p. 2-1190-1192,1196
D ALCO Electronic Prods., North Andover, Mass. *

- D Electro-Mech Components, So. El Monte, Cal.** *
Staver Co., Bay Shore, N.Y. *
Trimm, Libertyville, Ill. *
 M Atlantic Optical Moulding Co., Dudley, Mass.
 Centralab Semiconductor, El Monte, Cal.
DM Chicago Miniature Lamp/Drake, Chicago, Ill.
 Circon Corp., Santa Barbara, Cal.
 D Clare-Pendar, Post Falls, Idaho
DM Genisco Technology Corp., Compton, Cal.
 D GTE Sylvania Inc., Danvers, Mass.
 M GTI Corporation, Pittsburgh, Pa.
 D Licon Div., Chicago, Ill.
 NOBEX Div., Burlingame, Cal.
 Penn Keystone Corp., Ansonia, Conn.

- Photo Chemical Prods. Cal., Santa Monica, Cal.
 Precision Paper Tube Co., Wheeling, Ill.
 D Vemaline Prods. Co., Wyckoff, N.J.

Caps, Wire-Splicing—See Splicers, Wire

Card Holders, Circuit Board—See Volume 1

Card Readers—See Volume 1

Cards, Linear Function (With Discrete Components)

- CELCO, Mahwah, N.J.** p. 1-630
Elgenco, Santa Monica, Cal. p. 1-685
Hybrid Systems Corp., Burlington, Mass. p. 1-170
ILC Data Device Corp., Bohemia, N.Y. p. 1-171
NES, Streamwood, Ill. *
 D Cambridge Thermionic Corp., Cambridge, Mass.
 Dattilo Enterprises, Louisville, Ky.
 GTE Sylvania, Muncy, Pa.
 Guardian Electric Co. of Cal., Torrance, Cal.
 D Intech, Santa Clara, Cal.
 Integrated Microsystems Inc., Mountain View, Cal.
 Jaesic Industries Co., Wixom, Mich.
 M Leighton Electronics, Leighton, Pa.
 Metric Systems Corp., Ft. Walton Beach, Fla.
 D Paraplegics Mfg., Bensenville, Ill.
 Struthers-Dunn, Bettendorf, Iowa

Cards, Linear Function (With IC'S)

- CELCO, Mahwah, N.J.** p. 1-630
Hybrid Systems Corp., Burlington, Mass. p. 1-170
ILC Data Device Corp., Bohemia, N.Y. p. 1-171
NES, Streamwood, Ill. *
 Data Numerics, Farmingdale, N.Y.
 E & L Instruments, Derby, Conn.
 GTE Sylvania, Muncy, Pa.
 Guardian Electric Co. of Cal., Torrance, Cal.
 D Intech, Santa Clara, Cal.
 Integrated Microsystems Inc., Mountain View, Cal.
 Jaesic Industries Co., Wixom, Mich.
 M Leighton Electronics, Leighton, Pa.
 Metric Systems Corp., Ft. Walton Beach, Fla.
 D Paraplegics Mfg., Bensenville, Ill.
 Sensor Corp., Scottsdale, Pa.
 Struthers-Dunn, Bettendorf, Iowa
 Wyle Computer Prods., El Segundo, Calif.

Cards, Logic (With Discrete Components)—See Volume 1

Cards, Logic (With IC'S)—See Volume 1

Carriages, Probe

- Hewlett-Packard Co., Palo Alto, Cal.
 D PRD Elctns., Syosset, N.Y.

Carriers—See Volume 1

Carts & Dollies, Instrument & Equipment—See Volume 1

Cases, Equipment, Instrument, Meter (Portable)—See Volume 1

Cases, Equipment, Instrument, Meter (Stationary)—See Volume 1

Cases, Shielded—See Volume 1

Cases, Transit - Also See Containers, Shipping, Metal & Fiberglass—See Volume 1

Cathode-Ray Readout Tubes—See Tubes, Readout

CATV Systems & Equipment—See Volume 1

Cavities, Microwave

- M Applied Microwave, Westwood, Mass.** p. 1-901-904
MCL, LaGrange, Ill. p. 1-922,925
Zero Mfg. Co., Burbank, Cal. p. 1-106-109
Amperex Electronic Corp., Slatersville, R.I. *
D Amperex Electronic Corp., Hicksville, N.Y. *
 D Ailtech, Farmingdale, N.Y.
 Aircom, Union, N.H.
 M A.R.F. Products, Boulder, Colo.
 Coax Devices Inc., Chelsea, Mass.
 M Coleman Microwave Co., Lebanon, N.J.
 Collins Radio, Dallas, Tex.
 Dynalab Corp., Van Nuys, Cal.
 Frequency Engrg. Labs., Farmingdale, N.J.

- Hughes Aircraft Co., Culver City, Cal.
 M Lorch Elctns. Corp., Englewood, N.J.
 M Lorch Devices Inc., Englewood, N.J.
 Maury Microwave Corp., Cucamonga, Calif.
 M Microlab/FXR, Livingston, N.J.
 Microphase Corp., Cos Cob, Conn.
 Microwave Assocs., Burlington, Mass.
 D Microwave Development Labs., Needham Hgts., Mass.
 M Norsal Industries, Brentwood, N.Y.
 D PRD Elctns., Syosset, N.Y.
 M Premier Microwave, Port Chester, N.Y.
 Reeve Electronics, Chicago, Ill.
 M Trak Microwave Corporation, Tampa, Fla.
 UTE Microwave, Asbury Park, N.J.
 Varian Assocs., Palo Alto, Cal.
 Varian Electron Tube & Device Grp., San Carlos, Cal.
 Varian Solid State East Beverly Div., Beverly, Mass.
 M Watkins-Johnson Co., Palo Alto, Cal.

Cells, Electrolytic (Timing)—See Volume 1

Cells, Load—See Volume 1

Cells, Photoconductive—See Volume 1

Cells, Photoemissive—See Volume 1

Cells, Photovoltaic—See Volume 1

Cells, Solar—See Volume 1

Cements—See Adhesives, (All Types)

Ceramic Resonators—See Volume 1

Chambers, Altitude—See Volume 1

Chambers, Explosion—See Volume 1

Chambers, Humidity—See Volume 1

Chambers, Magnetic Environment—See Volume 1

Chambers, Pressure—See Volume 1

Chambers, Radiation—See Volume 1

Chambers, Salt Spray—See Volume 1

Chambers, Sand & Dust—See Volume 1

Chambers, Shock—See Volume 1

Chambers, Sunshine—See Volume 1

Chambers, Temperature—See Volume 1

Chambers, Vacuum—See Volume 1

Chambers, Vibration—See Volume 1

Character Recognition Systems—See Volume 1

Chargers, Battery—See Volume 1

Chargers, Magnet—See Volume 1

Chassis, Circuit Board Mounting—See Volume 1

Chassis Marking Kits—See Kits, Marking (Dial, Instrument, Equipment, etc.)

Chassis, Metal—See Volume 1

Chassis Slides—See Volume 1

Checkers—See Volume 1

Chemicals, Anti-Static—See Coatings, Anti-Static

Chemicals, Electroplating

- 3M Company, St. Paul, Minn.** *
 Acheson Colloids Co., Port Huron, Mich.
 M Allied Chemical Corp., Morristown, N.J.
 Alpha Metals, Jersey City, N.J.
 Atomergic Chemetals Co., Carle Place, N.Y.
 Baker, J.T. Chemical Co., Phillipsburg, N.J.
 Celanese Chemical Co., New York, N.Y.
 Conversion Chem. Corp., Rockville, Conn.
 Dow Chemical Co., Midland, Mich.
 Edmund Scientific Co., Barrington, N.J.
 E.I. DuPont de Nemours & Co., Wilmington, Del.
 Engelhard Minerals & Chem., Murray Hill, N.J.
 Fidelity Chem. Prods. Corp., Newark, N.J.
 Kandu Corporation, Arvada, Colo.
 D London Chemical Co., Bensenville, Ill.

M Mallinckrodt, St. Louis, Mo.
Photocircuits Div., Kollmorgen Corp., Glen Cove, N.Y.
Sel-Rex Co. Div. Oxy Metal Industries Corp., Nutley, N.J.
D Sifco Metachemical, Independence, Ohio
Union Carbide, Chemicals & Plastics, New York, N.Y.
D Uniroyal, New York, N.Y.
D United Mineral & Chem. Corp., New York, N.Y.

Chemicals, Epoxy Stripping

Conversion Chem. Corp., Rockville, Conn.
Dolph, John C. Co., Monmouth Junction, N.J.
DM Dynaloy, Hanover, N.J.
Formulated Resins Inc., Greenville, R.I.
M Hardman Inc., Belleville, N.J.
M Isochem Resins Co., Lincoln, R.I.
D London Chemical Co., Bensenville, Ill.
Mann, Henry Inc., Huntingdon Valley, Pa.
D Miller-Stephenson Chem. Co., Danbury, Conn.
Mona Inds., Paterson, N.J.
Photocircuits Div., Kollmorgen Corp., Glen Cove, N.Y.
D Ram Chems., Gardena, Calif.

Chemicals, Etching

D Vector Electronic Co., Sylmar, Cal. p. 2-358
D GC Electronics, Rockford, Ill. *

3M Company, St. Paul, Minn. *

Adre Co., Milwaukee, Wisc.
Air Prods. & Chems., Allentown, Pa.
M Allied Chemical Corp., Morristown, N.J.
Atomergic Chemetals Co., Carle Place, N.Y.
Auric Corp., Newark, N.J.
Baker, J.T. Chemical Co., Phillipsburg, N.J.
M Chemplast, Wayne, N.J.
Conversion Chem. Corp., Rockville, Conn.
Dow Chemical Co., Midland, Mich.
E.I. DuPont de Nemours & Co., Wilmington, Del.
Electrotec Inc., Dallas, Tex.
Fidelity Chem. Prods. Corp., Newark, N.J.
Gates, Geo. W. & Co., Franklin Sq., N.Y.
Kandu Corporation, Arvada, Colo.
M Mallinckrodt, St. Louis, Mo.
DM Matheson Gas Products, East Rutherford, N.J.
Mona Inds., Paterson, N.J.
Photocircuits Div., Kollmorgen Corp., Glen Cove, N.Y.
D Sifco Metachemical, Independence, Ohio
Union Carbide, Chemicals & Plastics, New York, N.Y.

Chemicals, Fungicidal—See Coatings, Fungicidal**Chemicals, Wire Stripping**

D GC Electronics, Rockford, Ill. *

Adtool Corp., Montreal W P Q, Can.
M Allied Chemical Corp., Morristown, N.J.
Dow Chemical Co., Midland, Mich.
D Eraser Co., Syracuse, N.Y.
Fidelity Chem. Prods. Corp., Newark, N.J.
D Kenco Alloy & Chemical Co., Addison, Ill.
D London Chemical Co., Bensenville, Ill.
M MacDonald & Co., Glendale, Calif.
Methode Elctns., Chicago, Ill.
Miller-Stephenson Chem. Co., Danbury, Conn.

Chestsets—See Volume 1**Chips, IC—See Volume 1****Chokes, A-F—See Volume 1****Chokes, Air Core**

D Bell Industries, Compton, Cal. p. 2-370-379
Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-381
Caddel-Burns Mfg. Co., Mineola, N. Y. p. 2-382-385
Magnetic, Holtsville, N.Y. p. 2-1770
NWL Transformers, Trenton, N.J. p. 2-1772
Sanford-Miller Corp., Brooklyn, N.Y. p. 1-1863
Biometrics Instrument Corp., Garland, Tex. *

D Millen Mfg. Co. Inc., James, Malden, Mass. *

M Torvico Elctns., Lakewood, N.J. *

American Monarch Corp., Minneapolis, Minn.
Bicron Elctns. Co., Canaan, Conn.
M Caddell Coil Corp., Poultney, Vt.
Coilcraft, Cary, Ill.
Cramer Coil, Grafton, Wisc.
M Electronic Transformer Corp., Paterson, N.J.
Elma Engineering, Palo Alto, Cal.
Ferrodyne Corp., Venice, Calif.
JDN Electronics, Gillette, N.J.
Mag-Con, New Brighton, Minn.
M Peschel Instrs., Cape Coral, Fla.
DM Thordarson Meissner, Mt. Carmel, Ill.

Chokes, Filter

D Bell Industries, Compton, Cal. p. 2-370-379

M Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-381

Caddel-Burns Mfg. Co., Mineola, N. Y. p. 2-382-385

D Dale Electronics Inc., Columbus, Neb. p. 2-1452

D Dale Elctns., Yankton, S.D. p. 2-1452

M Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747

M Hisonic, Olathe, Kan. p. 2-1755

K.G.S. Elctns., Pasadena, Cal. p. 2-1752

Magnetic, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y. p. 2-1768

NWL Transformers, Trenton, N.J. p. 2-1772

D Sanford-Miller Corp., Brooklyn, N.Y. p. 1-1863

Signal Transformer Co., Brooklyn, N.Y. p. 2-1796

DM Torotol Inc., Grandview, Mo. p. 2-434-439

D Triad-Utrad, Huntington, Ind. p. 2-1822-1829

Vari-L Co., Denver, Colo. p. 2-441

Biometrics Instrument Corp., Garland, Tex. *

Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *

M Del Electronics Corp., Mt. Vernon, N.Y. *

Electrocube Inc., San Gabriel, Cal. *

Lambda Elctns., Melville, N.Y. *

D Ohmite Mfg. Co., Skokie, Ill. *

M Pico Elctns. Inc., Mount Vernon, N.Y. *

Potter Co., Wesson, Miss. *

Shigoto Inds., Ltd., New York, N.Y. *

D Todd Systems, Yonkers, N.Y. *

M Torvico Elctns., Lakewood, N.J. *

Acme Electric, Cuba, N.Y.

American Monarch Corp., Minneapolis, Minn.

D B. H. Industries, Los Angeles, Cal.

M Caddell Coil Corp., Poultney, Vt.

Coilcraft, Cary, Ill.

Mr. Roger Love, Madison, NJ

Cramer Coil, Grafton, Wisc.

Custom Coil & Transformer Co., Zanesville, Ohio

M Dietz Design, Belton, Mo.

E-Tronics, Sepulveda, Cal.

Eastern Delta Corp., Fair Lawn, N.J.

Electrocom Inds., S. Bend, Ind.

M Electronic Transformer Corp., Paterson, N.J.

M EWC, Kenilworth, N.J.

Ferrodyne Corp., Venice, Calif.

Gowanda Electronics Corp., Gowanda, N.Y.

J.D.N. Electronics Inc., Gillette, N.J.

D Lectro Magnetics, Los Angeles, Cal.

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

North Electric Co., Galion, Ohio

M OPT Inds. Inc., Phillipsburg, N.J.

M Peschel Instrs., Cape Coral, Fla.

M Polyphase Instr. Co., Bridgeport, Pa.

Schott Corp., Minneapolis, Minn.

D Stancor/Essex International, Chicago, Ill.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

TDK Elctns. Corp., Long Island City, N.Y.

DM Thordarson Meissner, Mt. Carmel, Ill.

Torelco Inc., Irvington, N.J.

Tranex Inc., Mountain View, Cal.

M Watkins-Johnson Co., Palo Alto, Cal.

Chokes, R-F

Airco Elctns., Nogales, Ariz. p. 2-368,369,1408,1409

M Aladdin Elctns., Nashville, Tenn. p. 2-1729,1730

D Bell Industries, Compton, Cal. p. 2-370-379

Caddel-Burns Mfg. Co., Mineola, N. Y. p. 2-382-385

D Dale Electronics Inc., Columbus, Neb. p. 2-1452

Dale Elctns., Yankton, S.D. p. 2-1452

DM Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388

M Hisonic, Olathe, Kan. p. 2-1755

Magnetic, Holtsville, N.Y. p. 2-1770

D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1252

Sanford-Miller Corp., Brooklyn, N.Y. p. 1-1863

Vari-L Co., Denver, Colo. p. 2-441

Biometrics Instrument Corp., Garland, Tex. *

D Ferrocube Corp., Saugerties, N.Y. *

D GC Electronics, Rockford, Ill. *

Lambda Elctns., Melville, N.Y. *

D Ohmite Mfg. Co., Skokie, Ill. *

DM Torotol Inc., Grandview, Mo. *

M American Trans-Coil Corp., Richmond Hill, N.Y.

Automatic Coil, New Hyde Pk., N.Y.

D Barker & Williamson, Bristol, Pa.

M Caddell Coil Corp., Poultney, Vt.

D Cambridge Thermionic Corp., Cambridge, Mass.

Coilcraft, Cary, Ill.

Coil Specialty Co., Boalsburg, Pa.

Cramer Coil, Grafton, Wisc.

M Dietz Design, Belton, Mo.

M Gowanda Electronics Corp., Gowanda, N.Y.

Hytronics Corp., Pinellas Park, Fla.

M J.D.N. Electronics Inc., Gillette, N.J.

D Lectro Magnetics, Los Angeles, Cal.

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

Morey Corp., Downers Grove, Ill.

D Norelcom Electronics, Farmingdale, N.Y.

D Siemens Corp., Iselin, N.J.

M Syscon Int'l., So. Bend, Ind.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

TDK Elctns. Corp., Long Island City, N.Y.

DM Thordarson Meissner, Mt. Carmel, Ill.

D United Mineral & Chem. Corp., New York, N.Y.

D Workman Electronic Prods., Sarasota, Fla.

Chokes, Swinging

M Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-381

Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388

M Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747

Magnetic, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y. p. 2-1768

Neshaminy Transformer, Furlong, Pa. p. 2-1775,1776

NWL Transformers, Trenton, N.J. p. 2-1772

Signal Transformer Co., Brooklyn, N.Y. p. 2-1797

D Triad-Utrad, Huntington, Ind. p. 2-1822-1829

Biometrics Instrument Corp., Garland, Tex. *

M Del Electronics Corp., Mt. Vernon, N.Y. *

Electrocube Inc., San Gabriel, Cal. *

Lambda Elctns., Melville, N.Y. *

M Pico Elctns. Inc., Mount Vernon, N.Y. *

D Todd Systems, Yonkers, N.Y. *

M Torotol Inc., Grandview, Mo. *

M Torvico Elctns., Lakewood, N.J. *

D Altex Div., Anaheim, Calif.

American Magnetics Corp., Cartersville, Ill.

American Monarch Corp., Minneapolis, Minn.

M Dietz Design, Belton, Mo.

E-Tronics, Sepulveda, Cal.

Eastern Delta Corp., Fair Lawn, N.J.

M Electronic Transformer Corp., Paterson, N.J.

EWC, Kenilworth, N.J.

Ferrodyne Corp., Venice, Calif.

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

Phoenix Transformer Co., Phoenix, Ariz.

M Polyphase Instr. Co., Bridgeport, Pa.

Schott Corp., Minneapolis, Minn.

D Stancor/Essex International, Chicago, Ill.

DM Thordarson Meissner, Mt. Carmel, Ill.

Tranex Inc., Mountain View, Cal.

Chokes, Waveguide

Syston-Donner Microwave Div., Van Nuys, Cal. *

M Airtrol, Morris Plains, N.J.

M Co-Operative Inds., Chester, N.J.

M Microlab/FXR, Livingston, N.J.

Microwave Assocs., Burlington, Mass.

D Microwave Development Labs., Needham Hgts., Mass.

M Premier Microwave, Port Chester, N.Y.

Reeve Electronics, Chicago, Ill.

Waveline, W. Caldwell, N.J.

Choppers - Also see Light Choppers—

See Volume 1

Chronometers—See Volume 1**Circuit Analyzers—See Volume 1****Circuit Board Holders, Jig Type—See**

Volume 1

Circuit Breakers—See Volume 1**Circuit Testers—See Volume 1****Circuits, Cordwood**

Collins Radio, Dallas, Tex.

Circuits, Flexible

Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-2022

Hutchinson Industrial Corp., Hutchinson, Minn. p. 1-1542,1543

M SGL Printed Circuits, Wayne, N.J. p. 2-3556
Sheldahl, Northfield, Minn. p. 2-3555
Spectra-Strip Corp., Garden Grove, Cal.

3M Company, St. Paul, Minn. p. 2-1034-1055
Rowe Industries, Toledo, Ohio *

M Ansley Elctns. Corp., Los Angeles, Cal.
Beman Mfg., New Cumberland, Pa.
Buckbee Mears Co., St. Paul, Minn.
M Bureau Engraving, Minneapolis, Minn.
M Chem Aero, Wilmington, Cal.
Diceon Electronics, Irvine, Cal.
Dytronics Div., Leesburg, Ind.
Flexprint Div., Manchester, N.H.
M GTI Corporation, Pittsburgh, Pa.
Lockheed Elctns. Co., Watchung, N.J.
Methode Elctns., Chicago, Ill.
Mid-West Metal Prods., Kansas City, Kans.
Minco Products Inc., Minneapolis, Minn.
M Rogers Corp., Rogers, Conn.
Stanford Applied Engineering, Santa Clara, Cal.
Synthane Taylor Corp., Valley Forge, Pa.
M Tech-Etch, Hingham, Mass.

Circuits, Hybrid, Thick Film—See
Volume 1

Circuits, Hybrid, Thin-Film—See Volume 1

Circuits, Integrated, Monolithic—See
Volume 1

Circuits, Integrated, Silicon Monolithic,
Unpackaged Chips—See Volume 1

Circuits, Printed, Multilayer

Hutchinson Industrial Corp., Hutchinson, Minn.
p. 1-1542, 1543
National Tel-Tronics, Meadville, Pa. p. 2-722
M SGL Printed Circuits, Wayne, N.J. p. 2-3556
Spectra-Strip Corp., Garden Grove, Cal.

TRW/Cinch-Graphik, Elctn. Comps., City of
Industry, Cal. p. 2-896,897
Advanced Circuitry, Springfield, Mo.
AEL, Colmar, Pa.

American Lava Corp., Chattanooga, Tenn.
M Astro Circuit Corp., Tewksbury, Mass.
Buckbee Mears Co., St. Paul, Minn.
M Bureau Engraving, Minneapolis, Minn.
Centralab, Milwaukee, Wisc.

M Chem Aero, Wilmington, Cal.
Collins Radio, Dallas, Tex.
Diceon Electronics, Irvine, Cal.

DM Diva, Eatontown, N.J.
Electronics One Inc., Atlanta, Ga.
Exetron Corp., Santa Clara, Cal.
Flexprint Div., Manchester, N.H.
GTE Sylvania, Muncy, Pa.

GTE Sylvania Inc., Waltham, Mass.
Hughes Aircraft Co., Culver City, Cal.
Int'l. Elctn. Resch., Burbank, Cal.
Knol Enterprise, San Luis Obispo, Cal.
Lockheed Elctns. Co., Watchung, N.J.

M Lorch Devices Inc., Englewood, N.J.
MBC Engineering Inc., Santa Clara, Cal.
Methode Elctns., Chicago, Ill.
Metropolitan Circuits Inc., Costa Mesa, Cal.

M Mica Corporation, Culver City, Calif.
National Beryllia Corp., Haskell, N.J.
Norsal Industries, Brentwood, N.Y.
North American Printed Circuit Div., Stafford, Conn.

M Photocircuits Div., Kollmorgen Corp., Glen Cove, N.Y.
Ragen Precision Inds., N. Arlington, N.J.
Rogers Corp., Rogers, Conn.
Stanford Applied Engineering, Santa Clara, Cal.
Synthane Taylor Corp., Valley Forge, Pa.

Circuits, Printed (With Components)—
See Cards, Linear Function (With Discrete
Components)

Circuits, Thick Film, Thin Film—See
Volume 1

Circuitors, Ferrite

Bendix, Franklin, Ind. p. 2-1280
D Amperex Electronic Corp., Hicksville, N.Y. *
Syston-Donner Microwave Div., Van Nuys,
Cal. *
Addington Labs., Santa Clara, Calif.
M Aertech Industries, Sunnyvale, Cal.
M Airtion, Morris Plains, N.J.
California Microwave, Sunnyvale, Cal.
M Cir-Q-Tel, Kensington, Md.
E & M Laboratories, Westlake Village, Cal.
Fuji Electrochemical Co., Tokyo, Japan

Hughes Aircraft Co., Culver City, Cal.
M Merrimac Inds., West Caldwell, N.J.
M Microlab/FXR, Livingston, N.J.
Microwave Assocs., Burlington, Mass.
Microwave Prods., Chatsworth, Cal.
M Norsal Industries, Brentwood, N.Y.
M Premier Microwave, Port Chester, N.Y.
Sivers Lab, Corona del Mar, Cal.
Special Microwave Devices Oper., Waltham, Mass.
TDK Elctns. Corp., Long Island City, N.Y.
M Teledyne Microwave, Mountain View, Cal.
M Trak Microwave Corporation, Tampa, Fla.
D TRG, Woburn, Mass.
UTE Microwave, Asbury Park, N.J.

Citizens Band, Business Band, Marine
Band Comm. Systems—See Volume 1

Clamps & Clips, Cable-Also See Wire &
Cable Ties

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1861
Amphenol Cadre Div., Endicott, N.Y.

M Amphenol Connector Div., Broadview, Ill.
p. 2-460,461
Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461

DM Amphenol RF Div., Danbury, Conn.
p. 2-460,461

D Amphenol Sales Div., Broadview, Ill.
p. 2-460,461

DM Daburn Electronics & Cable Corp., Bronx, N.Y.
p. 2-1990,1991

DM Panduit Corp., Tinley Park, Ill. p. 2-2048-2051
M Rowe Industries, Toledo, Ohio p. 2-796,797

D Smith Inc., Herman H., Brooklyn, N.Y.
p. 2-875,876

D 3M Company, St. Paul, Minn. p. 2-1034-1055
D TRW/Cinch Connectors, Elk Grove Village, Ill.
p. 2-896,897

D Vector Electronic Co., Sylmar, Cal. p. 2-1060
D Waldom Electronics, Chicago, Ill.

p. 2-1262-1266
D GC Electronics, Rockford, Ill. *
D Grayhill Inc., LaGrange, Ill. *

DM Keystone Elctns. Corp., New York, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *

D Accessories for Electronics, Bayside, N.Y.
Acme Model Engrg. Co., Ridgefield, N.J.

DM Amrad Corporation, Paris, Tex.
Autosplice/Dv Gen Staple, New York City, N.Y.
Beman Mfg., New Cumberland, Pa.

D Birnbach Co., Freeport, N.Y.
DM Budwig Mfg. Co., Ramona, Calif.
Communications Technology Corp., Los Angeles, Cal.

M Dennison Mfg. Co., Framingham, Mass.
D Eaton Corporation, Cleveland, Ohio
D Electrovert, Mt. Vernon, N.Y.

Globe Plastics, Pomona, Cal.
D Gries Reproducer Co., New Rochelle, N.Y.
D Heyman Mfg. Co., Kenilworth, N.J.

D ICO/Rally Corp., Palo Alto, Cal.
D Ideal Industries Inc., Sycamore, Ill.
D ITT Holub Industries, Sycamore, Ill.

Jermyn, San Francisco, Cal.
D Klein, Mathias & Sons, Chicago, Ill.
DM Simmons Fastener Corp., Albany, N.Y.

Sjoberg, C. & Son, Cranston, R.I.
D Thomas & Betts Co., Elizabeth, N.J.
DM Transcon Mfg. Co., Dallas, Tex.

D Tyton Corp., Milwaukee, Wisc.
D Vemaline Prods. Co., Wyckoff, N.J.
DM Weckesser Co. Inc., Chicago, Ill.

D Zeus Ind'l. Prods., Raritan, N.J.

Clamps & Clips, Component
D Amatonic Electronic Hardware, New Haven,
Conn. p. 2-457

DM Daburn Electronics & Cable Corp., Bronx, N.Y.
p. 2-1990

D Millen Mfg. Co. Inc., James, Malden, Mass.
p. 2-1247

DM Panduit Corp., Tinley Park, Ill. p. 2-2048-2051
M Rowe Industries, Toledo, Ohio p. 2-796,797

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-854
D Sprague Products Co., No. Adams, Mass.
p. 2-300,301

D Thermalloy, Dallas, Tex. p. 1-1874-1876
D Waldom Electronics, Chicago, Ill.

p. 2-1262-1266
E-Systems, Huntington, Ind. *
D GC Electronics, Rockford, Ill. *

D Grayhill Inc., LaGrange, Ill. *
DM Keystone Elctns. Corp., New York, N.Y. *
D Vector Electronic Co., Sylmar, Cal. *

D Accessories for Electronics, Bayside, N.Y.
DM Amrad Corporation, Paris, Tex.
D Atlee Corp., Woburn, Mass.

Autosplice/Dv Gen Staple, New York City, N.Y.
Braun Co., St. Petersburg, Fla.
D Electrovert, Mt. Vernon, N.Y.
D ICO/Rally Corp., Palo Alto, Cal.
ITT Holub Industries, Sycamore, Ill.
Jermyn, San Francisco, Cal.
Seastrom Mfg. Co. Inc., Glendale, Cal.
M Sjoberg, C. & Son, Cranston, R.I.
Timber-Top, Freeport, N.Y.
DM Transcon Mfg. Co., Dallas, Tex.
D Viking Inds., Chatsworth, Cal.
D Zierick Mfg. Corp., Mt. Kisco, N.Y.

Clamps & Clips, Ground—See Volume 1

Cleaners & Solvents

D Jonard Industries Corp., Tuckahoe, N.Y.
p. 2-1707

Regmo Data Corp., Minneapolis, Minn. p. 2-344
D GC Electronics, Rockford, Ill. *
Adtool Corp., Montreal W P Q, Can.

Alconox Inc., New York, N.Y.
M Allied Chemical Corp., Morristown, N.J.
D Alpha Metals, Jersey City, N.J.

Ambroid Co., Brockton, Mass.
D Aremco Prods., Ossining, N.Y.
Audio-Technica U.S., Fairlawn, Ohio

Baker, J.T. Chemical Co., Phillipsburg, N.J.
Baron-Blakeslee, Chicago, Ill.
D Bendix Corp., Davenport, Iowa

D Caig Labs., Westbury, N.Y.
Celanese Chemical Co., New York, N.Y.
D Chemtronics, Hauppauge, N.Y.

Clean Room Prods., Bay Shore, N.Y.
D Cobehn, Fairfield, N.J.
D Cole-Flex Corp., W. Babylon, N.Y.

Communications Technology Corp., Los Angeles, Cal.
DM Conap, Allegany, N.Y.
Conversion Chem. Corp., Rockville, Conn.

D Dolph, John C. Co., Monmouth Junction, N.J.
Dow Chemical Co., Midland, Mich.
D Dynaloy, Hanover, N.J.

Eastman Chem. Prods., Kingsport, Tenn.
E.I. DuPont de Nemours & Co., Wilmington, Del.
D Eraser Co., Syracuse, N.Y.

Fidelity Chem. Prods. Corp., Newark, N.J.
Formulated Resins Inc., Greenville, R.I.
D Friend's Mfg., Williamstown, N.J.

M Hardman Inc., Belleville, N.J.
D Heeger Inc., Los Angeles, Cal.
Hightemp Resins, Stamford, Conn.

D Hollis Engrg., Nashua, N.H.
M Isochem Resins Co., Lincoln, R.I.
Kandu Corporation, Arvada, Colo.

Kenco Alloy & Chemical Co., Addison, Ill.
DM Kester Solder Div., Chicago, Ill.
D Krylon, Norristown, Pa.

LMB Heeger, Los Angeles, Cal.
D London Chemical Co., Bensenville, Ill.
DM LPS Research Labs., Los Angeles, Cal.

M Mallinckrodt, St. Louis, Mo.
Mann, Henry Inc., Huntingdon Valley, Pa.
D Merix Chem. Co., Chicago, Ill.

D Miller-Stephenson Chem. Co., Danbury, Conn.
Mona Inds., Paterson, N.J.
DM Multicore Solders, Westbury, N.Y.

National Camera Inc., Englewood, Colo.
M. P. Odell Co., Cleveland, Ohio
Philadelphia Quartz Co., Valley Forge, Pa.

Phillips Mfg. Co., Chicago, Ill.
PTS Electronics Inc., Bloomington, Ind
D Quietrole Co., Spartanburg, S.C.

D R-Columbia Products, Highland Park, Ill.
D Ram Chems., Gardena, Calif.
D Randolph Prods. Co., Carlstadt, N.J.

RCA Parts & Accessories, Deptford, N.J.
Sara Scientific Co., San Francisco, Calif.
DM Tech Spray, Amarillo, Tex.

D Techni-Tool, Plymouth Meeting, Pa.
D Udel Manufacturing, Covina, Cal.
Ultrasonic Corp., Pipestone, Minn.

Ultrasonic Instrs. Int'l., Farmingdale, N.Y.
Union Carbide, Chemicals & Plastics, New York, N.Y.
Westinghouse Elec., Sykesville, Md.

D Workman Electronic Prods., Sarasota, Fla.

Cleaners, Ultrasonic—See Volume 1

Clips, Alligator
Elctn. Molding Corp., Woonsocket, R.I.
p. 2-676-679

D ITT Pomona Electronics Div., Pomona, Cal.
p. 2-748,752,776,777

DM Mueller Electric Co., Cleveland, Ohio
p. 2-718,719

D National Tel-Tronics, Meadville, Pa. p. 2-720
M Rowe Industries, Toledo, Ohio p. 2-796,797

D Smith Inc., Herman H., Brooklyn, N.Y.
p. 2-831,832,836,837

D Vaco Products Co., Chicago, Ill. p. 2-1717

D Daburn Electronics & Cable Corp., Bronx, N.Y. *

D GC Electronics, Rockford, Ill. *

Grayhill Inc., LaGrange, Ill. *

D Industrial Devices, Edgewater, N.J. *

Shigoto Inds., Ltd., New York, N.Y. *

D Vector Electronic Co., Sylmar, Cal. *

D AMP Special Industries, Valley Forge, Pa.
Beman Mfg., New Cumberland, Pa.

D Birnbach Co., Freeport, N.Y.

D N T-T/Peerless, Leominster, Mass.

D Philmore Mfg. Co. Inc., Inwood, N.Y.

D Rye Inds., Mamaroneck, N.Y.

DM Saxton Prods., Congers, N.Y.

D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan

D X-Acto, Long Island City, N.Y.
Zierick Mfg. Corp., Mt. Kisco, N.Y.

Clips, Battery

DM Mueller Electric Co., Cleveland, Ohio
p. 2-718,719

M Rowe Industries, Toledo, Ohio p. 2-796,797

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-831

D Waldom Electronics, Chicago, Ill.

p. 2-1070-1074

D GC Electronics, Rockford, Ill. *

DM Keystone Elctns. Corp., New York, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

Braun Co., St. Petersburg, Fla.

D Philmore Mfg. Co. Inc., Inwood, N.Y.
Zierick Mfg. Corp., Mt. Kisco, N.Y.

Clips, Board, Harness

D E-Z-Hook, Arcadia, Cal. p. 2-671

Penduit Corp., Tinley Park, Ill. p. 2-2048-2051

Vector Electronic Co., Sylmar, Cal. p. 2-1060

D Smith Inc., Herman H., Brooklyn, N.Y. *

Beman Mfg., New Cumberland, Pa.

D Eaton Corporation, Cleveland, Ohio

D Electrovert, Mt. Vernon, N.Y.

M MacDonald & Co., Glendale, Calif.

Sjoberg, C. & Son, Cranston, R.I.

D Thomas & Betts Co., Elizabeth, N.J.
Zierick Mfg. Corp., Mt. Kisco, N.Y.

Clips, Breadboard

E-Z-Hook, Arcadia, Cal. p. 2-671

D Vector Electronic Co., Sylmar, Cal.
p. 2-362,1058-1060

Vero Electronics, Hauppauge, N.Y. p. 2-366

D Accessories for Electronics, Bayside, N.Y.
E & L Instruments, Derby, Conn.

Clips, Fahnestock, Spring Wire

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-856

D Waldom Electronics, Chicago, Ill.
p. 2-1070-1074

D GC Electronics, Rockford, Ill. *

Acme Model Engrg. Co., Ridgefield, N.J.

Birnbach Co., Freeport, N.Y.

D Eaton Corporation, Cleveland, Ohio

D Zierick Mfg. Corp., Mt. Kisco, N.Y.

Clips, Logic Test—See Volume 1

Clips, Test

D E-Z-Hook, Arcadia, Cal. p. 2-671

M Elctrn. Molding Corp., Woonsocket, R.I.
p. 2-676-679

D ITT Pomona Electronics Div., Pomona, Cal.
p. 2-757-760,780

DM Mueller Electric Co., Cleveland, Ohio
p. 2-718,719

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-837

D Vector Electronic Co., Sylmar, Cal. p. 2-1060

D Augat Inc., Attleboro, Mass. *

D Daburn Electronics & Cable Corp., Bronx, N.Y. *

General Elec. Co., Schenectady, N.Y. *

D Grayhill Inc., LaGrange, Ill. *

D Industrial Devices, Edgewater, N.J. *

DM Keystone Elctns. Corp., New York, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

Abacus Elctns. Corp., Dobbs Ferry, N.Y.

Aerotronic Assocs., Contoocook, N.H.

M Anchor Specialty Mfg. Inc., Teterboro, N.J.

M Avid Electronics Corp., Baldwin, Pl., N.Y.

Beman Mfg., New Cumberland, Pa.

Birnbach Co., Freeport, N.Y.

D Cambridge Thermionic Corp., Cambridge, Mass.
E & L Instruments, Derby, Conn.

Electro Sci. Inds., Portland, Ore.

Jermyn, San Francisco, Cal.

M Jettron Prods., Hanover, N.J.

D Philmore Mfg. Co. Inc., Inwood, N.Y.
Pylon Co., Attleboro, Mass.

D Rye Inds., Mamaroneck, N.Y.

D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan

D Techni-Tool, Plymouth Meeting, Pa.

D Workman Electronic Prods., Sarasota, Fla.
Zierick Mfg. Corp., Mt. Kisco, N.Y.

Clips, Transistor & Diode—See Retainers, Transistor & Diode

Clips & Caps, Grid & Plate

Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461

D Amphenol Sales Div., Broadview, Ill.
p. 2-460,461

D Millen Mfg. Co. Inc., James, Malden, Mass.
p. 2-1247

National Tel-Tronics, Meadville, Pa. p. 2-720

D GC Electronics, Rockford, Ill. *

D Smith Inc., Herman H., Brooklyn, N.Y. *

Amp Inc., Harrisburg, Pa.

Beman Mfg., New Cumberland, Pa.

D Eaton Corporation, Cleveland, Ohio

D Hobson Bros., Chicago, Ill.

Kentucky Electronics, Owensboro, Ky.

D N T-T/Peerless, Leominster, Mass.

D Zierick Mfg. Corp., Mt. Kisco, N.Y.

Clips & Holders, Fuse-Also See Panels, Fuse

Bussmann Manufacturing, St. Louis, Mo.
p. 1-1960-1965

Connector Corp., Chicago, Ill. p. 2-657,659,660

DM Littelfuse, Des Plaines, Ill. p. 1-2098,2099

D National Tel-Tronics, Meadville, Pa. p. 2-721

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-878

D GC Electronics, Rockford, Ill. *

DM Keystone Elctns. Corp., New York, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

D Accessories for Electronics, Bayside, N.Y.
Acme Model Engrg. Co., Ridgefield, N.J.

DM Amrad Corporation, Paris, Tex.
Anchor Plastics, Long Island City, N.Y.

D Atlee Corp., Woburn, Mass.

Beman Mfg., New Cumberland, Pa.

Birnbach Co., Freeport, N.Y.

Braun Co., St. Petersburg, Fla.

Carbone Lorraine Industries Corp., Boonton, N.J.

Compu-Lite Corp., Irvine, Cal.

Eby Co., Hugh H., Philadelphia, Pa.

Leviton Mfg. Co., Little Neck, N.Y.

D N T-T/Peerless, Leominster, Mass.

Oneida Electronics Mfg., Meadville, Pa.

D Philmore Mfg. Co. Inc., Inwood, N.Y.

Seastrom Mfg. Co. Inc., Glendale, Cal.

D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan

Taylor Industries Inc., Howell, Mich.

D Underwriters Safety, Chicago, Ill.

D Zierick Mfg. Corp., Mt. Kisco, N.Y.

Clocks (All Types)—See Volume 1

Clutches, Friction—See Volume 1

Clutches, Magnetic—See Volume 1

Clutches, Positive—See Volume 1

Coatings, Anti-Static

M Micro-Circuits Co., New Buffalo, Mich.
p. 2-342,343

Regmo Data Corp., Minneapolis, Minn. p. 2-344

Acheson Colloids Co., Port Huron, Mich.

D Cag Labs., Westbury, N.Y.

D Chemtronics, Hauppauge, N.Y.

Chomerics, Woburn, Mass.

Evaporated Coatings, Huntingdon Valley, Pa.

Libbey Owens-Ford Co., Toledo, Ohio

D Merix Chem. Co., Chicago, Ill.

Metavac, Flushing, N.Y.

N L Inds., New York, N.Y.

D Randolph Prods. Co., Carlstadt, N.J.

DM Tech Spray, Amarillo, Tex.

D Technical Wire Products, Cranford, N.J.
Thin Film Services, Gile, Wisc.

Union Carbide, Chemicals & Plastics, New York, N.Y.

D Uniroyal, New York, N.Y.

D Zippertubing Co., Los Angeles, Calif.

Coatings, Conductive, Electric

M Micro-Circuits Co., New Buffalo, Mich.
p. 2-342,343

Regmo Data Corp., Minneapolis, Minn. p. 2-344

M Analog Devices, Norwood, Mass. *

Acheson Colloids Co., Port Huron, Mich.

Allaco Prods Div., Watertown, Mass.

Alpha Metals, Jersey City, N.J.

D Aremcro Prods., Ossining, N.Y.

Bacon Inds., Watertown, Mass.

Chomerics, Woburn, Mass.

Corning Glass Works, Corning, N.Y.

DM Dynaloy, Hanover, N.J.

E.I. DuPont de Nemours & Co., Wilmington, Del.

Electro Mats. Corp. Amer., Mamaroneck, N.Y.

D Electro-Science Labs., Pennsauken, N. J.

Emerson & Cuming, Canton, Mass.

Epoxy Technology, Watertown, Mass.

Evaporated Coatings, Huntingdon Valley, Pa.

Formulated Resins Inc., Greenville, R.I.

M Hardman Inc., Belleville, N.J.

Int'l. Elctrn. Resch., Burbank, Cal.

M Isochem Resins Co., Lincoln, R.I.

D Krylon, Norristown, Pa.

Libbey Owens-Ford Co., Toledo, Ohio

Materials for Elctns., Jamaica, N.Y.

Materials Resch. Corp., Orangeburg, N.Y.

D Merix Chem. Co., Chicago, Ill.

Metavac, Flushing, N.Y.

DM Metex Corp., Edison, N.J.

Murata Mfg. Co. Ltd., Kyoto, Japan

Packaged Resins Div., Watertown, Mass.

Photocircuits Div., Kollmorgen Corp., Glen Cove, N.Y.

Sel-Rex Co. Div. Oxy Metal Industries Corp., Nutley, N.J.

SermeTel Teleflex Inc., Limerick, Pa.

Sunshine Sci. Instrs., Philadelphia, Pa.

DM Tech Spray, Amarillo, Tex.

D Techni-Tool, Plymouth Meeting, Pa.

D Technical Wire Products, Cranford, N.J.

Thin Film Services, Gile, Wisc.

D Thomas & Betts Co., Elizabeth, N.J.

Triac Electronics, New York, N.Y.

Union Carbide Corp., New York, N.Y.

D Uniroyal, New York, N.Y.

Varian Assocs., Palo Alto, Cal.

Coatings,

Electromagnetic-Wave-Absorbing

M Micro-Circuits Co., New Buffalo, Mich.
p. 2-342,343

Humiseal Div., Woodside, N.Y. *

Acheson Colloids Co., Port Huron, Mich.

Dow Chemical Co., Midland, Mich.

Esco Products, Oak Ridge, N.J.

Evaporated Coatings, Huntingdon Valley, Pa.

D Krylon, Norristown, Pa.

Metavac, Flushing, N.Y.

N L Inds., New York, N.Y.

D Optics International, Tenafly, N.J.

Oriel Corp. of America, Stamford, Conn.

Sel-Rex Co. Div. Oxy Metal Industries Corp., Nutley, N.J.

Thin Film Services, Gile, Wisc.

Union Carbide, Chemicals & Plastics, New York, N.Y.

Coatings, Fungicidal

D GC Electronics, Rockford, Ill. *

Humiseal Div., Woodside, N.Y. *

DM Conap, Allegany, N.Y.

D Dolph, John C. Co., Monmouth Junction, N.J.

Dow Chemical Co., Midland, Mich.

Formulated Resins Inc., Greenville, R.I.

Miller-Stephenson Chem. Co., Danbury, Conn.

N L Inds., New York, N.Y.

D Randolph Prods. Co., Carlstadt, N.J.

D Sterling, Sewickley, Pa.

Coatings, Compounds, Lubricants, etc., Heat Conductive

D GC Electronics, Rockford, Ill. p. 2-341

Carborundum Co., Niagara Falls, N.Y. *

Humiseal Div., Woodside, N.Y. *

Acheson Colloids Co., Port Huron, Mich.

Air Prods. & Chems., Allentown, Pa.

D Aremcro Prods., Ossining, N.Y.

Astrodyne, Wilmington, Mass.

D Chemtronics, Hauppauge, N.Y.

Chomerics, Woburn, Mass.

Dolph, John C. Co., Monmouth Junction, N.J.

Dow Corning, Midland, Mich.

D Dynaloy, Hanover, N.J.

E.I. DuPont de Nemours & Co., Wilmington, Del.

Electro Mats. Corp. Amer., Mamaroneck, N.Y.

D Electro-Science Labs., Pennsauken, N. J.

Emerson & Cuming, Canton, Mass.

Epoxy Technology, Watertown, Mass.

Formulated Resins Inc., Greenville, R.I.

D General Elec. Co., Waterford, N.Y.

M Hardman Inc., Belleville, N.J.

Int'l. Elctrn. Resch., Burbank, Cal.

M Isochem Resins Co., Lincoln, R.I.

Jermyn, San Francisco, Cal.

D Krylon, Norristown, Pa.

DM LPS Research Labs, Los Angeles, Cal.

M MacDonald & Co., Glendale, Calif.

D Materials Resch. Corp., Orangeburg, N.Y.
 D Merix Chem. Co., Chicago, Ill.
 National Beryllia Corp., Haskell, N.J.
 Packaged Resins Div., Watertown, Mass.
 Randolph Prods. Co., Carlstadt, N.J.
 SermeTel Teleflex Inc., Limerick, Pa.
 DM Stock Drive Prods., New Hyde Pk., N.Y.
 SWS Silicones, Adrian, Mich.
 DM Tech Spray, Amarillo, Tex.
 D Technical Wire Products, Cranford, N.J.
 Union Carbide, Chemicals & Plastics, New York, N.Y.
 D Uniroyal, New York, N.Y.
 Varian Assocs., Palo Alto, Cal.

Coatings, High-Temperature, Ceramic, Plasma Spray—See Volume 1

Coatings, Insulating

D GC Electronics, Rockford, Ill. p. 2-341
 DM Humiseal Div., Woodside, N.Y. p. 2-338,339,1270,1271
 D Para-Kote, Marshall, Minn. p. 2-1773,1774
 Regmo Data Corp., Minneapolis, Minn. p. 2-344
 SGL Homalite, Wilmington, Del. p. 2-1254
 M Analog Devices, Norwood, Mass. *

Abesto Corp., Bloomfield, N.J.
 Acheson Colloids Co., Port Huron, Mich.
 Allaco Prods Div., Watertown, Mass.
 D Arecco Prods., Ossining, N.Y.
 D Caig Labs., Westbury, N.Y.
 M Chemplast, Wayne, N.J.
 D Chemtronics, Hauppauge, N.Y.
 DM Conap, Allegany, N.Y.
 Coors Porcelain Co., Golden, Colo.
 D Dolph, John C. Co., Monmouth Junction, N.J.
 Dow Chemical Co., Midland, Mich.
 Dow Corning, Midland, Mich.
 E.I. DuPont de Nemours & Co., Wilmington, Del.
 Electro Mats Corp. Amer., Mamaroneck, N.Y.
 D Electro-Science Labs., Pennsauken, N.J.
 Emerson & Cuming, Canton, Mass.
 Epoxy Technology, Watertown, Mass.
 Evaporated Coatings, Huntingdon Valley, Pa.
 Formulated Resins Inc., Greenville, R.I.
 D General Elec. Co., Waterford, N.Y.
 M Hardman Inc., Belleville, N.J.
 Hightemp Resins, Stamford, Conn.
 Int'l. Elctn. Resch., Burbank, Cal.
 M Isochem Resins Co., Lincoln, R.I.
 D Kenco Alloy & Chemical Co., Addison, Ill.
 D London Chemical Co., Bensenville, Ill.
 Mann, Henry Inc., Huntingdon Valley, Pa.
 Materials Resch. Corp., Orangeburg, N.Y.
 Mine Safety Appliances Co., Pittsburgh, Pa.
 Mobay Chem. Corporation, Pittsburgh, Pa.
 Murata Mfg. Co. Ltd., Kyoto, Japan
 National Beryllia Corp., Haskell, N.J.
 M Permaluster, Burbank, Calif.
 D Ram Chems., Gardena, Calif.
 Sel-Rex Co. Div. Oxy Metal Industries Corp., Nutley, N.J.
 SermeTel Teleflex Inc., Limerick, Pa.
 DM Sterling, Sewickley, Pa.
 SWS Silicones, Adrian, Mich.
 DM Tech Spray, Amarillo, Tex.
 Thin Film Services, Gile, Wisc.
 3M Co., St. Paul, Minn.
 Union Carbide, Chemicals & Plastics, New York, N.Y.
 Union Carbide Corp., New York, N.Y.
 D Uniroyal, New York, N.Y.
 Varian Assocs., Palo Alto, Cal.

Coatings, Protective

D GC Electronics, Rockford, Ill. p. 2-341
 Regmo Data Corp., Minneapolis, Minn. p. 2-344
 SGL Homalite, Wilmington, Del. p. 2-1254
 DM Humiseal Div., Woodside, N.Y. *

Millen Mfg. Co. Inc., James, Malden, Mass. *

3M Company, St. Paul, Minn. *

Abesto Corp., Bloomfield, N.J.
 Acheson Colloids Co., Port Huron, Mich.
 D Alpha Metals, Jersey City, N.J.
 American Lava Corp., Chattanooga, Tenn.
 D Caig Labs., Westbury, N.Y.
 Communications Technology Corp., Los Angeles, Cal.
 DM Conap, Allegany, N.Y.
 Conversion Chem. Corp., Rockville, Conn.
 Dolph, John C. Co., Monmouth Junction, N.J.
 Dow Chemical Co., Midland, Mich.
 Dow Corning, Midland, Mich.
 Eastman Chem. Prods., Kingsport, Tenn.
 E.I. DuPont de Nemours & Co., Wilmington, Del.
 D Electro-Science Labs., Pennsauken, N.J.
 Emerson & Cuming, Canton, Mass.
 Fidelity Chem. Prods. Corp., Newark, N.J.
 Formulated Resins Inc., Greenville, R.I.
 M Hardman Inc., Belleville, N.J.

Hughes Aircraft Co., Culver City, Cal.
 Int'l. Elctn. Resch., Burbank, Cal.
 M Isochem Resins Co., Lincoln, R.I.
 D Kenco Alloy & Chemical Co., Addison, Ill.
 D Kylon, Norristown, Pa.
 D London Chemical Co., Bensenville, Ill.
 M LPS Research Labs., Los Angeles, Cal.
 Mann, Henry Inc., Huntingdon Valley, Pa.
 Markal Co., Chicago, Ill.
 D Materials Resch. Corp., Orangeburg, N.Y.
 D Merix Chem. Co., Chicago, Ill.
 Micro Line Div. Bausch & Lomb, Jamestown, N.Y.
 Miller-Stephenson Chem. Co., Danbury, Conn.
 DM Multicore Solders, Westbury, N.Y.
 Murata Mfg. Co. Ltd., Kyoto, Japan
 N L Inds., New York, N.Y.
 D Optics International, Tenafly, N.J.
 Photo Chemical Prods. Cal., Santa Monica, Cal.
 D Ram Chems., Gardena, Calif.
 D Randolph Prods. Co., Carlstadt, N.J.
 M Seal-Peel, Troy, Mich.
 Sel-Rex Co. Div. Oxy Metal Industries Corp., Nutley, N.J.
 SermeTel Teleflex Inc., Limerick, Pa.
 D Solder Removal Co., Covina, Cal.
 D Sterling, Sewickley, Pa.
 SWS Silicones, Adrian, Mich.
 DM Tech Spray, Amarillo, Tex.
 Techni-Tool, Plymouth Meeting, Pa.
 Tempil Div., So. Plainfield, N.J.
 Union Carbide, Chemicals & Plastics, New York, N.Y.
 Union Carbide Corp., New York, N.Y.
 D Uniroyal, New York, N.Y.
 DM Western Coating Co., Royal Oak, Mich.

Code & Tab Markers—See Wire Markers (All Types)

Coded Discs, Optical—See Volume 1

Coders, A-F—See Volume 1

Coders, Beacon—See Volume 1

Coders, Transponder—See Volume 1

Coil Assemblies & Forms-Also See Bobbins

D Bell Industries, Compton, Cal. p. 2-370-379
 Caddell-Burns Mfg. Co., Mineola, N.Y. p. 2-382-385
 CELCO, Mahwah, N.J. p. 1-631
 Coto-Coil Co., Providence, R.I. p. 1-1618-1623
 Dale Elctns., Yankton, S.D. p. 2-1452
 Dia-Netics Inc., Northridge, Cal. p. 2-423
 Douglas Randall Div., Pawcatuck, Conn. p. 2-1734
 Endicott Coil Co., Binghamton, N.Y. p. 2-396
 Harbison Ind'l. Prods., Levittown, Pa. p. 2-397
 ITT Thermotech, Hopkins, Minn. p. 2-1232,1233
 Krystinel Corp., Port Chester, N.Y. p. 2-1234
 Magneto, Holtsville, N.Y. p. 2-1770
 Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1252
 Nano Pulse Industries, Orange, Cal. p. 2-1773,1774
 North Hills Elctns., Glen Cove, N.Y. p. 2-399
 D Vector Electronic Co., Sylmar, Cal. p. 1-103
 M Microtran Co., Valley Stream, N.Y. *

Nytronics Comps. Group Inc., Darlington, S.C. *

Shigoto Inds., Ltd., New York, N.Y. *

Anchor Plastics, Long Island City, N.Y.
 Anro Elex Inds. Ltd., Downsview, Ont. Can.
 A. P. W. Co., Rockaway, N.J.
 Artisan Elctns. Corp., Parsippany, N.J.
 M Atlas Fibre Co., Chicago, Ill.
 Bicon Elctns. Co., Canaan, Conn.
 Caddell Coil Corp., Poultney, Vt.
 Cardinal Control Co., Kensington, Conn.
 Coil Specialty Co., Boalsburg, Pa.
 Cortec, Newport Beach, Cal.
 Cosmo Plastics Co., Cleveland, Ohio
 M D & L Sales Co. Inc., Paterson, N.J.
 D Electronic Coil Corp., Plainville, Conn.
 EWC, Kenilworth, N.J.
 Form-It Products Inc., Chicago, Ill.
 Fuji Electrochemical Co., Tokyo, Japan
 M Gowanda Electronics Corp., Gowanda, N.Y.
 Gries Reproducer Co., New Rochelle, N.Y.
 GTE Sylvania Inc., Danvers, Mass.
 Hamamatsu TV Co., Ltd., Hamamatsu City, Shizuoka Pref., Japan
 M Kates Scientific Instrs., Newton, Mass.
 Magnos, Incorporated, Harvard, Mass.
 D Mark Specialties, Costa Mesa, Cal.
 Montevideo Technology Inc., Edina, Minn.
 Morey Corp., Downers Grove, Ill.

Ogallala Elctns., Ogallala, Neb.
 Permaluster, Burbank, Calif.
 Plessey Ceramic Div., Frenchtown, N.J.
 Precision Paper Tube Co., Wheeling, Ill.
 Pyroferic - N. Y., Bronx, N.Y.
 Resdel Corp., Rio Grande, N.J.
 D Spec Plastics Inc., No. Hollywood, Cal.
 DM Stevens Prods., E. Orange, N.J.
 M Syscon Int'l. So. Bend, Ind.
 Telectro Sys. Corp., Corona, N.Y.
 Templine, Gardena, Cal.
 DM United Prods. Co., New Hyde Pk., N.Y.
 U.S. Elctns., Long Branch, N.J.
 D Workman Electronic Prods., Sarasota, Fla.

Coil Standards—See Volume 1

Coil-Winding Equipment—See Volume 1

Coils, A-F

M Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-381
 D Dale Electronics Inc., Columbus, Neb. p. 2-1452
 Dale Elctns., Yankton, S.D. p. 2-1452
 Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388
 M Hisonic, Olathe, Kan. p. 2-1755
 Magneto, Holtsville, N.Y. p. 2-1770
 DM Microtran Co., Valley Stream, N.Y. p. 2-1757-1762
 Neshaminy Transformer, Furlong, Pa. p. 2-1775,1776
 North Hills Elctns., Glen Cove, N.Y. p. 2-399
 NWL Transformers, Trenton, N.J. p. 2-1772
 Solid State Electronics Corp., Sepulveda, Cal. p. 1-126
 DM Torotol Inc., Grandview, Mo. p. 2-430-439
 Triad-Utrad, Huntington, Ind. p. 2-1822-1829
 Vari-L Co., Denver, Colo. p. 2-442,443
 Bel Fuse, Jersey City, N.J. *

Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *

Chesterfield Prods. Inc., Saddle Brook, N.J. *

Computer Comps., Jamaica, N.Y. *

Data Delay Devices, Clifton, N.J. *

MESC Elctns. Corp., Palisades Pk., N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Nytronics Comps. Group Inc., Darlington, S.C. *

Pico Elctns. Inc., Mount Vernon, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

M Torwico Elctns., Lakewood, N.J. *

American Magnetics Corp., Cartersville, Ill.
 M American Trans-Coil Corp., Richmond Hill, N.Y.
 Anro Elex Inds. Ltd., Downsview, Ont. Can.
 Automatic Coil, New Hyde Pk., N.Y.
 Bicon Elctns. Co., Canaan, Conn.
 Coil-Craft Inc., Bronxville, N.Y.
 Coil Specialty Co., Boalsburg, Pa.
 D Components Specialties, Hempstead, N.Y.
 De Coursey Engrg. Lab., Culver City, Cal.
 M Dietz Design, Belton, Mo.
 Electro-Pacific, Goleta, Calif.
 Electrocom Inds., S. Bend, Ind.
 M Electronic Transformer Corp., Paterson, N.J.
 EWC, Kenilworth, N.J.
 General Instr. Corp., Automatic Mfg. Div., Chicopee, Mass.
 M JB Elctn, Transformers, Chicago, Ill.
 Morey Corp., Downers Grove, Ill.
 Phoenix Transformer Co., Phoenix, Ariz.
 Pulse Engrg., San Diego, Cal.
 QTron Corp., Santa Ana, Cal.
 D Stancor/Essex International, Chicago, Ill.
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
 TDK Elctns. Corp., Long Island City, N.Y.
 Tranex Inc., Mountain View, Cal.
 TRW/UTC Transformers, New York, N.Y.
 DM United Prods. Co., New Hyde Pk., N.Y.
 U.S. Elctns., Long Branch, N.J.

Coils, Antenna (Including Loading Type)
 Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388
 M Rowe Industries, Toledo, Ohio p. 2-796,797
 Vari-L Co., Denver, Colo. p. 2-442,443
 Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *

Computer Comps., Jamaica, N.Y. *

M American Trans-Coil Corp., Richmond Hill, N.Y.
 Anro Elex Inds. Ltd., Downsview, Ont. Can.
 Automatic Coil, New Hyde Pk., N.Y.
 D Barker & Williamson, Bristol, Pa.
 M Caddell Coil Corp., Poultney, Vt.
 Coil Specialty Co., Boalsburg, Pa.
 DM Hy-Gain Electronics Corp., Lincoln, Neb.
 D K-W Engineering Works, Menomonee Falls, Wisc.

D Lattin Radio Labs., Owensboro, Ky.
 D Morey Corp., Downers Grove, Ill.
 M Piconics Inc., Tyngsboro, Mass.
 M Polyphase Instr. Co., Bridgeport, Pa.
 DM United Prods. Co., New Hyde Pk., N.Y.
 U.S. Elctns., Long Branch, N.J.
 D Workman Electronic Prods., Sarasota, Fla.

Coils, Broadcast

D Bell Industries, Compton, Cal. p. 2-370-379
 Caddel-Burns Mfg. Co., Mineola, N. Y.
 p. 2-382-385
 Dale Elctns., Yankton, S.D. p. 2-1452
 Bulova Watch Co., Freq Controls Div.,
 Woodside, N.Y. *

M American Trans-Coil Corp., Richmond Hill, N.Y.
 Anro Elex Inds. Ltd., Downsview, Ont, Can.
 A. P. W. Co., Rockaway, N. J.
 Automatic Coil, New Hyde Pk., N.Y.
 M Caddell Coil Corp., Poultney, Vt.
 Coil-Craft Inc., Bronxville, N.Y.
 Coil Specialty Co., Boalsburg, Pa.
 D Components Specialties, Hempstead, N.Y.
 General Instr. Corp., Automatic Mfg. Div., Chicopee,
 Mass
 J.D.N. Electronics Inc., Gillette, N.J.
 Morey Corp., Downers Grove, Ill.
 M Piconics Inc., Tyngsboro, Mass.
 DM United Prods. Co., New Hyde Pk., N.Y.

Coils, Chip

Airco Elctns., Bradford, Pa.
 p. 2-368,369,1408,1409
 DM Delevan Div., Coil Prods., E. Aurora, N.Y.
 p. 2-388
 Bulova Watch Co., Freq Controls Div.,
 Woodside, N.Y. *

Nytronics Comps. Group Inc., Darlington, S.C. *

Anro Elex Inds. Ltd., Downsview, Ont, Can.
 Coilcraft, Cary, Ill.
 Fuji Electrochemical Co., Tokyo, Japan
 Morey Corp., Downers Grove, Ill.
 M Thincor, Hatboro, Pa.

Coils, Degaussing

Bulova Watch Co., Freq Controls Div.,
 Woodside, N.Y. *

D GC Electronics, Rockford, Ill. *

D Microtran Co., Valley Stream, N.Y. *

Annis R B Co., Indianapolis, Ind.
 Anro Elex Inds. Ltd., Downsview, Ont, Can.
 Coil Specialty Co., Boalsburg, Pa.
 M Electronic Transformer Corp., Paterson, N.J.
 Elma Engineering, Palo Alto, Cal.
 LDJ Electronics, Troy, Mich.
 Mag-Con, New Brighton, Minn.
 Morey Corp., Downers Grove, Ill.
 D Stancor/Essex International, Chicago, Ill.
 DM Thordarson Meissner, Mt. Carmel, Ill.

Coils, Field

Bulova Watch Co., Freq Controls Div.,
 Woodside, N.Y. *

D Waldom Electronics, Chicago, Ill. *

Advanced Kinetics, Costa Mesa, Calif.
 Anro Elex Inds. Ltd., Downsview, Ont, Can.
 A. P. W. Co., Rockaway, N. J.
 D Electronic Coil Corp., Plainville, Conn.
 M Electronic Transformer Corp., Paterson, N.J.
 LDJ Electronics, Troy, Mich.
 Morey Corp., Downers Grove, Ill.
 Ogallala Elctns., Ogallala, Neb.
 U.S. Elctns., Long Branch, N.J.
 Walker Scientific, Worcester, Mass.

Coils, Focusing

CELCO, Mahwah, N.J. p. 1-631
 Syntronic Instruments Inc., Addison, Ill.
 p. 2-427

D Amperex Electronic Corp., Slattersville, R.I. *

Bulova Watch Co., Freq Controls Div.,
 Woodside, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

D Altec Div., Anaheim, Calif.
 Anro Elex Inds. Ltd., Downsview, Ont, Can.
 M Electronic Transformer Corp., Paterson, N.J.
 Elma Engineering, Palo Alto, Cal.
 Litton Inds., San Carlos, Calif.
 Morey Corp., Downers Grove, Ill.
 Ogallala Elctns., Ogallala, Neb.
 DM Thordarson Meissner, Mt. Carmel, Ill.
 Varian Assoc., Palo Alto, Cal.
 Varian Electron Tube & Device Grp., San Carlos, Cal.
 Varian Palo Alto Microwave Tube Div., Palo Alto, Cal.
 Walker Scientific, Worcester, Mass.
 D Workman Electronic Prods., Sarasota, Fla.

Coils, Foil-Wound

Magnetico, Holtsville, N.Y. p. 2-1770
 Bulova Watch Co., Freq Controls Div.,
 Woodside, N.Y. *

Electrocube Inc., San Gabriel, Cal. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

M Torwico Elctns., Lakewood, N.J. *

D Waldom Electronics, Chicago, Ill. *

D Altec Div., Anaheim, Calif.
 American Magnetics Corp., Cartersville, Ill.
 Anro Elex Inds. Ltd., Downsview, Ont, Can.
 Electro-Pacific, Goleta, Calif.
 Elma Engineering, Palo Alto, Cal.
 EWC, Kenilworth, N.J.
 Morey Corp., Downers Grove, Ill.
 Ogallala Elctns., Ogallala, Neb.
 M Osborne Transformer Corp., Detroit, Mich.
 Permaluster, Burbank, Calif.
 D Stancor/Essex International, Chicago, Ill.
 Tranex Inc., Mountain View, Cal.
 Walker Scientific, Worcester, Mass.

Coils, High-Q, Low-Frequency

Aladdin Elctns., Nashville, Tenn.
 p. 2-1729,1730

D Bell Industries, Compton, Cal. p. 2-370-379
 M Bourns Pacific Magnetic Corp., Romoland, Cal.
 p. 2-381
 Caddel-Burns Mfg. Co., Mineola, N. Y.
 p. 2-382-385

MCELCO, Mahwah, N.J. p. 1-631
 D Dale Electronics Inc., Columbus, Neb.
 p. 2-1452

Dale Elctns., Yankton, S.D. p. 2-1452
 Del Electronics Corp., Mt. Vernon, N.Y.
 p. 1-1175

Delevan Div., Coil Prods., E. Aurora, N.Y.
 p. 2-388

El-Rad Mfg. Co., Chicago, Ill. p. 2-1773,1774
 M Freed Transformer Co., Brooklyn, N.Y.
 p. 1-716,717; p. 2-1738-1747

M Hisonic, Olathe, Kan. p. 2-1755
 Magnetico, Holtsville, N.Y. p. 2-1770
 DM Microtran Co., Valley Stream, N.Y. p. 2-1761
 Neshaminy Transformer, Furlong, Pa.
 p. 2-1775,1776

North Hills Elctns., Glen Cove, N.Y. p. 2-399
 NWL Transformers, Trenton, N.J. p. 2-1772
 Solid State Electronics Corp., Sepulveda, Cal.
 p. 1-126

DM Torotol Inc., Grandview, Mo. p. 2-430-439
 D Triad-Utrad, Huntington, Ind. p. 2-1822-1829
 Vari-L Co., Denver, Colo. p. 2-442,443

Allen Avionics, Mineola, N.Y. *

Biometrics Instrument Corp., Garland, Tex. *

Bulova Watch Co., Freq Controls Div.,
 Woodside, N.Y. *

Chesterfield Prods. Inc., Saddle Brook, N.J. *

Data Delay Devices, Clifton, N.J. *

MESC Elctns. Corp., Palisades Pk., N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Millen Mfg. Co. Inc., James, Malden, Mass. *

D Nytronics Comps. Group Inc., Darlington, S.C. *

Pico Elctns. Inc., Mount Vernon, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

M Torwico Elctns., Lakewood, N.J. *

D Waldom Electronics, Chicago, Ill. *

D Altec Div., Anaheim, Calif.
 American Magnetics Corp., Cartersville, Ill.
 M American Trans-Coil Corp., Richmond Hill, N.Y.
 Anro Elex Inds. Ltd., Downsview, Ont, Can.
 Automatic Coil, New Hyde Pk., N.Y.
 Bicorn Elctns. Co., Canaan, Conn.
 M Caddell Coil Corp., Poultney, Vt.
 D Cambridge Thermionic Corp., Cambridge, Mass.
 Coil-Craft Inc., Bronxville, N.Y.
 Coilcraft, Cary, Ill.
 Coil Specialty Co., Boalsburg, Pa.
 Cramer Coil, Grafton, Wisc.
 M Dietz Design, Belton, Mo.
 D Dormeyer Industries, Chicago, Ill.
 Electro-Pacific, Goleta, Calif.
 Electrocom Inds., S. Bend, Ind.
 M Electronic Transformer Corp., Paterson, N.J.
 Elma Engineering, Palo Alto, Cal.
 EWC, Kenilworth, N.J.
 Ferrodyne Corp., Venice, Calif.
 General Instr. Corp., Automatic Mfg. Div., Chicopee,
 Mass
 M Genisco Tech. Corp., Compton, Cal.
 Icore Int'l., Sunnyvale, Cal.
 J.D.N. Electronics Inc., Gillette, N.J.
 M Lenox-Fugle Elctns., S. Plainfield, N.J.
 Morey Corp., Downers Grove, Ill.
 Phoenix Transformer Co., Phoenix, Ariz.
 M San Fernando Elec. Mfg., San Fernando, Cal.
 M Syscon Int'l., So. Bend, Ind.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101,
 Japan
 TDK Elctns. Corp., Long Island City, N.Y.
 Torelco Inc., Irvington, N.J.
 Tranex Inc., Mountain View, Cal.
 D TRW/UTC Transformers, New York, N.Y.
 U.S. Elctns., Long Branch, N.J.

Coils, Hybrid & Repeater

Aladdin Elctns., Nashville, Tenn.
 p. 2-1729,1730

Caddel-Burns Mfg. Co., Mineola, N. Y.
 p. 2-382-385

Delevan Div., Coil Prods., E. Aurora, N.Y.
 p. 2-388

Magnetico, Holtsville, N.Y. p. 2-1770
 DM Microtran Co., Valley Stream, N.Y. p. 2-1763
 Bulova Watch Co., Freq Controls Div.,
 Woodside, N.Y. *

Chesterfield Prods. Inc., Saddle Brook, N.J. *

Computer Comps., Jamaica, N.Y. *

D Altec Div., Anaheim, Calif.
 American Magnetics Corp., Cartersville, Ill.
 M American Trans-Coil Corp., Richmond Hill, N.Y.
 Anro Elex Inds. Ltd., Downsview, Ont, Can.
 Cardinal Control Co., Kensington, Conn.
 Coil-Craft Inc., Bronxville, N.Y.
 M Dietz Design, Belton, Mo.
 M Electronic Transformer Corp., Paterson, N.J.
 EWC, Kenilworth, N.J.
 D ITI Electronics, Clifton, N.J.
 Morey Corp., Downers Grove, Ill.
 Phoenix Transformer Co., Phoenix, Ariz.
 D TRW/UTC Transformers, New York, N.Y.
 DM United Prods. Co., New Hyde Pk., N.Y.
 U.S. Elctns., Long Branch, N.J.

Coils, I-F

M Aladdin Elctns., Nashville, Tenn.
 p. 2-1729,1730

D Bell Industries, Compton, Cal. p. 2-370-379
 Caddel-Burns Mfg. Co., Mineola, N. Y.
 p. 2-382-385

D Dale Electronics Inc., Columbus, Neb.
 p. 2-1452

D Dale Elctns., Yankton, S.D. p. 2-1452
 El-Rad Mfg. Co., Chicago, Ill. p. 2-1773,1774

M Hisonic, Olathe, Kan. p. 2-1755
 Vari-L Co., Denver, Colo. p. 2-442,443
 Bel Fuse, Jersey City, N.J. *

Bulova Watch Co., Freq Controls Div.,
 Woodside, N.Y. *

Computer Comps., Jamaica, N.Y. *

D Microtran Co., Valley Stream, N.Y. *

Millen Mfg. Co. Inc., James, Malden, Mass. *

Nytronics Comps. Group Inc., Darlington, S.C. *

Shigoto Inds., Ltd., New York, N.Y. *

M Torotol Inc., Grandview, Mo. *

M Torwico Elctns., Lakewood, N.J. *

M American Trans-Coil Corp., Richmond Hill, N.Y.
 Anro Elex Inds. Ltd., Downsview, Ont, Can.
 Automatic Coil, New Hyde Pk., N.Y.
 Bicorn Elctns. Co., Canaan, Conn.
 M Caddell Coil Corp., Poultney, Vt.
 D Cambridge Thermionic Corp., Cambridge, Mass.
 Coil-Craft Inc., Bronxville, N.Y.
 Coilcraft, Cary, Ill.
 Coil Specialty Co., Boalsburg, Pa.
 D Components Specialties, Hempstead, N.Y.
 M Dietz Design, Belton, Mo.
 EWC, Kenilworth, N.J.
 General Instr. Corp., Automatic Mfg. Div., Chicopee,
 Mass
 Hytronics Corp., Pinellas Park, Fla.
 J.D.N. Electronics Inc., Gillette, N.J.
 Morey Corp., Downers Grove, Ill.
 M Piconics Inc., Tyngsboro, Mass.
 QTron Corp., Santa Ana, Cal.
 DM San Fernando Elec. Mfg., San Fernando, Cal.
 M Syscon Int'l., So. Bend, Ind.
 TDK Elctns. Corp., Long Island City, N.Y.
 DM Thordarson Meissner, Mt. Carmel, Ill.
 DM United Prods. Co., New Hyde Pk., N.Y.
 U.S. Elctns., Long Branch, N.J.
 D Workman Electronic Prods., Sarasota, Fla.

Coils, Metallized Glass

Bulova Watch Co., Freq Controls Div.,
 Woodside, N.Y. *

M American Trans-Coil Corp., Richmond Hill, N.Y.
 Anro Elex Inds. Ltd., Downsview, Ont, Can.
 GTE Sylvania Inc., Danvers, Mass.
 DM JFD Electronics Components Corp., Bklyn., N.Y.
 Morey Corp., Downers Grove, Ill.
 DM United Prods. Co., New Hyde Pk., N.Y.

Coils, Molded

Airco Elctns., Bradford, Pa. p. 2-368,369,1408,1409
DM Airco Elctns., Nogales, Ariz. p. 2-368,369,1408,1409
M Aladdin Elctns., Nashville, Tenn. p. 2-1729,1730
DM Bell Industries, Compton, Cal. p. 2-370-379
CELCO, Mahwah, N.J. p. 1-631
D Dale Elctns., Yankton, S.D. p. 2-1452
DM Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388
 Douglas Randall Div., Pawcatuck, Conn. p. 2-1734
 Endicott Coil Co., Binghamton, N.Y. p. 2-396
M Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747
M Hisonic, Olathe, Kan. p. 2-1755
 Magneto, Holtsville, N.Y. p. 2-1770
 Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1252
M Rowe Industries, Toledo, Ohio p. 2-796,797
DM Torotal Inc., Grandview, Mo. p. 2-431-439
 Biometrics Instrument Corp., Garland, Tex. *
 Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *
 Coto-Coil Co., Providence, R.I. *
D Elctn. Molding Corp., Woonsocket, R.I. *
MESC Elctns. Corp., Palisades Pk., N.J. *
M Kappa Networks, Carteret, N.J. *
 K.G.S. Elctns., Pasadena, Cal. *
D Nytronics Comps. Group Inc., Darlington, S.C. *
M American Trans-Coil Corp., Richmond Hill, N.Y. p. 2-1729,1730
 Anro Elex Inds. Ltd., Downsview, Ont, Can. p. 2-370-379
 Coilcraft, Cary, Ill. p. 2-382-385
M Component Specialties, Temple City, Cal. p. 2-1452
 Cosmo Plastics Co., Cleveland, Ohio p. 2-1452
D Dormeyer Industries, Chicago, Ill. p. 2-1452
 Electro-Pacific, Goleta, Calif. p. 2-1452
 EWC, Kenilworth, N.J. p. 2-1452
 Filtron Company, Westbury, N.Y. p. 2-1452
M Genisco Tech. Corp., Compton, Cal. p. 2-1452
M Gowanda Electronics Corp., Gowanda, N.Y. p. 2-1452
M JB Elctn., Transformers, Chicago, Ill. p. 2-1452
M Kates Scientific Instrs., Newton, Mass. p. 2-1452
 Montevideo Technology Inc., Edina, Minn. p. 2-1452
 Morey Corp., Downers Grove, Ill. p. 2-1452
 Pulse Engrg., San Diego, Cal. p. 2-1452
M Schott Corp., Minneapolis, Minn. p. 2-1452
 Singer Co., Schiller Park, Ill. p. 2-1452
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan p. 2-1452
 TDK Elctns. Corp., Long Island City, N.Y. p. 2-1452
 Torelco Inc., Irvington, N.J. p. 2-1452
D United Mineral & Chem. Corp., New York, N.Y. p. 2-1452
DM United Prods. Co., New Hyde Pk., N.Y. p. 2-1452
 U.S. Elctns., Long Branch, N.J. p. 2-1452

Coils, Oscillator

D Bell Industries, Compton, Cal. p. 2-370-379
 Caddel-Burns Mfg. Co., Mineola, N.Y. p. 2-382-385
M Hisonic, Olathe, Kan. p. 2-1755
 Magneto, Holtsville, N.Y. p. 2-1770
 North Hills Elctns., Glen Cove, N.Y. p. 2-399
 Solid State Electronics Corp., Sepulveda, Cal. p. 1-126
DM Torotal Inc., Grandview, Mo. p. 2-430-439
 Vari-L Co., Denver, Colo. p. 2-442,443
 American Time Products, Bulova Watch, Woodside, N.Y. *
 Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *
M American Trans-Coil Corp., Richmond Hill, N.Y. p. 2-1729,1730
 Anro Elex Inds. Ltd., Downsview, Ont, Can. p. 2-370-379
 Arenberg Ultrasonic Lab Inc., Jamaica Plain, Mass. p. 2-442,443
 Coil-Craft Inc., Bronxville, N.Y. p. 2-442,443
 Coil Specialty Co., Boalsburg, Pa. p. 2-442,443
 EWC, Kenilworth, N.J. p. 2-442,443
 J.D.N. Electronics Inc., Gillette, N.J. p. 2-442,443
 Morey Corp., Downers Grove, Ill. p. 2-442,443
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan p. 2-442,443
D Workman Electronic Prods., Sarasota, Fla. p. 2-442,443

Coils, Relay

D Bell Industries, Compton, Cal. p. 2-370-379
 Coto-Coil Co., Providence, R.I. p. 1-1618-1623
D Dale Electronics Inc., Columbus, Neb. p. 2-1452
 Dale Elctns., Yankton, S.D. p. 2-1452
 Dia-Netics Inc., Northridge, Cal. p. 2-422
 Douglas Randall Div., Pawcatuck, Conn. p. 2-1734
 El-Rad Mfg. Co., Chicago, Ill. p. 2-1773,1774
 Endicott Coil Co., Binghamton, N.Y. p. 2-396

Kilovac Corp., Santa Barbara, Cal. p. 1-1747
 Liberty Controls, Shorewood, Ill. p. 1-1762
 Solid State Electronics Corp., Sepulveda, Cal. p. 1-126
Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *
Computer Comps., Jamaica, N.Y. *
D GC Electronics, Rockford, Ill. *
 Kappa Networks, Carteret, N.J. *
 Regdon Corp., Brookfield, Ill. *
 Shigoto Inds., Ltd., New York, N.Y. *
 American Magnetics Corp., Cartersville, Ill. *
M American Trans-Coil Corp., Richmond Hill, N.Y. p. 2-1729,1730
 Anro Elex Inds. Ltd., Downsview, Ont, Can. p. 2-370-379
 A. P. W. Co., Rockaway, N.J. p. 2-370-379
 Artisan Elctns. Corp., Parsippany, N.J. p. 2-370-379
 Cardinal Control Co., Kensington, Conn. p. 2-370-379
 Coil Specialty Co., Boalsburg, Pa. p. 2-370-379
 Component Specialties, Temple City, Cal. p. 2-370-379
 Custom Coil & Transformer Co., Zanesville, Ohio p. 2-370-379
D Dormeyer Industries, Chicago, Ill. p. 2-370-379
D Electronic Coil Corp., Plainville, Conn. p. 2-370-379
M Genisco Tech. Corp., Compton, Cal. p. 2-370-379
 Guardian California, Torrance, Cal. p. 2-370-379
 JDN Electronics, Gillette, N.J. p. 2-370-379
 Morey Corp., Downers Grove, Ill. p. 2-370-379
 QTron Corp., Santa Ana, Cal. p. 2-370-379
 Relay Service Co., Chicago, Ill. p. 2-370-379
M San Fernando Elec. Mfg., San Fernando, Cal. p. 2-370-379
 Struthers-Dunn, Pitman, N.J. p. 2-370-379
DM United Prods. Co., New Hyde Pk., N.Y. p. 2-370-379
 U.S. Elctns., Long Branch, N.J. p. 2-370-379

Coils, R-F

Airco Elctns., Bradford, Pa. p. 2-368,369,1408,1409
DM Airco Elctns., Nogales, Ariz. p. 2-368,369,1408,1409
M Aladdin Elctns., Nashville, Tenn. p. 2-1729,1730
D Bell Industries, Compton, Cal. p. 2-370-379
 Caddel-Burns Mfg. Co., Mineola, N.Y. p. 2-382-385
D Dale Electronics Inc., Columbus, Neb. p. 2-1452
 Dale Elctns., Yankton, S.D. p. 2-1452
DM Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388
 El-Rad Mfg. Co., Chicago, Ill. p. 2-1773,1774
M Hisonic, Olathe, Kan. p. 2-1755
 Magneto, Holtsville, N.Y. p. 2-1770
 Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1252
 North Hills Elctns., Glen Cove, N.Y. p. 2-399
D Nytronics Comps. Group Inc., Darlington, S.C. p. 2-400-421
MRF Interonics, Bay Shore, N.Y. p. 1-572,573
DM Torotal Inc., Grandview, Mo. p. 2-430,431
 Vari-L Co., Denver, Colo. p. 2-442,443
 Bel Fuse, Jersey City, N.J. *
 Biometrics Instrument Corp., Garland, Tex. *
 Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *
 Computer Comps., Jamaica, N.Y. *
 Data Delay Devices, Clifton, N.J. *
D GC Electronics, Rockford, Ill. *
 Kappa Networks, Carteret, N.J. *
D McGraw-Edison Co., Manchester, N.H. *
 Shigoto Inds., Ltd., New York, N.Y. *
M American Trans-Coil Corp., Richmond Hill, N.Y. p. 2-1729,1730
 Anro Elex Inds. Ltd., Downsview, Ont, Can. p. 2-370-379
 Automatic Coil, New Hyde Pk., N.Y. p. 2-370-379
D Barker & Williamson, Bristol, Pa. p. 2-370-379
 Bicon Elctns. Co., Canaan, Conn. p. 2-370-379
D Cambridge Thermionic Corp., Cambridge, Mass. p. 2-370-379
 Coil-Craft Inc., Bronxville, N.Y. p. 2-370-379
 Coilcraft, Cary, Ill. p. 2-382-385
 Coil Specialty Co., Boalsburg, Pa. p. 2-370-379
 Collins Radio, Dallas, Tex. p. 2-370-379
 Cramer Coil, Grafton, Wisc. p. 2-370-379
M Dietz Design, Belton, Mo. p. 2-370-379
 Elma Engineering, Palo Alto, Cal. p. 2-370-379
 EWC, Kenilworth, N.J. p. 2-370-379
 General Instr. Corp., Automatic Mfg. Div., Chicopee, Mass. p. 2-370-379
 Genisco Technology Corp., Compton, Cal. p. 2-370-379
M Genisco Tech. Corp., Compton, Cal. p. 2-370-379
M Gowanda Electronics Corp., Gowanda, N.Y. p. 2-370-379
D Helix Spring Corp., Long Island City, N.Y. p. 2-370-379
 Hughes Aircraft Co., Culver City, Cal. p. 2-370-379
 Hytronics Corp., Pinellas Park, Fla. p. 2-370-379
 JDN Electronics, Gillette, N.J. p. 2-370-379
M J.D.N. Electronics Inc., Gillette, N.J. p. 2-370-379
M Lenox-Fugle Elctns., S. Plainfield, N.J. p. 2-370-379
 Morey Corp., Downers Grove, Ill. p. 2-370-379
D Norelcom Electronics, Farmingdale, N.Y. p. 2-370-379
M Piconics Inc., Tyngsboro, Mass. p. 2-370-379

QTron Corp., Santa Ana, Cal. p. 2-370-379
 Rutherford Research Prods. Co., Rutherford, N.J. p. 2-370-379
DM San Fernando Elec. Mfg., San Fernando, Cal. p. 2-370-379
 Stanford Applied Engineering, Santa Clara, Cal. p. 2-370-379
 Superex Electronics Corp., Yonkers, N.Y. p. 2-370-379
M Syscon Int'l., So. Bend, Ind. p. 2-370-379
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan p. 2-370-379
 TDK Elctns. Corp., Long Island City, N.Y. p. 2-370-379
DM United Prods. Co., New Hyde Pk., N.Y. p. 2-370-379
 U.S. Elctns., Long Branch, N.J. p. 2-370-379
D Workman Electronic Prods., Sarasota, Fla. p. 2-370-379

Coils, Saturable Reactor

Abacus Controls Inc., Somerville, N.J. p. 2-1731
Aladdin Elctns., Nashville, Tenn. p. 2-1729,1730
M Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-381
Caddel-Burns Mfg. Co., Mineola, N.Y. p. 2-382-385
Dale Elctns., Yankton, S.D. p. 2-1452
M Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747
M Hisonic, Olathe, Kan. p. 2-1755
M Industrial Control Co., Farmingdale, N.Y. p. 1-1916,1917
 Neshaminy Transformer, Furlong, Pa. p. 2-1775,1776
NWL Transformers, Trenton, N.J. p. 2-1772
 Vari-L Co., Denver, Colo. p. 2-442,443
 Biometrics Instrument Corp., Garland, Tex. *
 Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *
M Del Electronics Corp., Mt. Vernon, N.Y. *
 Electrocube Inc., San Gabriel, Cal. *
 General Magnetics, Bloomfield, N.J. *
 K.G.S. Elctns., Pasadena, Cal. *
DM Microtran Co., Valley Stream, N.Y. *
D Nytronics Comps. Group Inc., Darlington, S.C. *
M Sterling Transformer Corp., Brooklyn, N.Y. *
M Torotal Inc., Grandview, Mo. *
M Torvicco Elctns., Lakewood, N.J. *
D Altex Div., Anaheim, Calif. p. 2-1729,1730
 American Magnetics Corp., Cartersville, Ill. p. 2-1729,1730
M American Trans-Coil Corp., Richmond Hill, N.Y. p. 2-1729,1730
 Anro Elex Inds. Ltd., Downsview, Ont, Can. p. 2-370-379
 Bicon Elctns. Co., Canaan, Conn. p. 2-370-379
 Coilcraft, Cary, Ill. p. 2-382-385
 Cross Electronics Inc., Warrendale, Pa. p. 2-382-385
M Dietz Design, Belton, Mo. p. 2-370-379
 Electro-Pacific, Goleta, Calif. p. 2-370-379
 Electrocom Inds., S. Bend, Ind. p. 2-370-379
M Electronic Transformer Corp., Paterson, N.J. p. 2-370-379
 Elma Engineering, Palo Alto, Cal. p. 2-370-379
 EWC, Kenilworth, N.J. p. 2-370-379
 Ferrodyn Corp., Venice, Calif. p. 2-370-379
 Genisco Technology Corp., Compton, Cal. p. 2-370-379
 Mag-Con, New Brighton, Minn. p. 2-370-379
 Morey Corp., Downers Grove, Ill. p. 2-370-379
M Osborne Transformer Corp., Detroit, Mich. p. 2-370-379
 Phoenix Transformer Co., Phoenix, Ariz. p. 2-370-379
M Polyphase Instr. Co., Bridgeport, Pa. p. 2-370-379
 Rtron Corp., Skokie, Ill. p. 2-370-379
D Stancor/Essex International, Chicago, Ill. p. 2-370-379
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan p. 2-370-379
 Tohoku Metal Inds., Ltd., Tokyo, Japan p. 2-370-379
 Torelco Inc., Irvington, N.J. p. 2-370-379
D TRW/UTC Transformers, New York, N.Y. p. 2-370-379
DM United Prods. Co., New Hyde Pk., N.Y. p. 2-370-379

Coils, Shielded

Airco Elctns., Bradford, Pa. p. 2-368,369,1408,1409
DM Airco Elctns., Nogales, Ariz. p. 2-368,369,1408,1409
DM Bell Industries, Compton, Cal. p. 2-370-379
 Caddel-Burns Mfg. Co., Mineola, N.Y. p. 2-382-385
CELCO, Mahwah, N.J. p. 1-631
D Dale Elctns., Yankton, S.D. p. 2-1452
DM Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388
M Hisonic, Olathe, Kan. p. 2-1755
 Magneto, Holtsville, N.Y. p. 2-1770
 North Hills Elctns., Glen Cove, N.Y. p. 2-399
NWL Transformers, Trenton, N.J. p. 2-1772
 Nytronics Comps. Group Inc., Darlington, S.C. p. 2-400-421
DM Torotal Inc., Grandview, Mo. p. 2-430,432-439
 American Time Products, Bulova Watch, Woodside, N.Y. *
 Biometrics Instrument Corp., Garland, Tex. *
 Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *

Computer Comps., Jamaica, N.Y. *

Data Delay Devices, Clifton, N.J. *

Kappa Networks, Carteret, N.J. *

Millen Mfg. Co. Inc., James, Malden, Mass. *

M Torwico Elctns., Lakewood, N.J. *

M American Trans-Coil Corp., Richmond Hill, N.Y.

Anro Elex Inds. Ltd., Downsview, Ont, Can.

Automatic Coil, New Hyde Pk., N.Y.

Coil-Craft Inc., Bronxville, N.Y.

Coil Specialty Co., Boalsburg, Pa.

M Dietz Design, Belton, Mo.

M Electronic Transformer Corp., Paterson, N.J.

Elma Engineering, Palo Alto, Cal.

EWG, Kenilworth, N.J.

Filtron Company, Westbury, N.Y.

Gowanda Electronics Corp., Gowanda, N.Y.

M JB Elctn, Transformers, Chicago, Ill

M J.D.N. Electronics Inc., Gillette, N.J.

M Lenox-Fugle Elctns., S. Plainfield, N.J.

Montevideo Technology Inc., Edina, Minn.

Morey Corp., Downers Grove, Ill.

M Piconics Inc., Tyngsboro, Mass.

QTron Corp., Santa Ana, Cal.

M Syscon Int'l., So. Bend, Ind.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

DM United Prods. Co., New Hyde Pk., N.Y.

Coils, Solenoid

DM Aircor Elctns., Nogales, Ariz.

p. 2-368,369,1408,1409

D Bell Industries, Compton, Cal. p. 2-370-379

D Dale Electronics Inc., Columbus, Neb.

p. 2-1452

Dale Elctns., Yankton, S.D. p. 2-1452

Delevan Div., Coil Prods., E. Aurora, N.Y.

p. 2-388

Dia-Netics Inc., Northridge, Cal. p. 2-422

Douglas Randall Div., Pawcatuck, Conn.

p. 2-1734

Endicott Coil Co., Binghamton, N.Y. p. 2-396

Liberty Controls, Shorewood, Ill.

p. 1-1760,1761

Magnetico, Holtsville, N.Y. p. 2-1770

North Hills Elctns., Glen Cove, N.Y. p. 2-399

NWL Transformers, Trenton, N.J. p. 2-1772

American Time Products, Bulova Watch, Woodside, N.Y. *

Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *

Computer Comps., Jamaica, N.Y. *

Coto-Coil Co., Providence, R.I. *

MESC Elctns. Corp., Palisades Pk., N.J. *

M Kappa Networks, Carteret, N.J. *

Nytronics Comps. Group Inc., Darlington, S.C. *

D Ohmite Mfg. Co., Skokie, Ill. *

Regdon Corp., Brookfield, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

M Torwico Elctns., Lakewood, N.J. *

Advanced Kinetics, Costa Mesa, Calif.

American Magnetics Corp., Carterville, Ill.

American Magnetics, Oak Ridge, Tenn.

M American Trans-Coil Corp., Richmond Hill, N.Y.

Anro Elex Inds. Ltd., Downsview, Ont, Can.

A. P. W. Co., Rockaway, N.J.

Artisan Elctns. Corp., Parsippany, N.J.

Automatic Coil, New Hyde Pk., N.Y.

Bicron Elctns. Co., Canaan, Conn.

Cardinal Control Co., Kensington, Conn.

Coil Specialty Co., Boalsburg, Pa.

M Component Specialties, Temple City, Cal.

Cramer Coil, Grafton, Wisc.

Custom Coil & Transformer Co., Zanesville, Ohio

M Dietz Design, Belton, Mo.

D Dormeyer Industries, Chicago, Ill.

Electrocom Inds., S. Bend, Ind.

D Electronic Coil Corp., Plainville, Conn.

M Electronic Transformer Corp., Paterson, N.J.

Elma Engineering, Palo Alto, Cal.

Filtron Company, Westbury, N.Y.

General Instr. Corp., Automatic Mfg. Div., Chicopee, Mass

M Genisco Tech. Corp., Compton, Cal.

JDN Electronics, Gillette, N.J.

J.D.N. Electronics Inc., Gillette, N.J.

D JPI, Santa Monica, Cal.

LDJ Electronics, Troy, Mich.

M Lisk, G.W. Co., Clifton Springs, N.Y.

Mag-Con, New Brighton, Minn.

Magnos, Incorporated, Harvard, Mass.

Montevideo Technology Inc., Edina, Minn.

Morey Corp., Downers Grove, Ill.

D NAMCO CONTROLS, Cleveland, Ohio

Phoenix Transformer Co., Phoenix, Ariz.

M Piconics Inc., Tyngsboro, Mass.

QTron Corp., Santa Ana, Cal.

M San Fernando Elec. Mfg., San Fernando, Cal.

Singer Co., Schiller Park, Ill.

DM United Prods. Co., New Hyde Pk., N.Y.

U.S. Elctns., Long Branch, N.J.

Varian Electron Tube & Device Grp., San Carlos, Cal.

Walker Scientific, Worcester, Mass.

Coils, Telephone

Aladdin Elctns., Nashville, Tenn.

p. 2-1729,1730

Bourns Pacific Magnetic Corp., Romoland, Cal.

p. 2-381

Dia-Netics Inc., Northridge, Cal. p. 2-422

Magnetico, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y. p. 2-1763

American Time Products, Bulova Watch, Woodside, N.Y. *

Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *

Computer Comps., Jamaica, N.Y. *

Kappa Networks, Carteret, N.J. *

Regdon Corp., Brookfield, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

M American Trans-Coil Corp., Richmond Hill, N.Y.

Anro Elex Inds. Ltd., Downsview, Ont, Can.

A. P. W. Co., Rockaway, N.J.

Cardinal Control Co., Kensington, Conn.

Coil-Craft Inc., Bronxville, N.Y.

Electrocom Inds., S. Bend, Ind.

D Electronic Coil Corp., Plainville, Conn.

M Electronic Transformer Corp., Paterson, N.J.

M JB Elctn, Transformers, Chicago, Ill

Morey Corp., Downers Grove, Ill.

D TRW/UTC Transformers, New York, N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

U.S. Elctns., Long Branch, N.J.

Coils, Telephone Pickup (For Recording)

—See Volume 1

Coils, Toroidal

M Aladdin Elctns., Nashville, Tenn.

p. 2-1729,1730

DM Bell Industries, Compton, Cal. p. 2-370-379

M Bourns Pacific Magnetic Corp., Romoland, Cal.

p. 2-381

Caddell-Burns Mfg. Co., Mineola, N.Y.

p. 2-382-385

CELCO, Mahwah, N.J. p. 1-631

Corcom, Chicago, Ill. p. 1-546,547

DM Dale Electronics Inc., Columbus, Neb.

p. 2-1452

D Dale Elctns., Yankton, S.D. p. 2-1452

D Delevan Div., Coil Prods., E. Aurora, N.Y.

p. 2-388

MEI-Rad Mfg. Co., Chicago, Ill. p. 2-1773,1774

M Freed Transformer Co., Brooklyn, N.Y.

p. 1-716,717; p. 2-1738-1747

M Hisonic, Olathe, Kan. p. 2-1755

M Industrial Control Co., Farmingdale, N.Y.

p. 1-1916,1917

Magnetico, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y. p. 2-1761

Nano Pulse Industries, Orange, Cal.

p. 2-1773,1774

North Hills Elctns., Glen Cove, N.Y. p. 2-399

MRF Interonics, Bay Shore, N.Y. p. 1-572,573

Solid State Electronics Corp., Sepulveda, Cal.

p. 1-126

Technitrol, Philadelphia, Pa. p. 2-1810,1811

DM Torotol Inc., Grandview, Mo. p. 2-430-439

D Triad-Utrad, Huntington, Ind. p. 2-1822-1829

All-Tronics Inc., Westbury, N.Y. *

American Time Products, Bulova Watch, Woodside, N.Y. *

Bel Fuse, Jersey City, N.J. *

Biometrics Instrument Corp., Garland, Tex. *

Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *

M Data Delay Devices, Clifton, N.J. *

Electrocube Inc., San Gabriel, Cal. *

MESC Elctns. Corp., Palisades Pk., N.J. *

Kappa Networks, Carteret, N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Nytronics Comps. Group Inc., Darlington, S.C. *

Shigoto Inds., Ltd., New York, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

M Torwico Elctns., Lakewood, N.J. *

Allen Elctns. Div., Macungie, Pa.

D Altac Div., Anaheim, Calif.

M American Trans-Coil Corp., Richmond Hill, N.Y.

Anro Elex Inds. Ltd., Downsview, Ont, Can.

Automatic Coil, New Hyde Pk., N.Y.

D Barker & Williamson, Bristol, Pa.

Bicron Elctns. Co., Canaan, Conn.

D Cambridge Thermionic Corp., Cambridge, Mass.

Coil-Craft Inc., Bronxville, N.Y.

Coilcraft, Cary, Ill.

Collins Radio, Dallas, Tex.

Cross Electronics Inc., Warrendale, Pa.

D De Coursey Engrg. Lab., Culver City, Cal.

M Dietz Design, Belton, Mo.

Electro-Pacific, Goleta, Calif.

Electrocom Inds., S. Bend, Ind.

M Electronic Transformer Corp., Paterson, N.J.

EWG, Kenilworth, N.J.

Ferrodyne Corp., Venice, Calif.

Filtron Company, Westbury, N.Y.

General Instr. Corp., Automatic Mfg. Div., Chicopee, Mass

Genisco Technology Corp., Compton, Cal.

M Genisco Tech. Corp., Compton, Cal.

Gowanda Electronics Corp., Gowanda, N.Y.

Hytronics Corp., Pinellas Park, Fla.

M JB Elctn, Transformers, Chicago, Ill

JDN Electronics, Gillette, N.J.

J.D.N. Electronics Inc., Gillette, N.J.

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

Montevideo Technology Inc., Edina, Minn.

Morey Corp., Downers Grove, Ill.

M OPT Inds. Inc., Phillipsburg, N.J.

M Polyphase Instr. Co., Bridgeport, Pa.

Pulse Engrg., San Diego, Cal

RtroN Corp., Skokie, Ill.

M San Fernando Elec. Mfg., San Fernando, Cal.

Schott Corp., Minneapolis, Minn.

Stanford Applied Engineering, Santa Clara, Cal.

M Syscon Int'l., So. Bend, Ind.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

Torelco Inc., Irvington, N.J.

D TRW/UTC Transformers, New York, N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

Coils, Transducer

Dale Elctns., Yankton, S.D. p. 2-1452

Dia-Netics Inc., Northridge, Cal. p. 2-422

Endicott Coil Co., Binghamton, N.Y. p. 2-396

Magnetico, Holtsville, N.Y. p. 2-1770

American Time Products, Bulova Watch, Woodside, N.Y. *

Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *

D Microtran Co., Valley Stream, N.Y. *

Nytronics Comps. Group Inc., Darlington, S.C. *

M Torwico Elctns., Lakewood, N.J. *

D Waldom Electronics, Chicago, Ill. *

D Altec Div., Anaheim, Calif.

M American Trans-Coil Corp., Richmond Hill, N.Y.

D Ametek Controls Division, Feasterville, Pa.

Anro Elex Inds. Ltd., Downsview, Ont, Can.

Bicron Elctns. Co., Canaan, Conn.

Cardinal Control Co., Kensington, Conn.

D Electronic Coil Corp., Plainville, Conn.

M Electronic Transformer Corp., Paterson, N.J.

General Instr. Corp., Automatic Mfg. Div., Chicopee, Mass

Montevideo Technology Inc., Edina, Minn.

Morey Corp., Downers Grove, Ill.

Sensor Corp., Scottsdale, Pa.

Templine, Gardena, Cal.

D TRW/UTC Transformers, New York, N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

U.S. Elctns., Long Branch, N.J.

Coils, Transformer

Abacus Controls Inc., Somerville, N.J.

p. 2-1731

M Aladdin Elctns., Nashville, Tenn.

p. 2-1729,1730

D Bell Industries, Compton, Cal. p. 2-370-379

Bourns Pacific Magnetic Corp., Romoland, Cal.

p. 2-381

D Dale Electronics Inc., Columbus, Neb.

p. 2-1452

D Dale Elctns., Yankton, S.D. p. 2-1452

M Del Electronics Corp., Mt. Vernon, N.Y.

p. 1-1174,1175

M Delevan Div., Coil Prods., E. Aurora, N.Y.

p. 2-388

Dia-Netics Inc., Northridge, Cal. p. 2-422

Douglas Randall Div., Pawcatuck, Conn.

p. 2-1734

Endicott Coil Co., Binghamton, N.Y. p. 2-396

Freed Transformer Co., Brooklyn, N.Y.

p. 1-716,717; p. 2-1738-1747

Magnetico, Holtsville, N.Y. p. 2-1770

Nano Pulse Industries, Orange, Cal.

p. 2-1773,1774

NWL Transformers, Trenton, N.J. p. 2-1772

Solid State Electronics Corp., Sepulveda, Cal.

p. 1-126

Technitrol, Philadelphia, Pa. p. 2-1810,1811

Vari-L Co., Denver, Colo. p. 2-1831-1833
American Time Products, Bulova Watch, Woodside, N.Y. *

Bel Fuse, Jersey City, N.J. *

Biometrics Instrument Corp., Garland, Tex. *

Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *

Computer Comps., Jamaica, N.Y. *

Coto-Coil Co., Providence, R.I. *

Dynamic Instr. Corp., Hauppauge, N.Y. *

Electrocube Inc., San Gabriel, Cal. *

General Magnetics, Bloomfield, N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Microtran Co., Valley Stream, N.Y. *

Nytronics Comps. Group Inc., Darlington, S.C. *

Shigoto Inds., Ltd., New York, N.Y. *

M Torotell Inc., Grandview, Mo. *

M Torwico Elctns., Lakewood, N.J. *

Acme Electric, Cuba, N.Y. *

M American Trans-Coil Corp., Richmond Hill, N.Y. *

Anro Elex Inds. Ltd., Downsview, Ont, Can. *

A. P. W. Co., Rockaway, N. J. *

M Caddell Coil Corp., Poultney, Vt. *

Cardinal Control Co., Kensington, Conn. *

Coil-Craft Inc., Bronxville, N.Y. *

Coilcraft, Cary, Ill. *

Coil Specialty Co., Boalsburg, Pa. *

M Component Specialties, Temple City, Cal. *

Cramer Coil, Grafton, Wisc. *

Custom Coil & Transformer Co., Zanesville, Ohio *

M Dietz Design, Belton, Mo. *

D Dormeyer Industries, Chicago, Ill. *

E-Tronics, Sepulveda, Cal. *

Electro-Pacific, Goleta, Calif. *

Electrocom Inds., S. Bend, Ind. *

D Electronic Coil Corp., Plainville, Conn. *

M Electronic Transformer Corp., Paterson, N.J. *

Elma Engineering, Palo Alto, Cal. *

EWC, Kenilworth, N.J. *

Ferrodyne Corp., Venice, Calif. *

M Genisco Tech. Corp., Compton, Cal. *

Hytronics Corp., Pinellas Park, Fla. *

M JB Elctn, Transformers, Chicago, Ill *

J.D.N. Electronics Inc., Gillette, N.J. *

Mag-Con, New Brighton, Minn. *

Morey Corp., Downers Grove, Ill. *

North Electric Co., Galion, Ohio *

M OPT Inds. Inc., Phillipsburg, N.J. *

M Osborne Transformer Corp., Detroit, Mich. *

Permaluster, Burbank, Calif. *

Pulse Engrg., San Diego, Cal *

Schott Corp., Minneapolis, Minn. *

D Stancor/Essex International, Chicago, Ill. *

M Syscon Int'l., So. Bend, Ind. *

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan *

DM Thordarson Meissner, Mt. Carmel, Ill. *

Tranex Inc., Mountain View, Cal. *

D TRW/UTC Transformers, New York, N.Y. *

DM United Prods. Co., New Hyde Pk., N.Y. *

U.S. Elctns., Long Branch, N.J. *

Walker Scientific, Worcester, Mass. *

Coils, TV (All Types)

D Bell Industries, Compton, Cal. p. 2-370-379
CELCO, Mahwah, N.J. p. 1-631
Dale Elctns., Yankton, S.D. p. 2-1452
Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388
Syntonic Instruments Inc., Addison, Ill. p. 2-424-429
American Time Products, Bulova Watch, Woodside, N.Y. *

Bel Fuse, Jersey City, N.J. *

Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *

D Nytronics Comps. Group Inc., Darlington, S.C. *

Shigoto Inds., Ltd., New York, N.Y. *

M American Trans-Coil Corp., Richmond Hill, N.Y. *

Anro Elex Inds. Ltd., Downsview, Ont, Can. *

Automatic Coil, New Hyde Pk., N.Y. *

Caddell Coil Corp., Poultney, Vt. *

Coilcraft, Cary, Ill. *

Coil Specialty Co., Boalsburg, Pa. *

D Components Specialties, Hempstead, N.Y. *

Cramer Coil, Grafton, Wisc. *

General Instr. Corp., Automatic Mfg. Div., Chicopee, Mass *

Gowanda Electronics Corp., Gowanda, N.Y. *

JDN Electronics, Gillette, N.J. *

J.D.N. Electronics Inc., Gillette, N.J. *

Morey Corp., Downers Grove, Ill. *

DM Thordarson Meissner, Mt. Carmel, Ill. *

DM United Prods. Co., New Hyde Pk., N.Y. *

U.S. Elctns., Long Branch, N.J. *

D Workman Electronic Prods., Sarasota, Fla. *

Coils, Variable

Airco Elctns., Bradford, Pa. p. 2-368,369,1408,1409
M Aladdin Elctns., Nashville, Tenn. p. 2-1729,1730
D Bell Industries, Compton, Cal. p. 2-370-379
Caddell-Burns Mfg. Co., Mineola, N. Y. p. 2-382-385
Dale Elctns., Yankton, S.D. p. 2-1452
DM Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388
El-Rad Mfg. Co., Chicago, Ill p. 2-1773,1774
M Hisonic, Olathe, Kan. p. 2-1755
Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1252
North Hills Elctns., Glen Cove, N.Y. ... p. 2-399
D Nytronics Comps. Group Inc., Darlington, S.C. p. 2-400-421
Vari-L Co., Denver, Colo. p. 2-442,443
American Time Products, Bulova Watch, Woodside, N.Y. *

Biometrics Instrument Corp., Garland, Tex. *

Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *

Chesterfield Prods. Inc., Saddle Brook, N.J. *

Computer Comps., Jamaica, N.Y. *

Data Delay Devices, Clifton, N.J. *

D Microtran Co., Valley Stream, N.Y. *

D Altac Div., Anaheim, Calif. *

M American Trans-Coil Corp., Richmond Hill, N.Y. *

Anro Elex Inds. Ltd., Downsview, Ont, Can. *

Automatic Coil, New Hyde Pk., N.Y. *

M Caddell Coil Corp., Poultney, Vt. *

Coil-Craft Inc., Bronxville, N.Y. *

Coilcraft, Cary, Ill. *

Coil Specialty Co., Boalsburg, Pa. *

Component Specialties, Temple City, Cal. *

M Dietz Design, Belton, Mo. *

Electrocom Inds., S. Bend, Ind. *

Elma Engineering, Palo Alto, Cal. *

General Instr. Corp., Automatic Mfg. Div., Chicopee, Mass *

Gowanda Electronics Corp., Gowanda, N.Y. *

Hytronics Corp., Pinellas Park, Fla. *

DM JFD Electronics Components Corp., Bklyn., N.Y. *

J.D.N. Electronics Inc., Gillette, N.J. *

Morey Corp., Downers Grove, Ill. *

M Piconics Inc., Tyngsboro, Mass. *

D San Fernando Elec. Mfg., San Fernando, Cal. *

Stanford Applied Engineering, Santa Clara, Cal. *

M Syscon Int'l., So. Bend, Ind. *

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan *

TRW/UTC Transformers, New York, N.Y. *

DM United Prods. Co., New Hyde Pk., N.Y. *

U.S. Elctns., Long Branch, N.J. *

Walker Scientific, Worcester, Mass. *

Coils, Vidicon Alignment

M CELCO, Mahwah, N.J. p. 1-631
Syntonic Instruments Inc., Addison, Ill. p. 2-426
American Time Products, Bulova Watch, Woodside, N.Y. *

D Amperex Electronic Corp., Slatersville, R.I. *

Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *

M American Trans-Coil Corp., Richmond Hill, N.Y. *

Hamamatsu TV Co., Ltd., Hamamatsu City, Shizuoka Pref., Japan *

Morey Corp., Downers Grove, Ill. *

M Teltron, Pottstown, Pa. *

Cold-Cathode Readout Tubes—See Tubes, Readout

Combiners, Microwave—See Couplers, Microwave

Comm. Systems, Carrier Current—See Volume 1

Comm. Systems, Data—See Volume 1

Comm. Systems, Facsimile—See Volume 1

Comm. Systems, F-M—See Volume 1

Comm. Systems, Frequency Shift—See Volume 1

Comm. Systems, Intercom—See Volume 1

Comm. Systems, Laser—See Volume 1

Comm. Systems, Microwave

GRM Corp., Medford, N.J. p. 1-120
M RHG Elctns. Lab., Deer Park, N.Y. p. 2-1389
Vari-L Co., Denver, Colo. p. 2-1392-1400
All Systems, Moorestown, N.J. *

AEL, Colmar, Pa. *

M A.R.F. Products, Boulder, Colo. *

Aydn Energy Systems, Palo Alto, Cal. *

Camusat Gueguen Telecom. Int'l., White Plains, N.Y. *

M Cardion Elctns., Woodbury, N.Y. *

Collins Radio, Dallas, Tex. *

M Cubic Corp., San Diego, Cal. *

Elctn. Comm., St. Petersburg, Fla. *

Environmental Communications Inc., Costa Mesa, Cal. *

Farinon Electric, San Carlos, Calif. *

Frequency Engrg. Labs., Farmingdale, N.J. *

General Elec. Co., Lynchburg, Va. *

GTE Lenkurt Inc., San Carlos, Calif. *

GTE Sylvania Inc., Washington, D.C. *

Hughes Aircraft Co., Culver City, Cal. *

Microwave Assocs., Burlington, Mass. *

Motorola Comms. Div., Schaumburg, Ill. *

Narda Microwave Corp., Plainview, N.Y. *

Pacific Communications, Santa Ana, Cal. *

M Resdel Engrg. Corp., Arcadia, Cal. *

Tasker Systems, Chatsworth, Cal. *

Transcom Electronics, La Mesa, Cal. *

Varian Electron Tube & Device Grp., San Carlos, Cal. *

Waveline, W. Caldwell, N.J. *

Comm. Systems, Multiplex—See Volume 1

Comm. Systems, Radiotelephone—See Volume 1

Comm. Systems, Selective Paging—See Volume 1

Comm. Systems, Single-Sideband—See Volume 1

Comm. Systems, Telemetry—See Volume 1

Comm. Systems, Telephone—See Volume 1

Comm. Systems, Teletype—See Volume 1

Commutators—See Volume 1

Comparators, Analog—See Volume 1

Comparators, Attenuation—See Volume 1

Comparators, Capacitance—See Volume 1

Comparators, Density—See Volume 1

Comparators, Digital—See Volume 1

Comparators, Frequency—See Volume 1

Comparators, Impedance—See Volume 1

Comparators, Inductance—See Volume 1

Comparators, Logic Test—See Volume 1

Comparators, Phase—See Volume 1

Comparators, Reluctance—See Volume 1

Comparators, Resistance—See Volume 1

Comparators, Voltage—See Volume 1

Compounds, Encapsulating, Molding, Potting-Also See Plastic Raw Materials

Amphenol Cadre Div., Endicott, N.Y. p. 2-460,461
M Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747
SGL Homalite, Wilmington, Del. p. 2-1254
Acheson Colloids Co., Port Huron, Mich. *

Allaco Prods Div., Watertown, Mass. *

Armstrong Cork Co., Lancaster, Pa. *

Astrodyne, Wilmington, Mass. *

Bacon Inds., Watertown, Mass. *

Brand Dielectrics, N. Windham, Conn. *

D Chemtronics, Hauppauge, N.Y. *

Communications Technology Corp., Los Angeles, Cal. *

DM Conap, Allegany, N.Y. *

Corning Glass Works, Corning, N.Y. *

Corning Glass Works, Television Prods. Div., Corning, N.Y.
 D Dolph, John C. Co., Monmouth Junction, N.J.
 Dow Chemical Co., Midland, Mich.
 Dow Corning, Midland, Mich.
 Eastman Chem. Prods., Kingsport, Tenn.
 E.I. DuPont de Nemours & Co., Wilmington, Del.
 D Electro-Science Labs., Pennsauken, N.J.
 Emerson & Cuming, Canton, Mass.
 Epoxy Technology, Watertown, Mass.
 Formulated Resins Inc., Greenville, R.I.
 General Elec., Schenectady, N.Y.
 D General Elec. Co., Watford, N.Y.
 Glastic Corp., Cleveland, Ohio
 M Goodrich Chem. Co., B.F., Cleveland, Ohio
 M Hardman Inc., Belleville, N.J.
 Hightemp Resins, Stamford, Conn.
 M Isochem Resins Co., Lincoln, R.I.
 Leepoxy Plastics, Ft. Wayne, Ind.
 M MacDonald & Co., Glendale, Calif.
 Miller-Stephenson Chem. Co., Danbury, Conn.
 National Beryllia Corp., Haskell, N.J.
 Packaged Resins Div., Watertown, Mass.
 Plastics Engrg. Co., Sheboygan, Wisc.
 D Ram Chems., Gardena, Calif.
 Seal-Peel, Troy, Mich.
 SermeTel Teleflex Inc., Limerick, Pa
 D Sterling, Sewickley, Pa.
 SWS Silicones, Adrian, Mich.
 3M Co., St. Paul, Minn.
 Tra-Con, Medford, Mass.
 Triac Electronics, New York, N.Y.
 Union Carbide, Chemicals & Plastics, New York, N.Y.
 Uniroyal, New York, N.Y.
 D Wakefield Engrg., Wakefield, Mass.
 D Western Coating Co., Royal Oak, Mich.

Compounds, Insulating

SGL Homalite, Wilmington, Del. p. 2-1254
 D Thermalloy, Dallas, Tex p. 1-1877
 D GC Electronics, Rockford, Ill. *

Acheson Colloids Co., Port Huron, Mich.
 Allaco Prods Div., Watertown, Mass.
 American Lava Corp., Chattanooga, Tenn.
 D AMP Special Industries, Valley Forge, Pa.
 Bacon Inds., Watertown, Mass.
 Brand Dielectrics, N. Windham, Conn.
 D Chemtronics, Hauppauge, N.Y.
 Chomerics, Woburn, Mass.
 Communications Technology Corp., Los Angeles, Cal.
 DM Conap, Allegany, N.Y.
 Corning Glass Works, Television Prods. Div., Corning, N.Y.
 Dixon Corp., Bristol, R.I.
 Dolph, John C. Co., Monmouth Junction, N.J.
 Dow Corning, Midland, Mich.
 Eastman Chem. Prods., Kingsport, Tenn.
 Emerson & Cuming, Canton, Mass.
 Epoxy Technology, Watertown, Mass.
 D General Elec. Co., Watford, N.Y.
 M Goodrich Chem. Co., B.F., Cleveland, Ohio
 M Hardman Inc., Belleville, N.J.
 National Beryllia Corp., Haskell, N.J.
 D Norelcom Electronics, Farmingdale, N.Y.
 Packaged Resins Div., Watertown, Mass.
 SermeTel Teleflex Inc., Limerick, Pa
 D Sterling, Sewickley, Pa.
 SWS Silicones, Adrian, Mich.
 3M Co., St. Paul, Minn.
 Union Carbide, Chemicals & Plastics, New York, N.Y.
 D Uniroyal, New York, N.Y.

Compressors, Data—See Volume 1

Computer Logic Circuits—See Volume 1

Computer Tape Recorders—See Volume 1

Computer Type Indicators—See Lights; Dials; Readouts

Computers, Analog—See Volume 1

Computers, Desk Top (Digital)—See Volume 1

Computers, Digital—See Volume 1

Computers, Hybrid, Analog-Digital—See Volume 1

Computing Equipment, Peripheral—See Volume 1

Condensers—See Capacitors

Conditioners, Power Line—See Volume 1

Conductive Fabrics, Films & Tapes—See Fabrics, Conductive

Conductive Plastic Materials

Acheson Colloids Co., Port Huron, Mich.
 Allaco Prods Div., Watertown, Mass.
 Bacon Inds., Watertown, Mass.
 Cadillac Plastic & Chemical, Detroit, Mich.
 Cal-Metex Corp., Inglewood, Cal.
 Chomerics, Woburn, Mass.
 DM Conap, Allegany, N.Y.
 Dixon Corp., Bristol, R.I.
 D Dynaloy, Hanover, N.J.
 Electro Mats. Corp. Amer., Mamaroneck, N.Y.
 Emerson & Cuming, Canton, Mass.
 Epoxy Technology, Watertown, Mass.
 Formulated Resins Inc., Greenville, R.I.
 D Merix Chem. Co., Chicago, Ill.
 DM Metex Corp., Edison, N.J.
 Packaged Resins Div., Watertown, Mass.
 D Technical Wire Products, Cranford, N.J.
 Triac Electronics, New York, N.Y.
 M Zippertubing Co., Los Angeles, Calif.

Conduit, Electrical

M Rowe Industries, Toledo, Ohio p. 2-796,797
 D SGL Waber Electric, Westville, NJ p. 2-356
 D The Anaconda Company Brass Division, Waterbury, Conn.
 M Co-Operative Inds., Chester, N.J.
 I-T-E Electrical Components Grp., E. Farmingdale, N.Y.
 Icore Int'l., Sunnyvale, , Cal.
 D Zippertubing Co., Los Angeles, Calif.

Connector Adapters

D Amatom Electronic Hardware, New Haven, Conn. p. 2-457
 DM Amphenol Connector Div., Broadview, Ill. p. 2-460,461
 Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
 DM Amphenol RF Div., Danbury, Conn. p. 2-460,461

D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
 D Arco Electronics Inc., Great Neck, N.Y. p. 2-619

DM Bendix Corp., The, Sidney, N.Y. p. 2-640
 M Bird Electronic Corp., Solon, Ohio p. 1-819
 Connector Corp., Chicago, Ill. p. 2-658-660
 M Elctrn. Molding Corp., Woonsocket, R.I. p. 2-676-679

D ITT Pomona Electronics Div., Pomona, Cal. p. 2-742

Omni Spectra, Farmington, Mich. p. 2-725
 M Rowe Industries, Toledo, Ohio p. 2-796,797
 DM Sealectro Corp., Mamaroneck, N.Y. p. 2-811
 D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Vernitron Elec. Comps., Laconia, N.H. p. 2-1062

D Waldom Electronics, Chicago, Ill. p. 2-1070-1074

D Augat Inc., Attleboro, Mass *

DM Bendix, Franklin, Ind. *

D GC Electronics, Rockford, Ill. *

General Radio Co., Concord, Mass. *

Shigoto Inds., Ltd., New York, N.Y. *

D Vector Electronic Co., Sylmar, Cal. *

Air-O-Tronics Prods., Morrisville, N.Y.
 Alaun Engrg., Alhambra, Cal
 Amp Inc., Harrisburg, Pa.
 American Microwave Inds., Waltham, Mass.

D Astrolab, Rahway, N.J.
 Ava Elctns., Landsdowne, Pa
 Barker Prods. Co., Saugus, Mass.
 Beman Mfg., New Cumberland, Pa.
 D Blonder-Tongue Labs., Old Bridge, N.J.
 Boston Insulated Wire & Cable Co., Dorchester, Mass.

D Cablewave Systems Inc., North Haven, Conn.
 M Detoronics Corp., S. El Monte, Cal.
 Dynatron Co., Los Angeles, Cal.
 D Ev-Game Inc., Freeport, N.Y.

DM Excel Products Co., New Brunswick, N.J.
 M Glenair, Glendale, Cal.
 Hypertronics Corp., Stow, Mass.
 Industrial Electronic Hardware, New York, N.Y.
 M Jettron Prods., Hanover, N.J.
 Lemo USA, Berkeley, Cal.

D Malco, A Microdot Co., Chicago, Ill.
 Maury Microwave Corp., Cucamonga, Calif.
 M Microlab/FXR, Livingston, N.J.
 Narda Microwave Corp., Plainview, N.Y.
 National Connector, Minneapolis, Minn.
 D Recoton Corp., Long Island City, N.Y.
 Reynolds Inds., Marina Del Rey, Cal.

Rhode & Schwarz Sls., Fairfield, N.J.
 D Rye Inds., Mamaroneck, N.Y.
 D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
 Sola Electric, Elk Grove Village, Ill.
 DM Solitron/Microwave, Port Salerno, Fla.
 M Specialty Connector Corp., Indianapolis, Ind.
 Stanford Applied Engrg., Santa Ana, Cal.
 D Switchcraft, Chicago, Ill.
 Trompeter Electronics, Chatsworth, Cal.
 Weinschel Engrg. Co., Gaithersburg, Md.
 D Workman Electronic Prods., Sarasota, Fla.

Connector Blocks, Mother Board

M Rowe Industries, Toledo, Ohio p. 2-796,797
 D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Vernitron Elec. Comps., Laconia, N.H. p. 2-1064

Amphenol RF Div., Danbury, Conn. *

Connector Corp., Chicago, Ill. *

D Molex Inc., Lisle, Ill. *

D Smith Inc., Herman H., Brooklyn, N.Y. *

D Control Data Corp., Westlake Village, Cal.
 Douglas Electronics, San Leandro, Cal.

DM Dynatech Corp., Santa Ana, Cal.
 DM Excel Products Co., New Brunswick, N.J.
 GTE Automatic Electric Inc., Northlake, Ill.
 Hypertronics Corp., Stow, Mass.
 Industrial Electronic Hardware, New York, N.Y.
 Methode Elctns., Chicago, Ill.

D Molex Products, Downers Grove, Ill.
 U.S. Components, Bronx, N.Y.

Connector Boxes & Strips, Power Outlet

Arrow-Hart, Hartford, Conn. p. 2-621
 D Bud Radio, Willoughby, Ohio p. 1-54,55
 D Corcom, Chicago, Ill. p. 1-547
 M Rowe Industries, Toledo, Ohio p. 2-796,797
 D SGL Waber Electric, Westville, NJ p. 2-356
 D Vector Electronic Co., Sylmar, Cal. p. 1-103
 D Vernitron Elec. Comps., Laconia, N.H. p. 2-1062

M Zero Mfg. Co., Burbank, Cal. p. 1-106-109

D Smith Inc., Herman H., Brooklyn, N.Y. *

Excel Products Co., New Brunswick, N.J.
 Industrial Electronic Hardware, New York, N.Y.

D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
 Sierra Elec., Gardena, Calif.

D Wadsworth Electric Mfg. Co., Covington, Ky.
 Wiremold Co., West Hartford, Conn.

Connectors & Terminals, Push-On, Quick Disconnect

Allied Systems Corp., Greensboro, N.C. p. 2-458,459

D Amatom Electronic Hardware, New Haven, Conn. p. 2-457

D Amphenol Connector Div., Broadview, Ill. p. 2-460,461

D Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461

Berg Electronics, New Cumberland, Pa. p. 2-645-647,652

Connector Corp., Chicago, Ill. p. 2-658-660

D Continental Connector Corp., Woodside, N.Y. p. 2-665

Dale Elctns., Yankton, S.D. p. 2-1452

D E-Z-Hook, Arcadia, Cal. p. 2-671

M Elctrn. Molding Corp., Woonsocket, R.I. p. 2-676-679

D ETC Terminal Products, Solon, Ohio p. 2-695-706

Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686

DM Keystone Elctns. Corp., New York, N.Y. p. 2-715

D National Tel-Tronics, Meadville, Pa. p. 2-721-723

D Panduit Corp., Tinley Park, Ill. p. 2-2048-2051

M Rowe Industries, Toledo, Ohio p. 2-796,797

DM Sealectro Corp., Mamaroneck, N.Y. p. 2-803,804

D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Vaco Products Co., Chicago, Ill. p. 2-1056,1057

D Vector Electronic Co., Sylmar, Cal. p. 2-1060

D Vernitron Elec. Comps., Laconia, N.H. p. 2-1062

D Waldom Electronics, Chicago, Ill. p. 2-1070-1074

DM Amphenol RF Div., Danbury, Conn. *

D Augat Inc., Attleboro, Mass *

D Daburn Electronics & Cable Corp., Bronx, N.Y. *

D GC Electronics, Rockford, Ill. *

General Radio Co., Concord, Mass. *

PRODUCT INDEX & DIRECTORY

Connectors, Circular, MS/AN

D Molex Inc., Lisle, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

DM Smith Inc., Herman H., Brooklyn, N.Y. *

Abacus Elctns. Corp., Dobbs Ferry, N.Y.

D Accessories for Electronics, Bayside, N.Y.

Accesso-Wire, Garnersville, N.Y.

Amp Inc., Harrisburg, Pa.

DM AMP Special Industries, Valley Forge, Pa.

M Armel Electronics, N. Bergen, N.J.

DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.

DM Astrolab, Rahway, N.J.

Autosplice/Dv Gen Staple, New York City, N.Y.

DM Avibank Mfg. Inc., Burbank, Calif.

M Avid Electronics Corp., Baldwin, Pl., N.Y.

Bead Elctns., Bridgeport, Conn.

D Beman Mfg., New Cumberland, Pa.

D Blonder-Tongue Labs., Old Bridge, N.J.

D Burndy Corporation, Norwalk, Conn.

Ceramaseal, New Lebanon Center, N.Y.

D Circuit Assembly Corp., Costa Mesa, Ca.

Control Data Corp., Westlake Village, Cal.

M Detronics Corp., S. El Monte, Cal.

Doran Mfg. Co., Cincinnati, Ohio

DM Dynatech Corp., Santa Ana, Cal.

Emporium Specialties Co., Austin, Pa.

D Excel Products Co., New Brunswick, N.J.

D Hoffman Industrial Prods., Farmingdale, N.Y.

Hollingsworth Solderless Terminal, Phoenixville, Pa.

Hypertronics Corp., Stow, Mass.

I-T-E Electrical Components Grp., E. Farmingdale, N.Y.

DM ICO/Rally Corp., Palo Alto, Cal.

Icore Int'l., Sunnyvale, Cal.

ITT Holub Industries, Sycamore, Ill.

D Javex Elctns., Cherry Valley, Cal.

DM Kings Electronics, Tuckahoe, N.Y.

DM Kulka Elec. Corp., Mt. Vernon, N.Y.

Lemo USA, Berkeley, Cal.

Magnum Elec. Corp., Erie, Mich.

D Malco, A Microdot Co., Chicago, Ill.

M Mark Eyelet & Stamping, Wolcott, Conn.

Methode Elctns., Chicago, Ill.

D Modpak, Waltham, Mass.

D National Connector, Minneapolis, Minn.

D N-T/Peerless, Leominster, Mass.

D Program Data Co., Carson, Cal.

D Robinson-Nugent, New Albany, Ind.

D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan

Sjoberg, C. & Son, Cranston, R.I.

M Specialty Connector Corp., Indianapolis, Ind.

D Technical Wire Products, Cranford, N.J.

D Teledyne Penn-Union Elec., Edinboro, Pa.

D Thomas & Betts Co., Elizabeth, N.J.

D Underwriters Safety, Chicago, Ill.

DM U.S. Components, Bronx, N.Y.

Winchester Elctns., Oakville, Conn.

D Workman Electronic Prods., Sarasota, Fla.

D Zierick Mfg. Corp., Mt. Kisco, N.Y.

Connectors, Antenna—See Connectors, R-F, Coaxial

Connectors, Audio

Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461

D Amphenol Sales Div., Broadview, Ill. p. 2-460,461

Connector Corp., Chicago, Ill. p. 2-657-660

D ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693

D National Tel-Tronics, Meadville, Pa. p. 2-720

M Rowe Industries, Toledo, Ohio p. 2-796,797

D Sealectro Corp., Mamaroneck, N.Y. p. 2-807-810

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-818

D Trimm, Libertyville, Ill. p. 2-896

D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Vernitron Elec. Comps., Laconia, N.H. p. 2-1062

D Waldom Electronics, Chicago, Ill. p. 2-1070-1074

D GC Electronics, Rockford, Ill. *

DM Keystone Elctns. Corp., New York, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

M Armel Electronics, N. Bergen, N.J.

Barker Prods. Co., Saugus, Mass.

D Ev-Game Inc., Freeport, N.Y.

D Elco, Willow Grove, Pa.

Industrial Electronic Hardware, New York, N.Y.

DM Kings Electronics, Tuckahoe, N.Y.

Lemo USA, Berkeley, Cal.

D Molex Products, Downers Grove, Ill.

D N-T/Peerless, Leominster, Mass.

D Philmore Mfg. Co. Inc., Inwood, N.Y.

Rye Inds., Mamaroneck, N.Y.

DM Saxton Prods., Congers, N.Y.

D Switchcraft, Chicago, Ill.

Trompeter Electronics, Chatsworth, Cal.

D Workman Electronic Prods., Sarasota, Fla.

Connectors, Back Panel—See Connectors, Wirewrap (Z-3 Level)

Connectors, Battery

Connector Corp., Chicago, Ill. p. 2-657-659

MITT Cannon Electric, Santa Ana, Cal. p. 2-687-693

M Rowe Industries, Toledo, Ohio p. 2-796,797

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-856

D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Vernitron Elec. Comps., Laconia, N.H. p. 2-1062

D Waldom Electronics, Chicago, Ill. p. 2-1070-1074

D GC Electronics, Rockford, Ill. *

DM Keystone Elctns. Corp., New York, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

AMP Special Industries, Valley Forge, Pa.

Beman Mfg., New Cumberland, Pa.

Birnbach Co., Freeport, N.Y.

M Detronics Corp., S. El Monte, Cal.

D Eby Co., Hugh H., Philadelphia, Pa.

Gulton Inds., Buena Park, Cal.

Icore Int'l., Sunnyvale, Cal.

Industrial Electronic Hardware, New York, N.Y.

Ronor Systems, Cheshire, Conn.

Sjoberg, C. & Son, Cranston, R.I.

D Workman Electronic Prods., Sarasota, Fla.

D Zierick Mfg. Corp., Mt. Kisco, N.Y.

Connectors, Cable

AirBorn, Addison, Tex. p. 2-452-455

Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461

DM Amphenol RF Div., Danbury, Conn. p. 2-460,461

D Amphenol Sales Div., Broadview, Ill. p. 2-460,461

D Arco Electronics Inc., Great Neck, N.Y. p. 2-619

Connector Corp., Chicago, Ill. p. 2-657,659,660

D Continental Connector Corp., Woodside, N.Y. p. 2-665

CW Industries, Warminster, Pa. p. 1-1987; p. 2-656

D E-Z-Hook, Arcadia, Cal. p. 2-671

Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686

D ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693

National Tel-Tronics, Meadville, Pa. p. 2-720,721

D Omni Spectra, Farmington, Mich. p. 2-725

D Positronic Inds., Springfield, Mo. p. 2-788

M Rowe Industries, Toledo, Ohio p. 2-796,797

DM Sealectro Corp., Mamaroneck, N.Y. p. 2-805,807-810

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-849

D 3M Company, St. Paul, Minn. p. 2-1034-1055

DM TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Vernitron Elec. Comps., Laconia, N.H. p. 2-1062

D Waldom Electronics, Chicago, Ill. p. 2-1070-1074

D Arrow-Hart, Hartford, Conn. *

D Augat Inc., Attleboro, Mass. *

D GC Electronics, Rockford, Ill. *

D Molex Inc., Lisle, Ill. *

Square D Co., Milwaukee, Wisc. *

AMP Special Industries, Valley Forge, Pa.

American Microwave Inds., Waltham, Mass.

D Antenna Corp. of America, Burlington, Iowa

M Armel Electronics, N. Bergen, N.J.

D Astrolab, Rahway, N.J.

Boston Insulated Wire & Cable Co., Dorchester, Mass.

Caton Connector Corp., Great Neck, N.Y.

Control Data Corp., Westlake Village, Cal.

Gulton Inds., Buena Park, Cal.

Hypertronics Corp., Stow, Mass.

I-T-E Electrical Components Grp., E. Farmingdale, N.Y.

D Ideal Industries Inc., Sycamore, Ill.

Industrial Electronic Hardware, New York, N.Y.

Interdyne, Van Nuys, Cal.

Jettron Prods., Hanover, N.J.

DM Kings Electronics, Tuckahoe, N.Y.

Lemo USA, Berkeley, Cal.

D Malco, A Microdot Co., Chicago, Ill.

Motorola Comms. Div., Schaumburg, Ill.

D Preformed Line Products Co., Cleveland, Ohio

Robinson-Nugent, New Albany, Ind.

Ronor Systems, Cheshire, Conn.

Saxton Prods., Congers, N.Y.

DM Solitron/Microwave, Port Salerno, Fla.

D Teledyne Penn-Union Elec., Edinboro, Pa.

DM Texas Instruments, Attleboro, Mass.

Trompeter Electronics, Chatsworth, Cal.

DM U.S. Components, Bronx, N.Y.

DM Viking Inds., Chatsworth, Cal.

Connectors, Chassis, Rack & Panel

AirBorn, Addison, Tex. p. 2-452-455

DM Amphenol Connector Div., Broadview, Ill. p. 2-460,461

D Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461

D Amphenol Sales Div., Broadview, Ill. p. 2-460,461

D Bendix Corp., The, Sidney, N.Y. p. 2-641

D Concord Elctns., New York, N.Y. p. 2-654,655

DM Continental Connector Corp., Woodside, N.Y. p. 2-665

D Dale Elctns., Yankton, S.D. p. 2-1452

D Elctn. Molding Corp., Woonsocket, R.I. p. 2-676-679

D ETC Terminal Products, Solon, Ohio p. 2-695-706

Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686

DM ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693

D Johnson Co., E.F., Waseca, Minn. p. 2-709

National Tel-Tronics, Meadville, Pa. p. 2-720,721

D Omni Spectra, Farmington, Mich. p. 2-725

D Positronic Inds., Springfield, Mo. p. 2-788

M Rowe Industries, Toledo, Ohio p. 2-796,797

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-818,849,854,874

D Superior Electric Co., Bristol, Conn. p. 2-799

D 3M Company, St. Paul, Minn. p. 2-1034-1055

D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

Vernitron Elec. Comps., Laconia, N.H. p. 2-1062

D Vero Electronics, Hauppauge, N.Y. p. 2-365

D Waldom Electronics, Chicago, Ill. p. 2-1070-1074

D Molex Inc., Lisle, Ill. *

M Addington Labs, Santa Clara, Cal.

Amp Inc., Harrisburg, Pa.

DM AMP Special Industries, Valley Forge, Pa.

M Armel Electronics, N. Bergen, N.J.

DM Astrolab, Rahway, N.J.

Autosplice/Dv Gen Staple, New York City, N.Y.

D Burndy Corporation, Norwalk, Conn.

D Circuit Assembly Corp., Costa Mesa, Ca.

D Control Data Corp., Westlake Village, Cal.

DM Dynatech Corp., Santa Ana, Cal.

D Eby Co., Hugh H., Philadelphia, Pa.

D Elco, Willow Grove, Pa.

DM Excel Products Co., New Brunswick, N.J.

Gulton Inds., Buena Park, Cal.

M Hermetic Seal Corp., Rosemead, Cal.

M Hypertronics Corp., Stow, Mass.

Industrial Electronic Hardware, New York, N.Y.

DM Kings Electronics, Tuckahoe, N.Y.

D Malco, A Microdot Co., Chicago, Ill.

Methode Elctns., Chicago, Ill.

D Molex Products, Downers Grove, Ill.

Mupac Corp., Brockton, Mass.

D National Connector, Minneapolis, Minn.

Ronor Systems, Cheshire, Conn.

Saxton Prods., Congers, N.Y.

Stanford Applied Engineering, Santa Clara, Cal.

Stanford Applied Engrg., Santa Ana, Cal.

Trompeter Electronics, Chatsworth, Cal.

U.S. Components, Bronx, N.Y.

M U.S. Terminals, Cincinnati, Ohio

Winchester Elctns., Oakville, Conn.

Connectors, Circular, MS/AN

DM Amphenol Connector Div., Broadview, Ill. p. 2-460,461

M Amphenol Connector Div., SAMS Oper., Chatsworth, Cal. p. 2-460,461

Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461

DM Amphenol Sales Div., Broadview, Ill. p. 2-460,461

DM Arco Electronics Inc., Great Neck, N.Y. p. 2-619

DM Bendix Corp., The, Sidney, N.Y. p. 2-640,642

DM ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693

M Rowe Industries, Toledo, Ohio p. 2-796,797

DM TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Waldom Electronics, Chicago, Ill. p. 2-1070-1074
D Vernitron Elec. Comps., Laconia, N.H. *
M Addingtong Labs, Santa Clara, Cal.
 Caton Connector Corp., Great Neck, N.Y.
M Detronics Corp., S. El Monte, Cal.
 Gulton Inds., Buena Park, Cal.
M Hermetic Seal Corp., Rosemead, Cal.
 Hypertronics Corp., Stow, Mass.
 Lemo USA, Berkeley, Cal.
M Stanford Applied Engineering, Santa Clara, Cal.
 Stanford Applied Engrg., Santa Ana, Cal.
 Winchester Elctns., Oakville, Conn.

Connectors, Edgeboard—See Connectors, Printed Circuit

Connectors, Filtered

Amphenol Canada Ltd., Scarborough, (Ont.), Can. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
D Bendix Corp., The, Sidney, N.Y. p. 2-642
D Corcom, Chicago, Ill. p. 1-547
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686
MITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
M Rowe Industries, Toledo, Ohio p. 2-796,797
Frequency Elctns., New Hyde Pk., N.Y. *
 Amp Inc., Harrisburg, Pa.
 American Microwave Inds., Waltham, Mass.

Connectors, Flat Cable (Including Flexible)

AirBorn, Addison, Tex. p. 2-452-455
D Augat Inc., Attleboro, Mass. p. 2-636
Bendix Corp., The, Sidney, N.Y. p. 2-641
Berg Electronics, New Cumberland, Pa. p. 2-645,648,649
D Continental Connector Corp., Woodside, N.Y. p. 2-662,664
CW Industries, Warminster, Pa. p. 1-1967; p. 2-656
Dale Elctns., Yankton, S.D. p. 2-1452
D Elctn. Molding Corp., Woonsocket, R.I. p. 2-676-679
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686
D ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
M Rowe Industries, Toledo, Ohio p. 2-796,797
D Spectra-Strip Corp., Garden Grove, Cal. p. 2-2057
D 3M Company, St. Paul, Minn. p. 2-1034-1055
Connector Corp., Chicago, Ill. *
D Johnson Co., E.F., Waseca, Minn. *
 Access-Wire, Garnersville, N.Y.
 Amp Inc., Harrisburg, Pa.
 AMP Special Industries, Valley Forge, Pa.
D Ansley Elctns. Corp., Los Angeles, Cal.
M Arnel Electronics, N. Bergen, N.J.
 Autosplince/Dv Gen Staple, New York City, N.Y.
D Burndy Corporation, Norwalk., Conn.
D Control Data Corp., Westlake Village, Cal.
DM Dynatech Corp., Santa Ana, Cal.
 Gary Mfg., New Brunswick, N.J.
D IFE Div., Rumford, R.I.
 Industrial Electronic Hardware, New York, N.Y.
 Interdyne, Van Nuys, Cal.
DM Kings Electronics, Tuckahoe, N.Y.
 Lemo USA, Berkeley, Cal.
D Malco, A Microdot Co., Chicago, Ill.
 Methode Elctns., Chicago, Ill.
 Mupac Corp., Brockton, Mass.
 National Connector, Minneapolis, Minn.
D Program Data Co., Carson, Cal.
 Stanford Applied Engrg., Santa Ana, Cal.
M Star Tron Corp., Providence, R.I.
 D Technical Wire Products, Cranford, N.J.

Connectors, Heavy Duty, Power

AMP Captrion Div./AMP Inc., Elizabethtown, Pa. p. 2-450,451
DM Amphenol Connector Div., Broadview, Ill. p. 2-460,461
M Amphenol Connector Div., SAMS Opers., Chatsworth, Cal. p. 2-460,461
D Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
Arrow-Hart, Hartford, Conn. p. 2-621
DM Bendix Corp., The, Sidney, N.Y. p. 2-642
DM Continental Connector Corp., Woodside, N.Y. p. 2-665
D ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693

D Omni Spectra, Farmington, Mich. p. 2-725
D Positronic Inds., Springfield, Mo. p. 2-788
M Rowe Industries, Toledo, Ohio p. 2-796,797
D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
D Molex Inc., Lisle, Ill. *
Square D Co., Milwaukee, Wisc. *
Vernitron Elec. Comps., Laconia, N.H. *
M APM-Hexseal, Englewood, N.J.
M Arnel Electronics, N. Bergen, N.J.
DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.
D Burndy Corporation, Norwalk., Conn.
 Control Data Corp., Westlake Village, Cal.
M Detronics Corp., S. El Monte, Cal.
D Elco, Willow Grove, Pa.
 Gulton Inds., Buena Park, Cal.
 Hypertronics Corp., Stow, Mass.
 I-T-E Electrical Components Grp., E. Farmingdale, N.Y.
 Lemo USA, Berkeley, Cal.
D Preformed Line Products Co., Cleveland, Ohio
D Teledyne Penn-Union Elec., Edinboro, Pa.
D Underwriters Safety, Chicago, Ill.
D U.S. Components, Bronx, N.Y.

Connectors, Hermetically Sealed, Pressurized & Waterproof

M Amphenol Connector Div., Broadview, Ill. p. 2-460,461
M Amphenol Connector Div., SAMS Opers., Chatsworth, Cal. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
DM Arco Electronics Inc., Great Neck, N.Y. p. 2-619
DM Bendix Corp., The, Sidney, N.Y. p. 2-640,642
DM Bendix, Franklin, Ind. p. 2-643
D Continental Connector Corp., Woodside, N.Y. p. 2-665
Dale Elctns., Yankton, S.D. p. 2-1452
Frequency Elctns., New Hyde Pk., N.Y. p. 1-323
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686
D ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
D Omni Spectra, Farmington, Mich. p. 2-725
M Rowe Industries, Toledo, Ohio p. 2-796,797
DM Sealectro Corp., Mamaroneck, N.Y. p. 2-807,810
M Alberox Corp., New Bedford, Mass. *
AMP Captrion Div./AMP Inc., Elizabethtown, Pa. *
DM Amphenol RF Div., Danbury, Conn. *
M Addingtong Labs, Santa Clara, Cal.
 American Microwave Inds., Waltham, Mass.
DM Astrolab, Rahway, N.J.
D Cablewave Systems Inc., North Haven, Conn.
 Caton Connector Corp., Great Neck, N.Y.
M Co-Operative Inds., Chester, N.J.
M Connector Inds. of America, Cincinnati, Ohio
M Detronics Corp., S. El Monte, Cal.
 Elco, Willow Grove, Pa.
M Elctn. Seals, Van Nuys, Cal.
 Fusite Div./Emerson Elec., Cincinnati, Ohio
M Glenair, Glendale, Cal.
 Gulton Inds., Buena Park, Cal.
M Hermetic Seal Corp., Rosemead, Cal.
 Hypertronics Corp., Stow, Mass.
D Ideal Industries Inc., Sycamore, Ill.
DM Kings Electronics, Tuckahoe, N.Y.
D Malco, A Microdot Co., Chicago, Ill.
 Simmonds Precision, Norwich, N.Y.
DM Solitron/Microwave, Port Salerno, Fla.
M Specialty Connector Corp., Indianapolis, Ind.
 Stanford Applied Engrg., Santa Ana, Cal.
D U.S. Components, Bronx, N.Y.

Connectors, High-Voltage (1,000 Volts & Over)

AirBorn, Addison, Tex. p. 2-452-455
AMP Captrion Div./AMP Inc., Elizabethtown, Pa. p. 2-450,451
DM Amphenol Connector Div., Broadview, Ill. p. 2-460,461
M Amphenol Connector Div., SAMS Opers., Chatsworth, Cal. p. 2-460,461
Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
DM Amphenol RF Div., Danbury, Conn. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
Bendix Corp., The, Sidney, N.Y. p. 2-640
Connector Corp., Chicago, Ill. p. 2-660
DM Continental Connector Corp., Woodside, N.Y. p. 2-665

CPS Inc. - Power Supply Grp., Sunnyvale, Cal. p. 1-1162,1163
Dale Elctns., Yankton, S.D. p. 2-1452
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686
ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
D ITT Pomona Electronics Div., Pomona, Cal. p. 2-740
Kilovolt Corp., Hackensack, N.J. p. 1-1302-1305
D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1247
National Tel-Tronics, Meadville, Pa. p. 2-721
M Rowe Industries, Toledo, Ohio p. 2-796,797
SGL Electronics, Westville, N.J. p. 2-1254
TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
DM Bendix, Franklin, Ind. *
Del Electronics Corp., Mt. Vernon, N.Y. *
Square D Co., Milwaukee, Wisc. *
Amp Inc., Harrisburg, Pa.
D AMP Special Industries, Valley Forge, Pa.
 American Microwave Inds., Waltham, Mass.
M Arnel Electronics, N. Bergen, N.J.
 Boston Insulated Wire & Cable Co., Dorchester, Mass.
D Burndy Corporation, Norwalk., Conn.
 Caton Connector Corp., Great Neck, N.Y.
 Ceramaseal, New Lebanon Center, N.Y.
 Connector Inds. of America, Cincinnati, Ohio
M Detronics Corp., S. El Monte, Cal.
 Dielectric Sciences, Burlington, Mass.
 Elco, Willow Grove, Pa.
 Gulton Inds., Buena Park, Cal.
 Hermetic Seal Corp., Rosemead, Cal.
D Hobson Bros., Chicago, Ill.
 Hypertronics Corp., Stow, Mass.
 I-T-E Electrical Components Grp., E. Farmingdale, N.Y.
M Jettron Prods., Hanover, N.J.
DM Kings Electronics, Tuckahoe, N.Y.
 Lemo USA, Berkeley, Cal.
D Malco, A Microdot Co., Chicago, Ill.
M Preformed Line Products Co., Cleveland, Ohio
 Reynolds Inds., Marina Del Rey, Cal.
 Simmonds Precision, Norwich, N.Y.
DM Solitron/Microwave, Port Salerno, Fla.
M Specialty Connector Corp., Indianapolis, Ind.
 Stanford Applied Engrg., Santa Ana, Cal.
D Thomas & Betts Co., Elizabeth, N.J.
 Times Wire & Cable, Wallingford, Conn.
 U.S. Components, Bronx, N.Y.
M U.S. Terminals, Cincinnati, Ohio
 Voltek Inc., Beverly Hills, Cal.
 Zi-Tech Div., Palo Alto, Cal.

Connectors, Integrated Circuit—See Sockets, Integrated Circuit

Connectors, Miniature, Subminiature & Microminiature

AirBorn, Addison, Tex. p. 2-452-455
M Amphenol Connector Div., Broadview, Ill. p. 2-460,461
Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
DM Amphenol RF Div., Danbury, Conn. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
D Arco Electronics Inc., Great Neck, N.Y. p. 2-619
DM Bendix Corp., The, Sidney, N.Y. p. 2-640
DM Bendix, Franklin, Ind. p. 2-643
Berg Electronics, New Cumberland, Pa. p. 2-645,648
DM Concord Elctns., New York, N.Y. p. 2-654,655
Connector Corp., Chicago, Ill. p. 2-657-660
DM Continental Connector Corp., Woodside, N.Y. p. 2-665
DM Dale Electronics Inc., Columbus, Neb. p. 2-1452
D Dale Elctns., Yankton, S.D. p. 2-1452
D E-Z-Hook, Arcadia, Cal. p. 2-671
D Elctn. Molding Corp., Woonsocket, R.I. p. 2-676,677,678,679
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686
D ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
LVC Inds. Inc., Flushing, N.Y. p. 1-2010,2011,2100
D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1249
National Tel-Tronics, Meadville, Pa. p. 2-720,721
Omni Spectra, Farmington, Mich. p. 2-725

DM Positronic Inds., Springfield, Mo. p. 2-788
M Rowe Industries, Toledo, Ohio p. 2-796,797
D Sealectro Corp., Mamaroneck, N.Y. p. 2-807-810
D Spectra-Strip Corp., Garden Grove, Cal. p. 2-2057
D 3M Company, St. Paul, Minn. p. 2-1034-1055
DM TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
D Waldom Electronics, Chicago, Ill. p. 2-1070-1074
CW Industries, Warminster, Pa. *
Frequency Elctns., New Hyde Pk., N.Y. *
D GC Electronics, Rockford, Ill. *
D Johnson Co., E.F., Waseca, Minn. *
Shigoto Inds., Ltd., New York, N.Y. *
Texas Instruments, Attleboro, Mass. *
Amp Inc., Harrisburg, Pa.
DM AMP Special Industries, Valley Forge, Pa.
American Microwave Inds., Waltham, Mass.
M Armel Electronics, N. Bergen, N.J.
DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.
D Astrolab, Rahway, N.J.
Bead Elctns., Bridgeport, Conn.
D Burndy Corporation, Norwalk, Conn.
D Cablewave Systems Inc., North Haven, Conn.
D Cambridge Thermionic Corp., Cambridge, Mass.
M Connector Inds. of America, Cincinnati, Ohio
D Control Data Corp., Westlake Village, Cal.
M Detronics Corp., S. El Monte, Cal.
D Eaton Corporation, Cleveland, Ohio
D Eby Co., Hugh H., Philadelphia, Pa.
D Elco, Willow Grove, Pa.
Emporium Specialties Co., Austin, Pa.
DM Excel Products Co., New Brunswick, N.J.
General Valve Corp., E. Hanover, N.J.
Gulton Inds., Buena Park, Cal.
Hathaway Industries Inc., Tulsa, Okla.
M Hermetic Seal Corp., Rosemead, Cal.
Hypertronics Corp., Stow, Mass.
Industrial Electronic Hardware, New York, N.Y.
Kentucky Electronics, Owensboro, Ky.
DM Kings Electronics, Tuckahoe, N.Y.
Lemo USA, Berkeley, Cal.
D Malco, A Microdot Co., Chicago, Ill.
M Mark Eyelet & Stamping, Wolcott, Conn.
Methode Elctns., Chicago, Ill.
D Molex Products, Downers Grove, Ill.
Narda Microwave Corp., Plainville, N.Y.
D National Connector, Minneapolis, Minn.
D Program Data Co., Carson, Cal.
D Robinson-Nugent, New Albany, Ind.
Singer Co., Little Falls, N.J.
Sjoberg, C. & Son, Cranston, R.I.
DM Solitron/Microwave, Port Salerno, Fla.
Specialty Connector Corp., Indianapolis, Ind.
Stanford Applied Engineering, Santa Clara, Cal.
Stanford Applied Engrg., Santa Ana, Cal.
Statham Instruments, Oxnard, Cal.
D Switchcraft, Chicago, Ill.
M Ted Corporation, Shawnee Mission, Kans.
DM Texas Instruments, Attleboro, Mass.
Trompeter Electronics, Chatsworth, Cal.
DM U.S. Components, Bronx, N.Y.
M U.S. Terminals, Cincinnati, Ohio
Winchester Elctns., Oakville, Conn.

Connectors, Missile (Umbilicals, Interstage, Post Boost)

M Amphenol Connector Div., Broadview, Ill. p. 2-460,461
M Amphenol Connector Div., SAMS Opers., Chatsworth, Cal. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
D Bendix Corp., The, Sidney, N.Y. p. 2-642
Connector Corp., Chicago, Ill. p. 2-660
Dale Elctns., Yankton, S.D. p. 2-1452
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686
ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
M Projects Unlimited, Dayton, Ohio p. 1-271
M Rowe Industries, Toledo, Ohio p. 2-796,797
D Sealectro Corp., Mamaroneck, N.Y. p. 2-807-810
M TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
AirBorn, Addison, Tex. *
M Amphenol RF Div., Danbury, Conn. *
DM Bendix, Franklin, Ind. *
M Addington Labs, Santa Clara, Cal.
D Astrolab, Rahway, N.J.
D Burndy Corporation, Norwalk, Conn.
Caton Connector Corp., Great Neck, N.Y.
M Detronics Corp., S. El Monte, Cal.

M Glenair, Glendale, Cal.
Gulton Inds., Buena Park, Cal.
National Connector, Minneapolis, Minn.
D Program Data Co., Carson, Cal.
Reynolds Inds., Marina Del Rey, Cal.

Connectors, Piggy Back—See Connectors, Wirewrap (Z-3 Level)

Connectors, Plug-In, Program Board

Allied Systems Corp., Greensboro, N.C. p. 2-458,459
D Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
D Arco Electronics Inc., Great Neck, N.Y. p. 2-619
D Bendix Corp., The, Sidney, N.Y. p. 2-641
Berg Electronics, New Cumberland, Pa. p. 2-645,650
Info-Lite Corp., Corona, N.Y. p. 1-2076
Interswitch, Burlingame, Cal. p. 1-2074
D ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
MLVC Inds. Inc., Flushing, N.Y. p. 1-2010,2011,2100
D Molex Inc., Lisle, Ill. p. 2-1068,1069
M Rowe Industries, Toledo, Ohio p. 2-796,797
D Superior Electric Co., Bristol, Conn. p. 2-799
Texas Instruments, Attleboro, Mass. p. 2-1033
D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
D Vector Electronic Co., Sylmar, Cal. p. 2-360
D Waldom Electronics, Chicago, Ill. p. 2-1070-1074
D Smith Inc., Herman H., Brooklyn, N.Y. *
D 3M Company, St. Paul, Minn. *
M Virginia Panel Corp., Waynesboro, Va. *
Amp Inc., Harrisburg, Pa.
DM AMP Special Industries, Valley Forge, Pa.
Aries Electronics, Frenchtown, N.J.
M Armel Electronics, N. Bergen, N.J.
DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.
Burdette Buss Bars, Cherry Hill, N.J.
D Burndy Corporation, Norwalk, Conn.
D Cambridge Thermionic Corp., Cambridge, Mass.
DM Excel Products Co., New Brunswick, N.J.
Hypertronics Corp., Stow, Mass.
Industrial Electronic Hardware, New York, N.Y.
Mac Panel Co., High Pt., N.C.
Methode Elctns., Chicago, Ill.
D National Connector, Minneapolis, Minn.
D Program Data Co., Carson, Cal.
Reynolds Inds., Marina Del Rey, Cal.
Texas Instruments, Attleboro, Mass.

Connectors, Printed Circuit

M AirBorn, Addison, Tex. p. 2-452-455
D Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
D Arco Electronics Inc., Great Neck, N.Y. p. 2-619
D Augat Inc., Attleboro, Mass. p. 2-636
D Bendix Corp., The, Sidney, N.Y. p. 2-641
Berg Electronics, New Cumberland, Pa. p. 2-645,648,650
Connector Corp., Chicago, Ill. p. 2-657-660
DM Continental Connector Corp., Woodside, N.Y. p. 2-662-664
DM Dale Electronics Inc., Columbus, Neb. p. 2-1452
Dale Elctns., Yankton, S.D. p. 2-1452
M Elctn. Molding Corp., Woonsocket, R.I. p. 2-676-679
Elfab Corp., Addison, Tex. p. 2-680,681
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686
ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
DM Keystone Elctns. Corp., New York, N.Y. p. 2-715
Molex Inc., Lisle, Ill. p. 2-1068,1069
D Omni Spectra, Farmington, Mich. p. 2-725
DM Positronic Inds., Springfield, Mo. p. 2-789
D RDI/Reed Devices, Glen Ellyn, Ill. p. 2-792,793
M Rowe Industries, Toledo, Ohio p. 2-796,797
DM Smith Inc., Herman H., Brooklyn, N.Y. p. 2-852
D Spectra-Strip Corp., Garden Grove, Cal. p. 2-2057
D 3M Company, St. Paul, Minn. p. 2-1034-1055
DM TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
DM Vector Electronic Co., Sylmar, Cal. p. 2-360
Vernitron Elec. Comps., Laconia, N.H. p. 2-1064
D Vero Electronics, Hauppauge, N.Y. p. 2-365

D Waldom Electronics, Chicago, Ill. p. 2-1070-1074
CW Industries, Warminster, Pa. *
D Daburn Electronics & Cable Corp., Bronx, N.Y. *
Frequency Elctns., New Hyde Pk., N.Y. *
D GC Electronics, Rockford, Ill. *
Texas Instruments, Attleboro, Mass. *
Adcor Electronic Packaging Corp., New York, N.Y.
Amp Inc., Harrisburg, Pa.
DM AMP Special Industries, Valley Forge, Pa.
American Microwave Inds., Waltham, Mass.
D Ansley Elctns. Corp., Los Angeles, Cal.
M Armel Electronics, N. Bergen, N.J.
M Art Wire & Stamping Co., Cedar Knolls, N.J.
DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.
DM Astrolab, Rahway, N.J.
Autosplisec/Dv Gen Staple, New York City, N.Y.
Bead Elctns., Bridgeport, Conn.
Birnbach Co., Freeport, N.Y.
Burdette Buss Bars, Cherry Hill, N.J.
D Burndy Corporation, Norwalk, Conn.
D Cambridge Thermionic Corp., Cambridge, Mass.
D Circuit-Stik, Torrance, Cal.
Components Corp., Danville, N.J.
D Control Data Corp., Westlake Village, Cal.
Control Products Div., Union, N.J.
Douglas Electronics, San Leandro, Cal.
DM Dynatech Corp., Santa Ana, Cal.
D Eby Co., Hugh H., Philadelphia, Pa.
D Elco, Willow Grove, Pa.
DM Excel Products Co., New Brunswick, N.J.
Gary Mfg., New Brunswick, N.J.
Hathaway Industries Inc., Tulsa, Okla.
Hypertronics Corp., Stow, Mass.
Industrial Electronic Hardware, New York, N.Y.
D Jolo Industries, Garden Grove, Cal.
DM Kings Electronics, Tuckahoe, N.Y.
D Malco, A Microdot Co., Chicago, Ill.
D Masterite Corporation, Torrance, Cal.
Methode Elctns., Chicago, Ill.
D Modpak, Waltham, Mass.
D Molex Products, Downers Grove, Ill.
Mupac Corp., Brockton, Mass.
D National Connector, Minneapolis, Minn.
Precision Paper Tube Co., Wheeling, Ill.
D Program Data Co., Carson, Cal.
Pylon Co., Attleboro, Mass.
D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
D Spec Plastics Inc., No. Hollywood, Cal.
Stanford Applied Engineering, Santa Clara, Cal.
Stanford Applied Engrg., Santa Ana, Cal.
M Star Tron Corp., Providence, R.I.
D Technical Wire Products, Cranford, N.J.
Teledyne Kinetics, Solana Beach, Cal.
Teradyne, Boston, Mass.
DM Texas Instruments, Attleboro, Mass.
DM U.S. Components, Bronx, N.Y.
Winchester Elctns., Oakville, Conn.

Connectors, R-F, Coaxial & Triaxial

DM Amphenol RF Div., Danbury, Conn. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
DM Arco Electronics Inc., Great Neck, N.Y. p. 2-619
DM Bendix Corp., The, Sidney, N.Y. p. 2-642
DM Bendix, Franklin, Ind. p. 2-643
M Bird Electronic Corp., Solon, Ohio p. 2-619
Connector Corp., Chicago, Ill. p. 2-657-660
DM Dale Electronics Inc., Columbus, Neb. p. 2-1452
D E-Z-Hook, Arcadia, Cal. p. 2-671
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686
D ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
D Johnson Co., E.F., Waseca, Minn. p. 2-707
D National Tel-Tronics, Meadville, Pa. p. 2-720
D Omni Spectra, Farmington, Mich. p. 2-725
M Rowe Industries, Toledo, Ohio p. 2-796,797
Sealectro Corp., Mamaroneck, N.Y. p. 2-805,807-811
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-847,849
TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
Amperex Electronic Corp., Slattersville, R.I. *
Frequency Elctns., New Hyde Pk., N.Y. *
D GC Electronics, Rockford, Ill. *
General Radio Co., Concord, Mass. *
D McGraw-Edison Co., Manchester, N.H. *
M Addington Labs, Santa Clara, Cal.
AEL, Colmar, Pa.

D AEL Communications Corp., Sub. of Amer. Elctn. Labs. Inc., Lansdale, Pa.
Amp Inc., Harrisburg, Pa.
DM AMP Special Industries, Valley Forge, Pa.
American Microwave Inds., Waltham, Mass.
Andrew Antenna Co. Ltd., Whitby, Ont., Can.
D Antenna Corp. of America, Burlington, Iowa
M Arnel Electronics, N. Bergen, N.J.
DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.
DM Astrolab, Rahway, N.J.
D Burndy Corporation, Norwalk, Conn.
D Cablewave Systems Inc., North Haven, Conn.
Caton Connector Corp., Great Neck, N.Y.
Ceramaseal, New Lebanon Center, N.Y.
D Channel Master Div. Avnet, Ellenville, N.Y.
Connector Inds. of America, Cincinnati, Ohio
D Control Data Corp., Westlake Village, Cal.
M Detronics Corp., S. El Monte, Cal.
D Finney Co., Bedford, Ohio
D Great Western Aviation, Denver, Colo.
Gulton Inds., Buena Park, Cal.
Hypertronics Corp., Stow, Mass.
DM Kings Electronics, Tuckahoe, N.Y.
Lemo USA, Berkeley, Cal.
D Malco, A Microdot Co., Chicago, Ill.
Maury Microwave Corp., Cucamonga, Calif.
D Modpak, Waltham, Mass.
Motorola Comms. Div., Schaumburg, Ill.
Narda Microwave Corp., Plainview, N.Y.
D Norelcom Electronics, Farmingdale, N.Y.
M Norsal Industries, Brentwood, N.Y.
Pasternack Enterprises, Huntington Beach, Cal.
D Preferred Line Products Co., Cleveland, Ohio
D Sitco Antennas, Portland, Ore.
DM Solitron/Microwave, Port Salerno, Fla.
M Specialty Connector Corp., Indianapolis, Ind.
Technical Mat'l., Mamaroneck, N.Y.
DM Ted Corporation, Shawnee Mission, Kans.
D Thomas & Betts Co., Elizabeth, N.J.
D Times Wire & Cable, Wallingford, Conn.
Trompeter Electronics, Chatsworth, Cal.
Weinschel Engrg. Co., Gaithersburg, Md.

Connectors, Stripline

Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
Amphenol RF Div., Danbury, Conn. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
D Arco Electronics Inc., Great Neck, N.Y. p. 2-619
D ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
D Omni Spectra, Farmington, Mich. p. 2-725
DM Sealectro Corp., Mamaroneck, N.Y. p. 2-810
D Bendix Corp., The, Sidney, N.Y. p. 2-1452
D Bendix, Franklin, Ind. p. 2-687-693
D Molex Inc., Lisle, Ill. p. 2-687-693
American Microwave Inds., Waltham, Mass.
D Astrolab, Rahway, N.J.
Cablewave Systems Inc., North Haven, Conn.
D Excel Products Co., New Brunswick, N.J.
Hypertronics Corp., Stow, Mass.
D Modpak, Waltham, Mass.
Narda Microwave Corp., Plainview, N.Y.
M Norsal Industries, Brentwood, N.Y.
DM Solitron/Microwave, Port Salerno, Fla.
Times Wire & Cable, Wallingford, Conn.

Connectors, Test

M Amphenol Connector Div., SAMS Ops., Chatsworth, Cal. p. 2-460,461
D Arco Electronics Inc., Great Neck, N.Y. p. 2-619
D Continental Connector Corp., Woodside, N.Y. p. 2-662
D Continental Specialties, New Haven, Conn. p. 2-348-351
Dale Elctns., Yankton, S.D. p. 2-1452
D E-Z-Hook, Arcadia, Cal. p. 2-671
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686
D Milen Mfg. Co. Inc., James, Malden, Mass. p. 2-1247-1249
D Positronic Inds., Springfield, Mo. p. 2-789
M Rowe Industries, Toledo, Ohio p. 2-796,797
D Sealectro Corp., Mamaroneck, N.Y. p. 2-803,804
DM TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
D Vector Electronic Co., Sylmar, Cal. p. 2-362
Amphenol RF Div., Danbury, Conn. p. 2-460,461
D Bendix Corp., The, Sidney, N.Y. p. 2-1452
D GC Electronics, Rockford, Ill. p. 2-687-693
General Radio Co., Concord, Mass. p. 2-796,797
D Johnson Co., E.F., Waseca, Minn. p. 2-803,804

Jonard Industries Corp., Tuckahoe, N.Y. p. 2-460,461
D Molex Inc., Lisle, Ill. p. 2-687-693
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-1452
D Accessories for Electronics, Bayside, N.Y.
Air-O-Tronics Prods., Morrisville, N.Y.
American Microwave Inds., Waltham, Mass.
M Arnel Electronics, N. Bergen, N.J.
DM Astrolab, Rahway, N.J.
DM Excel Products Co., New Brunswick, N.J.
M Glenair, Glendale, Cal.
Hypertronics Corp., Stow, Mass.
Jermyn, San Francisco, Cal.
M Jettron Prods., Hanover, N.J.
Lemo USA, Berkeley, Cal.
D National Connector, Minneapolis, Minn.
D Program Data Co., Carson, Cal.
Pylon Co., Attleboro, Mass.
Techno-Comps. Corp., Van Nuys, Cal.
Times Wire & Cable, Wallingford, Conn.
D U.S. Components, Bronx, N.Y.

Connectors, Thermocouple

DM Amphenol Connector Div., Broadview, Ill. p. 2-460,461
D Bendix Corp., The, Sidney, N.Y. p. 2-640,642
Dale Elctns., Yankton, S.D. p. 2-1452
ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
Omega Engrg., Stamford, Conn. p. 1-2324-2327
D Positronic Inds., Springfield, Mo. p. 2-788
Amphenol RF Div., Danbury, Conn. p. 2-460,461
M ARI Inds., Franklin Pk., Ill.
Ceramaseal, New Lebanon Center, N.Y.
M Connector Inds. of America, Cincinnati, Ohio
George Instrument Co., Royal Oak, Mich.
Gordon, Claud S. Co., Richmond, Ill.
Gulton Inds., Buena Park, Cal.
M Hermetic Seal Corp., Rosemead, Cal.
Honeywell, Ft. Washington, Pa.
DM Kings Electronics, Tuckahoe, N.Y.
Leico Inds., New York, N.Y.
Lemo USA, Berkeley, Cal.
Marlin Manufacturing Corp., Cleveland, Ohio
Simmonds Precision, Norwich, N.Y.
Stanford Applied Engrg., Santa Ana, Cal.
Thermo Elec. Co., Saddle Brook, N.J.

Connectors, Wirewrap (2-3 Level)

AirBorn, Addison, Tex. p. 2-452-455
D Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
D Arco Electronics Inc., Great Neck, N.Y. p. 2-619
Berg Electronics, New Cumberland, Pa. p. 2-645,650
Connector Corp., Chicago, Ill. p. 2-659,660
DM Continental Connector Corp., Woodside, N.Y. p. 2-663
D E-Z-Hook, Arcadia, Cal. p. 2-671
Elctn. Molding Corp., Woonsocket, R.I. p. 2-676-679
ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
D Positronic Inds., Springfield, Mo. p. 2-788
D Spectra-Strip Corp., Garden Grove, Cal. p. 2-2057
Texas Instruments, Attleboro, Mass. p. 2-1032
D 3M Company, St. Paul, Minn. p. 2-1034-1055
DM TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
D Vector Electronic Co., Sylmar, Cal. p. 2-360
CW Industries, Warminster, Pa. p. 2-1032
D Molex Inc., Lisle, Ill. p. 2-687-693
D AMP Special Industries, Valley Forge, Pa.
Aries Electronics, Frenchtown, N.J.
M Arnel Electronics, N. Bergen, N.J.
M Art Wire & Stamping Co., Cedar Knolls, N.J.
Autosplice/Dv Gen Staple, New York City, N.Y.
Burdette Buss Bars, Cherry Hill, N.J.
D Control Data Corp., Westlake Village, Cal.
DM Dynatech Corp., Santa Ana, Cal.
D Eby Co., Hugh H., Philadelphia, Pa.
DM Excel Products Co., New Brunswick, N.J.
Gary Mfg., New Brunswick, N.J.
Hypertronics Corp., Stow, Mass.
Industrial Electronic Hardware, New York, N.Y.
Jermyn, San Francisco, Cal.
D Malco, A Microdot Co., Chicago, Ill.
D Masterite Corporation, Torrance, Cal.
Methode Elctns., Chicago, Ill.
D O. K. Machine & Tool Corp., Bronx, N.Y.
D Preformed Line Products Co., Cleveland, Ohio
D Robinson-Nugent, New Albany, Ind.
Stanford Applied Engineering, Santa Clara, Cal.
M Star Tron Corp., Providence, R.I.
Teradyne, Boston, Mass.
M Teradyne Comps., Lowell, Mass.

DM Texas Instruments, Attleboro, Mass.
DM U.S. Components, Bronx, N.Y.
Western Electronic Systems, Palo Alto, Cal.

Connectors, Wire—See Wire Nuts**Consoles, Cabinet—See Volume 1****Contact Cleaners—See Cleaners & Solvents-Also See Burnishers, Contact****Contact Strips, Finger**

Airflyte Elctns. Co., Bayonne, N.J. p. 1-932,933
Instrument Specialties, Little Falls, N.J. p. 2-1226,1229
DM Keystone Elctns. Corp., New York, N.Y. p. 2-1226,1229
Shigoto Inds., Ltd., New York, N.Y. p. 2-1226,1229
D Tapeswitch Corp. Amer., Farmingdale, N.Y. p. 2-1226,1229
Beman Mfg., New Cumberland, Pa.
Braun Co., St. Petersburg, Fla.
Engelhard Minerals & Chem., Murray Hill, N.J.
Excel Products Co., New Brunswick, N.J.
DM Metex Corp., Edison, N.J.
Methode Elctns., Chicago, Ill.
D National Connector, Minneapolis, Minn.
Plessey Inc., Melville, N.Y.
Texas Instruments, Attleboro, Mass.
Wilkinson Co., Westlake Village, Cal.

Contactors—See Volume 1**Contacts, Electrical**

AirBorn, Addison, Tex. p. 2-452-455
D Airflyte Elctns. Co., Bayonne, N.J. p. 1-932,933
Allied Systems Corp., Greensboro, N.C. p. 2-458,459
D Atomat Electronic Hardware, New Haven, Conn. p. 2-457
D Amphenol Connector Div., Broadview, Ill. p. 2-460,461
Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
Berg Electronics, New Cumberland, Pa. p. 2-645,652
D Concord Elctns., New York, N.Y. p. 2-654,655
Connector Corp., Chicago, Ill. p. 2-657-660
Elctn. Molding Corp., Woonsocket, R.I. p. 2-676-679
Graphite Metallizing Corp., Yonkers, N.Y. p. 1-960
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686
Instrument Specialties, Little Falls, N.J. p. 2-1226,1229
D Jones Elctns., Hiram, No. Hollywood, Cal. p. 2-685
DM Positronic Inds., Springfield, Mo. p. 2-788
M Rowe Industries, Toledo, Ohio p. 2-796,797
D Sealectro Corp., Mamaroneck, N.Y. p. 2-803,804
D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
M Amphenol RF Div., Danbury, Conn. p. 2-460,461
DM Keystone Elctns. Corp., New York, N.Y. p. 2-1226,1229
D Molex Inc., Lisle, Ill. p. 2-687-693
Vector Electronic Co., Sylmar, Cal. p. 2-360
D Waldom Electronics, Chicago, Ill. p. 2-896,897
Amp Inc., Harrisburg, Pa.
Auto-Swage Products Inc., Shelton, Conn.
Autosplice/Dv Gen Staple, New York City, N.Y.
M Avid Electronics Corp., Baldwin, Pl., N.Y.
Bead Elctns., Bridgeport, Conn.
Beman Mfg., New Cumberland, Pa.
Braun Co., St. Petersburg, Fla.
D Burndy Corporation, Norwalk, Conn.
Cal-Metex Corp., Inglewood, Cal.
Carbone Lorraine Industries Corp., Boonton, N.J.
D Circuit Assembly Corp., Costa Mesa, Cal.
D Control Data Corp., Westlake Village, Cal.
D-Cemco, Burbank, Calif.
M Deringer Mfg. Co., Mundelein, Ill.
D Eaton Corporation, Cleveland, Ohio
D Elco, Willow Grove, Pa.
Engelhard Minerals & Chem., Murray Hill, N.J.
DM Excel Products Co., New Brunswick, N.J.
Fansteel Inc., N. Chicago, Ill.
Gary Mfg., New Brunswick, N.J.
GTE Sylvania Inc., Delmont, Pa.
Industrial Electronic Hardware, New York, N.Y.
D Malco, A Microdot Co., Chicago, Ill.
DM Metex Corp., Edison, N.J.
Methode Elctns., Chicago, Ill.
D National Connector, Minneapolis, Minn.
Ohio Carbon Co., Cleveland, Ohio
D Ostby & Barton Co., Providence, R.I.

PRODUCT INDEX & DIRECTORY

Cords & Cable, Dial Drive

Philips Elmet Corp., Lewiston, Me.
Plessey Inc., Melville, N.Y.
Pylon Co., Attleboro, Mass.
DM Servometer Corp., Cedar Grove, N.J.
Sjoberg, C. & Son, Cranston, R.I.
Stackpole Carbon Co., St. Marys, Pa.
Stanford Applied Engrg., Santa Ana, Cal.
D Technical Wire Products, Cranford, N.J.
Texas Instruments, Attleboro, Mass.
D Union Carbide Corp., New York, N.Y.

Containers, Shielded (All Types)—See Volume 1

Containers, Shipping, Metal & Fiberglass—Also see Cases, Transit—See Volume 1

Containers, Storage—See Volume 1

Controllers, Programmable—See Volume 1

Control Panels & Systems, Computer—See Boards, Programming

Control Systems, Air Traffic—See Volume 1

Controls, Capacitance Operated—See Volume 1

Controls, Carbon—See Potentiometers; Rheostats

Controls, Constant Impedance—See Volume 1

Controls, Counting and Sorting—See Volume 1

Controls, Density—See Volume 1

Controls, Dimension—See Volume 1

Controls, Door Opening & Closing (Industrial)—See Volume 1

Controls, Environmental Test Equipment—See Volume 1

Controls, Fader—See Volume 1

Controls, Fluid Conductivity—See Volume 1

Controls, Fluid Flow—See Volume 1

Controls, Frequency—See Volume 1

Controls, Gas—See Volume 1

Controls, Hardware, Shafts & Accessories—See Volume 1

Controls, Humidity—See Volume 1

Controls, Ignitron Firing—See Volume 1

Controls, Joystick—See Volume 1

Controls, Lamp Dimming, Flashing—See Volume 1

Controls, Level, Dry Material—See Volume 1

Controls, Level, Liquid—See Volume 1

Controls, Machine Tool—See Volume 1

Controls, Moisture—See Volume 1

Controls, Motor Speed—See Volume 1

Controls, Oscillator—See Volume 1

Controls, Photoelectric—See Volume 1

Controls, Positioning—See Volume 1

Controls, Pressure—See Volume 1

Controls, Proportional—See Volume 1

Controls, Proximity-Also See Controls, Capacitance Operated—See Volume 1

Controls, Remote—See Volume 1

Controls, Run, Shutdown Command, Start—See Volume 1

Controls, SCR—See Volume 1

Controls, Sensing, Monitoring-Voltage, Phase, Frequency—See Volume 1

Controls, Servo System—See Volume 1

Controls, Stepping Motor—See Volume 1

Controls, Temperature—See Volume 1

Controls, Thyatron Grid—See Volume 1

Controls, Timing—See Volume 1

Controls, Torque-Electronic—See Volume 1

Controls, Voltage Regulating—See Volume 1

Controls, Volume & Tone—See Potentiometers; Rheostats

Convection Cooling Packages, Semiconductor—See Volume 1

Converters, A-C to D-C (Non-Rotary)—See Volume 1

Converters, Analog To Digital—See Volume 1

Converters, Analog To Pulse—See Volume 1

Converters, Binary To Decimal—See Volume 1

Converters, Card To Tape—See Volume 1

Converters, CRT Display—See Volume 1

Converters, D-C to D-C, Less Than 30 VDC Output—See Volume 1

Converters, D-C to D-C, 30 to 300 VDC Output—See Volume 1

Converters, D-C to D-C, 300 to 1,000 VDC Output—See Volume 1

Converters, D-C to D-C, Greater Than 1,000 VDC Output—See Volume 1

Converters, D-C to Frequency (Power)—See Volume 1

Converters, D-C to Sine-Cosine—See Volume 1

Converters, Digital To Analog—See Volume 1

Converters, Digital To Paper Tape—See Volume 1

Converters, Digital To Resolver—See Volume 1

Converters, Digital To Synchro—See Volume 1

Converters, Frequency, Logarithmic—See Volume 1

Converters, Frequency Shift Keying—See Volume 1

Converters, Frequency, Test—See Volume 1

Converters, Frequency to D-C - Also see Power Supplies A-C Input, D-C Output—See Volume 1

Converters, Graphic To Digital—See Volume 1

Converters, High-Frequency—See Volume 1

Converters, Low-Frequency—See Volume 1

Converters, Microwave Frequency—See Volume 1

Converters, Multiplying, Analog to Digital and Digital to Analog—See Volume 1

Converters, Paper Tape To Magnetic Tape—See Volume 1

Converters, Paper Tape To Paper Tape—See Volume 1

Converters, Phase—See Volume 1

Converters, Polar To Rectangular Coordinates—See Volume 1

Converters, Power Frequency, Electronic—See Volume 1

Converters, Power Frequency, Rotary—See Volume 1

Converters, Pressure To D-C, Pressure To Frequency—See Volume 1

Converters, Pulse To Analog—See Volume 1

Converters, Pulse To Digital—See Volume 1

Converters, Resolver To Digital—See Volume 1

Converters, Rotary—See Volume 1

Converters, Scan—See Volume 1

Converters, Single Sideband Receiver—See Volume 1

Converters, Synchro To Digital—See Volume 1

Converters, Synchro To Linear D-C—See Volume 1

Converters, Synchro To Sine-Cosine—See Volume 1

Converters, Tape To Card—See Volume 1

Converters, Telemetry—See Volume 1

Converters UHF To VHF—See Volume 1

Converters, Voltage To Frequency—See Volume 1

Coolants, Circuit & Components Also see Refrigerants, Spray
D Chemtronics, Hauppauge, N.Y.
Dow Chemical Co., Midland, Mich.
Dow Corning, Midland, Mich.
E.I. DuPont de Nemours & Co., Wilmington, Del.
D General Elec. Co., Waterford, N.Y.
D Heeger Inc., Los Angeles, Cal.
LMB Heeger, Los Angeles, Cal.
D Miller-Stephenson Chem. Co., Danbury, Conn.
SWS Silicones, Adrian, Mich.
Triac Electronics, New York, N.Y.
Union Carbide, Chemicals & Plastics, New York, N.Y.
D Workman Electronic Prods., Sarasota, Fla.

Cooling Equipment—See Volume 1

Cooling/Heating Modules, Thermoelectric—See Volume 1

Cooling Sprays—See Coolants, Circuit & Components; Refrigerants, Spray

Cords & Cable, Dial Drive
D Columbia Elctn. Cables, New Bedford, Mass. p. 2-1911
Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1090
M Rowe Industries, Toledo, Ohio p. 2-796,797
D GC Electronics, Rockford, Ill. *
Shigoto Inds., Ltd., New York, N.Y. *
DM Amrad Corporation, Paris, Tex.
Birnbach Co., Freeport, N.Y.
D Hackensack Cable Corp., West Columbia, S.C.

Cords, Communication, Control, Microphone, etc.—See Cable, Specific Type

Cords & Tapes, Lacing

DM Alpha Wire Corp., Elizabeth, N.J. p. 2-1878
DM Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1992

DM Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
DM Smith Inc., Herman H., Brooklyn, N.Y. p. 2-829,876

D Varflex Corp., Rome, N.Y. p. 2-1274,1275
D GC Electronics, Rockford, Ill. *

DM Amrad Corporation, Paris, Tex.
D Birnbach Co., Freeport, N.Y.
M Chemplast, Wayne, N.J.
D Cole-Flex Corp., W. Babylon, N.Y.
Communications Technology Corp., Los Angeles, Cal.
M Gudebrod Bros. Silk Co., Philadelphia, Pa.
DM ICO/Rally Corp., Palo Alto, Cal.
Mann, Henry Inc., Huntingdon Valley, Pa.
M Newman Corp., M. M., Marblehead, Mass.
D Norelcom Electronics, Farmingdale, N.Y.
DM Transcon Mfg. Co., Dallas, Tex.
D Zippertubing Co., Los Angeles, Calif.

Cords, Line & Set, Extension

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1859
CEA, San Luis Obispo, Cal. p. 1-1125
D Columbia Elctn. Cables, New Bedford, Mass. p. 2-1911

D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1966
D Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993

M Rowe Industries, Toledo, Ohio p. 2-796,797
D SGL Weber Electric, Westville, NJ p. 2-356

Allied Systems Corp., Greensboro, N.C. *
Shigoto Inds., Ltd., New York, N.Y. *
Standard Wire & Cable Co., Los Angeles, Cal. *

D Waldom Electronics, Chicago, Ill. *
M Arco Wire & Cable, N. Hollywood, Cal.
Beman Mfg., New Cumberland, Pa.

D Birnbach Co., Freeport, N.Y.
D Cable Systems & Assembly Co., Everett, Mass.
Essex International, Sycamore, Ill.
Excel Specialty Corp., Chicago, Ill.
Leviton Mfg. Co., Little Neck, N.Y.

D Manhattan Elec. Cable Corp., Rye, N.Y.
Morey Corp., Downers Grove, Ill.
D Pacific Electricord Co., Gardena, Cal.

DM Saxton Prods., Congers, N.Y.
M Storm Products Co., Inglewood, Ca.
Triac Electronics, New York, N.Y.

TRW/Holyoke Wire & Cable, South Hadley, Mass.
Universal Security Instrs., Baltimore, Md.
D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

D Workman Electronic Prods., Sarasota, Fla.

Birnbach Co., Freeport, N.Y.

D Cable Systems & Assembly Co., Everett, Mass.

California Avionics Labs., Palo Alto, Calif.

Conrac Corp., Westminster, Cal.

D Ev-Game Inc., Freeport, N.Y.

Essex International, Sycamore, Ill.

Excel Specialty Corp., Chicago, Ill.

GTE Lenkurt Inc., San Carlos, Calif.

Mac Panel Co., High Pt., N.C.

D Malco, A Microdot Co., Chicago, Ill.

Manger Elec. Co., Stamford, Conn.

Morey Corp., Downers Grove, Ill.

D Philmore Mfg. Co. Inc., Inwood, N.Y.

D Rye Inds., Mamaroneck, N.Y.

Saxton Prods., Congers, N.Y.

Scientific Measurements, Evanston, Ill.

Technical Mat'l., Mamaroneck, N.Y.

Tektronix, Beaverton, Ore.

Trompeter Electronics, Chatsworth, Cal.

M U.S. Terminals, Cincinnati, Ohio

D Workman Electronic Prods., Sarasota, Fla.

Cords, Power—See Cable, Power

Cords, Retractable

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1860

D Belden Corp., Richmond, Ind. p. 2-1882-1909

D Columbia Elctn. Cables, New Bedford, Mass. p. 2-1911

D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1965

D Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1988,1989

D Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993

D ITT Pomona Electronics Div., Pomona, Cal. p. 2-774,782

M Rowe Industries, Toledo, Ohio p. 2-796,797

D GC Electronics, Rockford, Ill. *

Interelectronics Corp., Congers, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

Standard Wire & Cable Co., Los Angeles, Cal. *

D Birnbach Co., Freeport, N.Y.

Boston Insulated Wire & Cable Co., Dorchester, Mass.

Morey Corp., Downers Grove, Ill.

D N T-T/Peerless, Leominster, Mass.

Russell Inds., Lynbrook, N.Y.

Rye Inds., Mamaroneck, N.Y.

DM Saxton Prods., Congers, N.Y.

M Storm Products Co., Inglewood, Ca.

D Superior Cable Div., Hickory, N.C.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

TDK Elctns. Corp., Long Island City, N.Y.

Tohoku Metal Inds., Ltd., Tokyo, Japan

United Mineral & Chem. Corp., New York, N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

Cores, Magnetic, Ferrite, Pot/Cup

Arnold Engineering Co., Marengo, Ill. p. 2-1212,1213

Fair-Rite Prods. Corp., Wallkill, N.Y. p. 2-1215

D Ferroxcube Corp., Saugerties, N.Y. p. 2-1218-1225

Krystinel Corp., Port Chester, N.Y. p. 2-1234

Allen-Bradley Co., Milwaukee, Wisc. *

Ceramic Magnetics, Fairfield, N.J.

Fuji Electrochemical Co., Tokyo, Japan

D Indiana General, Keasbey, N.J.

Lockheed Elctns. Co., Watchung, N.J.

Magnetic Metals Co., Camden, N.J.

Magnetics, Butler, Pa.

Murata Mfg. Co. Ltd., Kyoto, Japan

Permag Corp., Jamaica, N.Y.

D Siemens Corp., Iselin, N.J.

Stackpole Carbon Co., St. Mary's, Pa.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

TDK Elctns. Corp., Long Island City, N.Y.

Tohoku Metal Inds., Ltd., Tokyo, Japan

United Mineral & Chem. Corp., New York, N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

DM United Prods. Co., New Hyde Pk., N.Y.

</

United Mineral & Chem. Corp., New York, N.Y.
DM United Prods. Co., New Hyde Pk., N.Y.

Cores, Magnetic, Metal Alloy (Other Than Silicon & Nickel-Iron)

Arnold Engineering Co., Marengo, Ill.
p. 2-1212, 1213
Hutchinson Industrial Corp., Hutchinson, Minn.
p. 1-1542, 1543
Inter-Tech. Grp., Irvington-on-Hudson, N.Y.
p. 2-1230
SGL Electronics, Westville, N.J. p. 2-1254
Fuji Electrochemical Co., Tokyo, Japan
Magnetic Metals Co., Camden, N.J.
M Magnetics, Butler, Pa.
Permag Corp., Jamaica, N.Y.
DM United Prods. Co., New Hyde Pk., N.Y.

Cores, Magnetic, Nickel-Iron, EL, EE, F & Ring Laminations

Arnold Engineering Co., Marengo, Ill.
p. 2-1212, 1213
Hutchinson Industrial Corp., Hutchinson, Minn.
p. 1-1542, 1543
Inter-Tech. Grp., Irvington-on-Hudson, N.Y.
p. 2-1230
SGL Electronics, Westville, N.J. p. 2-1254
Barker Elec. Sls., Ship Bottom, NJ
Fuji Electrochemical Co., Tokyo, Japan
Magnetic Metals Co., Camden, N.J.
M Magnetics, Butler, Pa.
Permag Corp., Jamaica, N.Y.
Tohoku Metal Inds., Ltd., Tokyo, Japan
DM United Prods. Co., New Hyde Pk., N.Y.

Cores, Magnetic, Nickel-Iron, Toroid

Arnold Engineering Co., Marengo, Ill.
p. 2-1212, 1213
Inter-Tech. Grp., Irvington-on-Hudson, N.Y.
p. 2-1230
Krystinel Corp., Port Chester, N. Y. p. 2-1234
SGL Electronics, Westville, N.J. p. 2-1254
Barker Elec. Sls., Ship Bottom, NJ
Dynacor, Rockville, Md.
Magnetic Metals Co., Camden, N.J.
M Magnetics, Butler, Pa.
Permag Corp., Jamaica, N.Y.
DM United Prods. Co., New Hyde Pk., N.Y.

Cores, Magnetic, Powdered Iron, Pot/Cup

Arnold Engineering Co., Marengo, Ill.
p. 2-1212, 1213
Cortec, Newport Beach, Cal.
Fuji Electrochemical Co., Tokyo, Japan
Pyroferic - N. Y., Bronx, N.Y.
Tohoku Metal Inds., Ltd., Tokyo, Japan
DM United Prods. Co., New Hyde Pk., N.Y.

Cores, Magnetic, Powdered Iron, Slug

Arnold Engineering Co., Marengo, Ill.
p. 2-1212, 1213
Caddell-Burns Mfg. Co., Mineola, N. Y.
p. 2-382-385
M Analog Devices, Resistor Pdt., Rochester, NY
Cortec, Newport Beach, Cal.
Pyroferic - N. Y., Bronx, N.Y.
Tohoku Metal Inds., Ltd., Tokyo, Japan
DM United Prods. Co., New Hyde Pk., N.Y.
D Workman Electronic Prods., Sarasota, Fla.

Cores, Magnetic, Powdered Iron, Toroid

Arnold Engineering Co., Marengo, Ill.
p. 2-1212, 1213
Cortec, Newport Beach, Cal.
Pyroferic - N. Y., Bronx, N.Y.
Tohoku Metal Inds., Ltd., Tokyo, Japan
DM United Prods. Co., New Hyde Pk., N.Y.

Cores, Magnetic, Powdered Permalloy, Toroid

Arnold Engineering Co., Marengo, Ill.
p. 2-1212, 1213
M Magnetics, Butler, Pa.
DM United Prods. Co., New Hyde Pk., N.Y.

Cores, Magnetic, Silicon "C"

Arnold Engineering Co., Marengo, Ill.
p. 2-1212, 1213
Inter-Tech. Grp., Irvington-on-Hudson, N.Y.
p. 2-1230
SGL Electronics, Westville, N.J. p. 2-1254
Barker Elec. Sls., Ship Bottom, NJ
Magnetic Metals Co., Camden, N.J.
M Magnetics, Butler, Pa.

Cores, Magnetic, Silicon EI, EE & F, Laminations

Arnold Engineering Co., Marengo, Ill.
p. 2-1212, 1213
Inter-Tech. Grp., Irvington-on-Hudson, N.Y.
p. 2-1230
SGL Electronics, Westville, N.J. p. 2-1254
Thomas & Skinner, Indpls., Ind. p. 1-819
Fuji Electrochemical Co., Tokyo, Japan
Magnetic Metals Co., Camden, N.J.
M Magnetics, Butler, Pa.

Cores, Magnetic, Silicon, Toroid

Arnold Engineering Co., Marengo, Ill.
p. 2-1212, 1213
Inter-Tech. Grp., Irvington-on-Hudson, N.Y.
p. 2-1230
SGL Electronics, Westville, N.J. p. 2-1254
Barker Elec. Sls., Ship Bottom, NJ
Magnetic Metals Co., Camden, N.J.
M Magnetics, Butler, Pa.
United Prods. Co., New Hyde Pk., N.Y.

Corners, Waveguide—See Bends & Twists, Microwave

Coulometers—See Volume 1

Counters, Bidirectional—See Volume 1

Counters, Coil Winding—See Volume 1

Counters, Directional—See Volume 1

Counters, Electro-Magnetic—See Volume 1

Counters, Event—See Volume 1

Counters, Frequency—See Volume 1

Counters, Mechanical—See Volume 1

Counters, Particle—See Volume 1

Counters, Photoelectric—See Volume 1

Counters, Predetermining—See Volume 1

Counters, Preset—See Volume 1

Counters, Printing—See Volume 1

Counters, Proportional—See Volume 1

Counters, Pulse—See Volume 1

Counters, Reversible—See Volume 1

Counters, Revolution—See Volume 1

Counters, Variable Time Base—See Volume 1

Couplers, Acoustic—See Volume 1

Couplers, Antenna—See Volume 1

Couplers, Directional

Amphenol RF Div., Danbury, Conn.
p. 2-460, 461
Applied Research Inc., Port Washington, N.Y.
p. 2-1276, 1277
Arra Inc., Bay Shore, N.Y. p. 2-1278, 1279
Bendix, Franklin, Ind. p. 2-1280
M Bird Electronic Corp., Solon, Ohio p. 1-618
M Electro Impulse, Red Bank, N.J.
p. 1-492, 662-666

North Hills Elctns., Glen Cove, N.Y. p. 2-1388
D Omni Spectra, Farmington, Mich. p. 2-724
Rental Electronics, Lexington, Mass.
p. 1-792-795

General Radio Co., Concord, Mass. *

NES, Streamwood, Ill. *

Syston-Donner Microwave Div., Van Nuys, Cal. *

AEL, Colmar, Pa.
Aircorn, Union, N.H.

M Airtion, Morris Plains, N.J.
American Microwave Inds., Waltham, Mass.

DM Anaren Microwave, Syracuse, N.Y.
D Blonder-Tongue Labs., Old Bridge, N.J.

Coaxial Dynamics, Cleveland, Ohio
Coil-Craft Inc., Bronxville, N.Y.

M Connecticut Microwave Corp., New Hartford, Conn.
Engelmann Microwave, Montville, N.J.
Environmental Communications Inc., Costa Mesa, Cal.

D Finney Co., Bedford, Ohio
Hewlett-Packard Co., Palo Alto, Cal.

HRB-Singer, State College, Pa.
D Jerrold Electronics Corp., Horsham, Pa.
M Lorch Elctns. Corp., Englewood, N.J.
M Lorch Devices Inc., Englewood, N.J.
Maury Microwave Corp., Cucamonga, Calif.
M Merrimac Inds., West Caldwell, N.J.
M Microlab/FXR, Livingston, N.J.
Microphase Corp., Cos Cob, Conn.
D Microwave Development Labs., Needham Hgts., Mass.
Microwave/Sys., E. Syracuse, N.Y.
Morey Corp., Downers Grove, Ill.
Mu-Del Elctns., Silver Spring, Md.
Narda Microwave Corp., Plainville, N.Y.
M Norsal Industries, Brentwood, N.Y.
D PRD Elctns., Syosset, N.Y.
M Premier Microwave, Port Chester, N.Y.
R L C Elctns., Mt. Kisco, N.Y.
Rhode & Schwarz Sls., Fairfield, N.J.
D Singer Co., Palo Alto, Cal.
Technical Mat'l., Mamaroneck, N.Y.
M Technical Research & Mfg., Manchester, N.H.
M Transco Prods., Venice, Cal.
D TRG., Woburn, Mass.
Tucker Electronics Co., Garland, Tex.
Varian Assocs., Palo Alto, Cal.
Varian Electron Tube & Device Grp., San Carlos, Cal.
Varian Palo Alto Microwave Tube Div., Palo Alto, Cal.
Waveline, W. Caldwell, N.J.
Weinschel Engrg. Co., Gaithersburg, Md.
Wide Band Engrg. Co. Inc., Phoenix, Ariz.
D Wiltron Co., Palo Alto, Cal.

Couplers, Microwave

Amphenol RF Div., Danbury, Conn.
p. 2-460, 461
Applied Research Inc., Port Washington, N.Y.
p. 2-1276, 1277
Arra Inc., Bay Shore, N.Y. p. 2-1278, 1279
M Electro Impulse, Red Bank, N.J.
p. 1-492, 662-666

D Omni Spectra, Farmington, Mich. p. 2-724
MRHG Elctns. Lab., Deer Park, N.Y. p. 2-1389

Amperex Electronic Corp., Slatersville, R.I. *

Bendix, Franklin, Ind. *

General Radio Co., Concord, Mass. *

Syston-Donner Microwave Div., Van Nuys, Cal. *

AEL, Colmar, Pa.
M Aertech Industries, Sunnyvale, Cal.

Aircorn, Union, N.H.
M Airtion, Morris Plains, N.J.

American Microwave Inds., Waltham, Mass.
DM Anaren Microwave, Syracuse, N.Y.

M Co-Operative Inds., Chester, N.J.
Coaxial Dynamics, Cleveland, Ohio

M Connecticut Microwave Corp., New Hartford, Conn.
Elcom Systems, Deer Pk., N.Y.

Engelmann Microwave, Montville, N.J.
Environmental Communications Inc., Costa Mesa, Cal.

Gabriel Elctns. Inc., Scarborough, Me.
GTE Sylvania Inc., Washington, D.C.

Hewlett-Packard Co., Palo Alto, Cal.
HRB-Singer, State College, Pa.

Hughes Aircraft Co., Culver City, Cal.
Litton Inds., San Carlos, Calif.

M Lorch Elctns. Corp., Englewood, N.J.
M Lorch Devices Inc., Englewood, N.J.

Maury Microwave Corp., Cucamonga, Calif.
M Merrimac Inds., West Caldwell, N.J.

M Microlab/FXR, Livingston, N.J.
Microphase Corp., Cos Cob, Conn.

Microwave Assocs., Burlington, Mass.
D Microwave Development Labs., Needham Hgts., Mass.

Microwave Prods., Chatsworth, Cal.
Microwave/Sys., E. Syracuse, N.Y.

Morey Corp., Downers Grove, Ill.
Narda Microwave Corp., Plainville, N.Y.

M Norsal Industries, Brentwood, N.Y.
D PRD Elctns., Syosset, N.Y.

M Premier Microwave, Port Chester, N.Y.
Reeve Electronics, Chicago, Ill.

R L C Elctns., Mt. Kisco, N.Y.
D Singer Co., Palo Alto, Cal.

Sivers Lab, Corona del Mar, Cal.
M Technical Research & Mfg., Manchester, N.H.

M Transco Prods., Venice, Cal.
D TRG., Woburn, Mass.

TRW Elec. Functions, Camden, N.J.
Tucker Electronics Co., Garland, Tex.

Varian Assocs., Palo Alto, Cal.
Varian Electron Tube & Device Grp., San Carlos, Cal.

Varian Palo Alto Microwave Tube Div., Palo Alto, Cal.
Waveline, W. Caldwell, N.J.

Weinschel Engrg. Co., Gaithersburg, Md.

Couplers, Multi-Set—See Volume 1**Couplers, Rotary**

- M Airtron, Morris Plains, N.J.
 Microphase Corp., Cos Cob, Conn.
 D Microwave Development Labs., Needham Hgts., Mass.
 Morey Corp., Downers Grove, Ill.
 M Premier Microwave, Port Chester, N.Y.
 Waveline, W. Caldwell, N.J.

Couplings, Quick-Disconnect, Liquid or Gas

- Airmatic/Beckett-Harcum, Wilmington, Ohio
 Consolidated Controls Corp., Bethel, Conn.
 Edwards High Vacuum, Grand Island, N.Y.
 M Lear Siegler, Santa Monica, Calif.
 DM Matheson Gas Products, East Rutherford, N.J.
 Owatonna Tool Co., Owatonna, Minn.
 M Premier Microwave, Port Chester, N.Y.
 Snap-On-Tools, Kenosha, Wisc.

Couplings, Shaft, Rigid & Flexible

- D Amatonic Electronic Hardware, New Haven, Conn. p. 2-1258
 DM Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1091
 D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1245, 1246
 M Precision Mechanisms Corp., Westbury, N.Y. p. 1-1919
 Smith Inc., Herman H., Brooklyn, N.Y. p. 2-849
 Jackson Bros., (London) Ltd., New York, N.Y. *
 DM Keystone Elctns. Corp., New York, N.Y. *
 Anchor Plastics, Long Island City, N.Y.
 Birnbach Co., Freeport, N.Y.
 Bowmar/ALI, Acton, Mass.
 Disc Instruments, Costa Mesa, Ca.
 Farrand Controls, Valhalla, N.Y.
 M Helical Prods. Co., Santa Maria, Cal.
 M Instru-Lec Corp., Mt. Vernon, N.Y.
 M Machine Components Corp., Plainview, N.Y.
 D Metal Bellows Corp., Sharon, Mass.
 D Naugler Engrg., Beverly, Mass.
 Northfield Precision Instr. Corp., Island Park, N.Y.
 Perfect Gear & Instr. Div., Northridge, Calif.
 M PIC Design Division, Ridgefield, Conn.
 Renbrandt, Boston, Mass.
 DM Servometer Corp., Cedar Grove, N.J.
 Sterling Instr., New Hyde Pk., NY
 DM Stock Drive Prods., New Hyde Pk., N.Y.
 Theta Instr. Corp., Fairfield, N.J.
 D Vemaline Prods. Co., Wyckoff, N.J.

Covers, Protective (Including Dust)—See Volume 1**Crayons, Coatings, Pellets, etc., Temperature Indicating**—See Volume 1**Crossbars**—See Volume 1**Crystal Blanks**—See Volume 1**Crystals, Frequency Control**—See Volume 1**Crystals, Piezoelectric**—See Volume 1**Crystals, Quartz**—See Volume 1**Crystals, Semiconductor (Ingots & Wafers)**—See Volume 1**Crystals, Yig**—See Volume 1**Cups, Encapsulation**

- Micrite Metal Mfg., Canoga Park, Cal. p. 2-1236-1239
 DM Keystone Elctns. Corp., New York, N.Y. *
 Electrical Plastics Corp., Long Branch, N.J.
 EpoxyCast Electronic Case Co., Yonkers, N.Y.
 Gibson/Egan Co., Arcadia, Calif.
 Globe Plastics, Pomona, Cal.
 M Moldtronics, Downers Grove, Ill.
 Precision Paper Tube Co., Wheeling, Ill.
 Raychem Corp., Menlo Park, Cal.
 Resdel Corp., Rio Grande, N.J.
 Robison Elctns., San Luis Obispo, Cal.
 D Spec Plastics Inc., No. Hollywood, Cal.
 Wells Electronics, South Bend, Ind.

Current Sensors-Also See Transducers, Volt, etc.—See Volume 1**Current Sources**—See Volume 1**Cutters, Diagonal**—See Cutters, Wire, Hand Operated**Cutters, Wire, Automatic**—See Volume 1**Cutters, Wire, Hand Operated**

- D Channellock, Meadville, Pa. p. 2-1693
 D ETC Terminal Products, Solon, Ohio p. 2-695-706
 Gardner-Denver, Grand Haven, Mich. p. 2-1697
 D GC Electronics, Rockford, Ill. p. 2-1696
 D Panduit Corp., Tinley Park, Ill. p. 2-2048-2051
 D Vaco Products Co., Chicago, Ill. p. 2-1716
 Belden Corp., Richmond, Ind. *
 D Waldom Electronics, Chicago, Ill. *
 D Adtool Corp., Montreal W P Q, Can.
 D AMP Special Industries, Valley Forge, Pa.
 D Ideal Industries Inc., Sycamore, Ill.
 ITT Holub Industries, Sycamore, Ill.
 D Klein, Mathias & Sons, Chicago, Ill.
 Mann, Henry Inc., Huntingdon Valley, Pa.
 D Midland International Corp., No. Kansas City, Mo.
 Motorola Comms. Div., Schaumburg, Ill.
 D O. K. Machine & Tool Corp., Bronx, N.Y.
 D Porter, H.K., Somerville, Mass.
 Snap-On-Tools, Kenosha, Wisc.
 Universal Security Instrs., Baltimore, Md.
 D Xcelite, Orchard Park, N.Y.

Dampers, Servo—See Volume 1**Dampers, Structural, Chassis, Panel, etc.**—See Volume 1**Data Acquisition & Reduction Systems**—See Volume 1**Data Compressors, Digital**—See Volume 1**Data Display Indicators**—See Lights; Dials; Display Devices & Displays; Tubes, Readout**Data Display Systems**—See Displays; Terminals, Data Display**Data Loggers**—See Volume 1**Decade Boxes, Capacitance**—See Volume 1**Decade Boxes, Delay Line**—See Volume 1**Decade Boxes, Inductance**—See Volume 1**Decade Boxes, Resistance**—See Volume 1**Decade Boxes, Transformer**—See Volume 1**Decalcomania-Also See Labels, Pressure Sensitive**

- D Datak Corp., Guttenberg, N.J. ... p. 2-354, 1079
 Cherry Electrical Prods. Corp., Waukegan, Ill. *
 M Meyercood Co., Wheaton, Ill.
 Photo Chemical Prods. Cal., Santa Monica, Cal.

Decoders, Binary To Decimal—See Volume 1**Decoders, Digital To Analog**—See Volume 1**Decoders, Pulse**—See Volume 1**Decoders, Readout**—See Drivers & Decoders For Readouts**Decoders, Telemetry**—See Volume 1**Decoders, Tone**—See Volume 1**Decoders, Video**—See Volume 1**Decommutators, Telemetering**—See Volume 1**Decontaminants**—See Cleaners & Solvents**Degaussers**—See Volume 1**Degreasing Chemicals**—See Cleaners & Solvents**Dehumidifiers (For Equipment)**—See Volume 1**Dehydrators**—See Volume 1**Delay Lines, Cable**—See Volume 1**Delay Lines, Distributed, Constant (Fixed)**—See Volume 1**Delay Lines, Distributed, Constant (Variable)**—See Volume 1**Delay Lines, Glass & Quartz**—See Volume 1**Delay Lines, Liquid**—See Volume 1**Delay Lines, Lumped-Constant (Electrically Variable)**—See Volume 1**Delay Lines, Lumped-Constant (Fixed)**—See Volume 1**Delay Lines, Lumped-Constant (Mechanically Variable)**—See Volume 1**Delay Lines, Magnetostrictive**—See Volume 1**Delay Lines, Miniature & Subminiature-Also See Specific Types Of Delay Lines**—See Volume 1**Delay Lines, Solid Blank**—See Volume 1**Delay Lines, Strip**—See Volume 1**Delay Lines, Trimmer**—See Volume 1**Delay Lines, Ultrasonic**—See Volume 1**Delay Lines, Video**—See Volume 1**Delay Lines, Waveguide**—See Volume 1**Delay Lines, Wire**—See Volume 1**Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays)**—See Volume 1**Demagnetizers**—See Volume 1**Demodulators**—See Volume 1**Demodulators, Magnetic**—See Volume 1**Densitometers, Electronic**—See Volume 1**Deposition Equipment, Vacuum & Accessories-Also See Evaporation Equipment, Electron Beam**—See Volume 1**Desiccators**—See Volume 1**Desoldering Tools & Equipment**—See Soldering Accessories; Soldering Equip.; Soldering Guns; etc.**Detectors, A-F**—See Volume 1**Detectors, Coaxial**—See Volume 1**Detectors, Corona**—See Volume 1**Detectors, Crystal**—See Volume 1**Detectors, Flaw & Defect-Also See Locators, Open-Short**—See Volume 1**Detectors, F-M**—See Volume 1**Detectors, Frequency**—See Volume 1**Detectors, Gas Leak**—See Volume 1**Detectors, Impedance**—See Volume 1**Detectors, Infrared**—See Volume 1**Detectors, Light Intensity**—See Volume 1**Detectors, Magnetic**—See Volume 1**Detectors, Microwave**—See Volume 1**Detectors, Null**—See Volume 1**Detectors, Phase-Sensitive**—See Volume 1**Detectors, Photovoltaic**—See Volume 1

PRODUCT INDEX & DIRECTORY

Detectors, R-F—See Volume 1

Detectors, Radiation—See Volume 1

Detectors, Standing Wave—See Volume 1

Detectors, Ultraviolet—See Volume 1

Detectors, Vacuum—See Volume 1

Detectors, Vibration—See Volume 1

Detectors, Video—See Volume 1

Detectors, Voltage—See Volume 1

Dials, Instrument, Metal, Plastic, etc.

D Amphenol Connector Div., Controls Oper., Broadview, Ill. p. 2-460,461

DM Beckman Instrs., Fullerton, Cal. p. 2-1621

D Datak Corp., Guttenberg, N.J. ... p. 2-354,1079

Hutchinson Industrial Corp., Hutchinson, Minn. p. 1-1542,1543

Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1090

D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1247,1249

SGL Homalite, Wilmington, Del. p. 2-1254

D Spectrol Electronics Corp., City of Industry, Cal. p. 2-1681

D Arrow-Hart, Hartford, Conn. *

E-Systems, Huntington, Ind. *

DM Electronic Hardware Corp., Jamaica, N.Y. *

Jackson Bros., (London) Ltd., New York, N.Y. *

D Waldom Electronics, Chicago, Ill. *

Abacus Elctns. Corp., Dobbs Ferry, N.Y.

Anchor Plastics, Long Island City, N.Y.

Apahouser Corp. of N.E., Watertown, Mass.

D Davies Molding Co., Harry, Chicago, Ill.

Dura Plastics N.Y., Westport, Conn.

D LFE Corporation, Waltham, Mass.

Main Electrs., Wichita, Kan.

DM Matheson Gas Products, East Rutherford, N.J.

D Mechanical Engraving Co., Bronx, N.Y.

D NOBEX Div., Burlington, Cal.

Panelgraphic Corp., Caldwell, N.J.

Perfect Gear & Instr. Div., Northridge, Calif.

Photo Chemical Prods. Cal., Santa Monica, Cal.

PIC Design Division, Ridgefield, Conn.

Rogan Corp., Northbrook, Ill.

Sterling Instr., New Hyde Pk., NY

DM Stock Drive Prods., New Hyde Pk., N.Y.

M Tech-Etch, Hingham, Mass.

Theta Instr. Corp., Fairfield, N.J.

D Vemaline Prods. Co., Wyckoff, N.J.

Dials, Telephone-Type—See Volume 1

Dials, Turns-Counting

D Amphenol Connector Div., Controls Oper., Broadview, Ill. p. 2-460,461

D Amphenol Sales Div., Broadview, Ill. p. 2-460,461

DM Beckman Instrs., Fullerton, Cal. p. 2-1621

D Bourms, Riverside, Cal. p. 2-1623-1626

D Clarostat Mfg. Co., Dover, N.H. p. 2-1627

D Duncan Electronics, Costa Mesa, Cal. p. 2-1654,1655

Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1090

Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1247

D Spectrol Electronics Corp., City of Industry, Cal. p. 2-1681

DM Systron-Donner Corp., Concord, Cal. p. 1-812,813

D TRW/IRC Potentiometers, St. Petersburg, Fla. p. 2-896,897

Harrel, E. Norwalk, Conn.

D Mechanical Engraving Co., Bronx, N.Y.

Nucleus Corp., Madison Hgts., Mich.

D Ragen Data Systems, Farmingdale, N.Y.

DM Vector General, Woodland Hills, Cal.

Dielectric Heating Equipment—See Volume 1

Dielectrics—See Films; Insulation Materials

Differentials, Mechanical—See Gears & Gear Mechanisms

Digital Tape Recorders—See Volume 1

Digitizers, Pencil Follower (Inc. Coordinate & Graphic)—See Volume 1

Dimmers, Light—See Volume 1

Diode Arrays (Including Photo)—See Volume 1

Diodes, Avalanche—See Volume 1

Diodes, Backward—See Volume 1

Diodes, Breakdown—See Volume 1

Diodes, Electroluminescent (Radiating)—See Volume 1

Diodes, Frequency Multiplier—See Volume 1

Diodes, Germanium—See Volume 1

Diodes, Gunn—See Volume 1

Diodes, High-Voltage (1,000 Volts & Over)—See Volume 1

Diodes, Hot Carrier—See Volume 1

Diodes, Impatt—See Volume 1

Diodes, Light-Emitting (LED's)—See Volume 1

Diodes, Limiting—See Volume 1

Diodes, Matched Pairs—See Volume 1

Diodes, Matched Quads—See Volume 1

Diodes, Microwave Detector—See Volume 1

Diodes, Microwave Mixer—See Volume 1

Diodes, Noise—See Volume 1

Diodes, Photoelectric—See Volume 1

Diodes, PIN—See Volume 1

Diodes, Schottky—See Volume 1

Diodes, Selenium—See Volume 1

Diodes, Silicon—See Volume 1

Diodes, Step Recovery—See Volume 1

Diodes, Switching—See Volume 1

Diodes, Tunnel—See Volume 1

Diodes, Varactor—See Volume 1

Diodes, Video Detector—See Volume 1

Diodes, Zener & Stabistors (Forward Reference Diodes)—See Volume 1

Diplexers, Antenna—See Volume 1

Direction Finders—See Volume 1

Discharge Systems, Energy—See Volume 1

Discriminators—See Volume 1

Disc Packs, Magnetic—See Volume 1

Discs, Computer Memory—See Volume 1

Discs, Optical Encoder—See Volume 1

Display Devices, LED

Dialight, Brooklyn, N.Y. p. 2-1141

DM Hewlett-Packard, Palo Alto, Cal. p. 1-1014,1015; p. 2-1150-1153

DM Industrial Elctn. Engrs., Van Nuys, Cal. p. 2-1161

NES, Streamwood, Ill. p. 1-182,183

D Tec, Tucson, Ariz. p. 2-1201,1202

General Elec. Co., Schenectady, N.Y. *

D Sprague Products Co., No. Adams, Mass. *

D A E G Telefunken, Englewood Clfs., N.J.

AEL, Colmar, Pa.

M Cardion Elctns., Woodbury, N.Y.

M Environmental Communications Inc., Costa Mesa, Cal.

Fairchild Semiconductor, Mountain View, Cal.

DM Hewlett-Packard Co., Palo Alto, Cal.

Hughes Aircraft Co., Culver City, Cal.

Interface Technology Inc., St. Louis, Mo.

Sanders Data Systems, Nashua, N.H.

Displays, Electroluminescent

Display Devices, Liquid Crystal

D Hamlin Inc., Lake Mills, Wisc. p. 2-1148,1149

D Tekelec Inc., Oxnard, Cal. p. 2-1205

General Elec. Co., Schenectady, N.Y. *

D Industrial Elctn. Engrs., Van Nuys, Cal. *

North Hills Elctns., Glen Cove, N.Y. *

D A E G Telefunken, Englewood Clfs., N.J.

M American Microsystems, Santa Clara, Cal.

Atomergic Chemetals Co., Carle Place, N.Y.

M Environmental Communications Inc., Costa Mesa, Cal.

Hughes Aircraft Co., Culver City, Cal.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Ragen Precision Inds., N. Arlington, N.J.

D RCA Solid State Div., Somerville, N.J.

Sanders Data Systems, Nashua, N.H.

D Siemens Corp., Iselin, N.J.

Transparent Conductors Inc., Goleta, Cal.

Display Panels (Back-Lighted & Edge-Lighted)

D Dialight, Brooklyn, N.Y. p. 2-1138

Display Devices, Encinitas, Cal. p. 2-1143

M Industrial Elctn. Engrs., Van Nuys, Cal. p. 2-1162,1163

Info-Lite Corp., Corona, N.Y. p. 2-1159

LVC Inds. Inc., Flushing, N.Y. p. 2-1137

SGL Homalite, Wilmington, Del. p. 2-1254

DM Shelly Assocs., Santa Ana, Cal. p. 2-1189

Tec, Tucson, Ariz. p. 2-1204

Jan Hardware Mfg. Co., Long Island City, N.Y. * NES, Streamwood, Ill. *

D A E G Telefunken, Englewood Clfs., N.J.

D Autocon Inds., Minneapolis, Minn.

Automation Displays Inc., Eau Claire, Wisc.

Beta Technology, Farmingdale, N.Y.

M Cardion Elctns., Woodbury, N.Y.

Dataprobe, So. Hackensack, N.J.

D Datatron, Santa Ana, Cal.

Hughes Aircraft Co., Culver City, Cal.

Korby Mfg. Co., Seattle, Wash.

Nucleus Corp., Madison Hgts., Mich.

Panelgraphic Corp., Caldwell, N.J.

Photo Chemical Prods. Cal., Santa Monica, Cal.

Sanders Data Systems, Nashua, N.H.

Singer Co., Little Falls, N.J.

D Vemaline Prods. Co., Wyckoff, N.J.

Displays, Dot Matrix

Dialight, Brooklyn, N.Y. p. 2-1140

D Hewlett-Packard, Palo Alto, Cal. p. 1-1014,1015; p. 2-1150-1153

Industrial Elctn. Engrs., Van Nuys, Cal. p. 2-1163

Info-Lite Corp., Corona, N.Y. p. 2-1159

D Litronix, Cupertino, Cal. p. 2-1176

LVC Inds. Inc., Flushing, N.Y. p. 2-1137

NEC America, New York, N.Y. p. 2-1184

Shelly Assocs., Santa Ana, Cal. p. 2-1189

D Tec, Tucson, Ariz. p. 2-1202

D GC Electronics, Rockford, Ill. *

NES, Streamwood, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

Sprague Products Co., No. Adams, Mass. *

AEL, Colmar, Pa.

Bowmar Instr. Corp., Ft. Wayne, Ind.

M Cardion Elctns., Woodbury, N.Y.

Data Disc Inc., Sunnyvale, Cal.

D Datatron, Santa Ana, Cal.

D Facit-Addo, Secaucus, N.J.

Fairchild Semiconductor, Mountain View, Cal.

Ferranti Elec., Plainville, N.Y.

D Ferranti-Packard, Ltd. Elec. Div., Toronto, Can. M6M 4M3

D Genisco Technology Corp., Compton, Cal.

D Hewlett-Packard Co., Palo Alto, Cal.

Instant Instruments Inc., Haverhill, Mass.

D Master Specialties Co., Costa Mesa, Cal.

D Monsanto-Elctn. Spec. Prods., Palo Alto, Cal.

OPCOA, Edison, N.J.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Precision Dynamics Corp., Burbank, Cal.

Sanders Data Systems, Nashua, N.H.

D Scientific Technology, Mountain View, Cal.

D Siemens Corp., Iselin, N.J.

Theta Instr. Corp., Fairfield, N.J.

D Vector General, Woodland Hills, Cal.

D Velonex, Display Prods., Santa Clara, Cal.

M Westinghouse Canada Ltd., Hamilton, Ont., Can.

D Xciton Corp., Latham, N.Y.

Displays, Electroluminescent

Shigoto Inds., Ltd., New York, N.Y. *

Hughes Aircraft Co., Culver City, Cal.

D National Electronics, Geneva, Ill.

OPCOA, Edison, N.J.

Precision Dynamics Corp., Burbank, Cal.

Sanders Data Systems, Nashua, N.H.
Singer Co., Little Falls, N.J.
Varian Electron Tube & Device Grp., San Carlos, Cal.

Displays, Electromechanical

Allard Instr., Westbury, N.Y. p. 2-1121
D Dialight, Brooklyn, N.Y. p. 2-1138
M Industrial Elctn. Engrs., Van Nuys, Cal.

p. 2-1162

LVC Inds. Inc., Flushing, N.Y. p. 2-1137

D Precision Timer Co., Westbrook, Conn. p. 1-268

Staver Co., Bay Shore, N.Y. p. 2-1200

DM Veeder-Root, Hartford, Conn. p. 1-274,275

M Vernitech, Deer Pk., N.Y. p. 1-277

Shigoto Inds., Ltd., New York, N.Y. *

Bowmar Instr. Corp., Ft. Wayne, Ind.

M Cardion Elctns., Woodbury, N.Y.

Clare-Pendar, Post Falls, Idaho

Ferranti Elec., Plainville, N.Y.

GAP Instr. Corp., Hauppauge, N.Y.

Hughes Aircraft Co., Culver City, Cal.

Lundy Elctns. & Sys., Glen Head, N.Y.

Major Data Corp., Costa Mesa, Cal.

Montevideo Technology Inc., Edina, Minn.

North American Philips Controls Corp., Cheshire, Conn.

Penn Keystone Corp., Ansonia, Conn.

Sanders Data Systems, Nashua, N.H.

Singer Co., Little Falls, N.J.

Statham Instruments, Oxnard, Cal.

WABCO Aerospace Dept., Pittsburgh, PA.

p. 2-1160

Hughes Aircraft Co., Fullerton, Cal.

Sanders Data Systems, Nashua, N.H.

Displays, Light-Emitting Diode (LED)

D Dialight, Brooklyn, N.Y. p. 2-1141

DM Hewlett-Packard, Palo Alto, Cal.

p. 1-1014,1015; p. 2-1150-1153

DM Industrial Elctn. Engrs., Van Nuys, Cal.

p. 2-1161

D Litronix, Cupertino, Cal.

p. 2-1174,1176,1178,1179

NES, Streamwood, Ill. p. 1-182,183

D Tec, Tucson, Ariz. p. 2-1201,1202

Shigoto Inds., Ltd., New York, N.Y. *

D Sprague Products Co., No. Adams, Mass. *

D A E G Telefunken, Englewood Clfs., N.J.

AEL, Colmar, Pa.

M Atlantic Research Corporation, Alexandria, Va

M Environmental Communications Inc., Costa Mesa, Cal.

Fairchild Semiconductor, Mountain View, Cal.

D Genisco Technology Corp., Compton, Cal.

DM Hewlett-Packard Co., Palo Alto, Cal.

Hughes Aircraft Co., Culver City, Cal.

Master Specialties Co., Costa Mesa, Cal.

D Monsanto-Elctn. Spec. Prods., Palo Alto, Cal.

D National Semiconductor Corp., Santa Clara, Cal.

OPCOA, Edison, N.J.

Precision Dynamics Corp., Burbank, Cal.

Sanders Data Systems, Nashua, N.H.

Scientific Measurements, Evanston, Ill.

Sensor Corp., Scottsdale, Pa.

Sensor Technology, Chatsworth, Cal.

D Siemens Corp., Iselin, N.J.

Singer Co., Little Falls, N.J.

Theta Instr. Corp., Fairfield, N.J.

D Xciton Corp., Latham, N.Y.

Displays, Lighted Segment

D Beckman Instrs., Scottsdale, Ariz. p. 2-1128

D Dialight, Brooklyn, N.Y. p. 2-1140

DM Hewlett-Packard, Palo Alto, Cal.

p. 1-1014,1015; p. 2-1150-1153

M Industrial Elctn. Engrs., Van Nuys, Cal.

p. 2-1160-1162

Info-Lite Corp., Corona, N.Y. p. 2-1159

D Inter-Market, Glenview, Ill. p. 2-1173

D Litronix, Cupertino, Cal. p. 2-1176

LVC Inds. Inc., Flushing, N.Y. p. 2-1137

NEC America, New York, N.Y. p. 2-1184

D Refac Elctns./Pinlites, Fairfield, N.J. p. 2-1185

D Tec, Tucson, Ariz. p. 2-1202

D ALCO Electronic Prods., North Andover, Mass. *

D Sprague Products Co., No. Adams, Mass. *

D Wagner Elec., Livingston, N.J. *

D A E G Telefunken, Englewood Clfs., N.J.

AEL, Colmar, Pa.

Automation Displays Inc., Eau Claire, Wisc.

DM Chicago Miniature Lamp/Drake, Chicago, Ill.

Durging & Brown, Burlington, Vt.

M Environmental Communications Inc., Costa Mesa, Cal.

Fairchild Semiconductor, Mountain View, Cal.

D Genisco Technology Corp., Compton, Cal.

DM Hewlett-Packard Co., Palo Alto, Cal.

D LFE Corporation, Waltham, Mass.

Master Specialties Co., Costa Mesa, Cal.

D Monsanto-Elctn. Spec. Prods., Palo Alto, Cal.

Mura Corp., Jericho, N.Y.

D National Electronics, Geneva, Ill.

OPCOA, Edison, N.J.

Penn Keystone Corp., Ansonia, Conn.

Precision Dynamics Corp., Burbank, Cal.

RCA Electronic Comps., Harrison, N.J.

Sanders Data Systems, Nashua, N.H.

Scientific Measurements, Evanston, Ill.

Singer Co., Little Falls, N.J.

Theta Instr. Corp., Fairfield, N.J.

D Xciton Corp., Latham, N.Y.

Displays, Liquid Crystal

Beckman Instrs., Fullerton, Cal.

p. 2-1126,1127

D Hamlin Inc., Lake Mills, Wisc. p. 2-1148,1149

D Tekelec Inc., Oxnard, Cal. p. 2-1205

D Industrial Elctn. Engrs., Van Nuys, Cal. *

D A E G Telefunken, Englewood Clfs., N.J.

Atomergic Chemicals Co., Carle Place, N.Y.

M Environmental Communications Inc., Costa Mesa, Cal.

Hughes Aircraft Co., Culver City, Cal.

D RCA Solid State Div., Somerville, N.J.

Sanders Data Systems, Nashua, N.H.

D Siemens Corp., Iselin, N.J.

Transparent Conductors Inc., Goleta, Cal.

D Wallace S. K. Assocs., Tampa, Fla.

Displays, Planar Gas Discharge

D Beckman Instrs., Scottsdale, Ariz. p. 2-1128

Dialight, Brooklyn, N.Y. p. 2-1139

Industrial Elctn. Engrs., Van Nuys, Cal.

p. 2-1163

M Info-Lite Corp., Corona, N.Y. p. 2-1159

D NEC America, New York, N.Y. p. 2-1184

Analog Devices, Norwood, Mass. *

D A E G Telefunken, Englewood Clfs., N.J.

D Burroughs Corp., Plainfield, N.J.

Sanders Data Systems, Nashua, N.H.

Signalite Div., Neptune, N.J.

Displays, Projection Type (CRT; Electromechanical; Film; Light Valve)

Ann Arbor Terminals, Ann Arbor, Mich.

p. 1-134

CELCO, Mahwah, N.J. p. 1-630

M Industrial Elctn. Engrs., Van Nuys, Cal.

p. 2-1162,1163

Infodex, Waterbury, Conn. p. 1-730-733

M Kratos, Pasadena, Cal. p. 1-177

LVC Inds. Inc., Flushing, N.Y. p. 2-1137

Millen Mfg. Co. Inc., James, Malden, Mass.

p. 2-1251

DM Shelly Assocs., Santa Ana, Cal. p. 2-1188

D Tec, Tucson, Ariz. p. 2-1204

D ALCO Electronic Prods., North Andover, Mass. *

Allard Instr., Westbury, N.Y. *

Gould, Cleveland, Ohio *

NES, Streamwood, Ill. *

Staver Co., Bay Shore, N.Y. *

D A E G Telefunken, Englewood Clfs., N.J.

Aydin Controls, Ft. Washington, Pa.

D Burroughs Corp., Plainfield, N.J.

M Cardion Elctns., Woodbury, N.Y.

Conrac Div., Covina, Calif.

Daco Instr. Co., Milford, Conn.

D Datatron, Santa Ana, Cal.

Develco, Mountain View, Cal.

M E-Systems Inc., Dallas, Tex.

Four-Phase Systems, Cupertino, Cal.

GTE Sylvania Inc., Washington, D.C.

Hewlett-Packard Corp., Colorado Springs, Colo.

Honeywell, Minneapolis, Minn.

HRB-Singer, State College, Pa.

Hughes Aircraft Co., Culver City, Cal.

Information Displays, Mt. Kisco, N.Y.

Kollsman Instr. Co., Syosset, N.Y.

Leeds & Northrup Co., North Wales, Pa.

Lundy Elctns. & Sys., Glen Head, N.Y.

Major Data Corp., Costa Mesa, Cal.

D Master Specialties Co., Costa Mesa, Cal.

Megatek Corp., San Diego, Cal.

D Metra Instruments, Mt. View, Cal.

Optimation, Chatsworth, Cal.

Princeton Elctn. Prods., New Brunswick, N.J.

Sanders Data Systems, Nashua, N.H.

M Singer Co., Glendale, Cal.

Tektronix, Beaverton, Ore.

M Watkins-Johnson Co., Palo Alto, Cal.

Displays, Status

Beckman Instrs., Scottsdale, Ariz. p. 2-1128

D Cherry Electrical Prods. Corp., Waukegan, Ill.

p. 1-1984,1985

D Dialight, Brooklyn, N.Y. p. 2-1138

D IEE/Schadow, Eden Prairie, Minn.

p. 1-2067-2069

M Industrial Elctn. Engrs., Van Nuys, Cal.

p. 2-1162

M Info-Lite Corp., Corona, N.Y. p. 2-1159

LVC Inds. Inc., Flushing, N.Y. p. 2-1137

D Precision Timer Co., Westbrook, Conn. p. 1-268

DM Shelly Assocs., Santa Ana, Cal. p. 2-1189

Staver Co., Bay Shore, N.Y. p. 2-1200

D Tec, Tucson, Ariz. p. 2-1202,1204

NES, Streamwood, Ill. *

D Wagner Elec., Livingston, N.J. *

D A E G Telefunken, Englewood Clfs., N.J.

AEL, Colmar, Pa.

Automation Displays Inc., Eau Claire, Wisc.

Aydin Controls, Ft. Washington, Pa.

M Cardion Elctns., Woodbury, N.Y.

Daco Instr. Co., Milford, Conn.

D Datatron, Santa Ana, Cal.

E-Systems Inc., Dallas, Tex.

D Ferranti-Packard, Ltd. Elec. Div., Toronto, Can.M6M 4M3

D Genisco Technology Corp., Compton, Cal.

Hughes Aircraft Co., Culver City, Cal.

Penn Keystone Corp., Ansonia, Conn.

Photo Chemical Prods. Cal., Santa Monica, Cal.

Sanders Data Systems, Nashua, N.H.

D Vernaline Prods. Co., Wyckoff, N.J.

Displays, Tube—See Tubes, Readout
Dissipators, Heat—See Volume 1
Distortion Analyzers, Indicators—See Volume 1
Dividers, Analog—See Volume 1
Dividers, Frequency—See Volume 1
Dividers, Magnetic Analog—See Volume 1
Dividers, Power (LF, HF, VHF, UHF)—See Volume 1
Dividers, Power, Microwave

Arra Inc., Bay Shore, N.Y. p. 2-1278,1279

North Hills Elctns., Glen Cove, N.Y. p. 2-1388

D Omni Spectra, Farmington, Mich. p. 2-724

MRHG Elctns. Lab., Deer Park, N.Y. p. 2-1389

Vari-L Co., Denver, Colo. p. 2-1401-1403

M Vega Precision Labs., Vienna, Va. p. 1-928

Bendix, Franklin, Ind. *

M General Microwave Corp., Farmingdale, NY *

General Radio Co., Concord, Mass. *

Systrom-Donner Microwave Div., Van Nuys, Cal. *

AEL, Colmar, Pa.

M Aertech Industries, Sunnyvale, Cal.

Aircon, Union, N.H.

M Airtrom, Morris Plains, N.J.

American Microwave Inds., Waltham, Mass.

DM Anaren Microwave, Syracuse, N.Y.

Coax Devices Inc., Chelsea, Mass.

Collins Radio, Dallas, Tex.

Environmental Communications Inc., Costa Mesa, Cal.

HRB-Singer, State College, Pa.

Hughes Aircraft Co., Culver City, Cal.

M Lorch Elctns. Corp., Englewood, N.J.

M Lorch Devices Inc., Englewood, N.J.

Maury Microwave Corp., Cucamonga, Calif.

M Merrimac Inds., West Caldwell, N.J.

M Microlab/FXR, Livingston, N.J.

Microphase Corp., Cos Cob, Conn.

Microwave Assocs., Burlington, Mass.

D Microwave Development Labs., Needham Hgts., Mass.

Microwave/Sys., E. Syracuse, N.Y.

Mu-Del Elctns., Silver Spring, Md.

Narda Microwave Corp., Plainville, N.Y.

M Norsal Industries, Brentwood, N.Y.

D PRD Elctns., Syosset, N.Y.

M Premier Microwave, Port Chester, N.Y.

Reeve Electronics, Chicago, Ill.

R L C

PRODUCT INDEX & DIRECTORY

Enclosures, Module, Plug-In

Waveline, W. Caldwell, N.J.
Weinschel Engrg. Co., Gaithersburg, Md.

Dividers, Voltage - Also see **Networks, Resistance; Transformers, Voltage Dividing**—See Volume 1

Doors, Cabinet, Metal—See Volume 1

Doublers, Frequency—See Volume 1

Drafting Machines—See Volume 1

Drafting Symbols, Dry Transfer, Pressure Sensitive, etc. (Including Lettering)—See Volume 1

Drawers, Sliding—See Volume 1

Drills & Accessories, Hand & Power
Airmatic/Beckett-Harcum, Wilmington, Ohio
D Aremc Prods., Ossining, N.Y.
Chemical Etching Equip. & Supply, Alexandria, Va.
HAPCO, Boulder, Colo.
DM High Speed Hammer Co., Rochester, N.Y.
Jensen Tools & Alloys, Phoenix, Ariz.
Kandu Corporation, Arvada, Colo.
D Klein, Mathias & Sons, Chicago, Ill.
Lear Siegler, Santa Monica, Calif.
Mann, Henry Inc., Huntingdon Valley, Pa.
D Moody Tools, Providence, R.I.
National Camera Inc., Englewood, Colo.
Snap-On-Tools, Kenosha, Wisc.
Techni-Tool, Plymouth Meeting, Pa.
D Vigor Co., New York, N.Y.
X-Acto, Long Island City, N.Y.

Drivers, Chopper—See Volume 1

Drivers, Nut
D Channellock, Meadville, Pa. p. 2-1693
Jonard Industries Corp., Tuckahoe, N.Y. p. 2-1708
Vaco Products Co., Chicago, Ill. p. 2-1714
D GC Electronics, Rockford, Ill. *

Adtool Corp., Montreal W P O, Can.
D Klein, Mathias & Sons, Chicago, Ill.
M MacDonald & Co., Glendale, Calif.
Mann, Henry Inc., Huntingdon Valley, Pa.
D Hunter Tools, El Monte, Calif.
Megavolt, New York, N.Y.
D Moody Tools, Providence, R.I.
D Porter, H.K., Somerville, Mass.
Snap-On-Tools, Kenosha, Wisc.
D Techni-Tool, Plymouth Meeting, Pa.
D Xcelite, Orchard Park, N.Y.

Drivers, Solenoid—See Volume 1

Drivers, Speaker—See Volume 1

Drivers, Switch
Arra Inc., Bay Shore, N.Y. p. 2-1278,1279
Hybrid Systems Corp., Burlington, Mass. p. 2-1496,1497
AEL, Colmar, Pa.
M Circuit Technology, Farmingdale, N.Y.
M Cole Instrument Corp., Costa Mesa, Cal.
E & M Laboratories, Westlake Village, Cal.
M Environmental Communications Inc., Costa Mesa, Cal.
General Instrument Corp., Hicksville, N.Y.
M Lorch Devices Inc., Englewood, N.J.
M LRC Inc., Hudson, N.H.
Narda Microwave Corp., Plainview, N.Y.
Plessey Semiconductors, Santa Ana, Cal.
D Siliconix, Santa Clara, Cal.
M Technical Research & Mfg., Manchester, N.H.

Drivers, Tube—See **Drivers & Decoders for Readouts**

Drivers & Decoders For Readouts
M Beckman Instrs., Fullerton, Cal. p. 2-1126,1127
D Beckman Instrs., Scottsdale, Ariz. p. 2-1128
D Dialight, Brooklyn, N.Y. p. 2-1139
D ILC Data Device Corp., Bohemia, N.Y. p. 2-1171
D Refac Elctns./Pinlites, Fairfield, N.J. p. 2-1185
Staver Co., Bay Shore, N.Y. p. 2-1200
D Tec, Tucson, Ariz. p. 2-1202
D ALCO Electronic Prods., North Andover, Mass. *

Executone, Printact Relay Div., Long Island City, N.Y. *

M General Instruments Corp., Hicksville, N.Y. *

M Industrial Elctn. Engrs., Van Nuys, Cal. *

M NEC Microsystems, Ft. Lauderdale, Fla. *

NES, Streamwood, Ill. *

D Precision Monolithics Inc., Santa Clara, Cal. *

Promemco, Hauppauge, N.Y. *

M Environmental Communications Inc., Costa Mesa, Cal.
General Instrument Corp., Hicksville, N.Y.
D Hewlett-Packard Co., Palo Alto, Cal.
D ITT Semiconductor, West Palm Beach, Fla.
Keltron, Waltham, Mass.
National Electronics, Geneva, Ill.
DM National Semiconductor Corp., Santa Clara, Cal.
Precision Dynamics Corp., Burbank, Cal.
DM RCA Solid State Div., Somerville, N.J.
D Stewart-Warner Microcircuits, Sunnyvale, Cal.
Theta Instr. Corp., Fairfield, N.J.
Varian Electron Tube & Device Grp., San Carlos, Cal.

Drives & Drive Mechanisms (Dial)
Dale Elctns., Yankton, S.D. p. 2-1452
Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1088
Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1248
M Precision Mechanisms Corp., Westbury, N.Y. p. 1-1919
Servo-Tek Prods. Co., Hawthorne, N.J. p. 1-980,981
Jackson Bros., (London) Ltd., New York, N.Y. *

D Waldom Electronics, Chicago, Ill. *

M ABA Industries, Pinellas Pk., Fla.
Bowmar/ALI, Acton, Mass.
Leeds & Northrup Co., North Wales, Pa.
M Machine Components Corp., Plainview, N.Y.
M MPC Prods. Corp., Chicago, Ill.
Perfect Gear & Instr. Div., Northridge, Calif.
Pertec Corp., El Segundo, Cal.
PIC Design Division, Ridgefield, Conn.
Sigma Instruments, Braintree, Mass.
Sterling Instr., New Hyde Pk., NY
DM Stock Drive Prods., New Hyde Pk., N.Y.
Theta Instr. Corp., Fairfield, N.J.
Transcoil, Worcester, Pa.
D Vemaline Prods. Co., Wyckoff, N.J.

Drums, Computer Memory—Also See Memory Systems, Drum—See Volume 1

Dry Transfer Letters & Numbers—See Kits, Marking-Drafting Symbols

Ducts, Wiring
D Panduit Corp., Tinley Park, Ill. p. 2-2048-2051
DMSG L Waber Electric, Westville, NJ p. 2-356
Square D Co., Milwaukee, Wisc. *

D AMP Special Industries, Valley Forge, Pa.
M Co-Operative Inds., Chester, N.J.
D Electrovert, Mt. Vernon, N.Y.
Hoffman Engineering Co., Anoka, Minn.
Taylor Industries Inc., Howell, Mich.
D Wadsworth Electric Mfg. Co., Covington, Ky.
Wiremold Co., West Hartford, Conn.

Dummy Loads
Arra Inc., Bay Shore, N.Y. p. 2-1278,1279
M Bird Electronic Corp., Solon, Ohio p. 1-619
Carborundum Co., Niagara Falls, N.Y. p. 2-1445
M Electro Impulse, Red Bank, N.J. p. 1-492,662-666
GRM Corp., Medford, N.J. p. 1-120
D Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1501
Bendix, Franklin, Ind. *

D GC Electronics, Rockford, Ill. *

Heath Co., Benton Harbor, Mich. *

D Ohmite Mfg. Co., Skokie, Ill. *

Syston-Donner Microwave Div., Van Nuys, Cal. *

M Torolot Inc., Grandview, Mo. *

D Vector Electronic Co., Sylmar, Cal. *

Aircom, Union, N.H.
M Airtron, Morris Plains, N.J.
Alan Industries Inc., Columbus, Ind.
Alford Mfg. Co., Winchester, Mass.
American Microwave Inds., Waltham, Mass.
D Astrolab, Rahway, N.J.
M AUL Instrs., Flushing, N.Y.
Avtron Mfg., Cleveland, Ohio
D Barker & Williamson, Bristol, Pa.
Coax Devices Inc., Chelsea, Mass.
Coaxial Dynamics, Cleveland, Ohio
M Coleman Microwave Co., Lebanon, N.J.
Collins Radio, Dallas, Tex.
M Connecticut Microwave Corp., New Hartford, Conn.
M Dielectric Comms, Raymond, Maine
Electronautics, Littleton, Mass.
Hy-Gain Electronics Corp., Lincoln, Neb.

M Lorch Devices Inc., Englewood, N.J.
Maury Microwave Corp., Cucamonga, Calif.
M Microlab/FXR, Livingston, N.J.
D Microwave Development Labs., Needham Hgts., Mass.
Motorola Comms. Div., Schaumburg, Ill.
Narda Microwave Corp., Plainview, N.Y.
M Norsal Industries, Brentwood, N.Y.
Plessey Environmental Sys., San Diego, Cal.
M Premier Microwave, Port Chester, N.Y.
Radiation Devices Co., Baltimore, Md.
Reeve Electronics, Chicago, Ill.
R L C Elctns., Mt. Kisco, N.Y.
Rhode & Schwarz Sls., Fairfield, N.J.
Sivers Lab, Corona del Mar, Cal.
TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
Technical Mat'l., Mamaroneck, N.Y.
D TRG., Woburn, Mass.
Waveline, W. Caldwell, N.J.
Weinschel Engrg. Co., Gaithersburg, Md.
D Workman Electronic Prods., Sarasota, Fla.

Duplexers, Microwave—See Volume 1

Duplicators, Magnetic Tape—See Volume 1

Duplicators, Paper Tape—See Volume 1

Dust Covers—See Volume 1

DVM'S—See Volume 1

Editing Equipment, Tape—See Volume 1

Ejectors & Extractors, P-C Boards—See Pullers, Circuit Board

Elastomers, Heat Shrinkable—See Caps, Forms & Tapes, Heat Shrinkable

Electrodes, Electroplating—See Volume 1

Electrodes, High-Voltage—See Volume 1

Electronic Switches (Oscilloscope)—See Volume 1

Electroplating Equipment & Supplies—See Volume 1

Elements, Sensing—See Volume 1

Eliminators, Battery—Also See Power Supplies—See Volume 1

Encapsulating Materials—See Compounds, Encapsulating

Enclosures—See Volume 1

Enclosures, Module, Plug-In
D Elctn. Molding Corp., Woonsocket, R.I. p. 2-676,677,678,679
Hybrid Systems Corp., Burlington, Mass. p. 1-170
D ITT Pomona Electronics Div., Pomona, Cal. p. 2-754-756,761-771
DM Keystone Elctns. Corp., New York, N.Y. p. 2-715
Refac Elctns./Pinlites, Fairfield, N.J. p. 2-1185
D Vector Electronic Co., Sylmar, Cal. p. 1-103
Vero Electronics, Hauppauge, N.Y. p. 2-364
NES, Streamwood, Ill. *

Applied Data Comm., Santa Ana, Cal.
D Cambridge Thermionic Corp., Cambridge, Mass.
Circuit Assembly Corp., Costa Mesa, Ca.
M Dietz Design, Belton, Mo.
EpoxyCast Electronic Case Co., Yonkers, N.Y.
LMB Heeger, Los Angeles, Cal.
Overly-Hautz Co., Cleveland, Ohio
Scientific-Atlanta, Tucker, Ga.
D Spec Plastics Inc., No. Hollywood, Cal.
Standard Logic Inc., Santa Ana, Cal.

Encoders, Digital—See Volume 1

Encoders, Displacement, Linear—See Volume 1

Encoders, Keyboard—See Volume 1

Encoders, Shaft Angle, Contacting—See Volume 1

Encoders, Shaft Angle, Magnetic—See Volume 1

Escutcheons

Encoders, Shaft Angle, Optical—See Volume 1

Encoders, Shaft Position—See Volume 1

Encoders, Tone—See Volume 1

Engineering Reference Books—See Volume 1

Epoxies—See Compounds, Encapsulating; Adhesives

Equalizers, Audio—See Volume 1

Equalizers, Delay—See Volume 1

Equalizers, Phase—See Volume 1

Erasers, Magnetic Tape (Bulk)—See Volume 1

Escutcheons

Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1097,1098
Photo Chemical Prods. Cal., Santa Monica, Cal.
South Shore Metal Prods., Farmingdale, N.Y.

Etchants, Printed Circuit

D Vector Electronic Co., Sylmar, Cal. p. 2-358
D GC Electronics, Rockford, Ill. *
D Smith Inc., Herman H., Brooklyn, N.Y. *
3M Company, St. Paul, Minn. *
Air Prods. & Chems., Allentown, Pa.
Allied Chemical Corp., Morristown, N.J.
Conversion Chem. Corp., Rockville, Conn.
Dow Chemical Co., Midland, Mich.
E. I. DuPont de Nemours & Co., Wilmington, Del.
Kandu Corporation, Arvada, Colo.
D Techiques, Englewood, N.J.
Union Carbide, Chemicals & Plastics, New York, N.Y.

Evaporation Equipment, Electron Beam—See Volume 1

Exciters—See Volume 1

Exciters, Vibration—See Volume 1

Expanders, Data—See Volume 1

Expanders, Meter—See Volume 1

Explosive Gas Indicators—See Volume 1

Extractors, Circuit Board, Tube—See Pullers

Eyelets

DM Keystone Elctns. Corp., New York, N.Y. *
Staver Co., Bay Shore, N.Y. *
D Vector Electronic Co., Sylmar, Cal. *
Acme Model Engrg. Co., Ridgefield, N.J.
DM Aimsco Inc., Seattle, Wash.
Atlas Eyelets, Fairhaven, Mass.
Auto-Swage Products Inc., Shelton, Conn.
Bead Elctns., Bridgeport, Conn.
Beman Mfg., New Cumberland, Pa.
M Braxton Mfg. Co., Watertown, Conn.
D Cambridge Thermionic Corp., Cambridge, Mass.
D Circon Corp., Santa Barbara, Cal.
General Mfg. Co., Glendale, Calif.
M GTI Corporation, Pittsburgh, Pa.
HAPCO, Boulder, Colo.
M Kaweck Beryco Inds., New York, NY
Kentucky Electronics, Owensboro, Ky.
M Mark Eyelet & Stamping, Wolcott, Conn.
Pylon Co., Attleboro, Mass.
Sjoberg, C. & Son, Cranston, R.I.
D USM Corp., Shelton, Conn.
D Zierick Mfg. Corp., Mt. Kisco, N.Y.

Fabrics, Conductive

Acheson Colloids Co., Port Huron, Mich.
Carbone Lorraine Industries Corp., Boonton, N.J.
D Merix Chem. Co., Chicago, Ill.
D Technical Wire Products, Cranford, N.J.
D Zippertubing Co., Los Angeles, Calif.

Facsimile Equipment—See Volume 1

Fans—See Volume 1

Fasteners, Metal

D Amatomet Electronic Hardware, New Haven, Conn. p. 2-1258
D Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1991
E-Systems, Huntington, Ind. p. 2-1490,1491

DM Keystone Elctns. Corp., New York, N.Y. p. 2-714

DM Positronic Inds., Springfield, Mo. p. 2-788

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-863,866,874,877
D Waldom Electronics, Chicago, Ill. p. 2-1262-1266

D Elctn. Molding Corp., Woonsocket, R.I. *

D GC Electronics, Rockford, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

Abacus Elctns. Corp., Dobbs Ferry, N.Y.

Abbott Screw & Mfg. Co., Chicago, Ill.

Accessories for Electronics, Bayside, N.Y.

Accesso-Wire, Garnersville, N.Y.

Acme Model Engrg. Co., Ridgefield, N.J.

DM Aimsco Inc., Seattle, Wash.

DM Allen Mfg. Co., Hartford, Conn.

Anchor Bolt & Screw, Chicago, Ill.

M APM-Hexseal, Englewood, N.J.

Associated Spring Corp., Bristol, Conn.

Auburn Mfg., Middletown, Conn.

DM Aurich F W & Co, Seattle, Wash.

Auto-Swage Products Inc., Shelton, Conn.

Autosplise/Dv Gen Staple, New York City, N.Y.

DM Avibank Mfg. Inc., Burbank, Calif.

M Avid Electronics Corp., Baldwin, Pl., N.Y.

Bead Elctns., Bridgeport, Conn.

Birnbach Co., Freeport, N.Y.

D Bostitch, E. Greenwich, R.I.

Camcar Screw & Mfg., Rockford, Ill.

M Cherry Rivet & Boots Nut Divs., Santa Ana, Calif.

D Circon Corp., Santa Barbara, Cal.

Communications Technology Corp., Los Angeles, Cal.

Delbert Blinn Co., Pomona, Calif.

D Deutsch Fastener Corp., Los Angeles, Cal.

D Dimco-Gray Company, Dayton, Ohio

DM Dzus Fastener Co., West Islip, N.Y.

D Eaton Corporation, Cleveland, Ohio

DM Esna Div., Union, N.J.

Globe Plastics, Pomona, Cal.

D Gries Reproducer Co., New Rochelle, N.Y.

M Groov-Pin Corp., Ridgefield, N.J.

D Heli-Coil Prods., Danbury, Conn.

DM ITT Harper, Morton Grove, ILL.

Kentucky Electronics, Owensboro, Ky.

M Kinetron Corp., Asbury Park, N.J.

M Mark Eyelet & Stamping, Wolcott, Conn.

M Morris, J.I. Co., Southbridge, Mass.

D Nelson Stud Welding TRW Inc., Lorain, Ohio

Pan-L-Fast, N. Hollywood, Cal.

M Paneloc Corp., Collinsville, Conn.

M Penn Engrg. & Mfg. Corp., Doylestown, Pa.

D Penn Fibre & Specialty, Phila., Pa.

M PIC Design Division, Ridgefield, Conn.

Precision Metal Prods. Co., Stoneham, Mass.

Pylon Co., Attleboro, Mass.

Seastrom Mfg. Co. Inc., Glendale, Cal.

DM Simmons Fastener Corp., Albany, N.Y.

Sjoberg, C. & Son, Cranston, R.I.

Sterling Instr., New Hyde Pk., NY

DM Stock Drive Prods., New Hyde Pk., N.Y.

Tridair Inds., Torrance, Calif.

D TRW/Cinch-Monadnock, An Elctn. Comps., City of Industry, Cal.

Universal Security Instrs., Baltimore, Md.

D USM Corp., Shelton, Conn.

D Vemaline Prods. Co., Wyckoff, N.J.

M Waldes Kohinoor, Long Island City, N.Y.

Waterbury Pressed Metal Co., Waterbury, Conn.

D Wrought Washer Mfg., Milwaukee, Wisc.

D Zierick Mfg. Corp., Mt. Kisco, N.Y.

Fasteners, Non-Metallic

D Amatomet Electronic Hardware, New Haven, Conn. p. 2-1258
D Bivar, Santa Ana, Cal. p. 2-1266
D Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1990,1991
E-Systems, Huntington, Ind. p. 2-1491
D Grayhill Inc., LaGrange, Ill. p. 2-1261
DM Panduit Corp., Tinley Park, Ill. p. 2-2048-2051
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-874
D Waldom Electronics, Chicago, Ill. p. 2-1262-1266
D GC Electronics, Rockford, Ill. *
D 3M Company, St. Paul, Minn. *
Accessories for Electronics, Bayside, N.Y.
Acme Model Engrg. Co., Ridgefield, N.J.
DM Aimsco Inc., Seattle, Wash.
DM Amrad Corporation, Paris, Tex.
Amp Inc., Harrisburg, Pa.
Anchor Bolt & Screw, Chicago, Ill.
M Avid Electronics Corp., Baldwin, Pl., N.Y.
Birnbach Co., Freeport, N.Y.
Delbert Blinn Co., Pomona, Calif.
Dennison Mfg. Co., Framingham, Mass.
D Dzus Fastener Co., West Islip, N.Y.

D Eaton Corporation, Cleveland, Ohio

D Electrovert, Mt. Vernon, N.Y.

Globe Plastics, Pomona, Cal.

D Gries Reproducer Co., New Rochelle, N.Y.

D ITT Harper, Morton Grove, ILL.

Paneloc Corp., Collinsville, Conn.

D Penn Fibre & Specialty, Phila., Pa.

M PIC Design Division, Ridgefield, Conn.

Pylon Co., Attleboro, Mass.

DM Simmons Fastener Corp., Albany, N.Y.

Sterling Instr., New Hyde Pk., NY

DM Stock Drive Prods., New Hyde Pk., N.Y.

Taylor Industries Inc., Howell, Mich.

Tridair Inds., Torrance, Calif.

Universal Security Instrs., Baltimore, Md.

DM Weckesser Co. Inc., Chicago, Ill.

Fault Locators—See Volume 1

Feedthrus & Seals, Environmental

M Amphenol Connector Div., SAMS Oper., Chatsworth, Cal. p. 2-460,461
M Rowe Industries, Toledo, Ohio p. 2-796,797
M Aliberx Corp., New Bedford, Mass. *
Amphenol RF Div., Danbury, Conn. *
D Elctn. Molding Corp., Woonsocket, R.I. *
D Smith Inc., Herman H., Brooklyn, N.Y. *
M Addington Labs, Santa Clara, Cal.
American Lava Corp., Chattanooga, Tenn.
M APM-Hexseal, Englewood, N.J.
Ceramaseal, New Lebanon Center, N.Y.
M Detronics Corp., S. El Monte, Cal.
Edwards High Vacuum, Grand Island, N.Y.
Eltec Instruments Inc., Daytona Beach, Fla.
Fusite Div./Emerson Elec., Cincinnati, Ohio
M GTI Corporation, Pittsburgh, Pa.
Gulton Inds., Buena Park, Cal.
M Hermetic Seal Corp., Rosemead, Cal.
High Vacuum Equip. Corp., Hingham, Mass.
Marlow Industries, Garland, Tex.
Materials Resch. Corp., Orangeburg, N.Y.
D Metal Bellows Corp., Sharon, Mass.
Minnesota Rubber Co., Minneapolis, Minn.
Perkin-Elmer Ultek Inc., Palo Alto, Cal.
M Servometer Corp., Cedar Grove, N.J.
Simmonds Precision, Norwich, N.Y.
D Sloan Technology Corp., Santa Barbara, Cal.
Vactronic Lab. Equip., E. Northport, N.Y.
Varian Assocs., Palo Alto, Cal.
Vernay Laboratories, Yellow Springs, Ohio

Ferrite Material & Parts

D Fair-Rite Prods. Corp., Wallkill, N.Y. p. 2-1215
Ferroxcube Corp., Saugerties, N.Y. p. 2-1218-1225
Krystinel Corp., Port Chester, N.Y. p. 2-1234,1235
Atomergic Chemetals Co., Carle Place, N.Y.
Ceramic Magnetics, Fairfield, N.J.
D Countis Inds., San Luis Obispo, Cal.
Deltronic Crystal Inds., Denville, N.J.
Electro-Mechanics Co., Austin, Tex.
Ferronics, East Rochester, N.Y.
Hughes Aircraft Co., Culver City, Cal.
D Indiana General, Keesbey, N.J.
M Magnetics, Butler, Pa.
Murata Mfg. Co. Ltd., Kyoto, Japan
Permag Corp., Jamaica, N.Y.
Quartzite Processing, Malden, Mass.
D Siemens Corp., Iselin, N.J.
Stackpole Carbon Co., St. Mary's, Pa.
TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
M Trak Microwave Corporation, Tampa, Fla.
United Mineral & Chem. Corp., New York, N.Y.
U.S. Elctns., Long Branch, N.J.

Fiber Optic Bundles—See Volume 1

Films, Capacitor

D A E G Telefunken, Englewood Clifs., N.J.
D Dixon Corp., Bristol, R.I.
D Electro-Science Labs., Pennsauken, N.J.
Elctn. Concepts, Eatontown, N.J.
Engelhard Minerals & Chem., Murray Hill, N.J.
Filtron Company, Westbury, N.Y.
General Elec., Schenectady, N.Y.
ITT Jennings, Monrovia, Cal.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
Permaluster, Burbank, Calif.
Plessey Inc., Melville, N.Y.
Schweitzer, Peter J. Div., Lee, Mass.
Thin Film Services, Gile, Wisc.
3M Co., St. Paul, Minn.
D United Mineral & Chem. Corp., New York, N.Y.

Films, Masking (Incl. Photographic)

D AGFA-Gevaert, Teterboro, N.J.

Conforming Matrix Corp., Toledo, Ohio
 E.I. DuPont de Nemours & Co., Wilmington, Del.
 D Electro-Science Labs., Pennsauken, N.J.
 M Environmental Communications Inc., Costa Mesa, Cal.
 M Keuffel & Esser Co., Morristown, N.J.
 Seal-Peel, Troy, Mich.
 Thin Film Services, Gile, Wisc.
 D Western Coating Co., Royal Oak, Mich.

Films, Resistance
 Caddock Electronics, Riverside, Cal.
 p. 1-884-887; p. 2-1428-1443

M Analog Devices, Norwood, Mass. *
Computer Instrs., Hempstead, N.Y. *
Sprague Products Co., No. Adams, Mass. *
 Acheson Colloids Co., Port Huron, Mich.
 M Analog Devices, Resistor Pdt., Rochester, NY
 D Electro-Science Labs., Pennsauken, N.J.
 M Environmental Communications Inc., Costa Mesa, Cal.
 M HyComp Inc., Maynard, Mass.
 Metavac, Flushing, N.Y.
 M Norsal Industries, Brentwood, N.Y.
 Panasonic, Ind'l. Elctr. Comps., New York, N.Y.
 Plessey Inc., Melville, N.Y.

Filter Synthesizers—See Volume 1
Filters, Active (All Types)—See Volume 1
Filters, A-F—See Volume 1
Filters, Air—See Volume 1
Filters, Analog—See Volume 1
Filters, Antenna—See Volume 1
Filters, Band Elimination—See Volume 1
Filters, Band Pass—See Volume 1
Filters, Band Reject, Band Stop—See Volume 1
Filters, Ceramic—See Volume 1
Filters, Coaxial—See Volume 1
Filters, Comb—See Volume 1
Filters, Continuously Variable—See Volume 1
Filters, Crystal (Incl. Monolithic Devices)—See Volume 1
Filters, Digital—See Volume 1
Filters, EMI/RFI—See Volume 1
Filters, Equalizer—See Volume 1
Filters, Harmonic—See Volume 1
Filters, High-Pass—See Volume 1
Filters, I-F—See Volume 1
Filters, LC—See Volume 1
Filters, Line—See Volume 1
Filters, Linear Phase—See Volume 1
Filters, Low-Pass—See Volume 1
Filters, Mechanical—See Volume 1
Filters, Microwave
 Applied Research Inc., Port Washington, N.Y.
 p. 2-1276,1277
 Arra Inc., Bay Shore, N.Y. p. 2-1278,1279
 D Greenray Inds., Mechanicsburg, Pa. p. 1-327
 Hope Elctns., Clifton, N.J. p. 2-1287
 MRF Interonics, Bay Shore, N.Y. p. 1-572,573
 D Texscan Corp., Indianapolis, Ind. p. 1-817
 TT Elctns., Los Angeles, Cal. p. 1-588-591
 MUSCC/Centralab, Elec. Div., Los Angeles, Cal.
 p. 1-594,595
 Vari-L Co., Denver, Colo. p. 1-600
 General Radio Co., Concord, Mass. *
 Syston-Donner Microwave Div., Van Nuys, Cal. *

M American Trans-Coil Corp., Richmond Hill, N.Y.
 M Cir-Q-Tel, Kensington, Md.
 Coaxial Dynamics, Cleveland, Ohio
 M Coleman Microwave Co., Lebanon, N.J.
 Collins Radio, Dallas, Tex.
 Dynalab Corp., Van Nuys, Cal.
 Engelmann Microwave, Montville, N.J.
 M Environmental Communications Inc., Costa Mesa, Cal.
 Frequency Engrg. Labs., Farmingdale, N.J.
 Gulton Inds., Metuchen, N.J.
 Hughes Aircraft Co., Culver City, Cal.
 M Lorch Elctns. Corp., Englewood, N.J.
 M Lorch Devices Inc., Englewood, N.J.
 Maury Microwave Corp., Cucamonga, Calif.
 M Microlab/FXR, Livingston, N.J.
 Microphase Corp., Cos Cob, Conn.
 Microwave Assocs., Burlington, Mass.
 D Microwave Development Labs., Needham Hgts., Mass.
 Microwave Prods., Chatsworth, Cal.
 Mu-Del Elctns., Silver Spring, Md.
 Narda Microwave Corp., Plainview, N.Y.
 M Norsal Industries, Brentwood, N.Y.
 Physical Electronics Labs., Menlo Park, Cal.
 M Premier Microwave, Port Chester, N.Y.
 R L C Elctns., Mt. Kisco, N.Y.
 Sivers Lab, Corona del Mar, Cal.
 M Teledyne Mcc., Palo Alto, Cal.
 M Teledyne Microwave, Mountain View, Cal.
 Telonic Altair, Laguna Beach, Calif.
 M Transco Prods., Venice, Cal.
 TRG., Woburn, Mass.
 Tucker Electronics Co., Garland, Tex.
 UTE Microwave, Asbury Park, N.J.
 Varian Assocs., Palo Alto, Cal.
 Varian Electron Tube & Device Grp., San Carlos, Cal.
 Varian Palo Alto Microwave Tube Div., Palo Alto, Cal.
 Varian, Solid State West Division, Palo Alto, Cal.
 M Watkins-Johnson Co., Palo Alto, Cal.
 Waveline, W. Caldwell, N.J.
 DM Yig-Tek Corp., Santa Clara, Cal.

Filters, Notch—See Volume 1
Filters, Programmable—See Volume 1
Filters, R-F—See Volume 1
Filters, Single Sideband—See Volume 1
Filters, Synchronous Tracking—See Volume 1
Filters, Telemetry—See Volume 1
Filters, Tone, Telegraph—See Volume 1
Filters, Tunable—See Volume 1
Filters, Tuning Fork—See Volume 1
Filters, UHF & VHF—See Volume 1
Filters, Variable—See Volume 1
Filters, Vestigial Sideband—See Volume 1
Filters, Waveguide
 Arra Inc., Bay Shore, N.Y. p. 2-1278,1279
 D Greenray Inds., Mechanicsburg, Pa. p. 1-327
 D Texscan Corp., Indianapolis, Ind. p. 1-817
 McCoy Electronics, Mount Holly Springs, Pa. *
 Syston-Donner Microwave Div., Van Nuys, Cal. *

Addington Labs., Santa Clara, Calif.
 AEL, Colmar, Pa.
 M AIL, Deer Park, N.Y.
 Aircorn, Union, N.H.
 M Airtron, Morris Plains, N.J.
 M Cir-Q-Tel, Kensington, Md.
 M Coleman Microwave Co., Lebanon, N.J.
 Dynalab Corp., Van Nuys, Cal.
 Filtron Company, Westbury, N.Y.
 Frequency Engrg. Labs., Farmingdale, N.J.
 M Genisco Tech. Corp., Compton, Cal.
 Hughes Aircraft Co., Culver City, Cal.
 M Lorch Elctns. Corp., Englewood, N.J.
 M Lorch Devices Inc., Englewood, N.J.
 Maury Microwave Corp., Cucamonga, Calif.
 M Microlab/FXR, Livingston, N.J.
 Microphase Corp., Cos Cob, Conn.
 Microwave Assocs., Burlington, Mass.
 D Microwave Development Labs., Needham Hgts., Mass.
 M Norsal Industries, Brentwood, N.Y.
 M Premier Microwave, Port Chester, N.Y.
 R L C Elctns., Mt. Kisco, N.Y.
 Sivers Lab, Corona del Mar, Cal.

M Teledyne Microwave, Mountain View, Cal.
 TRG., Woburn, Mass.
 UTE Microwave, Asbury Park, N.J.
 Varian Assocs., Palo Alto, Cal.
 Varian Electron Tube & Device Grp., San Carlos, Cal.
 Varian Palo Alto Microwave Tube Div., Palo Alto, Cal.
 Waveline, W. Caldwell, N.J.

Flanges, Waveguide
 Syston-Donner Microwave Div., Van Nuys, Cal. *

M Airtron, Morris Plains, N.J.
 M Co-Operative Inds., Chester, N.J.
 Gabriel Elctns. Inc., Scarborough, Me.
 Maury Microwave Corp., Cucamonga, Calif.
 M Microlab/FXR, Livingston, N.J.
 D Microwave Development Labs., Needham Hgts., Mass.
 Narda Microwave Corp., Plainview, N.Y.
 M Premier Microwave, Port Chester, N.Y.
 TRG., Woburn, Mass.
 Varian Assocs., Palo Alto, Cal.
 Varian Electron Tube & Device Grp., San Carlos, Cal.
 Waveline, W. Caldwell, N.J.

Flashers—See Volume 1
Flashlights & Lanterns—See Volume 1
Flat Packages, Integrated Circuit—See Volume 1
Fluid Flow Indicators—See Volume 1
Flux, Brazing & Soldering Materials
 D Wall-Lenk Mfg. Co., Kinston, N.C. p. 2-1718,1719

D GC Electronics, Rockford, Ill. *
 Adtool Corp., Montreal W P Q, Can.
 D Alpha Metals, Jersey City, N.J.
 D Bow Solder Products, Newark, N.J.
 D Caig Labs., Westbury, N.Y.
 Chemetron Corp., Chicago, Ill.
 DM Duntun, M.W. Co., Providence, R.I.
 E.I. DuPont de Nemours & Co., Wilmington, Del.
 Engelhard Minerals & Chem., Murray Hill, N.J.
 Gte Sylvania, Belmont, Cal.
 Handy & Harman, New York, N.Y.
 D Heeger Inc., Los Angeles, Cal.
 DM Kenco Alloy & Chemical Co., Addison, Ill.
 DM Kester Solder Div., Chicago, Ill.
 Lake Chemical Co., Chicago, Ill.
 LMB Heeger, Los Angeles, Cal.
 D London Chemical Co., Bensenville, Ill.
 DM Multicore Solders, Westbury, N.Y.
 NL Industries, New York, N.Y.
 D Superior Flux & Mfg. Co., Cleveland, Ohio
 Union Carbide Corp., New York, N.Y.

Foil, Capacitor
 Fansteel Inc., N Chicago, Ill.
 ITT Jennings, Monrovia, Cal.
 Panasonic, Ind'l. Elctr. Comps., New York, N.Y.
 Polyflon Corp., New Rochelle, N.Y.
 M Reynolds Metals Co., Richmond, VA.
 Schweitzer, Peter J. Div., Lee, Mass.
 D United Mineral & Chem. Corp., New York, N.Y.

Foil, Magnetic
Mad-Vance Magnetics, Rochester, Ind. p. 2-1210
Arnold Engineering Co., Marengo, Ill. p. 2-1212,1213
M Eagle Magnetics Co., Indianapolis, Ind. p. 2-1216
Inter-Tech. Grp., Irvington-on-Hudson, N.Y. p. 2-1230
SGL Electronics, Westville, N.J. p. 2-1254
Jan Hardware Mfg. Co., Long Island City, N.Y. *
 M Allegheny Ludlum Steel Co., Pittsburgh, Pa.
 Amunel Mfg. Corp., Philadelphia, Pa.
 M Bram Metallurgical-Chem. Co., Phila., Pa.
 GTE Sylvania Inc., Newark, N.J.
 M Hamilton Technology, Lancaster, Pa.
 M Kaweck Beryco Inds., New York, NY
 D Magnetic Metals Co., Camden, N.J.
 M Magnetics, Butler, Pa.
 Russell Inds., Lynbrook, N.Y.
 Tohoku Metal Inds., Ltd., Tokyo, Japan
 Universal Security Instrs., Baltimore, Md.

Foil, Magnetic Shielding—See Shields, Magnetic
Forks, Tuning—See Volume 1
Forms, Coil—See Coil Assemblies & Forms
Forms, Wire
 Alpha Metals, Jersey City, N.J.

M Ametek, Hunter Spring Division, Hatfield, Pa.
M Art Wire & Stamping Co., Cedar Knolls, N.J.
Associated Spring Corp., Bristol, Conn.
Auto-Swage Products Inc., Shelton, Conn.
Autosplis/Dv Gen Staple, New York City, N.Y.
Bead Elctns., Bridgeport, Conn.
Copperweld Bimetallics, Glassport, PA
D Eaton Corporation, Cleveland, Ohio
Emporium Specialties Co., Austin, Pa.
M GTI Corporation, Pittsburgh, Pa.
M Hadley Components Div., Hadley, Pa.
D Helix Spring Corp., Long Island City, N.Y.
ITT Jennings, Monrovia, Cal.
Kentucky Electronics, Owensboro, Ky.
Materials Resch. Corp., Orangeburg, N.Y.
M Templeman, D.R. Co., Plainville, Conn.
Titchener, E.H. & Co., Binghamton, N.Y.
Wilkinson Co., Westlake Village, Cal.

Frames, Cabinet & Rack—See Volume 1

Freeze Spray—See Refrigerants, Spray;
Coolants, Circuit & Component

Freezer Cabinets—See Volume 1

Frequency Analyzers—See Volume 1

Frequency Extenders—See Volume 1

Frequency Sources—See Volume 1

Function, Modules—See Volume 1

Furnaces, Electric—See Volume 1

Furnaces, Gas (Production)—See
Volume 1

Furnaces, Vacuum—See Volume 1

Furniture, Electronic Lab.—See Volume 1

Fuse Clips—See Clips & Holders, Fuse

Fuses—See Volume 1

Fuses, Failure Indicating—See Volume 1

Fuses, Thermal—See Volume 1

Fuses, Time Delay—See Volume 1

Gages, Displacement, Linear
Jonard Industries Corp., Tuckahoe, N.Y.
p. 2-1706

Computer Instrs., Hempstead, N.Y. *

M Moxon Inc., Irvine, Cal. *

NES, Streamwood, Ill. *

Applied Control Co., Fairfield, N.J.
Automatic Timing & Controls Co., King of Prussia, Pa.
Bourne, Riverside, Calif.
Gaertner Scientific Corp., Chicago, Ill.
Hewlett-Packard Co., Palo Alto, Cal.
Lion Precision Corp., Newton, Mass.
Opto-Metric Tools, Rockleigh, N.J.
Schaevitz Engrg., Pennsauken, N.J.
Sensor Corp., Scottsdale, Pa.
Statham Instruments, Oxnard, Cal.
Trans-Tek, Ellington, Conn.
West Coast Resch. Corp., Los Angeles, Calif.

Gages, Ionization—See Volume 1

**Gages, Pressure-Also See Transducers,
Pressure**—See Volume 1

Gages, Strain—See Volume 1

Gages, Tension—See Volume 1

Gages, Vacuum—See Volume 1

Galvanometers—See Volume 1

Gaskets—See Seals

**Gaskets, Shielding, R-F-Also See
Shields, R-F**
Instrument Specialties, Little Falls, N.J.
p. 2-1226, 1229

M Rowe Industries, Toledo, Ohio p. 2-796, 797

D Tec, Tucson, Ariz. p. 2-1203

D Vector Electronic Co., Sylmar, Cal. p. 1-103

M McLean Engrg. Labs., Princeton Jctn., N.J. *

M Airtron, Morris Plains, N.J.
Anchor Plastics, Long Island City, N.Y.
M Auburn Mfg., Middletown, Conn.
Cal-Metex Corp., Inglewood, Cal.
Chomerics, Woburn, Mass.
Connecticut Hard Rubber Co., New Haven, Conn.

Emerson & Cuming, Canton, Mass.
M Lundy Elctns. & Sys., Glen Head, N.Y.
DM Metex Corp., Edison, N.J.
D Penn Fibre & Specialty, Phila., Pa.
M Premier Microwave, Port Chester, N.Y.
D Technical Wire Products, Cranford, N.J.

**Gates, Computer Circuit (AND, OR,
NOR, ETC.)**—See Volume 1

Gearheads & Speed Reducers—See
Volume 1

Gears & Gear Mechanisms (Precision)
Jan Hardware Mfg. Co., Long Island City, N.Y.
p. 2-1088, 1089

M Precision Mechanisms Corp., Westbury, N.Y.
p. 1-1919

I M C Magnetics, Westbury, N.Y. *

Jackson Bros., (London) Ltd., New York, N.Y. *

Bowmar Instr. Corp., Ft. Wayne, Ind.
Eaton Corp., Cleveland, Ohio
EEMCO Div., Los Angeles, Cal.
Gibson/Egan Co., Arcadia, Calif.
M Hamilton Technology, Lancaster, Pa.
M Instru-Lec Corp., Mt. Vernon, N.Y.
Invincible Gear Co., Detroit, Mich.
Lear Siegler, Santa Monica, Calif.
M Machine Components Corp., Plainview, N.Y.
Meltronic Inc., Leeds, Ala.
M Micro-Mo Electronics Inc., Cleveland, Ohio
Montevideo Technology Inc., Edina, Minn.
M MPC Prods. Corp., Chicago, Ill.
Orbit Instr. Corp., Syosset, N.Y.
Perfect Gear & Instr. Div., Northridge, Calif.
M PIC Design Division, Ridgefield, Conn.
Sterling Instr., New Hyde Pk., NY
DM Stock Drive Prods., New Hyde Pk., N.Y.
M Transcoil, Worcester, Pa.
Western Gear Corp., City of Industry, Cal

Generators, A-M—See Volume 1

Generators, A-M/F-M—See Volume 1

Generators, Audio—See Volume 1

Generators, Character—See Volume 1

Generators, Color Bar—See Volume 1

Generators, Digital Delay—See Volume 1

Generators, Electrical Power—See
Volume 1

Generators, F-M—See Volume 1

Generators, FM/Stereo—See Volume 1

Generators, Function—See Volume 1

Generators, Gating/Timing—See
Volume 1

Generators, Hall—See Volume 1

Generators, Harmonic—See Volume 1

Generators, Infrared—See Lamps, Infrared

Generators, Low-Frequency—See
Volume 1

Generators, Marker—See Volume 1

Generators, Microwave—See Volume 1

Generators, Noise, Random (Electrical)—
See Volume 1

Generators, Phase—See Volume 1

Generators, Pulse—See Volume 1

Generators, R-F—See Volume 1

Generators, Sawtooth, Sine—See
Volume 1

**Generators, Sine-Cosine Function
(Module)**—See Volume 1

Generators, Single-Sideband—See
Volume 1

Generators, Spectrum—See Volume 1

Generators, Square-Wave—See Volume 1

Generators, Sweep—See Volume 1

Generators, Time Code—See Volume 1

Generators, Timing, Digital—See
Volume 1

Generators, Tone—See Volume 1

Generators, Tone-Burst—See Volume 1

Generators, UHF/VHF—See Volume 1

Generators, Ultrasonic—See Volume 1

Generators, Word—See Volume 1

Geophysical Equip.—See Volume 1

Germanium—See Volume 1

Glues—See Adhesives

Governors, Centrifugal—See Volume 1

Graphalloy Products
Graphite Metallizing Corp., Yonkers, N.Y. *

D Pure Carbon Co., St. Marys, Pa.

Graphic Recording Instruments—See
Volume 1

Graphite Parts
Graphite Metallizing Corp., Yonkers, N.Y. *

D Aremco Prods., Ossining, N.Y.
M Atlantic Research Corporation, Alexandria, Va
Atomergic Chemicals Co., Carle Place, N.Y.
D Carbone Lorraine Industries Corp., Boonton, N.J.
National Beryllia Corp., Haskell, N.J.
Ohio Carbon Co., Cleveland, Ohio
D Pure Carbon Co., St. Marys, Pa.
Stackpole Carbon Co., St. Marys, Pa.
Textool Products, Irving, Tex.
Ultra Carbon Corp., Bay City, Mich.

Grilles & Accessories, Speaker—See
Volume 1

Grilles, Metal, Plastic—See Volume 1

Grommets
D Amatomet Electronic Hardware, New Haven,
Conn. p. 2-1258

D Sealectro Corp., Mamaroneck, N.Y. p. 2-804

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-866

D Waldom Electronics, Chicago, Ill.
p. 2-1262-1266

D GC Electronics, Rockford, Ill. *

Abesto Corp., Bloomfield, N.J.
DM Aimsco Inc., Seattle, Wash.
D Beman Mfg., New Cumberland, Pa.
DM Budwig Mfg. Co., Ramona, Calif.
Dixon Corp., Bristol, R.I.
D Eaton Corporation, Cleveland, Ohio
D Electrovert, Mt. Vernon, N.Y.
D Heyman Mfg. Co., Kenilworth, N.J.
D ICO/Rally Corp., Palo Alto, Cal.
M Mark Eyelet & Stamping, Wolcott, Conn.
Precision Paper Tube Co., Wheeling, Ill.
Russell Inds., Lynbrook, N.Y.
Sjoberg, C. & Son, Cranston, R.I.
D TRW/Cinch-Monadnock, An Elctrn. Comps., City of
Industry, Cal.
D USM Corp., Shelton, Conn.
M U.S. Terminals, Cincinnati, Ohio

Guides, Circuit Board—See Volume 1

Gyros (All Types)—See Volume 1

Hall Effect Devices—See Volume 1

**Handles For Cabinets, Circuit Boards,
Racks, etc.**—See Volume 1

**Handsets, Chestsets, Headphones,
Headsets, Etc.**—See Volume 1

Hardware—See Fasteners; Bolts; Brackets;
Clamps; Terminals; Etc.

Harnesses, Wire—See Cable Assemblies &
Harnesses

Headers, Hermetic—See Seals, Hermetic;
Services, Hermetic Sealing

Headers, Relay & Transformer
Bendix, Franklin, Ind. p. 2-1214

DM Keystone Elctns. Corp., New York, N.Y.

p. 2-715

- Alberox Corp., New Bedford, Mass.** *
- Ceramaseal, New Lebanon Center, N.Y.
- M Detronics Corp., S. El Monte, Cal.
- Eimac, San Carlos, Calif.
- M GTI Corporation, Pittsburgh, Pa.
- Gulton Inds., Buena Park, Cal.
- M Hermetic Seal Corp., Rosemead, Cal.
- Methode Elctns., Chicago, Ill.
- M Moldronics, Downers Grove, Ill.

Headers, Transistor & Diode

DM Keystone Elctns. Corp., New York, N.Y.

p. 2-715

- Bendix, Franklin, Ind.** *
- Aries Electronics, Frenchtown, N.J.
- M Detronics Corp., S. El Monte, Cal.
- Eimac, San Carlos, Calif.
- General Electric Co., Cleveland, Ohio
- M GTI Corporation, Pittsburgh, Pa.
- Gulton Inds., Buena Park, Cal.
- M Hermetic Seal Corp., Rosemead, Cal.
- M Moldronics, Downers Grove, Ill.
- National Beryllia Corp., Haskell, N.J.
- Nippert Co., Delaware, Ohio

Heads, Audio & Stereo (Recording, Playback & Erase)—See Volume 1

Heads, Data (Recording, Playback & Erase)—See Volume 1

Heads, Reflective—See Volume 1

Heads, Video (Recording, Playback & Erase)—See Volume 1

Heat Dissipators—See Volume 1

Heat Exchangers & Systems—See Volume 1

Heat Guns, Production

DM Daburn Electronics & Cable Corp., Bronx, N.Y.

p. 2-1978,1992

DM Master Appliance Corp., Racine, Wisc.

p. 2-1710-1713

Wall-Lenk Mfg. Co., Kinston, N.C.

p. 2-1718,1719

- Jonard Industries Corp., Tuckahoe, N.Y.** *
- Acesso-Wire, Garnersville, N.Y.
- D Adtool Corp., Montreal W P Q, Can.
- D American Elec. Heater, Detroit, Mich.
- M M Newman Corp., Marblehead, Mass.
- M Brady Co., W. H., Milwaukee, Wis.
- D Burlington Opers. Div., Burlington, Mass.
- Caig Labs., Westbury, N.Y.
- M Chemplast, Wayne, N.J.
- D Cole-Flex Corp., W. Babylon, N.Y.
- D Eraser Co., Syracuse, N.Y.
- Henes Mfg. Co., Phoenix, Ariz.
- D ICD/Rally Corp., Palo Alto, Cal.
- Jensen Tools & Alloys, Phoenix, Ariz.
- M MacDonald & Co., Glendale, Calif.
- Mann, Henry Inc., Huntingdon Valley, Pa.
- Newman Corp., M. M., Marblehead, Mass.
- Sara Scientific Co., San Francisco, Calif.
- Sigma Sys. Corp., San Diego, Calif.
- D Techni-Tool, Plymouth Meeting, Pa.
- D Thomas & Betts Co., Elizabeth, N.J.
- D UNGAR, Div., Compton, Cal.
- D Wahl Clipper Corp., Sterling, Ill.

Heat Shrinkable Elastomers, Plastics—

See Caps, Forms & Tapes, Heat Shrinkable; Tubing, Heat Shrinkable

Heat Sinks—See Heat Sinks, Soldering; Transistor, Diode, Thyristor, Heat Dissipators

Heat Sinks, Soldering

- D Channellock, Meadville, Pa.** p. 2-1693
- D Smith Inc., Herman H., Brooklyn, N.Y.** p. 2-853
- D Augat Inc., Attleboro, Mass.** *
- D Daburn Electronics & Cable Corp., Bronx, N.Y.** *
- D Delco Electronics Div., Kokomo, Ind.** *
- D GC Electronics, Rockford, Ill.** *
- Jan Hardware Mfg. Co., Long Island City, N.Y.** *
- Jonard Industries Corp., Tuckahoe, N.Y.** *
- D Adtool Corp., Montreal W P Q, Can.
- American Lava Corp., Chattanooga, Tenn.
- Avtron Mfg., Cleveland, Ohio
- Fansteel Inc., N Chicago, Ill.
- Janel, Stirling, N.J.
- Jensen Tools & Alloys, Phoenix, Ariz.

- M MacDonald & Co., Glendale, Calif.
- Mann, Henry Inc., Huntingdon Valley, Pa.
- D Hunter Tools, El Monte, Calif.
- Motorola Comms. Div., Schaumburg, Ill.
- South Shore Metal Prods., Farmingdale, N.Y.
- D Techni-Tool, Plymouth Meeting, Pa.
- Tempil Div., So. Plainfield, N.J.
- D Wakefield Engrg., Wakefield, Mass.
- D X-Acto, Long Island City, N.Y.
- D Xcelite, Orchard Park, N.Y.

Heaters & Accessories, Induction—See Volume 1

Heaters & Heating Elements (For Components & Equipment) Also see Ovens—See Volume 1

Hermetic Sealing—See Volume 1

Hinges—See Fasteners

Holders & Carriers, Chip (Capacitor, IC, LSI)—See Volume 1

Holders & Carriers, IC, LSI (Packaged)—See Volume 1

Holders, Battery—See Retainers, Battery; Connectors, Battery

Holders, Brush—See Volume 1

Holders, Circuit Board (Production Type)—See Volume 1

Holders, Crystal—See Volume 1

Holders, Fuse—See Clips & Holders, Fuse; Panels, Fuse

Holders, Lamp—See Sockets, Lamp & Lamp Assemblies

Holders, Test Lead—See Volume 1

Holders, Tube—See Volume 1

Honeycomb Sheets, Panels, etc.

M Zero Mfg. Co., Burbank, Cal. p. 1-106-109

M McLean Engrg. Labs., Princeton Jctn., N.J. *

- Cal-Metex Corp., Inglewood, Cal.
- Corning Glass Works, Corning, N.Y.
- Hughes Aircraft Co., Culver City, Cal.
- Laser Technology, N. Hollywood, Calif.

DM Lectro Magnetics, Los Angeles, Cal.

Met-L-Wood Corp., Chicago, Ill.

DM Metex Corp., Edison, N.J.

M Nurad, Baltimore, Md.

D Technical Wire Products, Cranford, N.J.

Triac Electronics, New York, N.Y.

Horns, Microwave-Also See Antennas, Microwave

Amphenol RF Div., Danbury, Conn.

p. 2-460,461

Micrite Metal Mfg., Canoga Park, Cal.

p. 2-1236-1239

Syston-Donner Microwave Div., Van Nuys, Cal. *

AEL, Colmar, Pa.

Aircorn, Union, N.H.

Coax Devices Inc., Chelsea, Mass.

Datron Systems, Chatsworth, Cal.

Electro-Mechanics Co., Austin, Tex.

Gabriel Elctns. Inc., Scarborough, Me.

GTE Sylvania Inc., Washington, D.C.

Hughes Aircraft Co., Culver City, Cal.

Maury Microwave Corp., Cucamonga, Calif.

M Microlab/FXR, Livingston, N.J.

D Microwave Development Labs., Needham Hgts., Mass.

Narda Microwave Corp., Plainview, N.Y.

M Nurad, Baltimore, Md.

D PASO Sound Products Inc., New York, N.Y.

M Premier Microwave, Port Chester, N.Y.

Sivers Lab, Corona del Mar, Cal.

M Teledyne Micronetics, San Diego, Calif.

M Transco Prods., Venice, Cal.

D TRG, Woburn, Mass.

Universal Security Instrs., Baltimore, Md.

M Watkins-Johnson Co., Palo Alto, Cal.

Waveline, W. Caldwell, N.J.

Housings, Circuit Module—See

Enclosures, Module, Plug-In

Housings, Photomultiplier Tube—See Volume 1

Hybrid Voltage Regulators—See Volume 1

Hydrophones & Accessories—See Volume 1

Hysteresisgraphs—See Volume 1

Igniters, Arc Lamp—See Volume 1

Impedance Comparators—See Volume 1

Impedance Converters, Microwave—See Volume 1

Incremental Magnetic Recorders—See Volume 1

Index Assemblies, Switch—See Volume 1

Indicator Lights—See Lights, Dial, Panel, etc.

Indicators, Angle—Also See Encoders, Shaft Position—See Volume 1

Indicators, Antenna Position—See Volume 1

Indicators, Azimuth—See Volume 1

Indicators, Capacitor Leakage—See Volume 1

Indicators, Circuit Condition, On, Off etc. (Electro-Mechanical)-Also see Indicators, Instrument

Allard Instr., Westbury, N.Y. p. 1-601

Applied Electro Technology, Santa Ana, Cal.

p. 1-1578

Bussmann Manufacturing, St. Louis, Mo.

p. 1-1960-1965

D IEE/Schadow, Eden Prairie, Minn.

p. 1-2067-2069

Kratos, Pasadena, Cal p. 1-750

D Micro Switch, Freeport, Ill. p. 1-2101

D Modutec, Norwalk, Conn. p. 1-777-779

DM SGL Weber Electric, Westville, NJ p. 2-356

Sheller-Globe Corp., Perkasie, Pa. p. 1-666,669

D Shelly Assocs., Santa Ana, Cal. p. 2-1186

Sodeco Div., Elmsford, N.Y. p. 1-260,261

DM Unimax Switch Corp., Wallingford, Conn.

p. 1-2304

D Electro-Mech Components, So. El Monte, Cal. *

General Elec. Co., Schenectady, N.Y. *

NES, Streamwood, Ill. *

Staver Co., Bay Shore, N.Y. *

D Waldom Electronics, Chicago, Ill. *

Applied Control Co., Fairfield, N.J.

Artisan Elctns. Corp., Parsippany, N.J.

DM Chicago Miniature Lamp/Drake, Chicago, Ill.

D Clare-Pendar, Post Falls, Idaho

D Compu-Lite Corp., Irvine, Cal.

M Control Switch, Folcroft, Pa.

Daco Instr. Co., Milford, Conn.

Honeywell, Mpls., Minn.

M IMC Magnetics Corp., Maywood, Cal.

Jay-El Prods., Gardena, Calif.

Korry Mfg. Co., Seattle, Wash.

M Minelco, Div. General Time Corp., Thomaston, Conn.

Montevideo Technology Inc., Edina, Minn.

Nucleus Corp., Madison Hgts., Mich.

OPCOA, Edison, N.J.

M Penn Keystone Corp., Ansonia, Conn.

Sierra Elec., Gardena, Calif.

Universal Security Instrs., Baltimore, Md.

Indicators, Computer Type & Data

Display—See Lights, Dial; Display Devices; Displays

Indicators, Distortion—See Volume 1

Indicators, Elapsed-Time—See Volume 1

Indicators, Electromechanical—See Indicators, Circuit Condition, On / Off

Indicators, Frequency—See Volume 1

Indicators, Humidity & Moisture (Electronic)—See Volume 1

Indicators, Illumination—See Volume 1

Indicators, Instrument, Flag, Pointer, etc.

Allard Instr., Westbury, N.Y. p. 1-601
D Modutec, Norwalk, Conn. p. 1-777-779
D Hickok Electrical Instr., Cleveland, Ohio *
NES, Streamwood, Ill. *
D Waldom Electronics, Chicago, Ill. *
M Abrams Instr., Lansing, Mich.
 Airpax Elctns., Ft. Lauderdale, Fla.
 Analytical Measurements, Chatham, N.J.
 The Bendix Corp., Teterboro, N.J.
D Bendix Corp., Ft. Lauderdale, Fla.
M Clifton Precision, Clifton Hgts., Pa.
 Daco Instr. Co., Milford, Conn.
M Ideal Precision Meter Co., Brooklyn, N.Y.
M IMC Magnetics Corp., Maywood, Cal.
 Int'l. Instrs., Orange, Conn.
 Jewell Electrical Instruments, Manchester, N.H.
D JPI, Santa Monica, Cal.
 Larson Aero Dev., Concord, Calif.
 Leeds & Northrup Co., North Wales, Pa.
M Mineico, Div. General Time Corp., Thomaston, Conn.
 Nucleus Corp., Madison Hgts., Mich.
M Penn Keystone Corp., Ansonia, Conn.
D Ragen Data Systems, Farmingdale, N.Y.
 Robertshaw Controls Co., Richmond, Va.
 Sensitive Research Instrs., Mt. Vernon, N.Y.
D Sigma Instruments, Braintree, Mass.
M Transcoil, Worcester, Pa.

Indicators, Linear Displacement—See Volume 1**Indicators, Liquid Level—See Volume 1****Indicators, Magnetic Field—See Volume 1****Indicators, Material Thickness—See Volume 1****Indicators, Noise-Figure—See Volume 1****Indicators, Null—See Volume 1****Indicators, Numeric Readout—See Display Devices & Displays; Tubes, Readout****Indicators, Positioning—See Volume 1****Indicators, Power Level—See Volume 1****Indicators, Pressure—See Volume 1****Indicators, Proximity—See Volume 1****Indicators, R-F—See Volume 1****Indicators, Rotary Shaft Position—See Volume 1****Indicators, Servo—See Volume 1****Indicators, Shorted Turn—See Volume 1****Indicators, Sound Level—See Volume 1****Indicators, Speed—See Volume 1****Indicators, Strain (For Use With Strain Gauges)—See Volume 1****Indicators, Telemetry—See Volume 1****Indicators, Temperature—See Volume 1****Indicators, Temperature (Non-Meter Type)—See Volume 1****Indicators, Torque—See Volume 1****Indicators, Transient Voltage—See Volume 1****Indicators, Vacuum—See Volume 1****Indicators, VSWR—See Volume 1****Inductance Comparators—See Volume 1****Inductance Standards—See Volume 1****Induction Potentiometers—See Volume 1****Inductors—See Coils****Inks For Thick Film Microcircuits—See Volume 1****Insertion Loss Measurement Systems—See Volume 1****Inserts—See Bushings****Instrument Parts, Precision—See Bearings; Gears; Springs; etc.****Insulation Materials**

DM Daburn Electronics & Cable Corp., Bronx, N.Y.
 p. 2-1973-1978,1992
DM Humiseal Div., Woodside, N.Y.
 p. 2-338,339,1270,1271

M Perfection Mica Co., Bensenville, Ill.
 p. 2-1257,2055
 p. 2-1274,1275

D Varflex Corp., Rome, N.Y. p. 2-1274,1275
DM Vector Electronic Co., Sylmar, Cal. p. 2-358

Carborundum Co., Niagara Falls, N.Y. *

Acheson Colloids Co., Port Huron, Mich.

American Lava Corp., Chattanooga, Tenn.

Armstrong Cork Co., Lancaster, Pa.

M Atlas Fibre Co., Chicago, Ill.

M Auburn Mfg., Middletown, Conn.

Bird, Richard H. & Co., Waltham, Mass.

Brand Dielectrics, N. Windham, Conn.

D Brand-Rex Co., Willimantic, Conn.

D Centralab, Milwaukee, Wisc.

M Chemplast, Wayne, N.J.

M Cleveland Mica Co., Lakewood, Ohio

D Cole-Flex Corp., W. Babylon, N.Y.

Communications Technology Corp., Los Angeles, Cal.

DM Conap, Allegany, N.Y.

Corning Glass Works, Television Prods. Div., Corning, N.Y.

D Dixon Corp., Bristol, R.I.

Dolph, John C. Co., Monmouth Junction, N.J.

Dow Chemical Co., Midland, Mich.

Dow Corning, Midland, Mich.

E.I. DuPont de Nemours & Co., Wilmington, Del.

Electro-Science Labs., Pennsauken, N.J.

Formulated Resins Inc., Greenville, R.I.

D General Elec. Co., Waterford, N.Y.

Gte Sylvania, Belmont, Cal.

M Hardman Inc., Belleville, N.J.

DM ICO/Rally Corp., Palo Alto, Cal.

M Isochem Resins Co., Lincoln, R.I.

M Laminated Fabricators, San Bruno, Calif.

Mobay Chem. Corporation, Pittsburgh, Pa.

Murata Mfg. Co. Ltd., Kyoto, Japan

National Beryllia Corp., Haskell, N.J.

Newman Corp., M. M., Marblehead, Mass.

D Norelcom Electronics, Farmingdale, N.Y.

NVF Co., Yorklyn, Del.

D Penn Fibre & Specialty, Phila., Pa.

Precision Paper Tube Co., Wheeling, Ill.

Raychem Corp., Menlo Park, Cal.

M Rogers Corp., Rogers, Conn.

Rostone Corp., Lafayette, Ind.

Schweitzer, Peter J. Div., Lee, Mass.

SWS Silicones, Adrian, Mich.

Synthane Taylor Corp., Valley Forge, Pa.

3M Co., St. Paul, Minn.

Union Carbide, Chemicals & Plastics, New York, N.Y.

Union Carbide Corp., New York, N.Y.

D Uniroyal, New York, N.Y.

D United Mineral & Chem. Corp., New York, N.Y.

D Workman Electronic Prods., Sarasota, Fla.

D Zippertubing Co., Los Angeles, Calif.

Insulation Parts, Fabricated

D Amatorm Electronic Hardware, New Haven, Conn. p. 2-1258

Amphenol RF Div., Danbury, Conn. p. 2-460,461

DM Concord Elctns., New York, N.Y. p. 2-654,655

Industrial Mica Div., Englewood, N.J. p. 1-1268

National Tel-Tronics, Meadville, Pa. p. 2-720,721

M Perfection Mica Co., Bensenville, Ill. p. 2-1257,2055

Thermelloy, Dallas, Tex. p. 1-1877-1879

D Varflex Corp., Rome, N.Y. p. 2-1274,1275

D Vector Electronic Co., Sylmar, Cal. p. 2-358

Grayhill Inc., LaGrange, Ill. *

D Accessories for Electronics, Bayside, N.Y.

American Lava Corp., Chattanooga, Tenn.

M Atlantic Optical Moulding Co., Dudley, Mass.

M Atlas Fibre Co., Chicago, Ill.

M Auburn Mfg., Middletown, Conn.

M Avid Electronics Corp., Baldwin, Pl., N.Y.

Brand Dielectrics, N. Windham, Conn.

D Central Plastics Dist., Chicago, Ill.

Centralab, Milwaukee, Wisc.

M Chemplast, Wayne, N.J.

M Cleveland Mica Co., Lakewood, Ohio

D Cole-Flex Corp., W. Babylon, N.Y.

M Comco Plastics, Richmond Hill, N.Y.

Communications Technology Corp., Los Angeles, Cal.
 Corning Glass Works, Television Prods. Div., Corning, N.Y.

Delbert Blinn Co., Pomona, Calif.

Diamonite Products Div., Shreve, Ohio

D Dixon Corp., Bristol, R.I.

Form-It Products Inc., Chicago, Ill.

M Laminated Fabricators, San Bruno, Calif.

National Beryllia Corp., Haskell, N.J.

NVF Co., Yorklyn, Del.

D Penn Fibre & Specialty, Phila., Pa.

Precision Paper Tube Co., Wheeling, Ill.

Quartzite Processing, Malden, Mass.

Rostone Corp., Lafayette, Ind.

Sjoberg, C. & Son, Cranston, R.I.

Star Porcelain Co., Trenton, N.J.

DM Stevens Prods., E. Orange, N.J.

Synthane Taylor Corp., Valley Forge, Pa.

TOR Corporation, Van Nuys, Cal.

Tran-Tec Corporation, Columbus, Neb.

D United Mineral & Chem. Corp., New York, N.Y.

M U.S. Terminals, Cincinnati, Ohio

D Workman Electronic Prods., Sarasota, Fla.

Insulators, Antenna

Alberox Corp., New Bedford, Mass. *

D Daburn Electronics & Cable Corp., Bronx, N.Y. *

Acheson Colloids Co., Port Huron, Mich.

M Avid Electronics Corp., Baldwin, Pl., N.Y.

D Birnbach Co., Freeport, N.Y.

Lapp Insulator Div., Interpace Corp., LeRoy, N.Y.

DM Nat'l Ceramic Co., Trenton, N.J.

D Rohn Mfg., Peoria, Ill.

D S & A Electronics, Toledo, Ohio

Star Porcelain Co., Trenton, N.J.

Synthane Taylor Corp., Valley Forge, Pa.

Insulators, Bushing (Metallized)—See Bushings**Insulators, Clip, Test & Battery**

DM Mueller Electric Co., Cleveland, Ohio
 p. 2-718,719

D Smith Inc., Herman H., Brooklyn, N.Y.
 p. 2-816,831,838,864

D Daburn Electronics & Cable Corp., Bronx, N.Y. *

DM Keystone Elctns. Corp., New York, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

Birnbach Co., Freeport, N.Y.

D N T-T/Peerless, Leominster, Mass.

D Showa Musen Kogyo Co. Ltd., Shinagawa-Ku Tokyo, Japan

Integrated Circuit Packaging Systems—See Volume 1**IC's, Active Filters—See Volume 1****IC's, Adders, Full, Half, Modulo-2 Also see IC's, Arithmetic Logic Units—See Volume 1****IC's, Amplifiers, Audio—See Volume 1****IC's, Amplifiers, Current—See Volume 1****IC's, Amplifiers, Instrumentation—See Volume 1****IC's, Amplifiers, Logarithmic—See Volume 1****IC's, Amplifiers, Operational—See Volume 1****IC's, Amplifiers, Operational, Micropower—See Volume 1****IC's, Amplifiers, Opto-Electronic—See Volume 1****IC's, Amplifiers, Radio-Frequency—See Volume 1****IC's, Amplifiers, Sample-And-Hold—See Volume 1****IC's, Amplifiers, Sense Also see IC's, Comparators, Analog—See Volume 1****IC's AND, AND-OR-Invert Gates—See Volume 1****IC's, Arithmetic Logic Units (ALU) Also see IC's, Adders—See Volume 1****IC's, Breadboard Circuits—See Volume 1**

IC's, Buffers—See Volume 1

IC's, Bus Drivers—See Volume 1

IC's, Calculator Kits—See Volume 1

IC's, Central Processing Units (CPU)—See Volume 1

IC's, Character Generators, Dot-Matrix—See Volume 1

IC's, Chroma Amplifiers Demodulators, Signal Processors—See Volume 1

IC's, Clock Drivers—See Volume 1

IC's, Code Converters—See Volume 1

IC's, Communications Circuits—See Volume 1

IC's, Comparators, Analog Also see **IC's, Amplifiers, Sense**—See Volume 1

IC's, Comparators, Digital—See Volume 1

IC's, Converters, Analog-To-Digital—See Volume 1

IC's, Converters, Binary-To-Binary-Code-Decimal—See Volume 1

IC's, Converters, Digital-To-Analog—See Volume 1

IC's, Converters, Voltage-To-Frequency—See Volume 1

IC's, Counters and Adapters—See Volume 1

IC's, Current Regulators—See Volume 1

IC's, Data Bus Drivers—See Volume 1

IC's, D-C Amplifiers—See Volume 1

IC's, Decoders, Decoder/Drivers (All Types)—See Volume 1

IC's, Demultiplexers—See Volume 1

IC's, Differential Amplifiers—See Volume 1

IC's, Diode Matrices—See Volume 1

IC's, Discriminators, F-M—See Volume 1

IC's, Display Drivers, 7-Segment, 9-Segment NIXIE, Etc—See Volume 1

IC's, Encoders & Decoders—See Volume 1

IC's, Exclusive OR Gates—See Volume 1

IC's, Expanders—See Volume 1

IC's, Flip-Flops J-K, R-S, R-S-T, Type D, Pulse Triggered, Etc—See Volume 1

IC's, Four-Quadrant Multipliers—See Volume 1

IC's, Frequency Dividers—See Volume 1

IC's, Frequency-Shift Keyers—See Volume 1

IC's, Frequency Synthesizers—See Volume 1

IC's, Function Generators—See Volume 1

IC's, Gates—See Volume 1

IC's, Hexidecimal Counters—See Volume 1

IC's, High-Voltage (200 V & Over)—See Volume 1

IC's, Intermediate-Frequency Amplifiers—See Volume 1

IC's, Inverters—See Volume 1

IC's, Keyboard Encoders—See Volume 1

IC's, Lamp Drivers—See Volume 1

IC's, Latch—See Volume 1

IC's, Level Shifters, Translators—See Volume 1

IC's Line Drivers/Receivers & Line Drivers/Transmitters—See Volume 1

IC's, Linear Multipliers—See Volume 1

IC's, Logic Circuits—See Volume 1

IC's, Memories—See Volume 1

IC's, Microprocessors—See Volume 1

IC's, Mixers—See Volume 1

IC's, Modulator/Demodulators, Balanced—See Volume 1

IC's, Multiplexers, Analog—See Volume 1

IC's, Multiplexers, Digital—See Volume 1

IC's, Multipliers, Analog—See Volume 1

IC's, Multivibrators—See Volume 1

IC's, NAND, NOR & OR/NOR gates—See Volume 1

IC's, Oscillators—See Volume 1

IC's, Parity Generator/Checkers—See Volume 1

IC's, Phase Lock Loop Circuits—See Volume 1

IC's, Power Amplifiers (1 W Minimum)—See Volume 1

IC's, Power Gates—See Volume 1

IC's, Pulse Shapers—See Volume 1

IC's, Receiver/Transmitter, Asynchronous—See Volume 1

IC's, Receivers, A-M, F-M—See Volume 1

IC's, Receivers, Teletype—See Volume 1

IC's, Relay Drivers—See Volume 1

IC's, Sample-And-Hold Circuits—See Volume 1

IC's, Schmitt Triggers—See Volume 1

IC's, Shift Registers, Static or Dynamic—See Volume 1

IC's, Subtractors—See Volume 1

IC's, Switches, Analog—See Volume 1

IC's, Television, A-M/F-M Sound Circuits—See Volume 1

IC's, Three-State Logic (TSL)—See Volume 1

IC's, Timers—See Volume 1

IC's, Transducer, Pressure—See Volume 1

IC's, Transistor Arrays—See Volume 1

IC's, Translators, ECL to TTL, ECL to MOS, etc.—See Volume 1

IC's, Transmitters, Teletype—See Volume 1

IC's, Video Amplifiers—See Volume 1

IC's, Voltage Regulators—See Volume 1

IC's, Waveform Generators—See Volume 1

IC's, Wideband Amplifiers—See Volume 1

IC's, Zero-Voltage Switches—See Volume 1

Integrators, Electronic—See Volume 1

Integrators, Mechanical & Electro-Mechanical—See Volume 1

Intensifiers, Image—See Volume 1

Intercom Systems - Also see Comm. Systems, Selective Paging—See Volume 1

Interferometer Systems—See Volume 1

Intervalometers—See Volume 1

Inverters, A-C to D-C—See Volume 1

Inverters, D-C to A-C Also see Power Supplies, A-C Output—See Volume 1

Inverters, D-C to D-C—See Volume 1

Isolators, D-C/D-C Signal—See Volume 1

Isolators, Line—See Volume 1

Isolators, Microwave (All Types)
 Bendix, Franklin, Ind. p. 2-1280
 General Elec. Co., Schenectady, N.Y. *
 Systron-Donner Microwave Div., Van Nuys, Cal. *
 Addington Labs., Santa Clara, Calif.
 AEL, Colmar, Pa.
 M Aertech Industries, Sunnyvale, Cal.
 M Airtron, Morris Plains, N.J.
 Amplica Inc., Westlake Village, Cal.
 California Microwave, Sunnyvale, Cal.
 M Cir-Q-Tel, Kensington, Md.
 E & M Laboratories, Westlake Village, Cal.
 Hughes Aircraft Co., Culver City, Cal.
 M Hughes Aircraft Co., Torrance, Cal.
 Hughes Aircraft Co., Fullerton, Cal.
 M Lorch Devices Inc., Englewood, N.J.
 M Merrimac Inds., West Caldwell, N.J.
 M Microlab/FXR, Livingston, N.J.
 Microwave Assocs., Burlington, Mass.
 Microwave Prods., Chatsworth, Cal.
 M Norsal Industries, Brentwood, N.Y.
 D PRD Elctns., Syosset, N.Y.
 M Premier Microwave, Port Chester, N.Y.
 Sivers Lab, Corona del Mar, Cal.
 Special Microwave Devices Oper., Waltham, Mass.
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
 M Teledyne Microwave, Mountain View, Cal.
 M Trak Microwave Corporation, Tampa, Fla.
 D TRG., Woburn, Mass.
 UTE Microwave, Asbury Park, N.J.
 Varian Assocs., Palo Alto, Cal.
 Varian Electron Tube & Device Grp., San Carlos, Cal.
 Varian Palo Alto Microwave Tube Div., Palo Alto, Cal.

Isolators, Opto—See Volume 1

Isolators, Source—See Volume 1

Jack Adapters (All Types)
 DM Amphenol RF Div., Danbury, Conn. p. 2-460,461
 D ITT Pomona Electronics Div., Pomona, Cal. p. 2-727,730,731,735,737,739
 D National Tel-Tronics, Meadville, Pa. p. 2-721
 M Rowe Industries, Toledo, Ohio p. 2-796,797
 DM Bendix, Franklin, Ind. *
 D GC Electronics, Rockford, Ill. *
 Shigoto Inds., Ltd., New York, N.Y. *
 D Smith Inc., Herman H., Brooklyn, N.Y. *
 DM Astrolab, Rahway, N.J.
 D Barker Prods. Co., Saugus, Mass.
 Birnbach Co., Freeport, N.Y.
 D Blonder-Tongue Labs., Old Bridge, N.J.
 D Ev-Game Inc., Freeport, N.Y.
 Methode Elctns., Chicago, Ill.
 D N T-T/Peerless, Leominster, Mass.
 D Rye Inds., Mamaroneck, N.Y.
 Saxton Prods., Congers, N.Y.
 D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
 Sierra Elec., Gardena, Calif.
 D Switchcraft, Chicago, Ill.
 D Workman Electronic Prods., Sarasota, Fla.

Jack Covers
 Allied Systems Corp., Greensboro, N.C. p. 2-458,459

Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1091
D Waldom Electronics, Chicago, Ill. p. 1-1070-1074
DM Keystone Elctns. Corp., New York, N.Y. *
 D Cambridge Thermionic Corp., Cambridge, Mass.
 Mid-West Metal Prods., Kansas City, Kans.
 Morey Corp., Downers Grove, Ill.
 Mupac Corp., Brockton, Mass.
 Sierra Elec., Gardena, Calif.
 D Switchcraft, Chicago, Ill.

Jack Panel Assemblies & Accessories—
 See Panels, Jack

Jacks (All Types)

DM ADC Prods., Minneapolis, Minn. p. 2-445,448
Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
Amphenol RF Div., Danbury, Conn. p. 2-460,461

D Concord Elctns., New York, N.Y. p. 2-654,655
Connector Corp., Chicago, Ill. p. 2-657-660
DM Elctrn. Molding Corp., Woonsocket, R.I. p. 2-676-679

D ITT Pomona Electronics Div., Pomona, Cal. p. 2-746,747,750,751
Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1091

D Johnson Co., E.F., Waseca, Minn. p. 2-707,708,710,711
D Jones Elctns., Hiram, No. Hollywood, Cal. p. 2-683,684

D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1249
National Tel-Tronics, Meadville, Pa. p. 2-721
M Rowe Industries, Toledo, Ohio p. 2-796,797
Sealectro Corp., Mamaroneck, N.Y. p. 2-803-805

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-818,822-826,828-830,836,843,844,852,886
D Superior Electric Co., Bristol, Conn. p. 2-799
D Trimm, Libertyville, Ill. p. 2-895
D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Waldom Electronics, Chicago, Ill. p. 1-1070-1074

DM Augat Inc., Attleboro, Mass *
DM Bendix, Franklin, Ind. *
DM Daburn Electronics & Cable Corp., Bronx, N.Y. *
D GC Electronics, Rockford, Ill. *

General Radio Co., Concord, Mass. *
DM Keystone Elctns. Corp., New York, N.Y. *
DM Raytheon Co., Burlington, Mass. *

Shigoto Inds., Ltd., New York, N.Y. *
M Virginia Panel Corp., Waynesboro, Va. *
M Accessories for Electronics, Bayside, N.Y.

Amp Inc., Harrisburg, Pa.
Barker Prods. Co., Saugus, Mass.
Bead Elctns., Bridgeport, Conn.
Beman Mfg., New Cumberland, Pa.
Birnback Co., Freeport, N.Y.

D Components Specialties, Hempstead, N.Y.
D Eby Co., Hugh H., Philadelphia, Pa.
Hypertronics Corp., Stow, Mass.

M International Importers, Chicago, Ill.
D Javex Elctns., Cherry Valley, Cal.
D Jerrold Electronics Corp., Horsham, Pa.
D Jolo Industries, Garden Grove, Cal.
Methode Elctns., Chicago, Ill.

D N T-T/Peerless, Leominster, Mass.
D Philmore Mfg. Co. Inc., Inwood, N.Y.
D Porter, H.K., Somerville, Mass.
D Rye Inds., Mamaroneck, N.Y.

DM Saxton Prods., Congers, N.Y.
D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
Sierra Elec., Gardena, Calif.
D Switchcraft, Chicago, Ill.
Trompeter Electronics, Chatsworth, Cal.
M U.S. Terminals, Cincinnati, Ohio

Jigs And Fixtures, Chassis & Circuit Board—See Volume 1

Joint Compounds, Semiconductor—See
 Coatings, Compounds, Lubricants, Etc.,
 Heat Conductive

Joints, Rotary, Microwave
Graphite Metallizing Corp., Yonkers, N.Y. *
Syston-Donner Microwave Div., Van Nuys, Cal. *

M Microlab/FXR, Livingston, N.J.
D Microwave Development Labs., Needham Hgts., Mass.
M Premier Microwave, Port Chester, N.Y.
D Sivers Lab, Corona del Mar, Cal.

D TRG., Woburn, Mass.
Waveline, W. Caldwell, N.J.

Jumpers, Bonding
M Janco Corp., Burbank, Cal. p. 1-2090
Mini-Systems, North Attleboro, Mass. *
Vernitron Elec. Comps., Laconia, N.H. *
Estes Engrg. Co., Port Angeles, Wash.
Excel Specialty Corp., Chicago, Ill.

Jumpers, Circuit Board
D E-Z-Hook, Arcadia, Cal. p. 2-671
D ITT Pomona Electronics Div., Pomona, Cal. p. 2-775,776
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-838
D Spectra-Strip Corp., Garden Grove, Cal. p. 2-2057

D Augat Inc., Attleboro, Mass *
D Elctrn. Molding Corp., Woonsocket, R.I. *
D GC Electronics, Rockford, Ill. *

DM Keystone Elctns. Corp., New York, N.Y. *
D 3M Company, St. Paul, Minn. *
D Vector Electronic Co., Sylmar, Cal. *

M Virginia Panel Corp., Waynesboro, Va. *
DM Ansley Electronics Corp., Los Angeles, Cal.
Aries Electronics, Frenchtown, N.J.
Autosplice/Dv Gen Staple, New York City, N.Y.

D Beman Mfg., New Cumberland, Pa.
D Circuit Assembly Corp., Costa Mesa, Ca.
E & L Instruments, Derby, Conn.
M Manger Elec. Co., Stamford, Conn.
Mupac Corp., Brockton, Mass.
D Zippertubing Co., Los Angeles, Calif.

Jumpers, Wire, Terminated—See Cords, Patch

Junctions, Hybrid, Microwave
Arra Inc., Bay Shore, N.Y. p. 2-1278,1279
Vari-L Co., Denver, Colo. p. 2-1392-1400
M General Microwave Corp., Farmingdale, NY *
Syston-Donner Microwave Div., Van Nuys, Cal. *

Aircorn, Union, N.H.
M Airtorn, Morris Plains, N.J.
Alford Mfg. Co., Winchester, Mass.
American Microwave Inds., Waltham, Mass.

DM Anaren Microwave, Syracuse, N.Y.
Coax Devices Inc., Chelsea, Mass.
Engelmann Microwave, Montville, N.J.
Frequency Engrg. Labs., Farmingdale, N.J.
Hughes Aircraft Co., Culver City, Cal.

M Lorch Elctns. Corp., Englewood, N.J.
M Lorch Devices Inc., Englewood, N.J.
Maury Microwave Corp., Cucamonga, Calif.
M Merrimac Inds., West Caldwell, N.J.
M Microlab/FXR, Livingston, N.J.
Microphase Corp., Cos Cob, Conn.
D Microwave Development Labs., Needham Hgts., Mass.

Narda Microwave Corp., Plainview, N.Y.
M Norsal Industries, Brentwood, N.Y.
M Premier Microwave, Port Chester, N.Y.
Reeve Electronics, Chicago, Ill.
R L C Elctns., Mt. Kisco, N.Y.
Sivers Lab, Corona del Mar, Cal.

M Technical Research & Mfg., Manchester, N.H.
M Transco Prods., Venice, Cal.
D TRG., Woburn, Mass.
Varian Electron Tube & Device Grp., San Carlos, Cal.
Varian Solid State East Beverly Div., Beverly, Mass.
Waveline, W. Caldwell, N.J.

Keys, Tone—See Volume 1

Keyboards, Alphanumeric & Decimal—See Volume 1

Kits, Breadboarding (For Engineers)
D Continental Specialties, New Haven, Conn. p. 2-348-351
Jonard Industries Corp., Tuckahoe, N.Y. p. 2-1708

DM Keystone Elctns. Corp., New York, N.Y. p. 2-715
M LVC Inds. Inc., Flushing, N.Y. p. 1-2010,2011,2100
D Vector Electronic Co., Sylmar, Cal. p. 2-362
D Vero Electronics, Hauppauge, N.Y. p. 2-365

D Augat Inc., Attleboro, Mass *
D E-Z-Hook, Arcadia, Cal. *

D GC Electronics, Rockford, Ill. *
NES, Streamwood, Ill. *

M Precision Mechanisms Corp., Westbury, N.Y. *
Promemco, Hauppauge, N.Y. *

Acheson Colloids Co., Port Huron, Mich.
D British Aircraft Corp. (USA Inc.), Arlington, Va.
D Cambridge Thermionic Corp., Cambridge, Mass.

Centron Engrg., Torrance, Cal.
D Christiansen Radio Inc., Laguna Beach, Cal.
Circon Corp., Santa Barbara, Cal.

D Circuit-Stik, Torrance, Cal.
Circuit Structures Lab., Burbank, Calif.
Corning Glass Works, Fluidic Products, Corning, N.Y.
D-Cemco, Burbank, Calif.
E & L Instruments, Derby, Conn.

D Instant Instruments Inc., Haverhill, Mass.
Jermyn, San Francisco, Cal.
D Modpak, Waltham, Mass.
PIC Design Division, Ridgefield, Conn.
Standard Logic Inc., Santa Ana, Cal.
Sterling Instr., New Hyde Pk, NY
D Victory Engrg. Corp., Springfield, N.J.

Kits, Cable-End Sealing
M M M Newman Corp., Marblehead, Mass.
Cableware Systems Inc., North Haven, Conn.
D Cole-Flex Corp., W. Babylon, N.Y.
Communications Technology Corp., Los Angeles, Cal.
M Hardman Inc., Belleville, N.J.
Newman Corp., M. M., Marblehead, Mass.
SWS Silicones, Adrian, Mich.
Tra-Con, Medford, Mass.

Kits, Connector
D Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
M Rowe Industries, Toledo, Ohio p. 2-796,797
D Vaco Products Co., Chicago, Ill. p. 2-1057
D Waldom Electronics, Chicago, Ill. p. 1-1070-1074

Amphenol RF Div., Danbury, Conn. *
D Smith Inc., Herman H., Brooklyn, N.Y. *

D AMP Special Industries, Valley Forge, Pa.
Mann, Henry Inc., Huntingdon Valley, Pa.
D Switchcraft, Chicago, Ill.
D Zippertubing Co., Los Angeles, Calif.

Kits, Marking (Dial, Instrument, Equipment, etc.)
D Datak Corp., Guttenberg, N.J. p. 2-354,1079
Adcotech Corp., Sunnyvale, Cal.
Brady Co., W. H., Milwaukee, Wis.
E & L Instruments, Derby, Conn.
Globe Plastics, Pomona, Cal.

M International Identifications, Timonium, Md.
Lectroetch, E. Cleveland, Ohio
Matthews & Co., Jas. H., Pittsburgh, Pa.
Motorola Comms. Div., Schaumburg, Ill.
Neuses, P.K., Rolling Meadows, Ill.
Photo Chemical Prods. Cal., Santa Monica, Cal.
Russell Inds., Lynbrook, N.Y.

D Switchcraft, Chicago, Ill.
D Techni-Tool, Plymouth Meeting, Pa.
D Techniques, Englewood, N.J.
D Zippertubing Co., Los Angeles, Calif.

Kits, Potentiometer, Rheostat
Dale Elctns., Yankton, S.D. p. 2-1452
E-Systems, Huntington, Ind. p. 2-1663

Kits, Power Supply—See Volume 1

Kits, Printed Circuit
DM Keystone Elctns. Corp., New York, N.Y. p. 2-715
SGL Printed Circuits, Wayne, N.J. p. 2-356
D Vector Electronic Co., Sylmar, Cal. p. 2-358
D Vero Electronics, Hauppauge, N.Y. p. 2-365
D GC Electronics, Rockford, Ill. *

D Bishop Graphics, Chatsworth, Cal.
Centron Engrg., Torrance, Cal.
D Christiansen Radio Inc., Laguna Beach, Cal.
D Circuit-Stik, Torrance, Cal.
D Cordover & Co., Carl, Hollywood, Fla.
D Electro-Science Labs., Pennsauken, N.J.
Instant Instruments Inc., Haverhill, Mass.
Kandu Corporation, Arvada, Colo.
M Leighton Electronics, Leighton, Pa
DM Scanbec Canoga Industries, El Monte, Cal.
D Techniques, Englewood, N.J.

Kits, Programming Board
Allied Systems Corp., Greensboro, N.C. p. 2-458,459
M Info-Lite Corp., Corona, N.Y. p. 1-2076
M LVC Inds. Inc., Flushing, N.Y. p. 1-2010,2011,2100
E & L Instruments, Derby, Conn.

Kits, Shielding
M Perfection Mica Co., Bensenville, Ill. p. 2-1257,2055
Acheson Colloids Co., Port Huron, Mich.
M Craig Sys. Corp., Lawrence, Mass.
Emerson & Cuming, Canton, Mass.
D Estes Engrg. Co., Port Angeles, Wash.

Ferronics, East Rochester, N.Y.
 D Lectro Magnetics, Los Angeles, Cal.
 DM Metex Corp., Edison, N.J.
 D Modpak, Waltham, Mass.
 Russell Inds., Lynbrook, N.Y.
 D Technical Wire Products, Cranford, N.J.
 D Zippertubing Co., Los Angeles, Calif.

Kits, Switch Assembling—See Volume 1

Kits, Terminal

D Panduit Corp., Tintley Park, Ill. p. 2-2048-2051
 D Vaco Products Co., Chicago, Ill. p. 2-1057
 D Waldom Electronics, Chicago, Ill. p. 1-1070-1074

D Augat Inc., Attleboro, Mass. *
 DM Keystone Elctns. Corp., New York, N.Y. *
 D Smith Inc., Herman H., Brooklyn, N.Y. *
 D Vector Electronic Co., Sylmar, Cal. *
 Amp Inc., Harrisburg, Pa.
 D AMP Special Industries, Valley Forge, Pa.
 D Cambridge Thermionic Corp., Cambridge, Mass.
 Circon Corp., Santa Barbara, Cal.
 Communications Technology Corp., Los Angeles, Cal.
 Hollingsworth Solderless Terminal, Phoenixville, Pa.
 D Teledyne Penn-Union Elec., Edinboro, Pa.
 D Thomas & Betts Co., Elizabeth, N.J.

Kits, Test Equipment—See Volume 1

Kits, Training Aid—See Volume 1

Knives & Knife Sets

D Channellock, Meadville, Pa. p. 2-1693
 Shigoto Inds., Ltd., New York, N.Y. *
 Chemical Etching Equip. & Supply, Alexandria, Va.
 D Circon Corp., Santa Barbara, Cal.
 Communications Technology Corp., Los Angeles, Cal.
 Janel, Stirling, N.J.
 Jensen Tools & Alloys, Phoenix, Ariz.
 D Klein, Mathias & Sons, Chicago, Ill.
 M MacDonald & Co., Glendale, Calif.
 Mann, Henry Inc., Huntingdon Valley, Pa.
 D Techni-Tool, Plymouth Meeting, Pa.
 D Uber Grafic Instrs., Palo Alto, Calif.
 X-Acto, Long Island City, N.Y.

Knobs

D ALCO Electronic Prods., North Andover, Mass. p. 2-1076-1078
 Amatom Electronic Hardware, New Haven, Conn. p. 2-1258
 D Buckeye Stamping Co., Columbus, Ohio p. 2-1075
 E-Systems, Huntington, Ind. p. 2-1664
 DM Electronic Hardware Corp., Jamaica, N.Y. p. 2-1081, 1082
 D Interlok, Burlingame, Cal. p. 2-1084-1086
 Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1099-1103
 DM Kurz-Kasch, Wilmington, Ohio p. 2-1104
 D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1249
 DM Raytheon Co., Burlington, Mass. p. 2-1105-1113

Seacor, Norwood, N.J. p. 1-2270, 2271
 D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-865
 UID Electronics Div., Hollywood, Fla. p. 1-2306
 D GC Electronics, Rockford, Ill. *
 D Industrial Devices, Edgewater, N.J. *
 Shigoto Inds., Ltd., New York, N.Y. *
 D Waldom Electronics, Chicago, Ill. *
 D Cambridge Thermionic Corp., Cambridge, Mass.
 D Davies Molding Co., Harry, Chicago, Ill.
 D Davis & Co., J.W., Dallas, Tex.
 D Dimco-Gray Company, Dayton, Ohio
 D Douglas-Workman Elctns Corp., Ft. Lauderdale, Fla.
 Lear Siegler, Santa Monica, Calif.
 D NOBEX Div., Burlingame, Cal.
 D Norelcom Electronics, Farmingdale, N.Y.
 D Philmore Mfg. Co. Inc., Inwood, N.Y.
 PIC Design Division, Ridgefield, Conn.
 Radial Controls, Indianapolis, Ind.
 D Raytheon Co., Quincy, Mass.
 Rogan Corp., Northbrook, Ill.
 Sterling Instr., New Hyde Pk., NY
 DM Stock Drive Prods., New Hyde Pk., N.Y.
 DM Vemaline Prods. Co., Wyckoff, N.J.
 Westmoreland Plastics Co., Latrobe, Pa.

Labels, Pressure-Sensitive, Adhesive

D Datak Corp., Guttenberg, N.J. p. 2-354, 1079
 Display Devices, Encinitas, Cal. p. 2-1143
 Shigoto Inds., Ltd., New York, N.Y. *
 Acme Model Engrg. Co., Ridgefield, N.J.
 Althor Prods., Brooklyn, N.Y.
 M Anodyne Inc., N. Miami Beach, Fla.
 D Bishop Graphics, Chatsworth, Cal.

Brady Co., W. H., Milwaukee, Wis.
 Dennison Mfg. Co., Framingham, Mass.
 D Labelon Corp., Canandaigua, N.Y.
 M Manger Elec. Co., Stamford, Conn.
 M Markem Corp., Keene, NH
 DM Metalphoto Corp., Cleveland, Ohio
 M Meyercoord Co., Wheaton, Ill.
 Photo Chemical Prods. Cal., Santa Monica, Cal.
 Scientifico Scientific Components Co., Newport Beach, Cal.
 D Thomas & Betts Co., Elizabeth, N.J.
 D Uniroyal, New York, N.Y.

Labels, Temperature Indicating—See Volume 1

Laboratories, Testing—See Volume 1

Lacing, Cable—See Cords & Tapes, Lacing

Laminates, Metal Clad (Including Copper)

D Vector Electronic Co., Sylmar, Cal. p. 2-358
 DM Keystone Elctns. Corp., New York, N.Y. *
 Sheldahl, Northfield, Minn. *
 3M Company, St. Paul, Minn. *
 Alpha Metals, Jersey City, N.J.
 M Atlantic Laminates, Franklin, N.H.
 Burlington Opers. Div., Burlington, Mass.
 Cincinnati Milacron, Blanchester, Ohio
 D Dixon Corp., Bristol, R.I.
 E.I. DuPont de Nemours & Co., Wilmington, Del.
 Engelhard Minerals & Chem., Murray Hill, N.J.
 DM General Elec. Co., Coshocton, Ohio
 Kandu Corporation, Arvada, Colo.
 Met-L-Wood Corp., Chicago, Ill.
 M Mica Corporation, Culver City, Calif.
 DM Norplex Div., LaCrosse, Wisc.
 NVF Co., Yorklyn, Del.
 D Penn Fibre & Specialty, Phila., Pa.
 Plessey Inc., Melville, N.Y.
 Polyflon Corp., New Rochelle, N.Y.
 D Skydyne A Brooks & Perkins Co., Port Jarvis, N.Y.
 D Stevens Prods., E. Orange, N.J.
 Synthane Taylor Corp., Valley Forge, Pa.

Laminates, Plastic Impregnated (Unclad)

DM Keystone Elctns. Corp., New York, N.Y. p. 2-715
 Sheldahl, Northfield, Minn. *
 M Atlantic Laminates, Franklin, N.H.
 Autosplce/DV Gen Staple, New York City, N.Y.
 Cadillac Plastic & Chemical, Detroit, Mich.
 Cincinnati Milacron, Blanchester, Ohio
 D Comco Plastics, Richmond Hill, N.Y.
 M General Elec. Co., Coshocton, Ohio
 D Glastic Corp., Cleveland, Ohio
 Hughes Aircraft Co., Culver City, Cal.
 M Laminated Fabricators, San Bruno, Calif.
 M Mica Corporation, Culver City, Calif.
 DM Norplex Div., LaCrosse, Wisc.
 NVF Co., Yorklyn, Del.
 D Penn Fibre & Specialty, Phila., Pa.
 Photo Chemical Prods. Cal., Santa Monica, Cal.
 Precision Paper Tube Co., Wheeling, Ill.
 Rogers Corp., Rogers, Conn.
 DM Stevens Prods., E. Orange, N.J.
 Synthane Taylor Corp., Valley Forge, Pa.
 Triac Electronics, New York, N.Y.

Laminates, Plastic (With Integral Heating Elements)—See Volume 1

Laminations, Magnetic Recording Head

Inter-Tech. Grp., Irvington-on-Hudson, N.Y. p. 2-1230
 SGL Electronics, Westville, N.J. p. 2-1254
 American Chemical Etching, Pacoima, Cal.
 Buckbee Mears Co., St. Paul, Minn.
 M Hamilton Technology, Lancaster, Pa.
 M Magnetics, Butler, Pa.
 Plessey Inc., Melville, N.Y.

Laminations, Transformer & Inductor

Arnold Engineering Co., Marengo, Ill. p. 2-1212, 1213
 Inter-Tech. Grp., Irvington-on-Hudson, N.Y. p. 2-1230
 SGL Electronics, Westville, N.J. p. 2-1254
 Thomas & Skinner, Indpls., Ind. p. 1-819
 Shigoto Inds., Ltd., New York, N.Y. *
 M Allegheny Ludlum Steel Co., Pittsburgh, Pa.
 Magnetic Metals Co., Camden, N.J.
 M Magnetics, Butler, Pa.

Lamp Adapters

D Arcoelectric Switch Corp., No. Hollywood, Cal. p. 2-1125

Display Devices, Encinitas, Cal. p. 2-1142
 LVC Inds. Inc., Flushing, N.Y. p. 2-1137
 D Elctn. Molding Corp., Woonsocket, R.I. *
 GTE Sylvania Inc., Danvers, Mass.
 D Int'l. Prods. Inc., Atchison, Kans.
 Leviton Mfg. Co., Little Neck, N.Y.
 D Workman Electronic Prods., Sarasota, Fla.

Lamp Drivers

D Beckman Instrs., Fullerton, Cal. p. 2-1126, 1127
 Hybrid Systems Corp., Burlington, Mass. p. 2-1496, 1497
 ILC Data Device Corp., Bohemia, N.Y. p. 1-171
 D Tec, Tucson, Ariz. p. 2-1202
 Applied Electro Technology, Santa Ana, Cal. *
 Industrial Devices, Edgewater, N.J. *
 Industrial Elctn. Engrs., Van Nuys, Cal. *
 Automation Displays Inc., Eau Claire, Wisc.
 M Circuit Technology, Farmingdale, N.Y.
 Data Display Products, Los Angeles, Cal.
 Environmental Communications Inc., Costa Mesa, Cal.
 Fairchild Semiconductor, Mountain View, Cal.
 General Instrument Corp., Hicksville, N.Y.
 D Lithic Systems, Saratoga, Cal.
 DM National Semiconductor Corp., Santa Clara, Cal.
 S S A C Precision Products Inc., Liverpool, N.Y.
 D Stewart-Warner Microcircuits, Sunnyvale, Cal.
 D Teledyne Semiconductor, Mountain View, Cal.
 U.S. Scientific Instrs., Boston, Mass.

Lamp Holders—See Sockets, Lamp & Lamp Assemblies

Lamps, Dial & Pilot, Incandescent

D Amatom Electronic Hardware, New Haven, Conn. p. 2-1258
 D Arcoelectric Switch Corp., No. Hollywood, Cal. p. 2-1125
 D Dialight, Brooklyn, N.Y. p. 2-1138
 Display Devices, Encinitas, Cal. p. 2-1142
 General Electric Co., Cleveland, Ohio p. 2-1144, 1145
 DM GTE Sylvania Inc., Hillsboro, N.H. p. 2-1147
 D IEE/Schadow, Eden Prairie, Minn. p. 1-2070, 2072
 DM Illuminated Products Inc., Anaheim, Cal. p. 2-1156-1158
 D Industrial Devices, Edgewater, N.J. p. 2-1168-1171
 DM Industrial Elctn. Engrs., Van Nuys, Cal. p. 2-1164-1167
 Info-Lite Corp., Corona, N.Y. p. 2-1159
 D Inter-Market, Glenview, Ill. p. 2-1173
 D LVC Inds. Inc., Flushing, N.Y. p. 2-1137
 D Refac Elctns./Pinlites, Fairfield, N.J. p. 2-1185
 DM Shelly Assocs., Santa Ana, Cal. p. 2-1186
 D Sloan Company, Sun Valley, Cal. p. 2-1190-1194
 D Tec, Tucson, Ariz. p. 2-1201, 1203
 D ALCO Electronic Prods., North Andover, Mass. *

D Electro-Mech Components, So. El Monte, Cal. *
 D GC Electronics, Rockford, Ill. *
 General Elec. Co., Schenectady, N.Y. *
 Shigoto Inds., Ltd., New York, N.Y. *
 Sorensen Lighted Controls, W. Hartford, Conn. *

D Wagner Elec., Livingston, N.J. *
 Aerolite Elcxs Corp., Union City, N.J.
 Amp Inc., Harrisburg, Pa.
 D AMP Special Industries, Valley Forge, Pa.
 DM Chicago Miniature Lamp/Drake, Chicago, Ill.
 Circon Corp., Santa Barbara, Cal.
 DM Control Switch, Folcroft, Pa.
 Data Display Products, Los Angeles, Cal.
 D Drake Mfg. Co., Harwood Heights, Ill.
 DM General Illumination, Roseville, Minn.
 DM Genisio Technology Corp., Compton, Cal.
 GTE Sylvania Inc., Danvers, Mass.
 D Int'l. Prods. Inc., Atchison, Kans.
 Licon Div., Chicago, Ill.
 D Master Specialties Co., Costa Mesa, Cal.
 D Mura Corp., Jericho, N.Y.
 D Oshino Electric Lamp Works, Ltd, Shinagawa-ku, Tokyo, Japan
 Penn Keystone Corp., Ansonia, Conn.
 Precision Dynamics Corp., Burbank, Cal.
 M Precision Lamp, Mountain View, Cal.
 D Vemaline Prods. Co., Wyckoff, N.J.
 Westinghouse Elec., Bloomfield, N. J.
 D Workman Electronic Prods., Sarasota, Fla.

Lamps, Electroluminescent—See Panels, Electroluminescent

Lamps, Exciter, Photographic

- Hamamatsu Corp., Middlesex, N.J.** p. 1-2354,2355
- D Christie Elec., Los Angeles, Cal.** *
- Shigoto Inds., Ltd., New York, N.Y.** *
- EG & G, Salem, Mass.
- D GTE Sylvania Inc., Danvers, Mass.**
- Torr Labs., Los Angeles, Cal.
- Westinghouse Elec., Bloomfield, N.J.

Lamps, Flashtube

- D EG&G, Salem, Mass.** p. 1-1013
- General Electric Co., Cleveland, Ohio** p. 2-1144,1145
- General Radio Co., Concord, Mass.** *
- Shigoto Inds., Ltd., New York, N.Y.** *
- Anglo Corp., Rosemont, Ill.
- DM Apollo Corp., Kawasaki, Japan**
- Aristo Grid Lamp Prdts., Port Washington, N.Y.
- Edmund Scientific Co., Barrington, N.J.
- EG & G, Salem, Mass.
- Eimac, San Carlos, Calif.
- D GTE Sylvania Inc., Danvers, Mass.**
- M Kemlite Labs., Chicago, Ill.**
- D Mura Corp., Jericho, N.Y.**
- D Siemens Corp., Iselin, N.J.**
- DM Torr Labs., Los Angeles, Cal.**
- U.S. Scientific Instrs., Boston, Mass.
- Varian Assocs., Palo Alto, Cal.
- West Coast Resch. Corp., Los Angeles, Calif.

Lamps, Glow—See Lamps, Neon**Lamps, Infrared**

- EG&G, Salem, Mass.** p. 1-1013
- D General Electric Co., Cleveland, Ohio** p. 2-1144,1145
- D Litronix, Cupertino, Cal.** p. 2-1175,1179
- D General Elec. Co., Schenectady, N.Y.** *
- Advanced Kinetics, Costa Mesa, Calif.
- Caig Labs., Westbury, N.Y.
- Eimac, San Carlos, Calif.
- Fusion Systems Corp., Rockville, Md.
- Gamma Scientific Inc., San Diego, Cal.
- GTE Sylvania Inc., Danvers, Mass.
- D Monsanto-Electr. Spec. Prods., Palo Alto, Cal.**
- OAL Assocs., Westbury, N.Y.
- Optron, Carrollton, Tex.
- D Scientific Technology, Mountain View, Cal.**
- D Siemens Corp., Iselin, N.J.**
- Skan-A-Matic Corp., Elbridge, N.Y.
- Varian Assocs., Palo Alto, Cal.
- Varian Electron Tube & Device Grp., San Carlos, Cal.
- M Warnecke Electron Tubes, Des Plaines, Ill.**
- D Western Coil & Elec. Co., Racine, Wisc.**
- Westinghouse Elec., Bloomfield, N.J.

Lamps, Magnifying, Inspection—See Volume 1**Lamps, Mercury Vapor**

- Christie Elec., Los Angeles, Cal.** *
- Shigoto Inds., Ltd., New York, N.Y.** *
- Advanced Kinetics, Costa Mesa, Calif.
- D American Ultraviolet, Chatham, N.J.**
- Aristo Grid Lamp Prdts., Port Washington, N.Y.
- Chemical Etching Equip. & Supply, Alexandria, Va.
- Edmund Scientific Co., Barrington, N.J.
- D Epic, New York, N.Y.**
- Fusion Systems Corp., Rockville, Md.
- Gaertner Scientific Corp., Chicago, Ill.
- Gates, Geo. W. & Co., Franklin Sq., N.Y.
- GTE Sylvania Inc., Danvers, Mass.
- D Illumination Industries, Sunnyvale, Cal.**
- Oriel Corp. of America, Stamford, Conn.
- DM Shannon Luminous Mat'ls., Hollywood, Cal.**
- Westinghouse Elec., Bloomfield, N.J.

Lamps, Miniature & Subminiature

- D Arcoelectric Switch Corp., No. Hollywood, Cal.** p. 2-1125
- D Dialight, Brooklyn, N.Y.** p. 2-1138
- D General Electric Co., Cleveland, Ohio** p. 2-1144,1145
- DM GTE Sylvania Inc., Hillsboro, N.H.** p. 2-1147
- D IEE/Schadow, Eden Prairie, Minn.** p. 1-2070,2072
- DM Illuminated Products Inc., Anaheim, Cal.** p. 2-1156-1158
- D Industrial Devices, Edgewater, N.J.** p. 2-1168,1170
- DM Industrial Electr. Engrs., Van Nuys, Cal.** p. 2-1164-1167
- Info-Lite Corp., Corona, N.Y.** p. 2-1159
- D Inter-Market, Glenview, Ill.** p. 2-1173
- Ledex Inc., Dayton, Ohio** p. 1-2092-2096
- MLVC Inds. Inc., Flushing, N.Y.** p. 2-1137

- D Refac Electrns./Pinlites, Fairfield, N.J.** p. 2-1185
- DM Shelly Assocs., Santa Ana, Cal.** p. 2-1186
- D Sloan Company, Sun Valley, Cal.** p. 2-1190-1192,1194
- Sorensen Lighted Controls, W. Hartford, Conn.** p. 2-1198,1199
- D Tec, Tucson, Ariz.** p. 2-1201,1203
- DM Union Carbide, New York, N.Y.** p. 1-1514,1515
- D Wagner Elec., Livingston, N.J.** p. 2-1208
- D ALCO Electronic Prods., North Andover, Mass.** *

- D Electro-Mech Components, So. El Monte, Cal.** *
- General Elec. Co., Schenectady, N.Y.** *
- Shigoto Inds., Ltd., New York, N.Y.** *
- Aristo Grid Lamp Prdts., Port Washington, N.Y.
- DM Chicago Miniature Lamp/Drake, Chicago, Ill.**
- Circon Corp., Santa Barbara, Cal.
- DM Control Switch, Folcroft, Pa.**
- Data Display Products, Los Angeles, Cal.
- Drake Mfg. Co., Harwood Heights, Ill.
- M Edmund Scientific Co., Barrington, N.J.**
- D General Illumination, Roseville, Minn.**
- DM Genisco Technology Corp., Compton, Cal.**
- M Gilway Sales Company, Woburn, Mass.**
- DM GTE Sylvania Inc., Danvers, Mass.**
- D Int'l. Prods. Inc., Atchison, Kans.**
- Janel, Stirling, N.J.
- D JPI, Santa Monica, Cal.**
- D Monsanto-Electr. Spec. Prods., Palo Alto, Cal.**
- D Mura Corp., Jericho, N.Y.**
- D Norelcom Electronics, Farmingdale, N.Y.**
- D Oshino Electric Lamp Works, Ltd, Shinagawa-ku, Tokyo, Japan**
- M Precision Lamp, Mountain View, Cal.**
- M Radatron Corp., N. Tonawanda, NY**
- Ragen Precision Inds., N. Arlington, N.J.
- Skan-A-Matic Corp., Elbridge, N.Y.
- D Techni-Tool, Plymouth Meeting, Pa.**
- D Titan Tool Supply Co., Buffalo, N.Y.**
- D Vemaline Prods. Co., Wyckoff, N.J.**
- Westinghouse Elec., Bloomfield, N.J.
- D Workman Electronic Prods., Sarasota, Fla.**

Lamps, Neon

- D Amatam Electronic Hardware, New Haven, Conn.** p. 2-1258
- D Arcoelectric Switch Corp., No. Hollywood, Cal.** p. 2-1125
- Dialight, Brooklyn, N.Y.** p. 2-1138
- General Electric Co., Cleveland, Ohio** p. 2-1144,1145
- D IEE/Schadow, Eden Prairie, Minn.** p. 1-2069
- D Industrial Devices, Edgewater, N.J.** p. 2-1168-1170
- D Inter-Market, Glenview, Ill.** p. 2-1173
- MLVC Inds. Inc., Flushing, N.Y.** p. 2-1137
- Shelly Assocs., Santa Ana, Cal.** p. 2-1186
- D Tec, Tucson, Ariz.** p. 2-1203
- D ALCO Electronic Prods., North Andover, Mass.** *

- D Electro-Mech Components, So. El Monte, Cal.** *
- D Illuminated Products Inc., Anaheim, Cal.** *
- Shigoto Inds., Ltd., New York, N.Y.** *
- D AMP Special Industries, Valley Forge, Pa.**
- D Apollo Corp., Kawasaki, Japan**
- Aristo Grid Lamp Prdts., Port Washington, N.Y.
- DM Chicago Miniature Lamp/Drake, Chicago, Ill.**
- Circon Corp., Santa Barbara, Cal.
- Data Display Products, Los Angeles, Cal.
- Drake Mfg. Co., Harwood Heights, Ill.
- D General Illumination, Roseville, Minn.**
- DM Genisco Technology Corp., Compton, Cal.**
- Glowlite Corp., Pauls Valley, Okla.
- D Int'l. Prods. Inc., Atchison, Kans.**
- M Kemlite Labs., Chicago, Ill.**
- Licon Div., Chicago, Ill.
- M MacDonald & Co., Glendale, Calif.**
- D Mura Corp., Jericho, N.Y.**
- D Oneida Electronics Mfg., Meadville, Pa.**
- Oriel Corp. of America, Stamford, Conn.
- Signalite Div., Neptune, N.J.
- D Vemaline Prods. Co., Wyckoff, N.J.**
- D Workman Electronic Prods., Sarasota, Fla.**

Lamps, Projection

- D General Electric Co., Cleveland, Ohio** p. 2-1144,1145
- D Christie Elec., Los Angeles, Cal.** *
- Shigoto Inds., Ltd., New York, N.Y.** *
- D American Ultraviolet, Chatham, N.J.**
- Aristo Grid Lamp Prdts., Port Washington, N.Y.
- M Edmund Scientific Co., Barrington, N.J.**
- Eimac, San Carlos, Calif.
- D Genisco Technology Corp., Compton, Cal.**
- D GTE Sylvania Inc., Danvers, Mass.**
- D Illumination Industries, Sunnyvale, Cal.**
- ITT Electron Tube, Easton, Pa.

- Precision Lamp, Mountain View, Cal.
- Scientific Scientific Components Co., Newport Beach, Cal.
- Varian Assocs., Palo Alto, Cal.
- Westinghouse Elec., Bloomfield, N.J.

Lamps, Solid State—Also see Diodes, Light-Emitting

- D Arcoelectric Switch Corp., No. Hollywood, Cal.** p. 2-1125
- D Dialight, Brooklyn, N.Y.** p. 2-1139
- DM Hewlett-Packard, Palo Alto, Cal.** p. 1-1014,1015; p. 2-1150-1153
- D Industrial Devices, Edgewater, N.J.** p. 2-1170
- DM Industrial Electr. Engrs., Van Nuys, Cal.** p. 2-1163
- Inter-Market, Glenview, Ill.** p. 2-1173
- Leecraft Mfg. Co., Long Island City, N.Y.** p. 2-1182,1183
- LVC Inds. Inc., Flushing, N.Y.** p. 2-1137
- D Shelly Assocs., Santa Ana, Cal.** p. 2-1187
- D Sloan Company, Sun Valley, Cal.** p. 2-1194
- D Tec, Tucson, Ariz.** p. 2-1201,1203
- D General Elec. Co., Schenectady, N.Y.** *
- D Illuminated Products Inc., Anaheim, Cal.** *
- D Litronix, Cupertino, Cal.** *
- Shigoto Inds., Ltd., New York, N.Y.** *
- Spectronics, Richardson, Tex.** *
- D A E G Telefunken, Englewood Cliffs, N.J.**
- DM Chicago Miniature Lamp/Drake, Chicago, Ill.**
- Data Display Products, Los Angeles, Cal.
- Drake Mfg. Co., Harwood Heights, Ill.
- Fairchild Semiconductor, Mountain View, Cal.
- D General Illumination, Roseville, Minn.**
- D Genisco Technology Corp., Compton, Cal.**
- DM Hewlett-Packard Co., Palo Alto, Cal.**
- Licon Div., Chicago, Ill.
- D Monsanto-Electr. Spec. Prods., Palo Alto, Cal.**
- OPCOA, Edison, N.J.
- Oshino Electric Lamp Works, Ltd, Shinagawa-ku, Tokyo, Japan**
- D Scientific Technology, Mountain View, Cal.**
- Sensor Technology, Chatsworth, Cal.
- D Siemens Corp., Iselin, N.J.**

Lamps, Tungsten Halogen

- D General Electric Co., Cleveland, Ohio** p. 2-1144,1145
- Shigoto Inds., Ltd., New York, N.Y.** *
- Edmund Scientific Co., Barrington, N.J.
- Gamma Scientific Inc., San Diego, Cal.
- D GTE Sylvania Inc., Danvers, Mass.**
- Oriel Corp. of America, Stamford, Conn.
- Scientific Scientific Components Co., Newport Beach, Cal.

Lamps, Ultraviolet

- EG&G, Salem, Mass.** p. 1-1013
- Hamamatsu Corp., Middlesex, N.J.** p. 1-2354,2355
- Christie Elec., Los Angeles, Cal.** *
- D American Ultraviolet, Chatham, N.J.**
- Aristo Grid Lamp Prdts., Port Washington, N.Y.
- Fusion Systems Corp., Rockville, Md.
- Gaertner Scientific Corp., Chicago, Ill.
- Gates, Geo. W. & Co., Franklin Sq., N.Y.
- Hamamatsu TV Co., Ltd., Hamamatsu City, Shizuoka Pref., Japan
- D Illumination Industries, Sunnyvale, Cal.**
- M Kemlite Labs., Chicago, Ill.**
- Oriel Corp. of America, Stamford, Conn.
- DM Shannon Luminous Mat'ls., Hollywood, Cal.**
- Varian Assocs., Palo Alto, Cal.
- Varian Electron Tube & Device Grp., San Carlos, Cal.
- D Western Coil & Elec. Co., Racine, Wisc.**

Lamps, Xenon

- D EG&G, Salem, Mass.** p. 1-1013
- D Christie Elec., Los Angeles, Cal.** *
- Shigoto Inds., Ltd., New York, N.Y.** *
- D American Ultraviolet, Chatham, N.J.**
- Atlas Electric Devices, Chicago, Ill.
- Chemical Etching Equip. & Supply, Alexandria, Va.
- EG&G, Salem, Mass.
- Eimac, San Carlos, Calif.
- Fusion Systems Corp., Rockville, Md.
- Gates, Geo. W. & Co., Franklin Sq., N.Y.
- D GTE Sylvania Inc., Danvers, Mass.**
- D Illumination Industries, Sunnyvale, Cal.**
- M Kemlite Labs., Chicago, Ill.**
- D Mura Corp., Jericho, N.Y.**
- Oriel Corp. of America, Stamford, Conn.
- D Siemens Corp., Iselin, N.J.**
- DM Torr Labs., Los Angeles, Cal.**
- U.S. Scientific Instrs., Boston, Mass.
- Varian Assocs., Palo Alto, Cal.

PRODUCT INDEX & DIRECTORY

Limit Stops, Mechanical

Varian Electron Tube & Device Grp., San Carlos, Cal.
West Coast Resch. Corp., Los Angeles, Calif.

Lasers & Laser Systems—See Volume 1

Lead Assemblies & Receptacles, High Voltage—Also See Connectors; Cable Assemblies

Allied Systems Corp., Greensboro, N.C. p. 2-458,459
AMP Capatron Div./AMP Inc., Elizabethtown, Pa. p. 2-450,451
D Amphenol Connector Div., Broadview, Ill. p. 2-460,461

M Rowe Industries, Toledo, Ohio p. 2-796,797
DM Amphenol RF Div., Danbury, Conn. *
Shigoto Inds., Ltd., New York, N.Y. *
M Aircraft & Elec Spcltys, Plainfield, Ind
Amp Inc., Harrisburg, Pa.
D Berman Mfg., New Cumberland, Pa.
Ceramaseal, New Lebanon Center, N.Y.
M Co-Operative Inds., Chester, N.J.
Dielectric Sciences, Burlington, Mass
D Electronic Coil Corp., Plainville, Conn.
Estes Engrg. Co., Port Angeles, Wash.
Excel Specialty Corp., Chicago, Ill.
Gulton Inds., Buena Park, Cal.
M Hadley Components Div., Hadley, Pa.
Hermetic Seal Corp., Rosemead, Cal.
M International Identifications, Timonium, Md.
M Jetttron Prods., Hanover, N.J.
M Manger Elec. Co., Stamford, Conn.
Morey Corp., Downers Grove, Ill.
D N-T-T/Peerless, Leominster, Mass.
Reynolds Inds., Marina Del Rey, Cal.
DM Saxton Prods., Congers, N.Y.
Simmonds Precision, Norwich, N.Y.

Leads, Test & Adaptors—See Volume 1

LED's—See Volume 1

Lenses, Optical & Camera—See Volume 1

Lenses, Readout & Display

Display Devices, Encinitas, Cal. p. 2-1143
D Shelly Assocs., Santa Ana, Cal. p. 2-1187
D Industrial Devices, Edgewater, N.J. *
M Industrial Elctn. Engrs., Van Nuys, Cal. *
Atlantic Optical Moulding Co., Dudley, Mass.
D Clare-Pendar, Post Falls, Idaho
Edmund Scientific Co., Barrington, N.J.
Esco Products, Oak Ridge, NJ
M GTI Corporation, Pittsburgh, Pa.
Kollsman Instr. Co., Syosset, N.Y.
M Lenox Instr. Co., Philadelphia, Pa.
Metavac, Flushing, N.Y.
M Moldtronics, Downers Grove, Ill.
D NOBEX Div., Burlington, Cal.
Photo Chemical Prods. Cal., Santa Monica, Cal.

Lenses, R-F—See Volume 1

Light Choppers—See Volume 1

Light Sources, Photoelectric—See Volume 1

Light Sources, Stroboscopic—See Lights, Stroboscopic

Lighting Equipment, Emergency—See Volume 1

Lights, Arc

Hamamatsu Corp., Middlesex, N. J. p. 1-2354,2355
D Christie Elec., Los Angeles, Cal. *
Atlas Electric Devices, Chicago, Ill.
Chemical Etching Equip. & Supply, Alexandria, Va.
Edmund Scientific Co., Barrington, N.J.
Eimac, San Carlos, Calif.
Gates, Geo. W. & Co., Franklin Sq., N.Y.
D Illumination Industries, Sunnyvale, Cal.
Oriol Corp. of America, Stamford, Conn.

Lights, Dial, Panel, Pilot, & Accessories

D Atomat Electronic Hardware, New Haven, Conn. p. 2-1258
D Arcoelectric Switch Corp., No. Hollywood, Cal. p. 2-1125
Capitol Machine & Switch Co., Danbury, Conn. p. 1-1970
D Chicago Switch, Chicago, Ill. p. 1-1988
D Dialight, Brooklyn, N.Y. p. 2-1138
Display Devices, Encinitas, Cal. p. 2-1142
D General Electric Co., Cleveland, Ohio p. 2-1144,1145

D GTE Sylvania Inc., Hillsboro, N.H. p. 2-1147
DM Hewlett-Packard, Palo Alto, Cal. p. 1-1014,1015; p. 2-1150-1153
DM Illuminated Products Inc., Anaheim, Cal. p. 2-1154,1155
D Industrial Devices, Edgewater, N.J. p. 2-1168-1171
DM Industrial Elctn. Engrs., Van Nuys, Cal. p. 2-1164-1167
Info-Lite Corp., Corona, N.Y. p. 2-1159
D Inter-Market, Glenview, Ill. p. 2-1173
D Ledex Inc., Dayton, Ohio p. 1-2092-2096
D Leecraft Mfg. Co., Long Island City, N.Y. p. 2-1182,1183
Litronix, Cupertino, Cal. p. 2-1175
DM Littelfuse, Des Plaines, Ill. p. 2-1180,1181
M LVC Inds. Inc., Flushing, N.Y. p. 2-1137
D Shelly Assocs., Santa Ana, Cal. p. 2-1187
D Sloan Company, Sun Valley, Cal. p. 2-1190-1194
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-867
Stacoswitch, Costa Mesa, Cal. p. 2-1114,1115
D Tec, Tucson, Ariz. p. 2-1201,1203
D Wagner Elec., Livingston, N.J. p. 2-1209
D ALCO Electronic Prods., North Andover, Mass. *

Allen-Bradley Co., Milwaukee, Wisc. *
D Arrow-Hart, Hartford, Conn. *
D Electro-Mech Components, So. El Monte, Cal. *
General Elec. Co., Schenectady, N.Y. *
D Grayhill Inc., LaGrange, Ill. *
D Raytheon Co., Burlington, Mass. *
Shigoto Inds., Ltd., New York, N.Y. *
Sorensen Lighted Controls, W. Hartford, Conn. *

D Waldom Electronics, Chicago, Ill. *
Amp Inc., Harrisburg, Pa.
DM Chicago Miniature Lamp/Drake, Chicago, Ill.
Circon Corp., Santa Barbara, Cal.
D Clare-Pendar, Post Falls, Idaho
DM Control Switch, Folcroft, Pa.
D Cutler-Hammer, Milwaukee, Wisc.
Data Display Products, Los Angeles, Cal.
D Datatron, Santa Ana, Cal.
DM Drake Mfg. Co., Harwood Heights, Ill.
DM General Illumination, Roseville, Minn.
Glowlite Corp., Pauls Valley, Okla.
GTE Sylvania Inc., Danvers, Mass.
DM Hewlett-Packard Co., Palo Alto, Cal.
D Int'l. Prods. Inc., Atchison, Kans.
Korby Mfg. Co., Seattle, Wash.
D Master Specialties Co., Costa Mesa, Cal.
D Monsanto-Elctn. Spec. Prods., Palo Alto, Cal.
D Mura Corp., Jericho, N.Y.
OPCOA, Edison, N.J.
Penn Keystone Corp., Ansonia, Conn.
D Philmore Mfg. Co. Inc., Inwood, N.Y.
Photo Chemical Prods. Cal., Santa Monica, Cal.
M Precision Lamp, Mountain View, Cal.
Signet Scientific Co., Burbank, Cal.
S S A C Precision Products Inc., Liverpool, N.Y.
DM Vemaline Prods. Co., Wyckoff, N.J.
Westmoreland Plastics Co., Latrobe, Pa.
D Workman Electronic Prods., Sarasota, Fla.

Lights, Edge Lighting, Panel

D Dialight, Brooklyn, N.Y. p. 2-1138
DM GTE Sylvania Inc., Hillsboro, N.H. p. 2-1147
DM Illuminated Products Inc., Anaheim, Cal. p. 2-1154,1155
D Leecraft Mfg. Co., Long Island City, N.Y. p. 2-1182,1183
LVC Inds. Inc., Flushing, N.Y. p. 2-1137
D Shelly Assocs., Santa Ana, Cal. p. 2-1186
General Elec. Co., Schenectady, N.Y. *
Aristo Grid Lamp Prdts., Port Washington, N.Y.
DM Chicago Miniature Lamp/Drake, Chicago, Ill.
Control Switch, Folcroft, Pa.
GTE Sylvania Inc., Danvers, Mass.
Key Tronic Corp., Spokane, Wash.
Korby Mfg. Co., Seattle, Wash.
D Monsanto-Elctn. Spec. Prods., Palo Alto, Cal.
D Mura Corp., Jericho, N.Y.
OPCOA, Edison, N.J.
M Precision Lamp, Mountain View, Cal.
M Radatron Corp., N. Tonawanda, NY
Signet Scientific Co., Burbank, Cal.
DM Vemaline Prods. Co., Wyckoff, N.J.

Lights Indicator—See Lights, Dial, Panels; Displays & Display Devices

Lights, Infrared

EG&G, Salem, Mass. p. 1-1013
D Litronix, Cupertino, Cal. p. 2-1175
Chemical Etching Equip. & Supply, Alexandria, Va.
Eimac, San Carlos, Calif.

GTE Sylvania Inc., Danvers, Mass.
D Monsanto-Elctn. Spec. Prods., Palo Alto, Cal.
OAL Assocs., Westbury, N.Y.
OPCOA, Edison, N.J.
Optron, Carrollton, Tex.
D Scientific Technology, Mountain View, Cal.
Scientifico Scientific Components Co., Newport Beach, Cal.
Sensor Technology, Chatsworth, Cal.
D Siemens Corp., Iselin, N.J.

Lights, Neon, Test—See Lights, Press-To-Test

Lights, Oil-Tight

D Dialight, Brooklyn, N.Y. p. 2-1138
DM Illuminated Products Inc., Anaheim, Cal. p. 2-1155
M Info-Lite Corp., Corona, N.Y. p. 2-1159
Ledex Inc., Dayton, Ohio p. 1-2092-2096
Allen-Bradley Co., Milwaukee, Wisc. *
D Arrow-Hart, Hartford, Conn. *
Electro-Mech Components, So. El Monte, Cal. *
General Elec. Co., Schenectady, N.Y. *
DM Chicago Miniature Lamp/Drake, Chicago, Ill.
Control Switch, Folcroft, Pa.
Cutler-Hammer, Milwaukee, Wisc.
Data Display Products, Los Angeles, Cal.
OPCOA, Edison, N.J.
DM Vemaline Prods. Co., Wyckoff, N.J.

Lights, Placard—See Lights, Dial, Panel, Pilot & Accessories

Lights, Press-To-Test

D Dialight, Brooklyn, N.Y. p. 2-1138
Illuminated Products Inc., Anaheim, Cal. p. 2-1155
LVC Inds. Inc., Flushing, N.Y. p. 2-1137
D Tec, Tucson, Ariz. p. 2-1203
Allen-Bradley Co., Milwaukee, Wisc. *
D Electro-Mech Components, So. El Monte, Cal. *
General Elec. Co., Schenectady, N.Y. *
DM Chicago Miniature Lamp/Drake, Chicago, Ill.
D Clare-Pendar, Post Falls, Idaho
DM Control Switch, Folcroft, Pa.
Cutler-Hammer, Milwaukee, Wisc.
Korby Mfg. Co., Seattle, Wash.
DM Vemaline Prods. Co., Wyckoff, N.J.

Lights, Stroboscopic Source

EG&G, Salem, Mass. p. 1-1013
General Radio Co., Concord, Mass. *
Slaughter Co., Ardmore, Okla. *
Benthos, N. Falmouth, Mass.
Chadwick-Helmuth Co., Monrovia, Calif.
M Edmund Scientific Co., Barrington, N.J.
EG & G, Salem, Mass.
Eimac, San Carlos, Calif.
Electro Life, Geneva, Ill.
D Great Western Aviation, Denver, Colo.
GTE Sylvania Inc., Danvers, Mass.
D Mura Corp., Jericho, N.Y.
Pioneer Elec. & Resch. Co., Forest Park, Ill.
DM Power Instrs., Skokie, Ill.
Scientifico Scientific Components Co., Newport Beach, Cal.
Sticht Co., Herman H., New York, N.Y.
TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
U.S. Scientific Instrs., Boston, Mass.

Lights, Ultraviolet

EG&G, Salem, Mass. p. 1-1013
Hamamatsu Corp., Middlesex, N. J. p. 1-2354,2355
D Christie Elec., Los Angeles, Cal. *
D American Ultraviolet, Chatham, N.J.
Aristo Grid Lamp Prdts., Port Washington, N.Y.
Clean Room Prods., Bay Shore, N.Y.
Dolan-Jenner Inds., Melrose, Mass.
M Edmund Scientific Co., Barrington, N.J.
Eimac, San Carlos, Calif.
Gates, Geo. W. & Co., Franklin Sq., N.Y.
GTE Sylvania Inc., Danvers, Mass.
D Illumination Industries, Sunnyvale, Cal.
D Quantrad Corporation, El Segundo, Cal.
Sara Scientific Co., San Francisco, Calif.
DM Shannon Luminous Mat'ls., Hollywood, Cal.

Limit Stops, Mechanical

Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1088
M Precision Mechanisms Corp., Westbury, N.Y. p. 1-1919
Square D Co., Milwaukee, Wisc. *
D Tapeswitch Corp. Amer., Farmingdale, N.Y. *

Bowmar/ALI, Acton, Mass.
 Datron Systems, Chatsworth, Cal.
 Dillon, W.C. & Co., Van Nuys 340, Calif.
 D GTE Sylvania Inc., Waltham, Mass.
 Perfect Gear & Instr. Div., Northridge, Calif.
 M PIC Design Division, Ridgefield, Conn.
 Sterling Instr., New Hyde Pk., NY

Limiters, Current—See Volume 1

Limiters, Microwave

Arra Inc., Bay Shore, N.Y. p. 2-1278,1279
 M General Microwave Corp., Farmingdale, NY*
 AEL, Colmar, Pa.
 M Aertech Industries, Sunnyvale, Cal.
 M Airtron, Morris Plains, N.J.
 Alpha Instr. Inc., Woburn, Mass.
 Collins Radio, Dallas, Tex.
 Dynalab Corp., Van Nuys, Cal.
 Engelmann Microwave, Montville, N.J.
 Environmental Communications Inc., Costa Mesa, Cal.
 M GHZ Devices, So. Chelmsford, Mass.
 Hughes Aircraft Co., Culver City, Cal.
 M Merrimac Inds., West Caldwell, N.J.
 M Microlab/FXR, Livingston, N.J.
 Microphase Corp., Cos Cob, Conn.
 Microwave Assocs., Burlington, Mass.
 M Norsal Industries, Brentwood, N.Y.
 Physical Electronics Labs., Menlo Park, Cal.
 Radiation Devices Co., Baltimore, Md.
 Special Microwave Devices Oper., Waltham, Mass.
 Varian Assocs., Palo Alto, Cal.
 D Varian Electron Tube & Device Grp., San Carlos, Cal.
 M Watkins-Johnson Co., Palo Alto, Cal.

Limiters, Surge—See Volume 1

Line Stretchers, Microwave

Arra Inc., Bay Shore, N.Y. p. 2-1278,1279
 D Omni Spectra, Farmington, Mich. p. 2-724
 DM Systron-Donner Corp., Concord, Cal.
 p. 1-812,813
 DM Systron-Donner Instr. Div., Concord, Cal.
 p. 1-812,813

Amphenol RF Div., Danbury, Conn.*
 General Radio Co., Concord, Mass.*
 Aircom, Union, N.H.
 Alford Mfg. Co., Winchester, Mass.
 Coax Devices Inc., Chelsea, Mass.
 M Lorch Elctns. Corp., Englewood, N.J.
 M Lorch Devices Inc., Englewood, N.J.
 Maury Microwave Corp., Cucamonga, Calif.
 M Microlab/FXR, Livingston, N.J.
 Narda Microwave Corp., Plainview, N.Y.
 M Norsal Industries, Brentwood, N.Y.
 M Premier Microwave, Port Chester, N.Y.
 R L C Elctns., Mt. Kisco, N.Y.
 Rhode & Schwarz Sls., Fairfield, N.J.
 Waveline, W. Caldwell, N.J.

Liners, Tube Shield—See Volume 1

Loads, Electronic, Variable-Also See Dummy Loads—See Volume 1

Locators, Open-Short—See Volume 1

Locks, Dial & Shaft

D Amatam Electronic Hardware, New Haven, Conn. p. 2-1258
 E-Systems, Huntington, Ind. p. 2-1665
 Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1092
 Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1248,1249
 Jackson Bros., (London) Ltd., New York, N.Y.*
 DM Keystone Elctns. Corp., New York, N.Y.*
 Lambda Elctns., Melville, N.Y.*
 D Raytheon Co., Burlington, Mass.*
 D Smith Inc., Herman H., Brooklyn, N.Y.*
 Abacus Elctns. Corp., Dobbs Ferry, N.Y.
 DM Aimsco Inc., Seattle, Wash.
 Bowmar/ALI, Acton, Mass.
 PIC Design Division, Ridgefield, Conn.
 D Vemaline Prods. Co., Wyckoff, N.J.

Logic Cards (without Components)—See Boards, Plug-In

Logic Circuits—See Volume 1

Loudspeakers—See Volume 1

Louvers, Vents, & Windows (For Equipment)—See Volume 1

Lubricants

D GC Electronics, Rockford, Ill. p. 2-341

M General Devices Co., Indianapolis, Ind. p. 1-66
 Jonard Industries Corp., Tuckahoe, N.Y. p. 2-1707

Acesso-Wire, Garnersville, N.Y.
 Acheson Colloids Co., Port Huron, Mich.
 Atomergic Chemetals Co., Carle Place, N.Y.
 Brooks Co. Inc., Winfield, Woburn, Mass.
 D Caig Labs., Westbury, N.Y.
 Centralab Semiconductor, El Monte, Cal.
 M Chemplast, Wayne, N.J.
 D Chemtronics, Hauppauge, N.Y.
 D Cole-Flex Corp., W. Babylon, N.Y.
 D CVC Products, Rochester, N.Y.
 Dow Corning, Midland, Mich.
 Edwards High Vacuum, Grand Island, N.Y.
 E.I. DuPont de Nemours & Co., Wilmington, Del.
 Formulated Resins Inc., Greenville, R.I.
 D General Elec. Co., Waterford, N.Y.
 Hughes Aircraft Co., Culver City, Cal.
 DM LPS Research Labs, Los Angeles, Cal.
 M MacDonald & Co., Glendale, Calif.
 D Merix Chem. Co., Chicago, Ill.
 D Miller-Stephenson Chem. Co., Danbury, Conn.
 D Norelcom Electronics, Farmingdale, N.Y.
 M Nye, William F., New Bedford, Mass.
 D Quietrol Co., Spartanburg, S.C.
 D Ram Chems., Gardena, Calif.
 Sermetel Teleflex Inc., Limerick, Pa.
 DM Shannon Luminous Mat'ls., Hollywood, Cal.
 SWS Silicones, Adrian, Mich.
 DM Tech Spray, Amarillo, Tex.
 Techni-Tool, Plymouth Meeting, Pa.
 Union Carbide, Chemicals & Plastics, New York, N.Y.
 D Workman Electronic Prods., Sarasota, Fla.
 X-Acto, Long Island City, N.Y.

Lugs, Terminal—See Terminals, Lug

LVDT's—See Volume 1

Machines, Cleaning & Degreasing - Also see Cleaners, Ultrasonic—See Volume 1

Machines, Coil-Winding—See Volume 1

Machines, Component Handling, Feeding, Insertion & Sorting—See Volume 1

Machines & Tools, Crimping—See Tools, Crimping & Swaging

Machines, Hermetic Sealing—See Volume 1

Machines, Induction Heating (Electronic)—See Volume 1

Machines, Lead Cutting & Forming—See Volume 1

Machines, Marking & Numbering—See Volume 1

Machines, Mask Alignment & Exposure—See Volume 1

Machines, Metallizing, Vacuum—See Volume 1

Machines, Plastic Molding—See Volume 1

Machines, Plating—See Volume 1

Machines, Printed Circuit Drilling, Etching & Punching—See Volume 1

Machines & Accessories, Semiconductor Manufacturing—See Volume 1

Machines, Spinner, Photo-Resist—See Volume 1

Machines, Terminal Installing—See Volume 1

Machines, Transistor Assembling—See Volume 1

Machines, Ultrasonic Bonding—See Volume 1

Machines, Vibration Fatigue Testing—See Volume 1

Machines, Wafer Alignment—See Volume 1

Machines, Wire Marking, Hand & Automatic—See Volume 1

Machines, Wire Measuring & Cutting—See Volume 1

Machines, Wire Wrapping-Also See Tools, Wire Wrapping—See Volume 1

Magnetizers—See Volume 1

Magnetodiodes—See Volume 1

Magnetometers—See Volume 1

Magnetoresistors, Hall—See Volume 1

Magnetrons—See Volume 1

Magnets, Focusing—See Magnets, Permanent

Magnets (Lab. Type)

RFL Inds., Boonton, N.J. p. 1-791
 ISC Magnetics Div., Plainview, N.Y.*
 Shigoto Inds., Ltd., New York, N.Y.*
 Elma Engineering, Palo Alto, Cal.
 LDJ Electronics, Troy, Mich.
 Magnos, Incorporated, Harvard, Mass.
 Permag Corp., Jamaica, N.Y.
 Sensitive Research Instrs., Mt. Vernon, N.Y.
 D Shester Engineering Co., Culver City, Cal.
 Varian Assocs., Palo Alto, Cal.
 Varian Palo Alto Microwave Tube Div., Palo Alto, Cal.
 Walker Scientific, Worcester, Mass.

Magnets, Permanent

Arnold Engineering Co., Marengo, Ill. p. 2-1212,1213
 Ferroxcube Corp., Saugerties, N.Y. p. 2-1218-1225
 Thomas & Skinner, Indpls., Ind. p. 1-819
 Allen-Bradley Co., Milwaukee, Wisc.*
 Shigoto Inds., Ltd., New York, N.Y.*
 Weston Instrs., Newark, N.J.*
 Barker Elec. Sls., Ship Bottom, NJ
 Ceramic Magnetics, Fairfield, N.J.
 M Edmund Scientific Co., Barrington, N.J.
 Ferronics, East Rochester, N.Y.
 General Magnetic Co., Detroit, Mich.
 M Hamilton Technology, Lancaster, Pa.
 Hoskins Mfg. Co., Detroit, Mich.
 D Indiana General/Div. Emm Corp., Valparaiso, Ind.
 D Moody Tools, Providence, R.I.
 Murata Mfg. Co. Ltd., Kyoto, Japan
 Nucleonic Prods., Canoga Park, Cal.
 Ogallala Elctns., Ogallala, Neb.
 Permag Corp., Jamaica, N.Y.
 M Permanent Magnet Co., Indianapolis, Ind.
 R-Columbia Products, Highland Park, Ill.
 D Reed Switch Dev. Co., Greenwich, Conn.
 Rol-a-chart Div., Diamond Springs, Cal.
 Sel-Rex Co. Div. Oxy Metal Industries Corp., Nutley, N.J.
 D Shester Engineering Co., Culver City, Cal.
 Stackpole Carbon Company, Kane, Pa.
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
 TDK Elctns. Corp., Long Island City, N.Y.
 3M Co., St. Paul, Minn.
 Tohoku Metal Inds., Ltd., Tokyo, Japan
 Varian Assocs., Palo Alto, Cal.
 Varian Electron Tube & Device Grp., San Carlos, Cal.
 Varian Palo Alto Microwave Tube Div., Palo Alto, Cal.

Magnets, Superconducting

Advanced Kinetics, Costa Mesa, Calif.
 American Magnetics, Oak Ridge, Tenn.
 Elma Engineering, Palo Alto, Cal.
 Oxford Instr. Corp., Annapolis, Md.
 Permag Corp., Jamaica, N.Y.
 Varian Assocs., Palo Alto, Cal.

Magnifying Glasses, Inspection—See Volume 1

Markers, Dry Transfer—See Kits, Marking

Markers, Identification—See Labels; Nameplates

Markers, R-F—See Volume 1

Markers, Terminal—See Kits, Marking, etc.

Markers, Wire, Tab & Sleeve—See Wire Markers

Masers—See Volume 1

Mask Alignment & Exposure Systems—
See Volume 1

Masts, Antenna—See Volume 1

Materials, Graphite

- Acheson Colloids Co., Port Huron, Mich.
- D Aremco Prods., Ossining, N.Y.
- M Atlantic Research Corporation, Alexandria, Va
- Atomergic Chemetals Co., Carle Place, N.Y.
- Ohio Carbon Co., Cleveland, Ohio
- Stackpole Carbon Co., St. Marys, Pa.
- Ultra Carbon Corp., Bay City, Mich.
- D Union Carbide Corp., New York, N.Y.

Materials, Magnetic—See Shields,
Magnetic

Materials, Self-Lubricating

- Carborundum Co., Niagara Falls, N.Y. *
- Acheson Colloids Co., Port Huron, Mich.
- Atomergic Chemetals Co., Carle Place, N.Y.
- Cadillac Plastic & Chemical, Detroit, Mich.
- Carbone Lorraine Industries Corp., Boonton, N.J.
- M Chemplast, Wayne, N.J.
- D Dixon Corp., Bristol, R.I.
- E.I. DuPont de Nemours & Co., Wilmington, Del.
- Hughes Aircraft Co., Culver City, Cal.
- M Isochem Resins Co., Lincoln, R.I.
- Materials Resch. Corp., Orangeburg, N.Y.
- Ohio Carbon Co., Cleveland, Ohio
- D Pure Carbon Co., St. Marys, Pa.
- Rogers Corp., Rogers, Conn.

**Matrices, Computer-Also See Boards,
Programming**—See Volume 1

Memories, Buffer—See Volume 1

Memory Systems, Delay Line—See
Volume 1

Memory Systems, Core—See Volume 1

Memory Systems, Disc—See Volume 1

Memory Systems, Drum—See Volume 1

Memory Systems, Tape—See Volume 1

Memory Systems, Thin-Film, Planar—
See Volume 1

Memory Systems, Thin-Film, Plated Wire
—See Volume 1

Memory Systems, Semiconductor—See
Volume 1

**Metal Compounds, Foils, Powders,
Sheet, Stock**

MAd-Vance Magnetics, Rochester, Ind. p. 2-1210

- Acheson Colloids Co., Port Huron, Mich.
- Adre Co., Milwaukee, Wisc.
- D Alpha Metals, Jersey City, N.J.
- M Armc Steel Corp., Middletown, Ohio
- Atomergic Chemetals Co., Carle Place, N.Y.
- M Bram Metallurgical-Chem. Co., Phila., Pa.
- Engelhard Minerals & Chem., Murray Hill, N.J.
- Fansteel Inc., N Chicago, Ill.
- General Electric Co., Cleveland, Ohio
- Gliddon Metals, Cleveland, Ohio
- M Hamilton Technology, Lancaster, Pa.
- Handy & Harman, New York, N.Y.
- M Kaweck Beryco Inds., New York, NY
- Leico Inds., New York, N.Y.
- M Magnetics, Butler, Pa.
- Materials Resch. Corp., Orangeburg, N.Y.
- NL Industries, New York, N.Y.
- Philips Elmet Corp., Lewiston, Me.
- M Reynolds Metals Co., Richmond, Va.
- Ulvac Corp., Fairfield, Conn.
- D United Mineral & Chem. Corp., New York, N.Y.

Metal Oxides

Micrite Metal Mfg., Canoga Park, Cal.
p. 2-1236-1239

- Acheson Colloids Co., Port Huron, Mich.
- Alpha Metals, Jersey City, N.J.
- Atomergic Chemetals Co., Carle Place, N.Y.
- Baker, J.T. Chemical Co., Phillipsburg, N.J.
- Dow Chemical Co., Midland, Mich.
- Gliddon Metals, Cleveland, Ohio
- GTE Sylvania, Towanda, Pa.
- Handy & Harman, New York, N.Y.
- Int'l. Elctrn. Resch., Burbank, Cal.

- M Kaweck Beryco Inds., New York, NY
- Leico Inds., New York, N.Y.
- M Mallinckrodt, St. Louis, Mo.
- Materials Resch. Corp., Orangeburg, N.Y.
- Philadelphia Quartz Co., Valley Forge, Pa.
- Plessey Inc., Melville, N.Y.
- RCA Solid State Div., Somerville, N.J.
- D United Mineral & Chem. Corp., New York, N.Y.

Metal Parts—See Volume 1

Metals, Clad

- M Advanced Materials Systems, Atteboro, Mass.
- D Alpha Metals, Jersey City, N.J.
- Atomergic Chemetals Co., Carle Place, N.Y.
- M Bram Metallurgical-Chem. Co., Phila., Pa.
- Copperweld Bimetallics, Glassport, Pa.
- E.I. DuPont de Nemours & Co., Wilmington, Del.
- Engelhard Minerals & Chem., Murray Hill, N.J.
- GTE Sylvania Inc., Newark, N.J.
- Handy & Harman, New York, N.Y.
- Plessey Inc., Melville, N.Y.
- M Reynolds Metals Co., Richmond, Va.
- Tech Materials Inc., Lincoln, R.I.
- Texas Instruments, Atteboro, Mass.
- Wall A. T. Co., Warwick, R.I.

Metals, High Purity

- Alpha Metals, Jersey City, N.J.
- D Aremco Prods., Ossining, N.Y.
- Atomergic Chemetals Co., Carle Place, N.Y.
- M Bram Metallurgical-Chem. Co., Phila., Pa.
- M Eagle-Picher Industries, Joplin, Mo.
- Engelhard Minerals & Chem., Murray Hill, N.J.
- Gliddon Metals, Cleveland, Ohio
- GTE Sylvania Inc., Newark, N.J.
- M Kaweck Beryco Inds., New York, NY
- Leico Inds., New York, N.Y.
- Materials Resch. Corp., Orangeburg, N.Y.
- NL Industries, New York, N.Y.
- Nucleonic Prods., Canoga Pk., Cal.
- Plessey Inc., Melville, N.Y.
- Ulvac Corp., Fairfield, Conn.
- D United Mineral & Chem. Corp., New York, N.Y.
- Wilkinson Co., Westlake Village, Cal.

Metals, Precious

- Acheson Colloids Co., Port Huron, Mich.
- M Advanced Materials Systems, Atteboro, Mass.
- Alpha Metals, Jersey City, N.J.
- D Aremco Prods., Ossining, N.Y.
- Atomergic Chemetals Co., Carle Place, N.Y.
- Auric Corp., Newark, N.J.
- M Bram Metallurgical-Chem. Co., Phila., Pa.
- E.I. DuPont de Nemours & Co., Wilmington, Del.
- D Electro-Science Labs., Pennsauken, N. J.
- Engelhard Minerals & Chem., Murray Hill, N.J.
- Gte Sylvania, Belmont, Cal.
- Handy & Harman, New York, N.Y.
- M Kaweck Beryco Inds., New York, NY
- Leico Inds., New York, N.Y.
- Materials for Elctrns., Jamaica, N.Y.
- Materials Resch. Corp., Orangeburg, N.Y.
- Plessey Inc., Melville, N.Y.
- Sel-Rex Co. Div. Oxy Metal Industries Corp., Nutley, N.J.
- Tech Materials Inc., Lincoln, R.I.
- D United Mineral & Chem. Corp., New York, N.Y.
- United Refining & Smelting Co., Franklin Park, Ill.
- Wall A. T. Co., Warwick, R.I.
- Wilkinson Co., Westlake Village, Cal.
- D Williams Precious Metal Div., Buffalo, N.Y.

Metals, Rare

- Alpha Metals, Jersey City, N.J.
- D Aremco Prods., Ossining, N.Y.
- DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.
- Atomergic Chemetals Co., Carle Place, N.Y.
- M Bram Metallurgical-Chem. Co., Phila., Pa.
- Dow Chemical Co., Midland, Mich.
- M Kaweck Beryco Inds., New York, NY
- Leico Inds., New York, N.Y.
- Materials for Elctrns., Jamaica, N.Y.
- Materials Resch. Corp., Orangeburg, N.Y.
- Sel-Rex Co. Div. Oxy Metal Industries Corp., Nutley, N.J.
- D United Mineral & Chem. Corp., New York, N.Y.

Metals, Refractory

- D Aremco Prods., Ossining, N.Y.
- Atomergic Chemetals Co., Carle Place, N.Y.
- M Bram Metallurgical-Chem. Co., Phila., Pa.
- Fansteel Inc., N Chicago, Ill.
- General Electric Co., Cleveland, Ohio
- GTE Sylvania, Towanda, Pa.
- M Kaweck Beryco Inds., New York, NY
- Leico Inds., New York, N.Y.

- Materials Resch. Corp., Orangeburg, N.Y.
- Philips Elmet Corp., Lewiston, Me.
- D United Mineral & Chem. Corp., New York, N.Y.
- United Refining & Smelting Co., Franklin Park, Ill.

Metals, Semiconductor—See Volume 1

Metal-To-Glass Alloys—See Seals,
Glass-To-Metal

Meter Cases—See Volume 1

Meter Controllers—See Volume 1

Meter Expanders—See Volume 1

Meters, A-C Leakage Including Adapters
—See Volume 1

Meters, Acceleration—See Volume 1

Meters, Admittance—See Volume 1

Meters, Ampere, A-C—See Volume 1

Meters, Ampere, D-C—See Volume 1

Meters, Ampere, R-F—See Volume 1

Meters, Ampere, True RMS—See
Volume 1

Meters, Ampere-Hour—See Volume 1

Meters, Attenuation—See Volume 1

Meters, Audio Level—See Volume 1

Meters, Capacitance—See Volume 1

Meters, Clamp-On—See Volume 1

Meters, Conductance—See Volume 1

Meters, Counting Rate, Nuclear—See
Volume 1

Meters, Decibel Indicating—See Volume 1

Meters, Distortion & Noise—See
Volume 1

Meters, Edge-Wise—See Volume 1

Meters, Elapsed Time—See Volume 1

Meters, Electrometer—See Volume 1

Meters, Field Strength—See Volume 1

Meters, Fluid Flow—See Volume 1

Meters, Flutter & Wow—See Volume 1

Meters, Flux—See Volume 1

Meters, F-M Deviation—See Volume 1

Meters, Frequency—See Volume 1

Meters, Frequency Deviation—See
Volume 1

Meters, Frequency (Digital)—See
Volume 1

Meters, Galvanometer—See Volume 1

Meters, Gauss—See Volume 1

Meters, Grid Dip—See Volume 1

Meters, Illuminated Scale—See Volume 1

Meters, Impedance—See Volume 1

Meters, Inductance—See Volume 1

Meters, Kilovolt—See Volume 1

Meters, Kilowatt—See Volume 1

Meters, Laser Energy—See Volume 1

Meters, Light (Non Photographic)—See
Volume 1

Meters, Megohm—See Volume 1

Meters, Microampere—See Volume 1

Meters, Micro-Microampere—See
Volume 1

Meters, Micro-Nanovolt—See Volume 1

Meters, Microhm—See Volume 1

Meters, Microvolt—See Volume 1

Meters, Microwave—See Volume 1

Meters, Milliampere—See Volume 1

Meters, Milliohm—See Volume 1

Meters, Millivolt—See Volume 1

Meters, Modulation—See Volume 1

Meters, Moving Scale—See Volume 1

Meters, Multitester—See Volume 1

Meters, Multitester (Digital)—See Volume 1

Meters, Multitester (Potentiometric)—See Volume 1

Meters, Nanoampere—See Volume 1

Meters, Nanovolt—See Volume 1

Meters, Noise-Figure—See Volume 1

Meters, Noise & Sound Level—See Volume 1

Meters, Null—See Volume 1

Meters, Ohm—See Volume 1

Meters, Panel (D'Arsonval Movement)—See Volume 1

Meters, Panel (Digital)—See Volume 1

Meters, Peak Power—See Volume 1

Meters, Period—See Volume 1

Meters, Permeameter—See Volume 1

Meters, Phase-Angle—See Volume 1

Meters, Phase Vector Volt—See Volume 1

Meters, Picoampere—See Volume 1

Meters, Power Factor—See Volume 1

Meters, Power, R-F—See Volume 1

Meters, Pyrometer—See Volume 1

Meters, Q—See Volume 1

Meters, Ratio—See Volume 1

Meters, Recording—See Volume 1

Meters, Reflectometer—See Volume 1

Meters, R-F—See Volume 1

Meters, RFI—See Volume 1

Meters, S-Unit—See Volume 1

Meters, Snap-around—See Volume 1

Meters, Standing Wave Ratio—See Volume 1

Meters, Temperature (Contacting)—See Volume 1

Meters, Temperature, Dial-Type (Non-Contacting)—See Volume 1

Meters, Thermal Transfer—See Volume 1

Meters, Time Interval—See Volume 1

Meters, Vacuum Tube Volt (VTVM)—See Volume 1

Meters, VAR—See Volume 1

Meters, Vibration—See Volume 1

Meters, Volt—See Volume 1

Meters, Volt, Deviation—See Volume 1

Meters, Volt, Differential—See Volume 1

Meters, Volt, Digital (DVM) & Accessories—See Volume 1

Meters, Volt, Frequency Selective—See Volume 1

Meters, Volt, Log-Conversion—See Volume 1

Meters, Volt, Peak—See Volume 1

Meters, Volt, Potentiometric—See Volume 1

Meters, Volt, R-F—See Volume 1

Meters, Volt, Sampling—See Volume 1

Meters, Volt, True RMS—See Volume 1

Meters, Volt-Ohm-Milliampere (VOM)—See Volume 1

Meters, Volt-Ohm-Milliamperes (Vom) Digital—See Volume 1

Meters, VU—See Volume 1

Meters, Watt—See Volume 1

Meters, Watt-Hour—See Volume 1

Meters, Wave—See Volume 1

Meters, Waveguide—See Volume 1

Microcircuit Production Equip.—See Volume 1

Microcircuits—See Volume 1

Microphone Accessories (Including Stands, Holders, Booms)—See Volume 1

Microphones, Carbon—See Volume 1

Microphones, Cardioid—See Volume 1

Microphones, Ceramic—See Volume 1

Microphones, Condenser—See Volume 1

Microphones, Crystal—See Volume 1

Microphones, Dynamic—See Volume 1

Microphones, Lavalier—See Volume 1

Microphones, Magnetic—See Volume 1

Microphones, Omnidirectional—See Volume 1

Microphones, Velocity—See Volume 1

Microphones, Wireless—See Volume 1

Microscopes—See Volume 1

Microscopes, Infrared—See Volume 1

Microscopes, Measuring—See Volume 1

Microwave Comb Generator—See Volume 1

Microwave Integrated Circuits (MIC's)
D Omni Spectra, Farmington, Mich. p. 2-725
MRHG Elctns. Lab., Deer Park, N.Y. p. 2-1389
Frequency Elctns., New Hyde Pk., N.Y. *
Vari-L Co., Denver, Colo. *
AEL, Colmar, Pa.
M Aertech Industries, Sunnyvale, Cal.
American Microwave Inds., Waltham, Mass.
Avantek, Santa Clara, Cal.
M Bendix Corp., Towson, Md.
Fairchild Semiconductor, Mountain View, Cal.
Fuji Electrochemical Co., Tokyo, Japan
HRB-Singer, State College, Pa.
Microwave Assocs., Burlington, Mass.
Narda Microwave Corp., Plainview, N.Y.
DM Plessey Semiconductors, Santa Ana, Cal.
Scientific Research Corp., Tampa, Fla.
M Trak Microwave Corporation, Tampa, Fla.
D TRW Semiconductor, Lawndale, Cal.
Varian Electron Tube & Device Grp., San Carlos, Cal.

Mismatches, Microwave, Precision
Arra Inc., Bay Shore, N.Y. p. 2-1278,1279

D Texscan Corp., Indianapolis, Ind. p. 1-817
Aircorn, Union, N.H.
Coax Devices Inc., Chelsea, Mass.
M Lorch Devices Inc., Englewood, N.J.
Maury Microwave Corp., Cucamonga, Calif.
M Merrimac Inds., West Caldwell, N.J.
M Microlab/FXR, Livingston, N.J.
M Norsal Industries, Brentwood, N.Y.
D PRD Elctns., Syosset, N.Y.
M Premier Microwave, Port Chester, N.Y.
Rhode & Schwarz Sls., Fairfield, N.J.
Weinschel Engrg. Co., Gaithersburg, Md.

Mixer-Preamplifiers, Microwave
MRHG Elctns. Lab., Deer Park, N.Y. p. 2-1389
MScientific Communications, Garland, Tex.
p. 1-926,927; p. 2-1391
Vari-L Co., Denver, Colo. p. 2-1392-1400
General Elec. Co., Schenectady, N.Y. *
AEL, Colmar, Pa.
M Aertech Industries, Sunnyvale, Cal.
D Ailtech, Farmingdale, N.Y.
M Airtron, Morris Plains, N.J.
M Cincinnati Elctns. Corp., Cincinnati, Ohio
Dynalab Corp., Van Nuys, Cal.
Environmental Communications Inc., Costa Mesa, Cal.
M Hughes Aircraft Co., Torrance, Cal.
M Lorch Elctns. Corp., Englewood, N.J.
M Lorch Devices Inc., Englewood, N.J.
M Merrimac Inds., West Caldwell, N.J.
M Microlab/FXR, Livingston, N.J.
Microphase Corp., Cos Cob, Conn.
Microwave Assocs., Burlington, Mass.
DM Miteg Inc., Hauppauge, N.Y.
Mu-Del Elctns., Silver Spring, Md.
Spectra Sonics, Ogden, Utah
M Technical Research & Mfg., Manchester, N.H.
M Transco Prods., Venice, Cal.
Varian Assocs., Palo Alto, Cal.
Varian Electron Tube & Device Grp., San Carlos, Cal.
Varian Solid State East Beverly Div., Beverly, Mass.
M Watkins-Johnson Co., Palo Alto, Cal.

Mixers, Audio—See Volume 1

Mixers, Microwave
Mini-Circuits Lab., Brooklyn, N.Y. p. 2-1291
MRHG Elctns. Lab., Deer Park, N.Y. p. 2-1389
Vari-L Co., Denver, Colo. p. 2-1392-1400
General Elec. Co., Schenectady, N.Y. *
General Radio Co., Concord, Mass. *
Syston-Donner Microwave Div., Van Nuys, Cal. *
AEL, Colmar, Pa.
M Aertech Industries, Sunnyvale, Cal.
D Ailtech, Farmingdale, N.Y.
Aircorn, Union, N.H.
M Airtron, Morris Plains, N.J.
American Microwave Inds., Waltham, Mass.
DM Anaren Microwave, Syracuse, N.Y.
Coax Devices Inc., Chelsea, Mass.
Collins Radio, Dallas, Tex.
Engelmann Microwave, Montville, N.J.
Environmental Communications Inc., Costa Mesa, Cal.
Frequency Engrg. Labs., Farmingdale, N.J.
HRB-Singer, State College, Pa.
Hughes Aircraft Co., Culver City, Cal.
M Hughes Aircraft Co., Torrance, Cal.
M Lorch Elctns. Corp., Englewood, N.J.
M Lorch Devices Inc., Englewood, N.J.
M Merrimac Inds., West Caldwell, N.J.
Micro-Now Instr. Co., Chicago, Ill.
M Microlab/FXR, Livingston, N.J.
Microphase Corp., Cos Cob, Conn.
Microwave Assocs., Burlington, Mass.
D Microwave Development Labs., Needham Hgts., Mass.
Microwave Prods., Chatsworth, Cal.
Microwave/Sys., E. Syracuse, N.Y.
DM Miteg Inc., Hauppauge, N.Y.
Mu-Del Elctns., Silver Spring, Md.
Narda Microwave Corp., Plainview, N.Y.
M Norsal Industries, Brentwood, N.Y.
D PRD Elctns., Syosset, N.Y.
M Premier Microwave, Port Chester, N.Y.
R L C Elctns., Mt. Kisco, N.Y.
M Technical Research & Mfg., Manchester, N.H.
M Transco Prods., Venice, Cal.
D TRG., Woburn, Mass.
Varian Assocs., Palo Alto, Cal.
Varian Electron Tube & Device Grp., San Carlos, Cal.
Varian Solid State East Beverly Div., Beverly, Mass.
M Watkins-Johnson Co., Palo Alto, Cal.
Wavefine, W. Caldwell, N.J.
Weinschel Engrg. Co., Gaithersburg, Md.

Mixers, R-F

- Mini-Circuits Lab., Brooklyn, N.Y. p. 2-1291
- M RHG Elctns. Lab., Deer Park, N.Y. p. 2-1389
- Vari-L Co., Denver, Colo. p. 2-1392-1400
- General Radio Co., Concord, Mass. *
- Syston-Donner Microwave Div., Van Nuys, Cal. *
- AEL, Colmar, Pa.
- M Aertech Industries, Sunnyvale, Cal.
- D Ailtech, Farmingdale, N.Y.
- American Microwave Inds., Waltham, Mass.
- DM Anaren Microwave, Syracuse, N.Y.
- C-COR Elctns., State College, Pa.
- D Channel Master Div. Avnet, Ellenville, N.Y.
- Elcom Systems, Deer Pk., N.Y.
- Engelmann Microwave, Montville, N.J.
- Environmental Communications Inc., Costa Mesa, Cal.
- Frequency Engrg. Labs., Farmingdale, N.J.
- HRB-Singer, State College, Pa.
- D Lithic Systems, Saratoga, Cal.
- M Lorch Elctns. Corp., Englewood, N.J.
- M Lorch Devices Inc., Englewood, N.J.
- M Merrimac Inds., West Caldwell, N.J.
- Microphase Corp., Cos Cob, Conn.
- D Microwave Development Labs., Needham Hgts., Mass.
- DM Miteg Inc., Hauppauge, N.Y.
- Narda Microwave Corp., Plainview, N.Y.
- Plessey Semiconductors, Santa Ana, Cal.
- R L C Elctns., Mt. Kisco, N.Y.
- Summit Engineering Corp., Bozeman, Mont.
- M Transco Prods., Venice, Cal.
- Varian Solid State East Beverly Div., Beverly, Mass.
- Weinschel Engrg. Co., Gaithersburg, Md.

Modems—See Volume 1

Modulation Transfer Analyzers—See Volume 1

Modulator/Demodulators, Data—See Volume 1

Modulator/Demodulators, Laser—See Volume 1

Modulators, A-M—See Volume 1

Modulators, F-M—See Volume 1

Modulators, Light—See Volume 1

Modulators, Magnetic—See Volume 1

Modulators, Microwave—See Volume 1

Modulators, Phase—See Volume 1

Modulators, Pulse—See Volume 1

Modulators, R-F—See Volume 1

Modulators, Telemetering—See Volume 1

Modules, Logic (Encapsulated)—Also See Cards; Circuits; Networks—See Volume 1

Monitors, Current—See Volume 1

Monitors, Frequency—See Volume 1

Monitors, Humidity—See Volume 1

Monitors, Laser Energy—See Volume 1

Monitors, Modulation—See Volume 1

Monitors, Phase & Phase-Angle—See Volume 1

Monitors, Phase Sequence & Loss—See Volume 1

Monitors, Power, A-C & D-C—See Volume 1

Monitors, Power, A-F—See Volume 1

Monitors, Power, R-F—See Volume 1

Monitors, Pulse Code Modulation—See Volume 1

Monitors, Temperature—Also See Controls, Temperature—See Volume 1

Monitors, Thermocouple—See Volume 1

Monitors, Video—See Volume 1

Monitors, Voltage—See Volume 1

Monitors, Waveform—See Volume 1

Motor & Generator Armatures, Rotors, Stators—See Volume 1

Motor Electric Generator Sets—See Volume 1

Motor Speed Drives—See Volume 1

Motors, Brushless, D-C—See Volume 1

Motors, Clock & Timing—See Volume 1

Motors, Control—See Volume 1

Motors, Drag Cup—See Volume 1

Motors, Fractional Horsepower—See Volume 1

Motors, Gearhead—See Volume 1

Motors, Gyro—See Volume 1

Motors, Hysteresis—See Volume 1

Motors, Incremental, Stepping—See Volume 1

Motors, Induction—See Volume 1

Motors, Miniature—See Volume 1

Motors, Permanent Magnet—See Volume 1

Motors, Selsyn—See Volume 1

Motors, Servo—See Volume 1

Motors, Squirrel Cage—See Volume 1

Motors, Stepping—See Volume 1

Motors, Synchronous—See Volume 1

Motors, Synchronous, Polarized—See Volume 1

Motors, Timing—See Volume 1

Motors, Torque (Including Torquers)—See Volume 1

Motors, Universal, A-C Or D-C Operation—See Volume 1

Mounts, Antenna—See Volume 1

Mounts, CRT & Accessories—See Volume 1

Mounts, Crystal—See Volume 1

Mounts, Integrated Circuit—See Sockets, Integrated Circuit; Boards, Plug-In

Mounts, Klystron

- Coax Devices Inc., Chelsea, Mass.
- Maury Microwave Corp., Cucamonga, Calif.
- Narda Microwave Corp., Plainview, N.Y.
- M Premier Microwave, Port Chester, N.Y.
- D TRG., Woburn, Mass.

Mounts, Microwave

- M General Microwave Corp., Farmingdale, NY *
- AEL, Colmar, Pa.
- Aircorn, Union, N.H.
- Gabriel Elctns. Inc., Scarborough, Me.
- Hewlett-Packard Co., Palo Alto, Cal.
- Hughes Aircraft Co., Culver City, Cal.
- Maury Microwave Corp., Cucamonga, Calif.
- Microlect Co., Salem, Ore.
- M Microlab/FXR, Livingston, N.J.
- Microwave Assocs., Burlington, Mass.
- Narda Microwave Corp., Plainview, N.Y.
- D PRD Elctns., Syosset, N.Y.
- M Premier Microwave, Port Chester, N.Y.
- Waveline, W. Caldwell, N.J.

Mounts, Mobile Antenna—See Volume 1

Mounts, Shock & Vibration—See Volume 1

Mounts, Tape Head—See Volume 1

Mounts, Thermistor—See Volume 1

Mounts, Transistor (Including Kits)—See Volume 1

Multiplexers, Analog—See Volume 1

Multiplexers, Digital—See Volume 1

Multiplexers, Transmission—See Volume 1

Multipliers, Analog—See Volume 1

Multipliers, Crystal—See Volume 1

Multipliers, Diode—See Volume 1

Multipliers, Frequency—See Volume 1

Multipliers, Hall—See Volume 1

Multipliers, Magnetic Analog—See Volume 1

Multipliers, Meter—See Volume 1

Multipliers, Servo—See Volume 1

Nameplates

- D Datak Corp., Guttenberg, N.J. p. 2-354,1079
- SGL Homalite, Wilmington, Del. p. 2-1254
- Shigoto Inds., Ltd., New York, N.Y. *
- D Waldom Electronics, Chicago, Ill. *
- Acromark Co., Berkeley Hts., N.J.
- M Anodyne Inc., N. Miami Beach, Fla.
- M Bell Co., Trussville, Ala.
- M Brady Co., W. H., Milwaukee, Wis.
- M Central Plastics Dists., Chicago, Ill.
- Dennison Mfg. Co., Framingham, Mass.
- Electro Stylus, Colorado Springs, Colo.
- D Furnas Elec. Co., Batavia, Ill.
- Kandu Corporation, Arvada, Colo.
- M Laminated Fabricators, San Bruno, Calif.
- M Markem Corp., Keene, NH
- Matthews & Co., Jas. H., Pittsburgh, Pa.
- D Mechanical Engraving Co., Bronx, N.Y.
- DM Metalphoto Corp., Cleveland, Ohio
- M Meyercord Co., Wheaton, Ill.
- Panelgraphic Corp., Caldwell, N.J.
- Photo Chemical Prods. Cal., Santa Monica, Cal.
- PIC Design Division, Ridgefield, Conn.
- SGL Graphics, Warminster, Pa.
- Sterling Instr., New Hyde Pk., NY
- M Tech-Etch, Hingham, Mass.

Networks, Crossover, Attenuator (Audio)—See Volume 1

Networks, Directional Antenna Phasing—See Volume 1

Networks, Ladder

- Airco Elctns., Niagara Falls, N.Y. p. 2-368,369,1408,1409
- D Allen-Bradley Co., Milwaukee, Wisc. p. 2-1410-1417
- M Artronic Instr. Co., Silver Spring, Md. p. 1-430,431
- D Beckman Instrs., Fullerton, Cal. p. 1-881
- Caddock Electronics, Riverside, Cal. p. 1-886,887; p. 2-1441
- D Dale Electronics Inc., Columbus, Neb. p. 2-1452
- D Dale Electronics, Norfolk, Nebr. p. 2-1452
- M ESC Elctns. Corp., Palisades Pk., N.J. p. 1-550,551
- Gamble, Charles T. Inds., Riverside, N.J. p. 2-1492
- M Hisonic, Olathe, Kan. p. 1-565
- M Hybrid Systems Corp., Burlington, Mass. p. 2-1496,1497
- ILC Data Device Corp., Bohemia, N.Y. p. 1-171
- M KRL Electronics, Manchester, N.H. p. 2-1498,1499
- Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528
- Shalco, Smithfield, N.C. p. 2-1543
- Tel Labs, Manchester, N.H. p. 2-1688-1691
- DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1580,1581
- TT Elctns., Los Angeles, Cal. p. 1-588-591
- Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1571
- M Analog Devices, Norwood, Mass. *
- Data Delay Devices, Clifton, N.J. *
- D McGraw-Edison Co., Manchester, N.H. *
- D RCL Electronics Div., Irvington, N.J. *

Sprague Products Co., No. Adams, Mass. *
Tech Labs., Palisades Pk., N.J. *
M Analog Devices, Resistor Pdt., Rochester, NY
 Angstrom Precision, Hagerstown, Md.
M BG Electronics, Mount Vernon, N.Y.
 Burr-Brown, Tucson, Ariz.
 Centralab, Milwaukee, Wisc.
M Circuit Technology, Farmingdale, N.Y.
D Cutler-Hammer Shallicross, Selma, N.C.
M Dietz Design, Belton, Mo.
 Elctm. Precision Comps. Corp., Mt. Vernon, N.Y.
M Electrotec Inc., Dallas, Tex.
 Environmental Communications Inc., Costa Mesa, Cal.
 General Instrument Corp., Hicksville, N.Y.
 General Resistance, Mt. Vernon, N.Y.
M Genisco Tech. Corp., Compton, Cal.
 Gentron Corp., Milwaukee, Wisc.
M Halex, Torrance, Cal.
M HyComp Inc., Maynard, Mass.
D International Sensor Systems, Aurora, Neb.
 Kelvin, Van Nuys, Cal.
M LRC Inc., Hudson, N.H.
D Marstan Resistor, Orange, N.J.
D Mepco/Electra, Morristown, N.J.
 Mills Resistor Co., Los Alamitos, Cal.
M OPT Inds. Inc., Phillipsburg, N.J.
 Sprague Elec. Co., No. Adams, Mass.
 TRW/IRC Fixed Resistors, Burlington, Iowa
 Welwyn Canada Div., London, Ont., Can.

Networks, LC

M Artronic Instr. Co., Silver Spring, Md.
 p. 1-430,431
MESC Elctns. Corp., Palisades Pk., N.J.
 p. 1-550,551
M Hisonic, Olathe, Kan. p. 1-565
 Magnetics, Holtsville, N.Y. p. 2-1770
M Torotel Inc., Grandview, Mo. p. 1-417
TT Elctns., Los Angeles, Cal. p. 1-588-591
All-Tronics Inc., Westbury, N.Y. *
Allen Avionics, Mineola, N.Y. *
Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *
Computer Instrs., Hempstead, N.Y. *
M Data Delay Devices, Clifton, N.J. *
Electrocube Inc., San Gabriel, Cal. *
Microtran Co., Valley Stream, N.Y. *
D RCL Electronics Div., Irvington, N.J. *
Sprague Products Co., No. Adams, Mass. *
M American Trans-Coil Corp., Richmond Hill, N.Y.
M A.R.F. Products, Boulder, Colo.
BG Electronics, Mount Vernon, N.Y.
 Centralab, Milwaukee, Wisc.
 Coilcraft, Cary, Ill.
M Columbia Components, Hempstead, N.Y.
M Dietz Design, Belton, Mo.
 Dynalab Corp., Van Nuys, Cal.
 Electrocom Inds., S. Bend, Ind.
M Electronic Transformer Corp., Paterson, N.J.
 Engineered Components Co., San Luis Obispo, Cal.
 Environmental Communications Inc., Costa Mesa, Cal.
 General Instrument Corp., Hicksville, N.Y.
M Genisco Tech. Corp., Compton, Cal.
 Maxwell Labs., San Diego, Calif.
M OPT Inds. Inc., Phillipsburg, N.J.
 Rtron Corp., Skokie, Ill.
 Sprague Elec. Co., No. Adams, Mass.
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
 TDK Elctns. Corp., Long Island City, N.Y.
M Thincor, Hatboro, Pa.

Networks, Matching—See Volume 1

Networks, Phase

Allen-Bradley Co., Milwaukee, Wisc.
 p. 2-1410-1417
M Artronic Instr. Co., Silver Spring, Md.
 p. 1-430,431
Dranetz Engrg. Labs., So. Plainfield, N.J.
 p. 1-852-657
MESC Elctns. Corp., Palisades Pk., N.J.
 p. 1-550,551
M Hisonic, Olathe, Kan. p. 1-565
M KRL Electronics, Manchester, N.H.
 p. 2-1498,1499
TT Elctns., Los Angeles, Cal. p. 1-589,591
Computer Instrs., Hempstead, N.Y. *
M Data Delay Devices, Clifton, N.J. *
Millen Mfg. Co. Inc., James, Malden, Mass. *
RCL Electronics Div., Irvington, N.J. *
Sprague Products Co., No. Adams, Mass. *
M Torotel Inc., Grandview, Mo. *
 Angstrom Precision, Hagerstown, Md.
 M A.R.F. Products, Boulder, Colo.

D Balco Capacitors, Orange, N.J.
M BG Electronics, Mount Vernon, N.Y.
 Centralab, Milwaukee, Wisc.
 Collins Radio, Dallas, Tex.
M Columbia Components, Hempstead, N.Y.
 Computer Devices Corp., Commack, N.Y.
M Dietz Design, Belton, Mo.
 Dynalab Corp., Van Nuys, Cal.
 Engineered Components Co., San Luis Obispo, Cal.
 Environmental Communications Inc., Costa Mesa, Cal.
M Genisco Tech. Corp., Compton, Cal.
D Marstan Resistor, Orange, N.J.
M Merrimac Inds., West Caldwell, N.J.
M OPT Inds. Inc., Phillipsburg, N.J.
 Sprague Elec. Co., No. Adams, Mass.
 Theta Instr. Corp., Fairfield, N.J.
 Universal Ad-Yu Elctns., Milwaukee, Wisc.

Networks, Pulse Forming

Allen-Bradley Co., Milwaukee, Wisc.
 p. 2-1410-1417
M Artronic Instr. Co., Silver Spring, Md.
 p. 1-430,431
MEI-Rad Mfg. Co., Chicago, Ill. p. 2-1773,1774
MESC Elctns. Corp., Palisades Pk., N.J.
 p. 1-550,551
ILC Data Device Corp., Bohemia, N.Y. p. 1-171
M Projects Unlimited, Dayton, Ohio p. 1-271
Vari-L Co., Denver, Colo. p. 2-1401-1403
MAMP Captron Div./AMP Inc., Elizabethtown, Pa. *
M Axel Elctns., Jamaica, N.Y. *
Cober Elctns., Stamford, Conn. *
Computer Instrs., Hempstead, N.Y. *
M Del Electronics Corp., Mt. Vernon, N.Y. *
Millen Mfg. Co. Inc., James, Malden, Mass. *
RCL Electronics Div., Irvington, N.J. *
Sprague Products Co., No. Adams, Mass. *
M Torotel Inc., Grandview, Mo. *
TT Elctns., Los Angeles, Cal. *
M American Trans-Coil Corp., Richmond Hill, N.Y.
 Amp Inc., Harrisburg, Pa.
 Centralab, Milwaukee, Wisc.
 Collins Radio, Dallas, Tex.
M Columbia Components, Hempstead, N.Y.
 Engineered Components Co., San Luis Obispo, Cal.
 Hughes Aircraft Co., Culver City, Cal.
 Kappa Scientific Corp., Santa Barbara, Cal.
 Maxwell Labs., San Diego, Calif.
M OPT Inds. Inc., Phillipsburg, N.J.
M Plastic Capacitors, Chicago, Ill.
M Polyphase Instr. Co., Bridgeport, Pa.
 Simmonds Precision, Norwich, N.Y.
 Sprague Elec. Co., No. Adams, Mass.
D Television Microtime, Bloomfield, Conn.

Networks, Rejection—See Filters

Networks, RC

D Allen-Bradley Co., Milwaukee, Wisc.
 p. 2-1410-1417
Arco Electronics Inc., Great Neck, N.Y.
 p. 2-32-39
D Beckman Instrs., Fullerton, Cal.
 p. 2-1418,1419
Bourns, Riverside, Cal. p. 2-1420
MESC Elctns. Corp., Palisades Pk., N.J.
 p. 1-550,551
MF-Dyne Elctns., Bridgeport, Conn.
 p. 2-130-133
Gamble, Charles T. Inds., Riverside, N.J.
 p. 2-1492
M KRL Electronics, Manchester, N.H.
 p. 2-1498,1499
Pyrofilm Resistor Co., Whippany, N.J.
 p. 2-1526-1528
M Southern Electronics Co., Burbank, Cal.
 p. 2-240,241
Tel Labs, Manchester, N.H. p. 2-1688-1691
TT Elctns., Los Angeles, Cal. p. 1-588,590
All-Tronics Inc., Westbury, N.Y. *
M Analog Devices, Norwood, Mass. *
Bulova Watch Co., Freq Controls Div., Woodside, N.Y. *
Custom Elctns., Oneonta, N.Y. *
Del Electronics Corp., Mt. Vernon, N.Y. *
Electrocube Inc., San Gabriel, Cal. *
D RCL Electronics Div., Irvington, N.J. *
Shigoto Inds., Ltd., New York, N.Y. *
Sprague Products Co., No. Adams, Mass. *
D Acushnet Capacitor Co., New Bedford, Mass.
D Altec Div., Anaheim, Calif.
D Balco Capacitors, Orange, N.J.
 Bell Industries, Electronic Components Div., Burbank, Cal.
D Centralab, Milwaukee, Wisc.

CTS Corp., Elkart, Ind.
M Dietz Design, Belton, Mo.
 Dynalab Corp., Van Nuys, Cal.
 Elctm. Precision Comps. Corp., Mt. Vernon, N.Y.
 Engineered Components Co., San Luis Obispo, Cal.
 Environmental Communications Inc., Costa Mesa, Cal.
 General Instrument Corp., Hicksville, N.Y.
 General Resistance, Mt. Vernon, N.Y.
M Genisco Tech. Corp., Compton, Cal.
 Kelvin, Van Nuys, Cal.
M LRC Inc., Hudson, N.H.
D Marstan Resistor, Orange, N.J.
 Maxwell Labs., San Diego, Calif.
D Mepco/Electra, Morristown, N.J.
 Mills Resistor Co., Los Alamitos, Cal.
 Murata Mfg. Co. Ltd., Kyoto, Japan
 Plessey Ceramic Div., Frenchtown, N.J.
 Presin Co., Shelton, Conn.
 Resistance Prods., Harrisburg, Pa.
 Rtron Corp., Skokie, Ill.
D Sprague Elec. Co., No. Adams, Mass.
 Stettner-Trush Inc., Cazenovia, N.Y.
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
 TDK Elctns. Corp., Long Island City, N.Y.
M Thincor, Hatboro, Pa.
 Tri-Sage Inc., Pittsford, NY
M Western Microsystems, Santaée, Cal.
 White Instrs., Austin, Tex.

Networks, Resistance

Airco Elctns., Niagara Falls, N.Y.
 p. 2-368,369,1408,1409
D Allen-Bradley Co., Milwaukee, Wisc.
 p. 2-1410-1417
D Beckman Instrs., Fullerton, Cal.
 p. 2-1418,1419
D Bourns, Riverside, Cal. p. 2-1420
Caddock Electronics, Riverside, Cal.
 p. 1-886,887,2-1440,1441
DM Dale Electronics Inc., Columbus, Neb.
 p. 2-1452
Dale Electronics, Norfolk, Nebr. p. 2-1452
Gamble, Charles T. Inds., Riverside, N.J.
 p. 2-1492
GRM Corp., Medford, N.J. p. 1-120
M Hybrid Systems Corp., Burlington, Mass.
 p. 2-1496,1497
Keystone Carbon Co., St. Marys, Pa.
 p. 1-2317,2318
M KRL Electronics, Manchester, N.H.
 p. 2-1498,1499
Pyrofilm Resistor Co., Whippany, N.J.
 p. 2-1526-1528
D RCL Electronics Div., Irvington, N.J.
 p. 2-1530-1542
RFL Inds., Boonton, N.J. p. 1-122
Shallico, Smithfield, N.C. p. 2-1543
Sprague Products Co., No. Adams, Mass.
 p. 2-1546
Tel Labs, Manchester, N.H. p. 2-1688-1691
DM TRW/IRC Resistors, Philadelphia, Pa.
 p. 2-1558,1559,1562
Vishay Resistive Systems Grp., Malvern, Pa.
 p. 2-1571

M Analog Devices, Norwood, Mass. *
D McGraw-Edison Co., Manchester, N.H. *
Tech Labs., Palisades Pk., N.J. *
D Altec Div., Anaheim, Calif.
M Analog Devices, Resistor Pdt., Rochester, NY
 Angstrom Precision, Hagerstown, Md.
 Beckman Instrs., (A1SSD), Fullerton, Cal.
 C-F Electronics, Van Nuys, Cal.
 Centralab, Milwaukee, Wisc.
M Circuit Technology, Farmingdale, N.Y.
D CTS Corp., Elkart, Ind.
D Cutler-Hammer Shallicross, Selma, N.C.
 Electro Sci. Inds., Portland, Ore.
 Elctm. Precision Comps. Corp., Mt. Vernon, N.Y.
M Electrotec Inc., Dallas, Tex.
 Environmental Communications Inc., Costa Mesa, Cal.
 General Instrument Corp., Hicksville, N.Y.
 General Resistance, Mt. Vernon, N.Y.
 Gentron Corp., Milwaukee, Wisc.
M Halex, Torrance, Cal.
Hy-Cal Engineering, Santa Fe Springs, Cal
D International Sensor Systems, Aurora, Neb.
M Julie Research Lab., New York, N.Y.
 Kelvin, Van Nuys, Cal.
M LRC Inc., Hudson, N.H.
D Marstan Resistor, Orange, N.J.
D Mepco/Electra, Morristown, N.J.
 Mills Resistor Co., Los Alamitos, Cal.
 Panasonic, Ind'l Elctm. Comps., New York, N.Y.
 Plessey Ceramic Div., Frenchtown, N.J.

Pulse Engrg., San Diego, Cal.
Resistance Prods., Harrisburg, Pa.
Rodan Ind's., Anaheim, Ca.
D Sprague Elec. Co., No. Adams, Mass.
Tri-Sage Inc., Pittsford, NY
TRW/IRC Fixed Resistors, Burlington, Iowa
DM Ultronic, Grand Junction, Col.
Welwyn Canada Div., London, Ont., Can.

Null Detectors—See Volume 1

Nuts, Metal—See Fasteners, Metal

Nuts, Plastic—See Fasteners, Non-Metallic

Oceanographic Equip. (Electronic)—See Volume 1

Oils—See Lubricants

Optical-Coupler Isolators—See Volume 1

Optics, Fiber—See Volume 1

Oscillators, Audio (Module)—See Volume 1

Oscillators, Audio (Test)—See Volume 1

Oscillators, Beat Frequency (BFO)—See Volume 1

Oscillators, Bias—See Volume-1

Oscillators, Bridge (Test)—See Volume 1

Oscillators, Cavity—See Volume 1

Oscillators, Crystal Controlled (Module)—See Volume 1

Oscillators, Decade (Test)—See Volume 1

Oscillators, Klystron—See Volume 1

Oscillators, LC—See Volume 1

Oscillators, Low-Frequency (Module)—See Volume 1

Oscillators, Magnetron—See Volume 1

Oscillators, Microwave
M Applied Microwave, Westwood, Mass.
p. 1-901-904
Arra Inc., Bay Shore, N.Y. p. 2-1278,1279
D Greenray Inds., Mechanicsburg, Pa. p. 1-327
Hope Elctns., Clifton, N.J. p. 2-1287
Marconi Instrs., Northvale, N.J. p. 1-766-771
MCL, LaGrange, Ill. p. 1-922,923
Ovenaire, Charlottesville, Va. p. 1-400-402
Polarad Elctn. Instrs., Lake Success, N.Y.
p. 1-784,785
REI Sales Co., Burlington, Mass. p. 1-796,797
Rental Electronics, Lexington, Mass.
p. 1-792-795
D Texscan Corp., Indianapolis, Ind. p. 1-817
D Amperex Electronic Corp., Hicksville, N.Y. *
M Electronic Research Co., Shawnee Mission, Kans. *
General Elec. Co., Schenectady, N.Y. *
General Radio Co., Concord, Mass. *

DM Addington Labs., Sunnyvale, Cal.
M Aertech Industries, Sunnyvale, Cal.
D Ailtech, Farmingdale, N. Y.
Aircorn, Union, N.H.
M Airtron, Morris Plains, N.J.
Arvin Frequency Devices, Columbus, Ind.
M Avantek, Santa Clara, Cal.
California Microwave, Sunnyvale, Cal.
Collins Radio, Dallas, Tex.
Continental Rentals Div., Bedford, Mass.
M Deltronic Crystal Inds., Denville, N.J.
Dynalab Corp., Van Nuys, Cal.
Environmental Communications Inc., Costa Mesa, Cal.
Frequency West, Santa Clara, Cal.
Hewlett-Packard Co., Palo Alto, Cal.
Hughes Aircraft Co., Fullerton, Cal.
M Litton Inds., San Carlos, Calif.
Maury Microwave Corp., Cucamonga, Calif.
Microphase Corp., Cos Cob, Conn.
DM Mitec Inc., Hauppauge, N.Y.
Mu-Del Elctns., Silver Spring, Md.
Narda Microwave Corp., Plainview, N.Y.
Nihon Dempa Kogyo Co., Ltd., Tokyo, Japan
M Omni-Spectra, Tempe, Ariz.
D Parametric Inds., Winchester, Mass.
Physical Electronics Labs., Menlo Park, Cal.

D PRD Elctns., Syosset, N.Y.
DM RCA, Ind'l. Tube Div., Lancaster, Pa.
Reeve Electronics, Chicago, Ill.
D R F D, Tampa, Fla.
Scientific Research Corp., Tampa, Fla.
Singer Co., Palo Alto, Cal.
Sivers Lab, Corona del Mar, Cal.
M Somerset Radiation Lab., Arlington, Va.
Special Microwave Devices Oper., Waltham, Mass.
Sperry Microwave Components, Gainesville, Fla.
M Teledyne Microwave, Mountain View, Cal.
M Trak Microwave Corporation, Tampa, Fla.
Tucker Electronics Co., Garland, Tex.
Varian Assocs., Palo Alto, Cal.
D Varian Electron Tube & Device Grp., San Carlos, Cal.
Varian Solid State East Beverly Div., Beverly, Mass.
Varian, Solid State West Division, Palo Alto, Cal.
M Watkins-Johnson Co., Palo Alto, Cal.
Weinschel Engrg. Co., Gaithersburg, Md.
D Wiltron Co., Palo Alto, Cal.
DM Yig-Tek Corp., Santa Clara, Cal.

Oscillators, Power (Module)—See Volume 1

Oscillators, Test Equipment—See Generators (Specific Types)

Oscillators, Pulse (Module)—See Volume 1

Oscillators, Pulse (Test)—See Volume 1

Oscillators, RC (Module)—See Volume 1

Oscillators, Reed—See Volume 1

Oscillators, R-F (Module)—See Volume 1

Oscillators, R-F (Test)—See Volume 1

Oscillators, Sinusoidal (Module)—See Volume 1

Oscillators, Sinusoidal (Test)—See Volume 1

Oscillators, Square-Wave (Module)—See Volume 1

Oscillators, Square-Wave (Test)—See Volume 1

Oscillators, Sweep—See Volume 1

Oscillators, Telemetry—See Volume 1

Oscillators, Temperature Compensated—See Volume 1

Oscillators, Tuning-Fork Controlled—See Volume 1

Oscillators, UHF/VHF (Module)—See Volume 1

Oscillators, UHF/VHF (Test)—See Volume 1

Oscillators, Ultrasonic (Module)—See Volume 1

Oscillators, Ultrasonic (Test)—See Volume 1

Oscillators, Voltage Controlled (Module)—See Volume 1

Oscillographs, Direct Writing—See Volume 1

Oscilloscope Plug-Ins—See Volume 1

Oscilloscopes, Digital Readout—See Volume 1

Oscilloscopes, General Purpose—See Volume 1

Oscilloscopes, High-Frequency (Above 75 MHZ)—See Volume 1

Oscilloscopes, Low-Frequency (D-C to 3 MHZ)—See Volume 1

Oscilloscopes, Mid-Frequency (D-C to 75 MHZ)—See Volume 1

Oscilloscopes, Multi-Beam—See Volume 1

Oscilloscopes, Multiple Channel—See Volume 1

Oscilloscopes, Portable, Battery Operated—See Volume 1

Oscilloscopes, Processing—See Volume 1

Oscilloscopes, Programmable—See Volume 1

Oscilloscopes, Sampling—See Volume 1

Oscilloscopes, Storage—See Volume 1

Oscilloscopes, Three-Dimensional—See Volume 1

Outlets, Electrical—See Volume 1

Ovens, Aging, Burn-In, Life Test—See Volume 1

Ovens, Crystal & Component—See Volume 1

Ovens, Electric—See Volume 1

Ovens, Vacuum—See Volume 1

Packages, Integrated Circuit—See Volume 1

Packaging Panels, IC—See Boards, Plug-In

Pads, L, T, & H—See Volume 1

Pads, Transistor Mounting—See Volume 1

Paging Systems—See Volume 1

Paints, Conductive, Electric—See Coatings, Conductive, Electric

Paints, Metallic
M Micro-Circuits Co., New Buffalo, Mich.
p. 2-342,343
Acheson Colloids Co., Port Huron, Mich.
D Electro-Science Labs., Pennsauken, N. J.
N L Inds., New York, N. Y.
D Randolph Prods. Co., Carlstadt, N.J.
Sermetel Teleflex Inc., Limerick, Pa.
D Technical Wire Products, Cranford, N.J.

Paints, Radioactive—See Coatings, Radioactive

Paints, Reflective
Acheson Colloids Co., Port Huron, Mich.
Hughes Aircraft Co., Culver City, Cal.
N L Inds., New York, N. Y.
D Randolph Prods. Co., Carlstadt, N.J.

Paints, Resistive-Also see Inks for Thick-Film Microcircuits
M Micro-Circuits Co., New Buffalo, Mich.
p. 2-342,343
Acheson Colloids Co., Port Huron, Mich.
E.I. DuPont de Nemours & Co., Wilmington, Del.
Electro Mats. Corp. Amer., Mamaroneck, N.Y.
D Electro-Science Labs., Pennsauken, N. J.
Engelhard Minerals & Chem., Murray Hill, N.J.
General Elec., Schenectady, N.Y.
Hughes Aircraft Co., Culver City, Cal.
M Isochem Resins Co., Lincoln, R.I.
Murata Mfg. Co. Ltd., Kyoto, Japan
N L Inds., New York, N. Y.
Plessey Inc., Melville, N.Y.
D Randolph Prods. Co., Carlstadt, N.J.
Sel-Rex Co. Div. Oxy Metal Industries Corp., Nutley, N.J.
Sermetel Teleflex Inc., Limerick, Pa.
Templ Div., So. Plainfield, N.J.

Panel Equipment—See Dials; Connectors; Jacks; Lights; etc.

Panel Marking Kits—See Kits, Marking (Dial, Instrument, Equipment, etc.)

Panels, Fuse—See Volume 1

Panels, IC Packaging—See Boards, Plug-In

Panels, Jack
DM ADC Prods., Minneapolis, Minn. p. 2-444,449

- Allied Systems Corp., Greensboro, N.C.** p. 2-458,459
M Elctrn. Molding Corp., Woonsocket, R.I. p. 2-676-679
MGRM Corp., Medford, N.J. p. 1-120
Info-Lite Corp., Corona, N.Y. p. 1-2076
LVC Inds. Inc., Flushing, N.Y. p. 1-2010,2011,2100
National Tel-Tronics, Meadville, Pa. p. 2-720,721
Omega Engrg., Stamford, Conn. p. 1-2324-2327
Trimm, Libertyville, Ill. p. 2-895
D Vector Electronic Co., Sylmar, Cal. p. 2-1061
M Virginia Panel Corp., Waynesboro, Va. *
D Altec Div., Anaheim, Calif.
Amp Inc., Harrisburg, Pa.
M Anchor Specialty Mfg. Inc., Teterboro, N.J.
Apahouser Corp. of N.E., Watertown, Mass.
Artisan Elctrns. Corp., Parsippany, N.J.
D Ava Elctrns., Landsdowne, Pa.
Birnbach Co., Freeport, N.Y.
D Cambridge Thermionic Corp., Cambridge, Mass.
D Heeger Inc., Los Angeles, Cal.
Honeywell, Ft. Washington, Pa.
D International Data Sciences, Providence, R.I.
D ITI Electronics, Clifton, N.J.
LMB Heeger, Los Angeles, Cal.
Mac Panel Co., High Pt., N.C.
Marlin Manufacturing Corp., Cleveland, Ohio
D Mechanical Engraving Co., Bronx, N.Y.
Methode Elctrns., Chicago, Ill.
Mid-West Metal Prods., Kansas City, Kans.
D Mobil Electronics, Anderson, Ind.
Mupac Corp., Brockton, Mass.
D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
D Switchcraft, Chicago, Ill.
Technical Mat'l., Mamaroneck, N.Y.
Trompeter Electronics, Chatsworth, Cal.

Panels, Metal—See Volume 1**Panels, Meter—See Volume 1****Panels, Patch—See Panels, Jack****Panels, Power Bus For IC's**

- M Anchor Specialty Mfg. Inc., Teterboro, N.J.**
M Chem Aero, Wilmington, Cal.
Control Products Corp., Chicago, Ill.
Cutler-Hammer, Milwaukee, Wisc.
DM Dynatech Corp., Santa Ana, Cal.
Electronic Control Systems, Fairmont, W. Va.
Lakeshore Electric Corp., Bedford, Ohio
D Mechanical Engraving Co., Bronx, N.Y.
Methode Elctrns., Chicago, Ill.
Mupac Corp., Brockton, Mass.

Panels, Relay Rack—See Volume 1**Panoramic Adapters—See Volume 1****Paper-Tape Preparation Systems—See Volume 1****Paper, Graphic Recording—See Volume 1****Patch Boards—See Boards, Programming****Pedestals, Radar**

- M Aeroflex Labs., Plainview, N.Y.** *
M ABA Industries, Pinellas Pk., Fla.
The Bendix Corp., Teterboro, N.J.
Datron Systems, Chatsworth, Cal.
Hughes Aircraft Co., Culver City, Cal.
Tasker Systems, Chatsworth, Cal.
M Teledyne Micronetics, San Diego, Calif.

Perforators, Paper Tape (Electrically Powered)—See Volume 1**Perforators, Paper Tape (Manually Operated)—See Volume 1****Phones—See Volume 1****Phonographs, Parts & Accessories—See Volume 1****Photocells & Phototubes—See Volume 1****Photoelectric Equipment—See Volume 1****Photoelectric Tubes—See Volume 1****Photoemissive Detectors—See Volume 1****Photometers—See Volume 1****Photomultiplier Tube Housings—See Volume 1****Pickups, Magnetic, Proximity, Torque, Vibration, etc.—See Volume 1****Pickups, Telephone (For Recording)—See Volume 1****Pilot Lamps—See Lamps, Dial & Pilot****Pin Straighteners, Tube—See Volume 1****Pins, Cotter, Dowel, Taper, etc.—See Pins, Mechanical****Pins, Electrically Conductive**

- Allied Systems Corp., Greensboro, N.C.** p. 2-458,459
Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
D Arco Electronics Inc., Great Neck, N.Y. p. 2-619
D Concord Elctrns., New York, N.Y. p. 2-654,655
Connector Corp., Chicago, Ill. p. 2-657-660
Elctrn. Molding Corp., Woonsocket, R.I. p. 2-676-679
Interswitch, Burlingame, Cal. p. 1-2075
LVC Inds. Inc., Flushing, N.Y. p. 1-2010,2011,2100
D Positronic Inds., Springfield, Mo. p. 2-789
DM Vector Electronic Co., Sylmar, Cal. p. 2-1058-1060
D Vero Electronics, Hauppauge, N.Y. p. 2-366
D Waldom Electronics, Chicago, Ill. p. 1-1070-1074

- D Augat Inc., Attleboro, Mass.** *
Berg Electronics, New Cumberland, Pa. *
Accessories for Electronics, Bayside, N.Y.
M Art Wire & Stamping Co., Cedar Knolls, N.J.
Auto-Swage Products Inc., Shelton, Conn.
M Avid Electronics Corp., Baldwin, Pl., N.Y.
Bead Elctrns., Bridgeport, Conn.
D Beman Mfg., New Cumberland, Pa.
M Chem Aero, Wilmington, Cal.
D Circuit Assembly Corp., Costa Mesa, Ca.
Gary Mfg., New Brunswick, N.J.
D General Illumination, Roseville, Minn.
M GTI Corporation, Pittsburgh, Pa.
Kentucky Electronics, Owensboro, Ky.
D Precision Metal Prods. Co., Stoneham, Mass.
Pylon Co., Attleboro, Mass.
M U.S. Terminals, Cincinnati, Ohio

Pins, Mechanical

- D Vector Electronic Co., Sylmar, Cal.** p. 2-1060
DM Keystone Elctrns. Corp., New York, N.Y. *
Abbott Screw & Mfg. Co., Chicago, Ill.
DM Allen Mfg. Co., Hartford, Conn.
M Art Wire & Stamping Co., Cedar Knolls, N.J.
Auto-Swage Products Inc., Shelton, Conn.
Autosplice/Dv Gen Staple, New York City, N.Y.
DM Avibank Mfg. Inc., Burbank, Calif.
M Avid Electronics Corp., Baldwin, Pl., N.Y.
Bead Elctrns., Bridgeport, Conn.
Bird, Richard H. & Co., Waltham, Mass.
D Deutsch Fastener Corp., Los Angeles, Cal.
DM Esna Div., Union, N.J.
Gary Mfg., New Brunswick, N.J.
M Groov-Pin Corp., Ridgefield, N.J.
M GTI Corporation, Pittsburgh, Pa.
Kentucky Electronics, Owensboro, Ky.
M PIC Design Division, Ridgefield, Conn.
D Precision Metal Prods. Co., Stoneham, Mass.
Sterling Instr., New Hyde Pk., NY
Tridair Inds., Torrance, Calif.
M U.S. Terminals, Cincinnati, Ohio

Plastic Raw Materials, Liquids, Pellets, Powders, Resins

- SGL Homalite, Wilmington, Del.** p. 2-1254
Acheson Colloids Co., Port Huron, Mich.
Air Prods. & Chems., Allentown, Pa.
Allaco Prods Div., Watertown, Mass.
Bacon Inds., Watertown, Mass.
Cadillac Plastic & Chemical, Detroit, Mich.
Central Plastics Dist., Chicago, Ill.
Consep, Allegany, N.Y.
D Dolph, John C. Co., Monmouth Junction, N.J.
Dow Chemical Co., Midland, Mich.
Dow Corning, Midland, Mich.
D Dura Plastics N.Y., Westport, Conn.
DM Dynaloy, Hanover, N.J.
Eastman Chem. Prods., Kingsport, Tenn.
E.I. DuPont de Nemours & Co., Wilmington, Del.
Fiberfil Div. Dart Ind., Evansville, Ind.

- FMC Corp., New York, N.Y.**
Formulated Resins Inc., Greenville, R.I.
D General Elec., Selkirk, N.Y.
M Goodrich Chem. Co., B.F., Cleveland, Ohio
Hardman Inc., Belleville, N.J.
Hightemp Resins, Stamford, Conn.
M Isochem Resins Co., Lincoln, R.I.
D Merix Chem. Co., Chicago, Ill.
Mobay Chem. Corporation, Pittsburgh, Pa.
Packaged Resins Div., Watertown, Mass.
Plastics Engrg. Co., Sheboygan, Wisc.
Ram Chems., Gardena, Calif.
Tra-Con, Medford, Mass.
Union Carbide, Chemicals & Plastics, New York, N.Y.
Uniroyal, New York, N.Y.

Plastics, Encapsulating—See Compounds, Encapsulating**Plastics, Heat Shrinkable—See Caps, Forms & Tapes, Heat Shrinkable-Also See Tubing, Heat Shrinkable****Plastics, Custom Molding—See Volume 1****Plated Wire Memory Systems—See Volume 1****Plates, Core Loading (Memory)—See Volume 1****Plates, Instructional, Name, Silk Screen—See Nameplates****Players, Magnetic Tape—See Volume 1****Pliers**

- D Channellock, Meadville, Pa.** p. 2-1693
D Jonard Industries Corp., Tuckahoe, N.Y. p. 2-1708
D Vaco Products Co., Chicago, Ill. p. 2-1716
D GC Electronics, Rockford, Ill. *
D 3M Company, St. Paul, Minn. *
D Adtool Corp., Montreal W P Q, Can.
D Erikson Specialized Tool Co., Pico-Rivera, Cal.
Janel, Stirling, N.J.
Jensen Tools & Alloys, Phoenix, Ariz.
M Kawecky Beryco Inds., New York, NY
M MacDonald & Co., Glendale, Calif.
Mann, Henry Inc., Huntingdon Valley, Pa.
D Hunter Tools, El Monte, Calif.
Motorola Comms. Div., Schaumburg, Ill.
National Camera Inc., Englewood, Colo.
O. K. Machine & Tool Corp., Bronx, N.Y.
Sjoberg, C. & Son, Cranston, R.I.
Snap-On-Tools, Kenosha, Wisc.
D Techni-Tool, Plymouth Meeting, Pa.
DM Vigor Co., New York, N.Y.
M Waldes Kohinoor, Long Island City, N.Y.
X-Acto, Long Island City, N.Y.
D Xcelite, Orchard Park, N.Y.

Plotters, X-Y, & Accessories—See Volume 1**Plug Adapters**

- M Amphenol Connector Div., Broadview, Ill.** p. 2-460,461
DM Amphenol RF Div., Danbury, Conn. p. 2-460,461
D Augat Inc., Attleboro, Mass. p. 2-636
Connector Corp., Chicago, Ill. p. 2-657-660
D Elctrn. Molding Corp., Woonsocket, R.I. p. 2-676-679
D ITT Pomona Electronics Div., Pomona, Cal. p. 2-728-739,741,743,751,753
National Tel-Tronics, Meadville, Pa. p. 2-721
M Rowe Industries, Toledo, Ohio p. 2-796,797
ID Smith Inc., Herman H., Brooklyn, N.Y. p. 2-818,821,829,843-845,847,848,872
D Vector Electronic Co., Sylmar, Cal. p. 1-103
Dynamic Instr. Corp., Hauppauge, N.Y. *
General Radio Co., Concord, Mass. *
DM Keystone Elctrns. Corp., New York, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
Air-O-Tronics Prods., Morrisville, N.Y.
D Barker Prods. Co., Saugus, Mass.
Birnbach Co., Freeport, N.Y.
D Cablewave Systems Inc., North Haven, Conn.
D Cambridge Thermionic Corp., Cambridge, Mass.
D Ev-Game Inc., Freeport, N.Y.
D Javex Elctrns., Cherry Valley, Cal.
Jerome Industries Corp., Orange, N.J.
D Jolo Industries, Garden Grove, Cal.
Leico Inds., New York, N.Y.
Marlin Manufacturing Corp., Cleveland, Ohio
D N T-T/Peerless, Leominster, Mass.

D Philmore Mfg. Co. Inc., Inwood, N.Y.
 D Rye Inds., Mamaroneck, N.Y.
 DM Saxton Prods., Congers, N.Y.
 D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
 Trompeter Electronics, Chatsworth, Cal.
 D Workman Electronic Prods., Sarasota, Fla.

Plug & Jack Sets

DMADC Prods., Minneapolis, Minn. p. 2-447
 Amphenol RF Div., Danbury, Conn.

p. 2-460,461
 Connector Corp., Chicago, Ill. p. 2-657-660
 D ITT Pomona Electronics Div., Pomona, Cal.

p. 2-742,747-749,781-783
 Jan Hardware Mfg. Co., Long Island City, N.Y.

p. 2-1091
 DM National Tel-Tronics, Meadville, Pa. p. 2-720
 M Rowe Industries, Toledo, Ohio p. 2-796,797
 DM Sealectro Corp., Mamaroneck, N.Y.

p. 2-803,804
 D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-818
 D Superior Electric Co., Bristol, Conn. p. 2-799
 D TRW/Cinch Connectors, Elk Grove Village, Ill.

p. 2-896,897
 D Waldom Electronics, Chicago, Ill.

p. 1-1070-1074
 D GC Electronics, Rockford, Ill. *

General Radio Co., Concord, Mass. *

DM Keystone Elctns. Corp., New York, N.Y. *

Millen Mfg. Co. Inc., James, Malden, Mass. *

Shigoto Inds., Ltd., New York, N.Y. *

Accessories for Electronics, Bayside, N.Y.
 Barker Prods. Co., Saugus, Mass.
 Beman Mfg., New Cumberland, Pa.

Birnbach Co., Freeport, N.Y.
 D Cambridge Thermionic Corp., Cambridge, Mass.

D Components Specialties, Hempstead, N.Y.
 D Ev-Game Inc., Freeport, N.Y.

George Instrument Co., Royal Oak, Mich.
 Honeywell, Ft. Washington, Pa.
 Hypertronics Corp., Stow, Mass.

D Javex Elctns., Cherry Valley, Cal.
 Leico Inds., New York, N.Y.

Mallory Controls, Frankfort, Ind.
 Marlin Manufacturing Corp., Cleveland, Ohio

D N T-T/Peerless, Leominster, Mass.
 D Philmore Mfg. Co. Inc., Inwood, N.Y.

D Rye Inds., Mamaroneck, N.Y.
 DM Saxton Prods., Congers, N.Y.

Sierra Elec., Gardena, Calif.
 Trompeter Electronics, Chatsworth, Cal.

M U.S. Terminals, Cincinnati, Ohio
 Weinschel Engrg. Co., Gaithersburg, Md.

Plug Buttons—See Volume 1

Plug Caps & Shells

M Rowe Industries, Toledo, Ohio p. 2-796,797
 D Vector Electronic Co., Sylmar, Cal. p. 1-103
 Smith Inc., Herman H., Brooklyn, N.Y. *

Staver Co., Bay Shore, N.Y. *

D Circuit Assembly Corp., Costa Mesa, Ca.

D Javex Elctns., Cherry Valley, Cal.
 Leviton Mfg. Co., Little Neck, N.Y.

D Pacific Electrod Corp., Gardena, Cal.
 D Rye Inds., Mamaroneck, N.Y.

Plugboard Programming Systems—See Boards, Programming

Plugs, Electrical (All Types)

DMADC Prods., Minneapolis, Minn. p. 2-447
 Allied Systems Corp., Greensboro, N.C.

p. 2-458,459
 M Amphenol Connector Div., Broadview, Ill.

p. 2-460,461
 M Amphenol Connector Div., SAMS Opers., Chatsworth, Cal. p. 2-460,461

D Amphenol Ind'l Div., Chicago, Ill. p. 2-460,461
 Amphenol RF Div., Danbury, Conn.

p. 2-460,461
 D Amphenol Sales Div., Broadview, Ill.

p. 2-460,461
 D Augat Inc., Attleboro, Mass. p. 2-636
 Connector Corp., Chicago, Ill. p. 2-657-660

M Elctn. Molding Corp., Woonsocket, R.I.

p. 2-676-679
 D Johnson Co., E.F., Waseca, Minn. p. 2-707-710
 Millen Mfg. Co. Inc., James, Malden, Mass.

p. 2-1249
 National Tel-Tronics, Meadville, Pa.

p. 2-720,721
 M Rowe Industries, Toledo, Ohio p. 2-796,797
 Schrack Electrical Sales Corp., New York, N.Y.

p. 1-1813
 Sealectro Corp., Mamaroneck, N.Y.

p. 2-802,805

DM SGL Waber Electric, Westville, NJ p. 2-356
 D Smith Inc., Herman H., Brooklyn, N.Y.

p. 2-818-824,826-830,835,838,841-848,851,872
 D Superior Electric Co., Bristol, Conn. p. 2-799
 Trimm, Libertyville, Ill. p. 2-895

D TRW/Cinch Connectors, Elk Grove Village, Ill.

p. 2-896,897
 Vector Electronic Co., Sylmar, Cal. p. 1-103
 D Waldom Electronics, Chicago, Ill.

p. 1-1070-1074
 D Daburn Electronics & Cable Corp., Bronx, N.Y. *

General Radio Co., Concord, Mass. *

DM Keystone Elctns. Corp., New York, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

D Specialties Mfg. Co., St. Clair Shores, Mich. *

Vernitron Elec. Comps., Laconia, N.H. *

Amp Inc., Harrisburg, Pa.

D Beman Mfg., New Cumberland, Pa.
 Birnbach Co., Freeport, N.Y.

D Blonder-Tongue Labs., Old Bridge, N.J.
 D Eby Co., Hugh H., Philadelphia, Pa.

D Elco, Willow Grove, Pa.
 Gulton Inds., Buena Park, Cal.

Hypertronics Corp., Stow, Mass.
 D Javex Elctns., Cherry Valley, Cal.

Leviton Mfg. Co., Little Neck, N.Y.
 Methode Elctns., Chicago, Ill.

D Pacific Electrod Corp., Gardena, Cal.
 Robinson-Nugent, New Albany, Ind.

Rye Inds., Mamaroneck, N.Y.
 D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan

D Thomas & Betts Co., Elizabeth, N.J.
 D Workman Electronic Prods., Sarasota, Fla.

Plugs, Fused

Shigoto Inds., Ltd., New York, N.Y. *

Gulton Inds., Buena Park, Cal.

Pointers, Dial

Jan Hardware Mfg. Co., Long Island City, N.Y.

p. 2-1090
 Millen Mfg. Co. Inc., James, Malden, Mass. *

D Waldom Electronics, Chicago, Ill. *

Birnbach Co., Freeport, N.Y.
 PIC Design Division, Ridgefield, Conn.

Zierick Mfg. Corp., Mt. Kisco, N.Y.

Position Control Systems, Servo—See Volume 1

Posts, Binding

D Amatome Electronic Hardware, New Haven, Conn. p. 2-457
 Amphenol RF Div., Danbury, Conn.

p. 2-460,461
 Graphite Metallizing Corp., Yonkers, N.Y.

p. 1-961
 D ITT Pomona Electronics Div., Pomona, Cal.

p. 2-745,746,750,751
 D Johnson Co., E.F., Waseca, Minn. p. 2-712
 Millen Mfg. Co. Inc., James, Malden, Mass.

p. 2-1247-1249
 DM National Tel-Tronics, Meadville, Pa. p. 2-720
 D Projects Unlimited, Dayton, Ohio p. 1-271

DM Smith Inc., Herman H., Brooklyn, N.Y.

p. 2-813-817,840,844,846,848,849
 D Superior Electric Co., Bristol, Conn. p. 2-799
 D Waldom Electronics, Chicago, Ill.

p. 1-1070-1074
 D Daburn Electronics & Cable Corp., Bronx, N.Y. *

Elctn. Molding Corp., Woonsocket, R.I. *

D GC Electronics, Rockford, Ill. *

General Radio Co., Concord, Mass. *

D Grayhill Inc., LaGrange, Ill. *

DM Raytheon Co., Burlington, Mass. *

Shigoto Inds., Ltd., New York, N.Y. *

Auto-Swage Products Inc., Shelton, Conn.
 D Birnbach Co., Freeport, N.Y.

D Cambridge Thermionic Corp., Cambridge, Mass.
 D Eby Co., Hugh H., Philadelphia, Pa.

Elco, Willow Grove, Pa.
 D NOBEX Div., Burlington, Cal.

D N T-T/Peerless, Leominster, Mass.
 D Philmore Mfg. Co. Inc., Inwood, N.Y.

D Rye Inds., Mamaroneck, N.Y.
 D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan

D Zierick Mfg. Corp., Mt. Kisco, N.Y.

Posts, Harness Board

D Smith Inc., Herman H., Brooklyn, N.Y. *

Auto-Swage Products Inc., Shelton, Conn.

D Thomas & Betts Co., Elizabeth, N.J.

Potentiometer, Elements

Computer Instrs., Hempstead, N.Y.

p. 2-1642,1643

Jan Hardware Mfg. Co., Long Island City, N.Y.

p. 2-1090
 M New England Instr., Natick, Mass. p. 2-1671

Analog Devices, Norwood, Mass. *

Carter Mfg. Corp., Bolton, Ma. *

NES, Streamwood, Ill. *

Vishay Intertechnology, Malvern, Pa. *

M Astro Elctns., Fullerton, Calif.
 M Betatronix, Hauppauge, N.Y.

M Bowmar/TIC, Newbury Park, Calif.
 M Litton Systems, Mt. Vernon, N.Y.

M Maurey Instrument Corp., Chicago, Ill.
 Waters Mfg., Wayland, Mass.

Potentiometers, Carbon Ceramic

D Allen-Bradley Co., Milwaukee, Wisc.

p. 2-1584-1591
 DM Bourns, Riverside, Cal. p. 2-1623-1626
 CTS Microelectronics, W. Lafayette, Ind.

p. 2-1622
 Shigoto Inds., Ltd., New York, N.Y. *

D Centralab, Milwaukee, Wisc.

DM CTS Corp., Elkart, Ind.

Murata Mfg. Co. Ltd., Kyoto, Japan
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

United Mineral & Chem. Corp., New York, N.Y.

Potentiometers, Carbon Film

D Bourns, Riverside, Cal. p. 2-1623-1626
 Computer Instrs., Hempstead, N.Y.

p. 2-1642,1643
 New England Instr., Natick, Mass.

p. 2-1670,1671
 DM Vishay Intertechnology, Malvern, Pa. p. 2-1687

Shigoto Inds., Ltd., New York, N.Y. *

Trimm, Libertyville, Ill. *

D Centralab, Milwaukee, Wisc.

M Litton Systems, Mt. Vernon, N.Y.

Mallory Controls, Frankfort, Ind.

Motorola Comms. Div., Schaumburg, Ill.

Murata Mfg. Co. Ltd., Kyoto, Japan

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

United Mineral & Chem. Corp., New York, N.Y.

Potentiometers, Ceramic-Metal (Cermet)

Allen-Bradley Co., Milwaukee, Wisc.

p. 2-1584-1591
 DM Amphenol Connector Div., Controls Opers., Broadview, Ill. p. 2-460,461

DM Beckman Instrs., Fullerton, Cal.

p. 2-1610,1611
 DM Bourns, Riverside, Cal. p. 2-1623-1626

D Clarostat Mfg. Co., Dover, N.H. p. 2-1627
 CTS Microelectronics, W. Lafayette, Ind.

p. 2-1622
 Dale Electronics Inc., Columbus, Neb.

p. 2-1452
 D Spectrol Electronics Corp., City of Industry, Cal.

p. 2-1680
 DM TRW/IRC Potentiometers, St. Petersburg, Fla.

p. 2-896,897
 Computer Instrs., Hempstead, N.Y. *

Ohmite Mfg. Co., Skokie, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

M Betatronix, Hauppauge, N.Y.

D Centralab, Milwaukee, Wisc.

DM CTS Corp., Elkart, Ind.

D Diplohmatic Div., Seattle, Wash.

D Electro-Science Labs., Pennsauken, N.J.

Murata Mfg. Co. Ltd., Kyoto, Japan

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Samarius, Derby, Conn.

D United Mineral & Chem. Corp., New York, N.Y.

DM Weston Comps. Div., Archbald, Pa.

DM Weston Schlumberger, Archbald, Pa.

Potentiometers, Composition, Carbon

DM Bourns, Riverside, Cal. p. 2-1623-1626

DM Clarostat Mfg. Co., Dover, N.H. p. 2-1627

CTS Microelectronics, W. Lafayette, Ind.

p. 2-1622

D Spectrol Electronics Corp., City of Industry, Cal.

p. 2-1680

DM Vishay Intertechnology, Malvern, Pa. p. 2-1687

D Allen-Bradley Co., Milwaukee, Wisc. *

D Ohmite Mfg. Co., Skokie, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

Stackpole Components Co., Raleigh, N.C. *

D Centralab, Milwaukee, Wisc.

D Components Specialties, Hempstead, N.Y.

DM CTS Corp., Elkart, Ind.

Mallory Controls, Frankfort, Ind.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

D Philmore Mfg. Co. Inc., Inwood, N.Y.

United Mineral & Chem. Corp., New York, N.Y.

Potentiometers, Conductive Plastic

D Amphenol Connector Div., Controls Opers., Broadview, Ill. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
DM Beckman Instrs., Fullerton, Cal. p. 2-1610,1611
DM Bourns, Riverside, Cal. p. 2-1623-1626
M Carter Mfg. Corp., Bolton, Ma. p. 2-1640,1641
D Clarostat Mfg. Co., Dover, N.H. p. 2-1627
Duncan Electronics, Costa Mesa, Cal. p. 2-1654,1655
New England Instr., Natick, Mass. p. 2-1666-1671
D Spectrol Electronics Corp., City of Industry, Cal. p. 2-1680
DM Systron-Donner Corp., Concord, Cal. p. 1-812,813
Computer Instrs., Hempstead, N.Y. *
 Aviation Elec., Ltd., Montreal, H4L 4x8 Que., Can.
M Betatronix, Hauppauge, N.Y.
M Bowmar/TIC, Newbury Park, Calif.
 Centralab, Milwaukee, Wisc.
M Litton Systems, Mt. Vernon, N.Y.
M Maurey Instrument Corp., Chicago, Ill.
 PIC Design Division, Ridgefield, Conn.
 Samarius, Derby, Conn.
 Waters Mfg., Wayland, Mass.

Potentiometers, Hot Molded

Allen-Bradley Co., Milwaukee, Wisc. p. 2-1584-1591
D Amphenol Connector Div., Controls Opers., Broadview, Ill. p. 2-460,461
D Clarostat Mfg. Co., Dover, N.H. p. 2-1627
DM Vishay Intertechnology, Malvern, Pa. p. 2-1687
Ohmite Mfg. Co., Skokie, Ill. *
 D Centralab, Milwaukee, Wisc.
M Litton Systems, Mt. Vernon, N.Y.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Potentiometers, Lab Type—See Volume 1

Potentiometers, Linear

D Allen-Bradley Co., Milwaukee, Wisc. p. 2-1584-1591
DM Amphenol Connector Div., Controls Opers., Broadview, Ill. p. 2-460,461
DM Amphenol Sales Div., Broadview, Ill. p. 2-460,461
Astrosystems, Lake Success, N.Y. p. 1-142
DM Beckman Instrs., Fullerton, Cal. p. 2-1610,1611
M Carter Mfg. Corp., Bolton, Ma. p. 2-1640,1641
D Clarostat Mfg. Co., Dover, N.H. p. 2-1627
Computer Instrs., Hempstead, N.Y. p. 2-1642,1643
CTS Microelectronics, W. Lafayette, Ind. p. 2-1622
Duncan Electronics, Costa Mesa, Cal. p. 2-1654,1655
Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1090
New England Instr., Natick, Mass. p. 2-1666-1671
D Spectrol Electronics Corp., City of Industry, Cal. p. 2-1678-1680
DM Systron-Donner Corp., Concord, Cal. p. 1-812,813
DM TRW/IRC Potentiometers, St. Petersburg, Fla. p. 2-896,897
D GC Electronics, Rockford, Ill. *
General Radio Co., Concord, Mass. *
Ohmite Mfg. Co., Skokie, Ill. *
Shigoto Inds., Ltd., New York, N.Y. *
D A E G Telefunken, Englewood Cliffs, N.J.
 Angstrom Precision, Hagerstown, Md.
M Betatronix, Hauppauge, N.Y.
M Bowmar/TIC, Newbury Park, Calif.
 Centralab, Milwaukee, Wisc.
M Columbia Components, Hempstead, N.Y.
DM CTS Corp., Elkart, Ind.
 D Electro-Techniques, Oceanside, Cal.
M Humphrey, San Diego, Calif.
M Litton Systems, Mt. Vernon, N.Y.
DM Maurey Instrument Corp., Chicago, Ill.
 MPC Prods. Corp., Chicago, Ill.
 Perkin-Elmer Corp., Norwalk, Conn.
D Philmore Mfg. Co. Inc., Inwood, N.Y.
 Singer Co., Little Falls, N.J.
 Waters Mfg., Wayland, Mass.

Potentiometers, Metal Film

D Amphenol Connector Div., Controls Opers., Broadview, Ill. p. 2-460,461
DM TRW/IRC Potentiometers, St. Petersburg, Fla. p. 2-896,897

Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1687
NEC America, New York, N.Y. *
D Centralab, Milwaukee, Wisc.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
 Samarius, Derby, Conn.
D Weston Schlumberger, Archbald, Pa.

Potentiometers, Metal, Glazed—See Potentiometers, Ceramic-Metal

Potentiometers, Motorized—See Volume 1

Potentiometers Multiturn

Allen-Bradley Co., Milwaukee, Wisc. p. 2-1584-1591
M Amphenol Connector Div., Controls Opers., Broadview, Ill. p. 2-460,461
DM Amphenol Sales Div., Broadview, Ill. p. 2-460,461
DM Beckman Instrs., Fullerton, Cal. p. 2-1610,1611
DM Bourns, Riverside, Cal. p. 2-1623-1626
D Clarostat Mfg. Co., Dover, N.H. p. 2-1627
Computer Instrs., Hempstead, N.Y. p. 2-1642,1643
CTS Microelectronics, W. Lafayette, Ind. p. 2-1622
Dale Electronics Inc., Columbus, Neb. p. 2-1452
D Duncan Electronics, Costa Mesa, Cal. p. 2-1654,1655
Spectrol Electronics Corp., City of Industry, Cal. p. 2-1679
DM Systron-Donner Corp., Concord, Cal. p. 1-812,813
D TRW/IRC Potentiometers, St. Petersburg, Fla. p. 2-896,897
Shigoto Inds., Ltd., New York, N.Y. *
M Astro Elctns., Fullerton, Calif.
M Betatronix, Hauppauge, N.Y.
M Bowmar/TIC, Newbury Park, Calif.
 D CTS Corp., Elkart, Ind.
 D Electro-Techniques, Oceanside, Cal.
M Litton Systems, Mt. Vernon, N.Y.
M Maurey Instrument Corp., Chicago, Ill.
 D Mepeco/Electra, Morristown, N.J.
 Perkin-Elmer Corp., Norwalk, Conn.
 D United Mineral & Chem. Corp., New York, N.Y.
DM Weston Comps. Div., Archbald, Pa.
 D Weston Schlumberger, Archbald, Pa.

Potentiometers, Nonlinear

D Amphenol Connector Div., Controls Opers., Broadview, Ill. p. 2-460,461
DM Amphenol Sales Div., Broadview, Ill. p. 2-460,461
DM Beckman Instrs., Fullerton, Cal. p. 2-1610,1611
M Carter Mfg. Corp., Bolton, Ma. p. 2-1640,1641
Computer Instrs., Hempstead, N.Y. p. 2-1642,1643
CTS Microelectronics, W. Lafayette, Ind. p. 2-1622
Duncan Electronics, Costa Mesa, Cal. p. 2-1654,1655
Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1090
New England Instr., Natick, Mass. p. 2-1666,1668-1671
D Spectrol Electronics Corp., City of Industry, Cal. p. 2-1678-1680
Ohmite Mfg. Co., Skokie, Ill. *
Shigoto Inds., Ltd., New York, N.Y. *
 Angstrom Precision, Hagerstown, Md.
M Betatronix, Hauppauge, N.Y.
M Bowmar/TIC, Newbury Park, Calif.
 D Centralab, Milwaukee, Wisc.
M CTS Corp., Elkart, Ind.
 D Electro-Techniques, Oceanside, Cal.
M Litton Systems, Mt. Vernon, N.Y.
M Maurey Instrument Corp., Chicago, Ill.
 Perkin-Elmer Corp., Norwalk, Conn.
D Philmore Mfg. Co. Inc., Inwood, N.Y.
 Waters Mfg., Wayland, Mass.
DM Weston Comps. Div., Archbald, Pa.

Potentiometers, Rectilinear

D Allen-Bradley Co., Milwaukee, Wisc. p. 2-1584-1591
D Amphenol Connector Div., Controls Opers., Broadview, Ill. p. 2-460,461
DM Beckman Instrs., Fullerton, Cal. p. 2-1610,1611
D Bourns, Riverside, Cal. p. 2-1623-1626
M Carter Mfg. Corp., Bolton, Ma. p. 2-1640,1641
Clarostat Mfg. Co., Dover, N.H. p. 2-1627

Computer Instrs., Hempstead, N.Y. p. 2-1642,1643
CTS Microelectronics, W. Lafayette, Ind. p. 2-1622
Duncan Electronics, Costa Mesa, Cal. p. 2-1654,1655
Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1090
New England Instr., Natick, Mass. p. 2-1669-1671
D Spectrol Electronics Corp., City of Industry, Cal. p. 2-1680
Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1687
 Aviation Elec., Ltd., Montreal, H4L 4x8 Que., Can.
M Betatronix, Hauppauge, N.Y.
 Bourns, Riverside, Calif.
M Bowmar/TIC, Newbury Park, Calif.
 Conrac Corp., Duarte, Cal.
D CTS Corp., Elkart, Ind.
 D Electro-Techniques, Oceanside, Cal.
M Humphrey, San Diego, Calif.
M Litton Systems, Mt. Vernon, N.Y.
DM Maurey Instrument Corp., Chicago, Ill.
 Samarius, Derby, Conn.
 Texas Instrs. Inc., Houston, Tex.
DM Weston Comps. Div., Archbald, Pa.
 D Weston Schlumberger, Archbald, Pa.

Potentiometers, Servo Mount—See Volume 1

Potentiometers, Trimmer, Carbon Ceramic

DM Bourns, Riverside, Cal. p. 2-1623-1626
CTS Microelectronics, W. Lafayette, Ind. p. 2-1622
D Spectrol Electronics Corp., City of Industry, Cal. p. 2-1677
D GC Electronics, Rockford, Ill. *
Shigoto Inds., Ltd., New York, N.Y. *
 D Centralab, Milwaukee, Wisc.
DM CTS Corp., Elkart, Ind.
 Murata Mfg. Co. Ltd., Kyoto, Japan
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
 United Mineral & Chem. Corp., New York, N.Y.
 D Weston Schlumberger, Archbald, Pa.

Potentiometers, Trimmer, Carbon Composition

D Allen-Bradley Co., Milwaukee, Wisc. p. 2-1584-1591
DM Bourns, Riverside, Cal. p. 2-1623-1626
CTS Microelectronics, W. Lafayette, Ind. p. 2-1622
D Spectrol Electronics Corp., City of Industry, Cal. p. 2-1677
DM Vishay Intertechnology, Malvern, Pa. p. 2-1687
D GC Electronics, Rockford, Ill. *
D Ohmite Mfg. Co., Skokie, Ill. *
Shigoto Inds., Ltd., New York, N.Y. *
Stackpole Components Co., Raleigh, N.C. *
 D Centralab, Milwaukee, Wisc.
D CTS Corp., Elkart, Ind.
 Mallory Controls, Frankfort, Ind.
 Motorola Comms. Div., Schaumburg, Ill.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
DM Piher Int'l. Corp., Des Plaines, Ill.
 United Mineral & Chem. Corp., New York, N.Y.
 D Weston Schlumberger, Archbald, Pa.

Potentiometers, Trimmer, Carbon Film

DM Bourns, Riverside, Cal. p. 2-1623-1626
CTS Microelectronics, W. Lafayette, Ind. p. 2-1622
International Comps Corp., Melville, N.Y. p. 2-192,193
DM Vishay Intertechnology, Malvern, Pa. p. 2-1687
Shigoto Inds., Ltd., New York, N.Y. *
 D Centralab, Milwaukee, Wisc.
D CTS Corp., Elkart, Ind.
 Motorola Comms. Div., Schaumburg, Ill.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
 D United Mineral & Chem. Corp., New York, N.Y.
 D Weston Schlumberger, Archbald, Pa.

Potentiometers, Trimmer, Ceramic-Metal (Cermet)

Allen-Bradley Co., Milwaukee, Wisc. p. 2-1584-1591
Amphenol Connector Div., Controls Opers., Broadview, Ill. p. 2-460,461
DM Amphenol Sales Div., Broadview, Ill. p. 2-460,461
DM Beckman Instrs., Fullerton, Cal. p. 2-1612-1620
DM Bourns, Riverside, Cal. p. 2-1623-1626

CTS Microelectronics, W. Lafayette, Ind. p. 2-1622

D Dale Electronics Inc., Columbus, Neb. p. 2-1452

D Spectrol Electronics Corp., City of Industry, Cal. p. 2-1677

DM TRW/IRC Potentiometers, St. Petersburg, Fla. p. 2-896,897

Shigoto Inds., Ltd., New York, N.Y. *

D Centralab, Milwaukee, Wisc.

DM CTS Corp., Elkart, Ind.

D Diplohmatic Div., Seattle, Wash.

DM Mepco/Electra, Morristown, N.J.

M Minelco, Div. General Time Corp., Thomaston, Conn.

Murata Mfg. Co. Ltd., Kyoto, Japan

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Samarus, Derby, Conn.

D United Mineral & Chem. Corp., New York, N.Y.

DM Weston Comps. Div., Archbald, Pa.

DM Weston Schlumberger, Archbald, Pa.

Potentiometers, Trimmer, Conductive Plastic

D Amphenol Connector Div., Controls Oper., Broadview, Ill. p. 2-460,461

M Bourns, Riverside, Cal. p. 2-1623-1626

M Carter Mfg. Corp., Bolton, Ma. p. 2-1640,1641

Centralab, Milwaukee, Wisc.

Samarus, Derby, Conn.

Potentiometers, Trimmer, Hot Molded

D Allen-Bradley Co., Milwaukee, Wisc. p. 2-1584-1591

D Vishay Intertechnology, Malvern, Pa. *

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Potentiometers, Trimmer, Metal Film

D Amphenol Connector Div., Controls Oper., Broadview, Ill. p. 2-460,461

DM Amphenol Sales Div., Broadview, Ill. p. 2-460,461

International Comps Corp., Melville, N.Y. p. 2-192

DM TRW/IRC Potentiometers, St. Petersburg, Fla. p. 2-896,897

Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1687

NEC America, New York, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

Centralab, Milwaukee, Wisc.

M Minelco, Div. General Time Corp., Thomaston, Conn.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Samarus, Derby, Conn.

DM Techno-Comps. Corp., Van Nuys, Cal.

D Weston Schlumberger, Archbald, Pa.

Potentiometers, Trimmer, Wirewound

Amphenol Connector Div., Controls Oper., Broadview, Ill. p. 2-460,461

DM Amphenol Sales Div., Broadview, Ill. p. 2-460,461

DM Bourns, Riverside, Cal. p. 2-1623-1626

M Carter Mfg. Corp., Bolton, Ma. p. 2-1640,1641

D Clarostat Mfg. Co., Dover, N.H. p. 2-1627

CTS Microelectronics, W. Lafayette, Ind. p. 2-1622

M Dale Electronics Inc., Columbus, Neb. p. 2-1452

D Spectrol Electronics Corp., City of Industry, Cal. p. 2-1676

DM TRW/IRC Potentiometers, St. Petersburg, Fla. p. 2-896,897

CW Industries, Warminster, Pa. *

International Comps Corp., Melville, N.Y. *

D Ohmite Mfg. Co., Skokie, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

Angstrom Precision, Hagerstown, Md.

Centralab, Milwaukee, Wisc.

D CTS Corp., Elkart, Ind.

D Diplohmatic Div., Seattle, Wash.

DM Maurey Instrument Corp., Chicago, Ill.

M Minelco, Div. General Time Corp., Thomaston, Conn.

Murata Mfg. Co. Ltd., Kyoto, Japan

DM Techno-Comps. Corp., Van Nuys, Cal.

D United Mineral & Chem. Corp., New York, N.Y.

DM Weston Comps. Div., Archbald, Pa.

DM Weston Schlumberger, Archbald, Pa.

Potentiometers, Wirewound

Allen-Bradley Co., Milwaukee, Wisc. p. 2-1584-1591

D Amphenol Connector Div., Controls Oper., Broadview, Ill. p. 2-460,461

DM Amphenol Sales Div., Broadview, Ill. p. 2-460,461

DM Beckman Instrs., Fullerton, Cal. p. 2-1610,1611

DM Bourns, Riverside, Cal. p. 2-1623-1626

M Carter Mfg. Corp., Bolton, Ma. p. 2-1640,1641

DM Clarostat Mfg. Co., Dover, N.H. p. 2-1627

CTS Microelectronics, W. Lafayette, Ind. p. 2-1622

M Duncan Electronics, Costa Mesa, Cal. p. 2-1654,1655

Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1090

New England Instr., Natick, Mass. p. 2-1670,1671

D Spectrol Electronics Corp., City of Industry, Cal. p. 2-1676

DM Systron-Donner Corp., Concord, Cal. p. 1-812,813

DM TRW/IRC Potentiometers, St. Petersburg, Fla. p. 2-896,897

CW Industries, Warminster, Pa. *

D GC Electronics, Rockford, Ill. *

General Radio Co., Concord, Mass. *

D Ohmite Mfg. Co., Skokie, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

M Angstrom Precision, Hagerstown, Md.

M Astro Elctns., Fullerton, Calif.

Aviation Elec., Ltd., Montreal, H4L 4x8 Que., Can.

M Betatronix, Hauppauge, N.Y.

M Bowmar/TIC, Newbury Park, Calif.

D Centralab, Milwaukee, Wisc.

D Components Specialties, Hempstead, N.Y.

Conrac Corp., Duarte, Cal.

DM CTS Corp., Elkart, Ind.

D Electro-Techniques, Oceanside, Cal.

M Humphrey, San Diego, Calif.

D Javex Elctns., Cherry Valley, Cal.

Jerome Industries Corp., Orange, N.J.

M Litton Systems, Mt. Vernon, N.Y.

Mallory Controls, Frankfort, Ind.

M Maurey Instrument Corp., Chicago, Ill.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Perkin-Elmer Corp., Norwalk, Conn.

Samarus, Derby, Conn.

DM Techno-Comps. Corp., Van Nuys, Cal.

D United Mineral & Chem. Corp., New York, N.Y.

Waters Mfg., Wayland, Mass.

DM Weston Comps. Div., Archbald, Pa.

Weston Schlumberger, Archbald, Pa.

D Workman Electronic Prods., Sarasota, Fla.

Power Drivers, Hybrid (High Current, High Voltage)—See Volume 1

Power Supplies, A-C Input, Less Than 30 VDC Output—See Volume 1

Power Supplies, A-C Input, 30 to 300 VDC Output—See Volume 1

Power Supplies, A-C Input, 300 to 1,000 VDC Output—See Volume 1

Power Supplies, A-C Input, Greater Than 1,000 VDC Output—See Volume 1

Power Supplies, A-C Output - Also see Inverters; Regulators—See Volume 1

Power Supplies, D-C Input, A-C Output—See Volume 1

Power Supplies, D-C Input, D-C Output—See Volume 1

Power Supplies, D-C Output, Current Regulated—See Volume 1

Power Supplies for Arc Lamps—See Volume 1

Power Supplies, Bipolar—See Volume 1

Power Supplies for CRT's—See Volume 1

Power Supplies for Computer—See Volume 1

Power Supplies, Constant Current—See Volume 1

Power Supplies, Constant Voltage—See Volume 1

Power Supplies, Constant Voltage/Constant Current—See Volume 1

Power Supplies, Dual Output, Triple Output—See Volume 1

Power Supplies, Energy Storage—See Volume 1

Power Supplies High Current (greater than 8 amperes)—See Volume 1

Power Supplies for Integrated Circuits—See Volume 1

Power Supplies for Klystrons—See Volume 1

Power Supplies, Lab (Including Metered Units)—See Volume 1

Power Supplies for Lasers—See Volume 1

Power Supplies, Low Current (Less Than 0.4 Ampere)—See Volume 1

Power Supplies, Medium Current (0.4 to 8 Amperes)—See Volume 1

Power Supplies, Modular—See Volume 1

Power Supplies, Multiple Output—See Volume 1

Power Supplies for OP Amps—See Volume 1

Power Supplies, Operational—See Volume 1

Power Supplies for Photomultipliers—See Volume 1

Power Supplies, Printed Circuit Card—See Volume 1

Power Supplies, Programmable—See Volume 1

Power Supplies for Radar, Sonar—See Volume 1

Power Supplies for Readouts & Displays—See Volume 1

Power Supplies, Regulated—See Volume 1

Power Supplies, Standby (Emergency)—See Volume 1

Power Supplies for Strain Gauges & Transducers—See Volume 1

Power Supplies for TWT's—See Volume 1

Power Supplies, Uninterruptable (UPS)—See Volume 1

Power Supplies, Unregulated—See Volume 1

Power Supplies for Welding, Electroplating & Flocking—See Volume 1

Power Supplies for Xenon Lamps—See Volume 1

Power Supply Interfaces & Accessories—See Volume 1

Prebonding Etchants—See Chemicals, Etching

Preforms, Precious Metal

D Alpha Metals, Jersey City, N.J.

Engelhard Minerals & Chem., Murray Hill, N.J.

Handy & Harman, New York, N.Y.

Plessey Inc., Melville, N.Y.

Wilkinson Co., Westlake Village, Cal.

DM Williams Precious Metal Div., Buffalo, N.Y.

Prescalers—See Volume 1

Preselector-Mixers

MRHG Elctns. Lab., Deer Park, N.Y. p. 2-1389

Vari-L Co., Denver, Colo. p. 2-1392-1400

AEL, Colmar, Pa.

M Aertech Industries, Sunnyvale, Cal.

Ailtech, City of Industry, Cal.

M Coleman Microwave Co., Lebanon, N.J.

Environmental Communications Inc., Costa Mesa, Cal.
 Frequency Engrg. Labs., Farmingdale, N.J.
 M Lorch Elctns. Corp., Englewood, N.J.
 M Lorch Devices Inc., Englewood, N.J.
 M Microlab/FXR, Livingston, N.J.
 Microphase Corp., Cos Cob, Conn.
 M Premier Microwave, Port Chester, N.Y.
 Radio Development Lab., Deer Park, NY
 D R F D, Tampa, Fla.
 UTE Microwave, Asbury Park, N.J.
 Viable Systems Inc., Needham, Mass.
 DM Yig-Tek Corp., Santa Clara, Cal.

Preselectors—See Volume 1

Pressure Vessels—See Volume 1

Pressure Indicators—See Volume 1

Pressurization Units—See Volume 1

Printers, Digital—See Volume 1

Printers, Line, Tape-Listing—See Volume 1

Printing, Dry Transfer—See Kits, Marking (Dial Instrument)

Probes, Hall—See Volume 1

Probes, High-Voltage (1,000 Volts & Over)—See Volume 1

Probes, Logic Test—See Volume 1

Probes, Microwave
 M General Microwave Corp., Farmingdale, NY p. 1-718
 Aircorn, Union, N.H.
 Alford Mfg. Co., Winchester, Mass.
 Coax Devices Inc., Chelsea, Mass.
 Hewlett-Packard Co., Palo Alto, Cal.
 Maury Microwave Corp., Cucamonga, Calif.
 M Microdynamics, So. El Monte, Cal.
 M Microlab/FXR, Livingston, N.J.
 Narda Microwave Corp., Plainview, N.Y.
 D Nu-Concept Computer Systems, Colmar, Pa.
 Philips Test & Measuring Instrs., Woodbury, N.Y.
 D PRD Elctns., Syoset, N.Y.
 M Premier Microwave, Port Chester, N.Y.
 Waveline, W. Caldwell, N.J.

Probes, Oscilloscopes—See Volume 1

Probes, R-F—See Volume 1

Probes, Temperature—See Volume 1

Probes, Test Lead—See Volume 1

Process Control Systems—See Volume 1

Program Board Connectors—See Connectors, Plug-In Program Board

Programmers, Cam & Drum—See Volume 1

Programmers, Matrix Boards—See Boards, Programming

Programmers, Punched Card—See Volume 1

Programmers, Tape—See Volume 1

Protectors, Brownout—See Volume 1

Protectors, Contact—See Volume 1

Protectors, Surge - Also see Suppressors, Arc; Arresters, Electrical Surge; Suppressors, Transient Voltage—See Volume 1

Public Address Systems—See Volume 1

Pullers, Circuit Board
 Bivar, Santa Ana, Cal. p. 2-1259,1266
 D Thermalloy, Dallas, Tex. p. 1-1877
 D Triad-Utrad, Huntington, Ind. p. 2-1822-1829
 D Vero Electronics, Hauppauge, N.Y. p. 2-366
 Jonard Industries Corp., Tuckahoe, N.Y. *
 D Vector Electronic Co., Sylmar, Cal. *
 D Waldom Electronics, Chicago, Ill. *
 Accessories for Electronics, Bayside, N.Y.
 DM Air Quip-Robleyco, Richardson, Tex.
 DM Calmark Corp., San Gabriel, Cal.

D Cambridge Thermionic Corp., Cambridge, Mass.
 Gibson/Egan Co., Arcadia, Calif.
 Matrix Engineering Corp., Gardena, Cal.
 DM Scanbe Canoga Industries, El Monte, Cal.
 Stanford Applied Engineering, Santa Clara, Cal.
 Titchener, E.H. & Co., Binghamton, N.Y.

Pullers, Tube
 Allen-Bradley Co., Milwaukee, Wisc. *
 D Jonard Industries Corp., Tuckahoe, N.Y. *
 D Hunter Tools, El Monte, Calif

Pulsers, Diode—See Volume 1

Pulsers, Logic Test—See Volume 1

Pumps, Vacuum—See Volume 1

Punched Card Equipment—See Volume 1

Punches, Chassis
 AMP Capitor Div./AMP Inc., Elizabethtown, Pa. p. 1-128
 D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-879
 D GC Electronics, Rockford, Ill. *
 D Di-Acro, Lake City, Minn.
 D Greenlee Tool Co., Rockford, Ill.

Pyrometers, Infrared—See Volume 1

Pyrometers, Optical, Non-Infrared—See Volume 1

Pyrometers, Recording—See Volume 1

Quartz, Fused
 Amersil, Hillside, N.J.
 Atomergic Chemetals Co., Carle Place, N.Y.
 M Bram Metallurgical-Chem. Co., Phila., Pa.
 Corning Glass Works, Corning, N.Y.
 Corning Glass Works, Television Prods. Div., Corning, N.Y.
 Esco Products, Oak Ridge, NJ
 General Electric Co., Cleveland, Ohio
 Materials Resch. Corp., Orangeburg, N.Y.
 D Optics International, Tenafly, N.J.
 Quartzite Processing, Malden, Mass.
 M Valpey Corp., Holliston, Mass.

Quartz, Raw—See Volume 1

Racks, Aging—See Volume 1

Racks, Cabinet—See Volume 1

Racks, Desk & Console—See Volume 1

Racks, Circuit Board—See Volume 1

Racks, Module—See Volume 1

Racks, Relay & Mounting—See Volume 1

Radar Equipment—See Volume 1

Radar Systems—See Volume 1

Radio Comm. Systems—See Volume 1

Radiographic Equipment—See Volume 1

Radiometers—See Volume 1

Rare Earths—See Metals, Rare

Reactors, Charging
 M Del Electronics Corp., Mt. Vernon, N.Y. p. 1-1174,1175
 Hipotronics, Brewster, N.Y. p. 1-722,723,1230,1231
 NWL Transformers, Trenton, N.J. p. 2-1772
 Aydin Energy Systems, Palo Alto, Cal.
 Basler Electric Co., Highland, Ill.
 Mr. Roger Love, Madison, NJ
 Electrocom Inds., S. Bend, Ind.
 Ferrodyne Corp., Venice, Calif.
 M Peschel Instrs., Cape Coral, Fla.
 M Polyphase Instr. Co., Bridgeport, Pa.
 DM Thordarson Meissner, Mt. Carmel, Ill.
 Torelco Inc., Irvington, N.J.

Reactors, Epitaxial—See Volume 1

Reactors, Filter
 Abacus Controls Inc., Somerville, N.J. p. 2-1731
 M Del Electronics Corp., Mt. Vernon, N.Y. p. 1-1174,1175
 Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747
 DM Microtran Co., Valley Stream, N.Y. ... p. 2-1768

NWL Transformers, Trenton, N.J. p. 2-1772
 DM Torotol Inc., Grandview, Mo. p. 2-432-439
 Triad-Utrad, Huntington, Ind. p. 2-1822-1829
 Electrocube Inc., San Gabriel, Cal. *
 M Pico Elctns. Inc., Mount Vernon, N.Y. *
 M Sterling Transformer Corp., Brooklyn, N.Y. *
 American Magnetics Corp., Carterville, Ill.
 M American Trans-Coil Corp., Richmond Hill, N.Y.
 Aydin Energy Systems, Palo Alto, Cal.
 Basler Electric Co., Highland, Ill.
 Bicon Elctns. Co., Canaan, Conn.
 Electrocom Inds., S. Bend, Ind.
 M Electronic Transformer Corp., Paterson, N.J.
 Ferrodyne Corp., Venice, Calif.
 M Genisco Tech. Corp., Compton, Cal.
 Mag-Con, New Brighton, Minn.
 M Osborne Transformer Corp., Detroit, Mich.
 M Peschel Instrs., Cape Coral, Fla.
 M Polyphase Instr. Co., Bridgeport, Pa.
 Pulse Engrg., San Diego, Cal.
 Schott Corp., Minneapolis, Minn.
 D Stancor/Essex International, Chicago, Ill.
 DM Thordarson Meissner, Mt. Carmel, Ill.
 Torelco Inc., Irvington, N.J.
 Tranex Inc., Mountain View, Cal.

Reactors, Loading
 M Del Electronics Corp., Mt. Vernon, N.Y. p. 1-1174,1175
 DM Microtran Co., Valley Stream, N.Y. ... p. 2-1768
 NWL Transformers, Trenton, N.J. p. 2-1772
 Coilcraft, Cary, Ill.
 Electrocom Inds., S. Bend, Ind.
 M Electronic Transformer Corp., Paterson, N.J.
 Ferrodyne Corp., Venice, Calif.
 M Genisco Tech. Corp., Compton, Cal.
 Osborne Transformer Corp., Detroit, Mich.
 M Polyphase Instr. Co., Bridgeport, Pa.

Reactors, Saturable
 Abacus Controls Inc., Somerville, N.J. p. 2-1731
 M Artronic Instr. Co., Silver Spring, Md. p. 1-430,431
 M Del Electronics Corp., Mt. Vernon, N.Y. p. 1-1174,1175
 Hipotronics, Brewster, N.Y. p. 1-722,723,1230,1231
 M Industrial Control Co., Farmingdale, N.Y. p. 1-1916,1917
 NWL Transformers, Trenton, N.J. p. 2-1772
 Biometrics Instrument Corp., Garland, Tex. *
 Electrocube Inc., San Gabriel, Cal. *
 General Elec. Co., Schenectady, N.Y. *
 M Hisonic, Olathe, Kan. *
 D Microtran Co., Valley Stream, N.Y. *
 M Sterling Transformer Corp., Brooklyn, N.Y. *
 M Torotol Inc., Grandview, Mo. *
 M Torwico Elctns., Lakewood, N.J. *
 Vari-L Co., Denver, Colo. *
 American Magnetics Corp., Carterville, Ill.
 Basler Electric Co., Highland, Ill.
 Bicon Elctns. Co., Canaan, Conn.
 Coilcraft, Cary, Ill.
 Cross Electronics Inc., Warrendale, Pa.
 M Dietz Design, Belton, Mo.
 Electro-Pacific, Goleta, Calif.
 Electrocom Inds., S. Bend, Ind.
 M Electronic Transformer Corp., Paterson, N.J.
 Elma Engineering, Palo Alto, Cal.
 Ferrodyne Corp., Venice, Calif.
 Mag-Con, New Brighton, Minn.
 Magnetics, Div. of Spang Industries, Sandy Lake, Pa.
 M Osborne Transformer Corp., Detroit, Mich.
 M Polyphase Instr. Co., Bridgeport, Pa.
 Sigma Instruments, Braintree, Mass.
 Sola Electric, Elk Grove Village, Ill.
 D Stancor/Essex International, Chicago, Ill.
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
 DM Thordarson Meissner, Mt. Carmel, Ill.
 Torelco Inc., Irvington, N.J.
 Tranex Inc., Mountain View, Cal.

Readers, Badge—See Volume 1

Readers, Character—See Volume 1

Readers, Microfiche—See Volume 1

Readers, Punched Card—See Volume 1

Readers, Punched Tape—See Volume 1

Readouts—See Display Devices & Displays; Tubes, Readout

Receivers, A-M/F-M (Including Precision Test)—See Volume 1

Receivers, Beacon—See Volume 1

Receivers, Communication—See Volume 1

Receivers, Field Intensity, Microwave—See Volume 1

Receivers, Fixed Frequency—See Volume 1

Receivers, Frequency Shift—See Volume 1

Receivers, Headphone—See Volume 1

Receivers, Loran & Omega—See Volume 1

Receivers, Microwave—See Volume 1

Receivers, Monitoring, Communications—See Volume 1

Receivers, Multiplex—See Volume 1

Receivers, NBS—See Volume 1

Receivers, Panoramic—See Volume 1

Receivers, Phase Lock—See Volume 1

Receivers, Radar—See Volume 1

Receivers, Single-Sideband—See Volume 1

Receivers, Time Code—See Volume 1

Receivers, Tone—See Volume 1

Receivers, TV—See Volume 1

Receivers, VLF—See Volume 1

Receptacles—See Connectors; Jacks; Sockets

Recorders, Computer Data—See Volume 1

Recorders, Electrostatic—See Volume 1

Recorders, Event—See Volume 1

Recorders, F-M—See Volume 1

Recorders, Film Strip, Magnetic—See Volume 1

Recorders, Graphic—See Volume 1

Recorders, Magnetic Tape (Reel & Cartridge)—See Volume 1

Recorders, Polar—See Volume 1

Recorders, Pyrometer—See Volume 1

Recorders, Sound Level—See Volume 1

Recorders, Strip-Chart—See Volume 1

Recorders, Transient—See Volume 1

Recorders, Vibration—See Volume 1

Recorders, Video (including Tape & Disc)—See Volume 1

Recorders, X-Y—See Volume 1

Records, Frequency Test—See Volume 1

Rectifiers, Bridges & Assemblies—See Volume 1

Rectifiers, Copper Oxide—See Volume 1

Rectifiers, Copper Sulfide—See Volume 1

Rectifiers, Electron Tube—See Volume 1

Rectifiers, Germanium—See Volume 1

Rectifiers, Selenium—See Volume 1

Rectifiers, Silicon—See Volume 1

Rectifiers, Silicon Controlled—See Volume 1

Rectifiers, Thyatron—See Volume 1

Reducers, Speed-Also See Gear Mechanisms—See Volume 1

Reels, Cord & Cable

Lambda Elctns., Melville, N.Y.*
Aero-Motive Mfg Co., Kalamazoo, Mich.
M Ametek, Hunter Spring Division, Hatfield, Pa.
D Hykon Mfg. Co., Alliance, Ohio
Morey Corp., Downers Grove, Ill.
New Era Prods., Cleveland, Ohio
D Thomas & Betts Co., Elizabeth, N.J.

Reels, Tape—See Volume 1

Reference Books—See Volume 1

References, D-C Voltage—See Volume 1

Refrigerants, Spray

E.I. DuPont de Nemours & Co., Wilmington, Del.
D Heeger Inc., Los Angeles, Cal.
Union Carbide, Chemicals & Plastics, New York, N.Y.
D Workman Electronic Prods., Sarasota, Fla.

Refrigerated Cooling Equipment—See Volume 1

Refrigerators, Environmental Test—See Volume 1

Regulators, Current—See Volume 1

Regulators, Frequency—See Volume 1

Regulators & References, Silicon-Also See Diodes, Zener—See Volume 1

Regulators & Stabilizers, Voltage Also see Transformers, Voltage Regulating; Hybrid Voltage Regulators; IC's, Voltage Regulators—See Volume 1

Relays, Antenna—See Volume 1

Relays, Audio Operated—See Volume 1

Relays, Coaxial—See Volume 1

Relays, Contact—See Volume 1

Relays, Cradle—See Volume 1

Relays, Crystal Can, 1/2 Crystal Can—See Volume 1

Relays, Current Sensing—See Volume 1

Relays, Differential—See Volume 1

Relays, Frequency Selective—See Volume 1

Relays, General Purpose—See Volume 1

Relays, High-Voltage (500 Volts & Over)—See Volume 1

Relays, Hybrid—See Volume 1

Relays, Impulse—See Volume 1

Relays, Latching—See Volume 1

Relays, Mercury Displacement—See Volume 1

Relays, Mercury-Wetted Contacts—See Volume 1

Relays, Meter—See Volume 1

Relays, Motor Start—See Volume 1

Relays, Overload—See Volume 1

Relays, Phase-Sensing—See Volume 1

Relays, Plate Circuit—See Volume 1

Relays, Plug-In—See Volume 1

Relays, Polarized—See Volume 1

Relays, Power—See Volume 1

Relays, Printed Circuit Mounting (Including Transistor & DIP Case Types)—See Volume 1

Relays, Programmable—See Volume 1

Relays, Reed—See Volume 1

Relays, R-F (Including Antenna & Coaxial)—See Volume 1

Relays, Rotary—See Volume 1

Relays, Sensitive—See Volume 1

Relays, Solid-State—See Volume 1

Relays, Stepping—See Volume 1

Relays, Telephone—See Volume 1

Relays, Thermal—See Volume 1

Relays, Time-Delay—See Volume 1

Relays, Transistor & DIP Case Types—See Volume 1

Relays, Vacuum Contact—See Volume 1

Relays, Vibrating Reed—See Volume 1

Relays, Voltage Sensitive—See Volume 1

Repeaters, Pulse—See Volume 1

Repeaters, Servo—See Volume 1

Resins, Encapsulating—See Compounds, Encapsulating

Resins, Synthetic—See Plastic Raw Materials

Resistance Comparators—See Volume 1

Resistor, Hardware

D Bivar, Santa Ana, Cal. p. 2-1266
D Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1500
D Waldom Electronics, Chicago, Ill.*
D Accessories for Electronics, Bayside, N.Y.
M Hadley Components Div., Hadley, Pa.
D International Sensor Systems, Aurora, Neb.

Resistors, Adjustable-Also see Potentiometers; Rheostats

D Amphenol Connector Div., Controls Opers., Broadview, Ill. p. 2-460,461
DM Beckman Instrs., Fullerton, Cal. p. 2-1610-1620
M Bourns, Riverside, Cal. p. 2-1623-1626
D Clarostat Mfg. Co., Dover, N.H. p. 2-1627
Consolidated Resistance Co. of America, Yonkers, N.Y. p. 2-1427
CTS of Berne, Berne, Ind. p. 2-1421-1426
DM Dale Electronics Inc., Columbus, Neb. p. 2-1452
E-Systems, Huntington, Ind. p. 2-1487
DM Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1500
New England Instr., Natick, Mass. p. 2-1666-1671
M Resistors, Chicago, Ill. p. 2-1544,1545
D TRW/IRC Potentiometers, St. Petersburg, Fla. p. 2-896,897
Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1687
D Allen-Bradley Co., Milwaukee, Wisc.*
Computer Instrs., Hempstead, N.Y.*
Gamble, Charles T. Inds., Riverside, N.J.*
General Radio Co., Concord, Mass.*
D Ohmite Mfg. Co., Skokie, Ill.*
Shigoto Inds., Ltd., New York, N.Y.*
Angstrohm Precision, Hagerstown, Md.
D Centralab, Milwaukee, Wisc.
DM CTS Corp., Elkart, Ind.
Diplomatic Div., Seattle, Wash.
Guidline Instrs., Larchmont, N.Y.
M Litton Systems, Mt. Vernon, N.Y.
Mallory Controls, Frankfort, Ind.
M Maurey Instrument Corp., Chicago, Ill.
Metavac, Flushing, N.Y.
Motorola Comms. Div., Schaumburg, Ill.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
Samaris, Derby, Conn.
M Star Tron Corp., Providence, R.I.
DM Techno-Comps. Corp., Van Nuys, Cal.
D United Mineral & Chem. Corp., New York, N.Y.

DM Ward Leonard Elec. Co. Inc., Mt. Vernon, N.Y.
Welwyn Canada Div., London, Ont., Can.
DM Weston Comps. Div., Archbald, Pa.
Wilbrecht Electronics, St. Paul, Minn.

Resistors, Ballast (Including Tube & Solid State Devices)

D E-Systems, Huntington, Ind. *

D Electrocube Inc., San Gabriel, Cal. *

D TRW/IRC Resistors, Philadelphia, Pa. *

Kelvin, Van Nuys, Cal.

TDK Elctns. Corp., Long Island City, N.Y.

Thor Elctns. Corp., Elizabeth, N.J.

Resistors, Beryllia Core—See Resistors, Integral Heat Dissipator

Resistors, Carbon Film

Airco Elctns., Bradford, Pa.
p. 2-368,369,1408,1409

M Dale Electronics Inc., Columbus, Neb.
p. 2-1452

D Dale Electronics, Norfolk, Nebr. p. 2-1452

International Comps Corp., Melville, N.Y.
p. 2-193

Pyrofilm Resistor Co., Whippany, N.J.
p. 2-1526-1528

DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1564

M Victoreen Instrument Div., Cleveland, Ohio
p. 2-1581

M Analog Devices, Norwood, Mass. *

Ohmite Mfg. Co., Skokie, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

D Sprague Products Co., No. Adams, Mass. *

D Baknor Industries Ltd., Port Credit, Ont.

D Beman Mfg., New Cumberland, Pa.

Centralab, Milwaukee, Wisc.

D Constanta Co. of Can., Montreal, Can.

M International Importers, Chicago, Ill.

M Litton Systems, Mt. Vernon, N.Y.

DM Mepeco/Electra, Morristown, N.J.

M Micro-Ohm Corp., South Laguna, Cal.

Motorola Comms. Div., Schaumburg, Ill.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

DM Pher Int'l. Corp., Des Plaines, Ill.

RCA Parts & Accessories, Deptford, N.J.

Resistance Prods., Harrisburg, Pa.

DM Solitron/Microwave, Port Salerno, Fla.

Stackpole Carbon Co., St. Mary's, Pa.

Stettner-Trush Inc., Cazenovia, N.Y.

D TRW/IRC Fixed Resistors, Burlington, Iowa

D United Mineral & Chem. Corp., New York, N.Y.

D Wallace S. K. Assocs., Tampa, Fla.

Welwyn Canada Div., London, Ont., Can.

D Workman Electronic Prods., Sarasota, Fla.

Resistors, Ceramic Core

D Allen-Bradley Co., Milwaukee, Wisc.
p. 2-1410-1417

D Beckman Instrs., Fullerton, Cal.
p. 2-1418,1419

D Caddock Electronics, Riverside, Cal.
p. 1-884,887; p. 2-1428-1433

Carborundum Co., Niagara Falls, N.Y. p. 2-1445

D Gamble, Charles T. Inds., Riverside, N.J.
p. 2-1493-1495

DM Milwaukee Resistor Corp., Milwaukee, Wisc.
p. 2-1500,1501

MRCL Electronics Div., Irvington, N.J.
p. 2-1530-1542

Tel Labs, Manchester, N.H. p. 2-1688-1691

M Analog Devices, Norwood, Mass. *

Shigoto Inds., Ltd., New York, N.Y. *

C-F Electronics, Van Nuys, Cal.

D Carbone Lorraine Industries Corp., Boonton, N.J.

Centralab, Milwaukee, Wisc.

D Constanta Co. of Can., Montreal, Can.

D Cutler-Hammer Shallcross, Selma, N.C.

Detoronic Corp., S. El Monte, Cal.

D Electro-Science Labs., Pennsauken, N.J.

Elctn. Precision Comps. Corp., Mt. Vernon, N.Y.

Gentron Corp., Milwaukee, Wisc.

Kelvin, Van Nuys, Cal.

D Marstan Resistor, Orange, N.J.

D Mepeco/Electra, Morristown, N.J.

Mills Resistor Co., Los Alamitos, Cal.

Murata Mfg. Co. Ltd., Kyoto, Japan

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

RCA Parts & Accessories, Deptford, N.J.

Samarius, Derby, Conn.

Stackpole Carbon Co., St. Mary's, Pa.

D United Mineral & Chem. Corp., New York, N.Y.

M Vermont Precision Resistor Co., Stowe, Vt.

D Workman Electronic Prods., Sarasota, Fla.

Resistors, Ceramic Metal (Cermet)

Allen-Bradley Co., Milwaukee, Wisc.
p. 2-1410-1417

CTS of Berne, Berne, Ind. p. 2-1421-1426

Mini-Systems, North Attleboro, Mass.
p. 2-1502

Varadyne Industries, Santa Monica, Cal. *

DM CTS Corp., Elkart, Ind.

Environmental Communications Inc., Costa Mesa, Cal.

DM Mepeco/Electra, Morristown, N.J.

Tri-Sage Inc., Pittsford, NY

Viclan, San Diego, Cal.

Resistors, Chip (For Microcircuits)

Airco Elctns., Niagara Falls, N.Y.
p. 2-368,369,1408,1409

D Caddock Electronics, Riverside, Cal.
p. 1-884,885; p. 2-1439

CTS of Berne, Berne, Ind. p. 2-1421-1426

D Dale Electronics Inc., Columbus, Neb.
p. 2-1452

Dale Electronics, Norfolk, Nebr. p. 2-1452

M Hybrid Systems Corp., Burlington, Mass.
p. 1-890

M Mini-Systems, North Attleboro, Mass.
p. 2-1502

D Pyrofilm Resistor Co., Whippany, N.J.
p. 2-1526-1528

DM RCL Electronics Div., Irvington, N.J.
p. 2-1530-1542

Vishay Resistive Systems Grp., Malvern, Pa.
p. 2-1571

M Analog Devices, Norwood, Mass. *

Varadyne Industries, Santa Monica, Cal. *

Accumet Engineering Corp., Hudson, Mass.

M Analog Devices, Resistor Pdt., Rochester, NY

Angstrom Precision, Hagerstown, Md.

DM Cal-R, Santa Monica, Cal.

CTS Corp., Elkart, Ind.

M Electrotec Inc., Dallas, Tex.

Eltec Instruments Inc., Daytona Beach, Fla.

Environmental Communications Inc., Costa Mesa, Cal.

M Film Microelectronics, Burlington, Mass

Gentron Corp., Milwaukee, Wisc.

M HyComp Inc., Maynard, Mass.

Hybex, Tucson, Ariz.

M LRC Inc., Hudson, N.H.

D Motorola Semiconductor Prods., Phoenix, Ariz.

TRW/IRC Fixed Resistors, Burlington, Iowa

Viclan, San Diego, Cal.

Welwyn Canada Div., London, Ont., Can.

M Western Microsystems, Santee, Cal.

Resistors, Composition, Carbon

Airco Elctns., Bradford, Pa.
p. 2-368,369,1408,1409

D Allen-Bradley Co., Milwaukee, Wisc.
p. 2-1410-1417

Carborundum Co., Niagara Falls, N.Y. p. 2-1445

CTS of Berne, Berne, Ind. p. 2-1421-1426

International Comps Corp., Melville, N.Y.
p. 2-193

DM TRW/IRC Resistors, Philadelphia, Pa.
p. 2-1549-1551

D GC Electronics, Rockford, Ill. *

D Ohmite Mfg. Co., Skokie, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

D Baknor Industries Ltd., Port Credit, Ont.

Centralab, Milwaukee, Wisc.

M CTS Corp., Elkart, Ind.

M International Importers, Chicago, Ill.

Motorola Comms. Div., Schaumburg, Ill.

Ohio Carbon Co., Cleveland, Ohio

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

RCA Parts & Accessories, Deptford, N.J.

Stackpole Carbon Co., St. Mary's, Pa.

D Workman Electronic Prods., Sarasota, Fla.

Resistors, Decade

D Beckman Instrs., Fullerton, Cal.
p. 2-1418,1419

D Caddock Electronics, Riverside, Cal.
p. 1-886,887; p. 2-1441

D Clarostat Mfg. Co., Dover, N.H. p. 2-1627

Consolidated Resistance Co. of America, Yonkers, N.Y. p. 2-1427

D Gamble, Charles T. Inds., Riverside, N.J.
p. 2-1492

MRCL Electronics Div., Irvington, N.J.
p. 2-1530-1542

Rental Electronics, Lexington, Mass.
p. 1-792-795

Shallco, Smithfield, N.C. p. 2-1543

Vishay Resistive Systems Grp., Malvern, Pa.
p. 2-1571

General Radio Co., Concord, Mass. *

D McGraw-Edison Co., Manchester, N.H. *

D Ohmite Mfg. Co., Skokie, Ill. *

Tech Labs., Palisades Pk., N.J. *

M Analog Devices, Resistor Pdt., Rochester, NY

Angstrom Precision, Hagerstown, Md.

Centralab, Milwaukee, Wisc.

Cutler-Hammer Shallcross, Selma, N.C.

Electro Sci. Inds., Portland, Ore.

Elctn. Precision Comps. Corp., Mt. Vernon, N.Y.

General Resistance, Mt. Vernon, N.Y.

Jordan Electric Co., Van Nuys, Cal.

D Marstan Resistor, Orange, N.J.

Mills Resistor Co., Los Alamitos, Cal.

RCA Electronic Comps., Harrison, N.J.

Rhode & Schwarz Sls., Fairfield, N.J.

Resistors, Disc, Rod & Tube

D Caddock Electronics, Riverside, Cal.
p. 2-1428-1439

Carborundum Co., Niagara Falls, N.Y. p. 2-1445

D Clarostat Mfg. Co., Dover, N.H. p. 2-1627

D Milwaukee Resistor Corp., Milwaukee, Wisc.
p. 2-1500,1501

D Pyrofilm Resistor Co., Whippany, N.J.
p. 2-1526-1528

DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1568

Metavac, Flushing, N.Y.

Ohio Carbon Co., Cleveland, Ohio

DM Solitron/Microwave, Port Salerno, Fla.

Resistors, Film, Metallized

Allen-Bradley Co., Milwaukee, Wisc.
p. 2-1410-1417

M Dale Electronics Inc., Columbus, Neb.
p. 2-1452

D Dale Electronics, Norfolk, Nebr. p. 2-1452

Mini-Systems, North Attleboro, Mass.
p. 2-1502

Pyrofilm Resistor Co., Whippany, N.J.
p. 2-1526-1528

DM TRW/IRC Resistors, Philadelphia, Pa.
p. 2-1548,1556-1558,1565

M Victoreen Instrument Div., Cleveland, Ohio
p. 2-1572-1579

M Vishay Resistive Systems Grp., Malvern, Pa.
p. 2-1571

D Wagner Elec., Livingston, N.J. p. 2-1582

Airco Elctns., Bradford, Pa. *

M Analog Devices, Norwood, Mass. *

Caddock Electronics, Riverside, Cal. *

DM Corning Glass Works, Corning, N.Y. *

CW Industries, Warminster, Pa. *

International Comps Corp., Melville, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

M Analog Devices, Resistor Pdt., Rochester, NY

DM Angstrom Precision, Hagerstown, Md.

Centralab, Milwaukee, Wisc.

D Constanta Co. of Can., Montreal, Can.

Electra/Midland Corp., Mineral Wells, Tex.

Electrotec Inc., Dallas, Tex.

Engelhard Minerals & Chem., Murray Hill, N.J.

Environmental Communications Inc., Costa Mesa, Cal.

M Halex, Torrance, Cal.

M LRC Inc., Hudson, N.H.

DM Mepeco/Electra, Morristown, N.J.

Metavac, Flushing, N.Y.

M.I.A.L. U.S.A., Nutley, N.J.

M Micro-Ohm Corp., South Laguna, Cal.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

RCA Parts & Accessories, Deptford, N.J.

Resistance Prods., Harrisburg, Pa.

Sensor Technology, Chatsworth, Cal.

DM Solitron/Microwave, Port Salerno, Fla.

Stettner-Trush Inc., Cazenovia, N.Y.

D TRW/IRC Fixed Resistors, Burlington, Iowa

D United Mineral & Chem. Corp., New York, N.Y.

M Vermont Precision Resistor Co., Stowe, Vt.

Welwyn Canada Div., London, Ont., Can.

D Wilco Sales, Mineola, N.Y.

Resistors, Film, Non-Metallized

Airco Elctns., Niagara Falls, N.Y.
p. 2-368,369,1408,1409

Mini-Systems, North Attleboro, Mass.
p. 2-1502

M Analog Devices, Norwood, Mass. *

D Caddock Electronics, Riverside, Cal. *

D Ohmite Mfg. Co., Skokie, Ill. *

Centralab, Milwaukee, Wisc.

D Constanta Co. of Can., Montreal, Can.

Intergrated Microsystems Inc., Mountain View, Cal.

LRC Inc., Hudson, N.H.

D Mepeco/Electra, Morristown, N.J.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

RCA Parts & Accessories, Deptford, N.J.

Resistance Prods., Harrisburg, Pa.
D United Mineral & Chem. Corp., New York, N.Y.
Welwyn Canada Div., London, Ont., Can.

Resistors, Flame Retardant

Carborundum Co., Niagara Falls, N.Y. p. 2-1445
D Clarostat Mfg. Co., Dover, N.H. p. 2-1627
DM Corning Glass Works, Corning, N.Y. p. 2-1449
DM Dale Electronics Inc., Columbus, Neb. p. 2-1452

Gamble, Charles T. Inds., Riverside, N.J. p. 2-1493
MKRL Electronics, Manchester, N.H. p. 2-1498, 1499

DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1553, 1566
D Caddock Electronics, Riverside, Cal. p. 2-1433, 1434, 1438

D E-Systems, Huntington, Ind. p. 2-1445
Shigoto Inds., Ltd., New York, N.Y. p. 2-1627
C-F Electronics, Van Nuys, Cal. p. 2-1421-1426
Kahgan Electronics Corp., Hempstead, NY p. 2-1452

DM Meppo/Electra, Morristown, N.J. p. 2-1452
Panasonic, Ind'l. Elctn. Comps., New York, N.Y. p. 2-1452
United Mineral & Chem. Corp., New York, N.Y. p. 2-1452

Resistors, Flux-Sensitive

ISC Magnetics Div., Plainview, N.Y. p. 2-1452

Resistors, Fuse—See Volume 1

Resistors, Glass

M Victoreen Instrument Div., Cleveland, Ohio p. 2-1580, 1581
D Caddock Electronics, Riverside, Cal. p. 2-1433, 1434, 1438

DM Angstrom Precision, Hagerstown, Md. p. 2-1445
Eltec Instruments Inc., Daytona Beach, Fla. p. 2-1449
Kelvin, Van Nuys, Cal. p. 2-1452

DM Meppo/Electra, Morristown, N.J. p. 2-1452
Metavac, Flushing, N.Y. p. 2-1452
D Workman Electronic Prods., Sarasota, Fla. p. 2-1452

Resistors, Heat Sink Encased—See

Resistors, Integral Heat Dissipator

Resistors, High Frequency

D Caddock Electronics, Riverside, Cal. p. 2-1433, 1434, 1438
Carborundum Co., Niagara Falls, N.Y. p. 2-1445
D Corning Glass Works, Corning, N.Y. p. 2-1449
Dale Electronics Inc., Columbus, Neb. p. 2-1452

Dale Electronics, Norfolk, Nebr. p. 2-1452
Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452
MKRL Electronics, Manchester, N.H. p. 2-1498, 1499

Mini-Systems, North Attleboro, Mass. p. 2-1502
D Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528

MRCL Electronics Div., Irvington, N.J. p. 2-1530-1542
Resistors, Chicago, Ill. p. 2-1544, 1545
Tel Labs, Manchester, N.H. p. 2-1688-1691

DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1564, 1565, 1567
M Victoreen Instrument Div., Cleveland, Ohio p. 2-1581

M Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1571
M Analog Devices, Norwood, Mass. p. 2-1452

D E-Systems, Huntington, Ind. p. 2-1445
General Radio Co., Concord, Mass. p. 2-1452
D McGraw-Edison Co., Manchester, N.H. p. 2-1452

M Analog Devices, Resistor Pdt., Rochester, NY p. 2-1452
Angstrom Precision, Hagerstown, Md. p. 2-1445
Beman Mfg., New Cumberland, Pa. p. 2-1449

D Carbone Lorraine Industries Corp., Boonton, N.J. p. 2-1452
D Constanta Co. of Can., Montreal, Can. p. 2-1452
Elctn. Precision Comps. Corp., Mt. Vernon, N.Y. p. 2-1452

General Resistance, Mt. Vernon, N.Y. p. 2-1452
D Meppo/Electra, Morristown, N.J. p. 2-1452
Metavac, Flushing, N.Y. p. 2-1452

Mills Resistor Co., Los Alamitos, Cal. p. 2-1452
Resistance Prods., Harrisburg, Pa. p. 2-1452
TRW/IRC Fixed Resistors, Burlington, Iowa p. 2-1452

Viclan, San Diego, Cal. p. 2-1452
Welwyn Canada Div., London, Ont., Can. p. 2-1452

Resistors, High Megohm (Over 22

Megohms)
Allen-Bradley Co., Milwaukee, Wisc. p. 2-1410-1417
Caddock Electronics, Riverside, Cal. p. 2-1433, 1434, 1438

CTS of Berne, Berne, Ind. p. 2-1421-1426
D Dale Electronics, Norfolk, Nebr. p. 2-1452
Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452

Gamble, Charles T. Inds., Riverside, N.J. p. 2-1493
Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1501
D Omtronics Mfg., Omaha, Neb. p. 2-1516-1525

MRCL Electronics Div., Irvington, N.J. p. 2-1530-1542
D Dale Electronics, Norfolk, Nebr. p. 2-1452
Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452

Gamble, Charles T. Inds., Riverside, N.J. p. 2-1493
Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1501
D Omtronics Mfg., Omaha, Neb. p. 2-1516-1525

MRCL Electronics Div., Irvington, N.J. p. 2-1530-1542
D Dale Electronics, Norfolk, Nebr. p. 2-1452
Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452

D Dale Electronics Inc., Columbus, Neb. p. 2-1452
D Dale Electronics, Norfolk, Nebr. p. 2-1452

Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452
International Comps Corp., Melville, N.Y. p. 2-193

M KRL Electronics, Manchester, N.H. p. 2-1498, 1499
Mini-Systems, North Attleboro, Mass. p. 2-1502

New England Instr., Natick, Mass. p. 2-1670, 1671
D Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528

MRCL Electronics Div., Irvington, N.J. p. 2-1530-1542
M Ross Engineering Corp., Campbell, Cal. p. 1-1807

DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1563, 1564
M Victoreen Instrument Div., Cleveland, Ohio p. 2-1572-1581

Airco Elctns., Niagara Falls, N.Y. p. 2-1452
M Analog Devices, Norwood, Mass. p. 2-1452
Beman Mfg., New Cumberland, Pa. p. 2-1449

D Carbone Lorraine Industries Corp., Boonton, N.J. p. 2-1452
Centralab, Milwaukee, Wisc. p. 2-1452
D Constanta Co. of Can., Montreal, Can. p. 2-1452

CTS Corp., Elkart, Ind. p. 2-1452
Electra/Midland Corp., Mineral Wells, Tex. p. 2-1452
Elctn. Precision Comps. Corp., Mt. Vernon, N.Y. p. 2-1452

Eltec Instruments Inc., Daytona Beach, Fla. p. 2-1452
Kelvin, Van Nuys, Cal. p. 2-1452
DM Meppo/Electra, Morristown, N.J. p. 2-1452

Panasonic, Ind'l. Elctn. Comps., New York, N.Y. p. 2-1452
Penn Airborne Prods., Southampton, Pa. p. 2-1452
Resistance Prods., Harrisburg, Pa. p. 2-1452

Sensitive Research Instrs., Mt. Vernon, N.Y. p. 2-1452
Stackpole Carbon Co., St. Mary's, Pa. p. 2-1452
TRW/IRC Fixed Resistors, Burlington, Iowa p. 2-1452

D United Mineral & Chem. Corp., New York, N.Y. p. 2-1452
Viclan, San Diego, Cal. p. 2-1452
Welwyn Canada Div., London, Ont., Can. p. 2-1452

Resistors, High Temperature (Over 125 C)
D Beckman Instrs., Fullerton, Cal. p. 2-1418, 1419

D Caddock Electronics, Riverside, Cal. p. 2-1433, 1434, 1438
Carborundum Co., Niagara Falls, N.Y. p. 2-1445
D Corning Glass Works, Corning, N.Y. p. 2-1449

Dale Electronics Inc., Columbus, Neb. p. 2-1452
Dale Electronics, Norfolk, Nebr. p. 2-1452
Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452

Gamble, Charles T. Inds., Riverside, N.J. p. 2-1493
M Hybrid Systems Corp., Burlington, Mass. p. 1-890

M KRL Electronics, Manchester, N.H. p. 2-1498, 1499
DM Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1500, 1501

Mini-Systems, North Attleboro, Mass. p. 2-1502
New England Instr., Natick, Mass. p. 2-1669-1671

D Omtronics Mfg., Omaha, Neb. p. 2-1516-1525
D Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528

D RCL Electronics Div., Irvington, N.J. p. 2-1530-1542
Tel Labs, Manchester, N.H. p. 2-1688-1691
DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1564, 1563, 1565, 1566

M Victoreen Instrument Div., Cleveland, Ohio p. 2-1572-1579
M Analog Devices, Norwood, Mass. p. 2-1452

D E-Systems, Huntington, Ind. p. 2-1445
D McGraw-Edison Co., Manchester, N.H. p. 2-1452
D Ohmite Mfg. Co., Skokie, Ill. p. 2-1452

C-F Electronics, Van Nuys, Cal. p. 2-1452
Centralab, Milwaukee, Wisc. p. 2-1452
D Constanta Co. of Can., Montreal, Can. p. 2-1452

D Cutler-Hammer Shallcross, Selma, N.C. p. 2-1452
Electra/Midland Corp., Mineral Wells, Tex. p. 2-1452
Elctn. Precision Comps. Corp., Mt. Vernon, N.Y. p. 2-1452

Eltec Instruments Inc., Daytona Beach, Fla. p. 2-1452
Gentron Corp., Milwaukee, Wisc. p. 2-1452
Kelvin, Van Nuys, Cal. p. 2-1452

D Marston Resistor, Orange, N.J. p. 2-1452
DM Meppo/Electra, Morristown, N.J. p. 2-1452
Mills Resistor Co., Los Alamitos, Cal. p. 2-1452

Ohio Carbon Co., Cleveland, Ohio p. 2-1452
Panasonic, Ind'l. Elctn. Comps., New York, N.Y. p. 2-1452
RCA Parts & Accessories, Deptford, N.J. p. 2-1452

Resistance Prods., Harrisburg, Pa. p. 2-1452
TRW/IRC Fixed Resistors, Burlington, Iowa p. 2-1452
Viclan, San Diego, Cal. p. 2-1452

Welwyn Canada Div., London, Ont., Can. p. 2-1452
Panasonic, Ind'l. Elctn. Comps., New York, N.Y. p. 2-1452
RCA Parts & Accessories, Deptford, N.J. p. 2-1452

Resistance Prods., Harrisburg, Pa. p. 2-1452
TRW/IRC Fixed Resistors, Burlington, Iowa p. 2-1452
Viclan, San Diego, Cal. p. 2-1452

Welwyn Canada Div., London, Ont., Can. p. 2-1452
Panasonic, Ind'l. Elctn. Comps., New York, N.Y. p. 2-1452
RCA Parts & Accessories, Deptford, N.J. p. 2-1452

Panasonic, Ind'l. Elctn. Comps., New York, N.Y. p. 2-1452
RCA Parts & Accessories, Deptford, N.J. p. 2-1452
Resistance Prods., Harrisburg, Pa. p. 2-1452
TRW/IRC Fixed Resistors, Burlington, Iowa p. 2-1452
D United Mineral & Chem. Corp., New York, N.Y. p. 2-1452
Viclan, San Diego, Cal. p. 2-1452
Welwyn Canada Div., London, Ont., Can. p. 2-1452

Resistors, High Voltage (1,000 Volts & Over)

Airco Elctns., Niagara Falls, N.Y. p. 2-368, 369, 1408, 1409
Caddock Electronics, Riverside, Cal. p. 2-1433, 1434, 1438

Carborundum Co., Niagara Falls, N.Y. p. 2-1445
Clarostat Mfg. Co., Dover, N.H. p. 2-1627
CTS of Berne, Berne, Ind. p. 2-1421-1426

D Dale Electronics Inc., Columbus, Neb. p. 2-1452
D Dale Electronics, Norfolk, Nebr. p. 2-1452
Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452

M Electro Impulse, Red Bank, N.J. p. 1-492, 662-666
Gamble, Charles T. Inds., Riverside, N.J. p. 2-1494, 1495

Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1500
Mini-Systems, North Attleboro, Mass. p. 2-1502

D Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528
MRCL Electronics Div., Irvington, N.J. p. 2-1530-1542

M Ross Engineering Corp., Campbell, Cal. p. 1-1807
DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1563, 1564, 1567

M Victoreen Instrument Div., Cleveland, Ohio p. 2-1572-1581
M Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1571

Allen-Bradley Co., Milwaukee, Wisc. p. 2-1410-1417
M Analog Devices, Norwood, Mass. p. 2-1452
Kilovolt Corp., Hackensack, N.J. p. 2-1452

Square D Co., Milwaukee, Wisc. p. 2-1452
D Beman Mfg., New Cumberland, Pa. p. 2-1449
Centralab, Milwaukee, Wisc. p. 2-1452

D Constanta Co. of Can., Montreal, Can. p. 2-1452
CTS Corp., Elkart, Ind. p. 2-1452
Elctn. Precision Comps. Corp., Mt. Vernon, N.Y. p. 2-1452

Gentron Corp., Milwaukee, Wisc. p. 2-1452
Julie Research Lab., New York, N.Y. p. 2-1452
DM Meppo/Electra, Morristown, N.J. p. 2-1452

D Oneida Electronics Mfg., Meadville, Pa. p. 2-1452
Panasonic, Ind'l. Elctn. Comps., New York, N.Y. p. 2-1452
RCA Parts & Accessories, Deptford, N.J. p. 2-1452

Resistance Prods., Harrisburg, Pa. p. 2-1452
Sensitive Research Instrs., Mt. Vernon, N.Y. p. 2-1452
TRW/IRC Fixed Resistors, Burlington, Iowa p. 2-1452

D United Mineral & Chem. Corp., New York, N.Y. p. 2-1452
D Ward Leonard Elec. Co. Inc., Mt. Vernon, N.Y. p. 2-1452
Welwyn Canada Div., London, Ont., Can. p. 2-1452

D Workman Electronic Prods., Sarasota, Fla. p. 2-1452
Resistors, Hot Molded
D Allen-Bradley Co., Milwaukee, Wisc. p. 2-1410-1417

International Comps Corp., Melville, N.Y. p. 2-193
MKRL Electronics, Manchester, N.H. p. 2-1498, 1499

D Omtronics Mfg., Omaha, Neb. p. 2-1516-1525
DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1552, 1566

D Ohmite Mfg. Co., Skokie, Ill. p. 2-1452
Shigoto Inds., Ltd., New York, N.Y. p. 2-1627
DM Angstrom Precision, Hagerstown, Md. p. 2-1445

Centralab, Milwaukee, Wisc. p. 2-1452
Kelvin, Van Nuys, Cal. p. 2-1452
Panasonic, Ind'l. Elctn. Comps., New York, N.Y. p. 2-1452

Resistors, Integral Heat Dissipator

D Caddock Electronics, Riverside, Cal. p. 2-1433, 1434, 1438
D Dale Electronics Inc., Columbus, Neb. p. 2-1452

Dale Electronics, Norfolk, Nebr. p. 2-1452
Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452
Gamble, Charles T. Inds., Riverside, N.J. p. 2-1493

Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1501
D Omtronics Mfg., Omaha, Neb. p. 2-1516-1525
MRCL Electronics Div., Irvington, N.J. p. 2-1530-1542

D Dale Electronics, Norfolk, Nebr. p. 2-1452
Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452
Gamble, Charles T. Inds., Riverside, N.J. p. 2-1493

Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1501
D Omtronics Mfg., Omaha, Neb. p. 2-1516-1525
MRCL Electronics Div., Irvington, N.J. p. 2-1530-1542

D Dale Electronics, Norfolk, Nebr. p. 2-1452
Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452
Gamble, Charles T. Inds., Riverside, N.J. p. 2-1493

Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1501
D Omtronics Mfg., Omaha, Neb. p. 2-1516-1525
MRCL Electronics Div., Irvington, N.J. p. 2-1530-1542

D Dale Electronics, Norfolk, Nebr. p. 2-1452
Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452
Gamble, Charles T. Inds., Riverside, N.J. p. 2-1493

Tel Labs, Manchester, N.H. p. 2-1688-1691
 Elctn. Precision Comps. Corp., Mt. Vernon, N.Y.
 Gentron Corp., Milwaukee, Wisc.
 Kelvin, Van Nuys, Cal.
 Welwyn Canada Div., London, Ont., Can.

Resistors, Low Temperature Coefficient

Airco Elctns., Bradford, Pa. p. 2-368,369,1408,1409
 Airco Elctns., Niagara Falls, N.Y. p. 2-368,369,1408,1409
 D Allen-Bradley Co., Milwaukee, Wisc. p. 2-1410-1417
 D Beckman Instrs., Fullerton, Cal. p. 2-1418,1419
 D Caddock Electronics, Riverside, Cal. p. 1-884-887; p. 2-1428-1443
 Consolidated Resistance Co. of America, Yonkers, N.Y. p. 2-1427
 DM Corning Glass Works, Corning, N.Y. p. 2-1449
 CTS of Berne, Berne, Ind. p. 2-1421-1426
 D Dale Electronics Inc., Columbus, Neb. p. 2-1452
 D Dale Electronics, Norfolk, Nebr. p. 2-1452
 Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452
 D E-Systems, Huntington, Ind. p. 2-1486
 Gamble, Charles T. Inds., Riverside, N.J. p. 2-1492,1493
 M KRL Electronics, Manchester, N.H. p. 2-1498,1499
 Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1500,1501
 Mini-Systems, North Attleboro, Mass. p. 2-1502
 New England Instr., Natick, Mass. p. 2-1666,1670,1671

D Omtronics Mfg., Omaha, Neb. p. 2-1516-1525
 DM Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528
 DM RCL Electronics Div., Irvington, N.J. p. 2-1530-1542
 M Resistors, Chicago, Ill. p. 2-1544,1545
 Tel Labs, Manchester, N.H. p. 2-1688-1691
 DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1556-1558
 M Victoreen Instrument Div., Cleveland, Ohio p. 2-1572-1579
 M Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1571
 M Analog Devices, Norwood, Mass. *
 CW Industries, Warminster, Pa. *
 International Comps Corp., Melville, N.Y. *
 D McGraw-Edison Co., Manchester, N.H. *
 Nytronics Comps. Group Inc., Darlington, S.C. *
 D Ohmite Mfg. Co., Skokie, Ill. *
 D Wagner Elec., Livingston, N.J. *
 M Analog Devices, Resistor Pdt., Rochester, NY
 Angstrom Precision, Hagerstown, Md.
 C-F Electronics, Van Nuys, Cal.
 D Constanta Co. of Can., Montreal, Can.
 Cox & Co., New York, N.Y.
 DM CTS Corp., Elkart, Ind.
 D Cutler-Hammer Shallcross, Selma, N.C.
 Electra/Midland Corp., Mineral Wells, Tex.
 Electro Mats. Corp. Amer., Mamaroneck, N.Y.
 Electro Sci. Inds., Portland, Ore.
 Elctn. Precision Comps. Corp., Mt. Vernon, N.Y.
 Eltec Instruments Inc., Daytona Beach, Fla.
 Environmental Communications Inc., Costa Mesa, Cal.
 General Resistance, Mt. Vernon, N.Y.
 Gentron Corp., Milwaukee, Wisc.
 Guildline Instrs., Larchmont, N.Y.
 M Jordan Electric Co., Van Nuys, Cal.
 Julie Research Lab., New York, N.Y.
 Kelvin, Van Nuys, Cal.
 D Marstan Resistor, Orange, N.J.
 D Mepeco/Electra, Morristown, N.J.
 Metavac, Flushing, N.Y.
 Mills Resistor Co., Los Alamitos, Cal.
 M Precision Resistor Co., Hillside, N.J.
 Stettner-Trush Inc., Cazenovia, N.Y.
 TRW/IRC Fixed Resistors, Burlington, Iowa
 D United Mineral & Chem. Corp., New York, N.Y.
 M Vermont Precision Resistor Co., Stowe, Vt.
 Viclan, San Diego, Cal.
 D Ward Leonard Elec. Co. Inc., Mt. Vernon, N.Y.
 Welwyn Canada Div., London, Ont., Can.
 D Workman Electronic Prods., Sarasota, Fla.

Resistors, Metal Glazed

D Beckman Instrs., Fullerton, Cal. p. 2-1418,1419
 D Caddock Electronics, Riverside, Cal. p. 1-884-887; p. 2-1428-1443

International Comps Corp., Melville, N.Y. p. 2-193
 Mini-Systems, North Attleboro, Mass. p. 2-1502
 DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1554,1555,1564
 M Victoreen Instrument Div., Cleveland, Ohio p. 2-1572-1579
 Airco Elctns., Bradford, Pa. *
 M Analog Devices, Norwood, Mass. *
 Shigoto Inds., Ltd., New York, N.Y. *
 D Wagner Elec., Livingston, N.J. *
 Centralab, Milwaukee, Wisc.
 Electro Mats. Corp. Amer., Mamaroneck, N.Y.
 D Electro-Science Labs., Pennsauken, N. J.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
 Resistance Prods., Harrisburg, Pa.
 Sel-Rex Co. Div. Oxy Metal Industries Corp., Nutley, N.J.
 D United Mineral & Chem. Corp., New York, N.Y.

Resistors, Microwave

Bird Electronic Corp., Solon, Ohio p. 1-619
 D Caddock Electronics, Riverside, Cal. p. 1-886,887; p. 2-1428-1443
 Carborundum Co., Niagara Falls, N.Y. p. 2-1445
 M Electro Impulse, Red Bank, N.J. p. 1-492,662-666
 Mini-Systems, North Attleboro, Mass. p. 2-1502
 D Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528
 MRCL Electronics Div., Irvington, N.J. p. 2-1530-1542
 M Analog Devices, Norwood, Mass. *
 General Radio Co., Concord, Mass. *
 Centralab, Milwaukee, Wisc.
 D Constanta Co. of Can., Montreal, Can.
 M Electrotec Inc., Dallas, Tex.
 Hughes Aircraft Co., Culver City, Cal.
 M LRC Inc., Hudson, N.H.
 Metavac, Flushing, N.Y.
 M Norsal Industries, Brentwood, N.Y.
 Weinschel Engrg. Co., Gaithersburg, Md.

Resistors, Negative Temperature Coefficient

D Beckman Instrs., Fullerton, Cal. p. 2-1418,1419
 Carborundum Co., Niagara Falls, N.Y. p. 1-2309-2315
 Fenwel Elctns., Framingham, Mass. p. 1-2316
 D Gamble, Charles T. Inds., Riverside, N.J. p. 2-1492,1493
 Keystone Carbon Co., St. Marys, Pa. p. 1-2317,2318
 NL Inds., Muskegon, Mich. p. 1-2320
 DM Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528
 MRCL Electronics Div., Irvington, N.J. p. 2-1530-1542
 M Victoreen Instrument Div., Cleveland, Ohio p. 2-1581
 M Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1571

M Analog Devices, Norwood, Mass. *
 DM TRW/IRC Resistors, Philadelphia, Pa. *
 Beman Mfg., New Cumberland, Pa.
 DM Cal-R, Santa Monica, Cal.
 D Carbone Lorraine Industries Corp., Boonton, N.J.
 Centralab, Milwaukee, Wisc.
 D Constanta Co. of Can., Montreal, Can.
 Cox & Co., New York, N.Y.
 Elctn. Precision Comps. Corp., Mt. Vernon, N.Y.
 Eltec Instruments Inc., Daytona Beach, Fla.
 Environmental Communications Inc., Costa Mesa, Cal.
 Julie Research Lab., New York, N.Y.
 Kelvin, Van Nuys, Cal.
 M LRC Inc., Hudson, N.H.
 D Mepeco/Electra, Morristown, N.J.
 Mills Resistor Co., Los Alamitos, Cal.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
 Resistance Prods., Harrisburg, Pa.
 M Rodan Ind's., Anaheim, Ca.
 D Siemens Corp., Iselin, N.J.
 TRW/IRC Fixed Resistors, Burlington, Iowa
 D United Mineral & Chem. Corp., New York, N.Y.
 M Vermont Precision Resistor Co., Stowe, Vt.
 D Victory Engrg. Corp., Springfield, N.J.
 D Workman Electronic Prods., Sarasota, Fla.

Resistors, Non-Inductive

D Beckman Instrs., Fullerton, Cal. p. 2-1418,1419
 D Caddock Electronics, Riverside, Cal. p. 1-886,887; p. 2-1429-1443

Carborundum Co., Niagara Falls, N.Y. p. 2-1445
 Consolidated Resistance Co. of America, Yonkers, N.Y. p. 2-1427
 D Corning Glass Works, Corning, N.Y. p. 2-1449
 M Dale Electronics Inc., Columbus, Neb. p. 2-1452
 Dale Electronics, Norfolk, Nebr. p. 2-1452
 Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452
 D E-Systems, Huntington, Ind. p. 2-1485-1487
 M Electro Impulse, Red Bank, N.J. p. 1-492,662-666
 DM Gamble, Charles T. Inds., Riverside, N.J. p. 2-1492-1495
 M KRL Electronics, Manchester, N.H. p. 2-1498,1499
 Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1500,1501
 Mini-Systems, North Attleboro, Mass. p. 2-1502
 DM Nytronics Comps. Group Inc., Darlington, S.C. p. 2-1504-1507
 D Ohmite Mfg. Co., Skokie, Ill. p. 2-1508-1515
 D Omtronics Mfg., Omaha, Neb. p. 2-1516-1525
 DM RCL Electronics Div., Irvington, N.J. p. 2-1530-1542
 M Resistors, Chicago, Ill. p. 2-1544,1545
 Shalco, Smithfield, N.C. p. 2-1543
 M Tel Labs, Manchester, N.H. p. 2-1688-1691
 DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1556-1558,1565,1567
 M Victoreen Instrument Div., Cleveland, Ohio p. 2-1572-1579,1581
 M Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1571
 M Analog Devices, Norwood, Mass. *
 D McGraw-Edison Co., Manchester, N.H. *
 Shigoto Inds., Ltd., New York, N.Y. *
 Angstrom Precision, Hagerstown, Md.
 Beman Mfg., New Cumberland, Pa.
 C-F Electronics, Van Nuys, Cal.
 DM Cal-R, Santa Monica, Cal.
 D Carbone Lorraine Industries Corp., Boonton, N.J.
 D Constanta Co. of Can., Montreal, Can.
 DM Cutler-Hammer Shallcross, Selma, N.C.
 Electro Sci. Inds., Portland, Ore.
 Elctn. Precision Comps. Corp., Mt. Vernon, N.Y.
 D General Resistance, Mt. Vernon, N.Y.
 Gentron Corp., Milwaukee, Wisc.
 M Jordan Electric Co., Van Nuys, Cal.
 Julie Research Lab., New York, N.Y.
 Kelvin, Van Nuys, Cal.
 M LRC Inc., Hudson, N.H.
 D Marstan Resistor, Orange, N.J.
 Mills Resistor Co., Los Alamitos, Cal.
 M Precision Resistor Co., Hillside, N.J.
 Resistance Prods., Harrisburg, Pa.
 Samarius, Derby, Conn.
 Stackpole Carbon Co., St. Mary's, Pa.
 D TRW/IRC Fixed Resistors, Burlington, Iowa
 M Vermont Precision Resistor Co., Stowe, Vt.
 D Ward Leonard Elec. Co. Inc., Mt. Vernon, N.Y.
 Welwyn Canada Div., London, Ont., Can.
 D Workman Electronic Prods., Sarasota, Fla.

Resistors, Oil Filled

Consolidated Resistance Co. of America, Yonkers, N.Y. p. 2-1427
 M Electro Impulse, Red Bank, N.J. p. 1-492,662-666
 M KRL Electronics, Manchester, N.H. p. 2-1498,1499
 Tel Labs, Manchester, N.H. p. 2-1688-1691
 Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1571
 D McGraw-Edison Co., Manchester, N.H. *
 General Resistance, Mt. Vernon, N.Y.
 M Julie Research Lab., New York, N.Y.
 Kelvin, Van Nuys, Cal.
 Mills Resistor Co., Los Alamitos, Cal.

Resistors, Plug-In

Consolidated Resistance Co. of America, Yonkers, N.Y. p. 2-1427
 CTS of Berne, Berne, Ind. p. 2-1421-1426
 Dale Electronics Inc., Columbus, Neb. p. 2-1452
 Dale Electronics, Norfolk, Nebr. p. 2-1452
 Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452
 Gamble, Charles T. Inds., Riverside, N.J. p. 2-1494,1495
 M KRL Electronics, Manchester, N.H. p. 2-1498,1499
 Shalco, Smithfield, N.C. p. 2-1543
 Tel Labs, Manchester, N.H. p. 2-1688-1691
 M Analog Devices, Norwood, Mass. *

D McGraw-Edison Co., Manchester, N.H. *

D CTS Corp., Elkart, Ind. *

Jordan Electric Co., Van Nuys, Cal.

Julie Research Lab., New York, N.Y.

Mills Resistor Co., Los Alamitos, Cal.

Pulse Engrg., San Diego, Cal.

TRW/IRC Fixed Resistors, Burlington, Iowa

Welwyn Canada Div., London, Ont., Can.

Resistors, Positive Temperature Coefficient

Allen-Bradley Co., Milwaukee, Wisc. p. 2-1410-1417

D Beckman Instrs., Fullerton, Cal. p. 2-1418, 1419

Consolidated Resistance Co. of America, Yonkers, N.Y. p. 2-1427

D Corning Glass Works, Corning, N.Y. p. 2-1449

D E-Systems, Huntington, Ind. ... p. 2-1485-1488

D Gamble, Charles T. Inds., Riverside, N.J. p. 2-1492-1495

Keystone Carbon Co., St. Marys, Pa. p. 1-2317, 2318

M KRL Electronics, Manchester, N.H. p. 2-1498, 1499

NL Inds., Muskegon, Mich. p. 1-2322, 2323

DM Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528

DM RCL Electronics Div., Irvington, N.J. p. 2-1530-1542

Tel Labs, Manchester, N.H. p. 2-1688-1691

DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1566

M Victoreen Instrument Div., Cleveland, Ohio p. 2-1572-1579

M Vishay Resistive Systems Grp., Malvern, Pa. p. 2-1571

M Analog Devices, Norwood, Mass. *

D McGraw-Edison Co., Manchester, N.H. *

Angstrom Precision, Hagerstown, Md.

C-F Electronics, Van Nuys, Cal.

DM Cal-R, Santa Monica, Cal. Centralab, Milwaukee, Wisc.

D Constanta Co. of Can., Montreal, Can. Cox & Co., New York, N.Y.

D Elctn. Precision Comps. Corp., Mt. Vernon, N.Y. Environmental Communications Inc., Costa Mesa, Cal.

General Resistance, Mt. Vernon, N.Y.

Jordan Electric Co., Van Nuys, Cal.

Kelvin, Van Nuys, Cal.

M LRC Inc., Hudson, N.H. *

DM Marstan Resistor, Orange, N.J. *

D Mecco/Electra, Morristown, N.J. *

Mills Resistor Co., Los Alamitos, Cal.

Murata Corporation of America, Elmsford, N.Y.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Precision Resistor Co., Hillsdale, N.J.

DM Rodan Ind's., Anaheim, Ca. *

D Siemens Corp., Iselin, N.J. *

TRW/IRC Fixed Resistors, Burlington, Iowa

M Vermont Precision Resistor Co., Stowe, Vt. *

D Workman Electronic Prods., Sarasota, Fla. *

Resistors, Power (2 Watts & Over)

Airco Elctms., Bradford, Pa. p. 2-368, 369, 1408, 1409

Airco Elctms., Niagara Falls, N.Y. p. 2-368, 369, 1408, 1409

Allen-Bradley Co., Milwaukee, Wisc. p. 2-1410-1417

Caddock Electronics, Riverside, Cal. p. 2-1430-1432, 1434-1438

Carborundum Co., Niagara Falls, N.Y. p. 2-1445

D Clarostat Mfg. Co., Dover, N.H. p. 2-1627

Consolidated Resistance Co. of America, Yonkers, N.Y. p. 2-1427

DM Corning Glass Works, Corning, N.Y. p. 2-1449

CTS of Berne, Berne, Ind. p. 2-1421-1426

M Dale Electronics Inc., Columbus, Neb. p. 2-1452

Dale Electronics, Norfolk, Nebr. p. 2-1452

Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452

E-Systems, Huntington, Ind. ... p. 2-1485-1489

M Gamble, Charles T. Inds., Riverside, N.J. p. 2-1493-1495

International Comps Corp., Melville, N.Y. p. 2-193

M KRL Electronics, Manchester, N.H. p. 2-1498, 1499

DM Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1500, 1501

Mini-Systems, North Attleboro, Mass. p. 2-1502

DM Nytronics Comps. Group Inc., Darlington, S.C. p. 2-1504-1507

D Omtronics Mftg., Omaha, Neb. p. 2-1516-1525

D Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528

DM RCL Electronics Div., Irvington, N.J. p. 2-1530-1542

M Resistors, Chicago, Ill. p. 2-1544, 1545

D Sprague Products Co., No. Adams, Mass. p. 2-1547

MTel Labs, Manchester, N.H. p. 2-1688-1691

DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1556, 1564, 1565, 1567

M Victoreen Instrument Div., Cleveland, Ohio p. 2-1574-1579, 1581

M Analog Devices, Norwood, Mass. *

D McGraw-Edison Co., Manchester, N.H. *

Ohmite Mfg. Co., Skokie, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

Square D Co., Milwaukee, Wisc. *

Alpha Components Corp., El Segundo, Cal.

D Baknor Industries Ltd., Port Credit, Ont. C-F Electronics, Van Nuys, Cal.

DM Cal-R, Santa Monica, Cal. Centralab, Milwaukee, Wisc.

DM CTS Corp., Elkart, Ind. *

D Cutler-Hammer Shallicross, Selma, N.C. *

Diplohmatic Div., Seattle, Wash.

D Elctn. Precision Comps. Corp., Mt. Vernon, N.Y. *

Julie Research Lab., New York, N.Y.

Kelvin, Van Nuys, Cal.

Lectrohm Div. of Capco, Grand Junction, Colo.

Mallory Controls, Frankfort, Ind.

M Micro-Ohm Corp., South Laguna, Cal. *

Mills Resistor Co., Los Alamitos, Cal.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

M Precision Resistor Co., Hillsdale, N.J. *

Resistance Prods., Harrisburg, Pa.

Samarius, Derby, Conn.

D Sprague Elec. Co., No. Adams, Mass. *

Stackpole Carbon Co., St. Marys, Pa.

Standard Condenser Corp., Chicago, Ill.

TRW/IRC Fixed Resistors, Burlington, Iowa

DM Ultronic, Grand Junction, Col. *

D United Mineral & Chem. Corp., New York, N.Y. *

DM Ward Leonard Elec. Co. Inc., Mt. Vernon, N.Y. *

Welwyn Canada Div., London, Ont., Can.

D Workman Electronic Prods., Sarasota, Fla. *

Resistors, Pressure Sensitive

M KRL Electronics, Manchester, N.H. p. 2-1498, 1499

Resistors, Rectilinear

D Allen-Bradley Co., Milwaukee, Wisc. p. 2-1410-1417

Consolidated Resistance Co. of America, Yonkers, N.Y. p. 2-1427

CTS of Berne, Berne, Ind. p. 2-1421-1426

M KRL Electronics, Manchester, N.H. p. 2-1498, 1499

New England Instr., Natick, Mass. p. 2-1669-1671

M Analog Devices, Norwood, Mass. *

Computer Instrs., Hempstead, N.Y. *

M Astro Elctms., Fullerton, Calif. *

Bourne, Riverside, Calif.

D Carbone Lorraine Industries Corp., Boonton, N.J. *

DM CTS Corp., Elkart, Ind. *

Diplohmatic Div., Seattle, Wash.

M Litton Systems, Mt. Vernon, N.Y. *

DM Maurey Instrument Corp., Chicago, Ill. *

Samarius, Derby, Conn.

D United Mineral & Chem. Corp., New York, N.Y. *

Resistors, Standards—See Volume 1

Resistors, Strip

Gamble, Charles T. Inds., Riverside, N.J. p. 2-1494

DM RCL Electronics Div., Irvington, N.J. p. 2-1530-1542

Tel Labs, Manchester, N.H. p. 2-1688-1691

DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1568

D McGraw-Edison Co., Manchester, N.H. *

D Ohmite Mfg. Co., Skokie, Ill. *

M Litton Systems, Mt. Vernon, N.Y. *

Metavac, Flushing, N.Y.

TRW/IRC Fixed Resistors, Burlington, Iowa

D United Mineral & Chem. Corp., New York, N.Y. *

D Ward Leonard Elec. Co. Inc., Mt. Vernon, N.Y. *

Resistors, Suppressor

Carborundum Co., Niagara Falls, N.Y. p. 2-1445-1447

NL Inds., Muskegon, Mich. p. 1-2321

Estes Engrg. Co., Port Angeles, Wash.

Gentron Corp., Milwaukee, Wisc.

Ohio Carbon Co., Cleveland, Ohio

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

D United Mineral & Chem. Corp., New York, N.Y. *

D Workman Electronic Prods., Sarasota, Fla. *

Resistors, Surge

D Caddock Electronics, Riverside, Cal. p. 2-1438

Gamble, Charles T. Inds., Riverside, N.J. p. 2-1494, 1495

Keystone Carbon Co., St. Marys, Pa. p. 1-2317, 2318

Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1500, 1501

D Ohmite Mfg. Co., Skokie, Ill. *

Beman Mfg., New Cumberland, Pa. *

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

RCA Parts & Accessories, Deptford, N.J.

Rodan Ind's., Anaheim, Ca.

Stackpole Carbon Co., St. Marys, Pa.

D Ward Leonard Elec. Co. Inc., Mt. Vernon, N.Y. *

Resistors, Tapped

Airco Elctms., Niagara Falls, N.Y. p. 2-368, 369, 1408, 1409

D Caddock Electronics, Riverside, Cal. p. 1-886, 887; p. 2-1440, 1441

D Clarostat Mfg. Co., Dover, N.H. p. 2-1627

Consolidated Resistance Co. of America, Yonkers, N.Y. p. 2-1427

CTS of Berne, Berne, Ind. p. 2-1421-1426

Dale Electronics Inc., Columbus, Neb. p. 2-1452

D Dale Electronics, Norfolk, Nebr. p. 2-1452

Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452

DM Gamble, Charles T. Inds., Riverside, N.J. p. 2-1494, 1495

M Hybrid Systems Corp., Burlington, Mass. p. 1-890

M Milwaukee Resistor Corp., Milwaukee, Wisc. p. 2-1500

DM RCL Electronics Div., Irvington, N.J. p. 2-1530-1542

Resistors, Chicago, Ill. p. 2-1544, 1545

Tel Labs, Manchester, N.H. p. 2-1688-1691

DM TRW/IRC Resistors, Philadelphia, Pa. p. 2-1568

D E-Systems, Huntington, Ind. *

D McGraw-Edison Co., Manchester, N.H. *

D Ohmite Mfg. Co., Skokie, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

Tech Labs., Palisades Pk., N.J. *

Centralab, Milwaukee, Wisc.

D Constanta Co. of Can., Montreal, Can. *

CTS Corp., Elkart, Ind. *

Elctn. Precision Comps. Corp., Mt. Vernon, N.Y. *

Environmental Communications Inc., Costa Mesa, Cal.

General Resistance, Mt. Vernon, N.Y.

M Julie Research Lab., New York, N.Y. *

Mallory Controls, Frankfort, Ind.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Samarius, Derby, Conn.

TRW/IRC Fixed Resistors, Burlington, Iowa

D Ward Leonard Elec. Co. Inc., Mt. Vernon, N.Y. *

Welwyn Canada Div., London, Ont., Can.

Resistors, Temperature Sensitive—See Volume 1

Resistors, Tin Oxide

DM Corning Glass Works, Corning, N.Y. p. 2-1449

D Dale Electronics Inc., Columbus, Neb. p. 2-1452

Dale Electronics, Norfolk, Nebr. p. 2-1452

Dale Elctns. Canada, Ltd., Scarborough, Ont., Can. p. 2-1452

Mallory Controls, Frankfort, Ind.

Welwyn Canada Div., London, Ont., Can.

Resistors, Variable—See Potentiometers; Rheostats; Resistors, Adjustable

Resistors, Voltage-Sensitive

D Carborundum Co., Niagara Falls, N.Y. p. 2-1446, 1447

NL Inds., Muskegon, Mich. p. 1-2321

Tel Labs, Manchester, N.H. p. 2-1688-1691

Mauratron, Dallas, Tex. *

D Carbone Lorraine Industries Corp., Boonton, N.J. *

Centralab, Milwaukee, Wisc.

General Elec., Syracuse, NY

Gentron Corp., Milwaukee, Wisc.

D Mecco/Electra, Morristown, N.J. *

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

RCA Parts & Accessories, Deptford, N.J.

Schauer Mfg. Corp., Cincinnati, Ohio

D Siliconix, Santa Clara, Cal *

D Victory Engrg. Corp., Springfield, N.J. *

D Workman Electronic Prods., Sarasota, Fla. *

Resistors, Wirewound

- D** Clarostat Mfg. Co., Dover, N.H. p. 2-1627
 Consolidated Resistance Co. of America,
 Yonkers, N.Y. p. 2-1427
CTS of Berne, Berne, Ind. p. 2-1421-1426
DM Dale Electronics Inc., Columbus, Neb.
 p. 2-1452
D Dale Elctns. Canada, Ltd., Scarborough, Ont.,
 Can. p. 2-1452
D E-Systems, Huntington, Ind. p. 2-1484-1489
DM Gamble, Charles T. Inds., Riverside, N.J.
 p. 2-1492-1495
M KRL Electronics, Manchester, N.H.
 p. 2-1498, 1499
DM Milwaukee Resistor Corp., Milwaukee, Wisc.
 p. 2-1500, 1501
Ohmite Mfg. Co., Skokie, Ill. p. 2-1508-1515
D Omtronics Mfg., Omaha, Neb. p. 2-1516-1525
M RCL Electronics Div., Irvington, N.J.
 p. 2-1530-1542
M Resistors, Chicago, Ill. p. 2-1544, 1545
Shallco, Smithfield, N.C. p. 2-1543
D Sprague Products Co., No. Adams, Mass.
 p. 2-1547
M Tel Labs, Manchester, N.H. p. 2-1688-1691
DM TRW/IRC Resistors, Philadelphia, Pa.
 p. 2-1552, 1553, 1565, 1568
Caddock Electronics, Riverside, Cal. *
D McGraw-Edison Co., Manchester, N.H. *
Shigoto Inds., Ltd., New York, N.Y. *
Square **D** Co., Milwaukee, Wisc. *
M Astro Elctns., Fullerton, Calif.
DM Balco Capacitors, Orange, N.J.
 C-F Electronics, Van Nuys, Cal.
DM Cal-R, Santa Monica, Cal.
 Centralab, Milwaukee, Wisc.
 Coil Specialty Co., Boalsburg, Pa.
DM CTS Corp., Elkart, Ind.
DM Cutler-Hammer Shallicross, Selma, N.C.
 Diplohmatic Div., Seattle, Wash.
 Electro Sci. Inds., Portland, Ore.
D Elctn. Precision Comps. Corp., Mt. Vernon, N.Y.
D General Resistance, Mt. Vernon, N.Y.
M Jordan Electric Co., Van Nuys, Cal.
 Julie Research Lab., New York, N.Y.
 Kelvin, Van Nuys, Cal.
 Lectrohm Div. of Capco, Grand Junction, Colo.
M Litton Systems, Mt. Vernon, N.Y.
 Mallory Controls, Frankfort, Ind.
DM Marstan Resistor, Orange, N.J.
M Micro-Ohm Corp., South Laguna, Cal.
 Mills Resistor Co., Los Alamitos, Cal.
 Motorola Comms. Div., Schaumburg, Ill.
 Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
M Precision Resistor Co., Hillside, N.J.
 RCA Parts & Accessories, Deptford, N.J.
 Samarius, Derby, Conn.
 Standard Condenser Corp., Chicago, Ill.
DM Ultronix, Grand Junction, Col.
D United Mineral & Chem. Corp., New York, N.Y.
DM Ward Leonard Elec. Co. Inc., Mt. Vernon, N.Y.
D Waters Mfg., Wayland, Mass.
 Welwyn Canada Div., London, Ont., Can.
D Workman Electronic Prods., Sarasota, Fla.

Resistors, Wire Woven

- D** Milwaukee Resistor Corp., Milwaukee, Wisc. *
DM Nytronics Comps. Group Inc., Darlington, S.C. *
 RCA Parts & Accessories, Deptford, N.J.

Resolvers, Synchro—See Volume 1

Restorers, Pulse Form—See Volume 1

Retainers, Battery

- Connector Corp.**, Chicago, Ill. p. 2-658
Mauratron, Dallas, Tex. p. 1-1313
DM Keystone Elctns. Corp., New York, N.Y. *
 Acme Model Engrg. Co., Ridgfield, N.J.
DM Amrad Corporation, Paris, Tex.
 Anchor Plastics, Long Island City, N.Y.
D Workman Electronic Prods., Sarasota, Fla.

Retainers, Relay—See Volume 1

Retainers, Transistor & Diode

- DM** Keystone Elctns. Corp., New York, N.Y. *
D Vector Electronic Co., Sylmar, Cal. *
DM Amrad Corporation, Paris, Tex.
 Birnbach Co., Freeport, N.Y.
 Gibson/Egan Co., Arcadia, Calif.
 Gudebrod Bros. Silk Co., Philadelphia, Pa.
 Int'l. Elctn. Resch., Burbank, Cal.
 Jermyn, San Francisco, Cal.
M Jetttron Prods., Hanover, N.J.
D Workman Electronic Prods., Sarasota, Fla.

Retainers, Tube—See Volume 1

Retractors & Carriers—See Cable

Retractors

RFI Measuring Equipment—See Volume 1

RFI Shielding—See Shields, R-F

RFI Testing Services—See Volume 1

Rheostats

- M** Clarostat Mfg. Co., Dover, N.H. p. 2-1627
DM E-Systems, Huntington, Ind. p. 2-1656-1662
 New England Instr., Natick, Mass.
 p. 2-1670, 1671
D Ohmite Mfg. Co., Skokie, Ill. p. 2-1673-1675
D GC Electronics, Rockford, Ill. *
 Shigoto Inds., Ltd., New York, N.Y. *
M Betatronix, Hauppauge, N.Y.
 CTS Corp., Elkart, Ind.

Rings, Retaining

- D** Vaco Products Co., Chicago, Ill. p. 2-1717
D GC Electronics, Rockford, Ill. *
M Atlantic Research Corporation, Alexandria, Va.
D Eaton Corporation, Cleveland, Ohio
 National Camera Inc., Englewood, Colo.
M PIC Design Division, Ridgefield, Conn.
 Sterling Instr., New Hyde Pk., NY
M Templeman, D.R. Co., Plainville, Conn.
 Titchener, E.H. & Co., Binghamton, N.Y.
 Tridair Inds., Torrance, Calif.
M Walde Kohinoor, Long Island City, N.Y.

Rivets

- Auto-Swage Products Inc.**, Shelton, Conn.
D Channel Master Div. Avnet, Ellenville, N.Y.
M Cherry Rivet & Boots Nut Divs., Santa Ana, Calif.
 Circon Corp., Santa Barbara, Cal.
D Deutsch Fastener Corp., Los Angeles, Cal.
D Eaton Corporation, Cleveland, Ohio
 Engelhard Minerals & Chem., Murray Hill, N.J.
D Gries Reproducer Co., New Rochelle, N.Y.
DM ITT Harper, Morton Grove, Ill.
 Mark Eyelet & Stamping, Wolcott, Conn.
 National Camera Inc., Englewood, Colo.
 Plessey Inc., Melville, N.Y.
 Pylon Co., Attleboro, Mass.
 Taylor Industries Inc., Howell, Mich.
D USM Corp., Shelton, Conn.

Rods, Ground

- D** GC Electronics, Rockford, Ill. *
D Channel Master Div. Avnet, Ellenville, N.Y.
 Copperhead Bimetallics, Glassport, PA
D Premax Prods. Div., Niagara Falls, N.Y.

Rotators—See Volume 1

Rotors, Motor & Generator—See Volume 1

Rubber, Conductive

- Acheson Colloids Co.**, Port Huron, Mich.
Cal-Metex Corp., Inglewood, Cal.
 Chomerics, Woburn, Mass.
 Dow Corning, Midland, Mich.
D Electro-Science Labs., Pennsauken, N.J.
M Hardman Inc., Belleville, N.J.
DM Metex Corp., Edison, N.J.
 SWS Silicones, Adrian, Mich.
D Technical Wire Products, Cranford, N.J.
 Vernay Laboratories, Yellow Springs, Ohio

Rubber Guards (For Equipment)—See Volume 1

Rubber, Silicone

- D** Varflex Corp., Rome, N.Y. p. 2-1274, 1275
Abesto Corp., Bloomfield, N.J.
 Allaco Prods Div., Watertown, Mass.
M APM-Hexseal, Englewood, N.J.
 Bacon Inds., Watertown, Mass.
 Cadillac Plastic & Chemical, Detroit, Mich.
 Connecticut Hard Rubber Co., New Haven, Conn.
 Dow Corning, Midland, Mich.
 Emerson & Cuming, Canton, Mass.
 Formulated Resins Inc., Greenville, R.I.
D General Elec. Co., Watford, N.Y.
M Hardman Inc., Belleville, N.J.
 Minnesota Rubber Co., Minneapolis, Minn.
D Norelcom Electronics, Farmingdale, N.Y.
D Ram Chems., Gardena, Calif.
 SWS Silicones, Adrian, Mich.
 Tra-Con, Medford, Mass.
 Vernay Laboratories, Yellow Springs, Ohio

Scale Expanders, Meter—See Volume 1

Scalars, Binary, Decade—See Volume 1

Scales, Dial

- D** Datak Corp., Guttenberg, N.J. p. 2-354, 1079
Hutchinson Industrial Corp., Hutchinson, Minn.
 p. 1-1542, 1543
Jan Hardware Mfg. Co., Long Island City, N.Y.
 p. 2-1090
Millen Mfg. Co. Inc., James, Malden, Mass.
 p. 2-1249
SGL Homalite, Wilmington, Del. p. 2-1254
D Waldom Electronics, Chicago, Ill. *
 Anchor Plastics, Long Island City, N.Y.
 Apahouser Corp. of N.E., Watertown, Mass.
 Beckman Instrs. (AISSD), Fullerton, Cal.
D Chatillon John & Sons, Kew Gardens, N.Y.
 Dillon, W.C. & Co., Van Nuys 340, Calif.
D General Electric Co., West Lynn, Mass.
M Howe Richardson Scale Co., Clifton, N.J.
D Mechanical Engraving Co., Bronx, N.Y.
 Panelgraphic Corp., Caldwell, N.J.
 Photo Chemical Prods. Cal., Santa Monica, Cal.
 Sunshine Sci. Instrs., Philadelphia, Pa.
D Taylor Instr. Process Control Div., Rochester, N.Y.
M Tech-Etch, Hingham, Mass.
 Theta Instr. Corp., Fairfield, N.J.
D Toledo Scale, Toledo, Ohio
D Vemaline Prods. Co., Wyckoff, N.J.

Scanners, Crossbar—See Volume 1

Scanners, Flying Spot—See Volume 1

Scanners, Infrared—See Volume 1

Scanners, Instrument, Input/Output—See Volume 1

Scanners, Optical—See Volume 1

Scanners, Reed—See Volume 1

Scissors

- D** Jonard Industries Corp., Tuckahoe, N.Y.
 p. 2-1708
Shigoto Inds., Ltd., New York, N.Y. *
D Adtool Corp., Montreal W P Q, Can.
 Clauss Cutlery Co., Fremont, Ohio
D Klein, Mathias & Sons, Chicago, Ill.
M MacDonald & Co., Glendale, Calif.
 Mann, Henry Inc., Huntingdon Valley, Pa.
D Techni-Tool, Plymouth Meeting, Pa.
D Vigor Co., New York, N.Y.

Scope Dollies—See Volume 1

SCR's—See Volume 1

SCR Firing Controls—See Volume 1

Scramblers, Data—See Volume 1

Screens, Printed Circuit

- SGL Printed Circuits**, Wayne, N.J. p. 2-356
TRW/Cinch-Graphix, Elctn. Comps., City of Industry, Cal. p. 2-896, 897
D Excel Products Co., New Brunswick, N.J.
 Hughes Aircraft Co., Culver City, Cal.
 Morey Corp., Downers Grove, Ill.
 Nucleus Corp., Madison Hgts., Mich.
 Sel-Rex Co. Div. Oxy Metal Industries Corp., Nutley, N.J.
D Techniques, Englewood, N.J.
M Wire Cloth Enterprises, Pittsburgh, Pa.
D Zenrad Controls Co., Santa Barbara, Ca.

Screwdrivers

- D** Channellock, Meadville, Pa. p. 2-1693
D Jonard Industries Corp., Tuckahoe, N.Y.
 p. 2-1708
D Vaco Products Co., Chicago, Ill. p. 2-1714
Gardner-Denver, Grand Haven, Mich. *
Shigoto Inds., Ltd., New York, N.Y. *
D Adtool Corp., Montreal W P Q, Can.
DM Allen Mfg. Co., Hartford, Conn.
D Erikson Specialized Tool Co., Pico-Rivera, Cal.
 H.J.J. Co., Los Gatos, Cal.
 Janel, Stirling, N.J.
 Jensen Tools & Alloys, Phoenix, Ariz.
M Kawecky Beryco Inds., New York, NY
D Klein, Mathias & Sons, Chicago, Ill.
M MacDonald & Co., Glendale, Calif.
 Mann, Henry Inc., Huntingdon Valley, Pa.
D Hunter Tools, El Monte, Calif.
D Moody Tools, Providence, R.I.
 National Camera Inc., Englewood, Colo.
D Neuses, P.K., Rolling Meadows, Ill.
 Optimized Devices Inc., Pleasantville, N.Y.
 Snap-On-Tools, Kenosha, Wisc.
D Techni-Tool, Plymouth Meeting, Pa.
D Vigor Co., New York, N.Y.

X-Acto, Long Island City, N.Y.
D Xcelite, Orchard Park, N.Y.

Screws, Lead, Feed & Translatory—See
Drives & Drives Mechanisms (Dial)

Screws—See Fasteners

Scribers
Jonard Industries Corp., Tuckahoe, N.Y. *
Mann, Henry Inc., Huntingdon Valley, Pa.
D Moody Tools, Providence, R.I.

Scribers, Wafer-Also See Machines & Accessories, Semiconductor Manufacturing—See Volume 1

Sealers—See Coatings

Seals & Feedthrus, Environmental—See
Feedthrus & Seals, Environmental

Seals, Ceramic To Metal
M Albarox Corp., New Bedford, Mass. p. 2-456
Bendix, Franklin, Ind. p. 2-1214
M Victoreen Instrument Div., Cleveland, Ohio
p. 2-1065
General Elec. Co., Schenectady, N.Y. *
Airpax Elctns., Cambridge, Md.
American Lava Corp., Chattanooga, Tenn.
M Atlantic Research Corporation, Alexandria, Va
Cadillac Plastic & Chemical, Detroit, Mich.
Centralab, Milwaukee, Wisc.
Ceramaseal, New Lebanon Center, N.Y.
Coors Porcelain Co., Golden, Colo.
Corning Glass Works, Corning, N.Y.
Corning Glass Works, Television Prods. Div., Corning, N.Y.
M Detorionics Corp., S. El Monte, Cal.
Diamonite Products Div., Shreve, Ohio
Eimac, San Carlos, Calif.
Electro-Science Labs., Pennsauken, N. J.
Fansteel Inc., N Chicago, Ill.
D General Elec. Co., Waterford, N.Y.
Gulton Inds., Buena Park, Cal.
Hardman Inc., Belleville, N.J.
Hermetic Seal Corp., Rosemead, Cal.
Lapp Insulator Div., Interpace Corp., LeRoy, N.Y.
Materials for Elctns., Jamaica, N.Y.
National Beryllia Corp., Haskell, N.J.
Plessey Inc., Melville, N.Y.
D Plessey Ceramic Div., Frenchtown, N.J.
Research Instrument Co., Garden City, N. Y.
SermeTel Teleflex Inc., Limerick, Pa
Simmonds Precision, Norwich, N.Y.
Torr Labs., Los Angeles, Cal.
Varian Assocs., Palo Alto, Cal.
Varian Electron Tube & Device Grp., San Carlos, Cal.

Seals, Glass To Metal
Bendix, Franklin, Ind. *
M Airpax Elctns., Cambridge, Md.
M Allegheny Ludlum Steel Co., Pittsburgh, Pa.
DM Armstrong Cork Co., Lancaster, Pa.
Auburn Mfg., Middletown, Conn.
Cadillac Plastic & Chemical, Detroit, Mich.
Ceramaseal, New Lebanon Center, N.Y.
Connector Inds. of America, Cincinnati, Ohio
Corning Glass Works, Corning, N.Y.
Corning Glass Works, Television Prods. Div., Corning, N.Y.
M Detorionics Corp., S. El Monte, Cal.
D Electro-Science Labs., Pennsauken, N. J.
Elctn. Seals, Van Nuys, Cal.
Fredericks Co., Huntington Valley, Pa.
Fusite Div./Emerson Elec., Cincinnati, Ohio
D General Elec. Co., Waterford, N.Y.
M GTI Corporation, Pittsburgh, Pa.
Gulton Inds., Buena Park, Cal.
Hardman Inc., Belleville, N.J.
M Hermetic Seal Corp., Rosemead, Cal.
M Magnetics, Butler, Pa.
National Beryllia Corp., Haskell, N.J.
Research Instrument Co., Garden City, N. Y.
SermeTel Teleflex Inc., Limerick, Pa
Satham Instruments, Oxnard, Cal.
Tech Materials Inc., Lincoln, R.I.
Torr Labs., Los Angeles, Cal.
Varian Electron Tube & Device Grp., San Carlos, Cal.
D Viking Inds., Chatsworth, Cal.
Wall A. T. Co., Warwick, R.I.

Seals, Hermetic-Also See Services, Hermetic Sealing
M Albarox Corp., New Bedford, Mass. p. 2-456
Bendix, Franklin, Ind. p. 2-1214
Inter-Tech. Grp., Irvington-on-Hudson, N.Y.
p. 2-1230

Mini-Systems, North Attleboro, Mass.
p. 2-1503

Amphenol RF Div., Danbury, Conn. *
American Lava Corp., Chattanooga, Tenn.
Centralab, Milwaukee, Wisc.
Ceramaseal, New Lebanon Center, N.Y.
Connector Inds. of America, Cincinnati, Ohio
Corning Glass Works, Corning, N.Y.
Corning Glass Works, Television Prods. Div., Corning, N.Y.
M Detorionics Corp., S. El Monte, Cal.
Eimac, San Carlos, Calif.
D Electro-Science Labs., Pennsauken, N. J.
Elctn. Seals, Van Nuys, Cal.
Fansteel Inc., N Chicago, Ill.
Fusite Div./Emerson Elec., Cincinnati, Ohio
M GTI Corporation, Pittsburgh, Pa.
Gulton Inds., Buena Park, Cal.
Hermetic Seal Corp., Rosemead, Cal.
D Metal Bellows Corp., Sharon, Mass.
Minnesota Rubber Co., Minneapolis, Minn.
National Beryllia Corp., Haskell, N.J.
Plessey Ceramic Div., Frenchtown, N.J.
Polyton Corp., New Rochelle, N.Y.
Research Instrument Co., Garden City, N. Y.
Simmonds Precision, Norwich, N.Y.
Singer Co., Little Falls, N.J.
Varian Electron Tube & Device Grp., San Carlos, Cal.
D Zippertubing Co., Los Angeles, Calif.

Seals, Microwave—See Gaskets, Shielding, R-F; Seals, Waveguide

Seals, Waveguide—See Volume 1

Search Unit, Magnetic Tape—See
Volume 1

Seizers
D GC Electronics, Rockford, Ill. *
Jonard Industries Corp., Tuckahoe, N.Y. *
Mann, Henry Inc., Huntingdon Valley, Pa.

Selsyns—See Volume 1

Semiconductor Material—See Volume 1

Semiconductor Wafer Fabrication, Assembling (Packaging)—See Volume 1

Semiconductor Wafer Fabrication, Designing (Topological)—See Volume 1

Semiconductor Wafer Fabrication, Maskmaking (Tooling)—See Volume 1

Semiconductor Wafer Fabrication, Processing—See Volume 1

Semiconductor Wafer Fabrication, Testing—See Volume 1

Semiconductors—See Volume 1

Sensors—See Volume 1

Sensors, Light—See Volume 1

Sensors, Temperature—See Volume 1

Sequence Controllers—See Volume 1

Services, Assembly & Fabrication (Including R & D)—See Volume 1

Services, Backplane Wiring—See
Volume 1

Services, Calibration & Instrument Repair—See Volume 1

Services, Coating (All-Types)—See
Volume 1

Services, Computer-Aided Design (CAD)—See Volume 1

Services, Crimping—See Volume 1

Services Custom Molding, Plastics—See
Volume 1

Services, Decapsulation—See Volume 1

Services, Electrical Measurement & Test—See Volume 1

Services, Encapsulation—See Volume 1

Services, Environmental Testing—See
Volume 1

Services, Hermetic Sealing—See
Volume 1

Services, High Vacuum—See Volume 1

Services, Instrument Design (Industrial)—See Volume 1

Services, Metal Etching, Engraving—See
Volume 1

Services, Metal Parts Fabrication—See
Volume 1

Services, Metallizing (Including Electroforming)—See Volume 1

Services, Molding—See Volume 1

Services, Packaging—See Volume 1

Services, Photographic—See Volume 1

Services, Plastics Fabrication—See
Volume 1

Services, Plating—See Volume 1

Services, Qualification—See Volume 1

Services, Rental, Electronic Instrumentation—See Volume 1

Services, RFI Measuring—See Volume 1

Services, Silk Screening—See Volume 1

Services, Vibration Surveys—See
Volume 1

Services, Wire Cutting & Stripping—See
Volume 1

Services, Wirewrapping Also see
Services, Backplane Wiring—See
Volume 1

Servo Systems—See Volume 1

Shaft Encoders, Shaft Position—See
Volume 1

Shafts & Adapters Also See Couplings, Shaft, Rigid & Flexible—See Volume 1

Shake Tables—See Volume 1

Shells, Encapsulation—See Volume 1

Shielding Beads, Ferrite
Arnold Engineering Co., Marengo, Ill.
p. 2-1212, 1213
Fair-Rite Prods. Corp., Wallkill, N.Y. p. 2-1215
D Ferroxcube Corp., Saugerties, N.Y.
p. 2-1218-1225
Ferronics, East Rochester, N.Y.

Shields, Cable—See Braid, Cable

Shields, Cathode-Ray Tube—See
Volume 1

Shields, Coil
MAD-Vance Magnetics, Rochester, Ind. p. 2-1211
Caddell-Burns Mfg. Co., Mineola, N. Y.
p. 2-382-385
CELCO, Mahwah, N.J. p. 1-631
M Eagle Magnetics Co., Indianapolis, Ind.
p. 2-1216
Inter-Tech. Grp., Irvington-on-Hudson, N.Y.
p. 2-1230
Krystinel Corp., Port Chester, N. Y. p. 2-1234
Micrite Metal Mfg., Canoga Park, Cal.
p. 2-1236-1239
M Perfection Mica Co., Bensenville, Ill. p. 2-1255
SGL Electronics, Westville, N.J. p. 2-1254
Millen Mfg. Co. Inc., James, Malden, Mass. *
Staver Co., Bay Shore, N.Y. *
Amuneal Mfg. Corp., Philadelphia, Pa.
M Kinetron Corp., Asbury Park, N.J.
Precision Paper Tube Co., Wheeling, Ill.

Shields, Corona
Hipotronics, Brewster, N.Y.
p. 1-722, 723, 1230, 1231

Jan Hardware Mfg. Co., Long Island City, N.Y.
p. 2-1096

Micrite Metal Mfg., Canoga Park, Cal.
p. 2-1236-1239

M Micro-Circuits Co., New Buffalo, Mich.
p. 2-342,343

M Rowe Industries, Toledo, Ohio p. 2-796,797

Acheson Colloids Co., Port Huron, Mich.
Polyflon Corp., New Rochelle, N.Y.

Shields, Electrostatic—See Volume 1

Shields, Indicator Light

M Ad-Vance Magnetics, Rochester, Ind. p. 2-1211

Micrite Metal Mfg., Canoga Park, Cal.
p. 2-1236-1239

Staver Co., Bay Shore, N.Y. *

Cal-Metex Corp., Inglewood, Cal.
DM Metex Corp., Edison, N.J.
Precision Paper Tube Co., Wheeling, Ill.

Shields, Magnetic

M Ad-Vance Magnetics, Rochester, Ind. p. 2-1210

CELCO, Mahwah, N.J. p. 1-631

M Eagle Magnetics Co., Indianapolis, Ind.
p. 2-1216,1217

Inter-Tech. Grp., Irvington-on-Hudson, N.Y.
p. 2-1230

Jan Hardware Mfg. Co., Long Island City, N.Y.
p. 2-1096

Micrite Metal Mfg., Canoga Park, Cal.
p. 2-1236-1239

Millen Mfg. Co. Inc., James, Malden, Mass.
p. 2-1241-1244

M Perfection Mica Co., Bensenville, Ill. p. 2-1256

SGL Electronics, Westville, N.J. p. 2-1254

M Allegheny Ludlum Steel Co., Pittsburgh, Pa.
Amunual Mfg. Corp., Philadelphia, Pa.
Estes Engrg. Co., Port Angeles, Wash.
Hamamatsu TV Co., Ltd., Hamamatsu City, Shizuoka Pref., Japan
Icore Int'l., Sunnyvale, , Cal.
IRD Mechanalysis, Columbus, Ohio
M Kinetron Corp., Asbury Park, N.J.
DM Lector Magnetics, Los Angeles, Cal.
M Magnetics, Butler, Pa.
D Metal Bellows Corp., Sharon, Mass.
Permaluster, Burbank, Calif.
Russell Inds., Lynbrook, N.Y.
Tohoku Metal Inds., Ltd., Tokyo, Japan
DM Zippertubing Co., Los Angeles, Calif.

Shields, R-F-Also See Gaskets, Shielding, R-F

Instrument Specialties, Little Falls, N.J.
p. 2-1226,1229

Micrite Metal Mfg., Canoga Park, Cal.
p. 2-1236-1239

M Micro-Circuits Co., New Buffalo, Mich.
p. 2-342,343

M Rowe Industries, Toledo, Ohio p. 2-796,797

McLean Engrg. Labs., Princeton Jctn., N.J. *

Millen Mfg. Co. Inc., James, Malden, Mass. *

Staver Co., Bay Shore, N.Y. *

Acheson Colloids Co., Port Huron, Mich.
M American Chemical Etching, Pacoima, , Cal.
M Auburn Mfg., Middletown, Conn.
Cal-Metex Corp., Inglewood, Cal.
Chomerics, Woburn, Mass.
M Co-Operative Inds., Chester, N.J.
Emerson & Cuming, Canton, Mass.
Estes Engrg. Co., Port Angeles, Wash.
Evaporated Coatings, Huntingdon Valley, Pa.
Icore Int'l., Sunnyvale, , Cal.
Int'l. Elctrn. Resch., Burbank, Cal.
DM Lector Magnetics, Los Angeles, Cal.
M Lundy Elctrns. & Sys., Glen Head, N.Y.
D Metal Bellows Corp., Sharon, Mass.
DM Metex Corp., Edison, N.J.
D Modpak, Waltham, Mass.
Polyflon Corp., New Rochelle, N.Y.
D Technical Wire Products, Cranford, N.J.
3M Co., St. Paul, Minn.
M Universal Shielding Corp., Plainview, N.Y.
M Zippertubing Co., Los Angeles, Calif.

Shields, Switch—See Volume 1

Shields, Transformer

M Ad-Vance Magnetics, Rochester, Ind. p. 2-1211

M Eagle Magnetics Co., Indianapolis, Ind.
p. 2-1217

Inter-Tech. Grp., Irvington-on-Hudson, N.Y.
p. 2-1230

Jan Hardware Mfg. Co., Long Island City, N.Y.
p. 2-1096

Micrite Metal Mfg., Canoga Park, Cal.
p. 2-1236-1239

M Micro-Circuits Co., New Buffalo, Mich.
p. 2-342,343

M Perfection Mica Co., Bensenville, Ill.
p. 2-1255,1257

SGL Electronics, Westville, N.J. p. 2-1254

Millen Mfg. Co. Inc., James, Malden, Mass. *

Staver Co., Bay Shore, N.Y. *

M Allegheny Ludlum Steel Co., Pittsburgh, Pa.
Amunual Mfg. Corp., Philadelphia, Pa.
M Kinetron Corp., Asbury Park, N.J.
D Lector Magnetics, Los Angeles, Cal.

Shields, Tube—See Volume 1

Shields, Wire—See Braid, Cable

Shift Registers—See Volume 1

Shifters, Phase, Microwave

Arra Inc., Bay Shore, N.Y. p. 2-1278,1279

MDaico Industries Inc., Compton, Cal. p. 2-1283

M Amphenol RF Div., Danbury, Conn. *

Bendix, Franklin, Ind. *

Syston-Donner Microwave Div., Van Nuys, Cal. *

All Systems, Moorestown, N.J.
Addington Labs., Santa Clara, Calif.
AEL, Colmar, Pa.
Aircorn, Union, N.H.
M Airtron, Morris Plains, N.J.
Alford Mfg. Co., Winchester, Mass.
DM Anaren Microwave, Syracuse, N.Y.
Collins Radio, Dallas, Tex.
Environmental Communications Inc., Costa Mesa, Cal.
Frequency Engrg. Labs., Farmingdale, N.J.
M GHZ Devices, So. Chelmsford, Mass.
Hewlett-Packard Co., Palo Alto, Cal.
Hughes Aircraft Co., Culver City, Cal.
Maury Microwave Corp., Cucamonga, Calif.
M Merrimac Inds., West Caldwell, N.J.
M Microlab/FXR, Livingston, N.J.
Microwave Assocs., Burlington, Mass.
D Microwave Development Labs., Needham Hgts., Mass.
Narda Microwave Corp., Plainview, N.Y.
M Norsal Industries, Brentwood, N.Y.
M Premier Microwave, Port Chester, N.Y.
Reeve Electronics, Chicago, Ill.
Sivers Lab., Corona del Mar, Cal.
M Technical Research & Mfg., Manchester, N.H.
D TRG, Woburn, Mass.
Universal Ad-Yu Elctrns., Milwaukee, Wisc.
UTE Microwave, Asbury Park, N.J.
Varian Assocs., Beverly, Mass.
Waveline, W. Caldwell, N.J.
D Wiltron Co., Palo Alto, Cal

Shifters, Phase, R-F—See Volume 1

Shifters, Phase 60/400 CPS—See Volume 1

Shrinkable Plastics & Elastomers—See Caps, Forms & Tapes Heat Shrinkable; Tubing Heat Shrinkable

Shunts, Meter—See Volume 1

Shutters, Microwave

M Amphenol RF Div., Danbury, Conn. *

M Airtron, Morris Plains, N.J.
Hughes Aircraft Co., Culver City, Cal.
Microwave Assocs., Burlington, Mass.
D Microwave Development Labs., Needham Hgts., Mass.
M Premier Microwave, Port Chester, N.Y.
Varian Assocs., Palo Alto, Cal.
Varian Electron Tube & Device Grp., San Carlos, Cal.
Waveline, W. Caldwell, N.J.

Signal Averagers—See Volume 1

Signal Conditioners & Equipment—See Volume 1

Signal Generators—See Generators, Specific Type

Signal Tracers—See Volume 1

Silica, Fused

Amersil, Hillside, N.J.
Atomergic Chemetals Co., Carle Place, N.Y.
M Bram Metallurgical-Chem. Co., Phila., Pa.
Corning Glass Works, Corning, N.Y.
Corning Glass Works, Television Prods. Div., Corning, N.Y.

Esco Products, Oak Ridge, NJ
General Electric Co., Cleveland, Ohio
D Optics International, Tenaflly, N.J.

Simulators, Motion—See Volume 1

Simulators, Radar—See Volume 1

Sinks, Heat—See Volume 1

Sleeves—See Tubing

Slide Rules (Circuitry Computing)—See Volume 1

Slides, Cabinet & Chassis—See Volume 1

Sliding Loads, Microwave—See Volume 1

Slip-Rings & Assemblies—See Volume 1

Slotted Lines, Microwave—See Volume 1

Smith Chart Impedance Plotters, Automatic—See Volume 1

Socket Adapters

D Arco Electronics Inc., Great Neck, N.Y.
p. 2-619

D Augat Inc., Attleboro, Mass p. 2-636

D Bivar, Santa Ana, Cal. p. 2-1266

Connector Corp., Chicago, Ill. p. 2-657-660

M Elctrn. Molding Corp., Woonsocket, R.I.
p. 2-676,677,678,679

Qualco, Los Altos, Cal. p. 2-790

M Rowe Industries, Toledo, Ohio p. 2-796,797

Shigoto Inds., Ltd., New York, N.Y. *

D Smith Inc., Herman H., Brooklyn, N.Y. *

D Vector Electronic Co., Sylmar, Cal. *

Air-O-Tronics Prods., Morrisville, N.Y.
Birnbach Co., Freeport, N.Y.
Cablewave Systems Inc., North Haven, Conn.
D Cambridge Thermionic Corp., Cambridge, Mass.
D Circuit-Stik, Torrance, Cal.
Gary Mfg., New Brunswick, N.J.
D IFE Div., Rumford, R.I.
Leviton Mfg. Co., Little Neck, N.Y.
Methode Elctrns., Chicago, Ill.
D Robinson-Nugent, New Albany, Ind.
D Rye Inds., Mamaroneck, N.Y.
D Textool Products, Irving, Tex.
D Workman Electronic Prods., Sarasota, Fla.

Sockets, Capacitor

Berg Electronics, New Cumberland, Pa.
p. 2-645,651

Elctrn. Molding Corp., Woonsocket, R.I.
p. 2-676,677,678,679

Erie Technological Products, Erie, Pa. *

D Loranger Mfg. Corp., Warren, Pa.
D Robinson-Nugent, New Albany, Ind.
D Textool Products, Irving, Tex.

Sockets, Crystal

Berg Electronics, New Cumberland, Pa.
p. 2-645,651

Connector Corp., Chicago, Ill. p. 2-659,660

D Millen Mfg. Co. Inc., James, Malden, Mass.
p. 2-1247

D Waldom Electronics, Chicago, Ill.
p. 1-1070-1074

D Augat Inc., Attleboro, Mass *

M Elctrn. Molding Corp., Woonsocket, R.I. *

D Eby Co., Hugh H., Philadelphia, Pa.
D Elco, Willow Grove, Pa.
D Javex Elctrns., Cherry Valley, Cal.
Methode Elctrns., Chicago, Ill.
D Robinson-Nugent, New Albany, Ind.
D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
D Textool Products, Irving, Tex.
D Workman Electronic Prods., Sarasota, Fla.

Sockets, Diode

Berg Electronics, New Cumberland, Pa.
p. 2-645,651

Connector Corp., Chicago, Ill. p. 2-657,659,660

D Sealectro Corp., Mamaroneck, N.Y. p. 2-806

D TRW/Cinch Connectors, Elk Grove Village, Ill.
p. 2-896,897

D Augat Inc., Attleboro, Mass *

Vector Electronic Co., Sylmar, Cal. *

D Circuit Assembly Corp., Costa Mesa, Ca.
M Jettron Prods., Hanover, N.J.
D Loranger Mfg. Corp., Warren, Pa.
Methode Elctrns., Chicago, Ill.
D N T-T/Peerless, Leominster, Mass.
Robinson-Nugent, New Albany, Ind.
Stanford Applied Engineering, Santa Clara, Cal.

Stanford Applied Engrg., Santa Ana, Cal.
 D Textool Products, Irving, Tex.
 M U.S. Terminals, Cincinnati, Ohio
 D Wells Electronics, South Bend, Ind.

Sockets, DIP and DIL

Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
D Arco Electronics Inc., Great Neck, N.Y. p. 2-619
D Augat Inc., Attleboro, Mass. p. 2-638,639
Connector Corp., Chicago, Ill. p. 2-659,660
D Continental Specialties, New Haven, Conn. p. 2-348-351
Electrn. Molding Corp., Woonsocket, R.I. p. 2-676-679
DM Industrial Elctrn. Engrs., Van Nuys, Cal. p. 2-1161
D Molex Inc., Lisle, Ill. p. 2-1068,1069
Qualco, Los Altos, Cal. p. 2-790
D Spectra-Strip Corp., Garden Grove, Cal. p. 2-2057

DM Texas Instruments, Attleboro, Mass. p. 2-1032,1033
D Thermalloy, Dallas, Tex. p. 1-1880
D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
D Vector Electronic Co., Sylmar, Cal. p. 2-1060
D Vero Electronics, Hauppauge, N.Y. p. 2-366
D GC Electronics, Rockford, Ill. *
D Smith Inc., Herman H., Brooklyn, N.Y. *
D 3M Company, St. Paul, Minn. *
Amp Inc., Harrisburg, Pa.
D AMP Special Industries, Valley Forge, Pa.
Aries Electronics, Frenchtown, N.J.
D Burndy Corporation, Norwalk, Conn.
D Cambridge Thermionic Corp., Cambridge, Mass.
D Circuit Assembly Corp., Costa Mesa, Ca.
D Circuit-Stik, Torrance, Cal.
DM Dynatech Corp., Santa Ana, Cal.
DM Excel Products Co., New Brunswick, N.J.
Gary Mfg., New Brunswick, N.J.
Gibson/Egan Co., Arcadia, Calif.
Industrial Electronic Hardware, New York, N.Y.
Jermyn, San Francisco, Cal.
D Jolo Industries, Garden Grove, Cal.
D Loranger Mfg. Corp., Warren, Pa.
Methode Elctns., Chicago, Ill.
D Molex Products, Downers Grove, Ill.
Precision Dynamics Corp., Burbank, Cal.
Robinson-Nugent, New Albany, Ind.
Scanbe Canoga Industries, El Monte, Cal.
Stanford Applied Engineering, Santa Clara, Cal.
Stanford Applied Engrg., Santa Ana, Cal.
Teradyne, Boston, Mass.
DM Texas Instruments, Attleboro, Mass.
D Textool Products, Irving, Tex.
U.S. Terminals, Cincinnati, Ohio
D Wells Electronics, South Bend, Ind.
Western Electronic Systems, Palo Alto, Cal.

Sockets, Integrated Circuit

D Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
D Arco Electronics Inc., Great Neck, N.Y. p. 2-619
D Augat Inc., Attleboro, Mass. p. 2-638,639
Berg Electronics, New Cumberland, Pa. p. 2-645,651
Connector Corp., Chicago, Ill. p. 2-659,660
D Continental Specialties, New Haven, Conn. p. 2-348-351
Electrn. Molding Corp., Woonsocket, R.I. p. 2-676-679
D ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
D Molex Inc., Lisle, Ill. p. 2-1068,1069
D Sealectro Corp., Mamaroneck, N.Y. p. 2-806
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-854
D Teledyne Relays, Hawthorne, Cal. p. 1-1819
DM Texas Instruments, Attleboro, Mass. p. 2-1032,1033
D Thermalloy, Dallas, Tex. p. 1-1880
D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
Vector Electronic Co., Sylmar, Cal. p. 2-1060
D Waldom Electronics, Chicago, Ill. p. 1-1070-1074
D Continental Connector Corp., Woodside, N.Y. *
D GC Electronics, Rockford, Ill. *
D Omni Spectra, Farmington, Mich. *
3M Company, St. Paul, Minn. *
Amp Inc., Harrisburg, Pa.
D AMP Special Industries, Valley Forge, Pa.
Aries Electronics, Frenchtown, N.J.

D Burndy Corporation, Norwalk, Conn.
D Circuit-Stik, Torrance, Cal.
DM Dynatech Corp., Santa Ana, Cal.
E & L Instruments, Derby, Conn.
DM Excel Products Co., New Brunswick, N.J.
Gary Mfg., New Brunswick, N.J.
Gibson/Egan Co., Arcadia, Calif.
D IFE Div., Rumford, R.I.
Industrial Electronic Hardware, New York, N.Y.
Jermyn, San Francisco, Cal.
M Jettron Prods., Hanover, N.J.
D Jolo Industries, Garden Grove, Cal.
D Loranger Mfg. Corp., Warren, Pa.
Master Elctn. Controls, Santa Monica, Cal.
Methode Elctns., Chicago, Ill.
D Molex Products, Downers Grove, Ill.
Mupac Corp., Brockton, Mass.
National Connector, Minneapolis, Minn.
Precision Dynamics Corp., Burbank, Cal.
Pylon Co., Attleboro, Mass.
D Robinson-Nugent, New Albany, Ind.
Scanbe Canoga Industries, El Monte, Cal.
D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
Stanford Applied Engineering, Santa Clara, Cal.
Stanford Applied Engrg., Santa Ana, Cal.
Teradyne Comps., Lowell, Mass.
Texas Instruments, Attleboro, Mass.
D Textool Products, Irving, Tex.
U.S. Terminals, Cincinnati, Ohio
D Wells Electronics, South Bend, Ind.

Sockets, Lamp & Lamp Assemblies

Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
D Arcoelectric Switch Corp., No. Hollywood, Cal. p. 2-1125
D Bivar, Santa Ana, Cal. p. 2-1266
D Chicago Switch, Chicago, Ill. p. 1-1988
Connector Corp., Chicago, Ill. p. 2-659,660
D Dialight, Brooklyn, N.Y. p. 2-1138
Display Devices, Encinitas, Cal. p. 2-1142
D GTE Sylvania Inc., Hillsboro, N.H. p. 2-1147
D IEE/Schadow, Eden Prairie, Minn. p. 1-2070,2072
D Industrial Devices, Edgewater, N.J. p. 2-1171
Minfo-Lite Corp., Corona, N.Y. p. 2-1159
D Inter-Market, Glenview, Ill. p. 2-1173
D Leecraft Mfg. Co., Long Island City, N.Y. p. 2-1182,1183
DM Littelfuse, Des Plaines, Ill. p. 2-1180,1181
LVC Inds. Inc., Flushing, N.Y. p. 2-1137
D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1247
Qualco, Los Altos, Cal. p. 2-790
M Rowe Industries, Toledo, Ohio p. 2-796,797
D Sealectro Corp., Mamaroneck, N.Y. p. 2-806
D Sloan Company, Sun Valley, Cal. p. 2-1190-1192,1195-1197
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-867
Stacoswitch, Costa Mesa, Cal. p. 2-1114,1115
D ALCO Electronic Prods., North Andover, Mass. *
D Augat Inc., Attleboro, Mass. *
D Christie Elec., Los Angeles, Cal. *
Electrn. Molding Corp., Woonsocket, R.I. *
D GC Electronics, Rockford, Ill. *
D Industrial Elctn. Engrs., Van Nuys, Cal. *
Shigoto Inds., Ltd., New York, N.Y. *
Trim, Libertyville, Ill. *
Aerolite Elctn. Corp., Union City, N.J.
D American Ultraviolet, Chatham, N.J.
DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.
Auto-Swage Products Inc., Shelton, Conn.
DM Chicago Miniature Lamp/Drake, Chicago, Ill.
Circon Corp., Santa Barbara, Cal.
D Circuit Assembly Corp., Costa Mesa, Ca.
D Clare-Pendar, Post Falls, Idaho
D Compu-Lite Corp., Irvine, Cal.
DM Control Switch, Folcroft, Pa.
Data Display Products, Los Angeles, Cal.
M Drake Mfg. Co., Harwood Heights, Ill.
Gary Mfg., New Brunswick, N.J.
D General Illumination, Roseville, Minn.
DM Genisco Technology Corp., Compton, Cal.
D GTE Sylvania Inc., Danvers, Mass.
Illumination Industries, Sunnyvale, Cal.
Industrial Electronic Hardware, New York, N.Y.
Korry Mfg. Co., Seattle, Wash.
D Kulka Elec. Corp., Mt. Vernon, N.Y.
Leviton Mfg. Co., Little Neck, N.Y.
D Gulton Industries, Plano, Tex
D Molex Products, Downers Grove, Ill.
D Oshino Electric Lamp Works, Ltd., Shinagawa-ku, Tokyo, Japan

D Philmore Mfg. Co. Inc., Inwood, N.Y.
Scientifico Scientific Components Co., Newport Beach, Cal.
D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
Sierra Elec., Gardena, Calif.
Varian Electron Tube & Device Grp., San Carlos, Cal.
D Workman Electronic Prods., Sarasota, Fla.

Sockets, Miniature & Subminiature—See Sockets, Diode; DIP & DIL; IC; Transistor

Sockets, Relay

D American Zettler, Irvine, Cal. p. 1-1574,1576
D Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
Berg Electronics, New Cumberland, Pa. p. 2-645,651
D Cläre & Co., C.P., Chicago, Ill. p. 1-1607,1608,1610
Connector Corp., Chicago, Ill. p. 2-657-659
D Curtis Industries Inc., Milwaukee, Wisc. p. 2-666,667
D Gould Inc., Plantsville, Conn. p. 1-1686
Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1093
D Magnecraft Elec. Co., Chicago, Ill. p. 1-1769,1775
D Potter & Brumfield, Princeton, Ind. p. 1-1803
Qualco, Los Altos, Cal. p. 2-790
RD/Reed Devices, Glen Ellyn, Ill. p. 2-792,793
Schrack Electrical Sales Corp., New York, N.Y. p. 1-1812
D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
D Waldom Electronics, Chicago, Ill. p. 1-1070-1074
D Aemco Div., Mankato, Minn. *
D Augat Inc., Attleboro, Mass. *
Computer Comps., Jamaica, N.Y. *
D Continental Connector Corp., Woodside, N.Y. *
D Diversified Electronics Inc., Evansville, Ind. *
D GC Electronics, Rockford, Ill. *
D Leach Corp., Los Angeles, Cal. *
D Smith Inc., Herman H., Brooklyn, N.Y. *
Amp Inc., Harrisburg, Pa.
AMP Special Industries, Valley Forge, Pa.
M Arnel Electronics, N. Bergen, N.J.
M Branson Corp., Denville, N.J.
D Burndy Corporation, Norwalk, Conn.
Cardinal Control Co., Kensington, Conn.
D Custom Connector Corp., Cleveland, Ohio
M DAN-L Inc., E. Northport, N.Y.
D Eby Co., Hugh H., Philadelphia, Pa.
D Elco, Willow Grove, Pa.
Gary Mfg., New Brunswick, N.J.
Guardian Electric Co., Chicago, Ill.
Industrial Electronic Hardware, New York, N.Y.
ITT Semiconductors-Capacitors, No. Andover, Mass.
M Jettron Prods., Hanover, N.J.
Loranger Mfg. Corp., Warren, Pa.
Master Elctn. Controls, Santa Monica, Cal.
Methode Elctns., Chicago, Ill.
D Molex Products, Downers Grove, Ill.
PSG Industries Inc., Perkasie, Pa.
D Robinson-Nugent, New Albany, Ind.
D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
D Sigma Instruments, Baintree, Mass.
Solatron Enterprises, Inglewood, Calif.
Struthers-Dunn, Pitman, N.J.
D Textool Products, Irving, Tex.

Sockets, SCR

Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill. p. 2-460,461
Connector Corp., Chicago, Ill. p. 2-659,660
D Thermalloy, Dallas, Tex. p. 1-1880
Gary Mfg., New Brunswick, N.J.
Industrial Electronic Hardware, New York, N.Y.
Jermyn, San Francisco, Cal.
M Jettron Prods., Hanover, N.J.
D Loranger Mfg. Corp., Warren, Pa.
Master Elctn. Controls, Santa Monica, Cal.
D Robinson-Nugent, New Albany, Ind.
D Textool Products, Irving, Tex.

Sockets, Test

D Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
Berg Electronics, New Cumberland, Pa. p. 2-645,651
Electrn. Molding Corp., Woonsocket, R.I. p. 2-676-679
D Positronic Inds., Springfield, Mo. p. 2-789
Qualco, Los Altos, Cal. p. 2-790

- Sealectro Corp., Mamaroneck, N.Y.**
 p. 2-804,805
D Thermalloy, Dallas, Tex p. 1-1880
D TRW/Cinch Connectors, Elk Grove Village, Ill.
 p. 2-896,897
D Augat Inc., Attleboro, Mass *
Continental Connector Corp., Woodside, N.Y. *
General Radio Co., Concord, Mass. *
D ITT Pomona Electronics Div., Pomona, Cal. *
D Smith Inc., Herman H., Brooklyn, N.Y. *
 Abacus Elctns. Corp., Dobbs Ferry, N.Y.
 Gary Mfg., New Brunswick, N.J.
 Hypertronics Corp., Stow, Mass.
D IFE Div., Rumford, R.I.
 Jermy, San Francisco, Cal.
M Jettron Prods., Hanover, N.J.
D Loranger Mfg. Corp., Warren, Pa.
 Master Elctn. Controls, Santa Monica, Cal.
D National Connector, Minneapolis, Minn.
 Pylon Co., Attleboro, Mass.
D Robinson-Nugent, New Albany, Ind.
D Rye Inds., Mamaroneck, N.Y. *
 Solatron Enterprises, Inglewood, Calif.
 Stanford Applied Engrg., Santa Ana, Cal.
D Textool Products, Irving, Tex.
 U.S. Terminals, Cincinnati, Ohio
D Wells Electronics, South Bend, Ind.
D Workman Electronic Prods., Sarasota, Fla.
- Sockets, Transistor**
D Amatam Electronic Hardware, New Haven, Conn. p. 2-457
Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
D Amphenol Sales Div., Broadview, Ill.
 p. 2-460,461
D Augat Inc., Attleboro, Mass p. 2-639
Berg Electronics, New Cumberland, Pa.
 p. 2-645,651
Connector Corp., Chicago, Ill. p. 2-659,660
Elctn. Molding Corp., Woonsocket, R.I.
 p. 2-676-679
Qualco, Los Altos, Cal. p. 2-790
Sealectro Corp., Mamaroneck, N.Y. p. 2-806
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-854
D Thermalloy, Dallas, Tex p. 1-1880
D TRW/Cinch Connectors, Elk Grove Village, Ill.
 p. 2-896,897
D UID Electronics Div., Hollywood, Fla. p. 1-2306
D Waldom Electronics, Chicago, Ill.
 p. 1-1070-1074
D Grayhill Inc., LaGrange, Ill. *
D ITT Pomona Electronics Div., Pomona, Cal. *
DM Keystone Elctns. Corp., New York, N.Y. *
D Vector Electronic Co., Sylmar, Cal. *
 Accessories for Electronics, Bayside, N.Y.
 Auto-Swage Products Inc., Shelton, Conn.
 Delbert Blinn Co., Pomona, Calif.
D Eby Co., Hugh H., Philadelphia, Pa.
D Elco, Willow Grove, Pa.
 Gary Mfg., New Brunswick, N.J.
 Industrial Electronic Hardware, New York, N.Y.
 Jermy, San Francisco, Cal.
M Jettron Prods., Hanover, N.J.
D Loranger Mfg. Corp., Warren, Pa.
D Malco, A Microdot Co., Chicago, Ill.
 Methode Elctns., Chicago, Ill.
M Moldtronics, Downers Grove, Ill.
 National Connector, Minneapolis, Minn.
D Oneida Electronics Mfg., Meadville, Pa.
D Robinson-Nugent, New Albany, Ind.
D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
 Stanford Applied Engrg., Santa Ana, Cal.
D Textool Products, Irving, Tex.
 M U.S. Terminals, Cincinnati, Ohio
D Wells Electronics, South Bend, Ind.
D Workman Electronic Prods., Sarasota, Fla.

Sockets, Tube, Vibrator

- D Amphenol Ind'l. Div., Chicago, Ill.** p. 2-460,461
D Amphenol Sales Div., Broadview, Ill.
 p. 2-460,461
Connector Corp., Chicago, Ill. p. 2-657-660
D RDI/Reed Devices, Glen Ellyn, Ill. p. 2-792,793
DM TRW/Cinch Connectors, Elk Grove Village, Ill.
 p. 2-896,897
UID Electronics Div., Hollywood, Fla. p. 1-2306
D Waldom Electronics, Chicago, Ill.
 p. 1-1070-1074
Berg Electronics, New Cumberland, Pa. *
D ITT Pomona Electronics Div., Pomona, Cal. *
Millen Mfg. Co. Inc., James, Malden, Mass. *
Shigoto Inds., Ltd., New York, N.Y. *
Vector Electronic Co., Sylmar, Cal. *
DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.
D Eby Co., Hugh H., Philadelphia, Pa.

- D Eimac, San Carlos, Calif.**
D Elco, Willow Grove, Pa.
 Gary Mfg., New Brunswick, N.J.
M Jettron Prods., Hanover, N.J.
D Malco, A Microdot Co., Chicago, Ill.
 Master Elctn. Controls, Santa Monica, Cal.
 Methode Elctns., Chicago, Ill.
D Oneida Electronics Mfg., Meadville, Pa.
RCA Electronic Comps., Harrison, N.J.
D Rye Inds., Mamaroneck, N.Y. *
D Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan
D Varian Electron Tube & Device Grp., San Carlos, Cal.
D Workman Electronic Prods., Sarasota, Fla.

Solar Cells—See Volume 1**Solder (All Types)**

- Wall-Lenk Mfg. Co., Kinston, N.C.**
 p. 2-1718,1719
D GC Electronics, Rockford, Ill. *
 Adtool Corp., Montreal W P Q, Can.
D Alpha Metals, Jersey City, N.J.
 American Electric Cable Co., Holyoke, Mass.
 Bow Solder Products, Newark, N.J.
D Caig Labs., Westbury, N.Y.
 Chemetron Corp., Chicago, Ill.
 Chemical Etching Equip. & Supply, Alexandria, Va.
D Chemtronics, Hauppauge, N.Y.
D Circon Corp., Santa Barbara, Cal.
DM Duntun, M.W. Co., Providence, R.I.
 E.I. DuPont de Nemours & Co., Wilmington, Del.
 Electro Mats. Corp. Amer., Mamaroneck, N.Y.
D Electro-Science Labs., Pennsauken, N.J.
 Engelhard Minerals & Chem., Murray Hill, N.J.
DM Excel Products Co., New Brunswick, N.J.
D Glenmarc Mfg. Inc., Northbrook, Ill.
 Jensen Tools & Alloys, Phoenix, Ariz.
DM Kenco Alloy & Chemical Co., Addison, Ill.
DM Kester Solder Div., Chicago, Ill.
M MacDonald & Co., Glendale, Calif.
 Mann, Henry Inc., Huntingdon Valley, Pa.
DM Multicore Solders, Westbury, N.Y.
 National Camera Inc., Englewood, Colo.
 NL Industries, New York, N.Y.
 Nucleus Corp., Madison Hgts., Mich.
 Plessey Inc., Melville, N.Y.
D Workman Electronic Prods., Sarasota, Fla.

Solder Lugs—See Terminals, Lug (All Types)**Solder Pots & Baths**

- D Hexacon Elec. Co., Roselle Park, N.J.** *
M Acme Elec. Heating Corp., Hialeah, Fla.
D Adtool Corp., Montreal W P Q, Can.
D Caig Labs., Westbury, N.Y.
 Chemical Etching Equip. & Supply, Alexandria, Va.
 Electrovert, Mt. Vernon, N.Y.
D ESICO, Deep River, Conn.
D Hollis Engrg., Nashua, N.H.
M MacDonald & Co., Glendale, Calif.
 Mann, Henry Inc., Huntingdon Valley, Pa.
DM Precision Elec. Co., Kezar Falls, Me.
 Raychem Corp., Menlo Park, Cal.
D Techni-Tool, Plymouth Meeting, Pa.

Soldering Accessories

- D Edsyn, Van Nuys, Cal.** p. 2-1694,1695
D GC Electronics, Rockford, Ill. p. 2-1696
General Elec. Co., Schenectady, N.Y.
 p. 2-1698,1699
D Hexacon Elec. Co., Roselle Park, N.J.
 p. 2-1703-1705
Wall-Lenk Mfg. Co., Kinston, N.C.
 p. 2-1718,1719
Jonard Industries Corp., Tuckahoe, N.Y. *
D Adtool Corp., Montreal W P Q, Can.
 Air-O-Tronics Prods., Morrisville, N.Y.
M Air-Vac Engrg. Co., Milford, Conn.
 Alpha Metals, Jersey City, N.J.
D American Elec. Heater, Detroit, Mich.
 M M Newman Corp., Marblehead, Mass.
D Caig Labs., Westbury, N.Y.
 Chemetron Corp., Chicago, Ill.
 Christiansen Radio Inc., Laguna Beach, Cal.
D Circon Corp., Santa Barbara, Cal.
 Enterprise Development Corp., Indianapolis, Ind.
D Erikson Specialized Tool Co., Pico-Rivera, Cal.
D ESICO, Deep River, Conn.
 Janel, Stirling, N.J.
 Jensen Tools & Alloys, Phoenix, Ariz.
 Kahle Engrg. Co., Union City, N.J.
D Kenco Alloy & Chemical Co., Addison, Ill.
M MacDonald & Co., Glendale, Calif.
 Mann, Henry Inc., Huntingdon Valley, Pa.
D Hunter Tools, El Monte, Calif
D Matrix Engineering Corp., Gardena, Cal.

- D Miller, L.C. Co., Monterey Park, Calif.**
 Motorola Comms. Div., Schaumburg, Ill.
 National Camera Inc., Englewood, Colo.
DM Precision Elec. Co., Kezar Falls, Me.
D Schurman Products Inc., E. Weymouth, Mass.
DM Solder Removal Co., Covina, Cal.
D Techni-Tool, Plymouth Meeting, Pa.
D Telvac Instr. Co., Van Nuys, Cal.
 Tescom Instr. Div., Minneapolis, Minn.
 Titchener, E.H. & Co., Binghamton, N.Y.
D UNGAR, Div., Compton, Cal.
 Union Carbide Corp., New York, N.Y.
D Wahl Clipper Corp., Sterling, Ill.

Soldering Equip., Induction Heating—See Volume 1**Soldering Equip., Printed Circuit—See Volume 1****Soldering Equip., Resistance—See Volume 1****Soldering Systems, Temperature Controlled—See Volume 1****Soldering Equip., Ultrasonic—See Volume 1****Soldering Guns, Irons & Desoldering Tools**

- D Edsyn, Van Nuys, Cal.** p. 2-1694,1695
D GC Electronics, Rockford, Ill. p. 2-1696
General Elec. Co., Schenectady, N.Y.
 p. 2-1698,1699
D Hexacon Elec. Co., Roselle Park, N.J.
 p. 2-1700-1705
D Wall-Lenk Mfg. Co., Kinston, N.C.
 p. 2-1718,1719
Heath Co., Benton Harbor, Mich. *
Jonard Industries Corp., Tuckahoe, N.Y. *
D Adtool Corp., Montreal W P Q, Can.
M Air-Vac Engrg. Co., Milford, Conn.
D American Elec. Heater, Detroit, Mich.
 M M Newman Corp., Marblehead, Mass.
 Chemetron Corp., Chicago, Ill.
D Circon Corp., Santa Barbara, Cal.
D Cooper Group, Apex, N.C.
DM Enterprise Development Corp., Indianapolis, Ind.
D ESICO, Deep River, Conn.
D Hollis Engrg., Nashua, N.H.
 Jensen Tools & Alloys, Phoenix, Ariz.
M MacDonald & Co., Glendale, Calif.
 Mann, Henry Inc., Huntingdon Valley, Pa.
D Hunter Tools, El Monte, Calif
 Motorola Comms. Div., Schaumburg, Ill.
 National Camera Inc., Englewood, Colo.
D Newman Corp., M. M., Marblehead, Mass.
D Nu-Concept Computer Systems, Colmar, Pa.
D O. K. Machine & Tool Corp., Bronx, N.Y.
 Pace Inc., Silver Spring, Md.
D Philmore Mfg. Co. Inc., Inwood, N.Y.
DM Precision Elec. Co., Kezar Falls, Me.
 Snap-On-Tools, Kenosha, Wisc.
D Solder Removal Co., Covina, Cal.
 Tescom Instr. Div., Minneapolis, Minn.
D UNGAR, Div., Compton, Cal.
 Union Carbide Corp., New York, N.Y.
D Wahl Clipper Corp., Sterling, Ill.
DM Wik-It Elctns. Corp., Sunnyvale, Cal.
D Wilco Sales, Mineola, N.Y.

Solenoids, Linear—See Volume 1**Solenoids, Proportional—See Volume 1****Solenoids, Rotary—See Volume 1****Solvents—See Cleaners & Solvents****Sound Absorbing Materials**

- Utah Electronic Div., Huntington, Ind.** ... p. 1-31
 Auburn Mfg., Middletown, Conn.
 Automation Devices, Fairview, Pa.
 Dow Chemical Co., Midland, Mich.
 E.I. DuPont de Nemours & Co., Wilmington, Del.
D Zippertubing Co., Los Angeles, Calif.

Sound Level Indicators—See Volume 1**Sound Recording Equip.—See Volume 1****Spacers**

- D Amatam Electronic Hardware, New Haven, Conn.** p. 2-1258
D Bivar, Santa Ana, Cal. p. 2-1259,1266
D Concord Elctns., New York, N.Y. p. 2-654,655

PRODUCT INDEX & DIRECTORY

Strips, Marker & Fanning

Jan Hardware Mfg. Co., Long Island City, N.Y.
p. 2-1094,1095

DM Keystone Elctns. Corp., New York, N.Y.
p. 2-714

D Positronic Inds., Springfield, Mo. p. 2-789

D Smith Inc., Herman H., Brooklyn, N.Y.
p. 2-859-863

D Waldom Electronics, Chicago, Ill.
p. 2-1262-1266

Zero Mfg. Co., Burbank, Cal. p. 1-106-109

M Elctn. Molding Corp., Woonsocket, R.I. *

D GC Electronics, Rockford, Ill. *

D Industrial Mica Div., Englewood, N.J. *

Abacus Elctns. Corp., Dobbs Ferry, N.Y.

D Accessories for Electronics, Bayside, N.Y.

Auburn Mfg., Middletown, Conn.

Auto-Swage Products Inc., Shelton, Conn.

M Avid Electronics Corp., Baldwin, Pl., N.Y.

Birnback Co., Freeport, N.Y.

D Cambridge Thermionic Corp., Cambridge, Mass.

Corning Glass Works, Television Prods. Div., Corning, N.Y.

D D-Cemco, Burbank, Calif.

Delbert Blinn Co., Pomona, Calif.

D Dynaloy, Hanover, N.J.

Edal Inds., E. Haven, Conn.

General Mfg. Co., Glendale, Calif.

D ICO/Rally Corp., Palo Alto, Cal.

Newman Corp., M. M., Marblehead, Mass.

D N T-T/Peerless, Leominster, Mass.

M PIC Design Division, Ridgefield, Conn.

D Plessey Ceramic Div., Frenchtown, N.J.

D Precision Metal Prods. Co., Stoneham, Mass.

Precision Paper Tube Co., Wheeling, Ill.

M Preformed Line Products Co., Cleveland, Ohio

Resdel Corp., Rio Grande, N.J.

Sterling Instr., New Hyde Pk., NY

D Workman Electronic Prods., Sarasota, Fla.

Spaghetti—See Tubing, Spaghetti

Spark Gaps—See Volume 1

Speaker Systems—See Volume 1

Speakers, Explosion & Flame Proof—See Volume 1

Speakers, Horn—See Volume 1

Speakers, Intercom—See Volume 1

Speakers, Midrange—See Volume 1

Speakers, Musical Instrument—See Volume 1

Speakers, Paging—See Volume 1

Speakers, Pillow—See Volume 1

Speakers, Public Address—See Volume 1

Speakers, Replacement (Including Aircraft, Automotive & TV)—See Volume 1

Speakers, Submergence-Proof—See Volume 1

Speakers, Tweeter—See Volume 1

Speakers, Weatherproof—See Volume 1

Speakers, Woofer—See Volume 1

Spectrometers—See Volume 1

Speed Drives, Motor—See Volume 1

Spiral Wrap—See Tubing, Spiral Wrap

Splicers, Coaxial Cable

Amphenol RF Div., Danbury, Conn.

p. 2-460,461

M Rowe Industries, Toledo, Ohio p. 2-796,797

Jonard Industries Corp., Tuckahoe, N.Y. *

Amp Inc., Harrisburg, Pa.

Autosplice/Dv Gen Staple, New York City, N.Y.

D Blonder-Tongue Labs., Old Bridge, N.J.

D Burndy Corporation, Norwalk, Conn.

Cablewave Systems Inc., North Haven, Conn.

Communications Technology Corp., Los Angeles, Cal.

Excel Products Co., New Brunswick, N.J.

D Finney Co., Bedford, Ohio

D Javex Elctns., Cherry Valley, Cal.

D Thomas & Betts Co., Elizabeth, N.J.

D Workman Electronic Prods., Sarasota, Fla.

Splices, wire (Including, Butt & Cap Types)

Allied Systems Corp., Greensboro, N.C.

p. 2-458,459

D Amatom Electronic Hardware, New Haven, Conn.

ETC Terminal Products, Solon, Ohio

p. 2-695-706

D Panduit Corp., Tinley Park, Ill. p. 2-2048-2051

M Rowe Industries, Toledo, Ohio p. 2-796,797

D Waldom Electronics, Chicago, Ill.

p. 1-1070-1074

Jonard Industries Corp., Tuckahoe, N.Y. *

Accesso-Wire, Garnersville, N.Y.

Amp Inc., Harrisburg, Pa.

D AMP Special Industries, Valley Forge, Pa.

Autosplice/Dv Gen Staple, New York City, N.Y.

Birnback Co., Freeport, N.Y.

D Burndy Corporation, Norwalk, Conn.

Communications Technology Corp., Los Angeles, Cal.

Excel Products Co., New Brunswick, N.J.

Hoffman Industrial Prods., Farmingdale, N.Y.

M I-T-E Electrical Components Grp., E. Farmingdale, N.Y.

D Ideal Industries Inc., Sycamore, Ill.

D Preformed Line Products Co., Cleveland, Ohio

Sjoberg, C. & Son, Cranston, R.I.

D Thomas & Betts Co., Elizabeth, N.J.

D Workman Electronic Prods., Sarasota, Fla.

D Zippertubing Co., Los Angeles, Calif.

Splicing Equipment, Magnetic Tape—See Volume 1

Spoolers, Punched Tape—See Volume 1

Springs (All Types)

Instrument Specialties, Little Falls, N.J.

p. 2-1226,1229

D GC Electronics, Rockford, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

Acme Model Engrg. Co., Ridgefield, N.J.

M American Chemical Etching, Pacoima, Cal.

M Ametek, Hunter Spring Division, Hatfield, Pa.

Associated Spring Corp., Bristol, Conn.

Auto-Swage Products Inc., Shelton, Conn.

Braun Co., St. Petersburg, Fla.

D Chatillon John & Sons, Kew Gardens, N.Y.

D Eaton Corporation, Cleveland, Ohio

Engelhard Minerals & Chem., Murray Hill, N.J.

Helical Prods. Co., Santa Maria, Cal.

D Helix Spring Corp., Long Island City, N.Y.

M PIC Design Division, Ridgefield, Conn.

M Templeman, D.R. Co., Plainville, Conn.

Stabilizers, Current—See Volume 1

Stabilizers, Line Impedance—See Volume 1

Stablizers, Voltage—See Volume 1

Stablizers, Voltage/Current, Automatic—See Volume 1

Stalos (Stabilized Local Oscillators)—See Oscillators, Microwave

Standards, Atomic Beam—See Volume 1

Standards, Capacitance—See Volume 1

Standards, Current—See Volume 1

Standards, Delay Line—See Volume 1

Standards, Frequency—See Volume 1

Standards, Inductance—See Volume 1

Standards, Noise—See Volume 1

Standards, Phase—See Volume 1

Standards, Resistance—See Volume 1

Standards, Synchro & Resolver—See Volume 1

Standards, Temperature—See Volume 1

Standards, Time—See Volume 1

Standards, Voltage—See Volume 1

Standards, Voltage Ratio—See Volume 1

Standoffs—See Bushings, Glass, Plastic, Metal, etc.

Stands, Instruments—See Volume 1

Stators, Motor & Generator—See Volume 1

Stools—See Volume 1

Strain Reliefs, Cable & Wire

D Amatom Electronic Hardware, New Haven, Conn.

p. 2-1258

Amphenol Cadre Div., Endicott, N.Y.

p. 2-460,461

Amphenol Connector Div., Broadview, Ill.

p. 2-460,461

Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461

D Amphenol Sales Div., Broadview, Ill.

p. 2-460,461

DM Panduit Corp., Tinley Park, Ill. p. 2-2048-2051

M Rowe Industries, Toledo, Ohio p. 2-796,797

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-878

D GC Electronics, Rockford, Ill. *

D Waldom Electronics, Chicago, Ill. *

DM Amrad Corporation, Paris, Tex.

D Ansley Elctns. Corp., Los Angeles, Cal.

D Eaton Corporation, Cleveland, Ohio

D Heyman Mfg. Co., Kenilworth, N.J.

I-T-E Electrical Components Grp., E. Farmingdale, N.Y.

D ICO/Rally Corp., Palo Alto, Cal.

Newman Corp., M. M., Marblehead, Mass.

Sjoberg, C. & Son, Cranston, R.I.

D Thomas & Betts Co., Elizabeth, N.J.

DM Transcon Mfg. Co., Dallas, Tex.

D Zippertubing Co., Los Angeles, Calif.

Strip-Line Components, Microwave

Amphenol Cadre Div., Endicott, N.Y.

p. 2-460,461

Amphenol RF Div., Danbury, Conn.

p. 2-460,461

Arra Inc., Bay Shore, N.Y. p. 2-1278,1279

Bendix, Franklin, Ind. *

Systron-Donner Microwave Div., Van Nuys, Cal. *

3M Company, St. Paul, Minn. *

M Airtrol, Morris Plains, N.J.

M American Chemical Etching, Pacoima, Cal.

M American Microwave Inds., Waltham, Mass.

DM Anaren Microwave, Syracuse, N.Y.

Coaxial Dynamics, Cleveland, Ohio

Dynalab Corp., Van Nuys, Cal.

E & M Laboratories, Westlake Village, Cal.

Environmental Communications Inc., Costa Mesa, Cal.

HRB-Singer, State College, Pa.

Hughes Aircraft Co., Culver City, Cal.

M Lorch Elctns. Corp., Englewood, N.J.

M Lorch Devices Inc., Englewood, N.J.

M Merrimac Inds., West Caldwell, N.J.

Metavac, Flushing, N.Y.

M Microlab/FXR, Livingston, N.J.

Microwave Assocs., Burlington, Mass.

Microwave Prods., Chatsworth, Cal.

D Modpak, Waltham, Mass.

Narda Microwave Corp., Plainview, N.Y.

M Norsal Industries, Brentwood, N.Y.

M Premier Microwave, Port Chester, N.Y.

DM Solitron/Microwave, Port Salerno, Fla.

M Technical Research & Mfg., Manchester, N.H.

Varian Assocs., Palo Alto, Cal.

Varian Assoc., Beverly, Mass

Varian Electron Tube & Device Grp., San Carlos, Cal.

Varian Solid State East Beverly Div., Beverly, Mass.

Strips, Ground—See Volume 1

Strips, Marker & Fanning

D ETC Terminal Products, Solon, Ohio

p. 2-695-706

D Panduit Corp., Tinley Park, Ill. p. 2-2048-2051

D TRW/Cinch Connectors, Elk Grove Village, Ill.

p. 2-896,897

Vernitron Elec. Comps., Laconia, N.H.

p. 2-1064

Anchor Plastics, Long Island City, N.Y.

D Electrovert, Mt. Vernon, N.Y.

Hathaway Industries Inc., Tulsa, Okla.

M International Identifications, Timonium, Md.

DM Kulka Elec. Corp., Mt. Vernon, N.Y.

D Mechanical Engraving Co., Bronx, N.Y.

D Thomas & Betts Co., Elizabeth, N.J.

D Zippertubing Co., Los Angeles, Calif.

Stroboscopes—See Lights, Stroboscopic Source

Substrates, Ceramic

Substrates, Ceramic

Frequency Elctns., New Hyde Pk., N.Y.

p. 1-323

3M Company, St. Paul, Minn.

p. 2-1034-1038, 1040-1055

M Analog Devices, Norwood, Mass. *

General Elec. Co., Schenectady, N.Y. *

Accumet Engineering Corp., Hudson, Mass.

Advance Ross Elctns. Corp., Chicago, Ill.

American Lava Corp., Chattanooga, Tenn.

D Aremco Prods., Ossining, N.Y.

Atomergic Chemetals Co., Carle Place, N.Y.

D Centralab, Milwaukee, Wisc.

Coors Porcelain Co., Golden, Colo.

Corning Glass Works, Corning, N.Y.

Diamondite Products Div., Shreve, Ohio

D Electro-Science Labs., Pennsauken, N.J.

Environmental Communications Inc., Costa Mesa, Cal.

M Film Microelectronics, Burlington, Mass

Honeywell, Minneapolis, Minn.

Marlow Industries, Garland, Tex.

Materials Resch. Corp., Orangeburg, N.Y.

Mecco/Electra, Substrate Div., San Diego, Cal.

D Mecco/Electra, Morristown, N.J.

D Metalized Ceramics, Providence, R.I.

National Beryllia Corp., Haskell, N.J.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Plessey Inc., Melville, N.Y.

Radio Materials Co., Chicago, Ill.

M Spacetac, Bedford, Mass.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

Union Carbide Corp., New York, N.Y.

M Valpey Corp., Holliston, Mass.

Substrates, Flexible

3M Company, St. Paul, Minn.

p. 2-1034-1055

GTE Sylvania Inc., Newark, N.J.

Substrates, Glass

Frequency Elctns., New Hyde Pk., N.Y.

p. 1-323

3M Company, St. Paul, Minn.

p. 2-1034-1055

Accumet Engineering Corp., Hudson, Mass.

Amersil, Hillsdale, N.J.

M Atlantic Optical Moulding Co., Dudley, Mass.

Corning Glass Works, Corning, N.Y.

Corning Glass Works, Television Prods. Div., Corning, N.Y.

Galileo Electro-Optics Corp., Sturbridge, Mass.

D Metrologic Instruments, Bellmawr, N.J.

Triac Electronics, New York, N.Y.

Suppressors, Arc—See Volume 1

Suppressors, Noise

Hopkins Engrg., San Fernando, Cal.

p. 1-566, 567

M Transtector Systems, Monterey Park, Cal.

p. 1-2302, 2303

M All-Tronics Inc., Westbury, N.Y. *

D Ferroxcube Corp., Saugerties, N.Y. *

D GC Electronics, Rockford, Ill. *

D Smith Inc., Herman H., Brooklyn, N.Y. *

D Sprague Products Co., No. Adams, Mass. *

Codi Corporation, Fair Lawn, N.J.

M DynaMagnetic Engrg., Santa Ana, Cal.

Estes Engrg. Co., Port Angeles, Wash.

M Genisco Tech. Corp., Compton, Cal.

Maury Microwave Corp., Cucamonga, Calif.

Narda Microwave Corp., Plainview, N.Y.

M Rtron Corp., Skokie, Ill.

Sprague Elec. Co., No. Adams, Mass.

Standard Condenser Corp., Chicago, Ill.

Stettner-Trush Inc., Cazenovia, N.Y.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

Weinschel Engrg. Co., Gaithersburg, Md.

Suppressors, Transient Voltage (All Types)—See Volume 1

Switch Handle Boots—See Volume 1

Switch Hardware—See Volume 1

Switch Mounting Plates—See Volume 1

Switchboards—See Volume 1

Switches, Acceleration—See Volume 1

Switches, Air Flow Actuated—See Volume 1

Switches, Antenna Changeover—See Volume 1

Switches, Cam—See Volume 1

Switches, Centrifugal—See Volume 1

Switches, Coaxial Cable—See Volume 1

Switches, Coded—See Volume 1

Switches, Crossbar—See Volume 1

Switches, Data-Sampling—See Volume 1

Switches, Decade—See Volume 1

Switches, Feed-Through Cord—See Volume 1

Switches, Foot-Pedal, Mat, Ribbon, etc.—See Volume 1

Switches, High-Voltage (Over 250 Volts)—See Volume 1

Switches, Illuminated—See Volume 1

Switches, Inertia—See Volume 1

Switches, Joystick—See Volume 1

Switches, Keyboard—See Volume 1

Switches, Key-Lock—See Volume 1

Switches, Leaf—See Volume 1

Switches, Lever—See Volume 1

Switches, Limit—See Volume 1

Switches, Liquid Level/Pressure—See Volume 1

Switches, Lock—See Volume 1

Switches, Magnetic Reed—See Volume 1

Switches, Magnetically Actuated—See Volume 1

Switches, Matrix—See Volume 1

Switches, Mercury Displacement—See Volume 1

Switches, Mercury Wetted Contacts—See Volume 1

Switches, Microwave—See Volume 1

Switches, Motor-Driven—See Volume 1

Switches, Paddle Handle—See Volume 1

Switches, Photoelectric—See Volume 1

Switches, Portable Tool Handle—See Volume 1

Switches, Power—See Volume 1

Switches, Pressure—See Volume 1

Switches, Printed-Circuit Mountable—See Volume 1

Switches, Program—See Volume 1

Switches, Proximity—See Volume 1

Switches, Pushbutton (All Types)—See Volume 1

Switches, Reed—See Volume 1

Switches, Reed, Matrix—See Volume 1

Switches, R-F—See Volume 1

Switches, Rocker—See Volume 1

Switches, Rotary—See Volume 1

Switches, Slide—See Volume 1

Switches, Snap-Action (All Types)—See Volume 1

Switches, Solid State—See Volume 1

Switches, Stack—See Volume 1

Switches, Step Type—See Volume 1

Switches, Tap—See Volume 1

Switches, Thermally Actuated—See Volume 1

Switches, Thumbwheel—See Volume 1

Switches, Time Delay—See Volume 1

Switches, Timing—See Volume 1

Switches, Toggle—See Volume 1

Switches, Touch Actuated—See Volume 1

Switches, Transfer—See Volume 1

Switches, Vacuum—See Volume 1

Switches, Waveguide

DM Amphenol RF Div., Danbury, Conn.

p. 2-460, 461

Arra Inc., Bay Shore, N.Y. p. 2-1278, 1279

M General Microwave Corp., Farmingdale, NY *

Syston-Donner Microwave Div., Van Nuys, Cal. *

M Adams-Russell Co., Waltham, Mass.

AEL, Colmar, Pa.

Aircorn, Union, N.H.

M Airtron, Morris Plains, N.J.

Fifth Dimension, Princeton, N.J.

Hewlett-Packard Co., Palo Alto, Cal.

Maury Microwave Corp., Cucamonga, Calif.

M Microlab/FXR, Livingston, N.J.

Microwave Assocs., Burlington, Mass.

D Microwave Development Labs., Needham Hgts., Mass.

Norsal Industries, Brentwood, N.Y.

M Nurad, Baltimore, Md.

D PRD Elctns., Syosset, N.Y.

M Premier Microwave, Port Chester, N.Y.

Sivers Lab, Corona del Mar, Cal.

Special Microwave Devices Oper., Waltham, Mass.

M Teledyne Microwave, Mountain View, Cal.

Torr Labs., Los Angeles, Cal.

M Transco Prods., Venice, Cal.

D TRG., Woburn, Mass.

Varian Assocs., Palo Alto, Cal.

Varian Electron Tube & Device Grp., San Carlos, Cal.

Waveline, W. Caldwell, N.J.

Switchlights—See Volume 1

Synchro Transmitters, Solid-State—See Volume 1

Synchronizers, Klystron & BWO—See Volume 1

Synchros—See Volume 1

Synthesizers, Delay Line—See Volume 1

Synthesizers, Frequency—See Volume 1

Synthesizers, Waveform—See Volume 1

Tables, X-Y Axis—See Volume 1

Tachometers, Pulse—See Volume 1

Tachometers, Generator—See Volume 1

Tachometers, Stroboscopic—See Volume 1

Tape Decks—See Volume 1

Tape Duplicators—See Volume 1

Tape Recording Accessories—See Volume 1

Tape Search Equipment—See Volume 1

Tape Winders—See Volume 1

Tapes, Electrical Insulation

DM Markel, L. Frank & Sons, Norristown, Pa.

p. 2-1272, 1273

D Varflex Corp., Rome, N.Y. p. 2-1274, 1275

Automatic Die Cutting Mch, New York, N.Y.

Brand Dielectrics, N. Windham, Conn.

D Burlington Opers. Div., Burlington, Mass.

Cadillac Plastic & Chemical, Detroit, Mich.

M Chemplast, Wayne, N.J.

D Cole-Flex Corp., W. Babylon, N.Y.

Connecticut Hard Rubber Co., New Haven, Conn.

D Dixon Corp., Bristol, R.I.

General Elec., Schenectady, N.Y.

PRODUCT INDEX & DIRECTORY

Terminal Strips (Including Barrier Types)

D ICO/Rally Corp., Palo Alto, Cal.
Norelcom Electronics, Farmingdale, N.Y.
Okonite Co., Ramsey, N.J.
M Press-On Prods., Addison, Ill.
Russell Inds., Lynbrook, N.Y.
D Rye Inds., Mamaroneck, N.Y.
3M Co., St. Paul, Minn.
D United Mineral & Chem. Corp., New York, N.Y.
D Vidaire Electronics Mfg., Freeport, N.Y.

Tapes, Films & Foils, Pressure Sensitive

Sheldahl, Northfield, Minn. *

Applied Graphics, Glenwood Landing, N.Y.
Auburn Mfg., Middletown, Conn.
D Bishop Graphics, Chatsworth, Cal.
M Brady Co., W. H., Milwaukee, Wis.
Cadillac Plastic & Chemical, Detroit, Mich.
Centron Engrg., Torrance, Cal.
M Chemplast, Wayne, N.J.
D Circuit-Stik, Torrance, Cal.
D Cole-Flex Corp., W. Babylon, N.Y.
Connecticut Hard Rubber Co., New Haven, Conn.
D Fitchburg Coated Products, Scranton, Pa.
D Labelon Corp., Canandaigua, N.Y.
Norelcom Electronics, Farmingdale, N.Y.
M Press-On Prods., Addison, Ill.
Schweitzer, Peter J. Div., Lee, Mass.
3M Co., St. Paul, Minn.
D United Mineral & Chem. Corp., New York, N.Y.
D Zippertubing Co., Los Angeles, Calif.

Tapes, Heat Shrinkable—See Caps, Forms & Tapes, Heat Shrinkable

Tapes, Recording, Magnetic (All Types)—See Volume 1

Technical Books—See Volume 1

Tees, Coaxial

DM Amphenol RF Div., Danbury, Conn. p. 2-460,461

Arra Inc., Bay Shore, N.Y. p. 2-1278,1279

D Omni Spectra, Farmington, Mich. p. 2-724

M Rowe Industries, Toledo, Ohio p. 2-798,797

D Sealectro Corp., Mamaroneck, N.Y. p. 2-808

General Radio Co., Concord, Mass. *

Alford Mfg. Co., Winchester, Mass.

D Astrolab, Rahway, N.J.
Ava Elctns., Landsdowne, Pa
Cablewave Systems Inc., North Haven, Conn.
Maury Microwave Corp., Cucamonga, Calif.
M Microlab/FXR, Livingston, N.J.
Microwave Assocs., Burlington, Mass.
M Norsal Industries, Brentwood, N.Y.
M Premier Microwave, Port Chester, N.Y.
Rhode & Schwarz Sis., Fairfield, N.J.
DM Saxton Prods., Congers, N.Y.
D Sinclair Radio Labs., Concord, Ontario, Can. L4K 1B6
Telonic Altair, Laguna Beach, Calif.
Trompeter Electronics, Chatsworth, Cal.
Weinschel Engrg. Co., Gaithersburg, Md.

Tees, Waveguide

Amphenol RF Div., Danbury, Conn. p. 2-460,461

Arra Inc., Bay Shore, N.Y. p. 2-1278,1279

Syston-Donner Microwave Div., Van Nuys, Cal. *

Aircom, Union, N.H.
M Airtron, Morris Plains, N.J.
Hewlett-Packard Co., Palo Alto, Cal.
Maury Microwave Corp., Cucamonga, Calif.
M Microlab/FXR, Livingston, N.J.
Microwave Assocs., Burlington, Mass.
D Microwave Development Labs., Needham Hgts., Mass.
Polyflon Corp., New Rochelle, N.Y.
M Premier Microwave, Port Chester, N.Y.
Reeve Electronics, Chicago, Ill.
Sivers Lab, Corona del Mar, Cal.
D TRG., Woburn, Mass.
Waveline, W. Caldwell, N.J.

Telecommunication Systems & Equipment—See Volume 1

Telemetering Indicators—See Volume 1

Telemetering Systems, Electronic—See Volume 1

Telephone Channel Test & Simulator Equipment—Also see Testers, Telephone—See Volume 1

Telephone Handsets—See Volume 1

Telephone Systems, Telephones Sound Powered—See Volume 1

Teleprinters—See Volume 1

Teletypewriters & Equipment—See Volume 1

Television Systems & Equipment, Cable (CATV) & Master Antenna (MATV)—See Volume 1

Television Systems & Equipment Closed-Circuit—See Volume 1

Temperature Indicators—See Volume 1

Temperature Sensors—See Volume 1

Templates, Printed Circuit Design—See Volume 1

Tensile Testers—See Volume 1

Terminal Blocks (Including Barrier Types)

DM ADC Prods., Minneapolis, Minn. p. 2-449

Allied Systems Corp., Greensboro, N.C. p. 2-458,459

Berg Electronics, New Cumberland, Pa. p. 2-645,650

Connector Corp., Chicago, Ill. p. 2-658-660

D Continental Connector Corp., Woodside, N.Y. p. 2-663

D Continental Specialties, New Haven, Conn. p. 2-348-351

D Curtis Industries Inc., Milwaukee, Wisc. p. 2-666,667

M Elctn. Molding Corp., Woonsocket, R.I. p. 2-676-679

D ETC Terminal Products, Solon, Ohio p. 2-695-706

D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1247-1249

D National Tel-Tronics, Meadville, Pa. p. 2-721

D RDI/Reed Devices, Glen Ellyn, Ill. p. 2-794,795

Trimm, Libertyville, Ill. p. 2-895

D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Vernitron Elec. Comps., Laconia, N.H. p. 2-1063,1064

General Elec. Co., Schenectady, N.Y. *

Jan Hardware Mfg. Co., Long Island City, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

D Smith Inc., Herman H., Brooklyn, N.Y. *

Square D Co., Milwaukee, Wisc. *

Acesso-Wire, Garnersville, N.Y.

D AMP Special Industries, Valley Forge, Pa.

M Armel Electronics, N. Bergen, N.J.

D Burndy Corporation, Norwalk, Conn.

D Control Products Div., Union, N.J.

Doran Mfg. Co., Cincinnati, Ohio

D Electrovert, Mt. Vernon, N.Y.

DM Excel Products Co., New Brunswick, N.J.

GTE Automatic Electric Inc., Northlake, Ill.

Hathaway Industries Inc., Tulsa, Okla.

DM Kulka Elec. Corp., Mt. Vernon, N.Y.

M Laminated Fabricators, San Bruno, Calif.

Magnum Elec. Corp., Erie, Mich.

Methode Elctns., Chicago, Ill.

D Molex Products, Downers Grove, Ill.

Morey Corp., Downers Grove, Ill.

D N T-T/Pearless, Leominster, Mass.

D Teledyne Penn-Union Elec., Edinboro, Pa.

D Thomas & Betts Co., Elizabeth, N.J.

D Underwriters Safety, Chicago, Ill.

Universal Security Instrs., Baltimore, Md.

Terminal Boards

Airflyte Elctns. Co., Bayonne, N.J. p. 1-932,933

Allied Systems Corp., Greensboro, N.C. p. 2-458,459

D Continental Connector Corp., Woodside, N.Y. p. 2-663

D Continental Specialties, New Haven, Conn. p. 2-348-351

DM Keystone Elctns. Corp., New York, N.Y. p. 2-713

D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1247-1249

National Tel-Tronics, Meadville, Pa. p. 2-720,722,723

D RDI/Reed Devices, Glen Ellyn, Ill. p. 2-794,795

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-868

D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Vector Electronic Co., Sylmar, Cal. p. 2-358

D Daburn Electronics & Cable Corp., Bronx, N.Y. *

General Elec. Co., Schenectady, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

Vernitron Elec. Comps., Laconia, N.H. *

Advanced Circuitry, Springfield, Mo.

M Armel Electronics, N. Bergen, N.J.

M Avid Electronics Corp., Baldwin, Pl., N.Y.

Bell Co., Trussville, Ala.

D Christiansen Radio Inc., Laguna Beach, Cal.

M Comco Plastics, Richmond Hill, N.Y.

Data Numerics, Farmingdale, N.Y.

Doran Mfg. Co., Cincinnati, Ohio

E & L Instruments, Derby, Conn.

Elgin Elctns., Waterford, PA.

DM Excel Products Co., New Brunswick, N.J.

Hughes Aircraft Co., Culver City, Cal.

DM Kulka Elec. Corp., Mt. Vernon, N.Y.

Laminated Fabricators, San Bruno, Calif.

Magnum Elec. Corp., Erie, Mich.

Mechanical Engraving Co., Bronx, N.Y.

Morey Corp., Downers Grove, Ill.

Polyflon Corp., New Rochelle, N.Y.

Precision Metal Prods. Co., Stoneham, Mass.

DM Showa Musen Kogyo Co., Ltd., Shinagawa-Ku Tokyo, Japan

Stellux Industries, Rochester, N. Y.

M U.S. Terminals, Cincinnati, Ohio

D Workman Electronic Prods., Sarasota, Fla.

Terminal Equipment, Digital—See Volume 1

Terminal Strips (Including Barrier Types)

D Amatam Electronic Hardware, New Haven, Conn. p. 2-457

Berg Electronics, New Cumberland, Pa. p. 2-645,652

D Curtis Industries Inc., Milwaukee, Wisc. p. 2-666,667

M Elctn. Molding Corp., Woonsocket, R.I. p. 2-676-679

D ETC Terminal Products, Solon, Ohio p. 2-695-706

DM Keystone Elctns. Corp., New York, N.Y. p. 2-713

D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1247-1249

DM National Tel-Tronics, Meadville, Pa. p. 2-720

D RDI/Reed Devices, Glen Ellyn, Ill. p. 2-794,795

D Sealectro Corp., Mamaroneck, N.Y. p. 2-800-802

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-868

D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Vernitron Elec. Comps., Laconia, N.H. p. 2-1063,1064

D Waldom Electronics, Chicago, Ill. p. 2-1070-1074

ALCO Electronic Prods., North Andover, Mass. *

D Daburn Electronics & Cable Corp., Bronx, N.Y. *

General Elec. Co., Schenectady, N.Y. *

Jackson Bros., (London) Ltd., New York, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

Square D Co., Milwaukee, Wisc. *

Abacus Elctns. Corp., Dobbs Ferry, N.Y.

Acme Model Engrg. Co., Ridgefield, N.J.

Aphouser Corp. of N.E., Watertown, Mass.

M Armel Electronics, N. Bergen, N.J.

Autosplice/Dv Gen Staple, New York City, N.Y.

M Avid Electronics Corp., Baldwin, Pl., N.Y.

D Beman Mfg., New Cumberland, Pa.

Birnbach Co., Freeport, N.Y.

D Cambridge Thermionic Corp., Cambridge, Mass.

D Christiansen Radio Inc., Laguna Beach, Cal.

D-Cemco, Burbank, Calif.

Doran Mfg. Co., Cincinnati, Ohio

Electrical Plastics Corp., Long Branch, N.J.

D Electrovert, Mt. Vernon, N.Y.

Elgin Elctns., Waterford, PA.

Excel Products Co., New Brunswick, N.J.

Hathaway Industries Inc., Tulsa, Okla.

Industrial Electronic Hardware, New York, N.Y.

DM Kulka Elec. Corp., Mt. Vernon, N.Y.

Magnum Elec. Corp., Erie, Mich.

D Malco, A Microdot Co., Chicago, Ill.

D Mechanical Engraving Co., Bronx, N.Y.

D Molex Products, Downers Grove, Ill.

Morey Corp., Downers Grove, Ill.

D N T-T/Pearless, Leominster, Mass.

Precision Metal Prods. Co., Stoneham, Mass.

Sjoberg, C. & Son, Cranston, R.I.

Zierick Mfg. Corp., Mt. Kisco, N.Y.

Terminals, Data Display (including Alphanumeric & Graphic)—See Volume 1

Terminals, Feedthru

- MAIberox Corp.**, New Bedford, Mass. p. 2-456
D Amatom Electronic Hardware, New Haven, Conn. p. 2-457
MAmphenol Connector Div., SAMS Oper., Chatsworth, Cal. p. 2-460,461
DM Concord Elctns., New York, N.Y. p. 2-654,655
D Jones Elctns., Hiram, No. Hollywood, Cal. p. 2-683,685
DM Keystone Elctns. Corp., New York, N.Y. p. 2-713
D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1247-1249
National Tel-Tronics, Meadville, Pa. p. 2-721
D Positronic Inds., Springfield, Mo. p. 2-789
M Rowe Industries, Toledo, Ohio p. 2-796,797
M Sealectro Corp., Mamaroneck, N.Y. p. 2-800-802
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-887-890
TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
Vector Electronic Co., Sylmar, Cal. p. 2-1058-1060
D Vero Electronics, Hauppauge, N.Y. p. 2-366
M Victoreen Instrument Div., Cleveland, Ohio p. 2-1065
D Augat Inc., Attleboro, Mass. *
D Daburn Electronics & Cable Corp., Bronx, N.Y. *
D Johnson Co., E.F., Waseca, Minn. *
MTaurus Corp., Lambertville, N.J. *
MTorwico Elctns., Lakewood, N.J. *
Abacus Elctns. Corp., Dobbs Ferry, N.Y.
M Accessories for Electronics, Bayside, N.Y.
American Lava Corp., Chattanooga, Tenn.
M Armel Electronics, N. Bergen, N.J.
M Art Wire & Stamping Co., Cedar Knolls, N.J.
M Avid Electronics Corp., Baldwin, Pl., N.Y.
D Beman Mfg., New Cumberland, Pa.
Birnbach Co., Freeport, N.Y.
D Cambridge Thermionic Corp., Cambridge, Mass.
Ceramaseal, New Lebanon Center, N.Y.
DM D-Cemco, Burbank, Calif.
Dixon Corp., Bristol, R.I.
D Eaton Corporation, Cleveland, Ohio
D Elco, Willow Grove, Pa.
Emporium Specialties Co., Austin, Pa.
DM Excel Products Co., New Brunswick, N.J.
Fusite Div./Emerson Elec., Cincinnati, Ohio
Gary Mfg., New Brunswick, N.J.
M General Mfg. Co., Glendale, Calif.
D Goe Engrg. Co., City of Industry, Calif.
Guilton Inds., Buena Park, Cal.
M Hermetic Seal Corp., Rosemead, Cal.
D Heyman Mfg. Co., Kenilworth, N.J.
D Javex Elctns., Cherry Valley, Cal.
DM Kulka Elec. Corp., Mt. Vernon, N.Y.
D National Connector, Minneapolis, Minn.
Polyflon Corp., New Rochelle, N.Y.
Precision Metal Prods. Co., Stoneham, Mass.
Pylon Co., Attleboro, Mass.
Sjoberg, C. & Son, Cranston, R.I.
Sterling Instr., New Hyde Pk., N.Y.
DM United Prods. Co., New Hyde Pk., N.Y.
M U.S. Terminals, Cincinnati, Ohio
Varian Assocs., Palo Alto, Cal.
Varian Electron Tube & Device Grp., San Carlos, Cal.
Whitso, Schiller Park, Ill.
D Zierick Mfg. Corp., Mt. Kisco, N.Y.
- Terminals, Ferrule, Cable-End**
National Tel-Tronics, Meadville, Pa. p. 2-721
M Rowe Industries, Toledo, Ohio p. 2-796,797
Amp Inc., Harrisburg, Pa.
Autosplice/Dv Gen Staple, New York City, N.Y.
M Avid Electronics Corp., Baldwin, Pl., N.Y.
Bead Elctns., Bridgeport, Conn.
DM Excel Products Co., New Brunswick, N.J.
Sjoberg, C. & Son, Cranston, R.I.
- Terminals, Lug (All Types)**
Allied Systems Corp., Greensboro, N.C. p. 2-458,459
D Amatom Electronic Hardware, New Haven, Conn. p. 2-457
Berg Electronics, New Cumberland, Pa. p. 2-645,652
DM Concord Elctns., New York, N.Y. p. 2-654,655
Connector Corp., Chicago, Ill. p. 2-657,659,660
D ETC Terminal Products, Solon, Ohio p. 2-695-706
ITT Thermotech, Hopkins, Minn. p. 2-1232,1233
Jones Elctns., Hiram, No. Hollywood, Cal. p. 2-685
DM Keystone Elctns. Corp., New York, N.Y. p. 2-713

National Tel-Tronics, Meadville, Pa.

- DM Panduit Corp.**, Tinley Park, Ill. p. 2-2048-2051
D Positronic Inds., Springfield, Mo. p. 2-789
M Sealectro Corp., Mamaroneck, N.Y. p. 2-800-802
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-872
DM Vector Electronic Co., Sylmar, Cal. p. 2-1059
D Waldom Electronics, Chicago, Ill. p. 2-1070-1074
D Augat Inc., Attleboro, Mass. *
D Daburn Electronics & Cable Corp., Bronx, N.Y. *
D GC Electronics, Rockford, Ill. *
D ITT Pomona Electronics Div., Pomona, Cal. *
Jackson Bros., (London) Ltd., New York, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
MTaurus Corp., Lambertville, N.J. *
Abacus Elctns. Corp., Dobbs Ferry, N.Y.
Acme Model Engrg. Co., Ridgefield, N.J.
Amp Inc., Harrisburg, Pa.
AMP Special Industries, Valley Forge, Pa.
Autosplice/Dv Gen Staple, New York City, N.Y.
M Avid Electronics Corp., Baldwin, Pl., N.Y.
D Beman Mfg., New Cumberland, Pa.
Birnbach Co., Freeport, N.Y.
D Burndy Corporation, Norwalk, , Conn.
D Circon Corp., Santa Barbara, Cal.
D D-Cemco, Burbank, Calif.
Emporium Specialties Co., Austin, Pa.
DM Excel Products Co., New Brunswick, N.J.
Gary Mfg., New Brunswick, N.J.
General Mfg. Co., Glendale, Calif.
D Hoffman Industrial Prods., Farmingdale, N.Y.
Hollingsworth Solderless Terminal, Phoenixville, Pa.
I-T-E Electrical Components Grp., E. Farmingdale, N.Y.
DM ICO/Rally Corp., Palo Alto, Cal.
D Ideal Industries Inc., Sycamore, Ill.
D Malco, A Microdot Co., Chicago, Ill.
Mark Eyelet & Stamping, Wolcott, Conn.
National Connector, Minneapolis, Minn.
D N T-T/Peerless, Leominster, Mass.
Precision Metal Prods. Co., Stoneham, Mass.
Seastrom Mfg. Co. Inc., Glendale, Cal.
D Showa Musen Kogyo Co. Ltd., Shinagawa-Ku Tokyo, Japan
Sjoberg, C. & Son, Cranston, R.I.
D Teledyne Penn-Union Elec., Edinboro, Pa.
D Thomas & Betts Co., Elizabeth, N.J.
DM United Prods. Co., New Hyde Pk., N.Y.
M U.S. Terminals, Cincinnati, Ohio
D Workman Electronic Prods., Sarasota, Fla.
D Zierick Mfg. Corp., Mt. Kisco, N.Y.
- Terminals, Miniature & Subminiature**
D Amatom Electronic Hardware, New Haven, Conn. p. 2-457
Berg Electronics, New Cumberland, Pa. p. 2-645,646
DM Concord Elctns., New York, N.Y. p. 2-654,655
Connector Corp., Chicago, Ill. p. 2-657,659,660
D Jones Elctns., Hiram, No. Hollywood, Cal. p. 2-682,683,685
DM Keystone Elctns. Corp., New York, N.Y. p. 2-713
D Millen Mfg. Co. Inc., James, Malden, Mass. p. 2-1249
DM National Tel-Tronics, Meadville, Pa. p. 2-720-722
DM Positronic Inds., Springfield, Mo. p. 2-789
M Sealectro Corp., Mamaroneck, N.Y. p. 2-800-802
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-845,851,868
D Vector Electronic Co., Sylmar, Cal. p. 2-1058-1060
D Waldom Electronics, Chicago, Ill. p. 2-1070-1074
D Augat Inc., Attleboro, Mass. *
D Daburn Electronics & Cable Corp., Bronx, N.Y. *
M Elctn. Molding Corp., Woonsocket, R.I. *
D GC Electronics, Rockford, Ill. *
Jackson Bros., (London) Ltd., New York, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
MTaurus Corp., Lambertville, N.J. *
Abacus Elctns. Corp., Dobbs Ferry, N.Y.
M Accessories for Electronics, Bayside, N.Y.
Amp Inc., Harrisburg, Pa.
M Armel Electronics, N. Bergen, N.J.
M Art Wire & Stamping Co., Cedar Knolls, N.J.
Auto-Swage Products Inc., Shelton, Conn.
Autosplice/Dv Gen Staple, New York City, N.Y.
Bead Elctns., Bridgeport, Conn.
Birnbach Co., Freeport, N.Y.
D Burndy Corporation, Norwalk, , Conn.
D Cambridge Thermionic Corp., Cambridge, Mass.
D Circon Corp., Santa Barbara, Cal.
DM D-Cemco, Burbank, Calif.
Doran Mfg. Co., Cincinnati, Ohio
D Elco, Willow Grove, Pa.
Emporium Specialties Co., Austin, Pa.
DM Excel Products Co., New Brunswick, N.J.
Gary Mfg., New Brunswick, N.J.
General Mfg. Co., Glendale, Calif.
D Goe Engrg. Co., City of Industry, Calif.
Hughes Aircraft Co., Culver City, Cal.
DM Kulka Elec. Corp., Mt. Vernon, N.Y.
Magnum Elec. Corp., Erie, Mich.
D Malco, A Microdot Co., Chicago, Ill.
Methode Elctns., Chicago, Ill.
D Molex Products, Downers Grove, Ill.
D National Connector, Minneapolis, Minn.
Penn Engrg. & Mfg. Corp., Doylestown, Pa.
Precision Metal Prods. Co., Stoneham, Mass.
Raychem Corp., Menlo Park, Cal.
Sjoberg, C. & Son, Cranston, R.I.
Stanford Applied Engrg., Santa Ana, Cal.
M U.S. Terminals, Cincinnati, Ohio
D Zierick Mfg. Corp., Mt. Kisco, N.Y.

- Emporium Specialties Co.**, Austin, Pa.
DM Excel Products Co., New Brunswick, N.J.
Gary Mfg., New Brunswick, N.J.
M General Mfg. Co., Glendale, Calif.
D Goe Engrg. Co., City of Industry, Calif.
M I-T-E Electrical Components Grp., E. Farmingdale, N.Y.
D Javex Elctns., Cherry Valley, Cal.
DM Kulka Elec. Corp., Mt. Vernon, N.Y.
D Malco, A Microdot Co., Chicago, Ill.
Mark Eyelet & Stamping, Wolcott, Conn.
D Molex Products, Downers Grove, Ill.
D National Connector, Minneapolis, Minn.
D N T-T/Peerless, Leominster, Mass.
D Precision Metal Prods. Co., Stoneham, Mass.
Pylon Co., Attleboro, Mass.
Sjoberg, C. & Son, Cranston, R.I.
D Teledyne Penn-Union Elec., Edinboro, Pa.
DM United Prods. Co., New Hyde Pk., N.Y.
M U.S. Terminals, Cincinnati, Ohio
Whitso, Schiller Park, Ill.
D Zierick Mfg. Corp., Mt. Kisco, N.Y.

Terminals, Printed Circuit Board

- D Amphenol Ind'l. Div.**, Chicago, Ill. p. 2-460,461
Berg Electronics, New Cumberland, Pa. p. 2-645,649,652
Elctn. Molding Corp., Woonsocket, R.I. p. 2-676,677,678,679
Jones Elctns., Hiram, No. Hollywood, Cal. p. 2-684,685
DM Keystone Elctns. Corp., New York, N.Y. p. 2-713
D Molex Inc., Lisle, Ill. p. 2-1068,1069
National Tel-Tronics, Meadville, Pa. p. 2-721,722
DM Positronic Inds., Springfield, Mo. p. 2-789
Sealectro Corp., Mamaroneck, N.Y. p. 2-804
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-851
D TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
Vector Electronic Co., Sylmar, Cal. p. 2-1058-1060
D Vero Electronics, Hauppauge, N.Y. p. 2-366
D Waldom Electronics, Chicago, Ill. p. 2-1070-1074
D Augat Inc., Attleboro, Mass. *
D GC Electronics, Rockford, Ill. *
Shigoto Inds., Ltd., New York, N.Y. *
Abacus Elctns. Corp., Dobbs Ferry, N.Y.
M Accessories for Electronics, Bayside, N.Y.
Amp Inc., Harrisburg, Pa.
D AMP Special Industries, Valley Forge, Pa.
M Art Wire & Stamping Co., Cedar Knolls, N.J.
DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.
Auto-Swage Products Inc., Shelton, Conn.
Autosplice/Dv Gen Staple, New York City, N.Y.
M Avid Electronics Corp., Baldwin, Pl., N.Y.
Bead Elctns., Bridgeport, Conn.
D Beman Mfg., New Cumberland, Pa.
Birnbach Co., Freeport, N.Y.
D Burndy Corporation, Norwalk, , Conn.
D Cambridge Thermionic Corp., Cambridge, Mass.
D Circon Corp., Santa Barbara, Cal.
DM D-Cemco, Burbank, Calif.
Doran Mfg. Co., Cincinnati, Ohio
D Elco, Willow Grove, Pa.
Emporium Specialties Co., Austin, Pa.
DM Excel Products Co., New Brunswick, N.J.
Gary Mfg., New Brunswick, N.J.
General Mfg. Co., Glendale, Calif.
D Goe Engrg. Co., City of Industry, Calif.
Hughes Aircraft Co., Culver City, Cal.
DM Kulka Elec. Corp., Mt. Vernon, N.Y.
Magnum Elec. Corp., Erie, Mich.
D Malco, A Microdot Co., Chicago, Ill.
Methode Elctns., Chicago, Ill.
D Molex Products, Downers Grove, Ill.
D National Connector, Minneapolis, Minn.
Penn Engrg. & Mfg. Corp., Doylestown, Pa.
Precision Metal Prods. Co., Stoneham, Mass.
Raychem Corp., Menlo Park, Cal.
Sjoberg, C. & Son, Cranston, R.I.
Stanford Applied Engrg., Santa Ana, Cal.
M U.S. Terminals, Cincinnati, Ohio
D Zierick Mfg. Corp., Mt. Kisco, N.Y.

Terminals, Push-On—See Connectors & Terminals, Push-On, Quick Disconnect

Terminals, Solderless

- Allied Systems Corp.**, Greensboro, N.C. p. 2-458,459
D Amatom Electronic Hardware, New Haven, Conn. p. 2-457

PRODUCT INDEX & DIRECTORY

Terminations, Microwave

Berg Electronics, New Cumberland, Pa. p. 2-645,652

D ETC Terminal Products, Solon, Ohio p. 2-695-706

DM Keystone Elctns. Corp., New York, N.Y. p. 2-713

DM Panduit Corp., Tinley Park, Ill. p. 2-2048-2051

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-869-871

TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Vaco Products Co., Chicago, Ill. p. 2-1056

D Vector Electronic Co., Sylmar, Cal. p. 2-1060

D Waldom Electronics, Chicago, Ill. p. 2-1070-1074

D Augat Inc., Attleboro, Mass. *

D Daburn Electronics & Cable Corp., Bronx, N.Y. *

M Elctn. Molding Corp., Woonsocket, R.I. *

D GC Electronics, Rockford, Ill. *

Square D Co., Milwaukee, Wisc. *

Amp Inc., Harrisburg, Pa. *

M Art Wire & Stamping Co., Cedar Knolls, N.J. *

Auto-Swage Products Inc., Shelton, Conn. *

Autosplice/Dv Gen Staple, New York City, N.Y. *

D Beman Mfg., New Cumberland, Pa. *

Birnbach Co., Freeport, N.Y. *

D Burndy Corporation, Norwalk, Conn. *

Bussco Engrg., El Segundo, Cal. *

D Circon Corp., Santa Barbara, Cal. *

Doran Mfg. Co., Cincinnati, Ohio *

E & L Instruments, Derby, Conn. *

D Elco, Willow Grove, Pa. *

Emporium Specialties Co., Austin, Pa. *

DM Excel Products Co., New Brunswick, N.J. *

Gary Mfg., New Brunswick, N.J. *

Hathaway Industries Inc., Tulsa, Okla. *

D Hoffman Industrial Prods., Farmingdale, N.Y. *

Hollingsworth Solderless Terminal, Phoenixville, Pa. *

I-T-E Electrical Components Grp., E. Farmingdale, N.Y. *

D Ideal Industries Inc., Sycamore, Ill. *

D Javex Elctns., Cherry Valley, Cal. *

DM Kulka Elec. Corp., Mt. Vernon, N.Y. *

Magnum Elec. Corp., Erie, Mich. *

D Malco, A Microdot Co., Chicago, Ill. *

D Molex Products, Downers Grove, Ill. *

D National Connector, Minneapolis, Minn. *

Sjoberg, C. & Son, Cranston, R.I. *

D Teledyne Penn-Union Elec., Edinboro, Pa. *

D Thomas & Betts Co., Elizabeth, N.J. *

Universal Security Instrs., Baltimore, Md. *

Whitso, Schiller Park, Ill. *

D Workman Electronic Prods., Sarasota, Fla. *

D Zierick Mfg. Corp., Mt. Kisco, N.Y. *

Terminals, Standoff

M Alberox Corp., New Bedford, Mass. p. 2-456

D Amatam Electronic Hardware, New Haven, Conn. p. 2-457

DM Concord Elctns., New York, N.Y. p. 2-654,655

DM Elctn. Molding Corp., Woonsocket, R.I. p. 2-676-679

Jan Hardware Mfg. Co., Long Island City, N.Y. p. 2-1094,1095

D Jones Elctns., Hiram, No. Hollywood, Cal. p. 2-682,683,685

DM Keystone Elctns. Corp., New York, N.Y. p. 2-714

D National Tel-Tronics, Meadville, Pa. p. 2-721-723

DM Positronic Inds., Springfield, Mo. p. 2-789

M Rowe Industries, Toledo, Ohio p. 2-796,797

DM Sealectro Corp., Mamaroneck, N.Y. p. 2-800-802

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-891-893

D Augat Inc., Attleboro, Mass. *

Berg Electronics, New Cumberland, Pa. *

D Grayhill Inc., LaGrange, Ill. *

D Jackson Bros., (London) Ltd., New York, N.Y. *

D Millen Mfg. Co. Inc., James, Malden, Mass. *

M Taurus Corp., Lambertville, N.J. *

M Torwico Elctns., Lakewood, N.J. *

Abacus Elctns. Corp., Dobbs Ferry, N.Y. *

M Accessories for Electronics, Bayside, N.Y. *

M Armel Electronics, N. Bergen, N.J. *

M Art Wire & Stamping Co., Cedar Knolls, N.J. *

Auto-Swage Products Inc., Shelton, Conn. *

M Avid Electronics Corp., Baldwin, Pl., N.Y. *

Birnbach Co., Freeport, N.Y. *

D Cambridge Thermionic Corp., Cambridge, Mass. *

Ceramaseal, New Lebanon Center, N.Y. *

D Circon Corp., Santa Barbara, Cal. *

DM D-Cemco, Burbank, Calif. *

Dixon Corp., Bristol, R.I. *

Edal Inds., E. Haven, Conn. *

D Elco, Willow Grove, Pa. *

Emporium Specialties Co., Austin, Pa. *

DM Excel Products Co., New Brunswick, N.J. *

Gary Mfg., New Brunswick, N.J. *

M General Mfg. Co., Glendale, Calif. *

D Goe Engrg. Co., City of Industry, Calif. *

Gulton Inds., Buena Park, Cal. *

M Hermetic Seal Corp., Rosemead, Cal. *

National Connector, Minneapolis, Minn. *

Penn Engrg. & Mfg. Corp., Doylestown, Pa. *

D Precision Metal Prods. Co., Stoneham, Mass. *

Sjoberg, C. & Son, Cranston, R.I. *

Sterling Instr., New Hyde Pk., NY *

DM United Prods. Co., New Hyde Pk., N.Y. *

M U.S. Terminals, Cincinnati, Ohio *

Whitso, Schiller Park, Ill. *

D Zierick Mfg. Corp., Mt. Kisco, N.Y. *

Terminals, Threaded

D Amatam Electronic Hardware, New Haven, Conn. p. 2-457

DM Concord Elctns., New York, N.Y. p. 2-654,655

Jones Elctns., Hiram, No. Hollywood, Cal. p. 2-682

DM Keystone Elctns. Corp., New York, N.Y. p. 2-714

D Positronic Inds., Springfield, Mo. p. 2-789

DM Sealectro Corp., Mamaroneck, N.Y. p. 2-803

Millen Mfg. Co. Inc., James, Malden, Mass. *

D Smith Inc., Herman H., Brooklyn, N.Y. *

M Accessories for Electronics, Bayside, N.Y. *

M Armel Electronics, N. Bergen, N.J. *

M Art Wire & Stamping Co., Cedar Knolls, N.J. *

M Avid Electronics Corp., Baldwin, Pl., N.Y. *

D Cambridge Thermionic Corp., Cambridge, Mass. *

DM D-Cemco, Burbank, Calif. *

D Eaton Corporation, Cleveland, Ohio *

DM Excel Products Co., New Brunswick, N.J. *

Gary Mfg., New Brunswick, N.J. *

M General Mfg. Co., Glendale, Calif. *

Magnum Elec. Corp., Erie, Mich. *

Penn Engrg. & Mfg. Corp., Doylestown, Pa. *

Precision Metal Prods. Co., Stoneham, Mass. *

Sterling Instr., New Hyde Pk., NY *

M U.S. Terminals, Cincinnati, Ohio *

D Zierick Mfg. Corp., Mt. Kisco, N.Y. *

Terminals, Turret

D Amatam Electronic Hardware, New Haven, Conn. p. 2-457

Elctn. Molding Corp., Woonsocket, R.I. p. 2-676-679

D Jones Elctns., Hiram, No. Hollywood, Cal. p. 2-682,683

DM Keystone Elctns. Corp., New York, N.Y. p. 2-713

DM Positronic Inds., Springfield, Mo. p. 2-789

RDI/Reed Devices, Glen Ellyn, Ill. p. 2-794,795

DM Sealectro Corp., Mamaroneck, N.Y. p. 2-800-802

D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-817,857,858

D Augat Inc., Attleboro, Mass. *

Abacus Elctns. Corp., Dobbs Ferry, N.Y. *

M Accessories for Electronics, Bayside, N.Y. *

M Armel Electronics, N. Bergen, N.J. *

Auto-Swage Products Inc., Shelton, Conn. *

M Avid Electronics Corp., Baldwin, Pl., N.Y. *

Bead Elctns., Bridgeport, Conn. *

D Cambridge Thermionic Corp., Cambridge, Mass. *

DM D-Cemco, Burbank, Calif. *

DM Excel Products Co., New Brunswick, N.J. *

Gary Mfg., New Brunswick, N.J. *

M General Mfg. Co., Glendale, Calif. *

DM Kulka Elec. Corp., Mt. Vernon, N.Y. *

D Precision Metal Prods. Co., Stoneham, Mass. *

DM United Prods. Co., New Hyde Pk., N.Y. *

M U.S. Terminals, Cincinnati, Ohio *

Whitso, Schiller Park, Ill. *

Terminals, Wirewrap

Allied Systems Corp., Greensboro, N.C. p. 2-458,459

D Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461

Berg Electronics, New Cumberland, Pa. p. 2-645,646,650

Connector Corp., Chicago, Ill. p. 2-659,660

Elctn. Molding Corp., Woonsocket, R.I. p. 2-676-679

Elfab Corp., Addison, Tex. p. 2-680,681

D National Tel-Tronics, Meadville, Pa. p. 2-721-723

D Positronic Inds., Springfield, Mo. p. 2-788

RDI/Reed Devices, Glen Ellyn, Ill. p. 2-794,795

TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897

D Vector Electronic Co., Sylmar, Cal. p. 2-1058

D Vero Electronics, Hauppauge, N.Y. p. 2-366

D Waldom Electronics, Chicago, Ill. p. 2-1070-1074

D Augat Inc., Attleboro, Mass. *

D Smith Inc., Herman H., Brooklyn, N.Y. *

Amp Inc., Harrisburg, Pa. *

D AMP Special Industries, Valley Forge, Pa. *

M Art Wire & Stamping Co., Cedar Knolls, N.J. *

Auto-Swage Products Inc., Shelton, Conn. *

Autosplice/Dv Gen Staple, New York City, N.Y. *

M Avid Electronics Corp., Baldwin, Pl., N.Y. *

Bead Elctns., Bridgeport, Conn. *

Bussco Engrg., El Segundo, Cal. *

D Cambridge Thermionic Corp., Cambridge, Mass. *

Emporium Specialties Co., Austin, Pa. *

DM Excel Products Co., New Brunswick, N.J. *

Gary Mfg., New Brunswick, N.J. *

General Mfg. Co., Glendale, Calif. *

D IFE Div., Rumford, R.I. *

Methode Elctns., Chicago, Ill. *

Mupac Corp., Brockton, Mass. *

D N-T/Peerless, Leominster, Mass. *

D O. K. Machine & Tool Corp., Bronx, N.Y. *

D Robinson-Nugent, New Albany, Ind. *

M U.S. Terminals, Cincinnati, Ohio *

Whitso, Schiller Park, Ill. *

Zierick Mfg. Corp., Mt. Kisco, N.Y. *

Terminations, Antenna-Also See Dummy Loads

Arra Inc., Bay Shore, N.Y. p. 2-1278,1279

M Bird Electronic Corp., Solon, Ohio p. 1-619

Carborundum Co., Niagara Falls, N.Y. p. 2-1445

M Electro Impulse, Red Bank, N.J. p. 1-492,662-666

Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528

M Rowe Industries, Toledo, Ohio p. 2-796,797

D Sealectro Corp., Mamaroneck, N.Y. p. 2-807-810

Bendix, Franklin, Ind. *

M McGraw-Edison Co., Manchester, N.H. *

Syston-Donner Microwave Div., Van Nuys, Cal. *

Aircom, Union, N.H. *

M Airtron, Morris Plains, N.J. *

Alan Industries Inc., Columbus, Ind. *

D Antenna Corp. of America, Burlington, Iowa *

D Astrolab, Rahway, N.J. *

Autosplice/Dv Gen Staple, New York City, N.Y. *

D Barker & Williamson, Bristol, Pa. *

Coax Devices Inc., Chelsea, Mass. *

Coaxial Dynamics, Cleveland, Ohio *

M Coleman Microwave Co., Lebanon, N.J. *

Collins Radio, Dallas, Tex. *

Elcom Systems, Deer Pk., N.Y. *

Engelmann Microwave, Montville, N.J. *

Excel Products Co., New Brunswick, N.J. *

D Javex Elctns., Cherry Valley, Cal. *

DM Kings Electronics, Tuckahoe, N.Y. *

Maury Microwave Corp., Cucamonga, Calif. *

M Microlab/FXR, Livingston, N.J. *

Microwave Development Labs., Needham Hgts., Mass. *

Narda Microwave Corp., Plainview, N.Y. *

R L C Elctns., Mt. Kisco, N.Y. *

Rhode & Schwarz Sls., Fairfield, N.J. *

Sjoberg, C. & Son, Cranston, R.I. *

Special Microwave Devices Oper., Waltham, Mass. *

Technical Mat'l., Mamaroneck, N.Y. *

M Transco Prods., Venice, Cal. *

D TRG., Woburn, Mass. *

Waveline, W. Caldwell, N.J. *

Terminations, Microwave

Amphenol RF Div., Danbury, Conn. p. 2-460,461

Applied Research Inc., Port Washington, N.Y. p. 2-1276,1277

Arra Inc., Bay Shore, N.Y. p. 2-1278,1279

Bendix, Franklin, Ind. p. 2-1280

Bird Electronic Corp., Solon, Ohio p. 1-619

M Electro Impulse, Red Bank, N.J. p. 1-492,662-666

D Pyrofilm Resistor Co., Whippany, N.J. p. 2-1526-1528

M Rowe Industries, Toledo, Ohio p. 2-796,797

D Texscan Corp., Indianapolis, Ind. p. 1-817

Wavetek, San Diego, Cal. p. 1-852-859

General Radio Co., Concord, Mass. *

Syston-Donner Microwave Div., Van Nuys, Cal. *

AEI, Colmar, Pa. *

Aircom, Union, N.H. *

M Airtron, Morris Plains, N.J. *

Alford Mfg. Co., Winchester, Mass. *

American Microwave Inds., Waltham, Mass. *

D Astrolab, Rahway, N.J. *

Coax Devices Inc., Chelsea, Mass.
M Coleman Microwave Co., Lebanon, N.J.
 Collins Radio, Dallas, Tex.
M Deteronics Corp., S. El Monte, Cal.
 Elcom Systems, Deer Pk., N.Y.
 Engelmann Microwave, Montville, N.J.
 Hewlett-Packard Co., Palo Alto, Cal.
 Hughes Aircraft Co., Culver City, Cal.
DM Kings Electronics, Tuckahoe, N.Y.
M Manger Elec. Co., Stamford, Conn.
 Maury Microwave Corp., Cucamonga, Calif.
M Merrimac Inds., West Caldwell, N.J.
 Metavac, Flushing, N.Y.
M Microlab/FXR, Livingston, N.J.
 Microwave Assocs., Burlington, Mass.
D Microwave Development Labs., Needham Hgts., Mass.
 Narda Microwave Corp., Plainview, N.Y.
D PRD Elctns., Syosset, N.Y.
M Premier Microwave, Port Chester, N.Y.
 Radiation Devices Co., Baltimore, Md.
 R L C Elctns., Mt. Kisco, N.Y.
 Rhode & Schwarz Sls., Fairfield, N.J.
 Sivers Lab, Corona del Mar, Cal.
 Solitron/Microwave, Port Salerno, Fla.
 Special Microwave Devices Oper., Waltham, Mass.
 Telonic Altair, Laguna Beach, Calif.
M Transco Prods., Venice, Cal.
D TRG., Woburn, Mass.
 Varian Assocs., Palo Alto, Cal.
 Waveline, W. Caldwell, N.J.
 Weinschel Engrg. Co., Gaithersburg, Md.

Terminations, VHF, Video, Pulse—See Volume 1

Test Equipment, Closed Circuit TV-Also See Television Systems & Equipment, Closed-Circuit—See Volume 1

Test Equipment, Color TV—See Volume 1

Test Equipment, Mechanical Impedance—See Volume 1

Test Systems, Automatic D-C—See Volume 1

Test Systems, Computer Controlled (Automatic)—See Volume 1

Testers, Accelerometer—See Volume 1

Testers, Battery—See Volume 1

Testers Burn-In, Aging—See Volume 1

Testers, Cable—See Volume 1

Testers, Capacitor—See Volume 1

Testers, Circuit—See Volume 1

Testers, Coil—See Volume 1

Testers, Communication Equipment (Automatic)—See Volume 1

Testers, Component Linearity—See Volume 1

Testers, Corona—See Volume 1

Testers, Diode—See Volume 1

Testers, Electric Power—See Volume 1

Testers, Encoder—See Volume 1

Testers, Ground Resistance—See Volume 1

Testers, Hi-Pot—See Volume 1

Testers, Insulation Breakdown—See Volume 1

Testers, Integrated Circuit (Automatic)—See Volume 1

Testers, Integrated Circuit (Manual)—See Volume 1

Testers, Life, Component—See Volume 1

Testers, Logic Card—See Volume 1

Testers, Magnetic Core—See Volume 1

Testers, Magnetron—See Volume 1

Testers, Material—See Volume 1

Testers, Meter—See Volume 1

Testers, Microwave—See Volume 1

Testers, Modem—See Volume 1

Testers, Motor—See Volume 1

Testers, Potentiometer—See Volume 1

Testers, Power Supply—See Volume 1

Testers, Radar—See Volume 1

Testers, Ratio Voltage—See Volume 1

Testers, Relay—See Volume 1

Testers, Resistivity—See Volume 1

Testers, Resistor—See Volume 1

Testers, Servo—See Volume 1

Testers, Shock—See Volume 1

Testers, Short-Turn—See Volume 1

Testers, Signal Tracing—See Volume 1

Testers, Solderability—See Volume 1

Testers, Synchro/Resolver—See Volume 1

Testers, Telephone - Also see Telephone Channel Test & Simulator Equipment—See Volume 1

Testers, Teletypewriter—See Volume 1

Testers, Thickness (all types)—See Volume 1

Testers, Torque—See Volume 1

Testers, Tracking & Erosion Resistance (Insulation)—See Volume 1

Testers, Transistor—See Volume 1

Testers, Transmission & Delay—See Volume 1

Testers, Tube—See Volume 1

Testers, Vibration-Also See Services, Environmental Test—See Volume 1

Testers, Voltage—See Volume 1

Testers, Voltage Breakdown—See Volume 1

Testing, Environmental—See Volume 1

Thermistors—See Volume 1

Thermocouples, Elements & Accessories—See Volume 1

Thermocouple Devices & Materials—See Volume 1

Thermometers, Electronic (All Types)—See Volume 1

Thermometers, Resistance—See Volume 1

Thermostats-Also See Switches, Thermally Actuated; Controls, Temperature—See Volume 1

Thin-Film Memory Systems, Planar—See Volume 1

Thyratrons—See Volume 1

Thyristors (Includes Silicon Controlled Rectifiers)—See Volume 1

Ties, Wire & Cable—See Wire & Cable Ties

Timer Switches—See Volume 1

Timers, Counting—See Volume 1

Timers, Cycle & Reset—See Volume 1

Timers, Delay - Also See Delays, Time—See Volume 1

Timers, Electrolytic Cell—See Volume 1

Timers, Interval—See Volume 1

Timers, Programmed—See Volume 1

Timers, Sequence—See Volume 1

Timers, Solid State—See Volume 1

Timing Switches—See Volume 1

Tool Kits & Sets

D Channellock, Meadville, Pa. p. 2-1693
D Jonard Industries Corp., Tuckahoe, N.Y. p. 2-1708

D Vaco Products Co., Chicago, Ill. p. 2-1714, 1716

D GC Electronics, Rockford, Ill. *

Heath Co., Benton Harbor, Mich. *

DM Keystone Elctns. Corp., New York, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

D Adre Co., Milwaukee, Wisc.

Adtool Corp., Montreal W P Q, Can.

DM Allen Mfg. Co., Hartford, Conn.

D Bearing Inspection, Santa Fe Springs, Cal.

D Circon Corp., Santa Barbara, Cal.

Communications Technology Corp., Los Angeles, Cal.

M Daniels Mfg. Corp., Bloomfield Hills, Mich.

Emporium Specialties Co., Austin, Pa.

D Erikson Specialized Tool Co., Pico-Rivera, Cal.

Janel, Stirling, N.J.

Jensen Tools & Alloys, Phoenix, Ariz.

M Kawecki Beryco Inds., New York, NY

D Klein, Mathias & Sons, Chicago, Ill.

M MacDonald & Co., Glendale, Calif.

Mann, Henry Inc., Huntingdon Valley, Pa.

D Hunter Tools, El Monte, Calif.

D Moody Tools, Providence, R.I.

National Camera Inc., Englewood, Colo.

D Philmore Mfg. Co. Inc., Inwood, N.Y.

Snap-On-Tools, Kenosha, Wisc.

D Techni-Tool, Plymouth Meeting, Pa.

D Teledyne Penn-Union Elec., Edinboro, Pa.

D Telvac Instr. Co., Van Nuys, Cal.

D Thomas & Betts Co., Elizabeth, N.J.

D Uber Grafic Instrs., Palo Alto, Calif.

D Wilcox Sales, Mineola, N.Y.

X-Acto, Long Island City, N.Y.

D Xcelite, Orchard Park, N.Y.

Tools, Alignment & Tuning

D Jonard Industries Corp., Tuckahoe, N.Y. p. 2-1708

Syntronic Instruments Inc., Addison, Ill. p. 2-427

D GC Electronics, Rockford, Ill. *

DM Keystone Elctns. Corp., New York, N.Y. *

D Erikson Specialized Tool Co., Pico-Rivera, Cal.

Janel, Stirling, N.J.

Jensen Tools & Alloys, Phoenix, Ariz.

M MacDonald & Co., Glendale, Calif.

Mann, Henry Inc., Huntingdon Valley, Pa.

National Camera Inc., Englewood, Colo.

D N T-T/Peerless, Leominster, Mass.

D PTS Electronics Inc., Bloomington, Ind

Snap-On-Tools, Kenosha, Wisc.

D Techni-Tool, Plymouth Meeting, Pa.

D Workman Electronic Prods., Sarasota, Fla.

D Xcelite, Orchard Park, N.Y.

Tools, Cable Tie

Gardner-Denver, Grand Haven, Mich. p. 1-1541

DM Panduit Corp., Tinley Park, Ill. p. 2-2048-2051

Jonard Industries Corp., Tuckahoe, N.Y. *

D 3M Company, St. Paul, Minn. *

D AMP Special Industries, Valley Forge, Pa.

American Microwave Inds., Waltham, Mass.

Autosplice/Dv Gen Staple, New York City, N.Y.

D Workman Electronic Prods., Sarasota, Fla.

Tools & Kits, Contact Insertion/Removal

Amphenol Connector Div., Broadview, Ill. p. 2-460, 461

D Amphenol Ind'l Div., Chicago, Ill. p. 2-460, 461

Amphenol Sales Div., Broadview, Ill. p. 2-460, 461

Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686

D ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693

DM Positronic Inds., Springfield, Mo. p. 2-788

M Virginia Panel Corp., Waynesboro, Va. p. 2-1067
Allied Systems Corp., Greensboro, N.C.*
D Augat Inc., Attleboro, Mass.*
Electr. Molding Corp., Woonsocket, R.I.*
Jonard Industries Corp., Tuckahoe, N.Y.*
3M Company, St. Paul, Minn.*
D Waldom Electronics, Chicago, Ill.*
D Burndy Corporation, Norwalk, Conn.*
M Daniels Mfg. Corp., Bloomfield Hills, Mich.*
Mac Panel Co., High Pt., N.C.*
Mann, Henry Inc., Huntingdon Valley, Pa.*
Robinson-Nugent, New Albany, Ind.*
D Solder Removal Co., Covina, Cal.*

Tools, Connector

Amphenol Connector Div., Broadview, Ill. p. 2-460,461
Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
DM Amphenol RF Div., Danbury, Conn. p. 2-460,461
Amphenol Sales Div., Broadview, Ill. p. 2-460,461
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686
D Omni Spectra, Farmington, Mich. p. 2-725
DM Positronic Inds., Springfield, Mo. p. 2-788
D Vaco Products Co., Chicago, Ill. p. 2-1057
M Virginia Panel Corp., Waynesboro, Va. p. 2-1067

Jonard Industries Corp., Tuckahoe, N.Y.*
D Molex Inc., Lisle, Ill.*
D 3M Company, St. Paul, Minn.*
D Waldom Electronics, Chicago, Ill.*
Amp Inc., Harrisburg, Pa.*
D Ansley Elctns. Corp., Los Angeles, Cal.*
D Burndy Corporation, Norwalk, Conn.*
M Daniels Mfg. Corp., Bloomfield Hills, Mich.*
D Dracon Industries, Chatsworth, Cal.*
M Glenair, Glendale, Cal.*
Hoffman Industrial Prods., Farmingdale, N.Y.*
D Klein, Mathias & Sons, Chicago, Ill.*
Mac Panel Co., High Pt., N.C.*
Mann, Henry Inc., Huntingdon Valley, Pa.*
D Molex Products, Downers Grove, Ill.*
O. K. Machine & Tool Corp., Bronx, N.Y.*
Robinson-Nugent, New Albany, Ind.*
Sjoberg, C. & Son, Cranston, R.I.*
D Teledyne Penn-Union Elec., Edinboro, Pa.*
D Thomas & Betts Co., Elizabeth, N.J.*
Trompeter Electronics, Chatsworth, Cal.*

Tools, Crimping & Swaging

D Amphenol Connector Div., Broadview, Ill. p. 2-460,461
D Amphenol Ind'l. Div., Chicago, Ill. p. 2-460,461
DM Amphenol RF Div., Danbury, Conn. p. 2-460,461
Amphenol Sales Div., Broadview, Ill. p. 2-460,461
Berg Electronics, New Cumberland, Pa. p. 2-645,647,649
DM Buchanan Crimp Tool Prods., Union, N.J. p. 2-853
D Concord Elctns., New York, N.Y. p. 2-654,655
ETC Terminal Products, Solon, Ohio p. 2-695-706
Hughes Aircraft Co., Connecting Devices, Newport Beach, Cal. p. 2-686
D ITT Cannon Electric, Santa Ana, Cal. p. 2-687-693
National Tel-Tronics, Meadville, Pa. p. 2-720
D Panduit Corp., Tinley Park, Ill. p. 2-2048-2051
DM Positronic Inds., Springfield, Mo. p. 2-788
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-833,834,849,863,870,871,874,878,881,884
TRW/Cinch Connectors, Elk Grove Village, Ill. p. 2-896,897
D Vaco Products Co., Chicago, Ill. p. 2-1057
DM Vector Electronic Co., Sylmar, Cal. p. 2-1059
M Virginia Panel Corp., Waynesboro, Va. p. 2-1067
Allied Systems Corp., Greensboro, N.C.*
D Jonard Industries Corp., Tuckahoe, N.Y.*
DM Keystone Elctns. Corp., New York, N.Y.*
D Molex Inc., Lisle, Ill.*
D 3M Company, St. Paul, Minn.*
D Waldom Electronics, Chicago, Ill.*
Adcotech Corp., Sunnyvale, Cal.*
D Adtool Corp., Montreal W P Q, Can.*
Amp Inc., Harrisburg, Pa.*
D AMP Special Industries, Valley Forge, Pa.*
American Microwave Inds., Waltham, Mass.*
Autosplice/Dv Gen Staple, New York City, N.Y.*
D Beman Mfg., New Cumberland, Pa.*
DM Black & Webster, Waltham, Mass.*
D Blonder-Tongue Labs., Old Bridge, N.J.*

D Burndy Corporation, Norwalk, Conn.*
D Ciron Corp., Santa Barbara, Cal.*
M Daniels Mfg. Corp., Bloomfield Hills, Mich.*
D Elco, Willow Grove, Pa.*
D Finney Co., Bedford, Ohio*
Hoffman Industrial Prods., Farmingdale, N.Y.*
Hollingsworth Solderless Terminal, Phoenixville, Pa.*
I-T-E Electrical Components Grp., E. Farmingdale, N.Y.*
D ICO/Rally Corp., Palo Alto, Cal.*
D Ideal Industries Inc., Sycamore, Ill.*
Janel, Stirling, N.J.*
Jensen Tools & Alloys, Phoenix, Ariz.*
D Klein, Mathias & Sons, Chicago, Ill.*
Mac Panel Co., High Pt., N.C.*
M MacDonald & Co., Glendale, Calif.*
Mann, Henry Inc., Huntingdon Valley, Pa.*
D Hunter Tools, El Monte, Calif.*
D Molex Products, Downers Grove, Ill.*
National Camera Inc., Englewood, Colo.*
O. K. Machine & Tool Corp., Bronx, N.Y.*
Pico Crimping Tools Co., Santa Fe Springs, Calif.*
D Porter, H.K., Somerville, Mass.*
Sjoberg, C. & Son, Cranston, R.I.*
Snap-On-Tools, Kenosha, Wisc.*
D Techni-Tool, Plymouth Meeting, Pa.*
D Thomas & Betts Co., Elizabeth, N.J.*
Trompeter Electronics, Chatsworth, Cal.*
D Workman Electronic Prods., Sarasota, Fla.*
X-Acto, Long Island City, N.Y.*
D Zierick Mfg. Corp., Mt. Kisco, N.Y.*

Tools, Heat Sealing—See Volume 1

Tools, Microelectronic Handling

D Jonard Industries Corp., Tuckahoe, N.Y. p. 2-1708
Qualco, Los Altos, Cal. p. 2-791
D Arecco Prods., Ossining, N.Y.*
D Ciron Corp., Santa Barbara, Cal.*
Janel, Stirling, N.J.*
Jensen Tools & Alloys, Phoenix, Ariz.*
M MacDonald & Co., Glendale, Calif.*
Mann, Henry Inc., Huntingdon Valley, Pa.*
D Matrix Engineering Corp., Gardena, Cal.*
D Orbit Inds., San Luis Obispo, Calif.*
D Techni-Tool, Plymouth Meeting, Pa.*
D Vigor Co., New York, N.Y.*

Tools, Parts-Handling, Vacuum Operated

Gardner-Denver, Grand Haven, Mich.*
D Jonard Industries Corp., Tuckahoe, N.Y.*
M Air-Vac Engrg. Co., Milford, Conn.*
D Arecco Prods., Ossining, N.Y.*
Henes Mfg. Co., Phoenix, Ariz.*
Janel, Stirling, N.J.*
Jensen Tools & Alloys, Phoenix, Ariz.*
M MacDonald & Co., Glendale, Calif.*
Mann, Henry Inc., Huntingdon Valley, Pa.*
National Camera Inc., Englewood, Colo.*
D Techni-Tool, Plymouth Meeting, Pa.*
D Telvac Instr. Co., Van Nuys, Cal.*

Tools, Relay Servicing

D Jonard Industries Corp., Tuckahoe, N.Y. p. 2-1708
D Adre Co., Milwaukee, Wisc.*
Janel, Stirling, N.J.*
Jensen Tools & Alloys, Phoenix, Ariz.*
M MacDonald & Co., Glendale, Calif.*
Mann, Henry Inc., Huntingdon Valley, Pa.*
D Neuses, P.K., Rolling Meadows, Ill.*
D Techni-Tool, Plymouth Meeting, Pa.*

Tools, Resistance Soldering—See Volume 1

Tools, Wire Wrapping-Also See Machines, Wire Wrapping

Gardner-Denver, Grand Haven, Mich. p. 2-1697
D Jonard Industries Corp., Tuckahoe, N.Y. p. 2-1709
D Vector Electronic Co., Sylmar, Cal. p. 2-1058
D Adtool Corp., Montreal W P Q, Can.*
Autosplice/Dv Gen Staple, New York City, N.Y.*
DM ICO/Rally Corp., Palo Alto, Cal.*
Jensen Tools & Alloys, Phoenix, Ariz.*
Mann, Henry Inc., Huntingdon Valley, Pa.*
Mupac Corp., Brockton, Mass.*
Neuses, P.K., Rolling Meadows, Ill.*
O. K. Machine & Tool Corp., Bronx, N.Y.*
D Ostby & Barton Co., Providence, R.I.*
D Robinson-Nugent, New Albany, Ind.*
Tescom Instr. Div., Minneapolis, Minn.*

Torches, Soldering, Welding & Access.

DM Master Appliance Corp., Racine, Wisc. p. 2-1713

Wall-Lenk Mfg. Co., Kinston, N.C. p. 2-1718,1719
Jonard Industries Corp., Tuckahoe, N.Y.*
Air Prods. & Chems., Allentown, Pa.*
Chemtron Corp., Chicago, Ill.*
Henes Mfg. Co., Phoenix, Ariz.*
Jensen Tools & Alloys, Phoenix, Ariz.*
Mann, Henry Inc., Huntingdon Valley, Pa.*
National Camera Inc., Englewood, Colo.*
Tescom Instr. Div., Minneapolis, Minn.*
Union Carbide Corp., New York, N.Y.*

Toroids—See Coils, Toroidal

Torquers, Gyro—See Volume 1

Totalizers, Digital—See Volume 1

Tracers, Curve, Tube & Transistor—See Volume 1

Tracers, Signal—See Volume 1

Tracers, Voltage Curve—See Volume 1

Tracking Systems—See Volume 1

Transceivers—See Volume 1

Transcription & Record Players—See Volume 1

Transducers, Acceleration—See Volume 1

Transducers, Displacement—See Volume 1

Transducers, Flow—See Volume 1

Transducers, Force—See Volume 1

Transducers, Frequency—See Volume 1

Transducers, Incremental Digital Position, Rotary—See Volume 1

Transducers, Magnetic Pickup—See Volume 1

Transducers, Power—See Volume 1

Transducers, Pressure—See Volume 1

Transducers, Proximity—See Volume 1

Transducers, Strain Gage—See Volume 1

Transducers, Temperature—See Volume 1

Transducers, Thermoelectric—See Volume 1

Transducers, Torque—See Volume 1

Transducers, Ultrasonic—See Volume 1

Transducers, Velocity—See Volume 1

Transducers, Vibration—See Volume 1

Transducers Volt, Watt, Current VAR, Power Factor, Frequency—See Volume 1

Transformers, Audio

Aladdin Elctns., Nashville, Tenn. p. 2-1727,1728
M Bours Pacific Magnetic Corp., Romoland, Cal. p. 2-1732,1733
Douglas Randall Div., Pawcatuck, Conn. p. 2-1734
M Freed Transformer Co., Brooklyn, N.Y. p. 2-1716,1717; p. 2-1738-1747
M Hisonic, Olathe, Kan. p. 2-1755
Magnetic, Holtsville, N.Y. p. 2-1770
DM Microtran Co., Valley Stream, N.Y. p. 2-1757-1760,1762,1763
Neshaminy Transformer, Furlong, Pa. p. 2-1775,1776
NWL Transformers, Trenton, N.J. p. 2-1772
M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783
RFL Inds., Boonton, N.J. p. 1-122
M Torotel Inc., Grandview, Mo. p. 2-1819-1821
D Triad-Utrad, Huntington, Ind. p. 2-1822-1829
Aemco Div., Mankato, Minn.*
American Vector/TDC, Dayton, N.J.*
Biometrics Instrument Corp., Garland, Tex.*
CML-Macarr, Edison, N.J.*
K.G.S. Elctns., Pasadena, Cal.*

Lambda Elctns., Melville, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

M Torwico Elctns., Lakewood, N.J. *

D Altec Div., Anaheim, Calif.

American Magnetics Corp., Carterville, Ill.

Aydin Energy Systems, Palo Alto, Cal.

M BG Electronics, Mount Vernon, N.Y.

Coil-Craft Inc., Bronxville, N.Y.

D Components Specialties, Hempstead, N.Y.

Custom Coil & Transformer Co., Zanesville, Ohio

D Davis & Co., J.W., Dallas, Tex.

M Dietz Design, Belton, Mo.

D Dynaco Inc., Blackwood, N.J.

Electro-Voice, Buchanan, Mich.

Electrocom Inds., S. Bend, Ind.

M Electronic Transformer Corp., Paterson, N.J.

Elma Engineering, Palo Alto, Cal.

M EWC, Kenilworth, N.J.

Ferrodyne Corp., Venice, Calif.

D Frazier, Dallas, Tex.

Genisco Technology Corp., Compton, Cal.

Gotham Audio Corp., New York, N.Y.

Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.

Hughes Aircraft Co., Culver City, Cal.

Hytronics Corp., Pinellas Park, Fla.

M JB Elctn, Transformers, Chicago, Ill

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

Merrimack Magnetics, Lowell, Mass.

M OPT Inds. Inc., Phillipsburg, N.J.

M Osborne Transformer Corp., Detroit, Mich.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Perkin-Elmer Corp., Norwalk, Conn.

D Philmore Mfg. Co. Inc., Inwood, N.Y.

Phoenix Transformer Co., Phoenix, Ariz.

M Polyphase Instr. Co., Bridgeport, Pa.

Pulse Engrg., San Diego, Cal.

Rhode & Schwarz Sls., Fairfield, N.J.

D Rye Inds., Mamaroneck, N.Y.

D Sennheiser Elctn. Corp., New York, N.Y.

D Sescom, Gardena, Cal.

D Stancor/Essex International, Chicago, Ill.

Stanford Applied Engineering, Santa Clara, Cal.

DM Thordarson Meissner, Mt. Carmel, Ill.

Torelco Inc., Irvington, N.J.

Tranex Inc., Mountain View, Cal.

D TRW/UTC Transformers, New York, N.Y.

Transformers, Autotransformer

Abacus Controls Inc., Somerville, N.J. p. 2-1731

M Abbott Transistor Labs., Los Angeles, Cal. p. 2-1720-1725

M Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-1732, 1733

M Del Electronics Corp., Mt. Vernon, N.Y. p. 1-1174, 1175

Douglas Randall Div., Pawcatuck, Conn. p. 2-1734

Electrocube Inc., San Gabriel, Cal. p. 2-1736, 1737

M Freed Transformer Co., Brooklyn, N.Y. p. 1-716, 717; p. 2-1738-1747

D General Radio Co., Concord, Mass. p. 2-1748-1750

K.G.S. Elctns., Pasadena, Cal. p. 1-1752

Magnetico, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y. p. 2-1769

NWL Transformers, Trenton, N.J. p. 2-1772

M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783

D Sanford-Miller Corp., Brooklyn, N.Y. p. 1-1883

Signal Transformer Co., Brooklyn, N.Y. p. 2-1798, 1799

D Todd Systems, Yonkers, N.Y. p. 2-1812-1815

M Torwico Elctns., Lakewood, N.J. p. 2-1818

D Triad-Utrad, Huntington, Ind. p. 2-1822-1829

ACDC Electronics, Oceanside, Cal. *

Aemco Div., Mankato, Minn. *

American Vector/TDC, Dayton, N.J. *

M Axel Elctns., Jamaica, N.Y. *

Biometrics Instrument Corp., Garland, Tex. *

CML-Macarr, Edison, N.J. *

General Elec. Co., Schenectady, N.Y. *

General Magnetics, Bloomfield, N.J. *

M Hisonic, Olathe, Kan. *

Lambda Elctns., Melville, N.Y. *

D Ohmite Mfg. Co., Skokie, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

DM Staco, Dayton, Ohio *

M Sterling Transformer Corp., Brooklyn, N.Y. *

M Torotal Inc., Grandview, Mo. *

Acme Electric, Cuba, N.Y. *

D A C Transformer Corp., Newark, N.J.

D Altec Div., Anaheim, Calif.

American Magnetics Corp., Carterville, Ill.

American Monarch Corp., Minneapolis, Minn.

Aydin Energy Systems, Palo Alto, Cal.

Basler Electric Co., Highland, Ill.

D B. H. Industries, Los Angeles, Cal

Bicron Elctns. Co., Canaan, Conn.

Carson Mfg. Co., Indianapolis, Ind.

Coil Specialty Co., Boalsburg, Pa.

Collins Radio, Dallas, Tex.

M Component Specialties, Temple City, Cal.

Control Data Corp., Minneapolis, Minn.

Custom Coil & Transformer Co., Zanesville, Ohio

M Dietz Design, Belton, Mo.

D Dormeyer Industries, Chicago, Ill.

M Electronic Transformer Corp., Paterson, N.J.

Elma Engineering, Palo Alto, Cal.

EWC, Kenilworth, N.J.

Ferrodyne Corp., Venice, Calif.

Foster Transformer Co., Cincinnati, Ohio

D Frazier, Dallas, Tex.

D GTE Sylvania Inc., Waltham, Mass.

Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.

D Hughey & Phillips, Burbank, Cal.

M JB Elctn, Transformers, Chicago, Ill

D Jefferson Elec., Bellwood, Ill.

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

Merrimack Magnetics, Lowell, Mass.

Micron Industries Corp., Stone Park, Ill.

North Electric Co., Galion, Ohio

M OPT Inds. Inc., Phillipsburg, N.J.

M Osborne Transformer Corp., Detroit, Mich.

Perkin-Elmer Corp., Norwalk, Conn.

Phoenix Transformer Co., Phoenix, Ariz.

Schott Corp., Minneapolis, Minn.

Sola Electric, Elk Grove Village, Ill.

D Stancor/Essex International, Chicago, Ill.

DM Thordarson Meissner, Mt. Carmel, Ill.

Tranex Inc., Mountain View, Cal.

Triac Electronics, New York, N.Y.

D TRW/UTC Transformers, New York, N.Y.

Transformers, Bias—See Transformers, Power**Transformers, Bridging—See Transformers, Matching****Transformers, Chopper**

Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388

Magnetico, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y. p. 2-1762

Neshaminy Transformer, Furlong, Pa. p. 2-1775, 1776

M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783

M Solid State Electronics Corp., Sepulveda, Cal. p. 1-1816

M Torwico Elctns., Lakewood, N.J. p. 2-1818

M Transmagetics, Farmingdale, N.Y. p. 1-125

D Triad-Utrad, Huntington, Ind. p. 2-1822-1829

M Axel Elctns., Jamaica, N.Y. *

M Hisonic, Olathe, Kan. *

Lambda Elctns., Melville, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

M Torotal Inc., Grandview, Mo. *

American Magnetics Corp., Carterville, Ill.

American Monarch Corp., Minneapolis, Minn.

Collins Radio, Dallas, Tex.

M Component Specialties, Temple City, Cal.

M Electronic Transformer Corp., Paterson, N.J.

M EWC, Kenilworth, N.J.

Ferro-Tech Corp., Bloomfield, Conn.

Torelco Inc., Irvington, N.J.

D TRW/UTC Transformers, New York, N.Y.

Transformers, Constant Voltage

Abacus Controls Inc., Somerville, N.J. p. 2-1731

M Del Electronics Corp., Mt. Vernon, N.Y. p. 1-1174, 1175

Douglas Randall Div., Pawcatuck, Conn. p. 2-1734

M Freed Transformer Co., Brooklyn, N.Y. p. 1-716, 717; p. 2-1738-1747

Magnetico, Holtsville, N.Y. p. 2-1770

Neshaminy Transformer, Furlong, Pa. p. 2-1775, 1776

D Oaktron Inds., Monroe, Wisconsin p. 1-26, 27

Topaz Electronics, San Diego, Cal. p. 1-1503

D Triad-Utrad, Huntington, Ind. p. 2-1822-1829

ACDC Electronics, Oceanside, Cal. *

M Axel Elctns., Jamaica, N.Y. *

Biometrics Instrument Corp., Garland, Tex. *

CML-Macarr, Edison, N.J. *

D General Elec. Co., Schenectady, N.Y. *

General Magnetics, Bloomfield, N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Lambda Elctns., Melville, N.Y. *

D Microtran Co., Valley Stream, N.Y. *

Ohmite Mfg. Co., Skokie, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

Signal Transformer Co., Brooklyn, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

Acme Electric, Cuba, N.Y.

American Magnetics Corp., Carterville, Ill.

American Monarch Corp., Minneapolis, Minn.

Basler Electric Co., Highland, Ill.

D Bogen Div., Paramus, N.J.

Control Data Corp., Minneapolis, Minn.

D Davis & Co., J.W., Dallas, Tex.

E-Tronics, Sepulveda, Cal.

M Electronic Transformer Corp., Paterson, N.J.

Elma Engineering, Palo Alto, Cal.

Ferrodyne Corp., Venice, Calif.

Ferro-Tech Corp., Bloomfield, Conn.

Foster Transformer Co., Cincinnati, Ohio

D GTE Sylvania Inc., Waltham, Mass.

Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.

D Jefferson Elec., Bellwood, Ill.

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

Merrimack Magnetics, Lowell, Mass.

Micron Industries Corp., Stone Park, Ill.

North Electric Co., Galion, Ohio

M OPT Inds. Inc., Phillipsburg, N.J.

M Osborne Transformer Corp., Detroit, Mich.

D Perkin-Elmer Corp., Norwalk, Conn.

Phoenix Transformer Co., Phoenix, Ariz.

M Polyphase Instr. Co., Bridgeport, Pa.

Ratelco, Seattle, Wash.

Schott Corp., Minneapolis, Minn.

D Sola Electric, Elk Grove Village, Ill.

TDC, Div. Freq. Technology Inc., Littleton, Mass.

DM Thordarson Meissner, Mt. Carmel, Ill.

Tranex Inc., Mountain View, Cal.

M Transistor Devices, Cedar Knolls, N.J.

D TRW/UTC Transformers, New York, N.Y.

Transformers, Control—See Transformers, Power; Transformers, Synchro, Control**Transformers, Converter, D-C To D-C**

Aladdin Elctns., Nashville, Tenn. p. 2-1727, 1728

M Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-1732, 1733

Caddel-Burns Mfg. Co., Minsola, N. Y. p. 2-382-385

Dale Elctns., Yankton, S.D. p. 2-1452

M Del Electronics Corp., Mt. Vernon, N.Y. p. 1-1174, 1175

Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388

El-Rad Mfg. Co., Chicago, Ill. p. 2-1773, 1774

M Freed Transformer Co., Brooklyn, N.Y. p. 1-716, 717; p. 2-1738-1747

M Hisonic, Olathe, Kan. p. 2-1755

K.G.S. Elctns., Pasadena, Cal. p. 2-1753, 1754

Magnetico, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y. p. 2-1764

M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783

M Stevens-Arnold, So. Boston, Mass. p. 1-1476, 1477

Technitrol, Philadelphia, Pa. p. 2-1810, 1811

Topaz Electronics, San Diego, Cal. p. 1-1503

M Torwico Elctns., Lakewood, N.J. p. 2-1818

D Triad-Utrad, Huntington, Ind. p. 2-1822-1829

American Vector/TDC, Dayton, N.J. *

M Axel Elctns., Jamaica, N.Y. *

Bikar Corporation, Harbor City, Cal. *

Biometrics Instrument Corp., Garland, Tex. *

Lambda Elctns., Melville, N.Y. *

North Hills Elctns., Glen Cove, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

M Torotal Inc., Grandview, Mo. *

D Alpha Components Corp., El Segundo, Cal.

American Magnetics Corp., Carterville, Ill.

American Monarch Corp., Minneapolis, Minn.

Amp Inc., Harrisburg, Pa.

Automatic Coil, New Hyde Pk., N.Y.

Aydin Energy Systems, Palo Alto, Cal.

Basler Electric Co., Highland, Ill.

D B. H. Industries, Los Angeles, Cal

Bicron Elctns. Co., Canaan, Conn.

Coilcraft, Cary, Ill.

Design Automation, Lexington, Mass.

PRODUCT INDEX & DIRECTORY

Transformers, 400 Hz

M Dietz Design, Belton, Mo.
E-Tronics, Sepulveda, Cal.
Electrocom Inds., S. Bend, Ind.
M Electronic Transformer Corp., Paterson, N.J.
EWC, Kenilworth, N.J.
Ferrodyn Corp., Venice, Calif.
Ferro-Tech Corp., Bloomfield, Conn.
Fuji Electrochemical Co., Tokyo, Japan
Halmar Electronics, Columbus, Ohio
Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.
Hytronics Corp., Pinellas Park, Fla.
M JB Elctn, Transformers, Chicago, Ill
Mag-Con, New Brighton, Minn.
M Magnetic Circuit Elements, Monterey, Cal.
Merrimack Magnetics, Lowell, Mass.
North Electric Co., Galion, Ohio
M OPT Inds. Inc., Phillipsburg, N.J.
PCA Elctns., Sepulveda, Cal.
D Perkin-Elmer Corp., Norwalk, Conn.
M Peschel Instrs., Cape Coral, Fla.
Phoenix Transformer Co., Phoenix, Ariz.
M Polyphase Instr. Co., Bridgeport, Pa.
Pulse Engrg., San Diego, Cal
Schott Corp., Minneapolis, Minn.
D Stancor/Essex International, Chicago, Ill.
Stanford Applied Engineering, Santa Clara, Cal.
TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
TDK Elctns. Corp., Long Island City, N.Y.
DM Thordarson Meissner, Mt. Carmel, Ill.
Torelco Inc., Irvington, N.J.
Tranex Inc., Mountain View, Cal.
M Transistor Devices, Cedar Knolls, N.J.
D TRW/UTC Transformers, New York, N.Y.
Ward Leonard Elec. Co. Inc., Mt. Vernon, N.Y.

Transformers, Current—See Transformers, Instrument

Transformers, Data—See Transformers, Telephone Coupling

Transformers, Decade

Magnetico, Holtsville, N.Y. p. 2-1770
M North Atlantic Inds., Plainview, N.Y. p. 1-188,772
M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783
MSolid State Electronics Corp., Sepulveda, Cal. p. 1-126
M Torwico Elctns., Lakewood, N.J. p. 2-1818
Astrosystems, Lake Success, N.Y. *
Lambda Elctns., Melville, N.Y. *
Microtran Co., Valley Stream, N.Y. *
North Hills Elctns., Glen Cove, N.Y. *
American Magnetics Corp., Carterville, Ill.
D B. H. Industries, Los Angeles, Cal
Electro Sci. Inds., Portland, Ore.
M Electronic Transformer Corp., Paterson, N.J.
Perkin-Elmer Corp., Norwalk, Conn.
Phoenix Transformer Co., Phoenix, Ariz.
M Polyphase Instr. Co., Bridgeport, Pa.

Transformers, Differential

Caddel-Burns Mfg. Co., Mineola, N. Y. p. 2-382-385
Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388
Douglas Randall Div., Pawcatuck, Conn. p. 2-1734
Magnetico, Holtsville, N.Y. p. 2-1770
M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783
M Torwico Elctns., Lakewood, N.J. p. 2-1818
M Del Electronics Corp., Mt. Vernon, N.Y. *
Lambda Elctns., Melville, N.Y. *
D Altac Div., Anaheim, Calif.
American Magnetics Corp., Carterville, Ill.
D Ametek Controls Division, Feasterville, Pa.
Automatic Timing & Controls Co., King of Prussia, Pa.
Bicron Elctns. Co., Canaan, Conn.
Bourns, Riverside, Calif.
Columbia Resch. Labs., Woodlyn, Pa.
M Electronic Transformer Corp., Paterson, N.J.
D Perkin-Elmer Corp., Norwalk, Conn.
D TRW/UTC Transformers, New York, N.Y.

Transformers, Discriminator

D Bell Industries, Compton, Cal. p. 2-370-379
Caddel-Burns Mfg. Co., Mineola, N. Y. p. 2-382-385
Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388
El-Rad Mfg. Co., Chicago, Ill. p. 2-1773,1774
MESCC Elctns. Corp., Palisades Pk., N.J. p. 1-550,551

M Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747
Magnetico, Holtsville, N.Y. p. 2-1770
M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783
M Torwico Elctns., Lakewood, N.J. p. 2-1818
General Magnetics, Bloomfield, N.J. *
M Hisonic, Olathe, Kan. *
Lambda Elctns., Melville, N.Y. *
DM Microtran Co., Valley Stream, N.Y. *
Millen Mfg. Co. Inc., James, Malden, Mass. *
North Hills Elctns., Glen Cove, N.Y. *
M Torotol Inc., Grandview, Mo. *
American Magnetics Corp., Carterville, Ill.
M American Trans-Coil Corp., Richmond Hill, N.Y.
Automatic Coil, New Hyde Pk., N.Y.
M BG Electronics, Mount Vernon, N.Y.
Coilcraft, Cary, Ill.
Coil Specialty Co., Boalsburg, Pa.
Collins Radio, Dallas, Tex.
M Dietz Design, Belton, Mo.
M Electronic Transformer Corp., Paterson, N.J.
Ferrodyn Corp., Venice, Calif.
General Instr. Corp., Automatic Mfg. Div., Chicopee, Mass.
Genisco Technology Corp., Compton, Cal.
M Lorch Devices Inc., Englewood, N.J.
M Piconics Inc., Tyngsboro, Mass.
M Polyphase Instr. Co., Bridgeport, Pa.
D TRW/UTC Transformers, New York, N.Y.

Transformers, Donut—See Transformers, Toroidal

Transformers, Driver

M Abbott Transistor Labs., Los Angeles, Cal. p. 2-1720-1725
M Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-1732,1733
Dale Elctns., Yankton, S.D. p. 2-1452
Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388
M Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747
Magnetico, Holtsville, N.Y. p. 2-1770
DM Microtran Co., Valley Stream, N.Y. p. 2-1759,1760,1762
Neshaminy Transformer, Furlong, Pa. p. 2-1775,1776
NWL Transformers, Trenton, N.J. p. 2-1772
M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783
M Torotol Inc., Grandview, Mo. p. 2-1819-1821
M Torwico Elctns., Lakewood, N.J. p. 2-1818
D Triad-Utrad, Huntington, Ind. p. 2-1822-1829
ACDC Electronics, Oceanside, Cal. *
M Axel Elctns., Jamaica, N.Y. *
Biometrics Instrument Corp., Garland, Tex. *
M Hisonic, Olathe, Kan. *
K.G.S. Elctns., Pasadena, Cal. *
Lambda Elctns., Melville, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
M Sterling Transformer Corp., Brooklyn, N.Y. *
American Magnetics Corp., Carterville, Ill.
Basler Electric Co., Highland, Ill.
Coilcraft, Cary, Ill.
Collins Radio, Dallas, Tex.
M Component Specialties, Temple City, Cal.
D Components Specialties, Hempstead, N.Y.
Custom Coil & Transformer Co., Zanesville, Ohio
M Dietz Design, Belton, Mo.
M Electronic Transformer Corp., Paterson, N.J.
M EWC, Kenilworth, N.J.
Ferrodyn Corp., Venice, Calif.
Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.
Hytronics Corp., Pinellas Park, Fla.
M JB Elctn, Transformers, Chicago, Ill
Mag-Con, New Brighton, Minn.
M Magnetic Circuit Elements, Monterey, Cal.
Merrimack Magnetics, Lowell, Mass.
M OPT Inds. Inc., Phillipsburg, N.J.
M Osborne Transformer Corp., Detroit, Mich.
M Peschel Instrs., Cape Coral, Fla.
Phoenix Transformer Co., Phoenix, Ariz.
M Polyphase Instr. Co., Bridgeport, Pa.
Sloan Technology Corp., Santa Barbara, Cal.
D Stancor/Essex International, Chicago, Ill.
Stanford Applied Engineering, Santa Clara, Cal.
DM Thordarson Meissner, Mt. Carmel, Ill.
Tranex Inc., Mountain View, Cal.
M Transistor Devices, Cedar Knolls, N.J.
D TRW/UTC Transformers, New York, N.Y.

Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-1732,1733
M Del Electronics Corp., Mt. Vernon, N.Y. p. 1-1174,1175
Douglas Randall Div., Pawcatuck, Conn. p. 2-1734
Dynamic Instr. Corp., Hauppauge, N.Y. p. 1-1177; p. 2-1735
Ferrotran Elctn., New York, N.Y. p. 2-1751
M Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747
Magnetico, Holtsville, N.Y. p. 2-1770
DM Microtran Co., Valley Stream, N.Y. p. 2-1765-1769
Neshaminy Transformer, Furlong, Pa. p. 2-1775,1776
NWL Transformers, Trenton, N.J. p. 2-1772
M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783
M Sterling Transformer Corp., Brooklyn, N.Y. p. 2-1804,1805
D Todd Systems, Yonkers, N.Y. p. 2-1812-1815
M Torwico Elctns., Lakewood, N.J. p. 2-1818
D Triad-Utrad, Huntington, Ind. p. 2-1822-1829
American Vector/TDC, Dayton, N.J. *
ATR Electronics, St. Paul, Minn. *
M Axel Elctns., Jamaica, N.Y. *
Biometrics Instrument Corp., Garland, Tex. *
CML-Macarr, Edison, N.J. *
K.G.S. Elctns., Pasadena, Cal. *
Lambda Elctns., Melville, N.Y. *
Promemco, Hauppauge, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
Signal Transformer Co., Brooklyn, N.Y. *
M Torotol Inc., Grandview, Mo. *
American Magnetics Corp., Carterville, Ill.
American Monarch Corp., Minneapolis, Minn.
Aydin Energy Systems, Palo Alto, Cal.
Basler Electric Co., Highland, Ill.
D B. H. Industries, Los Angeles, Cal
Collins Radio, Dallas, Tex.
M Component Specialties, Temple City, Cal.
Custom Coil & Transformer Co., Zanesville, Ohio
Custom Power, Orange, Cal.
M Dietz Design, Belton, Mo.
Elcor Prods. Neotec Elctns. Inc., Silver Spring, Md.
Electro-Pacific, Goleta, Calif.
M Electronic Transformer Corp., Paterson, N.J.
Elma Engineering, Palo Alto, Cal.
EWC, Kenilworth, N.J.
Ferrodyn Corp., Venice, Calif.
Ferro-Tech Corp., Bloomfield, Conn.
D Herald Electronics, Chicago, Ill.
Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.
M JB Elctn, Transformers, Chicago, Ill
Mag-Con, New Brighton, Minn.
M Magnetic Circuit Elements, Monterey, Cal.
Merrimack Magnetics, Lowell, Mass.
M OPT Inds. Inc., Phillipsburg, N.J.
M Osborne Transformer Corp., Detroit, Mich.
M Peschel Instrs., Cape Coral, Fla.
Phoenix Transformer Co., Phoenix, Ariz.
M Polyphase Instr. Co., Bridgeport, Pa.
Sloan Technology Corp., Santa Barbara, Cal.
D Stancor/Essex International, Chicago, Ill.
Stanford Applied Engineering, Santa Clara, Cal.
DM Thordarson Meissner, Mt. Carmel, Ill.
Tranex Inc., Mountain View, Cal.
M Transistor Devices, Cedar Knolls, N.J.
D TRW/UTC Transformers, New York, N.Y.

Transformers, Flyback

El-Rad Mfg. Co., Chicago, Ill. p. 2-1773,1774
Magnetico, Holtsville, N.Y. p. 2-1770
D Triad-Utrad, Huntington, Ind. p. 2-1822-1829
Lambda Elctns., Melville, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
Amperex Electronic Corp., Slatersville, R.I.
Fuji Electrochemical Co., Tokyo, Japan
General Instr. Corp., Chicopee, Mass.
Panasonic, Ind'l. Elctn. Comps., New York, N.Y.
D Stancor/Essex International, Chicago, Ill.
TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
DM Thordarson Meissner, Mt. Carmel, Ill.

Transformers, Foil-Wound—See Coils, Foil-Wound

Transformers, 400 Hz

Abacus Controls Inc., Somerville, N.J. p. 2-1731
Abbott Transistor Labs., Los Angeles, Cal. p. 2-1720,1724,1725

Transformers, Filament

M Abbott Transistor Labs., Los Angeles, Cal. p. 2-1720-1725

M Del Electronics Corp., Mt. Vernon, N.Y.
p. 1-1174,1175
Douglas Randall Div., Pawcatuck, Conn.
p. 2-1734

Electrocube Inc., San Gabriel, Cal.
p. 2-1736,1737

M Freed Transformer Co., Brooklyn, N.Y.
p. 1-716,717; p. 2-1738-1747

M Hisonic, Olathe, Kan. p. 2-1755

Magnetico, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y. ... p. 2-1765

Pico Elctns. Inc., Mount Vernon, N.Y.
p. 2-1778-1783

M Torotel Inc., Grandview, Mo. p. 2-1821

M Torwico Elctns., Lakewood, N.J. p. 2-1818

D Triad-Utrad, Huntington, Ind. ... p. 2-1822-1829

ACDC Electronics, Oceanside, Cal. *

MAMP Capatron Div./AMP Inc., Elizabethtown, Pa. *

Arnold Magnetics Corp., Culver City, Cal. *

MAxel Elctns., Jamaica, N.Y. *

Biometrics Instrument Corp., Garland, Tex. *

General Magnetics, Bloomfield, N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Promemco, Hauppauge, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

Signal Transformer Co., Brooklyn, N.Y. *

DM Staco, Dayton, Ohio *

American Monarch Corp., Minneapolis, Minn.
Basler Electric Co., Highland, Ill.
Custom Power, Orange, Cal.

M Electronic Transformer Corp., Paterson, N.J.
Ferrodyne Corp., Venice, Calif.
Ferro-Tech Corp., Bloomfield, Conn.
Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.

M JB Elctn, Transformers, Chicago, Ill

M OPT Inds. Inc., Phillipsburg, N.J.

M Osborne Transformer Corp., Detroit, Mich.
Perkin-Elmer Corp., Norwalk, Conn.

M Peschel Instrs., Cape Coral, Fla.

M Polyphase Instr. Co., Bridgeport, Pa.

M Schott Corp., Minneapolis, Minn.
Sola Electric, Elk Grove Village, Ill.

D Stancor/Essex International, Chicago, Ill.
Torelco Inc., Irvington, N.J.

Tranex Inc., Mountain View, Cal.

D TRW/UTC Transformers, New York, N.Y.

Transformers, High-Voltage (1,000 Volts & Over)

Bertan Assocs., Hicksville, N.Y.
p. 1-1120,1121

M Del Electronics Corp., Mt. Vernon, N.Y.
p. 1-1174,1175
Douglas Randall Div., Pawcatuck, Conn.
p. 2-1734

M Freed Transformer Co., Brooklyn, N.Y.
p. 1-716,717; p. 2-1738-1747

M Hipotronics, Brewster, N.Y.
p. 1-722,723,1230,1231

M Hisonic, Olathe, Kan. p. 2-1755

Kilovolt Corp., Hackensack, N.J.
p. 1-1302-1305

Magnetico, Holtsville, N.Y. p. 2-1770

NWL Transformers, Trenton, N.J. p. 2-1772

Spellman High Voltage Elctns. Corp., Bronx, N.Y. p. 1-1460-1471

Technitrol, Philadelphia, Pa. p. 2-1810,1811

D Todd Systems, Yonkers, N.Y. p. 2-1812-1815

Universal Voltronics Corp., Mt. Kisco, N.Y.
p. 1-1527

American Vector/TDC, Dayton, N.J. *

MAMP Capatron Div./AMP Inc., Elizabethtown, Pa. *

MAxel Elctns., Jamaica, N.Y. *

Biometrics Instrument Corp., Garland, Tex. *

CML-Macarr, Edison, N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Lambda Elctns., Melville, N.Y. *

DM Microtran Co., Valley Stream, N.Y. *

Power Designs, Westbury, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

Square D Co., Milwaukee, Wisc. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

Acme Electric, Cuba, N.Y.

American Magnetics Corp., Cartersville, Ill.

Aydin Energy Systems, Palo Alto, Cal.

Basler Electric Co., Highland, Ill.

Bicron Elctns. Co., Canaan, Conn.

M Caddell Coil Corp., Poultney, Vt.

M Electronic Transformer Corp., Paterson, N.J.

Elma Engineering, Palo Alto, Cal.

Ferrodyne Corp., Venice, Calif.

Ferro-Tech Corp., Bloomfield, Conn.

Foster Transformer Co., Cincinnati, Ohio

Grand Transformers, Grand Haven, Mich.

D GTE Sylvania Inc., Waltham, Mass.

Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.

D Jefferson Elec., Bellwood, Ill.

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

Megavolt, New York, N.Y.

Micron Industries Corp., Stone Park, Ill.

North Electric Co., Galion, Ohio

M Osborne Transformer Corp., Detroit, Mich.

Perkin-Elmer Corp., Norwalk, Conn.

M Peschel Instrs., Cape Coral, Fla.

M Polyphase Instr. Co., Bridgeport, Pa.

Schott Corp., Minneapolis, Minn.

D Stancor/Essex International, Chicago, Ill.

TDC, Div. Freq. Technology Inc., Littleton, Mass.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

DM Thordarson Meissner, Mt. Carmel, Ill.

Torelco Inc., Irvington, N.J.

Tranex Inc., Mountain View, Cal.

D TRW/UTC Transformers, New York, N.Y.

Voltek Inc., Beverly Hills, Cal.

Transformers, I-F

Aladdin Elctns., Nashville, Tenn.
p. 2-1727,1728

D Bell Industries, Compton, Cal. p. 2-370-379

Caddell-Burns Mfg. Co., Mineola, N.Y.
p. 2-382-385

Dale Electronics Inc., Columbus, Neb.
p. 2-1452

Dale Elctns., Yankton, S.D. p. 2-1452

Delevan Div., Coil Prods., E. Aurora, N.Y.
p. 2-388

Douglas Randall Div., Pawcatuck, Conn.
p. 2-1734

El-Rad Mfg. Co., Chicago, Ill. p. 2-1773,1774

Mini-Circuits Lab., Brooklyn, N.Y. p. 2-1291

M Torwico Elctns., Lakewood, N.J. p. 2-1818

Vari-L Co., Denver, Colo. p. 2-1831-1833

Biometrics Instrument Corp., Garland, Tex. *

CML-Macarr, Edison, N.J. *

D GC Electronics, Rockford, Ill. *

M Hisonic, Olathe, Kan. *

Lambda Elctns., Melville, N.Y. *

D Millen Mfg. Co. Inc., James, Malden, Mass. *

Shigoto Inds., Ltd., New York, N.Y. *

M American Trans-Coil Corp., Richmond Hill, N.Y.
Automatic Coil, New Hyde Pk., N.Y.

M Caddell Coil Corp., Poultney, Vt.

D Cambridge Thermionic Corp., Cambridge, Mass.
Coil-Craft Inc., Bronxville, N.Y.

Coilcraft, Cary, Ill.

Coil Specialty Co., Boalsburg, Pa.

D Components Specialties, Hempstead, N.Y.

M Dietz Design, Belton, Mo.

Fuji Electrochemical Co., Tokyo, Japan

General Instr. Corp., Automatic Mfg. Div., Chicopee, Mass.

Gowanda Electronics Corp., Gowanda, N.Y.

Hytronics Corp., Pinellas Park, Fla.

Morey Corp., Downers Grove, Ill.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

M Piconics Inc., Tyngsboro, Mass.

M Polyphase Instr. Co., Bridgeport, Pa.

M Syscon Int'l., So. Bend, Ind.

DM Thordarson Meissner, Mt. Carmel, Ill.

D Workman Electronic Prods., Sarasota, Fla.

Transformers, Input

M Abbott Transistor Labs., Los Angeles, Cal.
p. 2-1720-1725

M Bourns Pacific Magnetic Corp., Romoland, Cal.
p. 2-1732,1733

Dale Elctns., Yankton, S.D. p. 2-1452

M Del Electronics Corp., Mt. Vernon, N.Y.
p. 1-1174,1175

Delevan Div., Coil Prods., E. Aurora, N.Y.
p. 2-388

Ferrotran Elctn., New York, N.Y. p. 2-1751

M Freed Transformer Co., Brooklyn, N.Y.
p. 1-716,717; p. 2-1738-1747

Magnetico, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y.
p. 2-1757-1760,1762,1763

Neshaminy Transformer, Furlong, Pa.
p. 2-1775,1776

NWL Transformers, Trenton, N.J. p. 2-1772

M Pico Elctns. Inc., Mount Vernon, N.Y.
p. 2-1778-1783

M Solid State Electronics Corp., Sepulveda, Cal.
p. 1-128

M Stevens-Arnold, So. Boston, Mass.
p. 1-1476,1477

Technitrol, Philadelphia, Pa. p. 2-1810,1811

Todd Systems, Yonkers, N.Y. p. 2-1812-1815

M Torotel Inc., Grandview, Mo. ... p. 2-1819-1821

M Torwico Elctns., Lakewood, N.J. p. 2-1818

Triad-Utrad, Huntington, Ind. ... p. 2-1822-1829

Vari-L Co., Denver, Colo. p. 2-1831-1833

American Vector/TDC, Dayton, N.J. *

Biometrics Instrument Corp., Garland, Tex. *

CML-Macarr, Edison, N.J. *

M Hisonic, Olathe, Kan. *

Lambda Elctns., Melville, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

D Altec Div., Anaheim, Calif.

American Magnetics Corp., Cartersville, Ill.

M American Trans-Coil Corp., Richmond Hill, N.Y.

Basler Electric Co., Highland, Ill.

Bicron Elctns. Co., Canaan, Conn.

M Caddell Coil Corp., Poultney, Vt.

Coil-Craft Inc., Bronxville, N.Y.

Collins Radio, Dallas, Tex.

M Component Specialties, Temple City, Cal.

Custom Coil & Transformer Co., Zanesville, Ohio

M Dietz Design, Belton, Mo.

M Electronic Transformer Corp., Paterson, N.J.

M EWVC, Kenilworth, N.J.

Ferrodyne Corp., Venice, Calif.

D Gotham Audio Corp., New York, N.Y.

Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.

Hytronics Corp., Pinellas Park, Fla.

M JB Elctn, Transformers, Chicago, Ill

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

Merrimack Magnetics, Lowell, Mass.

North Electric Co., Galion, Ohio

M OPT Inds. Inc., Phillipsburg, N.J.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Perkin-Elmer Corp., Norwalk, Conn.

Phoenix Transformer Co., Phoenix, Ariz.

M Polyphase Instr. Co., Bridgeport, Pa.

Pulse Engrg., San Diego, Cal

M Syscon Int'l., So. Bend, Ind.

TDC, Div. Freq. Technology Inc., Littleton, Mass.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

DM Thordarson Meissner, Mt. Carmel, Ill.

Tranex Inc., Mountain View, Cal.

D TRW/UTC Transformers, New York, N.Y.

Transformers, Instrument

M Abbott Transistor Labs., Los Angeles, Cal.
p. 2-1720-1725

M Aladdin Elctns., Nashville, Tenn.
p. 2-1727,1728

M Bourns Pacific Magnetic Corp., Romoland, Cal.
p. 2-1732,1733

Dale Elctns., Yankton, S.D. p. 2-1452

M Del Electronics Corp., Mt. Vernon, N.Y.
p. 1-1174,1175

Delevan Div., Coil Prods., E. Aurora, N.Y.
p. 2-388

Douglas Randall Div., Pawcatuck, Conn.
p. 2-1734

Dranetz Engrg. Labs., So. Plainfield, N.J.
p. 1-652-657

Ferrotran Elctn., New York, N.Y. p. 2-1751

D Larson Instr. Co., Orangeburg, N.Y. p. 1-757

Magnetico, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y.
p. 2-1763,1765-1769

M North Atlantic Inds., Plainview, N.Y.
p. 1-188,772

NWL Transformers, Trenton, N.J. p. 2-1772

M Pico Elctns. Inc., Mount Vernon, N.Y.
p. 2-1778-1783

M Sterling Transformer Corp., Brooklyn, N.Y.
p. 2-1803-1807

M Stevens-Arnold, So. Boston, Mass.
p. 1-1476,1477

M Torwico Elctns., Lakewood, N.J. p. 2-1818

D Triad-Utrad, Huntington, Ind. ... p. 2-1822-1829

Vari-L Co., Denver, Colo. p. 2-1831-1833

Astrosystems, Lake Success, N.Y. *

CML-Macarr, Edison, N.J. *

Esterline Angus, Indianapolis, Ind. *

M Hisonic, Olathe, Kan. *

K.G.S. Elctns., Pasadena, Cal. *

Lambda Elctns., Melville, N.Y. *

Power Designs, Westbury, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

Allis-Chalmers, Milwaukee, Wisc.

American Magnetics Corp., Cartersville, Ill.

Annis R B Co., Indianapolis, Ind.

D B. H. Industries, Los Angeles, Cal

Bicron Elctns. Co., Canaan, Conn.

M Component Specialties, Temple City, Cal.

Custom Coil & Transformer Co., Zanesville, Ohio

M Dietz Design, Belton, Mo.
 D Dormeyer Industries, Chicago, Ill.
 Elcor Prods. Neotec Elctns. Inc., Silver Spring, Md.
 Electrical Instr. Svc., Mt. Vernon, N.Y.
 M Electronic Transformer Corp., Paterson, N.J.
 EWC, Kenilworth, N.J.
 Ferrodyne Corp., Venice, Calif.
 Hytronics Corp., Pinellas Park, Fla.
 Mag-Con, New Brighton, Minn.
 M Magnetic Circuit Elements, Monterey, Cal.
 Merrimack Magnetics, Lowell, Mass.
 M OPT Inds. Inc., Phillipsburg, N.J.
 M Osborne Transformer Corp., Detroit, Mich.
 Pearson Elctns. Inc., Palo Alto, Cal.
 Perkin-Elmer Corp., Norwalk, Conn.
 Phoenix Transformer Co., Phoenix, Ariz.
 M Polyphase Instr. Co., Bridgeport, Pa.
 Princeton Applied Resch. Corp., Princeton, N.J.
 Pulse Engrg., San Diego, Cal.
 Schott Corp., Minneapolis, Minn.
 Sensitive Research Instrs., Mt. Vernon, N.Y.
 DM Thordarson Meissner, Mt. Carmel, Ill.
 Tranex Inc., Mountain View, Cal.
 D TRW/UTC Transformers, New York, N.Y.
 Varian Assocs., Palo Alto, Cal.

Transformers, Interstage

M Bourns Pacific Magnetic Corp., Romoland, Cal.
 p. 2-1732, 1733
Caddell-Burns Mfg. Co., Mineola, N. Y.
 p. 2-382-385
Dale Elctns., Yankton, S.D. p. 2-1452
Delevan Div., Coil Prods., E. Aurora, N.Y.
 p. 2-388
Douglas Randall Div., Pawcatuck, Conn.
 p. 2-1734
M ESC Elctns. Corp., Palisades Pk., N.J.
 p. 1-550, 551
M Freed Transformer Co., Brooklyn, N.Y.
 p. 1-716, 717; p. 2-1738-1747
Magnetico, Holtville, N.Y. p. 2-1770
DM Microtran Co., Valley Stream, N.Y.
 p. 2-1757-1760, 1762
Neshaminy Transformer, Furlong, Pa.
 p. 2-1775, 1776
M Pico Elctns. Inc., Mount Vernon, N.Y.
 p. 2-1778, 1779
M Solid State Electronics Corp., Sepulveda, Cal.
 p. 1-126
Technitrol, Philadelphia, Pa. p. 2-1810, 1811
M Torotol Inc., Grandview, Mo. p. 2-1819-1821
M Torwico Elctns., Lakewood, N.J. p. 2-1818
Triad-Utrad, Huntington, Ind. p. 2-1822-1829
Vari-L Co., Denver, Colo. p. 2-1831-1833
Biometrics Instrument Corp., Garland, Tex. *
M Hisonic, Olathe, Kan. *
Lambda Elctns., Melville, N.Y. *
M Sterling Transformer Corp., Brooklyn, N.Y. *
American Magnetics Corp., Carterville, Ill.
 M American Trans-Coil Corp., Richmond Hill, N.Y.
 Basler Electric Co., Highland, Ill.
 M Caddell Coil Corp., Poughkeepsie, N.Y.
 Coil-Craft Inc., Bronxville, N.Y.
 Collins Radio, Dallas, Tex.
 Custom Coil & Transformer Co., Zanesville, Ohio
 M Dietz Design, Belton, Mo.
 M Electronic Transformer Corp., Paterson, N.J.
 M EWC, Kenilworth, N.J.
 Ferrodyne Corp., Venice, Calif.
 General Instr. Corp., Automatic Mfg. Div., Chicopee, Mass.
 Hytronics Corp., Pinellas Park, Fla.
 M JB Elctn, Transformers, Chicago, Ill.
 Mag-Con, New Brighton, Minn.
 M Magnetic Circuit Elements, Monterey, Cal.
 Merrimack Magnetics, Lowell, Mass.
 M OPT Inds. Inc., Phillipsburg, N.J.
 Phoenix Transformer Co., Phoenix, Ariz.
 M Polyphase Instr. Co., Bridgeport, Pa.
 M Syscon-Int'l., So. Bend, Ind.
 DM Thordarson Meissner, Mt. Carmel, Ill.
 Tranex Inc., Mountain View, Cal.
 D TRW/UTC Transformers, New York, N.Y.

Transformers, Inverter

Abacus Controls Inc., Somerville, N.J.
 p. 2-2131
M Bourns Pacific Magnetic Corp., Romoland, Cal.
 p. 2-1732, 1733
Caddell-Burns Mfg. Co., Mineola, N. Y.
 p. 2-382-385
Dale Electronics Inc., Columbus, Neb.
 p. 2-1452
Delevan Div., Coil Prods., E. Aurora, N.Y.
 p. 2-388
Electrocube Inc., San Gabriel, Cal.
 p. 2-1736, 1737

M Freed Transformer Co., Brooklyn, N.Y.
 p. 1-716, 717; p. 2-1738-1747
M Hisonic, Olathe, Kan. p. 2-1755
Magnetico, Holtville, N.Y. p. 2-1770
Nano Pulse Industries, Orange, Cal.
 p. 2-1773, 1774
Pico Elctns. Inc., Mount Vernon, N.Y.
 p. 2-1778-1783
M Stevens-Arnold, So. Boston, Mass.
 p. 1-1476, 1477
Technitrol, Philadelphia, Pa. p. 2-1810, 1811
ACDC Electronics, Oceanside, Cal. *
American Vector/TDC, Dayton, N.J. *
ATR Electronics, St. Paul, Minn. *
M Axel Elctns., Jamaica, N.Y. *
Biometrics Instrument Corp., Garland, Tex. *
CML-Macarr, Edison, N.J. *
M Torotol Inc., Grandview, Mo. *
 Alpha Components Corp., El Segundo, Cal.
 American Monarch Corp., Minneapolis, Minn.
 D B. H. Industries, Los Angeles, Cal.
 Bicon Elctns. Co., Canaan, Conn.
 Coilcraft, Cary, Ill.
 Cramer Coil, Grafton, Wisc.
 Electrocom Inds., S. Bend, Ind.
 M Electronic Transformer Corp., Paterson, N.J.
 Gould Inc., Trenton, N.J.
 Hytronics Corp., Pinellas Park, Fla.
 M JB Elctn, Transformers, Chicago, Ill.
 Mag-Con, New Brighton, Minn.
 North Electric Co., Galion, Ohio
 M OPT Inds. Inc., Phillipsburg, N.J.
 M Osborne Transformer Corp., Detroit, Mich.
 Perkin-Elmer Corp., Norwalk, Conn.
 M Peschel Instrs., Cape Coral, Fla.
 Pulse Engrg., San Diego, Cal.
 Schott Corp., Minneapolis, Minn.
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
 D Terado Corp., St. Paul, Minn.
 DM Thordarson Meissner, Mt. Carmel, Ill.
 Torelco Inc., Irvington, N.J.
 Tranex Inc., Mountain View, Cal.
 TRW/UTC Transformers, New York, N.Y.

Transformers, Isolation

Abbott Transistor Labs., Los Angeles, Cal.
 p. 2-1720-1725
M Bourns Pacific Magnetic Corp., Romoland, Cal.
 p. 2-1732, 1733
CEA, San Luis Obispo, Cal. p. 1-1125
Dale Elctns., Yankton, S.D. p. 2-1452
M Del Electronics Corp., Mt. Vernon, N.Y.
 p. 1-1174, 1175
Delevan Div., Coil Prods., E. Aurora, N.Y.
 p. 2-388
Deltac Corp., San Diego, Cal. p. 1-1181
Douglas Randall Div., Pawcatuck, Conn.
 p. 2-1734
Dranetz Engrg. Labs., So. Plainfield, N.J.
 p. 1-652-657
Electrocube Inc., San Gabriel, Cal.
 p. 2-1736, 1737
Electronic Navigation Inds., Rochester, N.Y.
 p. 1-674-676
Ferrotran Elctn., New York, N.Y. p. 2-1751
M Freed Transformer Co., Brooklyn, N.Y.
 p. 1-716, 717; p. 2-1738-1747
Hipotronics, Brewster, N.Y.
 p. 1-722, 723, 1230, 1231
K.G.S. Elctns., Pasadena, Cal. p. 2-1754
Magnetico, Holtville, N.Y. p. 2-1770
DM Microtran Co., Valley Stream, N.Y.
 p. 2-1763, 1765, 1766, 1768, 1769
Mini-Circuits Lab., Brooklyn, N.Y. p. 2-1291
Neshaminy Transformer, Furlong, Pa.
 p. 2-1775, 1776
North Hills Elctns., Glen Cove, N.Y. p. 2-1771
NWL Transformers, Trenton, N.J. p. 2-1772
M Pico Elctns. Inc., Mount Vernon, N.Y.
 p. 2-1778-1783
RoMarNetics, Northridge, Cal. p. 2-1785
D Sanford-Miller Corp., Brooklyn, N.Y. p. 1-1863
Signal Transformer Co., Brooklyn, N.Y.
 p. 2-1799
M Sterling Transformer Corp., Brooklyn, N.Y.
 p. 2-1803
M Stevens-Arnold, So. Boston, Mass.
 p. 1-1476, 1477
Technitrol, Philadelphia, Pa. p. 2-1810, 1811
D Todd Systems, Yonkers, N.Y. p. 2-1812-1815
Topaz Electronics, San Diego, Cal.
 p. 1-592, 593, 1506; p. 2-1816, 1817
M Torotol Inc., Grandview, Mo. p. 2-1819-1821
M Torwico Elctns., Lakewood, N.J. p. 2-1818
D Triad-Utrad, Huntington, Ind. p. 2-1822-1829

Universal Voltronics Corp., Mt. Kisco, N.Y.
 p. 1-1527
Vari-L Co., Denver, Colo. p. 2-1831-1833
American Vector/TDC, Dayton, N.J. *
MAMP Capatron Div./AMP Inc., Elizabethtown, Pa. *
Astrosystems, Lake Success, N.Y. *
MAxel Elctns., Jamaica, N.Y. *
Biometrics Instrument Corp., Garland, Tex. *
CML-Macarr, Edison, N.J. *
Dynamic Instr. Corp., Hauppauge, N.Y. *
General Elec. Co., Schenectady, N.Y. *
M Hisonic, Olathe, Kan. *
Lambda Elctns., Melville, N.Y. *
Promemco, Hauppauge, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
Square D Co., Milwaukee, Wisc. *
DM Staco, Dayton, Ohio *
 Acme Electric, Cuba, N.Y.
 D Altec Div., Anaheim, Calif.
 American Magnetics Corp., Carterville, Ill.
 American Monarch Corp., Minneapolis, Minn.
 Aydin Energy Systems, Palo Alto, Cal.
 Basler Electric Co., Highland, Ill.
 D B. H. Industries, Los Angeles, Cal.
 Carson Mfg. Co., Indianapolis, Ind.
 Collins Radio, Dallas, Tex.
 Control Data Corp., Minneapolis, Minn.
 Custom Coil & Transformer Co., Zanesville, Ohio
 Custom Power, Orange, Cal.
 M Dietz Design, Belton, Mo.
 Elcor Prods. Neotec Elctns. Inc., Silver Spring, Md.
 Electro-Pacific, Goleta, Calif.
 M Electronic Transformer Corp., Paterson, N.J.
 Elma Engineering, Palo Alto, Cal.
 EWC, Kenilworth, N.J.
 Ferrodyne Corp., Venice, Calif.
 Ferro-Tech Corp., Bloomfield, Conn.
 Foster Transformer Co., Cincinnati, Ohio
 Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.
 D Hughey & Phillips, Burbank, Cal.
 M JB Elctn, Transformers, Chicago, Ill.
 D Jefferson Elec., Bellwood, Ill.
 Mag-Con, New Brighton, Minn.
 M Magnetic Circuit Elements, Monterey, Cal.
 Magnetics, Div. of Spang Industries, Sandy Lake, Pa.
 Megavolt, New York, N.Y.
 Merrimack Magnetics, Lowell, Mass.
 Micron Industries Corp., Stone Park, Ill.
 M OPT Inds. Inc., Phillipsburg, N.J.
 M Osborne Transformer Corp., Detroit, Mich.
 Perkin-Elmer Corp., Norwalk, Conn.
 M Peschel Instrs., Cape Coral, Fla.
 Phoenix Transformer Co., Phoenix, Ariz.
 M Polyphase Instr. Co., Bridgeport, Pa.
 Pulse Engrg., San Diego, Cal.
 RCA Electronic Comps., Harrison, N.J.
 Schott Corp., Minneapolis, Minn.
 D Stancor/Essex International, Chicago, Ill.
 Stanford Applied Engineering, Santa Clara, Cal.
 TDC, Div. Freq. Technology Inc., Littleton, Mass.
 TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
 DM Thordarson Meissner, Mt. Carmel, Ill.
 Tranex Inc., Mountain View, Cal.
 Triac Electronics, New York, N.Y.
 D TRW/UTC Transformers, New York, N.Y.

Transformers, Line

M Abbott Transistor Labs., Los Angeles, Cal.
 p. 2-1720-1725
M Bourns Pacific Magnetic Corp., Romoland, Cal.
 p. 2-1732, 1733
M Del Electronics Corp., Mt. Vernon, N.Y.
 p. 1-1174, 1175
Electrocube Inc., San Gabriel, Cal.
 p. 2-1736, 1737
Ferrotran Elctn., New York, N.Y. p. 2-1751
Magnetico, Holtville, N.Y. p. 2-1770
DM Microtran Co., Valley Stream, N.Y.
 p. 2-1757-1760, 1762, 1763
NWL Transformers, Trenton, N.J. p. 2-1772
D Oaktron Inds., Monroe, Wisconsin p. 1-26, 27
M Pico Elctns. Inc., Mount Vernon, N.Y.
 p. 2-1778-1783
M Sterling Transformer Corp., Brooklyn, N.Y.
 p. 2-1803
Technitrol, Philadelphia, Pa. p. 2-1810, 1811
D Todd Systems, Yonkers, N.Y. p. 2-1812-1815
Topaz Electronics, San Diego, Cal.
 p. 1-592, 593, 1506; p. 2-1816, 1817
M Torwico Elctns., Lakewood, N.J. p. 2-1818
D Triad-Utrad, Huntington, Ind. p. 2-1822-1829
Utah Electronic Div., Huntington, Ind. p. 1-31
MAxel Elctns., Jamaica, N.Y. *

General Elec. Co., Schenectady, N.Y. *

M Hisonic, Olathe, Kan. *

Lambda Elctns., Melville, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

Square D Co., Milwaukee, Wisc. *

M Torotol Inc., Grandview, Mo. *

D Altec Div., Anaheim, Calif.

D American Magnetics Corp., Carterville, Ill.

American Monarch Corp., Minneapolis, Minn.

Basler Electric Co., Highland, Ill.

D B. H. Industries, Los Angeles, Cal.

D Bogen Div., Paramus, N.J.

D Components Specialties, Hempstead, N.Y.

Custom Coil & Transformer Co., Zanesville, Ohio

Custom Power, Orange, Cal.

M Dietz Design, Belton, Mo.

D Electro-Voice, Buchanan, Mich.

Electrocom Inds., S. Bend, Ind.

M Electronic Transformer Corp., Paterson, N.J.

Elma Engineering, Palo Alto, Cal.

D GTE Sylvania Inc., Waltham, Mass.

D Herald Electronics, Chicago, Ill.

M JB Elctrn. Transformers, Chicago, Ill.

Mag-Con, New Brighton, Minn.

Micron Industries Corp., Stone Park, Ill.

Phoenix Transformer Co., Phoenix, Ariz.

M Polyphase Instr. Co., Bridgeport, Pa.

Shure Brothers, Evanston, Ill.

Sola Electric, Elk Grove Village, Ill.

D Stancor/Essex International, Chicago, Ill.

TDC, Div. Freq. Technology Inc., Littleton, Mass.

DM Thordarson Meissner, Mt. Carmel, Ill.

Tranex Inc., Mountain View, Cal.

D TRW/UTC Transformers, New York, N.Y.

D Workman Electronic Prods., Sarasota, Fla.

Transformers, Linear Variable-Differential

—See Transformers, Differential

Transformers, Magnetic Amplifier

Abacus Controls Inc., Somerville, N.J.

M Bourns Pacific Magnetic Corp., Romoland, Cal.

M Freed Transformer Co., Brooklyn, N.Y.

Magnetico, Holtsville, N.Y.

NWL Transformers, Trenton, N.J.

ACDC Electronics, Oceanside, Cal. *

M Axel Elctns., Jamaica, N.Y. *

General Magnetics, Bloomfield, N.J. *

M Microtran Co., Valley Stream, N.Y. *

M Torotol Inc., Grandview, Mo. *

M American Trans-Coil Corp., Richmond Hill, N.Y.

Basler Electric Co., Highland, Ill.

Bicron Elctns. Co., Canaan, Conn.

Coilcraft, Cary, Ill.

Cross Electronics Inc., Warrendale, Pa.

Electrocom Inds., S. Bend, Ind.

M Electronic Transformer Corp., Paterson, N.J.

Genisco Technology Corp., Compton, Cal.

Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.

M JB Elctrn. Transformers, Chicago, Ill.

Mag-Con, New Brighton, Minn.

Sola Electric, Elk Grove Village, Ill.

Torelco Inc., Irvington, N.J.

Tranex Inc., Mountain View, Cal.

Transformers, Matching

M Aladdin Elctns., Nashville, Tenn.

Amplifier Research Corp., Souderton, Pa.

M Bourns Pacific Magnetic Corp., Romoland, Cal.

Caddel-Burns Mfg. Co., Mineola, N.Y.

Delevan Div., Coil Prods., E. Aurora, N.Y.

Douglas Randall Div., Pawcatuck, Conn.

M Electro Impulse, Red Bank, N.J.

Electronic Navigation Inds., Rochester, N.Y.

M ESC Elctns. Corp., Palisades Pk., N.J.

M Freed Transformer Co., Brooklyn, N.Y.

M Hisonic, Olathe, Kan.

Magnetico, Holtsville, N.Y.

DM Microtran Co., Valley Stream, N.Y.

North Hills Elctns., Glen Cove, N.Y.

D Oaktron Inds., Monroe, Wisconsin ... p. 2-26,27

M Pico Elctns. Inc., Mount Vernon, N.Y.

RFL Inds., Boonton, N.J.

Technitrol, Philadelphia, Pa.

M Torotol Inc., Grandview, Mo.

M Torwico Elctns., Lakewood, N.J.

Triad-Utrad, Huntington, Ind.

D Utah Electronic Div., Huntington, Ind.

Vari-L Co., Denver, Colo.

Aemco Div., Mankato, Minn.

American Vector/TDC, Dayton, N.J.

M Axel Elctns., Jamaica, N.Y.

CML-Macarr, Edison, N.J.

D GC Electronics, Rockford, Ill.

Kappa Networks, Carteret, N.J.

K.G.S. Elctns., Pasadena, Cal.

Lambda Elctns., Melville, N.Y.

M McGraw-Edison Co., Manchester, N.H.

Shigoto Inds., Ltd., New York, N.Y.

M Sterling Transformer Corp., Brooklyn, N.Y.

D Altec Div., Anaheim, Calif.

American Magnetics Corp., Carterville, Ill.

D Antenna Corp. of America, Burlington, Iowa

Automatic Coil, New Hyde Pk., N.Y.

D Ava Elctns., Landsdowne, Pa.

D Blonder-Tongue Labs., Old Bridge, N.J.

D Bogen Div., Paramus, N.J.

M Caddell Coil Corp., Poughkeepsie, N.Y.

D Channel Master Div. Avnet, Ellenville, N.Y.

Coil-Craft Inc., Bronxville, N.Y.

Collins Radio, Dallas, Tex.

Cramer Coil, Grafton, Wisc.

Delta-Benco-Cascade LTD., Rexdale, Ont. Can. M9W 1G1

M Dietz Design, Belton, Mo.

Elcom Systems, Deer Pk., N.Y.

Electrocom Inds., S. Bend, Ind.

M Electronic Transformer Corp., Paterson, N.J.

M EWC, Kenilworth, N.J.

Ferrodyne Corp., Venice, Calif.

D Finney Co., Bedford, Ohio

D Great Western Aviation, Denver, Colo.

Hytronics Corp., Pinellas Park, Fla.

M JB Elctrn. Transformers, Chicago, Ill.

D Jerrold Electronics Corp., Horsham, Pa.

M Lorch Elctns. Corp., Englewood, N.J.

M Lorch Devices Inc., Englewood, N.J.

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

M OPT Inds. Inc., Phillipsburg, N.J.

M Osborne Transformer Corp., Detroit, Mich.

Palomar Engrs., Escondido, Cal.

Panasonic, Ind'l Elctrn. Comps., New York, N.Y.

Phoenix Transformer Co., Phoenix, Ariz.

M Piconics Inc., Tyngsboro, Mass.

M Polyphase Instr. Co., Bridgeport, Pa.

M Premier Microwave, Port Chester, N.Y.

Princeton Applied Resch. Corp., Princeton, N.J.

Pulse Engrg., San Diego, Cal.

Rhode & Schwarz Sls., Fairfield, N.J.

D S & A Electronics, Toledo, Ohio

Shure Brothers, Evanston, Ill.

D Sitco Antennas, Portland, Ore.

Sound Technology, Cupertino, Cal.

D Stancor/Essex International, Chicago, Ill.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

TDK Elctns. Corp., Long Island City, N.Y.

M Technical Research & Mfg., Manchester, N.H.

Telrex Labs., Asbury Park, N.J.

DM Thordarson Meissner, Mt. Carmel, Ill.

Tranex Inc., Mountain View, Cal.

D TRW/UTC Transformers, New York, N.Y.

Varian Assocs., Palo Alto, Cal.

Wide Band Engrg. Co. Inc., Phoenix, Ariz.

D Workman Electronic Prods., Sarasota, Fla.

Transformers, Microminiature

M Abbott Transistor Labs., Los Angeles, Cal.

M Aladdin Elctns., Nashville, Tenn.

D Bell Industries, Compton, Cal.

M Bourns Pacific Magnetic Corp., Romoland, Cal.

Delevan Div., Coil Prods., E. Aurora, N.Y.

Magnetico, Holtsville, N.Y.

DM Microtran Co., Valley Stream, N.Y.

Nano Pulse Industries, Orange, Cal.

M Pico Elctns. Inc., Mount Vernon, N.Y.

M Solid State Electronics Corp., Sepulveda, Cal.

Technitrol, Philadelphia, Pa.

M Torotol Inc., Grandview, Mo.

Vari-L Co., Denver, Colo.

General Magnetics, Bloomfield, N.J. *

Shigoto Inds., Ltd., New York, N.Y. *

Signal Transformer Co., Brooklyn, N.Y. *

M American Trans-Coil Corp., Richmond Hill, N.Y.

Coilcraft, Cary, Ill.

M Electronic Transformer Corp., Paterson, N.J.

Ferrodyne Corp., Venice, Calif.

Hytronics Corp., Pinellas Park, Fla.

M JB Elctrn. Transformers, Chicago, Ill.

Morey Corp., Downers Grove, Ill.

M Polyphase Instr. Co., Bridgeport, Pa.

Pulse Engrg., San Diego, Cal.

D Stancor/Essex International, Chicago, Ill.

DM Thordarson Meissner, Mt. Carmel, Ill.

Tranex Inc., Mountain View, Cal.

TRW/UTC Transformers, New York, N.Y.

Transformers, Microphone

Bourns Pacific Magnetic Corp., Romoland, Cal.

Delevan Div., Coil Prods., E. Aurora, N.Y.

M Freed Transformer Co., Brooklyn, N.Y.

Magnetico, Holtsville, N.Y.

DM Microtran Co., Valley Stream, N.Y.

Pico Elctns. Inc., Mount Vernon, N.Y.

M Torotol Inc., Grandview, Mo.

Triad-Utrad, Huntington, Ind.

Lambda Elctns., Melville, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

D Altec Div., Anaheim, Calif.

American Magnetics Corp., Carterville, Ill.

D Bogen Div., Paramus, N.J.

M Electronic Transformer Corp., Paterson, N.J.

Ferrodyne Corp., Venice, Calif.

Gotham Audio Corp., New York, N.Y.

Mag-Con, New Brighton, Minn.

D PASO Sound Products Inc., New York, N.Y.

Phoenix Transformer Co., Phoenix, Ariz.

M Polyphase Instr. Co., Bridgeport, Pa.

D Primo Microphone Inc., Elk Grove Village, Ill.

Pulse Engrg., San Diego, Cal.

D Sescom, Gardena, Cal.

Shure Brothers, Evanston, Ill.

D Stancor/Essex International, Chicago, Ill.

DM Thordarson Meissner, Mt. Carmel, Ill.

Tranex Inc., Mountain View, Cal.

Transformers, Mixing

Delevan Div., Coil Prods., E. Aurora, N.Y.

M Freed Transformer Co., Brooklyn, N.Y.

DM Microtran Co., Valley Stream, N.Y.

Mini-Circuits Lab., Brooklyn, N.Y.

M Pico Elctns. Inc., Mount Vernon, N.Y.

M Torwico Elctns., Lakewood, N.J.

D Triad-Utrad, Huntington, Ind.

Lambda Elctns., Melville, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

D Altec Div., Anaheim, Calif.

American Magnetics Corp., Carterville, Ill.

Collins Radio, Dallas, Tex.

M Dietz Design, Belton, Mo.

M Electronic Transformer Corp., Paterson, N.J.

Ferrodyne Corp., Venice, Calif.

M Magnetic Circuit Elements, Monterey, Cal.

Phoenix Transformer Co., Phoenix, Ariz.

M Piconics Inc., Tyngsboro, Mass.

M Polyphase Instr. Co., Bridgeport, Pa.

D Stancor/Essex International, Chicago, Ill.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

DM Thordarson Meissner, Mt. Carmel, Ill.

D TRW/UTC Transformers, New York, N.Y.

Transformers, Modulation

Bourns Pacific Magnetic Corp., Romoland, Cal.

M Del Electronics Corp., Mt. Vernon, N.Y.

Delevan Div., Coil Prods., E. Aurora, N.Y.

NWL Transformers, Trenton, N.J.

M Pico Elctns. Inc., Mount Vernon, N.Y.

M Torwico Elctns., Lakewood, N.J.

D Triad-Utrad, Huntington, Ind.

Vari-L Co., Denver, Colo.

M Axel Elctns., Jamaica, N.Y. *

General Magnetics, Bloomfield, N.J. *

Lambda Elctns., Melville, N.Y. *

DM Microtran Co., Valley Stream, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

M Torotal Inc., Grandview, Mo. *

American Magnetics Corp., Cartersville, Ill.

Aydin Energy Systems, Palo Alto, Cal.

Collins Radio, Dallas, Tex.

M Dietz Design, Belton, Mo.

M Electronic Transformer Corp., Paterson, N.J.

Ferrodyne Corp., Venice, Calif.

Mag-Con, New Brighton, Minn.

M OPT Inds. Inc., Phillipsburg, N.J.

Phoenix Transformer Co., Phoenix, Ariz.

M Polyphase Instr. Co., Bridgeport, Pa.

Schott Corp., Minneapolis, Minn.

D Stancor/Essex International, Chicago, Ill.

M Syscon Int'l., So. Bend, Ind.

DM Thordarson Meissner, Mt. Carmel, Ill.

D TRW/UTC Transformers, New York, N.Y.

Varian Assocs., Palo Alto, Cal.

Transformers, Output

Abacus Controls Inc., Somerville, N.J.

p. 2-1731

M Abbott Transistor Labs., Los Angeles, Cal.

p. 2-1720-1725

M Bourns Pacific Magnetic Corp., Romoland, Cal.

p. 2-1732, 1733

Dale Elctns., Yankton, S.D. p. 2-1452

M Del Electronics Corp., Mt. Vernon, N.Y.

p. 1-1174, 1175

Delevan Div., Coil Prods., E. Aurora, N.Y.

p. 2-388

Douglas Randall Div., Pawcatuck, Conn.

p. 2-1734

Dynamic Instr. Corp., Hauppauge, N.Y.

p. 1-1177; p. 2-1735

Electrocube Inc., San Gabriel, Cal.

p. 2-1736, 1737

M Hisonic, Olathe, Kan. p. 2-1755

Magnetico, Holtville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y. p. 2-1760

Neshaminy Transformer, Furlong, Pa.

p. 2-1775, 1776

NWL Transformers, Trenton, N.J. p. 2-1772

M Pico Elctns. Inc., Mount Vernon, N.Y.

p. 2-1778-1783

Todd Systems, Yonkers, N.Y. p. 2-1812-1815

M Torotal Inc., Grandview, Mo. p. 2-1819-1821

M Torwico Elctns., Lakewood, N.J. p. 2-1818

Triad-Utrad, Huntington, Ind. p. 2-1822-1829

ACDC Electronics, Oceanside, Cal. *

American Vector/TDC, Dayton, N.J. *

M Axel Elctns., Jamaica, N.Y. *

Biometrics Instrument Corp., Garland, Tex. *

CML-Macarr, Edison, N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Lambda Elctns., Melville, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

D Altex Div., Anaheim, Calif.

American Magnetics Corp., Cartersville, Ill.

American Monarch Corp., Minneapolis, Minn.

Basler Electric Co., Highland, Ill.

Coil-Craft Inc., Bronxville, N.Y.

Collins Radio, Dallas, Tex.

D Components Specialties, Hempstead, N.Y.

Custom Coil & Transformer Co., Zanesville, Ohio

M Dietz Design, Belton, Mo.

M Electronic Transformer Corp., Paterson, N.J.

EWVC, Kenilworth, N.J.

Ferrodyne Corp., Venice, Calif.

Grand Transformers, Grand Haven, Mich.

Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.

Hytronics Corp., Pinellas Park, Fla.

M JB Elctrn, Transformers, Chicago, Ill

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

Panasonic, Ind'l. Elctrn. Comps., New York, N.Y.

Perkin-Elmer Corp., Norwalk, Conn.

Phoenix Transformer Co., Phoenix, Ariz.

M Polyphase Instr. Co., Bridgeport, Pa.

Schott Corp., Minneapolis, Minn.

D Stancor/Essex International, Chicago, Ill.

TDC, Div. Freq. Technology Inc., Littleton, Mass.

DM Thordarson Meissner, Mt. Carmel, Ill.

Tranex Inc., Mountain View, Cal.

D TRW/UTC Transformers, New York, N.Y.

Transformers, Plate

Abacus Controls Inc., Somerville, N.J.

p. 2-1731

M Abbott Transistor Labs., Los Angeles, Cal.

p. 2-1720-1725

Bourns Pacific Magnetic Corp., Romoland, Cal.

p. 2-1732, 1733

M Del Electronics Corp., Mt. Vernon, N.Y.

p. 1-1174, 1175

Douglas Randall Div., Pawcatuck, Conn.

p. 2-1734

Ferrotran Elctrn., New York, N.Y. p. 2-1751

Neshaminy Transformer, Furlong, Pa.

p. 2-1775, 1776

NWL Transformers, Trenton, N.J. p. 2-1772

M Sterling Transformer Corp., Brooklyn, N.Y.

p. 2-1806, 1807

M Torwico Elctns., Lakewood, N.J. p. 2-1818

D Triad-Utrad, Huntington, Ind. p. 2-1822-1829

Universal Voltronics Corp., Mt. Kisco, N.Y.

p. 1-1527

ACDC Electronics, Oceanside, Cal. *

American Vector/TDC, Dayton, N.J. *

M Axel Elctns., Jamaica, N.Y. *

Biometrics Instrument Corp., Garland, Tex. *

CML-Macarr, Edison, N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Lambda Elctns., Melville, N.Y. *

DM Microtran Co., Valley Stream, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

American Magnetics Corp., Cartersville, Ill.

American Monarch Corp., Minneapolis, Minn.

Aydin Energy Systems, Palo Alto, Cal.

Basler Electric Co., Highland, Ill.

Custom Coil & Transformer Co., Zanesville, Ohio

M Dietz Design, Belton, Mo.

M Electronic Transformer Corp., Paterson, N.J.

Elma Engineering, Palo Alto, Cal.

Ferrodyne Corp., Venice, Calif.

Fuji Electrochemical Co., Tokyo, Japan

Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.

M JB Elctrn, Transformers, Chicago, Ill

Mag-Con, New Brighton, Minn.

Megavolt, New York, N.Y.

Merrimack Magnetics, Lowell, Mass.

M OPT Inds. Inc., Phillipsburg, N.J.

M Osborne Transformer Corp., Detroit, Mich.

Phoenix Transformer Co., Phoenix, Ariz.

M Polyphase Instr. Co., Bridgeport, Pa.

Schott Corp., Minneapolis, Minn.

D Stancor/Essex International, Chicago, Ill.

Stanford Applied Engineering, Santa Clara, Cal.

TDC, Div. Freq. Technology Inc., Littleton, Mass.

DM Thordarson Meissner, Mt. Carmel, Ill.

Tranex Inc., Mountain View, Cal.

D TRW/UTC Transformers, New York, N.Y.

Transformers, Power

Abacus Controls Inc., Somerville, N.J.

p. 2-1731

M Abbott Transistor Labs., Los Angeles, Cal.

p. 2-1720-1725

M Bourns Pacific Magnetic Corp., Romoland, Cal.

p. 2-1732, 1733

Connor-Winfield Corp., W. Chicago, Ill.

p. 1-299

M Del Electronics Corp., Mt. Vernon, N.Y.

p. 1-1174, 1175

Douglas Randall Div., Pawcatuck, Conn.

p. 2-1734

Dynamic Instr. Corp., Hauppauge, N.Y.

p. 1-1177; p. 2-1735

Electrocube Inc., San Gabriel, Cal.

p. 2-1736, 1737

Ferrotran Elctrn., New York, N.Y. p. 2-1751

M Freed Transformer Co., Brooklyn, N.Y.

p. 1-716, 717; p. 2-1738-1747

M Hisonic, Olathe, Kan. p. 2-1755

K.G.S. Elctns., Pasadena, Cal. p. 2-1752, 1754

Magnetico, Holtville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y.

p. 2-1765-1769

Neshaminy Transformer, Furlong, Pa.

p. 2-1775, 1776

NWL Transformers, Trenton, N.J. p. 2-1772

M Pico Elctns. Inc., Mount Vernon, N.Y.

p. 2-1778-1783

Promemco, Hauppauge, N.Y. p. 2-1784

RoMarNetics, Northridge, Cal. p. 2-1785

D Sanford-Miller Corp., Brooklyn, N.Y. p. 1-1863

Signal Transformer Co., Brooklyn, N.Y.

p. 2-1791, 1792, 1794, 1795, 1799-1802

M Sterling Transformer Corp., Brooklyn, N.Y.

p. 2-1803-1807

M Stevens-Arnold, So. Boston, Mass.

p. 1-1476, 1477

D Todd Systems, Yonkers, N.Y. p. 2-1812-1815

Topaz Electronics, San Diego, Cal.

p. 1-592, 593, 1506; p. 2-1816, 1817

M Torwico Elctns., Lakewood, N.J. p. 2-1818

D Triad-Utrad, Huntington, Ind. p. 2-1822-1829

Universal Voltronics Corp., Mt. Kisco, N.Y.

p. 1-1527

Vari-L Co., Denver, Colo. p. 2-1831-1833

ACDC Electronics, Oceanside, Cal. *

American Vector/TDC, Dayton, N.J. *

MAMP Captron Div./AMP Inc., Elizabethtown, Pa. *

M Arnold Magnetics Corp., Culver City, Cal. *

ATR Electronics, St. Paul, Minn. *

M Axel Elctns., Jamaica, N.Y. *

Biometrics Instrument Corp., Garland, Tex. *

CML-Macarr, Edison, N.J. *

Dale Electronics Inc., Columbus, Neb. *

General Elec. Co., Schenectady, N.Y. *

Lambda Elctns., Melville, N.Y. *

Ohmite Mfg. Co., Skokie, Ill. *

Shigoto Inds., Ltd., New York, N.Y. *

Square D Co., Milwaukee, Wisc. *

M Staco, Dayton, Ohio *

M Torotal Inc., Grandview, Mo. *

Accurate Electronics Co., Chicago, Ill.

Acme Electric, Cuba, N.Y.

D Altex Div., Anaheim, Calif.

American Magnetics Corp., Cartersville, Ill.

American Monarch Corp., Minneapolis, Minn.

D Antenna Corp. of America, Burlington, Iowa

Aydin Energy Systems, Palo Alto, Cal.

Basler Electric Co., Highland, Ill.

D B. H. Industries, Los Angeles, Cal

Bicon Elctns. Co., Canaan, Conn.

Carson Mfg. Co., Indianapolis, Ind.

M Component Specialties, Temple City, Cal.

Control Data Corp., Minneapolis, Minn.

Cramer Coil, Grafton, Wisc.

Custom Coil & Transformer Co., Zanesville, Ohio

Custom Power, Orange, Cal.

M Dietz Design, Belton, Mo.

D Dynaco Inc., Blackwood, N.J.

E-TRONICS, Sepulveda, Cal.

Elcor Prods. Neotec Elctns. Inc., Silver Spring, Md.

Electro-Pacific, Goleta, Calif.

M Electronic Transformer Corp., Paterson, N.J.

Elma Engineering, Palo Alto, Cal.

DM EWVC, Kenilworth, N.J.

Ferrodyne Corp., Venice, Calif.

Ferro-Tech Corp., Bloomfield, Conn.

Foster Transformer Co., Cincinnati, Ohio

Fuji Electrochemical Co., Tokyo, Japan

Grand Transformers, Grand Haven, Mich.

D GTE Sylvania Inc., Waltham, Mass.

Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.

Hughes Aircraft Co., Culver City, Cal.

Hytronics Corp., Pinellas Park, Fla.

M JB Elctrn, Transformers, Chicago, Ill

D Jefferson Elec., Bellwood, Ill.

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

Megavolt, New York, N.Y.

Merrimack Magnetics, Lowell, Mass.

Micron Industries Corp., Stone Park, Ill.

North Electric Co., Gallion, Ohio

M OPT Inds. Inc., Phillipsburg, N.J.

M Osborne Transformer Corp., Detroit, Mich.

Perkin-Elmer Corp., Norwalk, Conn.

M Peschel Instrs., Cape Coral, Fla.

Phoenix Transformer Co., Phoenix, Ariz.

M Polyphase Instr. Co., Bridgeport, Pa.

Ratelco, Seattle, Wash.

M Schott Corp., Minneapolis, Minn.

Shester Engineering Co., Culver City, Cal.

Sola Electric, Elk Grove Village, Ill.

D Stancor/Essex International, Chicago, Ill.

TDC, Div. Freq. Technology Inc., Littleton, Mass.

DM Thordarson Meissner, Mt. Carmel, Ill.

Torelco Inc., Irvington, N.J.

Tranex Inc., Mountain View, Cal.

M Transistor Devices, Cedar Knolls, N.J.

D TRW/UTC Transformers, New York, N.Y.

Varian Assocs., Palo Alto, Cal.

Transformers, Printed Circuit Mounting

M Abbott Transistor Labs., Los Angeles, Cal.

p. 2-1720, 1721

M Aladdin Elctns., Nashville, Tenn.

p. 2-1727, 1728

M Artronic Instr. Co., Silver Spring, Md.

p. 1-430, 431

D Bell Industries, Compton, Cal. p. 2-370-379

M Bourns Pacific Magnetic Corp., Romoland, Cal.

p. 2-1732, 1733

Caddel-Burns Mfg. Co., Mineola, N.Y.

p. 2-382-385

Dale Elctns., Yankton, S.D. p. 2-1452

Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388

Douglas Randall Div., Pawcatuck, Conn. p. 2-1734

Dynamic Instr. Corp., Hauppauge, N.Y. p. 1-1177; p. 2-1735

Ferrotran Elctrn., New York, N.Y. p. 2-1751

M Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747

M Hisonic, Olathe, Kan. p. 2-1755

Magneto, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y. p. 2-1757-1760, 1762-1767

Mini-Circuits Lab., Brooklyn, N.Y. p. 2-1291

Nano Pulse Industries, Orange, Cal. p. 2-1773, 1774

Neshaminy Transformer, Furlong, Pa. p. 2-1775, 1776

North Hills Elctns., Glen Cove, N.Y. p. 2-1771

M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783

Promemco, Hauppauge, N.Y. p. 2-1784

RoMarNetics, Northridge, Cal. p. 2-1785

Signal Transformer Co., Brooklyn, N.Y. p. 2-1793

Technitrol, Philadelphia, Pa. p. 2-1810, 1811

Todd Systems, Yonkers, N.Y. p. 2-1812-1815

M Torotol Inc., Grandview, Mo. p. 2-1819-1821

M Torwico Elctns., Lakewood, N.J. p. 2-1818

D Triad-Utrad, Huntington, Ind. p. 2-1822-1829

Vari-L Co., Denver, Colo. p. 2-1831-1833

Biometrics Instrument Corp., Garland, Tex. *

Dale Electronics Inc., Columbus, Neb. *

General Magnetics, Bloomfield, N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Lambda Elctns., Melville, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

American Magnetics Corp., Cartersville, Ill. *

American Monarch Corp., Minneapolis, Minn. *

M American Trans-Coil Corp., Richmond Hill, N.Y. *

Basler Electric Co., Highland, Ill. *

MBG Electronics, Mount Vernon, N.Y. *

D B. H. Industries, Los Angeles, Cal. *

Caddell Coil Corp., Poultney, Vt. *

Coil-Craft Inc., Bronxville, N.Y. *

Collins Radio, Dallas, Tex. *

Custom Coil & Transformer Co., Zanesville, Ohio *

M Dietz Design, Belton, Mo. *

D Dormeyer Industries, Chicago, Ill. *

Electrocom Inds., S. Bend, Ind. *

M Electronic Transformer Corp., Paterson, N.J. *

D EWC, Kenilworth, N.J. *

Ferrodyne Corp., Venice, Calif. *

Ferro-Tech Corp., Bloomfield, Conn. *

Gowanda Electronics Corp., Gowanda, N.Y. *

Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y. *

Hytronics Corp., Pinellas Park, Fla. *

M JB Elctn, Transformers, Chicago, Ill. *

Jerome Industries Corp., Orange, N.J. *

Mag-Con, New Brighton, Minn. *

M Magnetic Circuit Elements, Monterey, Cal. *

M OPT Inds. Inc., Phillipsburg, N.J. *

M Osborne Transformer Corp., Detroit, Mich. *

Perkin-Elmer Corp., Norwalk, Conn. *

Phoenix Transformer Co., Phoenix, Ariz. *

M Piconics Inc., Tyngsboro, Mass. *

M Polyphase Instr. Co., Bridgeport, Pa. *

Pulse Engrg., San Diego, Cal. *

Schott Corp., Minneapolis, Minn. *

D Stancor/Essex International, Chicago, Ill. *

Stanford Applied Engineering, Santa Clara, Cal. *

M Syscon Int'l., So. Bend, Ind. *

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan *

DM Thordarson Meissner, Mt. Carmel, Ill. *

Torelco Inc., Irvington, N.J. *

Tranex Inc., Mountain View, Cal. *

M Transistor Devices, Cedar Knolls, N.J. *

D TRW/UTC Transformers, New York, N.Y. *

D Workman Electronic Prods., Sarasota, Fla. *

Transformers, Pulse

M Aladdin Elctns., Nashville, Tenn. p. 2-1727, 1728

M Artronic Instr. Co., Silver Spring, Md. p. 1-430, 431

M Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-1732, 1733

Caddel-Burns Mfg. Co., Mineola, N.Y. p. 2-382-385

Dale Electronics Inc., Columbus, Neb. p. 2-1452

Dale Elctns., Yankton, S.D. p. 2-1452

Del Electronics Corp., Mt. Vernon, N.Y. p. 1-1174, 1175

Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388

EG&G, Salem, Mass. p. 1-1013

MEI-Rad Mfg. Co., Chicago, Ill. p. 2-1773, 1774

Electronic Navigation Inds., Rochester, N.Y. p. 1-674-676

M ESC Elctns. Corp., Palisades Pk., N.J. p. 1-550, 551

M Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747

M Hisonic, Olathe, Kan. p. 2-1755

Magneto, Holtsville, N.Y. p. 2-1770

Nano Pulse Industries, Orange, Cal. p. 2-1773, 1774

Neshaminy Transformer, Furlong, Pa. p. 2-1775, 1776

D Para-Kota, Marshall, Minn. p. 2-1773, 1774

M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783

Sprague Products Co., No. Adams, Mass. p. 2-1790

Technitrol, Philadelphia, Pa. p. 2-1810, 1811

D Triad-Utrad, Huntington, Ind. p. 2-1822-1829

Vari-L Co., Denver, Colo. p. 2-1831-1833

M AMP Capatron Div./AMP Inc., Elizabethtown, Pa. *

M Axel Elctns., Jamaica, N.Y. *

Bel Fuse, Jersey City, N.J. *

Biometrics Instrument Corp., Garland, Tex. *

Cober Elctns., Stamford, Conn. *

M Kappa Networks, Carteret, N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Lambda Elctns., Melville, N.Y. *

DM Microtran Co., Valley Stream, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

M Torotol Inc., Grandview, Mo. *

American Magnetics Corp., Cartersville, Ill. *

Automatic Coil, New Hyde Pk., N.Y. *

Aydin Energy Systems, Palo Alto, Cal. *

D Cambridge Thermionic Corp., Cambridge, Mass. *

Coilcraft, Cary, Ill. *

Collins Radio, Dallas, Tex. *

M Component Specialties, Temple City, Cal. *

M Dietz Design, Belton, Mo. *

E-H Resch Labs., Oakland, Cal. *

EG & G, Salem, Mass. *

Electrocom Inds., S. Bend, Ind. *

M Electronic Transformer Corp., Paterson, N.J. *

M EWC, Kenilworth, N.J. *

Ferrodyne Corp., Venice, Calif. *

General Instr. Corp., Automatic Mfg. Div., Chicopee, Mass. *

D Great Western Aviation, Denver, Colo. *

Hughes Aircraft Co., Culver City, Cal. *

Hytronics Corp., Pinellas Park, Fla. *

M JB Elctn, Transformers, Chicago, Ill. *

Mag-Con, New Brighton, Minn. *

Maxwell Labs., San Diego, Calif. *

Morey Corp., Downers Grove, Ill. *

PCA Elctns., Sepulveda, Cal. *

Pearson Elctns. Inc., Palo Alto, Cal. *

Phoenix Transformer Co., Phoenix, Ariz. *

M Piconics Inc., Tyngsboro, Mass. *

M Polyphase Instr. Co., Bridgeport, Pa. *

Pulse Engrg., San Diego, Cal. *

Schott Corp., Minneapolis, Minn. *

Scientifico Scientific Components Co., Newport Beach, Cal. *

Sprague Elec. Co., No. Adams, Mass. *

Stanford Applied Engineering, Santa Clara, Cal. *

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan *

TDK Elctns. Corp., Long Island City, N.Y. *

DM Thordarson Meissner, Mt. Carmel, Ill. *

Tohoku Metal Inds., Ltd., Tokyo, Japan *

D TRW/UTC Transformers, New York, N.Y. *

U.S. Scientific Instrs., Boston, Mass. *

Varian Assocs., Palo Alto, Cal. *

Velonex, Instrument Div., Santa Clara, Cal. *

D Workman Electronic Prods., Sarasota, Fla. *

Transformers, Reactor—See Reactors, Filter

Transformers, Rectifier

Abacus Controls Inc., Somerville, N.J. p. 2-1731

M Abbott Transistor Labs., Los Angeles, Cal. p. 2-1720-1725

M Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-1732, 1733

M Del Electronics Corp., Mt. Vernon, N.Y. p. 1-1174, 1175

Dynamic Instr. Corp., Hauppauge, N.Y. p. 1-1177; p. 2-1735

Electrocube Inc., San Gabriel, Cal. p. 2-1736, 1737

Ferrotran Elctrn., New York, N.Y. p. 2-1751

Magneto, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y. p. 2-1765-1769

Neshaminy Transformer, Furlong, Pa. p. 2-1775, 1776

NWL Transformers, Trenton, N.J. p. 2-1772

Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783

RoMarNetics, Northridge, Cal. p. 2-1785

D Sanford-Miller Corp., Brooklyn, N.Y. p. 1-1863

Signal Transformer Co., Brooklyn, N.Y. p. 2-1794, 1795, 1797

M Sterling Transformer Corp., Brooklyn, N.Y. p. 2-1804-1807

M Torwico Elctns., Lakewood, N.J. p. 2-1818

Triad-Utrad, Huntington, Ind. p. 2-1822-1829

M Arnold Magnetics Corp., Culver City, Cal. *

ATR Electronics, St. Paul, Minn. *

M Axel Elctns., Jamaica, N.Y. *

Biometrics Instrument Corp., Garland, Tex. *

CML-Macarr, Edison, N.J. *

General Magnetics, Bloomfield, N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Lambda Elctns., Melville, N.Y. *

Promemco, Hauppauge, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

M Torotol Inc., Grandview, Mo. *

Accurate Electronics Co., Chicago, Ill. *

Acme Electric, Cuba, N.Y. *

Alpha Components Corp., El Segundo, Cal. *

American Magnetics Corp., Cartersville, Ill. *

American Monarch Corp., Minneapolis, Minn. *

Aydin Energy Systems, Palo Alto, Cal. *

Basler Electric Co., Highland, Ill. *

M Bendix, Eatontown, N.J. *

D B. H. Industries, Los Angeles, Cal. *

Bicon Elctns. Co., Canaan, Conn. *

Control Data Corp., Minneapolis, Minn. *

Custom Coil & Transformer Co., Zanesville, Ohio *

Eastern Delta Corp., Fair Lawn, N.J. *

Elcor Prods. Neotec Elctns. Inc., Silver Spring, Md. *

Electro-Pacific, Goleta, Calif. *

M Electronic Transformer Corp., Paterson, N.J. *

M EWC, Kenilworth, N.J. *

Ferrodyne Corp., Venice, Calif. *

Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y. *

M JB Elctn, Transformers, Chicago, Ill. *

Jerome Industries Corp., Orange, N.J. *

Mag-Con, New Brighton, Minn. *

M Magnetic Circuit Elements, Monterey, Cal. *

Merrimack Magnetics, Lowell, Mass. *

North Electric Co., Gallion, Ohio *

M Osborne Transformer Corp., Detroit, Mich. *

Phoenix Transformer Co., Phoenix, Ariz. *

M Polyphase Instr. Co., Bridgeport, Pa. *

Schott Corp., Minneapolis, Minn. *

D Shester Engineering Co., Culver City, Cal. *

D Stancor/Essex International, Chicago, Ill. *

TDC, Div. Freq. Technology Inc., Littleton, Mass. *

DM Thordarson Meissner, Mt. Carmel, Ill. *

Tranex Inc., Mountain View, Cal. *

D TRW/UTC Transformers, New York, N.Y. *

Transformers, Reference

Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-1732, 1733

Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388

Magneto, Holtsville, N.Y. p. 2-1770

M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783

Technitrol, Philadelphia, Pa. p. 2-1810, 1811

M Torwico Elctns., Lakewood, N.J. p. 2-1818

General Magnetics, Bloomfield, N.J. *

Lambda Elctns., Melville, N.Y. *

DM Microtran Co., Valley Stream, N.Y. *

North Atlantic Inds., Plainview, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

American Magnetics Corp., Cartersville, Ill. *

M Electronic Transformer Corp., Paterson, N.J. *

Ferrodyne Corp., Venice, Calif. *

M Magnetic Circuit Elements, Monterey, Cal. *

Perkin-Elmer Corp., Norwalk, Conn. *

M Polyphase Instr. Co., Bridgeport, Pa. *

Schott Corp., Minneapolis, Minn. *

D TRW/UTC Transformers, New York, N.Y. *

Transformers, R-F

M Aladdin Elctns., Nashville, Tenn. p. 2-1727, 1728

Amplifier Research Corp., Souderton, Pa. p. 1-2, 3

D Bell Industries, Compton, Cal. p. 2-370-379
Caddell-Burns Mfg. Co., Mineola, N. Y. p. 2-382-385
Dale Electronics Inc., Columbus, Neb. p. 2-1452
Dale Elctns., Yankton, S.D. p. 2-1452
Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388
Douglas Randall Div., Pawcatuck, Conn. p. 2-1734
El-Rad Mfg. Co., Chicago, Ill p. 2-1773,1774
M Electro Impulse, Red Bank, N.J. p. 1-492,662-666
Electronic Navigation Inds., Rochester, N.Y. p. 1-674-676
M Hisonic, Olathe, Kan. p. 2-1755
Magneticco, Holtsville, N.Y. p. 2-1770
Mini-Circuits Lab., Brooklyn, N.Y. p. 2-1291
North Hills Elctns., Glen Cove, N.Y. p. 2-1771
Vari-L Co., Denver, Colo. p. 2-1831-1833
Biometrics Instrument Corp., Garland, Tex. *
Lambda Elctns., Melville, N.Y. *
M Sterling Transformer Corp., Brooklyn, N.Y. *
M American Trans-Coil Corp., Richmond Hill, N.Y.
Automatic Coil, New Hyde Pk., N.Y.
Ayden Energy Systems, Palo Alto, Cal.
D Barker & Williamson, Bristol, Pa.
D Blonder-Tongue Labs., Old Bridge, N.J.
M Caddell Coil Corp., Poughkeepsie, N.Y.
D Cambridge Thermionic Corp., Cambridge, Mass.
Coil-Craft Inc., Bronxville, N.Y.
Coilcraft, Cary, Ill.
Coil Specialty Co., Boalsburg, Pa.
Collins Radio, Dallas, Tex.
M Dietz Design, Belton, Mo.
EWC, Kenilworth, N.J.
D Finney Co., Bedford, Ohio
Genisco Technology Corp., Compton, Cal.
Gowanda Electronics Corp., Gowanda, N.Y.
Grand Transformers, Grand Haven, Mich.
Hytronics Corp., Pinellas Park, Fla.
M Lorch Elctns. Corp., Englewood, N.J.
M Lorch Devices Inc., Englewood, N.J.
Morey Corp., Downers Grove, Ill.
M Piconics Inc., Tyngsboro, Mass.
M Polyphase Instr. Co., Bridgeport, Pa.
D Sinclair Radio Labs., Concord, Ontario, Can. L4K 1B6
Summit Engineering Corp., Bozeman, Mont.
M Syscon Int'l., So. Bend, Ind.
TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
TRW/UTC Transformers, New York, N.Y.
M Watkins-Johnson Co., Palo Alto, Cal.
D Workman Electronic Prods., Sarasota, Fla.

Transformers, Rotary

Magneticco, Holtsville, N.Y. p. 2-1770
Lambda Elctns., Melville, N.Y. *
Ohmite Mfg. Co., Skokie, Ill. *
Electric Indicator Co., Norwalk, Conn.
M Electronic Transformer Corp., Paterson, N.J.
S. Himmelstein & Co., Elk Grove Village, Ill.
Perkin-Elmer Corp., Norwalk, Conn.
TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

Transformers, Scott-T

M Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-1732,1733
Dale Elctns., Yankton, S.D. p. 2-1452
M Del Electronics Corp., Mt. Vernon, N.Y. p. 1-1174,1175
Magneticco, Holtsville, N.Y. p. 2-1770
Neshaminy Transformer, Furlong, Pa. p. 2-1775,1776
NWL Transformers, Trenton, N.J. p. 2-1772
Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783
M Torwico Elctns., Lakewood, N.J. p. 2-1818
M Transmagnetics, Farmingdale, N.Y. p. 1-125
Astrosystems, Lake Success, N.Y. *
Biometrics Instrument Corp., Garland, Tex. *
D General Magnetics, Bloomfield, N.J. *
K.G.S. Elctns., Pasadena, Cal. *
Lambda Elctns., Melville, N.Y. *
DM Microtran Co., Valley Stream, N.Y. *
M Sterling Transformer Corp., Brooklyn, N.Y. *
M Torotol Inc., Grandview, Mo. *
American Magnetics Corp., Cartersville, Ill.
Basler Electric Co., Highland, Ill.
Bicon Elctns. Co., Canaan, Conn.
Collins Radio, Dallas, Tex.
M Control Sciences, Granada Hills, Cal.
Electro-Pacific, Goleta, Calif.
M Electronic Transformer Corp., Paterson, N.J.
Elma Engineering, Palo Alto, Cal.
EWC, Kenilworth, N.J.

Ferrodyne Corp., Venice, Calif.
D GTE Sylvania Inc., Waltham, Mass.
M JB Elctn. Transformers, Chicago, Ill
Mag-Con, New Brighton, Minn.
Magnetics, Div. of Spang Industries, Sandy Lake, Pa.
M Osborne Transformer Corp., Detroit, Mich.
Perkin-Elmer Corp., Norwalk, Conn.
Phoenix Transformer Co., Phoenix, Ariz.
M Polyphase Instr. Co., Bridgeport, Pa.
Schott Corp., Minneapolis, Minn.
Tranex Inc., Mountain View, Cal.
D TRW/UTC Transformers, New York, N.Y.

Transformers, Servo

Ferrotran Elctn., New York, N.Y. p. 2-1751
Magneticco, Holtsville, N.Y. p. 2-1770
DM Microtran Co., Valley Stream, N.Y. p. 2-1759,1760
Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783
General Magnetics, Bloomfield, N.J. *
M Torotol Inc., Grandview, Mo. *
Collins Radio, Dallas, Tex.
M Control Sciences, Granada Hills, Cal.
M Electronic Transformer Corp., Paterson, N.J.
M JB Elctn. Transformers, Chicago, Ill
Perkin-Elmer Corp., Norwalk, Conn.
Singer Co., Little Falls, N.J.
TDC, Div. Freq. Technology Inc., Littleton, Mass.
DM Thordarson Meissner, Mt. Carmel, Ill.
D TRW/UTC Transformers, New York, N.Y.

Transformers, Step-Down, Step-Up— See Transformers, Power

Transformers, Synchro Control

Astrosystems, Lake Success, N.Y. p. 1-143
Magneticco, Holtsville, N.Y. p. 2-1770
M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783
M Torwico Elctns., Lakewood, N.J. p. 2-1818
M Transmagnetics, Farmingdale, N.Y. p. 1-125
M Vernitron Corp., Torrance, Cal. p. 1-1924
Lambda Elctns., Melville, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
M Sterling Transformer Corp., Brooklyn, N.Y. *
American Magnetics Corp., Cartersville, Ill.
M Control Sciences, Granada Hills, Cal.
Electric Indicator Co., Norwalk, Conn.
M Electronic Transformer Corp., Paterson, N.J.
EWC, Kenilworth, N.J.
M JB Elctn. Transformers, Chicago, Ill
Perkin-Elmer Corp., Norwalk, Conn.
Phoenix Transformer Co., Phoenix, Ariz.
Singer Co., Little Falls, N.J.
DM Thordarson Meissner, Mt. Carmel, Ill.

Transformers, Telephone Coupling

Aladdin Elctns., Nashville, Tenn. p. 2-1727,1728
Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-1732,1733
Douglas Randall Div., Pawcatuck, Conn. p. 2-1734
M Hisonic, Olathe, Kan. p. 2-1755
Magneticco, Holtsville, N.Y. p. 2-1770
DM Microtran Co., Valley Stream, N.Y. p. 2-1763
Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783
Vari-L Co., Denver, Colo. p. 2-1831-1833
M Torotol Inc., Grandview, Mo. *
Coilcraft, Cary, Ill.
Electrocom Inds., S. Bend, Ind.
M Electronic Transformer Corp., Paterson, N.J.
D ITI Electronics, Clifton, N.J.
M JB Elctn. Transformers, Chicago, Ill
M OPT Inds. Inc., Phillipsburg, N.J.
D Stancor/Essex International, Chicago, Ill.
DM Thordarson Meissner, Mt. Carmel, Ill.
Tranex Inc., Mountain View, Cal.

Transformers, Toroidal

MA Aladdin Elctns., Nashville, Tenn. p. 2-1727,1728
MA Artronc Instr. Co., Silver Spring, Md. p. 1-430,431
D Bell Industries, Compton, Cal. p. 2-370-379
M Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-1732,1733
Caddell-Burns Mfg. Co., Mineola, N. Y. p. 2-382-385
Dale Electronics Inc., Columbus, Neb. p. 2-1452
Dale Elctns., Yankton, S.D. p. 2-1452
Delevan Div., Coil Prods., E. Aurora, N.Y. p. 2-388
MEI-Rad Mfg. Co., Chicago, Ill p. 2-1773,1774

Electrocube Inc., San Gabriel, Cal. p. 2-1736,1737
M Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747
M Hisonic, Olathe, Kan. p. 2-1755
Magneticco, Holtsville, N.Y. p. 2-1770
DM Microtran Co., Valley Stream, N.Y. p. 2-1765
Mini-Circuits Lab., Brooklyn, N.Y. p. 2-1291
Nano Pulse Industries, Orange, Cal. p. 2-1773,1774
North Hills Elctns., Glen Cove, N.Y. p. 2-1771
D Para-Kote, Marshall, Minn. p. 2-1773,1774
M Solid State Electronics Corp., Sepulveda, Cal. p. 1-126
Technitrol, Philadelphia, Pa. p. 2-1810,1811
M Torwico Elctns., Lakewood, N.J. p. 2-1818
D Triad-Utrad, Huntington, Ind. p. 2-1822-1829
Astrosystems, Lake Success, N.Y. *
MAxel Elctns., Jamaica, N.Y. *
Bel Fuse, Jersey City, N.J. *
Bikar Corporation, Harbor City, Cal. *
Biometrics Instrument Corp., Garland, Tex. *
K.G.S. Elctns., Pasadena, Cal. *
Lambda Elctns., Melville, N.Y. *
Shigoto Inds., Ltd., New York, N.Y. *
DM Staco, Dayton, Ohio *
M Sterling Transformer Corp., Brooklyn, N.Y. *
M Torotol Inc., Grandview, Mo. *
D Altac Div., Anaheim, Calif.
M American Trans-Coil Corp., Richmond Hill, N.Y.
Automatic Coil, New Hyde Pk., N.Y.
Bicon Elctns. Co., Canaan, Conn.
M Caddell Coil Corp., Poughkeepsie, N.Y.
D Cambridge Thermionic Corp., Cambridge, Mass.
Coil-Craft Inc., Bronxville, N.Y.
Coilcraft, Cary, Ill.
Collins Radio, Dallas, Tex.
Cross Electronics Inc., Warrendale, Pa.
De Coursey Engrg. Lab., Culver City, Cal.
M Dietz Design, Belton, Mo.
E-Tronics, Sepulveda, Cal.
Electro-Pacific, Goleta, Calif.
Electrocom Inds., S. Bend, Ind.
M Electronic Transformer Corp., Paterson, N.J.
M EWC, Kenilworth, N.J.
Ferrodyne Corp., Venice, Calif.
Genisco Technology Corp., Compton, Cal.
Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.
Hytronics Corp., Pinellas Park, Fla.
M JB Elctn. Transformers, Chicago, Ill
Lorch Elctns. Corp., Englewood, N.J.
Mag-Con, New Brighton, Minn.
M Magnetic Circuit Elements, Monterey, Cal.
North Electric Co., Galion, Ohio
M OPT Inds. Inc., Phillipsburg, N.J.
M Osborne Transformer Corp., Detroit, Mich.
Perkin-Elmer Corp., Norwalk, Conn.
M Polyphase Instr. Co., Bridgeport, Pa.
Pulse Engrg., San Diego, Cal.
M Sawyer Inds., Arcadia, Cal.
Schott Corp., Minneapolis, Minn.
Stanford Applied Engineering, Santa Clara, Cal.
TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan
TDK Elctns. Corp., Long Island City, N.Y.
DM Thordarson Meissner, Mt. Carmel, Ill.
Torelco Inc., Irvington, N.J.
D TRW/UTC Transformers, New York, N.Y.
DM United Prods. Co., New Hyde Pk., N.Y.

Transformers, Transistor

D Bell Industries, Compton, Cal. p. 2-370-379
M Bourns Pacific Magnetic Corp., Romoland, Cal. p. 2-1732,1733
Dale Elctns., Yankton, S.D. p. 2-1452
M Freed Transformer Co., Brooklyn, N.Y. p. 1-716,717; p. 2-1738-1747
Magneticco, Holtsville, N.Y. p. 2-1770
DM Microtran Co., Valley Stream, N.Y. p. 2-1757-1760,1762,1763
Nano Pulse Industries, Orange, Cal. p. 2-1773,1774
M Pico Elctns. Inc., Mount Vernon, N.Y. p. 2-1778-1783
M Solid State Electronics Corp., Sepulveda, Cal. p. 1-126
Technitrol, Philadelphia, Pa. p. 2-1810,1811
M Torotol Inc., Grandview, Mo. p. 2-1819,1820
D Triad-Utrad, Huntington, Ind. p. 2-1822-1829
Vari-L Co., Denver, Colo. p. 2-1831-1833
Biometrics Instrument Corp., Garland, Tex. *
Computer Comps., Jamaica, N.Y. *
General Magnetics, Bloomfield, N.J. *
M Hisonic, Olathe, Kan. *
K.G.S. Elctns., Pasadena, Cal. *
Lambda Elctns., Melville, N.Y. *

Promemco, Hauppauge, N.Y. *

Shigoto Inds., Ltd., New York, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

American Monarch Corp., Minneapolis, Minn.

Coil-Craft Inc., Bronxville, N.Y.

Custom Coil & Transformer Co., Zanesville, Ohio

Electrocom Inds., S. Bend, Ind.

M Electronic Transformer Corp., Paterson, N.J.

EWC, Kenilworth, N.J.

Ferrodyne Corp., Venice, Calif.

Hammond Manufacturing Company (U.S.) Inc., Buffalo, N.Y.

Hytronics Corp., Pinellas Park, Fla.

M JB Elctn, Transformers, Chicago, Ill

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

PCA Elctns., Sepulveda, Cal.

M Piconics Inc., Tyngsboro, Mass.

M Polyphase Instr. Co., Bridgeport, Pa.

Pulse Engrg., San Diego, Cal.

D Stancor/Essex International, Chicago, Ill.

DM Thordarson Meissner, Mt. Carmel, Ill.

Torelco Inc., Irvington, N.J.

D TRW/UTC Transformers, New York, N.Y.

Transformers, Trigger—See Transformers, Pulse

Transformers, Ultrasonic

Caddel-Burns Mfg. Co., Mineola, N. Y.

p. 2-382-385

Dale Elctns., Yankton, S.D. p. 2-1452

Douglas Randall Div., Pawcatuck, Conn.

p. 2-1734

Dranetz Engrg. Labs., So. Plainfield, N.J.

p. 1-652-657

El-Rad Mfg. Co., Chicago, Ill p. 2-1773, 1774

Electronic Navigation Inds., Rochester, N.Y.

p. 1-674-676

Magnetico, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y. p. 2-1772

NWL Transformers, Trenton, N.J. p. 2-1772

M Pico Elctns. Inc., Mount Vernon, N.Y.

p. 2-1778-1783

M Torwico Elctns., Lakewood, N.J. p. 2-1818

Vari-L Co., Denver, Colo. p. 2-1831-1833

American Vector/TDC, Dayton, N.J. *

M Axel Elctns., Jamaica, N.Y. *

Lambda Elctns., Melville, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

American Monarch Corp., Minneapolis, Minn.

Bicon Elctns. Co., Canaan, Conn.

M Dietz Design, Belton, Mo.

M Electronic Transformer Corp., Paterson, N.J.

EWC, Kenilworth, N.J.

Mag-Con, New Brighton, Minn.

Phoenix Transformer Co., Phoenix, Ariz.

M Polyphase Instr. Co., Bridgeport, Pa.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

TDK Elctns. Corp., Long Island City, N.Y.

D TRW/UTC Transformers, New York, N.Y.

Transformers, Variable

Caddel-Burns Mfg. Co., Mineola, N. Y.

p. 2-382-385

Dale Elctns., Yankton, S.D. p. 2-1452

M Del Electronics Corp., Mt. Vernon, N.Y.

p. 1-1174, 1175

Delevan Div., Coil Prods., E. Aurora, N.Y.

p. 2-388

General Radio Co., Concord, Mass.

p. 2-1748-1750

Ohmite Mfg. Co., Skokie, Ill. p. 2-1777

DM Staco, Dayton, Ohio p. 2-1808, 1809

D Superior Electric Co., Bristol, Conn.

p. 2-1786-1789

D General Elec. Co., Schenectady, N.Y. *

Lambda Elctns., Melville, N.Y. *

Microtran Co., Valley Stream, N.Y. *

M American Trans-Coil Corp., Richmond Hill, N.Y.

M Caddell Coil Corp., Poughkeepsie, N.Y.

Columbia Resch. Labs., Woodlyn, Pa.

Grand Transformers, Grand Haven, Mich.

Perkin-Elmer Corp., Norwalk, Conn.

M Piconics Inc., Tyngsboro, Mass.

DM Thordarson Meissner, Mt. Carmel, Ill.

Triac Electronics, New York, N.Y.

D TRW/UTC Transformers, New York, N.Y.

UPI Semiconductor Div., Patterson, N.J.

Transformers, Voltage-Dividing

Abacus Controls Inc., Somerville, N.J.

p. 2-1731

M Bourns Pacific Magnetic Corp., Romoland, Cal.

p. 2-1732, 1733

Dale Elctns., Yankton, S.D. p. 2-1452

M Del Electronics Corp., Mt. Vernon, N.Y.

p. 1-1174, 1175

Delevan Div., Coil Prods., E. Aurora, N.Y.

p. 2-388

Douglas Randall Div., Pawcatuck, Conn.

p. 2-1734

Dranetz Engrg. Labs., So. Plainfield, N.J.

p. 1-652-657

Magnetico, Holtsville, N.Y. p. 2-1770

M North Atlantic Inds., Plainview, N.Y.

p. 1-188, 772

NWL Transformers, Trenton, N.J. p. 2-1772

M Pico Elctns. Inc., Mount Vernon, N.Y.

p. 2-1778-1783

M Torwico Elctns., Lakewood, N.J. p. 2-1818

Astrosystems, Lake Success, N.Y. *

M Hisonic, Olathe, Kan. *

Lambda Elctns., Melville, N.Y. *

DM Microtran Co., Valley Stream, N.Y. *

Signal Transformer Co., Brooklyn, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

D Altec Div., Anaheim, Calif.

American Magnetics Corp., Cartersville, Ill.

Basler Electric Co., Highland, Ill.

Electro Sci. Inds., Portland, Ore.

M Electronic Transformer Corp., Paterson, N.J.

Ferrodyne Corp., Venice, Calif.

Guidline Instrs., Larchmont, N.Y.

M Magnetic Circuit Elements, Monterey, Cal.

Perkin-Elmer Corp., Norwalk, Conn.

M Polyphase Instr. Co., Bridgeport, Pa.

D Stancor/Essex International, Chicago, Ill.

DM Thordarson Meissner, Mt. Carmel, Ill.

Tranex Inc., Mountain View, Cal.

D TRW/UTC Transformers, New York, N.Y.

Transformers, Voltage-Regulating-Also See Regulators & Stabilizers, Voltage

Abacus Controls Inc., Somerville, N.J.

p. 2-1731

D California Instrs. Co., San Diego, Cal. p. 1-1164

Connor-Winfield Corp., W. Chicago, Ill.

p. 1-299

M Del Electronics Corp., Mt. Vernon, N.Y.

p. 1-1174, 1175

Deltec Corp., San Diego, Cal. p. 1-1181

Douglas Randall Div., Pawcatuck, Conn.

p. 2-1734

Freed Transformer Co., Brooklyn, N.Y.

p. 1-716, 717; p. 2-1738-1747

Magnetico, Holtsville, N.Y. p. 2-1770

Neshaminy Transformer, Furlong, Pa.

p. 2-1775, 1776

NWL Transformers, Trenton, N.J. p. 2-1772

D Superior Electric Co., Bristol, Conn.

p. 1-1443; p. 2-1786-1789

Topaz Electronics, San Diego, Cal. p. 1-1503

M Torwico Elctns., Lakewood, N.J. p. 2-1818

ACDC Electronics, Oceanside, Cal. *

Biometrics Instrument Corp., Garland, Tex. *

CML-Macarr, Edison, N.J. *

D General Elec. Co., Schenectady, N.Y. *

General Magnetics, Bloomfield, N.J. *

General Radio Co., Concord, Mass. *

K.G.S. Elctns., Pasadena, Cal. *

Lambda Elctns., Melville, N.Y. *

D Microtran Co., Valley Stream, N.Y. *

D Ohmite Mfg. Co., Skokie, Ill. *

Signal Transformer Co., Brooklyn, N.Y. *

Square D Co., Milwaukee, Wisc. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

D Advanced Power Inc., Anaheim, Cal.

D Altec Div., Anaheim, Calif.

American Magnetics Corp., Cartersville, Ill.

American Monarch Corp., Minneapolis, Minn.

Behlman Div., California Instrs., San Diego, Cal.

Control Data Corp., Minneapolis, Minn.

Cyberex, Mentor, Ohio

Dressen-Barnes Elctns., Pasadena, Cal.

E-Tronics, Sepulveda, Cal.

Electro-Pacific, Goleta, Calif.

M Electronic Transformer Corp., Paterson, N.J.

Elin Div., San Diego, Cal.

Ferrodyne Corp., Venice, Calif.

Ferro-Tech Corp., Bloomfield, Conn.

Foster Transformer Co., Cincinnati, Ohio

Grand Transformers, Grand Haven, Mich.

Kato Engineering Co., Mankato, Minn.

Mag-Con, New Brighton, Minn.

M Magnetic Circuit Elements, Monterey, Cal.

Micron Industries Corp., Stone Park, Ill.

North Electric Co., Galion, Ohio

M OPT Inds. Inc., Phillipsburg, N.J.

M Osborne Transformer Corp., Detroit, Mich.

D Perma Power Div., Elmhurst, Ill.

Phoenix Transformer Co., Phoenix, Ariz.

Schott Corp., Minneapolis, Minn.

D Sola Electric, Elk Grove Village, Ill.

D Stancor/Essex International, Chicago, Ill.

TDC, Div. Freq. Technology Inc., Littleton, Mass.

DM Thordarson Meissner, Mt. Carmel, Ill.

Tranex Inc., Mountain View, Cal.

D TRW/UTC Transformers, New York, N.Y.

D Wilco Sales, Mineola, N.Y.

Transformers, Wideband

MAIaddin Elctns., Nashville, Tenn.

p. 2-1727, 1728

M Bourns Pacific Magnetic Corp., Romoland, Cal.

p. 2-1732, 1733

Caddel-Burns Mfg. Co., Mineola, N. Y.

p. 2-382-385

Delevan Div., Coil Prods., E. Aurora, N.Y.

p. 2-388

Dranetz Engrg. Labs., So. Plainfield, N.J.

p. 1-652-657

El-Rad Mfg. Co., Chicago, Ill p. 2-1773, 1774

Electronic Navigation Inds., Rochester, N.Y.

p. 1-674-676

M ESC Elctns. Corp., Palisades Pk., N.J.

p. 1-550, 551

M Hisonic, Olathe, Kan. p. 2-1755

Magnetico, Holtsville, N.Y. p. 2-1770

DM Microtran Co., Valley Stream, N.Y.

p. 2-1758, 1763

Nano Pulse Industries, Orange, Cal.

p. 2-1773, 1774

North Hills Elctns., Glen Cove, N.Y. p. 2-1771

M Pico Elctns. Inc., Mount Vernon, N.Y.

p. 2-1778-1783

Technitrol, Philadelphia, Pa. p. 2-1810, 1811

M Torwico Elctns., Lakewood, N.J. p. 2-1818

Vari-L Co., Denver, Colo. p. 2-1831-1833

American Vector/TDC, Dayton, N.J. *

M Axel Elctns., Jamaica, N.Y. *

CML-Macarr, Edison, N.J. *

General Magnetics, Bloomfield, N.J. *

K.G.S. Elctns., Pasadena, Cal. *

Lambda Elctns., Melville, N.Y. *

M Sterling Transformer Corp., Brooklyn, N.Y. *

M Torotel Inc., Grandview, Mo. *

American Magnetics Corp., Cartersville, Ill.

Aydin Energy Systems, Palo Alto, Cal.

D Blonder-Tongue Labs., Old Bridge, N.J.

M Caddell Coil Corp., Poughkeepsie, N.Y.

Coil-Craft Inc., Bronxville, N.Y.

Coilcraft, Cary, Ill.

M Dietz Design, Belton, Mo.

Dynalab Corp., Van Nuys, Cal.

M Electronic Transformer Corp., Paterson, N.J.

EWC, Kenilworth, N.J.

Hughes Aircraft Co., Culver City, Cal.

M JB Elctn, Transformers, Chicago, Ill

M Lorch Elctns. Corp., Englewood, N.J.

M Lorch Devices Inc., Englewood, N.J.

M Magnetic Circuit Elements, Monterey, Cal.

M Polyphase Instr. Co., Bridgeport, Pa.

Pulse Engrg., San Diego, Cal.

D Sinclair Radio Labs., Concord, Ontario, Can. L4K 1B6

Stanford Applied Engineering, Santa Clara, Cal.

Summit Engineering Corp., Bozeman, Mont.

TDK Electronics Co., Ltd., Chiyoda-ku, Tokyo 101, Japan

D TRW/UTC Transformers, New York, N.Y.

Varian Assocs., Palo Alto, Cal.

M Watkins-Johnson Co., Palo Alto, Cal.

Wide Band Engrg. Co. Inc., Phoenix, Ariz.

Transistor, Arrays—See Volume 1

Transistor, Diode, Thyristor Heat Dissipators—See Volume 1

Transistors, Chip, Unpackaged—See Volume 1

Transistors, Darlington—See Volume 1

Transistors, Dual—See Volume 1

Transistors, Field-Effect—See Volume 1

Transistors, Photo (Including Arrays)—See Volume 1

Transistors, Power—See Volume 1

Transistors, Pressure Sensitive—See Volume 1

Transistors, R-F—See Volume 1

Transistors, Switching—See Volume 1

Transistors, Unijunction—See Volume 1
Translators, Data—See Volume 1
Transmission Line, Wire & Cable—See
Cable, Transmission Line
Transmission Systems, Data—See
Volume 1
Transmitters, Beacon—See Volume 1
Transmitters, Fixed Frequency—See
Volume 1
Transmitters, Fixed Station Comm.—See
Volume 1
Transmitters, Microwave—See Volume 1
Transmitters, Multiplex—See Volume 1
Transmitters, Pressure & Flow—See
Volume 1
Transmitters, Pulse Code Modulation—
See Volume 1
Transmitters, Pulse Phase Modulation—
See Volume 1
Transmitters, Pulse Time Modulation—
See Volume 1
Transmitters, Radar—See Volume 1
Transmitters, Single-Sideband—See
Volume 1
Transmitters, Telemetry—See Volume 1
Transmitters, Tropospheric Scatter—See
Volume 1
Transmitters, Tone—See Volume 1
Transmitters, UHF/VHF—See Volume 1
Transmitters, ULF/VLF—See Volume 1
Transponders—See Volume 1
Transports, card—See Volume 1
Transports, Tape (all kinds)—See
Volume 1
Triacs—See Volume 1
Triggers, SCR—See Volume 1
Tubes, Backward Wave—See Volume 1
Tubes, Ballast—See Resistors, Ballast
Tubes, Cathode-Ray, Data Storage, TV
Picture—See Volume 1
Tubes, Cathode-Ray, Instrument Use—
See Volume 1
Tubes, Cathode-Ray, Multiple Gun—See
Volume 1
Tubes, Cathode-Ray, Projection—See
Volume 1
Tubes, Cathode-Ray, Scan Conversion—
See Volume 1
Tubes, Cathode-Ray, Shaped-Beam—
See Volume 1
Tubes, Ceramic (Electron)—See Volume 1
Tubes, Counting—See Volume 1
Tubes, Electrometer—See Volume 1
Tubes, Electron Multiplier—See Volume 1
Tubes, Flash—See Volume 1
Tubes, Forward Wave—See Volume 1
Tubes, Gas—See Volume 1
Tubes, Ignitron—See Volume 1
Tubes, Image Converter—See Volume 1
Tubes, Indicator—See Tubes, Readout
Tubes, Industrial Power—See Volume 1
Tubes, Klystron—See Volume 1
Tubes, Laser—See Volume 1
Tubes, Magnetron—See Volume 1
Tubes, Microwave—See Volume 1
Tubes, Noise Source—See Volume 1
Tubes, Photomultiplier—See Volume 1
Tubes, Readout (CRT, Cold-Cathode,
Vacuum Fluorescent, Incandescent,
etc.)
D Amperex Electronic Corp., Slatersville, R.I.
p. 1-2350,2351
DM Industrial Electr. Engrs., Van Nuys, Cal.
p. 2-1160
Infodex, Waterbury, Conn. p. 1-730-733
NEC America, New York, N.Y. p. 2-1184
D Refac Electr./Pinlites, Fairfield, N.J. p. 2-1185
D Amperex Electronic Corp., Hicksville, N.Y. *
Inter-Tech. Grp., Irvington-on-Hudson, N.Y. ... *
DM Syston-Donner, Sunnyvale, Cal. *
D Wagner Elec., Livingston, N.J. *
D A E G Telefunken, Englewood Cliffs, N.J.
Amperex Electronic Corp., Slatersville, R.I.
D Apollo Corp., Kawasaki, Japan
DM Burroughs Corp., Plainfield, N.J.
Clinton Electr. Corp., Rockford, Ill.
DuMont Electron Tubes & Devices Corp., Clifton, N.J.
GTE Sylvania Inc., Waltham, Mass.
Litton Inds., San Carlos, Calif.
Major Data Corp., Costa Mesa, Cal.
Panasonic, Ind'l. Electr. Comps., New York, N.Y.
RCA Electronic Comps., Harrison, N.J.
D RCA, Ind'l. Tube Div., Lancaster, Pa.
Thomson-CSF Electron Tubes Inc., New York, N.Y.
Thor Electr. Corp., Elizabeth, N.J.
United Paper Inc., Paterson, N.J.
Varian Assocs., Palo Alto, Cal.
Varian Electron Tube & Device Grp., San Carlos, Cal.
D Vector General, Woodland Hills, Cal.
M Watkins-Johnson Co., Palo Alto, Cal.
D Westinghouse Elec. Corp., Elmira, N.Y.
Tubes, Receiving—See Volume 1
Tubes, Rectifying, Gas-Filled—See
Volume 1
Tubes, Rectifying, Vacuum—See
Volume 1
Tubes, Strobe—See Lights, Stroboscopic
Tubes, Switching—See Volume 1
Tubes, Tv Camera Pickup—See Volume 1
Tubes, Thyatron—See Volume 1
Tubes, Transmit-Receive (TR)—See
Volume 1
Tubes, Transmitting—See Volume 1
Tubes, Traveling-Wave—See Volume 1
Tubes, Vidicon—See Volume 1
Tubes, Voltage Reference Or Regulating
—See Volume 1
Tubes, X-Ray—See Volume 1
Tubing, Ceramic
Omega Engrg., Stamford, Conn.
p. 1-2324-2327
American Lava Corp., Chattanooga, Tenn.
D Aremc Prods., Ossining, N.Y.
Centralab, Milwaukee, Wisc.
Coors Porcelain Co., Golden, Colo.
Corning Glass Works, Corning, N.Y.
Diamonite Products Div., Shreve, Ohio
General Electric Co., Cleveland, Ohio
Gte Sylvania, Belmont, Cal.
National Beryllia Corp., Haskell, N.J.
DM Nat'l Ceramic Co., Trenton, N.J.
D Plessey Ceramic Div., Frenchtown, N.J.
Quartzite Processing, Malden, Mass.
Star Porcelain Co., Trenton, N.J.
Tubing, Fiberglass
D Dearborn Wire & Cable Co., Rosemont, Ill.
p. 2-1993
DM Markel, L. Frank & Sons, Norristown, Pa.
p. 2-1272,1273
DM Varflex Corp., Rome, N.Y. p. 2-1274,1275
D Alpha Wire Corp., Elizabeth, N.J. *
D Brand-Rex Co., Williamantic, Conn.
Cadillac Plastic & Chemical, Detroit, Mich.
Central Plastics Dists., Chicago, Ill.
DM ICO/Rally Corp., Palo Alto, Cal.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Precision Paper Tube Co., Wheeling, Ill.
SGL Graphics, Warminster, Pa.
M SHAKESPEARE, Columbia, S.C.
Tubing, Glass
Dearborn Wire & Cable Co., Rosemont, Ill.
p. 2-1993
Amersil, Hillside, N.J.
Corning Glass Works, Corning, N.Y.
Corning Glass Works, Television Prods. Div., Corning, N.Y.
Esco Products, Oak Ridge, NJ
General Electric Co., Cleveland, Ohio
M GTI Corporation, Pittsburgh, Pa.
Sargent Welch Sci. Co., Skokie, Ill.
Tubing, Heat Shrinkable-Also See Caps,
Forms & Tapes, Heat Shrinkable
D Alpha Wire Corp., Elizabeth, N.J.
p. 2-1863-1869
D Cimco Wire & Cable, Allendale, N.J.
p. 2-1910,2023
DM Daburn Electronics & Cable Corp., Bronx, N.Y.
p. 2-1974-1978
DM Dearborn Wire & Cable Co., Rosemont, Ill.
p. 2-1993
DM Markel, L. Frank & Sons, Norristown, Pa.
p. 2-1272,1273
Mauratron, Dallas, Tex. p. 1-1313
D GC Electronics, Rockford, Ill. *
National Wire & Cable Corp., Los Angeles, Cal. *
DM Amrad Corporation, Paris, Tex.
D AMP Special Industries, Valley Forge, Pa.
Anchor Plastics, Long Island City, N.Y.
Automatic Die Cutting Mch., New York, N.Y.
D Birnbach Co., Freeport, N.Y.
M Brady Co., W. H., Milwaukee, Wis.
Brand Dielectrics, N. Windham, Conn.
D Burlington Opers. Div., Burlington, Mass.
Cadillac Plastic & Chemical, Detroit, Mich.
Central Plastics Dists., Chicago, Ill.
M Chemplast, Wayne, N.J.
Chomerics, Woburn, Mass.
D Cole-Flex Corp., W. Babylon, N.Y.
Emerson & Cuming, Canton, Mass.
Gries Reproducer Co., New Rochelle, N.Y.
DM ICO/Rally Corp., Palo Alto, Cal.
M International Identifications, Timonium, Md.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
DM Newman Corp., M. M., Marblehead, Mass.
D Norelcom Electronics, Farmingdale, N.Y.
Penntube Plastics, Clifton Heights, Pa.
Precision Paper Tube Co., Wheeling, Ill.
Raychem Corp., Menlo Park, Cal.
Russell Inds., Lynbrook, N.Y.
M Storm Products Co., Inglewood, Ca.
D Thomas & Betts Co., Elizabeth, N.J.
3M Co., St. Paul, Minn.
Union Carbide, Chicago, Ill.
DM Zeus Ind'l. Prods., Raritan, N.J.
Tubing, Metal
DM Uniform Tubes, Collegeville, Pa. *
M Bram Metallurgical-Chem. Co., Phila., Pa.
M Co-Operative Inds., Chester, N.J.
Dow Chemical Co., Midland, Mich.
Icore Int'l., Sunnyvale, Cal.
M ITT-Higbie Mfg. Co., Rochester, Mich.
K & S Engineering, Chicago, Ill.
M Kaweck Beryco Inds., New York, NY
Lear Siegler, Santa Monica, Calif.
Leico Inds., New York, N.Y.
NL Industries, New York, N.Y.
Okonite Co., Ramsey, N.J.
M Reynolds Metals Co., Richmond, VA.
D Rohn Mfg., Peoria, Ill.
Wall A. T. Co., Warwick, R.I.
Wilkinson Co., Westlake Village, Cal.
Tubing, Plastic-Also See Tubing,
Spaghetti
DM Alpha Wire Corp., Elizabeth, N.J.
p. 2-1862,1875,1879

D Bivar, Santa Ana, Cal. p. 2-1266
DM Cimco Wire & Cable, Allendale, N.J. p. 2-1910,2023
DM Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1973,1992
DM Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
DM Markel, L. Frank & Sons, Norristown, Pa. p. 2-1272,1273
SGL Homalite, Wilmington, Del. p. 2-1254
DM Varflex Corp., Rome, N.Y. p. 2-1274,1275
D GC Electronics, Rockford, Ill. *
National Wire & Cable Corp., Los Angeles, Cal. *
 Abesto Corp., Bloomfield, N.J.
 Ace Plastic Co., Jamaica, N.Y.
 Acme Model Engrg. Co., Ridgefield, N.J.
 Airmatic/Beckett-Harcum, Wilmington, Ohio
 Anchor Plastics, Long Island City, N.Y.
 D Birnbach Co., Freeport, N.Y.
 D Blum, Julius & Co., Carlstadt, N.J.
 Brand Dielectrics, N. Windham, Conn.
 D Brand-Rex Co., Willimantic, Conn.
 D Burlington Opers. Div., Burlington, Mass.
 Cadillac Plastic & Chemical, Detroit, Mich.
 Central Plastics Dist., Chicago, Ill.
 M Chemplast, Wayne, N.J.
 M Co-Operative Inds., Chester, N.J.
 D Cole-Flex Corp., W. Babylon, N.Y.
 Communications Technology Corp., Los Angeles, Cal.
 Dow Chemical Co., Midland, Mich.
 D ICO/Rally Corp., Palo Alto, Cal.
 International Identifications, Timonium, Md.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
DM Newman Corp., M. M., Marblehead, Mass.
 Norelcom Electronics, Farmingdale, N.Y.
 NVF Co., Yorklyn, Del.
 Okonite Co., Ramsey, N.J.
 D Penn Fibre & Specialty, Phila., Pa.
 Penntube Plastics, Clifton Heights, Pa.
 M Phoenix Wire, S. Hero, Vt.
 Precision Paper Tube Co., Wheeling, Ill.
 Resdel Corp., Rio Grande, N.J.
 D Rye Inds., Mamaronock, N.Y.
DM Stevens Prods., E. Orange, N.J.
 Synthane Taylor Corp., Valley Forge, Pa.
 3M Co., St. Paul, Minn.
DM Transcon Mfg. Co., Dallas, Tex.
 Union Carbide, Chicago, Ill.
 D Uniroyal, New York, N.Y.
DM Zeus Ind'l. Prods., Raritan, N.J.
DM Zippertubing Co., Los Angeles, Calif.

Tubing, Spaghetti

DM Alpha Wire Corp., Elizabeth, N.J. p. 2-1876,1877
DM Cimco Wire & Cable, Allendale, N.J. p. 2-1910,2023
DM Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1973
DM Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
DM Markel, L. Frank & Sons, Norristown, Pa. p. 2-1272,1273
Omega Engrg., Stamford, Conn. p. 1-2324-2327
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-876
DM Varflex Corp., Rome, N.Y. p. 2-1274,1275
D GC Electronics, Rockford, Ill. *
National Wire & Cable Corp., Los Angeles, Cal. *
 Birnbach Co., Freeport, N.Y.
 Brand Dielectrics, N. Windham, Conn.
 D Brand-Rex Co., Willimantic, Conn.
 Cadillac Plastic & Chemical, Detroit, Mich.
 Central Plastics Dist., Chicago, Ill.
 M Chemplast, Wayne, N.J.
 D Cole-Flex Corp., W. Babylon, N.Y.
DM ICO/Rally Corp., Palo Alto, Cal.
 International Identifications, Timonium, Md.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
DM Newman Corp., M. M., Marblehead, Mass.
 Penntube Plastics, Clifton Heights, Pa.
 M Phoenix Wire, S. Hero, Vt.
 D Transcon Mfg. Co., Dallas, Tex.
DM Zeus Ind'l. Prods., Raritan, N.J.
DM Zippertubing Co., Los Angeles, Calif.

Tubing, Spiral Wrap

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1878
DM Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1992
Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
DM Markel, L. Frank & Sons, Norristown, Pa. p. 2-1272,1273
D Panduit Corp., Tinley Park, Ill. p. 2-2048-2051
DM Amrad Corporation, Paris, Tex.

Amp Inc., Harrisburg, Pa.
 D AMP Special Industries, Valley Forge, Pa.
 D Birnbach Co., Freeport, N.Y.
 Central Plastics Dist., Chicago, Ill.
 M Chemplast, Wayne, N.J.
 M Co-Operative Inds., Chester, N.J.
 D Cole-Flex Corp., W. Babylon, N.Y.
 D Electrovert, Mt. Vernon, N.Y.
 D ICO/Rally Corp., Palo Alto, Cal.
 Icore Int'l., Sunnyvale, Cal.
 D Jonesville Paper Tube Corp., Jonesville, Mich.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
DM Newman Corp., M. M., Marblehead, Mass.
 NVF Co., Yorklyn, Del.
 Paramount Industries, Ft. Wayne, Ind.
 Penntube Plastics, Clifton Heights, Pa.
 Precision Paper Tube Co., Wheeling, Ill.
DM Transcon Mfg. Co., Dallas, Tex.
 D Zeus Ind'l. Prods., Raritan, N.J.
DM Zippertubing Co., Los Angeles, Calif.

Tubing, Waveguide

M Uniform Tubes, Collegeville, Pa. p. 2-2065
Syston-Donner Microwave Div., Van Nuys, Cal. *
M Airtron, Morris Plains, N.J.
M The Anaconda Company Brass Division, Waterbury, Conn.
M Co-Operative Inds., Chester, N.J.
 Corning Glass Works, Television Prods. Div., Corning, N.Y.
 Maury Microwave Corp., Cucamonga, Calif.
 D Microwave Development Labs., Needham Hgts., Mass.
M Premier Microwave, Port Chester, N.Y.
 TRG, Woburn, Mass.
 Wall A. T. Co., Warwick, R.I.
 Waveline, W. Caldwell, N.J.

Tubing, Zipper

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1872-1874,1880
D Daburn Electronics & Cable Corp., Bronx, N.Y. *
 Brand Dielectrics, N. Windham, Conn.
 Cal-Metex Corp., Inglewood, Cal.
DM ICO/Rally Corp., Palo Alto, Cal.
 International Identifications, Timonium, Md.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
DM Zippertubing Co., Los Angeles, Calif.

Tuners, A-M/F-M—See Volume 1

Tuners, Microwave—See Volume 1

Tuning Forks—See Volume 1

Tweezers, Hand & Vacuum

D GC Electronics, Rockford, Ill. *
D Jonard Industries Corp., Tuckahoe, N.Y. *
 D Adtool Corp., Montreal W P Q, Can.
 M Air-Vac Engrg. Co., Milford, Conn.
 D Circon Corp., Santa Barbara, Cal.
 Clauss Cutlery Co., Fremont, Ohio
 Janel, Stirling, N.J.
 M MacDonald & Co., Glendale, Calif.
 Mann, Henry Inc., Huntingdon Valley, Pa.
 National Camera Inc., Englewood, Colo.
 D Orbit Inds., San Luis Obispo, Calif.
 D Precision Elec. Co., Kezar Falls, Me.
 D Techni-Tool, Plymouth Meeting, Pa.
 D Telvac Instr. Co., Van Nuys, Cal.
 D Vigor Co., New York, N.Y.
 X-Acto, Long Island City, N.Y.

Typewriters, Input-Output (All Types)—See Volume 1

Ultraviolet Inspection Lighting-Also See Microscopes, Ultraviolet—See Volume 1

Underwater Communication, Detection, Navigation, etc. Equipment—See Volume 1

Urea Formaldehyde—See Plastic Raw Materials

Valves, Solenoid—See Volume 1

Valves, Vacuum—See Volume 1

Varactors—See Volume 1

Varistors—See Resistors, Voltage Sensitive

Verification Systems, Tape—See Volume 1

VHF Equipment—See Generators; Receivers; etc.

Vibration Test Systems—See Volume 1

Vibrators—See Volume 1

Vibrators, Instrument (Stiction Elimination)—See Volume 1

Vidicon Tubes—See Volume 1

Viewing Hoods, Cathode Ray Tube

Hewlett-Packard Co., Palo Alto, Cal.
 Tektronix, Beaverton, Ore.

Vinyl Compounds—See Plastic Raw Materials

VLF Equipment—See Volume 1

Voltage Sources—See Volume 1

Wafer Fabrication, Semiconductor—See Volume 1

Wall Plates—See Volume 1

Washers—See Fasteners

Wave Soldering Equipment—See Volume 1

Waveguide-Coax Adapters

Amphenol RF Div., Danbury, Conn.

Arra Inc., Bay Shore, N.Y. p. 2-460,461

Rental Electronics, Lexington, Mass. p. 1-792-795

Syston-Donner Microwave Div., Van Nuys, Cal. *

Aircorn, Union, N.H.

M Airtron, Morris Plains, N.J.
 Alford Mfg. Co., Winchester, Mass.
 American Microwave Inds., Waltham, Mass.
 Andrew Corp., Orland Park, Ill.

DM Astrolab, Rahway, N.J.
 Cablewave Systems Inc., North Haven, Conn.
 Coax Devices Inc., Chelsea, Mass.

Hewlett-Packard Co., Palo Alto, Cal.

Hughes Aircraft Co., Fullerton, Cal.

Maury Microwave Corp., Cucamonga, Calif.

M Microbal/FXR, Livingston, N.J.
 Microwave Assocs., Burlington, Mass.
 D Microwave Development Labs., Needham Hgts., Mass.

Narda Microwave Corp., Plainview, N.Y.

M Nurad, Baltimore, Md.

Polyflon Corp., New Rochelle, N.Y.

D PRD Elctns., Syosset, N.Y.

M Premier Microwave, Port Chester, N.Y.

Reeve Electronics, Chicago, Ill.

R L C Elctns., Mt. Kisco, N.Y.

Sivers Lab, Corona del Mar, Cal.

M Transco Prods., Venice, Cal.

UTE Microwave, Asbury Park, N.J.

Waveline, W. Caldwell, N.J.

Waveguides

Amphenol RF Div., Danbury, Conn.

Arra Inc., Bay Shore, N.Y. p. 2-460,461

M Electro Impulse, Red Bank, N.J. p. 1-492,662-666

M Uniform Tubes, Collegeville, Pa. p. 2-2065
Bendix, Franklin, Ind. *

Syston-Donner Microwave Div., Van Nuys, Cal. *

M Adams-Russell Co., Waltham, Mass.

Airtron, Morris Plains, N.J.

Andrew Antenna Co. Ltd., Whitby, Ont., Can.

Andrew Corp., Orland Park, Ill.

M Co-Operative Inds., Chester, N.J.

Corning Glass Works, Television Prods. Div., Corning, N.Y.

Gabriel Elctns. Inc., Scarborough, Me.

Hughes Aircraft Co., Culver City, Cal.

Maury Microwave Corp., Cucamonga, Calif.

D Microwave Development Labs., Needham Hgts., Mass.

Narda Microwave Corp., Plainview, N.Y.

Polyflon Corp., New Rochelle, N.Y.

M Premier Microwave, Port Chester, N.Y.

Reeve Electronics, Chicago, Ill.

DM Servometer Corp., Cedar Grove, N.J.
Waveline, W. Caldwell, N.J.

Wave Traps—See Volume 1

Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)—See Volume 1

Wire, Airframe

DM Cimco Wire & Cable, Allendale, N.J. p. 2-1910,2023
DM Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1980
DM Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
M Victor Wire & Cable Corp., Los Angeles, Cal. p. 2-2066
DM Alpha Wire Corp., Elizabeth, N.J.*
Standard Wire & Cable Co., Los Angeles, Cal. *
Cerro Wire & Cable Co., New Haven, Conn.
Icore Int'l., Sunnyvale, Cal.
D Manhattan Elec. Cable Corp., Rye, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
M Prestolite Wire Division, Port Huron, Mich.
M Storm Products Co., Inglewood, Ca.
M Thermax Wire Corp., Flushing, N.Y.

Wire, Antenna (All Types)

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1858
D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
D Columbia Elctn. Cables, New Bedford, Mass. p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1961,1968
D Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
D Daburn Electronics & Cable Corp., Bronx, N.Y. *
D GC Electronics, Rockford, Ill.*
Standard Wire & Cable Co., Los Angeles, Cal. *
American Electric Cable Co., Holyoke, Mass.
D Antenna Corp. of America, Burlington, Iowa
M Arco Wire & Cable, N. Hollywood, Cal.
Birnback Co., Freeport, N.Y.
Copperweld Bimetallics, Glassport, PA
D Hackensack Cable Corp., West Columbia, S.C.
D Jersey Specialty Co., Wayne, N.J.
Leviton Mfg. Co., Little Neck, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
D Rohn Mfg., Peoria, Ill.
Saxton Prods., Congers, N.Y.
Times Wire & Cable, Wallingford, Conn.
TRW/Holyoke Wire & Cable, South Hadley, Mass.
D Workman Electronic Prods., Sarasota, Fla.

Wire, Bare, Copper

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1837,1858
D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
D Columbia Elctn. Cables, New Bedford, Mass. p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1960
D Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
Omega Engrg., Stamford, Conn. p. 1-2324-2327

DM Daburn Electronics & Cable Corp., Bronx, N.Y. *
Shigoto Inds., Ltd., New York, N.Y.*
Standard Wire & Cable Co., Los Angeles, Cal. *
D The Anaconda Co., Greenwich, Conn.
D Birnback Co., Freeport, N.Y.
M Bram Metallurgical-Chem. Co., Phila., Pa.
D CCS Hatfield Wire & Cable Group, Cranford, N.J.
D Custom Cable Co., Oceanside, N.Y.
Gte Sylvania, Belmont, Cal.
M Hamilton Technology, Lancaster, Pa.
Kentucky Electronics, Owensboro, Ky.
Leico Inds., New York, N.Y.
D Manhattan Elec. Cable Corp., Rye, N.Y.
Materials Resch. Corp., Orangeburg, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Molecu-Wire Corp., Farmingdale, N.J.
Nesor Alloy Corp., W. Caldwell, N.J.
Okonite Co., Ramsey, N.J.
D Pace Wire & Cable Corp., Oceanside, N.Y.
Saxton Prods., Congers, N.Y.
TRW/Holyoke Wire & Cable, South Hadley, Mass.
D United Mineral & Chem. Corp., New York, N.Y.
Universal Security Instrs., Baltimore, Md.
DM Viking Wire Co., Danbury, Conn.
Wilkinson Co., Westlake Village, Cal.

Wire, Bare, Nickel

Standard Wire & Cable Co., Los Angeles, Cal. *
The Anaconda Co., Greenwich, Conn.
Atomerig Chemetals Co., Carle Place, N.Y.
M Bram Metallurgical-Chem. Co., Phila., Pa.

Control Products Corp., Chicago, Ill.
GTE Sylvania Inc., Newark, N.J.
M Hamilton Technology, Lancaster, Pa.
Kentucky Electronics, Owensboro, Ky.
Leico Inds., New York, N.Y.
M Magnetics, Butler, Pa.
Materials Resch. Corp., Orangeburg, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Wilkinson Co., Westlake Village, Cal.

Wire, Bare, Nickel-Chrome

D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1960
Omega Engrg., Stamford, Conn. p. 1-2324-2327
The Anaconda Co., Greenwich, Conn.
Atomerig Chemetals Co., Carle Place, N.Y.
M Bram Metallurgical-Chem. Co., Phila., Pa.
Control Products Corp., Chicago, Ill.
D Eaton Corporation, Cleveland, Ohio
Gordon, Claud S. Co., Richmond, Ill.
GTE Sylvania Inc., Newark, N.J.
M Hamilton Technology, Lancaster, Pa.
Hoskins Mfg. Co., Detroit, Mich.
Leico Inds., New York, N.Y.
Materials Resch. Corp., Orangeburg, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Molecu-Wire Corp., Farmingdale, N.J.
Nesor Alloy Corp., W. Caldwell, N.J.

Wire, Braid (Excluding Shielding)

M Amphenol Connector Div., SAMS Opers., Chatsworth, Cal. p. 2-460,461
D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
D Columbia Elctn. Cables, New Bedford, Mass. p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1964,1966
D Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
DM Whitmor Wire & Cable, No. Hollywood, Cal. p. 2-2072
D Daburn Electronics & Cable Corp., Bronx, N.Y. *
Standard Wire & Cable Co., Los Angeles, Cal. ...*
Victor Wire & Cable Corp., Los Angeles, Cal. ...*
M Aircraft & Elex Spoltys, Plainfield, Ind
M Arco Wire & Cable, N. Hollywood, Cal.
Atomerig Chemetals Co., Carle Place, N.Y.
D Birnback Co., Freeport, N.Y.
M Bram Metallurgical-Chem. Co., Phila., Pa.
Cal-Metex Corp., Inglewood, Cal.
M Co-Operative Inds., Chester, N.J.
M Kates Scientific Instrs., Newton, Mass.
M Lenz Electric Mfg. Co., Chicago, Ill.
D Manhattan Elec. Cable Corp., Rye, N.Y.
DM Metex Corp., Edison, N.J.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Nat'l-Standard Co., Niles, Mich.
Nesor Alloy Corp., W. Caldwell, N.J.
TRW/Holyoke Wire & Cable, South Hadley, Mass.
Wireflex Incorporated, Bourbon, Ind.
D Zippertubing Co., Los Angeles, Calif.

Wire, Braid (Shielding)—See Braid, Cable

Wire & Cable Ties

D Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1981
D ETC Terminal Products, Solon, Ohio p. 2-695-706
DM Grayhill Inc., LaGrange, Ill. p. 2-2021
DM Panduit Corp., Tinley Park, Ill. p. 2-2048-2051
M Rowe Industries, Toledo, Ohio p. 2-796,797
D Smith Inc., Herman H., Brooklyn, N.Y. p. 2-875,879
D 3M Company, St. Paul, Minn. p. 2-1034-1055
D GC Electronics, Rockford, Ill.*
D Waldom Electronics, Chicago, Ill.*
Acesso-Wire, Garnersville, N.Y.
DM Amrad Corporation, Paris, Tex.
D AMP Special Industries, Valley Forge, Pa.
Autospice/Dv Gen Staple, New York City, N.Y.
D Burndy Corporation, Norwalk, Conn.
Copperweld Bimetallics, Glassport, PA
M Dennison Mfg. Co., Framingham, Mass.
D Electrovert, Mt. Vernon, N.Y.
Heyman Mfg. Co., Kenilworth, N.J.
Hoffman Industrial Prods., Farmingdale, N.Y.
M I-T-E Electrical Components Grp., E. Farmingdale, N.Y.
DM ICO/Rally Corp., Palo Alto, Cal.
D Ideal Industries Inc., Sycamore, Ill.
ITT Holub Industries, Sycamore, Ill.
M Manger Elec. Co., Stamford, Conn.
Norelcom Electronics, Farmingdale, N.Y.
D Preformed Line Products Co., Cleveland, Ohio
DM Simmons Fastener Corp., Albany, N.Y.
DM Transcon Mfg. Co., Dallas, Tex.

DM Tyton Corp., Milwaukee, Wisc.
DM Weckesser Co. Inc., Chicago, Ill.
Whitso, Schiller Park, Ill.
D Workman Electronic Prods., Sarasota, Fla.
D Zippertubing Co., Los Angeles, Calif.

Wire, Ceramic Insulated

Omega Engrg., Stamford, Conn. p. 1-2324-2327
D Amperex Electronic Corp., Hicksville, N.Y.*
DM Daburn Electronics & Cable Corp., Bronx, N.Y. *
Standard Wire & Cable Co., Los Angeles, Cal. *
D Ametek Controls Division, Feasterville, Pa.
MARI Inds., Franklin Pk., Ill.
Control Products Corp., Chicago, Ill.
Gordon, Claud S. Co., Richmond, Ill.
Gulton Inds., Buena Park, Cal.
Molecu-Wire Corp., Farmingdale, N.J.
Permaluster, Burbank, Calif.

Wire, Clad (All Types)

D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
Standard Wire & Cable Co., Los Angeles, Cal. *
M Advanced Materials Systems, Attleboro, Mass.
Copperweld Bimetallics, Glassport, PA
Engelhard Minerals & Chem., Murray Hill, N.J.
Gordon, Claud S. Co., Richmond, Ill.
Handy & Harman, New York, N.Y.
Kentucky Electronics, Owensboro, Ky.
Leviton Mfg. Co., Little Neck, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Texas Instruments, Attleboro, Mass.

Wire, Enamel Insulated—See Wire, Hookup (All-Types)

Wire, Fiberglass Insulated—See Wire, Glass Insulated

Wire, Flame Retardant

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1836-1840
D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
D Columbia Elctn. Cables, New Bedford, Mass. p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1935,1963
D Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1980,1981,1983
DM Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
National Wire & Cable Corp., Los Angeles, Cal. p. 2-2045
Standard Wire & Cable Co., Los Angeles, Cal. *
Victor Wire & Cable Corp., Los Angeles, Cal. ...*
Acesso-Wire, Garnersville, N.Y.
American Electric Cable Co., Holyoke, Mass.
The Anaconda Co., Greenwich, Conn.
M Arco Wire & Cable, N. Hollywood, Cal.
Boston Insulated Wire & Cable Co., Dorchester, Mass.
D Brand-Rex Co., Willimantic, Conn.
Cerro Wire & Cable Co., New Haven, Conn.
Circuit Assembly Corp., Costa Mesa, Ca.
D Custom Cable Co., Oceanside, N.Y.
General Elec., Bridgeport, Conn.
Gulton Inds., Buena Park, Cal.
Icore Int'l., Sunnyvale, Cal.
D Jersey Specialty Co., Wayne, N.J.
Lenz Electric Mfg. Co., Chicago, Ill.
D Manhattan Elec. Cable Corp., Rye, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Prestolite Wire Division, Port Huron, Mich.
M Thermax Wire Corp., Flushing, N.Y.
Wireflex Incorporated, Bourbon, Ind.

Wire, Flat Strip—See Cable, Flat

Wire, Glass Insulated

D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
DM Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1979,1982
DM Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
Omega Engrg., Stamford, Conn. p. 1-2324-2327
Standard Wire & Cable Co., Los Angeles, Cal. *
D The Anaconda Co., Greenwich, Conn.
M Arco Wire & Cable, N. Hollywood, Cal.
Birnback Co., Freeport, N.Y.
Boston Insulated Wire & Cable Co., Dorchester, Mass.
Brand-Rex Co., Willimantic, Conn.
Cerro Wire & Cable Co., New Haven, Conn.
General Elec., Bridgeport, Conn.
Gordon, Claud S. Co., Richmond, Ill.

GTE Sylvania Inc., Newark, N.J.
 Gulton Inds., Buena Park, Cal.
 Lenz Electric Mfg. Co., Chicago, Ill.
 D Manhattan Elec. Cable Corp., Rye, N.Y.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Molecu-Wire Corp., Farmingdale, N.J.
 TRW/Holyoke Wire & Cable, South Hadley, Mass.
 Wireflex Incorporated, Bourbon, Ind.

Wire, Guy

D Columbia Elctn. Cables, New Bedford, Mass.
 p. 2-1911
 Birnbach Co., Freeport, N.Y.
 D Channel Master Div. Avnet, Ellenville, N.Y.
 Copperweld Bimetallics, Glassport, PA
 D Hackensack Cable Corp., West Columbia, S.C.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Molecu-Wire Corp., Farmingdale, N.J.
 Nat'l-Standard Co., Niles, Mich.
 D Rohn Mfg., Peoria, Ill.
 DM Saxton Prods., Congers, N.Y.
 D Sitco Antennas, Portland, Ore.

Wire, Heater—See Cable, Heater**Wire, High-Temperature (Over 125 C)**

D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
 DM Cimco Wire & Cable, Allendale, N.J.
 p. 2-1910,2023
 D Columbia Elctn. Cables, New Bedford, Mass.
 p. 2-1911
 DM Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1935
 Daburn Electronics & Cable Corp., Bronx, N.Y.
 p. 2-1980-1984
 D Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993
 DM Markel, L. Frank & Sons, Norristown, Pa.
 p. 2-2024,2025

Omega Engrg., Stamford, Conn.
 p. 1-2324-2327
 M Rowe Industries, Toledo, Ohio p. 2-2052,2053
 M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
 DMA Alpha Wire Corp., Elizabeth, N.J.*
 National Wire & Cable Corp., Los Angeles, Cal. *
 Standard Wire & Cable Co., Los Angeles, Cal. *
 Victor Wire & Cable Corp., Los Angeles, Cal. ...*
 D The Anaconda Co., Greenwich, Conn.
 M Arco Wire & Cable, N. Hollywood, Cal.
 M ARI Inds., Franklin Pk., Ill.
 Assembled Products Co., St. Albans, Vt.
 Atomergic Chemetals Co., Carle Place, N.Y.
 D Birnbach Co., Freeport, N.Y.
 Boston Insulated Wire & Cable Co., Dorchester, Mass.
 M Bram Metallurgical-Chem. Co., Phila., Pa.
 D Brand-Rex Co., Willimantic, Conn.
 Cerro Wire & Cable Co., New Haven, Conn.
 D Custom Cable Co., Oceanside, N.Y.
 Essex International, Sycamore, Ill.
 General Elec., Bridgeport, Conn.
 GTE Sylvania Inc., Newark, N.J.
 Gulton Inds., Buena Park, Cal.
 Hoskins Mfg. Co., Detroit, Mich.
 Icore Int'l., Sunnyvale, Cal.
 M Judd Wire Div., Burlington, Mass.
 Kentucky Electronics, Owensboro, Ky.
 Leviton Mfg. Co., Little Neck, N.Y.
 D Manhattan Elec. Cable Corp., Rye, N.Y.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Molecu-Wire Corp., Farmingdale, N.J.
 D Pace Wire & Cable Corp., Oceanside, N.Y.
 Permaluster, Burbank, Calif.
 M Phoenix Wire, S. Hero, Vt.
 Prestolite Wire Division, Port Huron, Mich.
 Raychem Corp., Menlo Park, Cal.
 Sermetel Teleflex Inc., Limerick, Pa.
 M Storm Products Co., Inglewood, Ca.
 Templeline, Gardena, Cal.
 DM Thermax Wire Corp., Flushing, N.Y.
 Times Wire & Cable, Wallingford, Conn.
 DM Viking Wire Co., Danbury, Conn.
 Wilkinson Co., Westlake Village, Cal.
 Wireflex Incorporated, Bourbon, Ind.

Wire, High Voltage (1000 Volts & Over)

D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
 DM Cimco Wire & Cable, Allendale, N.J.
 p. 2-1910,2023
 D Columbia Elctn. Cables, New Bedford, Mass.
 p. 2-1911
 DM Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1929,1930,1933,1936,1963
 D Daburn Electronics & Cable Corp., Bronx, N.Y.
 p. 2-1979-1981,1983,1984
 DM Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993

DM Markel, L. Frank & Sons, Norristown, Pa.
 p. 2-2024,2025
 National Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2045
 M Rowe Industries, Toledo, Ohio p. 2-2052,2053
 DM Whitmor Wire & Cable, No. Hollywood, Cal.
 p. 2-2072
 DM Alpha Wire Corp., Elizabeth, N.J.*
 Standard Wire & Cable Co., Los Angeles, Cal. *
 Victor Wire & Cable Corp., Los Angeles, Cal. ...*
 Acceso-Wire, Garnersville, N.Y.
 D The Anaconda Co., Greenwich, Conn.
 M Arco Wire & Cable, N. Hollywood, Cal.
 Birnbach Co., Freeport, N.Y.
 Boston Insulated Wire & Cable Co., Dorchester, Mass.
 Brand-Rex Co., Willimantic, Conn.
 D CCS Hatfield Wire & Cable Group, Cranford, N.J.
 D Custom Cable Co., Oceanside, N.Y.
 Dielectric Sciences, Burlington, Mass.
 General Elec., Bridgeport, Conn.
 Gulton Inds., Buena Park, Cal.
 M Judd Wire Div., Burlington, Mass.
 Lenz Electric Mfg. Co., Chicago, Ill.
 Leviton Mfg. Co., Little Neck, N.Y.
 D Manhattan Elec. Cable Corp., Rye, N.Y.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Okonite Co., Ramsey, N.J.
 Prestolite Wire Division, Port Huron, Mich.
 Raychem Corp., Menlo Park, Cal.
 M Reynolds Metals Co., Richmond, VA.
 M Storm Products Co., Inglewood, Ca.
 Times Wire & Cable, Wallingford, Conn.
 TRW/Holyoke Wire & Cable, South Hadley, Mass.
 Wireflex Incorporated, Bourbon, Ind.

Wire, Hookup (All Types)

D Alpha Wire Corp., Elizabeth, N.J.
 p. 2-1835-1840,1858
 D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
 DM Cimco Wire & Cable, Allendale, N.J.
 p. 2-1910,2023
 D Columbia Elctn. Cables, New Bedford, Mass.
 p. 2-1911
 DM Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1934,1935,1937,1958,1964,1967
 DM Daburn Electronics & Cable Corp., Bronx, N.Y.
 p. 2-1979,1980,1982,1983
 DM Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993
 DM Markel, L. Frank & Sons, Norristown, Pa.
 p. 2-2024,2025
 National Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2043,2045
 D Panduit Corp., Tinley Park, Ill. p. 2-2048-2051
 D Rowe Industries, Toledo, Ohio p. 2-2052
 DM Spectra-Strip Corp., Garden Grove, Cal.
 p. 2-2057
 DM Victor Wire & Cable Corp., Los Angeles, Cal.
 p. 2-2066
 DM Whitmor Wire & Cable, No. Hollywood, Cal.
 p. 2-2072
 M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
 D GC Electronics, Rockford, Ill.*
 Jonard Industries Corp., Tuckahoe, N.Y.*
 Shigoto Inds., Ltd., New York, N.Y.*
 Standard Wire & Cable Co., Los Angeles, Cal. *
 M American Electric Cable Co., Holyoke, Mass.
 M Arco Wire & Cable, N. Hollywood, Cal.
 D Birnbach Co., Freeport, N.Y.
 Boston Insulated Wire & Cable Co., Dorchester, Mass.
 D Brand-Rex Co., Willimantic, Conn.
 Cerro Wire & Cable Co., New Haven, Conn.
 D Essex International, Sycamore, Ill.
 General Elec., Bridgeport, Conn.
 Icore Int'l., Sunnyvale, Cal.
 M Judd Wire Div., Burlington, Mass.
 Lenz Electric Mfg. Co., Chicago, Ill.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Motorola Comms. Div., Schaumburg, Ill.
 D Norelcom Electronics, Farmingdale, N.Y.
 D On-Guard Corp. of America, Carlstadt, NJ
 D Pacific Electricord Co., Gardena, Cal.
 M Phoenix Wire, S. Hero, Vt.
 Prestolite Wire Division, Port Huron, Mich.
 Raychem Corp., Menlo Park, Cal.
 Rockland Insulated Wire & Cable, Haverstraw, N.Y.
 Saxton Prods., Congers, N.Y.
 M Storm Products Co., Inglewood, Ca.
 D Superior Cable Div., Hickory, N.C.
 DM Thermax Wire Corp., Flushing, N.Y.
 TRW/Holyoke Wire & Cable, South Hadley, Mass.
 Wireflex Incorporated, Bourbon, Ind.
 D Workman Electronic Prods., Sarasota, Fla.

Wire, Irradiated

D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
 DM Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993
 D Rowe Industries, Toledo, Ohio p. 2-2052
 M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
 DMA Alpha Wire Corp., Elizabeth, N.J.*
 DM Daburn Electronics & Cable Corp., Bronx, N.Y. *
 Standard Wire & Cable Co., Los Angeles, Cal. *
 Acceso-Wire, Garnersville, N.Y.
 M American Electric Cable Co., Holyoke, Mass.
 M Arco Wire & Cable, N. Hollywood, Cal.
 Boston Insulated Wire & Cable Co., Dorchester, Mass.
 D Brand-Rex Co., Willimantic, Conn.
 Essex International, Sycamore, Ill.
 DM Judd Wire Div., Burlington, Mass.
 D Manhattan Elec. Cable Corp., Rye, N.Y.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Permaluster, Burbank, Calif.
 Raychem Corp., Menlo Park, Cal.
 M Storm Products Co., Inglewood, Ca.

Wire, Lead-In & Ground

D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
 D Columbia Elctn. Cables, New Bedford, Mass.
 p. 2-1911
 D Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1938,1964
 D Daburn Electronics & Cable Corp., Bronx, N.Y.
 p. 2-1979,1980,1982,1983
 Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993
 D Rowe Industries, Toledo, Ohio p. 2-2052
 M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
 DMA Alpha Wire Corp., Elizabeth, N.J.*
 Standard Wire & Cable Co., Los Angeles, Cal. *
 M American Electric Cable Co., Holyoke, Mass.
 D Antenna Corp. of America, Burlington, Iowa
 Birnbach Co., Freeport, N.Y.
 Boston Insulated Wire & Cable Co., Dorchester, Mass.
 D Brand-Rex Co., Willimantic, Conn.
 D Channel Master Div. Avnet, Ellenville, N.Y.
 Copperweld Bimetallics, Glassport, PA
 Essex International, Sycamore, Ill.
 General Electric Co., Cleveland, Ohio
 M Judd Wire Div., Burlington, Mass.
 Lenz Electric Mfg. Co., Chicago, Ill.
 D Manhattan Elec. Cable Corp., Rye, N.Y.
 D Pace Wire & Cable Corp., Oceanside, N.Y.
 D Pacific Electricord Co., Gardena, Cal.
 D Rohn Mfg., Peoria, Ill.
 Saxton Prods., Congers, N.Y.
 D Superior Cable Div., Hickory, N.C.
 TRW/Holyoke Wire & Cable, South Hadley, Mass.

Wire, Litz

D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
 Daburn Electronics & Cable Corp., Bronx, N.Y. *
 Standard Wire & Cable Co., Los Angeles, Cal. *
 M Bram Metallurgical-Chem. Co., Phila., Pa.

Wire, Magnet

D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
 Caddell-Burns Mfg. Co., Mineola, N. Y.
 p. 2-382-385
 D Consolidated Wire & Assoc. Corps., Chicago, Ill.
 p. 2-1959,1960
 DM Dearborn Wire & Cable Co., Rosemont, Ill.
 p. 2-1993
 M Daburn Electronics & Cable Corp., Bronx, N.Y. *
 Shigoto Inds., Ltd., New York, N.Y.*
 D Victor Wire & Cable Corp., Los Angeles, Cal. ...*
 D The Anaconda Co., Greenwich, Conn.
 D Birnbach Co., Freeport, N.Y.
 M Bram Metallurgical-Chem. Co., Phila., Pa.
 Gulton Inds., Buena Park, Cal.
 Mil Spec Wire & Cable Corp., Freeport, N.Y.
 Molecu-Wire Corp., Farmingdale, N.J.
 Permaluster, Burbank, Calif.
 D Philips Elmet Corp., Lewiston, Me.
 M Phoenix Wire, S. Hero, Vt.
 M Reynolds Metals Co., Richmond, VA.
 Saxton Prods., Congers, N.Y.
 Texas Instruments, Attleboro, Mass.
 Tohoku Metal Inds., Ltd., Tokyo, Japan
 DM Viking Wire Co., Danbury, Conn.

Wire Markers (All Types)-Also see Strips Marker & Fanning

D Panduit Corp., Tinley Park, Ill. p. 2-2048-2051
 D Alpha Wire Corp., Elizabeth, N.J.*
 Acceso-Wire, Garnersville, N.Y.
 M Brady Co., W. H., Milwaukee, Wis.
 Electrovert, Mt. Vernon, N.Y.

D Ideal Industries Inc., Sycamore, Ill.
M Manger Elec. Co., Stamford, Conn.
Markem Corp., Keene, NH
Matthews & Co., Jas. H., Pittsburgh, Pa.
Newman Corp., M. M., Marblehead, Mass.
D Penn Fibre & Specialty, Phila., Pa.
Raychem Corp., Menlo Park, Cal.
M Storm Products Co., Inglewood, Ca.
Tyton Corp., Milwaukee, Wisc.
D Zippertubing Co., Los Angeles, Calif.

Wire, Multiconductor—See Cable, Multiconductor

Wire Nuts

D Panduit Corp., Tinley Park, Ill. p. 2-2048-2051
D Waldom Electronics, Chicago, Ill. p. 1-1070-1074
Hickok Electrical Instr., Cleveland, Ohio *
Shigoto Inds., Ltd., New York, N.Y. *
Accesso-Wire, Garnersville, N.Y.
Autosplice/Dv Gen Staple, New York City, N.Y.
I-T-E Electrical Components Grp., E. Farmingdale, N.Y.
D Ideal Industries Inc., Sycamore, Ill.
ITT Holub Industries, Sycamore, Ill.
Universal Security Instrs., Baltimore, Md.

Wire, Plastic Insulated—See Wire Hookup (All Types)

Wire, Plated (All Types)

Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1979,1980
D Alpha Wire Corp., Elizabeth, N.J. *
Standard Wire & Cable Co., Los Angeles, Cal. *
M Advanced Materials Systems, Attleboro, Mass.
M Arco Wire & Cable, N. Hollywood, Cal.
CCS Hatfield Wire & Cable Group, Cranford, N.J.
Kentucky Electronics, Owensboro, Ky.
Nesor Alloy Corp., W. Caldwell, N.J.
Philips Elmet Corp., Lewiston, Me.
Universal Security Instrs., Baltimore, Md.

Wire, Radiation-Resistant

Belden Corp., Richmond, Ind. ... p. 2-1882-1909
D Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1981
D Alpha Wire Corp., Elizabeth, N.J. *
Standard Wire & Cable Co., Los Angeles, Cal. *
The Anaconda Co., Greenwich, Conn.
M Arco Wire & Cable, N. Hollywood, Cal.
M ARI Inds., Franklin Pk., Ill.
Boston Insulated Wire & Cable Co., Dorchester, Mass.
Cerro Wire & Cable Co., New Haven, Conn.
General Elec., Bridgeport, Conn.
Gulton Inds., Buena Park, Cal.
Icore Int'l., Sunnyvale, , Cal.
M Judd Wire Div., Burlington, Mass.
D Manhattan Elec. Cable Corp., Rye, N.Y.
DM Metex Corp., Edison, N.J.
Molecu-Wire Corp., Farmingdale, N.J.
Permaluster, Burbank, Calif.
Raychem Corp., Menlo Park, Cal.
Templine, Gardena, Cal.
DM Thermax Wire Corp., Flushing, N.Y.
Times Wire & Cable, Wallingford, Conn.

Wire, Resistance

D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1960
Daburn Electronics & Cable Corp., Bronx, N.Y. *
The Anaconda Co., Greenwich, Conn.
M Arco Wire & Cable, N. Hollywood, Cal.
M Bram Metallurgical-Chem. Co., Phila., Pa.
Cox & Co., New York, N.Y.
Hoskins Mfg. Co., Detroit, Mich.
D Manhattan Elec. Cable Corp., Rye, N.Y.
Wireflex Incorporated, Bourbon, Ind.

Wire, Resistance Thermometer

Omega Engrg., Stamford, Conn. p. 1-2324-2327
M Arco Wire & Cable, N. Hollywood, Cal.
Cox & Co., New York, N.Y.
Engelhard Minerals & Chem., Murray Hill, N.J.
GTE Sylvania Inc., Newark, N.J.
M Kates Scientific Instrs., Newton, Mass.
D Manhattan Elec. Cable Corp., Rye, N.Y.
Materials Resch. Corp., Orangeburg, N.Y.
Molecu-Wire Corp., Farmingdale, N.J.
Templine, Gardena, Cal.

Wire, Ribbon

D Columbia Elctn. Cables, New Bedford, Mass. p. 2-1911

D Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
D Alpha Wire Corp., Elizabeth, N.J. *
Standard Wire & Cable Co., Los Angeles, Cal. *
D 3M Company, St. Paul, Minn. *
American Electric Cable Co., Holyoke, Mass.
M Arco Wire & Cable, N. Hollywood, Cal.
DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.
Autosplice/Dv Gen Staple, New York City, N.Y.
M Bram Metallurgical-Chem. Co., Phila., Pa.
Circuit Assembly Corp., Costa Mesa, Ca.
D Custom Cable Co., Oceanside, N.Y.
Engelhard Minerals & Chem., Murray Hill, N.J.
GTE Sylvania, Towanda, Pa.
GTE Sylvania Inc., Newark, N.J.
Hoskins Mfg. Co., Detroit, Mich.
International Identifications, Timonium, Md.
Jermyn, San Francisco, Cal.
M Judd Wire Div., Burlington, Mass.
DM Manhattan Elec. Cable Corp., Rye, N.Y.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Nesor Alloy Corp., W. Caldwell, N.J.
Permaluster, Burbank, Calif.
Plessey Inc., Melville, N.Y.
Raychem Corp., Menlo Park, Cal.
TRW/Holyoke Wire & Cable, South Hadley, Mass.
Wilkinson Co., Westlake Village, Cal.
D Workman Electronic Prods., Sarasota, Fla.
D Zippertubing Co., Los Angeles, Calif.

Wire, Semiconductor Lead

Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1980
D Alpha Wire Corp., Elizabeth, N.J. *
Standard Wire & Cable Co., Los Angeles, Cal. *
M Art Wire & Stamping Co., Cedar Knolls, N.J.
DM Associated Engrg. & Mfg. Corp., Upper Montclair, N.J.
Engelhard Minerals & Chem., Murray Hill, N.J.
Fansteel Inc., N. Chicago, Ill.
Fusite Div./Emerson Elec., Cincinnati, Ohio
General Electric Co., Cleveland, Ohio
GTE Sylvania Inc., Newark, N.J.
M Hadley Components Div., Hadley, Pa.
Molecu-Wire Corp., Farmingdale, N.J.
Nat'l-Standard Co., Niles, Mich.
Nesor Alloy Corp., W. Caldwell, N.J.
Plessey Inc., Melville, N.Y.

Wire, Shielded

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1836-1840
D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
DM Cimco Wire & Cable, Allendale, N.J. p. 2-1910,2023
D Columbia Elctn. Cables, New Bedford, Mass. p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1929,1930,1934,1935,1938-1942
DM Daburn Electronics & Cable Corp., Bronx, N.Y. p. 2-1979,1981,1983
DM Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
DM Markel, L. Frank & Sons, Norristown, Pa. p. 2-2024,2025
National Wire & Cable Corp., Los Angeles, Cal. p. 2-2046
M Perfection Mica Co., Bensenville, Ill. p. 2-1255,2055
M Rowe Industries, Toledo, Ohio p. 2-2052,2053
DM Whitmor Wire & Cable, No. Hollywood, Cal. p. 2-2072
M Woven Elctns., Mauldin, S. C. p. 2-2068-2071
Standard Wire & Cable Co., Los Angeles, Cal. *
D 3M Company, St. Paul, Minn. *
DM Victor Wire & Cable Corp., Los Angeles, Cal. ... *
Accesso-Wire, Garnersville, N.Y.
M American Electric Cable Co., Holyoke, Mass.
D The Anaconda Co., Greenwich, Conn.
D Anixter-Mark, Skokie, Ill.
M Arco Wire & Cable, N. Hollywood, Cal.
D Birnbach Co., Freeport, N.Y.
Boston Insulated Wire & Cable Co., Dorchester, Mass.
Brand-Rex Co., Willimantic, Conn.
D CCS Hatfield Wire & Cable Group, Cranford, N.J.
Cerro Wire & Cable Co., New Haven, Conn.
M Co-Operative Inds., Chester, N.J.
D Custom Cable Co., Oceanside, N.Y.
Estes Engrg. Co., Port Angeles, Wash.
General Elec., Bridgeport, Conn.
Gulton Inds., Buena Park, Cal.
Icore Int'l., Sunnyvale, , Cal.
D Jersey Specialty Co., Wayne, N.J.
M Judd Wire Div., Burlington, Mass.

Lenz Electric Mfg. Co., Chicago, Ill.
DM Manhattan Elec. Cable Corp., Rye, N.Y.
DM Metex Corp., Edison, N.J.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
Nesor Alloy Corp., W. Caldwell, N.J.
Okonite Co., Ramsey, N.J.
D Pace Wire & Cable Corp., Oceanside, N.Y.
Permaluster, Burbank, Calif.
Prestolite Wire Division, Port Huron, Mich.
Raychem Corp., Menlo Park, Cal.
Rockland Insulated Wire & Cable, Haverstraw, N.Y.
D Rye Inds., Mamaroneck, N.Y.
Saxton Prods., Congers, N.Y.
DM Thermax Wire Corp., Flushing, N.Y.
Times Wire & Cable, Wallingford, Conn.
TRW/Holyoke Wire & Cable, South Hadley, Mass.
M Zippertubing Co., Los Angeles, Calif.

Wire Shielding-Also see Braid, Cable

D Columbia Elctn. Cables, New Bedford, Mass. p. 2-1911
D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1962
DM Dearborn Wire & Cable Co., Rosemont, Ill. p. 2-1993
M Perfection Mica Co., Bensenville, Ill. p. 2-1255,2055
DM Rowe Industries, Toledo, Ohio p. 2-2052,2053
DM Whitmor Wire & Cable, No. Hollywood, Cal. p. 2-2072
D Alpha Wire Corp., Elizabeth, N.J. *
DM Daburn Electronics & Cable Corp., Bronx, N.Y. *
Standard Wire & Cable Co., Los Angeles, Cal. *
D Victor Wire & Cable Corp., Los Angeles, Cal. ... *
M Aircraft & Elex Spoltsy, Plainfield, Ind
M American Electric Cable Co., Holyoke, Mass.
The Anaconda Co., Greenwich, Conn.
D Astrolab, Rahway, N.J.
Cal-Metex Corp., Inglewood, Cal.
Estes Engrg. Co., Port Angeles, Wash.
Icore Int'l., Sunnyvale, , Cal.
International Identifications, Timonium, Md.
Lenz Electric Mfg. Co., Chicago, Ill.
M Manger Elec. Co., Stamford, Conn.
DM Metex Corp., Edison, N.J.
Mil Spec Wire & Cable Corp., Freeport, N.Y.
M Storm Products Co., Inglewood, Ca.
Texas Instruments, Attleboro, Mass.
TRW/Holyoke Wire & Cable, South Hadley, Mass.
D Zippertubing Co., Los Angeles, Calif.

Wire, Strain Gauge

D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
D Consolidated Wire & Assoc. Corps., Chicago, Ill. p. 2-1938
Standard Wire & Cable Co., Los Angeles, Cal. *
GTE Sylvania Inc., Newark, N.J.
Materials Resch. Corp., Orangeburg, N.Y.
Molecu-Wire Corp., Farmingdale, N.J.

Wire Strippers, Automatic—See Volume 1

Wire Strippers, Chemical—See Chemicals, Wire Stripping

Wire Strippers, Hand Operated

D Channellock, Meadville, Pa. p. 2-1693
Gardner-Denver, Grand Haven, Mich. p. 2-1697
D GC Electronics, Rockford, Ill. p. 2-1696
D Panduit Corp., Tinley Park, Ill. p. 2-2048-2051
D Vaco Products Co., Chicago, Ill. p. 2-1716
Jonard Industries Corp., Tuckahoe, N.Y. *
D Waldom Electronics, Chicago, Ill. *
Accesso-Wire, Garnersville, N.Y.
D Adtool Corp., Montreal W P Q, Can.
American Electric Cable Co., Holyoke, Mass.
D AMP Special Industries, Valley Forge, Pa.
D Burndy Corporation, Norwalk, , Conn.
Claus Cutlery Co., Fremont, Ohio
D Eraser Co., Syracuse, N.Y.
D Gagne Assocs., Binghamton, N.Y.
Hoffman Industrial Prods., Farmingdale, N.Y.
D Ideal Industries Inc., Sycamore, Ill.
ITT Holub Industries, Sycamore, Ill.
Jensen Tools & Alloys, Phoenix, Ariz.
D Klein, Mathias & Sons, Chicago, Ill.
Mann, Henry Inc., Huntingdon Valley, Pa.
National Camera Inc., Englewood, Colo.
D O. K. Machine & Tool Corp., Bronx, N.Y.
D Teledyne Kinetics, Solana Beach, Cal.
Universal Security Instrs., Baltimore, Md.
Western Elctn. Prods. Co., San Clemente, Cal.
D Workman Electronic Prods., Sarasota, Fla.
D Xcelite, Orchard Park, N.Y.

Wire Strippers, Thermal

M Ad-Vance Magnetics, Rochester, Ind. *
Jonard Industries Corp., Tuckahoe, N.Y. *

Acesso-Wire, Garnersville, N.Y.
 D American Elec. Heater, Detroit, Mich.
 D Eraser Co., Syracuse, N.Y.
 D Ideal Industries Inc., Sycamore, Ill.
 Mann, Henry Inc., Huntingdon Valley, Pa.
 Pioneer Magnetics, Santa Monica, Cal.
 Western Elctn. Prods. Co., San Clemente, Cal.

Wire, Test Lead

D Alpha Wire Corp., Elizabeth, N.J. p. 2-1861
 D Belden Corp., Richmond, Ind. ... p. 2-1882-1909
 Columbia Elctn. Cables, New Bedford, Mass.

DM Consolidated Wire & Assoc. Corps., Chicago, Ill. ... p. 2-1911
 p. 2-1963

DM Daburn Electronics & Cable Corp., Bronx, N.Y. ... p. 2-1983

D Dearborn Wire & Cable Co., Rosemont, Ill. ... p. 2-1993

D Smith Inc., Herman H., Brooklyn, N.Y. ... p. 2-835,836,879

Victor Wire & Cable Corp., Los Angeles, Cal. ... p. 2-2066

Jonard Industries Corp., Tuckahoe, N.Y. *

National Wire & Cable Corp., Los Angeles, Cal. ... *

Standard Wire & Cable Co., Los Angeles, Cal. ... *

M Aircraft & Elex Spclty, Plainfield, Ind

D Birnbach Co., Freeport, N.Y.

D Custom Cable Co., Oceanside, N.Y.

D Essex International, Sycamore, Ill.

M Judd Wire Div., Burlington, Mass.

D Manhattan Elec. Cable Corp., Rye, N.Y.

Mil Spec Wire & Cable Corp., Freeport, N.Y.

D Pace Wire & Cable Corp., Oceanside, N.Y.

D Rye Inds., Mamaroneck, N.Y.

Saxton Prods., Congers, N.Y.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

Wire, TFE Insulated

DM Alpha Wire Corp., Elizabeth, N.J. p. 2-1858

Belden Corp., Richmond, Ind. ... p. 2-1882-1909

DM Cimco Wire & Cable, Allendale, N.J. ... p. 2-1910,2023

DM Consolidated Wire & Assoc. Corps., Chicago, Ill. ... p. 2-1935,1936

DM Daburn Electronics & Cable Corp., Bronx, N.Y. ... p. 2-1980,1981,1984

DM Dearborn Wire & Cable Co., Rosemont, Ill. ... p. 2-1993

DM Markel, L. Frank & Sons, Norristown, Pa. ... p. 2-2024,2025

D Victor Wire & Cable Corp., Los Angeles, Cal. ... p. 2-2066

M Woven Elctns., Mauldin, S. C. ... p. 2-2068-2071

National Wire & Cable Corp., Los Angeles, Cal. ... *

Standard Wire & Cable Co., Los Angeles, Cal. ... *

The Anaconda Co., Greenwich, Conn.

M Arco Wire & Cable, N. Hollywood, Cal.

Astro Products Co., S. Burlington, Vt.

Boston Insulated Wire & Cable Co., Dorchester, Mass.

Cerro Wire & Cable Co., New Haven, Conn.

M Chemplast, Wayne, N.J.

D Custom Cable Co., Oceanside, N.Y.

Gordon, Claud S. Co., Richmond, Ill.

D Manhattan Elec. Cable Corp., Rye, N.Y.

Mil Spec Wire & Cable Corp., Freeport, N.Y.

M Phoenix Wire, S. Hero, Vt.

M Storm Products Co., Inglewood, Ca.

DM Thermax Wire Corp., Flushing, N.Y.

Wire, Thermocouple

Omega Engrg., Stamford, Conn.

p. 1-2324-2327

D Amperex Electronic Corp., Hicksville, N.Y. *

DM Daburn Electronics & Cable Corp., Bronx, N.Y. ... *

Standard Wire & Cable Co., Los Angeles, Cal. ... *

D Victor Wire & Cable Corp., Los Angeles, Cal. ... *

D Alnor Instrument Co., Niles, Ill.

The Anaconda Co., Greenwich, Conn.

M Arco Wire & Cable, N. Hollywood, Cal.

M ARI Inds., Franklin Pk., Ill.

Barber-Colman Co., Rockford, Ill.

Boston Insulated Wire & Cable Co., Dorchester, Mass.

Bram Metallurgical-Chem. Co., Phila., Pa.

CCS Hatfield Wire & Cable Group, Cranford, N.J.

Cerro Wire & Cable Co., New Haven, Conn.

D Custom Cable Co., Oceanside, N.Y.

Degussa Inc., New York, N.Y.

Engelhard Minerals & Chem., Murray Hill, N.J.

General Elec., Bridgeport, Conn.

George Instrument Co., Royal Oak, Mich.

Gordon, Claud S. Co., Richmond, Ill.

GTE Sylvania Inc., Newark, N.J.

Gulton Inds., Buena Park, Cal.

Honeywell, Ft. Washington, Pa.

Hoskins Mfg. Co., Detroit, Mich.

Leeds & Northrup Co., North Wales, Pa.

Leico Inds., New York, N.Y.

Marlin Manufacturing Corp., Cleveland, Ohio

Mil Spec Wire & Cable Corp., Freeport, N.Y.

Molecu-Wire Corp., Farmingdale, N.J.

Templine, Gardena, Cal.

D Thermax Wire Corp., Flushing, N.Y.

Thermo Elec. Co., Saddle Brook, N.J.

TRW/Holyoke Wire & Cable, South Hadley, Mass.

Wire, Transmission—See Cable, Transmission Line**Wire, Twisted Pair—See Cable, Twisted Pair****Wire Twisters, Automatic—See Volume 1****Wire Twisters, Hand Operated**

Jonard Industries Corp., Tuckahoe, N.Y. *

Adtool Corp., Montreal W P Q, Can.

Janel, Stirling, N.J.

M MacDonald & Co., Glendale, Calif.

Mann, Henry Inc., Huntingdon Valley, Pa.

National Camera Inc., Englewood, Colo.

Rutherford Research Prods. Co., Rutherford, N.J.

Snap-On-Tools, Kenosha, Wisc.

D Storm Products Co., Inglewood, Ca.

D Techni-Tool, Plymouth Meeting, Pa.

Wiring Panels & Boards, Computer—See Boards, Programming**Work Positioners, Circuit Board & Chassis—See Volume 1****Wrenches**

D Channellock, Meadville, Pa. p. 2-1693

D Jonard Industries Corp., Tuckahoe, N.Y. ... p. 2-1708

D Vaco Products Co., Chicago, Ill. p. 2-1715

Gardner-Denver, Grand Haven, Mich. *

Tec, Tucson, Ariz. *

D Adtool Corp., Montreal W P Q, Can.

DM Allen Mfg. Co., Hartford, Conn.

Communications Technology Corp., Los Angeles, Cal.

Emporium Specialties Co., Austin, Pa.

D Erikson Specialized Tool Co., Pico-Rivera, Cal.

ITT Holub Industries, Sycamore, Ill.

Janel, Stirling, N.J.

Jensen Tools & Alloys, Phoenix, Ariz.

M Kaweck Beryco Inds., New York, NY

D Klein, Mathias & Sons, Chicago, Ill.

M MacDonald & Co., Glendale, Calif.

Mann, Henry Inc., Huntingdon Valley, Pa.

D Hunter Tools, El Monte, Calif

D Moody Tools, Providence, R.I.

Neuses, P.K., Rolling Meadows, Ill.

Owatonna Tool Co., Owatonna, Minn.

D Raymond Engrg. Inc., Middletown, Conn.

Snap-On-Tools, Kenosha, Wisc.

D Techni-Tool, Plymouth Meeting, Pa.

D Thomas & Betts Co., Elizabeth, N.J.

D Vigor Co., New York, N.Y.

D Xcelite, Orchard Park, N.Y.

X-Ray Inspection Equipment—See Volume 1**X-Y Axis Tables—See Volume 1****Yokes, Deflection, Oscilloscope**

CELCO, Mahwah, N.J. p. 1-631

Syntronic Instruments Inc., Addison, Ill. ... p. 2-424-429

Triad-Utrad, Huntington, Ind. ... p. 2-1822-1829

Intronics Inc., Newton, Mass.

Sanders Data Systems, Nashua, N.H.

Stackpole Carbon Co., St. Mary's, Pa.

DM Thordarson Meissner, Mt. Carmel, Ill.

Yokes, Deflection, Radar PPI

CELCO, Mahwah, N.J. p. 1-631

Syntronic Instruments Inc., Addison, Ill. ... p. 2-424-429

Intronics Inc., Newton, Mass.

Stackpole Carbon Co., St. Mary's, Pa.

Yokes, Deflection, Cathode-Ray Tube

D Amperex Electronic Corp., Slatersville, R.I. ... p. 1-2350,2351

CELCO, Mahwah, N.J. p. 1-631

Syntronic Instruments Inc., Addison, Ill. ... p. 2-424-429

D Triad-Utrad, Huntington, Ind. ... p. 2-1822-1829

Amperex Electronic Corp., Slatersville, R.I.

DM Cleveland Electronics, Cleveland, Ohio

Ferranti Elec., Plainview, N.Y.

General Instr. Corp., Chicopee, Mass.

GTE Sylvania Inc., Waltham, Mass.

Intronics Inc., Newton, Mass.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Stackpole Carbon Co., St. Mary's, Pa.

D Thordarson Meissner, Mt. Carmel, Ill.

Yokes, Deflection, TV Camera

D Amperex Electronic Corp., Slatersville, R.I. ... p. 1-2350,2351

CELCO, Mahwah, N.J. p. 1-631

Syntronic Instruments Inc., Addison, Ill. ... p. 2-424-429

DM Cleveland Electronics, Cleveland, Ohio

Intronics Inc., Newton, Mass.

Panasonic, Ind'l. Elctn. Comps., New York, N.Y.

Stackpole Carbon Co., St. Mary's, Pa.

Teltron, Pottstown, Pa.

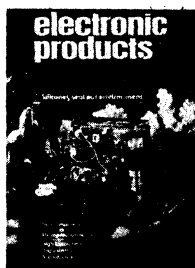
Zone Boxes, Thermocouple—See Volume 1

Last Page of this Section.
Trade Mark Directory starts on Page 301.

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

**Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530**



electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.

4 ways IC Update Master can solve the problem of device selection.

Smaller companies often offer special performance devices. How would you find a company making a device you need?

Go to the Master. Section 2 is a product guide to the entire IC industry. It allows you to survey all devices, their key operational characteristics, and the companies who supply each one.

You want to call for information on TI's MOS memories . . . What city would you call for information.

Go to the Master. Section 7 is a comprehensive telephone directory of the entire IC Industry. Page 7-37 lists Texas Instruments and the extension number for product information on MOS. It also contains a phone listing for TI sales offices and distributors throughout the country.

Motorola makes an MCM 4004 device . . . where would you look to find an alternate source for an MCM 4004?

Go to the Master. Section 3 is an industry wide cross reference. It contains over 14,000 cross references. Page 3-20 lists five other companies and their part numbers for pin-for-pin replacements of an MCM 4004.

Got a design problem . . . could an application note help?

Go to the Master. Section 5 is a comprehensive guide to the many IC application notes available. It lists the devices covered, describes each note and tells who publishes each one.

You can get a
copy of
the Master
for only \$30

There are literally hundreds of other problems the Master can help you solve. It is a totally new concept and should revolutionize the cataloging of IC data . . . it will make your job of device selection easier than ever before possible.

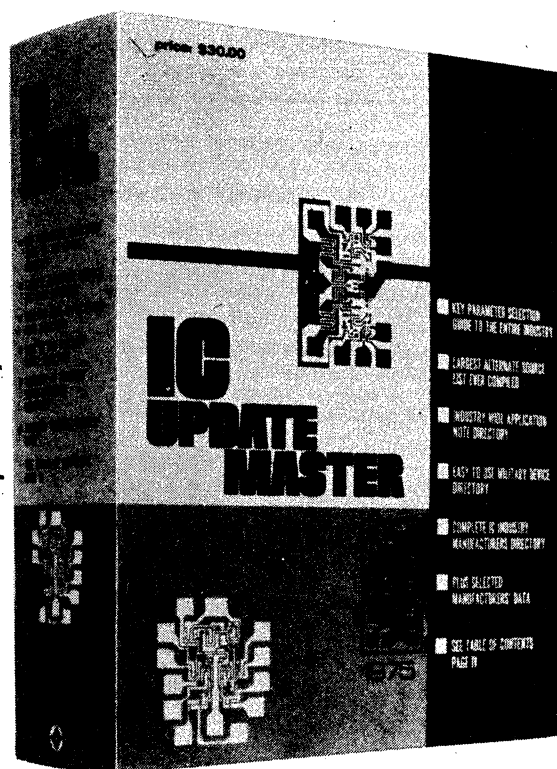
When you get IC Update Master you'll wonder how you've gotten along without it. Send check or money order for \$30 to:

Patti Foley
United Technical Publications
645 Stewart Ave., Garden City, N.Y. 11530

Money Back Guarantee if not 100% fully satisfied return for complete refund.



UNITED TECHNICAL PUBLICATIONS, INC.
DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530
(516) 248-9700



Over 2000 pages of help.

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

18TH EDITION

EEM 75/76

TRADEMARK DIRECTORY

The trade marks listed here were supplied by more than 2,500 manufacturers of electronic products whose product listings appear in EEM. For addresses, telephone numbers and personnel to contact for information on pricing, applications and customer service, refer to the Manufacturers and Sales Offices Directory in the yellow pages.

ABACUS - probes-test stations - Alessi Industries
Ablataflux R - Heat Flux sensor - Hy-Cal Engineering
Absafil - fiberglass reinforced ABS - Fiberfil Div. Dart Ind.
Abscon R - ABS materials - Goodrich Chem. Co., B.F.
Absorbo Mop - sponge mop - Clean Room Prods.
Absorbo-Wipe - urethane foam wiper - Clean Room Prods.
Accelarex - high speed gold process. - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Accelograph - planar accelerometer, visual direct recording - Humphrey, Inc.
ACCESS Process - decapsulation process - Amphenol Connector Div., SAMS Opers.
Access (Std) - control and monitor - Digitech Data Inds., Inc.
ACCESS 100 - selective decapsulation process - Amphenol Cadre Div.
Accopeac - gasket materials - Armstrong Cork Co.
Accrelime - a solid state indicating temperature controller - Barber-Colman Co.
Accuchart - chart paper - Gould, Inc.
Accu-Coat - screen printer - Aremco Prods., Inc.
Accucom - automatic data error corrector - International Data Sciences
Accu-Cut - substrate cut-off machine - Aremco Prods., Inc.
Accudata - signal conditioning - Honeywell, Inc.
Accu-Drill - ceramic drilling mach. - Aremco Prods., Inc.
Accudrive - dual speed drive - Bowmar/ALI, Inc.
Accufilm - drafting film - Bishop Graphics
ACCUFLEX - timers counters - Eagle Signal
Accu-Flo - metering pump - Beckman Instrs., (AISSD)
Acculine - automatic rotary dip soldering system - Hollis Engrg., Inc.
Acculock - recorders, magnetic tape - Emerson, Industrial Controls Div.
Acculog - recorders, magnetic tape - Emerson, Industrial Controls Div.
ACC-U-LOK - electronic line shaft system - Control Systems Research, Inc.
Accumet - solid state controller - Hotpack Corp.
Accumode - signal conditioner - Endevco
Accupower - power supplies-uninterruptible - Emerson, Industrial Controls Div.
Accuprint - drafting vellum - Bishop Graphics
Accuride - ball bearing slides - Accuride

Accuspede - controls-motor control - Emerson, Industrial Controls Div.
Accu-Stat - Controls - Allis-Chalmers
Accu-Strates - substrates .050" with a 2m" B/S - Accumet Engineering Corp.
Accutrim - trimming potentiometers - Vishay Resistive Systems Grp.
Accutron - timers and clocks - Bulova Watch Co.
Acc - electronic testing devices - Communications Technology Corp.
Acc - lock - Chicago Lock Co.
ACL - Pyro-processing system - Allis-Chalmers
Acoustalloy - diaphragm - Electro-Voice, Inc.
Acousta-Master - amplifiers & sound sys - Bogen Div.
Acousta-Voicing - sound equalization process - Altec Div.
Acoustifoam - windscreen material - Electro-Voice, Inc.
Acro-dial - 50 no. repertory telephone dialer - Acron Corp.
Acro-larm - emergency telephone dialer - Acron Corp.
Acro-probe - logic probe - Acron Corp.
Acrylafil - fiberglass reinforced styrene-acrylonitrile - Fiberfil Div. Dart Ind.
Acrylweld - 2-part acrylic adhesive - Hardman Inc.
Act/Ion - ion-sensitive electrodes - Corning Glass Works
Actionator - heavy duty industrial motors - Honeywell
Acto - automatic frequency measuring system - Systron-Donner Corp.
Acts - automatic continuity test system - Data Numerics
Acuflex - acupuncture equip. - Jaesic Industries Co.
AD - vibratory feeders - Automation Devices, Inc.
AD - placement units - Automation Devices, Inc.
Adam - modular bread boarding system - E & L Instruments, Inc.
Adapt-a-Switch - Non Lighted & Lighted Pushbutton Switches - Arrow-Hart, Inc.
"Adapt-O-Mount" - motor base adapter - Overly-Hautz Co.
Adapts - analog/digital processing and test system - Varian Data Machines
Adapts - data acquisition & system control - Varian Data Machines
Adas - airborne recorders - Lockheed Aircraft Svc.
ADD-A-TRACK - tape recorders - V-M Corporation
Adjust-a-box - adjustable box wrench - Hunter Tools
Adjustohm - adjustable wire-wound resistors - Ward Leonard Elec. Co. Inc.

Adjusto-Switch - rotary switch - Airflyte Elctns. Co.
Adjusto Torq - clutches & brakes - General-Electro Mechanical
ADLAKE - Solid State Devices - Adams & Westlake Co.
ADLAKE - Dry Reed Relays - Adams & Westlake Co.
ADLAKE - Mercury Plunger Relays - Adams & Westlake Co.
ADLAKE - Mercury Wetted Relays - Adams & Westlake Co.
AD-MU-00 - magnetic shielding alloy - Ad-Vance Magnetics
AD-MU-78 - magnetic shielding alloy - Ad-Vance Magnetics
AD-MU-80 - magnetic shielding alloy - Ad-Vance Magnetics
Adpac&T - industrial 12 bit A/D converter - Analogic Corp.
Adventurer - tool boxes - Vichek Plastics Co.
AEI - Semiconductors - Calvert Elctns., Inc.
Aelectra - electronic teaching equipment audio visual equipment - Ashman Industries (1968) Ltd.
AERO - frequency meters, elapsed time indicators - Arnoux Corp.
AerOblox - heater, cable - ARI Inds., Inc.
AerOcoax - heater, cable - ARI Inds., Inc.
AerOdet - resistance thermometer - ARI Inds., Inc.
AerOgard - thermowell - ARI Inds., Inc.
Aerograph - gas chromatographs, liquid chromatographs - Varian Assocs.
Aerolite - components - Aerolite Elcxs Corp.
Aeron - air pollution test equipment - GCA/Precision Scientific
"Aeronautic Bearings" - ball bearings - Raway Bearing Corp.
AerOpad - thermocouples - ARI Inds., Inc.
AerOpak - thermocouple wire - ARI Inds., Inc.
AerOrod - heaters - ARI Inds., Inc.
AerOseal - moisture barrier - ARI Inds., Inc.
Aerotorch - butane torches - Wall-Lenk Mfg. Co.
AE-16 Rosin - activated rosin core solder - Bow Solder Products
AE-21 Nochar - activator rosin core solder - Bow Solder Products
Agamp - automatic gain adjusting amplifier - GTE Lenkurt Inc.
Agastat - timing devices, programmers - Control Products Div.
Agaswitch - time delay switches - Control Products Div.

Agnicon - silver-nickel contact material - GTE Sylvania Inc.
Agnostick - silver-cadmium oxide contact material - GTE Sylvania Inc.
AIM DAC - I.C. D/A converter - Precision Monolithics Inc.
AIMSERT - inserts - Aimsco Inc.
Aire-Regulator - temperature humidity chamber - Atlas Electric Devices
AIRFLEX - Clutches & Brakes - Eaton Corp.
AIROTOR - blower wheel - Torin Corp.
Air Pal - compact 2,3,4-way valves - Airmatic/Beckett-Harcum
AIRPAX "parkmeter" - Panel & edge-reading meters - Airpax Elctns.
Air-Quenching - Clinker cooler - Allis-Chalmers
AirSet - Roller mills - Allis-Chalmers
Ajaxomatic - automatic metal pouring - Ajax Magnethermic Corp.
Akrobin - plastic storage bin - Akro-Mils, Inc.
Alautronex - gold alloy plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Alchrome - heating element alloy - GTE Sylvania Inc.
ALCOJET - powder machine detergent - Alconox Inc.
ALCOKNOB - PANEL & CONTROL KNOBS - ALCO Electronic Prods., Inc.
ALCOLITE - MINIATURE LAMPS & LIGHTS - ALCO Electronic Prods., Inc.
ALCONOX - powder manual detergent - Alconox Inc.
ALCOSTRIP - CERAMIC STRIPS - ALCO Electronic Prods., Inc.
ALCOSWITCH - MINIATURE SWITCHES - ALCO Electronic Prods., Inc.
Alert - emergency locator transmitter - Pacific Communications
Alfred - Microwave Test Equipment - Singer Co.
Align-O-Pot - special shaft feature - Bourns, Inc.
Alinabal - rod ends & spherical bearings - MPB Corp.
Alkanex - polyester resin wire enamel varnish - General Elec.
Allacast Sys. - epoxy potting & encapsulating - Packaged Resins Div.
Allacast System - epoxy potting & encapsulating - Allacast Prods Div.
Allen-Head - hex socket screws - Allen Mfg. Co.
Allis-Chalmers - All goods - Allis-Chalmers
Alloy Rods - welding wire & electrodes - Chemetron Corp.
All Power - vehicle power converter - Techsonics
Allros - non-activated rosin flux - Alpha Metals, Inc.
All-State - brazing & soldering alloys - Chemetron Corp.
All-Talk - Telephones - Fanon/Courier Corp., Subs.
ALMA - Integrated Circuit Testers - Develco
Alnico 5 Cb - permanent magnet grade - Thomas & Skinner, Inc.
Alnico 9 Nb - permanent magnet grade - Thomas & Skinner, Inc.
ALPA - cameras, lenses, filters, programmer/timer - Heitz, Inc., Karl
ALPAC - ALUMINUM PACKAGE BRIDGE - Semtech Corp.
ALPAC JR. - ALUMINUM PACKAGE BRIDGE - Semtech Corp.
ALPAC SR. - ALUMINUM PACKAGE BRIDGE - Semtech Corp.
ALPAC "T" - 10 AMP FULL WAVE BRIDGE - Semtech Corp.
ALPAC 3 JR. - 5 AMP 3 PHASE BRIDGE - Semtech Corp.
ALPAC 3T - 10 AMP 3 PHASE BRIDGE - Semtech Corp.
ALPAC 50 - 50 AMP FULL WAVE BRIDGE, ROUND - Semtech Corp.
ALPAC 50-R - RECTANGULAR FULL WAVE BRIDGE - Semtech Corp.
Alpha - floated rate integrated gyros - Singer Co.
ALPHALINE - 2 wire temp. & pressure transmitters - Rosemount Inc.
Alpha-Lite - alpha-numeric readout - Refac Elctns./Pinlites
Alpha Max - D-C Servo Motor - I M C Magnetics
Alpha Tone - tone encoders, decoders - Alpha Electronic Services
Alphatron - vacuum gauge - Varian Assocs.
AISIbase - Multilayer Substrates & Multi-chip pkgs. - American Lava Corp.
AISIcoat - Ceramic Coatings - American Lava Corp.
AISIPak - Ceramic packages & Chip Carriers - American Lava Corp.
Altecom - intercommunications - Altec Div.
Alt-Coder - altitude measurement & readout system - Kollsman Instr. Co.
Alt-Lertar - altitude alerting device - Kollsman Instr. Co.
Alugard - lightning arresters - General Elec. Co.
Alumalytic - capacitors - General Elec. Co.
ALUMA-TRAK - Aluminum Chassis Slides - Zero Mfg. Co.
ALUMEL - thermocouple alloy - Hoskins Mfg. Co.
Alumifoam - foam dielectric - Times Wire & Cable

Aluminax - aluminum shielded coaxial cables - Saxton Prods.
Aluminex - speaker voice coil form - CTS of Paducah, Inc.
Aluminex - speaker bobbins and speakers - CTS Corp.
Alumisol - solid dielectric - Times Wire & Cable
Alumispline - spline dielectric - Times Wire & Cable
ALUMOWELD - Rod, wire and strand - Copperweld Bimetallics
Alumtap - cutting fluid - Brooks Co. Inc., Winfield
AMBICON - automatic level control - Fairchild Sound Equip.
Ambi-Stat - ambient temperature controllers - Honeywell
Ambitrol - constant voltage/current supply - Power Designs, Inc.
Ambroid - liquid cement - Ambroid Co.
American - liquid meters - Singer Co.
American - gas meters, calorimeters and flow meters - Singer Co.
American Beauty - soldering irons, supplies, ultrasonic cleaners - American Elec. Heater
Amerail Fused Silica - opaque fused silica - Amersil, Inc.
Amflex - coaxial cable - Amphenol RF Div.
Aminco-Aire - environmental control source - American Instr. Co.
Amite - digital watches - American Microsystems, Inc.
AMLOC - dryer control - Pall Trinity Micro Corp.
Ampac&T - amplifiers (10V inverter, 10V follower, 10V differential - Analogic Corp.
Ampact - explosive cartridges - Amp Inc.
Amp-Blade - connector - Amp Inc.
Amp-Crimpac - flat packs header - Amp Inc.
Amp-Edge - connectors - Amp Inc.
Ampeex - connectors - Amp Inc.
Amp-Fine-Y-R - splice - Amp Inc.
Amp-Fit - tube fittings - Amp Inc.
Amplilume - indicator lights - Amp Inc.
Amp-In - connectors - Amp Inc.
Amp-Incert - connectors - Amp Inc.
Ampip - post-insulation pod - Amp Inc.
Amp Klip - semiconductor fuses - International Rectifier Corp.
Amplastic - plastic tubing - Amp Inc.
Amp-Leaf - connectors - Amp Inc.
Ampli-Bond - electrical splices & terminals - Amp Inc.
Amplibox - portable public address system - PASO Sound Products Inc.
Ampli-Cycle - power converter - Electric Machinery Mfg. Co.
Ampliducer - strainage transducer incorporating highlevel signal amplifier - West Coast Resch. Corp.
Amplifilm - dielectric material - Amp Inc.
Amplimica - capacitors - Amp Inc.
Ampli-Speed - magnetic drives - Electric Machinery Mfg. Co.
Amplite-End - closed-end splice - Amp Inc.
Ampliver - splices - Amp Inc.
Ampli-Vox - public address systems - Perma Power Div.
Amp-Lok - connectors - Amp Inc.
Ampradu - interconnection system - Amp Inc.
Amp-O-Lectric - electric machines - Amp Inc.
Ampomator - making machine - Amp Inc.
Amportapower - hydraulic tools - Amp Inc.
Ampower - splices & terminals - Amp Inc.
Amprobe - clamp-on volt/ammeters and strip chart recorders - Amprobe Instr.
Ampseal - connectors - Amp Inc.
Amp Shield - connectors - Amp Inc.
Amp-Sulation - heat shrinkable tubing - Amp Inc.
Amp-Tab - connectors - Amp Inc.
Amp-Tapematic - machines for tape-mounted terminals - Amp Inc.
Amp-Tapetronic - electric machine for applying tape-mounted terminals - Amp Inc.
Amp-Unyt - connectors - Amp Inc.
AMS 6002 - 1024-bit P-channel MOS RAM - Advanced Memory Sys., Inc.
AMS 6003 - 2048-bit P-channel MOS RAM - Advanced Memory Sys., Inc.
AMS 7001 - 1024-bit N-channel MOS RAM - Advanced Memory Sys., Inc.
AMS 7001 Storage Card - High-speed Read/Write Memory Card - Advanced Memory Sys., Inc.
Analogue - analog data logger - NES, Inc.
Analok - A/D conversion circuit - Analog Devices
Analytical Titr-Kit - redox and pH measurements - Analytical Measurements
Analyzer 2000 series - distortion analyzers - Digitech Data Inds., Inc.
Anniversary - copper tips, iron plated, nickel flashed - Wall-Lenk Mfg. Co.
Antex - solder irons - M M Newman Corp.
Antex - solder irons - Newman Corp., M. M.
"Anti-Static #79" - static eliminator - Merix Chem. Co.

"Anti-Static #79-OL" - static eliminator - Merix Chem. Co.
Anzac - active & passive components - Adams-Russell Co., Inc.
APC-N - precision 7mm connector - Amphenol RF Div.
APC-7 - precision 7mm connector - Amphenol RF Div.
APC-7S - precision 7mm connector - Amphenol RF Div.
Apex - metallic seals - Electrotechnics, Inc.
Apixxon - oils, greases, waxes - Biddle, James G.
Apilon - ceramic friction material - Delevan Div., American Prec. Inds.
Aqua-Clean - pc board water cleaner - Hollis Engrg., Inc.
Aquadeg - conductive/resistive coating - Acheson Colloids Co.
AQUA-SOL - Water soluble soldering fluxes - Kenco Alloy & Chemical Co., Inc.
AR - chemicals - Mallinckrodt, Inc.
Arcolectics - aluminum electrolytic capacitors - Arco Electronics Inc.
Arcom - mobile digital communication system - Atlantic Research Corporation
ARDA - tinning apparatus - Electrovert
Aremcobond - epoxy adhesives - Aremco Prods., Inc.
Aremcolox - machinable ceramics - Aremco Prods., Inc.
Aristocrat - spkr. sys. - Electro-Voice, Inc.
Arkmax - Columnar Alnico Permanent Magnets - Arnold Engineering Co.
ARM - connectors - American Microwave Inds., Inc.
Armaflex - foamed plastic insulation - Armstrong Cork Co.
Armalok - urethane foam insulation - Armstrong Cork Co.
Armco Nitronic 32 - non-magnetic stainless steel for skidwire & power applications - Armco Steel Corp.
Armco Nitronic 33 - low magnetic permeability stainless for riser & line pipe - Armco Steel Corp.
Armco Nonoriented Electrical Steels - silicon steels for core applications - Armco Steel Corp.
Armco Oriented Electrical Steels - silicon steels with grain orientation - Armco Steel Corp.
ARMM - micro miniature connectors - American Microwave Inds., Inc.
Armortite - direct burial non-metallic sheath - Okonite Co.
Arnox - Ceramic Permanent Magnets - Arnold Engineering Co.
Aro - resistance welding guns - portable - Falstrom Co.
Aron Alpha - adhesives - Vigor Co.
Arontite - sealants - Vigor Co.
ARSM - sub-miniature connectors - American Microwave Inds., Inc.
ARULAB - ultrasonic test equipment - Arenberg Ultrasonic Lab Inc.
Arval - equip. balancers - Falstrom Co.
A-Scope - interferometer - Varian Assocs.
ASTRO - encapsulated electronics - Astro Products Co.
ASTRO-AIRE - fans - Astro Dynamics
Astro-Brite 135 - color TV picture tube - Westinghouse Elec. Corp.
astro-cobra-flex - semi-rigid flexible cable - Astrolab, Inc.
Astrodome - photoelectric control - General Elec. Co.
ASTROFLO - flow generators and flowmeters - Astro Dynamics
Astrogide - p.c. card guides; guides circuit board - Bivar, Inc.
ASTROLIFT - general cargo lift & Dual parking lift - Astro Dynamics
Astroline - console model wave soldering sys. - Hollis Engrg., Inc.
Astrolite - Drake Mfg. Co.
Astroluk - universal coaxial connector - Astrolab, Inc.
Astroplate - tarnish free finish - Amphenol RF Div.
Astro Super Flex - coaxial cable (precision) - Astrolab, Inc.
Astro/348 - connector - Amphenol Connector Div.
Asymptotic R Calorimeter - Heat Flux sensor - Hy-Cal Engineering
Atlas - technicians service books - LMB Heeger, Inc.
Atom - aluminum electrolytic capacitors - Sprague Elec. Co.
Atom - fire detection system - Kidde, Walter & Co.
Atomiclad II - composite electrical contact rivets - GTE Sylvania Inc.
ATR - Applicable to all products - ATR Electronics, Inc.
ATS'960 - Automated Test System - Texas Instrs. Inc.
Attache Phone - phone in a briefcase - Livormore Data Systems, Inc.
Attenuator-Rated Ferramics - ferrites - Indiana General
Attenueduct - wave guide filter - Filtron Company, Inc.
Audimax - limiter - CBS Laboratories
Audio Baton - audio filter - Blonder-Tongue Labs., Inc.
Audio Hailer - S-168M - Audio Equip. Co., Inc.
AUDIOTEX - home entertainment accessories - GC Electronics
Audio-Verter - paper tape transmitter - Digitronics Corp.

Auric - gold plating solutions - Fidelity Chem. Prods. Corp.
Aurion-X - ion-exchange gold reclamation unit - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Aurobond - gold strike - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Autac - selective gold plating - Viking Inds., Inc.
AUTO-AMP - servo controls - Hills-McCanna Co.
Auto-Answer - automatic telephone answer - Bramco Controls Div.
Autobalance - automatic true rms AC/DC transfer standard - Ballantine Laboratories, Inc.
AUTO-BOOST - automatic low-line voltage booster - Microtran Co., Inc.
Auto-Bridge - automatic limit bridge - Beckman Instrs.
Autodata - data acquisition systems - Vidar Autodata Inc.
Auto-Draft - interactive graphics system - Auto Trol Corp.
Auto-Flow - mark II drafting machine - Keuffel & Esser Co.
AUTO-GAIN - automatic gain amplifier - Ithaco, Inc.
Autohet - automatic heterodyne converter - EIP, Incorporated
Autoline - automatic in-line pc board cleaner - Hollis Engrg., Inc.
Autoloader - system for automatically loading substrate into the sel-rx tf screen printer - Sel-Rex Co. Div. Oxy Metal Industries Corp.
AUTOLOC TM - Lock-in Amplifier - Keithley Instruments Inc.
Automac - press overload control - Cardinal Control Co.
Automagnetic - (magnetic processing system) - RFL Inds.
Automata - card reading equipment - Chatsworth Data Corp.
Automet - automatic weather reporting - E-Systems Inc.
Autometric - automatic resolution universal counter - Ballantine Laboratories, Inc.
Auto Mod - complete telemetry systems - Autocon Inds., Inc.
Autopin - continuous wire pinning machines - Autosplice/Dv Gen Staple
Autopolar - microwave polarization switch - Teledyne Micronetics
Autoprep - gas chromatograph - Varian Assocs.
Auto-Probe TM - Portable digital multimeter - Keithley Instruments Inc.
AutoRad - x-ray exposure control - Torr Labs.
Auto-Ranger - charge amplifiers - Uniholtz-Dickie Corp.
AUTOROTOR-HAM II - Rotor for Amateur Operators - Cornell-Dubilier Electronics
Autosal - lab salinometer - Guildline Instrs., Inc.
AutoScan - Automatic Test Equipment - Addison Div. Muirhead, Inc.
Auto-Snap® - flexible panel switching - Automation Displays Inc.
Autosplice - wire fed splicing equipment - Autosplice/Dv Gen Staple
Autosyn - instruments & systems of remote indications - The Bendix Corp.
Autotab - high production circuit board hardware - Autosplice/Dv Gen Staple
AUTOTAK® - Automatic tachometer indicator - Howell Inst. Inc.
Autotape - positioning system - Cubic Corp.
AUTOTEMP® - automatic temperature indicator - Howell Inst. Inc.
Auto-Ten - automatic attenuator - Fairchild Sound Equip.
AutoTrak - Automatic Test Equipment - Addison Div. Muirhead, Inc.
Autronax - acid type gold electroplating process for ind'l applications - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Avanti - fluorescent emergency lights - Teledyne Big Beam
AWAC - aluminum-aluminum power conductors - Copperweld Bimetals
Axial Flow - valves, regulators and control devices - Singer Co.
Aximax - fan - Rotron, Inc.
Axiolm - axial lead enamel resistors - Ward Leonard Elec. Co. Inc.
A4 - acoustic automatic answer attachment - M12 Data Systems Inc.

B

B - potentiometers - Bourns, Inc.
Bakelite - plastics products; vinyl, pe, etc. - Union Carbide, Chemicals & Plastics
Balco - resistance alloy - GTE Sylvania Inc.
BAL-CON - stacking connector - Eby Co., Hugh H. Baldwin - instruments - BLH Elctns., Inc.
Belladler - microphones - Conrac Corp.
Ballantine - AC voltmeters - Ballantine Laboratories, Inc.

Ball-Lok - quick release pins - Avibank Mfg. Inc.
Ball-Pak - Bearings for disc harrows - Allis-Chalmers
Banc-Lok - inserts - Cherry Rivet & Boots Nut Divs.
Band-o-Code - band marking of insulated wire - Storm Products Co.
BANDOMATIC - installation tooling - Burndy Corporation
Band-Scan - control system - Sequential Information Systems
Bantam - leak detector - Varian Assocs.
BANTAM - miniature round connectors - Burndy Corporation
Bentam Rota-Crimp - crimping tools - Amp Inc.
Ban the Blob - fluorescent ballasts - Jefferson Elec.
Barocel - pressure transducers - Datametrics Inc.
Barratron - transmitting tubes - Litton Inds.
Baseline - thermal relays - Warren G-V Communications
Bazooka - vacuum probes - Air-Vac Engrg. Co.
Bazooka - solder gobbler/iron - Air-Vac Engrg. Co.
BDT - non cyanide gold plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
BeaU - connector, barrier terminal strips - Vernitron Elec. Comps.
Beau-Tech Tools - soldering aids - Precision Elec. Co.
Becon - printed circuit connectors - Teledyne Kinetics
BEE Line - communication connectors - Hughes Aircraft Co., Connecting Devices
Beepites - Drake Mfg. Co.
Behman - ac power sources - Elin Div.
Beldfoil R - Aluminum/Polyester Shield Material - Belden Corp.
Belgard - burglar alarm - Aqualarm Inc.
Belloco Nameplates - plastic & metal identification plates - Bell Co., Inc.
BELLE KLIPSCH - loudspeaker system - Klipsch & Assocs. Inc.
"Bellowform" - printed circuit connector contact - Continental Connector Corp.
BELT-LINE - Teflon Transistor Sockets - U.S. Terminals
Bemac II - ac generators - Electric Machinery Mfg. Co.
Bemcoil - surface heat exchange material - Bemco, Inc.
Bemol - Lubricants, molybdenum disulfide - Rogers Corp.
Benavac Mark II - heterodyne processor - Delta-Benco-Cascade LTD.
Benchmark - bench top test chamber - Tenney Engrg., Inc.
Bench-Master Solderette - wavesoldering equip. - Electrovert
Berg - pliers - Erikson Specialized Tool Co.
BergCon - packaging system - Berg Electronics
BergFlo - plating process - Berg Electronics
BergLance - male pin - Berg Electronics
BergLok - modular interconnection system - Berg Electronics
Berggold - graduated gold plating - Berg Electronics
BergPac - reed relay terminal - Berg Electronics
BergPin - wire wrapping pins - Berg Electronics
BergPost - wire wrapping posts - Berg Electronics
BergStik - straight and right angle headers - Berg Electronics
Berlon - beryllium oxide epoxy resin materials - National Beryllia Corp.
Berlox - pure oxide ceramics, composite systems, ceramic-to-metal assemblies - National Beryllia Corp.
Berlox-strate - pure beryllia substrates - National Beryllia Corp.
Besponder - Tracking Radar Devices - Vega Precision Labs.
BEST - Automotive Speakers, Stereo Kits, & Access. - Oxford Speaker Co.
BET - RF power transistors - Motorola Semiconductor Prods.
Beta - precision CRT displays - Infodex, Inc.
Beveloid - conical involute gears - Invincible Gear Co.
Beyer - earphones, input transformers - Gotham Audio Corp.
Bicronite - epoxy coating process - Bicon Elctns. Co.
Bicon/Vollmer Gages - contact measuring instrument - Bicon Elctns. Co.
Bicon X-Ray Gage - non contact measuring instrument - Bicon Elctns. Co.
Bi-Film - resistance elements - Bourns, Inc.
Biflex - type of speaker - Altac Div.
Big Beam - emergency lights & hand lamps - Teledyne Big Beam
"Big-Bertha" - rotatable antenna support masts - Telrex Labs.
Big Inch - motors - Haydon Switch & Instr., Inc.
Big Look® - panel meters - General Electric Co.
BIMET - clad metals - Handy & Harman
Bimode - solid state diodes - Varian Assocs.
BIMODE - diodes - Varian Electron Tube & Device Grp.
Bimode Diodes - microwave multiplier diodes - Varian Solid State East Beverly Div.
BINA-DEC R - BCD converter - Industrial Elctn. Engrs.
BINAVERTER - Binary to Decimal Converter - Metric Systems Corp.

BINA-VIEW R - binary-input self-decoding readout - Industrial Elctn. Engrs.
Biode - silver/silver chloride electrode (af/agcl) - Biocom, Inc.
Biolink - telemetry systems - Biocom, Inc.
Bio-Solv - solubilizers - Beckman Instrs., (AISSD)
Bi-Pac - mechanical switch module - Controls Research Corp.
BIPAX - flexible package - Tra-Con, Inc.
Biplexer - 19.2 bps full-duplex modem - Codex Corp.
Biraco - tubing - Birnbach Co., Inc.
Bi-Scan - electrostatic printer/plotter - Varian Data Machines
Biscuit - blower - Rotron, Inc.
Bistable Amplifier - ultrasensitive solid state relay - Cross Electronics Inc.
BIT - miniature audio transformer - TRW/UTC Transformers
Bit Error 2000 series - rate test sets - Digitech Data Inds., Inc.
BITran - educational computer - Fabri-Tek, Inc.
B.I.T.S. - Backplane Integrated Test System - Addison Div. Muirhead, Inc.
BITSWITCH - PCB-mounted programming device - Stanford Applied Engineering
Black-Daylite - television receivers - General Elec. Co.
Black-Magic - Unified low cross talk Transmission Line flat cable - Ansley Elctns. Corp.
Black-Out - front panel for lighted readout - Info-Lite Corp.
Blendmaster - metering, mixing, dispensing machines - Hull Corp.
BLEND-OHM - screenable resistance paste - Methode Elctns., Inc.
Blendtrol - digital blending sys. - Foxboro Co.
BLI - instrumentation - Beukers Labs., Inc.
B-Line - potentiometers - Bourns, Inc.
Bloc-Lite - indicators-lighted - LVC Inds. Inc.
Blue Dot - precision coaxial connectors - Maury Microwave Corp.
Blue Dot - flashcubes - flashbulbs - magicubes - GTE Sylvania Inc.
Blue-Point - automotive hand tools - Snap-On-Tools
BLUE RIBBON - electrical connectors - Amphenol Ind'l Div.
Blue-Streak - Pre Homogenous flat cable - Ansley Elctns. Corp.
Blue Stuff - cleaner/lubricant - Tech Spray, Inc.
Blue Top - projector lamps - GTE Sylvania Inc.
Bogen-Call - paging sys - Bogen Div.
Bogen-Call Pagermaster - personal, selective paging - Lear Siegler, Inc.
Bogen-Phone - telephone-intercom sys - Bogen Div.
Bomb-Tail - closed-end splice - Amp Inc.
Bondalum - transit cases - Craig Sys. Corp.
Boomerang - sediment corer - Benthos, Inc.
Boots - nuts - Cherry Rivet & Boots Nut Divs.
BOPAC - microwave circuitry & components - Varian Assocs.
BOPAC - microwave circuitry components - Varian Electron Tube & Device Grp.
Bopac - microwave circuitry components - Varian Assocs.
Bord Pak - instrument cases & card guides & racks - Buckeye Stamping Co.
Bostrflex - high flexibility industrial cables - Boston Insulated Wire & Cable Co.
Bostrgard - high temperature soaking pit cables to 2100°F - Boston Insulated Wire & Cable Co.
Bostrad - fire & radiation resistant elec. cables - Boston Insulated Wire & Cable Co.
Bourns - potentiometers - Bourns, Inc.
Bouyoucos - soil moisture meas. inst. - Beckman Instrs.
Boxer - Airmovers - I M C Magnetics
BOXER - axial fans - IMC Magnetics Corp.
Boyd Bolt - self-retained bolts - Tridair Inds.
BR - relays - Babcock Electronics
Brandenburg - high voltage power supplies - Zi-Tech Div.
Bransonic - ultrasonic cleaner - Branson Cleaning Equip. Co.
Brazaloy - flux - Chemetron Corp.
BRILLO-LOCK - air filters, permanent aluminum - Evans George Corp.
Brimer - cathode raytubes - Inter-Tech. Grp., Inc.
BriteSorb - synthetic magnesium silicate - Philadelphia Quartz Co.
Broad-Band Rated Ferramics - ferrites - Indiana General
Brookamite - flowmeter - Brooks Instr. Div.
Brown Booster - high-surge voltage regulator - Micron Industries Corp.
Brush - name of recorder line - Gould, Inc.
Bubbittrol - pressure operated control - Autocon Inds., Inc.
Buchanan - terminal blocks, printed circuit board connectors - Control Products Div.

Buddybuzzer - dual alarm system - Tapeswitch Corp. Amer.
Bulk Metal - resistor and potentiometer elements - Vishay Resistive Systems Grp.
Bullet - sealing hub connector - Thomas & Betts Co.
Bullet Blade - Plows - Allis-Chalmers
Bullet-Nose - lugs - Sealectro Corp.
BULLS-EYE - subminiature circular connectors - Hughes Aircraft Co., Connecting Devices
BUSS - fuses & fuseholders - Bussmann Manufacturing
Butterfly - double-break switches - Licon Div.
Butterfly - double-break mechanism - Licon Div.

C

Cabinetro - motor control - General Elec. Co.
Cable Maker - terminals - Amp Inc.
Cablemaster - cable test equipment - Chatsworth Data Corp.
Cablemaster - cable & harness test equip. - Cablemaster Div.
Cablematic - wire stripping tools - Ripley Co., Inc.
Cable-Rap - plastic spiral wrap - Transcon Mfg. Co.
CADENCE - musical instrument speakers - Utah Electronic Div.
Cadis - computer aided design information sys. - Macrodata
Caeson 27 & 28 - solvent - solvent
Cage-Trol - induction-motor controls - Electric Machinery Mfg. Co.
CALECTRO - experimenter-hobbyist items - GC Electronics
Calfax - specialty fasteners - Tridair Inds.
Call-Brain - amplitude measuring system (scoper) - Dynascan Corp.
CALICO - monitor oscilloscopes - California Instrs. Co.
Caliper - thickness tester - Branson Cleaning Equip. Co.
CALORIMIXER - Gas Mixing Controls - Cutler-Hammer, Inc.
Calrod - heaters - General Elec. Co.
CAMBI-CARD - circuit boards - Cambridge Thermionic Corp.
CAMBION - electronic components & swagers - Cambridge Thermionic Corp.
Cam-Bolt - spring-lock shelf supports - Simmons Fastener Corp.
Camper - lanterns - Teledyne Big Beam
CAPABLE - computerized logic tester - Computer Automation, Inc.
Caplet - rivets-insulated - Pylon Co., Inc.
Capopad - combination transistor pad & cap - Bivar, Inc.
Caps - cannon authorized plug specialist - ITT Cannon Electric
Cap-Sure - component holders - Industrial Devices
Captain - lighting prods. - Union Carbide
Caravelle II - CB Rig - Fanon/Courier Corp., Subs.
Carbolube - carbon products - Carbone Lorraine Industries Corp.
Cardiline - microphone - Electro-Voice, Inc.
Cardopull - p.c. card ejectors - Bivar, Inc.
Carefree - rechargeable batteries - Eagle-Picher Inds.
CAROUSEL IV & IVA - Inertial navigation system - Delco Electronics Div.
Cartridge Lamps - Drake Mfg. Co.
CartriFile R - magnetic tape and disk systems - Tri-Data Corp.
Cartrol - industrial memory system - Pacific Technology
Cary - spectrophotometers - Varian Assocs.
CASCADE - die-cast coax speakers - Utah Electronic Div.
C-A-S-H - I.C. Packing Hardware - Standard Logic Inc.
CAST - Computerized auto. systems tester - PRD Elctns., Inc.
Catabond - copperclad laminates - NVF Co.
Catalog #100 - catalog - Workman Electronic Prods., Inc.
CAVEX - Speed Reducers - Eaton Corp.
CAVMATIC - ultrasonic generators - Phillips Mfg. Co.
C-B - coils - Caddell-Burns Mfg. Co., Inc.
CBE - compression bonded encapsulation - Westinghouse Elec. Corp.
CB-Mate - CB wattmeters - Bird Electronic Corp.
CC Enveloped by Q - used on all products - Coil-Craft Inc.
CC-4 - printed circuit board - Photocircuits Div., Kollmorgen Corp.
C-Dek - data entry devices - Mohawk OEM Sales
CDM - Terminal Blocks - Curtis Industries Inc.
CDP - p.a. horn - Electro-Voice, Inc.
CE-CON - card edge connector - Eby Co., Hugh H.
Calcor - ceramic substrates - Corning Glass Works
CELESTA - die-cast coax speakers - Utah Electronic Div.
Cell Mate - battery chargers - Seven Sciences, Inc.
Cell-O-Air - polyethylene dielectric - Superior Cable Div.
Cello-Flex - Electrical insulation - Allis-Chalmers
Celluline R - Tubular TV Lead-In Wire - Belden Corp.
CEM - coaxial magnetron - Varian Assocs.

Cem - coaxial magnetrons - Varian Assocs.
CEM - magnetrons - Varian Electron Tube & Device Grp.
Cemco - switches - Columbus Electric Mfg. Co.
Centaur - fan - Rotron, Inc.
Centigrd - low profile DPDT relay - Teledyne Relays
Centi-Loc - connector - ITT Cannon Electric
Centra-Gap - lamination shape - Thomas & Skinner, Inc.
Centricore - cores - Magnetic Metals Co.
Centrisafe - centrifugal accelerator (centrifuge) - Trio-Tech, Inc. of Calif.
Centrisort - automatic parts handler - Trio-Tech, Inc. of Calif.
Centri-Stak - Multi-stage compressors - Allis-Chalmers
Centrix - Grinding mills - Allis-Chalmers
Centura - wallplates, switches, outlets - Leviton Mfg. Co., Inc.
Centurion SSB Plus - SSB Transceiver - Fanon/Courier Corp., Subs.
Ceradot - cermet fixed resistor - CTS Corp.
Cerafil - Ceramic Capacitor - AVX Ceramics
Ceralam - Ceramic Capacitor - AVX Ceramics
Ceramabond - ceramic adhesive - Aremco Prods., Inc.
Ceramacast - castable ceramics - Aremco Prods., Inc.
Ceramacot - ceramic coatings - Aremco Prods., Inc.
Cerama-Dip - potting ceramic - Aremco Prods., Inc.
Cerama-Probe - measuring instr/coatings - Aremco Prods., Inc.
Cerameterm - terminal - Fansteel Inc.
Ceramicon - Ceramic capacitors - Erie Technological Products
Ceramo - thermocouple wire - Thermo Elec. Co., Inc.
Ceramacouple - thermocouple - Thermo Elec. Co., Inc.
CERAMOLITHIC - mfg. process - USCC/Centralab, Elec. Div.
CERAMOLITHIC - ceramic capacitors - Centralab
CeramVac Series - ceramic vacuum relays - Torr Labs.
Ceramvar - controlled expansion alloy - GTE Sylvania Inc.
Cerasetal - Ceramic Capacitor - AVX Ceramics
Ceratrims - cermet trimmers - CTS Corp.
CeraTrolS - cermet potentiometer - CTS Corp.
Cercor - heat exchangers - Corning Glass Works
Cerma-Cal - steel-housing, ceramic-base thyristor - Hutson Industries
Cermide - variable & fixed resistors (primarily high resistance) - CTS Corp.
Cermolox - ceramic/metal power tubes - RCA, Ind'l. Tube Div.
Cerocup - Ceramic Capacitor - AVX Ceramics
Cerol - Ceramic Capacitor - AVX Ceramics
Certacell - voltage reference - Codi Corporation
Certavolt - voltage ref. - Codi Corporation
Certi-Crimp - crimping tools - Amp Inc.
Certi-look - insertion tools - Amp Inc.
Certimesh - woven wire cloth - Pall Trinity Micro Corp.
Certi-Seal - splice - Amp Inc.
Challenger - amplifiers & sound sys - Bogen Div.
Challenger - Steel Electronic Cabinets (Medium Duty) - Equipto Enclosure Systems
ChA-MP - tool - Amp Inc.
"Champion" - adding-subtracting machines - Victor Comptometer Corp.
Channellite - piezoelectric ceramics - Channel Inds.
Channellight - room construction - Hotpack Corp.
Channelltron - electron multiplier (CEM) - Galileo Electro-Optics Corp.
Channelltron - electron multiplier array (CEMA) - Galileo Electro-Optics Corp.
Charaband - computer line printer - Dataproducts Corp.
Chase - nipples & couplings - Thomas & Betts Co.
CHASSIS-TRAK - Slides & Handles - General Devices Co., Inc.
Check-Lite - Pilot Light Push Button - Adalet Mfg. Co.
Chem-Blanks - photo-etching - Braun Co., Inc.
Chemcor - chemically strengthened glasses - Corning Glass Works
Chemcor - chemically strengthened glasses - Corning Glass Works, Television Prods. Div.
Chemfluor - products of teflon - Chemplast, Inc.
Chem K - high capacitance insulating material - Chem Aero, Inc.
Chemputer - circular chemical computer - Coleman Instr. Div.
Chemtron - reed relays - COSAR Corp.
Cherry - rivets - Cherry Rivet & Boots Nut Divs.
Cherry Lock - rivets - Cherry Rivet & Boots Nut Divs.
Chinealok - varnishes - Dolph, John C. Co.
Chip Stik - Calculator chip w/memory - Western Digital Corp.
ChipStrate&T - solderable chips on standardized substrates - Uniroute Corp.
Chlorothene Nu - chlorinated solvent - Dow Chemical Co.
Chlorothene VG - chlorinated solvent - Dow Chemical Co.
Cho-Nector - elastomer interconnector - Chomerics, Inc.
Cho-Seal - conductive elastomer RFI gasket - Chomerics, Inc.

Cho-Shrink - conductive heat shrinkable plastic - Chomerics, Inc.
Cho-Sil - conductive elastomer RFI gasket - Chomerics, Inc.
Cho-Therm - Electrically isolating, thermally conductive elastomer - Chomerics, Inc.
Chromafilter - filters for display readouts - Panelgraphic Corp.
Chromafuse - display light diffusers - Panelgraphic Corp.
Chromascreen - rear projection screen - Panelgraphic Corp.
Chromatrix - color tv picture tubes - GTE Sylvania Inc.
Chromatrix - color TV picture tubes - GTE Sylvania Inc.
Chroma 80 - video tape - Memorex Corp.
Chroma 90 - video tape - Memorex Corp.
CHROMEL - thermocouple & resistance alloys - Hoskins Mfg. Co.
Chronologger - electronic attendance reporting system - NES, Inc.
Chronos DTM - hand held digital test meter - Advanced Digital Research
Chronotrol - a indicating program controller - Barber-Colman Co.
Cimclad - copper clad laminate - Cincinnati Milacron
CIMRON - digital multimeters - California Instrs. Co.
Cimron - digital multimeters - Calico Div.
Circap - ceramic capacitors - Dilectron
Circa-Tin - immersion tin process - Conversion Chem. Corp.
Circle "B" - motors and timers - Bristol Saybrook Co.
Circuit-Deck - precision cermet switches - Beckman Instrs.
Circuitip - level tips for printed-circuit components - Amp Inc.
Circuitrim R - trimming potentiometer - TRW/IRC Potentiometers
CIRCUIT RYDER - infrared thermometer - Raytek, Inc.
Circuit Zaps - pc prototype material - Bishop Graphics
CIRKITBLOCK - buildingblock power module - Powercube Corp.
Circlip - plug-in circulator - Cir-Q-Tel, Inc.
CJ - cold junction reference source - Omega Engrg., Inc.
CLAREED - switching assemblies - Clare & Co., C.P.
Claspcon - .025" & .045" square wire to crimp terminal connector - Molex Inc.
Classette - tape recorders - Audiotronics
Classic - Motors & Gearmotors - Carter Motor Co.
Classic - cabinets - Par-Metal Prods. Div.
Classic - Intercoms - Fanon/Courier Corp., Subs.
Classic III - CB Rig - Fanon/Courier Corp., Subs.
Clean-N-Dri - detergent - Clean Room Prods.
CLEVELAND - Speed Variator - Eaton Corp.
CLEVELAND - Worm Gear Sets - Eaton Corp.
CLEVELAND - Speed Reducers - Eaton Corp.
CLF - fuses - General Elec. Co.
Climate-Lab - environmental chamber - American Instr. Co.
Clincher - ball valves - Jamesbury Corp.
Cliniflow - blood flowmeters - Carolina Medical Elctns., Inc.
Clip-AC - Line Voltage Regulator - Tele-Dynamics/Wanlass
Clorinol - A-C capacitors - Sprague Elec. Co.
CLR-2 - Base Antenna - Hy-Gain Electronics Corp.
CMC - directional couplers - Connecticut Microwave Corp.
CMC1200 - elevator control - Cubic Corp.
CMV Teflon - teflon parts - Dixon Corp.
Co/Air - switches & outlets - Leviton Mfg. Co., Inc.
Coaxiclamp - connectors & splices - Amp Inc.
Coaxicon - connector - Amp Inc.
"Coaxitube" - coaxial cable - Precision Tube
Coaxswitch - Coaxial Switches - Bird Electronic Corp.
Co-Belt - extremely rugged recorders - Genisco Tech. Corp.
Cobra - cb 2-way radios - Dynascan Corp.
Cobreflex - horn - University Sound
Codasyn - frequency synthesizer - Adret Corporation
Codistor I - low voltage regulators - Codi Corporation
Codistor II - high voltage silicon rectifiers - Codi Corporation
Coltite - wire-wrapping bits & sleeves - O. K. Machine & Tool Corp.
Collimor R - alignment meter - Materials Resch. Corp.
Color Bright 85 RE - color TV picture tubes - GTE Sylvania Inc.
Color Bright 85 RE - color tv picture tubes - GTE Sylvania Inc.
Color Bright 85 XR - color tv picture tubes - GTE Sylvania Inc.
Color Bright 85 XR - color TV picture tubes - GTE Sylvania Inc.
Color Cord - cord sets - Pacific Electric Cord Co.
Color-Keyed - connectors, tools & dies - Thomas & Betts Co.
Color/Matic - color analyser - Lektra Labs., Inc.

Color Screen 85 - color TV picture tubes - GTE Sylvania Inc.
Color Screen 85 - color tv picture tubes - GTE Sylvania Inc.
Colorvue - 50-220 MHz line of solid state CATV equip - AEL Communications Corp., Sub. of Amer. Elctn. Labs. Inc.
Combat - boron nitride - Carborundum Co.
COMPAC - MEDIUM CURRENT BRIDGE RECTIFIER, SILICON - Semtech Corp.
COMPAC Series Counters - Electrical and Mechanical Counters - ENM
Compactor - Pressure roll process for material agglomeration - Allis-Chalmers
Com-Pak - power supplies - Lambda Elctns.
Com-Pak Mark II - power supplies - Lambda Elctns.
Complimit - peak limiting amplifier - Spectra Sonics
COMPLIT - digital plotting systems - Houston Instrument
"Comptograph" - calculators - Victor Comptometer Corp.
Comp-U-Kit - electronic modules - Scientific Measurements
Computerminal - data terminal - Wyle Computer Prods., Inc.
Computroller - 3330 type disc controllers - Diva, Inc.
Comstac - graphic recording paper and film - Keuffel & Esser Co.
ComTran - educational computer - Fabri-Tek, Inc.
Conacure - hardeners (curing agents) for epoxies & polyurthanes - Conap, Inc.
Conapoxy - epoxy base resins & compounds - Conap, Inc.
Conathane - Polyurethane resins & systems - Conap, Inc.
Concentrik - put together replacement potentiometers (for concentric controls) - CTS Corp.
CONCO-FOAM - 300 ohm twin lead - Consolidated Wire & Assoc. Corps.
CONDOR - propeller fan - IMC Magnetics Corp.
Conducting Twenty/Twenty - conductive epoxy - Allaco Prods Div.
Conducting Twenty/Twenty - epoxy/conductive - Packaged Resins Div.
Condux - electrically conductive elastomers - Hardman Inc.
CO-NETIC - magnetic shielding material - Perfection Mica Co.
ConFlat - flanges - Varian Assocs.
Conflat - sealing flanges - Varian Assocs.
Confuzz - conductive tapes & closures - Technical Wire Products, Inc.
CONHEX - r.f. connector - Sealectro Corp.
CONITEL - digital data acquisition & supervisory system - Leeds & Northrup Co.
Conmax - conductive nickel/silicone - Technical Wire Products, Inc.
Connecto-Blok - wiring system - Thomas & Betts Co.
Conographics - graphic display terminal - Hughes Aircraft Co.
Conographics - graphic display terminal - Hughes Aircraft Co.
Conqueror II - CB Rig - Fanon/Courier Corp., Subs.
Conrad-Missimer Division - manufactures standard environmental test chambers and equipment - Bemco, Inc.
Consil - conductive silver/silicone - Technical Wire Products, Inc.
Consotrol - instruments - Foxboro Co.
CONtac - harness assembly - Barg Electronics
Contempo - console system - Par-Metal Prods. Div.
Controflex - flexible ribbon - Tapeswitch Corp. Amer.
Controfluxer - Regulator/Filter Device - Advanced Power Inc.
CONTROLPAC - control systems - Eagle Signal
CONTROL PLUS - temp controls, counting & timing controls - MKC Electronics
Converti-Fuse - panelboards, safety switches, switchboards - General Elec. Co.
Cool Glo - light tables - Bishop Graphics
Co-Ord - matrix boards - LVC Inds. Inc.
Copelum - terminals & splices - Amp Inc.
COPEL - resistance alloy - Hoskins Mfg. Co.
Coppergard - shielded coaxials - Superior Cable Div.
"Copperply" - lead wire (copper-coated) - Nat'l-Standard Co.
Copper Sweat - plumber, solder - Bow Solder Products
Copperweld - rod, wire and strand - Copperweld Bimetals
CopScan - FM Monitor Scanners - Fanon/Courier Corp., Subs.
Copyphone - facsimile transmission systems - Telfautograph Corp.
Cords Limited - cord sets - Essex International, Inc.
Corning - instruments, recorders - Corning Glass Works
Corning - fluidic products - Corning Glass Works, Fluidic Products

Corning - glass optical waveguides - Corning Glass Works, Television Prods. Div.
CORNWALL - loudspeaker system - Klipsch & Assocs. Inc.
Coronol - rubber insulated cable - General Elec.
Corngard - polyester film - Superior Cable Div.
COS/MOS - complementary symmetry metal-oxide-semiconductor - RCA Solid State Div.
Count Modules - printers - Practical Automation, Inc.
COUPLATE - thick film circuit - Centralab
Couploid - Face couplings - Invincible Gear Co.
Covap R - tungston filaments - Materials Resch. Corp.
COWECO - coil winding equipment - Coil Winding Equip. Co.
CPPC - synchros & servo motors - Clifton Precision
Cradle - telephone type relays - Gould Inc.
Cradleclip - wire cable harness - Electrovert
Craig - film editing equipment - Kalart Victor Corp.
Cramolin - contact cleaner - Caig Labs., Inc.
Cranegard - hookload indicators - Dillon, W.C. & Co.
Crescent - rings, retaining - Waldes Kohinoor, Inc.
Cris-Pic - TV image impressor - Kalart Victor Corp.
Criteria System - IC burnin systems - Reliability Inc.
CRL - electronic components - Centralab
CRL (within a diamond) - electronic components - Centralab
CRONUS - digital electronic stopwatch - Intersil, Inc.
Crop-Trol - temperature controllers - Honeywell
Crossfire - broadband antenna system - Channel Master Div. Avnet
CRT - corona resistant teflon cable - Daburn Electronics & Cable Corp.
CRT-PAC - CATHODE RAY TUBE SILICON HIGH VOLTAGE MULTIPLIER - Semtech Corp.
Cruiser - CB Rig - Fanon/Courier Corp., Subs.
Cryo-Pan - thermal shroud tubing - High Vacuum Equip. Corp.
CryoSource TM - Cryogenic Refrigerators - Sargent Welch Sci. Co.
Cryoterm - noise sources, cryogenic - Maury Microwave Corp.
Cryo-Tip - cryogenic cooling tip - Air Prods. & Chems., Inc.
Crystal-Cap R - polyester film capacitors - General Instr. Corp., Semiconductor Prods Grp.
Crystal Chronetic - motors - Haydon Switch & Instr., Inc.
Crystal Clear - optically clear epoxy adhesive - Allaco Prods Div.
Crystal-Clear - optically clear epoxy adhesive - Packaged Resins Div.
C-Scan - solid state keyboard - Controls Research Corp.
CTC-71 - energized rosin filled core solder - Alpha Metals, Inc.
Cubath - acid copper electroplating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
CUBE-PAC - module assembly package - Powercube Corp.
Cubic - computer tape - Memorex Corp.
Cubitape - Surveying tool - Cubic Corp.
Cubond - copper brazing paste - Gliddon Metals
CuClad - rigid microwave substrate material - 3M Company
CUE-SWITCH R - low-mass, slim-profile, image transparent switch - Industrial Elctn. Engrs.
Cuflex - flexible pointed circuit material - 3M Company
CUPAC - HIGH CURRENT STUD SILICON RECTIFIER - Semtech Corp.
Cupron - resistance alloy - GTE Sylvania Inc.
Cupronel - thermocouple alloy - GTE Sylvania Inc.
Cuprox - analytical reagent - Coleman Instr. Div.
Curristor - current sensing resistor - General Resistance, Inc.
Curtis Indechron - low cost elapsed time indicato - Curtis Instrs., Inc.
Curvaco - Transformers - Allis-Chalmers
Cushion Grip - Screwdrivers - Klein, Mathias & Sons, Inc.
Cusil - brazing alloys - Gte Sylvania, Inc.
Custom - Converters - Carter Motor Co.
Custom Vand VII - Pumps - Allis-Chalmers
CV-D - microphone - Electro-Voice, Inc.
C-W - coils - Caddell-Burns Mfg. Co., Inc.
Cycle Log - controller, programmable - Foxboro Co.
CYCL-FLEX - timers counters - Eagle Signal
Cyclohm - fans-blowers - Howard Industries
Cyclonair - blower - Rotron, Inc.
Cyclonome - Pulse Counters & Stepping Motors - Sigma Instruments, Inc.
CYCLOPTIC - Stereoscopic Microscope - American Optical Corp.
Cyclo-Rubber - cyclicized rubber materials - Hardman Inc.
C-21 - pressure sensitive individual wire seals - Hughes Aircraft Co., Connecting Devices

D

DAFAB - Polyester Monofilament fabric - Wire Cloth Enterprises, Inc.
Deflex - vinyl tubings - Daburn Electronics & Cable Corp.
Deflon - teflon tubings - Daburn Electronics & Cable Corp.
Deg - lubricant - Acheson Colloids Co.
Dage - coax connectors - Bendix
DAKA WARE - plastic knobs - Davies Molding Co., Harry
Dalic - selective electroplating - Sifco Metachemical
DAMS - dedicated analytical module system for single purpose spectro- or electro-chemical instrumentation - Bromberg Engineering
Danometer - digital voltmeter - Dana Labs., Inc.
Dan-L - Relay Socket - DAN-L Inc.
Danner - linear motion & rotary attenuators - Gotham Audio Corp.
Danyon - special formulation vinyl insulation on retractile cords - Daburn Electronics & Cable Corp.
Dapen - resin - FMC Corp.
Daprene - shrinkable neoprene tubing - Daburn Electronics & Cable Corp.
Datab - pressure-sensitive markers (computer printed) - Brady Co., W. H.
Datocal - Optoelectronic Relay - Sigma Instruments, Inc.
DATA CHECK 200H - cable & continuity tester - Data Numerics
DATA CHECK 200S - Cable & continuity tester - Data Numerics
Datacord - magnetic tape transport - American Videonetics Corp.
Datadraft - automated drafting system - Dimensional Systems, Inc.
Datafile - mass memory - Burroughs Corp.
DATA IV/70 - Key-to-disc Systems - Four-Phase Systems
Datakoat - spray coatings - Datak Corp.
Data Krome - optics system - Kollsman Instr. Co.
Data-Lit - numeric & alph numeric displays - Litronix
Datalite - ultra-miniature indicators - Dialight
Datamark - kits for marking elctn. equip. - Datak Corp.
DATA-MONITOR - annunciators - Tec, Inc.
Datanet - data communications equip. - Honeywell Information Systems
DATA PANEL - backlighted display systems - Tec, Inc.
DATAQUIRE - data acquisition systems - DataGraphics Corp.
Datarama - status display systems - Ferranti-Packard, Ltd. Elec. Div.
Data-Rite - contact - T-Bar Inc.
DATA-SCREEN - data display (crt) terminals - Tec, Inc.
DataScript - data input device for remote projection equipment - Kollsman Instr. Co.
Dataseeker - modem/comm. terminal interface test set - Dataprobe, Inc.
Datasette - digital magnetic tape cassette recorder/reader - Chalco Engrg. Corp.
Dataswitch - reed relay - Wheelock Signals
Datasyn - digital readout system - Data Technology Inc.
Data-Trak - analog programmer - Research, Inc.
Data Transcriber - data acq syst. - Baganoff Assocs., Inc.
Data-Verter - data acquisition, recording, & transmitting equip. - Digitronics Corp.
Data-Voices - voice operated identification computer entry system - Datawest Corp.
DATAWATCH - alarm monitors & signal transmitters - Matrix Instrument Co.
DATAxT - Data Acquisition Modules - Data Translation
DATOS - instrumentation interfaces - DataGraphics Corp.
Decap - cured epoxy remover - Dynaloy, Inc.
Decitek - Punched tape readers - Decitek
Decitrek - digital control sys. - Theta Instr. Corp.
Decohm - relays - open and hermetically sealed - Davis Elec. Co.
Decora - wallplates, switches outlets - Leviton Mfg. Co., Inc.
DEECEDUCER - Pressure-To-DC Converter - Solid State Electronics Corp.
Defectometer - ndt - eddy current equipment - Automation Inds.
Deflection - yokes - CELCO
Degrestil - vapor degrestil - Electrovert
DEI MOTOR GUARD - under voltage monitor - Diversified Electronics Inc.
DeKabox - decade resistors and capacitors - Electro Sci. Inds.
DeKadial - decade dials - Electro Sci. Inds.
DeKapacitor - decade capacitor - Electro Sci. Inds.
DeKapot - decade potentiometers - Electro Sci. Inds.
DeKastat - decade rheostat - Electro Sci. Inds.
DeKavider - decade voltage divider - Electro Sci. Inds.
Dektak - surface elevation measuring equip - Sloan Technology Corp.
DEL-CON - Digital Systems - Delco Electronics Div.

Delmica - capacitor - Del Electronics Corp.
Delphic II - data projectors - Kollsman Instr. Co.
Deltabeston - asbestos-insulated wires - General Elec.
Deltadyne - differential press, ind. switches & gages - Pall Corp.
Deltafilm - film capacitors - Dearborn Elctns. Div.
DELTA ALERT - Ultrasonic Burglar Alarm - Delta Products
Deltaply - fluorocarbon capacitors - Dearborn Elctns. Div.
Delta-T - digital audio time delay - Gotham Audio Corp.
DELTA-T - Semiconductor Cooling Products - Wakefield Engrg., Inc.
Delta-Tension - self-tensioning tape cartridge - Genisco Tech. Corp.
Deluxe Molded - Drake Mfg. Co.
Demod - demodulator - General Magnetics
Densichron R - Densitometers - Sargent Welch Sci. Co.
Densi-Lux - enlarging meter - Lektra Labs., Inc.
Densi-Meter - color analyzer - Lektra Labs., Inc.
Densi-Timer - automatic enlarging timer - Lektra Labs., Inc.
DENSITOCOLOR - controls, density - Heitz, Inc., Karl Dentroneix - pliers - Mann, Henry Inc.
Depend-a-Bond - solders - Alpha Metals, Inc.
DESCO - plug-in assemblies - Dietz Design, Inc.
Desicote - water-repellent coating compound - Beckman Instrs., (AISSD)
Designers - data sheets - Motorola Semiconductor Prods.
DESIGN III - Desktop CRT Display Terminal - Ann Arbor Terminals, Inc.
DeSolder Well - desoldering station - Hexacon Elec. Co.
De Solv - resin solvent - Ram Chems.
DETECT-A-FIRE - fire detectors - Fenwal, Inc.
DET-O-JET - liquid machine detergent - Alconox Inc.
Dewprobe - dewpoint sensors - Honeywell
D-I - differential ion pump - Perkin-Elmer Ultek Inc.
Diac - rms AC converters - Dana Labs., Inc.
Diactor - voltage regulator - General Elec. Co.
Diagraph - impedance plotter - Rhode & Schwarz Sis.
Dial-A-Gain - voltage amplifiers - Unholtz-Dickie Corp.
Dial-An-Amp - constant current adaptor - General Resistance, Inc.
Dial-An-Ohm - dialable resistance decade - General Resistance, Inc.
Dial-A-Source - dialable current source - General Resistance, Inc.
Dial-a-Temp - variable heat soldering station - Hexacon Elec. Co.
DialaTrol - temperature controllers - Honeywell
Dial-A-Vider - dialable voltage divider - General Resistance, Inc.
Dial-A-Volt - dialable voltage reference - General Resistance, Inc.
Dial & Coder - Automatic Telephone Dialer - Delta Products
Dial-Flo - oven air velocity control - Hotpack Corp.
Dial-O-Verter - data communication equip. - Digitronics Corp.
Diamfile - diamond contact cleaner - Jonard Industries Corp.
Diamond - impregnated wire - Laser Technology, Inc.
Diamond Grip - terminals & splices - Amp Inc.
DIB - dual in-line bridge - Varo Semiconductor, Inc.
Diekut Stik-Ons - drafting aids - Bishop Graphics
Die-Saver - fluidic die protection systems - Corning Glass Works, Fluidic Products
Diffaxial - speaker - University Sound
"Dif Filters" - dual in-line LC filters - ESC Elctns. Corp.
Diffraction Horn - tweeter - Electro-Voice, Inc.
Difilm - film dielectric capacitors - Sprague Elec. Co.
Digiac - digital computer trainers - Digiac Corp.
Digibezel - alpha-numeric display - NOBEX Div.
DigiBit - digital logic modules - Tech Serv., Inc.
Digicard - ic packaging - Digitronics Corp.
Digichek - digital logic analyzers - Applied Control Co.
Digicom - digital communication - E-Systems Inc.
Digicom - stepping commutator - General Devices, Inc.
DIGI CORDER - digital cassette terminal memory unit - Intern'l. Computer Prods., Inc.
Digicount - bi-directional counters and displays - Itek Corp. Meas. Sys. Div.
DIGI DECK - digital recording mag. tape deck - Intern'l. Computer Prods., Inc.
Digi Designer - circuit design aid - E & L Instruments, Inc.
Digidial - digital turns-counting dial - Beckman Instrs.
Digi-Drives - control systems - Sequential Information Systems
Digi-Klips - printed circuit connectors - Components Corp.
Digiline - linear measuring systems - Itek Corp. Meas. Sys. Div.
Digi-Lock - control system - Sequential Information Systems
Digilogger - digital data logger - NES, Inc.
Digi-Mark - electronic frequency counter - Chadwick-Helmuth Co., Inc.

DIGIMAX - digital data instrumentation - Leeds & Northrup Co.
Digimite - portable, digital potentiometer - Thermo Elec. Co., Inc.
Digiphase - digital frequency synthesizers - Dana Labs., Inc.
Digiplus - digital logic modules - Tech Serv., Inc.
Digi-Probe - pulse & logic detection & analysis - Automatic Production Systems Inc.
Digiscale - linear measuring system - Itek Corp. Meas. Sys. Div.
Digisec - optical shaft encoders - Itek Corp. Meas. Sys. Div.
Digi-Shaft - shaft/digital converter - Computer Conversions Corp.
DIGISWITCH - digital (thumbwheel) switches - Digitran Co.
DigiTec - Electronic Test and Measurement Equipment - United Systems
Digitamp - controller - Delta Design, Inc.
Digitest - digital multimeter - Schneider Electronics, Inc.
"Digit-Matic" - digital printers - Victor Comptometer Corp.
Digitrak - signal tracking device - Edo Western Corp.
Digitrend - multipoint digital recording system - Doric Sci. Corp.
Digi-Tronic - digital weight indicator - Howe Richardson Scale Co.
Digivac S/G - vacuum readout tube - Wagner Elec.
DIGIVUE R - Display/Memory unit. This is a gas discharge, plasma panel - Owens-Illinois, Inc.
Dilectron - ceramic capacitors - Dilectron
D I Line - double insulated line - UNGAR, Div.
DI-MESA - thyristor construction technique - Hutson Industries
Dimie - capacitors - Dearborn Elctns. Div.
DI-Min-Ode - 1.5 watt zener diode - General Semiconductor Industries, Inc.
Diode-Lite - led indicator lights - Dialight
Di Pak - dual-in-line packaging sys - Scanbe Canoga Industries
Dip Alarm - solid state audio indicator in dip package - Projects Unlimited, Inc.
DIP-BIT - filters - Cambridge Thermionic Corp.
D-I-P Delay Lines - digital delay module - Pulse Engrg., Inc.
Dip-Dry - drying systems - Allied Chemical Corp.
Dip Flash - solid state load pulser - Projects Unlimited, Inc.
Dip-Lite - digital readout with dual-in-line mounting - Refac Elctns./Pinlites
Dip-Pak - hot melt peelable plastic coating - Fidelity Chem. Prods. Corp.
Dipstik - high density packaging module - Stanford Applied Engrg., Inc.
DIPSTIK - DIP packaging system - Stanford Applied Engineering
Director - Intercoms - Fanon/Courier Corp., Subs.
Directorr R - Direct Drive Vacuum Pump - Sargent Welch Sci. Co.
Directron - selenium rectifiers - Sanford-Miller Corp.
Directweld - DC welded steel tubing - ITT-Higbie Mfg. Co.
Discaps - ceramic capacitors - Radio Materials Co.
Discohm - disc type power resistors - Ward Leonard Elec. Co. Inc.
Disc-R-Kap - resistor capacitor combination - Centralab
Displaducer - inertial angular displacement transducer - Larson Aero Dev.
Displex - cryogenic refrigerator - Air Prods. & Chems., Inc.
Dissopad - wash away spacers - Bivar, Inc.
DISTEC - displacement detecting instruments - Helm Instr. Co.
DI-T - inch - TRW/UTC Transformers
DMS - transient recorder - Zonic Technical Labs.
DNF1100 - noise filter - Burwen Lab. Inc.
DNF1201 - noise filter - Burwen Lab. Inc.
DNF1500 - noise filter - Burwen Lab. Inc.
Dodge - screw thread inserts for plastics - Heli-Coil Prods.
Dolflex - enamels & compounds - Dolph, John C. Co.
Dolphon - epoxy resin compounds, polyester resins - Dolph, John C. Co.
Dolphaseel - water repellent - Dolph, John C. Co.
Dolph-Spray - lacquer, enamel, varnish - Dolph, John C. Co.
Donner - inertial systems - Systron-Donner Inertial Div.
Doorbell - rectifier modules - Unirode Corp.
DOROIDAL - coils - Cambridge Thermionic Corp.
Do-T - uncoupled audio transformer - TRW/UTC Transformers
DOT MicroSTOR - domain tip memory - Cambridge Memories, Inc.
Double/Bubble - package for 2-part epoxies - Hardman Inc.
Double Diamond - glass thermometers and bi-metal thermometers - H-B Instr. Co.

Double-Seal - ball valves - Jamesbury Corp.
Double-Talk - phased mobile antennas - New-Tronics Corp.
Dow Key - coaxial relays & switches - Kilovac Corp.
d/p Cell - transmitter, electronic or pneum - Foxboro Co.
DRP - potting & encapsulating compounds - Hardman Inc.
Dragon - rubber and friction tape - Okonite Co.
Dri-Flo - orifice meters of the metallic bellows type for differential pressure measurement - Singer Co.
Dri-Lok - fluorescent ballasts - Jefferson Elec.
Dri-Mark - pressure sensitive transfers - Meyercord Co.
Dr: Wick - de soldering braid - American Elec. Heater
Dryatrol - pneumatic switching valve - Pall Trinity Micro Corp.
D&S2AMS - digital dedicated analytical module system - Bromberg Engineering
DTF - disciplined time/frequency standard model FE-1050A - Frequency Elctns.
DU - null-balance spectrophotometer - Beckman Instrs., (AISSD)
Dualatch - connectors - Amp Inc.
Dualay - self-supporting aerial cables - Okonite Co.
Dual-Cooled - Transformers - Allis-Chalmers
Dual Hi/Lo Filter - double high pass/low pass filter - Rockland Sys. Corp.
Dual-Lock - spring-lock shelf supports - Simmons Fastener Corp.
Dual-Scan - supervisory control system - GRM Corp.
Dual Source - power supply - Elasco
Dual-Trol - recycling timer - Industrial Timer Corp.
"Dub-L-Loc" - straps-grommets - Budwig Mfg. Co.
Ducter - ohmmeters - Biddle, James G.
Dumont - Electronic tubes - Duxtrux Inds., Inc.
Dunco - relays - Struthers-Dunn, Inc.
Duo-Clean - pc board degreaser - Hollis Engrg., Inc.
Duodial - turns-counting dial - Beckman Instrs.
Duofoil R - Aluminum/Polyester/Aluminum Shield - Belden Corp.
Duo-Seal R - Vacuum Pumps - Sargent Welch Sci. Co.
Duostat - power supply - Beckman Instrs., (AISSD)
Duotrol - pressure operated control - Autocon Inds., Inc.
Duo-Tyne - connector - Amp Inc.
Duo-volt - Outdoor Lighting Control - Sigma Instruments, Inc.
Duplex - type of speaker - Altex Div.
Dura-Blue - ion sensitive bulbs of glass electrodes - Beckman Instrs., (AISSD)
Durac - hydrometers - H-B Instr. Co.
Duracell - batteries - Mallory Battery
Dura Clad - transformers - Aladdin Elctns.
Duracolor - foil shielded coax - Columbia Elctn. Cables
"Dura-Con" - microminiature connectors - TRW/Cinch Connectors
Duraflex - waveguides & flexible metallic conduit/hose - Co-Operative Inds., Inc.
Durafom - patented foam tv transmission line - Columbia Elctn. Cables
Duramic - diaphragms and parts for use with scientific apparatus and equipment - Singer Co.
Duranol II - non-flammable impregnant - Filtron Company, Inc.
Dura-Pac - solid state relays - H-B Instr. Co.
Durasel - rectifier - Alpha Components Corp.
Duratem - microwave switches - Varian Assoc.
DURATEMP - microwave switches - Varian Electronic Tube & Device Grp.
Duratherm - high temperature furnace cable - Boston Insulated Wire & Cable Co.
Duratrak - contact surface - General Radio Co.
Durawatt - power transistors - National Semiconductor Corp.
Durcon - laboratory sinks and tops - Dullron Co., Inc.
Dur-Cor - hard oxide transparent photoplates for making IC photomasks - Corning Glass Works, Television Prods. Div.
Durever - soldering iron tips - Precision Elec. Co.
Durotherm - soldering tips - Hexacon Elec. Co.
Dur-X-Thane - extruded polyurethane cable jacket - Whitmor Wire & Cable
Duzell - flux - Chemetron Corp.
DV B - microminiature ceramic variable capacitors - JFD Electronics Components Corp.
DW "Multi-Switch" - "multi-switch" switches - Switchcraft, Inc.
Dymax - engineering adhesives - MPB Corp.
Dymograph Balancers - balancing machines - Annis R B Co.
DYNAC - injection molding adaptive control system - Dynisco
Dynacalad - batteries - Exide Power Sys. Div.
Dynacote - accelerator - Radiation Dynamics, Inc.
Dyna-Crimp - hydraulic crimping unit - Amp Inc.
DYNA-CU - magnetic compass transducer sys. - Larson Aero Dev.
Dynacube - miniature generator/alternator - Hamilton Technology, Inc.
Dyna-Flex - triple-tip probe - Dynascan Corp.

DYNafarm - coaxial RF switches - Amphenol RF Div.
Dynagen - accelerator - Radiation Dynamics, Inc.
Dynagrip - solder/flux kit - Chemtron Corp.
Dyna-Jet - tube tester - Dynascan Corp.
Dynakit - high fidelity components in kit form - Dynaco Inc.
Dynaload - power supply tester - Transistor Devices
Dynamag - duo-plasmatron ion source - Radiation Dynamics, Inc.
DYNAMATIC - AC & DC Adjustable Speed Drivers - Eaton Corp.
Dyna-Mike - hi-k ceramic capacitor - ITT Jennings
Dynamitron - accelerator - Radiation Dynamics, Inc.
Dyna-Mod - audio/video modulator - Dynair Elctns. Inc.
Dynamonitor - acceleration voltmeter - Endevco
DYNAMOUNT - automotive speaker system - Jensen Sound Labs.
DYN/AMP - D.C. current metering - Halmar Electronics, Inc.
Dynaphase 28 - dynamic headsets - Stanton Magnetics, Inc.
Dynaphase 40 - dynamic headsets - Stanton Magnetics, Inc.
Dynaphase 50 - dynamic headsets - Stanton Magnetics, Inc.
Dynaphase 60 - dynamic headsets - Stanton Magnetics, Inc.
Dynaphase 65-4C - 4 channel dynamic headset - Stanton Magnetics, Inc.
"Dyna-Q" - loading coils - K-W Engineering Works
Dyna-Race - aluminum ball bearing slides - Grant Hardware Co.
DynaRad 150 - x-ray inspection system - Torr Labs.
Dynasolve - cured plastic removers - Dynaloy, Inc.
Dyna-Switch - overload prevention switches - Dillon, W.C. & Co.
Dynastach - electric tachometers - Electric Tachometer Corp.
DYNATRAC - heterodyne lock-in amplifier - Ithaco, Inc.
Dyna-Trol - furnaces - L & L Special Furnace Co.
Dynatrol® - controls - Automation Prdts.
Dyna-Tune - demodulators - Dynair Elctns. Inc.
Dynayoke - yokes - CELCO
Dy-Noz-Stick - digital test probe - Nu-Concept Computer Systems, Inc.
Dytech - commercial/marine temperature monitors - Aerospace Avionics, Inc.

E

E - switches, rotary, cam, power, snap-action - Electro Switch Corp.
EAGLE A - low permeability alloy - Eagle Magnetics Co.
EAGLE "AAA" - high permeability alloy - Eagle Magnetics Co.
Eastobond - hot-melt adhesives - Eastman Chem. Prods.
Easy-Crimp - ratchet hand tools - Hollingsworth Solderless Terminal
EASY-FLO - silver brazing alloy - Handy & Harman
EASYMATCH - RF TUNER - Alford Mfg. Co.
Easypoxy - epoxy adhesive kits - Conap, Inc.
EATON - Precision Gearing - Eaton Corp.
EATON - Power Transmission Equipment - Eaton Corp.
EATON - Fluid Strainers - Eaton Corp.
Eaton Brand - fasteners - Eaton Corporation
EB-CON - edge board connector - Eby Co., Hugh H.
Eccentrix - adjustable shear/alignment pin - Tridair Inds.
ECCO - epoxies, urethanes, etc. - Emerson & Cuming, Inc.
E-CELL devices - Microcoulometers for timing & integrating - Plessey Electro-Products
Echo - Intercoms - Fanon/Courier Corp., Subs.
Echo Gel - encaps. compound - Communications Technology Corp.
Echord - tape recorder - RIL Elctns., Inc.
Echordette - tape recorder - RIL Elctns., Inc.
Eclipse&T S100, S200 - computers - Data General Corp.
Ecliptic - Tachometer Generators - Carter Motor Co.
ECO FUSE - econ limiter fuse - Economy Fuse Div.
Ecoline - mobile air filtration unit - Hollis Engrg., Inc.
Ecolog - environmental data logger - NERA, Inc.
E COM - core Memory System - Standard Memories, Inc.
Econalign; Pow-R-Flex; Simul-Torque - couplings, shaft, rigid & flexible - Metal Bellows Corp.
ECON FUSE - clearexide plug fuse - Economy Fuse Div.
Econistor - inexpensive resistors - General Resistance, Inc.
Econocap - capacitance diodes - Motorola Semiconductor Prods.
Econ-o-Clad - laminates metal clad - Engelhard Minerals & Chem.
Econofire - pastes-thick film microcircuits - Electro Mats Corp. Amer.
Econoflux - liquid inorganic acid flux - Alpha Metals, Inc.

Econogide - p.c. card guides; guides/circuit board - Bivar, Inc.
Econoglo - Drake Mfg. Co.
Econo-Heat - furnaces - Aremco Prods., Inc.
Econo-King - portable oven - Hotpack Corp.
Econo-Lap - thick film lapped substrates - Accumet Engineering Corp.
Econo-Line - automatic plating and/or processing sys. with an economical approach. - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Econoline - plastic low-signal transistors - Sprague Elec. Co.
Econo-Line - rotary switches - Oak Inds. Inc.
Econolite TM - Miniature panel lights - Chicago Switch, Inc.
Econo-Master - furnaces - L & L Special Furnace Co.
Economite TM - Miniature slide switches - Chicago Switch, Inc.
Econo-Polish - substrates .025" with a 1.5m" one side - Accumet Engineering Corp.
Econopot - Off-the-shelf Precision Potentiometer - New England Instr.
Econo-Skan - reflective scanner - Skan-A-Matic Corp.
Econ-o-Tape - laminates metal clad - Engelhard Minerals & Chem.
Eddystone - communications receivers - Marconi Instrs.
Edgecon - edge connectors - Molex Inc.
Edgegard Hood - dust-free work bench - Baker Co., Inc.
EDGE-ON - pc connector - Burndy Corporation
Edge-Pac R - PC connectors - Elfab Corp.
Edison - temperature detectors, fire detectors - Edison, Instr. Div.
Edison U/V - flame safeguard - Edison, Instr. Div.
EDU - Digital Clock - Efratom California, Inc.
EEV - Industrial Tubes - Calvert Elctns., Inc.
Efcor - electrical fittings - I-T-E Electrical Components Grp.
EFR - Receiver/Controller LF/VLF - Efratom California, Inc.
E-GAS - specially prepared sulfur hexafluoride for etching silicon - Matheson Gas Products
e-Gun - evaporation source - Varian Assocs.
80 K Series Hybrids - plug-in logic modules - Struthers-Dunn, Inc.
#800 Dipsert IC Base - dispenses IC's - Solder Removal Co.
#880 Insertic Tool - inserts integrated circuits - Solder Removal Co.
#885 Pul-N-Sertic Tool - inserts & extracts IC's - Solder Removal Co.
EL - thyristors & gas filled rectifiers - Electronics Co.
Elastic Stop nuts - self-locking nuts - Esna Div.
Elasto-Flex - shock absorbing skids - Craig Sys. Corp.
Electric Lacquer - lacquer - Dolph, John C. Co.
Electricord - wire, cord and cable - Pacific Electricord Co.
Electrifugal - Pumping units - Allis-Chalmers
Electri-Sealed - Seals pumps - Allis-Chalmers
Electrocolor 111 & 135 - color TV picture tube - Westinghouse Elec. Corp.
Electrocom - solid state commutator - General Devices, Inc.
ELECTROCOM® - Teletypewriter terminal equipment - Electrocom Inds.
Electrocrafter - electronic components - GC Electronics
ELECTRO CUT&T - insulation, tape & foam cutters. - Automatic Die Cutting Mch
Electrodrag - Conductive/resistive coatings - Acheson Colloids Co.
Electroduct - PVC wiring duct - Electrovert
Electrofeed - vibratory parts feeder - Black & Webster, Inc.
Electrolab - electricity/rotating machines, trainers - Digiac Corp.
Electro-Lap Seal - cable joint and terminal kit - Okonite Co.
Electro-Lift - garage door openers - Perma Power Div.
Electrologic - single & multiple card reader & interface - Meriam Inc.
Electromate - ion measuring instrument - Beckman Instrs. (AISSD)
ELECTROMAX - signalling controller - Leeds & Northrup Co.
Electro Module - packaged clutch & brake - Warner Elec. Brake & Clutch Co.
Electronflo - electroplate fusing sys. - Electrovert
Elektronik - temperature recorders & controllers - Honeywell
Electropans R - electrically conducting glass - Libbey Owens-Ford Co.
Electropunch - punch press-electric - Black & Webster, Inc.
Electroscan 30 - electroanalytical system - Beckman Instrs. (AISSD)
Electroset - automatic terminal setter - Black & Webster, Inc.
Electro-Shield - rfi shielding components - Estes Engrg. Co.

Electrostat - Static D.C. Adjustable Speed Drivers - WER Industrial
Electrotape - indexing table - Black & Webster, Inc.
Electrotape - surveying tool - Cubic Corp.
ELECTRO TIME - solid state devices - Clare & Co., C.P.
Electro-Ty - calbe tie - Electrovert
Electro-Voice - all electro-voice products - Electro-Voice, Inc.
Electro-Voice - cartridges & needles - Ev-Game Inc.
"Electrowriter" - electrographic handwriting - Victor Comptometer Corp.
ELGARD - Uninterruptible Power Source - Elgar Corporation
Eliminator - loudspeaker - Electro-Voice, Inc.
Elin - ac power sources, ac line correctors - Elin Div.
Elin - ac line correctors - Behlman Div., California Instrs.
Elinco - ac and dc sub-fractional and fractional hp motors and generators - Electric Indicator Co., Inc.
Elipiti-Grip - terminals - Thomas & Betts Co.
Elipit-O-Reel - elliptical waveguide - Gabriel Elctns. Inc.
ELMCO - coil winding machinery - Elden Mfg. Co.
EL-MENCO - capacitors - Electro Motive Corp.
Elmet - molybdenum and tungsten - Philips Elmet Corp.
"ELMO" TM - exterior light monitor - Doran Mfg. Co.
Elph - digital thermocouple indicator - Thermo Elec. Co., Inc.
Eltax - electronic telex exchange - Frederick Electronics Corp.
EMA iron - microwave absorbing material - Electronautics
EMC - Field intensity analyzer - Singer Instrumentation
EMCOR - Modular Enclosure Systems - Ingersoll Prods.
Emico - electrical meters - Sheller-Globe Corp.
Emlock - miniature connector for flexible cable - Cablewave Systems Inc.
E-Module - ultrasonic generator - Branson Cleaning Equip. Co.
Empco - electromagnetic transducers - Carolina Medical Elctns., Inc.
"Empirical-Log" - "Empirical-logs" broad band antenna's - Telrex Labs.
Emralon - dry film lubricants - Acheson Colloids Co.
EMS-II - Electronic Message Switcher - Texas Instrs. Inc.
EMT - reverberation units, compressors, turntables, wow & flutter meters, orchestra tuning standard - Gotham Audio Corp.
EMTEL - Seismic/Isoamp/Time & Frequency Standards - Develco
ENCOM - intercom equip. & telephone apparatus - Encom Prods. Co., Inc.
ENDECO - soldering/desoldering tools - Enterprise Development Corp.
Endevco - vibration, force and pressure transducers, and signal conditioners - Endevco
Endur-All - Transformers - Allis-Chalmers
Enercon - rotary drives - Control Products Div.
Energized - core solder - Alpha Metals, Inc.
Ener/Pak - Standby power units - Allis-Chalmers
Engaloy - brazing alloys - Engelhard Minerals & Chem.
Engineering Structural Foam - foam resins - General Elec.
Ensolite - pvc sponge mat'l. - Uniroyal, Inc.
Enviro-Bond - compound - Superior Cable Div.
Enviro Vac - thermal control system - High Vacuum Equip. Corp.
E-Pac - UPS System - Instr. & Control Sys., Inc.
EPC - bobbins & cases - Electrical Plastics Corp.
Epibase - silicon power transistors - Motorola Semiconductor Prods.
Epicap - capacitance diodes - Motorola Semiconductor Prods.
Epilon TM - ion implanted diodes & rectifiers - Solid State Devices, Inc.
Epocap - epoxy compounds - Hardman Inc.
Epocel - filter cartridge - Pall Trinity Micro Corp.
Epocel - filter medium - Pall Corp.
Epocrete - 2-part epoxy concrete materials - Hardman Inc.
Epocure - epoxy curing agents - Hardman Inc.
Epolast - epoxy compounds - Hardman Inc.
Epolene - polyolefin waxes - Eastman Chem. Prods.
Epomarine - 2-part epoxy compounds for splash zone & underwater application - Hardman Inc.
Eposet - epoxy compounds - Hardman Inc.
Eposolve - solvent for epoxy clean-up - Hardman Inc.
Epo-Tek - epoxies - Epoxy Technology
Epoweld - epoxy compounds - Hardman Inc.
EPOXYCAST - High-Voltage Transformer - TDC, Div. Freq. Technology Inc.
Equipt-Air - Blowers & Fans - Equipto Enclosure Systems
Equipto - Steel Electronic Cabinets (Heavy Duty) - Equipto Enclosure Systems
Equipto - stools, racks, lockers - Equipto
Equiseal - Pump stuffing boxes - Allis-Chalmers
ERDAC III - electronic recording systems - Macrodyne Inc.

Erickson - couplings - Thomas & Betts Co.
ERSA Tip 1G - soldering iron - Edsyn, Inc.
Erain - wire rosin cored solder - Multicore Solders
Escon - special relays - Guardian California
Esosil - optical fused quartz & silica - Esco Products
ESlok nuts - commercial self-locking nuts - Esna Div.
ESlok screws/bolts - self-locking externally threaded fasteners - Esna Div.
Estane R - polyurethanes, thermoplastic - Goodrich Chem. Co., B.F.
ETC - Transformers & reactors - Electronic Transformer Corp.
Etch/Path System 100 - semiconductor metal etcher - Qualco
Etch/Path System 200 - semiconductor metal etcher - Qualco
Eternacel[®] - lithium organic battery - Power Conversion Inc.
Ethafoam - polyethylene foam - Dow Chemical Co.
Ethocel - ethylcellulose resin - Dow Chemical Co.
Ethofil - fiberglass reinforced polyethylene - Fiberfil Div. Dart Ind.
ETS - electronic training systems - Digiac Corp.
E-V - all electro-voice products - Electro-Voice, Inc.
Evanohm - resistance alloy - GTE Sylvania Inc.
Everdur - conduit - The Anaconda Company Brass Division
Eveready - batteries, flashlights, miniature lamps, lanterns - Union Carbide
Everfast - liquid cement - Ambroid Co.
EVM - loudspeaker - Electro-Voice, Inc.
EXCELLITE - audio-type connectors - Amphenol Ind'l. Div.
Exec and VIP - hand lamps - Teledyne Big Beam
Exec-u-Flite - altimeter systems - Kollsman Instr. Co.
Executive - Intercoms - Fanon/Courier Corp., Subs.
Exetron - Watch - Exetron Corp.
Exide - batteries & chargers - Exide Power Sys. Div.
Exide - maintenance free batteries - Wisco Div.
ExpandCore 10 - DEC System 10 Add-On - Cambridge Memories, Inc.
ExpandCore 11 - DEC PDP-11 Add-On - Cambridge Memories, Inc.
ExpandCore 16 - 16K core memory - Cambridge Memories, Inc.
ExpandCore 620 - varian 620 Add-On - Cambridge Memories, Inc.
ExpandCore 8 - 8K core memory - Cambridge Memories, Inc.
ExpandMac - Lockheed MAC 16 Add-On - Cambridge Memories, Inc.
Expandomatic - ph measuring instruments - Beckman Instrs., (AISSD)
Extended Range - heat guns - Sigma Sys. Corp.
Extra - liquid scintillation sample vials - Beckman Instrs., (AISSD)
Extrusol - bar solder - Multicore Solders
E-Z-Code - wire markers - Thomas & Betts Co.
"E-Z-DUO" - cir. breaker "two in one" - Wadsworth Electric Mfg. Co.
Eze-Stik - pressure sensitive label stock - Fitchburg Coated Products
"E-Z-RED" - cir. breakers - Wadsworth Electric Mfg. Co.
"E-Z Release" - spring loaded contact - Continental Connector Corp.
E-Z-Trim - potentiometer - Bourns, Inc.
E-1 - display terminal - Information Displays, Inc.

F

FA - fluid adhesives - Bacon Inds.
Fabicon - Automatic image orthicon - Teltron
Fabicon - completely automatic camera tube - Teltron
Fabri-Therm - varnished glass cloth - General Elec.
Faceloid - involute face gears - Invincible Gear Co.
FACT - flexible automatic circuit testing machine - Hughes Aircraft Co.
FACT - flexible automatic circuit tester - Hughes Aircraft Co.
Fairloc - integral fastener - Sterling Instr.
FAIRLOC - rotating component fastening device - Stock Drive Prods.
Fanasteel - metals, wire, tubing - Fansteel Inc.
Faria - meter movements panel meters - Faria Meter Corp.
Farm-O-Stat - temperature controllers - Honeywell
FARVAL - Centralized Lubricating Systems - Eaton Corp.
FasBUS - DEC PDP-11 semiconductor Add-On - Cambridge Memories, Inc.
Fas'n-It - white glue - Ambroid Co.
Fast - flux & solder - Lake Chemical Co.
Fastaire - dryers, hand, electric - blowers, portable, electric - Humphrey, Inc.
FASTATCH - switches and variable resistors - Centralab
Fastemp - electronic thermometers - Amprobe Instr.

Fastep - magnetic particle brake/clutch - Lear Siegler, Inc.
Fastin-Faston - connectors - Amp Inc.
Fastline - core memory system - Fabri-Tek, Inc.
Faston - receptacle & tab terminals - Amp Inc.
Fastrak[®] - marker - General Radio Co.
Fastraps[®] - wire/cable ties - Grayhill Inc.
F.A.T. - fully additive circuitry - Advanced Circuitry
Faylon - mixing consoles & equalizers - Gotham Audio Corp.
Fazeguard - phase failure sensor - Opad Elec. Co., Inc.
Feather - fan - Rotron, Inc.
Featheride - cartridge - Electro-Voice, Inc.
Fedis - front end design information sys. - Macrodata
FENWAL 360 SYSTEM - portable fire suppression system - Fenwal, Inc.
Ferramic - ferrites - Indiana General
PETRON - solid state tube replacements - Teledyne Semiconductor
FFA - fluid flexible adhesives - Bacon Inds.
FFB - friction brake - General-Electro Mechanical
FFC - friction clutch - General-Electro Mechanical
FFRB - fail-safe friction brake - General-Electro Mechanical
Fiberfrax - ceramic fiber products - Carborundum Co.
Fiber-Lite - fiber optic illuminators - Dolan-Jenner Inds., Inc.
Fiberloy - Polymer base materials - Rogers Corp.
Fibertemp - fiber temperature sensor - Trans-Met Engrg.
FI-CORD - recorders, magnetic tape - Heitz, Inc., Karl
Fidelfex - metal strippers - Fidelity Chem. Prods. Corp.
Fidelplate - electroless plating solutions - Fidelity Chem. Prods. Corp.
Fieldial - magnetic field regulators - Varian Assocs.
Fieldial - magnetic field regulator - Varian Assocs.
Fieldlab - oxygen analyzer - Beckman Instrs., (AISSD)
Filamite - filament wound parts - NVF Co.
Fil-Cap - miniature feed-thru capacitors - Filttron Company, Inc.
Filmatic - polyester film capacitor, self encased - Paktron Div.
Filmatic - computer tape cleaning machine - Udel Manufacturing
Filmbrid - quadrature coupler - Merrimac Inds., Inc.
Filmit - film dielectric capacitors - Sprague Elec. Co.
Film-Met - trimming potentiometer (metal film) - Amphenol Connector Div., Controls Ops.
Filplate - tape preservation fluid - Udel Manufacturing
Fil-Shield - shielded enclosures - Filttron Company, Inc.
Filtercon - RFI Filters - Erie Technological Products
Filter Flo Diffuser - HEPA filtration module - Weber Tech Products
Fil Therm - thermal fuse - Filttron Company, Inc.
Filttron - principal register trademark - Filttron Company, Inc.
FINCO - Antennas & Accessories - Finney Co.
Fineline - console model wave soldering system - Hollis Engrg., Inc.
FINGRIP - terminal - Burndy Corporation
FIN-PAC - FAMILY OF HIGH VOLTAGE SILICON RECTIFIERS - Semtech Corp.
Fire Away - portable fire extinguishers - Kidde, Walter & Co.
FIREROD - cartridge heater - Watlow Elec. Mfg. Co.
Fire Star - fire-fighting vehicle - Lockheed Aircraft Svc.
Firewall EP, Sr & Firewall III - fire resistant cable-control, power & instrumentation - Cerro Wire & Cable Co.
Firezone - high temperature wire - Cerro Wire & Cable Co.
Firon - pastes-thick film microcircuits - Electro Mats. Corp. Amer.
Five/Ten - electron beam system - Sloan Technology Corp.
5-Way - binding posts - Superior Electric Co.
5x5 R - lightweight pilots' headphones - Telex Communications, Inc.
Flamenol - polyvinyl chloride-insulated wires - General Elec.
Flash Flow Welder - tap welder - Ewald Instrs. Corp.
Flash Front - back lighted dead front panels - Panelgraphic Corp.
Flash Stripper - shielding stripper - Ewald Instrs. Corp.
FLATOHM - resistor - Centralab
Flat Plate - slot array antenna - Rantec Div.
FLATSO - Radial Lead Thick Film Resistor - Pyrofilm Resistor Co., Inc.
Fiat Store - Core Memory - Standard Logic Inc.
Flattec - connector system - Elco
Flexguide - flexible waveguide - Airtron
Flex-A-Plug - plug-in type power take-off devices - General Elec. Co.
Flex'ator - constant force compression spring - Ametek, Hunter Spring Division
Flexcon - connector, test - Air-O-Tronics Prods.
Flexfoam - foam dielectric microphone cable - Columbia Elctrn. Cables
Flexi Glove - vinyl glove - Clean Room Prods.

Flexite - extruded plastic tubings - Markel, L. Frank & Sons
Flexitorch - tig welding - Falstrom Co.
Flexlead - high temperature wire & cable - Markel, L. Frank & Sons
Flexlife - flexible high gloss cable jackets - Columbia Elctrn. Cables
Flexmax Circuits - multilayer flexible printed circuits - Flexprint Div.
Flexobond - urethane adhesive - Allaco Prods Div.
Flexobond - urethane adhesive - Packaged Resins Div.
Flexoprene - Neoprene jacketed portable cable - Standard Wire & Cable Co.
Flex-Pak - amplifiers & sound sys - Bogen Div.
Flex-Plate - Driving components for flexible couplings - Allis-Chalmers
Flexprint Circuitry - flexible printed circuits - Flexprint Div.
Flexstrip - Flat cable and Jumpers - Ansley Elctrns. Corp.
Flextac - connectors - Hypertronics Corp.
Flextech - extruded mechanical tubings - Markel, L. Frank & Sons
Flextension - special aerosol extender - Tech Spray, Inc.
Flex-Tex - Coupling (CAC) - Allis-Chalmers
Flex-Weld - Welding technique for flat conductor cable - Ansley Elctrns. Corp.
Flip-Chip - Logic Module - Digital Equipment Corp.
Flip-Dip - p.c. mounting method - Berg Electronics
Flip Loc - quick detach clamp - Viking Inds., Inc.
Flip-Pak - solid-state controlling device - Gems Sensors Div.
Flipper - wire snips - Clauss Cutlery Co.
Flippy - reversible flexible disk - Information Terminals
FLIP-R - Flip-chip resistor - Mini-Systems, Inc.
Floatrol - float operated control - Autocon Inds., Inc.
Flo Fuse[®] - automatic stop valve - Marotta Sci. Controls, Inc.
Flotrac - displacement instrumentation - Hull Corp.
Flourglide - dry lubricants - Chemplast, Inc.
Flowtronic - velocity flowmeters - Datametrics Inc.
Fluid Pisont - Bearings for motor-pump units - Allis-Chalmers
Fluor alloy - solutions and mixes - Beckman Instrs., (AISSD)
Fluor-X - nuclear gauges - Nuclear Resch. Corp.
Flushlite - Drake Mfg. Co.
Flush-Seal Pressure Plugs - socket head plugs - Allen Mfg. Co.
Flying Coil - d c ironless - EEMCO Div.
Foamcone - radar-augmentation device - Teledyne Micronetics
Foamflex - semi-rigid cable - Cableware Systems Inc.
Foam Wipe - urethane foam wiper - Clean Room Prods.
FOBALLOY - substitute for gold-tin solder - Plessey Inc.
Footrol - foot switches - General Control Co.
Forbon - vulcanized fibre - NVF Co.
Formaldefil - fiberglass reinforced acetal - Fiberfil Div. Dart Ind.
Forum - conference system - Fairchild Sound Equip.
Fotoceram - glass-ceramics - Corning Glass Works, Fluidic Products
Fotoform - glass-ceramics - Corning Glass Works, Fluidic Products
Fotoform - light sensitive glasses - Corning Glass Works
Foundation - panel instrument line - Westinghouse Elec. Corp.
Fox 1 & Fox 2 - computers - Foxboro Co.
FPL - control systems - Sequential Information Systems
Frahm - resonant reed frequency meters, tachometers - Biddle, James G.
FRC Fab-Ri-Cable - woven ribbon cable - Zippertubing Co.
"FREON" - Flourinated Solvents & Refrigerants - E.I. DuPont de Nemours & Co.
FREQUETER - Frequency-To-DC Converter - Solid State Electronics Corp.
FRICION-AIRE - elementless electric oven - Blue M Electric Co.
Frigichip - thermoelectric cooling modules - Melcor-Materials Elctrn. Prods.
Frigidri - refrigerated dryer - Pall Trinity Micro Corp.
FRK - Miniature Rubidium Frequency Stabled - Efratom California, Inc.
Frost Aid - coolant - Chemtronics, Inc.
"Frost-Off" - de-icer - Merix Chem. Co.
FRT - Rubidium Laboratory Standard - Efratom California, Inc.
Full-View - flowmeter - Brooks Instr. Div.
Fulseco - controller - Taylor Instr. Process Control Div.
Funulet - funnel flanged eyelets - Circon Corp.
Fusa-Fab - tape - General Elec.
Fusa-Flex - tape - General Elec.
Fusa-Flex - putty - General Elec.
Fusa-Mat - tape - General Elec.
Fusecor - glass reinforced vinyl cable filler - Whitmor Wire & Cable

Fuseplug - fused electrical connector - Arco Electronics Inc.
FUSETRON - fuses & fuseholders - Bussmann Manufacturing
Fusionbrazed - brazed steel tubing - ITT-Higbie Mfg. Co.
Fusionweld - AC welded steel tubing - ITT-Higbie Mfg. Co.
Futura - ion measuring electrodes - Beckman Instrs., (AISSD)
Fuz-Ion Sealed - metalized polycarbonate capacitors - Dearborn Elctns. Div.
Fuzz Buttons - electrical contacts - Technical Wire Products, Inc.
FWACO - fasteners - Aimsco Inc.
Fyrindex - fire detector - Kidde, Walter & Co.
Fyrite - Oxygen & Carbon Dioxide Indicator - Bacharach Instrument Co.
Fyr-Lace - lacing tape - Gudebrod Bros. Silk Co., Inc.

G

GaAsLITES - light emitting diodes - Monsanto-Elctn. Spec. Prods.
GAC - relay armature - General Automatic Corp.
Gammamet - high voltage & current contact - GTE Sylvania Inc.
Gammatrol - nuclear gauges - Nuclear Resch. Corp.
GAP KAP - ceramic capacitor - Centralab
Garaless - mold release agent - Ram Chems.
Garylert - resin curing catalyst - Ram Chems.
Gardman - Temperature Controllers, millivoltmeters - Gulton Inds., Inc.
Gerox - resin curing catalyst - Ram Chems.
Gas-Pointer - Dual Range Combustible Gas Indicator - Bacharach Instrument Co.
Gates - Rock and ore processing equipment - Allis-Chalmers
GEL/CELL - rechargeable gelled electrolyte bat. - Globe Union, Inc.
Gelyte - lead acid battery - Gould, Inc.
Gemat - tape, glass mat - General Elec.
Gemcor - clutches & brakes - General-Electro Mechanical
Gemlite - Drake Mfg. Co.
GE-Mov - metal oxide varistor - General Elec. Co.
GE-mov varistors - metal oxide varistors - General Elec.
Genal - injection phenolics - General Elec.
Genalex - instruments - General Elec. Co.
GENERATION 70 - low-cost pulse instruments - E-H Resch. Labs., Inc.
Genesolv - fluorinated solvents - Allied Chemical Corp.
Geodolite - measuring instr. - Spectra-Physics, Inc.
Geon R - vinyls - Goodrich Chem. Co., B.F.
Geoprene - neoprene insulated cable - General Elec.
Georgian - speaker system, cabinet - Electro-Voice, Inc.
Geosol TM - Heavy-Wall Solderable Insulation - Belden Corp.
Geotrol - gasoline-resistant wire - General Elec.
GERTSCH - Frequency meters & AC instrumentation - Singer Instrumentation
Giant - general instrument advanced nitride technology - General Instr. Corp.
Giant II - general instrument advanced N-channel tech. - Ion-implant - General Instr. Corp.
Giantview - large screen television projector - General TV Network
Giant Voice - public address and warning systems - Altac Div.
Giballay - powder metal composition material - GTE Sylvania Inc.
Giga-Trims - piston air trimmer - Johanson Mfg. Corp.
Gladidator SSB Plus - SSB Transceiver - Fanon/Courier Corp., Subs.
Glascoate - protective coating - Dolph, John C. Co.
GlasGuard - Ceramic Capacitor - AVX Ceramics
Gleasy® - fiberglass tubing - SGL Graphics
Glasrod - pultruded rod shapes - Glastic Corp.
Glass Amp - Lead mounted Rectifier - General Instruments Corp.
Glass Amp II - Lead mounted Rectifier - General Instruments Corp.
Glassivated - high-reliability diodes - Motorola Semiconductor Prods.
Gleaner - Harvesters - Allis-Chalmers
Gleaner-Baldwin - Harvesters - Allis-Chalmers
Glennite - piezo ceramic & ferro ceramic materials - Gulton Inds.
GlidCop - dispersion strengthened copper - Gliddon Metals
Globber - igniters, components, elements - Carborundum Co.
Glo-Dot - pilot lights - Industrial Devices
Glo-Lite - Drake Mfg. Co.
Glyptal - paint varnish enamel lacquer - General Elec.
Glyptal - resin adhesive - General Elec.
Gold-Bond - selective gold plating - Braun Co., Inc.
Goldtop - high temperature battery - General Electric

Gold Top - hi temperature batteries - General Elec. Co.
Goodwin - sporting goods - Midland International Corp.
Gozinta - tuner cleaner tool - Workman Electronic Prods., Inc.
GPD - General Purpose Devices (low cost amplifiers in TO-12 packages) - Avantek, Inc.
GP/duroid - Fiber-elastomer materials - Rogers Corp.
GP-612 - Digital Printer - Gulton Inds., Inc.
Graftan, Symbolpoint - programs for upd series digitizer systems - Data Technology Inc.
Granulator - Grinding mill - Allis-Chalmers
Graphallast® - submerged bearing - Graphite Metallizing Corp.
Graphalloy® - bearing, elec brush, or contact - Graphite Metallizing Corp.
Graphilm® - lubricant to 1000° F - Graphite Metallizing Corp.
Graphlon® - submerged bearing - Graphite Metallizing Corp.
Graphmetax® - insulating material - Graphite Metallizing Corp.
Grate-Kiln - Kiln processing system - Allis-Chalmers
Gravitin - filter element - Pall Trinity Micro Corp.
Greencaps - low cost capacitors - Radio Materials Co.
Greenline (FINCO) - MATV & Components - Finney Co.
G.R.I. - hermetically sealed reed switches - Risk Inds, Inc., George
Gripnet Connector - terminal - Berg Electronics
Griping - rings, retaining - Waldes Kohinoor, Inc.
GROMMES - Hi Fi & Stereo components public address & sound equipment - Precision Electronics, Inc.
Grommet Strip - continuous strip grommeting - Electrovert
Gromatrip - extruded channel - ICO/Rally Corp.
Groundmatic - outlets - Leviton Mfg. Co., Inc.
GR874R - coaxial components - General Radio Co.
GR900® - precision coaxial components - General Radio Co.
Guardette - motor overload protectors - General Elec. Co.
Gude-Dial Cord and Champion-Dial Cord - dial cord - Gudebrod Bros. Silk Co., Inc.
Gude-Glass - lacing tape - Gudebrod Bros. Silk Co., Inc.
Gudelace - lacing tape - Gudebrod Bros. Silk Co., Inc.
Gude-Nylace - lacing tape - Gudebrod Bros. Silk Co., Inc.
Gude-Q - lacing tape - Gudebrod Bros. Silk Co., Inc.
Gude-Space - lacing tape - Gudebrod Bros. Silk Co., Inc.
Gude-Ties - lacing tape - Gudebrod Bros. Silk Co., Inc.
Gyro Flux Gate - remote indicating compass system - The Bendix Corp.
Gyropoise - turntable - Stanton Magnetics, Inc.
GyroSURVEYOR - borehole surveying gyros and systems - Humphrey, Inc.

H

Hailer JR - S-203 - Audio Equip. Co., Inc.
Haltiplier - Watt & Var Transducers - Scientific Columbus
Halttron - Hall Effect Probes & Hall Effect Instrumentation - Ohio Semitronics, Inc.
Ham-Mate - Radio Amateur Wattmeters - Bird Electronic Corp.
Hand-Hole - buried plant enclosure - Superior Cable Div.
Han-D-Mag - audiophile demagnetizers - Annis R B Co.
HANDY FLUX - fluxes for brazing - Handy & Harman
HANDYLab - prepacked devices - Motorola Semiconductor Prods.
Handy-Wrap - wire wrapping tools - Ostby & Barton Co.
Hardset - heat-curing hard rubber compound - Hardman Inc.
Harowyn - brushing synchros - Harowe Servo Controls
Hartlock - Locking & Non-Locking Caps & Connectors - Arrow-Hart, Inc.
HATCORONE - Butyl rubber insulation - CCS Hatfield Wire & Cable Group
HATFLEX - Non-metallic cable - CCS Hatfield Wire & Cable Group
HATLON - Hypalon insulation - CCS Hatfield Wire & Cable Group
HATRON - NBR/PVC jacket (color) - CCS Hatfield Wire & Cable Group
HATVINOL - PVC insulation - CCS Hatfield Wire & Cable Group
Havar - alloy - Hamilton Technology, Inc.
Hayate - fiberglass reinforced plastics - Synthane Taylor Corp.
HC Holtzer - Cabot Motors - Eastern Air Devices Motor Div.
HD - heavy duty detergent cleaner - Clean Room Prods.
HDT - hitemp adhesive - Allaco Prods Div.
HDT - high temp adhesive - Packaged Resins Div.
HeatBank - heat recovery system - Hughes Aircraft Co.
Heat Guard - elec. soldering iron holders - Hexacon Elec. Co.

Heat-Les - air dryer - Pall Trinity Micro Corp.
Heat-Les - desiccant dryer - Pall Corp.
Heat Prober - thermister type electronic thermometer - Wahl, Wm. Corp.
Heatram - power supply dissipator - Power Designs, Inc.
Heatrax - heat shrinkable tubing - ICO/Rally Corp.
Heat-Seal Stik - sealant and pipe thread compound - Lake Chemical Co.
Heat Spy - infrared thermometers - Wahl, Wm. Corp.
Heatzone - high temperature wire - Cerro Wire & Cable Co.
Heatstrip - heating element - Therm-O-Lab Corp.
Heintz & Kaufman - electron tubes - JSH Electronics, Inc.
HELIAx - elliptical waveguide - Andrew Corp.
Heliax - coaxial cable & elliptical waveguides - Andrew Antenna Co. Ltd.
HELIAx - coaxial cable - Andrew Corp.
Heli-Cal - flexible shaft coupling - Helical Prods. Co., Inc.
Helicord - retractile cords - Storm Products Co.
Helidel - delay lines - Beckman Instrs.
Helilube - potentiometer lubricant - Beckman Instrs.
Helipot - precision potentiometers - Beckman Instrs.
Helitrim - trimming potentiometers - Beckman Instrs.
Heli-Tube - spiral tubing - M M Newman Corp.
Heli-Tube - spiral wrap tubing - Newman Corp., M. M.
HELI-WHIP - whip antennas - Anixter-Mark
Helix Design - potentiometers, transducers & delay lines - Beckman Instrs.
HELM-PAK - modular instrument controls & monitors - Helm Instr. Co.
HEP - hobby devices - Motorola Semiconductor Prods.
HERESY - loudspeaker system - Klipsch & Assocs. Inc.
Hermeflex - hermetic rotary seals - Singer Co.
Hermeticool - refrigeration system - Tenney Engrg., Inc.
Hetrocolor - time base corrector - Television Microtime, Inc.
Hexacon - elec. soldering irons - Hexacon Elec. Co.
HEXCLAD - contact mfg. process - Plessey Inc.
Hex Wick - solder remover - Hexacon Elec. Co.
HEYCO - strain relief bushings, insulating bushings & cable clamps - Heyman Mfg. Co.
HGA/Transtech - amplifiers-powerpacks - HGA Elctns., Inc.
H/I - scientific instruments - Hacker Instrs., Inc.
Hiatt Clips - coaxial cable clips - Electrovert
Hi-Break - electric circuit breakers - General Elec. Co.
Hi-Brite - paints - Shannon Luminous Mat'ls.
Hickory Brand - wire & cable - Superior Cable Div.
HICO - sub-miniature, low inertia, permanent magnet DC motors; gearmotors; & tach generators, fans & blowers - Horizons International, Inc.
HICO - relays - Hoagland Instr.
Hi-Cor - organic flux filled solder - Alpha Metals, Inc.
Hi-Cyclic - directional control valves - Airmatic/Beckett-Harcum
Hi-Density - Feeders - Allis-Chalmers
Hi-Etch - capacitors - General Elec. Co.
Hi-Ex - fire extinguishing foam - Kidde, Walter & Co.
Hi-Flux - magnetic equipment - Annis R B Co.
Hi-Fy - gas chromatographs - Varian Assocs.
Hi-Jul - energy capacitors - Dearborn Elctns. Div.
Hi-KAP - ceramic capacitor - Centralab
Hi/Lo Filter - high pass/low pass filter - Rockland Sys. Corp.
Hi-Mag - insulator - Dolph, John C. Co.
Hinge-Lock - spring-lock shelf supports - Simmons Fastener Corp.
Hi MIL - high noise-immunity logic - Teledyne Semiconductor
Hinjon - lugs - Thomas & Betts Co.
Hipotrode - high voltage spark electrode - Hipotronics, Inc.
Hi Pow - high power dummy loads - Electronics
Hippo-clip - clips - Mueller Electric Co.
Hi-Therm - varnish - Dolph, John C. Co.
Hi-Thro - fluoborate plating baths - Allied Chemical Corp.
HI-VO-KAPS - ceramic capacitors - Centralab
Hi-Volt - voltage testers - Industrial Devices
Hi-Z - ground fault sensors - Electronics Co.
Hi-Z - voltmeter & accessories - Ross Engineering Corp.
HKP - cutting machine - Porter, H.K., Inc.
HLT - stressed panel fastener - Tridair Inds.
HMC - hybrid microelectronic circuits - AEL, Inc.
Hole-in-the-Head - tamper-proof screws - Pan-L-Fast
Homalite-LR - low reflectance plastic sheet - SGL Homalite
Hometalaxial - RCA power transistor technology offering low-charge carrier density at the collector junction for reduced heating effect - RCA Solid State Div.
Homosil - clear fused quartz - Amersil, Inc.
HONEY BEE - Video Audio Tape Motor - Hurst Mfg. Corp.
HOPPER STAKER - swaging machines - Cambridge Thermionic Corp.
Hopstretcher - antenna feed - Gabriel Elctns. Inc.

Horizon Line - voltmeters & ammeters - General Elec. Co.
Horizon Line® - panel meters - General Electric Co.
Hornet - miniature soldering iron - Hexacon Elec. Co.
Hot Hand - tubing shrinkers - American Elec. Heater
"Hot Line Telephone" - automatic dial telephone - Warren G-V Communications
Hot Shot - dry batteries - Union Carbide
Hot Tip - soldering accessory - Air-O-Tronics Prods.
Howell-Bunger - Hydraulic free discharge regulating valve - Allis-Chalmers
HPI - meters - Assembled Products Co.
HR - heat resistant transfers - Meyercoed Co.
Hub-Clamp - fastener - Sterling Instr.
HUBLOC - component fastening device - Stock Drive Prods.
Hub-Lock - fastener - Sterling Instr.
Humidolain - ceramic products - Star Porcelain Co.
Humiseal - coatings - Humiseal Div.
Humistat - relative humidity controller - American Instr. Co.
Humitex - recording chart - Foxboro Co.
Hustler - communication antennas & accessories - New-Tronics Corp.
Hy-A-Sil - silicon rectifiers - Sanford-Miller Corp.
HYBRIDGE - RF BRIDGE - Alford Mfg. Co.
Hybrid Modules - precision resistor divider networks - Pulse Engrg., Inc.
Hy-Bute/60 - butyl gum, for insulation - General Elec. Co.
Hycar R CTBN - reactive liquid polymers - Goodrich Chem. Co., B.F.
HYDENT - compression terminals & splices - Burndy Corporation
HYDRATEMP - Synthetic-rubber insulation - CCS Hatfield Wire & Cable Group
Hydrive - high output amplifiers - Infodex, Inc.
Hydrocone - Crushers - Allis-Chalmers
Hydrofeed - recording lathe - Components Corp.
HYDRO-FLOW FLUID - Soldering leveling & fusing chemical - Kenco Alloy & Chemical Co., Inc.
Hydro-Jet - pc board water cleaner - Hollis Engrg., Inc.
Hydropress - book pressing machine - A. M. W. Corp.
Hydroset - Crusher mechanism for vertical shaft movement - Allis-Chalmers
Hydrosolv - liquid organic water soluble flux - Alpha Metals, Inc.
Hydro Squeegee - solder leveling/cleaning mach. - Lear Siegler, Inc.
Hydrotector - package r-h inspection sys - American Instr. Co.
"Hye-Que" - antenna connector - Budwig Mfg. Co.
HYFEN - connector contacts - Burndy Corporation
Hy-Fi - gas chromatograph - Varian Assocs.
Hyflux - Alnico 5 magnets - Indiana General/Div. Emm Corp.
Hygrade - fabric base sleeveings - Markel, L. Frank & Sons
Hygro-Cel - cup r-h sensor device - American Instr. Co.
Hygro-Champ - clamp r-h measuring device - American Instr. Co.
HygroDynamics - hygrometer product line - American Instr. Co.
Hygrosensor - relative humidity transducer - American Instr. Co.
Hygrotran - convertors, humidity signal (resistance) - American Instr. Co.
HYJOULE - high energy fault Locators - Associated Research, Inc.
HYLINK - compression splice - Burndy Corporation
HYLOK - connector system - Burndy Corporation
HYLUG - compression terminal - Burndy Corporation
Hyper Sel - rectifier - Alpha Components Corp.
Hypertac - connectors - Hypertronics Corp.
Hypertac - PC and rack & panel connectors - Industrial Electronic Hardware
HYPOINT - leadless ic receptacle - Burndy Corporation
HYPOT - high potential Testers - Associated Research, Inc.
HYPRESS - installation tooling - Burndy Corporation
Hy-Range - CB Transceivers - Hy-Gain Electronics Corp.
HYRING - two piece compression terminations - Burndy Corporation
Hy-Scan - Monitor Receivers - Hy-Gain Electronics Corp.
Hy Seas - VHF marine equipment - Hy-Gain Electronics Corp.
Hy-Therm R - Heat flux sensor - Hy-Cal Engineering
H-Zone - high temperature wire - Cerro Wire & Cable Co.
H-10&T - servicemen's leak detector - General Electric Co.

IBR - integrated bridge rectifier - Varo Semiconductor, Inc.

ICEM - magnetrons - Varian Electron Tube & Device Grp.
ICEM - inverted coaxial magnetron - Varian Assocs.
icem - coaxial magnetrons - Varian Assocs.
Ice-Trol - ambient-compensated temperature controllers - Honeywell
Ickypic II - compound - Communications Technology Corp.
ICPAX - integrated circuit packaging system - Techmar Corp.
Icsotimer - time delay - Instr. & Control Sys., Inc.
Idads - automatic drafting system - Information Displays, Inc.
IDEA - Integrated Diesel Engine Analyzer - PRD Elctrms., Inc.
IDIGraf - display terminal - Information Displays, Inc.
IDIIOM/II - computer controlled display - Information Displays, Inc.
IEE-APOLLO - incandescent, segmented filamentary display - Industrial Elctrn. Engrs.
Imagescope - fiber optic flexible image device - Galileo Electro-Optics Corp.
IMCair - propeller fans/centrifugal blowers - IMC Magnetics Corp.
IMCder - Incremental Optical Encoder - I M C Magnetics
IMCom - Brushless D-C Motor - I M C Magnetics
IMCool - Tubeaxial Fans - I M C Magnetics
Imidex - polyimide-containing composition - General Elec.
ImLec - electronic components - Inter-Market, Inc.
Imlec - thumbwheel switches - Inter-Market, Inc.
Imlec - indicators, legend displays - Inter-Market, Inc.
Imlec - lamps, pilot lights - Inter-Market, Inc.
Imlec - CCTV equipment - Inter-Market, Inc.
Immersion Gold - immersion plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
IMPAC - COMMERCIAL MEDIUM CURRENT SILICON RECTIFIER - Semtech Corp.
Impac - digital panel meters - Velonex, Display Prods.
"Imperial" - adding machines - Victor Comptometer Corp.
Imperial Line - heavy-duty production - UNGAR, Div. Industries Corp.
ImperviTran - environmentalized transformer - Micron Industries Corp.
Incert - edge-mount leadless ceramic pkg. - Metalized Ceramics
Incor - Rare earth magnets - Indiana General/Div. Emm Corp.
Incre-Lock - control systems - Sequential Information Systems
Incusil 10 - brazing alloys - Gte Sylvania, Inc.
Incusil 15 - brazing alloys - Gte Sylvania, Inc.
Indomica - mica - Humiseal Div.
Indox - Ceramic magnets - Indiana General/Div. Emm Corp.
Induct-A-Ring - shaker armature - Unholtz-Dickie Corp.
Inductosyn - transducers - Farrand Controls, Inc.
Inductosyn - encoder - Del Electronics Corp.
Inductrol - induction voltage-regulator - General Elec. Co.
Industrite - abrasion, heat, chem., oil & flame resistant cable - Boston Insulated Wire & Cable Co.
Industrol 812 - digital process control - Research, Inc.
Infinetron - resistance elements - Bourns, Inc.
Infinetron - conductive plastic potentiometer - Bourns, Inc.
Info-Lite - lighted readouts, status indicators & systems - Info-Lite Corp.
INFOTRAK - card-chart recorder - Leeds & Northrup Co.
Infrasil - clear fused quartz - Amersil, Inc.
Inscoc - electronic instrumentation - Electro-Optical Inds., Inc.
Insertomat - component assembly system - Electrovert
In-Source® - vacuum evaporation system - Applied Materials Inc.
Insta-Lead - precut wire leads - Storm Products Co.
Instamator® - construction estimating calculator - Diversified Electronics Co.
Instant Circuit Boards - instant circuit boards - Circuit-Stik, Inc.
Instant Lettering - dry transfers - Datak Corp.
"Instant Weld"® - alpha cyanoacrylate adhesive - Oneida Electronics Mfg.
Instaplate R - processing equip. for metalphoto R - Metalphoto Corp.
Insta-Test - breakdown testers - Grand Transformers
Insul-Bolt - fastener-insulated - Pylon Co., Inc.
Insulcaps - heat shrinkable caps - Burlington Opers. Div.
Insulcon - glowers - Carborundum Co.
Insulet - rivets-insulated - Pylon Co., Inc.
Insulets - outlet fittings - Thomas & Betts Co.
Insuliner - sleeves - Thomas & Betts Co.
INSULINK - insulated compression splice - Burndy Corporation
Insul-Mate - test adapters - Air-O-Tronics Prods.

Insulsplice - continuous strip insulating equipment - Autosplice/Dv Gen Staple
Insultape - heat shrinkable tape - Burlington Opers. Div.
Insultek - insulating finish - Int'l. Elctrn. Resch.
Insultite - heat shrinkable tubings - Burlington Opers. Div.
Insulube - insulating finish - Int'l. Elctrn. Resch.
INSULUG - insulated compression terminal - Burndy Corporation
Integra - consoles - Par-Metal Prods. Div.
Integra-Test - leak detector - Varian Assocs.
Integrid - integrated cir. P.C. card - Elgin Elctrms., Inc.
Interap - capacitors - International Comps Corp.
Interarcite - digital cassette tape transports - Interdyne
Intercheck - thermal switch - Guideline Instrs., Inc.
Interconnect PABX Telephone Systems - 20 lines & up - Milgo Electronic Corp.
Interface: A - speaker system - Electro-Voice, Inc.
Interface 33 - Styled Modular Instrument Enclosures - Amco Engineering Co.
International Servicemaster - tubes - International Comps Corp.
Interohm - resistors - International Comps Corp.
Interosper - Tracking-Radar Devices - Vega Precision Labs.
Intershake - communication test equipment - Atlantic Research Corporation
Interzone - polyimide insulated wire - Cerro Wire & Cable Co.
INTER-B - low pickup cabling - Perfection Mica Co.
Intri-Cut - chemical milling process - Chem Aero, Inc.
"Invert-A-Stat" - static inverter - Gould Inc.
"Inverted-Vee" - "balun" fed doublet antenna kit - Telrex Labs.
Inverter-Rated Ferramics - ferrites - Indiana General
Inverto-Tran - ferrite inverter transformer series - Pulse Engrg., Inc.
Invertron - ac power sources - Elin Div.
INVERTRON - ac power sources - California Instrs. Co.
Invertron - AC power sources - Calico Div.
Invertron - ac power supplies - Behlman Div., California Instrs.
Involoid - internal rack generated - Invincible Gear Co.
"Ionflo" - ion deflection measurement - Thermo Sys., Inc.
IPAC - Time Sequencer - Instr. & Control Sys., Inc.
IPT-500 Series - comp. test handler - IPT Corp.
IPT-700 Series - comp. test handler - IPT Corp.
IPT-800 Series - comp. test handler - IPT Corp.
IRD - all products - IRD Mechanalysis, Inc.
Iriditron - gamma radiography machines - Automation Inds.
Irisocorder - Videopupillography - Hamamatsu TV Co., Ltd.
Ironclad - battery plates - Exide Power Sys. Div.
Iron Grip, V-Grip - shelving, racks, bins - Equipto
Irrasil - tape, silicone - General Elec.
Irrathene - irradiated polyethylene - General Elec.
Irricon - tape, semi-conducting - General Elec.
Isobase - accelerometer - Endevco
Isobox - enclosure that isolates an accelerometer from changing ambient conditions - Endevco
ISO-CURVE - R-T, curve-matched, interchangeable thermistors - Fenwal Elctrms.
Iso-Elastic - temperature compensated alloy - Chatillon John & Sons
Isofilm - electronic capacitors - General Elec. Co.
Iso Fork - tuning fork - Philamon, Inc.
Isoformer - transformer - Elcor Prods. Neotec Elctrms. Inc.
ISO-KAP - ceramic capacitors - Centralab
ISO-LATCH - Iso Thermal Latching Valve - General Valve Corp.
Isolationist - line isolation transformers - CEA
Isolene - liquid cis 1,4 polyisoprene rubber polymer - Hardman Inc.
Iso-Lit - opto isolators (couplers) - Litronix
ISO-OP-AMP - solid state modular isolation operational amp. - Burr-Brown
ISO-PAK - Modular DC/DC Converter Power Supplies - Stevens-Arnold, Inc.
Isopil - plug-in isolator - Cir-Q-Tel, Inc.
Isoply - isolated power supply - Elcor Prods. Neotec Elctrms. Inc.
ISOPODS - electronic packaging system (module) - Hughes Aircraft Co.
ISOPOLAR REFERENCE - ultrastable precision reference - Data Precision Corporation
Isorex - transformer - Elcor Prods. Neotec Elctrms. Inc.
Iso-Seal - temperature compensated scale - Chatillon John & Sons
ISOTAB - plastic tab-mount thyristor - Hutson Industries
Isotherm - thermistors - Victory Engrg. Corp.
Isothermal - RF transistors - Motorola Semiconductor Prods.
ISO-TIP - cordless rechargeable soldering iron - Wahl Clipper Corp.

Isovar - power supply automatic current to voltage crossover - Elcor Prods. Neotec Elctns. Inc.
Iso watt - isolated VERSAWATT type - RCA Solid State Div.
"I" Supply - constant current source - Calx Mfg. Co., Inc.
I&S2 - ion implantation - American Microsystems, Inc.
ITECO - test equipment - Industrial Test Equip.
IVACON - AC Line Conditioner - Deltec Corp.

J

Jackey - folding hex key set - Allen Mfg. Co.
JAICO - relays & blade switches - Jaidinger Mfg. Co., Inc.
Jak-switch TM - Jack adapter switch - Chicago Switch, Inc.
JANETTE - Speed Reducers, Gearmotors - Eastern Air Devices Motor Div.
Janset - knobs - Jan Hardware Mfg. Co.
JAQUET - Speed Indicators - Sticht Co., Inc. Herman H.
Jareck - hydro mechanical presses - Taylor-Winfield Corp.
JETCAL® - jet engine tester - Howell Inst. Inc.
Jetflow - channel inductors - Ajax Magnethermic Corp.
Jet Flux - liquid flux - Chemetron Corp.
Jet Plater - self-contained plating unit - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Jet Set - self-locking honeycomb panel fastener - Esna Div.
Jet-Temp - thermocouples - General Elec. Co.
Joita - autolinear coupling - Jan Hardware Mfg. Co.
"Jones" - plugs and sockets - TRW/Cinch Connectors
JotDraft - printed circuit symbols - Datak Corp.
Judco - insulated wire & cable - Judd Wire Div.
Junior Spectrophotometer - low cost uv-visible-spectrophotometer - Coleman Instr. Div.
J-W - Gas Detection Product Logo - Bacharach Instrument Co.

K

Kalar - elastomeric compounds - Hardman Inc.
Kalene - elastomeric compounds - Hardman Inc.
Kalex - polyurethane elastomers - Hardman Inc.
Kamag 14 - generators - Kato Engineering Co.
Kappa - delay lines - Kappa Networks
Kapsaal - low friction seal - Minnesota Rubber Co.
KARADIO - Applicable to auto radio sets - ATRI Electronics, Inc.
Karak - carbon graphite parts - Ohio Carbon Co.
Karen - precision altitude system - Kollsman Instr. Co.
Kari - float switch - Zi-Tech Div.
Kasil - potassium silicate - Philadelphia Quartz Co.
K-dot - Sync Instrument Motor - Hurst Mfg. Corp.
Keenserts - inserts & studs - Tridair Inds.
Keeper - cables for ion measuring electrodes - Beckman Instrs., (AISSD)
Kelox - solid bushing inserts for strong threads in weak materials - Heli-Coil Prods.
Keltip - cryogenic sensor - Degussa Inc.
Kelvin Klamps - four-terminal clamps - Electro Sci. Inds.
Kelvin Klips - four-terminal clips - Electro Sci. Inds.
KEMET - tantalum, ceramic & film capacitors - Union Carbide Corp.
Kemfuzer - chemical fuse - Bel Fuse
KEMPUR - inert gas purifiers - Kewaunee Scien. Equip. Corp.
Kenbrite - zinc plating bath - Conversion Chem. Corp.
Kencad - cadmium plating bath - Conversion Chem. Corp.
KENCOR - MAGNETIC DRUM MEMORIES - Kenton Engrg. Corp.
Ken-Rad - radio tubes - General Elec. Co.
Ken-Tel - telephone cables and wires - Okonite Co.
Kentrix - multimeter & meter line & its accs. - Uchida of America Corp.
Kenvert - sealers, acids, dry powders - Conversion Chem. Corp.
KEP - electrical impulse counters - Kessler-Ellis Prods.
KERN - lenses - Heitz, Inc., Karl
KeyNet - key to tape remote data entry - Honeywell Information Systems
Keyplex - disk to tape data entry - Honeywell Information Systems
Keytape - data entry - Honeywell Information Systems
K & H - speaker systems, equalizers - Gotham Audio Corp.
KIFIS - integrated flight instrument system - Kollsman Instr. Co.
Kilo-Pac - Power Supply - Velonex, Instrument Div.
Kilovac - relays & switches - Kilovac Corp.
KILOVOLT STAC - HIGH VOLTAGE SILICON RECTIFIER FOR OIL - Semtech Corp.
Kimfol - polycarbonate film - Schweitzer, Peter J. Div.

Kimfone - polysulphone film - Schweitzer, Peter J. Div.
Kinamatic - machines electric motors & generators - General Elec. Co.
Kinastrol - machines & controls - General Elec. Co.
Kine-Finish - roll-finishing dies - MPB Corp.
Kineform - roll forming dies - MPB Corp.
Kine-Miser - roll-roll-forming and roll-finishing attachments on turning machines - MPB Corp.
Kine-Roller - roll-forming and roll-finishing machines - MPB Corp.
King - floated rate integrated gyros - Singer Co.
Kingsley Wire-Marking Machines - marking machines - Kingsley Mach. Co.
Kink-Loc - lead formations - Radio Materials Co.
KINOPTIK - lenses for image intensifiers, scanners - Heitz, Inc., Karl
KINOPTIK - lenses, collimator - Heitz, Inc., Karl
Kintrac VII - kinetic rate monitoring instruments - Beckman Instrs., (AISSD)
KLEEN-STRIP - self-stripping foil-shielded cables - National Wire & Cable Corp.
Kleentack - contact cleaner - R-Columbia Products, Inc.
Klein-Buhrke - safety equip - Klein, Mathias & Sons, Inc.
Klein Chicago Grips - a grip to pull cables - Klein, Mathias & Sons, Inc.
Klein Haven Grips - a grip to pull cables - Klein, Mathias & Sons, Inc.
"Klein Kord" - Safety Straps - Klein, Mathias & Sons, Inc.
Klein Spee-D-Nut driver - nutdriver with revolving handle - Klein, Mathias & Sons, Inc.
Klein Speedriver - screwdriver with revolving head - Klein, Mathias & Sons, Inc.
Klipring - rings, retaining - Waldes Kohinoor, Inc.
KLIPSCHORN - loudspeaker system - Klipsch & Assocs. Inc.
Klip Sels - transient surge suppressors - International Rectifier Corp.
Klipsocket TM - lampholders - Chicago Switch, Inc.
"Kliptite" - push-on terminal tabs - Kulka Elec. Corp.
KLIXON - motor controls - Texas Instruments
K & N Level - zinc plating bath - Conversion Chem. Corp.
Knobpot - potentiometer - Bourns, Inc.
Kodacel - plastic film & sheet - Eastman Chem. Prods.
Contact 60 - aerosol contact cleaner - Jonard Industries Corp.
Kontakt-Chemie - sprays for electronic equipment - Regmo Data Corp.
Kontakt WL - degreaser-washer - Regmo Data Corp.
Kontakt 60 - contact cleaner - Regmo Data Corp.
Kontakt 61 - anti-corrosion lubricator - Regmo Data Corp.
Kon-Tork - Torque proportioning differentials - Allis-Chalmers
Kooler-Krown - heat dissipator - UNITRACK Div.
Korless Electrodes - edm electrodes - Uniform Tubes
Korvex - shrinkable tubing - Chemplast, Inc.
K-Pak - chips carrier - Motorola Semiconductor Prods.
K-Prene - urethane material - Di-Acro
Krak-Stik - sealant and pipe thread compound - Lake Chemical Co.
Kralastic - electroplating chem. - Uniroyal, Inc.
Kreco - communications antennas - Kreckman, Herb Co.
KRESKY-WARD - Furnaces - Zero Mfg. Co.
K-Set - magnetic tape head - Michigan Magnetics
KSR - capacitors - General Elec. Co.
Kwick-Konnect - connectors - Sealecort Corp.
Kwik-Way - water applied decals - Meyercoord Co.
Kyread - magnetic tape developer - Kyros Corp.

L

Labpot - potentiometers - Bourns, Inc.
La-Co - fluxes and sealing compounds - Lake Chemical Co.
La-Co Loc - plastic pipe cements - Lake Chemical Co.
Lakin - hickey - Thomas & Betts Co.
Lamitor - polyester fiberglass - NVF Co.
Lamplighter - photoelectric street lighting control - Cardinal Control Co.
Lamtac - connectors - Hypertronics Corp.
Lancelok - terminals - Amp Inc.
Landmark - high fidelity music system - Electro-Voice, Inc.
Landmark - music system - Electro-Voice, Inc.
LA SCALA - loudspeaker system - Klipsch & Assocs. Inc.
Lase-A-Lign - laser alignment autocollimator - Laser Inc.
Laserscribe® - automatic wafer scribe - Quantronix Corp.
Lasertrim® - resistor trimming system - Apollo Lasers Inc.
"Lastec" - wire saws, wire, polishing machines, sieve shakers - Laser Technology, Inc.

Laticrete - coatings, anti-static & conductive - Uniroyal, Inc.
Lauda - constant temperature circ - Brinkmann Instrs., Inc.
Lavalain - ceramic products - Star Porcelain Co.
LC - tuners - JFD Electronics Components Corp.
LCA - low coefficient of expansion adhesives - Bacon Inds.
Leak-Pruf - acid core solder - Alpha Metals, Inc.
LEAK-TEC - liquid leak detecting fluids - American Gas & Chemicals Co., Ltd.
Le Carbone - brushes & contacts - Carbone Lorraine Industries Corp.
Le Carbone-AD - batteries - Carbone Lorraine Industries Corp.
Lectro-AU-Lyte - acid type electroplating process of 80% gold and 20% nickel - Sel-Rex Co. Div. Oxy Metal Industries Corp.
LectroDuct - shielded electrical raceways - Lectro Magnetics, Inc.
Lectrofilm - capacitors - General Elec. Co.
Lectroless AU - electroless gold plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Lectro Line - RFI/EMI power line filters - Lectro Magnetics, Inc.
Lectro-Nic - nickel plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Lectro-Screen - durable, ductile nickel electroformed screens for thick film production - Sel-Rex Co. Div. Oxy Metal Industries Corp.
LectroShield - shielded room & cabinets - Lectro Magnetics, Inc.
LectroVent - shielded air ventilators - Lectro Magnetics, Inc.
L.E.D. - light emitting diode - Packaged Resins Div.
LED - light emitting diode castings sys. - Allaco Prods Div.
LEE-BUS - Bus Bars - Atlee Corp.
LEE-STRIP - Bus Strip - Atlee Corp.
LEE-TAC - Lam. Bus Bar Insulation - Atlee Corp.
Lektra/Lite - diffusion light source - Lektra Labs., Inc.
Lektron - sound lectern - PASO Sound Products Inc.
Lenscote - anti-reflection optical coating - Metavac, Inc.
Leonard - Trash rakes for intake of hydraulic turbines - Allis-Chalmers
Lepak - cap sealing equipment - Lepel High Frequency Labs.
Level-Tek - detection & control sys - Robertshaw Controls Co.
Level-Tel - detection & control sys - Robertshaw Controls Co.
Lav-o-Let - switches, outlets - Leviton Mfg. Co., Inc.
LEVOLIER - switches - McGill Mfg. Co. Inc.
Lev-o-Lock - plugs, connectors - Leviton Mfg. Co., Inc.
LEXAN - polycarbonate resin - General Elec.
LGH - high voltage lead - Amp Inc.
LID - leadless inverted device (micro-semiconductor) - Amperex Electronic Corp.
Life Term - terminals for RFI Filters - Filtron Company, Inc.
Light Conditioning TM - dimmer control - Leviton Mfg. Co., Inc.
LIGHT WATCHMAN - photoelectric controls - Ripley Co., Inc.
Limistor - linear thermistor - Keystone Carbon Co.
Limitamp - motor control - General Elec. Co.
LIMITRON - fast acting fuses - Bussmann Manufacturing
Limitstat - safety thermostat - Hotpack Corp.
Linamatic - book backlining machine - A. M. W. Corp.
LINC Tape - mini computer tape memory system - Computer Operations
LINE - Electro-Mechanical Relays - Line Electric Co. Unit Esterline Corp.
Linebusy - Telephone Comm. System Accessory - Phone-Aid Co.
Line-O-Lite - pilot lights - Industrial Devices
Line Radiator - loudspeaker - Electro-Voice, Inc.
Line Radiator - speaker system - Electro-Voice, Inc.
Line-Volt - voltage testers - Industrial Devices
Link-Lock - spring-lock shelf supports - Simmons Fastener Corp.
Linobate - lithium niobate - Crystal Technology
LiquiFlex - Adjustable speed drives (formerly Accutrol) - Allis-Chalmers
LIQUI-NOX - liquid manual detergent - Alconox Inc.
LIRA - infrared analyzer - Mine Safety Appliances Co.
Lite-Mike - light instrumentation - EG & G, Inc.
Lite-Mike - light meter - EG&G, Inc.
Lite-Panels - Drake Mfg. Co.
Lithocon - silicon storage tube - Princeton Elctn. Prods.
Littl "Multi-Switch" - "multi-switch" switches - Switchcraft, Inc.
Little Caesar - retention assembly - ITT Cannon Electric
Little Gem - drawers - Equipto
"Little Gem" - foot press - Sjoberg, C. & Son, Inc.
"Little Gem" - flat clips - Sjoberg, C. & Son, Inc.

Little Giant - patch & monitor modules - International Data Sciences
Little Giant - 1 watt microglass regulators - Centralab Semiconductor
"Little Joe" - tools - MacDonald & Co.
Live-Lock - structural panel fastener - Tridair Inds.
Lloyd - lampholders, fluorescent - Westmoreland Plastics Co.
LMB - Metal cabinets, etc. - Heeger Inc.
Load-Pak - solid-state controlling device - Gems Sensors Div.
Lo-Cate - tracking & positioning sys. - Beukers Labs., Inc.
Lockit-Socket - Integrated Circuit Sockets - U.S. Terminals
Locktite - connectors - Thomas & Betts Co.
Lo-Cog - d-c motors - Pittman Corp.
LOCOST - automated test systems - Julie Research Lab.
Loc-Trac - Zipper Tubing Track - Alpha Wire Corp.
Lo-Flo - fuel oil meters - Singer Co.
Logan - antenna - Instruments for Industry, Inc.
Logicator - electro magnetic readout - Bowmar Instr. Corp.
Logic Pen - logic probe - Advanced Digital Research
Logic Timer - digital timing instruments - Durgin & Brown, Inc.
LogiTran - educational computer - Fabri-Tek, Inc.
Lokon - locknuts - Allen Mfg. Co.
LOSCO COPPERBRITE - copper cleaner - London Chemical Co.
LOSCO SEALBRITE - solderable protective coating - London Chemical Co.
LOSCO SONIC-SOLE - degreasing & flux removal - London Chemical Co.
LOSCOTERGE - flux removal & cleaning & copper cleaner - London Chemical Co.
LONER - SOLDERING INSTRUMENT (IRON) - Edsyn, Inc.
Longhair - record brush - Stanton Magnetics, Inc.
Lorcap - ceramic discs and monolithic capacitors - Arco Electronics Inc.
Lo-Torque - low force limit switch - Denison, R.B., Inc.
Lo-Volt - voltage testers - Industrial Devices
Low-Head - Vibrating and gyratory screens - Allis-Chalmers
Low-Var - capacitors, fixed, ceramic - Republic Elctns. Corp.
Loxarmor - interlocked armor cables - Okonite Co.
Loxswitch - limit switch - Denison, R.B., Inc.
Lox Thermistor - thermistors - Victory Engrg. Corp.
LPB - lighted pushbutton switch - Unimax Switch Corp.
LPS ESA-100 - rust inhibitor lubricants - LPS Research Labs
LPS instant cold galvanize - rust inhibitor - LPS Research Labs
LPS instant contact cleaner - solvent degreaser - LPS Research Labs
LPS #1 - rust inhibitor lubricants - LPS Research Labs
LPS #2 - rust inhibitor lubricants - LPS Research Labs
LPS #3 - rust inhibitor lubricants - LPS Research Labs
LSHV - high voltage cables - Boston Insulated Wire & Cable Co.
LST - low skin temperature oven - Hotpack Corp.
Lubritrol - Mill lubrication system - Allis-Chalmers
Lug-It - lugs - Thomas & Betts Co.
Lumapac - inverter/ballasts - EWC, Inc.
LumenMeter - light instrumentation - EG & G, Inc.
Lumen Meter - light measuring instrument - EG&G, Inc.
Lumiten - light controlled attenuator - Fairchild Sound Equip.
Lustre-Zinc - zinc chromate plating - Titchener, E.H. & Co.
Lustrocolor, Mark III, IV & V - color TV picture tube - Westinghouse Elec. Corp.
Luxicon - light conduit - Dolan-Jenner Inds., Inc.
LX-CJ - self powered cold junction reference source - Omega Engrg., Inc.
LYREC - tape timers - Gotham Audio Corp.

M

MACHINE MINDERS - energy signature transducers - Macrodyne Inc.
MACO - a solid state programmable sequence logic control system - Barber-Colman Co.
Mac-16 - digital computer - Lockheed Elctns. Co.
Magacycler - frequency to voltage converter - Pioneer Magnetics
Magaverter - voltage to frequency converter - Pioneer Magnetics
MAGCENTRIC - magnetic bearings - Cambridge Thermionic Corp.
Magflo - bath magnetic stirrer - Hotpack Corp.
Magic Circle - Electronic Remote Control - A.R.F. Products
MAGIC SERIES - Airborne digital computers - Delco Electronics Div.

Magic tip - screw holding screw driver - Hunter Tools
MAGIC WAND - Electrostatic Neutralizers - Sticht Co., Inc. Herman H.
Magitran - wafer thin loudspeaker systems - Era Acoustics
MAGLOCK - magnetic proximity switches - NAMCO CONTROLS
MAG-MIX - magnetic stirrers - GCA/Precision Scientific
Magmod - magnetic modulator - General Magnetics
Magnacaps - low voltage capacitors - Radio Materials Co.
Magnacord - tape equipment - Telex Communications, Inc.
Magnapak - magnetostrictive spaced lamination transducers - Westinghouse Elec.
Magne-Press - small bench presses - Airmatic/Beckett-Harcum
MAGNAREED - Power Reed - Solid State Electronics Corp.
MAGNATORC - small dc motors - Hansen Mfg. Co.
Magnettrak - ultrasonic cleaning generator - Westinghouse Elec.
Magne-Weigh - dial indicator scales - Howe Richardson Scale Co.
Magneform - metal forming equip. - Maxwell Labs., Inc.
Magne-Gage - plating thickness gauge - American Instr. Co.
Magnetometrics - magnetic measuring instrumentation - Walker Scientific, Inc.
Magneseal - low magnetic flux densities - RFL Inds.
MAGNESIL - magnetic materials - Magnetics
Magnetic Tweezer - pick-up tool - Orbit Inds.
Magnetreater - de-magnetizer (variable) - RFL Inds.
Magnette - circuit breakers - Heinemann Elec. Co.
Magnion - laboratory magnet systems - Walker Scientific, Inc.
MAGNI-WHIRL - constant temperature baths - Blue M Electric Co.
Magnum&T - high current bridges - Unitrode Corp.
Magolite - lightweight insulating cement - Varian Assocs.
Magolite - insulating cement - Semicon Assoc., Inc.
MAGSENSE - voltage comparator - Pioneer Instrumentation
Magstrip - Terminal Strip - Magnum Elec. Corp.
Magswitch - magnet operated switch - Denison, R.B., Inc.
MAGTECH - d.c. tachometer generators, d. c. torque & servo motors - Magnetic Technology
Magterm - Independent Perimeter Terminals - Magnum Elec. Corp.
Major - fan - Rotron, Inc.
M. A. Miller - replacement phonograph stylii - Pageant/M.A. Miller Co.
Manchex - batteries - Exide Power Sys. Div.
Manix Mfrg - production equip. pliers - Mann, Henry Inc.
Manson - friction tape - Okonite Co.
Manumatic - leak detector - Varian Assocs.
MARK - microwave antennas - Anixter-Mark
Markal Ball Point Marker - industrial marker - Markal Co.
Markal Dura-Ink & Sharpie - felt tip markers - Markal Co.
Markal Paintstik - paintstik markers (industrial paint in stick form) - Markal Co.
Markal Paper Riter - felt tip pen - Markal Co.
Markal Protective Coating - coating compounds - Markal Co.
Markal Protective Coating - protective coatings - Markal Co.
Markal Slic-Tite with "Teflon" - 4 thread sealants (stick, paste, tape, packing) - Markal Co.
Markal Thermomelt - temperature indicators crayons - Markal Co.
Markal Thermomelt - temperature indicators - Markal Co.
Mark "C" - switches - Cole Instrument Corp.
Mark-El - parts marking service - Acme Model Engrg. Co.
Markette I - flexible disk - Memorex Corp.
MARK I - wave solder mach. - Tech. Devices Co.
MARK II - wire cutter & stripper - Tech. Devices Co.
MARK III - circuit card fixture - Tech. Devices Co.
Mark III - Alpha Numeric Printer - Gulton Inds., Inc.
Mark IV - single cable 5-300 MHz hybrid, integrated push-pull line of solid state 2-way CATV equip - AEL Communications Corp., Sub. of Amer. Elctn. Labs. Inc.
Mark IV Hammer - impact printing mechanism - Dataproducts Corp.
Mark IX - comp. lead trimmer - Tech. Devices Co.
Markman - Temperature Recorders - Gulton Inds., Inc.
Mark Ten & Mark Ten "B" - Electronic Ignition Systems - Delta Products

Mark V - dual cable, hybrid, integrated push-pull 5-300 MHz line of solid state 2-way CATV equip - AEL Communications Corp., Sub. of Amer. Elctn. Labs. Inc.
MARK V - component lead former - Tech. Devices Co.
Mark X - disc packs - Memorex Corp.
MARLOX - metal sheathed thermocouples - Marlin Manufacturing Corp.
Marquis - loudspeaker, enclosures - Electro-Voice, Inc.
Martech - extruded & molded bio-medical prods. - Markel, L. Frank & Sons
Marz R - metals purity grade - Materials Resch. Corp.
MASKCOAT - Plating Stop-off - Western Coating Co.
Masq-Matic - automatic plating sys. for continuous strip IC lead frame plating - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Masterline - matv equipment - Blonder-Tongue Labs., Inc.
MASTER-MITE - flameless heat gun - Master Appliance Corp.
Master Power - vehicle power converter - Techsonics
Mat-N-Lok - connectors - Amp Inc.
Metri Dot - Printers - Practical Automation, Inc.
Metrix IV - Electronic Cabinetry - Zero Mfg. Co.
Max-C - piston trimmer capacitors - JFD Electronics Components Corp.
Maxel V and VII - Pumps - Allis-Chalmers
Maxi-Color R - Shielded TV Lead-In Wire - Belden Corp.
Maxipak - closed circuit TV systems - Audiotronics
Maxi Power - vehicle power converter - Techsonics
MAXI-"Q"UBETM - Case B 110 mil chip capacitor - American Technical Ceramics
MazeMaster - Wiring Aide - Addison Div. Muirhead, Inc.
McCully - Crushers and other minerals processing machinery - Allis-Chalmers
M.C. Jones - microwave devices - Bendix
M.C.M. - dow inertia moving coil motors - Electro-Craft Corp.
MC (MC5000) - Digital High Speed Printers - Datalog Div., Litton Sys.
McMOS - complementary MOS logic IC's - Motorola Semiconductor Prods.
MCRT - torque meters & rotary transformers - S. Himmelstein & Co.
MCSIM - Microcontroller simulator - Scientific Micro Sys.
M DAC - miniature digital-to-analog convertor - Analog Devices
MDTL - diode-transistor logic IC's - Motorola Semiconductor Prods.
Measure-Matic - positive displacement pumps - Airmatic/Beckett-Harcum
MEC - custom wire processing - Manger Elec. Co., Inc.
MECL - emitter-coupled logic IC's - Motorola Semiconductor Prods.
MECL 10,000 - emitter-coupled logic IC's - Motorola Semiconductor Prods.
Mecl/221 - electronic calculators - Victor Comptometer Corp.
Mecl/223 - electronic calculators - Victor Comptometer Corp.
Mecl/224 - electronic calculators - Victor Comptometer Corp.
Mecl/225 - electronic calculators - Victor Comptometer Corp.
Medallion - car sound, accessories, tools - Midland International Corp.
MEDI-SAFE - Low Leakage Medical Cable - Brand-Rex Co.
Mega-Bias - duplicating equip. & access. - International Electro-Magnetics
Megaflex - tubing, fluorocarbon, flexible - Co-Operative Inds., Inc.
Meg-A-Life II - device and program - Motorola Semiconductor Prods.
Megamemory - large scale memory system - Electronic Memories & Magnetics Corp.
Megason - ultrasonic cleaners, vapor degreasers - Ultrasonic Instrs. Int'l, Inc.
MegaSorb - pumps - Varian Assocs.
Megatrometer - high megohm meter - Penn Airborne Prods.
Megavoice - power megaphone - PASO Sound Products Inc.
MEG-CHEK - megohmmeters - Associated Research, Inc.
Megeer - insulation, continuity, earth test instrs. - Biddle, James G.
Megmeter - megohm indicator, insulation tester - Ross Engineering Corp.
MEGOHMER - Insulation Testers - Sticht Co., Inc. Herman H.
Mektherm - Heater circuits - Rogers Corp.
Mektron - Printed circuitry - Rogers Corp.
Melacel - cellulose fiber - Pall Trinity Micro Corp.
Melcor - thermoelectric cooling module - Melcor-Materials Elctn. Prods.

Meldin - polyimide molded shapes and parts - Dixon Corp.
Memotron - direct view storage tube - Hughes Aircraft Co.
Memotron - direct view storage tube - Hughes Aircraft Co.
Mentor - multimeters, limit testers, ratio trim/test instrs. - Biddle, James G.
Mercutron - keyboard switch module - Mechanical Enterprises, Inc.
Mercutronic Keyboard - computer terminal keyboard - Mechanical Enterprises, Inc.
Merix Anti-Static for Records - LP records & electronic cleaner - Merix Chem. Co.
Merlon R - polycarbonate - Mobay Chem. Corporation
Mesa - modular semiconductor equipment - Allied Chemical Corp.
Messagefax - transmission of typed or handwritten material - Datalog Div., Litton Sys.
Metalex - shielded frames - Cal-Metex Corp.
Metal Glaze R - cermet element - TRW/IRC Potentiometers
Metal Glaze TM - thick film resistors-proprietary system - TRW/IRC Resistors
Metalonics - cathodes, dispenser, - Philips Elmet Corp.
Metanet - thick-film resistors - Sprague Elec. Co.
Meta 4[®] - computer systems - Digital Scientific
Met-Bel - vacuum/compressor pumps - Metal Bellows Corp.
Met Coil - multilayer ceramic inductors - Metalized Ceramics
Metfilm - metalized film dielectric capacitors - Sprague Elec. Co.
Met Gold - selective gold plating - Metalized Ceramics
Met-Loc - all metal self locking thread system - Deutsch Fastener Corp.
METOXILITE - HIGH TEMP. BONDED SILICON RECTIFIER - Semtech Corp.
Met Pac - low cost packaging - Metalized Ceramics
Metracorder - magnetic tape recorder (ASC11) - Metra Instruments, Inc.
Metralarm - high speed digital data display & alarm - Metra Instruments, Inc.
Metralogger - data & alarm printer - Metra Instruments, Inc.
Metrascope - bargraph CRT data acquisition display - Metra Instruments, Inc.
Metri-Gap - measuring gages - Lion Precision Corp.
Metron pH Meter - low cost pH meter - Coleman Instr. Div.
Metro Basket - wire material handling baskets - Metropolitan Wire Corp.
Metrobeam - construction laser - Metrologic Instruments, Inc.
"Metro-Coat" - solder coat process - Metropolitan Circuits Inc.
Metrohm - polarograph - Brinkmann Instrs., Inc.
Metso - sodium metasilicate - Philadelphia Quartz Co.
MEZZER - electronic measuring instruments - Castle TV Tuner Service, Inc.
Me-2 - dual-in-line sockets - Scanbe Canoga Industries
MF - Drake Mfg. Co.
MHTL - high-threshold logic IC's - Motorola Semiconductor Prods.
Mica and Indomica - insulation and parts - Industrial Mica Div.
Micacled - insulation - Electric Machinery Mfg. Co.
Mica Mat - mica paper reconstituted mica - General Elec.
MIC amp R Modules - Thin Film Unit Amplifier - Avantek, Inc.
"Micanite" - micaceous materials - 3M Co.
Micapak - multilayer lamination service - Mica Corporation
Micaply - high pressure laminates - Mica Corporation
Micatemp - high temperature wire - Cerro Wire & Cable Co.
Michigan - loudspeakers - Electro-Voice, Inc.
MICLAD - Electrical insulation - Allis-Chalmers
Mic-Pac - hi freq hi power transistor package - Microwave Semiconductor Corp.
Micro-Acoustic - audio equalizer - Frazier, Inc.
Micro Bead - thermistor - Victory Engrg. Corp.
Microceram - microminiature ceramic fixed capacitors - JFD Electronics Components Corp.
MICROCHOPPER - Solid State Chopper - Solid State Electronics Corp.
MICROCLAREED - switching assemblies - Clare & Co., C.P.
Micro-Clean - pc board in-line cleaner - Hollis Engrg., Inc.
MicroCoax - miniature semiridge coaxial cable - Uniform Tubes
Microcom - telemetry commutator - General Devices, Inc.
MicroController - bipolar microcomputer - Scientific Micro Sys.
Microdata 1600 - computer - Microdata Corp.

Microdata 32/S - computer - Microdata Corp.
Microdata 3200 - computer - Microdata Corp.
Microdata 400/10 - computer - Microdata Corp.
Microdata 800 - computer - Microdata Corp.
Microdial - digital & concentric dials - Amphenol Connector Div., Controls Oper.
Microflash - flash equipment - EG&G, Inc.
Microflexor - reflectors - Microflex Co.
MICROFLEX - timers counters - Eagle Signal
Microfork - tuning fork - Murata Corporation of America
Microfuse - miniature fuses - Littelfuse, Inc.
MICRO-GAP - replacement speakers - Utah Electronic Div.
Micro-gator - Clips - Mueller Electric Co.
Microhex - connectors - Sealectro Corp.
Micro i - miniature inductors - Delevan Div., Coil Prods.
Microlet - microminiature eyelet - Circon Corp.
Microloss - microwave absorbent material - Coax Devices Inc.
Micro-Master - microfilm equipment - Keuffel & Esser Co.
Micro Match - monitoring & test equip. - Bendix
Micromatic - polyester & polypropylene film capacitors (axial lead), self encased - Paktron Div.
Micro-Minac - digital computers - Singer Co.
Microminim - Flexible miniature cables - Standard Wire & Cable Co.
Micro-Optic - fiber optic controls - Dolan-Jenner Inds., Inc.
Micropac modules - process interface hardware for micro mini, maxi computers - PCS., Inc.
Micropac OEM - microcomputer based control system for the high volume OEM - PCS., Inc.
Micropac RT - remote multiplexer for computers - PCS., Inc.
Micropac 80 - microcomputer development system - PCS., Inc.
Micropak - closed circuit TV systems - Audiotronics
Micropin - contact - ITT Cannon Electric
Micropix - cathode ray tubes - Litton Inds.
Micro-Plug - phone plugs - Switchcraft, Inc.
Micropot - precision & trimming potentiometers - Amphenol Connector Div., Controls Oper.
MicroProbe - elec. test instr. - Circon Corp.
Microram - semiconductor memory - Electronic Memories & Magnetics Corp.
MICRORED - Microminiature Reed Relay - Solid State Electronics Corp.
Micro Sentry - voltage relay - Magnetics, Div. of Spang Industries, Inc.
Microsocket - contact - ITT Cannon Electric
Microsource - power supply - Elasco
Microspec - infrared spectrophotometer - Beckman Instrs., (AISDD)
MICROSTAR - Laboratory Microscope - American Optical Corp.
Microstrate - laminates - National Beryllia Corp.
Micro-Synclamps - sub-min. servo clamps - Timber-Top, Inc.
Micro-T - miniature package (transistors) - Motorola Semiconductor Prods.
Microtech - flexible waveguides - Waveline, Inc.
Microtel - microwave radio - GTE Lenkurt Inc.
MICROTEMP - Thermal Cutoff - Micro Devices Corp.
MICROTEMP MULTIPROTECTOR - SENSES HEAT-CURRENT - Micro Devices Corp.
Microthik - keyboards - Refac Elctns/Wild Rover
MicroTool - small hand tools - Circon Corp.
Microtransmitter - monolithic radio transmitter (1C) - Lithic Systems, Inc.
Microtron - cooking tubes - Litton Inds.
Micro-Vectorbord - Small Hole Perforated Insulating Board - Vector Electronic Co., Inc.
Micro Video - television microscope sys. - Circon Corp.
Micro Video Metrology - television microscopic measuring sys. - Circon Corp.
Micro-Well - ink rollers - Mohawk OEM Sales
Microzone - electrophoresis apparatus - Beckman Instrs., (AISDD)
MIDA - miniature integral diode assemblies - Motorola Semiconductor Prods.
MIDGET - modular integrated digital tester - PRD Elctns., Inc.
Midgi-Coder - bod to numeric decoder/driver - Refac Elctns./Pinlites
Midgi-Counter - decode counter, encoder - Refac Elctns./Pinlites
Midgi-Dial - dial assy. - Theta Instr. Corp.
Midgi-Lite - digital readout - Refac Elctns./Pinlites
Midgi-Wedg - Drake Mfg. Co.
Midland - communication, home entertainment - Midland International Corp.
Midway - wall plates - Leviton Mfg. Co., Inc.
Mil-Clamp - coaxial connector cable attachment - Amphenol RF Div.
Mil-Crimp - coaxial connector cable attachment - Amphenol RF Div.

Mil-E-Store - military core memory system - Dataproducts Corp.
Milk-Trol - ambient-compensated temperature controllers - Honeywell
Milliken - high-speed cameras (16 mm) - Teledyne Camera Sys.
MILLISEC - Ultra High Speed Relays - Stevens-Arnold, Inc.
Milli-Torr - ionization gauge - Varian Assocs.
Mil-Loc - mil-st stressed panel fastener - Deutsch Fastener Corp.
MilMaster - electronic micrometers - Electron-Machine Corp.
Milros - mildly activated rosin flux - Alpha Metals, Inc.
Milwaukee Wrot - washers & stampings - Wrought Washer Mfg., Inc.
Mina - ball bearings - MPB Corp.
Mina-Gear - gear-motors - General Elec. Co.
Minapac - plastic bearing retainers - MPB Corp.
Minapure - lubricant - MPB Corp.
Mineac - miniature electronic auto collimator - Barnes Engrg. Co.
Mineon - Drake Mfg. Co.
MineSpot - lighting system - Mine Safety Appliances Co.
Miniature - Relay Socket - DAN-L Inc.
Mini-Aud - audio power amplifier - Dynair Elctns. Inc.
Mini-Bal - balanced amplifier - Dynair Elctns. Inc.
MINI BEE - Video Audio Tape Motor - Hurst Mfg. Corp.
Minibreaker - small circuit protectors - Aiken Industries
Minibridge - silicon rectifier - Elctn. Devices
Mini/Bus - Electrical power distribution systems - Rogers Corp.
MINIBUTTON - digital (thumbwheel) switches - Digitran Co.
Minicam - camera - CBS Laboratories
Mini-Cator - indicator lights - Industrial Devices
MINI-CONSOLE - small plastic instrument enclosure - Techmar Corp.
mini-cubeR - Case A 55 mil chip capacitor - American Technical Ceramics
Mini-Dap - pulse DA - Dynair Elctns. Inc.
Mini-Dav - video DA - Dynair Elctns. Inc.
Mini-Davs - syne-mixing video DA - Dynair Elctns. Inc.
Mini-Dial - dial assy. - Theta Instr. Corp.
Minidisc Package - impatt diodes - Hughes Aircraft Co.
Mini-Fade - 2-input video fader - Dynair Elctns. Inc.
MINIform - coaxial RF switches - Amphenol RF Div.
Mini-gator - Clips - Mueller Electric Co.
MINI-GUN - heat tool - Raychem Corp.
Minilamp - miniature indicator lights - Int'l. Prods. Inc.
MINILEVER - digital (thumbwheel) switches - Digitran Co.
Miniload - Miniature RF Loads - Bird Electronic Corp.
MINILOK - terminal blocks - Burndy Corporation
Mini-Matrix - plugboard switch - NES, Inc.
Mini-mike TM - Miniature slide switches - Chicago Switch, Inc.
MINI-MISER - low-cost stepping motor - Ldex Inc.
Mini Mite - portable potentiometer - Thermo Elec. Co., Inc.
Mini-Mix - mixers, adapters, audio accessories - Switchcraft, Inc.
Mini-Mod - audio-video modulator - Dynair Elctns. Inc.
Mini-Monitor - Miniature RF Wattmeters - Bird Electronic Corp.
Mini-Mop - video cable equalizer - Dynair Elctns. Inc.
"Mini-Mounts" - a sys. for prototype circuit assembly (breadboarding) - Christiansen Radio Inc.
Mini-Mov - metal oxide varistor - General Elec. Co.
MiniOhm - miniature resistors - General Resistance, Inc.
Minipak - soldering equip. - Electrovert
Mini-Pre - audio pre-amplifier - Dynair Elctns. Inc.
Miniprogrammer - programming switches - Cole Instrument Corp.
Mini-Reader - portable rh-temp indicator - American Instr. Co.
MINIREED - Miniature Reed Relay - Solid State Electronics Corp.
Mini-Rote - rotary commutator - Airflyte Elctns. Co.
MiniSat - low VCE (sat) transistor - PowerTech, Inc.
Mini Sentry - infrared intrusion detector - Laser Systems Corp.
Mini-Seq. - sequential switcher - Dynair Elctns. Inc.
Minisort - miniature p.c. socket - Berg Electronics
Miniservo - Compact Lab Recorder - Esterline Angus
Mini-Slide - pilot lights & sockets - Industrial Devices
Minisource - power supply - Elasco
Mini-Split - special effects generator - Dynair Elctns. Inc.
Mini-Spot - Screen Brightness Meter - Photo Research Corp.
MINISTAC - SUB-MINIATURE HIGH VOLTAGE - Semtech Corp.
MINISTIC - SUB-MINIATURE SILICON RECTIFIER - Semtech Corp.
Mini-Store - commercial core memory system - Dataproducts Corp.

MINISWITCH - digital (thumbwheel) switches - Digitran Co.
Mini-Syncclamps - min. servo clamps - Timber-Top, Inc.
Mini-System - digital strain recorder - B & F Instrs., Inc.
Mini T - subminiature 5 amp general purpose relay - Teledyne Relays
Minitac - connectors - Hypertronics Corp.
Minicure - epoxy adhesive - Packaged Resins Div.
Minicure - epoxy adhesive - Allaco Prods Div.
Mini-Test - continuity tester - Industrial Devices
Minithin - thin wall teflon wire - Thermax Wire Corp.
Minitron - hermetically sealed miniature inverter - Nova Electric Mfg. Co.
Mini-Twister - wire twisting device - Storm Products Co.
Miniverter - miniaturized frequency changers/inverters - Nova Electric Mfg. Co.
Mini-Volt - voltage testers - Industrial Devices
Mini-Wedge - pilot lights & sockets - Industrial Devices
Mini-3 - 3 input video switcher - Dynair Elctns. Inc.
Mini-6 - video switcher - Dynair Elctns. Inc.
MIN-KAPS - ceramic capacitors - Centralab
Minnie - connector - Amphenol Connector Div.
Mirr-Maid - mirror pictures - Thin Film Services
Mirropane R - transparent mirrors - Libbey Owens-Ford Co.
Misco Redline - replacement & specialty speakers - Minneapolis Speaker Co.
Miser - micropower led flasher (1C) - Lithic Systems, Inc.
Missalite - Rectangular Annunciator Light - Illuminated Products Inc.
Mix-Kit - package device for 2-part compounds - Hardman Inc.
MKS Baratron - pressure-vacuum meter - MKS Instrs., Inc.
MLC - multilayer monolithic capacitor - Radio Materials Co.
MMOS - MOS logic IC's - Motorola Semiconductor Prods.
Mobilaxm - back-up alarms - Midwest Electronic Industries
Mobilflash - alternating flasher - Midwest Electronic Industries
Mobilfone R - radio communication equip. - Mobil Electronics, Inc.
Mobilite - L.V. lights - Midwest Electronic Industries
Mobilmatic - remote control - Mobil Electronics, Inc.
Mobilpage - business sound system - Midwest Electronic Industries
Mobiltel - mobile telephone equipment - GTE Lenkurt Inc.
Mobiltemp - remote temp. indicator - Midwest Electronic Industries
Mobiltone R - tone signalling equip. - Mobil Electronics, Inc.
Model AP - Tape/Ticket Printer - ITT General Controls
Model D Decade - digital printer - ITT General Controls
MODEL T - Sync Instrument Motor - Hurst Mfg. Corp.
Model UP - Universal Ticket Printer - ITT General Controls
Modems - medium and high speed data sets - International Communications
Modpak - closed circuit TV systems - Audiotronics
Modscan - data acquisition & control systems - LFE Control Systems Industries
Moducal® - lightweight fiberglass panels - SGL Graphics
Mod-U-Card - modular plug-in circuit cards - NES, Inc.
Modulair - cabinet panel - Rotron, Inc.
Module-Masq - semi-automatic selective gold plating sys. for sheet & strip. - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Module-Matic - tape controlled plating sys. - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Module-X - modular plating equip. - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Moduline - gas chromatography instruments - Varian Assocs.
Moduline - gas chromatographs - Varian Assocs.
Moduline - rotary switches - Oak Inds. Inc.
Modulite® - sign panels and displays - SGL Graphics
Modul/Matic - color analyzer - Lektra Labs., Inc.
Moduload - RF Loads with integral heat exchangers - Bird Electronic Corp.
MODULOK - terminal blocks - Burndy Corporation
Modu-Mount Cabinetry - electronic enclosures - Honeywell Inc.
Modupac - modular logic circuits - Analogic Corp.
MODUPANEL - rack adapter systems for modular supplies - Syston Donner Trygon Div.
Moduprint - printers - Practical Automation, Inc.
Modutrim - microminiature ceramic variable capacitors - JFD Electronics Components Corp.
MOISTURPUMP - industrial dehumidifiers - Electro Impulse
MOLALLOY - solid lubricant components - Pure Carbon Co., Inc.
Molan - computer control language - Harrel, Inc.

"Mold-Ease Conc. Per" - mold lubricant - Merix Chem. Co.
Molded Heat - molded to shape electrical heater - Sierracin/Thermal Sys.
"Molded-On" - cable end molding - Barker Prods. Co.
Molgard - mold release agent - Ram Chems.
Moli-Spray - Lubricants, molybdenum disulfide aerosol - Rogers Corp.
Molydag - dry film lubricants - Acheson Colloids Co.
Molyspray - molybdenum metallizing wire - Philips Elmet Corp.
Monastrip EP - epoxy stripper - Mona Inds., Inc.
Mono AD - I.C. A/D converter - Precision Monolithics Inc.
Monobeam - infrared analyzers - Beckman Instrs., (AISSD)
Monobloc - Monolithic ceramic capacitors - Erie Technological Products
Monobond - epoxy adhesive - Allaco Prods Div.
Monobond - epoxy adhesive - Packaged Resins Div.
Monoceram - monolithic type ceramic capacitor - San Fernando Elec. Mfg.
Monochip - custom integrated circuit - Interdesign Inc.
Mono CMP - monolithic comparator - Precision Monolithics Inc.
Mono DAC - monolithic D/A converter - Precision Monolithics Inc.
MONO-KAP - ceramic capacitor - Centralab
MONO-KAP TM - ceramic capacitors - USCC/Centralab, Elec. Div.
Monolithic - switch arrays - Refac Elctns/Wild Rover
Mono OP - monolithic operational amplifier - Precision Monolithics Inc.
"Mono-Pole" - steel antenna supporting mast structures - Telrax Labs.
Monopoxy - single-component epoxy resin adhesive - Hardman Inc.
Monoxor - Carbon Monoxide Detector & Indicator - Bacharach Instrument Co.
Monsanto - Electronic Test and Measurement Equipment - United Systems
Moody - hand tools - Moody Tools, Inc.
Moody Kit - tool sets - Moody Tools, Inc.
MoON-X - high perfection silicon - Monsanto
Mother Trucker - Truck Antenna - Hy-Gain Electronics Corp.
Motogard - motor overtemperature protection system - Power Control Corp.
Motomatic - motor & speed controls - Electro-Craft Corp.
Motopulse - rotary solenoid - Barber Corp.
Mototrol - pressure operated control - Autocon Inds., Inc.
Mounty - hand lamps - Teledyne Big Beam
MPC - precision coaxial connectors - Maury Microwave Corp.
MPF - precision waveguide flanges - Maury Microwave Corp.
MP-System 1000 - modular instrumentation system - McKee-Pedersen Instrs.
Mr. Battery - custom battery designs - Power, Inc.
MRTL - resistor-transistor logic IC's - Motorola Semiconductor Prods.
MSP - miniature surge protector - Joslyn Elctrn. Sys.
MTLC - ultraminiature tuners - JFD Electronics Components Corp.
MTM - magnetic tape memory - Raymond Engrg. Inc.
MTNS - metal thick nitride semiconductor - General Instr. Corp.
MTOS - metal thick oxide semiconductor - General Instr. Corp.
MTTL - transistor-transistor logic IC's - Motorola Semiconductor Prods.
Mu-Caps - capacitors, fixed, ceramic - Republic Elctns. Corp.
Mucon - capacitors, fixed, ceramic - Republic Elctns. Corp.
Muffin - fan - Rotron, Inc.
Muffle Module - sound enclosure - Automation Devices, Inc.
Multibit - multi state core for memory applications - Electronic Memories & Magnetics Corp.
Multi-Cell II - silicon high-current rectifiers - Motorola Semiconductor Prods.
Multi-CJ - multi calibration cold junction reference source - Omega Engrg., Inc.
Multi-Coax - coaxial contacts - Amphenol RF Div.
Multicore - solder & chemicals - Multicore Solders
Multidex - rotary switches - Oak Inds. Inc.
Multidial - Turns Counting Dial - Spectrol Electronics Corp.
Multiductor - tripple frequency convertor - Ajax Magnethermic Corp.
Multiflash - flash equipment - EG&G, Inc.
Multiform - glass and glass-ceramic preforms & spacers - Corning Glass Works, Television Prods. Div.
Multimemory - semiconductor memory system - Electronic Memories & Magnetics Corp.

Multi Mite - portable potentiometer - Thermo Elec. Co., Inc.
Multi-Mode Tonotron - direct view storage tube - Hughes Aircraft Co.
Multi-Mode Tonotron - direct view storage tube - Hughes Aircraft Co.
Multi-Pac - Power Supply - Velonex, Instrument Div.
Multi-Pac R - multiple PC boards, sandwiched - Elfab Corp.
Multipak - powder compacting presses - Pentronix
Multipak - closed circuit TV systems - Audiotronics
Multiple Microflash - flash equipment - EG&G, Inc.
Multiplex - Paper making machinery - Allis-Chalmers
Multi-Printer - digital printer - ITT General Controls
Multi-Swage - swaged electronic components - Bead Elctns.
Multi-Switch - "multi-switch" switches - Switchcraft, Inc.
Multitayn - encoder - Del Electronics Corp.
Multitron - gamma radiography machines - Automation Inds.
Multewire - circuit board - Photocircuits Div., Kollmorgen Corp.
Multizone R - zone melting apparatus - Materials Resch. Corp.
Musicastrer - speaker system - Electro-Voice, Inc.
Musicastrer - loudspeaker - Electro-Voice, Inc.
Muxpac&T - Ultra high impedance 8-channel multiplexer - Analogic Corp.
MVM - air variable - JFD Electronics Components Corp.
mW MRTL - resistor-transistor logic IC's - Motorola Semiconductor Prods.
Mycro Z - polished silicon wafers - Siltec Corp.
Mkroy - glass bonded mica - Synthene Taylor Corp.
M2 - memory module - MI2 Data Systems Inc.

N

NAFOAM - low-capacity instrumentation cables - National Wire & Cable Corp.
NAFOIL - Foil-shielded cables - National Wire & Cable Corp.
Namograph - marking machines - Kingsley Mach. Co.
Nanaline - delay line fixed - Bel Fuse
Nanistor - high speed resistors - General Resistance, Inc.
Nanocom - telemetry commutator - General Devices, Inc.
Nanohex - connectors - Sealectro Corp.
Nanologic - data acquisition and timing system - Chronetics, Inc.
Nanomemory - Core memory system - Electronic Memories & Magnetics Corp.
Nanos - fan - Rotron, Inc.
Nano-Skan - reflective scanner - Skan-A-Matic Corp.
Narrow-Caps - capacitors, fixed, ceramic - Republic Elctns. Corp.
Natite - industrial ceramic materials - Nat'l Ceramic Co.
Navtrak - navigation systems - Edo Western Corp.
NCG - oxy fuel gas welding apparatus - Chemetron Corp.
Needle Finder - needle merchandiser - Ev-Game Inc.
Neg'ator - constant force spring - Ametek, Hunter Spring Division
NELWELD - equipment - Nelson Stud Welding TRW Inc.
NEOFLEX - Neoprene insulated welding cable - CCS Hatfield Wire & Cable Group
Neptune - San Fernando Elec. Mfg.
NETIC - magnetic shielding material - Perfection Mica Co.
Neumann - condenser microphones, disk cutting equip., rumble meters, phase correlation meters - Gotham Audio Corp.
Neuralite - Device for voltage regulators - Allis-Chalmers
Neutronex - neutral noncyanide gold electroplating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Newdamp - balancing fluid - Bacon Inds.
New Easy - cutting machine - Porter, H.K., Inc.
Newtron - digital readout tube - Apollo Corp.
N-GAS - special mixture for chemical vapor deposition of silicon nitride. - Matheson Gas Products
Nial - thermocouple alloy - GTE Sylvania Inc.
Nicad - nickel cadmium Bottaur - Gould, Inc.
Nickelply - steel wire (nickel-coated) - Nat'l-Standard Co.
Nicoro - brazing alloys - Gte Sylvania, Inc.
Nicoro 80 - brazing alloys - Gte Sylvania, Inc.
Nicuel 3 - brazing alloys - Gte Sylvania, Inc.
Night Lark - power failure lights - Teledyne Big Beam
NiGuard - Ceramic Capacitor - AVX Ceramics
NIMO R - 10 & 64 gun CRT - Industrial Elctrn. Engrs.
Nimpac - Power Supply - Velonex, Instrument Div.
90° Sweep - sweep right angle TNC, N & SMA, SC - Astrolab, Inc.
Nloro - brazing alloys - Gte Sylvania, Inc.

Niromet - controlled expansion alloy - GTE Sylvania Inc.
Niron - controlled expansion alloy - GTE Sylvania Inc.
NI Span C Alloy 902 - temperature compensated material - Engelhard Minerals & Chem.
Nitrophyl - Cellular hard rubber floats - Rogers Corp.
Nitrox - reactor system - Applied Materials Inc.
Nixie R - indicator tube - Burroughs Corp.
Nixox - catalyst chamber - Air Prods. & Chems., Inc.
Noala - automatic noise level adjuster - Altec Div.
No Arc - hi voltage insulator - Chemtronics, Inc.
Nobex - components - NOBEX Div.
NoBrush - permanent magnet converters, frequency-generators, & alternators - Georator Corporation
Noisefoe - ear muffs - Mine Safety Appliances Co.
Nokorode - soldering flux - Dunton, M.W. Co.
Nomad - portable cases - B & F Instrs., Inc.
No-Mar - special set screw - PIC Design Division
No-Nik - wire stripper - Clauss Cutlery Co.
Nontact - non-contact temperature sensor - Trans-Met Engrg.
Norac - non-rotating armored cable - Boston Insulated Wire & Cable Co.
Norbatherm - temperature controller - Cross Electronics Inc.
Nordic - high density connector - Viking Inds., Inc.
Normatic - solid state welder control - Square D Co.
Normatyp - drytransfer lettering - Keuffel & Esser Co.
Norpak - solid state logic control - Square D Co.
NORPLEX - Industrial Laminated Thermosetting Plastics - Norplex Div.
Norseman - hand tools - Erikson Specialized Tool Co.
Norsman - wire wrap connector - Viking Inds., Inc.
North Seeker - gyro/repeater sys. - Humphrey, Inc.
Noryl - thermoplastic resin - General Elec.
Noryl Resins - phenylene oxide based resins - General Elec.
No-Slip - positive drive belt - PIC Design Division
No-Til - Planters - Allis-Chalmers
Novacon - DC to DC converter - Nova Electric Mfg. Co.
Novadisc - fixed-head disc - Data General Corp.
Novaerter - frequency changers/inverters - Nova Electric Mfg. Co.
NOVA-1200, 1210, 1220, 800, 820, 840, 2, 830 - computers - Data General Corp.
N-S Rocket Wire - high-tensile wire - Nat'l-Standard Co.
Nu Blac - ceramic products - Star Porcelain Co.
Nucor - power components - NUCOR Corp.
Nurl-Loc - Terminals, wire-wrap panels, sockets, test jacks - Richardson
Nutsert - insert fasteners - Avibank Mfg. Inc.
Nybar - barrier film - Nye, William F., Inc.
Nyctact - electrical contact lubricant - Nye, William F., Inc.
NYFAB - Nylon monofilament fabric - Wire Cloth Enterprises, Inc.
NyGrip - Nylon Cable Clamp - Weckesser Co. Inc.
Nylafil - fiberglass reinforced nylon - Fiberfil Div. Dart Ind.
NYLET - terminal bushings - Heyman Mfg. Co.
Nylobond - connectors - Amp Inc.
NYLOCLIP - nylon cable clip - Burndy Corporation
Nylode - talc reinforced nylon - Fiberfil Div. Dart Ind.
Nylox - adhesive composition for nylon, etc. - Hardman Inc.
Nyloy - rod ends with ball bearings - MPB Corp.
Nystagmotrac - optical stimulator - Beckman Instrs., (AISSD)
NYTYE - wire & cable ties - Heyman Mfg. Co.
N-4 - zirconium copper alloy - Nippert Co.

O

Observer - cctv cameras - Blonder-Tongue Labs., Inc.
Odin - edgeboard connector - Viking Inds., Inc.
O-GAS - special mixture for chemical vapor deposition of silicon dioxide - Matheson Gas Products
OHFST - clear fused quartz - Amersil, Inc.
Ohiohm - resistors - Ohio Carbon Co.
Omega - conductor-resistor laminates - Mica Corporation
Ohm-Free 1035 - thick film conductor ink - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Ohmpath - thick film resistive inks - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Oiladg - lubricant - Acheson Colloids Co.
Oilon PV80 - self lubricating plastic - Cadillac Plastic & Chemical
Oilostatic - oil pressure pipe type cable transmission systems - Okonite Co.
OK - company name - O. K. Machine & Tool Corp.
Okoclad - aluminum sheathed wiring systems - Okonite Co.
Okocord - portable cord and flexible cable - Okonite Co.
Okoflex - instrument control tubing - Okonite Co.
Okoguard - high-voltage cable - Okonite Co.

Okolene - (polyethylene) insulated wire - Okonite Co.
Okometal - fatigue-resistant alloyed lead sheaths - Okonite Co.
Okonite - wire, cable, tape, rubber & cement splice roller - Okonite Co.
Okoprene - cable & wire protective coverings - Okonite Co.
Okosael - chemical resistant cable and wire - Okonite Co.
Okosheath - covering for lead sheathed cable - Okonite Co.
Okotherm - high temperature cable - Okonite Co.
Olympic Series - CATV systems & equipment - C-COR Elctns.
OMAG, MULTISCOPE - magnifiers, microscopes - Heitz, Inc., Karl
Omega - data reduction sys. - Beckman Instrs., (AISSD)
Omega - Metallic seals - Servotronics, Inc.
Omegaclad - insulated wire - Omega Engrg., Inc.
Omegelok - compression fitting - Omega Engrg., Inc.
Omegatite - thermocouple insulators - Omega Engrg., Inc.
OMI - electronic components - Omtronics Mfg., Inc.
Ommi-Coat - nuclear gauges - Nuclear Resch. Corp.
Omnephase - AC phase controls - Omnetics, Inc.
Omnetime - solid state timers - Omnetics, Inc.
Ommi-Amp - thermocouple amplifiers & transmitters - Omega Engrg., Inc.
OMNICLOSURE - electronic enclosures - Techmar Corp.
Omniscorder - miniature recorder - Edison, Instr. Div.
Omnidaptor - universal 45 RPM adaptor - Aldshir Mfg.
OMNIFEROUS - real-time FFT analyzers - Nicolet Scientific Corp.
Ommi-Glow - pilot lights - Industrial Devices
OMNIGRAPHIC - graphic recorders - Houston Instrument
Omniguard - monitor - Edison, Instr. Div.
Ommi-II - deposit control master - Sloan Technology Corp.
Ommi-Lert - programmable indicator lights - Industrial Devices
Omniprox - proximity sensors - Scientific Technology
OMNISCRIBE TM - strip chart recorders - Houston Instrument
Ommisort - document sorting system - E-Systems Inc.
Ommi-Spra - special aerosol extender - Tech Spray, Inc.
OmmiTester - automatic circuit test set - Automatic Production Systems Inc.
OMNY-BUS - laminar bus bar - Methode Elctns., Inc.
OMNY-PAC - printed circuits/I. C. applications - Methode Elctns., Inc.
#1 Gun - portable electric heat gun - Burlington Opers. Div.
1+1 - two tone selective call system - Bramco Controls Div.
1420 LINEAR TESTER - bench top IC tester for linear IC's - Sitek, Inc.
"On The Ball" - aerospace chemical - Merix Chem. Co.
O-Pac - power packs - Opad Elec. Co., Inc.
"Open-Aire" - stereo headphones - Sennheiser Elctrn. Corp.
Operational Filter - multifunction variable filter - Rockland Sys. Corp.
Optech - shaft encoder - H H Controls Co., Inc.
Optecon - optical incremental encoders - Data Technology Inc.
Opticator - electroluminescent readout - Bowmar Instr. Corp.
Opti-Coder - encoder - Sequential Information Systems
OPTIMA - electronic enclosures - Optima Enclosures
Option Blocks - individual/dual terminators resistor networks pull up/pull down interface resistor networks - Pulse Engrg., Inc.
Opti-Scan - encoder - Sequential Information Systems
Opti-Sensor - pick off - Sequential Information Systems
Optivue Plus - CRT lifetime warranty - Channel Master Div. Avnet
Opto-Hybrids - hybrid microcircuit subsystem combining photovoltaic sensor, current amplifier, level detector and dtl/ttl output amplifier - Centralab Semiconductor
Optoline - pc board assembly director - Hollis Engrg., Inc.
Optosafe - safety curtains & spatial volume sensor - Scientific Technology
Optosil - clear fused quartz - Amersil, Inc.
Optoswitch - led photoelectric controls - Scientific Technology
Orange Drop - radial lead film capacitors - Sprague Elec. Co.
OraSorb - carbon filter for plating baths - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Orcon Switch - pushbutton switches - Switchcraft, Inc.
Original Bright Gold - cyanide gold plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Orthomode - hybrid mixers - Varian Assocs.

ORTHOMODE - hybrid mixers - Varian Electron Tube & Device Grp.
Orthomode Mixers - microwave rf mixers - Varian Solid State East Beverly Div.
ORTHONOL - magnetic materials - Magnetics
Orthonull - balance finder - General Radio Co.
Orthosil - special lamination material - Thomas & Skinner, Inc.
Orthospin Mixers - microwave mixers - Varian Solid State East Beverly Div.
Orthostar - Double Balanced Mixer - Aertech Industries
Oryx - subminiature soldering irons - Telvac Instr. Co.
OSCIDUCER - Pressure-To-Frequency Converter - Solid State Electronics Corp.
Osha-Spac - safety products - Cadillac Plastic & Chemical
OSM - omni spectra miniature - Omni Spectra
OSSM - omni spectra sub-miniature - Omni Spectra
OTA - operational transconductance amplifier - RCA Solid State Div.
Outdoorsman - battery-operated lanterns - Teledyne Big Beam
Ovalite - pilot lights - Industrial Devices
Overlay - RCA's high-frequency RF technology - RCA Solid State Div.
Oversewing Machine - book binding sewer - A. M. W. Corp.
Oxytron - complete pre-plate sys. for printed circuit production - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Oylite-Stik - sealant and pipe thread compound - Lake Chemical Co.

P

Pacecom - computer cables - Pace Wire & Cable Corp.
Pace/pak - modular hybrid circuits - International Rectifier Corp.
Pacer - mercury-vapor photo printers - Chemcut Corp.
Pacers - temperature compensated reference diodes - Centralab Semiconductor
Pachydyne&T - R. F. power supply - Applied Materials Inc.
Page-All - Telephones - Fanon/Courier Corp., Subs.
Pageant - replacement phonograph styli - Pageant/M.A. Miller Co.
Pagemaster - paging sys - Bogen Div.
Pak-Drives - control systems - Sequential Information Systems
Pak-Rak - storage rack - test rack or shipping container - UNITRACK Div.
Pak Series - 4 to 12kw electron beam power supplies - Sloan Technology Corp.
Pak-X-Trac - DIP desoldering tool - Nu-Concept Computer Systems, Inc.
Palco - brazing alloys - Gte Sylvania, Inc.
Pall - filters - Pall Trinity Micro Corp.
Palladex II - palladium plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
PallCell - filter medium - Pall Corp.
Pall-Flo - valve - Pall Trinity Micro Corp.
Pallmatic - drain valve - Pall Trinity Micro Corp.
Paloro - brazing alloys - Gte Sylvania, Inc.
PAMCO - electro-mechanical assembly service - Paraplegics Mfg.
Panalyzer - x-ray spectrochemical analyzer - Panametrics Inc.
Panaplex R - panel display - Burroughs Corp.
Pan-A-Trol - control panels - General Elec. Co.
Panavox - Ceiling &/or Wall Loud Speaker - Wilder Engrg. Prods, Inc.
Pancake - Overfloor raceways systems - Wiremold Co.
Panduct (R) - Plastic Wiring Duct - Panduit Corp.
Panel Mite - standard size thumbwheel switch - Tech Labs., Inc.
Paneltone 87D - metal display panels - Panelgraphic Corp.
Panhandle - carrier equipment - GTE Lenkurt Inc.
Pan-L-Clad - plastic-metal laminated panels - Photo Chemical Prods. Cal.
Pan-Term (R) - Solderless Terminals - Panduit Corp.
Panther - rubber, friction and plastic tapes - Okonite Co.
Pan-Ty (R) - Cable Ties - Panduit Corp.
Paper Riter - felt tip marker - Lake Chemical Co.
Parafomer - Line Conditioner - Tele-Dynamics/Wanless
PATCH-OHM - resistor block - Cambridge Thermionic Corp.
PATHE ELECTRONIC - cameras, motion picture 16mm and double-super 8mm - Heitz, Inc., Karl
Patinate - lead plating process - Conversion Chem. Corp.
Patrician - deluxe spkr. sys. - Electro-Voice, Inc.
PDC - solid state & incandescent display sys. - Precision Dynamics Corp.
PDP - Programmable Data Processor - Digital Equipment Corp.

PDQ - Modular edgeboard connector - Stanford Applied Engineering
PEAC - photo-electronic auto collimator - Barnes Engrg. Co.
Peaklite - indicator light - Penn Keystone Corp.
Peaklok - transient voltmeter - Pioneer Instrumentation
Peak-N-Notch - active band pass/stop filter - Radiation Devices Co.
Peak Shock Annunciator - an instrument for indicating that specific preset response accelerations have been exceeded - Engdahl Enterprises
Peak Shock Recorder - an instrument for sensing & recording response spectrum - Engdahl Enterprises
PEC (within a diamond) - thick film circuits - Centralab
PEDALINE - Footswitches - Line Electric Co. Unit Esterline Corp.
PED-A-VAC - low cost desoldering equipment - Pace Inc.
Pee-Wee - Clips - Mueller Electric Co.
Pegi - Insulating cable cleats - Adalet Mfg. Co.
Pelaspac Pac - protective packaging foam - Dow Chemical Co.
Pelican - Hydraulic Flow Control Gates - Allis-Chalmers
Pem - self-clinching fasteners - Penn Engrg. & Mfg. Corp.
PemFlex - self-locking fasteners - Penn Engrg. & Mfg. Corp.
PemHex - self-clinching, self-locking fasteners - Penn Engrg. & Mfg. Corp.
PemSert - self-clinching flush fasteners - Penn Engrg. & Mfg. Corp.
Pem-Sorter - automated press - Penn Engrg. & Mfg. Corp.
Penfile - burnisher cleaner - Jonard Industries Corp.
"Pennlon" - molecular reinforced polyolefin - Dixon Corp.
Pentaflow - premium grade miniature fans - Pamotor, Inc.
PEP-AST - analog storage terminal - Princeton Elctn. Prods.
PEP-VID - video image differentiator - Princeton Elctn. Prods.
PEP-400 - image storage & scan conversion terminal - Princeton Elctn. Prods.
PEP-402 - image storage & scan conversion terminal - Princeton Elctn. Prods.
PERFAB - Perlon monofilament fabric - Wire Cloth Enterprises, Inc.
Perfect Pair - matched emitter/sensor optohybrid assembly - Centralab Semiconductor
PERI-APOLLAR - lenses - Heitz, Inc., Karl
Perma Brush - rotating switch - General Devices, Inc.
Perma-Cell - rechargeable batteries - General Elec. Co.
Permafoam - shielded foam transmission line - Columbia Elctn. Cables
PERMALENE EP - Ethylene propylene rubber insulation - CCS Hatfield Wire & Cable Group
PERMALENE PE - High-molecular weight insulation - CCS Hatfield Wire & Cable Group
PERMALENE XP - Cross-linked polyethylene insulation - CCS Hatfield Wire & Cable Group
Permalux - electrical apparatus - General Elec. Co.
Permaline - cable jacketing material - Columbia Elctn. Cables
Permaline - seismic base slip tables - Unholtz-Dickie Corp.
Permanode - platinized tantalum anodes - Sel-Rex Co. Div. Oxy Metal Industries Corp.
PERMAPRENE - Neoprene jacket - CCS Hatfield Wire & Cable Group
Perma-Probe - leak detector sniffer probe - Varian Assocs.
Perma-Resin - resin coating systems - Photo Chemical Prods. Cal.
Perma-Shield - pressure-sensitive wire markers - Brady Co., W. H.
PERMA-TORQ - coil forms - Cambridge Thermionic Corp.
Permohm R - Uniform Web Lead-In Wire - Belden Corp.
Permpad - permanent p.c. component spacers - Bivar, Inc.
Pestlyzer - measuring instruments - Varian Assocs.
Petrosorb - adsorbent filled cartridge - Pall Trinity Micro Corp.
Petrosorb - filter housing - Pall Trinity Micro Corp.
P-F - plastic fabricated dust bellows - Gagne Assocs., Inc.
Phantom Power - neumann simplex power supply for condenser microphones - Gotham Audio Corp.
Phase/AMP - SCR power control - Halmar Electronics, Inc.
Phazor - phase measuring equip. - Industrial Test Equip.
Phenolite - laminated plastics - NVF Co.
Phenoweld - phenolic adhesives for nylon, etc. - Hardman Inc.
Phi-Deck - cassette tape transport - Individualized Instruct. Inc.

Phonealert - Telephone Comm. System Accessory - Phone-Aid Co.
Phosroc - high temperature wire - Cerro Wire & Cable Co.
Photact - photographic papers and films - Keuffel & Esser Co.
Photo Etch - printed circuit set - Datak Corp.
Photofluorometer - photoelectric fluorometer - Coleman Instr. Div.
Photoforming - chemical milling - Hamilton Technology, Inc.
Photo-Lux - back illuminated panels - Photo Chemical Prods. Cal.
PHOTOMOD - photocell coupler - Clairex Elctns. Inc.
Photo-Optic - photoelectric controls - Dolan-Jenner Inds., Inc.
Photorepeater - automatic sys.-electro-mechanical-optical - GCA/David W. Mann
Picabond - communications splice - Amp Inc.
PICOCLEAR - switching assemblies - Clare & Co., C.P.
Picofuse - miniature fuses - Littelfuse, Inc.
Picomini - microminiature vibration transducer - Endeveco
PICOMM - coordinate measuring machine - Potter Instr. Co.
Pico-Pac - Power Supply - Velonex, Instrument Div.
PICOREED - switching assemblies - Clare & Co., C.P.
Picotrim - capacitors - Voltronics Corp.
Pidg - terminals & splices - Amp Inc.
Piezite - ceramic crystal - Endeveco
Piggy - wire connectors - Thomas & Betts Co.
PIL - miniature pulse transformer - TRW/UTC Transformers
Pin Bar® - solderless bus bar - Lear Siegler
PINCOMM - pin compatible core memory - Standard Memories, Inc.
Pinlite - micro-miniature lamps - Refac Elctns./Pinlites
Pin Saver - pin straightener, connector - Air-O-Tronics Prods.
Pintofile - instrument systems terminal - XINCOM Corp.
Pipette Paste & Stik - sealants & pipe thread compound - Lake Chemical Co.
Pipix - fiber optic crt's - Litton Inds.
Pistoncap - trimmer capacitors - Sprague-Goodman Electronics, Inc.
Pitmo - d-c motors - Pittman Corp.
Pitran - pressure sensitive transistors - Stow Labs., Inc.
Pittman - d-c motors - Pittman Corp.
Pixie - force transducer - Endeveco
PIXIEPOT(R) - 10-turn potentiometer - Duncan Electronics, Inc.
Piaco-var - alloy - Hamilton Technology, Inc.
Planar Coax - microelectronic interconnection and packaging technique - Bunker-Ramo Corp.
Planetgear - counters - Haydon Switch & Instr., Inc.
Plaohm - plaque type power resistors - Ward Leonard Elec. Co. Inc.
Plasloide - talc reinforced polypropylene - Fiberfil Div. Dart Ind.
Plasilube - lubricated thermoplastics - Fiberfil Div. Dart Ind.
Plasma-Lux/Plasmalux - digital readouts - Cherry Electrical Prods. Corp.
Plasma-Power - laser power supplies - Crestronics Inc.
Plasti-Bond - terminals - Amp Inc.
Plasti-Cal - top-laminated transfers - Meyercord Co.
Plastic-Pack - Concave backing material - Allis-Chalmers
"Plastiform" - flexible magnets - 3M Co.
Plasti-Grip - terminals & splices - Amp Inc.
Plastilease - mold release agent - Ram Chems.
PLASTI-PAK - plastic packaging material - Centralab
Plasto-Joint Stik - pipe thread compound - Lake Chemical Co.
Platanex III - platinum plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Platinum Anodes - platinum plated titanium anodes - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Plasma-Beam - zone refining equip. - Materials Resch. Corp.
Plenco - phenolic molding compounds - Plastics Engrg. Co.
Plasa - passivated diodes - Varian Solid State East Beverly Div.
Plike - wire stripping plier - Hunter Tools
Plug-In Analyzers - spectrum analyzers - Nelson Ross Elctns.
Plugmold - Multioutlet Systems - Wiremold Co.
Plug-N-Probe - probe, test - Air-O-Tronics Prods.
Plug Stat - temp sw - Control Prods., Inc.
Plumbicon - TV camera tubes - Amperelex Electronic Corp.
Pluistor - positive temperature coefficient thermistors - Victory Engrg. Corp.
PLYCON - harness systems - Methode Elctns., Inc.
PLYO-DUCT - flat, flexible cable - Methode Elctns., Inc.
PMB - magnetic brake - General-Electro Mechanical
PMC - magnetic clutch - General-Electro Mechanical

PMI - phono accessories & parts - Pageant/M.A. Miller Co.
Pneu-Therm - pneumatic-temp transducers - Dynamic Controls Corp.
PNR - control cable - Cerro Wire & Cable Co.
PNRX-90 - control cable - Cerro Wire & Cable Co.
Pocket Magnetometers - gauss meters - Annis R B Co.
Pogo Contact - connectors (contacts-spring loaded) - Pylon Co., Inc.
Poke-Home - crimp contacts - Amphenol Connector Div.
POKE-HOME - removable contact connector - Amphenol Ind'l. Div.
POLARFLEX 10 - Hot-Melt strippable coating - Western Coating Co.
PolarHex - positive polarization means for coupling connectors - Hughes Aircraft Co., Connecting Devices
"Polarizing Screwlocks" - locking device for rack & panel connector - Continental Connector Corp.
Polar Path - gyro magnetic compass system - The Bendix Corp.
Polasheet - conductive gasketing - Cal-Metex Corp.
Polastrip - conductive gasketing - Cal-Metex Corp.
POLARFLEX - transmission of fingerprints - Datalog Div., Litton Sys.
POL-LAR - formed capacitor covers - Precision Paper Tube Co.
Poly-C - capacitor - General Elec. Co.
Polycarbafil - fiberglass reinforced polycarbonate - Fiberfil Div. Dart Ind.
Polychip - copper-plated teflon chip capacitor - Polyflon Corp.
Polycycle - motor-generators - General Elec. Co.
Poly-Dimensional - Styled Small Instrument Enclosures - Amco Engineering Co.
Polydyne - speed drives - General Elec. Co.
Polyguide - clad laminates - Burlington Opers. Div.
Poly-Lok - polyethylene compound - Superior Cable Div.
Polynoid - linear induction motor - Skinner Polynoid Div.
Poly-Planar - plastic wafer-thin loudspeakers - Era Acoustics
Poly-Planar - plastic wafer-thin loudspeakers - Magitran Co.
Poly Q - liquid scintillation sample vials - Beckman Instrs., (AISSD)
Polyred - Cross-Linked Polyethylene Insulated Wire - Brand-Rex Co.
Polyacin - polycrystalline scintillation phosphor - Harshaw Chemical Co.
Polyseal - motors, insulation, coils, windings - General Elec. Co.
Polyseal - sweep test sys. - Rhode & Schwarz Sls.
Poly-Sonic - outdoor speakers - Era Acoustics
Poly-Sonic - outdoor speakers - Magitran Co.
Poly-T - injection moldable thermoset - Fiberfil Div. Dart Ind.
Polytran - polycrystalline optical material - Harshaw Chemical Co.
Polyvolt - lighting controls - General Elec. Co.
"Pop" Rivets - blind fasteners - USM Corp.
Poron - Porous plastic materials - Rogers Corp.
Porta/Flex - vapor degreaser, portable - Gagne Assocs., Inc.
Portalarm - portable security alarms - Scientific Technology
Portametric - portable measuring instrument - Electro Sci. Inds.
PORTA-PEAK - portable strain gage measuring instruments - Helm Instr. Co.
Portastamp - portable hand held digital T/C pyrometer - Trans-Met Engrg.
Porta-Test - leak detector - Varian Assocs.
Porta-Trace - portable light boxes - Gagne Assocs., Inc.
Portationer - epoxy dispenser - Glenmarc Mfg. Inc.
Posi-Ground - voltage leakage elimination in soldering irons - Hexacon Elec. Co.
Posistor - positive Temp Coeff. resistor - Murata Corporation of America
Posiform - Flexible circuit cable assemblies - Rogers Corp.
Postrol - forced oil injection systems - Electrovert
Postite - Drake Mfg. Co.
Powerblock Power System - high current darlington - PowerTech, Inc.
Power Commander - battery charger - RIL Elctns., Inc.
Power-Crater - Engines - Allis-Chalmers
Power-Dyne - torque wrench - Raymond Engrg. Inc.
POWERFET - 2 watt fet amplifier - Teledyne-Crystallitics
Powerflex - Electronic Switching & Controlling Systems - Sigma Instruments, Inc.
Powerformer - dry type transformer - Jefferson Elec.
Power-Glas - glassivation of junctions - General Elec.
Power Glas - glass passivated thyristors - General Elec. Co.
Powergrip - belts - Uniroyal, Inc.
Powerhouse - utility searchlights - Teledyne Big Beam
Powerhouse - hand lamps - Teledyne Big Beam

Power-Line - p.a. amplifier - University Sound
Powerline - power line filters - Filtron Company, Inc.
Power Mark - circuit breakers - General Elec. Co.
Power Mov - power metal oxide varistor - General Elec. Co.
POWER-O-MATIC 60 - ovens and control - Blue M Electric Co.
POWER-O-MATIC 70 - ovens and control - Blue M Electric Co.
POWER-O-MATIC 80 - ovens, furnaces & control - Blue M Electric Co.
Powerpac - hi freq hi power transistor package - Microwave Semiconductor Corp.
Power-Plus - Amplifiers - Fanon/Courier Corp., Subs.
Power Point - plug in cart. - Electro-Voice, Inc.
Powerstat - variable transformers - Superior Electric Co.
Power-Style - switchboards - Square D Co.
POWERSWITCH - solid state relay - Fenwal, Inc.
Powertherm - SCR bridge rectifier - Gentron Corp.
Powertron - a.c. power supplies - Industrial Test Equip.
PowerUp-15 - fast charge battery - General Electric
Power/Vac - circuit interrupters - General Elec. Co.
Power Verter - dc to dc inverter - Alpha Components Corp.
Power-R-Disc - flat-pack power rectifiers & power SCR's - Westinghouse Elec. Corp.
POXYLUBE - Dry-Film Lubricants - General Devices Co., Inc.
PRAM tm - Programmable Random Access Memory - Harris Semiconductor
PRECO - bobbin lugger - Precision Paper Tube Co.
Prexnx - heater cable & cord - General Elec.
"Premax" - communication antennas & accessories - Premax Prods. Div.
"Premax" - ground rods - Premax Prods. Div.
Pre-Met - plating solution filter - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Prep-Lap - seam welders - Taylor-Winfield Corp.
Pres-Bond - gasketing tapes - Press-On Prods.
Pre-Semby - etched circuits - Analog Devices
Pres-Loc - pres to open or close - Deutsch Fastener Corp.
Pres-Mount - double coated adhesive foam tape - Press-On Prods.
Pres-Pak - pressure sensitive adhesive coated corrugated - Press-On Prods.
Pressfax & Pressfax DRR - Transmission of newspaper/magazine pages - Datalog Div., Litton Sys.
PRESS-FIT - teflon-insulated terminals - Sealectro Corp.
Presslite - Illuminated Pushbutton Switch - Illuminated Products Inc.
Pressuretrol - pressure controllers - Honeywell
PRESTEST - Indicating Light with Test Circuit - Cutler-Hammer, Inc.
Prime - Centralab semiconductor high reliability program - Centralab Semiconductor
Primewire - premium alum. welding wire - Chemetron Corp.
Princess Line - micro-precision production - UNGAR, Div.
Princeton 801 - graphic computer terminal - Princeton Elctrn. Prods.
Printact - printed contact - Printact Relay Div.
PRINTACT - Printed Contact Relay - Executone, Printact Relay Div.
Print N Mark - component marking & printing equip. - GTI Corporation
Printweigh - weight printer - Toledo Scale
Pritchard Photometer - Photometer - Photo Research Corp.
Probeys - infra-red imaging system - Hughes Aircraft Co.
Probeys - infra-red imaging system - Hughes Aircraft Co.
Probotrol - liquid contact probe - Autocon Inds., Inc.
Process 87-D - marking & finishing panel process - Panelgraphic Corp.
Professional - transistor & diode test equipment - Components Corp.
Profil - fiberglass reinforced polypropylene - Fiberfil Div. Dart Ind.
Pro-Grip - Propionate Cable Clamps - Weckesser Co. Inc.
Proloid - radar-augmentation device - Teledyne Micronetics
Pro-Med - acupuncture equip. - Jaesic Industries Co.
Prong-Lock - rings, retaining - Waldes Kohinoor, Inc.
Propellon - coolant - LMB Heeger, Inc.
Propellon - Coolants - Heeger Inc.
Propimax - fan - Rotron, Inc.
Proportionall - heat input control - Hotpack Corp.
Protectocoats - solderability protection - Alpha Metals, Inc.
Protectoswitch - operator safety device for punch presses - Black & Webster, Inc.
Protistor - fuses - Carbone Lorraine Industries Corp.

Protonex - gold electroplating process that defies metallic contamination - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Prototypes by Kotokast - experimental molded parts - Minnesota Rubber Co.
Proxagard - presence sensing equipment - Gordon Engineering Corp.
Proxi-switch - (capacitance proximity devices) - Photobell Co., Inc.
Proxswitch - proximity switch - Denison, R.B., Inc.
P/S ALLOY - laboratory clamps - GCA/Precision Scientific
PSB - Drake Mfg. Co.
P-Shooter ("Polymer") - polymeric sealant applicator gun - Hardman Inc.
PSI - captive screw, low cost - Tridair Inds.
PSS - pss filter medium - Pall Corp.
PSS - filter media - Pall Trinity Micro Corp.
PTM - filters, dryers - Pall Trinity Micro Corp.
PTM-66 - color analyzer - Lektra Labs, Inc.
Pull-Thru - contact insertion tool - Hughes Aircraft Co., Connecting Devices
Pulsacript - printing demandmeters - General Elec. Co.
Pulsecurity - Wireless Remote Alarm - A.R.F. Products
Pulse-Dot - soldering equip. - Circon Corp.
Pulselector - Resonant Reed Device - A.R.F. Products
Pulsender - Mechanical Pulsar - A.R.F. Products
Pulse-Rated Toroids - ferrites - Indiana General
Pulsignal - Electronic Remote Control - A.R.F. Products
Pulsistor - power thermistors - Victory Engrg. Corp.
Pultec - equalizers, filters and amplifiers - Pulse Techniques, Inc.
Puppets - PC circuit layout & design system - Bishop Graphics
PUREBIDE - ceramic graphite - Pure Carbon Co., Inc.
PUREBON - mechanical carbon - Pure Carbon Co., Inc.
Push-Penny - plugs - Thomas & Betts Co.
PV - female receptacles - Berg Electronics
PVB - potentiometric voltmeter bridge - Electro Sci. Inds.
PVCA - Vinyl Insulated Aluminum Strip - Brand-Rex Co.
PVZ - capacitors - General Elec. Co.
Pwrpac&T - power supplies - Analogic Corp.
PYGMV - connector - Bendix Corp., The
Pyranol - capacitor and dielectric material - General Elec. Co.
Pyranol Transformer - electric transformer - General Elec. Co.
Pyr-AU-Bond - gold electroplating process developed for wire & eutectic bonding & leaded glass semi-conductor devices - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Pyrex - borosilicate glasses - Corning Glass Works
Pyrex - borosilicate glasses and products - Corning Glass Works, Television Prods. Div.
Pyrobond-PT-333 - silicon carbide graphite conversion - Ultra Carbon Corp.
Pyrocera - glass-ceramics - Corning Glass Works
Pyroceram - glass-ceramic sealing compounds - Corning Glass Works, Television Prods. Div.
Pyrocon - surface temperature pyrometer - Alnor Instrument Co.
Pyromark - refractory coatings - Tempil Div.
Pyromatic - solid-state temp control - Alnor Instrument Co.
Pyro Panel - infrared heat panel - Research, Inc.
Pyro-Tech - pyrolytic coated graphite - Ultra Carbon Corp.
Pyrotest - Hand Held Potentiometer - Gulton Inds., Inc.
Pyrotroller - electronic temp control - Alnor Instrument Co.
PZT - piezoelectric ceramics - Vernitron Piezoelectric Div.
P-10 Low - Loss - linear solenoid - Barber Corp.

Q

QC - mic connector - Electro-Voice, Inc.
QCC - Quick Custom Cable - Alpha Wire Corp.
Q Compound - encaps. compound - Communications Technology Corp.
QHT - transformers - General Elec. Co.
QO - molded case circuit breakers - Square D Co.
Q-PEX - alkaline etchant - Conversion Chem. Corp.
QR - rotary fastener - Tridair Inds.
QSR - electronic capacitors - General Elec. Co.
QT-Synclamps - 1/4 turn servo clamps - Timber-Top, Inc.
Quad - logs on printed material & decals on components - CVC Products, Inc.
Quadco - controls - Quadrastat Controls Corp.
Quad-O-Dyn - hydraulic seal - Minnesota Rubber Co.
Quad-O-Stat - hydraulic seal - Minnesota Rubber Co.
Quadrader - surveillance and precision approach radar - ITT Gilfillan Div. of ITT
Quadra-Powr - valve actuator - Jamesbury Corp.
Quad-X - hydraulic seal - Minnesota Rubber Co.

QUALICOMP - electronic components - International Importers
Qualifier 901 - Digital IC Tester - Fairchild Sys. Technology
Quantachron - time based programmer - Matrix Corp.
QuantaLatch - transient recorder - QuantaLog, Inc.
Quantum - broadband antenna system - Channel Master Div. Avnet
QUANTUM L - computer tape - Memorex Corp.
QUARTZQ - coil dope - Millen Mfg. Co. Inc., James
Quat 2 - biocidal-fungicidal cleaner - Clean Room Prods.
Quencharc - capacitor resistor rc network - Paktron Div.
Quick Connect - thermal relays - Warren G-V Communications
Quick-Crimp - crimp terminals & connectors - I-T-E Electrical Components Grp.
Quick-E-Poles - Divided, vertical multioutlet assemblies - Wiremold Co.
Quickkey - low profile keyboard - Chomerics, Inc.
Quick-Lock - spring-lock shelf supports - Simmons Fastener Corp.
Quick-Scan - control/measuring instrs. - Taylor Instr. Process Control Div.
Quick-Set - thermo-regulators - H-B Instr. Co.
"QUIET" - Ultra Low Noise Mixer - RHG Elctns. Lab.
Quik/Bus - Power distribution conductors - Rogers Corp.
Quik-Change - indicator lights - Industrial Devices
Quik-Circuits - printed circuit board hobby line - Circuit-Stik, Inc.
QUIK-E - D.C. voltage calibrator - Pioneer Instrumentation
QUIK/PIK - small parts storage - Akro-Mils, Inc.
Quik-Wrap - wire wrapping & unwrapping tools - Jonard Industries Corp.
Quso - micro-fine silica - Philadelphia Quartz Co.
QWIK-TV - connector strain relief - Glenair, Inc.

R

RA-CON - right angle connector - Eby Co., Hugh H.
Radex - spkr. cone design - Electro-Voice, Inc.
R.A.D.I. - random access digital indication - Westronics
RADIAX - slotted coaxial cable - Andrew Corp.
Radiax - radiating coaxial cable - Andrew Antenna Co. Ltd.
Radiflux 300 - x-ray inspection system - Torr Labs.
RadiFlux 360 - x-ray inspection system - Torr Labs.
Radi-Flux R - Heat Flow Calibration - Hy-Cal Engineering
"Radiodyne" - receivers, towers etc. - Western Coil & Elec. Co.
RADIOHM - variable resistor - Centralab
Rainbow - Color Changing cap presslite switch - Illuminated Products Inc.
Raisedlay - laminates metal clad - Engelhard Minerals & Chem.
Rally Rap - spirally cut tubing - ICO/Rally Corp.
Ramanel - polyester enamel - Ram Chems.
Ramaset - epoxy enamel - Ram Chems.
RAMCON - rotary actuators - Hills-McCanna Co.
Ramdom Data Telecom - data acq - Baganoff Assocs., Inc.
Ramor-IC - DIP desoldering and extraction tool - Solder Removal Co.
Ram-Pac Power Sources - DC-DC converters - Reliability Inc.
RamRod - zener diodes - Motorola Semiconductor Prods.
Range Rider - modem test sets, printers, analysers - International Data Sciences
Rapid-Syn - steppers, drivers, pulse sources & preset indexers - Computer Devices of Calif.
RATIOHMIC RESISTANCE - high accuracy resistance measurements - Data Precision Corporation
Ratiometric Ohms - ohms converters - Dana Labs., Inc.
Raycarl - cold heading process - Camcar Screw & Mfg.
Raycorder - digital magnetic tape recorder - Raymond Engrg. Inc.
RAYLAY - Light Controlled Relay - Solid State Electronics Corp.
Raymaster - all light source equipment - Gates, Geo. W. & Co., Inc.
Raymer - tuners-amplifiers-receivers for background music & general purpose - Trutone Elctns., Inc.
RAYNGER - infrared thermometer - Raytek, Inc.
RAYOTUBE - temperature detector (radiation-type) - Leeds & Northrup Co.
RAYOVIN - hook-up wire - Raychem Corp.
Raysistor - Optoelectronic Devices - Raytheon Co.
Reactalloy - pastes-hydrogen firing - Electro Mats. Corp. Amer.
Reactospeed - variable speed motor control - Autocon Inds., Inc.
Reactrol - regulator - General Elec. Co.
Reality - data base management system - Microdata Corp.

Real Time I, II, III - microprogrammable array transform processor - Datwest Corp.
Rebel 23 Plus - CB Rig - Fanon/Courier Corp., Subs.
Recipromatic® - counter - General Radio Co.
RE-CIRK-IT - circuit breakers - Heinemann Elec. Co.
Re-Coil - induction heater accessory - Miller, L.C. Co.
Rectodyne - power supplies - Christie Elec.
Redball - CB Rig - Fanon/Courier Corp., Subs.
Red Cap - Monolithic dipped ceramic capacitors - Erie Technological Products
Reddi-Wrap - precut wire for wire wrapping - Storm Products Co.
Reddy - lugs & taps - Thomas & Betts Co.
Redhead - light-emitting diodes - Motorola Semiconductor Prods.
Redi-Bar® - cultured Quartz Bar - P. R. Hoffman Co.
REDI LINE - Motor-generator to 1000 watts - Applied Motors Inc.
"RED LIGHTNING" - #72 "Red Lightning" Soft Solder Liquid Flux - Superior Flux & Mfg. Co.
Red Line - thermal relays - Warren G-V Communications
Red-Lit - discrete led lamps - Litronix
"RED MARVEL" - #74 "Red Marvel" Soft Solder Liquid Flux - Superior Flux & Mfg. Co.
Red Top - thermo-regulator - H-B Instr. Co.
REEDAC - solid state relay - Gordos/Grisby-Barton
Reedlays - relay - Computer Comps.
Reevelec - heating equipment - Reeve Electronics, Inc.
Ref Bloc R - Precise ambient reference junction, thermocouples - Hy-Cal Engineering
Ref Cel R - Multi-channel reference system temp. - Hy-Cal Engineering
Reflectin-Lead - solder plating bath - Conversion Chem. Corp.
Reflectoscope - ndt - ultrasonic equipment - Automation Inds.
ReFLEX - battery charging system - Christie Elec.
Refractosyn - angle detector - H H Controls Co., Inc.
Regadyne - all AC adjustable speed drives - Control Products Corp.
Regal - numbering machines - Bostitch
Regency - loudspeaker, enclosures - Electro-Voice, Inc.
Regent - Motors & Gearmotors - Carter Motor Co.
Regulimit - adjustable safety thermostat - Hotpack Corp.
Regu/Tan - Combined regulator and transformer unit - Allis-Chalmers
Regutron - speed controls - Electric Machinery Mfg. Co.
Reliabraz - copper brazing powder - Alpha Metals, Inc.
RELI-ACON - printed circuit connectors - Methode Elctns., Inc.
Reliacor - activated rosin flux - Alpha Metals, Inc.
Reliaform - rosin foam fluxes - Alpha Metals, Inc.
Relialab - environmental rooms - Tenney Engrg., Inc.
RELI-ALOK - ejector/lock component - Methode Elctns., Inc.
Reliance - regulators for controlling the flow and pressure of gas - Singer Co.
RELI-APAC - backplane wiring systems - Methode Elctns., Inc.
RELI-APLANE - backpanel/connector system - Methode Elctns., Inc.
RELI-APLUG - plug-in header - Methode Elctns., Inc.
Reliaros - activated rosin flux - Alpha Metals, Inc.
Reliasolv - grade cleaners - Alpha Metals, Inc.
Reliastemp - environmental rooms - Tenney Engrg., Inc.
Rely-Ohm - Hybrid Resistor System - Engelhard Minerals & Chem.
Remove-A-Pad - temporary spacers-dissolving type - Dynalox, Inc.
RESINITE - impregnated coil forms - Precision Paper Tube Co.
Resiston - potentiometers - Bourns, Inc.
Resist-O-Stat - decade/resistor - General Resistance, Inc.
Resistox - oxidation resistant copper powder - Gliddon Metals
Resi/Tran - Pad mounted transformers - Allis-Chalmers
Re-Tip - soldering iron tip cleaner - Solder Removal Co.
REVERBERTRON - artificial reverberation device - Fairchild Sound Equip.
Rever-Synclamps - reverse servo clamps - Timber-Top, Inc.
Revmaster - motor speed controls - Opad Elec. Co., Inc.
RFI, MICRO-FILTER - for RFI/EMC filters - RF Interionics
Rhenex - rhodium plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Rhino-Hide - cable - Pacific Electriccord Co.
Rhodex - rhodium plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Ribflex - ribbon wound power resistors - Ward Leonard Elec. Co. Inc.
Rigimesh - sintered woven wire cloth - Pall Trinity Micro Corp.
Rigimesh - filter medium - Pall Corp.
RIM - Research Instrument Module System - Princeton Applied Resch. Corp.

Ring-Gun - assembly tool - Waldes Kohinoor, Inc.
Ring-Jector - assembly tool - Waldes Kohinoor, Inc.
Ring-Mount - assembly tool - Waldes Kohinoor, Inc.
Ring-O-Mat - assembly tool - Waldes Kohinoor, Inc.
Rip!-Flo - Vibrating screens - Allis-Chalmers
Ripple Round - anodes - Alpha Metals, Inc.
Rippleweld - lead attach process for filmatic R capacitors - Paktron Div.
Rivet-Loc - terminals - Saelectro Corp.
ROBOT - cameras, recorders, lenses, filters, programmer/timers - Heitz, Inc., Karl
ROBOT - x-ray cameras, remote controls, digital /counter, oscilloscope cameras - Heitz, Inc., Karl
Robotec - electronic overload protection - Power Designs, Inc.
Rock-A-Lite - lighted rocker switch - Leecraft Mfg. Co., Inc.
Rockeyl - Grinding mill - Allis-Chalmers
ROCKETTE - Rocker Operated Switches - Cutler-Hammer, Inc.
Rock-Wipe Switch - switches - Cherry Electrical Prods. Corp.
Roder - controlled expansion alloy - GTE Sylvania Inc.
Rodpeb - Grinding mills - Allis-Chalmers
Ro-Flo - Compressors and vacuum pumps - Allis-Chalmers
Roll-a-chart Magnets - Permanent & Flexible Plastic Magnets - Roll-a-chart Div.
Roll-Mark - automatic application system - Meyercord Co.
Roll 'N Measure - tapeless measuring device - Klein, Mathias & Sons, Inc.
Rollpin - self-locking spring pins - Esna Div.
Rolltemp - roll temperature sensor - Trans-Met Engrg.
Rolltronic - Roll Temperature Control System - Trans-Met Engrg.
Rolm - 1601 Ruggednova - Rolm Corp.
Rolox - 2-part epoxy compounds - Hardman Inc.
Rol-Pak - rings, retaining - Waldes Kohinoor, Inc.
Roly-Poly - round water-thin replacement speakers - Magitran Co.
Roly-Poly - replacement round speakers - Era Acoustics
Rom-Simulator - Microcontroller simulator - Scientific Micro Sys.
Rosite R, GCD & TA - inorganic cold molded parts - Rostone Corp.
Rosite 2150 - melamine, cold molded, arc quenching - Rostone Corp.
Rosite 3250 & 3550 - glass reinforced polyester, non-tracking - Rostone Corp.
Rosite 3450 - glass reinf. polyester, corrosion resistant - Rostone Corp.
Rota-Crimp - crimping tools - Amp Inc.
Rotaswitch - shaft encoder - Disc Instruments, Inc.
Roto-Cone - Valves - Allis-Chalmers
Roto-Lock - Spring-lock shelf supports - Simmons Fastener Corp.
Roto-Net's - stepping motor - Heinemann Elec. Co.
Rotopulser - rotary pulse transducer - Dynapar Corp.
Rotosil - opaque fused silica - Amersil, Inc.
Roto-Tellite - indicator light - Master Specialties Co.
Rotovalve - Hydraulic flow control valve - Allis-Chalmers
Rotran - Rotary Generator - Inland Motor Div. Kollmorgen
RP E Z Kleen Air Filter - air filter - Research Prods. Corp.
RP Industrial Filter - air filter - Research Prods. Corp.
RP MV EZ Kleen Air Filter - air filter - Research Prods. Corp.
RT - stripping solutions - Allied Chemical Corp.
RT/duroid - Fiber-reinforced plastic material - Rogers Corp.
RT, Hybridisc, ULR - ceramic capacitors - Diletron
Rubbon - fluxless solder - Chemetron Corp.
Rubicon - bridges, potentiometers, colorimeters - Penn Airborne Prods.
RUF-NEK - waterproof seismic connectors - Hughes Aircraft Co., Connecting Devices
Ruggednova - 1602 Ruggednova - Rolm Corp.
Rulon - reinforced teflon for bearings and seals - Dixon Corp.
Ruah - wire strippers - Eraser Co.
Rustrak - Miniature Graphic Recorders - Gulton Inds., Inc.
Ruthenex - ruthenium electroplating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Rx Gears - high precision instrument gears - Instru-Lec Corp.
R620/L-100 - ruggedized computer - Varian Data Machines

S

Saber-Champ - blade probe rh measuring device - American Instr. Co.
Sabre - instrumentation recorder/reproducers - Sangamo Electric Co.

Sabre Tooth - connectors - Thomas & Betts Co.
Safe-Pak - solid-state controlling device - Gems Sensors Div.
"Safe-T" - Bullpins - Klein, Mathias & Sons, Inc.
Safe-T-Klip - test clip - Industrial Devices
Safe-T-Kord - test cord - Industrial Devices
Safe-Tran - Pad mounted transformers - Allis-Chalmers
Safety White - fluorescent ballasts - Jefferson Elec.
SAF-T-PLUG - wall-mounted power supply - Dynamic Instr. Corp.
Sa-Fuse - electrical controls - Electric Machinery Mfg. Co.
Sali - Insulating bushings - Adalet Mfg. Co.
Sai-Met - flux - LMB Heeger, Inc.
Salmat - Flux - Heeger Inc.
Sam - aircraft S&B radio - Brelonix, Inc.
Samguard - security - Aerolite Elexs Corp.
Sampec&T - Sample and holds (fast acquisition, buffered and high speed - Analogic Corp.
Sam R - monitoring SSB/AM receiver - Brelonix, Inc.
SAN-DEL - instrument cleaning systems - M. P. Odell Co.
Sans-A-Fuse - fusing device - Workman Electronic Prods., Inc.
SAR - silicon avalanche rectifier - Varo Semiconductor, Inc.
Sara-Sonic - ultrasonic cleaners - Sara Scientific Co.
Sara "7" - detergent - Sara Scientific Co.
Sat II - microfilm reader - Information Handling Services
Satintone STD - metal display panels - Panelgraphic Corp.
Saucer - fan - Rotron, Inc.
SBE - Two-Way Communications - Linear Systems, Inc.
SBG - chemicals - Mallinckrodt, Inc.
SCA - transistors - Semicos, Inc.
Scalar - patented antenna feed horn - TRG,
Scanatron - facsimile - Victor Comptometer Corp.
Scanfare - FM Monitor Scanners - Fanon/Courier Corp., Subs.
Scope-Mate - portable oscilloscope camera - Vu-data Corp.
SCOPE-MOBILE - Cart, oscilloscope, wheeled - Tektronix, Inc.
SCORESTRATES - ceramic substrate - Centralab
"Scotch" - electrical insulating tapes - 3M Co.
Scotch - P.C. board masking tapes - 3M Company
"Scotchcast" - electrical insulating resins - 3M Co.
Scotchflex - cable/connector system - 3M Company
"Scotchite" - tubings - 3M Co.
SCREW LAUNCHER - screw holding drivers - Vaco Products Co.
SCR-Rated - PM DC Motors - Indiana Gen'l. Div.
S-D77 - programmable controllers - Struthers-Dunn, Inc.
Sea-Air - marine SSB radio telephone - Brelonix, Inc.
Sealcor - aluminum rod - Chemetron Corp.
Sealdin, Sealdtank, Sealdrum - containers, storage - Uniroyal, Inc.
SEALCROBOARD - cordless program board - Saelectro Corp.
Saelectrocard - static card readers - Saelectro Corp.
Saelectrowitch - programming switches - Saelectro Corp.
Sealflex - insulation - Electric Machinery Mfg. Co.
SEALINK - sealed splice - Burndy Corporation
Sealox - microcircuit packages, silicon - National Beryllia Corp.
Seal-Pac - transformer - General Elec. Co.
SEAL-STOP - STOP-OFF FOR ELECTROPLATING - Seal-Peel, Inc.
Sea Scanner - sonar system - Honeywell
SeaSpace - oceanography apparatus - Exide Power Sys. Div.
Secre/Data - data scrambler - Com/Tech Systems Inc.
Secre/Fax - facsimile scrambler - Com/Tech Systems Inc.
Secre/Vox - voice scrambler - Com/Tech Systems Inc.
Se-Cur-It - wood glue - Ambroid Co.
SE/duroid - Resin bonded fibrous material - Rogers Corp.
SEED TM - Shield Effectiveness Evaluation Device - Belden Corp.
SE Eyelets - eyelets - USM Corp.
Seico - thermocouples - Syscon Int'l., Inc.
Seico - surface temperature sensors - Syscon Int'l., Inc.
Seico - portable pyrometers - Syscon Int'l., Inc.
"Seico-Pak" - IF band-pass filter - General Instr. Corp., Automatic Mfg. Div.
SELECTASHAFT - rotary switches - Centralab
Select-a-Wave - wavesoldering equipment - Electrovert
Selection - specific ion electrodes - Beckman Instrs., (AISSD)
SELECTOFRAME - lead frame - Plessey Inc.
Selectrol - float operated control - Autocon Inds., Inc.
Selectronic - data terminal - Anderson Jacobson
Select-Talk - Telephones - Fanon/Courier Corp., Subs.
SELF-LOC-K - removable, crimp contacts - AirBorn, Inc.
Self-Scan R - panel display - Burroughs Corp.
Selistor - arc suppressor - Eastern Delta Corp.

Sellelectric TM - wiring devices - Leviton Mfg. Co., Inc.
Sel-Masq - semi-automatic selective strip electroplating machine - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Sel-Rex-Bright Rhodium - rhodium plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Sel-Rex Pur-A-Gold - gold electroplating process for semi-conductor applications - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Sel-Rex Rhodium Sulfate - rhodium plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Sembo - dispenser cathodes - Semicon Assoc., Inc.
Semiac - semiconductor variac - Alpha Components Corp.
Semi/Dyne - Traveling Wave Tube Amplifiers - LOGIMETRICS INC.
Semitung - tungsten powder - Semicon Assoc., Inc.
Semitung - tungsten materials - Varian Assocs.
SEMPAC - MOLDED SILICON RECTIFIER - Semtech Corp.
Sensible R - Heat Flow Gage - Hy-Cal Engineering
Sensaire - temperature transmitter - Taylor Instr. Process Control Div.
Sensall - level sensing systems - National Sonics
Sensco - industrial radiation pyrometers - Electro-Optical Inds., Inc.
Sensiflex - sensitive pressure switches and equip. for fluids - Gagne Assocs., Inc.
Sensimatic - accounting machine - Burroughs Corp.
Sensimeter R - Readout system, temp. meas. - Hy-Cal Engineering
Sens-Pak - solid-state controlling device - Gems Sensors Div.
Sentinel - fan - Rotron, Inc.
Sentriline - Filter-Couplers, RF - Bird Electronic Corp.
Sentronic - load cells - Thwing-Albert Instr. Co.
Sentry - loudspeaker - Electro-Voice, Inc.
Sentry Master - hotel TV theft alarm - Channel Master Div. Avnet
Seo-Grip - Nylon Cable Clamp - Weckesser Co. Inc.
Serdex - Humidity Indicators & Recorders - Bacharach Instrument Co.
Serdex Modules - serial data exchange circuits - Analog Devices
SerendIP - SPST solid state relay - Teledyne Relays
SERIES 200 - Modular CRT Display Terminal - Ann Arbor Terminals, Inc.
Series 3 - graphics display terminal - Vector General, Inc.
Series 6000 - tape drive - Microdata Corp.
Series 8000 - disc drive - Microdata Corp.
SermaBond - cement type coatings - SermaTel Teleflex Inc.
SermaLon - fluorocarbon filled coating material - SermaTel Teleflex Inc.
SermaLoy - diffusion coatings - SermaTel Teleflex Inc.
SermaLube - dry film lubrication coatings - SermaTel Teleflex Inc.
SermaSeal - inorganic sealant coatings - SermaTel Teleflex Inc.
SermaTel W - inorganic corrosion resistant coatings - SermaTel Teleflex Inc.
SERVO-CAP - hi current ceramic capacitors - USCC/Centralab, Elec. Div.
Servocap - ceramic capacitor - Centralab
Servo-Linear - speaker system - Electro-Voice, Inc.
Servospeed - electronic motor speed control - Electro-Devices, Inc.
Serv-Rite - thermocouples & T/C wire - Gordon, Claud S. Co.
Setchell Carlson - video monitors, uhf/vhf receivers - Audiometrics
"7MAG" - aerospace chemical coating - Merix Chem. Co.
71-1 T.D. - circuit card fixture - Tech. Devices Co.
SF/duroid - Electrical insulating materials - Rogers Corp.
SFR - selectable fixed resistor - Bourns, Inc.
SGL Waber - outlet strips; wheeled carriers - SGL Waber Electric
SHADOWWEIGHT - tone arm - V-M Corporation
Shawnee - solid state counter - Automatic Timing & Controls Co.
Shawnee - solid state timer - Automatic Timing & Controls Co.
Shearite - hand tools - Amp Inc.
Shieldflex - shielding materials - Magnetic Metals Co.
Shield-Kon - grounding sheath connectors - Thomas & Betts Co.
Shieldmu - shielding materials - Magnetic Metals Co.
Shield-Stripp - hand tool for stripping braided coax shielding - Gagne Assocs., Inc.
Sho Rate - flowmeter - Brooks Instr. Div.
"Shorewall" - sheet piling - Overly-Hautz Co.
Short Stop - electronic motor brake - Ambi-Tech Inds. Inc.
Shrinkdown - heat shrinkable tubings - Markel, L. Frank & Sons
Shure Squeezer - tool - Thomas & Betts Co.
Shure-Stake - tool - Thomas & Betts Co.

Sidicon - silicon vidicon tube - Teltron
Signaflo - Transmission Line flat cable - Ansley Elctns. Corp.
SIGNALEX - Electro-Mechanical Digital Readouts - Staver Co., Inc.
Signal Kicker - antennas - Turner Div.
"Signalock" - Frequency Locking System - LOGIMETRICS INC.
SigNet - signal network cables - Superior Cable Div.
Silastic - Adhesive/sealant - Dow Corning
Sil-Bond - selective silver plating - Braun Co., Inc.
Sil-Clad - insulation - Electric Machinery Mfg. Co.
Silco-Flex - Motor and generator insulation - Allis-Chalmers
Silcoro 80 - brazing alloys - Gte Sylvania, Inc.
SILENT PAGER - WAITRESS PAGING SYSTEM - Baumker Mfg. Co.
Silfared - infrared filter - Metavac, Inc.
Silflex - silicone sleeving - Varflex Corp.
Silflo - brazing alloys - Chemetron Corp.
SIL-FOS - silver brazing alloy - Handy & Harman
Silgar - tube - Alpha Components Corp.
Silicane - low cost silicone substitute - Packaged Resins Div.
Silic-O-Netic - time-delay relay - Heinemann Elec. Co.
Silicontrol - scr gate drives - Vectrol, Inc.
Silimite - Feedwater treatment for removal of silica - Allis-Chalmers
Silmate - silicone rubber form-in-place gaskets - General Elec. Co.
Silohm - resistors, varistors - Carbone Lorraine Industries Corp.
Silox - reactor system - Applied Materials Inc.
Silpaint - thick film silver conductive paste for microelectronics - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Silvaloy - brazing alloys - Engelhard Minerals & Chem.
Silvercap - capacitor - Del Electronics Corp.
Silver-Grip - special set screws - PIC Design Division
Silver II - silver oxide watch battery - Ray-O-Vac Div.
Silverweld - terminations - Bourns, Inc.
Silvrex - silver plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Silvrex - silver plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Simpson "260" - vom multimeter - Simpson Electric Co.
Simuline® - Telephone Channel Simulation Equipment - Seg Subsidiary
Simuline® - telephone channel test & simulation equipment - Comstron Seg.
SineDolor - Dental desensitizer - Controltek Inc.
S.I.R.&R - synchronous inverter regulator system of electronic voltage control - Acme Electric
Sivicon - silicon vidicon camera tube - Amperelex Electronic Corp.
Six-Pac - reed switch module - Controls Research Corp.
Skan-coat - reflective scanner - Skan-A-Matic Corp.
Skipper - fan - Rotron, Inc.
SKY CAP - Ceramic Capacitor - AVX Ceramics
Sky-Tie - Bus drop cable clamps - Adalet Mfg. Co.
SL - chemicals - Mallinckrodt, Inc.
Sleev-Scru - fastener-insulated - Pylon Co., Inc.
Slit-Tite with "Teflon" - 4 thread sealants: paste, stik, tape, cord - Lake Chemical Co.
SLIDELINE(R) - slide actuated potentiometer (control) - Duncan Electronics, Inc.
Slidelite - lighted switch - Leecraft Mfg. Co., Inc.
Slim-Caps - capacitors, fixed, ceramic - Republic Elctns. Corp.
Slim Jim - magnetic tape head - Michigan Magnetics
Slim Jr. - miniature soldering iron - Hexacon Elec. Co.
Slimline - digital panel instruments - NES, Inc.
SLIMPAC - HIGH VOLTAGE RECTIFIER - Semtech Corp.
SLIMPAC JR. - HIGH VOLTAGE RECTIFIER - Semtech Corp.
SLIMPAC SR. - HIGH VOLTAGE RECTIFIER - Semtech Corp.
Slim Sr. - miniature soldering iron - Hexacon Elec. Co.
SLIP-LOCK - Teflon Insulated Terminals - U.S. Terminals
Slip-Sync - automatic synchronizer - Chadwick-Helmuth Co., Inc.
Slo-Blo - miniature fuses - Littelfuse, Inc.
Slo-Syn - synchronors/stepping motors, controls, drives - Superior Electric Co.
SMART - add on & replacement core memory - Standard Memories, Inc.
Smart counters - 6 digit display calculator - Nu-Metrics
Smitty - folding hex wrench set - Hunter Tools
Smoke Signal - smoke & gas detector - Universal Security Instrs.
Snail - connectors - Pylon Co., Inc.
Snap-A-Part - break apart ceramic substrates - Mepco/Electra, Substrate Div.
"Snapblocks" - Sectional terminal blocks - Kulka Elec. Corp.
Snap-Coupler - Tractor quick hitches - Allis-Chalmers

Snap-In - captive screws - Tridair Inds.
Snaphite - indicator light - Leecraft Mfg. Co., Inc.
SNAP-LOCK - limit switches - NAMCO CONTROLS
Snap-on - automotive hand tools - Snap-On-Tools
Snap-Out - aluminum tower - Up-Right Scaffolds
Snap-Pak - rings, retaining - Waldes Kohinor, Inc.
SNAPPER - DC servo motors - Torque Systems
SNAP-TITE - variable resistor - Centralab
SnapTrack - relay/timer mounting system - RDI/Reed Devices, Inc.
Snaptrol - snap together replacement potentiometers - CTS Corp.
SNAP-WRAP - modular connector panels - Amphenol Ind'l. Div.
Sniffer - Portable Combustible Gas Indicator - Bacharach Instrument Co.
Snipe - Wiping action Snap Switch - Illuminated Products Inc.
Snortini - desoldering tool (mini) - Edsyn, Inc.
Snow-Bee - Snow thrower - Allis-Chalmers
-S/N-R - fatigue life gage - Micro-Measurements Div.
Socks - connectors - Thomas & Betts Co.
Soder-Mask - a temporary solder resist - Solder Removal Co.
Soder-Wick - a desoldering aid - Solder Removal Co.
Sod-R-Braze - soldering & brazing equip. - Chemetron Corp.
SODR-X-TRACTOR - desoldering tool - Pace Inc.
Softr - work hats - Clauss Cutlery Co.
So-Hot - heater - Therm-O-Lab Corp.
SOLATRON - line voltage regulator - Sola Electric
SOLDAPULLT - DESOLDERING TOOL - Edsyn, Inc.
SOLDAVAC - DESOLDERING TOOL - Edsyn, Inc.
Soldercon - IC & transistor sockets - Molex Inc.
Solderette - wavesolder equip. - Electrovert
Solder Master - elec. soldering irons - Hexacon Elec. Co.
SOLDERPAK - automated insulation - Raychem Corp.
Solid-D - polyethylene dielectric - Superior Cable Div.
Solid-Gel - rechargeable batteries - Elpower Corp.
Solid-Lite - solid state lamps & displays - OPCOA, Inc.
Solid State - dry reed hybrid modules - Struthers-Dunn, Inc.
Solid-Tubes - silicon rectifier - Elctn. Devices
Solistrand - terminals & splices - Amp Inc.
Solofast - quick-operating fasteners - Paneloc Corp.
Solu Bridge - solution conductivity instrument - Beckman Instrs.
Solu Chek - electrical conductivity meters - Beckman Instrs.
Solu Meter - liquid measuring instrs. - Beckman Instrs.
Sol-U-Salt - plating salts - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Sonac - ultrasonic controls - Delavan Electronics
"SONA GRAPH" - Sound Spectrum Analyzer - Kay Elemetrics Corp.
SONBLASTER - ultrasonic cleaner - Ultrasonic Corp.
Sono - cleaning solvents - Ultrasonic Instrs. Int'l, Inc.
Sonocaster - speaker system - Electro-Voice, Inc.
Sonocaster - loudspeaker - Electro-Voice, Inc.
SONODOME - high frequency speakers - Jensen Sound Labs.
Sonodur - hardness tester - Branson Cleaning Equip. Co.
Sonoflux - ndt - magnetic particle equipment - Automation Inds.
Sonogen - cleaners & degreasers - Branson Cleaning Equip. Co.
Sonoray - flaw/thickness tester - Branson Cleaning Equip. Co.
Sonotite - piezoelectric ceramic - Linden Labs., Inc.
Son-Tector - ultrasonic detector - Techsonics
Soundcaster - mobile sound system - PASO Sound Products Inc.
Sound Director - Sound Columns - Argos Products Co., Inc.
Sound discriminator - audio detection system - Acron Corp.
Sound Spot - microphone - Electro-Voice, Inc.
SpaceMaker - Electric motor controls - Allis-Chalmers
Space Saver - 3 1/2" compact edgewise photoelectric controller - Larson Instr. Co., Inc.
Space Saver - electrical fittings - I-T-E Electrical Components Grp.
Spade-Lok - terminal - Amp Inc.
Sparkcaps - spark gap capacitors - Radio Materials Co.
Spartan - fan - Rotron, Inc.
Spartan SSB Plus - SSB Transceiver - Fanon/Courier Corp., Subs.
Spavver - aerosol prods. - Krylon
Spasaver TM - Miniature switches - Chicago Switch, Inc.
SPC-12 - 8-bit general purpose industrial control minicomputer - General Automation
SPC-16 - 16-bit general purpose automation minicomputer - General Automation
Specialyst - dual optics-24x and 48x large screen - Visidyne Inc.
Spec-Master - outlets, switches - Leviton Mfg. Co., Inc.

Spec Stat - temp sw - Control Prods., Inc.
Spectra - Exposure Meters, Photometers, TV Optoliner - Photo Research Corp.
Spectrochrom - chromatographic analyzer - Beckman Instrs., (AISSD)
Spectrocolorimeter - spectrophotometer-colorimeter - Beckman Instrs., (AISSD)
Speculag - silver plating bath - Conversion Chem. Corp.
Spec 200 - electronic control inst. - Foxboro Co.
Speech Director - Sound System Lectern - Argos Products Co., Inc.
Speedetax - speed detection equipment - Speed Detectors, Inc.
Speedfoil - high speed radiant heater - Armstrong Cork Co.
Speed Nut - fasteners - Eaton Corporation
SPEEDOMAX - electronic indicators, recorders, controllers - Leeds & Northrup Co.
Speedreader - remote meter reading attachments - Singer Co.
Speed Serts - inserts & studs - Tridair Inds.
Speed Servo II - Servo Chart Recorders - Esterline Angus
Speed-Wrap - wire-wrapping tools - O. K. Machine & Tool Corp.
Speedy - wire snips - Clauss Cutlery Co.
Spemco M-H - switches - Specialties Mfg. Co., Inc.
Sphincter - sockets - Pylon Co., Inc.
Spiradel - High Q Constant Delay Line - Allen Avionics, Inc.
Spirafil - semi-rigid cable - Cablewave Systems Inc.
Spirakore - transformer - General Elec. Co.
Spiral - blower - Rotron, Inc.
Spiraltron - electron multiplier (SEM) - Galileo Electro-Optics Corp.
Spiral Wrap Heaters - heaters wrapped around cylinders - Sierracin/Thermal Sys.
Spirap - wire & cable binding - Amp Inc.
SPIRA-SHIELD - flexible cable sheath - Perfection Mica Co.
Spirator - constant force spiral spring - Ametek, Hunter Spring Division
Split - ball bearings - MPB Corp.
Spoolarc - spooled wire - Chemetron Corp.
Sportsman - flashlights and lanterns - Ray-O-Vac Div.
Spot Check - magnetic tape head - Michigan Magnetics
Spot-Lok - nylok spot-lok socket screws - Allen Mfg. Co.
Spotmeter - Photometer - Photo Research Corp.
Spring Kit - packaged springs & forms - Helix Spring Corp.
Springter - sockets - Pylon Co., Inc.
Spriband - wire/cables harnesses - Electrovert
Sprite - fan - Rotron, Inc.
SPT - tape, splicing - General Elec.
Sputtergun - thin film sputtering system - Sloan Technology Corp.
Sputtersphere TM - sputtering system - Materials Resch. Corp.
Squaristor - square resistors - General Resistance, Inc.
SR - clear fused quartz - Amersil, Inc.
S.R.M. - sma-type r.f. connectors - Sealectro Corp.
SRO - Stereo-4 - Electro-Voice, Inc.
S-R-4 - strain gages - BLH Elctns., Inc.
SSB Analyzers - spectrum analyzers - Nelson Ross Elctns.
STABILAC - Stable AC Power Source - TDC, Div. Freq. Technology Inc.
STABILARC - Lighting Ballast - TDC, Div. Freq. Technology Inc.
Stabilene - stable base film - Keuffel & Esser Co.
Stabilflo - control valves - Foxboro Co.
Stabiline - automatic voltage regulators - Superior Electric Co.
Stabilite - laser resonator design - Spectra-Physics, Inc.
Stabilizer 100 - pc board component lead lock-in system* - Hollis Engrg., Inc.
Stabilizer 150 - pc board fluxing and component lead lock-in system* - Hollis Engrg., Inc.
Stable-K - capacitors, fixed, ceramic - Republic Elctns. Corp.
Stacer - self-extending spiral tube - Ametek, Hunter Spring Division
STACPAC - RECTIFIER, SILICON - Semtech Corp.
Staffel - terminal blocks & strips - Electrovert
Sta-Flow - synthetic plastic resins - Air Prods. & Chems., Inc.
Sta-Flux - stabilizer and flux combined for use in stabilizer 150 systems - Hollis Engrg., Inc.
Stairway-Type - tower sections - Up-Right Scaffolds
Sta-Kon - terminals, tools - Thomas & Betts Co.
Stancote - Plastic insulated wire - Standard Wire & Cable Co.
STANDCO - Tachometers, Frequency Meters, Elapsed Time Meters - Sticht Co., Inc. Herman H.
Stanflex - Rubber jacketed portable cable - Standard Wire & Cable Co.
Stantrol - temperature & heater controllers - ARI Inds., Inc.

STANTRON - MODULAR ELECTRONIC CABINETS - Stantron Div.
STARAN - associative array processor system - Goodyear Aerospace Corp.
Sta-Strap (R) - Cable Ties - Panduit Corp.
StatFlex - dc adjustable speed drive - Allis-Chalmers
STAT-I-CHART - Visual Control Boards - Rol-a-chart Div.
Status - electrostatic recorders - Varian Assocs.
Status - a prod. line of electrostatic recorders - Varian Data Machines
Status Sys. - digital printer/plotter systems - Varian Data Machines
Status 21 - electrostatic printer/plotter - Varian Data Machines
Status 31 - electrostatic printer/plotter - Varian Data Machines
Status 33 - electrostatic printer/plotter - Varian Data Machines
STATUS-INDICATOR - compact, 12-message projection readout - Industrial Elctn. Engrs.
Status Seeker - logic test sets - Dataprobe, Inc.
Stavolt - power supplies - Christie Elec.
Sta-Vo-Trol - voltage regulator - General Elec. Co.
Stadvolt - a.c. line voltage regulator - Kelk, George Ltd.
Stenafax - electronic stencils - Fitchburg Coated Products
Step - sequential television equipment programmer - Chrono-log Corp.
Stereo - spkr. sys. - Electro-Voice, Inc.
STEREO-O-MATIC - record changers - V-M Corporation
STEREOSTAR - Stereoscopic Microscope - American Optical Corp.
Stereo-V - phono cartridge - Electro-Voice, Inc.
Stereo-4 - 4-channel matrix system - Electro-Voice, Inc.
STI - LED photoelectric controls - Scientific Technology
Sticky Fingers - self-adhesive rf/em1 shielding - Instrument Specialties
STICPAC - XRAY RECTIFIER - Semtech Corp.
Stic 2 - adhesive spray - Caig Labs., Inc.
Stik Klips - adhesive backed fastening devices - Daburn Electronics & Cable Corp.
Stik-On Heaters - adhesive backed resistance heaters - Sierracin/Thermal Sys.
STODDART - Field intensity meters - Singer Instrumentation
STORED-ARC - welder - Nelson Stud Welding TRW Inc.
Storm-Flex - silicone flat cable - Storm Products Co.
Strainrite - ceramic products - Star Porcelain Co.
Strapping - wire/cables harnesses - Electrovert
STRATE-BREAKS - prescored ceramic substrates - Coors Porcelain Co.
Strato-Therm - splice & terminal - Amp Inc.
Streamseal - Butterfly valves - Allis-Chalmers
Stripec - hi freq hi power transistor package - Microwave Semiconductor Corp.
Stripall - thermal wire stripper - Teledyne Kinetics
Stripmaster - wire strippers - Ideal Industries Inc.
Strip Pack - terminal board - Elgin Elctns., Inc.
StripSwitch - shell-less P.C. board switch - UID Electronics Div.
Striprol - self assemble replacement kits (for side-by-side potentiometers) - CTS Corp.
Strobeguard - high intensity obstruction warning lights-for utility towers, tall buildings, microwave antennas - EG&G, Inc.
STROBETTE - stroboscopes-tachometer - Power Instrs., Inc.
Strobex - strobe light - Chadwick-Helmuth Co., Inc.
Strobolumer - electronic stroboscope - General Radio Co.
Strobosleaver - stroboscopic light source - General Radio Co.
Stroboscac - electronic stroboscope - General Radio Co.
Strobrite - high intensity stroboscope - U.S. Scientific Instrs.
Strongest - all purpose solder - Chemetron Corp.
STUNTRONIC - station controllers - Teletype Corp.
Stur-D-Dial Cord - dial cord - Gudebrod Bros. Silk Co., Inc.
Sturdi-Stand - electric soldering iron holder - Hexacon Elec. Co.
Stur-D-Lace - lacing tape - Gudebrod Bros. Silk Co., Inc.
STYCAST - casting resins - Emerson & Cuming, Inc.
Styafil - fiberglass reinforced polystyrene - Fiberfil Div. Dart Ind.
Styrofoam - polystyrene foam - Dow Chemical Co.
Styron - polystyrene - Dow Chemical Co.
SUBBER - signal tracing analyzer-by signal substitution - Castle TV Tuner Service, Inc.
Sub-Minax - coaxial connector - Amphenol RF Div.
Sue - digital computer - Lockheed Elctns. Co.
Suffamex - nickel plating chems. - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Suffil - fiberglass reinforced polysulfone - Fiberfil Div. Dart Ind.

SUNSWITCH - photoelectric controls - Ripley Co., Inc.
Super-Band - 50-270 MHz line of solid state CATV equip - AEL Communications Corp., Sub. of Amer. Elctn. Labs. Inc.
Super-Cast - vehicle scales - Howe Richardson Scale Co.
Super Caster - spkr. syst. - Electro-Voice, Inc.
Super Caster - Stereo-V - Electro-Voice, Inc.
Super Champ - hand tool - Amp Inc.
Supercharger - I.C. handling equipment - Delta Design, Inc.
Supercon - electrical connectors - Superior Electric Co.
Supercordx - cord - General Elec.
Supercoranol - rubber insulated cable - General Elec.
Super Erecta Shelf - open wire shelving & trucks - Metropolitan Wire Corp.
SUPERFAST - 30 NANOSECOND RECTIFIER, SILICON - Semtech Corp.
Superflex - coaxial cable - Columbia Elctn. Cables
Super Frost Aid - component cooler - Chemtronics, Inc.
Super-Hush - thin-film resistors - Analog Devices
Superior - Gyrotory and jaw crushers - Allis-Chalmers
Super-K - capacitors, fixed, ceramic - Republic Elctns. Corp.
Supermatic - solid state controller - Hotpack Corp.
Super Mite - portable potentiometer - Thermo Elec. Co., Inc.
Supernova - computers - Data General Corp.
Super/reg - electronic DC voltage regulators - Trio Labs, Inc.
SUPERSAFE - 6 Supersafe Fluoride-Free Paste Flux - Superior Flux & Mfg. Co.
SUPERSAFE - #32 Supersafe For Use In Foam Fluxers - Superior Flux & Mfg. Co.
SUPERSAFE - #77 Supersafe Non-Corrosive Paste Flux - Superior Flux & Mfg. Co.
SUPERSAFE - #30 Supersafe Soft Solder Liquid Flux - Superior Flux & Mfg. Co.
Super-Sonax - tweeter - Electro-Voice, Inc.
Super-Stab - power resistor networks - Analog Devices
Superstrate R - ceramic substrates, ultra-fine grained - Materials Resch. Corp.
Super-Syncclamps - large servo clamps - Timber-Top, Inc.
Super-Torq - cap screws - Allen Mfg. Co.
Super-Track - ratio resistor networks - Analog Devices
Super-Twistaguide - triple strength twistaguide - Airtron
Super 270 - connector - Amphenol Connector Div.
Super-40 - waveguides & accessories - Airtron
Supramesh - filter medium - Pall Corp.
Supramesh - rigimesh w/stainless steel powder sinter-bonded - Pall Trinity Micro Corp.
Suprasil - clear fused quartz - Amersil, Inc.
Suprasil-W - clear fused quartz - Amersil, Inc.
Sure-Ty - cable ties - I-T-E Electrical Components Grp.
Surfamex - porous stainless steel fiber - Pall Trinity Micro Corp.
Surgitron - ac & dc protectors - Joslyn Elctn. Sys.
Surmetic - plastic package (zener diodes) - Motorola Semiconductor Prods.
Sus-Tension - film processing hangers - Lektra Labs., Inc.
Sweep-Sync - automatic synchronizer - Chadwick-Helmuth Co., Inc.
Swemer - sweep marker generator - Leader Instruments Corp.
Swidget - slide switch - CW Industries
Swidget, Jr. - slide switch - CW Industries
Swing-Wa - switches, panelboards - General Elec. Co.
Swittpot - screw drivers - Moody Tools, Inc.
Sydneywynder - slide switch - CW Industries
Sylgard - Resin - Dow Corning
Sylvania - integrated circuits - Lansdale Transistor & Elctns.
Synch-Lock - control systems - Sequential Information Systems
SYNCHRO-DIP - solid state relay - Gordos/Grisby-Barton
Synchro-Lok - thick film screen alignment system - Sel-Rex Co. Div. Oxy Metal Industries Corp.
SYNCHRON - timing motors & clock movements - Hansen Mfg. Co.
Synchro-Pac - syn. motors - Electric Machinery Mfg. Co.
SYNCHRO-REEDAC - solid state relay - Gordos/Grisby-Barton
Synchrostat - electrical controls - Electric Machinery Mfg. Co.
Synchro Sweep Generators - frequency response sweepers - Nelson Ross Elctns.
Synchrotal - self-synchronous motors - Kollsman Instr. Co.
Synclamps - servo clamps - Timber-Top, Inc.
Syn-Loc - motors - Bristol Saybrook Co.
Syncon - condenser microphones - Dynalab Corp.
Synconometer - digital time comparator - General Radio Co.

Sync-Trol - synchronous-motor controls - Electric Machinery Mfg. Co.
Synduction - Motors - Allis-Chalmers
Synthane - laminated plastic - Synthane Taylor Corp.
SYNTHINOL - hook up wire - Consolidated Wire & Assoc. Corps.
Synthite - varnishes - Dolph, John C. Co.
Syntholvar - extruded pvc tubing - Varflex Corp.
Syntorque - a.c. motor - EEMCO Div.
SYNTRON - Semiconductor Products - FMC Corporation
SYNTRON - Parts Handling Products - FMC Corporation
SYNTRON - Material Handling Products - FMC Corporation
SYSTEM III&T - wire-wrapping cards - Adcor Electronic Packaging Corp.
SYSTEM III&T - artwork design services - Adcor Electronic Packaging Corp.
SYSTEM III&T - universal PC cards - Adcor Electronic Packaging Corp.
System IV/40 - Remote Intelligent Terminal System - Four-Phase Systems
System IV/70 - Intelligent Terminal System - Four-Phase Systems
System 18/30 - small, general purpose computer - General Automation
System 308 - Fourier spectrum analyzers - Elsytec, Inc.
System 547 - modular wet processing production system - Chemcut Corp.
Systrac - systems - Systron-Donner Inertial Div.
SYSTROL - solid state drive systems - Control Systems Research, Inc.
Systron - data products - Systron-Donner Inertial Div.
S-42 Alloy - antimony gold plating process - Sel-Rex Co. Div. Oxy Metal Industries Corp.

T

T-A - digital meters - Tekelec, Inc.
Tab-Gun - heat guns - Sigma Sys. Corp.
TABLOCK - mixed flow wheel - Torin Corp.
Tabi-Top - automatic plating sys. - Sel-Rex Co. Div. Oxy Metal Industries Corp.
TACHLITE - stroboscopes - Power Instrs., Inc.
Tacholog - tachometers with revolution counters - Kollsman Instr. Co.
Tach-Pak - tachometer system - Airpax Elctns.
Tach-Trol - tachometer system - Airpax Elctns.
TAG-RING - shielded wire termination - Glenair, Inc.
"Tallymaster" - adding-subtracting machines - Victor Computometer Corp.
Tan-Film TM - tantalum thin film resistors - TRW/IRC Resistors
Tankard - digital set counter - Automatic Timing & Controls Co.
Tankard - digital set timer - Automatic Timing & Controls Co.
Tanktrol - pressure operated control - Autocon Inds., Inc.
Tantalex - tantalum electrolytic capacitors - Sprague Elec. Co.
Tantalite - lithium tantalate - Crystal Technology
Tantalytic - capacitors - General Elec. Co.
Tape Cable - flat flexible cable - Brand-Rex Co.
TAPECON - tape cable connector assemble - Burndy Corporation
TAPELESS TAPE MEASURE - Hand Held Measuring Device - ENM
TAPE PAK - fish tapes - Ideal Industries Inc.
Taperlock - connector for semi-rigid cable - Cablewave Systems Inc.
Tapeswitch - longitudinal contact pairs - Tapeswitch Corp. Amer.
Tapfree - cutting fluid - Brooks Co. Inc., Winfield
Tapit TM - Miniature pushbutton switches - Chicago Switch, Inc.
Tap-Lite - switches - Pacific Electricord Co.
Tap-Lok - self-tapping threaded inserts - Groov-Pin Corp.
TA'POT - tape potentiometer - Howell Inst. Inc.
Taptone - electronic can tapping inspection device - Benthos, Inc.
TARGET - antennas - S & A Electronics
Tarzan - fan - Rotron, Inc.
Tasc-2 - radioisotopic analysis system - Harshaw Chemical Co.
Tasc-5 - cerebral function analyzer - Harshaw Chemical Co.
Tasc-8 - pulmonary function analyzer - Harshaw Chemical Co.
Taylorclad - metal clad laminates - Synthane Taylor Corp.
Taylorite - vulcanized fibre - Synthane Taylor Corp.
Tayloron - laminated plastic - Synthane Taylor Corp.
Tayp-Air - airborne taper pin - Amp Inc.
Tay-Tronic - welding controls - Taylor-Winfield Corp.
T-Bar - multi-contact switches & relays - T-Bar Inc.
TCI - touch switches - Refac Elctns/Wild Rover

TDI - power supply - Transistor Devices
TDM - power supply - Transistor Devices
TDMD - power supply - Transistor Devices
Teachware - educational software - Fabri-Tek, Inc.
TechniMatC - receiver and transmitter sys - Technical Mat'l
Techni-Rite - Analog & Event Recorders - Gulton Inds., Inc.
Teckshield - custom shielded enclosures - Technical Wire Products, Inc.
Teckstik - shielding & sealing gasket - Technical Wire Products, Inc.
Teckstrip - EMI/RFI gasket - Technical Wire Products, Inc.
TEC-LITE - indicating devices - Tec, Inc.
Tekelec T-A - digital voltmeters, multimeters - Tekelec Inc.
TEL/CELL - telecommunications & standby battery - Globe Union, Inc.
Telco - antennas & installation accessories - GC Electronics
Telcon - metal alloys - Inter-Tech. Grp., Inc.
Tel-Beam II - large screen tv projector - Kalart Victor Corp.
Tel/Data 2000 series - data analyzer - Digitech Data Inds., Inc.
Telefax - X-Ray baggage inspection unit - Teltron
Tel-Pac TM - Elfab Corp.
Telapen - handwriting transmission systems - Telautograph Corp.
Tel-Power Poles - Divided, vertical multioutlet assemblies - Wiremold Co.
Teleproducts - communication products - Atlantic Research Corporation
TELEQUIPMENT - Low-priced Oscilloscopes - Tektronix, Inc.
Telescan - complete telemetry systems - Autocon Inds., Inc.
Telescriber - handwriting transmission systems - Telautograph Corp.
Telerslide - Drake Mfg. Co.
Telesponder - Tracking Radar Devices - Vega Precision Labs.
Telestap - remote control systems - Autocon Inds., Inc.
"Tele-Torque" - Torque-Wrenches, Dual-Scale - Owatonna Tool Co.
Teletrol - complete telemetry systems - Autocon Inds., Inc.
Televac - vacuum measuring instrumentation - Fredericks Co.
Televex - 45 RPM adaptors and playback styli - Aldshir Mfg.
Television Tube Caddy(R)-TV - Servicemans' Case - Argos Products Co., Inc.
Tel-Eye - solid state alarm sensor - Autocon Inds., Inc.
Telicon - Improved vidicon tube - Teletron
Telinc - voice processing equipment - International Communications
Teltronize - Patented process for (image tubes) - Teletron
Temars - transportation environment measuring and recording system - Endevo
"Temflex" - tapes & tabings - 3M Co.
TEM/Guide - coaxial/waveguide components - UTE Microwave
TEMPCAL - thermocouple/thermal switch tester - Howell Inst. Inc.
Temperex - gold electroplating process for high temp applications - Sel-Rex Co. Div. Oxy Metal Industries Corp.
Tempgard - temperature alarm system - Tenney Engrg., Inc.
Tempilabels - temperature indicating labels - Tempil Div.
Tempilaq - coatings - Tempil Div.
Tempil Pellets - pellets - Tempil Div.
Tempilstick - crayons - Tempil Div.
Temp-Lace - lacing tape - Gudebrod Bros. Silk Co., Inc.
TEMPO - Hi Fidelity Speakers - Oxford Speaker Co.
Temp-Plate - temperature indicating decals - Wahl, Wm. Corp.
Temp-R-Glas - teflon coated fiberglass - Connecticut Hard Rubber Co.
Temp-R-Tape - teflon tape - Connecticut Hard Rubber Co.
Tempruf - temperature compensated spring - Chatillon John & Sons
Tempscribe - Recording Thermometer - Bacharach Instrument Co.
Tempstat - standard controller - Hotpack Corp.
Tempstir - lab. mixer/stirrer/temp. controller - GCA/Precision Scientific
Temptron - industrial infrared thermometer - Barnes Engrg. Co.
Tenite - polyallomer, polyester, cellulosic & polyolefin plastics - Eastman Chem. Prods.
Tenna Rotor - TV antenna rotator - Alliance Mfg. Co.
Tenna-Tube - wall-thru - Javex Elctns.

Tenuline - RF Attenuators - Bird Electronic Corp.
Tera-Ohmmeter - insulation resistance tester - Rhode & Schwarz Sls.
TERG-A-ZYME - powder manual detergent - Alconox Inc.
Termaline - RF Loads & Wattmeters - Bird Electronic Corp.
Termalum - terminals & splices - Amp Inc.
Termashield - ferrules or splices - Amp Inc.
Termi-Blok - tab terminal junction block - Amp Inc.
TERMI CETTE - digital cassette terminal memory unit - Intern'l. Computer Prods., Inc.
Termi-Foil - terminals - Amp Inc.
Termi-Grid - interconnection sys - Amp Inc.
Termi-Kit - cable terminating system - General Elec.
TERMINET - data communications printer - General Elec. Co.
Terminyl - terminals & splices - Amp Inc.
Termi-Plate - connectors - Amp Inc.
Termi-Point - wiring system - Amp Inc.
Termi-Twist - connectors - Amp Inc.
Terrastar - amphibious vehicle - Lockheed Aircraft Svc.
TESTCLIP - I.C. tester and comparator - Fluke Trendar Corp.
Testclip - hand held-incircuit IC tester (digital) - Trendar
Test Lead Caddy - test aid - Air-O-Tronics Prods.
TESTPAC - Automatic test system - ZEHNTLE, Inc.
Tetco - speed recorder - Electric Tachometer Corp.
Texin r - urethane elastomer - Mobay Chem. Corporation
TEXTOLITE - industrial laminates - General Elec. Co.
"TFR" - transistorized float rectifier - Warren G-V Communications
TGS - taguchi gas sensor - Figaro Engrg. Inc.
TGS - taguchi (the inventor) gas-sensing semi-conductor - Figaro Engrg. Inc.
T Head - hand tool - Amp Inc.
The Big Look - voltmeters & ammeters - General Elec. Co.
The Fault Finder - AC leakage current detector - Sotcher Measurement
The Ferret&T - halogen leak detector - General Electric Co.
THELCO, FREAS - ovens, incubators, baths - GCA/Precision Scientific
The Metal Stickers - welding and soldering equip. - Hughes Aircraft Co.
Thermac - temperature control - Research, Inc.
Thermacomb - Corrugated Ceramics - American Lava Corp.
THERMALERT - infrared thermometer - Raytek, Inc.
Thermal Mapper - infra-red scanner - Bendix Corp.
ThermalMaster - industrial infrared thermometer - Barnes Engrg. Co.
Thermasplice - splice for shielded wire - Amp Inc.
Thermatabs - temperature indicating labels - Camwil Inc.
ThermaZip - thermal materials & jacketing - Zippertubing Co.
Thermcoat CC - ceramic cement - Omega Engrg., Inc.
Thermcoat CO and COL - cement - Omega Engrg., Inc.
Thermcoat HT - adhesive and electrical insulator - Omega Engrg., Inc.
Thermcoat Kit - insulation and cement kit - Omega Engrg., Inc.
Thermcoat SL - silicone lacquer - Omega Engrg., Inc.
THERMILINEAR - thermometer - Yellow Springs Instrument Co.
THERMIVOLT - signal conditioner - Yellow Springs Instrument Co.
Thermobead - Glass coated bead thermistor - Thermometrics, Inc.
Thermobond - Phenolic Insulating Varnish - Sterling
THERMOBOND - varactor diodes - Varian Electron Tube & Device Grp.
Thermobond - varactor diodes - Varian Assocs.
Thermochip - thermoelectric cooling modules - Melcor-Materials Elctn. Prods.
Thermochuck - temp controlled chucks - Temptronic Corporation
Thermodur - High Temperature Varnish - Sterling
THERMOFIT - heat shrinkable tubing - Raychem Corp.
THERMOFLAG - Transistor Heat Dissipators - Staver Co., Inc.
Thermoflake - Flake (thick film) thermistor - Thermometrics, Inc.
"Thermoflo" - thermal flow measurement - Thermo Sys., Inc.
THERMOFORM - high temperature insulating products - Precision Paper Tube Co.
THERMOHM - temperature detector (resistance thermometer-type) - Leeds & Northrup Co.
Thermolain - ceramic products - Star Porcelain Co.
Thermolastic - heating element - Cox & Co., Inc.
Thermomatic - constant temperature block - Beckman Instrs. (A1SSD)
Thermonic - induction heating equip. - Taylor-Winfield Corp.

Thermopad - plastic package (power transistors) - Motorola Semiconductor Prods.

Thermopak - Plastic Molded Triac & SCR No Metal Tab - ECC Corp.

Thermopatch - heating element - Cox & Co., Inc.

Thermopoxy Compound - Epoxies - Sterling

Thermoprobe - bead-in-glass probe thermistor - Thermometrics, Inc.

Thermorod - Bead-in-glass rod thermistor - Thermometrics, Inc.

Thermosheet - heating element - Cox & Co., Inc.

Thermospot - temp controlled probes - Temptronic Corporation

Thermo Stack - core memory stack - Fabri-Tek, Inc.

Thermotream - temp controlled microchambers - Temptronic Corporation

THERMOSWITCH - temperature controls - Fenwal, Inc.

Thermotab - Plastic Molded Triacs & SCR Metal Tab - ECC Corp.

Thermotape - heating element - Cox & Co., Inc.

Thermo-Tactor - overload protection sys. - General Elec. Co.

Thermoterm - noise sources, hot - Maury Microwave Corp.

Therm-O-Trac - heat control soldering station - Hexacon Elec. Co.

THERMOVANE - Transistor Heat Dissipators - Staver Co., Inc.

Thermowatt - silicon power transistors - Motorola Semiconductor Prods.

Thermowire - heating element - Cox & Co., Inc.

The Short Stop - AC leakage current tester - Sotcher Measurement

The Voice of the Theatre - speaker systems - Altec Div.

"THIN-HEET" - etched foil heating element - Safeway Products

Thinistor - thermistor - Victory Engrg. Corp.

"Thinlay" - micro-thin selective electroplating - Advanced Materials Systems

Thinline - capacitors, fixed, ceramic - Republic Elctns. Corp.

THINPAK - miniature relay - American Zettler, Inc.

Thinshield - electrostatic shielding technique - CEA

Thin-Trims - variable ceramic trimmers - Johanson Mfg. Corp.

THINVERTER - miniature power converters - Arnold Magnetics Corp.

THINWALL - pre-impregnated tubing - Precision Paper Tube Co.

Third-Hand - automated soldering gun - Hollis Engrg., Inc.

"Thirsty" Foam Wire - hi-absorbent urethane foam wiper - Clean Room Prods.

Thorkom - miniature polycarbonate connector - Viking Inds., Inc.

Thorn - cathode raytubes - Inter-Tech. Grp., Inc.

Thorn-Brimar - cathode raytubes - Inter-Tech. Grp., Inc.

Thorox - thorium oxide - National Beryllia Corp.

3-Wire Line - grounded production - UNGAR, Div.

3200 DIGITAL TESTER - bench top IC tester for digital IC's - Sitek, Inc.

ThruLine - RF Wattmeters - Bird Electronic Corp.

Thumb Mite - miniature size thumbwheel switch - Tech Labs., Inc.

Thy-Mo-Trol - motor control - General Elec. Co.

Thyristrol - SCR proportional power & controllers - Cross Electronics Inc.

Thyrite - dielectric or resistance mat'l. - General Elec. Co.

Ti-Ball - pumps - Varian Assocs.

Timatch - connector - Times Wire & Cable

Time Capsule - 2 lead ac timer - Artisan Elctns. Corp.

Time Electronics - voltage calibrator - Zi-Tech Div.

Timefax - electrosensitive recording paper - Fitchburg Coated Products

Timemark - electrosensitive recording paper - Fitchburg Coated Products

Time-O-Lite - photographic timers - Industrial Timer Corp.

Time-Pak - solid-state controlling device - Gems Sensors Div.

Tineon - indicator light - Leecraft Mfg. Co., Inc.

Tinnerman® brand - fasteners - Eaton Corporation

Tinsil - silver bearing solder - Bow Solder Products

Tintac - organic coating - Conversion Chem. Corp.

Tintillate - tin plating bath - Conversion Chem. Corp.

Tiny-Glow - pilot lights - Industrial Devices

Tiny "L" - inductors - Aladdin Elctns.

Tinylite - Drake Mfg. Co.

Tinymag - relays - Torwico Elctns., Inc.

Tinymax - transformers - Torwico Elctns., Inc.

Tinymite - flexible coupling - Renbrandt, Inc.

TINY-PAK - Miniature flat pack package - Mini-Systems, Inc.

Tiny Ties - miniature wire & cable ties - Transcon Mfg. Co.

Tiny Trim - variable trimmer delay line - Kappa Networks

Tisan - programmer - Artisan Elctns. Corp.

Tite-Bite - connectors - Thomas & Betts Co.

Titelite - Drake Mfg. Co.

TKC - printed circuit connectors - Teledyne Kinetics

T-Lite - bi-pin indicator light - GTE Sylvania Inc.

TOG-L-LOK - Clamping tool - Channellock, Inc.

Toho - paper tape perforator - Uchida of America Corp.

Tokin - all products - Tohoku Metal Inds., Ltd.

TONE-O-MATIC LOUDNESS - loudness control - V-M Corporation

Tong Test - clamp on ammeter - Columbia Electric Mfg. Co.

Tonomagic - nonship chemical - R-Columbia Products, Inc.

Tonotron - direct view storage tube - Hughes Aircraft Co.

Top Brass - microphone - Electro-Voice, Inc.

Tophel - thermocouple alloy - GTE Sylvania Inc.

Tophet - heating element alloy - GTE Sylvania Inc.

TOR Heat Sinks - aluminum heat sinks-transistor mounting pads - TOR Corporation

Tormax - stepper motors and control elec. - IMC Magnetics Corp.

TORQLINER - coil forms for electrical windings - Cambridge Thermionic Corp.

Torgometer - direct-reading dial torque measuring tools - Snap-On-Tools

Torq Switch - centrifugal switches - Torq Engineered Products, Inc.

Torgsyn Remote Positioner - direct drive servomechanism - Vernitron Corp.

TORQUE COMMANDER - screw driver sets - Vaco Products Co.

Torque-Rite - air tool torque control system - S. Himmelstein & Co.

Torque Watch - Torque Watch Gauge - Waters Mfg., Inc.

Torrex Series - x-ray inspection system - Torr Labs.

Torrlite Series - xenon flashtubes - Torr Labs.

Torr Seal - resin - Varian Assocs.

Torr Seal - high vacuum sealer - Varian Assocs.

Torx - fastener drive system - Camcar Screw & Mfg.

T-O-T - sealant and pipe thread compound - Lake Chemical Co.

Touch Mos - touch control technology - American Microsystems, Inc.

T-Pads - semiconductor pads - Transcon Mfg. Co.

Tra-Bond - adhesives - Tra-Con, Inc.

Tra-Cast - potting compounds - Tra-Con, Inc.

TRACER-flo - hermetic leak tester - Trio-Tech, Inc. of Calif.

Tracer-Tech - inspection penetrants - Shannon Luminous Mat'ls.

Tracker&T - servicemen's battery-operated portable leak detector - General Electric Co.

TRACOR WESTRONICS - all product lines - Westronics

Traction Booster - Tractor draft control system - Allis-Chalmers

TRACTORADIO - Applicable to Tractor radios - ATR Electronics, Inc.

Tra-Duct - conductive adhesives - Tra-Con, Inc.

TRAILFLEX - CV-cured mining cables - CCS Hatfield Wire & Cable Group

Traktet - tracking field effect transistor - Analog Devices

Tran Bal - inverter ballast - Bodine Co.

Transactive DPLs - compact DPLs with added circuit functions - Analogic Corp.

Transaire - pressure transmitter - Taylor Instr. Process Control Div.

Trans-Box - plastic boxes - Vichek Plastics Co.

Transcope - pneumatic transmitter/recorder - Taylor Instr. Process Control Div.

Transelectric - telephone apparatus - Encom Prods. Co., Inc.

Transistar - chemicals - Mallinckrodt, Inc.

Transitlite - laser alignment device - Spectra-Physics, Inc.

TRANS-O-MATIL - automatic transfer switch - Lakeshore Electric Corp.

Trans-Start - electrical controls - Electric Machinery Mfg. Co.

Transvoit - standard voltage - Guildline Instrs., Inc.

TransZorb - silicon transient suppressor - General Semiconductor Industries, Inc.

Travel-Tron - campor TV antenna - Antenna Corp. of America

TRENDTRAK - curve follower program control unit - Leeds & Northrup Co.

Trevar - alloy - Hamilton Technology, Inc.

Triac Kooler - heat dissipator - UNITRACK Div.

Tri-Amp - Selenium Rectifier - General Instruments Corp.

"Tri-Band" - 3-band antenna - Telrex Labs.

"Tri-Beam" - u.v. ray generators - Western Coil & Elec. Co.

Tri-Break - circuit breakers - General Elec. Co.

Tri/Ciad - motors, generators, frequency converters - General Elec. Co.

Tricolor - Color Temp. Meter - Photo Research Corp.

Trigac - trigonometric analog converters - Singer Co.

Trigard - 3 electrode spark gap - Joslyn Elctn. Sys.

Trig-R-Heat - soldering gun - Wall-Lenk Mfg. Co.

Trimatron - dimmer control - Leviton Mfg. Co., Inc.

Trimit - potentiometer - Bourns, Inc.

TRIM KITTM - Capacitor Kit - American Technical Ceramics

"Trimline" - PC mounting variable delay line - ESC Elctns. Corp.

Trimpot - potentiometer - Bourns, Inc.

TRIM-STEP - encoder, shaft angle, optical - Trump-Ross Ind'l. Controls

TR-IOTA - encoder, shaft angle, optical - Trump-Ross Ind'l. Controls

TRI-PHASIC CONVERSION - autozeroing integration technique - Data Precision Corporation

Triplate - patented semiconductor process - Alpha Instr. Inc.

TRIPLE MATE - SOLDERING TIPS FOR ABOVE - Edsyn, Inc.

Triplematic - mixing, metering, dispensing machinery - Hardman Inc.

Tri-State - three stage output ICS - National Semiconductor Corp.

Trol Aid - control cleaner - Chemtronics, Inc.

Trol-A-Temp - heating & cooling controls - EWC, Inc.

Troxler - selector switch - CTS Corp.

Trolpac&T - control units (timing generator and register/decoder - Analogic Corp.

TROH - fuses & fuseholders & fuse clips - Bussmann Manufacturing

Troubleshooter - extension spotlights - Teledyne Big Beam

Troubleshooter - in-circuit component system - ZEHNTEK, Inc.

Truarc - rings, tools & gages - Walde Kohinoor, Inc.

Trucote - flux coated silver rod - Chemetron Corp.

TRUFLEX - thermostat metals - Texas Instruments

TRU-MITE - encoder, shaft angle, optical - Trump-Ross Ind'l. Controls

TRU-ROTA - encoder, shaft angle, optical - Trump-Ross Ind'l. Controls

TRYPACK - modular precision power supplies - Systron Donner Trygon Div.

T-Screen - insulated tape-shield dividing - Superior Cable Div.

TTS - timeshare terminals - TTS

Tube O'Gel - thixotropic gelling agent - Beckman Instrs., (AISD)

TUBE-PAC - SOLID STATE SILICON VACUUM TUBE REPLACEMENT - Semtech Corp.

TUBE-R-CAP - capacitor resistor combination - Centralab

Tuchswitch - solid state limit switch - Denison, R.B., Inc.

Tuff-Tainer - plastic boxes - Vichek Plastics Co.

Tuf-Test - lacing tape - Gudebrod Bros. Silk Co., Inc.

Tuf-Ties - wire & cable ties - Transcon Mfg. Co.

Tulox - cellulose acetate butyrate tubing - Blum, Julius & Co., Inc.

Tunger - rectifying apparatus - General Elec. Co.

Tun-O-Foam - tuner cleaner/lubricant - Chemtronics, Inc.

Tun-O-Lube - tuner cleaner - Chemtronics, Inc.

Tun-O-Power - tuner cleaner-polish-lubricant - Chemtronics, Inc.

Tun-O-Wash - tuner degreaser - Chemtronics, Inc.

TURBO - Varnished Cotton Sleaving - Brand-Rex Co.

TURBOCRYL - Acrylic Coated Glass Sleaving - Brand-Rex Co.

TURBOGLAS - Varnished Cotton Sleaving - Brand-Rex Co.

TURBOLEX - General Purpose Vinyl Tubing - Brand-Rex Co.

TURBOSIL - Silicone Coated Glass Sleaving - Brand-Rex Co.

TURBOTHERM - High Temperature Vinyl Tubing - Brand-Rex Co.

TurboTorr TM - Turbo-Molecular Pumping Units - Sargent Welch Sci. Co.

TURBOTUF - Vinyl Coated Glass Sleaving - Brand-Rex Co.

TURBOZONE - Low Temperature Vinyl Tubing - Brand-Rex Co.

TURBO 117 - Silicone Rubber Coated Glass Sleaving - Brand-Rex Co.

Turner - microphones - Conrac Corp.

Turn-Loc - captive screw - Deutsch Fastener Corp.

Tutorette - audiocard readers - Audiophonics

TV-PAC - HIGH VOLTAGE MULTIPLIER - Semtech Corp.

TVS - torque verification system - S. Himmelstein & Co.

Twenty/Twenty - epoxy adhesive - Packaged Resins Div.

Twenty/Twenty - epoxy adhesive - Allaco Prods Div.

Twinducer - Gear drives, two motors - Allis-Chalmers

Twin-Hex - crimp tool system - Amphenol RF Div.

Twin Light - circuit indicator light - GTE Sylvania Inc.
TWIP - SOLDERING & DESOLDERING SUPPLY HOLDER - Edsyn, Inc.
Twistaguide - twistable flexible waveguide - Airttron
Twist-Lite - lighted pushbutton switch - Master Specialties Co.
20/20 - custom panel instrument line - Westinghouse Elec. Corp.
2+2 - four tone selective call system - Bramco Controls Div.
TWYSTRON - microwave amplifier tubes - Varian Electron Tube & Device Grp.
Twystron - amplifier - Varian Palo Alto Microwave Tube Div.
Twystron - microwave amplifier - Varian Assocs.
Tygon - polyvinyl chloride tubing - Blum, Julius & Co., Inc.
Typotron - direct view storage tube - Hughes Aircraft Co.
Typotron - direct view storage tube - Hughes Aircraft Co.
Ty-Rap - cable ties, clamps, & tools & accessories - Thomas & Betts Co.
Tytex - batteries - Exide Power Sys. Div.
T-1 Military Indicator Light - indicator light - GTE Sylvania Inc.

U

UAR/T - universal asynchronous receiver/transmitter - General Instr. Corp.
UBIQUITOUS® - real-time spectrum analyzers - Nicolet Scientific Corp.
Uchida - fuse, electronic computer & related system - Uchida of America Corp.
U-D-F - unidirectional flow inductors - Ajax Magnethermic Corp.
UFLEX - UF & MNC types - CCS Hatfield Wire & Cable Group
Uibloc - plastic package (transistors) - Motorola Semiconductor Prods.
Ultra-Solv - cleaning solvents - Udel Manufacturing
Ultipor - filter medium - Pall Corp.
Ultipor - filter media - Pall Trinity Micro Corp.
Ultra-Craft - catalog - Workman Electronic Prods., Inc.
Ultra "F" - graphite purification process - Ultra Carbon Corp.
ULTRAFLEX - Adjustable Speed Drives & Controllers - Cutler-Hammer, Inc.
Ultra-Flux - flux - Engelhard Minerals & Chem.
Ultra-Glow - illuminated push button, slide & rocker switches - UID Electronics Div.
ULTRA-KAP - ceramic capacitor - Centralab
Ultra-Mate - connector - Amphenol Connector Div.
ULTRA-ONE - variable resistor - Centralab
Ultrapak - wave soldering sys - Electrovert
ULTRA-SEAL - Solderable, protective coatings - Kenco Alloy & Chemical Co., Inc.
Ultrasil - clear fused quartz - Amersil, Inc.
ULTRA-SOL - Solvent cleaners - Kenco Alloy & Chemical Co., Inc.
Ultra-Strates - substrates .025" with a 2m" B/S - Accumet Engineering Corp.
Ultratec - catalog - Workman Electronic Prods., Inc.
Ultra-Temp - high temperature adhesive - Aremco Prods., Inc.
Ultraverter - uhf to vhf converter - Blonder-Tongue Labs., Inc.
Ultravox - portable sound column - PASO Sound Products Inc.
Ultrax - 100 ultra high purity chemicals - Baker, J.T. Chemical Co.
ULTROHM - Resistors - Ultronic, Inc.
Ultrol - cross-linked polyethylene cable - Brand-Rex Co.
Unibase - silicon power transistors - Motorola Semiconductor Prods.
UNIBUS - Signal Data Path - Digital Equipment Corp.
UNI-BUS - Bus Ducts & distribution systems - Cutler-Hammer, Inc.
Unicaram - fixed ceramic capacitors - JFD Electronics Components Corp.
Unicoat - insulation coating - Bacon Inds.
Unicom - CATV trunk amplifier - Delta-Benco-Cascade LTD.
Uni-Core - acid filled core solder - Alpha Metals, Inc.
UNI-CURVE - R-T, curve-matched, interchangeable thermistors - Fenwal Elctns.
Unidaptor - special 45 RPM adaptor - Aldshir Mfg.
Unidex - rotary switches - Oak Inds. Inc.
UNIDYNE - unidirectional microphone - Shure Brothers, Inc.
Uni-Kit - cable splicing kit - General Elec.
Uni-Laser - small, one-piece pulsed laser - Laser Inc.
Uniline - sound columns - University Sound
UNI-PAC - integrated circuit socket - Methode Elctns., Inc.

Uniply - automatic multirange supply - Power Designs, Inc.
UNIRING - one piece compression termination - Burndy Corporation
UNI-ROTOR - pumps - Astro Dynamics
Uniseal - for microphones - Electro-Voice, Inc.
UNISPHERE - unidirectional microphone - Shure Brothers, Inc.
United Electron - tubes - United Page Inc.
Unitized - electric motors - General Elec. Co.
Unitrack - circuit card guides (plastic and metal) - UNITRACK Div.
Unitron - telescopes - Unitron Scientific, Inc.
Unitron - gamma radiography machines - Automation Inds.
Uni-Tunnel - backward diodes - Centralab Semiconductor
Unitwest - coupling - Jan Hardware Mfg. Co.
"Universal" - mobile antenna fittings - K-W Engineering Works
Universal - Clips - Mueller Electric Co.
Universal Active Filter - multi loop negative feedback filter - Kinetic Tech., Inc.
Universal Pilot Housing - pilot lamp socket - GTE Sylvania Inc.
Universal Time Capsule - AC or DC timer from 1 to 1000 seconds - Artisan Elctns. Corp.
Uniwatt - plastic package (transistors) - Motorola Semiconductor Prods.
Uniweld - unique construction of coils, applied specifically to our line of buzzers - Endicott Coil Co.
Unpluggables - spring loaded test probes - Ostby & Barton Co.
UNREEL TM - Reel-less Wire & Cable Package - Belden Corp.
Urefil - fiberglass reinforced polyurethane - Fiberfil Div. Dart Ind.
Uresolve - cured silicone & urethane dissolver - Dynaloy, Inc.
USE - magnetic comps. - U.S. Elctns.
U-Tile-Mu - shielding tiles - Amunel Mfg. Corp.
Utili-Splice - connectors - Amp Inc.
Utili-Tap - power cable - Amp Inc.
Utili-Tenshun - connectors - Amp Inc.
Uvex - weatherable plastic sheet - Eastman Chem. Prods.
UVtron - Ultraviolet radiation detector - Hamamatsu TV Co., Ltd.

V

Vacdon - pumps - Varian Assocs.
VACOMBO - kits - Vaco Products Co.
VACONNECTORS - tap connectors - Vaco Products Co.
VacPac - vacuum equipt - Hull Corp.
Vac-Seal - epoxy resin - Perkin-Elmer Ultek Inc.
Vac Sorb - vacuum forepump - Varian Assocs.
VacSorb - pumps - Varian Assocs.
VACTORR - vacuum pumps - GCA/Precision Scientific
Vactrol - optical couplers (or) isolators - Vactec, Inc.
Vaculoy - oxide free bar solder - Alpha Metals, Inc.
Vacumette - resistor - CW Industries
Vac-U-Sel - current rectifiers - General Elec. Co.
VADAC - voice analyzer converter - E-Systems Inc.
VAL-AN - Military Cases - Zero Mfg. Co.
Valley - Paper mill equipment - Allis-Chalmers
Valox - thermoplastic polyester - General Elec.
ValueLine - Motor control - Allis-Chalmers
Value Vial - vials - Beckman Instrs., (AISSD)
VALUPOWER SERIES - high power precision system slot range power supplies - Systron Donner Trygon Div.
Valvactor - valve positioner - Foxboro Co.
VAM - air variable capacitors - JFD Electronics Components Corp.
Vaporflo - humidification system - Tenney Engrg., Inc.
Varax - Line Voltage Regulator - Tele-Dynamics/Wanlass
Varfil - flexible sleeving - Varflex Corp.
Varflo - flexible sleeving - Varflex Corp.
Varglas - flexible sleeving - Varflex Corp.
Variable-D - microphone - Electro-Voice, Inc.
Variac® - adjustable autotransformer - General Radio Co.
Varicon - electrical contact - Elco
VARIDAC - converters - Perkin-Elmer Corp.
Vari-L - electrically variable inductors - Vari-L Co.
Varilok - electrical contact - Elco
Varipak - printed circuit card cage - Elco
Variplate - interconnecting system - Elco
Vari-Tax - Speed changers - Allis-Chalmers
Varitor - elect. variable inductor - Data Delay Devices
Varitrim - capacitors - Voltronics Corp.
Vari-Vac - metering valve - Vactronic Lab. Equip., Inc.
VAST - computer-controlled ATE - PRD Elctns., Inc.
V BALL - precision rubber balls - Vernay Laboratories, Inc.
VECO Vamp - meter protector - Victory Engrg. Corp.

Vectorbord - Perforated Insulating Board - Vector Electronic Co., Inc.
Vectorgraphics 11 - interactive graphics display system - Vector General, Inc.
Vectortablet - data tablet - Vector General, Inc.
Vectrol - power sys. - Vectrol, Inc.
Velcor - hue shift corrector - Television Microtime, Inc.
Velometer - air-velocity instrument - Alnor Instrument Co.
VENT-RAK - Cabinets, Chassis & Accessories - General Devices Co., Inc.
Verifier - PCB tester - Western Electronic Systems
Verilux - digital indication - Toledo Scale
Vernistat - a.c. potentiometer - Perkin-Elmer Corp.
Vernitorq - brushless DC torque motor - Vernitron Corp.
Veroboard - P.C. Board - Vero Electronics
Verobox - Aluminum Mini-Enclosure - Vero Electronics
Verolock - Card Frame Locking Mechanism - Vero Electronics
Verorack - Card Frame - Vero Electronics
Versa-Cage - p.c. card rack - UNITRACK Div.
Versa-Fab - tape - General Elec.
Versaformer - Current transformer - Allis-Chalmers
Versa Lock - matv device lock - Blonder-Tongue Labs., Inc.
Versamatic - book pasting machine - A. M. W. Corp.
Versamount brackets - card guides brackets (plastic and metal) - UNITRACK Div.
Versa-Pac - Motors - Allis-Chalmers
Versapak - temperature controllers - Honeywell
Versapot - calibrator/potentiometer - Biddle, James G.
VERSA-RANGE - refrigerated test chambers - Blue M Electric Co.
Versatap - matv tap offs - Blonder-Tongue Labs., Inc.
Versatol - rubber insulated cable - General Elec.
Versa-Tran - temperature controllers - Honeywell
Versa-Trap - roughing pump accessories - Perkin-Elmer Ultek Inc.
Versatyme® - programmable controller - Applied Materials Inc.
Versawatt - molded plastic package for TO-66 sockets - RCA Solid State Div.
Versilube - silicone lubricant - General Elec. Co.
Verserisal - environmentally sealed inverter - Nova Electric Mfg. Co.
Vertohold - Embedment anchor - Edo Western Corp.
V-Guard - stylus assembly - Stanton Magnetics, Inc.
VIBRACHOPPER - DC Driven Solid State Chopper - Solid State Electronics Corp.
VIBRALERT - vibration switches - Metrix Instrument Co.
Vibramike - optical displacement measuring device - Advanced Dynamic Instrs. Div.
Vibra-mite - vibration pickup - Vibra-Metrics, Inc.
VIBRA SONE - ultrasonic cleaning sys. - Phillips Mfg. Co.
Vibraswitch - monitoring sys - Robertshaw Controls Co.
Vibra-Tel - monitoring sys - Robertshaw Controls Co.
Vibrode - capacitor modulators - Beckman Instrs., (AISSD)
VIBROGROUND - ground resistance testers - Associated Research, Inc.
Vicom - commercial edgeboard connector - Viking Inds., Inc.
VICON® - CCTV accessories - Vicon Industries Inc.
Videofax - high speed document transmission - Datalog Div., Litton Sys.
Videopak - closed circuit TV systems - Audiotronics
VIDICUE - Model 5050 Video Tape Editing System - Datatron, Inc.
Vidifont - character generator - CBS Laboratories
Vidigage - thickness tester - Branson Cleaning Equip. Co.
Vigiltron - safety switch-high level alarm - Autocon Inds., Inc.
VII® - CCTV accessories - Vicon Industries Inc.
Viking - tape equipment - Telex Communications, Inc.
Vikon - burn resistant vidicon surface - Teltron
Vikon - Non burn LLLTV vidicon - Teletron
VINYLINK - vinyl insulated splice - Burndy Corporation
VINYLUG - vinyl insulated terminal - Burndy Corporation
VIP - programmable controllers - Struthers-Dunn, Inc.
VIP - Aluminum Instrument Enclosures - Zero Mfg. Co.
Viscorder - graphic recorders - Honeywell, Inc.
Visi-Dial - dial assy. - Theta Instr. Corp.
Visi-Guard - lightning & electrical surge protector - Joslyn Elctn. Sys.
VISTAL - Translucent polycrystalline Al2O3 ceramic - Coors Porcelain Co.
VITACOTE - soldering iron tips - ESICO, Inc.
Vita Drive - rubber drive wheel-cleaner - Friend's Mfg.
Vital - telecommunications solder connector - Viking Inds., Inc.
Vitrohm - vitreous enamel wire-wound resistors - Ward Leonard Elec. Co. Inc.
Vitrolain - ceramic products - Star Porcelain Co.
VN-TC - Power & Control Cable - Brand-Rex Co.
VOCAL MASTER - sound system - Shure Brothers, Inc.

Voice Director - Portable P.A. System - Argos Products Co., Inc.
Vol-Con - voltage/continuity tester - Kurz-Kasch, Inc.
Voltaut - taut-band suspension sys. - Kratos
Volt-Pac - variable transformers - General Elec. Co.
Voltprobe - voltage testers - Amprobe Instr.
Volttrip - limit detection & control - Kratos
Voltensor - voltage level monitor module - Calex Mfg. Co., Inc.
Volumax - controller peak - CBS Laboratories
Vol-U-Meter - flow calibrator - Brooks Instr. Div.
Volumetric - diaphragm - Electro-Voice, Inc.
Voyager I - portable microfiche reader - Visidyne Inc.
Voyager II - compact lap reader screen, 7"W x 9.5"H-20x or 24x - Visidyne Inc.
Voyager II - portable microfiche reader - Visidyne Inc.
V-Pac Power Sources - DC-DC converters - Reliability Inc.
VPR - metal film resistors - Vermont Precision Resistor Co.
V-Q - vacuum interrupters - Electric Machinery Mfg. Co.
VSMF - visual search microfilm - Information Handling Services
V TIP - rubber tipped armatures - Vernay Laboratories, Inc.
VTO - MIC Varactor-Tuned Oscillators (in TO-8 packages) - Avantek, Inc.
Vu-Break - circuit breakers - General Elec. Co.
Vulcan - soldering irons melting pots - Precision Elec. Co.
Vulkaflex - cross-linked polyolefin cords & leads - General Elec.
Vulkene - cross-linked polyethylene insulated wires - General Elec.
Vumatik - miniature pneumatic instrumentation - Honeywell
Vutronic - miniature electric instrumentation - Honeywell
V V C - voltage variable semiconductor capacitor - Codi Corporation
VX Super Refractory - crucibles, boats - Gte Sylvania, Inc.
Vycor - 96% silica glasses - Corning Glass Works
VYLINK - Irradiated Vinyl Insulated Wire - Brand-Rex Co.
V-2 - transducers - Westinghouse Elec. Corp.
V-53 - resistors - Vishay Resistive Systems Grp.
V71, V72, V73, V74 - digital computers - Varian Data Machines

W

Wafercon - P.C. board wafer connectors - Molex Inc.
Wafer-Sphere - butterfly valves - Jamesbury Corp.
Wait-A-Bit - delay lines - Aladdin Elctns.
WALSCO - tape-phono drives & belts - GC Electronics
WAMCO - custom built cases - Miller, W. A. Co.
Wassco Glo Melt - resistance soldering material - American Elec. Heater
Water-Bloc - flooding compound - Superior Cable Div.
Watertite - moisture resistant rubber insulation - Okonite Co.
Water Welder - oxy-hydrogen flame generator - Henes Mfg. Co.
Wattcher - RF Monitor/Alarm - Bird Electronic Corp.
Watt-Pak - solid-state controlling device - Gems Sensors Div.
Wavedipper - lead tinning - Electrovert
Waveform Eductor - signal averager - Princeton Applied Resch. Corp.
Wavelabs - vibration measurement - Systron-Donner Inertial Div.

Wavetrak - wave tracking device - Edo Western Corp.
Weather-Ometer - accelerated weathering chamber - Atlas Electric Devices
Webair - computer room air conditioner - Weber Tech Products
WEDGELOCK - "T" SLUG CONSTRUCTION - Standard Grigsby Inc.
Weecoll - chokes, r.f. - Syscon Int'l., Inc.
Weecoll - variable inductors - Syscon Int'l., Inc.
Weecoll - if transformers, hf transformers - Syscon Int'l., Inc.
Weecoll - miniature inductive components - Syscon Int'l., Inc.
Weighmaster - electronic scales - Electro-Numerics Corp.
WELCON - Integrated Circuit Carriers, Contactors & Sockets - Wells Electronics, Inc.
Weldohm R - Strong Flat TV Lead-In - Belden Corp.
Weldox - adhesives compositions - Hardman Inc.
Wellflex - semi-rigid cable - Cablewave Systems Inc.
Wenking - potentiometer - Brinkmann Instrs., Inc.
Wenking - potentiostats - Brinkmann Instrs., Inc.
West - Temperature Controllers - Gulton Inds., Inc.
West-Cap - glass encapsulated monolithic cap - San Fernando Elec. Mfg.
West-Ing Arc - elec. welding apparatus - Westinghouse Elec.
Wheeler - flanges - Varian Assocs.
Whisper - fan - Rotron, Inc.
WHO's - wire holding objects - Gudebrod Bros. Silk Co., Inc.
Widebeta - radioactivity detection sys. - Beckman Instrs., (AISSD)
Wik-It - solder remover - Wik-It Elctns. Corp.
Wilbraz - hi-temp brazing alloys - Wilkinson Co.
Wild One - Solid State Guitar/P.A./Musical Instrument Amplifier - Wilder Engrg. Prods, Inc.
Willard - charge-retaining batteries - Wisco Div.
Winchester Relays - Reed Relays - Elctn. Instr. & Specialty
Windjammer - motorized & belted blowers - Ametek/Lamb Electric
Wirecenter - semi-automatic wiring machine - Hughes Aircraft Co.
WIRE NUT - wire connectors - Ideal Industries Inc.
Wiretemp - wire temperature sensor - Trans-Met Engrg.
Wire-Wrap - tools and machines for making solderless wrapped connections - Gardner-Denver
Woolke - wow & flutter meters - Gotham Audio Corp.
Wolverine - loudspeakers - Electro-Voice, Inc.
Wood Electric - circuit breakers - Potter & Brumfield
Wrap Rack - card packaging - Scanbe Canoga Industries
Wrap-X - logic card with 16-14 or 16 pin 1c sockets - Datascan Div.
Wrarost - Terminals for wire wrapping - Auto-Swage Products Inc.
Wrinlay Process - markings for elect. panels - Photo Chemical Prods. Cal.
Write-On-It - labeling tape - Labelon Corp.
Wybar - component lead forming - Eraser Co.

X

XacTemp - pyrometers - Gordon, Claud S. Co.
XacTgland - adjustable T/C comp. fittings - Gordon, Claud S. Co.
XacThead - thermocouple heads - Gordon, Claud S. Co.
XacTlok - thermocouple comp. fitting - Gordon, Claud S. Co.

XacTohm - resistance temperature sensors - Gordon, Claud S. Co.
XacTpak - thermocouple assemblies - Gordon, Claud S. Co.
XacTseal - sealant for thermocouple wire ends - Gordon, Claud S. Co.
XCITE - hydraulic excitation equipment - Zonic Technical Labs.
X-Citers - magnetic tape head - Michigan Magnetics
"Xele" - knives - Klein, Mathias & Sons, Inc.
Xenolite - arc lamp sys - Christie Elec.
XL - bench & portable scales - Howe Richardson Scale Co.
X-L - power supply - Transistor Devices
XLS - soldering pencils - Wall-Lenk Mfg. Co.
XL-TC - power and control cable - Brand-Rex Co.
X-Olene - cross linked polyethylene cable - Okonite Co.
X Series - exit auxiliary lights - Teledyne Big Beam
Xtradur - soldering tips - Hexacon Elec. Co.
X-Var - paint strippers - Fidelity Chem. Prods. Corp.

Y

Yellow Handle - crimping tools - Amp Inc.
YELLOW 77 - wire pulling lubricant - Ideal Industries Inc.
YEW - measuring instruments - Yewtec Corporation
Yewtec - measuring instruments - Yewtec Corporation
Young World - toys - Midland International Corp.

Z

"Z" Amp - zener current source - General Resistance, Inc.
Zero Amp - mixing amplifier - Spectra Sonics
Zero Centurion - Carrying Cases - Zero Mfg. Co.
Zero-Flow - multilayer dielectric ink - Engelhard Minerals & Chem.
ZERO-HALLIBURTON - Aluminum Luggage & Camera Cases - Zero Mfg. Co.
Zeromatic - ph measuring instrs. - Beckman Instrs., (AISSD)
ZERO-PLY - Sandwich Construction Modular Cases - Zero Mfg. Co.
Zero Quip - Work Stations - Zero Mfg. Co.
ZERO-SPACE SERIES - Aluminum Cabinets & Consoles - Zero Mfg. Co.
ZERO-TRAK - Steel Chassis Slides - Zero Mfg. Co.
Zestron - reed relays - COSAR Corp.
ZIP DIP - zero insertion pressure dip skt - Textool Products, Inc.
Zipax - cable shielding - Cal-Metec Corp.
Zip-In - shelving, bins - Equipito
Zip-Loc - stressed panel fastener - Deutsch Fastener Corp.
Zippertubing - zip-on jacketing - Zippertubing Co.
Zip R Processor - processing equip. for metalphoto R - Metalphoto Corp.
ZIP Sys. - automated circuit test sys. - Automation Dynamics
ZipTape - marking systems - Zippertubing Co.
Z-Match - microwave comps. - Vari-L Co.
Z-Match - wide band transformers, mixers, frequency doublers - Vari-L Co.
Z-Trol - x-ray gage thickness control - Electron-Machine Corp.
"Z" Volt - zener voltage reference - General Resistance, Inc.

Last Page of this Section.

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



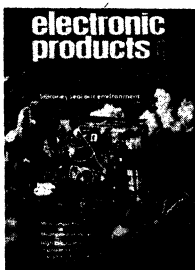
electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

**Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530**



electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.

18TH EDITION

eem7576

VOLUME 2

PASSIVE COMPONENTS / SWITCHES / MATERIALS / HARDWARE / DISPLAYS / WIRE & CABLE / DISTRIBUTOR DIRECTORY

- 2•2 Capacitors (all types)
- 2•338 Chemicals / Cleaners / Coatings / Materials
- 2•345 Circuit Boards & Assemblies / Breadboarding Kits
- 2•368 Coil & Choke Assemblies & Forms
- 2•444 Connectors, Terminals, Sockets
- 2•1075 Panel Components (excluding Lighting & Displays)
- 2•1121 Displays & Readouts (including Lamps & Lights)
- 2•1210 Mechanical Components (Bearings, Cores, Magnets, etc.)
- 2•1258 Hardware (Non-Current Carrying)
- 2•1268 Insulators / Insulation
- 2•1276 Microwave Components & Accessories
- 2•1408 Resistors, Fixed
- 2•1584 Resistors, Variable
- 2•1693 Tools (Hand & Power) / Soldering Supplies
- 2•1720 Transformers
- 2•1835 Wire / Cable / Harnesses & Accessories

VOLUME 1

INSTRUMENTATION & SYSTEMS / POWER SOURCES / SUBASSEMBLIES / SEMICONDUCTORS / RELAYS / CONTROLS

- 1•2 Amplifier Assemblies
- 1•14 Audio Equipment & Accessories
- 1•44 Enclosures / Packaging Systems
- 1•110 Communications / Telemetry Equipment
- 1•127 Computing, Data Handling Equipment & Accessories
- 1•228 Control Systems & Components
- 1•279 Crystals / Oscillators / Crystal Filters
- 1•422 Delay Lines
- 1•468 Environmental Test Equipment
- 1•472 Fans / Blowers / Cooling Equipment
- 1•525 Filters (excluding Crystal)
- 1•601 Instruments, Measuring & Test
- 1•863 Instruments, Graphic Recording
- 1•880 Integrated Circuits & Hybrids
- 1•901 Microwave Systems & Subsystems
- 1•929 Motors & Drives
- 1•1006 Electro-Optical Components & Accessories
- 1•1026 Power Sources (including Batteries)
- 1•1540 Production Equipment / Manufacturing Services
- 1•1547 Relays & Solenoids
- 1•1837 Semiconductors
- 1•1910 Servomechanisms
- 1•1926 Switches / Protective Components
- 1•2308 Thermo-Electric Components
- 1•2330 Transducers
- 1•2350 Tubes & Tube Parts

AVX: The Insiders.

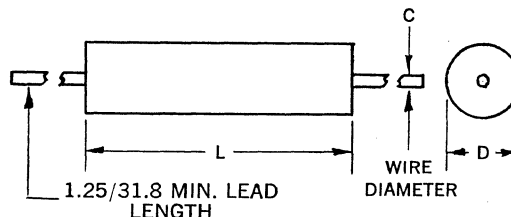
GlasGuard™

Glass Cased Axial Lead Capacitors

Style	L Max.	Dia. Max.	Wire Dia. Nom.
GC09	.170/4.30	.065/1.60	.020/.501*
GC10	.170/4.30	.100/2.54	.020/.501*
GC70	.260/6.55	.100/2.54	.020/.501*

Dimensions: Inches/Millimeters

* Alternate .025/.634 available



Temperature Characteristics

	CHAR. A	CHAR. B	CHAR. C	CHAR. E
Operating Temperature Range	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C	-55°C to +85°C
Capacitance Change	0 ±30 ppm	±7½%	±15%	+22 — 56% +10°C to +85°C
EIA Characteristic	COG (NPO)	X7F	X7R	Z5U
Capacity Range	1 to 2,200 pf	10 to 10,000 pf	470 to 68,000 pf	470 to 120,000 pf
Capacity Tolerances	5%, 10%	±5%, 10%	±10%, 20%	±20%, +80% -20%
Dissipation Factor Initial	.1%	1.0%	2.5%	3.0%
Dissipation Factor Post Test	.2%	1.5%	3.0%	4.0%
Insulation Resistance Initial @ 25°C	100,000 megohms or 1,000 megs x mfd.	100,000 megohms or 1,000 megs x mfd.	100,000 megohms or 1,000 megs x mfd.	10,000 megs or 1,000 megs x mfd.
Initial @ Elevated Temperature	10,000 megs or 100 megs x mfd at 125°C.	10,000 megs or 100 megs x mfd at 125°C.	10,000 megs or 100 megs x mfd at 125°C.	1,000 megs or 10 megs x mfd at 85°C
@ 25°C After Moisture or Immersion	50,000 megs or 500 megs x mfd.	50,000 megs or 500 megs x mfd.	50,000 megs or 500 megs x mfd.	5,000 megs or 500 megs x mfd.
@ 25°C After Life	50,000 megs or 500 megs x mfd.	50,000 megs or 500 megs x mfd.	50,000 megs or 500 megs x mfd.	1,000 megs or 100 megs x mfd.
@ Elevated Temperature After Life	5,000 megs or 50 megs x mfd at 125°C.	5,000 megs or 50 megs x mfd at 125°C.	5,000 megs or 50 megs x mfd at 125°C.	N.A.
Test Conditions for Capacity and D.F. Frequency Voltage	1 — 1000 pf 1 MHz > 1000 pf 1 KHz ≤ 1.0 VRMS	1 — 100 pf 1 MHz > 100 pf 1 KHz ≤ 1.0 VRMS	1 — 100 pf 1 MHz > 100 pf 1 KHz ≤ 1.0 VRMS	1 KHz ≤ .5 VRMS
Working Voltage	200 100 50	200 100 50 25	200 100 50 25	100 50 25
Dielectric Withstanding Voltage	3X rated	3X rated	3X rated	2.5X rated

* .5 pf minimum below 10 pf

Capacitance Range in pf

	100 VDC TEMP. CHAR.				50 VDC TEMP. CHAR.				25 VDC TEMP. CHAR.		
	A	B	C	E	A	B	C	E	B	C	E
GC09	56	100	680	1800	120	390	2700	5600	—	—	.01
GC10	470	470	3300	6800	820	1800	.012 MF	.018 MF	3300	.022 MF	.033 MF
GC70	1200	1200	.01 MF	.018 MF	2200	4700	.047 MF	.056 MF	.01 MF	.068 MF	.12 MF

AVAILABLE CAPACITANCE TOLERANCES

D = ±.5 pf

J = ±5%

K = ±10%

M = ±20%

Z = +80 — 20%

How to Order

GC70 1 C 10 3 K

Capacitance Tolerance Code

Multiplier (Number of Zeros)

Significant Figures of Capacitance Characteristic

Temperature Characteristic

Voltage: 6 = 200 V; 1 = 100 V; 5 = 50 V; 2 = 25V

Style

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.**AVX CERALAM[®] CHIPS**

Ceralam Chips Type ULA 25 - 50 - 100 Volt

Additional Specifications
and Ordering Information
on the following page.**Temperature Characteristics**

	CHAR. A	CHAR. B	CHAR. C	CHAR. E
Operating Temperature Range	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C	-55°C to +85°C
Capacitance Change	0 ±30 ppm	±7½%	±15%	+22 -56% +10°C to +85°C
EIA Characteristic	COG (NPO)	X7F	X7R	Z5U
Capacity Range	1 pf to 22,000	10 pf to 0.1 mfd	10 pf to .56 mfd	56 pf to .58 mfd
Capacity Tolerances	±1%*, 2%, 5%, 10%	±5%, 10%	±10%, 20%	±20%, +80% -20%
Dissipation Factor Initial	.1%	1.0%	2.5%	3.0%
Dissipation Factor Post Test	.2%	1.5%	3.0%	4.0%
Insulation Resistance Initial @ 25°C	100,000 megohms or 1,000 megs x mfd.	100,000 megohms or 1,000 megs x mfd.	100,000 megohms or 1,000 megs x mfd.	10,000 megs or 1,000 megs x mfd.
Initial @ Elevated Temperature @ 25°C After Moisture or Immersion	10,000 megs or 100 megs x mfd at 125°C.	10,000 megs or 100 megs x mfd at 125°C.	10,000 megs or 100 megs x mfd at 125°C.	1,000 megs or 100 megs x mfd at 85°C.
@ 25°C After Life	30,000 megs or 300 megs x mfd.	30,000 megs or 300 megs x mfd.	30,000 megs or 300 megs x mfd.	3,000 megs or 300 megs x mfd.
@ Elevated Temperature After Life	30,000 megs or 300 megs x mfd.	30,000 megs or 300 megs x mfd.	30,000 megs or 300 megs x mfd.	1000 megs or 100 megs x mfd.
Test Conditions for Capacity and D.F. Frequency Voltage	1 — 1000 pf 1 MHz† > 1000 pf 1 KHz 1.0 ±.2 VAC	1 — 100 pf 1 MHz > 100 pf 1 KHz 1.0 ±.2 VAC	1 — 100 pf 1 MHz > 100 pf 1 KHz 1.0 ±.2 VAC	1 KHz < .5 VAC
Working Voltage	200 100 50	200 100 50 25	200 100 50 25	100 50 25
Dielectric Withstanding Voltage	3X rated	3X rated	3X rated	2.5X rated

* 1% or .5 pf whichever is greater

† 1-100 pf if parts are for MIL-C-55681

Capacitance Range in pf

AVX TYPE/EIA STYLE	100 VDC TEMP. CHAR.				50 VDC TEMP. CHAR.				25 VDC TEMP. CHAR.			
	A	B	C	E	A	B	C	E	B	C	E	E
ULA05	1 to 270	100 to 270	680 to 1000	1800 to 4700	180 to 470	330 to 1000	2200 to 6800	5600 to .015 μF	1200 to 1800	8200 to .015 μF	.018 to .022 μF	
ULA10 CC0805* CDR01	1 to 470	150 to 470	1200 to 3300	2700 to 8200	300 to 820	560 to 1800	3600 to .012 μF	.01 to .022 μF	2200 to 3300	.015 to .022 μF	.027 to .039 μF	
ULA15	1 to 820	330 to 820	2000 to 5600	5600 to .015 μF	560 to 1200	1000 to 2700	6800 to .018 μF	.018 to .047 μF	3300 to 5600	.022 to .039 μF	.056 to .068 μF	
ULA35	10 to 2200	1000 to 2200	6800 to .015 μF	.015 to .047 μF	1500 to 3600	2700 to 8200	.018 to .056 μF	.056 to .15 μF	.01 to .018 μF	.008 to .12 μF	.12 to .22 μF	
ULA50	820 to 4700	1800 to 4700	.015 to .033 μF	.033 to .1 μF	3300 to 8200	2600 to .018 μF	.039 to .12 μF	.12 to .27 μF	.022 to .033 μF	.15 to .27 μF	.33 to .39 μF	
ULA75	220 to 1500	560 to 1500	4700 to .012 μF	.01 to .027 μF	1000 to 2200	1800 to 5600	.015 to .039 μF	.033 to .082 μF	6800 to .010 μF	.047 to .082 μF	.10 to .12 μF	
ULA55 CDR04	820 to 5000	2200 to 5600	.015 to .039 μF	.039 to .10 μF	4700 to 9100	6800 to .018 μF	.047 to .15 μF	.047 to .33 μF	.022 to .039 μF	.020 to .27 μF	.39 to .47 μF	
ULA65 CDR05	1800 to .012 μF	8200 to .012 μF	.033 to .082 μF	.082 to .22 μF	.8220 to .018 μF	.015 to .047 μF	.1 to .33 μF	.27 to .68 μF	.056 to .1 μF	.056 to .68 μF	.82 to 1.0 μF	
ULA70 CC1805 CDR02	270 to 1500	680 to 1500	4700 to .012 μF	.012 to .033 μF	1200 to 2700	1800 to 5600	.015 to .047 μF	.039 to .1 μF	1800 to .012 μF	.056 to .082 μF	.12 to .15 μF	
ULA78 CC1808 CDR03	470 to 3300	1200 to 3300	.01 to .022 μF	.027 to .056 μF	2200 to 5600	4700 to .012 μF	.018 to .1 μF	.068 to .18 μF	.015 to .022 μF	.1 to .18 μF	.22 to .27 μF	
ULA68	1800 to .01 μF	4700 to .01 μF	.033 to .082 μF	.068 to 0.22 μF	6800 to .018 μF	.012 to .039 μF	.1 to .27 μF	0.27 to .68 μF	.047 to .082 μF	.33 to 0.56 μF	.82 to 1.0 μF	
ULA60 CC2225 ⁽¹⁾ CDR06 ⁽²⁾	2200 to .012 μF	5600 to .012 μF	.039 to .1 μF	.1 to .27 μF	.012 to .002 μF	.015 to .047 μF	.12 to .33 μF	.33 to .82 μF	.056 to .1 μF	.39 to .68 μF	1.0 to 1.2 μF	

(1) EIA-RS198 designation

(2) MIL-C-55681 designation

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

Continued from
preceding page.

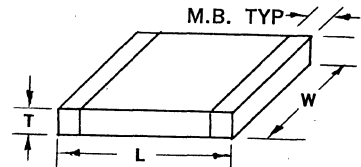
AVX CERALAM[®] CHIPS

Ceralam Chips Type ULA 25 - 50 - 100 Volt

Dimensions Ceralam Chips

AVX Type	L		W		T		M.B.		Styles EIA-RS198 MIL-C-55681
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	
ULA05	.060 1.52	.040 1.01	.060 1.52	.040 1.01	.050 1.27	.020 0.50	.012 .30	.003 .08	
ULA10	.090 2.28	.070 1.77	.060 1.52	.040 1.01	.050 1.27	.020 0.50	0.25 .63	.005 .13	CC 0805 CDR 01
ULA15	.105 2.66	.085 2.15	.060 1.52	.040 1.01	.060 1.52	.020 0.50	.030 .76	.010 .25	CC 1005
ULA35	.135 3.42	.115 2.92	.110 2.79	.090 2.28	.060 1.52	.020 0.50	.030 .76	.010 .25	CC 1210
ULA50	.150 3.81	.130 3.30	.180 4.57	.160 4.06	.060 1.52	.020 0.50	.030 .76	.010 .25	
ULA75	.160 4.06	.140 3.55	.060 1.52	.040 1.01	.060 1.52	.020 0.50	.030 .76	.010 .25	
ULA55	.185 4.69	.165 4.19	.135 3.42	.115 2.92	.060 1.52	.020 0.50	.030 .76	.010 .25	CC 1812 CDR 04
ULA65	.195 4.95	.175 4.44	.260 6.60	.240 6.09	.060 1.52	.020 0.50	.030 .76	.010 .25	CDR 05
ULA70	.195 4.95	.165 4.19	.060 1.52	.040 1.01	.060 1.52	.020 0.50	.030 .76	.010 .25	CC 1805 CDR 2
ULA78	.195 4.95	.165 4.19	.090 2.28	.070 1.77	.060 1.52	.020 0.50	.030 .76	.010 .25	CC 1808 CDR 03
ULA68	.235 5.97	.215 5.46	.220 5.59	.200 5.08	.060 1.52	.020 0.50	.030 .76	.010 .25	
ULA60	.235 6.09	.210 5.33	.260 6.60	.235 6.09	.060 1.52	.020 0.50	.030 .76	.010 .25	CC 2225 CDR 06

Dimensions: Inches/Millimeters



Add .005/.127 to chart for
solder coated lands

VOLTAGE

6 = 200 V

5 = 50 V

1 = 100 V

2 = 25 V

101 = 100 pf - third digit signifies number of zeros. Values below 10 pf use "R" in place of decimal point (5R6 = 5.6 pf).

AVAILABLE CAPACITANCE TOLERANCES

C = ± 25 pf

J = $\pm 5\%$

D = ± 5 pf

K = $\pm 10\%$

F = $\pm 1\%$

M = $\pm 20\%$

G = $\pm 2\%$

Z = +80 -20%

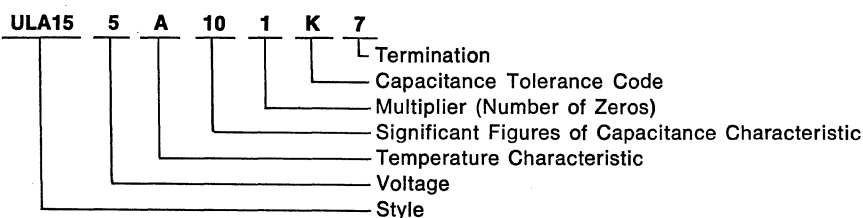
H = $\pm 3\%$

AVAILABLE TERMINATIONS

1. Palladium Silver
2. Palladium Silver Solder Alloy 62-36-2
3. Nickel Barrier-Solder Alloy (Double Solder Guard)
4. Gold — consult plant for availability
5. Silver Term
6. —————
7. NiGuard®-Silver, Nickel, Gold Plated, Std. AVX Term
8. NiGuard®-Solder Alloy 62-36-2

Also available with ribbon or wire leads with or without epoxy skim coating. Consult factory for details.
NiGuard will be furnished unless specified otherwise.
Dimensions shown include NiGuard Lands.
Add .005 for solder coated lands.

How to Order



THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

SKY CAPS®

Sky Cap® Type 3400 — Dipped Monolithic

Additional Specifications
and Ordering Information
on the following page.

Temperature Characteristics

	CHAR. A	CHAR. B	CHAR. C	CHAR. E
Operating Temperature Range	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C	-55°C to +85°C
Capacitance Change	0 ±30 ppm	±7½%	±15%	+22 -56% +10°C to +85°C
EIA Characteristic	COG (NPO)	X7F	X7R	Z5U
Capacity Range	1.8 to 47,000 pf	10 to 330,000 pf	56 pf to 33 mfd	56 pf to 6.8 mfd
Capacity Tolerances	±1%*, 2%, 5%, 10%	±5%, 10%	±10%, 20%	±20%, +80% -20%
Dissipation Factor Initial	.1%	1.0%	2.5%	3.0%
Dissipation Factor Post Test	.2%	1.5%	3.0%	4.0%
Insulation Resistance Initial @ 25°C Initial @ Elevated Temperature @ 25°C After Moisture or Immersion @ 25°C After Life @ Elevated Temperature After Life	100,000 megohms or 1,000 megs x mfd. 10,000 megs or 100 megs x mfd at 125°C. 50,000 megs or 500 megs x mfd. 50,000 megs or 500 megs x mfd. 5,000 megs or 50 megs x mfd at 125°	100,000 megohms or 1,000 megs x mfd. 10,000 megs or 100 megs x mfd at 125°C. 30,000 megs or 300 megs x mfd. 30,000 megs or 300 megs x mfd. 3,000 megs or 30 megs x mfd.	100,000 megohms or 1,000 megs x mfd. 10,000 megs or 100 megs x mfd at 125°C. 30,000 megs or 300 megs x mfd. 30,000 megs or 300 megs x mfd. 3,000 megs or 30 megs x mfd.	10,000 megs or 1,000 megs x mfd. 1,000 megs or 10 megs x mfd at 85°C. 3,000 megs or 300 megs x mfd. 1,000 megs or 100 megs x mfd. N.A.
Test Conditions for Capacity and D.F. Frequency Voltage	1 — 1000 pf 1 MHz† > 1000 pf 1 KHz 1.0 ±.2 VAC	1 — 100 pf 1 MHz > 100 pf 1 KHz 1.0 ±.2 VAC	1 — 100 pf 1 MHz > 100 pf 1 KHz 1.0 ±.2 VAC	1 KHz < .5 VAC
Working Voltage	200 100 50	200 100 50 25	200 100 50 25	100 50 25
Dielectric Withstanding Voltage	3X rated	3X rated	3X rated	2.5X rated
Solder Temperature	> 500°F	> 500°F	> 500°F	> 500°F

* 1% or .5 pf whichever is greater

† 1-100 pf if parts are for MIL-C-11015

Capacitance Range in pf

	CHAR. A		CHAR. B		CHAR. C		CHAR. E	
	100 V	50 V	50 V	50 V	50 V	25 V	50 V	25 V
3417	2.2-12	2.2-12	10-50	10-50	50-380	50-380	56-2000	56-2000
3418	68-170	170-300	250-1200	1200-1700	7200-13,000	13,000-17,000	12,000-24,000	24,000-36,000
3419 3429	360-1700	1700-3300	10,000-17,000	17,000-24,000	68,000-110,000	110,000-170,000	120,000-175,000	175,000-350,000
3424	2000-3900	3900-9200	30,000-33,000	33,000-72,000	200,000-510,000	510,000-720,000	300,000-1.0 mfd	1.0 mfd-1.7 mfd
3420 3430	2200-5100	5100-10,000	33,000-50,000	50,000-68,000	300,000-720,000	720,000-1.2 mfd	500,000-1.2 mfd	1.2 mfd-2.2 mfd
3421 3431	6800-10,000	10,000-30,000	68,000-110,000	110,000-200,000	500,000-1.2 mfd	1.2 mfd-1.7 mfd	1.2 mfd-3.0 mfd	2.7 mfd-3.6 mfd
3422 3432	16,000-30,000	30,000-50,000	170,000-220,000	220,000-340,000	680,000-2.2 mfd	2.2 mfd-4.0 mfd	2.2 mfd-5.0 mfd	5.0 mfd-6.8 mfd

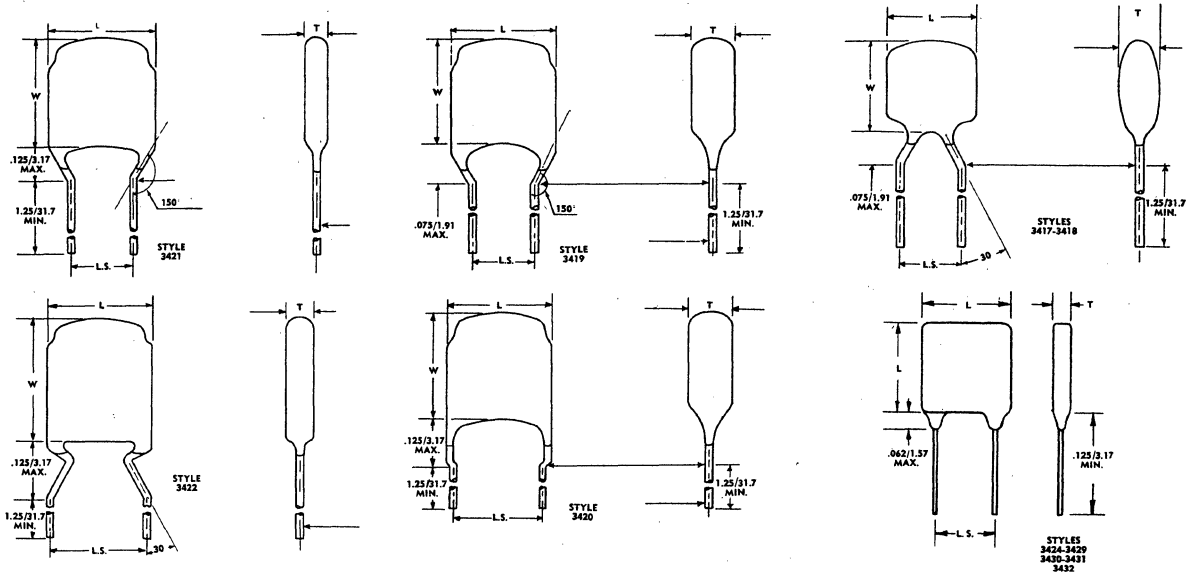
THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

Continued from
preceding page.

SKY CAPS®



Dimensions

Part Number	L Max.	W Max.	T Max.	L.S. ±.030	AWG No.
3417	.100/2.54	.100/2.54	.100/2.54	.100/2.54	24
3418	.150/3.81	.150/3.81	.100/2.54	.100/2.54	24
3419*	.200/5.08	.200/5.08	.125/3.18	.100/2.54	24
3420	.300/7.62	.300/7.62	.150/3.81	.200/5.08	24
3421	.400/10.16	.400/10.16	.150/3.81	.200/5.08	24
3422	.500/12.70	.500/12.70	.200/5.08	.400/10.16	22
3424	.390/9.91	.202/5.13	.150/3.81	.250/6.35	24
3429	.200/5.08	.200/5.08	.125/3.18	.100/2.54	24
3430	.300/7.62	.300/7.62	.150/3.81	.200/5.08	24
3431	.400/10.16	.400/10.16	.150/3.81	.200/5.08	24
3432	.500/12.7	.500/12.7	.200/5.08	.400/10.16	22

Consult factory for variations in lead spacing and lead gauge

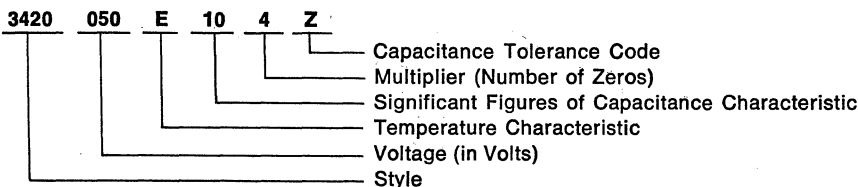
* 3439 identical to 3419 except for .200 lead spacing

Dimensions: Inches/Millimeters

Military Equivalents

Military Specifications	3417	3418	3419	3439	3420	3421	3422
MIL-C-20	CC13 CCR13	CC14 CCR14	—	CC15 CCR15	CC16 CCR16	CC17 CCR17	CC18 CCR18
MIL-C-11015	CK50	CK51	CK52	—	CK53	CK54	CK55

How to Order



THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

Additional Specifications
and Ordering Information
on the following page.

CERALAM[®] MOLDED RADIAL LEAD CAPACITORS

Type MC — Six Sizes, Four Voltages, Four Temperature Characteristics

Temperature Characteristics

	CHAR. A	CHAR. B	CHAR. C	CHAR. E
Operating Temperature Range	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C	-55°C to +85°C
Capacitance Change	0 ±30 ppm	±7½%	±15%	+22 -56% +10°C to +85°C
EIA Characteristic	COG (NPO)	X7F	X7R	Z5U
Capacity Range	1.0 to 220,000	8.2 to 1.0 mfd	56 to 5 mfd	56 pf to 10 mfd
Capacity Tolerances	±1%*, 2%, 5%, 10%	±5%, 10%	±10%, 20%	±20%, +80% -20%
Dissipation Factor Initial Max.	.1%	1.0%	2.5%	3.0%
Dissipation Factor Post Test Max.	.2%	1.5%	3.0%	4.0%
Insulation Resistance Initial @ 25°C Initial @ Elevated Temperature @ 25°C After Moisture or Immersion @ 25°C After Life @ Elevated Temperature After Life	100,000 megohms or 1,000 megs x mfd. 10,000 megs or 100 megs x mfd at 125°C. 50,000 megs or 500 megs x mfd. 50,000 megs or 500 megs x mfd. 5,000 megs or 50 megs x mfd at 125°	100,000 megohms or 1,000 megs x mfd. 10,000 megs or 100 megs x mfd at 125°C. 50,000 megs or 500 megs x mfd. 50,000 megs or 500 megs x mfd. 5,000 megs or 50 megs x mfd at 125°	100,000 megohms or 1,000 megs x mfd. 10,000 megs or 100 megs x mfd at 125°C. 50,000 megs or 500 megs x mfd. 50,000 megs or 500 megs x mfd. 5,000 megs or 50 megs x mfd at 125°	10,000 megs or 1,000 megs x mfd. 1,000 megs or 10 megs x mfd at 85°C. 5,000 megs or 500 megs x mfd. 1000 megs or 100 megs x mfd. N.A.
Test Conditions for Capacity and D.F. Frequency Voltage	1 — 1000 pf 1 MHz† > 1000 pf 1 KHz 1.0 ±.2 VAC	1 — 100 pf 1 MHz > 100 pf 1 KHz 1.0 ±.2 VAC	1 — 100 pf 1 MHz > 100 pf 1 KHz 1.0 ±.2 VAC	1 KHz < .5 VAC
Working Voltage	200 100 50	200 100 50 25	200 100 50 25	100 50 25
Dielectric Withstanding Voltage	3X rated	3X rated	3X rated	2.5X rated
Solder Temperature	> 500°F	> 500°F	> 500°F	> 500°F

* 1% or .5 pf whichever is greater

† 1-100 pf if parts are for MIL-C-11015 or MIL-C-39014

Dimensions

	Length		Width		Thickness		Lead Spacing		Lead Dia.		Military Styles MIL-C		
	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	11015	39014	20
MC35 (Fig. 2)	.170 4.32	.150 3.81	.130 3.30	.110 2.79	.070 1.78	.050 1.27	.130 3.30	.100 2.54	.018 .456	.014 3.56	N.A.	N.A.	N.A.
MC50 (Fig. 1)	.200 5.08	.180 4.57	.200 5.08	.180 4.57	.100 2.54	.080 2.03	.215 5.46	.185 4.70	.027 .686	.023 .584	CK05	CKR05	CC05 CCR05 CC09* CCR09*
MC60 (Fig. 2)	.300 7.62	.280 7.11	.300 7.62	.280 7.11	.100 2.54	.080 2.03	.215 5.46	.185 4.70	.027 .686	.023 .584	CK06	CKR06	CC06 CCR06
MC98 (Fig. 2)	.300 7.62	.280 7.11	.300 7.62	.280 7.11	.160 4.06	.140 3.56	.215 5.46	.185 4.70	.027 .686	.023 .584	N.A.	N.A.	N.A.
MC95 (Fig. 2)	.510 12.95	.490 12.45	.510 12.95	.490 12.45	.160 4.06	.140 3.56	.430 10.92	.370 9.40	.027 .686	.023 .584	N.A.	N.A.	CC07 CCR07
MC96 (Fig. 2)	.510 12.95	.490 12.45	.510 12.95	.490 12.45	.260 6.60	.240 6.10	.430 10.92	.370 9.40	.027 .686	.023 .584	N.A.	N.A.	CC08 CCR08
SC60 (Fig. 2)	.300 7.62	.280 7.11	.300 7.62	.280 7.11	.150 2.54	.080 2.03	.215 5.46	.185 4.70	.027 .686	.023 .584	CK06	CKR06 CKR08	N.A.

* MC54 identical to MC50 except 0.1" L.S.

Dimensions: Inches/Millimeters

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

Continued from
preceding page.

CERALAM[®] MOLDED RADIAL LEAD CAPACITORS

Type MC — Six Sizes, Four Voltages, Four Temperature Characteristics

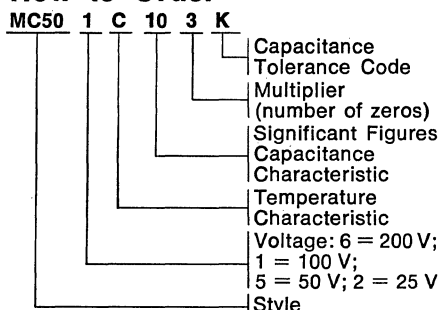
Capacitance Range in pf

	100 VDC: Temp. Char.				50 VDC: Temp. Char.				25 Volts		
	A	B	C	E	A	B	C	E	B	C	E
MC35	.560	.560	3900	.01	910	2200	.015	.033	3900	.027	.047
MC50	3900	3900	.02	.068	6800	.015	.15	.22	.027	.18	.33
MC60	.01	.01	.12	.18	.018	.039	.47	.68	.068	.68	1.0
MC98	.018	.018	.15	.39	.033	.082	.68	1.2	.15	1.0	1.8
MC95	.082	.082	.56	1.5	.12	.27	1.8	4.7	.56	3.9	6.8
MC96	.12	.12	1.0	2.2	.22	.47	.33	.68	1.0	6.8	10.0

AVAILABLE CAPACITANCE TOLERANCES

C = ± 25 pf G = $\pm 2\%$ K = $\pm 10\%$
D = ± 5 pf H = $\pm 3\%$ M = $\pm 20\%$
F = $\pm 1\%$ J = $\pm 5\%$ Z = $+80 -20\%$

How to Order



NEW! CERASEAL[®] TYPE SC 50 VDC

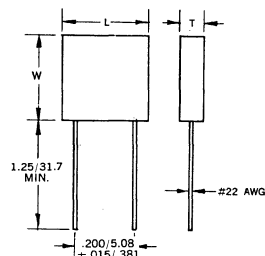
All Ceramic Case Monolithic Construction, Maximum Radiation Resistance,
MIL-C-11015D Performance, Oxygen Free Copper Leads per
MIL STD 1276 Type C, Thin Epoxy Overcoat

Temperature Characteristics

	CHAR. C
Operating Temperature Range	-55°C to +125°C
Capacitance Change	$\pm 15\%$
EIA Characteristic	X7R
Capacity Range	.47 mfd to 2.0 mfd
Capacity Tolerances	10%, 20%
Dissipation Factor Initial	2.5%
Dissipation Factor Post Test	3.0%
Insulation Resistance Initial @ 25°C	100,000 megohms or 1,000 megs x mfd.
Initial @ Elevated Temperature @ 25°C After Moisture or Immersion	10,000 megs or 100 megs x mfd at 125°C.
@ 25°C After Life	50,000 megs or 500 megs x mfd.
@ Elevated Temperature After Life	5,000 megs or 50 megs x mfd at 125°C.
Test Conditions for Capacity and D.F. Frequency Voltage	1 KHz 1.0 ± 2 VAC
Working Voltage	200 100 50 25
Dielectric Withstanding Voltage	3X rated
Solder Temperature	> 500°F

Capacity (MF)	AVX Part No.	Dimensions		
		L ($\pm .010$) .254	W ($\pm .010$) .254	T (Max.)
.47	SC605C474*	.290/7.37	.290/7.37	.100/2.54
.56	SC605C564*	.290/7.37	.290/7.37	.100/2.54
.68	SC605C684*	.290/7.37	.290/7.37	.100/2.54
.82	SC605C824*	.290/7.37	.290/7.37	.100/2.54
1.0	SC605C105*	.290/7.37	.290/7.37	.100/2.54
1.2	SC605C125*	.290/7.37	.290/7.37	.150/3.81
1.5	SC605C155*	.290/7.37	.290/7.37	.150/3.81
1.8	SC605C185*	.290/7.37	.290/7.37	.150/3.81
2.0	SC605C205*	.290/7.37	.290/7.37	.150/3.81

* Add Tolerance Letter K = $\pm 10\%$ or M = $\pm 20\%$ Inches/Millimeters

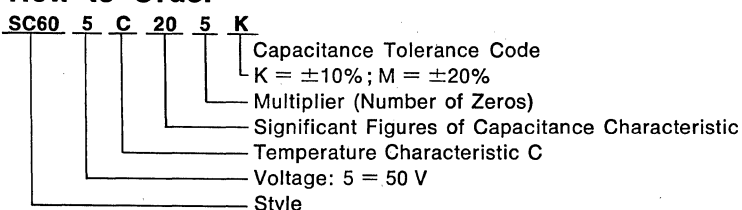


CKR08 PER MIL-C-39014

AVX Ceraseal Capacitors From 1.2 to 2.0 MFD

Type Designation	Failure Rate Level (%/1,000 Hours)					Capacitance pf	Capacitance Tolerance $\pm$ Percent	Rated DC Voltage Volts
	2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.01(S)			
CKR08BX125K-	0001	0004	0007	0010	0013	1,200,000	10	50
CKR08BX155K-	0002	0005	0008	0011	0014	1,500,000	10	50
CKR08BX205K-	0003	0006	0009	0012	0015	2,000,000	10	50

How to Order



THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

Additional Specifications
and Ordering Information
on the following page.

CERALAM[®] MILITARY TYPE

CK05-CK06 CKR05-CKR06-CKR08

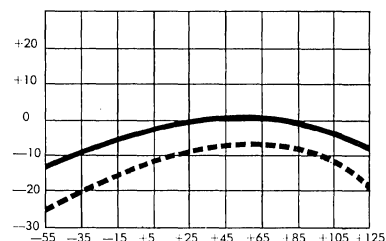
To MIL-C-11015D To MIL-C-39014B

Transfer Molded Case, Oxygen Free Copper Leads
MIL-STD. 1276 Type C, 50 - 100 - 200 Volt Ratings

Specifications

Capacity Range	10 pf to 2.0 Mfd
Capacity Tolerances	±10% and ±20%
Dissipation Factor	2.5% Max.
Insulation Resistance	100,000 Megohms Min. or 1,000 Meg-Mfd, whichever is less
Working Voltage	50, 100 or 200 VDC
Flash Test Voltage	2.5 Times Rated VDC
Temperature Characteristics	BX, ±15% ΔC, -55 to +125°C No Bias Voltage. +15 -25% ΔC, -55 to +125°C with Rated Voltage

Typical BX Voltage Temperature Limits



FAILURE RATE — LEVEL-PERCENT/1000 HOURS

L = 2.0% P = 0.1% S = 0.001%
M = 1.0% R = 0.01%

Capacitance and Voltage Range Charts CK05/CK06

Capacity Value (pf)	11015 Type Designation	D.C. Volt	Capacity Value (pf)	11015 Type Designation	D.C. Volt	Capacity Value (pf)	11015 Type Designation	D.C. Volt	Capacity Value (pf)	11015 Type Designation	D.C. Volt
10	CK05BX100*	200	1200	CK05BX122†	100	1200	CK06BX122†	200	47000	CK06BX473*	100
12	CK05BX120†	200	1500	CK05BX152*	100	1500	CK06BX152*	200	56000	CK06BX563†	100
15	CK05BX150*	200	1800	CK05BX182†	100	1800	CK06BX182†	200	68000	CK06BX683*	100
18	CK05BX180†	200	2200	CK05BX222*	100	2200	CK06BX222*	200	82000	CK06BX823†	100
22	CK05BX220*	200	2700	CK05BX272†	100	2700	CK06BX272†	200	100000	CK06BX104*	100
27	CK05BX270†	200	3300	CK05BX332*	100	3300	CK06BX332*	200	120000	CK06BX124†	50
33	CK05BX330*	200	3900	CK05BX392†	100	3900	CK06BX392†	200	150000	CK06BX154*	50
39	CK05BX390†	200	4700	CK05BX472*	100	4700	CK06BX472*	200	180000	CK06BX184†	50
47	CK05BX470*	200	5600	CK05BX562†	100	5600	CK06BX562†	200	220000	CK06BX224*	50
56	CK05BX560†	200	6800	CK05BX682*	100	6800	CK06BX682*	200	270000	CK06BX274†	50
68	CK05BX680*	200	8200	CK05BX822†	100	8200	CK06BX822†	200	330000	CK06BX334*	50
82	CK05BX820†	200	10000	CK05BX103*	100	10000	CK06BX103*	200	390000	CK06BX394†	50
100	CK05BX101*	200	12000	CK05BX123†	50	12000	CK06BX123†	100	470000	CK06BX474*	50
120	CK05BX121†	200	15000	CK05BX153*	50	15000	CK06BX153*	100	560000‡	CK06BX564†	50
150	CK05BX151*	200	18000	CK05BX183†	50	18000	CK06BX183†	100	680000‡	CK06BX684*	50
180	CK05BX181†	200	22000	CK05BX223*	50	22000	CK06BX223*	100	820000‡	CK06BX824†	50
200	CK05BX221*	200	27000	CK05BX273†	50	27000	CK06BX273†	100	1.0 Mfd‡	CK06BX105*	50
270	CK05BX271†	200	33000	CK05BX333*	50	33000	CK06BX333*	100			
330	CK05BX331*	200	39000	CK05BX393†	50	39000	CK06BX393†	100			
390	CK05BX391†	200	47000	CK05BX473*	50						
470	CK05BX471*	200	56000	CK05BX563†	50						
560	CK05BX561†	200	68000	CK05BX683*	50						
680	CK05BX681*	200	82000	CK05BX823†	50						
820	CK05BX821†	200	100000	CK05BX104*	50						
1000	CK05BX102*	200									

* Add tolerance letter K = 10% or M = 20%

† Available as standard MIL part in K = 10% only

‡ Ceramic encased Ceraseal construction

Note: MIL-C-39014B has added style CKR07BX474K thru 105K which is a thicker version (.185) of CKR06.

CKR06 meets all electrical and physical specs of CKR07 and it is a thinner (.090) unit.

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

Additional Specifications
and Ordering Information
on the following page.

CERALAM[®] MILITARY TYPE

CK05-CK06 CKR05-CKR06-CKR08

To MIL-C-11015D To MIL-C-39014B

Transfer Molded Case, Oxygen Free Copper Leads
MIL-STD. 1276 Type C, 50 - 100 - 200 Volt Ratings

MIL-C-39014 Dash Numbers

Military Type Designation	M39014/01-(Dash Number From Table)					Capacitance pf	Capacitance Tolerance ± Percent	DC Rated Voltage
	Failure Rate Level (%/1,000 Hours)							
	2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)			
CKR05BX100K-	1361	1201	1241	1281	1321	10	10	200
CKR05BX100M-	1362	1202	1242	1282	1322	10	20	200
CKR05BX120K-	1363	1203	1243	1283	1323	12	10	200
CKR05BX150K-	1364	1204	1244	1284	1324	15	10	200
CKR05BX150M-	1365	1205	1245	1285	1325	15	20	200
CKR05BX180K-	1366	1206	1246	1286	1326	18	10	200
CKR05BX220K-	1367	1207	1247	1287	1327	22	10	200
CKR05BX220M-	1368	1208	1248	1288	1328	22	20	200
CKR05BX270K-	1369	1209	1249	1289	1329	27	10	200
CKR05BX330K-	1370	1210	1250	1290	1330	33	10	200
CKR05BX330M-	1371	1211	1251	1291	1331	33	20	200
CKR05BX390K-	1372	1212	1252	1292	1332	39	10	200
CKR05BX470K-	1373	1213	1253	1293	1333	47	10	200
CKR05BX470M-	1374	1214	1254	1294	1334	47	20	200
CKR05BX560K-	1375	1215	1255	1295	1335	56	10	200
CKR05BX680K-	1376	1216	1256	1296	1336	68	10	200
CKR05BX680M-	1377	1217	1257	1297	1337	68	20	200
CKR05BX820K-	1378	1218	1258	1298	1338	82	10	200
CKR05BX101K-	1379	1219	1259	1299	1339	100	10	200
CKR05BX101M-	1380	1220	1260	1300	1340	100	20	200
CKR05BX121K-	1381	1221	1261	1301	1341	120	10	200
CKR05BX151K-	1382	1222	1262	1302	1342	150	10	200
CKR05BX151M-	1383	1223	1263	1303	1343	150	20	200
CKR05BX181K-	1384	1224	1264	1304	1344	180	10	200
CKR05BX221K-	1385	1225	1265	1305	1345	220	10	200
CKR05BX221M-	1386	1226	1266	1306	1346	220	20	200
CKR05BX271K-	1387	1227	1267	1307	1347	270	10	200
CKR05BX331K-	1388	1228	1268	1308	1348	330	10	200
CKR05BX331M-	1389	1229	1269	1309	1349	330	20	200
CKR05BX391K-	1390	1230	1270	1310	1350	390	10	200
CKR05BX471K-	1391	1231	1271	1311	1351	470	10	200
CKR05BX471M-	1392	1232	1272	1312	1352	470	20	200
CKR05BX561K-	1393	1233	1273	1313	1353	560	10	200
CKR05BX681K-	1394	1234	1274	1314	1354	680	10	200
CKR05BX681M-	1395	1235	1275	1315	1355	680	20	200
CKR05BX821K-	1396	1236	1276	1316	1356	820	10	200
CKR05BX102K-	1397	1237	1277	1317	1357	1,000	20	200
CKR05BX102M-	1398	1238	1278	1318	1358	1,000	20	200
CKR05BX122K-	1399	1239	1279	1319	1359	1,200	10	100
CKR05BX152K-	1400	1240	1280	1320	1360	1,500	10	100
CKR05BX152M-	1401	1441	1481	1521	1561	1,500	20	100
CKR05BX182K-	1402	1442	1482	1522	1562	1,800	10	100
CKR05BX222K-	1403	1443	1483	1523	1563	2,200	10	100
CKR05BX222M-	1404	1444	1484	1524	1564	2,200	20	100
CKR05BX272K-	1405	1445	1485	1525	1565	2,700	10	100
CKR05BX332K-	1406	1446	1486	1526	1566	3,300	10	100
CKR05BX332M-	1407	1447	1487	1527	1567	3,300	20	100
CKR05BX392K-	1408	1448	1488	1528	1568	3,900	10	100
CKR05BX472K-	1409	1449	1489	1529	1569	4,700	10	100
CKR05BX472M-	1410	1450	1490	1530	1570	4,700	20	100
CKR05BX562K-	1411	1451	1491	1531	1571	5,600	10	100
CKR05BX682K-	1412	1452	1492	1532	1572	6,800	10	100
CKR05BX682M-	1413	1453	1493	1533	1573	6,800	20	100
CKR05BX822K-	1414	1454	1494	1534	1574	8,200	10	100
CKR05BX103K-	1415	1455	1495	1535	1575	10,000	10	100
CKR05BX103M-	1416	1456	1496	1536	1576	10,000	20	100
CKR05BX123K-	1417	1457	1497	1537	1577	12,000	10	50
CKR05BX153K-	1418	1458	1498	1538	1578	15,000	10	50
CKR05BX153M-	1419	1459	1499	1539	1579	15,000	20	50
CKR05BX183K-	1420	1460	1500	1540	1580	18,000	10	50
CKR05BX223K-	1421	1461	1501	1541	1581	22,000	10	50
CKR05BX223M-	1422	1462	1502	1542	1582	22,000	20	50
CKR05BX273K-	1423	1463	1503	1543	1583	27,000	10	50
CKR05BX333K-	1424	1464	1504	1544	1584	33,000	10	50
CKR05BX333M-	1425	1465	1505	1545	1585	33,000	20	50
CKR05BX393K-	1426	1466	1506	1546	1585	39,000	10	50
CKR05BX473K-	1427	1467	1507	1547	1587	47,000	10	50
CKR05BX473M-	1428	1468	1508	1548	1588	47,000	20	50
CKR05BX563K-	1429	1469	1509	1549	1589	56,000	10	50
CKR05BX683K-	1430	1470	1510	1550	1590	68,000	10	50
CKR05BX683M-	1431	1471	1511	1551	1591	68,000	20	50
CKR05BX823K-	1432	1472	1512	1552	1592	82,000	10	50
CKR05BX104K-	1433	1473	1513	1553	1593	100,000	10	50
CKR05BX104M-	1434	1474	1514	1554	1594	100,000	20	50

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

CERALAM[®] MILITARY TYPE

CK05-CK06 CKR05-CKR06-CKR08

To MIL-C-11015D To MIL-C-39014B

MIL-C-39014 Dash Numbers

Military Type Designation	M39014/02-(Dash Number From Table)					Capacitance pf	Capacitance Tolerance ± Percent	DC Rated Voltage Volts
	Failure Rate Level (%/1,000 Hours)							
	2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)			
CKR06BX122K	1361	1201	1241	1281	1321	1,200	10	200
CKR06BX152K	1362	1202	1242	1282	1322	1,500	10	200
CKR06BX152M	1363	1203	1243	1283	1323	1,500	20	200
CKR06BX182K	1364	1204	1244	1284	1324	1,800	10	200
CKR06BX222K	1366	1206	1246	1286	1326	2,200	10	200
CKR06BX222M	1367	1207	1247	1287	1327	2,200	20	200
CKR06BX272K	1368	1208	1248	1288	1328	2,700	10	200
CKR06BX332K	1369	1209	1249	1289	1329	3,300	10	200
CKR06BX332M	1370	1210	1250	1290	1330	3,300	20	200
CKR06BX392K	1371	1211	1251	1291	1331	3,900	10	200
CKR06BX472K	1372	1212	1252	1292	1322	4,700	10	200
CKR06BX472M	1373	1213	1253	1293	1333	4,700	20	200
CKR06BX562K	1374	1214	1254	1294	1334	5,600	10	200
CKR06BX682K	1375	1215	1255	1295	1335	6,800	10	200
CKR06BX682M	1376	1216	1256	1296	1336	6,800	20	200
CKR06BX822K	1377	1217	1257	1297	1337	8,200	10	200
CKR06BX103K	1378	1218	1258	1298	1338	10,000	10	200
CKR06BX103M	1379	1219	1259	1299	1339	10,000	20	200
CKR06BX123K	1380	1231	1271	1311	1351	12,000	10	100
CKR06BX153K	1381	1220	1260	1300	1340	15,000	10	100
CKR06BX183K	1382	1221	1261	1301	1341	18,000	10	100
CKR06BX223K	1383	1222	1272	1302	1342	22,000	10	100
CKR06BX273K	1384	1232	1272	1312	1352	27,000	10	100
CKR06BX333K	1385	1223	1263	1303	1343	33,000	10	100
CKR06BX393K	1386	1224	1264	1304	1344	39,000	10	100
CKR06BX473K	1387	1225	1265	1305	1345	47,000	10	100
CKR06BX563K	1388	1226	1266	1306	1346	56,000	10	100
CKR06BX683K	1389	1227	1267	1307	1347	68,000	10	100
CKR06BX823K	1390	1229	1269	1309	1349	82,000	10	100
CKR06BX104K	1391	1230	1270	1310	1350	100,000	10	100
CKR06BX124K	1392	1233	1273	1313	1353	120,000	10	50
CKR06BX154K	1393	1234	1274	1314	1354	150,000	10	50
CKR06BX184K	1394	1235	1275	1315	1355	180,000	10	50
CKR06BX224K	1395	1236	1276	1316	1356	220,000	10	50
CKR06BX274K	1396	1237	1277	1317	1357	270,000	10	50
CKR06BX334K	1397	1238	1278	1318	1358	330,000	10	50
CKR06BX394K	1398	1239	1279	1319	1359	390,000	10	50
CKR06BX474K	1399	1240	1280	1320	1360	470,000	10	50
CKR06BX564K	1400	1404	1408	1412	1416	560,000	10	50
CKR06BX684K	1401	1405	1409	1413	1417	680,000	10	50
CKR06BX824K	1402	1406	1410	1414	1418	820,000	10	50
CKR06BX105K	1403	1407	1411	1415	1419	1,000,000	10	50

MIL-C-39014 CKR08 Dash Numbers

CKR08BX125K	0001	0004	0007	0010	0013	1,200,000	10	50
CKR08BX155K	0002	0005	0008	0011	0014	1,500,000	10	50
CKR08BX205K	0003	0006	0009	0012	0015	2,000,000	10	50

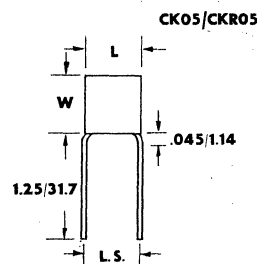


FIG. 1

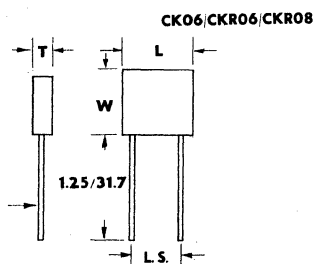


FIG. 2

	$\pm .010/.250$	$\pm .010/.250$	$\pm .010/.250$	$\pm .015/.381$
CK05/CKR05	.190/4.82	.190/4.82	.090/2.29	.200/5.08
CK06/CKR06	.290/7.37	.290/7.37	.090/2.29	.200/5.08
CKR08	.290/7.37	.290/7.37	.140/3.56	.200/5.08

How to Order

MIL-C-11015 and MIL-C-20 order by Military Type Designation.
MIL-C-39014 order by Part Number as listed on the following pages.

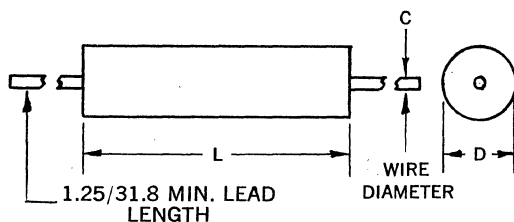
THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

CERALAM[®] MOLDED AXIAL LEAD CAPACITORS

Type MC — Eight Sizes, Four Voltages, Four Temperature Characteristics



Note: Non-Conductive material shall not extend beyond .010 from end of capacitor body.

Temperature Characteristics

	CHAR. A	CHAR. B	CHAR. C	CHAR. E
Operating Temperature Range	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C	-55°C to +85°C
Capacitance Change	0 ±30 ppm	±7½%	±15%	+22 -56% +10°C to +85°C
EIA Characteristic	COG (NPO)	X7F	X7R	Z5U
Capacity Range	1.0 to 220,000	10 to 1.0 mfd	56 to 6.8 mfd	56 to 10 mfd
Capacity Tolerances	±1%*, 2%, 5%, 10%	±5%, 10%	±10%, 20%	±20%, +80% -20%
Dissipation Factor Initial	.1%	1.0%	2.5%	3.0%
Dissipation Factor Post Test	.2%	1.5%	3.0%	4.0%
Insulation Resistance Initial @ 25°C Initial @ Elevated Temperature @ 25°C After Moisture or Immersion @ 25°C After Life @ Elevated Temperature After Life	100,000 megohms or 1,000 megs x mfd. 10,000 megs or 100 megs x mfd at 125°C. 50,000 megs or 500 megs x mfd. 50,000 megs or 500 megs x mfd. 5,000 megs or 50 megs x mfd at 125°C.	100,000 megohms or 1,000 megs x mfd. 10,000 megs or 100 megs x mfd at 125°C. 50,000 megs or 500 megs x mfd. 50,000 megs or 500 megs x mfd. 5,000 megs or 50 megs x mfd at 125°C.	100,000 megohms or 1,000 megs x mfd. 10,000 megs or 100 megs x mfd at 125°C. 50,000 megs or 500 megs x mfd. 50,000 megs or 500 megs x mfd. 5,000 megs or 50 megs x mfd at 125°C.	10,000 megs or 1,000 megs x mfd. 1,000 megs or 10 megs x mfd at 85°C 5,000 megs or 500 megs x mfd. 1,000 megs or 100 megs x mfd. N.A.
Test Conditions for Capacity and D.F. Frequency Voltage	1 — 1000 pf 1 MHz† > 1000 pf 1 KHz 1.0 ±.2 VAC	1 — 100 pf 1 MHz > 100 pf 1 KHz 1.0 ±.2 VAC	1 — 100 pf 1 MHz > 100 pf 1 KHz 1.0 ±.2 VAC	1 KHz < .5 VAC
Working Voltage	200 100 50	200 100 50 25	200 100 50 25	100 50 25
Dielectric Withstanding Voltage	3X rated	3X rated	3X rated	2.5X rated
Solder Temperature	> 500°F	> 500°F	> 500°F	> 500°F

* 1% or .5 pf whichever is greater

† 1-100 pf nf parts are for MIL-C-11015 or MIL-C-39014

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

CERALAM[®] MOLDED AXIAL LEAD CAPACITORS

Dimensions

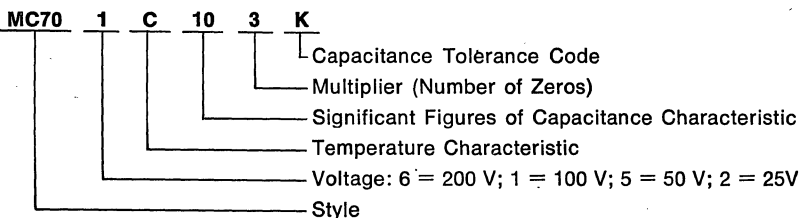
Style	Length		Dia.		Lead Dia.		Military Styles MIL-C		
	Max.	Min.	Max.	Min.	Max.	Min.	11015	39014	20
MC10	.170	.140	.100	.080	.018	.014	CK12	CKR11	CC75 CCR75
	4.32	3.56	2.54	2.03	.457	.356			
MC70	.260	.240	.100	.080	.027	.014	CK13	CKR12	CC76 CCR76
	6.60	6.10	2.54	2.03	.686	.356			
MC78	.250	.230	.140	.120	.018	.014	CK14	CKR14	CC77 CCR77
	6.35	5.84	3.56	3.05	.457	.356			
MC20	.400	.380	.150	.130	.027	.023	CK15	CKR15	CC78 CCR78
	10.16	9.65	3.81	3.38	.686	.584			
MC90	.520	.480	.200	.180	.027	.023	CK16	CKR16	CC79 CCR79
	13.21	12.19	5.08	4.57	.686	.584			
MC85	.520	.480	.265	.235	.027	.023	CK15	CKR15	CC78 CCR78
	13.21	12.19	6.73	5.97	.686	.584			
MC86	.710	.670	.260	.240	.027	.023	CK16	CKR16	CC79 CCR79
	18.03	17.02	6.60	6.10	.686	.584			
MC87	.710	.670	.365	.335	.027	.023	CK16	CKR16	CC79 CCR79
	18.03	17.02	4.27	8.51	.686	.584			

Dimensions: Inches/Millimeters

Capacitance Range in pf

	100 VDC: Temp. Char.				50 VDC: Temp. Char.				25 Volts		
	A	B	C	E	A	B	C	E	B	C	E
MC10	560	560	4700	.01	1000	2200	.015	.033	4700	.033	.056
MC70	1200	1200	.01	.022	2200	4700	.047	.068	.01	.068	.1
MC78	4700	4700	.033	.082	8200	.015	.12	.27	.033	.22	.39
MC20	8200	8200	.10	.15	.012	.027	.27	.47	.056	.39	.68
MC90	.022	.022	.15	.39	.033	.082	.56	1.2	.15	1.2	1.8
MC85	.033	.033	.33	.56	.051	.12	1.0	2.0	.22	1.5	2.7
MC86	.047	.047	.39	.82	.082	.18	1.2	2.7	.33	2.2	3.9
MC87	.012	.12	1.0	2.2	.22	.47	3.3	6.8	1.0	6.8	10.0

How to Order



AVAILABLE CAPACITANCE TOLERANCES

C = $\pm .25$ pf	J = $\pm 5\%$
D = $\pm .5$ pf	K = $\pm 10\%$
F = $\pm 1\%$	M = $\pm 20\%$
G = $\pm 2\%$	Z = $+80 -20\%$
H = $\pm 3\%$	

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX: The Insiders.

CERALAM[®] MILITARY MOLDED AXIAL CAPACITORS

Transfer Molded Cases, Oxygen Free Copper Leads

MIL-STD 1276 Type C, 50 - 100 Volt Rating

Specifications

Capacity Range	10 pf to 3.3 Mfd
Capacity Tolerance	±10% and ±20%
Dissipation Factor	2.5% Max.
Insulation Resistance	100,000 Megohms or 1000 Meg Mfd whichever is less
Working Voltage	50 or 100 VDC
Flash Test Voltage	2.5 Times Rated
Temperature Characteristic	BX ±15% ΔC -55° to +125°C No Bias Voltage BX +15 -25% ΔC -55° to +125°C With Rated Voltage BR ±15% ΔC -55° to +125°C No Bias Voltage BR +15 -40% ΔC -55° to +125°C With Rated Voltage

MIL-C-11015 Part Listing

Capacity Value pf	100 V Rating	Capacity Value pf	100 V Rating	50 V Rating
10	CK12BX100*	5600	CK13BX562†	CK12BX562†
12	CK12BX120†	6800	CK13BX682*	CK12BX682*
15	CK12BX150*	8200	CK13BX822†	CK12BX822†
18	CK12BX180†	10000	CK13BX103*	CK12BX103*
22	CK12BX220*	12000	CK14BX123†	CK13BX123†
27	CK12BX270†	15000	CK14BX153*	CK13BX153*
33	CK12BX330*	18000	CK14BX183†	CK13BX183†
39	CK12BX390†	22000	CK14BX223*	CK13BX223*
47	CK12BX470*	27000	CK14BX273†	CK13BR273†
56	CK12BX560†	33000	CK14BX333*	CK13BR333*
68	CK12BX680*	39000	CK14BX393†	CK13BR393†
82	CK12BX820†	47000	CK14BX473*	CK13BR473*
100	CK12BX101*	56000	CK14BR563†	
120	CK12BX121†	68000	CK14BR683*	
150	CK12BX151*	82000	CK14BR823†	
180	CK12BX181†	100000	CK14BR104*	
220	CK12BX221†	120000	CK15BX104*	CK14BR124†
270	CK12BX271†	150000	CK15BR124†	CK14BR154*
330	CK12BX331*	180000	CK15BR154*	CK14BR184†
390	CK12BX391†	220000	CK15BR184†	CK14BR224*
470	CK12BX471*	270000	CK15BR224*	CK14BR274†
560	CK12BX561†	330000	CK15BR274†	
680	CK12BX681*	470000	CK15BR334*	CK15BR474*
820	CK12BX821†	1 Mfd	CK16BR474*	CK15BR105*
1000	CK12BX102*	2.2 Mfd	CK16BR105*	CK16BR225*
1200	CK12BX122†	3.3 Mfd		CK16BR335*
1500	CK12BX152*			
1800	CK12BX182†			
2200	CK12BX222*			
2700	CK12BX272†			
3300	CK12BX332*			
3900	CK12BX392†			
4700	CK12BX472*			

* Add Tolerance Letter K = 10% M = 20%

† Available as standard MIL part in K = 10% only

MIL-C-20	MIL-C-11015	MIL-C-39014
CC75/CCR75	CK12	CKR11
CC76/CCR76	CK13	CKR12
CC77/CCR77	CK14	CKR14
CC78/CCR78	CK15	CKR15
CC79/CCR79	CK16	CKR16

MIL-C-20

NPO molded axial parts are now available in conformance to MIL-C-20. The table above provides information on sizes for MIL-C-20 in comparison to MIL-C-11015 and MIL-C-39014. Please consult the Military Specifications for capacitance, tolerance and voltage availability.

MIL Style	Length	Diameter	Wire Dia.
CK12	.160 ±.010	.090 ±.010	.016 +.004 -.001
CKR11	.160 ±.010	.090 ±.010	.015/.027
CK13	.250 ±.010	.090 ±.010	.016 +.004 -.001
CKR12	.250 ±.010	.090 ±.010	.015/.027
CK14	.390 ±.010	.140 ±.010	.025 +.004 -.001
CKR14	.390 ±.010	.140 ±.010	.015/.027
CK15	.500 ±.020	.250 ±.015	.025 +.004 -.001
CKR15	.500 ±.020	.250 ±.015	.015/.027
CK16	.690 ±.030	.350 ±.020	.025 +.004 -.001
CKR16	.690 ±.030	.350 ±.020	.015/.027

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

CERALAM[®] MILITARY MOLDED AXIAL CAPACITORS

Transfer Molded Cases, Oxygen Free Copper Leads
MIL-STD 1276 Type C, 50 - 100 Volt Rating

MIL-C-39014 Dash Numbers

Military Type Designation	M39014/05-(Dash Number From Table)					Capacitance pf	Capacitance Tolerance ± Percent	DC Rated Voltage
	Failure Rate Level (%/1,000 Hours)							
	2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)			
CKR11BX100K-	2401	2601	2801	2001	2201	10	10	100
CKR11BX100M-	2402	2602	2802	2002	2202	10	20	100
CKR11BX120K-	2403	2603	2803	2003	2203	12	10	100
CKR11BX150K-	2404	2604	2804	2004	2204	15	10	100
CKR11BX150M-	2405	2605	2805	2005	2205	15	20	100
CKR11BX180K-	2406	2606	2806	2006	2206	18	10	100
CKR11BX220K-	2407	2607	2807	2007	2207	22	10	100
CKR11BX220M-	2408	2608	2808	2008	2208	22	20	100
CKR11BX270K-	2409	2609	2809	2009	2209	27	10	100
CKR11BX330K-	2410	2610	2810	2010	2210	33	10	100
CKR11BX330M-	2411	2611	2811	2011	2211	33	20	100
CKR11BX390K-	2412	2612	2812	2012	2212	39	10	100
CKR11BX470K-	2413	2613	2813	2013	2213	47	10	100
CKR11BX470M-	2414	2614	2814	2014	2214	47	20	100
CKR11BX560K-	2415	2615	2815	2015	2215	56	10	100
CKR11BX680K-	2416	2616	2816	2016	2216	68	10	100
CKR11BX680M-	2417	2617	2817	2017	2217	68	20	100
CKR11BX820K-	2418	2618	2418	2018	2218	82	10	100
CKR11BX101K-	2419	2619	2819	2019	2219	100	10	100
CKR11BX101M-	2420	2620	2820	2020	2220	100	20	100
CKR11BX121K-	2421	2621	2821	2021	2221	120	10	100
CKR11BX151K-	2422	2622	2822	2022	2222	150	10	100
CKR11BX151M-	2423	2623	2823	2023	2223	150	20	100
CKR11BX181K-	2424	2624	2824	2024	2224	180	10	100
CKR11BX221K-	2425	2625	2825	2025	2225	220	10	100
CKR11BX221M-	2426	2626	2826	2026	2226	220	20	100
CKR11BX271K-	2427	2627	2827	2027	2227	270	10	100
CKR11BX331K-	2428	2628	2828	2028	2228	330	10	100
CKR11BX331M-	2429	2629	2829	2029	2229	330	20	100
CKR11BX391K-	2430	2630	2830	2030	2230	390	10	100
CKR11BX471K-	2431	2631	2831	2031	2231	470	10	100
CKR11BX471M-	2432	2632	2832	2032	2232	470	20	100
CKR11BX561K-	2433	2633	2833	2033	2233	560	10	100
CKR11BX681K-	2434	2636	2834	2034	2234	680	10	100
CKR11BX681M-	2435	2635	2835	2035	2235	680	20	100
CKR11BX821K-	2436	2636	2836	2036	2236	820	10	100
CKR11BX102K-	2437	2637	2837	2037	2237	1,000	10	100
CKR11BX102M-	2438	2638	2838	2038	2238	1,000	20	100
CKR11BX122K-	2439	2639	2839	2039	2239	1,200	10	100
CKR11BX152K-	2440	2640	2840	2040	2240	1,500	10	100
CKR11BX152M-	2441	2641	2841	2041	2241	1,500	20	100
CKR11BX182K-	2442	2642	2842	2042	2242	1,800	10	100
CKR11BX222K-	2443	1643	2843	2043	2243	2,200	10	100
CKR11BX222M-	2444	2644	2844	2044	2244	2,200	20	100
CKR11BX272K-	2445	2655	2845	2045	2245	2,700	10	100
CKR11BX332K-	2446	2646	2846	2046	2246	3,300	10	100
CKR11BX332M-	2447	2647	2847	2047	2247	3,300	20	100
CKR11BX392K-	2448	2648	2848	2048	2248	3,900	10	100
CKR11BX472K-	2449	2649	2849	2049	2249	4,700	10	100
CKR11BX472M-	2450	2650	2850	2050	2250	4,700	20	100
CKR11BX562K-	2451	2651	2851	2051	2251	5,600	10	50
CKR11BX682K-	2452	2652	2852	2052	2252	6,800	10	50
CKR11BX682M-	2453	2653	2853	2053	2253	6,800	20	50
CKR11BX822K-	2454	2654	2854	2054	2254	8,200	10	50
CKR11BX103K-	2455	2655	2855	2055	2255	10,000	10	50
CKR11BX103M-	2456	2656	2856	2056	2256	10,000	20	50
CKR12BX562K-	2457	2657	2857	2057	2257	5,600	10	100
CKR12BX682K-	2458	2658	2858	2058	2258	6,800	10	100
CKR12BX682M-	2459	2659	2859	2059	2259	6,800	20	100
CKR12BX822K-	2460	2660	2860	2060	2260	8,200	10	100
CKR12BX103K-	2461	2661	2861	2061	2261	10,000	10	100
CKR12BX103M-	2462	2662	2862	2062	2262	10,000	20	100
CKR12BX123K-	2463	2663	2863	2063	2263	12,000	10	50
CKR12BX153K-	2464	2664	2864	2064	2264	15,000	10	50
CKR12BX153M-	2465	2665	2865	2065	2265	15,000	20	50
CKR12BX183K-	2466	2666	2866	2066	2266	18,000	10	50
CKR12BX223K-	2467	2667	2867	2067	2267	22,000	10	50
CKR12BX223M-	2468	2668	2868	2068	2268	22,000	20	50
CKR12BX273K-	2469	2669	2869	2069	2269	27,000	10	50
CKR12BX333K-	2470	2670	2870	2070	2270	33,000	10	50
CKR12BX333M-	2471	2671	2871	2071	2271	33,000	20	50
CKR12BX393K-	2472	2672	2872	2072	2272	39,000	10	50
CKR12BX473K-	2473	2673	2873	2073	2273	47,000	10	50
CKR12BX473M-	2474	2674	2874	2074	2274	47,000	20	50

FOR ADDITIONAL DETAILS REFER TO MIL-C-39014 SPECIFICATION

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

Continued from
preceding page.**AVX: The Insiders.****CERALAM[®] MILITARY MOLDED AXIAL CAPACITORS**
MIL-C-39014 Dash Numbers

Military Type Designation	M39014/05-(Dash Number From Table)					Capacitance pf	Capacitance Tolerance ± Percent	DC Rated Voltage
	Failure Rate Level (%/1,000 Hours)							
	2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)			
Style CKR14-100 VDC (BX)								
CKR14BX123K-	2475	2675	2875	2075	2275	12,000	10	100
CKR14BX153K-	2476	2676	2876	2076	2276	15,000	10	100
CKR14BX153M-	2477	2677	2877	2077	2277	15,000	20	100
CKR14BX183K-	2478	2678	2878	2078	2278	18,000	10	100
CKR14BX223K-	2479	2679	2879	2079	2279	22,000	10	100
CKR14BX223M-	2480	2680	2880	2080	2280	22,000	20	100
CKR14BX273K-	2481	2681	2881	2081	2281	27,000	10	100
CKR14BX333K-	2482	2682	2882	2082	2282	33,000	10	100
CKR14BX333M-	2483	2683	2883	2083	2283	33,000	20	100
CKR14BX393K-	2484	2684	2884	2084	2284	39,000	10	100
CKR14BX473K-	2485	2685	2885	2085	2285	47,000	10	100
CKR14BX473M-	2486	2686	2886	2086	2286	47,000	20	100
Style CKR14-50 VDC (BX)								
CKR14BX563K-	2487	2687	2887	2087	2287	56,000	10	50
CKR14BX683K-	2488	2688	2888	2088	2288	68,000	10	50
CKR14BX683M-	2489	2689	2889	2089	2289	68,000	20	50
CKR14BX823K-	2490	2690	2890	2090	2290	82,000	10	50
CKR14BX104K-	2491	2691	2891	2091	2291	100,000	10	50
CKR14BX104M-	2492	2692	2892	2092	2292	100,000	20	50
Style CKR14-100 VDC (BR)								
CKR14BR563K-	2493	2693	2893	2093	2293	56,000	10	100
CKR14BR683K-	2494	2694	2894	2094	2294	68,000	10	100
CKR14BR683M-	2495	2695	2895	2095	2295	68,000	20	100
CKR14BR823K-	2496	2696	2896	2096	2296	82,000	10	100
CKR14BR104K-	2497	2697	2897	2097	2297	100,000	10	100
CKR14BR104M-	2498	2698	2898	2098	2298	100,000	20	100
Style CKR14-50 VDC (BR)								
CKR14BR124K-	2499	2699	2899	2099	2299	120,000	10	50
CKR14BR154K-	2500	2700	2900	2100	2300	150,000	10	50
CKR14BR154M-	2501	2701	2901	2101	2301	150,000	20	50
CKR14BR184K-	2502	2702	2902	2102	2302	180,000	10	50
CKR14BR224K-	2503	2703	2903	2103	2303	220,000	10	50
CKR14BR224M-	2504	2704	2904	2104	2304	220,000	20	50
CKR14BR274K-	2505	2705	2905	2105	2305	270,000	10	50
Style CKR15-100 VDC (BX)								
CKR15BX563K-	2506	2706	2906	2106	2306	56,000	10	100
CKR15BX683K-	2507	2707	2907	2107	2307	68,000	10	100
CKR15BX683M-	2508	2708	2908	2108	2308	68,000	20	100
CKR15BX823K-	2509	2709	2909	2109	2309	82,000	10	100
CKR15BX104K-	2510	2710	2910	2110	2310	100,000	10	100
CKR15BX104M-	2511	2711	2911	2111	2311	100,000	20	100
Style CKR15-100 VDC (BR)								
CKR15BR124K-	2512	2712	2912	2112	2312	120,000	10	100
CKR15BR154K-	2513	2713	2913	2113	2313	150,000	10	100
CKR15BR154M-	2514	2714	2914	2114	2314	150,000	20	100
CKR15BR184K-	2515	2715	2915	2115	2315	180,000	10	100
CKR15BR224K-	2516	2716	2916	2116	2316	220,000	10	100
CKR15BR224M-	2517	2717	2917	2117	2317	220,000	20	100
CKR15BR274K-	2518	2718	2918	2118	2318	270,000	10	100
CKR15BR334K-	2519	2719	2919	2119	2319	330,000	10	100
CKR15BR334M-	2520	2720	2920	2120	2320	330,000	20	100
Style CKR15-50 VDC (BR)								
CKR15BR474K-	2521	2721	2921	2121	2321	470,000	10	50
CKR15BR474M-	2522	2722	2922	2122	2322	470,000	20	50
CKR15BR684K-	2523	2723	2923	2123	2323	680,000	10	50
CKR15BR684M-	2524	2724	2924	2124	2324	680,000	20	50
CKR15BR105K-	2525	2725	2925	2125	2325	1,000,000	10	50
CKR15BR105M-	2526	2726	2926	2126	2326	1,000,000	20	50
Style CKR16-100 VDC (BR)								
CKR16BR474K-	2527	2727	2927	2127	2327	470,000	10	100
CKR16BR474M-	2528	2728	2928	2128	2328	470,000	20	100
CKR16BR684K-	2529	2729	2929	2129	2329	680,000	10	100
CKR16BR684M-	2530	2730	2930	2130	2330	680,000	20	100
CKR16BR105K-	2531	2731	2931	2131	2331	1,000,000	10	100
CKR16BR105M-	2532	2732	2932	2132	2332	1,000,000	20	100
Style CKR16-50 VDC (BR)								
CKR16BR225K-	2533	2733	2933	2133	2333	2,200,000	10	50
CKR16BR225M-	2534	2734	2934	2134	2334	2,200,000	20	50
CKR16BR335K-	2535	2735	2935	2135	2335	3,300,000	10	50
CKR16BR335M-	2536	2736	2936	2136	2336	3,300,000	20	50

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

Additional Specifications
and Ordering Information
on the following page.

DISC CAPACITORS

Class 1, 500 V
Temperature Compensating
Type 5000 (Formerly Type DI)

Class 2, 500 V
Variable Capacitance vs. Temperature
(Formerly Type DI-0 thru DI-8)

High Q and Excellent Stability... Dipped Phenolic Coating... Wax Impregnated... Solder Coated Copper Leads. MIL-C-20 or EIA-RS198 Class 1 Environmental Performance.

Specific capacitance stability ranges in response to temperature... Dipped phenolic coating... Wax Impregnated... Solder Coated Copper Leads. MIL-C-11015 or EIA-RS198 Class 2 Environmental Performance.

Specifications

Capacity Range	1 pf thru 1000 pf
Capacity Tolerance	$\pm .25$ pf thru $\pm 20\%$
Dissipation Factor	.1% Max. 30 pf and Up
Insulation Resistance	20,000 Megohms Minimum
Working Voltage	500 VDC
Flash Test Voltage	3 Times Rated
Temperature Characteristic	NPO thru N2200 consult factory for other T.C.'s
Marking	AVX, Capacity, Capacity Tol., T.C.

Specifications

Capacity Range	10 pf thru 44000 pf
Capacity Tolerance	$\pm 5\%$ thru GMV
Dissipation Factor	2.5% Max.
Insulation Resistance	20,000 Megohms Minimum
Working Voltage	500 VDC
Flash Test Voltage	3 Times Rated
Temperature Characteristic	X5F thru X5
Marking	AVX, Capacity, Capacity Tol., T.C.*

Dimensions

New Style	Former Style	D Max.	T Max.	$\pm .030 / .762$
5001	DI-0	.240/6.10	.156/3.97	.187/4.76
5002	DI-1	.300/7.62	.156/3.97	.250/6.35
5004	DI-2	.370/9.40	.156/3.97	.250/6.35
5006	DI-3	.425/10.8	.156/3.97	.250/6.35 $\pm$
5009	DI-3A	.490/12.5	.156/3.97	.250/6.35 $\pm$
5010	DI-4	.570/14.5	.156/3.97	.375/9.53 $\dagger$
5016	DI-5	.675/17.1	.156/3.97	.375/9.53 $\dagger$
5019	DI-6	.740/18.8	.156/3.97	.375/9.53 $\dagger$
5022	DI-6A	.800/20.3	.156/3.97	.375/9.53 $\dagger$
5023	DI-7	.900/22.9	.156/3.97	.375/9.53 $\dagger$
5025	DI-8	.960/24.4	.156/3.97	.375/9.53 $\dagger$
$\dagger .375 \pm .030 / 9.53 \pm .762$ Available on Special Order				
$\dagger .250 \pm .030 / 6.35 \pm .762$ Available on Special Order				

Dimensions: Inches/Millimeters

Crimp Lead Disc Capacitors

Available with either inside or outside crimp, they are designed specifically for simplification in production line assembly of printed circuit disc components.

They are available with the same electrical characteristics and physical sizes as furnished in our standard disc types.

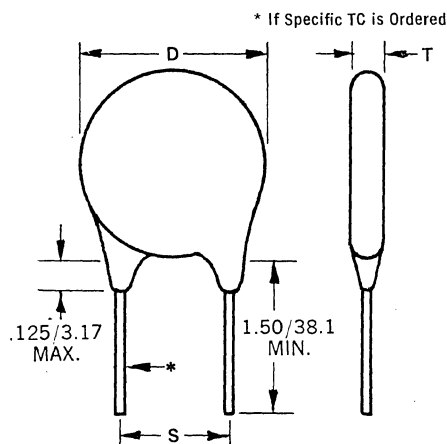
Lead spacing is $.250 \pm .035$ on discs under .500 in diameter and $.375 \pm .035$ on discs .500 in diameter and larger.

Lead length is normally $\frac{3}{16}$ " measured from crimp — longer lead lengths are available on request.

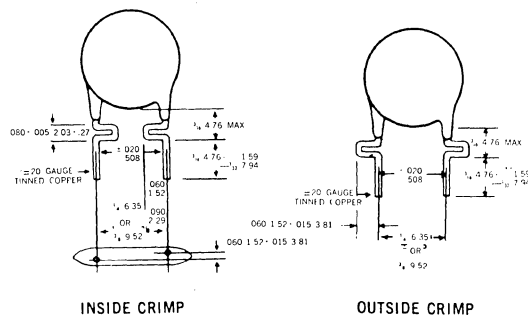
Specify inside or outside crimp when ordering.

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252



* All capacitors available with either #20 or #22 AWG Leads at AVX option unless specific gage is requested by customer.



AVX: The Insiders.

Continued from
preceding page.

DISC CAPACITORS

Class 1

The tables shown below indicate the tolerance available on specific temperature characteristics. It may be noted that limits are established on the basis of measurements at 25°C and +85°C and that T.C. becomes more negative at low temperature. Wider tolerances are required on low capacitance values because of the effects of stray capacitance.

T.C. TOLERANCES: +25°C TO +°C IN PPM/°C

Capacitance in pf	NPO	N030	N080	N150	N220	N330	N470	N750	N1500	N2200
.5 to 2	±250	±250	±250	±250	±250	±250	±250	±250	±250	±500
2.1 to 3.9	±120	±120	±120	±120	±120	±120	±120	±120	±250	±500
4 to 9.9	±60	±60	±60	±60	±60	±60	±120	±120	±250	±500
10 and Over	±30	±30	±30	±30	±30	±60	±60	±120	±250	±500
Closest MIL-C-20D Equivalent	CG	HG	LG	PG	RG	SH	TH	UJ	NONE	NONE
EIA Desig.	COG	S1G	U1G	P2G	R2G	S2H	T2H	U2J	P3K	R3L

T.C. TOLERANCES: -55°C TO +25°C IN PPM/°C

Capacitance in pf	NPO	N030	N080	N150	N220	N330	N470	N750	N1500	N2200
.5 to 2	+250 -341	+250 -348	+250 -359	+250 -374	+250 -390	+250 -414	+250 -444	+250 -506	+250 -670	+500 -1100
2.1 to 3.9	+120 -182	+120 -189	+120 -200	+120 -215	+120 -231	+120 -255	+120 -285	+120 -340	+250 -670	+500 -1100
4 to 9.9	+60 -109	+60 -116	+60 -127	+60 -142	+60 -158	+60 -180	+120 -285	+120 -340	+250 -670	+500 -1100
10 and Over	+30 -75	+30 -80	+30 -90	+30 -105	+30 -120	+60 -180	+60 -210	+120 -340	+250 -670	+500 -1100

Capacitance Range in pf

New Style		5001	5002	5004	5006	5009	5010	5016	5019	5022	5023	5025
Former Style		DI-0	DI-1	DI-2	DI-3	DI-3A	DI-4	DI-5	DI-6	DI-6A	DI-7	DI-8
Temp. Coef.	Min. C	MAXIMUM CAPACITY AVAILABLE IN PF										
NPO	1	7	15	24	32	46	57	82	100	120	150	180
N030	1	7	15	24	32	46	57	82	100	120	150	180
N080	1.5	8	16	27	40	51	68	91	110	130	160	200
N150	1.5	9	18	32	42	60	75	100	130	150	200	230
N220	2	10	20	34	48	64	82	110	140	160	220	250
N330	2	11	22	40	48	72	91	120	150	180	240	280
N470	2.5	14	27	43	52	88	110	150	180	220	270	340
N750	3	18	38	60	80	115	150	200	240	300	360	450
N1500	10	30	62	100	120	190	270	360	430	510	680	800
N2200	15	36	82	144	190	275	360	470	620	680	910	1000

How to Order

5002	NPO	15	0	K
				Capacitance Tolerance Code
				Multiplier
				Significant Figures of Capacitance Characteristic
				Temperature Coefficient
				Style

AVAILABLE CAPACITANCE TOLERANCES

C = ±.25 pf	J = ±5%
D = ±.5 pf	K = ±10%
F = ±1%	M = ±20%
G = ±2%	Z = +80 -20%
H = ±3%	

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

DISC CAPACITORS

Class 2

MIL-C-11015D CODE		
Symbol	Temperature Range	
A	-55°C to +85°C	
B	-55°C to +125°C	
C	-55°C to +150°C	
Symbol	Cap. Change Zero Volts	Cap. Change Rated Volts
R	+15%, -15%	+15%, -40%
W	+22%, -56%	+22%, -66%
X	+15%, -15%	+15%, -25%
Y	+30%, -70%	+30%, -80%
Z	+20%, -20%	+20%, -30%

Temperature characteristic is specified by combining range and change symbols, for example BR or AW. Specification slash sheets indicate the characteristic applicable to a given style of capacitor.

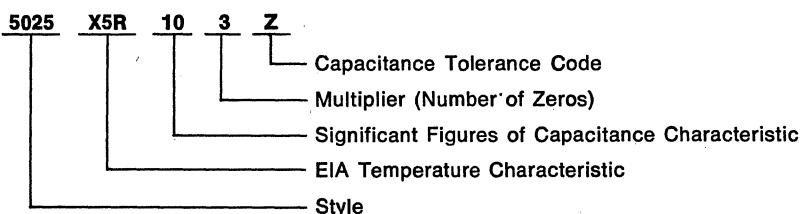
EIA CODE	
Percent Capacity Change Over Temperature Range	
RS198	Temperature Range
X7	-55°C to +125°C
X5	-55°C to +85°C
Y5	-30°C to +85°C
Z5	+10°C to +85°C
Code	Per Cent Capacity Change
D	±3.3%
E	±4.7%
F	±7.5%
P	±10%
R	±15%
S	±22%
T	+22%, -33%
U	+22%, -56%
V	+22%, -82%

EXAMPLE — A capacitor is desired with the capacitance value at 25°C to increase no more than 7.5% or decrease no more than 7.5% from -30°C to +85°C. EIA Code will be Y5F.

Capacitance Range in pf

New Style		5001	5002	5004	5006	5009	5010	5016	5019	5022	5023	5025
Former Style		DI-0	DI-1	DI-2	DI-3	DI-3A	DI-4	DI-5	DI-6	DI-6A	DI-7	DI-8
EIA Char.	Min. C	MAXIMUM CAPACITANCE AVAILABLE IN PF										
X5F, Y5E, Z5D	10	200	400	680	1000	1500	1800	2400	3000	3600	4500	5400
X5F, Y5F, Z5F	20	330	620	1000	1600	2200	3000	3900	5000	5600	7500	8200
X5P, Y5P, Z5P	20	430	900	1500	2300	3100	3100	5100	6700	7700	10,000	12,000
X5R, Y5S, Z5P	20	490	1000	1700	2700	3800	4400	6000	7600	9000	11,000	13,000
X5U, Y5U, Z5U	20	680	1200	2200	3300	4500	7000	10,000	13,000	15,000	20,000	24,000
Z5U	20	1000	1800	3000	5000	6200	10,000	15,000	20,000	23,000	27,000	36,000
X5V, Y5V, Z5V	20	1200	2200	3600	5600	9000	12,000	18,000	22,000	30,000	35,000	44,000

How to Order



AVAILABLE CAPACITANCE TOLERANCES

C = ±.25 pf	J = ±5%
D = ±.5 pf	K = ±10%
F = ±1%	M = ±20%
G = ±2%	Z = +80 -20%
H = ±3%	

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

HIGH VOLTAGE DISC CAPACITORS

Type HVD-1 thru HVD-7 — 1000 VDC thru 6000 VDC

Dipped Phenolic Coating, Wax Impregnated, Solder Coated Copper Leads
EIA-RS165 Environmental Performance

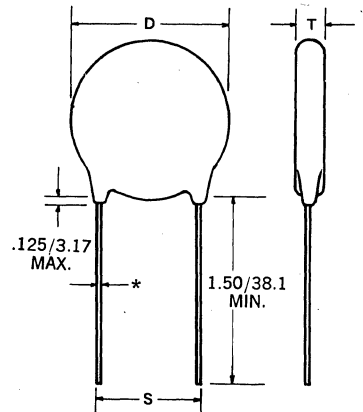
Specifications

Capacity Range	26 pf thru 22000 pf
Capacity Tolerance	10%, (X5R only) 20% & GMV
Dissipation Factor	2.5%
Insulation Resistance	20,000 Megohms Minimum
Working Voltage	1000 VDC thru 6000 VDC
Flash Test Voltage	1.75 Times Rated Voltage
Temperature Characteristic	X5R and Z5U

Type HVD Disc Capacitors are available in many variations of capacity, temperature characteristics and voltage. The capacity range charts cover the popular ranges but by no means all combinations. Our Engineering Department is available to design to your special requirements.

Capacitance Range in pf

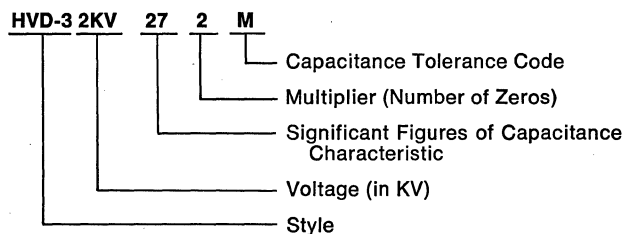
Style	Voltage & EIA Char.	Min. C	HVD-1	HVD-2	HVD-3	HVD-4	HVD-5	HVD-6	HVD-7
MAXIMUM CAPACITANCE VALUE IN PF									
1000VX5R	51	51	500	750	1000	2000	3000	3700	5600
1000VZ5U	51	51	2000	3400	5000	9000	15,000	18,000	22,000
2000VX5R	26	26	250	400	600	900	1800	2200	3300
2000VZ5U	26	26	1000	1500	2700	3900	7500	10,000	15,000
3000VX5R	41	41	—	—	420	550	1000	1500	2200
3000VZ5U	41	41	—	—	1800	2400	4700	5600	10,000
4000VX5R	31	31	—	—	350	490	800	1000	1800
4000VZ5U	31	31	—	—	1500	2200	4000	5100	7200
5000VX5R	41	41	—	—	—	390	630	780	1000
5000VZ5U	41	41	—	—	—	1800	2700	3300	5000
6000VX5R	36	36	—	—	—	300	500	600	900
6000VZ5U	36	36	—	—	—	1500	2200	3000	4000



Dimensions: High Voltage Discs

D	Max.	T Max.				S ±.030			
		1 KV	2-4 KV	5 KV	6 KV	1-2 KV	3-4 KV	5-6 KV	
HVD-1	.310	.156	.187	.250	.312	.250	.375	.500	
	7.87	3.96	4.75	6.35	7.92	6.35	9.53	12.7	
HVD-2	.385	.156	.187	.250	.312	.250	.375	.500	
	9.78	3.96	4.75	6.35	7.92	6.35	9.53	12.7	
HVD-3	.440	.156	.187	.250	.312	.250	.375	.500	
	11.18	3.96	4.75	6.35	7.92	6.35	9.53	12.7	
HVD-4	.590	.156	.187	.250	.312	.375	.375	.500	
	14.99	3.96	4.75	6.35	7.92	9.53	9.53	12.7	
HVD-5	.690	.156	.187	.250	.312	.375	.375	.500	
	17.53	3.96	4.75	6.35	7.92	9.53	9.53	12.7	
HVD-6	.760	.156	.187	.250	.312	.375	.375	.500	
	19.30	3.96	4.75	6.35	7.92	9.53	9.53	12.7	
HVD-7	.906	.156	.187	.250	.312	.375	.375	.500	
	23.01	3.96	4.75	6.35	7.92	9.53	9.53	12.7	

How to Order



AVAILABLE CAPACITANCE TOLERANCES

C = ±.25 pf	J = ±5%
D = ±.5 pf	K = ±10%
F = ±1%	M = ±20%
G = ±2%	Z = +80 -20%
H = ±3%	

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

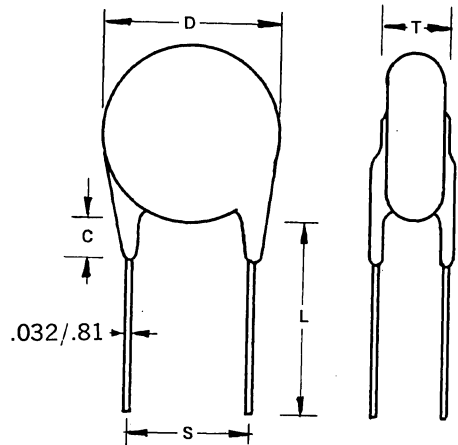
AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

VOLTAGE MULTIPLIER CAPACITORS

8 and 10 KV Discs, Style: 5038, 5039, 5054

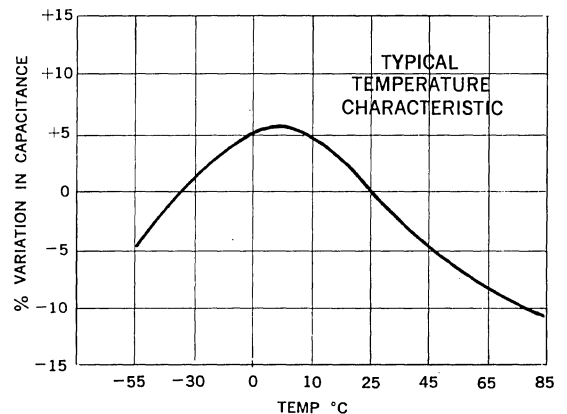
Designed for High Voltage D.C. Multiplier Circuits...
Excellent Temperature Stability... Low Voltage Coefficient...
Anti-Corona Performance Epoxy Coated —
Compatible with Potting or Molding Compounds.



Specifications

Capacity	1,000 or 700 pf
Capacity Tolerance	±20%
Dissipation Factor	2% Max. at 1 KHz
Insulation Resistance	20,000 Megohms, Minimum
Working Voltage	8 and 10 KV
Flash Test Voltage	1.5 Times Rated Voltage
Temperature Characteristic	Z5R, ±15% ΔC +10 to +85°C
Voltage Characteristic	-20% ΔC at 10 KV
Corona Voltage	2500 VRMS @ 60 Hz 100 Pico Coulombs

Typical Temperature Characteristics



Dimensions

D.C. Working Voltage	Capacity pf	Dwg. Part No.	Dimensions: Inches/Millimeters				
			D Max.	T Max.	C Max.	S ±.062	L Min.
10 KV	1000	5038Z5R102MA	.850/21.6	.375/9.53	.375/9.53	.500/12.7	1.00/25.4
10 KV	1000	5054Z5R102MA	.750/17.8	.300/7.62	.250/6.35	.500/12.7	1.00/25.4
8 KV	700	5039Z5R701MA	.500/12.7	.250/6.35	.250/6.35	.500/12.7	1.00/25.4

Dimensions: Inches/Millimeters

How to Order

Specify Part No. in above chart.

Example: 5038Z5R102MA

is 1000 ±20% Z5R, .850 Max. Diam.

THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

AVX: The Insiders.

FEED-THRU CAPACITORS

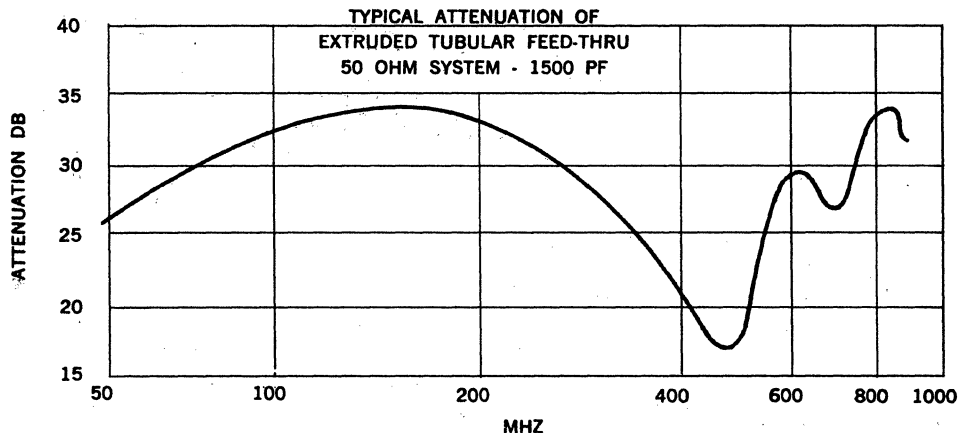
Types 4400 and 7400 — 250 and 1500 Volt — Bolt and Eyelet

Units shown are produced with conventional tubular dielectrics. Bolt type units are shown with Z5U characteristic dielectric (GP). If need exists for a specific TC, consult factory. Eyelet type feed-thrus shown as 4420 thru 4428 are inexpensive, dependable miniaturized eyelet feed-thrus differing from the 7400 Series in that the solder form is furnished as an integral part of the feed-thru — eliminating the need of solder preforms in assembly. All operations on these parts are done automatically, giving the capacitor a high degree of reliability.

Post style units have terminals held in position by a crimp and are soldered at both ends of the tube. Square terminals for wire wrapped solderless connections are also available.

Specifications

Capacity Range	5 pf thru 4000 pf
Capacity Tolerance	±5%; ±10%, ±20% and GMV
Dissipation Factor	.2 to 3%
Insulation Resistance	10,000 Megohms Minimum
Working Voltage	250, 500, 1,000 and 1,500 Volts DC
Flash Test Voltage	2 Times Rated Voltage
Temperature Characteristic	P200 thru Z5U
Marking	Typographical or Color Code on 7404-7405



THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

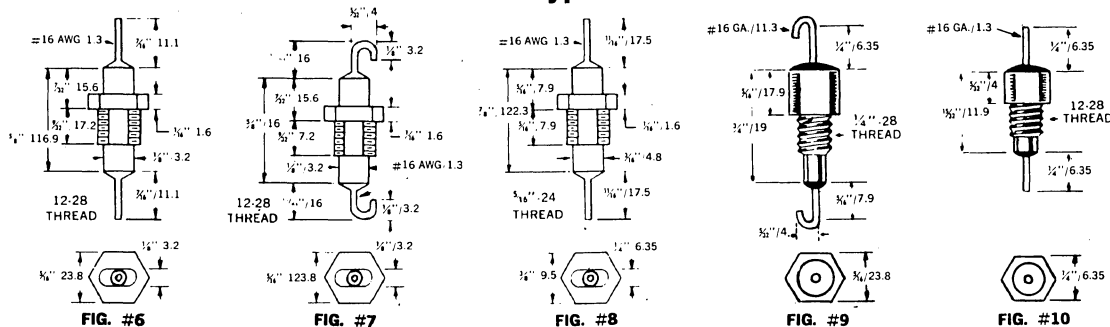
CAPACITORS (ALL TYPES)

AVX: The Insiders.

FEED-THRU CAPACITORS (CONT'D)

250 and 1500 Volt, TYPES 4400 and 7400 Bolt and Eyelet

Bolt Type Feed-Thru

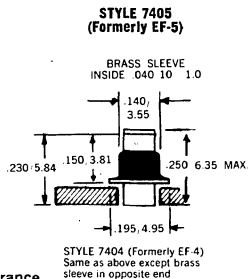


DC WORKING VOLTAGE	TC	TYPE	CAP. RANGE	DWG.	TYPE	CAP. RANGE	DWG.
500V	GP*	CFS-1	15-1500 PF	Fig. #6	CFC-1	15-1500 PF	Fig. #7
500V	GP	BLF-1CC	† 10-4000 PF	Fig. #9	BSF-1BB	10-1500 PF	Fig. #10
1000V	GP	BLF-2CC	† 10-3000 PF	Fig. #9	BSF-2BB	10-1000 PF	Fig. #10
1500V	GP	CF-167A	100-1000 PF	Fig. #8	* ±20% Tolerance available standard ±10% Tolerance available		

Tubular Feed-Thru

DC WORKING VOLTAGE 500 V		STYLE 4423	DC WORKING VOLTAGE 500 V		STYLE 4427 (Formerly EF12)
CAPACITY RANGE IN PF	TEMPERATURE CHARACTERISTICS				

DC WORKING VOLTAGE 250 V	
CAPACITY RANGE IN PF	TEMPERATURE CHARACTERISTICS
5 to 10	NP0 ± 60
11 to 33	N330 ± 500
22 to 33	N750 ± 120
36 to 180	N3300 ± 1000
200 to 560	X5P
620 to 1500	Z5U



Available minimum capacity tolerance

Type 4420 thru 4428

±5% for P200 thru N2200

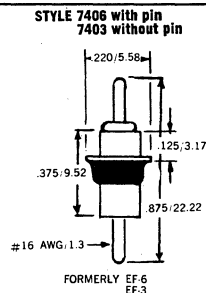
±10% for Z5P, ±20% for Z5U

Type EF-5 and EF-6

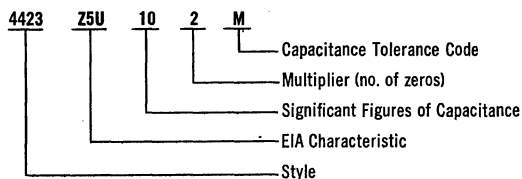
±10% for NP0 thru X5P

±20% for Z5U

DC WORKING VOLTAGE 500 V	
CAPACITY RANGE IN PF	TEMPERATURE CHARACTERISTICS
10 to 15	NP0 ± 60
16 to 43	N330 ± 500
30 to 43	N750 ± 120
47 to 200	N3300 ± 1000
220 to 680	X5P
750 to 2200	Z5U



How to Order



THESE PRODUCTS AVAILABLE FROM AVX CERAMICS FRANCHISED DISTRIBUTORS

AVX Ceramics, P.O. Box 867, Myrtle Beach, S.C. 29577 • Tel: (803) 448-3191 • TWX: 810-661-2252

Alissa Manufacturing Company

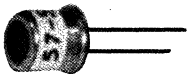
MANUFACTURERS OF HIGH RELIABILITY OPTOELECTRONIC TEST EQUIPMENT



ALISSA MANUFACTURING COMPANY MANUFACTURES CUSTOMIZED OPTOPRODUCT TEST EQUIPMENT SUCH AS:

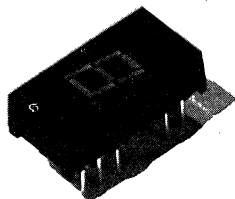
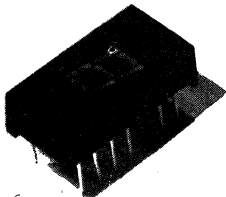
- PHOTOTRANSISTOR ARRAY TESTERS
 - LED TESTERS
 - PHOTODIODE TESTERS
 - NUMERIC INDICATOR TESTERS
- FOR PRODUCTION AS WELL AS FINAL ACCEPTANCE TESTING.

HI-REL TESTING AND LIFE TESTING ARE PERFORMED ON ALL OPTOPRODUCTS AND OTHER RELATED COMPONENTS INCLUDING THE TESTING OF DIGIT-MONO-DIES AND PHOTO-DIES.



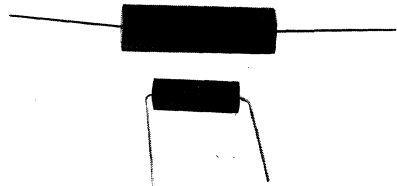
ALISSA WILL TEST THE ABOVE OPTOPRODUCTS PER CUSTOMER SPECIFICATIONS WHICH INCLUDE CRITICAL PARAMETERS SUCH AS:

- LIGHT CURRENT SENSITIVITY CAN BE MEASURED AT 0.01 mw/cm²
- VCE AND T_c CAN BE VARIED AND CHECKED ACCURATELY BEYOND THE PRESENT-STATE-OF-THE-ART.



MANUFACTURERS OF HIGH RELIABILITY FILM CAPACITORS

THE HOT ONES!



WITH THE COOLEST PERFORMANCE!!

- ULTRA HIGH-REL 200°C RATED FILM CAPACITORS
- HIGH VOLTAGE CAPACITORS
- HERMETICALLY SEALED, METAL CASED CAPACITORS
- EPOXY 'B' CASED CAPACITORS
- WRAP AND FILL CAPACITORS
- SPECIAL BATH-TUB CANS WITH SEVERAL TERMINATION CONFIGURATIONS
- CAPACITORS FOR ALL TYPES OF AC/DC APPLICATIONS



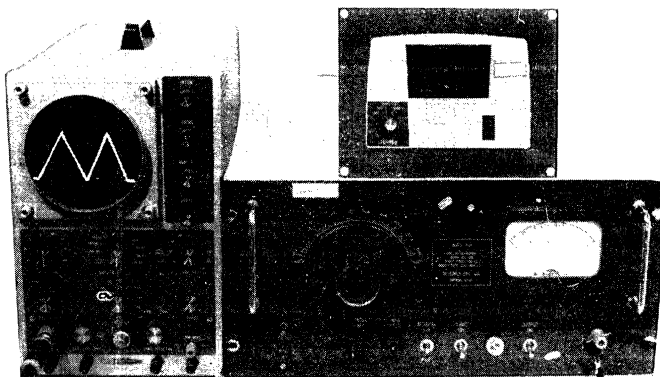
FOR FURTHER INFORMATION WRITE TO
ALISSA MANUFACTURING COMPANY
2800 LA CIENEGA AVENUE, LOS ANGELES
CALIFORNIA 90034 - OR CALL
(213) 559-7480 OR (213) 559-7481

2800 LA CIENEGA AVENUE

• LOS ANGELES, CALIFORNIA 90034 • (213) 559-7480

Alissa Manufacturing Company

ALL ALISSA CAPACITORS ARE 100% AC-POWER CONDITIONED AT VERY HIGH FREQUENCIES AND CHECKED FOR HEAT RISE TO INSURE THE UTMOST IN RELIABILITY. THIS POWER CONDITIONING IS CONDUCTED DURING THE THERMAL SHOCK/CYCLING TEST FROM -62°C AND UP TO $+200^{\circ}\text{C}$, FOLLOWING THE 100% DC POWER CONDITIONING TESTS.



GENERAL CAPACITOR INFORMATION

- METAL CASED CAPACITORS AND EPOXY 'B' CASED CAPACITORS

Case Sizes—can be supplied per Mil-C-83421/1 or per customer requirements

μF Values and Voltage Ratings—per customer requirements

Screening Levels Available—Levels 1, 2, and 3 per Table I.

- HIGH VOLTAGE CAPACITORS

600VDC and higher voltage ratings are available in metal cases or Epoxy 'B' cases

μF Values—per customer requirements

Screening Levels Available—Levels 1, 2, and 3 per Table I.

- CAPACITOR DIELECTRICS

The above capacitors are metallized film capacitors and are available in Polycarbonate, Polysulfone, and Kapton dielectrics

- LEAD WIRE MATERIAL AVAILABLE

Tinned Copperweld, Oxygen Free Copper, or Nickel per Mil-Std-1276

2800 LA CIENEGA AVENUE

• LOS ANGELES, CALIFORNIA 90034

• (213) 559-7480

Alissa Manufacturing Company

CAPACITOR SPECIFICATIONS

AKJ—Polycarbonate film capacitors (metallized and foil)

CMJ—Polysulfone film capacitors (metallized and foil)

PMJ—Kapton film capacitors (metallized and foil)

Other dielectric capacitors are also available such as Mylar, Polypropylene, Polystyrene, etc.

• OPERATING TEMPERATURE RANGE

AKJ — -62°C to $+125^{\circ}\text{C}$

CMJ — -62°C to $+150^{\circ}\text{C}$

PMJ — -62°C to $+200^{\circ}\text{C}$

• INSULATION RESISTANCE

The minimum Insulation Resistance when measured from terminal to terminal with an applied potential equal to the rated voltage shall be as follows:

$+25^{\circ}\text{C} = 3.0 \times 10^6 \text{ MEGS Min}$

$+85^{\circ}\text{C} = 1.5 \times 10^6 \text{ MEGS Min}$

$+125^{\circ}\text{C} = 2.5 \times 10^4 \text{ MEGS Min}$

• DISSIPATION FACTOR

0.15% Max at 25°C

• TEST POTENTIAL

DC—At $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ capacitors shall withstand a DC Voltage of at least 200% of the rated DC Voltage

AC—At $25^{\circ}\text{C} \pm 5^{\circ}\text{C}$ capacitors shall withstand an AC Voltage of at least 200% of the rated AC Voltage

• CAPACITANCE CHANGE WITH TEMPERATURE

Relative to $+25^{\circ}\text{C}$: $-55^{\circ}\text{C} = -1\%$ and at $+125^{\circ}\text{C} = +0.75\%$

• FINE LEAK AND GROSS LEAK TESTS

Fine Leak Test— $1 \times 10^{-6} \text{ ATM-CC/sec}$ max leak rate

Gross Leak Test—Oil test for 1 minute in accordance with method 112 of MIL-STD-202, Condition A.

• GENERAL INFORMATION

Capacitors are capable of meeting or exceeding requirements of any existing established Hi-Rel Capacitor Specification.

2800 LA CIENEGA AVENUE

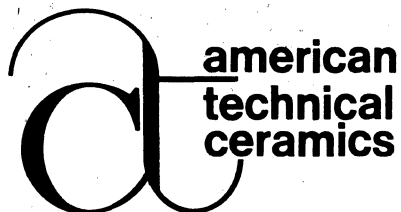
• LOS ANGELES, CALIFORNIA 90034 • (213) 559-7480

Photos & Catalog by Lawrence Enterprises
P.O. Box 48474 (213) 651-3530
Los Angeles, CA 90048

TABLE NO. 1
100% SCREENING LEVELS

TEST ITEM NO.	EXAMINATION OR TEST	CONDITIONS	LIMITS		SCREENING LEVELS		
			MINIMUM	MAXIMUM	1	2	3
1	DC POWER- CONDITIONING	140% OF THE RATED DC VOLTAGE DURING THERMAL SHOCK/CYCLING	AKJ + -62°C to +125°C CMJ + -62°C to +150°C PMJ + -62°C to +200°C		24 HOURS	16 HOURS	NOT APPLICABLE
2	AC POWER CONDITIONING	140% OF THE RATED AC VOLTAGE AT 4 KHZ DURING THERMAL SHOCK/CYCLING	-62°C	+125°C	24 HOURS	16 HOURS	8 HOURS
3	SEAL	FINE LEAK TEST GROSS LEAK TEST	—	1 x 10 ⁻⁶ ATM/CC-SEC	✓ ✓	GROSS LEAK PER MIL-STD-202 METHOD 112, CONDITION A	GROSS LEAK PER MIL-STD-202 METHOD 112, CONDITION A
4	DIELECTRIC STRENGTH	200% OF THE RATED DC VOLTS 200% OF THE RATED AC VOLTS	60 SECONDS 60 SECONDS	—	✓ ✓	✓ ✓	✓ ✓
5	INSULATION RESISTANCE	AT RATED VOLTAGE FROM TERMINAL TO TERMINAL. FOR OVER 1 μF CAPACITORS, IR = MEGS x μF MIN. IR MEASUREMENTS ARE PER- FORMED ONLY @ 25°C (ON 100% BASIS)	—	—	SEE PAGE 3	@ 25°C = 2 x 10 ⁶ MEGS MIN @ 85°C = 1 x 10 ⁶ MEGS MIN @ 125°C = 1 x 10 ⁴ MEGS MIN	@ 25°C = 1 x 10 ⁶ MEGS MIN @ 85°C = 1 x 10 ⁵ MEGS MIN @ 125°C = 1 x 10 ⁴ MEGS MIN
6	CAPACITANCE % TOLERANCE	@ 1 KHZ AND 25°C	—	WITHIN SPEC IFIED LIMITS	✓	✓	✓
7	DISSIPATION FACTOR	@ 1 KHZ AND 25°C VALVES OVER 1 μF @ 100 HZ	—	—	0.15%	0.20%	0.20%
8	VISUAL INSPECTION	EXTERNAL—DIMENSIONS, MARKING AND WORKMANSHIP	—	WITHIN SPEC IFIED LIMITS	✓	✓	✓
9	MARKING	ALL CAPACITORS ARE MARKED WITH A LOT DATE CODE FOR TRACEABILITY			CAPACITORS ARE SERIALIZED AND VARIABLES DATA SUPPLIED	✓	✓

CAPACITORS (ALL TYPES)



ATC 100 UHF/MICROWAVE LOW-LOSS PORCELAIN CAPACITORS

- High Q thru Microwaves
- 0.1 pF to 1000 pF standard
- High RF current capability
- Rugged Terminations
- Absolute Retrace
- Hermetic Construction
- Close Tolerances standard
- High Reliability
- Completely Characterized:
Full RF and DC test data

APPLICATIONS

Phased-array radar ... wide-band amplifiers ...
low noise circuits ... receiver RF-IF stages ...
proximity fuses ... radiosonde ... microwave
power sources ... UHF mobile ... ECM ... DME
... UHF/microwave power amplifiers ... tropo-
scatter communications ... commercial aircraft
communications ... military ... marine and
amateur AM/FM/SSB ... military hand-held
survival radios.

CHARACTERISTICS

Quality Factor: Greater than 10,000 at 1 MHz.
Capacitance Values: Case A, from 0.1 pF to 100 pF;
Case B, from 0.1 pF to 1000 pF.

Tolerances: B (± 0.1 pF); C (± 0.25 pF); D (± 0.5 pF); F ($\pm 1\%$); G ($\pm 2\%$); J ($\pm 5\%$); K ($\pm 10\%$); M ($\pm 20\%$)

Temperature Coefficient of Capacitance: $+90 \pm 20$ PPM/ $^{\circ}\text{C}$ (-55°C to $+125^{\circ}\text{C}$)

Dielectric Test Voltage: 250% of WVDC rating for 5 secs

Retrace: $\pm 0.1\%$ or ± 0.1 pF, whichever is greater

Aging Effects: None

Piezoelectric Effects: None (No capacitance variation with voltage or pressure)

Capacitance Drift: $\pm 0.1\%$ or ± 0.1 pF, whichever is greater

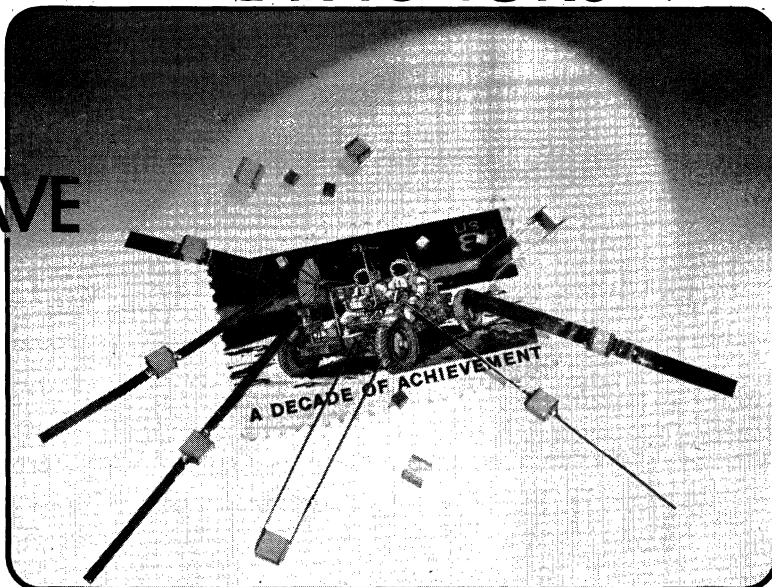
Insulation Resistance: 0.1 pF to 470 pF: 10^6 megohms min @ 25°C , 10^5 megohms min @ 125°C ;
510 pF to 1000 pF: 10^5 megohms min @ 25°C , 10^4 megohms min @ 125°C

Operating Temperature Range: From -55°C to $+125^{\circ}\text{C}$ (no derating of working voltage); above 125°C , derate linearly to 50% WVDC @ 200°C

MILITARY SPECIFICATIONS (QPL)

The ATC 100 series is QPL to MIL-C-11272: CY81 (Case A chip), CY82 (Case A pellet), CY83 (Case B chip), CY84 (Case B pellet), CY85 (Case B microstrip leaded), CY86 (Case B axial ribbon leaded), CY87 (Case B radial wire leaded), CY88 (Case B radial ribbon leaded), CY89 (Case B axial wire leaded)

UHF/MICROWAVE CAPACITORS



ATC 100, ATC 700 CAPACITANCE TOLERANCES / RANGES

B (± 0.1 pF) from 0.1 pF to 9.1 pF	Series	Size	Capacitance Values	DC Working Voltage
C (± 0.25 pF) from 0.3 pF to 9.1 pF	ATC 100	Case A	0.1 pF to 100 pF	50 volts
D (± 0.5 pF) from 0.5 pF to 6.2 pF				
F ($\pm 1\%$) from 10 pF to 5100 pF				
G ($\pm 2\%$) from 10 pF to 5100 pF				
J ($\pm 5\%$) from 6.8 pF to 5100 pF	ATC 700	Case A	47 pF to 1000 pF	50 volts
K ($\pm 10\%$) from 6.8 pF to 5100 pF				
M ($\pm 20\%$) from 6.8 pF to 5100 pF				

ATC 100, ATC 700 CAPACITANCE VALUES

0.1	1.4	3.6	12	43	150	510	1800
0.2	1.5	3.9	13	47	160	560	2000
0.3	1.6	4.3	15	51	180	620	2200
0.4	1.7	4.7	16	56	200	680	2400
0.5	1.8	5.1	18	62	220	750	2700
0.6	1.9	5.6	20	68	240	820	3000
0.7	2.0	6.2	22	75	270	910	3300
0.8	2.1	6.8	24	82	300	1000	3600
0.9	2.2	7.5	27	91	330	1100	3900
1.0	2.4	8.2	30	100	360	1200	4300
1.1	2.7	9.1	33	110	390	1300	4700
1.2	3.0	10	36	120	430	1500	5000
1.3	3.3	11	39	130	470	1600	5100

CAPACITOR

FOR 1975 CATALOG, RF CAPACITOR HANDBOOK, OR CAPACITOR SAMPLES, CONTACT ATC AT



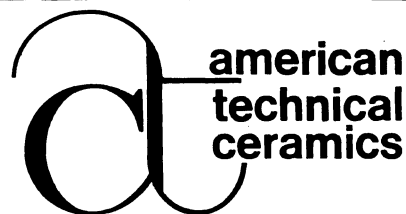
The RF Capacitor Handbook presents over 200 pages of comprehensive detail for design considerations and uses for miniature chip and leaded RF capacitors. You'll find theoretical and empirical high-frequency circuit design equations, characteristics of capacitor dielectrics, especially at high RF power levels and frequencies, actual test data at frequencies from 100 MHz to 3 GHz, and practical design methods for increasing gain and power, DC to RF conversion efficiency, bandwidth, transistor lifetime, circuit MTBF, and low-noise performance.

ATC 100 CHIPS AND LEADED DEVICES

CHIPS (PdAg terminations)			DIMENSIONS		
MILITARY CODE	CASE SIZE	TYPE	LENGTH	WIDTH	THICKNESS
CY81	A	 Chip	$.055 \pm .010$ in. $1.4 \pm .25$ mm.		$.055$ in. max. 1.4 mm. max.
CY83	B	 Chip	$.110 \pm .015$ in. $2.79 \pm .38$ mm.		$.100$ in. max. 2.54 mm. max.

PELLETS (solder coated chips)			DIMENSIONS		
MILITARY CODE	CASE SIZE	TYPE	LENGTH	WIDTH	THICKNESS
CY82	A	 Pellet	$.080$ in. max. 2.03 mm. max.	$.055 \pm .010$ in. $1.4 \pm .25$ mm.	$.055$ in. max. 1.4 mm. max.
CY84	B	 Pellet	$.140$ in. max. 3.56 mm. max.	$.110 \pm .015$ in. $2.79 \pm .38$ mm.	$.100$ in. max. 2.54 mm. max.

LEADED CAPACITORS (CASE B)			LEAD DIMENSIONS		
MILITARY CODE	LEAD STYLE		LEAD MATERIAL: SILVER RIBBON & SILVER WIRE		
			LENGTH	WIDTH	THICKNESS
CY85	Micro-strip		.250 in. min. 6.35 mm. min.	0.093 ± .005 in. 2.36 ± .13 mm.	.004 ± .001 in. .102 ± .025 mm.
CY86	Axial Ribbon				
CY88	Radial Ribbon				
	Narrow Axial Ribbon			.050 ± .005 In. 1.27 ± .13 mm.	.006 ± .003 in. .153 ± .076 mm.
	Narrow Micro-strip				
CY87	Radial Wire		.500 in. min. 12.7 mm. min.	≈ 26 AWG, nom. .016 in. dia. nom. .375 mm. dia.	
CY89	Axial Wire				



ATC 700 ULTRA-STABLE CERAMIC CAPACITORS

- True Zero T.C.
- 47 pF to 5100 pF standard
- No Piezoelectric Effects
- No Aging effects
- 1000 pF in 55 mil cube

APPLICATIONS

Excellent for low power levels at UHF frequencies as DC blocks and emitter bypasses . . . superior in VHF low power high-stability tank circuits for variable-frequency oscillators, and H.F. discriminators . . . reduces variation due to temperature in low frequency filters . . . permits predictable RC timing circuits . . . replaces mica, polystyrene and teflon dielectric capacitors with much greater capacity values per unit volume and improved environmental characteristics.

CHARACTERISTICS

Capacitance Values: Case A, from 47 pF to 1000 pF; Case B, from 200 pF to 5100 pF

Tolerances: F ($\pm 1\%$); G ($\pm 2\%$); J ($\pm 5\%$); K ($\pm 10\%$); M ($\pm 20\%$)

Working Voltage: 50 WVDC

Temperature Coefficient of Capacitance: 0 ± 30 PPM/ $^{\circ}\text{C}$ (-55°C to $+125^{\circ}\text{C}$)

Dissipation Factor: .0005 max @ 1 KHz except .001 for Case A > 470 pF

Insulation Resistance: 10^5 megohms min @ 25°C , 10^4 megohms min @ 125°C

Dielectric Test Voltage: 300% rated voltage for 5 secs

Operating Temperature Range: -55°C to $+125^{\circ}\text{C}$

ATC 700 capacitors meet MIL-C-55681

KITS ?? SEE THE FOLLOWING PAGES

ONE NORDEN LANE, HUNTINGTON STATION, NEW YORK 11746 (516) 271-9600 • TWX 510-226-6993



ATC 100 UHF/MICROWAVE

CASE A mini-cubes®

ATC 100 A EVALUATION KIT SERIES

40 capacitors, four each of ten values and tolerances:

KIT ATC 1001C-AC:	palladium silver	\$ 29.95	pF	Tol	pF	Tol	pF	Tol	pF	Tol	pF	Tol
KIT ATC 1001C-AP:	pelletized*	\$ 39.95	1.0	B	2.7	D	4.7	D	12	K	47	K
			1.8	C	3.3	D	8.2	K	22	K	82	K

144 capacitors, four each of thirty six values and tolerances:

ATC 100 A TRIM KIT™ SERIES

KIT ATC 1002C-AC:	palladium silver	\$ 99.95	pF	Tol	pF	Tol	pF	Tol	pF	Tol	pF	Tol
KIT ATC 1002C-AP:	pelletized*	\$129.95	0.3	B	1.0	B	1.7	B	2.7	B	5.1	C
			0.4	B	1.1	B	1.8	B	3.0	B	5.6	C
			0.5	B	1.2	B	1.9	B	3.3	C	6.2	C
			0.6	B	1.3	B	2.0	B	3.6	C	6.8	J
			0.7	B	1.4	B	2.1	B	3.9	C	7.5	J
			0.8	B	1.5	B	2.2	B	4.3	C	8.2	J
			0.9	B	1.6	B	2.4	B	4.7	C	9.1	J
											10	J

ATC 100 A DESIGNER KIT SERIES

125 capacitors, five each of twenty five values and tolerances:

KIT ATC 1003C-AC:	palladium silver	\$119.95	pF	Tol	pF	Tol	pF	Tol	pF	Tol	pF	Tol
KIT ATC 1003C-AP:	pelletized*	\$149.95	1.0	B	2.7	C	6.8	J	18	J	47	J
			1.3	B	3.3	C	8.2	J	22	J	56	K
			1.6	B	3.9	C	10	J	27	J	68	K
			1.9	B	4.7	C	12	J	33	J	82	K
			2.1	B	5.6	C	15	J	39	J	91	K

CASE B MAXI-"Q"UBES™

ATC 100 B EVALUATION KIT SERIES

60 capacitors, four each of fifteen values and tolerances:

KIT ATC 1011C-BC:	palladium silver	\$ 59.95	pF	Tol	pF	Tol	pF	Tol	pF	Tol	pF	Tol
KIT ATC 1011C-BP:	pelletized*	\$ 69.95	1.0	C	5.6	D	16	J	51	J	200	J
KIT ATC 1011C-BMS:	microstrip	\$ 89.95	2.2	D	7.5	D	24	J	75	J	470	M
KIT ATC 1011C-BRW:	radial wire	\$ 89.95	3.6	D	11	J	36	J	100	J	620	M

144 capacitors, four each of thirty six values and tolerances:

ATC 100 B TRIM KIT™ SERIES

KIT ATC 1012C-BC:	palladium silver	\$149.95	pF	Tol	pF	Tol	pF	Tol	pF	Tol	pF	Tol
KIT ATC 1012C-BP:	pelletized*	\$179.95	0.3	B	1.0	B	1.7	B	2.7	B	5.1	C
KIT ATC 1012C-BMS:	microstrip	\$219.95	0.4	B	1.1	B	1.8	B	3.0	B	5.6	C
			0.5	B	1.2	B	1.9	B	3.3	C	6.2	C
			0.6	B	1.3	B	2.0	B	3.6	C	6.8	J
			0.7	B	1.4	B	2.1	B	3.9	C	7.5	J
			0.8	B	1.5	B	2.2	B	4.3	C	8.2	J
			0.9	B	1.6	B	2.4	B	4.7	C	9.1	J
											10	J

250 capacitors, five each of fifty values and tolerances:

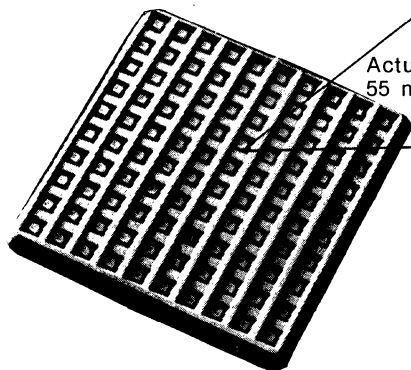
KIT ATC 1013C-BC:	palladium silver	\$249.95	pF	Tol	pF	Tol	pF	Tol	pF	Tol	pF	Tol
KIT ATC 1013C-BP:	pelletized*	\$299.95	0.3	B	2.7	C	9.1	J	36	J	200	K
KIT ATC 1013C-BMS:	microstrip	\$279.95	0.4	B	3.0	C	10	J	43	J	220	K
			0.5	B	3.3	C	11	J	47	J	240	K
			0.6	B	3.6	C	13	J	56	K	300	K
			0.7	B	4.3	C	16	J	62	K	360	M
			0.9	B	5.6	C	18	J	68	K	430	M
			1.2	B	6.2	C	24	J	91	K	470	M
			1.5	C	6.8	J	27	J	130	K	510	M
			1.8	C	7.5	J	30	J	160	K	560	M
			2.2	C	8.2	J	33	J	180	K	620	M

*Pelletized chips are palladium silver chip capacitors, solder coated.

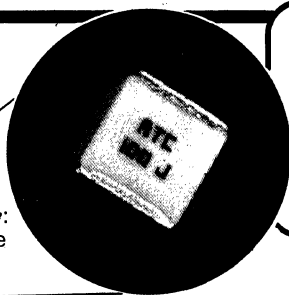
Silver bearing solder included with each kit (372°F solder, 62% Sn, 36% Pb, 2% Ag).

TOLERANCE CODE: B=±0.1 pF; C=±0.25 pF; D=±0.5 pF; F=±1%; G=±2%; J=±5%; K=±10%; M=±20%

CAPACITOR KITS



Actual Size:
55 mil cube

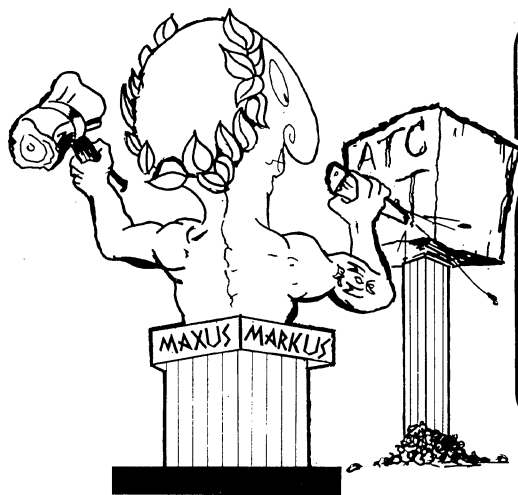


**american
technical
ceramics**

MARKED

ATC 100 UHF/MICROWAVE CAPACITOR KITS

DESIGN VALUES: 40 MARKED POPULAR VALUES IMMEDIATELY AVAILABLE IN PROTOTYPE AND PRODUCTION QUANTITIES (BACKED BY A STOCK OF OVER ONE MILLION CHIPS IN THE DESIGN VALUES SHOWN BELOW). MARKING MEETS MIL-STD-202, METHOD 215 AND IS UNAFFECTED BY ALL COMMONLY USED SOLVENTS AND TEMPERATURES TO 1500°F.



DESIGN VALUE KIT C1
mini-cube® A trim kit
(55 mil cube)

QTY.	CASE	CAP. (pF)	TOL.
10	A	0.1	B
10	A	0.5	B
10	A	0.8	B
10	A	1.8	B
10	A	3.3	B
10	A	4.7	C
10	A	6.2	C
10	A	8.2	C
10	A	9.1	C
10	A	10.0	J

DESIGN VALUE KIT C2
mini-cube® A Tune Kit
(55 mil cube)

QTY.	CASE	CAP. (pF)	TOL.
10	A	12.0	J
10	A	15.0	J
10	A	18.0	J
10	A	22.0	J
10	A	27.0	J
10	A	33.0	J
10	A	47.0	J
10	A	62.0	J
10	A	82.0	J
10	A	100.0	M

DESIGN VALUE KIT C3
MAXI-"Q"UBE™ B trim kit
(110 mil cube)

QTY.	CASE	CAP. (pF)	TOL.
10	B	1.6	C
10	B	1.8	C
10	B	2.4	C
10	B	4.7	C
10	B	5.6	C
10	B	6.2	C
10	B	7.5	C
10	B	8.2	K
10	B	10.0	K
10	B	12.0	K

DESIGN VALUE KIT C4
MAXI-"Q"UBE™ B Tune Kit
(110 mil cube)

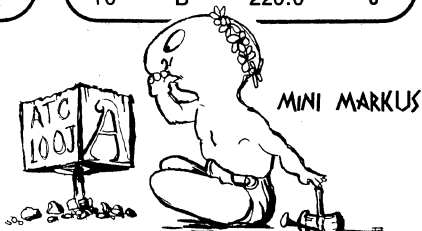
QTY.	CASE	CAP. (pF)	TOL.
10	B	18.0	K
10	B	24.0	J
10	B	27.0	K
10	B	30.0	J
10	B	43.0	J
10	B	68.0	J
10	B	110.0	J
10	B	120.0	J
10	B	180.0	J
10	B	220.0	J

BUY ANY DESIGN VALUE KIT OF 100
ATC 100 LOW LOSS PORCELAIN
CHIP CAPACITORS FOR \$77.00.

To place your order for any ATC
capacitor kits, write directly to the
address below; for immediate deliv-
ery, call (516) 271-9600.

tomorrow's capacitors....today

mini-cube® is a registered trademark, and MAXI-"Q"UBE™ and TRIM KIT™ are proprietary trademarks of ATC.



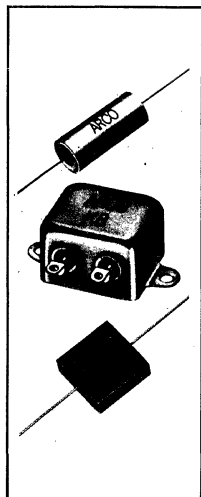
ONE NORDEN LANE, HUNTINGTON STATION, NEW YORK 11746 • 516/271-9600 • TWX 510-226-6993

Arco Electronics, Inc.

PFC

Manufacturing Division
ARCO ELECTRONICS

precision polystyrene capacitors



ZERO TEMPERATURE COEFFICIENT

TYPE KT TUBULAR

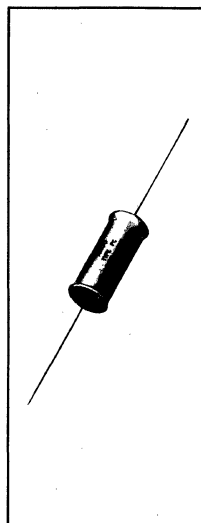
TYPE KB RECTANGULAR BATHTUB CANS

HERMETICALLY SEALED — METAL CASE

TYPE KE FLAT EPOXY ENCAPSULATED

A unique combination of Polystyrene and Mica dielectrics resulting in a capacitor offering a truly ZERO TEMPERATURE COEFFICIENT (± 10 ppm/°C from -55°C to $+85^{\circ}\text{C}$ standard production) with the ultimate in long term STABILITY. Type KT and KB capacitors will meet or exceed all requirements of MIL-C-19978, where applicable, under ALL ENVIRONMENTAL CONDITIONS specified therein.

ARCO Type KT, KB, and KE capacitors provide the utmost in performance for PRECISION-OSCILLATORS, TIMING CIRCUITS, and RC NETWORKS.



SUPERIOR ENVIRONMENTAL PROTECTION AT LOW COST — SMALLEST SIZE

TYPE PC & PJ TUBULAR TYPE SC & SJ TUBULAR

The unique design of ARCO Type PC capacitors provides physical and electrical stability, ruggedness and strength of termination, and excellent uniformity in production. All these features enable tight control of the narrow specification limits published. Type PC offers the smallest, lowest cost construction available, while retaining optimum performance characteristics.

The Type PC enclosure provides unusual protection against moisture, solvents and inadvertent contact with a soldering iron. The rugged, heat resistant jacket material makes Type PC particularly suited to printed circuit dip-solder assemblies subject to solvent cleaning and also to densely packed component structures where there is danger of damage to adjacent units while making solder connections.

Extensive evaluation has confirmed the excellent moisture resistance of the Type PC (surpassed only by metal cased enclosures) and its conformance to the most stringent shock and vibration specifications.

Type PC capacitors are exceptionally well suited for PRECISION FILTERS, DELAY LINES, and PRECISION TIMING CIRCUITS, where small size and excellence of performance are mandatory at LOW COST.

BURN-IN: All ARCO capacitors are subjected to a minimum of two 16 hour burn-in periods with 300% of rated voltage applied at 85°C .

GENERAL SPECIFICATIONS

OPERATING TEMPERATURE RANGE: The ARCO capacitor types listed can be used for continuous operation from -55°C to $+85^{\circ}\text{C}$ without derating. Transient exposure to $+95^{\circ}\text{C}$ will have NO DELETERIOUS effect.

CAPACITANCE TOLERANCE: ARCO specializes in precision capacitors. Available from standard production are tolerances of $\pm 10\%$, $\pm 5\%$, $\pm 3\%$, $\pm 2\%$, $\pm 1\%$, $\pm \frac{1}{2}\%$, $\pm \frac{1}{4}\%$, $\pm 0.1\%$.

VOLTAGE RATING: All ARCO capacitors are available in 100, 200, 400, 600 and 1,000 Volts DC ratings. Special voltages can be supplied upon request or to specification.

SPECIFICATIONS

DISSIPATION FACTOR: When measured at or referred to 1 kHz the dissipation factor shall not exceed the following:

.001 @ 23°C

INSULATION RESISTANCE: Insulation resistance when measured at the applicable test temperature, shall equal or exceed the following values:

	23°C	$+85^{\circ}\text{C}$
megohm x mfd	10^5	10^3
except the insulation resistance in megohms need not exceed	10^6	10^4

*NOTE: Verified on 100% of production.

STABILITY: Long term (1 year) capacitance drift under maximum operating conditions shall not exceed $\pm 0.05\%$.

TEMPERATURE COEFFICIENT: The temperature coefficient of ARCO Type KT, KB, and KE capacitors is truly zero, they are usually produced to a tolerance of ± 10 ppm/°C. They can also be produced to zero ± 5 ppm/°C. The linearity of the temperature coefficient regardless of tolerance is ± 1 ppm/°C. Other temperature coefficient centers may be supplied within the range of -100 to $+20$ ppm/°C. THE TEMPERATURE COEFFICIENT OF THESE CAPACITORS is tested on a 100% basis. Data verifying these tests can be supplied at NO EXTRA COST as requested.

DIELECTRIC ABSORPTION: When tested in accordance with paragraph 4.6.15 of MIL-C-19978, the dielectric absorption shall not exceed 1.0% over the entire operating temperature range.

CONSTRUCTION: The ARCO Type KT, KB, and KE capacitors are constructed by a unique combination of polystyrene dielectric sections with a linear negative temperature coefficient cross compensating a mica dielectric capacitor section with a linear positive TC. The polystyrene capacitor section is wound with a SOLID CORE in the center for optimum stability, and is terminated with a disc lead assembly soldered directly to the extended foil for a completely NON-INDUCTIVE construction resulting in the lowest possible contact resistance. The mica capacitor section is the well known Arco capacitor exhibiting highest reliability and performance characteristics. The individual capacitor sections as well as their combination have been constructed so as to guarantee all performance characteristics listed as well as complete FREEDOM FROM MICROPHONISM.

SPECIFICATIONS

DISSIPATION FACTOR: When measured at or referred to 1 kHz the dissipation factor shall not exceed the following:

.0001 @ 23°C .0002 @ 85°C

INSULATION RESISTANCE: Insulation resistance when measured at the applicable test temperature, shall equal or exceed the following values:

	23°C	$+85^{\circ}\text{C}$
megohm x mfd	10^6	1.5×10^5
except the insulation resistance in megohms need not exceed	2×10^6	3×10^5

*NOTE: Verified on 100% of production.

DIELECTRIC ABSORPTION: When tested in accordance with paragraph 4.6.15 of MIL-C-19978, the dielectric absorption shall not exceed 0.05% over the entire operating temperature range.

STABILITY: Long term (1 year) capacitance drift under maximum operating conditions shall not exceed the following limits for the types listed:

Type PC & PJ $\pm 0.1\%$ Type SC & SJ $\pm 0.05\%$

TEMPERATURE COEFFICIENT: The temperature coefficient of all the ARCO capacitor types herein listed is negative 120 ± 15 ppm/°C.

CONSTRUCTION: The ARCO precision polystyrene capacitors Types PC and SC are encased in an irradiated polyolefin jacket sealed with bonded silicone rubber. Types PJ and SJ are encased in a silicone treated fused polystyrene jacket. This unique construction economically protects the excellent electrical characteristics exhibited in Types PC and SC and is primarily intended for use where they will not be subjected to the following hazards:

1. Physical damage due to excessive heat during dip or flow solder assembly.
2. Solvent damage during cleaning operations.
3. Exposure to excessive humidity for prolonged periods of time.

All types herein listed are wound with a SOLID CORE in the center for optimum stability, and are terminated with a disc lead assembly soldered directly to the extended foil for a completely NON-INDUCTIVE construction resulting in the lowest possible contact resistance and exhibiting complete FREEDOM FROM MICROPHONISM.

precision RC networks

THE ULTIMATE IN TEMPERATURE COEFFICIENT CONTROL OF RC PRODUCT

LINEAR TC OF ± 5 PPM/°C OVER

TEMPERATURE RANGE OF -55°C TO $+85^{\circ}\text{C}$

ARCO's ability to produce capacitors with adjustable and closely uniform characteristics has facilitated the design of highly precise RC networks. By matching zero temperature coefficient resistors and capacitors, or by balancing temperature coefficients to obtain a zero (or other specified) T.C. on the RC product, networks which have long term stability independent of temperature are obtained. At the same time, RC products of better than $\pm 0.05\%$ accuracy can be supplied. Testing is performed on a 100% basis on both resistors and capacitors with temperature coefficient data recorded at the temperature extremes.

Arco

COMMUNITY DRIVE
GREAT NECK, NEW YORK 11022
(516) 487-0500

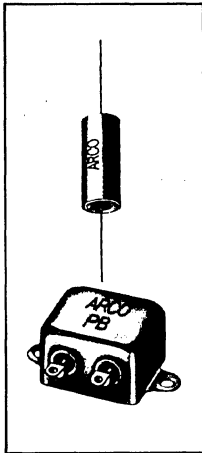
9822 INDEPENDENCE AVENUE
CHATSWORTH, CALIFORNIA 91311
(213) 882-8707

Arco Electronics, Inc.

PFC

Manufacturing Division
ARCO ELECTRONICS

precision polystyrene capacitors



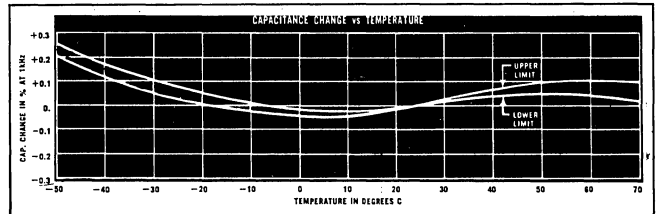
FOR MILITARY APPLICATIONS AND HOSTILE ENVIRONMENTS TYPE PT, & ST TUBULAR TYPE PB, & SB RECTANGULAR BATHTUB CANS HERMETICALLY-SEALED — METAL CASE

Design innovations and extreme care in production have enabled ARCO to approach the optimum performance characteristics of the polystyrene film. These capacitors will exceed all performance requirements of MIL-C-19978 under ALL ENVIRONMENTAL CONDITIONS specified therein. ARCO polystyrene capacitors were specifically designed for the most critical applications where requirements for extremely high insulation resistance, high Q, extraordinary stability, close tolerance, and low dielectric absorption and dissipation factor are mandatory. These capacitors are intended primarily for use in ANALOG and DIGITAL COMPUTERS, CALCULATORS, HIGH Q TUNED CIRCUITS, INTEGRATORS, PRECISION FILTER CIRCUITS, PULSE NETWORKS, SERVO SYSTEMS, and as REFERENCE CAPACITORS.

TEMPERATURE-STABLE SMALL SIZE TYPE HT TUBULAR TYPE HB RECTANGULAR BATHTUB CANS HERMETICALLY SEALED — METAL CASE

An exclusive ARCO design modifying the temperature characteristics of the dielectric film to provide capacitors insensitive to temperature changes ($\pm 0.1\%$ change to 85°C). Type HT and HB capacitors will meet ALL ENVIRONMENTAL REQUIREMENTS OF MIL-C-19978.

ARCO Type HT and HB capacitors are specifically designed for INTEGRATORS, PRECISION TIMING CIRCUITS, and PRECISION RC NETWORKS.



GENERAL SPECIFICATIONS

OPERATING TEMPERATURE RANGE: The ARCO capacitor types listed can be used for continuous operation from -55°C to $+85^\circ\text{C}$ without derating. Transient exposure to $+95^\circ\text{C}$ will have NO DELETERIOUS effect.

CAPACITANCE TOLERANCE: ARCO specializes in precision capacitors. Available from standard production are tolerances of $\pm 10\%$, $\pm 5\%$, $\pm 3\%$, $\pm 2\%$, $\pm 1\%$, $\pm 1/2\%$, $\pm 1/4\%$, $\pm 0.1\%$.

DIELECTRIC ABSORPTION: When tested in accordance with paragraph 4.6.15 of MIL-C-19978, the dielectric absorption shall not exceed 0.05% over the entire operating temperature range.

INSULATION RESISTANCE: Insulation resistance when measured at the applicable test temperature, shall equal or exceed the following values:

	23°C	*85°C
megohm x mfd	10^4	1.5×10^5
except the insulation resistance } in megohms need not exceed }	10^8	10^6

*NOTE: Verified on 100% of production.

CONSTRUCTION: All ARCO precision polystyrene capacitor types here listed are hermetically sealed in metal cases with compression glass-to-metal, solder-sealed terminals. They are wound with a SOLID CORE in the center for optimum stability, and are terminated with a disc lead assembly soldered directly to the extended foil for a completely NON-INDUCTIVE construction resulting in the lowest possible contact resistance and exhibiting complete FREEDOM FROM MICROPHONISM.

SPECIFICATIONS

DISSIPATION FACTOR: When measured at or referred to 1 kHz the dissipation factor shall not exceed the following:

.0001 @ 23°C .0002 @ 85°C

VOLTAGE RATING: All ARCO capacitors are available in 100, 200, 400, 600 and 1,000 Volts DC ratings. Special voltages can be supplied upon request or to specification.

STABILITY: Long term (1 year) capacitance drift under maximum operating conditions shall not exceed the following limits for the types listed:

Type PT & PB $\pm 0.1\%$ Type ST & SB $\pm 0.05\%$

TEMPERATURE COEFFICIENT: The following temperature coefficient variants are available:

Type PT & PB negative 120 ± 15 ppm/°C
Type ST & SB negative 120 ± 15 ppm/°C

BURN-IN: All ARCO capacitors are subjected to a minimum of two 16 hour burn-in periods with 300% of rated voltage applied at 85°C .

SPECIFICATIONS

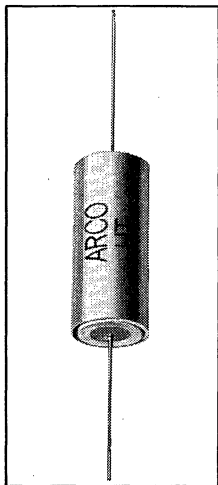
DISSIPATION FACTOR: When measured at or referred to 1 kHz the dissipation factor shall not exceed 0.002 @ 23°C.

VOLTAGE RATING: ARCO Type HT and HB capacitors are produced in 100 Volt DC rating. Other voltages to 1,000 volts can be supplied upon request.

STABILITY: Long term (1 year) capacitance drift under maximum operating conditions shall not exceed $\pm 0.1\%$.

TEMPERATURE COEFFICIENT: The temperature coefficient of ARCO Type HT and HB capacitors is controlled so that the variation of capacitance from room temperature to 85°C is less than $\pm 0.1\%$; from room temperature to -55°C variation is less than $\pm 0.25\%$. Tighter control is available to special order ($\pm 0.05\%$ from 10°C to 50°C).

new products



precision polypropylene capacitors

TYPE PPT TUBULAR HERMETICALLY SEALED METAL CASE

ARCO's unique design innovations and extreme care in production has resulted in a polypropylene capacitor approaching the performance parameters of polystyrene. With polypropylene dielectric there is approximately a 50% reduction in size. These capacitors can also be operated to 125°C without derating voltage. ARCO polypropylene capacitors are excellent for all critical applications which require high insulation resistance, high Q, extreme stability, close tolerance, low dielectric absorption and dissipation factor. The temperature coefficient makes an excellent choice for high Q tuned circuits, precision filter circuits, pulse networks and RC circuits.

SPECIFICATIONS

OPERATING TEMPERATURE RANGE: The ARCO capacitor types listed can be used for continuous operation from -55°C to $+125^\circ\text{C}$ without derating.

CAPACITANCE TOLERANCE: ARCO specializes in precision capacitors. Available from standard production are tolerances of $\pm 10\%$, $\pm 5\%$, $\pm 3\%$, $\pm 2\%$, $\pm 1\%$, $\pm 1/2\%$, $\pm 1/4\%$.

DIELECTRIC ABSORPTION: When tested in accordance with paragraph 4.6.15 of MIL-C-19978, the dielectric absorption shall not exceed 0.05% over the entire operating temperature range.

STABILITY: Long term (1 year) capacitance drift under maximum operating conditions shall not exceed:

$\pm 0.1\%$ to 105°C $\pm 0.2\%$ to 125°C

DISSIPATION FACTOR: When measured at or referred to 1 kHz the dissipation factor shall not exceed the following:

.0002 @ 23°C .0003 @ 85°C

INSULATION RESISTANCE: Insulation resistance when measured at the applicable test temperature, shall equal or exceed the following values:

	23°C	*85°C	105°C	125°C
Megohm x mfd	10^4	1.5×10^5	10^5	10^4
Except the insulation resistance } in megohms need not exceed }	10^7	1.5×10^6	10^6	10^5

*NOTE: Verified on 100% of production.

TEMPERATURE COEFFICIENT:

Negative 200 ± 30 ppm/°C from room temperature to -55°C
Negative 350 ± 30 ppm/°C from room temperature to $+105^\circ\text{C}$

BURN-IN: All ARCO capacitors are subjected to a minimum of two 16 hour burn-in periods with 300% of rated voltage applied at 85°C .

CONSTRUCTION: ARCO Type PPT capacitors are hermetically sealed in metal cases with compression glass-to-metal, solder-sealed terminals. They are wound with a SOLID CORE in the center for optimum stability, and are terminated with a disc lead assembly soldered directly to the extended foil for a completely NON-INDUCTIVE construction resulting in the lowest possible contact resistance and exhibiting complete FREEDOM FROM MICROPHONISM.

Arco

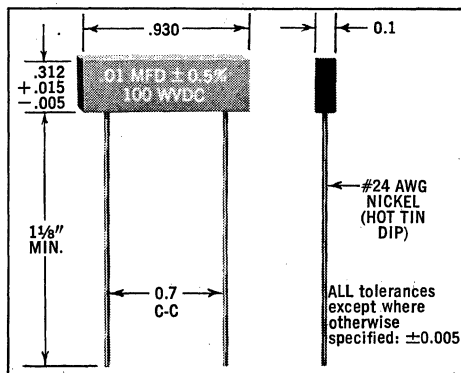
COMMUNITY DRIVE
GREAT NECK, NEW YORK 11022
(516) 487-0500

9822 INDEPENDENCE AVENUE
CHATSWORTH, CALIFORNIA 91311
(213) 882-8707

Arco Electronics, Inc.

PFC
 Manufacturing Division
 ARCO ELECTRONICS

precision polystyrene capacitors



SPECIFICATIONS

CAPACITANCE RANGE: .001 to .01 mfd (lower and higher values are available upon request). Max. value .015 mfd.

TOLER.: $\pm 5\%$, $\pm 2\%$, $\pm 1\%$, $\pm \frac{1}{2}\%$, $\pm \frac{1}{4}\%$, $\pm 0.1\%$.

VOLTAGE RATING: 100 WVDC.

INSULATION RESISTANCE: 10^{13} ohms minimum @ 25°C, 10^{12} ohms @ 85°C.

DISSIPATION FACTOR: 0.01% maximum @ 25°C, 0.02 maximum @ 85°C.

DIELECTRIC ABSORPTION: 0.05% maximum at all temperatures.

TEMP. COEFFICIENT: Negative 190 ± 30 ppm/°C.

LONG TERM OPERATING STABILITY: $\pm 0.1\%$ maximum drift under fixed or variable operating conditions within specified maximum limits.

TYPE PE

ARCO Electronics announces availability of a new polystyrene dielectric capacitor with a thin configuration specifically designed for conservation of space in printed circuits and in filters. Flat polystyrene sections are encapsulated in uniform epoxy preforms to provide the following features:

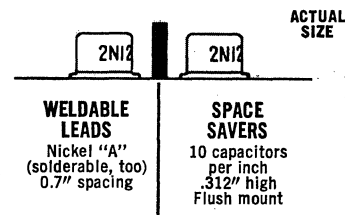
0.1" THICKNESS

Uniform lead spacing for p-c use.

Uniform size and flush mounting.

Both weldable and solderable leads.

Rugged, moisture proof construction.



In addition to the physical advantages of this design, the electrical excellence of ARCO polystyrenes has been retained. High long term stability under maximum operating conditions, low dissipation factor and dielectric absorption, extremely high insulation resistance, close tolerance are featured. And also important is the ARCO control of quality which results in close uniformity not only from unit to unit, but from production lot to production lot as well.

The Nickel "A" leads of ARCO Type PE capacitors are welded directly to the capacitor section. The strength and permanence of electrical contact is thereby entirely independent of encapsulation.

All ARCO Type PE capacitors are "debugged" 100% prior to shipment by accelerated life test at stress levels exceeding ratings to eliminate potential early failures.

TYPE LE, PRECISION POLYCARBONATE CAPACITORS

SPECIFICATIONS

CAPACITANCE RANGE: .001 to .025 MFD.

OPERATING TEMPERATURE: -55°C to +105°C.

DISSIPATION FACTOR: shall not exceed .3% maximum @ 25°C when measured @ 1 KHZ.

DIELECTRIC ABSORPTION: 0.5% max. @ 25°C.

LONG TERM STABILITY: $\pm 0.2\%$ max, for +10°C to +40°C Range $\pm 2\%$ max. under maximum operating conditions.

INSULATION RESISTANCE: 200,000 megohms @ 25°C.

TEMPERATURE COEFFICIENT: Capacitance change will not exceed $\pm 2\%$ of the room temperature value over the entire operating temperature range.

TOLERANCES: $\pm 5\%$, $\pm 2\%$, $\pm 1\%$.

TYPE EE, PRECISION POLYESTER CAPACITORS

SPECIFICATIONS

CAPACITANCE RANGE: .001 to .056 MFD.

OPERATING TEMPERATURE: -55°C to +105°C.

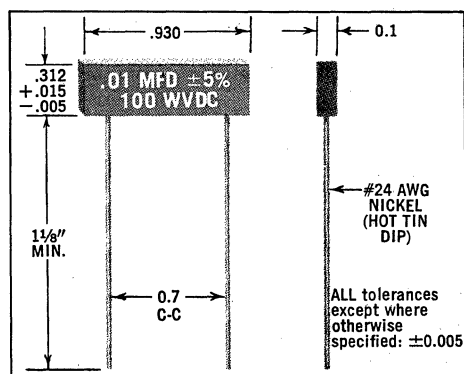
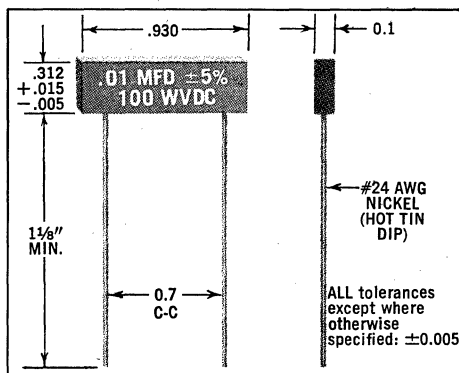
DISSIPATION FACTOR: Shall not exceed 1% maximum @ 25°C when measured @ 1 KHZ.

LONG TERM STABILITY: shall not exceed 10%.

INSULATION RESISTANCE: 100,000 megohms @ 25°C.
2,000 megohms @ 105°C.

TEMPERATURE COEFFICIENT: Capacitance change will not exceed:
-10% @ -55°C.
+4% @ +85°C.
+8% @ +105°C.

TOLERANCES: $\pm 5\%$, $\pm 2\%$, $\pm 1\%$.



CONTACT YOUR LOCAL **Arco** DISTRIBUTOR FOR CATALOGS AND SPECIFICATIONS

ELECTRONIC COMPONENTS FOR INDUSTRY SOLD NATIONALLY THROUGH **Arco** DISTRIBUTORS

Arco Electronics, Inc.

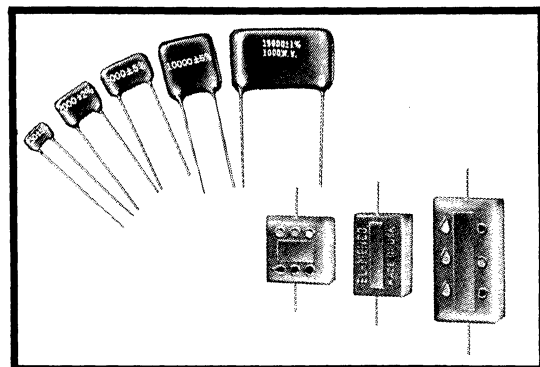
CAPACITORS

COMMUNITY DRIVE
GREAT NECK, NEW YORK 11022
(516) 487-0500

9822 INDEPENDENCE AVENUE
CHATSORTH, CALIFORNIA 91311
(213) 882-8707

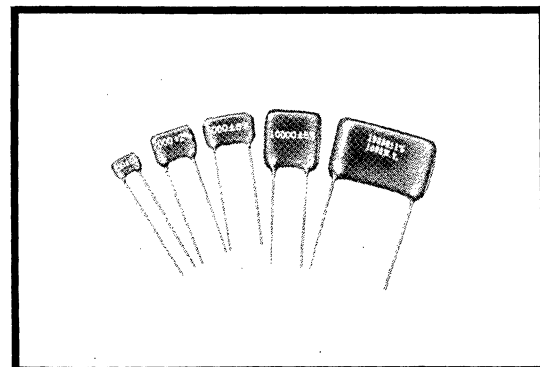
DIPPED AND MOLDED SILVERED MICA ONLY 1 FAILURE PER 43,000,000 UNIT-HOURS!

- It has been computed that "debugged" DM30, 10,000 MMF units, when subjected to 257,000 hours of life at 85°C with 100% of the rated DC voltage applied, will yield only 1 FAILURE PER 43,000,000 UNIT-HOURS!
- DM15, DM16, DM19, DM20 . . . perfect for miniaturization and for new designs using printed wiring circuits. Also available in DM30, DM42 and DM43.
- New "hairpin" parallel leads insure easy application.
- Exceed all electrical requirements of military specification MIL-C-5A.
- DM5 — subminiature completely encapsulated mica capacitors. Ideal for high density miniature applications.
- CM15, CM20, CM30, CM35 and CM42 . . . molded mica designed to meet MIL-C-5 specifications.



HIGH RELIABILITY MICA PER MIL-C-39001A

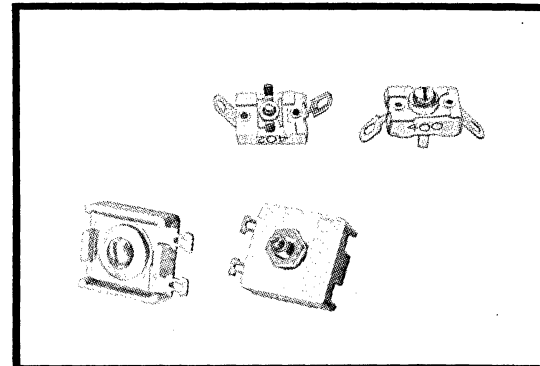
- Designed to meet the most critical design requirements.
- Types CMR04; CMR05; CMR06; CMR07 & CMR08 designed to meet MIL-C-39001A.
- Rated voltages 100, 300 and 500 VDCW.
- Temperature Ranges: O = -55° to +125°C
P = -55° to +150°C
- Failure Levels: L = 2.0% per 1000 hours
M = 1.0% per 1000 hours
P = 0.1% per 1000 hours



TRIMMERS/PADDERS

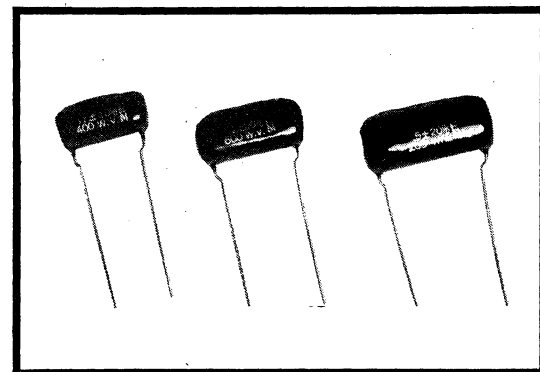
DESIGN VERSATILITY!

- Available in 350 VDC and 500 VDC as well as other test voltages.
- All bases are of low-loss steatite.
- Special lugs are obtainable for printed circuitry.
- Miniature units are available.
- Solder Lugs can be bent in any position without affecting the capacity setting due to the rigid construction.
- Various types of mounting brackets are available for all trimmers.
- Units can be constructed for special applications.



DIPPED TUBULARS

- Working volts DC: 100, 200, 400, 600, 1000 and 1600.
- Durez phenolic resin impregnated.
- Tolerances: $\pm 10\%$ and $\pm 20\%$ (closer tolerances available).
- Dielectric strength: 2 or $2\frac{1}{2}$ times rated voltage, depending upon working voltage.
- Exceed all electrical requirements of E.I.A. specification RS-164 and military specifications MIL-C-91A and MIL-C-25A.



REQUEST ENGINEERING PRODUCT BULLETINS FROM ARCO

CONTACT YOUR LOCAL **Arco** DISTRIBUTOR FOR CATALOGS AND SPECIFICATIONS

ELECTRONIC COMPONENTS FOR INDUSTRY SOLD NATIONALLY THROUGH **Arco** DISTRIBUTORS

Arco Electronics, Inc.

CAPACITORS

COMMUNITY DRIVE
GREAT NECK, NEW YORK 11022
(516) 487-0500

9822 INDEPENDENCE AVENUE
CHATSWORTH, CALIFORNIA 91311
(213) 882-8707

ELECTROLYTICS

MINIATURE ALUMINUM ARCOLYTICS

MINIATURE ALUMINUM ELECTROLYTICS

- Ultra-small units are made for transistor circuitry and other subminiature applications.
- High quality, low cost electrolytic capacitors, with windings sealed in an aluminum can protected by a vinyl sleeve.
- Operation temperature: -30°C to $+85^{\circ}\text{C}$.
- Available in either axial or radial lead construction.
- Available voltages: 3, 6, 12, 15, 25, 50, 100, 150, 250 and 350 VDCW.

ARCOLYTIC CAPACITORS

TUBULAR & TWIST MOUNT ELECTROLYTICS

- Hermetically sealed in aluminum cans.
- Made with 99.99% pure aluminum foil.
- Designed for high temperature operation: 85°C .
- Suitable to withstand high surge voltages and ripple currents.
- Built and tested to meet EIA specification RS-154.
- Greater shelf, operating life and dependable performance in TV, Radio and Hi-Fi applications.
- Available in single, and multiple section units.
- Excellent moisture resistance due to construction, either hermetically sealed aluminum tube with insulating cardboard sleeves, or double insulated wax filled cardboard tubes. Supplied on tubular units only.

NEW PRODUCTS

85°C

COMPUTER GRADE

ARCO now offers the Type ARC computer grade capacitors in the widest range of capacity and voltage available in the industry.

The ARCOLYTIC Type ARC capacitors are designed for use in computers, power supply filters, industrial controls, welders and photo flash energy storage, or any other application where high reliability, heavy duty electrolytic capacitors are required.

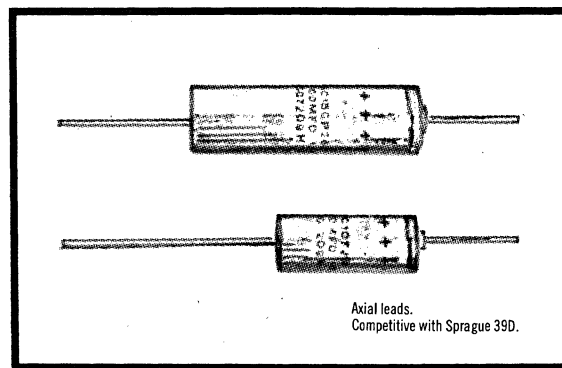
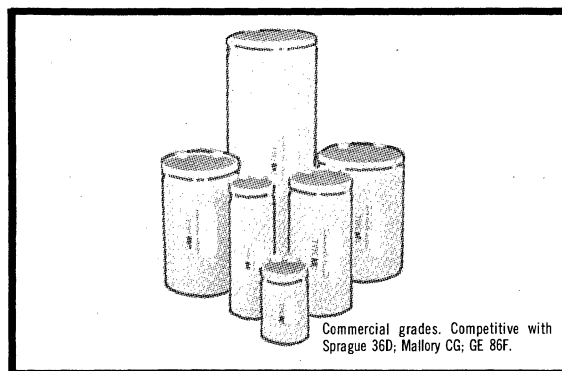
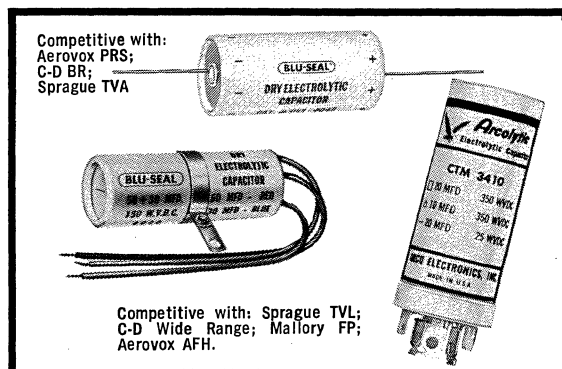
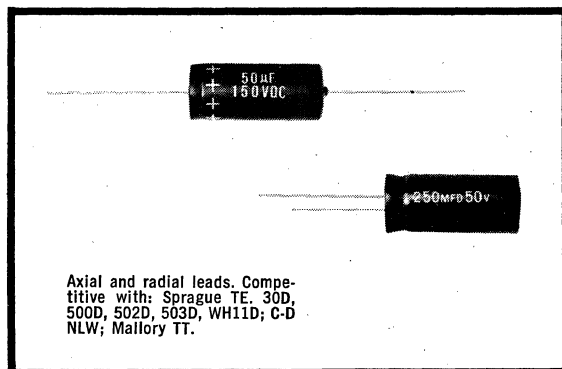
TUBULAR

COMPUTER GRADE

ARCO Type 39A is the axial tubular version of the 85°C computer grade capacitor. These capacitors are now available in a wide variety of case sizes and standard ratings plus extra high density ratings.

ARCO 39A family capacitors are designed for use in computers, power supplies, industrial controls, energy storage or any other applications where extreme high reliability, compact size and performance are required.

REQUEST ENGINEERING PRODUCT BULLETINS FROM ARCO



CONTACT YOUR LOCAL **Arco** DISTRIBUTOR FOR CATALOGS AND SPECIFICATIONS

ELECTRONIC COMPONENTS FOR INDUSTRY SOLD NATIONALLY THROUGH **Arco** DISTRIBUTORS

Arco Electronics, Inc.

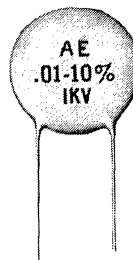
CAPACITORS

COMMUNITY DRIVE
GREAT NECK, NEW YORK 11022
(516) 487-0500

9822 INDEPENDENCE AVENUE
CHATSWORTH, CALIFORNIA 91311
(213) 882-8707

1000VDCW CERAMIC DISCS

- Low cost, small size for by-pass and coupling applications in IF and RF circuits, where temperature coefficient is unimportant.
- Outstanding moisture resistance due to rugged phenolic coating and high temperature way impregnation.
- Conservative design provides extra reserve for resistance to surges and temporary overloads.
- Available in 1000, 3000 and 6000 VDCW, and temperature compensating (TO; NPO; N750) and stable types.
- Ideal for original equipment or for replacement.



General purpose and industrial grade. Competitive with: Sprague 5GA; Centralab DD; Aerovox GPD.

LOW VOLTAGE CERAMIC DISCS

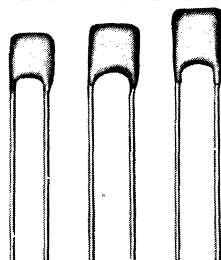
- Inexpensive, miniature size for high density designs.
- Popular values, for Transistor circuits.
- New Low Voltage Disc Ceramics, 25, 50 and 100 VDCW.
- Small size for transistor circuitry.
- Available in $\pm 20\%$, and $+80\% - 20\%$ tolerance.
- Values from .005 mfd to .1 mfd with Z5U or Z5V characteristics.



Competitive with: Spragues TG, HY; Centralab CK, UK, DC.

MONOLITHIC CERAMICS

- Miniature sizes for transistor circuitry.
- Available at 50, 100 VDCW.
- General Purpose, NPO and 15% Stable T.C. Types.
- Applications for Commercial Timing and Coupling Circuits.
- Capacitance Ranges from 1.0 pf thru 4.7 mfd. with $\pm 1, 2, 5, 10$ and 20% tolerances.
- Dipped Durez construction for durability.



Monolithic Ceramics
General purpose, NPO, 15% T.C.
stable types. Competitive with:
Erie Red-Caps; Aerovox Sky-Caps.

DIPPED TANTALUM

- Sub-miniature designs for high density packaging.
- Available in standard voltages 6.3 to 50VDCW.
- Capacitance range 0.1 to 680 MFD.
- Straight or crimped leads.
- Solid electrolyte with a highly stable oxide layer with an epoxy coating for reliability.



Competitive with
KEMET: T360, T362
DICKSON: GS
ITT: TAG
SPRAGUE: 196D

REQUEST ENGINEERING PRODUCT BULLETINS FROM ARCO

CONTACT YOUR LOCAL **Arco** DISTRIBUTOR FOR CATALOGS AND SPECIFICATIONS

ELECTRONIC COMPONENTS FOR INDUSTRY SOLD NATIONALLY THROUGH **Arco** DISTRIBUTORS

Arco Electronics, Inc.

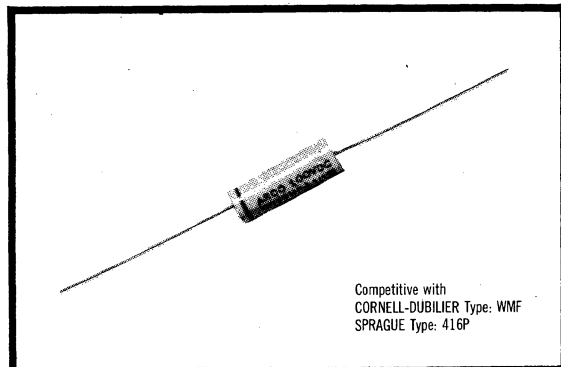
CAPACITORS

COMMUNITY DRIVE
GREAT NECK, NEW YORK 11022
(516) 487-0500

9822 INDEPENDENCE AVENUE
CHATSWORTH, CALIFORNIA 91311
(213) 882-8707

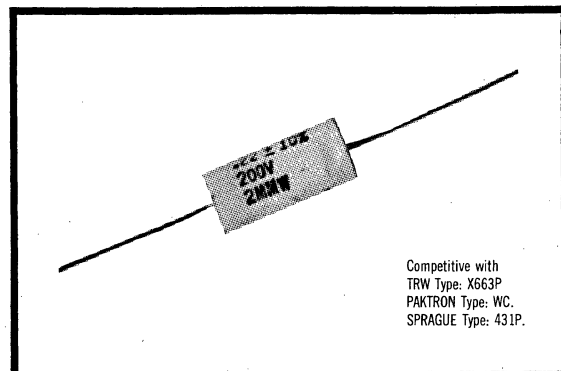
POLYESTER (MYLAR®) WRAP TYPES MW AND MWA

- Low priced film wrapped units for use in industrial electronic equipment, computers, communications and home entertainment equipment.
- Available Standard Voltages: 100, 200, 400, and 600 VDCW.
- Standard Tolerance: $\pm 10\%$ others on request.
- Extended Foil Construction with epoxy end-seals.
- Capacitance Range .001 to 5.0 MED.



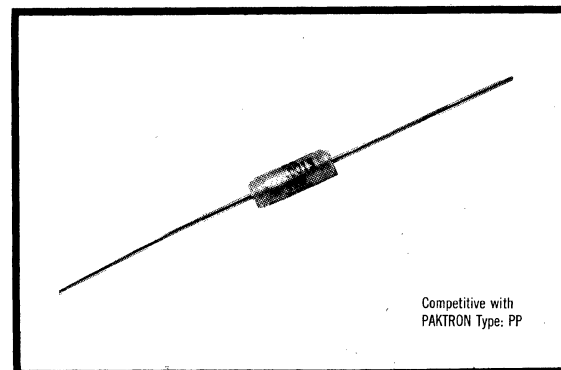
METALIZED MYLAR® WRAP TYPE 2MMW

- Economically priced metalized film wrap units.
- Size saving over conventional film foil units.
- Voltage Rating: 200 VDC.
- Insulation Resistance: 30,000 megohms min.
- Metalized Polyester Tape - wrapped construction and end sealed with thermosetting epoxy.
- Standard tolerance: $\pm 10\%$.
- Operating Temperature Range: -55°C to $+85^{\circ}\text{C}$.
to $+125^{\circ}\text{C}$ derated 50%



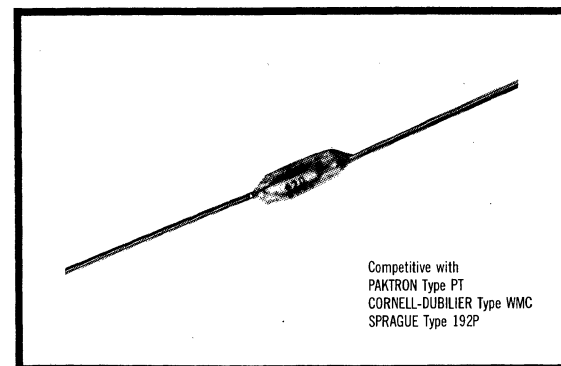
MINIATURE POLYPROPYLENE WRAP TYPE 2MP

- Small miniature design and uniform size suited for automatic insertion.
- 200 VDC working voltage.
- Operating Temperature Range: -55°C to $+105^{\circ}\text{C}$.
- Excellent Moisture Resistance.
- Capacitance Ranges .001 to .15MFD.
- Standard tolerance: $\pm 10\%$.



MINIATURE POLYESTER (MYLAR®) WRAP TYPE 2MPT

- Highly stable units.
- Miniature designs.
- 200 VDC working voltage.
- Low inductance and high insulation resistance.
- Operating Temperature Range: -55°C to $+85^{\circ}\text{C}$.
to $+125^{\circ}\text{C}$ derated 50%
- Capacitance Range: .001 to .15 MFD.
- Standard Tolerance: $\pm 10\%$.



*DUPONT TM

REQUEST ENGINEERING PRODUCT BULLETINS FROM ARCO

CONTACT YOUR LOCAL **Arco** DISTRIBUTOR FOR CATALOGS AND SPECIFICATIONS

ELECTRONIC COMPONENTS FOR INDUSTRY SOLD NATIONALLY THROUGH **Arco** DISTRIBUTORS

Arco Electronics, Inc.

CONNECTOR PRODUCTS

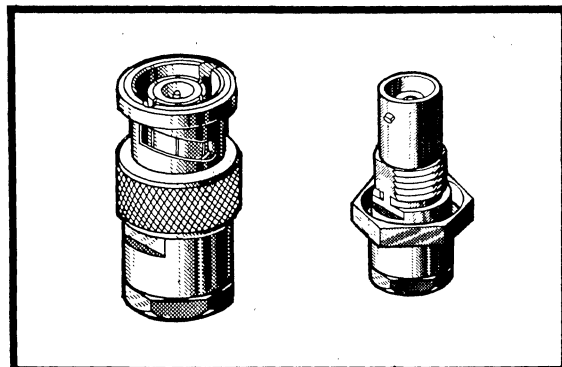
CAPACITORS (ALL TYPES)

COMMUNITY DRIVE
GREAT NECK, NEW YORK 11022
(516) 487-0500

9822 INDEPENDENCE AVENUE
CHATSORTH, CALIFORNIA 91311
(213) 882-8707

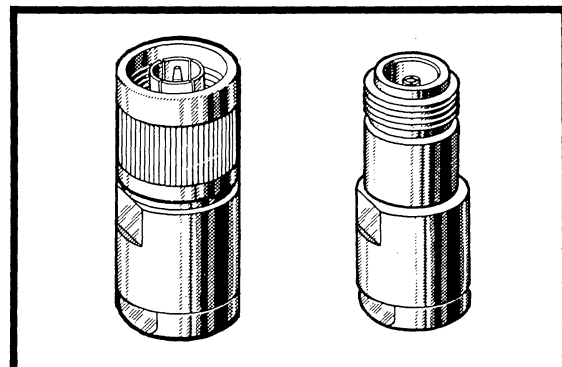
TYPE BNC

These Connectors are small and lightweight, equipped with a bayonet lock coupling for fast connection and disconnection. They are of constant impedance with a nominal value of 50 ohms and introduce little discontinuity in 50 ohm coaxial circuits. BNC's are fully weatherproofed, and rated for use where maximum voltage does not exceed 500 volts.



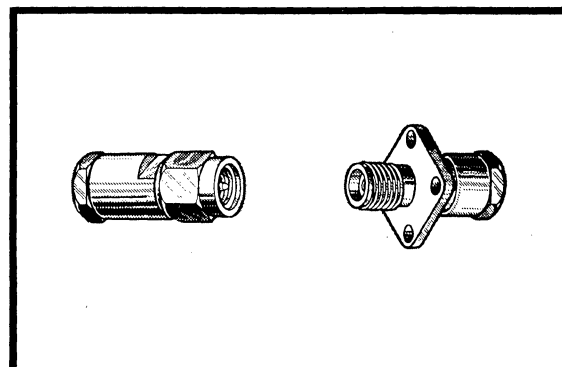
TYPE N

Recommended for use where a medium size connector with screw type coupling is desired. They are a general purpose connector of constant impedance and may be used with minimum mismatch in 50 ohm circuits. These connectors have a maximum peak rating of 1500 volts and a practical frequency limit of 10,000 mc, they are also gasketed for weatherproof operation.



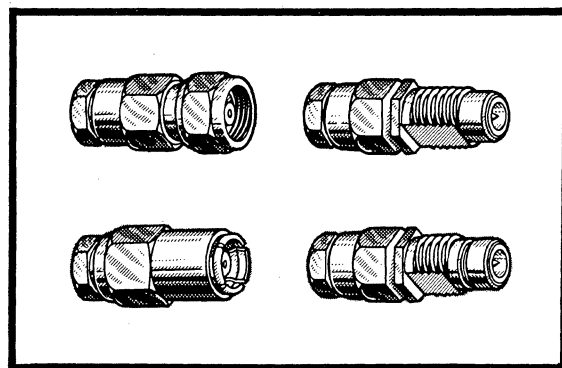
TYPE SMA

Developed to fill the need for a low VSWR general purpose connector for use at all microwave frequencies. Its inherent ruggedness, simplicity and size lend well to lower frequency usage also, it is especially well suited for systems as well as components use; with a complete range of types available. The relatively small size and low VSWR, compared to other commonly used microwave connectors, has contributed measurably to the miniaturization of microwave connectors. It also allows operation at all frequencies up to 26 GHz. Choice of materials is an important consideration. All shell and body parts are made of stainless steel for ruggedness and long life.



TYPE SMB & SMC

Designed for critical miniaturization requirements. Recommended for use in test equipment video lead applications, communication receivers, IF & RF circuits, or wherever miniaturization is a factor. Their rugged construction, matched impedance and excellent frequency characteristics make them well suited to missile & satellite applications. Both series are fundamentally of the same interior construction allowing outside dimensions to remain essentially constant for most cable sizes used.



ADAPTORS, JACKS & ACCESSORIES AVAILABLE

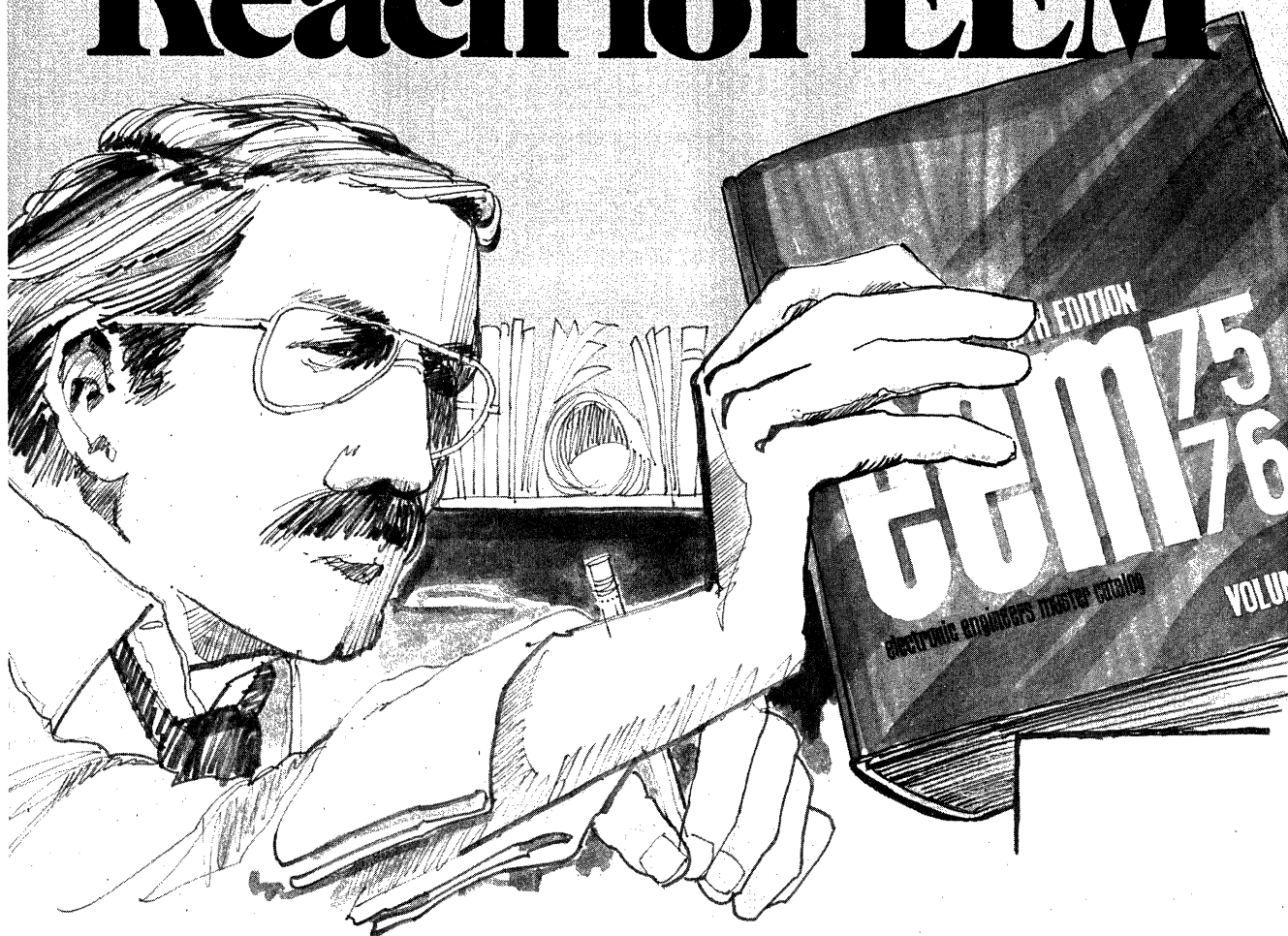
SEE OUR OTHER PAGE ON CONNECTORS PAGE 2-619
REQUEST ENGINEERING PRODUCT BULLETINS FROM ARCO

CONTACT YOUR LOCAL **Arco** DISTRIBUTOR FOR CATALOGS AND SPECIFICATIONS

ELECTRONIC COMPONENTS FOR INDUSTRY SOLD NATIONALLY THROUGH **Arco** DISTRIBUTORS

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

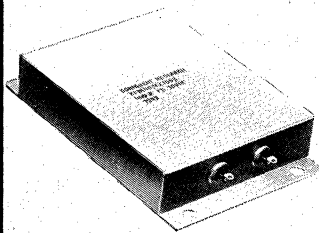
COMPONENT RESEARCH CO.



**ESTABLISHED RELIABILITY
PRECISION FILM CAPACITORS**

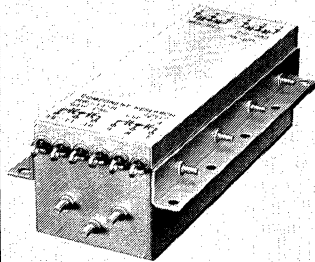
50 PAGES

- ★ **Capacitor Specifications**
- ★ **Reliability and Test Data**
- ★ **AC Voltage and Current Data**
- ★ **Prices & Ordering Information**



AT LEFT: Smallest Size, highest IR, 200 μ F, polycarbonate capacitor for memory applications, space guidance, and tracking stations.

AT RIGHT: Ultra-high reliability capacitor for AC applications. Has very low equivalent series resistance, is remarkably cool and efficient for its size.



AT LEFT: CRC AC-DC rated Polycarbonate capacitors are qualified to established reliability specifications, Mil-C-83421/1 and Mil-C-39022/9C.



1717 19TH ST., SANTA MONICA, CAL. 90404
PHONE: (213) 829-3615 TWX: 910-343-6864

COMPONENT RESEARCH CATALOG J

	PAGES
MIL-C-83421/1 POLYCARBONATE INFORMATION	2-11
MIL-C-83421/1 Replaces MIL-C-39022/9C	2
Key Screening Features	3
Retention of Qualification Tests	4
AC and DC Life Test Data	5
How to Specify MIL-C-83421/1 Part Numbers	6
AC Application and Reliability Information	7
MIL-C-83421/1 Capacitor Dimensions	8
AC Ratings 400 Hz to 40,000 Hz	9
CRH01 to CRH05 Styles (CRC Series A12)	10
CRH06 to CRH00 Styles (CRC Series K12)	11
MIL-C-39022/9C POLYCARBONATE INFORMATION	12-17
MIL-C-39022/9C 100% Screening	12
How to Select and Specify Per MIL-C-39022/9C	13
CRH01 Level 1 Styles (CRC Series C12)	14
CRH01 Level 2 Styles (CRC Series D12)	15
CRH01 Level 3 Styles (CRC Series E12)	16
MIL-C-39022/9C Capacitor Dimensions	17
GENERAL INFORMATION	18-23
Part Number System — Standard Types	18
Cross Reference Part Number Guide	19
Marking and Traceability Information	19
Manufacturing and Inspection Flow Plan	20
Size vs Weight, Patent Information, Construction Details, Special Ratings and Measurement Information	21
Key Capacitor Product Features	22
Capacitor Comparison Chart	23
QPL Program Approvals	23
TEFLON CAPACITOR INFORMATION	24-31
Series B11 Level 1 Teflon	24
Series C11 Level 1 Teflon	25
Series D11 Level 2 Teflon	26
Series E11 Level 3 Teflon	27
Series 11, Series D51 Capacitor Dimensions	28
Series D51 Level 2 Teflon	29
Teflon Capacitor Life Test Data	30
CORDWOOD MINIATURE METALLIZED	31
Series D31 Teflon	31
Series E32 Polycarbonate	31
POLYSTYRENE CAPACITOR INFORMATION	32-35
Series N53 Level 3	32
Series N53 Capacitor Dimensions	33
Miniature N13 Polystyrene	33
Series L53 High Temperature Polystyrene	34, 37
Special Polystyrene Capacitors	35
SPECIAL PRODUCT INFORMATION	35-39
Special Capacitor Application Section	35
Series 14 Polysulfone Life Test Data	36
Special Capacitor Types — Ultra High IR	36
Special Screening For Critical Applications	37
Series 14 Polysulfone Specifications	38
Series 14 Capacitor Dimensions — AC Ratings	39
New Products	50
PRICES (U.S. AND CANADA)	40-49
Polycarbonate Series 12	40-44
Polycarbonate Series E32	45
Teflon Series D31	45
Teflon Series B11, C11	46
Teflon Series D11, E11	47
Teflon Series D51	48
Polystyrene Series N53	49

FOR EXPORT SALES, CONTACT M. STEWART AND CO.
205 S. Beverly Dr., Beverly Hills, Cal. 90212 (213) 272-0103
Cable Address: MENDARET Beverly Hills

COMPONENT RESEARCH CO.

INDEX TO
CATALOG
SUPPLEMENT

SUPPLEMENTARY CAPACITOR-INFORMATION SECTION

CRC HAS ADDED THIS SECTION TO PROVIDE INFORMATION ON NEW PRODUCTS, UNUSUAL CAPACITOR TEST DATA, AND A COMPILATION OF MISCELLANEOUS ITEMS OF INTEREST TO DESIGNERS, COMPONENT ENGINEERS, AND RELIABILITY PERSONNEL. IN ADDITION WE ARE PLANNING TO MANUFACTURE A COMPREHENSIVE PRODUCT LINE OF STANDARD AND CUSTOM FEED-THROUGH CAPACITORS AND EMI FILTERS. WE BELIEVE THESE PRODUCTS WILL BE OF HIGHER QUALITY AND PERFORMANCE THAN ANY SIMILAR PRODUCTS NOW AVAILABLE.

MANY OF OUR CUSTOMERS NOW USING EMI FILTERS HAVE EXPRESSED DISSATISFACTION WITH THE QUALITY AND RELIABILITY OF THE FILTERS PRESENTLY AVAILABLE, AND HAVE URGED US TO ENTER THIS AREA OF INTEREST. PLEASE FORWARD TO US ANY

OF YOUR REQUIREMENTS FOR CAPACITORS, NETWORKS, AND EMI FILTERS, SO THAT WE CAN DETERMINE IF WE CAN MEET YOUR NEEDS.

NEW LOCATION AFTER NOVEMBER

1655 TWENTY SIXTH STREET

SANTA MONICA, CALIFORNIA 90404

AS THIS CATALOG SUPPLEMENT IS BEING PUBLISHED, CONSTRUCTION IS BEING COMPLETED ON OUR NEW, MODERN RESEARCH AND MANUFACTURING FACILITY LOCATED A SHORT DISTANCE FROM OUR PRESENT FACILITY AT 1717 19th STREET, IN SANTA MONICA. OVER 50,000 SQUARE FEET OF MANUFACTURING, RESEARCH AND WAREHOUSE SPACE WILL BE AVAILABLE TO US TO HANDLE THE EVER INCREASING DEMAND FOR OUR ESTABLISHED RELIABILITY CAPACITORS.

CATALOG-SUPPLEMENT INDEX • SUPPLEMENTARY SECTION FOLLOWS PAGE 50

SECTION

CAPACITOR CHARACTERISTICS COMPARISON CHART COVERS METALLIZED POLYCARBONATE
MIL-SPECIFICATION TYPE CAPACITORS, METAL CASED, WITH AXIAL LEADS.

B

C

LONG TERM THERMAL AGING TEST REPORT FOR METALLIZED POLYCARBONATE CAPACITORS
SHOWS DATA AFTER 400 CYCLES OF CONTINUOUS EXPOSURE FROM -65°C TO $+125^{\circ}\text{C}$.

D

E

HOW TO ANTICIPATE AND PREDICT CAPACITOR TERMINATION FAILURES,
AND IMPROVE RELIABILITY BY 100% SCREENING.

F

MIS-APPLICATIONS OF CAPACITORS IN AC CIRCUITS, ENVIRONMENTAL AND STORAGE
EFFECTS ON TERMINATIONS AND HOW CAPACITOR OPENS AND INTERMITTENTS DEVELOP.

G

DC LIFE TEST DATA FOR METALLIZED TEFLON CAPACITORS FOR ANALOG AND
MEMORY APPLICATIONS.

H

HIGH VIBRATION TEST REPORT COVERING SPECIAL C12 POLYCARBONATE CAPACITORS.

H

VIKING ULTRA HIGH-RELIABILITY METALLIZED TEFLON CAPACITORS.

I

CRC PREMIUM PERFORMANCE ESTABLISHED RELIABILITY FILM CAPACITORS

QUALIFIED TO MIL-C-83421/1 & *MIL-C-39022/9C

*MIL-C-39022/9B and /9C have been discontinued and re-written with minor changes in content to become MIL-C-83421/1. We will supply capacitors to MIL-C-83421/1 and to MIL-C-39022/9C as required by our customers.

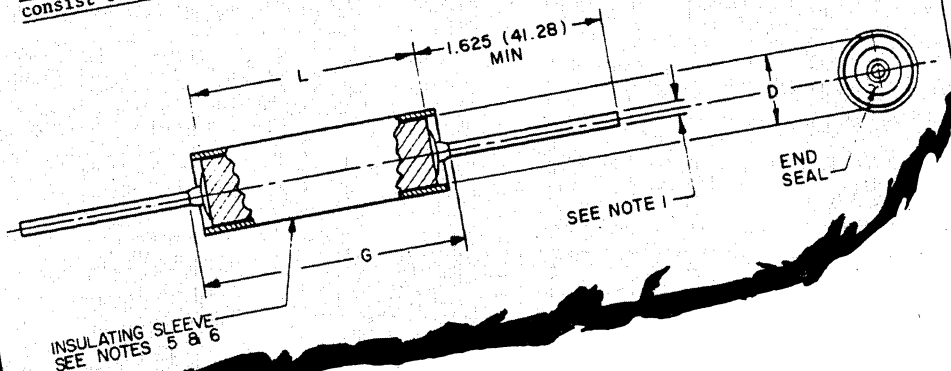
MIL-C-83421/1(USAF)
31 October 1973

MILITARY SPECIFICATION SHEET

CAPACITORS, FIXED, SUPERMETALLIZED PLASTIC FILM DIELECTRIC, DC AND AC,
HERMETICALLY SEALED IN METAL CASES,
ESTABLISHED RELIABILITY
STYLES CRH01, CRH02, CRH03, CRH04, CRH05, CRH06,
CRH07, CRH08, CRH09, AND CRH00

This specification is approved for use by all Departments and Agencies of the Department of Defense.

The complete requirements for procuring the capacitors described herein shall consist of this document and the latest issue of Specification MIL-C-83421.



Facts about MIL-C-83421

This catalog covers comprehensive information concerning MIL-C-83421/1 capacitors, including dimensions, specifications, quality assurance, retention of qualification testing and pricing.

Component Research Co. presents this information as part of its effort to improve the reliability and performance of capacitors for aerospace use.

MIL-C-83421 is a new general specification that contains higher quality, reliability and performance, metallized plastic film capacitors than MIL-C-39022/1 to MIL-C-39022/8. MIL-C-83421 will ultimately cover a range of metallized polycarbonate, polysulfone, poly-

styrene, polypropylene, teflon, and other plastic films. The scope of MIL-C-83421 will be to provide 100% screened, high reliability capacitors suitable for critical aerospace and industrial use.

Special screening tests and tight parameter limits have been incorporated in order to make MIL-C-83421 capacitors superior in reliability, performance, and quality for DC or AC applications.

Additional testing and data covering corona, radiation effects, ESR ratings, and dielectric absorption ratings with temperature and short durations, will ultimately be included.

**CRC HIGH RELIABILITY
CAPACITORS****MIL-C-83421/1 SCREENING
AND KEY FEATURES****100% GROUP A SCREENING AND INSPECTION
MIL-C-83421/1 POLYCARBONATE CAPACITORS**

CRC QUALITY LEVEL 1			CRC QUALITY LEVEL 3		
MIL-C-83421/1 Style	VDC	CRC Capacitor Type	MIL-C-83421/1 Style	VDC	CRC Capacitor Type
CRH01	30	A12A	CRH06	30	K12A
CRH02	50	A12B	CRH07	50	K12B
CRH03	100	A12C	CRH08	100	K12C
CRH04	200	A12D	CRH09	200	K12D
CRH05	400	A12E	CRH00	400	K12E
1 48 hours Burn-In at 125°C and 140% of rated DC voltage.			1 5 Cycles of thermal aging from -65°C to +125°C.		
2 10 Cycles of thermal aging from -65°C to +125°C.			2 Gross leak test.		
3 Gross leak test.			3 Helium leak test. 1 x 10 ⁻⁵ atm cm ³ /sec max. leak rate.		
4 Helium leak test. 1 x 10 ⁻⁶ atm cm ³ /sec max. leak rate.			4 AC dielectric hipot by 100 Hz square wave at a minimum peak to peak voltage of 3 x rated DC voltage (except 800 V P/P for 400 VDC).		
5 AC dielectric hipot by 100 Hz square wave at a minimum peak to peak voltage of 3 x rated DC voltage (except 800 V P/P for 400 VDC).			5 DC dielectric hipot at 200% rated volts.		
6 DC dielectric hipot at 200% rated volts.			6 Insulation resistance at 25°C, 100,000 megohms-uF. 1,000,000 megohms minimum for values 0.1 uF or less.		
7 Insulation resistance at 25°C, 300,000 megohms-uF. 3,000,000 megohms minimum for values 0.1 uF or less.			7 0.15% max. dissipation factor at 25°C.		
8 0.15% max. dissipation factor at 25°C.			8 Capacitance % tolerance at 25°C.		
9 Capacitance % tolerance at 25°C.			9 0.1% max. dielectric absorption.		
10 0.1% max. dielectric absorption.			10 Visual inspection for workmanship dimensions, marking and packaging		
11 Visual inspection for workmanship dimensions, marking and packaging					

**HIGH INSULATION
RESISTANCE**

Styles CRH01 to CRH05 exceed 3,000,000 megohms at 25°C for values 0.1 uF or less. CRC polycarbonate capacitors have the highest insulation resistance of any capacitors available for their size. Specially screened capacitors of this type are available with an insulation resistance of 1,000,000 megohms-uF at 25°C and improved IR characteristics at higher temperatures.

**AC RATED
TO 40 KHz**

CRC miniature metallized polycarbonate capacitors have a dissipation factor so low, (generally 0.1% but rated 0.15% max.) that they can handle high current for their size. Their dissipation factor remains low after burn-in, 100% thermal aging, and AC square wave hipot. This quality feature of CRC capacitors makes them mandatory for use in most aerospace programs which require maximum reliability in AC applications under extreme environments.

**HIGH STABILITY
LOW TEMP. COEFFICIENT**

The A12 and K12 capacitors offer a choice of temperature coefficient and stability limits to suit your application requirements. The capacitance vs. temperature slopes from capacitor to capacitor within a lot are very similar. The A12 series differ approximately ± 30 PPM/°C from unit to unit, within a lot, from -55°C to +125°C.

**LOWEST COST
HIGHEST RELIABILITY**

When ordinary type metallized polycarbonate capacitors are subjected to a form of screening to hopefully produce high reliability capacitors, the results may be costly and uncertain. The savings achieved by the use of CRC capacitors are: Uniform performance, longer equipment life possible; Improved stability, reduced rejects, and costly failure analysis. The cost for continuous Group B testing for retention of qualification is included in the unit price; there are no extra costs for test samples or testing.

CRC CAPACITORS QUALITY CONFORMANCE

PERIODIC TESTING PROGRAM

(FOR RETENTION OF QPL MIL-C-83421/1)

GROUP "B" INSPECTION PER MIL-C-83421, TABLE IV

GROUP B, SUBGROUPS 1, 2 AND 3: In order to maintain qualification, Component Research Company performs Periodic Testing (Quality Conformance Testing). Capacitors are selected from current production lots of CRH01 through CRH00 styles, which have successfully completed 100% "Group A" inspection shown on page 3.

SUBGROUP 1 TESTS

10 Each CRH Style Monthly

- Barometric Pressure
- Insulation Resistance at Max. Rated Temperature
- Temperature Coefficient
- Life (2,000 Hours)

SUBGROUP 2 TESTS

CRH01 Parts Jan., July
CRH02 Parts Feb., Aug.
100 Volt Parts March, Sept.
200 Volt Parts April, Oct.
400 Volt Parts May, Nov.

- AC Conditioning 250 Hours
- Dissipation Factor
- Insulation Resistance
- Δ Capacitance

SUBGROUP 3 TESTS

18 Parts Every 6 Months,
Consisting of CRH01,
CRH02, CRH03, CRH04 and CRH05

- Vibration
- Salt Spray
- Immersion
- Solderability
- Shock
- Moisture Resistance
- Terminal Strength
- Resistance to Solvents

DC LIFE TEST PERFORMED MONTHLY

GROUP B, SUBGROUP 1 FOR ALL CRH STYLES COVERING ALL FAILURE RATE LEVELS

Capacitors are DC-Life tested at 100°C and at 140% of the rated D.C. voltage for 2,000 hours. (This is an acceleration factor of 5:1, approximately).

EXAMINATION OR TEST

CONDITIONS

POST TEST LIMITS

CRH01, CRH02, CRH03,
CRH04, and CRH05

CRH06, CRH07, CRH08,
CRH09, and CRH00

Barometric
Pressure

Per MIL-C-83421

No breakdowns

No breakdowns

Insulation
Resistance

@ Rated voltage
@ 125°C

2,000 Megs-uF need not
exceed 20,000 Megs

1,000 Megs-uF need not
exceed 10,000 Megs

Temperature
Coefficient

Δ Cap. at -55°C
Retrace at 25°C
 Δ Cap. at +125°C

-1.5% to 0.5% max.
 $\pm 0.1\%$ max.
+0.8% to -0.5% max.

-2.0% to -0.5% max.
 $\pm 0.25\%$ max.
 $\pm 2.0\%$ max.

POST LIFE TEST LIMITS AFTER 2,000 HOURS LIFE

Insulation Resistance
at Rated Voltage
and 25°C

Insulation Sleeves

10,000 Megs min.

10,000 Megs min.

Terminal to Terminal

100,000 Meg-uF need not
exceed 1,000,000 Megs

33,333 Megs-uF need not
exceed 333,333 Megs

Terminals to Case

10,000 Megs min.

10,000 Megs min.

Δ Capacitance %
change with life

At 1 KHz and 25°C

$\pm 2\%$ max. of
initial value

$\pm 4\%$ max. of
initial value

% Dissipation Factor

At 1 KHz and 25°C

0.25% max.

0.35% max.

AC- SINUSOIDAL LIFE TEST PERFORMED MONTHLY

Capacitors are AC life tested for 250 hours at 100°C and at 140% of the rated RMS voltage at the applicable test frequency as shown in Table V. This test is performed monthly in order to verify the AC RMS voltage and current ratings.

POST AC TEST LIMITS

Insulation Resistance at Rated Voltage and 25°C

100,000 Megs-uF, need not exceed 1,000,000 Megs

Capacitance % Change at 1 KHz and 25°C

2% max. of initial value

% Dissipation Factor at 25°C

0.25% max.

TABLE V AC-LIFE TEST PARAMETERS PER MIL-C-83421/1

CRH Style	Equiv. CRC Type	DC Volts Rating	400 Hz AC RMS Volts Rating	250 Hours at 100°C Life Test Conditions	
				AC RMS Volts	Frequency In Hertz
01	A12A	30	22	30	4,000
02	A12B	50	36	50	4,000
03	A12C	100	60	84	4,000
04	A12D	200	120	168	400
05	A12E	400	240	336	400

CRC HIGH RELIABILITY CAPACITORS

AC-DC LIFE TEST DATA

MIL-C-83421/1 POLYCARBONATE CAPACITORS

DC LIFE TEST

Data shown is typical of continuous DC life testing performed monthly with samples from current production lots. Samples are tested monthly to maintain failure rate P (0.1%/1,000 hrs.).

AC LIFE TEST

Each month capacitors of assorted values selected from Table I of MIL-C-83421/1 and of the voltage rating specified in paragraph 4.6.2.1.1 (b) of MIL-C-83421, are

submitted to 250 hours life at the test voltage and frequency specified in Table V of MIL-C-83421/1.

The excellent low loss and high quality of CRC polycarbonate capacitors enables them to withstand this severe testing without failure. Under these test conditions a 3.9 uF, 50 VDC capacitor is handling 5 AMPS RMS. This can be considered outstanding with a case size as small as 0.562 x 1.375. A 3.9 uF, 50 VDC capacitor is normally rated at 3.6 AMPS RMS AC MAX, as shown in Table I of MIL-C-83421/1.

DC LIFE TEST DATA

PER MIL-C-83421
PARA. 3.27, 4.7.23.2.1
TEST REPORT 74TR35
CRH01 Through CRH00

TEST RESULTS FOR 280 POLYCARBONATE CAPACITORS TESTED FOR 2000 HOURS AT 100°C WITH 140% RATED VOLTAGE APPLIED. THERE WERE NO FAILURES FOR THIS TEST.

AC LIFE TEST DATA

74TR35
PER MIL-C-83421
PARA. 3.28, 4.7.24

88 30 VDC CAPACITORS WERE SUBJECTED TO 30 VRMS AC AT 4000 HZ, 100°C FOR 250 HOURS. NO FAILURES OCCURRED.
67 50 VDC CAPACITORS WERE SUBJECTED TO 50 VRMS AC AT 4000 HZ, 100°C FOR 250 HOURS. NO FAILURES OCCURRED.

List of Capacitors Life Tested				Insulation Resistance In Megohms at 25°C			% Capacitance Change With Life			% Dissipation Factor At 25°C		
MIL Type	CRC Type	uF Value	Quan. Tested	Post Test Limits (Min. IR)	Test Results		Post Test Limits	Test Results		Post Test Limits	Test Results	
					Low	High		Low	High		Low	High
CRH01	A12A	.47	30	2.1 x 10 ⁵	1 x 10 ⁶	2.3 x 10 ⁶	±2%	-.06%	+.31%	.25%	.07%	.08%
CRH01	A12A	.10	30	1 x 10 ⁶	1.2 x 10 ⁶	1 x 10 ⁷	±2%	+.01%	+.21%	.25%	.07%	.08%
CRH01	A12A	.056	30	1 x 10 ⁶	1.7 x 10 ⁷	3 x 10 ⁷	±2%	+.15%	+.34%	.25%	.07%	.12%
CRH06	K12A	.15	5	2.2 x 10 ⁵	1.3 x 10 ⁶	2 x 10 ⁶	±5%	-.50%	-2.1%	.35%	.11%	.14%
CRH06	K12A	.039	5	3.3 x 10 ⁵	7.5 x 10 ⁶	1.5 x 10 ⁷	±5%	-.02%	-1.4%	.35%	.13%	.18%
CRH06	K12A	.082	5	3.3 x 10 ⁵	1 x 10 ⁷	1.5 x 10 ⁷	±5%	+.31%	+.41%	.35%	.07%	.08%
CRH02	A12B	.12	10	8.3 x 10 ⁶	1.7 x 10 ⁷	5 x 10 ⁷	±2%	-.08%	+.42%	.25%	.07%	.08%
CRH02	A12B	.05	10	1 x 10 ⁶	5 x 10 ⁷	5 x 10 ⁷	±2%	+.01%	+.02%	.25%	.07%	.08%
CRH02	A12B	.012	10	1 x 10 ⁶	5 x 10 ⁷	5 x 10 ⁷	±2%	-.01%	+.39%	.25%	.05%	.07%
CRH07	K12B	.15	5	2.2 x 10 ⁵	1.7 x 10 ⁷	2.5 x 10 ⁷	±5%	+.05%	+.12%	.35%	.07%	.08%
CRH07	K12B	.039	5	3.3 x 10 ⁵	2 x 10 ⁶	1.7 x 10 ⁷	±5%	-.28%	-1.0%	.35%	.07%	.10%
CRH07	K12B	.01	5	3.3 x 10 ⁵	2.5 x 10 ⁷	5 x 10 ⁷	±5%	+.28%	-.40%	.35%	.06%	.07%
CRH03	A12C	.022	10	1 x 10 ⁶	1.4 x 10 ⁷	5 x 10 ⁷	±2%	+.01%	-.15%	.25%	.07%	.08%
CRH03	A12C	.018	5	1 x 10 ⁶	2.5 x 10 ⁷	3 x 10 ⁷	±2%	+.04%	+.22%	.25%	.06%	.07%
CRH03	A12C	.01	10	1 x 10 ⁶	2 x 10 ⁷	5 x 10 ⁷	±2%	+1.14%	-1.19%	.25%	.05%	.10%
CRH08	K12C	.047	5	3.3 x 10 ⁵	2.5 x 10 ⁷	3 x 10 ⁷	±5%	+.10%	+.19%	.35%	.07%	.08%
CRH08	K12C	.05	5	3.3 x 10 ⁵	2 x 10 ⁷	2.5 x 10 ⁷	±5%	+.01%	+.14%	.35%	.07%	.08%
CRH08	K12C	.012	5	3.3 x 10 ⁵	1.6 x 10 ⁷	3 x 10 ⁷	±5%	+2.6%	+3.4%	.35%	.08%	.10%
CRH04	A12D	.039	10	1 x 10 ⁶	1.5 x 10 ⁶	4 x 10 ⁷	±2%	-.05%	+.12%	.25%	.07%	.07%
CRH04	A12D	.027	10	1 x 10 ⁶	2.9 x 10 ⁷	4 x 10 ⁷	±2%	-.03%	+.21%	.25%	.07%	.07%
CRH04	A12D	.1	10	1 x 10 ⁶	7 x 10 ⁶	9 x 10 ⁶	±2%	-.02%	+.22%	.25%	.07%	.08%
CRH09	K12D	.50	5	6.6 x 10 ⁴	3 x 10 ⁶	4 x 10 ⁶	±5%	+.08%	+.14%	.35%	.07%	.09%
CRH09	K12D	.033	5	3.3 x 10 ⁵	2.5 x 10 ⁷	4 x 10 ⁷	±5%	+.07%	+.14%	.35%	.06%	.07%
CRH09	K12D	.039	5	3.3 x 10 ⁵	2 x 10 ⁷	4 x 10 ⁷	±5%	+.08%	+.25%	.35%	.07%	.08%
CRH05	A12E	.022	10	1 x 10 ⁶	4 x 10 ⁶	2.5 x 10 ⁷	±2%	+.03%	-1.2%	.25%	.06%	.07%
CRH05	A12E	.05	10	1 x 10 ⁶	8 x 10 ⁶	2 x 10 ⁷	±2%	-.03%	+.32%	.25%	.06%	.07%
CRH05	A12E	.047	10	1 x 10 ⁶	1.7 x 10 ⁷	2 x 10 ⁷	±2%	+.06%	+.24%	.25%	.07%	.15%
CRH00	K12D	.068	5	3.3 x 10 ⁵	7 x 10 ⁵	8 x 10 ⁶	±5%	-.08%	+.21%	.35%	.08%	.08%
CRH00	K12D	.027	5	3.3 x 10 ⁵	8 x 10 ⁶	3 x 10 ⁷	±5%	+.30%	-.36%	.35%	.07%	.08%
CRH00	K12D	.039	5	3.3 x 10 ⁵	3 x 10 ⁶	3 x 10 ⁷	±5%	-.10%	+.11%	.35%	.06%	.07%
CRH01	A12A	.22	22	4.5 x 10 ⁵	2.7 x 10 ⁶	6 x 10 ⁶	±2%	+.06%	+.14%	.25%	.06%	.08%
CRH01	A12A	4.0	12	2.5 x 10 ⁴	1.2 x 10 ⁵	5 x 10 ⁵	±2%	-.02%	+.42%	.25%	.04%	.07%
CRH01	A12A	.068	12	1 x 10 ⁶	1.5 x 10 ⁶	5 x 10 ⁶	±2%	+.01%	+.29%	.25%	.06%	.07%
CRH01	A12A	.022	12	1 x 10 ⁶	7.5 x 10 ⁶	1.5 x 10 ⁷	±2%	+.03%	-.57%	.25%	.06%	.07%
CRH01	A12A	1.5	6	6 x 10 ⁴	3 x 10 ⁵	6.2 x 10 ⁵	±2%	-.08%	-.12%	.25%	.07%	.08%
CRH01	A12A	.82	6	1.2 x 10 ⁵	1.1 x 10 ⁶	1.2 x 10 ⁶	±2%	+.05%	-.06%	.25%	.08%	.11%
CRH01	A12A	.39	6	2.5 x 10 ⁵	1.6 x 10 ⁶	1.8 x 10 ⁶	±2%	+.04%	-.05%	.25%	.08%	.09%
CRH01	A12A	.47	6	2.1 x 10 ⁵	1.7 x 10 ⁶	1.8 x 10 ⁶	±2%	-.01%	+.02%	.25%	.06%	.07%
CRH01	A12A	.33	6	3.0 x 10 ⁵	1.7 x 10 ⁶	1.8 x 10 ⁶	±2%	+.01%	-.02%	.25%	.07%	.08%
CRH02	A12B	.1	22	1 x 10 ⁶	3 x 10 ⁶	7.5 x 10 ⁶	±2%	+.06%	+.19%	.25%	.06%	.08%
CRH02	A12B	3.0	15	3.3 x 10 ⁴	2.1 x 10 ⁵	5 x 10 ⁵	±2%	+.07%	+.81%	.25%	.04%	.04%
CRH02	A12B	.5	10	2 x 10 ⁵	8.3 x 10 ⁵	1.3 x 10 ⁶	±2%	+.01%	+.07%	.25%	.06%	.07%
CRH02	A12B	1.0	10	1 x 10 ⁵	4.4 x 10 ⁵	8.3 x 10 ⁵	±2%	+.08%	+.18%	.25%	.06%	.08%
CRH02	A12B	.1	10	1 x 10 ⁶	3 x 10 ⁶	4.2 x 10 ⁶	±2%	+.09%	-.11%	.25%	.07%	.08%

CRC HIGH RELIABILITY CAPACITORS

HOW TO SELECT AND SPECIFY MIL-C-83421/1 CAPACITOR PART NUMBERS

SELECTION INFORMATION

MIL-C-83421/1 covers 30 volt to 400 volt DC rated capacitors for applications requiring a tight capacitance tolerance, excellent capacitance stability, very high insulation resistance and low loss factors. This specification applies in addition where the AC component of voltage is large with respect to the applied DC voltage, and where momentary breakdowns cannot be tolerated.

MIL-C-83421/1 offers the users two quality level styles. Each style includes 30 VDC, 50 VDC, 100 VDC, 200 VDC and 400 VDC rated capacitors, with 0.25%, 0.5%, 1%, 2%, 5% and 10% capacitance tolerances to select from.

A study of catalog page 3 provides a comparison of screening steps and key features that are unique with capacitors qualified to MIL-C-83421/1. If any doubt exists as to the use of these capacitors for high energy AC conditions not covered in the AC ratings of Table 1, a complete description of current and voltage conditions, including waveforms, should be forwarded to us for review and recommendations.

CONSTRUCTION INFORMATION

All CRH capacitors are tubular, metal cased, with both wire lead terminals isolated from the case. All the capacitors are provided with a plastic heat shrink-fit sleeve to insulate the metal case. The lead wires are #22 AWG for 0.312 or less case diameters and #20 AWG for 0.400 and 0.500 diameters. The lead wires are normally tinned copper clad steel per type "W" of MIL-STD-1276. Capacitors with gold plated nickel leads per N2 of MIL-STD-1276 can also be provided at additional cost. For 0.562" and larger diameters, #18 AWG tinned copper, OFHC, leads are used.

Unless you specifically request a lead material type for 0.500" and smaller diameters, Component Research will supply the material currently in production at time of order.

AC RATINGS

AC ratings at 400 Hz; 4000 Hz; and 40,000 Hz RMS AC voltage (sinusoidal), with current limits from -55°C to +100°C, are listed for each individual capacitance value and DC voltage rated style in Table 1. When operating above 100°C, derate all voltages linearly from full rated voltage at 100°C to 50% of rating at 125°C.

Although CRC capacitors have a low dissipation factor of 0.15% max. at 25°C, their dissipation factor is lower yet at temperatures from 75°C to 125°C.

This results in lower watts-loss and heat rise at elevated temperatures — with, of course, improved reliability for AC or DC applications.

APPLICATION NOTES

Make certain that the sum of any instantaneous peak AC voltages plus any superimposed DC voltages do not exceed the capacitor's rated DC voltage.

Effective heat sinking will permit operation at higher current levels than listed in Table 1. However, our CRC application engineers should be advised prior to use in any application where non-sinusoidal operating conditions are encountered, or when higher RMS currents are involved.

Component Research Co. can supply special AC capacitors with greater current handling capability and reduced heat rise.

FAILURE RATE LETTERS

Component Research is presently qualified to failure rate "P" and intends to maintain this level continuously. Because MIL-C-83421/1 has such stringent post test limits, a "P" failure rate is indicative of higher quality than a higher letter such as "R" or "S" in other film capacitor specifications with looser post test limits.

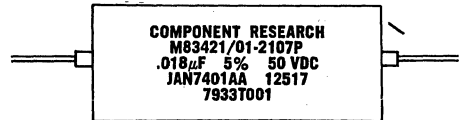
Series A12 and K12 prices covering MIL-C-83421/1 capacitors are listed at the rear of this catalog and are based upon a "P" failure rate.

HOW TO SPECIFY

MIL-C-83421/1 PART NUMBERS

For ordering and marking purposes only, MIL-C-83421/1 capacitors must be identified as M83421/01

An example of MIL-Spec marking is shown below. The sample shown is a 0.018μF, 5%, 50 volt, Style CRH02 capacitor.



COMPONENT RESEARCH

Manufacturer's name, may be abbreviated when space is limited.

M83421/01

Basic military specification number (for marking only).

-2

Indicates CRH02 style which covers 50 VDC rating and higher quality screened type. (CRH07 is a 50 VDC style with reduced screening and performance. See page 3.)

107

Dash No. of required μF value and % tolerance selected from Table 1 of MIL-C-83421/1.

P

(P is failure rate letter.)

JAN

Jan marking.

7401

Weekly date code per MIL-STD-1285.

AA

Unique sub lot or batch code for traceability.

12517

CRC federal code number.

*7983T

Unique batch test number.

*001

Unique serial number.

**This marking found on CRC capacitors is not required by MIL-C-83421/1 but is standard marking identification used by CRC to permit maximum traceability for Level 1 parts such as CRH01 to CRH05 styles.*

ADDITIONAL MARKING EXAMPLE:

A 0.0015 μF, 1%, 100 VDC, CRH03 capacitor selected from Table 1 below would be identified as M83421/01-3015P.

MIL-C-83421/1
TABLE 1
(SECTION SHOWN
OF 100 VDC STYLES)

Capacitance value (nom) (in μF)	Dimensions 1/ (in inches with mm in parentheses)			Dash number 2/	AC ratings (for sinusoidal operation from -65° to +100°C) -3/						
	L ±.030 (.76)	D ±.020 (.51)	G, max		0 to .4 KHz		At 4 KHz		At 40 KHz		
					Volts (in A)	Current (in A)	Volts (in A)	Current (in A)	Volts (in A)	Current (in A)	
0.001	0.500 (12.70)	0.170 (4.32)	0.700 (17.78)	-001- -002- -003- -004- -005- -006- -007- -008- -009- -010- -011- -012- -013- -014- -015- -016- -017- -018- -019- -020- -021- -022- -023- -024- -025- -026- -027- -028- -029- -030- -031- -032- -033- -034- -035- -036- -037- -038- -039- -040- -041- -042- -043- -044- -045- -046- -047- -048- -049- -050- -051- -052- -053- -054- -055- -056- -057- -058- -059- -060- -061- -062- -063- -064- -065- -066- -067- -068- -069- -070- -071- -072- -073- -074- -075- -076- -077- -078- -079- -080- -081- -082- -083- -084- -085- -086- -087- -088- -089- -090- -091- -092- -093- -094- -095- -096- -097- -098- -099- -100- -101- -102- -103- -104- -105- -106- -107- -108- -109- -110- -111- -112- -113- -114- -115- -116- -117- -118- -119- -120- -121- -122- -123- -124- -125- -126- -127- -128- -129- -130- -131- -132- -133- -134- -135- -136- -137- -138- -139- -140- -141- -142- -143- -144- -145- -146- -147- -148- -149- -150- -151- -152- -153- -154- -155- -156- -157- -158- -159- -160- -161- -162- -163- -164- -165- -166- -167- -168- -169- -170- -171- -172- -173- -174- -175- -176- -177- -178- -179- -180- -181- -182- -183- -184- -185- -186- -187- -188- -189- -190- -191- -192- -193- -194- -195- -196- -197- -198- -199- -200- -201- -202- -203- -204- -205- -206- -207- -208- -209- -210- -211- -212- -213- -214- -215- -216- -217- -218- -219- -220- -221- -222- -223- -224- -225- -226- -227- -228- -229- -230- -231- -232- -233- -234- -235- -236- -237- -238- -239- -240- -241- -242- -243- -244- -245- -246- -247- -248- -249- -250- -251- -252- -253- -254- -255- -256- -257- -258- -259- -260- -261- -262- -263- -264- -265- -266- -267- -268- -269- -270- -271- -272- -273- -274- -275- -276- -277- -278- -279- -280- -281- -282- -283- -284- -285- -286- -287- -288- -289- -290- -291- -292- -293- -294- -295- -296- -297- -298- -299- -300- -301- -302- -303- -304- -305- -306- -307- -308- -309- -310- -311- -312- -313- -314- -315- -316- -317- -318- -319- -320- -321- -322- -323- -324- -325- -326- -327- -328- -329- -330- -331- -332- -333- -334- -335- -336- -337- -338- -339- -340- -341- -342- -343- -344- -345- -346- -347- -348- -349- -350- -351- -352- -353- -354- -355- -356- -357- -358- -359- -360- -361- -362- -363- -364- -365- -366- -367- -368- -369- -370- -371- -372- -373- -374- -375- -376- -377- -378- -379- -380- -381- -382- -383- -384- -385- -386- -387- -388- -389- -390- -391- -392- -393- -394- -395- -396- -397- -398- -399- -400- -401- -402- -403- -404- -405- -406- -407- -408- -409- -410- -411- -412- -413- -414- -415- -416- -417- -418- -419- -420- -421- -422- -423- -424- -425- -426- -427- -428- -429- -430- -431- -432- -433- -434- -435- -436- -437- -438- -439- -440- -441- -442- -443- -444- -445- -446- -447- -448- -449- -450- -451- -452- -453- -454- -455- -456- -457- -458- -459- -460- -461- -462- -463- -464- -465- -466- -467- -468- -469- -470- -471- -472- -473- -474- -475- -476- -477- -478- -479- -480- -481- -482- -483- -484- -485- -486- -487- -488- -489- -490- -491- -492- -493- -494- -495- -496- -497- -498- -499- -500- -501- -502- -503- -504- -505- -506- -507- -508- -509- -510- -511- -512- -513- -514- -515- -516- -517- -518- -519- -520- -521- -522- -523- -524- -525- -526- -527- -528- -529- -530- -531- -532- -533- -534- -535- -536- -537- -538- -539- -540- -541- -542- -543- -544- -545- -546- -547- -548- -549- -550- -551- -552- -553- -554- -555- -556- -557- -558- -559- -560- -561- -562- -563- -564- -565- -566- -567- -568- -569- -570- -571- -572- -573- -574- -575- -576- -577- -578- -579- -580- -581- -582- -583- -584- -585- -586- -587- -588- -589- -590- -591- -592- -593- -594- -595- -596- -597- -598- -599- -600- -601- -602- -603- -604- -605- -606- -607- -608- -609- -610- -611- -612- -613- -614- -615- -616- -617- -618- -619- -620- -621- -622- -623- -624- -625- -626- -627- -628- -629- -630- -631- -632- -633- -634- -635- -636- -637- -638- -639- -640- -641- -642- -643- -644- -645- -646- -647- -648- -649- -650- -651- -652- -653- -654- -655- -656- -657- -658- -659- -660- -661- -662- -663- -664- -665- -666- -667- -668- -669- -670- -671- -672- -673- -674- -675- -676- -677- -678- -679- -680- -681- -682- -683- -684- -685- -686- -687- -688- -689- -690- -691- -692- -693- -694- -695- -696- -697- -698- -699- -700- -701- -702- -703- -704- -705- -706- -707- -708- -709- -710- -711- -712- -713- -714- -715- -716- -717- -718- -719- -720- -721- -722- -723- -724- -725- -726- -727- -728- -729- -730- -731- -732- -733- -734- -735- -736- -737- -738- -739- -740- -741- -742- -743- -744- -745- -746- -747- -748- -749- -750- -751- -752- -753- -754- -755- -756- -757- -758- -759- -760- -761- -762- -763- -764- -765- -766- -767- -768- -769- -770- -771- -772- -773- -774- -775- -776- -777- -778- -779- -780- -781- -782- -783- -784- -785- -786- -787- -788- -789- -790- -791- -792- -793- -794- -795- -796- -797- -798- -799- -800- -801- -802- -803- -804- -805- -806- -807- -808- -809- -810- -811- -812- -813- -814- -815- -816- -817- -818- -819- -820- -821- -822- -823- -824- -825- -826- -827- -828- -829- -830- -831- -832- -833- -834- -835- -836- -837- -838- -839- -840- -841- -842- -843- -844- -845- -846- -847- -848- -849- -850- -851- -852- -853- -854- -855- -856- -857- -858- -859- -860- -861- -862- -863- -864- -865- -866- -867- -868- -869- -870- -871- -872- -873- -874- -875- -876- -877- -878- -879- -880- -881- -882- -883- -884- -885- -886- -887- -888- -889- -890- -891- -892- -893- -894- -895- -896- -897- -898- -899- -900- -901- -902- -903- -904- -905- -906- -907- -908- -909- -910- -911- -912- -913- -914- -915- -916- -917- -918- -919- -920- -921- -922- -923- -924- -925- -926- -927- -928- -929- -930- -931- -932- -933- -934- -935- -936- -937- -938- -939- -940- -941- -942- -943- -944- -945- -946- -947- -948- -949- -950- -951- -952- -953- -954- -955- -956- -957- -958- -959- -960- -961- -962- -963- -964- -965- -966- -967- -968- -969- -970- -971- -972- -973- -974- -975- -976- -977- -978- -979- -980- -981- -982- -983- -984- -985- -986- -987- -988- -989- -990- -991- -992- -993- -994- -995- -996- -997- -998- -999- 1000	60.0	.001	60.0	.002	60.0	.015	
0.0012											
0.0015											
0.0018											

CRC HIGH RELIABILITY CAPACITORS

MIL-C-83421/1 AC RATED CAPACITORS RELIABILITY QUESTIONS AND ANSWERS

What are the limiting factors restricting the use of metallized polycarbonate capacitors for AC applications?

A properly manufactured and screened capacitor can handle considerable RMS and peak currents from -55°C to $+125^{\circ}\text{C}$ without significant case temperature heat rise. The dissipation factor of capacitors to be used in AC applications must be uniformly low to limit the watts loss incurred usually by capacitors with a high (ESR) equivalent series resistance.

We recommend a maximum dissipation factor of 0.15% at 1 KHz as the acceptance test limit. All capacitors should be subjected to temperature cycling prior to final measurement of DF to observe if they remain less than 0.15%. This test eliminates problems which may occur in use, after storage, or operation at extreme temperatures, leading to higher DF and operational failure.

CRC catalog page 9 contains the maximum RMS current and voltage ratings for sinusoidal conditions, continuous duty cycle, at 400 Hz and 40 KHz. For conditions other than shown, send to our sales office a sketch of the current and voltage waveforms under worst case and normal operating conditions. Include all other information necessary for quotation purposes. See page 35.

Is polycarbonate better than other dielectrics for AC applications?

If size, weight, cost, or operating temperatures were not important considerations, then other dielectric style capacitors are superior to polycarbonate.

As an example, CRC can supply polystyrene, teflon, or polypropylene AC capacitors with approximately ten times lower loss than the series 12 polycarbonate capacitors.

Polysulfone introduced as a new product on pages 38 and 39, is slightly better than polycarbonate for AC applications below 100°C , and can be used above 125°C (the limit for polycarbonate), to 150°C with proper voltage derating.

CRC considers mylar and paper dielectric styles too lossy for AC applications and therefore does not recommend this type for such requirements. Additional information on AC capacitors appears on other pages of this catalog.

What type of screening test will assure that the polycarbonate capacitors are reliable for AC applications?

Once it has been determined that your application requirements can be met by CRC standard polycarbonate series 12 capacitors, the screening test used by CRC and incorporated into MIL-C-83421/1 will be sufficient to provide the quality assurance needed.

As an example 100% of the capacitors are temperature cycled then are subjected to a square wave voltage at 100 Hz at 300% of rated DC voltage for peak to peak amplitude.

During this test the capacitors must handle approximately 35 microsecond wide current pulses for one minute at a rate of 200 per second.

A routine examination of the current and voltage waveforms during square wave hipot of 10 μF , 50 VDC type CRH capacitors, shows that with 150 volts peak to peak voltage at 100 Hz applied, the peak current is 85 amps. This is equivalent to operation with a half sine wave peak current pulse of 8.5 amps/ μF at a 200 PPS rate. SEE WAVEFORMS AT RIGHT.

Following the square wave voltage stress test the capacitors must meet 0.15% max. dissipation factor limits.

As shown on catalog page 5, life testing of CRC metallized polycarbonate capacitors at 400 Hz and 4000 Hz is performed continuously as retention of qualification to MIL-C-83421/1.

Are the new CRC series 12 AC rated polycarbonate capacitors higher in cost than their earlier type PL and PG capacitors supplied since 1965?

A study of series 12 polycarbonate prices, shows that with few exceptions price reductions (particularly for closer tolerances and larger μF values) are the rule. An examination of the series 12 specifications shows higher guaranteed performance and continuous retention of qualification testing. This in itself represents a substantial price decrease in terms of value adding without increased cost.

Why are CRC low dissipation factor polycarbonate capacitors replacing commonly manufactured capacitors in AC applications?

There is a risk that the dissipation factor of such capacitors will increase with use and result in hot spots at the terminations. Field failures of such capacitors have been reported where the capacitors have exploded and caused fire damage.

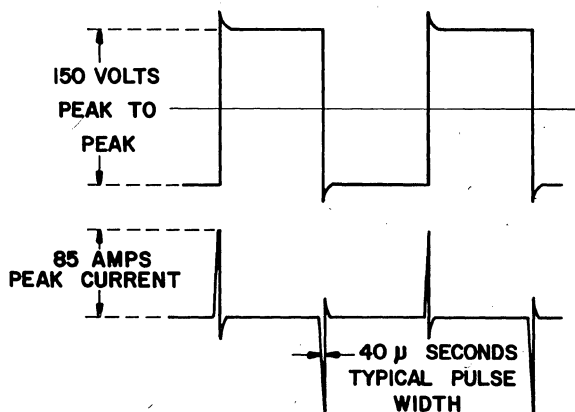
It may be possible to use ordinary higher DF capacitors without noticeable problems at 400 Hz provided that RMS voltage is sufficiently low such that the RMS current is limited. Heat sinking will also help prevent excess heat rise due to poor quality terminations.

Interestingly enough CRC polycarbonate capacitors have a lower dissipation factor at temperatures from 75°C to 125°C than at 25°C which lowers their effective heat rise at higher temperatures. Where the current source is limited, higher DF capacitors may not heat sufficiently to short, but may gradually suffer from increasing DF to the point where they are effectively open.

What is the maximum current that can be applied to MIL-C-83421/1 capacitors?

The 40 KHz current and voltage ratings listed in Table I of the Mil-Spec and also shown on page 9 of this catalog are based upon continuous operation under sinusoidal conditions. It is essential that any use under conditions exceeding these limits be discussed further with our applications engineers for elimination of failures. Under certain conditions, the capacitors can be used at higher frequencies and in square wave filtering applications. For good reliability it is best to study these special applications on an individual basis. CRC plans to provide data tables showing allowable working conditions during higher frequency sinusoidal, pulsed, and non-sinusoidal conditions.

TYPICAL VOLTAGE AND PEAK CURRENT WAVEFORMS SHOWN FOR A12B106, 10 μF , 50 V, METALLIZED POLYCARBONATE CAPACITOR DURING THE ONE MINUTE AC SQUARE WAVE SCREENING AT 100 Hz.



CRC HIGH RELIABILITY CAPACITORS

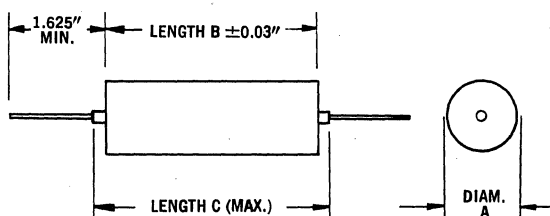
MIL-C-83421/1

A12, K12 CASE SIZES

SERIES
12

**SERIES A12, K12
POLYCARBONATE CAPACITORS**

- | | |
|---------------------------|--------|
| • PART NUMBER SYSTEM | 6, 18 |
| • LIFE TEST DATA | 5 |
| • DETAILED SPECIFICATIONS | 10, 11 |
| • AC RATINGS | 9 |
| • SPECIAL AC CAPACITORS | 37 |
| • PRICES | 40-44 |



CASE DIMENSION	TOLERANCE LIMITS
"A" Diameter	±0.010" Without Sleeveing
	-0.00"
	+0.02" With Mylar Sleeveing
"B" Case Length	±0.03" With or Without Sleeveing
"C" Bead to Bead Length	The lengths shown in tables are maximum and include the four bead "C" dimensions for A12 and K12 capacitors are 0.1" less than MIL-C-83421-1 requires.

[illegible]

CRC HIGH RELIABILITY CAPACITORS

SERIES 12 POLYCARBONATE

AC RATINGS 400 Hz TO 40,000 Hz COVERS
MIL-C-83421/1 AND MIL-C-39022/9C CAPACITORS

Component Research Co. has over 150 KVA of specialized AC generating equipment operating from 400 Hz to 100,000 Hz, sinusoidal conditions, for burn-in, life testing, and continuous research and development. In addition, square wave and pulse generators capable of simulating massive energy stress or sharp rise times enables Component Research engineers to sample test standard production type capacitors to ascertain their capability under higher stress operating conditions. Custom designed capacitors for critical space, military,

and commercial applications are thoroughly screened and evaluated to eliminate excess heating or any other cause for failure. The AC ratings of MIL-C-83421/1 were developed as a result of tests conducted on CRC polycarbonate capacitors from 400 Hz to 40,000 Hz. Following is data similar to that found in MIL-C-83421/1.

AC Ratings: AC ratings are for sinusoidal conditions from -55°C to +100°C. Derate linearly to 50% of AC rated RMS voltage at 125°C.

uF	12A 30VDC			12B 50VDC			12C 100VDC			12D 200VDC			12E 400VDC		
	AC RATINGS			AC RATINGS			AC RATINGS			AC RATINGS			AC RATINGS		
	RMS Volts 400 Hz	RMS Volts 40 KHz	Max. RMS Amps	RMS Volts 400 Hz	RMS Volts 40 KHz	Max. RMS Amps	RMS Volts 400 Hz	RMS Volts 40 KHz	Max. RMS Amps	RMS Volts 400 Hz	RMS Volts 40 KHz	Max. RMS Amps	RMS Volts 400 Hz	RMS Volts 40 KHz	Max. RMS Amps
.001	22.0	22.0	.006	36.0	36.0	.009	60.0	60.0	.015	120.0	80.0	.020	240.0	100.0	.025
.0012	22.0	22.0	.007	36.0	36.0	.011	60.0	60.0	.018	120.0	80.0	.024	240.0	100.0	.030
.0015	22.0	22.0	.008	36.0	36.0	.013	60.0	60.0	.022	120.0	80.0	.030	240.0	100.0	.037
.0018	22.0	22.0	.010	36.0	36.0	.016	60.0	60.0	.027	120.0	80.0	.036	240.0	100.0	.045
.002	22.0	22.0	.011	36.0	36.0	.018	60.0	60.0	.030	120.0	80.0	.040	240.0	100.0	.050
.0022	22.0	22.0	.012	36.0	36.0	.020	60.0	60.0	.033	120.0	80.0	.044	240.0	100.0	.055
.0027	22.0	22.0	.015	36.0	36.0	.024	60.0	60.0	.041	120.0	80.0	.054	240.0	100.0	.068
.0033	22.0	22.0	.018	36.0	36.0	.030	60.0	60.0	.050	120.0	80.0	.066	240.0	100.0	.083
.0039	22.0	22.0	.021	36.0	36.0	.035	60.0	60.0	.058	120.0	80.0	.078	240.0	100.0	.097
.0047	22.0	22.0	.026	36.0	36.0	.042	60.0	60.0	.071	120.0	80.0	.094	240.0	100.0	.12
.005	22.0	22.0	.028	36.0	36.0	.045	60.0	60.0	.075	120.0	80.0	.10	240.0	100.0	.13
.0056	22.0	22.0	.031	36.0	36.0	.050	60.0	60.0	.084	120.0	80.0	.11	240.0	100.0	.14
.0068	22.0	22.0	.037	36.0	36.0	.061	60.0	60.0	.10	120.0	80.0	.14	240.0	100.0	.17
.0082	22.0	22.0	.045	36.0	36.0	.074	60.0	60.0	.12	120.0	80.0	.16	240.0	100.0	.21
.01	22.0	22.0	.055	36.0	36.0	.090	60.0	60.0	.15	120.0	80.0	.20	240.0	100.0	.25
.012	22.0	22.0	.066	36.0	36.0	.11	60.0	59.0	.18	120.0	78.0	.23	240.0	100.0	.30
.015	22.0	22.0	.082	36.0	36.0	.14	60.0	58.0	.22	120.0	76.0	.29	240.0	94.0	.35
.018	22.0	22.0	.100	36.0	36.0	.16	60.0	57.0	.26	120.0	74.0	.33	240.0	90.0	.41
.02	22.0	22.0	.11	36.0	36.0	.18	60.0	55.0	.28	120.0	71.0	.36	240.0	88.0	.44
.022	22.0	22.0	.12	36.0	36.0	.20	60.0	53.0	.29	120.0	68.0	.37	240.0	85.0	.47
.027	22.0	22.0	.15	36.0	36.0	.24	60.0	51.0	.34	120.0	65.0	.44	240.0	81.0	.55
.033	22.0	22.0	.18	36.0	36.0	.30	60.0	50.0	.41	120.0	62.0	.51	240.0	78.0	.65
.039	22.0	22.0	.22	36.0	36.0	.35	60.0	48.0	.47	120.0	60.0	.59	240.0	75.0	.73
.047	22.0	22.0	.26	36.0	36.0	.42	60.0	47.0	.55	120.0	57.0	.67	240.0	71.0	.83
.05	22.0	22.0	.28	36.0	36.0	.45	60.0	46.0	.58	120.0	56.0	.70	240.0	70.0	.88
.056	22.0	22.0	.31	36.0	36.0	.50	60.0	46.0	.64	120.0	56.0	.78	240.0	67.5	.95
.068	22.0	22.0	.37	36.0	34.0	.58	60.0	42.0	.71	120.0	50.0	.85	240.0	60.0	1.02
.082	22.0	22.0	.45	36.0	32.0	.66	60.0	38.0	.78	120.0	44.0	.90	240.0	50.0	1.03
.1	22.0	22.0	.55	36.0	30.0	.75	60.0	36.0	.90	120.0	42.0	1.10	240.0	46.0	1.20
.12	22.0	22.0	.66	36.0	30.0	.90	60.0	35.0	1.05	120.0	40.0	1.20	240.0	44.5	1.34
.15	22.0	22.0	.83	36.0	26.0	.98	60.0	33.0	1.24	120.0	36.0	1.34	240.0	40.0	1.50
.18	22.0	22.0	1.00	36.0	25.0	1.13	60.0	31.0	1.40	120.0	34.0	1.54	240.0	38.0	1.70
.20	22.0	22.0	1.00	36.0	24.0	1.20	60.0	30.0	1.50	120.0	33.0	1.65	240.0	37.0	1.85
.22	22.0	18.5	1.02	36.0	23.0	1.27	60.0	27.0	1.50	120.0	32.0	1.76	240.0	35.0	1.93
.27	22.0	17.0	1.15	36.0	19.0	1.28	60.0	24.0	1.62	120.0	29.0	1.96	240.0	33.0	2.24
.33	22.0	16.0	1.32	36.0	18.0	1.48	60.0	23.0	1.90	120.0	28.0	2.31	240.0	32.0	2.65
.39	22.0	15.0	1.46	36.0	17.0	1.66	60.0	22.0	2.15	120.0	27.0	2.63	240.0	32.0	3.14
.47	22.0	14.0	1.65	36.0	15.7	1.85	60.0	21.0	2.47	120.0	26.0	3.06	240.0	31.0	3.64
.50	22.0	13.5	1.69	36.0	15.2	1.90	60.0	20.0	2.50	120.0	25.0	3.13	240.0	30.0	3.75
.56	22.0	12.9	1.81	36.0	14.4	2.01	60.0	19.0	2.64	120.0	23.0	3.17	240.0	29.0	4.05
.68	22.0	12.0	2.04	36.0	14.0	2.38	60.0	16.0	2.72	120.0	20.0	3.40	240.0	26.0	4.50
.82	22.0	10.0	2.05	36.0	12.0	2.46	60.0	14.0	2.87	120.0	18.0	3.70	240.0	23.4	4.80
1.0	22.0	8.4	2.10	36.0	10.0	2.50	60.0	12.0	3.00	120.0	15.0	3.75	240.0	20.8	5.20
1.2	22.0	7.2	2.15	36.0	9.1	2.73	60.0	11.0	3.25	120.0	13.5	4.05	240.0	18.3	5.50
1.5	22.0	5.8	2.17	36.0	7.7	2.90	60.0	10.0	3.75	120.0	12.0	4.50	240.0	16.0	6.00
1.8	22.0	4.8	2.2	36.0	6.6	3.00	—	—	—	120.0	11.0	5.00	240.0	15.0	6.80
2.0	22.0	4.4	2.2	36.0	6.2	3.10	60.0	8.1	4.10	120.0	10.0	5.00	240.0	14.0	7.00
2.2	22.0	4.0	2.2	36.0	5.8	3.20	60.0	7.5	4.12	120.0	9.1	5.00			
2.5	—	—	—	—	—	—	—	—	—	120.0	8.0	5.00			
2.7	22.0	3.3	2.2	36.0	5.0	3.34	60.0	6.5	4.40	120.0	7.7	5.20			
3.0	22.0	2.9	2.2	36.0	4.5	3.40	60.0	6.0	4.51	120.0	7.0	5.27			
3.3	22.0	2.7	2.2	36.0	4.2	3.5	60.0	5.5	4.55	120.0	6.5	5.36			
3.9	22.0	2.3	2.2	36.0	3.7	3.6	60.0	5.0	4.90	120.0	5.5	5.40			
4.7	22.0	1.9	2.2	36.0	3.1	3.6	60.0	4.3	5.00						
5.0	22.0	1.8	2.2	36.0	2.9	3.6	60.0	4.0	5.00						
5.6	22.0	1.6	2.2	36.0	2.6	3.6	60.0	3.6	5.00						
6.8	22.0	1.3	2.2	36.0	2.1	3.6	60.0	3.0	5.00						
8.0	22.0	1.1	2.2	36.0	1.8	3.6	60.0	2.5	5.00						
8.2	22.0	1.1	2.2	36.0	1.8	3.6	60.0	2.4	5.00						
10.0	22.0	.88	2.2	36.0	1.4	3.6	60.0	2.0	5.00						
12.0	22.0	.73	2.2												
15.0	22.0	.59	2.2												
20.0	22.0	.44	2.2												
22.0	22.0	.40	2.2												

MIL-C-83421/1 POLYCARBONATE AC TESTED CAPACITORS



MIL STYLE	DC VOLTS	400 Hz AC VOLTS	CRC BASIC P/N
CRH01	30	22 VRMS	A12A
CRH02	50	36 VRMS	A12B
CRH03	100	60 VRMS	A12C
CRH04	200	120 VRMS	A12D
CRH05	400	240 VRMS	A12E

SERIES A12 QUALITY ASSURANCE

ALL CAPACITORS ARE 100% SCREENED AND TESTED AS FOLLOWS:

1	48 hours Burn-in at 125°C and 140% of the rated DC voltage.
2	Thermal aging. 10 temperature cycles from -65°C to 125°C.
3	Helium Leak Test. 1×10^{-6} atm/cm ³ /sec max. leak rate.
4	DC dielectric strength. Apply 200% of rated DC voltage from lead to lead and from leads to case for one minute.
5	AC dielectric strength. Apply 100 Hz square wave from lead to lead at a minimum peak to peak voltage of 3 x rated DC Voltage for one minute (except 800V peak to peak for 400 VDC styles).
6	Insulation Resistance. At rated voltage and 25°C, 300,000 megs — uF minimum, but need not exceed 3,000,000 Megohms.
7	Capacitance. % Tolerance at 1 KHz and 25°C.
8	Dissipation Factor. At 1 KHz and 25°C, 0.15% maximum.
9	Temperature Coefficient. Measured from -55°C to 125°C at a minimum of 5 temperature points. (Performed on monthly lot sampling basis).
10	0.1% max. dielectric absorption.
11	Visual inspection. Check dimensions, marking and packaging.
12	Traceability to production and test records by permanent marking of parts with lot control number.
13	Process and inspection data is maintained on file per NPC-200-3, MIL-Q-9858 quality control standards and MIL-STD-790, Reliability Assurance Program.
14	Capacitors are serialized and packaged with certified test data to accompany each shipment.

CONSTRUCTION: Polycarbonate dielectric, hermetically sealed, extended metal film electrodes, leads isolated from case.

LEAD WIRE SIZE AND TYPE

Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copperweld) CRC type "W"
0.400" and 0.500"	20	
0.562" and larger	18	Oxygen free tinned copper wire CRC type "C" or type "W"

A12 ADDITIONAL INFORMATION

PAGES

• Part Number System	6, 18
• Case Dimensions	8
• AC Current and Voltage Ratings	9
• Life Test Data	5
• Reliability	7
• Patent Information	21
• Prices - Delivery - Terms	40-44

PAGE 10

catalog J

COMPONENT RESEARCH CO., INC. • 1717 19TH STREET • SANTA MONICA, CALIF. 90404 • (213) 829-3615 TWX: (910) 343-6864

CRC SERIES A12 QUALITY LEVEL 1

SPECIFICATIONS

OPERATING TEMPERATURE: -65°C to 100°C at full rated voltage. Derate linearly from 100°C to 50% of rated voltage at 125°C.

CAPACITANCE CHANGE WITH TEMPERATURE (25°C REFERENCE)

-55°C -0.5% to -1.5%
25°C 0.1% Max. Hysteresis
+125°C -0.5% to +0.8%

STABILITY: Capacitance values measured at any two corresponding temperature points taken in five successive temperature cycles shall be as follows:

RANGE	RETRACE
-25°C to 85°C	0.03% Max.
-65°C to 125°C	0.2% Max.

INSULATION RESISTANCE: Measured from terminal to terminal at rated voltage, and 5 minutes maximum charge time. For values greater than 1 uF, allow an additional minute/uF charge time.

MINIMUM IR

Range	25°C	55°C	85°C	100°C	125°C
.001 to 0.1 uF (in Megohms)	3,000,000	2,000,000	1,000,000	300,000	20,000
Greater than 0.1 uF (in Megohms—uF)	300,000	200,000	100,000	30,000	2,000

Readings shown are for 1 uF or less. For values over 1 uF, divide readings by uF to obtain min IR.
Example: A 4 uF capacitor is 75,000 megohms at 25°C.

DIELECTRIC ABSORPTION: 0.1% Max. at 25°C.

DISSIPATION FACTOR: 0.15% Max. at 1 KHz and 25°C. Values greater than 1 uF measure at 0.1 KHz.

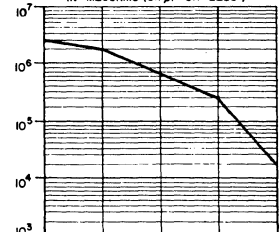
DIELECTRIC STRENGTH: 200% of rated voltage.

SEAL TEST: 1×10^{-6} atm/cm³/sec Max. leak rate.

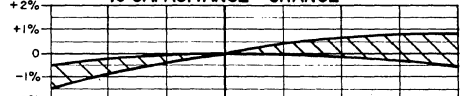
ENVIRONMENTAL: Capacitors shall meet all applicable requirements of MIL-C-83421/1.

SERIES A12 POLYCARBONATE CAPACITORS

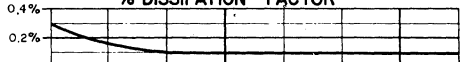
INSULATION RESISTANCE IN MEGOHMS (0.1 uF OR LESS)



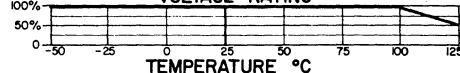
% CAPACITANCE CHANGE



% DISSIPATION FACTOR



VOLTAGE RATING



MIL-C-83421/1 POLYCARBONATE AC TESTED CAPACITORS



MIL STYLE	DC VOLTS	400 Hz AC VOLTS	CRC BASIC P/N
CRH06	30	22 VRMS	K12A
CRH07	50	36 VRMS	K12B
CRH08	100	60 VRMS	K12C
CRH09	200	120 VRMS	K12D
CRH00	400	240 VRMS	K12E

SERIES K12 QUALITY ASSURANCE

ALL CAPACITORS ARE 100% SCREENED AND TESTED AS FOLLOWS:

1	Thermal aging. 5 temperature cycles from -65°C to 125°C.
2	Helium Leak Test. 1×10^{-5} atm/cm ³ /sec max. leak rate.
3	DC dielectric strength. Apply 200% of rated DC voltage from lead to lead and from leads to case for one minute.
4	AC dielectric strength. Apply 100 Hz square wave from lead to lead at a minimum peak to peak voltage of 3 x rated DC Voltage for one minute (except 800V peak to peak for 400 VDC styles).
5	Insulation Resistance. At rated voltage and 25°C, 100,000 megs — uF minimum, but need not exceed 1,000,000 Megohms.
6	Capacitance. % Tolerance at 1 KHz and 25°C.
7	Dissipation Factor. At 1 KHz and 25°C, 0.15% maximum.
8	Temperature Coefficient. Measured from -55°C to 125°C at a minimum of 5 temperature points. (Performed on monthly lot sampling basis).
9	0.1% max. dielectric absorption.
10	Visual inspection. Check dimensions, marking and packaging.
11	Traceability to production and test records by permanent marking of parts with lot control number.
12	Process and inspection data is maintained on file per NPC-200-3, MIL-Q-9858 quality control standards and MIL-STD-790, Reliability Assurance Program.

CONSTRUCTION: Polycarbonate dielectric, hermetically sealed, extended metal film electrodes, leads isolated from case.

LEAD WIRE SIZE AND TYPE

Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copperweld) CRC type "W"
0.400" and 0.500"	20	
0.562" and larger	18	Oxygen free tinned copper wire CRC type "C" or type "W"

K12 ADDITIONAL INFORMATION

PAGES

• Part Number System	6, 18
• Case Dimensions	8
• AC Current and Voltage Ratings	9
• Life Test Data	5
• Reliability	7
• Patent Information	21
• Prices - Delivery - Terms	40-44

CRC SERIES K12 QUALITY LEVEL 3

SPECIFICATIONS

OPERATING TEMPERATURE: -65°C to 100°C at full rated voltage. Derate linearly from 100°C to 50% of rated voltage at 125°C.

CAPACITANCE CHANGE WITH TEMPERATURE (25°C REFERENCE)

-55°C -0.5% to -2.0%
25°C 0.25% Max. Hysteresis
+125°C ±2%

STABILITY: Capacitance values measured at any two corresponding temperature points taken in five successive temperature cycles shall be as follows:

RANGE	RETRACE
-25°C to 85°C	0.05% Max.
-65°C to 125°C	0.25% Max.

INSULATION RESISTANCE: Measured from terminal to terminal at rated voltage, and 5 minutes maximum charge time. For values greater than 1 uF, allow an additional minute/uF charge time.

MINIMUM IR

Range	25°C	55°C	85°C	100°C	125°C
.001 to 0.1 uF (in Megohms)	1,000,000	500,000	100,000	50,000	10,000
Greater than 0.1 uF (in Megohms — uF)	100,000	50,000	10,000	5,000	1,000

Readings shown are for 1 uF or less. For values over 1 uF, divide readings by uF to obtain min. IR.
Example: A 10 uF capacitor is 10,000 megohms at 25°C.

DIELECTRIC ABSORPTION: 0.1% Max. at 25°C.

DISSIPATION FACTOR: 0.15% Max. at 1 KHz and 25°C. Values greater than 1 uF measure at 0.1 KHz.

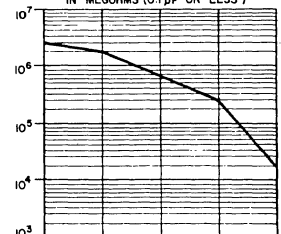
DIELECTRIC STRENGTH: 200% of rated voltage.

SEAL TEST: 1×10^{-5} atm/cm³/ sec Max. leak rate.

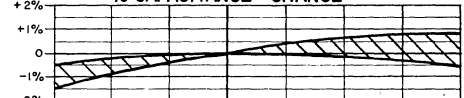
ENVIRONMENTAL: Capacitors shall meet all applicable requirements of MIL-C-83421/1.

SERIES K12 POLYCARBONATE CAPACITORS

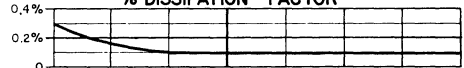
INSULATION RESISTANCE IN MEGOHMS (0.1 uF OR LESS)



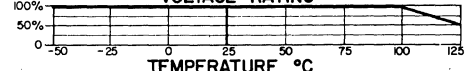
% CAPACITANCE CHANGE



% DISSIPATION FACTOR



VOLTAGE RATING



CRC HIGH RELIABILITY CAPACITORS

100% Group A Screening & Inspection

*MIL-C-39022/9 POLYCARBONATE CAPACITORS

HIGH INSULATION RESISTANCE

CHROIA, D, G, K and N styles exceed 3,000,000 megohms at 25°C for values 0.1 uF or less. CRC polycarbonate capacitors have the highest insulation resistance of any capacitors available for their size. Special CRC capacitors are available with higher limits.

AC RATED TO 40KHz

CRC miniature polycarbonate capacitors, have a dissipation factor so low, (generally 0.1% but rated 0.15% max.) that they can handle extremely high RMS or peak current. See page 9 for further information.

HIGH STABILITY-LOW TEMPERATURE COEFFICIENT

Three quality levels are available with a choice of drift and TC limits suitable for most temperature sensitive applications. Long term drift data on file indicates 0.5% max. capacitance shelf drift for five years, with current production showing improved stability.

* MIL-C-83421/1 HAS REPLACED MIL-C-39022/9C FOR NEW DESIGN. CRC WILL CONTINUE TO SUPPLY BOTH TYPES AS REQUIRED. SEE PAGES 2-11.

FREE FROM MOMENTARY BREAKDOWNS

CRC capacitors are engineered to be completely free from breakdowns, intermittents or noise. All CRC capacitors must pass rigorous testing with sensitive equipment capable of detecting changes of several picoamps.

HIGHEST QUALITY AT LOWEST COST

Year after year CRC capacitor quality is upgraded. CRC specifications become more exacting, yet CRC manages to maintain or lower capacitor prices. Furthermore, there are no additional charges for MIL-C-39022/9 Retention of Qualification Testing, when purchasing CHROI capacitors from CRC (See page 4 for Retention of Qualification Testing.)

QUALITY LEVEL ①

Equivalent CRC Types	Mil-C-39022/9 Styles	VDC
C12A	CHROIA	30
C12B	CHROID	50
C12C	CHROIG	100
C12D	CHROIK	200
C12E	CHROIN	400

- 1 48 hours Burn-In at 125°C and 140% of the rated DC voltage
- 2 10 Temperature Cycles from -65°C to 125°C
- 3 Helium Leak Test, 1×10^{-6} atm/cm³/sec max.
- 4 AC-dielectric Strength at 100 Hz square wave at a minimum peak to peak voltage of 3x rated DC voltage (except 800V peak to peak for 400VDC styles).
- 5 DC-dielectric Strength at 200% of the rated DC voltage
- 6 Insulation Resistance at the rated voltage and 25°C, 300,000 megs - uF min., and 3,000,000 megs min. for 0.1 uF or less.
- 7 Capacitance % Tolerance at 1KHz and 25°C
- 8 Dissipation Factor at 1KHz and 25°C, 0.15% maximum
- 9 Visual Inspection for dimensions, marking and packaging

QUALITY LEVEL ②

Equivalent CRC Types	Mil-C-39022/9 Styles	VDC
D12A	CHROIB	30
D12B	CHROIE	50
D12C	CHROIH	100
D12D	CHROIL	200
D12E	CHROIP	400

- 1 16 hours Burn-In at 25°C and 140% of the rated DC voltage
- 2 10 Temperature Cycles from -65°C to 125°C
- 3 Helium Leak Test, 1×10^{-6} atm/cm³/sec max.
- 4 AC-dielectric Strength at 100 Hz square wave at a minimum peak to peak voltage of 3x rated DC voltage (except 800V peak to peak for 400VDC styles).
- 5 DC-dielectric Strength at 200% of the rated DC voltage
- 6 Insulation Resistance at the rated voltage and 25°C, 200,000 megs - uF min., and 2,000,000 megs min. for 0.1 uF or less.
- 7 Capacitance % Tolerance at 1KHz and 25°C
- 8 Dissipation Factor at 1KHz and 25°C, 0.15% maximum
- 9 Visual Inspection for dimensions, marking and packaging

QUALITY LEVEL ③

Equivalent CRC Types	Mil-C-39022/9 Styles	VDC
E12A	CHROIC	30
E12B	CHROIF	50
E12C	CHROIJ	100
E12D	CHROIM	200
E12E	CHROIR	400

- 1 5 Temperature Cycles from -65°C to 125°C
- 2 Helium Leak Test, 1×10^{-5} atm/cm³/sec max.
- 3 AC-dielectric Strength at 100 Hz square wave at a minimum peak to peak voltage of 3x rated DC voltage (except 800V peak to peak for 400VDC styles).
- 4 DC-dielectric Strength at 200% of the rated DC voltage
- 5 Insulation Resistance at the rated voltage and 25°C, 100,000 megs - uF min., and 1,000,000 megs min. for 0.1 uF or less.
- 6 Capacitance % Tolerance at 1KHz and 25°C
- 7 Dissipation Factor at 1KHz and 25°C, 0.15% maximum
- 8 Visual Inspection for dimensions, marking and packaging

CRC HIGH RELIABILITY CAPACITORS

HOW TO SELECT & SPECIFY

*MIL-C-39022/9 CAPACITOR PART NUMBERS

SELECTION INFORMATION

MIL-C-39022/9 covers 30 volt to 400 volt DC rated capacitors for applications requiring a tight capacitance tolerance, excellent capacitance stability, very high insulation resistance and low loss factors. This specification applies in addition where the AC component of voltage is large with respect to the applied DC voltage, and where momentary breakdowns cannot be tolerated. Table II of MIL-C-39022/9 describes in part, three quality levels and their respective performance and test criteria.

CRC has clarified the data shown in table II and all additional specifications requirements, by presenting this information in test plan form on page 12 of CRC catalog J.

A study of life test data on Page 5 will indicate the excellent characteristics of polycarbonate capacitors manufactured by Component Research Co. to MIL-C-39022/9 latest revision.

HOW TO SPECIFY MILITARY PART NUMBERS

Select the style required, then place the dash number after M39022/9. As an example: A 0.001 uF 1% 50VDC CHROIE capacitor as shown in table 1 would be identified as M39022/9-E003P. The P indicates our failure rate as of March 1972. See section dealing with failure rates on this page.

SLEEVING

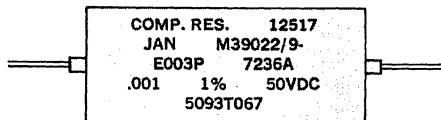
All CHROI capacitors are mylar shrink-fit sleeved.

LEADS

All CHROI capacitors are supplied with #22 AWG tinned copper clad steel leads for 0.312" or less case diameters. #20 AWG leads are supplied for 0.400" and .500" diameter capacitors. Gold plated nickel leads are still being used where specifically requested, but are not recommended for new designs. #18 AWG tinned copper, OFHC leads are used for 0.562" and larger diameter capacitors.

Unless you specifically request a lead material choice for the 0.500" diameter and smaller cases, Component Research will supply the material currently in production at time of order.

MARKING EXPLANATION (TYPICAL EXAMPLE)



COMP. RES.	ABBREVIATION FOR COMPONENT RESEARCH CO. (WHEN SPACE IS LIMITED).
12517	CRC VENDOR CODE NO.
JAN M39022/9-	BASIC MILITARY MARKING
E003	DASH NO. SELECTED FROM TABLE 1.
P	(P IS FAILURE RATE LETTER)
7236A	WEEKLY DATE CODE PER MIL STD 1285
*5093T	REPRESENTS UNIQUE CRC TEST NUMBER.
067	UNIQUE SERIAL NUMBER

*This marking is not required by MIL-C-39022/9. This is standard CRC marking for CHRO1A, D, G, K and N styles only.

*MIL-C-83421/1 HAS REPLACED MIL-C-39022/9C FOR NEW DESIGN. CRC WILL CONTINUE TO SUPPLY BOTH TYPES AS REQUIRED. SEE PAGES 2-11.

AC RATINGS

AC ratings at 400Hz; 4000Hz; and 40,000Hz RMS AC voltage (sinusoidal), with current limits from -55°C to +100°C, are listed for each individual capacitance value and DC voltage rated style in table 1. When operating above 100°C, derate all voltages linearly from full rated voltage at 100°C to 50% of rating at 125°C.

CRC qualified polycarbonate capacitors, with a 0.15% max. dissipation factor, will in a still-air environment, and at maximum rated operating conditions rise no more than 20°C. With conventional heat sinking methods, the capacitor heat rise will be considerably less than 20°C.

Although CRC capacitors have a low dissipation factor of 0.15% max. at 25°C, their dissipation factor is lower yet at temperatures from 75°C to 125°C.

This results in lower watts-loss and heat rise at elevated temperatures—with, of course, improved reliability for AC or DC applications.

APPLICATION NOTES

Make certain that the sum of any instantaneous peak AC voltages plus any superimposed DC voltages do not exceed the capacitor's rated DC voltage.

Effective heat sinking will permit operation at higher current levels than listed in table 1. However our CRC application engineers should be advised prior to use in any application where non-sinusoidal operating conditions are encountered, or when higher RMS currents are involved.

Our engineers will be pleased to study your needs and advise you if the capacitors will operate reliably under your special operating conditions.

Component Research Co. can supply special AC capacitors with greater current handling capability and reduced heat rise, in the same case sizes as shown for MIL-C-39022/9. See page 35.

FAILURE RATE LEVELS

Component Research Co. is conducting continuous lot testing in order to achieve lower failure rates. Upon periodic review of this data by DESC, lower failure rates will be granted based on total number of capacitor life test hours without any failure.

Because MIL-C-39022/9 has such stringent post test limits the failure rate levels in MIL-C-39022/9 are effectively lower than the same failure rate levels in conventional film capacitor specifications and other military specifications.

MIL-C-39022/9
TABLE 1
(SECTION SHOWN
OF 30VDC STYLES)

Capacitance value (nom) (in uF)	Dimensions 1/ (in inches with max in parentheses)			Dash number 2/		AC ratings (for sinusoidal operation from -55° to +100°C) 3/ (%)					
	D			Capacitance tolerance value (in %)		0 to 4 KHz		At 4 KHz		At 40 KHz	
	L ± .030 (.76)	± .020 (.51)	G max	± 0.25	± 0.5	Volts (in A)	Current (in A)	Volts (in A)	Current (in A)	Volts (in A)	Current (in A)
STYLES CHROID, CHROIE, AND CHROIF - 50 VOLTS (DC RATING)											
0.001	0.500 (12.70)	0.170 (4.32)	0.700 (17.78)	-001-	-002-	36.0	.001	36.0	.001	36.0	.009
0.0012				-001-	-002-						
0.0015				-001-	-002-						
0.0018				-001-	-002-						

SERIES
C12

POLYCARBONATE

AC TESTED CAPACITORS



- QUALIFIED TO MIL-C-39022/9C
- 100% SCREENED (QUALITY LEVEL 1)
- 3,000,000 MEGOHMS IR (0.1 μ F or less)
- 0.15% MAX. DISSIPATION FACTOR
- STANDARD TOLERANCES $\pm 0.25\%$ TO $\pm 10\%$

C12 SPECIFICATIONS

OPERATING TEMPERATURE: -65°C to 100°C at full rated voltage. Derate linearly from 100°C to 50% of rated voltage at 125°C .

TEMPERATURE COEFFICIENT OF CAPACITANCE: (25°C Reference).

$-0.75\% \pm 0.25\%$ at -55°C	$+0.05\% \pm 0.1\%$ at 55°C
$-0.35\% \pm 0.15\%$ at -25°C	$+0.15\% \pm 0.15\%$ at 85°C
$-0.25\% \pm 0.15\%$ at -10°C	$+0.25\% \pm 0.25\%$ at 125°C
$-0.15\% \pm 0.1\%$ at 0°C	

STABILITY: Capacitance values measured at any two corresponding temperature points taken in five successive temperature cycles shall be as follows:

RANGE	RETRACE
-25°C to 85°C	0.03% Max.
-65°C to 125°C	0.2% Max.

INSULATION RESISTANCE: Measured from terminal to terminal at rated voltage, and 5 minutes maximum charge time. For values greater than 1 μ F, allow an additional minute/ μ F charge time.

MINIMUM IR

Range	25°C	55°C	85°C	100°C	125°C
.001 to 0.1 μ F (in Megohms)	3,000,000	2,000,000	1,000,000	300,000	20,000
Greater than 0.1 μ F (in Megohms- μ F)	300,000	200,000	100,000	30,000	2,000

Readings shown are for 1 μ F or less. For values over 1 μ F, divide readings by μ F to obtain min IR.

Example: A 4 μ F capacitor is 75,000 megohms at 25°C.

DIELECTRIC ABSORPTION: 0.1% Max. at 25°C.

DISSIPATION FACTOR: 0.15% Max. at 1KHz and 25°C. Values greater than 1 μ F measure at 0.1KHz.

DIELECTRIC STRENGTH: 200% of rated voltage.

CONSTRUCTION: Polycarbonate dielectric, hermetically sealed, extended metal film electrodes, leads isolated from case.

LEAD WIRE SIZE AND TYPE

Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copperweld) CRC type "W"
0.400" and 0.500"	20	
0.562" and larger	18	Oxygen free tinned copper wire CRC type "C"

SEAL TEST: 1×10^{-6} atm/cm³/sec max. leak rate.

ENVIRONMENTAL: Capacitors shall meet all applicable requirements of MIL-C-39022/9C.

MIL STYLE	CRC STYLE	DC VOLTS	OLD P/N
CHROIA	C12A	30VDC	03 PV
CHROID	C12B	50VDC	05 PK
CHROIG	C12C	100VDC	1 PK
CHROIK	C12D	200VDC	2 PK
CHROIN	C12E	400VDC	4 PK

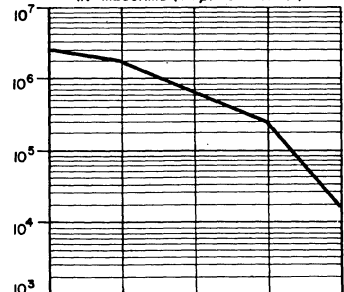
- PART NUMBER SYSTEM: PAGES 13, 18
- LIFE TEST DATA: PAGE 5
- CASE DIMENSIONS: PAGE 17
- AC VOLTS AND CURRENT RATINGS: PAGE 9
- SPECIAL AC CAPACITORS: PAGE 35
- PRICES: PAGES 40-44

C12 QUALITY ASSURANCE

All capacitors are 100% screened and tested as follows:

- 48 hours Burn-In at 125°C and 140% of the rated DC voltage.
- 10 Temperature Cycles from -65°C to 125°C .
- Helium Leak Test. 1×10^{-6} atm/cm³/sec max. leak rate.
- DC dielectric strength apply 200% of rated DC voltage from lead to lead and from leads to case for one minute.
- AC dielectric strength apply 100 Hz square wave from lead to lead at a minimum peak to peak voltage of 3 x rated DC voltage for one minute (except 800V peak to peak for 400VDC styles).
- Insulation Resistance at the rated voltage and 25°C, 300,000 megs — μ F minimum, but need not exceed 3,000,000 Megohms.
- Capacitance % Tolerance at 1KHz and 25°C.
- Dissipation Factor at 1KHz and 25°C, 0.15% maximum.
- Temperature Coefficient measured from -55°C to 125°C at a minimum of 5 temperature points. (Performed on lot sampling monthly basis.)
- Visual Inspection for dimensions, marking and packaging.
- Traceability to production and test records by permanent marking of parts with lot control number.
- Process and inspection data is maintained on file per NPC-200-3, MIL-Q-9858 quality control standards and MIL-STD-790, Reliability Assurance Program.
- Capacitors are serialized and packaged with certified test data to accompany each shipment.

INSULATION RESISTANCE IN MEGOHMS (0.1 μ F OR LESS)

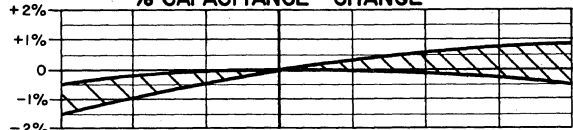


SERIES

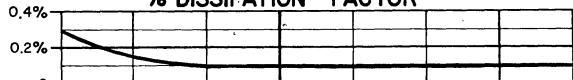
C12

**POLYCARBONATE
CAPACITORS**

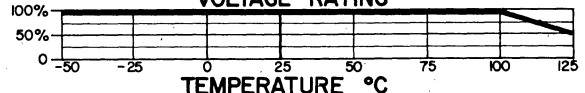
% CAPACITANCE CHANGE



% DISSIPATION FACTOR



VOLTAGE RATING



SERIES
D12

POLYCARBONATE

AC TESTED CAPACITORS



- QUALIFIED TO MIL-C-39022/9C
- 100% SCREENED (QUALITY LEVEL 2)
- 2,000,000 MEGOHMS IR (0.1 uF or less)
- 0.15% MAX. DISSIPATION FACTOR
- STANDARD TOLERANCES $\pm 0.25\%$ TO $\pm 10\%$

D12 SPECIFICATIONS

OPERATING TEMPERATURE: -65°C to 100°C at full rated voltage. Derate linearly from 100°C to 50% of rated voltage at 125°C .

TEMPERATURE COEFFICIENT OF CAPACITANCE: (25°C Reference).

-1.5% Max. at -55°C	$+0.2\%$ Max. at 55°C
-0.5% Max. at -25°C	$+0.5\%$ Max. at 85°C
-0.35% Max. at -10°C	$+1.0\%$ Max. at 125°C
-0.25% Max. at 0°C	

STABILITY: Capacitance values measured at any two corresponding temperature points taken in five successive temperature cycles shall be as follows:

RANGE	RETRACE
-25°C to 85°C	0.05% Max.
-65°C to 125°C	0.25% Max.

INSULATION RESISTANCE: Measured from terminal to terminal at rated voltage, and 5 minutes maximum charge time. For values greater than 1 uF, allow an additional minute/uF charge time.

MINIMUM IR

Range	25°C	55°C	85°C	100°C	125°C
.001 to 0.1 uF (in Megohms)	2,000,000	1,000,000	500,000	200,000	10,000
Greater than 0.1 uF (in Megohms-uF)	200,000	100,000	50,000	20,000	1,000

Readings shown are for 1 uF or less. For values over 1 uF, divide readings by uF to obtain min IR.

Example: A 6.8 uF capacitor is 30,000 megohms at 25°C .

DIELECTRIC ABSORPTION: 0.1% Max. at 25°C .

DISSIPATION FACTOR: 0.15% Max. at 1KHz and 25°C . Values greater than 1 uF measure at 0.1KHz.

DIELECTRIC STRENGTH: 200% of rated voltage.

CONSTRUCTION: Polycarbonate dielectric, hermetically sealed, extended metal film electrodes, leads isolated from case.

LEAD WIRE SIZE AND TYPE

Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copperweld) CRC type "W"
0.400" and 0.500"	20	
0.562" and larger	18	Oxygen free tinned copper wire CRC type "C"

SEAL TEST: 1×10^{-6} atm/cm²/sec max. leak rate.

ENVIRONMENTAL: Capacitors shall meet all applicable requirements of MIL-C-39022/9C.

MIL STYLE	CRC STYLE	DC VOLTS	OLD P/N
CHROIB	D12A	30VDC	03 PL
CHROIE	D12B	50VDC	05 PL
CHROIH	D12C	100VDC	1 PL
CHROIL	D12D	200VDC	2 PL
CHROIP	D12E	400VDC	4 PL

- PART NUMBER SYSTEM: PAGES 13, 18
- LIFE TEST DATA: PAGE 5
- CASE DIMENSIONS: PAGE 17
- AC VOLTS AND CURRENT RATINGS: PAGE 9
- SPECIAL AC CAPACITORS: PAGE 35
- PRICES: PAGES 40-44

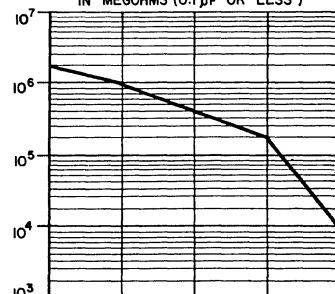
D12 QUALITY ASSURANCE

All capacitors are 100% screened and tested as follows:

- 16 hours Burn-In at 125°C and 140% of the rated DC voltage.
- 10 Temperature Cycles from -65°C to 125°C .
- Helium Leak Test. 1×10^{-4} atm/cm²/sec max. leak rate.
- DC dielectric strength apply 200% of rated DC voltage from lead to lead and from leads to case for one minute.
- AC dielectric strength apply 100 Hz square wave from lead to lead at a minimum peak to peak voltage of 3 x rated DC voltage for one minute (except 800V peak to peak for 400VDC styles).
- Insulation Resistance at the rated voltage and 25°C , 200,000 megs - uF minimum, but need not exceed 2,000,000 Megohms.
- Capacitance % Tolerance at 1KHz and 25°C .
- Dissipation Factor at 1KHz and 25°C , 0.15% maximum.
- Visual Inspection for dimensions, marking and packaging.
- Traceability to production and test records by permanent marking of parts with lot control number.
- Process and inspection data is maintained on file per NPC-200-3, MIL-Q-9858 quality control standards, and MIL-STD-790 Reliability Assurance Program.

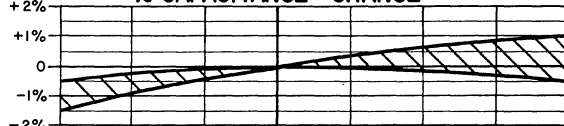
INSULATION RESISTANCE

IN MEGOHMS (0.1 uF OR LESS)

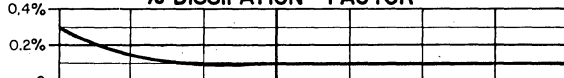


SERIES
D12
POLYCARBONATE
CAPACITORS

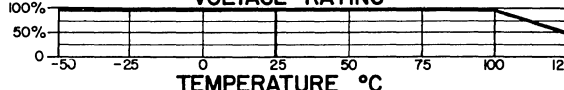
% CAPACITANCE CHANGE



% DISSIPATION FACTOR



VOLTAGE RATING



SERIES
E12

POLYCARBONATE

AC TESTED CAPACITORS



- QUALIFIED TO MIL-C-39022/9C
- 100% SCREENED (QUALITY LEVEL 3)
- 1,000,000 MEGOHMS IR (0.1 uF or less)
- 0.15% MAX. DISSIPATION FACTOR
- STANDARD TOLERANCES $\pm 0.25\%$ TO $\pm 10\%$

E12 SPECIFICATIONS

OPERATING TEMPERATURE: -65°C to 100°C at full rated voltage. Derate linearly from 100°C to 50% of rated voltage at 125°C .

TEMPERATURE COEFFICIENT OF CAPACITANCE: (25°C Reference).

$\pm 2\%$ Max.	-55°C to 125°C
$\pm 1\%$ Max.	-25°C to 85°C
$\pm 0.5\%$ Max.	0°C to 55°C

STABILITY: Capacitance values measured at any two corresponding temperature points taken in five successive temperature cycles shall be as follows:

RANGE	RETRACE
-25°C to 85°C	0.25% Max.
-65°C to 125°C	0.50% Max.

INSULATION RESISTANCE: Measured from terminal to terminal at rated voltage, and 5 minutes maximum charge time. For values greater than 1 uF, allow an additional minute/uF charge time.

MINIMUM IR					
Range	25°C	55°C	85°C	100°C	125°C
.001 to 0.1 uF (in Megohms)	1,000,000	500,000	100,000	50,000	10,000
Greater than 0.1 uF (in Megohms—uF)	100,000	50,000	10,000	5,000	1,000

Readings shown are for 1 uF or less. For values over 1 uF, divide readings by uF to obtain min IR.

Example: A 10 uF capacitor is 10,000 megohms at 25°C .

DIELECTRIC ABSORPTION: 0.1% Max. at 25°C .

DISSIPATION FACTOR: 0.15% Max. at 1KHz and 25°C . Values greater than 1 uF measure at 0.1KHz.

DIELECTRIC STRENGTH: 200% of rated voltage.

CONSTRUCTION: Polycarbonate dielectric, hermetically sealed, extended metal film electrodes, leads isolated from case.

LEAD WIRE SIZE AND TYPE		
Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copperweld) CRC type "W"
0.400" and 0.500"	20	
0.562" and larger	18	Oxygen free tinned copper wire CRC type "C"

SEAL TEST: 1×10^{-5} atm/cm²/sec max. leak rate.

ENVIRONMENTAL: Capacitors shall meet all applicable requirements of MIL-C-39022/9C.

MIL STYLE	CRC STYLE	DC VOLTS	OLD P/N
CHROIC	E12A	30VDC	03 PG
CHROIF	E12B	50VDC	05 PG
CHROIJ	E12C	100VDC	1 PG
CHROIM	E12D	200VDC	2 PG
CHROIR	E12E	400VDC	4 PG

- PART NUMBER SYSTEM: PAGES 13,18
- LIFE TEST DATA: PAGE 5
- CASE DIMENSIONS: PAGE 17
- AC VOLTS AND CURRENT RATINGS: PAGE 9
- SPECIAL AC CAPACITORS: PAGE 35
- PRICES: PAGES 40-44

E12 QUALITY ASSURANCE

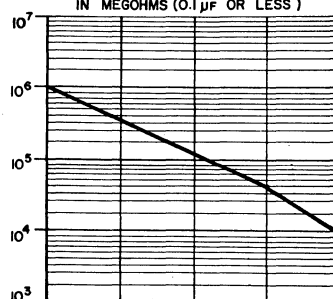
All capacitors are 100% screened and tested as follows:

- 5 Temperature Cycles from -65°C to 125°C .
- Helium Leak Test. 1×10^{-5} atm/cm²/sec max. leak rate.
- DC dielectric strength apply 200% of rated DC voltage from lead to lead and from leads to case for one minute.
- AC dielectric strength apply 100 Hz square wave from lead to lead at a minimum peak to peak voltage of 3 x rated DC voltage for one minute (except 800V peak to peak for 400VDC styles).
- Insulation Resistance at the rated voltage and 25°C , 100,000 megs — uF minimum, but need not exceed 1,000,000 Megohms.
- Capacitance % Tolerance at 1KHz and 25°C .
- Dissipation Factor at 1KHz and 25°C , 0.15% maximum.
- Visual Inspection for dimensions, marking and packaging.
- Traceability to production and test records by permanent marking of parts with lot control number.
- Process and inspection data is maintained on file per NPC-200-3, MIL-Q-9858 quality control standards and MIL-STD-790 Reliability Assurance Program.

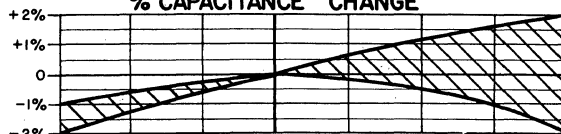
SERIES
E12
POLYCARBONATE
CAPACITORS

INSULATION RESISTANCE

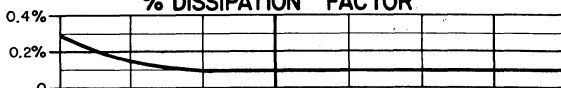
IN MEGOHMS (0.1 uF OR LESS)



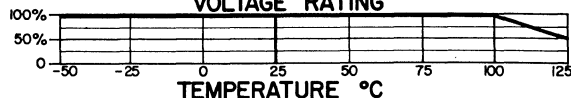
% CAPACITANCE CHANGE



% DISSIPATION FACTOR



VOLTAGE RATING



CRC HIGH RELIABILITY CAPACITORS

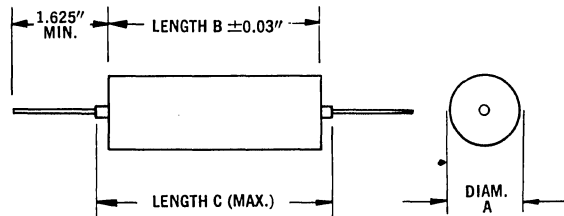
MIL-C-39022/9 POLYCARBONATE C12, D12, E12, CASE SIZES

**SERIES
12**

MIL-C-39022/9C VS MIL-C-83421/1

MIL-C-39022/9C Polycarbonate capacitor specifications have been replaced by MIL-C-83421/1 as explained in CRC catalog pages 2-11. MIL-C-83421/1 screening steps are not basically different than those of MIL-C-39022/9C but re-writing of the documents has resulted in a more clearly understood specification for our Metallized Polycarbonate capacitors. Several case dimensions were changed in going to MIL-C-83421/1, and minor corrections were made in current and voltage ratings, and several capacitance values were added and deleted. CRC will continue to supply both types as long as required by our customers. All "C" max dimensions for Series A12 and K12 capacitors shown on page 8 of catalog J, are 0.1" shorter than for MIL-C-39022/9C capacitors listed below.

All capacitor values and dimensions which differ from MIL-C-83421/1 or from CRC A12, K12 specifications are shown in bold face type below.



CASE DIMENSION	TOLERANCE LIMITS
"A" Diameter	± 0.010 " Without Slewing - 0.00" + 0.02" With Mylar Slewing
"B" Case Length	± 0.03 " With or Without Slewing
"C" Bead to Bead Length	The lengths shown in tables are maximum and include the solder bead.

uF	12A 30VDC			12B 50VDC			12C 100VDC			12D 200VDC			12E 400VDC		
	Diam. A	Length B	Length C	Diam. A	Length B	Length C	Diam. A	Length B	Length C	Diam. A	Length B	Length C	Diam. A	Length B	Length C
.001	.170	.500	.700	.170	.500	.700	.170	.500	.700	.170	.562	.762	.193	.562	.762
.0012	.170	.500	.700	.170	.500	.700	.170	.500	.700	.170	.562	.762			
.0015	.170	.500	.700	.170	.500	.700	.170	.500	.700	.170	.562	.762			
.0018	.170	.500	.700	.170	.500	.700	.170	.500	.700	.170	.562	.762			
.002	.170	.500	.700	.170	.500	.700	.170	.500	.700	.170	.562	.762	.193	.562	.762
.0022	.170	.500	.700	.170	.500	.700	.170	.500	.700	.170	.562	.762			
.0027	.170	.500	.700	.170	.500	.700	.170	.500	.700	.170	.562	.762			
.0033	.170	.500	.700	.170	.500	.700	.170	.500	.700	.170	.562	.762			
.0039	.170	.500	.700	.170	.500	.700	.170	.500	.700	.170	.562	.762			
.0047	.170	.500	.700	.170	.500	.700	.170	.500	.700	.170	.562	.762	.235	.687	.887
.005	.170	.500	.700	.170	.500	.700	.170	.500	.700	.170	.562	.762			
.0056	.170	.500	.700	.170	.500	.700	.170	.500	.700	.170	.562	.762			
.0068	.170	.500	.700	.170	.500	.700	.170	.687	.887	.170	.562	.762			
.0082	.170	.500	.700	.170	.562	.762	.170	.687	.887	.170	.562	.762			
.01	.170	.500	.700	.170	.562	.762	.170	.687	.887	.193	.562	.762	.235	.687	.887
.012	.170	.500	.700	.170	.562	.762	.170	.687	.887	.193	.562	.762			
.015	.170	.500	.700	.170	.562	.762	.170	.687	.887	.235	.562	.762	.235	.813	1.013
.018	.170	.500	.700	.193	.562	.762	.193	.687	.887	.235	.687	.887			
.02	.170	.500	.700	.193	.562	.762	.193	.687	.887	.235	.687	.887			
.022	.170	.500	.700	.193	.562	.762	.193	.687	.887	.235	.687	.887	.312	.813	1.013
.027	.170	.562	.762	.193	.562	.762	.193	.687	.887	.312	.687	.887	.312	.813	1.013
.03	.170	.562	.762	.193	.562	.762	.193	.687	.887	.312	.687	.887	.312	.813	1.013
.033	.170	.562	.762	.170	.687	.887	.235	.687	.887	.312	.687	.887	.312	.813	1.013
.039	.170	.562	.762	.170	.687	.887	.235	.687	.887	.312	.687	.887	.400	.813	1.013
.047	.170	.562	.762	.170	.687	.887	.235	.687	.887	.312	.687	.887			
.05	.170	.562	.762	.170	.687	.887	.235	.687	.887	.312	.813	1.013	.400	.813	1.013
.056	.170	.562	.762	.193	.687	.887	.235	.687	.887	.312	.813	1.013	.400	.813	1.013
.068	.170	.687	.887	.193	.687	.887	.235	.813	1.013	.312	.813	1.013	.400	.813	1.013
.082	.170	.687	.887	.193	.813	1.013	.312	.687	.887	.312	.813	1.013	.400	.813	1.013
.1	.193	.687	.887	.193	.813	1.013	.312	.687	.887	.312	.813	1.013	.400	1.063	1.263
.12	.193	.687	.887	.235	.687	.887	.312	.687	.887	.312	.813	1.013	.400	1.063	1.263
.15	.235	.562	.762	.235	.687	.887	.312	.813	1.013	.400	1.063	1.263	.400	1.375	1.575
.18	.235	.562	.762	.235	.687	.887	.312	.813	1.013	.400	1.063	1.263			
.20	.235	.687	.887	.235	.813	1.013	.312	.813	1.013	.400	1.375	1.575			
.22	.235	.687	.887	.235	.813	1.013	.312	.813	1.013	.400	1.375	1.575	.500	1.375	1.575
.27	.235	.687	.887	.312	.687	.887	.312	1.063	1.263	.500	1.375	1.575	.562	1.375	1.575
.33	.235	.687	.887	.312	.687	.887	.312	1.063	1.263	.500	1.375	1.575			
.39	.235	.687	.887	.312	.813	1.013	.400	1.063	1.263	.500	1.375	1.575			
.47	.312	.687	.887	.312	.813	1.013	.400	1.063	1.263	.500	1.375	1.575	.562	1.875	2.075
.50	.312	.687	.887	.400	.813	1.013	.400	1.063	1.263	.500	1.375	1.575	.562	1.875	2.075
.56	.312	.687	.887	.400	.813	1.013	.500	1.125	1.325	.500	1.375	1.575			
.68	.312	.813	1.013	.400	1.063	1.263	.500	1.125	1.325	.562	1.375	1.575			
.82	.312	.813	1.013	.400	1.063	1.263	.500	1.125	1.325	.562	1.375	1.575			
1.0	.312	.813	1.013	.400	1.063	1.263	.562	1.125	1.325	.562	1.875	2.075	.750	1.875	2.075
1.25	.400	.813	1.013	.400	1.063	1.263	.562	1.375	1.575	.562	1.875	2.075			
1.5	.400	.813	1.013	.400	1.063	1.263	.562	1.375	1.575	.670	1.875	2.075	1.00	2.375	2.575
2.0	.400	.813	1.013	.500	1.125	1.325	.670	1.375	1.575	.750	1.875	2.075	1.00	2.375	2.575
2.2	.400	.813	1.013	.500	1.125	1.325	.670	1.375	1.575	.750	1.875	2.075			
2.5	.400	.813	1.013	.500	1.125	1.325	.670	1.375	1.575	.750	1.875	2.075			
3.0	.400	1.063	1.263	.500	1.375	1.575	.670	1.875	2.075	1.00	1.875	2.075			
3.3	.400	1.063	1.263	.500	1.375	1.575	.670	1.875	2.075	1.00	1.875	2.075			
4.0	.400	1.375	1.575	.562	1.375	1.575	.750	1.875	2.075	1.00	2.375	2.575			
4.7	.500	1.375	1.575	.670	1.375	1.575	.750	1.875	2.075						
5.0	.500	1.375	1.575	.670	1.375	1.575	.750	1.875	2.075						
5.6	.500	1.375	1.575	.670	1.375	1.575	.750	1.875	2.075						
6.8	.562	1.375	1.575	.670	1.875	2.075	1.0	2.375	2.575						
8.0	.562	1.375	1.575	.670	1.875	2.075	1.0	2.375	2.575						
10.0	.562	1.375	1.575	.670	1.875	2.075	1.0	2.375	2.575						
15.0	.562	1.875	2.075												
20.0	.670	1.875	2.075												
22.0	.670	1.875	2.075												

CRC HIGH RELIABILITY CAPACITORS

HOW TO SPECIFY COMPONENT RESEARCH PART NUMBERS

WINDING STYLE & CASE STYLE	DIELECTRIC	DC VOLTS	CAPACITANCE (IN PICOFARADS)	% CAP. TOLERANCE	MYLAR SLEEVING	WIRE LEADS
1. METALLIZED FILM & UNGROUNDED CASE	1. TEFLON	A 30V B 50V	10 INDICATES THE SIGNIFICANT DIGITS. 4 INDICATES THE NUMBER OF ZEROS TO BE ADDED TO 10. EXAMPLES: 102=1000PF=.001 uF 103=10,000PF=.01 uF 104=100,000PF=.1 uF 105=1,000,000PF=1 uF 393=39,000PF=.039 uF	A 0.1% B 0.25% D 0.5% F 1% G 2% J 5% K 10%	(S) SPECIFY "S" WHEN SLEEVING IS REQUIRED	(W) TINNED COPPER CLAD STEEL (COPPERWELD)
2. METALLIZED FILM & GROUNDED CASE	2. POLYCARBONATE	C 100V D 200V E 400V				(C) OXYGEN FREE TINNED COPPER MIL-STD-1276 TYPE C
3. METALLIZED FILM & UNGROUNDED CASE (CORDWOOD)	3. POLYSTYRENE	F 600V G 1000V				(N) GOLD PLATED NICKEL MIL-STD-1276 TYPE N2
4. METALLIZED FILM & GROUNDED CASE (CORDWOOD)	4. POLYSULFONE	H 1500V J 2000V			(X) SPECIFY "X" WHEN NO SLEEVING IS REQUIRED	(A) NO MATERIAL SPECIFIED. MUST BE SOLDERABLE
5. METAL FOIL & UNGROUNDED CASE	5. POLYPROPYLENE	K 3000V L 4000V				
6. METAL FOIL & GROUNDED CASE		M 5000V				

A

1

2

A

104

F

S

W

PART NUMBER EXAMPLE A12A104FSW ALSO APPEARS ON PAGE 19.

SCREENING CODE SYMBOL	SCREENING CONDITIONS							CAPACITOR TYPES COVERED BY SCREENING				
	BURN-IN				THERMAL AGING			QUALITY LEVEL	DIELECTRIC	MIL SPEC TYPE	CRC TYPE	SEE PAGE
	HOURS	RATED VOLTS	VOLTAGE	TEMPERATURE	NO. OF CYCLES	LOW TEMP.	HIGH TEMP.					
A	48	140%	DC	125°C	10	-65°C	+125°C	1	Polycarbonate	MIL-C-83421/1 CRH01 to 05	A12	10
B	48	140%	DC	125°C	20	-65°C	+125°C	1	Teflon	—	B11	24
C	48	140%	DC	125°C	10	-65°C	+125°C	1	Teflon Polycarbonate	— MIL-C-39022/9C	C11 C12	25 14
D	16	140%	DC	125°C	10	-65°C	+125°C	2 2 2	Polycarbonate Teflon Teflon	MIL-C-39022/9C — —	D12 D11 D51	15 26 29
E	—	—	—	—	5	-65°C	+125°C	3 3	Teflon Polycarbonate	— MIL-C-39022/9C	E11 E12	27 16
G	48	140%	DC	150°C	10	-65°C	+125°C	1	Polysulfone	—	G14	37
H	16	140%	DC	150°C	10	-65°C	+125°C	2	Polysulfone	—	H14	38
J	96	140%	DC	125°C	10	-65°C	+125°C	1 1	Teflon Polycarbonate	— —	J11 J12	37 37
K	—	—	—	—	5	-65°C	+125°C	3	Polycarbonate	MIL-C-83421/1 CRH06 to 00	K12	11
L	16	100%	DC	105°C	5	-65°C	+85°C	1	Polystyrene	—	L53	34, 37
N	—	—	—	—	5	-65°C	+85°C	3	Polystyrene	—	N53	32
R	16	140%	RMS AC 400 Hz	100°C	5	-65°C	+125°C	2	Polycarbonate	—	R12	37
X	SPECIAL SCREENING TO CUSTOMER REQUIREMENTS											19, 37

CRC HIGH RELIABILITY CAPACITORS

CAPACITOR IDENTIFICATION & CROSS REFERENCE TABLE

Component Research Co. has been manufacturing precision film capacitors since 1959. As a result of introducing new, improved products, our part numbers have changed and a few older types are now considered obsolete. CRC will continue to supply obsolete types if you cannot find a substitute item, and we are able to obtain the required film materials. Following is a guide to the old and new part number types which are similar. Due to possible differences in screening, dimensions, and performance, it is best to contact our applications department when you plan to retrofit or use our new part numbers to replace the old. Old catalogs describing obsolete part numbers are available if required.

IDENTIFICATION FOR SPECIAL REQUIREMENTS

CRC believes that there is a sufficient choice of capacitors in this catalog to satisfy virtually all applications. In the event you have any requirement involving a modification of our specifications the following special identification will be used.

Example: X11B154BW588 (typical special part number). "X" preceding the part number indicates a special customer requirement. The number group at the end of the part number is assigned as a unique identification of the special manufacturing and inspection instructions. In the example shown above "588" is a typical unique identification number.

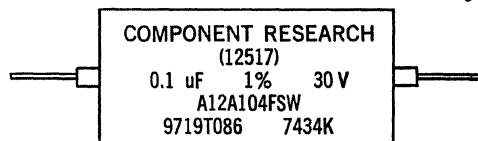
PART NUMBER EXAMPLES

Example 1 A12A104FSW shown to the right and in the marking example on Page 18, is a metallized polycarbonate, 0.1 μ F, 1%, 30 VDC, ungrounded case, capacitor. The capacitor has sleeving, tinned copper-clad steel leads, 48 hours burn-in, and 10 thermal aging cycles. It is made to quality level 1.

Example 2 C11B183FXW is a "C" screened metallized teflon level 1 capacitor, 0.018 μ F, 1% tol., 50 VDC. No sleeving is required. It has an ungrounded case and tinned copper clad steel leads.

Example 3 E22D15993BSC is "E" screened, metallized polycarbonate, 1.599 μ F, 0.25%, 200 VDC. The capacitor has a grounded case with mylar sleeving and OFHC leads. 15993 in the part number is derived by adding three zeros to 1599 to make 1,599,000 picofarads, which is 1.599 μ F. Example 3 is considered a nonstandard part because of the grounded case and the μ F value.

MARKING EXAMPLE — Standard Types



UNIQUE TEST & SERIAL NO. — All level 1 capacitors are permanently identified with a test number followed by a serial number for traceability to test records. 9719T is a typical test number, 086 is the capacitor serial number.

LOT CONTROL NO. — All level 1, 2, and 3 capacitors are traceable to process records and materials used, by means of the weekly date code. The individual lot letter K, indicates the tenth lot made in the 34th week of 1972.

NOTE: ONLY LEVEL 1 CAPACITORS ARE SERIALIZED

CROSS-REFERENCE GUIDE - OLD AND NEW PART NUMBERS

POLYCARBONATE STYLES						TEFLON STYLES			
FORMER TYPES	DC VOLTS	MIL-C-83421/1 EQUIVALENT	NEW TYPE	QUALITY LEVEL		FORMER TYPES	DC VOLTS	NEW TYPE	QUALITY LEVEL
03PV	C12A	30	CRH01	A12A	1	05TJ	50	B11B	1
05PK	C12B	50	CRH02	A12B	1	1TJ	100	B11C	1
1PK	C12C	100	CRH03	A12C	1	2TJ	200	B11D	1
2PK	C12D	200	CRH04	A12D	1	05TC	50	C11B	1
4PK	C12E	400	CRH05	A12E	1	1TC	100	C11C	1
03PG	E12A	30	CRH06	K12A	3	2TC	200	C11D	1
05PG	E12B	50	CRH07	K12B	3	05TA	50	D11B	2
1PG	E12C	100	CRH08	K12C	3	1TA	100	D11C	2
2PG	E12D	200	CRH09	K12D	3	2TA	200	D11D	2
4PG	E12E	400	CRH00	K12E	3	05TL	50	E11B	3
MIL-C-39022/9C TYPES	DC VOLTS	MIL-C-83421/1 EQUIVALENT	NEW TYPE	QUALITY LEVEL		1TL	100	E11C	3
CHRO1A	30	CRH01	A12A	1		2TL	200	E11D	3
CHRO1B	30	None	D12A	2		1TU	100	D51C	2
CHRO1C	30	CRH06	K12A	3		2TU	200	D15D	2
CHRO1D	50	CRH02	A12B	1		1TF	100	None	3
CHRO1E	50	None	D12B	2		05TQ	50	D31B	3
CHRO1F	50	CRH07	K12B	3		POLYSTYRENE			
CHRO1G	100	CRH03	A12C	1		05PA	50	N53B	3
CHRO1H	100	None	D12C	2		1PA	100	N53C	3
CHRO1J	100	CRH08	K12D	3		POLYSULFONE			
CHRO1K	200	CRH04	A12D	1		05MP	50	H14B	2
CHRO1L	200	None	D12D	2		1MP	100	H14C	2
CHRO1M	200	CRH09	K12D	3		2MP	200	H14D	2
CHRO1N	400	CRH05	A12E	1		4MP	400	H14E	2
CHRO1P	400	None	D12E	2		MYLAR STYLES			
CHRO1R	400	CRH00	K12E	3		REPLACE WITH			
FORMER TYPES	DC VOLTS	REPLACED BY		QUALITY LEVEL		1MA	100	K12C Polycarbonate	
03PQ	30	E32A		3		2MM	200	K12D Polycarbonate	
05PQ	50	E32B		3					

CRC HIGH RELIABILITY CAPACITORS

MANUFACTURING & INSPECTION FLOW PLAN

MIL-C-83421 • MIL-C-39022/9C • STANDARD CAPACITORS

100% INSPECTION PER MIL-C-83421

The high reliability capacitor screening plans developed by Component Research Co. have been adopted by space and military contractors throughout the world for critical programs. The new general specification MIL-C-83421 incorporates much of the screening features shown below at an attempt to provide a "state of the art" capacitor specification for general industrial and aerospace use.

Our flow plan for manufacturing and inspection shown below covers the steps used to process and screen all of our polycarbonate, teflon, polystyrene and polysulfone film capacitors. The individual specifica-

tions shown in the catalog list the actual screening performed for each style. A choice of three quality levels provides different degrees of intensive screening to assure the highest possible quality at lowest cost. Special screening plans are available which include tests such as 100% corona inception inspection, 40 KHz AC burn-in at 100°C, high impedance monitoring for intermittent conditions at low voltage during temperature cycling, ESR inspection at 100 KHz, dielectric absorption effects with rapid switching rates and varying temperature, and many other sensitive measurement phenomena.

•MANUFACTURING AND INSPECTION FLOW PLAN

100% PROCESSED AND SCREENED

Steps 1-6 show the 100% processing (up to and including hermetic sealing), of MIL-C-39022/9 and MIL-C-83421/1 qualified polycarbonate and CRC standard capacitors—Polycarbonate, Teflon, Polystyrene and Polysulfone. The quality level selected will be determined by the individual capacitor specification.

*SPECIAL MIL-C-83421/1 SCREENING IS SHOWN ON PAGE 3

PROCESSING STEPS

1. CAPACITOR MATERIAL INSPECTION
2. IDENTIFY PROCESS PAPERWORK WITH MATERIAL LOT NUMBERS
3. CAPACITOR SUB-ASSEMBLY INSPECTION
4. SPECIAL VACUUM PROCESSING
5. HERMETIC SEAL AFTER NITROGEN BACK-FILL
6. INITIAL INSPECTION OF COMPLETED CAPACITOR (7X POWER)

QUALITY LEVEL ①

- | | |
|---|--|
| 7. BURN-IN | 16. SERIALIZATION OF LEVEL 1 CAPACITORS |
| 8. TEMPERATURE CYCLING | 17. REPEAT ELECTRICAL MEASUREMENTS AND RECORD DATA AS REQUIRED |
| 9. HELIUM LEAK TEST AND GROSS LEAK TEST | 18. CONDUCT SPECIAL MEASUREMENTS WHEN REQUIRED BY CUSTOMER |
| 10. AC-DIELECTRIC STRENGTH | 19. FINAL VISUAL INSPECTION OF WORKMANSHIP, MARKING, PAPERWORK AND PACKAGING |
| 11. DC-DIELECTRIC STRENGTH | 20. SHIP DATA AND CERTIFICATE OF COMPLIANCE WITH PARTS |
| 12. INSULATION RESISTANCE | |
| 13. % CAPACITANCE TOLERANCE | |
| 14. % DISSIPATION FACTOR | |
| 15. SELECTION FOR PERFORMANCE GRADES | |

Highest reliability capacitors with standard or special screening for Apollo, Viking, and other space programs. Also used in military and ultra high quality industrial applications.

Qualified for space, critical applications, F15 aircraft, and other programs.

QUALITY LEVEL ②

7. BURN-IN
8. TEMPERATURE CYCLING
9. HELIUM LEAK TEST AND GROSS LEAK TEST
10. AC-DIELECTRIC STRENGTH
11. DC-DIELECTRIC STRENGTH
12. INSULATION RESISTANCE
13. % CAPACITANCE TOLERANCE
14. % DISSIPATION FACTOR
15. FINAL VISUAL INSPECTION OF WORKMANSHIP, MARKING, PAPERWORK, AND PACKAGING
16. SHIP C OF C WITH PARTS

High reliability capacitors screened for space, missile and industrial applications. Qualified for many programs such as The Tow Missile, The Lance Missile and F15 aircraft.

QUALITY LEVEL ③

7. TEMPERATURE CYCLING
8. HELIUM LEAK TEST AND GROSS LEAK TEST
9. AC-DIELECTRIC STRENGTH
10. DC-DIELECTRIC STRENGTH
11. INSULATION RESISTANCE
12. % CAPACITANCE TOLERANCE
13. % DISSIPATION FACTOR
14. FINAL VISUAL INSPECTION OF WORKMANSHIP, MARKING, PAPERWORK AND PACKAGING
15. SHIP C OF C WITH PARTS

High reliability capacitors with reduced screening and performance levels for lower cost high volume programs, such as missiles, aircraft and telephone equipment applications.

Random samples from completed production lots of all quality levels are periodically tested. These tests may consist of Insulation Resistance at high temperature, Dielectric Absorption, Temperature Coefficient and AC stress analysis tests.

In addition, samples are life tested for retention of qualification.

CRC HIGH RELIABILITY CAPACITORS

GENERAL PRODUCT INFORMATION

ORDERING INFORMATION — Prices: See pages 40 to 49 for net prices covering quantities from 1 to 10 pieces. Discount schedules for quantities up to 250 pieces are also listed. Please contact our sales office for larger quantities. **Terms:** Our terms are net 30 days to customers approved by our credit department. All shipments are F.O.B., Santa Monica, Calif. **Delivery:** Most items listed are available from stock or within 10 weeks for quantities up to 1000 pieces. **Minimum Order:** Minimum billing per order is \$20.00. **Complete Part Number:** Please make certain that you have complete part number to avoid any errors or delays. Please check part number instructions in individual specification pages and part number information shown on page 18.

PATENT INFORMATION — CRC capacitors are exclusively manufactured under one or more of the following patents and additional patents pending: 3,238,428; 3,260,906; 3,292,063; 3,506,895; 3,539,886; 3,603,849; 3,626,362.

CONSTRUCTION INFORMATION — All standard capacitors listed are hermetically sealed after vacuum process and both gross leak and helium leak tested for true hermeticity. Unless otherwise specified all parts listed are metal cased, tubular, with both wire terminals isolated from the metal case.

PART NUMBER OBSOLESCENCE — Due to changes in military specifications for which we are qualified, upgrading of our catalog specifications, or size reduction, part numbers formerly used may now be obsolete. We urge our customers to change their existing drawings to indicate the new part numbers for old and new design, wherever possible. If you are unable to make this change, CRC will continue to supply and mark parts indefinitely to the old specifications. See page 19.

INSTALLATION INSTRUCTIONS — To prevent damage to the hermetic seal joint, use a tweezer type heat sink between the soldering iron and solder beads when soldering within 1/4" of beads. Prior to lead bending or twisting, protect glass seals and solder joints by gripping with a small pliers, area of leads near solder beads.

Contaminating films on the glass seal surfaces may occur during customer handling and installation of capacitors. To preserve the high insulation resistance inherent in CRC capacitors, clean the glass seal surfaces thoroughly with acetone or chlorinated hydrocarbon fluid.

CAPACITOR MEASUREMENT INFORMATION — The high quality of CRC capacitors may be difficult to evaluate unless sufficiently sensitive and accurate equipment is utilized in conjunction with proper measurement techniques.

Capacitance bridges equal to the General Radio 1620A are recommended for best accuracy of capacitance. This bridge is satisfactory for dissipation factor measurement of capacitors up to 1 uF. CRC has developed a special bridge capable of accurately measuring dissipation factor of capacitors up to 100 uF or more at frequencies up to 1KHz. For inspection of DF of larger than 1 uF capacitors it is suggested that you use samples correlated by our measurement laboratory.

Insulation resistance measurement is performed by Component Research Co. using leakage current methods which are repeatable to 1 picoamp for capacitors less than 0.1 uF. Larger values require adequate charge time to minimize dielectric absorption effects. Guard boxes are used to perform leakage current and dielectric absorption measurements.

SPECIAL MATCHING — We can assort capacitors into sets of two or more capacitors matched for capacitance value within $\pm 0.1\%$ of each other at nominal cost. Where capacitors must track with temperature, they can be supplied in matched sets as closely as $\pm 0.1\%$ over their temperature range. Capacitors of opposing temperature coefficient slopes can be supplied to obtain lower temperature coefficients than for standard types.

SPECIAL CAPACITOR VALUES — If your application requires odd values such as 0.10015 uF $\pm 0.1\%$ or 0.9999 uF $\pm 0.25\%$, such requirements are readily met from our large stock of standard and non-standard values. Individual capacitors can be permanently marked or tagged with discrete values accurate to six places if required.

SPECIAL VOLTAGE RATINGS — Problems of size may occur when replacement of a poor quality capacitor is required. Under certain conditions such as restricting the operating temperature, or limiting DC hipot to 150% of rated volts, a substantial size reduction is possible. Check with our applications engineering department for our recommendations in such cases.

SPECIAL PART NUMBER IDENTIFICATION — CRC believes that there is a sufficient choice of capacitors in this catalog to satisfy virtually all applications. In the event you have any requirement involving a modification of our specifications, the following special identification will be used.

Example: X11B154BW588 (typical special part number). "X" preceding the part number indicates a special customer requirement. The number group at the end of the part number is assigned as a unique identification of the special manufacturing and inspection instructions. In example shown, "588" is a typical unique identification number.

STANDARD CRC CASE SIZES & WEIGHTS

CRC No. Case	CASE DIMENSIONS IN INCHES			Typical* Weight $\pm 20\%$ Accuracy (ounces)
	A Diam.	B Length	C Length	
CF329-1	.170	.500	.700	.0353
CF329-2	.170	.562	.762	.0424
CF329-3	.170	.687	.887	.0459
CF329-4	.193	.562	.762	.0459
CF329-5	.193	.687	.887	.0459
CF329-6	.193	.813	1.013	.0494
CF329-7	.235	.562	.762	.0494
CF329-8	.235	.687	.887	.0565
CF329-9	.235	.813	1.013	.0635
CF329-10	.312	.687	.887	.0883
CF329-11	.312	.813	1.013	.0953
CF329-12	.312	1.063	1.263	.1059
CF329-13	.400	.813	1.013	.1412
CF329-14	.400	1.063	1.263	.2118
CF329-15	.400	1.375	1.575	.2118
CF329-16	.500	1.125	1.325	.2824
CF329-17	.500	1.375	1.575	.3177
CF329-18	.562	1.125	1.325	.4059
CF329-19	.562	1.375	1.575	.4589
CF329-20	.562	1.875	2.075	.6072
CF329-21	.670	1.375	1.575	.6354
CF329-22	.670	1.875	2.075	.7589
CF329-23	.750	1.875	2.075	.9884
CF329-24	1.00	1.875	2.075	1.6061
CF329-25	1.00	2.375	2.575	1.9768
CF329-26	1.00	2.625	2.825	2.2945

CRC No. Case	CASE DIMENSIONS IN MILLIMETERS			Typical* Weight $\pm 20\%$ Accuracy (grams)
	A Diam.	B Length	C Length	
CF329-1	4.32	12.70	17.78	1.0
CF329-2	4.32	14.28	19.36	1.2
CF329-3	4.32	17.45	22.53	1.3
CF329-4	4.90	14.28	19.36	1.3
CF329-5	4.90	17.45	22.53	1.3
CF329-6	4.90	20.65	25.73	1.4
CF329-7	5.97	14.28	19.36	1.4
CF329-8	5.97	17.45	22.53	1.6
CF329-9	5.97	20.65	25.73	1.8
CF329-10	7.93	17.45	22.53	2.5
CF329-11	7.93	20.65	25.73	2.7
CF329-12	7.93	27.00	32.08	3.0
CF329-13	10.16	20.65	25.73	4.0
CF329-14	10.16	27.00	32.08	6.0
CF329-15	10.16	34.93	40.01	6.0
CF329-16	12.70	28.58	33.66	8.0
CF329-17	12.70	34.93	40.01	9.0
CF329-18	14.28	28.58	33.66	11.5
CF329-19	14.28	34.93	40.01	13.0
CF329-20	14.28	47.63	52.71	17.2
CF329-21	17.02	34.93	40.01	18.0
CF329-22	17.02	47.63	52.71	21.5
CF329-23	19.05	47.63	52.71	28.0
CF329-24	25.40	47.63	52.71	45.5
CF329-25	25.40	60.33	65.41	56.0
CF329-26	25.40	71.63	76.71	65.0

*The typical weights shown above apply to all capacitor types listed in our catalog. The $\pm 20\%$ weight tolerance covers variations in density for a given case size part made from teflon or any other listed dielectric. The weight tolerance also makes allowance for foil or metalized construction.

Please contact us if more accurate weight information is required for any given series of capacitors.

CRC HIGH RELIABILITY CAPACITORS	KEY CAPACITOR FEATURES
UNIQUE CONSTRUCTION	CRC capacitor windings are firmly supported within their hermetic enclosures to withstand high frequency shock and vibration levels per MIL-C-39022/9, and MIL-C-83421. The capacitors are uniquely constructed to provide winding support for the thinnest dielectric films, and have as well, stress free lead terminations that can withstand extended temperature cycling. CRC capacitors are exclusively manufactured under one or more of the following patents and additional patents pending: 3,238,428; 3,260,906; 3,292,063; 3,506,895; 3,539,886; 3,603,849; 3,626,362.
HIGH INSULATION RESISTANCE	Standard stock capacitors, 0.1 uF and less are rated up to 10,000,000 megohms for teflon, 5,000,000 megohms for polystyrene, and 3,000,000 megohms for polycarbonate and polysulfone types. If required, capacitors can be supplied with higher ratings for extremely critical applications. Thousands of such special teflon capacitors are in use in the attitude controls for the Boeing 747. Tests by the user during which the capacitors were left on charge for several years, indicate a capacitor self-time constant that exceeds 100 years.
LOW DIELECTRIC ABSORPTION	Special CRC equipment can perform this sensitive test at fast switching rates to determine how CRC capacitors will operate in critical sample and hold circuits. Recent tests on 1 uF capacitors using 10 milliseconds charge time, 1 millisecond discharge, and 100 milliseconds recovery time, indicate readings as low as 0.0035% for teflon and 0.007% for polystyrene capacitors.
LOW DISSIPATION FACTOR	A measure of the reliability and quality of the electrode terminations is determined by capacitor heat rise during 4 KHz to 40 KHz power measurements performed by CRC. Tests prove that the superior terminations of the CRC capacitors can be verified by their low 1 KHz and 10 KHz dissipation factor readings. The permanence of this quality has been further demonstrated by maintenance of low dissipation factor after temperature cycling, DC Life, AC Life, and all other environmental conditions. SEE PAGE 5, 7, 37
HIGH STABILITY LOW TEMPERATURE COEFFICIENT	The combined effects of CRC unique winding construction, temperature cycling and burn-in result in maximum stability, uniform TC linearity, and reproduceability. Capacitors can be supplied with virtually zero TC over limited temperature spans. SEE SPECIAL MATCHING PAGE 21.
HIGH RELIABILITY SCREENING	In addition to DC burn-in and 400 Hz RMS AC burn-in, CRC performs special burn-in at frequencies up to 40 KHz. 100% temperature cycling follows each burn-in sequence. In special AC applications, we provide 100% corona inception inspection at 150% to 200% of rated RMS AC volts. SEE PAGES 7, 18, 37.
PAGE 22 catalog J	COMPONENT RESEARCH CO., INC. • 1717 19TH STREET • SANTA MONICA, CALIF. 90404 • (213) 829-3615 TWX. (910) 343-6864

CRC HIGH RELIABILITY CAPACITORS

A COMPARISON OF CAPACITOR TYPES A PARTIAL LISTING OF TYPES AVAILABLE IN CATALOG "J"

DIELECTRIC	Type	Quality Level	Typical Temperature Coefficient Limits Max. % Capacitance Change Relative to 25°C							Typical Leakage Current in Nanoamps for 1 MFD Capacitors Measured at 30VDC (1 Microamp = 1000 Nanoamps)				% Max. Drift 5 Cycles -25°C to +85°C	% Max. Dissipation Factor 25°C	% Max. Dielectric Absorption 25°C
			-50°C	-25°C	0°C	50°C	75°C	100°C	125°C	25°C	75°C	100°C	125°C			
SERIES 11 TEFLON	B11	①	+0.4	+0.25	+0.1	-0.15	-0.2	-0.3	-0.4	0.06	0.15	0.3	1.2	0.01	0.03	0.01
	C11	①	+0.7	+0.5	+0.25	-0.25	-0.4	-0.5	-0.6	0.06	0.15	0.3	1.2	0.02	0.03	0.01
	D11	②	+0.6	+0.4	+0.2	-0.25	-0.4	-0.5	-0.6	0.06	0.15	0.3	1.2	0.02	0.03	0.01
	E11	③	+1.0	+0.7	+0.3	-0.4	-0.6	-0.8	-1.0	0.3	0.75	2.3	3	0.05	0.10	0.02
SERIES 31 TEFLON (Cordwood)	C31	①	+0.8	+0.6	+0.3	-0.35	-0.5	-0.6	-0.7	0.12	0.3	0.6	1.8	0.02	0.05	0.02
	D31	②	+0.7	+0.5	+0.25	-0.25	-0.4	-0.5	-0.6	0.12	0.3	0.6	1.8	0.02	0.05	0.02
SERIES 51 TEFLON	C51	①	+0.8	+0.6	+0.2	-0.2	-0.5	-0.6	-0.8	0.03	0.06	0.18	1.2	0.02	0.01	0.01
	D51	②	+0.8	+0.6	+0.2	-0.2	-0.5	-0.6	-0.8	0.03	0.06	0.18	1.2	0.05	0.01	0.01
	E51	③	+1.2	+0.8	+0.4	-0.3	-0.6	-0.8	-1.2	0.1	0.15	0.6	3	0.1	0.02	0.02
SERIES 12 POLY-CARBONATE	C12	①	-1.2	-0.5	-0.20	±0.15	±0.3	±0.4	±0.5	0.05	0.15	0.6	6	0.03	0.15	0.10
	D12	②	-1.5	-0.5	-0.25	±0.25	±0.4	±0.6	±1	0.1	0.3	1	18	0.05	0.15	0.10
	E12	③	-2	-1	-0.35	±0.35	±0.6	±1	±2	0.3	3	6	18	0.25	0.15	0.10
	F12	④	-2	-1	-0.35	±0.35	±0.6	±1	±2	0.3	3	6	18	0.25	0.25	0.20
SERIES 53 POLYSTYRENE	M53	②	+0.8	+0.5	+0.25	-0.25	-0.5	(85°C Max.)		0.03	0.2	—	—	0.02	0.01	0.02
	N53	③	+0.8	+0.5	+0.25	-0.25	-0.5	(85°C Max.)		0.03	0.2	—	—	0.03	0.01	0.02
SERIES 14 POLYSULFONE	G14	①	-0.5	-0.2	-0.05	±0.05	±0.1	±0.25	±0.4	0.1	1	2	10	0.03	0.15	0.20
	H14	②	-0.6	-0.3	-0.1	±0.1	±0.25	±0.4	±0.6	0.2	2	4	12	0.05	0.15	0.20

QUALIFICATION INFORMATION

Component Research Co. capacitor products appear on the preferred parts lists and qualified products lists of many agencies and defense contractors. Following is a partial list of approvals.

MIL-C-83421/1 qualification information appears on pages 2-11.

FULLY QUALIFIED FOR CRITICAL APPLICATIONS

PROGRAM	SPECIFICATION	CRC QUALIFIED CAPACITORS	
		Former Part No.	New (Equiv.) Part No.
F-15	MIL-C-39022/9	PV, PK, PL and PG Polycarbonate	C12, D12 and E12 Series
A-7D	218-37669	PK, Polycarbonate	C12 Series
Astronaut Life Support System	195-102, 195-103	PV, PK, Polycarbonate	C12 Series
Nimbus Satellite	51865	PV, Polycarbonate	C12 Series
Apollo 8	SCD 26158	PL, Polycarbonate	D12 Series
Tow Light Source	MISI3707/1	PL, Polycarbonate	D12 Series
DC-10, B747	ED 746343	PL, Polycarbonate	D12 Series
POSEIDON	2621674	PL, Polycarbonate	D12 Series
Mark 48 Torpedo	2589355	PG, Polycarbonate	E12 Series
F-15	4001818	TJ, Teflon	B11 Series
MRSA	S30409	TC, Teflon	C11 Series
Lance	MISI3263	TA, Teflon	D11 Series
Lunar Orbiter	27-30100	TU, Teflon Foil	D51 Series
Mark 48 Torpedo	2501070, 2500774	Pa, Polystyrene	N53 Series

SERIES
B11

TEFLON

HIGH STABILITY CAPACITORS



- QUALIFIED FOR SPACE
- 100% SCREENED (QUALITY LEVEL 1)
- 5,000,000 MEGOHMS IR (0.1 uF or less)
- 100% SERIALIZED FOR DATA RECORDING
- STANDARD TOLERANCES $\pm 0.25\%$ TO $\pm 10\%$

B11 SPECIFICATIONS

OPERATING TEMPERATURE: -65°C to 125°C at full rated voltage.

TEMPERATURE COEFFICIENT OF CAPACITANCE: (25°C Reference).

+0.4% Max. at -55°C	-0.15% Max. at 55°C
+0.25% Max. at -25°C	-0.25% Max. at 85°C
+0.2% Max. at -10°C	-0.4% Max. at 125°C
+0.1% Max. at 0°C	

STABILITY: Capacitance values measured at any two corresponding temperature points taken in five successive temperature cycles shall be as follows:

RANGE	RETRACE
-25°C to 85°C	0.01% Max.
-65°C to 125°C	0.05% Max.

INSULATION RESISTANCE: Measured from terminal to terminal at rated voltage, and 5 minutes maximum charge time. For values greater than 1 uF, allow an additional minute/uF charge time.

MINIMUM IR					
Range	25°C	55°C	85°C	100°C	125°C
.001 to 0.1 uF (in Megohms)	5,000,000	5,000,000	2,000,000	1,000,000	250,000
Greater than 0.1 uF (in Megohms—uF)	500,000	500,000	200,000	100,000	25,000

Readings shown are for 1 uF or less. For values over 1 uF, divide readings by uF to obtain min IR.

Example: A 2 uF capacitor is 250,000 megohms at 25°C.

DIELECTRIC ABSORPTION: 0.01% Max. at 25°C.

DISSIPATION FACTOR: 0.03% Max. at 1KHz and 25°C. Values greater than 1 uF measure at 0.1KHz.

DIELECTRIC STRENGTH: 200% of rated voltage.

CONSTRUCTION: Teflon dielectric, hermetically sealed, extended metal film electrodes, leads isolated from case.

LEAD WIRE SIZE AND TYPE		
Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copperweld) CRC type "W"
0.400" and larger	20	

SEAL TEST: 1×10^{-6} atm/cm³/sec. max. leak rate.

ENVIRONMENTAL: Capacitors shall meet all applicable requirements of MIL-C-83421.

CRC STYLE	DC VOLTS	OLD P/N
B11B	50VDC	05 TJ
B11C	100VDC	1 TJ
B11D	200VDC	2 TJ

• PART NUMBER SYSTEM	PAGE 18
• MFG. & INSPECTION FLOW PLAN	PAGE 20
• QPL PROGRAM APPROVALS	PAGE 23
• CASE DIMENSIONS	PAGE 28
• LIFE TEST DATA	PAGE 30
• PRICES	PAGE 46

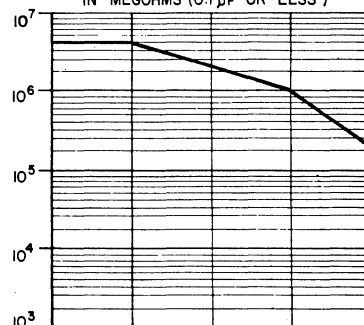
B11 QUALITY ASSURANCE

All capacitors are 100% screened and tested as follows:

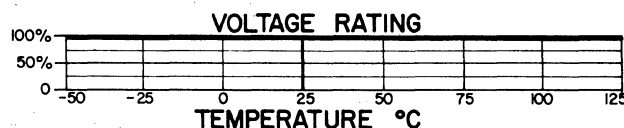
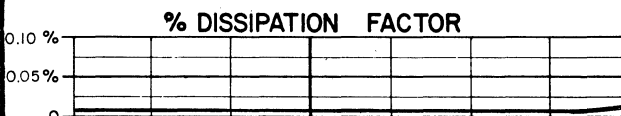
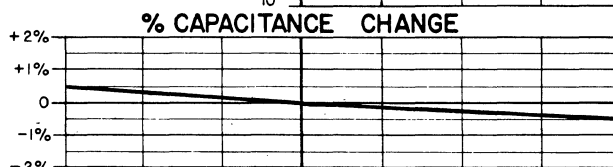
1. 48 hours Burn-In at 125°C and 140% of the rated DC voltage.
2. 20 Temperature Cycles from -65°C to 125°C .
3. Helium Leak Test. 1×10^{-4} atm/cm³/sec. max. leak rate.
4. DC dielectric strength apply 200% of rated DC voltage from lead to lead and from leads to case for one minute.
5. Insulation Resistance at the rated voltage and 25°C, 500,000 megs — uF minimum, but need not exceed 5,000,000 Megohms.
6. Capacitance % Tolerance at 1KHz and 25°C.
7. Dissipation Factor at 1KHz and 25°C, 0.03% maximum.
8. Temperature Coefficient measured from -55°C to 125°C at a minimum of 5 temperature points.
9. Visual Inspection for dimensions, marking and packaging.
10. Traceability to production and test records by permanent marking of parts with lot control number.
11. Process and inspection data is maintained on file per NPC-200-3, MIL-Q-9858 quality control standards and MIL-STD-790 Reliability Assurance Program.
12. Capacitors are serialized and packaged with certified test data to accompany each shipment.

INSULATION RESISTANCE

IN MEGOHMS (0.1 uF OR LESS)



SERIES
B11
TEFLON
CAPACITORS



SERIES
C11

TEFLON

HIGH STABILITY CAPACITORS



- QUALIFIED FOR SPACE
- 100% SCREENED (QUALITY LEVEL 1)
- 5,000,000 MEGOHMS IR (0.1 uF or less)
- 100% SERIALIZED FOR DATA RECORDING
- STANDARD TOLERANCES $\pm 0.25\%$ TO $\pm 10\%$

C11 SPECIFICATIONS

OPERATING TEMPERATURE: -65°C to 125°C at full rated voltage.

TEMPERATURE COEFFICIENT OF CAPACITANCE: (25°C Reference).

+0.7% Max. at -55°C	-0.25% Max. at 55°C
+0.5% Max. at -25°C	-0.50% Max. at 85°C
+0.3% Max. at -10°C	-0.60% Max. at 125°C
+0.25% Max. at 0°C	

STABILITY: Capacitance values measured at any two corresponding temperature points taken in five successive temperature cycles shall be as follows:

RANGE	RETRACE
-25°C to 85°C	0.02% Max.
-65°C to 125°C	0.1% Max.

INSULATION RESISTANCE: Measured from terminal to terminal at rated voltage, and 5 minutes maximum charge time. For values greater than 1 uF, allow an additional minute/uF charge time.

MINIMUM IR					
Range	25°C	55°C	85°C	100°C	125°C
.001 to 0.1 uF (in Megohms)	5,000,000	5,000,000	2,000,000	1,000,000	250,000
Greater than 0.1 uF (in Megohms-uF)	500,000	500,000	200,000	100,000	25,000

Readings shown are for 1 uF or less. For values over 1 uF, divide readings by uF to obtain min IR.

Example: A 2 uF capacitor is 250,000 megohms at 25°C .

DIELECTRIC ABSORPTION: 0.01% Max. at 25°C .

DISSIPATION FACTOR: 0.03% Max. at 1KHz and 25°C . Values greater than 1 uF measure at 0.1KHz.

DIELECTRIC STRENGTH: 200% of rated voltage.

CONSTRUCTION: Teflon dielectric, hermetically sealed, extended metal film electrodes, leads isolated from case.

LEAD WIRE SIZE AND TYPE		
Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copperweld) CRC type "W"
0.400" and larger	20	

SEAL TEST: 1×10^{-6} atm/cm³/sec. Max. leak rate.

ENVIRONMENTAL: Capacitors shall meet all applicable requirements of MIL-C-83421.

CRC STYLE	DC VOLTS	OLD P/N
C11B	50VDC	05 TC
C11C	100VDC	1 TC
C11D	200VDC	2 TC

• PART NUMBER SYSTEM	PAGE 18
• MFG. & INSPECTION FLOW PLAN	PAGE 20
• QPL PROGRAM APPROVALS	PAGE 23
• CASE DIMENSIONS	PAGE 28
• LIFE TEST DATA	PAGE 30
• PRICES	PAGE 46

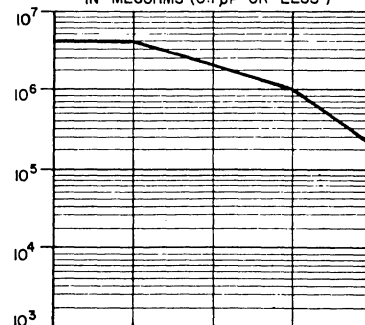
C11 QUALITY ASSURANCE

All capacitors are 100% screened and tested as follows:

- 48 hours Burn-In at 125°C and 140% of the rated DC voltage.
- 10 Temperature Cycles from -65°C to 125°C .
- Helium Leak Test. 1×10^{-6} atm/cm³/sec. max. leak rate.
- DC dielectric strength apply 200% of rated DC voltage from lead to lead and from leads to case for one minute.
- Insulation Resistance at the rated voltage and 25°C , 500,000 megs — uF minimum, but need not exceed 5,000,000 Megohms.
- Capacitance % Tolerance at 1KHz and 25°C .
- Dissipation Factor at 1KHz and 25°C , 0.03% maximum.
- Capacitors are 100% tested for 0.1% maximum drift with five cycles from -65°C to 125°C .
- Visual Inspection for dimensions, marking and packaging.
- Traceability to production and test records by permanent marking of parts with lot control number.
- Process and inspection data is maintained on file per NPC-200-3, MIL-Q-9858 quality control standards and MIL-STD-790 Reliability Assurance Program.
- Capacitors are serialized and packaged with certified test data to accompany each shipment.

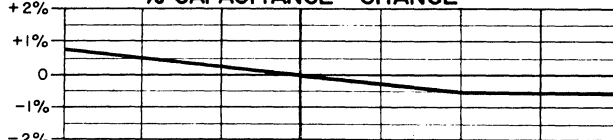
INSULATION RESISTANCE

IN MEGOHMS (0.1 uF OR LESS)

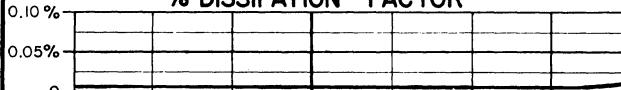


SERIES
C11
 TEFLON
 CAPACITORS

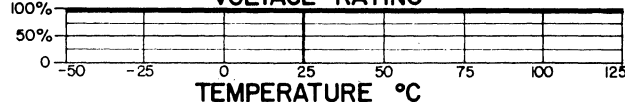
% CAPACITANCE CHANGE



% DISSIPATION FACTOR



VOLTAGE RATING



SERIES

D11**TEFLON****HIGH STABILITY CAPACITORS**

- QUALIFIED FOR SPACE
- 100% SCREENED (QUALITY LEVEL 2)
- 5,000,000 MEGOHMS IR (0.1 μ F or less)
- STANDARD TOLERANCES $\pm 0.25\%$ TO $\pm 10\%$

CRC STYLE**DC VOLTS****OLD P/N**

D11B

50VDC

05 TA

D11C

100VDC

1 TA

D11D

200VDC

2 TA

• PART NUMBER SYSTEM	PAGE 18
• MFG. & INSPECTION FLOW PLAN	PAGE 20
• QPL PROGRAM APPROVALS	PAGE 23
• CASE DIMENSIONS	PAGE 28
• LIFE TEST DATA	PAGE 30
• PRICES	PAGES 46, 47

D11 SPECIFICATIONS

OPERATING TEMPERATURE: -65°C to 125°C at full rated voltage.

TEMPERATURE COEFFICIENT OF CAPACITANCE: (25°C Reference).

+0.7% Max. at -55°C	-0.25% Max. at 55°C
+0.5% Max. at -25°C	-0.5% Max. at 85°C
+0.3% Max. at -10°C	-0.6% Max. at 125°C
+0.25% Max. at 0°C	

STABILITY: Capacitance values measured at any two corresponding temperature points taken in five successive temperature cycles shall be as follows:

RANGE	RETRACE
-25°C to 85°C	0.02% Max.
-65°C to 125°C	0.1% Max.

INSULATION RESISTANCE: Measured from terminal to terminal at rated voltage, and 5 minutes maximum charge time. For values greater than 1 μ F, allow an additional minute/ μ F charge time.

MINIMUM IR					
Range	25°C	55°C	85°C	100°C	125°C
.001 to 0.1 μ F (in Megohms)	5,000,000	5,000,000	2,000,000	1,000,000	250,000
Greater than 0.1 μ F (in Megohms $-\mu$ F)	500,000	500,000	200,000	100,000	25,000

Readings shown are for 1 μ F or less. For values over 1 μ F, divide readings by μ F to obtain min IR.

Example: A 2 μ F capacitor is 250,000 megohms at 25°C .

DIELECTRIC ABSORPTION: 0.01% Max. at 25°C .

DISSIPATION FACTOR: 0.03% Max. at 1KHz and 25°C . Values greater than 1 μ F measure at 0.1KHz.

DIELECTRIC STRENGTH: 200% of rated voltage.

CONSTRUCTION: Teflon dielectric, hermetically sealed, extended metal film electrodes, leads isolated from case.

LEAD WIRE SIZE AND TYPE		
Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copperweld) CRC type "W"
0.400" and larger	20	

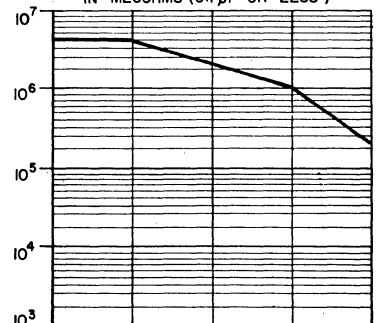
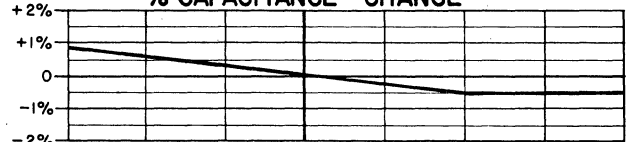
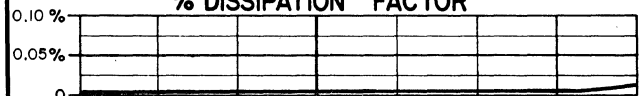
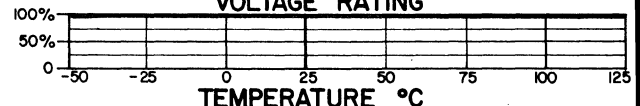
SEAL TEST: 1×10^{-6} atm/cm²/sec. max. leak rate.

ENVIRONMENTAL: Capacitors shall meet all applicable requirements of MIL-C-83421.

D11 QUALITY ASSURANCE

All capacitors are 100% screened and tested as follows:

- 16 hours Burn-In at 125°C and 140% of the rated DC voltage.
- 10 Temperature Cycles from -65°C to 125°C .
- Helium Leak Test. 1×10^{-6} atm/cm²/sec. max. leak rate.
- DC dielectric strength apply 200% of rated DC voltage from lead to lead and from leads to case for one minute.
- Insulation Resistance at the rated voltage and 25°C , 500,000 megs $-\mu$ F minimum, but need not exceed 5,000,000 Megohms.
- Capacitance % Tolerance at 1KHz and 25°C .
- Dissipation Factor at 1KHz and 25°C , 0.03% maximum.
- Visual Inspection for dimensions, marking and packaging.
- Traceability to production and test records by permanent marking of parts with lot control number.
- Process and inspection data is maintained on file per NPC-200-3, MIL-Q-9858 quality control standards and MIL-STD-790 Reliability Assurance Program.

INSULATION RESISTANCE
IN MEGOHMS (0.1 μ F OR LESS)**SERIES D11
TEFLON
CAPACITORS****% CAPACITANCE CHANGE****% DISSIPATION FACTOR****VOLTAGE RATING**

SERIES

E11**TEFLON****HIGH STABILITY CAPACITORS**

- **RECOMMENDED FOR INDUSTRIAL AND COMPUTER DC APPLICATIONS**
- **100% SCREENED (QUALITY LEVEL 3)**
- **1,000,000 MEGOHMS IR (0.1 uF or less)**
- **STANDARD TOLERANCES $\pm 0.25\%$ TO $\pm 10\%$**

E11 SPECIFICATIONS

OPERATING TEMPERATURE: -65°C to 125°C at full rated voltage.

TEMPERATURE COEFFICIENT OF CAPACITANCE: (25°C Reference).

$\pm 1\%$ Max. -55°C to 125°C

STABILITY: Capacitance values measured at any two corresponding temperature points taken in five successive temperature cycles shall be as follows:

RANGE	RETRACE
-25°C to 85°C	0.05% Max.
-65°C to 125°C	0.25% Max.

INSULATION RESISTANCE: Measured from terminal to terminal at rated voltage, and 5 minutes maximum charge time. For values greater than 1 uF, allow an additional minute/uF charge time.

MINIMUM IR

Range	25°C	55°C	85°C	100°C	125°C
.001 to 0.1 uF (in Megohms)	1,000,000	1,000,000	500,000	250,000	100,000
Greater than 0.1 uF (in Megohms — uF)	100,000	100,000	50,000	25,000	10,000

DIELECTRIC ABSORPTION: .02% Max. at 25°C .

DISSIPATION FACTOR: 0.1% Max. at 1KHz and 25°C . Values over 1 uF measure at 0.1KHz.

DIELECTRIC STRENGTH: 200% of rated voltage.

CONSTRUCTION: Teflon dielectric, hermetically sealed, extended metal film electrodes, leads isolated from case.

LEAD WIRE SIZE AND TYPE

Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	E11 Lead material will be either gold plated nickel or tinned copperweld as available.
0.400" and larger	20	

Readings shown are for 1 uF or less. For values over 1 uF, divide readings by uF to obtain min IR.
Example: A 10 uF, 100 volt capacitor at 25°C is 1,000,000/10 mgs = 100,000 megohms.

SEAL TEST: 1×10^{-5} atm/cm²/sec. max. leak rate.

CRC STYLE**DC VOLTS****OLD P/N**

E11B

50VDC

05 TL

E11C

100VDC

1 TL

E11D

200VDC

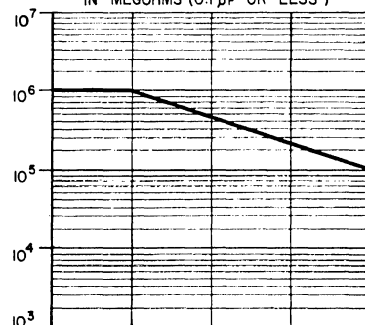
2 TL

• PART NUMBER SYSTEM	PAGE 18
• MFG. & INSPECTION FLOW PLAN	PAGE 20
• CASE DIMENSIONS	PAGE 28
• LIFE TEST DATA	PAGE 30
• PRICES	PAGE 47

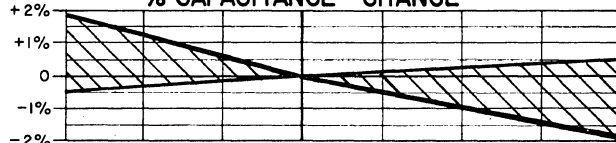
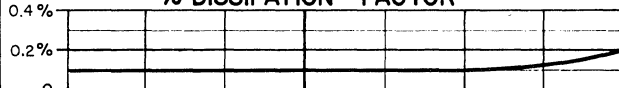
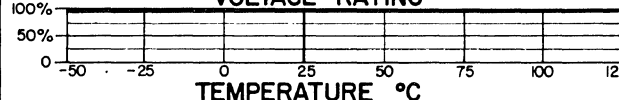
E11 QUALITY ASSURANCE

All capacitors are 100% screened and tested as follows:

1. 5 Temperature Cycles from -65°C to 125°C .
2. Helium Leak Test. 1×10^{-5} atm/cm²/sec. max. leak rate.
3. DC dielectric strength apply 200% of rated DC voltage from lead to lead and from leads to case for one minute.
4. Insulation Resistance at the rated voltage and 25°C , 100,000 mgs — uF minimum, but need not exceed 1,000,000 Megohms.
5. Capacitance % Tolerance at 1KHz and 25°C .
6. Dissipation Factor at 1KHz and 25°C , 0.1% maximum.
7. Visual Inspection for dimensions, marking and packaging.

INSULATION RESISTANCE
IN MEGOHMS (0.1 uF OR LESS)

SERIES
E11
TEFLON
CAPACITORS

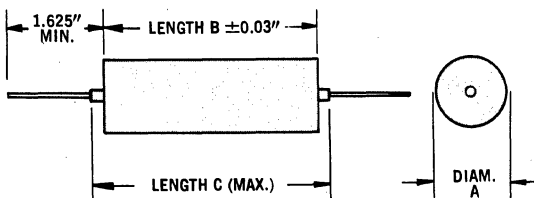
% CAPACITANCE CHANGE**% DISSIPATION FACTOR****VOLTAGE RATING**

SERIES 11 TEFLON

CASE DIMENSIONS

uF	11B 50VDC			11C 100 VDC			11D 200 VDC		
	Diam. A	Length B	Length C	Diam. A	Length B	Length C	Diam. A	Length B	Length C
.001	.235	.687	.887	.235	.687	.887	.235	.687	.887
.0012	.235	.687	.887	.235	.687	.887	.235	.687	.887
.0015	.235	.687	.887	.235	.687	.887	.235	.687	.887
.0018	.235	.687	.887	.235	.687	.887	.235	.687	.887
.002	.235	.687	.887	.235	.687	.887	.235	.687	.887
.0022	.235	.687	.887	.235	.687	.887	.235	.687	.887
.0027	.235	.687	.887	.235	.687	.887	.235	.687	.887
.0033	.235	.687	.887	.235	.687	.887	.235	.687	.887
.0039	.235	.687	.887	.235	.687	.887	.235	.687	.887
.0047	.235	.687	.887	.235	.687	.887	.235	.687	.887
.005	.235	.687	.887	.235	.687	.887	.235	.687	.887
.0056	.235	.687	.887	.235	.687	.887	.235	.687	.887
.0068	.235	.687	.887	.235	.687	.887	.235	.687	.887
.0082	.235	.687	.887	.235	.687	.887	.235	.687	.887
.01	.235	.687	.887	.235	.687	.887	.235	.687	.887
.012	.235	.687	.887	.235	.687	.887	.235	.687	.887
.015	.312	.687	.887	.312	.687	.887	.312	.687	.887
.018	.312	.687	.887	.312	.687	.887	.312	.813	1.013
.02	.312	.687	.887	.312	.687	.887	.312	.813	1.013
.022	.312	.687	.887	.312	.687	.887	.312	.813	1.013
.027	.312	.687	.887	.312	.813	1.013	.312	.813	1.013
.033	.312	.687	.887	.312	.813	1.013	.400	.813	1.013
.039	.312	.687	.887	.400	.813	1.013	.400	1.063	1.263
.047	.312	.687	.887	.400	.813	1.013	.400	1.063	1.263
.05	.312	.687	.887	.400	.813	1.013	.400	1.063	1.263
.056	.312	.813	1.013	.400	.813	1.013	.400	1.063	1.263
.068	.312	.813	1.013	.400	.813	1.013	.400	1.063	1.263
.082	.312	.937	1.137	.400	1.063	1.263	.500	1.125	1.325
.1	.312	.937	1.137	.400	1.063	1.263	.500	1.125	1.325
.12	.312	1.063	1.263	.500	1.125	1.325	.500	1.375	1.575
.15	.312	1.063	1.263	.500	1.125	1.325	.562	1.375	1.575
.18	.400	1.063	1.263	.500	1.125	1.325	.562	1.375	1.575
.20	.400	1.063	1.263	.562	1.125	1.325	.562	1.375	1.575
.22	.400	1.063	1.263	.562	1.125	1.325	.562	1.375	1.575
.27	.400	1.063	1.263	.562	1.125	1.325	.670	1.375	1.575
.33	.500	1.125	1.325	.562	1.125	1.325	.670	1.375	1.575
.39	.500	1.125	1.325	.562	1.375	1.575	.562	1.875	2.075
.47	.562	1.125	1.325	.670	1.375	1.575	.670	1.875	2.075
.50	.562	1.125	1.325	.670	1.375	1.575	.670	1.875	2.075
.56	.562	1.125	1.325	.670	1.375	1.575	.670	1.875	2.075
.68	.562	1.125	1.325	.670	1.875	2.075	.750	1.875	2.075
.82	.562	1.375	1.575	.670	1.875	2.075	.750	1.875	2.075
1.0	.670	1.375	1.575	.670	1.875	2.075	.750	1.875	2.075
1.5	.670	1.875	2.075	.750	1.875	2.075	1.00	1.875	2.075
2.0	.670	1.875	2.075	1.0	1.875	2.075	1.00	2.375	2.575

CONSTRUCTION INFORMATION



TYPE D51 TEFLON

CASE DIMENSIONS

uF	D51C TEFLON 100 VDC				D51D TEFLON 200 VDC			
	BASIC PART NO.	Diam. A	Length B	Length C	BASIC PART NO.	Diam. A	Length B	Length C
.001	D51C102	.235	.687	.887	D51D102	.235	.687	.887
.0012	D51C122	.235	.687	.887	D51D122	.235	.687	.887
.0015	D51C152	.235	.687	.887	D51D152	.235	.687	.887
.0018	D51C182	.235	.687	.887	D51D182	.235	.687	.887
.002	D51C202	.235	.687	.887	D51D202	.235	.687	.887
.0022	D51C222	.235	.687	.887	D51D222	.235	.687	.887
.0027	D51C272	.235	.687	.887	D51D272	.235	.687	.887
.0033	D51C332	.235	.687	.887	D51D332	.235	.687	.887
.0039	D51C392	.235	.687	.887	D51D392	.235	.687	.887
.0047	D51C472	.235	.687	.887	D51D472	.235	.687	.887
.005	D51C502	.235	.687	.887	D51D502	.235	.687	.887
.0056	D51C562	.235	.687	.887	D51D562	.235	.687	.887
.0068	D51C682	.235	.687	.887	D51D682	.235	.687	.887
.0082	D51C822	.235	.687	.887	D51D822	.235	.687	.887
.01	D51C103	.235	.687	.887	D51D103	.235	.687	.887
.012	D51C123	.235	.687	.887	D51D123	.235	.687	.887
.015	D51C153	.312	.687	.887	D51D153	.312	.687	.887
.018	D51C183	.312	.687	.887	D51D183	.400	.813	1.013
.02	D51C203	.312	.687	.887	D51D203	.400	.813	1.013
.022	D51C223	.312	.687	.887	D51D223	.400	.813	1.013
.027	D51C273	.400	.813	1.013	D51D273	.400	1.063	1.263
.033	D51C333	.400	.813	1.013	D51D333	.400	1.063	1.263
.039	D51C393	.400	1.063	1.263	D51D393	.400	1.063	1.263
.047	D51C473	.400	1.063	1.263	D51D473	.400	1.063	1.263
.05	D51C503	.400	1.063	1.263	D51D503	.400	1.063	1.263
.056	D51C563	.400	1.063	1.263	D51D563	.400	1.063	1.263
.068	D51C683	.400	1.063	1.263	D51D683	.400	1.063	1.263
.082	D51C823	.562	1.125	1.325	D51D823	.562	1.125	1.325
.1	D51C104	.562	1.125	1.325	D51D104	.562	1.125	1.325
.12	D51C124	.562	1.125	1.325	D51D124	.562	1.375	1.575
.15	D51C154	.562	1.375	1.575	D51D154	.562	1.875	2.075
.18	D51C184	.562	1.875	2.075	D51D184	.670	1.875	2.075
.20	D51C204	.562	1.875	2.075	D51D204	.670	1.875	2.075
.22	D51C224	.562	1.875	2.075	D51D224	.670	1.875	2.075
.27	D51C274	.670	1.875	2.075	D51D274	.670	1.875	2.075
.33	D51C334	.670	1.875	2.075	D51D334	.750	1.875	2.075
.39	D51C394	.750	1.875	2.075	D51D394	.750	1.875	2.075
.47	D51C474	.750	1.875	2.075	D51D474	1.00	2.375	2.575
.50	D51C504	.750	1.875	2.075	D51D504	1.00	2.375	2.575
.56	D51C564	.750	1.875	2.075	D51D564	1.00	2.375	2.575
.68	D51C684	1.00	1.875	2.075	D51D684	1.00	2.375	2.575
.82	D51C824	1.00	2.375	2.575	D51D824	1.00	2.625	2.825
1.0	D51C105	1.00	2.375	2.575	D51D105	1.00	2.625	2.825

LEAD WIRE SIZE AND TYPE

Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copper-weld) CRC type "W"
0.400" and larger	20	

CASE DIMENSIONS	TOLERANCE LIMITS
"A" Diameter	$\pm 0.010"$ Without Sleving $-0.00"$ $+0.02"$ With Mylar Sleving
"B" Case Length	$\pm 0.03"$ With or Without Sleving
"C" Bead to Bead Length	The lengths shown in tables are maximum and include the distance between solder beads.

CRC HIGH RELIABILITY CAPACITORS

TEFLON SPECIFICATIONS AND CASE SIZES

**TYPE
D51**

D51 SPECIFICATIONS

OPERATING TEMPERATURE: -65°C to 125°C at full rated voltage.

TEMPERATURE COEFFICIENT OF CAPACITANCE (25°C Reference).

+0.8% Max. at -50°C	-0.3% Max. at +50°C
+0.6% Max. at -25°C	-0.5% Max. at +75°C
+0.3% Max. at 0°C	-0.6% Max. at +100°C
	-0.8% Max. at +125°C

STABILITY WITH 5 TEMPERATURE CYCLES:

0.05% Max. Drift	-25°C to +85°C
0.25% Max. Drift	-65°C to +125°C

INSULATION RESISTANCE measured from terminal to terminal at rated voltage, and 5 minutes maximum charge time. For values greater than 1 mfd, allow an additional minute/mfd charge time.

MINIMUM I R					
Range	25°C	55°C	85°C	100°C	125°C
.001 to 0.1 uF (in Megohms)	10,000,000	5,000,000	3,000,000	1,500,000	300,000
Greater than 0.1 uF (in Megohms -- uF)	1,000,000	500,000	300,000	150,000	30,000

DIELECTRIC ABSORPTION: 0.01% Max. at 25°C.

DISSIPATION FACTOR: 0.01% Max. at 1 KHz and 25°C.

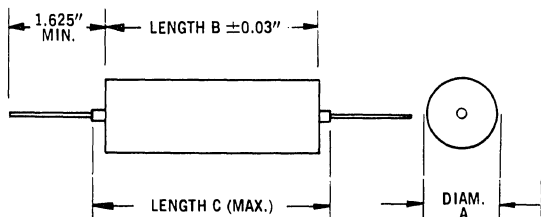
DIELECTRIC STRENGTH: 200% of rated voltage.

CONSTRUCTION: Teflon dielectric, hermetically sealed, extended metal foil or special metal film electrodes, leads isolated from case.

LEAD WIRE SIZE AND TYPE		
Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copper-weld) CRC type "W"
0.400" and larger	20	

SEAL TEST: 1×10^{-6} atm/cm²/sec. max. leak rate.

ENVIRONMENTAL: Capacitors shall meet all applicable requirements of MIL-C-83421.



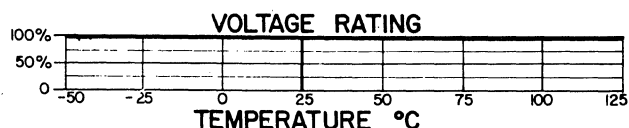
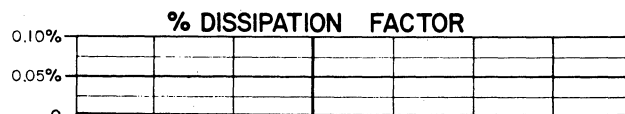
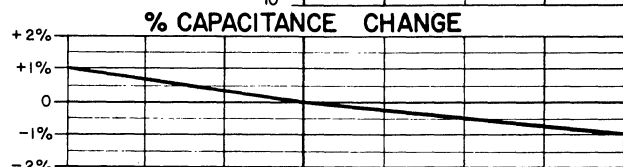
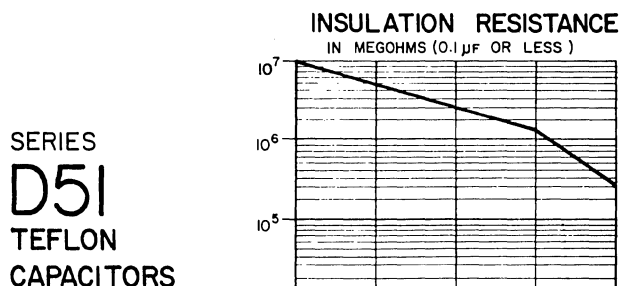
CASE DIMENSION	TOLERANCE LIMITS
"A" Diameter	±0.010" Without Slewing -0.00" +0.02" With Mylar Slewing
"B" Case Length	±0.03" With or Without Slewing
"C" Bead to Bead Length	The lengths shown in tables are maximum and include the distance between solder beads.

• PART NUMBER SYSTEM	PAGE 18
• MFG. & INSPECTION FLOW PLAN	PAGE 20
• QPL PROGRAM APPROVALS	PAGE 23
• CASE DIMENSIONS	PAGE 28
• LIFE TEST DATA	PAGE 30
• PRICES	PAGE 48
• STANDARD TOLERANCES	±0.25% to ±10%

D51 QUALITY ASSURANCE

All capacitors are 100% screened and tested as follows:

- 16 hours Burn-In at 125°C and 140% of the rated DC voltage.
- 10 Temperature Cycles from -65°C to 125°C.
- Helium Leak Test. 1×10^{-6} atm/cm²/sec. max. leak rate.
- DC dielectric strength apply 200% of rated DC voltage from lead to lead and from leads to case for one minute.
- Insulation Resistance at the rated voltage and 25°C, 1,000,000 megs — uF minimum, but need not exceed 10,000,000 Megohms.
- Capacitance % Tolerance at 1KHz and 25°C.
- Dissipation Factor at 1KHz and 25°C, 0.005% maximum.
- Visual inspection for dimensions, marking and packaging.
- Traceability to production and test records by permanent marking of parts with lot control number.
- Process and inspection data is maintained on file per NPC-200-3, MIL-Q-9858 quality control standards and MIL-STD-790 Reliability Assurance Program.



CRC HIGH RELIABILITY CAPACITORS

LIFE TEST DATA

TYPE B11B TEFLON • TYPE X51 TEFLON • TYPE "JW" TEFLON

TYPE B11B TEFLON CAPACITORS (Formerly 05TJ)

Test reports covering high reliability metallized teflon capacitors manufactured by Component Research Co. since 1962 show that these capacitors are still unequalled for low loss, stability and reliability.

The test data listed below is typical of the performance characteristics of CRC type B11B or C11B teflon capacitors, shown on pages 24 and 25 of this catalog.

Additional test data is on file which has been accumulated from qualification testing since 1963 for critical programs such as Apollo, Lunar Orbiter, Discoverer, etc.

If your application demands highest possible insulation resistance up to 125°C, and extreme low loss characteristics, we suggest series 11 teflon capacitors. For high RMS AC current

applications see series 51 teflon or contact a CRC applications engineer at the address shown at bottom of page for further details.

TYPE B11B LIFE TEST SUMMARY

Summary data shown below covers 85 precision teflon 50VDC capacitors, life tested for 1000 hours at 125°C, with 70VDC applied. There were no failures for all capacitors tested. Data has been extracted from CRC test reports 70TR12, 71TR18, 71TR19, 71TR20 and 71TR21.

List of Capacitors Life Tested			Insulation Resistance In Megohms at 25°C			% Capacitance Change With Life			% Dissipation Factor at 25°C		
CRC Type	Capacitance μ F Value	No. Tested	Post Test Limits	Test Results		Post Test Limits	Test Results		Post Test Limits	Test Results	
				Low	High		Low	High		Low	High
05 TJ	.04667	7	2.2×10^5	1.5×10^7	4.5×10^7	0.5%	-.07%	-.27%	0.1%	.01%	.02%
05 TJ	.047	5	2.2×10^5	4×10^4	4.5×10^7	0.5%	-.08%	-.47%	0.1%	.01%	.02%
05 TJ	.05	9	2.2×10^5	2×10^4	4.5×10^7	0.5%	-.18%	-.34%	0.1%	.01%	.01%
05 TJ	.068	5	2.2×10^5	9×10^4	1.5×10^7	0.5%	-.09%	-.33%	0.1%	.01%	.05%
05 TJ	.10	11	2.2×10^5	3×10^4	4.5×10^7	0.5%	-.06%	-.37%	0.1%	.01%	.09%
05 TJ	.15	4	2.2×10^5	3×10^4	4.5×10^7	0.5%	-.09%	-.16%	0.1%	.01%	.03%
05 TJ	.1942	8	2.2×10^5	5×10^4	4.5×10^7	0.5%	-.02%	-.20%	0.1%	.01%	.04%
05 TJ	.33	5	2.2×10^5	7×10^4	1.5×10^7	0.5%	-.07%	-.16%	0.1%	.01%	.01%
05 TJ	.47	8	2.2×10^5	1.1×10^4	4.5×10^7	0.5%	-.08%	-.28%	0.1%	.01%	.08%
05 TJ	.5	6	2.2×10^5	1.5×10^4	4.5×10^7	0.5%	-.08%	-.22%	0.1%	.02%	.06%
05 TJ	2.0	17	1.1×10^5	1.3×10^5	2.2×10^7	0.5%	+.02%	-.10%	0.1%	.01%	.01%

TYPE X51 SPECIAL TEFLON CAPACITORS (Similar to New D51 Series)

Test Item No.	Examination or Test	Conditions	Limits
1	Burn-In	@ 85°C, 96 hrs. @ 750VDC	
2	Temperature Cycling	-62°C/125°C	5 cycles
3	Seal Test	Helium Leak Test	1×10^{-4} max. leak rate
4	AC-Dielectric Strength	@25°C, 30 min. 400 volts peak square wave @ 500 Hz	
5	DC-Dielectric Strength	Lead to lead and leads to case	@ 1000VDC
6	Insulation Resistance	@ 500V, 25°C	5000 picoamps max.
7	Capacitance % Tolerance	@ 1 KHz, 25°C	$\pm 0.5\%$ max.
8	Dissipation Factor	@ 1 KHz, 25°C	0.01% max.
9	Temperature Coefficient	0°C to 25°C 25°C to 85°C	$\pm .35\%$ max. $\pm .65\%$ max.

In applications involving abnormal AC current or voltage conditions it is recommended that you contact CRC applications engineers or consult AC data pages in this catalog.

The X51 500 volt teflon capacitors were specially designed to provide low loss high frequency AC characteristics in small package size. Our customer was having difficulty with catastrophic failure, drift and overheating using ordinary capacitors but the CRC X51 capacitors solved these problems and improved circuit performance considerably.

Table at left is part of X51 screening and processing performed on a 100% basis.

TYPE X51 LIFE TEST SUMMARY

Data shown below covers 48 teflon-foil capacitors life tested at 750VDC at 85°C for 1000 hours. There were no failures in this test. This data has been extracted from CRC test reports 70TR09, 70TR15, 71TR22 and 71TR23.

CRC Type	Capacitance μ F Value	No. Tested	Post Test Limits	Test Results		Post Test Limits	Test Results		Post Test Limits	Test Results	
				Low	High		Low	High		Low	High
X51	0.1	24	1×10^5	5×10^6	1.6×10^4	$\pm 1\%$	0.00%	+ .16%	0.01%	.01%	.01%
X51	0.2	24	1×10^5	6×10^6	2×10^7	$\pm 1\%$	0.00%	- .16%	0.01%	.01%	.01%

SPECIAL TYPE "JW" TEFLON CAPACITORS (For Apollo)

The series 11 teflon capacitors listed in this catalog are of the same construction and are similar in performance to the "JW" teflon capacitors.

The "JW" capacitors were specially screened to meet critical Apollo requirements and were an important factor in maintenance of precise guidance and control for Apollo flights.

Life test data is shown as a demonstration of the excellent performance of our earlier teflon high reliability capacitors.

The newer series 11 teflon capacitors are now available at much lower cost than the "JW" capacitors and have even greater reliability as a result of added years of manufacturing experience.

TYPE "JW" LIFE TEST SUMMARY

The summary data shown below covers 100 precision teflon capacitors consisting of 50 05JW2233G (0.22 μ F 50VDC 2%) and 50 05JW224G (.22 μ F 50VDC 2%) capacitors that were life tested for 2,000 hours at 125°C and at 75VDC. There were no failures for all the capacitors tested. Data has been extracted from CRC Test Report No. 5-534.

CRC Type	Capacitance μ F Value	No. Tested	Post Test Limits	Test Results		Post Test Limits	Test Results		Post Test Limits	Test Results	
				Low	High		Low	High		Low	High
05 JW	.022	50	9×10^4	4.5×10^4	4.5×10^7	$\pm 3\%$	-.11%	-.95%	0.05%	.01%	.03%
05 JW	.22	50	9×10^4	5×10^4	1.5×10^7	$\pm 3\%$	-.09%	-.75%	0.05%	.01%	.04%

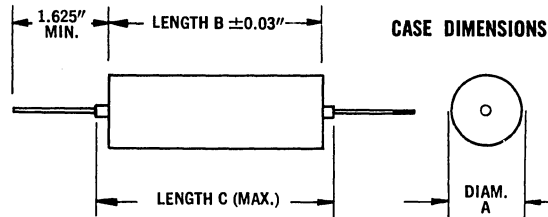
CRC HIGH RELIABILITY CAPACITORS

CORDWOOD (Reduced Length) CASE SIZES

SERIES E32 CORDWOOD POLYCARBONATE

- Specifications same as series E12 except for dimensions and AC ratings. See page 16.
- Price and ordering information appears on page 45.
- See page 18 for part number system.

SERIES E32 & D31



CASE DIMENSION	TOLERANCE LIMITS
"A" Diameter	± 0.010 " Without Sleeveing -0.00 " $+0.02$ " With Mylar Sleeveing
"B" Case Length	± 0.03 " With or Without Sleeveing
"C" Bead to Bead Length	The lengths shown in tables are maximum and include the solder beads.

SERIES D31 CORDWOOD TEFLON

- See page 26 for D11 Teflon specifications which apply to D31B cordwood capacitors (except for temperature coefficient which is approximately 25% greater than D11 capacitors).
- See page 45 for prices and lead wire requirements, and ordering information.
- See page 18 for complete details concerning the part number system.

E32A 30VDC POLYCARBONATE					E32B 50VDC POLYCARBONATE				uF	D31B 50VDC TEFLON			
uF	Basic Part No.	Diam. A	Length B	Length C	Basic Part No.	Diam. A	Length B	Length C		Basic Part No.	Diam. A	Length B	Length C
.001	E32A102	.170	.500	.600	E32B102	.170	.500	.600	.001	D31B102	.193	.562	.600
.0012	E32A122	.170	.500	.600	E32B122	.170	.500	.600	.0012	D31B122	.193	.562	.600
.0015	E32A152	.170	.500	.600	E32B152	.170	.500	.600	.0015	D31B152	.193	.562	.600
.0018	E32A182	.170	.500	.600	E32B182	.170	.500	.600	.0018	D31B182	.193	.562	.600
.002	E32A202	.170	.500	.600	E32B202	.170	.500	.600	.002	D31B202	.193	.562	.600
.0022	E32A222	.170	.500	.600	E32B222	.170	.500	.600	.0022	D31B222	.193	.562	.600
.0027	E32A272	.170	.500	.600	E32B272	.170	.500	.600	.0027	D31B272	.193	.562	.600
.0033	E32A332	.170	.500	.600	E32B332	.170	.500	.600	.0033	D31B332	.193	.562	.600
.0039	E32A392	.170	.500	.600	E32B392	.170	.500	.600	.0039	D31B392	.235	.562	.600
.0047	E32A472	.170	.500	.600	E32B472	.170	.500	.600	.0047	D31B472	.235	.562	.600
.005	E32A502	.170	.500	.600	E32B502	.170	.500	.600	.005	D31B502	.235	.562	.600
.0056	E32A562	.170	.500	.600	E32B562	.170	.500	.600	.0056	D31B562	.235	.562	.600
.0068	E32A682	.170	.500	.600	E32B682	.170	.500	.600	.0068	D31B682	.235	.562	.600
.0082	E32A822	.170	.500	.600	E32B822	.170	.500	.600	.0082	D31B822	.235	.562	.600
.01	E32A103	.170	.500	.600	E32B103	.170	.500	.600	.01	D31B103	.235	.562	.600
.012	E32A123	.170	.500	.600	E32B123	.170	.500	.600	.012	D31B123	.235	.562	.600
.015	E32A153	.170	.500	.600	E32B153	.170	.500	.600	.015	D31B153	.235	.625	.670
.018	E32A183	.170	.500	.600	E32B183	.170	.500	.600	.018	D31B183	.235	.625	.670
.02	E32A203	.170	.500	.600	E32B203	.193	.562	.600	.02	D31B203	.235	.625	.670
.022	E32A223	.170	.500	.600	E32B223	.193	.562	.600	.022	D31B223	.235	.625	.670
.027	E32A273	.170	.500	.600	E32B273	.193	.562	.600	.027	D31B273	.235	.625	.670
.033	E32A333	.170	.500	.600	E32B333	.193	.562	.600	.033	D31B333	.312	.625	.670
.039	E32A393	.170	.500	.600	E32B393	.193	.625	.670	.039	D31B393	.312	.625	.670
.047	E32A473	.170	.500	.600	E32B473	.193	.625	.670	.047	D31B473	.312	.625	.670
.05	E32A503	.170	.500	.600	E32B503	.193	.625	.670	.05	D31B503	.312	.625	.670
.056	E32A563	.170	.562	.600	E32B563	.193	.625	.670	.056	D31B563	.312	.625	.670
.068	E32A683	.170	.562	.600	E32B683	.235	.625	.670	.068	D31B683	.312	.625	.670
.082	E32A823	.193	.562	.600	E32B823	.235	.625	.670	.082	D31B823	.312	.625	.670
.1	E32A104	.193	.562	.600	E32B104	.235	.625	.670	.1	D31B104	.312	.625	.670
.12	E32A124	.193	.687	.750	E32B124	.235	.625	.670	.12	D31B124	.312	.937	1.00
.15	E32A154	.193	.687	.750	E32B154	.312	.625	.670	.15	D31B154	.312	.937	1.00
.18	E32A184	.193	.687	.750	E32B184	.312	.625	.670	.18	D31B184	.400	.937	1.00
.20	E32A204	.193	.687	.750	E32B204	.312	.625	.670	.2	D31B204	.400	.937	1.00
.22	E32A224	.193	.687	.750	E32B224	.312	.625	.670	.22	D31B224	.400	.937	1.00
.27	E32A274	.235	.687	.750	E32B274	.312	.625	.670					
.33	E32A334	.235	.687	.750	E32B334	.312	.687	.750					
.39	E32A394	.235	.687	.750	E32B394	.312	.687	.750					
.47	E32A474	.235	.687	.750	E32B474	.312	.687	.750					
.50	E32A504	.235	.687	.750	E32B504	.312	.687	.750					
.56	E32A564	.312	.687	.750	E32B564	.400	.687	.750					
.68	E32A684	.312	.687	.750	E32B684	.400	.687	.750					
.82	E32A824	.312	.687	.750	E32B824	.400	.687	.750					
1.0	E32A105	.312	.687	.750	E32B105	.400	.687	.750					
1.2	E32A125	.312	.813	.900									
1.5	E32A155	.312	.937	1.00									
2.0	E32A205	.312	1.063	1.10									
2.2	E32A225	.312	1.063	1.10									
2.7	E32A275	.400	.937	1.00									
3.0	E32A305	.400	.937	1.00									
3.3	E32A335	.400	.937	1.00									
4.0	E32A405	.400	1.063	1.10									
4.7	E32A475	.400	1.375	1.45									
5.0	E32A505	.400	1.375	1.45									
5.6	E32A565	.500	1.375	1.45									
6.8	E32A685	.500	1.375	1.45									
8.0	E32A805	.500	1.375	1.45									
10.0	E32A106	.500	1.375	1.45									
SERIES E32 & D31 LEAD WIRE SIZE & TYPE													
CASE DIAMETER								Lead Wire Size #AWG		LEAD WIRE MATERIAL			
0.312" and smaller								22		Tinned Copper Clad Steel (Tinned Copperweld) CRC type "W"			
0.400" and 0.500"								20					
ENVIRONMENTAL: Capacitors shall meet all applicable requirements of MIL-C-83421. CONSTRUCTION: Hermetically sealed, extended metal film electrodes, leads isolated from case.													

SERIES E32 & D31 LEAD WIRE SIZE & TYPE

CASE DIAMETER	Lead Wire Size #AWG	LEAD WIRE MATERIAL
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copperweld) CRC type "W"
0.400" and 0.500"	20	

ENVIRONMENTAL: Capacitors shall meet all applicable requirements of MIL-C-83421.
CONSTRUCTION: Hermetically sealed, extended metal film electrodes, leads isolated from case.

SERIES

N53**POLYSTYRENE-FOIL****HIGH INSULATION RESISTANCE
AND LONG TERM STABILITY**

- QUALIFIED FOR SPACE APPLICATIONS, CRITICAL OPERATIONAL AMPLIFIER SYSTEMS AND NETWORKS
- 100% SCREENED (LEVEL 3)
- 5,000,000 MEGOHMS IR (0.1 MFD OR LESS)

DC VOLTS	CRC TYPE	OLD P/N
50 VDC	N53B	05 PA
100 VDC	N53C	1 PA
200 VDC	N53D	2 PA

- PART NUMBER SYSTEM: PAGE 18
- CASE DIMENSIONS: PAGE 33
- APPLICATION NOTES: PAGE 34
- PRICES: PAGE 49
- STANDARD TOLERANCES: $\pm 0.1\%$ to $\pm 10\%$
- SERIES L53 Capacitors with burn-in and high reliability screening can also be supplied. For advance information on a new high temperature polystyrene capacitor see pages 34, 37.

N53 SPECIFICATIONS

OPERATING TEMPERATURE: -65°C to 85°C at full rated volts.

TEMPERATURE COEFFICIENT: (See special notes below*)
 Values 0.001 MFD to 0.0082 MFD $-80 \pm 50\text{PPM}/^{\circ}\text{C}$
 0.01 MFD to 2.0 MFD $-60 \pm 50\text{PPM}/^{\circ}\text{C}$

*NOTES: Special Polystyrene Capacitors can be supplied with a negative coefficient of -20 to $-100\text{ PPM}/^{\circ}\text{C}$ that is linear to $\pm 30\text{ PPM}/^{\circ}\text{C}$, $\pm 20\text{ PPM}/^{\circ}\text{C}$ and $\pm 10\text{ PPM}/^{\circ}\text{C}$. A WIDE SELECTION is available of larger MFD values in bathtub and custom cases.

STABILITY: .03% maximum drift with 5 cycles from -25°C to 85°C .

INSULATION RESISTANCE: Measured from terminal to terminal at rated voltage, and 5 minutes maximum charge time. For values greater than 1 μF , allow an additional minute/ μF charge time.

MINIMUM IR			
Range	25°C	55°C	85°C
0.001 to 0.2 μF (in Megohms)	5,000,000 Megohms	2,500,000 Megohms	500,000 Megohms
0.22 to 1.0 μF (in Megohms)	1,000,000 Megohms	500,000 Megohms	100,000 Megohms
Above 1.0 μF (in Megohms - μF)	$\dagger$ 1,000,000 Megohms- μF	$\dagger$ 500,000 Megohms- μF	$\dagger$ 100,000 Megohms- μF
$\dagger$ For capacitor values over 1 μF , divide by μF value to obtain minimum IR limits.			
EXAMPLE: A 2 μF capacitor at 25°C is 500,000 megohms			

DIELECTRIC ABSORPTION: 0.02% Max. at 25°C.

DISSIPATION FACTOR: 0.02% Max. at 1 KHz and 25°C.
 Values above 1 μF measured at 0.1 KHz.

DIELECTRIC STRENGTH: 200% of rated volts.

CONSTRUCTION: Polystyrene dielectric, hermetically sealed, extended metal foil or special metal film electrodes, leads isolated from case.

LEAD WIRE SIZE AND TYPE		
Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copperweld) CRC type "W"
0.400" and 0.500"	20	
0.562" and larger	18	Oxygen free tinned copper wire CRC type "C"

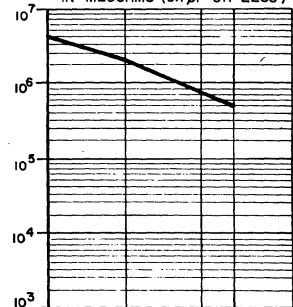
SEAL TEST: 1×10^{-6} atm/cm²/sec max. leak rate.

ENVIRONMENTAL: Capacitors shall be capable of meeting all applicable requirements of MIL-C-83421 including high frequency vibration.

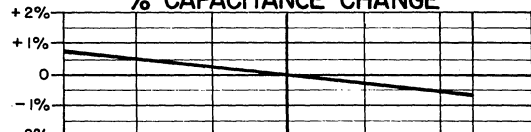
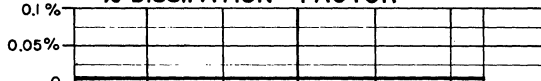
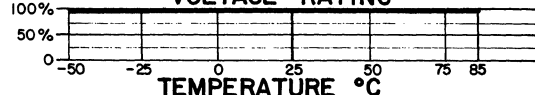
N53 QUALITY ASSURANCE

All capacitors are 100% screened and tested as follows:

1. 5 Temperature Cycles from -65°C to 85°C .
2. Helium Leak Test. 1×10^{-6} atm/cm²/sec. max. leak rate.
3. DC dielectric strength at 200% of the rated DC voltage.
4. Insulation Resistance at the rated voltage and 25°C, 1,000,000 megs — μF minimum. See minimum IR table in specifications.
5. Capacitance % Tolerance at 1 KHz and 25°C.
6. Dissipation Factor at 1 KHz and 25°C, 0.02% maximum.
7. Visual inspection (External) for dimensions, marking and packaging.
8. Traceability to production and test records by permanent marking of parts with lot control number.
9. Process and inspection data is maintained on file per NPC-200-3, Mil-Q-9858 quality control standards and MIL-STD-790 Reliability Assurance Program.

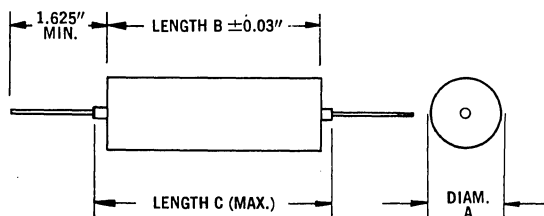
INSULATION RESISTANCE
IN MEGOHMS (0.1 μF OR LESS)

SERIES

N53**POLYSTYRENE
CAPACITORS****% CAPACITANCE CHANGE****% DISSIPATION FACTOR****VOLTAGE RATING**

CRC SERIES N53 POLYSTYRENE CAPACITOR DIMENSIONS

Series N53 Polystyrene Capacitors are widely used in instrumentation applications requiring high insulation resistance, low dielectric absorption, excellent stability, and linear temperature coefficient of capacitance. Larger capacitance values and higher voltage ratings are available and will be added to our N53 specifications in our next catalog issue. Contact our sales office for special requirements.



CASE DIMENSION	TOLERANCE LIMITS
"A" Diameter	±0.010" Without Sleeveing
	-0.00" +0.02" With Mylar Sleeveing
"B" Case Length	±0.03" With or Without Sleeveing
"C" Bead to Bead Length	The lengths shown in tables are maximum and include the solder beads

uF	BASIC PART NO.	N53B 50 VDC			BASIC PART NO.	N53C 100 VDC		
		Diam. A	Length B	Length C		Diam. A	Length B	Length C
.001	N53B102	.193	.687	.887	N53C102	.193	.687	.887
.0012	N53B122	.193	.687	.887	N53C122	.193	.687	.887
.0015	N53B152	.193	.687	.887	N53C152	.193	.687	.887
.0018	N53B182	.193	.687	.887	N53C182	.193	.687	.887
.002	N53B202	.193	.687	.887	N53C202	.193	.687	.887
.0022	N53B222	.193	.687	.887	N53C222	.193	.687	.887
.0027	N53B272	.193	.687	.887	N53C272	.193	.687	.887
.0033	N53B332	.193	.687	.887	N53C332	.193	.687	.887
.0039	N53B392	.193	.687	.887	N53C392	.193	.687	.887
.0047	N53B472	.193	.687	.887	N53C472	.193	.687	.887
.005	N53B502	.193	.687	.887	N53C502	.193	.687	.887
.0056	N53B562	.193	.687	.887	N53C562	.193	.687	.887
.0068	N53B682	.193	.687	.887	N53C682	.193	.687	.887
.0082	N53B822	.193	.813	1.013	N53C822	.193	.813	1.013
.01	N53B103	.193	.813	1.013	N53C103	.193	.813	1.013
.012	N53B123	.235	.813	1.013	N53C123	.235	.813	1.013
.015	N53B153	.235	.813	1.013	N53C153	.235	.813	1.013
.018	N53B183	.312	.813	1.013	N53C183	.312	.813	1.013
.02	N53B203	.312	.813	1.013	N53C203	.312	.813	1.013
.022	N53B223	.312	.813	1.013	N53C223	.312	.813	1.013
.027	N53B273	.312	.813	1.013	N53C273	.312	.813	1.013
.033	N53B333	.312	.813	1.013	N53C333	.312	.813	1.013
.039	N53B393	.312	.813	1.013	N53C393	.400	.813	1.013
.047	N53B473	.312	.813	1.013	N53C473	.400	.813	1.013
.05	N53B503	.312	.813	1.013	N53C503	.400	.813	1.013
.056	N53B563	.312	.813	1.013	N53C563	.400	.813	1.013
.068	N53B683	.400	.813	1.013	N53C683	.400	1.063	1.263
.082	N53B823	.400	1.063	1.263	N53C823	.400	1.063	1.263
.1	N53B104	.400	1.063	1.263	N53C104	.400	1.375	1.575
.12	N53B124	.400	1.063	1.263	N53C124	.400	1.375	1.575
.15	N53B154	.400	1.375	1.575	N53C154	.400	1.375	1.575
.18	N53B184	.500	1.375	1.575	N53C184	.500	1.375	1.575
.20	N53B204	.500	1.375	1.575	N53C204	.500	1.375	1.575
.22	N53B224	.500	1.375	1.575	N53C224	.562	1.375	1.575
.27	N53B274	.562	1.375	1.575	N53C274	.562	1.875	2.075
.33	N53B334	.562	1.375	1.575	N53C334	.562	1.875	2.075
.39	N53B394	.562	1.875	2.075	N53C394	.670	1.875	2.075
.47	N53B474	.562	1.875	2.075	N53C474	.670	1.875	2.075
.50	N53B504	.562	1.875	2.075	N53C504	.670	1.875	2.075
.56	N53B564	.562	1.875	2.075	N53C564	.670	1.875	2.075
.68	N53B684	.670	1.875	2.075	N53C684	.750	1.875	2.075
.82	N53B824	.750	1.875	2.075	N53C824	1.00	1.875	2.075
1.0	N53B105	.750	1.875	2.075	N53C105	1.00	1.875	2.075
1.5	N53B155	1.0	1.875	2.075	N53C155	1.00	2.375	2.575
2.0	N53B205	1.0	2.375	2.575				

SPECIAL MINIATURE SERIES N13 POLYSTYRENE CAPACITORS

Component Research Co. has developed a new product line of special Metallized Polystyrene Capacitors, Type N13, which are approximately 50% smaller in size than the N53 Series. The N13 capacitors have the same high quality, high performance features as Series 53 and will ultimately be qualified to established reliability specification MIL-C-83421. The unique patented construction and process features of CRC capacitors have been incorporated into the N13 Series which makes them the most reliable and miniature Polystyrene capacitors

available for aerospace or industrial applications. The N13 Series has a low dissipation factor of 0.02% maximum and can be fully operated to 85°C reliably without voltage derating.

We believe the N13 Series will be useful in airborne applications where the N53 Series are too large in size and weight or where the Series 12 Polycarbonate have too high a dielectric absorption or too low an insulation resistance. Please contact our sales office for further information.

CRC HIGH RELIABILITY CAPACITORS

N53 POLYSTYRENE CAPACITORS SPECIAL TYPE L53 POLYSTYRENE CAPACITORS

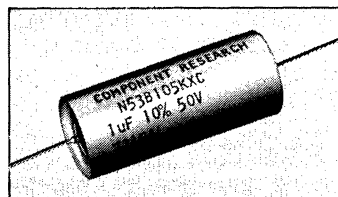
N53 POLYSTYRENE APPLICATION NOTES

Medical Research Laboratories, Industrial Research Institutes and Instrumentation Manufacturers find our N53 polystyrene capacitors are their favorite choice for integrating and other memory applications.

The N53B105KXC 1 μ F, 50VDC capacitor shown below is .0750" x 1.875" hermetically sealed, and helium leak tested to maintain its low loss characteristics for long term use.

Typically, this capacitor exhibits less than 0.01 nanoamps leakage current at 25°C $\pm$ 20°C with 10VDC applied. The low dielectric absorption, low dissipation factor and excellent capacitance stability with time, makes this capacitor ideal for laboratory and critical industrial applications.

N53 polystyrene capacitors are available in bathtub



**STANDARD
TUBULAR
P/N
N53B105KXC**

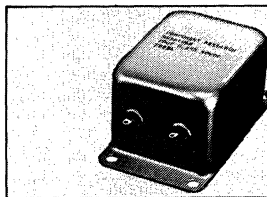
cases and custom designed metal cases where capacitance values above the standard values listed on catalog page 33 are needed.

Capacitors up to 100 μ F of extremely high quality can be supplied to meet individual customer requirements.

The N53B106B 10 μ F, 50VDC polystyrene capacitor shown below is approximately 2.25" x 2.88" x 2" high, plus the $\frac{3}{8}$ " wide mounting flanges. Leakage current at 10VDC and at 25°C is less than 0.1 nanoamps.

A 10 μ F 10% 50VDC, N53B106K capacitor domestic price is approximately \$40.00 in quantities from 1-10 pieces.

Special polystyrene capacitors for high AC power resonating use, are also available with very low loss frequency characteristics and heavy duty terminations.



**SPECIAL
BATHTUB
P/N
N53B106B**

SPECIAL "L53" TYPE HIGH TEMPERATURE POLYSTYRENE CAPACITORS

CRC has developed miniature polystyrene capacitors that can safely be stored above 85°C. This has been made possible by the use of a combination of the CRC patented winding and termination construction, and special metal film electrodes which support the polystyrene dielectric in a stress-free manner at temperatures above 85°C (CRC patent pending.)

Although CRC is confident that operation is possible at temperatures up to 105°C, (some lots have been operated at 125°C) we recommend that the normal operating temperature range be limited from -65°C to 85°C. This recommendation is not based upon any reliability problems at 105°C, but is rather due to a slight capacitance offset (called TC Hysteresis) that occurs when operated or stored above 85°C. The L53 polystyrene capacitors have an unusually linear temperature coefficient slope from -55°C to 85°C. Their retrace is superb and we believe this type will be excellent for low cost standards

which we now supply for laboratory use.

As of February 1971 a total of 40 capacitors ranging from 0.0022 MFD to 0.01 MFD consisting of 50 and 100 volts DC rated units were subjected to a Reliability Demonstration test for a total of 2,000 hours at 105°C and at 100% of the rated DC voltage. All the capacitors also received a total of 75 temperature cycles from -62°C to +85°C in order to further stress the terminations of these capacitors. The capacitors were then visually inspected, seal tested and electrically inspected.

The capacitors indicated no significant Δ % capacitance, % DF and IR changes and there were no opens or shorts as indicated by the measurements shown in the table below. CRC will be conducting further testing on larger quantities of capacitors covering wider microfarad and voltage ranges in order to determine the proper ratings for these unusually reliable high temperature polystyrene capacitors. See page 37.

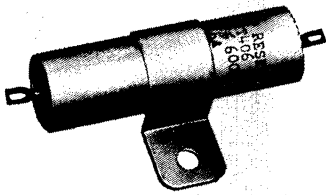
L53 POLYSTYRENE DC LIFE TEST DATA AT 105°C

TEST REPORT CRC XT398

Test results for 26 50VDC polystyrene capacitors life tested for 2,000 hours at 105°C with 50VDC applied. There were no failures for this group.	LIST OF CAPACITORS LIFE TESTED			INSULATION RESISTANCE IN MEGOHMS AT 25°C		% CAPACITANCE CHANGE WITH LIFE		% DISSIPATION FACTOR AT 25°C	
	CRC Type	MFD Value	No. Tested	Test Results		Test Results		Test Results	
				Low	High	Low	High	Low	High
	L53	.0022	5	5.6 x 10 ⁵	4.5 x 10 ⁷	+.05	+.80	.01	.01
	L53	.005	5	4.5 x 10 ⁷	4.5 x 10 ⁷	-.03	+.34	.01	.01
	L53	.01	14	3.4 x 10 ⁵	4.5 x 10 ⁷	0.00	+.30	.01	.01
	L53	.068	2	2.2 x 10 ⁷	4.5 x 10 ⁷	0.00	+.70	.01	.01
Test results for 14 100VDC polystyrene capacitors life tested for 2,000 hours at 105°C with 100VDC applied. There were no failures for this group.	L53	.005	14	2 x 10 ⁵	4.5 x 10 ⁷	+.01	+.50	.01	.01

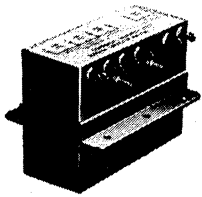
SPECIAL CAPACITOR APPLICATION SECTION

POWER RESONATING • SCR COMMUTATING • PULSE FORMING • AC ORDERING INFORMATION



The 0.033 μF , 2%, 600VDC, polystyrene capacitor shown is .562" x 1.875" size and is rated at 1.5 AMPS RMS AC. The capacitor is designed to handle 300V RMS AC at frequencies up to 25,000 Hz and to simultaneously withstand rugged environmental testing for a high reliability underseas application.

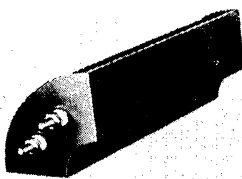
During operation and extreme environmental conditions the capacitor must not exhibit microphonics, noise, or corona and the short or long term capacitance drift must be maintained to very close limits. In many applications, burn-in under AC conditions similar to customer use can be performed as a 100% screening procedure.



In this application, high quality foil polypropylene and polystyrene capacitors were used to provide precise three phase motor control of a critical underwater guidance system. The capacitors must withstand transient voltage and current spikes during severe environmental stress without affecting reliability.

The highest quality materials are used including RTV silicone rubber potting compounds which are carefully lot controlled and processed to provide excellent electrical properties and extended life.

Typically the capacitors operate at 180V RMS from 400 Hz to 1200 Hz and must also withstand transients of 500 volts per millisecond under pulse peak to peak conditions of 800 volts.



As an example of CRC design of special purpose capacitors, four, quarter round capacitors were assembled to form a coaxial capacitor with a 2" I.D. hole. Through this hole a copper pipe is passed with a circulating coolant to remove the heat generated due to the watts-loss of the capacitors.

In this application all parts were custom designed to provide low loss including special terminals capable of handling 100 AMPS RMS with minimum heating.

Special capacitors can be supplied to handle peak currents ranging into thousands of amperes for short periods in the micro-second region.

CRC patented capacitor designs provide the lowest possible loss, the highest reliability, consistent with minimum package size and reasonable cost.

CRC has over 150 KVA of AC power generators in constant use for power burn-in and life test of capacitors from 400 Hz to 40 KHz. Our present plans are to double this power generating capability with a view to CRC becoming a world leader in the development and manufacture of finest quality AC capacitors as well as CRC standard precision capacitors.

STUDYING YOUR AC CAPACITOR REQUIREMENTS

It is important to provide detailed information concerning all normal and worst case conditions, space availability, quantity, delivery required, and if possible any problems previously encountered with capacitors used.

In the example below the customer has presented his requirements in detail including the current and voltage waveforms.

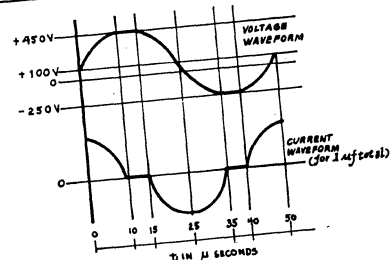
Please provide us with similar information when making inquiries for special AC capacitors so that we can make recommendations or quotations with minimum delay.

Following is a typical example of how your AC capacitor inquiry should be formulated. (Excerpt from a customer RFQ).

Item	REQUIREMENTS			Notes
	C1	C2	C3	
Capacitance	0.5 μF	0.1 μF	0.05 μF	
Tolerance 25°C	$\pm 1\%$	$\pm 1\%$	$\pm 1\%$	
Max. Capacitance Change (-20°C to +71°C)	$\pm 1\%$			
Peak to Peak Voltage	700V	700V	700V	1
RMS Voltage	250V	250V	250V	
Peak Current	28.3A	4.65A	2.3A	
RMS Current	17.3A	2.84A	1.4A	
Peak (Fault) Current	35.5A	5.9A	3.0A	
Max. Frequency, (KHz)	20	20	20	2
Temp. Range, Operating	-20°C to +70°C	-20°C to +70°C	-20°C to +70°C	
Temp. Range, Storage	-55°C to +85°C	-55°C to +85°C	-55°C to +85°C	3
% Dissipation Factor	$\leq 0.1\%$	$\leq 0.1\%$	$\leq 0.1\%$	4
Life, Goal in Hours	10,000	10,000	10,000	5
Weight	$\leq 0.38\#$	$\leq 0.08\#$	$\leq 0.04\#$	
Quantity Needed	8	14	14	
Applicable Mil Specs	N/A	N/A	N/A	6, 7
Construction	Hermetic	Tubular	Preferred	
Terminals	Axial Wire Leads			

NOTES

- Refer to voltage waveform.
- Frame Temp.
- Goal is $< 0.05\%$.
- Goal is $< 0.5\#/\mu\text{F}$. Vendor to advise case size.
- Delivery is required within 4 weeks.
- Vendor to recommend wire size and material. best suited for current handling. 1.5" length is satisfactory.
- Item presently being used is foil mylar and is overheating and has too low a Q. Please recommend capacitor that will have minimum heat rise and will maintain resonance of tank circuit within $\pm 0.3\%$ when operated continuously at 25°C ambient $\pm 5^\circ\text{C}$.



LIFE TEST DATA Series 14 Polysulfone Capacitors

Polysulfone, one of our newer dielectric materials, has many advantages to offer in terms of extended temperature range, and low temperature coefficient of capacitance.

In accordance with the CRC established policy of introducing new products with conservative ratings, life testing has been conducted at 125°C and at ratings that we believe will provide reliable, high quality polysulfone capacitors. Our new series

14 polysulfone specifications are in line with this policy, and are based upon the manufacture and test of thousands of polysulfone capacitors since 1970.

In addition to AC life tests, DC life at higher temperatures and voltage levels are in process. Future catalog issues will undoubtedly contain additional polysulfone specifications and life test data at extended conditions.

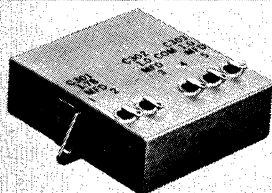
DC LIFE TEST DATA	LIST OF CAPACITORS LIFE TESTED			INSULATION RESISTANCE IN MEGOHMS AT 25°C			% CAPACITANCE WITH LIFE			% DISSIPATION FACTOR AT 25°C		
	CRC* Type	MFD Value	No. Tested	Post Test Limits (Min. IR)	Test Results		Post Test Limits	Test Results		Post Test Limits	Test Results	
					Low	High		Low	High		Low	High
TEST REPORTS CRC XT520, XT542, XT544 AND XT547 TEST RESULTS FOR 101 50VDC POLYSULFONE CAPACITORS LIFE TESTED FOR 2,000 HOURS AT 125°C WITH 53VDC APPLIED. THERE WERE NO FAILURES FOR THIS GROUP.	*05 MP	.0068	9	6.4 x 10 ⁵	1.5 x 10 ⁷	4.5 x 10 ⁷	±4%	-.02%	+.89%	0.25%	.05%	.08%
	*05 MP	.22	10	2.8 x 10 ⁵	3 x 10 ⁶	9 x 10 ⁶	±4%	+.01%	+.30%	0.25%	.07%	.08%
	*05 MP	1.5	40	4.5 x 10 ⁴	8 x 10 ⁵	3 x 10 ⁶	±4%	+.01%	+.48%	0.25%	.03%	.06%
	*05 MP	2.0	42	3 x 10 ⁴	2.2 x 10 ⁵	4.5 x 10 ⁶	±4%	+.02%	+.46%	0.25%	.03%	.05%
TEST REPORTS CRC XT518, XT539, XT540 AND XT541 TEST RESULTS FOR 128 100VDC POLYSULFONE CAPACITORS LIFE TESTED FOR 2,000 HOURS AT 125°C WITH 105VDC APPLIED. THERE WERE NO FAILURES FOR THIS GROUP.	*FORMER TYPE MP POLYSULFONE IS SIMILAR TO H14 SERIES											
	*1 MP	.01	10	6.5 x 10 ⁵	5 x 10 ⁶	4.5 x 10 ⁷	±4%	-.01%	-.37%	0.25%	.05%	.07%
	*1 MP	.015	36	6.5 x 10 ⁵	1.7 x 10 ⁶	4.5 x 10 ⁷	±4%	+.01%	+.93%	0.25%	.05%	.09%
	*1 MP	.068	37	6.5 x 10 ⁵	1.3 x 10 ⁷	9 x 10 ⁷	±4%	+1.15%	+1.21%	0.25%	.06%	.09%
	*1 MP	.12	45	5.3 x 10 ⁵	1 x 10 ⁶	3 x 10 ⁷	±4%	-.01%	-.37%	0.25%	.04%	.07%

SPECIAL CAPACITOR TYPES

High Energy AC

Ultra High IR DC

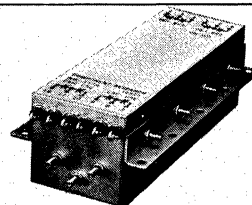
TEFLON CAPACITOR NETWORK



TEFLON CAPACITOR NETWORK: This teflon memory and computing network is one of the most critical components in the Lance Missile System. The capacitors must maintain very high insulation resistance, low dielectric absorption, and low capacitance change with temperature during storage and all through the severe environments of launching.

The capacitors are also specially designed to be free from mechanically induced noise which could affect the highly advanced and sensitive electronics control of the missile guidance. Testimonial letters from our customers are on file attesting to the unusually high quality and performance they have experienced in using our products.

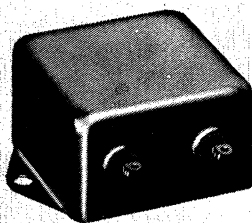
FOR AC APPLICATIONS



CAPACITORS DESIGNED FOR AC APPLICATIONS by CRC have very low equivalent series resistance and are remarkably cool and efficient for their size. The capacitor shown contains eight 1.2 MFD sections that operate up to 25 KHz at 170 volts AC RMS maximum with 25 amps at 25% duty cycle for each capacitor.

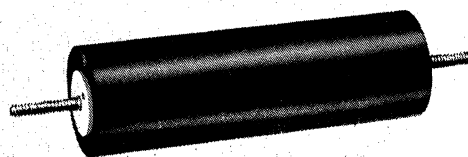
CRC was selected as the manufacturer to produce this special capacitor because of the extreme reliability required for a weapons program.

STANDARD SIZE BATHTUB CASE



STANDARD SIZE BATHTUB CASES provide a quicker, convenient, lower cost method of providing special type capacitors for applications not satisfied by our standard metal cased tubular capacitors. Special capacitors of this type can frequently be shipped within three weeks of order, manufactured with a choice of dielectric materials, construction, % tolerance range, voltage ratings, and special performance characteristics that is virtually limitless in scope.

Due to a special matching and trimming technique, extremely accurate capacitors can be provided in bathtub cases at lower cost than an equivalent accuracy in our tubular style capacitors.



PLASTIC CASED CAPACITOR

CRC IS NOW CUSTOM MANUFACTURING PLASTIC CASED CAPACITORS of extremely low loss and minimum heat rise for very high current, high energy applications.

These capacitors are available in ratings from DC to 50 KHz and voltages of up to 5000 volts RMS AC. The capacitors are available with brass threaded terminals or a variety of high conductivity copper lugs for low inductance and effective heat sinking. All plastic cased capacitors are thoroughly sealed against atmospheric effects by a special vacuum encapsulation process.

A standard product line offering a range of case sizes, voltage ratings, and performance styles will soon be available for prompt delivery.

CRC HIGH RELIABILITY CAPACITORS

Component Research capacitors are used in critical applications where their reliability and performance can affect the success of an entire program involving years of preparation and billions of dollars of program cost. For over a decade, aerospace programs from Apollo to Viking have used CRC capacitors for timing circuits and other control circuits, essential for controlling spacecraft millions of miles from earth, after years of space travel.

You can depend upon CRC to provide the most reliable capacitor and screening plan for your critical applications. Following are typical screening plans for standard and special applications.

VIKING QUALIFIED POLYSULFONE

G14 Polysulfone capacitors are the H14 series listed on pages 38 and 39 with 48 hours burn-in at 150°C followed by 10 thermal aging cycles from -65°C to +125°C. A specially screened G14 type has been supplied for the Viking space program which must withstand 135°C sterilization temperatures for 600 hours, very high levels of shock and vibration, and then perform in a very high impedance circuit at low voltage levels without intermittent conditions developing. During such tests some capacitors have been observed to develop problems at low temperature and special screening methods are used in this super-critical application to 100% monitor for breakdowns during temperature cycling.

400 HZ AC BURN-IN

R12 Polycarbonate capacitors are the same as the series 12 capacitors listed in the catalog except for 100% AC burn-in at 140% of rated RMS volts at 400 Hz for 16 hours at 100°C. The 400 Hz AC testing is becoming popular as a means of achieving high reliability in aircraft programs where a faulty capacitor could lead to serious consequences. The R12 type of screening will ultimately become a standard burn-in method of testing AC capacitors for MIL-C-83421. 100% recorded readings of capacitance, dissipation factor, and insulation resistance, can be provided, before and after burn-in.

40 KHZ BURN-IN & CORONA SCREENING

Type BF51 teflon foil capacitors are being used in a high frequency switching application with a rise time of less than 1 microsecond, in a limited space. Typically a 0.025 uF, 400 VDC rated teflon foil, oil impregnated capacitor operates with; 200 volt peak to peak, 10 KHz square wave voltage conditions, a rise and fall time of 100 nanoseconds, in a 0.312 x 1.063 case. Under these conditions this teflon capacitor is relatively cool with peak current of 30 amps developed at a 20 KHz repetition rate.

Following is the 100% screening used for this AC application.

1. **Burn-in** for 48 hours at 125°C. Apply 180 VRMS at 40 KHz $\pm 5\%$.
2. **Thermal aging** temperature cycle 5 times -65°C to +125°C. Per MIL-C-83421.
3. **Seal Test** Bake for 4 hours at 125°C. Check for oil leakage or visual damage.
4. **Corona Test** Apply 400 VRMS at 60 Hz and check for evidence of corona inception.
5. **AC Stress Test** Apply 100 Hz square wave voltage, terminal to terminal, for 1 minute, per MIL-C-83421/1, at 1000 volts peak to peak.
6. **DC Hipot** Apply 800 VDC terminal to terminal and to case at 25°C for 1 minute, per MIL-C-83421.
7. **Insulation Resistance** when measured with 400 VDC at 25°C, 1,000,000 megohms minimum.
8. **% Capacitance** at 1 KHz.
9. **% Dissipation factor** at 10 KHz, 0.01% maximum.
10. **Final visual** and mechanical inspection.

SPECIAL SCREENING FOR CRITICAL APPLICATIONS

40 KHZ AC BURN-IN

Special 40 KHz burn-in for type 12 polycarbonate capacitors is available at maximum rated conditions of the RMS AC voltage conditions of Table I of MIL-C-83421/1. Typically, a 0.1 uF, 30 VDC rated type C12A104 or A12A104 is receiving 22 volts RMS AC at 40 KHz, at 85°C, for 168 hours, a special screening for the Trident program.

SCREENING FOR SPACE APPLICATIONS

Type J11 teflon and J12 polycarbonate capacitors receive 96 hours burn-in and other screening conditions as required by JPL for their space applications. If you have a JPL or similar space agency subcontract, we will be happy to coordinate capacitor specification preparation to facilitate procurement with minimum delay and effort.

105°C SCREENED POLYSTYRENE CAPACITORS

Series L53 105°C screened polystyrene capacitors are one of the many unique Component Research capacitor products which demonstrate CRC superior performance and outstanding quality. The following screening plan for a space application is typical of the many custom screening procedures we have available for the most critical and sophisticated applications.

L53 SCREENING PER TP619

Test Step	Test	Conditions	Limits	Record Readings
1	Burn-in	At 140% of rated voltage at 105°C for 16 hours.	No opens or shorts	NO
2	Temperature Cycling	5 cycles from -65°C to +85°C.	N/A	NO
3	Gross Leak	Helium bomb for 1 hour at 75 PSI. Place in alcohol and check for bubbles.	No bubbles	NO
4	Fine Leak Test	Place in helium leak detector and evacuate and check for leakage.	1 x 10 ⁻⁶ atm/cm ² /sec. max. leakage rate	NO
5	AC Dielectric Strength	Apply 100 Hz square wave from lead to lead at min. peak voltage of 3X rated DC voltage for 1 min. minimum.	No opens or shorts	NO
6	DC Dielectric Strength	Apply 2X rated DC voltage, lead to lead and lead to case for 1 minute minimum.	No opens or shorts	NO
7	Insulation Resistance	At 25°C at rated voltage. Charge time 1 minute. Allow 1 minute additional charge time/uF for values above 1 uF.	Ref. MIL-C-83421	YES
8	Capacitance % Tolerance	At 1 KHz at 25°C.	Ref. MIL-C-83421	YES
9	Dissipation Factor	At 1 KHz at 25°C. Above 1 uF measure at .1 KHz.	.02%	YES
10	Serialize parts that pass above screening tests.			
11	DC Dielectric Strength	Apply 2X rated DC voltage, lead to lead and lead to case for 1 minute minimum.	No opens or shorts	NO
12	Insulation Resistance	At 25°C at rated voltage. Charge time 1 minute. Allow 1 minute additional charge time/uF for values above 1 uF.	Ref. MIL-C-83421	YES
13	Capacitance % Tolerance	At 1 KHz at 25°C.	Ref. MIL-C-83421	YES
14	Dissipation Factor	At 1 KHz at 25°C. Above 1 uF measure at .1 KHz.	.02%	YES
15	Burn-In	At 140% of rated DC voltage at 85°C for 100 hours.	No opens or shorts	NO
16	Temperature Cycling	5 cycles from -65°C to +85°C.	N/A	NO
17	DC Dielectric Strength	Apply 2X rated DC voltage, lead to lead and lead to case for 1 minute minimum.	No opens or shorts	NO
18	Insulation Resistance	At 25°C at rated voltage. Charge time 1 minute. Allow 1 minute additional charge time/uF for values above 1 uF.	Ref. MIL-C-83421	YES
19	Capacitance % Tolerance	At 1 KHz at 25°C.	Ref. MIL-C-83421	YES
20	Dissipation Factor	At 1 KHz at 25°C. Above 1 uF measure at .1 KHz.	.02%	YES
21	Visual Inspection	Inspect condition of leads, case and marking per CRC Method 875.	N/A	NO

FURTHER L53 POLYSTYRENE INFORMATION APPEARS ON PAGE 34.

SERIES

H14**POLYSULFONE****HIGH TEMPERATURE
FILM CAPACITORS**

- **-65°C TO +150°C OPERATING TEMPERATURE**
- **VERY LOW TEMPERATURE COEFFICIENT**
- **100% SCREENED AND TESTED**
- **MEETS APPLICABLE REQUIREMENTS OF MIL-C-83421**

H14 SPECIFICATIONS

OPERATING TEMPERATURE: -65°C to 125°C at full rated voltage. Derate linearly from 125°C to 50% of rated voltage at 150°C.

TEMPERATURE COEFFICIENT: 25°C reference

-0.5% ±0.2% at -50°C	0.00% ±0.2% at +75°C
-0.2% ±0.15% at -25°C	+0.10% ±0.3% at +100°C
0.0% ±0.1% at 0°C	+0.30% ±0.5% at +125°C
0.0% ±0.1% at +50°C	+0.50% ±0.7% at +150°C

STABILITY: Capacitance values measured at any two corresponding temperature points taken in five successive temperature cycles shall be as follows:

RANGE

-25°C to +85°C
-65°C to +150°C

RETRACE

.05% Max.
0.2% Max.

INSULATION RESISTANCE: Measured from terminal to terminal at rated voltage, and 5 minutes maximum charge time. For values greater than 1 uF, allow an additional minute/uF charge time.

MINIMUM IR

Range	25°C/50°C	75°C	100°C	125°C	150°C
.001 to 0.1 uF (in Megohms)	3,000,000	1,000,000	100,000	20,000	5,000
Greater than 0.1 uF (in Megohms - uF)	300,000	100,000	10,000	2,000	500

Readings shown are for 1 uF or less. For values over 1 uF, divide readings by uF to obtain min IR.

Example: An 8 uF capacitor is 37,500 megohms at 25°C.

DIELECTRIC ABSORPTION: 0.2% Max. at 25°C.

DISSIPATION FACTOR: 0.15% Max. at 1 KHz and 25°C. Values greater than 1 uF measure at 0.1 KHz.

DIELECTRIC STRENGTH: 200% of rated DC volts.

CONSTRUCTION: Polysulfone Dielectric, extended metal film electrodes, hermetically sealed metal tubular case, leads isolated from case.

LEAD WIRE SIZE AND TYPE

Case Diameter	Lead Wire Size #AWG	Lead Wire Material
0.312" and smaller	22	Tinned Copper Clad Steel (Tinned Copperweld) CRC type "W"
0.400" and 0.500"	20	
0.562" and larger	18	Oxygen free tinned copper wire CRC type "C"

SEAL TEST: 1×10^{-6} atm/cm²/sec max. leak rate.

ENVIRONMENTAL: Capacitors shall meet all applicable requirements of MIL-C-83421.

DC VOLTS

50VDC

100VDC

200VDC

400VDC

CRC TYPE

H14B

H14C

H14D

H14E

OLD P/N

05 MP

1 MP

2 MP

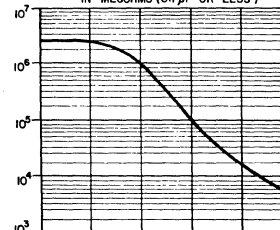
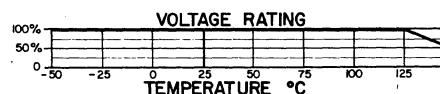
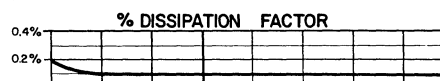
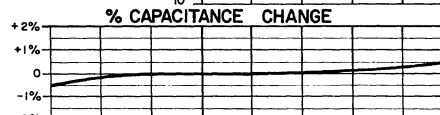
4 MP

- **PART NUMBER SYSTEM:** PAGE 18
- **CASE DIMENSIONS:** PAGE 39
- **LIFE TEST DATA:** PAGE 36
- **AC RATINGS:** PAGE 39
- **STANDARD TOLERANCES:**
±0.25% to ±10%
- **PRICES:** Add approximately 30% to polycarbonate D12 prices shown on pages 40 - 44 or contact our sales office for exact price schedule.

H14 QUALITY ASSURANCE

All capacitors are 100% screened and tested as follows:

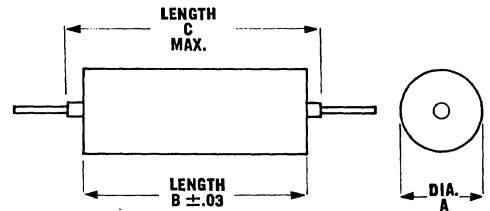
1. 16 hours Burn-In at 150°C and 140% of the rated DC voltage. (Allow for 50% derating).
2. 10 Temperature Cycles from -65°C to 125°C.
3. Helium Leak Test. 1×10^{-4} atm/cm²/sec max. leak rate.
4. DC dielectric strength apply 200% of rated DC voltage from lead to lead and leads to case for one minute.
5. AC dielectric strength apply 100 Hz square wave from lead to lead at a minimum peak to peak voltage of 3 x rated DC voltage for one minute, (except 800V peak to peak for 400VDC styles).
6. Insulation Resistance at rated voltage and 25°C, 300,000 megs - uF minimum but need not exceed 3,000,000 megohms.
7. Capacitance % Tolerance at 1 KHz and 25°C.
8. Dissipation Factor at 1 KHz and 25°C, 0.15% maximum.
9. Visual Inspection for dimensions, marking and packaging.
10. Traceability to production and test records by permanent marking of parts with lot control number.
11. Process and inspection data is maintained on file per NPC-200-3, MIL-Q-9858 quality control standards, and MIL-STD-790 Reliability Assurance Program.

**INSULATION RESISTANCE
IN MEGOHMS (0.1 uF OR LESS)****SERIES
H14
POLYSULFONE
CAPACITORS**

CRC HIGH RELIABILITY CAPACITORS

SERIES 14 POLYSULFONE CAPACITOR DIMENSIONS • AC RATINGS

Series H14 Polysulfone capacitors are being supplied for many applications where the temperature range exceeds 125°C and reaches 150°C, and where the temperature coefficient must be lower than for our Polycarbonate capacitors. Although the quality and supply of Polysulfone film has varied for several years of past production, CRC is continuing to receive sufficient material to manufacture most items listed below and believes the quality and supply problems will end during 1975. Type H14 specifications are subject to change and will be revised in the near future when it is anticipated they will be added to the MIL-C-83421 list of established reliability, metallized film capacitors.



NOTES:

- 1) "A" dimensions listed are for unsleeved cases.
- 2) "C" dimension is 0.2" Max. more than "B" dimensions in table.

uF	H14B 50VDC					H14C 100VDC					H14D 200VDC					H14E 400VDC				
	SIZE		AC RATINGS			SIZE		AC RATINGS			SIZE		AC RATINGS			SIZE		AC RATINGS		
	Diam. A	Length B	RMS Volts 400 Hz	RMS Volts 40 KHz	Max. RMS Amps.	Diam. A	Length B	RMS Volts 400 Hz	RMS Volts 40 KHz	Max. RMS Amps.	Diam. A	Length B	RMS Volts 400 Hz	RMS Volts 40 KHz	Max. RMS Amps.	Diam. A	Length B	RMS Volts 400 Hz	RMS Volts 40 KHz	Max. RMS Amps.
.001	.170	.500	36.0	36.0	.009	.170	.500	60.0	60.0	.015	.170	.562	120.0	80.0	.020	.193	.562	240.0	100.0	.025
.0012	.170	.500	36.0	36.0	.012	.170	.500	60.0	60.0	.018	.170	.562	120.0	80.0	.024	.193	.562	240.0	100.0	.030
.0015	.170	.500	36.0	36.0	.014	.170	.500	60.0	60.0	.022	.170	.562	120.0	80.0	.029	.193	.562	240.0	100.0	.034
.0018	.170	.500	36.0	36.0	.016	.170	.500	60.0	60.0	.027	.170	.562	120.0	80.0	.036	.193	.562	240.0	100.0	.040
.002	.170	.500	36.0	36.0	.018	.170	.500	60.0	60.0	.030	.170	.562	120.0	80.0	.040	.193	.562	240.0	100.0	.050
.0022	.170	.500	36.0	36.0	.020	.170	.500	60.0	60.0	.033	.170	.562	120.0	80.0	.044	.193	.562	240.0	100.0	.058
.0027	.170	.500	36.0	36.0	.020	.170	.500	60.0	60.0	.041	.170	.562	120.0	80.0	.054	.235	.687	240.0	100.0	.068
.0033	.170	.500	36.0	36.0	.030	.170	.500	60.0	60.0	.050	.170	.562	120.0	80.0	.066	.235	.687	240.0	100.0	.083
.0039	.170	.500	36.0	36.0	.040	.170	.500	60.0	60.0	.062	.170	.562	120.0	80.0	.070	.235	.687	240.0	100.0	.10
.0047	.170	.500	36.0	36.0	.042	.170	.500	60.0	60.0	.071	.170	.562	120.0	80.0	.094	.235	.687	240.0	100.0	.12
.005	.170	.500	36.0	36.0	.045	.170	.500	60.0	60.0	.075	.170	.562	120.0	80.0	.10	.235	.687	240.0	100.0	.13
.0056	.170	.500	36.0	36.0	.050	.170	.500	60.0	60.0	.083	.170	.562	120.0	80.0	.11	.235	.687	240.0	100.0	.14
.0068	.170	.500	36.0	36.0	.061	.170	.687	60.0	60.0	.11	.170	.562	120.0	80.0	.14	.235	.687	240.0	100.0	.17
.0082	.170	.562	36.0	36.0	.074	.170	.687	60.0	60.0	.13	.170	.562	120.0	80.0	.17	.235	.687	240.0	100.0	.21
.01	.170	.562	36.0	36.0	.090	.170	.687	60.0	60.0	.15	.193	.562	120.0	80.0	.20	.235	.687	240.0	100.0	.25
.012	.170	.562	36.0	36.0	.11	.170	.687	60.0	59.0	.18	.193	.562	120.0	78.0	.24	.235	.687	240.0	96.0	.28
.015	.170	.562	36.0	36.0	.14	.170	.687	60.0	58.0	.22	.235	.562	120.0	76.0	.29	.235	.813	240.0	94.0	.35
.018	.193	.562	36.0	36.0	.16	.193	.687	60.0	57.0	.26	.235	.687	120.0	74.0	.33	.312	.813	240.0	90.0	.40
.02	.193	.562	36.0	36.0	.18	.193	.687	60.0	55.0	.28	.235	.687	120.0	71.0	.36	.312	.813	240.0	88.0	.44
.022	.193	.562	36.0	36.0	.20	.193	.687	60.0	53.0	.30	.235	.687	120.0	68.0	.38	.312	.813	240.0	85.0	.47
.027	.193	.562	36.0	36.0	.25	.193	.687	60.0	51.0	.35	.312	.687	120.0	65.0	.44	.312	.813	240.0	81.0	.55
.033	.193	.562	36.0	36.0	.30	.193	.687	60.0	50.0	.42	.312	.687	120.0	62.0	.52	.312	.813	240.0	78.0	.65
.039	.170	.687	36.0	36.0	.35	.235	.687	60.0	48.0	.47	.312	.687	120.0	60.0	.59	.312	.813	240.0	75.0	.73
.047	.170	.687	36.0	36.0	.43	.235	.687	60.0	47.0	.56	.312	.687	120.0	57.0	.67	.400	.813	240.0	71.0	.83
.05	.170	.687	36.0	36.0	.45	.235	.687	60.0	46.0	.58	.312	.813	120.0	56.0	.70	.400	.813	240.0	70.0	.88
.056	.193	.687	36.0	36.0	.50	.235	.687	60.0	46.0	.65	.312	.813	120.0	56.0	.79	.400	.813	240.0	65.0	.91
.068	.193	.687	36.0	34.0	.58	.235	.813	60.0	42.0	.72	.312	.813	120.0	50.0	.85	.400	.813	240.0	60.0	1.0
.082	.193	.813	36.0	32.0	.66	.312	.687	60.0	38.0	.78	.312	.813	120.0	44.0	1.0	.400	1.063	240.0	50.0	1.1
.1	.193	.813	36.0	30.0	.75	.312	.687	60.0	36.0	.90	.312	.813	120.0	42.0	1.1	.400	1.063	240.0	46.0	1.2
.12	.235	.687	36.0	30.0	.90	.312	.687	60.0	35.0	1.1	.312	.813	120.0	40.0	1.2	.400	1.063	240.0	43.0	1.3
.15	.235	.687	36.0	26.0	.97	.312	.813	60.0	31.0	1.2	.400	1.063	120.0	36.0	1.4	.400	1.375	240.0	40.0	1.5
.18	.235	.813	36.0	25.0	1.0	.312	.813	60.0	30.0	1.4	.400	1.375	120.0	34.0	1.7	.500	1.375	240.0	38.0	1.7
.20	.235	.813	36.0	24.0	1.1	.312	.813	60.0	29.0	1.5	.400	1.375	120.0	33.0	1.7	.500	1.375	240.0	36.0	1.8
.22	.235	.813	36.0	20.0	1.2	.312	.813	60.0	25.0	1.5	.400	1.375	120.0	32.0	1.8	.500	1.375	240.0	35.0	1.9
.27	.312	.687	36.0	19.0	1.3	.312	1.063	60.0	24.0	1.6	.500	1.375	120.0	29.0	2.0	.562	1.375	240.0	33.0	2.1
.33	.312	.687	36.0	18.0	1.5	.312	1.063	60.0	23.0	1.9	.500	1.375	120.0	28.0	2.3	.562	1.375	240.0	32.0	2.7
.39	.312	.813	36.0	17.0	1.7	.400	1.063	60.0	22.0	2.2	.500	1.375	120.0	27.0	2.6	.562	1.875	240.0	31.5	3.2
.47	.312	.813	36.0	16.0	1.8	.400	1.063	60.0	21.0	2.4	.500	1.375	120.0	26.0	3.1	.562	1.875	240.0	31.0	3.6
.50	.400	.813	36.0	15.0	1.9	.400	1.063	60.0	20.0	2.5	.500	1.375	120.0	25.0	3.1	.562	1.875	240.0	30.0	3.8
.56	.400	.813	36.0	14.5	2.1	.400	1.063	60.0	18.0	2.5	.500	1.375	120.0	23.0	3.2	.562	1.875	240.0	28.0	4.0
.68	.400	.813	36.0	14.0	2.4	.500	1.125	60.0	16.0	2.7	.562	1.375	120.0	20.0	3.4	.750	1.875	240.0	26.0	4.4
.82	.400	1.063	36.0	12.0	2.5	.500	1.125	60.0	14.0	2.9	.562	1.875	120.0	19.0	3.8	.750	1.875	240.0	22.0	4.5
1.0	.400	1.063	36.0	10.0	2.5	.562	1.125	60.0	12.0	3.0	.562	1.875	120.0	15.0	3.9	.750	1.875	240.0	19.0	4.8
1.2	.400	1.063	36.0	9.0	2.7	.562	1.125	60.0	11.0	3.5	.562	1.875	120.0	13.5	4.0	1.00	1.875	240.0	18.0	5.4
1.5	.400	1.063	36.0	8.0	2.9	.562	1.375	60.0	10.0	3.8	.670	1.875	120.0	12.0	4.5	1.00	2.375	240.0	16.0	6.0
2.0	.500	1.125	36.0	6.0	3.0	.670	1.375	60.0	8.1	4.1	.750	1.875	120.0	10.0	5.0	1.00	2.375	240.0	14.0	7.0
2.2	.500	1.125	36.0	5.8	3.2	.670	1.375	60.0	7.5	4.2	.750	1.875	120.0	9.0	5.0	1.00	2.375	240.0	12.6	7.0
2.7	.500	1.375	36.0	5.0	3.0	.670	1.875	60.0	7.0	4.4	.750	1.875	120.0	8.0	5.1	1.00	2.625	240.0	10.3	7.0
3.0	.500	1.375	36.0	4.5	3.4	.670	1.875	60.0	6.0	4.5	1.00	1.875	120.0	7.0	5.2	1.00	2.625	240.0	9.3	7.0
3.3	.500	1.375	36.0	4.1	3.4	.670	1.875	60.0	5.5	4.6	1.00	1.875	120.0	6.0	5.3					
4.0	.562	1.375	36.0	3.6	3.6	.750	1.875	60.0	4.8	4.8		2.375	120.0	5.4	5.4					
4.7	.670	1.375	36.0	3.2	3.6	.750	1.875	60.0	4.3	5.0										
5.0	.670	1.375	36.0	3.0	3.6	.750	1.875	60.0	4.0	5.0										
5.6	.670	1.375	36.0	2.6	3.6	.750	1.875	60.0	3.5	5.0										
6.8	.670	1.875	36.0	2.2	3.6	1.0	2.375	60.0	3.0	5.0										
8.0	.670	1.875	36.0	1.8	3.6	1.0	2.375	60.0	2.4	5.0										
10.0	.670	1.875	36.0	1.5	3.6	1.0	2.375	60.0	2.0	5.0										

CRC HIGH RELIABILITY
CAPACITORS30VDC POLYCARBONATE
PRICES (1-10 UNITS)SERIES
12A

HOW TO ORDER

- Select basic part number required and place desired tolerance letter, at end of basic number.
- See part number system on page 18 for complete details concerning sleeving and wire leads.
- IMPORTANT:** You must have complete part number for ordering purposes.

Example: D12A183JXW describes a 0.018 uF, 5%, 30 VDC capacitor, without sleeving and with "D" type screening.

SERIES 12A INFORMATION

- Complete information is found on pages 12 - 17.
- 12A capacitors can be ordered by MIL Spec part number — See page 13.
- 5.6 uF or smaller capacitor values, (0.500" and smaller in diameter) use "W" wire leads.
- 6.8 uF or larger values, (0.562" and larger in diameter), use "C" wire leads.
- Prices subject to change.
- QUANTITY DISCOUNTS:**
11-25 less 10% 26-50 less 15% Contact our sales offices
51-100 less 20% 101-250 less 25% for larger quantities.

MIL-C-83421/1	PRICE INFORMATION	SPECIFICATIONS
Type CRH01 30 VDC	Use C12A Prices + 10%	See A12A Page 10
Type CRH06 30 VDC	Use E12A Prices + 10%	See K12A Page 11

uF	CRC QUALITY LEVEL 1								CRC QUALITY LEVEL 2								CRC QUALITY LEVEL 3							
	C12A 30V POLYCARBONATE								D12A 30V POLYCARBONATE								E12A 30V POLYCARBONATE							
	Equivalent to CHROIA Style of MIL-C-39022/9C								Equivalent to CHROIB Style of MIL-C-39022/9C								Equivalent to CHROIC Style of MIL-C-39022/9C							
	BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B		BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B		BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B	
.001	C12A102	\$6.19	\$6.81	\$8.05	\$9.90	\$11.14	\$13.62	D12A102	\$4.13	\$4.54	\$5.37	\$6.61	\$7.43	\$9.09	E12A102	\$3.44	\$3.78	\$4.47	\$5.50	\$6.19	\$7.57			
.0012	C12A122	6.19	6.81	8.05	9.90	11.14	13.62	D12A122	4.13	4.54	5.37	6.61	7.43	9.09	E12A122	3.44	3.78	4.47	5.50	6.19	7.57			
.0015	C12A152	6.19	6.81	8.05	9.90	11.14	13.62	D12A152	4.13	4.54	5.37	6.61	7.43	9.09	E12A152	3.44	3.78	4.47	5.50	6.19	7.57			
.0018	C12A182	6.19	6.81	8.05	9.90	11.14	13.62	D12A182	4.13	4.54	5.37	6.61	7.43	9.09	E12A182	3.44	3.78	4.47	5.50	6.19	7.57			
.002	C12A202	6.19	6.81	8.05	9.90	11.14	13.62	D12A202	4.13	4.54	5.37	6.61	7.43	9.09	E12A202	3.44	3.78	4.47	5.50	6.19	7.57			
.0022	C12A222	6.19	6.81	8.05	9.90	11.14	13.62	D12A222	4.13	4.54	5.37	6.61	7.43	9.09	E12A222	3.44	3.78	4.47	5.50	6.19	7.57			
.0027	C12A272	6.19	6.81	8.05	9.90	11.14	13.62	D12A272	4.13	4.54	5.37	6.61	7.43	9.09	E12A272	3.44	3.78	4.47	5.50	6.19	7.57			
.0033	C12A332	6.19	6.81	8.05	9.90	11.14	13.62	D12A332	4.13	4.54	5.37	6.61	7.43	9.09	E12A332	3.44	3.78	4.47	5.50	6.19	7.57			
.0039	C12A392	6.19	6.81	8.05	9.90	11.14	13.62	D12A392	4.13	4.54	5.37	6.61	7.43	9.09	E12A392	3.44	3.78	4.47	5.50	6.19	7.57			
.0047	C12A472	6.19	6.81	8.05	9.90	11.14	13.62	D12A472	4.13	4.54	5.37	6.61	7.43	9.09	E12A472	3.44	3.78	4.47	5.50	6.19	7.57			
.005	C12A502	6.19	6.81	8.05	9.90	11.14	13.62	D12A502	4.13	4.54	5.37	6.61	7.43	9.09	E12A502	3.44	3.78	4.47	5.50	6.19	7.57			
.0056	C12A562	6.19	6.81	8.05	9.90	11.14	13.62	D12A562	4.13	4.54	5.37	6.61	7.43	9.09	E12A562	3.44	3.78	4.47	5.50	6.19	7.57			
.0068	C12A682	6.19	6.81	8.05	9.90	11.14	13.62	D12A682	4.13	4.54	5.37	6.61	7.43	9.09	E12A682	3.44	3.78	4.47	5.50	6.19	7.57			
.0082	C12A822	6.19	6.81	8.05	9.90	11.14	13.62	D12A822	4.13	4.54	5.37	6.61	7.43	9.09	E12A822	3.44	3.78	4.47	5.50	6.19	7.57			
.01	C12A103	6.19	6.81	8.05	9.90	11.14	13.62	D12A103	4.13	4.54	5.37	6.61	7.43	9.09	E12A103	3.44	3.78	4.47	5.50	6.19	7.57			
.012	C12A123	6.19	6.81	8.05	9.90	11.14	13.62	D12A123	4.13	4.54	5.37	6.61	7.43	9.09	E12A123	3.44	3.78	4.47	5.50	6.19	7.57			
.015	C12A153	6.19	6.81	8.05	9.90	11.14	13.62	D12A153	4.13	4.54	5.37	6.61	7.43	9.09	E12A153	3.44	3.78	4.47	5.50	6.19	7.57			
.018	C12A183	6.19	6.81	8.05	9.90	11.14	13.62	D12A183	4.13	4.54	5.37	6.61	7.43	9.09	E12A183	3.44	3.78	4.47	5.50	6.19	7.57			
.02	C12A203	6.19	6.81	8.05	9.90	11.14	13.62	D12A203	4.13	4.54	5.37	6.61	7.43	9.09	E12A203	3.44	3.78	4.47	5.50	6.19	7.57			
.022	C12A223	6.19	6.81	8.05	9.90	11.14	13.62	D12A223	4.13	4.54	5.37	6.61	7.43	9.09	E12A223	3.44	3.78	4.47	5.50	6.19	7.57			
.027	C12A273	6.19	6.81	8.05	9.90	11.14	13.62	D12A273	4.13	4.54	5.37	6.61	7.43	9.09	E12A273	3.44	3.78	4.47	5.50	6.19	7.57			
.033	C12A333	6.19	6.81	8.05	9.90	11.14	13.62	D12A333	4.13	4.54	5.37	6.61	7.43	9.09	E12A333	3.44	3.78	4.47	5.50	6.19	7.57			
.039	C12A393	6.19	6.81	8.05	9.90	11.14	13.62	D12A393	4.13	4.54	5.37	6.61	7.43	9.09	E12A393	3.44	3.78	4.47	5.50	6.19	7.57			
.047	C12A473	6.19	6.81	8.05	9.90	11.14	13.62	D12A473	4.13	4.54	5.37	6.61	7.43	9.09	E12A473	3.44	3.78	4.47	5.50	6.19	7.57			
.05	C12A503	6.19	6.81	8.05	9.90	11.14	13.62	D12A503	4.13	4.54	5.37	6.61	7.43	9.09	E12A503	3.44	3.78	4.47	5.50	6.19	7.57			
.056	C12A563	6.19	6.81	8.05	9.90	11.14	13.62	D12A563	4.13	4.54	5.37	6.61	7.43	9.09	E12A563	3.44	3.78	4.47	5.50	6.19	7.57			
.068	C12A683	6.19	6.81	8.05	9.90	11.14	13.62	D12A683	4.13	4.54	5.37	6.61	7.43	9.09	E12A683	3.44	3.78	4.47	5.50	6.19	7.57			
.082	C12A823	6.19	6.81	8.05	9.90	11.14	13.62	D12A823	4.13	4.54	5.37	6.61	7.43	9.09	E12A823	3.44	3.78	4.47	5.50	6.19	7.57			
.10	D12B104	6.19	6.81	8.05	9.90	11.14	13.62	D12A104	4.13	4.54	5.37	6.61	7.43	9.09	E12A104	3.44	3.78	4.47	5.50	6.19	7.57			
.12	C12A124	6.35	6.99	8.26	10.16	11.43	13.97	D12A124	4.24	4.66	5.51	6.78	7.63	9.33	E12A124	3.53	3.88	4.59	5.65	6.35	7.77			
.15	C12A154	6.35	6.99	8.26	10.16	11.43	13.97	D12A154	4.24	4.66	5.51	6.78	7.63	9.33	E12A154	3.53	3.88	4.59	5.65	6.35	7.77			
.18	C12A184	6.44	7.08	8.37	10.30	11.59	14.17	D12A184	4.30	4.73	5.59	6.88	7.74	9.46	E12A184	3.58	3.94	4.65	5.73	6.44	7.88			
.20	C12A204	6.44	7.08	8.37	10.30	11.59	14.17	D12A204	4.30	4.73	5.59	6.88	7.74	9.46	E12A204	3.58	3.94	4.65	5.73	6.44	7.88			
.22	C12A224	6.44	7.08	8.37	10.30	11.59	14.17	D12A224	4.30	4.73	5.59	6.88	7.74	9.46	E12A224	3.58	3.94	4.65	5.73	6.44	7.88			
.27	C12A274	6.52	7.17	8.48	10.43	11.74	14.34	D12A274	4.34	4.77	5.64	6.94	7.81	9.55	E12A274	3.62	3.98	4.71	5.79	6.52	7.96			
.33	C12A334	6.84	7.52	8.89	10.94	12.31	15.05	D12A334	4.56	5.02	5.93	7.30	8.21	10.03	E12A334	3.80	4.18	4.94	6.08	6.84	8.36			
.39	C12A394	6.89	7.58	8.96	11.02	12.40	15.16	D12A394	4.60	5.06	5.98	7.36	8.28	10.12	E12A394	3.83	4.21	4.98	6.13	6.89	8.43			
.47	C12A474	6.89	7.58	8.96	11.02	12.40	15.16	D12A474	4.60	5.06	5.98	7.36	8.28	10.12	E12A474	3.83	4.21	4.98	6.13	6.89	8.43			
.50	C12A504	6.89	7.58	8.96	11.02	12.40	15.16	D12A504	4.60	5.06	5.98	7.36	8.28	10.12	E12A504	3.83	4.21	4.98	6.13	6.89	8.43			
.56	C12A564	7.13	7.84	9.27	11.41	12.83	15.69	D12A564	4.75	5.23	6.18	7.60	8.55	10.45	E12A564	3.96	4.36	5.15	6.34	7.13	8.71			
.68	C12A684	7.36	8.10	9.57	11.78	13.25	16.19	D12A684	4.91	5.40	6.38	7.86	8.84	10.80	E12A684	4.09	4.50	5.32	6.54	7.36	9.00			
.82	C12A824	7.36	8.10	9.57	11.78	13.25	16.19	D12A824	4.91	5.40	6.38	7.86	8.84	10.80	E12A824	4.09	4.50	5.32	6.54	7.36	9.00			
1.0	C12A105	7.36	8.10	9.57	11.78	13.25	16.19	D12A105	4.91	5.40	6.38	7.86	8.84	10.80	E12A105	4.09	4.50	5.32	6.54	7.36	9.00			
1.2	C12A125	7.79	8.57	10.13	12.46	14.02	17.14	D12A125	5.20	5.72	6.76	8.32	9.36	11.44	E12A125	4.33	4.76	5.63	6.93	7.79	9.53			
1.5	C12A155	8.14	8.95	10.58	13.02	14.65	17.91	D12A155	5.42	5.96	7.05	8.67	9.76	11.92	E12A155	4.52	4.97	5.88	7.23	8.14	9.94			
1.8	C12A185	8.37	9.21	10.88	13.39	15.07	18.41	D12A185	5.58	6.14	7.25	8.93	10.04	12.28	E12A185	4.65	5.12	6.05	7.44	8.37	10.23			
2.0	C12A205	8.53	9.38	11.09	13.65	15.35	18.77	D12A205	5.69	6.26	7.40	9.10	10.24	12.52	E12A205	4.74	5.21	6.16	7.58	8.53	10.43			
2.2	C12A225	8.96	9.86	11.65	14.34	16.13	19.71	D12A225	5.98	6.58	7.77	9.57	10.76	13.16	E12A225	4.98	5.48	6.47	7.97	8.96	10.96			
2.7	C12A275	9.14	10.05	11.88	14.62	16.45	20.11	D12A275	6.10	6.71	7.93	9.76	10.98	13.42	E12A275	5.08	5.59	6.60	8.13	9.14	11.18			
3.0	C12A305	9.32	10.25	12.12	14.91	16.78	20.50	D12A305	6.22	6.84	8.09	9.95	11.20	13.68	E12A305	5.18	5.70	6.73	8.29	9.32	11.40			
3.3	C12A335	9.77	10.75	12.70	15.63	17.59	21.49	D12A335	6.52	7.17	8.48	10.43	11.74	14.34	E12A335	5.43	5.97	7.02	8.69	9.77	11.95			
3.9	C12A395	10.28	11.31	13.36	16.45	18.50	22.62	D12A395	6.85	7.54	8.91	10.96	12.33	15.07	E12A395	5.71	6.28	7.46	9.14	10.28	12.56			
4.0	C12A405	10.28	11.31	13.36	16.45	18.50	22.62	D12A405	6.85	7.54	8.91	10.96	12.33	15.07	E12A405	5.71	6.28	7.46	9.14	10.28	12.56			
4.7	C12A475	11.03	12.13	14.34	17.65	19.8																		

**CRC HIGH RELIABILITY
CAPACITORS****50VDC POLYCARBONATE
PRICES (1-10 UNITS)****SERIES
12B****HOW TO ORDER**

- Select basic part number required and place desired tolerance letter, at end of basic number.
- See part number system on page 18 for complete details concerning sleeving and wire leads.
- **IMPORTANT:** You must have complete part number for ordering purposes.

Example: C12B504BXW describes a 0.5 uF, 0.25%, 50 VDC capacitor, without sleeving and with "C" type screening.

SERIES 12B INFORMATION

- Complete information is found on pages 12 - 17.
- 12B capacitors can be ordered by MIL Spec part number — See page 13.
- 3.3 uF or smaller capacitor values, (0.500" and smaller in diameter) use "W" wire leads.
- 4.0 uF or larger values, (0.562" and larger in diameter), use "C" wire leads.
- Prices subject to change.
- **QUANTITY DISCOUNTS:**
11-25 less 10% 26-50 less 15% Contact our sales office
51-100 less 20% 101-250 less 25% for larger quantities.

MIL-C-83421/1	PRICE INFORMATION	SPECIFICATIONS
Type CRH02 50 VDC	Use C12B Prices +10%	See A12B Page 10
Type CRH07 50 VDC	Use E12B Prices +10%	See K12B Page 11

uF	CRC QUALITY LEVEL 1							CRC QUALITY LEVEL 2							CRC QUALITY LEVEL 3						
	C12B 50V POLYCARBONATE							D12B 50V POLYCARBONATE							E12B 50V POLYCARBONATE						
	Equivalent to CHROID Style of MIL-C-39022/9C							Equivalent to CHROIE Style of MIL-C-39022/9C							Equivalent to CHROIF Style of MIL-C-39022/9C						
	BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B	BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B	BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001	C12B102	\$6.19	\$6.81	\$8.05	\$9.90	\$11.14	\$13.62	D12B102	\$4.13	\$4.54	\$5.37	\$6.61	\$7.43	\$9.09	E12B102	\$3.44	\$3.78	\$4.47	\$5.50	\$6.19	\$7.57
.0012	C12B122	6.19	6.81	8.05	9.90	11.14	13.62	D12B122	4.13	4.54	5.37	6.61	7.43	9.09	E12B122	3.44	3.78	4.47	5.50	6.19	7.57
.0015	C12B152	6.19	6.81	8.05	9.90	11.14	13.62	D12B152	4.13	4.54	5.37	6.61	7.43	9.09	E12B152	3.44	3.78	4.47	5.50	6.19	7.57
.0018	C12B182	6.19	6.81	8.05	9.90	11.14	13.62	D12B182	4.13	4.54	5.37	6.61	7.43	9.09	E12B182	3.44	3.78	4.47	5.50	6.19	7.57
.002	C12B202	6.19	6.81	8.05	9.90	11.14	13.62	D12B202	4.13	4.54	5.37	6.61	7.43	9.09	E12B202	3.44	3.78	4.47	5.50	6.19	7.57
.0022	C12B222	6.19	6.81	8.05	9.90	11.14	13.62	D12B222	4.13	4.54	5.37	6.61	7.43	9.09	E12B222	3.44	3.78	4.47	5.50	6.19	7.57
.0027	C12B272	6.19	6.81	8.05	9.90	11.14	13.62	D12B272	4.13	4.54	5.37	6.61	7.43	9.09	E12B272	3.44	3.78	4.47	5.50	6.19	7.57
.0033	C12B332	6.19	6.81	8.05	9.90	11.14	13.62	D12B332	4.13	4.54	5.37	6.61	7.43	9.09	E12B332	3.44	3.78	4.47	5.50	6.19	7.57
.0039	C12B392	6.19	6.81	8.05	9.90	11.14	13.62	D12B392	4.13	4.54	5.37	6.61	7.43	9.09	E12B392	3.44	3.78	4.47	5.50	6.19	7.57
.0047	C12B472	6.19	6.81	8.05	9.90	11.14	13.62	D12B472	4.13	4.54	5.37	6.61	7.43	9.09	E12B472	3.44	3.78	4.47	5.50	6.19	7.57
.005	C12B502	6.19	6.81	8.05	9.90	11.14	13.62	D12B502	4.13	4.54	5.37	6.61	7.43	9.09	E12B502	3.44	3.78	4.47	5.50	6.19	7.57
.0056	C12B562	6.19	6.81	8.05	9.90	11.14	13.62	D12B562	4.13	4.54	5.37	6.61	7.43	9.09	E12B562	3.44	3.78	4.47	5.50	6.19	7.57
.0068	C12B682	6.19	6.81	8.05	9.90	11.14	13.62	D12B682	4.13	4.54	5.37	6.61	7.43	9.09	E12B682	3.44	3.78	4.47	5.50	6.19	7.57
.0082	C12B822	6.19	6.81	8.05	9.90	11.14	13.62	D12B822	4.13	4.54	5.37	6.61	7.43	9.09	E12B822	3.44	3.78	4.47	5.50	6.19	7.57
.01	C12B103	6.19	6.81	8.05	9.90	11.14	13.62	D12B103	4.13	4.54	5.37	6.61	7.43	9.09	E12B103	3.44	3.78	4.47	5.50	6.19	7.57
.012	C12B123	6.19	6.81	8.05	9.90	11.14	13.62	D12B123	4.13	4.54	5.37	6.61	7.43	9.09	E12B123	3.44	3.78	4.47	5.50	6.19	7.57
.015	C12B153	6.19	6.81	8.05	9.90	11.14	13.62	D12B153	4.13	4.54	5.37	6.61	7.43	9.09	E12B153	3.44	3.78	4.47	5.50	6.19	7.57
.018	C12B183	6.19	6.81	8.05	9.90	11.14	13.62	D12B183	4.13	4.54	5.37	6.61	7.43	9.09	E12B183	3.44	3.78	4.47	5.50	6.19	7.57
.02	C12B203	6.19	6.81	8.05	9.90	11.14	13.62	D12B203	4.13	4.54	5.37	6.61	7.43	9.09	E12B203	3.44	3.78	4.47	5.50	6.19	7.57
.022	C12B223	6.19	6.81	8.05	9.90	11.14	13.62	D12B223	4.13	4.54	5.37	6.61	7.43	9.09	E12B223	3.44	3.78	4.47	5.50	6.19	7.57
.027	C12B273	6.19	6.81	8.05	9.90	11.14	13.62	D12B273	4.13	4.54	5.37	6.61	7.43	9.09	E12B273	3.44	3.78	4.47	5.50	6.19	7.57
.033	C12B333	6.19	6.81	8.05	9.90	11.14	13.62	D12B333	4.13	4.54	5.37	6.61	7.43	9.09	E12B333	3.44	3.78	4.47	5.50	6.19	7.57
.039	C12B393	6.19	6.81	8.05	9.90	11.14	13.62	D12B393	4.13	4.54	5.37	6.61	7.43	9.09	E12B393	3.44	3.78	4.47	5.50	6.19	7.57
.047	C12B473	6.19	6.81	8.05	9.90	11.14	13.62	D12B473	4.13	4.54	5.37	6.61	7.43	9.09	E12B473	3.44	3.78	4.47	5.50	6.19	7.57
.05	C12B503	6.19	6.81	8.05	9.90	11.14	13.62	D12B503	4.13	4.54	5.37	6.61	7.43	9.09	E12B503	3.44	3.78	4.47	5.50	6.19	7.57
.056	C12B563	6.19	6.81	8.05	9.90	11.14	13.62	D12B563	4.13	4.54	5.37	6.61	7.43	9.09	E12B563	3.44	3.78	4.47	5.50	6.19	7.57
.068	C12B683	6.19	6.81	8.05	9.90	11.14	13.62	D12B683	4.13	4.54	5.37	6.61	7.43	9.09	E12B683	3.44	3.78	4.47	5.50	6.19	7.57
.082	C12B823	6.19	6.81	8.05	9.90	11.14	13.62	D12B823	4.13	4.54	5.37	6.61	7.43	9.09	E12B823	3.44	3.78	4.47	5.50	6.19	7.57
.10	C12A104	6.19	6.81	8.05	9.90	11.14	13.62	D12B104	4.13	4.54	5.37	6.61	7.43	9.09	E12B104	3.44	3.78	4.47	5.50	6.19	7.57
.12	C12B124	6.35	6.99	8.26	10.16	11.43	13.97	D12B124	4.24	4.66	5.51	6.78	7.63	9.33	E12B124	3.53	3.88	4.59	5.65	6.35	7.77
.15	C12B154	6.35	6.99	8.26	10.16	11.43	13.97	D12B154	4.24	4.66	5.51	6.78	7.63	9.33	E12B154	3.53	3.88	4.59	5.65	6.35	7.77
.18	C12B184	6.44	7.08	8.37	10.30	11.59	14.17	D12B184	4.30	4.73	5.59	6.88	7.74	9.46	E12B184	3.58	3.94	4.65	5.73	6.44	7.88
.20	C12B204	6.44	7.08	8.37	10.30	11.59	14.17	D12B204	4.30	4.73	5.59	6.88	7.74	9.46	E12B204	3.58	3.94	4.65	5.73	6.44	7.88
.22	C12B224	6.44	7.08	8.37	10.30	11.59	14.17	D12B224	4.30	4.73	5.59	6.88	7.74	9.46	E12B224	3.58	3.94	4.65	5.73	6.44	7.88
.27	C12B274	6.52	7.17	8.48	10.43	11.74	14.34	D12B274	4.34	4.77	5.64	6.94	7.81	9.55	E12B274	3.62	3.98	4.71	5.79	6.52	7.96
.33	C12B334	6.84	7.52	8.89	10.94	12.31	15.05	D12B334	4.56	5.02	5.93	7.30	8.21	10.03	E12B334	3.80	4.18	4.94	6.08	6.84	8.36
.39	C12B394	6.89	7.58	8.96	11.02	12.40	15.16	D12B394	4.60	5.06	5.98	7.36	8.28	10.12	E12B394	3.83	4.21	4.98	6.13	6.89	8.43
.47	C12B474	6.89	7.58	8.96	11.02	12.40	15.16	D12B474	4.60	5.06	5.98	7.36	8.28	10.12	E12B474	3.83	4.21	4.98	6.13	6.89	8.43
.50	C12B504	6.89	7.58	8.96	11.02	12.40	15.16	D12B504	4.60	5.06	5.98	7.36	8.28	10.12	E12B504	3.83	4.21	4.98	6.13	6.89	8.43
.56	C12B564	7.13	7.84	9.27	11.41	12.83	15.69	D12B564	4.75	5.23	6.18	7.60	8.55	10.45	E12B564	3.96	4.36	5.15	6.34	7.13	8.71
.68	C12B684	7.36	8.10	9.57	11.78	13.25	16.19	D12B684	4.91	5.40	6.38	7.86	8.84	10.80	E12B684	4.09	4.50	5.32	6.54	7.36	9.00
.82	C12B824	7.36	8.10	9.57	11.78	13.25	16.19	D12B824	4.91	5.40	6.38	7.86	8.84	10.80	E12B824	4.09	4.50	5.32	6.54	7.36	9.00
1.0	C12B105	7.36	8.10	9.57	11.78	13.25	16.19	D12B105	4.91	5.40	6.38	7.86	8.84	10.80	E12B105	4.09	4.50	5.32	6.54	7.36	9.00
1.2	C12B125	7.79	8.57	10.13	12.46	14.02	17.14	D12B125	5.20	5.72	6.76	8.32	9.36	11.44	E12B125	4.33	4.76	5.63	6.93	7.79	9.53
1.5	C12B155	8.14	8.95	10.58	13.02	14.65	17.91	D12B155	5.42	5.96	7.05	8.67	9.76	11.92	E12B155	4.52	4.97	5.88	7.23	8.14	9.94
1.8	C12B185	8.37	9.21	10.88	13.39	15.07	18.41	D12B185	5.56	6.14	7.25	8.93	10.04	12.28	E12B185	4.65	5.12	6.05	7.44	8.37	10.23
2.0	C12B205	8.53	9.38	11.09	13.65	15.35	18.77	D12B205	5.69	6.26	7.40	9.10	10.24	12.52	E12B205	4.74	5.21	6.16	7.58	8.53	10.43
2.2	C12B225	8.96	9.86	11.65	14.34	16.13	19.71	D12B225	5.98	6.58	7.77	9.57	10.76	13.16	E12B225	4.98	5.48	6.47	7.97	8.96	10.96
2.7	C12B275	9.14	10.05	11.88	14.62	16.45	20.11	D12B275	6.10	6.71	7.93	9.76	10.98	13.42	E12B275	5.08	5.59	6.60	8.13	9.14	11.18
3.0	C12B305	9.32	10.25	12.12	14.91	16.78	20.50	D12B305	6.22	6.84	8.09	9.95	11.20	13.68	E12B305	5.18	5.70	6.73	8.29	9.32	11.40
3.3	C12B335	9.77	10.75	12.70	15.63	17.59	21.49	D12B335	6.52	7.17	8.48	10.43	11.74	14.34	E12B335	5.43	5.97	7.06	8.69	9.77	11.95
3.9	C12B395	10.28	11.31	13.36	16.45	18.50	22.62	D12B395	6.85	7.54	8.91	10.96	12.33	15.07	E12B395	5.71	6.28	7.42	9.14	10.28	12.56
4.0	C12B405	10.28	11.31	13.36	16.45	18.50	22.62	D12B405	6.85	7.54	8.91	10.96	12.33	15.07	E12B405	5.71	6.28	7.42	9.14	10.28	12.56
4.7	C12B475	11.03	12.13	14.34	17.65	19.85	24.27	D12B475	7.36	8.10	9.57	11.78	13.25	16.19	E12B475	6.13	6.74	7.97	9.81	11.03	13.49
5.0	C12B505	11.03	12.13	14.34	17.65	19.85	24.27	D12B505	7.36	8.10	9.57	11.78	13.25	16.19	E						

**CRC HIGH RELIABILITY
CAPACITORS****100VDC POLYCARBONATE
PRICES (1-10 UNITS)****SERIES
12C****HOW TO ORDER**

- Select basic part number required and place desired tolerance letter, at end of basic number.
- See part number system on page 18 for complete details concerning sleeving and wire leads.
- IMPORTANT:** You must have complete part number for ordering purposes.

Example: C12C106FSC describes a 10 uF, 1%, 100 VDC capacitor, with mylar sleeving, #18AWG OFHC leads, and "C" type screening.

SERIES 12C INFORMATION

- Complete information is found on pages 12 - 17.
- 12C capacitors can be ordered by MIL Spec part number — See page 13.
- 0.82 uF or smaller capacitor values, (0.500" and smaller in diameter) use "W" wire leads.
- 1.0 uF or larger values, (0.562" and larger in diameter), use "C" wire leads.
- Prices subject to change.
- QUANTITY DISCOUNTS:**
11-25 less 10% 26-50 less 15% Contact our sales office
51-100 less 20% 101-250 less 25% for larger quantities.

MIL-C-83421/1	PRICE INFORMATION	SPECIFICATIONS
Type CRH03 100VDC	Use C12C Prices +10%	See A12C Page 10
Type CRH08 100 VDC	Use E12C Prices +10%	See K12C Page 11

UF	CRC QUALITY LEVEL 1							CRC QUALITY LEVEL 2							CRC QUALITY LEVEL 3						
	C12C 100V POLYCARBONATE							D12C 100V POLYCARBONATE							E12C 100V POLYCARBONATE						
	Equivalent to CHROIG Style of MIL-C-39022/9C							Equivalent to CHROIH Style of MIL-C-39022/9C							Equivalent to CHROIJ Style of MIL-C-39022/9C						
	BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B	BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B	BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001	C12C102	\$6.19	\$6.81	\$8.05	\$9.90	\$11.14	\$13.62	D12C102	\$4.13	\$4.54	\$5.37	\$6.61	\$7.43	\$9.09	E12C102	\$3.44	\$3.78	\$4.47	\$5.50	\$6.19	\$7.57
.0012	C12C122	6.19	6.81	8.05	9.90	11.14	13.62	D12C122	4.13	4.54	5.37	6.61	7.43	9.09	E12C122	3.44	3.78	4.47	5.50	6.19	7.57
.0015	C12C152	6.19	6.81	8.05	9.90	11.14	13.62	D12C152	4.13	4.54	5.37	6.61	7.43	9.09	E12C152	3.44	3.78	4.47	5.50	6.19	7.57
.0018	C12C182	6.19	6.81	8.05	9.90	11.14	13.62	D12C182	4.13	4.54	5.37	6.61	7.43	9.09	E12C182	3.44	3.78	4.47	5.50	6.19	7.57
.002	C12C202	6.19	6.81	8.05	9.90	11.14	13.62	D12C202	4.13	4.54	5.37	6.61	7.43	9.09	E12C202	3.44	3.78	4.47	5.50	6.19	7.57
.0022	C12C222	6.19	6.81	8.05	9.90	11.14	13.62	D12C222	4.13	4.54	5.37	6.61	7.43	9.09	E12C222	3.44	3.78	4.47	5.50	6.19	7.57
.0027	C12C272	6.19	6.81	8.05	9.90	11.14	13.62	D12C272	4.13	4.54	5.37	6.61	7.43	9.09	E12C272	3.44	3.78	4.47	5.50	6.19	7.57
.0033	C12C332	6.19	6.81	8.05	9.90	11.14	13.62	D12C332	4.13	4.54	5.37	6.61	7.43	9.09	E12C332	3.44	3.78	4.47	5.50	6.19	7.57
.0039	C12C392	6.19	6.81	8.05	9.90	11.14	13.62	D12C392	4.13	4.54	5.37	6.61	7.43	9.09	E12C392	3.44	3.78	4.47	5.50	6.19	7.57
.0047	C12C472	6.19	6.81	8.05	9.90	11.14	13.62	D12C472	4.13	4.54	5.37	6.61	7.43	9.09	E12C472	3.44	3.78	4.47	5.50	6.19	7.57
.005	C12C502	6.19	6.81	8.05	9.90	11.14	13.62	D12C502	4.13	4.54	5.37	6.61	7.43	9.09	E12C502	3.44	3.78	4.47	5.50	6.19	7.57
.0056	C12C562	6.19	6.81	8.05	9.90	11.14	13.62	D12C562	4.13	4.54	5.37	6.61	7.43	9.09	E12C562	3.44	3.78	4.47	5.50	6.19	7.57
.0068	C12C682	6.19	6.81	8.05	9.90	11.14	13.62	D12C682	4.13	4.54	5.37	6.61	7.43	9.09	E12C682	3.44	3.78	4.47	5.50	6.19	7.57
.0082	C12C822	6.19	6.81	8.05	9.90	11.14	13.62	D12C822	4.13	4.54	5.37	6.61	7.43	9.09	E12C822	3.44	3.78	4.47	5.50	6.19	7.57
.01	C12C103	6.19	6.81	8.05	9.90	11.14	13.62	D12C103	4.13	4.54	5.37	6.61	7.43	9.09	E12C103	3.44	3.78	4.47	5.50	6.19	7.57
.012	C12C123	6.19	6.81	8.05	9.90	11.14	13.62	D12C123	4.13	4.54	5.37	6.61	7.43	9.09	E12C123	3.44	3.78	4.47	5.50	6.19	7.57
.015	C12C153	6.19	6.81	8.05	9.90	11.14	13.62	D12C153	4.13	4.54	5.37	6.61	7.43	9.09	E12C153	3.44	3.78	4.47	5.50	6.19	7.57
.018	C12C183	6.19	6.81	8.05	9.90	11.14	13.62	D12C183	4.13	4.54	5.37	6.61	7.43	9.09	E12C183	3.44	3.78	4.47	5.50	6.19	7.57
.02	C12C203	6.19	6.81	8.05	9.90	11.14	13.62	D12C203	4.13	4.54	5.37	6.61	7.43	9.09	E12C203	3.44	3.78	4.47	5.50	6.19	7.57
.022	C12C223	6.19	6.81	8.05	9.90	11.14	13.62	D12C223	4.13	4.54	5.37	6.61	7.43	9.09	E12C223	3.44	3.78	4.47	5.50	6.19	7.57
.027	C12C273	6.19	6.81	8.05	9.90	11.14	13.62	D12C273	4.13	4.54	5.37	6.61	7.43	9.09	E12C273	3.44	3.78	4.47	5.50	6.19	7.57
.033	C12C333	6.19	6.81	8.05	9.90	11.14	13.62	D12C333	4.13	4.54	5.37	6.61	7.43	9.09	E12C333	3.44	3.78	4.47	5.50	6.19	7.57
.039	C12C393	6.19	6.81	8.05	9.90	11.14	13.62	D12C393	4.13	4.54	5.37	6.61	7.43	9.09	E12C393	3.44	3.78	4.47	5.50	6.19	7.57
.047	C12C473	6.19	6.81	8.05	9.90	11.14	13.62	D12C473	4.13	4.54	5.37	6.61	7.43	9.09	E12C473	3.44	3.78	4.47	5.50	6.19	7.57
.05	C12C503	6.19	6.81	8.05	9.90	11.14	13.62	D12C503	4.13	4.54	5.37	6.61	7.43	9.09	E12C503	3.44	3.78	4.47	5.50	6.19	7.57
.056	C12C563	6.19	6.81	8.05	9.90	11.14	13.62	D12C563	4.13	4.54	5.37	6.61	7.43	9.09	E12C563	3.44	3.78	4.47	5.50	6.19	7.57
.068	C12C683	6.19	6.81	8.05	9.90	11.14	13.62	D12C683	4.13	4.54	5.37	6.61	7.43	9.09	E12C683	3.44	3.78	4.47	5.50	6.19	7.57
.082	C12C823	6.19	6.81	8.05	9.90	11.14	13.62	D12C823	4.13	4.54	5.37	6.61	7.43	9.09	E12C823	3.44	3.78	4.47	5.50	6.19	7.57
.10	C12C104	6.19	6.81	8.05	9.90	11.14	13.62	D12C104	4.13	4.54	5.37	6.61	7.43	9.09	E12C104	3.44	3.78	4.47	5.50	6.19	7.57
.12	C12C124	6.35	6.99	8.26	10.16	11.43	13.97	D12C124	4.24	4.66	5.51	6.78	7.63	9.33	E12C124	3.53	3.88	4.59	5.65	6.35	7.77
.15	C12C154	6.35	6.99	8.26	10.16	11.43	13.97	D12C154	4.24	4.66	5.51	6.78	7.63	9.33	E12C154	3.53	3.88	4.59	5.65	6.35	7.77
.18	C12C184	6.44	7.08	8.37	10.30	11.59	14.17	D12C184	4.30	4.73	5.59	6.88	7.74	9.46	E12C184	3.58	3.94	4.65	5.73	6.44	7.88
.20	C12C204	6.44	7.08	8.37	10.30	11.59	14.17	D12C204	4.30	4.73	5.59	6.88	7.74	9.46	E12C204	3.58	3.94	4.65	5.73	6.44	7.88
.22	C12C224	6.44	7.08	8.37	10.30	11.59	14.17	D12C224	4.30	4.73	5.59	6.88	7.74	9.46	E12C224	3.58	3.94	4.65	5.73	6.44	7.88
.27	C12C274	6.52	7.17	8.48	10.43	11.74	14.34	D12C274	4.34	4.77	5.64	6.94	7.81	9.55	E12C274	3.62	3.98	4.71	5.79	6.52	7.96
.33	C12C334	6.84	7.52	8.89	10.94	12.31	15.05	D12C334	4.56	5.02	5.93	7.30	8.21	10.03	E12C334	3.80	4.18	4.94	6.08	6.84	8.36
.39	C12C394	6.89	7.58	8.96	11.02	12.40	15.16	D12C394	4.60	5.06	5.98	7.36	8.28	10.12	E12C394	3.83	4.21	4.98	6.13	6.89	8.43
.47	C12C474	6.89	7.58	8.96	11.02	12.40	15.16	D12C474	4.60	5.06	5.98	7.36	8.28	10.12	E12C474	3.83	4.21	4.98	6.13	6.89	8.43
.50	C12C504	6.89	7.58	8.96	11.02	12.40	15.16	D12C504	4.60	5.06	5.98	7.36	8.28	10.12	E12C504	3.83	4.21	4.98	6.13	6.89	8.43
.56	C12C564	7.13	7.84	9.27	11.41	12.83	15.69	D12C564	4.75	5.23	6.18	7.60	8.55	10.45	E12C564	3.96	4.36	5.15	6.34	7.13	8.71
.68	C12C684	7.36	8.10	9.57	11.78	13.25	16.19	D12C684	4.91	5.40	6.38	7.86	8.84	10.80	E12C684	4.09	4.50	5.32	6.54	7.36	9.00
.82	C12C824	7.36	8.10	9.57	11.78	13.25	16.19	D12C824	4.91	5.40	6.38	7.86	8.84	10.80	E12C824	4.09	4.50	5.32	6.54	7.36	9.00
1.0	C12C105	7.36	8.10	9.57	11.78	13.25	16.19	D12C105	4.91	5.40	6.38	7.86	8.84	10.80	E12C105	4.09	4.50	5.32	6.54	7.36	9.00
1.2	C12C125	7.79	8.57	10.13	12.46	14.02	17.14	D12C125	5.20	5.72	6.76	8.32	9.36	11.44	E12C125	4.33	4.76	5.63	6.93	7.79	9.53
1.5	C12C155	8.14	8.95	10.58	13.02	14.65	17.91	D12C155	5.42	5.96	7.05	8.67	9.76	11.92	E12C155	4.52	4.97	5.88	7.23	8.14	9.94
1.8	C12C185	8.37	9.21	10.88	13.39	15.07	18.41	D12C185	5.58	6.14	7.25	8.93	10.04	12.28	E12C185	4.65	5.12	6.05	7.44	8.37	10.23
2.0	C12C205	8.53	9.38	11.09	13.65	15.35	18.77	D12C205	5.69	6.26	7.40	9.10	10.24	12.52	E12C205	4.74	5.21	6.16	7.58	8.53	10.43
2.2	C12C225	8.96	9.86	11.65	14.34	16.13	19.71	D12C225	5.98	6.58	7.77	9.57	10.76	13.16	E12C225	4.98	5.48	6.47	7.97	8.96	10.96
2.7	C12C275	9.14	10.05	11.88	14.62	16.45	20.11	D12C275	6.10	6.71	7.93	9.76	10.98	13.42	E12C275	5.08	5.59	6.60	8.13	9.14	11.18
3.0	C12C305	9.32	10.25	12.12	14.91	16.78	20.50	D12C305	6.22	6.84	8.09	9.95	11.20	13.68	E12C305	5.18	5.70	6.73	8.29	9.32	11.40
3.3	C12C335	9.77	10.75	12.70	15.63	17.59	21.49	D12C335	6.52	7.17	8.48	10.43	11.74	14.34	E12C335	5.43	5.97	7.06	8.69	9.77	11.95
3.9	C12C395	10.28	11.31	13.36	16.45	18.50	22.62	D12C395	6.85	7.54	8.91	10.96	12.33	15.07	E12C395	5.71	6.28	7.42	9.14	10.28	12.56
4.0	C12C405	10.28	11.31	13.36	16.45	18.50	22.62	D12C405	6.85	7.54	8.91	10.96	12.33	15.07	E12C405	5.71	6.28	7.42	9.14	10.28	12.56
4.7	C12C475	11.03	12.13	14.34	17.65	19.85	24.27	D12C475	7.36	8.10	9.57	11.78	13.25	16.19	E12C475	6.13	6.74	7.97	9.81	11.03	13.49
5.0	C12C505	11.03	12.13	14.34	17.65	19.8															

**CRC HIGH RELIABILITY
CAPACITORS****200VDC POLYCARBONATE
PRICES (1-10 UNITS)****SERIES
12D****HOW TO ORDER**

- Select basic part number required and place desired tolerance letter, at end of basic number.
- See part number system on page 18 for complete details concerning sleeving and wire leads.
- **IMPORTANT:** You must have complete part number for ordering purposes.

Example: D12D224BSW describes a 0.22 uF, 0.25%, 200 VDC capacitor, with mylar sleeving and "D" type screening.

SERIES 12D INFORMATION

- Complete information is found on pages 12 - 17.
- 12D capacitors can be ordered by MIL Spec part number — See page 13.
- 0.56 uF or smaller capacitor values, (0.500" and smaller in diameter) use "W" wire leads.
- 0.68 uF or larger values, (0.562" and larger in diameter), use "C" wire leads.
- Prices subject to change.
- **QUANTITY DISCOUNTS:**
11-25 less 10% 26-50 less 15% Contact our sales office
51-100 less 20% 101-250 less 25% for larger quantities.

MIL-C-83421/1	PRICE INFORMATION	SPECIFICATIONS
Type CRH04 200 VDC	Use C12D Prices +10%	See A12D Page 10
Type CRH09 200 VDC	Use E12D Prices +10%	See K12D Page 11

uF	CRC QUALITY LEVEL 1							CRC QUALITY LEVEL 2							CRC QUALITY LEVEL 3						
	C12D 200V POLYCARBONATE							D12D 200V POLYCARBONATE							E12D 200V POLYCARBONATE						
	Equivalent to CHROIK Style of MIL-C-39022/9C							Equivalent to CHROIL Style of MIL-C-39022/9C							Equivalent to CHROIM Style of MIL-C-39022/9C						
	BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B	BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B	BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001 .0012 .0015	C12D102 C12D122 C12D152	\$6.19 6.19 6.19	\$6.81 6.81 6.81	\$8.05 8.05 8.05	\$9.90 9.90 9.90	\$11.14 11.14 11.14	\$13.62 13.62 13.62	D12D102 D12D122 D12D152	\$4.13 4.13 4.13	\$4.54 4.54 4.54	\$5.37 5.37 5.37	\$6.61 6.61 6.61	\$7.43 7.43 7.43	\$9.09 9.09 9.09	E12D102 E12D122 E12D152	\$3.44 3.44 3.44	\$3.78 3.78 3.78	\$4.47 4.47 4.47	\$5.50 5.50 5.50	\$6.19 6.19 6.19	\$7.57 7.57 7.57
.0018 .002 .0022	C12D182 C12D202 C12D222	6.19 6.19 6.19	6.81 6.81 6.81	8.05 8.05 8.05	9.90 9.90 9.90	11.14 11.14 11.14	13.62 13.62 13.62	D12D182 D12D202 D12D222	4.13 4.13 4.13	4.54 4.54 4.54	5.37 5.37 5.37	6.61 6.61 6.61	7.43 7.43 7.43	9.09 9.09 9.09	E12D182 E12D202 E12D222	3.44 3.44 3.44	3.78 3.78 3.78	4.47 4.47 4.47	5.50 5.50 5.50	6.19 6.19 6.19	7.57 7.57 7.57
.0027 .0033 .0039	C12D272 C12D332 C12D392	6.19 6.19 6.19	6.81 6.81 6.81	8.05 8.05 8.05	9.90 9.90 9.90	11.14 11.14 11.14	13.62 13.62 13.62	D12D272 D12D332 D12D392	4.13 4.13 4.13	4.54 4.54 4.54	5.37 5.37 5.37	6.61 6.61 6.61	7.43 7.43 7.43	9.09 9.09 9.09	E12D272 E12D332 E12D392	3.44 3.44 3.44	3.78 3.78 3.78	4.47 4.47 4.47	5.50 5.50 5.50	6.19 6.19 6.19	7.57 7.57 7.57
.0047 .005 .0056	C12D472 C12D502 C12D562	6.19 6.19 6.19	6.81 6.81 6.81	8.05 8.05 8.05	9.90 9.90 9.90	11.14 11.14 11.14	13.62 13.62 13.62	D12D472 D12D502 D12D562	4.13 4.13 4.13	4.54 4.54 4.54	5.37 5.37 5.37	6.61 6.61 6.61	7.43 7.43 7.43	9.09 9.09 9.09	E12D472 E12D502 E12D562	3.44 3.44 3.44	3.78 3.78 3.78	4.47 4.47 4.47	5.50 5.50 5.50	6.19 6.19 6.19	7.57 7.57 7.57
.0068 .0082 .01	C12D682 C12D822 C12D103	6.19 6.19 6.19	6.81 6.81 6.81	8.05 8.05 8.05	9.90 9.90 9.90	11.14 11.14 11.14	13.62 13.62 13.62	D12D682 D12D822 D12D103	4.13 4.13 4.13	4.54 4.54 4.54	5.37 5.37 5.37	6.61 6.61 6.61	7.43 7.43 7.43	9.09 9.09 9.09	E12D682 E12D822 E12D103	3.44 3.44 3.44	3.78 3.78 3.78	4.47 4.47 4.47	5.50 5.50 5.50	6.19 6.19 6.19	7.57 7.57 7.57
.012 .015 .018	C12D123 C12D153 C12D183	6.19 6.19 6.19	6.81 6.81 6.81	8.05 8.05 8.05	9.90 9.90 9.90	11.14 11.14 11.14	13.62 13.62 13.62	D12D123 D12D153 D12D183	4.13 4.13 4.13	4.54 4.54 4.54	5.37 5.37 5.37	6.61 6.61 6.61	7.43 7.43 7.43	9.09 9.09 9.09	E12D123 E12D153 E12D183	3.44 3.44 3.44	3.78 3.78 3.78	4.47 4.47 4.47	5.50 5.50 5.50	6.19 6.19 6.19	7.57 7.57 7.57
.02 .022 .027	C12D203 C12D223 C12D273	6.19 6.19 6.19	6.81 6.81 6.81	8.05 8.05 8.05	9.90 9.90 9.90	11.14 11.14 11.14	13.62 13.62 13.62	D12D203 D12D223 D12D273	4.13 4.13 4.13	4.54 4.54 4.54	5.37 5.37 5.37	6.61 6.61 6.61	7.43 7.43 7.43	9.09 9.09 9.09	E12D203 E12D223 E12D273	3.44 3.44 3.44	3.78 3.78 3.78	4.47 4.47 4.47	5.50 5.50 5.50	6.19 6.19 6.19	7.57 7.57 7.57
.033 .039 .047	C12D333 C12D393 C12D473	6.23 6.30 6.44	6.85 6.93 7.08	8.10 8.19 8.37	9.97 10.08 10.30	11.21 11.34 11.59	13.71 13.86 14.17	D12D333 D12D393 D12D473	4.15 4.20 4.30	4.57 4.62 4.73	5.40 5.46 5.59	6.64 6.72 6.88	7.47 7.56 7.74	9.13 9.24 9.46	E12D333 E12D393 E12D473	3.46 3.50 3.58	3.81 3.85 3.94	4.50 4.55 4.65	5.54 5.60 5.73	6.23 6.30 6.44	7.61 7.70 7.88
.05 .056 .068	C12D503 C12D563 C12D683	6.44 6.44 6.48	7.08 7.08 7.13	8.37 8.37 8.42	10.30 10.30 10.37	11.59 11.59 11.66	14.17 14.17 14.26	D12D503 D12D563 D12D683	4.30 4.30 4.32	4.73 4.73 4.75	5.59 5.59 5.62	6.88 6.88 6.91	7.74 7.74 7.78	9.46 9.46 9.50	E12D503 E12D563 E12D683	3.58 3.58 3.60	3.94 3.94 3.96	4.65 4.65 4.68	5.73 5.73 5.76	6.44 6.44 6.48	7.88 7.88 7.92
.082 .10 .12	C12D823 C12D104 C12D124	6.59 6.66 6.73	7.25 7.33 7.40	8.57 8.66 8.75	10.54 10.66 10.77	11.86 11.99 12.11	14.81 14.65 14.96	D12D823 D12D104 D12D124	4.39 4.44 4.49	4.83 4.88 4.94	5.71 5.77 5.84	7.02 7.10 7.18	7.90 7.99 8.08	9.66 9.77 9.88	E12D823 E12D104 E12D124	3.66 3.70 3.74	4.03 4.07 4.11	4.76 4.81 4.86	5.86 5.92 5.98	6.59 6.66 6.73	8.05 8.14 8.23
.15 .18 .20	C12D154 C12D184 C12D204	6.80 6.84 6.84	7.48 7.52 7.52	8.84 8.89 8.89	10.88 10.94 10.94	12.24 12.31 12.31	14.96 15.05 15.05	D12D154 D12D184 D12D204	4.54 4.56 4.56	4.99 5.02 5.02	5.90 5.93 5.93	7.26 7.30 7.33	8.17 8.21 8.21	9.99 10.03 10.03	E12D154 E12D184 E12D204	3.78 3.80 3.80	4.16 4.18 4.18	4.91 4.94 4.94	6.05 6.08 6.08	6.80 6.84 6.84	8.32 8.36 8.36
.22 .27 .33	C12D224 C12D274 C12D334	6.88 6.98 7.09	7.57 7.68 7.80	8.94 9.07 9.22	11.01 11.17 11.34	12.38 12.56 12.76	15.14 15.36 15.60	D12D224 D12D274 D12D334	4.58 4.66 4.73	5.04 5.13 5.20	5.95 6.06 6.15	7.33 7.46 7.57	8.24 8.39 8.51	10.08 10.25 10.41	E12D224 E12D274 E12D334	3.82 3.88 3.94	4.20 4.27 4.33	4.97 5.04 5.12	6.11 6.21 6.30	6.88 6.98 7.09	8.40 8.54 8.67
.39 .47 .50	C12D394 C12D474 C12D504	7.20 7.31 7.42	7.92 8.04 8.16	9.36 9.50 9.65	11.52 11.70 11.87	12.96 13.16 13.36	15.84 16.08 16.32	D12D394 D12D474 D12D504	4.80 4.87 4.94	5.28 5.36 5.43	6.24 6.33 6.42	7.68 7.79 7.90	8.64 8.77 8.89	10.56 10.71 10.87	E12D394 E12D474 E12D504	4.00 4.06 4.12	4.40 4.47 4.53	5.20 5.28 5.36	6.40 6.50 6.59	7.20 7.31 7.42	8.80 8.93 9.06
.56 .68 .82	C12D564 C12D684 C12D824	7.52 8.06 8.17	8.27 8.87 8.99	9.78 10.48 10.62	12.03 12.90 13.07	13.54 14.51 14.71	16.54 17.73 17.97	D12D564 D12D684 D12D824	5.02 5.38 5.45	5.52 5.92 6.00	6.53 6.99 7.09	8.03 8.61 8.72	9.04 9.68 9.81	11.04 11.84 11.99	E12D564 E12D684 E12D824	4.18 4.48 4.54	4.60 4.93 4.99	5.43 5.82 5.90	6.69 7.17 7.26	7.52 8.06 8.17	9.20 9.86 9.99
1.0 1.2 1.5	C12D105 C12D125 C12D155	8.28 8.42 9.11	9.11 9.26 10.02	10.76 10.95 11.84	13.25 13.47 14.58	14.90 15.16 16.40	18.22 18.52 20.04	D12D105 D12D125 D12D155	5.52 5.62 6.07	6.07 6.18 6.68	7.18 7.31 7.89	8.83 8.99 9.71	9.94 10.12 10.93	12.14 12.36 13.35	E12D105 E12D125 E12D155	4.60 4.68 5.06	5.06 5.15 5.57	5.98 6.08 6.58	7.36 7.49 8.10	8.28 8.42 9.11	10.12 10.30 11.13
1.8 2.0 2.2	C12D185 C12D205 C12D225	9.59 10.19 10.73	10.55 11.21 11.80	12.47 13.25 13.95	15.34 16.30 17.17	17.26 18.34 19.31	21.10 22.42 23.61	D12D185 D12D205 D12D225	6.40 6.79 7.15	7.04 7.47 7.87	8.32 8.83 9.30	10.24 10.86 11.44	11.52 12.22 12.87	14.08 14.94 15.73	E12D185 E12D205 E12D225	5.33 5.66 5.96	5.86 6.23 6.56	6.93 7.36 7.75	8.53 9.06 9.54	9.59 10.19 10.73	11.73 12.45 13.11
2.7 3.0 3.3	C12D275 C12D305 C12D335	11.27 11.92 12.56	12.40 13.11 13.82	14.65 15.50 16.33	18.03 19.07 20.10	20.29 21.46 22.61	24.79 26.22 27.63	D12D275 D12D305 D12D335	7.51 7.94 8.38	8.26 8.73 9.22	9.76 10.32 10.89	12.02 12.70 13.41	13.52 14.29 15.08	16.52 17.47 18.44	E12D275 E12D305 E12D335	6.26 6.62 6.98	6.89 7.28 7.68	8.14 8.61 9.07	10.02 10.59 11.17	11.27 11.92 12.56	13.77 14.56 15.37
3.9 4.0	C12D395 C12D405	14.29 14.29	15.72 15.72	18.58 18.58	22.86 22.86	25.72 25.72	31.44 31.44	D12D395 D12D405	9.53 9.53	10.48 10.48	12.39 12.39	15.25 15.25	17.15 17.15	20.97 20.97	E12D395 E12D405	7.94 7.94	8.73 8.73	10.32 10.32	12.70 12.70	14.29 14.29	17.47 17.47

CRC HIGH RELIABILITY
CAPACITORS400VDC POLYCARBONATE
PRICES (1-10 UNITS)SERIES
12E

HOW TO ORDER

- Select basic part number required and place desired tolerance letter, at end of basic number.
- See part number system on page 18 for complete details concerning sleeving and wire leads.
- IMPORTANT:** You must have complete part number for ordering purposes.

Example: D12E104FSW describes a 0.1 uF, 1%, 400 VDC capacitor, with mylar sleeving and "D" type screening.

SERIES 12E INFORMATION

- Complete information is found on pages 12 - 17.
- 12E capacitors can be ordered by MIL Spec part number — See page 13.
- 0.22 uF or smaller capacitor values, (0.500" and smaller in diameter) use "W" wire leads.
- 0.33 uF or larger values, (0.562" and larger in diameter), use "C" wire leads.
- Prices subject to change.
- QUANTITY DISCOUNTS:**
11-25 less 10% 26-50 less 15% Contact our sales office
51-100 less 20% 101-250 less 25% for larger quantities.

MIL-C-83421/1	PRICE INFORMATION	SPECIFICATIONS
Type CRH05 400 VDC	Use C12E Prices +10%	See A12E Page 10
Type CRH00 400 VDC	Use E12E Prices +10%	See K12E Page 11

UF	CRC QUALITY LEVEL 1								CRC QUALITY LEVEL 2								CRC QUALITY LEVEL 3							
	C12E 400V POLYCARBONATE								D12E 400V POLYCARBONATE								E12E 400V POLYCARBONATE							
	Equivalent to CHROIN Style of MIL-C-39022/9C								Equivalent to CHROIP Style of MIL-C-39022/9C								Equivalent to CHROIR Style of MIL-C-39022/9C							
	BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B		BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B		BASIC PART No.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B	
.001	C12E102	\$6.48	\$7.13	\$8.42	\$10.37	\$11.66	\$14.26	D12E102	\$4.32	\$4.75	\$5.62	\$6.91	\$7.78	\$9.50	E12E102	\$3.60	\$3.96	\$4.68	\$5.76	\$6.48	\$7.92			
.0012	C12E122	6.48	7.13	8.42	10.37	11.66	14.26	D12E122	4.32	4.75	5.62	6.91	7.78	9.50	E12E122	3.60	3.96	4.68	5.76	6.48	7.92			
.0015	C12E152	6.48	7.13	8.42	10.37	11.66	14.26	D12E152	4.32	4.75	5.62	6.91	7.78	9.50	E12E152	3.60	3.96	4.68	5.76	6.48	7.92			
.0018	C12E182	6.48	7.13	8.42	10.37	11.66	14.26	D12E182	4.32	4.75	5.62	6.91	7.78	9.50	E12E182	3.60	3.96	4.68	5.76	6.48	7.92			
.002	C12E202	6.48	7.13	8.42	10.37	11.66	14.26	D12E202	4.32	4.75	5.62	6.91	7.78	9.50	E12E202	3.60	3.96	4.68	5.76	6.48	7.92			
.0022	C12E222	6.48	7.13	8.42	10.37	11.66	14.26	D12E222	4.32	4.75	5.62	6.91	7.78	9.50	E12E222	3.60	3.96	4.68	5.76	6.48	7.92			
.0027	C12E272	6.48	7.13	8.42	10.37	11.66	14.26	D12E272	4.32	4.75	5.62	6.91	7.78	9.50	E12E272	3.60	3.96	4.68	5.76	6.48	7.92			
.0033	C12E332	6.48	7.13	8.42	10.37	11.66	14.26	D12E332	4.32	4.75	5.62	6.91	7.78	9.50	E12E332	3.60	3.96	4.68	5.76	6.48	7.92			
.0039	C12E392	6.48	7.13	8.42	10.37	11.66	14.26	D12E392	4.32	4.75	5.62	6.91	7.78	9.50	E12E392	3.60	3.96	4.68	5.76	6.48	7.92			
.0047	C12E472	6.48	7.13	8.42	10.37	11.66	14.26	D12E472	4.32	4.75	5.62	6.91	7.78	9.50	E12E472	3.60	3.96	4.68	5.76	6.48	7.92			
.005	C12E502	6.48	7.13	8.42	10.37	11.66	14.26	D12E502	4.32	4.75	5.62	6.91	7.78	9.50	E12E502	3.60	3.96	4.68	5.76	6.48	7.92			
.0056	C12E562	6.48	7.13	8.42	10.37	11.66	14.26	D12E562	4.32	4.75	5.62	6.91	7.78	9.50	E12E562	3.60	3.96	4.68	5.76	6.48	7.92			
.0068	C12E682	6.48	7.13	8.42	10.37	11.66	14.26	D12E682	4.32	4.75	5.62	6.91	7.78	9.50	E12E682	3.60	3.96	4.68	5.76	6.48	7.92			
.0082	C12E822	6.48	7.13	8.42	10.37	11.66	14.26	D12E822	4.32	4.75	5.62	6.91	7.78	9.50	E12E822	3.60	3.96	4.68	5.76	6.48	7.92			
.01	C12E103	6.48	7.13	8.42	10.37	11.66	14.26	D12E103	4.32	4.75	5.62	6.91	7.78	9.50	E12E103	3.60	3.96	4.68	5.76	6.48	7.92			
.012	C12E123	6.48	7.13	8.42	10.37	11.66	14.26	D12E123	4.32	4.75	5.62	6.91	7.78	9.50	E12E123	3.60	3.96	4.68	5.76	6.48	7.92			
.015	C12E153	6.48	7.13	8.42	10.37	11.66	14.26	D12E153	4.32	4.75	5.62	6.91	7.78	9.50	E12E153	3.60	3.96	4.68	5.76	6.48	7.92			
.018	C12E183	6.48	7.13	8.42	10.37	11.66	14.26	D12E183	4.32	4.75	5.62	6.91	7.78	9.50	E12E183	3.60	3.96	4.68	5.76	6.48	7.92			
.02	C12E203	6.48	7.13	8.42	10.37	11.66	14.26	D12E203	4.32	4.75	5.62	6.91	7.78	9.50	E12E203	3.60	3.96	4.68	5.76	6.48	7.92			
.022	C12E223	6.48	7.13	8.42	10.37	11.66	14.26	D12E223	4.32	4.75	5.62	6.91	7.78	9.50	E12E223	3.60	3.96	4.68	5.76	6.48	7.92			
.027	C12E273	6.48	7.13	8.42	10.37	11.66	14.26	D12E273	4.32	4.75	5.62	6.91	7.78	9.50	E12E273	3.60	3.96	4.68	5.76	6.48	7.92			
.033	C12E333	6.48	7.13	8.42	10.37	11.66	14.26	D12E333	4.32	4.75	5.62	6.91	7.78	9.50	E12E333	3.60	3.96	4.68	5.76	6.48	7.92			
.039	C12E393	6.48	7.13	8.42	10.37	11.66	14.26	D12E393	4.32	4.75	5.62	6.91	7.78	9.50	E12E393	3.60	3.96	4.68	5.76	6.48	7.92			
.047	C12E473	6.62	7.28	8.61	10.59	11.92	14.56	D12E473	4.42	4.86	5.75	7.07	7.96	9.72	E12E473	3.68	4.05	4.78	5.89	6.62	8.10			
.05	C12E503	6.62	7.28	8.61	10.59	11.92	14.56	D12E503	4.42	4.86	5.75	7.07	7.96	9.72	E12E503	3.68	4.05	4.78	5.89	6.62	8.10			
.056	C12E563	6.66	7.33	8.66	10.66	11.99	14.65	D12E563	4.44	4.88	5.77	7.10	7.99	9.77	E12E563	3.70	4.07	4.81	5.97	6.66	8.14			
.068	C12E683	6.73	7.40	8.75	10.77	12.11	14.81	D12E683	4.49	4.94	5.84	7.18	8.08	9.88	E12E683	3.74	4.11	4.86	5.98	6.68	8.23			
.082	C12E823	6.77	7.45	8.80	10.83	12.19	14.89	D12E823	4.51	4.96	5.86	7.22	8.12	9.92	E12E823	3.76	4.14	4.89	6.02	6.77	8.27			
.10	C12E104	6.77	7.45	8.80	10.83	12.19	14.89	D12E104	4.51	4.96	5.86	7.22	8.12	9.92	E12E104	3.76	4.14	4.89	6.02	6.77	8.27			
.12	C12E124	6.98	7.68	9.07	11.17	12.56	15.36	D12E124	4.66	5.13	6.06	7.46	8.39	10.25	E12E124	3.88	4.27	5.04	6.21	6.98	8.54			
.15	C12E154	6.98	7.68	9.07	11.17	12.56	15.36	D12E154	4.66	5.13	6.06	7.46	8.39	10.25	E12E154	3.88	4.27	5.04	6.21	6.98	8.54			
.18	C12E184	7.09	7.80	9.22	11.34	12.76	15.60	D12E184	4.73	5.20	6.15	7.57	8.51	10.41	E12E184	3.94	4.33	5.12	6.30	7.09	8.67			
.20	C12E204	7.27	8.00	9.45	11.63	13.09	15.99	D12E204	4.85	5.34	6.31	7.76	8.73	10.67	E12E204	4.04	4.44	5.25	6.46	7.27	8.89			
.22	C12E224	7.56	8.32	9.83	12.10	13.61	16.63	D12E224	5.04	5.54	6.55	8.06	9.07	11.09	E12E224	4.20	4.62	5.46	6.72	7.56	9.24			
.27	C12E274	7.81	8.59	10.15	12.50	14.06	17.18	D12E274	5.21	5.73	6.77	8.34	9.38	11.46	E12E274	4.34	4.77	5.64	6.94	7.81	9.55			
.33	C12E334	8.06	8.87	10.48	12.90	14.51	17.73	D12E334	5.38	5.92	6.99	8.61	9.68	11.84	E12E334	4.48	4.93	5.82	7.17	8.06	9.86			
.39	C12E394	8.14	8.95	10.58	13.02	14.65	17.91	D12E394	5.42	5.96	7.05	8.67	9.76	11.92	E12E394	4.52	4.97	5.88	7.23	8.14	9.94			
.47	C12E474	8.24	9.06	10.71	13.18	14.83	18.13	D12E474	5.50	6.05	7.15	8.80	9.90	12.10	E12E474	4.58	5.04	5.95	7.33	8.24	10.08			
.50	C12E504	8.32	9.15	10.82	13.31	14.98	18.30	D12E504	5.54	6.09	7.20	8.86	9.97	12.19	E12E504	4.62	5.08	6.01	7.39	8.32	10.16			
.56	C12E564	8.42	9.26	10.95	13.47	15.16	18.52	D12E564	5.62	6.18	7.31	8.99	10.12	12.36	E12E564	4.68	5.15	6.08	7.49	8.42	10.30			
.68	C12E684	9.04	9.94	11.75	14.46	16.27	19.89	D12E684	6.02	6.62	7.83	9.63	10.84	13.24	E12E684	5.02	5.52	6.53	8.03	9.04	11.09			
.82	C12E824	9.65	10.62	12.55	15.44	17.37	21.23	D12E824	6.43	7.07	8.36	10.29	11.57	14.15	E12E824	5.36	5.90	6.97	8.58	9.65	11.79			
1.0	C12E105	10.30	11.33	13.39	16.48	18.54	22.66	D12E105	6.86	7.55	8.92	10.98	12.35	15.09	E12E105	5.72	6.29	7.44	9.15	10.30	12.58			
1.2	C12E125	12.67	13.94	16.47	20.27	22.81	27.87	D12E125	8.45	9.30	10.99	13.52	15.21	18.59	E12E125	7.04	7.74	9.15	11.26	12.67	15.49			
1.5	C12E155	13.21	14.53	17.17	21.14	23.78	29.06	D12E155	8.81	9.69	11.45	14.10	15.86	19.38	E12E155	7.34	8.07	9.54	11.74	13.21	16.15			
1.8	C12E185	13.75	15.13	17.88	22.00	24.75	30.25	D12E185	9.17	10.09	11.92	14.67	16.51	20.17	E12E185	7.64	8.40	9.93	12.22	13.75	16.81			
2.0	C12E205	14.29	15.72	18.58	22.86	25.72	31.44	D12E205	9.53	10.48	12.39	15.25	17.15	20.97	E12E205	7.94	8.73	10.32	12.70	14.29	17.47			

SERIES
E32
CORDWOOD POLYCARBONATE
CAPACITOR PRICES
HOW TO ORDER

- See page 31 for specification information and case sizes.
- Select basic part number required and place desired tolerance letter at end of basic number.
- **IMPORTANT:** You must have complete part number for ordering purposes.
Example: E32A563GXW is a 0.056 uF, 2%, 30 VDC, polycarbonate capacitor, no sleeving with level 3 screening.
- Check part number information on page 18 for complete details concerning sleeving and wire leads.
- Type "W" leads are used for all capacitor values listed.
- Prices subject to change.
- **QUANTITY DISCOUNTS:**
11-25 less 10% 51-100 less 20%
26-50 less 15% 101-250 less 25%

E32A PRICES (1 - 10 UNITS)
E32B PRICES (1 - 10 UNITS)

uF	BASIC PART NO.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B	BASIC PART NO.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001	E32A102	\$4.13	\$4.54	\$5.37	\$6.61	\$7.43	\$9.09	E32B102	\$4.13	\$4.54	\$5.37	\$6.61	\$7.43	\$9.09
.0012	E32A122	4.13	4.54	5.37	6.61	7.43	9.09	E32B122	4.13	4.54	5.37	6.61	7.43	9.09
.0015	E32A152	4.13	4.54	5.37	6.61	7.43	9.09	E32B152	4.13	4.54	5.37	6.61	7.43	9.09
.0018	E32A182	4.13	4.54	5.37	6.61	7.43	9.09	E32B182	4.13	4.54	5.37	6.61	7.43	9.09
.002	E32A202	4.13	4.54	5.37	6.61	7.43	9.09	E32B202	4.13	4.54	5.37	6.61	7.43	9.09
.0022	E32A222	4.13	4.54	5.37	6.61	7.43	9.09	E32B222	4.13	4.54	5.37	6.61	7.43	9.09
.0027	E32A272	4.13	4.54	5.37	6.61	7.43	9.09	E32B272	4.13	4.54	5.37	6.61	7.43	9.09
.0033	E32A332	4.13	4.54	5.37	6.61	7.43	9.09	E32B332	4.13	4.54	5.37	6.61	7.43	9.09
.0039	E32A392	4.13	4.54	5.37	6.61	7.43	9.09	E32B392	4.13	4.54	5.37	6.61	7.43	9.09
.0047	E32A472	4.13	4.54	5.37	6.61	7.43	9.09	E32B472	4.13	4.54	5.37	6.61	7.43	9.09
.005	E32A502	4.13	4.54	5.37	6.61	7.43	9.09	E32B502	4.13	4.54	5.37	6.61	7.43	9.09
.0056	E32A562	4.13	4.54	5.37	6.61	7.43	9.09	E32B562	4.13	4.54	5.37	6.61	7.43	9.09
.0068	E32A682	4.13	4.54	5.37	6.61	7.43	9.09	E32B682	4.13	4.54	5.37	6.61	7.43	9.09
.0082	E32A822	4.13	4.54	5.37	6.61	7.43	9.09	E32B822	4.13	4.54	5.37	6.61	7.43	9.09
.01	E32A103	4.13	4.54	5.37	6.61	7.43	9.09	E32B103	4.13	4.54	5.37	6.61	7.43	9.09
.012	E32A123	4.13	4.54	5.37	6.61	7.43	9.09	E32B123	4.13	4.54	5.37	6.61	7.43	9.09
.015	E32A153	4.13	4.54	5.37	6.61	7.43	9.09	E32B153	4.13	4.54	5.37	6.61	7.43	9.09
.018	E32A183	4.13	4.54	5.37	6.61	7.43	9.09	E32B183	4.13	4.54	5.37	6.61	7.43	9.09
.02	E32A203	4.13	4.54	5.37	6.61	7.43	9.09	E32B203	4.13	4.54	5.37	6.61	7.43	9.09
.022	E32A223	4.13	4.54	5.37	6.61	7.43	9.09	E32B223	4.13	4.54	5.37	6.61	7.43	9.09
.027	E32A273	4.13	4.54	5.37	6.61	7.43	9.09	E32B273	4.13	4.54	5.37	6.61	7.43	9.09
.033	E32A333	4.13	4.54	5.37	6.61	7.43	9.09	E32B333	4.13	4.54	5.37	6.61	7.43	9.09
.039	E32A393	4.13	4.54	5.37	6.61	7.43	9.09	E32B393	4.13	4.54	5.37	6.61	7.43	9.09
.047	E32A473	4.13	4.54	5.37	6.61	7.43	9.09	E32B473	4.13	4.54	5.37	6.61	7.43	9.09
.05	E32A503	4.13	4.54	5.37	6.61	7.43	9.09	E32B503	4.13	4.54	5.37	6.61	7.43	9.09
.056	E32A563	4.13	4.54	5.37	6.61	7.43	9.09	E32B563	4.13	4.54	5.37	6.61	7.43	9.09
.068	E32A683	4.13	4.54	5.37	6.61	7.43	9.09	E32B683	4.13	4.54	5.37	6.61	7.43	9.09
.082	E32A823	4.13	4.54	5.37	6.61	7.43	9.09	E32B823	4.13	4.54	5.37	6.61	7.43	9.09
.10	E32A104	4.13	4.54	5.37	6.61	7.43	9.09	E32B104	4.13	4.54	5.37	6.61	7.43	9.09
.12	E32A124	4.24	4.66	5.51	6.78	7.63	9.33	E32B124	4.24	4.66	5.51	6.78	7.63	9.33
.15	E32A154	4.24	4.66	5.51	6.78	7.63	9.33	E32B154	4.24	4.66	5.51	6.78	7.63	9.33
.18	E32A184	4.30	4.73	5.59	6.88	7.74	9.46	E32B184	4.30	4.73	5.59	6.88	7.74	9.46
.20	E32A204	4.30	4.73	5.59	6.88	7.74	9.46	E32B204	4.30	4.73	5.59	6.88	7.74	9.46
.22	E32A224	4.30	4.73	5.59	6.88	7.74	9.46	E32B224	4.30	4.73	5.59	6.88	7.74	9.46
.27	E32A274	4.34	4.77	5.64	6.94	7.81	9.55	E32B274	4.34	4.77	5.64	6.94	7.81	9.55
.33	E32A334	4.56	5.02	5.93	7.30	8.21	10.03	E32B334	4.56	5.02	5.93	7.30	8.21	10.03
.39	E32A394	4.60	5.06	5.98	7.36	8.28	10.12	E32B394	4.60	5.06	5.98	7.36	8.28	10.12
.47	E32A474	4.60	5.06	5.98	7.36	8.28	10.12	E32B474	4.60	5.06	5.98	7.36	8.28	10.12
.50	E32A504	4.60	5.06	5.98	7.36	8.28	10.12	E32B504	4.60	5.06	5.98	7.36	8.28	10.12
.56	E32A564	4.75	5.23	6.18	7.60	8.55	10.45	E32B564	4.75	5.23	6.18	7.60	8.55	10.45
.68	E32A684	4.91	5.40	6.38	7.86	8.84	10.80	E32B684	4.91	5.40	6.38	7.86	8.84	10.80
.82	E32A824	4.91	5.40	6.38	7.86	8.84	10.80	E32B824	4.91	5.40	6.38	7.86	8.84	10.80
1.0	E32A105	4.91	5.40	6.38	7.86	8.84	10.80	E32B105	4.91	5.40	6.38	7.86	8.84	10.80
1.2	E32A125	5.20	5.72	6.76	8.32	9.36	11.44							
1.5	E32A155	5.42	5.96	7.05	8.67	9.76	11.92							
1.8	E32A185	5.58	6.14	7.25	8.93	10.04	12.28							
2.0	E32A205	5.69	6.26	7.40	9.10	10.24	12.52							
2.2	E32A225	5.98	6.58	7.77	9.57	10.76	13.16							
2.7	E32A275	6.10	6.71	7.93	9.76	10.98	13.42							
3.0	E32A305	6.22	6.84	8.09	9.95	11.20	13.68							
3.3	E32A335	6.52	7.17	8.48	10.43	11.74	14.34							
3.9	E32A395	6.85	7.54	8.91	10.96	12.33	15.07							
4.0	E32A405	6.85	7.54	8.91	10.96	12.33	15.07							
4.7	E32A475	7.36	8.10	9.57	11.78	13.25	16.19							
5.0	E32A505	7.36	8.10	9.57	11.78	13.25	16.19							
5.6	E32A565	8.09	8.90	10.52	12.94	14.56	17.80							
6.8	E32A685	8.45	9.30	10.99	13.52	15.21	18.59							
8.0	E32A805	9.60	10.56	12.48	15.36	17.28	21.12							
8.2	E32A825	9.60	10.56	12.48	15.36	17.28	21.12							
10.0	E32A106	9.60	10.56	12.48	15.36	17.28	21.12							

SERIES
D31B
CORDWOOD TEFLON
CAPACITOR PRICES
HOW TO ORDER

- See page 31 for specification information and case sizes.
- Select basic part number required and place desired tolerance letter at end of basic number.
- **IMPORTANT:** You must have complete part number for ordering purposes.
Example: D31B273BSW is a 0.027 uF, 0.25%, 50VDC teflon capacitor with mylar sleeving and level 2 screening.
- Check part number information on page 18 for complete details concerning sleeving and wire leads.
- Type "W" leads are used for all capacitor values listed.
- Prices subject to change.
- **QUANTITY DISCOUNTS:**
11-25 less 10%
26-50 less 15%
51-100 less 20%
101-250 less 25%

Example: D31B273BSW is a 0.027 uF, 0.25%, 50VDC teflon capacitor with mylar sleeving and level 2 screening.

- Check part number information on page 18 for complete details concerning sleeving and wire leads.
- Type "W" leads are used for all capacitor values listed.
- Prices subject to change.

- **QUANTITY DISCOUNTS:**
11-25 less 10%
26-50 less 15%
51-100 less 20%
101-250 less 25%

D31B PRICES (1 - 10 UNITS)

uF	BASIC PART NO.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001	D31B102	\$4.96	\$5.48	\$6.47	\$7.73	\$9.90	\$13.14
.0012	D31B122	4.96	5.48	6.47	7.73	9.90	13.14
.0015	D31B152	4.96	5.48	6.47	7.73	9.90	13.14
.0018	D31B182	4.96	5.48	6.47	7.73	9.90	13.14
.002	D31B202	4.96	5.48	6.47	7.73	9.90	13.14
.0022	D31B222	4.96	5.48	6.47	7.73	9.90	13.14
.0027	D31B272	4.96	5.48	6.47	7.73	9.90	13.14
.0033	D31B332	4.96	5.48	6.47	7.73	9.90	13.14
.0039	D31B392	4.96	5.48	6.47	7.73	9.90	13.14
.0047	D31B472	4.96	5.48	6.47	7.73	9.90	13.14
.005	D31B502	4.96	5.48	6.47	7.73	9.90	13.14
.0056	D31B562	4.96	5.48	6.47	7.73	9.90	13.14
.0068	D31B682	4.96	5.48	6.47	7.73	9.90	13.14
.0082	D31B822	4.96	5.48	6.47	7.73	9.90	13.14
.01	D31B103	4.96	5.48	6.47	7.73	9.90	13.14
.012	D31B123	4.96	5.48	6.47	7.73	9.90	13.14
.015	D31B153	4.96	5.48	6.47	7.73	9.90	13.14
.018	D31B183	4.96	5.48	6.47	7.73	9.90	13.14
.02	D31B203	4.96	5.48	6.47	7.73	9.90	13.14
.022	D31B223	4.96	5.48	6.47	7.73	9.90	13.14
.027	D31B273	5.35	5.77	6.67	7.92	10.30	14.32
.033	D31B333	5.35	5.77	6.67	7.92	10.30	14.32
.039	D31B393	5.48	6.16	7.07	8.39	10.90	14.46
.047	D31B473	5.76	6.49	7.60	8.92	11.29	14.59
.05	D31B503	5.76	6.49	7.60	8.92	11.29	14.59
.056	D31B563	6.02	6.98	9.18	10.43	12.01	14.72
.068	D31B683	6.19	7.63	9.77	11.09	13.60	15.58
.082	D31B823	7.86	9.11	10.50	11.82	14.46	17.29
.10	D31B104	7.86	9.11	10.50	11.82	14.46	17.29
.12	D31B124	8.63	9.80	11.35	12.67	15.38	19.14
.15	D31B154	8.63	9.80	11.35	12.67	15.38	19.14
.18	D31B184	11.33	12.88	14.26	15.58	18.29	21.12
.20	D31B204	11.33	12.88	14.26	15.58	18.29	21.12
.22	D31B224	11.33	12.88	14.26	15.58	18.29	21.12

CRC HIGH RELIABILITY CAPACITORS

*50VDC TEFLON PRICES (1-10 UNITS)

**SERIES
11**

HOW TO ORDER QUALITY LEVEL 1 B11 TEFLON

- See page 28 for 50V, 100V, and 200V, B11 series case sizes.
- *Prices shown below for 50 volt, B11B capacitors are the same for the 100 volt, B11C, and 200 volt, B11D, teflon capacitors.
- Select basic part number required and place desired tolerance letter at end of basic number.
- **IMPORTANT:** You must have complete part number for ordering purposes as shown below.
Example: B11B103JXW is a 0.01 μ F, 5%, 50V capacitor with no sleeving.
Example: B11C334DSW is a 0.33 μ F, 0.5%, 100V capacitor with mylar sleeving.
Example: B11D105FXW is a 1.0 μ F, 1%, 200V capacitor with no sleeving.
- See page 24 for B11 specifications.
- **QUANTITY DISCOUNTS:**
11-25 less 10% 26-50 less 15%
51-100 less 20% 101-250 less 25%
- Contact our sales office for larger quantities.

HOW TO ORDER QUALITY LEVEL 1 C11 TEFLON

- See page 28 for 50V, 100V, and 200V, C11 series case sizes.
- *Prices shown below for 50 volt, C11B capacitors are the same for the 100 volt, C11C, and 200 volt, C11D teflon capacitors.
- Select basic part number required and place desired tolerance letter at end of basic number.
- **IMPORTANT:** You must have complete part number for ordering purposes.
Example: C11B682FSW is a 0.0068 μ F, 1%, 50V, capacitor with mylar sleeving.
Example: C11C152BXW is a 0.0015 μ F, 0.25%, 100V, capacitor with no sleeving.
Example: C11D155JSW is a 1.5 μ F, 5%, 200V, capacitor with mylar sleeving.
- See page 25 for C11 specifications.
- Prices subject to change.
- **QUANTITY DISCOUNTS:**
11-25 less 10% 26-50 less 15%
51-100 less 20% 101-250 less 25%
- Contact our sales office for larger quantities.

B11B 50VDC TEFLON

μ F	BASIC PART NO.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001	B11B102	\$9.30	\$10.22	\$12.09	\$13.95	\$15.80	\$18.59
.0012	B11B122	9.30	10.22	12.09	13.95	15.80	18.59
.0015	B11B152	9.30	10.22	12.09	13.95	15.80	18.59
.0018	B11B182	9.30	10.22	12.09	13.95	15.80	18.59
.002	B11B202	9.30	10.22	12.09	13.95	15.80	18.59
.0022	B11B222	9.30	10.22	12.09	13.95	15.80	18.59
.0027	B11B272	9.30	10.22	12.09	13.95	15.80	18.59
.0033	B11B332	9.30	10.22	12.09	13.95	15.80	18.59
.0039	B11B392	9.30	10.22	12.09	13.95	15.80	18.59
.0047	B11B472	9.30	10.22	12.09	13.95	15.80	18.59
.005	B11B502	9.30	10.22	12.09	13.95	15.80	18.59
.0056	B11B562	9.30	10.22	12.09	13.95	15.80	18.59
.0068	B11B682	9.30	10.22	12.09	13.95	15.80	18.59
.0082	B11B822	9.30	10.22	12.09	13.95	15.80	18.59
.01	B11B103	9.30	10.22	12.09	13.95	15.80	18.59
.012	B11B123	9.30	10.22	12.09	13.95	15.80	18.59
.015	B11B153	9.30	10.22	12.09	13.95	15.80	18.59
.018	B11B183	9.34	10.27	12.14	14.01	15.88	18.68
.02	B11B203	9.38	10.32	12.19	14.07	15.94	18.75
.022	B11B223	9.43	10.37	12.24	14.12	16.02	18.84
.027	B11B273	9.47	10.41	12.30	14.20	16.08	18.92
.033	B11B333	9.92	10.92	12.91	14.89	16.86	19.85
.039	B11B393	10.27	11.30	13.33	15.38	17.46	20.52
.047	B11B473	10.56	11.60	13.73	15.83	17.94	21.11
.05	B11B503	10.56	11.60	13.73	15.83	17.94	21.11
.056	B11B563	11.02	12.11	14.31	16.53	18.73	22.11
.068	B11B683	11.60	12.76	15.09	17.41	19.72	23.21
.082	B11B823	13.78	15.15	17.91	20.66	23.42	27.55
.1	B11B104	13.78	15.15	17.91	20.66	23.42	27.55
.12	B11B124	14.10	15.50	18.33	21.15	23.95	28.18
.15	B11B154	14.70	16.17	19.11	22.05	24.99	29.40
.18	B11B184	15.99	17.60	20.79	24.00	27.19	31.99
.2	B11B204	17.53	19.26	22.78	26.28	29.79	35.04
.22	B11B224	17.53	19.26	22.78	26.28	29.79	35.04
.27	B11B274	19.21	21.13	24.01	26.89	30.73	36.50
.33	B11B334	21.21	23.32	26.52	29.69	33.92	40.29
.39	B11B394	22.93	25.22	27.52	29.81	34.40	41.27
.47	B11B474	24.10	26.51	28.92	31.33	36.15	43.38
.5	B11B504	24.89	27.38	29.87	32.36	37.34	44.80
.56	B11B564	26.49	29.14	31.79	34.44	39.74	47.68
.68	B11B684	28.07	30.88	33.68	36.49	42.11	50.53
.82	B11B824	30.15	33.17	36.18	39.20	45.23	54.27
1.0	B11B105	31.80	34.98	38.16	41.34	47.70	57.24
1.5	B11B155	39.16	43.08	46.99	50.91	55.57	63.23
2.0	B11B205	48.94	53.83	58.73	63.62	69.47	79.04

C11B 50VDC TEFLON

μ F	BASIC PART NO.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001	C11B102	\$6.20	\$6.81	\$8.06	\$9.30	\$10.53	\$12.39
.0012	C11B122	6.20	6.81	8.06	9.30	10.53	12.39
.0015	C11B152	6.20	6.81	8.06	9.30	10.53	12.39
.0018	C11B182	6.20	6.81	8.06	9.30	10.53	12.39
.002	C11B202	6.20	6.81	8.06	9.30	10.53	12.39
.0022	C11B222	6.20	6.81	8.06	9.30	10.53	12.39
.0027	C11B272	6.20	6.81	8.06	9.30	10.53	12.39
.0033	C11B332	6.20	6.81	8.06	9.30	10.53	12.39
.0039	C11B392	6.20	6.81	8.06	9.30	10.53	12.39
.0047	C11B472	6.20	6.81	8.06	9.30	10.53	12.39
.005	C11B502	6.20	6.81	8.06	9.30	10.53	12.39
.0056	C11B562	6.20	6.81	8.06	9.30	10.53	12.39
.0068	C11B682	6.20	6.81	8.06	9.30	10.53	12.39
.0082	C11B822	6.20	6.81	8.06	9.30	10.53	12.39
.01	C11B103	6.20	6.81	8.06	9.30	10.53	12.39
.012	C11B123	6.20	6.81	8.06	9.30	10.53	12.39
.015	C11B153	6.38	7.02	8.29	9.57	10.85	12.76
.018	C11B183	6.44	7.08	8.37	9.66	10.95	12.88
.02	C11B203	6.47	7.12	8.41	9.70	10.99	12.93
.022	C11B223	6.50	7.15	8.44	9.74	11.05	12.99
.027	C11B273	6.53	7.18	8.48	9.79	11.09	13.05
.033	C11B333	6.84	7.53	8.90	10.27	11.63	13.69
.039	C11B393	7.08	7.79	9.19	10.61	12.04	14.15
.047	C11B473	7.28	8.00	9.47	10.92	12.37	14.56
.05	C11B503	7.28	8.00	9.47	10.92	12.37	14.56
.056	C11B563	7.60	8.35	9.87	11.40	12.92	15.20
.068	C11B683	8.00	8.80	10.41	12.01	13.60	16.01
.082	C11B823	9.50	10.45	12.35	14.25	16.15	19.00
.1	C11B104	9.50	10.45	12.35	14.25	16.15	19.00
.12	C11B124	10.07	11.07	13.09	15.11	17.11	20.13
.15	C11B154	10.50	11.55	13.65	15.75	17.85	21.00
.18	C11B184	11.42	12.57	14.85	17.14	19.42	22.85
.2	C11B204	12.52	13.76	16.27	18.77	21.28	25.03
.22	C11B224	12.52	13.76	16.27	18.77	21.28	25.03
.27	C11B274	13.72	15.09	17.15	19.21	21.95	26.07
.33	C11B334	15.15	16.66	18.94	21.21	24.23	28.78
.39	C11B394	16.38	18.02	20.48	22.93	26.21	31.12
.47	C11B474	17.85	19.59	22.32	24.99	28.55	33.91
.5	C11B504	18.44	20.23	23.06	25.81	29.51	35.03
.56	C11B564	20.03	22.03	25.04	28.05	32.05	38.07
.68	C11B684	21.44	23.58	26.80	30.01	34.30	40.73
.82	C11B824	24.60	27.05	29.51	31.98	36.89	44.28
1.0	C11B105	26.50	29.15	31.80	34.45	39.75	47.70
1.5	C11B155	32.64	35.90	39.17	42.43	46.31	52.69
2.0	C11B205	40.78	44.86	48.94	53.01	57.89	65.87

PAGE 46

catalog J

COMPONENT RESEARCH CO., INC. • 1717 19TH STREET • SANTA MONICA, CALIF. 90404 • (213) 829-3615 TWX: (910) 343-6864

**CRC HIGH RELIABILITY
CAPACITORS*****50VDC TEFLON
PRICES (1-10 UNITS)****SERIES
11****HOW TO ORDER
QUALITY LEVEL 2 D11 TEFLON**

- See page 28 for 50V, 100V, and 200V, D11 series case sizes.
- *Prices shown below for 50 volt, D11B capacitors are the same for the 100 volt, D11C, and 200 volt, D11D, teflon capacitors.
- Select basic part number required and place desired tolerance letter at end of basic number.
- **IMPORTANT:** You must have complete part number for ordering purposes as shown below.
Example: D11B472FXW is a 0.0047 uF, 1%, 50V capacitor with no sleeving.
Example: D11C154KSW is a 0.15 uF, 10%, 100V capacitor with mylar sleeving.
Example: D11D824DXW is a 0.82 uF, 0.5%, 200V capacitor with no sleeving.
- See page 26 for D11 specifications.
- **QUANTITY DISCOUNTS:**
11-25 less 10% 26-50 less 15%
51-100 less 20% 101-250 less 25%

D11B 50VDC TEFLON

uF	BASIC PART NO.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001	D11B102	\$4.13	\$4.54	\$5.37	\$6.20	\$7.02	\$8.26
.0012	D11B122	4.13	4.54	5.37	6.20	7.02	8.26
.0015	D11B152	4.13	4.54	5.37	6.20	7.02	8.26
.0018	D11B182	4.13	4.54	5.37	6.20	7.02	8.26
.002	D11B202	4.13	4.54	5.37	6.20	7.02	8.26
.0022	D11B222	4.13	4.54	5.37	6.20	7.02	8.26
.0027	D11B272	4.13	4.54	5.37	6.20	7.02	8.26
.0033	D11B332	4.13	4.54	5.37	6.20	7.02	8.26
.0039	D11B392	4.13	4.54	5.37	6.20	7.02	8.26
.0047	D11B472	4.13	4.54	5.37	6.20	7.02	8.26
.005	D11B502	4.13	4.54	5.37	6.20	7.02	8.26
.0056	D11B562	4.13	4.54	5.37	6.20	7.02	8.26
.0068	D11B682	4.13	4.54	5.37	6.20	7.02	8.26
.0082	D11B822	4.13	4.54	5.37	6.20	7.02	8.26
.01	D11B103	4.13	4.54	5.37	6.20	7.02	8.26
.012	D11B123	4.13	4.54	5.37	6.20	7.02	8.26
.015	D11B153	4.40	4.84	5.72	6.60	7.48	8.80
.018	D11B183	4.44	4.88	5.77	6.66	7.55	8.88
.02	D11B203	4.46	4.91	5.80	6.69	7.58	8.92
.022	D11B223	4.48	4.93	5.82	6.72	7.62	8.96
.027	D11B273	4.50	4.95	5.85	6.75	7.65	9.00
.033	D11B333	4.72	5.19	6.14	7.08	8.02	9.44
.039	D11B393	4.88	5.37	6.34	7.32	8.30	9.76
.047	D11B473	5.02	5.52	6.53	7.53	8.53	10.04
.05	D11B503	5.02	5.52	6.53	7.53	8.53	10.04
.056	D11B563	5.24	5.76	6.81	7.86	8.91	10.48
.068	D11B683	5.52	6.07	7.18	8.28	9.38	11.04
.082	D11B823	6.55	7.21	8.52	9.83	11.14	13.10
.1	D11B104	6.55	7.21	8.52	9.83	11.14	13.10
.12	D11B124	7.19	7.91	9.35	10.79	12.22	14.38
.15	D11B154	7.50	8.25	9.75	11.25	12.75	15.00
.18	D11B184	8.16	8.98	10.61	12.24	13.87	16.32
.2	D11B204	8.94	9.83	11.62	13.41	15.20	17.88
.22	D11B224	8.94	9.83	11.62	13.41	15.20	17.88
.27	D11B274	9.80	10.78	12.25	13.72	15.68	18.62
.33	D11B334	10.82	11.90	13.53	15.15	17.31	20.56
.39	D11B394	11.70	12.87	14.63	16.38	18.72	22.23
.47	D11B474	13.22	14.54	16.53	18.51	21.15	25.12
.5	D11B504	13.66	15.03	17.08	19.12	21.86	25.95
.56	D11B564	14.84	16.32	18.55	20.78	23.74	28.20
.68	D11B684	15.88	17.47	19.85	22.23	25.41	30.17
.82	D11B824	18.92	20.81	22.70	24.60	28.38	34.06
1.0	D11B105	21.42	23.56	25.70	27.85	32.13	38.56
1.5	D11B155	29.50	32.45	35.40	38.35	44.25	53.10
2.0	D11B205	34.58	38.04	41.50	44.95	51.87	62.24

**HOW TO ORDER
QUALITY LEVEL 3 E11 TEFLON**

- See page 28 for 50V, 100V, and 200V, E11 series case sizes.
- *Prices shown below for 50 volt, E11B capacitors are the same for the 100 volt, E11C, and 200 volt, E11D, teflon capacitors.
- Select basic part number required and place desired tolerance letter at end of basic number.
- **IMPORTANT:** You must have complete part number for ordering purposes as shown below.
Example: E11B204JSW is a 0.2 uF, 5%, 50V, capacitor with mylar sleeving.
Example: E11C273BXW is a 0.027 uF, 0.25%, 100V, capacitor with no sleeving.
Example: E11D562GSW is a 0.0056 uF, 2%, 200V, capacitor with mylar sleeving.
- See Page 27 for E11 specifications.
- Prices subject to change.
- **QUANTITY DISCOUNTS:**
11-25 less 10% 26-50 less 15%
51-100 less 20% 101-250 less 25%
- Contact our sales office for larger quantities.

E11B 50VDC TEFLON

uF	BASIC PART NO.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001	E11B102	\$3.51	\$3.86	\$4.56	\$5.27	\$5.97	\$7.02
.0012	E11B122	3.51	3.86	4.56	5.27	5.97	7.02
.0015	E11B152	3.51	3.86	4.56	5.27	5.97	7.02
.0018	E11B182	3.51	3.86	4.56	5.27	5.97	7.02
.002	E11B202	3.51	3.86	4.56	5.27	5.97	7.02
.0022	E11B222	3.51	3.86	4.56	5.27	5.97	7.02
.0027	E11B272	3.51	3.86	4.56	5.27	5.97	7.02
.0033	E11B332	3.51	3.86	4.56	5.27	5.97	7.02
.0039	E11B392	3.51	3.86	4.56	5.27	5.97	7.02
.0047	E11B472	3.51	3.86	4.56	5.27	5.97	7.02
.005	E11B502	3.51	3.86	4.56	5.27	5.97	7.02
.0056	E11B562	3.51	3.86	4.56	5.27	5.97	7.02
.0068	E11B682	3.51	3.86	4.56	5.27	5.97	7.02
.0082	E11B822	3.51	3.86	4.56	5.27	5.97	7.02
.01	E11B103	3.51	3.86	4.56	5.27	5.97	7.02
.012	E11B123	3.51	3.86	4.56	5.27	5.97	7.02
.015	E11B153	3.74	4.11	4.86	5.61	6.36	7.48
.018	E11B183	3.77	4.15	4.90	5.66	6.42	7.55
.02	E11B203	3.79	4.17	4.93	5.69	6.44	7.58
.022	E11B223	3.81	4.19	4.95	5.71	6.48	7.62
.027	E11B273	3.82	4.21	4.97	5.74	6.50	7.65
.033	E11B333	4.01	4.41	5.22	6.02	6.82	8.02
.039	E11B393	4.15	4.56	5.39	6.22	7.05	8.30
.047	E11B473	4.27	4.69	5.55	6.40	7.25	8.53
.05	E11B503	4.27	4.69	5.55	6.40	7.25	8.53
.056	E11B563	4.45	4.90	5.79	6.68	7.57	8.91
.068	E11B683	4.69	5.16	6.10	7.04	7.97	9.38
.082	E11B823	5.57	6.13	7.24	8.36	9.47	11.13
.1	E11B104	5.57	6.13	7.24	8.36	9.47	11.13
.12	E11B124	6.11	6.72	7.95	9.17	10.39	12.22
.15	E11B154	6.37	7.01	8.29	9.56	10.84	12.75
.18	E11B184	6.94	7.63	9.02	10.40	11.79	13.87
.2	E11B204	7.60	8.36	9.88	11.40	12.92	15.20
.22	E11B224	7.60	8.36	9.88	11.40	12.92	15.20
.27	E11B274	8.33	9.16	10.41	11.66	13.33	15.83
.33	E11B334	9.20	10.11	11.50	12.88	14.71	17.48
.39	E11B394	9.94	10.94	12.44	13.92	15.91	18.90
.47	E11B474	11.24	12.36	14.05	15.73	17.98	21.35
.5	E11B504	11.61	12.78	14.52	16.25	18.58	22.06
.56	E11B564	12.61	13.87	15.77	17.66	20.18	23.97
.68	E11B684	13.50	14.85	16.87	18.90	21.60	25.64
.82	E11B824	16.08	17.69	19.29	20.91	24.12	28.95
1.0	E11B105	18.21	20.03	21.84	23.67	27.31	32.78
1.5	E11B155	25.07	27.58	30.09	32.60	37.61	45.13
2.0	E11B205	29.39	32.33	35.27	38.21	44.09	52.90

**CRC HIGH RELIABILITY
CAPACITORS****100VDC & 200VDC TEFLON
PRICES (1-10 UNITS)****SERIES
D51****HOW TO ORDER**

- Select basic part number required and place desired tolerance letter at end of basic number.
- **IMPORTANT:** You must have complete basic number for ordering purposes as shown below.
Example: D51C472KSW is a 0.0047 uF, 10%, 100V capacitor with mylar sleeving.
Example: D51D824JXW is a 0.82 uF, 5%, 200V capacitor without sleeving.
- Prices subject to change.

• QUANTITY DISCOUNTS:

11-25 less 10% 26-50 less 15%
51-100 less 20% 101-250 less 25%

- Contact our sales office for larger quantities.

**QUALITY LEVEL 2, D51 SERIES
TEFLON CAPACITORS**

- See page 28 for D51 case sizes and specifications.
- See page 30 for X51 life test data.

D51C 100VDC TEFLON

uF	BASIC PART NO.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001	D51C102	\$4.54	\$4.99	\$5.90	\$6.81	\$7.72	\$9.08
.0012	D51C122	4.54	4.99	5.90	6.81	7.72	9.08
.0015	D51C152	4.54	4.99	5.90	6.81	7.72	9.08
.0018	D51C182	4.54	4.99	5.90	6.81	7.72	9.08
.002	D51C202	4.54	4.99	5.90	6.81	7.72	9.08
.0022	D51C222	4.54	4.99	5.90	6.81	7.72	9.08
.0027	D51C272	4.54	4.99	5.90	6.81	7.72	9.08
.0033	D51C332	4.54	4.99	5.90	6.81	7.72	9.08
.0039	D51C392	4.54	4.99	5.90	6.81	7.72	9.08
.0047	D51C472	4.54	4.99	5.90	6.81	7.72	9.08
.005	D51C502	4.54	4.99	5.90	6.81	7.72	9.08
.0056	D51C562	4.54	4.99	5.90	6.81	7.72	9.08
.0068	D51C682	4.54	4.99	5.90	6.81	7.72	9.08
.0082	D51C822	4.54	4.99	5.90	6.81	7.72	9.08
.01	D51C103	4.54	4.99	5.90	6.81	7.72	9.08
.012	D51C123	4.54	4.99	5.90	6.81	7.72	9.08
.015	D51C153	4.74	5.21	6.16	7.11	8.06	9.48
.018	D51C183	4.88	5.37	6.34	7.32	8.30	9.76
.02	D51C203	4.91	5.40	6.38	7.37	8.35	9.82
.022	D51C223	4.93	5.42	6.41	7.40	8.38	9.86
.027	D51C273	4.95	5.45	6.44	7.43	8.42	9.90
.033	D51C333	5.19	5.71	6.75	7.79	8.82	10.38
.039	D51C393	5.37	5.91	6.98	8.06	9.13	10.74
.047	D51C473	5.52	6.07	7.18	8.28	9.38	11.04
.05	D51C503	5.52	6.07	7.18	8.28	9.38	11.04
.056	D51C563	5.76	6.34	7.49	8.64	9.79	11.52
.068	D51C683	6.07	6.68	7.89	9.11	10.32	12.14
.082	D51C823	7.21	7.93	9.37	10.82	12.26	14.42
.1	D51C104	7.21	7.93	9.37	10.82	12.26	14.42
.12	D51C124	7.91	8.70	10.28	11.87	13.45	15.82
.15	D51C154	8.25	9.08	10.73	12.38	14.03	16.50
.18	D51C184	8.98	9.88	11.67	13.47	15.27	17.96
.2	D51C204	9.83	10.81	12.78	14.75	16.71	19.66
.22	D51C224	9.83	10.81	12.78	14.75	16.71	19.66
.27	D51C274	10.78	11.86	13.48	15.09	17.25	20.48
.33	D51C334	11.90	13.09	14.88	16.66	19.04	22.61
.39	D51C394	12.87	14.16	16.09	18.02	20.59	24.45
.47	D51C474	14.54	15.99	18.18	20.36	23.26	27.63
.5	D51C504	15.03	16.53	18.79	21.04	24.05	28.56
.56	D51C564	16.32	17.95	20.40	22.85	26.11	31.01
.68	D51C684	17.47	19.22	21.84	24.46	27.95	33.19
.82	D51C824	20.81	22.89	24.97	27.05	31.22	37.46
1.0	D51C105	23.56	25.92	28.27	30.63	35.34	42.41

D51D 200VDC TEFLON

uF	BASIC PART NO.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001	D51D102	\$4.99	\$5.49	\$6.49	\$7.49	\$8.49	\$9.99
.0012	D51D122	4.99	5.49	6.49	7.49	8.49	9.99
.0015	D51D152	4.99	5.49	6.49	7.49	8.49	9.99
.0018	D51D182	4.99	5.49	6.49	7.49	8.49	9.99
.002	D51D202	4.99	5.49	6.49	7.49	8.49	9.99
.0022	D51D222	4.99	5.49	6.49	7.49	8.49	9.99
.0027	D51D272	4.99	5.49	6.49	7.49	8.49	9.99
.0033	D51D332	4.99	5.49	6.49	7.49	8.49	9.99
.0039	D51D392	4.99	5.49	6.49	7.49	8.49	9.99
.0047	D51D472	4.99	5.49	6.49	7.49	8.49	9.99
.005	D51D502	4.99	5.49	6.49	7.49	8.49	9.99
.0056	D51D562	4.99	5.49	6.49	7.49	8.49	9.99
.0068	D51D682	4.99	5.49	6.49	7.49	8.49	9.99
.0082	D51D822	4.99	5.49	6.49	7.49	8.49	9.99
.01	D51D103	4.99	5.49	6.49	7.49	8.49	9.99
.012	D51D123	4.99	5.49	6.49	7.49	8.49	9.99
.015	D51D153	5.21	5.73	6.78	7.82	8.87	10.43
.018	D51D183	5.37	5.91	6.97	8.05	9.13	10.74
.02	D51D203	5.40	5.94	7.02	8.11	9.19	10.80
.022	D51D223	5.42	5.96	7.05	8.14	9.22	10.85
.027	D51D273	5.45	6.00	7.08	8.17	9.26	10.89
.033	D51D333	5.71	6.28	7.43	8.57	9.70	11.42
.039	D51D393	5.91	6.50	7.68	8.87	10.04	11.81
.047	D51D473	6.07	6.68	7.90	9.11	10.32	12.14
.05	D51D503	6.07	6.68	7.90	9.11	10.32	12.14
.056	D51D563	6.34	6.97	8.24	9.50	10.77	12.67
.068	D51D683	6.68	7.35	8.68	10.02	11.35	13.35
.082	D51D823	7.93	8.72	10.31	11.90	13.49	15.86
.1	D51D104	7.93	8.72	10.31	11.90	13.49	15.86
.12	D51D124	8.70	9.57	11.31	13.06	14.80	17.40
.15	D51D154	9.08	9.99	11.80	13.62	15.43	18.15
.18	D51D184	9.88	10.87	12.84	14.82	16.80	19.76
.2	D51D204	10.81	11.89	14.06	16.23	18.38	21.63
.22	D51D224	10.81	11.89	14.06	16.23	18.38	21.63
.27	D51D274	11.86	13.05	15.83	17.60	19.98	23.53
.33	D51D334	13.09	14.40	17.37	19.83	22.94	26.87
.39	D51D394	14.16	15.58	17.70	19.82	22.65	26.90
.47	D51D474	15.99	17.59	20.00	22.40	25.59	30.39
.5	D51D504	16.53	18.18	20.67	23.14	26.46	31.42
.56	D51D564	17.95	19.75	22.44	25.14	28.72	34.11
.68	D51D684	19.22	21.14	24.02	26.91	30.75	36.51
.82	D51D824	22.89	25.18	27.47	29.76	34.34	41.21
1.0	D51D105	25.92	28.51	31.10	33.69	38.87	46.65

**CRC HIGH RELIABILITY
CAPACITORS****50VDC & 100VDC POLYSTYRENE
PRICES (1-10 UNITS)****SERIES
N53****HOW TO ORDER**

- Select basic part number required and place desired tolerance letter at end of basic number.
- **IMPORTANT:** You must have complete basic number for ordering purposes as shown below.
Example: N53B682FSW is a 0.0068 uF, 1%, 50V capacitor with mylar sleeving.
Example: N53C155GXW is a 1.5 uF, 2%, 100V capacitor with no sleeving.
- 0.1% tolerance capacitors are available at approximately twice the 0.5% prices shown below.

• QUANTITY DISCOUNTS:

11-25 less 10% 26-50 less 15%
51-100 less 20% 101-250 less 25%

- Contact our sales office for larger quantities.

**QUALITY LEVEL 3, N53 SERIES
POLYSTYRENE CAPACITORS**

- See page 33 for N53 case sizes.
- See page 32 for N53 specifications.
- See page 34 for special L53 polystyrene life test data.
- See page 35 for special AC rated polystyrene capacitors.

N53B 50VDC POLYSTYRENE

uF	BASIC PART NO.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001	N53B102	\$4.13	\$4.54	\$5.37	\$6.61	\$7.43	\$9.09
.0012	N53B122	4.13	4.54	5.37	6.61	7.43	9.09
.0015	N53B152	4.13	4.54	5.37	6.61	7.43	9.09
.0018	N53B182	4.13	4.54	5.37	6.61	7.43	9.09
.002	N53B202	4.13	4.54	5.37	6.61	7.43	9.09
.0022	N53B222	4.13	4.54	5.37	6.61	7.43	9.09
.0027	N53B272	4.13	4.54	5.37	6.61	7.43	9.09
.0033	N53B332	4.13	4.54	5.37	6.61	7.43	9.09
.0039	N53B392	4.13	4.54	5.37	6.61	7.43	9.09
.0047	N53B472	4.13	4.54	5.37	6.61	7.43	9.09
.005	N53B502	4.13	4.54	5.37	6.61	7.43	9.09
.0056	N53B562	4.13	4.54	5.37	6.61	7.43	9.09
.0068	N53B682	4.13	4.54	5.37	6.61	7.43	9.09
.0082	N53B822	4.13	4.54	5.37	6.61	7.43	9.09
.01	N53B103	4.13	4.54	5.37	6.61	7.43	9.09
.012	N53B123	4.24	4.66	5.51	6.78	7.63	9.33
.015	N53B153	4.24	4.66	5.51	6.78	7.63	9.33
.018	N53B183	4.30	4.73	5.59	6.88	7.74	9.46
.02	N53B203	4.30	4.73	5.59	6.88	7.74	9.46
.022	N53B223	4.30	4.73	5.59	6.88	7.74	9.46
.027	N53B273	4.30	4.73	5.59	6.88	7.74	9.46
.033	N53B333	4.30	4.73	5.59	6.88	7.74	9.46
.039	N53B393	4.35	4.79	5.66	6.96	7.83	9.57
.047	N53B473	4.40	4.84	5.72	7.04	7.92	9.68
.05	N53B503	4.45	4.90	5.79	7.12	8.01	9.79
.056	N53B563	4.51	4.96	5.86	7.22	8.12	9.92
.068	N53B683	4.56	5.02	5.93	7.30	8.21	10.03
.082	N53B823	4.68	5.15	6.08	7.49	8.42	10.30
.1	N53B104	4.72	5.19	6.14	7.55	8.50	10.38
.12	N53B124	4.79	5.27	6.23	7.66	8.62	10.54
.15	N53B154	4.86	5.35	6.32	7.78	8.75	10.69
.18	N53B184	4.91	5.40	6.38	7.86	8.84	10.80
.20	N53B204	5.30	5.83	6.89	8.48	9.54	11.66
.22	N53B224	5.42	5.96	7.05	8.67	9.76	11.92
.27	N53B274	5.80	6.38	7.54	9.28	10.44	12.76
.33	N53B334	6.22	6.84	8.09	9.95	11.20	13.68
.39	N53B394	6.52	7.17	8.48	10.43	11.74	14.34
.47	N53B474	6.70	7.37	8.71	10.72	12.06	14.74
.50	N53B504	6.70	7.37	8.71	10.72	12.06	14.74
.56	N53B564	6.80	7.48	8.84	10.88	12.24	14.96
.68	N53B684	6.90	7.59	8.97	11.04	12.42	15.18
.82	N53B824	7.10	7.81	9.23	11.36	12.78	15.62
1.0	N53B105	7.36	8.10	9.57	11.78	13.25	16.19
1.5	N53B155	8.09	8.90	10.52	12.94	14.56	17.80
2.0	N53B205	9.60	10.56	12.48	15.36	17.28	21.12

N53C 100VDC POLYSTYRENE

uF	BASIC PART NO.	10% tol. K	5% tol. J	2% tol. G	1% tol. F	0.5% tol. D	0.25% tol. B
.001	N53C102	\$4.13	\$4.54	\$5.37	\$6.61	\$7.43	\$9.09
.0012	N53C122	4.13	4.54	5.37	6.61	7.43	9.09
.0015	N53C152	4.13	4.54	5.37	6.61	7.43	9.09
.0018	N53C182	4.13	4.54	5.37	6.61	7.43	9.09
.002	N53C202	4.13	4.54	5.37	6.61	7.43	9.09
.0022	N53C222	4.13	4.54	5.37	6.61	7.43	9.09
.0027	N53C272	4.13	4.54	5.37	6.61	7.43	9.09
.0033	N53C332	4.13	4.54	5.37	6.61	7.43	9.09
.0039	N53C392	4.13	4.54	5.37	6.61	7.43	9.09
.0047	N53C472	4.13	4.54	5.37	6.61	7.43	9.09
.005	N53C502	4.13	4.54	5.37	6.61	7.43	9.09
.0056	N53C562	4.13	4.54	5.37	6.61	7.43	9.09
.0068	N53C682	4.13	4.54	5.37	6.61	7.43	9.09
.0082	N53C822	4.13	4.54	5.37	6.61	7.43	9.09
.01	N53C103	4.13	4.54	5.37	6.61	7.43	9.09
.012	N53C123	4.24	4.66	5.51	6.78	7.63	9.33
.015	N53C153	4.24	4.66	5.51	6.78	7.63	9.33
.018	N53C183	4.30	4.73	5.59	6.88	7.74	9.46
.02	N53C203	4.30	4.73	5.59	6.88	7.74	9.46
.022	N53C223	4.30	4.73	5.59	6.88	7.74	9.46
.027	N53C273	4.30	4.73	5.59	6.88	7.74	9.46
.033	N53C333	4.30	4.73	5.59	6.88	7.74	9.46
.039	N53C393	4.35	4.79	5.66	6.96	7.83	9.57
.047	N53C473	4.40	4.84	5.72	7.04	7.92	9.68
.05	N53C503	4.45	4.90	5.79	7.12	8.01	9.79
.056	N53C563	4.51	4.96	5.86	7.22	8.12	9.92
.068	N53C683	4.56	5.02	5.93	7.30	8.21	10.03
.082	N53C823	4.72	5.19	6.14	7.55	8.50	10.38
.1	N53C104	4.79	5.27	6.23	7.66	8.62	10.54
.12	N53C124	4.91	5.40	6.38	7.86	8.84	10.80
.15	N53C154	4.95	5.45	6.44	7.92	8.91	10.89
.18	N53C184	5.10	5.61	6.63	8.16	9.18	11.22
.20	N53C204	5.40	5.94	7.02	8.64	9.72	11.88
.22	N53C224	5.65	6.22	7.35	9.04	10.17	12.43
.27	N53C274	6.12	6.73	7.96	9.79	11.02	13.46
.33	N53C334	6.52	7.17	8.48	10.43	11.74	14.34
.39	N53C394	6.90	7.59	8.97	11.04	12.42	15.18
.47	N53C474	7.15	7.87	9.30	11.44	12.87	15.73
.50	N53C504	7.15	7.87	9.30	11.44	12.87	15.73
.56	N53C564	7.25	7.98	9.43	11.60	13.05	15.95
.68	N53C684	7.39	8.13	9.61	11.82	13.30	16.26
.82	N53C824	7.65	8.42	9.95	12.24	13.77	16.83
1.0	N53C105	8.09	8.90	10.52	12.94	14.56	17.80
1.5	N53C155	9.60	10.56	12.48	15.36	17.28	21.12

COMPONENT RESEARCH

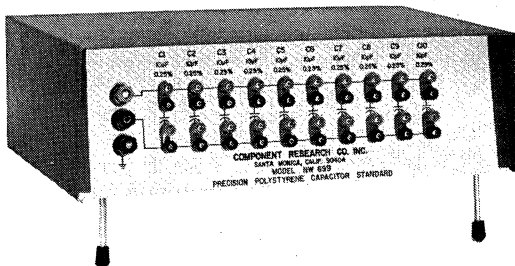
Established Reliability
PLASTIC FILM CAPACITORS
 QUALIFIED TO
MIL-C-83421/1 &
MIL-C-39022/9C

50 PAGES

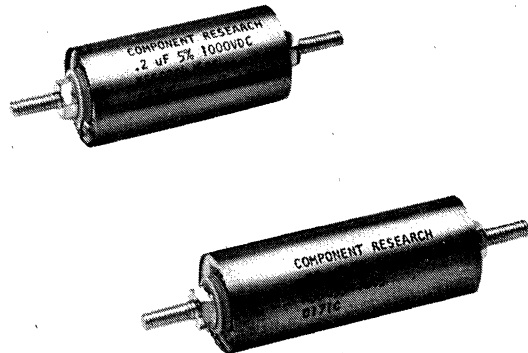
VOL. 2 PAGES 2-42 TO 2-91
IN EEM

- ★ SPECIFICATIONS
- ★ AC LIFE TEST DATA
- ★ QUALIFICATION INFORMATION
- ★ PRICES AND DELIVERY

Component Research Co. manufactures special capacitor standards which are used as references for system checkout applications. Typically, capacitor banks can be supplied from 1 uF to 1000 uF to an accuracy of $\pm 0.1\%$ at 25°C. Banks can be provided with selector switches or connecting links to provide series and parallel connection capability for breadboard purposes. Assemblies generally are made from high reliability type N53 polystyrene capacitor sections which are carefully aged and sealed for low temperature coefficient and drift. Their insulation resistance is usually 1,000,000 megohms-uF and the dissipation factor is less than 0.1% at the output terminals.



The capacitor standard shown above consists of ten individual 10 uF, $\pm 0.25\%$, 100 VDC polystyrene capacitors which can be parallel connected for a total of 100 uF, $\pm 0.25\%$. Provision has been made for series or parallel connection as shown on the front panel. The individual capacitor output arrangement permits connection to both legs of comparison bridges such as impedance comparators or to ratio transformer devices.



Extremely low ESR, AC and DC rated, oil impregnated foil and metallized capacitors as shown above are available in compact hermetically sealed enclosures. These capacitors are capable of handling 50 amps RMS at frequencies up to 100 KHz or more in a case size of 1" x 2.375". These capacitors have an unusually low heat rise under severe AC pulsed or continuous conditions.

NEW ADDRESS IN 1975

PENNSYLVANIA AT TWENTY-SIXTH STREET
SANTA MONICA, CALIF. 90404

Our new 50,000 square foot facility at Pennsylvania and 26th St. in Santa Monica, Calif. will be in operation late in 1975. This will enable CRC to handle all orders with increased efficiency in the shortest possible time.

COMPONENT RESEARCH CO.

CATALOG
SUPPLEMENT

A

SUPPLEMENTARY CAPACITOR-INFORMATION SECTION

CRC HAS ADDED THIS SECTION TO PROVIDE INFORMATION ON NEW PRODUCTS, UNUSUAL CAPACITOR TEST DATA, AND A COMPILATION OF MISCELLANEOUS ITEMS OF INTEREST TO DESIGNERS, COMPONENT ENGINEERS, AND RELIABILITY PERSONNEL. IN ADDITION WE ARE PLANNING TO MANUFACTURE A COMPREHENSIVE PRODUCT LINE OF STANDARD AND CUSTOM FEED-THROUGH CAPACITORS AND EMI FILTERS. WE BELIEVE THESE PRODUCTS WILL BE OF HIGHER QUALITY AND PERFORMANCE THAN ANY SIMILAR PRODUCTS NOW AVAILABLE.

MANY OF OUR CUSTOMERS NOW USING EMI FILTERS HAVE EXPRESSED DISSATISFACTION WITH THE QUALITY AND RELIABILITY OF THE FILTERS PRESENTLY AVAILABLE, AND HAVE URGED US TO ENTER THIS AREA OF INTEREST. PLEASE FORWARD TO US ANY

OF YOUR REQUIREMENTS FOR CAPACITORS, NETWORKS, AND EMI FILTERS, SO THAT WE CAN DETERMINE IF WE CAN MEET YOUR NEEDS.

NEW LOCATION AFTER NOVEMBER

1655 TWENTY SIXTH STREET

SANTA MONICA, CALIFORNIA 90404

AS THIS CATALOG SUPPLEMENT IS BEING PUBLISHED, CONSTRUCTION IS BEING COMPLETED ON OUR NEW, MODERN RESEARCH AND MANUFACTURING FACILITY LOCATED A SHORT DISTANCE FROM OUR PRESENT FACILITY AT 1717 19th STREET, IN SANTA MONICA. OVER 50,000 SQUARE FEET OF MANUFACTURING, RESEARCH AND WAREHOUSE SPACE WILL BE AVAILABLE TO US TO HANDLE THE EVER INCREASING DEMAND FOR OUR ESTABLISHED RELIABILITY CAPACITORS.

CATALOG-SUPPLEMENT INDEX • SUPPLEMENTARY SECTION FOLLOWS PAGE 50	SECTION
CAPACITOR CHARACTERISTICS COMPARISON CHART COVERS METALLIZED POLYCARBONATE	B
MIL-SPECIFICATION TYPE CAPACITORS, METAL CASED, WITH AXIAL LEADS.	C
LONG TERM THERMAL AGING TEST REPORT FOR METALLIZED POLYCARBONATE CAPACITORS SHOWS DATA AFTER 400 CYCLES OF CONTINUOUS EXPOSURE FROM -65°C TO $+125^{\circ}\text{C}$.	D E
HOW TO ANTICIPATE AND PREDICT CAPACITOR TERMINATION FAILURES, AND IMPROVE RELIABILITY BY 100% SCREENING.	F
MIS-APPLICATIONS OF CAPACITORS IN AC CIRCUITS, ENVIRONMENTAL AND STORAGE EFFECTS ON TERMINATIONS AND HOW CAPACITOR OPENS AND INTERMITTENTS DEVELOP.	G
DC LIFE TEST DATA FOR METALLIZED TEFLON CAPACITORS FOR ANALOG AND MEMORY APPLICATIONS.	H
HIGH VIBRATION TEST REPORT COVERING SPECIAL C12 POLYCARBONATE CAPACITORS.	H
VIKING ULTRA HIGH-RELIABILITY METALLIZED TEFLON CAPACITORS.	I

CATALOG
SUPPLEMENT

B

COMPONENT

COMPARISON CHART FOR MIL-SPECIFICATION

Component Research Company has prepared this capacitor performance and characteristics chart in order for engineers to clearly see what choice in specification limits and screening is available in the established reliability Mil-Specifications for Metallized Polycarbonate Capacitors.

Due to possible ambiguity in specification wording, both manufacturer and user may not be following the

specifications faithfully in carrying out the intent of the military requirements.

Component Research Company as a manufacturer qualified to "R" failure rate for MIL-C-83421/1 and MIL-C-39022/9C, uses the characteristics and 100% screening shown for these two MIL-SPECIFICATIONS in this chart as a minimum, for meeting specification requirements.

CHARACTERISTIC	MIL-C-83421/1		MIL-C-39022/9C
	STYLE CRH01 - CRH05	STYLE CRH06 - CRH00	STYLE CHR01A, D, G, K, N
CONSTRUCTION: METAL CASED, HERMETICALLY SEALED, TUBULAR, AXIAL LEADS	Yes	Yes	Yes
OPERATING TEMPERATURE	-65°C to +100°C Derate AC — DC Voltage by 50% @ 125°C		-65°C Derate
DC VOLTAGE RATINGS	30VDC, 50VDC, 100VDC, 200VDC, 400VDC		30VDC,
AC VOLTAGE RATINGS	From 0 to 40 KHz		From
CAPACITANCE TOLERANCES AVAILABLE	0.25%, 0.5%, 1%, 2%, 5%, 10%	0.25%, 0.5%, 1%, 2%, 5%, 10%	0.25%, 0.5%, 1%, 2%, 5%, 10%
MAXIMUM DF @ 25°C	0.15% Max.	0.15% Max.	0.15% Max.
MAXIMUM DF @ 85°C	0.15% Max.	0.15% Max.	0.15% Max.
MAXIMUM DF @ 125°C	0.15% Max.	0.15% Max.	0.15% Max.
MAXIMUM DF AFTER LIFE @ 25°C	0.25% Max.	0.35% Max.	0.25% Max.
MAXIMUM CAPACITANCE CHANGE	-1.5% to -0.5% @ -55°C +0.8% to -0.5% @ +125°C	-2.0% to -0.5% @ -55°C ±2.0% @ +125°C	-1.5% to -0.5% @ -55°C +0.8% to -0.5% @ +125°C
MINIMUM I.R. FOR 0.1μF OR LESS @ RATED VOLTAGE @ +25°C	3,000,000 Megohms Min.	1,000,000 Megohms Min.	3,000,000 Megohms Min.
MINIMUM I.R. MEGS - μF	300,000 MEGS - μF Need Not Exceed 3,000,000 Megohms	100,000 MEGS - μF Need Not Exceed 1,000,000 Megohms	300,000 MEGS - μF Need Not Exceed 3,000,000 Megohms
DIELECTRIC ABSORPTION	0.1% Max.	0.1% Max.	Not Specified
VIBRATION LEVEL	10-2000 Hz 50g's	10-2000 Hz 50g's	10-2000 Hz 20g's
SHOCK LEVEL	100g's 6 MS.	100g's 6 MS.	100g's 6 MS.
100% DC BURN-IN	Yes (48 hrs.)	No	Yes (48 hrs.)
100% THERMAL CYCLING	Yes	Yes	Yes
100% SEAL TEST (GROSS LEAK)	Yes	Yes	Yes
100% SEAL TEST (HELIUM LEAK)	Yes 1 x 10 ⁻⁶ atm CM ³ /S Max. Leak Rate	Yes 1 x 10 ⁻⁶ atm CM ³ /S Max. Leak Rate	Yes 1 x 10 ⁻⁶ atm CM ³ /S Max. Leak Rate
100% AC SQUARE WAVE	Yes	Yes	Yes
100% DC HI-POT	Yes	Yes	Yes
100% INSULATION RESISTANCE	Yes	Yes	Yes
100% CAPACITANCE	Yes	Yes	Yes
100% DISSIPATION FACTOR	*Yes	*Yes	*Yes
100% DIELECTRIC ABSORPTION	Yes	Yes	No

*COMPONENT RESEARCH COMPANY CERTIFIES THAT IT WILL NOT
SHIP ANY CAPACITORS EXCEEDING 0.15% DISSIPATION FACTOR.

COMPONENT RESEARCH CO., INC. • 1717 19th ST. • SANTA MONICA, CALIF. 90404 • (213) 829-3615 • TWX 910-343-6864

RESEARCH CO.

CATALOG
SUPPLEMENT

C

TYPE METALLIZED POLYCARBONATE CAPACITORS

A study of the dissipation factor limits and the AC ratings shows that only the MIL-C-83421/1 and MIL-C-39022/9C can be reliably used for AC applications, if we consider dissipation factor critical.

Although the dissipation factor limits for MIL-C-39022/9C styles CHR01B, E, H, L, P, C, F, J, M and R are listed as greater than 0.15% every M39022/9C shipped by Component Research Company is certified to be less than 0.15%, because we feel any value higher than this

will result in unreliable life in AC applications, and possibly intermittent life in DC applications. Catalog supplement sections F and G go into greater detail on this matter.

Please note that the 100% screening performed by Component Research Company using 0.15% maximum % dissipation factor, is an additional assurance of high termination quality, which established reliability Mil-Specifications do not always assure.

MIL-C-39022/9C		MIL-C-39022/7	MIL-C-39022/10
STYLE CHR01B, E, H, L, P STYLE CHR01C, F, J, M, R		STYLE CHR49	STYLE CHR10
Yes	Yes	Yes	Yes
to +100°C AC-DC Voltage by 50% @ 125°C		-55°C to 85°C	-55°C to 85°C Derate DC Voltage by 60% @ 125°C
50VDC, 100VDC, 200VDC, 400VDC		None	50VDC, 100VDC, 200VDC, 400VDC, 600VDC
0 to 40 KHz		@ 0.4 KHz	None
0.25%, 0.5%, 1%, 2%, 5%, 10%	0.25%, 0.5%, 1%, 2%, 5%, 10%	5%, 10%	1%, 2%, 5%, 10%
0.2% Max.	0.25% Max.	0.3% Max.	0.25% Max.
0.2% Max.	0.25% Max.	0.6% Max.	0.40% Max.
0.2% Max.	0.25% Max.	Not Specified	0.60% Max.
0.25% Max.	0.35% Max.	0.75% Max.	0.5% Max.
-1.7% to -0.5% @ -55°C +1.2% to -0.7% @ +125°C	-2.0% to -0.5% @ -55°C ±2.0% @ +125°C	-3.0% to 0% @ -55°C -3.0% to 0% @ +85°C	-2.0% to 0% @ -55°C ±1% @ +85°C ±2% @ +125°C
2,000,000 Megohms Min.	1,000,000 Megohms Min.	50,000 Megohms Min.	250,000 Megohms Min.
200,000 Megs - μ F Need Not Exceed 2,000,000 Megohms	100,000 Megs - μ F Need Not Exceed 1,000,000 Megohms	25,000 Megs - μ F Need Not Exceed 50,000 Megohms	100,000 Megs - μ F Need Not Exceed 250,000 Megohms
Not Specified	Not Specified	Not Specified	Not Specified
10-2000 Hz 20g's	10-2000 Hz 20g's	10-2000 Hz 15g's	10-2000 Hz 20g's
100g's 6 MS.	100g's 6 MS.	100g's 6 MS.	100g's 6 MS.
Yes (16 hrs.)	No	No	Yes (48 hrs.)
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
Yes 1 x 10 ⁻⁴ atm CM ³ /S Max. Leak Rate	Yes 1 x 10 ⁻⁵ atm CM ³ /S Max. Leak Rate	No	No
Yes	Yes	No	Yes
Yes	Yes	AC Hi-Pot Instead of DC	Yes
Yes	Yes	Yes	Yes
Yes	Yes	Yes	Yes
*Yes	*Yes	Yes	Yes
No	No	No	No

*COMPONENT RESEARCH COMPANY CERTIFIES THAT IT WILL NOT
SHIP ANY CAPACITORS EXCEEDING 0.15% DISSIPATION FACTOR.

COMPONENT

LONG TERM THERMAL AGING TEST REPORT

Thirty series C12A, 30VDC, Metallized Polycarbonate Capacitors were selected from current production and submitted to thermal aging PER MIL-C-83421/1 to determine the effects of continuous temperature cycling for 1000 cycles on dissipation factor, capacitance, and insulation resistance. As of publication date, parts completed 400 cycles from -65°C to $+125^{\circ}\text{C}$ with no

evidence of visual damage, catastrophic failure, or any intermittent type measurement indication.

Testing will continue to 1000 cycles and test data will be made available to anyone requesting this information. Testing will be complete prior to our next catalog publication date of June 1976.

% CAPACITANCE DRIFT

Serial No.	Part No.	Initial Capacitance in μF	20 Cycles	50 Cycles	100 Cycles	200 Cycles	300 Cycles	400 Cycles
001	C12A102	.000998	+ .02%	+ .07%	+ .09%	.00%	+ .02%	- .01%
002	C12A102	.000997	0.00%	- .04%	+ .02%	- .03%	- .03%	- .05%
003	C12A102	.000998	+ .02%	0.0%	+ .05%	+ .01%	- .02%	- .04%
004	C12A102	.000997	+ .11%	+ .06%	+ .13%	+ .05%	+ .01%	- .04%
005	C12A102	.000998	- .03%	- .03%	+ .04%	- .03%	- .06%	- .12%
006	C12A102	.000998	+ .05%	+ .05%	+ .15%	+ .14%	+ .13%	+ .13%
007	C12A103	.010003	+ .02%	+ .02%	+ .01%	+ .31%	+ .26%	+ .25%
008	C12A103	.010006	+ .07%	+ .07%	+ .05%	- .03%	- .04%	- .06%
009	C12A103	.010002	+ .05%	+ .06%	+ .02%	- .06%	- .11%	- .11%
010	C12A103	.010010	+ .05%	+ .05%	- .01%	- .12%	- .16%	- .17%
011	C12A103	.010006	+ .04%	+ .05%	- .01%	- .14%	- .15%	- .11%
012	C12A103	.010002	+ .05%	+ .05%	+ .01%	- .09%	- .13%	- .13%
013	C12A104	.094914	+ .05%	+ .06%	+ .12%	+ .06%	+ .04%	+ .03%
014	C12A104	.094869	+ .05%	+ .07%	+ .12%	+ .06%	+ .04%	+ .04%
015	C12A104	.094928	+ .04%	+ .05%	+ .10%	+ .02%	- .01%	- .01%
016	C12A104	.095203	+ .06%	+ .05%	+ .11%	+ .04%	+ .03%	+ .04%
017	C12A104	.091920	+ .04%	+ .04%	+ .08%	+ .05%	+ .14%	+ .18%
018	C12A104	.094990	+ .05%	+ .06%	+ .13%	+ .05%	+ .03%	+ .03%
019	C12A105	.997860	+ .04%	+ .05%	+ .11%	+ .04%	+ .04%	+ .04%
020	C12A105	.997900	+ .04%	+ .06%	+ .13%	+ .05%	+ .05%	+ .05%
021	C12A105	.999010	+ .05%	+ .07%	+ .14%	+ .09%	+ .09%	+ .09%
022	C12A105	.997800	+ .04%	+ .07%	+ .12%	+ .05%	+ .06%	+ .05%
023	C12A105	.998650	+ .05%	+ .06%	+ .12%	+ .05%	+ .05%	+ .05%
024	C12A105	.998430	+ .04%	+ .05%	+ .12%	+ .04%	+ .04%	+ .04%
025	C12A106	9.9504	- .01%	+ .06%	+ .13%	+ .07%	- .01%	+ .12%
026	C12A106	9.9584	+ .01%	+ .08%	+ .16%	+ .09%	+ .02%	+ .14%
027	C12A106	9.9623	- .01%	+ .06%	+ .11%	+ .05%	- .04%	+ .09%
028	C12A106	10.1033	- .01%	+ .07%	+ .13%	+ .06%	- .03%	+ .11%
029	C12A106	10.0928	- .01%	+ .08%	+ .15%	+ .10%	+ .01%	+ .15%
030	C12A106	10.1013	- .01%	+ .05%	+ .12%	+ .06%	+ .04%	- .10%

INSULATION RESISTANCE @ RATED VOLTAGE (IN MEGOHMS)

Serial No.	Part No.	Initial Value	20 Cycles	50 Cycles	100 Cycles	200 Cycles	300 Cycles	400 Cycles
001	C12A102	15,000,000	15,000,000	10,000,000	15,000,000	15,000,000	15,000,000	15,000,000
002	C12A102	15,000,000	15,000,000	10,000,000	10,000,000	15,000,000	15,000,000	15,000,000
003	C12A102	15,000,000	10,000,000	15,000,000	15,000,000	15,000,000	15,000,000	15,000,000
004	C12A102	15,000,000	15,000,000	10,000,000	15,000,000	15,000,000	15,000,000	15,000,000
005	C12A102	15,000,000	15,000,000	15,000,000	10,000,000	15,000,000	15,000,000	15,000,000
006	C12A102	15,000,000	15,000,000	15,000,000	15,000,000	15,000,000	15,000,000	15,000,000
007	C12A103	15,000,000	15,000,000	10,000,000	15,000,000	15,000,000	15,000,000	15,000,000
008	C12A103	15,000,000	15,000,000	10,000,000	15,000,000	15,000,000	15,000,000	15,000,000
009	C12A103	15,000,000	15,000,000	15,000,000	10,000,000	15,000,000	15,000,000	15,000,000
010	C12A103	15,000,000	15,000,000	10,000,000	15,000,000	15,000,000	15,000,000	15,000,000
011	C12A103	15,000,000	10,000,000	7,500,000	15,000,000	15,000,000	15,000,000	15,000,000
012	C12A103	15,000,000	15,000,000	10,000,000	15,000,000	15,000,000	15,000,000	15,000,000
013	C12A104	6,000,000	7,500,000	7,500,000	7,500,000	7,500,000	7,500,000	6,000,000
014	C12A104	6,000,000	7,500,000	7,500,000	7,500,000	10,000,000	7,500,000	5,000,000
015	C12A104	6,000,000	7,500,000	6,000,000	6,000,000	6,000,000	6,000,000	5,000,000
016	C12A104	6,000,000	7,500,000	7,500,000	6,000,000	6,000,000	6,000,000	6,000,000
017	C12A104	7,500,000	10,000,000	7,500,000	7,500,000	7,500,000	7,500,000	6,000,000
018	C12A104	10,000,000	10,000,000	7,500,000	7,500,000	7,500,000	7,500,000	6,000,000
019	C12A105	750,000	750,000	680,000	625,000	680,000	660,000	680,000
020	C12A105	790,000	730,000	790,000	625,000	650,000	789,000	1,500,000
021	C12A105	790,000	750,000	650,000	670,000	680,000	714,000	1,570,000
027	C12A105	1,300,000	1,070,000	1,360,000	680,000	680,000	1,000,000	1,420,000
023	C12A105	850,000	790,000	750,000	680,000	680,000	830,000	790,000
024	C12A105	830,000	770,000	680,000	680,000	690,000	910,000	1,500,000
025	C12A106	300,000	170,000	65,200	136,000	187,000	187,000	270,000
026	C12A106	270,000	230,000	79,000	166,000	230,000	200,000	270,000
027	C12A106	270,000	230,000	71,400	157,000	214,000	200,000	270,000
028	C12A106	270,000	230,000	125,000	157,000	230,000	214,000	250,000
029	C12A106	270,000	250,000	120,000	150,000	230,000	214,000	250,000
030	C12A106	270,000	250,000	110,000	200,000	200,000	200,000	270,000

RESEARCH CO.

CATALOG
SUPPLEMENT

E

DATA COVERS 400 TEMPERATURE CYCLES

A SUMMARY OF TEST RESULTS INDICATES THE FOLLOWING

Capacitance Value	Capacitance Drift Minimum	Capacitance Drift Maximum	% Dissipation Factor Freq.	% Dissipation Factor Maximum	Insulation Resistance Minimum IR in Megohms
.001 μ F	-.01%	+.13%	1 KHz 10 KHz	.07% .07%	15,000,000
.01 μ F	-.06%	+.26%	1 KHz 10 KHz	.07% .17%	15,000,000
.1 μ F	-.01%	+.18%	1 KHz 10 KHz	.08% .29%	5,000,000
1.0 μ F	+.04%	+.09%	1 KHz 10 KHz	.10% .46%	680,000
10 μ F	+.04%	+.15%	1 KHz	.06% .27%	250 000 (Equivalent to 2,500,000 Megs- μ F)

The capacitors tested are identical in construction with series A12A and K12A supplied to MIL-C-83421/1 and C12A, E12A, supplied to MIL-C-39022/9C. The only differences that exist are in screening and conditioning. This results in better stability for types with more extensive conditioning.

% DISSIPATION FACTOR @ LOW FREQUENCY

@ 1 KHz FOR VALUES 1 μ F OR LESS
@ 0.1 KHz FOR VALUES GREATER THAN 1 μ F

Serial No.	Part No.	Freq.	Initial Value	20 Cycles	50 Cycles	100 Cycles	200 Cycles	300 Cycles	400 Cycles
001	C12A102	1 KHz	.06%	.06%	.06%	.05%	.06%	.06%	.06%
002	C12A102	1 KHz	.07%	.07%	.07%	.06%	.06%	.07%	.07%
003	C12A102	1 KHz	.06%	.06%	.06%	.05%	.06%	.05%	.05%
004	C12A102	1 KHz	.06%	.06%	.06%	.05%	.06%	.05%	.05%
005	C12A102	1 KHz	.06%	.06%	.06%	.06%	.06%	.05%	.06%
006	C12A102	1 KHz	.06%	.06%	.06%	.05%	.06%	.05%	.05%
007	C12A103	1 KHz	.05%	.06%	.07%	.08%	.08%	.08%	.07%
008	C12A103	1 KHz	.05%	.06%	.07%	.07%	.07%	.07%	.07%
009	C12A103	1 KHz	.05%	.06%	.07%	.07%	.07%	.07%	.07%
010	C12A103	1 KHz	.05%	.07%	.07%	.07%	.07%	.07%	.07%
011	C12A103	1 KHz	.05%	.06%	.07%	.07%	.07%	.07%	.07%
012	C12A103	1 KHz	.06%	.06%	.07%	.07%	.07%	.07%	.07%
013	C12A104	1 KHz	.07%	.08%	.08%	.08%	.08%	.08%	.08%
014	C12A104	1 KHz	.07%	.08%	.08%	.08%	.08%	.08%	.08%
015	C12A104	1 KHz	.07%	.08%	.08%	.08%	.08%	.08%	.07%
016	C12A104	1 KHz	.07%	.07%	.08%	.08%	.08%	.08%	.07%
017	C12A104	1 KHz	.07%	.08%	.08%	.08%	.08%	.08%	.08%
018	C12A104	1 KHz	.07%	.08%	.08%	.08%	.08%	.08%	.08%
019	C12A105	1 KHz	.07%	.08%	.08%	.08%	.08%	.08%	.08%
020	C12A105	1 KHz	.08%	.09%	.09%	.09%	.09%	.10%	.10%
021	C12A105	1 KHz	.07%	.08%	.08%	.08%	.08%	.08%	.07%
022	C12A105	1 KHz	.07%	.08%	.08%	.08%	.08%	.08%	.08%
023	C12A105	1 KHz	.08%	.09%	.09%	.09%	.09%	.09%	.10%
024	C12A105	1 KHz	.08%	.09%	.09%	.09%	.09%	.10%	.10%
025	C12A106	.1 KHz	.05%	.05%	.05%	.05%	.04%	.05%	.03%
026	C12A106	.1 KHz	.04%	.04%	.04%	.04%	.04%	.06%	.03%
027	C12A106	.1 KHz	.04%	.05%	.05%	.05%	.04%	.05%	.03%
028	C12A106	.1 KHz	.04%	.04%	.04%	.04%	.04%	.05%	.03%
029	C12A106	.1 KHz	.04%	.04%	.04%	.04%	.04%	.05%	.03%
030	C12A106	.1 KHz	.04%	.04%	.04%	.04%	.04%	.05%	.03%

% DISSIPATION FACTOR @ HIGH FREQUENCY

@ 10 KHz FOR VALUES 1 μ F OR LESS
@ 1 KHz FOR VALUES GREATER THAN 1 μ F

Serial No.	Part No.	Freq.	Initial Value	20 Cycles	50 Cycles	100 Cycles	200 Cycles	300 Cycles	400 Cycles
001	C12A102	10 KHz	.06%	.07%	.07%	.06%	.07%	.07%	.07%
002	C12A102	10 KHz	.06%	.06%	.06%	.06%	.06%	.07%	.07%
003	C12A102	10 KHz	.07%	.06%	.06%	.06%	.06%	.07%	.07%
004	C12A102	10 KHz	.07%	.06%	.06%	.06%	.06%	.07%	.06%
005	C12A102	10 KHz	.07%	.06%	.06%	.06%	.06%	.06%	.07%
006	C12A102	10 KHz	.07%	.06%	.06%	.06%	.06%	.07%	.07%
007	C12A103	10 KHz	.16%	.18%	.18%	.18%	.18%	.19%	.17%
008	C12A103	10 KHz	.17%	.17%	.17%	.18%	.17%	.18%	.14%
009	C12A103	10 KHz	.17%	.17%	.17%	.17%	.17%	.18%	.13%
010	C12A103	10 KHz	.17%	.17%	.17%	.18%	.17%	.17%	.13%
011	C12A103	10 KHz	.17%	.17%	.17%	.17%	.17%	.16%	.13%
012	C12A103	10 KHz	.17%	.07%	.07%	.17%	.17%	.17%	.13%
013	C12A104	10 KHz	.21%	.21%	.21%	.21%	.23%	.25%	.23%
014	C12A104	10 KHz	.21%	.22%	.22%	.22%	.26%	.30%	.29%
015	C12A104	10 KHz	.22%	.22%	.22%	.21%	.22%	.24%	.20%
016	C12A104	10 KHz	.21%	.21%	.21%	.20%	.20%	.21%	.18%
017	C12A104	10 KHz	.21%	.21%	.21%	.20%	.25%	.22%	.21%
018	C12A104	10 KHz	.23%	.24%	.24%	.23%	.24%	.32%	.24%
019	C12A105	10 KHz	.29%	.27%	.27%	.21%	.20%	.30%	.22%
020	C12A105	10 KHz	.44%	.41%	.41%	.34%	.38%	.43%	.38%
020	C12A105	10 KHz	.27%	.25%	.25%	.21%	.19%	.27%	.15%
022	C12A105	10 KHz	.30%	.28%	.28%	.24%	.23%	.29%	.23%
023	C12A105	10 KHz	.46%	.42%	.42%	.36%	.37%	.43%	.46%
024	C12A105	10 KHz	.44%	.42%	.42%	.38%	.38%	.47%	.38%
025	C12A106	1 KHz	.20%	.12%	.11%	.13%	.13%	.12%	.24%
026	C12A106	1 KHz	.11%	.12%	.10%	.11%	.13%	.13%	.22%
027	C12A106	1 KHz	.12%	.12%	.10%	.12%	.12%	.12%	.25%
028	C12A106	1 KHz	.13%	.12%	.10%	.12%	.13%	.12%	.27%
029	C12A106	1 KHz	.12%	.12%	.11%	.12%	.12%	.10%	.25%
030	C12A106	1 KHz	.12%	.12%	.10%	.11%	.11%	.10%	.25%

COMPONENT

HOW TO ANTICIPATE FAILURES & IMPROVE

Plastic film dielectric type capacitors can provide remarkably good electrical characteristics and high reliability but it takes a combination of sound construction, suitable film quality, exacting process control, and 100% testing to achieve this.

We are listing below some pitfalls to avoid because we are concerned with a proliferation of marginal quality capacitors frequently used in high reliability level Aerospace and industrial applications. Additional information appears on pages 7 and 37 of our catalog "J" section.

MIS-APPLICATION OF CAPACITORS IN AC CIRCUITS

To begin with, the highest quality capacitor will fail if you are exceeding its ratings by subjecting it to excessive voltage and current stresses. In sinusoidal applications metallized capacitors that warm up over 20°C after several hours of operation are considered a borderline case, and you may be applying too high an RMS voltage or frequency. Consult the AC ratings in MIL-C-83421/1 for metallized polycarbonate capacitors as a guide to typical limits.

If the capacitors you are using have higher than normal dissipation factor readings, this may be a sign of high series resistance caused by poor terminations on the capacitor section. The square wave AC screening for one minute covered in MIL-C-83421/1 is a good way of eliminating capacitors with gross dissipation factor quality.

Unfortunately, if dissipation factor limits are set too high as post test requirements, suspect capacitors will pass the square wave test, in fact may have been damaged by this test, but are permitted to pass what we consider are abnormally high DF limits. A termination that is poor at room temperature generally should be worse at higher temperature and increased heating caused by power loss at the terminations may cause ultimate degeneration and possible explosion.

We consider 100% AC burn-in at elevated temperature an excellent method of checking for good terminations. Burn-in should

be followed by 100% dissipation factor examination. See page 37 for special AC screening information.

In SCR commutation and transistor switching type applications, heat rise of a metallized capacitor is not always a good means of determining if the capacitor can handle the non-sinusoidal current pulses usually encountered if the capacitor is subjected to relatively high peak currents at a low duty cycle; it may suddenly open after hours, possibly months of operation and never may have shown more than a few degrees warm-up during operation.

A recent example of operating beyond specified limits resulting in ultimate failure is shown by the following experiment performed on three 0.033 μ F, 30VDC, Type E12A333, metallized polycarbonate capacitors. Each capacitor has nominal case dimensions of 0.170" diameter by 0.562" length and #22 AWG wire leads.

The capacitors were placed in parallel to form a 0.1 μ F load into the output of a CRC designed power generator supplying a 60 volt peak to peak square wave at a 20KHz repetition rate.

An examination of the current pulses developed indicated that the capacitors were handling a peak current of 8.4 amps with a cosine type waveshape having a 1.2 μ second width at the base.

The capacitors were operated for 100 hours at 25°C with less than 2°C heat rise. If we compare the MIL-C-83421/1 rated current at 40KHz of 0.18A rms maximum for a 0.033 μ F 30VDC capacitors, with the

RESEARCH CO.

CATALOG
SUPPLEMENT**G**

CAPACITOR RELIABILITY BY 100% SCREENING

peak current of 2.8 amps during this test, it appears that these capacitors can handle this level.

A more conservative level which we intend to verify by long term testing is 1.8 amps maximum peak current based on a peak current not to exceed ten times the 40KHz rms rated current of 0.18A for this capacitor. After increasing the square wave voltage to 80 volts peak to peak, the capacitors opened up.

The peak current during this test period was approximately 3.8 amps which is more than twenty times the RMS rated current of 0.18 amps. This is an example of how much higher in peak current CRC capacitors can be stressed, but certainly we do not recommend that you go to extremes in using these capacitors.

We recommend that you send us your oscilloscope current and voltage waveforms for analysis if you have non-sinusoidal applications. (See page 35, Catalog "J".) We are currently undergoing a test program to confirm that it is safe to operate our metallized polycarbonate capacitors under non-sinusoidal conditions of a 1μ second current pulse width at a 10KHz repetition rate providing the peak currents do not exceed ten times their maximum AC ratings at 40KHz.

As an example a $0.1\mu\text{F}$ 100VDC rated E12C104 or K12C104 capacitor maximum rated at 0.9A rms could be operated with 9 amps of peak current provided you did not exceed a 10KHz repetition rate.

Component Research Company bases the above as a result of many other tests and customer usage. We will of course continue to increase our test scope covering non-sinusoidal operation and publish operating specifications for such conditions.

CAPACITOR OPENS & INTERMITTENTS AFTER ENVIRONMENTAL TESTING OR LONG TERM STORAGE

CRC has frequently been requested to replace "Brand X" metallized capacitors (which may have cost 50% less). Problems began to plague production lines long after being qualified for the application and long after passing initial breadboard and preproduction tests.

Unfortunately many specifications and programs do not take time into consideration. Capacitor terminations may withstand DC burn-in, DC life, and even AC life but may start to break down as a result of expansion and contraction of all the metal and plastic materials involved in the construction of a capacitor.

The extreme differences in dimensional change between plastic and metal materials as a result of temperature cycling may result in microscopic ruptures of termination joints, possible electrode oxidation and generally unstable termination series resistance.

Component Research Company patented stress free termination design and precise quality control eliminates the above problems. This is the reason we recommend 100% temperature cycling or thermal aging followed by screening as described above.

Our goal is to continue to provide increasing amounts of detailed information and data of this type. In this manner the reliability and safety of electronic equipment needed for military and commercial transportation or general usage equipment will be enhanced and maintained.

Please contact us if you have any suggestions how to further this goal.

CATALOG
SUPPLEMENT

H

COMPONENT

- DC LIFE TEST DATA FOR METALLIZED TEFLON
- VIBRATION REPORT FOR METALLIZED POLYCARBONATE

TEST REPORT No. XT907

In this test, thirty metallized Teflon Capacitors, part number D11B504, 0.5 μ F, 50VDC, in a 0.562" x 1.125" case size were subjected to DC life testing at 140% of rated voltage at 125°C. At the conclusion of 7300 hours of test the capacitors changed less than 0.5% in capacitance. There was an increase in dissipation factor to 0.12% maximum for serial number 017. Twenty-one other units remained within 0.05% dissipation factor. The dissipation factor increase is not significant for DC applications where there is a relatively small AC current content. We do not recommend this type of Teflon Capacitor for high current handling AC applications. We can supply very stable, Teflon Foil Capacitors which are capable of handling over 100 AMPS RMS per microfarad and several thousand peak amperes, if required.

The insulation resistance measured from 500,000 MEGS- μ F to 12,000,000 MEGS- μ F, and this we consider superb performance. As can be seen it is now possible to supply high reliability, high insulation resistance, low capacitance drift Teflon capacitors to specification limits far beyond the scope of present specifications if a program requires such performance.

DC LIFE TEST DATA FOR METALLIZED TEFLON CAPACITORS

Serial No.	Part No.	% Capacitance Drift After 7300 Hrs. Life	Insulation Resistance In Megohms After 7300 Hrs. Life	% Dissipation Factor @ 1 KHz After 7300 Hrs. Life
001	D11B504	-0.27%	10,000,000	.04%
002	D11B504	-0.11%	3,500,000	.05%
003	D11B504	-0.29%	2,300,000	.04%
004	D11B504	-0.10%	4,100,000	.11%
005	D11B504	-0.36%	1,100,000	.02%
006	D11B504	-0.18%	2,200,000	.04%
007	D11B504	-0.11%	3,300,000	.05%
008	D11B504	-0.07%	6,200,000	.06%
009	D11B504	-0.15%	2,900,000	.08%
010	D11B504	-0.05%	3,500,000	.04%
011	D11B504	-0.11%	4,500,000	.05%
012	D11B504	-0.01%	12,500,000	.05%
013	D11B504	-0.09%	12,500,000	.05%
014	D11B504	-0.06%	16,600,000	.02%
015	D11B504	-0.23%	12,500,000	.06%
016	D11B504	-0.01%	12,500,000	.08%
017	D11B504	-0.15%	7,100,000	.12%
018	D11B504	+0.02%	5,500,000	.02%
019	D11B504	-0.05%	6,200,000	.08%
020	D11B504	-0.03%	5,000,000	.04%
021	D11B504	-0.33%	12,500,000	.02%
022	D11B504	-0.43%	12,500,000	.03%
023	D11B504	-0.60%	16,600,000	.02%
024	D11B504	-0.41%	25,000,000	.05%
025	D11B504	-0.38%	12,500,000	.03%
026	D11B504	-0.42%	16,600,000	.05%
027	D11B504	-0.41%	10,000,000	.02%
028	D11B504	-0.35%	25,000,000	.02%
029	D11B504	-0.42%	25,000,000	.02%
030	D11B504	-0.46%	25,000,000	.06%

HIGH LEVEL VIBRATION TEST REPORT #644-1-74-152 FOR SPECIAL C12 POLYCARBONATE CAPACITORS

Component Research Company became involved in the development of C12A Metallized Polycarbonate capacitors capable of handling very high vibration levels, as a consequence of capacitor failures in the Atlas Centaur Program.

In this application we replaced other capacitors. Thus CRC provided far superior electrical performance, as well as rugged construction. And all this within a minimum of lead time.

During this test three samples of each case size covering the range of capacitor values to be qualified, while using random vibration, were subjected to a level of 35 grms and 70 grms. These levels were performed from 100 Hz to 1000 Hz by the contractor and no failures occurred.

Electrical measurements below were performed by the contractor and indicated that these capacitors are fully qualified to operate for the intended use.

CRC READINGS FOR THESE CAPACITORS

Serial No.	Initial Measurements		Post Vibration Measurements	
	Capacitance In μ F	% Dissipation Factor	Capacitance In μ F	% Dissipation Factor
XT914-1B001	.0987	.07%	.1000	.07%
XT914-1B002	.0989	.07%	.0999	.08%
XT914-1B003	.0989	.07%	.0996	.08%
XT914-1C001	2.960	.110%	2.960	.14%
XT914-1C002	2.960	.090%	2.960	.10%
XT914-1C003	2.980	.060%	2.970	.09%
XT914-1D001	.4921	.090%	.493	.11%
XT914-1D002	.4933	.096%	.494	.13%
XT914-1D003	.4906	.089%	.491	.11%
XT914-1E002	6.780	.080%	6.79	.08%
XT914-1H003	9.980	.070%	10.00	.08%
XT914-1H004	9.990	.070%	10.00	.07%
XT914-1F001	5.080	.160%	5.080	.18%
XT914-1F002	5.030	.170%	5.040	.18%
XT914-1F003	5.090	.160%	5.100	.17%
XT914-1G001	8.850	.100%	8.850	.12%
XT914-1G002	8.900	.110%	8.910	.12%
XT914-1G003	8.990	.110%	8.990	.12%

TEST PERFORMED & A LIST OF THE CASE SIZES USED

Quan.	Diam.	Length	μ F	VDC	Remarks
3	.170	.687	.082	30	Standard C12 Construction
3	.193	.813	.1	50	Standard C12 Construction
3	.235	.813	.22	50	Standard C12 Construction
3	.312	1.063	.27	100	Special C12 Construction
3	.400	1.375	4.0	30	Special C12 Construction
3	.400	1.375	.1	400	Special C12 Construction
3	.500	1.375	3.0	50	Special C12 Construction
3	.562	1.875	.5	400	Special C12 Construction
3	.670	1.875	6.8	50	Special C12 Construction
3	.750	1.875	5.0	100	Special C12 Construction
3	1.00	2.625	9.3	200	Special C12 Construction

RESEARCH CO.**CATALOG
SUPPLEMENT****VIKING ULTRA HIGH RELIABILITY TEFLON
CAPACITOR SPECIFICATIONS****I**

Component Research Co. is proud to have been selected for Viking sole source procurement of extremely accurate, high quality teflon capacitors similar to the B11B and B11C series shown on pages 24 and 25 of catalog J.

Critical weight limitations prevent the use of redundant circuits. The capacitors must maintain their excellent performance with 600 hours of spacecraft sterilization, severe shock and vibration levels at launching and five to ten years of space travel. A single capacitor failure may mean a major setback to one of the most important and complex space ventures known to man.

Component Research Co. accepts this challenge with a confidence based upon over a decade of experience in the manufacture of high quality, high reliability film capacitors.

100% GROUP "A" ACCEPTANCE TESTS

EXAMINATION OR TEST	MIL-C-39022C PARAGRAPH AND AS MODIFIED BY MIL-C-39022/9B	SV90DM39022 PARAGRAPH	TEST REQUIREMENTS
1 VOLTAGE CONDITIONING		4.9	FOR 100 HOURS AT 135°C AND 140% OF RATED VDC
2 TEMPERATURE CYCLING	3.7, 4.7.3		10 CYCLES MIN. FROM -62°C TO +125°C
3 SEAL		4.10	IN WATER AT 25°C
4 DC-DIELECTRIC STRENGTH	3.9, 4.7.5		AT 200% OF THE RATED VOLTAGE FOR ONE MINUTE MIN.
5 INSULATION RESISTANCE (TERMINAL TO TERMINAL ONLY)	3.10, 4.7.6	Table III	AT RATED VOLTAGE Megs x MFD Min. At 25°C 5 x 10 ⁵ At 100°C 1 x 10 ⁵ At 125°C 2.5 x 10 ⁴ Net Not Exceed Megohms 5 x 10 ⁴ 1 x 10 ⁴ 2.5 x 10 ³
6 CAPACITANCE % TOLERANCE	3.11, 4.7.7		WITHIN SPECIFIED TOLERANCE MEASURED AT 1 KHz AND 25°C
7 % DISSIPATION FACTOR	3.12, 4.7.8		0.03% MAX. AT 1 KHz AND 25°C FOR VALUES OVER 1 MFD MEASURE AT 0.1 KHz
8 TEMPERATURE COEFFICIENT	3.21, 4.7.17	Table III	AT -55°C, +0.4% MAX. AT +25°C (RETRACE), ±.02% AT +125°C, -0.4% MAX.
9 VISUAL AND MECHANICAL INSPECTION			EXTERNAL ONLY FOR DIMENSIONS, WORKMANSHIP AND MARKING
10 RADIOGRAPHIC	3.6, 4.7.2	3.2, 4.7	X-RAYED IN TWO PLANES AT 90 DEGREE ROTATION, PERPENDICULAR TO THEIR LONGITUDINAL AXES.

VIKING QUALIFICATION INSPECTION PER TABLE V OF SV90DM39022 & MIL-C-39022/9B.
74 GROUP "A" CAPACITORS WERE RANDOMLY SELECTED AND TESTED AS SHOWN.

GROUP II, 12 UNITS

- 600 hours sterilization at 135°C
- Shock (PYRO) - 1,880G, 0.4ms half sine pulse
- Shock (Landing) - 80G, 22ms duration
- Vibration (Sine) - 75G, 10 to 2,000 Hz
- Vibration (Random) - 36.6G for 3 minutes min.

POST ELECTRICAL TESTS

- Δ Capacitance (% Change)
- % Dissipation Factor
- Insulation Resistance

GROUP III, 12 UNITS

- Solderability
- Low Temperature and Capacitance Change with Temp.
- Resistance to Soldering Heat
- Terminal Strength

POST ELECTRICAL TESTS

- Δ Capacitance (% Change)
- % Dissipation Factor
- Insulation Resistance

GROUP IV, 50 UNITS

- Life (accelerated) for 2,000 hours min. at 125°C and 140% of rated DC voltage

POST ELECTRICAL TESTS

- Δ Capacitance (% Change)
- % Dissipation Factor
- Insulation Resistance

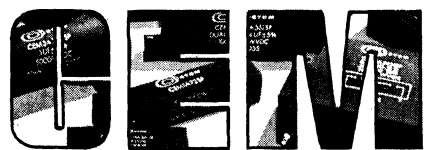
Mica Capacitors CUSTOM Has What Design Engineers Need



Wrap and Fill: CMR Product Type
Application: Designed primarily for hermetically sealed and potted in applications.



Epoxy Housed: CER Product Type
Application: For specialized mounting arrangements and operation under selected environmental parameters.



Epoxy Molded: CEM Product Type
Application: When specialized form factors and operation under the extremes of environmental resistance are required.

Electrical Ratings

Capacitance Range: 40 pf to 10 μ f (CMR); 40 pf to 40 μ f (CER, CEM).

Capacitance Tolerance: $\pm 10\%$ (± 2 , ± 5 or $\pm 20\%$ available).

Voltage Range: 250 V to 40 KV (CMR); 250 V to 50 KV (CER, CEM).

Volume Efficiency: approx. .25 joules per cubic inch (CMR);

approx. .2 joules per cubic inch (CER, CEM).

Thermal Coefficient of Capacitance: + 5% max. from 25°C to 125°C.

- 3% max. from 25°C to -55°C.

Operating Temperature - 65°C to +125°C without derating.

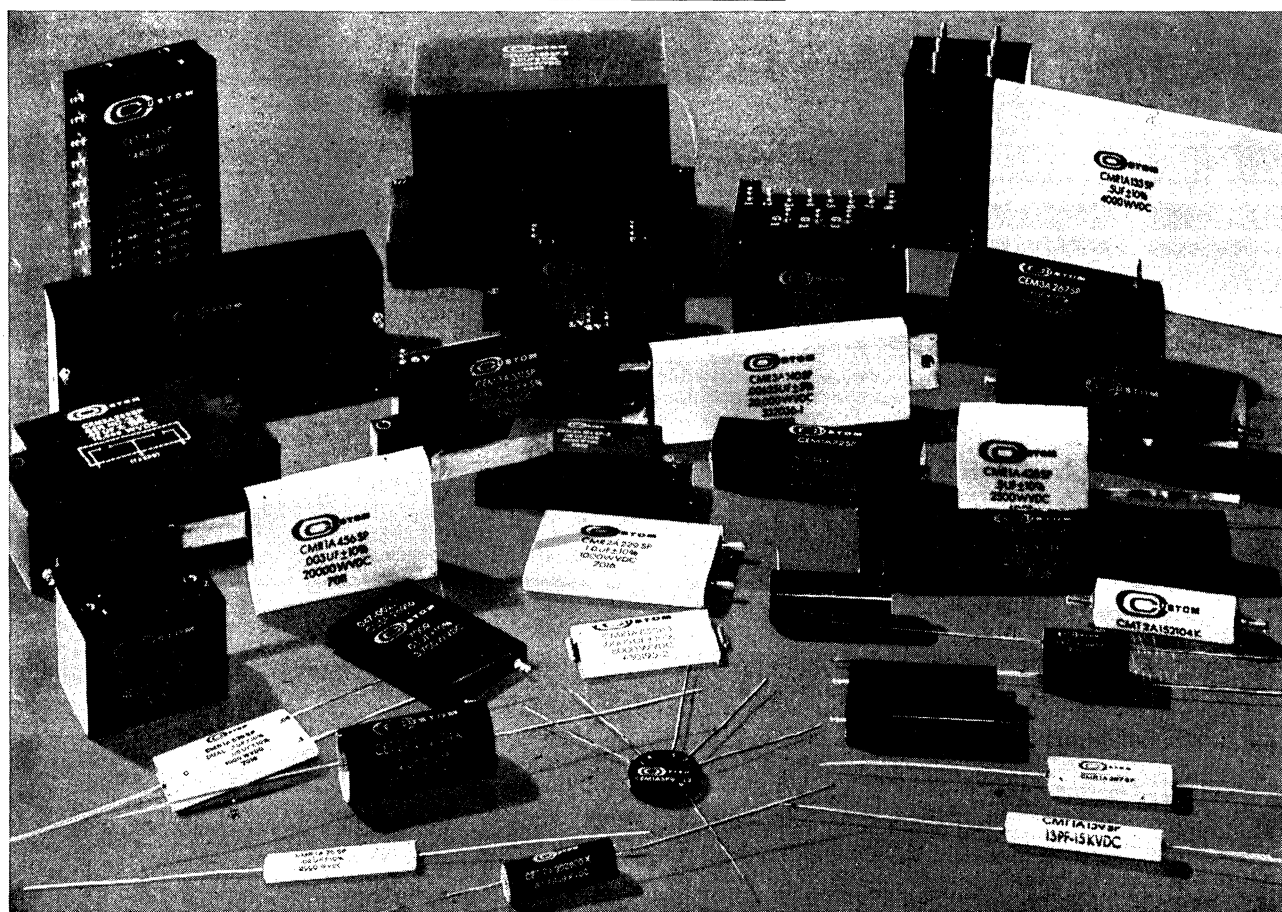
Send for FREE Product Brochures.



CUSTOM ELECTRONICS, INC.

5 Browne St., Oneonta, N. Y. 13820

PH: (607) 432-3880 TWX: 510-241-8292



Long on Reliability Short on Delivery

Mica Capacitors by Custom Electronics

Custom can meet your capacitor needs better, because each process in our capacitor production begins and ends with quality control to avoid failure in the field. Let us show you how we can fill your requirements.

Write for FREE descriptive TechniTip, includes sample of mica dielectric.



Send for FREE Product Brochures
CUSTOM ELECTRONICS, INC.
5 Browne Street, Oneonta, N.Y. 13820
PH: (607) 432-3880 TWX: 510-241-8292

Check these specifications on typical units:

CMR — Wrap and Fill type

Cap. & Tol.	WVDC	L × W × T Max.	Typical Price
0.1 μf $\pm 10\%$	1,000	2.062" × 1.425" × 0.200"	\$8.05
0.1 μf $\pm 10\%$	3,000	2.562" × 1.620" × 0.270"	9.25
0.01 μf $\pm 10\%$	10,000	2.562" × 1.800" × 0.350"	8.80

CER — Epoxy Housed type

Cap. & Tol.	WVDC	L × W × T Max.	Typical Price
.1 μf $\pm 10\%$	2,000	2.062" × 1.39" × .278"	\$15.00
.1 μf $\pm 10\%$	5,000	2.812" × 1.906" × .485"	18.50
.001 μf $\pm 10\%$	10,000	1.938" × 1.656" × .312"	9.50

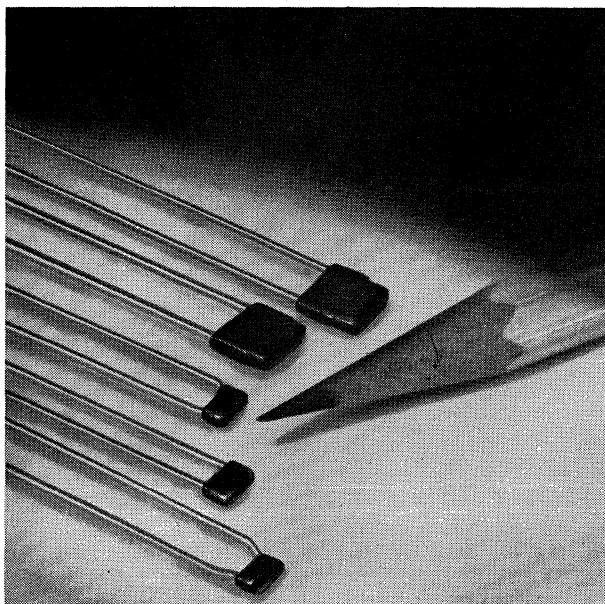
CEM — Epoxy Molded Type

Cap. & Tol.	WVDC	L × W × T Max.	Typical Price
500 pf $\pm 10\%$	15,000	3.312" × .812" × .812"	\$33.50
.02 μf $\pm 10\%$	10,000	5.88" × .5" × 1.437"	22.00
.05 μf $\pm 10\%$	5,000	2.75" × 1.4" × 1.2"	26.50

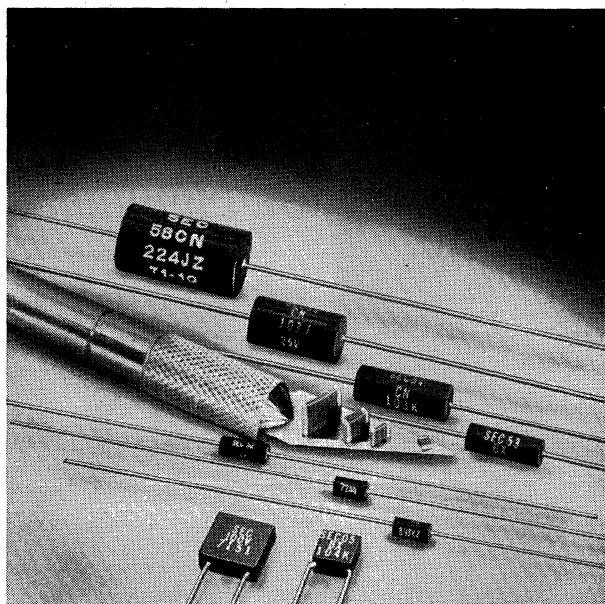
BELL INDUSTRIES

Electronic Components Division

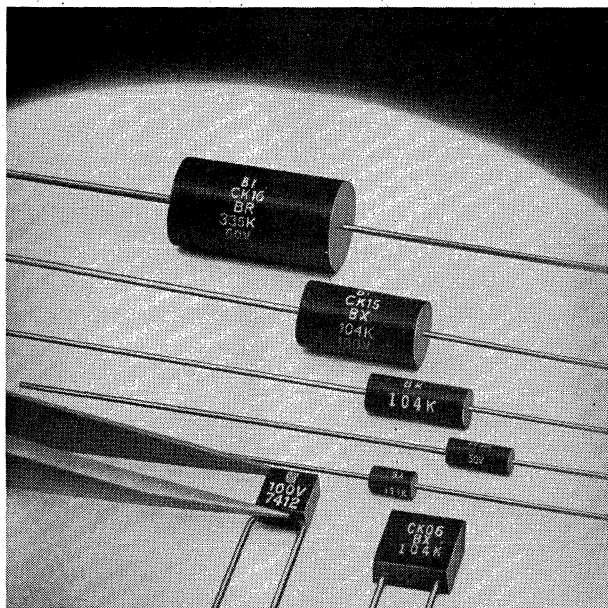
Ceramic Capacitors



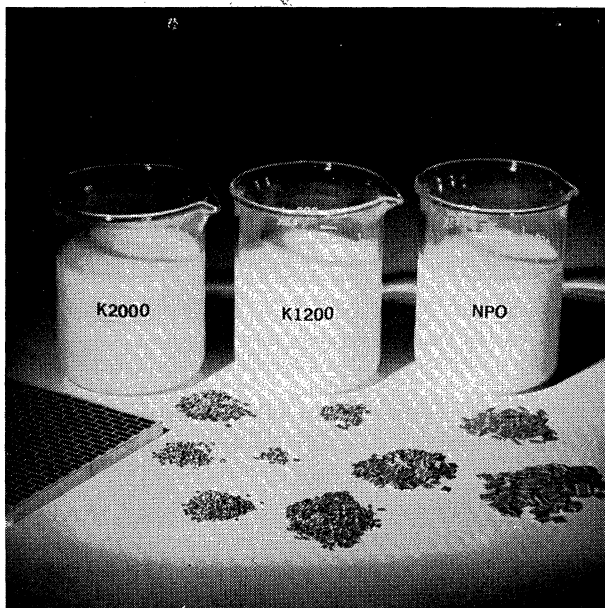
Epoxy Coated Capacitors... Low cost... NPO from 1 pf through .10 uf... K1200 from 1 pf through 3.3 uf... available with $\pm 2\%$, $\pm 5\%$, $\pm 10\%$, $\pm 20\%$ tolerances or GMV.



Mil Spec Capacitors... Radial leads/Axial leads... All values... CK05, CK06, CK12, CK13, CK14, CK15, CK16... Commercial versions available.



Leaded Ceramic Capacitors... Axial tubular NPO from 1 pf through .10 uf... Radial NPO from 1 pf through .10 uf... Radial K1200 from 1 pf through 3.3 uf.



Ceramic Chip Capacitors... K1200 (W5P) Series from 100 pf through 1 uf... NPO series from 1 pf through .047 uf... 25, 50, 100, 200 WVDC.

We specialize in custom packaging for individual requirements... ganged units for high density packaging... 22, 24 or 26 gauge leads spaced on .100", .200", .300" or .400" centers.

Please call for quotation, or write for full line ceramic capacitor catalog.



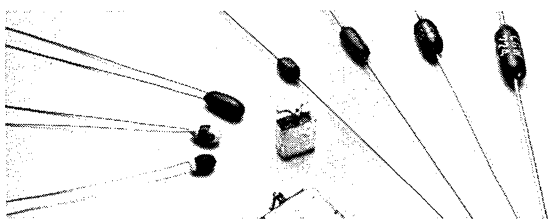
BELL INDUSTRIES / Electronic Components Division

150 West Cypress Ave. ■ Burbank, California 91502 ■ (213) 846-9302 ■ TWX 910-498-2207

CORNING
ELECTRONICS

 CORNING GLASS WORKS
Corning, New York 14830

Capacitors


INDEX
Description
**EEM
Page No.**
Capacitors
GLASS

CY10, 15, 20, 30	2-106
CY06, 07, 08	2-107
CYR10, 15, 20, 30	2-108
CYR51, 52, 53	2-109
CYFR10, 15, 20, 30	2-110

GLASS-K AND CERAMIC

CK31, 32	2-111
CK12, 13, 14	2-112
CKR11, 12, 14	2-113
CAC02, 03, 04, 05	2-114

TANTALUM

Minitan Modular (MM Series)	2-115
Minitan Cordwood (MZ Series)	2-116
Minitan Non-Polar (MN Series)	2-117
Minidip (MD Series)	2-118
Tantalum Chips (MC Series)	2-119

See Section 4700, Page 2-1499 for Corning Metal Film Resistors.

NEED MORE INFORMATION?
**FOR MORE INFORMATION ON CORNING®
ELECTRONIC COMPONENTS. . .**

1. Contact your nearest Corning Sales Office . . . (See list of sales offices below)
2. Contact your nearest franchised Corning distributor or representative.
3. Contact: Corning Glass Works
Electronic Products Division
Corning, New York 14830
(607) 974-8652

**FOR MORE INFORMATION ON . . .
AVAILABILITIES or PRICING of**

Glass, GLASS/K or Ceramic Capacitors
Call your local franchised Corning distributor, or . . . Call Customer Service at (919) 876-1100.

Resistors

Call your local franchised Corning distributor, or . . . Call Customer Service at (814) 362-5571.

Tantalum Capacitors

Call your local franchised Corning distributor, or . . . Call Customer Service at (207) 282-5111.

**PRODUCT CAPABILITIES or
PRODUCT PERFORMANCE or
PRODUCT SPECIFICATIONS of**

Glass, GLASS/K or Ceramic Capacitors
Call Product Engineering at
(919) 876-1100.

Resistors

Call Product Engineering at
(814) 362-5571.

Tantalum Capacitors

Call Product Engineering at
(207) 282-5111.

APPLICATIONS of all PRODUCTS

Call Applications Engineering
at (607) 974-8679.

SALES OFFICES AND MANUFACTURING FACILITIES
HEADQUARTERS

Corning Glass Works
Electronic Products Division
Corning, New York 14830
(607) 974-8652

SALES OFFICES

Corning Glass Works
Electronic Products Division
225 Great Road
Littleton, MA. 01460
(617) 486-3125

Corning Glass Works
5725 East River Road
O'Hare Plaza, Suite 525
Chicago, IL. 60631
(312) 693-6830

Corning Glass Works
500 South Main Street
P.O. Box 1467
Orange, CA. 92668
(714) 541-5275
(213) 628-7220

Corning Glass Works
Central Building, Suite 104
363 Taaffe Avenue
Sunnyvale, CA. 94086
(408) 732-5050

Corning Glass Works
3900 Electronics Drive
Raleigh, NC. 27604
(919) 876-1100

MANUFACTURING FACILITIES

Corning Glass Works
550 High Street
Bradford, PA. 16701
(814) 362 5571

Components Incorporated
313 Elm Street
Biddeford, ME. 04005
(207) 282-5111

Corning Glass Works
Highway 132
Wilmington, NC. 28401
(919) 791-5040

Corning Glass Works
3900 Electronics Drive
Raleigh, NC 27604
(919) 876-1100

MAJOR INTERNATIONAL SALES OFFICES
CANADA

Corning Glass Works
Leaside Plant
135 Vanderhoof Avenue
Toronto, Ontario, Canada
(416) 421-1500

FRANCE

Sovcor Electronique
11, Chemin de Ronde
78 Le Vesinet, France
Ph: 966-5100

GERMANY

Sovcor Elektronik GmbH
Babenhauser Landstrasse 49
D-6000 Frankfurt am Main
Germany
Ph: 611 652031

ENGLAND

Electrosil Limited
Pallion
Post Office Box 37
Sunderland SR4 6SU
England
Ph: Sunderland 71481

BRAZIL

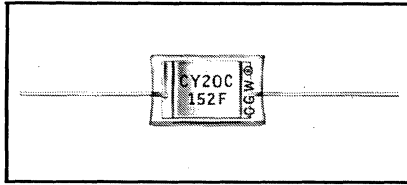
Vidros Corning Brazil Ltda.
Alameda Ministro Rocha Azevedo, 912
Caixa Postal 8972
CEP01410 Sao Paulo
SP-Brazil
Ph: 804834, 804691, 801420

JAPAN

Corning International Services, S.A.
Kowa Building No. 16 Annex
9-20 Akasaka, 1-Chome
Minato-Ku, Tokyo, Japan
Ph: 586-1051

Glass Capacitors

CYFM10, 15, 20, 30 (INDUSTRIAL); CY10, 15, 20, 30 (QPL to MIL-C-11272)



APPLICATIONS

These extremely stable glass capacitors, CORNING® style CYFM, meet or exceed all requirements of MIL-C-11272. With glass dielectric, fused monolithic construction and true glass-to-metal seals at the leads, they have very low losses and are virtually immune to severe environmental stresses.

PERFORMANCE CHARACTERISTICS

Tolerance—Available tolerances for each value of capacitance are shown in the ordering information table. For codes, refer to the Part Numbers paragraph.

Temperature Coefficient— $+140 \pm 25$ ppm/°C at 100 kHz. TC will track and retrace to within ± 5 ppm. Capacitance drift is less than 0.1% or 0.1 pF, whichever is greater.

Voltage Coefficient—Zero

Losses—Extremely low, and remain relatively low at elevated temperatures. Dissipation factor is less than 0.001 at 1.0 kHz and 25°C.

Life—After 2,000 hours at 125°C with 150% of rated voltage applied, capacitance change is less than 0.5% or 0.5 pF whichever is greater.

Insulation Resistance—Greater than 100,000 megohms at 25°C; greater than 10,000 megohms at 125°C.

Voltage/Temperature Ratings—Voltage ratings are shown in the ordering information table. The operating temperature range is -55°C to $+125^\circ\text{C}$, with no derating required.

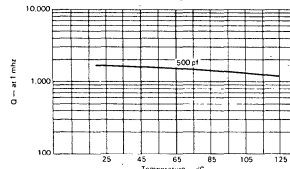
Moisture Resistance—Exceeds all requirements of MIL-C-11272 and MIL-STD-202, Method 106.

Part Numbers—Basic part numbers are shown in the ordering information table. Add the appropriate suffix to specify tolerance. Suffix codes: "C" = $\pm 0.25\text{pF}$, "D" = $\pm 0.5\text{pF}$, "F" = $\pm 1\%$, "G" = $\pm 2\%$, "J" = $\pm 5\%$, "K" = $\pm 10\%$, "M" = $\pm 20\%$.

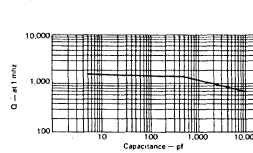
PART NUMBERS AND ORDERING INFORMATION

Capacitance Value (pF)	Military Type Designation	Corning Part No.	DC Working Voltage Available	Tolerances
STANDARD VALUES CYFM-10				
0.5	CY10C0R5	CYFM10C0R5	500 C	
1.0	CY10C010	CYFM10C010	500 C,D	
1.5	CY10C015	CYFM10C015	500 C,D	
2.2	CY10C022	CYFM10C022	500 C,D	
2.7	CY10C027	CYFM10C027	500 C,D	
3.0	CY10C030	CYFM10C030	500 C,D	
3.3	CY10C033	CYFM10C033	500 C,D	
3.6	CY10C036	CYFM10C036	500 C,D	
3.9	CY10C039	CYFM10C039	500 C,D	
4.3	CY10C043	CYFM10C043	500 C,D	
4.7	CY10C047	CYFM10C047	500 C,K	
5.1	CY10C051	CYFM10C051	500 C,J,K	
5.6	CY10C056	CYFM10C056	500 C,J,K	
6.2	CY10C062	CYFM10C062	500 C,J,K	
6.8	CY10C068	CYFM10C068	500 C,J,K	
7.5	CY10C075	CYFM10C075	500 C,J,K	
8.2	CY10C082	CYFM10C082	500 C,J,K	
9.1	CY10C091	CYFM10C091	500 C,J,K	
10	CY10C100	CYFM10C100	500 C,J,K,M	
11	CY10C110	CYFM10C110	500 C,J,K,M	
12	CY10C120	CYFM10C120	500 C,J,K,M	
13	CY10C130	CYFM10C130	500 C,G,J,K,M	
15	CY10C150	CYFM10C150	500 C,G,J,K,M	
16	CY10C160	CYFM10C160	500 C,G,J,K,M	
18	CY10C180	CYFM10C180	500 C,G,J,K,M	
20	CY10C200	CYFM10C200	500 C,G,J,K,M	
22	CY10C220	CYFM10C220	500 C,G,J,K,M	
24	CY10C240	CYFM10C240	500 C,G,J,K,M	
27	CY10C270	CYFM10C270	500 F,G,J,K,M	
30	CY10C300	CYFM10C300	500 F,G,J,K,M	
33	CY10C330	CYFM10C330	500 F,G,J,K,M	
36	CY10C360	CYFM10C360	500 F,G,J,K,M	
39	CY10C390	CYFM10C390	500 F,G,J,K,M	
43	CY10C430	CYFM10C430	500 F,G,J,K,M	
47	CY10C470	CYFM10C470	500 F,G,J,K,M	
51	CY10C510	CYFM10C510	500 F,G,J,K,M	
56	CY10C560	CYFM10C560	500 F,G,J,K,M	
62	CY10C620	CYFM10C620	500 F,G,J,K,M	
68	CY10C680	CYFM10C680	500 F,G,J,K,M	
75	CY10C750	CYFM10C750	500 F,G,J,K,M	
82	CY10C820	CYFM10C820	500 F,G,J,K,M	
91	CY10C910	CYFM10C910	500 F,G,J,K,M	
100	CY10C101	CYFM10C101	500 F,G,J,K,M	
110	CY10C111	CYFM10C111	500 F,G,J,K,M	
120	CY10C121	CYFM10C121	500 F,G,J,K,M	
130	CY10C131	CYFM10C131	500 F,G,J,K,M	
150	CY10C151	CYFM10C151	500 F,G,J,K,M	
160	CY10C161	CYFM10C161	500 F,G,J,K,M	
180	CY10C181	CYFM10C181	500 F,G,J,K,M	
200	CY10C201	CYFM10C201	500 F,G,J,K,M	
220	CY10C221	CYFM10C221	300 F,G,J,K,M	
240	CY10C241	CYFM10C241	300 F,G,J,K,M	
270	CY10C271	CYFM10C271	300 F,G,J,K,M	
300	CY10C301	CYFM10C301	300 F,G,J,K,M	
STANDARD VALUES CYFM-15				
220	CY15C221	CYFM15C221	500 F,G,J,K,M	
240	CY15C241	CYFM15C241	500 F,G,J,K,M	
270	CY15C271	CYFM15C271	500 F,G,J,K,M	
300	CY15C301	CYFM15C301	500 F,G,J,K,M	
330	CY15C331	CYFM15C331	500 F,G,J,K,M	
360	CY15C361	CYFM15C361	500 F,G,J,K,M	
390	CY15C391	CYFM15C391	500 F,G,J,K,M	
430	CY15C431	CYFM15C431	500 F,G,J,K,M	
470	CY15C471	CYFM15C471	500 F,G,J,K,M	
510	CY15C511	CYFM15C511	500 F,G,J,K,M	
560	CY15C561	CYFM15C561	300 F,G,J,K,M	
620	CY15C621	CYFM15C621	300 F,G,J,K,M	
680	CY15C681	CYFM15C681	300 F,G,J,K,M	
750	CY15C751	CYFM15C751	300 F,G,J,K,M	
820	CY15C821	CYFM15C821	300 F,G,J,K,M	
910	CY15C911	CYFM15C911	300 F,G,J,K,M	
1000	CY15C102	CYFM15C102	300 F,G,J,K,M	
1100	CY15C112	CYFM15C112	300 F,G,J,K,M	
1200	CY15C122	CYFM15C122	300 F,G,J,K,M	
STANDARD VALUES CYFM-20				
560	CY20C561	CYFM20C561	500 F,G,J,K,M	
620	CY20C621	CYFM20C621	500 F,G,J,K,M	
680	CY20C681	CYFM20C681	500 F,G,J,K,M	
750	CY20C751	CYFM20C751	500 F,G,J,K,M	
820	CY20C821	CYFM20C821	500 F,G,J,K,M	
910	CY20C911	CYFM20C911	500 F,G,J,K,M	
1000	CY20C102	CYFM20C102	500 F,G,J,K,M	
1100	CY20C112	CYFM20C112	500 F,G,J,K,M	
1200	CY20C122	CYFM20C122	500 F,G,J,K,M	
1300	CY20C132	CYFM20C132	500 F,G,J,K,M	
1500	CY20C152	CYFM20C152	500 F,G,J,K,M	
1600	CY20C162	CYFM20C162	500 F,G,J,K,M	
1800	CY20C182	CYFM20C182	500 F,G,J,K,M	
2000	CY20C202	CYFM20C202	500 F,G,J,K,M	
2200	CY20C222	CYFM20C222	500 F,G,J,K,M	
2400	CY20C242	CYFM20C242	500 F,G,J,K,M	
2700	CY20C272	CYFM20C272	500 F,G,J,K,M	
3000	CY20C302	CYFM20C302	500 F,G,J,K,M	
3300	CY20C332	CYFM20C332	500 F,G,J,K,M	
3600	CY20C362	CYFM20C362	500 F,G,J,K,M	
3900	CY20C392	CYFM20C392	500 F,G,J,K,M	
4300	CY20C432	CYFM20C432	300 F,G,J,K,M	
4700	CY20C472	CYFM20C472	300 F,G,J,K,M	
5100	CY20C512	CYFM20C512	300 F,G,J,K,M	
5600	CY20C562	CYFM20C562	300 F,G,J,K,M	
6200	CY20C622	CYFM20C622	300 F,G,J,K,M	
6800	CY20C682	CYFM20C682	300 F,G,J,K,M	
7500	CY20C752	CYFM20C752	300 F,G,J,K,M	
8200	CY20C822	CYFM20C822	300 F,G,J,K,M	
9100	CY20C912	CYFM20C912	300 F,G,J,K,M	
10000	CY20C103	CYFM20C103	300 F,G,J,K,M	
STANDARD VALUES CYFM-30				
3600	CY30C362	CYFM30C362	500 F,G,J,K,M	
3900	CY30C392	CYFM30C392	500 F,G,J,K,M	
4300	CY30C432	CYFM30C432	500 F,G,J,K,M	
4700	CY30C472	CYFM30C472	500 F,G,J,K,M	
5100	CY30C512	CYFM30C512	500 F,G,J,K,M	
5600	CY30C562	CYFM30C562	500 F,G,J,K,M	
6200	CY30C622	CYFM30C622	500 F,G,J,K,M	
6800	CY30C682	CYFM30C682	500 F,G,J,K,M	
7500	CY30C752	CYFM30C752	300 F,G,J,K,M	
8200	CY30C822	CYFM30C822	300 F,G,J,K,M	
9100	CY30C912	CYFM30C912	300 F,G,J,K,M	
10000	CY30C103	CYFM30C103	300 F,G,J,K,M	

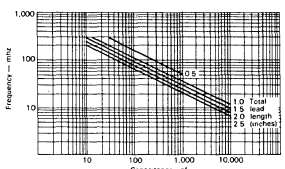
*Add letter for tolerance code above lines



Quality Factor vs. Temperature

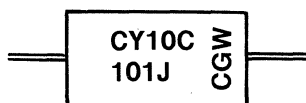


Quality Factor vs. Capacitance



Resonant Frequency vs. Capacitance

PART MARKING



CY — Glass Capacitor
10 — Case Size
C — Operating Temperature Range
101 — Capacitance, Coded in pF
J — Tolerance
CGW — Corning Glass Works

Dimensions—Inches (Millimeters)

Style	L Min—Max	W Min—Max	T Min—Max	Lead Dia	Weight (Grams)
CY10	.2969-.3906 (7.54-9.93)	.1406-.2031 (3.58-5.16)	.0469-.1093 (1.19-2.77)	.020 24 AWG (.51)	.25-.50
CY15	.4219-.5156 (10.72-13.11)	.2344-.2968 (5.94-7.54)	.0625-.1562 (1.60-3.96)	.020 24 AWG (.51)	.75-1.25
CY20	.6719-.7968 (17.07-20.24)	.3750-.4687 (9.52-11.91)	.0938-.1875 (2.39-4.78)	.025 22 AWG (.63)	2.50-4.00
CY30	.7032-.8281 (17.86-21.03)	.6719-.8281 (17.07-21.03)	.0938-.1875 (2.39-4.78)	.025 22 AWG (.63)	5.00-7.00

Note: Leads are solder coated Dumet.

CORNING
ELECTRONICS

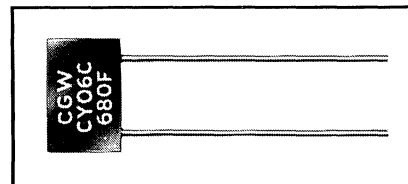
 CORNING GLASS WORKS
Corning, New York 14830

Glass Capacitors

TY06, 07, 08 (INDUSTRIAL) CY06, 07, 08 (QPL to MIL-C-11272)

PART NUMBERS AND ORDERING INFORMATION

Capacitance Value (pF)	Military Type Designation	Corning Part No.	DC Working Voltage Available	Tolerances
STANDARD VALUES CY06				
1.0	CY06C010	TY06C010	300	C,D
1.5	CY06C1R5	TY06C1R5	300	C,D
2.2	CY06C2R2	TY06C2R2	300	C,D
2.7	CY06C2R7	TY06C2R7	300	C,D
3.0	CY06C030	TY06C030	300	C,D
3.3	CY06C3R3	TY06C3R3	300	C,D
3.6	CY06C3R6	TY06C3R6	300	C,D
3.9	CY06C3R9	TY06C3R9	300	C,D
4.3	CY06C4R3	TY06C4R3	300	C,D
4.7	CY06C4R7	TY06C4R7	300	C,K
5.1	CY06C5R1	TY06C5R1	300	C,J,K
5.6	CY06C5R6	TY06C5R6	300	C,J,K
6.2	CY06C6R2	TY06C6R2	300	C,J,K
6.8	CY06C6R8	TY06C6R8	300	C,J,K
7.5	CY06C7R5	TY06C7R5	300	C,J,K
8.2	CY06C8R2	TY06C8R2	300	C,J,K
9.1	CY06C9R1	TY06C9R1	300	C,J,K
10	CY06C100	TY06C100	300	C,J,K,M
11	CY06C110	TY06C110	300	C,J,K,M
12	CY06C120	TY06C120	300	C,J,K,M
13	CY06C130	TY06C130	300	C,G,J,K,M
15	CY06C150	TY06C150	300	C,G,J,K,M
16	CY06C160	TY06C160	300	C,G,J,K,M
18	CY06C180	TY06C180	300	C,G,J,K,M
20	CY06C200	TY06C200	300	C,G,J,K,M
22	CY06C220	TY06C220	300	C,G,J,K,M
24	CY06C240	TY06C240	300	C,G,J,K,M
27	CY06C270	TY06C270	300	F,G,J,K,M
30	CY06C300	TY06C300	300	F,G,J,K,M
33	CY06C330	TY06C330	300	F,G,J,K,M
36	CY06C360	TY06C360	300	F,G,J,K,M
39	CY06C390	TY06C390	300	F,G,J,K,M
43	CY06C430	TY06C430	300	F,G,J,K,M
47	CY06C470	TY06C470	300	F,G,J,K,M
51	CY06C510	TY06C510	300	F,G,J,K,M
56	CY06C560	TY06C560	300	F,G,J,K,M
62	CY06C620	TY06C620	300	F,G,J,K,M
68	CY06C680	TY06C680	300	F,G,J,K,M
75	CY06C750	TY06C750	300	F,G,J,K,M
82	CY06C820	TY06C820	300	F,G,J,K,M
Capacitance Value (pF)	Military Type Designation	Corning Part No.	DC Working Voltage Available	Tolerances
STANDARD VALUES CY06				
91	CY06C910	TY06C910	300	F,G,J,K,M
100	CY06C101	TY06C101	300	F,G,J,K,M
110	CY06C111	TY06C111	300	F,G,J,K,M
120	CY06C121	TY06C121	300	F,G,J,K,M
130	CY06C131	TY06C131	300	F,G,J,K,M
150	CY06C151	TY06C151	300	F,G,J,K,M
160	CY06C161	TY06C161	300	F,G,J,K,M
180	CY06C181	TY06C181	300	F,G,J,K,M
200	CY06C201	TY06C201	300	F,G,J,K,M
220	CY06C221	TY06C221	300	F,G,J,K,M
240	CY06C241	TY06C241	300	F,G,J,K,M
270	CY06C271	TY06C271	300	F,G,J,K,M
300	CY06C301	TY06C301	300	F,G,J,K,M
330	CY06C331	TY06C331	300	F,G,J,K,M
360	CY06C361	TY06C361	300	F,G,J,K,M
390	CY06C391	TY06C391	300	F,G,J,K,M
430	CY06C431	TY06C431	300	F,G,J,K,M
470	CY06C471	TY06C471	300	F,G,J,K,M
510	CY06C511	TY06C511	300	F,G,J,K,M
560	CY06C561	TY06C561	300	F,G,J,K,M
STANDARD VALUES CY07				
620	CY07C621	TY07C621	300	F,G,J,K,M
680	CY07C681	TY07C681	300	F,G,J,K,M
750	CY07C751	TY07C751	300	F,G,J,K,M
820	CY07C821	TY07C821	300	F,G,J,K,M
910	CY07C911	TY07C911	300	F,G,J,K,M
1000	CY07C102	TY07C102	300	F,G,J,K,M
STANDARD VALUES CY08				
1100	CY08C112	TY08C112	300	F,G,J,K,M
1200	CY08C122	TY08C122	300	F,G,J,K,M
1300	CY08C132	TY08C132	300	F,G,J,K,M
1500	CY08C152	TY08C152	300	F,G,J,K,M
1600	CY08C162	TY08C162	300	F,G,J,K,M
1800	CY08C182	TY08C182	300	F,G,J,K,M
2000	CY08C202	TY08C202	300	F,G,J,K,M
2200	CY08C222	TY08C222	300	F,G,J,K,M
2400	CY08C242	TY08C242	300	F,G,J,K,M



APPLICATIONS

—These precision miniature glass capacitors, CORNING® style TY0, meet or exceed all requirements of MIL-C-11272. Constructed of a fused monolithic capacitive element in a rectangular case with gold-plated radial Dumet leads, this series permits high packaging efficiency for printed circuit applications where extremely stable, low-loss capacitors are required.

PERFORMANCE CHARACTERISTICS

Tolerance—Available tolerances are "C" = $\pm 0.25\text{pF}$, "D" = $\pm 0.5\text{pF}$, "F" = $\pm 1\%$, "G" = $\pm 2\%$, "J" = $\pm 5\%$, "K" = $\pm 10\%$, "M" = $\pm 20\%$ as shown in the ordering information table. Standard tolerance for 5.1pF and above is $\pm 5\%$, below 5.1pF the standard tolerance is $\pm 0.25\text{pF}$.

Temperature Coefficient— $+140 \pm 25$ ppm/ $^{\circ}\text{C}$ at 100 kHz. TC will track and retrace to within $\pm 5\text{ppm}$. Capacitance drift is less than 0.1% or 0.1 pF, whichever is greater.

Voltage Coefficient—Zero.

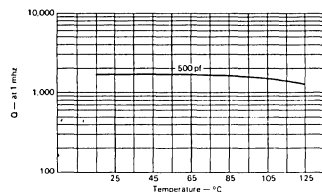
Losses—Extremely low, and remain relatively low at elevated temperatures. Dissipation factor at 1 kHz and 25°C is less than 0.001 for values greater than 100 pF and less than 0.002 for values of 100 pF and below.

Life—After 2,000 hours at 125°C with 150% of rated voltage applied, capacitance change is less than 0.5% or 0.5 pF; dissipation factor is less than 0.0025 for values above 100 pF and less than 0.0045 for values of 100 pF and below; insulation resistance is greater than 100,000 megohms.

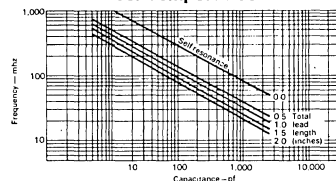
Insulation Resistance—Greater than 100,000 megohms at 25°C ; greater than 10,000 megohms at 125°C .

Voltage/Temperature Rating—WVDC over the temperature range of -55°C to $+125^{\circ}\text{C}$ with no derating required.

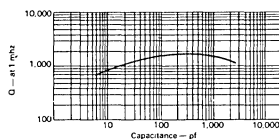
*Add letter for tolerance code above lines.



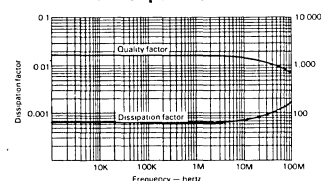
Quality Factor vs. Temperature



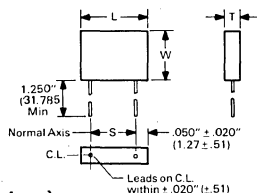
Resonant Frequency vs. Capacitance



Quality Factor vs. Capacitance



Quality Factor and Dissipation Factor vs. Frequency

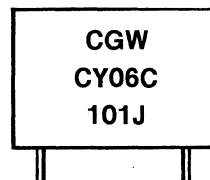


Dimensions—Inches (Millimeters)

Case Size	L ±.005 (±.13)	W ±.010 (±.25)	T ±.005 (±.13)	S ±.020 (±.51)	Weight (Grams)
CY06	.300 (7.62)	.200 (5.08)	.115 (2.92)	.200 (5.08)	.3 - .4
CY07	.300 (7.62)	.300 (7.62)	.115 (2.92)	.200 (5.08)	.4 - .5
CY08	.500 (12.70)	.300 (7.62)	.115 (2.92)	.400 (10.16)	.7 - .8

Note: All leads are 24 AWG, $.020 \pm .002$ (.51 $\pm$.05) diameter. Leads are solderable and weldable gold-plated Dumet, per MIL-STD-1276, Type D.

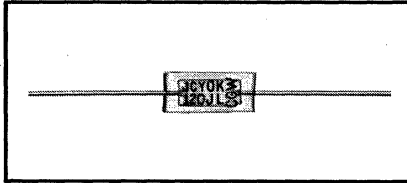
PART MARKING



CGW — Corning Glass Works
CY — Glass Capacitor
06 — Case Size
C — Operating Temperature Range
101 — Capacitance, Coded in pF
J — Tolerance

Glass Capacitors

CYR10, 15, 20, 30 (ESTABLISHED RELIABILITY) M23269/01, 02, 03, 04 (QPL to MIL-C-23269)
 FAILURE RATE LEVELS L, M AND S



APPLICATIONS

These precision glass-dielectric capacitors are QPL to Established Reliability specification MIL-C-23269. Fused monolithic construction provides excellent electrical performance, environmental immunity, stability and retraceability.

PERFORMANCE CHARACTERISTICS

Temperature Coefficient— $+140 \pm 25$ ppm/°C from -55°C to $+125^{\circ}\text{C}$. TC of all units will track and retrace to within ± 5 ppm.

Life—At rated conditions (100% rated voltage, 125°C), capacitance change is less than:

- $\pm 0.5\%$ after 2,000 hours
- $\pm 2.0\%$ after 30,000 hours

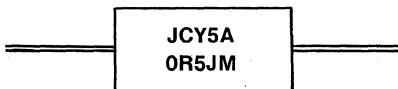
At accelerated conditions (150% rated voltage, 125°C), capacitance change is less than:

- $\pm 0.5\%$ after 2,000 hours
- $\pm 2.0\%$ after 6,000 hours

Insulation Resistance—A minimum of 100,000 megohms at 25°C and 10,000 megohms at 125°C .

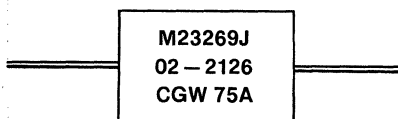
Voltage/Temperature Ratings—Voltage ratings are shown in the part number tables. The operating temperature range is -55°C to $+125^{\circ}\text{C}$.

PART MARKING—CYR10



J — Jan Trademark
 C — Capacitor
 Y — Glass Dielectric
 5 — Last digit of year
 A — 4 week lot code
 OR5 — Capacitance code—
 OR5 = 3.5pF
 J — Capacitance tolerance—
 J = $\pm 5\%$
 M — Failure level

PART MARKING—CYR15-30



M23269 — Military specification established reliability glass capacitor
 J — Jan Trademark
 02 — Case size (CYR15)
 2 — Failure rate (L level)
 126 — Dash Number—(capacitance in pF and capacitance tolerance)
 CGW — Corning Glass Works
 75 — Year
 A — Lot Code

PART NUMBERS AND ORDERING INFORMATION (AXIAL LEAD)

Value (pF)	Part Number* Capacitance Tolerance	Value (pF)	Part Number* Capacitance Tolerance
Style CYR10 M23269/01-		Style CYR15 M23269/02-	
500 Volts	$\pm 25\text{pF}$ $\pm 5\%$	500 Volts	$\pm 1\%$ $\pm 2\%$ $\pm 5\%$
.5	—001 —	220	—001 —002 —003
1.0	—002 —	240	—004 —005 —006
1.5	—003 —	270	—007 —008 —009
2.2	—004 —005 —	300	—010 —011 —012
2.7	—006 —	330	—013 —014 —015
3.0	—007 —008 —	360	—016 —017 —018
3.3	—009 —	390	—019 —020 —021
3.6	—010 —011 —	430	—022 —023 —024
3.9	—012 —	470	—025 —026 —027
4.3	—013 —014 —	510	—028 —029 —030
4.7	—015 —	300 Volts	
5.1	—016 —	560	—031 —032 —033
5.6	—017 —	620	—034 —035 —036
6.2	—019 —	680	—037 —038 —039
6.8	—021 —	750	—040 —041 —042
7.5	—023 —	820	—043 —044 —045
8.2	—025 —	910	—046 —047 —048
9.1	—027 —	1000	—049 —050 —051
10	—029 —	1100	—052 —053 —054
11	—031 —	1200	—055 —056 —057
12	—033 —	Style CYR20 M23269/03-	
500 Volts	$\pm 1\%$ $\pm 2\%$ $\pm 5\%$	500 Volts	$\pm 1\%$ $\pm 2\%$ $\pm 5\%$
13	— —035 —036	560	—001 —002 —003
15	— —037 —038	620	—004 —005 —006
16	— —039 —040	680	—007 —008 —009
18	— —041 —042	750	—010 —011 —012
20	— —043 —044	820	—013 —014 —015
22	— —045 —046	910	—016 —017 —018
24	— —047 —048	1000	—019 —020 —021
27	—049 —050 —051	1100	—022 —023 —024
30	—052 —053 —054	1200	—025 —026 —027
33	—055 —056 —057	1300	—028 —029 —030
36	—058 —059 —060	1500	—031 —032 —033
39	—061 —062 —063	1600	—034 —035 —036
43	—064 —065 —066	1800	—037 —038 —039
47	—067 —068 —069	2000	—040 —041 —042
51	—070 —071 —072	2200	—043 —044 —045
56	—073 —074 —075	2400	—046 —047 —048
62	—076 —077 —078	2700	—049 —050 —051
68	—079 —080 —081	3000	—052 —053 —054
75	—082 —083 —084	3300	—055 —056 —057
82	—085 —086 —087	300 Volts	
91	—088 —089 —090	3600	—058 —059 —060
100	—091 —092 —093	3900	—061 —062 —063
110	—094 —095 —096	4300	—064 —065 —066
120	—097 —098 —099	4700	—067 —068 —069
130	—100 —101 —102	5100	—070 —071 —072
150	—103 —104 —105	Style CYR30 M23269/04-	
160	—106 —107 —108	500 Volts	$\pm 1\%$ $\pm 2\%$ $\pm 5\%$
180	—109 —110 —111	3600	—001 —002 —003
200	—112 —113 —114	3900	—004 —005 —006
300 Volts		4300	—007 —008 —009
220	—115 —116 —117	4700	—010 —011 —012
240	—118 —119 —120	5100	—013 —014 —015
270	—121 —122 —123	5600	—016 —017 —018
300	—124 —125 —126	6200	—019 —020 —021

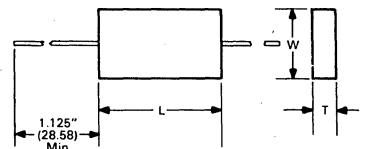
*Add first digit to indicate failure rate, as follows:

Failure Rate (90% Confidence)
 2 — L 2%/1000 Hours
 3 — M 1%/1000 Hours
 7 — S .001%/1000 Hours
Example:
 M23269/01-3007
 CYR10 3pF $\pm 25\text{pF}$
 M Failure Rate
NOTE: Available only in CYR-10-30 styles with 100 wvdc rating.

Dimensions — Inches (Millimeters)

Case Size	L	W	T	Lead Dia. $+ .004 (+ 0.1)$ $- .001 (- 0.03)$
CYR10	.344 $\pm$.047 (8.74 $\pm$ 1.19)	.172 $\pm$.031 (4.37 $\pm$.79)	.078 $\pm$.031 (1.98 $\pm$.79)	.020 (.51)
CYR15	.469 $\pm$.047 (11.91 $\pm$ 1.19)	.266 $\pm$.031 (6.76 $\pm$.79)	.109 $\pm$.047 (2.77 $\pm$ 1.19)	.020 (.51)
CYR20	.734 $\pm$.062 (18.64 $\pm$ 1.57)	.422 $\pm$.047 (10.72 $\pm$ 1.19)	.141 $\pm$.047 (3.58 $\pm$ 1.19)	.025 (.63)
CYR30	.766 $\pm$.062 (19.46 $\pm$ 1.57)	.750 $\pm$.078 (19.05 $\pm$ 1.98)	.141 $\pm$.047 (3.58 $\pm$ 1.19)	.025 (.63)

Note: All leads are solder-coated copper-clad nickel-iron.



CORNING
ELECTRONICS

 CORNING GLASS WORKS
Corning, New York 14830

Glass Capacitors
CYR51, 52, 53 (ESTABLISHED RELIABILITY) M23269/10 (QPL TO MIL-C-23269)
FAILURE RATE LEVELS L, M, AND S

PART NUMBERS AND ORDERING INFORMATION (RADIAL LEAD)

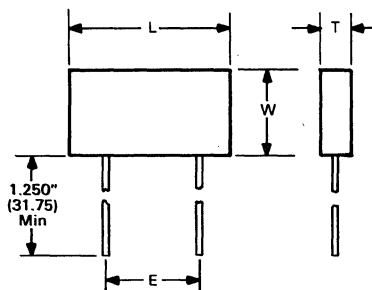
Value (pF)	Part Number* Capacitance Tolerance	Value (pF)	Part Number* Capacitance Tolerance
Style CYR51 M23269/10-		Style CYR51 M23269/10-	
300Volts	±.25pF ±2% ±5%	300Volts	±1% ±2% ±5%
1	—001 — — —	91	—091 —092 —093
1.5	—002 — — —	110	—097 —098 —099
2.2	—003 — — —	120	—100 —101 —102
2.7	—004 — — —	130	—103 —104 —105
3.0	—005 — — —	150	—106 —107 —108
3.3	—006 — — —	160	—109 —110 —111
3.6	—007 — — —	180	—112 —113 —114
3.9	—008 — — —	200	—115 —116 —117
4.3	—009 — — —	220	—118 —119 —120
4.7	—010 — — —	240	—121 —122 —123
5.1	—011 — — —	270	—124 —125 —126
5.6	—013 — — —	300	—127 —128 —129
6.2	—015 — — —	330	—130 —131 —132
6.8	—017 — — —	360	—133 —134 —135
7.5	—019 — — —	390	—136 —137 —138
8.2	—021 — — —	430	—139 —140 —141
9.1	—023 — — —	470	—142 —143 —144
10	—025 — — —	510	—145 —146 —147
11	—027 — — —	560	—148 —149 —150
12	—029 — — —	Style CYR52 M23269/10-	
13	—031 — — —	300Volts	±1% ±2% ±5%
15	—034 — — —	620	—201 —202 —203
16	—037 — — —	680	—204 —205 —206
18	—040 — — —	750	—207 —208 —209
20	—043 — — —	820	—210 —211 —212
22	—046 — — —	910	—213 —214 —215
24	—049 — — —	1000	—216 —217 —218
	±1% ±2% ±5%	Style CYR53 M23269/10-	
27	—052 — — —	300Volts	±1% ±2% ±5%
30	—055 — — —	1100	—301 —302 —303
33	—058 — — —	1200	—304 —305 —306
36	—061 — — —	1500	—310 —311 —312
39	—064 — — —	1600	—313 —314 —315
43	—067 — — —	1800	—316 —317 —318
47	—070 — — —	2000	—319 —320 —321
51	—073 — — —	2200	—322 —323 —324
56	—076 — — —	2400	—325 —326 —327
62	—079 — — —		
68	—082 — — —		
75	—085 — — —		
82	—088 — — —		

*Add first digit to indicate failure rate, as follows:

 Failure Rate
(90% Confidence)

 2 — L 2%/1000 Hours
3 — M 1%/1000 Hours

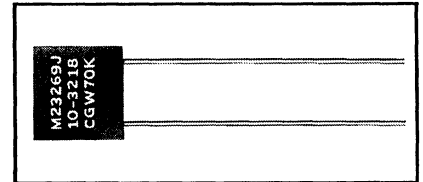
Example:

 M23269-01-3007
CYR10 3pF ± 25pF
M Failure Rate
M23269/10-2053
CYR51 27 pF ±2%
L Failure Rate


Dimensions — Inches (Millimeters)

Case Size	L ± .005 (± .13)	W ± .010 (± .25)	T ± .005 (± .13)	Lead Dia. ± .002 (± .051)	S ± .020 (± .51)
CYR51	.300 (7.62)	.200 (5.08)	.115 (2.92)	.020 (.51)	.200 (5.08)
CYR52	.300 (7.62)	.300 (5.08)	.115 (2.92)	.020 (.51)	.200 (5.08)
CYR53	.500 (12.70)	.300 (7.62)	.115 (2.92)	.020 (.51)	.400 (5.08)

Note: All leads are copper-clad nickel-iron in accordance with MIL-STD-1276 Type D.



APPLICATIONS

These precision glass-dielectric capacitors are QPL to Established Reliability specification MIL-C-23269. Fused monolithic construction provides excellent electrical performance, environmental immunity, stability and retraceability.

PERFORMANCE CHARACTERISTICS

Temperature Coefficient—+140 ±25 ppm/°C from -55°C to +125°C. TC of all units will track and retrace to within ±5 ppm.

Life—At rated conditions (100% rated voltage, 125°C), capacitance change is less than:

 ±0.5% after 2,000 hours
±2.0% after 30,000 hours

At accelerated conditions (150% rated voltage, 125°C), capacitance change is less than:

 ±0.5% after 2,000 hours
±2.0% after 6,000 hours

Insulation Resistance—A minimum of 100,000 megohms at 25°C and 10,000 megohms at 125°C.

Voltage/Temperature Ratings—Voltage ratings are shown in the part number tables. The operating temperature range is -55°C to +125°C.

Cross-Reference Information

MIL-C-23269	MIL-C-11272
Style	Style
CYR51	CY06
CYR52	CY07
CYR53	CY08

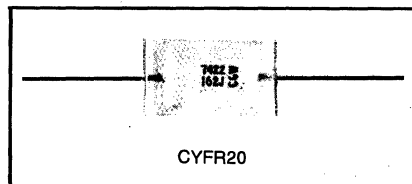
PART MARKING

M23269 J	STYLE
10-2001	CYR51,
CGW 75A	52, 53
II II	

 M23269 — Military specification established reliability glass capacitor
 J — Jan
 10 — Case Size
 2 — Failure rate (L level)
 001 — Capacitance. Coded in pF and capacitance tolerance
 CGW — Corning Glass Works
 75 — Year
 A — Lot Code

Glass Capacitors

CYFR 10, 15, 20, 30 (HIGH RELIABILITY)



APPLICATIONS

CORNING® style CYFR high reliability glass capacitors have failure rates among the lowest available. These capacitors meet or exceed all requirements of Corning specifications J-950 and J-951, which combine the most exacting features of many specifications and substantially exceed those of most.

PERFORMANCE CHARACTERISTICS

Tolerance—Available tolerances are "C" = 0.25 pF, "D" = ±0.5 pF, "F" = ±1%, "G" = ±2%, "J" = ±5% as shown in the ordering information table.

Temperature Coefficient—+140 ±25 ppm/°C at 100 kHz. TC will track and retrace to within ±5 ppm. Capacitance drift is less than 0.1% or 0.1 pF, whichever is greater.

Voltage Coefficient—Zero.

Losses—Extremely low, and remain relatively low at elevated temperatures and high frequencies. Dissipation factor is less than 0.001 at 1 kHz and 25°C.

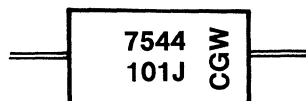
Life—After 2,000 hours at 125°C with 150% of rated voltage applied, capacitance change is less than 0.5% or 0.5 pF, dissipation factor is less than 0.0015, and insulation resistance is greater than 500,000 megohms.

Insulation Resistance—Greater than 500,000 megohms at 25°C; greater than 10,000 megohms at 125°C.

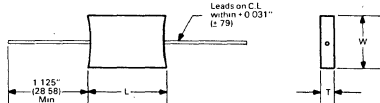
Voltage/Temperature Ratings—Voltage ratings are shown in the ordering information table. The operating temperature range is -55°C to +125°C with no derating required.

Moisture Resistance—Exceeds all requirements of MIL-C-11272 and MIL-STD-202, Method 106.

PART MARKING



75 — Year
 44 — Lot Code
 101 — Capacitance. Coded in pF
 J — Tolerance
 CGW — Corning Glass Works

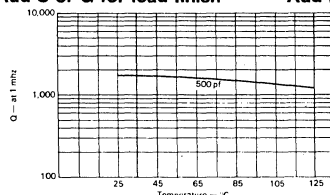


PART NUMBERS AND ORDERING INFORMATION

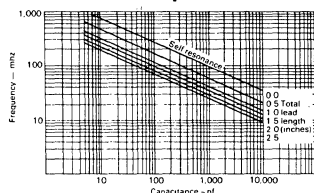
Capacitance Value (pF)	Corning Part Number	DC Working Voltage	Tolerances Available	Capacitance Value (pF)	Corning Part Number	DC Working Voltage	Tolerances Available
STANDARD VALUES CYFR10				STANDARD VALUES CYFR15, con't.			
0.5	CYFR10-0R5*	500	C	240	CYFR15-241*	500	F,G,J
1.0	CYFR10-010	500	C	270	CYFR15-271	500	F,G,J
1.5	CYFR10-1R5	500	C	300	CYFR15-301	500	F,G,J
2.2	CYFR10-2R2	500	C,D	330	CYFR15-331	500	F,G,J
2.7	CYFR10-2R7	500	C	360	CYFR15-361	500	F,G,J
3.0	CYFR10-030	500	C,D	390	CYFR15-391	500	F,G,J
3.3	CYFR10-3R3	500	C	430	CYFR15-431	500	F,G,J
3.6	CYFR10-3R6	500	C,D	470	CYFR15-471	500	F,G,J
3.9	CYFR10-3R9	500	C	510	CYFR15-511	500	F,G,J
4.3	CYFR10-4R3	500	C,D	560	CYFR15-561	300	F,G,J
4.7	CYFR10-4R7	500	C	620	CYFR15-621	300	F,G,J
5.1	CYFR10-5R1	500	C	750	CYFR15-751	300	F,G,J
5.6	CYFR10-5R6	500	C	820	CYFR15-821	300	F,G,J
6.2	CYFR10-6R2	500	C,J	910	CYFR15-911	300	F,G,J
6.8	CYFR10-6R8	500	C,J	1000	CYFR15-102	300	F,G,J
7.5	CYFR10-7R5	500	C,J	1100	CYFR15-112	300	F,G,J
8.2	CYFR10-8R2	500	C,J	1200	CYFR15-122	300	F,G,J
9.1	CYFR10-9R1	500	C,J	STANDARD VALUES CYFR20			
10	CYFR10-100	500	C,J	560	CYFR20-561*	500	F,G,J
11	CYFR10-110	500	C,J	620	CYFR20-621	500	F,G,J
12	CYFR10-120	500	C,J	680	CYFR20-681	500	F,G,J
13	CYFR10-130	500	G,J	750	CYFR20-751	500	F,G,J
15	CYFR10-150	500	G,J	820	CYFR20-821	500	F,G,J
16	CYFR10-160	500	G,J	910	CYFR20-911	500	F,G,J
18	CYFR10-180	500	G,J	1000	CYFR20-102	500	F,G,J
20	CYFR10-200	500	G,J	1100	CYFR20-112	500	F,G,J
22	CYFR10-220	500	G,J	1200	CYFR20-122	500	F,G,J
24	CYFR10-240	500	G,J	1300	CYFR20-132	500	F,G,J
27	CYFR10-270	500	F,G,J	1500	CYFR20-152	500	F,G,J
30	CYFR10-300	500	F,G,J	1600	CYFR20-162	500	F,G,J
33	CYFR10-330	500	F,G,J	1800	CYFR20-182	500	F,G,J
36	CYFR10-360	500	F,G,J	2000	CYFR20-202	500	F,G,J
39	CYFR10-390	500	F,G,J	2200	CYFR20-222	500	F,G,J
43	CYFR10-430	500	F,G,J	2400	CYFR20-242	500	F,G,J
47	CYFR10-470	500	F,G,J	2700	CYFR20-272	500	F,G,J
51	CYFR10-510	500	F,G,J	3000	CYFR20-302	500	F,G,J
56	CYFR10-560	500	F,G,J	3300	CYFR20-332	500	F,G,J
62	CYFR10-620	500	F,G,J	3600	CYFR20-362	300	F,G,J
68	CYFR10-680	500	F,G,J	3900	CYFR20-392	300	F,G,J
75	CYFR10-750	500	F,G,J	4300	CYFR20-432	300	F,G,J
82	CYFR10-820	500	F,G,J	4700	CYFR20-472	300	F,G,J
91	CYFR10-910	500	F,G,J	5100	CYFR20-512	300	F,G,J
100	CYFR10-101	500	F,G,J	STANDARD VALUES CYFR30			
110	CYFR10-111	500	F,G,J	3600	CYFR30-362*	500	F,G,J
120	CYFR10-121	500	F,G,J	3900	CYFR30-392	500	F,G,J
130	CYFR10-131	500	F,G,J	4300	CYFR30-432	500	F,G,J
150	CYFR10-151	500	F,G,J	4700	CYFR30-472	500	F,G,J
160	CYFR10-161	300	F,G,J	5100	CYFR30-512	500	F,G,J
180	CYFR10-181	300	F,G,J	5600	CYFR30-562	500	F,G,J
200	CYFR10-201	300	F,G,J	6200	CYFR30-622	500	F,G,J
220	CYFR10-221	300	F,G,J	6800	CYFR30-682	300	F,G,J
240	CYFR10-241	300	F,G,J	7500	CYFR30-752	300	F,G,J
STANDARD VALUES CYFR15				8200	CYFR30-822	300	F,G,J
160	CYFR15-161*	500	F,G,J	9100	CYFR30-912	300	F,G,J
180	CYFR15-181	500	F,G,J	10000	CYFR30-103	300	F,G,J
200	CYFR15-201	500	F,G,J				
220	CYFR15-221	500	F,G,J				

*Add S or G for lead finish

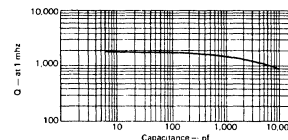
**Add letter for tolerance code



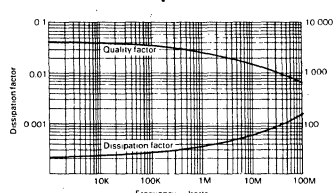
Quality Factor vs. Temperature



Resonant Frequency vs. Capacitance



Quality Factor vs. Capacitance



Quality Factor and Dissipation Factor vs. Frequency

Dimensions—Inches (Millimeters)

Style	Min—Max	Min—Max	T Min—Max	Lead Dia ±.004 (+0.1) —.001 (-0.03)	Weight (Grams)
CYFR10	.2969—.3906 (7.54—9.93)	.1406—.2031 (3.58—5.16)	.0469—.1093 (1.19—2.77)	.020 24 AWG (.51)	.25—.50
CYFR15	.4219—.5156 (10.72—13.11)	.2344—.2968 (5.94—7.54)	.0625—.1562 (1.60—3.96)	.020 24 AWG (.51)	.75—1.25
CYFR20	.6719—.7968 (17.07—20.24)	.3750—.4687 (9.52—11.91)	.0938—.1875 (2.39—4.78)	.025 22 AWG (.63)	2.50—4.00
CYFR30	.7032—.8281 (17.86—21.03)	.6719—.8281 (17.07—21.03)	.0938—.1875 (2.39—4.78)	.025 22 AWG (.63)	5.00—7.00

Note: Leads are solderable and weldable Durnet.

CORNING
ELECTRONICS

 CORNING GLASS WORKS
Corning, New York 14830

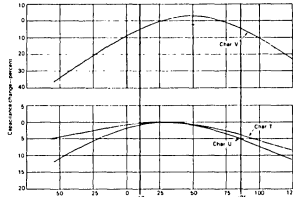
Ceramic GLASS-K™ Capacitors

CYK01, 02 (INDUSTRIAL) CK31, 32 (QPL to MIL-C-11015/25)

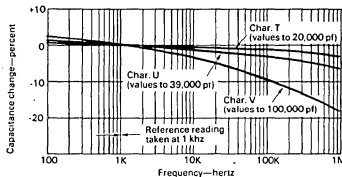
PART NUMBERS AND ORDERING INFORMATION

Capacitance Value (pF)	Corning Part No.	Military Type Designation	DC Working Voltage	Tolerances Available
STANDARD VALUES CK31				
270	CYK01BT271	CK31BT271	50	J,K
330	CYK01BT331	CK31BT331	50	J,K
390	CYK01BT391	CK31BT391	50	J,K
470	CYK01BT471	CK31BT471	50	J,K
560	CYK01BT561	CK31BT561	50	J,K
680	CYK01BT681	CK31BT681	50	J,K
820	CYK01BT821	CK31BT821	50	J,K
1000	CYK01BT102	CK31BT102	50	J,K
1200	CYK01BT122	CK31BT122	50	J,K
1500	CYK01BT152	CK31BT152	50	J,K
1800	CYK01BT182	CK31BT182	50	J,K
2200	CYK01BT222	CK31BT222	50	J,K
2700	CYK01BT272	CK31BT272	50	J,K
3300	CYK01BT332	CK31BT332	50	J,K
3900	CYK01BT392	CK31BT392	50	J,K
4700	CYK01BT472	CK31BT472	50	J,K
5000	CYK01BT562	CK31BT562	50	J,K
6800	CYK01BT682	CK31BT682	50	J,K
8200	CYK01BT822	CK31BT822	50	J,K
10000	CYK01BT103	CK31BT103	50	J,K
12000	CYK01BU123	CK31BU123	50	K,M
15000	CYK01BU153	CK31BU153	50	K,M
18000	CYK01BU183	CK31BU183	50	K,M
20000	CYK01BU203	CK31BU203	50	K,M
STANDARD VALUES CK32 (Cont.)				
22000	CYK01BU223	CK31BU223	50	K,M
27000	CYK01BU273	CK31BU273	50	K,M
33000	CYK01BU333	CK31BU333	50	K,M
39000	CYK01BU393	CK31BU393	50	K,M
47000	CYK01BU473	CK31BU473	50	K,M
51000	CYK01BU513	CK31BU513	50	K,M
STANDARD VALUES CK32				
12000	CYK02BT123	CK32BT123	50	J,K
15000	CYK02BT153	CK32BT153	50	J,K
18000	CYK02BT183	CK32BT183	50	J,K
20000	CYK02BT203	CK32BT203	50	J,K
22000	CYK02BU223	CK32BU223	50	K,M
27000	CYK02BU273	CK32BU273	50	K,M
33000	CYK02BU333	CK32BU333	50	K,M
39000	CYK02BU393	CK32BU393	50	K,M
56000	CYK02BV563	CK32BV563	50	K,M
68000	CYK02BV683	CK32BV683	50	K,M
82000	CYK02BV823	CK32BV823	50	K,M
100000	CYK02BV104	CK32BV104	50	K,M

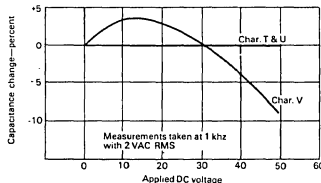
*Add Letter for Tolerance Code above line: J = $\pm 5\%$, K = $\pm 10\%$, M = $\pm 20\%$



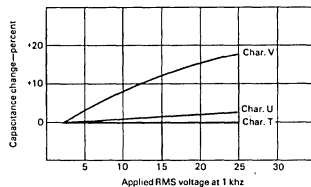
Capacitance vs. Temperature



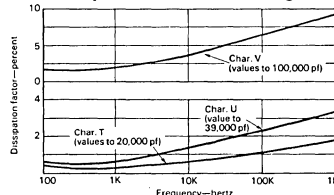
Capacitance Change vs. Frequency



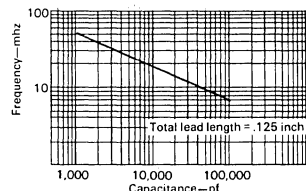
Capacitance vs. dc Voltage



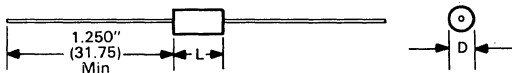
Capacitance vs. ac Voltage



Dissipation Factor vs. Frequency



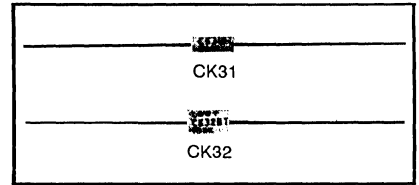
Resonant Frequency vs. Capacitance



Dimensions—Inches (Millimeters)

Case Size	L Max	D Max	Lead Dia. +.004 (.10) —.001 (.03)	Weight (Grams)
CK31	.250 (6.35)	.100 (2.54)	.016 (.41)	.2
CK32	.250 (6.35)	.140 (3.56)	.016 (.41)	.3

Note: Leads are gold-plated, solderable and weldable Dumet per MIL-STD-1276, Type D.



APPLICATIONS

These miniature multilayer ceramic capacitors, CORNING® style CYK01 and CYK02, meet or exceed all requirements of MIL-C-11015. High volumetric efficiency and reliable performance result from the special GLASS-K® dielectric, which is fused into a compact monolithic structure, sized for automatic insertion. Available in three different stability characteristics, these capacitors are suitable for both military and commercial applications in miniature circuitry.

PERFORMANCE CHARACTERISTICS

Tolerance— $\pm 20\%$ and $\pm 10\%$ in characteristics "U" and "V", and $\pm 10\%$ and $\pm 5\%$ in characteristic "T".

Stability Characteristics—Available as follows:

- T—TC: $\pm 2, -10\%$;
TVC: $\pm 2, -10\%$
- U—TC: $\pm 2, -15\%$;
TVC: $\pm 2, -15\%$
- V—TC: $\pm 20, -45\%$;
TVC: $\pm 20, -50\%$

Dissipation factor—

- T: $< 1\%$
- U: $< 1.5\%$
- V: $< 3.0\%$

Life—Meets or exceeds requirements of MIL-C-11015. At 200% of rated voltage, 125°C , the capacitance change for each stability characteristic is as follows:

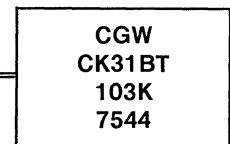
- T: $< 2\%$
- U: $< 5\%$
- V: $< 20\%$

Insulation Resistance—100,000 megohms or 1,000 megohm-microfarads, whichever is less.

Voltage/Temperature Ratings—Rated voltage is 50 Vdc. The operating temperature range is -55°C to $+125^\circ\text{C}$.

Moisture Resistance—Meets or exceeds requirements of MIL-C-11015 and MIL-STD-202, Method 106. The capacitance change is less than 2% for stability characteristics T and U, and less than 5% for characteristic V.

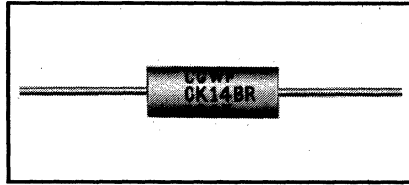
PART MARKING



CGW — Corning Glass Works
CK — Style
31 — Case Size
B — Operating Temperature Range
T — Stability Characteristic
103 — Capacitance, Coded in pF
K — Tolerance
7544 — Date and Lot Code

Ceramic Capacitors

CK12, 13, 14 (QPL to MIL-C-11015/20)



APPLICATIONS

These miniature multilayer ceramic capacitors are QPL to MIL-C-11015/20. The exclusive dielectric provides high volumetric efficiency and superior reliability. The monolithic units are molded into rugged flame-retardant cases, ideally suited for automatic insertion.

PERFORMANCE CHARACTERISTICS

Tolerance— $\pm 20\%$ and $\pm 10\%$.

Stability Characteristics—Available as follows:

- X — TC: $\pm 15\%$; TVC: $+15, -25\%$
 R — TC: $\pm 15\%$; TVC: $+15, -40\%$

Dissipation Factor—2.5% maximum @ 1 kHz.

Life—Meets or exceeds requirements of MIL-C-11015, 200% of rated voltage, 125°C, for 2,000 hours.

Insulation Resistance—100,000 megohms or 1,000 megohm-microfarads.

Voltage/Temperature Ratings—Voltage ratings are shown in the ordering information table. The operating temperature range is -55°C to $+125^\circ\text{C}$.

Moisture Resistance—Meets or exceeds requirements of MIL-C-11015 and MIL-STD-202, Method 106.

Dielectric Withstanding Voltage—250% of rated dc voltage.

Part Numbers—Part numbers are shown in the ordering information table. Use suffix "M" for $\pm 20\%$ tolerance if available, and suffix "K" for $\pm 10\%$ tolerance.

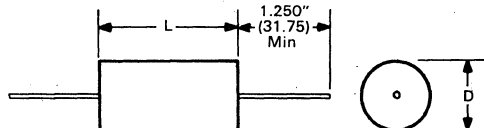
Cross-Reference Information

MIL-C-11015/20	MIL-C-39014/5
Style	Style
CK12	CKR11
CK13	CKR12
CK14	CKR14

PART NUMBERS AND ORDERING INFORMATION

Capacitance Values (pF)	Military Type Designation	DC Working Voltage	Tolerances Available	Capacitance Values (pF)	Military Type Designation	DC Working Voltage	Tolerances Available
STANDARD VALUES CK12				STANDARD VALUES CK13			
10	CK12BX100*	100	K,M	5600	CK13BX562*	100	K
12	CK12BX120	100	K	6800	CK13BX682	100	K,M
15	CK12BX150	100	K,M	8200	CK13BX822	100	K
18	CK12BX180	100	K	10000	CK13BX103	100	K,M
22	CK12BX220	100	K,M	12000	CK13BX123	50	K
27	CK12BX270	100	K	15000	CK13BX153	50	K,M
33	CK12BX330	100	K,M	18000	CK13BX183	50	K
39	CK12BX390	100	K	22000	CK13BX223	50	K,M
47	CK12BX470	100	K,M	27000	CK13BR273	50	K
56	CK12BX560	100	K	33000	CK13BR333	50	K,M
68	CK12BX680	100	K,M	39000	CK13BR393	50	K
82	CK12BX820	100	K	47000	CK13BR473	50	K,M
100	CK12BX101	100	K,M	STANDARD VALUES CK14			
120	CK12BX121	100	K	12000	CK14BX123*	100	K
150	CK12BX151	100	K,M	15000	CK14BX153	100	K,M
180	CK12BX181	100	K	18000	CK14BX183	100	K
220	CK12BX221	100	K,M	22000	CK14BX223	100	K,M
270	CK12BX271	100	K	27000	CK14BX273	100	K
330	CK12BX331	100	K,M	33000	CK14BX333	100	K,M
390	CK12BX391	100	K	39000	CK14BX393	100	K
470	CK12BX471	100	K,M	47000	CK14BX473	100	K,M
560	CK12BX561	100	K	56000	CK14BR563	100	K
680	CK12BX681	100	K,M	68000	CK14BR683	100	K,M
820	CK12BX821	100	K	82000	CK14BR823	100	K
1000	CK12BX102	100	K,M	100000	CK14BR104	100	K,M
1200	CK12BX122	100	K	120000	CK14BR124	50	K
1500	CK12BX152	100	K,M	150000	CK14BR154	50	K,M
1800	CK12BX182	100	K	180000	CK14BR184	50	K
2200	CK12BX222	100	K,M	220000	CK14BR224	50	K,M
2700	CK12BX272	100	K	270000	CK14BR274	50	K
3300	CK12BX332	100	K,M				
3900	CK12BX392	100	K				
4700	CK12BX472	100	K,M				
5600	CK12BX562	50	K				
6800	CK12BX682	50	K,M				
8200	CK12BX822	50	K				
10000	CK12BX103	50	K,M				

*Add letter for tolerance code above lines.

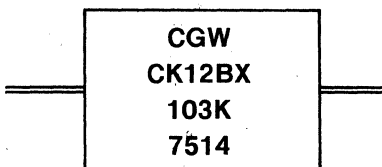


Dimensions—Inches (Millimeters)

Case Size	L $\pm .010$ ($\pm .25$)	D $\pm .010$ ($\pm .25$)	Lead Dia. $+.004$ (.10) $-.001$ (.03)	Weight (Grams)
CK12	.160 (4.06)	.090 (2.29)	.016	.2
CK13	.250 (6.35)	.090 (2.29)	.016 (.41)	.2
CK14	.390 (9.91)	.140 (3.56)	.025 (.63)	.5

Note: All leads are solder-coated duct, per MIL-STD-1276, Type D.

PART MARKING



CGW — Corning Glass Works
 CK — Style
 12 — Case Size
 B — Operating Temperature Range
 X — Stability Characteristic
 103 — Capacitance
 K — Tolerance
 7514 — Date and Lot Code

CORNING

ELECTRONICS

CORNING GLASS WORKS
Corning, New York 14830

Ceramic Capacitors

CKR11, 12, 14 (QPL to MIL-C-39014/5) Established Reliability

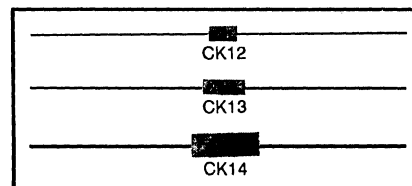
PART NUMBERS AND ORDERING INFORMATION

M39014/05 — (Dash Number)						Capacitance Value	Capacitance Tolerance	DC Rated Voltage
Failure Rate Level — (% 1,000 Hours)						pF	± %	Volt- age
2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)				
Style CKR11 BX								
2401	2601	2801	2001	2201		10	10	100
2402	2602	2802	2002	2202		10	20	100
2403	2603	2803	2003	2203		12	10	100
2404	2604	2804	2004	2204		15	10	100
2405	2605	2805	2005	2205		15	20	100
2406	2606	2806	2006	2206		18	10	100
2407	2607	2807	2007	2207		22	10	100
2408	2608	2808	2008	2208		22	20	100
2409	2609	2809	2009	2209		27	10	100
2410	2610	2810	2010	2210		33	10	100
2411	2611	2811	2011	2211		33	20	100
2412	2612	2812	2012	2212		39	10	100
2413	2613	2813	2013	2213		47	10	100
2414	2614	2814	2014	2214		47	20	100
2415	2615	2815	2015	2215		56	10	100
2416	2616	2816	2016	2216		68	10	100
2417	2617	2817	2017	2217		68	20	100
2418	2618	2818	2018	2218		82	10	100
2419	2619	2819	2019	2219		100	10	100
2420	2620	2820	2020	2220		100	20	100
2421	2621	2821	2021	2221		120	10	100
2422	2622	2822	2022	2222		150	10	100
2423	2623	2823	2023	2223		150	20	100
2424	2624	2824	2024	2224		180	10	100
2425	2625	2825	2025	2225		220	10	100
2426	2626	2826	2026	2226		220	20	100
2427	2627	2827	2027	2227		270	10	100
2428	2628	2828	2028	2228		330	10	100
2429	2629	2829	2029	2229		330	20	100
2430	2630	2830	2030	2230		390	10	100
2431	2631	2831	2031	2231		470	10	100
2432	2632	2832	2032	2232		470	20	100
2433	2633	2833	2033	2233		560	10	100
2434	2634	2834	2034	2234		680	10	100
2435	2635	2835	2035	2235		680	20	100
2436	2636	2836	2036	2236		820	10	100
2437	2637	2837	2037	2237		1000	10	100
2438	2638	2838	2038	2238		1000	20	100
2439	2639	2839	2039	2239		1200	10	100
2440	2640	2840	2040	2240		1500	10	100
2441	2641	2841	2041	2241		1500	20	100
2442	2642	2842	2042	2242		1800	10	100
2443	2643	2843	2043	2243		2200	10	100
2444	2644	2844	2044	2244		2200	20	100
2445	2645	2845	2045	2245		2700	10	100
2446	2646	2846	2046	2246		3300	10	100
2447	2647	2847	2047	2247		3300	20	100
2448	2648	2848	2048	2248		3900	10	100
2449	2649	2849	2049	2249		4700	10	100
2450	2650	2850	2050	2250		4700	20	100
2451	2651	2851	2051	2251		5600	10	50
2452	2652	2852	2052	2252		6800	10	50
2453	2653	2853	2053	2253		6800	20	50
2454	2654	2854	2054	2254		8200	10	50
2455	2655	2855	2055	2255		10000	10	50
2456	2656	2856	2056	2256		10000	20	50

M39014/05 — (Dash Number)						Capacitance Value	Capacitance Tolerance	DC Rated Voltage
Failure Rate Level — (% 1,000 Hours)						pF	± %	Volt- age
2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)				
Style CKR12 BX								
2457	2657	2857	2057	2257		5600	10	100
2458	2658	2858	2058	2258		6800	10	100
2459	2659	2859	2059	2259		6800	20	100
2460	2660	2860	2060	2260		8200	10	100
2461	2661	2861	2061	2261		10000	10	100
2462	2662	2862	2062	2262		10000	20	100
2463	2663	2863	2063	2263		12000	10	50
2464	2664	2864	2064	2264		15000	10	50
2465	2665	2865	2065	2265		15000	20	50
2466	2666	2866	2066	2266		18000	10	50
2467	2667	2867	2067	2267		22000	10	50
2468	2668	2868	2068	2268		22000	20	50
2469	2669	2869	2069	2269		27000	10	50
2470	2670	2870	2070	2270		33000	10	50
2471	2671	2871	2071	2271		33000	20	50
2472	2672	2872	2072	2272		39000	10	50
2473	2673	2873	2073	2273		47000	10	50
2474	2674	2874	2074	2274		47000	20	50

M39014/05 — (Dash Number)						Capacitance Value	Capacitance Tolerance	DC Rated Voltage
Failure Rate Level — (% 1,000 Hours)						pF	± %	Volt- age
2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)				
Style CKR14 BX								
2475	2675	2875	2075	2275		12000	10	100
2476	2676	2876	2076	2276		15000	10	100
2477	2677	2877	2077	2277		15000	20	100
2478	2678	2878	2078	2278		18000	10	100
2479	2679	2879	2079	2279		22000	10	100
2480	2680	2880	2080	2280		22000	20	100
2481	2681	2881	2081	2281		27000	10	100
2482	2682	2882	2082	2282		33000	10	100
2483	2683	2883	2083	2283		33000	20	100
2484	2684	2884	2084	2284		39000	10	100
2485	2685	2885	2085	2285		47000	10	100
2486	2686	2886	2086	2286		47000	20	100
2487	2687	2887	2087	2287		56000	10	50
2488	2688	2888	2088	2288		68000	10	50
2489	2689	2889	2089	2289		68000	20	50
2490	2690	2890	2090	2290		82000	10	50
2491	2691	2891	2091	2291		100000	10	50
2492	2692	2892	2092	2292		100000	20	50

M39014/05 — (Dash Number)						Capacitance Value	Capacitance Tolerance	DC Rated Voltage
Failure Rate Level — (% 1,000 Hours)						pF	± %	Volt- age
2.0(L)	1.0(M)	0.1(P)	0.01(R)	0.001(S)				
Style CKR14 BR								
2493	2693	2893	2093	2293		56000	10	100
2494	2694	2894	2094	2294		68000	10	100
2495	2695	2895	2095	2295		68000	20	100
2496	2696	2896	2096	2296		82000	10	100
2497	2697	2897	2097	2297		100000	10	100
2498	2698	2898	2098	2298		100000	20	100
2499	2699	2899	2099	2299		120000	10	50
2500	2700	2900	2100	2300		150000	10	50
2501	2701	2901	2101	2301		150000	20	50
2502	2702	2902	2102	2302		180000	10	50
2503	2703	2903	2103	2303		220000	10	50
2504	2704	2904	2104	2304		220000	20	50
2505	2705	2905	2105	2305		270000	10	50



APPLICATIONS

These miniature multilayer ceramic capacitors are QPL to Established Reliability specification MIL-C-39014/5. The dielectric is fused into a monolithic structure, which is then molded into a tough, flameproof case, sized for automatic insertion. These units offer excellent frequency characteristics, superior voltage coefficients and high volumetric efficiency.

PERFORMANCE CHARACTERISTICS

Tolerance— $\pm 20\%$ and $\pm 10\%$.

Stability Characteristics—Available as follows:

BX—TC: $\pm 15\%$; TVC: $+15, -25\%$

BR—TC: $\pm 15\%$; TVC: $+15, -40\%$

Dissipation Factor—2.5% maximum.

Insulation Resistance—At 25°C, 100,000 megohms or 1,000 megohm-microfarads. At 125°C, 10,000 megohms or 100 megohm-microfarads.

Voltage/Temperature Ratings—Voltage ratings are shown in the ordering information table. The operating temperature range is -55°C to $+125^\circ\text{C}$.

Part Numbers—Part numbers are formed by adding a dash number from the part number table to the basic mil spec number—M39014/05—(add dash number)

Examples:

M39014/05-2401
CKR11 10pF $\pm 10\%$ 100V
L Failure Rate (BX)

M39014/05-2698
CKR14 100,000 pF $\pm 20\%$ 100V
M Failure Rate (BR)

Cross-Reference Information

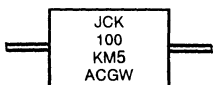
MIL-C-39014/5	MIL-C-11015/20
Style	Style
CKR11	CK12
CKR12	CK13
CKR14	CK14

Failure Rate (90% Confidence)

L = 2%/1000 Hours
M = 1%/1000 Hours
P = .1%/1000 Hours
R = .01%/1000 Hours
S = .001%/1000 Hours

PART MARKING

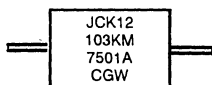
STYLE CKR11



J—JAN Trademark
C—Capacitor
K—Ceramic Dielectric

100—Capacitance
Code in pF (10pF)
K—Capacitance Tolerance ($\pm 10\%$)
M—Failure Rate Level (1%/1000 hrs.)
5—Last Digit of Year
A—3 Week Lot Code
ACGW—Corning Glass Works

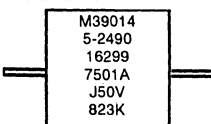
STYLE CKR12



J—JAN Trademark
C—Capacitor
K—Ceramic Dielectric

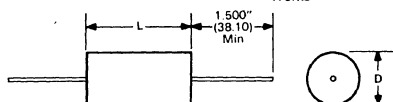
12—Size
103—Capacitance (10,000 pF)
K—Capacitance Tolerance ($\pm 10\%$)
M—Failure Rate Level (1%/1000 hrs.)
75—Last 2 Digits of Year
01—Week of Year
A—Lot Code
CGW—Corning Glass Works

STYLE CKR14

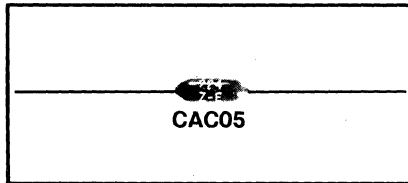


M39014—General Specification

5—Specification Sheet
2490—Dash Number
16299—CGW ID Number
75—Year
01—Week
A—Lot Code
J—JAN Trademark
50V—Voltage Rating
823—Coded Capacitance
K—Capacitance Tolerance



Ceramic Capacitors

 CAC02, 03, 04, 05 (SPINSEAL)[™] Axial, Conformal Coated


INTRODUCING SPINSEAL[™]

These miniature monolithic ceramic capacitors are designed for high volume commercial and industrial applications where space and weight are at a premium. The Spinseal technology permits us to manufacture axials at high speeds while closely controlling uniformity and performance. Especially suited for automatic insertion application, Spinseal is the low cost axial ceramic capacitor.

EIA TEMPERATURE CHARACTERISTICS

Available as follows:

X7R (stable)— $\pm 15\%$
 from -55°C to $+125^{\circ}\text{C}$
Z5U (general purpose)— $\pm 22\%$
 -56% from $+10^{\circ}\text{C}$ to $+85^{\circ}\text{C}$

PERFORMANCE CHARACTERISTICS

Standard capacitance tolerances available.

X7R K = $\pm 10\%$
 M = $\pm 20\%$
Z5U M = $\pm 20\%$
 Z = $+80, -20\%$

Dissipation Factor:

X7R—2.5% maximum

Z5U—3.0% maximum

Insulation Resistance:

X7R—100,000 megohms or 1000 megohm-microfarads, whichever is less.

Z5U—10,000 megohms or 100 megohm-microfarads, whichever is less.

Voltage Ratings: 50 and 100 volts dc.

Dielectric Strength: 2.5 times rated voltage for 1 to 5 seconds.

PART NUMBERS AND ORDERING INFORMATION

X7R PART NUMBERS

CAP.	50 VOLT
5600pF	CAC02X7R562-050A
6800pF	CAC02X7R682-050A
8200pF	CAC02X7R822-050A
10000pF	CAC02X7R103-050A
.012 μF	CAC02X7R123-050A
.015 μF	CAC02X7R153-050A
.018 μF	CAC02X7R183-050A
.022 μF	CAC02X7R223-050A
.027 μF	CAC02X7R273-050A
.033 μF	CAC02X7R333-050A
.039 μF	CAC02X7R393-050A
.047 μF	CAC02X7R473-050A
.056 μF	CAC02X7R563-050A
.068 μF	CAC02X7R683-050A
.082 μF	CAC02X7R823-050A
.1 μF	CAC02X7R104-050A
.012 μF	CAC03X7R123-050A
.015 μF	CAC03X7R153-050A
.018 μF	CAC03X7R183-050A
.022 μF	CAC03X7R223-050A
.027 μF	CAC03X7R273-050A
.033 μF	CAC03X7R333-050A
.039 μF	CAC03X7R393-050A
.047 μF	CAC03X7R473-050A
.056 μF	CAC03X7R563-050A
.068 μF	CAC03X7R683-050A
.082 μF	CAC03X7R823-050A
.1 μF	CAC03X7R104-050A
.012 μF	CAC04X7R123-050A
.015 μF	CAC04X7R153-050A
.018 μF	CAC04X7R183-050A
.022 μF	CAC04X7R223-050A
.027 μF	CAC04X7R273-050A
.033 μF	CAC04X7R333-050A
.039 μF	CAC04X7R393-050A
.047 μF	CAC04X7R473-050A
.056 μF	CAC04X7R563-050A
.068 μF	CAC04X7R683-050A
.082 μF	CAC04X7R823-050A
.1 μF	CAC04X7R104-050A
.012 μF	CAC05X7R123-050A
.015 μF	CAC05X7R153-050A
.018 μF	CAC05X7R183-050A
.022 μF	CAC05X7R223-050A
.027 μF	CAC05X7R273-050A
.033 μF	CAC05X7R333-050A
.039 μF	CAC05X7R393-050A
.047 μF	CAC05X7R473-050A
.056 μF	CAC05X7R563-050A
.068 μF	CAC05X7R683-050A
.082 μF	CAC05X7R823-050A
.1 μF	CAC05X7R104-050A

CAP.	100 VOLT
10pF	CAC02X7R100-100A
12pF	CAC02X7R120-100A
15pF	CAC02X7R150-100A
18pF	CAC02X7R180-100A
22pF	CAC02X7R220-100A
27pF	CAC02X7R270-100A
33pF	CAC02X7R330-100A
39pF	CAC02X7R390-100A
47pF	CAC02X7R470-100A
56pF	CAC02X7R560-100A
68pF	CAC02X7R680-100A
82pF	CAC02X7R820-100A
100pF	CAC02X7R101-100A
120pF	CAC02X7R121-100A
150pF	CAC02X7R151-100A
180pF	CAC02X7R181-100A
220pF	CAC02X7R221-100A
270pF	CAC02X7R271-100A
330pF	CAC02X7R331-100A

X7R PART NUMBERS

CAP.	100 VOLT
390pF	CAC02X7R391-100A
470pF	CAC02X7R471-100A
560pF	CAC02X7R561-100A
680pF	CAC02X7R681-100A
820pF	CAC02X7R821-100A
1000pF	CAC02X7R102-100A
1200pF	CAC02X7R122-100A
1500pF	CAC02X7R152-100A
1800pF	CAC02X7R182-100A
2200pF	CAC02X7R222-100A
2700pF	CAC02X7R272-100A
3300pF	CAC02X7R332-100A
3900pF	CAC02X7R392-100A
4700pF	CAC02X7R472-100A
5600pF	CAC02X7R562-100A
6800pF	CAC02X7R682-100A
8200pF	CAC02X7R822-100A
10000pF	CAC02X7R103-100A
.012 μF	CAC03X7R123-100A
.015 μF	CAC03X7R153-100A
.018 μF	CAC03X7R183-100A
.022 μF	CAC03X7R223-100A
.027 μF	CAC03X7R273-100A
.033 μF	CAC03X7R333-100A
.039 μF	CAC03X7R393-100A
.047 μF	CAC03X7R473-100A
.056 μF	CAC03X7R563-100A
.068 μF	CAC03X7R683-100A
.082 μF	CAC03X7R823-100A
.1 μF	CAC03X7R104-100A

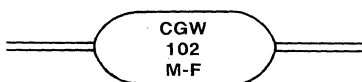
Z5U PART NUMBERS

CAP.	50 VOLT
.027 μF	CAC02Z5U273-050A
.033 μF	CAC02Z5U333-050A
.039 μF	CAC02Z5U393-050A
.047 μF	CAC02Z5U473-050A
.056 μF	CAC02Z5U563-050A
.068 μF	CAC02Z5U683-050A
.082 μF	CAC02Z5U823-050A
.1 μF	CAC02Z5U104-050A
.012 μF	CAC03Z5U124-050A
.015 μF	CAC03Z5U154-050A
.018 μF	CAC03Z5U184-050A
.022 μF	CAC03Z5U224-050A
.027 μF	CAC03Z5U274-050A
.033 μF	CAC03Z5U334-050A
.039 μF	CAC03Z5U394-050A
.047 μF	CAC03Z5U474-050A
.056 μF	CAC03Z5U564-050A
.068 μF	CAC03Z5U684-050A
.082 μF	CAC03Z5U824-050A
.1 μF	CAC03Z5U105-050A
.012 μF	CAC04Z5U125-050A
.015 μF	CAC04Z5U155-050A
.018 μF	CAC04Z5U185-050A
.022 μF	CAC04Z5U225-050A
.027 μF	CAC04Z5U275-050A
.033 μF	CAC04Z5U335-050A
.039 μF	CAC04Z5U395-050A
.047 μF	CAC04Z5U475-050A
.056 μF	CAC04Z5U565-050A
.068 μF	CAC04Z5U685-050A
.082 μF	CAC04Z5U825-050A
.1 μF	CAC04Z5U106-050A
.012 μF	CAC05Z5U126-050A
.015 μF	CAC05Z5U156-050A
.018 μF	CAC05Z5U186-050A
.022 μF	CAC05Z5U226-050A
.027 μF	CAC05Z5U276-050A
.033 μF	CAC05Z5U336-050A
.039 μF	CAC05Z5U396-050A
.047 μF	CAC05Z5U476-050A
.056 μF	CAC05Z5U566-050A
.068 μF	CAC05Z5U686-050A
.082 μF	CAC05Z5U826-050A
.1 μF	CAC05Z5U107-050A

CAP.	100 VOLT
1000pF	CAC02Z5U102-100A
1200pF	CAC02Z5U122-100A
1500pF	CAC02Z5U152-100A
1800pF	CAC02Z5U182-100A
2200pF	CAC02Z5U222-100A
2700pF	CAC02Z5U272-100A
3300pF	CAC02Z5U332-100A
3900pF	CAC02Z5U392-100A
4700pF	CAC02Z5U472-100A
5600pF	CAC02Z5U562-100A
6800pF	CAC02Z5U682-100A
8200pF	CAC02Z5U822-100A
.01 μF	CAC02Z5U103-100A
.012 μF	CAC02Z5U123-100A
.015 μF	CAC02Z5U153-100A
.018 μF	CAC02Z5U183-100A
.022 μF	CAC02Z5U223-100A
.027 μF	CAC02Z5U273-100A
.033 μF	CAC02Z5U333-100A
.039 μF	CAC02Z5U393-100A
.047 μF	CAC02Z5U473-100A
.056 μF	CAC02Z5U563-100A
.068 μF	CAC02Z5U683-100A
.082 μF	CAC02Z5U823-100A
.1 μF	CAC02Z5U104-100A
.012 μF	CAC03Z5U123-100A
.015 μF	CAC03Z5U153-100A
.018 μF	CAC03Z5U183-100A
.022 μF	CAC03Z5U223-100A
.027 μF	CAC03Z5U273-100A
.033 μF	CAC03Z5U333-100A
.039 μF	CAC03Z5U393-100A
.047 μF	CAC03Z5U473-100A
.056 μF	CAC03Z5U563-100A
.068 μF	CAC03Z5U683-100A
.082 μF	CAC03Z5U823-100A
.1 μF	CAC03Z5U105-100A
.012 μF	CAC04Z5U124-100A
.015 μF	CAC04Z5U154-100A
.018 μF	CAC04Z5U184-100A
.022 μF	CAC04Z5U224-100A
.027 μF	CAC04Z5U274-100A
.033 μF	CAC04Z5U334-100A
.039 μF	CAC04Z5U394-100A
.047 μF	CAC04Z5U474-100A
.056 μF	CAC04Z5U564-100A
.068 μF	CAC04Z5U684-100A
.082 μF	CAC04Z5U824-100A
.1 μF	CAC04Z5U106-100A
.012 μF	CAC05Z5U126-100A
.015 μF	CAC05Z5U156-100A
.018 μF	CAC05Z5U186-100A
.022 μF	CAC05Z5U226-100A
.027 μF	CAC05Z5U276-100A
.033 μF	CAC05Z5U336-100A
.039 μF	CAC05Z5U396-100A
.047 μF	CAC05Z5U476-100A
.056 μF	CAC05Z5U566-100A
.068 μF	CAC05Z5U686-100A
.082 μF	CAC05Z5U826-100A
.1 μF	CAC05Z5U107-100A

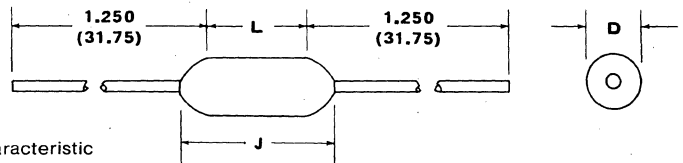
*Insert K, M or Z to Indicate Tolerance

PART MARKING



CGW — Corning Glass Works
 1 — First Significant Figure
 0 — Second Significant Figure
 2 — Multiplier

M — Tolerance $\pm 20\%$
 F — Temperature Characteristic
 F = Z5U
 (D = X7R)



Dimension—Inches (Millimeters)

Case Size	J Max.	Dimensions L Max.	D Max.	Lead Dia. $\pm .002(.05)$	Voltage Rating	X7R Capacitance range	Z5U Capacitance Range
CAC02	.190 (4.83)	.145 (3.68)	.100 (2.54)	.020 (.51)	50	5600pF - .022 μF	.027 μF - .047 μF
CAC03	.290 (7.37)	.230 (5.84)	.100 (2.54)	.020 (.51)	100	10pF - 6800pF	.001 μF - .022 μF
CAC04	.290 (7.37)	.260 (6.60)	.145 (3.68)	.020 (.51)	50	.01 μF - .047 μF	.056 μF - .12 μF
CAC05	.420 (10.67)	.370 (9.40)	.145 (3.68)	.025 (.64)	50	5600pF - .015 μF	.01 μF - .056 μF
					100	.047 μF - .1 μF	.1 μF - .27 μF
					50	.01 μF - .047 μF	.068 μF - .12 μF
					100	.047 μF - .27 μF	.27 μF - .47 μF
					50	.01 μF - .1 μF	.1 μF - .22 μF

NOTE: Leads are solder-coated domet.

CORNING
ELECTRONICS

 CORNING GLASS WORKS
Corning, New York 14830

Solid Tantalum Capacitors

SUBMINIATURE MINITAN MODULAR MM SERIES

PART NUMBERS AND ORDERING INFORMATION

P/N	μF Cap.	WVDC	Max. % DF	Max. DCL
W Case Size Std. Cap. Tol +40%, -20%				
MMW-020-472*-**	.0047	20	10	0.5
MMW-020-682-.-	.0068	20	10	0.5
MMW-020-103-.-	.010	20	10	0.5
MMW-020-153-.-	.015	20	10	0.5
MMW-020-223-.-	.022	20	10	0.5
MMW-020-333-.-	.033	20	10	0.5
MMW-020-473-.-	.047	20	10	0.5
MMW-020-683-.-	.068	20	10	0.5
MMW-015-104-.-	.10	15	10	0.5
MMW-010-154-.-	.15	10	10	0.5
MMW-006-224-.-	.22	6	10	0.5
MMW-004-334-.-	.33	4	10	0.5
MMW-002-474-.-	.47	2	10	0.5

U Case Size Std. Cap. Tol +40% -20%				
MMU-020-102*-**	.0010	20	6	0.5
MMU-020-152-.-	.0015	20	6	0.5
MMU-020-222-.-	.0022	20	6	0.5
MMU-020-332-.-	.0033	20	6	0.5
MMU-020-472-.-	.0047	20	6	0.5
MMU-020-682-.-	.0068	20	6	0.5
MMU-020-103-.-	.010	20	6	0.5
MMU-020-153-.-	.015	20	6	0.5
MMU-020-223-.-	.022	20	6	0.5
MMU-020-333-.-	.033	20	6	0.5
MMU-020-473-.-	.047	20	6	0.5
MMU-020-683-.-	.068	20	6	0.5
MMU-020-104-.-	.10	20	6	0.5
MMU-020-154-.-	.15	20	6	0.5
MMU-020-224-.-	.22	20	6	0.5
MMU-015-334-.-	.33	15	6	0.5
MMU-010-474-.-	.47	10	6	0.5
MMU-006-684-.-	.68	6	6	0.5
MMU-004-105-.-	1.0	4	8	0.5
MMU-003-155-.-	1.5	3	10	0.5
MMU-002-225-.-	2.2	2	10	0.5

F Case Size Std. Cap. Tol +20%				
MMF-035-472*-**	.0047	35	6	0.5
MMF-035-682-.-	.0068	35	6	0.5
MMF-035-103-.-	.010	35	6	0.5
MMF-035-153-.-	.015	35	6	0.5
MMF-035-223-.-	.022	35	6	0.5
MMF-035-333-.-	.033	35	6	0.5
MMF-035-473-.-	.047	35	6	0.5
MMF-035-683-.-	.068	35	6	0.5
MMF-035-104-.-	.10	35	6	0.5
MMF-035-154-.-	.15	35	6	0.5
MMF-035-224-.-	.22	35	6	0.5
MMF-035-334-.-	.33	35	6	0.5
MMF-035-474-.-	.47	35	6	0.5

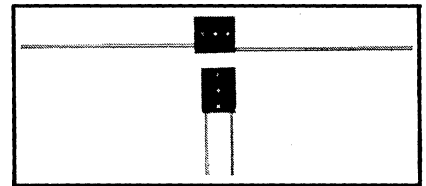
P/N	μF Cap.	WVDC	Max. % DF	Max. DCL
MMF-025-684*-**	.68	25	6	0.5
MMF-020-105-.-	1.0	20	6	0.5
MMF-015-225-.-	2.2	10	6	0.5
MMF-006-335-.-	3.3	6	6	0.5
MMF-004-475-.-	4.7	4	8	0.5
MMF-003-685-.-	6.8	3	10	0.5
MMF-002-106-.-	10.	2	10	0.5

M Case Size Std. Cap. Tol +20%				
MMM-035-684*-**	.68	35	6	1.0
MMM-035-105-.-	1.0	35	6	1.0
MMM-035-155-.-	1.5	35	6	1.0
MMM-025-225-.-	2.2	25	6	1.0
MMM-020-335-.-	3.3	20	6	1.0
MMM-020-475-.-	4.7	20	6	1.0
MMM-010-685-.-	6.8	10	6	1.0
MMM-006-106-.-	10.	6	6	1.0
MMM-004-156-.-	15.	4	8	1.0
MMM-003-226-.-	22.	3	10	1.0

L Case Size Std. Cap. Tol +20%				
MML-035-225*-**	2.2	35	6	2.0
MML-035-335-.-	3.3	35	6	2.0
MML-035-475-.-	4.7	35	6	2.0
MML-025-685-.-	6.8	25	6	2.0
MML-020-106-.-	10.	20	6	2.0
MML-015-156-.-	15.	15	6	2.0
MML-010-226-.-	22.	10	6	2.0
MML-006-336-.-	33.	6	6	2.0
MML-004-476-.-	47.	4	8	2.0

S Case Size Std. Cap. Tol +20%				
MMS-035-685*-**	6.8	35	6	3.0
MMS-025-106-.-	10.	25	6	3.0
MMS-020-156-.-	15.	20	6	3.0
MMS-015-226-.-	22.	15	6	3.0
MMS-010-336-.-	33.	10	6	3.0
MMS-006-476-.-	47.	6	6	3.0
MMS-004-686-.-	68.	4	8	3.0

J Case Size Std. Cap. Tol +20%				
MMJ-035-106*-**	10.	35	6	9.0
MMJ-035-156-.-	15.	35	6	9.0
MMJ-035-226-.-	22.	35	6	9.0
MMJ-025-336-.-	33.	25	6	9.0
MMJ-020-476-.-	47.	20	6	9.0
MMJ-015-686-.-	68.	15	8	9.0
MMJ-010-107-.-	100.	10	8	9.0
MMJ-006-157-.-	150.	6	10	9.0
MMJ-003-227-.-	220.	3	15	9.0



APPLICATIONS

FOR FILTERING • COUPLING • BY-PASSING • TIMING

These precision, microminiature polar capacitors are suitable for general filtering, coupling, bypassing, and noncritical RC timing applications to 85°C without derating and to 125°C with derating to 2/3 WVDC (Except MMW case size). Very favorable capacitance to volume ratios make them especially suited to high density applications such as found in avionics systems, subminiature communications equipment, and thick film circuitry.

PERFORMANCE CHARACTERISTICS

Capacitance—Measured at +25°C and 120Hz on a polarized capacitance bridge with a maximum polarizing voltage of 2.2 vdc and a maximum ac signal of 1.0 volts rms.

Tolerance—Except for the MMW and MMU case sizes, Standard tolerance is $\pm 20\%$ with $\pm 10\%$ or $\pm 5\%$ tolerance available in all case sizes (.01 MFD and above in the W case size). 10% decade values are offered in $\pm 10\%$ or $\pm 5\%$ tolerance.

Dissipation Factor—Measured simultaneously with capacitance as above. See Part Number Table for maximum +25°C, 120 Hz values.

DC Leakage Current—With rated WVDC applied through a 1000 ohm resistor for 5 minutes maximum, DCL values in μA at +25°C will not exceed those shown in the Part Number Table. At 85°C, DCL values will not exceed 10 times Part Number Table values. At 125°C with 2/3 rated WVDC applied, DCL values will not exceed 15 times Part Number Table values.

Operating Voltage—Capacitors will operate reliably up to rated WVDC AT +85°C and to +125°C with linear derating to 2/3 WVDC (With the exception of the MMW case size which is limited to +85°C operation). Capacitors will withstand peak voltages in the reverse direction equal to 15% of the dc rating at +25°C, 10% at +55°C, and 5% at +85°C. Ac ripple voltage should be limited so that the forward dc voltage plus peak ac voltage does not exceed rated WVDC.

Surge Voltage—At +85°C and at 60-second intervals, capacitors withstand 1000 30-second applications at 130% rated WVDC.

Moisture Resistance—Following Method 106, MIL-STD-202 testing, capacitors will meet initial dc leakage requirements. Capacitance will be within $\pm 10\%$ of initial values.

Life Test—After 2,000 hours +85°C with rated WVDC applied, capacitors will meet initial dc leakage and DF requirements. Capacitance will not change more than $\pm 10\%$ from original values.

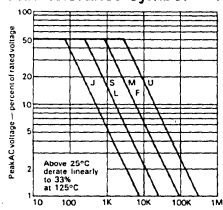
MECHANICAL

Construction—Tantalum pellets are encased in polyester sleeves and sealed with a special moisture resistant epoxy resin. This rugged, fully insulated package withstands a one minute application of a 100 volt potential applied between the leads shorted together and an encircling metal foil envelope.

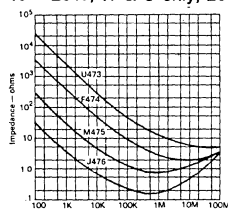
Leads—Leads are solder coated (W case size leads are gold plated) pure nickel wire suitable for soldering or welding. Tested in accordance with MIL-C-55365, .007" diameter leads withstand an 8 oz pull, .010" diameter leads a 1 lb. pull, and .016 diameter leads a 3 lb. pull. All lead diameters withstand 5 rotations twist.

*Add "A" — for Axial leads. "R" — for Radial leads

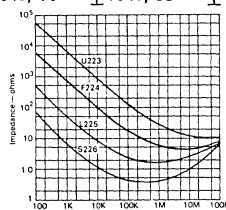
**Add tolerance symbol—40 = +40 -20%, W & U only; 20 = $\pm 20\%$; 10 = $\pm 10\%$; 05 = $\pm 5\%$;



Maximum Ripple Voltage



Impedance vs. Frequency



Impedance vs. Frequency

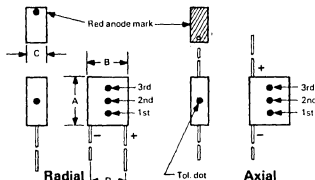
PART MARKING

MMJ case size is type marked, all others are color coded.

EIA COLOR DOT CODING

0—Black (omitted) 1—Brown
2—Red 3—Orange
4—Yellow 5—Green
6—Blue 7—Violet
8—Gray 9—White

Capacitance value is shown by means of standard EIA color code dots except for the MMJ case size where all data is printed. Because the polyester cases are black, black dots are omitted. $\pm 10\%$ tolerance is indicated by a silver dot. $\pm 5\%$ tolerance by a gold dot. No tolerance dot is used for $\pm 20\%$.



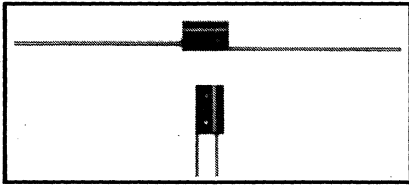
Dimensions—Inches (Millimeters)

Case Size	A Max.	B Max.	C Max.	D
MMW	.100 (2.54)	.050 (1.27)	.040 (1.02)	.030 (.76) $\pm .015$ ($\pm .38$) .050 (1.27)
MMU	.125 (3.18)	.070 (1.78)	.040 (1.02)	$\pm .015$ ($\pm .38$) .100 (2.54)
MMF	.165 (4.19)	.120 (3.05)	.070 (1.78)	$\pm .020$ ($\pm .51$) .150 (3.81)
MMM	.225 (5.72)	.185 (4.70)	.075 (1.91)	$\pm .020$ ($\pm .51$) .180 (4.57)
MML	.290 (7.37)	.220 (5.59)	.110 (2.79)	$\pm .025$ ($\pm .64$) .200 (5.08)
MMS	.310 (7.87)	.230 (5.84)	.130 (3.30)	$\pm .025$ ($\pm .64$) .300 (7.62)
MMJ	.475 (12.07)	.375 (9.53)	.150 (3.81)	$\pm .025$ ($\pm .64$)

Leads: W leads are 33 AWG, .007 $\pm$.001 (.18 $\pm$.025) diameter
U, F, M leads are 30 AWG, .010 $\pm$.002 (.25 $\pm$.051) diameter
L, S, J leads are 26 AWG, .016 $\pm$.002 (.41 $\pm$.051) diameter
All anode leads are 1.625 $\pm$.125 (.413 $\pm$ 3.18) long
All cathode leads are 1.375 $\pm$.125 (.349 $\pm$ 3.18) long

Solid Tantalum Capacitors

SUBMINIATURE MINITAN CORDWOOD MZ SERIES



APPLICATIONS

FOR FILTERING • COUPLING • BY-PASSING • TIMING

These precision, microminiature polar capacitors are suitable for general filtering, coupling, bypassing, and noncritical RC timing applications to +85°C without derating and to +125°C with derating to 2/3 WVDC. Very favorable capacitance to volume ratios make them especially suited to high density applications such as found in avionics systems, subminiature communications equipment, and thick film circuitry.

PERFORMANCE CHARACTERISTICS

Capacitance—Measured at +25°C and 120Hz on a polarized capacitance bridge with a maximum polarizing voltage of 2.2 vdc and a maximum ac signal of 1.0 volts rms.

Tolerance—Except for MZY and MZP case sizes, standard tolerance is $\pm 20\%$ with $\pm 10\%$ or $\pm 5\%$ tolerance available in all case sizes. 10% decade values are offered in $\pm 10\%$ or $\pm 5\%$ tolerance.

Dissipation Factor—Measured simultaneously with capacitance as above. See Part Number Section for maximum +25°C, 120 Hz values.

DC Leakage Current—With rated WVDC applied through a 1000 ohm resistor for a maximum of 5 minutes, at 25°C. DCL values in μA will not exceed those shown in the part number section.

at 85°C—10 times the value
at 125°C—15 times the value (at 2/3 rated voltage).

Operating Voltage—Capacitors will operate reliably up to rated WVDC at +85°C and to +125°C with linear derating to 2/3 WVDC. Capacitors will withstand peak voltages in the reverse direction equal to 15% of the dc rating at +25°C, 10% at +55°C, and 5% at +85°C. Ac ripple voltage should be limited so that the forward dc voltage plus peak ac voltage does not exceed rated WVDC.

Surge Voltage—At +85°C and at 60-second intervals, capacitors withstand 1000 30-second applications of 130% rated WVDC.

Temperature—No derating is required between -55°C and +85°C. Between +85°C and +125°C, derate linearly to 2/3 WVDC.

Moisture Resistance—Following Method 106, MIL-STD-202 testing, capacitors will meet initial dc leakage requirements. Capacitance will be within $\pm 10\%$ of initial values.

Life Test—After 2,000 hours +85°C with rated WVDC applied, capacitors will meet initial dc leakage and DF requirements. Capacitance will not change more than $\pm 10\%$ from original values.

MECHANICAL

Construction—Tantalum pellets are encased in polyester sleeves and sealed with a special moisture resistant epoxy resin. This rugged, fully insulated package withstands a one minute application of a 100 volt potential applied between the leads shorted together and an encircling metal foil envelope.

Leads—Leads are solder coated pure nickel wire suitable for soldering or welding. Tested in accordance with MIL-C-55365, .010 diameter leads withstand a 1 lb. pull and .016 diameter leads withstand a 3 lb. pull. All lead diameters withstand 5 rotations twist.

PART NUMBERS AND ORDERING INFORMATION

P/N	μF Cap.	WVDC	Max. % DF	Max. DCL
MZY Case Size Std. Cap. Tol. $\pm 40\%$ -20%				
MZY-020-102***	.0010	20	6	0.5
MZY-020-152---	.0015	20	6	0.5
MZY-020-222---	.0022	20	6	0.5
MZY-020-332---	.0033	20	6	0.5
MZY-020-472---	.0047	20	6	0.5
MZY-020-682---	.0068	20	6	0.5
MZY-020-103---	.010	20	6	0.5
MZY-020-153---	.015	20	6	0.5
MZY-020-223---	.022	20	6	0.5
MZY-020-333---	.033	20	6	0.5
MZY-020-473---	.047	20	6	0.5
MZY-020-683---	.068	20	6	0.5
MZY-020-104---	.10	20	6	0.5
MZY-020-154---	.15	20	6	0.5
MZY-020-224---	.22	20	6	0.5
MZY-015-334---	.33	15	6	0.5
MZY-010-474---	.47	10	6	0.5
MZY-006-684---	.68	6	6	0.5
MZY-004-105---	1.0	4	8	0.5
MZY-003-155---	1.5	3	10	0.5
MZY-002-225---	2.2	2	10	0.5

MZP Case Size Std. Cap. Tol. $\pm 40\%$ -20%				
MZP-050-102***	.0010	50	6	0.5
MZP-050-152---	.0015	50	6	0.5
MZP-050-222---	.0022	50	6	0.5
MZP-050-332---	.0033	50	6	0.5
MZP-050-472---	.0047	50	6	0.5
MZP-050-682---	.0068	50	6	0.5
MZP-050-103---	.010	50	6	0.5
MZP-050-153---	.015	35	6	0.5
MZP-035-223---	.022	35	6	0.5
MZP-035-333---	.033	35	6	0.5
MZP-035-473---	.047	35	6	0.5
MZP-035-683---	.068	35	6	0.5
MZP-035-104---	.10	35	6	0.5
MZP-035-154---	.15	35	6	0.5
MZP-035-224---	.22	35	6	0.5
MZP-020-334---	.33	20	6	0.5
MZP-020-474---	.47	20	6	0.5

P/N	μF Cap.	WVDC	Max. % DF	Max. DCL
MZY Case Size Std. Cap. Tol. $\pm 20\%$				
MZY-015-684***	.68	15	6	0.5
MZY-010-105---	1.0	10	6	0.5
MZY-006-155---	1.5	6	6	0.5
MZY-004-225---	2.2	4	8	0.5
MZY-003-335---	3.3	3	10	0.5
MZY-002-475---	4.7	2	10	0.5

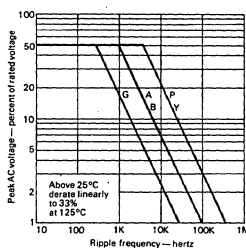
MZB Case Size Std. Cap. Tol. $\pm 20\%$				
MZB-035-334***	.33	35	6	0.5
MZB-035-474---	.47	35	6	0.5
MZB-020-684---	.68	20	6	0.5
MZB-020-105---	1.0	20	6	0.5
MZB-015-155---	1.5	15	6	0.5
MZB-010-225---	2.2	10	6	0.5
MZB-006-335---	3.3	6	6	0.5
MZB-004-475---	4.7	4	8	0.5
MZB-003-685---	6.8	3	10	0.5
MZB-002-106---	10.	2	10	0.5

MZA Case Size Std. Cap. Tol. $\pm 20\%$				
MZA-035-684***	.68	35	6	1.0
MZA-035-105---	1.0	35	6	1.0
MZA-020-155---	1.5	20	6	1.0
MZA-020-225---	2.2	20	6	1.0
MZA-015-335---	3.3	15	6	1.0
MZA-010-475---	4.7	10	6	1.0
MZA-006-685---	6.8	6	6	1.0
MZA-004-106---	10.	4	8	1.0
MZA-003-156---	15.	3	10	1.0
MZA-002-226---	22.	2	10	1.0

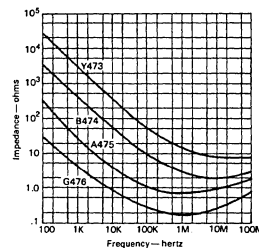
MZG Case Size Std. Cap. Tol. $\pm 20\%$				
MZG-035-155***	1.5	35	6	1.5
MZG-035-225---	2.2	35	6	1.5
MZG-020-335---	3.3	20	6	1.5
MZG-020-475---	4.7	20	6	1.5
MZG-020-685---	6.8	20	6	1.5
MZG-015-106---	10.	15	6	1.5
MZG-010-156---	15.	10	6	1.5
MZG-006-226---	22.	6	6	1.5
MZG-004-336---	33.	4	8	1.5
MZG-003-476---	47.	3	10	1.5

*Add—"A" for Axial, "R" for Radial.

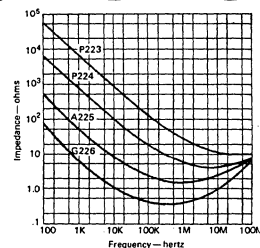
**Add tolerance symbol—40 = $\pm 40\%$ -20%, Y & P only; 20 = $\pm 20\%$; 10 = $\pm 10\%$; 05 = $\pm 5\%$;



Maximum Ripple Voltage



Impedance vs. Frequency

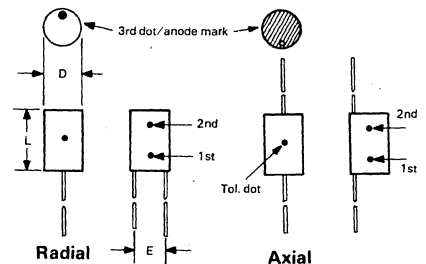


Impedance vs. Frequency

Marking—Capacitance value is shown by means of standard EIA color code dots. The anode indicator dot also serves as the third color dot. Because the Polyester cases are black, black dots are omitted. $\pm 10\%$ tolerance is indicated by a silver dot, $\pm 5\%$ tolerance by a gold dot. No tolerance dot is used for $\pm 20\%$.

EIA COLOR DOT CODING

0—Black (omitted)	1—Brown
2—Red	3—Orange
4—Yellow	5—Green
6—Blue	7—Violet
8—Gray	9—White



Dimensions—Inches (Millimeters)

Case Size	L Max.	D Max.	E
MZY	.125 (3.18)	.070 (1.78)	.050 (1.27) $\pm .015 (\pm .38)$
MZP	.160 (4.06)	.070 (1.78)	.050 (1.27) $\pm .015 (\pm .38)$
MZB	.200 (5.08)	.080 (2.03)	.050 (1.27) $\pm .015 (\pm .38)$
MZA	.225 (5.72)	.100 (2.54)	.070 (1.78) $\pm .020 (\pm .51)$
MZG	.250 (6.35)	.150 (3.81)	.120 (3.05) $\pm .025 (\pm .64)$

Leads Y, P, B, A leads are 30 AWG, .010 $\pm$.002 (.25 $\pm$.051) diameter

G leads are 26 AWG, .016 $\pm$.002 (.41 $\pm$.051) diameter

All anode leads are 1.625 $\pm$.125 (.413 $\pm$ 3.18) long

All cathode leads are 1.375 $\pm$.125 (.349 $\pm$ 3.18) long

CORNING
ELECTRONICS

CORNING GLASS WORKS
Corning, New York 14830

Solid Tantalum Capacitors

SUBMINIATURE MINITAN NONPOLAR MN SERIES

PART NUMBERS AND ORDERING INFORMATION

P/N	μF Cap.	WVDC	Max. % DF	Max. DCL
MNY Case Size Std. Cap. Tol. +20%				
MNY-020-1025-..	.0010	20	6	0.5
MNY-020-152-..	.0015	20	6	0.5
MNY-020-222-..	.0022	20	6	0.5
MNY-020-332-..	.0033	20	6	0.5
MNY-020-472-..	.0047	20	6	0.5
MNY-020-682-..	.0068	20	6	0.5
MNY-020-103-..	.010	20	6	0.5
MNY-020-153-..	.015	20	6	0.5
MNY-020-223-..	.022	20	6	0.5
MNY-020-333-..	.033	20	6	0.5
MNY-020-473-..	.047	20	6	0.5
MNY-020-683-..	.068	20	6	0.5
MNY-020-104-..	.10	20	6	0.5
MNY-015-154-..	.15	15	6	0.5
MNY-010-224-..	.22	10	6	0.5
MNY-006-334-..	.33	6	6	0.5
MNY-004-474-..	.47	4	8	0.5
MNY-003-684-..	.68	3	10	0.5
MNY-002-105-..	1.0	2	10	0.5

MNP Case Size Std. Cap. Tol. +20%				
MNP-050-1025-..	.0010	50	6	0.5
MNP-050-152-..	.0015	50	6	0.5
MNP-050-222-..	.0022	50	6	0.5
MNP-050-332-..	.0033	50	6	0.5
MNP-050-472-..	.0047	50	6	0.5
MNP-035-682-..	.0068	35	6	0.5
MNP-035-103-..	.010	35	6	0.5
MNP-035-153-..	.015	35	6	0.5
MNP-035-223-..	.022	35	6	0.5
MNP-035-333-..	.033	35	6	0.5
MNP-035-473-..	.047	35	6	0.5
MNP-035-683-..	.068	35	6	0.5
MNP-035-104-..	.10	35	6	0.5
MNP-020-154-..	.15	20	6	0.5
MNP-020-224-..	.22	20	6	0.5
MNP-015-334-..	.33	15	6	0.5
MNP-010-474-..	.47	10	6	0.5
MNP-006-684-..	.68	6	6	0.5
MNP-004-105-..	1.0	4	8	0.5
MNP-003-155-..	1.5	3	10	0.5
MNP-002-225-..	2.2	2	10	0.5

MNB Case Size Std. Cap. Tol. +20%				
MNB-035-1542-..	.15	35	6	0.5
MNB-035-224-..	.22	35	6	0.5
MNB-020-334-..	.33	20	6	0.5
MNB-020-474-..	.47	20	6	0.5
MNB-015-684-..	.68	15	6	0.5
MNB-010-105-..	1.0	10	6	0.5
MNB-006-155-..	1.5	6	6	0.5
MNB-004-225-..	2.2	4	8	0.5
MNB-003-335-..	3.3	3	10	0.5
MNB-002-475-..	4.7	2	10	0.5

MNA Case Size Std. Cap. Tol. +20%				
MNA-035-3342-..	.33	35	6	1.0
MNA-035-474-..	.47	35	6	1.0
MNA-020-684-..	.68	20	6	1.0
MNA-020-105-..	1.0	20	6	1.0
MNA-015-155-..	1.5	15	6	1.0
MNA-010-225-..	2.2	10	6	1.0
MNA-006-335-..	3.3	6	6	1.0
MNA-004-475-..	4.7	4	8	1.0
MNA-003-685-..	6.8	3	10	1.0
MNA-002-106-..	10.	2	10	1.0

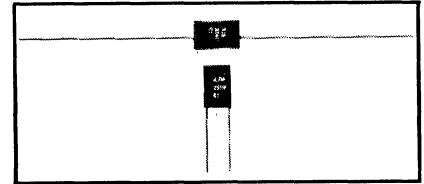
P/N	μF Cap.	WVDC	Max. % DF	Max. DCL
MNG Case Size Std. Cap. Tol. +20%				
MNG-035-6842-..	.68	35	6	1.5
MNG-035-105-..	1.0	35	6	1.5
MNG-020-155-..	1.5	20	6	1.5
MNG-020-225-..	2.2	20	6	1.5
MNG-020-335-..	3.3	20	6	1.5
MNG-015-475-..	4.7	15	6	1.5
MNG-010-685-..	6.8	10	6	1.5
MNG-006-106-..	10.	6	6	1.5
MNG-004-156-..	15.	4	8	1.5
MNG-003-226-..	22.	3	10	1.5

MNF Case Size Std. Cap. Tol. +20%				
MNF-035-1042-..	.10	35	6	0.5
MNF-035-154-..	.15	35	6	0.5
MNF-035-224-..	.22	35	6	0.5
MNF-025-334-..	.33	25	6	0.5
MNF-020-474-..	.47	20	6	0.5
MNF-015-684-..	.68	15	6	0.5
MNF-010-105-..	1.0	10	6	0.5
MNF-006-155-..	1.5	6	6	0.5
MNF-004-225-..	2.2	4	8	0.5
MNF-003-335-..	3.3	3	10	0.5
MNF-002-475-..	4.7	2	10	0.5

MNM Case Size Std. Cap. Tol. +20%				
MNM-035-3342-..	.33	35	6	1.0
MNM-035-474-..	.47	35	6	1.0
MNM-035-684-..	.68	35	6	1.0
MNM-025-105-..	1.0	25	6	1.0
MNM-020-155-..	1.5	20	6	1.0
MNM-020-225-..	2.2	20	6	1.0
MNM-010-335-..	3.3	10	6	1.0
MNM-006-475-..	4.7	6	6	1.0
MNM-004-685-..	6.8	4	8	1.0
MNM-003-106-..	10.	3	10	1.0

MNL Case Size Std. Cap. Tol. +20%				
MNL-035-1052-..	1.0	35	6	2.0
MNL-035-155-..	1.5	35	6	2.0
MNL-035-225-..	2.2	35	6	2.0
MNL-025-335-..	3.3	25	6	2.0
MNL-020-475-..	4.7	20	6	2.0
MNL-015-685-..	6.8	15	6	2.0
MNL-010-106-..	10.	10	6	2.0
MNL-006-156-..	15.	6	6	2.0
MNL-004-226-..	22.	4	8	2.0

MNS Case Size Std. Cap. Tol. +20%				
MNS-035-3352-..	3.3	35	6	3.0
MNS-025-475-..	4.7	25	6	3.0
MNS-020-685-..	6.8	20	6	3.0
MNS-015-106-..	10.	15	6	3.0
MNS-010-156-..	15.	10	6	3.0
MNS-006-226-..	22.	6	6	3.0
MNS-004-336-..	33.	4	8	3.0



APPLICATIONS

FOR FILTERING • COUPLING • BY-PASSING • TIMING

These precision, microminiature nonpolar capacitors are intended specifically for high density packaging applications where occasional or continuous voltage reversals occur. No dc bias is required. Weldable/solderable leads and a wide range of shapes, case sizes, and lead configurations facilitate application to a broad range of miniaturized electronic circuitry.

PERFORMANCE CHARACTERISTICS

Capacitance—Measured at +25°C and 120Hz on a polarized capacitance bridge with a maximum polarizing voltage of 2.2 vdc and a maximum ac signal of 1.0 volts rms.

Tolerance—Standard tolerance is ±20% with ±10% or ±5% tolerance available in all case sizes. 10% decade values are offered in ±10% or ±5% tolerance.

Dissipation Factor—Measured simultaneously with capacitance as above. See Part Number Table for maximum +25°C, 120 Hz values.

DC Leakage Current—With rated WVDC applied through a 1000 ohm resistor for 5 minutes maximum, DCL values in μA at +25°C will not exceed those shown in Part Number Table. At 85°C DCL values will not exceed 10 times Part Number Table values. At +125°C with 2/3 rated WVDC applied, DCL values will not exceed 15 times Part Number Table values.

Operating Voltage—Capacitors will operate at +85°C and to +125°C with linear derating to 2/3 rated voltage. Dc biasing is not necessary. Peak ac voltage plus dc voltage should not exceed rated voltage.

Surge Voltage—At +85°C and at 60-second intervals, capacitors withstand 1000 30-second applications of 130% rated WVDC.

Moisture Resistance—Following Method 106, MIL-STD-202 testing, capacitors will meet initial dc leakage requirements. Capacitance will be within ±10% of initial values.

Life Test—After 2000 hours at +85°C with rated WVDC applied, capacitors will meet initial dc leakage and DF requirements. Capacitance will not change more than ±10% from original values.

MECHANICAL

Construction—Tantalum pellets are encased in polyester sleeves and sealed with a special moisture resistant epoxy resin. This rugged, fully insulated package withstands a one minute application of a 100 volt potential applied between the leads shorted together and an encircling metal foil envelope.

Leads—Leads are solder coated pure nickel wire suitable for soldering or welding. Tested in accordance with MIL-C-55365, .010 diameter leads withstand a 1 lb. pull and .016 diameter leads a 3 lb. pull. All lead diameters withstand 5 rotations twist.

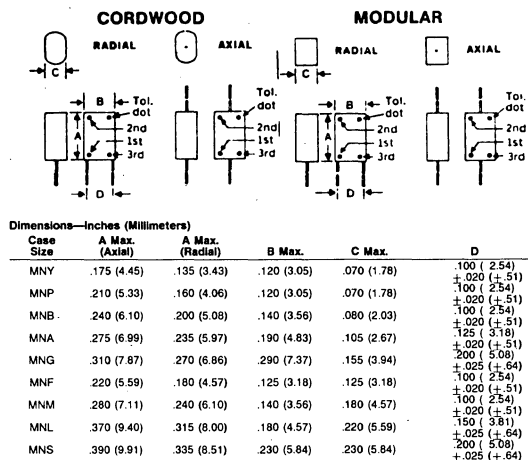
Marking—Capacitance value is shown by means of standard EIA color code dots. Because the polyester cases are black, black dots are omitted. ±10% tolerance is indicated by a silver dot, ±5% tolerance by a gold dot. No tolerance dot is used for ±20%. MNS case size is type marked all other case sizes are color coded.

EIA COLOR DOT CODING

0—Black (omitted)	1—Brown
2—Red	3—Orange
4—Yellow	5—Green
6—Blue	7—Violet
8—Gray	9—White

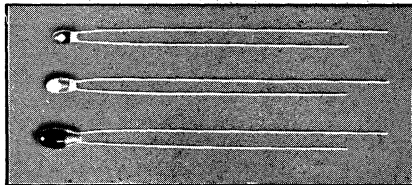
*Add—"A" for Axial, "R" for Radial

**Add tolerance Symbol—20 = ±20%; 10 = ±10%; 05 = ±5%;



Solid Tantalum Capacitors

SUBMINIATURE MINIDIPS MD SERIES



APPLICATIONS

For Filtering • Coupling • By-Passing • Timing

These subminiature, polar tantalum capacitors are suitable for general filtering, coupling, by-passing, and non-critical RC timing applications to +85°C without voltage derating. Intended specifically for commercial and industrial applications. Minidip Series capacitors feature subminiature size and superior performance at a reasonable cost.

PERFORMANCE CHARACTERISTICS

Capacitance—Measured on a polarized capacitance bridge with a maximum polarizing voltage of 2.2 vdc and a maximum ac signal of 1.0 volts rms.

Tolerance—Standard tolerance is $\pm 20\%$.

Dissipation Factor—Measured simultaneously with capacitance as above.

Operating Voltage—Capacitors will operate reliably up to rated WVDC at +85°C without derating. Ac ripple voltage should be limited so that the forward dc voltage plus peak ac voltage does not exceed rated WVDC.

Temperature Range—(-55°C to +85°C) without voltage derating.

Surge Voltage—At +85°C and at 60-second intervals, capacitors withstand 1000 30-second applications of 130% rated WVDC.

Life Test—After 2000 hours at +85°C with rated WVDC applied, capacitors will not exceed 150% of the initial dc leakage and D.F. limits. Capacitance will not change more than $\pm 10\%$ from the initial value.

MECHANICAL

Construction—Minidip Series capacitors feature subminiature tantalum anodes, sealed in high stability, moisture resistant epoxy.

Leads—Leads are solder coated, high purity nickel wire suitable for either soldering or welding. They will withstand a 1 lb. pull.

Marking—Capacitance value in pF is shown by means of standard EIA color code rings. Polarity and rated voltage is indicated by a colored dot.

PART NUMBERS AND ORDERING INFORMATION

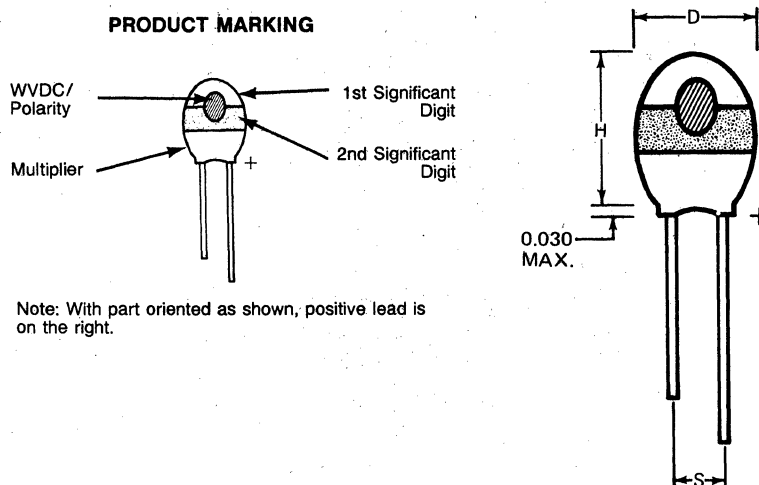
Value (Mfd)	Part Number	Case Size	Max. D.F. (%)	Max. DCL (μ a)	Value (Mfd)	Part Number	Case Size	Max. D.F. (%)	Max. DCL (μ a)
2 Volts					15 Volts				
2.2	MD2-002-225-20	MD2	10	1.0	.33	MD2-015-334-20	MD2	8	1.0
4.7	MD3-002-475-20	MD3	10	1.0	.68	MD3-015-684-20	MD3	8	1.0
10.0	MD4-002-106-20	MD4	10	1.0	1.5	MD4-015-155-20	MD4	8	1.0
3 Volts					20 Volts				
1.5	MD2-003-155-20	MD2	10	1.0	.15	MD2-020-154-20	MD2	8	1.0
3.3	MD3-003-335-20	MD3	10	1.0	.22	MD2-020-224-20	MD2	8	1.0
6.8	MD4-003-685-20	MD4	10	1.0	.33	MD3-020-334-20	MD3	8	1.0
4 Volts					.47	MD3-020-474-20	MD3	8	1.0
1.0	MD2-004-105-20	MD2	8	1.0	.68	MD4-020-684-20	MD4	8	1.0
2.2	MD3-004-225-20	MD3	8	1.0	1.0	MD4-020-105-20	MD4	8	1.0
4.7	MD4-004-475-20	MD4	8	1.0	35 Volts				
6 Volts					.10	MD2-035-104-20	MD2	8	1.0
.68	MD2-006-684-20	MD2	8	1.0	.15	MD3-035-154-20	MD3	8	1.0
1.5	MD3-006-155-20	MD3	8	1.0	.22	MD3-035-224-20	MD3	8	1.0
3.3	MD4-006-335-20	MD4	8	1.0	.33	MD4-035-334-20	MD4	8	1.0
10 Volts					.47	MD4-035-474-20	MD4	8	1.0
.47	MD2-010-474-20	MD2	8	1.0					
1.0	MD3-010-105-20	MD3	8	1.0					
2.2	MD4-010-225-20	MD4	8	1.0					

Capacitance Code			WVDC/Polarity Dot	
Color	Significant Figures	Multiplier	Color	WVDC
Black	0		Brown	2v
Brown	1		White	3v
Red	2		Purple	4v
Orange	3	1,000	Yellow	6v
Yellow	4	10,000	Black	10v
Green	5	100,000	Green	15v
Blue	6	1,000,000	Blue	20v
Violet	7		Pink	35v
Gray	8			
White	9			

Dimensions—Inches (Millimeters)

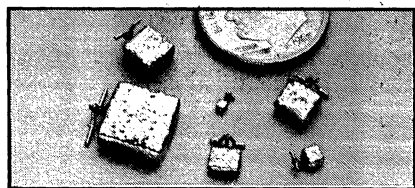
Case Size	H Max.	D Max.	S ± 0.015 (0.38)	Lead Length ± 0.125 (± 3.18)		Diameter ± 0.001 (± 0.025)
				Anode	Cathode	
MD2	0.175 (4.44)	0.095 (2.41)	0.050 (1.27)	1.625 (41.3)	1.375 (34.9)	30 AWG 0.010 (0.250)
MD3	0.210 (5.33)	0.110 (2.79)	0.050 (1.27)	1.625 (41.3)	1.375 (34.9)	30 AWG 0.010 (0.250)
MD4	0.260 (6.60)	0.125 (3.18)	0.050 (1.27)	1.625 (41.3)	1.375 (34.9)	30 AWG 0.010 (0.250)

PRODUCT MARKING



Solid Tantalum Capacitors

SUBMINIATURE TANTALUM CHIPS MC SERIES



APPLICATIONS

For Filtering • Coupling • By-Passing • Timing

Microminiature MC chip capacitors are designed specifically for hybrid, thick film, and microcircuit applications where mounting space is critical and where conventionally packaged capacitors may not be used. The MC series capacitors are suitable for general coupling, filtering, by-passing, and non-critical timing applications over the temperature range of -55°C to $+125^{\circ}\text{C}$ and over the capacitance range .1 to 100 μF . Extended capacitance values are available on special order.

PERFORMANCE CHARACTERISTICS

Capacitance—Measured on polarized capacitance bridge with a maximum polarizing voltage of 2.2 vdc and a maximum ac signal 1.0 volts rms. See Part Number Table for available ratings.

Tolerance—Standard tolerance is $\pm 20\%$, except for the MCU case size ($+40\%$, -20%). $\pm 10\%$ and $\pm 5\%$ tolerances are available in all case sizes. 10% decade values are offered in $\pm 10\%$ or $\pm 5\%$ tolerances.

DC Leakage Current—With rated dc voltage applied through a 1000 ohm resistor in series with the capacitor. DCL will not exceed the values shown in Part Number Table. At $+85^{\circ}\text{C}$, DCL values will not exceed 10 times Part Number Table values. At $+125^{\circ}\text{C}$ with $\frac{2}{3}$ rated WVDC applied, DCL values will not exceed 15 times Part Number Table values.

Operating Voltage—Capacitors will operate reliably up to rated WVDC at $+85^{\circ}\text{C}$ and $+125^{\circ}\text{C}$ with linear derating to $\frac{2}{3}$ WVDC. Ac ripple voltage should be limited so that the forward dc voltage plus peak ac voltage does not exceed rated WVDC.

Temperature—No derating is required between -55°C and $+85^{\circ}\text{C}$. Between $+85^{\circ}\text{C}$ and $+125^{\circ}\text{C}$, derate linearly to $\frac{2}{3}$ WVDC.

Surge Voltage—At $+85^{\circ}\text{C}$ and at 60-second intervals, capacitors withstand 1000 30-second applications of 130% rated WVDC.

Life Test—After 2000 hours at $+85^{\circ}\text{C}$ with rated WVDC applied, capacitors will meet initial dc leakage and DF requirements. Capacitance will not change more than $\pm 10\%$ from initial values.

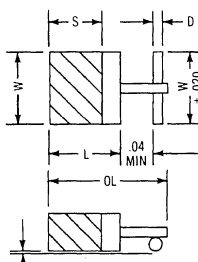
MECHANICAL

Construction—Tantalum pellets are coated with 60/38/2 (2% silver) eutectic solder suitable for reflow solder mounting. The negative terminal is the capacitor body itself. The positive terminal is a solder coated nickel wire.

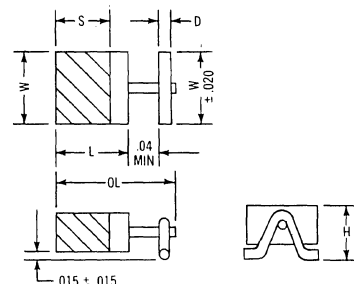
PART NUMBERS AND ORDERING INFORMATION

Part Number	Cap. In μF @ 25°C 120 Hz	WVDC @ 85°C	Max.DF% @ 25°C 120 Hz	Max.DCL In μA @ 25°C
MCU Case Size				
MCU-020-104	.10	20	6	0.5
MCU-020-154	.15	20	6	0.5
MCU-020-224	.22	20	6	0.5
MCU-015-334	.33	15	6	0.5
MCU-010-474	.47	10	6	0.5
MCU-008-684	.68	6	6	0.5
MCU-004-105	1.0	4	8	0.5
MCU-003-155	1.5	3	10	0.5
MCF Case Size				
MCF-035-104	.10	35	6	0.5
MCF-035-154	.15	35	6	0.5
MCF-035-224	.22	35	6	0.5
MCF-035-334	.33	35	6	0.5
MCF-035-474	.47	35	6	0.5
MCF-025-684	.68	25	6	0.5
MCF-020-105	1.0	20	6	0.5
MCF-015-155	1.5	15	6	0.5
MCF-010-225	2.2	10	6	0.5
MCF-006-335	3.3	6	6	0.5
MCF-004-475	4.7	4	8	0.5
MCF-003-685	6.8	3	10	0.5
MCF-002-106	10.0	2	10	0.5
MCM Case Size				
MCM-035-684	.68	35	6	1.0
MCM-035-105	1.0	35	6	1.0
MCM-035-155	1.5	35	6	1.0
MCM-025-225	2.2	25	6	1.0
MCM-020-335	3.3	20	6	1.0
MCM-020-475	4.7	20	6	1.0
MCM-010-685	6.8	10	6	1.0
MCM-006-106	10.0	6	6	1.0
MCM-004-156	15.0	4	8	1.0
MCM-003-226	22.0	3	10	1.0
MCL Case Size				
MCL-035-225	2.2	35	6	2.0
MCL-035-335	3.3	35	6	2.0
MCL-035-475	4.7	35	6	2.0
MCL-025-685	6.8	25	6	2.0
MCL-020-106	10.0	20	6	2.0
MCL-015-156	15.0	15	6	2.0
MCL-010-226	22.0	10	6	2.0
MCL-006-336	33.0	6	6	2.0
MCL-004-476	47.0	4	8	2.0
MCS Case Size				
MCS-035-685	6.8	35	6	3.0
MCS-025-106	10.0	25	6	3.0
MCS-020-156	15.0	20	6	3.0
MCS-015-226	22.0	15	6	3.0
MCS-010-336	33.0	10	6	3.0
MCS-006-476	47.0	6	6	3.0
MCS-004-686	68.0	4	8	3.0
MCJ Case Size				
MCJ-035-100	10.0	35	8	9.0
MCJ-035-156	15.0	35	8	9.0
MCJ-035-226	22.0	35	8	9.0
MCJ-025-336	33.0	25	8	9.0
MCJ-020-476	47.0	20	8	9.0
MCJ-015-686	68.0	15	8	9.0
MCJ-010-107	100.00	10	8	9.0

*Tolerance is indicated by adding suffix "-40" for $+40\%$ -20% tolerance, "-20" for $\pm 20\%$, "-10" for $\pm 10\%$, and "-05" for $\pm 5\%$ tolerance, i.e., MCU-020-104-40, MCS-035-685-10, etc.



MCU & MCF CASE SIZES



MCM THRU MCJ CASE SIZES

Dimensions —Inches (Millimeter)

Case Size	H Max.	W Max.	L Max.	OL Max.	D ($\pm .002$) ($\pm .001$)	S Min.
MCU	.060 (1.52)	.056 (1.65)	.085 (2.16)	.155 (3.94)	.016 (.41)	75%
MCF	.085 (2.16)	.110 (2.79)	.110 (2.79)	.180 (4.57)	.020 (.51)	75%
MCM	.100 (2.54)	.170 (4.32)	.175 (4.44)	.245 (6.22)	.020 (.51)	75%
MCL	.120 (3.05)	.205 (5.21)	.230 (5.84)	.300 (7.62)	.020 (.51)	75%
MCS	.145 (3.68)	.210 (5.33)	.240 (6.10)	.310 (7.87)	.020 (.51)	75%
MCJ	.170 (4.32)	.355 (9.02)	.390 (9.91)	.460 (11.68)	.020 (.51)	75%

Lead Attachment—Positive leads may be attached by conventional welding or soldering techniques. Negative terminal attachment is accomplished by reflow soldering. Soldering technique, time, and temperature are critical to reliable performance and circuit yields.

CAPACITORS (ALL TYPES)



CAPACITORS

PRECISION & HIGH VOLTAGE

Wrap & Fill

Hermetic Seal

Epoxy Cased

Ceramic Cased

Custom Designed

polycarbonate

polystyrene

polypropylene

paper

mylar

teflon

delmica®

for lasers
filters
power supplies
medical electronics
high voltage equipment
induction heating
radar
timing circuits

H.F. power
energy storage

• Voltages from 25 volts to 250,000 volts • Tolerances to 0.1%

Send for Complete Catalogs on • Capacitors • High Power Supplies • Transformers

DEL ELECTRONICS CORP.

250 E. Sanford Blvd.



MOUNT VERNON, N. Y. 10550

Tel. 914-699-2000—TWX: 710-562-0130

electrocube capacitors

Special service on non-standard ratings, sizes or packages.

Capacitors, in nearly any value, type, case configuration or size can be furnished by Electrocube, on special order with short delivery. We'll design them to a particular requirement or make them to your specifications. We'll supply metal cases including bath tubs, tubular and rectangular hermetically sealed units, as well as epoxy, and wrap and fill types. More than 4,000 standard units are also available. Representative data for standard units are presented on the following pages. Information on other case styles, voltages and dielectrics is available on request.

Size reductions. Electrocube can supply a full line — more than 800 different units in six case styles and four voltage ratings — that require as little as 39% of the volume of standard metallized mylar units. Volume reductions of as much as 30% are possible with Electrocube metallized polycarbonate capacitors made with .00008 gauge film.

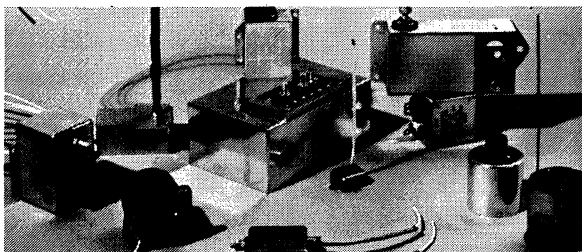
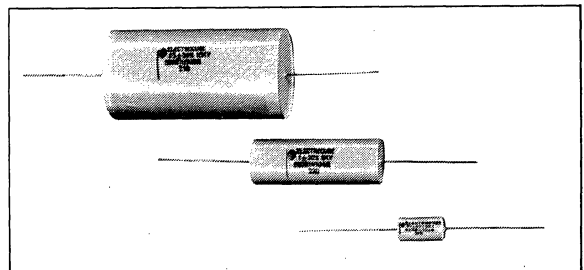
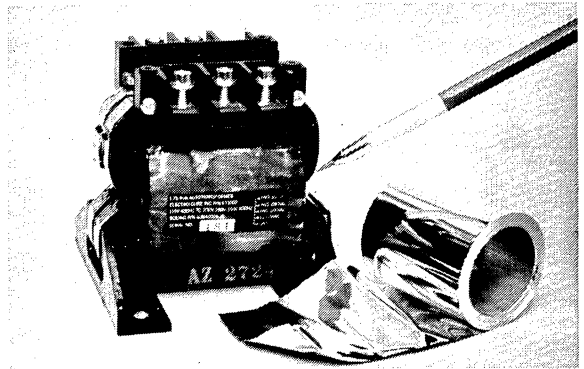
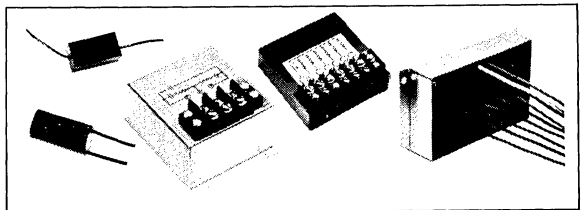
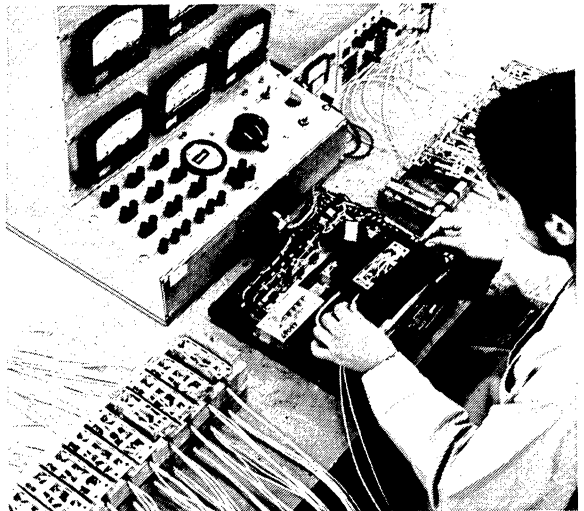
Plug-in packages. Six different sizes, both 14 and 16 lead DIP units are available for automatic insertion. Each package will accommodate as many as seven or eight capacitors. These units save package space and assembly time.

EMI filters. We also design and produce filters for a wide range of applications. Electrocube filters have been used in such projects as Apollo, Minuteman and the C-5A. We can supply subminiatures to multicircuit to high power and screen room filters — .1 to 500 Amp, 1 to 5,000 VDC, DC to 1,000 Hz. (See page 1-553)

RC networks. Our RC networks are tough enough to take up to 2,000,000 arcs, sparks or noise transients. Standard molded units are rated 125 to 500 VAC, 200 to 2,000 VDC. Molded or metal case units can be furnished to your requirements.

Ballasts. We can supply weight saving custom units to meet MIL specs and almost any lamp or supply requirement.

Transformers. Electrocube manufactures wire wound and foil wound transformers, both laminated and C core, toroids and special inductors. Through company funded development and testing, Electrocube introduced the first commercially available autotransformers in 10KVA and lower ratings, and has developed processing techniques that make these devices reliable and economical. We also can supply aluminum foil chokes with advantages similar to those of foil wound transformers. (See pgs. 2-1736, 2-1737)



CAPACITORS (ALL TYPES)



Metallized Polycarbonate Wrap/Fill

50 VOLT

100 VOLT

200 VOLT

DIMENSIONS					CATALOG PART NUMBER	LEAD SIZE (AWG)	DIMENSIONS					CATALOG PART NUMBER	LEAD SIZE (AWG)	DIMENSIONS					CATALOG PART NUMBER	LEAD SIZE (AWG)
MFD	T ±.05"	W ±.05"	L ±.05"	MFD			T ±.05"	W ±.05"	L ±.05"	MFD	T ±.05"			W ±.05"	L ±.05"					
For .0010 thru .033 MFD - See Higher Voltages																				
.039	.09	.18	.40	650B1A393	26	.018	.09	.18	.40	650B1B183	26	.0039	.09	.18	.40	650B1C392	26			
.047	.09	.18	.40	650B1A473	26	.022	.09	.18	.40	650B1B223	26	Thru	.09	.18	.40	650B1C	26			
.056	.09	.18	.40	650B1A563	26	.033	.09	.18	.40	650B1B333	26	.015	.09	.18	.40	650B1C153	26			
.068	.09	.18	.40	650B1A683	26	.039	.09	.18	.40	650B1B393	26	.018	.10	.19	.40	650B1C183	26			
.082	.09	.18	.40	650B1A823	26	.047	.09	.18	.40	650B1B473	26	.022	.11	.20	.40	650B1C223	26			
.10	.09	.18	.40	650B1A104	26	.056	.10	.19	.40	650B1B563	26	.027	.09	.18	.53	650B1C273	26			
.12	.09	.18	.40	650B1A124	26	.068	.11	.21	.40	650B1B683	26	.033	.09	.18	.53	650B1C333	26			
.15	.10	.20	.40	650B1A154	26	.082	.09	.18	.53	650B1B823	26	.039	.10	.20	.53	650B1C393	26			
.18	.09	.18	.53	650B1A184	26	.10	.10	.19	.53	650B1B104	26	.047	.11	.21	.53	650B1C473	26			
.22	.09	.18	.53	650B1A224	26	.12	.11	.20	.53	650B1B124	26	.056	.13	.22	.53	650B1C563	24			
.27	.10	.19	.53	650B1A274	26	.15	.12	.22	.53	650B1B154	24	.068	.15	.24	.53	650B1C683	24			
.33	.11	.21	.53	650B1A334	26	.18	.14	.23	.53	650B1B184	24	.082	.16	.26	.53	650B1C823	24			
.39	.13	.22	.53	650B1A394	24	.22	.16	.25	.53	650B1B224	24	.10	.18	.28	.53	650B1C104	24			
.47	.14	.24	.53	650B1A474	24	.27	.18	.28	.53	650B1B274	24	.12	.21	.30	.53	650B1C124	24			
.56	.16	.25	.53	650B1A564	24	.33	.20	.30	.53	650B1B334	24	.15	.23	.33	.53	650B1C154	24			
.68	.18	.27	.53	650B1A684	24	.39	.23	.32	.53	650B1B394	24	.18	.21	.30	.68	650B1C184	24			
.82	.20	.29	.53	650B1A824	24	.47	.20	.30	.68	650B1B474	24	.22	.23	.33	.68	650B1C224	24			
1.0	.22	.32	.53	650B1A105	24	.56	.23	.32	.68	650B1B564	24	.27	.24	.33	.78	650B1C274	24			
1.2	.20	.29	.68	650B1A125	24	.68	.23	.32	.78	650B1B684	24	.33	.26	.36	.78	650B1C334	24			
1.5	.22	.32	.68	650B1A155	24	.82	.25	.35	.78	650B1B824	24	.39	.30	.40	.78	650B1C394	22			
1.8	.22	.32	.78	650B1A185	24	1.0	.28	.38	.78	650B1B105	22	.47	.33	.43	.78	650B1C474	22			
2.0	.24	.34	.78	650B1A205	24	1.2	.31	.41	.78	650B1B125	22	.56	.32	.41	.95	650B1C564	22			
2.5	.28	.37	.78	650B1A255	24	1.5	.31	.40	.95	650B1B155	22	.68	.25	.42	1.17	650B1C684	22			
3.0	.31	.41	.78	650B1A305	22	1.8	.34	.43	.95	650B1B185	22	.82	.28	.45	1.17	650B1C824	22			
3.5	.34	.43	.78	650B1A355	22	2.0	.40	.49	1.17	650B1B205	22	1.0	.32	.49	1.17	650B1C105	22			
4.0	.31	.40	.95	650B1A405	22	2.5	.31	.48	1.17	650B1B255	22	1.2	.36	.52	1.17	650B1C125	22			
4.5	.33	.42	.95	650B1A455	22	3.0	.35	.51	1.17	650B1B305	20	1.5	.41	.58	1.17	650B1C155	20			
5.0	.25	.42	1.17	650B1A505	22	3.5	.38	.55	1.17	650B1B355	20	1.8	.46	.62	1.17	650B1C185	20			
6.0	.28	.45	1.17	650B1A605	22	4.0	.41	.58	1.17	650B1B405	20	2.0	.49	.65	1.17	650B1C205	20			
8.0	.34	.50	1.17	650B1A805	22	4.5	.44	.61	1.17	650B1B455	20	2.5	.47	.64	1.45	650B1C255	20			
10.0	.39	.56	1.17	650B1A106	20	5.0	.47	.63	1.17	650B1B505	20	3.0	.47	.63	1.70	650B1C305	20			
12.0	.43	.60	1.17	650B1A126	20	6.0	.52	.68	1.17	650B1B605	20	3.5	.51	.67	1.70	650B1C355	20			
15.0	.49	.66	1.17	650B1A156	20	8.0	.53	.69	1.45	650B1B805	20	4.0	.50	.66	1.90	650B1C405	20			
18.0	.47	.64	1.45	650B1A186	20	10.0	.54	.70	1.70	650B1B106	20	4.5	.53	.70	1.90	650B1C455	20			
20.0	.50	.67	1.45	650B1A206	20	12.0	.54	.70	1.90	650B1B126	20	5.0	.57	.73	1.90	650B1C505	20			
30.0	.56	.73	1.70	650B1A306	20	15.0	.61	.78	1.90	650B1B156	20	6.0	.63	.79	1.90	650B1C605	20			
40.0	.66	.83	1.70	650B1A406	20	18.0	.68	.84	1.90	650B1B186	20	8.0	.74	.90	1.90	650B1C805	20			
50.0	.75	.91	1.70	650B1A506	20	20.0	.72	.88	1.90	650B1B206	20	10.0	.84	1.00	1.90	650B1C106	20			

Epoxy Case

50 VOLT

100 VOLT

200 VOLT

DIMENSIONS						CATALOG PART NUMBER	LEAD SIZE (AWG)	DIMENSIONS						CATALOG PART NUMBER	LEAD SIZE (AWG)					
MFD	T ±.01"	H (MAX.)	L ±.01"	S ±.015"	MFD			T ±.01"	H (MAX.)	L ±.01"	S ±.015"									
For .0010 thru .068 MFD - See Higher Voltages																				
.082	.18	.30	.42	.300	652A1A823	22	.027	.18	.30	.42	.300	652A1B273	22	.0056	.18	.30	.42	.300	652A1C562	22
Thru	.18	.30	.42	.300	652A1A	22	.033	.18	.30	.42	.300	652A1B333	22	Thru	.18	.30	.42	.300	652A1C	22
.15	.18	.30	.42	.300	652A1A154	22	.039	.18	.30	.42	.300	652A1B393	22	.015	.18	.30	.42	.300	652A1C153	22
.18	.18	.30	.55	.400	652A1A184	22	.047	.18	.30	.42	.300	652A1B473	22	.018	.18	.30	.42	.300	652A1C183	22
.22	.18	.30	.55	.400	652A1A224	22	.056	.18	.30	.42	.300	652A1B563	22	.022	.18	.30	.42	.300	652A1C223	22
.27	.18	.30	.55	.400	652A1A274	22	.068	.18	.30	.42	.300	652A1B683	22	.027	.18	.30	.55	.400	652A1C273	22
.33	.18	.30	.55	.400	652A1A334	22	.082	.18	.30	.55	.400	652A1B823	22	.033	.18	.30	.55	.400	652A1C333	22
.39	.18	.30	.55	.400	652A1A394	22	.10	.18	.30	.55	.400	652A1B104	22	.039	.18	.30	.55	.400	652A1C393	22
.47	.24	.37	.55	.400	652A1A474	22	.12	.18	.30	.55	.400	652A1B124	22	.047	.18	.30	.55	.400	652A1C473	22
.56	.24	.37	.55	.400	652A1A564	22	.15	.18	.30	.55	.400	652A1B154	22	.056	.24	.37	.55	.400	652A1C563	22
.68	.24	.37	.55	.400	652A1A684	22	.18	.24	.37	.55	.400	652A1B184	22	.068	.24	.37	.55	.400	652A1C683	22
.82	.30	.43	.55	.400	652A1A824	22	.22	.24	.37	.55	.400	652A1B224	22	.082	.24	.37	.55	.400	652A1C823	22
1.0	.30	.43	.55	.400	652A1A105	22	.27	.24	.37	.55	.400	652A1B274	22	.10	.24	.37	.55	.400	652A1C104	22
1.2	.30	.43	.67	.500	652A1A125	22	.33	.30	.43	.55	.400	652A1B334	22	.12	.30	.43	.55	.400	652A1C124	22
1.5	.30	.43	.67	.500	652A1A155	22	.39	.30	.43	.55	.400	652A1B394	22	.15	.30	.43	.55	.400	652A1C154	22
1.8	.30	.43	.67	.500	652A1A185	22	.47	.30	.43	.67	.500	652A1B474	22	.18	.30	.43	.67	.500	652A1C184	22
2.0	.30	.43	.82	.600	652A1A205	22	.56	.30	.43	.67	.500	652A1B564	22	.22	.30	.43	.67	.500	652A1C224	22
2.5	.40	.55	.82	.600	652A1A255	22	.68	.30	.43	.82	.600	652A1B684	22	.27	.30	.43	.82	.600	652A1C274	22
3.0	.40	.55	.82	.600	652A1A305	22	.82	.40	.55	.82	.600	652A1B824	20	.33	.40	.55	.82	.600	652A1C334	20
3.5	.40	.55	.82	.600	652A1A355	20	1.0	.40	.55	.82	.600	652A1B105	20	.39	.40	.55	.82	.600	652A1C394	20
4.0	.40	.55	1.04	.800	652A1A405	20	1.2	.40	.55	.82	.600	652A1B125	20	.47	.40	.55	1.04	.800	652A1C474	20
4.5	.40	.55	1.04	.800	652A1A455	20	1.5	.40	.55	1.04	.800	652A1B155	20	.56	.40	.55	1.04	.800	652A1C564	20
5.0	.40	.55	1.24	1.100	652A1A505	20	1.8	.40	.55	1.04	.800	652A1B185	20	.68	.40	.55	1.24	1.100	652A1C684	20
6.0	.40	.55	1.24	1.100	652A1A605	20	2.0	.40	.55	1.24	1.100	652A1B205	20	.82	.40	.55	1.24	1.100	652A1C824	20
8.0	.40	.55	1.24	1.100	652A1A805	20	2.5	.40	.55	1.24	1.100	652A1B255	20	1.0	.40	.55	1.24	1.100	652A1C105	20
10.0	.57	.73	1.24	1.100	652A1A106	20	3.0	.40	.55	1.24	1.100	652A1B305	20	1.2	.57	.73	1.24	1.100	652A1C125	20
12.0	.57	.73	1.24	1.100	652A1A126	20	3.5	.57	.73	1.24	1.100	652A1B355	20	1.5	.57	.73	1.24	1.100	652A1C155	20
15.0	.57	.73	1.24	1.100	652A1A156	20	4.0	.57	.73	1.24	1.100	652A1B405	20	1.8	.57	.73	1.24	1.100	652A1C185	20
18.0	.57	.73	1.75	1.600	652A1A186	20	4.5	.57	.73	1.24	1.100	652A1B455	20	2.0	.57	.73	1.24	1.100	652A1C205	20
20.0	.57	.73	1.75	1.600	652A1A206	20	5.0	.57	.73	1.24	1.100	652A1B505	20	2.5	.57	.73	1.75	1.600	652A1C255	20
							6.0	.57	.73	1.24	1.100	652A1B605	20	3.0	.57	.73	1.75	1.600	652A1C305	20
							8.0	.57	.73	1.75	1.600	652A1B805	20	3.5	.57	.73	1.75	1.600	652A1C355	20



Metallized Mylar* Wrap/Fill

100 VOLT

200 VOLT

MFD	DIMENSIONS			CATALOG PART NUMBER	LEAD SIZE (AWG)	MFD	DIMENSIONS			CATALOG PART NUMBER	LEAD SIZE (AWG)
	T ±.05"	W ±.05"	L ±.05"				T ±.05"	W ±.05"	L ±.05"		
For .0010 thru .015 MFD - See Higher Voltages											
.018	.09	.18	.40	23081B183-*	26	.0068	.09	.18	.40	23081C682-*	26
.022	.09	.18	.40	23081B223-	26	.010	.09	.18	.40	23081C103-	26
.033	.09	.18	.40	23081B333-	26	.012	.09	.18	.40	23081C123-	26
.039	.09	.18	.40	23081B393-	26	.015	.09	.18	.40	23081C153-	26
.047	.09	.18	.40	23081B473-	26	.018	.10	.20	.40	23081C183-	26
.056	.09	.18	.40	23081B563-	26	.022	.09	.18	.53	23081C223-	26
.068	.10	.19	.40	23081B683-	26	.027	.09	.18	.53	23081C273-	26
.082	.11	.20	.40	23081B823-	26	.033	.09	.18	.53	23081C333-	26
.10	.09	.18	.53	23081B104-	26	.039	.09	.18	.53	23081C393-	26
.12	.09	.18	.53	23081B124-	26	.047	.09	.18	.53	23081C473-	26
.15	.09	.18	.53	23081B154-	26	.056	.11	.20	.53	23081C563-	26
.18	.09	.18	.53	23081B184-	26	.068	.12	.22	.53	23081C683-	24
.22	.10	.20	.53	23081B224-	26	.082	.14	.23	.53	23081C823-	24
.27	.12	.22	.53	23081B274-	24	.10	.16	.25	.53	23081C104-	24
.33	.14	.23	.53	23081B334-	24	.12	.17	.27	.53	23081C124-	24
.39	.15	.25	.53	23081B394-	24	.15	.20	.29	.53	23081C154-	24
.47	.17	.27	.53	23081B474-	24	.18	.22	.32	.53	23081C184-	24
.56	.19	.28	.53	23081B564-	24	.22	.18	.28	.68	23081C224-	24
.68	.22	.31	.53	23081B684-	24	.27	.20	.29	.68	23081C274-	24
.82	.18	.27	.68	23081B824-	24	.33	.24	.33	.68	23081C334-	24
1.0	.20	.29	.68	23081B105-	24	.39	.21	.30	.78	23081C394-	24
1.2	.22	.32	.68	23081B125-	24	.47	.24	.33	.78	23081C474-	24
1.5	.21	.30	.78	23081B155-	24	.56	.26	.36	.78	23081C564-	24
1.8	.23	.33	.78	23081B185-	24	.68	.29	.39	.78	23081C684-	24
2.0	.25	.34	.78	23081B205-	24	.82	.33	.42	.78	23081C824-	22
3.0	.31	.41	.78	23081B305-	22	1.0	.32	.41	.95	23081C105-	22
4.0	.32	.41	.95	23081B405-	22	1.2	.25	.42	1.17	23081C125-	22
5.0	.26	.42	1.17	23081B505-	22	1.5	.29	.45	1.17	23081C155-	22
6.0	.29	.45	1.17	23081B605-	22	1.8	.32	.49	1.17	23081C185-	22
8.0	.35	.51	1.17	23081B805-	20	2.0	.35	.51	1.17	23081C205-	20
10.0	.46	.63	1.17	23081B106-	20	3.0	.44	.61	1.17	23081C305-	20
12.0	.51	.68	1.17	23081B126-	20	4.0	.44	.61	1.45	23081C405-	20
15.0	.50	.67	1.45	23081B156-	20	5.0	.45	.61	1.70	23081C505-	20
18.0	.56	.72	1.45	23081B186-	20	6.0	.49	.65	1.70	23081C605-	20
20.0	.52	.68	1.70	23081B206-	20	8.0	.53	.70	1.90	23081C805-	20
30.0	.56	.75	1.90	23081B306-	20	10.0	.70	.87	1.90	23081C106-	20
40.0	.72	.88	1.90	23081B406-	20	15.0	.87	1.04	1.90	23081C156-	20
50.0	.79	.95	1.90	23081B506-	20	20.0	1.01	1.18	1.90	23081C206-	20

100 VOLT

Epoxy Case

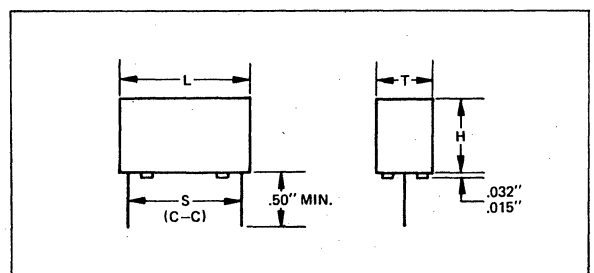
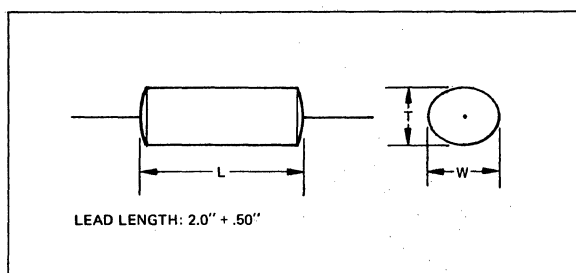
200 VOLT

MFD	DIMENSIONS				CATALOG PART NUMBER	LEAD SIZE (AWG)	MFD	DIMENSIONS				CATALOG PART NUMBER	LEAD SIZE (AWG)
	T ±.01"	H (MAX.)	L ±.01"	S ±.015"				T ±.01"	H (MAX.)	L ±.01"	S ±.015"		
For .0010 thru .018 MFD - See Higher Voltages							For .0010 thru .0068 MFD - See Higher Voltages						
.022	.18	.30	.42	.300	232A1B223- *	22	.0082	.18	.30	.42	.300	232A1C822- *	22
.027	.18	.30	.42	.300	232A1B273-	22	.010	.18	.30	.42	.300	232A1C103-	22
.033	.18	.30	.42	.300	232A1B333-	22	.012	.18	.30	.42	.300	232A1C123-	22
.039	.18	.30	.42	.300	232A1B393-	22	.015	.18	.30	.42	.300	232A1C153-	22
.047	.18	.30	.42	.300	232A1B473-	22	.018	.18	.30	.42	.300	232A1C183-	22
.056	.18	.30	.42	.300	232A1B563-	22	.022	.18	.30	.55	.400	232A1C223-	22
.068	.18	.30	.42	.300	232A1B683-	22	.027	.18	.30	.55	.400	232A1C273-	22
.082	.18	.30	.42	.300	232A1B823-	22	.033	.18	.30	.55	.400	232A1C333-	22
.10	.18	.30	.55	.400	232A1B104-	22	.039	.18	.30	.55	.400	232A1C393-	22
.12	.18	.30	.55	.400	232A1B124-	22	.047	.18	.30	.55	.400	232A1C473-	22
.15	.18	.30	.55	.400	232A1B154-	22	.056	.18	.30	.55	.400	232A1C563-	22
.18	.18	.30	.55	.400	232A1B184-	22	.068	.18	.30	.55	.400	232A1C683-	22
.22	.18	.30	.55	.400	232A1B224-	22	.082	.24	.37	.55	.400	232A1C823-	22
.27	.18	.30	.55	.400	232A1B274-	22	.10	.24	.37	.55	.400	232A1C104-	22
.33	.24	.37	.55	.400	232A1B334-	22	.12	.24	.37	.55	.400	232A1C124-	22
.39	.24	.37	.55	.400	232A1B394-	22	.15	.30	.43	.55	.400	232A1C154-	22
.47	.24	.37	.55	.400	232A1B474-	22	.18	.30	.43	.55	.400	232A1C184-	22
.56	.30	.43	.55	.400	232A1B564-	22	.22	.30	.43	.67	.500	232A1C224-	22
.68	.30	.43	.55	.400	232A1B684-	22	.27	.30	.43	.67	.500	232A1C274-	22
.82	.30	.43	.67	.500	232A1B824-	22	.33	.30	.43	.67	.500	232A1C334-	22
1.0	.30	.43	.67	.500	232A1B105-	22	.39	.30	.43	.82	.600	232A1C394-	22
1.2	.30	.43	.67	.500	232A1B125-	22	.47	.30	.43	.82	.600	232A1C474-	22
1.5	.30	.43	.82	.600	232A1B155-	22	.56	.40	.55	.82	.600	232A1C564-	20
1.8	.30	.43	.82	.600	232A1B185-	22	.68	.40	.55	.82	.600	232A1C684-	20
2.0	.40	.55	.82	.600	232A1B205-	20	.82	.40	.55	.82	.600	232A1C824-	20
3.0	.40	.55	.82	.600	232A1B305-	20	1.0	.40	.55	1.04	.800	232A1C105-	20
4.0	.40	.55	1.04	.800	232A1B405-	20	1.2	.40	.55	1.24	1.100	232A1C125-	20
5.0	.40	.55	1.24	1.100	232A1B505-	20	1.5	.40	.55	1.24	1.100	232A1C155-	20
6.0	.40	.55	1.24	1.100	232A1B605-	20	1.8	.40	.55	1.24	1.100	232A1C185-	20
8.0	.57	.73	1.24	1.100	232A1B805-	20	2.0	.57	.73	1.24	1.100	232A1C205-	20
10.0	.57	.73	1.24	1.100	232A1B106-	20	3.0	.57	.73	1.24	1.100	232A1C305-	20
15.0	.57	.73	1.75	1.600	232A1B156-	20	4.0	.57	.73	1.75	1.600	232A1C405-	20
							5.0	.57	.73	1.75	1.600	232A1C505-	20

*Add suffix letter to part number for capacitance tolerance desired: $\pm 20\%$ = None $\pm 10\%$ = K $\pm 5\%$ = J $\pm 2\%$ = G $\pm 1\%$ = F.

**Higher voltages and other case styles (round wrap and fill, rectangular epoxy, round and rectangular metal hermetically sealed) are available.

*Mylar is a registered TM of DuPont



CAPACITORS (ALL TYPES)



electrocube capacitors

Miniature High Voltage

1000 VOLT

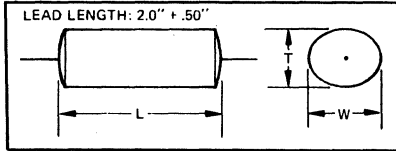
2000 VOLT

3000 VOLT

DIMENSIONS					CATALOG PART NUMBER	LEAD SIZE (AWG)
MFD	T ± .05"	W ± .05"	L ± .05"			
.001	.12	.32	1.0	52081G102-	20	
.002	.16	.36	1.0	52081G202-	20	
.003	.19	.39	1.0	52081G302-	20	
.005	.21	.41	1.0	52081G502-	20	
.01	.33	.53	1.0	52081G103-	20	
.02	.33	.53	1.3	52081G203-	20	
.03	.41	.61	1.3	52081G303-	20	
.05	.43	.63	1.5	52081G503-	20	
.10	.64	.84	1.5	52081G104-	20	
.20	.79	.99	1.8	52081G204-	20	
.30	1.01	1.21	1.8	52081G304-	20	
.50	.75	1.05	3.3	52081G504-	20	
1.0	.93	1.23	4.3	52081G105-	20	

DIMENSIONS					CATALOG PART NUMBER	LEAD SIZE (AWG)
MFD	T ± .05"	W ± .05"	L ± .05"			
.001	.12	.35	1.0	52081J102-	20	
.002	.19	.39	1.0	52081J202-	20	
.003	.25	.45	1.0	52081J302-	20	
.005	.23	.43	1.3	52081J502-	20	
.01	.34	.54	1.3	52081J103-	20	
.02	.40	.60	1.5	52081J203-	20	
.03	.52	.72	1.5	52081J303-	20	
.05	.45	.65	2.3	52081J503-	20	
.10	.55	.75	3.3	52081J104-	20	
.20	.60	.90	4.3	52081J204-	20	
.30	.76	1.06	4.3	52081J304-	20	
.50	1.02	1.32	4.3	52081J504-	18	
1.0	1.50	1.80	4.3	52081J105-	18	

DIMENSIONS					CATALOG PART NUMBER	LEAD SIZE (AWG)
MFD	T ± .05"	W ± .05"	L ± .05"			
.001	.20	.40	1.0	52081L102-	20	
.002	.26	.46	1.0	52081L202-	20	
.003	.33	.53	1.0	52081L302-	20	
.005	.31	.51	1.3	52081L502-	20	
.01	.46	.66	1.3	52081L103-	20	
.02	.55	.75	1.5	52081L203-	20	
.03	.68	.88	1.5	52081L303-	20	
.05	.61	.81	2.3	52081L503-	20	
.10	.68	.88	3.3	52081L104-	20	
.20	.78	1.08	4.3	52081L204-	20	
.30	1.00	1.30	4.3	52081L304-	18	
.50	1.33	1.63	4.3	52081L504-	18	
1.0	1.95	2.25	4.3	52081L105-	18	



5000 VOLT

8000 VOLT

10,000 VOLT

DIMENSIONS					CATALOG PART NUMBER	LEAD SIZE (AWG)
MFD	T ± .05"	W ± .05"	L ± .05"			
.001	.20	.40	1.3	52081N102-	20	
.002	.27	.50	1.3	52081N202-	20	
.003	.35	.55	1.3	52081N302-	20	
.005	.45	.65	1.3	52081N502-	20	
.01	.52	.72	1.5	52081N103-	20	
.02	.67	.87	1.8	52081N203-	20	
.03	.67	.87	2.3	52081N303-	20	
.05	.88	1.08	2.3	52081N503-	20	
.10	.98	1.18	3.3	52081N104-	18	
.20	1.13	1.43	4.3	52081N204-	18	
.30	1.42	1.72	4.3	52081N304-	18	
.50	1.87	2.17	4.3	52081N504-	18	

DIMENSIONS					CATALOG PART NUMBER	LEAD SIZE (AWG)
MFD	T ± .05"	W ± .05"	L ± .05"			
.001	.35	.55	1.8	52081Y102-	20	
.002	.50	.70	1.8	52081Y202-	20	
.003	.60	.80	1.8	52081Y302-	20	
.005	.65	.85	2.0	52081Y502-	20	
.01	.78	.98	2.5	52081Y103-	20	
.02	.78	.98	3.5	52081Y203-	20	
.03	.99	1.19	3.5	52081Y303-	20	
.05	1.02	1.32	4.5	52081Y503-	18	
.10	1.50	1.80	4.5	52081Y104-	18	
.20						
.30						
.50						

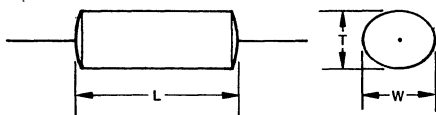
DIMENSIONS					CATALOG PART NUMBER	LEAD SIZE (AWG)
MFD	T ± .05"	W ± .05"	L ± .05"			
.001	.40	.60	1.8	52081S102-	20	
.002	.60	.80	1.8	52081S202-	20	
.003	.60	.80	2.0	52081S302-	20	
.005	.66	.86	2.5	52081S502-	20	
.01	.98	1.18	2.5	52081S103-	20	
.02	.98	1.18	3.5	52081S203-	20	
.03	1.23	1.43	3.5	52081S303-	20	
.05	1.29	1.59	4.5	52081S503-	18	
.10	1.87	2.17	4.5	52081S104-	18	
.20						
.30						
.50						

*Add suffix letter to part number for capacitance tolerance desired: ±20% = None ±10% = K ±5% = J ±2% = G ±1% = F.
 **Higher voltages and other case styles (round wrap and fill, rectangular epoxy, round and rectangular metal hermetically sealed) are available.

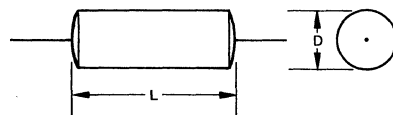
Mylar*/Foil

250B OVAL												TYPE 250D ROUND																
200 WVDC					400 WVDC					600 WVDC					200 WVDC				400 WVDC				600 WVDC					
Cap. Mfd.	Dash	Number	T	W	L	Dash	Number	T	W	L	Dash	Number	T	W	L	Cap. Mfd.	Dash	Number	D	L	Dash	Number	D	L	Dash	Number	D	L
.001																.001	1C102	.14	.53		1E102	.14	.53		1F102	.14	.53	
.0015																.0015	1C152	.14	.53		1E152	.14	.53		1F152	.17	.53	
.0022																.0022	1C222	.14	.53		1E222	.14	.53		1F222	.17	.68	
.0033																.0033	1C332	.14	.53		1E332	.17	.53		1F332	.17	.68	
.0047																.0047	1C472	.14	.53		1E472	.17	.68		1F472	.20	.68	
.0068																.0068	1C682	.14	.53		1E682	.17	.68		1F682	.20	.81	
.01	1C103	.11	.20	.53		1E103	.14	.23	.68		1F103	.19	.28	.81		.01	1C103	.17	.53		1E103	.20	.68		1F103	.24	.81	
.015	1C153	.11	.20	.68		1E153	.14	.23	.81		1F153	.20	.29	.81		.015	1C153	.17	.68		1E153	.20	.81		1F153	.25	.81	
.022	1C223	.14	.23	.68		1E223	.18	.28	.81		1F223	.25	.34	.90		.022	1C223	.20	.68		1E223	.24	.81		1F223	.31	.90	
.033	1C333	.16	.26	.68		1E333	.20	.29	.81		1F333	.26	.35	.90		.033	1C333	.22	.68		1E333	.26	.81		1F333	.32	.90	
.047	1C473	.17	.27	.81		1E473	.26	.35	.90		1F473	.33	.42	.90		.047	1C473	.23	.81		1E473	.32	.90		1F473	.39	.90	
.068	1C683	.18	.28	.81		1E683	.31	.40	.90		1F683	.39	.48	1.17		.068	1C683	.24	.81		1E683	.37	.90		1F683	.45	1.17	
.10	1C104	.21	.31	.81		1E104	.33	.42	.90		1F104	.41	.57	1.17		.10	1C104	.26	.81		1E104	.39	.90		1F104	.51	1.17	
.15	1C154	.26	.35	.90		1E154	.39	.48	1.17		1F154	.45	.62	1.45		.15	1C154	.32	.90		1E154	.45	1.17		1F154	.55	1.45	
.22	1C224	.26	.43	.90		1E224	.41	.57	1.17		1F224	.47	.63	1.45		.22	1C224	.35	.90		1E224	.51	1.17		1F224	.57	1.45	
.33	1C334	.28	.45	1.17		1E334	.41	.57	1.45		1F334	.59	.75	1.68		.33	1C334	.38	1.17		1E334	.51	1.45		1F334	.69	1.68	
.47	1C474	.35	.52	1.17		1E474	.47	.63	1.68		1F474	.66	.82	1.90		.47	1C474	.45	1.17		1E474	.57	1.68		1F474	.76	1.90	
.68	1C684	.41	.57	1.17		1E684	.54	.70	1.90							.68	1C684	.51	1.17		1E684	.64	1.90					
1.0	1C105	.41	.57	1.45		1E105	.66	.82	1.90							1.0	1C105	.51	1.45		1E105	.76	1.90					
1.5	1C155	.54	.70	1.45												1.5	1C155	.64	1.45									
2.0	1C205	.59	.75	1.68												2.0	1C205	.75	1.68									
TOLERANCE ±.050												LEAD LENGTH 2 ± 1/2 INCHES																

*Mylar is a registered TM of DuPont



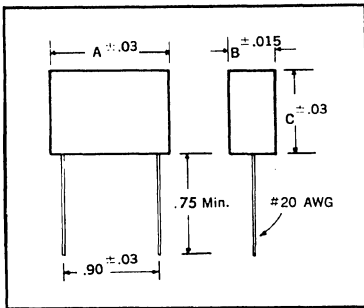
LEAD LENGTH: 2.0" + .50"



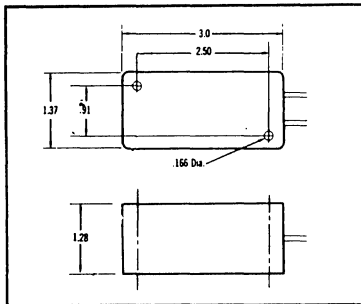
LEAD LENGTH: 2.0" + .50"

electrocube capacitors

RC Networks

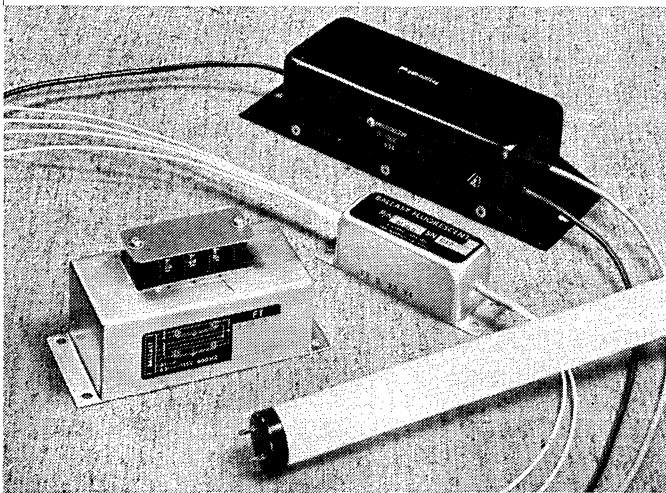


Capacity MFD	Resistance Ohms ±10%	Rated Voltage	Peak Pulse Voltage	Dimensions A in.	B in.	C in.	Electro Cube Part Number
0.5 ± 10%	22	200 VDC	300 V	1.00	.38	.63	RG 1780 — 1
0.5 ± 10%	33		300 V	1.00	.38	.63	RG 1780 — 2
0.5 ± 10%	47		300 V	1.00	.38	.63	RG 1780 — 3
1.0 ± 10%	22	or	300 V	1.00	.50	.75	RG 1781 — 1
1.0 ± 10%	33		300 V	1.00	.50	.75	RG 1781 — 2
1.0 ± 10%	47	125 VAC	300 V	1.00	.50	.75	RG 1781 — 3
0.1 ± 20%	22	600 VDC	900 V	1.00	.38	.63	RG 1782 — 1
0.1 ± 20%	33		900 V	1.00	.38	.63	RG 1782 — 2
0.1 ± 20%	47		900 V	1.00	.38	.63	RG 1782 — 3
0.25 ± 20%	22	or	900 V	1.00	.50	.75	RG 1783 — 1
0.25 ± 20%	33		900 V	1.00	.50	.75	RG 1783 — 2
0.25 ± 20%	47	250 VAC	900 V	1.00	.50	.75	RG 1783 — 3
0.5 ± 10%	22		900 V	1.25	.58	.83	RG 1784 — 1
0.5 ± 10%	33		900 V	1.25	.58	.83	RG 1784 — 2
0.5 ± 10%	47		900 V	1.25	.58	.83	RG 1784 — 3



Part #	Resistance Ohms	Tolerance %	Power Watts	Capacity MFD	Tolerance %	VDC Volts	VAC Volts	Thyrector Part #	Lead Length Inches	Circuit #
RG 1676-1	100	10	10	1.0	10	1000	480	N/A	24	1
-148	100	10	10	1.0	10	1000	480	N/A	48	1
-2	100	10	10	.5	10	1000	480	N/A	24	1
-3	10	10	2	1.0	10	600	250	N/A	25	1
-10	220	10	5	2.0	10	600	250	N/A	25	1
-12	220	10	2	.5	10	1000	480	N/A	24	1
-13	220	10	1	.47	10	1000	480	N/A	24	1
-1848	220	10	5	.47	10	1000	480	N/A	48	1
-19	220	10	2	1.0	10	400	120	N/A	24	1
-20	100	10	2	2.0	20	600	250	N/A	18	1
-21	10	10	5	1.0	10	1000	480	N/A	24	1

Ballasts



Electrocube has designed and produced a wide variety of fluorescent ballasts for airborne and ground systems installation, as well as selected commercial applications. These lightweight units are offered in 60 Hz and 400 Hz versions, and feature load factor correction, burnout protection and cold weather starting.

Ballasts have been produced for operation on DC and to 15 KHz, for fixed or dimmable circuits. Either leading or lagging power factors may be specified, and burnout protection can be provided against tube rectification. For cold weather applications, ballasts have been designed for normal operation in temperatures to -10°C.

While these ballasts are intended for particular customer needs, the company's modular approach to design and production, and the large inventory of existing designs accumulated over many years, enhances the probability of satisfying new requirements efficiently and economically.

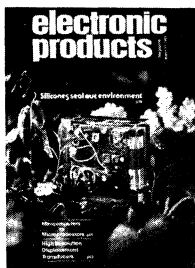


1710 South Del Mar Avenue
San Gabriel, California 91776
Telephone: (213) 283-0511
TWX: 910-589-1609

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

***Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530***

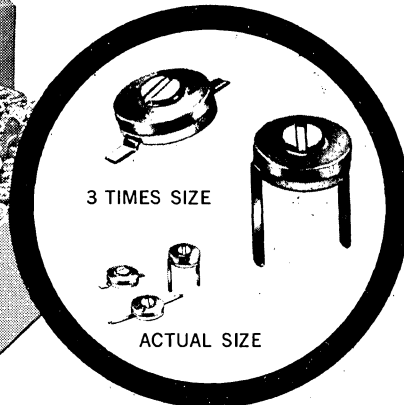


electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.

New From ERIE / Low Profile VARI-Thin®
CERAMIC TRIMMER CAPACITORS

ERIE STYLE 513



ONLY .196" (5mm) DIAMETER

Outstanding Features

- Only .196" (5mm) diameter x .080" (2mm) high
- Ideal for wide range of products requiring real miniaturized capacitance trimming.
- Operates efficiently at -55°C to +125°C
- Available in your choice of three terminal arrangements.
- Ceramic base seats directly on module substrates or circuit boards. No metal or mechanical attachments protruding beneath the base plane.
- Monobloc® Rotor design offers optimum stability for higher capacitance ranges. Eliminates need to use unstable higher K dielectric materials. Monobloc construction offers greater ruggedness which cannot be achieved when using single plate construction, particularly with fragile H-K Dielectric materials.

The smallest trimmer now gets smaller . . . this describes ERIE's new Style 513 VARI-Thin Ceramic Trimmer Capacitor. Only .196" in diameter and .080" high the ERIE 513 is perfect for electronic quartz watches, avionics apparatus, communications equipment, oscilloscopes, crystal oscillators, crystal filters . . . an almost endless variety of applications requiring miniaturized capacitance trimming. The tiny 513 VARI-Thin is available with three terminal arrangements as shown at left. Today ERIE VARI-Thin Trimmer Capacitors are found in many popular electronic quartz watches . . . principally due to their small size, excellent performance and accurate trimming capability.

SPECIFICATIONS

Working Voltage	See Table Below
Dielectric Strength	2.5 times WVDC for 1 to 5 seconds
Operating Temperature Range	-55°C to +125°C
Q Factor @ 1MHz	500 Min. (Dielectric Code A)
	200 Min. (Dielectric Code G)
Torque	0.3 to 2.0 oz. in.
Qualification Specification	ERIE Spec. 513

ORDERING DATA and CAPACITANCE RANGES

Erie Style (See terminal arrangement at left for last three digit variation.)	Dielectric Type Code	Capacitance Range (pF)	Working Voltage (Vdc)	
			85° C	125° C
513-000	A	1—5	100	50
513-000	A	2—10	100	50
513-000	A	3.5—20	100	50
513-000	A	5—30	100	50
513-000	G	7—40	25	25

TO ORDER:

Specify ERIE Style Number, Dielectric Code and Capacitance Range.

Call ERIE for other Capacitance Ranges and Terminal Arrangements.

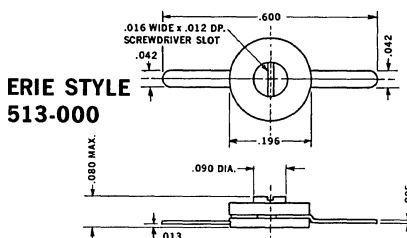
Marking:

E, Cap. Range, Dielectric Type Code.

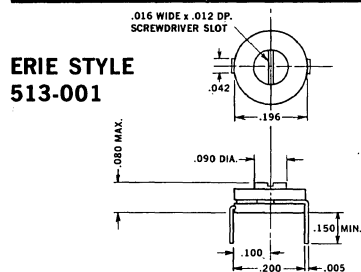
ERIE TECHNOLOGICAL PRODUCTS, INC.

ERIE, PA. 16512 814/453-5611

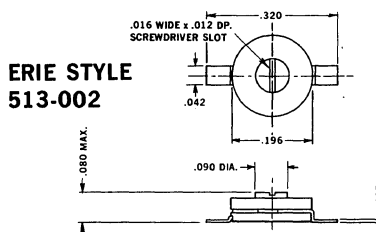
ERIE



ERIE STYLE
513-000



ERIE STYLE
513-001



ERIE STYLE
513-002

DIMENSIONS IN INCHES

For dimensions .125", tolerance is $\pm .005$
For dimensions .126", tolerance is $\pm .015$
Except as noted



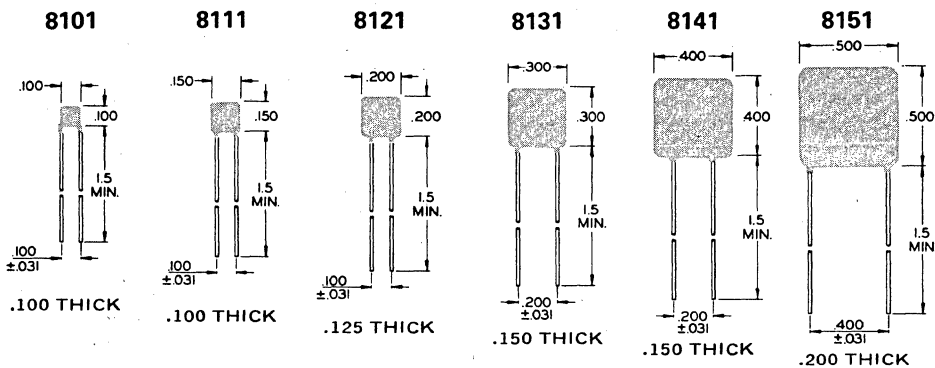
50 and 100 VOLT CERAMIC CAPACITORS

RED CAP dielectrics are manufactured by ERIE's exclusive Monobloc Process® . . . the most modern proven ceramic film technology. This advanced capability affords a broad range of capacitance values and a wide selection of temperature characteristics . . . in the smallest practical sizes . . . with proven reliability.

Lower value capacitors incorporate electrically and mechanically rugged, single plate. High capacitance values are obtained by stacking parallel plates with noble metal electrodes and firing at very high temperatures to form an inherently reliable fused monolithic "bloc."

RED CAPS are encapsulated with JET-SEAL, a hard, bright polymeric coating, formulated to provide mechanical and electrical protection under the most severe environmental conditions.

RED CAPS meet or exceed all applicable requirements of Mil-C-20 and Mil-C-11015.



100 Volt ULTRA STABLE -55°C to 150°C			100 Volt STABLE -55°C to 125°C			100 Volt GENERAL PURPOSE -55°C to 85°C			50 Volt GENERAL PURPOSE -55°C to 85°C		
PART NUMBER	CAP.	TOL.	PART NUMBER	CAP.	TOL.	PART NUMBER	CAP.	TOL.	PART NUMBER	CAP.	TOL.
8101-100 COKO 109B	1.	±.1pF	8101-100 W5R0 151K	150	± 10%	8101-100-651-471M	470	± 20%	8101-050-651-471M		
8101-100 COKO 129B	1.2	±.1pF	8101-100 W5R0 221K	220	± 10%	8101-100-651-681M	680	± 20%	8101-050-651-681M		
8101-100 COKO 159B	1.5	±.1pF	8101-100 W5R0 331K	330	± 10%	8101-100-651-102M	1000	± 20%	8101-050-651-102M		
8101-100 COKO 189B	1.8	±.1pF	8111-100 W5R0 471K	470	± 10%	8101-100-651-152M	1500	± 20%	8101-050-651-152M		
8101-100 COGO 229C	2.2	±.25pF	8111-100 W5R0 681K	680	± 10%	8111-100-651-182M	1800	± 20%	8111-050-651-182M		
8101-100 COGO 279C	2.7	±.25pF	8121-100 W5R0 102K	1000	± 10%	8111-100-651-222M	2200	± 20%	8111-050-651-222M		
8101-100 COGO 339C	3.3	±.25pF	8121-100 W5R0 152K	1500	± 10%	8111-100-651-272M	2700	± 20%	8111-050-651-272M		
8101-100 COGO 479D	4.7	±.5pF	8121-100 W5R0 222K	2200	± 10%	8111-100-651-332M	3300	± 20%	8111-050-651-332M		
8101-100 COGO 569D	5.6	±.5pF	8121-100 W5R0 332K	3300	± 10%	8121-100-651-472M	4700	± 20%	8121-050-651-472M		
8101-100 COGO 689D	6.8	±.5pF	8121-100 W5R0 472K	4700	± 10%	8121-100-651-682M	6800	± 20%	8121-050-651-682M		
8101-100 COGO 829D	8.2	±.5pF	8121-100 W5R0 682K	6800	± 10%	8121-100-651-103M	.01	± 20%	8121-050-651-103M		
8101-100 COGO 100K	10	±10%	8121-100 W5R0 103K	.01	± 10%	8121-100-651-153M	.015	± 20%	8121-050-651-153M		
8111-100 COGO 150K	15	±10%	8131-100 W5R0 153K	.015	± 10%	8121-100-651-223M	.022	± 20%	8121-050-651-223M		
8111-100 COGO 220K	22	±10%	8131-100 W5R0 223K	.022	± 10%	8121-100 651-273M	.027	± 20%	8121-050-651-273M		
8121-100 COGO 330K	33	±10%	8131-100 W5R0 333K	.033	± 10%	8121-100-651-333M	.033	± 20%	8121-050-651-333M		
8121-100 COGO 470K	47	±10%	8131-100 W5R0 473K	.047	± 10%	8121-100-651-473M	.047	± 20%	8121-050-651-473M		
8121-100 COGO 680K	68	±10%	8131-100 W5R0 683K	.068	± 10%	8121-100-651-683M	.068	± 20%	8121-050-651-683M		
8121-100 COGO 101K	100	±10%	8131-100 W5R0 104K	.1	± 10%	8131-100-651-104M	.1	± 20%	8121-050-651-104M		
8121-100 COGO 151K	150	±10%	8141-100 W5R0 224K	.22	± 10%	8131-100-651-154M	.15	± 20%	8121-050-651-154M		
8121-100 COGO 221K	220	±10%	8151-100 W5R0 334K	.33	± 10%	8131-100-651-224M	.22	± 20%	8131-050-651-224M		
8121-100 COGO 331K	330	±10%	8151-100 W5R0 474K	.47	± 10%	8131-100-651-274M	.27	± 20%			
8121-100 COGO 471K	470	±10%	8151-100 W5R0 564K	.56	± 10%	8131-100-651-334M	.33	± 20%	8131-050-651-334M		
8121-100 COGO 681K	680	±10%				8131-100-651-474M	.47	± 20%	8131-050-651-474M		
8121-100 COGO 102K	1000	±10%				8141-100-651-684M	.68	± 20%	8131-050-651-684M		
8131-100 COGO 152K	1500	±10%				8141-100-651-105M	1.0	± 20%	8131-050-651-105M		
8131-100 COGO 222K	2200	±10%				8151-100-651-155M	1.5	± 20%	8141-050-651-155M		
8131-100 COGO 332K	3300	±10%				8151-100-651-225M	2.2	± 20%	8141-050-651-225M		
8141-100 COGO 472K	4700	±10%					3.3	± 20%	8151-050-651-335M		
8141-100 COGO 682K	6800	±10%					4.7	± 20%	8151-050-651-475M		
8141-100 COGO 103K	.01	±10%									

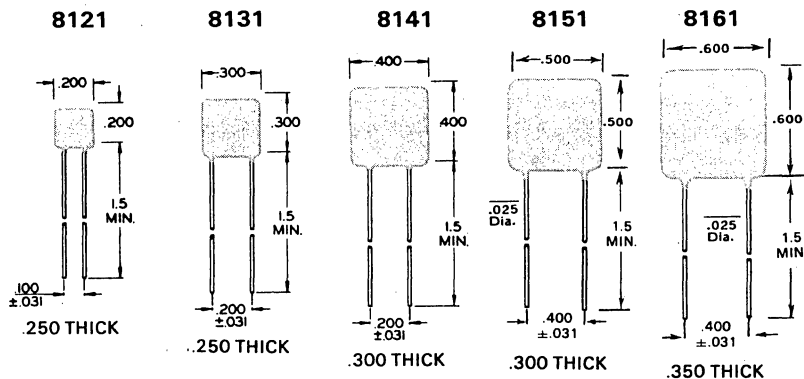
ERIE TECHNOLOGICAL PRODUCTS, INC., ERIE, PA. 16512 814/453-5611

**500 VOLT****CERAMIC CAPACITORS**

Erie High Voltage Red Caps are designed for applications where compactness and light weight are critical. Where higher voltages are required than are available in standard monolithic capacitors. Where replacement for larger size mica capacitors is advantageous. Where reliability of standard dual capacitors is not sufficient.

The range of temperature characteristics available adapts these capacitors from the ultra stable requirements of tuned circuits to the general purpose needs for coupling and by-passing. Filter Networks, Power Supplies, Transmitters, and more ideal applications for Erie High Voltage Red Cap Ceramic Capacitors.

These small size, very reliable 500 Volt Capacitors are available in a full range of capacitance values. Red Caps are manufactured by Erie's exclusive Monobloc Process® . . . a modern, advanced ceramic film technology. They feature . . . high insulation resistance, shock resistance, small size, and Jet Seal encapsulant . . . a hard, bright polymeric coating.



500 Volt ULTRA STABLE —55°C to 150°C			500 Volt STABLE —55°C to 125°C			500 Volt GENERAL PURPOSE —55°C to 85°C		
PART NUMBER	CAP.	TOL.	PART NUMBER	CAP.	TOL.	PART NUMBER	CAP.	TOL.
8121-500 COGO 100D	10	± .5 pF	8121-500 W5RO 102K	1000	10%	8121-500 651 222M	2200	20%
8121-500 COGO 150J	15	5%	8121-500 W5RO 152K	1500	10%	8121-500 651 332M	3300	20%
8121-500 COGO 220J	22	5%	8121-500 W5RO 222K	2200	10%	8121-500 651 472M	4700	20%
8121-500 COGO 330J	33	5%	8121-500 W5RO 332K	3300	10%	8121-500 651 682M	6800	20%
8121-500 COGO 470J	47	5%	8121-500 W5RO 472K	4700	10%	8121-500 651 103M	.01	20%
8121-500 COGO 680J	68	5%	8121-500 W5RO 682K	6800	10%	8131-500 651 153M 8131-500 651 223M 8131-500 651 273M 8131-500 651 333M 8131-500 651 473M 8131-500 651 683M	.015	20%
8121-500 COGO 101J	100	5%	8131-500 W5RO 103K	.01	10%		.022	20%
8121-500 COGO 151J	150	5%	8131-500 W5RO 153K 8131-500 W5RO 233K 8131-500 W5RO 333K 8141-500 W5RO 473K	.015	10%		.027	20%
8131-500 COGO 221J	220	5%		.022	10%		.033	20%
8131-500 COGO 331J	330	5%		.033	10%		.047	20%
8131-500 COGO 471J	470	5%		.047	10%		.068	20%
8131-500 COGO 681J	680	5%	8151-500 W5RO 683K 8151-500 W5RO 104K	.068	10%	8141-500 651 104M 8141-500 651 154M	.1	20%
8131-500 COGO 102J	1000	5%		.1	10%		.15	20%
8141-500 COGO 152J	1500	5%	8161-500 W5RO 224K	.22	10%	8151-500 651 224M 8151-500 651 334M	.22	20%
8141-500 COGO 222J	2200	5%					.33	20%
8141-500 COGO 332J	3300	5%				8161-500 651 474M	.47	20%
8151-500 COGO 472J	4700	5%						
8161-500 COGO 682J	6800	5%						
8161-500 COGO 103J	.01	5%						

ERIE TECHNOLOGICAL PRODUCTS, INC., ERIE, PA. 16512 814/453-5611

F-DYNE ELECTRONICS CO.

449 HOWARD AVENUE
BRIDGEPORT, Conn. 06605
(203) 367-6431

MINIATURE FILM DIELECTRIC CAPACITORS

ALL DIELECTRICS / ALL CASE STYLES

DIELECTRICS AND CHARACTERISTICS

POLYESTER (MYLAR) FOIL

Cap. Range: .0003-10 mfd
Volt. Range: 50-2000 vdc
Temp. Range: -55 to 125°C
IR: 50 K (meg) (mfds) or 100 K megs
DF: .75% max.

METALLIZED POLYESTER

Cap. Range: .01-50 mfd
Volt. Range: 50 vdc-10 kvdc
Temp. Range: -55 to 125°C
IR: 25 K (meg) (mfds) or 50 K megs
DF: 1% max.

POLYCARBONATE FOIL

Cap. Range: .0003-5 mfd
Volt. Range: 25-1000 vdc
Temp. Range: -55 to 125°C
IR: 75 K (meg) (mfds) or 500 K megs
DF: .3% max.

METALLIZED POLYCARBONATE

Cap. Range: .01-50 mfd
Volt. Range: 50-1000 vdc
Temp. Range: -55 to 125°C
IR: 30 K (meg) (mfds) or 150 K megs
DF: .3% max.

POLYPROPYLENE FOIL

Cap. Range: .0003-5 mfd
Volt. Range: 50-1000 vdc
Temp. Range: -55 to 105°C
IR: 100 K (meg) (mfds) or 500 K megs
DF: .1% max.

METALLIZED POLYPROPYLENE

Cap. Range: .01-50 mfd
Volt. Range: 50 V-10,000 vdc
Temp. Range: -55 to 105°C
IR: 50 K (meg) (mfds) or 100 K megs
DF: .2% max.

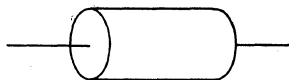
TEFLON

Cap. Range: .001-5 mfd
Volt. Range: 50-600 vdc
Temp. Range: -55 to +160°C
IR: 1000 K (meg) (mfds) or 2000 K megs
DF: .01% max

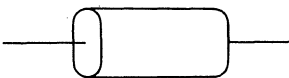
POLYSTYRENE FOIL

Cap. Range: .0005-5 mfd
Volt. Range: 50-600 vdc
Temp. Range: -55 to 85°C
IR: 100 K (meg) (mfds) or 500 K megs
DF: 1% max.

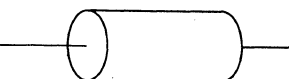
STANDARD CASE STYLES



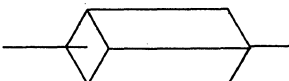
STYLE 1
WRAP & FILL-ROUND



STYLE 2
WRAP & FILL-FLAT



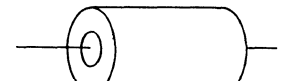
STYLE 3
EPOXY OR PHENOLIC-ROUND



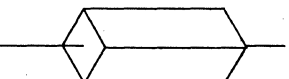
STYLE 4
EPOXY RECTANGULAR-AXIAL



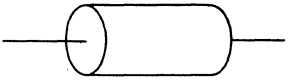
STYLE 5
EPOXY RECTANGULAR-RADIAL



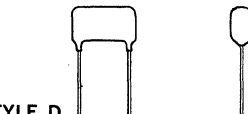
STYLE 6
METAL CASE ROUND-AXIAL



STYLE 7
METAL CASE RECTANGULAR

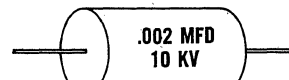


STYLE 8
STEATITE OR CERAMIC

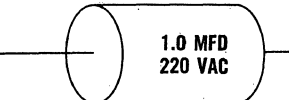


STYLE D
DIP COATED-RADIAL

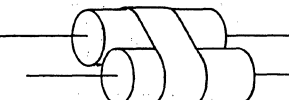
CUSTOM DESIGNS



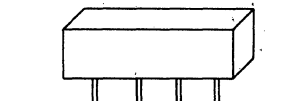
HIGH VOLTAGE



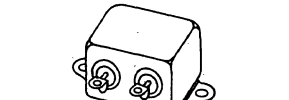
AC DESIGNS



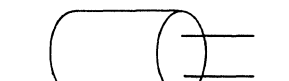
MATCHED CAPACITORS



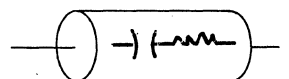
MULTIPLE CAPACITOR ASSEMBLIES



METAL CASED RECTANGULAR



PC TUBULAR



R/C NETWORKS



FEED THRU ASSEMBLIES

TEMPERATURE COMPENSATING
"O" TC and controlled capacitance change for stability or matching with resistors and pot cores

F-Dyne precision film capacitors are readily available in 10 pf capacitance increments, i.e., 430 pf, 440 pf or .18763, .18764, etc. Tolerances may be as low as .25% or .1% with matched pairs.
New—West Coast customers may call Southern Electronics Co., 726 South Flower Street, Burbank, Calif. 91502 (213) 845-2458 for information or service. Southern Electronics is wholly owned by F-Dyne Electronics

F-DYNE ELECTRONICS CO.

449 HOWARD AVENUE
BRIDGEPORT, Conn. 06605
(203) 367-6431

MINIATURE FILM DIELECTRIC CAPACITORS

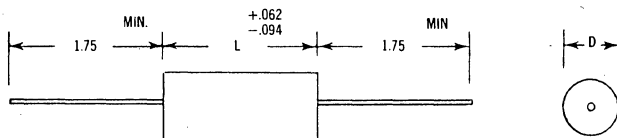
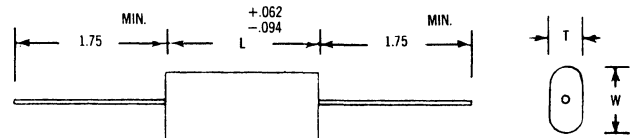
ALL DIELECTRICS / ALL CASE STYLES

POPULAR STYLES**MYLAR FOIL****WRAP AND FILL ROUND/AXIAL LEAD**

CAPACITANCE	PE 13		PE 12		PE 11		PE 11		PE 11		PE 11		PE 11	
	80 VDC		100 VDC		100 VDC		200 VDC		400 VDC		600 VDC		1000 VDC	
	D	L	D	L	D	L	D	L	D	L	D	L	D	L
.0001	.156	.375	.187	.375	.187	.500	.187	.500	.187	.500	.203	.687	.250	.687
.00027	.156	.375	.187	.375	.187	.500	.187	.500	.187	.500	.203	.687	.250	.687
.00033	.156	.375	.187	.375	.187	.500	.187	.500	.187	.500	.203	.687	.250	.687
.00047	.156	.375	.187	.375	.187	.500	.187	.500	.187	.500	.203	.687	.250	.687
.00056	.156	.375	.187	.375	.187	.500	.187	.500	.187	.500	.203	.687	.250	.687
.00068	.156	.375	.187	.375	.187	.500	.187	.500	.187	.500	.203	.687	.250	.687
.00082	.156	.375	.187	.375	.187	.500	.187	.500	.187	.500	.203	.687	.250	.687
.0010	.156	.375	.187	.375	.187	.500	.187	.500	.203	.500	.203	.687	.250	.687
.0015	.156	.375	.187	.375	.187	.500	.187	.500	.203	.500	.203	.687	.250	.687
.0022	.156	.375	.187	.375	.187	.500	.187	.500	.203	.500	.203	.687	.250	.687
.0033	.156	.375	.187	.375	.187	.500	.187	.500	.203	.500	.203	.687	.265	.687
.0047	.156	.375	.187	.375	.187	.500	.187	.500	.203	.500	.203	.687	.296	.687
.0068	.156	.375	.187	.375	.187	.500	.187	.500	.203	.500	.203	.687	.312	.687
.0082	.156	.375	.187	.375	.187	.500	.187	.500	.234	.500	.234	.687	.312	.812
.010	.171	.375	.187	.375	.187	.500	.187	.500	.250	.500	.266	.687	.359	.812
.012	.171	.375	.187	.437	.187	.500	.187	.500	.250	.500	.297	.687	.375	.812
.015	.187	.375	.187	.437	.187	.500	.187	.500	.250	.500	.281	.687	.421	.812
.022	.203	.375	.187	.500	.203	.500	.203	.500	.250	.750	.328	.687	.421	.937
.033	.218	.437	.203	.500	.218	.500	.218	.500	.296	.750	.344	.937	.500	.937
.039	.218	.437	.218	.500	.218	.625	.218	.625	.265	.875	.375	.937	.546	.937
.047	.234	.500	.250	.500	.234	.625	.234	.625	.281	.875	.406	.937	.531	1.062
.056	.234	.500	.265	.500	.250	.625	.250	.625	.312	.875	.437	.937	.562	1.062
.068	.250	.500	.281	.500	.265	.625	.265	.625	.328	.875	.469	.937	.562	1.187
.082	.265	.500	.296	.500	.296	.625	.296	.625	.359	1.062	.469	1.062	.609	1.187
.10	.296	.500	.296	.500	.281	.750	.281	.750	.390	1.062	.517	1.062	.578	1.562
.12	.312	.500	.328	.625	.296	.750	.296	.750	.343	1.312	.562	1.062	.640	1.562
.15	.296	.625	.243	.625	.328	.750	.328	.750	.375	1.312	.578	1.187	.687	1.562
.18	.312	.625	.359	.625	.296	1.062	.375	1.062	.406	1.312	.609	1.187	.765	1.562
.22	.343	.625	.293	.875	.328	1.062	.406	1.062	.437	1.312	.609	1.562	.750	1.687
.27	.296	.875	.375	.875	.343	1.187	.453	1.187	.468	1.687	.656	1.562	.828	1.687
.33	.328	.875	.406	.875	.375	1.187	.484	1.187	.500	1.687	.734	1.562	.921	1.687
.39	.296	1.187	.343	1.187	.406	1.187	.437	1.187	.546	1.687	.719	1.687	.984	1.687
.47	.343	1.187	.375	1.187	.406	1.312	.484	1.312	.609	1.687	.781	1.687	.984	1.937
.56	.359	1.187	.406	1.187	.453	1.312	.531	1.312	.641	1.687	.844	1.687	1.062	1.937
.68	.375	1.187	.453	1.187	.484	1.312	.531	1.687	.703	1.687	.937	1.687	1.156	1.937
.82	.406	1.187	.500	1.187	.515	1.312	.562	1.687	.766	1.687	.937	1.937	1.140	2.187
1.00	.468	1.187	.562	1.187	.515	1.562	.594	1.687	.844	1.687	1.125	1.937	1.375	2.187
1.25			.500	1.437	.562	1.562	.625	1.687	.875	1.937	1.250	1.937		
1.50			.540	1.437	.593	1.687	.671	1.687	.953	1.937	1.281	2.187		
1.80			.565	1.437	.656	1.687	.734	1.687	.968	2.250	1.391	2.187		
2.00			.593	1.562	.718	1.687	.750	1.687	1.109	2.250	1.438	2.187		
3.00			.734	1.562	1.000	1.812	1.031	1.937	1.344	2.250	1.578	2.500		
4.00			.718	1.812	1.187	2.062	1.062	2.187	1.344	2.500	1.718	2.750		
5.00			.812	1.812	1.250	2.250	1.281	2.187	1.500	2.500	1.828	3.000		

Catalog Available On Request

Lower capacitance values, higher capacitance values and non-standard capacitance values are available.
Alternate case configurations are also available where space problems are encountered.

ROUND DIMENSIONAL OUTLINE**FLAT DIMENSIONAL OUTLINE****LEAD # GAGE****D TOLERANCE**

AWG	Diameter		
#24	.250 & under	.249 & under	±.032
#22	.265 thru .437	.250 thru .500	±.046
#20	.453 thru .812	.501 thru 1.00	±.062
#18	.828 & over	1.015 & over	±.093

LEAD GAGE**T & W TOLERANCE**

#24 AWG for T .140 & under	.249 & under	±.032
#22 AWG for T .156 thru .312	.250 thru .500	±.046
#20 AWG for T .328 thru .812	.501 thru 1.00	±.062
#18 AWG for T .828 & over	1.015 & over	±.093

F-DYNE ELECTRONICS CO.

449 HOWARD AVENUE
BRIDGEPORT, Conn. 06605
(203) 367-6431

MINIATURE FILM DIELECTRIC CAPACITORS

ALL DIELECTRICS / ALL CASE STYLES

MYLAR FOIL**POPULAR STYLES****WRAP AND FILL FLAT/AXIAL LEAD**

	PE 23			PE 22			PE 21			PE 21		
	50 & 100 VDC			100 VDC			100 VDC			200 VDC		
CAPACITANCE	T	W	L	T	W	L	T	W	L	T	W	L
.00033				.109	.218	.375	.125	.218	.500	.125	.218	.500
.00047				.109	.218	.375	.125	.218	.500	.125	.218	.500
.00056				.109	.218	.375	.125	.218	.500	.125	.218	.500
.00068				.109	.218	.375	.125	.218	.500	.125	.218	.500
.00082				.109	.218	.375	.125	.218	.500	.125	.218	.500
.0010				.109	.218	.375	.125	.218	.500	.125	.218	.500
.0015				.109	.218	.375	.125	.218	.500	.125	.218	.500
.0022				.109	.218	.375	.125	.218	.500	.125	.218	.500
.0033				.109	.218	.375	.125	.218	.500	.125	.218	.500
.0047				.109	.218	.375	.125	.218	.500	.125	.218	.500
.0068				.109	.218	.375	.125	.218	.500	.125	.218	.500
.0082				.109	.218	.375	.125	.218	.500	.125	.218	.500
.01				.109	.218	.375	.125	.218	.500	.125	.218	.500
.012				.109	.218	.375	.125	.218	.500	.125	.218	.500
.015				.109	.218	.375	.125	.218	.500	.125	.218	.500
.022	.109	.218	.375	.125	.234	.375	.140	.250	.500	.140	.250	.500
.033	.125	.234	.375	.125	.234	.375	.156	.265	.500	.156	.265	.500
.047	.109	.218	.500	.125	.234	.500	.156	.265	.625	.156	.265	.625
.056	.125	.234	.500	.140	.250	.500	.171	.281	.625	.171	.281	.625
.068	.140	.250	.500	.156	.265	.500	.203	.296	.625	.203	.296	.625
.082	.156	.265	.500	.203	.312	.500	.234	.328	.625	.234	.328	.625
.10	.189	.196	.500	.218	.328	.500	.203	.328	.750	.203	.328	.625
.12	.218	.328	.500	.234	.343	.500	.218	.343	.750	.218	.343	.750
.15	.218	.343	.625	.218	.328	.625	.250	.375	.750	.250	.375	.750
.18	.234	.328	.625	.296	.375	.625	.218	.343	1.062	.296	.421	1.062
.22	.250	.343	.625	.218	.343	.875	.250	.375	1.062	.328	.453	1.062
.27	.218	.343	.875	.234	.359	.875	.265	.390	1.187	.437	.562	1.187
.33	.234	.359	.875	.296	.421	.875	.296	.421	1.125	.406	.531	1.187
.39	.187	.312	1.187	.265	.390	1.187	.328	.453	1.187	.359	.484	1.312
.47	.218	.343	1.187	.296	.421	1.187	.328	.453	1.312	.406	.531	1.312
.56	.265	.390	1.187	.328	.453	1.187	.375	.500	1.312	.425	.591	1.312
.68	.281	.406	1.187	.375	.500	1.187	.406	.531	1.312	.359	.515	1.687
.82	.312	.437	1.187	.421	.546	1.187	.437	.562	1.312	.406	.562	1.687
1.00	.359	.484	1.187	.484	.609	1.187	.406	.546	1.562	.468	.640	1.687
1.25						1.437	.453	.625	1.562	.531	.687	1.687

	PE 21			PE 21			PE 21			
	400 VDC			600 VDC			1000 VDC			
CAPACITANCE	T	W	L	T	W	L	T	W	L	
.00033	.125	.250	.500	.125	.250	.687	.187	.296	.687	
.00047	.125	.250	.500	.125	.250	.687	.187	.296	.687	
.00056	.125	.250	.500	.125	.250	.687	.187	.296	.687	
.00068	.125	.250	.500	.125	.250	.687	.187	.296	.687	
.00082	.125	.250	.500	.125	.250	.687	.187	.296	.687	
.0010	.125	.250	.500	.125	.250	.687	.187	.296	.687	
.0015	.125	.250	.500	.125	.250	.687	.187	.312	.687	
.0022	.125	.250	.500	.125	.250	.687	.218	.343	.687	
.0033	.125	.250	.500	.125	.250	.687	.243	.359	.687	
.0047	.125	.250	.500	.156	.281	.687	.243	.359	.812	
.0068	.156	.287	.500	.171	.296	.687	.250	.375	.812	
.0082	.156	.287	.500	.187	.312	.687	.265	.390	.812	
.01	.187	.287	.500	.187	.312	.687	.281	.406	.812	
.012	.187	.287	.500	.218	.343	.687	.296	.421	.812	
.015	.187	.287	.500	.203	.328	.687	.343	.468	.812	
.022	.187	.287	.750	.250	.375	.687	.359	.484	.937	
.033	.218	.343	.750	.265	.390	.937	.437	.553	.937	
.047	.203	.328	.875	.296	.437	.937	.453	.578	1.062	
.056	.234	.359	.875	.359	.484	.937	.484	.609	1.062	
.068	.250	.375	.875	.390	.515	.937	.484	.609	1.187	
.082	.281	.406	1.062	.390	.515	1.062	.531	.656	1.187	
.10	.312	.437	1.062	.437	.578	1.062	.484	.640	1.437	
.12	.343	.609	1.062	.484	.609	1.187	.546	.703	1.437	
.15	.296	.437	1.312	.500	.625	1.187	.593	.750	1.437	
.18	.328	.453	1.312	.437	.562	1.187	.671	.828	1.437	
.22	.359	.484	1.312	.500	.671	1.437	.562	.734	1.687	
.27	.406	.609	1.437	.562	.718	1.437	.656	.812	1.687	
.33	.406	.609	1.687	.625	.796	1.437	.734	.906	1.687	
.39	.437	.859	1.687	.625	.796	1.687	.812	.968	1.687	
.47	.453	.859	1.687	.687	.843	1.687	.812	1.093	1.937	
.56	.546	.703	1.687	.750	.903	1.687	.875	1.187	1.937	
.68	.609	.765	1.687	.843	1.000	1.687	.968	1.250	1.937	
.82	.687	.828	1.687	.750	1.062	1.937	.968	1.250	2.187	
1.00	.750	.906	1.687	.937	1.250	1.937	1.187	1.500	2.187	
1.25	.703	.984	1.937	1.062	1.359	1.937				
1.50	.781	1.093	1.937	1.093	1.390	2.187				
2.00	.937	1.218	2.250	1.250	1.562	2.187				
4.00	1.187	1.500	2.250	1.531	1.828	2.750				
5.00	1.312	1.625	2.500	1.687	1.937	3.000				

Lower capacitance values, higher capacitance values and non-standard capacitance values are available.
Alternate case configurations are also available where space problems are encountered.

Catalog Available On Request

F-DYNE ELECTRONICS CO.

449 HOWARD AVENUE
BRIDGEPORT, Conn. 06605
(203) 367-6431

MINIATURE FILM DIELECTRIC CAPACITORS

ALL DIELECTRICS / ALL CASE STYLES

POLYCARBONATE FOIL WRAP & FILL/AXIAL LEAD

POPULAR STYLES

ROUND	PC 12		PC 11		PC 11		PC 11		PC 11		PC 11	
	50-80 VDC		100 VDC		200 VDC		400 VDC		600 VDC		1000 VDC	
CAPACITANCE	D	L	D	L	D	L	D	L	D	L	D	L
.0010	.187	.375	.187	.375	.187	.375	.187	.375	.187	.625	.234	.812
.0012	.187	.375	.187	.375	.187	.375	.187	.375	.187	.625	.250	.812
.0015	.187	.375	.187	.375	.187	.375	.187	.375	.187	.625	.281	.812
.0022	.187	.375	.187	.375	.187	.375	.187	.500	.187	.625	.343	.812
.0033	.187	.375	.187	.375	.203	.375	.203	.500	.203	.625	.359	.937
.0039	.187	.375	.187	.375	.218	.500	.219	.625	.218	.625	.375	.937
.0047	.187	.375	.187	.375	.234	.375	.234	.625	.250	.625	.421	.937
.0056	.187	.375	.187	.375	.187	.500	.250	.625	.281	.625	.359	1.187
.0068	.187	.375	.187	.375	.187	.500	.234	.750	.312	.625	.375	1.187
.0082	.187	.375	.187	.375	.187	.500	.250	.750	.312	.750	.421	1.187
.010	.187	.375	.187	.375	.203	.500	.281	.750	.343	.750	.453	1.187
.012	.187	.375	.187	.500	.203	.500	.312	.750	.375	.750	.500	1.187
.015	.203	.375	.187	.500	.234	.500	.328	.750	.437	.875	.458	1.437
.018	.187	.500	.203	.500	.250	.500	.343	.750	.421	.062	.500	1.437
.022	.187	.500	.203	.500	.250	.500	.343	.875	.437	.062	.578	1.437
.033	.203	.500	.218	.500	.234	.750	.406	.875	.500	1.187	.687	1.437
.039	.234	.500	.218	.625	.265	.750	.453	.875	.562	1.187	.656	1.687
.047	.250	.500	.234	.625	.296	.750	.453	1.187	.562	1.437	.718	1.687
.056	.265	.500	.250	.625	.312	.750	.484	1.187	.625	1.437	.781	1.687
.068	.281	.500	.265	.625	.281	1.062	.484	1.312	.625	1.562	.859	1.687
.082	.296	.500	.296	.625	.312	1.062	.531	1.312	.687	1.562	.859	1.937
.10	.296	.500	.281	.750	.345	1.062	.578	1.312	.687	1.687	.937	1.937
.12	.312	.625	.296	.750	.375	1.062	.625	1.312	.750	1.687	1.031	1.937
.15	.328	.625	.343	.750	.359	1.312	.703	1.312	.812	1.687	1.062	2.25
.18	.343	.625	.312	1.062	.390	1.312	.750	1.437	.843	1.687	1.156	2.25
.22			.343	1.062	.437	1.312	.828	1.437	.906	1.687	1.250	2.25
.27			.390	1.312	.453	1.312	.796	1.687	.931	2.00	1.312	2.50
.33			.437	1.312	.468	1.312	.890	1.687	1.031	2.00	1.451	2.50
.39			.468	1.312	.562	1.312	.953	1.687	1.125	2.00	1.560	2.75
.47			.484	1.312	.562	1.312	.750	1.937	1.250	2.00	1.656	2.75
.56			.500	1.312	.593	1.312						
.68			.500	1.312								
.82			.531	1.437								
1.00			.578	1.437								

FLAT	PC 21											
	50-80 VDC			100 VDC			200 VDC			400 VDC		
CAPACITANCE	T	W	L	T	W	L	T	W	L	T	W	L
.0010	.109	.218	.375	.109	.218	.375	.109	.218	.375	.109	.218	.625
.0012	.109	.218	.375	.109	.218	.375	.109	.218	.375	.109	.218	.625
.0015	.109	.218	.375	.109	.218	.375	.109	.218	.375	.109	.218	.625
.0018	.109	.218	.375	.109	.218	.375	.109	.218	.375	.109	.218	.625
.0022	.109	.218	.375	.109	.218	.375	.109	.218	.375	.109	.218	.625
.0033	.109	.218	.375	.109	.218	.375	.109	.218	.375	.125	.250	.625
.0039	.109	.218	.375	.109	.218	.375	.109	.218	.500	.140	.265	.625
.0047	.109	.218	.375	.109	.218	.375	.109	.218	.500	.156	.281	.625
.0056	.109	.218	.375	.109	.218	.375	.109	.218	.500	.171	.296	.625
.0068	.109	.218	.375	.109	.218	.375	.109	.218	.500	.156	.281	.750
.0082	.109	.218	.375	.109	.218	.375	.109	.218	.500	.171	.296	.750
.010	.109	.218	.375	.109	.218	.375	.109	.218	.500	.203	.328	.750
.012	.109	.218	.375	.109	.218	.375	.109	.218	.500	.203	.328	.750
.015	.109	.218	.375	.109	.218	.375	.156	.265	.500	.250	.375	.750
.018	.125	.218	.375	.125	.250	.500	.156	.265	.500	.250	.375	.750
.022	.125	.218	.375	.125	.250	.500	.171	.281	.500	.296	.421	.875
.027	.125	.234	.500	.156	.235	.500	.140	.250	.750	.328	.453	.875
.033	.125	.234	.500	.156	.235	.500	.156	.265	.750	.328	.453	.875
.039	.109	.218	.625	.171	.265	.625	.187	.296	.750	.375	.500	.875
.047	.109	.218	.625	.187	.281	.625	.218	.328	.750	.343	.515	1.187
.056	.125	.234	.625	.187	.281	.625	.234	.343	.750	.375	.546	1.187
.068	.140	.250	.625	.203	.296	.625	.203	.312	1.062	.375	.546	1.312
.082	.156	.265	.625	.218	.312	.625	.234	.343	1.062	.421	.593	1.312
.10	.171	.281	.625	.234	.328	.750	.265	.375	1.062	.468	.640	1.312
.12	.203	.312	.625	.234	.328	.750	.296	.406	1.062	.515	.687	1.312
.15	.234	.343	.625	.283	.375	.750	.250	.421	1.312	.578	.703	1.312
.18	.250	.359	.625	.250	.375	1.062	.281	.453	1.312	.671	.796	1.437
.22				.283	.407	1.062	.328	.500	1.312	.750	.875	1.437
.27				.343	.468	1.312	.343	.531	1.312	.718	.843	1.687
.33				.359	.484	1.312	.453	.625	1.312	.812	.937	1.687
.39				.390	.515	1.312	.484	.609	1.312	875	1.00	1.687
.47				.406	.531	1.312	.500	.625	1.312	1.125	1.343	2.00
.56				.421	.546	1.312	.515	.640	1.312			
.68				.437	.562	1.437						
.82				.453	.578	1.437						
1.00				.500	.625	1.437						

Lower capacitance values, higher capacitance values and non-standard capacitance values are available.
Alternate case configurations are also available where space problems are encountered.

Catalog Available On Request

CAPACITORS (ALL TYPES)



CAPACITORS



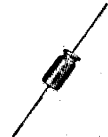
29F



29F
(Rectangular)



16K



69F, 69F2000
69F3000, 69F4000



69F
(Rectangular)



62F, 69F900



86F, 88F, 92F



84F

Application	Catalog Type	Description	Voltage Range	UF Range	Temperature Range	Bulletin Reference	Market Usage
For polar and nonpolar coupling, filtering, decoupling, bypass, energy storage and timing in military and high-performance industrial amplifiers, transmitters, receivers, servo systems, and navigation systems.	29F	Standard and high-voltage tantalum foil; MIL-C-3965: CL20, CL21, CL22, CL23, CL24, CL25, CL26, CL27, CL30, CL31, CL32, CL33, CL34, CL35, CL36, CL37, CL51, CL52, CL53, CL54, CL70, CL71, CL72, CL73. Tubular and rectangular	Up to 450 VDC	0.15 to 3500 μ f	—55C to 85C or 125C	GEP-1812	Military, Industrial
High-reliability type for military or aerospace use where hermetic seal and extreme reliability are prime factors.	16K	Hermetic seal tantalum foil; MIL-C-39006: CLR25, CLR27, CLR35, CLR37.	Up to 150 VDC	0.15 to 580 μ f	—55C to 125C	GEP-1858	Military
For polar applications where no reverse voltage is expected—coupling, decoupling, filtering, bypass, energy storage and timing in military and high-performance industrial amplifiers, transmitters, receivers, servo systems, and navigation systems.	69F	Tantalum porous anode; MIL-C-3965: CL64, CL65, CL55. Tubular and rectangular	Up to 125 VDC	1.7 to 2400 μ f	—55C to 125C	GEP-1814	Military, Industrial
	69F2000	Extended capacitance tantalum porous anode. Tubular only.	Up to 125 VDC	22 to 1800 μ f	—55C to 125C	GEP-1842	Military Industrial
For polar applications where no reverse voltage is expected—coupling, decoupling, filtering, bypass, energy storage and timing in military and high-performance industrial equipment for severe environmental conditions requiring hermetic seal.	69F3000	Glass-to-metal hermetic seal tantalum porous anode; MIL-C-3965: CL66, CL67.	Up to 125 VDC	1.7 to 560 μ f	—55C to 125C	GEP-1846	Military Industrial
	69F4000	Glass-to-tantalum hermetic seal tantalum porous anode; MIL-C-39006: CLR65.	Up to 125 VDC	1.7 to 560 μ f	—55C to 125C	GEP-1857	Military
For polar applications where no reverse voltage is expected—coupling, filtering, decoupling, bypass, energy storage and timing in industrial and entertainment amplifiers, transmitters, receivers, servo systems, and navigation systems, within temperature capabilities.	62F	Porous anode subminiature tantalum.	Up to 60 VDC	0.1 to 325 μ f	—55C to 85C	GEC-1840	Industrial
	69F900	Subminiature tantalum porous anode	Up to 60 VDC	3.3 to 450 μ f	—55C to 85C	GEP-1841	Industrial
For bulk filtering and energy storage in military and high-performance or standard industrial power supplies, including computer usage and welding equipment.	86F	High performance, high volumetric efficiency	Up to 450 VDC	75 to 540,000 μ f	—40C to 65C, 85C	GEC-1813	Industrial
	88F 92F	Long life, high ripple current	Up to 150 VDC	170 to 180,000 μ f	—40C to 85C	GEP-1861 GEP-1860	Industrial
For filtering, bypass, decoupling, and coupling in entertainment-type radio, TV, high-fidelity systems, and in industrial instruments and test equipment.	84F	Tubular aluminum electrolytic	Up to 450 VDC	2 to 18,000 μ f	—40C to 85C	Consult GE Sales Engineer	Industrial, Entertainment

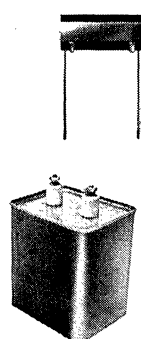
For complete information contact your nearby GE Sales Office or write to General Electric Co., Section 998-2, Schenectady, N. Y. 12345.

GENERAL  ELECTRIC

CAPACITORS (ALL TYPES)



CAPACITORS



75F



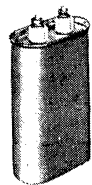
65F



61F, 63F, 74F51, AE



BA, 74F01



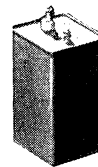
23F



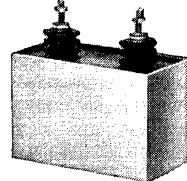
28F



26F, 45F



14F



14F

Application	Catalog Type	Description	Voltage Range	UF Range	Temperature Range	Bulletin Reference	Market Usage
For circuits in test, measurement, control, and communications equipment of all types, where high-quality film-foil units are an economic choice.	75F	Polyester film-foil. Epoxy-encapsulated. Welded radial leads. Units have mounting feet and precise dimensions, for high-density packaging.	50 to 600V	.0010 to 1 μ f	—55C to 125C	GEP-1816	Industrial
For low-voltage printed-circuit board applications where board space is at a premium.	65F	Polyester film and aluminum foil roll, compressed and packaged in a regular epoxy case with radial leads.	50V only	.0010 to 1.5 μ f	—55C to 85C	GEC-1834	Industrial
For use where size, weight, cost, and reliability give advantage over metal-clad tubulars, molded, or ceramic case units.	61F 63F AE	Polyester film-foil roll, wrap and -pot, with axial leads. 63F meets performance requirements of MIL-C-27287.	Up to 300V	.0010 to 2 μ f	—55C to 125C	GEC-1833 GEP-1853 GEC-1819	Industrial, Military
	74F51	Same as 61F except with polycarbonate film dielectric	100 or 200V	.0010 to 1 μ f	—55C to 125C	GEP-1854	Industrial
	BA	Metallized polyester film roll, wrap-and-pot, with axial leads.	100 or 200V	0.1 to 10 μ f	—55C to 125C	GEC-1815	Industrial
For manufacturing and test equipment, electronic timers and control, communications equipment, and other forms of industrial electronic equipment where small size is required.	74F01	Same as BA except with metallized polycarbonate film.	200V	0.1 to 10 μ f	—55C to 125C	GEP-1855	Industrial
General-purpose d-c capacitors for filtering, blocking, bypass, and arc-suppression in power supplies, control circuits, and other d-c circuit functions.	23F	Paper/Pyranol® in drawn metal cases.	400 to 12,500 VDC,	0.05 to 35 μ f	—55C to 85C	Consult GE Sales Engineer	Industrial
Specially designed for such SCR applications as phase control, frequency multipliers and changers, power supply filters, time ratio controls, inverters, and rectifier spike suppression.	28F	Paper, metallized paper, and film dielectrics with very low internal losses and high peak current carrying capability.	200 to 2000 VDC, 115 to 700 VAC	0.25 to 150 μ f	—55C to 80C	GEA-8688	Industrial
General-purpose a-c capacitors for motor and transformer applications. New Pyranol II impregnant multiplies life and increases reliability.	45F	Paper/Pyranol II in drawn oval cases.	200 to 720 VAC	0.5 to 55 μ f	—30C to 70C	GEA-8691	Industrial
General-purpose a-c capacitors for transformer or motor-run applications in geographical areas where the use of polychlorinated biphenyl (PCB) impregnant is undesirable or prohibited.	26F	Paper/ECONOL* in drawn metal cases. ECONOL is the name of General Electric's new biodegradable, low-toxicity impregnant. *Trade-mark of General Electric Co.	330 to 660 VAC	0.5 to 55 μ f	—55C to 70C	Consult GE Sales Engineer	Industrial
For high-voltage d-c rectifier power supply filters, and high-voltage blocking and bypass in communications, radar and other high-voltage circuits.	14F	Paper/Film oil impregnated in all-welded steel rectangular case of leak-proof construction.	5000 to 20,000 VDC	0.67 to 150 μ f	—40C to 105C	GEP-1752	Industrial
For light-duty energy storage-discharge duty, such as photoflash applications.	14F	Paper/Pyranol in fabricated steel cases.	1000 to 10,000 VDC	12.5 to 640 μ f	0 to 40C	GEP-1751	Industrial

For complete information contact your nearby GE Sales Office or write to General Electric Co., Section 998-2, Schenectady, N. Y. 12345.

GENERAL ELECTRIC



CAPACITORS (ALL TYPES)

CAPACITORS

GENERAL ELECTRIC INTERCHANGEABILITY GUIDE

TANTALUM ELECTROLYTIC

TYPE	GE NUMBER	MIL-C- 3965E	MIL-C- 39006	COMPETITOR EQUIVALENTS			
				SPRAGUE	MALLORY	TANSITOR	CORNELL- DUBILIER
Tantalum Foil							
85C Polar, Plain Foil	29F	CL34, 35*		110D	TAF	TPF	TAN
85/125C Polar Plain Foil	29F/16K	CL30, 31	CLR35	120D	TFS	TPF	TAND
85C Non Polar Plain Foil	29F	CL36, 37*		111D	TAF	TPF	TAN
85/125C Non Polar Plain Foil	29F/16K	CL32, 33	CLR37	121D	TFS	TPF	TAND
85C Polar Etched Foil	29F	CL24, 25*		112D	TBF	TEF	TAN
85/125C Polar Etched Foil	29F/16K	CL20, 21, 70, 71	CLR25 CLR71	122D	TFE	TEF	TAND
85C Non Polar Etched Foil	29F	CL26, 27*		113D	TBF	TEF	TAN
85/125C Non Polar Etched Foil	29F/16K	CL22, 23, 72, 73	CLR73	123D	TFE	TEF	TAND
85/125C Package Type KSR	29F 3200	CL51, 52, 53, 54		300D 301D 302D 303D		RE RP	RC53
Tantalum Wet Slug							
Non Acid, Sub Miniature, Tubular	62F						
Sub Miniature Tubular	69F900			145D 146D	MTP, TAH, TAP, TNT	MW	
85/125C Tubular	69F	CL64, 65	CLR65	109D 130D	TLS	W	TX
Extended Capacitance Tubular	69F2000			109D 130D		UW	TX
Hermetically Sealed Tubular	69F3000	CL66, 67		137D	TLW	WH	TX
Hermetically Sealed Tubular	69F4000		CLR65	138D	TLW	WT	
Packaged Type	69F1100	CL55		202D 211D	TL	RW	RC64

* To MIL-C-3965C only

ALUMINUM ELECTROLYTIC

TYPE	GE NUMBER	COMPETITOR EQUIVALENTS						
		SPRAGUE	MALLORY	SANGAMO	CORNELL- DUBILIER	STM	GENERAL INSTRUMENTS	AEROVOX
A-C Motor Start	35F	9A, 7A	P	MJ	ETW			MDRP
Metal Case Tubular	43F/84F	43-51D, TVA 39D	PFP	MT/MTD, DCM	FAH		CQM, TD/TDL, TM	AFH, PCS
Computer Grade	86F	36D	CGS	DCM	FAH	91C		
Computer Grade	88F	32D	CG	500	UHL			
Computer Grade	92F	602D			UPH			

For complete information contact your nearby Sales Office, or write to General Electric Co., Section 998-2, Schenectady, N. Y. 12345.

GENERAL  ELECTRIC



CAPACITORS

GENERAL ELECTRIC INTERCHANGEABILITY GUIDE

FILM DIELECTRIC

TYPE	GE NO.	COMPETITOR EQUIPMENT												
		SPRAGUE	CORNELL-DUBILIER	TRW	AEROVOX	WEST CAP (SAN FERNANDO ELECT.)	DEARBORN	MIDWEC	MARSHALL IND. (ELECTRON PRODUCTS)	GUDEMAN	ELECTRO CUBE	NYTRONICS	PAKTRON	WESCO
Lectro Film-B Polyester (Mylar) Film Foil	61F	410, 411P	WMF MFP	663UW	V146X	WR, PR, WF68		3	E, EE	338	250	103, 107	WA, WB,	32, 33M
Lectro Film-B Miniature Film Foil Polyester	AE	192P								356				
Lectro Film-B Military Grade (MIL-C-27287) Polyester Film	63F (CTM)	CTM	CTM	643UW (CTM)		CTM	CTM	CTM	CTM	CTM				
Micro Flat Film Foil Polyester	65F	230P		602			LP7R	2B						MW
Black Hawk Polyester	75F	225P	DMF	601PE				2 E3FR				126, 151	MB, MR, MT	
Metalized Polyester Film	BA	430, 431P	MMW	X663	V146Z	WR, WF70	LM66	7	D, DE	363, 364	210			32, 33MM
Polycarbonate Film Foil	74F51	610P	WCR	463UW				6						32, 33PC
Metalized Polycarbonate Film	74F01	630, 631P	MCR, MCP	X463UW	K146Z		LP88	12	H		625		MPC	32, 33MPC

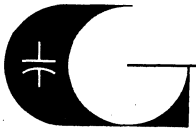
POWER AND INDUSTRIAL CAPACITORS (OIL-FILLED)

DESCRIPTION			GE TYPE NUMBERS	COMPETITOR EQUIPMENTS					
VOLTAGE	DIELECTRIC SYSTEM	CASE		SPRAGUE	CORNELL-DUBILIER	AEROVOX	SANGAMO	MALLORY	CSI
DC/AC	PAPER/FOIL	RECTANGULAR	23F	94P, 95P, 137P, 138P, 151P, 152P, 153P, 166P, 167P, 170P, 171P, 265P, 267P	T, TCD, TMK, TR, WA, WAB, WC, WCB, WCT, WU, WUB, WUT, YAB, YCB, YCT	P09, P16, P18	71		
DC/AC	PAPER/FOIL	BATHTUB	23F*	90P, 93P,	DYR	P30			
DC/AC	PAPER/FOIL	RECTANGULAR	23F*	154P		P10 (CYLINDRICAL)	60, 62, 64, 66, 68		
AC	PAPER/FOIL	OVAL	45F	200P, 201P, OR, OV	KB, KK, KT	P142, P150F, P162F, P164F, P166F, RDO, RGO, RMD, RSO	80	31A, 32A, 37A, 38A	93G, 94G, 95G, 97G
AC	PAPER/FOIL	RECTANGULAR	45F		KGNT, KN	RY	75	27A, 28A, 29A	
AC	PAPE/FOIL	CYL	45F*	OC	KV, CMA, CRA	RR		23A	94G, 95G, 97G
DC/AC SCR TYPE	PAPER/FOIL	RECTANGULAR	28F	330P	SCRG, KKSCR, KMSCR				
DC/AC SCR TYPE	METALIZED PAPER	RECTANGULAR	28F	331P		P09ZNR			
DC/AC SCR TYPE	POLYCARB. FILM/FOIL	RECTANGULAR	28F*	332P	SCRG				
DC/AC SCR TYPE	METAL POLYCARB. FILM	RECTANGULAR	28F*	333P	SCR				
DC/AC SCR TYPE	METAL PAPER	OVAL	28F		SCR				

* Nearest Equivalent; GE has electrical equivalents for all competitive oil-filled designs, most offer superior performance and volumetric efficiency.

For complete information contact your nearby GE Sales Office, or write to General Electric Co., Section 998-2, Schenectady, N. Y. 12345.

GENERAL ELECTRIC

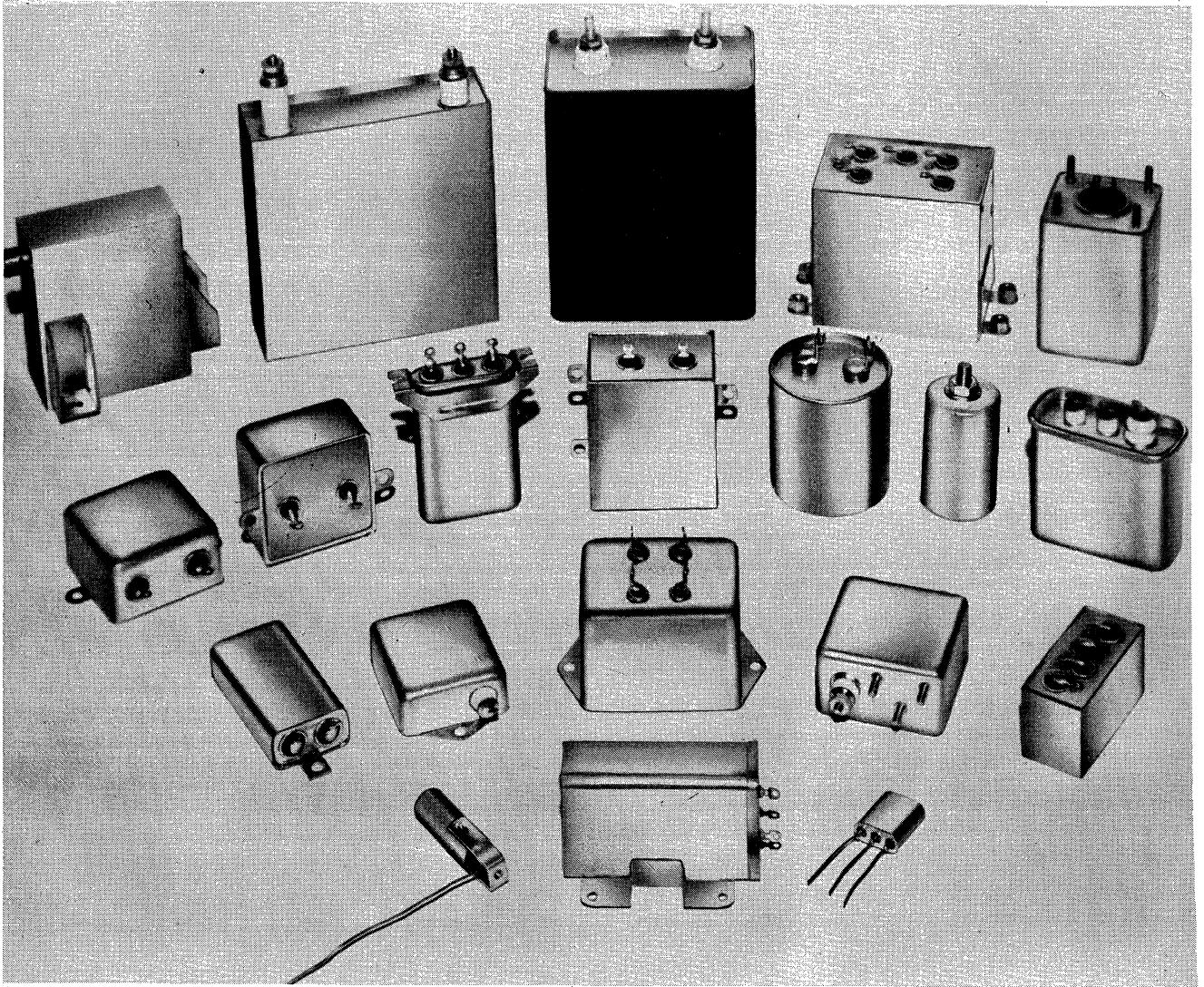


THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

**standard and special capacitors
designed to individual specifications**



The Gudeman Company has long been an established leader in the field of manufacturing special capacitors to customer's individual specifications.

Pictured above are just a few examples of the variety of styles and configurations available. There are literally thousands of designs for special capacitors in our files which have been produced over the years for satisfied users.

The unique flexibility of The Gudeman Company with respect to such specials is available for use in your application.

This flexibility of design and fabrication covers not only mechanical or physical configurations but extends to the use of most dielectric materials presently available.

The examples shown above have been manufactured utilizing such dielectrics as: paper, paper-mylar, mylar, metallized mylar, polystyrene, mylar-polystyrene, teflon, metallized teflon, polycarbonate, metallized polycarbonate, metallized paper, metallized paper-mylar and irradiated polyethylene. Other dielectric materials are presently under investigation for use with both standard and special capacitors alike.

Impregnants used in conjunction with special items are: micro-crystalline wax, silicone oil, chlorinated diphenyl, mineral oil, polybutene, "perma-fil" special epon resins, and many special combination impregnants for specific applications.

Capacitor enclosures are available for standard or unusual geometric outlines with standard or special hardware as dictated by application.

As circuit design requires, units are available in multiple sections of large banks, with matched values, if necessary. Combinations of dielectric materials are also available for such "modules."

The Gudeman Company offers a unique service with respect to special capacitors with the over-all capabilities of "long and short run" facilities, engineering in depth and a closely governed Quality Control system. The Quality Control operation offers additional advantages relative to complete qualification testing facilities for quality assurance testing if necessary. The "QC" department has monitored over 60,000,000 unit hours of testing on our line of high reliability capacitors and is well versed in statistical analysis where required.

We might add that our manufacturing experience in the line of high reliability capacitors allows us to constantly improve on the reliability of all capacitors, standard or special. The feedback of information in this product line is incorporated into the design and fabrication techniques of all other lines to reduce potential "failure modes."

The Gudeman Company offers its design-engineering-production staff for consultation on your special capacitor requirements. An unusual "design-comparison" file often results in substantial savings to users in both time and money with improved performance in the capacitor component.



THE GUDEMAN CORPORATION
capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

**a complete index
to the complete line of capacitors and filters**

type	Gudeman series #	Gudeman pg. no.	EEM pg.
capacitors			
Miniaturized Ceramic Dielectric	701A and 702A Series	3	2-140
Miniature Tubular Polycarbonate Dielectric	357 Series	4	2-141
Miniature Polycarbonate-Foil Dielectric	401 Series	5	2-142
Balanced Polycarbonate Film-Foil Dielectric	466 Series	6	2-143
"XC" Plastic Film Dielectric	XC203 and XC204 Series	7	2-144
Miniature "Mylar" Dielectric	338 and 355 Series	9 & 10	2-146, 2-147
Miniature "Mylar" Dielectric	P356 Series	8	2-145
Polystyrene Dielectric	X-727 Series	11 & 12	2-148, 2-149
Miniature "Mylar"-Foil (Extended Foil) Dielectric	383 Series	13	2-150
Extended Foil Teflon Dielectric	371 Series	14	2-151
"Thinfilm" Metallized Polycarbonate Dielectric	317 and 318 Series	15 & 16	2-152, 2-153
Metallized Polycarbonate Dielectric	409 and 410 Series	17	2-154
Miniature Metallized Polycarbonate Dielectric	410 Series	18	2-155
Miniature Metallized Polycarbonate Dielectric	412 series	19 & 20	2-156, 2-157
"Thinfilm" Metallized Polycarbonate Dielectric	396 and 397 series	21	2-158
"Thinfilm" Metallized Mylar Dielectric	322 and 323 Series	22	2-159
"Thinfilm" Metallized Mylar Dielectric	363 and 364 Series	23	2-160
Miniature Metallized Mylar Dielectric	68 Series	24	2-161
Polyester & Kraft Capacitor Tissue Dielectric Wax Impregnated — Metallized Dielectric	51 Series	25	2-162
Metallized Paper Dielectric	88 Series	26	2-163
Paper Dielectric — Inserted Tab Construction	GC245 and GC246 Series	27	2-164
High Voltage Capacitors — 2000 VDC thru 10,000 VDC	GC145 and GC146 Series	28	2-165
Paper Plastic Dielectric — High Voltage	672 Series	29 & 30	2-166, 2-167
Paper Plastic Dielectric — High Reliability Capacitors	462 Series	31	2-168
filters			
EMI & RFI Filters	64L- 64RL6-	1	1-557
Tubular Broadband Low Pass	100 Series	2	1-558
Bathtub Broadband Low Pass	100 Series	3	1-559
Miniature Feed-Thru	271 and 272 Series	4	1-560
RFI Filters	FLO Series	5	1-561



THE GUDEMAN CORPORATION

capacitors and EMI filters

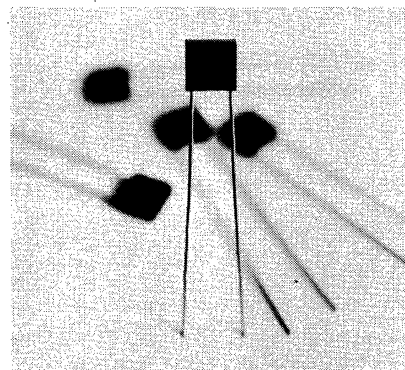
340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

miniaturized ceramic dielectric series 701A and 702A

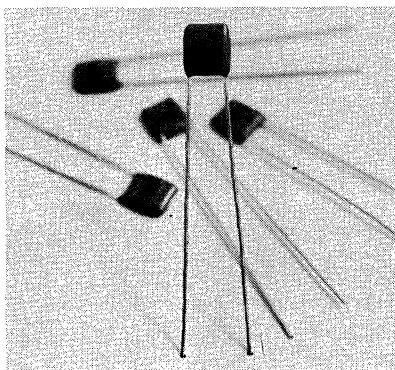
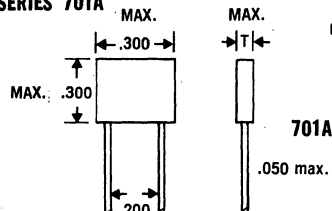
HIGHEST VOLUMETRIC EFFICIENCY AVAILABLE IN CAPACITANCE VALUES FROM ONE THROUGH FIVE MICROFARADS.

OTHER VALUES AND SIZES THROUGH 100 MFD AVAILABLE. (100 MFD IN ONE CUBIC INCH.)

50 VOLT STABLE, 15% TC, -55°C TO $+125^{\circ}\text{C}$

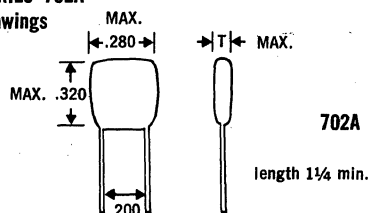


SERIES 701A



SERIES 702A

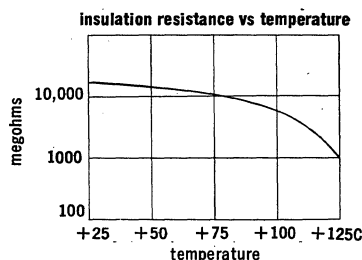
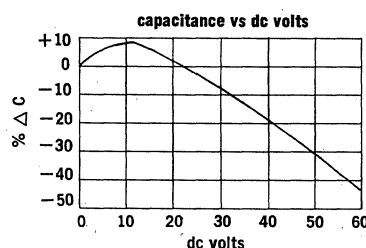
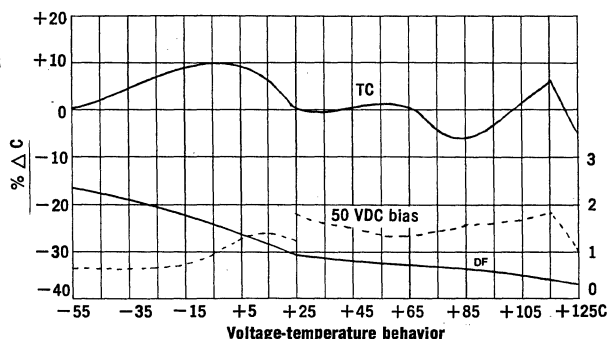
dimensional drawings



CAP MFD	T Inches	Part Number
1.0	.100	701A105K
2.0	.150	701A205K
3.0	.200	701A305K
4.0	.300	701A405K
5.0	.300	701A505K

CAP MFD	T Inches	Part Number
1.0	.090	702A105K
2.0	.140	702A205K
3.0	.190	702A305K
4.0	.290	702A405K
5.0	.290	702A505K

typical performance curves from 1.0 MFD units aged 500 HRS



features

- A. Compact — no other smaller units known — an outstanding achievement
- B. Style — popular radial CK06 series.
- C. Stability — 15% TC, -55°C to $+125^{\circ}\text{C}$. (EIA X7R) meets BX/BR characteristics through most applications — a unique positive trend TC
- D. D F — low dissipation factor even at negative temperature range
- E. Voltage — rated 50 VDC, 125 VDC Hi-pot, (typical breakdown 400-600 VDC)
- F. IR — insulation resistance exceptionally high at all temperatures

construction

These special dielectric capacitors are formulated to produce a temperature characteristic (TC) which tends to be positive over most of the temperature range. They have superb multi-layer technology with dense layers and are processed to eliminate the problem of internal delaminations and flaws which seem to plague others. A full soldered lead attachment using high temperature solder (MP+224°C) and encapsulated in a pre-molded shell with a tough moisture resistant epoxy.

specifications

general

Standard capacitors have 10% tolerance and solder coated copper leads. Marking includes Mfg. - Cap. and Tol. (Mil code) - Voltage - Part Number

- A. Temperature Range — -55°C to $+125^{\circ}\text{C}$
- B. Capacitance — 1.0 MFD through 5.0 MFD, 10% tolerance
- C. Leads — solder coated copper
- D. Case — pre-molded, epoxy or epoxy "dipped"

electrical

- A. Voltage — 50 VDC rated, 125 VDC Hi-pot
- B. Measurement — 25°C , 1 VRMS, 1 KHz
- C. Dissipation Factor — 2.5% maximum
- D. Insulation Resistance — $+25^{\circ}\text{C}$ — 1000 MEGOHM-MICROFARADS $+125^{\circ}\text{C}$ — 100 MEGOHM-MICROFARADS
- E. Temperature Characteristic — 15% (EIA X7R)
- F. Environmental — Gudeman monolithic ceramic capacitors are designed to meet the requirements of MIL-C-39014

Q.C. NOTE: High voltages will temporarily change capacitance. Units can be de-aged to time zero (remove voltage and hi-pot history) by heating to $+150^{\circ}\text{C}$ for one hour.



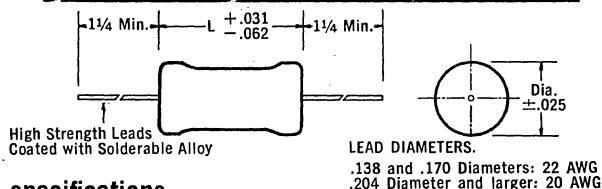
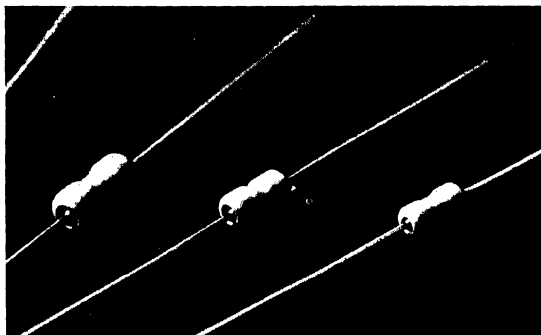
THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

miniature tubular polycarbonate dielectric capacitors

series 357 "PCG" —55°C to +125°C
Sealed in Non-Metallic Cases 100 VDC and 200 VDC



specifications

DISSIPATION FACTOR:

Less than .25% when measured at or referred to a frequency of 1,000 CPS at +25°C.

INSULATION RESISTANCE:

The minimum insulation resistance when measured with an applied potential of 100 to 200 volts, but not to exceed the rated voltage, shall be as follows:

TEMPERATURE	MEGOHMS MINIMUM
At + 25°C	150,000
At + 85°C	15,000
At +125°C	1,000

TEST VOLTAGE:

Shall withstand a DC voltage equal to 200% of the rated voltage for one minute at a temperature of +25%, ±5°C.

ACCELERATED LIFE TEST:

Shall withstand an accelerated life test of 250 hours with 140% of the voltage rating, applied at the applicable high ambient temperature, per MIL-C-25C. Not more than one failure in 18 pieces tested shall be allowed.

VOLTAGE RATINGS:

These capacitors are designed to operate over the temperature range of —55°C to +85°C at full rated DC voltage and up to +125°C with working voltages as follows:

+85°C	+125°C
200 VDC	100 VDC
100 VDC	50 VDC

LEAD PULL TEST:

These capacitors shall withstand a five (5) pound pull applied axially for one minute.

LEAD BEND TEST:

Leads shall be bent without breakage about the point of egress from the capacitor. First 90 degrees in one direction then back to the original position, and the 90 degrees in the opposite direction.

CAPACITANCE CHANGE WITH TEMPERATURE:

The capacitance change shall not exceed the following values with reference to the +25°C capacitance value:

TEMPERATURE	% CAP. CHANGE
— 55°C	—2% Maximum
+ 85°C	±1.25% Maximum
+125°C	±2% Maximum

HUMIDITY TEST:

Series 357 capacitors are not intended to be operated where humidity is a problem. This series is intended for use in circuits which are encapsulated or hermetically sealed.

MARKING:

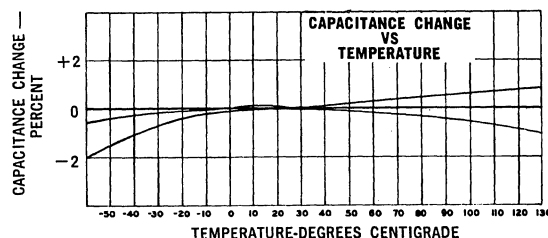
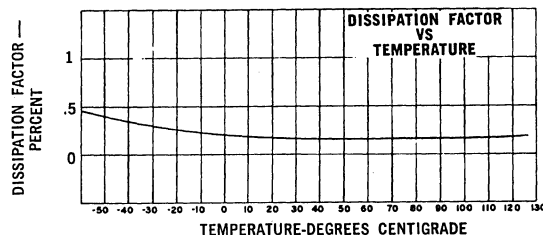
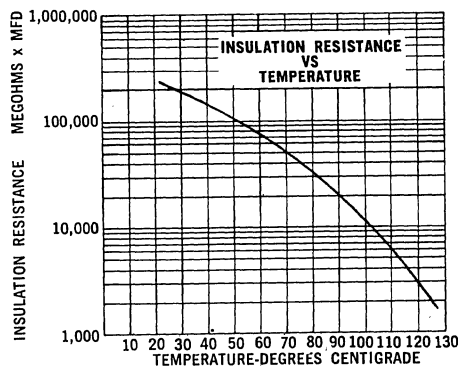
Small size of units limits marking information to the following: capacity, voltage, series prefix (357), Gueman or trademark.

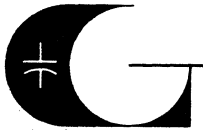
SPECIAL CAPACITORS:

Capacitance values, voltages and sizes not listed in this bulletin will be furnished upon request.

CAP. IN MFDS.	100 VDC		200 VDC	
	PART NO.	SIZE DIA. x L	PART NO.	SIZE DIA. x L
.001	357B102	.138 x 3/16	357C102	.138 x 3/16
.0015	357B152	.138 x 3/16	357C152	.170 x 3/16
.0022	357B222	.138 x 3/16	357C222	.170 x 3/16
.0033	357B332	.138 x 3/16	357C332	.170 x 3/16
.0039	357B392	.138 x 3/16	357C392	.170 x 3/16
.0047	357B472	.170 x 3/16	357C472	.204 x 1/2
.0068	357B682	.170 x 3/16	357C682	.204 x 1/2
.0082	357B822	.170 x 3/16	357C822	.225 x 1/2
.01	357B103	.170 x 3/16	357C103	.225 x 1/2
.012	357B123	.204 x 1/2	357C123	.225 x 3/8
.015	357B153	.204 x 1/2	357C153	.290 x 1/2
.018	357B183	.204 x 3/8	357C183	.290 x 1/2
.022	357B223	.204 x 3/8	357C223	.290 x 3/8
.027	357B273	.225 x 3/8	357C273	.290 x 3/8
.033	357B333	.225 x 3/8	357C333	.318 x 3/8
.039	357B393	.290 x 1/2	357C393	.318 x 3/8
.047	357B473	.290 x 1/2	357C473	.318 x 7/8
.056	357B563	.290 x 3/4	357C563	.318 x 7/8
.068	357B683	.290 x 3/4	357C683	.318 x 1
.082	357B823	.318 x 3/4	357C823	.318 x 1 1/8
.1	357B104	.318 x 3/4	357C104	.318 x 1 1/8
.12	357B124	.318 x 7/8		
.15	357B154	.318 x 7/8		
.18	357B184	.318 x 1 1/8		
.22	357B224	.318 x 1 1/8		

TYPICAL CURVES





THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

miniature polycarbonate-foil dielectric series 401

HERMETICALLY SEALED (GLASS-TO-METAL)

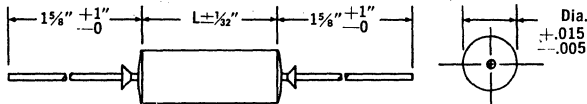
TUBULAR METALLIC CASES

—55°C TO +125°C

100 VDC THRU 600 VDC

outline drawing

Standard leads consist of solid, bare, tinned wire. Special nickel leads are available for applications requiring a high degree of weldability.



LEADS: 24 gauge: .175 and .195 Dia.; 22 gauge: .235 and .312 Dia.; 20 gauge: .400 Dia. and larger case sizes. For sleeving add .020 max. to Dia. and 1/8 to nominal case length.

specifications

CAPACITANCE AND TOLERANCE

The capacitance limits at +25°C are determined by the specified tolerance. Capacitors are measured at or referred to a frequency of 1000 cps.

DISSIPATION FACTOR

Less than .15% at 1000 cps. at +25°C.

INSULATION RESISTANCE

The charging potential is equal to the specified operating voltage for a given temperature. The minimum electrification time is two minutes. Listed below are minimum values:

Temperature	Nominal Capacitance Mfd.	R X C Megohms X mfd.	R Megohms
+25°C	Greater than .5 Smaller than .5	50,000	100,000
+85°C	Greater than .5 Smaller than .5	5,000	10,000
+125°C	Greater than .5 Smaller than .5	500	1,000

TEST VOLTAGE

Shall withstand a DC voltage equal to 200% of the rated voltage for one minute at a temperature of +25°C, ±5°C.

ACCELERATED LIFE TEST

Shall withstand an accelerated life test of 250 hours with 140% of applied rated voltage at applicable high test temperature. Only one failure in 12 capacitors tested shall be allowed. A failure is defined as the following:

- If the capacitor has a short or open circuit.
- If the capacitance has changed more than 5% from its original value.
- If the insulation resistance is less than 50% of the specified value above.
- If the DF is greater than 20% of its initial specified value.

TEMPERATURE AND IMMERSION CYCLING

Shall meet all requirements of the applicable paragraph of the latest issue of MIL-C-19978.

MOISTURE RESISTANCE

Designed to meet all requirements of the applicable paragraph of the latest issue of MIL-C-19978.

VIBRATION

Designed to withstand the Grade 3 vibration tests of the applicable paragraph of the latest issue of MIL-C19978.

A-C VOLTAGE RATING:

(—55°C to +85°C Ambient)

D-C Voltage Rating	400 cps
100	65
200	120
300	200
400	240
600	250

LEAD PULL TEST

Shall withstand a steady pull force of 5 lbs. applied axially to a capacitor lead for one minute.

LEAD BENDING TEST

The leads shall withstand without breakage the following stresses performed near the point of egress: bend 90 degrees in one direction, then back to the original position and 90 degrees in the opposite direction.

CAPACITANCE CHANGE WITH TEMPERATURE

The change of capacitance with reference to the actual value at ±25°C does not exceed the following limits.

TEMPERATURE	CHANGE OF CAPACITANCE
—55°C to +125°C	2%

100 V.D.C.

Part No.	Capacitance Mfd.	Dia-meter Inches	Length Inches
F401B102	.001	.195	3/4
F401B122	.0012	.195	3/4
F401B152	.0015	.195	3/4
F401B182	.0018	.195	3/4
F401B222	.0022	.195	3/4
F401B272	.0027	.195	3/4
F401B332	.0033	.195	3/4
F401B392	.0039	.195	3/4
F401B472	.0047	.195	3/4
F401B562	.0056	.235	3/4
F401B682	.0068	.235	3/4
F401B822	.0082	.312	7/8
F401B103	.01	.312	7/8
F401B123	.012	.312	7/8
F401B153	.015	.312	7/8
F401B183	.018	.312	7/8
F401B223	.022	.312	7/8
F401B273	.027	.312	7/8
F401B333	.033	.312	7/8
F401B393	.039	.400	7/8
F401B473	.047	.400	7/8
F401B563	.056	.400	7/8
F401B683	.068	.400	7/8
F401B823	.082	.400	7/8
F401B104	.1	.400	7/8
F401B124	.12	.400	1.0
F401B154	.15	.400	1.0
F401B185	.18	.400	1 1/4
F401B224	.22	.400	1 1/4
F401B274	.27	.500	1 1/2
F401B334	.33	.500	1 1/2
F401B394	.39	.562	1 1/4
F401B474	.47	.562	1 1/4
F401B564	.56	.562	1 1/2
F401B684	.68	.562	1 1/2
F401B824	.82	.670	1 1/2
F401B105	1.00	.670	1 1/2

200 V.D.C.

Part No.	Capacitance Mfd.	Dia-meter Inches	Length Inches
F401C102	.001	.195	3/4
F401C122	.0012	.195	3/4
F401C152	.0015	.195	3/4
F401C182	.0018	.195	3/4
F401C222	.0022	.195	3/4
F401C272	.0027	.235	3/4
F401C332	.0033	.235	3/4
F401C392	.0039	.312	7/8
F401C472	.0047	.312	7/8
F401C562	.0056	.312	7/8
F401C682	.0068	.312	7/8
F401C822	.0082	.312	7/8
F401C103	.01	.312	7/8
F401C123	.012	.312	7/8
F401C153	.015	.312	7/8
F401C183	.018	.312	7/8
F401C223	.022	.400	7/8
F401C273	.027	.400	7/8
F401C333	.033	.400	7/8
F401C393	.039	.400	7/8
F401C473	.047	.400	7/8
F401C563	.056	.400	1.0
F401C683	.068	.400	1.0
F401C823	.082	.400	1 1/4
F401C104	.1	.400	1 1/4
F401C124	.12	.500	1 1/2
F401C154	.15	.500	1 1/2
F401C184	.18	.562	1 1/4
F401C224	.22	.562	1 1/4
F401C274	.27	.562	1 1/2
F401C334	.33	.562	1 1/2
F401C394	.39	.670	1 1/2
F401C474	.47	.670	1 1/2
F401C564	.56	.750	1 1/2
F401C684	.68	.750	1 1/2
F401C824	.82	.750	2 1/4
F401C105	1.0	.750	2 1/4

400 V.D.C.

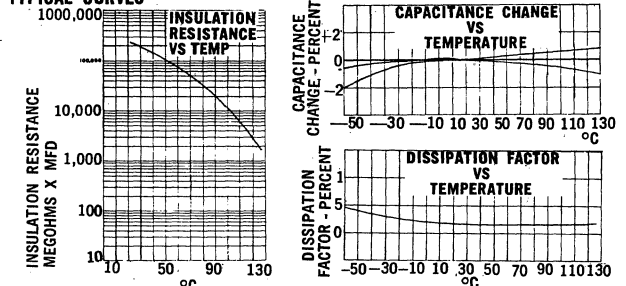
Part No.	Capacitance Mfd.	Dia-meter Inches	±.032 Length Inches
F401E102	.001	.235	3/4
F401E122	.0012	.235	3/4
F401E152	.0015	.235	3/4
F401E182	.0018	.235	3/4
F401E222	.0022	.235	3/4
F401E272	.0027	.312	7/8
F401E332	.0033	.312	7/8
F401E392	.0039	.312	7/8
F401E472	.0047	.312	7/8
F401E562	.0056	.312	7/8
F401E682	.0068	.312	7/8
F401E822	.0082	.312	7/8
F401E103	.01	.312	7/8
F401E123	.012	.400	7/8
F401E153	.015	.400	7/8
F401E183	.018	.400	1.0
F401E223	.022	.400	1.0
F401E273	.027	.400	1 1/4
F401E333	.033	.400	1 1/4
F401E393	.039	.400	1 1/2
F401E473	.047	.400	1 1/2
F401E563	.056	.562	1 1/2
F401E683	.068	.562	1 1/2
F401E823	.082	.562	1 1/2
F401E104	.1	.562	1 1/2
F401E124	.12	.562	1 1/2
F401E154	.15	.562	1 1/2
F401E184	.18	.670	1 1/2
F401E224	.22	.670	1 1/2
F401E274	.27	.750	1 1/2
F401E334	.33	.750	1 1/2
F401E394	.39	.750	2 1/2
F401E474	.47	.750	2 1/2
F401E564	.56	1.00	2 1/2
F401E684	.68	1.00	2 1/2

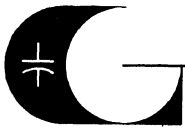
600 V.D.C.

Part No.	Capacitance Mfd.	Dia-meter Inches	±.032 Length Inches
F401F102	.001	.312	7/8
F401F122	.0012	.312	7/8
F401F152	.0015	.312	7/8
F401F182	.0018	.312	7/8
F401F222	.0022	.312	7/8
F401F272	.0027	.400	7/8
F401F332	.0033	.400	7/8
F401F392	.0039	.400	7/8
F401F472	.0047	.400	7/8
F401F562	.0056	.400	7/8
F401F682	.0068	.400	7/8
F401F822	.0082	.400	7/8
F401F103	.01	.400	7/8
F401F123	.012	.400	1.0
F401F153	.015	.400	1.0
F401F183	.018	.400	1 1/4
F401F223	.022	.400	1 1/4
F401F273	.027	.400	1 1/2
F401F333	.033	.400	1 1/2
F401F393	.039	.562	1 1/2
F401F473	.047	.562	1 1/2
F401F563	.056	.562	1 1/2
F401F683	.068	.562	1 1/2
F401F823	.082	.670	1 1/2
F401F104	.1	.670	1 1/2
F401F124	.12	.670	1 1/2
F401F154	.15	.670	1 1/2
F401F184	.18	.750	1 1/2
F401F224	.22	.750	1 1/2
F401F274	.27	1.00	1 1/2
F401F334	.33	1.00	1 1/2
F401F394	.39	1.00	2 1/2
F401F474	.47	1.00	2 1/2
F401F564	.56	1.00	2 1/2
F401F684	.68	1.00	2 1/2

"F" indicates "Floating." Substitute "G" for "Grounded." Add following to Part No. for Tolerance: —20 = ±20%; —10 = ±10%; —5 = ±5%.

TYPICAL CURVES





THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

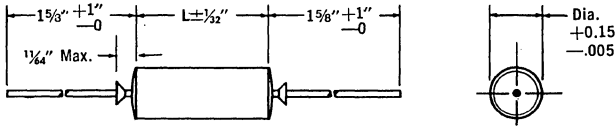
balanced polycarbonate film-foil dielectric

series 466

**HERMETICALLY SEALED (GLASS-TO-METAL)
MINIATURE METAL CASE**
—55°C TO +125°C WITHOUT DERATING
100 VDC THRU 600 VDC

outline drawing

Standard leads consist of solid, bare, tinned wire. Nickel or gold plated leads per MIL-STD 1276 are also available.



Leads: 22 gauge: .235 and .312 Dia.; 20 gauge: .400 and larger
For sleeving add .032 to dia. and 1/8" to the nominal case length.

specifications

CAPACITANCE AND TOLERANCE

The capacitance limits at +25°C are determined by the specified tolerance. Capacitors are measured or referred to a frequency of 1000 CPS.

DISSIPATION FACTOR

Less than .3% from +25°C to +125°C at 1000 CPS.

INSULATION RESISTANCE

The charging potential is equal to the specified operating voltage for a given temperature. The electrification time is two minutes. Minimum values are:

Temperature	Nominal Capacitance MFD	R X C Megohms X MFD	R Megohms
+25°C	Greater than .5 Smaller than .5	25,000	50,000
+125°C	Greater than .5 Smaller than .5	200	500

TEST VOLTAGE

Shall withstand a DC voltage equal to 200% of the rated voltage for one minute at a temperature of +25°C.

ACCELERATED LIFE TEST

Shall withstand an accelerated life test of 1000 hours with 140% of applied rated voltage at +125°C with one failure allowed in 18 capacitors tested.

A failure is defined as:

- If the capacitor has a short or open circuit
- If the capacitance has changed more than 1.5% from its original measured value
- If the insulation resistance is less than 50% of the specified value at +25°C
- If the DF is greater than .5% at +25°C

TEMPERATURE AND IMMERSION CYCLING

Meets the requirements of the applicable paragraph of MIL-C-19978.

MOISTURE RESISTANCE

Meets the requirements of the applicable paragraph of MIL-C-19978.

VIBRATION

Shall withstand Grade 3 vibration tests of the applicable paragraph of MIL-C-19978.

AC VOLTAGE RATING (—55°C to +105°C Ambient)

DC VOLTAGE RATING	AC VOLTAGE RATING @ 400 CPS
100	70
200	140
400	240
600	330

LEAD PULL TEST

Shall withstand a steady pull force of 5 lbs. applied axially for one minute.

LEAD BENDING TEST

The leads shall withstand without breakage the following stresses performed near the point of egress: bend 90 degrees in one direction, then back to the original position and 90 degrees in the opposite direction.

CAPACITANCE CHANGE WITH TEMPERATURE

Values below are guaranteed performance. Typical values are lower than those stated.

Rated Voltage	Temperature	Maximum Capacitance Change†
100VDC - 200VDC	+25°C to +125°C	+ .5 % — .75 %
100VDC - 200VDC	+25°C to —55°C	— .25 % — 1.5 %
400VDC - 600VDC	+25°C to +125°C	+ 1.5 % — .75 %
400VDC - 600VDC	+25°C to —55°C	— 1.0 % — 1.5 %

*For capacitance values greater than .01 mfd. Values of .01 mfd. and less exhibit same change as 400-600 VDC units.

100 VOLTS D.C.

Capacitance Mfd.	Part No.	Diameter Inches	Length Inches
.001	F466B102	.235	3/4
.0012	F466B122	.235	3/4
.0015	F466B152	.235	3/4
.0018	F466B182	.235	3/4
.0022	F466B222	.235	3/4
.0027	F466B272	.235	3/4
.0033	F466B332	.235	3/4
.0039	F466B392	.235	3/4
.0047	F466B472	.235	3/4
.0056	F466B562	.235	3/4
.0068	F466B682	.235	3/4
.0082	F466B822	.312	7/8
.01	F466B103	.312	7/8
.012	F466B123	.312	7/8
.015	F466B153	.312	7/8
.018	F466B183	.312	7/8
.022	F466B223	.312	7/8
.027	F466B273	.312	7/8
.033	F466B333	.312	7/8
.039	F466B393	.312	7/8
.047	F466B473	.400	7/8
.056	F466B563	.400	7/8
.068	F466B683	.400	7/8
.082	F466B823	.400	1 1/8
.10	F466B104	.400	1 1/8
.12	F466B124	.400	1 1/8
.15	F466B154	.400	1 1/8
.18	F466B184	.562	1 1/8
.22	F466B224	.562	1 1/8
.27	F466B274	.562	1 1/8
.33	F466B334	.562	1 1/8
.39	F466B394	.562	1 1/8
.47	F466B474	.562	1 1/8
.56	F466B564	.670	1 1/8
.68	F466B684	.670	1 1/8
.82	F466B824	.750	1 1/8
1.0	F466B105	.750	1 1/8

200 VOLTS D.C.

Capacitance Mfd.	Part No.	Diameter Inches	Length Inches
.001	F466C102	.235	3/4
.0012	F466C122	.235	3/4
.0015	F466C152	.235	3/4
.0018	F466C182	.235	3/4
.0022	F466C222	.235	3/4
.0027	F466C272	.235	3/4
.0033	F466C332	.235	3/4
.0039	F466C392	.235	3/4
.0047	F466C472	.235	3/4
.0056	F466C562	.312	7/8
.0068	F466C682	.312	7/8
.0082	F466C822	.312	7/8
.01	F466C103	.312	7/8
.012	F466C123	.312	7/8
.015	F466C153	.312	7/8
.018	F466C183	.312	7/8
.022	F466C223	.312	7/8
.027	F466C273	.400	7/8
.033	F466C333	.400	7/8
.039	F466C393	.400	7/8
.047	F466C473	.400	1 1/8
.056	F466C563	.400	1 1/8
.068	F466C683	.400	1 1/8
.082	F466C823	.400	1 1/8
.10	F466C104	.400	1 1/8
.12	F466C124	.562	1 1/8
.15	F466C154	.562	1 1/8
.18	F466C184	.562	1 1/8
.22	F466C224	.562	1 1/8
.27	F466C274	.562	1 1/8
.33	F466C334	.562	1 1/8
.39	F466C394	.670	1 1/8
.47	F466C474	.670	1 1/8
.56	F466C564	.750	2 1/8
.68	F466C684	.750	2 1/8
.82	F466C824	1.0	2 1/8
1.0	F466C105	1.0	2 1/8

400 VOLTS D.C.

Capacitance Mfd.	Part No.	Diameter Inches	Length Inches
.001	F466E102	.235	3/4
.0012	F466E122	.235	3/4
.0015	F466E152	.235	3/4
.0018	F466E182	.235	3/4
.0022	F466E222	.235	3/4
.0027	F466E272	.235	3/4
.0033	F466E332	.235	3/4
.0039	F466E392	.312	7/8
.0047	F466E472	.312	7/8
.0056	F466E562	.312	7/8
.0068	F466E682	.312	7/8
.0082	F466E822	.312	7/8
.01	F466E103	.400	7/8
.012	F466E123	.400	7/8
.015	F466E153	.400	7/8
.018	F466E183	.400	7/8
.022	F466E223	.400	1 1/8
.027	F466E273	.400	1 1/8
.033	F466E333	.400	1 1/8
.039	F466E393	.400	1 1/8
.047	F466E473	.400	1 1/8
.056	F466E563	.562	1 1/8
.068	F466E683	.562	1 1/8
.082	F466E823	.562	1 1/8
.10	F466E104	.562	1 1/8
.12	F466E124	.670	1 1/8
.15	F466E154	.670	1 1/8
.18	F466E184	.670	1 1/8
.22	F466E224	.670	1 1/8
.27	F466E274	.750	2 1/8
.33	F466E334	.750	2 1/8
.39	F466E394	1.0	2 1/8
.47	F466E474	1.0	2 1/8
.56	F466E564	1.0	2 1/8
.68	F466E684	1.0	2 1/8
.82	F466E824	1.0	2 1/8

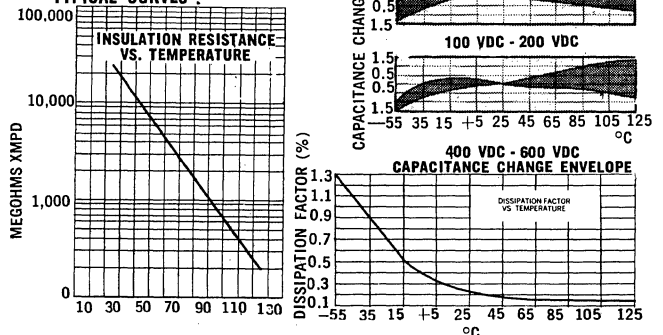
600 VOLTS D.C.

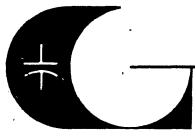
Capacitance Mfd.	Part No.	Diameter Inches	Length Inches
.001	F466F102	.312	3/4
.0012	F466F122	.312	3/4
.0015	F466F152	.312	3/4
.0018	F466F182	.312	3/4
.0022	F466F222	.312	7/8
.0027	F466F272	.312	7/8
.0033	F466F332	.312	7/8
.0039	F466F392	.400	7/8
.0047	F466F472	.400	7/8
.0056	F466F562	.400	7/8
.0068	F466F682	.400	7/8
.0082	F466F822	.400	7/8
.01	F466F103	.400	1
.012	F466F123	.400	1
.015	F466F153	.400	1
.018	F466F183	.400	1 1/8
.022	F466F223	.400	1 1/8
.027	F466F273	.500	1 1/8
.033	F466F333	.500	1 1/8
.039	F466F393	.562	1 1/8
.047	F466F473	.562	1 1/8
.056	F466F563	.562	1 1/8
.068	F466F683	.562	1 1/8
.082	F466F823	.670	1 1/8
.10	F466F104	.670	1 1/8
.12	F466F124	.670	1 1/8
.15	F466F154	.670	1 1/8
.18	F466F184	.750	1 1/8
.22	F466F224	.750	1 1/8
.27	F466F274	1	1 1/8
.33	F466F334	1	1 1/8
.39	F466F394	1	2 1/8
.47	F466F474	1.0	2 1/8
.56	F466F564	1.0	2 1/8

"F" indicates "floating" for grounded substitute "G"

Add following to Part No. for tolerance: —20 = +20%; —10 = +10%; —5 = ±5%

TYPICAL CURVES





THE GUDEMAN CORPORATION
capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

"XC" plastic film dielectric

series XC203 & XC204—

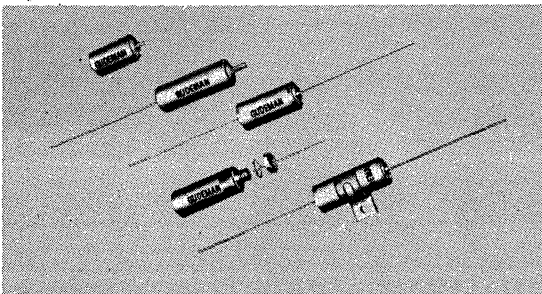
HERMETICALLY SEALED (GLASS-TO-METAL)

TUBULAR CASED

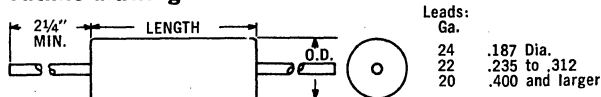
—65°C TO +165°C WITHOUT DERATING

EXTENDED FOIL CONSTRUCTION

200 VDC THRU 600 VDC



outline drawing



Dimensions shown are for uninsulated types. When insulating sleeving is required the diameter shall be increased by a maximum of .04" and the length shall be increased by 1/8" ± 1/4".

Mtg. by means of lead wires is not recommended for units larger than .562 x 1 1/8" Lg.

specifications

INSULATION RESISTANCE

The minimum insulation resistance when measured with an applied potential of 100 volts and an electrification time of two minutes shall be as follows:

At 25°C—75,000 megohm-mfds. minimum, but need not exceed 200,000 megohms

At 85°C—4000 megohm-mfds. minimum, but need not exceed 8000 megohms.

At 125°C—250 megohm-mfds. minimum, but need not exceed 500 megohms.

At 165°C—50 megohm-mfds. minimum, but need not exceed 100 megohms.

NOTE—The above IR characteristics are very conservative and it can be generally expected that they will be much higher than specified. The Gudeman engineering dept. believes that in introducing a new line of capacitors a conservative view point be maintained, thereby proffering a component which will offer the greatest degree of reliability.

POWER FACTOR

The power factor of these capacitors shall be no greater than .5 percent when measured at 1000 cps at 25°C.

ACCELERATED LIFE TEST

These capacitors shall withstand an accelerated life test of 250 hours at 165°C with an applied voltage of 140 percent of rated voltage on units not exceeding .05 watt seconds.

One failure in 12 samples permitted.

TEST VOLTAGE

These capacitors shall withstand a DC voltage equal to 200 percent of the rated voltage for one minute at a temperature of 25°C.

MOISTURE RESISTANCE AND VIBRATION

These capacitors shall meet the requirements for Moisture Resistance and Vibration of Specification MIL-C-25A.

CAPACITANCE CHANGE

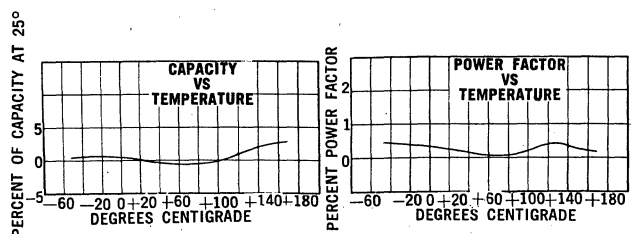
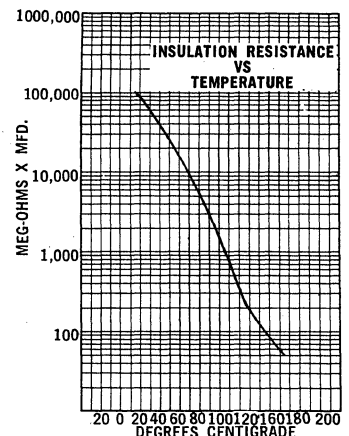
The capacitance change shall not be greater than —2 percent to +6 percent from —65°C to +165°C when compared to the nominal value measured at +25°C.

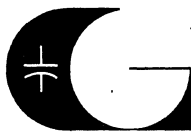
Part No.	Voltage WVDC	CAP. Mfd.	Circuit 203		Circuit 204	
			L ± 1/2	D ± .015	L ± 1/2	D ± .015
XC204C102-	200	.001	1 1/4	.187	3/4	.187
XC204C152-	200	.0015	1 1/4	.187	3/4	.187
XC204C222-	200	.0022	1 1/4	.235	7/8	.235
XC204C332-	200	.0033	1 1/4	.235	7/8	.235
XC204C472-	200	.0047	1 1/4	.235	7/8	.235
XC204C682-	200	.0068	1 1/4	.312	7/8	.312
XC204C103-	200	.010	1 1/4	.312	7/8	.312
XC204C153-	200	.015	1 1/4	.312	1	.312
XC204C223-	200	.022	1 1/4	.400	7/8	.400
XC204C333-	200	.033	1 1/4	.400	1	.400
XC204C473-	200	.047	1 1/4	.400	1 1/8	.400
XC204C683-	200	.068	1 1/4	.400	1 1/8	.400
XC204C104-	200	.10	1 1/4	.562	1 1/8	.562
XC204C154-	200	.15	1 1/4	.562	1 1/8	.562
XC204C224-	200	.22	1 1/4	.562	1 1/8	.562
XC204C334-	200	.33	1 1/4	.670	1 3/4	.670
XC204C474-	200	.47	1 1/4	.750	1 3/4	.750
XC204E102-	400	.001	1 1/4	.235	7/8	.235
XC204E152-	400	.0015	1 1/4	.235	7/8	.235
XC204E222-	400	.0022	1 1/4	.235	7/8	.235
XC204E332-	400	.0033	1 1/4	.312	7/8	.312
XC204E472-	400	.0047	1 1/4	.312	7/8	.312
XC204E682-	400	.0068	1 1/4	.312	1	.312
XC204E103-	400	.010	1 1/4	.400	7/8	.400
XC204E153-	400	.015	1 1/4	.400	7/8	.400
XC204E223-	400	.022	1 1/4	.400	1 1/8	.400
XC204E333-	400	.033	1 1/4	.400	1 1/8	.400
XC204E473-	400	.047	1 1/4	.400	1 1/8	.400
XC204E683-	400	.068	1 1/4	.562	1 1/8	.562
XC204E104-	400	.10	1 1/4	.562	1 1/8	.562
XC204E154-	400	.15	1 1/4	.670	1 1/8	.670
XC204E224-	400	.22	1 1/4	.750	1 3/4	.750
XC204E334-	400	.33	2 1/4	.750	2 1/4	.750
XC204F102-	600	.001	1 1/4	.235	7/8	.235
XC204F152-	600	.0015	1 1/4	.235	1	.235
XC204F222-	600	.0022	1 1/4	.312	7/8	.312
XC204F332-	600	.0033	1 1/4	.312	7/8	.312
XC204F472-	600	.0047	1 1/4	.312	1	.312
XC204F682-	600	.0068	1 1/4	.400	7/8	.400
XC204F103-	600	.010	1 1/4	.400	1	.400
XC204F153-	600	.015	1 1/4	.400	1 1/8	.400
XC204F223-	600	.022	1 1/4	.400	1 1/8	.400
XC204F333-	600	.033	1 1/4	.562	1 1/8	.562
XC204F473-	600	.047	1 1/4	.562	1 1/8	.562
XC204F683-	600	.068	1 1/4	.670	1 1/8	.670
XC204F104-	600	.10	1 1/4	.670	1 1/8	.670
XC204F154-	600	.15	1 1/4	.750	1 1/8	.750

"204" indicates "floating." Substitute "203" for "Grounded."

Add following to Part No. for tolerance: —20 = ±20% (Std.); —10 = ±10%; —5 = ±5%.

TYPICAL CURVES





THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

miniature "mylar"* dielectric

series P356

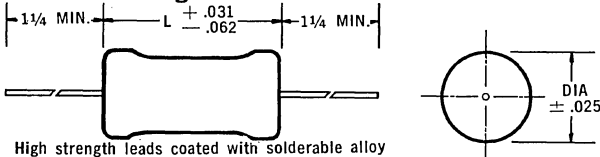
"BLUE-R"® TUBULAR

SEALED IN NEW EPOXY COAT

—55°C TO +125°C

80 VDC TO 600 VDC

outline drawing



High strength leads coated with solderable alloy

LEAD DIAMETERS: .138 and .170 Diameters: 22 AWG
.204 Diameter and larger: 20 AWG

specifications

DISSIPATION FACTOR

The dissipation factor shall not exceed 1.0% when measured at or referred to a frequency of 1,000 CPS at +25°C.

INSULATION RESISTANCE

The minimum insulation resistance when measured with an applied potential of 80 to 500 volts, but not to exceed the rated voltage, shall be as follows:

At + 25°C 50,000 megohm-mfds minimum but need not exceed 150,000 megohms.

At + 85°C 5,000 megohms-mfds minimum but need not exceed 15,000 ohms.

At + 125°C 50 megohms-mfds minimum but need not exceed 300 megohms.

TEST VOLTAGE

Shall withstand a DC voltage equal to 200% of the rated voltage for one minute at a temperature of +25%, ±5°C.

ACCELERATED LIFE TEST

Shall withstand an accelerated life test of 250 hours with 140% of the voltage rating, applied at the applicable high ambient temperature, per MIL-C-25C. Not more than one failure in 18 pieces tested shall be allowed.

VOLTAGE RATINGS

These capacitors are designed to operate over the temperature range of —55°C to +85°C at full rated DC voltage and up to +125°C with working voltages as follows:

+85°C	+125°C
600 VDC	300 VDC
400 VDC	200 VDC
200 VDC	150 VDC
80 VDC	50 VDC

MOISTURE ASSISTANCE

Capacitors shall withstand 500 hours of 95% relative humidity at 40°C. Voltage will not be applied. Upon completion of test, units will be dried for four hours. Minimum insulation resistance at 25°C. will be 25,000 megohm-mfds but need not exceed 75,000 megohms. Not more than one failure in 12 shall be permitted.

MARKING

Small size of units limits marking information to the following: capacity, voltage, series prefix (356), Gudeman or trademark.

LEAD PULL TEST

Shall withstand a five (5) pound pull applied axially for one minute.

LEAD BENDING TEST

Leads shall be bent without breakage about the point of egress from the capacitor. First 90 degrees in one direction then back to the original position, and then 90 degrees in the opposite direction.

CAPACITANCE CHANGE WITH TEMPERATURE

The capacitance change shall not exceed the following values with reference to the +25°C capacitance value:

TEMPERATURE	% CAP. CHANGE
— 55°C	—10% Maximum
+ 85°C	+ 5% Maximum
+125°C	+16% Maximum

80 VDC

CAP. IN MFDS.	Part No.	Dia.	L.
.001			
.0015			
.0022	P 356AZ222	.138"	3/16"
.0033	P 356AZ332	.138"	3/16"
.0047	P 356AZ472	.138"	3/16"
.0068	P 356AZ682	.170"	3/8"
.0082	P 356AZ822	.170"	3/8"
.01	P 356AZ103	.170"	3/8"
.012	P 356AZ123	.170"	3/8"
.015	P 356AZ153	.170"	3/8"
.018	P 356AZ183	.170"	3/8"
.022	P 356AZ223	.170"	3/8"
.027	P 356AZ273	.204"	1/2"
.033	P 356AZ333	.204"	1/2"
.039	P 356AZ393	.204"	1/2"
.047	P 356AZ473	.204"	1/2"
.056	P 356AZ563	.225"	1/2"
.068	P 356AZ683	.225"	1/2"
.082	P 356AZ823	.225"	1/2"
.1	P 356AZ104	.290"	1/2"
.12	P 356AZ124	.290"	5/8"
.15	P 356AZ154	.290"	5/8"
.18	P 356AZ184	.318"	5/8"
.22	P 356AZ224	.318"	5/8"
.27	P 356AZ274	.318"	7/8"
.33	P 356AZ334	.318"	7/8"
.39	P 356AZ394	.318"	1 1/8"
.47	P 356AZ474	.318"	1 1/8"

200 VDC

CAP. IN MFDS.	Part No.	Dia.	L.
.001	P 356C102	.138"	3/16"
.0015	P 356C152	.138"	3/16"
.0022	P 356C222	.170"	3/16"
.0033	P 356C332	.170"	3/16"
.0047	P 356C472	.170"	3/16"
.0068	P 356C682	.170"	3/16"
.0082	P 356C822	.170"	1/2"
.01	P 356C103	.170"	1/2"
.012	P 356C123	.204"	1/2"
.015	P 356C153	.204"	1/2"
.018	P 356C183	.204"	1/2"
.022	P 356C223	.204"	1/2"
.027	P 356C273	.225"	1/2"
.033	P 356C333	.225"	1/2"
.039	P 356C393	.290"	1/2"
.047	P 356C473	.290"	1/2"
.056	P 356C563	.290"	5/8"
.068	P 356C683	.290"	5/8"
.082	P 356C823	.318"	5/8"
.1	P 356C104	.318"	5/8"
.12	P 356C124	.318"	7/8"
.15	P 356C154	.318"	7/8"
.18	P 356C184	.318"	1 1/8"
.22	P 356C224	.318"	1 1/8"

400 VDC

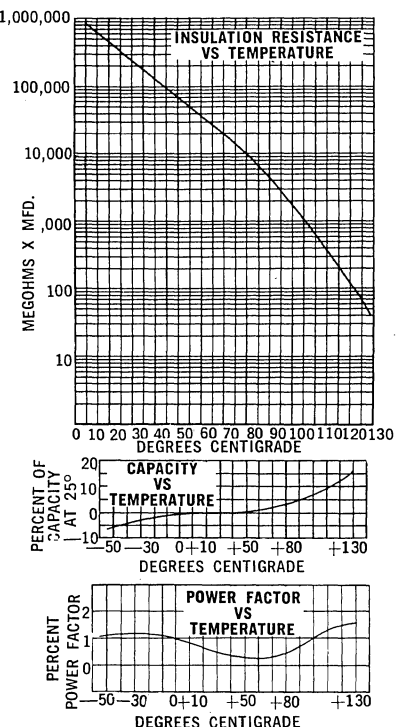
CAP. IN MFDS.	Part No.	Dia.	L.
.001	P 356E102	.170"	3/8"
.0015	P 356E152	.170"	3/8"
.0022	P 356E222	.170"	3/8"
.0033	P 356E332	.204"	3/8"
.0047	P 356E472	.204"	3/8"
.0068	P 356E682	.225"	3/8"
.0082	P 356E822	.225"	3/8"
.01	P 356E103	.225"	3/8"
.012	P 356E123	.290"	1/2"
.015	P 356E153	.290"	1/2"
.018	P 356E183	.290"	5/8"
.022	P 356E223	.290"	5/8"
.027	P 356E273	.318"	5/8"
.033	P 356E333	.318"	5/8"
.039	P 356E393	.318"	7/8"
.047	P 356E473	.318"	7/8"
.056	P 356E563	.318"	1 1/8"
.068	P 356E683	.318"	1 1/8"

600 VDC

CAP. IN MFDS.	Part No.	Dia.	L.
.001	P 356F102	.170"	1/2"
.0015	P 356F152	.204"	1/2"
.0022	P 356F222	.204"	1/2"
.0033	P 356F332	.225"	1/2"
.0047	P 356F472	.290"	5/8"
.0068	P 356F682	.290"	5/8"
.0082	P 356F822	.318"	5/8"
.01	P 356F103	.318"	5/8"
.012	P 356F123	.318"	7/8"
.015	P 356F153	.318"	7/8"
.018	P 356F183	.318"	7/8"
.022	P 356F223	.318"	7/8"

add following to part no. for tolerance:
—M = ±20%; —K = ±10%;
—J = ±5%

TYPICAL CURVES





THE GUDDAMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60640 ■ 312 337 7400 ■ TWX 910 221 3863

miniature "mylar"* dielectric

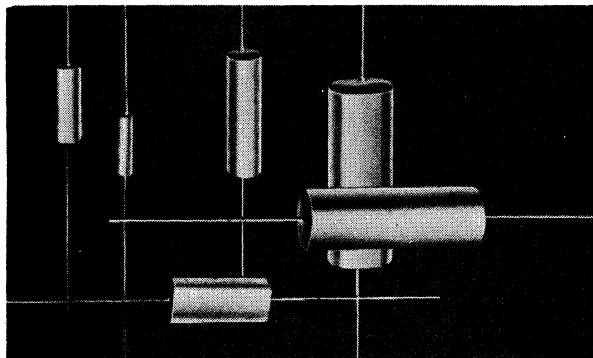
series 338 & 355

SEALED IN NON-METALLIC CASES with PLASTIC RESIN END SEALS

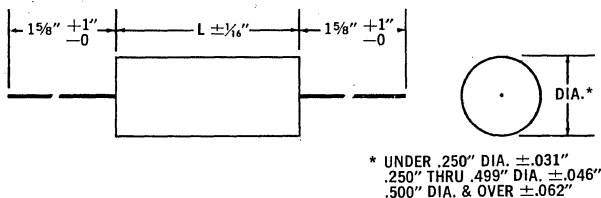
—55°C TO +125°C

50 VDC TO 600 VDC

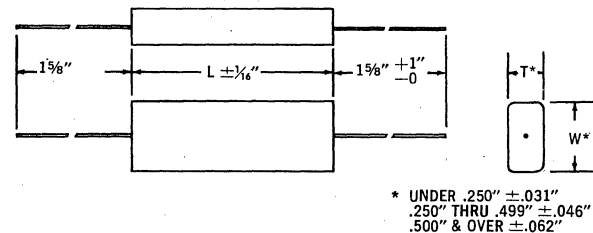
FLAT (series 338) AND TUBULAR (series 355)



series 355 case outline



series 338 case outline



specifications

DISSIPATION FACTOR

Less than 1.0% when measured at or referred to a frequency of 1000 CPS at +25°C, per MIL-C-25C.

INSULATION RESISTANCE

The minimum insulation resistance when measured with an applied potential of 50 to 500 volts, but not to exceed the rated voltage, shall be as follows:

At + 25°C 50,000 megohm-mfids minimum but need not exceed 150,000 megohms.

At + 85°C 1000 megohm-mfids minimum but need not exceed 6000 ohms.

At + 125°C 50 megohm-mfids minimum but need not exceed 300 megohms.

TEST VOLTAGE

Shall withstand a DC voltage equal to 200% of the rated voltage for one minute at a temperature of +25°C, $\pm 5^\circ\text{C}$.

ACCELERATED LIFE TEST

Shall withstand an accelerated life test of 250 hours with 140% of the voltage rating, applied at the applicable high ambient temperature, per MIL-C-25C.

The 355, and 338 series capacitors are furnished with high strength leads coated with a solderable alloy in the sizes shown below:

355 SERIES

Up to .156 Dia.
 .156 Dia. to .375 Dia.
 .375 to .750 Dia.
 Greater than .750 Dia.

GAUGE

#24 AWG
 #22 AWG
 #20 AWG
 #18 AWG

338 SERIES

"T" Dim. up to .156
 "T" Dim. .156 to .375
 "T" Dim. .375 to .750
 "T" Dim. Over .750

MOISTURE RESISTANCE

Shall withstand the moisture resistance requirements as specified in military specification MIL-C-25C.

VIBRATION-ACCELERATION

Shall withstand the Grade 3 vibration-acceleration requirements of MIL-C-25C.

VOLTAGE RATINGS

Designed to operate over the temperature range of -55°C to $+85^\circ\text{C}$ at full rated DC voltage and up to $+125^\circ\text{C}$ with working voltages as follows:

-55°C	+125°C
600 VDC	300 VDC
400 VDC	200 VDC
200 VDC	150 VDC
150 VDC	100 VDC
50 VDC	50 VDC

LEAD PULL TEST

Shall withstand a five (5) pound pull applied axially for one minute, per MIL-C-25C.

LEAD BEND TEST

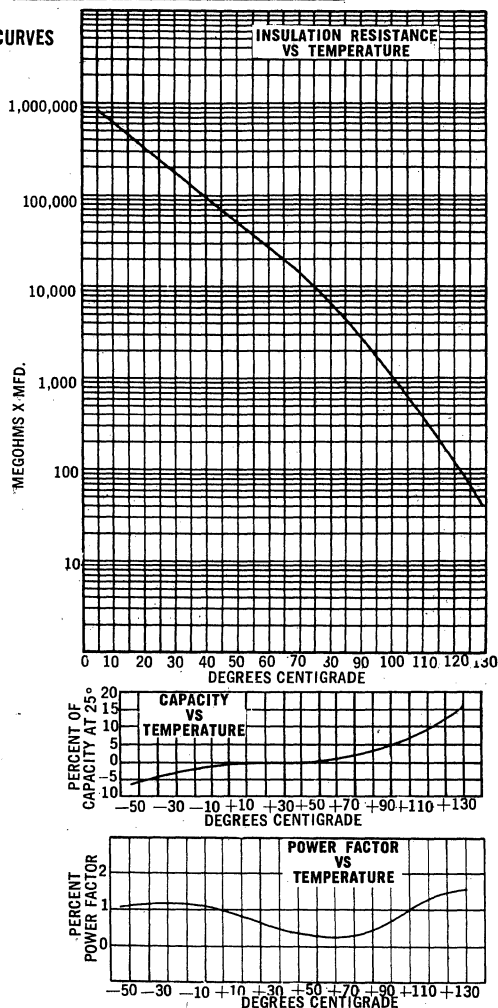
Shall be bent without breakage about the point of egress from the capacitor. First 90 degrees in one direction then back to the original position, and then 90 degrees in the opposite direction, per MIL-C-25C.

CAPACITANCE CHANGE WITH TEMPERATURE

The capacitance change shall not exceed the following values with reference to the +25°C capacitance value:

TEMPERATURE	% CAP. CHANGE
-55°C	-10% Maximum
+85°C	+5% Maximum
+125°C	+16% Maximum

TYPICAL CURVES



CAPACITORS (ALL TYPES)



THE GUDEMAN CORPORATION
capacitors and EMI filters

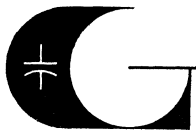
340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

series 355

CAP. IN MFDS.	Part No.	50 VDC. Dia.	L.	Part No.	150 VDC. Dia.	L.	Part No.	200 VDC. Dia.	L.	Part No.	400 VDC. Dia.	L.	Part No.	600 VDC. Dia.	L.
.001				355Y102	.156"	1/2"	355C102	.156"	1/2"	355E102	.156"	3/4"	355F102	.156"	1 1/4"
.0015				355Y152	.156"	1/2"	355C152	.156"	1/2"	355E152	.156"	3/4"	355F152	.171"	1 1/4"
.0022				355Y222	.156"	1/2"	355C222	.156"	1/2"	355E222	.156"	3/4"	355F222	.187"	1 1/4"
.0033				355Y332	.156"	1/2"	355C332	.156"	1/2"	355E332	.156"	3/4"	355F332	.218"	1 1/4"
.0047				355Y472	.156"	1/2"	355C472	.156"	1/2"	355E472	.156"	3/4"	355F472	.218"	3/4"
.0068				355Y682	.156"	1/2"	355C682	.156"	1/2"	355E682	.171"	1 1/4"	355F682	.250"	3/4"
.0082				355Y822	.156"	1/2"	355C822	.156"	1/2"	355E822	.187"	1 1/4"	355F822	.265"	3/4"
.01				355Y103	.156"	1/2"	355C103	.171"	1/2"	355E103	.203"	1 1/4"	355F103	.281"	3/4"
.012				355Y123	.171"	1/2"	355C123	.187"	1/2"	355E123	.218"	1 1/4"	355F123	.281"	1 1/4"
.015				355Y153	.187"	1/2"	355C153	.203"	1/2"	355E153	.234"	1 1/4"	355F153	.312"	1 1/4"
.018				355Y183	.187"	3/4"	355C183	.203"	1 1/4"	355E183	.250"	1 1/4"	355F183	.328"	1 1/4"
.022				355Y223	.203"	3/4"	355C223	.218"	1 1/4"	355E223	.265"	1 1/4"	355F223	.359"	1 1/4"
.027				355Y273	.203"	1 1/4"	355C273	.218"	1 1/4"	355E273	.250"	1 1/4"	355F273	.328"	1 1/4"
.033				355Y333	.203"	1 1/4"	355C333	.250"	1 1/4"	355E333	.281"	1 1/4"	355F333	.375"	1 1/4"
.039				355Y393	.234"	1 1/4"	355C393	.281"	1 1/4"	355E393	.296"	1 1/4"	355F393	.390"	1 1/4"
.047				355Y473	.234"	1 1/4"	355C473	.250"	1 1/4"	355E473	.328"	1 1/4"	355F473	.421"	1 1/4"
.056				355Y563	.234"	1 1/4"	355C563	.281"	1 1/4"	355E563	.296"	1 1/4"	355F563	.453"	1 1/4"
.068				355Y683	.250"	1 1/4"	355C683	.312"	1 1/4"	355E683	.312"	1 1/4"	355F683	.453"	1 1/4"
.082				355Y823	.265"	1 1/4"	355C823	.328"	1 1/4"	355E823	.343"	1 1/4"	355F823	.484"	1 1/4"
.1	355A104	.250"	1 1/4"	355Y104	.296"	1 1/4"	355C104	.359"	1 1/4"	355E104	.375"	1 1/4"	355F104	.453"	1 1/4"
.12	355A124	.265"	1 1/4"	355Y124	.328"	1 1/4"	355C124	.390"	1 1/4"	355E124	.359"	1 1/4"	355F124	.453"	1 1/4"
.15	355A154	.281"	1 1/4"	355Y154	.359"	1 1/4"	355C154	.421"	1 1/4"	355E154	.390"	1 1/4"	355F154	.500"	1 1/4"
.18	355A184	.312"	1 1/4"	355Y184	.343"	1 1/4"	355C184	.406"	1 1/4"	355E184	.375"	1 1/4"	355F184	.562"	1 1/4"
.22	355A224	.328"	1 1/4"	355Y224	.359"	1 1/4"	355C224	.437"	1 1/4"	355E224	.421"	1 1/4"	355F224	.609"	1 1/4"
.27	355A274	.359"	1 1/4"	355Y274	.359"	1 1/4"	355C274	.437"	1 1/4"	355E274	.468"	1 1/4"	355F274	.609"	2 1/4"
.33	355A334	.406"	1 1/4"	355Y334	.390"	1 1/4"	355C334	.484"	1 1/4"	355E334	.500"	1 1/4"	355F334	.640"	2 1/4"
.39	355A394	.359"	1 1/4"	355Y394	.406"	1 1/4"	355C394	.531"	1 1/4"	355E394	.546"	1 1/4"	355F394	.687"	2 1/4"
.47	355A474	.375"	1 1/4"	355Y474	.453"	1 1/4"	355C474	.546"	1 1/4"	355E474	.593"	1 1/4"	355F474	.765"	2 1/4"
.56	355A564	.406"	1 1/4"	355Y564	.421"	1 1/4"	355C564	.531"	1 1/4"	355E564	.593"	1 1/4"	355F564	.750"	2 1/4"
.68	355A684	.437"	1 1/4"	355Y684	.453"	1 1/4"	355C684	.578"	1 1/4"	355E684	.640"	1 1/4"	355F684	.828"	2 1/4"
.82	355A824	.484"	1 1/4"	355Y824	.500"	1 1/4"	355C824	.531"	1 1/4"	355E824	.687"	2 1/4"	355F824	.921"	2 1/4"
1.0	355A105	.468"	1 1/4"	355Y105	.531"	1 1/4"	355C105	.609"	1 1/4"	355E105	.750"	2 1/4"	355F105	.906"	2 1/4"
1.5	355A155	.578"	1 1/4"	355Y155	.718"	1 1/4"	355C155	.750"	1 1/4"	355E155	.828"	2 1/4"	355F155	1.109"	2 1/4"
2.0	355A205	.609"	1 1/4"	355Y205	.812"	1 1/4"	355C205	.906"	2 1/4"	355E205	.953"	2 1/4"	355F205	1.265"	2 1/4"
3.0	355A305	.734"	1 1/4"												
4.0	355A405	.765"	1 1/4"												
5.0	355A505	.859"	1 1/4"												

series 338

CAP. IN MFDS.	Part No.	50 VDC.			Part No.	150 VDC.			Part No.	200 VDC.			Part No.	400 VDC.			Part No.	600 VDC.		
		T.	W.	L.		T.	W.	L.		T.	W.	L.		T.	W.	L.		T.	W.	L.
.001					338Y102	.125"	.234"	1/2"	338C102	.125"	.250"	1/2"	338E102	.125"	.250"	5/8"	338F102	.125"	.250"	1 1/4"
.0015					338Y154	.125"	.234"	1/2"	338C154	.125"	.250"	1/2"	338E154	.125"	.250"	5/8"	338F154	.125"	.250"	1 1/4"
.0022					338Y222	.125"	.234"	1/2"	338C222	.125"	.250"	1/2"	338E222	.125"	.250"	5/8"	338F222	.125"	.250"	1 1/4"
.0033					338Y332	.125"	.234"	1/2"	338C332	.125"	.250"	1/2"	338E332	.125"	.250"	5/8"	338F332	.140"	.250"	1 1/4"
.0047					338Y472	.125"	.234"	1/2"	338C472	.125"	.250"	1/2"	338E472	.125"	.250"	5/8"	338F472	.140"	.250"	3/4"
.0068					338Y682	.125"	.234"	1/2"	338C682	.125"	.250"	1/2"	338E682	.125"	.250"	5/8"	338F682	.171"	.281"	3/4"
.0082					338Y822	.125"	.234"	1/2"	338C822	.125"	.250"	1/2"	338E822	.125"	.250"	5/8"	338F822	.187"	.312"	3/4"
.01					338Y103	.125"	.234"	1/2"	338C103	.125"	.250"	1/2"	338E103	.125"	.250"	5/8"	338F103	.203"	.328"	3/4"
.012					338Y123	.125"	.234"	1/2"	338C123	.125"	.250"	1/2"	338E123	.140"	.250"	5/8"	338F123	.203"	.328"	1 1/4"
.015					338Y153	.125"	.234"	1/2"	338C153	.125"	.250"	1/2"	338E153	.156"	.265"	5/8"	338F153	.234"	.343"	1 1/4"
.018					338Y183	.125"	.234"	3/4"	338C183	.125"	.250"	1 1/4"	338E183	.171"	.281"	1 1/4"	338F183	.265"	.375"	1 1/4"
.022					338Y223	.125"	.234"	3/4"	338C223	.140"	.250"	1 1/4"	338E223	.187"	.312"	1 1/4"	338F223	.281"	.406"	1 1/4"
.027					338Y273	.125"	.234"	1 1/4"	338C273	.140"	.250"	1 1/4"	338E273	.171"	.281"	1 1/4"	338F273	.218"	.375"	1 1/4"
.033					338Y333	.125"	.234"	1 1/4"	338C333	.171"	.281"	1 1/4"	338E333	.171"	.328"	1 1/4"	338F333	.250"	.453"	1 1/4"
.039					338Y393	.156"	.265"	1 1/4"	338C393	.203"	.328"	1 1/4"	338E393	.218"	.343"	1 1/4"	338F393	.281"	.437"	1 1/4"
.047					338Y473	.156"	.265"	1 1/4"	338C473	.171"	.281"	1 1/4"	338E473	.218"	.390"	1 1/4"	338F473	.281"	.500"	1 1/4"
.056					338Y563	.156"	.265"	1 1/4"	338C563	.187"	.312"	1 1/4"	338E563	.187"	.343"	1 1/4"	338F563	.312"	.546"	1 1/4"
.068					338Y683	.171"	.281"	1 1/4"	338C683	.234"	.343"	1 1/4"	338E683	.234"	.375"	1 1/4"	338F683	.296"	.531"	1 1/4"
.082					338Y823	.187"	.312"	1 1/4"	338C823	.250"	.375"	1 1/4"	338E823	.250"	.406"	1 1/4"	338F823	.343"	.562"	1 1/4"
.1	338A104	.171"	.296"	1 1/4"	338Y104	.203"	.375"	1 1/4"	338C104	.281"	.406"	1 1/4"	338E104	.281"	.437"	1 1/4"	338F104	.312"	.531"	1 1/4"
.12	338A124	.187"	.312"	1 1/4"	338Y124	.218"	.390"	1 1/4"	338C124	.312"	.437"	1 1/4"	338E124	.250"	.406"	1 1/4"	338F124	.312"	.531"	1 1/4"
.15	338A154	.203"	.329"	1 1/4"	338Y154	.218"	.421"	1 1/4"	338C154	.343"	.500"	1 1/4"	338E154	.281"	.437"	1 1/4"	338F154	.328"	.546"	1 1/4"
.18	338A184	.234"	.359"	1 1/4"	338Y184	.218"	.390"	1 1/4"	338C184	.281"	.437"	1 1/4"	338E184	.281"	.437"	1 1/4"	338F184	.375"	.687"	1 1/4"
.22	338A224	.250"	.375"	1 1/4"	338Y224	.218"	.468"	1 1/4"	338C224	.343"	.500"	1 1/4"	338E224	.312"	.468"	1 1/4"	338F224	.421"	.718"	1 1/4"
.27	338A274	.281"	.406"	1 1/4"	338Y274	.250"	.406"	1 1/4"	338C274	.328"	.500"	1 1/4"	338E274	.359"	.515"	1 1/4"	338F274	.421"	.718"	2 1/4"
.33	338A334	.328"	.453"	1 1/4"	338Y334	.281"	.437"	1 1/4"	338C334	.359"	.531"	1 1/4"	338E334	.406"	.562"	1 1/4"	338F334	.421"	.843"	2 1/4"
.39	338A394	.265"	.406"	1 1/4"	338Y394	.312"	.468"	1 1/4"	338C394	.421"	.593"	1 1/4"	338E394	.437"	.593"	1 1/4"	338F394	.468"	.875"	2 1/4"
.47	338A474	.281"	.421"	1 1/4"	338Y474	.359"	.515"	1 1/4"	338C474	.437"	.609"	1 1/4"	338E474	.437"	.671"	1 1/4"	338F474	.578"	.984"	2 1/4"
.56	338A564	.312"	.453"	1 1/4"	338Y564	.312"	.468"	1 1/4"	338C564	.421"	.593"	1 1/4"	338E564	.437"	.671"	1 1/4"	338F564	.531"	.906"	2 1/4"
.68	338A684	.343"	.484"	1 1/4"	338Y684	.343"	.515"	1 1/4"	338C684	.468"	.625"	1 1/4"	338E684	.484"	.718"	1 1/4"	338F684	.625"	1.015"	2 1/4"
.82	338A824	.390"	.531"	1 1/4"	338Y824	.406"	.562"	1 1/4"	338C824	.421"	.593"	1 1/4"	338E824	.468"	.859"	2 1/4"	338F824	.718"	1.437"	2 1/4"
1.0	338A105	.343"	.531"	1 1/4"	338Y105	.375"	.687"	1 1/4"	338C105	.468"	.625"	1 1/4"	338E105	.531"	.921"	2 1/4"	338F105	.656"	1.093"	2 1/4"
1.5	338A155	.453"	.640"	1 1/4"	338Y155	.562"	.796"	1 1/4"	338C155	.671"	.906"	1 1/4"	338E155	.671"	.906"	2 1/4"	338F155	.843"	1.265"	2 1/4"
2.0	338A205	.484"	.671"	1 1/4"	338Y205	.656"	.890"	1 1/4"	338C205	.625"	.953"	2 1/4"	338E205	.765"	1.046"	2 1/4"	338F205	1.000"	1.437"	2 1/4"
3.0	338A305	.609"	.796"	1 1/4"																
4.0	338A405	.609"	.843"	1 1/4"																
5.0	338A505	.703"	.937"	1 1/4"																



THE GUDEMAN CORPORATION
capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

polystyrene dielectric

series X-727

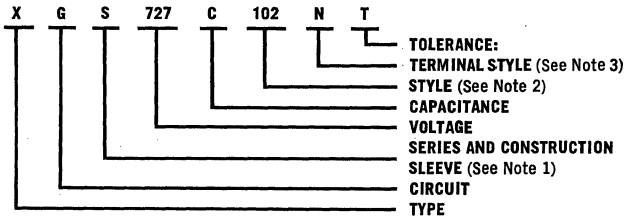
HERMETICALLY SEALED (GLASS TO METAL)

TUBULAR METALLIC CASE

-65°C TO +85°C

LOW DIELECTRIC ABSORPTION

example of catalog number



NOTE 1. Insert letter "S" only when insulating sleeve is required.

NOTE 2. Insert the letter for style required. Absence of letter symbol indicates basic style is to be furnished.

NOTE 3. Insert the letter "T" only when solder lug terminals are required in lieu of axial wire lead terminals.

CIRCUIT AND INTERNAL CONSTRUCTION

XG-727 Specifies — one terminal grounded, extended foil construction.

XF-727 Specifies — both terminals insulated, extended foil construction.

VOLTAGE RATING AT 85°C

DC Working Voltage	100	Symbol B
	200	C
	400	E
	600	F

SPECIAL CAPACITORS

Non-standard capacitance values and tolerances not listed are available upon special request. Polystyrene capacitors may also be obtained in bathtub and in rectangular case styles. The above coding system can be used in like manner to obtain any specific types desired when ordering.

ELECTRICAL AND ENVIRONMENTAL TESTS

Series X-727 Polystyrene capacitors will meet the applicable electrical and environmental requirements of Military Specification MIL-C-25C in addition to the more stringent requirements as specified herein.

CAPACITANCE

The nominal capacitance value is expressed in micro-microfarads by a three digit number. The first two digits are the first two digits of the capacitance value. The last digit designates the number of zeros which follow the first two digits.

CAPACITANCE TOLERANCE

For .0099 mfd. and smaller the Standard Tolerance is $\pm 20\%$. For .01 mfd. and larger the Standard Tolerance is $\pm 10\%$.

Tolerance Symbol	-20	Tolerance	$\pm 20\%$
	-10		$\pm 10\%$
	-5		$\pm 5\%$
	-2		$\pm 2\%$
	-1		$\pm 1\%$

LEAD SPECIFICATIONS

Standard lead length is $2\frac{1}{4}$ " min. in the following AWG sizes.

Case Diameter	.187	AWG Size	No. 24
	.235 to .312		No. 22
	.400 and larger		No. 20

SELECTION OF EXTENDED FOIL AND INSERTED TAB CONSTRUCTION

The extended foil construction is generally recommended except where a saving of size and space is of paramount importance and the circuit requirement is such that the applied voltage is not less than 10 volts and the higher loss, due to the inserted tab construction, does not constitute a critical factor in the design of the circuit.

specifications

TEST VOLTAGE

Withstand 200% of rated voltage for 1 minute at 25°C.

LIFE TEST

Not more than one failure of 12 units on test for 250 hours when tested at 140% of rated voltage at 85°C.

DISSIPATION FACTOR

Less than .05% at 1000 Hz and 25°C up to 1. ufd and less than .2% for values over 1. ufd.

INSULATION RESISTANCE

The minimum insulation resistance when measured with an applied potential of 100 volts and an electrification time of two minutes at 25°C shall be as follows: 500,000 megohms x mfd. minimum for capacitance values from 10 mfd. to .33 mfd. For values less than .33 mfd. insulation resistance to be 1,500,000 megohms min. but need not exceed 10,000,000 megohms.

CAPACITOR "Q"

"Q" is greater than 2000 up to 1 megacycle at 25°C.

CAPACITANCE STABILITY

Less than .25% drift per year.

TEMPERATURE COEFFICIENT OF CAPACITANCE

The capacitance change shall not be greater than +1.5% to -.8% from -65°C to +85°C when referred to 25°C capacitance value, or -100 PPM/°C ± 30 PPM/°C.

DIELECTRIC ABSORPTION

At 25°C — less than .05% of the initial 100 volts charging voltage shall reappear after charging for $\frac{1}{2}$ hour and immediately discharging for 10 seconds through 1 ohm resistor. Absorption Voltage should be read 5 minutes but not later than 10 minutes after removing shorting bar.

Percent dielectric absorption = $V_{\text{Absorp.}} / V_{\text{Charge}} \times 100$

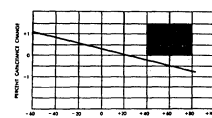
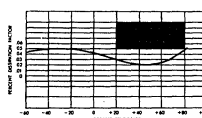
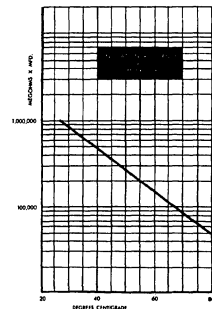
NOTES ON MEASUREMENT OF DIELECTRIC ABSORPTION

Dielectric absorption voltage is a complex phenomena and has been the subject of many studies at the Gudeman Co.

In general, the following holds true:

1. Absorption voltage is approximately proportional to charging time, charging voltage and temperature.
2. It decreases with longer shorting time.
3. Immediately after removal of shorting bar the measured absorption voltage appears low but rises steadily and finally levels off.

typical curves



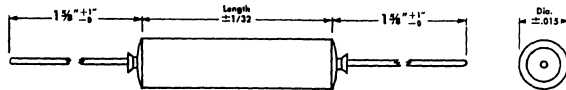


340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

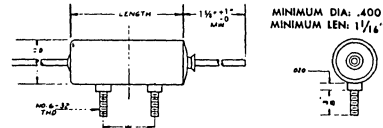
series X-727 (continued)

outline drawings

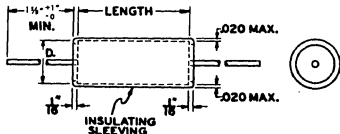
BASIC STYLE



STYLE "K"

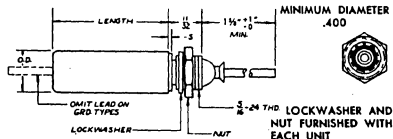


SLEEVING STYLE



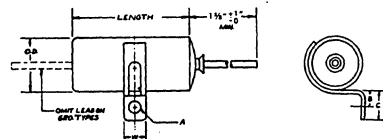
When "L" is	then "W" is
1 1/8"	5/8"
1 1/2"	3/4"
1 3/4"	7/8"
1 7/8"	1 1/8"
2 1/8"	1 1/4"
2 1/2"	1 3/8"
2 3/4"	2"

STYLE "N"



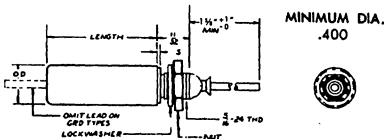
When "D" is	then "S" is
.400"	.000"
.562" (and up)	.031"

STYLE "J"



When "D" is	then "W" is	"A" is	"B" is	"C" is
.235"	1/4"	.144"	.187"	.312"
.312"	1/4"	.144"	.187"	.312"
.400"	1/4"	.144"	.187"	.312"
.562"	1/2"	.156"	.250"	.437"
.670"	1/2"	.156"	.250"	.437"
.750"	1/2"	.156"	.250"	.437"
1.000"				

STYLE "NF"



When "D" is	then "S" is
.400"	.000"
.562" (and up)	.031"

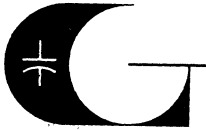
series XG-727

ONE TERMINAL GROUNDED — EXTENDED FOIL CONSTRUCTION*

Dimensions shown are for uninsulated types. When insulating sleeve is required the diameter shall be increased by a maximum of .04" and the length shall be increased by 1/8" ± 1/32". Mounting by means of lead wires is not recommended for units larger than .562" x 1 1/4".

Type	Cap. Mfd.	30 WVDC		100 WVDC		200 WVDC		400 WVDC		600 WVDC	
		D ± .015	L ± 1/32	D ± .015	L ± 1/32	D ± .015	L ± 1/32	D ± .015	L ± 1/32	D ± .015	L ± 1/32
XG-727-102	.001	.187	1 1/8"					.312	1 1/8"	.312	1 1/8"
XG-727-152	.0015	.187	1 1/8"					.312	1 1/8"	.312	1 1/8"
XG-727-222	.0022	.187	1 1/8"					.312	1 1/8"	.400	1 1/8"
XG-727-332	.0033	.187	1 1/8"			.235	1 1/8"	.312	1 1/8"	.400	1 1/8"
XG-727-472	.0047	.187	1 1/8"			.312	1 1/8"	.400	1 1/8"	.400	1 1/8"
XG-727-562	.0056	.235	1 1/8"								
XG-727-682	.0068	.235	1 1/8"	.235	3/4"	.400	1 1/8"	.400	1 1/8"	.400	1 1/8"
XG-727-822	.0082	.235	1 1/8"								
XG-727-103	.01	.235	1 1/8"	.312	1 1/8"	.400	1 1/8"	.400	1 1/8"	.400	1 1/8"
XG-727-123	.012	.235	1 1/8"								
XG-727-153	.015	.235	1 1/8"	.312	1 1/8"	.400	1 1/8"	.400	1 1/8"	.562	1 1/8"
XG-727-183	.018	.312	1 1/8"								
XG-727-223	.022	.312	1 1/8"	.400	1 1/8"	.400	1 1/8"	.562	1 1/8"	.562	1 1/8"
XG-727-273	.027	.312	1 1/8"								
XG-727-333	.033	.312	1 1/8"	.400	1 1/8"	.562	1 1/8"	.562	1 1/8"	.670	1 1/8"
XG-727-473	.047	.312	1 1/8"	.400	1 1/8"	.562	1 1/8"	.562	1 1/8"	.670	1 1/8"
XG-727-563	.056	.400	1 1/8"								
XG-727-683	.068	.400	1 1/8"	.562	1 1/8"	.562	1 1/8"	.670	1 1/8"	.750	2 1/8"
XG-727-823	.082	.400	1 1/8"								
XG-727-104	.1	.400	1 1/8"	.562	1 1/8"	.670	1 1/8"	1.00	1 1/8"	1.00	1 1/8"
XG-727-124	.12	.400	1 1/8"								
XG-727-153	.15	.400	1 1/8"	.562	1 1/8"	.670	1 1/8"	1.00	1 1/8"	1.00	2 1/8"
XG-727-184	.18										
XG-727-224	.22	.400	1 1/8"	.670	1 1/8"	.750	2 1/8"	1.00	1 1/8"	1.00	2 3/8"
XG-727-274	.27	.562	1 1/8"								
XG-727-334	.33	.562	1 1/8"	.670	1 1/8"	1.00	1 1/8"	1.00	2 1/8"		
XG-727-394	.39	.562	1 1/8"								
XG-727-474	.47	.562	1 1/8"	.750	2 1/8"	1.00	2 1/8"				
XG-727-564	.56	.670	1 1/8"								
XG-727-684	.68	.670	1 1/8"	1.00	1 1/8"	1.00	2 3/8"				
XG-727-105	1.0			1.00	2 1/8"						

* FOR SERIES XF-727 (both terminals insulated, extended foil construction) add 1/8" to length



THE GUDDAMAN CORPORATION

capacitors and EMI filters

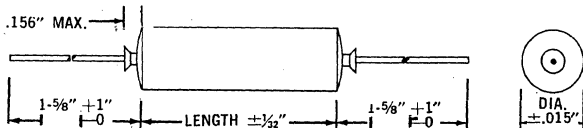
340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

miniature "mylar*"—foil (extended foil) dielectric

series 383

HERMETICALLY SEALED (GLASS-TO-METAL)
TUBULAR METALLIC CASES
—55°C TO +85°C WITHOUT DERATING
30 VDC THRU 600 VDC

outline drawing



Grounded circuits are available in all sizes: for grounded length subtract $\frac{1}{4}$ inch from catalog length.

Case Diameter (Inches)	Lead Gauge (AWG)
.175 and .195	24
.235 and .312	22
.400 and up	20

Standard leads consist of solid, bare, tinned wire. Special nickel leads are available for applications requiring a higher degree of weldability.

specifications

CAPACITANCE AND TOLERANCE

The capacitance limits at $\pm 25^\circ\text{C}$ are determined by the specified tolerance. Capacitors which have a nominal value of 1 MFD or less are measured or referred to a frequency of 1000 cps. Nominal capacitances above 1 MFD are measured at or referred to a frequency of 60 cps.

DISSIPATION FACTOR

Less than 0.6% at $\pm 25^\circ\text{C}$.

INSULATION RESISTANCE

The charging potential is equal to the specified operating voltage for a given temperature. The minimum electrification time is two minutes. Listed below are minimum values:

Temperature	Nominal Capacitance Mfd	R X C Megohms X Mfd	R Megohms
25°C	Greater than .5 Smaller than .5	50,000	100,000
85°C	Greater than .1 Smaller than .1	5,000	50,000
125°C	Greater than .02 Smaller than .02	100	5,000
150°C	Greater than .01 Smaller than .01	10	1,000

TEST VOLTAGE

Designed to withstand a test potential equal to 200% of the rated voltage for two minutes at 25°C.

The test voltage must be applied and discharged through a current limiting resistance of approximately 1000 ohms.

VOLTAGE RATING ABOVE 85°C

Derate above +85°C at a rate of 1.2% of rated voltage per degree C.

ACCELERATED LIFE TEST

Capacitors are designed to withstand a test potential equal to 140% of the rated voltage at the test temperature used for a period of 250 hours. One failure in 25 samples tested is permitted. The life test voltage must be applied and discharged through a current limiting resistance of approximately 1,000 ohms.

TEMPERATURE AND IMMERSION CYCLING

Designed to meet all requirements of the applicable paragraph of the latest issue of MIL-C-25.

MOISTURE RESISTANCE

Designed to meet all requirements of the applicable paragraph of the latest issue of MIL-C-25.

VIBRATION

Designed to withstand the Grade 3 vibration tests of the applicable paragraph of the latest issue of MIL-C-25.

AC VOLTAGE RATING

Designed to operate safely up to the following AV voltages at 85°C.

NOMINAL VOLTAGE VDC	AC — VOLTAGES AT 85°C (rms)	
	Up to 120 cps	Up to 400 cps
100	70	56
200	140	70
400	280	110
600	420	160

For 105°C operation the listed AC voltages should be derated to 60% of the 85°C values.

If both AC and DC voltages are present the sum of the DC voltage and the amplitude of the AC voltage must not exceed the specified DC-rating at a given temperature.

LEAD PULL TEST

Designed to withstand a steady pull force of 5 lbs. applied axially to a capacitor lead for one minute.

LEAD BENDING TEST

The leads withstand without breakage the following stresses performed near the point of egress: bend 90 degrees in one direction, then back to the original position and 90 degrees in the opposite direction.

30 VOLTS

Part No.	Cap MFD	Dia. In.	Length In.
F383Z155	1.5	.562	1 3/4
F383Z225	2.2	.670	1 3/4
F383Z335	3.3	.750	1 3/4
F383Z475	4.7	.750	2 3/4

50 VOLTS

Part No.	Cap MFD	Dia. In.	Length In.
F383A562	.0056	.175	3/4
F383A682	.0068	.175	3/4
F383A822	.0082	.175	3/4
F383A103	.01	.175	3/4
F383A123	.012	.175	3/4
F383A153	.015	.175	3/4
F383A183	.018	.195	3/4
F383A223	.022	.195	3/4
F383A273	.027	.195	3/4
F383A333	.033	.195	3/4
F383A393	.039	.235	3/4
F383A473	.047	.235	3/4
F383A563	.056	.312	7/8
F383A683	.068	.312	7/8
F383A823	.082	.312	7/8
F383A104	.1	.312	7/8
F383A124	.12	.312	7/8
F383A154	.15	.312	7/8
F383A184	.18	.400	7/8
F383A224	.22	.400	7/8
F383A274	.27	.400	7/8
F383A334	.33	.400	7/8
F383A394	.39	.400	1 1/8
F383A474	.47	.400	1 1/8
F383A564	.56	.400	1 3/8
F383A684	.68	.400	1 3/8
F383A824	.82	.562	1 3/8
F383A105	1.0	.562	1 3/8

200 VOLTS

Part No.	Cap MFD	Dia. In.	Length In.
F383C562	.0056	.235	3/4
F383C682	.0068	.235	3/4
F383C822	.0082	.235	3/4
F383C103	.01	.235	3/4
F383C123	.012	.235	3/4
F383C153	.015	.235	3/4
F383C183	.018	.235	3/4
F383C223	.022	.235	3/4
F383C273	.027	.312	7/8
F383C333	.033	.312	7/8
F383C393	.039	.312	7/8
F383C473	.047	.312	7/8
F383C563	.056	.312	7/8
F383C683	.068	.312	7/8
F383C823	.082	.400	7/8
F383C104	.1	.400	7/8
F383C124	.12	.400	7/8
F383C154	.15	.400	7/8
F383C184	.18	.400	7/8
F383C224	.22	.400	1 1/8
F383C274	.27	.400	1 1/8
F383C334	.33	.400	1 1/8
F383C394	.39	.562	1 1/8
F383C474	.47	.562	1 1/8
F383C564	.56	.562	1 3/8
F383C684	.68	.562	1 3/8
F383C824	.82	.562	1 3/8
F383C105	1.0	.562	1 3/8

100 VOLTS

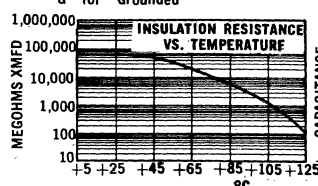
Part No.	Cap MFD	Dia. In.	Length In.
F383B102	.001	.175	3/4
F383B122	.0012	.175	3/4
F383B152	.0015	.175	3/4
F383B182	.0018	.175	3/4
F383B222	.0022	.175	3/4
F383B272	.0027	.175	3/4
F383B332	.0033	.175	3/4
F383B392	.0039	.175	3/4
F383B472	.0047	.175	3/4
F383B562	.0056	.195	3/4
F383B682	.0068	.195	3/4
F383B822	.0082	.235	3/4
F383B103	.01	.235	3/4
F383B123	.012	.235	3/4
F383B153	.015	.235	3/4
F383B183	.018	.235	3/4
F383B223	.022	.235	3/4
F383B273	.027	.312	7/8
F383B333	.033	.312	7/8
F383B393	.039	.312	7/8
F383B473	.047	.312	7/8
F383B563	.056	.312	7/8
F383B683	.068	.312	7/8
F383B823	.082	.400	7/8
F383B104	.1	.400	7/8
F383B124	.12	.400	7/8
F383B154	.15	.400	7/8
F383B184	.18	.400	1 1/8
F383B224	.22	.400	1 1/8
F383B274	.27	.400	1 1/8
F383B334	.33	.400	1 1/8
F383B394	.39	.562	1 1/8
F383B474	.47	.562	1 1/8
F383B564	.56	.562	1 3/8
F383B684	.68	.562	1 3/8
F383B824	.82	.562	1 3/8
F383B105	1.0	.562	1 3/8
F383B155	1.5	.670	1 3/8
F383B205	2.0	.750	1 3/8

400 VOLTS

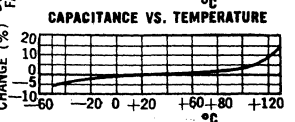
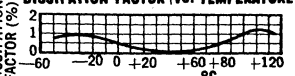
Part No.	Cap MFD	Dia. In.	Length In.
F388E272	.0027	.235	3/4
F388E332	.0033	.235	3/4
F388E392	.0039	.235	3/4
F388E472	.0047	.235	3/4
F388E562	.0056	.312	7/8
F388E682	.0068	.312	7/8
F388E822	.0082	.312	7/8
F388E103	.01	.312	7/8
F388E123	.012	.312	7/8
F388E153	.015	.312	7/8
F388E183	.018	.312	1
F388E223	.022	.312	1
F388E273	.027	.400	7/8
F388E333	.033	.400	7/8
F388E393	.039	.400	1
F388E473	.047	.400	1
F388E563	.056	.400	1 1/4
F388E683	.068	.400	1 1/4
F388E823	.082	.400	1 1/2
F388E104	.1	.400	1 1/2
F388E124	.12	.562	1 1/8
F388E154	.15	.562	1 1/8
F388E184	.18	.562	1 1/2
F388E224	.22	.562	1 1/2
F388E274	.27	.562	1 3/8
F388E334	.33	.562	1 3/8
F388E394	.39	.670	1 3/8
F388E474	.47	.670	1 3/8
F388E564	.56	.750	2 1/8
F388E684	.68	.750	2 1/8
F388E824	.82	.750	2 3/8
F388E105	1.0	.750	2 3/8

Add following to part no. to indicate tolerance: —20 = $\pm 20\%$; —10 = $\pm 10\%$; —5 = $\pm 5\%$

"F" Indicates "Floating", Substitute "G" for "Grounded"



DISSIPATION FACTOR VS. TEMPERATURE





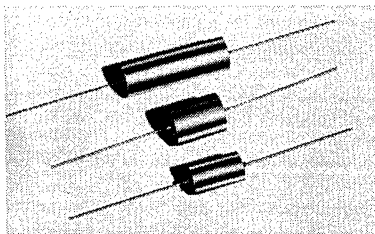
THE GUDEMAN CORPORATION

capacitors and EMI filters

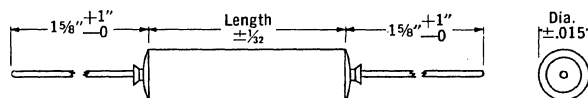
340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

extended foil teflon dielectric series 371

HERMETICALLY SEALED (GLASS TO METAL)
TUBULAR METAL CASE
—55°C TO +200°C WITHOUT DERATING
200 VDC THRU 600 VDC



outline drawing



LEAD SPECIFICATIONS: Solid tinned leads 1 5/8" long +1" —0 tolerance. No. 22 AWG for .235" and .312" Dia. cans. No. 20 AWG for larger case diameters. For Series F371 (Both Terminals Insulated From Case) add 1/4" to above case length for diameters larger than .400". For diameters .400 and smaller add 1/2" to above case length.

specifications

DISSIPATION FACTOR

Maximum dissipation factor shall be 0.1% at +25°C when measured at a frequency of 1000 CPS. Maximum dissipation factor shall be 0.2% at +200°C.

INSULATION RESISTANCE

The minimum insulation resistance when measured with an applied potential of between 200 and 500 volts and an electrification time of 2 minutes, but never greater than rated voltage shall be as follows:

- At + 25°C 125,000 megohm-mfds capacitance values .5 MFD and greater.
250,000 megohms for cap. values below .5 MFDS.
- + 85°C 40,000 meg-mfds for cap. values 1. MFD and greater.
40,000 megohms for cap. values below 1. MFD.
- + 125°C 5,000 meg x mfds for cap. values .25 MFD and greater.

TEST VOLTAGE

Shall withstand a DC voltage equal to 200% of the rated voltage for 2 minutes. Test voltage will be applied and discharged through a current limiting resistor of one Ohm per volt.

LIFE TEST VOLTAGE

Shall withstand an accelerated life test of 250 hours at +200°C and 140% of rated voltage. One failure in 12 samples permitted.

CAPACITANCE DRIFT

Capacitance will drift less than 2% from its initial value at 25°C after being temperature cycled from —55°C to 200°C.

CAPACITANCE "Q"

The "Q" of Gudeman Series 371 will average 5000 up to +125°C and will exceed 500 at +200°C.

DIELECTRIC ABSORPTION

At +25°C less than .05% of the initial 100 volts charging voltage shall re-appear after charging for 1/2 hour and immediately discharging for 10 seconds through a one ohm resistor. Absorption voltage should be read 5 minutes, but not later than 10 minutes, after removing shorting bar. Percent dielectric absorption = V absorption x 100.
V charge

MOISTURE RESISTANCE AND VIBRATION

Shall meet the requirements for moisture resistance and vibration of Specification MIL-C-25A.

CAPACITANCE CHANGE WITH TEMPERATURE

Capacitance change shall not be greater than —4% at 200°C or +2.5% at —55°C relative to the nominal value at +25°C.

200 VDC

Part No.	Capacity	Dia. ±.015"	Length ±1/2"
G371C152	.0015	.235	2 3/4"
G371C392	.0039	.312	2 3/4"
G371C472	.0047	.312	2 3/4"
G371C822	.0082	.400	2 3/4"
G371C103	.01	.400	1 3/4"
G371C123	.012	.400	1 3/4"
G371C153	.015	.400	1 3/4"
G371C183	.018	.400	1 3/4"
G371C223	.022	.400	1 3/4"
G371C273	.027	.562	1 3/4"
G371C333	.033	.562	1 3/4"
G371C393	.039	.562	1 3/4"
G371F473	.047	.562	1 3/4"
G371F563	.056	.562	1 3/4"
G371F683	.068	.562	1 3/4"
G371F823	.082	.562	1 3/4"
G371F104	.1	.562	1 3/4"
G371F124	.12	.562	1 3/4"
G371F154	.15	.562	1 3/4"
G371F184	.18	.750	1 3/4"
G371F224	.22	.750	1 3/4"
G371F274	.27	1.00	1 3/4"
G371F394	.39	1.00	1 3/4"
G371F474	.47	1.00	2 3/4"

400 VDC

Part No.	Capacity	Dia. ±.015"	Length ±1/2"
G371E822	.0082	.400	2 3/4"
G371E103	.01	.400	1 3/4"
G371E153	.015	.400	1 3/4"
G371E183	.018	.562	1 3/4"
G371E223	.022	.562	1 3/4"
G371E273	.027	.562	1 3/4"
G371E333	.033	.562	1 3/4"
G371E393	.039	.562	1 3/4"
G371E473	.047	.562	1 3/4"
G371E563	.056	.562	1 3/4"
G371E683	.068	.562	1 3/4"
G371E823	.082	.670	1 3/4"
G371E104	.1	.670	1 3/4"
G471E124	.12	.750	2 1/4"
G371E154	.15	.750	2 1/4"
G371E184	.18	1.000	1 3/4"
G371E224	.22	1.000	1 3/4"
G371E274	.27	1.000	2 3/4"
G371E334	.33	1.000	2 3/4"

600 VDC continued

Part No.	Capacity	Dia. ±.015"	Length ±1/2"
G371F822	.0082	.400	1 3/4"
G371F103	.01	.400	1 3/4"
G371F123	.012	.400	1 3/4"
G371F153	.015	.400	1 3/4"
G371F183	.018	.562	1 3/4"
G371F223	.022	.562	1 3/4"
G371F273	.027	.562	1 3/4"
G371F333	.033	.562	1 3/4"
G371F393	.039	.562	1 3/4"
G371F473	.047	.562	1 3/4"
G371F563	.056	.562	1 3/4"
G371F683	.068	.562	1 3/4"
G371F823	.082	1.000	1 3/4"
G371F104	.1	1.000	1 3/4"
G371F124	.12	1.000	2 3/4"
G371F154	.15	1.000	2 3/4"

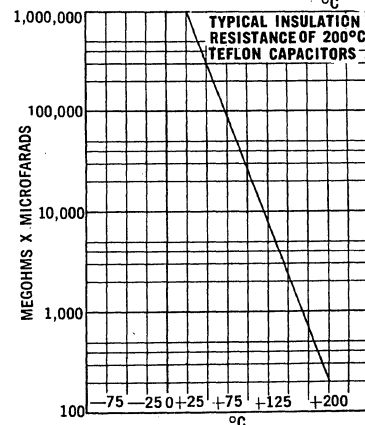
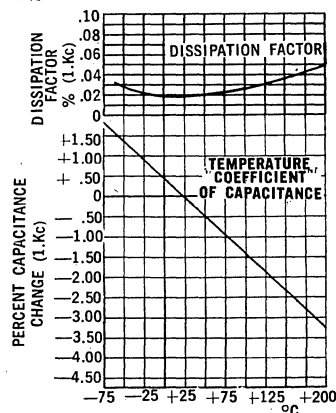
600 VDC

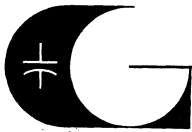
Part No.	Capacity	Dia. ±.015"	Length ±1/2"
G371F102	.001	.235	2 3/4"
G371F122	.0012	.312	2 3/4"
G371F152	.0015	.312	2 3/4"
G371F182	.0018	.312	2 3/4"
G371F222	.0022	.312	2 3/4"
G371F272	.0027	.312	2 3/4"
G371F332	.0033	.312	2 3/4"
G371F392	.0039	.400	2 3/4"
G371F472	.0047	.400	2 3/4"
G371F562	.0056	.400	2 3/4"
G371F682	.0068	.400	2 3/4"

"G" indicates "Grounded". Substitute "F" for "Floating"

Add following to part no. for tolerance: —20 = ±20%; —10 = ±10%; —5 = ±5%; —2 = ±2%; —1 = ±1%

TYPICAL CURVES





THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

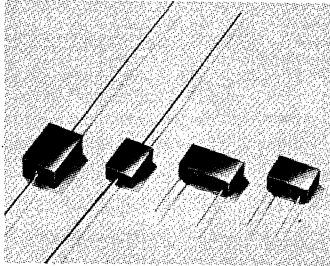
"thinfilm" metallized polycarbonate dielectric

series 317 & 318

ULTRAMINIATURE

SEALED IN RECTANGULAR EPOXY CASES
—55°C TO +125°C WITHOUT DERATING

SERIES 317 AXIAL LEADS
SERIES 318 RADIAL LEADS



specifications

OPERATING TEMPERATURE RANGE

317-318 series capacitors are designed to operate within the temperature range of —55°C to +125°C without voltage derating.

CAPACITANCE AND TOLERANCE

The capacitance limits at +25°C are determined by the specified tolerance. Capacitance is measured at or referred to a frequency of 1000 Hz.

DISSIPATION FACTOR

The dissipation factor at +25°C is less than 0.5% at 1000 Hz.

TEST VOLTAGE

Capacitors shall withstand a DC voltage equal to 200% of the rated voltage for one minute at a temperature of +25°C, ±5°C. Test will be applied through resistor of 1 ohm per volt.

INSULATION RESISTANCE

The minimum insulation resistance when measured at rated voltage but not to exceed 500 VDC shall be as follows:

At +25°C 100,000 megohm-mfds. minimum but need not exceed 200,000 megohms.

At +125°C 100 megohm-mfds. minimum but need not exceed 2000 megohms.

ACCELERATED LIFE TEST

Capacitors shall withstand an accelerated life test of 250 hours with 140% of applied rated voltage at applicable high test temperature. Only one failure in 12 capacitors tested shall be allowed. A failure is defined as the following:

A) If the capacitor has "opened".

B) If the capacitance has changed more than 5% from its original value.

C) If the insulation resistance is less than 30% of its original specified value.

D) If the dissipation factor is greater than 1%.

CAPACITANCE CHANGE WITH TEMPERATURE

The change of capacitance with reference to the actual value at +25°C shall not exceed ±2%.

LEAD SPECIFICATIONS

The 317 and 318 series capacitors are furnished with solid-bare, tinned lead. See table in part number listing for lead gauge.

NOTE: Nickel "A" weldable leads are available with capacitors specified in this bulletin, add letter "W" as a suffix on the part number.

LEAD PULL TEST

These capacitors shall withstand a five (5) pound pull applied axially for one minute.

LEAD BEND TEST

Leads shall be bent without breakage about the point of egress from the capacitor. First 90 degrees in one direction then back to the original position and then 90 degrees in the opposite direction.

HUMIDITY TEST

Capacitors shall withstand 250 hours of 95% relative humidity at 40°C. Voltage will not be applied. Upon completion of test, units will be dried for four hours. Minimum product of insulation resistance @ 25°C shall be 33% of the original specified value.

The capacitance is not to change more than 5% of its original value.

The dissipation factor shall not exceed 1.5%.

series 317

50 VDC

Cap.	L ±1/2	W ±.01	T ±.01	Lead Gauge	Gudeman Part No.
.001	.42	.29	.17	24	317A102
.0012	.42	.29	.17	24	317A122
.0015	.42	.29	.17	24	317A152
.0018	.42	.29	.17	24	317A182
.0022	.42	.29	.17	24	317A222
.0027	.42	.29	.17	24	317A272
.0033	.42	.29	.17	24	317A332
.0039	.42	.29	.17	24	317A392
.0047	.42	.29	.17	24	317A472
.0056	.42	.29	.17	24	317A562
.0068	.42	.29	.17	24	317A682
.0082	.42	.29	.17	24	317A822
.01	.42	.29	.17	24	317A103
.012	.42	.29	.17	24	317A123
.015	.42	.29	.17	24	317A153
.018	.42	.29	.17	24	317A183
.022	.42	.29	.17	24	317A223
.027	.42	.29	.17	24	317A273
.033	.42	.29	.17	24	317A333
.039	.42	.29	.17	24	317A393
.047	.42	.29	.17	24	317A473
.056	.42	.29	.17	24	317A563
.068	.42	.29	.17	24	317A683
.082	.42	.29	.17	24	317A823
.10	.42	.29	.17	24	317A104
.12	.57	.29	.17	24	317A124
.15	.57	.29	.17	24	317A154
.18	.57	.29	.17	24	317A184
.22	.57	.29	.17	24	317A224
.25	.55	.36	.23	24	317A254
.27	.55	.36	.23	24	317A274
.33	.55	.36	.23	24	317A334
.39	.55	.36	.23	24	317A394
.47	.55	.36	.23	24	317A474
.50	.57	.42	.29	24	317A504
.56	.57	.42	.29	24	317A564
.68	.57	.42	.29	24	317A684
.75	.82	.42	.29	22	317A754
.82	.82	.42	.29	22	317A824
1.0	.82	.42	.29	22	317A105
1.2	.82	.42	.29	22	317A125
1.5	.82	.54	.39	22	317A155
1.8	.82	.54	.39	22	317A185
2.0	.82	.54	.39	20	317A205
2.2	.82	.54	.39	22	317A225
2.7	1.24	.54	.39	20	317A275
3.0	1.24	.54	.39	20	317A305
3.3	1.24	.54	.39	20	317A335
3.9	1.24	.54	.39	20	317A395
4.7	1.24	.54	.39	20	317A475
5.0	1.24	.54	.39	20	317A505
5.6	1.24	.54	.39	20	317A565
6.8	1.20	.72	.56	20	317A685

100 VDC

Cap.	L ±1/2	W ±.01	T ±.01	Lead Gauge	Gudeman Part No.
.001	.42	.29	.17	24	317B102
.0012	.42	.29	.17	24	317B122
.0015	.42	.29	.17	24	317B152
.0018	.42	.29	.17	24	317B182
.0022	.42	.29	.17	24	317B222
.0027	.42	.29	.17	24	317B272
.0033	.42	.29	.17	24	317B392
.0039	.42	.29	.17	24	317B392
.0047	.42	.29	.17	24	317B472
.0056	.42	.29	.17	24	317B562
.0068	.42	.29	.17	24	317B682
.0082	.42	.29	.17	24	317B822
.01	.42	.29	.17	24	317B103
.012	.42	.29	.17	24	317B123
.015	.42	.29	.17	24	317B153
.018	.42	.29	.17	24	317B183
.022	.42	.29	.17	24	317B223
.027	.42	.29	.17	24	317B273
.033	.42	.29	.17	24	317B333
.039	.42	.29	.17	24	317B393
.047	.57	.29	.17	24	317B473
.056	.57	.29	.17	24	317B563
.068	.57	.29	.17	24	317B683
.082	.55	.36	.23	24	317B823
.10	.55	.36	.23	24	317B104
.12	.55	.36	.23	24	317B124
.15	.55	.36	.23	24	317B154
.18	.57	.42	.29	24	317B184
.22	.57	.42	.29	24	317B224
.25	.67	.42	.29	24	317B254
.27	.67	.42	.29	24	317B274
.33	.67	.42	.29	24	317B334
.39	.67	.42	.29	24	317B394
.47	.82	.42	.29	22	317B474
.50	.82	.42	.29	22	317B504
.56	.82	.54	.39	22	317B564
.68	.82	.54	.39	22	317B684
.75	.82	.54	.39	22	317B754
.82	.82	.54	.39	22	317B824
1.0	1.04	.54	.39	22	317B105
1.5	1.19	.54	.39	20	317B155
2.0	1.24	.72	.56	20	317B205
3.0	1.24	.72	.56	20	317B305
5.0	1.75	.72	.56	20	317B505

200 VDC

Cap.	L ±1/2	W ±.01	T ±.01	Lead Gauge	Gudeman Part No.
.001	.42	.29	.17	24	317C102
.0012	.42	.29	.17	24	317C122
.0015	.42	.29	.17	24	317C152
.0018	.42	.29	.17	24	317C182
.0022	.42	.29	.17	24	317C222
.0027	.42	.29	.17	24	317C272
.0033	.42	.29	.17	24	317C332
.0039	.42	.29	.17	24	317C392
.0047	.42	.29	.17	24	317C472
.0056	.42	.29	.17	24	317C562
.0068	.42	.29	.17	24	317C682
.0082	.42	.29	.17	24	317C822
.01	.42	.29	.17	24	317C103
.012	.42	.29	.17	24	317C123
.015	.42	.29	.17	24	317C153
.018	.42	.29	.17	24	317C183
.022	.57	.29	.17	24	317C223
.027	.57	.29	.17	24	317C273
.033	.57	.29	.17	24	317C333
.039	.57	.29	.17	24	317C393
.047	.55	.36	.23	24	317C473
.056	.55	.36	.23	24	317C563
.068	.55	.36	.23	24	317C683
.082	.57	.42	.29	24	317C823
.10	.57	.42	.29	24	317C104
.12	.57	.42	.29	24	317C124
.15	.67	.42	.29	24	317C154
.18	.67	.42	.29	24	317C184
.22	.82	.42	.29	22	317C224
.25	.82	.42	.29	22	317C254
.27	.82	.42	.29	22	317C274
.33	.82	.54	.39	22	317C334
.39	.82	.54	.39	22	317C394
.47	.82	.54	.39	22	317C474
.50	.82	.54	.39	22	317C504
.56	1.04	.54	.39	22	317C564
.68	1.04	.54	.39	20	317C684
.75	1.19	.54	.39	20	317C754
.82	1.19	.54	.39	20	317C824
1.0	1.24	.72	.56	20	317C105
1.5	1.24	.72	.56	20	317C155
2.0	1.75	.72	.56	20	317C205
3.0	1.75	.72	.56	20	317C305

NOTE: FILM-FOIL CONSTRUCTION MAY BE USED IN CAP. VALUES TO .01 UF



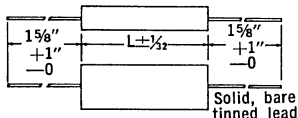
THE GUDDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

series 317 & 318 continued

outline drawings series 317

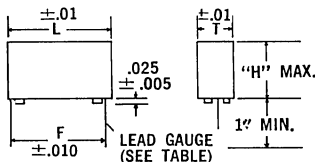


See Part No. Table for Lead Gauge.
Dimensions noted in inches.



NOTE: .42x.31x18 cases have one round standoff between leads.
.55 x .31 x 18 has two standoffs between leads.

series 318



NOTE: Nickel "A" weldable leads are available with capacitors specified in this bulletin, add letter "W" as a suffix on the part number.

series 318

50 VDC

Cap.	L	H	T	F	Lead Gauge	Gudeman Part No.
.001	.42	.31	.18	.300	22	318A102
.0012	.42	.31	.18	.300	22	318A122
.0015	.42	.31	.18	.300	22	318A152
.0018	.42	.31	.18	.300	22	318A182
.0022	.42	.31	.18	.300	22	318A222
.0027	.42	.31	.18	.300	22	318A272
.0033	.42	.31	.18	.300	22	318A332
.0039	.42	.31	.18	.300	22	318A392
.0047	.42	.31	.18	.300	22	318A472
.0056	.42	.31	.18	.300	22	318A562
.0068	.42	.31	.18	.300	22	318A682
.0082	.42	.31	.18	.300	22	318A822
.01	.42	.31	.18	.300	22	318A103
.012	.42	.31	.18	.300	22	318A123
.015	.42	.31	.18	.300	22	318A153
.018	.42	.31	.18	.300	22	318A183
.022	.42	.31	.18	.300	22	318A223
.027	.42	.31	.18	.300	22	318A273
.033	.42	.31	.18	.300	22	318A333
.039	.42	.31	.18	.300	22	318A393
.047	.42	.31	.18	.300	22	318A473
.056	.42	.31	.18	.300	22	318A563
.068	.42	.31	.18	.300	22	318A683
.082	.42	.31	.18	.300	22	318A823
.10	.42	.31	.18	.300	22	318A104
.12	.55	.31	.18	.400	22	318A124
.15	.55	.31	.18	.400	22	318A154
.18	.55	.31	.18	.400	22	318A184
.22	.55	.31	.18	.400	22	318A224
.27	.55	.38	.24	.400	22	318A254
.33	.55	.38	.24	.400	22	318A274
.39	.55	.38	.24	.400	22	318A334
.47	.55	.38	.24	.400	22	318A394
.56	.55	.44	.30	.400	22	318A474
.68	.55	.44	.30	.400	22	318A504
.82	.55	.44	.30	.400	22	318A564
1.0	.55	.44	.30	.400	22	318A684
1.2	.82	.44	.30	.600	22	318A824
1.5	.82	.44	.30	.600	22	318A105
1.8	.82	.44	.30	.600	22	318A125
2.0	.82	.56	.40	.600	22	318A155
2.2	.82	.56	.40	.600	22	318A185
2.7	.82	.56	.40	.600	22	318A225
3.0	.82	.56	.40	.600	22	318A275
3.3	1.24	.56	.40	1.100	20	318A335
3.9	1.24	.56	.40	1.100	20	318A395
4.7	1.24	.56	.40	1.100	20	318A475
5.0	1.24	.56	.40	1.100	20	318A505
5.6	1.24	.56	.40	1.100	20	318A565
6.8	1.24	.74	.57	1.100	20	318A685

100 VDC

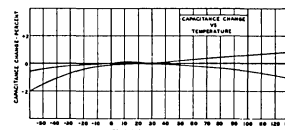
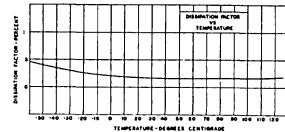
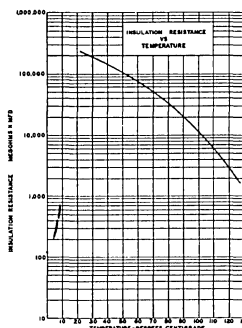
Cap.	L	H	T	F	Lead Gauge	Gudeman Part No.
.001	.42	.31	.18	.300	22	318B102
.0012	.42	.31	.18	.300	22	318B122
.0015	.42	.31	.18	.300	22	318B152
.0018	.42	.31	.18	.300	22	318B182
.0022	.42	.31	.18	.300	22	318B222
.0027	.42	.31	.18	.300	22	318B272
.0033	.42	.31	.18	.300	22	318B332
.0039	.42	.31	.18	.300	22	318B392
.0047	.42	.31	.18	.300	22	318B472
.0056	.42	.31	.18	.300	22	318B562
.0068	.42	.31	.18	.300	22	318B682
.0082	.42	.31	.18	.300	22	318B822
.01	.42	.31	.18	.300	22	318B103
.012	.42	.31	.18	.300	22	318B123
.015	.42	.31	.18	.300	22	318B153
.018	.42	.31	.18	.300	22	318B183
.022	.42	.31	.18	.300	22	318B223
.027	.42	.31	.18	.300	22	318B273
.033	.42	.31	.18	.300	22	318B333
.039	.42	.31	.18	.300	22	318B393
.047	.55	.31	.18	.400	22	318B473
.056	.55	.31	.18	.400	22	318B563
.068	.55	.31	.18	.400	22	318B683
.082	.55	.38	.24	.400	22	318B823
.10	.55	.38	.24	.400	22	318B104
.12	.55	.38	.24	.400	22	318B124
.15	.55	.38	.24	.400	22	318B154
.18	.55	.38	.24	.400	22	318B184
.22	.55	.44	.30	.400	22	318B224
.27	.67	.44	.30	.500	22	318B274
.33	.67	.44	.30	.500	22	318B334
.39	.67	.44	.30	.500	22	318B394
.47	.82	.44	.30	.600	22	318B474
.56	.82	.56	.40	.600	22	318B564
.68	.82	.56	.40	.600	22	318B684
.82	.82	.56	.40	.600	22	318B824
1.0	1.04	.56	.40	.800	22	318B105
1.2	1.24	.56	.40	1.100	20	318B125
1.5	1.24	.56	.40	1.100	20	318B155
1.8	1.24	.74	.57	1.100	20	318B185
2.0	1.24	.74	.57	1.100	20	318B205
2.2	1.24	.74	.57	1.100	20	318B225
2.7	1.24	.74	.57	1.100	20	318B275
3.0	1.24	.74	.57	1.100	20	318B305
3.3	1.75	.74	.57	1.600	20	318B335
3.9	1.75	.74	.57	1.600	20	318B395
4.7	1.75	.74	.57	1.600	20	318B475
5.0	1.75	.74	.57	1.600	20	318B505
5.6	1.75	.74	.57	1.600	20	318B565

200 VDC

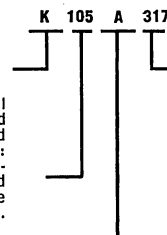
Cap.	L	H	T	F	Lead Gauge	Gudeman Part No.
.001	.42	.31	.18	.300	22	318C102
.0012	.42	.31	.18	.300	22	318C122
.0015	.42	.31	.18	.300	22	318C152
.0018	.42	.31	.18	.300	22	318C182
.0022	.42	.31	.18	.300	22	318C222
.0027	.42	.31	.18	.300	22	318C272
.0033	.42	.31	.18	.300	22	318C332
.0039	.42	.31	.18	.300	22	318C392
.0047	.42	.31	.18	.300	22	318C472
.0056	.42	.31	.18	.300	22	318C562
.0068	.42	.31	.18	.300	22	318C682
.0082	.42	.31	.18	.300	22	318C822
.01	.42	.31	.18	.300	22	318C103
.012	.42	.31	.18	.300	22	318C123
.015	.42	.31	.18	.300	22	318C153
.018	.42	.31	.18	.300	22	318C183
.022	.55	.31	.18	.400	22	318C223
.027	.55	.31	.18	.400	22	318C273
.033	.55	.31	.18	.400	22	318C333
.039	.55	.31	.18	.400	22	318C393
.047	.55	.38	.24	.400	22	318C473
.056	.55	.38	.24	.400	22	318C563
.068	.55	.38	.24	.400	22	318C683
.082	.55	.44	.30	.400	22	318C823
.10	.55	.44	.30	.400	22	318C104
.12	.55	.44	.30	.400	22	318C124
.15	.67	.44	.30	.500	22	318C154
.18	.67	.44	.30	.500	22	318C184
.22	.82	.44	.30	.600	22	318C224
.27	.82	.44	.30	.600	22	318C274
.33	.82	.56	.40	.600	22	318C334
.39	.82	.56	.40	.600	22	318C394
.47	.82	.56	.40	.600	22	318C474
.56	1.04	.56	.40	.800	22	318C564
.68	1.04	.56	.40	.800	22	318C684
.82	1.24	.56	.40	1.100	20	318C824
1.0	1.24	.74	.57	1.100	20	318C105
1.2	1.24	.74	.57	1.100	20	318C125
1.5	1.24	.74	.57	1.100	20	318C155
1.8	1.75	.74	.57	1.600	20	318C185
2.0	1.75	.74	.57	1.600	20	318C205
2.2	1.75	.74	.57	1.600	20	318C225
2.7	1.75	.74	.57	1.600	20	318C275
3.0	1.75	.74	.57	1.600	20	318C305

NOTE: FILM-FOIL CONSTRUCTION MAY BE USED IN CAP. VALUES TO .01 UF

typical curves



example of part number



CAPACITANCE TOLERANCE:
B = $\pm 2\%$ J = $\pm 5\%$
K = $\pm 10\%$ M = $\pm 20\%$

CAPACITANCE: The nominal capacitance value expressed in picofarads is identified by a three digit number. The first two digits represent significant figures and the last digit specifies the number of zeros to follow.

VOLTAGE RATING: A = 50

SERIES NUMBER:
317 metallized polycarbonate dielectric extended foil construction premoled plastic case, axial leads with resin end seal.

318 metallized polycarbonate, extended foil construction premoled plastic case, radial leads with resin end seal.



THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

metallized polycarbonate dielectric Series 409

series 409 & 410

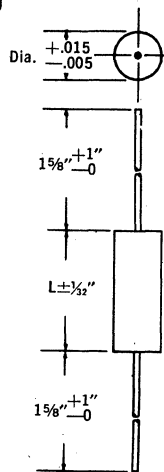
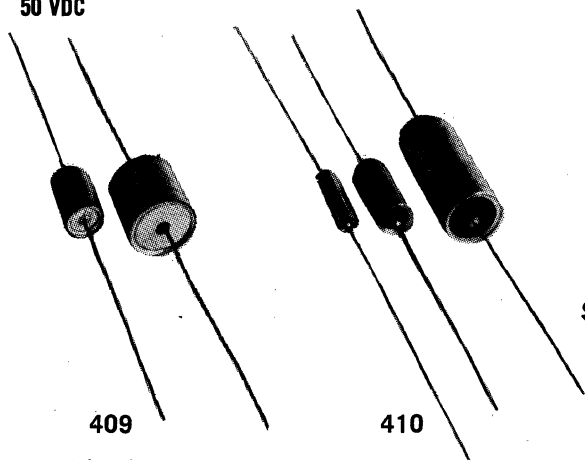
409 SERIES — HERMETICALLY SEALED (Ceramic End Seals)

410 SERIES — MINIATURE TUBULAR TYPES
(Metal Case — Glass to Metal Seals)

.00008" THICK FILM

—55°C TO +125°C WITHOUT DERATING

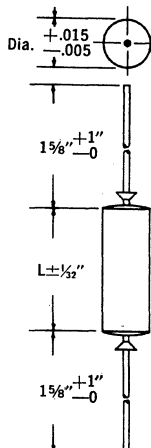
50 VDC



Dim. Include Solder Eyelet

LEADS: 24 gauge: .175 and .195 Dia.;
22 gauge: .235 and .312 Dia.; 20
gauge: .400 Dia. and larger case sizes.

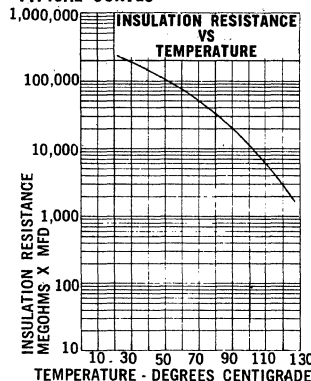
Series 410



LEADS: 24 gauge: .175 and .195
Dia.; 22 gauge: .235 and .312 Dia.;
20 gauge: .400 Dia. and larger case
sizes.

For Sleeve Add .020 max to Dia.
and 1/2 ± 1/2 to length

TYPICAL CURVES



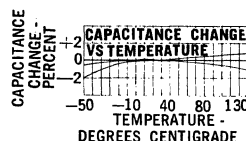
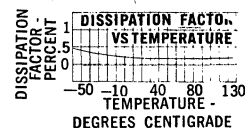
Part No.	Cap in MFDS.	Dia.	L
F409A103	.01	.175	1 1/2
F409A123	.012	.175	1 1/2
F409A153	.015	.175	1 1/2
F409A183	.018	.175	1 1/2
F409A223	.022	.175	1 1/2
F409A273	.027	.175	1 1/2
F409A333	.033	.175	1 1/2
F409A473	.047	.175	1 1/2
F409A563	.056	.175	1 1/2
F409A683	.068	.195	1 1/2
F409A823	.082	.195	1 1/2
F409A104	.1	.195	1 1/2
F409A124	.12	.235	1 1/2
F409A154	.15	.235	1 1/2
F409A184	.18	.312	1 1/2
F409A224	.22	.312	1 1/2
F409A274	.27	.312	1 1/2
F409A334	.33	.312	1 1/2
F409A474	.47	.400	1 1/2
*F409-.001	.56	.400	1 1/2
*F409A564	.56	.312	1 1/2
*F409-.002	.68	.500	1 1/2
F409A684	.68	.400	1 1/2
*F409-.003	.82	.500	1 1/2
F409A824	.82	.400	1 1/2
*F409-.004	1.0	.562	1 1/2
F409A105	1.0	.400	1 1/2
*F409-.005	1.2	.562	1 1/2
F409A125	1.2	.500	1 1/2
F409A155	1.5	.500	1 1/2
F409A205	2.0	.562	1 1/2
F409A305	3.0	.670	1 1/2

*Special No. assigned to alternate sizes for same cap. values.

Part No.	Cap in MFDS.	Dia.	L
F410A103	.01	.175	1 1/2
F410A123	.012	.175	1 1/2
F410A153	.015	.175	1 1/2
F410A183	.018	.175	1 1/2
F410A223	.022	.175	1 1/2
F410A273	.027	.175	1 1/2
F410A333	.033	.175	1 1/2
F410A473	.047	.175	1 1/2
F410A563	.056	.175	1 1/2
F410A683	.068	.175	5/8
F410A823	.082	.175	5/8
F410A104	.1	.175	5/8
F410A124	.12	.175	5/8
F410A154	.15	.195	5/8
F410A184	.18	.195	5/8
F410A224	.22	.235	5/8
F410A274	.27	.235	5/8
F410A334	.33	.312	5/8
F410A474	.47	.312	5/8
F410A564	.56	.312	5/8
F410A684	.68	.312	27/32
F410A824	.82	.312	27/32
F410A105	1.0	.312	27/32
F410A125	1.2	.400	27/32
F410A155	1.5	.400	27/32
F410A185	1.8	.400	27/32
F410A205	2.0	.400	27/32
F410A225	2.2	.400	1 1/8
F410A275	2.7	.400	1 1/8
F410A305	3.0	.400	1 1/8
F410A335	3.3	.400	1 1/8
F410A395	3.9	.500	1 1/8
F410A475	4.7	.500	1 1/8
F410A505	5.0	.500	1 1/8
F410A565	5.6	.500	1 1/8
F410A685	6.8	.562	1 1/8
F410A825	8.2	.562	1 1/8
F410A106	10.0	.670	1 1/8
F410A156	15.0	.750	1 3/8

"F" indicates "Floating". Substitute "G" for "Grounded".

Add following to part no. for tolerance: —20 = ±20%; —10 = ±10%; —5 = ±5%; —1 = ±1%.



specifications

CAPACITANCE AND TOLERANCE

The capacitance limits at +25°C are determined by the specified tolerance.

Capacitance is measured at or referred to a frequency of 1000 Hz.

DISSIPATION FACTOR

The dissipation factor at +25°C is less than 0.3% at 1000 Hz.

INSULATION RESISTANCE

The charging potential is equal to the specified operating voltage for a given temperature. The electrification time is two minutes. Listed below are minimum values:

TEMPERATURE	CAPACITANCE (mfd.)	RXC (megohms x mfd.)	R (megohms)
25°C	>.5	100,000	
	<.5		200,000
125°C	>.5	1000	
	<.5		2000

ACCELERATED LIFE TEST

Capacitors shall withstand an accelerated life test of 250 hours with 140% of applied rated voltage at applicable high test temperature. Only one failure in 18 capacitors tested shall be allowed. A failure is defined as the following:

- If the capacitor has "opened."
- If the capacitance has changed more than 5% from its original value.
- If the insulation resistance is less than 50% of its original value.



THE GUDDAMAN CORPORATION

capacitors and EMI filters

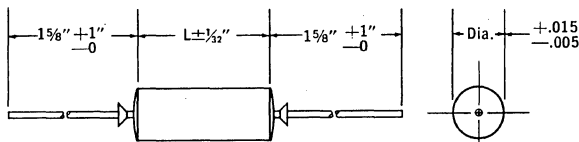
340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

miniature metallized polycarbonate dielectric

series 410

HERMETICALLY SEALED (GLASS-TO-METAL)
TUBULAR METALLIC CASES
—55°C TO +125°C WITHOUT DERATING
100 TO 400 VDC

outline drawing



Standard leads consist of solid, bare, tinned wire. Special nickel leads are available for applications requiring a higher degree of weldability.

LEADS: 24 gauge: .175 and .195 Dia.; 22 gauge: .235 and .312 Dia.; 20 gauge: .400 Dia. and larger case sizes.

For sleeving add .020 max. to Dia. and .032 +.032 extension to each end of capacitor.

specifications

CAPACITANCE AND TOLERANCE

The capacitance limits at +25°C are determined by the specified tolerance. Capacitors are measured or referred to a frequency of 1000 cps.

DISSIPATION FACTOR

The dissipation factor at +25°C is less than 0.3% at 1000 cps.

INSULATION RESISTANCE

The charging potential is equal to the specified operating voltage for a given temperature. The minimum electrification time is two minutes. Listed below are minimum values:

Temperature	Nominal Capacitance Mfd	R X C Megohms X mfd	R Megohms
25°C	Greater than .5 Smaller than .5	100,000	200,000
125°C	Greater than .5 Smaller than .5	1,000	2,000

TEST VOLTAGE

Shall withstand a DC voltage equal to 200% of the rated voltage for one minute at a temperature of +25°C, ±5°C. Test will be applied through resistor of 1 ohm per volt.

TEMPERATURE AND IMMERSION CYCLING

Designed to meet all requirements of the applicable paragraph of the latest issue of MIL-C-18312.

ACCELERATED LIFE TEST

Shall withstand an accelerated life test of 250 hours with 140% of applied rated voltage at applicable high test temperature. Only one failure in 18 capacitors tested shall be allowed. A failure is defined as the following.

- If the capacitor has "opened."
- If the capacitance has changed more than 5% from its original value.
- If the insulation resistance is less than 50% of its original value.
- If the DF is greater than 1%.

MOISTURE RESISTANCE

Designed to meet all requirements of the applicable paragraph of the latest issue of MIL-C-18312.

VIBRATION

Designed to withstand the Grade 3 vibration tests of the applicable paragraph of the latest issue of MIL-C-18312.

A-C VOLTAGE RATING:

(—55°C to +85°C Ambient)

D-C Voltage Rating	400 cps
100	65
200	120
300	200
400	240

LEAD PULL TEST

Designed to withstand a steady pull force of 5 lbs. applied axially to a capacitor lead for one minute.

LEAD BENDING TEST

The leads shall withstand without breakage the following stresses performed near the point of egress: bend 90 degrees in one direction, then back to the original position and 90 degrees in the opposite direction.

CAPACITANCE CHANGE WITH TEMPERATURE

The change of capacitance with reference to the actual value at +25°C does not exceed the following limits:

TEMPERATURE	CHANGE OF CAPACITANCE
—55°C	2%
+125°C	1%

100 VDC

Cap In MFDS.	Part No.	Dia.*	L.*
.01	F410B103	.175	3/16"
.012	F410B123	.175	3/16"
.015	F410B153	.175	3/16"
.018	F410B183	.195	3/16"
.022	F410B223	.195	3/16"
.027	F410B273	.195	3/16"
.033	F410B333	.195	3/16"
.039	F410B393	.195	3/16"
.047	F410B473	.195	5/8"
.056	F410B563	.195	5/8"
.068	F410B683	.235	5/8"
.082	F410B823	.235	5/8"
.1	F410B104	.235	1 1/16"
.12	F410B124	.235	1 1/16"
.15	F410B154	.312	5/8"
.18	F410B184	.312	5/8"
.22	F410B224	.312	1 1/16"
.27	F410B274	.312	1 1/16"
.33	F410B334	.312	1 1/16"
.39	F410B394	.312	1 1/16"
.47	F410B474	.400	1 1/16"
.56	F410B564	.400	1 1/16"
.68	F410B684	.400	1 1/16"
.82	F410B824	.400	1 1/16"
1.0	F410B105	.400	1"
1.5	F410B155	.500	1 1/8"
2.0	F410B205	.500	1 3/8"
3.0	F410B305	.562	1 3/8"
4.0	F410B405	.670	1 3/8"
5.0	F410B505	.670	1 3/8"
7.0	F410B705	.750	1 7/8"
8.0	F410B805	.750	2 1/8"
10.0	F410B106	1.00	2 1/8"

200 VDC

Cap In MFDS.	Part No.	Dia.*	L.*
.01	F410C103	.175	3/16"
.012	F410C123	.195	3/16"
.015	F410C153	.195	3/16"
.018	F410C183	.235	3/16"
.022	F410C223	.235	3/16"
.027	F410C273	.235	3/16"
.033	F410C333	.235	3/16"
.039	F410C393	.235	3/16"
.047	F410C473	.235	3/16"
.056	F410C563	.235	3/16"
.068	F410C683	.312	3/16"
.082	F410C823	.312	3/16"
.1	F410C104	.312	3/16"
.12	F410C124	.312	3/16"
.15	F410C154	.312	3/16"
.18	F410C184	.400	3/16"
.22	F410C224	.400	3/16"
.27	F410C274	.400	1 1/16"
.33	F410C334	.400	1 1/16"
.39	F410C394	.400	1 1/16"
.47	F410C474	.400	1 1/16"
.56	F410C564	.562	1 1/16"
.68	F410C684	.562	1 1/16"
.82	F410C824	.562	1 1/16"
1.0	F410C105	.562	1 1/16"
1.5	F410C155	.670	1 1/16"
2.0	F410C205	.670	1 1/16"
3.0	F410C305	.750	1 7/8"
4.0	F410C405	.750	2 1/8"
5.0	F410C505	.750	2 1/8"
7.0	F410C705	1.00	2 1/8"
8.0	F410C805	1.00	2 1/8"
10.0	F410C106	1.00	2 1/8"

300 VDC

Cap In MFDS.	Part No.	Dia.*	L.*
.01	F410D103	.235	1 1/16"
.012	F410D123	.312	1 1/16"
.015	F410D153	.312	1 1/16"
.018	F410D183	.312	1 1/16"
.022	F410D223	.312	1 1/16"
.027	F410D273	.312	1 1/16"
.033	F410D333	.312	1 1/16"
.039	F410D393	.312	1 1/16"
.047	F410D473	.312	1 1/16"
.056	F410D563	.312	1 1/16"
.068	F410D683	.312	1 1/16"
.082	F410D823	.400	1 1/16"
.1	F410D104	.400	1 1/16"
.12	F410D124	.400	1 1/16"
.15	F410D154	.400	1 1/16"
.18	F410D184	.500	1 1/16"
.22	F410D224	.500	1 1/16"
.27	F410D274	.562	1 1/16"
.33	F410D334	.562	1 1/16"
.39	F410D394	.562	1 1/16"
.47	F410D474	.562	1 1/16"
.56	F410D564	.562	1 1/16"
.68	F410D684	.562	1 1/16"
.82	F410D824	.670	1 1/16"
1.0	F410D105	.670	1 1/16"
1.5	F410D155	.750	2 1/8"
2.0	F410D205	.750	2 3/8"
3.0	F410D305	1.00	1 7/8"
4.0	F410D405	1.00	2 3/8"

400 VDC

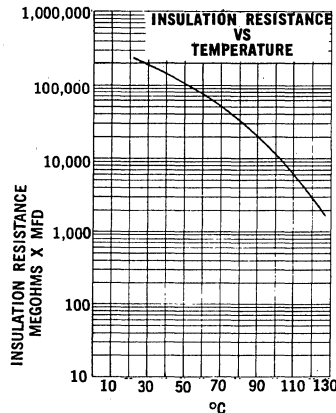
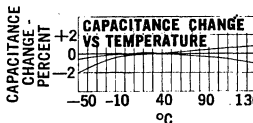
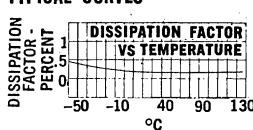
Cap In MFDS.	Part No.	Dia.*	L.*
.01	F410E103	.312	1 1/16"
.012	F410E123	.312	1 1/16"
.015	F410E153	.312	1 1/16"
.018	F410E183	.312	1 1/16"
.022	F410E223	.312	1 1/16"
.027	F410E273	.312	1 1/16"
.033	F410E333	.312	1 1/16"
.039	F410E393	.312	1 1/16"
.047	F410E473	.312	1 1/16"
.056	F410E563	.400	1 1/16"
.068	F410E683	.400	1 1/16"
.082	F410E823	.400	1 1/16"
.1	F410E104	.400	1 1/16"
.12	F410E124	.500	1 1/16"
.15	F410E154	.500	1 1/16"
.18	F410E184	.562	1 1/16"
.22	F410E224	.562	1 1/16"
.27	F410E274	.562	1 1/16"
.33	F410E334	.562	1 1/16"
.39	F410E394	.670	1 1/16"
.47	F410E474	.670	1 1/16"
.56	F410E564	.670	1 1/16"
.68	F410E684	.670	1 1/16"
.82	F410E824	.750	2 1/8"
1.0	F410E105	.750	2 1/8"
1.5	F410E155	1.00	2 1/8"
2.0	F410E205	1.00	2 1/8"

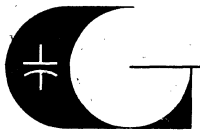
*Sizes shown are for floating circuit. Subtract 1/8" from length for grounded circuit.

"F" indicates "Floating". Substitute "G" for Grounded.

Add following to part no. for tolerance: —20 = ±20%; —10 = ±10%; —5 = ±5%; —1 = ±1%.

TYPICAL CURVES





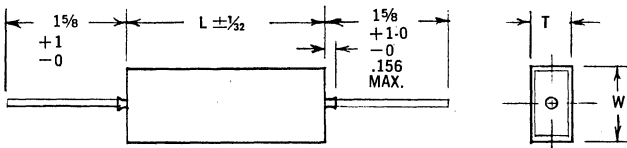
THE GUDEMAN CORPORATION
capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

miniature metallized polycarbonate dielectric series 412

hermetically sealed (glass-to-metal)
rectangular metallic cases
-55°C to +125°C without derating
50 to 400 vdc

outline drawing



dimensions

Body		Lead Gage
$\begin{smallmatrix} +.015 \\ - .005 \end{smallmatrix}$	$\begin{smallmatrix} +.015 \\ - .005 \end{smallmatrix}$	AWG (Dia.)
.220	.340	22 (.025)
.310	.410	22 (.025)
.400	.570	20 (.032)
.500	.650	20 (.032)
.600	.800	20 (.032)

For Style "S" - Insulated Case. Add .020 Max. to "T" and "W" dimension and 1/8 nominal to case length.

engineering specifications

BASIC DESCRIPTION

Gudeman 412 series capacitors use a metallized polycarbonate dielectric, hermetically sealed in rectangular metallic, non-magnetic cases with glass-to-metal compression seals.

OPERATING TEMPERATURE RANGE

412 series capacitors are designed to operate within the temperature range of -55°C to +125°C without voltage derating.

CAPACITANCE AND TOLERANCE

The capacitance limits at +25°C are determined by the specified tolerance. Capacitors are measured or referred to a frequency of 1000 cps.

DISSIPATION FACTOR

The dissipation factor at +25°C is less than 0.3% at 1000 cps.

INSULATION RESISTANCE

The charging potential is equal to the specified operating voltage for a given temperature. The minimum electrification time is two minutes. Listed below are minimum values:

Temperature	Nominal Capacitance Mfd.	R X C Megohms X Mfd.	R Megohms
25°C	Greater than .5	100,000	
	Smaller than .5		200,000
125°C	Greater than .5	1,000	
	Smaller than .5		2,000

ACCELERATED LIFE TEST

Capacitors shall withstand an accelerated life test of 250 hours with 140% of applied rated voltage at applicable high test temperature. Only one failure in 18 capacitors tested shall be allowed. A failure is defined as the following:

- If the capacitor has "opened."
- If the capacitance has changed more than 5% from its original value.
- If the insulation resistance is less than 50% of its original value.
- If the DF is greater than 1%.

TEST VOLTAGE

412 series capacitors shall withstand a DC voltage equal to 200% of the rated voltage for one minute at a temperature of +25°C, ±5°C. Test will be applied through resistor of 1 ohm per volt.

TEMPERATURE AND IMMERSION CYCLING

This series is designed to meet all requirements of the applicable paragraph of the latest issue of MIL-C-39022.

MOISTURE RESISTANCE

This series is designed to meet all requirements of the applicable paragraph of the latest issue of MIL-C-39022.

VIBRATION

This series is designed to withstand the Grade 3 vibration tests of the applicable paragraph of the latest issue of MIL-C-39022.

AC VOLTAGE RATING:

(-55°C to +85°C Ambient)

DC Voltage Rating	400 cps
50	30
100	65
200	120
300	200
400	240

LEAD PULL TEST

Capacitors of this series are designed to withstand a steady pull force of 5 lbs. applied axially to a capacitor lead for one minute.

LEAD BENDING TEST

The leads shall withstand without breakage the following stresses performed near the point of egress: bend 90 degrees in one direction, then back to the original position and 90 degrees in the opposite direction.

LEAD SPECIFICATIONS

Standard leads consist of solid, bare, tinned wire. Special nickel leads are available for applications requiring a higher degree of weldability.

CAPACITANCE CHANGE WITH TEMPERATURE

The change of capacitance with reference to the actual value at +25°C does not exceed the following limits:

Temperature	Change of Capacitance
-55°C	-2%
+125°C	±1%

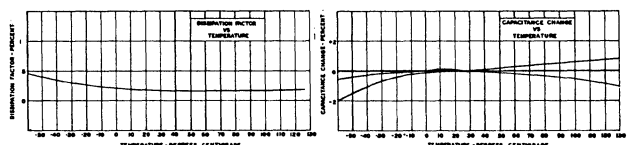
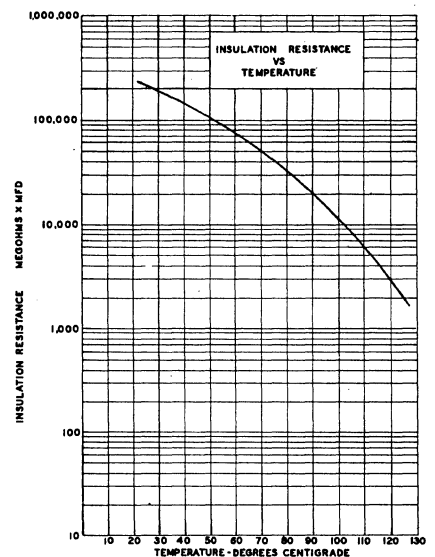
SPECIAL CAPACITORS

Capacitance values, voltage ratings, tolerances and sizes not listed in this catalog will be furnished upon request.

ENGINEERING SERVICE

Please feel free to consult our engineering department, without obligation, for assistance on any problem relating to the design, use or application of capacitors.

typical curves





THE GUDDAMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

series 412 (continued)

50 VOLTS

Part No.	Cap.	T	Inches W	L
F412A822	.0082	.220	.340	1/32
F412A103	.01	.220	.340	1/32
F412A123	.012	.220	.340	1/32
F412A153	.015	.220	.340	1/32
F412A183	.018	.220	.340	1/32
F412A223	.022	.220	.340	1/32
F412A273	.027	.220	.340	1/32
F412A333	.033	.220	.340	1/32
F412A393	.039	.220	.340	1/32
F412A473	.047	.220	.340	1/32
F412A563	.056	.220	.340	1/32
F412A683	.068	.220	.340	1/32
F412A823	.082	.220	.340	1/32
F412A104	.1	.220	.340	1/32
F412A124	.12	.220	.340	1/32
F420A154	.15	.220	.340	1/32
F412A184	.18	.220	.340	1/32
F412A224	.22	.220	.340	1/32
F412A274	.27	.220	.340	1/32
F412A334	.33	.220	.340	1/32
F412A394	.39	.220	.340	1/32
F412A474	.47	.220	.340	1/32
F412A564	.56	.220	.340	1/32
F412A684	.68	.220	.340	1/32
F412A824	.82	.220	.340	1/32
F412A105	1.0	.220	.340	1/32
F412A125	1.2	.220	.340	1/32
F412A155	1.5	.220	.340	1/32
F412A185	1.8	.310	.410	1/8
F412A225	2.2	.310	.410	1/8
F412A275	2.7	.310	.410	1/8
F412A335	3.3	.310	.410	1/8
F412A395	3.9	.310	.410	1/8
F412A475	4.7	.400	.570	1/8
F412A565	5.6	.400	.570	1/8
F412A685	6.8	.400	.570	1/8
F412A825	8.2	.500	.650	1/8
F412A106	10.0	.500	.650	1/8
F412A126	12.0	.500	.650	1/8
F412A156	15.0	.500	.650	1/8

75 VOLTS

Part No.	Cap.	T	Inches W	L
F412AX822	.0082	.220	.340	1/32
F412AX103	.01	.220	.340	1/32
F412AX123	.012	.220	.340	1/32
F412AX153	.015	.220	.340	1/32
F412AX183	.018	.220	.340	1/32
F412AX223	.022	.220	.340	1/32
F412AX273	.027	.220	.340	1/32
F412AX333	.033	.220	.340	1/32
F412AX393	.039	.220	.340	1/32
F412AX473	.047	.220	.340	1/32
F412AX563	.056	.220	.340	1/32
F412AX683	.068	.220	.340	1/32
F412AX823	.082	.220	.340	1/32
F412AX104	.1	.220	.340	1/32
F412AX124	.12	.220	.340	1/32
F412AX154	.15	.220	.340	1/32
F412AX184	.18	.220	.340	1/32
F412AX224	.22	.220	.340	1/32
F412AX274	.27	.220	.340	1/32
F412AX334	.33	.220	.340	1/32
F412AX394	.39	.220	.340	1/32
F412AX474	.47	.220	.340	1/32
F412AX564	.56	.220	.340	1/32
F412AX684	.68	.220	.340	1/32
F412AX824	.82	.220	.340	1/32
F412AX105	1.0	.310	.410	1/8
F412AX125	1.2	.310	.410	1/8
F412AX155	1.5	.310	.410	1/8
F412AX185	1.8	.310	.410	1/8
F412AX225	2.2	.400	.570	1/8
F412AX275	2.7	.400	.570	1/8
F412AX335	3.3	.400	.570	1/8
F412AX395	3.9	.400	.570	1/8
F412AX475	4.7	.400	.570	1/8
F412AX565	5.6	.400	.570	1/8
F412AX685	6.8	.500	.650	1/8
F412AX825	8.2	.500	.650	1/8
F412AX106	10.0	.500	.650	1/8
F412AX126	12.0	.500	.650	1/8
F412AX156	15.0	.600	.800	2/8

100 VOLTS

Part No.	Cap.	T	Inches W	L
F412B822	.0082	.220	.340	1/32
F412B103	.01	.220	.340	1/32
F412B123	.012	.220	.340	1/32
F412B153	.015	.220	.340	1/32
F412B183	.018	.220	.340	1/32
F412B223	.022	.220	.340	1/32
F412B273	.027	.220	.340	1/32
F412B333	.033	.220	.340	1/32
F412B393	.039	.220	.340	1/32
F412B473	.047	.220	.340	1/32
F412B563	.056	.220	.340	1/32
F412B683	.068	.220	.340	1/32
F412B823	.082	.220	.340	1/32
F412B104	.1	.220	.340	1/32
F412B124	.12	.220	.340	1/32
F412B154	.15	.220	.340	1/32
F412B184	.18	.220	.340	1/32
F412B224	.22	.220	.340	1/32
F412B274	.27	.220	.340	1/32
F412B334	.33	.220	.340	1/32
F412B394	.39	.220	.340	1/32
F412B474	.47	.220	.340	1/32
F412B564	.56	.220	.340	1/32
F412B684	.68	.310	.410	1/8
F412B824	.82	.310	.410	1/8
F412B105	1.0	.310	.410	1/8
F412B125	1.2	.310	.410	1/8
F412B155	1.5	.400	.570	1/8
F412B185	1.8	.400	.570	1/8
F412B225	2.2	.400	.570	1/8
F412B275	2.7	.400	.570	1/8
F412B335	3.3	.400	.570	1/8
F412B395	3.9	.400	.570	1/8
F412B475	4.7	.500	.650	1/8
F412B565	5.6	.500	.650	1/8
F412B685	6.8	.500	.650	1/8
F412B825	8.2	.500	.650	1/8
F412B106	10.0	.600	.800	2/8
F412B126	12.0	.600	.800	2/8
F412B156	15.0	.600	.800	2/8

150 VOLTS

Part No.	Cap.	T	Inches W	L
F412Y822	.0082	.220	.340	1/32
F412Y103	.01	.220	.340	1/32
F412Y123	.012	.220	.340	1/32
F412Y153	.015	.220	.340	1/32
F412Y183	.018	.220	.340	1/32
F412Y223	.022	.220	.340	1/32
F412Y273	.027	.220	.340	1/32
F412Y333	.033	.220	.340	1/32
F412Y393	.039	.220	.340	1/32
F412Y473	.047	.220	.340	1/32
F412Y563	.056	.220	.340	1/32
F412Y683	.068	.220	.340	1/32
F412Y823	.082	.220	.340	1/32
F412Y104	.1	.220	.340	1/32
F412Y124	.12	.220	.340	1/32
F412Y154	.15	.220	.340	1/32
F412Y184	.18	.220	.340	1/32
F412Y224	.22	.220	.340	1/32
F412Y274	.27	.220	.340	1/32
F412Y334	.33	.220	.340	1/32
F412Y394	.39	.310	.410	1/8
F412Y474	.47	.310	.410	1/8
F412Y564	.56	.310	.410	1/8
F412Y684	.68	.310	.410	1/8
F412Y824	.82	.400	.570	1/8
F412Y105	1.0	.400	.570	1/8
F412Y125	1.2	.400	.570	1/8
F412Y155	1.5	.400	.570	1/8
F412Y185	1.8	.400	.570	1/8
F412Y225	2.2	.400	.570	1/8
F412Y275	2.7	.500	.650	1/8
F412Y335	3.3	.500	.650	1/8
F412Y395	3.9	.500	.650	1/8
F412Y475	4.7	.500	.650	1/8
F412Y565	5.6	.600	.800	2/8
F412Y685	6.8	.600	.800	2/8

200 VOLTS

Part No.	Cap.	T	Inches W	L
F412C822	.0082	.220	.340	1/32
F412C103	.01	.220	.340	1/32
F412C123	.012	.220	.340	1/32
F412C153	.015	.220	.340	1/32
F412C183	.018	.220	.340	1/32
F412C223	.022	.220	.340	1/32
F412C273	.027	.220	.340	1/32
F412C333	.033	.220	.340	1/32
F412C393	.039	.220	.340	1/32
F412C473	.047	.220	.340	1/32
F412C563	.056	.220	.340	1/32
F412C683	.068	.220	.340	1/32
F412C823	.082	.220	.340	1/32
F412C104	.1	.220	.340	1/32
F412C124	.12	.220	.340	1/32
F412C154	.15	.220	.340	1/32
F412C184	.18	.220	.340	1/32
F412C224	.22	.220	.340	1/32
F412C274	.27	.310	.410	1/8
F412C334	.33	.310	.410	1/8
F412C394	.39	.310	.410	1/8
F412C474	.47	.310	.410	1/8
F412C564	.56	.400	.570	1/8
F412C684	.68	.400	.570	1/8
F412C824	.82	.400	.570	1/8
F412C105	1.0	.400	.570	1/8
F412C125	1.2	.400	.570	1/8
F412C155	1.5	.400	.570	1/8
F412C185	1.8	.500	.650	1/8
F412C225	2.2	.500	.650	1/8
F412C275	2.7	.500	.650	1/8
F412C335	3.3	.500	.650	1/8
F412C395	3.9	.600	.800	2/8
F412C475	4.7	.600	.800	2/8

300 VOLTS

Part No.	Cap.	T	Inches W	L
F412D822	.0082	.220	.340	1/32
F412D103	.01	.220	.340	1/32
F412D123	.012	.220	.340	1/32
F412D153	.015	.220	.340	1/32
F412D183	.018	.220	.340	1/32
F412D223	.022	.220	.340	1/32
F412D273	.027	.220	.340	1/32
F412D333	.033	.220	.340	1/32
F412D393	.039	.220	.340	1/32
F412D473	.047	.220	.340	1/32
F412D563	.056	.220	.340	1/32
F412D683	.068	.220	.340	1/32
F412D823	.082	.220	.340	1/32
F412D104	.1	.220	.340	1/32
F412D124	.12	.220	.340	1/32
F412D154	.15	.220	.340	1/32
F412D184	.18	.220	.340	1/32
F412D224	.22	.220	.340	1/32
F412D274	.27	.310	.410	1/8
F412D334	.33	.310	.410	1/8
F412D394	.39	.310	.410	1/8
F412D474	.47	.400	.570	1/8
F412D564	.56	.400	.570	1/8
F412D684	.68	.500	.650	1/8
F412D824	.82	.500	.650	1/8
F412D105	1.0	.500	.650	1/8
F412D125	1.2	.500	.650	1/8
F412D155	1.5	.600	.800	2/8
F412D185	1.8	.600	.800	2/8

400 VOLTS

Part No.	Cap.	T	Inches W	L
F412E822	.0082	.220	.340	1/32
F412E103	.01	.220	.340	3/8
F412E123	.012	.220	.340	3/8
F412E153	.015	.220	.340	3/8
F412E183	.018	.220	.340	3/8
F412E223	.022	.220	.340	3/8
F412E273	.027	.220	.340	3/8
F412E333	.033	.220	.340	3/8
F412E393	.039	.220	.340	1 1/8
F412E473	.047	.220	.340	1 1/8
F412E563	.056	.310	.410	3/2
F412E683	.068	.310	.410	1 1/8
F412E823	.082	.310	.410	1 1/8
F412E104	.1	.310	.410	1 1/8
F412E124	.12	.310	.410	1 1/8
F412E154	.15	.400	.570	1 1/8
F412E184	.18	.400	.570	1 1/8
F412E224	.22	.400	.570	1 1/8
F412E274	.27	.400	.570	1 1/8
F412E334	.33	.400	.570	1 1/8
F412E394	.39	.400	.570	1 1/8
F412E474	.47	.500	.650	1 1/2
F412E564	.56	.500	.650	1 1/2
F412E684	.68	.500	.650	2 1/8
F412E824	.82	.500	.650	2 1/8
F412E105	1.0	.600	.800	2 1/8
F412E125	1.2	.600	.800	2 1/8



THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

"thinfilm" metallized polycarbonate dielectric series 396 & 397

ULTRAMINIATURE TUBULAR (Series 396)
AND FLAT CAPACITORS (Series 397)

SEALED IN NON-METALLIC CASES

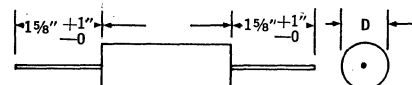
WITH PLASTIC RESIN END SEALS

—55°C TO +125°C WITHOUT DERATING

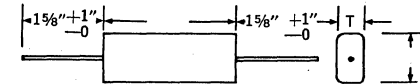
100 VDC TO 200 VDC

outline drawings

Series 396



Series 397



Solid, Bare Tinned Lead

See Part No. Table for Lead Gauge

NOTE: Nickel "A" weldable leads are available!
Add suffix "W" to Part No. for nickel lead.

specifications

CAPACITANCE AND TOLERANCE

The capacitance limits at +25°C are determined by the specified tolerance.
Capacitors are measured or referred to a frequency of 1000 cps.

DISSIPATION FACTOR

The dissipation factor at +25°C shall be less than 0.5% at 1000 cps.

INSULATION RESISTANCE

The charging potential is equal to the specified operating voltage for a given temperature. The minimum electrification time is two minutes. Listed below are minimum values:

Temperature	Nominal Capacitance Mfd.	R X C Megohms X mfd.	R Megohms
25°C	Greater than .5 Smaller than .5	50,000	100,000
125°C	Greater than .5 Smaller than .5	500	1,000

TEST VOLTAGE

Shall withstand a DC voltage equal to 200% of the rated voltage for one minute at a temperature of +25°C, ±5°C. Test voltage will be applied through resistor of 1 ohm per volt.

ACCELERATED LIFE TEST

Shall withstand an accelerated life test of 250 hours with 140% of applied rated voltage at applicable high test temperature. Only one failure in 12 capacitors tested shall be allowed. A failure is defined as the following:

- If the capacitor has "opened."
- If the capacitance has changed more than 5% from its original value.
- If the insulation resistance is less than 50% of the original specified value.
- If the DF is greater than 1%.

HUMIDITY

Not intended to be operated where humidity is a problem. This series is intended for use in circuits which are encapsulated or hermetically sealed.

LEAD PULL TEST

These capacitors shall withstand a five (5) pound pull applied axially for one minute, per MIL-C-25.

LEAD BEND TEST

Leads shall be bent without breakage about the point of egress from the capacitor. First 90 degrees in one direction then back to the original position and then 90 degrees in the opposite direction.

CAPACITANCE CHANGE WITH TEMP.

The change of capacitance with reference to the actual value at 25°C will not exceed the following limits:

TEMPERATURE	CHANGE OF CAPACITANCE
— 55°C	—2%
+125°C	±1%

SERIES 396

50 VOLTS

Cap. In Mfds.	Part No.	Dia. Max.	L ±1/16	Ld. Ga.
.01	396A103	.171	1/2"	24
.012	396A123	.171	1/2"	24
.015	396A153	.171	1/2"	24
.018	396A183	.171	1/2"	24
.022	396A223	.171	1/2"	24
.027	396A273	.171	1/2"	24
.033	396A333	.171	1/2"	24
.047	396A473	.171	1/2"	24
.056	396A563	.171	1/2"	24
.068	396A683	.171	5/8"	24
.082	396A823	.171	5/8"	24
.1	396A104	.171	5/8"	24
.12	396A124	.171	5/8"	24
.15	396A154	.187	5/8"	24
.18	396A184	.187	5/8"	24
.22	396A224	.234	5/8"	22
.27	396A274	.234	5/8"	22
.33	396A334	.312	5/8"	22
.47	396A474	.312	5/8"	22
.56	396A564	.312	5/8"	22
.68	396A684	.312	1 1/8"	22
.82	396A824	.312	1 1/8"	22
1.0	396A105	.312	1 1/8"	22
1.2	396A125	.390	1 1/8"	20
1.5	396A155	.390	1 1/8"	20
1.8	396A185	.390	1 1/8"	20
2.0	396A205	.390	1 1/8"	20
2.2	396A225	.390	1 1/8"	20
2.7	396A275	.390	1 1/8"	20
3.0	396A305	.390	1 1/8"	20
3.3	396A335	.390	1 1/8"	20
3.9	396A395	.500	1 1/8"	20
4.7	396A475	.500	1 1/8"	20
5.0	396A505	.500	1 1/8"	20
5.6	396A565	.500	1 1/8"	20
6.8	396A685	.562	1 1/8"	20
8.2	396A825	.562	1 1/8"	20
10.0	396A106	.671	1 1/8"	20
15.0	396A156	.750	1 3/8"	20

100 VOLTS

Cap. In Mfds.	Part No.	Dia. Max.	L ±1/16	Ld. Ga.
.01	396B103	.203	1/2"	24
.012	396B123	.203	1/2"	24
.015	396B153	.203	1/2"	24
.018	396B183	.218	1/2"	24
.022	396B223	.218	1/2"	24
.027	396B273	.218	1/2"	24
.033	396B333	.218	1/2"	24
.039	396B393	.218	1/2"	24
.047	396B473	.218	5/8"	24
.056	396B563	.218	5/8"	24
.068	396B683	.250	5/8"	22
.075	396B753	.250	5/8"	22
.082	396B823	.250	5/8"	22
.1	396B104	.250	1 1/8"	22
.12	396B124	.250	1 1/8"	22
.15	396B154	.343	5/8"	22
.18	396B184	.343	5/8"	22
.22	396B224	.343	1 1/8"	22
.27	396B274	.343	1 1/8"	22
.33	396B334	.343	1 1/8"	22
.39	396B394	.343	1 1/8"	22
.47	396B474	.421	1 1/8"	20
.56	396B564	.421	1 1/8"	20
.68	396B684	.421	1 1/8"	20
.82	396B824	.421	1 1/8"	20
1.0	396B105	.421	1 1/8"	20
1.5	396B155	.531	1 1/8"	20
2.0	396B205	.531	1 1/8"	20
2.2	396B225	.531	1 1/8"	20
3.0	396B305	.593	1 1/8"	20
4.0	396B405	.703	1 1/8"	20
5.0	396B505	.703	1 1/8"	20
7.0	396B705	.781	1 1/8"	20
8.0	396B805	.781	1 1/8"	20
10.0	396B106	1.031	2 1/8"	20

200 VOLTS

Cap. In Mfds.	Part No.	Dia. Max.	L ±1/16	Ld. Ga.
.01	396C103	.203	1/2"	24
.012	396C123	.218	1/2"	24
.015	396C153	.218	1/2"	24
.018	396C183	.250	1/2"	22
.022	396C223	.250	1/2"	22
.027	396C273	.250	1/2"	22
.033	396C333	.250	1/2"	22
.039	396C393	.250	1/2"	22
.047	396C473	.250	1/2"	22
.056	396C563	.250	1/2"	22
.068	396C683	.343	1/2"	22
.082	396C823	.343	1/2"	22
.1	396C104	.343	1/2"	22
.12	396C124	.343	1/2"	22
.15	396C154	.343	1/2"	22
.18	396C184	.421	1 1/8"	22
.22	396C224	.421	1 1/8"	20
.27	396C274	.421	1 1/8"	20
.33	396C334	.421	1 1/8"	20
.39	396C394	.421	1 1/8"	20
.47	396C474	.421	1 1/8"	20
.56	396C564	.593	1 1/8"	20
.68	396C684	.593	1 1/8"	20
.82	396C824	.593	1 1/8"	20
1.0	396C105	.593	1 1/8"	20
1.5	396C155	.703	1 1/8"	20
2.0	396C205	.703	1 1/8"	20
3.0	396C305	.781	1 1/8"	20
4.0	396C405	.781	2 1/8"	20
5.0	396C505	.781	2 1/8"	20
7.0	396C705	1.031	2 1/8"	20
8.0	396C805	1.031	2 1/8"	20
10.0	396C106	1.031	2 5/8"	20

SERIES 397

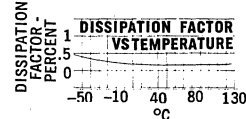
100 VOLTS

Cap. In Mfds.	Part No.	T Max.	W Max.	L ±1/16	Ld. Ga.
.01	397B103	.156	.250	1/2"	24
.012	397B123	.156	.250	1/2"	24
.015	397B153	.156	.250	1/2"	24
.018	397B183	.156	.250	1/2"	24
.022	397B223	.156	.250	1/2"	24
.027	397B273	.156	.250	1/2"	24
.033	397B333	.156	.250	1/2"	24
.039	397B393	.156	.250	1/2"	24
.047	397B473	.156	.250	5/8"	24
.056	397B563	.156	.250	5/8"	24
.068	397B683	.171	.296	5/8"	22
.075	397B753	.171	.296	5/8"	22
.082	397B823	.171	.296	5/8"	22
.1	397B104	.171	.296	1 1/8"	22
.12	397B124	.171	.296	1 1/8"	22
.15	397B154	.265	.390	5/8"	22
.18	397B184	.265	.390	5/8"	22
.22	397B224	.265	.390	1 1/8"	22
.27	397B274	.265	.390	1 1/8"	22
.33	397B334	.265	.390	1 1/8"	22
.39	397B394	.265	.390	1 1/8"	22
.47	397B474	.343	.453	1 1/8"	20
.56	397B564	.343	.453	1 1/8"	20
.68	397B684	.343	.453	1 1/8"	20
.82	397B824	.343	.453	1 1/8"	20
1.0	397B105	.343	.453	1 1/8"	20
1.5	397B155	.421	.578	1 1/8"	20
2.0	397B205	.421	.578	1 1/8"	20
3.0	397B305	.484	.640	1 1/8"	20
4.0	397B405	.578	.765	1 1/8"	20
5.0	397B505	.578	.765	1 1/8"	20
7.0	397B705	.656	.859	1 1/8"	20
8.0	397B805	.656	.859	1 1/8"	20
10.0	397B106	.906	1.109	2 1/8"	20

200 VOLTS

Cap. In Mfds.	Part No.	T Max.	W Max.	L ±1/16	Ld. Ga.
.01	397C103	.156	.250	1/2"	24
.012	397C123	.156	.250	1/2"	24
.015	397C153	.156	.250	1/2"	24
.018	397C183	.171	.211	1/2"	22
.022	397C223	.171	.211	1/2"	22
.027	397C273	.171	.211	1/2"	22
.033	397C333	.171	.211	1/2"	22
.039	397C393	.171	.211	1/2"	22
.047	397C473	.171	.211	1/2"	22
.056	397C563	.171	.211	1/2"	22
.068	397C683	.265	.390	5/8"	22
.082	397C823	.265	.390	5/8"	22
.1	397C104	.265	.390	5/8"	22
.12	397C124	.265	.390	5/8"	22
.15	397C154	.265	.390	5/8"	22
.18	397C184	.343	.453	1 1/8"	22
.22	397C224	.343	.453	1 1/8"	20
.27	397C274	.343	.453	1 1/8"	20
.33	397C334	.343	.453	1 1/8"	20
.39	397C394	.343	.453	1 1/8"	20
.47	397C474	.343	.453	1 1/8"	20
.56	397C564	.484	.640	1 1/8"	20
.68	397C684	.484	.640	1 1/8"	20
.82	397C824	.484	.640	1 1/8"	20
1.0	397C105	.484	.640	1 1/8"	20
1.5	397C155	.593	.750	1 1/8"	20
2.0	397C205	.593	.750	1 1/8"	20
3.0	397C305	.656	.859	1 1/8"	20
4.0	397C405	.656	.859	1 1/8"	20
5.0	397C505	.656	.859	1 1/8"	20
7.0	397C705	.906	1.109	2 1/8"	20
8.0	397C805	.906	1.109	2 1/8"	20
10.0	397C106	.906	1.109	2 5/8"	20

TYPICAL CURVES





THE GUDDAMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

"thinfilm" metallized mylar* dielectric

series 322 & 323

ULTRA MINIATURE CAPACITORS

SEALED IN RECTANGULAR EPOXY CASES WITH RESIN END SEAL

100 VDC TO 200 VDC

SERIES 322 — RADIAL LEADS

SERIES 323 — AXIAL LEADS

specifications

DISSIPATION FACTOR

The dissipation factor shall not exceed 1.0% when measured at or referred to a frequency of 1,000 CPS at +25°C. Nominal capacitance values above 1.0 mfd. are measured at or referred to a frequency of 60 cps.

INSULATION RESISTANCE

The minimum insulation resistance when measured with an applied potential of 50 to 200 volts, but not to exceed the rated voltage, shall be as follows:

At +25°C 10,000 megohm-mfds. minimum but need not exceed 30,000 megohms.
At +85°C 500 megohm-mfds. minimum but need not exceed 3000 megohms.
At +125°C 10 megohm-mfds. minimum but need not exceed 150 megohms.

ACCELERATED LIFE TEST

Shall withstand an accelerated life test of 250 hours with 140% of applied rated voltage at applicable high test temperature. Only one failure in 12 capacitors tested shall be allowed.

A failure is defined as the following:

- A) If the capacitor has "opened" or short circuited.
- B) If the capacitance has changed more than 10% from its original value.
- C) If the insulation resistance is less than 30% of its specified value.

TEST VOLTAGE

Shall withstand a DC voltage equal to 200% of the rated voltage for one minute at a temperature of +25°C±5°C.

VOLTAGE RATINGS

Designed to operate over the temperature range of -55°C to +85°C at full rated DC voltage and up to +125°C with working voltages as follows:

+85°C	+125°C
200VDC	100VDC
100VDC	50VDC

HUMIDITY TEST

Capacitors shall withstand 250 hours of 95% relative humidity at 40°C. Voltage will not be applied. Upon completion of test, units will be dried for four hours. Minimum product of insulation resistance shall be 5000 megohm-mfd but need not exceed 15,000 megohms.

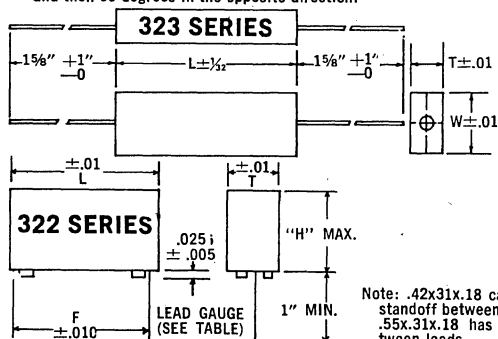
The capacitance will change not more than 10% of its original value. The dissipation factor shall not increase over 1.5%.

LEAD PULL TEST

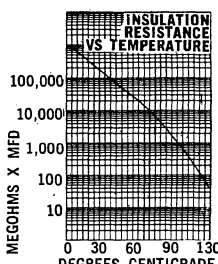
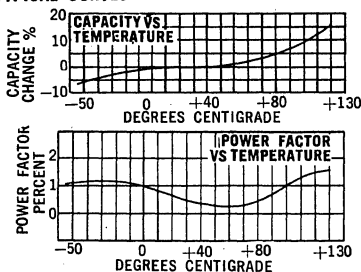
Shall withstand a five (5) pound pull applied axially for one minute.

LEAD BEND TEST

Leads shall be bent without breakage about the point of the egress from the capacitor. First 90 degrees in one direction then back to the original position, and then 90 degrees in the opposite direction.



TYPICAL CURVES



*DuPont trademark

100 VDC

MFD	100 VDC	L	W	T	Part No.	Lead Gauge
.001	.42	.29	.17	.17	323B102	24
.0012	.42	.29	.17	.17	323B122	24
.0015	.42	.29	.17	.17	323B152	24
.0018	.42	.29	.17	.17	323B182	24
.0022	.42	.29	.17	.17	323B222	24
.0027	.42	.29	.17	.17	323B272	24
.0033	.42	.29	.17	.17	323B332	24
.0039	.42	.29	.17	.17	323B392	24
.0047	.42	.29	.17	.17	323B472	24
.0056	.42	.29	.17	.17	323B562	24
.0068	.42	.29	.17	.17	323B682	24
.0082	.42	.29	.17	.17	323B822	24
.01	.42	.29	.17	.17	323B103	24
.012	.42	.29	.17	.17	323B123	24
.015	.42	.29	.17	.17	323B153	24
.018	.42	.29	.17	.17	323B183	24
.022	.42	.29	.17	.17	323B223	24
.027	.42	.29	.17	.17	323B273	24
.033	.42	.29	.17	.17	323B333	24
.039	.42	.29	.17	.17	323B393	24
.047	.42	.29	.17	.17	323B473	24
.056	.57	.29	.17	.17	323B563	24
.068	.57	.29	.17	.17	323B683	24
.082	.57	.29	.17	.17	323B823	24
.1	.57	.29	.17	.17	323B104	24
.12	.57	.29	.17	.17	323B124	24
.15	.55	.36	.23	.23	323B154	24
.18	.55	.36	.23	.23	323B184	24
.22	.55	.36	.23	.23	323B224	24
.25	.55	.36	.23	.23	323B254	24
.27	.55	.36	.23	.23	323B274	24
.33	.57	.42	.29	.29	323B334	24
.39	.57	.42	.29	.29	323B394	24
.47	.67	.42	.29	.29	323B474	24
.50	.67	.42	.29	.29	323B504	24
.56	.67	.42	.29	.29	323B564	24
.68	.67	.42	.29	.29	323B684	24
.75	.82	.42	.29	.29	323B754	24
.82	.82	.42	.29	.29	323B824	22
1.0	.82	.54	.39	.39	323B105	22
1.5	.82	.54	.39	.39	323B155	22
2.0	1.04	.54	.39	.39	323B205	22
3.0	1.24	.54	.39	.39	323B305	22
5.0	1.75	.72	.56	.56	323B505	20
8.0	1.75	.72	.56	.56	323B805	20
10.0	1.92	.72	.56	.56	323B106	20

SERIES 322

100 VDC

MFD	100 VDC	L	H	T	F	Part No.	Ld. Ga.
.001	.42	.31	.18	.300		322B102	22
.0012	.42	.31	.18	.300		322B122	22
.0015	.42	.31	.18	.300		322B152	22
.0018	.42	.31	.18	.300		322B182	22
.0022	.42	.31	.18	.300		322B222	22
.0027	.42	.31	.18	.300		322B272	22
.0033	.42	.31	.18	.300		322B332	22
.0039	.42	.31	.18	.300		322B392	22
.0047	.42	.31	.18	.300		322B472	22
.0056	.42	.31	.18	.300		322B562	22
.0068	.42	.31	.18	.300		322B682	22
.0082	.42	.31	.18	.300		322B822	22
.01	.42	.31	.18	.300		322B103	22
.012	.42	.31	.18	.300		322B123	22
.015	.42	.31	.18	.300		322B153	22
.018	.42	.31	.18	.300		322B183	22
.022	.42	.31	.18	.300		322B223	22
.027	.42	.31	.18	.300		322B273	22
.033	.42	.31	.18	.300		322B333	22
.039	.42	.31	.18	.300		322B393	22
.047	.42	.31	.18	.300		322B473	22
.056	.55	.31	.18	.400		322B563	22
.068	.55	.31	.18	.400		322B683	22
.082	.55	.31	.18	.400		322B823	22
.1	.55	.31	.18	.400		322B104	22
.12	.55	.31	.18	.400		322B124	22
.15	.55	.38	.24	.400		322B154	22
.18	.55	.38	.24	.400		322B184	22
.22	.55	.38	.24	.400		322B224	22
.25	.55	.38	.24	.400		322B254	22
.27	.55	.38	.24	.400		322B274	22
.33	.55	.44	.30	.400		322B334	22
.39	.55	.44	.30	.400		322B394	22
.47	.67	.44	.30	.500		322B474	22
.50	.67	.44	.30	.500		322B504	22
.56	.67	.44	.30	.500		322B564	22
.68	.67	.44	.30	.500		322B684	22
.75	.82	.44	.30	.600		322B754	22
.82	.82	.44	.30	.600		322B824	22
1.0	.82	.56	.40	.600		322B105	22
1.5	.82	.56	.40	.600		322B155	22
2.0	1.04	.56	.40	.800		322B205	22
3.0	1.24	.56	.40	1.100		322B305	20
5.0	1.75	.74	.57	1.600		322B505	20
8.0	1.75	.74	.57	1.600		322B805	20

NOTE: Nickel "A" weldable leads are available, simply add the letter "W" as a suffix on the part number.

NOTE: Larger case sizes may be supplied in plastic case material other than epoxy. Add following to part no. for tolerance: —M = ±20%; —K = ±10%; —J = ±5%; —B = ±2%.

200 VDC

MFD	200 VDC	L	W	T	Part No.	Lead Gauge
.001	.42	.29	.17	.17	323C102	24
.0012	.42	.29	.17	.17	323C122	24
.0015	.42	.29	.17	.17	323C152	24
.0018	.42	.29	.17	.17	323C182	24
.0022	.42	.29	.17	.17	323C222	24
.0027	.42	.29	.17	.17	323C272	24
.0033	.42	.29	.17	.17	323C332	24
.0039	.42	.29	.17	.17	323C392	24
.0047	.42	.29	.17	.17	323C472	24
.0056	.42	.29	.17	.17	323C562	24
.0068	.42	.29	.17	.17	323C682	24
.0082	.42	.29	.17	.17	323C822	24
.01	.42	.29	.17	.17	323C103	24
.012	.42	.29	.17	.17	323C123	24
.015	.42	.29	.17	.17	323C153	24
.018	.42	.29	.17	.17	323C183	24
.022	.42	.29	.17	.17	323C223	24
.027	.57	.29	.17	.17	323C273	24
.033	.57	.29	.17	.17	323C333	24
.039	.57	.29	.17	.17	323C393	24
.047	.55	.36	.23	.23	323C473	24
.056	.55	.36	.23	.23	323C563	24
.068	.55	.36	.23	.23	323C683	24
.082	.55	.36	.23	.23	323C823	24
.1	.57	.42	.29	.29	323C104	24
.12	.57	.42	.29	.29	323C124	24
.15	.67	.42	.29	.29	323C154	24
.18	.67	.42	.29	.29	323C184	24
.22	.67	.42	.29	.29	323C224	24
.25	.67	.42	.29	.29	323C254	24
.27	.82	.42	.29	.29	323C274	22
.33	.82	.54	.39	.39	323C334	22
.39	.82	.54	.39	.39	323C394	22
.47	.82	.54	.39	.39	323C474	22
.50	.82	.54	.39	.39	323C504	22
.56	1.04	.54	.39	.39	323C564	22
.68	1.04	.54	.39	.39	323C684	22
.75	1.04	.54	.39	.39	323C754	22
.82	1.19	.54	.39	.39	323C824	22
1.0	1.19	.54	.39	.39	323C105	22
1.5	1.75	.72	.56	.56	323C155	20
2.0	1.75	.72	.56	.56	323C205	20
3.0	1.75	.72	.56	.56	323C305	20

200 VDC

MFD	200 VDC				Part No.	Ld. Ga.
	L	H	T	F		
.001	.42	.31	.18	.300	322C102	22
.0012	.42	.31	.18	.300	322C122	22
.0015	.42	.31	.18	.300	322C152	22
.0018	.42	.31	.18	.300	322C182	22
.0022	.42	.31	.18	.300	322C222	22
.0027	.42	.31	.18	.300	322C272	22
.0033	.42	.31	.18	.300	322C332	22
.0039	.42	.31	.18	.300	322C392	22
.0047	.42	.31	.18	.300	322C472	22
.0056	.42	.31	.18	.300	322C562	22
.0068	.42	.31	.18	.300	322C682	22
.0082	.42	.31	.18	.300	322C822	22
.01	.42	.31	.18	.300	322C103	22
.012	.42	.31	.18	.300	322C123	22
.015	.42	.31	.18	.300	322C153	22
.018	.42	.31	.18	.300	322C183	22
.022	.42	.31	.18	.300	322C223	22
.027	.55	.31	.18	.400	322C273	22
.033	.55	.31	.18	.400	322C333	22
.039	.55	.31	.18	.400	322C393	22
.047	.55	.38	.24	.400	322C473	22
.056	.55	.38	.24	.400	322C563	22
.068	.55	.38	.24	.400	322C683	22
.082	.55	.38	.24	.400	322C823	22
.1	.55	.44	.30	.400	322C104	22
.12	.55	.44	.30	.400	322C124	22
.15	.67	.44	.30	.500	322C154	22
.18	.67	.44	.30	.500	322C184	22
.22	.67	.44	.30	.500	322C224	22
.25	.82	.44	.30	.600	322C254	22
.27	.82	.44	.30	.600	322C274	22
.33	.82	.56	.40	.600	322C334	22
.39	.82	.56	.40	.600	322C394	22
.47	.82	.56	.40	.600	322C474	22
.50	.82	.56	.40	.600	322C504	22
.56	1.04	.56	.40	.800	322C564	22
.68	1.04	.56	.40	.800	322C684	22
.75	1.04	.56	.40	.800	322C754	22
.82	1.24	.56	.40	1.100	322C824	20
1.0	1.24	.56	.40	1.100	322C105	20
1.5	1.75	.74	.57	1.600	322C155	20
2.0	1.75	.74	.57	1.600	322C205	20
3.0	1.75	.74	.57	1.600	322C305	20



THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

"thinfilm" metallized mylar* dielectric

series 363 & 364

ULTRA MINIATURE FLAT AND TUBULAR CAPACITORS

SEALED IN NON-METALLIC CASES WITH PLASTIC RESIN END SEALS

—55°C TO +125°C

100 VDC TO 600 VDC

specifications

DISSIPATION FACTOR

The dissipation factor shall not exceed 1.0% when measured at or referred to a frequency of 1,000 CPS at +25°C per MIL-C-25C. Nominal capacitance values above 1.0 mfd. are measured at or referred to a frequency of 60 cps.

INSULATION RESISTANCE

The minimum insulation resistance when measured with an applied potential of 50 to 500 volts, but not to exceed the rated voltage, shall be as follows:

At +25°C 50,000 megohm-mfds minimum but need not exceed 150,000 megohms
At +85°C 500 megohm-mfds minimum but need not exceed 3000 megohms
At +125°C 10 megohm-mfds minimum but need not exceed 150 megohms

TEST VOLTAGE

Shall withstand a DC voltage equal to 200% of the rated voltage for one minute at a temperature of +25°C, ±5°C.

ACCELERATED LIFE TEST

Shall withstand an accelerated life test of 250 hours with 140% of applied rated voltage at applicable high test temperature. Only one failure in 12 capacitors tested shall be allowed. A failure is defined as the following:

- If the capacitor has "opened" or short circuited.
- If the capacitance has changed more than 10% from its original value.
- If the insulation resistance is less than 30% of its original value.

VOLTAGE RATINGS

Designed to operate over the temperature range of —55°C to +85°C at full rated DC voltage and up to +125°C with working voltages as follows:

	+85°C	+125°C
400 VDC	200 VDC	100 VDC
200 VDC	100 VDC	50 VDC
100 VDC		

MOISTURE RESISTANCE

Shall withstand the moisture resistance requirements as specified in military specification MIL-C-25C.

VIBRATION-ACCELERATION

These capacitors shall withstand the Grade 3 vibration-acceleration requirements of MIL-C-25C.

LEAD PULL TEST

Shall withstand a five (5) pound pull applied axially for one minute, per MIL-C-25C.

LEAD BEND TEST

Leads shall be bent without breakage about the point of egress from the capacitor. First 90 degrees in one direction then back to the original position, and then 90 degrees in the opposite direction, per MIL-C-25C.

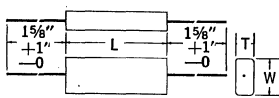
CAPACITANCE TEST WITH TEMPERATURE

The capacitance change shall not exceed the following values with reference to the +25°C capacitance value:

TEMPERATURE	% CAP CHANGE
—55°C	—10% Maximum
+85°C	+5% Maximum
+125°C	+16% Maximum

outline drawings

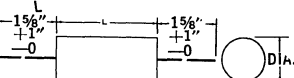
Series 363



NOTE: Nickel "A" weldable leads are available with the capacitors specified in this bulletin, simply add the letter "W" as a suffix on the part number.

DIMENSIONAL TOLERANCES: T & W Under .250 dia. ±.046, .250 & Up ±.062, Length ±.004

Series 364



DIMENSIONAL TOLERANCES: Under .250 dia. ±.046, .250 dia and up ±.062, length ±.004

363 SERIES

100 VDC

Cap. in Mfds.	Part No.	T.	W.	L.	Lead Gau. AWG.
.015	363B153	.125"	.250"	1 1/8"	24
.018	363B183	.125"	.250"	1 1/8"	24
.022	363B223	.125"	.250"	1 1/8"	24
.027	363B273	.125"	.250"	1 1/8"	24
.033	363B333	.125"	.250"	1 1/8"	24
.039	363B393	.125"	.250"	1 1/8"	24
.047	363B473	.125"	.250"	1 1/8"	24
.056	363B563	.125"	.250"	1 1/8"	24
.068	363B683	.125"	.250"	1 1/8"	24
.082	363B823	.125"	.250"	1 1/8"	24
.10	363B104	.125"	.250"	1 1/8"	24
.12	363B124	.125"	.250"	1 1/8"	24
.15	363B154	.125"	.250"	1 1/8"	24
.18	363B184	.125"	.250"	1 1/8"	24
.22	363B224	.125"	.250"	1 1/8"	24
.27	363B274	.125"	.250"	1 1/8"	24
.33	363B334	.125"	.250"	1 1/8"	24
.39	363B394	.125"	.250"	1 1/8"	24
.47	363B474	.125"	.250"	1 1/8"	24
.56	363B564	.125"	.250"	1 1/8"	24
.68	363B684	.125"	.250"	1 1/8"	24
.82	363B824	.125"	.250"	1 1/8"	24
1.0	363B105	.125"	.250"	1 1/8"	24
1.5	363B155	.125"	.250"	1 1/8"	24
2.0	363B205	.125"	.250"	1 1/8"	24
3.0	363B305	.125"	.250"	1 1/8"	24
4.0	363B405	.125"	.250"	1 1/8"	24
5.0	363B505	.125"	.250"	1 1/8"	24
6.0	363B605	.125"	.250"	1 1/8"	24

200 VDC

Cap. in Mfds.	Part No.	T.	W.	L.	Lead Gau. AWG.
.015	363C153	.125"	.250"	1 1/8"	24
.018	363C183	.125"	.250"	1 1/8"	24
.022	363C223	.125"	.250"	1 1/8"	24
.027	363C273	.125"	.250"	1 1/8"	24
.033	363C333	.125"	.250"	1 1/8"	24
.039	363C393	.125"	.250"	1 1/8"	24
.047	363C473	.125"	.250"	1 1/8"	24
.056	363C563	.125"	.250"	1 1/8"	24
.068	363C683	.125"	.250"	1 1/8"	24
.082	363C823	.125"	.250"	1 1/8"	24
.10	363C104	.125"	.250"	1 1/8"	24
.12	363C124	.125"	.250"	1 1/8"	24
.15	363C154	.125"	.250"	1 1/8"	24
.18	363C184	.125"	.250"	1 1/8"	24
.22	363C224	.125"	.250"	1 1/8"	24
.27	363C274	.125"	.250"	1 1/8"	24
.33	363C334	.125"	.250"	1 1/8"	24
.39	363C394	.125"	.250"	1 1/8"	24
.47	363C474	.125"	.250"	1 1/8"	24
.56	363C564	.125"	.250"	1 1/8"	24
.68	363C684	.125"	.250"	1 1/8"	24
.82	363C824	.125"	.250"	1 1/8"	24
1.0	363C105	.125"	.250"	1 1/8"	24
1.5	363C155	.125"	.250"	1 1/8"	24
2.0	363C205	.125"	.250"	1 1/8"	24
3.0	363C305	.125"	.250"	1 1/8"	24
4.0	363C405	.125"	.250"	1 1/8"	24
5.0	363C505	.125"	.250"	1 1/8"	24
6.0	363C605	.125"	.250"	1 1/8"	24

400 VDC

Cap. in Mfds.	Part No.	T.	W.	L.	Lead Gau. AWG.
.015	363E153	.125"	.250"	1 1/8"	24
.018	363E183	.125"	.250"	1 1/8"	24
.022	363E223	.125"	.250"	1 1/8"	24
.027	363E273	.125"	.250"	1 1/8"	24
.033	363E333	.125"	.250"	1 1/8"	24
.039	363E393	.125"	.250"	1 1/8"	24
.047	363E473	.125"	.250"	1 1/8"	24
.056	363E563	.125"	.250"	1 1/8"	24
.068	363E683	.125"	.250"	1 1/8"	24
.082	363E823	.125"	.250"	1 1/8"	24
.10	363E104	.125"	.250"	1 1/8"	24
.12	363E124	.125"	.250"	1 1/8"	24
.15	363E154	.125"	.250"	1 1/8"	24
.18	363E184	.125"	.250"	1 1/8"	24
.22	363E224	.125"	.250"	1 1/8"	24
.27	363E274	.125"	.250"	1 1/8"	24
.33	363E334	.125"	.250"	1 1/8"	24
.39	363E394	.125"	.250"	1 1/8"	24
.47	363E474	.125"	.250"	1 1/8"	24
.56	363E564	.125"	.250"	1 1/8"	24
.68	363E684	.125"	.250"	1 1/8"	24
.82	363E824	.125"	.250"	1 1/8"	24
1.0	363E105	.125"	.250"	1 1/8"	24
1.5	363E155	.125"	.250"	1 1/8"	24
2.0	363E205	.125"	.250"	1 1/8"	24
3.0	363E305	.125"	.250"	1 1/8"	24
4.0	363E405	.125"	.250"	1 1/8"	24
5.0	363E505	.125"	.250"	1 1/8"	24
6.0	363E605	.125"	.250"	1 1/8"	24

364 SERIES

100 VDC

Cap. in Mfds.	Part No.	Dia.	L.	Lead Gau. AWG.
.0068	364B682	.156"	1 1/8"	24
.0082	364B822	.156"	1 1/8"	24
.010	364B103	.156"	1 1/8"	24
.012	364B123	.156"	1 1/8"	24
.015	364B153	.156"	1 1/8"	24
.018	364B183	.156"	1 1/8"	24
.022	364B223	.156"	1 1/8"	24
.027	364B273	.156"	1 1/8"	24
.033	364B333	.156"	1 1/8"	24
.039	364B393	.156"	1 1/8"	24
.047	364B473	.156"	1 1/8"	24
.056	364B563	.156"	1 1/8"	24
.068	364B683	.156"	1 1/8"	24
.082	364B823	.156"	1 1/8"	24
.10	364B104	.156"	1 1/8"	24
.12	364B124	.156"	1 1/8"	24
.15	364B154	.156"	1 1/8"	24
.18	364B184	.156"	1 1/8"	24
.22	364B224	.156"	1 1/8"	24
.27	364B274	.156"	1 1/8"	24
.33	364B334	.156"	1 1/8"	24
.39	364B394	.156"	1 1/8"	24
.47	364B474	.156"	1 1/8"	24
.56	364B564	.156"	1 1/8"	24
.68	364B684	.156"	1 1/8"	24
.82	364B824	.156"	1 1/8"	24
1.0	364B105	.156"	1 1/8"	24
1.5	364B155	.156"	1 1/8"	24
2.0	364B205	.156"	1 1/8"	24
3.0	364B305	.156"	1 1/8"	24

Cap. in Mfds.	Part No.	Dia.	L.	Lead Gau. AWG.
4.0	*364W405	.500"	1 1/8"	20
5.0	*364W505	.562"	1 1/8"	20
6.0	*364W605	.625"	1 1/8"	20
7.0	*364W705	.671"	1 1/8"	20
8.0	*364W805	.656"	1 1/8"	20
9.0	*364W905	.718"	1 1/8"	20
10.0	*364W106	.734"	1 1/8"	20
*60VDC @ +85°C				
*30VDC @ +125°C				

200 VDC

Cap. in Mfds.	Part No.	Dia.	L.	Lead Gau. AWG.
.0068	364C682	.156"	1 1/8"	24
.0082	364C822	.156"	1 1/8"	24
.010	364C103	.156"	1 1/8"	24
.012	364C123	.156"	1 1/8"	24
.015	364C153	.156"	1 1/8"	24
.018	364C183	.156"	1 1/8"	24
.022	364C223	.156"	1 1/8"	24
.027	364C273	.156"	1 1/8"	24
.033	364C333	.156"	1 1/8"	24
.039	364C393	.156"	1 1/8"	24
.047	364C473	.156"	1 1/8"	24
.056	364C563	.156"	1 1/8"	24
.068	364C683	.156"	1 1/8"	24
.082	364C823	.156"	1 1/8"	24
.10	364C104	.156"	1 1/8"	24
.12	364C124	.156"	1 1/8"	24
.15	364C154	.156"	1 1/8"	24
.18	364C184	.156"	1 1/8"	24
.22	364C224	.156"	1 1/8"	24
.27	364C274	.156"	1 1/8"	24
.33	364C334	.156"	1 1/8"	24
.39	364C394	.156"	1 1/8"	24
.47	364C474	.156"	1 1/8"	24
.56	364C564	.156"	1 1/8"	24
.68	364C684	.156"	1 1/8"	24
.82	364C824	.156"	1 1/8"	24
1.0	364C105	.156"	1 1/8"	24
1.5	364C155	.156"	1 1/8"	24
2.0	364C205	.156"	1 1/8"	24
3.0	364C305	.156"	1 1/8"	24
4.0	364C405	.156"	1 1/8"	24
5.0	364C505	.156"	1 1/8"	24
6.0	364C605	.156"	1 1/8"	24

400 VDC

Cap. in Mfds.	Part No.	Dia.	L.	Lead Gau. AWG.
.0068	364E682	.156"	1 1/8"	24



THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

miniature metallized mylar* dielectric series 68

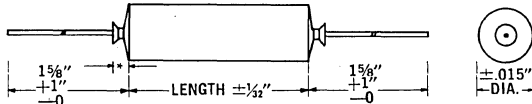
HERMETICALLY SEALED (GLASS-TO-METAL)

TUBULAR METALLIC CASES

—55°C TO +125°C WITHOUT DERATING

100 VDC THRU 600 VDC

outline drawing



*.093 max for .125 dia

otherwise .156 max

Standard leads consist of solid, bare, tinned wire. Special nickel leads are available for applications requiring a higher degree of weldability.

specifications

CAPACITANCE AND TOLERANCE

The capacitance limits at 25°C are determined by the specified tolerance. Capacitors which have a nominal value of 1 MFD or less are measured or referred to a frequency of 1000 cps. Nominal capacitances above 1 MFD are measured at or referred to a frequency of 60 cps.

DISSIPATION FACTOR

The dissipation factor at 25°C is less than 1.0%. Reference frequencies are as specified above.

INSULATION RESISTANCE

The charging potential is equal to the specified operating voltage for a given temperature. The minimum electrification time is two minutes. Listed below are minimum values:

Temperature	Nominal Capacitance MFD	R x C Megohms x MFD	R Megohms
25°C	Greater than .333	50,000	
	Smaller than .333		150,000
85°C	Greater than .167	500	
	Smaller than .167		3,000
125°C	Greater than .067	10	
	Smaller than .067		150

TEST VOLTAGE

Designed to withstand a test potential equal to 200% of the rated voltage for two minutes at 25°C.

The test voltage must be applied and discharged through a current limiting resistance of approximately 1000 ohms.

VOLTAGE RATING ABOVE 85°

No derating of the voltage is required for nominal ratings of 200, 400 and 600 VDC. All 100 VDC capacitors, however, are to be derated above 85°C at the rate of 1 VDC per degree C.

ACCELERATED LIFE TEST — AT 125°C

Capacitors are designed to withstand a test potential equal to 140% of the voltage at 125°C for a period of 250 hours.

The life test voltage must be applied and discharged through a current limiting resistance of approximately 1000 ohms.

TEMPERATURE AND IMMERSION CYCLING

Designed to meet all requirements of the applicable paragraph of the latest issue of MIL-C-25.

MOISTURE RESISTANCE

Designed to meet all requirements of the applicable paragraph of the latest issue of MIL-C-25.

VIBRATION

Designed to withstand the vibration tests of the applicable paragraph of the latest issue of MIL-C-25.

LEAD PULL TEST

Capacitors of this series are designed to withstand a steady pull force of 5 lbs. applied axially to a capacitor lead for one minute.

LEAD BENDING TEST

The leads without breakage the following stresses performed near the point of egress: bend 90 degrees in one direction, then back to the original position and 90 degrees in the opposite direction.

CAPACITANCE CHANGE WITH TEMPERATURE

The change of capacitance with reference to the actual value at 25°C does not exceed the following limits:

TEMPERATURE	CHANGE OF CAPACITANCE
— 55°C	— 8%
+ 85°C	+ 5%
+125°C	+18%

AC VOLTAGE RATING

Designed to operate safely up to the following AC voltages at 85°C.

Designed to operate safely up to the following AC voltages at 85°C.		
DC VOLTAGE RATING	AC — VOLTAGES AT 85°C (rms)	
	Up to 120 cps	Up to 400 cps
100	70	56
200	140	70
400	280	110
600	420	160

For 105°C operation the listed AC voltages should be derated to 60% of the 85°C values.

If both AC and DC voltages are present, the sum of the DC voltage and the amplitude of the AC voltage must not exceed the specified DC-rating at a given temperature.

100 VOLTS

Part No.	Capacitance MFD.	Diameter Inches	Length Inches
F68B102	.0010	.125	3/16
F68B122	.0012	.125	3/16
F68B152	.0015	.125	3/16
F68B182	.0018	.125	3/16
F68B222	.0022	.125	3/16
F68B272	.0027	.125	3/16
F68B332	.0033	.125	3/16
F68B392	.0039	.125	3/16
F68B472	.0047	.125	3/16
F68B562	.0056	.125	3/16
F68B682	.0068	.125	3/16
F68B822	.0082	.125	3/16
F68B103	.010	.125	3/16
F68B123	.012	.125	3/16
F68B153	.015	.125	3/16
F68B183	.018	.125	3/16
F68B223	.022	.125	3/16
F68B273	.027	.125	3/16
F68B333	.033	.125	3/16
F68B393	.039	.125	3/16
F68B473	.047	.175	5/8
F68B563	.056	.175	5/8
F68B683	.068	.175	5/8
F68B823	.082	.175	5/8
F68B104	.10	.235	5/8
F68B124	.12	.235	5/8
F68B154	.15	.235	5/8
F68B184	.18	.235	5/8
F68B274	.22	.235	5/8
F68B334	.33	.312	1 1/8
F68B394	.39	.312	1 1/8
F68B474	.47	.312	1 1/8
F68B564	.56	.400	1 1/8
F68B684	.68	.400	1 1/8
F68B824	.82	.400	1 1/8
F68B105	1.0	.400	1 1/8
F68B155	1.5	.500	1 1/8
F68B205	2.0	.562	1 1/8
F68B305	3.0	.562	1 1/8
F68B405	4.0	.670	1 1/8
F68B505	5.0	.670	1 1/8
F68B605	6.0	.670	1 1/8
F68B805	8.0	.670	1 1/8
F68B106	10.0	.750	1 1/8
F68B126	12.0	.750	2 1/8
F68B146	14.0	.750	2 1/8
F68B166	16.0	1.000	2 1/8
F68B206	20.0	1.000	2 1/8

grounded circuit available in diameters of .175 in. and up.

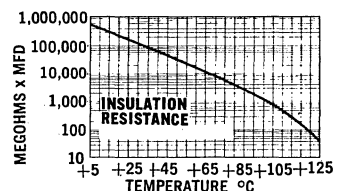
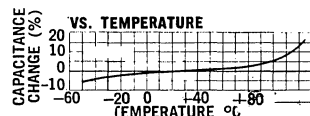
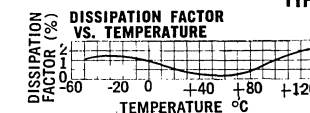
200 VOLTS

Part No.	Capacitance MFD.	Diameter Inches	Length Inches
F68C103	.010	.175	5/8
F68C123	.012	.175	5/8
F68C153	.015	.175	5/8
F68C183	.018	.175	5/8
F68C223	.022	.187	5/8
F68C273	.027	.187	5/8
F68C333	.033	.235	5/8
F68C393	.039	.235	5/8
F68C473	.047	.235	5/8
F68C563	.056	.235	5/8
F68C683	.068	.235	5/8
F68C823	.082	.235	5/8
F68C104	.10	.312	1 1/8
F68C124	.12	.312	1 1/8
F68C154	.15	.312	1 1/8
F68C184	.18	.312	1 1/8
F68C224	.22	.400	1 1/8
F68C274	.27	.400	1 1/8
F68C334	.33	.400	1 1/8
F68C394	.39	.400	1 1/8
F68C474	.47	.400	1 1/8

F indicates "Floating". Substitute "G" for "Grounded".

Add following to Part No. for Tolerance: —20 = ±20%; —10 = ±10%; —5 = ±5%.

TYPICAL CURVES



Part No.	Capacitance MFD.	Diameter Inches	Length Inches
F68C564	.56	.400	1 1/8
F68C684	.68	.562	1 1/8
F68C824	.82	.562	1 1/8
F68C105	1.0	.562	1 1/8
F68C155	1.5	.562	1 1/8
F68C205	2.0	.670	1 1/8
F68C305	3.0	.670	1 1/8
F68C405	4.0	.670	1 1/8
F68C505	5.0	.750	1 1/8
F68C805	8.0	1.000	1 1/8
F68C106	10.0	1.000	2 1/8

400 VOLTS

Part No.	Capacitance MFD.	Diameter Inches	Length Inches
F68E103	.010	.235	1 1/8
F68E123	.012	.235	1 1/8
F68E153	.015	.235	1 1/8
F68E183	.018	.235	1 1/8
F68E223	.022	.312	1 1/8
F68E273	.027	.312	1 1/8
F68E333	.033	.312	1 1/8
F68E393	.039	.312	1 1/8
F68E473	.047	.400	1 1/8
F68E563	.056	.400	1 1/8
F68E683	.068	.400	1 1/8
F68E823	.082	.400	1 1/8
F68E104	.10	.400	1 1/8
F68E124	.12	.400	1 1/8
F68E154	.15	.400	1 1/8
F68E184	.18	.400	1 1/8
F68E224	.22	.400	1 1/8
F68E274	.27	.562	1 1/8
F68E334	.33	.562	1 1/8
F68E394	.39	.562	1 1/8
F68E474	.47	.562	1 1/8
F68E564	.56	.670	1 1/8
F68E684	.68	.670	1 1/8
F68E824	.82	.750	1 1/8
F68E105	1.0	.750	1 1/8
F68E155	1.5	1.000	1 1/8
F68E205	2.0	1.000	1 1/8
F68E305	3.0	1.000	2 1/8
F68E405	4.0	1.000	2 1/8

600 VOLTS

Part No.	Capacitance MFD.	Diameter Inches	Length Inches
F68F103	.010	.312	1 1/8
F68F123	.012	.312	1 1/8
F68F153	.015	.312	1 1/8
F68F183	.018	.312	1 1/8
F68F223	.022	.400	1 1/8
F68F273	.027	.400	1 1/8
F68F333	.033	.400	1 1/8
F68F393	.039	.400	1 1/8
F68F473	.047	.400	1 1/8
F68F563	.056	.562	1 1/8
F68F683	.068	.562	1 1/8
F68F823	.082	.562	1 1/8
F68F104	.10	.562	1 1/8
F68F124	.12	.562	1 1/8
F68F154	.15	.562	1 1/8
F68F184	.18	.562	1 1/8
F68F224	.22	.670	1 1/8
F68F274	.27	.670	1 1/8
F68F334	.33	.750	1 1/8
F68F394	.39	.750	1 1/8
F68F474	.47	.750	1 1/8
F68F564	.56	.750	2 1/8
F68F684	.68	.750	2 1/8
F68F824	.82	1.000	1 1/8
F68F105	1.00	1.000	2 1/8



THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

polyester & kraft capacitor tissue dielectric

series 51

WAX IMPREGNATED — METALLIZED DIELECTRIC

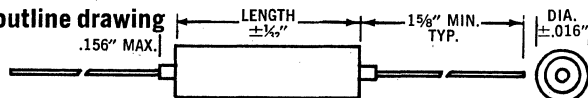
HERMETICALLY SEALED (GLASS TO METAL)

TUBULAR METAL CASE

—55°C TO +125°C WITHOUT DERATING

100 THRU 600 VDC

outline drawing



Standard leads consist of solid, bare, tinned wire. Special Nickel leads are available for applications requiring a higher degree of weldability.

specifications

CAPACITANCE AND TOLERANCE

The capacitance limits at +25°C are determined by the specified tolerance. Capacitors which have a nominal value of 1 MFD or less are measured at or referred to a frequency of 1000 cps. Nominal capacitances above 1 MFD are measured at or referred to a frequency of 60 cps.

DISSIPATION FACTOR

The dissipation factor at +25°C is less than 1.0%. Reference frequencies are as specified above.

INSULATION RESISTANCE

The charging potential is equal to the specified operating voltage for a given temperature. The minimum electrification time is two minutes.

TEMPERATURE	Nominal Capacitance MFD	Voltage VDC	R x C Megohms x MFD	R Megohms
+ 25°C	Greater than .167	ALL	2,000	12,000
	Smaller than .167			
+ 125°C	Greater than .067	100 thru	10	150
	Smaller than .067	300 VDC		
	Greater than .067	400 and	40	
	Smaller than .067	600 VDC		

TEST VOLTAGE

Designed to withstand a test potential equal to 200% of the rated voltage for two minutes at +25°C.

The test voltage must be applied and discharged through a current limiting resistance of approximately 1,000 ohms.

VOLTAGE RATING ABOVE 85°C

No derating of the voltage is required for nominal ratings of 200 through 600 VDC. All 100 VDC capacitors, however, are to be derated above +85°C at the rate of 1 VDC per degree C.

ACCELERATED LIFE TEST — AT 125°C

Designed to withstand a test potential equal to 140% of the rated voltage at +125°C for a period of 250 hours.

The life test voltage must be applied and discharged through a current limiting resistance of approximately 1,000 ohms.

TEMPERATURE AND IMMERSION CYCLING

Designed to meet all requirements of the applicable paragraph of the latest issue of MIL-C-25.

MOISTURE RESISTANCE

Designed to meet all requirements of the applicable paragraph of the latest issue of MIL-C-25.

VIBRATION

Designed to withstand the vibration tests of the applicable paragraph of the latest issue of MIL-C-25.

AC OPERATION

51 Series capacitors are designed to operate up to the following AC voltages.

NOMINAL VOLTAGE VDC	AC VOLTAGES AT + 85°C (rms) Up to 120 cps	Up to 400 cps
100	70	56
200	140	70
300	220	96
400	280	110
600	420	160

For +105°C operation the listed AC voltages should be derated to 60% of the +85°C values.

If both AC and DC voltages are present, the sum of the DC voltage and the amplitude of the AC voltage must not exceed the specified DC rating at a given temperature.

LEAD PULL TEST

Capacitors of this series are designed to withstand a steady pull force of 5 lbs. applied axially to a capacitor lead for one minute.

LEAD BENDING TEST

The leads without bending breakage the following stresses performed near the point of egress: bend 90 degrees in one direction, then back to the original position

and 90 degrees in the opposite direction.

CAPACITANCE CHANGE WITH TEMPERATURE

The change of capacitance with reference to the actual value at 25°C does not exceed the following limits.

TEMPERATURE	CHANGE OF CAPACITANCE
— 55°C	— 10%
+ 85°C	+ 4%
+ 125°C	+ 13%

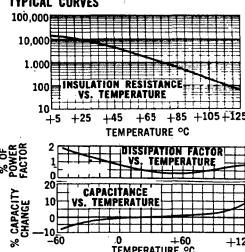
100 VOLTS

Part No.	Capacitance MFD.	Diameter Inches	Length Inches
F51B102	.0010	.175	5/8
F51B122	.0012	.175	5/8
F51B152	.0015	.175	5/8
F51B182	.0018	.175	5/8
F51B222	.0022	.175	5/8
F51B272	.0027	.175	5/8
F51B332	.0033	.175	5/8
F51B392	.0039	.175	5/8
F51B472	.0047	.175	5/8
F51B562	.0056	.175	5/8
F51B682	.0068	.175	5/8
F51B822	.0082	.175	5/8
F51B103	.010	.175	5/8
F51B123	.012	.175	5/8
F51B153	.015	.175	5/8
F51B183	.018	.175	5/8
F51B223	.022	.175	5/8
F51B273	.027	.175	5/8
F51B333	.033	.175	5/8
F51B393	.039	.175	5/8
F51B473	.047	.175	5/8
F51B563	.056	.175	5/8
F51B683	.068	.235	5/8
F51B823	.082	.235	5/8
F51B104	.10	.235	5/8
F51B124	.12	.235	1 1/8
F51B154	.15	.235	1 1/8
F51B184	.18	.235	1 1/8
F51B224	.22	.312	1 1/8
F51B274	.27	.312	1 1/8
F51B334	.33	.312	1 1/8
F51B394	.39	.312	1 1/8
F51B474	.47	.400	1 1/8
F51B564	.56	.400	1 1/8
F51B684	.68	.400	1 1/8
F51B824	.82	.400	1 1/8
F51B105	1.0	.500	1 1/8
F51B155	1.5	.562	1 1/8
F51B205	2.0	.670	1 1/8
F51B305	3.0	.670	1 1/8
F51B405	4.0	.670	1 1/8
F51B505	5.0	.670	1 1/8
F51B605	6.0	.670	1 1/8
F51B805	8.0	.750	1 1/8
F51B106	10.0	.750	2 1/8

200 VOLTS

Part No.	Capacitance MFD.	Diameter Inches	Length Inches
F51C103	.010	.235	3/4
F51C123	.012	.235	3/4
F51C153	.015	.235	3/4
F51C183	.018	.235	3/4
F51C223	.022	.235	3/4
F51C273	.027	.235	3/4
F51C333	.033	.235	3/4
F51C393	.039	.235	3/4
F51C473	.047	.312	3/4
F51C563	.056	.312	3/4
F51C683	.068	.312	3/4
F51C823	.082	.312	3/4
F51C104	.10	.312	3/4
F51C124	.12	.312	1 1/8
F51C154	.15	.312	1 1/8
F51C184	.18	.400	3/4
F51C224	.22	.400	3/4
F51C274	.27	.400	1 1/8
F51C334	.33	.400	1 1/8
F51C394	.39	.500	1 1/8
F51C474	.47	.500	1 1/8
F51C564	.56	.500	1 1/8
F51C684	.68	.500	1 1/8
F51C824	.82	.562	1 1/8
F51C105	1.0	.562	1 1/8
F51C155	1.5	.562	1 1/8
F51C205	2.0	.670	1 1/8
F51C305	3.0	.670	1 1/8
F51C405	4.0	.750	1 1/8
F51C505	5.0	1.000	1 1/8
F51C605	6.0	1.000	1 1/8
F51C805	8.0	1.000	1 1/8
F51C106	10.0	1.000	2 1/8
F51C126	12.0	1.000	2 1/8

TYPICAL CURVES



300 VOLTS

Part No.	Capacitance MFD.	Diameter Inches	Length Inches
F51D103	.010	.312	3/4
F51D123	.012	.312	3/4
F51D153	.015	.312	3/4
F51D183	.018	.312	3/4
F51D223	.022	.312	3/4
F51D273	.027	.312	3/4
F51D333	.033	.312	1 1/8
F51D393	.039	.312	1 1/8
F51D473	.047	.312	1 1/8
F51D563	.056	.400	3/4
F51D683	.068	.400	3/4
F51D823	.082	.400	1 1/8
F51D104	.10	.400	1 1/8
F51D124	.12	.400	1 1/8
F51D154	.15	.400	1 1/8
F51D184	.18	.400	1 1/8
F51D224	.22	.500	1 1/8
F51D274	.27	.500	1 1/8
F51D334	.33	.562	1 1/8
F51D394	.39	.562	1 1/8
F51D474	.47	.562	1 1/8
F51D564	.56	.562	1 1/8
F51D684	.68	.670	1 1/8
F51D824	.82	.670	1 1/8
F51D105	1.0	.750	1 1/8
F51D155	1.5	.750	2 1/8
F51D205	2.0	1.00	1 1/8
F51D255	2.5	1.00	2 1/8
F51D305	3.0	1.00	2 1/8

400 VOLTS

Part No.	Capacitance MFD.	Diameter Inches	Length Inches
F51E103	.010	.312	3/4
F51E123	.012	.312	3/4
F51E153	.015	.312	3/4
F51E183	.018	.312	3/4
F51E223	.022	.312	3/4
F51E273	.027	.312	3/4
F51E333	.033	.312	1 1/8
F51E393	.039	.400	1 1/8
F51E473	.047	.400	1 1/8
F51E563	.056	.400	1 1/8
F51E683	.068	.400	1 1/8
F51E823	.082	.500	1 1/8
F51E104	.10	.500	1 1/8
F51E124	.12	.500	1 1/8
F51E154	.15	.500	1 1/8
F51E184	.18	.562	1 1/8
F51E224	.22	.562	1 1/8
F51E274	.27	.562	1 1/8
F51E334	.33	.562	1 1/8
F51E394	.39	.670	1 1/8
F51E474	.47	.670	1 1/8
F51E564	.56	.670	1 1/8
F51E684	.68	.670	1 1/8
F51E824	.82	.750	1 1/8
F51E105	1.0	.750	1 1/8
F51E155	1.5	1.000	1 1/8
F51E205	2.0	1.000	1 1/8
F51E305	3.0	1.000	2 1/8

600 VOLTS

Part No.	Capacitance MFD.	Diameter Inches	Length Inches
F51F103	.010	.312	3/4
F51F123	.012	.312	3/4
F51F153	.015	.312	3/4
F51F183	.018	.312	3/4
F51F223	.022	.312	3/4
F51F273	.027	.312	3/4
F51F333	.033	.312	1 1/8
F51F393	.039	.400	1 1/8
F51F473	.047	.400	1 1/8
F51F563	.056	.400	1 1/8
F51F683	.068	.400	1 1/8
F51F823	.082	.500	1 1/8
F51F104	.10	.500	1 1/8
F51F124	.12	.562	1 1/8
F51F154	.15	.562	1 1/8
F51F184	.18	.562	1 1/8
F51F224	.22	.562	1 1/8
F51F274	.27	.562	1 1/8
F51F334	.33	.562	1 1/8
F51F394	.39	.670	1 1/8
F51F474	.47	.670	1 1/8
F51F564	.56	.670	1 1/8
F51F684	.68	.670	1 1/8
F51F824	.82	1.000	1 1/8
F51F105	1.0	1.000	1 1/8
F51F155	1.5	1.000	2 1/8
F51F205	2.0	1.000	2 1/8
F51F255	2.5	1.000	2 1/8

Add following to Part No. for tolerance: — 20 = ±20%; — 10 = ±10%; — 5 = ±5%. "F" indicates Floating. Substitute "G" for grounded. Subtract 1/8" from length for grounded types.



THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

metalized paper dielectric

series 88

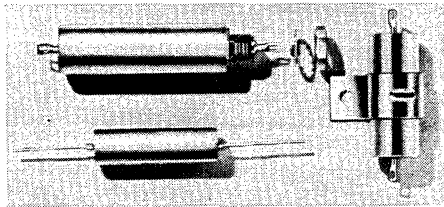
HERMETICALLY SEALED (GLASS TO METAL)

TUBULAR METAL CASE

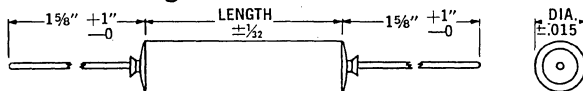
—55°C TO +125°C WITHOUT DERATING

50 VDC

WIRE LEADS OR LUG TERMINALS



outline drawing



Solid Tinned Wire Leads.

The following lead sizes will apply:

.235 and .312 diameter #22 AWG
.400 diameter and up #20 AWG

NOTE: Mounting by means of lead wires is not recommended for units larger than .562 x 1 3/4\"

NF STYLE WILL BE FURNISHED WITH #22 AWG LEADS.

specifications

CAPACITANCE AND TOLERANCE

The capacitance shall be within the specified tolerance limits of the nominal rating.

Capacitors of 1.0 MFD or less shall be measured at, or referred to, a frequency of 1000 cycles per second at 25°C. Capacitors greater than 1.0 MFD shall be measured at, or referred to, a frequency of 60 cycles per second at 25°C.

DISSIPATION FACTOR

The dissipation factor shall be a maximum of 1.0% at 25°C.

Capacitors of 1.0 MFD or less shall be measured at, or referred to, a frequency of 1000 cycle per second. Capacitors above 1.0 MFD shall be measured at, or referred to, a frequency of 60 cycles per second.

INSULATION RESISTANCE

Insulation resistance shall be measured at a charging potential of 50 VDC.

The insulation resistance shall equal or exceed the following for capacitance values up to and including 4.0 MFD.

Temperature	Tolerance
25°C—4000 megohms X mfd or 12,000 megohms, whichever is less	
85°C— 100 megohms X mfd or 300 megohms, whichever is less	
125°C— 10 megohms X mfd or 150 megohms, whichever is less	

For values above 4.0 MFD, the insulation resistance shall equal or exceed the following:

Temperature	Tolerance
25°C—2000 megohms X mfd	
85°C— 50 megohms X mfd	
125°C— 5 megohms X mfd	

TEST VOLTAGE

Shall withstand a D.C. potential of 200% of rated D.C. voltage at a temperature of 25°C applied for a period not to exceed two minutes, without permanent breakdown.

When the case is not a terminal, they shall withstand a D.C. potential of 200% of rated voltage between the case and the terminals.

LIFE TEST

Shall withstand a test potential of 140% of the rated D.C. voltage at 125°C for 250 hours.

One failure out of twelve (12) samples tested is allowed. A capacitor will be considered to have failed when:

- The capacitance has changed more than 10% from its original value.
- The insulation resistance is less than 50% of its original requirements.
- It exhibits a permanent open or short circuit.

TEMPERATURE & IMMERSION CYCLING

These capacitors shall meet the temperature and immersion cycling test of Military Specification MIL-C-25C.

MOISTURE RESISTANCE

Shall meet the moisture resistance requirements of Military Specification MIL-C-25C.

VIBRATION

Shall withstand the Grade 3 vibration as specified in Military Specification MIL-C-25C.

CORROSION RESISTANCE

These capacitors shall meet the corrosion test of Military Specification MIL-C-25C.

specifications (continued)

LEAD PULL TEST

Shall withstand a pull of 5 lbs. applied axially to the lead for a period of one minute.

LEAD BEND TEST

The leads shall withstand without breakage, a bend at the point of egress from the capacitor first 90° in one direction, back to the original position and then 90° in the opposite direction.

SHOCK

When securely mounted by their normal mounting means, the capacitors shall withstand 3 impact shocks of 50G intensity (18 shocks total) in each direction of each of the three major axis. The time duration of each impulse shock shall be 11 ±1 milli-seconds.

There shall be no intermittent or permanent open or short circuit as a result of this test.

CAPACITANCE CHANGE WITH TEMPERATURE

The Capacitance change at 125°C shall not be greater than 5% of the measured capacitance value at +25°C.

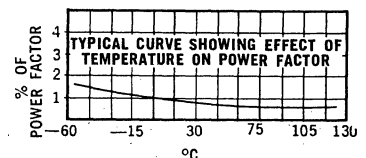
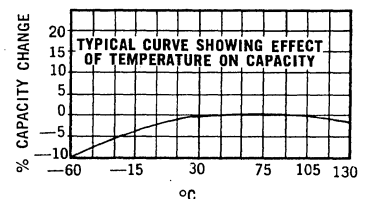
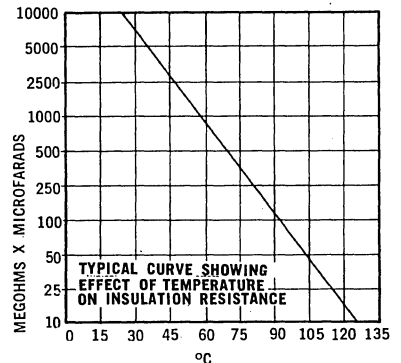
The capacitance change at —55°C shall not be greater than 10% of the measured capacitance value at +25°C.

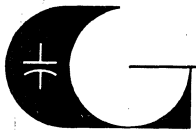
Part No.	Capacity	Voltage	O.D.	XMG Length	XMF Length
XMF-88A104	Under .1 MFD	50 VDC	.235	5/8"	1 1/8"
XMF-88A124	.1	50 VDC	.235	5/8"	1 1/8"
XMF-88A154	.12	50 VDC	.235	5/8"	1 1/8"
XMF-88A184	.15	50 VDC	.235	5/8"	1 1/8"
XMF-88A224	.18	50 VDC	.235	5/8"	1 1/8"
XMF-88A274	.22	50 VDC	.312	1 1/8"	1 1/2"
XMF-88A334	.27	50 VDC	.312	1 1/8"	1 1/2"
XMF-88A394	.33	50 VDC	.312	1 1/8"	1 1/2"
XMF-88A474	.39	50 VDC	.312	1 1/8"	1 1/2"
XMF-88A564	.47	50 VDC	.312	1 1/8"	1 1/2"
XMF-88A684	.56	50 VDC	.400	1 1/8"	1 1/2"
XMF-88A824	.68	50 VDC	.400	1 1/8"	1 1/2"
XMF-88A105	.82	50 VDC	.400	1 1/8"	1 1/2"
XMF-88A155	1.00	50 VDC	.400	1 1/8"	1 3/8"
XMF-88A205	1.50	50 VDC	.500	1 1/8"	1 3/8"
XMF-88A305	2.00	50 VDC	.562	1 1/4"	1 3/8"
XMF-88A405	3.00	50 VDC	.562	1 1/4"	1 3/8"
XMF-88A505	4.00	50 VDC	.670	1 1/2"	1 3/8"
XMF-88A605	5.00	50 VDC	.670	1 1/2"	1 3/8"
XMF-88A805	6.00	50 VDC	.750	1 3/4"	1 3/8"
XMF-88A106	8.00	50 VDC	.750	2"	2 1/8"
XMF-88A126	10.00	50 VDC	.750	2"	2 1/8"
XMF-88A146	12.00	50 VDC	1.000	1 3/4"	2 1/8"
XMF-88A166	14.00	50 VDC	1.000	2"	2 1/8"
XMF-88A206	16.00	50 VDC	1.000	2"	2 1/8"
XMF-88A206	20.00	50 VDC	1.000	2 5/8"	2 1/8"

"F" Indicates "Floating". Substitute "G" for "Grounded".

NOTE: 1—When sleeving is required, insert the letter "S" after prefix, example: XMF5 — XMG5.

TYPICAL CURVES





THE GUDDAMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

paper dielectric — inserted tab construction

series GC245 & 246

HERMETICALLY SEALED IN GLASS CASES
HIGH VOLTAGE — 1000 VDC THRU 10,000 VDC
—55°C TO +85°C WITHOUT DERATING
75% RATING TO 105°C

specifications

HIGH ALTITUDE APPLICATION:

The DC Voltage ratings listed are primarily for application at a barometric pressure between 28 and 32 inches. For high altitude application the permissible DC voltage should never exceed the rated DC voltage and shall be equal to or less than the maximum permissible operating voltage per length of glass tubing as follows:

PERMISSIBLE VOLTAGE RATING FOR HIGH ALTITUDE

Tube Length (in.)	1 3/4	1 1/2	1 1/4	1 1/8	3/4	3/8	1/4
Max. Volt. at 50,000 ft.	4500	5000	5300	5500	6000	7000	8000
Max. Volt. at 60,000 ft.	2400	2800	3500	4000	4300	4500	4700

RIPPLE VOLTAGE:

The ratings given are the steady-state DC voltage, or the DC voltage plus the permissible ripple voltage wherein the peak value of the permissible ripple voltage shall not exceed:

20% of the rating at	60 cps.
15% of the rating at	120 cps.
8% of the rating at	400 cps.
5% of the rating at	1000 cps.

INSULATION RESISTANCE:

The minimum insulation resistance when measured with an applied potential of 100 to 500 volts shall be as follows:

At 25°C—10,000 megohm-mfds. minimum but need not exceed 20,000 megohms.
At 85°C—100 megohm-mfds. minimum but need not exceed 1000 megohms.
At 105°C—30 megohm-mfds. minimum but need not exceed 300 megohms.

TEST VOLTAGE:

Shall withstand a DC voltage equal to 200% of the rated voltage for five seconds at a temperature of 25°C.

LIFE TEST:

Shall withstand an accelerated life test of 250 hours at 85°C with an applied voltage as follows:

Watt-Second Group	% of Rated Voltage for life test
0. to 0.49 watt-seconds	140
0.5 to 4.9 watt-seconds	130

One failure in 12 samples tested is permitted.

VOLTAGE DERATING:

When operated at high ambient temperature the capacitors shall be derated as follows:

At 85°C.....	No derating
At 105°C.....	25% derating

POWER FACTOR:

The power factor at 25°C shall not be more than 1% when measured at or referred to a frequency of 1000 cycles per second.

LEAD PULL TEST

Shall withstand for one minute a steady 5 pound pull applied axially.

VIBRATION:

The GC246 Series capacitors (wire leads) shall be mounted and soldered to rigidly supported terminals and the length of the lead shall be approximately 5% of an inch when measured from the capacitor to the supporting terminal. The GC245 Series shall be mounted to brackets.

The capacitors when mounted and subjected to a simple harmonic motion having an amplitude of 0.03 inches (Total excursion 0.06 inches maximum), and the frequency being varied uniformly between 10 to 55 cycles per second and return in approximately one minute. This motion shall be applied for a period of three hours in any direction. During the last 1/2 hour of vibration measurement shall be made for intermittent contacts, open circuits or short circuits. One failure in six samples tested is permitted.

TEMPERATURE AND IMMERSION CYCLING:

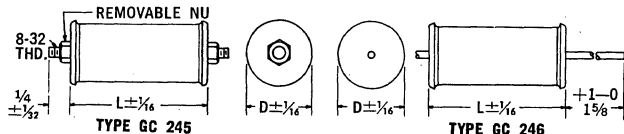
These capacitors shall be subjected to five thermal cycles as follows:

Start at +25°C
Raise to +105°C
Return to +25°C
Reduce to -55°C
Return to +25°C

After the thermal cycle the capacitors shall be subjected to five successive immersion cycles in two tanks of saturated solutions of sodium chloride and water, one at 65°C and the other at 0°C. The period of each cycle shall consist of 60 minutes immersion in each tank. After immersion cycling, the capacitors shall be washed in tap water, surface dried with a clean cloth and dried from 4 to 6 hours at room temperature. The capacitor shall meet the following requirements:

Dielectric Strength	125% Rated Voltage
Insulation Resistance	4000 megohms-mfds. minimum but need not exceed 8000 megohms.

In addition, the capacitors shall show no harmful or extensive corrosion and at least 90% of the exposed metallic surfaces of the capacitors shall be protected by the finish.



Catalog Number	CAP. MFD.	Dimensions L.	D.
----------------	-----------	---------------	----

1000 WVDC at 85°C

GC246G102	.001	1 3/8	1 1/2
GC246G202	.002	1 3/8	1 1/2
GC246G502	.005	1 3/8	1 1/2
GC246G103	.01	1 3/8	1 1/2
GC246G203	.02	1 3/8	1 1/2
GC246G503	.05	1 3/8	1 1/2
GC246G104	.1	1 3/4	5/8
GC245G254	.25	2 1/4	3/4
GC245G504	.5	2 3/4	7/8
GC245G105	1.0	2 3/4	1 1/4

2000 WVDC at 85°C

GC246J102	.001	1 3/8	1 1/2
GC246J202	.002	1 3/8	1 1/2
GC246J502	.005	1 3/8	1 1/2
GC246J103	.01	1 3/8	1 1/2
GC246J203	.02	1 3/8	1 1/2
GC245J503	.05	1 1/2	3/4
GC245J104	.1	2 1/4	3/4
GC245J254	.25	2 3/4	1 1/8
GC245J504	.5	2 3/4	1 3/8

3000 WVDC at 85°C

GC246L102	.001	1 3/8	1 1/2
GC246L202	.002	1 3/8	1 1/2
GC246L502	.005	1 3/8	1 1/2
GC246L103	.01	1 3/8	1 1/2
GC245L203	.02	1 1/2	3/4
GC245L503	.05	2 1/4	3/4
GC245L104	.1	2 3/4	7/8
GC245L254	.25	2 3/4	1 3/8

5000 WVDC at 85°C

GC246N102	.001	1 3/8	1 1/2
GC246N202	.002	1 3/8	1 1/2
GC246N502	.005	1 3/8	1 1/2
GC245N103	.01	1 3/4	7/8
GC245N203	.02	2 1/4	7/8
GC245N503	.05	2 3/4	1 1/8
GC245N104	.1	2 3/4	1 3/8

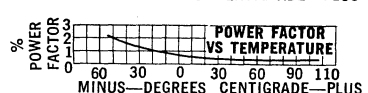
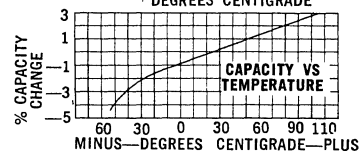
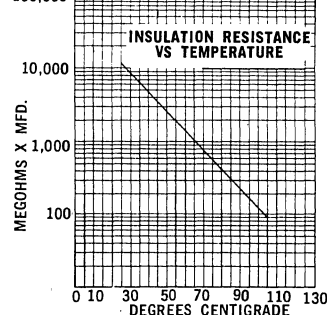
7500 WVDC at 85°C

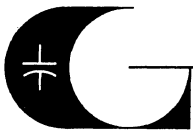
GC245R102	.001	1 3/8	3/4
GC245R202	.002	2	3/4
GC245R502	.005	2 1/4	3/4
GC245R103	.01	2 3/4	7/8
GC245R203	.02	2 3/4	1 1/8
GC245R503	.05	2 3/4	1 3/8
GC245R104	.1	4 1/4	1 3/8

Tolerance = ±20%. Closer tolerances available upon request.

TYPICAL CURVES

100,000





CAPACITORS (ALL TYPES)

THE GUDEMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863
FOR CURRENT SOURCE DATA CALL TOLL-FREE 800-645-9200 (IN N.Y. STATE CALL COLLECT (516) 294-0990)

high voltage capacitors — 2000 VDC thru 10,000 VDC

series GC145 & GC146

PAPER PLASTIC FILM DIELECTRIC —

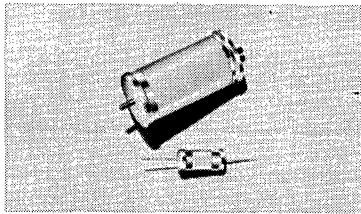
INSERTED TAB CONSTRUCTION

HERMETICALLY SEALED IN GLASS CASE

—55°C TO +125°C WITHOUT DERATING

SERIES 145 — SCREW STUD TERMINALS

SERIES 146 — WIRE LEADS



specifications

HIGH ALTITUDE APPLICATION:

The DC Voltage ratings listed are primarily for application at a barometric pressure between 28 and 32 inches. For high altitude application the permissible DC voltage should never exceed the rated DC voltage and shall be equal to or less than the maximum permissible operating voltage per length of glass tubing as follows:

PERMISSIBLE VOLTAGE RATING FOR HIGH ALTITUDE

Tube Length (in.)	1 $\frac{3}{8}$	1 $\frac{1}{2}$	1 $\frac{3}{4}$	2 $\frac{1}{4}$	2 $\frac{3}{4}$	3 $\frac{1}{2}$	4 $\frac{1}{4}$
Max. Volt at 50,000 Ft.	4500	5000	5300	5500	6000	7000	8000
Max. Volt at 60,000 Ft.	2400	2800	3500	4000	4300	4500	4700

RIPPLE VOLTAGE:

The ratings given are the steady-state DC voltage, or the DC voltage plus the permissible ripple voltage wherein the peak value of the permissible ripple voltage shall not exceed:

- 20% of the rating at 60 cps.
- 15% of the rating at 120 cps.
- 8% of the rating at 400 cps.
- 5% of the rating at 1000 cps.
- 1% of the rating at 10,000 cps.

INSULATION RESISTANCE:

The minimum insulation resistance when measured with an applied potential of 500 volts shall be as follows:

- At +25°C—20,000 megohm-mfds. minimum but need not exceed 100,000 megohms.
- At +125°C—20 megohm-mfds. minimum but need not exceed 250 megohms.

TEST VOLTAGE:

Shall withstand a DC Voltage equal to 200% of the rated voltage for five seconds at a temperature of +25°C.

ACCELERATED LIFE TEST:

These capacitors shall withstand an accelerated life test at 250 hours at +125°C with an applied voltage as follows:

Watt-Second Group	% of Rated Voltage for Life Test
0. to 0.49 Watt-Seconds	140
0.5 to 4.9 Watt-Seconds	130

One failure in 12 samples tested is permitted.

TEMPERATURE AND IMMERSION CYCLING:

Shall meet the temperature and immersion cycling tests of military specification MIL-C-25C.

POWER FACTOR:

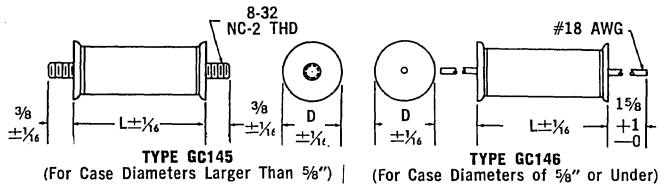
The power factor of the capacitors at +25°C shall not be more than 1% when measured at or referred to a frequency of 1000 cycles per second.

MOISTURE RESISTANCE:

Shall meet the moisture resistance tests of the military specification MIL-C-25C.

VIBRATION:

Shall meet the high frequency vibration requirements of MIL-C-25C.



Part No.	CAP. MFD	D	L
----------	----------	---	---

2000 VOLTS DC

GC146J102	.001	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC146J202	.002	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC146J502	.005	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC146J103	.01	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC146J203	.02	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145J503	.05	1 $\frac{1}{2}$ "	2 $\frac{1}{4}$ "
GC145J104	.1	1 $\frac{1}{2}$ "	2 $\frac{1}{4}$ "
GC145J254	.25	1 $\frac{1}{2}$ "	2 $\frac{3}{4}$ "

3000 VOLTS DC

GC146L102	.001	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC146L202	.002	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC146L502	.005	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC146L103	.01	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145L203	.02	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145L503	.05	1 $\frac{1}{2}$ "	2 $\frac{1}{4}$ "
GC145L104	.1	1 $\frac{1}{2}$ "	2 $\frac{3}{4}$ "

4000 VOLTS DC

GC146M102	.001	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC146M202	.002	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC146M502	.005	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145M103	.01	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145M203	.02	1 $\frac{1}{2}$ "	2 $\frac{1}{4}$ "
GC145M503	.05	1 $\frac{1}{2}$ "	2 $\frac{3}{4}$ "
GC145M104	.1	1 $\frac{1}{2}$ "	2 $\frac{3}{4}$ "

5000 VOLTS DC

GC146N102	.001	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC146N202	.002	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145N502	.005	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145N103	.01	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145N203	.02	1 $\frac{1}{2}$ "	2 $\frac{1}{4}$ "
GC145N503	.05	1 $\frac{1}{2}$ "	2 $\frac{3}{4}$ "
GC145N104	.1	1 $\frac{1}{2}$ "	3 $\frac{1}{2}$ "

7500 VOLTS DC

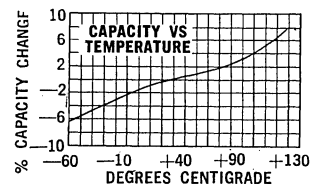
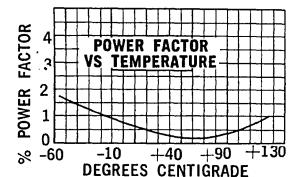
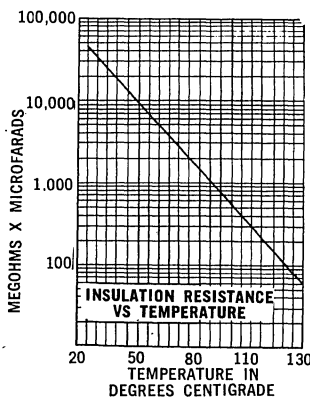
GC146R102	.001	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145R202	.002	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145R502	.005	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145R103	.01	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145R203	.02	1 $\frac{1}{2}$ "	2 $\frac{1}{4}$ "
GC145R503	.05	1 $\frac{1}{2}$ "	2 $\frac{3}{4}$ "

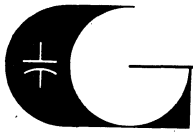
10,000 VOLTS DC

GC145S102	.001	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145S202	.002	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145S502	.005	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145S103	.01	1 $\frac{1}{2}$ "	1 $\frac{3}{8}$ "
GC145S203	.02	1 $\frac{1}{2}$ "	2 $\frac{1}{4}$ "

Add following to Part No. for tolerance: —M = $\pm 20\%$; —K = $\pm 10\%$; —J = $\pm 5\%$.

TYPICAL CURVES





THE GUDDAMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

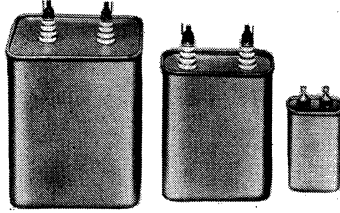
paper plastic dielectric

series 672

DRAWN RECTANGULAR CASE

-55°C TO +125°C

400 VDC TO 12500 VDC



specifications

ACCELERATED LIFE TEST

These capacitors shall withstand an accelerated life test of 250 hours with 140% of the voltage rating, applied at the applicable high ambient temperature, per MIL-C-25C. Not more than one failure in 24 units tested will be permitted.

TEST VOLTAGE

The 672 Series capacitor shall withstand a DC voltage equal to 200% of the rated voltage between terminals and terminals to case for one minute at a temperature of +25°C to ±5°C.

RIPPLE VOLTAGE

The sum of the peak AC voltage and the applied DC voltage shall not exceed the applicable rated voltage.

The peak AC voltage shall not exceed the percentage of the rated voltage as follows:

20% @ 60 Hz 8% @ 400 Hz 1% @ 10 KHz

15% @ 120 Hz 5% @ 1KHz

VOLTAGE RATINGS

The 672 Series, temperature symbol E, capacitors are designed for continuous operation over the temperature range of -55°C to +85°C. The 672 Series, temperature symbol K, capacitors are designed for continuous operation over the temperature range of -55°C to +125°C.

CAPACITANCE CHANGE WITH TEMPERATURE

The capacitance change shall not exceed ±10% over the operating temperature range of -55°C to +125°C when referred to the +25°C capacitance value.

DISSIPATION FACTOR

The dissipation factor shall not exceed .5% when measured at or referred to a frequency of 60 Hz at +25°C per MIL-C-19978B.

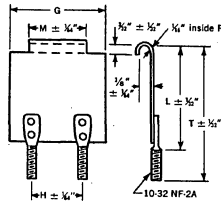
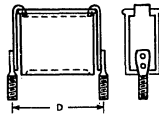
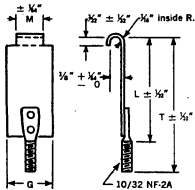
INSULATION RESISTANCE

The minimum insulation resistance when measured with an applied potential equal to the DC voltage rating or 500 VDC, whichever is less and an electrification time of two minutes shall be as follows:

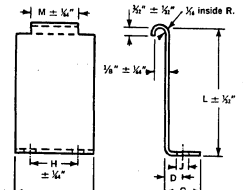
At +25°C The minimum insulation resistance shall be 20,000 megohms times microfarads, but need not exceed 100,000 megohms.

At +85°C The minimum insulation resistance shall be 300 megohms times microfarads, but need not exceed 2,000 megohms.

spade bracket

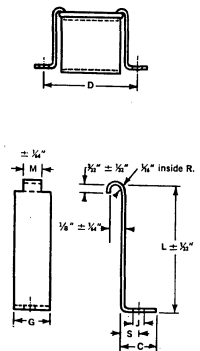


footed bracket



Ref Bkt	Part Number	G Max.	L	T	M	D	H
A1	1041-SA1	1/8	1.375	2.375	2 1/4	2 1/4	—
A2	1041-SA2	1/8	2	3	2 1/4	2 1/4	—
A3	1041-SA3	1/8	2.625	3.625	2 1/4	2 1/4	—
A4	1041-SA4	1/8	3	4	2 1/4	2 1/4	—
A5	1041-SA5	1/8	3.625	4.625	2 1/4	2 1/4	—
A6	1041-SA6	1/8	4.5	5.5	2 1/4	2 1/4	—
B1	1041-SB1	1/8	2.25	3.25	2 1/4	2 1/4	—
B2	1041-SB2	1/8	2.625	3.625	2 1/4	2 1/4	—
B3	1041-SB3	1/8	3.25	4.25	2 1/4	2 1/4	—
B4	1041-SB4	1/8	3.625	4.625	2 1/4	2 1/4	—
B5	1041-SB5	1/8	4	5	2 1/4	2 1/4	—
B6	1041-SB6	1/8	4.5	5.5	2 1/4	2 1/4	—
C1	1041-SC1	1/8	3	4	2 1/4	2 1/4	—
C2	1041-SC2	1/8	3.625	4.625	2 1/4	2 1/4	—
C3	1041-SC3	1/8	4	5	2 1/4	2 1/4	—
C4	1041-SC4	1/8	4.5	5.5	2 1/4	2 1/4	—
D1	1041-SD1	1/8	1.375	2.375	2 1/4	2 1/4	—
D2	1041-SD2	1/8	2	3	2 1/4	2 1/4	—
D3	1041-SD3	1/8	2.625	3.625	2 1/4	2 1/4	—
D4	1041-SD4	1/8	3	4	2 1/4	2 1/4	—
D5	1041-SD5	1/8	3.625	4.625	2 1/4	2 1/4	—
E1	1041-ES1	1/8	2.5	3.5	1.344	1.25	—
E2	1041-ES2	1/8	3.125	4.125	1.344	1.25	—
E3	1041-ES3	1/8	3.625	4.625	1.344	1.25	—
E4	1041-ES4	1/8	4.25	5.25	1.344	1.25	—
E5	1041-ES5	1/8	4.5	5.5	1.344	1.25	—
E6	1041-ES6	1/8	4.875	5.875	1.344	1.25	—
F1	1041-SF1	1/8	4.5	5.5	1.344	1.25	—
F2	1041-SF2	1/8	5.5	6.5	1.344	1.25	—
G1	1041-SG1	1/8	4.25	5.25	2.281	1.938	—
G2	1041-SG2	1/8	4.5	5.5	2.281	1.938	—
G3	1041-SG3	1/8	4.875	5.875	2.281	1.938	—
G4	1041-SG4	1/8	5.25	6.25	2.281	1.938	—
J1	1041-SJ1	1/8	3.625	4.625	3.656	3.375	—
J2	1041-SJ2	1/8	4.125	5.125	3.656	3.375	—
J3	1041-SJ3	1/8	4.5	5.5	3.656	3.375	—
J4	1041-SJ4	1/8	4.875	5.875	3.656	3.375	—
J5	1041-SJ5	1/8	5.25	6.25	3.656	3.375	—
J6	1041-SJ6	1/8	5.75	6.75	3.656	3.375	—
J7	1041-SJ7	1/8	6.25	7.25	3.656	3.375	—
J8	1041-SJ8	1/8	6.75	7.75	3.656	3.375	—
J9	1041-SJ9	1/8	7.25	8.25	3.656	3.375	—
J10	1041-SJ10	1/8	8.25	9.25	3.656	3.375	—
J11	1041-SJ11	1/8	9.375	10.375	3.656	3.375	—

Ref Bkt	Part Number	G Max.	J	L	M	S	C	H	D
A1	1042-FA1	1/8	.187	1.500	2 1/4	.219	.437	—	2 1/4
A2	1042-FA2	1/8	.187	2.125	2 1/4	.219	.437	—	2 1/4
A3	1042-FA3	1/8	.187	2.75	2 1/4	.219	.437	—	2 1/4
A4	1042-FA4	1/8	.187	3.125	2 1/4	.219	.437	—	2 1/4
A5	1042-FA5	1/8	.187	3.75	2 1/4	.219	.437	—	2 1/4
A6	1042-FA6	1/8	.187	4.625	2 1/4	.219	.437	—	2 1/4
B1	1042-FB1	1/8	.187	2.375	2 1/4	.250	.469	—	2 1/4
B2	1042-FB2	1/8	.187	2.75	2 1/4	.250	.469	—	2 1/4
B3	1042-FB3	1/8	.187	3.375	2 1/4	.250	.469	—	2 1/4
B4	1042-FB4	1/8	.187	3.75	2 1/4	.250	.469	—	2 1/4
B5	1042-FB5	1/8	.187	4.125	2 1/4	.250	.469	—	2 1/4
B6	1042-FB6	1/8	.187	4.625	2 1/4	.250	.469	—	2 1/4
C1	1042-FC1	1/8	.187	3.125	2 1/4	.250	.469	—	2 1/4
C2	1042-FC2	1/8	.187	3.75	2 1/4	.250	.469	—	2 1/4
C3	1042-FC3	1/8	.187	4.125	2 1/4	.250	.469	—	2 1/4
C4	1042-FC4	1/8	.187	4.625	2 1/4	.250	.469	—	2 1/4
D1	1042-FD1	1/8	.187	4.625	2 1/4	.250	.469	—	2 1/4
D2	1042-FD2	1/8	.187	5.125	2 1/4	.250	.469	—	2 1/4
D3	1042-FD3	1/8	.187	5.625	2 1/4	.250	.469	—	2 1/4
D4	1042-FD4	1/8	.187	6.125	2 1/4	.250	.469	—	2 1/4
D5	1042-FD5	1/8	.187	6.625	2 1/4	.250	.469	—	2 1/4
E1	1042-FE1	1/8	.187	6.125	2 1/4	.250	.469	—	2 1/4
E2	1042-FE2	1/8	.187	6.625	2 1/4	.250	.469	—	2 1/4
E3	1042-FE3	1/8	.187	7.125	2 1/4	.250	.469	—	2 1/4
E4	1042-FE4	1/8	.187	7.625	2 1/4	.250	.469	—	2 1/4
E5	1042-FE5	1/8	.187	8.125	2 1/4	.250	.469	—	2 1/4
E6	1042-FE6	1/8	.187	8.625	2 1/4	.250	.469	—	2 1/4
F1	1042-FF1	1/8	.187	8.125	2 1/4	.250	.469	—	2 1/4
F2	1042-FF2	1/8	.187	8.625	2 1/4	.250	.469	—	2 1/4
G1	1042-FG1	1/8	.187	9.125	2 1/4	.250	.469	—	2 1/4
G2	1042-FG2	1/8	.187	9.625	2 1/4	.250	.469	—	2 1/4
G3	1042-FG3	1/8	.187	10.125	2 1/4	.250	.469	—	2 1/4
G4	1042-FG4	1/8	.187	10.625	2 1/4	.250	.469	—	2 1/4
J1	1042-FJ1	1/8	.187	8.125	2 1/4	.250	.469	—	2 1/4
J2	1042-FJ2	1/8	.187	8.625	2 1/4	.250	.469	—	2 1/4
J3	1042-FJ3	1/8	.187	9.125	2 1/4	.250	.469	—	2 1/4
J4	1042-FJ4	1/8	.187	9.625	2 1/4	.250	.469	—	2 1/4
J5	1042-FJ5	1/8	.187	10.125	2 1/4	.250	.469	—	2 1/4
J6	1042-FJ6	1/8	.187	10.625	2 1/4	.250	.469	—	2 1/4
J7	1042-FJ7	1/8	.187	11.125	2 1/4	.250	.469	—	2 1/4
J8	1042-FJ8	1/8	.187	11.625	2 1/4	.250	.469	—	2 1/4
J9	1042-FJ9	1/8	.187	12.125	2 1/4	.250	.469	—	2 1/4
J10	1042-FJ10	1/8	.187	12.625	2 1/4	.250	.469	—	2 1/4
J11	1042-FJ11	1/8	.187	13.125	2 1/4	.250	.469	—	2 1/4



At +125°C The minimum insulation resistance shall be 20 megohms times microfarads, but need not exceed 250 megohms.

Insulation resistance to case when the case is not a terminal shall be greater than 50,000 megohms.

MILITARY SPECIFICATION

These capacitors are designed to meet and exceed the requirements of Military Specification MIL-C-19978B, Style CQ72 (MIL-C-19978B/3).

MOISTURE RESISTANCE

The 672 Series capacitors shall withstand the moisture resistance requirements as specified in military specification MIL-C-25C.

VIBRATION-ACCELERATION

These capacitors shall withstand the Grade 3 (2,000 cycle) vibration-acceleration requirements of MIL-C-25C. (MIL standard 202B, method 204, test condition B.)

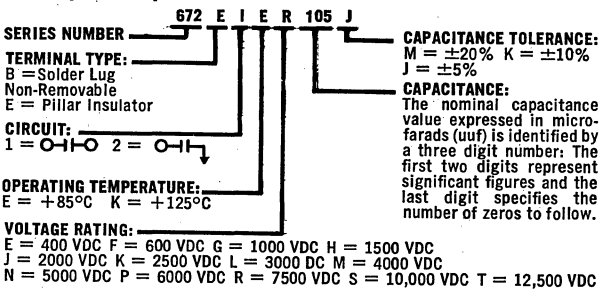
TEMPERATURE AND IMMERSION

These capacitors shall meet the temperature and immersion cycling requirements of MIL-C-25C.

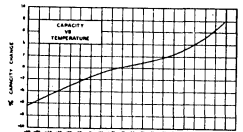
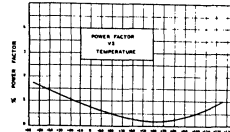
SPECIAL CAPACITORS

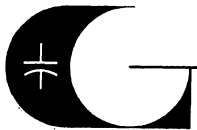
Capacitance values, voltages and sizes not listed will be furnished upon request.

example of part number



typical curves

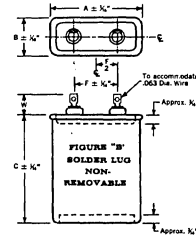
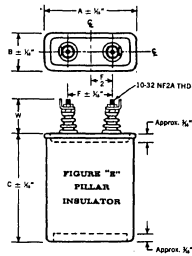




THE GUDEMAN CORPORATION

capacitors and EMI filters

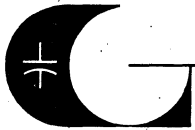
340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863



series 672 (continued)

Capacitance	Part Number Figure E	Part Number Figure B	Measurements in Inches			W Max.	Ref Bkt
			A	B	C		
400 VOLTS							
0.50	672E1EE504	672B1EE504	1 1/4	1 1/4	1 5/8	3/4	A1
1	672E1EE105	672B1EE105	1 1/4	1 1/4	1 5/8	3/4	A1
2	672E1EE205	672B1EE205	1 1/4	1 1/4	2 1/4	3/4	A2
4	672E1EE405	672B1EE405	2 1/2	1 3/4	2 7/8	3/4	B2
6	672E1EE605	672B1EE605	2 1/2	1 3/4	4 3/4	3/4	B6
8	672E1EE805	672B1EE805	3 3/4	1 1/4	4 1/4	3/4	C3
10	672E1EE106	672B1EE106	3 3/4	1 1/4	4 3/4	3/4	C4
12	672E1EE126	672B1EE126	3 3/4	1 1/4	3 7/8	3/4	D5
15	672E1EE156	672B1EE156	3 3/4	1 3/4	4 3/4	3/4	D5
600 VOLTS							
0.50	672E1EF504	672B1EF504	1 1/4	1 1/4	1 5/8	3/4	A1
1	672E1EF205	672B1EF205	1 1/4	1 1/4	2 1/4	3/4	A2
2	672E1EF105	672B1EF105	1 1/4	1 1/4	2 1/4	3/4	A2
4	672E1EF405	672B1EF405	2 1/2	1 3/4	3 3/4	3/4	B3
6	672E1EF605	672B1EF605	2 1/2	1 3/4	4 3/4	3/4	B6
8	672E1EF805	672B1EF805	3 3/4	1 1/4	3 7/8	3/4	C2
10	672E1EF106	672B1EF106	3 3/4	1 1/4	4 3/4	3/4	C4
12	672E1EF126	672B1EF126	3 3/4	2 1/4	3 3/8	3/4	E2
15	672E1EF156	672B1EF156	3 3/4	2 1/4	4 3/4	3/4	E5
1000 VOLTS							
0.50	672E1EG504	672B1EG504	1 1/4	1 1/4	1 5/8	3/4	A1
1	672E1EG105	672B1EG105	1 1/4	1 1/4	2 1/4	3/4	A2
2	672E1EG205	672B1EG205	1 1/4	1 1/4	3 7/8	3/4	A5
4	672E1EG405	672B1EG405	2 1/2	1 3/4	4 3/4	3/4	B6
6	672E1EG605	672B1EG605	3 3/4	1 1/4	4 3/4	3/4	C4
8	672E1EG805	672B1EG805	3 3/4	1 3/4	3 7/8	3/4	D2
10	672E1EG106	672B1EG106	3 3/4	1 3/4	4 3/4	3/4	D5
12	672E1EG126	672B1EG126	3 3/4	2 1/4	4 1/2	3/4	E4
15	672E1EG156	672B1EG156	3 3/4	2 1/2	4 3/4	3/4	F1
1500 VOLTS							
0.1	672E1EH104	672B1EH104	1 1/4	1 1/4	1 5/8	3/4	A1
0.25	672E1EH254	672B1EH254	1 1/4	1 1/4	1 5/8	3/4	A1
0.50	672E1EH504	672B1EH504	1 1/4	1 1/4	2 1/4	3/4	A2
1	672E1EH105	672B1EH105	1 1/4	1 1/4	3 7/8	3/4	A5
2	672E1EH205	672B1EH205	2 1/2	1 3/4	4 3/4	3/4	B6
4	672E1EH405	672B1EH405	3 3/4	1 3/4	4 3/4	3/4	D5
6	672E1EH605	672B1EH605	3 3/4	3 3/4	4 1/2	3/4	G1
8	672E1EH805	672B1EH805	4 3/4	3 3/4	4 3/8	3/4	J2
10	672E1EH106	672B1EH106	4 3/4	3 3/4	5 1/8	3/4	J4
12	672E1EH126	672B1EH126	4 3/4	3 3/4	6	3/4	J6
15	672E1EH156	672B1EH156	4 3/4	3 3/4	8 1/2	3/4	J10
2000 VOLTS							
2	672E1EJ205		3 3/4	1 1/4	4 3/4	1 3/8	C4
4	672E1EJ405		3 3/4	2 1/4	4 3/4	1 3/8	F1
6	672E1EJ605		3 3/4	3 3/4	5 1/8	1 3/8	G3
8	672E1EJ805		4 3/4	3 3/4	4 3/8	1 3/8	J2
10	672E1EJ106		4 3/4	3 3/4	5 1/2	1 3/8	J5
12	672E1EJ126		4 3/4	3 3/4	6	1 3/8	J6
15	672E1EJ156		4 3/4	3 3/4	9 5/8	1 3/8	J11
2500 VOLTS							
2	672E1EK205		3 3/4	1 1/4	4 3/4	1 3/8	C4
4	672E1EK405		3 3/4	2 1/4	5 1/8	1 3/8	E6
6	672E1EK605		4 3/4	3 3/4	4 3/8	1 3/8	J2
8	672E1EK805		4 3/4	3 3/4	5 1/2	1 3/8	J5
10	672E1EK106		4 3/4	3 3/4	6 1/2	1 3/8	J7
12	672E1EK126		4 3/4	3 3/4	9 5/8	1 3/8	J11
3000 VOLTS							
1	672E1EL105		3 3/4	1 3/4	3 1/4	1 3/8	D1
2	672E1EL205		3 3/4	2 1/4	3 7/8	1 3/8	E3
4	672E1EL405		3 3/4	3 3/4	5 1/2	1 3/8	G4
6	672E1EL605		4 3/4	3 3/4	5 1/2	1 3/8	J5
4000 VOLTS							
1	672E1EM105		3 3/4	1 1/4	3 7/8	2 3/4	C2
2	672E1EM205		3 3/4	2 1/4	5 1/8	2 3/4	E6
4	672E1EM405		4 3/4	3 3/4	5 1/2	2 3/4	J5
5000 VOLTS							
0.1	672E1EN104		3 3/4	1 1/4	3 1/4	2 3/4	C1
0.25	672E1EN254		3 3/4	1 1/4	3 1/4	2 3/4	C1
0.50	672E1EN504		3 3/4	1 1/4	3 1/4	2 3/4	C1
1	672E1EN105		3 3/4	1 3/4	3 7/8	2 3/4	D2
2	672E1EN205		3 3/4	2 1/2	5 1/4	2 3/4	F2
6000 VOLTS							
0.1	672E1EP104		3 3/4	1 1/4	3 1/4	2 3/4	C1
0.25	672E1EP254		3 3/4	1 1/4	3 1/4	2 3/4	C1
0.50	672E1EP504		3 3/4	1 1/4	3 1/4	2 3/4	C1
1	672E1EP105		3 3/4	2 1/4	4 3/4	2 3/4	E5
2	672E1EP205		3 3/4	3 3/4	4 1/2	2 3/4	G1
7500 VOLTS							
0.1	672E1ER104		3 3/4	1 1/4	3 1/4	2 3/4	C1
0.25	672E1ER254		3 3/4	1 1/4	3 7/8	2 3/4	C2
0.50	672E1ER504		3 3/4	2 1/4	4 1/2	2 3/4	E4
1	672E1ER105		3 3/4	3 3/4	5 1/8	2 3/4	G3
2	672E1ER205		4 3/4	3 3/4	8 1/2	2 3/4	J10
10,000 VOLTS							
0.1	672E1ES104		3 3/4	1 1/4	3 7/8	2 3/4	C2
0.25	672E1ES254		3 3/4	2 1/4	3 7/8	2 3/4	E3
0.50	672E1ES504		3 3/4	2 1/2	5 1/4	2 3/4	F2
1	672E1ES105		4 3/4	3 3/4	6	2 3/4	J6

Capacitance	Part Number Figure E	Part Number Figure B	Measurements in Inches			W Max.	Ref Bkt
			A	B	C		
12,500 VOLTS							
0.1	672E1ET104		3 3/4	2 1/4	3 3/8	2 1/8	E2
0.25	672E1ET254		3 3/4	2 1/4	4 1/2	2 1/8	E4
0.50	672E1ET504		4 3/4	3 3/4	5 1/8	2 1/8	J4
1	672E1ET105		4 3/4	3 3/4	8 1/2	2 1/8	J10
400 VOLTS							
0.25	672E1KE254	672B1KE254	1 1/4	1 1/4	1 5/8	3/4	A1
0.50	672E1KE504	672B1KE504	1 1/4	1 1/4	2 1/4	3/4	A2
1	672E1KE105	672B1KE105	1 1/4	1 1/4	2 7/8	3/4	A3
2	672E1KE205	672B1KE205	1 1/4	1 1/4	3 7/8	3/4	A5
4	672E1KE405	672B1KE405	2 1/2	1 3/4	4 3/4	3/4	B6
6	672E1KE605	672B1KE605	3 3/4	1 3/4	4 1/4	3/4	C3
8	672E1KE805	672B1KE805	3 3/4	1 3/4	4 1/4	3/4	D4
10	672E1KE106	672B1KE106	3 3/4	2 1/4	4 1/2	3/4	E4
12	672E1KE126	672B1KE126	3 3/4	2 1/4	5 1/8	3/4	E6
15	672E1KE156	672B1KE156	3 3/4	3 3/4	5 1/2	3/4	G4
600 VOLTS							
0.50	672E1KF504	672B1KF504	1 1/4	1 1/4	2 1/4	3/4	A2
1	672E1KF105	672B1KF105	1 1/4	1 1/4	2 7/8	3/4	A3
2	672E1KF205	672B1KF205	2 1/2	1 3/4	3 7/8	3/4	B4
4	672E1KF405	672B1KF405	3 3/4	1 3/4	3 7/8	3/4	D2
6	672E1KF605	672B1KF605	3 3/4	2 1/4	4 1/2	3/4	E4
8	672E1KF805	672B1KF805	3 3/4	2 1/2	4 3/4	3/4	F1
10	672E1KF106	672B1KF106	4 3/4	3 3/4	4 3/4	3/4	J2
12	672E1KF126	672B1KF126	4 3/4	3 3/4	4 3/4	3/4	J3
15	672E1KF156	672B1KF156	4 3/4	3 3/4	6	3/4	J6
1000 VOLTS							
0.25	672E1KG254	672B1KG254	1 1/4	1 1/4	2 1/4	3/4	A2
0.50	672E1KG504	672B1KG504	1 1/4	1 1/4	2 7/8	3/4	A3
1	672E1KG105	672B1KG105	2 1/2	1 3/4	3 1/2	3/4	B3
2	672E1KG205	672B1KG205	3 3/4	1 1/4	4 3/4	3/4	C4
4	672E1KG405	672B1KG405	3 3/4	2 1/2	4 3/4	1 3/8	F1
6	672E1KG605	672B1KG605	3 3/4	3 3/4	4 3/4	1 3/8	G2
8	672E1KG805	672B1KG805	4 3/4	3 3/4	4 3/8	1 3/8	J2
10	672E1KG106	672B1KG106	4 3/4	3 3/4	5 1/2	1 3/8	J5
12	672E1KG126	672B1KG126	4 3/4	3 3/4	6	1 3/8	J6
15	672E1KG156	672B1KG156	4 3/4	3 3/4	9 5/8	1 3/8	J11
1500 VOLTS							
0.1	672E1KH104	672B1KH104	1 1/4	1 1/4	1 5/8	3/4	A1
0.28	672E1KH254	672B1KH254	1 1/4	1 1/4	2 1/4	3/4	A2
0.50	672E1KH504	672B1KH504	1 1/4	1 1/4	2 1/4	3/4	A3
1	672E1KH105	672B1KH105	2 1/2	1 3/4	4 1/4	3/4	A5
2	672E1KH205	672B1KH205	3 3/4	1 3/4	4 1/4	1 3/8	B5
4	672E1KH405	672B1KH405	3 3/4	3 3/4	5 1/2	1 3/8	D4
6	672E1KH605	672B1KH605	4 3/4	3 3/4	6	1 3/8	G4
8	672E1KH805	672B1KH805	4 3/4	3 3/4	8 1/2	1 3/8	J6
2000 VOLTS							
1	672E1KJ105		3 3/4	1 1/4	4 1/4	1 3/8	C3
2	672E1KJ205		3 3/4	2 1/4	5 1/8	1 3/8	E6
4	672E1KJ405		4 3/4	3 3/4	5 1/8	1 3/8	J4
6	672E1KJ605		4 3/4	3 3/4	7	1 3/8	J8
2500 VOLTS							
0.50	672E1KK504		2 1/2	1 3/4	4 1/4	1 3/8	B5
1	672E1KK105		3 3/4	1 3/4	3 7/8	1 3/8	D2
2	672E1KK205		3 3/4	3 3/4	5 1/2	1 3/8	G4
4	672E1KK405		4 3/4	3 3/4	7	1 3/8	J8
3000 VOLTS							
1	672E1KL105		3 3/4	2 1/4	4 1/2	1 3/8	E4
2	672E1KL205		4 3/4	3 3/4	4 3/8	1 3/8	J2
4	672E1KL405		4 3/4	3 3/4	9 5/8	1 3/8	J11
4000 VOLTS							
0.25	672E1KM254		3 3/4	1 1/4	3 1/4	2 3/4	C1
0.50	672E1KM504		3 3/4	1 1/4	4 3/4	2 3/4	C4
1	672E1KM105		3 3/4	2 1/2	5 3/4	2 3/4	F2
2	672E1KM205		4 3/4	3 3/4	6 1/2	2 3/4	J7
5000 VOLTS							
0.50	672E1KN504		3 3/4	2 1/4	4 1/2	2 3/4	E4
1	672E1KN105		3 3/4	3 3/4	5 1/2	2 3/4	G4
2	672E1KN205		4 3/4	3 3/4	9 5/8	2 3/4	J11
6000 VOLTS							
0.25	672E1KP254		3 3/4	1 3/4	3 7/8	2 3/4	D2
0.50	672E1KP504		3 3/4	2 1/4	5 1/8	2 3/4	E6
1	672E1KP105		4 3/4	3 3/4	6	2 3/4	J6
7500 VOLTS							
0.1	672E1KR104		3 3/4	1 1/4	3 1/4	2 3/4	C1
0.25	672E1KR254		3 3/4	3 3/4	4 1/2	2 3/4	G1
0.50	672E1KR504		4 3/4	3 3/4	4 3/4	2 3/4	J3
10,000 VOLTS							
0.1	672E1KS104		3 3/4	2 1/4	3 3/4	2 3/4	E2
0.25	672E1KS254		4 3/4	3 3/4	4 3/4	2 3/4	J3
0.50	672E1KS504		4 3/4	3 3/4	7 1/2	2 3/4	J9
12,500 VOLTS							
0.1	672E1KT104		4 3/4	3 3/4	3 3/4	2 3/4	J1
0.25	672E1KT254		4 3/4	3 3/4	5 1/2	2 3/4	J5



THE GUDDAMAN CORPORATION

capacitors and EMI filters

340 WEST HURON STREET ■ CHICAGO ILLINOIS 60610 ■ 312 337 7400 ■ TWX 910 221 3863

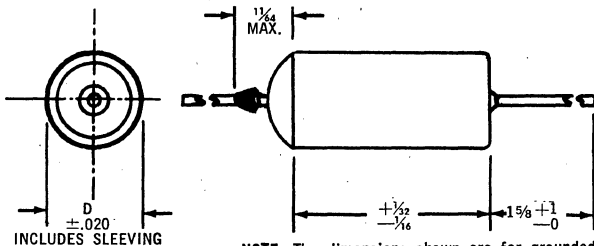
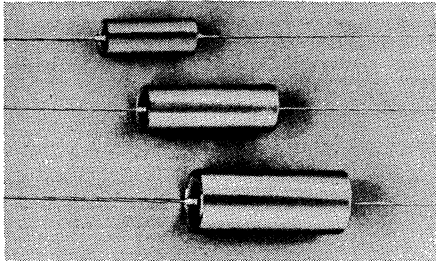
paper plastic dielectric

series 462

HIGH RELIABILITY CAPACITORS
HERMETICALLY SEALED (GLASS TO METAL)

TUBULAR METALLIC CASE

—65°C TO +125°C WITHOUT DERATING



NOTE: The dimensions shown are for grounded (XRGs) units. For floating (XRFS) units add $\frac{1}{2}$ " to length for diameters of .255, .332 and .420. Above .420 diameter, add $\frac{1}{8}$ " to length.

Furnished with "copper-clad" steel wire leads.

Case Diameter (In.)	AWG Size
.235 to .312	22
.400 to 1.00	20

specifications

XRFS462 units meet all electrical environmental requirements of MIL-C-14157.

INSULATION RESISTANCE

The minimum insulation resistance when measured in accordance with Specification MIL-C-14157 shall be as follows:

At 25°C—15,000 megohm-mfds. for capacitance values .6MFD and greater. 25,000 megohms for capacitance values below .6 MFD.

At 125°C—20 megohm-mfds. for capacitance values .08 MFD and greater. 250 megohms for capacitance values below .08 MFD.

CAPACITANCE CHANGE FROM +25°C ±5°C.

The maximum capacitance change shall be as follows:

At — 65°C ±3°C ... +2%, —10%
At +125°C ±3°C ... +10%, —3%

DISSIPATION FACTOR

The dissipation factor when measured at room temperature shall not be more than 0.6%.

Cap.	Dia.	Length	Part No.	MIL-C-14157 Designation
200 VOLTS D.C.				
.0068	.255	$\frac{23}{32}$	XRGS462C682	CPV09A3C682
.022	.332	$\frac{23}{32}$	XRGS462C223	CPV09A3C223
.033	.332	$\frac{23}{32}$	XRGS462C333	CPV09A3C333
.047	.420	$\frac{23}{32}$	XRGS462C473	CPV09A3C473
.068	.420	$1\frac{3}{32}$	XRGS462C683	CPV09A3C683
.1	.420	$1\frac{1}{32}$	XRGS462C104	CPV09A3C104
.15	.582	$1\frac{1}{16}$	XRGS462C154	CPV09A3C154
.22	.582	$1\frac{1}{16}$	XRGS462C224	CPV09A3C224
.33	.582	$1\frac{1}{16}$	XRGS462C334	CPV09A3C334
.47	.690	$1\frac{1}{8}$	XRGS462C474	CPV09A3C474
.68	.770	$1\frac{3}{8}$	XRGS462C684	CPV09A3C684
1.0	.770	$2\frac{1}{8}$	XRGS462C105	CPV09A3C105

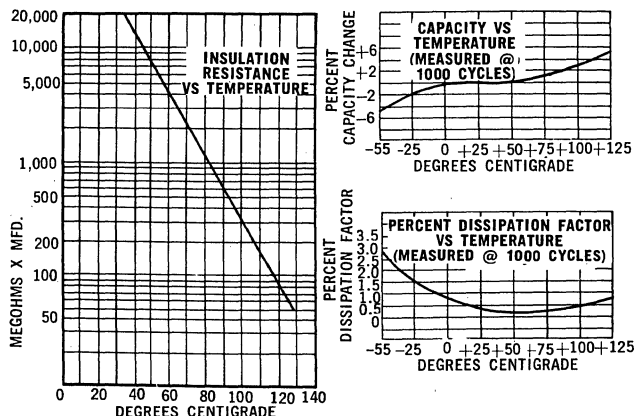
300 VOLTS D.C.				
.0047	.255	$\frac{23}{32}$	XRGS462Z472	CPV09A3D472
.015	.332	$\frac{23}{32}$	XRGS462Z153	CPV09A3D153
.022	.332	$\frac{23}{32}$	XRGS462Z223	CPV09A3D223
.033	.420	$\frac{23}{32}$	XRGS462Z333	CPV09A3D333
.047	.420	$1\frac{3}{32}$	XRGS462Z473	CPV09A3D473
.068	.420	$1\frac{1}{32}$	XRGS462Z683	CPV09A3D683
.1	.582	$1\frac{1}{16}$	XRGS462Z104	CPV09A3D104
.15	.582	$1\frac{1}{16}$	XRGS462Z154	CPV09A3D154
.22	.582	$1\frac{1}{16}$	XRGS462Z224	CPV09A3D224
.33	.690	$1\frac{1}{8}$	XRGS462Z334	CPV09A3D334
.47	.770	$1\frac{3}{8}$	XRGS462Z474	CPV09A3D474
.68	.770	$2\frac{1}{8}$	XRGS462Z684	CPV09A3D684
1.0	1.020	$2\frac{1}{8}$	XRGS462Z105	CPV09A3D105

400 VOLTS D.C.				
.0022	.255	$\frac{23}{32}$	XRGS462E222	CPV09A3E222
.0033	.255	$\frac{23}{32}$	XRGS462E332	CPV09A3E332
.0068	.332	$\frac{23}{32}$	XRGS462E682	CPV09A3E682
.01	.332	$\frac{23}{32}$	XRGS462E103	CPV09A3E103
.015	.332	$\frac{23}{32}$	XRGS462E153	CPV09A3E153
.022	.420	$\frac{23}{32}$	XRGS462E223	CPV09A3E223
.033	.420	$\frac{23}{32}$	XRGS462E333	CPV09A3E333
.047	.420	$1\frac{3}{32}$	XRGS462E473	CPV09A3E473
.068	.420	$1\frac{1}{32}$	XRGS462E683	CPV09A3E683
.1	.582	$1\frac{1}{16}$	XRGS462E104	CPV09A3E104
.15	.582	$1\frac{1}{16}$	XRGS462E154	CPV09A3E154
.22	.690	$1\frac{1}{8}$	XRGS462E224	CPV09A3E224
.33	.690	$1\frac{1}{8}$	XRGS462E334	CPV09A3E334
.47	.770	$2\frac{1}{8}$	XRGS462E474	CPV09A3E474
.68	.770	$2\frac{1}{8}$	XRGS462E684	CPV09A3E684
1.0	1.020	$2\frac{1}{8}$	XRGS462E105	CPV09A3E105

600 VOLTS D.C.				
.001	.255	$\frac{23}{32}$	XRGS462F102	CPV09A3F102
.0015	.255	$\frac{23}{32}$	XRGS462F152	CPV09A3F152
.0022	.332	$\frac{23}{32}$	XRGS462F222	CPV09A3F222
.0033	.332	$\frac{23}{32}$	XRGS462F332	CPV09A3F332
.0047	.332	$\frac{23}{32}$	XRGS462F472	CPV09A3F472
.0068	.332	$\frac{23}{32}$	XRGS462F682	CPV09A3F682
.01	.420	$\frac{23}{32}$	XRGS462F103	CPV09A3F103
.015	.420	$\frac{23}{32}$	XRGS462F153	CPV09A3F153
.022	.420	$1\frac{3}{32}$	XRGS462F223	CPV09A3F223
.033	.420	$1\frac{1}{32}$	XRGS462F333	CPV09A3F333
.047	.582	$1\frac{1}{16}$	XRGS462F473	CPV09A3F473
.068	.582	$1\frac{1}{16}$	XRGS462F683	CPV09A3F683
.1	.582	$1\frac{1}{16}$	XRGS462F104	CPV09A3F104
.15	.690	$1\frac{1}{8}$	XRGS462F154	CPV09A3F154
.22	.770	$1\frac{3}{8}$	XRGS462F224	CPV09A3F224
.33	.770	$2\frac{1}{8}$	XRGS462F334	CPV09A3F334
.47	1.020	$2\frac{1}{8}$	XRGS462F474	CPV09A3F474

"G" in Part No. indicates "Grounded". Substitute "F" for "Floating".
Add following to part no. for tolerance: —K = ±10%; —J = ±5%.

TYPICAL CURVES



GI capacitors

CROSS REFERENCE CHART AND INDEX

Manufacturer	Electrolytic P—		Film P—		Mica P—			Manufacturer	Electrolytic P—		Film P—		Mica P—	
	Mfg. Type	GI Type	Mfg. Type	GI Type	Mfg. Type	GI Type			Mfg. Type	GI Type	Mfg. Type	GI Type	Mfg. Type	GI Type
Aerovox	CRE	984	V161	165	ADM10	RDM10		Midwec	—	—	3(3X)	165	—	—
	PTT	984	V146X	165	ADM15	RDM15			—	—	301	165	—	—
	BCD	985			ADM19	RDM19			—	—	3X1	165	—	—
					ADM20	RDM20		Nytronics	—	—	CTM	165	—	—
Cornell-Dubilier					ADM30	RDM30			—	—	MAF	165	—	—
	NLW	974	WMF	165	CD10	RDM10		S & EL	—	—	107	165	—	—
	WHR	904	CTM	165	CD15	RDM15			—	—	10R	165	—	—
					CD20	RDM20		Sangamo	556	987	—	—	D10	RDM10
					CD30	RDM30							D15	RDM15
Elmenco/IEC	—	—	—	—	CD42	RDM42							D19	RDM19
					DM5	RDM05							D20	RDM20
					DM10	RDM10							D30	RDM30
					DM15	RDM15							D42	RDM42
					DM16	RDM16		Southern	—	—	MR	165	—	—
					DM19	RDM19			—	—				
					DM20	RDM20		Sprague	TL	984	192P	165	42M	RDM19
					DM30	RDM30			30D	974	148P	165		
F. Dyne	—	—	A	165	—	—			TE	974				
			B	165					500D	974				
			C	165					600D	994				
General Electric	76F	974	61F	165	—	—			31D	984				
	77F	974	63F	165				Standard	89D	985				
	78F	974	AE	165					—	—	MW-R	165	—	—
Gudeman	—	—	355	165	—	—		Tex-Cap	—	—	24	165	—	—
			356	165				TRW	—	—	663uW	165	—	—
Mallory	TT	974	—	—	—	—		West-Cap	—	—	608	165	—	—
	TTX	974							MAC	974	Rap-N-Fill	165	—	—
	MTA	984												
	MTV	985												

The GI catalog tells you almost everything you need to know about our capacitors. Sub-miniature aluminum electrolytics. Silver dipped mica. Polyester film capacitors. Off the shelf delivery available from your local GI/Miconics distributor.



**GENERAL INSTRUMENT
CORPORATION**

the capacitor company



SUB-MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

-30° TO +85° C POLAR TYPE 984 AND 985

SPECIFICATIONS

984



985



Construction: Tubular aluminum case with electrical grade rubber end seal and copper tinned terminal wires emerging from the seal. Internal connections are all-welded. A PVC sleeve insulates the case.

Configuration: Type 984 has axial leads. Alternate Type 986 has negative lead brought down side of case under the PVC insulating sleeve. Type 985 is designed for P/C mounting.

Operating Temperature: -30° C to +85° C (continuous) for sizes shown. Special designs available for +85° C and +105° C.

Working Voltage (V_{dcw}): The maximum continuous voltage which may be applied for the temperature range.

Surge Voltage (V_{dcs}): The maximum allowable short term (30 second) voltage, including transients and peak ripple which may be applied without damage.

The surge test is performed with a 1000 ohm resistor connected in series with the capacitor. The surge voltage shown in the tables is applied for 30 seconds at a rate of 12 times per hour for 100 hours at +25° C. At the completion of the test, capacitors shall meet the initial DC leakage requirements.

Capacitance: Shown as microfarads (uF) in the tables for each case size and working voltage. Measurement is made by the bridge method at +25° C and 120Hz with a maximum 1.0 volt rms signal applied.

Capacitance Tolerance: The standard tolerance is -10% +75% of rated capacitance from 3 to 50 V_{dcw} and -10% +50% from 51 to 150 V_{dcw}. Special tolerances are available: ±10% for 10uF and up; ±20% for 5uF and up.

Polarity: Types 984 and 985 capacitors are polarized for DC operation.

Reverse Voltage: Voltage reversals not exceeding 1.5 volts may be applied without damage.

Leakage Current (DCL): DCL in microamperes (uA) is measured after capacitors have been pre-conditioned by applying rated voltage (V_{dcw}) for 15 minutes at least 24 hours and not more than 48 hours prior to testing. To test, apply V_{dcw} to the capacitor with a 1000 ohm resistor in series for 5 minutes. Read DCL in uA. The maximum allowable DCL is determined by:

$$I = .06E \sqrt{C}$$

Where: I = Current in microamperes; E = Rated DC voltage; and C = Rated capacitance in microfarads. Leakage current need not be less than that derived from the formula or the following, whichever is greater:

Rated V_{dcw} 3 6 12 15 16 25 50 100 150

DCL uA 4 4 4 4 8 8 8 15 30

Dissipation Factor (DF): DF in percent is measured by the bridge method at +25° C and 120Hz with a maximum 1.0 volt rms signal applied. DF shall not exceed:

Rated V_{dcw} 3 6 12 15 25 50 100 150

DF% 40 35 30 26 19 19 17 15

Equivalent Series Resistance (ESR): $ESR = \frac{DF \times 10^4}{2 \pi fC}$

Where: DF = Dissipation Factor in %; f = frequency (Hertz); and C = Capacitance in microfarads (uF).

Ripple Current: The peak ripple voltage in combination with the DC polarizing voltage shall not exceed 120% of the rated V_{dcw} nor cause a voltage reversal in excess of 1.5 volts.

The maximum rms ripple current in milliamperes (mA) at +70° C and 120 Hertz which may be applied is:

Case Dia. Code	B	M	E	G	H	J	K	L
Case Dia. In.	.257	.282	.333	.396	.458	.521	.612	.646
Max. Ripple mA	8√C	9√C	10√C	15√C	20√C	25√C	30√C	35√C

For maximum ripple current at temperatures less than +70° C and frequencies other than 120 Hertz, multiply the figures derived from the preceding table by:

Temp. °C	Frequency (Hz)			
	60	120	400	2400
70	.8	1.0	1.1	1.4
65	1.6	2.0	2.2	2.8
45	2.0	2.5	2.75	3.5
25	2.4	3.0	3.3	4.2

Life Test: Test is conducted in a suitable chamber with circulating air. Apply voltage not to exceed the rated V_{dcw} for 1000 hours at +85° C ± 2° C. Remove capacitors from chamber and allow to cool to +25° C ± 1° C in a normal manner. Capacitance shall be at least 85% of the initial measured value (90% for a 500 hour life test). The product of ESR (ohms) and capacitance (uF) shall not exceed 130% of initial requirements.

Shelf Test: Conduct test in chamber with circulating air. No voltage is applied for 100 hours at +85° C ± 2° C. Remove capacitors from chamber and allow to cool to +25° C ± 1° C in a normal manner. Measure the capacitance as previously described. It shall meet initial requirements as shall ESR. The DCL shall not exceed 200% of the initial requirements.

Low Temperature Test: A suitable chamber must be used and capacitors stabilized to within ± 1° C of the testing temperature. Measure capacitance as previously described. It shall not have decreased to less than the percentages of the initial measured value as shown:

V _{dcw}	Temperature °C		
	+25	-20	-30
3-12	100%	70%	60%
15 up	100%	85%	75%

Terminal Test: Terminal wires shall withstand a steady axial pull of 5 pounds for 5 seconds.

Marking: Minimum marking shall be: General Instrument logo-type. Capacitance (uF), V_{dcw}, EIA code, date code and polarity. Marking is normally applied to the outer PVC sleeve.

Packaging: Standard packaging is bulk in corrugated cartons (Approx. 4" × 7" × 9"). Reel packaging is available for Type 984 up to .375" diameter. The standard G.I. reel packaging specification is available upon request.

SUB-MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

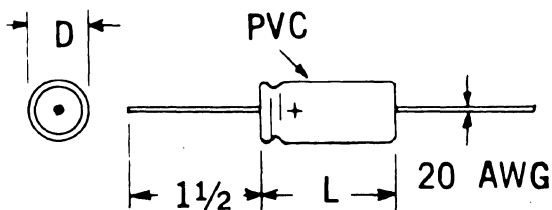
-30° TO +85°C POLAR TYPE 984 AND 985



AXIAL LEAD

984 POLAR -30° +85°C

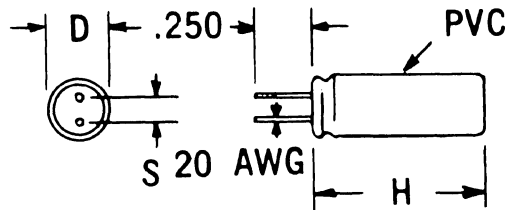
Specially engineered for commercial and entertainment electronic use. Combine high volumetric efficiency with excellent performance and reliability. 37 standard case sizes. Working voltages from 3 to 150. Popular ratings are shown below.



RADIAL LEAD

985 POLAR -30° +85°C

Special high gain foils are used for maximum volumetric efficiency consistent with reliability performance. The operating temperature range is compatible with most commercial and entertainment electronic applications. The 72 ratings shown below are the most popular.



Cap. μ F	Vdcw Max.	Dia. x Length (Max. Ins.)	Cat. No. 984-
1	150	.275 x .662	BC0678
2	150	.275 x .787	BE0679
5	50	.257 x .662	BC0658
5	100	.257 x .912	BH0702
5	150	.333 x .912	EH0682
8	100	.333 x .787	EE0704
8	150	.396 x .912	GH0683
10	25	.257 x .662	BC0632
10	50	.257 x .787	BE0660
10	100	.333 x .787	EE0705
10	150	.396 x .912	GH0684
15	15	.257 x .662	BC0604
15	25	.257 x .787	BE0633
15	50	.333 x .787	EE0661
15	100	.333 x .912	EH0706
15	150	.396 x 1.162	GM0685
20	15	.257 x .662	BE0605
20	25	.257 x .787	BE0634
20	50	.333 x .787	EE0662
20	100	.396 x .912	GH0707
20	150	.396 x 1.412	GS0686
25	15	.257 x .787	BE0606
25	25	.257 x .912	BH0635
25	50	.333 x .912	EH0663
25	100	.396 x .912	GH0708
25	150	.396 x 1.537	GU0687
50	15	.333 x .787	EE0610
50	25	.333 x .912	EH0639
50	50	.396 x .912	GH0667
50	100	.458 x 1.162	HM0709
50	150	.612 x 1.162	KM0691
75	25	.396 x .787	GE0641
75	50	.396 x 1.037	GK0669
75	100	.458 x 1.162	HM0710
75	150	.612 x 1.537	KU0714
100	15	.333 x .912	EH0614
100	25	.396 x .912	GH0634
100	50	.458 x 1.037	HK0671
100	100	.612 x 1.162	KM0711
100	150	.656 x 1.662	LW0715
150	12	.396 x .787	GE0586
150	15	.396 x .912	GH0617
150	25	.458 x .912	HH0646
150	50	.458 x 1.412	HS0674
200	15	.458 x .912	HH0619
200	25	.396 x 1.287	GP0648
200	50	.521 x 1.287	JP0676
200	100	.612 x 1.662	KW0712
250	6	.396 x .912	GH0557
250	12	.458 x .912	HH0589

Cap. μ F	Vdcw Max.	Dia. x Length (Max. Ins.)	Cat. No. 984-
250	15	.458 x 1.037	HK0620
250	25	.458 x 1.287	HP0649
250	50	.521 x 1.537	JU0677
500	6	.396 x 1.287	GP0560
500	12	.458 x 1.287	HP0592
500	15	.458 x 1.412	HS0623
500	25	.521 x 1.537	JU0652
500	50	.656 x 1.662	LW0717
800	12	.521 x 1.412	JS0594
800	15	.612 x 1.162	KM0625
800	25	.612 x 1.537	KU0720
1000	12	.521 x 1.537	JU0595
1000	15	.612 x 1.412	KS0692
1000	25	.656 x 1.662	LW0721
1500	15	.656 x 1.662	LW0728
2000	6	.612 x 1.537	KU0722
2000	12	.656 x 1.662	LW0729
2500	3	.612 x 1.412	KS0723
2500	6	.656 x 1.537	LU0724
3000	3	.612 x 1.662	KW0725
3500	3	.656 x 1.662	LW0726

Cap. μ F	Vdcw Max.	Dia. x Height (Max. Ins.)	S *	Cat. No. 985-
1	150	.271 x .537	2	CA0680
2	150	.271 x .787	2	CE0681
5	50	.271 x .537	2	CA0659
5	100	.271 x .787	2	CE0701
5	150	.333 x .787	3	EE0684
8	100	.333 x .662	3	EC0702
8	150	.396 x .787	4	GE0685
10	25	.271 x .537	2	CA0633
10	50	.333 x .537	3	EA0661
10	100	.333 x .787	3	EE0703
10	150	.396 x .787	4	GE0686
15	15	.271 x .537	2	CA0604
15	25	.271 x .662	2	CC0634
15	50	.333 x .662	3	EC0662
15	100	.333 x .912	3	EH0704
15	150	.396 x 1.037	4	GH0687
20	15	.271 x .662	2	CC0605
20	25	.333 x .537	3	EA0635
20	50	.333 x .787	3	EE0663
20	100	.396 x .787	4	GE0705
20	150	.458 x 1.037	4	HK0688
25	15	.271 x .662	2	CC0606
25	25	.333 x .537	3	EA0636

Cap. μ F	Vdcw Max.	Dia. x Height (Max. Ins.)	S *	Cat. No. 985-
25	50	.333 x .787	3	EE0664
25	100	.396 x .787	4	GE0706
25	150	.521 x .912	5	JH0689
50	15	.333 x .662	3	EC0610
50	25	.333 x .787	3	EE0640
50	50	.396 x .787	4	GE0668
50	100	.458 x 1.037	4	HK0707
50	150	.646 x 1.037	6	LK0693
75	25	.396 x .662	4	GC0642
75	50	.396 x 1.037	4	GK0670
75	100	.521 x 1.162	5	JM0708
75	150	.646 x 1.287	6	LP0709
100	15	.396 x .662	4	GC0614
100	25	.396 x .787	4	GE0644
100	50	.458 x 1.037	4	HK0672
100	100	.646 x 1.037	6	LK0710
100	150	.646 x 1.662	6	LW0711
150	15	.396 x .787	4	GE0617
150	25	.396 x 1.037	4	GK0647
150	50	.521 x 1.037	5	JK0675
150	100	.646 x 1.287	6	LP0712
200	15	.396 x .912	4	CH0619
200	25	.458 x 1.037	4	HK0649
200	50	.646 x .912	6	LU0677
200	100	.646 x 1.537	6	LU0713
250	6	.396 x .787	4	GE0714
250	12	.396 x .912	4	GH0589
250	15	.396 x 1.037	4	GK0620
250	25	.521 x .912	5	JH0650
250	50	.521 x 1.537	6	JO0678
500	6	.521 x .787	5	JE0715
500	12	.458 x 1.162	4	HM0592
500	15	.521 x 1.162	5	JM0623
500	25	.646 x 1.037	6	LK0653
500	50	.646 x 1.662	6	LW0716
800	12	.521 x 1.287	5	JP0594
800	15	.646 x 1.037	6	LK0625
800	25	.646 x 1.412	6	LS0717
1000	12	.646 x 1.037	6	LK0595
1000	15	.646 x 1.287	6	LP0626
1000	25	.646 x 1.662	6	LK0718
1500	12	.646 x 1.412	6	LS0719
1500	15	.646 x 1.537	6	LU0720
2000	6	.646 x 1.412	6	LS0721
2000	12	.646 x 1.662	6	LW0722
2500	3	.646 x 1.287	6	LP0694
2500	6	.646 x 1.537	6	LU0723
3000	3	.646 x 1.537	6	LU0724
3500	3	.646 x 1.662	6	LW0725

* "S" for All Types $\pm .015"$ 1 = .100 2 = .125 3 = .150 4 = .200 5 = .250 6 = .283 7 = .312



SUB-MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

-40° TO +85°C POLAR TYPE 974, 975 AND 945

SPECIFICATIONS

Construction: Type 974, tubular aluminum case with butyl end seal, PVC insulating sleeve and axial wire leads. Alternate Type 976 has negative lead brought down side of case under the PVC insulating sleeve. Type 975 has both terminal wires emerging through the end for P/C mounting. The Type 945 adds a phenolic disc for improved resistance to vibration.

Operating Temperature: -40° C to +85° C (continuous)

Working Voltage: The maximum continuous working voltage (Vdcw) which may be applied for the operating parameters stated.

Surge Voltage (Vdcs): The maximum allowable short term (0.5 minute) voltage including transients and peak ripple which may be applied for 30 seconds without permanent damage.

The surge test is performed with a 1000 ohm resistor connected in series with the capacitor. Surge voltage is applied for 30 seconds at a rate of 12 times per hour for 100 hours at +25° C. At the completion of this test, capacitors shall meet the initial DC leakage requirements.

Capacitance: Shown as microfarads (uF) in the tables for each case size and working voltage. Measurement is made by the bridge method at +25° C and 120Hz with a maximum 1.0 volt rms signal applied.

Capacitance Tolerance: The standard tolerance is -10% +75% of rated capacitance from 3 to 50 Vdcw and -10% +50% from 51 to 150 Vdcw. Tolerances of ±20% are available for 5uF and up or ±10% for 10uF and up.

Polarity: Types 974, 975 and 945 capacitors are polarized for DC operation.

Reverse Voltage: Voltage reversals not exceeding 1.5 volts may be applied without damage.

Leakage Current: Expressed as DCL and in terms of microamperes (uA). Capacitors must be pre-conditioned by applying rated voltage (Vdcw) for 15 minutes at least 24 hours and not more than 48 hours prior to testing. Measure DCL by applying rated DC voltage (Vdcw) to the capacitor with a 1000 ohm resistor in series for five minutes and read DCL in microamperes (uA). Maximum allowable DCL is determined by the formula:

$$I = \frac{E \sqrt{C}}{30}$$

Where: I=Current in microamperes; E=Rated DC voltage; and C=Rated capacitance in microfarads.

Leakage current need not be less than that derived from the formula or the following, whichever is greater:

Rated Vdcw	3	6	12	15	25	50	150
DCL (uA)	1	1	2	2.5	3	4	15

Dissipation Factor: The Dissipation Factor (DF) in percent is measured by the bridge method at ±25° C and 120Hz with a maximum 1.0 volt rms signal applied.

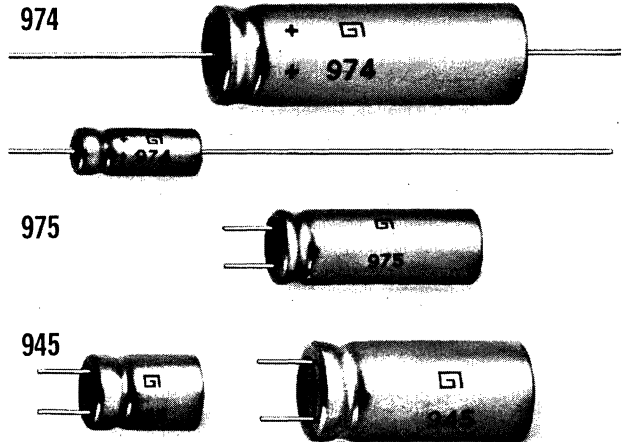
DF (in percent) shall not exceed:

Rated Vdcw	3	6	12	15	25	50	150
DF%	34	26	26	26	19	19	15

$$\text{Equivalent Series Resistance: ESR (ohms)} = \frac{DF \times 10^4}{2 \pi f C}$$

Where: DF = Dissipation Factor (%); f = frequency (Hz); and C = Capacitance (uF).

Ripple Current: Peak ripple voltage in combination with the DC polarizing voltage shall not exceed 120% of the rated Vdcw nor cause a voltage reversal exceeding 1.5 volts. Maximum ripple



at +85° C and 120Hz is:

Case Dia. (Max. In.)	.271	.333	.396	.458	.521	.646
Max Ripple (mA)	8√C	10√C	15√C	20√C	25√C	35√C

At temperatures other than 85° C or frequencies other than 120 Hertz, multiply the above figures by:

Temp. °C	60	120	400	2400
85	.8	1.0	1.1	1.4
65	1.6	2.0	2.2	2.8
45	2.0	2.5	2.75	3.5
25	2.4	3.0	3.3	4.2

Life Test: Conduct test in a chamber with circulating air. Apply rated voltage for 1000 hours at +85° C ±2° C. Remove the capacitors and allow to cool normally to +25° C ±1° C. Capacitance shall be at least 85% of the initial measured value. The product of ESR and capacitance shall not exceed 130% of the initial requirements.

Shelf Test: Test is conducted in a suitable chamber with circulating air. The capacitors are stored for 100 hours in the chamber at +85° C with no voltage applied. At the conclusion of 100 hours, remove the capacitors from the chamber and allow them to cool to +25° C ±1° C in a normal manner. Measure the capacitance as previously described. It shall meet initial requirements as shall ESR. DCL shall not exceed two times the initial requirements.

Low Temperature Test: In a suitable chamber, stabilize the temperature to within ±1° C of the desired value. The capacitance is measured while the capacitors remain in the chamber and shall not have decreased to less than the percentages of the initial measured value as follows:

Vdcw	+25	-20	-30	-40
3-12	100%	70%	60%	45%
15 up	100%	85%	75%	60%

Terminal Test: Terminal wires shall withstand a steady axial pull of 5 pounds for 5 seconds.

Marking: Minimum marking on the PVC insulating sleeve shall be: General Instrument logotype, capacitance, Vdcw, EIA code, date code and polarity.

Packaging: 974—Standard packaging is bulk in corrugated cartons (approx. 4" × 7" × 9"). Reel packaging is available for Type 974 up to .375" diameter. The standard G.I. reel packaging specification is available upon request.

975/945—Bulk in egg-crate cartons.

CAPACITOR DIVISION **GENERAL INSTRUMENT CORPORATION** 600 WEST JOHN ST., HICKSVILLE, NEW YORK 11802

PHONE: (516) 733-3000 / TWX: 510-221-1865 / IN CANADA: GENERAL INSTRUMENT LTD., 61 INDUSTRY STREET, TORONTO, ONTARIO

SUB-MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

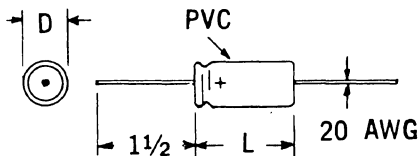
-40° TO +85°C POLAR TYPE 974, 975 AND 945



AXIAL LEAD

974 POLAR -40° +85°C

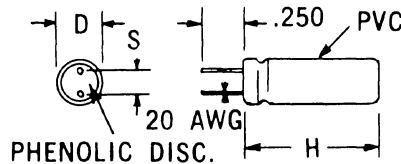
Designed for industrial electronic use over broad temperature range. High reliability performance with 0.634% per 1000 hr. failure rate at 60% confidence level. 72 popular ratings stocked by Miconics Distributors shown below.



RADIAL LEAD

945 POLAR -40° +85°C

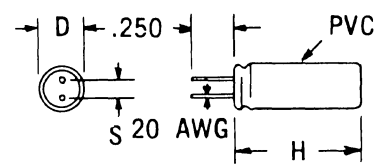
Same electrical performance as 975, but have special phenolic disc at end seal for maximum physical reliability and resistance to shock. Especially suited for automotive and avionics applications.



RADIAL LEAD

975 POLAR -40° +85°C

Engineered for maximum reliability over the broad operating temperature range. Especially suitable for industrial electronic circuits. 67 standard case configurations are available.



Cap. μ F	Vdcw Max.	Dia. x Length (Max. Ins.)	Cat. No. 974-
1	150	.257 x .662	BC0155
2	150	.257 x .787	BE0156
3	150	.333 x .787	EE0157
4	150	.333 x .787	EE0158
5	50	.257 x .662	BC0125
5	100	.333 x .662	EC0149
5	150	.333 x .912	EH0159
6	100	.333 x .787	EE0150
6	150	.396 x .819	GG0160
8	50	.257 x .787	BE0127
8	100	.333 x .787	EE0151
8	150	.396 x .787	EE0161
10	25	.257 x .662	BC0018
10	50	.333 x .662	EC0128
10	100	.333 x .912	EH0152
10	150	.396 x .912	GH0162
15	15	.257 x .662	BC0104
15	25	.257 x .787	BE0116
15	50	.333 x .787	EE0129
15	100	.396 x .912	GH0153
15	150	.396 x 1.162	GM0163
20	15	.275 x .787	BE0025
20	25	.333 x .662	EC0117
20	50	.333 x .787	EE0054
20	100	.396 x .912	GH0154
20	150	.396 x 1.412	GS0164
25	15	.257 x .787	BE0005
25	25	.333 x .787	EE0118
25	50	.333 x .912	GH0057
25	50	.333 x .912	GK0192
25	150	.396 x 1.537	GU0198
50	15	.333 x .787	EE0016
50	25	.333 x .912	EH0122
50	50	.396 x 1.037	GK0131
50	100	.396 x 1.537	GU0195
50	150	.521 x 1.537	JU0201
75	15	.333 x .912	EH0109
75	25	.396 x .912	GH0022
75	50	.396 x 1.287	GP0132
75	100	.521 x 1.412	JS0196
100	6	.333 x .787	EE0017
100	12	.333 x .912	EH0010
100	15	.333 x 1.037	EK0004
100	25	.396 x 1.037	GK0130
100	50	.396 x 1.537	GU0133
100	100	.521 x 1.537	JU0197
150	6	.333 x .912	EH0077
150	12	.396 x .912	GH0028
150	15	.396 x 1.037	GK0030
150	25	.396 x 1.287	GP0143
150	50	.458 x 1.537	HU0185
200	6	.396 x .912	GH0079
200	12	.396 x 1.037	GK0011
200	15	.458 x .912	HH0141
200	25	.458 x 1.287	HP0144
200	50	.521 x 1.537	JU0191
250	6	.396 x .912	GH0020
250	12	.396 x 1.162	GM0179
250	15	.396 x 1.287	GP0166
250	25	.458 x 1.412	HS0180
500	6	.458 x 1.162	HM0138
500	12	.458 x 1.412	HS0177
500	15	.458 x 1.537	HU0176
500	25	.521 x 1.537	JU0178
800	3	.396 x 1.537	GU0136
800	15	.521 x 1.537	JU0188
1000	6	.521 x 1.412	JS0183
1000	12	.521 x 1.537	JU0187
1300	3	.521 x 1.412	JS0181
1300	6	.521 x 1.287	JP0184
1800	3	.521 x 1.287	JP0182

Cap. μ F	Vdcw Max.	Dia. x Height (Max. Ins.)	S *	Cat. No. 945-
4	150	.396 x .599	4	GB0604
5	100	.396 x .599	4	GB0605
5	150	.396 x .724	4	GB0606
8	100	.396 x .599	4	GB0609
8	150	.458 x .724	4	HD0610
10	50	.396 x .599	4	GB0611
10	100	.396 x .724	4	GD0612
10	150	.458 x .850	4	HG0613
15	50	.396 x .599	4	GB0614
15	100	.458 x .724	4	HD0615
15	150	.521 x .850	5	JG0616
20	25	.396 x .599	4	GB0617
20	50	.396 x .724	4	GD0618
20	100	.396 x .850	4	GG0619
20	150	.521 x .974	5	JJ0620
25	25	.396 x .599	4	GB0621
25	50	.396 x .724	4	GD0622
25	100	.458 x .850	4	HG0623
25	150	.521 x .974	5	JJ0624
50	15	.396 x .599	4	GB0625
50	25	.396 x .724	4	GD0626
50	50	.458 x .850	4	HG0627
50	100	.521 x 1.099	5	LL0628
50	150	.646 x 1.099	7	LL0629
75	12	.396 x .599	4	GB0630
75	15	.396 x .724	4	GD0631
75	25	.458 x .724	4	HD0632
75	50	.521 x .850	5	JG0633
75	100	.646 x .974	7	LJ0634
75	150	.646 x 1.349	7	LR0635
100	15	.396 x .724	4	GD0637
100	25	.458 x .850	4	HG0638
100	50	.521 x .974	5	JJ0639
100	100	.646 x 1.224	7	LN0640
100	150	.646 x 1.724	7	LX0641
150	15	.458 x .850	4	HG0645
150	25	.521 x .850	5	JG0646
150	50	.646 x .974	7	LJ0647
150	100	.646 x 1.474	7	LT0648
200	15	.458 x .974	4	HJ0652
200	25	.521 x .974	5	JJ0653
200	50	.646 x 1.099	7	LL0654
200	100	.646 x 1.724	7	LX0655
250	15	.521 x .850	5	JG0659
250	25	.521 x 1.099	5	JL0660
250	50	.646 x 1.224	7	LN0661
500	15	.646 x .974	7	LJ0665
500	25	.646 x 1.224	7	LN0666
800	15	.646 x 1.224	7	LN0670
800	25	.646 x 1.599	7	LV0671
1000	6	.646 x 1.099	7	LL0673
1000	12	.646 x 1.224	7	LN0674
1000	15	.646 x 1.474	7	LT0675
1500	6	.646 x 1.224	7	LN0677
1500	12	.646 x 1.599	7	LV0678
2000	3	.646 x 1.224	7	LN0679
2000	6	.646 x 1.474	7	LT0680
2500	3	.646 x 1.474	7	LT0681
2500	6	.646 x 1.724	7	LX0682
3000	3	.646 x 1.599	7	LV0683
3500	3	.646 x 1.724	7	LX0684

Cap. μ F	Vdcw Max.	Dia. x Height (Max. Ins.)	S *	Cat. No. 975-
1	150	.271 x .537	2	CA0674
2	150	.333 x .537	3	EA0675
3	150	.333 x .662	3	EC0676
4	150	.333 x .662	3	EC0677
5	50	.271 x .662	2	CC0655
5	100	.271 x .787	2	CE0701
5	150	.333 x .787	3	EE0678
6	50	.271 x .662	2	CC0720
6	100	.333 x .662	3	EC0703
6	150	.333 x .787	3	EE0704
8	50	.271 x .662	2	CC0656
8	100	.333 x .662	3	EE0705
8	150	.396 x .787	4	GE0679
10	25	.271 x .662	2	CC0630
10	50	.271 x .787	2	EE0657
10	100	.333 x .787	3	EE0706
10	150	.396 x .787	4	GE0680
15	15	.271 x .662	2	CC0602
15	25	.271 x .662	2	CC0631
15	50	.333 x .662	3	EC0658
15	100	.396 x .787	4	GE0707
15	150	.396 x 1.037	4	GK0681
20	15	.271 x .662	2	CC0603
20	25	.271 x .787	3	EC0632
20	50	.333 x .787	3	EE0659
20	100	.396 x .787	4	GE0708
20	150	.458 x 1.037	4	HK0682
25	15	.271 x .662	2	CC0604
25	25	.333 x .662	3	EC0633
25	50	.396 x .662	4	GC0660
25	100	.396 x .912	4	GH0709
25	150	.521 x .912	5	JH0683
50	15	.333 x .662	3	EC0608
50	25	.396 x .662	4	GC0637
50	50	.396 x .912	4	GH0664
50	100	.458 x 1.162	4	HM0710
50	150	.646 x 1.037	6	LK0687
75	25	.396 x .787	4	GC0639
75	50	.396 x 1.162	4	GM0666
75	100	.646 x .912	6	LN0711
75	150	.646 x 1.287	6	LP0712
100	12	.333 x .912	3	EH0582
100	25	.396 x .662	4	GC0612
100	50	.458 x 1.162	4	HM0641
100	100	.646 x 1.162	6	LN0713
100	150	.646 x 1.662	6	LN0714
150	12	.396 x .787	4	GC0585
150	15	.396 x .912	4	GH0615
150	25	.458 x .912	4	HH0644
150	50	.646 x .912	6	LN0671
150	100	.646 x 1.412	6	LS0715
200	12	.396 x .912	4	GH0587
200	15	.396 x 1.037	4	GK0617
200	25	.521 x .912	5	JH0646
200	50	.646 x 1.037	6	LK0673
200	100	.646 x 1.662	6	LN0716
250	15	.458 x 1.037	4	HK0618
250	25	.521 x 1.037	5	JK0647
250	50	.646 x 1.162	6	LN0717
250	75	.646 x 1.662	6	LN0718
500	12	.521 x 1.037	5	JK0591
500	15	.521 x 1.162	5	JM0621
500	25	.646 x 1.162	6	LN0650
500	35	.646 x 1.537	6	LV0719
800	15	.646 x 1.162	6	LN0623
800	25	.646 x 1.537	6	LN0720
1000	15	.646 x 1.412	6	LS0721
1500	12	.646 x 1.537	6	LU0722
2000	10	.646 x 1.662	6	LN0723
2500	6	.646 x 1.662	6	LN0724
3000	3	.646 x 1.662	6	LN0725

* "S" for All Types $\pm .015"$ 1 = .100 2 = .125 3 = .150 4 = .200 5 = .250 6 = .283 7 = .312

CAPACITOR DIVISION GENERAL INSTRUMENT CORPORATION 600 WEST JOHN ST., HICKSVILLE, NEW YORK 11802

PHONE: (516) 733-3000 / TWX: 510-221-1865 / IN CANADA: GENERAL INSTRUMENT LTD., 61 INDUSTRY STREET, TORONTO, ONTARIO



SUB-MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

-40° TO +105°C POLAR TYPE 987

SPECIFICATIONS

987



Construction: Tubular aluminum case with high temperature elastomer seal and axial wire leads. All critical connections welded. Polyester insulating sleeves are standard.

Configuration: Axial wire leads for point to point wiring or horizontal mounting on P/C board.

Operating Temperature: -40°C to +105°C.

Working Voltage: Expressed as Vdcw in the tables and is the maximum continuous voltage which may be applied over the operating temperature range.

Surge Voltage: Expressed as Vdcs in the tables. This is the maximum allowable short term (0.5 minute) voltage including transients and peak ripple which may be applied without causing permanent damage.

The surge test is performed with a 1000 ohm resistor connected in series with the capacitor. The surge voltage shown in the tables is applied for 30 seconds at a rate of twelve times per hour for 100 hours at +25° C. At completion of test, units shall meet leakage requirements.

Capacitance: Capacitance is shown in microfarads (uF) in the tables for each case size and range of working voltages. Measurement is made by the bridge method at +25° C and 120 Hertz with a maximum 1.0 volt rms signal applied during measurement.

Capacitance Tolerance: The standard tolerance is -10% +50% of rated capacitance. Where required, ±20% tolerance is available above 5 uF; ±10% may be specified above 10uF.

Polarity: Type 987 capacitors are polarized for DC operation.

Reverse Voltage: Voltage reversals not exceeding 1.5 volts may be applied without damage.

Leakage Current: Expressed as DCL and in terms of microamperes (uA). Capacitors must be pre-conditioned by applying rated voltage (Vdcw) for 15 minutes at least 24 hours and not more than 48 hours prior to testing. Measure DCL by applying rated DC voltage (Vdcw) to the capacitor with a 1000 ohm resistor in series for five minutes and read DCL in microamperes (uA). Maximum allowable DCL is determined by the formula:

$$I = \frac{E \sqrt{C}}{30}$$

Where: I = Current in microamperes; E = Rated DC voltage; and C = Rated capacitance in microfarads.

Leakage current need not be less than that derived from the formula or the following, whichever is greater:

Rated Vdcw	3	6	12	15	25	50
DCL uA	1	1	2	2.5	3	4

Dissipation Factor: Expressed as DF in terms of percent. Measurement is made by the bridge method at +25° C and 120 Hertz with a maximum 1.0 volt rms signal applied. The dissipation factor at 120 Hertz shall not exceed the values shown in the following table:

Rated Vdcw	3	6	12	15	25	50
DF%	30	24	24	22	18	10

$$ESR = \frac{DF \times 10^4}{2 \pi f C}$$

Where: DF = Dissipation Factor in %; f = frequency (Hertz); and C = Capacitance (uF).

Ripple Current: The peak ripple voltage in combination with the DC polarizing voltage shall not exceed 120% of the rated Vdcw nor cause a voltage reversal in excess of 1.5 volts. The maximum rms ripple current in milliamperes (mA) at +105° C and 120 Hertz which may be applied is:

Case Dia. (In.) (Max.)	.257	.333	.396	.458	.521
Max. Ripple (mA)	8√C	10√C	15√C	20√C	25√C

For maximum ripple current at temperatures less than +105° C and frequencies other than 120 Hertz, multiply the figures derived from the preceding table by:

Temp. °C	60	120	400	2400
105	.8	1.0	1.1	1.4
85	1.6	2.0	2.2	2.8
65	2.0	2.5	2.75	3.5
25	2.4	3.0	3.3	4.2

Life Test: Test is conducted in a suitable chamber with circulating air. Apply voltage not to exceed the rated Vdcw for 1000 hours at +105° C ±2° C. Remove capacitors from chamber and allow to cool to +25° C ±1° C in a normal manner. Capacitance shall be at least 85% of the initial measured value (90% for a 500 hour life test). The product of ESR (ohms) and capacitance (uF) shall not exceed 130% of initial requirements.

Shelf Test: Test is conducted in a suitable chamber with circulating air. The capacitors are stored for 100 hours in the chamber at +105° C with no voltage applied. At the conclusion of 100 hours, remove the capacitors from the chamber and allow them to cool to +25° C ±1° C in a normal manner. Measure the capacitance as previously described. It shall meet initial requirements as shall ESR. DCL shall not exceed two times the initial requirements.

Low Temperature Test: A suitable test chamber must be used and capacitors stabilized to within ±1° C of the testing temperature. Capacitance is measured as previously described. The capacitance shall not have decreased to less than the percentages of the initial measured value as shown in the following table:

Vdcw	Temperature °C		
	+25° C	—30° C	—40° C
3-20	100%	75%	60%
25-40	100%	80%	70%
50	100%	85%	75%

Low Temperature Impedance: At low temperatures the 120 Hertz impedance shall not increase more than that shown in the following table:

Vdcw	Temperature		
	+25° C	—30° C	—40° C
3-20	100%	5.0x	10.0x
25-40	100%	3.0x	5.0x
50	100%	1.5x	3.0x

Lead Test: Leads shall withstand a steady pull of 5 pounds applied axially for 5 seconds.

Marking: Minimum marking shall be General Instrument logo-type, Capacitance (uF), Vdcw, EIA code, date code and polarity.

Packaging: Standard packaging is bulk in corrugated cartons (approx. 4" × 7" × 9"). Reel packaging is available up to .375" diameter. The standard G.I. reel packaging specification is available upon request.

SUB-MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

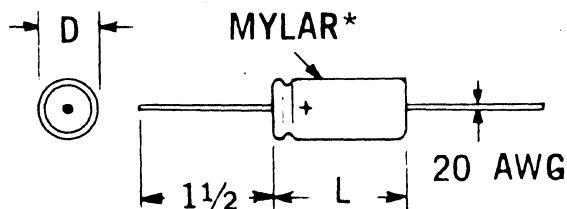
-40° TO +105°C POLAR TYPE 987



AXIAL LEAD

987 POLAR -40° +105°C

Extended temperature range for extra reliable performance at temperatures up to +105°C. Specially selected foils and electrolytes are used in manufacturing these capacitors. Recommended standard ratings are shown below.



Cap. μF	Vdcw Max.	Dia x Length (Max. Inches)	Cat. No. 987-
5	40	.257 x .662	BC0604
5	50	.257 x .787	BE0604
5	60	.257 x .787	BE0605
6	30	.257 x .662	BC0606
6	50	.257 x .787	BE0607
6	60	.257 x .912	BH0608
8	25	.257 x .662	BC0609
8	25	.257 x .787	BE0609
8	50	.257 x .912	BH0610
10	25	.257 x .787	BE0613
10	50	.257 x .912	BH0614
15	20	.257 x .787	BE0617
15	30	.257 x .912	BH0618
15	50	.333 x .787	EE0619
20	10	.257 x .787	BE0621
20	25	.257 x .912	BH0622
20	50	.333 x .912	EH0623
25	10	.257 x .787	BE0625
25	25	.333 x .787	EE0626
25	50	.333 x 1.037	EK0627
50	10	.333 x .787	EE0629
50	25	.333 x 1.037	EK0630
50	50	.396 x 1.162	GM0631
75	10	.333 x .912	EH0633
75	25	.396 x .912	GH0634
75	50	.396 x 1.412	GS0635
100	10	.333 x 1.037	EK0637
100	25	.396 x 1.162	GM0638
100	50	.458 x 1.412	HS0639
125	20	.396 x 1.162	GM0641

Cap. μF	Vdcw Max.	Dia x Length (Max. Inches)	Cat. No. 987-
125	25	.396 x 1.287	GP0642
125	50	.521 x 1.287	JP0643
150	10	.396 x 1.037	GK0645
150	25	.458 x 1.162	HM0646
150	30	.458 x 1.287	HP0647
150	50	.521 x 1.537	JU0648
200	10	.396 x 1.162	GM0649
200	20	.396 x 1.537	GU0650
200	30	.458 x 1.537	HU0651
200	40	.521 x 1.537	JU0652
250	10	.396 x 1.287	GP0653
250	20	.458 x 1.412	HS0654
250	30	.521 x 1.412	JS0655
300	10	.396 x 1.412	GS0656
300	20	.458 x 1.537	HU0657
300	30	.521 x 1.537	JU0658
350	10	.396 x 1.537	GU0659
350	20	.521 x 1.412	JS0660
350	25	.521 x 1.537	JU0661
400	6	.396 x 1.412	GS0662
400	10	.458 x 1.412	HS0663
400	20	.521 x 1.537	JU0664
500	3	.396 x 1.412	GS0665
500	6	.396 x 1.537	GU0666
500	10	.458 x 1.537	HU0667
650	10	.521 x 1.537	JU0668
750	3	.458 x 1.412	HS0669
750	6	.521 x 1.412	JS0670
1000	3	.521 x 1.412	JS0671

AVAILABLE NOW

EXTENDED TEMPERATURE RANGE SUBMINIATURE ALUMINUM ELECTROLYTICS

-55°C TO +105°C

AND

-55°C TO +125°C

AXIAL AND RADIAL LEAD

CONTACT FRED MALDEIS

(516) 733-3311

OR YOUR LOCAL REPRESENTATIVE



SUB-MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

-30° TO +85° C NON-POLAR TYPE 904 AND 905

Construction: 904 Tubular aluminum case with elastomer seals at each end for axial terminal wires. PVC insulating sleeves are supplied as standard. 905 Tubular aluminum case with single elastomer seal and PVC insulating sleeve.

Operating Temperature: -30° C to +85° C.

Working Voltage: Expressed as Vnpw in the tables and is the maximum continuous voltage which may be applied over the operating temperature range.

Surge Voltage: Expressed as Vdcs in the tables. This is the maximum allowable short term (0.5 minute) voltage including transients and peak ripple which may be applied without causing permanent damage.

The surge test is performed with a 1000 ohm resistor connected in series with the capacitor. The surge voltage shown in the tables is applied for 30 seconds at a rate of twelve times per hour for 100 hours at +25° C. At completion of test units shall meet initial leakage requirements.

Capacitance: Capacitance is shown in microfarads (uF) in the tables for each case and range of working voltages. Measurement is made by the bridge method at +25° C and 120 Hertz with a maximum 1.0 volt rms signal applied during measurement.

Capacitance Tolerance: The standard tolerance is ±30% of the nominal rated value for all operating voltages. Special tolerances are available: ±20% for ratings 5 uF and up; ±10% for ratings 10 uF and up.

Polarity: Types 904 and 905 capacitors are non-polarized for DC operation. Working voltage (Vnpw) may be applied in either direction.

Frequency: Types 904 and 905 capacitors are rated for operation at 120 Hertz. Special designs are available for other frequencies. Contact the factory.

Leakage Current: Expressed as DCL and in terms of microamperes (uA). Capacitors must be pre-conditioned by applying rated voltage (Vdcw) for 15 minutes at least 24 hours and not more than 48 hours prior to testing. Measure DCL by applying rated DC voltage (Vdcw) to the capacitor with a 1000 ohm resistor in series for five minutes and read DCL in microamperes (uA). Maximum allowable DCL is determined by the formula:

$$I = .06E \sqrt{C}$$

Where: I = Current in microamperes; E = Rated DC voltage; and C = Rated capacitance in microfarads.

Leakage current need not be less than that derived from the formula or the following, whichever is greater:

Rated Vnpw	3	6	12	15	16	25	50	100
DCL uA	4	4	4	4	8	8	8	15

Dissipation Factor: Expressed as DF in terms of percent and measured by the bridge method at +25° C and 120Hz with a maximum 1.0 volt rms signal applied. The dissipation factor shall not exceed the values shown:

Case Dia. (Inches)	.257	.271	.333	.396	.458	.521	.646
(Code)	(B)	(C)	(E)	(G)	(H)	(J)	(L)
DF%	20	20	20	15	15	15	15

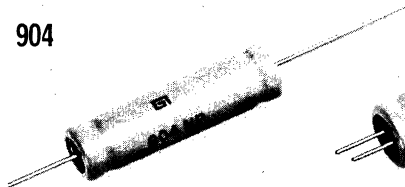
Equivalent Series Resistance: Expressed as ESR in ohms as follows:

$$ESR = \frac{DF \times 10^4}{2\pi fC}$$

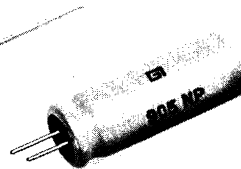
Where: DF = Dissipation Factor in %; f = frequency in Hertz; C = Capacitance in uF.

SPECIFICATIONS

904



905



Ripple Current: The maximum allowable ripple current is derived from the formula:

$$I = K \sqrt{WC}$$

Where: I = Current in milliamperes (mA); K = Constant (61.5 for B, C and E diameters and 71 for G, H, J and L); W = Watts (see table); C = Capacitance in microfarads (uF).

Length.	TYPE 904 MAXIMUM WATTS/CASE SIZE					
	G	J	L	N	S	U
Dia.						
B	.062	X	X	X	X	X
E	.064	.093	.109	.121	X	X
G	X	.117	.129	.143	.173	.187
H	X	.135	.152	.170	.187	.221
J	X	X	.177	.197	.236	.256

Length.	TYPE 905 MAXIMUM WATTS/CASE SIZE							
	A	C	E	H	K	M	P	S
Dia.								
C	.044	.054	.062	.074	X	X	X	X
E	.056	.068	.081	.094	.105	X	X	X
G	.066	.083	.096	.110	.120	.143	.150	.173
H	X	.100	.110	.140	.150	.170	.180	.190
J	X	X	.140	.160	.180	.197	.210	.236
L	X	X	X	.200	.220	.252	.280	.300

Life Test: Test is conducted in suitable chamber with circulating air. Apply rated voltage for 500 hours at +85° C ±2° C and reverse voltage each 24 hours throughout test. Remove capacitors from chamber and allow to cool normally to room temperature (+25° C ±1° C). Capacitance shall be at least 80% of initial measured value and DF shall not increase to more than 150% of initial requirement.

Shelf Test: Test is conducted in a suitable chamber with circulating air. The capacitors are stored for 100 hours in the chamber at +70° C with no voltage applied. At the conclusion of 100 hours, remove the capacitors from the chamber and allow them to cool to +25° C ±1° C in a normal manner. Measure the capacitance as previously described. It shall meet initial requirements as shall ESR. DCL shall not exceed two times the initial requirements.

Low Temperature Test: A suitable test chamber must be used and capacitors stabilized to within ±1° C of the testing temperature. Capacitance is measured as previously described. The capacitance shall not have decreased to less than the percentages of the initial measured value as shown in the following table:

Vnpw	+25	-20	-30
3-12	100%	70%	60%
15 up	100%	85%	70%

Lead Test: Leads shall withstand a steady pull of 5 pounds applied axially for 5 seconds.

Marking: Minimum marking shall be General Instrument logo-type, Capacitance (uF), Vnp, EIA code, and date code. Marking is normally applied to the outer PVC sleeve.

Packaging: Type 904 and 905 standard packaging is bulk in corrugated cartons (approx. 4" × 7" × 9"). Reel packaging is available for Type 904 up to .375 diameter. The standard G.I. reel packaging specification is available upon request.

SUB-MINIATURE ALUMINUM ELECTROLYTIC CAPACITORS

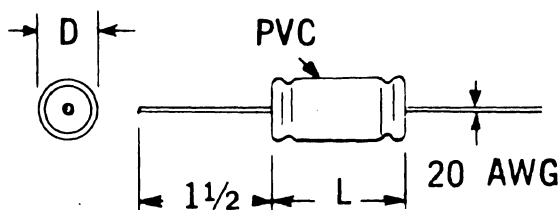
-30° TO +85°C NON-POLAR TYPE 904 AND 905



AXIAL LEAD

904 NON-POLAR -30° +85°C

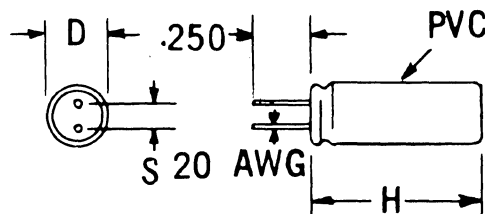
Engineered for non-polar applications. Special double bung construction ensures balanced operation in critical circuits. Standard tolerance is $\pm 30\%$, $\pm 20\%$ is available above 5 μF and $\pm 10\%$ is available above 10 μF . Recommended standard ratings appear below. The complete range of values and specifications appear in Bulletin EL-118. * $\pm 20\%$ only.



RADIAL LEAD

905 NON-POLAR -30° +85°C

Designed for non-polar electronic applications. The isolated case ensures balanced operation. The standard capacitance tolerance is $\pm 30\%$, $\pm 20\%$ is available above 5 μF and $\pm 10\%$ is available above 10 μF . For complete specifications and all available ratings, see the engineering Bulletin EL-117.



Cap. μF	Vdcw Max.	Dia. x Length (Max. Inches)	Cat. No. 904-
1	75	.257 x .819	BG0600
1	100	.333 x .819	EG0601
2	25	.257 x .819	BG0602
2	50	.333 x .819	EG0603
2	75	.333 x .944	EJ0604
2	100	.333 x 1.069	EL0605
3	25	.257 x .819	BG0606
3	50	.333 x .819	EG0607
3	75	.333 x .944	EJ0608
3	100	.333 x 1.069	EL0609
5	25	.333 x .819	EG0610
5	50	.333 x .944	EJ0611
5	100	.396 x 1.069	GL0612
10	15	.333 x .819	EG0613
10	25	.333 x .944	EJ0614
10	50	.333 x 1.194	EN0615
10	100	.396 x 1.537	GU0616
15	15	.333 x .944	EJ0617
15	25	.333 x 1.069	EL0618
15	50	.396 x 1.194	GN0619
15	100	.458 x 1.537	HU0620
20	15	.333 x .944	EJ0621
20	25	.333 x 1.194	EN0622
20	50	.396 x 1.387	GS0623
20	100	.521 x 1.387	JS0624
25	15	.333 x 1.069	EL0625
25	25	.333 x 1.194	EN0626
25	50	.396 x 1.537	GU0627
25	100	.521 x 1.537	JU0628
50	6	.333 x 1.069	EL0629
50	10	.333 x 1.194	EN0630
50	15	.396 x 1.194	GN0631
50	25	.396 x 1.387	GS0632
50	50	.521 x 1.537	JU0633
50	75	.521 x 1.537	JU0634†
75	6	.333 x 1.194	EN0635
75	10	.396 x 1.194	GN0636
75	15	.396 x 1.387	GS0637
75	25	.458 x 1.537	HU0638
75	50	.521 x 1.537	JU0639†
100	6	.396 x 1.069	GL0640
100	10	.396 x 1.387	GS0641
100	15	.458 x 1.387	HS0642
100	25	.521 x 1.387	JS0643
125	6	.396 x 1.194	GN0644
125	10	.396 x 1.537	GU0645
125	15	.458 x 1.537	HU0646
125	25	.521 x 1.537	JU0647
150	6	.396 x 1.387	GS0648
150	10	.458 x 1.387	HS0649

Cap. μF	Vdcw Max.	Dia. x Length (Max. Inches)	Cat. No. 904-
150	15	.521 x 1.387	JS0650
150	25	.521 x 1.537	JU0651†
175	6	.396 x 1.537	GU0652
175	10	.458 x 1.537	HU0653
175	15	.521 x 1.537	JU0654
200	6	.396 x 1.537	GU0655
200	10	.521 x 1.387	JS0656
200	15	.521 x 1.537	JU0657
250	6	.458 x 1.387	HS0658
250	10	.521 x 1.537	JU0659
250	15	.521 x 1.537	JU0660†
275	6	.458 x 1.537	HU0661
275	10	.521 x 1.537	JU0662
300	6	.521 x 1.387	JS0663
300	10	.521 x 1.537	JU0664
325	6	.521 x 1.387	JS0665
325	10	.521 x 1.537	JU0666†
350	6	.521 x 1.387	JS0667
350	10	.521 x 1.537	JU0668†
425	6	.521 x 1.537	JU0669
500	6	.521 x 1.537	JU0670†
550	6	.521 x 1.537	JU0671

Cap. μF	Vdcw Max.	Dia. x Height (Max. Inches)	S *	Cat. No. 905-
1	75	.271 x .537	2	CA0601
1	100	.271 x .662	2	CC0602
2	75	.271 x .787	2	CE0603
2	100	.333 x .662	3	EC0604
3	25	.271 x .537	2	CA0605
3	50	.271 x .787	2	CE0606
3	100	.333 x .787	3	EE0607
5	50	.333 x .662	2	CC0608
5	50	.333 x .662	3	EC0609
5	100	.396 x .787	4	GE0610
8	25	.271 x .787	2	CE0611
8	50	.333 x .787	3	EE0612
8	100	.396 x .912	4	GH0613
10	25	.333 x .662	3	EC0614
10	50	.333 x .912	3	EH0615
10	100	.458 x .912	4	HH0616
15	15	.333 x .662	3	EC0617
15	50	.396 x .787	4	GE0618
15	75	.458 x .912	4	HH0619
15	100	.521 x .912	5	HJ0620
20	25	.396 x .662	4	GC0621
20	50	.458 x .787	4	HE0622

Cap. μF	Vdcw Max.	Dia. x Height (Max. Inches)	S *	Cat. No. 905-
20	100	.521 x 1.037	5	JK0623
25	25	.396 x .787	4	GE0624
25	50	.458 x .912	4	HH0625
25	75	.521 x 1.037	5	JK0626
25	100	.646 x .912	6	LH0627
30	15	.396 x .662	4	GC0628
30	25	.396 x .787	4	GE0629
30	50	.458 x 1.037	4	HK0630
30	100	.646 x 1.037	6	LK0631
40	15	.396 x .787	4	GE0632
40	25	.396 x .912	4	GH0633
40	50	.521 x 1.037	5	JK0634
40	100	.646 x 1.287	6	LP0635
50	15	.396 x .787	4	GE0636
50	25	.458 x .912	4	HH0637
50	50	.521 x 1.162	5	JM0638
50	75	.646 x 1.037	6	LK0639
50	100	.646 x 1.412	6	LS0640
75	15	.458 x .912	4	HH0641
75	25	.521 x .912	5	JH0642
75	50	.646 x 1.037	6	LK0643
75	75	.646 x 1.412	6	LS0644
100	10	.458 x .912	4	HH0645
100	15	.458 x 1.037	4	HK0646
100	25	.521 x 1.037	5	JK0647
100	50	.646 x 1.287	6	LP0648
100	75	.646 x 1.662	6	LW0649
125	10	.458 x .912	4	HH0650
125	15	.521 x .912	5	JH0651
125	25	.646 x .912	6	LH0652
125	50	.646 x 1.537	6	LU0653
150	10	.458 x 1.037	4	HK0654
150	15	.521 x 1.037	5	JK0655
150	25	.646 x 1.037	6	LK0656
150	50	.646 x 1.662	6	LW0657
175	10	.521 x 1.037	5	JM0658
175	15	.521 x 1.037	5	JK0659
175	25	.646 x 1.162	6	LM0660
200	10	.521 x 1.037	5	JK0661
200	15	.521 x 1.287	5	JP0662
200	25	.646 x 1.162	6	LM0663
250	10	.521 x 1.162	5	JK0664
250	15	.521 x 1.412	5	JS0665
250	25	.646 x 1.412	6	LS0666
350	10	.646 x 1.037	6	LK0667
350	15	.646 x 1.287	6	LP0668
500	10	.646 x 1.412	6	LS0669
500	15	.646 x 1.662	6	LW0670
700	10	.646 x 1.662	6	LW0671
1000	6	.646 x 1.537	6	LU0672

* "S" for All Types $\pm .010"$ 1 = .100 2 = .125 3 = .150 4 = .200 5 = .250 6 = .283 7 = .312

CAPACITOR DIVISION GENERAL INSTRUMENT CORPORATION 600 WEST JOHN ST., HICKSVILLE, NEW YORK 11802

PHONE: (516) 733-3000 / TWX: 510-221-1865 / IN CANADA: GENERAL INSTRUMENT LTD., 61 INDUSTRY STREET, TORONTO, ONTARIO



DIPPED SILVER-MICA CAPACITORS

COMMERCIAL RDM and MIL-C-5D TYPES

Mica capacitors are as near to the perfect model of a capacitor as one can acquire commercially. Schematically the mica is classic: A flat insulator with conductors on each side. Electrically it is hard to beat. It has been said that if all other capacitors suddenly evaporated and only the mica was left, mica could do any task. Of course this is not very practical because electronic economics would take a terrible beating. But, here we have the second oldest capacitor known to man (The Leyden Jar is less than one year older), and the mica capacitor hangs in there doing its assigned tasks.

Why is the mica capacitor so good? One really need look no farther than the basic dielectric. Mica is a totally inert inorganic material. Formed millions of years ago by the awesome pressures of the earth's creation. Few other materials have mica's record of stability. And, it is this stability which makes mica so desirable in capacitors.

Stability is what makes the mica so widely used in RF circuitry. Once selected and installed, the mica stays there doing its job. This is also one of the reasons micas are widely specified in precision instruments: Rock solid stability. And, there's another point: accuracy. Capacitance tolerances to plus or minus one-half percent are available at very little extra expense (Above 100pF, of course).

The original mica capacitor was not an exact model of efficiency. Crude and cumbersome, it was gradually supplanted by the molded style. The molded style has now largely been replaced by the dipped style thanks to the invention of epoxy.

The dipped mica capacitor is made of a series of thin mica sheets with pure silver deposited on each side in a precise pattern and location. The sheets are then stacked with conductive foil (usually tin) between each sheet. The foil is folded toward one end and the entire stack clamped under pressure and held there by the clamp/terminal assembly. The terminals take off in one direction from the stack to form a "radial" configuration.

The stack is immediately treated with silicone to prevent moisture infiltration. Then the stack is dipped into Durez from one to four times to form an outer coating. This coating is porous and provides the media for the final epoxy impregnation. Of course there is a practical limit, which happens to be four coats, beyond which there is little or no gain in humidity protection.

The coating process is important to the user. The best protection is secured by the normal four coat G. I. Type RDM. The single coat SRDM offers good protection but should not be used in severe humidity conditions without subsequent potting. Another type, the ERDM has no Durez at all. It only has epoxy. This type must always be potted after assembly.

Mica capacitors may be operated continuously from -55 to $+150^{\circ}\text{C}$ which is well within the operating parameters of most other electronic components. The temperature coefficient is generally positive. Several TC values may be stated by the user within the limits of availability (See listings).

The following pages contain a listing of all MIL-C-5D ratings plus a selection of popular intermediate values. The list also shows non-MIL types such as RDM05, 16 and 20.

General Instrument is fully qualified to MIL-C-5D in styles CM04 through 13 in all ratings and voltages.

The lists on the following pages show a wide selection of popular ratings but are only a hint of the broad range of values and configurations available. For complete information, write for Bulletin MC-2B.

HOW TO SPECIFY MICA CAPACITORS

1. Select the desired capacitance/voltage/lead spacing. Lead spacing is standard within each type and increases as the Type number becomes larger. RDM05 is the smallest (.120") and RDM42 the largest (1.062").
2. Select the desired capacitance tolerance. Not all tolerances are available in all ratings (see notes). This is because the minimum practical tolerance is plus or minus $\frac{1}{2}$ picofarad.
3. Decide whether normal straight wire leads or the crimped configuration will be best. There is no extra charge for crimped leads.
4. Use the following lists to identify the exact capacitor desired by means of the part numbering system.

Typical part number: RDM10CD010D03

- a. *Prefix:* No prefix (as shown) indicates straight leads. Use "2" as a prefix for standard outside crimp.
- b. *Style:* RDM = Multiple Durez/Epoxy
SRDM = Single Durez/Epoxy
ERDM = Epoxy only. No Durez.
- c. *Type:* 05, 10, 15, 16, 19, 20, 30 or 42 (Lead spacing increases as type number increases).
- d. *Characteristic:* This refers to the temperature coefficient in parts per million PER $^{\circ}\text{C}$ and capacitance drift. The example states "C" which is -200 to $+200$ ppm and plus or minus (0.5% plus 0.1 pF)
"D" = -100 to $+100$ ppm and $\pm(0.3\% + .1 \text{ pF})$
"E" = -20 to $+100$ ppm and $\pm(0.1\% + .1 \text{ pF})$
"F" = 0 to $+70$ ppm and $\pm(0.05\% + .1 \text{ pF})$

The listings show the *best* available characteristic.

- e. *Working Voltage:* In the example "D" shows the working voltage as 500 Vdcw.
"C" = 300 Vdcw
"A" = 100 Vdcw

Other voltages available on special order (Please see Bulletin MC-2B for details).

- f. *Capacitance:* Expressed in picofarads (pF). The example shows "010" (zero, one, zero). The last digit *always* indicates the number of zeros. The *preceding* digits are significant. The example "010" therefore indicates *one* picofarad.
 $010 = 1 \text{ pF}$, $100 = 10 \text{ pF}$, $101 = 100 \text{ pF}$, $102 = 1000 \text{ pF}$, $1250 = 125 \text{ pF}$, $1251 = 1250 \text{ pF}$, etc.
- g. *Tolerance:* This is always shown by a code letter. The example shows "D" which is $\pm \frac{1}{2}\%$ pF and the *tightest* available tolerance for *any* rating. "E" = $\pm \frac{1}{2}\%$, F = $\pm 1\%$, G = $\pm 2\%$, H = $\pm 3\%$, J = $\pm 5\%$, K = $\pm 10\%$, M = $\pm 20\%$. Note that "D" and "J" are synonymous at 10 pF.
- h. *Operating Temperature:* Shown by the next to last digit in the part number as the letter "O". The standard is "O" which is -55 to $\pm 125^{\circ}\text{C}$. "P" = -55 to $+150^{\circ}\text{C}$ and is available on most ratings. "N" is sometimes used in old specs and indicates -55 to $+85^{\circ}\text{C}$.
- i. *Vibration Grade:* The last digit "3" indicates resistance to vibration per MIL-STD-202D, Method 204A (Condition D) from 10-2000Hz which is standard.

DIPPED SILVER-MICA CAPACITORS

RDM05-RDM10 and MIL-C-5D CM04/09



RDM05 (NO MIL EQUIV.)

Small and compact, the RDM05 is ideal for miniature delay lines and similar equipment.

While there is no MIL equivalent to the RDM05, each operating parameter of the capacitor well exceeds MIL requirements. The tables below show the full range of ratings available from 1 to 200 pF. Intermediate ratings are also available. Crimped leads are not recommended.

RDM10 (CM04/09)

The smallest MIL-C-5D style, the RDM10 (CM04/09) is one of the most popular mica capacitors.

The table below shows *all* of the available MIL ratings plus a selection of RDM10 ratings within the full range from 1 to 1000pF. Intermediate ratings are available and may be specified.

Cap. pF	Vdcw (Max.)	G. I. Type No. *	Opt. RDM Tol.	Max. Size (Inches)					
				RDM05			SRDM05		
				L	W	T	L	W	T
1	300	RDM05 CC010D03	M M MK	.270	.190	.110	.250	.160	.090
2	300	RDM05 CC020D03		.270	.190	.110	.250	.160	.090
3	300	RDM05 CC030D03		.270	.190	.110	.250	.160	.090
4	300	RDM05 CC040D03		.270	.190	.110	.250	.160	.090
5	300	RDM05 CC050D03		.270	.190	.110	.250	.160	.090
6	300	RDM05 CC060D03	MK	.270	.190	.110	.250	.160	.090
7	300	RDM05 CC070D03	MK	.270	.190	.110	.250	.160	.090
8	300	RDM05 CC080D03	MK	.270	.190	.110	.250	.160	.090
10	300	RDM05 CC100±03	MKJD	.270	.190	.110	.250	.160	.090
12	300	RDM05 CC120±03	MKJD	.270	.190	.110	.250	.160	.090
15	100	RDM05 CA150±03	MKJD	.270	.190	.110	.250	.160	.090
15	300	RDM05 CC150±03	MKJD	.270	.190	.120	.250	.170	.100
18	100	RDM05 CA180±03	MKJD	.270	.190	.110	.250	.160	.090
18	300	RDM05 CC180±03	MKJHD	.270	.200	.120	.250	.170	.100
20	100	RDM05 CA200±03	MKJHD	.270	.190	.110	.250	.160	.090
20	300	RDM05 CC200±03	MKJHD	.270	.200	.120	.250	.170	.100
22	100	RDM05 CA220±03	MKJHD	.270	.190	.120	.250	.170	.100
22	300	RDM05 CC220±03	MKJHD	.270	.200	.120	.250	.170	.100
24	100	RDM05 CA240±03	MKJHD	.270	.190	.120	.250	.170	.100
24	300	RDM05 CC240±03	MKJHD	.270	.200	.120	.250	.170	.100
27	100	RDM05 EA270±03	DKJHG	.270	.190	.120	.250	.170	.100
27	300	RDM05 EC270±03	DKJHG	.270	.200	.130	.250	.170	.110
30	100	RDM05 EA300±03	DKJHG	.270	.200	.120	.250	.170	.100
30	300	RDM05 EC300±03	DKJHG	.270	.200	.130	.250	.170	.110
33	100	RDM05 EA330±03	DKJHG	.270	.200	.120	.250	.170	.100
33	300	RDM05 EC330±03	DKJHG	.270	.200	.130	.250	.170	.110
36	100	RDM05 EA360±03	DKJHG	.270	.200	.120	.250	.170	.100
36	300	RDM05 EC360±03	DKJHG	.270	.210	.130	.250	.170	.110
39	100	RDM05 EA390±03	DKJHG	.270	.200	.120	.250	.170	.100
39	300	RDM05 EC390±03	DKJHG	.270	.210	.130	.250	.180	.110
43	100	RDM05 EA430±03	DKJHG	.270	.200	.120	.250	.170	.100
43	300	RDM05 EC430±03	DKJHG	.270	.210	.140	.250	.180	.120
47	100	RDM05 EA470±03	DKJHG	.270	.200	.130	.250	.170	.110
47	300	RDM05 EC470±03	DKJHG	.270	.210	.140	.250	.180	.120
51	100	RDM05 EA510±03	KJHGF	.270	.200	.130	.250	.170	.110
51	300	RDM05 EC510±03	KJHGF	.270	.210	.140	.250	.180	.120
56	100	RDM05 EA560±03	KJHGF	.270	.200	.130	.250	.170	.110
56	300	RDM05 EC560±03	KJHGF	.270	.220	.150	.250	.180	.130
62	100	RDM05 EA620±03	KJHGF	.270	.210	.130	.250	.170	.110
62	300	RDM05 EC620±03	KJHGF	.270	.220	.150	.250	.180	.130
68	100	RDM05 CA680±03	KJHGF	.270	.210	.140	.250	.180	.110
68	300	RDM05 CC680±03	KJHGF	.270	.220	.150	.250	.190	.130
75	100	RDM05 CA750±03	KJHGF	.270	.210	.140	.250	.180	.120
75	300	RDM05 CC750±03	KJHGF	.270	.230	.160	.250	.190	.140
82	100	RDM05 CA820±03	KJHGF	.270	.210	.140	.250	.180	.120
82	300	RDM05 CC820±03	KJHGF	.270	.230	.160	.250	.190	.140
91	100	RDM05 FA910±03	KJHGF	.270	.210	.140	.250	.180	.120
91	300	RDM05 FC910±03	KJHGF	.270	.230	.170	.250	.190	.150
100	100	RDM05 FA101±03	JHGFE	.270	.220	.150	.250	.180	.130
100	300	RDM05 FC101±03	JHGFE	.270	.240	.180	.250	.200	.160
110	100	RDM05 FA111±03	JHGFE	.270	.220	.150	.250	.190	.130
110	300	RDM05 FC111±03	JHGFE	.270	.240	.180	.250	.200	.160
120	100	RDM05 FA121±03	JHGFE	.270	.220	.160	.250	.190	.140
120	300	RDM05 FC121±03	JHGFE	.270	.250	.190	.250	.210	.170
130	100	RDM05 FA131±03	JHGFE	.270	.230	.160	.250	.190	.140
150	100	RDM05 FA151±03	JHGFE	.270	.230	.170	.250	.190	.150
160	100	RDM05 FA161±03	JHGFE	.270	.240	.170	.250	.200	.150
170	100	RDM05 FA171±03	JHGFE	.270	.240	.180	.250	.200	.160
180	100	RDM05 FA181±03	JHGFE	.270	.240	.180	.250	.200	.160
190	100	RDM05 FA191±03	JHGFE	.270	.245	.185	.250	.205	.165
200	100	RDM05 FA201±03	JHGFE	.270	.250	.190	.250	.210	.170

Cap. pF 1.	G. I. Type *	MIL Type *	G. I. & MIL Type No. *	Opt. MIL Tol.	Opt. RDM Tol.	Max. Size (Inches)					
						RDM10 & CM04			SRDM10		
						L	W	T	L	W	T
1	RDM10	CM04	CD010D03	M MK MK		.360	.330	.190	.310	.230	.120
2	RDM10		CD020D03			.360	.330	.190	.310	.230	.120
3	RDM10		CD030D03			.360	.330	.190	.310	.230	.120
5	RDM10	CM04	CD050D03			.360	.330	.190	.310	.230	.120
6	RDM10	CM04	CD060D03			.360	.330	.190	.310	.230	.120
7	RDM10	CM04	CD070D03	MK		.360	.330	.190	.310	.230	.120
8	RDM10	CM04	CD080D03	MK		.360	.330	.190	.310	.230	.120
10	RDM10	CM04	CD100D03	MKJ		.360	.330	.190	.310	.230	.120
12	RDM10	CM04	CD120J03	MKD		.360	.330	.190	.310	.230	.120
15	RDM10	CM04	CD150J03	MKD		.360	.330	.190	.310	.230	.120
18	RDM10	CM04	CD180J03	MKHD		.360	.330	.190	.310	.230	.120
20	RDM10	CM04	ED200J03	MKHD		.360	.330	.190	.310	.230	.120
22	RDM10	CM04	ED220J03	MKHD		.360	.330	.190	.310	.230	.120
24	RDM10	CM04	ED240J03	MKHD		.360	.330	.190	.310	.230	.120
27	RDM10	CM04	ED270±03	JG	DKJHG	.370	.330	.190	.310	.230	.120
30	RDM10	CM04	ED300±03	JG	DKJHG	.370	.340	.190	.310	.230	.120
33	RDM10	CM04	ED330±03	JG	DKJHG	.370	.340	.190	.310	.230	.120
36	RDM10	CM04	ED360±03	JG	DKJHG	.370	.340	.190	.310	.230	.120
39	RDM10	CM04	ED390±03	JG	DKJHG	.370	.340	.190	.310	.230	.120
43	RDM10	CM04	ED430±03	JG	DKJHG	.370	.340	.190	.310	.230	.120
47	RDM10	CM04	ED470±03	JG	DKJHG	.370	.340	.190	.310	.230	.120
51	RDM10	CM04	ED510±03	JGF	KJHGF	.370	.340	.190	.310	.230	.120
56	RDM10	CM04	ED560±03	JGF	KJHGF	.370	.340	.190	.310	.230	.120
62	RDM10	CM04	ED620±03	JGF	KJHGF	.370	.340	.190	.310	.230	.130
68	RDM10	CM04	ED680±03	JGF	KJHGF	.370	.340	.190	.320	.230	.130
75	RDM10	CM04	ED750±03	JGF	KJHGF	.370	.340	.200	.320	.230	.130
82	RDM10	CM04	ED820±03	JGF	KJHGF	.370	.350	.200	.320	.230	.130
91	RDM10	CM04	FD910±03	JGF	KJHGF	.370	.350	.200	.320	.230	.130
100	RDM10	CM04	FD101±03	JGF	JHGFE	.370	.350	.200	.320	.230	.130
110	RDM10	CM04	FD111±03	JGF	JHGFE	.380	.350	.200	.320	.240	.140
120	RDM10	CM04	FD121±03	JGF	JHGFE	.380	.350	.200	.320	.240	.140
130	RDM10	CM04	FD131±03	JGF	JHGFE	.380	.360	.200	.320	.240	.140
150	RDM10	CM04	FD151±03	JGF	JHGFE	.380	.360	.210	.320	.240	.140
160	RDM10	CM04	FD161±03	JGF	JHGFE	.380	.360	.210	.320	.240	.140
180	RDM10	CM04	FD181±03	JGF	JHGFE	.390	.370	.210	.330	.240	.150
200	RDM10	CM04	FD201±03	JGF	JHGFE	.390	.370	.220	.330	.240	.150
220	RDM10	CM04	FD221±03	JGF	JHGFE	.390	.370	.220	.340	.250	.160
240	RDM10	CM04	FD241±03	JGF	JHGFE	.390	.380	.220	.340	.250	.160
270	RDM10	CM04	FC271±03	JGF	JHGFE	.390	.380	.220	.340	.250	.160
300	RDM10	CM04	FC301±03	JGF	JHGFE	.390	.380	.220	.340	.250	.160
330	RDM10	CM04	FA331±03	JGF	JHGFE	.390	.370	.220	.330	.240	.150
360	RDM10	CM04	FA361±03	JGF	JHGFE	.390	.380	.220	.340	.250	.160
390	RDM10	CM04	FA391±03	JGF	JHGFE	.390	.380	.220	.340	.250	.160
430	RDM10		FA431±03		JHGFE	.400	.380	.220	.350	.260	.170
470	RDM10		FA471±03		JHGFE	.400	.380	.220	.350	.260	.170
510	RDM10		FA511±03		JHGFE	.400	.390	.230	.350	.260	.170
560	RDM10		FA561±03		JHGFE	.400	.390	.240	.360	.270	.180
620	RDM10		FA621±03		JHGFE	.400	.390	.240	.360	.270	.180
680	RDM10		FA681±03		JHGFE	.400	.390	.240	.360	.270	.180
750	RDM10		FA751±03		JHGFE	.400	.390	.240	.370	.280	.180
820	RDM10		FA821±03		JHGFE	.400	.390	.250	.370	.280	.190
910	RDM10		FA911±03		JHGFE	.400	.390	.250	.370	.290	.190
910	RDM10		FA102±03		JHGFE	.400	.390	.250	.370	.290	.190



DIPPED SILVER-MICA CAPACITORS

RDM15 (CM05/10) and RDM16

RDM15 (CM05/10)

By far the most popular mica capacitor style, the RDM15 (CM05/10) offers a broad range of ratings from 1 to 1500 pF and an advantageous size/cost ratio. All ratings in MIL-C-5D CM05/10 are shown in the table below *plus* the full range of RDM15 ratings. Intermediate ratings are available in RDM15.

Cap. pF	G. I. Type *	MIL Type *	G. I. & MIL Type No. *	Opt. MIL Tol.	Opt. RDM Tol.	Max. Size (Inches)					
						RDM15 & CM05			SRDM10		
						L	W	T	L	W	T
1	RDM15	CM05	CD010D03		MK	.450	.360	.170	.430	.280	.140
5	RDM15	CM05	CD050D03		MK	.450	.360	.170	.430	.280	.140
6	RDM15	CM05	CD060D03		MK	.450	.360	.170	.430	.280	.140
7	RDM15	CM05	CD070D03		MK	.450	.360	.170	.430	.280	.140
8	RDM15	CM05	CD080D03		MK	.450	.360	.170	.430	.280	.140
10	RDM15	CM05	CD100J03		MKD	.450	.360	.170	.430	.280	.140
12	RDM15	CM05	CD120J03		MKD	.450	.360	.170	.430	.280	.140
15	RDM15	CM05	CD150J03		MKD	.450	.360	.170	.430	.280	.140
18	RDM15	CM05	CD180J03		MKDH	.450	.360	.170	.430	.280	.140
20	RDM15	CM05	ED200J03		MKDH	.450	.360	.170	.430	.280	.140
22	RDM15	CM05	ED220J03		MKDH	.450	.360	.170	.430	.280	.140
24	RDM15	CM05	ED240J03		MKDH	.450	.360	.170	.430	.280	.140
27	RDM15	CM05	ED270J03	JG	KDJHG	.450	.360	.170	.430	.280	.140
30	RDM15	CM05	ED300J03	JG	KDJHG	.450	.360	.170	.430	.280	.140
33	RDM15	CM05	ED330J03	JG	KDJHG	.450	.360	.170	.430	.280	.140
36	RDM15	CM05	ED360J03	JG	KDJHG	.450	.360	.170	.430	.280	.140
39	RDM15	CM05	ED390J03	JG	KDJHG	.450	.360	.170	.430	.280	.140
43	RDM15	CM05	ED430J03	JG	KDJHG	.450	.360	.170	.430	.280	.140
47	RDM15	CM05	ED470J03	JG	KDJHG	.450	.360	.170	.430	.280	.140
51	RDM15	CM05	ED510J03	JGF	KJHGF	.450	.360	.170	.430	.280	.140
56	RDM15	CM05	ED560J03	JGF	KJHGF	.450	.360	.170	.430	.280	.140
62	RDM15	CM05	ED620J03	JGF	KJHGF	.450	.360	.170	.430	.280	.140
68	RDM15	CM05	ED680J03	JGF	KJHGF	.450	.360	.180	.430	.280	.150
75	RDM15	CM05	ED750J03	JGF	KJHGF	.450	.360	.180	.430	.280	.140
82	RDM15	CM05	ED820J03	JGF	KJHGF	.450	.360	.180	.430	.280	.150
91	RDM15	CM05	FD910J03	JGF	KJHGF	.460	.360	.180	.430	.280	.150
100	RDM15	CM05	FD100J03	JGF	JHGFE	.460	.360	.180	.430	.280	.150
110	RDM15	CM05	FD110J03	JGF	JHGFE	.460	.370	.180	.440	.290	.150
120	RDM15	CM05	FD120J03	JGF	JHGFE	.460	.370	.180	.440	.290	.150
130	RDM15	CM05	FD130J03	JGF	JHGFE	.460	.370	.180	.440	.290	.150
150	RDM15	CM05	FD150J03	JGF	JHGFE	.460	.370	.190	.440	.290	.150
160	RDM15	CM05	FD160J03	JGF	JHGFE	.460	.370	.190	.440	.290	.150
180	RDM15	CM05	FD180J03	JGF	JHGFE	.460	.370	.190	.440	.290	.160
200	RDM15	CM05	FD200J03	JGF	JHGFE	.460	.380	.190	.440	.290	.160
220	RDM15	CM05	FD220J03	JGF	JHGFE	.460	.380	.200	.440	.300	.160
240	RDM15	CM05	FD240J03	JGF	JHGFE	.460	.380	.200	.440	.300	.160
270	RDM15	CM05	FD270J03	JGF	JHGFE	.470	.390	.210	.440	.300	.160
300	RDM15	CM05	FD300J03	JGF	JHGFE	.470	.390	.210	.450	.310	.160
330	RDM15	CM05	FD330J03	JGF	JHGFE	.470	.390	.210	.450	.310	.160
360	RDM15	CM05	FD360J03	JGF	JHGFE	.470	.390	.210	.450	.310	.170
390	RDM15	CM05	FD390J03	JGF	JHGFE	.470	.390	.210	.450	.310	.170
430	RDM15	CM05	FD430J03	JGF	JHGFE	.470	.390	.210	.450	.310	.170
470	RDM15	CM05	FD470J03	JGF	JHGFE	.470	.400	.220	.450	.310	.180
510	RDM15	CM05	FD510J03	JGF	JHGFE	.460	.380	.200	.440	.300	.160
510	RDM15	CM05	FD511J03	JGF	JHGFE	.470	.400	.220	.450	.310	.190
560	RDM15	CM05	FD560J03	JGF	JHGFE	.460	.380	.200	.450	.310	.160
560	RDM15	CM05	FD561J03	JGF	JHGFE	.480	.410	.230	.460	.330	.190
620	RDM15	CM05	FD620J03	JGF	JHGFE	.470	.380	.200	.460	.310	.160
620	RDM15	CM05	FD621J03	JGF	JHGFE	.470	.380	.200	.460	.310	.160
620	RDM15	CM05	FD622J03	JGF	JHGFE	.480	.410	.230	.460	.330	.190
680	RDM15	CM05	FD680J03	JGF	JHGFE	.470	.390	.210	.450	.310	.160
680	RDM15	CM05	FD681J03	JGF	JHGFE	.470	.390	.210	.450	.310	.160
680	RDM15	CM05	FD682J03	JGF	JHGFE	.490	.420	.240	.470	.330	.190
750	RDM15	CM05	FD750J03	JGF	JHGFE	.470	.390	.210	.450	.310	.170
750	RDM15	CM05	FD751J03	JGF	JHGFE	.470	.390	.210	.450	.310	.170
750	RDM15	CM05	FD752J03	JGF	JHGFE	.470	.390	.210	.450	.310	.170
820	RDM15	CM05	FD820J03	JGF	JHGFE	.500	.430	.250	.470	.330	.190
820	RDM15	CM05	FD821J03	JGF	JHGFE	.470	.390	.210	.450	.310	.170
820	RDM15	CM05	FD822J03	JGF	JHGFE	.470	.390	.210	.450	.310	.170
910	RDM15	CM05	FD910J03	JGF	JHGFE	.470	.400	.220	.450	.310	.170
910	RDM15	CM05	FD911J03	JGF	JHGFE	.470	.400	.220	.460	.320	.180
1000	RDM15	CM05	FD1000J03	JGF	JHGFE	.480	.400	.230	.450	.310	.170
1000	RDM15	CM05	FD1001J03	JGF	JHGFE	.480	.400	.230	.460	.320	.180
1200	RDM15	CM05	FD1200J03	JGF	JHGFE	.490	.420	.240	.460	.320	.180
1200	RDM15	CM05	FD1201J03	JGF	JHGFE	.500	.430	.250	.470	.330	.190
1200	RDM15	CM05	FD1202J03	JGF	JHGFE	.500	.430	.250	.470	.330	.190
1500	RDM15	CM05	FD1500J03	JGF	JHGFE	.500	.430	.250	.470	.330	.190

RDM16 (NO MIL EQUIV.)

The RDM16 is a special mica capacitor engineered for telephone equipment.

There is no MIL equivalent to the RDM16 but all performance details well exceed the MIL requirements. The tables below list the full range of values from 100 to 1800 pF. In addition to the ratings shown, intermediate ratings may be specified.

Cap. pF	Vdcw (Max.)	G. I. Type No. *	Opt. RDM Tol.	Max. Size (Inches)					
				RDM16			SRDM16		
				L	W	T	L	W	T
100	500	RDM16 FD101J03	JHGFE	.720	.350	.180	.680	.280	.130
110	500	RDM16 FD111J03	JHGFE	.720	.360	.180	.680	.280	.130
120	500	RDM16 FD121J03	JHGFE	.720	.260	.180	.680	.280	.130
130	500	RDM16 FD131J03	JHGFE	.720	.360	.180	.680	.280	.130
150	500	RDM16 FD151J03	JHGFE	.720	.360	.180	.680	.280	.130
160	500	RDM16 FD161J03	JHGFE	.720	.360	.180	.680	.280	.130
180	500	RDM16 FD181J03	JHGFE	.720	.360	.180	.680	.280	.130
200	500	RDM16 FD201J03	JHGFE	.730	.360	.190	.680	.280	.130
220	500	RDM16 FD221J03	JHGFE	.730	.360	.190	.680	.280	.130
240	500	RDM16 FD241J03	JHGFE	.730	.360	.190	.680	.280	.130
250	500	RDM16 FD251J03	JHGFE	.730	.370	.190	.690	.290	.130
270	500	RDM16 FD271J03	JHGFE	.730	.370	.190	.690	.290	.140
300	500	RDM16 FD301J03	JHGFE	.730	.370	.190	.690	.290	.140
330	500	RDM16 FD331J03	JHGFE	.730	.370	.200	.690	.290	.140
360	400	RDM16 FD361J03	JHGFE	.730	.370	.200	.690	.290	.140
390	500	RDM16 FD391J03	JHGFE	.730	.370	.200	.690	.290	.140
430	500	RDM16 FD431J03	JHGFE	.730	.380	.200	.700	.300	.150
470	500	RDM16 FD471J03	JHGFE	.740	.380	.210	.700	.300	.150
510	500	RDM16 FD511J03	JHGFE	.740	.380	.210	.700	.300	.150
560	400	RDM16 FD561J03	JHGFE	.740	.390	.210	.710	.300	.160
620	500	RDM16 FD621J03	JHGFE	.750	.390	.220	.710	.300	.160
680	500	RDM16 FD681J03	JHGFE	.750	.390	.220	.710	.300	.160
750	500	RDM16 FD751J03	JHGFE	.750	.400	.230	.710	.310	.170
820	300	RDM16 FC821J03	JHGFE	.740	.390	.210	.700	.300	.150
910	300	RDM16 FC911J03	JHGFE	.740	.390	.210	.710	.300	.160
1000	300	RDM16 FC102J03	JHGFE	.750	.390	.220	.710	.300	.160
1100	300	RDM16 FC112J03	JHGFE	.750	.390	.220	.710	.300	.160
1200	300	RDM16 FC122J03	JHGFE	.750	.400	.230	.710	.310	.170
1300	300	RDM16 FC132J03	JHGFE	.750	.400	.240	.710	.310	.170
1500	300	RDM16 FC152J03	JHGFE	.760	.400	.240	.720	.320	.180
1600	100	RDM16 FA162J03	JHGFE	.760	.400	.240	.720	.320	.180
1800	100	RDM16 FA182J03	JHGFE	.760	.400	.240	.730	.320	.190

* Complete the type number by inserting the desired tolerance code in the space marked "±". For single dip style add the prefix "S". For crimped leads add the prefix "2".

MICA CAPACITOR TOLERANCES

Cap. Tol.	MIL-C-5D		RDM	
	Code	pF Range	Code	pF Range
± 1/2 pF	D	1 - 10	D	1 - 100
± 20%			M	3 - 100K
± 10%			K	5 - 100K
± 5%	J	12 - 91K	J	10 - 100K
± 3%			H	18 - 100K
± 2%	G	27 - 91K	G	27 - 100K
± 1%	F	51 - 91K	F	51 - 100K
± 1/2%			E	100 - 100K

◀ RDM15 NOTES

1. Ratings are for 500 Vdcw except ① (100V) and ② (300V).

* Complete type number by inserting tolerance code in space marked "±". Add prefix "S" for SRDM. Add prefix "2" to RDM for crimped leads. Change CM05 to CM10 for crimped leads.

READ "HOW TO SPECIFY" BEFORE ORDERING

CAPACITOR DIVISION GENERAL INSTRUMENT CORPORATION 600 WEST JOHN ST., HICKSVILLE, NEW YORK 11802

PHONE: (516) 733-3000

TWX: 510-221-1865

IN CANADA: GENERAL INSTRUMENT LTD., 61 INDUSTRY STREET, TORONTO, ONTARIO

DIPPED SILVER-MICA CAPACITORS

RDM19 (CM06/11) and RDM20



RDM19 (CM06/11)

The RDM19 (CM06/11) offers a higher level of capacitance than the RDM15 and is somewhat larger. All MIL-C-5D ratings are shown below plus a selection of RDM19 values which illustrate the range of the line. Intermediate ratings within the range are available.

Cap. pF	G. I. Type *	MIL Type *	G. I. & MIL Type No. *	Opt. MIL Tol.	Opt. RDM Tol.	Max. Size (Inches)					
						RDM19 & CM06			SRDM19		
						L	W	T	L	W	T
100	RDM19		FD101±03		JHGFE	.640	.500	.190	.610	.450	.130
110	RDM19		FD111±03		JHGFE	.640	.500	.190	.610	.450	.130
120	RDM19		FD121±03		JHGFE	.640	.500	.190	.610	.450	.130
130	RDM19		FD131±03		JHGFE	.640	.500	.190	.610	.450	.130
150	RDM19		FD151±03		JHGFE	.640	.500	.190	.610	.450	.130
160	RDM19		FD161±03		JHGFE	.640	.500	.190	.610	.450	.130
180	RDM19		FD181±03		JHGFE	.640	.500	.190	.610	.450	.130
200	RDM19		FD201±03		JHGFE	.640	.500	.190	.610	.450	.130
220	RDM19		FD221±03		JHGFE	.640	.500	.190	.610	.450	.130
220	RDM19		FD221±03		JHGFE	.640	.500	.190	.610	.450	.130
240	RDM19		FD241±03		JHGFE	.640	.500	.190	.610	.450	.130
270	RDM19		FD271±03		JHGFE	.640	.500	.190	.610	.450	.140
300	RDM19		FD301±03		JHGFE	.640	.500	.190	.610	.450	.140
330	RDM19		FD331±03		JHGFE	.640	.500	.190	.610	.450	.140
360	RDM19		FD361±03		JHGFE	.640	.510	.200	.610	.450	.140
390	RDM19		FD391±03		JHGFE	.640	.510	.200	.610	.450	.140
430	RDM19 CM06		FD431±03	JGF	JHGFE	.640	.510	.200	.610	.450	.140
470	RDM19 CM06		FD471±03	JGF	JHGFE	.640	.510	.200	.610	.450	.140
510	RDM19 CM06		FD511±03	JGF	JHGFE	.650	.510	.200	.610	.450	.140
560	RDM19 CM06		FD561±03	JGF	JHGFE	.650	.510	.200	.610	.450	.140
620	RDM19 CM06		FD621±03	JGF	JHGFE	.650	.510	.210	.610	.460	.150
680	RDM19 CM06		FD681±03	JGF	JHGFE	.650	.510	.210	.610	.460	.150
750	RDM19 CM06		FD751±03	JGF	JHGFE	.650	.510	.210	.610	.460	.150
820	RDM19 CM06		FD821±03	JGF	JHGFE	.650	.510	.210	.610	.460	.150
910	RDM19 CM06		FD911±03	JGF	JHGFE	.650	.510	.210	.620	.460	.160
1000	RDM19 CM06		FD102±03	JGF	JHGFE	.650	.520	.220	.620	.460	.160
1100	RDM19 CM06		FD112±03	JGF	JHGFE	.650	.520	.220	.620	.460	.160
1200	RDM19 CM06		FD122±03	JGF	JHGFE	.660	.520	.220	.620	.460	.170
1300	RDM19 CM06		FD132±03	JGF	JHGFE	.660	.520	.220	.620	.460	.170
1500	RDM19 CM06		FD152±03	JGF	JHGFE	.660	.520	.230	.620	.460	.170
1600	RDM19 CM06		FD162±03	JGF	JHGFE	.660	.530	.230	.620	.460	.180
1800	RDM19 CM06		FD182±03	JGF	JHGFE	.670	.530	.240	.630	.460	.180
2000	RDM19 CM06		FD202±03	JGF	JHGFE	.670	.530	.240	.630	.460	.180
2200	RDM19 CM06		FD222±03	JGF	JHGFE	.670	.530	.250	.630	.460	.190
2400	RDM19 CM06		FD242±03	JGF	JHGFE	.670	.540	.260	.630	.470	.210
2700	RDM19 CM06		FD272±03	JGF	JHGFE	.680	.540	.270	.630	.470	.220
3000	RDM19 CM06		FD302±03	JGF	JHGFE	.680	.550	.280	.630	.470	.230
3300	RDM19 CM06		FD332±03	JGF	JHGFE	.680	.550	.290	.640	.480	.240
3600	RDM19 CM06		FD362±03	JGF	JHGFE	.680	.560	.300	.640	.480	.250
3900	RDM19 CM06		FD392±03	JGF	JHGFE	.690	.560	.310	.640	.480	.260
4300	RDM19 CM06		FD432±03	JGF	JHGFE	.690	.570	.330	.650	.490	.280
4700	RDM19 CM06		FD472±03	JGF	JHGFE	.700	.580	.350	.650	.490	.300
5100	RDM19		FD512±03	JHGFE		.680	.550	.300	.630	.480	.240
5600	RDM19		FD562±03	JHGFE		.710	.590	.370	.660	.500	.320
5600	RDM19		FD562±03	JHGFE		.680	.560	.310	.640	.480	.250
5600	RDM19		FC562±03	JHGFE		.680	.560	.310	.640	.480	.250
5600	RDM19		FC622±03	JHGFE		.690	.560	.320	.640	.480	.260
5600	RDM19		FC622±03	JHGFE		.690	.560	.320	.640	.480	.260
5600	RDM19		FC682±03	JHGFE		.690	.570	.330	.640	.490	.270
5600	RDM19		FC682±03	JHGFE		.690	.570	.330	.640	.490	.270
7500	RDM19		FA752±03	JHGFE		.700	.570	.340	.650	.490	.280
8200	RDM19		FA822±03	JHGFE		.700	.580	.350	.650	.490	.300

RDM19/SRDM19 ALSO AVAILABLE IN:
1000 VDCW FROM 100 pF to 3000 pF.
SEE BULLETIN MC-2B

1. All ratings are for 500 Vdcw except ① (100V) and ③ (300V).

* Complete type number by adding tolerance code in space marked "±". For single dipped style add prefix "S" to RDM. For crimped leads add prefix "2" to RDM. For crimped lead MIL types change CM06 to CM11.

READ "HOW TO SPECIFY" BEFORE ORDERING

RDM20 (NO MIL EQUIV.)

The RDM20 was originally designed for use in television receivers. It offers genuine reliability advantages to other users because of its well-proven record providing the modest size increase can be accommodated.

There is no MIL equivalent to the RDM20. However, all performance details well exceed the MIL requirements.

Cap. Vdcw pF (Max.)		G. I. Type No. *		Opt. RDM Tol.	Max. Size (Inches)					
					RDM20			SRDM20		
					L	W	T	L	W	T
100	500	RDM20	ED101±03	JHGFE	.750	.500	.180	.700	.450	.120
120	500	RDM20	ED121±03	JHGFE	.750	.500	.190	.700	.450	.130
150	500	RDM20	ED151±03	JHGFE	.750	.500	.190	.700	.450	.130
180	500	RDM20	ED181±03	JHGFE	.750	.500	.190	.700	.450	.130
220	500	RDM20	ED221±03	JHGFE	.750	.500	.190	.700	.450	.130
270	500	RDM20	ED271±03	JHGFE	.750	.500	.190	.700	.450	.130
330	500	RDM20	ED331±03	JHGFE	.750	.500	.190	.700	.450	.130
390	500	RDM20	ED391±03	JHGFE	.750	.500	.190	.700	.450	.130
470	500	RDM20	ED471±03	JHGFE	.750	.500	.190	.700	.450	.130
560	500	RDM20	FD561±03	JHGFE	.750	.500	.190	.700	.450	.130
680	500	RDM20	FD681±03	JHGFE	.750	.510	.190	.700	.450	.140
820	500	RDM20	FD821±03	JHGFE	.750	.510	.200	.700	.450	.140
1000	500	RDM20	FD102±03	JHGFE	.750	.510	.200	.700	.450	.140
1200	500	RDM20	FD122±03	JHGFE	.750	.510	.200	.700	.450	.140
1500	500	RDM20	FD152±03	JHGFE	.750	.510	.210	.700	.460	.150
1800	500	RDM20	FD182±03	JHGFE	.760	.520	.220	.710	.460	.150
2200	500	RDM20	FD222±03	JHGFE	.760	.520	.220	.710	.460	.160
2700	500	RDM20	FD272±03	JHGFE	.770	.540	.260	.710	.460	.200
3300	500	RDM20	FD332±03	JHGFE	.780	.550	.280	.720	.470	.220
3600	500	RDM20	FD362±03	JHGFE	.780	.550	.290	.720	.470	.230
3900	500	RDM20	FD392±03	JHGFE	.780	.560	.300	.720	.480	.240
4700	300	RDM20	FC472±03	JHGFE	.770	.540	.270	.720	.470	.220
4700	300	RDM20	FD472±03	JHGFE	.790	.560	.320	.730	.480	.260
5600	300	RDM20	FC562±03	JHGFE	.780	.550	.290	.720	.480	.240
5600	300	RDM20	FD562±03	JHGFE	.790	.570	.340	.730	.490	.280
6800	100	RDM20	FA682±03	JHGFE	.780	.560	.300	.720	.470	.230
6800	300	RDM20	FC682±03	JHGFE	.790	.560	.320	.730	.480	.260
6800	500	RDM20	FD682±03	JHGFE	.800	.590	.370	.740	.500	.320
8200	100	RDM20	FA822±03	JHGFE	.780	.560	.310	.720	.480	.250
8200	300	RDM20	FC822±03	JHGFE	.790	.570	.340	.730	.490	.280
8200	500	RDM20	FD822±03	JHGFE	.810	.610	.410	.750	.510	.360
9100	100	RDM20	FA912±03	JHGFE	.790	.570	.330	.730	.480	.260
9100	300	RDM20	FC912±03	JHGFE	.800	.580	.360	.740	.490	.290
9100	500	RDM20	FD912±03	JHGFE	.810	.620	.430	.760	.520	.380
10K	100	RDM20	FA103±03	JHGFE	.790	.570	.340	.730	.490	.270
10K	300	RDM20	FC103±03	JHGFE	.800	.590	.370	.740	.490	.300
10K	500	RDM20	FD103±03	JHGFE	.820	.630	.450	.760	.530	.400
11K	100	RDM20	FA113±03	JHGFE	.790	.580	.350	.730	.490	.280
11K	300	RDM20	FC113±03	JHGFE	.800	.590	.380	.740	.500	.320
12K	100	RDM20	FA123±03	JHGFE	.800	.580	.360	.740	.490	.290
12K	300	RDM20	FC123±03	JHGFE	.810	.600	.400	.750	.500	.340
13K	100	RDM20	FA133±03	JHGFE	.800	.590	.380	.740	.500	.310
15K	100	RDM20	FA153±03	JHGFE	.810	.600	.400	.750	.500	.330
16K	100	RDM20	FA163±03	JHGFE	.810	.610	.410	.750	.510	.350
18K	100	RDM20	FA183±03	JHGFE	.820	.620	.440	.760	.520	.370
82	1000	RDM20	EF820±03	KJHGF	.750	.500	.190	.700	.450	.130
150	1000	RDM20	EF151±03	JHGFE	.750	.500	.190	.700	.450	.130
300	1000	RDM20	EF301±03	JHGFE	.750	.510	.200	.700	.460	.140
430	1000	RDM20	EF431±03	JHGFE	.760	.510	.200	.710	.460	.140
560	1000	RDM20	FF561±03	JHGFE	.760	.510	.210	.710	.460	.150
820	1000	RDM20	FF821±03	JHGFE	.760	.520	.220	.710	.470	.160
1500	1000	RDM20	FF152±03	JHGFE	.770	.530	.250	.720	.480	.190
3000	1000	RDM20	FF302±03	JHGFE	.780	.560	.310	.730	.510	.250
4300	1000	RDM20	FF432±03	JHGFE	.800	.590	.360	.750	.540	.300
5600	1000	RDM20	FF562±03	JHGFE	.810	.620	.420	.760	.570	.360
68	1500	RDM20	EH680±03	DJHGF	.750	.500	.190	.700	.450	.130
82	1500	RDM20	EH820±03	DJHGF	.750	.500	.190	.700	.450	.130
100	1500	RDM20	EH101±03	JHGFE	.750	.510	.200	.700	.460	.140
150	1500	RDM20	EH151±03	JHGFE	.750	.510	.200	.700	.460	.140
300	1500	RDM20	EH301±03	JHGFE	.750	.520	.210	.700	.470	.150
470	1500	RDM20	EH471±03	JHGFE	.760	.520	.230	.710	.470	.170
680	1500	RDM20	FH681±03	JHGFE	.770	.520	.250	.720	.480	.190
910	1500	RDM20	FH911±03	JHGFE	.770	.540	.270	.720	.490	.210
1200	1500	RDM20	FH122±03	JHGFE	.780	.560	.300	.730	.510	.240
1500	1500	RDM20	FH152±03	JHGFE	.790	.570	.320	.740	.520	.260



DIPPED SILVER-MICA CAPACITORS

RDM30 (CM07/12) and RDM42 (CM08/13)

RDM30 (CM07/12)

The RDM30 (CM07/12) provides ratings from 470 to 30,000 pF and operating voltages up to 2000 Vdcw.

The tables below list all of the available CM07/12 MIL ratings plus additional RDM30 ratings which illustrate the broad range available. Intermediate values may be specified in the RDM type.

Cap. pF	G. I. Type *	MIL Type *	G. I. & MIL Type No.	Opt. MIL Tol.	Opt. RDM Tol.	Max. Size (Inches)					
						RDM30 & CM07			SRDM30		
						L	W	T	L	W	T
470	RDM30		FD471 ±03		JHGFE	.760	.840	.230	.710	.780	.160
560	RDM30		FD561 ±03		JHGFE	.770	.850	.240	.720	.790	.170
680	RDM30		FD681 ±03		JHGFE	.770	.850	.240	.720	.790	.170
820	RDM30		FD821 ±03		JHGFE	.770	.850	.240	.720	.790	.170
1000	RDM30		FD102 ±03		JHGFE	.770	.850	.240	.720	.790	.170
1200	RDM30		FD122 ±03		JHGFE	.770	.850	.240	.720	.790	.170
1500	RDM30		FD152 ±03		JHGFE	.770	.850	.240	.720	.790	.170
1800	RDM30		FD182 ±03		JHGFE	.770	.850	.240	.720	.790	.180
2000	RDM30		FD202 ±03		JHGFE	.770	.850	.240	.720	.790	.180
2400	RDM30		FD242 ±03		JHGFE	.770	.850	.250	.720	.790	.180
2700	RDM30		FD272 ±03		JHGFE	.770	.850	.250	.720	.790	.190
3000	RDM30		FD302 ±03		JHGFE	.770	.850	.250	.720	.790	.190
3300	RDM30		FD332 ±03		JHGFE	.770	.850	.260	.720	.790	.190
3600	RDM30		FD362 ±03		JHGFE	.770	.850	.260	.720	.790	.200
3900	RDM30		FD392 ±03		JHGFE	.770	.850	.270	.720	.790	.200
4700	RDM30	CM07	FD472 ±03	JGF	JHGFE	.780	.850	.270	.720	.790	.210
5100	RDM30	CM07	FD512 ±03	JGF	JHGFE	.780	.860	.280	.720	.790	.210
5600	RDM30	CM07	FD562 ±03	JGF	JHGFE	.780	.870	.290	.720	.790	.220
6200	RDM30	CM07	FD622 ±03	JGF	JHGFE	.780	.870	.290	.730	.800	.220
6800	RDM30	CM07	FD682 ±03	JGF	JHGFE	.780	.870	.300	.730	.800	.230
7500	RDM30	CM07	FD752 ±03	JGF	JHGFE	.790	.880	.310	.730	.800	.240
8200	RDM30	CM07	FD822 ±03	JGF	JHGFE	.790	.880	.320	.730	.800	.250
9100	RDM30	CM07	FC912 ±03	JGF	JHGFE	.780	.870	.280	.720	.790	.210
9100	RDM30	CM07	FD912 ±03	JGF	JHGFE	.790	.880	.330	.730	.800	.260
10K	RDM30	CM07	FC103 ±03	JGF	JHGFE	.780	.870	.290	.730	.800	.220
10K	RDM30	CM07	FD103 ±03	JGF	JHGFE	.800	.890	.340	.730	.800	.270
11K	RDM30	CM07	FC113 ±03	JGF	JHGFE	.780	.870	.300	.730	.800	.230
11K	RDM30	CM07	FD113 ±03	JGF	JHGFE	.800	.890	.350	.740	.810	.280
12K	RDM30	CM07	FC123 ±03	JGF	JHGFE	.790	.880	.310	.730	.800	.240
12K	RDM30	CM07	FD123 ±03	JGF	JHGFE	.800	.890	.360	.740	.810	.290
13K	RDM30	CM07	FC133 ±03	JGF	JHGFE	.790	.880	.310	.730	.800	.250
13K	RDM30	CM07	FD133 ±03	JGF	JHGFE	.810	.890	.370	.740	.810	.300
15K	RDM30	CM07	FC153 ±03	JGF	JHGFE	.790	.880	.330	.730	.800	.260
15K	RDM30	CM07	FD153 ±03	JGF	JHGFE	.810	.900	.390	.740	.820	.330
16K	RDM30	CM07	FC163 ±03	JGF	JHGFE	.800	.890	.340	.730	.800	.270
16K	RDM30	CM07	FD163 ±03	JGF	JHGFE	.820	.900	.410	.740	.820	.340
18K	RDM30	CM07	FC183 ±03	JGF	JHGFE	.800	.890	.360	.740	.810	.280
18K	RDM30	CM07	FD183 ±03	JGF	JHGFE	.820	.910	.430	.750	.820	.360
20K	RDM30	CM07	FC203 ±03	JGF	JHGFE	.810	.890	.370	.740	.810	.300
20K	RDM30	CM07	FD203 ±03	JGF	JHGFE	.830	.920	.450	.750	.830	.380
22K	RDM30		FA223 ±03		JHGFE	.810	.890	.370	.740	.810	.310
24K	RDM30		FA243 ±03		JHGFE	.810	.900	.400	.740	.820	.320
27K	RDM30		FA273 ±03		JHGFE	.810	.900	.410	.740	.820	.340
30K	RDM30		FA303 ±03		JHGFE	.820	.910	.420	.750	.820	.360

RDM42 (CM08/13)

The RDM42 is the largest MIL-C-5D dipped style (CM08/13). It offers ratings as high as 100,000 pF (.10uF) and operating voltages to 1500 Vdcw.

All (CM08/13) ratings appear in the tables below plus the extended range of the commercial RDM42. In addition to the RDM42 ratings shown, intermediate values may be specified and in tolerances as tight as ±0.5%.

Cap. pF	G. I. Type *	MIL Type *	G. I. & MIL Type No.	Opt. MIL Tol.	Opt. RDM Tol.	Max. Size (Inches)					
						RDM42 & CM08			SRDM42		
						L	W	T	L	W	T
3300	RDM42		FD332 ±03		JHGFE	1.410	.870	.280	1.370	.800	.220
3900	RDM42		FD392 ±03		JHGFE	1.410	.870	.280	1.370	.800	.220
4700	RDM42		FD472 ±03		JHGFE	1.410	.870	.280	1.370	.800	.220
5600	RDM42		FD562 ±03		JHGFE	1.410	.870	.280	1.370	.800	.220
6800	RDM42		FD682 ±03		JHGFE	1.410	.870	.280	1.370	.800	.220
8200	RDM42		FD822 ±03		JHGFE	1.410	.870	.280	1.370	.800	.220
10K	RDM42		FD103 ±03		JHGFE	1.410	.870	.280	1.370	.800	.220
12K	RDM42		FD123 ±03		JHGFE	1.410	.870	.280	1.370	.800	.220
15K	RDM42		FD153 ±03		JHGFE	1.410	.870	.280	1.370	.800	.220
18K	RDM42		FD183 ±03		JHGFE	1.410	.870	.290	1.370	.800	.230
20K	RDM42		FD203 ±03		JHGFE	1.410	.870	.300	1.380	.800	.240
22K	RDM42	CM08	FD223 ±03	JGF	JHGFE	1.420	.880	.310	1.380	.810	.240
24K	RDM42	CM08	FC243 ±03	JGF	JHGFE	1.420	.870	.300	1.380	.810	.240
24K	RDM42	CM08	FD243 ±03	JGF	JHGFE	1.430	.880	.320	1.380	.810	.250
27K	RDM42	CM08	FC273 ±03	JGF	JHGFE	1.420	.880	.310	1.380	.810	.240
27K	RDM42	CM08	FD273 ±03	JGF	JHGFE	1.430	.880	.330	1.380	.810	.260
30K	RDM42	CM08	FC303 ±03	JGF	JHGFE	1.430	.880	.320	1.380	.810	.260
30K	RDM42	CM08	FD303 ±03	JGF	JHGFE	1.440	.890	.350	1.380	.810	.280
33K	RDM42	CM08	FC333 ±03	JGF	JHGFE	1.430	.880	.340	1.380	.810	.270
33K	RDM42	CM08	FD333 ±03	JGF	JHGFE	1.440	.890	.360	1.390	.820	.290
36K	RDM42	CM08	FC363 ±03	JGF	JHGFE	1.440	.890	.350	1.390	.820	.280
36K	RDM42	CM08	FD363 ±03	JGF	JHGFE	1.450	.900	.380	1.390	.820	.310
39K	RDM42	CM08	FC393 ±03	JGF	JHGFE	1.440	.890	.360	1.390	.820	.290
39K	RDM42	CM08	FD393 ±03	JGF	JHGFE	1.450	.900	.400	1.390	.830	.330
43K	RDM42	CM08	FC433 ±03	JGF	JHGFE	1.450	.900	.370	1.390	.830	.310
43K	RDM42	CM08	FD433 ±03	JGF	JHGFE	1.460	.910	.420	1.400	.830	.350
47K	RDM42	CM08	FC473 ±03	JGF	JHGFE	1.450	.900	.390	1.400	.830	.330
47K	RDM42	CM08	FD473 ±03	JGF	JHGFE	1.470	.910	.450	1.420	.840	.380
51K	RDM42	CM08	FC513 ±03	JGF	JHGFE	1.460	.900	.400	1.410	.830	.330
51K	RDM42	CM08	FD513 ±03	JGF	JHGFE	1.480	.920	.470	1.430	.840	.400
56K	RDM42	CM08	FA563 ±03	JGF	JHGFE	1.440	.900	.370	1.390	.830	.310
56K	RDM42	CM08	FC563 ±03	JGF	JHGFE	1.460	.910	.420	1.410	.840	.350
62K	RDM42	CM08	FA623 ±03	JGF	JHGFE	1.450	.900	.390	1.400	.830	.330
62K	RDM42	CM08	FC623 ±03	JGF	JHGFE	1.470	.920	.450	1.420	.840	.380
68K	RDM42	CM08	FA683 ±03	JGF	JHGFE	1.460	.900	.410	1.410	.830	.340
68K	RDM42	CM08	FC683 ±03	JGF	JHGFE	1.480	.920	.470	1.430	.840	.400
75K	RDM42	CM08	FA753 ±03	JGF	JHGFE	1.470	.910	.440	1.420	.840	.380
82K	RDM42	CM08	FA823 ±03	JGF	JHGFE	1.480	.920	.460	1.430	.840	.390
91K	RDM42	CM08	FA913 ±03	JGF	JHGFE	1.500	.940	.500	1.450	.860	.430
100K	RDM42	CM08	FA104 ±03	JGF	JHGFE	1.520	.960	.540	1.470	.880	.470

RDM42/SRDM42 ALSO AVAILABLE IN:
1000 VDCW FROM 3000-30,000 pF
1500 VDCW FROM 1000-20,000 pF
SEE BULLETIN MC-2B

1. All ratings are for 500 Vdcw except ① (100V) and ③ (300V).
* Complete type number by inserting desired tolerance code in space marked "±".
For single dip RDM, add prefix "S". For crimped lead RDM, add prefix "2". For crimped lead MIL, change CM08 to CM13.

MICA CAPACITOR TOLERANCES

Cap. Tol.	MIL-C-5D		RDM	
	Code	pF Range	Code	pF Range
±½ pF	D	1 - 10	D	1 - 100
±20%			M	3 - 100K
±10%			K	5 - 100K
±5%	J	12 - 91K	J	10 - 100K
±3%			H	18 - 100K
±2%	G	27 - 91K	G	27 - 100K
±1%	F	51 - 91K	F	51 - 100K
±½%			E	100 - 100K

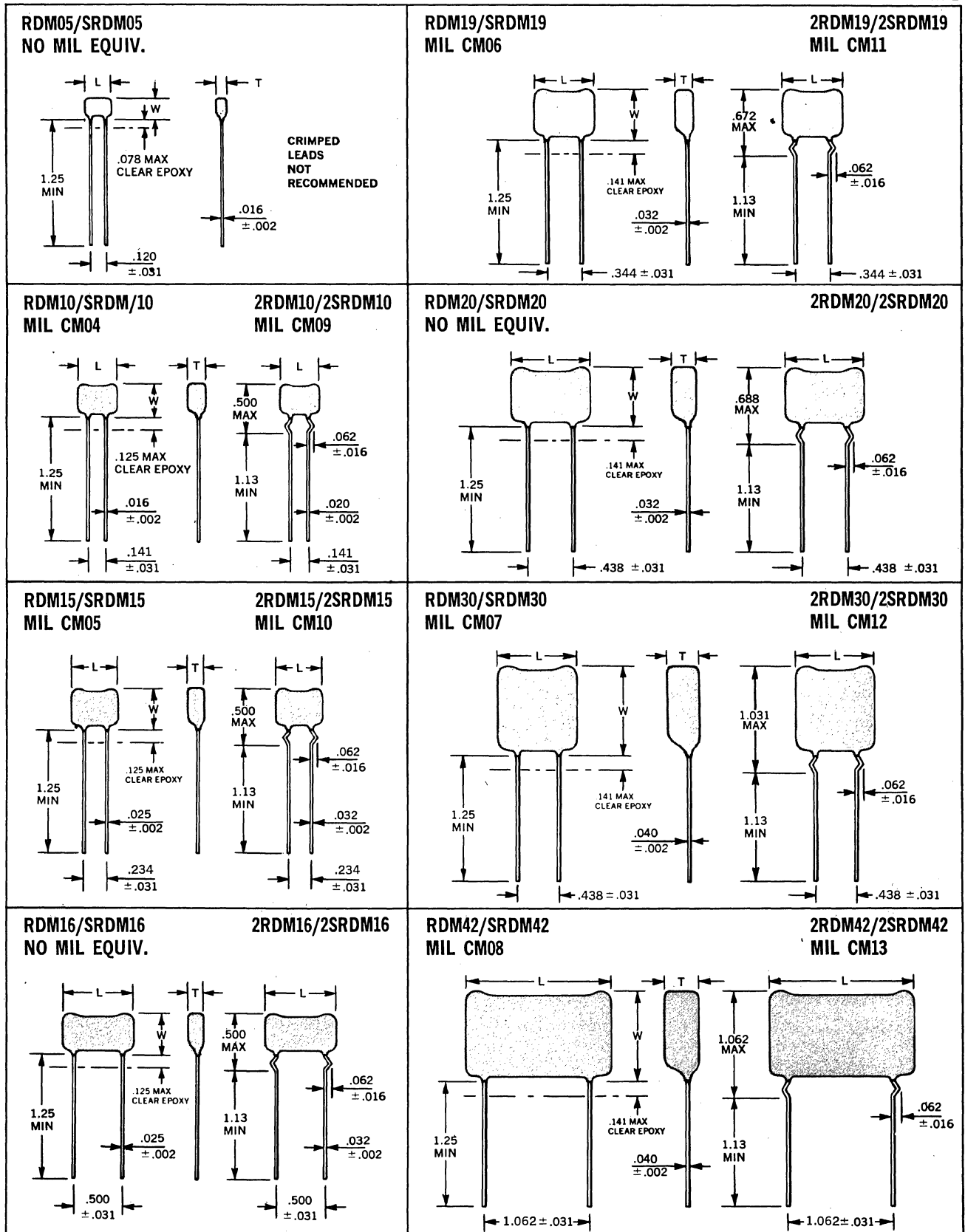
RDM30/SRDM30 ALSO AVAILABLE IN:
1000 VDCW FROM 470-12,000 pF
1500 VDCW FROM 100-5,600 pF
2000 VDCW FROM 100-5,600 pF

1. All ratings are for 500 Vdcw except ① (100V) and ③ (300V).
* Complete the type number by inserting the desired tolerance code in the space marked "±". For the single dip style add the prefix "S" to RDM. For crimped lead RDM, add the prefix "2". For crimped lead MIL, change CM07 to CM12.

READ "HOW TO SPECIFY" BEFORE ORDERING

DIPPED SILVER-MICA CAPACITORS

RDM and MIL-C-5D, STYLES and DIMENSIONS

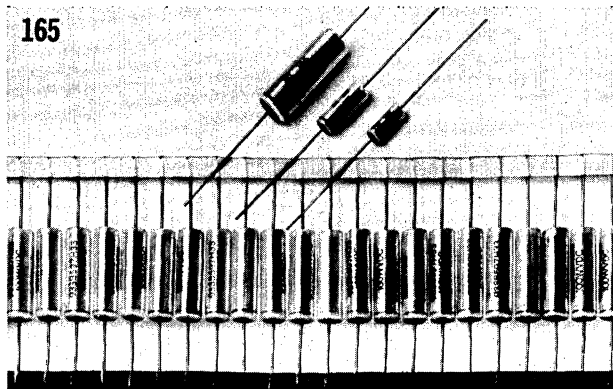




CRYSTAL-CAP[®] POLYESTER FILM (MYLAR[®]) CAPACITORS

TYPE 165 AXIAL LEADS

SPECIFICATIONS



Construction: Extended dielectric of self-sealed polyester film with tinned axial terminal wires.

Operating Temperature: -55°C to $+85^{\circ}\text{C}$ at full rated working voltage. -55°C to $+125^{\circ}\text{C}$ permissible with voltage derating, (See Capacitance vs. Temperature chart below.)

Working Voltage: Expressed as V_{dcw} in tables. This is the maximum continuous voltage which may be applied at $+85^{\circ}\text{C}$. For $+125^{\circ}\text{C}$ operation, see voltage derating chart below.

Surge Voltage: Expressed as V_{dcs} . Capacitors shall withstand a surge voltage of 250% of rated V_{dcw} for 15 seconds or 200% for 60 seconds.

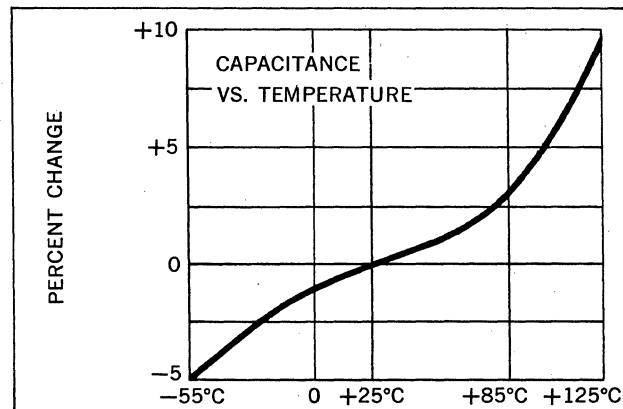
Capacitance: Shown in microfarads (μF) in the tables and measured by the bridge method at $+25^{\circ}\text{C}$ and 1000 Hertz.

Capacitance Tolerance: The standard tolerance is $\pm 10\%$ of rated capacitance. $\pm 20\%$ and $\pm 5\%$ tolerance is also available.

Outer Foil: The outer foil is indicated by a printed bar adjacent to the associated terminal wire.

Insulation Resistance: Expressed as IR. Measure by applying rated V_{dcw} or 500 Vdc (whichever is lesser) for two minutes. IR shall be within the following limits:

Temp. $^{\circ}\text{C}$	Megohm - μF 's	Need not exceed (Megohms)
+25	50,000	100,000
+85	5,000	15,000
+105	1,000	2,000
+125	50	200



Dissipation Factor: Expressed as DF in terms of percent. When measured by the bridge method at $\pm 25^{\circ}\text{C}$ and 1000 Hertz, DF shall not exceed 1.0%.

Life Test: Test is conducted in a suitable chamber with circulating air. Apply 150% of rated V_{dcw} for 250 hours at $+85^{\circ}\text{C}$. Remove capacitors from test chamber and allow to cool normally to $\pm 25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. Measure capacitance, IR and dissipation factor: IR shall not be less than 75% of initial required values; capacitance shall be within $\pm 10\%$ of initial value; DF shall not exceed 1.0%. No more than one failure per lot of 24 is permitted.

Humidity Test: Test must be conducted in a suitable chamber with calibrated measuring equipment and circulating air. Capacitors shall withstand 90% ($+5\%$ -0%) relative humidity at $+65^{\circ}\text{C} \pm 2^{\circ}\text{C}$ for 500 hours. At completion of exposure, wipe capacitors dry and let stand in circulating air for four hours at $+25^{\circ}\text{C}$. At conclusion of drying cycle, measure insulation resistance (IR) at $+25^{\circ}\text{C} \pm 1^{\circ}\text{C}$. IR shall not be less than 75% of initial required value. No more than one failure per lot of 18 is permitted.

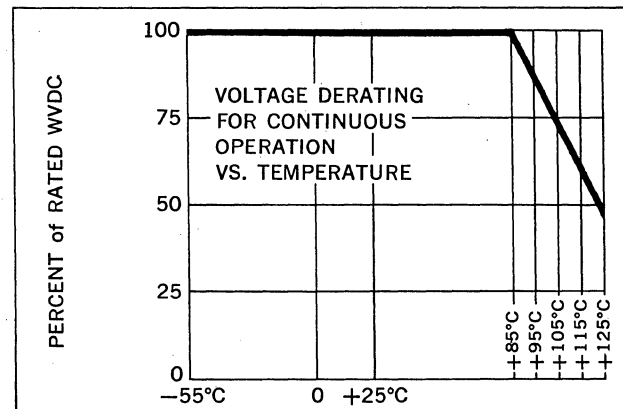
Terminal Bond Test: Clamp one terminal wire to a suitable support and attach 4.4 lb. weight to opposite wire with capacitor body in vertical position. Test shall be conducted for 10 seconds. No physical or electrical damage shall have occurred to capacitor.

Terminal Bend Test: Clamp capacitor securely in a suitable fixture with the body in a vertical position. Grasp the end of the upper terminal wire and bend it over a time period of 5 seconds to a position 90° to the right of the body. Return to original position over a period of 5 seconds. Bend the wire 90° to the left over a period of 5 seconds. Return to original position over a period of 5 seconds. Terminal wire shall remain intact. Axial pull on the wire shall not have exceeded 2.2 lbs. during this test.

Marking: Minimum marking shall be: 1. General Instrument symbol and Type (165), 2. Outer foil bar, 3. Capacitance in μF , 4. Tolerance, and 5. Working voltage.

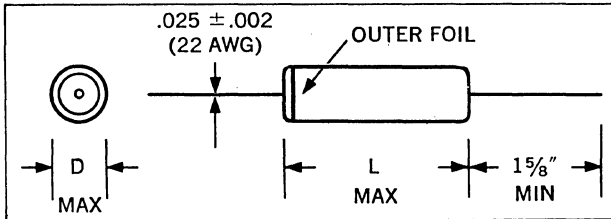
Customer part number or other marking may be applied on special order.

Packaging: Standard packaging is bulk in corrugated cartons. Reel packaging is available for Type 165 up to .375 inches maximum diameter. The standard G.I. reel packaging specification is available on request.



CRYSTAL-CAP[®] POLYESTER FILM (MYLAR[®]) CAPACITORS

TYPE 165 AXIAL LEADS



General Instrument "Crystal-Cap" film capacitors are made with DuPont Mylar in a unique manner. The bodies are self-sealed with the terminal wires being inserted precisely on center under heat and pressure. This construction provides both an excellent electrical connection and a very strong mechanical bond. This bond is actually stronger than typical wrap and fill types and far less susceptible to damage from soldering activities either manual or automatic.

As with all Mylar capacitors, applications include bypass, timing, coupling and filtering. Operating temperatures range from -55°C to $+85^{\circ}\text{C}$ at full rated voltage. Operation to $+125^{\circ}\text{C}$ is common except that voltage must be de-rated 50%. A unit rated at 200 Vdcw may be operated continuously at that voltage at $+85^{\circ}\text{C}$ but must not be operated continuously above 100 Vdcw at $+125^{\circ}\text{C}$.

The particular advantage of the Crystal-Cap capacitor in addition to its construction and performance is the concentricity of the terminal wires. This makes it ideal for automatic insertion equipment. Furthermore, the very simplicity of its design causes it to be smaller in size than other Mylar types (wrap and fill, molded, end-capped, etc.). Metallized Mylar capacitors are, of course, smaller but these specialized types cost considerably more and suffer distinct performance limitations.

The table below lists all standard Crystal-Cap capacitors from .001 to 1.0 uF and 50 to 600 Vdcw. Standard packaging is bulk. However, all sizes up to .375" diameter and/or 1.031" body length are available taped and reeled at modest extra cost.

NOTES:

HOW TO SPECIFY TYPE 165 CAPACITORS

1. Select working voltage and capacitance
2. Read the Type 165 part number
3. Insert at "*", B for bulk package or T for tape and reel
4. Add at "+", tolerance code letter:

M = $\pm 20\%$, K = $\pm 10\%$, J = $\pm 5\%$

TYPE 165 — Maximum Diameter x Length (Inches) and Part Numbers

Cap. uF	50-80 Vdcw				100 Vdcw				200 Vdcw				400 Vdcw				600 Vdcw				Cap. uF
	G. I. P/N (See Notes)		Max. Size		G. I. P/N (See Notes)		Max. Size		G. I. P/N (See Notes)		Max. Size		G. I. P/N (See Notes)		Max. Size		G. I. P/N (See Notes)		Max. Size		
			Dia.	Lgt.			Dia.	Lgt.			Dia.	Lgt.			Dia.	Lgt.			Dia.	Lgt.	
.0010	165*0001+	.170	.468	165*0038+	.170	.468	165*0075+	.170	.468	165*0112+	.170	.468	165*0145+	.170	.468	.0010					
.0012	165*0002+	.170	.468	165*0039+	.170	.468	165*0076+	.170	.468	165*0113+	.170	.468	165*0146+	.170	.468	.0012					
.0015	165*0003+	.170	.468	165*0040+	.170	.468	165*0077+	.170	.468	165*0114+	.170	.468	165*0147+	.180	.468	.0015					
.0018	165*0004+	.170	.468	165*0041+	.170	.468	165*0078+	.170	.468	165*0115+	.170	.468	165*0148+	.175	.531	.0018					
.0022	165*0005+	.170	.468	165*0042+	.170	.468	165*0079+	.170	.468	165*0116+	.170	.468	165*0149+	.170	.593	.0022					
.0027	165*0006+	.170	.468	165*0043+	.170	.468	165*0080+	.170	.468	165*0117+	.180	.468	165*0150+	.180	.593	.0027					
.0033	165*0007+	.170	.468	165*0044+	.170	.468	165*0081+	.170	.468	165*0118+	.195	.468	165*0151+	.190	.593	.0033					
.0039	165*0008+	.170	.468	165*0045+	.170	.468	165*0082+	.170	.468	165*0119+	.205	.468	165*0152+	.200	.593	.0039					
.0047	165*0009+	.170	.468	165*0046+	.170	.468	165*0083+	.170	.468	165*0120+	.215	.468	165*0153+	.200	.656	.0047					
.0050	165*0172+	.170	.468	165*0173+	.170	.468	165*0174+	.170	.468	165*0175+	.220	.468	165*0176+	.205	.656	.0050					
.0056	165*0010+	.170	.468	165*0047+	.175	.468	165*0084+	.175	.468	165*0121+	.205	.531	165*0154+	.215	.656	.0056					
.0068	165*0011+	.170	.468	165*0048+	.175	.468	165*0085+	.170	.531	165*0122+	.220	.531	165*0155+	.225	.656	.0068					
.0082	165*0012+	.170	.468	165*0049+	.175	.468	165*0086+	.180	.531	165*0123+	.210	.593	165*0156+	.230	.718	.0082					
.010	165*0013+	.170	.468	165*0050+	.170	.531	165*0087+	.190	.531	165*0124+	.230	.593	165*0157+	.245	.718	.010					
.012	165*0014+	.170	.531	165*0051+	.175	.531	165*0088+	.205	.531	165*0125+	.245	.593	165*0158+	.240	.843	.012					
.015	165*0015+	.175	.531	165*0052+	.170	.593	165*0089+	.225	.531	165*0126+	.265	.593	165*0159+	.250	.906	.015					
.018	165*0016+	.185	.531	165*0053+	.180	.593	165*0090+	.215	.593	165*0127+	.285	.593	165*0160+	.265	.906	.018					
.022	165*0017+	.200	.531	165*0054+	.195	.593	165*0091+	.215	.656	165*0128+	.285	.656	165*0161+	.275	.968	.022					
.027	165*0018+	.215	.531	165*0055+	.210	.593	165*0092+	.235	.656	165*0129+	.315	.656	165*0162+	.265	1.218	.027					
.033	165*0019+	.230	.531	165*0056+	.230	.593	165*0093+	.250	.656	165*0130+	.340	.656	165*0163+	.285	1.218	.033					
.039	165*0020+	.220	.593	165*0057+	.245	.593	165*0094+	.270	.656	165*0131+	.340	.718	165*0164+	.305	1.218	.039					
.047	165*0021+	.220	.656	165*0058+	.245	.656	165*0095+	.290	.656	165*0132+	.330	.843	165*0165+	.315	1.343	.047					
.050	165*0177+	.225	.656	165*0178+	.250	.656	165*0179+	.300	.656	165*0180+	.340	.843	165*0181+	.320	1.343	.050					
.056	165*0022+	.235	.656	165*0059+	.245	.718	165*0096+	.315	.656	165*0133+	.340	.906	165B.0166+	.340	1.343	.056					
.068	165*0023+	.255	.656	165*0060+	.250	.781	165*0097+	.320	.718	165*0134+	.355	.968	165B.0167+	.365	1.343	.068					
.082	165*0024+	.275	.656	165*0061+	.270	.781	165*0098+	.295	.906	165*0135+	.335	1.218	165B.0169+	.395	1.343	.082					
.10	165*0025+	.300	.656	165*0062+	.295	.781	165*0099+	.320	.906	165B0136+	.365	1.218	165B.0169+	.435	1.343	.10					
.12	165*0026+	.300	.718	165*0063+	.300	.843	165*0100+	.330	.968	165B0137+	.370	1.343	165B.0186+	.470	1.343	.12					
.15	165*0027+	.335	.718	165*0064+	.315	.906	165*0101+	.365	.968	165B0138+	.410	1.343	165B.0187+	.520	1.343	.15					
.18	165*0028+	.360	.718	165*0065+	.330	.968	165B0102+	.345	1.218	165B0139+	.445	1.343	165B.0188+	.565	1.343	.18					
.22	165*0029+	.350	.843	165*0066+	.310	1.031	165B0103+	.355	1.343	165B0140+	.490	1.343	165B.0189+	.620	1.343	.22					
.27	165B0130+	.335	1.031	165*0067+	.375	1.031	165B0104+	.390	1.343	165B0141+	.535	1.343	165B.0190+	.635	1.343	.27					
.33	165*0031+	.370	1.031	165B0068+	.340	1.218	165B0105+	.430	1.343	165B0142+	.590	1.343				.33					
.39	165B0032+	.335	1.343	165B0069+	.400	1.218	165B0106+	.460	1.343	165B0143+	.640	1.343				.39					
.47	165B0033+	.365	1.343	165B0070+	.415	1.343	165B0107+	.505	1.343	165B0144+	.700	1.343				.47					
.50	165B0182+	.380	1.343	165B0183+	.425	1.343	165B0184+	.520	1.343	165B0185+	.720	1.343				.50					
.56	165B0034+	.400	1.343	165B0071+	.450	1.343	165B0108+	.545	1.343							.56					
.68	165B0035+	.435	1.343	165B0072+	.490	1.343	165B0109+	.600	1.343							.68					
.82	165B0036+	.475	1.343	165B0073+	.535	1.343	165B0110+	.655	1.343							.82					
1.00	165B0037+	.520	1.343	165B0074+	.590	1.343	165B0111+	.720	1.343							1.00					



CAPACITORS

G.I./Miconics

Mi
CAPACITORS

DISTRIBUTORS

HUNTSVILLE, ALA., Hallmark Elctns. Corp., 2010 Bob Wallace Ave., (205) 837-8700

PHOENIX, ARIZ., Sterling Elctns., 1930 No. 22nd Ave., (602) 258-4536

PHOENIX, ARIZ., Kierulff Elctns., 2633 E. Buckeye Rd., (602) 968-6292

PHOENIX, ARIZ., Mirco Elctns., 2005 W. Peoria Ave., (602) 944-2281

CARSON, CAL., Hi-Rel Distr., 20507 S. Belshaw, (213) 537-6500

CHATSWORTH, CAL., Westates Elctns. Corp., 20151 Bahama St., (213) 241-4411

GLENDAL, CAL., R. V. Weatherford Co., 6921 San Fernando Rd., (213) 849-3451

MENLO PARK, CAL., Bell Ind., 1070 O'Brien Dr., (415) 323-9431

SAN DIEGO, CAL., Sterling Elctns., 7405 Convoey Ct., (714) 565-2441

SUN VALLEY, CAL., Sterling Elctns., 116-14 Pendleton St., (213) 767-5030

SUNNYDALE, CAL., Diplomat/Westland, 1118 Elko Dr., (408) 734-1900

WOODLAND HILLS, CAL., Jaco Elctns., 21201 Oxnard St., (213) 887-6400

DENVER, COLO., Indu'l. Elctns., (303) 770-4400

FAIRFIELD, CONN., U-tronics, Inc., 273 Linwood Ave., (203) 255-2451

NORWALK, CONN., Harvey/Conn., 112 Main St., (203) 853-1515

HAMDEN, CONN., Wilshire Elctns., 2554 State St., (203) 281-1166

ORLANDO, FLA., Hallmark Elctns Corp., 7233 Lake Elenor Dr., (305) 855-4020

WASHINGTON, D.C., Pytronics Inds., Inc., (301) 953-3000

ELK GROVE, ILL., Diplomat/Lakeland, 2451 Brickvale Dr., (312) 595-1000

SKOKIE, ILL., Bell Inds., 7701 N. Austin Ave., (312) 282-5400

PALATINE, ILL., Ohm/Elctns., 649 Vermont, (312) 359-5500

CEDAR RAPIDS, IOWA, Deeco, Inc., 2500 16th Ave., S.W., (319) 365-7551

KANSAS CITY, KAN., Hallmark Elctns. Corp., 9006 Rosehill Rd., (913) 888-4747

BALTIMORE, MD., A. S. I. Elctns., 1738 Whitehead Rd., (301) 265-5100

BALTIMORE, MD., Hallmark Elctns. Corp., 6660 Security Blvd., (301) 265-8500

GAITHERSBURG, MD., Kierulff Elctns., 16021 Ind'l. Dr., (301) 948-0250

HYATTSVILLE, MD., Milgray Elctns., 5405 Lafayette Pl., (301) 864-1111

LYNN, MASS., Land Elctns., 9R Franklin St., (617) 592-2220

NEWTON, MASS., Greene-Shaw Co., 70 Bridge St., (617) 969-8900

WALTHAM, MASS., QPL Elctn. Dist., 75 N. Beacon St., (617) 891-0460

WATERTOWN, MASS., Sterling Elctns., 51 Spring St., (617) 926-9720

FARMINGTON, MICH., Diplomat/Northland, (313) 477-3200

MINNEAPOLIS, MINN., Electro-Com Corp., 3816 Chandler Dr., (612) 788-8601

MINNEAPOLIS, MINN., Industrial Comp., (612) 831-2666

BERGENFIELD, N. J., Tech. Elctn. Dist., (201) 384-3643

CHERRY HILL, N. J., Milgray/Delaware, 1165 Markkless Rd., (609) 424-1300

CLIFTON, N. J., Wilshire Elctns., 312 Clifton Ave., (201) 365-2600

ISELIN, N. J., Brothers Elctns., (201) 388-7676

PERTH AMBOY, N. J., Sterling Elctns., 774 Pfeiffer Blvd., (201) 442-8000

RAHWAY, N. J., Terminal Elctns. Corp., 1463 Pinewood St., (201) 381-5700

PARSIPPANY, N. J., Tonar Elctns., 1220 U.S. Hwy. 46, (201) 335-9400

ALBUQUERQUE, N. M., Industrial Elctns., 310 Vale Verda, S.E., (505) 266-8721

ALBUQUERQUE, N. M., Sterling Elctns., (505) 247-2486

BINGHAMTON, N. Y., Harvey/Federal Elctns., Box 1208, (607) 748-8211

BUFFALO, N. Y., Summit Elctns., 916 Main St., (716) 884-3450

FARMINGDALE, N. Y., Arrow Elctns., 900 Broad Hollow, (516) 694-6800

FARMINGDALE, N. Y., Bart Elctns., 195 Central Ave., (516) 293-3144

FARMINGDALE, N. Y., Command Elctns. Corp., (516) 293-1212

FARMINGDALE, N. Y., Hallmark Elctns. Corp., 167 Marine St., (516) 293-7500

FARMINGDALE, N. Y., Wilshire Elctns., 1855 New Highway, Unit B, (516) 293-5775

FARMINGDALE, N. Y., Pride Elctns., (516) 293-4020

FREEPORT, N. Y., Milgray Elctns., 191 Hanse Ave., (516) 546-6000

FREEPORT, N. Y., Mil Spec Wire & Cable Corp., (516) 546-5454

HAUPPAUGE, N. Y., Jaco Elctns., 195 Engineers Rd., (516) 273-5500

JOHNSON CITY, N. Y., Wilshire Elctns., 617 Main St., Westover Park, (607) 791-1236

MOUNT VERNON, N. Y., QAR Industrial Elctn. Sls., 621 S. Columbus Ave., (914) 694-2224

ONTARIO CENTER, N. Y., Kehoe Comp. Sls., (315) 524-2491

PLAINVIEW, N. Y., Fairmont Elctn. Sls. Corp., 35 S. Service Rd., (516) 694-8200

ROCHESTER, N. Y., Simcona Elctns. Corp., 275 Mt. Read Blvd., (716) 328-3230

ROCHESTER, N. Y., Summit Elctns., 292 Commerce Dr., (716) 334-8110

WEST BABYLON, N. Y., Delmar Elctns., 101 Eads St., (516) 420-1234

WOODBURY, N. Y., Diplomat Elctns., (516) 921-9373

RALEIGH, N. C., Pytronics Inds., 4509 Creedmore Rd., (919) 782-6370

CLEVELAND, OHIO, Milgray Elctns., 1821 E. 40th St., (216) 481-8800

HARRISBURG, PA., Pytronics Inds., 2325 No. 7th St., (717) 233-6591

HUNTINGDON VALLEY, PA., Hallmark Elctn. Corp., 458 Pike Rd., (215) 355-2335

HUNTINGDON VALLEY, PA., Shap Elctns., 421 Pike Rd., (215) 698-9550

MONTGOMERYVILLE, PA., Pytronics Inds., Stump Rd., Box 433, (215) 242-6700

PHILADELPHIA, PA., Philadelphia Elctns., 1225 Vine St., (215) 568-7444

PITTSBURGH, PA., Pytronics Inds., (412) 276-6722

DALLAS, TEX., K. A. Elctns., 9333 Forrest La., (214) 634-7870

DALLAS, TEX., Hallmark Elctns. Corp., (214) 231-5101

FT. WORTH, TEX., Textronics Co., (817) 731-8701

HOUSTON, TEX., Sterling Elctns., 4201 S.W. Freeway, (713) 623-6600

SAN ANTONIO, TEX., Sterling Elctns., (512) 735-9173

RICHARDSON, TEX., Altair Co., 405 N. Plano Rd., (214) 263-8783

SALT LAKE CITY, UTAH, Cramer Elctns., 391 West 2560 South, (801) 487-4131

BELLEVUE, WASH., Bell Inds., 12410 S.E. 32nd, (206) 747-1515

SEATTLE, WASH., Sterling Elctns., 5608 6th Ave. So., (206) 762-9100

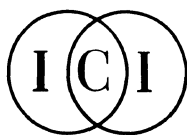
SEATTLE, WASH., Zepher Elctns., (206) 242-2517

MONTREAL, CAN., Electronic Wholesalers Co., Ltd., (514) 769-8861

SCARBOROUGH, CAN., Carsten Elctns., Ltd., 52 Howden Rd., (416) 951-2371

OTTAWA, CAN., Wackid Radio, (613) 728-1821

TORONTO, CAN., Electrosonic Ind'l. Sls., Ltd., 543 Yonge St., (416) 924-9301



an **Eltra** company

CAPACITORS (ALL TYPES)

MIDWEC DIVISION INDEPENDENT CABLE

P.O. BOX 417 A, SCOTTSBLUFF, NEBRASKA 69361
TELEPHONE: 308-632-4127 • TWX 910-627-0061



MYLAR FOIL

Type	Configuration	Case Style	Cap. Range (MFDS)	Volt Range (VDC)	Size Range (Inches)
3		Plastic Wrap & Fill	.001 to 2.00	100 to 1000	.156 x .500 to 1.609 x 3.000
3F 3FR		Plastic Wrap & Fill	.001 to 2.00	100 to 600	.125 x .250 x .500 to .984 x 1.937 x 3.000
3X		Plastic Wrap & Fill	.010 to 5.00	up to 100	.117 x .406 to .840 x 1.812
3XF 3XFR		Plastic Wrap & Fill	.010 to 5.00	up to 100	.075 x .149 x .437 to .578 x .875 x 1.812
301 3XI		Plastic Wrap & Fill	.0001 to .33	up to 100	.140 x .500 to .500 x .500
E3F		Epoxy	.001 to 2.00	100 or 200	.160 x .240 x .420 to .560 x .720 x 1.950
E3FR		Epoxy	.0010 to 1.00	100 or 200	.095 x .265 x .375 to .295 x 1.100 x 1.785
E3XF E3XFR		Epoxy	.015 to 2.00 .0082 to 1.00	50	.170 x .290 x .550 to .550 x .720 x 1.250 .095 x .265 x .375 to .250 x .890 x .985
D3		Epoxy Dip	.001 to .68	100	.200 x .350 x .500 to .475 x .875 x 1.125
P3		Phenolic	.001 to 2.00	100 to 600	.250 x .625 to 1.00 x 2.0
H3G H3GS		Hermetic Seal	.001 to 2.0	100 to 600	.173 x .687 to 1.00 x 2.812
H3 H3S		Hermetic Seal	.001 to 2.00	100 to 600	.173 x .750 to 1.00 x 2.875

GENERAL NOTES

Capacitance Tolerance: Standard tolerance is $\pm 5\%$. All types available in $\pm 20\%$, $\pm 10\%$, $\pm 3\%$, $\pm 2\%$, and $\pm 1\%$. The capacitance shall be measured at 1000 Hz. at 25°C for values up to and including 5.0 mfd. Values larger than 5.0 mfd. shall be measured at 60 Hz. and 25°C.

Dissipation Factor: Less than 0.60% when measured at 1000 Hz. and 25°C for values up to and including 5.0 mfd. and 60 Hz. for values larger than 5.0 mfd. 60 Hz. and 25°C.

Insulation Resistance: Greater than 100,000 megohm-microfarads after a 2 minute electrification at rated voltage and 25°C, but the I.R. need not exceed 200,000 megohms.

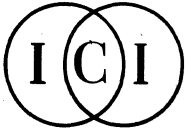
Dielectric Strength: Twice rated voltage for 60 seconds at 25°C, thru a current limiting resistance of 100 ohms per volt.

Temperature Range: May be operated at rated voltage from -55°C to $+85^{\circ}\text{C}$ and $+125^{\circ}\text{C}$ with 50% derating.

CAPACITORS (ALL TYPES)

MIDWEC DIVISION
INDEPENDENT CABLE

P.O. BOX 417 A, SCOTTSBLUFF, NEBRASKA 69361
 TELEPHONE: 308-632-4127 • TWX 910-627-0061



an **Eltra** company

MIDWEC
POLYSTYRENE-FOIL

Type	Configuration	Case Style	Cap. Range (MFDS)	Volt Range (VDC)	Size Range (Inches)
4		Plastic Wrap & Fill	.001 to 1.000	100 to 600	.235 x .562 to 1.593 x 3.062
4F 4FR		Plastic Wrap & Fill	.001 to 1.000	100 to 600	.153 x .295 x .562 to .812 x 1.250 x 2.125
D4		Epoxy Dip	.0001 to .10	100	.350 x .500 x .560 to .600 x .750 x 1.100
H4 H4S		Hermetic Seal	.001 to 1.00	100	.193 x .750 to 1.00 x 2.125
H44A H44B		Hermetic Seal	.01 to 1.00	100	.312 x .875 to .750 x 2.375

GENERAL NOTES

Capacitance Tolerance: Standard tolerance is $\pm 5\%$. Also available in $\pm 20\%$, $\pm 10\%$, $\pm 3\%$, $\pm 2\%$, and $\pm 1\%$. The capacitance shall be measured at 1000 Hz. and 25°C.

Dissipation Factor: Less than 0.1% when measured at 1000 Hz. and 25°C.

Insulation Resistance: 500,000 megohm-microfarads after a 2 minute electrification period at rated voltage and 25°C. The I.R. need not exceed 500,000 megohms.

Dielectric Strength: 200% of rated voltage for 60 seconds at 25°C thru a current limiting resistance of 100 ohms per volt.

Life Test: 250 hours at 140% of rated voltage and 85°C.

Temperature Range: May be operated at rated voltage from -55°C to +85°C.

Temperature Coefficient: -120 parts per million per °C, ± 20 PPM.

Dielectric Absorption: Will not exceed 0.1% when measured at 25°C.

Capacitance Tolerance: Standard tolerance is $\pm 5\%$. Also available in $\pm 20\%$, $\pm 10\%$, $\pm 3\%$, $\pm 2\%$, and $\pm 1\%$. The capacitance shall be measured at 1000 Hz. and 25°C.

Dissipation Factor: Less than .05% when measured as above.

Temperature Coefficient: H44A $\leq \pm 20$ PPM/°C
 H44B $\leq \pm 40$ PPM/°C

Insulation Resistance: 1,000,000 megohm-microfarads following a 2 minute electrification at rated voltage and 25°C. I.R. need not exceed 1,000,000 megohms. 250,000 meg. mfd. at 85°C.

Dielectric Strength: Twice rated voltage for 60 seconds at 25°C through a current limiting resistance of 100 ohms per volt.

Temperature Range: May be operated at rated voltage from -55°C to +85°C.

Life Test: 250 hours at 140% of rated voltage and 85°C.

Humidity Resistance: Meet or exceed requirements of MIL-STD-202, Method 103B, Test Condition A.

Construction: Extended foil winding, polystyrene dielectric, hermetically sealed case.

POLYPROPYLENE-FOIL

5		Plastic Wrap & Fill	.0001 to 1.000	160	.205 x .500 to .785 x 1.937
D5		Epoxy Dip	.0001 to .10	160	.300 x .450 x .500 to .475 x .625 x 1.025

Capacitance Tolerance: Standard tolerance is $\pm 5\%$. Also available in $\pm 20\%$, $\pm 10\%$, $\pm 3\%$, $\pm 2\%$, and $\pm 1\%$. The capacitance shall be measured at 1000 Hz. and 25°C.

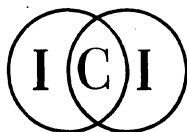
Dissipation Factor: Less than 0.1% when measured at 1000 Hz. and 25°C.

Insulation Resistance: 300,000 megohm-microfarads after a 2 minute electrification period at rated voltage and 25°C. The I.R. need not exceed 300,000 megohms.

Dielectric Strength: 200% of rated voltage for 60 seconds at 25°C thru a current limiting resistance of 100 ohms per volt.

Life Test: 250 hours at 140% of rated voltage and 85°C.

Temperature Range: May be operated at rated voltage from -55°C to +85°C.



an **Eltra** company

CAPACITORS (ALL TYPES)

MIDWEC DIVISION

INDEPENDENT CABLE

P.O. BOX 417 A, SCOTTSBLUFF, NEBRASKA 69361
TELEPHONE: 308-632-4127 • TWX 910-627-0061

MIDWEC

POLYCARBONATE-FOIL

Type	Configuration	Case Style	Cap. Range (MFDS)	Volt Range (VDC)	Size Range (Inches)
6		Plastic Wrap & Fill	.001 to 1.00	100	.155 x .500 to .995 x 1.937
6F 6FR		Plastic Wrap & Fill	.001 to 1.00	100	.095 x .175 x .500 to .785 x 1.185 x 1.937
E6F		Epoxy	.001 to 1.00	100	.160 x .240 x .420 to .560 x .720 x 1.950
H6 H6S		Hermetic Seal	.001 to 1.00	100	.193 x .562 to 1.00 x 2.00

GENERAL NOTES

Capacitance Tolerance: Standard tolerance is $\pm 5\%$. Also available in $\pm 20\%$, $\pm 10\%$, $\pm 4\%$, $\pm 3\%$, $\pm 2\%$, and $\pm 1\%$. The Capacitance shall be measured at 1000 Hz. and 25°C.

Dissipation Factor: Less than 0.20% when measured at 1000 Hz. and 25°C.

Insulation Resistance: Greater than 200,000 megohm-mfds. following a 2 minute electrification period at rated voltage or 500 VDC; whichever is less; and 25°C. I.R. need not exceed 500,000 megohms.

Dielectric Strength: Twice rated voltage for 60 seconds at 25°C, thru current limiting resistance of 100 ohms per volt.

Dielectric Absorption: Shall not exceed 0.5% (Ref. MIL-C-19978B).

Life Test: 250 hours at 140% of rated voltage and +125°C.

Temperature Range: May be operated at rated voltage from -55°C to +125°C.

METALIZED MYLAR

7		Plastic Wrap & Fill	.0047 to 10.00	200 to 600	.125 x .437 to 1.187 x 2.250
7F 7FR		Plastic Wrap & Fill	.0047 to 12.00	200 to 600	.125 x .187 x .437 to 1.218 x 1.750 x 2.00
7T		Plastic Wrap & Fill	.01 to 20.0	100	.125 x .437 to 1.062 x 2.500
7TF 7TFR		Plastic Wrap & Fill	.01 to 20.0	100	.093 x .156 x .437 to .750 x 1.187 x 2.500
7X 7XF 7XFR		Plastic Wrap & Fill	.10 to 22.00	100	.218 x .468 to .875 x 1.750 .140 x .218 x .468 to .733 x 1.062 x 1.750
E7F		Epoxy	.005 to 6.00	200 to 600	.160 x .240 x .420 to .560 x .720 x 1.950
H7 H7S		Hermetic Seal	.0047 to 10.00	200	.173 x .625 to 1.00 x 2.250

Capacitance Tolerance: Standard tolerance is $\pm 5\%$. Also available in $\pm 20\%$, $\pm 10\%$, $\pm 3\%$, $\pm 2\%$, and $\pm 1\%$. The capacitance shall be measured at 1000 Hz. and 25°C for values up to and including 5.0 mfd. Larger values shall be measured at 60 Hz. and 25°C.

Dissipation Factor: Less than 1.0% when measured as specified above.

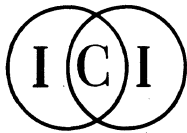
Dielectric Strength: Twice rated voltage for 60 seconds at 25°C; thru a current limiting resistance of 100 ohms per volt.

Insulation Resistance: 30,000 megohm-microfarads following a 2 minute electrification period at rated voltage and 25°C. I.R. need not exceed 30,000 megohms.

Life Test: 500 hours at 140% of rated voltage and 85°C.

Humidity Resistance: Meets or exceeds requirement of MIL-STD-202, Method 103B, Test Condition A.

Temperature Range: May be operated at rated voltage from -55°C to +85°C and to +125°C with 50% derating.



an **Eltra** company

CAPACITORS (ALL TYPES)

MIDWEC DIVISION

INDEPENDENT CABLE

P.O. BOX 417 A, SCOTTSBLUFF, NEBRASKA 69361
TELEPHONE: 308-632-4127 • TWX 910-627-0061



POLYSULFONE-FOIL

Type	Configuration	Case Style	Cap. Range (MFDS)	Volt Range (VDC)	Size Range (Inches)
8		Plastic Wrap & Fill	.001 to 2.00	100	.218 x .562 to .875 x 1.687
H8 H8S		Hermetic Seal	.001 to 2.00	up to 100	.193 x .687 to 1.000 x 1.875
H8G H8GS		Hermetic Seal	.001 to 2.00	100	.193 x .687 to 1.000 x 1.781

GENERAL NOTES

Capacitance Tolerance: Standard tolerance is $\pm 5\%$. Also available in $\pm 20\%$, $\pm 10\%$, $\pm 3\%$, $\pm 2\%$, and $\pm 1\%$. The capacitance shall be measured at 1000 Hz. and 25°C.

Dissipation Factor: Less than 0.2% when measured at 1000 Hz. and 25°C.

Insulation Resistance: Greater than 200,000 megohm-mfds. after a 2 minute electrification period at rated voltage and 25°C. I.R. need not exceed 500,000 megohms.

Dielectric Strength: Twice rated voltage for 60 seconds at 25°C through current limiting resistance of 100 ohms per volt, when applied terminal to terminal and terminal to case.

Life Test: 500 hours at 140% of rated voltage and 150°C.

Humidity Resistance: Meet or exceed requirements of MIL-STD-202, Method 103B, Test Condition A.

Temperature Range: May be operated at rated voltage from -55°C to +150°C with no derating.

Construction: Extended foil winding, polysulfone dielectric.

METALIZED POLYCARBONATE

12		Plastic Wrap & Fill	.01 to 10.00	100	.200 x .500 to 1.140 x 2.312
12F 12FR		Plastic Wrap & Fill	.01 to 10.00	100	.155 x .270 x .500 to .925 x 1.350 x 2.000
H12 H12S		Hermetic Seal	.01 to 10.00	100	.173 x .625 to 1.00 x 2.375
12X 12XF 12XFR		Plastic Wrap & Fill	.10 to 20.00	50	.245 x .530 to 1.030 x 1.812 .170 x .295 x .530 to .815 x 1.200 x 1.812
H12X H12XS		Hermetic Seal	.10 to 20.00	50	.233 x .625 to 1.00 x 2.125

Capacitance Tolerance: Standard tolerance is $\pm 5\%$. Also available in $\pm 20\%$, $\pm 10\%$, $\pm 3\%$, $\pm 2\%$, and $\pm 1\%$. The capacitance shall be measured at 1000 Hz. and 25°C for values up to and including 5.0 mfd. Larger values to be measured at 60 Hz.

Dissipation Factor: Less than 0.50% when measured as specified above.

Insulation Resistance: Greater than 75,000 megohm-microfarads after a 2 minute electrification period at rated voltage and 25°C. I.R. need not exceed 150,000 megohms.

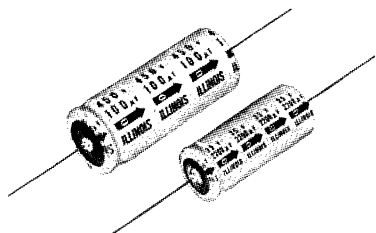
Dielectric Strength: 200% of rated voltage for 60 seconds at 25°C thru a current limiting resistance of 100 ohms per volt.

Temperature Range: May be operated at rated voltage from -55°C to +125°C.

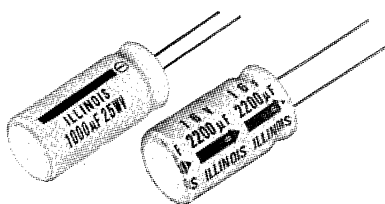
Life Test: 250 hours at 140% of rated voltage and 85°C.

ILLINOIS CAPACITOR SALES CO.

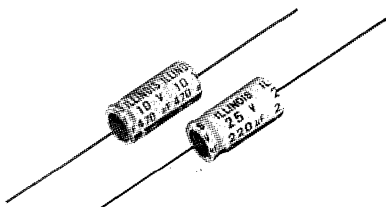
KNOWN THE WORLD OVER FOR TIME TESTED QUALITY CAPACITORS



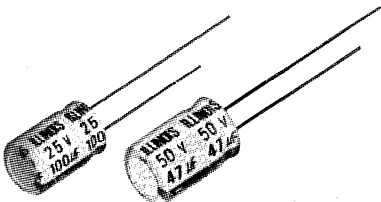
TYPE T COMMERCIAL/INDUSTRIAL ELECTROLYTIC CAPACITORS
0.47 MFD TO 22,000 MFD
6.3 WVDC TO 500 WVDC
-40°C +85°C MINIMUM
2000 HOUR OPERATION



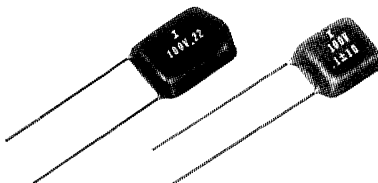
TYPE R COMMERCIAL/INDUSTRIAL ELECTROLYTIC CAPACITORS
0.47 MFD TO 10,000 MFD
6.3 WVDC TO 450 WVDC
-40°C +85°C MINIMUM
2000 HOUR OPERATION



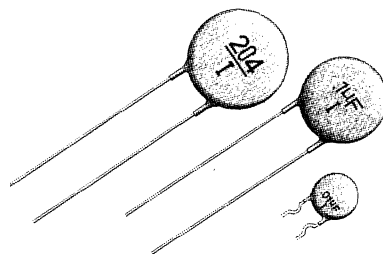
TYPE EX CONSUMER/COMMERCIAL ELECTROLYTIC CAPACITORS
0.47 MFD TO 500 MFD
6.3 WVDC TO 50 WVDC
-40°C +85°C MINIMUM
1000 HOUR OPERATION



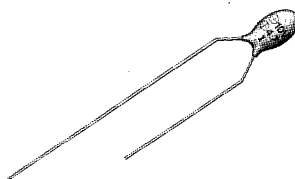
TYPE PC CONSUMER/COMMERCIAL ELECTROLYTIC CAPACITORS
0.47 MFD TO 250 MFD
6.3 WVDC TO 50 WVDC
-40°C +85°C MINIMUM
1000 HOUR OPERATION



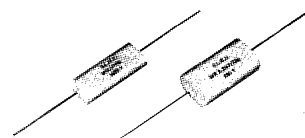
TYPE UM POLYESTER FILM CAPACITORS
INDUCTIVE WINDING
.001 MFD TO .47 MFD
100 WVDC OPERATION
±10% AND ±5% CAPACITY TOLERANCES



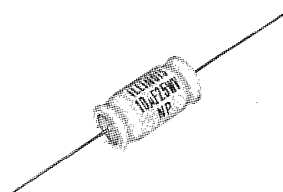
CERAMIC CAPACITORS
TYPE CC AND TYPE CQ
TEMPERATURE COMPENSATING
TYPE BC AND TYPE BQ
TEMPERATURE STABLE
TYPE GC AND TYPE GQ
GENERAL PURPOSE



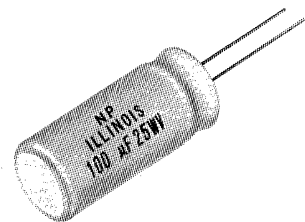
TYPE SD SOLID DIPPED TANTALUM CAPACITORS
0.1 MFD TO 100 MFD
3.15 WVDC TO 35 WVDC
±20% CAPACITY TOLERANCE



TYPE MW METALLIZED MYLAR CAPACITORS
WRAP AND FILLED CONSTRUCTION
NON-INDUCTIVE WINDING
250 WVDC TO 1600 WVDC
.01 MFD TO 10 MFD
±10% AND ±5% CAPACITY TOLERANCE



TYPE BPT NON-POLARIZED ELECTROLYTIC CAPACITORS
0.47 MFD TO 1000 MFD
16 WVDC TO 50 WVDC
-25°C +85°C MINIMUM
1000 HOUR OPERATION

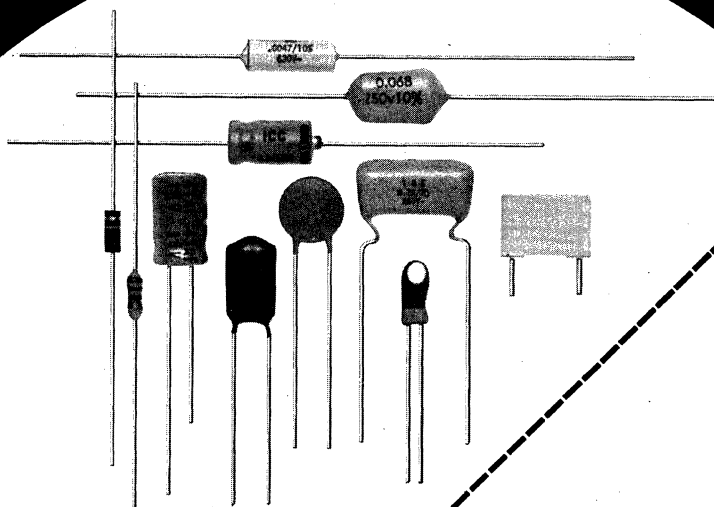


TYPE BPR NON-POLARIZED ELECTROLYTIC CAPACITORS
0.47 MFD TO 470 MFD
16 WVDC TO 50 WVDC
-25°C +85°C MINIMUM
1000 HOUR OPERATION

ILLINOIS CAPACITOR SALES CO.

6284 W. Oakton • Morton Grove, Illinois 60053
(312) 967-6270 • Telex: 72-4361 • Cable: ILLCON Morton Grove

For Passive Components, Semiconductors and Tubes, we're the head of the class.



PASSIVE COMPONENTS

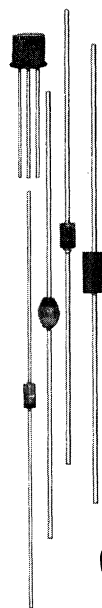
- **Capacitors**—aluminum electrolytics, non-polarized electrolytics, polyester and metalized polyester film, dipped tantalum, ceramic disc
- **Resistors**—carbon film and carbon composition

SEMICONDUCTORS

- Rectifier diodes
- Switching diodes
- Zener diodes
- Epoxy cased signal transistors

TUBES

- Receiving and special purpose
- Over 2,000 types
- Domestic and foreign
- Consumer and industrial
- Classic and antique, too.



For specific values, types, and prices, write or call today.

International ©

International Components Corporation
105 Maxess Road, Melville, New York 11746
(516) 293-1500 TELEX: 143130

We have capacitors for virtually anything you build.



TD SERIES Miniature Axial Lead Aluminum Electrolytic
Low Dissipation Factor
Low Leakage Current
.47mfd to 5000mfd
6.3 VDC to 50 VDC



PD SERIES Miniature Radial Lead Aluminum Electrolytic
Vertical Package
Welded Construction
.47mfd to 2200mfd
6.3 VDC to 50 VDC



CD SERIES Ceramic Disc
Miniature Size
Durez Coated
12 VDC to 50 VDC
330pfd to 100,000pfd



DP SERIES Radial Lead Epoxy Dipped Tantalum
Space Saving Size
Close Tolerances
1mfd to 220mfd
3 VDC to 35 VDC



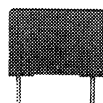
CM SERIES Metalized Polyester Film
Non-Inductively Wound
Self-healing
.0047mfd to 22mfd
63 VDC to 600 VDC



YM SERIES Metalized Polyester Film
Wrap and Fill Construction
Non-Inductively Wound
.0047mfd to 4.7mfd
250 VDC to 600 VDC



PMG SERIES Metalized Polyester Film
Crimped Radial Leads
Epoxy Dipped
.0047mfd to 2.2mfd
250 VDC to 600 VDC



GMA SERIES Metalized Polyester Film
Uniform Size Molded Case
Bottom Fill with Epoxy Resin
.001mfd to 10mfd
100 VDC to 1000 VDC



EM SERIES Polyester Film
Subminiature Size
Epoxy Dipped
.001mfd to .47mfd
100 VDC to 600 VDC

International ©

International Components Corporation 105 Maxess Road, Melville, New York 11746 (516) 293-1500 TELEX # 143130

El-Menco

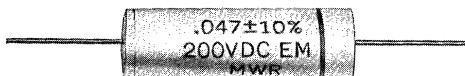
The world's leading manufacturer of mica capacitors



Fast Delivery of El-Menco®

Mass Produced, High Reliability,
Close Tolerance "P" Level
CMRO Dipped Mica Capacitors

Expanded plant and production facilities enable rapid delivery of established reliability CMRO capacitors, in quantity, per military specification MIL-C-39001, to a failure rate "P" level—0.1% per 1,000 hours at a 90% confidence level—no more than one failure per 1,000,000 unit-hours of operation! El-Menco also offers the world's largest range of standard Dipped Mica (DM) and Molded Mica (MM) capacitors: in dipped from 1 pF to 159,000 pF, in molded from 1 pF to 20,000 pF, both in a variety of voltages and tolerances from ± 0.5 pF to $\pm 10\%$.



Film Capacitors

Production quantity requirements of our Mylar* film capacitors, MDEF and MDE series, and of our Mylar wrapped and filled capacitors, MWR series, are available. Also, other styles and dielectrics, such as polypropylene, metallized mylar, molded mylar, and ceramic encased film capacitors.

*TM DuPont Corp.



Electrolytics

Off-the-shelf delivery is now provided of our TAD axial, PCD radial, and non-polarized miniature aluminum electrolytic series. These have welded construction and insulated aluminum cans. Unique end seal provides proper venting while effectively resisting humidity and cleaning agents.

Electro Motive CORPORATION

Melville, New York | Florence, South Carolina

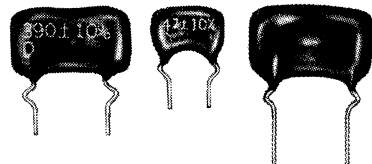
CAPACITORS

Mica

DIPPED MICA DM Series — Fabricated from the finest India Ruby Muscovite mica which exhibits the best characteristics obtainable. The result is optimum high temperature characteristics and excellent stability. Qualified to Mil-C-39001.

Capacitance Range: 1 pF — 159,000 pF

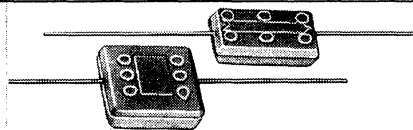
Operating Voltage: 50, 100, 500 V.D.C. Higher voltages available.



MOLDED MICA MM Series — Molded with mineral filled epoxy compound, encapsulating the finest mica available. Qualified to Mil-C-5.

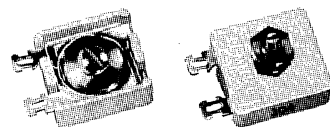
Capacitance Range: 1 pF — 20,000 pF

Operating Voltage: 100, 300, 500 V.D.C. Higher voltages available.



VARIABLE MICA TRIMMERS Variable Compression type made of stacked mica dielectric between nonferrous metal conducting plates mounted on a ceramic base. Any desired capacitance within the physical limitations of the ceramic base is available.

Operating Voltage: 175 and 250 V.D.C.

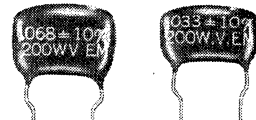


Film

MYLAR* FILM MDEF, MDE Series — Non-inductively wound Mylar dielectric, dipped in a special formulated epoxy material.

Capacitance Range: .001 MFD — 1.0 MFD

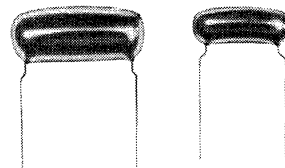
Operating Voltage: 100 and 200 V.D.C.



POLYPROPYLENE PPD Series—Radial leads, polypropylene film dielectric, extended foil construction and epoxy resin encased. These units show their greatest advantage when peak currents and several amperes are encountered and where corona resistance and low dissipation factor are a design criterion.

Capacitance Range: .001 MFD — .47 MFD

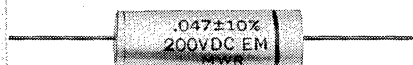
Operating Voltage: 200, 400, 600, 800, 1000, 1600 V.D.C.



MYLAR* WRAP MWR Series — axial lead extended foil Mylar dielectric. Mylar wrap with end fill of epoxy.

Capacitance Range: .001 MFD — 1.5 MFD

Operating Voltage: 100 and 200 V.D.C.

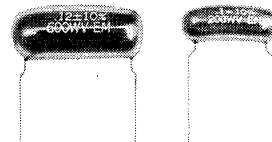


MYLAR* PAPER MPD Series — Dipped in phenolic resin and vacuum impregnated which make this type completely solid and, therefore, will not drip under any operating temperature.

Capacitance Range: .001 MFD — .5 MFD

Operating Voltage: 200, 400, 600, 1000, 1600 V.D.C.

* TM DuPont Corp.

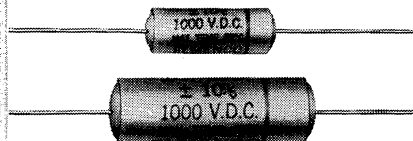


CERAMIC TUBE PCE paper ceramic, MPCE Mylar-paper ceramic Series — Non-inductively wound, vacuum impregnated in mineral oil. Enclosed in an impervious steatite ceramic tube sealed with epoxy and fill.

Capacitance Range: .001 MFD — .5 MFD

Operating Voltage: PCE 200, 400, 600, 1000 V.D.C.

MPCE 1000, 1600, 2000 V.D.C.



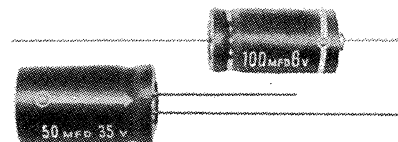
Electrolytic

MINIATURE ALUMINUM ELECTROLYTIC

TAD axial, PCD radial Series — Welded construction, in PVC insulated aluminum cans. Unique end seal provides proper venting while effectively resisting humidity and cleaning agents.

Capacitance Range: .47 MFD — 2200 MFD

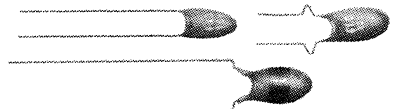
Operating Voltage: 6 Volts D.C. — 50 Volts D.C.



DIPPED SOLID TANTALUM DIT Series — Radial lead epoxy dipped miniature capacitors for printed circuit applications.

Capacitance Range: .1 MFD — 470 MFD

Operating Voltage: 3 Volts D.C. — 35 Volts D.C.



For further information or samples for evaluation, contact the El-Menco representative in your territory or Electro Motive in Melville.

Melville, New York 11746 / (516) 694-7700 Cable: Incortels NY TWX No.: 510-224-6427 Telex: 96-7852

Florence, South Carolina 29501 / (803) 669-2182 Cable: Elmotive FLR Telex: 57-3339

**ELECTRO MOTIVE
CORPORATION**



Over 50 years... Nothing succeeds like success.

In 1924, we employed six people. Then, wireless was a novelty. We were selling condensers as piece parts to home radio builders. We've diversified a lot and have become an international name, synonymous with quality components for the communications industry.

Jackson components are tried and tested to give perfect reliability over a long life. And you can have components custom made to suit your individual requirements.

Add to this our skilled personnel and up-to-the-minute equipment and you can understand why our 50 years experience is your guarantee of a reliable product.

We have been exporting our components to America for the past 20 years. All in all, those 20 years have been good ones and we've no reason to expect the next 20 won't be better.

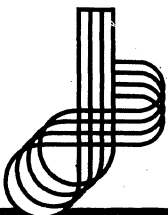
That's success for you.

New Products include:-

A range of Capacitive Angular
and Linear Displacement Transducers.

A ceramic dielectric Trimmer less than 3mm. thick.

An air dielectric
non-rotating piston trimmer specially designed
for microwave applications.

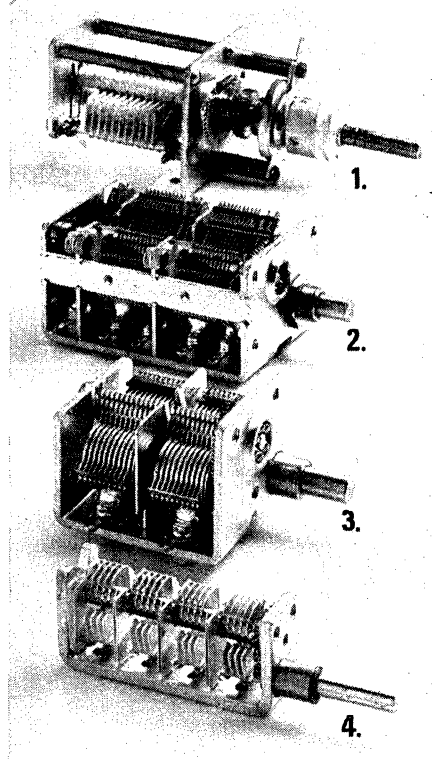


JACKSON BROTHERS (LONDON) LIMITED

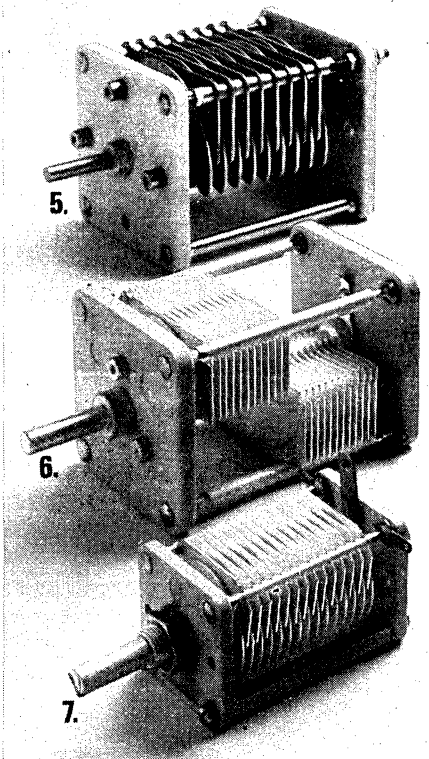
USA: M. Swedgal, 258 Broadway, New York, N.Y. 10007 Telephone: (212) 962-5485
ENGLAND: Kingsway, Waddon, Croydon, CR9 4DG. Tel: 01-681 2754

Variable Capacitors

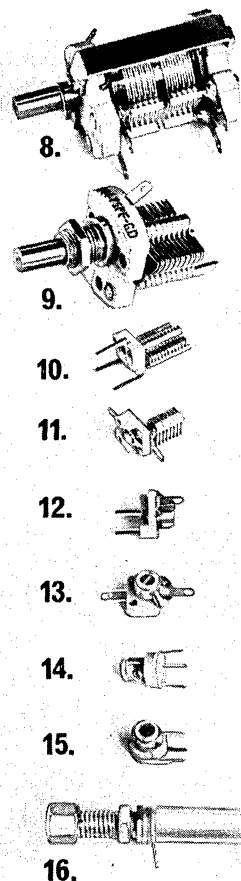
TUNING



TRANSMITTING



TRIMMING



This is only a small selection from our total range.
For full details write for illustrated catalogue.

TUNING	Part No.	TRIMMING	Part No.
1. V.F.O. Capacitor	4170	8. C808 Split Stator Trimmer	5103
2. P.503 AM/FM	4229/503/AM-FM	9. C804 Air Spaced Trimmer	4567
3. OG 2 Gang A.M.	5250/2/1G	10. C16 Air Trimmer PC/T	5440/PC/T
4. C21 4 Gang F.M.	5560/4	11. C16 Air Trimmer	5440
		12. C16 P.M. Tetfer	5640/P.M.
		13. C16 Tetfer	5640
		14. 8MM V.P.C.	5750 V.P.C.
		15. 8MM H.P.C.	5750 H.P.C.
		16. Tubular Capacitor	4463
TRANSMITTING	Part No.	TUNING CONTROLS	
5. TX 5 Capacitor	5720/1	17. DAF Ball Drive	4511/DAF
6. C9 Capacitor	5070/1 s/s	18. Adjustable Torque Ball Drive	5620
7. C11A Capacitor	5050/18	19. Miniature 10:1 Drive	5870/1
		20. Accelerator Spinwheel	5810/1

Also
* Tuning Controls
* Drives
* Terminals



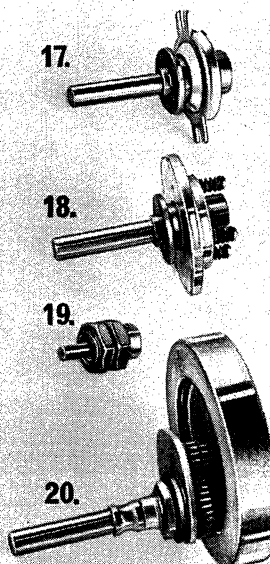
JACKSON BROS (LONDON) LTD

USA: M. Swedgal, 258 Broadway, New York, N.Y. 10007

Telephone: (212) 962-5485

ENGLAND: Kingsway, Waddon, Croydon, CR9 4DG. Tel: 01-681 2754

TUNING CONTROLS



vacuum capacitors

INTRODUCTION: ITT Jennings offers the broadest available line of high voltage capacitors for radio frequency applications. Units are available in glass and ceramic envelopes with working voltage ratings of 2 kv to 40 kv, at capacitance values to 5000pfd, with current ranges of 250 amps air cooled and 750 amps rms water cooled at 16 mhz.

ADVANTAGES: The use of a vacuum dielectric allows a unit design with a number of electrical, mechanical, and environmental advantages which include the following:

1. *High Voltage*—The high dielectric strength allows maximum voltage levels of any capacitor for a given capacity rating.
2. *High Current*—Due to low losses and heavy copper construction, vacuum capacitors carry high rf currents.

3. *Compact Design*—Units are small for their power handling capabilities due to the high breakdown voltage of the vacuum dielectric.

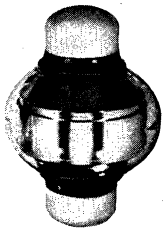
4. *High Maximum to Minimum Capacity Ratio*—Capacity change ratios are available to 150:1, making them desirable for wide tuning ranges.

5. *Low Losses*—Extremely low losses occur because of the dielectric, the low loss glass and ceramic envelopes, and the copper and silver solder construction. Therefore, units are able to handle large currents at high rf frequencies that would destroy capacitors with other dielectrics.

6. *Self Healing*—The vacuum dielectric permits moderate overloads that would damage other materials.

7. *High Altitude Operation*—Vacuum capacitors are free from internal degradation from extreme environmental conditions.

vacuum fixed capacitors



RF WORKING KV	TYPE	CAPACITY	PEAK VOLTAGE KILVOLTS		CONTINUOUS RMS AMPERES ² (16 MHz)	NOMINAL DIMENSIONS (Inches)	
		PF	TEST (60 Hz)	WORKING ¹		LENGTH	DIAMETER
3 kv	G*	JSLF 1000	5	3	70	1.7	3.2
		JSLF 5000	5	3	80	2.9	4.3
		JCSL 1000, 1500, 2000	5	3	50	4.0	2.9
7 kv to 9 kv	G	JCSF 25, 40, 50, 80, 120, 150	15	9	20	1.7	1.7
		JCS 250, 400, 500	15	9	65	4.0	3.1
		JCS 1000	12	7.2	65	4.7	3.7
		MC1 500, 750, 1000	15	9	80	4.2	4.2
		MMC1 2000	15	9	125	5.0	6.2
		MMC 1500, 2000	15	9	140	9.3	6.2
	C	CFDP 2000	15	9	125	3.3	5.7
12 kv to 20 kv	G	MC 500, 750, 1000	20	12	120	8.4	5.0
		MLC 500, 750, 1000	30	18	125	9.3	4.5
	C	CY 1, 2, 3, 4, 5	30	18	8	3.3	0.8
		CLF1 6, 12, 25, 50, 75, 100	30	20	70	6.5	2.3
		CLF1 200, 250	30	18	70	6.5	2.7
		CFED 150, 300	30	18	100	3.7	3.8
		CFED 500, 750, 1000	25	15	125	3.9	4.9
		CFEP 2000	35	21	215	5.8	8.2
27 kv to 33 kv	G	MMHC 450	55	33	145	9.3	6.2
		MMHC 1000	45	27	200	13.0	9.3
30 kv to 36 kv	C	CFHD 12, 25, 50, 100	60	36	130	5.2	3.8
		CFHD 200, 300	60	36	180	5.4	4.9
		CFHP 450	55	33	215	5.5	5.7
		CFHP 1000	50	30	215	6.2	7.2

* G = Glass; C = Ceramic

¹ RF working voltage is the maximum RF voltage that can be applied to the capacitor over the 2-32 MHz frequency range, provided the RF current rating is not exceeded.

² RF current rating is dependent upon capacity and frequency. Write for complete applications data.

ITT JENNINGS

970 McLaughlin Ave. • San Jose, Calif. 95116 • (408) 292-4025

DIVISION OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

vacuum variable capacitors

RF WORKING KV	TYPE	CAPACITY	PEAK VOLTAGE KILOVOLTS		CONTINUOUS RMS AMPERES ² (16 MHz)	NOMINAL DIMENSIONS (Inches)		
		PF	TEST (60 Hz)	Working ¹		LENGTH	DIAMETER	
1.8 kv to 5 kv	G	UCSL	4-250	5	3	30	4.2	2.2
		UCSL	5-750, 7-1000, 10-1500, 20-2000	5	3	42	8.3	3.2
		UCSL	50-3000	3	1.8	42	8.8	4.2
		USL	5-500	5	3	40	5.8	2.4
		USLS	5-465 Shorting	5	3	40	5.7	2.4
	C	CVCC	25-2500	5	3	60	5.3	3.8
		CVCD	5-500	5	3	70	6.0	2.8
		CVCD	10-1500, 20-2000, 50-3000	5	3	80	8.3	4.9
		CVCE	10-750	5	3	80	7.1	3.8
		CMV1	8-1000	3	3	25	4.4	1.8
		CMV1	8-650	5	5	25	4.4	1.8
		CMV1	25-4000	5	5	45	6.6	3.4
7.2 kv to 15 kv	G	ECS	2-8, 3-30	15	9	20	4.2	1.2
		UCS	5-200, 10-400	15	9	42	9.0	3.2
		UCSB	5-100	15	9	40	4.9	2.4
		UCSX	25-1000	15	9	45	9.9	3.8
		UCSXF	12-1000, 15-1200	15	9	50	10.1	4.4
		UCSXF	20-1500, 50-2000	12	7.2	50	10.1	5.2
		VMMC	50-1000, 100-2000	15	9	90	15.7	6.2
		VMMC	100-5000	15	9	125	21.4	9.3
	C	CADC	3-30	15	9	36	4.7	1.4
		CVDD	6.5-50, 10-100	15	9	70	6.7	2.8
		CVDD	10-300, 20-500	15	9	80	7.6	3.8
		CVDD	25-1000	15	9	105	8.0	4.9
		CVEP	25-500, 50-1000, 100-1500	20	12	140	10.2	7.2
		CVEP	100-2000	15	9	150	10.2	7.2
20 kv to 35 kv	G	UCSVH	8-35	35	21	35	4.8	3.0
		UHC	10-75	60	36	60	12.0	5.0
	C	CVFP	15-250, 25-450	40	24	140	9.6	5.7
		CVFP	20-750, 35-1000	40	24	150	11.7	7.2
		CVFP	100-2000	35	21	150	14.5	8.2
		CVHC	100-1600 (Air Cooled)	40	24	250	17.8	8.2
		CVHE	25-650 (Air Cooled)	55	33	250	12.5	7.2
		CVHP	10-250, 25-450, 30-650	55	33	170	11.9	7.2
		CVHP	60-1000	50	30	190	14.5	8.2
		CVHW	20-250, 25-450 (Water Cooled)	50	30	700	13.5	7.6
		CWV1	100-1000 (Water Cooled)	50	30	600	18.0	8.2
40 kv	C	CWV1	100-1600 (Water Cooled)	60	36	750	23.0	12.6

* G=Glass; C=Ceramic

¹ RF working voltage is the maximum RF voltage that can be applied to the capacitor over the 2-32 MHz frequency range, provided the RF current rating is not exceeded.² RF current rating is dependent upon capacity and frequency. Write for complete applications data.

APPLICATIONS: Because of the high power handling capability of vacuum capacitors, their application is broad in the field of communications where space is critical or where high voltage must be safely handled with maximum reliability.

Specific uses for the Jennings capacitor would include tunable or fixed elements in transmitter tank circuits, in impedance matching networks for antenna couplers, in high power filters for multi-coupling and harmonic reduction, and in various voltage dividing networks.



ITT JENNINGS

DIVISION OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

970 McLaughlin Ave. • San Jose, Calif. 95116 • (408) 292-4025

gas capacitors

CHV SERIES • VHF CAPACITORS

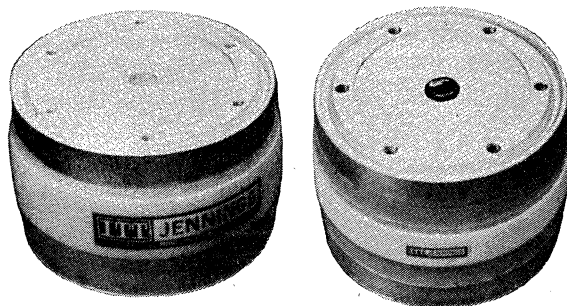


- Low loss design for use in high Q circuits.
- Small compact design suitable for VHF circuits.
- Low Minimum Capacity—1.5 pfd for CHV1-45 and 2.5 pfd for CHV2-50.
- Large Current Capacity—15 amperes RMS for CHV1-45 and 25 amperes RMS for CHV2-50 at 30 MHz.
- High Working Voltage—3 KV and 9 KV units available.

ITT Jennings CHV series variable capacitors give a new measure of capability to the designer of VHF circuits. Their unique gas dielectric provides a sealed low loss unit that can be used to construct compact circuits of extremely high "Q". "Q's" higher than 5000 have been achieved in circuits designed for use in the 30-80 MHz frequency range. Typical applications include VHF transmitter, antennas, antenna couplers and transmitting multicouplers. In the latter application the high circuit "Q" allows closer frequency spacing of the transmitters operating into the multicoupler. In addition, the high voltage and current capability of these capacitors will easily handle the circulating currents and resonant voltages encountered in a high "Q" design.

Specifications	CHV1-45-005	CHV2-50-0015
Peak Test Voltage (60 Hz)	5 KV	15 KV
Maximum Capacitance	45.0 pfd	50 pfd
Minimum Capacitance	1.5 pfd	2.5 pfd
RF Working Voltage	3 KV peak	9 KV peak
RF Current Rating at 30 MHz	15 amp RMS	25 amp RMS
Push Force (at 25°C)	20 lbs.	25 lbs.
Operating Temperature	-55° to +125°C	

CGF SERIES DC BLOCKER CAPACITORS



GENERAL DATA

Capacity (Pf)	1000 (±5%)
Maximum RF Current	150 amp at 16 MHz
Maximum DC Leakage Current at Working Voltage	1 microampere
Operating Temperature	-55°C to +125°C
Cooling	Natural Connection
Temperature Coefficient	0 ±100 PPM/°C

RF CURRENT VS FREQUENCY

Frequency (MHz)	2	3	4	8	16	24	32
Current (Amps RMS)							
CGF1-1000	*	*	215	180	150	135	125
CGF2-1000	*	190	180	165	150	145	140

* Current limited by RF working voltage.

- Low (less than 1 microampere) and stable DC leakage current.
- High RF current rating.
- Rugged Construction.
- Compact size.

The CGF Series of fixed capacitors utilize the latest techniques in capacitor design to provide a DC blocker of highest performance. Units are silver brazed and use a gas dielectric to achieve a low and stable DC leakage current. Internal construction maximizes heat flow from capacitor plates to mounting rings for high RF current capability.

The CGF Series is available with working voltages of from 6 to 18 KV DC or Peak RF in two sizes, one with 6, 9 and 12 KV ratings, the other with 15 and 18 KV ratings. Peak test voltages (60 Hz) range from 10 to 30 KV.

The units are specifically designed for DC blocker applications in high power RF amplifiers where the capacitor must handle both DC and RF voltages. In these applications the sum of the DC plus the Peak RF voltage should not exceed the rated working voltage.

The units are of rugged ceramic and metal construction and exceed the shock and vibration requirements specified in MIL-C-23183. They are cooled by natural connection and are suitable for mounting in any position.

Specifications				
Model	Peak Test Voltage (60 Hz)	Peak Working Voltage RF or DC	Dimensions (inches)	
			Length	Diameter
CGF1-1000-0010	10 KV	6 KV	3.50	4.75
CGF1-1000-0015	15 KV	9 KV	3.50	4.75
CGF1-1000-0020	20 KV	12 KV	3.50	4.75
CGF2-1000-0025	25 KV	15 KV	3.95	6.03
CGF2-1000-0030	30 KV	18 KV	3.95	6.03

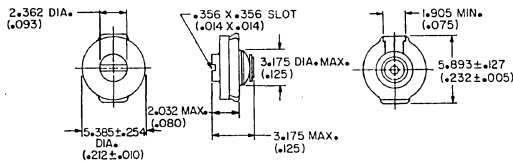
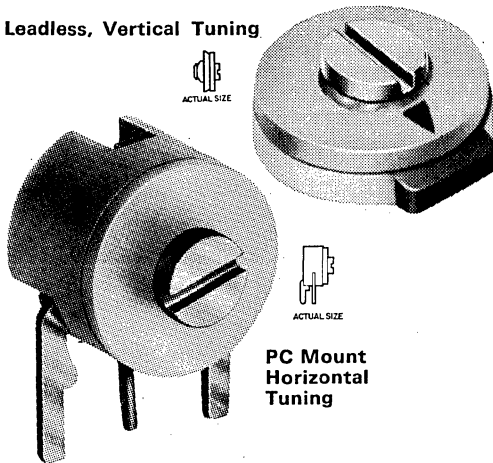
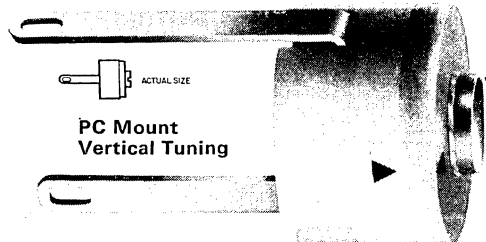
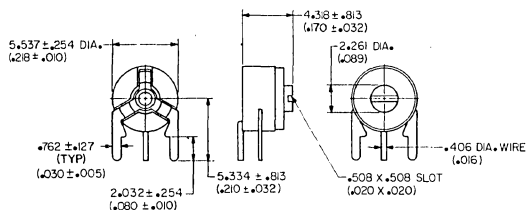
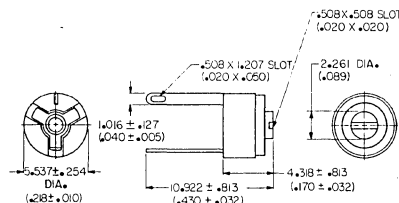
ITT JENNINGS

970 McLaughlin Ave. • San Jose, Calif. 95116 • (408) 292-4025

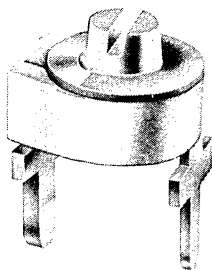
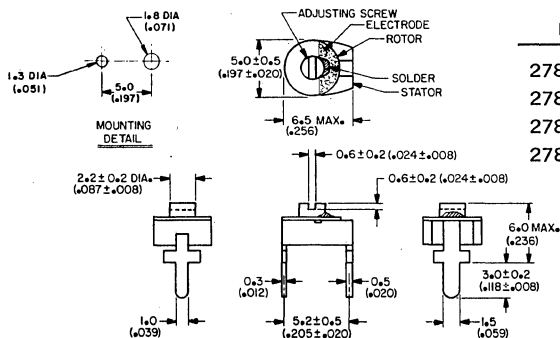
DIVISION OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION


**E. F. JOHNSON
COMPANY**

Sub-Miniature Ceramic Disc Trimmers


Leadless, Vertical Tuning

**PC Mount
Horizontal
Tuning**

**PC Mount
Vertical Tuning**


PC Vertical Cat. No.	PC Horizontal Cat. No.	Leadless Cat. No.	Nominal Capacity (pF)		Net Price
			Max.	Min.	
274-0009-005	274-0009-105	274-0009-250	9.0	2.5	\$3.95
274-0020-005	274-0020-105	274-0020-250	20.0	3.5	3.95
274-0025-005	274-0025-105	274-0025-250	25.0	5.0	3.95


PRINTED CIRCUIT MOUNTING


(Equivalent dimensions in inches)

This 5mm size ceramic trimmer is designed to preclude metal particle migration by utilizing tin plating of the stator plate rather than silver, and providing polarity orientation by means of terminal size.

Titinate rotor is precision lapped to minimize capacitance aging.

Q is 500 minimum at 1 MHz. Working voltage is 50 VDC up to +85°C. Temperature range, -30°C to +85°C.

Dielectric strength 150 VDC for 5 seconds. Insulation resistance 10,000 megohms at 50 VDC. Starting and running torque .415 to 2.08 oz.-in. (30 to 150 gram-centimeters).

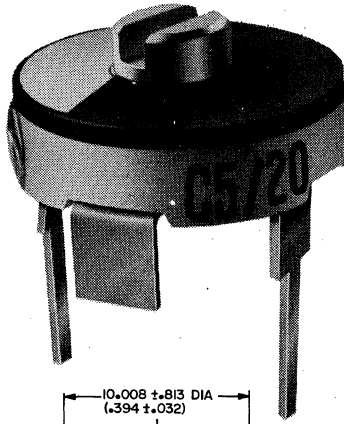
ELECTRICAL CHARACTERISTICS

Part No.	Temperature Characteristics	Temperature Coefficient (X10 ⁻⁶ /°C)	Nominal Capacitance (pF)		Rated Voltage (VDC)	Net Price
			Min.	Max.		
278-0103-005	A	NPO	1.0	3.0	50	57¢
278-0105-005	A	NPO	2.0	5.0	50	57¢
278-0410-005	D	N750	4.0	10.0	50	57¢
278-0420-005	D	N750	8.0	20.0	50	57¢

TEMPERATURE CHARACTERISTICS

Characteristics	-30°C		+85°C	
	Min (%)	Max (%)	Min (%)	Max (%)
A	-3.1	+1.4	-2.5	+2.0
D	+1.0	+5.0	-5.0	-1.5

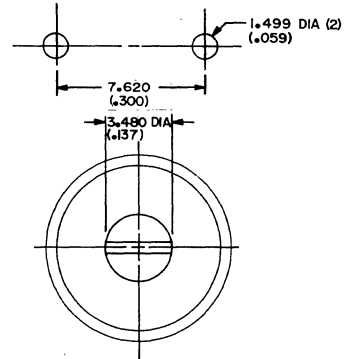
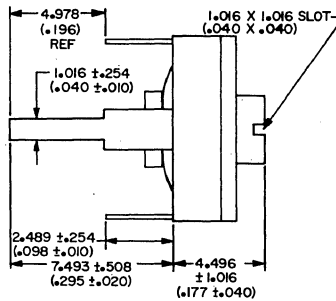
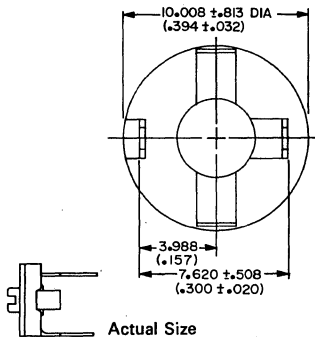
CAPACITORS (ALL TYPES)



10MM CERAMIC TRIMMER. Capacity ranges up to 30.0 pF maximum with an operating temperature range from -30°C to 125°C . Mount by means of two terminals on .300" centers, interchangeable with other similar ceramic trimmer types and also our type "T" air variable capacitor.

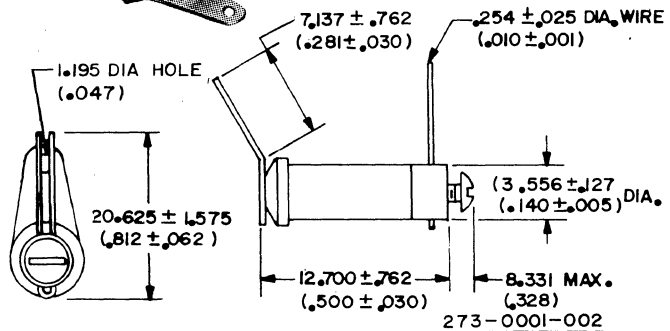
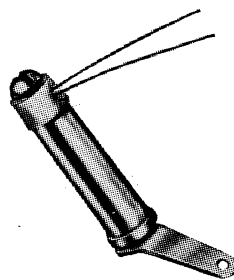
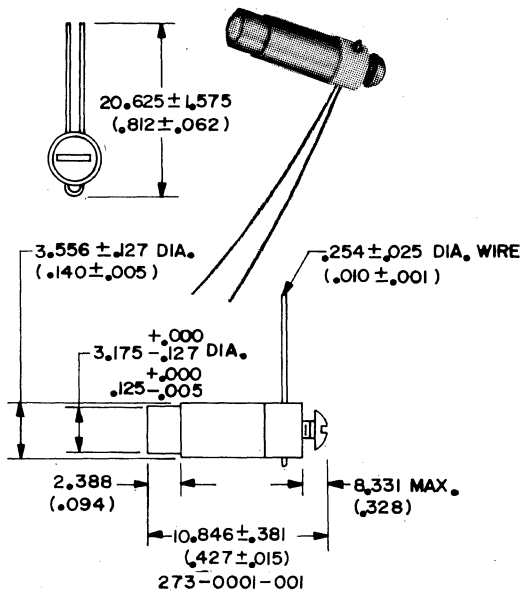
Q value is 500 minimum at 1 MHz. Working voltage 350 WVDC up to 85°C , 200 WVDC up to 125°C . Dielectric strength: 700 VDC for 5 seconds. Insulation resistance: greater than 10,000 megohms at 350 VDC. Starting and running torque: 1 Oz./in. to 6.5 oz./in.

Stator is ceramic (steatite). Rotor is titanate. Terminals and contacts are of brass and brass alloys. All metal parts are silver plated and iridized.



Part No.	Temperature Coefficient ($\times 10^{-6}/^{\circ}\text{C}$)	Nominal Capacitance (PF)		Net Price
		Min.	Max.	
275-0108-005	NPO	3.0	8.0	\$0.58
275-0112-005	NPO	3.0	12.0	.58
275-0213-005	N330	5.0	13.0	.58
275-0320-005	N470	5.0	20.0	.58
275-0430-005	N750	5.0	30.0	.58

Miniature Teflon® dielectric trimmer capacitors



These trimming capacitors are ideally suited for VHF and UHF applications requiring low minimum capacity and delta C. They provide high resolution and electrical stability. Tuning is linear. Q is high (2000 @ 150 MHz typically). Insulation resistance 10^6 megohms. Temperature range -55° to $+150^{\circ}\text{C}$. High resistance to shock and vibration.

Metal parts are gold plated. Insulation is Teflon®.

© Teflon is a registered trade name of Du Pont Co.

Cat. No.	Mounting	Nom. pf. Max.	Cap. Per Sec. Min.	Torque Oz. In.	Voltage Break-down	Adjustment Turns Per Inch	Net Price
273-0001-001	PC	1.5	.25	.2-3.0	2,000	80	\$0.60
273-0001-002	Solder Lug	1.5	.25	.2-3.0	2,000	80	.90


**E. F. JOHNSON
COMPANY**

Air Variable Capacitors

Johnson sub-miniature air variable capacitors are available in a variety of sizes, mounting configurations and section types. Rotors and stators are precision machined from one piece of solid brass for outstanding stability, uniformity and freedom from moisture entrap-

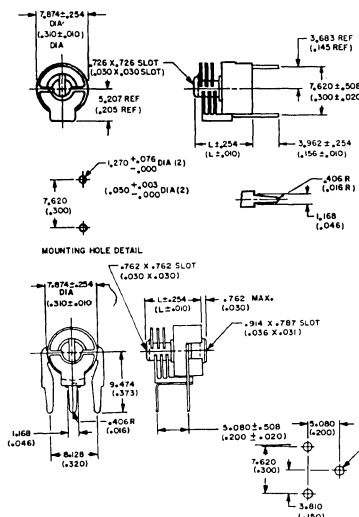
ment. They offer high "Q" . . . typically 2000 @ 150 MHz and exceptionally low temperature coefficient: Type T plus 30 ± 15 ppm/°C; Type U plus 45 ± 15 ppm/°C. Metal parts are silver-plated. Types U and V ceramic are steatite grade L-423 or better. Type T ceramic is 95% Alumina grade L-624 or better.



ACTUAL SIZE
Vertical
Tuning



ACTUAL SIZE
Horizontal
Tuning



Type "T" Air Variable Capacitors

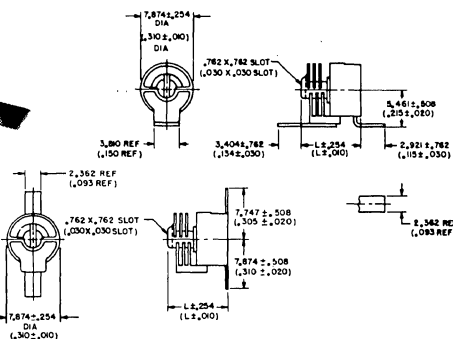
Designed to meet or exceed EIA-RS 2-4 and MIL-STD.202C methods 204 A and 201 A. Offer excellent retrace characteristics. Can be supplied with tuning slot on both ends of rotor. High temperature versions available as specials.



ACTUAL SIZE
Horizontal
Tuning



ACTUAL SIZE
Vertical
Tuning



PC Mount

Vert. Tuning Cat. No.	Horiz. Tuning Cat. No.	Nominal Capacity (pF)		Length (In.)	Vert. Net Price	Horiz. Net Price
		Max.	Min.			
187-0103-005	187-0303-105	5.4	1.3	.36	\$0.66	\$0.70
187-0106-005	187-0306-105	11.0	1.7	.47	.70	.74
187-0109-005	187-0309-105	15.7	1.9	.58	.78	.82

Stripline Mount

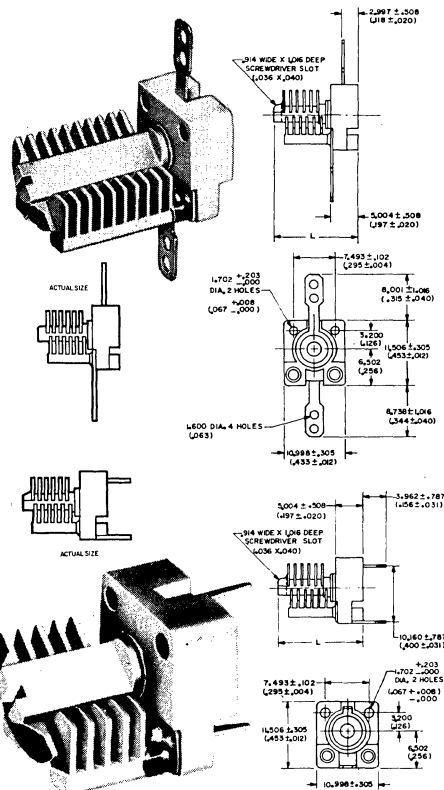
Vert. Tuning Cat. No.	Horiz. Tuning Cat. No.	Nominal Capacity (pF)		Length (In.)	Vert. Net Price	Horiz. Net Price
		Max.	Min.			
187-0103-175	187-0103-165	5.4	1.3	.36	\$0.82	\$0.82
187-0106-175	187-0106-165	11.0	1.7	.47	.84	.84
187-0109-175	187-0109-165	15.7	1.9	.58	.86	.86

Also available as specials with minimum of 4 plates to maximum of 20 plates.

Type "U" Capacitors

Cat. No.	Nominal Capacity (pF)		Plates	L ± 1/32"	Peak With- standing Voltage	Air Gap	Net Price
	Max.	Min.					
Two-Hole Mounting / Type "U" Capacitors—Single Section							
189-0501-004	4.2	1.2	4	27/64"	650	.010"	\$0.75
189-0502-004	6.7	1.3	6	15/32"	650	.010"	.77
189-0503-004	9.2	1.4	8	33/64"	650	.010"	.75
189-0504-004	11.6	1.5	10	9/16"	650	.010"	.77
189-0505-004	14.1	1.7	12	39/64"	650	.010"	.80
189-0506-004	16.7	1.8	14	43/64"	650	.010"	.82
189-0507-004	19.3	2.0	16	23/32"	500	.010"	.84
189-0508-004	21.9	2.2	18	49/64"	500	.010"	.86
189-0509-004	24.5	2.4	20	13/16"	500	.010"	.88

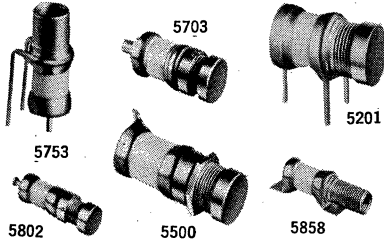
Cat. No.	Nominal Capacity (pF)		Plates	L ± 1/32"	Peak With- standing Voltage	Air Gap	Net Price
	Max.	Min.					
Printed Circuit Mounting / Vertical Type "U" Capacitors—Single Section							
189-0501-005	4.2	1.2	4	27/64"	650	.010"	\$0.70
189-0502-005	6.7	1.3	6	15/32"	650	.010"	.73
189-0503-005	9.2	1.4	8	39/64"	650	.010"	.70
189-0504-005	11.6	1.5	10	9/16"	650	.010"	.73
189-0505-005	14.1	1.7	12	39/64"	650	.010"	.75
189-0506-005	16.7	1.8	14	43/64"	650	.010"	.77
189-0507-005	19.3	2.0	16	23/32"	500	.010"	.79
189-0508-005	21.9	2.2	18	49/64"	500	.010"	.82
189-0509-005	24.5	2.4	20	13/16"	500	.010"	.84





VARIABLE CAPACITORS

HIGH Q AIR CAPACITORS

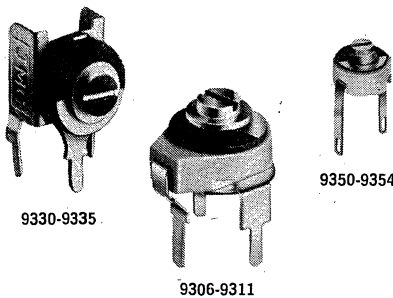


Air capacitors are beautiful for microwave, VHF, and UHF applications. They offer fine tuning, ultra high Q, low temperature coefficients and sizes for hybrid circuit as well as standard applications. Models 5200 (PC25) and 5201 (PC26) are QPL approved to MIL Spec 14409C.

Part No.	Length	Dia.	Capacitance Range — pf	Q @ 100 MHz
5200	.48	.28	0.8 to 10.0	>5000
5500*	.75	.28	1.0 to 20.0	>1500
5700	.48	.22	0.4 to 6.0	>10,000
5750	.51	.22	0.8 to 10.0	>7500
5800	.48	.15	0.35 to 3.5	>10,000
5850	.51	.15	0.5 to 5.0	>7500

*Illustrated

CERAMIC TRIMMER CAPACITORS

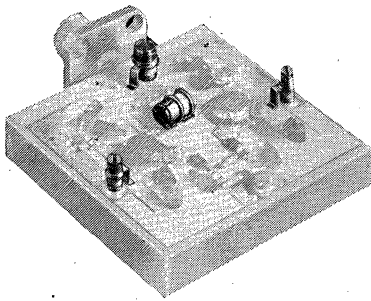


Ceramic trimmer capacitors are designed for broadband applications from audio to 200 MHz, where a negative temperature characteristic and ease of adjustment is important. Typical applications include crystal filters, crystal oscillators, CATV amplifiers, and communications and test equipment. Models are available for top tuning (illustrated), side tuning (illustrated) and bottom tuning.

Part No.	Part No.	Capacitance Range PF	Temperature Coefficient (PPM/°C)	Q @ 10 MHz
9306	9330	1.7 to 6.0	NPO ± 250	>500
9307	9331	1.7 to 10.0	NPO ± 250	>500
9308	9332	2.3 to 20.0	-450 ± 250	>500
9309	9333	3.8 to 30.0	-550 ± 250	>300
9310	9334	4.0 to 40.0	-1400 ± 800	>200
9311	9335	4.5 to 50.0	-1400 ± 800	>200

Part No.	Capacitance pf	Temperature Coefficient ppm/°C	Min. Q @ 100 MHz
9350	1.0 to 3.0	50 ± 50	>500
9351	2.0 to 5.0	NPO ± 200	>500
9352	3.0 to 10.0	N600 ± 300	>300
9353	3.5 to 18.0	N800 ± 300	>100
9354	5.0 to 25.0	N1400 ± 500	>100

GIGA-TRIM® CAPACITORS



Giga-Trim (gigahertz-trimmers) are tiny variable capacitors which provide a beautifully straightforward technique to fine tune RF hybrid circuits and MIC's into proper behavior. They replace time consuming cut-and-try adjustment techniques and trimming by interchange of fixed capacitors.



Part No.	Length	Dia.	Capacitance Range — pf	Q @ 250 MHz
7200	.55	.07	0.1 to 1.3	>250
7240	.55	.07	0.2 to 2.0	>2000
7260	.21	.07	0.3 to 1.2	>4000
7270	.31	.12	0.6 to 4.5	>2000
7280	.21	.12	0.4 to 2.5	>3000
7290	.56	.12	0.8 to 8.0	>1000

THIN-TRIM® CAPACITORS



Thin-Trim capacitors are a new development in tiny variable capacitors for demanding applications from quartz crystal watches to phased array MIC's. They provide the hybrid and microwave design engineer a reliable means of adjusting capacitance rather than abrasive trimming of fixed capacitors.



Part No.	Capacitance Range — pf	Temperature Coefficient	Q @ 100 MHz
9401-2	0.5 to 2.0	-200 ± 200 /°C	>1000
9401-4	1.0 to 4.0	-700 ± 300 /°C	>1000
9402-4	3.0 to 12.0	-700 ± 300 /°C	>750
9410-2	4.0 to 18.0	-200 ± 200 /°C	>900
9410-3	6.0 to 35.0	-400 ± 200 /°C	>700
9410-4	7.0 to 45.0	-750 ± 300 /°C	>500

JOHANSON MANUFACTURING CORPORATION

BOONTON, NEW JERSEY 07005

TELEPHONE (201) 334-2676

TWX 710-987-8367

CERAMIC CHIP CAPACITORS

Johanson

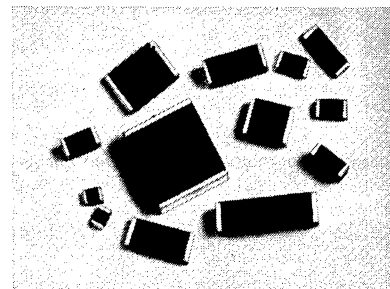
Monolithic Dielectrics

STANDARD CHIP CAPACITORS

Maximum Capacitance Available in Popular Sizes

JMDI Size	Dielectric	12	25	VDCW 50	100	200
R11 (.050 x .040 x .040T)	COG X7R Y5V		560pf .012mfd	560pf .01mfd	560pf 3300pf	470pf 1500pf
R15 (.080 x .050 x .050T)	COG X7R Y5V	.056mfd	1500pf .039mfd	1500pf .027mfd	1500pf .013mfd	1200pf 5600pf
R29 (.180 x .080 x .065T)	COG X7R Y5V		.012mfd .270mfd	.012mfd .180mfd	.012mfd .120mfd	8200pf .047mfd
S41 (.125 x .095 x .065T)	COG X7R Y5V	1.20mfd	.01mfd .22mfd	.01mfd .15mfd	.01mfd .082mfd	8200pf .039mfd

Fourteen configurations are available in four basic dielectrics; NPO/COG, BX/X7R, Z5U, and Y5V characteristics, to meet MIL-C-55681A and EIA 198B specifications. Capacitors feature high volume efficiency of capacitance, and are ideal for hybrid circuit applications.

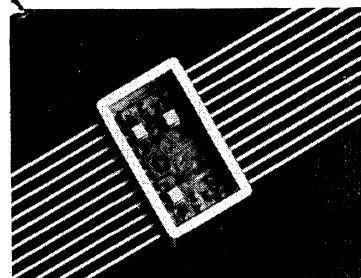


ULTRA HIGH CAPACITANCE CHIP CAPACITORS

Maximum Capacitance Available in Popular Sizes

JMDI Size	Dielectric	6	VDCW 12
R11 (.050 x .040 x .040T)	Y5V	.068mfd	.056mfd
R15 (.080 x .050 x .050T)	Y5V	.180mfd	.150mfd
S41 (.125 x .095 x .065T)	Y5V	1.80mfd	1.50mfd
S48 (.225 x .250 x .080T)	Y5V	5.60mfd	4.70mfd
L76 (.585 x .298 x .070T)	Y5V	12.0mfd	10.0mfd

Chips feature very high volume efficiency of capacitance, attainable through unique processing techniques and Y5V (K12000) dielectric. Values exceeding 10mfd available, depending on chip configuration. Ideal in circuits where space is a premium or as replacement of tantalum chips.



Maximum Capacitance Available with Voltage Applied

JMDI Size	1000 VDCW	2000 VDCW	3000 VDCW	4000 VDCW
HV42	6800pf	1800pf	6800pf	330pf
HV46	.015mfd	3900pf	1500pf	680pf
HV50	.033mfd	8200pf	3300pf	1500pf
HV60	.056mfd	.015mfd	4700pf	2200pf
HV65	.082mfd	.022mfd	8200pf	4700pf

Part No.	Dimensions (L x W x T)		
HV42	.15	.15	.12
HV46	.19	.19	.12
HV50	.33	.33	.12
HV60	.40	.40	.12
HV65	.54	.40	.12

HIGH VOLTAGE CHIP CAPACITORS

Available in either NPO/COG or BX/X7R dielectric, these units are designed to obtain high capacitance values to 4000 VDCW. Typical applications include high voltage power supplies and meter multiplier circuits. Built to suit specific customer requirements.

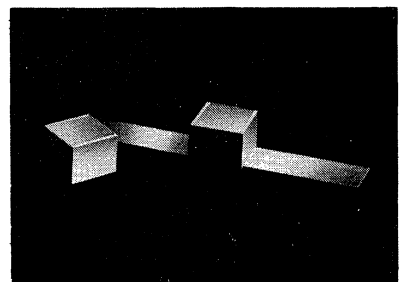


HIGH Q MICROWAVE CHIP CAPACITORS

JMDI Size	Dielectric	Max. Capacitance Available
R9 (.040 x .030 x .030T)	HI-Q	18pf
R12 (.055 x .055 x .055T)	HI-Q	100pf
R15 (.080 x .050 x .050T)	HI-Q	270pf
S42 (.110 x .110 x .100T)	HI-Q	1000pf

General Specifications:
Q @ 1 MHz > 10,000 (DF < .0001)
Q @ 100 MHz > 20000
Capacitance (pf)
T.C. +90 ±20 ppm/°C
Temp. Range -55°C to 125°C
VDCW up to 250V, (500 VDC test)

High-Q microwave chip capacitors are available in four basic sizes, displaying excellent performance in the VHF, UHF and microwave ranges. The configurations, insertion loss, and resonance-free performance make these chips ideal for microstrip and hybrid MIC applications. Available with standard termination or with easy to mount coplanar leads.



JOHANSON/MONOLITHIC DIELECTRICS, INC.

P.O. BOX 6456, BURBANK, CALIF. 91505

TWX 910-498-2735 TELEPHONE (201) 848-4465

DRY ELECTROLYTIC AC CAPACITORS



NEW
SMALLER
SIZE*

FOR MOTOR STARTING AND OTHER INTERMITTENT SERVICE

Mallory Type "P" Capacitors described here are designated "Motor Starting Types." These low cost, compact units are the result of more than 36 years experience in manufacturing electrolytic capacitors. They are not designed for continuous duty on AC, but are ideal in intermittent applications within their voltage, temperature, and duty cycle capabilities.

RATING BY CASE SIZE

"MAX" indicates maximum capacity for this case size.

MFD	110 VAC	125 VAC	165 VAC	220 VAC	250 VAC	330 VAC
21-25	1	1	1	1	1	1
25-30	1	1	1	1	1	1
30-36	1	1	1	1	1	MAX 1
36-43	1	1	1	1	1	MAX 2
43-52	1	1	1	1	MAX 1	3 or 4
47-56	1	1	1	1	2	3 or 4
53-64	1	1	1	MAX 1	MAX 2	MAX 3
64-77	1	1	1	2	3 or 4	4
72-87	1	1	1	MAX 2	MAX 3	MAX 4
88-106	1	1	1	3 or 4	MAX 4	5 or 6
108-130	1	1	1	MAX 3	5 or 6	MAX 5
124-149	1	1	MAX 1	MAX 4	5 or 6	MAX 6
130-154	1	1	2	5 or 6	5 or 6	7
145-174	1	1	2	5 or 6	MAX 5	7
161-193	1	1	MAX 2	5 or 6	MAX 6	MAX 7
189-227	1	MAX 1	3 or 4	MAX 5	7	8
216-260	MAX 1	2	3 or 4	MAX 6	7	8
233-280	2	MAX 2	MAX 3	7	MAX 7	8
243-292	2	3 or 4	4	7	8	8
270-324	MAX 2	3 or 4	4	7	8	8
324-389	3 or 4	3 or 4	4	MAX 7	8	MAX 8
340-408	3 or 4	MAX 3	MAX 4	8	8	—
378-455	3 or 4	4	5 or 6	8	8	—
400-480	MAX 3	4	5 or 6	8	8	—
430-516	4	4	5 or 6	8	8	—
460-553	4	4	5 or 6	8	MAX 8	—
540-648	4	MAX 4	MAX 5 + 6	8	—	—
590-708	MAX 4	5 or 6	7	MAX 8	—	—
710-850	5 or 6	5 or 6	7	—	—	—
815-970	5 or 6	MAX 5 + 6	MAX 7	—	—	—
850-1020	5 or 6	7	—	—	—	—
900-1080	MAX 5 + 6	7	—	—	—	—
1020-1264	7	7	—	—	—	—
1175-1410	7	MAX 7	—	—	—	—
1326-1590	MAX 7	—	—	—	—	—

CASE SIZE CODES

Case Number	Diameter	Height
1	1 $\frac{1}{16}$	2 $\frac{3}{4}$
†2	1 $\frac{1}{16}$	3 $\frac{3}{8}$
3	1 $\frac{1}{16}$	4 $\frac{3}{8}$
†4	1 $\frac{3}{16}$	3 $\frac{3}{8}$
†5	1 $\frac{3}{16}$	4 $\frac{3}{8}$
6	2 $\frac{1}{16}$	3 $\frac{3}{8}$
†7	2 $\frac{1}{16}$	4 $\frac{3}{8}$
8	2 $\frac{1}{16}$	4 $\frac{3}{8}$

†NEMA Standard Sizes.

*Standard Size Type P Still Available.

MALLORY

MALLORY CAPACITOR COMPANY

a division of P. R. MALLORY & CO. INC.
Box 372, Indianapolis, Indiana 46206

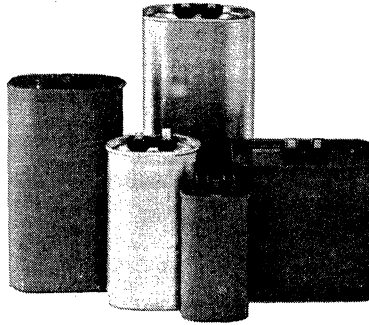
Electrical and Electronic Components • Timing Devices and Motors • Metallurgical Products • Batteries
SONALERT® is a registered trademark of P. R. Mallory & Co. Inc.

TYPE AC-OIL PAPER DIELECTRIC CAPACITORS

Mallory paper dielectric capacitors are useful in a variety of applications where continuous operation of this device is required on the normal AC power available in home and in industry. Refrigeration equipment, air conditioners, computers, and other business machines are representative of some of the products which employ these capacitors for efficient operation. Also they are utilized frequently in industrial controls, phase shifting and other heavy duty services.

These capacitors offer assurance of consistent performance in the applications listed. This level of reliability is the result of refinements attained throughout many years of manufacturing paper dielectric capacitors.

These capacitors contain polychlorinated biphenyls (PCB), which some studies have shown may be an environmental contaminant. These capacitors are also available with NON-PCB for application in areas which require biodegradable oil.

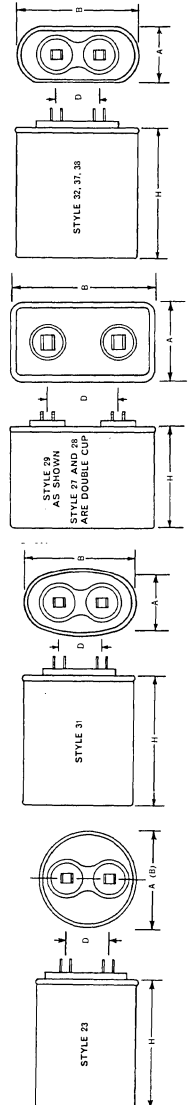


USES

- AIR CONDITIONING
- BUSINESS MACHINES
- POWER SUPPLIES
- REFRIGERATION
- INDUSTRIAL CONTROL
- PHASE SHIFTING
- FAN MOTORS
- LIGHTING

NORMAL PERFORMANCE — RATINGS AND SIZES

Voltage	MFD	Style	VAR Rating	Dimension "H"	Catalog Number	Voltage	MFD	Style	VAR Rating	Dimension "H"	Catalog Number	Voltage	MFD	Style	VAR Rating	Dimension "H"	Catalog Number
236	3	32	63.0	1 1/4	32BB2303	370	5	32	258.1	2 1/4	32BB3705	400	30	27	1810	4 1/4	27BB4030
236	4	32	84.0	1 1/4	32BB2304	370	6	32	309.7	2 1/4	32BB3706	400	30	38	1810	6 1/4	38BB4030
236	5	32	105.0	2 1/4	32BB2305	370	7.5	31	387.1	2 1/4	31BB3705	400	35	27	2111	4 1/4	27BB4035
236	6	32	126.0	2 1/4	32BB2306	370	7.5	32	387.1	3 1/4	32BB3705	400	35	31	2111	8 1/2	31BB4035
236	7.5	32	157.5	2 1/4	32BB2307	370	8	31	412.9	2 1/4	31BB3708	400	35	38	2111	8	38BB4035
236	8	32	168.0	2 1/4	32BB2308	370	8	32	412.9	4 1/4	32BB3708	400	40	27	2413	5 1/4	27BB4040
236	10	32	210.0	3 1/4	32BB2310	370	8	37	412.9	2 1/4	37BB3708	400	40	38	2413	9	38BB4040
236	12.5	32	262.5	4 1/4	32BB23125	370	10	31	516.1	2 1/4	31BB3710	400	45	27	2714	5 1/4	27BB4045
236	12.5	37	262.5	2 1/4	37BB23125	370	10	32	516.1	4 1/4	32BB3710	400	45	38	2714	9 1/2	38BB4045
236	15	37	315.0	2 1/4	37BB2315	370	10	37	516.1	2 1/4	37BB3710	400	50	27	3016	6 1/4	27BB4050
236	15	37	367.4	3 1/4	37BB23175	370	12.5	31	645.1	3	31BB37125	400	55	27	3318	6 1/4	27BB4055
236	20	37	419.9	3 1/4	37BB2320	370	12.5	37	645.1	3 1/2	37BB37125	440	2	32	146.0	2 1/4	32BB4402
236	25	37	524.9	4 1/4	37BB2325	370	15	31	774.2	3 1/4	31BB3715	440	3	32	219.0	2 1/4	32BB4403
236	30	37	629.9	4 1/4	37BB2330	370	15	37	774.2	3 1/2	37BB3715	440	4	32	291.9	3 1/4	32BB4404
236	35	37	734.9	5 1/4	37BB2335	370	15	38	774.2	3 1/2	38BB3715	440	5	31	364.9	2 1/4	31BB4405
236	35	38	734.9	4 1/4	38BB2335	370	17.5	31	903.2	4 1/4	31BB37175	440	5	32	364.9	3 1/4	32BB4405
236	40	37	839.9	6 1/4	37BB2340	370	17.5	37	903.2	4 1/4	37BB37175	440	6	31	437.9	2 1/4	31BB4406
236	40	38	839.9	5 1/4	38BB2340	370	17.5	38	903.2	3 1/4	38BB37175	440	6	32	437.9	4 1/4	32BB4406
236	45	37	944.9	3 1/4	37BB2345	370	20	31	1032	5 1/4	31BB3720	440	7	31	510.9	2 1/4	31BB4407
236	45	37	944.9	5 1/4	37BB2345	370	20	37	1032	5 1/4	37BB3720	440	7.5	31	547.4	2 1/4	31BB44075
236	45	38	944.9	5 1/4	38BB2345	370	20	38	1032	4 1/4	38BB3720	440	7.5	37	547.4	3 1/4	37BB44075
236	50	37	1050	3 1/4	37BB2350	370	25	27	1290	3 1/4	27BB3725	440	8	31	583.9	3	31BB4408
236	50	38	1050	6 1/4	38BB2350	370	25	28	1290	5 1/4	28BB3725	440	8	37	583.9	3 1/4	37BB4408
236	60	37	1260	4 1/4	37BB2360	370	25	31	1290	5 1/4	31BB3725	440	10	31	729.9	3 1/4	31BB4410
236	60	38	1260	7 1/4	38BB2360	370	25	37	1290	6 1/4	37BB3725	440	10	37	729.9	3 1/4	37BB4410
330	4	32	164.2	2 1/4	32BB3304	370	25	38	1290	4 1/4	38BB3725	440	12	31	875.8	4 1/4	31BB4412
330	5	32	205.3	2 1/4	32BB3305	370	30	27	1548	3 1/4	27BB3730	440	12.5	31	912.3	4 1/4	31BB44125
330	6	32	246.3	2 1/4	32BB3306	370	30	31	1548	3 1/4	31BB3730	440	12.5	37	912.3	4 1/4	37BB44125
330	7.5	32	307.9	3 1/4	32BB33075	370	30	37	1548	7 1/4	37BB3730	440	15	31	1095	4 1/4	31BB4415
330	8	32	328.4	3 1/4	32BB3308	370	30	38	1548	5 1/4	38BB3730	440	15	37	1095	5 1/4	37BB4415
330	10	31	410.5	2 1/4	31BB3310	370	35	27	1806	3 1/4	27BB3735	440	15	38	1095	4 1/4	38BB4415
330	10	32	410.5	4 1/4	32BB3310	370	35	31	1806	7 1/4	31BB3735	440	17.5	27	1277	3 1/4	27BB44175
330	10	37	410.5	2 1/4	37BB3310	370	35	38	1806	3 1/4	38BB3735	440	17.5	31	1277	7 1/4	31BB44175
330	12	32	492.7	4 1/4	32BB3312	370	40	27	2064	4 1/4	27BB3740	440	17.5	37	1277	6 1/4	37BB44175
330	12	37	492.7	2 1/4	37BB3312	370	40	31	2064	8 1/2	31BB3740	440	17.5	38	1277	4 1/4	38BB44175
330	12.5	31	513.2	2 1/4	31BB33125	370	40	38	2064	7 1/4	38BB3740	440	20	27	1460	3 1/4	27BB4420
330	12.5	37	513.2	2 1/4	37BB33125	370	45	27	2322	4 1/4	27BB3745	440	20	31	1460	6 1/4	31BB4420
330	15	31	615.8	3	31BB3315	370	45	38	2322	8 1/4	38BB3745	440	20	37	1460	7 1/4	37BB4420
330	15	37	615.8	3 1/2	37BB3315	370	50	27	2581	5 1/4	27BB3750	440	20	38	1460	5 1/4	38BB4420
330	15	38	615.8	3 1/2	38BB3315	370	50	38	2581	9 1/4	38BB3750	440	22.5	38	1642	6 1/4	38BB44225
330	17.5	31	718.5	3 1/4	31BB33175	400	3	32	181.0	2 1/4	32BB4003	440	25	27	1825	4 1/4	27BB4425
330	17.5	37	718.5	3 1/4	37BB33175	400	4	32	241.3	2 1/4	32BB4004	440	25	31	1825	7 1/4	31BB4425
330	17.5	38	718.5	3 1/4	38BB33175	400	5	32	301.6	3 1/4	32BB4005	440	25	38	1825	6 1/4	38BB4425
330	20	31	821.1	3 1/4	31BB3320	400	6	32	361.9	3 1/4	32BB4006	440	30	27	2190	4 1/4	27BB4430
330	20	37	821.1	4 1/4	37BB3320	400	7	31	422.2	2 1/2	31BB4007	440	30	38	2190	8	38BB4430
330	20	38	821.1	3 1/4	38BB3320	400	7.5	31	452.4	2 1/2	31BB40075	440	35	27	2554	5 1/4	27BB4435
330	25	31	1026	4 1/4	31BB3325	400	7.5	32	452.4	2 1/2	32BB40075	440	35	38	2554	9	38BB4435
330	25	37	1026	5 1/4	37BB3325	400	8	31	485.2	2 1/2	31BB4008	440	40	27	2919	5 1/4	27BB4440
330	25	38	1026	4 1/4	38BB3325	400	8	32	485.2	4 1/4	32BB4008	440	40	38	2919	10	38BB4440
330	30	31	1232	5 1/4	31BB3330	400	8	37	485.2	2 1/2	37BB4008	440	45	27	3284	6 1/4	27BB4445
330	30	37	1232	6 1/4	37BB3330	400	10	31	603.2	3	31BB4010	440	50	27	3649	6 1/4	27BB4450
330	30	38	1232	4 1/4	38BB3330	400	10	37	603.2	3 1/2	37BB4010	440	55	27	4014	7 1/4	27BB4455
330	35	27	1437	3 1/4	27BB3335	400	12	31	723.8	3 1/4	31BB4012	660	2	32	328.4	2 1/4	32BB6602
330	35	31	1437	6 1/4	31BB3335	400	12.5	31	754.0	3 1/4	31BB40125	660	3	31	492.7	2 1/4	31BB6603
330	35	37	1437	6 1/4	37BB3335	400	12.5	37	754.0	4 1/4	37BB40125	660	4	31	656.9	2 1/4	31BB6604
330	35	38	1437	5 1/4	38BB3335	400	15	31	904.8	4 1/4	31BB4015	660	4	37	656.9	2 1/4	37BB6604
330	40	27	1642	3 1/4	27BB3340	400	15	37	904.8	4 1/4	37BB4015	660	5	31	821.1	2 1/4	31BB6605
330	40	31	1642	7 1/4	31BB3340	400	15	38	904.8	3 1/4	38BB4015	660	5	37	821.1	3 1/4	37BB6605
330	40	38	1642	6 1/4	38BB3340	400	17.5	31	1056	4 1/4	31BB40175	660	6	31	985.3	3	31BB6606
330	45	27	1847	4 1/4	27BB3345	400	17.5	37	1056	5 1/4	37BB40175	660	6	37	985.3	3 1/4	37BB6606
330	45	31	1847	7 1/4	31BB3345	400	17.5	38	1056	4 1/4	38BB40175	660	8	37	1314	4 1/4	37BB6608
330	45	38	1847	6 1/4	38BB3345	400	20	31	1206	5 1/4	31BB4020	660	10	31	1642	4 1/4	31BB6610
330	50	27	2053	4 1/4	27BB3350	400	20	37	1206	6 1/4	37BB4020	660	10	38	1642	4 1/4	38BB6610
330	50	38	2053	7 1/4	38BB3350	400	20	38	1206	4 1/4	38BB4020	660	12	27	1971	3 1/4	27BB6612
330	60	27	2463	5 1/4	27BB3360	400	22.5	38	1357	5 1/4	38BB40225	660	12	38	1971	4 1/4	38BB6612
330	60	38	2463	8 1/2	38BB3360	400	25	27	1508	3 1/4	27BB4025	660	15	38	2463	6 1/4	38BB6615
370	2	32	103.2	1 1/4	32BB3702	400	25	31	1508	6 1/4	31BB4025						
370	3	32	154.8	2 1/4	32BB3703	400	25	37	1508	7 1/4	37BB4025						
370	4	32	206.4	2 1/4	32BB3704	400	25	38	1508	5 1/4	38BB4025						



NOTE: Drawings and tables shown are for standard sizes and configurations. Part numbers shown above are for PCB. NON-PCB may be ordered by substituting "N" in place of the "B" (3rd Digit). Example: 32NB2303.

ROUND AND OVAL CONTAINERS

ALUMINUM ELECTROLYTIC CAPACITORS

Type	Description	Terminals	Temp. Range (°C)	Voltage Range (WVDC)	Cap. Range (MFD)	Std. Tol. (%MFD)	Case Sizes Dia. x Length (in.) H x W x D (in.)	Features	TIB
TT TTX 	Aluminum Tubular, Axial Lead	Wire Leads	-40 to +85 -55 to +85	1 to 150	1 to 4600 1 to 2500	-10 +100 -10 +50	.26 x .62 to .75 .37 x .62 to 1.50 .44 x 1.00 to 2.00 .50 x 1.00 to 2.00 .62 x 1.00 to 1.50	Miniature, All Welded Construction Low DCL, Low ESR	4-104 4-105
TCW 	Aluminum Tubular, Axial Lead	Wire Leads	-20 to +85	3 to 450	2 to 20,000	-10 +100	.50 x 1.12 to 2.12 .62 x 1.12 to 2.62 .75 x 1.12 to 2.75 .87 x 1.37 to 3.12 1.00 x 1.37 to 3.89	All Welded Construction	4-103
TC 	Aluminum Tubular, Axial Lead or Single Ended	Wire Leads, Solder Lugs, PC Lugs	-40 to +85 -30 to +85	50 to 300 301 to 450	10 to 2250 10 to 130	-10 +100 -10 +50	.50 x 1.06 to 1.31 .62 x 1.06 to 1.81 .75 x 1.06 to 2.69 .87 x 1.31 to 2.69 1.00 x 1.31 to 3.81	Single or Dual Section, Rugged, Choice of Terminals	4-102
TCG TPG 	Aluminum Tubular, Axial Lead	Wire Leads	-40 to +85	3 to 450	3 to 23,000 2 to 17,000	-10 +75 -10 +50 -10 +100	.31 x .62 to .75 .37 x .81 to 1.62 .43 x .62 to 2.50 .50 x 1.12 to 2.12 .62 x 1.12 to 2.62 .75 x 1.12 to 2.62 .87 x 1.12 to 3.12 1.00 x 1.12 to 3.62	Computer Grade High MFD, Low DCL, Low ESR, All Welded Construction, High Reliability, Premium Grade	4-307 4-67
VTT VPG 	Aluminum Can, Vertical Mount, Single Ended	Wire Leads, Plug-in	-20 to +85 -40 to +85	6 to 50 3 to 150	1.5 to 47 20 to 2000	-10 +100 -10 +50	.24 x .43 .50 x 1.00 .50 x 1.25 .50 x 1.62	Miniature, All Welded Construction, High Reliability, Low DCL, Low ESR, Premium Grade	4-202 4-306
FP PPF 	Aluminum Can, Twist-Tab or PC Vertical Mount	Solder Lugs, Wire Wrap, PC Lugs	-30 to +85	3 to 450	20 to 75,000	-10 +150 -10 +100 -10 +50	.75 x 2.00 1.00 x 1.50 to 4.00 1.37 x 1.75 to 5.00	Single or Multi-Section	4-101
CGS CG PG 	Aluminum Can, Bracket Mount or Chassis Mount	Solder Lugs, Screw, Turret	-40 to +65 -40 to +85	3 to 450	10 to 540,000	-10 +75 -10 +50	1.00 x 1.50 to 4.00 1.00 x 1.75 to 4.25 1.37 x 2.00 to 4.75 1.37 x 2.12 to 5.62 1.75 x 2.12 to 5.62 1.75 x 2.25 to 5.62 2.00 x 2.12 to 5.62 2.50 x 3.12 to 5.62 3.00 x 3.62 to 8.62	65°C Computer 85°C Computer Grade, Low DCL, Low ESR, Hi Ripple Capability, High Reliability, Premium Grade	4-303 4-304 4-56
SFC 	Aluminum Can, Bracket or Buss-Bar Mount	Buss-Bar Screw	-40 to +85	6 to 50	6800 to 100,000	-0 +100	3.00 x 4.12 to 5.62	Computer Grade, Low DCL, Ultra-Low ESR, Ultra-High Ripple Capability	4-310
MTA MTV MCT 	Molded Plastic Tubular, Axial Lead, Vertical Mount, Single Ended	Wire Leads, Plug-in Wire Pins Flexible	-30 to +85	3 to 100	3 to 4500 3 to 9000	-10 +100 -10 +50	.31 x .87 .37 x .81 to 1.31 .37 x 1.12 .50 x .81 to 1.50 .50 x 1.50 .75 x 2.16 .87 x 1.50 to 2.50	Low Cost, All Welded Construction	4-201
HC NP 	Bakelite Case, Single Ended	Screw	-20 to +65	3 to 450 3 to 450NP	65 to 40,000 30 to 32,000	-10 +150 -10 +100 -10 +50 ±25%	1.44 x 2.75 to 2.06 x 4.37	Rugged Hi-Pot Case, Versatile Mounting, Non-Polar	4-46

MALLORY**MALLORY CAPACITOR COMPANY**a division of P. R. MALLORY & CO. INC.
Box 372, Indianapolis, Indiana 46206

Electrical and Electronic Components • Timing Devices and Motors • Metallurgical Products • Batteries

SONALERT® is a registered trademark of P. R. Mallory & Co. Inc.

See YELLOW SECTION for Local Sales Offices and Key Personnel

TANTALUM ELECTROLYTIC CAPACITORS

TANTALUM SOLID ELECTROLYTE

Type	Description	Terminals	Temp. Range (°C)	Voltage Range (WVDC)	Cap. Range (MFD)	Std. Tol. (%MFD)	Case Sizes Dia. x Length (in.) H x W x D (in.)	Features	TIB
 TAS	Metal Tubular, Axial Lead	Wire Leads	-80 to +125	6 to 50	.0047 to 330	±5 ±10 ±20	.12 x .25 .17 x .44 .28 x .65 .34 x .75	Hermetic	4-801
 TER	Mylar Sleeve over Metal Tubular, Axial Lead	Wire Leads	-55 to +125	6 to 50	.0047 to 330	±5 ±10 ±20	.13 x .29 .18 x .47 .29 x .69 .35 x .79	MIL Style CSR13 Reliability Per MIL-C-39003D	4-813
 TIM	Rectangular Molded Plastic, Radial Lead	Wire Leads, Plug-in	-55 to +125	3 to 50	.082 to 220	±10 ±20	.22 x .28 x .17 .33 x .36 x .17 .34 x .23 x .10 .37 x .60 x .19 .41 x .32 x .17	Low Cost, High Density Mounting, Automatic Insertion Capability	4-806
 TAC	Molded Plastic Tubular, Axial Lead	Wire Leads	-55 to +125	3 to 50	.082 to 82	±10 ±20	.10 x .29 .14 x .34 .17 x .34 .19 x .53	Low Cost, Automatic Insertion Capability	4-806
 TDM	Plastic Dipped, Rectangular Radial Lead	Wire Leads	-55 to +85	6 to 50	.10 to 330	±10 ±20	.27 x .27 x .18 .33 x .32 x .21 .37 x .40 x .22 .40 x .40 x .25 .46 x .48 x .32 .56 x .58 x .32	Low Profile Low Cost	4-814
 TDC	Plastic Dipped, Radial Lead	Wire Leads	-55 to +85	6 to 50	.10 to 330	±10 ±20	.17 x .35 .25 x .50 .35 x .65 .40 x .75	Very Low Cost	4-810

TANTALUM LIQUID ELECTROLYTE

 TLS	Silver Tubular, Axial Lead	Wire Leads	-55 to +125	6 to 125	1.7 to 1200	±5 ±10 -15 +20 -15 +30 -15 +50	.19 x .45 .28 x .64 .37 x .77 .37 x 1.06	MIL-C-3955 Styles CL64 & CL65, Low DCL, Wide Temp. Range	4-71
 TLX	Silver Tubular, Axial Lead, Hermetic Seal	Wire Leads	-55 to +125	6 to 125	1.7 to 1200	±5 ±10 -15 +20 -15 +30 -15 +50	.19 x .45 .28 x .64 .37 x .77 .37 x 1.06	MIL Style CLR65 Reliability Per MIL-C-39006, Low DCL, High Voltage, Wide Temp. Range	4-607
 CMT	Copper Tubular, Red Plastic, Axial Lead	Wire Leads	-55 to +85	6 to 60	1 to 450	±20	.11 x .30 .11 x .40 .14 x .60 .22 x .78	Low Cost, High MFD, Miniature Size	4-609
 MTP	Silver Tubular, Red Plastic, Axial Lead	Wire Leads	-55 to +85	6 to 60	3.3 to 470	±20	.11 x .30 .11 x .40 .14 x .60 .22 x .78	High MFD, Miniature Size	4-606
 TAH	Silver Tubular, Green Plastic, Axial Lead	Wire Leads	-55 to +125	4 to 60	2 to 330	-15 +75 ±10 -10 +20 -15 +20 -15 +50	.23 x .46 .23 x .59 .23 x .80	Miniature Size, Wide Temp. Range Low DCL	4-57
 XTM XTK XTH XTL XTV	Silver Can, Single or Dual Ended, Hermetic Seal	Wire Leads, Screw, Stud, Solder Lug, Turret	-55 to +175	20 to 900	2 to 2200	-15 +75 -15 +50 ±20	.66 x .44 to 1.78 .87 x .54 to 4.06 1.12 x .60 to 2.81	MIL Style CLR10 14 and 17, Reliability Per MIL-C-39006, High Temp., High MFD, High Voltage	4-84

MALLORY
MALLORY CAPACITOR COMPANY

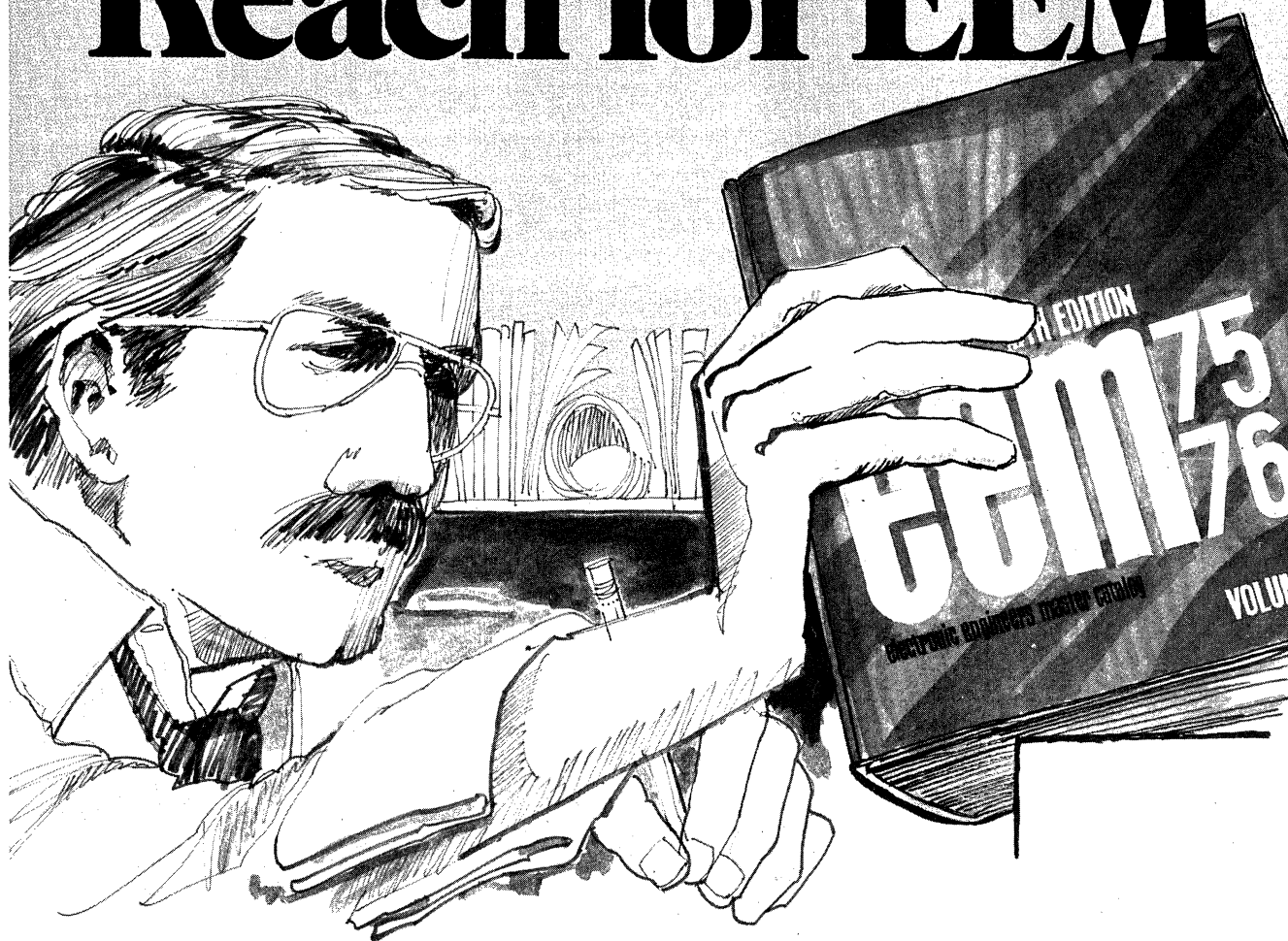
 a division of P. R. MALLORY & CO. INC.
 Box 372, Indianapolis, Indiana 46206

Electrical and Electronic Components • Timing Devices and Motors • Metallurgical Products • Batteries

SONALERT® is a registered trademark of P. R. Mallory & Co. Inc.

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**

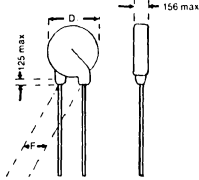


electronic engineers master

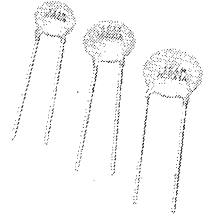
UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

muRata**ceramic capacitors****Super-Cap™ to 100V ±10%**

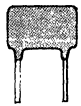
TC-X5P



TYPE	DIMENSIONS		16 VOLTS		25 VOLTS		50 VOLTS		100 VOLTS	
	D (MAX)	F	MAX CAP	IR (MEGΩ)	MAX CAP	IR (MEGΩ)	MAX CAP	IR (MEGΩ)	MAX CAP	IR (MEGΩ)
DD350	.237	.250	.015	350	.01	500	.01	500	—	—
DD360	.290	.250	.022	250	.015	350	.015	350	.01	500
DD380	.350	.250	.05	110	.022	250	.022	250	.015	350
DD310	.430	.250	.068	75	.05	110	.05	110	.022	250
DD312	.540	.375	.1	50	.068	75	.068	75	.05	110
DD314	.600	.375	.15	40	.1	50	.1	50	.068	75
DD316	.690	.375	.18	35	.12	38	.12	38	.1	50



Standard Capacitance tolerance: ±10%(K), ±20%(M), +80%, -20% (Z) 12V units also available

monolithic**RESIN COATED RECTANGULARS**

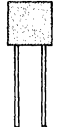
- NPO, X7F, X7R, Z5U Materials
- 25, 50 and 100 VDC
- 1 PF to 1.5 MF
- ±5, ±10, ±20 and +80, -20% Tolerances

**MOLDED RECTANGULARS**

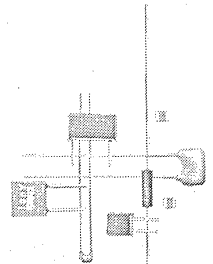
- NPO, X7R and Z5U Materials
- 25 and 50 VDC
- 10 to 470,000 PF
- ±10, ±20 and +80, -20% Tolerances

**CHIPS**

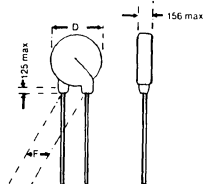
- NPO, X7F, X7R, Z5U Materials
- 25, 50 and 100 VDC
- 1 PF to 680,000 PF
- ±5, ±10, ±20 and +80, -20% Tolerances

**CASED RECTANGULARS**

- CK-05 and CK-06 Style
- BX Characteristics
- 50, 100 and 200 VDC
- ±10 and ±20% Tolerances
- 10 to 100,000 PF

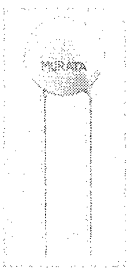
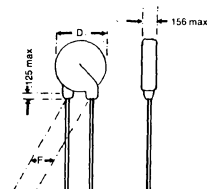
**MOLDED TUBULARS**

- NPO and X7R Materials
- CK-12 and CK-14 Styles
- 100 VDC
- 10 to 33,000 PF
- ±5, ±10 and ±20% Tolerances

temperature compensating 500 VDC

TYPE	DIMENS.		NPO	N030	N080	N150	N220	N330	N470	N750	N1500	N2200
	D (MAX)	F ±.06										
DD57	.275	.252	2-16	2-16	3-18	4-20	4-24	5-39	5-39	8-47	22-68	27-82
DD60	.296	.250	12-20	12-20	14-24	15-27	16-31	18-47	18-47	41-62	50-100	60-125
DD61	.375	.250	20-36	20-36	20-39	22-43	27-47	33-82	33-82	51-110	75-150	91-180
DD62-2	.434	.250	36-56	36-56	39-62	43-75	47-82	82-130	82-130	110-150	150-240	180-270
DD62-3	.500	.375	56-82	56-82	62-91	75-110	82-130	130-200	130-200	150-240	240-360	270-470
DD62-0	.591	.375	82-120	82-120	91-130	110-150	130-160	200-270	200-270	240-360	360-470	470-560
DD63-2	.670	.375	120-160	120-160	130-180	150-180	160-200	270-390	270-390	360-470	470-620	560-820
DD63-0	.749	.375	160-200	160-200	180-240	180-270	200-330	390-470	390-470	470-620	620-1100	820-1300

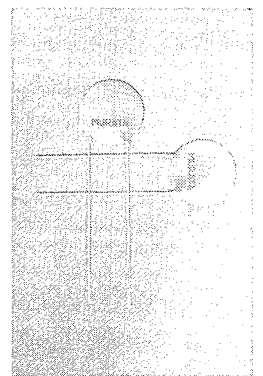
Standard Capacitance Tolerance: ±5%(J), ±10%(K), ±20%(M)

**general purpose 500 VDC**

TYPE	DIMENSIONS		CAPACITANCE (pf)					
	D (MAX)	F	X5F		Y5P Z5F Z5P X5R		Y5U	Z5U
DD57-0	.275	.250	100 120 150	180 220 270	100 120 150	180 220 270	1000	1000, 1500
DD60	.296	.250	330 390 470	560	330 390 470	560 680 820		1800
DD61	.375	.250	680, 820		1000, 1200		1200, 1500	2200, 2700
DD62-2	.434	.250	1000, 1200		1500, 2200		2000, 3900	3300, 5600
DD62-3	.500	.375	1500		3300		4700, 5600	6800, 8200
DD62-0	.591	.375	1800, 2200, 2700		3900, 4700		6800, 8200	10000
DD63-2	.670	.375	3300, 3900		5600, 6800		10000, 12000	12000, 18000
DD63-0	.749	.375	4700		7500, 10000		15000, 18000	20000, 22000
			5600		12000		20000, 22000	27000, 33000

Standard Capacitance Tolerances Y5F, Y5P, Z5F, Z5P: ±10%, ±20%(K,M). Y5U, Z5U: +80, -20%(Z). Other tolerances available on special order.

NOTE: For higher capacitance, units are available with two disc elements upon special request. 1000 VDCW capacitors are also available on special request.



muRata CORPORATION OF AMERICA Rockmart, Georgia 30153
Tel: 404-684-7143


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

POLYESTER FILM CAPACITORS

POLYESTER FILM CAPACITORS EXTENDED FOIL/FILM WRAP/EPOXY END FILL STYLE 107 -55°C TO +125°C

ELECTRICAL AND ENVIRONMENTAL CHARACTERISTICS

CAPACITANCE MEASUREMENTS

Capacitors of 1.0 μ F or less shall be measured at a frequency of 1000 Hz. Capacitors greater than 1.0 μ F shall be measured at 60 Hz. The standard capacitance tolerance is 20%. Other tolerances are available upon request.

Reference: MIL-STD-202, Method 305.

TEMPERATURE CHARACTERISTICS

The maximum change in capacitance from the measured value at +25°C shall be -6% at -55°C, and +15% at +125°C.

DISSIPATION FACTOR

When measured as specified in Paragraph 1, the dissipation factor at +25°C shall not exceed 0.6% for values up to 1.0 μ F and shall not exceed 1.0% for greater capacitance values.

INSULATION RESISTANCE

When measured at +25°C, and rated voltage (or 500 VDC, whichever is less), the insulation resistance shall be a minimum of 50,000 megohm-microfarads, but need not exceed 100,000 megohms. The period of electrification shall not exceed two minutes.

Reference: MIL-STD-202, Method 302.

VOLTAGE DERATING

The capacitors may be operated at full rated voltage from -55°C to +85°C, or with linear derating to 50% of rated voltage above +85°C with a maximum temperature of +125°C.

VOLTAGE TEST

When tested at +25°C, the capacitors shall withstand the indicated DC test voltages for a period of one minute:

Terminal to terminal	200% of DC rating
Terminal to case (less than .235 diameter)	200% of DC rating
Terminal to case (greater than .235 diameter)	400% of DC rating or 2,000 VDC, whichever is less

Reference: MIL-STD-202, Method 301.

LIFE TESTING

When tested for 1000 hours at 150% of the appropriate rated voltage for the test temperature, the capacitors shall exhibit no more than one failure in twelve pieces tested. Alternatively, an accelerated +125°C test may be performed at the +85°C voltage rating for a period of 250 hours. A failure is defined as:

- A capacitance change of more than 10% of its initial value;
- A dissipation factor greater than that specified in Paragraph 3;
- An insulation resistance less than $\frac{1}{3}$ that specified in Paragraph 4; or
- A permanent open or short.

VIBRATION

The capacitors will meet or exceed in the vibration requirements of MIL-STD-202, Method 201.

NYTRONICS CATALOG NUMBERING SYSTEM

	107	B	103	M	
Nytronics Style	D.C. Voltage Rating	Capacitance	In μ F. The first two digits are the significant figures, the third is the number of zeros.	Capacitance Tolerance	
	B = 100V			F = $\pm 1\%$	
	C = 200V			P = $\pm 2\%$	
	E = 400V			J = $\pm 5\%$	
	F = 600V			K = $\pm 10\%$	
				M = $\pm 20\%$	

Note: Special capacitance values, voltage ratings and sizes available to customer requirements.

PHYSICAL SIZE TOLERANCES

	100 Volts DC & 200 Volts DC		400 Volts DC	
DIAMETER	Up to .158	+ .032 - .000	Up to .218	$\pm .032$
	.159 to .200	+ .040 - .000	.219 to .500	$\pm .046$
	Over .200	+ .050 - .000	Over .500	$\pm .062$
LENGTH		+ $\frac{1}{16}$ - 0		+ $\frac{3}{32}$ - $\frac{1}{16}$

TINNED COPPERWELD LEADS

No. 22 AWG. (.025) for cases up to .325 Dia.
 No. 20 AWG. (.032) for cases .326 thru 1.0 Dia.
 No. 18 AWG. (.040) for cases above 1.0 Dia.

Also available are the following styles with characteristics similar to Type 107.

STYLE 103

Flat Press with Axial Leads
 Extended Foil Construction
 Polyester Film Dielectric
 Film Wrap-Epoxy Endfill
 -55°C to +125°C Operation

STYLE 118

Round Body with Axial Leads
 Extended Foil Construction
 Polyester Film Dielectric
 Polyethylene Case-Epoxy Endfill
 -55°C to +100°C Operation

STANDARD RATINGS

Capacitance μ F	Dia. x Length	Cat. No.
100 VOLTS DC WORKING		
.001	.138 $\frac{3}{16}$	107B102M
.0015	.138 $\frac{3}{16}$	107B152M
.0022	.138 $\frac{3}{16}$	107B222M
.0033	.138 $\frac{3}{16}$	107B332M
.0047	.138 $\frac{3}{16}$	107B472M
.0068	.138 $\frac{3}{16}$	107B682M
.0082	.138 $\frac{3}{16}$	107B822M
.01	.158 $\frac{1}{2}$	107B103M
.015	.158 $\frac{1}{2}$	107B153M
.022	.158 $\frac{1}{2}$	107B223M
.027	.158 $\frac{1}{2}$	107B273M
.033	.158 $\frac{1}{2}$	107B333M
.047	.190 $\frac{1}{2}$	107B473M
.068	.220 $\frac{1}{2}$	107B683M
.082	.265 $\frac{1}{2}$	107B823M
.1	.265 $\frac{1}{2}$	107B104M
.12	.300 $\frac{3}{4}$	107B124M
.15	.330 $\frac{3}{4}$	107B154M
.22	.350 $\frac{15}{16}$	107B224M
.27	.350 $\frac{15}{16}$	107B274M
.33	.385 $\frac{15}{16}$	107B334M
.39	.415 $\frac{15}{16}$	107B394M
.47	.450 $\frac{15}{16}$	107B474M
.56	.490 $\frac{15}{16}$	107B564M
.68	.540 $\frac{15}{16}$	107B684M
.82	.570 $\frac{15}{16}$	107B824M
1.	.590 $\frac{15}{16}$	107B105M
1.5	.670 $\frac{15}{16}$	107B155M
1.8	.730 $\frac{15}{16}$	107B185M
2.0	.700 $\frac{1}{2}$	107B205M
200 VOLTS DC WORKING		
.001	.138 $\frac{3}{16}$	107C102M
.0015	.138 $\frac{3}{16}$	107C152M
.0022	.138 $\frac{3}{16}$	107C222M
.0033	.138 $\frac{3}{16}$	107C332M
.0047	.138 $\frac{3}{16}$	107C472M
.0068	.138 $\frac{3}{16}$	107C682M
.0082	.138 $\frac{3}{16}$	107C822M
.01	.158 $\frac{3}{16}$	107C103M
.015	.158 $\frac{3}{16}$	107C153M
.022	.158 $\frac{3}{16}$	107C223M
.027	.158 $\frac{3}{16}$	107C273M
.033	.158 $\frac{3}{16}$	107C333M
.047	.190 $\frac{3}{16}$	107C473M
.068	.220 $\frac{3}{16}$	107C683M
.082	.265 $\frac{3}{16}$	107C823M
.1	.265 $\frac{3}{16}$	107C104M
.12	.285 $\frac{1}{2}$	107C124M
.15	.315 $\frac{1}{2}$	107C154M
.22	.325 $\frac{15}{16}$	107C224M
.27	.330 $\frac{15}{16}$	107C274M
.33	.360 $\frac{15}{16}$	107C334M
.39	.395 $\frac{15}{16}$	107C394M
.47	.430 $\frac{15}{16}$	107C474M
.56	.465 $\frac{15}{16}$	107C564M
.68	.510 $\frac{15}{16}$	107C684M
.82	.580 $\frac{15}{16}$	107C824M
1.	.590 $\frac{15}{16}$	107C105M
1.5	.680 $\frac{15}{16}$	107C155M
1.8	.740 $\frac{15}{16}$	107C185M
2.0	.750 $\frac{15}{16}$	107C205M
400 VOLTS DC WORKING		
.001	.156 $\frac{5}{16}$	107E102M
.0015	.156 $\frac{5}{16}$	107E152M
.0022	.156 $\frac{5}{16}$	107E222M
.0033	.156 $\frac{5}{16}$	107E332M
.0047	.187 $\frac{5}{16}$	107E472M
.0068	.218 $\frac{5}{16}$	107E682M
.0082	.234 $\frac{5}{16}$	107E822M
.01	.250 $\frac{5}{16}$	107E103M
.015	.296 $\frac{5}{16}$	107E153M
.022	.312 $\frac{3}{4}$	107E223M
.027	.281 $\frac{7}{8}$	107E273M
.033	.312 $\frac{7}{8}$	107E333M
.047	.343 $\frac{7}{8}$	107E473M
.068	.375 1	107E683M
.082	.406 1	107E823M
.1	.421 1	107E104M
.12	.468 1 $\frac{1}{4}$	107E124M
.15	.468 1 $\frac{1}{4}$	107E154M
.22	.546 1 $\frac{3}{8}$	107E224M
.27	.609 1 $\frac{3}{8}$	107E274M
.33	.593 1 $\frac{5}{8}$	107E334M
.39	.625 1 $\frac{5}{8}$	107E394M
.47	.671 1 $\frac{5}{8}$	107E474M
.56	.718 1 $\frac{3}{4}$	107E564M
.68	.796 1 $\frac{3}{4}$	107E684M
.82	.812 1 $\frac{7}{8}$	107E824M
1.	.812 2	107E105M
1.5	.921 2 $\frac{1}{4}$	107E155M
1.8	1.015 2 $\frac{1}{4}$	107E185M
2.0	1.093 2 $\frac{1}{4}$	107E205M

Special capacitance values, tolerances and sizes are available on request.


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

POLYSTYRENE CAPACITORS

POLYSTYRENE CAPACITORS

**EXTENDED FOIL
FILM WRAP/EPOXY END-FILL
STYLE 133
-55°C TO +85°C**

ELECTRICAL AND ENVIRONMENTAL CHARACTERISTICS

CAPACITANCE MEASUREMENTS

 Capacitors of 1.0 μ F or less shall be measured at a frequency of 1000 Hz.

 Capacitors greater than 1.0 μ F shall be measured at 60 Hz.

The standard capacitance tolerance is 20%. Other tolerances are available upon request.

Reference: MIL-STD-202, Method 305.

TEMPERATURE CHARACTERISTICS AND STABILITY

 When measured over the full operating range, the Temperature Coefficient shall be $-120\text{ppm}/^\circ\text{C} \pm 30\text{ppm}/^\circ\text{C}$.

 There shall be less than 0.1% change per year in capacitance when operated between $+20^\circ\text{C}$ and $+50^\circ\text{C}$.

 After cycling from -55°C to $+75^\circ\text{C}$, the capacitance shall not vary more than 0.2% from its initial measurement at $+25^\circ\text{C}$.

DISSIPATION FACTOR

 When measured as specified in Paragraph 1, the dissipation factor at $+25^\circ\text{C}$ shall not exceed 0.1%.

INSULATION RESISTANCE

 When measured at $+25^\circ\text{C}$, and rated voltage (or 500 VDC, whichever is less), the insulation resistance shall be a minimum of 200,000 megohm-microfarads, but need not exceed 500,000 megohms. The period of electrification shall not exceed two minutes.

Reference: MIL-STD-202, Method 302.

VOLTAGE DERATING

 The capacitors may be operated at full rated voltage from -55°C to $+65^\circ\text{C}$, or with linear derating to 60% of rated voltage above $+65^\circ\text{C}$ to the maximum operating temperature of $+85^\circ\text{C}$.

VOLTAGE TEST

 When tested at $+25^\circ\text{C}$, the capacitors shall withstand the indicated DC test voltages for a period of one minute:

Terminal to terminal	200% of DC rating
Terminal to case (less than .235 diameter)	200% of DC rating
Terminal to case (greater than .235 diameter)	400% of DC rating or 2,000 VDC, whichever is less

Reference: MIL-STD-202, Method 301.

LIFE TESTING

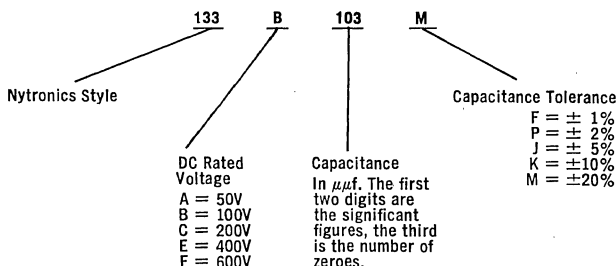
 When tested at 85°C for 250 hours at full 65°C rated voltage, the capacitors shall exhibit no more than one failure in twelve pieces tested. A failure is defined as:

- A capacitance change of more than 6% of its initial value;
- A dissipation factor greater than that specified in Paragraph 3;
- An insulation resistance less than 60% that specified in Paragraph 4; or
- A permanent open or short.

VIBRATION

The capacitors will meet or exceed the vibration requirements of MIL-STD-202, Method 201.

NYTRONICS CATALOG NUMBERING SYSTEM



Note: Special capacitance values, voltage ratings and sizes available to customer requirement.

Intermediate value available.

STANDARD RATINGS AT 85°C

50 VOLTS DC WORKING

Capacitance MFD	Diameter	Length	Cat. No.
.001	.218	.625	133A102M
.0015	.218	.625	133A152M
.0022	.218	.625	133A222M
.0033	.218	.625	133A332M
.0039	.218	.625	133A392M
.0047	.218	.625	133A472M
.0068	.218	.625	133A682M
.0082	.218	.625	133A822M
.01	.218	.625	133A103M
.015	.260	.625	133A153M
.022	.260	.750	133A223M
.027	.290	.750	133A273M
.033	.325	.750	133A333M
.039	.350	.812	133A393M
.047	.375	.812	133A473M
.068	.390	.937	133A683M
.082	.420	.937	133A823M
.1	.420	.937	133A104M
.12	.460	1.000	133A124M
.15	.460	1.125	133A154M
.18	.500	1.125	133A184M
.22	.600	1.125	133A224M
.27	.655	1.437	133A274M
.39	.703	1.437	133A394M
.47	.734	1.562	133A474M

100 VOLTS DC WORKING

Capacitance μ f	Diameter	Length	Cat. No.
.001	.218	.750	133B102M
.0015	.218	.750	133B152M
.0022	.218	.750	133B222M
.0033	.218	.750	133B332M
.0039	.218	.750	133B392M
.0047	.218	.750	133B472M
.0068	.234	.750	133B682M
.0082	.234	.750	133B822M
.01	.296	.750	133B103M
.012	.296	.750	133B123M
.015	.296	.750	133B153M
.022	.318	.875	133B223M
.027	.328	.875	133B273M
.033	.343	.875	133B333M
.039	.359	.875	133B393M
.047	.375	.875	133B473M
.068	.406	1.000	133B683M
.082	.460	1.000	133B823M
.1	.460	1.000	133B104M
.15	.460	1.125	133B154M
.18	.500	1.125	133B184M
.22	.600	1.125	133B224M
.27	.655	1.437	133B274M
.39	.703	1.437	133B394M
.47	.734	1.562	133B474M

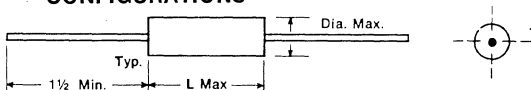
200 VOLTS DC WORKING

Capacitance μ f	Diameter	Length	Cat. No.
.001	.218	.750	133C102M
.0015	.218	.750	133C152M
.0022	.218	.750	133C222M
.0033	.218	.750	133C332M
.0039	.218	.750	133C392M
.0047	.218	.750	133C472M
.0068	.234	.750	133C682M
.0082	.234	.750	133C822M
.01	.296	1.000	133C103M
.012	.296	1.000	133C123M
.015	.296	1.000	133C153M
.022	.318	1.000	133C223M
.027	.375	1.000	133C273M
.033	.375	1.000	133C333M
.039	.437	1.125	133C393M
.047	.437	1.125	133C473M
.068	.500	1.125	133C683M
.082	.562	1.375	133C823M
.1	.500	1.375	133C104M
.15	.625	1.375	133C154M
.18	.687	1.375	133C184M
.22	.687	1.812	133C224M
.27	.687	1.812	133C274M
.39	.875	1.812	133C394M
.47	1.000	1.812	133C474M

400 VOLTS DC WORKING

Capacitance μ f	Diameter	Length	Cat. No.
.001	.218	.750	133E102M
.0015	.218	.750	133E152M
.0022	.218	.750	133E222M
.0033	.218	.750	133E332M
.0039	.218	.750	133E392M
.0047	.218	.750	133E472M
.0068	.234	.750	133E682M
.0082	.234	.750	133E822M
.01	.320	1.000	133E103M
.012	.320	1.000	133E123M
.015	.400	1.000	133E153M
.022	.400	1.000	133E223M
.027	.450	1.125	133E273M
.033	.450	1.125	133E333M
.039	.515	1.125	133E393M
.047	.515	1.125	133E473M
.068	.562	1.125	133E683M
.082	.562	1.375	133E823M
.1	.640	1.375	133E104M
.15	.640	1.812	133E154M
.18	.700	1.812	133E184M
.22	.750	1.812	133E224M
.27	.750	1.812	133E274M
.39	1.000	1.812	133E474M
.47	1.000	1.812	133E474M

CONFIGURATIONS



LEAD WIRE SIZE

No. 22 AWG. (.025) for cases up to .325 Dia.

No. 20 AWG. (.032) for cases .326 thru 1.0 Dia.

No. 18 AWG. (.040) for cases above 1.0 Dia.


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

**CERAMIC TUBE
CAPACITORS/
TYPE CT**
**PAPER DIELECTRIC-OIL IMPREGNATED
U.L. APPROVED FOR "ACROSS-THE-LINE" USE**
GENERAL

Type CT are mineral oil impregnated, paper and foil capacitors, non-inductively wound. The case is of steatite ceramic with epoxy resin endfill.

ELECTRICAL SPECIFICATION

Temperature Range: -40°C to +85°C with full rated voltage applied.

Dielectric Strength at 25°C.: The capacitors will withstand the following test voltage for 5 seconds when applied thru a current limiting resistor of not less than 20 OHMS per volt.

600 VDC and less: 250% of rated voltage.

Greater than 600 VDC: 200% of rated voltage.

Dissipation Factor: The dissipation factor shall not exceed 1% when measured at +25°C. Units shall be measured at 1000 CPS for capacitance of 1. MFD and less, and 60 CPS for capacitance greater than 1. MFD.

Insulation Resistance:

Temperature	Megohms MFD	Megohms Need Not Exceed
25°C	2000	10,000
85°C	20	250

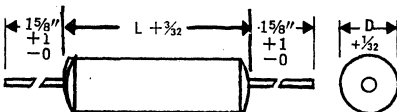
Humidity Test: The capacitor shall withstand continuous exposure at a relative humidity of 95% at a temperature of 40°C. for 250 hours. At the conclusion of the test, after drying in circulating air at room temperature for four hours, the insulation resistance shall not be less than one-third of the value shown in the specifications above.

Life Test: The capacitor shall withstand 150% of rated voltage at 85°C for 250 hours. Not more than one failure in twelve allowed. After life test, the insulation resistance shall not be less than one half of the initial requirements. Power factor shall not exceed 1.5% and the dielectric strength shall be the same as the initial requirements. All measurements at 25°C.

Underwriters' Laboratory Testing: Those capacitors rated .001 to .22 MFD and 400 or 600 WVDC shall meet or exceed the requirements of UL Subject 492 pertaining to antenna coupling, line by-pass and across-the-line components including the "UL Flame Test", "Across-The-Line Discharge Test" and "Expulsion Test". (See Nytronics Yellow Card Approval #E46325, dated 6 March, 1970.)

TINNED COPPERWELD LEADS

Nominal Wire Dia.	Nominal Tube Dia.
#22 AWG (.025)	Thru .374 Dia.
#20 AWG (.032)	.375 thru .717 Dia.
#18 AWG (.040)	.718 & larger Dia.



Contact factory for the following:
1600 VDC
Intermediate values,
Type 177 (solid impregnate)

Smaller size, UL approval for antenna coupling and line-by-pass application.

Nytronics Part No.	Capacitance MFD	Dia.	Length	Nytronics Part No.	Capacitance MFD	Dia.	Length
200 VOLTS DC WORKING							
CT2-D1	.001	.300	.875	CT2-S47	.047	.400	1.187
CT2-D15	.0015	.300	.875	CT2-S68	.068	.467	1.437
CT2-D22	.0022	.300	.875	CT2-S82	.082	.540	1.437
CT2-D33	.0033	.300	.875	CT2-P1	.1	.540	1.437
CT2-D47	.0047	.300	.875	CT2-P12	.12	.548	1.500
CT2-D68	.0068	.300	.875	CT2-P15	.15	.640	1.875
CT2-D82	.0082	.300	.875	CT2-P22	.22	.640	1.875
CT2-S1	.01	.300	.875	CT2-P33	.33	.738	1.875
CT2-S12	.012	.340	.937	CT2-P39	.39	.738	1.875
CT2-S18	.018	.340	.937	CT2-P47	.47	.785	1.875
CT2-S22	.022	.400	1.187	CT2-P56	.56	.875	2.250
CT2-S27	.027	.400	1.187	CT2-P82	.82	.937	2.500
CT2-S33	.033	.400	1.187	CT2-1	1.	.937	2.750

400 VOLTS DC WORKING

CT4-D1	.001	.300	.875	CT4-S47	.047	.540	1.437
CT4-D15	.0015	.300	.875	CT4-S56	.056	.548	1.500
CT4-D18	.0018	.300	.875	CT4-S68	.068	.562	1.625
CT4-D22	.0022	.300	.875	CT4-S82	.082	.562	1.625
CT4-D33	.0033	.300	.875	CT4-P1	.1	.640	1.750
CT4-D47	.0047	.300	.875	CT4-P12	.12	.640	1.875
CT4-D68	.0068	.340	.937	CT4-P15	.15	.738	1.875
CT4-D82	.0082	.375	1.000	CT4-P18	.18	.785	1.875
CT4-S1	.01	.375	1.000	CT4-P22	.22	.812	2.000
CT4-S12	.012	.400	1.187	CT4-P27	.27	.875	2.250
CT4-S15	.015	.400	1.187	CT4-P33	.33	.875	2.250
CT4-S22	.022	.467	1.250	CT4-P39	.39	.937	2.500
CT4-S33	.033	.467	1.250	CT4-P47	.47	.937	2.500
CT4-S39	.039	.540	1.437				

600 VOLTS DC WORKING

CT6-D1	.001	.340	.937	CT6-S47	.047	.540	1.437
CT6-D15	.0015	.340	.937	CT6-S56	.056	.640	1.750
CT6-D22	.0022	.340	.937	CT6-S68	.068	.640	1.750
CT6-D33	.0033	.340	.937	CT6-S82	.082	.640	1.875
CT6-D47	.0047	.340	.937	CT6-P1	.1	.640	1.875
CT6-D68	.0068	.400	1.187	CT6-P12	.12	.738	1.875
CT6-D82	.0082	.400	1.187	CT6-P15	.15	.785	1.875
CT6-S1	.01	.400	1.187	CT6-P18	.18	.785	1.875
CT6-S12	.012	.400	1.187	CT6-P22	.22	.812	2.000
CT6-S15	.015	.400	1.187	CT6-P27	.27	.937	2.500
CT6-S22	.022	.467	1.250	CT6-P33	.33	.937	2.500
CT6-S33	.033	.540	1.437	CT6-P39	.39	.937	2.750
CT6-S39	.039	.540	1.437	CT6-P47	.47	.937	2.750

1000 VOLTS DC WORKING

CT10-D1	.001	.340	.937	CT10-S22	.022	.540	1.437
CT10-D15	.0015	.340	.937	CT10-S25	.025	.548	1.500
CT10-D18	.0018	.340	.937	CT10-S27	.027	.548	1.500
CT10-D22	.0022	.340	.937	CT10-S33	.033	.640	1.750
CT10-D27	.0027	.400	1.187	CT10-S39	.039	.640	1.750
CT10-D33	.0033	.400	1.187	CT10-S47	.047	.640	1.750
CT10-D39	.0039	.400	1.187	CT10-S56	.056	.738	1.875
CT10-D47	.0047	.400	1.187	CT10-S82	.082	.785	1.875
CT10-D68	.0068	.400	1.187	CT10-P1	.1	.785	1.875
CT10-D82	.0082	.400	1.187	CT10-P12	.12	.812	2.125
CT10-S1	.01	.400	1.187	CT10-P15	.15	.812	2.125
CT10-S12	.012	.467	1.250	CT10-P18	.18	.937	2.500
CT10-S15	.015	.467	1.250	CT10-P22	.22	.937	2.500

NYTRONICS CATALOG NUMBERING SYSTEM

CT — Nytronics Type
 2 — Rated Voltage In Hundreds
 2 = 200 VDC
 4 = 400 VDC
 6 = 600 VDC
 10 = 1000 VDC
 16 = 1600 VDC
 P — Capacitance
 D = .001 to .0099 μ F
 S = .01 to .099 μ F
 P = .1 to .99 μ F
 No Letter = 1 μ F or greater
 22 — Capacitance Significant Figures

Example — A Type CT Capacitor rated .22 μ F, 200 WVDC is described by CT2-P22
 A Type CT Capacitor rated .022 μ F, 400 WVDC is described by CT4-S22


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

**TUBULAR
CAPACITORS**
**HIGH VOLTAGE TUBULAR CAPACITORS
DUAL DIELECTRIC/OIL IMPREGNATED
PHENOLIC CASED/EPOXY END FILL/TYPE 161**


TYPE 161

RECOMMENDED APPLICATIONS

Nytronics Type 161 Capacitors are well-suited for use in Oscilloscopes, Electronic Air Cleaners, Power Supplies of industrial devices, and related equipment. The design of these capacitors employs a Paper/Polyester Film Section, oil impregnated, incased in a phenolic tube designed specifically for high voltage application. A unique epoxy endfill process precludes oil seepage which occasionally occurs in similar designs.

TYPICAL RATINGS

CAP/MFD	3000 VDC	5000 VDC	8000 VDC	10,000 VDC
.005	1/2 x 1 1/2	3/8 x 1 7/8	3/4 x 2	3/4 x 2 1/2
.01	5/8 x 1 7/8	3/4 x 1 7/8	3/4 x 2 1/4	7/8 x 2 1/2
.05	3/4 x 2 1/8	1 x 2 1/2	1 x 4 1/4	1 1/2 x 3 1/8

NOTE: Other Ratings can be designed to your specifications.

OPERATING TEMPERATURE

—55°C to +85°C at full rated voltage.

DISSIPATION FACTOR

Will not exceed 1% at 25°C.

MEASUREMENTS

Capacitance up to 1 microfarad are measured at a frequency of 1000 cycles per second and capacitances over 1 microfarad at 60 cps.

DIELECTRIC STRENGTH TEST

Units will withstand a potential of 150% of rated voltage applied for one minute at 25°C.

STANDARD TOLERANCE

±20%. Other tolerances available on request.

STANDARD MARKING

Nytronics, Part No., Capacitance, Voltage, and Date Code.

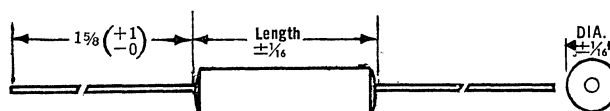
INSULATION RESISTANCE

When measured at the applicable test temperature with an electrification time of two minutes at 500 volts shall be equal to or greater than the values listed below:

Test Temperature	25°C	85°C
Megohms X Microfarads	2000	10
except that the insulation resistance in megohms need not exceed	25000	250

MOISTURE RESISTANCE

These capacitors will meet the moisture resistance requirements of EIA Specification RS-164, which requires units to withstand a 95% Relative Humidity at 40°C, except time of exposure may be increased to 500 hours. After exposure and subsequent drying periods, the insulation resistance will not be less than 1/3 of the initial requirement.



Tinned Copperweld Leads #20 AWG (.032) for sizes to 5/8" Dia.
#18 AWG (.040) for sizes 5/8" Dia. and over.


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

POLYESTER CAPACITORS

METALLIZED POLYESTER CAPACITORS TYPE 188 FILM WRAP / EPOXY END FILL -55°C TO +125°C

Type 188 Capacitors features extremely small size, light weight and self clearing metallized construction which virtually eliminates catastrophic failures. Well suited for Voltage Multiplier Circuits in TV power supplies and Electrostatic copiers. Also ideal for Potting or encapsulating in Electronic Sub assemblies, Power supplies, etc.

CAPACITANCE

Measurements shall be made at 1000 cycles per second for capacitance values thru 1. MFD and at 60 cycles per second for values over 1. MFD.

CAPACITANCE TOLERANCE

Standard capacitance tolerance is $\pm 20\%$ (M). Closer tolerances available upon request.

DISSIPATION FACTOR

The dissipation factor shall not exceed 1% when measured at 25°C. Measurements shall be made at 1000 Hz for capacitance values thru 1. MF and at 60 Hz for higher values.

TEST VOLTAGE

Capacitors shall withstand 200% of rated DC voltage for one minute at 25°, with the charging and discharge current limited to a maximum of 1. Ampere.

OPERATING TEMPERATURES

-55°C to +125°C.

LIFE TEST

Capacitors shall withstand a life test of 250 hours at 125°C, with 140% of the 125°C rated DC voltage applied. A resistance of one ohm per volt of applied voltage shall be inserted in series with the capacitor.

VOLTAGE DERATING

These capacitors will operate as full DC voltage ratings at 85°C. For operation at temperatures above 85°C, see Figure 4.

VIBRATION

Capacitors shall withstand a vibration test per Method 204, Test condition B of MIL-STD-202B as modified by MIL-C-27287. After test, the I.R. will be equal to or greater than 1/3 of the initial requirement.

INSULATION RESISTANCE

Temperature	Megohms x MF	IR Need Not Exceed Megohms
25°C	20,000	50,000
85°C	1,000	5,000
125°C	10	100

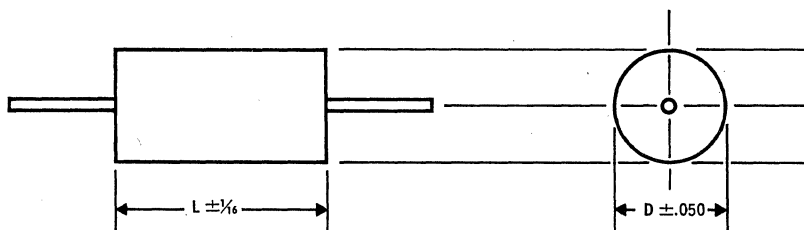
Measurements, shall be made after two minutes charge at rated voltage or 500 VDC, whichever is less.

HUMIDITY TEST

These capacitors shall meet the humidity test requirements of MIL-STD-202 Method, 103B. Test condition B. After testing, the I.R. will be equal to or greater than 1/3 of the initial requirement.

NOMENCLATURE

Case Style	DC Rated Voltage	Capacitance	Capacitance Tolerance
188 - Cylindrical	B = 100 VDC	Expressed in pf, first two digits are significant figures, third digit indicates number of zeroes following first two digits.	M = $\pm 20\%$
189 - Flat Oval	C = 200 VDC		K = $\pm 10\%$
	E = 400 VDC		J = $\pm 5\%$
	F = 600 VDC		



Capacitance	Diameter	Length	Cat. No.
100 VOLTS DC WORKING			
.010	.16	.40	188B103M
.012	.16	.40	188B123M
.015	.16	.40	188B153M
.018	.16	.40	188B183M
.022	.16	.40	188B223M
.027	.16	.40	188B273M
.033	.16	.40	188B333M
.039	.18	.40	188B393M
.047	.20	.40	188B473M
.056	.16	.53	188B563M
.068	.16	.53	188B683M
.082	.17	.53	188B823M
.10	.19	.53	188B104M
.12	.20	.53	188B124M
.15	.19	.65	188B154M
.18	.21	.65	188B184M
.22	.23	.65	188B224M
.27	.25	.65	188B274M
.33	.27	.65	188B334M
.39	.29	.65	188B394M
.47	.26	.78	188B474M
.56	.28	.78	188B564M
.68	.30	.78	188B684M
.82	.33	.78	188B824M
1.0	.36	.78	188B105M
1.2	.34	.97	188B125M
1.5	.37	.97	188B155M
2.0	.42	.97	188B205M
2.5	.42	1.17	188B255M
3.0	.45	1.17	188B305M
3.5	.49	1.17	188B355M
4.0	.52	1.17	188B405M
4.5	.49	1.45	188B455M
5.0	.52	1.45	188B505M

200 VOLTS DC WORKING

Capacitance	Diameter	Length	Cat. No.
.010	.16	.40	188C103M
.012	.17	.40	188C123M
.015	.19	.40	188C153M
.018	.21	.40	188C183M
.022	.16	.53	188C223M
.027	.17	.53	188C273M
.033	.19	.53	188C333M
.039	.20	.53	188C393M
.047	.18	.65	188C473M
.056	.20	.65	188C563M
.068	.21	.65	188C683M
.082	.23	.65	188C823M
.10	.25	.65	188C104M
.12	.27	.65	188C124M
.15	.30	.65	188C154M
.18	.27	.78	188C184M
.22	.30	.78	188C224M
.27	.32	.78	188C274M
.33	.35	.78	188C334M
.39	.33	.97	188C394M
.47	.35	.97	188C474M
.56	.38	.97	188C564M
.68	.42	.97	188C684M
.82	.46	.97	188C824M
1.0	.45	1.17	188C105M
1.2	.49	1.17	188C125M
1.5	.54	1.17	188C155M
2.0	.56	1.45	188C205M
2.5	.61	1.45	188C255M
3.0	.67	1.45	188C305M
3.5	.65	1.68	188C355M
4.0	.69	1.68	188C405M
4.5	.73	1.68	188C455M
5.0	.77	1.68	188C505M

Lead Sizes

.160 dia. — .250 = .020
 .251 dia. — .500 = .025
 .501 dia. & over = .032


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

POLYESTER CAPACITORS

METALLIZED POLYESTER CAPACITORS TYPE 188 FILM WRAP / EPOXY END FILL -55°C TO +125°C (CONT'D)

FIGURE 1
Type 188 and 189
Capacitors
Typical
Capacitance
Change vs.
Temperature

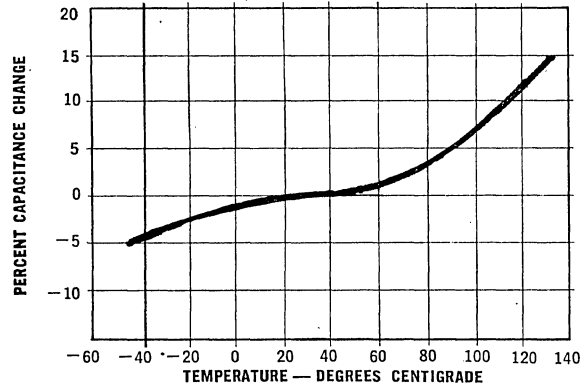


FIGURE 2
Type 188 and 189
Capacitors
Typical
Dissipation Factor
vs. Temperature

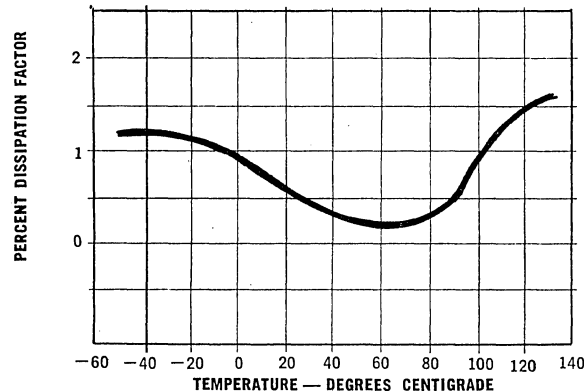


FIGURE 3
Type 188 and 189
Capacitors
Insulation
Resistance vs.
Temperature

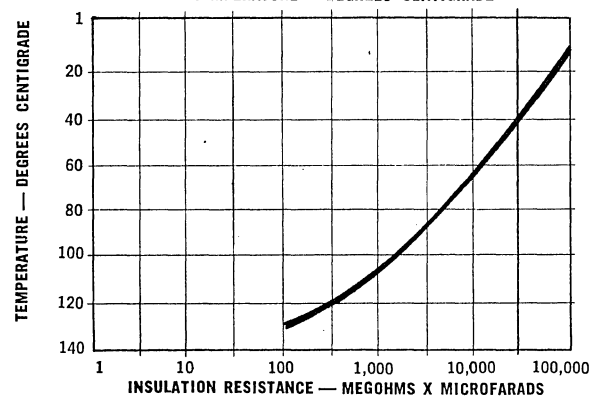
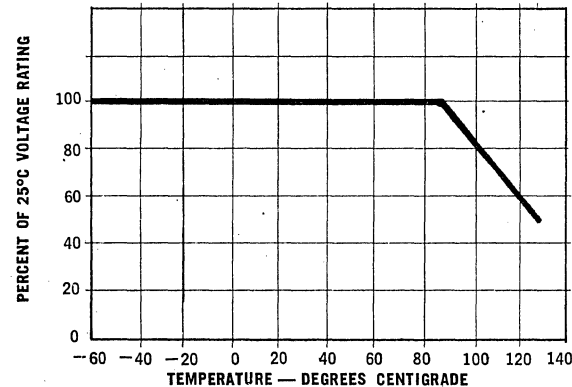


FIGURE 4
Type 188 and 189
Capacitors
Temperature
Derating Chart



Capacitance	Diameter	Length	Cat. No.
-------------	----------	--------	----------

400 VOLTS DC WORKING

.010	.20	.40	188E103M
.012	.16	.53	188E123M
.015	.17	.53	188E153M
.018	.19	.53	188E183M
.022	.20	.53	188E223M
.027	.18	.65	188E273M
.033	.20	.65	188E333M
.039	.21	.65	188E393M
.047	.23	.65	188E473M
.056	.25	.65	188E563M
.068	.27	.65	188E683M
.082	.25	.78	188E823M
.10	.27	.78	188E104M
.12	.29	.78	188E124M
.15	.32	.78	188E154M
.18	.35	.78	188E184M
.22	.33	.97	188E224M
.27	.36	.97	188E274M
.33	.39	.97	188E334M
.39	.42	.97	188E394M
.47	.46	.97	188E474M
.56	.44	1.17	188E564M
.68	.48	1.17	188E684M
.82	.54	1.17	188E824M
1.0	.53	1.45	188E105M
1.2	.57	1.45	188E125M
1.5	.63	1.45	188E155M
2.0	.65	1.68	188E205M
2.5	.73	1.68	188E255M
3.0	.79	1.68	188E305M
3.5	.85	1.68	188E355M
4.0	.78	2.25	188E405M
4.5	.83	2.25	188E455M
5.0	.87	2.25	188E505M

600 VOLTS DC WORKING

.010	.20	.53	188F103M
.012	.18	.65	188F123M
.015	.20	.65	188F153M
.018	.22	.65	188F183M
.022	.23	.65	188F223M
.027	.25	.65	188F273M
.033	.28	.65	188F333M
.039	.26	.78	188F393M
.047	.28	.78	188F473M
.056	.30	.78	188F563M
.068	.32	.78	188F683M
.082	.35	.78	188F823M
.10	.33	.97	188F104M
.12	.35	.97	188F124M
.15	.39	.97	188F154M
.18	.44	.97	188F184M
.22	.42	1.17	188F224M
.27	.45	1.17	188F274M
.33	.50	1.17	188F334M
.39	.55	1.17	188F394M
.47	.54	1.45	188F474M
.56	.58	1.45	188F564M
.68	.63	1.45	188F684M
.82	.63	1.68	188F824M
1.0	.69	1.68	188F105M
1.2	.75	1.68	188F125M
1.5	.84	1.68	188F155M
2.0	.82	2.25	188F205M
2.5	.92	2.25	188F255M
3.0	1.00	2.25	188F305M


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

POLYESTER CAPACITORS

METALLIZED POLYESTER CAPACITORS TYPE 189 FILM WRAP / EPOXY END FILL -55°C TO +125°C

Type 189 Capacitors features extremely small size, light weight and self clearing metallized construction which virtually eliminates catastrophic failures. Well suited for Voltage Multiplier Circuits in TV power supplies and Electrostatic copiers. Also ideal for Potting or encapsulating in Electronic Sub assemblies, Power supplies, etc.

CAPACITANCE

Measurements shall be made at 1000 cycles per second for capacitance values thru 1. MFD and at 60 cycles per second for values over 1. MFD.

CAPACITANCE TOLERANCE

Standard capacitance tolerance is $\pm 20\%$ (M). Closer tolerances available upon request.

DISSIPATION FACTOR

The dissipation factor shall not exceed 1% when measured at 25°C. Measurements shall be made at 1000 Hz for capacitance values thru 1. MF and at 60 Hz for higher values.

TEST VOLTAGE

Capacitors shall withstand 200% of rated DC voltage for one minute at 25°, with the charging and discharge current limited to a maximum of 1. Ampere.

OPERATING TEMPERATURES

-55°C to +125°C.

LIFE TEST

Capacitors shall withstand a life test of 250 hours at 125°C, with 140% of the 125°C rated DC voltage applied. A resistance of one ohm per volt of applied voltage shall be inserted in series with the capacitor.

VOLTAGE DERATING

These capacitors will operate as full DC voltage ratings at 85°C. For operation at temperatures above 85°C, see Figure 4.

VIBRATION

Capacitors shall withstand a vibration test per Method 204, Test condition B of MIL-STD-202B as modified by MIL-C-27287.

INSULATION RESISTANCE

Temperature	Megohms x MF	IR Need Not Exceed Megohms
25°C	20,000	50,000
85°C	1,000	5,000
125°C	10	100

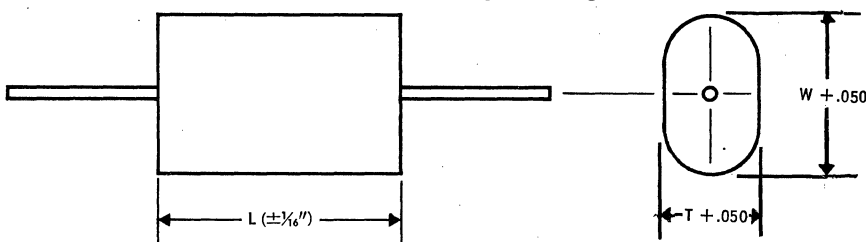
Measurements, shall be made after two minutes charge at rated voltage or 500 VDC, whichever is less.

HUMIDITY TEST

These capacitors shall meet the humidity test requirements of MIL-STD-202 Method, 103B, Test condition B. After testing, the I.R. will be equal to or greater than $\frac{1}{3}$ of the initial requirement.

NOMENCLATURE

Case Style	DC Rated Voltage	Capacitance	Capacitance Tolerance
188 - Cylindrical	B = 100 VDC	Expressed in pf, first two digits are significant figures, third digit indicates number of zeroes following first two digits.	M = $\pm 20\%$ K = $\pm 10\%$ J = $\pm 5\%$
189 - Flat Oval	C = 200 VDC E = 400 VDC F = 600 VDC		



Capacitance	Thickness	Width	Length	Cat. No.
100 VOLTS DC WORKING				
.010	.10	.20	.40	189B103M
.012	.10	.20	.40	189B123M
.015	.10	.20	.40	189B153M
.018	.10	.20	.40	189B183M
.022	.10	.20	.40	189B223M
.027	.10	.20	.40	189B273M
.033	.10	.20	.40	189B333M
.039	.10	.20	.40	189B393M
.047	.10	.22	.40	189B473M
.056	.11	.24	.40	189B563M
.068	.10	.20	.53	189B683M
.082	.10	.20	.53	189B823M
.10	.10	.20	.53	189B104M
.12	.10	.23	.53	189B124M
.15	.12	.25	.53	189B154M
.18	.14	.27	.53	189B184M
.22	.17	.30	.53	189B224M
.27	.19	.32	.53	189B274M
.33	.21	.34	.53	189B334M
.39	.24	.37	.53	189B394M
.47	.21	.34	.65	189B474M
.56	.23	.36	.65	189B564M
.68	.27	.40	.65	189B684M
.82	.24	.37	.78	189B824M
1.0	.26	.42	.78	189B105M
1.2	.29	.45	.78	189B125M
1.5	.33	.49	.78	189B155M
2.0	.32	.48	.97	189B205M
2.5	.36	.52	.97	189B255M
3.0	.35	.51	1.17	189B305M
3.5	.38	.54	1.17	189B355M
4.0	.41	.57	1.17	189B405M
4.5	.44	.60	1.17	189B455M
5.0	.47	.63	1.17	189B505M
6.0	.52	.68	1.17	189B605M
8.0	.46	.62	1.68	189B805M
10.0	.53	.69	1.68	189B106M

200 VOLTS DC WORKING

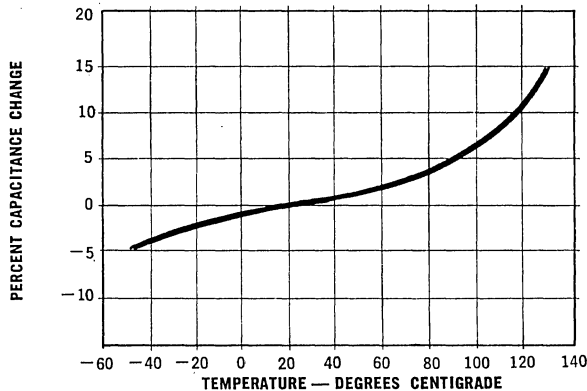
Capacitance	Thickness	Width	Length	Cat. No.
.010	.10	.20	.40	189C103M
.012	.10	.20	.40	189C123M
.015	.10	.20	.40	189C153M
.018	.10	.20	.40	189C183M
.022	.13	.26	.40	189C223M
.027	.10	.20	.53	189C273M
.033	.12	.22	.53	189C333M
.039	.12	.25	.53	189C393M
.047	.13	.26	.53	189C473M
.056	.14	.27	.53	189C563M
.068	.16	.29	.53	189C683M
.082	.18	.31	.53	189C823M
.10	.20	.33	.53	189C104M
.12	.22	.35	.53	189C124M
.15	.26	.39	.53	189C154M
.18	.24	.37	.65	189C184M
.22	.26	.39	.65	189C224M
.27	.24	.37	.78	189C274M
.33	.27	.40	.78	189C334M
.39	.30	.43	.78	189C394M
.47	.33	.46	.78	189C474M
.56	.37	.50	.78	189C564M
.68	.32	.48	.97	189C684M
.82	.35	.51	.97	189C824M
1.0	.35	.51	1.17	189C105M
1.2	.38	.54	1.17	189C125M
1.5	.43	.59	1.17	189C155M
2.0	.52	.68	1.17	189C205M
2.5	.46	.62	1.68	189C255M
3.0	.49	.65	1.68	189C305M
3.5	.54	.70	1.68	189C355M
4.0	.58	.74	1.68	189C405M
4.5	.62	.78	1.68	189C455M
5.0	.64	.84	1.68	189C505M
6.0	.70	.90	1.68	189C605M
8.0	.84	1.04	1.68	189C805M
10.0	.75	.95	2.25	189C106M

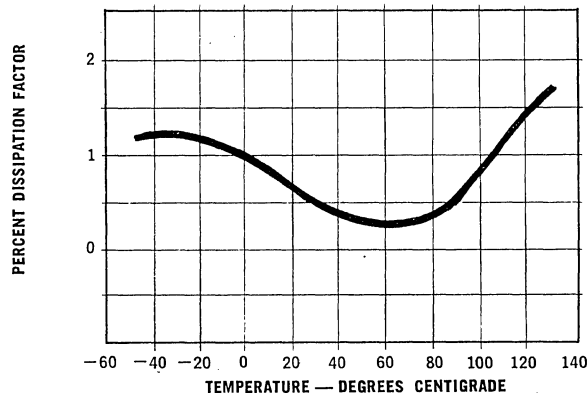
Lead Sizes	Nom. Body Length	Lead Dia.
Thru .530		.020
.650 thru .970		.025
Above .970		.032

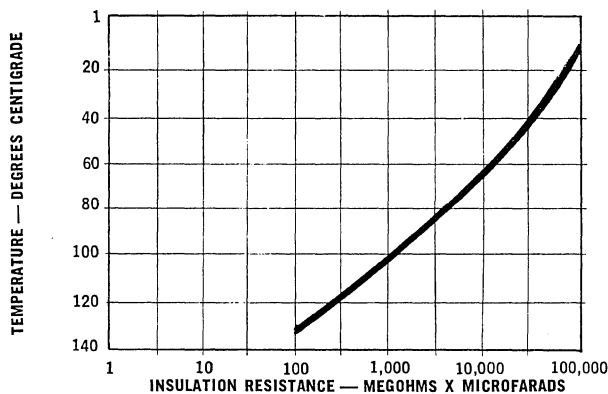

Nytronics Components Group Inc.

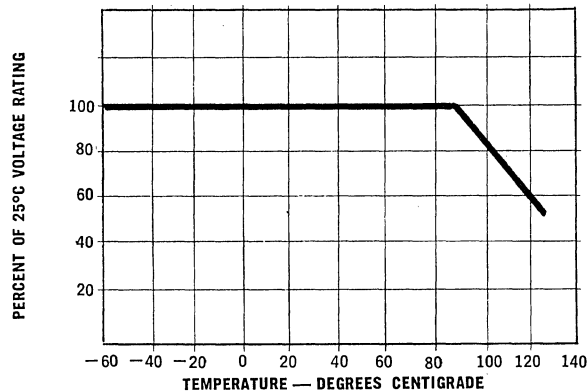
 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

**POLYESTER
CAPACITORS**
**METALLIZED POLYESTER CAPACITORS TYPE 189 FILM WRAP /
EPOXY END FILL -55°C TO +125°C (CONT'D)**
FIGURE 1

 Type 188 and 189
 Capacitors
 Typical
 Capacitance
 Change vs.
 Temperature

FIGURE 2

 Type 188 and 189
 Capacitors
 Typical
 Dissipation Factor
 vs. Temperature

FIGURE 3

 Type 188 and 189
 Capacitors
 Typical
 Insulation
 Resistance vs.
 Temperature

FIGURE 4

 Type 188 and 189
 Capacitors
 Temperature
 Derating Chart


Capaci- tance	Thickness	Width	Length	Cat. No.
------------------	-----------	-------	--------	----------

400 VOLTS DC WORKING

.010	.14	.24	.40	189E103M
.012	.10	.23	.53	189E123M
.015	.11	.21	.53	189E153M
.018	.12	.22	.53	189E183M
.022	.12	.25	.53	189E223M
.027	.13	.26	.53	189E273M
.033	.15	.28	.53	189E333M
.039	.17	.30	.53	189E393M
.047	.19	.32	.53	189E473M
.056	.21	.34	.53	189E563M
.068	.23	.36	.53	189E683M
.082	.26	.39	.53	189E823M
.10	.23	.36	.65	189E104M
.12	.25	.38	.65	189E124M
.15	.24	.37	.78	189E154M
.18	.26	.39	.78	189E184M
.22	.30	.43	.78	189E224M
.27	.33	.46	.78	189E274M
.33	.36	.52	.78	189E334M
.39	.33	.49	.97	189E394M
.47	.33	.53	.97	189E474M
.56	.34	.50	1.17	189E564M
.68	.38	.54	1.17	189E684M
.82	.43	.59	1.17	189E824M
1.0	.48	.64	1.17	189E105M
1.2	.54	.70	1.17	189E125M
1.5	.46	.62	1.68	189E155M
2.0	.54	.70	1.68	189E205M
2.5	.60	.80	1.68	189E255M
3.0	.67	.87	1.68	189E305M
3.5	.73	.93	1.68	189E355M
4.0	.78	.98	1.68	189E405M
4.5	.69	.89	2.25	189E455M
5.0	.75	.95	2.25	189E505M

600 VOLTS DC WORKING

.010	.12	.25	.53	189F103M
.012	.13	.26	.53	189F123M
.015	.15	.28	.53	189F153M
.018	.17	.30	.53	189F183M
.022	.19	.32	.53	189F223M
.027	.21	.34	.53	189F273M
.033	.24	.37	.53	189F333M
.039	.21	.34	.65	189F393M
.047	.24	.37	.65	189F473M
.056	.22	.35	.78	189F563M
.068	.25	.38	.78	189F683M
.082	.27	.40	.78	189F823M
.10	.30	.43	.78	189F104M
.12	.32	.48	.78	189F124M
.15	.36	.52	.78	189F154M
.18	.33	.49	.97	189F184M
.22	.37	.53	.97	189F224M
.27	.36	.52	1.17	189F274M
.33	.40	.56	1.17	189F334M
.39	.44	.60	1.17	189F394M
.47	.49	.65	1.17	189F474M
.56	.41	.57	1.68	189F564M
.68	.45	.61	1.68	189F684M
.82	.51	.67	1.68	189F824M
1.0	.58	.74	1.68	189F105M
1.2	.64	.80	1.68	189F125M
1.5	.73	.89	1.68	189F155M
2.0	.69	.89	2.25	189F205M
2.5	.80	1.00	2.25	189F225M
3.0	.87	1.07	2.25	189F305M

INTERMEDIATE VALUES AVAILABLE.


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

METALLIZED PAPER/MYLAR* CAPACITORS HERMETICALLY SEALED TYPE 230



ELECTRICAL AND ENVIRONMENTAL CHARACTERISTICS

1. CAPACITANCE MEASUREMENTS

 Capacitors of 1.0 μ F or less shall be measured at a frequency of 1000 Hz. Capacitors greater than 1.0 μ F measured at 60 Hz.

The standard capacitance tolerance is 20%. Other tolerances are available upon request.

Reference: MIL-STD-202, Method 305.

2. TEMPERATURE CHARACTERISTICS

The maximum change in capacitance from the measured value at +25°C shall be as follows:

Characteristic: N — Temperature: -55°C — Max. Change: -15%.

3. DISSIPATION FACTOR

When measured as specified in Paragraph 1, the dissipation factor at +25°C shall not exceed 1.0%.

4. INSULATION RESISTANCE

When measured at 25°C, and rated voltage (or 500 VDC, whichever is less), the insulation resistance shall be as follows:

Characteristic: N — Megohms x Microfarads: 2,000 — Need Not Exceed (Megohms): 12,000:

Reference: MIL-STD-202, Method 302.

5. VOLTAGE DERATING

The capacitors may be operated at full rated voltage from -55°C to +125°C.

6. VOLTAGE TEST

When tested at +25°C, the capacitors shall withstand the indicated DC test voltages for a period of one minute:

Terminal to terminal 200% of DC rating

Terminal to case (where case is not a terminal) 200% of DC rating

Reference: MIL-STD-202, Method 301.

7. LIFE TESTING

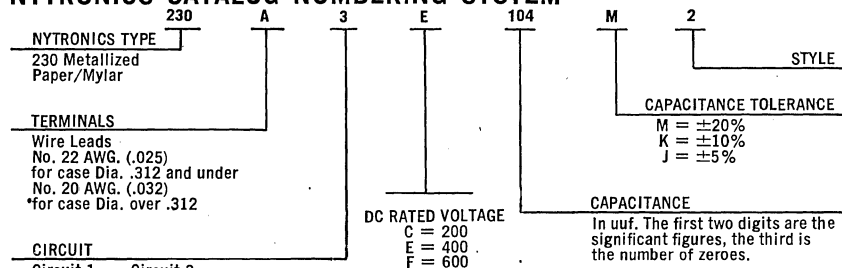
When tested for 1000 hours at 140% of the full rated voltage for the test temperature, the capacitors shall exhibit no more than one failure in twelve pieces tested. A failure is defined as:

- A capacitance change of more than 10% of its initial value;
- A dissipation factor greater than that specified in Paragraph 3;
- An insulation resistance less than $\frac{1}{3}$ that specified in Paragraph 4; or
- A permanent open or short.

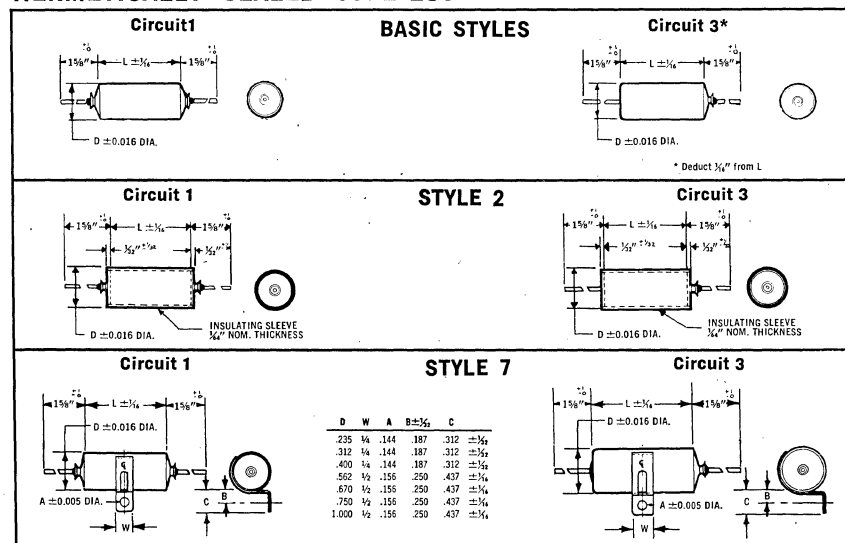
8. VIBRATION

The capacitors will meet or exceed the vibration requirements of MIL-STD-202, Method 204, Condition B.

NYTRONICS CATALOG NUMBERING SYSTEM



METALLIZED DIELECTRIC CAPACITORS HERMETICALLY SEALED TYPE 230



METALLIZED PAPER/ MYLAR* CAPACITORS

TYPE 230 METALLIZED PAPER/ MYLAR OPERATION TEMP. AT -55°C TO +125°C

Nytronics Part Number	Capacitance μ F	Dia. $\pm \frac{1}{32}$	Length $\pm \frac{1}{16}$
200 VOLTS DC WORKING			
230A1C103M	.01	.175	$\frac{3}{4}$
230A1C123M	.012	.195	$\frac{3}{4}$
230A1C153M	.015	.195	$\frac{3}{4}$
230A1C183M	.018	.235	$\frac{3}{4}$
230A1C223M	.022	.235	$\frac{3}{4}$
230A1C273M	.027	.235	$\frac{3}{4}$
230A1C333M	.033	.235	$\frac{3}{4}$
230A1C393M	.039	.312	$\frac{29}{32}$
230A1C473M	.047	.312	$\frac{29}{32}$
230A1C563M	.056	.312	$\frac{29}{32}$
230A1C683M	.068	.312	$\frac{29}{32}$
230A1C823M	.082	.312	$\frac{29}{32}$
230A1C104M	† .1	.312	$\frac{11}{8}$
230A1C124M	.12	.312	$\frac{11}{8}$
230A1C154M	.15	.312	$\frac{11}{8}$
230A1C184M	.18	.312	$\frac{11}{8}$
230A1C224M	† .22	.312	$\frac{11}{8}$
230A1C274M	.27	.400	$\frac{11}{8}$
230A1C334M	.33	.400	$\frac{11}{8}$
230A1C394M	.39	.400	$\frac{11}{8}$
230A1C474M	† .47	.400	$\frac{11}{8}$
230A1C564M	.56	.500	$\frac{11}{8}$
230A1C684M	.68	.500	$\frac{11}{8}$
230A1C824M	.82	.562	$\frac{11}{8}$
230A1C105M	† 1.	.562	$\frac{11}{8}$
230A1C155M	† 1.5	.562	$\frac{129}{32}$
230A1C205M	2.	.562	$\frac{129}{32}$
230A1C225M	† 2.2	.562	$\frac{129}{32}$
230A1C335M	† 3.3	.670	$\frac{17}{8}$
230A1C475M	† 4.7	1.000	$\frac{17}{8}$
230A1C685M	† 6.8	1.000	$\frac{17}{8}$
230A1C106M	† 10.	1.000	$\frac{23}{8}$
230A1C126M	† 12.	1.000	$\frac{23}{8}$

400 VOLTS DC WORKING

230A1E103M	.01	.312	$\frac{13}{16}$
230A1E123M	.012	.312	$\frac{13}{16}$
230A1E153M	.015	.312	$\frac{13}{16}$
230A1E183M	.018	.312	$\frac{13}{16}$
230A1E223M	.022	.312	$\frac{13}{16}$
230A1E273M	.027	.312	$\frac{11}{8}$
230A1E333M	.033	.312	$\frac{11}{8}$
230A1E393M	.039	.312	$\frac{11}{8}$
230A1E473M	† .047	.312	$\frac{11}{8}$
230A1E563M	.056	.400	$\frac{11}{8}$
230A1E683M	.068	.400	$\frac{11}{8}$
230A1E823M	.082	.400	$\frac{11}{8}$
230A1E104M	† .1	.400	$\frac{11}{8}$
230A1E124M	.12	.500	$\frac{11}{8}$
230A1E154M	.15	.500	$\frac{11}{8}$
230A1E184M	.18	.562	$\frac{11}{8}$
230A1E224M	† .22	.562	$\frac{11}{8}$
230A1E274M	.27	.562	$\frac{11}{8}$
230A1E334M	.33	.562	$\frac{11}{8}$
230A1E394M	.39	.562	$\frac{11}{8}$
230A1E474M	† .47	.562	$\frac{11}{8}$
230A1E564M	.56	.670	$\frac{17}{8}$
230A1E684M	.68	.670	$\frac{17}{8}$
230A1E824M	.82	.750	$\frac{17}{8}$
230A1E105M	† 1.	.750	$\frac{17}{8}$
230A1E155M	1.5	1.000	$\frac{17}{8}$
230A1E205M	2.	1.000	$\frac{17}{8}$
230A1E225M	† 2.2	1.000	$\frac{17}{8}$
230A1E335M	† 3.3	1.000	$\frac{23}{8}$

600 VOLTS DC WORKING

230A1F103M	† .01	.312	$\frac{13}{16}$
230A1F123M	.012	.312	$\frac{13}{16}$
230A1F153M	.015	.312	$\frac{13}{16}$
230A1F183M	.018	.312	$\frac{13}{16}$
230A1F223M	† .022	.312	$\frac{13}{16}$
230A1F273M	.027	.312	$\frac{11}{8}$
230A1F333M	.033	.312	$\frac{11}{8}$
230A1F393M	.039	.400	$\frac{11}{8}$
230A1F473M	† .047	.400	$\frac{11}{8}$
230A1F563M	.056	.400	$\frac{11}{8}$
230A1F683M	.068	.400	$\frac{11}{8}$
230A1F823M	.082	.500	$\frac{11}{8}$
230A1F104M	† .1	.500	$\frac{11}{8}$
230A1F124M	.12	.562	$\frac{11}{8}$
230A1F154M	.15	.562	$\frac{11}{8}$
230A1F184M	.18	.562	$\frac{13}{8}$
230A1F224M	† .22	.562	$\frac{13}{8}$
230A1F274M	.27	.562	$\frac{11}{8}$
230A1F334M	.33	.652	$\frac{13}{8}$
230A1F394M	.39	.670	$\frac{13}{8}$
230A1F474M	† .47	.670	$\frac{13}{8}$
230A1F564M	.56	.670	$\frac{17}{8}$
230A1F684M	.68	.670	$\frac{17}{8}$
230A1F824M	.82	1.000	$\frac{17}{8}$
230A1F105M	† 1.	1.000	$\frac{17}{8}$
230A1F155M	† 1.5	1.000	$\frac{17}{8}$
230A1F205M	2.	1.000	$\frac{21}{8}$
230A1F225M	† 2.2	1.000	$\frac{23}{8}$

† Denotes MIL Values

* DuPont TM


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

POLYSTYRENE FILM CAPACITORS HERMETICALLY SEALED TYPE 231 -65°C to +85°C



ELECTRICAL AND ENVIRONMENTAL CHARACTERISTICS

1. CAPACITANCE MEASUREMENTS

Capacitors of 1.0 μ F or less shall be measured at a frequency of 1000 Hz. Capacitors greater than 1.0 μ F measured at 60 Hz.
Tolerances of $\pm 20\%$, $\pm 10\%$, $\pm 5\%$, $\pm 2\%$, $\pm 1\%$ are standard. Tolerances closer than $\pm 1\%$ are available upon request.

Reference: MIL-STD-202, Method 305.

2. TEMPERATURE/CHARACTERISTICS AND STABILITY

When measured over the full operating range, the Temperature Coefficient shall be -120 ppm/ $^{\circ}$ C ± 30 ppm/ $^{\circ}$ C.

There shall be less than 0.1% change per year in capacitance when operated between $+20^{\circ}$ C and $+50^{\circ}$ C. When cycled from -55° C to $+75^{\circ}$ C, the capacitance shall not vary more than 0.2% from its initial measurement.

3. DISSIPATION FACTOR

When measured as specified in Paragraph 1, the dissipation factor at $+25^{\circ}$ C shall not exceed 0.1%.

4. INSULATION RESISTANCE

When measured at $+25^{\circ}$ C, and rated voltage (or 500 VDC, whichever is less), the insulation resistance shall be a minimum of 200,000 megohm-microfarads, but need not exceed 500,000 megohms. The period of electrification shall not exceed two minutes.

Reference: MIL-STD-202, Method 302.

5. VOLTAGE DERATING

The capacitors may be operated at full rated voltage from -55° C to $+85^{\circ}$ C.

6. VOLTAGE TEST

When tested at $+25^{\circ}$ C, the capacitors shall withstand the indicated DC test voltages for a period of one minute:

Terminal to terminal 200% of DC rating
Terminal to case 200% of DC rating
Reference: MIL-STD-202, Method 301.

7. LIFE TESTING

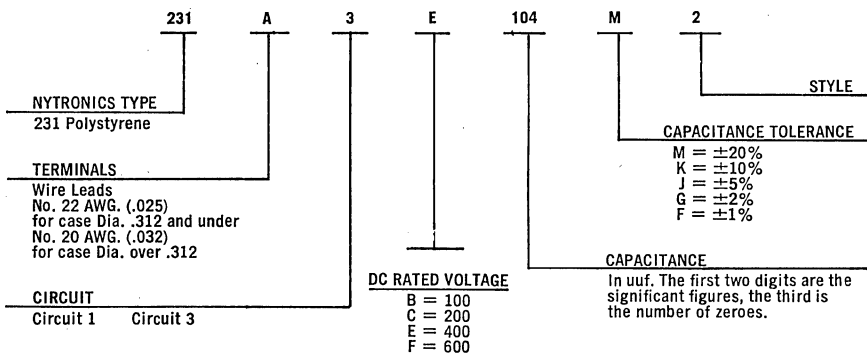
When tested at 85° C for 250 hours at 140% of the rated voltage, the capacitors shall exhibit no more than one failure in twelve pieces tested. A failure is defined as:

- A capacitance change of more than 6% of its initial value;
- A dissipation factor greater than that specified in Paragraph 3;
- An insulation resistance less than 60% that specified in Paragraph 4; or
- A permanent open or short.

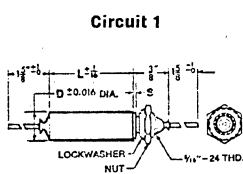
8. VIBRATION

The capacitors will meet or exceed the vibration requirements of MIL-STD-202, METHOD 201.

NYTRONICS CATALOG NUMBERING SYSTEM

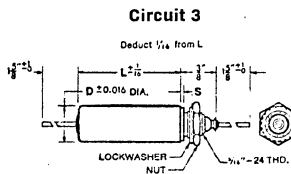


CONFIGURATIONS



STYLE 3

D	S
.400	.020
.562	.031
and up	
Minimum D=.400"	



CONFIGURATIONS ALSO AVAILABLE BASIC STYLE / STYLE 2
STYLE 7 — SEE METALLIZED PAPER/MYLAR CAPACITORS ON
PREVIOUS PAGE.

POLYSTYRENE FILM CAPACITORS

STANDARD RATINGS

Nytronics Part No. Capacitance μ F Dia. $\pm .016$ Length $\pm .04$

100 VOLTS DC WORKING

231A1B822K	.0082	.235	1 $\frac{1}{2}$ "
231A1B103K	.01	.235	1 $\frac{1}{2}$ "
231A1B123K	.012	.235	1 $\frac{1}{2}$ "
231A1B153K	.015	.235	1 $\frac{1}{2}$ "
231A1B183K	.018	.312	1 $\frac{1}{2}$ "
231A1B223K	.022	.312	1 $\frac{1}{2}$ "
231A1B273K	.027	.312	1 $\frac{1}{2}$ "
231A1B333K	.033	.312	1 $\frac{1}{2}$ "
231A1B393K	.039	.312	1 $\frac{1}{2}$ "
231A1B473K	.047	.400	1 $\frac{1}{2}$ "
231A1B563K	.056	.400	1 $\frac{1}{2}$ "
231A1B683K	.068	.400	1 $\frac{1}{2}$ "
231A1B823K	.082	.562	1 $\frac{1}{2}$ "
231A1B104K	.10	.562	1 $\frac{1}{2}$ "
231A1B124K	.12	.562	1 $\frac{1}{2}$ "
231A1B154K	.15	.562	1 $\frac{1}{2}$ "
231A1B184K	.18	.562	1 $\frac{1}{2}$ "
231A1B224K	.22	.562	1 $\frac{1}{2}$ "
231A1B274K	.27	.670	1 $\frac{1}{2}$ "
231A1B334K	.33	.670	1 $\frac{1}{2}$ "
231A1B394K	.39	.670	1 $\frac{1}{2}$ "
231A1B474K	.47	.670	1 $\frac{1}{2}$ "
231A1B564K	.56	.670	1 $\frac{1}{2}$ "
231A1B684K	.68	.750	1 $\frac{1}{2}$ "
231A1B824K	.82	1.000	1 $\frac{1}{2}$ "
231A1B105K	1.0	1.000	1 $\frac{1}{2}$ "
231A1B125K	1.2	1.000	1 $\frac{1}{2}$ "

200 VOLTS DC WORKING

231A1C472K	.0047	.235	1 $\frac{1}{2}$ "
231A1C562K	.0056	.235	1 $\frac{1}{2}$ "
231A1C682K	.0068	.235	1 $\frac{1}{2}$ "
231A1C822K	.0082	.312	1 $\frac{1}{2}$ "
231A1C103K	.01	.312	1 $\frac{1}{2}$ "
231A1C123K	.012	.312	1 $\frac{1}{2}$ "
231A1C153K	.015	.312	1 $\frac{1}{2}$ "
231A1C183K	.018	.312	1 $\frac{1}{2}$ "
231A1C223K	.022	.400	1 $\frac{1}{2}$ "
231A1C273K	.027	.400	1 $\frac{1}{2}$ "
231A1C333K	.033	.400	1 $\frac{1}{2}$ "
231A1C393K	.039	.400	1 $\frac{1}{2}$ "
231A1C473K	.047	.562	1 $\frac{1}{2}$ "
231A1C563K	.056	.562	1 $\frac{1}{2}$ "
231A1C683K	.068	.562	1 $\frac{1}{2}$ "
231A1C823K	.082	.562	1 $\frac{1}{2}$ "
231A1C104K	.10	.562	1 $\frac{1}{2}$ "
231A1C124K	.12	.562	1 $\frac{1}{2}$ "
231A1C154K	.15	.670	1 $\frac{1}{2}$ "
231A1C184K	.18	.670	1 $\frac{1}{2}$ "
231A1C224K	.22	.670	1 $\frac{1}{2}$ "
231A1C274K	.27	.750	1 $\frac{1}{2}$ "
231A1C334K	.33	.750	1 $\frac{1}{2}$ "
231A1C394K	.39	1.000	1 $\frac{1}{2}$ "
231A1C474K	.47	1.000	1 $\frac{1}{2}$ "
231A1C564K	.56	1.000	1 $\frac{1}{2}$ "

400 VOLTS DC WORKING

231A1E222K	.0022	.235	1 $\frac{1}{2}$ "
231A1E272K	.0027	.235	1 $\frac{1}{2}$ "
231A1E322K	.0032	.235	1 $\frac{1}{2}$ "
231A1E392K	.0039	.235	1 $\frac{1}{2}$ "
231A1E472K	.0047	.312	1 $\frac{1}{2}$ "
231A1E562K	.0056	.312	1 $\frac{1}{2}$ "
231A1E682K	.0068	.312	1 $\frac{1}{2}$ "
231A1E822K	.0082	.312	1 $\frac{1}{2}$ "
231A1E103K	.01	.312	1 $\frac{1}{2}$ "
231A1E123K	.012	.312	1 $\frac{1}{2}$ "
231A1E153K	.015	.400	1 $\frac{1}{2}$ "
231A1E183K	.018	.400	1 $\frac{1}{2}$ "
231A1E223K	.022	.400	1 $\frac{1}{2}$ "
231A1E273K	.027	.562	1 $\frac{1}{2}$ "
231A1E333K	.033	.562	1 $\frac{1}{2}$ "
231A1E393K	.039	.562	1 $\frac{1}{2}$ "
231A1E473K	.047	.562	1 $\frac{1}{2}$ "
231A1E563K	.056	.562	1 $\frac{1}{2}$ "
231A1E683K	.068	.562	1 $\frac{1}{2}$ "
231A1E823K	.082	.670	1 $\frac{1}{2}$ "
231A1E104K	.10	.670	1 $\frac{1}{2}$ "
231A1E124K	.12	.670	1 $\frac{1}{2}$ "
231A1E154K	.15	.670	1 $\frac{1}{2}$ "
231A1E184K	.18	.670	1 $\frac{1}{2}$ "
231A1E224K	.22	.750	1 $\frac{1}{2}$ "
231A1E274K	.27	.750	1 $\frac{1}{2}$ "
231A1E334K	.33	1.000	1 $\frac{1}{2}$ "
231A1E394K	.39	1.000	1 $\frac{1}{2}$ "
231A1E474K	.47	1.000	1 $\frac{1}{2}$ "

600 VOLTS DC WORKING

231A1F102K	.001	.235	1 $\frac{1}{2}$ "
231A1F122K	.0012	.235	1 $\frac{1}{2}$ "
231A1F152K	.0015	.235	1 $\frac{1}{2}$ "
231A1F182K	.0018	.235	1 $\frac{1}{2}$ "
231A1F222K	.0022	.312	1 $\frac{1}{2}$ "
231A1F272K	.0027	.312	1 $\frac{1}{2}$ "
231A1F322K	.0032	.312	1 $\frac{1}{2}$ "
231A1F392K	.0039	.312	1 $\frac{1}{2}$ "
231A1F472K	.0047	.312	1 $\frac{1}{2}$ "
231A1F562K	.0056	.312	1 $\frac{1}{2}$ "
231A1F682K	.0068	.312	1 $\frac{1}{2}$ "
231A1F822K	.0082	.312	1 $\frac{1}{2}$ "
231A1F103K	.01	.400	1 $\frac{1}{2}$ "
231A1F123K	.012	.400	1 $\frac{1}{2}$ "
231A1F153K	.015	.562	1 $\frac{1}{2}$ "
231A1F183K	.018	.562	1 $\frac{1}{2}$ "
231A1F223K	.022	.562	1 $\frac{1}{2}$ "
231A1F273K	.027	.562	1 $\frac{1}{2}$ "
231A1F333K	.033	.562	1 $\frac{1}{2}$ "
231A1F393K	.039	.562	1 $\frac{1}{2}$ "
231A1F473K	.047	.670	1 $\frac{1}{2}$ "
231A1F563K	.056	.670	1 $\frac{1}{2}$ "
231A1F683K	.068	.670	1 $\frac{1}{2}$ "
231A1F823K	.082	.670	1 $\frac{1}{2}$ "
231A1F104K	.10	.670	1 $\frac{1}{2}$ "
231A1F124K	.12	.750	1 $\frac{1}{2}$ "
231A1F154K	.15	1.000	1 $\frac{1}{2}$ "
231A1F184K	.18	1.000	1 $\frac{1}{2}$ "
231A1F224K	.22	1.000	1 $\frac{1}{2}$ "


Nytronics Components Group Inc.

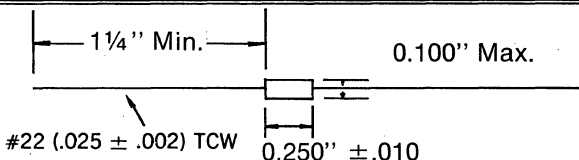
 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

CERAMIC CAPACITORS

The DECI-CAP

4.7 pF to 27,000 pF in 49 Standard Values.
 Available from stock for Immediate Delivery.
 Epoxy molded for highest performance and reliability.
 High density cordwood packaging facilitated by single size.
 (.100 diameter x .250 length for entire range.)

DECI-CAPS offer the design engineer unique epoxy-molded reliability and a new high standard in performance. These subminiature ceramic capacitors feature low power factor and exhibit outstanding stability over the entire -55° to $+125^{\circ}$ C operating range. Rugged epoxy molded envelope and high quality ceramic dielectric is designed to meet the environmental requirements of MIL-C-11015.



Electrical Characteristics	Deci-Cap
Capacitance Range, pF	4.7 to 27,000
Working Voltage	200 VDC
4.7 to 470 pF	100 VDC
560-27000	
Standard Tolerance	$\pm 10\%$
Dissipation Factor	.025 Max.
I.R., Megohms	20,000 Min.
Max. Charge from 25° C	$\pm 15\%$
Capacitance, -55 to $+125^{\circ}$ C	

Cap., pF	Deci-Cap Cat. No.
4.7	DC-047
5.6	DC-056
6.8	DC-068
8.2	DC-082
10	DC-100
12	DC-120
15	DC-150
18	DC-180
22	DC-220
27	DC-270
33	DC-330
39	DC-390
47	DC-470
56	DC-560
68	DC-680
82	DC-820
100	DC-101
120	DC-121
150	DC-151
180	DC-181
220	DC-221
270	DC-271
330	DC-331
390	DC-391
470	DC-471

Cap., pF	Deci-Cap Cat. No.
560	DC-561
680	DC-681
820	DC-821
1000	DC-102
1200	DC-122
1500	DC-152
1800	DC-182
2200	DC-222
2700	DC-272
3300	DC-332
3900	DC-392
4700	DC-472
5600	DC-562
6800	DC-682
8200	DC-822
10000	DC-103
12000	DC-123
15000	DC-153
18000	DC-183
22000	DC-223
27000	DC-273

 Add K to Cat. No. for $\pm 10\%$ Tol, J for $\pm 5\%$, M for $\pm 20\%$

The HY-CAP

High Capacity Ceramic Capacitor. Capacitance Range .01 mfd to 2.5 mfd.*

Nytronics offers the HY-CAP Ceramic Capacitor to accommodate design application in coupling, by-pass, filter, and all other circuits where temperature stability and high capacitance are mandatory. .016 diameter leads are ideal for point-to-point wiring as well as PC work.

ELECTRICAL CHARACTERISTICS

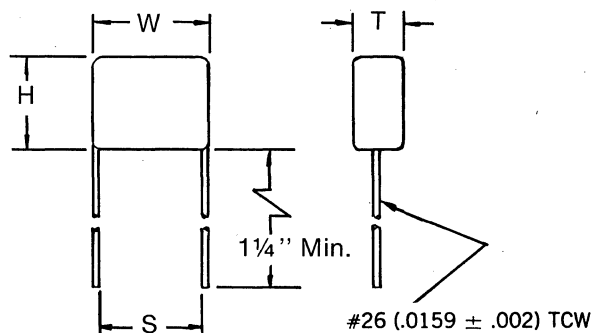
Capacitance Range: .01 mfd to 2.5 mfd *

 Tolerance: $\pm 20\%$ Std.; $\pm 10\%$ also available

 Working Voltage: 100 Volts D.C. (No derating to 125° C).

Dissipation Factor: .025 Max.

Insulation Resistance: 1000 Megohm-microfarad, min.

 Capacitance Change with Temperature: Max. Change $\pm 15\%$ from 25° C Cap., from -55° to $+125^{\circ}$ C.


NCG Part No.	Cap. (mfd.)	Size	NCG Part No.	Cap. (mfd.)	Size
HC-A-103-M	.01	A	HC-C-154-M	.15	C
HC-A-123-M	.012	A	HC-C-184-M	.18	C
HC-A-153-M	.015	A	HC-C-224-M	.22	C
HC-A-183-M	.018	A	HC-C-274-M	.27	C
HC-A-223-M	.022	A	HC-C-334-M	.33	C
HC-A-273-M	.027	A	HC-C-394-M	.39	C
HC-A-333-M	.033	A	HC-C-474-M	.47	C
HC-B-393-M	.039	B	HC-D-105-M	1.0	D
HC-B-473-M	.047	B	HC-E-155-M	1.5	E
HC-B-563-M	.056	B	HC-F-205-M	2.0	F
HC-B-683-M	.068	B	HC-G-255-M	2.5	G
HC-B-823-M	.082	B			
HC-B-104-M	.10	B			
HC-B-124-M	.12	B			

Size	W max.	H max.	T max.	S $\pm .050$
A	0.225	0.175	0.110	0.200
B	0.325	0.310	0.150	0.300
C	0.670	0.355	0.150	0.625
D	0.800	0.550	0.225	0.625
E	0.800	0.550	0.250	0.625
F	0.800	0.550	0.300	0.625
G	0.800	0.550	0.375	0.625


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

CERAMIC CAPACITORS

The NYT-CAP NPO SERIES

Ultra High Stability — 0 ± 25 ppm/ $^{\circ}$ C Temperature Coefficient.
 Transfer Molded Epoxy Case for high component density.
 New extended range to 10,000 pF.
 Available from stock.

A new development from Nytronics' ceramic research laboratory now makes possible the manufacture of an extremely stable ceramic capacitor in a miniature package size. Now you can have the capacitor stability long desired for use in oscillators, filters, and other critical circuitry.

ELECTRICAL CHARACTERISTICS

Capacitance Range: 4.7 pF to 10,000 pF.

Capacitance Tolerance: $\pm 10\%$ Standard; others available.

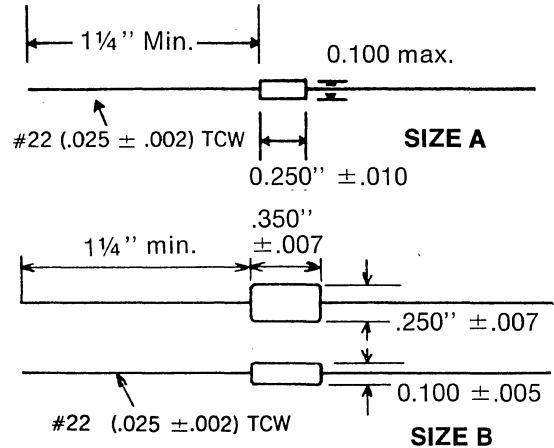
Working Voltage: 200 Volts D.C. to 4700 pF; 50 WVDC above this value.

Temperature Coefficient: ± 25 ppm/ $^{\circ}$ C over temperature range of -55° C to $+125^{\circ}$ C.

Dissipation Factor: Less than 0.001 at 25° C.

Insulation Resistance: 100,000 Megohms at 25° C. (Minimum)

Note: Hybrid Manufacturers — Also available from stock as monolithic (unencapsulated) chips for micro-circuit applications. "A" chip size is .170 X .065 X .070; "B" is .280 X .195 X .070. Other specs same as above. To order use part No. prefix NCU in place of NC.



Nytronics Part No.	Capacity (pF)	Case Size
NC-047	4.7	A
NC-056	5.6	A
NC-068	6.8	A
NC-082	8.2	A
NC-100	10	A
NC-120	12	A
NC-150	15	A
NC-180	18	A
NC-220	22	A
NC-270	27	A
NC-330	33	A

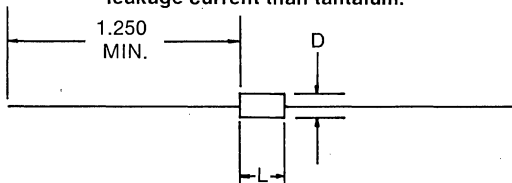
Nytronics Part No.	Capacity (pF)	Case Size
NC-390	39	A
NC-470	47	A
NC-560	56	A
NC-680	68	A
NC-820	82	A
NC-101	100	A
NC-121	120	A
NC-151	150	A
NC-181	180	A
NC-221	220	A

Nytronics Part No.	Capacity (pF)	Case Size
NC-271	270	B
NC-331	330	B
NC-391	390	B
NC-471	470	B
NC-561	560	B
NC-681	680	B
NC-821	820	B
NC-102	1000	B
NC-122	1200	B
NC-152	1500	B

Nytronics Part No.	Capacity (pF)	Case Size
NC-182	1800	B
NC-222	2200	B
NC-272	2700	B
NC-332	3300	B
NC-392	3900	B
NC-472	4700	B
NC-562	5600	B
NC-682	6800	B
NC-822	8200	B
NC-103	10000	B

The MILI-CAP EPOXY MOLDED EK12 - EK16

New series of encapsulated axial lead ceramic capacitors featuring values to 3.3 uF. Much lower leakage current than tantalum.



Case Size	L	D	Lead Size
A	.160 $\pm$.010	.090 $\pm$.010	26 Awg
B	.250 $\pm$.010	.090 $\pm$.010	26
C	.390 $\pm$.010	.140 $\pm$.010	22
D	.500 $\pm$.020	.250 $\pm$.015	22
E	.690 $\pm$.030	.350 $\pm$.020	22

ELECTRICAL CHARACTERISTICS:

Capacitance Range: 10 pF to 3.3 uF

Capacitance Tolerance: $\pm 10\%$ std.; other available

Power Factor: Less than 2.5% at 1 KHz, 25° C

Temperature Range: -55° C to $\pm 125^{\circ}$ C

Temperature Characteristic: $\pm 15\%$ max. Change from 25° C

Insulation Resistance: capacitance
 $> 100,000$ Megohms or 1000
 Megohms Microfarads, whichever
 is less.

Designed to meet the requirements of MIL-C-11015/20 B

Cap.	WVDC	Nytronics Catalog No.	Case Size	Cap.	WVDC	Nytronics Catalog No.	Case Size
10 pF	100	EK12BX100K	A	10,000	100	EK13BX103K	B
12	100	EK12BX120K	A	12,000	50	EK13BX123K	B
15	100	EK12BX150K	A	15,000	50	EK13BX153K	B
18	100	EK12BX180K	A	18,000	50	EK13BX183K	B
22	100	EK12BX220K	A	22,000	50	EK13BX223K	B
27	100	EK12BX270K	A	27,000	50	EK13BR273K	B
33	100	EK12BX330K	A	33,000	50	EK13BR333K	B
39	100	EK12BX390K	A	39,000	50	EK13BR393K	B
47	100	EK12BX470K	A	47,000	50	EK13BR473K	B
56	100	EK12BX560K	A	.012 Mfd	100	EK14BX123K	C
68	100	EK12BX680K	A	.015	100	EK14BX153K	C
82	100	EK12BX820K	A	.018	100	EK14BX183K	C
100	100	EK12BX101K	A	.022	100	EK14BX223K	C
120	100	EK12BX121K	A	.027	100	EK14BX273K	C
150	100	EK12BX151K	A	.033	100	EK14BX333K	C
180	100	EK12BX181K	A	.039	100	EK14BX393K	C
220	100	EK12BX221K	A	.047	100	EK14BX473K	C
270	100	EK12BX271K	A	.056	100	EK14BR563K	C
330	100	EK12BX331K	A	.068	100	EK14BR683K	C
390	100	EK12BX391K	A	.1	100	EK14BR104K	C
470	100	EK12BX471K	A	.12	50	EK14BR124K	C
560	100	EK12BX561K	A	.15	50	EK14BR154K	C
680	100	EK12BX681K	A	.18	50	EK14BR184K	C
820	100	EK12BX821K	A	.22	50	EK14BR224K	C
1000	100	EK12BX102K	A	.27	50	EK14BR274K	C
1200	100	EK12BX122K	A	.1	100	EK15BX104K	D
1500	100	EK12BX152K	A	.12	100	EK15BR124K	D
1800	100	EK12BX182K	A	.15	100	EK15BR154K	D
2200	100	EK12BX222K	A	.18	100	EK15BR184K	D
2700	100	EK12BX272K	A	.22	100	EK15BR224K	D
3300	100	EK12BX332K	A	.27	100	EK15BR274K	D
3900	100	EK12BX392K	A	.33	100	EK15BR334K	D
4700	100	EK12BX472K	A	.47	50	EK15BR474K	D
5600	50	EK12BX562K	A	1.0	50	EK15BR105K	D
6800	50	EK12BX692K	A	.47	100	EK16BR474K	E
8200	50	EK12BX822K	A	1.0	100	EK16BR105K	E
10,000	50	EK12BX103K	A	2.2	50	EK16BR225K	E
5600	100	EK13BX562K	B	3.3	50	EK16BR335K	E
6800	100	EK13BX682K	B				
8200	100	EK13BX822K	B				


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

**HERMETICALLY SEALED
CAPACITORS**

HERMETICALLY SEALED CAPACITORS CP04 AND CP05 TO MIL-C-25

INSERTED TAB CAPACITORS

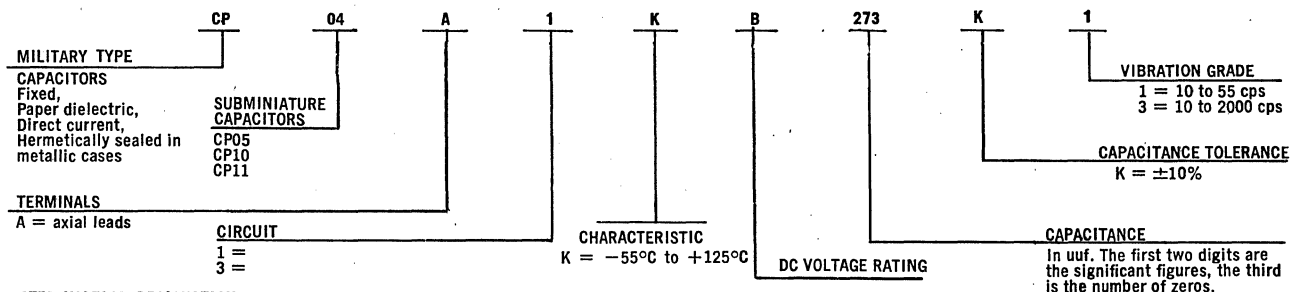
μF	WVDC	TYPE CP04A1* Plain Metal Case	
		Char. K -55°C to +125°C	Size* D. x L.
.001	600	CP04A1KF102K3	.235 x 3/4
.0015	600	CP04A1KF152K3	.235 x 3/4
.0022	600	CP04A1KF222K3	.235 x 3/4
.0033	600	CP04A1KF332K3	.235 x 3/4
.0047	600	CP04A1KF472K3	.235 x 3/4
.0068	600	CP04A1KF682K3	.235 x 3/4
.01	400	CP04A1KE103K3	.235 x 3/4
	600	CP04A1KF103K3	.312 x 7/8
.015	200	CP04A1KC153K3	.235 x 3/4
	600	CP04A1KF153K3	.312 x 7/8
.022	200	CP04A1KF223K3	.235 x 3/4
	600	CP04A1KF223K3	.312 x 7/8
.033	100	CP04A1KB333K3	.235 x 3/4
	400	CP04A1KE333K3	.312 x 7/8
	600	CP04A1KF333K3	.400 x 7/8
.047	200	CP04A1KC473K3	.312 x 7/8
	400	CP04A1KE473K3	.400 x 7/8
	600	CP04A1KF473K3	.400 x 1 1/8
.068	200	CP04A1KC683K3	.312 x 7/8
	400	CP04A1KE683K3	.400 x 1 1/8
	600	CP04A1KF683K3	.400 x 1 1/8
.1	100	CP04A1KB104K3	.312 x 7/8
	200	CP04A1KC104K3	.400 x 7/8
	400	CP04A1KE104K3	.400 x 1 1/8
	600	CP04A1KF104K3	.562 x 1 1/8
.15	100	CP04A1KB154K3	.400 x 7/8
	200	CP04A1KC154K3	.400 x 1 1/8
	400	CP04A1KE154K3	.562 x 1 1/8
	600	CP04A1KF154K3	.562 x 1 1/8
.22	100	CP04A1KB224K3	.400 x 1 1/8
	200	CP04A1KC224K3	.400 x 1 1/8
	400	CP04A1KE224K3	.562 x 1 1/8
	600	CP04A1KF224K3	.562 x 1 1/8
.33	100	CP04A1KB334K3	.400 x 1 1/8
	200	CP04A1KC334K3	.562 x 1 1/8
	400	CP04A1KE334K3	.562 x 1 1/8
	600	CP04A1KF334K3	.670 x 1 1/8
.47	100	CP04A1KB474K3	.562 x 1 1/8
	200	CP04A1KC474K3	.562 x 1 1/8
	400	CP04A1KE474K3	.670 x 1 1/8
	600	CP04A1KF474K3	.750 x 2 1/8
.68	100	CP04A1KB684K3	.562 x 1 1/8
	200	CP04A1KC684K3	.562 x 1 1/8
	400	CP04A1KE684K3	.750 x 2 1/8
	600	CP04A1KF684K3	1.0 x 1 1/8
1.0	100	CP04A1KB105K3	.562 x 1 1/8
	200	CP04A1KC105K3	.670 x 1 1/8
	400	CP04A1KE105K3	1.0 x 1 1/8

μF	WVDC	TYPE CP05A1* Metal Case with Insulating Sleeve	
		Char. K -55°C to +125°C	Size* D. x L.
.001	600	CP05A1KF102K3	.298 x 1 1/8
.0015	600	CP05A1KF152K3	.298 x 1 1/8
.0022	600	CP05A1KF222K3	.298 x 1 1/8
.0033	600	CP05A1KF332K3	.298 x 1 1/8
.0047	600	CP05A1KF472K3	.298 x 1 1/8
.0068	600	CP05A1KF682K3	.298 x 1 1/8
.01	400	CP05A1KE103K3	.298 x 1 1/8
	600	CP05A1KF103K3	.375 x 1 1/8
.015	200	CP05A1KC153K3	.298 x 1 1/8
	600	CP05A1KF153K3	.375 x 1 1/8
.022	200	CP05A1KC223K3	.298 x 1 1/8
	600	CP05A1KF223K3	.375 x 1 1/8
.033	100	CP05A1KB333K3	.298 x 1 1/8
	400	CP05A1KE333K3	.375 x 1 1/8
	600	CP05A1KF333K3	.463 x 1 1/8
.047	200	CP05A1KC473K3	.375 x 1 1/8
	400	CP05A1KE473K3	.463 x 1 1/8
	600	CP05A1KF473K3	.463 x 1 1/8
.068	200	CP05A1KC683K3	.375 x 1 1/8
	400	CP05A1KE683K3	.463 x 1 1/8
	600	CP05A1KF683K3	.463 x 1 1/8
.1	100	CP05A1KB104K3	.375 x 1 1/8
	200	CP05A1KE104K3	.463 x 1 1/8
	400	CP05A1KF104K3	.463 x 1 1/8
	600	CP05A1KF104K3	.625 x 1 1/8
.15	100	CP05A1KB154K3	.463 x 1 1/8
	200	CP05A1KC154K3	.463 x 1 1/8
	400	CP05A1KE154K3	.625 x 1 1/8
	600	CP05A1KF154K3	.625 x 1 1/8
.22	100	CP05A1KB224K3	.463 x 1 1/8
	200	CP05A1KC224K3	.463 x 1 1/8
	400	CP05A1KE224K3	.625 x 1 1/8
	600	CP05A1KF224K3	.625 x 1 1/8
.33	100	CP05A1KB334K3	.463 x 1 1/8
	200	CP05A1KC334K3	.625 x 1 1/8
	400	CP05A1KE334K3	.625 x 1 1/8
	600	CP05A1KF334K3	.733 x 1 1/8
.47	100	CP05A1KB474K3	.625 x 1 1/8
	200	CP05A1KC474K3	.625 x 1 1/8
	400	CP05A1KE474K3	.733 x 1 1/8
	600	CP05A1KF474K3	.813 x 2 1/8
.68	100	CP05A1KB684K3	.625 x 1 1/8
	200	CP05A1KC684K3	.625 x 1 1/8
	400	CP05A1KE684K3	.813 x 2 1/8
	600	CP05A1KF684K3	1.063 x 1 1/8
1.0	100	CP05A1KB105K3	.625 x 1 1/8
	200	CP05A1KC105K3	.733 x 1 1/8
	400	CP05A1KE105K3	1.063 x 1 1/8

 NOTE: The capacitors listed in this table have a capacitance tolerance of $\pm 10\%$.

* For case grounded reduce L dimension by 1/8". Above listing are ratings listed in Mil-C-25C. Other values are available in Nytronics Commercial Equivalents.

NYTRONICS CATALOG NUMBERING SYSTEM



RATED VOLTAGE DESIGNATIONS

(DC working at 40°C, except for characteristic K which is 85°C)

B = 100 C = 200 E = 400 F = 600 G = 1000

BASIC STYLE


 CP04A1/CP08A1
 CIRCUIT 1 — Case Floating

 CP04A3/CP08A3
 CIRCUIT 3 — Case Grounded

STYLE 3


 CP11A1/CP13A1
 CIRCUIT 1 — Case Floating

 CP11A3/CP13A3
 CIRCUIT 3 — Case Grounded

STYLE V (Insulated)


 CP05A1/CP09A1
 CIRCUIT 1 — Case Floating

 CP05A3/CP09A3
 CIRCUIT 3 — Case Grounded

STYLE 7


 CP10A1/CP12A1
 CIRCUIT 1 — Case Floating

 CP10A3/CP12A3
 CIRCUIT 3 — Case Grounded


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

**HERMETICALLY SEALED
CAPACITORS**

HERMETICALLY SEALED CAPACITORS CP08 AND CP09 TO MIL-C-25

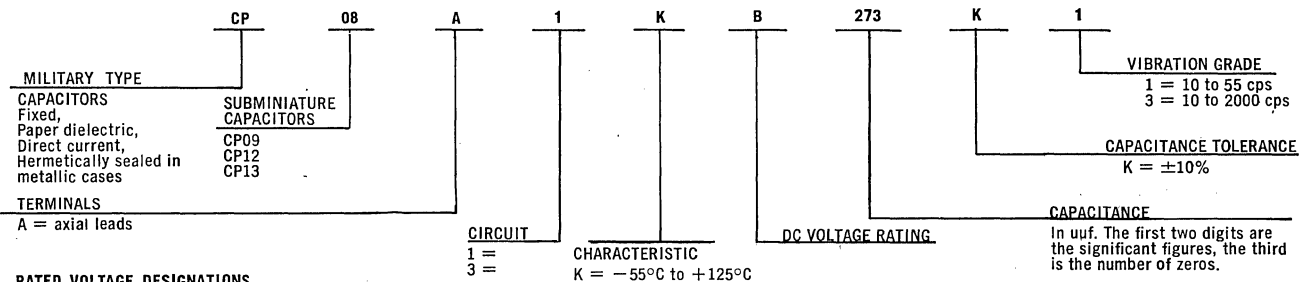
EXTENDED FOIL CAPACITORS

μF	WVDC	TYPE CP08A1 Plain Metal Case	
		Char. K -55°C to +125°C	Size* D. x L.
.001	600	CP08A1KF102K3	.235 x 3/4
.0015	600	CP08A1KF152K3	.235 x 3/4
.0022	600	CP08A1KF222K3	.235 x 3/4
.0033	400	CP08A1KE332K3	.235 x 3/4
	600	CP08A1KF332K3	.312 x 7/8
.0047	200	CP08A1KC472K3	.235 x 3/4
	600	CP08A1KF472K3	.312 x 7/8
.0068	200	CP08A1KC682K3	.235 x 3/4
	600	CP08A1KF682K3	.312 x 7/8
.01	100	CP08A1KB103K3	.235 x 3/4
	600	CP08A1KF103K3	.312 x 7/8
.015	100	CP08A1KB153K3	.235 x 3/4
	400	CP08A1KE153K3	.312 x 7/8
	600	CP08A1KF153K3	.400 x 7/8
.022	200	CP08A1KC223K3	.312 x 7/8
	600	CP08A1KF223K3	.400 x 7/8
.033	200	CP08A1KC333K3	.312 x 7/8
	400	CP08A1KE333K3	.400 x 7/8
	600	CP08A1KF333K3	.400 x 1 1/8
.047	100	CP08A1KB473K3	.312 x 7/8
	200	CP08A1KC473K3	.400 x 7/8
	400	CP08A1KE473K3	.400 x 1 1/8
	600	CP08A1KF473K3	.400 x 1 1/8
.068	200	CP08A1KC683K3	.400 x 7/8
	400	CP08A1KE683K3	.400 x 1 1/8
	600	CP08A1KF683K3	.562 x 1 1/8
.1	100	CP08A1KB104K3	.400 x 7/8
	200	CP08A1KC104K3	.400 x 1 1/8
	400	CP08A1KE104K3	.562 x 1 1/8
	600	CP08A1KF104K3	.562 x 1 1/8
.15	100	CP08A1KB154K3	.400 x 1 1/8
	200	CP08A1KC154K3	.400 x 1 1/8
	400	CP08A1KE154K3	.562 x 1 1/8
	600	CP08A1KF154K3	.562 x 1 1/8
.22	100	CP08A1KB224K3	.400 x 1 1/8
	200	CP08A1KC224K3	.562 x 1 1/8
	400	CP08A1KE224K3	.562 x 1 1/8
	600	CP08A1KF224K3	.670 x 1 1/8
.33	100	CP08A1KB334K3	.562 x 1 1/8
	200	CP08A1KC334K3	.562 x 1 1/8
	400	CP08A1KE334K3	.670 x 1 1/8
	600	CP08A1KF334K3	.750 x 2 1/8
.47	100	CP08A1KB474K3	.562 x 1 1/8
	200	CP08A1KC474K3	.562 x 1 1/8
	400	CP08A1KE474K3	.750 x 2 1/8
	600	CP08A1KF474K3	.750 x 2 1/8
.68	100	CP08A1KB684K3	.562 x 1 1/8
	200	CP08A1KC684K3	.670 x 1 1/8
1.0	100	CP08A1KB105K3	.670 x 1 1/8
	200	CP08A1KC105K3	.750 x 2 1/8

* For case grounded reduce L dimension by 1/16".

μF	WVDC	TYPE CP09A1 Metal Case with Insulating Sleeve	
		Char. K -55°C to +125°C	Size* D. x L.
.001	600	CP09A1KF102K3	.298 x 1 1/8
.0015	600	CP09A1KF152K3	.298 x 1 1/8
.0022	600	CP09A1KF222K3	.298 x 1 1/8
.0033	400	CP09A1KE332K3	.298 x 1 1/8
	600	CP09A1KF332K3	.375 x 1 1/8
.0047	200	CP09A1KC472K3	.298 x 1 1/8
	600	CP09A1KF472K3	.375 x 1 1/8
.0068	200	CP09A1KC683K3	.298 x 1 1/8
	600	CP09A1KF682K3	.375 x 1 1/8
.01	100	CP09A1KB103K3	.298 x 1 1/8
	600	CP09A1KF103K3	.375 x 1 1/8
.015	100	CP09A1KB153K3	.298 x 1 1/8
	400	CP09A1KE153K3	.375 x 1 1/8
	600	CP09A1KF153K3	.463 x 1 1/8
.022	200	CP09A1KF223K3	.463 x 1 1/8
	600	CP09A1KC223K3	.375 x 1 1/8
.033	200	CP09A1KC333K3	.375 x 1 1/8
	400	CP09A1KE333K3	.463 x 1 1/8
	600	CP09A1KF333K3	.463 x 1 1/8
.047	100	CP09A1KB473K3	.375 x 1 1/8
	200	CP09A1KC473K3	.463 x 1 1/8
	400	CP09A1KE473K3	.463 x 1 1/8
	600	CP09A1KF473K3	.463 x 1 1/8
.068	200	CP09A1KC683K3	.463 x 1 1/8
	400	CP09A1KE683K3	.463 x 1 1/8
	600	CP09A1KF683K3	.625 x 1 1/8
.1	100	CP09A1KB104K3	.463 x 1 1/8
	200	CP09A1KC104K3	.463 x 1 1/8
	400	CP09A1KE104K3	.625 x 1 1/8
	600	CP09A1KF104K3	.625 x 1 1/8
.15	100	CP09A1KB154K3	.463 x 1 1/8
	200	CP09A1KC154K3	.463 x 1 1/8
	400	CP09A1KE154K3	.625 x 1 1/8
	600	CP09A1KF154K3	.625 x 1 1/8
.22	100	CP09A1KB224K3	.463 x 1 1/8
	200	CP09A1KC224K3	.625 x 1 1/8
	400	CP09A1KE224K3	.625 x 1 1/8
	600	CP09A1KF224K3	.733 x 1 1/8
.33	100	CP09A1KB334K3	.625 x 1 1/8
	200	CP09A1KC334K3	.625 x 1 1/8
	400	CP09A1KE334K3	.733 x 1 1/8
	600	CP09A1KF334K3	.813 x 2 1/8
.47	100	CP09A1KB474K3	.625 x 1 1/8
	200	CP09A1KC474K3	.625 x 1 1/8
	400	CP09A1KE474K3	.813 x 2 1/8
	600	CP09A1KF474K3	.813 x 2 1/8
.68	100	CP09A1KB684K3	.625 x 1 1/8
	200	CP09A1KC684K3	.733 x 1 1/8
1.0	100	CP09A1KB105K3	.733 x 1 1/8
	200	CP09A1KC105K3	.813 x 2 1/8

NYTRONICS CATALOG NUMBERING SYSTEM



RATED VOLTAGE DESIGNATIONS

(DC working at 40°C, except for characteristic K which is 85°C)

B = 100 C = 200 E = 400 F = 600 G = 1000

BASIC STYLE

 CP04A1/CP08A1
 CIRCUIT 1 — Case Floating

 CP04A3/CP08A3
 CIRCUIT 3 — Case Grounded

STYLE 3

 CP11A1/CP13A1
 CIRCUIT 1 — Case Floating

 CP11A3/CP13A3
 CIRCUIT 3 — Case Grounded

STYLE V (Insulated)

 CP05A1/CP09A1
 CIRCUIT 1 — Case Floating

 CP05A3/CP09A3
 CIRCUIT 3 — Case Grounded

STYLE 7

 CP10A1/CP12A1
 CIRCUIT 1 — Case Floating

 CP10A3/CP12A3
 CIRCUIT 3 — Case Grounded


Nytronics Components Group Inc.

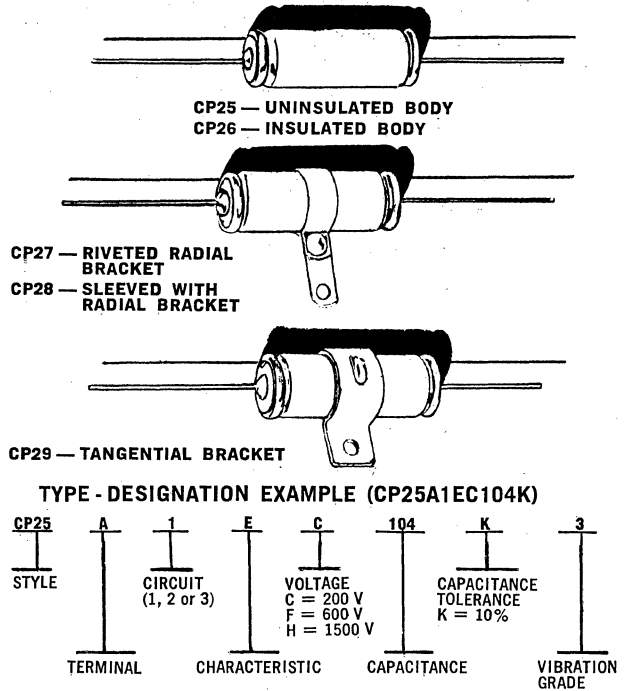
 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

MIL TYPE CP25 - CP29
MIL-C-25
 (LATEST REVISION)

MIL-C-25 (LATEST REVISION)
CP25 TO CP29

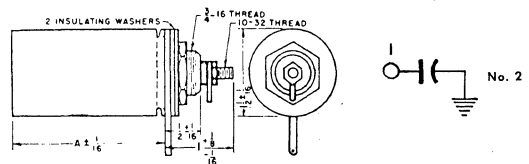
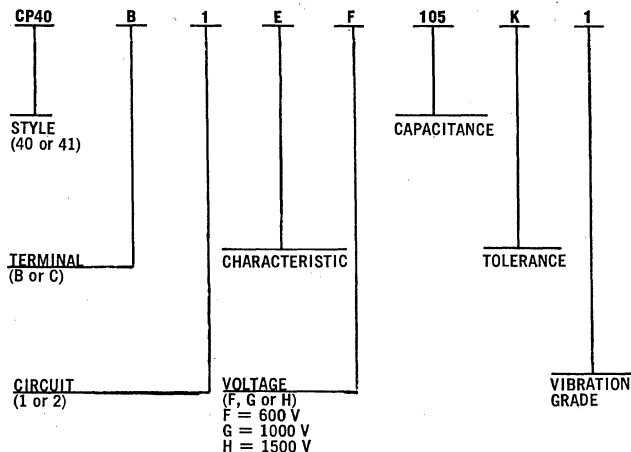
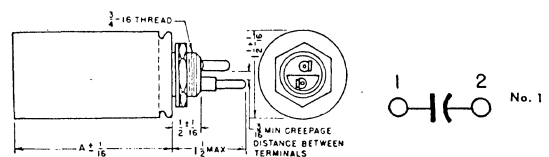
Available in capacitances from .003 thru 0.1 mf and voltages of 1500 VDC.

Type Designation ¹	Rated Voltage	Capacitance μ f
CP2-A-EC104-	200	.1
CP2-A-EC254-	200	.25
CP2-A-EC504-	200	.5
CP2-A-EF302-	600	.003
CP2-A-EF602-	600	.006
CP2-A-EF103-	600	.01
CP2-A-EF203-	600	.02
CP2-A-EF503-	600	.05
CP2-A-EF104-	600	.1
CP2-A-EF254-	600	.25
CP2-A-EF504-	600	.5
CP2-A-EG302-	1,000	.003
CP2-A-EG602-	1,000	.006
CP2-A-EG103-	1,000	.01
CP2-A-EG203-	1,000	.02
CP2-A-EG503-	1,000	.05
CP2-A-EG104-	1,000	.1
CP2-A-EG254-	1,000	.25
CP2-A-EH302-	1,500	.003
CP2-A-EH602-	1,500	.006
CP2-A-EH103-	1,500	.01
CP2-A-EH203-	1,500	.02
CP2-A-EH503-	1,500	.05
CP2-A-EH104-	1,500	.1

¹ Complete type designation will include additional symbols to complete style designation and to indicate circuit and capacitance tolerance.

CP40, CP41 (TYPES PCM, PCIM)

Available in capacitances from .25 mf thru 4.0 mf and voltages of 600 VDC thru 1500 VDC.

Type Designation 1/	DC Voltage Rating (see fig. 2) Volts	Capacitance μ f
CP4 ---- F105K1	600	1
CP4 ---- F205K1	600	2
CP4 ---- F405K1	600	4
CP4 ---- G105K1	1,000	1
CP4 ---- G205K1	1,000	2
CP4 ---- H254K1	1,500 3/	0.25
CP4 ---- H504K1	1,500	0.5
CP4 ---- H105K1	1,500	1

TYPE - DESIGNATION EXAMPLE (CP40B1EF105K)

CIRCUIT DIAGRAM — CP40
 Available with (C) or (B) Terminals

CIRCUIT DIAGRAM — CP41
 Available only with (B) Terminal


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

MIL TYPE
CP53, CP54, CP55
MIL-C-25 (LATEST REVISION)

CAPACITORS MIL TYPE CP53, CP54, CP55

Section assembled in hermetically sealed tin-coated drawn-shell container. Mineral-oil impregnated and filled. Lug-type terminal seals. Meets requirements of MIL-C-25.

Temperature Rating: -55°C to +85°C.

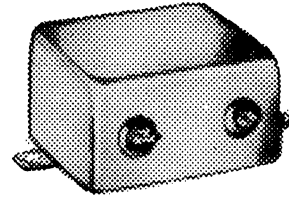
Standard Tolerance: -10% to +20%.

PDM VARIATIONS

MIL Type CP53, with terminals on side.

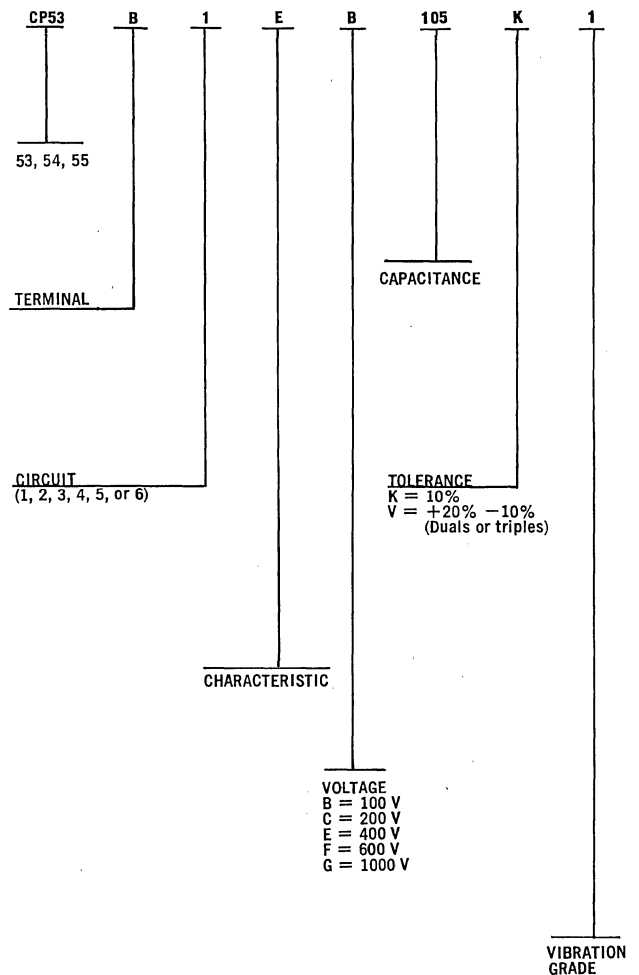
PDMT (CP54) With terminals on top.

PDMB (CP55) With terminals on the bottom.



Type Designation	DC Voltage Rating Volts	Capacitance μf
CP5-B- B105K1	100	1
CP5-B-EB205K1	100	2
CP5-B- B405K1	100	4
CP5-B-FB805K1	100	8
CP5-B-FB106K1	100	10
CP5-B-FC504K1	200	0.5
CP5-B-EC105K1	200	1
CP5-B-EC205K1	200	2
CP5-B-KE503K1	400	0.05
CP5-B-KE104K1	400	0.10
CP5-B-KE254K1	400	0.25
CP5-B-KE504K1	400	0.5
CP5-B-KE105K1	400	1
CP5-B-EF254K1	600	0.25
CP5-B- F504K1	600	0.5
CP5-B- F105K1	600	1
CP5-B-EF205K1	600	2
CP5-B-EG503K1	1,000	0.05
CP5-B-EG104K1	1,000	0.1
CP5-B- G254K1	1,000	0.25
CP5-B-EG504K1	1,000	0.5
CP5-B-EG105K1	1,000	1
CP5-B-EF503V1	600	0.05-0.05
CP5-B-EF104V1	600	0.1 -0.1
CP5-B- F254V1	600	0.25-0.25
CP5-B- F504V1	600	0.5 -0.5
CP5-B-EF105V1	600	1 -1
CP5-B-EG503V1	1,000	0.05-0.05
CP5-B- G104V1	1,000	0.1 -0.1
CP5-B-EG254V1	1,000	0.25-0.25
CP5-B-EG504V1	1,000	0.5 -0.5
CP5-B5-E504V1	400	0.5 -0.5 -0.5
CP5-B5-F104V1	600	0.1 -0.1 -0.1
CP5-B5EF254V1	600	0.25-0.25-0.25
CP5-B5EF504V1	600	0.5 -0.5 -0.5
CP5-B5EG503V1	1,000	0.05-0.05-0.05
CP5-B5EG104V1	1,000	0.1 -0.1 -0.1
CP5-B5EG254V1	1,000	0.25-0.25-0.25

TYPE - DESIGNATION EXAMPLE (CP53B1EB105K)



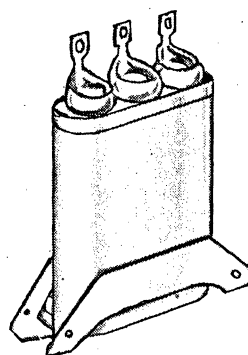

Nytronics Components Group Inc.
SAGE ELECTRONICS CORPORATION

ORANGE STREET, DARLINGTON, S. C. 29532 (803) 393-5421 • TWX 810-665-2182

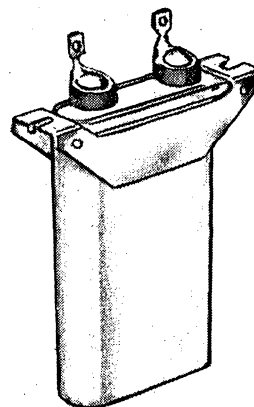
**MIL TYPE
CP67, CP69**
MIL-C-25 (LATEST REVISION)

CAPACITORS MIL TYPE CP67, CP69

Type Designation	DC Voltage Rating Volts	Capacitance μ f
CP6-B-EF503K1	600	0.05
CP6-B-EF104K1	600	0.1
CP6-B-EF254K1	600	0.25
CP6-B-EF504K1	600	0.5
CP6-B - F105K1	600	1
CP6-B-EG103K1	1,000	0.01
CP6-B-EG203K1	1,000	0.02
CP6-B-EG503K1	1,000	0.05
CP6-B - G104K1	1,000	0.1
CP6-B-EG254K1	1,000	0.25
CP6-B - G504K1	1,000	0.5
CP6-B-EF503V1	600	0.05-0.05
CP6-B-EF104V1	600	0.1 -0.1
CP6-B-EF254V1	600	0.25-0.25
CP6-B - F504K1	600	0.5 -0.5
CP6-B-EG103V1	1,000	0.01-0.01
CP6-B-EG203V1	1,000	0.02-0.02
CP6-B - G503V1	1,000	0.05-0.05
CP6-B - G104V1	1,000	0.1 -0.1
CP6-B - G254V1	1,000	0.25-0.25
CP6-B-5-F503V1	600	0.05-0.05-0.05
CP6-B5EFP04V1	600	0.1 -0.1 -0.1
CP6-B5-F254V1	600	0.25-0.25-0.25
CP6-B5EG103V1	1,000	0.01-0.01-0.01
CP6-B5EG203V1	1,000	0.02-0.02-0.02
CP6-B5EG503V1	1,000	0.05-0.05-0.05
CP6-B5EG104V1	1,000	0.1 -0.1 -0.1

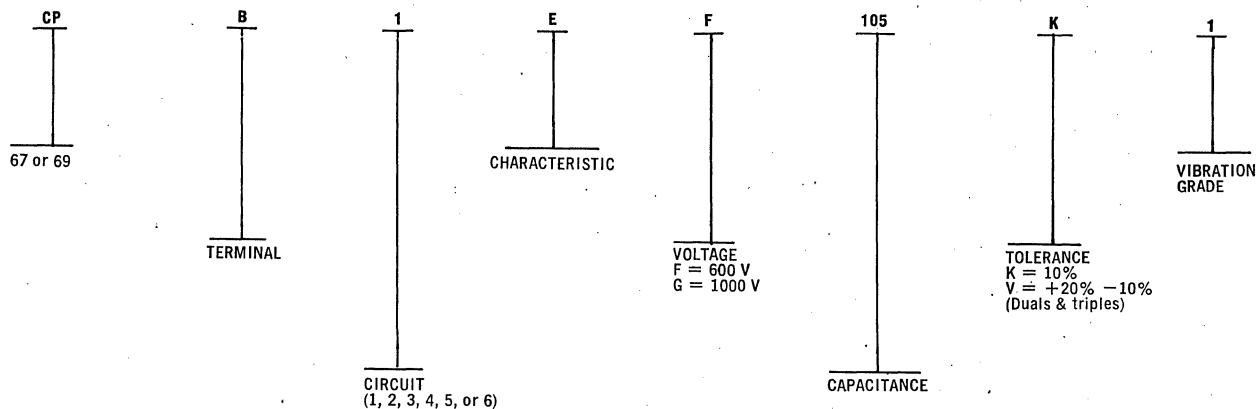


CP67

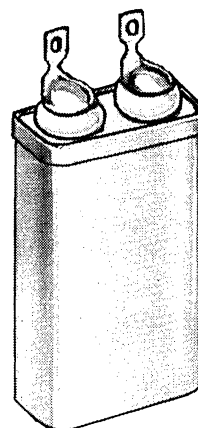


CP69

TYPE - DESIGNATION EXAMPLE



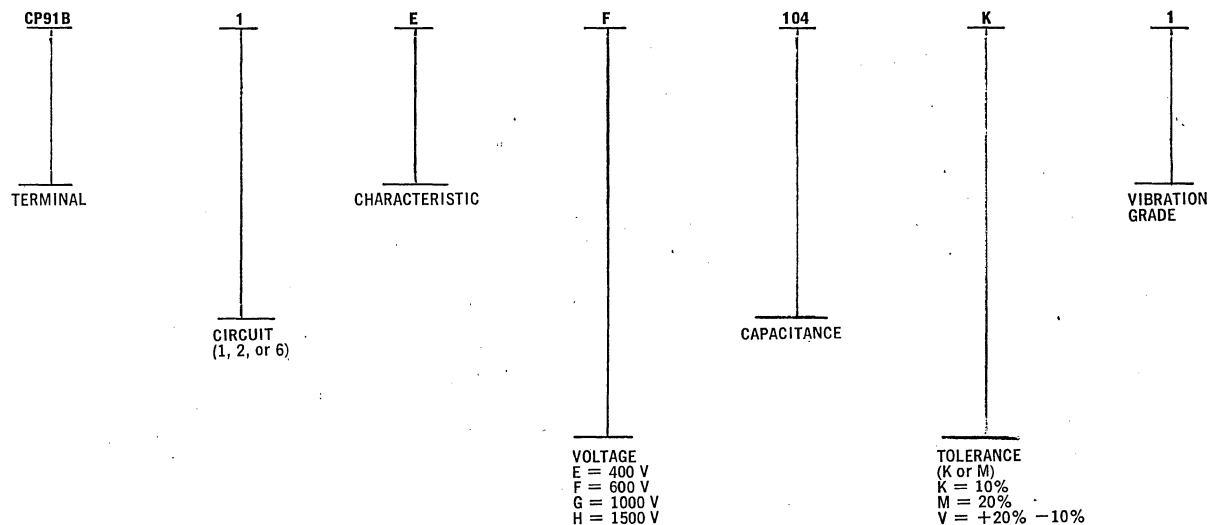
Type Designation	DC Voltage Rating Volts	Capacitance μf	Capacitance Tolerance
CP91B-KE104K1	400	0.1	K
CP91B-KE254K1	400	0.25	K
CP91B1KE504K1	400	0.5	K
CP91B-E105K1	400	1	K
CP91B-EF503K1	600	0.05	K
CP91B-EF254K1	600	0.25	K
CP91B-EF504K1	600	0.5	K
CP91B-F105K1	600	1	K
CP91B-EG103K1	1,000	0.01	K
CP91B-EG203K1	1,000	0.02	K
CP91B-EG503K1	1,000	0.05	K
CP91B-EG104K1	1,000	0.1	K
CP91B-EG254K1	1,000	0.25	K
CP91B-G504K1	1,000	0.5	K
CP91B6EE503V1	400	0.05-0.05 3/	V
CP91B6EE104V1	400	0.1 -0.1	V
CP91B6EE504V1	400	0.5 -0.5	V
CP91B6EF503V1	600	0.05-0.05	V
CP91B6-F104V1	600	0.1 -0.1	V
CP91B6EF254V1	600	0.25-0.25	V
CP91B6-F504V1	600	0.5 -0.5	V
CP91B6EG103V1	1,000	0.01-0.01	V
CP91B6EG203V1	1,000	0.02-0.02	V
CP91B6EG503V1	1,000	0.05-0.05	V
CP91B6-G104V1	1,000	0.1 -0.1	V
CP91B6-G254V1	1,000	0.25-0.25	V
CP91B6EH103V1	1,500	0.01-0.01	V
CP91B6EH503V1	1,500	0.05-0.05	V



CP91

**NOTE: AVAILABLE WITH SPADE-LUG
OR FOOTED BRACKET**

TYPE - DESIGNATION EXAMPLE



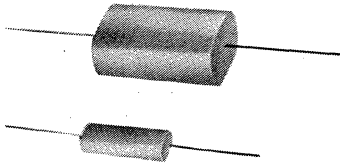


**THE
POTTER
COMPANY**

METALIZED POLYESTER FILM CAPACITORS

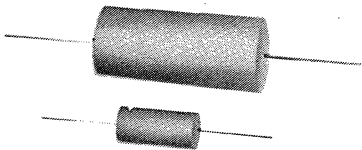
for Instrumentation, Data Processing, Telecommunications,
Industrial Controls & Special Applications

WRAP & FILL — FLATTENED



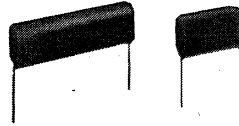
SERIES 3200

WRAP & FILL — ROUND



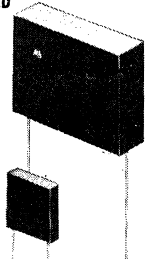
SERIES 3400

EPOXY DIPPED



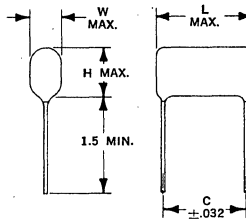
SERIES 4309

PLASTIC CASED

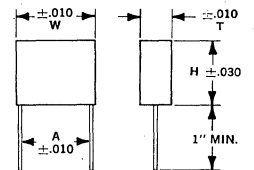


SERIES 4308

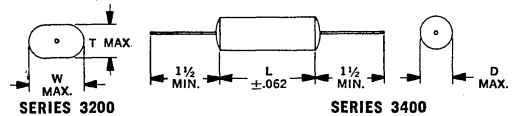
SERIES 3200 FLATTENED									SERIES 3400 ROUND								
CAP MFD's	200 VDC			400 VDC			600 VDC			200 VDC	400 VDC			600 VDC			
	L	T	W	L	T	W	L	T	W		L	T	W		L	T	W
.01	.44	.15	.28	.44	.15	.28	.50	.15	.28	.44	.20	.44	.20	.50	.22	.63	.27
.022	.44	.15	.28	.50	.15	.28	.63	.19	.32	.44	.20	.50	.23	.63	.27	.63	.27
.027	.44	.15	.28	.50	.17	.30	.63	.21	.34	.44	.20	.50	.25	.63	.29	.63	.29
.033	.44	.15	.28	.50	.19	.32	.63	.24	.37	.44	.20	.63	.24	.63	.31	.63	.31
.047	.44	.15	.28	.63	.20	.33	.63	.29	.42	.50	.20	.63	.28	.75	.31	.75	.31
.056	.50	.15	.28	.63	.22	.36	.75	.24	.37	.50	.22	.63	.30	.75	.34	.75	.34
.068	.50	.16	.29	.63	.24	.37	.75	.28	.41	.50	.23	.63	.32	.75	.37	.75	.37
.082	.50	.17	.30	.63	.27	.40	.75	.28	.45	.50	.25	.63	.35	.88	.35	.88	.35
.1	.50	.19	.33	.75	.24	.37	.75	.33	.50	.63	.24	.75	.32	1.00	.35	1.00	.35
.22	.75	.20	.34	.75	.34	.54	.88	.44	.62	.75	.28	1.00	.36	1.25	.43	1.25	.43
.27	.75	.23	.36	.75	.38	.58	1.00	.44	.61	.75	.31	1.00	.40	1.25	.47	1.25	.47
.33	.75	.25	.38	.75	.42	.62	1.00	.49	.67	.75	.33	1.00	.44	1.25	.52	1.25	.52
.47	1.00	.23	.36	1.00	.40	.60	1.25	.49	.68	1.00	.31	1.25	.44	1.50	.54	1.50	.54
.56	1.00	.26	.39	1.00	.43	.63	1.25	.55	.75	1.00	.34	1.25	.47	1.50	.59	1.50	.59
.68	1.00	.29	.42	1.25	.42	.62	1.25	.59	.79	1.00	.37	1.25	.52	1.50	.65	1.50	.65
.82	1.00	.33	.46	1.25	.40	.70	1.25	.59	.88	1.00	.41	1.25	.57	1.50	.70	1.50	.70
1.0	1.00	.36	.49	1.25	.45	.75	1.25	.69	.99	1.25	.37	1.25	.63	1.50	.77	1.50	.77
1.5	1.00	.45	.58	1.25	.58	.88	1.50	.79	1.09	1.25	.44	1.50	.68	1.75	.85	1.75	.85
2.0	1.25	.42	.56	1.50	.59	.89	1.50	.93	1.23	1.25	.50	1.50	.78	1.75	.98	1.75	.98
3.0	1.25	.50	.63	1.50	.75	1.05	1.75	.96	1.26	1.50	.56	1.75	.84	2.00	1.050	2.00	1.050



SERIES 4309



SERIES 4308



SERIES 3200

SERIES 3400

WRAP AND FILL STYLES utilize thermosetting pressure sensitive polyester film wrap filled with a flame-retardant epoxy providing excellent moisture resistance and protection against high external voltage stresses.

EPOXY DIPPED STYLES are coated with a rigid flame-retardant epoxy and offer excellent lead strength. The BLUESEAL process assures high moisture resistance in a small, economical package.

PLASTIC CASED STYLES employ a rectangular premolded case completely filled with a flame retardant epoxy assuring uniformity of size and shape. The rugged design provides added capacitance stability, environmental protection, and reliability under severe mechanical stress.

CHARACTERISTICS

CAPACITANCE: Standard tolerance is $\pm 20\%$.

OPERATING TEMPERATURE RANGE: -55°C to $+125^{\circ}\text{C}$. Derate 50% for operation at 125°C .

DIELECTRIC STRENGTH: 150% of rated voltage.

INSULATION RESISTANCE: Minimum 10,000 megohm-microfarads, but need not exceed 30,000 megohms.

DISSIPATION FACTOR: 1% maximum for .01 MFD and above, for less than .01 MFD, 1.5% maximum.

CONSTRUCTION: Metalized Polyester Film, Extended Foil.

LEADS: Tinned copper.

Standard ratings in all case styles are 50 thru 600 VDC and up to 10 MFD.

THE POTTER COMPANY also manufactures other types of film capacitors such as Metalized Polycarbonate and Polyester & Foil. Please send for complete catalog, listing full specifications for all types.

SERIES 4309 EPOXY DIPPED									SERIES 4308 PLASTIC CASED								
CAP MFD's	200 VDC			400 VDC			600 VDC			200 VDC	400 VDC			600 VDC			
	L	W	H	L	W	H	L	W	H		L	W	H		L	W	H
.022	.44	.22	.35	.50	.25	.38	.40	.69	.25	.38	.56	.40	.10	.40	.50	.15	.50
.027	.44	.22	.35	.56	.25	.37	.40	.69	.26	.42	.56	.50	.15	.50	.50	.15	.50
.033	.44	.23	.35	.56	.26	.39	.40	.69	.28	.44	.56	.50	.15	.50	.50	.15	.50
.047	.50	.23	.36	.69	.26	.39	.56	.81	.29	.45	.70	.50	.15	.50	.68	.25	.50
.056	.50	.24	.37	.69	.26	.43	.56	.81	.31	.47	.70	.50	.15	.50	.68	.25	.50
.068	.50	.26	.39	.69	.28	.45	.56	.81	.33	.50	.70	.50	.15	.50	.68	.25	.50
.082	.56	.25	.38	.81	.27	.44	.70	.81	.34	.54	.70	.50	.15	.50	.68	.25	.50
.1	.56	.27	.40	.81	.29	.46	.70	.94	.34	.54	.80	.50	.15	.50	.88	.25	.50
.15	.69	.27	.40	.81	.33	.52	.70	.94	.41	.60	.80	.68	.25	.50	1.00	.25	.50
.18	.69	.29	.41	.81	.33	.52	.80	.94	.44	.64	.80	.68	.25	.50	1.00	.25	.75
.22	.69	.29	.46	.94	.36	.55	.80	1.06	.45	.64	.90	.68	.25	.50	1.00	.25	.75
.27	.69	.32	.49	.94	.39	.59	.80	1.06	.49	.69	.90	.88	.25	.50	1.00	.31	.75
.33	.81	.30	.47	.94	.43	.62	.80	1.19	.50	.70	1.06	.88	.25	.50	1.00	.31	.75
.47	.81	.35	.52	1.06	.46	.66	.90	1.44	.53	.72	1.30	1.00	.25	.50	1.00	.50	.75
.56	.81	.36	.56	1.06	.50	.70	.90	1.44	.53	.82	1.30	1.00	.25	.75	1.00	.75	.75
.68	.94	.36	.56	1.19	.51	.71	1.06	1.56	.55	.85	1.40	1.00	.25	.75	1.00	.75	.75
.82	.94	.39	.59	1.19	.56	.75	1.06	1.56	.60	.89	1.40	1.00	.31	.75	1.00	.31	.75
1.0	.94	.43	.62	1.19	.61	.81	1.06	1.69	.64	.93	1.56	1.00	.31	.75	1.00	.31	.75
1.5	1.06	.47	.67	1.44	.61	.91	1.30	1.69	.74	1.04	1.56	1.00	.50	.75	1.00	.50	.75
2.0	1.19	.46	.75	1.44	.71	1.00	1.30	1.94	.84	1.13	1.80	1.00	.75	.75	1.00	.75	.75

SERIES 4308

Case Width	Lead Spacing (A)	Lead Size
.34	.20	26
.40	.30	26
.50	.40	24
.68	.60	22
.88	.80	22
1.00	.90	20

Shown here are only a portion of standard POTTER CO. capacitors ready for immediate delivery. Our engineers, if required, will design special capacitors to meet specific requirements.

THE POTTER COMPANY

P.O. BOX 337, NORTH HIGHWAY 51
WESSON, MISSISSIPPI 39191 (601) 643-2216
A Division of Pemcor, Inc.

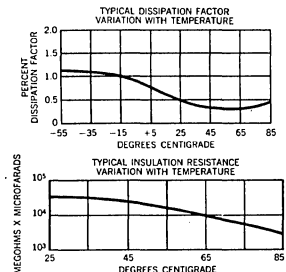
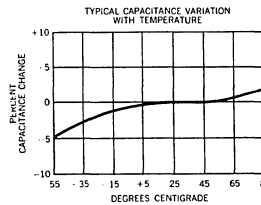
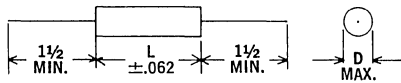


**THE
POTTER
COMPANY**

HIGH VOLTAGE BLUEAL FILM CAPACITORS — SERIES 3460

Metalized Polyester Wrap and Fill Styles

PERFORMANCE CURVES



	1000 VDC		2000 VDC		4000 VDC		6000 VDC		8000 VDC		10,000 VDC		15,000 VDC	
CAP. MFD.	L	D	L	D	L	D	L	D	L	D	L	D	L	D
.001	.750	.300	.750	.300	1.125	.300	1.500	.300	1.875	.300	2.250	.300	3.062	.370
.0012	.750	.300	.750	.300	1.125	.300	1.500	.300	1.875	.300	2.250	.300	3.062	.398
.0015	.750	.300	.750	.300	1.125	.300	1.500	.300	1.875	.300	2.250	.302	3.062	.435
.0018	.750	.300	.750	.300	1.125	.300	1.500	.300	1.875	.300	2.250	.321	3.062	.470
.0022	.750	.300	.750	.300	1.125	.300	1.500	.300	1.875	.319	2.250	.347	3.062	.509
.0025	.750	.300	.750	.300	1.125	.300	1.500	.300	1.875	.332	2.250	.364	3.062	.538
.0027	.750	.300	.750	.300	1.125	.300	1.500	.302	1.875	.343	2.250	.374	3.062	.559
.0033	.750	.300	.750	.301	1.125	.300	1.500	.325	1.875	.371	2.250	.402	3.062	.610
.0039	.750	.300	.750	.322	1.125	.300	1.500	.347	1.875	.396	2.250	.431	3.062	.658
.0047	.750	.300	.750	.342	1.125	.321	1.500	.374	1.875	.423	2.250	.466	3.062	.715
.005	.750	.300	.750	.351	1.125	.325	1.500	.384	1.875	.437	2.250	.478	3.062	.736
.0056	.750	.300	.750	.369	1.125	.339	1.500	.399	1.875	.458	2.250	.503	3.062	.775
.0068	.750	.321	.750	.398	1.125	.367	1.500	.434	1.875	.495	2.250	.545	3.062	.848
.0082	.750	.347	.750	.432	1.125	.396	1.500	.471	1.875	.537	2.250	.593	3.062	.925
.01	.750	.374	.875	.351	1.125	.431	1.500	.512	1.875	.587	2.250	.647	3.062	1.016
.012	.750	.402	.875	.377	1.125	.466	1.500	.556	1.875	.636	2.250	.702	3.062	1.232
.015	.750	.442	.875	.413	1.125	.512	1.500	.614	1.875	.702	2.250	.778	3.062	1.107
.018	.875	.357	.875	.450	1.125	.556	1.500	.667	1.875	.764	2.250	.848	3.062	1.343
.022	.875	.387	.875	.490	1.750	.396	1.500	.731	1.875	.838	2.250	.931	3.062	1.480
.025	.875	.408	.875	.517	1.750	.417	1.500	.775	1.875	.890	2.250	.988	3.062	1.575
.027	.875	.423	1.250	.364	1.750	.425	2.500	.510	1.875	.922	3.812	.638	3.062	1.635
.033	.875	.461	1.250	.394	1.750	.468	2.500	.556	1.875	1.014	3.812	.700		
.039	.875	.495	1.250	.421	1.750	.503	2.500	.599	3.187	.682	3.812	.754		
.047	.875	.537	1.250	.457	1.750	.545	2.500	.651	3.187	.742	3.812	.823		
.05	.875	.552	1.250	.470	1.750	.560	2.500	.670	3.187	.764	3.812	.848		
.056	1.250	.390	1.250	.493	1.750	.589	2.500	.706	3.187	.805	3.812	.894		
.068	1.250	.423	1.250	.535	1.750	.642	2.500	.841	3.187	.881	3.812	.977		
.082	1.250	.458	1.250	.582	1.750	.697	2.500	.771	3.187	.961	3.812	1.069		
.1	1.250	.500	1.250	.637	1.750	.764	2.500	.922	3.187	1.056	3.812	1.174		
.12	1.250	.541	1.750	.536	1.750	.831	2.500	1.005	3.187	1.152	3.812	1.282		
.15	1.250	.599	1.750	.591	1.750	.922	2.500	1.047	3.187	1.282	3.812	1.427		
.18	1.250	.649	1.750	.640	1.750	1.005	2.500	1.219						
.22	1.250	.712	1.750	.701	1.750	1.105	2.500	1.342						
.25	1.750	.583	1.750	.743	1.750	1.174								
.27	1.750	.602	1.750	.771	1.750	1.219								
.33	1.750	.658	1.750	.845	1.750	1.342								
.39	1.750	.710	2.250	.771										
.47	1.750	.774	2.250	.840										
.5	1.750	.796	2.250	.864										
.56	2.250	.709	2.250	.911										
.67	2.250	.774	2.250	1.000										
.82	2.250	.845	2.250	1.091										
1.0	2.250	.926	2.250	1.200										

Send for
Complete
BLUEAL
CATALOG
SERIES 3460

HOW TO ORDER

Please order by complete part number as outlined below.

TYPE High Voltage Metalized Polyester Wrap and Fill	3460	G	393	M	CAPACITANCE TOLERANCE M — ±20% K — ±10%
VOLTAGE G — 1000 V — 8000 J — 2000 S — 10,000 M — 4000 W — 15,000 P — 6000					
					CAPACITANCE Expressed in picofarads and identified by a three-digit number. First two digits represent significant figures. Last digit specifies the number of zeros.

CHARACTERISTICS

CAPACITANCE: Standard tolerance is ±20%.

OPERATING TEMP. RANGE: -40°C to +85°C without voltage derating.

DIELECTRIC STRENGTH: 150% of rated voltage for capacitors rated at 1000 VDC and 2000 VDC, 125% of rated voltage for capacitors rated at 4000 VDC through 15,000 VDC.

INSULATION RESISTANCE: 10,000 megohm-microfarads, but need not exceed 30,000 megohms at 25°C.

DISSIPATION FACTOR: 1% maximum at 25°C and 1000 Hz.

CONSTRUCTION: Metalized Polyester film, extended foil, axial leads.

CASE: Yellow thermosetting pressure-sensitive adhesive polyester film wrap, with blue flame-retardant epoxy end fill.

LEADS: Tinned copper.

22 AWG for All Diameters up to and Including .39
20 AWG for All Diameters .40 and Larger

THE POTTER COMPANY

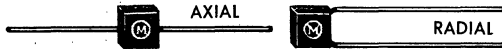
P.O. BOX 337, NORTH HIGHWAY 51
WESSON, MISSISSIPPI 39191 (601) 643-2216
A Division of Pemcor, Inc.

MUCON[®] SUBminiature CERAMIC CAPACITORS

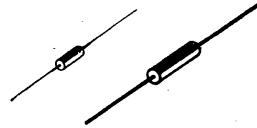
ULTRA-STABLE NPO MU-CAPS[®]

MOST STABLE MINIATURE CAPACITOR MADE

T.C.--ZERO ± 30 PPM/ $^{\circ}$ C



SQUARE ... from 1 PF. to .22 MF.



TUBULAR ... from 1 PF. to .22 MF.

THINLINE



Mucon's Thinline Capacitors are made of the following 16 different ceramic bodies for a broad choice of size and electrical properties:

Temperature-	NPO	N080	N150
Compensating	N220	N330	N450
Materials:	N750	N1400	N2400
	N3300	N4700	N5600

General Purpose: LOW-VAR, STABLE-K, HIGH-K & SUPER-K for wide range of stability and capacitance.

SPECIFICATIONS

Capacitance:
Range: TEMP.-COMP. BODIES
1/2 pf - 2200 pf
GEN. PURPOSE BODIES
50 pf - 150,000 pf
Voltages: 25 WVDC, 50WVDC,
200 WVDC and 500 WVDC
Leads: Tinned Copper, Nickel or
Dumet to MIL Spec.
Shapes: Square, rectangular,
single or multiple element.

CHIPS SINGLE LAYER



Sizes: .030" Sq. and up
Capacitance: SUPER-K Ceramic 150 PF. to 10,000 PF.
HIGH-K " 100 PF. to 5,000 PF.
STABLE-K " 50 PF. to 2,700 PF.
LOW-VAR " 20 PF. to 1,000 PF.
TEMP. COMP. " 1 PF. to 330 PF.

Electrodes: Normally silver. Other precious metals on request

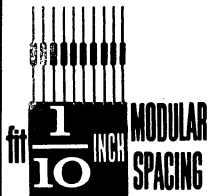
Voltage: 50 WVDC

NARROW-CAPS[®]

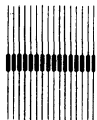
SPECIFICATIONS

Capacitance:
Range: 5 pf - 100,000 pf
Voltages: 10 WVDC - 50 WVDC
Sizes: .095" max. wide x 1/4"
max. long x .095" max.
thick through 750 pf. Larger
values 5/16" max. long.
Leads: #26 Tinned Copper, Nickel
or Dumet to MIL Spec.

NARROW-CAPS are designed for 1/10" modular spacing on printed circuits, or for cordwood applications.



SLIM-CAPS[®]

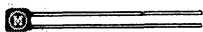


Designed for applications which require capacitors slimmer than NARROW-CAPS. SLIM-CAPS are .065" wide x .065" thick max. Body lengths from .100"—.250" max.

SPECIFICATIONS

Capacitance
Range: 1/2 pf - 20,000 pf
Voltages: 50 WVDC
Leads: #30 Tinned Copper, Nickel
or Dumet to MIL Spec.

M-CAPS



M-CAPS are monolithic capacitors with maximum capacitance/volume ratio in a choice of 3 dielectrics to cover all requirements. From .100" square to .300" square.

RIBBON LEADS

Style RLA

Size and specifications same as "Thinline" capacitors shown above, except radial and axial tinned copper ribbon leads, approximately .006" thick x 3/32" wide for units with max. size of .150" and up; .045" wide for smaller units.

**WRITE FOR FREE
CATALOG LISTING
COMPLETE DETAILED
SPECIFICATIONS FOR
ALL MUCON
SUB-MINIATURE
CERAMIC CAPACITORS,
ELEMENTS & FILTERS**

QPL's
CK05 and CK06
CK12 thru CK16

MILITARY CAPACITANCE RANGE IN PF MIL-C-20 NPO

STYLE	CAP. RANGE	VOLTAGE	STYLE	CAP. RANGE	VOLTAGE
CC75/CCR75	1.0 - 68	200	CC77/CCR77	2,700 - 5,600	50
CC75/CCR75	82 - 220	200	CC78/CCR78	820 - 3,300	200
CC75/CCR75	330 - 680	50	CC78/CCR78	3,900 - 12,000	100
CC76/CCR76	82 - 120	200	CC78/CCR78	15,000 - 27,000	50
CC76/CCR76	270 - 390	100	CC79/CCR79	3,900 - 10,000	200
CC76/CCR76	820 - 1,000	50	CC79/CCR79	15,000 - 39,000	100
CC77/CCR77	150 - 680	200	CC79/CCR79	47,000 - 82,000	50
C77/CCR77	470 - 2,200	100			

REPUBLIC ELECTRONICS CORP. 176 E. 7th St., PATERSON, N. J. 07524
201-279-0300 TWX 510-234-5908

MUCON[®] MU[®] CAPS

ULTRA-STABLE

±.3%

MOLDED CAPACITORS

MUCON ultra stable MU-CAPS consist of capacitor elements made of MUCON NPO ceramic encased in a specially formulated epoxy. Meet MIL-C-20.

CAP. PF. MUCON PART CASE SIZE MUCON PART CASE SIZE

CK05 SIZE .200" x .200" x .100"

10	MU25CG100M	A	MU27CG100M	F
12	MU25CG120M	A	MU27CG120M	F
15	MU25CG150M	A	MU27CG150M	F
18	MU25CG180M	A	MU27CG180M	F
22	MU25CG220M	A	MU27CG220M	F
27	MU25CG270M	A	MU27CG270M	F
33	MU25CG330M	A	MU27CG330M	F
39	MU25CG390M	A	MU27CG390M	F
47	MU25CG470M	A	MU27CG470M	F
56	MU25CG560M	A	MU27CG560M	F
68	MU25CG680M	A	MU27CG680M	F
82	MU25CG820M	A	MU27CG820M	F
100	MU25CG101M	A	MU27CG101M	F
120	MU25CG121M	A	MU27CG121M	F
150	MU25CG151M	A	MU27CG151M	F
180	MU25CG181M	A	MU27CG181M	F
220	MU25CG221M	A	MU27CG221M	F
330	MU25CG331M	A	MU27CG331M	F
390	MU25CG391M	A	MU27CG391M	F
470	MU25CG471M	A	MU27CG471M	F
560	MU25CG561M	A	MU27CG561M	F
680	MU25CG681M	A	MU27CG681M	F
820	MU25CG821M	A	MU27CG821M	F
1000	MU25CG102M	A	MU27CG102M	F
1200	MU25CG122M	A	MU27CG122M	F
1500	MU25CG152M	A	MU27CG152M	F
1800	MU25CG182M	A	MU27CG182M	F
2200	MU25CG222M	A	MU27CG222M	F
2700	MU25CG272M	A	MU27CG272M	F
3300	MU25CG332M	A	MU27CG332M	F

CK06 SIZE .300" x .300" x .100"

1200	MU26CG122M	B	MU28CG122M	G
1500	MU26CG152M	B	MU28CG152M	G
1800	MU26CG182M	B	MU28CG182M	G
2200	MU26CG222M	B	MU28CG222M	G
2700	MU26CG272M	B	MU28CG272M	G
3300	MU26CG332M	B	MU28CG332M	G
3900	MU26CG392M	B	MU28CG392M	G
4700	MU26CG472M	B	MU28CG472M	G
5600	MU26CG562M	B	MU28CG562M	G
6800	MU26CG682M	B	MU28CG682M	G
8200	MU26CG822M	B	MU28CG822M	G
10,000	MU26CG103M	B	MU28CG103M	G
12,000	MU26CG123M	B	MU28CG123M	G

MODIFIED CK06 SIZE .300" x .300" x .170"

15,000	MU29CG153M	B-1	MU30CG153M	G-1
18,000	MU29CG183M	B-1	MU30CG183M	G-1
22,000	MU29CG223M	B-1	MU30CG223M	G-1

CC68 SIZE .500" x .500" x .150"

10,000	MU08CG103M	D	MU13CG103M	I
12,000	MU08CG123M	D	MU13CG123M	I
15,000	MU08CG153M	D	MU13CG153M	I
18,000	MU08CG183M	D	MU13CG183M	I
22,000	MU08CG223M	D	MU13CG223M	I
27,000	MU08CG273M	D	MU13CG273M	I
33,000	MU08CG333M	D	MU13CG333M	I
39,000	MU08CG393M	D	MU13CG393M	I
47,000	MU08CG473M	D	MU13CG473M	I
56,000	MU08CG563M	D	MU13CG563M	I
68,000	MU08CG683M	D	MU13CG683M	I
82,000	MU08CG823M	D	MU13CG823M	I
100,000	MU08CG104M	D	MU13CG104M	I
120,000	MU08CG124M	D	MU13CG124M	I
150,000	MU08CG154M	D	MU13CG154M	I
180,000	MU08CG184M	D	MU13CG184M	I
220,000	MU08CG224M	D	MU13CG224M	I

CAPACITANCE: Values 1000 Pf and below measured at 1 MHz.
Values above 1000 Pf measured at 1 KHz.

CAPAC. TOL.: Last letter of part number. Specify M for ±20%, K for ±10%, J for ±5%, G for ±2%. Note all parts are shown for ±20%.

POWER FACTOR: Measured same as capacitance .1% max.

INSUL. RESIST.: 100,000 Megohms or 1000 Megohm Microfarads whichever is less.

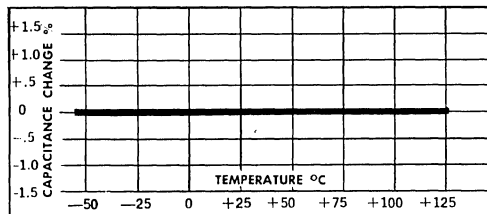
WORKING VOLTAGE: 50 WVDC

TEMP. RANGE: -55°C to +125°C.

TEMP. COEFF.: Zero ±30 ppm/°C.

TEMP. CHARACT.: ±.3% max. from +25°C. See curve.

LEADS: No. 22 AWG tinned copper 1¼" long minimum except #26 AWG for case sizes MT11 thru MT13.



CAP. PF. MUCON PART

CK13 SIZE

5	MT13CG509M
6	MT13CG609M
7	MT13CG709M
8	MT13CG809M
9	MT13CG909M
10	MT13CG100M
12	MT13CG120M
15	MT13CG150M
18	MT13CG180M
22	MT13CG220M
27	MT13CG270M
33	MT13CG330M
39	MT13CG390M
47	MT13CG470M
56	MT13CG560M
68	MT13CG680M
82	MT13CG820M
100	MT13CG101M
120	MT13CG121M
150	MT13CG151M
180	MT13CG181M
220	MT13CG221M
270	MT13CG271M
330	MT13CG331M
390	MT13CG391M
470	MT13CG471M
560	MT13CG561M
680	MT13CG681M
820	MT13CG821M
1000	MT13CG102M
1200	MT13CG122M
1500	MT13CG152M
1800	MT13CG182M

CAP. PF. MUCON PART

CK14 SIZE

82	MT14CG820M
100	MT14CG101M
120	MT14CG121M
150	MT14CG151M
180	MT14CG181M
220	MT14CG221M
270	MT14CG271M
330	MT14CG331M
390	MT14CG391M
470	MT14CG471M
560	MT14CG561M
680	MT14CG681M
820	MT14CG821M
1000	MT14CG102M
1200	MT14CG122M
1500	MT14CG152M
1800	MT14CG182M
2200	MT14CG222M
2700	MT14CG272M
3300	MT14CG332M
3900	MT14CG392M
4700	MT14CG472M
5600	MT14CG562M
6800	MT14CG682M
8200	MT14CG822M
10000	MT14CG103M
12000	MT14CG123M
15000	MT14CG153M
18000	MT14CG183M
22000	MT14CG223M
27000	MT14CG273M

CAP. PF. MUCON PART

CK15 SIZE

100	MT15CG101M
120	MT15CG121M
150	MT15CG151M
180	MT15CG181M
220	MT15CG221M
270	MT15CG271M
330	MT15CG331M
390	MT15CG391M
470	MT15CG471M
560	MT15CG561M
680	MT15CG681M
820	MT15CG821M
1000	MT15CG102M
1200	MT15CG122M
1500	MT15CG152M
1800	MT15CG182M
2200	MT15CG222M
2700	MT15CG272M
3300	MT15CG332M
3900	MT15CG392M
4700	MT15CG472M
5600	MT15CG562M
6800	MT15CG682M
8200	MT15CG822M
10,000	MT15CG103M
12,000	MT15CG123M
15,000	MT15CG153M
18,000	MT15CG183M
22,000	MT15CG223M
27,000	MT15CG273M
33,000	MT15CG333M
39,000	MT15CG393M

CAP. PF. MUCON PART

CK12 SIZE

5	MT12CG509M
6	MT12CG609M
7	MT12CG709M
8	MT12CG809M
9	MT12CG909M
10	MT12CG100M
12	MT12CG120M
15	MT12CG150M
18	MT12CG180M
22	MT12CG220M
27	MT12CG270M
33	MT12CG330M
39	MT12CG390M
47	MT12CG470M
56	MT12CG560M
68	MT12CG680M
82	MT12CG820M
100	MT12CG101M
120	MT12CG121M
150	MT12CG151M
180	MT12CG181M
220	MT12CG221M
270	MT12CG271M
330	MT12CG331M
390	MT12CG391M
470	MT12CG471M
560	MT12CG561M
680	MT12CG681M
820	MT12CG821M
1000	MT12CG102M
1200	MT12CG122M
1500	MT12CG152M
1800	MT12CG182M

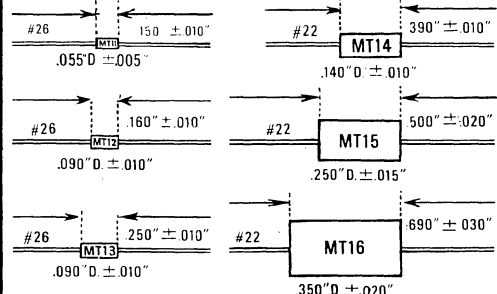
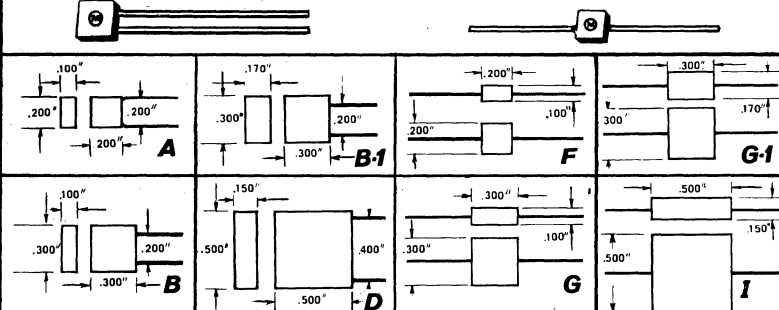
CAP. PF. MUCON PART

CK16 SIZE

6800	MT16CG682M
8200	MT16CG822M
10,000	MT16CG103M
12,000	MT16CG123M
15,000	MT16CG153M
18,000	MT16CG183M
22,000	MT16CG223M
27,000	MT16CG273M
33,000	MT16CG333M
39,000	MT16CG393M
47,000	MT16CG473M
56,000	MT16CG563M
68,000	MT16CG683M
82,000	MT16CG823M
100,000	MT16CG104M
120,000	MT16CG124M
150,000	MT16CG154M
180,000	MT16CG184M
220,000	MT16CG224M

RADIAL LEADS

AXIAL LEADS



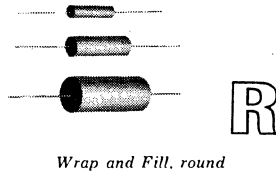
REPUBLIC ELECTRONICS CORP.

176 E. 7th St., PATERSON, N. J. 07524
201-279-0300 TWX 710-988-5908

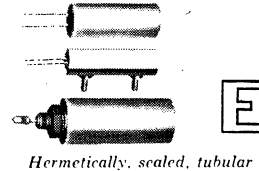
S&E[®] Manufacturing/Capacitors

18800 Parthenia Street, Northridge, California 91324 • (213) 349-4111 • TWX 910-493-1252

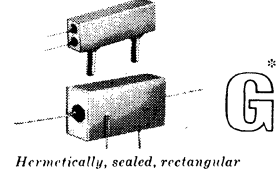
CASE STYLES FEATURES



Wrap and Fill, round



Hermetically, sealed, tubular



Hermetically, sealed, rectangular

17 SERIES—METALIZED*MYLAR

For circuits that require the ultimate electrical properties. Non Polar coupled with the smallest size over a wide temp. range.

- IR: 50K Meg $\times$ MFD Min. $\pm 25^\circ$ C
- DF Less Than 1% IKHZ at $\pm 25^\circ$ C
- Dielectric Strength: 200% of rated VDC 1 Min. Max.
- Temperature Range: -55° C to $+125^\circ$ C
- Voltage versus Temp.: 100% rated Voltage to 100° C 50% derating to $+125^\circ$ C
- Capacity versus Temp.: -55° C to $+25^\circ$ C, $\pm 5\%$ change; $+25^\circ$ C to $+85^\circ$ C, $\pm 3\%$, and $+25^\circ$ C to $+105^\circ$ C, $\pm 7\%$ change
- Quality Control and Production Tests consist of 100% group A requirements of MIL C 18312 on hermetic seal style E and all tests except for moisture leak tests on styles W-U-R-N-B-D.

		17R			
CASE SIZES	100	200	400	600	
DIA. LGTH.	VDC MFD	VDC MFD	VDC MFD	VDC MFD	
17 .40	.001	.001	.001	.001	
17 .40	.022	.0068	.0033	.0017	
22 .40	.039	.027	.01	.0047	
23 .54	.12	.033	.027	.0082	
27 .54	.18	.12	.047	.01	
32 .67	.50	.22	.075	.015	
34 .83	.68	.33	.12	.039	
46 .83		.39	.18	.047	
28 .97	.82				
39 .97	1.5	.47	.22		
47 .97		.68	.27		
51 .117	2.0	.82	.18	.047	
56 .117	5.0	1.5	.50	.18	
60 .117			.56		
65 .168	10.0	4.0	1.0	.68	
89 .168	20.0	8.0	3.0	1.5	

17E

		17E			
CASE SIZES	100	200	400	600	
DIA. LGTH.	VDC MFD	VDC MFD	VDC MFD	VDC MFD	
175 .500	.022	.0068	.0033	.001	
175 .500	.039	.0082	.0068	.0049	
235 .500		.027	.01		
195 .625	.056		.0056		
215 .625	.12	.056	.019	.01	
312 .625	.18	.12	.047		
312 .750	.33	.18	.056	.015	
400 .750	.50	.27	.1	.033	
400 .875	.68	.39	.12	.047	
400 .1125	1.5	.68		.056	
400 .1375	2.0			.1	
500 .1375	4.0	1.5	.39	.15	
562 .1375			.50	.18	
67 .1375	5.0		.56		
562 .1875		.20	.82	.39	
670 .1875	10.0	4.0	1.0	.56	
750 .1875	12.0	5.0	1.5	.82	

17G

		17G			
CASE SIZES	100	200	400	600	
TK. WD. LG.	VDC MFD	VDC MFD	VDC MFD	VDC MFD	
22 .34 .562	.082	.027	.01	.0047	
22 .34 .687	.22	.056	.033	.018	
22 .34 .812	.33	.10	.056	.027	
22 .34 .937	.50	.12	.068	.033	
22 .34 .1125	.68	.18	.1	.047	
31 .41 .937	.82	.27	.15	.068	
31 .41 .1125	1.0	.39	.18	.1	
31 .41 .1312	1.5	.50	.27	.12	
40 .57 .1125	2.0	.75	.39	.18	
40 .57 .1312	3.0	.82	.56	.27	
40 .57 .1562		1.0	.68	.33	
40 .57 .1812	5.0	1.5	.82	.39	
50 .65 .1562		2.0	1.0	.50	
50 .65 .1812				.56	
50 .65 .2062	8.0		1.5	.75	
50 .65 .2312		3.0		.82	
60 .80 .2062	12.0		2.0	1.0	
60 .80 .2312	15.0	5.0			

22 SERIES—METALIZED POLYCARBONATE

For circuits that require flat T.C., low losses, small size over a wide temperature and frequency range. Used in many wave filter, discriminator and critical timing circuits.

- IR: 100K Meg $\times$ MFD Min. at $\pm 25^\circ$ C
- DF less than .3% measured IKHZ at $\pm 25^\circ$ C
- Dielectric Strength: Up to 200% of rated VDC. Max. 1 Min.
- Temperature Range: -55° C to $+105^\circ$ C. When properly encased will operate to $+125^\circ$ C
- Temperature Coefficient: From -55° C to $+25^\circ$ C, 1.5% max. change; $+25^\circ$ C to $+105^\circ$ C, $\pm 7\%$ max. change.
- QC & Production Tests consist of 100% to group A requirements MIL C 18312 on hermetic seal style E and to all except moisture leak test on styles W-U-R-N-B-D.

		22R			
CASE SIZES	100	200	400	600	
DIA. LGTH.	VDC MFD	VDC MFD	VDC MFD	VDC MFD	
18 .40	.082	.039	.01	.0047	
21 .40	.18	.068	.022	.01	
18 .54	.22	.082	.027	.015	
38 .54	.56	.22	.082	.047	
24 .67	.68	.27	.1	.056	
29 .67	.75	.39	.25	.12	
32 .67	.75	.39	.25	.12	
40 .67	1.0	.56			
32 .83	1.5	.82	.27	.15	
39 .83	2.0	1.0	.39	.18	
41 .97		1.5	.47	.22	
48 .97			.56	.33	
38 .116	4.0		.68	.39	
45 .116	5.0	2.0	1.0	.5	
50 .116	8.0	2.5	1.5	.68	
62 .116	12.0				
64 .168	15.0	5.6			
68 .168	20.0	8.0			
106 .168	50.0	12.0			
44 .178			2.0	.75	
675 .178			4.0		

22E

		22E			
CASE SIZES	100	200	400	600	
DIA. LGTH.	VDC MFD	VDC MFD	VDC MFD	VDC MFD	
175 .50	.033	.018	.0015		
195 .50	.082	.039	.022	.0022	.001
235 .50					
195 .625	.12	.082	.01		
235 .625	.18	.1	.033	.027	
312 .625	.56	.12	.056	.033	.0082
312 .750	.68	.27	.18	.056	.022
400 .750	1.0	.50	.25	.082	.027
40 .875	2.0	.56	.39	.1	.039
50 .875	3.0	1.0	.47	.18	.056
40 .1125	3.0	1.0	.47	.18	.056
50 .1125	5.0	2.0	.56	.25	.12
562 .1125	6.8		.33		
50 .1375	8.0	3.0	1.0	.50	.18
562 .1375	10.0	5.0	1.5		
670 .1375	10.0	5.0		.27	
562 .1875	15.0	6.8	2.0	.82	.33
670 .1875	18.0	8.0	3.0		
75 .1875	20.0	12.0	4.0	1.0	.56
10 .1875	40.0	22.0	8.0	1.5	.82

22G

		22G			
CASE SIZES	100	200	400	600	
TK. WD. LG.	VDC MFD	VDC MFD	VDC MFD	VDC MFD	
22 .34 .562	.39	.039	.015	.0058	.0047
22 .34 .687	.56	.056	.056	.015	.01
22 .34 .812	.82	.18	.082	.022	.015
22 .34 .937	1.0	.39	.12	.033	.022
22 .34 .1125		.18	.047	.027	
31 .41 .937	2.0	.68	.39	.056	.033
31 .41 .1125	3.0	1.0	.50	.092	.056
31 .41 .1312				.12	.068
40 .57 .1125	5.0		.75	.18	.12
40 .57 .1312		2.0	.82	.25	.15
40 .57 .1562	7.0	3.0	1.0	.33	.18
40 .57 .1812			1.5	.39	.25
50 .65 .1562	10.0	7.0		.47	.27
50 .65 .1812		10.0	2.0	.56	.33
50 .65 .2062				.68	.39
50 .65 .2312			3.0	.75	.50
60 .80 .2062		5.0	1.0	.75	

13 SERIES—POLYSTYRENE

For the instruments that require long term stability, low leakage, minimum dielectric absorption.

- Used in many critical computer timing and hybrid circuits.
- Temperature Range: -55° C to $+85^\circ$ C
- IR: 100K Meg $\times$ MFD Min. $\pm 25^\circ$ C
- DF: .05% Max IKHZ at $\pm 25^\circ$ C
- TC: 130 PPM / $^\circ$ C ± 20 PPM
- Quality and Production test consists of 100% to group A requirements of MIL C 19978 on style E and all requirements except moisture leak test on style R.

		13R			
CASE SIZES	100	200	400	600	
DIA. LGTH.	VDC MFD	VDC MFD	VDC MFD	VDC MFD	
280 .680	.001	.001	.001	.001	
280 .680	.01	.0068	.005	.0039	
312 .680	.022	.01	.0082	.0068	
312 .875	.033	.015	.01	.032	
343 .875	.039	.027	.015	.01	
375 .875	.05	.033	.022	.015	
458 .875	.082	.039	.025		
406 .10	.1	.047	.033	.07	
468 .10	.12	.05	.039	.027	
437 .125	.15	.068	.05	.033	
50 .125	.20	1	.068	.039	
531 .125	.27	.15	.082	.05	

13E

		13E			
CASE SIZES	100	200	400	600	
DIA. LGTH.	VDC MFD	VDC MFD	VDC MFD	VDC MFD	
195 .75	.0027	.0015			
195 .75	.0039	.0018			
195 .75	.0082	.0033	.0015		
235 .75	.012	.0068	.0027		
312 .75	.022	.015	.01		
400 .87	.068	.033	.018		
500 .10	.12	.068	.033		
562 .112	.22	.1	.068		
562 .1375	.33	.15	.1		

10 SERIES—MYLAR FOIL

For the instrument that requires high reliability, precise characteristics year after year. Used in many communication, telephone, tracking and test instrument devices.

- Temperature Range: -55° C to $+125^\circ$ C
- IR: 50K Meg $\times$ MFD Min. at $\pm 25^\circ$ C
- Dielectric Strength: 200% of rated VDC Max. 1 Min.
- DF less than .5% IKHZ at $\pm 25^\circ$ C
- Temperature Coefficient: $\pm 5\%$ change from -55° C to $+25^\circ$ C $\pm 5\%$ change from $+25^\circ$ C to $+85^\circ$ C $\pm 9\%$ change from $+25^\circ$ C to $+105^\circ$ C $\pm 14\%$ change from $+25^\circ$ C to $+125^\circ$ C
- QC and Production Tests are 100% to group A of MIL C 19978 on hermetic style E and all tests except moisture leak requirement style R.

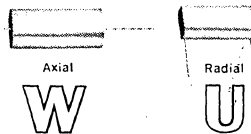
		10R			
CASE SIZES	100	200	400	600	1000
DIA. LGTH.	VDC MFD	VDC MFD	VDC MFD	VDC MFD	VDC MFD
156 .500	.001	.001			
156 .500	.01	.0082			
295 .750	.082	.047	.022	.0032	.0015
203 .625	.022	.022	.0058		
265 .625	.039	.027	.01		
218 .750	.047	.03	.02	.0047	.001
295 .750	.082	.047	.022	.0032	.0015
312 .750	.068	.025	.01		
281 .875	.1	.075	.027	.015	.0022
375 .875	.15	.1	.047	.022	.01
369 .10	.22		.068	.027	.015
50 .10			.12	.068	
406 .125	.39	.22			
468 .125	.47	.33	.15	.082	.047
625 .125	.82	.47			
609 .1375		.56	.27	.15	

10E

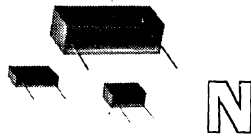
CASE SIZES		100	200	400	600
DIA	LGTH	VDC MFD	VDC MFD	VDC MFD	VDC MFD
195	.625	.001	.001	.001	
195	.625	.015	.01	.0047	.0015
235	.625		.015	.0058	
312	.625		.027		
312	.750	.082	.033		.0082
400	.750	.12	.047	.027	
400	.875	.15	.032	.047	.027
400	1.125	.22	.15	.058	.027
400	1.375	.33	.22	.1	.033
500	1.375	.33	.33	.15	.066
562	1.375	.56	.47	.22	.082
670	1.375	.90		.27	
670	1.875	1.0	.56	.39	.12
670	1.875	1.25	.82	.56	.12
750	1.875	1.5	1.0	.56	.33
1 0	1.875	2.0	1.5	.82	.39

S&E[®] Manufacturing/Capacitors

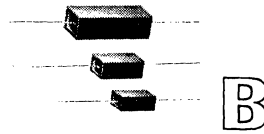
18800 Parthenia Street, Northridge, California 91324 • (213) 349-4111 • TWX 910-493-1252



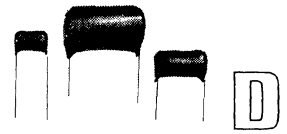
Wrap and Fill, rectangular



Molded, radial leads



Molded, axial leads.



Epoxy Dip Case

17W/17U										17N										17B										17D									
CASE SIZES			100		200		400		600		CASE SIZE			100		200		400		600		CASE SIZES			100		200		400		600								
L	T	W	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	L	T	H	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	L	T	H	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD							
.40	.12	.22	.022	.0056	.0033	.001					.395	.095	.295	.039	.01	.0027							.39	.17	.35	.027	.01	.0068	.0022										
.40	.17	.27	.039	.027	.01	.0047					.42	.16	.31	.047	.027	.012	.0047						.39	.19	.38	.019	.027	.01	.0047										
.54	.17	.28	.12	.039	.018	.0082					.55	.16	.31	.12	.033	.022	.012						.52	.17	.35	.082	.047	.015	.0056										
.54	.21	.32	.18	.12	.047	.01					.55	.19	.38	.18	.056								.52	.26	.45	.18	.12	.047	.01										
.67	.25	.38	.39	.18	.056	.012					.55	.24	.38	.27	.12	.047							.65	.23	.42	.22	.12	.056	.012										
.67	.30	.42	.50	.27	.032	.015					.55	.30	.40	.39		.015							.65	.25	.45	.39	.15	.082	.015										
.83	.27	.38	.56	.29	.1	.033					.68	.19	.50	.68									.65	.35	.55	.5	.27	.01											
.83	.42	.50	.68	.39	.18	.047					.67	.30	.50		.27		.018						.81	.27	.43	.56	.39	.18	.047										
.97	.22	.35	.82	.47	.2						.82	.30	.70			.18	.020						.81	.42	.60	.68	.39	.18	.047										
.97	.32	.46	1.5	.68	.22						.88	.25	.50	1.0	.39								.95	.37	.51	1.0	.56												
1.17	.34	.5	2.0	.82	.33	.1					1.0	.37	.50	2.0	.68	.27	.056						.95	.38	.59	1.5	.68	.22											
1.17	.47	.65	5.0	1.5	.56	.18					1.24	.40	.75	5.0	1.5	.68	.18						.95	.46	.66														
1.68	.47	.56	8.0	2.0	.82	.27					1.75	.57	.75	8.0	3.0	1.5	.39						1.15	.34	.55							.082							
1.68	.50	.65	10.0	4.0	1.0	.39																1.15	.39	.60	2.0	.75	.33	.10											
1.68	.65	.85	15.0	5.0	1.5	.82																1.15	.43	.65	3.0	1.0	.39	.12											
1.68	.75	1.0	20.0	8.0	2.0	1.5																																	

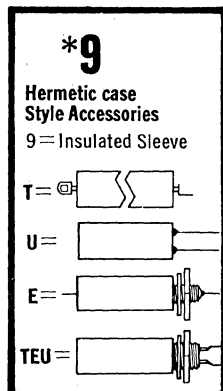
22W/22U										22N										22B										22D									
CASE SIZES			50		100		200		400		CASE SIZES			50		100		200		400		CASE SIZES			50		100		200		400		600						
L	T	W	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	L	T	H	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	L	T	H	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD							
.40	.12	.22	.047	.018	.01	.001					.395	.095	.295	.068	.01	.0068	.0015						.39	.17	.42	.1	.047	.022	.01	.0033									
.40	.15	.27	.25	.039	.022	.01					.42	.16	.31	.075	.047	.01	.0022						.39	.19	.57	.22	.1	.039	.022	.0068									
.54	.13	.23	.27	.082	.027	.015					.42	.18	.31	.1	.12	.022	.0047	.0022				.39	.26	.57	.33	.22	.082	.047	.01	.0047									
.54	.16	.28	.39	.1	.047	.027					.55	.16	.31		.047	.018	.0047						.29	.42	.57	.68	.27	.1	.018										
.54	.21	.32	.50	.12	.082	.047					.55	.18	.31	.22	.15	.056	.027						.23	.42	.67		.25		.027										
.67	.22	.40	1.0	.39	.25	.12					.55	.185	.38		.18	.056							.29	.42	.82	1.0	.75	.27	.068										
.83	.28	.38	1.5	.56	.30	.15					.55	.24	.38	.50	.22	.082	.039	.012					.39	.54	.704	1.5	1.0	.50	1.02	.082									
.83	.32	.45	2.0	.68	.39	.18					.60	.30	.40	.68	.27	.047	.018						.39	.54	1.19	5.0	3.0	.82	.39										
.97	.33	.48		1.0	.47	.27					.67	.30	.45		.39	.22	.047						.39	.54	1.19	5.0	3.0	.82	.39										
.97	.40	.55		1.5	.56	.36					.67	.30	.50		.56		.068						.56	.72	1.24	10.0	5.0	1.5	.5	.27									
1.16	.32	.43		1.5	.68	.50					.82	.30	.42	1.0		.27	1	.039					.56	.72	1.75	18.0	8.0	3.0	.82	.39									
1.16	.437	.55		10.0	2.5	1.5	.63				.82	.40	.50	1.5	1.0	.39	15	.068					.56	.72	1.92	22.0													
1.16	.54	.66		12.0	3.0						1.0	.37	.50	3.0	1.5	.68	1						.56	.72	1.92	22.0													
1.68	.51	.64		15.0	5.0						1.24	.40	.50	5.0	2.0	.82	.22	1					.56	.72	1.92	22.0													
1.68	.73	.86		30.0							1.24	.57	.75	10.0	4.0	1.5	.50	.27					.56	.72	1.92	22.0													
											1.75	.57	.75	18.0	6.0	3.0	.82	.33																					
											1.75	.57	1.0	22.0	10.0																								

22W/22U										22N										22B										22D																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
CASE SIZES			50		100		200		400		CASE SIZES			50		100		200		400		CASE SIZES			50		100		200		400		CASE SIZES			+ .032		50		100		200		400		600																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
L	T	W	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	L	T	H	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	L	T	H	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD	VDC	MFD

All intermediate values not listed are available as standard products.

ORDERING AND PART NUMBER INFORMATION

The dimensional tolerances for case styles R-W-U-D are $\pm .05$. Styles G-B-N-E are $\pm .031$, on length, and $\pm .015$ for other dimensions. All units are available in any value, ranging from .001 MFD to their maximum capacity, with tolerances to $\pm 1\%$. Standard tolerance is $\pm 20\%$. Other types of leads, configurations, and encasements are available upon request to meet your special requirements.



17

Dielectric

17= Metalized

Mylar

22= Metalized

Polycarbonate

10= Mylar Foil

13= Polystyrene

Foil

E

Case Style

E= Hermetic Rnd.

G= Hermetic Rect.

W= Wrap Fill,

Oval, Axial

U= Wrap Fill,

Oval, Radial

N= Molded Radial

B= Molded Axial

R= Wrap Fill, Round

D= Epoxy Dip

***1**

Circuits

1= Case Floating

2= Case ground

3= Case ground

With Lead

5= Feed Through

B

Voltage

A= 50 VDC

B= 100 VDC

C= 200 VDC

D= 300 VDC

E= 400 VDC

F= 600 VDC

G= 1000 VDC

103

Capacitance

Expressed in

MMFD

103= .01 MFD

Last digit

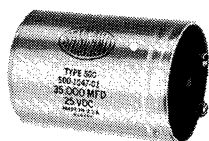
No Zeros

K

Tolerance

Standard $\pm 20\%$

K= $\pm 10\%$



Type 500—Electrolytic
Computer Grade 85°C
Bulletin 2236



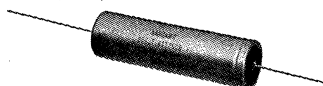
Type DCM—Electrolytic
Computer Grade 65°C
Bulletin 2231



Type 557—Electrolytic
— 55°C to + 125°C
Mil-C-39018
Bulletin 2240



Type 556—Electrolytic
Commercial Grade
Bulletin 2239



Type 066—Electrolytic
Industrial Grade
Bulletin 2241



Type 100—Electrolytic
Premium Grade
High Ripple Current
— 55°C to + 105°C
Bulletin 2271



Type U5—Molded Mica
Automatic Insertion
Bulletin 2325

SPECIFY SANGAMO CAPACITORS

for
Industrial
Military
Computer
Communications
and
Instrument
Applications

For more detailed information
contact your nearest Sangamo
Representative.

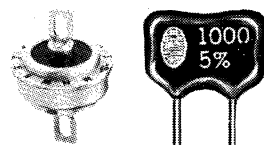
SANGAMO
ELECTRIC COMPANY

Capacitor Division

P.O. BOX 128

PICKENS, SOUTH CAROLINA 29671

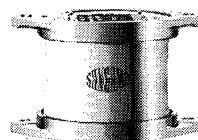
Phone: 803 - 878-6311



Type M—Mica Button
Type D—Mica Dipped
Bulletins 2311, 2323, & 2312



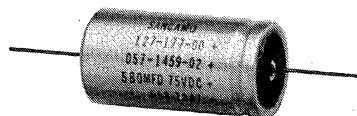
Type R—Mica Molded
Bulletin 2320



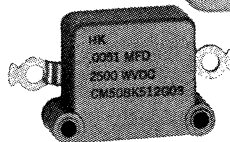
Type G—Mica
Transmitting
Bulletin 2322



Type 291—Cast Mica
Transmitting
Bulletin 2324



Type 057—Electrolytic
Premium Grade
— 55°C to + 85°C
Bulletin 2244



Type AK & HK—Molded Mica
Fixed Terminals
Bulletin 2321

CAPACITORS (ALL TYPES)



DOWN GO COST, SIZE, WEIGHT, VOLUME.

DESIGN SMALLER WITH
NEW SANGAMO

**Power
Pack**™

TYPE 100 CAPACITORS

Imagine a much smaller, much lighter weight computer grade electrolytic capacitor. It's a breakthrough in technology that lets you break through in design.

You can use fewer capacitors at less cost because the Sangamo Type 100 features high ripple current capability up to 46 amps at 120 Hz @ 65°C. Regulate the power supply better thanks to ESR values ranging from .0062 ohms to .052 ohms at 120 Hz. And count on additional savings since you get no temperature or voltage derating with operating temperatures that range from -55°C to 105°C.

What's more, all-aluminum construction of the Type 100 allows higher internal temperature without

deterioration. And excellent impedance vs. frequency response over the entire temperature range means power supplies can operate more efficiently in the 20 to 40 KHz range.

For details on Type 100 Power Pack Capacitors, just write to Jim Dutton, Marketing Manager Aluminum Electrolytic Capacitors, Sangamo Electric Company, Pickens, S. C. 29671, U.S.A. Or call him at (803) 878-6311 and ask for Bulletin 2271.

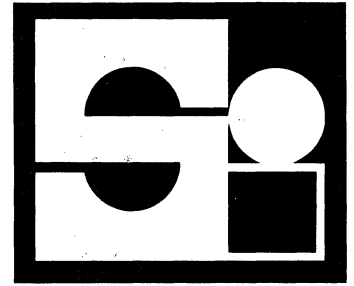
Then start thinking small.

SANGAMO
ELECTRIC COMPANY

TYPE 100 TYPICAL RATINGS

1-3/8" x 4-1/8"						2" x 4-1/8"						3" x 5-5/8"					
Rated VDC	Capacitance (mfd)	Max. ESR 120 Hz (Ohms)	Max. Ripple Current @ 120 Hz (rms amps)			Capacitance (mfd)	Max. ESR 120 Hz (Ohms)	Max. Ripple Current @ 120 Hz (rms amps)			Capacitance (mfd)	Max. ESR 120 Hz (Ohms)	Max. Ripple Current @ 120 Hz (rms amps)			Capacitance (mfd)	Max. ESR 120 Hz (Ohms)
			65°C	85°C	105°C			65°C	85°C	105°C			65°C	85°C	105°C		
10	20,000	.0146	22.5	17.0	6.5	45,000	.0084	31.5	22.5	8.5	170,000	.0077	45.0	31.0	10.0		
15	14,000	.0147	22.0	16.5	6.5	32,000	.0087	31.0	22.0	8.5	110,000	.0079	45.0	30.5	10.0		
25	9,000	.0154	21.5	15.5	6.0	19,000	.0091	30.5	21.5	8.0	73,000	.0080	44.0	30.0	9.5		
50	4,400	.0168	19.5	13.5	5.0	9,800	.0101	29.0	20.0	7.0	36,000	.0087	42.0	29.0	9.0		

METALLIZED POLYESTER CAPACITORS



SEACOR DELIVERS

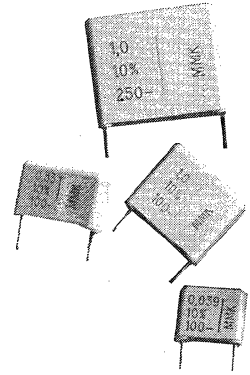
SERIES MMK METALLIZED POLYESTER CAPACITORS

DESCRIPTION

Series MMK metallized polyester capacitors are miniature, rectangular units with a molded thermoplastic case meeting U.L. flammability specifications 94 VE-1. The special MMKO case is molded of an extraordinary new plastic material. This special case has a 94 VE-0 flame rating and is virtually impervious to most solvents including, for example, FREON TMC* and those used for cleaning and degreasing electronic assemblies. It also exhibits very low water absorption; less than 0.08%/24 hours and 0.35% at equilibrium. The material is non-corroding.

All electrical specifications and dimensional data are identical for both the standard MMK and the special MMKO.

Series MMK units are available in 42 standard, commonly required values from 0.0027 mfd to 6.8 mfd. They are characterized by low dissipation factors and high circulating current capability. MMK's are designed for tube or solid state printed circuit applications where shape factors make for ease of assembly and stable vertical mounting with low profile. MMK's are available in voltage ratings of 100, 250, 400 and 630 VDC although not all values are standard in all voltages. Construction uses a non-inductive type winding.



MMK

SPECIFICATIONS

Capacitance Values: 0.0027 mfd to 6.8 mfd
Tolerances: $\pm 5\%$, 10%, 20% std.; $\pm 1\%$ and 2.5% spcl.

Working Voltages: 100 VDC, 250 VDC, 400 VDC, 630 VDC, nominal

Test Voltages—

Between term: 1.5 x working voltage applied for 1 min.

Term to Case: 2500 VDC

Life Test: 1.5 x working VDC @ 85°C for 1000 hrs

Dissipation Factor, $\tan \delta$:

less than 100×10^{-4} @ 1 KHz for C greater than 1 μF
 less than 200×10^{-4} @ 10 KHz for C less than 1 μF

Insulation Resistance: $>30,000$ Mohms for C less than 0.1 μF and VDC greater than 250

Op. Temp. Range: -40°C to 100°C , derate voltage 1.5%/°C from 85°C to 100°C

Temp. Coeff.: $T_c = +(400 \pm 200) \times 10^{-6}/^\circ\text{C}$; approx. 600 ppm/°C

Self Inductance: Approx. 10 nH/cm of case length

Construction—

Style: Flat, rectangular, low profile; radial wire leads

Case: Std. MMK, self-extinguishing thermoplastic;

Spcl. MMKO, special thermoplastic (VE-0), epoxy resin end fill

Leads: MMK, MMKO, copper tinned leads 0.236" long

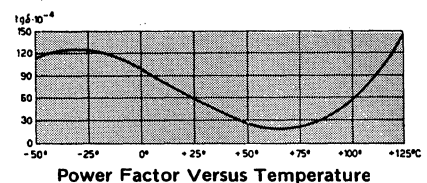
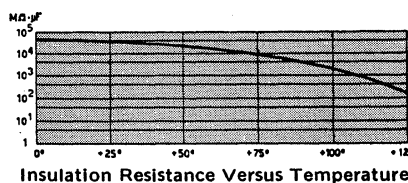
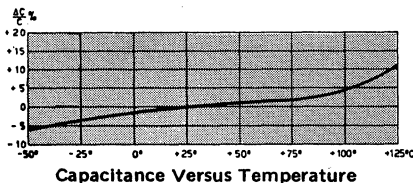
Request complete specifications.

TYPE 105 METALLIZED POLYESTER MINIATURE CAPACITORS

FEATURES—

Miniature size ■ Polyester ("Mylar"*) wound dielectric ■ Encapsulated; epoxy end fill ■ Low cost ■ -55°C to $+125^\circ\text{C}$ ■ Low dissipation factor ■ Non-inductive.

105



SPECIFICATIONS—

Std. Values: (100V) 0.068 mfd to 10.0 mfd; (250V) 0.033 mfd to 4.7 mfd; (400V) 0.015 mfd to 2.2 mfd; (630V) .01 mfd to 0.47 mfd

Tolerances: $\pm 5\%$, 10% std; other tols. on request

Working Voltage(s): 100 VDC, 250 VDC, 400 VDC, 630 VDC

Test Voltage: 1.5 x working voltage

Power Factor: $\tan \delta \leq 7.5 \times 10^{-3}$ @ 1 KHz, 25°C

* © Dupont

Insulation Resistance: C $>.33$ mfd, RC $\geq 10,000$ Mohms microfarad

C $\leq .33$ mfd, R $\geq 30,000$ Mohms

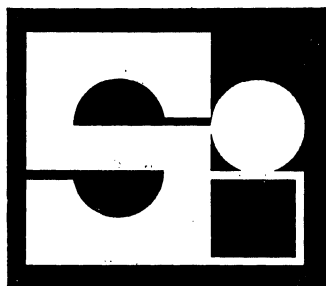
Op. Temp. Range: -55°C to $+125^\circ\text{C}$; derate V 1.2% above 85°C

Temp. Coeff.: Approx. 600 ppm/°C; see curve

Construction: Non-inductive; metallized polyester, Mylar wrap, epoxy end fill

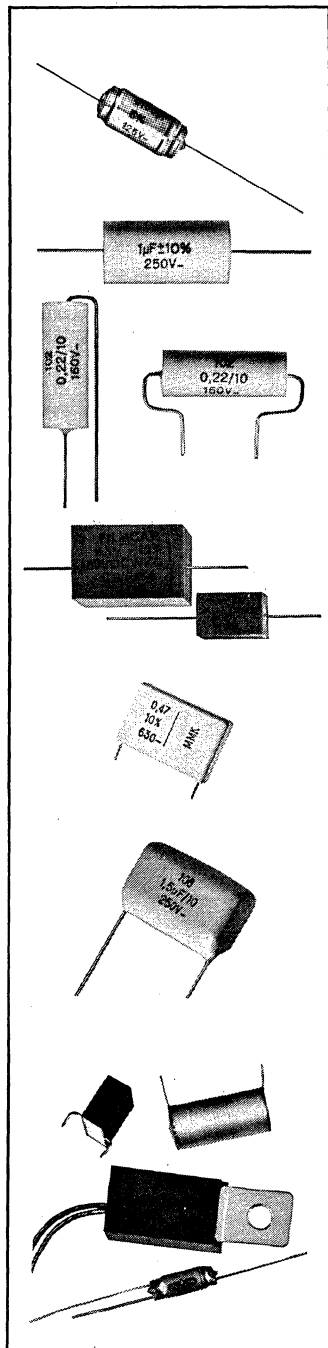
Leads: Solder-coated, copper clad steel wire, 1.38" $\pm .2$ " long

Seacor Inc. 598 Broadway ■ Norwood, New Jersey 07648 ■ (201) 768-6070 ■ TELEX 135354



CAPACITORS FILM CAPACITORS

STANDARD OR SPECIAL—QUALITY and PRICE



Whatever your wound film capacitor requirement, Seacor probably has it. And if it's really special—we'll do it.

Seacor: a broad line of standard wound dielectrics; quality and reliable delivery **proven** over the years; more than competitive prices. And, a top-flight engineering staff with an insatiable appetite for specials.

Representative Seacor wound capacitors are listed—and there are lots of others which aren't. Whether you need an off the shelf standard or an exotic ultraspecial: Check Seacor. First.

TUBULAR AXIAL LEAD

Polystyrene Foil: 25V, 63V, 160V, 630V; 10 PF to 0.1 MF; 1%, 2-1/2%, 5%, 10%, 20%.

Polyester Foil: 160V, 250V, 400V, 630V, 1000V; 1000 PF to 2 MF; 5%, 10%, 20%.

Metallized Polyester: 100V, 160V, 250V, 400V, 630V, 1000V; 1000 PF to 20 MF; 5%, 10%, 20%.

Metallized Polycarbonate: 100V, 160V, 250V, 400V, 630V, 1000V; 3300 PF to 20 MF; 5%, 10%, 20%.

HV Metallized Polycarbonate: 1500V, 2500V, 3500V, 5000V, 10,000V, 16,000V, 22,000V; 470 PF to 1.0 MF; 5%, 10%, 20%.

MOLDED CASE, AXIAL LEAD

Metallized Polyester: 63V, 160V, 250V, 400V; 0.01 MF to 10.0 MF; 5%, 10%, 20%.

Metallized Polycarbonate: 63V, 160V, 250V, 400V; 0.01 MF to 10.0 MF; 1%, 2%, 5%, 10%, 20%.

MOLDED CASE, RADIAL LEAD

Metallized Polyester: 100V, 250V, 400V, 630V; 1000 PF to 6.8 MF; 5%, 10%, 20%.

Metallized Polycarbonate: 63V, 160V, 250V, 400V; 0.01 MF to 10.0 MF; 1%, 2%, 5%, 10%, 20%.

EPOXY DIPPED RADIAL LEAD

Metallized Polyester: 63V, 160V, 250V, 400V, 630V; 1000 PF to 10 MF; 5%, 10%, 20%.

Metallized Polycarbonate: 63V, 160V, 250V, 400V; 0.01 MF to 10.0 MF; 1%, 2%, 5%, 10%, 20%.

Polyester Foil: 50V, 100V, 200V, 400V, 600V; 1000 PF to 0.47 MF; 10%, 20%.

ABOUT THOSE SPECIALS:

There's no "take 'em or leave 'em" at Seacor. Any wound capacitor you need—however exotic—we'll do our level best to produce for you, on-time and at high Seacor quality: closer tolerances; new dielectric films; film combinations, e.g., mylar/polycarbonate; high voltages, e.g., 25KV to 40KV. And mechanical specials: special brackets, lugs, leads, form factors, materials, etc., etc.

Seacor's engineers **can**. Find out for yourself.

SEACOR, INC.

598 Broadway ■ Norwood, New Jersey 07648 ■ (201) 768-6070 ■ TELEX 135354

**SOUTHERN
ELECTRONICS CORPORATION**

726 S. FLOWER ST.
BURBANK, CALIFORNIA 91502
(213) 845-2458

FILM DIELECTRIC CAPACITORS

CUSTOM / STANDARD

DIELECTRICS AND CHARACTERISTICS

POLYESTER (MYLAR) FOIL

Cap. Range: .0003-10 mfd
Volt. Range: 50-2000 vdc
Temp. Range: -55 to 125°C
IR: 50 K (meg) (mfd) or 100 K megs
DF: .75% max.

METALLIZED POLYESTER

Cap. Range: .01-50 mfd
Volt. Range: 50 vdc-10 kvdc
Temp. Range: -55 to 125°C
IR: 25 K (meg) (mfd) or 50 K megs
DF: 1% max.

POLYCARBONATE FOIL

Cap. Range: .0003-5 mfd
Volt. Range: 25-1000 vdc
Temp. Range: -55 to 125°C
IR: 75 K (meg) (mfd) or 500 K megs
DF: .3% max.

METALLIZED POLYCARBONATE

Cap. Range: .01-50 mfd
Volt. Range: 50-1000 vdc
Temp. Range: -55 to 125°C
IR: 30 K (meg) (mfd) or 150 K megs
DF: .3% max.

POLYPROPYLENE FOIL

Cap. Range: .0003-5 mfd
Volt. Range: 50-1000 vdc
Temp. Range: -55 to 105°C
IR: 100 K (meg) (mfd) or 500 K megs
DF: .1% max.

METALLIZED POLYPROPYLENE

Cap. Range: .01-50 mfd
Volt. Range: 50 V-10,000 vdc
Temp. Range: -55 to 105°C
IR: 50 K (meg) (mfd) or 100 K megs
DF: .2% max.

TEFLON

Cap. Range: .001-5 mfd
Volt. Range: 50-600 vdc
Temp. Range: -55 to +160°C
IR: 1000 K (meg) (mfd) or 2000 K megs
DF: .01% max.

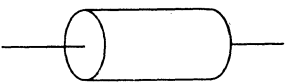
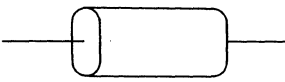
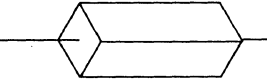
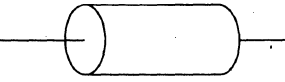
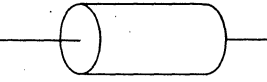
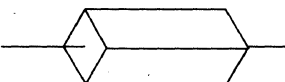
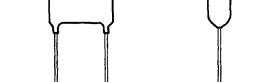
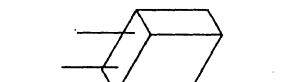
POLYSTYRENE FOIL

Cap. Range: .0005-5 mfd
Volt. Range: 50-600 vdc
Temp. Range: -55 to 85°C
IR: 100 K (meg) (mfd) or 500 K megs
DF: .1% max.

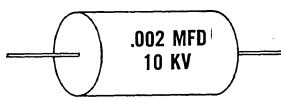
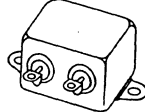
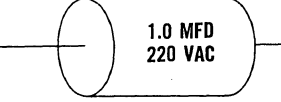
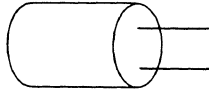
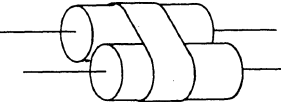
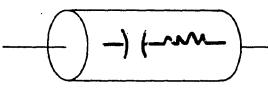
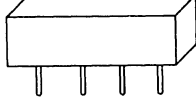
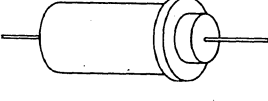
POLYSULFONE FOIL

Cap. Range: .0003-5 mfd
Volt. Range: 25-1000 vdc
Temp. Range: -55 to 150°C
IR: 75 K (meg) (mfd) or 500 K megs
DF: .3% max.

STANDARD CASE STYLES

		
STYLE 1 WRAP & FILL-ROUND	STYLE 6 METAL CASE ROUND-AXIAL	
		
STYLE 2 WRAP & FILL-FLAT	STYLE 7 METAL CASE RECTANGULAR	
		
STYLE 3 EPOXY OR PHENOLIC-ROUND	STYLE 8 STEATITE OR CERAMIC	
		
STYLE 4 EPOXY RECTANGULAR-AXIAL	STYLE D DIP COATED-RADIAL	
	PROMPT SERVICE ON STANDARD CAPACITORS Capacitors and filters are available from Southern Electronics to meet your special application requirements. Non-standard values, tolerances and case configurations can be supplied from stock or with quick delivery. A full line of standard film and Kraft-film dielectric capacitors is also available from stock or with a short delivery cycle.	
STYLE 5 EPOXY RECTANGULAR-RADIAL		

CUSTOM DESIGNS

	
HIGH VOLTAGE	METAL CASED RECTANGULAR
	
AC DESIGNS	PC TUBULAR
	
MATCHED CAPACITORS	R/C NETWORKS
	
MULTIPLE CAPACITOR ASSEMBLIES	FEED THRU ASSEMBLIES
TEMPERATURE COMPENSATING "O" TC and controlled capacitance change for stability or matching with resistors or pot cores	

SOUTHERN ELECTRONICS CORPORATION / A WHOLLY OWNED SUBSIDIARY OF **F-DYNE ELECTRONICS COMPANY**

726 S. FLOWER ST./BURBANK, CALIFORNIA 91502/(213) 845-2458

449 HOWARD AVE./BRIDGEPORT, CONN./ (203) 367-6431

**SOUTHERN
ELECTRONICS CORPORATION**

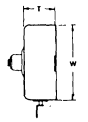
 726 S. FLOWER ST.
BURBANK, CALIFORNIA 91502
(213) 845-2458

FILM DIELECTRIC CAPACITORS

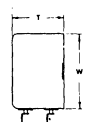
CUSTOM / STANDARD

POPULAR METAL CASE STYLES

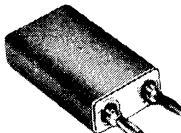
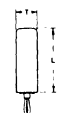
POLYSTYRENE/FOIL Adjustable Type PS 7A Hermetically sealed, Metal case

	MFD	100/400 VDC				NOTES 1. 0° to + 65°C Temperature Range. 2. Adjustment Range of $\pm 1\frac{1}{2}\%$ from nominal. 3. .01 Long Term Drift at controlled Temperature. 4. .005% Voltage coefficient available on request.	 L = Length
		L	W	T			
		.047	1.125	1.000	.500		
	.10	1.125	1.000	.6875			
	.47	2.000	1.750	.875			
	1.0	2.000	2.000	1.000			
	4.7	3.0625	2.875	2.125			
	10.0	3.0625	4.4375	2.125			

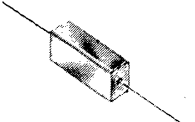
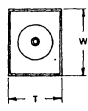
POLYSTYRENE/FOIL Decade Type PS 7D Hermetically sealed, Metal case

	MFD	Decade Range				NOTES ALSO AVAILABLE SWITCH MOUNTED FOR PANEL ASSEMBLY	 L = Length
		L	W	T			
		.001 — .01	1.750	1.250	.875		
	.01 — .10	1.750	1.250	.875			
	.10 — 1.0	2.000	2.000	1.500			
	1.0 — 10.0	5.000	4.250	4.375			

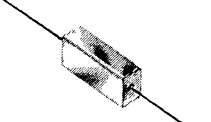
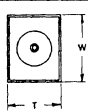
POLYSTYRENE/FOIL Plug-in Type PS 7P Hermetically sealed, Metal case

	MFD	100 V			MFD	200/400 V			NOTES STANDARD BANANA PLUG MOUNTING ON $\frac{3}{4}$ " CENTERS	 W = Width
		W	T	L		W	T	L		
		.047	1.3125	.625	1.250	.047	1.3125	.625	1.250	
	.10	1.3125	.625	1.250	.10	1.3125	.625	1.250		
	.47	1.3125	.625	1.500	.47	1.3125	.625	2.250		
	1.0	1.3125	.625	2.000	1.0	1.6	1.000	2.500		
	2.0	1.6	1.000	2.500	2.0					

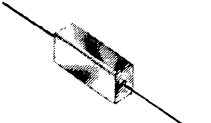
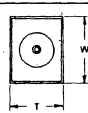
MYLAR/FOIL Rectangular Type PE 7G Hermetically sealed, Metal case

	MFD	100 V			MFD	200V			MFD	400V			 L = Length
		T	L	W		T	W	L		T	W	L	
		.0047	.22	.34	.5625	.0047	.22	.34	.5625	.0047	.22	.34	.5625
	.01	.22	.34	.5625	.01	.22	.34	.5625	.01	.22	.34	.6875	
	.047	.22	.34	.6875	.047	.31	.41	.8125	.047	.31	.41	.8125	
	.10	.31	.41	.8125	.10	.31	.41	1.125	.10	.40	.57	1.125	
	.47	.40	.57	1.3125	.47	.40	.57	1.5625	.47	.50	.65	1.8125	
	1.0	.40	.57	1.8125	1.0	.60	.80	1.8125	1.0	.60	.80	2.3125	
	2.0	.60	.80	1.8125	2.0				2.0				

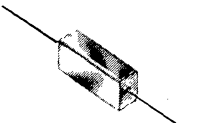
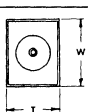
METALLIZED MYLAR Rectangular Type MPE 7G Hermetically sealed, Metal case

	MFD	50 V			MFD	100 V			MFD	200 V			 L = Length
		T	W	L		T	W	L		T	W	L	
		.01	.22	.34	.5625	.01	.22	.34	.5625	.01	.22	.34	.5625
	.047	.22	.34	.5625	.047	.22	.34	.5625	.047	.22	.34	.6875	
	.10	.22	.34	.5625	.10	.22	.34	.6875	.10	.22	.34	.8125	
	.47	.22	.34	.8125	.47	.31	.41	.8125	.47	.40	.57	1.125	
	1.0	.31	.41	.8125	1.0	.31	.41	1.125	1.0	.40	.57	1.5625	
	4.7	.40	.57	1.5625	4.7	.40	.57	1.8125	4.7	.60	.80	2.0625	

METALLIZED POLYCARBONATE Rectangular Type MPC 7G Hermetically sealed, Metal case

	MFD	50 V			MFD	100 V			MFD	200 V			 L = Length
		T	W	L		T	W	L		T	W	L	
		.01	.22	.34	.5625	.01	.22	.34	.5625	.01	.22	.34	.5625
	.047	.22	.34	.5625	.047	.22	.34	.5625	.047	.22	.34	.6875	
	.10	.22	.34	.5625	.10	.22	.34	.6875	.10	.22	.34	.8125	
	.47	.22	.34	.6875	.47	.31	.41	.8125	.47	.40	.57	1.125	
	1.0	.31	.41	.8125	1.0	.40	.57	1.125	1.0	.40	.57	1.3125	
	4.7	.40	.57	1.25	4.7	.50	.65	1.8125	4.7	.60	.80	2.3125	

POLYSTYRENE/FOIL Rectangular Type PS 7G Hermetically sealed, Metal case

	MFD	100 V			MFD	200/400 V			MFD	600 V			 L = Length
		T	W	L		T	W	L		T	W	L	
		.001	.22	.34	.82	.001	.22	.34	.82	.001	.22	.34	.82
	.0047	.22	.34	.82	.0047	.22	.34	.82	.0047	.22	.34	.94	
	.01	.22	.34	.82	.01	.22	.34	.94	.01	.31	.41	1.12	
	.047	.31	.41	.94	.047	.40	.57	1.12	.047	.40	.57	1.81	
	.10	.40	.57	1.12	.10	.40	.57	1.81	.10	.60	.80	1.81	
	.47	.50	.65	1.81	.47				.47				
	1.0	.60	.80	2.06	1.0				1.0				

Lower capacitance values, higher capacitance values and non-standard capacitance values are available.
Alternate case configurations are also available where space problems, are encountered.

Catalog Available On Request

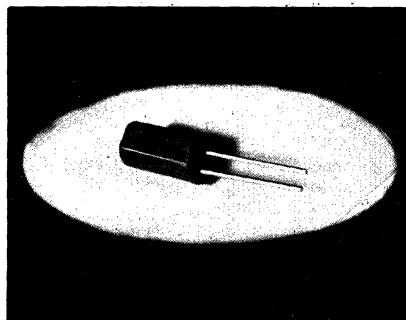
SOUTHERN ELECTRONICS CORPORATION / A WHOLLY OWNED SUBSIDIARY OF **F-DYNE ELECTRONICS COMPANY**

726 S. FLOWER ST./BURBANK, CALIFORNIA 91502/(213) 845-2458

449 HOWARD AVE./BRIDGEPORT, CONN./ (203) 367-6431

SPRAGUE CAPACITORS

TYPE 198D ECONOLINE* PLASTIC-CASE SOLID-TANTALUM CAPACITORS



- Low-cost production-oriented capacitors.
- Solid flame-retardant epoxy case has precise dimensions for automatic insertion. Completely shock and vibration resistant.
- Flatted area on side has clear easy-to-read marking. 2nd flat near top provides easy identification of positive lead either visually or by touch.
- Standoff feet on base eliminate moisture entrapment and facilitate cleaning of wiring boards.
- Low d-c leakage, low dissipation factor.
- Withstand severe temperature cycling and temperature shock over entire temperature range of -55°C to $+85^{\circ}\text{C}$.
- Units listed below have straight leads with .100" spacing as standard. For formed leads with .200" or .250" spacing, change last digit in Cat. No. to 2 or 3, respectively.
- Capacitance Tolerance, $\pm 10\%$. Capacitors with asterisk (*) are also available with tolerance of $\pm 20\%$. For $\pm 20\%$ tolerance, change 9th character in Cat. No. from 9 to 0.
- For complete technical data, refer to latest issue of Engineering Bulletin 3546.

★ Trademark

μF	Dia. x Height	Cat. No.	μF	Dia. x Height	Cat. No.	μF	Dia. x Height	Cat. No.
4 WVDC, 5.3 V SURGE			15 WVDC, 20 V SURGE					
10	.250 x .325	198D106X9004H1*	3.3	.250 x .325	198D335X9015H1*	0.15	.250 x .325	198D154X9035H1*
12	.250 x .325	198D126X9004H1	3.9	.250 x .325	198D395X9015H1	0.18	.250 x .325	198D184X9035H1
15	See 20 WVDC Listing		4.7	See 35 WVDC Listing		0.22	.250 x .325	198D224X9035H1*
18	See 15 WVDC Listing		5.6	See 35 WVDC Listing		0.27	.250 x .325	198D274X9035H1
22	See 15 WVDC Listing		6.8	See 35 WVDC Listing		0.33	.250 x .325	198D334X9035H1*
27	See 10 WVDC Listing		8.2	See 25 WVDC Listing		0.39	.250 x .325	198D394X9035H1
33	See 10 WVDC Listing		10	See 25 WVDC Listing		0.47	.250 x .325	198D474X9035H1*
39	See 10 WVDC Listing		12	See 25 WVDC Listing		0.56	.250 x .325	198D564X9035H1
47	See 6 WVDC Listing		15	See 20 WVDC Listing		0.68	.250 x .325	198D684X9035H1*
56	See 6 WVDC Listing		18	.250 x .475	198D186X9015K1	0.82	.250 x .325	198D824X9035H1
68	See 6 WVDC Listing		22	.250 x .475	198D226X9015K1*	1.0	.250 x .325	198D105X9035H1*
82	.250 x .475	198D826X9004K1				1.2	.250 x .475	198D125X9035K1
100	.250 x .475	198D107X9004K1*				1.5	.250 x .475	198D155X9035K1*
6 WVDC, 8 V SURGE			20 WVDC, 26 V SURGE			1.8	.250 x .475	198D185X9035K1
6.8	.250 x .325	198D685X9006H1*	2.7	.250 x .325	198D275X9020H1	2.2	.250 x .475	198D225X9035K1*
8.2	.250 x .325	198D825X9006H1	3.3	See 35 WVDC Listing		2.7	.250 x .475	198D275X9035K1
10	See 25 WVDC Listing		3.9	See 35 WVDC Listing		3.3	.250 x .475	198D335X9035K1*
12	See 25 WVDC Listing		4.7	See 35 WVDC Listing		3.9	.250 x .475	198D395X9035K1
15	See 20 WVDC Listing		5.6	See 35 WVDC Listing		4.7	.250 x .475	198D475X9035K1*
18	See 15 WVDC Listing		6.8	See 35 WVDC Listing		5.6	.250 x .475	198D565X9035K1
22	See 15 WVDC Listing		8.2	See 25 WVDC Listing		6.8	.250 x .475	198D685X9035K1*
27	See 10 WVDC Listing		10	See 25 WVDC Listing		50 WVDC, 65 V SURGE		
33	See 10 WVDC Listing		12	See 25 WVDC Listing		0.10	.250 x .325	198D104X9050H1*
39	See 10 WVDC Listing		15	.250 x .475	198D156X9020K1*	0.12	.250 x .325	198D124X9050H1
47	.250 x .475	198D476X9006K1*				0.15	.250 x .325	198D154X9050H1*
56	.250 x .475	198D566X9006K1				0.18	.250 x .325	198D184X9050H1
68	.250 x .475	198D686X9006K1*				0.22	.250 x .325	198D224X9050H1*
10 WVDC, 13 V SURGE			25 WVDC, 32 V SURGE			0.27	.250 x .325	198D274X9050H1
4.7	.250 x .325	198D475X9010H1*	1.2	.250 x .325	198D125X9025H1	0.33	.250 x .325	198D334X9050H1*
5.6	.250 x .325	198D565X9010H1	1.5	.250 x .325	198D155X9025H1*	0.39	.250 x .325	198D394X9050H1
6.8	See 35 WVDC Listing		1.8	.250 x .325	198D185X9025H1	0.47	.250 x .325	198D474X9050H1*
8.2	See 25 WVDC Listing		2.2	.250 x .325	198D225X9025H1*	0.56	.250 x .325	198D564X9050H1
10	See 25 WVDC Listing		2.7	See 35 WVDC Listing		0.68	.250 x .325	198D684X9050H1*
12	See 25 WVDC Listing		3.3	See 35 WVDC Listing		0.82	.250 x .325	198D824X9050H1
15	See 20 WVDC Listing		3.9	See 35 WVDC Listing		1.0	.250 x .325	198D105X9050H1*
18	See 15 WVDC Listing		4.7	See 35 WVDC Listing		1.2	.250 x .475	198D125X9050K1
22	See 15 WVDC Listing		5.6	See 35 WVDC Listing		1.5	.250 x .475	198D155X9050K1*
27	.250 x .475	198D276X9010K1	6.8	See 35 WVDC Listing		1.8	.250 x .475	198D185X9050K1
33	.250 x .475	198D336X9010K1*	8.2	.250 x .475	198D825X9025K1	2.2	.250 x .475	198D225X9050K1*
39	.250 x .475	198D396X9010K1	10	.250 x .475	198D106X9025K1*	2.7	.250 x .475	198D275X9050K1
			12	.250 x .475	198D126X9025K1	3.3	.250 x .475	198D335X9050K1*
						3.9	.250 x .475	198D395X9050K1
			35 WVDC, 46 V SURGE			4.7	.250 x .475	198D475X9050K1*
			0.10	.250 x .325	198D104X9035H1*			
			0.12	.250 x .325	198D124X9035H1			

SPRAGUE CAPACITORS

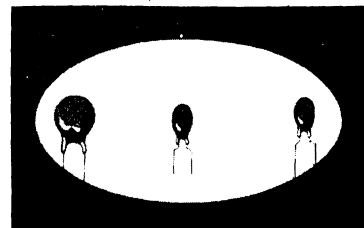
TYPE 196D DIPPED TANTALEX™ SOLID-TANTALUM CAPACITORS

- Epoxy-Dipped Coating Economically Provides Good Electrical and Mechanical Protection.
- High Stability, Very Little Capacitance Change, Even at Outer Limits of Operating Temperature Range (–55C to +85C).
- Low Dissipation Factor Permits Higher Ripples.
- Radial Leads For Mounting on Printed Boards.

- Capacitance Tolerance, ±10%. Capacitors With Asterisk (*) Are Also Available With Tolerance of ±20%. For ±20% Tolerance, Change 9th Character in Cat. No. from 9 to 0.

- Capacitors Listed Here Have Long Leads. Catalog Numbers Ending with A1 Have Straight Leads with .125" Spacing; A3 Indicates Straight Leads with .250" Spacing (See Unit 1). Numbers Ending with E4 Have "Hockeystick" Leads with .250" Spacing (See Unit 2). For Short "Hockeystick" Pin Leads (.187" L, .250" Spacing) Change A1 or E4 to E3. (See Unit 3).

- For Complete Technical Data, Refer to Latest Issue of Engineering Bulletin 3545.



UNIT 1

UNIT 3

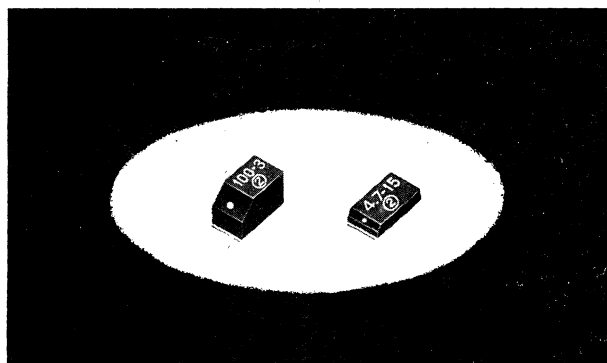
UNIT 2

μF	Dia. x Height	Cat. No.	μF	Dia. x Height	Cat. No.	μF	Dia. x Height	Cat. No.	μF	Dia. x Height	Cat. No.
4 WVDC, 5.3 V SURGE			15 WVDC, 20 V SURGE			25 WVDC, 32 V SURGE			50 WVDC, 65 V SURGE		
10	.175 x .375	196D106X9004HA1*	3.3	.175 x .375	196D335X9015HA1*	1.2	.175 x .375	196D125X9025HA1	0.10	.175 x .375	196D104X9050HA1*
12	.175 x .375	196D126X9004HA1	3.9	.175 x .375	196D395X9015HA1	1.5	.175 x .375	196D155X9025HA1*	0.12	.175 x .375	196D124X9050HA1
15	See 15 WVDC Listing		4.7	See 35 WVDC Listing		1.8	.175 x .375	196D185X9025HA1	0.15	.175 x .375	196D154X9050HA1*
18	See 15 WVDC Listing		5.6	See 25 WVDC Listing		2.2	.175 x .375	196D225X9025HA1*	0.18	.175 x .375	196D184X9050HA1
22	See 10 WVDC Listing		6.8	See 25 WVDC Listing		2.7	See 35 WVDC Listing		0.22	.175 x .375	196D224X9050HA1*
27	See 10 WVDC Listing		8.2	See 25 WVDC Listing		4.7	See 35 WVDC Listing		0.27	.175 x .375	196D274X9050HA1
33	See 6 WVDC Listing		10	See 20 WVDC Listing		5.6	.225 x .425	196D565X9025JA1	0.33	.175 x .375	196D334X9050HA1*
39	See 6 WVDC Listing		12	See 20 WVDC Listing		6.8	.225 x .425	196D685X9025JA1*	0.39	.175 x .375	196D394X9050HA1
47	.225 x .425	196D476X9004JA1*	15	.225 x .425	196D156X9015JA1*	8.2	.225 x .425	196D825X9025JA1	0.47	.175 x .375	196D474X9050HA1*
56	.225 x .425	196D566X9004JA1	18	.225 x .425	196D186X9015JA1	10	.225 x .450	196D106X9025KA1*	0.56	.175 x .375	196D564X9050HA1
68	See 6 WVDC Listing		22	.225 x .450	196D226X9015KA1*	12	.225 x .450	196D126X9025KA1	0.68	.175 x .375	196D684X9050HA1*
82	.225 x .450	196D826X9004KA1	27	.225 x .450	196D276X9015KA1*	15	See 35 WVDC Listing		0.82	.175 x .375	196D824X9050HA1
100	.225 x .450	196D107X9004KA1*	33	.225 x .450	196D336X9015KA1*	18	.350 x .650	196D186X9025PE4	1.0	.175 x .375	196D105X9050HA1*
120	See 6 WVDC Listing		39	.225 x .450	196D396X9015KA1	22	See 35 WVDC Listing		1.2	.225 x .425	196D125X9050JA1
150	See 6 WVDC Listing		47	See 20 WVDC Listing		27	.350 x .650	196D276X9025PE4	1.5	.225 x .425	196D155X9050JA1*
180	.350 x .650	196D187X9004PE4	56	See 15 WVDC Listing		33	.350 x .650	196D336X9025PE4*	1.8	.225 x .425	196D185X9050JA1
180	.450 x .530	★196D187X9004LA3	68	See 15 WVDC Listing		39	See 35 WVDC Listing		2.2	.225 x .425	196D225X9050JA1*
220	.350 x .650	196D227X9004PE4*	82	.350 x .650	196D826X9010PE4	47	See 35 WVDC Listing		2.7	.225 x .425	196D275X9050JA1
270	See 6 WVDC Listing		82	.450 x .500	★196D826X9010LA3	56	See 25 WVDC Listing		3.3	.225 x .425	196D335X9050JA1*
330	See 6 WVDC Listing		100	.350 x .650	196D107X9010PE4*	68	See 25 WVDC Listing		3.9	.225 x .425	196D395X9050JA1
6 WVDC, 8 V SURGE			120	See 15 WVDC Listing		82	.400 x .750	196D826X9020TE4	4.7	.225 x .425	196D475X9035JA1*
6.8	.175 x .375	196D685X9006HA1*	150	See 15 WVDC Listing		82	.600 x .800	★196D826X9020MA3	5.6	.225 x .450	196D565X9035KA1
8.2	.175 x .375	196D825X9006HA1	180	.400 x .750	196D187X9010TE4	100	.400 x .750	196D107X9020TE4*	6.8	.225 x .450	196D685X9035KA1*
10	See 20 WVDC Listing		180	.600 x .800	★196D187X9010MA3	35 WVDC, 46 V SURGE			8.2	.350 x .650	196D825X9035PE4
12	See 20 WVDC Listing		220	.400 x .750	196D227X9010TE4*	1.2	.175 x .375	196D104X9035HA1*	10	.350 x .650	196D106X9050PE4*
15	See 15 WVDC Listing		20 WVDC, 26 V SURGE			1.5	.175 x .375	196D154X9035HA1*	12	.350 x .650	196D126X9050PE4
18	See 15 WVDC Listing		2.7	.175 x .375	196D275X9020HA1	1.8	.175 x .375	196D184X9035HA1	15	.350 x .650	196D156X9050PE4*
22	See 10 WVDC Listing		3.3	See 35 WVDC Listing		2.2	.175 x .375	196D224X9035HA1*	18	.400 x .750	196D186X9050TE4
27	See 10 WVDC Listing		3.9	See 35 WVDC Listing		2.7	.175 x .375	196D274X9035HA1	22	.400 x .750	196D226X9050TE4*
33	.225 x .425	196D336X9006JA1*	4.7	See 35 WVDC Listing		3.3	.175 x .375	196D334X9035HA1*			
39	.225 x .425	196D396X9006JA1	5.6	See 25 WVDC Listing		3.9	.175 x .375	196D394X9035HA1			
47	.225 x .450	196D476X9006KA1*	6.8	See 25 WVDC Listing		4.7	.175 x .375	196D474X9035HA1*			
56	.225 x .450	196D566X9006KA1	8.2	See 25 WVDC Listing		5.6	.175 x .375	196D564X9035HA1			
68	.225 x .450	196D686X9006KA1*	10	See 20 WVDC Listing		6.8	.175 x .375	196D684X9035HA1*			
82	See 10 WVDC Listing		12	See 20 WVDC Listing		8.2	.175 x .375	196D824X9035HA1			
100	See 10 WVDC Listing		15	.225 x .425	196D156X9015JA1*	0.33	.175 x .375	196D334X9035HA1*			
120	.350 x .650	196D127X9006PE4	18	.225 x .425	196D186X9015JA1	0.39	.175 x .375	196D394X9035HA1			
120	.450 x .500	★196D127X9006LA3	22	.225 x .450	196D226X9015KA1*	0.47	.175 x .375	196D474X9035HA1*			
150	.350 x .650	196D157X9006PE4*	27	See 25 WVDC Listing		0.56	.175 x .375	196D564X9035HA1			
180	See 10 WVDC Listing		33	See 25 WVDC Listing		0.68	.175 x .375	196D684X9035HA1*			
220	See 10 WVDC Listing		39	See 20 WVDC Listing		0.82	.175 x .375	196D824X9035HA1			
270	.400 x .750	196D277X9006TE4	47	See 20 WVDC Listing		0.10	.175 x .375	196D104X9035HA1*			
330	.400 x .750	196D337X9006TE4*	56	.350 x .650	196D566X9015PE4	0.12	.175 x .375	196D124X9035HA1			
			68	.350 x .650	196D686X9015PE4*	0.15	.175 x .375	196D154X9035HA1*			
			82	See 20 WVDC Listing		0.18	.175 x .375	196D184X9035HA1			
						0.22	.175 x .375	196D224X9035HA1*			
						0.27	.175 x .375	196D274X9035HA1			
						0.33	.175 x .375	196D334X9035HA1*			
						0.39	.175 x .375	196D394X9035HA1			
						0.47	.175 x .375	196D474X9035HA1*			
						0.56	.175 x .375	196D564X9035HA1			
						0.68	.175 x .375	196D684X9035HA1*			
						0.82	.175 x .375	196D824X9035HA1			

★DISC ANODE NOT RECOMMENDED FOR NEW EQUIPMENT DESIGNS; AVAILABLE UNTIL PRESENT STOCKS ARE EXHAUSTED.

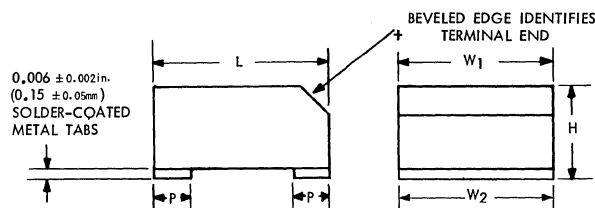
SPRAGUE CAPACITORS

TYPE 193D DOMINO® SOLID-TANTALUM CAPACITORS WITH FLUSH SOLDERABLE PAD TERMINALS



- Designed for hybrid circuit and low-profile printed wiring board applications.
- Fully-molded construction. Epoxy case provides superior mechanical protection during handling and mounting as well as excellent stability in severe operating and storage environments.
- Leadless design minimizes inductance and saves space. Exposed terminal surfaces on bottom of capacitor. Can be attached to substrates or circuit boards by dip-soldering, welding, re-flow soldering, or other conventional methods.
- Compatible with automatic assembly equipment.
- Low-profile configuration makes Domino Capacitors ideal for use in molded assemblies such as dual in-line (DIP) packages.
- Low d-c leakage, low dissipation factor.
- Capacitance tolerance, $\pm 10\%$.
- Operating range -55°C to $+85^{\circ}\text{C}$. May be operated up to $+125^{\circ}\text{C}$ when derated to two-thirds of rated working voltage.
- For complete technical data, refer to latest issue of Engineering Bulletin 3532.

Case Code	DIMENSIONS (in inches)				
	L $\pm .005$	W ₁ $\pm .01$ (Case)	W ₂ $\begin{smallmatrix} +.01 \\ -.005 \end{smallmatrix}$ (Pads)	H $\pm .005$	P $\pm .01$
A	.180	.100	.090	.070	.030
B	.180	.100	.090	.100	.030
C	.320	.180	.170	.070	.050
D	.320	.180	.170	.100	.050
E	.320	.180	.170	.195	.050



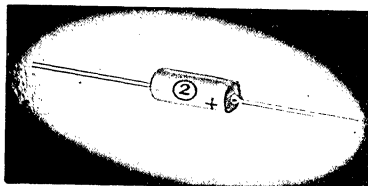
μF	Case Code	Catalog Number*
3 WVDC, 4 VDC SURGE		
100.0	E	193D107X9003E2
6 WVDC, 8 VDC SURGE		
3.3	B	193D335X9006B2
33.0	D	193D336X9006D2
68.0	E	193D686X9006E2
10 WVDC, 13 VDC SURGE		
1.0	A	193D105X9010A2
2.2	B	193D225X9010B2
6.8	C	193D685X9010C2
47.0	E	193D476X9010E2

μF	Case Code	Catalog Number*
15 WVDC, 20 VDC SURGE		
4.7	C	193D475X9015C2
10.0	D	193D106X9015D2
20 WVDC, 26 VDC SURGE		
0.47	A	193D474X9020A2
1.0	B	193D105X9020B2
3.3	C	193D335X9020C2
6.8	D	193D685X9020D2
22.0	E	193D226X9020E2
35 WVDC, 46 VDC SURGE		
0.22	A	193D224X9035A2
1.5	C	193D155X9035C2
3.9	D	193D395X9035D2
10.0	E	193D106X9035E2

*Capacitors listed here have a capacitance tolerance of $\pm 10\%$. These units are also available with a capacitance tolerance of $\pm 5\%$ on special order. To specify $\pm 5\%$ capacitors, change the 8th and 9th characters in the catalog number from "X9" to "X5."

SPRAGUE CAPACITORS

TYPE 150D TANTALEX[®] SOLID-TANTALUM CAPACITORS



- Hermetically sealed metal case.
- Exhibit stable capacitance and low dissipation factor over temperature range of -80°C to $+85^{\circ}\text{C}$. With appropriate voltage derating, may be operated to $+125^{\circ}\text{C}$.
- Listed units have plastic sleeves. For bare case, end Cat. No. in "0" instead of "2."
- Also available as non-polarized capacitors. See Type 151D in Catalog C-563.

- Listed units have capacitance tolerance of $\pm 10\%$. Capacitors with asterisk (*) are also available with capacitance tolerance of $\pm 20\%$. For $\pm 20\%$ tolerance, change 9th character in catalog number from 9 to 0.

- For complete technical data, refer to latest issue of Engineering Bulletin 3520.

μF	Size Code	Cat. No.	μF	Size Code	Cat. No.	μF	Size Code	Cat. No.	μF	Size Code	Cat. No.
6 WVDC — 8 VDC SURGE			15 WVDC — 18 VDC SURGE			50 WVDC — 65 VDC SURGE			35 WVDC — 40 VDC SURGE		
.22	A	150D224X9006A2*	.22	A	150D224X9015A2*	.0047	A	150D472X9035A2*	.0047	A	150D472X9035A2*
.27	A	150D274X9006A2	.27	A	150D274X9015A2	.0056	A	150D562X9035A2	.0056	A	150D562X9035A2
.33	A	150D334X9006A2*	.33	A	150D334X9015A2*	.0068	A	150D682X9035A2	.0068	A	150D682X9035A2
.39	A	150D394X9006A2	.39	A	150D394X9015A2	.0082	A	150D822X9035A2	.0082	A	150D822X9035A2
.47	A	150D474X9006A2*	.47	A	150D474X9015A2*	.01	A	150D104X9035A2*	.01	A	150D104X9035A2*
.56	A	150D564X9006A2	.56	A	150D564X9015A2	.12	A	150D124X9035A2	.12	A	150D124X9035A2
.68	A	150D684X9006A2*	.68	A	150D684X9015A2*	.15	A	150D154X9035A2	.15	A	150D154X9035A2
.82	A	150D824X9006A2	.82	A	150D824X9015A2	.18	A	150D184X9035A2	.18	A	150D184X9035A2
1.0	A	150D105X9006A2*	1.0	A	150D105X9015A2*	.22	A	150D224X9035A2*	.22	A	150D224X9035A2*
1.2	A	150D125X9006A2	1.2	A	150D125X9015A2	.27	A	150D274X9035A2	.27	A	150D274X9035A2
1.5	A	150D155X9006A2*	1.5	A	150D155X9015A2*	.33	A	150D334X9035A2*	.33	A	150D334X9035A2*
1.8	A	150D185X9006A2	1.8	A	150D185X9015A2	.39	A	150D394X9035A2	.39	A	150D394X9035A2
2.2	A	150D225X9006A2*	2.2	A	150D225X9015A2*	.47	A	150D474X9035A2*	.47	A	150D474X9035A2*
2.7	A	150D275X9006A2	2.7	A	150D275X9015A2	.56	A	150D564X9035A2	.56	A	150D564X9035A2
3.3	A	150D335X9006A2*	3.3	A	150D335X9015A2*	.68	A	150D684X9035A2*	.68	A	150D684X9035A2*
3.9	A	150D395X9006A2	3.9	A	150D395X9015A2	.82	A	150D824X9035A2	.82	A	150D824X9035A2
4.7	A	150D475X9006A2*	4.7	A	150D475X9015A2*	1.0	A	150D105X9035A2*	1.0	A	150D105X9035A2*
5.6	A	150D565X9006A2	5.6	A	150D565X9015A2	1.2	B	150D125X9035B2	1.2	B	150D125X9035B2
6.8	A	150D685X9006A2*	6.8	A	150D685X9015A2*	1.5	B	150D155X9035B2*	1.5	B	150D155X9035B2*
8.2	B	150D825X9006B2	8.2	B	150D825X9015B2	1.8	B	150D185X9035B2	1.8	B	150D185X9035B2
10	B	150D106X9006B2*	10	B	150D106X9015B2*	2.2	B	150D225X9035B2*	2.2	B	150D225X9035B2*
12	B	150D126X9006B2	12	B	150D126X9015B2	2.7	B	150D275X9035B2	2.7	B	150D275X9035B2
15	B	150D156X9006B2	15	B	150D156X9015B2	3.3	B	150D335X9035B2*	3.3	B	150D335X9035B2*
18	B	150D186X9006B2	18	B	150D186X9015B2	3.9	B	150D395X9035B2	3.9	B	150D395X9035B2
22	B	150D226X9006B2*	22	B	150D226X9015B2*	4.7	B	150D475X9035B2*	4.7	B	150D475X9035B2*
27	B	150D276X9006B2	27	B	150D276X9015B2	5.6	B	150D565X9035B2	5.6	B	150D565X9035B2
33	B	150D336X9006B2*	33	B	150D336X9015B2*	6.8	B	150D685X9035B2*	6.8	B	150D685X9035B2*
39	B	150D396X9006B2	39	B	150D396X9015B2	8.2	R	150D825X9035R2	8.2	R	150D825X9035R2
47	B	150D476X9006B2*	47	B	150D476X9015B2*	10	R	150D106X9035R2*	10	R	150D106X9035R2*
56	B	150D566X9006B2	56	B	150D566X9015B2	12	R	150D126X9035R2	12	R	150D126X9035R2
60	B	150D606X9006B2*	60	B	150D606X9015B2*	15	R	150D156X9035R2*	15	R	150D156X9035R2*
68	R	150D686X9006R2*	68	R	150D686X9015R2*	18	R	150D186X9035R2	18	R	150D186X9035R2
82	R	150D826X9006R2	82	R	150D826X9015R2	22	R	150D226X9035R2*	22	R	150D226X9035R2*
100	R	150D107X9006R2*	100	R	150D107X9015R2*	27	S	150D276X9035S2	27	S	150D276X9035S2
120	R	150D127X9006R2*	120	R	150D127X9015R2*	33	S	150D336X9035S2*	33	S	150D336X9035S2*
150	R	150D157X9006R2*	150	R	150D157X9015R2*	39	S	150D396X9035S2*	39	S	150D396X9035S2*
180	R	150D187X9006R2*	180	R	150D187X9015R2*	47	S	150D476X9035S2*	47	S	150D476X9035S2*
220	S	150D227X9006S2*	220	S	150D227X9015S2*	56	S	150D566X9035S2*	56	S	150D566X9035S2*
270	S	150D277X9006S2*	270	S	150D277X9015S2*	68	S	150D686X9035S2*	68	S	150D686X9035S2*
330	S	150D337X9006S2*	330	S	150D337X9015S2*	82	S	150D826X9035S2*	82	S	150D826X9035S2*
10 WVDC — 13 VDC SURGE			20 WVDC — 23 VDC SURGE			DIMENSIONS			35 WVDC — 40 VDC SURGE		
.22	A	150D224X9010A2*	.0047	A	150D472X9020A2*	Code	D. x L.		.0047	A	150D472X9035A2*
.27	A	150D274X9010A2	.0056	A	150D562X9020A2	A	.135" x .286"		.0056	A	150D562X9035A2
.33	A	150D334X9010A2*	.0068	A	150D682X9020A2*	B	.185" x .474"		.0068	A	150D682X9035A2
.39	A	150D394X9010A2	.0082	A	150D822X9020A2	P	.289" x .636"		.0082	A	150D822X9035A2
.47	A	150D474X9010A2*	.01	A	150D103X9020A2*	S	.351" x .786"		.01	A	150D103X9035A2*
.56	A	150D564X9010A2	.012	A	150D123X9020A2				.12	A	150D123X9035A2
.68	A	150D684X9010A2*	.015	A	150D153X9020A2*				.15	A	150D153X9035A2
.82	A	150D824X9010A2	.018	A	150D183X9020A2				.18	A	150D183X9035A2
1.0	A	150D105X9010A2*	.022	A	150D223X9020A2*				.22	A	150D223X9035A2*
1.2	A	150D125X9010A2	.027	A	150D273X9020A2				.27	A	150D273X9035A2
1.5	A	150D155X9010A2*	.033	A	150D333X9035A2*				.33	A	150D333X9035A2*
1.8	A	150D185X9010A2	.039	A	150D393X9035A2				.39	A	150D393X9035A2
2.2	A	150D225X9010A2*	.047	A	150D473X9035A2*				.47	A	150D473X9035A2*
2.7	A	150D275X9010A2	.056	A	150D563X9035A2*				.56	A	150D563X9035A2*
3.3	A	150D335X9010A2*	.068	A	150D683X9035A2*				.68	A	150D683X9035A2*
3.9	A	150D395X9010A2	.082	A	150D823X9035A2				.82	A	150D823X9035A2
4.7	A	150D475X9010A2*									
5.6	B	150D565X9010B2									
6.8	B	150D685X9010B2									
8.2	B	150D825X9010B2									

SPRAGUE CAPACITORS

TYPE 150D SOLID-ELECTROLYTE TANTALEX® CAPACITORS (Cont.)

μF	Size Code	Cat. No.	μF	Size Code	Cat. No.	μF	Size Code	Cat. No.	μF	Size Code	Cat. No.
.56	A	150D564X9050A2	.56	A	150D564X9060A2	.56	A	150D564X9075A2	.82	B	150D824X9100B2
.68	A	150D684X9050A2*	.68	A	150D684X9060A2*	.68	A	150D684X9075A2*	1.0	B	150D105X9100B2*
.82	A	150D824X9050A2	.82	B	150D824X9060B2	.82	B	150D824X9075B2	1.2	B	150D125X9100B2*
1.0	A	150D105X9050A2*	1.0	B	150D105X9060B2*	1.0	B	150D105X9075B2*	1.5	B	150D155X9100B2*
1.2	B	150D125X9050B2	1.2	B	150D125X9060B2	1.2	B	150D125X9075B2	1.8	B	150D185X9100B2*
1.5	B	150D155X9050B2*	1.5	B	150D155X9060B2*	1.5	B	150D155X9075B2*	2.2	B	150D225X9100B2*
1.8	B	150D185X9050B2	1.8	B	150D185X9060B2	1.8	B	150D185X9075B2	2.7	B	150D275X9100B2
2.2	B	150D225X9050B2*	2.2	B	150D225X9060B2*	2.2	B	150D225X9075B2*	3.3	R	150D335X9100R2*
2.7	B	150D275X9050B2	2.7	B	150D275X9060B2	2.7	B	150D275X9075B2	3.9	R	150D395X9100R2
3.3	B	150D335X9050B2*	3.3	B	150D335X9060B2*	3.3	B	150D335X9075B2*	4.7	R	150D475X9100R2*
3.9	B	150D395X9050B2	3.9	B	150D395X9060B2	3.9	B	150D395X9075B2	5.6	R	150D565X9100R2
4.7	B	150D475X9050B2*	4.7	R	150D475X9060R2*	4.7	R	150D475X9075R2*	6.8	R	150D685X9100R2*
5.6	R	150D565X9050R2	5.6	R	150D565X9060R2	5.6	R	150D565X9075R2	8.2	R	150D825X9050R2
6.8	R	150D685X9050R2*	6.8	R	150D685X9060R2*	6.8	R	150D685X9075R2*			
8.2	R	150D825X9050R2	8.2	R	150D825X9060R2	8.2	R	150D825X9075R2			
10	R	150D106X9050R2*	10	R	150D106X9060R2*	10	R	150D106X9075R2*			
12	R	150D126X9050R2	12	S	150D126X9060S2	10.0	R	150D106X9075R2*			
15	R	150D156X9050R2*	15	S	150D156X9060S2*	12.0	S	150D126X9075S2			
18	R	150D186X9050R2	18	S	150D186X9060S2	15.0	S	150D156X9075S2*			
22	S	150D226X9050S2*	22	S	150D226X9060S2*						
60 WVDC — 78 VDC SURGE			75 WVDC — 97 VDC SURGE			100 WVDC — 115 VDC SURGE			125 WVDC — 140 VDC SURGE		
.0047	A	150D472X9060A2*	.0047	A	150D472X9075A2*	.0047	A	150D472X9100A2*	.0047	A	150D472X9125A2*
.0056	A	150D562X9060A2	.0056	A	150D562X9075A2	.0056	A	150D562X9100A2	.0056	A	150D562X9125A2
.0068	A	150D682X9060A2*	.0068	A	150D682X9075A2*	.0068	A	150D682X9100A2*	.0068	A	150D682X9125A2*
.0082	A	150D822X9060A2	.0082	A	150D822X9075A2	.0082	A	150D822X9100A2	.0082	A	150D822X9125A2
.01	A	150D103X9060A2*	.01	A	150D103X9075A2*	.01	A	150D103X9100A2*	.01	A	150D103X9125A2*
.012	A	150D123X9060A2	.012	A	150D123X9075A2	.012	A	150D123X9100A2*	.012	A	150D123X9125A2
.015	A	150D153X9060A2*	.015	A	150D153X9075A2*	.015	A	150D153X9100A2*	.015	A	150D153X9125A2*
.018	A	150D183X9060A2	.018	A	150D183X9075A2	.018	A	150D183X9100A2	.018	A	150D183X9125A2
.022	A	150D223X9060A2*	.022	A	150D223X9075A2*	.022	A	150D223X9100A2*	.022	A	150D223X9125A2*
.027	A	150D273X9060A2	.027	A	150D273X9075A2	.027	A	150D273X9100A2	.027	A	150D273X9125A2
.033	A	150D333X9060A2*	.033	A	150D333X9075A2*	.033	A	150D333X9100A2*	.033	A	150D333X9125A2*
.039	A	150D393X9060A2	.039	A	150D393X9075A2	.039	A	150D393X9100A2*	.039	A	150D393X9125A2
.047	A	150D473X9060A2*	.047	A	150D473X9075A2*	.047	A	150D473X9100A2*	.047	A	150D473X9125A2*
.056	A	150D563X9060A2	.056	A	150D563X9075A2	.056	A	150D563X9100A2	.056	A	150D563X9125A2
.068	A	150D683X9060A2*	.068	A	150D683X9075A2*	.068	A	150D683X9100A2*	.068	A	150D683X9125A2*
.082	A	150D823X9060A2	.082	A	150D823X9075A2	.082	A	150D823X9100A2	.082	A	150D823X9125A2
.1	A	150D104X9060A2*	.1	A	150D104X9075A2*	.1	A	150D104X9100A2*	.1	A	150D104X9125A2*
.12	A	150D124X9060A2	.12	A	150D124X9075A2	.12	A	150D124X9100A2	.12	A	150D124X9125A2
.15	A	150D154X9060A2*	.15	A	150D154X9075A2*	.15	A	150D154X9100A2*	.15	A	150D154X9125A2*
.18	A	150D184X9060A2	.18	A	150D184X9075A2	.18	A	150D184X9100A2	.18	A	150D184X9125A2
.22	A	150D224X9060A2*	.22	A	150D224X9075A2*	.22	A	150D224X9100A2*	.22	A	150D224X9125A2*
.27	A	150D274X9060A2	.27	A	150D274X9075A2	.27	A	150D274X9100A2	.27	A	150D274X9125A2
.33	A	150D334X9060A2*	.33	A	150D334X9075A2*	.33	A	150D334X9100A2*	.33	A	150D334X9125A2*
.39	A	150D394X9060A2	.39	A	150D394X9075A2	.39	A	150D394X9100A2	.39	A	150D394X9125A2
.47	A	150D474X9060A2*	.47	A	150D474X9075A2*	.47	A	150D474X9100A2	.47	A	150D474X9125A2*
						.56	A	150D564X9100A2*	.56	B	150D564X9125B2
						.68	B	150D684X9100B2*	.68	B	150D684X9125B2*
									1.0	B	150D105X9125B2*
									1.2	B	150D125X9125B2
									1.5	B	150D155X9125B2*
									1.8	B	150D185X9125B2
									2.2	B	150D225X9125B2*
									2.7	B	150D275X9125B2
									3.3	R	150D335X9125B2*
									3.9	R	150D395X9125B2
									4.7	R	150D475X9125B2*
									5.6	R	150D565X9125B2
									6.8	R	150D685X9125B2*
									8.2	R	150D825X9125B2

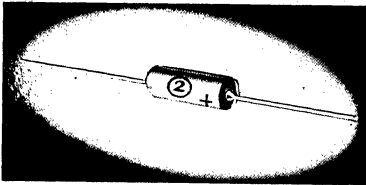
EXTENDED-RANGE TYPE 150D TANTALEX® CAPACITORS®

• Extended capacitance ratings (higher capacitance values in smaller case sizes) required in some new equipment designs. • Available at premium prices.

μF	Size Code	Cat. No.	μF	Size Code	Cat. No.	μF	Size Code	Cat. No.	μF	Size Code	Cat. No.
6 WVDC 8 VDC SURGE			15 WVDC 18 VDC SURGE			20 WVDC — 23 VDC SURGE			35 WVDC — 40 VDC SURGE		
10	A	150D106X9006A2*	150	R	150D157X9010R2*	2.7	A	150D275X9020A2	82	S	150D826X9030S2
12	A	150D126X9006A2	180	R	150D187X9010R2*	3.3	A	150D335X9020A2*	100	S	150D107X9030S2*
15	A	150D156X9006A2*	220	R	150D227X9010R2*	3.9	A	150D395X9020A2*	125 WVDC — 140 VDC SURGE		
68	B	150D686X9006B2*	270	R	150D277X9010R2	4.7	A	150D475X9020A2*	1.2	A	150D125X9035A2
82	B	150D826X9006B2	330	S	150D337X9010S2*	18	B	150D186X9020B2	1.5	A	150D155X9035A2*
100	B	150D107X9006B2*	390	S	150C397X9010S2	22	B	150D226X9020B2*	1.8	A	150D185X9035A2
330	R	150D337X9006R2*	470	S	150D477X9010S2*	27	B	150D276X9020B2	8.2	B	150D825X9035B2
390	R	150D397X9006R2	560	S	150D567X9010S2	56	R	150D566X9020R2	10	B	150D106X9035B2*
470	R	150D477X9006R2*	30 WVDC — 34 VDC SURGE			68	R	150D686X9020R2*	27	R	150D276X9035R2
560	S	150D567X9006S2	3.9	A	150D395X9015A2	82	R	150D826X9020R2	33	R	150D336X9035R2*
680	S	150D687X9006S2*	4.7	A	150D475X9015A2*	100	R	150D107X9020R2*	39	R	150D396X9035R2
820	S	150D827X9006S2	5.6	A	150D565X9015A2	120	R	150D127X9020R2	47	R	150D476X9035R2*
1000	S	150D108X9006S2*	6.8	A	150D685X9015A2*	150	S	150D157X9020S2*	56	S	150D566X9035S2
			27	B	150D276X9015B2	180	S	150D187X9020S2	68	S	150D686X9035S2*
			33	B	150D336X9015B2	220	S	150D227X9020S2*			
			39	B	150D396X9015B2				50 WVDC — 65 VDC SURGE		
5.6	A	150D565X9010A2	82	R	150D826X9015R2	2.2	A	150D225X9030A2*	1.2	A	150D125X9050A2
6.8	A	150D685X9010A2*	100	R	150D107X9015R2	2.7	A	150D275X9030A2	1.5	A	150D155X9050A2*
8.2	A	150D825X9010A2	120	R	150D127X9015R2	12	B	150D126X9030B2	5.6	B	150D565X9050B2
10	A	150D106X9010A2*	150	R	150D157X9015R2*	15	B	150D156X9030B2*	6.8	B	150D685X9050B2*
47	B	150D476X9010B2*	180	R	150D187X9015R2	18	B	150D186X9030B2	22	R	150D226X9050R2*
56	B	150D566X9010B2	220	S	150D227X9015S2*	56	R	150D566X9030R2	27	R	150D276X9050R2
68	B	150D686X9010B2*	270	S	150D277X9015S2	68	R	150D686X9030R2*	33	S	150D336X9050S2*
82	B	150D826X9010B2	330	S	150D337X9015S2*				39	S	150D396X9050S2

SPRAGUE CAPACITORS

EST. REL. MIL-C-39003 STYLE CSR13 SOLID TANTALUMS



- Solid-electrolyte tantalum type. Glass-to-metal hermetic seal. 125 C operation.

- For complete technical data, refer to latest issue of Engineering Bulletin 3520.2.

- Handled by Sprague and Sprague industrial distributors in full compliance with MIL-STD-790. Manufactured, marked, packed, shipped, received, inspected, stored in separate area, free from contamination or mix-up with other components.

SIZE CODE

A = .135"D.x286"L. C = .289"D.x686"L.
B = .185"D.x474"L. D = .351"D.x786"L.

MIL PART NUMBER M39003/01-

μF	WVDC	Size Code	MIL Type Designation*	Failure Rate L (2%)		Failure Rate M (1%)		Failure Rate P (0.1%)		Failure Rate R (0.01%)		Failure Rate S (0.001%)	
				Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%
5.6	6	A	CSR13B565K-	—	2001	—	2241	—	2481	—	2721	—	2961
6.8	6	A	CSR13B685--	2003	2002	2243	2242	2483	2482	2723	2722	2963	2962
47	6	B	CSR13B476--	2005	2004	2245	2244	2485	2484	2725	2724	2965	2964
56	6	B	CSR13B566K-	—	2006	—	2246	—	2486	—	2726	—	2966
150	6	C	CSR13B157--	2008	2007	2248	2247	2488	2487	2728	2727	2968	2967
180	6	C	CSR13B187K-	—	2009	—	2249	—	2489	—	2729	—	2969
270	6	D	CSR13B277K-	—	2010	—	2250	—	2490	—	2730	—	2970
330	6	D	CSR13B337--	2012	2011	2252	2251	2492	2491	2732	2731	2972	2971
3.9	10	A	CSR13C395K-	—	2013	—	2253	—	2493	—	2733	—	2973
4.7	10	A	CSR13C475--	2015	2014	2255	2254	2495	2494	2735	2734	2975	2974
27	10	B	CSR13C276K-	—	2016	—	2256	—	2496	—	2736	—	2976
33	10	B	CSR13C336--	2018	2017	2258	2257	2498	2497	2738	2737	2978	2977
39	10	B	CSR13C396K-	—	2019	—	2259	—	2499	—	2739	—	2979
82	10	C	CSR13C826K-	—	2020	—	2260	—	2500	—	2740	—	2980
100	10	C	CSR13C107--	2022	2021	2262	2261	2502	2501	2742	2741	2982	2981
120	10	C	CSR13C127K-	—	2023	—	2263	—	2503	—	2743	—	2983
180	10	D	CSR13C187K-	—	2024	—	2264	—	2504	—	2744	—	2984
220	10	D	CSR13C227--	2026	2025	2266	2265	2506	2505	2746	2745	2986	2985
2.7	15	A	CSR13D275K-	—	2027	—	2267	—	2507	—	2747	—	2987
3.3	15	A	CSR13D335--	2029	2028	2269	2268	2509	2508	2749	2748	2989	2988
18	15	B	CSR13D186K-	—	2030	—	2270	—	2510	—	2750	—	2990
22	15	B	CSR13D226--	2032	2031	2272	2271	2512	2511	2752	2751	2992	2991
56	15	C	CSR13D556K-	—	2033	—	2273	—	2513	—	2753	—	2993
68	15	C	CSR13D686--	2035	2034	2275	2274	2515	2514	2755	2754	2995	2994
120	15	D	CSR13D127K-	—	2036	—	2276	—	2516	—	2756	—	2996
150	15	D	CSR13D157--	2038	2037	2278	2277	2518	2517	2758	2757	2998	2997
1.2	20	A	CSR13E125K-	—	2039	—	2279	—	2519	—	2759	—	2999
1.5	20	A	CSR13E155--	2041	2040	2281	2280	2521	2520	2761	2760	3001	3000
1.8	20	A	CSR13E185K-	—	2042	—	2282	—	2522	—	2762	—	3002
2.2	20	A	CSR13E225--	2044	2043	2284	2283	2524	2523	2764	2763	3004	3003
8.2	20	B	CSR13E825K-	—	2045	—	2285	—	2525	—	2765	—	3005
10	20	B	CSR13E106--	2047	2046	2287	2286	2527	2526	2767	2766	3007	3006
12	20	B	CSR13E126K-	—	2048	—	2288	—	2528	—	2768	—	3008
15	20	B	CSR13E156--	2050	2049	2290	2289	2530	2529	2770	2769	3010	3009
27	20	C	CSR13E276K-	—	2051	—	2291	—	2531	—	2771	—	3011
33	20	C	CSR13E336--	2053	2052	2293	2292	2533	2532	2773	2772	3013	3012
39	20	C	CSR13E396K-	—	2054	—	2294	—	2534	—	2774	—	3014
47	20	C	CSR13E476--	2056	2055	2296	2295	2536	2535	2776	2775	3016	3015
56	20	D	CSR13E566K-	—	2057	—	2297	—	2537	—	2777	—	3017
68	20	D	CSR13E686--	2059	2058	2299	2298	2539	2538	2779	2778	3019	3018
82	20	D	CSR13E826K-	—	2060	—	2300	—	2540	—	2780	—	3020
100	20	D	CSR13E107--	2062	2061	2302	2301	2542	2541	2782	2781	3022	3021

*Type Nos. shown are incomplete. Capacitance Tolerance and/or Failure Rate must be added at end of number. Where 10th character (cap. tol.) is blank, insert "K" for ± 10%, "M" for ± 20%. A last character must be added to denote Failure Rate. Insert "L" for 2%, "M" for 1%, "P" for 0.1%, "R" for 0.01%, "S" for 0.001%.

SPRAGUE CAPACITORS

STYLE CSR13 SOLID TANTALUMS - (continued)

MIL PART NUMBER M39003/01--													
μF	WVDC	Size Code	MIL Type Designation*	Failure Rate L (2%)		Failure Rate M (1%)		Failure Rate P (0.1%)		Failure Rate R (0.01%)		Failure Rate S (0.001%)	
				Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%
5.6	35	B	CSR13F565K-	—	2063	—	2303	—	2543	—	2783	—	3023
6.8	35	B	CSR13F685--	2065	2064	2305	2304	2545	2544	2785	2784	3025	3024
22	35	C	CSR13F226--	2067	2066	2307	2306	2547	2746	2787	2786	3027	3026
27	35	D	CSR13F276K-	—	2068	—	2308	—	2548	—	2788	—	3028
33	35	D	CSR13F336--	2070	2069	2310	2309	2550	2549	2790	2789	3030	3029
39	35	D	CSR13F396K-	—	2071	—	2311	—	2551	—	2791	—	3031
47	35	D	CSR13F476--	2073	2072	2313	2312	2553	2552	2793	2792	3033	3032
.0047	50	A	CSR13G472--	2075	2074	2315	2314	2555	2554	2795	2794	3035	3034
.0056	50	A	CSR13G562K-	—	2076	—	2316	—	2556	—	2796	—	3036
.0068	50	A	CSR13G682--	2078	2077	2318	2317	2558	2557	2798	2797	3038	3037
.0082	50	A	CSR13G822K-	—	2079	—	2319	—	2559	—	2799	—	3039
.01	50	A	CSR13G103--	2081	2080	2321	2320	2561	2560	2801	2800	3041	3040
.012	50	A	CSR13G123K-	—	2082	—	2322	—	2562	—	2802	—	3042
.015	50	A	CSR13G153--	2084	2083	2324	2323	2564	2563	2804	2803	3044	3043
.018	50	A	CSR13G183K-	—	2085	—	2325	—	2565	—	2805	—	3045
.022	50	A	CSR13G223--	2087	2086	2327	2326	2567	2566	2807	2806	3047	3046
.027	50	A	CSR13G273K-	—	2088	—	2328	—	2568	—	2808	—	3048
.033	50	A	CSR13G333--	2090	2089	2330	2329	2570	2569	2810	2809	3050	3049
.039	50	A	CSR13G393K-	—	2091	—	2331	—	2571	—	2811	—	3051
.047	50	A	CSR13G473--	2093	2092	2333	2332	2573	2572	2813	2812	3053	3052
.056	50	A	CSR13G563K-	—	2094	—	2334	—	2574	—	2814	—	3054
.068	50	A	CSR13G683--	2096	2095	2336	2335	2576	2575	2816	2815	3056	3055
.082	50	A	CSR13G823K-	—	2097	—	2337	—	2577	—	2817	—	3057
.1	50	A	CSR13G104--	2099	2098	2339	2338	2579	2578	2819	2818	3059	3058
.12	50	A	CSR13G124K-	—	2100	—	2340	—	2580	—	2820	—	3060
.15	50	A	CSR13G154--	2102	2101	2342	2341	2582	2581	2822	2821	3062	3061
.18	50	A	CSR13G184K-	—	2103	—	2343	—	2583	—	2823	—	3063
.22	50	A	CSR13G224--	2105	2104	2345	2344	2585	2584	2825	2824	3065	3064
.27	50	A	CSR13G274K-	—	2106	—	2346	—	2586	—	2826	—	3066
.33	50	A	CSR13G334--	2108	2107	2348	2347	2588	2587	2828	2827	3068	3067
.39	50	A	CSR13G394K-	—	2109	—	2349	—	2589	—	2829	—	3069
.47	50	A	CSR13G474--	2111	2110	2351	2350	2591	2590	2831	2830	3071	3070
.56	50	A	CSR13G564K-	—	2112	—	2352	—	2592	—	2832	—	3072
.68	50	A	CSR13G684--	2114	2113	2354	2353	2594	2593	2834	2833	3074	3073
.82	50	A	CSR13G824K-	—	2115	—	2355	—	2595	—	2835	—	3075
1.0	50	A	CSR13G105--	2117	2116	2357	2356	2597	2596	2837	2836	3077	3076
1.2	50	B	CSR13G125K-	—	2118	—	2358	—	2598	—	2838	—	3078
1.5	50	B	CSR13G155--	2120	2119	2360	2359	2600	2599	2840	2839	3080	3079
1.8	50	B	CSR13G185K-	—	2121	—	2361	—	2601	—	2841	—	3081
2.2	50	B	CSR13G225--	2123	2122	2363	2362	2603	2602	2843	2842	3083	3082
2.7	50	B	CSR13G275K-	—	2124	—	2364	—	2604	—	2844	—	3084
3.3	50	B	CSR13G335--	2126	2125	2366	2365	2606	2605	2846	2845	3086	3085
3.9	50	B	CSR13G395K-	—	2127	—	2367	—	2607	—	2847	—	3087
4.7	50	B	CSR13G475--	2129	2128	2369	2368	2609	2608	2849	2848	3089	3088
5.6	50	C	CSR13G565K-	—	2130	—	2370	—	2610	—	2850	—	3090
6.8	50	C	CSR13G685--	2132	2131	2372	2371	2612	2611	2852	2851	3092	3091
8.2	50	C	CSR13G825K-	—	2133	—	2373	—	2613	—	2853	—	3093
10	50	C	CSR13G106--	2135	2134	2375	2374	2615	2614	2855	2854	3095	3094
12	50	C	CSR13G126K-	—	2136	—	2376	—	2616	—	2856	—	3096
15	50	C	CSR13G156--	2138	2137	2378	2377	2618	2617	2858	2857	3098	3097
18	50	C	CSR13G186K-	—	2139	—	2379	—	2619	—	2859	—	3099
22	50	D	CSR13G226--	2141	2140	2381	2380	2621	2620	2861	2860	3101	3100
.1	75	A	CSR13H104--	2143	2142	2383	2382	2723	2622	2863	2862	3103	3102
.12	75	A	CSR13H124K-	—	2144	—	2384	—	2624	—	2864	—	3104
.15	75	A	CSR13H154--	2146	2145	2386	2385	2626	2625	2866	2865	3106	3105
.18	75	A	CSR13H184K-	—	2147	—	2387	—	2627	—	2867	—	3107

*Type Nos. shown are incomplete. Capacitance Tolerance and/or Failure Rate must be added at end of number. Where 10th character (cap. tol.) is blank, insert "K" for ± 10%, "M" for ± 20%. A last character must be added to denote Failure Rate. Insert "L" for 2%, "M" for 1%, "P" for 0.1%, "R" for 0.01%, "S" for 0.001%.

SPRAGUE CAPACITORS

STYLE CSR13 SOLID TANTALUMS - (continued)

MIL PART NUMBER M39003/01--													
μF	WVDC	Size Code	MIL Type Designation*	Failure Rate L (2%)		Failure Rate M (1%)		Failure Rate P (0.1%)		Failure Rate R (0.01%)		Failure Rate S (0.001%)	
				Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%
.22	75	A	CSR13H224--	2149	2148	2389	2388	2629	2628	2869	2868	3109	3108
.27	75	A	CSR13H274K-	—	2150	—	2390	—	2630	—	2870	—	3110
.33	75	A	CSR13H334--	2152	2151	2392	2391	2632	2631	2872	2871	3112	3111
.39	75	A	CSR13H394K-	—	2153	—	2393	—	2633	—	2873	—	3113
.47	75	A	CSR13H474--	2155	2154	2395	2394	2635	2634	2875	2874	3115	3114
.56	75	A	CSR13H564K-	—	2156	—	2396	—	2636	—	2876	—	3116
.68	75	A	CSR13H684--	2158	2157	2398	2397	2638	2637	2878	2877	3118	3117
.82	75	B	CSR13H824K-	—	2159	—	2399	—	2639	—	2879	—	3119
1.0	75	B	CSR13H105--	2161	2160	2401	2400	2641	2640	2881	2880	3121	3120
1.2	75	B	CSR13H125K-	—	2162	—	2402	—	2642	—	2882	—	3122
1.5	75	B	CSR13H155--	2164	2163	2404	2403	2644	2643	2884	2883	3124	3123
1.8	75	B	CSR13H185K-	—	2165	—	2405	—	2645	—	2885	—	3125
2.2	75	B	CSR13H225--	2167	2166	2407	2406	2647	2646	2887	2886	3127	3126
2.7	75	B	CSR13H275K-	—	2168	—	2408	—	2648	—	2888	—	3128
3.3	75	B	CSR13H335--	2170	2169	2410	2409	2650	2649	2890	2889	3130	3129
3.9	75	B	CSR13H395K-	—	2171	—	2411	—	2651	—	2891	—	3131
4.7	75	C	CSR13H475--	2173	2172	2413	2412	2653	2652	2893	2892	3133	3132
5.6	75	C	CSR13H565K-	—	2174	—	2414	—	2654	—	2894	—	3134
6.8	75	C	CSR13H685--	2176	2175	2416	2415	2656	2655	2896	2895	3136	3135
8.2	75	C	CSR13H825K-	—	2177	—	2417	—	2657	—	2897	—	3137
10	75	C	CSR13H106--	2179	2178	2419	2418	2659	2658	2899	2898	3139	3138
12	75	D	CSR13H126K-	—	2180	—	2420	—	2660	—	2900	—	3140
15	75	D	CSR13H156--	2182	2181	2422	2421	2662	2661	2902	2901	3142	3141
.0047	100	A	CSR13J472--	2184	2183	2424	2423	2664	2663	2904	2903	3144	3143
.0056	100	A	CSR13J562K-	—	2185	—	2425	—	2665	—	2905	—	3145
.0068	100	A	CSR13J682--	2187	2186	2427	2426	2667	2666	2907	2906	3147	3146
.0082	100	A	CSR13J822K-	—	2188	—	2428	—	2668	—	2908	—	3148
.01	100	A	CSR13J103--	2190	2189	2430	2429	2670	2669	2910	2909	3150	3149
.012	100	A	CSR13J123K-	—	2191	—	2431	—	2671	—	2911	—	3151
.015	100	A	CSR13J153--	2193	2192	2433	2432	2673	2672	2913	2912	3153	3152
.018	100	A	CSR13J183K-	—	2194	—	2434	—	2674	—	2914	—	3154
.022	100	A	CSR13J223--	2196	2195	2436	2435	2676	2675	2916	2915	3156	3155
.027	100	A	CSR13J273K-	—	2197	—	2437	—	2677	—	2917	—	3157
.033	100	A	CSR13J333--	2199	2198	2439	2438	2679	2678	2919	2918	3159	3158
.039	100	A	CSR13J393K-	—	2200	—	2440	—	2680	—	2920	—	3160
.047	100	A	CSR13J473--	2202	2201	2442	2441	2682	2681	2922	2921	3162	3161
.056	100	A	CSR13J563K-	—	2203	—	2443	—	2683	—	2923	—	3163
.068	100	A	CSR13J683--	2205	2204	2445	2444	2685	2684	2925	2924	3165	3164
.082	100	A	CSR13J823K-	—	2206	—	2446	—	2686	—	2926	—	3166
.1	100	A	CSR13J104--	2208	2207	2448	2447	2688	2687	2928	2927	3168	3167
.12	100	A	CSR13J124K-	—	2209	—	2449	—	2689	—	2929	—	3169
.15	100	A	CSR13J154--	2211	2210	2451	2450	2691	2690	2931	2930	3171	3170
.18	100	A	CSR13J184K-	—	2212	—	2452	—	2692	—	2932	—	3172
.22	100	A	CSR13J224--	2214	2213	2454	2453	2694	2693	2934	2933	3174	3173
.27	100	A	CSR13J274K-	—	2215	—	2455	—	2695	—	2935	—	3175
.33	100	A	CSR13J334--	2217	2216	2457	2456	2697	2696	2937	2936	3177	3176
.39	100	A	CSR13J394K-	—	2218	—	2458	—	2698	—	2938	—	3178
.47	100	A	CSR13J474--	2220	2219	2460	2459	2700	2699	2940	2939	3180	3179
.56	100	A	CSR13J564K-	—	2221	—	2461	—	2701	—	2941	—	3181
.68	100	B	CSR13J684--	2223	2222	2463	2462	2703	2702	2943	2942	3183	3182
.82	100	B	CSR13J824K-	—	2224	—	2464	—	2704	—	2944	—	3184
1.0	100	B	CSR13J105--	2226	2225	2466	2465	2706	2705	2946	2945	3186	3185
1.2	100	B	CSR13J125K-	—	2227	—	2467	—	2707	—	2947	—	3187
1.5	100	B	CSR13J155--	2229	2228	2469	2468	2709	2708	2949	2948	3189	3188
1.8	100	B	CSR13J185K-	—	2230	—	2470	—	2710	—	2950	—	3190
2.2	100	B	CSR13J225--	2232	2231	2472	2471	2712	2711	2952	2951	3192	3191
2.7	100	B	CSR13J275K-	—	2233	—	2473	—	2713	—	2953	—	3193

*Type Nos. shown are incomplete. Capacitance Tolerance and/or Failure Rate must be added at end of number. Where 10th character (cap. tol.) is blank, insert "K" for ± 10%, "M" for ± 20%. A last character must be added to denote Failure Rate. Insert "L" for 2%, "M" for 1%, "P" for 0.1%, "R" for 0.01%, "S" for 0.001%.

SPRAGUE CAPACITORS

EST. REL. MIL-C-39003 STYLE CSR23 SOLID TANTALUMS

- Essentially the same as Type CSR13 capacitors but with extended capacitance ratings
(higher capacitance in same size cases) required in some new equipment designs.

MIL PART NUMBER M39003/03-

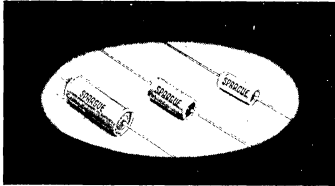
μF	WVDC	Size Code	MIL Type Designation*	Failure Rate L (2%)		Failure Rate M (1%)		Failure Rate P (0.1%)		Failure Rate R (0.01%)		Failure Rate S (0.001%)	
				Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%	Cap. Tol. ± 20%	Cap. Tol. ± 10%
10	6	A	CSR23B106--	0002	0001	0102	0101	0202	0201	0302	0301	0402	0401
12	6	A	CSR23B126K-	—	0003	—	0103	—	0203	—	0303	—	0403
100	6	B	CSR23B107--	0005	0004	0105	0104	0205	0204	0305	0304	0405	0404
330	6	C	CSR23B337--	0007	0006	0107	0106	0207	0206	0307	0306	0407	0406
390	6	C	CSR23B397K-	—	0008	—	0108	—	0208	—	0308	—	0408
470	6	C	CSR23B477--	0010	0009	0110	0109	0210	0209	0310	0309	0410	0409
680	6	D	CSR23B687--	0012	0011	0112	0111	0212	0211	0312	0311	0412	0411
820	6	D	CSR23B827K-	—	0013	—	0113	—	0213	—	0313	—	0413
1000	6	D	CSR23B108--	0015	0014	0115	0114	0215	0214	0315	0314	0415	0414
6.8	10	A	CSR23C685--	0017	0016	0117	0116	0217	0216	0317	0316	0417	0416
8.2	10	A	CSR23C825K-	—	0018	—	0118	—	0218	—	0318	—	0418
47	10	B	CSR23C476--	0020	0019	0120	0119	0220	0219	0320	0319	0420	0419
56	10	B	CSR23C566K-	—	0021	—	0121	—	0221	—	0321	—	0421
68	10	B	CSR23C686--	0023	0022	0123	0122	0223	0222	0323	0322	0423	0422
82	10	B	CSR23C826K-	—	0024	—	0124	—	0224	—	0324	—	0424
220	10	C	CSR23C227--	0026	0025	0126	0125	0226	0225	0326	0325	0426	0425
270	10	C	CSR23C277K-	—	0027	—	0127	—	0227	—	0327	—	0427
390	10	D	CSR23C397K-	—	0028	—	0128	—	0228	—	0328	—	0428
470	10	D	CSR23C477--	0030	0029	0130	0129	0230	0229	0330	0329	0430	0429
560	10	D	CSR23C567K-	—	0031	—	0131	—	0231	—	0331	—	0431
4.7	15	A	CSR23D475--	0033	0032	0133	0132	0233	0232	0333	0332	0433	0432
5.6	15	A	CSR23D565K-	—	0034	—	0134	—	0234	—	0334	—	0434
33	15	B	CSR23D336--	0036	0035	0136	0135	0236	0235	0336	0335	0436	0435
39	15	B	CSR23D396K-	—	0037	—	0137	—	0237	—	0337	—	0437
150	15	C	CSR23D157--	0039	0038	0139	0138	0239	0238	0339	0338	0439	0438
180	15	C	CSR23D187K-	—	0040	—	0140	—	0240	—	0340	—	0440
220	15	D	CSR23D227--	0042	0041	0142	0141	0242	0241	0342	0341	0442	0441
270	15	D	CSR23D277K-	—	0043	—	0143	—	0243	—	0343	—	0443
330	15	D	CSR23D337--	0045	0044	0145	0144	0245	0244	0345	0344	0445	0444
2.7	20	A	CSR23E275K-	—	0046	—	0146	—	0246	—	0346	—	0446
3.3	20	A	CSR23E335--	0048	0047	0148	0147	0248	0247	0348	0347	0448	0447
3.9	20	A	CSR23E395K-	—	0049	—	0149	—	0249	—	0349	—	0449
18	20	B	CSR23E186K-	—	0050	—	0150	—	0250	—	0350	—	0450
22	20	B	CSR23E226--	0052	0051	0152	0151	0252	0251	0352	0351	0452	0451
27	20	B	CSR23E276K-	—	0053	—	0153	—	0253	—	0353	—	0453
56	20	C	CSR23E566K-	—	0054	—	0154	—	0254	—	0354	—	0454
68	20	C	CSR23E686--	0056	0055	0156	0155	0256	0255	0356	0355	0456	0455
82	20	C	CSR23E826K-	—	0057	—	0157	—	0257	—	0357	—	0457
100	20	C	CSR23E107--	0059	0058	0159	0158	0259	0258	0359	0358	0459	0458
120	20	C	CSR23E127K-	—	0060	—	0160	—	0260	—	0360	—	0460
150	20	D	CSR23E157--	0062	0061	0162	0161	0262	0261	0362	0361	0462	0461
180	20	D	CSR23E187K-	—	0063	—	0163	—	0263	—	0363	—	0463
1.8	35	A	CSR23F185K-	—	0064	—	0164	—	0264	—	0364	—	0464
8.2	35	B	CSR23F826K-	—	0065	—	0165	—	0265	—	0365	—	0465
10	35	B	CSR23F106--	0067	0066	0167	0166	0267	0266	0367	0366	0467	0466
33	35	C	CSR23F336--	0069	0068	0169	0168	0269	0268	0369	0368	0469	0468
39	35	C	CSR23F396K-	—	0070	—	0170	—	0270	—	0370	—	0470
47	35	C	CSR23F476--	0072	0071	0172	0171	0272	0271	0372	0371	0472	0471
56	35	D	CSR23F566K-	—	0073	—	0173	—	0273	—	0373	—	0473
68	35	D	CSR23F686--	0075	0074	0175	0174	0275	0274	0375	0374	0475	0474
1.2	50	A	CSR23G125K-	—	0076	—	0176	—	0276	—	0376	—	0476
1.5	50	A	CSR23G155--	0078	0077	0178	0177	0278	0277	0378	0377	0478	0477
5.6	50	B	CSR23G565K-	—	0079	—	0179	—	0279	—	0379	—	0479
6.8	50	B	CSR23G685--	0081	0080	0181	0180	0281	0280	0381	0380	0481	0480
22	50	C	CSR23G226--	0083	0082	0183	0182	0283	0282	0383	0382	0483	0482
27	50	C	CSR23G276K-	—	0084	—	0184	—	0284	—	0384	—	0484
33	50	D	CSR23G336--	0086	0085	0186	0185	0286	0285	0386	0385	0486	0485
39	50	D	CSR23G396K-	—	0087	—	0187	—	0287	—	0387	—	0487

*Type Nos. shown are incomplete. Capacitance Tolerance and/or Failure Rate must be added at end of number. Where 10th character (cap. tol.) is blank, insert "K" for ±10%, "M" for ±20%. A last character must be added to denote Failure Rate. Insert "L" for 2%, "M" for 1%, "P" for 0.1%, "R" for 0.01%, "S" for 0.001%.

SPRAGUE CAPACITORS

ESTABLISHED RELIABILITY MIL-C-39006

STYLE CLR25/27 and CLR35/37 FOIL TANTALUM CAPACITORS



• Rated for operation to 85 C (to 125 C with voltage derating).

• Handled by Sprague and Sprague industrial distributors in full compliance with MIL-STD-790. Manufactured, marked, packed, shipped, received, inspected, stored in separate area, free from contamination or mix-up with other components.

• Capacitance tolerances: Style CLR25 27... 15 thru 30V = +75, -15%; 50 thru 75V = +50, -15%; 100V and up = +30, -15%. Style CLR35 37... 15 thru 150V = $\pm 20\%$; 200V and up = $\pm 15\%$.

SIZE CODE

A = .219" D. x .668" L. D = .406" D. x 2.125" L.
B = .312" D. x .969" L. E = .406" D. x 2.750" L.
C = .406" D. x 1.438" L.

STYLE CLR25, POLARIZED ETCHED FOIL

MIL Part No. M39006, 01-							MIL Part No. M39006 01-							MIL Part No. M39006, 01-						
μF	WVDC	Size Code	Failure Rate L(2%)	Failure Rate M(1%)	Failure Rate P(.1%)	Failure Rate R(.01%)	μF	WVDC	Size Code	Failure Rate L(2%)	Failure Rate M(1%)	Failure Rate P(.1%)	Failure Rate R(.01%)	μF	WVDC	Size Code	Failure Rate L(2%)	Failure Rate M(1%)	Failure Rate P(.1%)	Failure Rate R(.01%)
GLASS-TO-METAL HERMETIC SEAL																				
60	15	B	3001	3030	3059	3038	220	30	D	3011	3040	3069	3098	100	75	E	3021	3050	3079	3108
200	15	C	3002	3031	3060	3089	300	30	E	3012	3041	3070	3099	8	100	B	3022	3051	3080	3109
400	15	D	3003	3032	3061	3090	18	50	B	3013	3042	3071	3100	25	100	C	3023	3052	3081	3110
580	15	E	3004	3033	3062	3091	60	50	C	3014	3043	3072	3101	50	100	D	3024	3053	3082	3111
40	25	B	3005	3034	3063	3092	75	50	E	3015	3044	3073	3102	70	100	E	3025	3054	3083	3112
120	25	C	3006	3035	3064	3093	100	50	D	3016	3045	3074	3103	4	150	B	3026	3055	3084	3113
250	25	D	3007	3036	3065	3094	150	50	E	3017	3046	3075	3104	13	150	C	3027	3056	3085	3114
350	25	E	3008	3037	3066	3095	12	75	B	3018	3047	3076	3105	25	150	D	3028	3057	3086	3115
32	30	B	3009	3038	3067	3096	30	75	C	3019	3048	3077	3106	36	150	E	3029	3058	3087	3116
110	30	C	3010	3039	3068	3097	70	75	D	3020	3049	3078	3107							

GLASS-TO-METAL HERMETIC SEAL

ELASTOMER SEAL

15	15	A	2200	2232	2264	2296	32	30	D	2211	2243	2275	2307	2	100	A	2222	2254	2286	2318
60	15	B	2201	2233	2265	2297	4.5	50	A	2212	2244	2276	2308	8	100	B	2223	2255	2287	2319
200	15	C	2202	2234	2266	2298	18	50	B	2213	2245	2277	2309	25	100	C	2224	2256	2288	2320
400	15	D	2203	2235	2267	2299	60	50	C	2214	2246	2278	2310	50	100	D	2225	2257	2289	2321
580	15	E	2204	2236	2268	2300	100	50	D	2215	2247	2279	2311	70	100	E	2226	2258	2290	2322
10	25	A	2205	2237	2269	2301	150	50	E	2216	2248	2280	2312	1	150	A	2227	2259	2291	2323
40	25	B	2206	2238	2270	2302	3	75	A	2217	2249	2281	2313	4	150	B	2228	2260	2292	2324
120	25	C	2207	2239	2271	2303	12	75	B	2218	2250	2282	2314	13	150	C	2229	2261	2293	2325
250	25	D	2208	2240	2272	2304	30	75	C	2219	2251	2283	2315	25	150	D	2230	2262	2294	2326
350	25	E	2209	2241	2273	2305	70	75	D	2220	2252	2284	2316	36	150	E	2231	2263	2295	2327
8	30	A	2210	2242	2274	2306	100	75	E	2221	2253	2285	2317							

STYLE CLR27, NON-POLARIZED ETCHED FOIL

MIL Part No. M39006, 02-							MIL Part No. M39006, 02-							MIL Part No. M39006, 02-						
μF	WVDC	Size Code	Failure Rate L(2%)	Failure Rate M(1%)	Failure Rate P(.1%)	Failure Rate R(.01%)	μF	WVDC	Size Code	Failure Rate L(2%)	Failure Rate M(1%)	Failure Rate P(.1%)	Failure Rate R(.01%)	μF	WVDC	Size Code	Failure Rate L(2%)	Failure Rate M(1%)	Failure Rate P(.1%)	Failure Rate R(.01%)
GLASS-TO-METAL HERMETIC SEAL																				
40	15	B	1200	1228	1256	1284	60	30	C	1209	1237	1265	1293	35	75	D	1218	1246	1274	1302
120	15	C	1201	1229	1257	1285	120	30	D	1210	1238	1266	1294	50	75	E	1219	1247	1275	1303
250	15	D	1202	1230	1258	1286	170	30	E	1211	1239	1267	1295	4	100	B	1220	1248	1276	1304
350	15	E	1203	1231	1259	1287	10	50	B	1212	1240	1268	1296	12	100	C	1221	1249	1277	1305
20	25	B	1204	1232	1260	1288	30	50	C	1213	1241	1269	1297	25	100	D	1222	1250	1278	1306
70	25	C	1205	1233	1261	1289	60	50	D	1214	1242	1270	1298	35	100	E	1223	1251	1279	1307
140	25	D	1206	1234	1262	1290	80	50	E	1215	1243	1271	1299	2	150	B	1224	1252	1380	1308
200	25	E	1207	1235	1263	1291	6	75	B	1216	1244	1272	1300	6	150	C	1225	1253	1381	1309
18	30	B	1208	1236	1264	1292	15	75	C	1217	1245	1273	1301	12	150	D	1226	1254	1282	1310
														18	150	E	1227	1255	1283	1311

ELASTOMER SEAL

10	15	A	2200	2232	2264	2296	18	30	D	2211	2243	2275	2307	1	100	A	2222	2254	2286	2318
40	15	B	2201	2233	2265	2297	2.5	50	A	2212	2244	2276	2308	4	100	B	2223	2255	2287	2319
120	15	C	2202	2234	2266	2298	10	50	B	2213	2245	2277	2309	12	100	C	2224	2256	2288	2320
250	15	D	2203	2235	2267	2299	30	50	C	2214	2246	2278	2310	25	100	D	2225	2257	2289	2321
350	15	E	2204	2236	2268	2300	60	50	D	2215	2247	2279	2311	35	100	E	2226	2258	2290	2322
5	25	A	2205	2237	2269	2301	80	50	E	2216	2248	2280	2312	0.5	150	A	2227	2259	2291	2323
20	25	B	2206	2238	2270	2302	1.5	75	A	2217	2249	2281	2313	2	150	B	2228	2260	2292	2324
70	25	C	2207	2239	2271	2303	6	75	B	2218	2250	2282	2314	6	150	C	2229	2261	2293	2325
140	25	D	2208	2240	2272	2304	15	75	C	2219	2251	2283	2315							
200	25	E	2209	2241	2273	2305	35	75	D	2220	2252	2284	2316	12	150	D	2230	2262	2294	2326
4.5	30	A	2210	2242	2274	2306	50	75	E	2221	2253	2285	2317	18	150	E	2231	2263	2295	2327

SPRAGUE CAPACITORS

STYLE CLR35, POLARIZED PLAIN FOIL

MIL Part No. M39006/03-							MIL Part No. M39006/03-							MIL Part No. M39006/03-							
μF	WVDC	Size Code	Failure Rate L(2%)	Failure Rate M(1%)	Failure Rate P(.1%)	Failure Rate R(.01%)	μF	WVDC	Size Code	Failure Rate L(2%)	Failure Rate M(1%)	Failure Rate P(.1%)	Failure Rate R(.01%)	μF	WVDC	Size Code	Failure Rate L(2%)	Failure Rate M(1%)	Failure Rate P(.1%)	Failure Rate R(.01%)	
GLASS-TO-METAL HERMETIC SEAL																					
18	15	B	1300	1349	1398	1447	20	50	C	1314	1363	1412	1461	20	150	E	1328	1377	1426	1475	
55	15	C	1301	1350	1399	1448	40	50	D	1315	1364	1413	1462	1.5	200	B	1329	1378	1427	1476	
110	15	D	1302	1351	1400	1449	55	50	E	1316	1365	1414	1463	5	200	C	1330	1379	1428	1477	
160	15	E	1303	1352	1401	1450	4	75	B	1317	1366	1415	1464	10	200	D	1331	1380	1429	1478	
12	25	B	1304	1353	1402	1451	14	75	C	1318	1367	1416	1465	15	200	E	1332	1381	1430	1479	
35	25	C	1305	1354	1403	1452	28	75	D	1319	1368	1417	1466	1.2	250	B	1333	1382	1431	1480	
70	25	D	1306	1355	1404	1453	40	75	E	1320	1369	1418	4		250	C	1334	1383	1432	1481	
100	25	E	1307	1356	1405	1454	3	100	B	1321	1370	1419	8		250	D	1335	1384	1433	1482	
10	30	B	1308	1357	1406	1455	10	100	C	1322	1371	1420	1469	12	250	E	1336	1385	1434	1483	
30	30	C	1309	1358	1407	1456	20	100	D	1323	1372	1421	1470	1	300	B	1337	1386	1435	1484	
60	30	D	1310	1359	1408	1457	30	100	E	1324	1373	1422	1471	3	300	C	1338	1387	1436	1485	
85	30	E	1311	1360	1409	1458	2	150	B	1325	1374	1423	1472		7	300	D	1339	1388	1437	1486
68	35	E	1312	1361	1410	1459	7	150	C	1326	1375	1424	1473		10	300	E	1340	1389	1438	1487
6	50	B	1313	1362	1411	1460	14	150	D	1327	1376	1425	1474								

GLASS-TO-METAL HERMETIC SEAL

18	15	B	1300	1349	1398	1447	20	50	C	1314	1363	1412	1461	20	150	E	1328	1377	1426	1475
55	15	C	1301	1350	1399	1448	40	50	D	1315	1364	1413	1462	1.5	200	B	1329	1378	1427	1476
110	15	D	1302	1351	1400	1449	55	50	E	1316	1365	1414	1463	5	200	C	1330	1379	1428	1477
160	15	E	1303	1352	1401	1450	4	75	B	1317	1366	1415	1464	10	200	D	1331	1380	1429	1478
12	25	B	1304	1353	1402	1451	14	75	C	1318	1367	1416	1465	15	200	E	1332	1381	1430	1479
35	25	C	1305	1354	1403	1452	28	75	D	1319	1368	1417	1466	1.2	250	B	1333	1382	1431	1480
70	25	D	1306	1355	1404	1453	40	75	E	1320	1369	1418	1467	4	250	C	1334	1383	1432	1481
100	25	E	1307	1356	1405	1454	3	100	B	1321	1370	1419	1468	8	250	D	1335	1384	1433	1482
10	30	B	1308	1357	1406	1455	10	100	C	1322	1371	1420	1469	12	250	E	1336	1385	1434	1483
30	30	C	1309	1358	1407	1456	20	100	D	1323	1372	1421	1470	1	300	B	1337	1386	1435	1484
60	30	D	1310	1359	1408	1457	30	100	E	1324	1373	1422	1471	3	300	C	1338	1387	1436	1485
85	30	E	1311	1360	1409	1458	2	150	B	1325	1374	1423	1472	7	300	D	1339	1388	1437	1486
68	35	E	1312	1361	1410	1459	7	150	C	1326	1375	1424	1473	10	300	E	1340	1389	1438	1487
6	50	B	1313	1362	1411	1460	14	150	D	1327	1376	1425	1474							

ELASTOMER SEAL

4.5	15	A	2300	2360	2420	2480	20	50	C	2317	2377	2437	2497	20	150	E	2334	2394	2454	2514
18	15	B	2301	2361	2421	2481	40	50	D	2318	2378	2438	2498	0.35	200	A	2335	2395	2455	2515
55	15	C	2302	2362	2422	2482	55	50	E	2319	2379	2439	2499	1.5	200	B	2336	2396	2456	2516
110	15	D	2303	2363	2423	2483	1	75	A	2320	2380	2440	2500	5	200	C	2337	2397	2457	2517
160	15	E	2304	2364	2424	2484	4	75	B	2321	2381	2441	2501	10	200	D	2338	2398	2458	2518
3	25	A	2305	2365	2425	2485	14	75	C	2322	2382	2442	2502	15	200	E	2339	2399	2459	2519
12	25	B	2306	2366	2426	2486	28	75	D	2323	2383	2443	2503	0.3	250	A	2340	2400	2460	2520
35	25	C	2307	2367	2427	2487	40	75	E	2324	2384	2444	2504	1.2	250	B	2341	2401	2461	2521
70	25	D	2308	2368	2428	2488	3	100	A	2325	2385	2445	2505	4	250	C	2342	2402	2462	2522
100	25	E	2309	2369	2429	2489	10	100	B	2326	2386	2446	2506	8	250	D	2343	2403	2463	2523
2.5	30	A	2310	2370	2430	2490	20	100	C	2327	2387	2447	2507	12	250	E	2344	2404	2464	2524
10	30	B	2311	2371	2431	2491	30	100	D	2328	2388	2448	2508	0.27	300	A	2345	2405	2465	2525
30	30	C	2312	2372	2432	2492	0.5	150	A	2330	2390	2450	2510	1	300	B	2346	2406	2466	2526
60	30	D	2313	2373	2433	2493	2	150	B	2331	2391	2451	2511	3	300	C	2347	2407	2467	2527
85	30	E	2314	2374	2434	2494	7	150	C	2332	2392	2452	2512	7	300	D	2348	2408	2468	2528
1.5	50	A	2315	2375	2435	2495	14	150	D	2333	2393	2453	2513	10	300	E	2349	2409	2469	2529
6	50	B	2316	2376	2436	2496														

STYLE CLR37, NON-POLARIZED PLAIN FOIL

MIL Part No. M39006/04-							MIL Part No. M39006/04-							MIL Part No. M39006/04-						
μF	WVDC	Size Code	Failure Rate L(2%)	Failure Rate M(1%)	Failure Rate P(.1%)	Failure Rate R(.01%)	μF	WVDC	Size Code	Failure Rate L(2%)	Failure Rate M(1%)	Failure Rate P(.1%)	Failure Rate R(.01%)	μF	WVDC	Size Code	Failure Rate L(2%)	Failure Rate M(1%)	Failure Rate P(.1%)	Failure Rate R(.01%)
GLASS-TO-METAL HERMETIC SEAL																				
10	15	B	1200	1245	1290	1335	20	50	D	1214	1259	1304	1349	10	150	E	1228	1273	1318	1363
35	15	C	1201	1246	1291	1336	30	50	E	1215	1260	1305	1350	0.75	200	B	1229	1274	1319	1364
70	15	D	1202	1247	1292	1337	2	75	B	1216	1261	1306	1351	2.5	200	C	1230	1275	1320	1365
100	15	E	1203	1248	1293	1338	7	75	C	1217	1262	1307	1352	5	200	D	1231	1276	1321	1366
6	25	B	1204	1249	1294	1339	14	75	D	1218	1263	1308	1353	7.5	200	E	1232	1277	1322	1367
20	25	C	1205	1250	1295	1340	20	75	E	1219	1264	1309	1354	0.6	250	B	1233	1278	1323	1368
40	25	D	1206	1251	1296	1341	1.5	100	B	1220	1265	1310	1355	2	250	C	1234	1279	1324	1369
60	25	E	1207	1252	1297	1342	5	100	C	1221	1266	1311	1356	4	250	D	1235	1280	1325	1370
5.5	30	B	1208	1253	1298	1343	10	100	D	1222	1267	1312	1357	6	250	E	1236	1281	1326	1371
18	30	C	1209	1254	1299	1344	15	100	E	1223	1268	1313	1358	0.47	300	B	1237	1282	1327	1372
36	30	D	1210	1255	1300	1345	1	150	B	1224	1269	1314	1359	1.5	300	C	1238	1283	1328	1373
45	30	E	1211	1256	1301	1346	1.2	150	B	1225	1270	1315	1360	3.3	300	D	1239	1284	1329	1374
3	50	B	1212	1257	1302	1347	3.5	150	C	1226	1271	1316	1361	4.7	300	E	1240	1285	1330	1375
10	50	C	1213	1258	1303	1348	7	150	D	1227	1272	1317	1362							

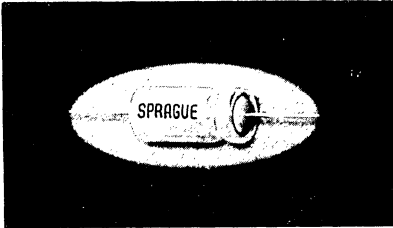
ELASTOMER SEAL

.25	15	A	2300	2355	2410	2465	10	50	C	2317	2372	2427	2482	10	150	E	2334	2389	2444	2499
10	15	B	2301	2356	2411	2466	20	50	D	2318	2373	2428	2483							
35	15	C	2302	2357	2412	2467	30	50	E	2319	2374	2429	2484	0.15	200	A	2335	2390	2445	2500
70	15	D	2303	2358	2413	2468								0.75	200	B	2336	2391	2446	2501
100	15	E	2304	2359	2414	2469	0.5	75	A	2320	2375	2430	2485	2.5	200	C	2337	2392	2447	2502
							2	75	B	2321	2376	2431	2486	5	200	D	2338	2393	2448	2503
1.5	25	A	2305	2360	2415	2470	7	75	C	2322	2377	2432	2487	7.5	200	E	2339	2394	2449	2504
6	25	B	2306	2361	2416	2471	14	75	D	2323	2378	2433	2488							
20	25	C	2307	2362	2417	2472	20	75	E	2324	2379	2434	2489	0.15	250	A	2340	2395	2450	2505
40	25	D	2308	2363	2418	2473								0.6	250	B	2341	2396	2451	2506
60	25	E	2309	2364	2419	2474	0.4	100	A	2325	2380	2435	2490	2	250	C	2342	2397	2452	2507
							1.5	100	B	2326	2381	2436	2491	4	250	D	2343	2398	2453	2508
1.4	30	A	2310	2365	2420	2475	5	100	C	2327	2382	2437	2492	6	250	E	2344	2399	2454	2509
5.5	30	B	2311	2366	2421	2476	10	100	D	2328	2383	2438	2493							
18	30	C	2312	2367	2422	2477	15	100	E	2329	2384	2439	2494	0.12	300	A	2345	2400	2455	2510
36	30	D	2313	2368	2423	2478								0.47	300	B	2346	2401	2456	2511
45	30	E	2314	2369	2424	2479	0.25	150	A	2330	2385	2440	2495	1.5	300	C	2347	2402	2457	2512
							1.5	150	B	2331	2386	2441	2496	3.3	300	D	2348	2403	2458	2513
0.8	50	A	2315	2370	2425	2480	3.5	150	C	2332	2387	2442	2497	4.7	300	E	2349	2404	2459	2514
3	50	B	2316	2371	2426	2481	7	150	D	2333	2388	2443	2498							

SPRAGUE CAPACITORS

TYPE 130D SINTERED-ANODE TANTALEX® CAPACITORS

NOTE: Type 109D (shown on next page) are comparable capacitors, and are generally more readily available.



- Reliable, superior quality capacitors rated for 125 C operation without voltage derating.
- Especially suited for military and critical industrial equipment.
- Capacitors listed below have plastic-film insulation. For bare metal case, change last digit of Cat. No. from "2" to "0" and subtract .016" from diameter and .063" from length.

- Meets 2000 cycle MIL missile vibration requirements.
- For complete technical data, refer to latest issue of Sprague Engineering Bulletins 3701 and 3701.2.

SIZE CODE

C = .203"D. x .515"L. T = .390"D. x .828"L.
F = .296"D. x .703"L. W = .390"D. x 1.312"L.

μF	Size Code	Cat. No.	μF	Size Code	Cat. No.	μF	Size Code	Cat. No.	μF	Size Code	Cat. No.	μF	Size Code	Cat. No.
----	-----------	----------	----	-----------	----------	----	-----------	----------	----	-----------	----------	----	-----------	----------

*GROUP 1: Standard Ratings

4 WVDC			20 C 130D206X9007C2	50 F 130D506X9015F2	55 T 130D556X9030T2	70 WVDC												
27 C 130D276X9004C2	85 F 130D856X9007F2	100 T 130D107X9015T2	60 T 130D606X9030T2	40 WVDC			2.5 C 130D255X9070C2											
30 C 130D306X9004C2	100 F 130D107X9007F2	110 T 130D117X9015T2	20 WVDC				10 F 130D106X9070F2											
120 F 130D127X9004F2	220 T 130D227X9007T2	10 WVDC					11 F 130D116X9070F2											
140 F 130D147X9004F2	250 T 130D257X9007T2						85 WVDC						27 T 130D276X9070T2					
290 T 130D297X9004T2	5 WVDC					30 T 130D306X9070T2												
330 T 130D337X9004T2						50 WVDC												
5 WVDC													100 WVDC					
			22 C 130D226X9005C2	7 C 130D705X9020C2	3.6 C 130D365X9040C2							1.7 C 130D175X9085C2						
			25 C 130D256X9005C2	8 C 130D805X9020C2	4 C 130D405X9040C2							9 F 130D905X9085F2						
100 F 130D107X9005F2	35 F 130D356X9020F2	18 F 130D186X9040F2	18 T 130D186X9085T2	50 WVDC			100 WVDC											
120 F 130D127X9005F2	40 F 130D406X9020F2	20 F 130D206X9040F2	70 WVDC															
260 T 130D267X9005T2	45 T 130D456X9040T2	50 T 130D506X9040T2								100 WVDC								
290 T 130D297X9005T2	80 T 130D806X9020T2	50 T 130D506X9040T2	100 WVDC															
7 WVDC						30 WVDC			100 WVDC									
			30 WVDC									100 WVDC						
															30 WVDC			100 WVDC
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC						100 WVDC												
			30 WVDC						100 WVDC									
												30 WVDC			100 WVDC			
30 WVDC																		

†GROUP 2: Approximately twice the capacitance of Group 1 capacitors of the same physical size at a given voltage rating.

4 WVDC			180 F 130D187X0007F2	20 WVDC			39 F 130D396X0040F2	43 T 130D436X0070T2
68 C 130D686X0004C2	390 T 130D397X0007T2	15 C 130D156X0020C2	68 F 130D686X0020F2	68 T 130D686X0040T2	140 W 130D147X0040W2	85 WVDC		
270 F 130D277X0004F2	750 W 130D757X0007W2	150 T 130D157X0020T2	300 W 130D307X0020W2	50 WVDC			3.6 C 130D365X0085C2	14 F 130D146X0085F2
560 T 130D567X0004T2	10 WVDC			30 WVDC			56 T 130D566X0050T2	25 T 130D256X0085T2
1200 W 130D128X0004W2	33 C 130D336X0010C2	10 C 130D106X0030C2			70 WVDC			56 W 130D566X0085W2
5 WVDC			120 F 130D127X0010F2	47 F 130D476X0030F2	100 WVDC			3 C 130D305X0100C2
56 C 130D566X0005C2	270 T 130D277X0010T2	82 T 130D826X0030T2			4.7 C 130D475X0070C2			11 F 130D116X0100F2
220 F 130D227X0005F2	540 W 130D547X0010W2	160 W 130D167X0030W2			22 F 130D226X0070F2			22 T 130D226X0100T2
430 T 130D437X0005T2	15 WVDC			40 WVDC				
850 W 130D857X0005W2	22 C 130D226X0015C2	8.2 C 130D825X0040C2						
7 WVDC			100 F 130D107X0015F2					
47 C 130D4760007C2	180 T 130D187X0015T2							
	350 W 130D357X0015W2							

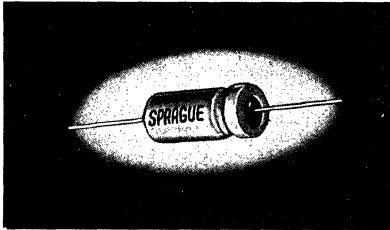
†GROUP 3: Extended-range capacitors, with substantially higher capacitance than units of the same physical size in Groups 1 or 2.

4 WVDC			150 C 130D157X0007C2	15 WVDC			330 T 130D337X0020T2	100 F 130D107X0040F2
200 C 130D207X0004C2	470 F 130D477X0007F2	68 C 130D686X0015C2	390 T 130D397X0020T2	270 F 130D277X0015F2	470 T 130D477X0020T2	140 T 130D147X0040T2	220 T 130D227X0040T2	
820 F 130D827X0004F2	560 F 130D567X0007F2	270 F 130D277X0015F2	470 T 130D477X0020T2	30 WVDC			50 WVDC	
1500 T 130D158X0005T2	1000 T 130D108X0007T2	560 T 130D567X0015T2	20 WVDC			33 C 130D336X0030C2	12 C 130D126X0050C2	
5 WVDC			82 C 130D826X0010C2	39 C 130D396X0020C2	120 F 130D127X0030F2	270 T 130D277X0030T2	15 C 130D156X0050C2	
180 C 130D187X0005C2	100 C 130D107X0010C2	47 C 130D476X0020C2	56 C 130D566X0020C2	150 F 130D157X0020F2	18 C 130D186X0040C2	27 C 130D276X0040C2	22 C 130D226X0050C2	
680 F 130D687X0005F2	330 F 130D337X0010F2	56 C 130D566X0020C2	150 F 130D157X0020F2	180 F 130D187X0020F2	68 F 130D686X0040F2	270 T 130D277X0030T2	47 F 130D476X0050F2	
1400 T 130D148X0005T2	390 F 130D397X0010F2	150 F 130D157X0020F2	220 F 130D227X0020F2	220 F 130D227X0020F2	40 WVDC			
7 WVDC			680 T 130D687X0010T2	220 F 130D227X0020F2	18 C 130D186X0040C2	27 C 130D276X0040C2	56 F 130D566X0050F2	
120 C 130D127X0007C2	820 T 130D827X0010T2	15 WVDC			68 F 130D686X0040F2	270 T 130D277X0030T2	82 F 130D826X0050F2	
		68 C 130D686X0015C2	20 WVDC			18 C 130D186X0040C2	82 T 130D826X0050T2	
		270 F 130D277X0015F2	39 T 130D397X0020T2	30 WVDC			110 T 130D117X0050T2	
		560 T 130D567X0015T2	470 T 130D477X0020T2	33 C 130D336X0030C2	40 WVDC			
				120 F 130D127X0030F2	18 C 130D186X0040C2			
				270 T 130D277X0030T2	27 C 130D276X0040C2			
				68 F 130D686X0040F2	68 F 130D686X0040F2			

*Capacitance tolerance, $\pm 10\%$. For $+20$, -15% tolerance change "X9" in Cat. No. to "C2." For $+75$, -15% tolerance change "X9" to "C7."
†Capacitance tolerance, $\pm 20\%$. For $\pm 10\%$ tolerance, change digit after "X" from "0" to "9."

SPRAGUE CAPACITORS

TYPE 109D SINTERED-ANODE TANTALEX® CAPACITORS



● Reliable, superior quality capacitors dual-rated for 125 C and 85C operation.

● Especially suited for military and critical industrial equipment.

● Capacitors listed below have plastic-film insulation. For bare metal case, change last digit of Cat. No. from "2" to "0" and subtract .016" from diameter and .063" from length.

● Meets 2000 cycle MIL missile vibration requirements.

● For complete technical data, refer to latest issue of Sprague Engineering Bulletins 3700 and 3700.2.

SIZE CODE

C = .203"D. x .515"L. T = .390"D. x .828"L.
F = .296"D. x .703"L. W = .390"D. x 1.312"L.

μF	Size Code	Cat. No.	μF	Size Code	Cat. No.	μF	Size Code	Cat. No.	μF	Size Code	Cat. No.	μF	Size Code	Cat. No.
----	-----------	----------	----	-----------	----------	----	-----------	----------	----	-----------	----------	----	-----------	----------

*GROUP 1: Standard Ratings

6 WVDC @ 85 C 4 WVDC @ 125 C			20 C 109D206X9010C2 85 F 109D856X9010F2 100 F 109D107X9010F2 220 T 109D227X9010T2 250 T 109D257X9010T2			50 F 109D506X9025F2 100 T 109D107X9025T2 110 T 109D117X9025T2			55 T 109D556X9050T2 60 T 109D606X9050T2			100 WVDC @ 85 C 70 WVDC @ 125 C		
27 C 109D276X9006C2	30 C 109D306X9006C2	120 F 109D127X9006F2	140 F 109D147X9006F2	290 T 109D297X9006T2	330 T 109D337X9006T2	30 WVDC @ 85 C 20 WVDC @ 125 C			60 WVDC @ 85 C 40 WVDC @ 125 C			2.5 C 109D255X9100C2 10 F 109D106X9100F2 11 F 109D116X9100F2 27 T 109D276X9100T2 30 T 109D306X9100T2		
8 WVDC @ 85 C 5 WVDC @ 125 C			15 WVDC @ 85 C 10 WVDC @ 125 C			7 C 109D705X9030C2 8 C 109D805X9030C2 35 F 109D356X9030F2 40 F 109D406X9030F2 80 T 109D806X9030T2 100 T 109D107X9030T2			3.6 C 109D365X9060C2 4 C 109D405X9060C2 18 F 109D186X9060F2 20 F 109D206X9060F2 45 T 109D456X9060T2 50 T 109D506X9060T2			125 WVDC @ 85 C 85 WVDC @ 125 C		
22 C 109D226X9008C2	25 C 109D256X9008C2	100 F 109D107X9008F2	120 F 109D127X9008F2	260 T 109D267X9008T2	290 T 109D297X9008T2	50 WVDC @ 85 C 30 WVDC @ 125 C			75 WVDC @ 85 C 50 WVDC @ 125 C			1.7 C 109D175X9125C2 9 F 109D905X9125F2 18 T 109D186X9125T2		
10 WVDC @ 85 C 7 WVDC @ 125 C			25 WVDC @ 85 C 15 WVDC @ 125 C			4.5 C 109D455X9050C2 5 C 109D505X9050C2 22 F 109D226X9050F2 25 F 109D256X9050F2			3 C 109D305X9075C2 3.5 C 109D355X9075C2 13 F 109D136X9075F2 15 F 109D156X9075F2 35 T 109D356X9075T2 40 T 109D406X9075T2			150 WVDC @ 85 C 100 WVDC @ 125 C		
18 C 109D186X9010C2			9 C 109D905X9025C2	10 C 109D106X9025C2	45 F 109D456X9025F2							1.7 C 109D175X9150C2	6.8 F 109D685X9150F2	14 T 109D146X9150T2

†GROUP 2: Approximately twice the capacitance of Group 1 capacitors of the same physical size at a given voltage rating.

6 WVDC @ 85 C 4 WVDC @ 125 C			180 F 109D187X0010F2 390 T 109D397X0010T2 750 W 109D757X0010W2	30 WVDC @ 85 C 20 WVDC @ 125 C			39 F 109D396X0060F2 68 T 109D686X0060T2 140 W 109D147X0060W2	43 T 109D436X0100T2 86 W 109D866X0100W2		
68 C 109D686X0006C2 270 F 109D277X0006F2 560 T 109D567X0006T2 1200 W 109D128X0006W2	15 WVDC @ 85 C 10 WVDC @ 125 C			15 C 109D156X0030C2 68 F 109D686X0030F2 150 T 109D157X0030T2 300 W 109D307X0030W2	75 WVDC @ 85 C 50 WVDC @ 125 C			125 WVDC @ 85 C 85 WVDC @ 125 C		
8 WVDC @ 85 C 5 WVDC @ 125 C			33 C 109D336X0015C2 120 F 109D127X0015F2 270 T 109D277X0015T2 540 W 109D547X0015W2	50 WVDC @ 85 C 30 WVDC @ 125 C			6.8 C 109D685X0075C2 33 F 109D336X0075F2 56 T 109D566X0075T2 110 W 109D117X0075W2	3.6 C 109D365X0125C2 14 F 109D146X0125F2 25 T 109D256X0125T2 56 W 109D566X0125W2		
56 C 109D566X0008C2 220 F 109D227X0008F2 430 T 109D437X0008T2 850 W 109D857X0008W2	25 WVDC @ 85 C 15 WVDC @ 125 C			10 C 109D106X0050C2 47 F 109D476X0050F2 82 T 109D826X0050T2 160 W 109D167X0050W2	100 WVDC @ 85 C 70 WVDC @ 125 C			150 WVDC @ 85 C 100 WVDC @ 125 C		
10 WVDC @ 85 C 7 WVDC @ 125 C			22 C 109D226X0025C2 100 F 109D107X0025F2 180 T 109D187X0025T2 350 W 109D357X0025W2	60 WVDC @ 85 C 40 WVDC @ 125 C			4.7 C 109D475X0100C2 22 F 109D226X0100F2	3 C 109D305X0150C2 11 F 109D116X0150F2 22 T 109D226X0150T2		
47 C 109D476X0010C2				8.2 C 109D825X0060C2						

†GROUP 3: Extended-range capacitors, with substantially higher capacitance than units of the same physical size in Groups 1 or 2.

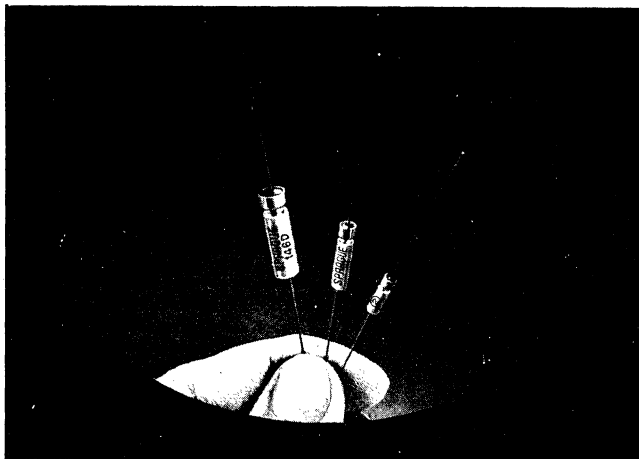
6 WVDC @ 85 C 4 WVDC @ 125 C			150 C 109D157X0010C2 470 F 109D477X0010F2 560 F 109D567X0010F2 1000 T 109D108X0010T2 1200 T 109D128X0010T2	25 WVDC @ 85 C 15 WVDC @ 125 C			330 T 109D337X0030T2 390 T 109D397X0030T2 470 T 109D477X0030T2	100 F 109D107X0060F2 140 T 109D147X0060T2 220 T 109D227X0060T2
200 C 109D207X0006C2 820 F 109D827X0006F2 1500 T 109D158X0006T2	15 WVDC @ 85 C 10 WVDC @ 125 C			68 C 109D686X0025C2 270 F 109D277X0025F2 560 T 109D567X0025T2	50 WVDC @ 85 C 30 WVDC @ 125 C			75 WVDC @ 85 C 50 WVDC @ 125 C
8 WVDC @ 85 C 5 WVDC @ 125 C			30 WVDC @ 85 C 20 WVDC @ 125 C			33 C 109D336X0050C2 120 F 109D127X0050F2 270 T 109D277X0050T2	12 C 109D126X0075C2 15 C 109D156X0075C2 22 C 109D226X0075C2 47 F 109D476X0075F2 56 F 109D566X0075F2 82 F 109D826X0075F2 82 T 109D826X0075T2 110 T 109D117X0075T2 180 T 109D187X0075T2	
180 C 109D187X0008C2 680 F 109D687X0008F2 1400 T 109D148X0008T2	82 C 109D826X0015C2 100 C 109D107X0015C2 330 F 109D337X0015F2 390 F 109D397X0015F2 680 T 109D687X0015T2 820 T 109D827X0015T2			39 C 109D396X0030C2 47 C 109D476X0030C2 56 C 109D566X0030C2 150 F 109D157X0030F2 180 F 109D187X0030F2 220 F 109D227X0030F2	60 WVDC @ 85 C 40 WVDC @ 125 C			
10 WVDC @ 85 C 7 WVDC @ 125 C					18 C 109D186X0060C2 27 C 109D276X0060C2 68 F 109D686X0060F2			
120 C 109D127X0010C2								

*Capacitance tolerance, ±10%. For +20, -15% tolerance, change "X9" in Cat. No. to "C2". For +75, -15% tolerance, change "X9" to "C7".

†Capacitance tolerance, +20%. For ±10% tolerance change digit after "X" from "0" to "9".

SPRAGUE CAPACITORS

TYPE 146D SINTERED-ANODE TANTALEX® CAPACITORS



- Miniature commercial/industrial tantalum capacitors with reliable elastomer seal for use on printed wiring boards, in packaged circuit modules, and other applications where space is at a premium.
- TFE-fluorocarbon elastomer high-temperature seal with thermo-setting epoxy resin end-fill provides improved mechanical strength.
- Designed for continuous operation over temperature range of -55°C to $+85^{\circ}\text{C}$.
- Special construction offers outstanding resistance to temperature cycling and provides trouble-free application when flow-soldering to printed wiring boards.
- Excellent stability of all electrical parameters, even after severe high temperature testing (85°C for 1000 hours at rated voltage).
- Metal-encased, with outer plastic-film insulation.
- For complete technical data, refer to latest issue of Sprague Engineering Bulletin 3751.

Catalog Number				Catalog Number			
μF	Dia. x Length	$\pm 20\%$ Cap. Tol.	$\pm 10\%$ Cap. Tol.	μF	Dia. x Length	$\pm 20\%$ Cap. Tol.	$\pm 10\%$ Cap. Tol.
6 WVDC				30 WVDC - (cont.)			
47	.110 x .400	146D476X0006G2	146D476X9006G2	100	.220 x .775	146D107X0030J2	146D107X9030J2
150	.140 x .600	146D157X0006H2	146D157X9006H2	120	.220 x .775	146D127X0030J2	146D127X9030J2
470	.220 x .775	146D477X0006J2	146D477X9006J2	50 WVDC			
10 WVDC				6.8	.110 x .400	146D685X0050G2	146D685X9050G2
33	.110 x .400	146D336X0010G2	146D336X9010G2	27	.140 x .600	146D276X0050H2	146D276X9050H2
100	.140 x .600	146D107X0010H2	146D107X9010H2	82	.220 x .775	146D826X0050J2	146D826X9050J2
120	.140 x .600	146D127X0010H2	146D127X9010H2	60 WVDC			
330	.220 x .775	146D337X0010J2	146D337X9010J2	1.0	.110 x .400	146D105X0060G2	146D105X9060G2
15 WVDC				1.2	.110 x .400	146D125X0060G2	146D125X9060G2
22	.110 x .400	146D226X0015G2	146D226X9015G2	1.5	.110 x .400	146D155X0060G2	146D155X9060G2
82	.140 x .600	146D826X0015H2	146D826X9015H2	1.8	.110 x .400	146D185X0060G2	146D185X9060G2
220	.220 x .775	146D227X0015J2	146D227X9015J2	2.2 to 3.9 WVDC			
20 WVDC				2.2	.110 x .400	146D225X0060G2	146D225X9060G2
15	.110 x .400	146D156X0020G2	146D156X9020G2	2.7	.110 x .400	146D275X0060G2	146D275X9060G2
56	.140 x .600	146D566X0020H2	146D566X9020H2	3.3	.110 x .400	146D335X0060G2	146D335X9060G2
180	.220 x .775	146D187X0020J2	146D187X9020J2	3.9	.110 x .400	146D395X0060G2	146D395X9060G2
30 WVDC				4.7	.110 x .400	146D475X0060G2	146D475X9060G2
10	.110 x .400	146D106X0030G2	146D106X9030G2	5.6	.110 x .400	146D565X0060G2	146D565X9060G2
47	.140 x .600	146D476X0030H2	146D476X9030H2	22	.140 x .600	146D226X0060H2	146D226X9060H2
				56	.220 x .775	146D566X0060J2	146D566X9060J2

SPRAGUE CAPACITORS

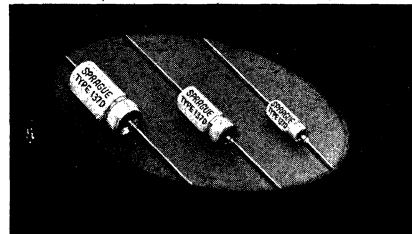
TYPE 137D HERMETICALLY-SEALED GELLED-ELECTROLYTE SINTERED-ANODE TANTALEX® CAPACITORS

- Glass-to-metal Hermetic Seal Makes Type 137D Capacitors Especially Well Suited For Use in Satellites and Other Space Equipment.
- Gelled-electrolyte For Optimum Performance Characteristics
- High Volumetric Efficiency Results in Space Savings
- Operating Temperature Range of -55°C to $+175^{\circ}\text{C}$
- Available in Voltage Ratings From 6 WVDC Through 150 WVDC At 85C With

Appropriate Derating For Higher Temperature Operation

- Capacitors Listed Below Have Outer Plastic Insulating Sleeve. For Units with Bare Case, End Catalog Number in 0 Instead of 2
- For Complete Technical Data, See Latest Issue of Sprague Engineering Bulletin Number 3703

Call Your Sprague Industrial Distributor
For Current Quantity Prices



μF	Case Size	Catalog Number*
6 WVDC		
68	C	137D686X0006C2
140	C	137D147X0006C2
270	F	137D277X0006F2
560	F	137D567X0006F2
560	A	137D567X0006A2
560	T	137D567X0006T2
1000	T	137D108X0006T2
1200	W	137D128X0006W2

8 WVDC		
56	C	137D566X0008C2
120	C	137D127X0008C2
220	F	137D227X0008F2
470	F	137D477X0008F2
470	A	137D477X0008A2
470	T	137D477X0008T2
850	T	137D857X0008T2
1000	W	137D108X0008W2

10 WVDC		
39	C	137D396X0010C2
47	C	137D476X0010C2
82	C	137D826X0010C2
100	C	137D107X0010C2
150	F	137D157X0010F2
180	F	137D187X0010F2
330	F	137D337X0010F2
330	A	137D337X0010A2
330	T	137D337X0010T2
390	F	137D397X0010F2
390	A	137D397X0010A2
390	T	137D397X0010T2
600	T	137D607X0010T2
680	W	137D687X0010W2
750	T	137D757X0010T2
820	W	137D827X0010W2

15 WVDC		
33	C	137D336X0015C2
68	C	137D686X0015C2
120	F	137D127X0015F2
270	F	137D277X0015F2
270	A	137D277X0015A2
270	T	137D277X0015T2
540	T	137D547X0015T2
560	W	137D567X0015W2

20 WVDC		
27	C	137D276X0020C2
56	C	137D566X0020C2
100	F	137D107X0020F2
220	F	137D227X0020F2
220	A	137D227X0020A2
220	T	137D227X0020T2
390	T	137D397X0020T2
470	W	137D477X0020W2

μF	Case Size	Catalog Number*
25 WVDC		
22	C	137D226X0025C2
47	C	137D476X0025C2
100	F	137D107X0025F2
180	F	137D187X0025F2
180	A	137D187X0025A2
180	T	137D187X0025T2
350	T	137D357X0025T2
390	W	137D397X0025W2

30 WVDC		
18	C	137D186X0030C2
39	C	137D396X0030C2
82	F	137D826X0030F2
150	F	137D157X0030F2
150	A	137D157X0030A2
150	T	137D157X0030T2
300	T	137D307X0030T2
330	W	137D337X0030W2

35 WVDC		
12	C	137D126X0035C2
15	C	137D156X0035C2
27	C	137D276X0035C2
33	C	137D336X0035C2
56	F	137D566X0035F2
68	F	137D686X0035F2
100	F	137D107X0035F2
100	A	137D107X0035A2
100	T	137D107X0035T2
120	F	137D127X0035F2
120	A	137D127X0035A2
120	T	137D127X0035T2
180	T	137D187X0035T2
220	T	137D227X0035T2
220	W	137D227X0035W2
270	W	137D277X0035W2

50 WVDC		
10	C	137D106X0050C2
22	C	137D226X0050C2
47	F	137D476X0050F2
82	F	137D826X0050F2
82	A	137D826X0050A2
82	T	137D826X0050T2
160	T	137D167X0050T2
180	W	137D187X0050W2

60 WVDC		
8.2	C	137D825X0060C2
18	C	137D186X0060C2
39	F	137D396X0060F2
68	F	137D686X0060F2
68	A	137D686X0060A2
68	T	137D686X0060T2
140	T	137D147X0060T2
150	W	137D157X0060W2

μF	Case Size	Catalog Number*
75 WVDC		
5.6	C	137D565X0075C2
6.8	C	137D685X0075C2
12	C	137D126X0075C2
15	C	137D156X0075C2
27	F	137D276X0075F2
33	F	137D336X0075F2
47	F	137D476X0075F2
47	A	137D476X0075A2
47	T	137D476X0075T2
56	F	137D566X0075F2
56	A	137D566X0075A2
56	T	137D566X0075T2
82	T	137D826X0075T2
100	W	137D107X0075W2
110	T	137D117X0075T2
120	W	137D127X0075W2

100 WVDC		
3.9	C	137D395X0100C2
4.7	C	137D475X0100C2
15	F	137D156X0100F2
18	F	137D186X0100F2
22	F	137D226X0100F2
33	A	137D336X0100A2
33	T	137D336X0100T2
43	A	137D436X0100A2
43	T	137D436X0100T2
68	W	137D686X0100W2
86	W	137D866X0100W2

125 WVDC		
3.6	C	137D365X0125C2
9.0	F	137D905X0125F2
14	F	137D146X0125F2
18	T	137D186X0125T2
25	T	137D256X0125T2
28	A	137D286X0125A2
56	W	137D566X0125W2

150 WVDC		
1.7	C	137D175X0150C2
3.0	C	137D305X0150C2
6.8	F	137D685X0150F2
11	F	137D116X0150F2
14	T	137D146X0150T2
22	T	137D226X0150T2
22	A	137D226X0150A2
47	W	137D476X0150W2

DIMENSIONS	
Case Code	Diam. x Length
C	0.219 x 0.515
F	0.312 x 0.704
A	0.312 x 1.095
T	0.406 x 0.828
W	0.406 x 1.312

*Catalog numbers listed above are for $\pm 20\%$ tolerance capacitors. For units with capacitance tolerance of $\pm 20\%$, -15% , change X0 in middle of catalog number to C2; for $+75\%$, -15% , change digits to C7; for $\pm 10\%$, change digits to X9.

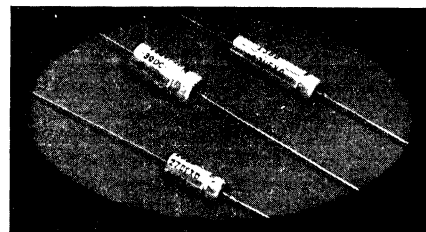
SPRAGUE CAPACITORS

TYPE 138D HERMETICALLY-SEALED GELLED-ELECTROLYTE SINTERED-ANODE TANTALEX® CAPACITORS

- Improved reliability through use of a glass-to-tantalum true hermetic anode seal.
- New construction eliminates all internal lead welds while retaining the strength of conventional internal lead-welded parts.
- Capacitor construction also offers outstanding resistance to extensive temperature cycling.
- Designed to meet or exceed environmental and life test requirements of MIL-C-39006.
- Gelled-electrolyte gives premium performance for all capacitor parameters with re-

spect to frequency and temperature variations.

- Capacitance values ranging from up to 1200 μ F at 6 WVDC to 47 μ F at 150 WVDC.
- Standard capacitance tolerances, $\pm 20\%$ and $\pm 10\%$. See (†).
- Rated for 85 C operation, and can be operated up to 125 C with appropriate voltage derating.
- For complete technical data, refer to latest issue of Sprague Engineering Bulletin 3704.



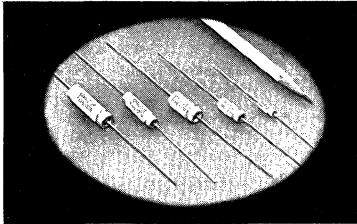
μ F	D. x L.	Catalog Number*†
6 WVDC		
30	.219 x .515	138D306X0006C2
68	.219 x .515	138D686X0006C2
140	.312 x .704	138D147X0006F2
270	.312 x .704	138D277X0006F2
330	.406 x .828	138D337X0006T2
560	.406 x .828	138D567X0006T2
1200	.406 x 1.126	138D128X0006K2
8 WVDC		
25	.219 x .515	138D256X0008C2
56	.219 x .515	138D566X0008C2
220	.312 x .704	138D227X0008F2
430	.406 x .828	138D437X0008T2
850	.406 x 1.126	138D857X0008K2
10 WVDC		
20	.219 x .515	138D206X0010C2
47	.219 x .515	138D476X0010C2
100	.312 x .704	138D107X0010F2
180	.312 x .704	138D187X0010F2
250	.406 x .828	138D257X0010T2
390	.406 x .828	138D397X0010T2
750	.406 x 1.126	138D757X0010K2
15 WVDC		
15	.291 x .515	138D156X0015C2
33	.219 x .515	138D336X0015C2
70	.312 x .704	138D706X0015F2
120	.312 x .704	138D127X0015F2
170	.406 x .828	138D177X0015T2
270	.406 x .828	138D277X0015T2
540	.406 x 1.126	138D547X0015K2
25 WVDC		
10	.219 x .515	138D106X0025C2
22	.219 x .515	138D226X0025C2
100	.312 x .704	138D107X0025F2
180	.406 x .828	138D187X0025T2
350	.406 x 1.126	138D357X0025K2
30 WVDC		
8.0	.219 x .515	138D805X0030C2
15	.219 x .515	138D156X0030C2
40	.312 x .704	138D406X0030F2
68	.312 x .704	138D686X0030F2
100	.406 x .828	138D107X0030T2
150	.406 x .828	138D157X0030T2
300	.406 x 1.126	138D307X0030K2

μ F	D. x L.	Catalog Number*†
50 WVDC		
5.0	.219 x .515	138D505X0050C2
10	.219 x .515	138D106X0050C2
25	.312 x .704	138D256X0050F2
47	.312 x .704	138D476X0050F2
60	.406 x .828	138D606X0050T2
82	.406 x .828	138D826X0050T2
160	.406 x 1.126	138D167X0050K2
60 WVDC		
4.0	.219 x .515	138D405X0060C2
8.2	.219 x .515	138D825X0060C2
20	.312 x .704	138D206X0060F2
39	.312 x .704	138D396X0060F2
50	.406 x .828	138D506X0060T2
68	.406 x .828	138D686X0060T2
140	.406 x 1.126	138D147X0060K2
75 WVDC		
3.5	.219 x .515	138D355X0075C2
6.8	.219 x .515	138D685X0075C2
15	.312 x .704	138D156X0075F2
33	.312 x .704	138D336X0075F2
40	.406 x .828	138D406X0075T2
56	.406 x .828	138D566X0075T2
110	.406 x 1.126	138D117X0075K2
100 WVDC		
2.5	.219 x .515	138D255X0100C2
4.7	.219 x .515	138D475X0100C2
11	.312 x .704	138D116X0100F2
22	.312 x .704	138D226X0100F2
30	.406 x .828	138D306X0100T2
43	.406 x .828	138D436X0100T2
86	.406 x 1.126	138D866X0100K2
125 WVDC		
1.7	.219 x .515	138D175X0125C2
3.6	.219 x .515	138D365X0125C2
9.0	.312 x .704	138D905X0125F2
14	.312 x .704	138D146X0125F2
18	.406 x .828	138D186X0125T2
25	.406 x .828	138D256X0125T2
56	.406 x 1.126	138D566X0125K2
150 WVDC		
1.7	.219 x .515	138D175X0150C2
3.0	.219 x .515	138D305X0150C2
6.8	.312 x .704	138D685X0150F2
11	.312 x .704	138D116X0150F2
14	.406 x .828	138D146X0150T2
22	.406 x .828	138D226X0150T2
47	.406 x 1.126	138D476X0150K2

*Catalog numbers listed above are for units with outer plastic-film insulating sleeve. For bare case units, change last digit of Cat. No. from "2" to "0" and subtract .032" from diameter and .063" from length. †Capacitors listed above have capacitance tolerance of $\pm 20\%$. For $\pm 10\%$ units, change "X0" in center of cat. no. to "X9".

SPRAGUE CAPACITORS

MIL-C-3965 HERMETICALLY-SEALED GELLED-ELECTROLYTE SINTERED-ANODE TANTALEX® CAPACITORS—TYPE CL66 & CL67



- Glass-to-Metal Hermetic Seal Makes These Capacitors Especially Well-Suited For Use In Satellites and Other Applications Requiring The Benefits of true Hermetic Sealing
- May Be Operated At Temperatures Up To 175C
- Extremely low leakage Current
- Military Version Of Well-Known Sprague Type 137D
- Capacitors Listed Here Have Capacitance Tolerance Of $\pm 10\%$. For $\pm 5\%$ Capacitors, Change 10th Character In MIL Type No. From K To J. For $\pm 20\%$ Capacitance Tolerance, Change K To M

Call Your Sprague Industrial Distributor For Current Quantity Prices

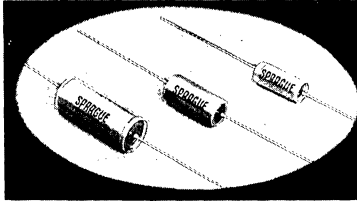
#F	Diam. x Length*	MIL Type Number	
		Bare Case	w/Insulating Sleeve
6 WVDC			
30	.188 x .453	CL66BB300KPG	CL67BB300KPG
68	.188 x .453	CL66BB680KPG	CL67BB680KPG
140	.281 x .641	CL66BB141KPG	CL67BB141KPG
270	.281 x .641	CL66BB271KPG	CL67BB271KPG
330	.375 x .766	CL66BB331KPG	CL67BB331KPG
560	.375 x .766	CL66BB561KPG	CL67BB561KPG
8 WVDC			
25	.188 x .453	CL66BC250KPG	CL67BC250KPG
56	.188 x .453	CL66BC560KPG	CL67BC560KPG
220	.281 x .641	CL66BC221KPG	CL67BC221KPG
430	.375 x .766	CL66BC431KPG	CL67BC431KPG
10 WVDC			
20	.188 x .453	CL66BD200KPG	CL67BD200KPG
47	.188 x .453	CL66BD470KPG	CL67BD470KPG
100	.281 x .641	CL66BD101KPG	CL67BD101KPG
180	.281 x .641	CL66BD181KPG	CL67BD181KPG
250	.375 x .766	CL66BD251KPG	CL67BD251KPG
390	.375 x .766	CL66BD391KPG	CL67BD391KPG
15 WVDC			
15	.188 x .453	CL66BE150KPG	CL67BE150KPG
33	.188 x .453	CL66BE330KPG	CL67BE330KPG
70	.281 x .641	CL66BE700KPG	CL67BE700KPG
120	.281 x .641	CL66BE121KPG	CL67BE121KPG
170	.375 x .766	CL66BE171KPG	CL67BE171KPG
270	.375 x .766	CL66BE271KPG	CL67BE271KPG
25 WVDC			
10	.188 x .453	CL66BG100KPG	CL67BG100KPG
22	.188 x .453	CL66BG220KPG	CL67BG220KPG
100	.281 x .641	CL66BG101KPG	CL67BG101KPG
180	.375 x .766	CL66BG181KPG	CL67BG181KPG
30 WVDC			
8	.188 x .453	CL66BH080KPG	CL67BH080KPG
15	.188 x .453	CL66BH150KPG	CL67BH150KPG
40	.281 x .641	CL66BH400KPG	CL67BH400KPG
68	.281 x .641	CL66BH680KPG	CL67BH680KPG
100	.375 x .766	CL66BH101KPG	CL67BH101KPG
150	.375 x .766	CL66BH151KPG	CL67BH151KPG

#F	Diam. x Length*	MIL Type Number	
		Bare Case	w/Insulating Sleeve
50 WVDC			
5	.188 x .453	CL66BJ050KPG	CL67BJ050KPG
10	.188 x .453	CL66BJ100KPG	CL67BJ100KPG
25	.281 x .641	CL66BJ250KPG	CL67BJ250KPG
47	.281 x .641	CL66BJ470KPG	CL67BJ470KPG
60	.375 x .766	CL66BJ600KPG	CL67BJ600KPG
82	.375 x .766	CL66BJ820KPG	CL67BJ820KPG
60 WVDC			
4	.188 x .453	CL66BK040KPG	CL67BK040KPG
8.2	.188 x .453	CL66BK8R2KPG	CL67BK8R2KPG
20	.281 x .641	CL66BK200KPG	CL67BK200KPG
39	.281 x .641	CL66BK390KPG	CL67BK390KPG
50	.375 x .766	CL66BK500KPG	CL67BK500KPG
68	.375 x .766	CL66BK680KPG	CL67BK680KPG
75 WVDC			
3.5	.188 x .453	CL66BL3R5KPG	CL67BL3R5KPG
6.8	.188 x .453	CL66BL6R8KPG	CL67BL6R8KPG
15	.281 x .641	CL66BL150KPG	CL67BL150KPG
33	.281 x .641	CL66BL330KPG	CL67BL330KPG
40	.375 x .766	CL66BL400KPG	CL67BL400KPG
56	.375 x .766	CL66BL560KPG	CL67BL560KPG
100 WVDC			
2.5	.188 x .453	CL66BN2R5KPG	CL67BN2R5KPG
4.7	.188 x .453	CL66BN4R7KPG	CL67BN4R7KPG
11	.281 x .641	CL66BN110KPG	CL67BN110KPG
22	.281 x .641	CL66BN220KPG	CL67BN220KPG
30	.375 x .766	CL66BN300KPG	CL67BN300KPG
43	.375 x .766	CL66BN430KPG	CL67BN430KPG
125 WVDC			
1.7	.188 x .453	CL66BP1R7KPG	CL67BP1R7KPG
3.6	.188 x .453	CL66BP3R6KPG	CL67BP3R6KPG
9	.281 x .641	CL66BP090KPG	CL67BP090KPG
14	.281 x .641	CL66BP140KPG	CL67BP140KPG
25	.375 x .766	CL66BP250KPG	CL67BP250KPG

*Dimensions shown are for CL66 capacitors. For CL67 units, add .031" to diameter and .063" to length.

SPRAGUE CAPACITORS

ESTABLISHED RELIABILITY MIL-C-39006 STYLE CLR65 SINTERED-ANODE TANTALUM CAPACITORS



- Handled by Sprague and Sprague industrial distributors in full compliance with MIL-STD-790. Manufactured, marked, packed, shipped, received, inspected, stored in separate area, free from contamination or mix-up with other components.
- Rated for operation to 85 C (to 125 C with voltage derating.)

SIZE CODE

A	.188" D. x .453" L.
B	.281" D. x .641" L.
C	.375" D. x .766" L.
D	.375" D. x 1.062" L.
E	.375" D. x 1.250" L.

MIL Part No. M39006/09-										MIL Part No. M39006/09-									
		Failure Rate L (2%)		Failure Rate M (1%)		Failure Rate P (0.1%)		Failure Rate R (0.01%)				Failure Rate L (2%)		Failure Rate M (1%)		Failure Rate P (0.1%)		Failure Rate R (0.01%)	
μF	Size WVDC Code	Cap. Tol. ±20%	Cap. Tol. ±10%	Cap. Tol. ±20%	Cap. Tol. ±10%	Cap. Tol. ±20%	Cap. Tol. ±10%	Cap. Tol. ±20%	Cap. Tol. ±10%	μF	Size WVDC Code	Cap. Tol. ±20%	Cap. Tol. ±10%	Cap. Tol. ±20%	Cap. Tol. ±10%	Cap. Tol. ±20%	Cap. Tol. ±10%	Cap. Tol. ±20%	Cap. Tol. ±10%

ELASTOMER-SEALED CAPACITORS TO MIL-C-39006/9B

30	6	A	1621	1622	1826	1827	2652	2653	2857	2858	150	30	C	1724	1725	1929	1930	2755	2756	2960	2961
68	6	A	1624	1625	1829	1830	2655	2656	2860	2861	300	30	D	1727	1728	1932	1933	2758	2759	2963	2964
140	6	B	1627	1628	1832	1833	2658	2659	2863	2864	5	50	A	1729	1730	1934	1935	2760	2761	2965	2966
270	6	B	1630	1631	1835	1836	2661	2662	2866	2867	10	50	A	1732	1733	1937	1938	2763	2764	2968	2969
330	6	C	1633	1634	1838	1839	2664	2665	2869	2870	25	50	B	1735	1736	1940	1941	2766	2767	2971	2972
560	6	C	1636	1637	1841	1842	2667	2668	2872	2873	47	50	B	1738	1739	1943	1944	2769	2770	2974	2975
1200	6	D	1639	1640	1844	1845	2670	2671	2875	2876	60	50	C	1741	1742	1946	1947	2772	2773	2977	2978
25	8	A	1641	1642	1846	1847	2672	2673	2877	2878	82	50	C	1744	1745	1949	1950	2775	2776	2980	2981
56	8	A	1644	1645	1849	1850	2675	2676	2880	2881	160	50	D	1747	1748	1952	1953	2778	2779	2983	2984
220	8	B	1647	1648	1852	1853	2678	2679	2883	2884	4	60	A	1749	1750	1954	1955	2780	2781	2985	2986
430	8	C	1650	1651	1855	1856	2681	2682	2886	2887	8.2	60	A	1752	1753	1957	1958	2783	2784	2988	2989
850	8	D	1653	1654	1858	1859	2684	2685	2889	2890	20	60	B	1755	1756	1960	1961	2786	2787	2991	2992
20	10	A	1655	1656	1860	1861	2686	2687	2891	2892	39	60	B	1758	1759	1963	1964	2789	2790	2994	2995
47	10	A	1658	1659	1863	1864	2689	2690	2894	2895	50	60	C	1761	1762	1966	1967	2792	2793	2997	2998
100	10	B	1661	1662	1866	1867	2692	2693	2897	2898	68	60	C	1764	1765	1969	1970	2795	2796	3000	3001
180	10	B	1664	1665	1869	1870	2695	2696	2900	2901	140	60	D	1767	1768	1972	1973	2798	2799	3003	3004
250	10	C	1667	1668	1872	1873	2698	2699	2903	2904	3.5	75	A	1769	1770	1974	1975	2800	2801	3005	3006
390	10	C	1670	1671	1875	1876	2701	2702	2906	2907	6.8	75	A	1772	1773	1977	1978	2803	2804	3008	3009
750	10	D	1673	1674	1878	1879	2704	2705	2909	2910	15	75	B	1775	1776	1980	1981	2806	2807	3011	3012
15	15	A	1675	1676	1880	1881	2706	2707	2911	2912	33	75	B	1778	1779	1983	1984	2809	2810	3014	3015
33	15	A	1678	1679	1883	1884	2709	2710	2914	2915	40	75	C	1781	1782	1986	1987	2812	2813	3017	3018
70	15	B	1681	1682	1886	1887	2712	2713	2917	2918	56	75	C	1784	1785	1989	1990	2815	2816	3020	3021
120	15	B	1684	1685	1889	1890	2715	2716	2920	2921	110	75	D	1787	1788	1992	1993	2818	2819	3023	3024
170	15	C	1687	1688	1892	1893	2718	2719	2923	2924	2.5	100	A	1789	1790	1994	1995	2820	2821	3025	3026
270	15	C	1690	1691	1895	1896	2721	2722	2926	2927	4.7	100	A	1792	1793	1997	1998	2823	2824	3028	3029
540	15	D	1693	1694	1898	1899	2724	2725	2929	2930	11	100	B	1795	1796	2001	2002	2826	2827	3031	3032
10	25	A	1695	1696	1900	1901	2726	2727	2931	2932	22	100	B	1798	1799	2004	2005	2829	2830	3034	3035
22	25	A	1698	1699	1903	1904	2729	2730	2934	2935	30	100	C	1801	1802	2007	2008	2832	2833	3037	3038
100	25	B	1701	1702	1906	1907	2732	2733	2937	2938	43	100	C	1804	1805	2010	2011	2835	2836	3040	3041
180	25	C	1704	1705	1909	1910	2735	2736	2940	2941	86	100	D	1807	1808	2013	2014	2838	2839	3043	3044
350	25	D	1707	1708	1912	1913	2738	2739	2943	2944	1.7	125	A	1809	1810	2016	2017	2841	2842	3046	3047
8	30	A	1709	1710	1914	1915	2740	2741	2945	2946	3.6	125	A	1812	1813	2019	2020	2844	2845	3049	3050
15	30	A	1712	1713	1917	1918	2743	2744	2948	2949	9	125	B	1815	1816	2022	2023	2847	2848	3051	3052
40	30	B	1715	1716	1920	1921	2746	2747	2951	2952	14	125	B	1818	1819	2025	2026	2850	2851	3054	3055
68	30	B	1718	1719	1923	1924	2749	2750	2954	2955	18	125	C	1821	1822	2028	2029	2853	2854	3057	3058
100	30	C	1721	1722	1926	1927	2752	2753	2957	2958	25	125	C	1824	1825	2031	2032	2856	2857	3060	3061
											56	125	D	1827	1828	2034	2035	2859	2860	3063	3064

HERMETICALLY-SEALED CAPACITORS TO MIL-C-39006/9B

30	6	A	4001	4002	4206	4207	4411	4412	4616	4617	20	10	A	4035	4036	4240	4241	4445	4446	4650	4651
68	6	A	4004	4005	4209	4210	4414	4415	4619	4620	47	10	A	4038	4039	4243	4244	4448	4449	4653	4654
140	6	B	4007	4008	4212	4213	4417	4418	4622	4623	100	10	B	4041	4042	4246	4247	4451	4452	4656	4657
270	6	B	4010	4011	4215	4216	4420	4421	4625	4626	180	10	B	4044	4045	4249	4250	4454	4455	4659	4660
330	6	C	4013	4014	4218	4219	4423	4424	4628	4629	250	10	C	4047	4048	4252	4253	4457	4458	4662	4663
560	6	C	4016	4017	4221	4222	4426	4427	4631	4632	390	10	C	4050	4051	4255	4256	4460	4461	4665	4666
1200	6	E	4019	4020	4224	4225	4429	4430	4634	4635	750	10	E	4053	4054	4258	4259	4463	4464	4668	4669
25	8	A	4021	4022	4226	4227	4431	4432	4636	4637	15	15	A	4055	4056	4260	4261	4465	4466	4670	4671
56	8	A	4024	4025	4229	4230	4434	4435	4639	4640	33	15	A	4058	4059	4263	4264	4468	4469	4673	4674
220	8	B	4027	4028	4232	4233	4437	4438	4642	4643	70	15	B	4061	4062	4266	4267	4471	4472	4676	4677
430	8	C	4030	4031	4235	4236	4440	4441	4645	4646	120	15	B	4064	4065	4269	4270	4474	4475	4679	4680
850	8	E	4033	4034	4238	4239	4443	4444	4648	4649	170	15	C	4067	4068	4272	4273	4477	4478	4682	4683

SPRAGUE CAPACITORS

STYLE CLR65 TANTALUM CAPACITORS, continued

MIL Part No. M39006/09-										MIL Part No. M39006/09-									
		Failure Rate L (2%)		Failure Rate M (1%)		Failure Rate P (0.1%)		Failure Rate R (0.01%)				Failure Rate L (2%)		Failure Rate M (1%)		Failure Rate P (0.1%)		Failure Rate R (0.01%)	
μF	Size	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	μF	Size	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.
WVDC	Code	±20%	±10%	±20%	±10%	±20%	±10%	±20%	±10%	WVDC	Code	±20%	±10%	±20%	±10%	±20%	±10%	±20%	±10%
270	15	C	4070	4071	4275	4276	4480	4481	4685	4686	39	60	B	4138	4139	4343	4344	4548	4549
540	15	E	4073	4074	4278	4279	4483	4484	4688	4689	50	60	C	4141	4142	4346	4347	4551	4552
10	25	A	4075	4076	4280	4281	4485	4486	4690	4691	68	60	C	4144	4145	4349	4350	4554	4555
22	25	A	4078	4079	4283	4284	4488	4489	4693	4694	140	60	E	4147	4148	4352	4353	4557	4558
100	25	B	4081	4082	4286	4287	4491	4492	4696	4697	3.5	75	A	4149	4150	4354	4355	4559	4560
180	25	C	4084	4085	4289	4290	4494	4495	4699	4700	6.8	75	A	4152	4153	4357	4358	4562	4563
350	25	E	4087	4088	4292	4293	4497	4498	4702	4703	15	75	B	4155	4156	4360	4361	4565	4566
8	30	A	4089	4090	4294	4295	4499	4500	4704	4705	33	75	B	4158	4159	4363	4364	4568	4569
15	30	A	4092	4093	4297	4298	4502	4503	4707	4708	40	75	C	4161	4162	4366	4367	4571	4572
40	30	B	4095	4096	4300	4301	4505	4506	4710	4711	56	75	C	4164	4165	4369	4370	4574	4575
68	30	B	4098	4099	4303	4304	4508	4509	4713	4714	110	75	E	4167	4168	4372	4373	4577	4578
100	30	C	4101	4102	4306	4307	4511	4512	4716	4717	2.5	100	A	4169	4170	4374	4375	4579	4580
150	30	C	4104	4105	4309	4310	4514	4515	4719	4720	4.7	100	A	4172	4173	4377	4378	4582	4583
300	30	E	4107	4108	4312	4313	4517	4518	4722	4723	11	100	B	4175	4176	4380	4381	4585	4586
5	50	A	4109	4110	4314	4315	4519	4520	4724	4725	22	100	B	4178	4179	4383	4384	4588	4589
10	50	A	4112	4113	4317	4318	4522	4523	4727	4728	30	100	C	4181	4182	4386	4387	4591	4592
25	50	B	4115	4116	4320	4321	4525	4526	4730	4731	43	100	C	4184	4185	4389	4390	4594	4595
47	50	B	4118	4119	4323	4324	4528	4529	4733	4734	86	100	E	4187	4188	4392	4393	4597	4598
60	50	C	4121	4122	4326	4327	4531	4532	4736	4737	1.7	125	A	4189	4190	4394	4395	4599	4600
82	50	C	4124	4125	4329	4330	4534	4535	4739	4740	3.6	125	A	4192	4193	4397	4398	4602	4603
160	50	E	4127	4128	4332	4333	4537	4538	4742	4743	9	125	B	4195	4196	4400	4401	4605	4606
4	60	A	4129	4130	4334	4335	4539	4540	4744	4745	14	125	B	4198	4199	4403	4404	4608	4609
8.2	60	A	4132	4133	4337	4338	4542	4543	4747	4748	18	125	C	5026	5027	5029	5030	5032	5033
20	60	B	4135	4136	4340	4341	4545	4546	4750	4751	25	125	C	4201	4202	4406	4407	4611	4612
											56	125	E	4204	4205	4409	4410	4614	4615

HERMETICALLY-SEALED CAPACITORS TO MIL-C-39006/9C

MIL Part No. M39006/09-										MIL Part No. M39006/09-									
		Failure Rate L (2%)		Failure Rate M (1%)		Failure Rate P (0.1%)						Failure Rate L (2%)		Failure Rate M (1%)		Failure Rate P (0.1%)			
μF	WVDC	Size Code	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	μF	WVDC	Size Code	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.	Cap. Tot.
			± 20%	± 10%	± 20%	± 10%	± 20%	± 10%					± 20%	± 10%	± 20%	± 10%	± 20%	± 10%	
30	6	A	6001	6002	6206	6207	6411	6412		150	30	C	6104	6105	6309	6310	6514	6515	
68	6	A	6004	6005	6209	6210	6414	6415		300	30	E	6107	6108	6312	6313	6517	6518	
140	6	B	6007	6008	6212	6213	6417	6418											
270	6	B	6010	6011	6215	6216	6420	6421		5	50	A	6109	6110	6314	6315	6519	6520	
330	6	C	6013	6014	6218	6219	6423	6424		10	50	A	6112	6113	6317	6318	6522	6523	
560	6	C	6016	6017	6221	6222	6426	6427		25	50	B	6115	6116	6320	6321	6525	6526	
1200	6	E	6019	6020	6224	6225	6429	6430		47	50	B	6118	6119	6323	6324	6528	6529	
										60	50	C	6121	6122	6326	6327	6531	6532	
25	8	A	6021	6022	6226	6227	6431	6432		82	50	C	6124	6125	6329	6330	6534	6535	
56	8	A	6024	6025	6229	6230	6434	6435		160	50	E	6127	6128	6332	6333	6537	6538	
220	8	B	6027	6028	6232	6233	6437	6438		4	60	A	6129	6130	6334	6335	6539	6540	
430	8	C	6030	6031	6235	6236	6440	6441		8.2	60	A	6132	6133	6337	6338	6542	6543	
850	8	E	6033	6034	6238	6239	6443	6444		20	60	B	6135	6136	6340	6341	6545	6546	
										39	60	B	6138	6139	6343	6344	6548	6549	
20	10	A	6035	6036	6240	6241	6445	6446		50	60	C	6141	6142	6346	6347	6551	6552	
47	10	A	6038	6039	6243	6244	6448	6449		68	60	C	6144	6145	6349	6350	6554	6555	
100	10	B	6041	6042	6246	6247	6451	6452		140	60	E	6147	6148	6352	6353	6557	6558	
180	10	B	6044	6045	6249	6250	6454	6455											
250	10	C	6047	6048	6252	6253	6457	6458		3.5	75	A	6149	6150	6354	6355	6559	6560	
390	10	C	6050	6051	6255	6256	6460	6461		6.8	75	A	6152	6153	6357	6358	6562	6563	
750	10	E	6053	6054	6258	6259	6463	6464		15	75	B	6155	6156	6360	6361	6565	6566	
										33	75	B	6158	6159	6363	6364	6568	6569	
15	15	A	6055	6056	6260	6261	6465	6466		40	75	C	6161	6162	6366	6367	6571	6572	
33	15	A	6058	6059	6263	6264	6468	6469		56	75	C	6164	6165	6369	6370	6574	6575	
70	15	B	6061	6062	6266	6267	6471	6472		110	75	E	6167	6168	6372	6373	6577	6578	
120	15	B	6064	6065	6269	6270	6474	6475											
170	15	C	6067	6068	6272	6273	6477	6478		2.5	100	A	6169	6170	6374	6375	6579	6580	
270	15	C	6070	6071	6275	6276	6480	6481		4.7	100	A	6172	6173	6377	6378	6582	6583	
540	15	E	6073	6074	6278	6279	6483	6484		11	100	B	6175	6176	6380	6381	6585	6586	
										22	100	B	6178	6179	6383	6384	6588	6589	
10	25	A	6075	6076	6280	6281	6485	6486		30	100	C	6181	6182	6386	6387	6591	6592	
22	25	A	6078	6079	6283	6284	6488	6489		43	100	C	6184	6185	6389	6390	6594	6595	
100	25	B	6081	6082	6286	6287	6491	6492		86	100	E	6187	6188	6392	6393	6597	6598	
180	25	C	6084	6085	6289	6290	6494	6495											
350	25	E	6087	6088	6292	6293	6497	6498		1.7	125	A	6189	6190	6394	6395	6599	6600	
										3.6	125	A	6192	6193	6397	6398	6602	6603	
8	30	A	6089	6090	6294	6295	6499	6500		9	125	B	6195	6196	6400	6401	6605	6606	
15	30	A	6092	6093	6297	6298	6502	6503		14	125	B	6198	6199	6403	6404	6608	6609	
40	30	B	6095	6096	6300	6301	6505	6506		18	125	C	6201	6202	6406	6407	6611	6612	
68	30	B	6098	6099	6303	6304	6508	6509		25	125	C	6204	6205	6409	6410	6614	6615	
100	30	C	6101	6102	6306	6307	6511	6512		56	125	E	7027	7028	7030	7031	7033	7034	

A black and white photograph showing two resistors. The top resistor is a standard axial lead resistor with a cylindrical body and two long leads. The bottom resistor is a surface-mount resistor, which is smaller and has a different shape, also with two leads. Both are set against a white oval background.

- Industrial quality at moderate prices.
- Excellent low Temperature operation
- All-welded construction – no pressure joints to cause open or intermittent circuits.
- Withstand high surge voltages
- Long shelf life, extremely low leakage current
- Will withstand 1000 hr. life test at rated voltage and 85 C.
- High capacitance in ultra-small physical size
- Furnished with plastic outer insulating sleeves
- For complete technical data, see latest issue of Sprague Engineering Bulletin 3149.

μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.
3 WVDC											
1	.260 x .536	500D105G003BA7	300	.385 x .973	500D307G006DD7	25	.260 x .723	500D256G016BB7	8	.260 x .723	500D805G050BB7
2	.260 x .536	500D205G003BA7	400	.385 x 1.286	500D407G006DF7	30	.322 x .723	500D306G016CB7	10	.322 x .723	500D106G050CB7
3	.260 x .536	500D305G003BA7	500	.385 x 1.536	500D507G006DH7	35	.322 x .723	500D356G016CB7	15	.322 x .723	500D156G050CB7
4	.260 x .536	500D405G003BA7	600	.385 x 1.536	500D607G006DF7	50	.322 x .723	500D506G016CB7	20	.322 x .848	500D206G050CC7
5	.260 x .536	500D505G003BA7	700	.448 x 1.286	500D707G006EH7	75	.322 x .848	500D756G016CC7	25	.322 x .848	500D256G050CC7
6	.260 x .536	500D605G003BA7	800	.448 x 1.536	500D807G006EH7	85	.385 x .723	500D856G016DB7	35	.385 x .848	500D356G050DC7
8	.260 x .536	500D805G003BA7	950	.448 x 1.536	500D957G006EH7	90	.322 x .848	500D906G016CC7	50	.385 x .973	500D506G050DD7
10	.260 x .536	500D106G003BA7	1000	.510 x 1.286	500D108G006FF7	100	.385 x .848	500D107G016DC7	75	.385 x 1.286	500D756G050DF7
15	.260 x .536	500D156G003BA7	1200	.510 x 1.536	500D128G006FH7	130	.385 x .848	500D137G016DC7	100	.385 x 1.536	500D107G050FH7
20	.260 x .536	500D206G003BA7	1500	.510 x 1.536	500D158G006FH7	150	.385 x .973	500D157G016DD7	120	.448 x 1.286	500D127G050EF7
25	.260 x .536	500D256G003BA7	1800	.510 x 1.786	500D188G006FK7	180	.385 x .973	500D187G016DD7	150	.448 x 1.536	500D157G050EH7
30	.260 x .536	500D306G003BA7	2000	.510 x 1.786	500D208G006FK7	200	.385 x 1.286	500D207G016DF7	200	.510 x 1.286	500D207G050FF7
50	.260 x .723	500D506G003BB7	12 WVDC			250	.385 x 1.286	500D257G016DF7	250	.510 x 1.286	500D257G050FF7
65	.260 x .723	500D656G003BB7	1	.260 x .536	500D105G012BA7	300	.385 x 1.536	500D307G016DH7	300	.510 x 1.536	500D307G050FH7
75	.322 x .723	500D756G003CB7	2	.260 x .536	500D205G012BA7	350	.385 x 1.536	500D357G016DH7	350	.510 x 1.786	500D357G050FK7
100	.322 x .723	500D107G003CB7	3	.260 x .536	500D305G012BA7	400	.448 x 1.286	500D407G016EF7	400	.510 x 1.786	500D407G050DK7
130	.322 x .723	500D137G003CB7	4	.260 x .536	500D405G012BA7	450	.448 x 1.536	500D457G016EH7	100 WVDC		
150	.322 x .848	500D157G003CC7	5	.260 x .536	500D505G012BA7	500	.448 x 1.536	500D507G016EH7	1	.260 x .536	500D105F100BA7
200	.322 x .848	500D207G003CC7	6	.260 x .536	500D605G012BA7	600	.448 x 1.536	500D607G016EH7	2	.260 x .723	500D205F100BB7
250	.385 x .848	500D257G003DC7	8	.260 x .536	500D805G012BA7	800	.510 x 1.536	500D807G016FH7	3	.322 x .723	500D305F100CB7
300	.385 x .848	500D307G003DC7	10	.260 x .536	500D106G012BA7	1000	.510 x 1.786	500D108G016FK7	4	.322 x .723	500D405F100CB7
400	.385 x .973	500D407G003DD7	15	.260 x .536	500D156G012BA7	25 WVDC			5	.322 x .848	500D505F100CC7
500	.385 x 1.286	500D507G003DF7	20	.260 x .723	500D206G012BB7	1	.260 x .536	500D105G025BA7	6	.322 x .848	500D605F100CC7
600	.385 x 1.286	500D607G003DF7	25	.260 x .723	500D256G012BB7	2	.260 x .536	500D205G025BA7	8	.385 x .848	500D805F100DC7
800	.385 x 1.536	500D807G003DH7	30	.260 x .723	500D306G012BB7	3	.260 x .536	500D305G025BA7	10	.385 x .848	500D106F100DC7
900	.448 x 1.286	500D907G003EF7	50	.322 x .723	500D506G012CB7	4	.260 x .536	500D405G025BA7	15	.385 x .848	500D156F100DD7
1000	.448 x 1.536	500D108G003EH7	60	.322 x .723	500D606G012CB7	5	.260 x .536	500D505G025BA7	20	.385 x 1.286	500D206F100DF7
1200	.448 x 1.536	500D128G003EH7	75	.322 x .848	500D756G012CC7	6	.260 x .536	500D505G025BA7	25	.385 x 1.536	500D256F100DH7
1500	.510 x 1.536	500D158G003FH7	90	.385 x .723	500D906G012DB7	8	.260 x .536	500D805G025BA7	30	.385 x 1.536	500D306F100DH7
1800	.510 x 1.536	500D188G00DFH7	100	.322 x .848	500D107G012CC7	10	.260 x .723	500D106G025BB7	40	.448 x 1.536	500D406F100EH7
2000	.510 x 1.536	500D208G003FH7	140	.385 x .848	500D147G012DC7	15	.260 x .723	500D156G025BB7	50	.510 x 1.536	500D506F100FH7
2200	.510 x 1.786	500D228G003FK7	150	.385 x .973	500D157G012DD7	20	.322 x .723	500D206G025CB7	60	.510 x 1.536	500D606F100FH7
2500	.510 x 1.786	500D258G003FK7	190	.385 x .973	500D197G012DD7	25	.322 x .723	500D256G025CB7	75	.510 x 1.786	500D756F100FK7
			200	.385 x 1.286	500D207G012DF7	30	.322 x .723	500D306G025CB7	150 WVDC		
			250	.385 x 1.286	500D257G012DF7	35	.322 x .723	500D356G025CB7	1	.260 x .536	500D105F150BA7
			290	.385 x 1.286	500D297G012DF7	50	.322 x .848	500D506G025CC7	2	.260 x .723	500D205F150BB7
			390	.385 x 1.536	500D397G012DH7	75	.385 x .848	500D756G025DC7	3	.322 x .723	500D305F150CB7
			400	.448 x 1.286	500D407G012EF7	100	.385 x .973	500D107G025DD7	4	.322 x .848	500D405F150CC7
			450	.448 x 1.286	500D457G012EF7	150	.385 x 1.286	500D157G025DF7	5	.322 x .848	500D505F150CC7
			500	.448 x 1.536	500D507G012EH7	200	.385 x 1.536	500D207G025DH7	6	.385 x .848	500D605F150DC7
			600	.448 x 1.536	500D607G012EH7	250	.448 x 1.286	500D257G025EH7	7	.385 x .848	500D705F150DC7
			800	.510 x 1.536	500D807G012FH7	300	.448 x 1.536	500D307G025EH7	8	.385 x .848	500D805F150DC7
			1000	.510 x 1.786	500D108G012FK7	350	.448 x 1.536	500D357G025EH7	10	.385 x .973	500D106F150DD7
			1200	.510 x 1.786	500D128G012FK7	400	.510 x 1.286	500D407G025FH7	15	.385 x 1.286	500D156F150DF7
			16 WVDC			450	.510 x 1.536	500D457G025FH7	20	.385 x 1.536	500D206F150DH7
			1	.260 x .536	500D105G016BA7	500	.510 x 1.536	500D507G025FH7	25	.448 x 1.286	500D256F150EF7
			2	.260 x .536	500D205G016BA7	600	.510 x 1.786	500D607G025FK7	30	.448 x 1.536	500D306F150EH7
			3	.260 x .536	500D305G016BA7	50 WVDC			35	.510 x 1.536	500D356F150FH7
			4	.260 x .536	500D405G016BA7	1	.260 x .536	500D105G050BA7	40	.510 x 1.536	500D406F150FH7
			5	.260 x .536	500D505G016BA7	2	.260 x .536	500D205G050BA7	50	.510 x 1.786	500D506F150FK7
			6	.260 x .536	500D605G016BA7	3	.260 x .536	500D305G050BA7	200 WVDC		
			8	.260 x .536	500D805G016BA7	4	.260 x .536	500D405G050BA7	1	.260 x .723	500D105F200BB7
			10	.260 x .536	500D106G016BA7	5	.260 x .536	500D505G050BA7	2	.322 x .723	500D205F200CB7
			15	.260 x .723	500D156G016BB7	6	.260 x .723	500D605G050BB7	3	.322 x .848	500D305F200CC7
			20	.260 x .723	500D206G016BB7						
			25	.260 x .723	500D256G006BB7						
			35	.260 x .723	500D356G006BB7						
			50	.260 x .723	500D506G006BB7						
			75	.322 x .723	500D756G006CB7						
			90	.322 x .723	500D906G006CB7						
			100	.322 x .848	500D107G006CC7						
			140	.322 x .848	500D147G006CC7						
			150	.385 x .848	500D157G006DC7						
			200	.385 x .848	500D207G006DC7						
			250	.385 x .973	500D257G006DD7						

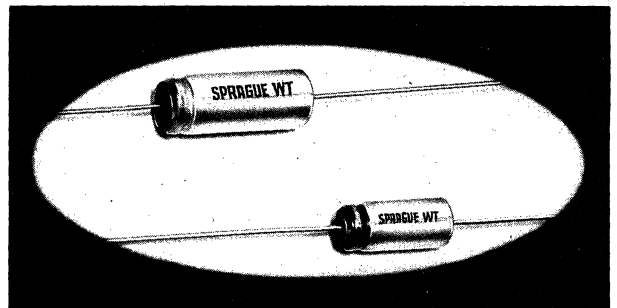
SPRAGUE CAPACITORS

TYPE 500D ALUMINUM ELECTROLYTICS, continued

μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.
4	.385 x .848	500D405F200DC7	6	.385 x 1.286	500D605F250DF7	12	.510 x 1.536	500D126F300FH7	2	.385 x 1.286	500D205F400DF7
5	.385 x .848	500D505F200DC7	8	.385 x 1.536	500D805F250DH7	15	.510 x 1.536	500D156F300FH7	3	.385 x 1.536	500D305F400DH7
6	.385 x .973	500D605F200DD7	10	.448 x 1.286	500D106F250EF7				4	.448 x 1.286	500D405F400EF7
8	.385 x 1.286	500D805F200DF7	12	.448 x 1.536	500D126F250EH7	350 WVDC					
10	.385 x 1.286	500D106F200DF7	15	.510 x 1.536	500D156F250FH7	1	.322 x .848	500D105F350CC7	5	.448 x 1.536	500D505F400EH7
15	.448 x 1.286	500D156F200EF7	20	.510 x 1.786	500D206F250FK7	2	.385 x .848	500D205F350DC7	6	.510 x 1.286	500D605F400FF7
20	.448 x 1.536	500D206F200EH7				3	.385 x .973	500D305F350DD7	8	.510 x 1.536	500D805F400FH7
25	.510 x 1.536	500D256F200FH7	300 WVDC			4	.385 x 1.286	500D405F350DF7	10	.510 x 1.786	500D106F400FK7
30	.510 x 1.786	500D306F200FK7				5	.385 x 1.536	500D505F350DH7	450 WVDC		
250 WVDC			1	.322 x .723	500D105F300CB7	6	.385 x 1.536	500D605F350DH7	1	.385 x .848	500D105F450DC7
1	.322 x .723	500D105F250CB7	2	.385 x .848	500D205F300DC7	8	.448 x 1.536	500D805F350EH7	2	.385 x 1.286	500D205F450DF7
2	.385 x .723	500D205F250DB7	3	.385 x .973	500D305F300DD7	10	.510 x 1.536	500D106F350FH7	3	.448 x 1.286	500D305F450EF7
3	.385 x .848	500D305F250DC7	4	.385 x 1.286	500D405F300DF7	12	.510 x 1.536	500D126F350FH7	4	.448 x 1.536	500D405F450EH7
4	.385 x .973	500D405F250DD7	5	.385 x 1.286	500D505F300DF7	15	.510 x 1.786	500D156F350FK7	5	.510 x 1.286	500D505F450FF7
5	.385 x 1.286	500D505F250DF7	6	.385 x 1.536	500D605F300DH7	400 WVDC			6	.510 x 1.536	500D605F450FH7
			8	.448 x 1.536	500D805F300EH7	1	.385 x .848	500D105F400DC7	8	.510 x 1.786	500D805F450FK7
			10	.448 x 1.536	500D106F300EH7				10	.510 x 1.786	500D106F450FK7

TYPE WH11D AXIAL-LEAD ECONOMY ELECTROLYTICS

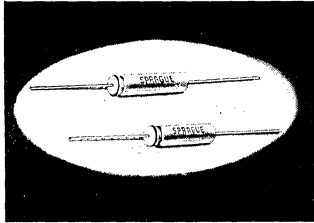
- Made in Hong Kong by Sprague World Trade Corp.
- Operating temperature range, -20°C to $+85^{\circ}\text{C}$.
- All-welded construction – no pressure joints to cause open or intermittent circuits.
- Low leakage current – means minimum drain and longer battery life in bypass circuits.
- Also excellent as coupling capacitors.
- For complete technical data, refer to latest issue of Sprague Engineering Bulletin 3148.



μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.
3 WVDC, 4 V SURGE			16 WVDC, 18 V SURGE			50 WVDC, 65 V SURGE			100 WVDC, 125 V SURGE		
25	.260 x .536	WH11D256G003Y	65	.322 x .723	WH11D656G012X	6	.260 x .536	WH11D605G025Y	120	.465 x 1.286	WH11D127G050K
65	.260 x .723	WH11D656G003A	100	.385 x .723	WH11D107G012C	8	.260 x .536	WH11D805G025Y	150	.465 x 1.536	WH11D157G050M
100	.322 x .723	WH11D107G003X	200	.385 x .973	WH11D207G012E	10	.260 x .723	WH11D106G025A	200	.510 x 1.286	WH11D207G050P
120	.322 x .723	WH11D127G003X	300	.385 x 1.286	WH11D307G012F	15	.260 x .723	WH11D156G025A	250	.510 x 1.286	WH11D257G050P
150	.385 x .723	WH11D157G003C	400	.385 x 1.536	WH11D407G012G	20	.322 x .723	WH11D206G025X	300	.510 x 1.536	WH11D307G050R
200	.385 x .723	WH11D207G003C	500	.465 x 1.286	WH11D507G012K	25	.322 x .723	WH11D256G025X	350	.510 x 1.786	WH11D357G050S
350	.385 x .973	WH11D357G003E	650	.465 x 1.536	WH11D657G012M	35	.322 x .723	WH11D356G025X	400	.510 x 1.786	WH11D407G050S
400	.385 x .973	WH11D407G003E	700	.510 x 1.286	WH11D707G012P	50	.385 x .723	WH11D506G025C			
500	.385 x 1.286	WH11D507G003F	800	.510 x 1.536	WH11D807G012R	65	.385 x .973	WH11D656G025E	150 WVDC, 175 V SURGE		
600	.385 x 1.286	WH11D607G003F	1200	.510 x 1.786	WH11D128G012S	75	.385 x .973	WH11D756G025E	1	.260 x .536	WH11D105F100Y
800	.385 x 1.536	WH11D807G003G				100	.385 x .973	WH11D107G025E	2	.260 x .723	WH11D205F100A
1000	.465 x 1.286	WH11D108G003K	25 WVDC, 35 V SURGE			120	.385 x 1.286	WH11D127G025F	3	.322 x .723	WH11D305F100X
1300	.465 x 1.536	WH11D138G003M	10	.260 x .536	WH11D106G016Y	150	.385 x 1.286	WH11D157G025F	4	.322 x .723	WH11D405F100X
2000	.510 x 1.536	WH11D208G003R	20	.260 x .723	WH11D206G016A	200	.385 x 1.536	WH11D207G025G	5	.385 x .723	WH11D505F100C
2500	.510 x 1.786	WH11D258G003S	25	.260 x .723	WH11D256G016A	250	.465 x 1.286	WH11D257G025K	6	.385 x .723	WH11D605F100C
6 WVDC, 8 V SURGE			50	.322 x .723	WH11D506G016X	300	.465 x 1.536	WH11D307G025M	8	.385 x .973	WH11D805F100E
20	.260 x .536	WH11D206G006Y	65	.385 x .723	WH11D656G016C	350	.465 x 1.536	WH11D357G025M	10	.385 x .973	WH11D106F100E
50	.260 x .723	WH11D506G006A	75	.385 x .723	WH11D756G016C	400	.510 x 1.286	WH11D407G025P	15	.385 x .973	WH11D156F100E
75	.322 x .723	WH11D756G006X	120	.385 x .973	WH11D127G016E	450	.510 x 1.536	WH11D457G025R	20	.385 x 1.286	WH11D206F100F
120	.385 x .723	WH11D127G006C	150	.385 x .973	WH11D157G016E	500	.510 x 1.536	WH11D507G025R	25	.385 x 1.536	WH11D256F100G
250	.385 x .973	WH11D257G006E	200	.385 x 1.286	WH11D207G016F	600	.510 x 1.786	WH11D607G025S	35	.465 x 1.536	WH11D356F100M
300	.385 x .973	WH11D307G006E	250	.385 x 1.286	WH11D257G016F				50	.510 x 1.536	WH11D506F100R
350	.385 x 1.286	WH11D357G006F	300	.385 x 1.536	WH11D307G016G	100 WVDC, 125 V SURGE			65	.510 x 1.786	WH11D656F100S
400	.385 x 1.286	WH11D407G006F	350	.385 x 1.536	WH11D357G016G	1	.260 x .536	WH11D105G050Y	75	.510 x 1.786	WH11D756F100S
500	.385 x 1.536	WH11D507G006G	400	.465 x 1.286	WH11D407G016K	2	.260 x .536	WH11D205G050Y			
600	.385 x 1.536	WH11D607G006G	450	.465 x 1.286	WH11D457G016K	3	.260 x .536	WH11D305G050Y	1	.260 x .536	WH11D105F150Y
700	.465 x 1.286	WH11D707G006K	500	.465 x 1.536	WH11D507G016M	4	.260 x .536	WH11D405G050Y	2	.322 x .723	WH11D205F150X
800	.465 x 1.536	WH11D807G006M	600	.465 x 1.536	WH11D607G016M	5	.260 x .723	WH11D505G050A	3	.385 x .723	WH11D305F150C
950	.465 x 1.536	WH11D957G006M	650	.510 x 1.286	WH11D657G016P	6	.260 x .723	WH11D605G050A	4	.385 x .723	WH11D405F150C
1000	.510 x 1.286	WH11D108G006P	800	.510 x 1.536	WH11D807G016R	8	.260 x .723	WH11D805G050A	5	.385 x .723	WH11D505F150C
1500	.510 x 1.536	WH11D158G006R	1000	.510 x 1.786	WH11D108G016S	10	.322 x .723	WH11D106G050X	6	.385 x .973	WH11D605F150E
2000	.510 x 1.786	WH11D208G006S				12	.322 x .723	WH11D126G050X	8	.385 x .973	WH11D805F150E
12 WVDC, 15 V SURGE			30 WVDC, 45 V SURGE			20	.385 x .723	WH11D206G050C	10	.385 x 1.286	WH11D106F150F
15	.260 x .536	WH11D156G012Y	1	.260 x .536	WH11D105G025Y	25	.385 x .973	WH11D256G050C	15	.385 x 1.286	WH11D156F150F
35	.260 x .723	WH11D356G012A	2	.260 x .536	WH11D205G025Y	35	.385 x .973	WH11D356G050E	20	.385 x 1.536	WH11D206F150G
			3	.260 x .536	WH11D305G025Y	65	.385 x 1.286	WH11D656G050F	25	.465 x 1.536	WH11D256F150M
			4	.260 x .536	WH11D405G025Y	75	.385 x 1.286	WH11D756G050F	35	.510 x 1.536	WH11D356F150R
			5	.260 x .536	WH11D505G025Y	100	.385 x 1.536	WH11D107G050G	50	.510 x 1.786	WH11D506F150S

SPRAGUE CAPACITORS

TYPE TE LITTL-LYTIC® ELECTROLYTICS



- Compare! These ultra-small capacitors will withstand a 2000 hr. life test at rated voltage and maximum operating temperature of 105 C.
- Extremely low d-c leakage current, low dissipation factor, high capacitance stability, even after severe high temperature shelf testing.
- Proven dependable performance in industrial as well as entertainment equipment with either transistor or modified electron-tube circuits.

- All terminal connections are welded, eliminating possibility of "open" or intermittent contacts occasionally found in pressure joints of conventional capacitors.
- Ultra-low leakage current
- Metal-encased, with clear plastic outer insulating sleeves.
- For complete technical data, see latest issue of Sprague Engineering Bulletin 3150.

μF	D. x L.	Sprague Products Cat. No.	Sprague O.E.M. Part. No.	μF	D. x L.	Sprague Products Cat. No.	Sprague O.E.M. Part. No.	μF	D. x L.	Sprague Products Cat. No.	Sprague O.E.M. Part. No.
3 WVDC				12 WVDC				25 WVDC			
1	.260 x .536	TE-1050	30D105G003BA9	1	.260 x .536	TE-1120	30D105G012BA9	1	.260 x .536	TE-1200	30D105G025BA9
2	.260 x .536	TE-1051	30D205G003BA9	2	.260 x .536	TE-1121	30D205G012BA9	2	.260 x .536	TE-1201	30D205G025BA9
3	.260 x .536	TE-1052	30D305G003BA9	3	.260 x .536	TE-1122	30D305G012BA9	3	.260 x .536	TE-1201.1	30D305G025BA9
4	.260 x .536	TE-1052.1	30D405G003BA9	4	.260 x .536	TE-1123	30D405G012BA9	4	.260 x .536	TE-1201.2	30D405G025BA9
5	.260 x .536	TE-1052.2	30D505G003BA9	5	.260 x .536	TE-1127	30D505G012BA9	5	.260 x .536	TE-1202	30D505G025BA9
6	.260 x .536	TE-1052.3	30D605G003BA9	6	.260 x .536	TE-1127.1	30D605G012BA9	6	.260 x .536	TE-1203	30D605G025BA9
8	.260 x .536	TE-1052.5	30D805G003BA9	8	.260 x .536	TE-1127.3	30D805G012BA9	8	.260 x .536	TE-1203.5	30D805G025BA9
10	.260 x .536	TE-1053	30D106G003BA9	10	.260 x .536	TE-1128	30D106G012BA9	10	.260 x .723	TE-1204	30D106G025BB9
15	.260 x .536	TE-1053.5	30D156G003BA9	15	.260 x .536	TE-1129	30D156G012BA9	15	.260 x .723	TE-1205	30D156G025BB9
20	.260 x .536	TE-1054	30D206G003BA9	20	.260 x .723	TE-1130	30D206G012BB9	20	.322 x .723	TE-1206	30D206G025CB9
25	.260 x .536	TE-1055	30D256G003BA9	25	.260 x .723	TE-1131	30D256G012BB9	25	.322 x .723	TE-1207	30D256G025CB9
30	.260 x .536	TE-1055.5	30D306G003BA9	30	.260 x .723	TE-1131.1	30D306G012BB9	30	.322 x .723	TE-1207.5	30D306G025CB9
50	.260 x .723	TE-1058	30D506G003BB9	50	.322 x .723	TE-1132.1	30D506G012BB9	35	.322 x .723	TE-1208	30D356G025CB9
65	.260 x .723	TE-1058.5	30D656G003BB9	60	.322 x .723	TE-1133.5	30D606G012CB9	50	.322 x .848	TE-1209	30D506G025CC9
75	.322 x .723	TE-1059	30D756G003CB9	75	.322 x .848	TE-1134	30D756G012CC9	75	.385 x .848	TE-1210	30D756G025DC9
100	.322 x .723	TE-1059.5	30D107G003CB9	90	.385 x .723	TE-1134.5	30D906G012DB9	100	.385 x .973	TE-1211	30D107G025DD9
130	.322 x .723	TE-1060.1	30D137G003CB9	100	.322 x .848	TE-1135	30D107G012CC9	150	.385 x 1.286	TE-1212	30D157G025DF9
150	.322 x .848	TE-1061	30D157G003CC9	140	.385 x .848	TE-1135.5	30D147G012DC9	200	.385 x 1.536	TE-1213	30D207G025DH9
200	.322 x .848	TE-1064	30D207G003CC9	150	.385 x .973	TE-1136	30D157G012DD9	50 WVDC			
250	.385 x .848	TE-1065	30D257G003DC9	190	.385 x .973	TE-1136.5	30D197G012DD9	1	.260 x .536	TE-1300	30D105G050BA9
300	.385 x .848	TE-1066	30D307G003DC9	200	.385 x 1.286	TE-1137	30D207G012DF9	2	.260 x .536	TE-1301	30D205G050BA9
400	.385 x .973	TE-1067	30D407G003DD9	250	.385 x 1.286	TE-1138	30D257G012DF9	3	.260 x .536	TE-1302	30D305G050BA9
500	.385 x 1.286	TE-1068	30D507G003DF9	290	.385 x 1.286	TE-1139	30D297G012DF9	4	.260 x .536	TE-1302.1	30D405G050BA9
600	.385 x 1.286	TE-1069.1	30D607G003DF9	390	.385 x 1.536	TE-1140	30D397G012DH9	5	.260 x .723	TE-1303	30D505G050BB9
800	.385 x 1.536	TE-1070.1	30D807G003DH9	16 WVDC				6	.260 x .723	TE-1303.1	30D605G050BB9
6 WVDC				1	.260 x .536	TE-1148	30D105G016BA9	8	.260 x .723	TE-1303.3	30D805G050BB9
1	.260 x .536	TE-1080	30D105G006BA9	2	.260 x .536	TE-1149	30D205G016BA9	10	.322 x .723	TE-1304	30D106G050CB9
2	.260 x .536	TE-1081	30D205G006BA9	3	.260 x .536	TE-1150	30D305G016BA9	15	.322 x .723	TE-1304.2	30D156G050CB9
3	.260 x .536	TE-1082	30D305G006BA9	4	.260 x .536	TE-1151	30D405G016BA9	20	.322 x .848	TE-1305	30D206G050CC9
4	.260 x .536	TE-1083	30D405G006BA9	5	.260 x .536	TE-1152	30D505G016BA9	25	.322 x .848	TE-1305.5	30D256G050CC9
5	.260 x .536	TE-1084	30D505G006BA9	6	.260 x .536	TE-1153	30D605G016BA9	35	.385 x .848	TE-1306	30D356G050DC9
6	.260 x .536	TE-1085	30D605G006BA9	8	.260 x .536	TE-1154	30D805G016BA9	50	.385 x .973	TE-1307	30D506G050DD9
8	.260 x .536	TE-1086	30D805G006BA9	10	.260 x .536	TE-1155	30D106G016BA9	75	.385 x 1.286	TE-1308	30D756G050DF9
10	.260 x .536	TE-1087	30D106G006BA9	15	.260 x .723	TE-1156	30D156G016BB9	100	.385 x 1.536	TE-1309	30D107G050DH9
15	.260 x .536	TE-1089	30D156G006BA9	20	.260 x .723	TE-1157	30D206G016BB9	100 WVDC			
20	.260 x .536	TE-1090	30D206G006BA9	25	.260 x .723	TE-1157.1	30D256G016BB9	1	.260 x .536	TE-1400	30D105F100BA9
25	.260 x .723	TE-1091	30D256G006BB9	30	.322 x .723	TE-1158	30D306G016CB9	2	.260 x .723	TE-1401	30D205F100BB9
35	.260 x .723	TE-1093	30D356G006BB9	35	.322 x .723	TE-1159	30D356G016CB9	3	.322 x .723	TE-1402	30D305F100CB9
50	.260 x .723	TE-1100	30D506G006CB9	50	.322 x .723	TE-1160	30D506G016CB9	4	.322 x .723	TE-1403	30D405F100CB9
75	.322 x .723	TE-1101.5	30D756G006CB9	75	.322 x .848	TE-1161	30D756G016CC9	5	.322 x .848	TE-1404	30D505F100CC9
90	.322 x .723	TE-1101.7	30D906G006CB9	85	.385 x .723	TE-1161.5	30D856G016DB9	6	.322 x .848	TE-1405	30D605F100CC9
100	.322 x .848	TE-1102	30D107G006CC9	90	.322 x .848	TE-1161.7	30D906G016CC9	8	.385 x .848	TE-1406	30D805F100DC9
140	.322 x .848	TE-1102.5	30D147G006CC9	100	.385 x .848	TE-1162	30D107G016DC9	10	.385 x .848	TE-1407	30D106F100DC9
150	.385 x .848	TE-1103	30D157G006DC9	130	.385 x .848	TE-1162.5	30D137G016DC9	15	.385 x .973	TE-1408	30D156F100DD9
200	.385 x .848	TE-1104	30D207G006DC9	150	.385 x .973	TE-1163	30D157G016DD9	20	.385 x 1.286	TE-1409	30D206F100DF9
250	.385 x .973	TE-1105	30D257G006DD9	180	.385 x .973	TE-1163.7	30D187G016DD9	25	.385 x 1.536	TE-1410	30D256F100DH9
300	.385 x .973	TE-1106	30D307G006DD9	200	.385 x 1.286	TE-1164	30D207G016DF9	30	.385 x 1.536	TE-1411	30D306F100DH9
400	.385 x 1.286	TE-1107	30D407G006DF9	250	.385 x 1.286	TE-1164.5	30D257G016DF9	150 WVDC			
500	.385 x 1.536	TE-1107.5	30D507G006DH9	300	.385 x 1.536	TE-1165.5	30D307G016DH9	1	.260 x .536	TE-1500	30D105F150BA9
600	.385 x 1.536	TE-1108.5	30D607G006DH9	350	.385 x 1.536	TE-1166	30D357G016DH9	2	.260 x .723	TE-1501	30D205F150BB9

CALL YOUR SPRAGUE INDUSTRIAL DISTRIBUTOR FOR CURRENT QUANTITY PRICES

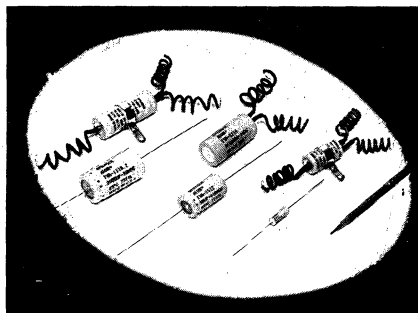
Copyright 1974, Sprague Products Company

IND-EEM-15-EFAI

Sizes subject to change without notice.

SPRAGUE CAPACITORS

TYPE TVA ATOM® ELECTROLYTICS



- The smallest dependable standard tubular—capacitors up to 475 volts operate at temperatures to 85°C (185°F). Higher voltage capacitors are designed for 65°C operation.
- Low leakage current, low dissipation factor, long shelf life.
- Will withstand high temperatures, high ripple currents, high surge voltages.
- Metal case construction with thermoplastic outer insulating sleeve except as noted by dagger (†) sign.
- Catalog numbers with TVAN prefix are non-polarized, and are ideal for speaker crossover networks. They are listed on 2nd following page.
- Starred (*) items have metal mounting strap attached, as shown in photo.

μF	WVDC	Dia. x Length	Cat. No.	μF	WVDC	Dia. x Length	Cat. No.	μF	WVDC	Dia. x Length	Cat. No.
SINGLE UNITS (Polar)*											
1000	1	5/8 x 2 1/8	TVA-1080	3	6	1/4 x 17/32	TVA-1099.82	4	12	1/4 x 17/32	TVA-1129.83
1	3	1/4 x 17/32	TVA-1081	4	6	1/4 x 17/32	TVA-1099.83	5	12	1/4 x 17/32	TVA-1129.84
2	3	1/4 x 17/32	TVA-1081.1	5	6	1/4 x 17/32	TVA-1099.84	6	12	1/4 x 17/32	TVA-1129.85
3	3	1/4 x 17/32	TVA-1081.2	6	6	1/4 x 17/32	TVA-1099.85	8	12	1/4 x 17/32	TVA-1129.86
4	3	1/4 x 17/32	TVA-1081.3	8	6	1/4 x 17/32	TVA-1099.86	10	12	1/4 x 17/32	TVA-1129.87
5	3	1/4 x 17/32	TVA-1081.4	10	6	1/4 x 17/32	TVA-1099.87	15	12	1/4 x 17/32	TVA-1129.89
6	3	1/4 x 17/32	TVA-1081.5	15	6	1/4 x 17/32	TVA-1099.89	20	12	1/4 x 23/32	TVA-1129.90
8	3	1/4 x 17/32	TVA-1081.6	20	6	1/4 x 17/32	TVA-1099.90	25	12	1/4 x 23/32	TVA-1129.91
10	3	1/4 x 17/32	TVA-1082	25	6	1/4 x 23/32	TVA-1099.91	30	12	1/4 x 23/32	TVA-1129.92
15	3	1/4 x 17/32	TVA-1082.5	35	6	1/4 x 23/32	TVA-1099.93	50	12	5/16 x 23/32	TVA-1129.94
20	3	1/4 x 17/32	TVA-1083	50	6	1/4 x 23/32	TVA-1100	60	12	5/16 x 23/32	TVA-1129.95
25	3	1/4 x 17/32	TVA-1084	75	6	5/16 x 23/32	TVA-1100.5	75	12	5/16 x 27/32	TVA-1129.96
30	3	1/4 x 17/32	TVA-1084.5	90	6	5/16 x 23/32	TVA-1100.6	90	12	3/8 x 23/32	TVA-1129.97
50	3	1/4 x 23/32	TVA-1085	100	6	5/16 x 27/32	TVA-1101	100	12	5/16 x 23/32	TVA-1130
65	3	1/4 x 23/32	TVA-1085.5	140	6	5/16 x 27/32	TVA-1101.2	140	12	3/8 x 27/32	TVA-1130.2
75	3	5/16 x 23/32	TVA-1088	150	6	3/8 x 27/32	TVA-1101.5	150	12	3/8 x 31/32	TVA-1130.3
100	3	5/16 x 23/32	TVA-1089	200	6	3/8 x 27/32	TVA-1101.7	190	12	3/8 x 31/32	TVA-1130.5
130	3	5/16 x 23/32	TVA-1089.5	250	6	3/8 x 31/32	TVA-1102	200	12	3/8 x 1 9/32	TVA-1130.6
150	3	5/16 x 27/32	TVA-1090	300	6	3/8 x 31/32	TVA-1102.1	250	12	3/8 x 1 9/32	TVA-1131
200	3	5/16 x 27/32	TVA-1091	400	6	3/8 x 1 9/32	TVA-1102.3	290	12	3/8 x 1 9/32	TVA-1131.1
250	3	3/8 x 27/32	TVA-1091.5	500	6	3/8 x 1 17/32	TVA-1103	390	12	3/8 x 1 17/32	TVA-1131.2
300	3	3/8 x 27/32	TVA-1092	600	6	3/8 x 1 17/32	TVA-1103.2	400	12	7/16 x 1 9/32	TVA-1131.3
400	3	3/8 x 31/32	TVA-1093	700	6	7/16 x 1 9/32	TVA-1103.4	450	12	7/16 x 1 9/32	TVA-1131.5
500	3	3/8 x 1 9/32	TVA-1094	800	6	7/16 x 1 17/32	TVA-1103.8	500	12	7/16 x 1 17/32	TVA-1132
600	3	3/8 x 1 9/32	TVA-1095	950	6	7/16 x 1 17/32	TVA-1103.9	600	12	7/16 x 1 17/32	TVA-1132.2
750	3	3/8 x 1 17/32	TVA-1097	1000	6	1/2 x 1 9/32	TVA-1104	800	12	1/2 x 1 9/16	TVA-1132.4
800	3	3/8 x 1 17/32	TVA-1097.1	1200	6	1/2 x 1 17/32	TVA-1104.1	900	12	1/2 x 1 13/16	TVA-1132.5
900	3	7/16 x 1 9/32	TVA-1097.2	1500	6	1/2 x 1 17/32	TVA-1105	1000	12	1/2 x 1 13/16	TVA-1133
1000	3	7/16 x 1 17/32	TVA-1097.3	1800	6	1/2 x 1 25/32	TVA-1105.1	1200	12	1/2 x 1 13/16	TVA-1133.4
1200	3	7/16 x 1 17/32	TVA-1097.4	2000	6	1/2 x 1 25/32	TVA-1106	1500	12	3/4 x 1 21/32	TVA-1133.5
1500	3	1/2 x 1 17/32	TVA-1097.5	2500	6	3/4 x 1 21/32	TVA-1106.5	2000	12	7/8 x 1 21/32	TVA-1134
1800	3	1/2 x 1 17/32	TVA-1097.6	3000	6	3/4 x 1 29/32	TVA-1107	2500	12	7/8 x 1 21/32	TVA-1134.5
2000	3	1/2 x 1 17/32	TVA-1097.7	4000	6	7/8 x 1 29/32	TVA-1108	3000	12	7/8 x 2 5/32	TVA-1135
2200	3	1/2 x 1 13/16	TVA-1097.8	5000	6	7/8 x 1 29/32	TVA-1109	4000	12	15/16 x 2 5/32	TVA-1136
2500	3	1/2 x 1 13/16	TVA-1097.9	10000	6	1 x 2 13/32	TVA-1115	5000	12	1 x 2 13/32	TVA-1136.1
3000	3	3/4 x 1 21/32	TVA-1098	1000	10	1/2 x 1 13/16	TVA-1128	10000	12	1 1/4 x 2 11/16	TVA-1137
4000	3	13/16 x 1 21/32	TVA-1099	3000	10	7/8 x 1 21/32	TVA-1129.2	1	16	1/4 x 17/32	TVA-1140
5000	3	13/16 x 1 29/32	TVA-1099.1	4000	10	7/8 x 1 29/32	TVA-1129.4	2	16	1/4 x 17/32	TVA-1141
10000	3	15/16 x 2 5/32	TVA-1099.6	5000	10	1 x 2 5/32	TVA-1129.5	3	16	1/4 x 17/32	TVA-1142
1	6	1/4 x 17/32	TVA-1099.80	10000	10	1 1/8 x 2 11/16	TVA-1129.8	4	16	1/4 x 17/32	TVA-1143
2	6	1/4 x 17/32	TVA-1099.81	1	12	1/4 x 17/32	TVA-1129.80	5	16	1/4 x 17/32	TVA-1144
				2	12	1/4 x 17/32	TVA-1129.81	6	16	1/4 x 17/32	TVA-1144.1
				3	12	1/4 x 17/32	TVA-1129.82				

* For non-polarized single units, see catalog numbers with TVAN prefix on 2nd following page.

SPRAGUE CAPACITORS

TYPE TVA ATOM® ELECTROLYTICS - Continued

μF	WVDC	Dia. x Length	Cat. No.	μF	WVDC	Dia. x Length	Cat. No.	μF	WVDC	Dia. x Length	Cat. No.
SINGLE UNITS - Continued											
8	16	1/4 x 17/32	TVA-1144.2	8000	25	1 1/4 x 3 11/16	TVA-1214.8	1000	100	1 1/4 x 2 11/16	TVA-1380
10	16	1/4 x 17/32	TVA-1145	10000	25	1 3/8 x 3 11/16	TVA-1214.10	1500	100	1 1/4 x 3 11/16	TVA-1382
15	16	1/4 x 23/32	TVA-1146	*900	30	7/8 x 1 21/32	TVA-1222	2000	100	1 3/8 x 4 5/32	TVA-1384
20	16	1/4 x 23/32	TVA-1147	1000	30	15/16 x 1 29/32	TVA-1222.1	1	150	1/4 x 17/32	TVA-1400
25	16	1/4 x 23/32	TVA-1148	200	35	7/16 x 1 17/32	TVA-1223	2	150	1/4 x 23/32	TVA-1400.1
30	16	5/16 x 23/32	TVA-1149	300	35	1/2 x 1 9/16	TVA-1225	3	150	5/16 x 23/32	TVA-1400.2
35	16	5/16 x 23/32	TVA-1149.1	500	35	1/2 x 1 13/16	TVA-1227	4	150	5/16 x 27/32	TVA-1402
50	16	5/16 x 23/32	TVA-1150	5500	35	1 x 3 13/32	TVA-1229	5	150	5/16 x 27/32	TVA-1403
75	16	5/16 x 27/32	TVA-1151	1	50	1/4 x 17/32	TVA-1300	6	150	3/8 x 27/32	TVA-1403.1
85	16	3/8 x 23/32	TVA-1152	2	50	1/4 x 17/32	TVA-1301	7	150	3/8 x 27/32	TVA-1403.2
90	16	5/16 x 27/32	TVA-1153	3	50	1/4 x 17/32	TVA-1302	8	150	3/8 x 27/32	TVA-1405
100	16	3/8 x 27/32	TVA-1160	4	50	1/4 x 17/32	TVA-1302.7	10	150	3/8 x 31/32	TVA-1406
130	16	3/8 x 27/32	TVA-1160.2	5	50	1/4 x 23/32	TVA-1303	12	150	3/8 x 19/32	TVA-1407
150	16	3/8 x 31/32	TVA-1160.3	6	50	1/4 x 23/32	TVA-1303.1	15	150	3/8 x 19/32	TVA-1408
175	16	3/8 x 31/32	TVA-1160.4	8	50	1/4 x 23/32	TVA-1303.2	16	150	3/8 x 117/32	TVA-1409
180	16	3/8 x 31/32	TVA-1160.5	10	50	5/16 x 23/32	TVA-1304	20	150	3/8 x 117/32	TVA-1410
200	16	3/8 x 1 9/32	TVA-1160.6	15	50	5/16 x 23/32	TVA-1305	25	150	7/16 x 19/32	TVA-1411
250	16	3/8 x 1 9/32	TVA-1161	20	50	5/16 x 27/32	TVA-1305.5	30	150	7/16 x 117/32	TVA-1412
300	16	3/8 x 117/32	TVA-1161.1	25	50	5/16 x 27/32	TVA-1306	35	150	1/2 x 117/32	TVA-1412.1
350	16	3/8 x 117/32	TVA-1161.2	35	50	3/8 x 27/32	TVA-1306.2	40	150	1/2 x 117/32	TVA-1413
400	16	7/16 x 1 9/32	TVA-1161.5	40	50	3/8 x 31/32	TVA-1306.5	50	150	1/2 x 113/16	TVA-1414
450	16	7/16 x 117/32	TVA-1161.6	50	50	3/8 x 31/32	TVA-1308	60	150	13/16 x 113/32	TVA-1415
500	16	7/16 x 117/32	TVA-1162	60	50	3/8 x 1 9/32	TVA-1309.3	75	150	7/8 x 113/32	TVA-1416
600	16	7/16 x 117/32	TVA-1162.2	75	50	3/8 x 1 9/32	TVA-1309.4	80	150	7/8 x 113/32	TVA-1418
800	16	1/2 x 1 9/16	TVA-1162.3	100	50	3/8 x 117/32	TVA-1310	85	150	7/8 x 121/32	TVA-1418.1
1000	16	1/2 x 113/16	TVA-1163	120	50	7/16 x 1 9/32	TVA-1310.1	100	150	7/8 x 121/32	TVA-1420
1200	16	1/2 x 113/16	TVA-1164	125	50	7/16 x 117/32	TVA-1310.2	150	150	7/8 x 25/32	TVA-1422
1500	16	13/16 x 1 21/32	TVA-1175.2	150	50	7/16 x 117/32	TVA-1311	160	150	1 x 1 29/32	TVA-1422.5
2000	16	13/16 x 1 21/32	*TVA-1170	200	50	1/2 x 1 5/16	TVA-1311.5	200	150	1 x 25/32	TVA-1423
2500	16	7/8 x 1 29/32	TVA-1175.3	250	50	1/2 x 1 5/16	TVA-1312	*250	150	1 1/8 x 25/32	*TVA-1424
3000	16	7/8 x 1 29/32	TVA-1175	300	50	1/2 x 1 9/16	TVA-1312.1	300	150	1 1/8 x 211/16	TVA-1425
4000	16	15/16 x 2 5/32	TVA-1175.4	350	50	1/2 x 1 13/16	TVA-1312.2	350	150	1 x 35/32	TVA-1426
5000	16	1 x 2 5/32	TVA-1175.5	400	50	1/2 x 1 13/16	TVA-1313	400	150	1 1/4 x 211/16	TVA-1426.1
6000	16	1 1/8 x 2 5/32	TVA-1175.6	500	50	3/4 x 1 21/32	TVA-1315	500	150	1 1/4 x 35/32	TVA-1428
8000	16	1 1/8 x 2 11/16	TVA-1175.7	600	50	13/16 x 1 21/32	TVA-1315.2	1000	150	1 3/8 x 45/32	TVA-1429
10000	16	1 1/4 x 2 11/16	TVA-1175.8	800	50	7/8 x 1 21/32	TVA-1315.4	80	175	13/16 x 1 29/32	TVA-1430
15000	16	1 1/4 x 3 11/16	TVA-1175.11	1000	50	15/16 x 1 29/32	TVA-1316	1	200	1/4 x 23/32	TVA-1434
20000	16	1 3/8 x 4 5/32	TVA-1175.13	1500	50	15/16 x 2 5/32	TVA-1318	2	200	5/16 x 23/32	TVA-1435
150	20	3/8 x 31/32	TVA-1180	2000	50	1 1/8 x 2 5/32	TVA-1318.2	3	200	5/16 x 27/32	TVA-1436
1500	20	7/8 x 1 21/32	TVA-1190	2500	50	1 1/8 x 2 11/16	TVA-1318.3	4	200	3/8 x 27/32	TVA-1437
2300	20	1 x 1 21/32	TVA-1194	3000	50	1 1/4 x 2 11/16	TVA-1318.4	5	200	3/8 x 27/32	TVA-1438
1	25	1/4 x 17/32	TVA-1200	4000	50	1 1/4 x 3 5/32	TVA-1318.5	6	200	3/8 x 31/32	TVA-1439
2	25	1/4 x 17/32	TVA-1201	5000	50	1 3/8 x 3 1/8	TVA-1318.7	8	200	3/8 x 19/32	TVA-1440
3	25	1/4 x 17/32	TVA-1201.1	8000	50	1 3/8 x 4 5/32	TVA-1318.10	10	200	3/8 x 19/32	TVA-1441
4	25	1/4 x 17/32	TVA-1202	250	60	1/2 x 1 9/16	TVA-1319	15	200	7/16 x 19/32	TVA-1442
5	25	1/4 x 17/32	TVA-1203	500	75	1 x 2 21/32	TVA-1319.5	20	200	7/16 x 117/32	TVA-1442.1
6	25	1/4 x 17/32	TVA-1203.1	1000	75	1 x 2 21/32	TVA-1319.7	25	200	1/2 x 19/16	TVA-1442.2
8	25	1/4 x 17/32	TVA-1203.3	*1500	75	1 x 3 21/32	TVA-1319.8	30	200	1/2 x 113/16	TVA-1442.3
10	25	1/4 x 23/32	TVA-1204	2000	75	13/8 x 2 3/8	TVA-1319.9	40	200	13/16 x 113/32	TVA-1442.5
15	25	1/4 x 23/32	TVA-1204.2	10	90	3/8 x 27/32	TVA-1320	50	200	13/16 x 121/32	TVA-1443
20	25	5/16 x 23/32	TVA-1204.5	16	90	3/8 x 31/32	TVA-1321	60	200	7/8 x 121/32	TVA-1443.1
25	25	5/16 x 23/32	TVA-1205	1	100	1/4 x 17/32	TVA-1330	75	200	13/16 x 25/32	TVA-1444
30	25	5/16 x 23/32	TVA-1205.1	2	100	1/4 x 23/32	TVA-1331	85	200	7/8 x 1 29/32	TVA-1444.2
35	25	5/16 x 23/32	TVA-1205.2	3	100	5/16 x 23/32	TVA-1332	100	200	7/8 x 25/32	TVA-1445
40	25	5/16 x 27/32	TVA-1205.7	4	100	5/16 x 23/32	TVA-1333	120	200	1 x 1 29/32	TVA-1446
50	25	5/16 x 27/32	TVA-1206	5	100	5/16 x 27/32	TVA-1334	*150	200	1 x 25/32	*TVA-1447
75	25	3/8 x 27/32	TVA-1206.1	6	100	5/16 x 27/32	TVA-1335	*200	200	1 1/8 x 211/16	*TVA-1480
100	25	3/8 x 31/32	TVA-1207	8	100	3/8 x 27/32	TVA-1336	500	200	1 1/4 x 311/16	TVA-1484
150	25	3/8 x 1 9/32	TVA-1207.5	10	100	3/8 x 27/32	TVA-1337	1	250	5/16 x 23/32	TVA-1500
200	25	3/8 x 117/32	TVA-1207.7	15	100	3/8 x 31/32	TVA-1338	2	250	3/8 x 23/32	TVA-1500.1
250	25	7/16 x 1 9/32	TVA-1208	20	100	3/8 x 19/32	TVA-1339	3	250	3/8 x 27/32	TVA-1500.2
300	25	7/16 x 117/32	TVA-1208.5	25	100	3/8 x 117/32	TVA-1340	4	250	3/8 x 31/32	TVA-1501
350	25	7/16 x 117/32	TVA-1208.6	30	100	3/8 x 117/32	TVA-1341	5	250	3/8 x 19/32	TVA-1502
400	25	1/2 x 1 5/16	TVA-1208.7	40	100	7/16 x 117/32	TVA-1342	6	250	3/8 x 19/32	TVA-1502.1
450	25	1/2 x 1 9/16	TVA-1208.8	50	100	1/2 x 19/16	TVA-1343	8	250	3/8 x 19/32	TVA-1503
500	25	1/2 x 1 9/16	TVA-1209	60	100	1/2 x 19/16	TVA-1344	10	250	7/16 x 19/32	TVA-1504
600	25	1/2 x 113/16	TVA-1209.2	75	100	1/2 x 113/16	TVA-1345	12	250	7/16 x 117/32	TVA-1505
800	25	3/4 x 1 21/32	TVA-1209.4	85	100	3/4 x 113/32	TVA-1345.2	15	250	1/2 x 19/16	TVA-1506
1000	25	13/16 x 1 21/32	TVA-1211	100	100	3/4 x 113/32	TVA-1346	16	250	1/2 x 19/16	TVA-1507
1500	25	7/8 x 1 29/32	TVA-1212	150	100	13/16 x 1 21/32	TVA-1347	20	250	1/2 x 113/16	TVA-1508
2000	25	1 x 1 29/32	TVA-1213	200	100	7/8 x 1 29/32	TVA-1348	25	250	3/4 x 113/32	TVA-1509
2500	25	1 x 1 29/32	TVA-1213.5	250	100	7/8 x 1 29/32	TVA-1349	30	250	13/16 x 113/32	TVA-1510
*3000	25	1 x 2 5/32	TVA-1214	300	100	1 x 1 29/32	TVA-1350	40	250	7/8 x 113/32	TVA-1511
4000	25	1 1/8 x 2 11/16	TVA-1214.2	400	100	1 x 2 5/32	TVA-1375	50	250	7/8 x 1 21/32	TVA-1512
5000	25	1 1/8 x 2 11/16	TVA-1214.5	500	100	1 1/8 x 2 5/32	TVA-1376	60	250	7/8 x 1 29/32	TVA-1513
				600	100	1 1/8 x 2 11/16	TVA-1377	70	250	7/8 x 1 29/32	TVA-1515
				800	100	1 1/8 x 2 11/16	TVA-1379	75	250	7/8 x 25/32	TVA-1520
								85	250	7/8 x 25/32	TVA-1521

*Mounting Strap Attached. *Single-ended with two 8-inch flexible leads.

IND-SERV-EEM-5-EFAI

Sizes subject to change without notice.

SPRAGUE CAPACITORS

TYPE TVA ATOM® ELECTROLYTICS - Continued

μF	WVDC	Dia. x Length	Cat. No.	μF	WVDC	Dia. x Length	Cat. No.	μF	Volts	Dia. x Length	Cat. No.
SINGLE UNITS - Continued											
100	250	1 x 1 29/32	TVA-1522	16	400	3/4 x 1 21/32	TVA-1655	5	10	1/4 x 17/32	TVAN-1110
125	250	7/8 x 2 5/8	TVA-1524	20	400	3/4 x 1 29/32	TVA-1656	6	10	1/4 x 17/32	TVAN-1111
150	250	1 1/8 x 2 5/32	TVA-1525	25	400	7/8 x 1 21/32	TVA-1657	8	10	1/4 x 17/32	TVAN-1112
160	250	1 x 2 5/32	TVA-1526	30	400	15/16 x 1 21/32	TVA-1658	10	10	1/4 x 23/32	TVAN-1112.4
*200	250	1 1/4 x 2 11/16	TVA-1528	40	400	15/16 x 1 29/32	TVA-1659	30	10	5/16 x 27/32	TVAN-1115
225	250	1 x 3 5/32	TVA-1528.2	50	400	1 x 2 5/32	TVA-1660	50	10	3/8 x 23/32	TVAN-1117
250	250	1 x 3 5/32	TVA-1528.3	60	400	1 x 2 13/32	TVA-1661	160	10	3/8 x 1 9/32	TVAN-1120
300	250	1 1/4 x 3 5/32	TVA-1528.5	75	400	1 1/8 x 2 5/32	TVA-1662	170	10	3/8 x 1 9/32	TVAN-1121
400	250	1 1/4 x 3 11/16	TVA-1528.7	85	400	1 1/8 x 2 11/16	TVA-1663	450	10	5/8 x 1 21/32	TVAN-1125
450	250	1 3/8 x 3 11/16	TVA-1528.8	100	400	1 1/4 x 2 11/16	TVA-1664	500	10	5/8 x 1 21/32	TVAN-1126
500	250	1 3/8 x 3 11/16	TVA-1528.9	150	400	1 1/4 x 3 5/32	TVA-1665	2000	10	7/8 x 2 5/32	TVAN-1129
600	250	1 3/8 x 4 5/32	TVA-1529	200	400	1 1/4 x 3 11/16	TVA-1666	500	12	5/8 x 2 1/8	TVAN-1132.1
6	275	3/8 x 1 17/32	TVA-1530	250	400	1 3/8 x 4 5/32	TVA-1667	4	15	1/4 x 17/32	TVAN-1150
1	300	5/16 x 23/32	TVA-1540	1	450	3/8 x 27/32	TVA-1700	10	15	1/4 x 23/32	TVAN-1155
2	300	3/8 x 27/32	TVA-1541	2	450	3/8 x 1 9/32	TVA-1701	500	15	5/8 x 2 1/8	TVAN-1162.1
3	300	3/8 x 31/32	TVA-1542	3	450	7/16 x 1 9/32	TVA-1701.1	1000	15	3/4 x 2 1/8	TVAN-1163.1
4	300	3/8 x 1 9/32	TVA-1543	4	450	7/16 x 1 17/32	TVA-1702	2.5	20	1/4 x 17/32	TVAN-1176
5	300	3/8 x 1 9/32	TVA-1544	5	450	1/2 x 1 5/16	TVA-1703	1	25	1/4 x 23/32	TVAN-1200
6	300	3/8 x 1 17/32	TVA-1545	6	450	1/2 x 1 9/16	TVA-1703.1	2	25	1/4 x 17/32	TVAN-1202
8	300	7/16 x 1 17/32	TVA-1546	8	450	1/2 x 1 13/16	TVA-1704	4	25	1/4 x 23/32	★TVA-1202.2
10	300	7/16 x 1 17/32	TVA-1547	10	450	1/2 x 1 13/16	TVA-1705	5	25	1/4 x 23/32	TVAN-1203.1
12	300	1/2 x 1 9/16	TVA-1548	12	450	3/4 x 1 21/32	TVA-1706	8	25	5/16 x 23/32	★TVA-1203.8
15	300	1/2 x 1 9/16	TVA-1549	15	450	3/4 x 1 29/32	TVA-1707	10	25	5/16 x 23/32	TVAN-1204.1
20	300	1/2 x 1 13/16	TVA-1550	16	450	7/8 x 1 21/32	TVA-1708	16	25	5/16 x 27/32	TVAN-1204.3
25	300	3/4 x 1 21/32	TVA-1551	20	450	13/16 x 2 5/32	TVA-1709	20	25	3/8 x 27/32	TVAN-1204.6
30	300	3/4 x 1 29/32	TVA-1552	25	450	15/16 x 1 29/32	TVA-1710	25	25	3/8 x 23/32	TVAN-1205.1
40	300	13/16 x 1 29/32	TVA-1553	30	450	1 x 1 29/32	TVA-1711	35	25	3/8 x 27/32	TVAN-1205.5
50	300	7/8 x 1 29/32	TVA-1570	40	450	15/16 x 2 13/32	TVA-1712	50	25	3/8 x 31/32	TVAN-1206.1
60	300	7/8 x 2 5/32	TVA-1570.1	50	450	1 1/8 x 2 5/32	TVA-1713	100	25	3/8 x 1 17/32	TVAN-1207.1
75	300	1 x 2 5/32	TVA-1571	60	450	1 1/8 x 2 5/32	TVA-1714	3	30	1/4 x 23/32	TVAN-1215
85	300	1 x 2 13/32	TVA-1571.2	75	450	1 1/4 x 2 11/16	TVA-1715	20	30	3/8 x 27/32	TVAN-1220
100	300	1 1/8 x 2 5/32	TVA-1573	80	450	1 x 3 21/32	TVA-1716	10	40	5/16 x 27/32	TVAN-1230
*140	300	1 x 3 5/32	★TVA-1575	85	450	1 1/4 x 2 11/16	TVA-1717	20	40	3/8 x 31/32	TVAN-1232
*150	300	1 1/4 x 2 11/16	TVA-1576	100	450	1 1/4 x 3 5/32	TVA-1718	2	50	1/4 x 23/32	TVAN-1301.1
*200	300	1 1/4 x 3 5/32	TVA-1578	120	450	1 1/4 x 3 11/16	TVA-1718.3	3	50	1/4 x 23/32	TVAN-1302.1
300	300	1 3/8 x 3 11/16	TVA-1580	*150	450	1 3/8 x 3 11/16	TVA-1719	4	50	1/4 x 23/32	★TVA-1302.5
400	300	1 3/8 x 4 5/32	TVA-1582	160	450	1 3/8 x 3 11/16	TVA-1719.2	5	50	5/16 x 23/32	TVAN-1303.1
1	350	5/16 x 27/32	TVA-1599	*200	450	1 3/8 x 4 5/32	TVA-1720	10	50	5/16 x 27/32	TVAN-1304.1
2	350	3/8 x 27/32	TVA-1600	1	475	1/2 x 1 13/32	TVA-1790	25	50	3/8 x 1 9/32	TVAN-1306.1
3	350	3/8 x 31/32	TVA-1600.1	2	475	5/8 x 1 5/32	TVA-1791	30	50	3/8 x 1 9/32	TVAN-1306.2
4	350	3/8 x 1 9/32	TVA-1601	3	475	5/8 x 1 13/32	TVA-1792	50	50	7/16 x 1 9/32	TVAN-1308.1
5	350	3/8 x 1 17/32	TVA-1602.5	4	475	5/8 x 1 21/32	TVA-1800	60	50	7/16 x 1 17/32	TVAN-1309.2
6	350	3/8 x 1 17/32	TVA-1602.6	5	475	5/8 x 1 21/32	TVA-1800.1	100	50	1/2 x 1 9/16	TVAN-1310.1
8	350	7/16 x 1 17/32	TVA-1603	6	475	11/16 x 1 21/32	TVA-1800.2	10	100	1/2 x 1 5/8	TVAN-1333
10	350	1/2 x 1 9/16	TVA-1604	8	475	3/4 x 1 13/32	TVA-1801	20	100	5/8 x 1 21/32	TVAN-1335
12	350	1/2 x 1 9/16	TVA-1605	10	475	3/4 x 1 21/32	TVA-1802	40	100	3/4 x 1 21/32	TVAN-1340
15	350	1/2 x 1 13/16	TVA-1607	12	475	3/4 x 1 29/32	TVA-1802.1	4	150	9/16 x 1 21/32	TVAN-1402.1
16	350	3/4 x 1 13/32	TVA-1607.1	15	475	13/16 x 1 29/32	TVA-1803	10	150	3/4 x 1 13/32	TVAN-1406.1
20	350	3/4 x 1 21/32	TVA-1608	16	475	7/8 x 1 21/32	TVA-1803.1	40	150	3/4 x 2 1/8	TVAN-1413.1
25	350	3/4 x 1 29/32	TVA-1609	20	475	13/16 x 2 5/32	TVA-1804	2	200	1/2 x 1 13/32	TVAN-1435.1
30	350	7/8 x 1 21/32	TVA-1610	1	500	1/2 x 1 5/32	TVA-1890	4	200	1 x 1 29/32	TVAN-1436
40	350	7/8 x 1 29/32	TVA-1611	3	500	5/8 x 1 13/32	TVA-1895	60	200	1 x 2 21/32	TVAN-1440
50	350	7/8 x 2 5/32	TVA-1612	5	500	3/4 x 1 5/32	TVA-1901	1	300	1/2 x 1 13/32	TVAN-1560
60	350	15/16 x 2 5/32	TVA-1613	8	500	3/4 x 1 21/32	TVA-1902	20	300	7/8 x 1 29/32	TVAN-1568
75	350	1 x 2 13/32	TVA-1614	10	500	3/4 x 1 21/32	TVA-1903	5	350	3/4 x 1 21/32	TVAN-1602
85	350	1 1/8 x 2 5/32	TVA-1615	12	500	7/8 x 1 29/32	TVA-1904	10	350	1 x 1 29/32	TVAN-1604.1
100	350	1 x 2 21/32	TVA-1620	16	500	7/8 x 2 5/32	TVA-1905	20	350	1 x 2 5/32	TVAN-1608.1
*150	350	1 1/4 x 2 11/16	TVA-1622	20	500	7/8 x 2 5/32	TVA-1906	10	400	7/8 x 1 29/32	★TVA-1650
160	350	1 x 3 21/32	TVA-1623	30	500	1 x 1 29/32	TVA-1907	20	400	1 x 2 5/32	TVAN-1652
*200	350	1 1/4 x 3 5/32	TVA-1624	40	500	1 x 2 13/32	TVA-1908	10	450	1 x 1 29/32	TVAN-1705.1
250	350	1 3/8 x 3 11/16	TVA-1627	60	500	1 x 3 13/32	TVA-1910	DUAL UNITS			
*300	350	1 3/8 x 4 5/32	TVA-1628	15	525	7/8 x 2 5/32	TVA-1920	μF	WVDC	Dia. x Length	Cat. No.
1	385	3/8 x 27/32	TVA-1640	2	550	5/8 x 1 5/32	TVA-1930	1500-1000	20-20	1 1/16 x 3 7/16	TVA-2175
2	385	3/8 x 1 9/32	TVA-1641	4	600	13/16 x 2 3/8	TVA-1960	2000-500	30-30	1 1/4 x 3 3/8	†TVA-2231
4	385	7/16 x 1 9/32	TVA-1643	8	600	1 1/16 x 2 7/8	TVA-1962	3000-1000	30-30	1 1/2 x 3 5/8	†TVA-2232.1
1	400	3/8 x 27/32	TVA-1645	10	600	1 1/16 x 3 3/16	TVA-1963	5000-1000	30-30	1 1/2 x 4 3/8	†TVA-2235
2	400	3/8 x 1 9/32	TVA-1646	16	600	1 1/16 x 4 3/16	TVA-1965	10-10	50-50	13/16 x 1 5/16	★TVA-2315
3	400	3/8 x 1 17/32	TVA-1647	20	600	1 1/16 x 3 7/8	TVA-1966	100-500	75-75	1 1/2 x 3 7/8	†TVA-2330
4	400	7/16 x 1 9/32	TVA-1648	SINGLE UNITS (Non-Polarized)				200-150	85-25	15/16 x 2 5/16	TVA-2335
5	400	7/16 x 1 17/32	TVA-1649	μF	Volts	Dia. x Length	Cat. No.	15-25	150-25	7/8 x 1 3/16	TVA-2345
6	400	1/2 x 1 5/16	TVA-1650	500	3	3/8 x 1 17/32	TVAN-1095	350-100	150-50	1 1/8 x 3 5/8	†TVA-2358
8	400	1/2 x 1 9/16	TVA-1651	50	6	3/8 x 23/32	TVAN-1100.1	16-16	150-150	13/16 x 1 9/16	★TVA-2420
10	400	1/2 x 1 13/16	TVA-1652	125	6	3/8 x 31/32	TVAN-1101.5	30-20	150-150	7/8 x 1 7/16	★TVA-2421
12	400	1/2 x 1 13/16	TVA-1653	500	6	1/2 x 1 13/16	TVAN-1103.1	20-12	150-150	13/16 x 1 9/16	★TVA-2425
15	400	3/4 x 1 21/32	TVA-1654	2	10	1/4 x 17/32	TVAN-1109	20-20	150-150	3/4 x 1 7/16	★TVA-2428
								30-30	150-150	7/8 x 1 7/16	★TVA-2434
								40-20	150-150	7/8 x 1 7/16	★TVA-2438

★Mounting Strap Attached.

*Single-ended with two 8-inch flexible leads.

†Kraftboard Case Construction.

IND-SERV-EEM-6-EFAI

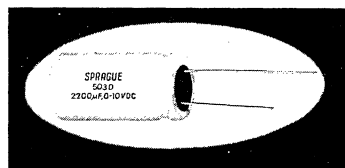
Sizes subject to change without notice.

SPRAGUE CAPACITORS

TYPE TVA ATOM® ELECTROLYTICS - Continued

μF	WVDC	Dia. x Length	Cat. No.	μF	WVDC	D. x L.	Cat. No.	μF	WVDC	D. x L.	Cat. No.
DUAL UNITS - Continued				200-100	150-150	1 3/8 x 3 7/8	†★TVA-2470	10-100	450-50	15/16 x 2 5/16	★TVA-2663
40-30	150-150	15/16 x 1 13/16	★TVA-2442	250-50	150-150	1 3/8 x 2 7/8	†TVA-2473	8-8	450-450	15/16 x 1 13/16	★TVA-2720
40-40	150-150	7/8 x 1 15/16	★TVA-2445	425-20	150-150	1 3/8 x 3 3/8	†★TVA-2473.5	10-10	450-450	7/8 x 1 15/16	★TVA-2722
50-30	150-150	7/8 x 1 15/16	★TVA-2450	250-200	150-150	1 3/8 x 3 7/8	†TVA-2475	16-8	450-450	15/16 x 2 5/16	★TVA-2725
50-50	150-150	7/8 x 1 15/16	★TVA-2453	60-125	200-50	1 1/8 x 2 7/8	†★TVA-2484	20-20	450-450	7/8 x 2 11/16	TVA-2730
60-20	150-150	7/8 x 1 15/16	★TVA-2455	60-1	200-200	15/16 x 2 5/16	★TVA-2493	30-30	450-450	1 x 3 3/16	★TVA-2735
60-40	150-150	15/16 x 2 13/16	★TVA-2456	200-5	200-200	1 x 3 11/16	★TVA-2498	40-40	450-450	1 x 3 15/16	★TVA-2740
60-60	150-150	15/16 x 2 13/16	★TVA-2457	20-20	250-250	15/16 x 1 13/16	★TVA-2515	50-30	450-450	1 x 3 15/16	★TVA-2743
80-20	150-150	7/8 x 2 7/16	★TVA-2459	40-10	250-250	7/8 x 1 15/16	★TVA-2520	80-30	450-450	1 x 4 7/16	★TVA-2750
80-30	150-150	7/8 x 2 3/16	★TVA-2460	80-10	250-250	1 x 2 3/16	★TVA-2525	20-100	475-50	1 1/16 x 2 9/16	★TVA-2765
80-40	150-150	7/8 x 2 7/16	★TVA-2461	120-80	250-250	1 3/8 x 3 1/8	†TVA-2535	DUAL UNITS - separate sections - 4 leads			
80-50	150-150	7/8 x 2 7/16	★TVA-2462	140-100	300-50	1 3/8 x 3 3/8	†TVA-2563	(available until present stocks are exhausted)			
100-50	150-150	1 x 2 11/16	★TVA-2463	200-100	300-50	1 3/8 x 3 7/8	†★TVA-2565	20-20	150-150	1 x 2 3/8	TU-220
100-100	150-150	1 x 3/8 x 3 3/8	†TVA-2464	60-32	300-300	1 1/16 x 3 1/16	★TVA-2585	40-20	150-150	1 1/16 x 2 5/8	TU-420
130-20	150-150	15/16 x 2 13/16	TVA-2464.8	150-100	300-300	1 3/8 x 4 3/8	†TVA-2590	120-120	150-150	1 1/16 x 4	TU-2120
150-20	150-150	1 x 2 11/16	TVA-2465.5	150-100	350-25	1 1/2 x 3 1/8	TVA-2622	16-16	250-250	1 x 2 7/8	TU-216
150-50	150-150	1 1/16 x 2 13/16	TVA-2465.8	30-5	350-350	15/16 x 2 5/16	TVA-2635.5	8-8	450-450	1 1/16 x 3 3/8	TU-88
150-150	150-150	1 3/8 x 3 1/8	†TVA-2466	30-20	350-350	1 x 1 15/16	TVA-2636	16-16	450-450	1 3/8 x 3 1/8	TU-1616
200-5	150-150	1 x 3 7/16	★TVA-2467	140-5	350-350	1 1/4 x 3 7/8	†★TVA-2640				

TYPE 503D VERTI-LYTIC® MINIATURE ELECTROLYTICS



- Made in Hong Kong by Sprague World Trade Corp. to meet the demand for low-cost capacitors in high-density applications.
- Metal-encased, with plastic insulating sleeve.
- Designed for 85 C operation.

- Excellent capacitance stability and ESR.
- Low leakage current.
- For complete technical data, refer to latest issue of Engineering Bulletin 3153.

μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.
0-6 WVDC, 8 V SURGE			220	.394 x .787	503D227G016CG	220	.512 x .984	503D227G035DH
47	.236 x .433	503D476G6R3AS	330	.512 x .787	503D337G016DG	330	.630 x .984	503D337G035EK
100	.315 x .492	503D107G6R3BB	470	.512 x .984	503D477G016DK	470	.630 x 1.240	503D477G035ER
470	.394 x .787	503D477G6R3CG	680	.630 x .984	503D687G016EK	680	.630 x 1.437	503D687G035EU
680	.512 x .787	503D687G6R3DG	1000	.630 x 1.240	503D108G016ER	0-50 WVDC, 63 V SURGE		
1000	.512 x .984	503D108G6R3DK	1500	.630 x 1.614	503D158G016ET	2.2	.197 x .433	503D225G050HS
1500	.630 x .984	503D158G6R3EK	0-25 WVDC, 32 V SURGE			4.7	.236 x .433	503D475G050AS
2200	.630 x 1.240	503D228G6R3ER	0.47	.197 x .433	503D474G025HS	15	.315 x .492	503D156G050BB
3300	.630 x 1.614	503D338G6R3ET	0.68	.197 x .433	503D684G025HS	33	.394 x .630	503D336G050CD
0-10 WVDC, 13, V SURGE			1.0	.197 x .433	503D105G025HS	68	.394 x .787	503D686G050CG
33	.236 x .433	503D336G010AS	1.5	.197 x .433	503D155G025HS	100	.512 x .787	503D107G050DDG
68	.315 x .492	503D686G010BB	2.2	.197 x .433	503D225G025HS	220	.630 x .984	503D227G050EK
100	.394 x .492	503D107G010CB	3.3	.197 x .433	503D335G025HS	330	.630 x 1.240	503D337G050ER
150	.394 x .492	503D157G010CB	4.7	.197 x .433	503D475G025HS	470	.630 x 1.614	503D477G050ET
220	.394 x .630	503D227G010CD	6.8	.236 x .433	503D686G025AS	0-63 WVDC, 73 V SURGE		
330	.394 x .787	503D337G010CG	10	.236 x .433	503D106G025AS	0.47	.197 x .433	503D474G063HS
470	.512 x .787	503D477G010DG	15	.315 x .492	503D156G025BB	0.68	.197 x .433	503D684G063HS
680	.512 x .984	503D687G010DK	22	.315 x .492	503D226G025BB	1.0	.197 x .433	503D105G063HS
1000	.630 x .984	503D108G010EK	33	.315 x .492	503D336G025BB	1.5	.197 x .433	503D155G063HS
1500	.630 x 1.240	503D158G010ER	47	.394 x .492	503D476G025CB	2.2	.236 x .433	503D225G063AS
2200	.630 x 1.437	503D228G010EU	68	.394 x .630	503D686G025CD	3.3	.236 x .433	503D335G063AS
0-16 WVDC, 20 V SURGE			100	.394 x .787	503D107G025CD	4.7	.315 x .492	503D475G063BB
6.8	.197 x .433	503D685G016HS	150	.512 x .787	503D157G025DG	6.8	.315 x .492	503D685G063BB
10	.197 x .433	503D106G016HS	220	.512 x .787	503D227G025DG	10	.315 x .492	503D106G063BB
15	.236 x .433	503D156G016AS	330	.512 x .984	503D337G025DK	15	.394 x .492	503D156G063CB
22	.236 x .433	503D226G016AS	470	.630 x .984	503D477G025EK	22	.394 x .492	503D226G063CB
47	.315 x .492	503D476G016BB	680	.630 x 1.240	503D687G025ER	33	.394 x .787	503D336G063CG
68	.394 x .492	503D686G016CB	1000	.630 x 1.437	503D108G025EU	47	.394 x .787	503D476G063CG
100	.394 x .630	503D107G016CD	0-35 WVDC, 44 V SURGE			68	.512 x .787	503D686G063DG
150	.394 x .630	503D157G016CD	6.8	.236 x .433	503D685G035AS	100	.512 x .984	503D107G063DK
			33	.394 x .492	503D336G035CB	150	.630 x .984	503D157G063EK
			47	.394 x .630	503D476G035CD	220	.630 x 1.437	503D227G063EU
			150	.512 x .787	503D157G035DG	330	.630 x 1.614	503D337G063ET

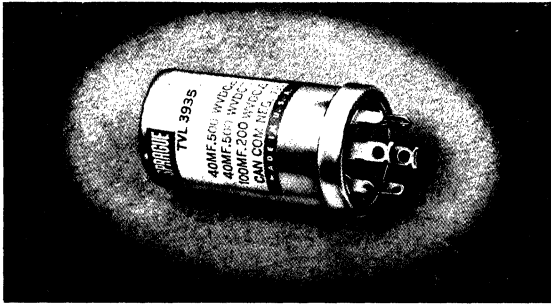
★Mounting Strap Attached. †Kraftboard Case Construction.

EEM-21-EFAI

Sizes subject to change without notice.

SPRAGUE CAPACITORS

TYPE TVL TWIST-LOK® ELECTROLYTICS



- Capacitors to 475V Operate up to 85 C (185 F). Higher Voltage Units Designed for 65 C
- Withstand High Surge Voltages
- Etched Cathode Construction. Ideal for High Ripple Selenium Rectifier Circuits
- Can be Mounted "Above Ground" Using Phenolic Mounting Plate and Insulating Tube
- Units Noted by † Sign are Exact Replacements for Color TV
- Catalog numbers with a TVLP Prefix Indicate Units with a Common Positive.

For a more complete line of over 600 Type TVL Capacitors, refer to Sprague Catalog C-563.

μF	WVDC	D. x L.	Cat. No.	μF	WVDC	D. x L.	Cat. No.	μF	WVDC	D. x L.	Cat. No.
SINGLE UNITS				DUAL UNITS				TRIPLE UNITS			
†1000	15	1 x 1½	TVL-1165	150	300	1½ x 3½	TVL-1584	†200-200	250-250	1½ x 4	TVL-2538
2000	15	1½ x 2	TVL-1168	160	300	1½ x 2½	TVL-1585	150-250	300-150	1½ x 3	TVL-2560.7
3000	15	1½ x 2	TVL-1170	†200	300	1½ x 3	TVL-1586	150-100	300-300	1½ x 3	TVL-2591
4000	15	1½ x 2	TVL-1173	†250	300	1½ x 3	TVL-1590	200-100	300-300	1½ x 4	TVL-2595
500	25	1 x 1½	TVL-1220	40	350	1 x 2	TVL-1621	20-20	350-350	1 x 2	TVL-2626
1000	25	1½ x 2	TVL-1230	50	350	1 x 2	TVL-1622	30-30	350-350	1 x 2½	TVL-2628
†2000	25	1½ x 1½	TVL-1242	80	350	1½ x 2	TVL-1630	†50-10	350-350	1 x 3	TVL-2629
†400	35	1 x 1½	TVL-1256	†100	350	1½ x 2	TVL-1635	†50-30	350-350	1½ x 2	TVL-2630
†3000	35	1½ x 2½	TVL-1269	125	350	1½ x 2½	TVL-1638	80-40	350-350	1½ x 2½	TVL-2634
100	50	¾ x 2	TVL-1317	†150	350	1½ x 2½	TVL-1642	†80-80	350-350	1½ x 2½	TVL-2635
250	50	1 x 2	TVL-1324	†200	350	1½ x 3½	TVL-1643	†100-40	350-350	1½ x 3	TVL-2638
†500	50	1½ x 2	TVL-1330	†250	350	1½ x 3½	TVL-1644.2	100-60	350-350	1½ x 2½	TVL-2639
†500	50	1 x 1½	TVL-1330.1	†320	350	1½ x 4	TVL-1645	†100-100	350-350	1½ x 3	TVL-2641
†1000	50	1½ x 2½	TVL-1338	10	450	1 x 1½	TVL-1705	†150-100	350-350	1½ x 3½	TVL-2642.4
†1500	50	1½ x 2½	TVL-1341	20	450	1 x 2	TVL-1714	†150-150	350-350	1½ x 4	TVL-2642.5
2000	50	1½ x 2½	TVLP-1342	30	450	1 x 2½	TVL-1720	160-10	350-350	1½ x 3	TVL-2643
†50	150	1 x 1½	TVL-1415	40	450	1 x 2½	TVL-1725	†200-200	350-350	1½ x 4½	TVL-2645.5
100	150	1 x 1½	TVL-1423	†50	450	1 x 2½	TVL-1728	300-20	350-350	1½ x 4	TVL-2645.7
120	150	1 x 2	TVL-1425	†70	450	1½ x 3	TVL-1734	80-80	400-200	1½ x 3½	TVL-2656
140	150	1 x 2½	TVL-1428	†80	450	1½ x 2½	TVL-1735	†100-80	400-350	1½ x 4	TVL-2657.16
150	150	1 x 2	TVL-1429	100	450	1½ x 2½	TVL-1750	†60-60	400-400	1½ x 3	TVL-2668
150	150	1½ x 2	TVL-1430	125	450	1½ x 3	TVL-1760	†100-100	400-400	1½ x 4	TVL-2678.5
200	150	1½ x 2	TVL-1431	†150	450	1½ x 3½	TVL-1770	†80-40	450-200	1½ x 3	TVL-2720
200	150	1 x 3	TVL-1431.1	160	450	1½ x 4	TVL-1772	†20-160	450-250	1½ x 2½	TVL-2722.7
300	150	1½ x 2	TVL-1434	†90	475	1½ x 3½	TVL-1850	†80-200	450-250	1½ x 4½	TVL-2722.8
†500	150	1½ x 3½	TVL-1439.5	30	500	1 x 2½	TVL-1947	†90-200	450-250	1½ x 4	TVL-2723
†120	200	1½ x 2	TVL-1469	40	500	1 x 2½	TVL-1950	†10-50	450-350	1½ x 2	TVL-2726
125	200	1 x 2½	TVL-1470	†80	500	1½ x 2½	TVL-1958	†80-2	450-350	1½ x 2½	TVL-2738.5
150	200	1 x 3	TVL-1741	†90	500	1½ x 2½	TVL-1960	†10-10	450-450	1 x 2	TVL-2750
†150	200	1½ x 2	TVL-1471.1	†100	500	1½ x 3	TVL-1962	†20-20	450-450	1 x 2½	TVL-2755
160	200	1½ x 2	TVL-1473	DUAL UNITS				†30-10	450-450	1 x 2½	TVL-2757
†200	200	1½ x 2	TVL-1475	†1000-1000	15-15	1½ x 2½	TVL-2161	30-30	450-450	1½ x 2	TVL-2759
†200	200	1 x 3½	TVL-1475.1	†500-500	25-25	1½ x 2	TVL-2233	†40-20	450-450	1½ x 2	TVL-2762
†220	200	1 x 3½	TVL-1476	1000-500	25-25	1½ x 2	TVL-2239	†40-40	450-450	1½ x 2½	TVL-2764
†300	200	1½ x 4	TVL-1480	†500-500	35-35	1½ x 2	TVL-2245.5	†50-50	450-450	1½ x 3	TVL-2767
†400	200	1½ x 3½	TVL-1485	100-100	50-50	1 x 1½	TVL-2326	60-20	450-450	1½ x 3	TVL-2768
†500	200	1½ x 4	TVL-1490	†1000-1000	50-50	1½ x 2½	TVL-2335.4	†60-60	450-450	1½ x 3	TVL-2772
20	250	1 x 1½	TVL-1509	40-40	150-150	1 x 1½	TVL-2428	80-10	450-450	1½ x 3	TVL-2776
40	250	1 x 2	TVL-1519	50-30	150-150	1 x 1½	TVL-2432	80-20	450-450	1½ x 2½	TVL-2776.5
80	250	1 x 2	TVL-1530	†50-50	150-150	1 x 1½	TVL-2435	†80-40	450-450	1½ x 3½	TVL-2778
100	250	1 x 3	TVL-1535	70-30	150-150	1 x 2	TVL-2439	†80-50	450-450	1½ x 3½	TVL-2778.5
150	250	1 x 2½	TVL-1539	80-50	150-150	1 x 2	TVL-2442.1	†80-80	450-450	1½ x 3½	TVL-2779
150	250	1½ x 2	TVL-1540	200-200	150-150	1½ x 2½	TVL-2447	†100-40	450-450	1½ x 3½	TVL-2780
†160	250	1½ x 2½	TVL-1541	†50-250	175-175	1½ x 2	TVL-2449.5	†100-60	450-450	1½ x 4	TVL-2782
†160	250	1 x 3½	TVL-1541.1	60-60	200-200	1 x 1½	TVL-2461	†100-100	450-450	1½ x 4	TVL-2782.5
†200	250	1½ x 2½	TVL-1547	100-100	200-200	1½ x 3	TVL-2464	†120-20	450-450	1½ x 3½	TVL-2783
†250	250	1½ x 4	TVL-1548	†250-100	200-200	1½ x 3	TVL-2475	†80-80	475-250	1½ x 3½	TVL-2807.8
†300	250	1½ x 2½	TVL-1550	300-300	200-200	1½ x 4	TVL-2475.5	†80-160	475-250	1½ x 4½	TVL-2808
†80	300	1 x 2½	TVL-1573	20-20	250-250	1 x 1½	TVL-2515	20-20	500-500	1½ x 2	TVL-2935
100	300	1 x 2½	TVL-1578	40-40	250-250	1 x 1½	TVL-2520	30-30	500-500	1½ x 2	TVL-2937
				†150-150	250-250	1½ x 2½	TVL-2535	40-40	500-500	1½ x 2½	TVL-2940
								60-40	500-500	1½ x 3½	TVL-2944
850-400-4	16-16-11.5	1 x 2½	TVL-3021	250-100-5	200-200-200	1½ x 3	TVL-3489.5				
†600-400-100	100-100-100	1½ x 4	TVL-3402.6	250-200-10	200-200-200	1½ x 4	TVL-3490				
40-30-20	150-150-150	1 x 2	TVL-3438	†250-200-50	200-200-200	1½ x 3½	TVL-3491				
40-40-40	150-150-150	1 x 1½	TVL-3440								
50-50-50	150-150-150	1 x 2	TVL-3442								
60-40-20	150-150-150	1 x 1½	TVL-3443	†4-80-10	300-175-150	1 x 2	TVL-3560.21				
80-40-20	150-150-150	1 x 2	TVL-3444	80-10-200	300-300-200	1½ x 3	TVL-3577.9				
†250-200-50	150-150-150	1½ x 3½	TVL-3453.8	80-40-40	300-300-300	1½ x 2½	TVL-3583				
200-200-40	175-175-175	1½ x 4	TVL-3454.12	200-100-2	300-300-300	1½ x 4	TVL-3588				
250-200-50	200-150-150	1½ x 3	TVL-3461.7	150-100-100	350-350-50	1½ x 4½	TVL-3628.5				
250-200-50	200-150-150	1½ x 3½	TVL-3461.8	†250-3-100	350-350-25	1½ x 4	TVL-3636.18				
200-150-150	200-200-200	1½ x 4	TVL-3489.3	150-5-100	350-350-50	1½ x 2½	TVL-3637.3				
				100-150-200	350-350-25	1½ x 3½	TVL-3637.10				

SPRAGUE CAPACITORS

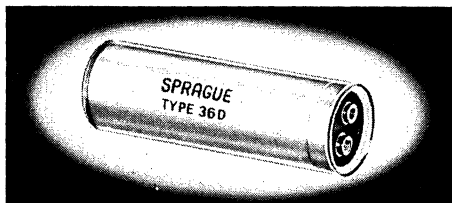
TVL TWIST-LOK ELECTROLYTICS, continued

μF	WVDC	D. x L.	Cat. No.	μF	WVDC	D. x L.	Cat. No.
†50-50-50	350-350-350	1 3/8 x 3 1/2	TVL-3639.9	†200-40-100-20	350-50-50-50	1 3/8 x 3 1/2	TVL-4599.4
60-40-20	350-350-350	1 3/8 x 2 1/2	TVL-3640	100-150-5-100	350-200-150-50	1 3/8 x 3	TVL-4603.7
80-60-60	350-350-350	1 3/8 x 3 1/2	TVL-3642	350-200-200-50	350-200-200-50	1 3/8 x 2	TVL-4603.13
†100-100-40	350-350-350	1 3/8 x 4	TVL-3646.5	†5-100-20-100	350-200-200-25	1 3/8 x 2	TVL-4603.15
140-140-20	350-350-350	1 3/8 x 4	TVL-3648	†120-100-100-100	350-300-150-75	1 3/8 x 4	TVL-4604.15
†200-300-4	350-350-350	1 3/8 x 3 1/2	TVL-3648.5	†180-80-150-100	350-200-200-200	1 3/8 x 4 1/2	TVL-4604.17
†200-80-120	350-350-350	1 3/8 x 4 1/2	TVL-3648.6	150-20-200-120	350-350-175-175	1 3/8 x 4	TVL-4608.10
†160-100-60	350-350-350	1 3/8 x 4 1/2	TVL-3648.7	†100-50-100-100	350-350-200-50	1 3/8 x 3 1/2	TVL-4608.11
†400-40-25	350-350-350	1 3/8 x 4 1/2	TVL-3648.9	†5-20-100-100	350-350-200-50	1 3/8 x 2	TVL-4608.12
80-80-200	400-200-25	1 3/8 x 3	TVL-3651.8	100-60-100-100	350-350-200-150	1 3/8 x 4 1/2	TVL-4609.4
80-80-100	400-200-50	1 3/8 x 3	TVL-3652	150-100-20-100	350-350-350-25	1 3/8 x 4 1/2	TVL-4622.9
10-4-20	400-350-25	1 x 2	TVL-3668	†250-20-20-50	350-350-350-25	1 3/8 x 4 1/2	TVL-4622.11
80-40-100	400-400-50	1 3/8 x 3	TVL-3683	†150-100-10-60	350-350-350-50	1 3/8 x 4 1/2	TVL-4624.8
80-40-150	400-400-50	1 3/8 x 4	TVL-3684	150-100-10-100	350-350-350-50	1 3/8 x 4	TVL-4633.8
100-10-80	400-400-350	1 3/8 x 3 1/2	TVL-3689.3	†20-20-20-20	350-350-350-350	1 3/8 x 2 1/2	TVL-4634.13
†100-30-20	400-400-400	1 3/8 x 4	TVL-3697	†40-100-200-250	350-350-200-350	1 3/8 x 5	TVL-4634.25
†50-160-50	450-250-50	1 3/8 x 4	TVL-3711.2	†40-40-40-40	350-350-350-350	1 3/8 x 4	TVL-4635.3
†20-160-40	450-250-150	1 3/8 x 3 1/2	TVL-3711.3	80-60-40-20	350-350-350-350	1 3/8 x 3 1/2	TVL-4635.7
†50-10-160	450-350-250	1 3/8 x 4 1/2	TVL-3719.4	100-100-50-50	350-350-350-350	1 3/8 x 4	TVL-4635.15
†80-2-25	450-350-25	1 3/8 x 2 1/2	TVL-3719.10	150-100-50-10	350-350-350-350	1 3/8 x 4	TVL-4635.16
†80-50-100	450-350-200	1 3/8 x 3 1/2	TVL-3723.7	†100-150-20-20	350-350-350-350	1 3/8 x 4 1/2	TVL-4635.23
†20-20-20	450-350-350	1 x 3 1/2	TVL-3724.12	†100-250-100-25	350-350-350-350	1 3/8 x 4 1/2	TVL-4635.27
†150-50-10	250-450-400	1 3/8 x 4	TVL-3725.11	80-80-4-100	400-200-150-50	1 3/8 x 3 1/2	TVL-4636.3
10-10-20	450-450-25	1 x 2	TVL-3731	10-4-4-20	400-350-150-25	1 3/8 x 2	TVL-4651.5
20-20-20	450-450-25	1 x 3	TVL-3739	40-80-100-25	400-350-200-50	1 3/8 x 3	TVL-4654
†80-65-50	450-450-50	1 3/8 x 3 1/2	TVL-3754.9	80-40-100-40	400-400-50-25	1 3/8 x 3	TVL-4663.3
†80-20-100	450-450-50	1 3/8 x 3	TVL-3757	80-40-100-20	400-400-50-25	1 3/8 x 3	TVL-4663.4
†80-50-50	450-450-50	1 3/8 x 4	TVL-3757.1	100-10-30-20	400-400-50-50	1 3/8 x 2 1/2	TVL-4663.5
†50-80-250	450-450-50	1 3/8 x 4	TVL-3757.4	†80-10-80-100	400-400-250-50	1 3/8 x 3	TVL-4664.8
†50-5-50	450-450-350	1 3/8 x 3	TVL-3774.5	100-10-20-20	400-400-350-50	1 3/8 x 3	TVL-4666.2
†50-20-4	450-450-350	1 x 3 1/2	TVL-3774.6	80-40-10-100	400-400-400-200	1 3/8 x 3 1/2	TVL-4671.2
†10-80-80	400-450-450	1 3/8 x 4 1/2	TVL-3775.7	†80-40-30-4	400-400-400-350	1 3/8 x 3	TVL-4672
†80-80-20	450-450-400	1 3/8 x 3 1/2	TVL-3775.9	100-80-10-10	400-400-400-400	1 3/8 x 3 1/2	TVL-4683
10-10-10	450-450-450	1 x 2	TVL-3776	†100-80-30-10	400-400-400-400	1 3/8 x 4 1/2	TVL-4683.8
15-15-15	450-450-450	1 x 2 1/2	TVL-3778.2	†100-100-40-10	400-400-400-400	1 3/8 x 4 1/2	TVL-4684
†20-20-20	450-450-450	1 3/8 x 2	TVL-3780	†20-160-50-50	450-250-75-50	1 3/8 x 4	TVL-4701.3
†30-20-20	450-450-450	1 3/8 x 2 1/2	TVL-3781	†80-2-100-25	450-350-25-25	1 3/8 x 3	TVL-4705.3
30-30-30	450-450-450	1 3/8 x 3	TVL-3782	10-140-100-20	450-350-300-300	1 3/8 x 4	TVL-4705.9
†40-10-10	450-450-450	1 3/8 x 2	TVL-3783	†50-20-4-40	450-450-150-25	1 3/8 x 2 1/2	TVL-4712.9
40-30-20	450-450-450	1 3/8 x 2 1/2	TVL-3784	†50-40-4-40	450-450-150-25	1 3/8 x 2 1/2	TVL-4712.10
40-40-10	450-450-450	1 3/8 x 2 1/2	TVL-3785	†80-30-20-50	450-450-250-50	1 3/8 x 3 1/2	TVL-4714.2
40-40-20	450-450-450	1 3/8 x 2 1/2	TVL-3786	†30-20-160-40	450-450-250-150	1 3/8 x 4	TVL-4714.4
40-40-40	450-450-450	1 3/8 x 3	TVL-3787	†30-50-100-250	450-450-250-50	1 3/8 x 4 1/2	TVL-4714.5
†50-20-4	450-450-450	1 x 3 1/2	TVL-3787.5	†80-50-20-50	450-450-250-50	1 3/8 x 4	TVL-4714.6
†60-20-20	450-450-450	1 3/8 x 3	TVL-3789	†30-20-160-10	450-450-250-250	1 3/8 x 4	TVL-4714.10
60-40-20	450-450-450	1 3/8 x 3	TVL-3791	†80-50-20-150	450-450-250-25	1 3/8 x 4	TVL-4714.11
†60-50-30	450-450-450	1 3/8 x 3 1/2	TVL-3791.3	†100-30-20-50	450-450-350-50	1 3/8 x 4	TVL-4716.3
†60-60-20	450-450-450	1 3/8 x 3 1/2	TVL-3791.4	†30-20-4-200	450-450-350-250	1 3/8 x 4	TVL-4716.4
†80-30-20	450-450-450	1 3/8 x 3 1/2	TVL-3791.8	†80-30-40-40	450-450-350-150	1 3/8 x 4	TVL-4716.7
†80-40-20	450-450-450	1 3/8 x 3	TVL-3793	†100-30-20-50	450-450-350-75	1 3/8 x 3 1/2	TVL-4716.8
†80-50-30	450-450-450	1 3/8 x 4	TVL-3793.3	†10-10-10-20	450-450-450-25	1 3/8 x 2	TVL-4723
†80-50-20	450-450-450	1 3/8 x 3 1/2	TVL-3793.4	20-20-20-20	450-450-450-25	1 3/8 x 2	TVL-4724.2
†100-50-20	450-450-450	1 3/8 x 4 1/2	TVL-3793.8	40-40-40-40	450-450-450-25	1 3/8 x 3	TVL-4739
40-80-10	475-450-450	1 3/8 x 3 1/2	TVL-3816	†80-50-10-20	450-450-450-25	1 3/8 x 4	TVL-4739.9
†50-40-40	475-475-25	1 3/8 x 3 1/2	TVL-3816.11	†80-30-20-40	450-450-450-150	1 3/8 x 4	TVL-4754
†50-18-40	475-475-25	1 3/8 x 2 1/2	TVL-3816.12	†80-80-20-2	450-450-250-450	1 3/8 x 4 1/2	TVL-4757.7
†18-10-40	475-475-25	1 3/8 x 2	TVL-3816.13	†30-20-10-20	450-450-450-350	1 3/8 x 2 1/2	TVL-4757.12
†80-10-18	475-475-475	1 3/8 x 3 1/2	TVL-3875	†10-10-10-10	450-450-450-450	1 3/8 x 2	TVL-4760
†80-30-10	475-475-475	1 3/8 x 3	TVL-3877	20-10-10-10	450-450-450-450	1 3/8 x 2	TVL-4761
30-20-20	500-500-500	1 3/8 x 2 1/2	TVL-3956	†20-20-20-20	450-450-450-450	1 3/8 x 2 1/2	TVL-4763
QUADRUPLE UNITS				30-30-20-20	450-450-450-450	1 3/8 x 3	TVL-4769.4
†200-500-500-500	125-100-60-35	1 3/8 x 3 1/2	TVL-4358	†40-20-20-20	450-450-450-450	1 3/8 x 2 1/2	TVL-4771.7
†200-200-100-10	150-150-150-75	1 3/8 x 2 1/2	TVL-4440.3	†40-40-20-20	450-450-450-450	1 3/8 x 2 1/2	TVL-4773
250-200-10-10	175-175-150-150	1 3/8 x 3 1/2	TVL-4449	40-40-30-30	450-450-450-450	1 3/8 x 4	TVL-4774
300-200-20-20	175-175-150-150	1 3/8 x 4 1/2	TVL-4449.2	40-40-40-40	450-450-450-450	1 3/8 x 3 1/2	TVL-4775
200-200-60-30	175-175-175-175	1 3/8 x 3 1/2	TVL-4450	†60-20-20-20	450-450-450-450	1 3/8 x 3	TVL-4778
†200-200-200-30	175-175-175-175	1 3/8 x 4 1/2	TVL-4451	†70-25-5-5	450-450-450-450	1 3/8 x 2 1/2	TVL-4781
250-400-50-5	200-175-175-175	1 3/8 x 4 1/2	TVL-4468	†80-40-20-20	450-450-450-450	1 3/8 x 3 1/2	TVL-4784.1
†80-450-150-5	200-200-175-175	1 3/8 x 4 1/2	TVL-4469.5	10-80-400-100	475-400-400-50	1 3/8 x 4	TVL-4805.2
240-240-160-5	200-200-200-200	1 3/8 x 4 1/2	TVL-4479.4	†80-4-4-200	475-450-450-25	1 3/8 x 4	TVL-4813.2
240-180-160-5	200-200-200-200	1 3/8 x 4 1/2	TVL-4479.8	†80-40-30-10	475-450-450-450	1 3/8 x 3 1/2	TVL-4814.4
250-200-40-10	200-200-200-200	1 3/8 x 3 1/2	TVL-4479.10	†50-18-4-40	475-475-150-25	1 3/8 x 2 1/2	TVL-4814.7
250-200-20-10	200-200-200-200	1 3/8 x 3 1/2	TVL-4479.11	†30-4-4-200	475-475-475-25	1 3/8 x 2	TVL-4818.4
160-450-60-5	200-200-200-200	1 3/8 x 4 1/2	TVL-4479.14	†100-4-4-200	475-475-475-25	1 3/8 x 4	TVL-4818.5
250-200-10-10	250-250-250-250	1 3/8 x 4	TVL-4541	†80-4-4-4	475-450-450-450	1 3/8 x 3	TVL-4820.3
250-200-40-10	250-250-250-250	1 3/8 x 4	TVL-4542	†50-40-4-40	475-475-150-25	1 3/8 x 3 1/2	TVL-4820.4
40-40-20-10	300-300-300-300	1 3/8 x 2	TVL-4579	†80-80-4-4	475-475-450-450	1 3/8 x 4 1/2	TVL-4820.5
†50-500-500-200	350-50-25-25	1 3/8 x 2 1/2	TVL-4596	†80-4-4-200	475-475-475-25	1 3/8 x 3 1/2	TVL-4823
†100-500-500-200	350-50-25-25	1 3/8 x 3	TVL-4599	20-20-20-20	475-475-475-475	1 3/8 x 2 1/2	TVL-4834
				40-20-10-10	475-475-475-475	1 3/8 x 2 1/2	TVL-4840
				†80-4-30-4	475-475-475-475	1 3/8 x 3 1/2	TVL-4845

For a more complete line of over 600 Type TVL Capacitors, refer to Sprague Catalog C-563.

SPRAGUE CAPACITORS

TYPE 36D POWERLYTIC® ALUMINUM ELECTROLYTICS



RECOMMENDED FOR REPLACEMENT APPLICATIONS

- Excellent space economy at operating temperatures to 85 C.
- Uses most reliable seal developed by Sprague for aluminum lytic capacitors.
- Low ESR, low leakage currents.
- Pressure-type safety vents employing silicone rubber are used on all cases.
- Extremely long shelf life.
- For technical data, refer to Sprague Engineering Bulletin 343.1.

μF	Size Code	Catalog Number*
3 WVDC, 4 VDC SURGE		
10000	AA	36D103G003AA2A
20000	AB	36D203G003AB2A
30000	AC	36D303G003AC2A
36000	AD	36D363G003AD2A
41000	AE	36D413G003AE2A
46000	AF	36D463G003AF2A
47000	BB	36D473G003BB2A
70000	BC	36D703G003BC2A
80000	CB	36D803G003CB2A
82000	BD	36D823G003BD2A
94000	BE	36D943G003BE2A
100000	BF	36D104G003BF2A
120000	CC	36D124G003CC2A
140000	CD	36D144G003CD2A
160000	CE	36D164G003CE2A
170000	DC	36D174G003DC2A
180000	CF	36D184G003CF2A
200000	DD	36D204G003DD2A
230000	DE	36D234G003DE2A
270000	DF	36D274G003DF2A

μF	Size Code	Catalog Number*
6 WVDC, 8 VDC SURGE		
7000	AA	36D702G006AA2A
14000	AB	36D143G006AB2A
21000	AC	36D213G006AC2A
25000	AD	36D253G006AD2A
29000	AE	36D293G006AE2A
32000	AF	36D323G006AF2A
33000	BB	36D333G006BB2A
50000	BC	36D503G006BC2A
57000	CB	36D573G006CB2A
58000	BD	36D583G006BD2A
66000	BE	36D663G006BE2A
75000	BF	36D753G006BF2A
86000	CC	36D863G006CC2A
100000	CD	36D104G006CD2A
110000	CE	36D114G006CE2A
120000	DC	36D124G006DC2A
140000	DD	36D144G006DD2A
160000	DE	36D164G006DE2A
190000	DF	36D194G006DF2A

μF	Size Code	Catalog Number*
10 WVDC, 12 VDC SURGE		
6000	AA	36D602G010AA2A
12000	AB	36D123G010AB2A
18000	AC	36D183G010AC2A
21000	AD	36D213G010AD2A
24000	AE	36D243G010AE2A
27000	AF	36D273G010AF2A
28000	BB	36D283G010BB2A
42000	BC	36D423G010BC2A
48000	CB	36D483G010CB2A
49000	BD	36D493G010BD2A
56000	BE	36D563G010BE2A
63000	BF	36D633G010BF2A
72000	CC	36D723G010CC2A
84000	CD	36D843G010CD2A
96000	CE	36D963G010CE2A
100000	CF	36D104G010CF2A
100000	DC	36D104G010DC2A
120000	DD	36D124G010DD2A
140000	DE	36D144G010DE2A
160000	DF	36D164G010DF2A

μF	Size Code	Catalog Number*
15 WVDC, 18 VDC SURGE		
4600	AA	36D462G015AA2A
9200	AB	36D922G015AB2A
13000	AC	36D133G015AC2A
16000	AD	36D163G015AD2A
18000	AE	36D183G015AE2A
20000	AF	36D203G015AF2A

μF	Size Code	Catalog Number*
25 WVDC, 30 VDC SURGE		
21000	BB	36D213G015BB2A
31000	BC	36D313G015BC2A
36000	CB	36D363G015CB2A
37000	BD	36D373G015BD2A
42000	BE	36D423G015BE2A
47000	BF	36D473G015BF2A
54000	CC	36D543G015CC2A
63000	CD	36D633G015CD2A
72000	CE	36D723G015CE2A
80000	DC	36D803G015DC2A
81000	CF	36D813G015CF2A
93000	DD	36D933G015DD2A
100000	DE	36D104G015DE2A
120000	DF	36D124G015DF2A

μF	Size Code	Catalog Number*
30 WVDC, 40 VDC SURGE		
2700	AA	36D272G025AA2A
5500	AB	36D552G025AB2A
8200	AC	36D822G025AC2A
9600	AD	36D962G025AD2A
11000	AE	36D113G025AE2A
12000	AF	36D123G025AF2A
18000	BC	36D183G025BC2A
21000	CB	36D213G025CB2A
22000	BD	36D223G025BD2A
25000	BE	36D253G025BE2A
28000	BF	36D283G025BF2A
32000	CC	36D323G025CC2A
38000	CD	36D383G025CD2A
43000	CE	36D433G025CE2A
47000	DC	36D473G025DC2A
48000	CF	36D483G025CF2A
55000	DD	36D553G025DD2A
63000	DE	36D633G025DE2A
71000	DF	36D713G025DF2A

μF	Size Code	Catalog Number*
30 WVDC, 40 VDC SURGE		
2000	AA	36D202G030AA2A
4000	AB	36D402G030AB2A
6000	AC	36D602G030AC2A
7200	AD	36D722G030AD2A
8300	AE	36D832G030AE2A
9300	AF	36D932G030AF2A
9500	BB	36D952G030BB2A
14000	BC	36D143G030BC2A
16000	BD	36D163G030BD2A
19000	BE	36D193G030BE2A
21000	BF	36D213G030BF2A
24000	CC	36D243G030CC2A
28000	CD	36D283G030CD2A
32000	CE	36D323G030CE2A
36000	DC	36D363G030DC2A
37000	CF	36D373G030CF2A
42000	DD	36D423G030DD2A
48000	DE	36D483G030DE2A
54000	DF	36D543G030DF2A

μF	Size Code	Catalog Number*
40 WVDC, 50 VDC SURGE		
1800	AA	36D182G040AA2A
3600	AB	36D362G040AB2A
5500	AC	36D552G040AC2A
6400	AD	36D642G040AD2A
7300	AE	36D732G040AE2A
8300	AF	36D832G040AF2A
8400	BB	36D842G040BB2A
12000	BC	36D123G040BC2A
14000	BD	36D143G040BD2A
16000	BE	36D163G040BE2A
19000	BF	36D193G040BF2A
21000	CC	36D213G040CC2A
25000	CD	36D253G040CD2A
28000	CE	36D283G040CE2A

μF	Size Code	Catalog Number*
50 WVDC, 65 VDC SURGE		
1300	AA	36D132G050AA2A
2600	AB	36D262G050AB2A
32000	CF	36D323G040CF2A
37000	DD	36D373G040DD2A
42000	DE	36D423G040DE2A
48000	DF	36D483G040DF2A

μF	Size Code	Catalog Number*
50 WVDC, 65 VDC SURGE		
1300	AA	36D132G050AA2A
2600	AB	36D262G050AB2A
3900	AC	36D392G050AC2A
4600	AD	36D462G050AD2A
5200	AE	36D522G050AE2A
5900	AF	36D592G050AF2A
6000	BB	36D602G050BB2A
9000	BC	36D902G050BC2A
10000	BD	36D103G050BD2A
12000	BE	36D123G050BE2A
13000	BF	36D133G050BF2A
15000	CC	36D153G050CC2A
18000	CD	36D183G050CD2A
20000	CE	36D203G050CE2A
22000	DC	36D223G050DC2A
23000	CF	36D233G050CF2A
26000	DD	36D263G050DD2A
30000	DE	36D303G050DE2A
34000	DF	36D343G050DF2A

μF	Size Code	Catalog Number*
75 WVDC, 95 VDC SURGE		
850	AA	36D851G075AA2A
1700	AB	36D172G075AB2A
2500	AC	36D252G075AC2A
3000	AD	36D302G075AD2A
3400	AE	36D342G075AE2A
3800	AF	36D382G075AF2A
3900	BB	36D392G075BB2A
5900	BC	36D592G075BC2A
6700	CB	36D672G075CB2A
6900	BD	36D692G075BD2A
7800	BE	36D782G075BE2A
8800	BF	36D882G075BF2A
10000	CC	36D103G075CC2A
11000	CD	36D113G075CD2A
13000	CE	36D133G075CE2A
14000	DC	36D143G075DC2A
15000	CF	36D153G075CF2A
17000	DD	36D173G075DD2A
20000	DE	36D203G075DE2A
22000	DF	36D223G075DF2A

μF	Size Code	Catalog Number*
100 WVDC, 125 VDC SURGE		
450	AA	36D451G100AA2A
900	AB	36D901G100AB2A
1300	AC	36D132G100AC2A
1500	AD	36D152G100AD2A
1800	AE	36D182G100AE2A
2000	AF	36D202G100AF2A
3000	BC	36D302G100BC2A
3500	CD	36D352G100CD2A
3600	BE	36D362G100BE2A
4000	BF	36D402G100BF2A
4500	CC	36D452G100CC2A
5300	CE	36D532G100CE2A
6100	CD	36D612G100CD2A
7000	CE	36D702G100CE2A

μF	Size Code	Catalog Number*
150 WVDC, 175 VDC SURGE		
7800	CF	36D782G100CF2A
7800	DC	36D782G100DC2A
9100	DD	36D912G100DD2A
10000	DE	36D103G100DE2A
11000	DF	36D113G100DF2A

μF	Size Code	Catalog Number*
150 WVDC, 175 VDC SURGE		
300	AA	36D301F150AA2A
600	AB	36D601F150AB2A
900	AC	36D901F150AC2A
1100	AD	36D112F150AD2A
1200	AE	36D122F150AE2A
1300	AF	36D132F150AF2A
1400	BB	36D142F150BB2A
2100	BC	36D212F150BC2A
2400	BD	36D242F150BD2A
2700	BE	36D272F150BE2A
3100	BF	36D312F150BF2A
3600	CC	36D362F150CC2A
4200	CD	36D422F150CD2A
4700	CE	36D472F150CE2A
5300	CF	36D532F150CF2A
5300	DC	36D532F150DC2A
6200	DD	36D622F150DD2A
7000	DE	36D702F150DE2A
7800	DF	36D782F150DF2A

μF	Size Code	Catalog Number*
200 WVDC, 250 VDC SURGE		
250	AA	36D251F200AA2A
430	AB	36D431F200AB2A
640	AC	36D641F200AC2A
770	AD	36D771F200AD2A
850	AE	36D851F200AE2A
950	AF	36D951F200AF2A
1400	BC	36D142F200BC2A
1600	CB	36D162F200CB2A
1700	BD	36D172F200BD2A
1900	BE	36D192F200BE2A
2100	BF	36D212F200BF2A
2500	CC	36D252F200CC2A
2900	CD	36D292F200CD2A
3300	CE	36D332F200CE2A
3700	CF	36D372F200CF2A
3700	DC	36D372F200DC2A
4300	DD	36D432F200DD2A
4800	DE	36D482F200DE2A
5500	DF	36D552F200DF2A

μF	Size Code	Catalog Number*
250 WVDC, 300 VDC SURGE		
170	AA	36D171F250AA2A
350	AB	36D351F250AB2A
530	AC	36D531F250AC2A
630	AD	36D631F250AD2A
700	AE	36D701F250AE2A
780	AF	36D781F250AF2A
800	BB	36D801F250BB2A
1200	BC	36D122F250BC2A
1300	CB	36D132F250CB2A
1400	BD	36D142F250BD2A
1500	BE	36D152F250BE2A
1700	BF	36D172F250BF2A
2000	CC	36D202F250CC2A
2400	CD	36D242F250CD2A

DIMENSIONS

Code	D. x L.	Code	D. x L.	Code	D. x L.	Code	D. x L.
AA	1.453 x 2.250	AF	1.453 x 5.750	BF	2.078 x 5.750	CF	2.578 x 5.750
AB	1.453 x 3.250	BB	2.078 x 3.250	CB	2.578 x 3.250	DC	3.078 x 4.250
AC	1.453 x 4.250	BC	2.078 x 4.250	CC	2.578 x 4.250	DD	3.078 x 4.750
AD	1.453 x 4.750	BD	2.078 x 4.750	CD	2.578 x 4.750	DE	3.078 x 5.250
AE	1.453 x 5.250	BE	2.078 x 5.250	CE	2.578 x 5.250	DF	3.078 x 5.750
						DJ	3.078 x 8.750

SPRAGUE CAPACITORS

TYPE 36D POWERLYTIC® ELECTROLYTICS, continued

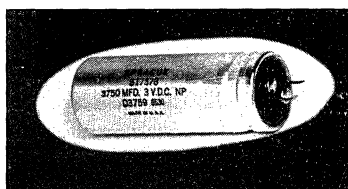
μF	Size Code	Catalog Number*	μF	Size Code	Catalog Number*	μF	Size Code	Catalog Number*	μF	Size Code	Catalog Number*
250 WVDC, 300 VDC SURGE (cont.)			300 WVDC, 350 VDC SURGE (cont.)			350 WVDC, 400 VDC SURGE (cont.)			400 WVDC, 475 VDC SURGE (cont.)		
2700	CE	36D272F250CE2A	2400	DD	36D242F300DD2A	2200	DE	36D222F350DE2A	1600	DF	36D162F400DF2A
3000	CF	36D302F250CF2A	2700	DE	36D272F300DE2A	2500	DF	36D252F350DF2A	450 WVDC, 525 VDC SURGE		
3000	DC	36D302F250DC2A	3100	DF	36D312F300DF2A	400 WVDC, 475 VDC SURGE			50	AA	36D500F450AA2A
3500	DD	36D352F250DD2A	350 WVDC, 400 VDC SURGE			65	AA	36D650F400AA2A	100	AB	36D101F450AB2A
4000	DE	36D402F250DE2A	95	AA	36D950F350AA2A	120	AB	36D121F400AB2A	140	AC	36D141F450AC2A
4500	DF	36D452F250DF2A	190	AB	36D191F350AB2A	190	AC	36D191F400AC2A	170	AD	36D171F450AD2A
300 WVDC, 350 VDC SURGE			290	AC	36D291F350AC2A	230	AD	36D231F400AD2A	190	AE	36D191F450AE2A
120	AA	36D121F300AA2A	360	AD	36D361F350AD2A	270	AE	36D271F400AE2A	210	AF	36D211F450AF2A
240	AB	36D241F300AB2A	390	AE	36D391F350AE2A	290	BB	36D291F400BB2A	220	BB	36D221F450BB2A
370	AC	36D371F300AC2A	420	BB	36D421F350BB2A	300	AF	36D301F400AF2A	330	BC	36D331F450BC2A
450	AD	36D451F300AD2A	440	AF	36D441F350AF2A	420	BC	36D421F400BC2A	380	CB	36D381F450CB2A
500	AE	36D501F300AE2A	650	BC	36D651F350BC2A	490	CB	36D491F400CB2A	390	BD	36D391F450BD2A
550	AF	36D551F300AF2A	750	CB	36D751F350CB2A	530	BD	36D531F400BD2A	440	BE	36D441F450BE2A
820	BC	36D821F300BC2A	780	BD	36D781F350BD2A	610	BE	36D611F400BE2A	490	BF	36D491F450BF2A
950	BD	36D951F300BD2A	880	BE	36D881F350BE2A	680	BF	36D681F400BF2A	570	CC	36D571F450CC2A
1100	BE	36D112F300BE2A	1000	BF	36D102F350BF2A	790	CC	36D791F400CC2A	660	CD	36D661F450CD2A
1200	BF	36D122F300BF2A	1100	CC	36D112F350CC2A	910	CD	36D911F400CD2A	760	CE	36D761F450CE2A
1400	CC	36D142F300CC2A	1300	CD	36D132F350CD2A	1000	CE	36D102F400CE2A	850	CF	36D851F450CF2A
1600	CD	36D162F300CD2A	1500	CE	36D152F350CE2A	1000	CD	36D102F400CD2A	860	DC	36D861F450DC2A
1800	CE	36D182F300CE2A	1600	DC	36D162F350DC2A	1100	CF	36D112F400CF2A	1000	DD	36D102F450DD2A
2100	CF	36D212F300CF2A	1700	DD	36D172F350DF2A	1200	DD	36D122F400DD2A	1100	DE	36D112F450DE2A
2100	DC	36D212F300DC2A	1900	DF	36D192F350DF2A	1400	DE	36D142F400DE2A	1200	DF	36D122F450DF2A

TYPE 36DX POWERLYTIC® ALUMINUM ELECTROLYTICS RECOMMENDED FOR NEW EQUIPMENT DESIGNS

• Have extended capacitance ratings (higher capacitance, smaller cases) required in new designs.

• Capacitors listed have outer plastic-film insulation. For bare case, change 14th digit of Cat. No. from "2" to "0". Capacitors listed have low-insert terminals. For high-insert or solder-lug terminals, change last letter from "A" to "B" or "C" respectively.

μF	Size Code	Catalog Number	μF	Size Code	Catalog Number	μF	Size Code	Catalog Number	μF	Size Code	Catalog Number
10 WVDC, 12 VDC SURGE			30 WVDC, 40 VDC SURGE			50 WVDC, 65 VDC SURGE			350 WVDC, 400 VDC SURGE		
9000	AA	36DX902G010AA2A	20000	AF	36DX203G025AF2A	51000	DC	36DX513G040DC2A	2500	BF	36DX252F250BF2A
18000	AB	36DX183G010AB2A	30000	BC	36DX303G025BC2A	76000	DF	36DX763G040DF2A	2900	CC	36DX292F250CC2A
27000	AC	36DX273G010AC2A	45000	BF	36DX453G025BF2A	120000	DJ	36DX124G040DJ2A	4200	CF	36DX422F250CF2A
41000	AF	36DX413G010AF2A	50000	CC	36DX503G025CC2A	200 WVDC, 250 VDC SURGE			6300	DF	36DX632F250DF2A
58000	BC	36DX583G010BC2A	75000	CF	36DX753G025CF2A	2400	AA	36DX242G050AA2A	10000	DJ	36DX103F250DJ2A
88000	BF	36DX883G010BF2A	75000	DC	36DX753G025DC2A	4800	AB	36DX482G050AB2A	450 WVDC, 525 VDC SURGE		
100000	CC	36DX104G010CC2A	110000	DF	36DX114G025DF2A	7200	AC	36DX722G050AC2A	130	AA	36DX131F350AA2A
150000	CF	36DX154G010CF2A	190000	DJ	36DX194G025DJ2A	11000	AF	36DX113G050AF2A	260	AB	36DX261F350AB2A
150000	DC	36DX154G010DC2A	40 WVDC, 50 VDC SURGE			16000	BC	36DX163G050BC2A	380	AC	36DX381F350AC2A
230000	DF	36DX234G010DF2A	4000	AA	36DX402G030AA2A	24000	BF	36DX243G050BF2A	580	AF	36DX581F350AF2A
390000	DJ	36DX394G010DJ2A	8000	AB	36DX802G030AB2A	27000	CC	36DX273G050CC2A	610	BB	36DX611F350BB2A
15 WVDC, 18 VDC SURGE			12000	AC	36DX123G030AC2A	40000	CF	36DX403G050CF2A	880	BC	36DX881F350BC2A
7500	AA	36DX752G015AA2A	18000	AF	36DX183G030AF2A	41000	DC	36DX413G050DC2A	1300	BF	36DX132F350BF2A
15000	AB	36DX153G015AB2A	26000	BC	36DX263G030BC2A	61000	DF	36DX613G050DF2A	1500	CC	36DX152F350CC2A
22000	AC	36DX223G015AC2A	39000	BF	36DX393G030BF2A	100000	DJ	36DX104G050DJ2A	2200	CF	36DX222F350CF2A
34000	AF	36DX343G015AF2A	44000	CC	36DX443G030CC2A	75 WVDC, 95 VDC SURGE			3300	DF	36DX332F350DF2A
50000	BC	36DX503G015BC2A	66000	CF	36DX663G030CF2A	1400	AA	36DX142G075AA2A	5100	DJ	36DX512F350DJ2A
75000	BF	36DX753G015BF2A	66000	DC	36DX663G030DC2A	2000	BC	36DX202F200BC2A	450 WVDC, 525 VDC SURGE		
83000	CC	36DX833G015CC2A	97000	DF	36DX973G030DF2A	2900	BF	36DX292F200BF2A	80	AA	36DX800F450AA2A
120000	CF	36DX124G015CF2A	160000	DJ	36DX164G030DJ2A	3400	CC	36DX342F200CC2A	160	AB	36DX161F450AB2A
120000	DC	36DX124G015DC2A	40 WVDC, 50 VDC SURGE			4900	CF	36DX492F200CF2A	230	AC	36DX231F450AC2A
180000	DF	36DX184G015DF2A	2900	AA	36DX292G040AA2A	7400	DF	36DX742F200DF2A	350	AF	36DX351F450AF2A
300000	DJ	36DX304G015DJ2A	5800	AB	36DX582G040AB2A	12000	DJ	36DX123F200DJ2A	380	BB	36DX381F450BB2A
25 WVDC, 30 VDC SURGE			8700	AC	36DX872G040AC2A	250 WVDC, 300 VDC SURGE			540	BC	36DX541F450BC2A
4500	AA	36DX452G025AA2A	13000	AF	36DX133G040AF2A	250	AA	36DX251F250AA2A	800	BF	36DX801F450BF2A
9000	AB	36DX902G025AB2A	20000	BC	36DX203G040BC2A	740	AC	36DX741F250AC2A	930	CC	36DX931F450CC2A
13000	AC	36DX133G025AC2A	30000	BF	36DX303G040BF2A	1100	AF	36DX112F250AF2A	1300	CF	36DX132F450CF2A
			34000	CC	36DX343G040CC2A	1200	BB	36DX122F250BB2A	2000	DF	36DX202F450DF2A
			51000	CF	36DX513G040CF2A	1700	BC	36DX172F250BC2A	3100	DJ	36DX312F450DJ2A



SPECIAL PURPOSE ELECTROLYTIC CAPACITORS

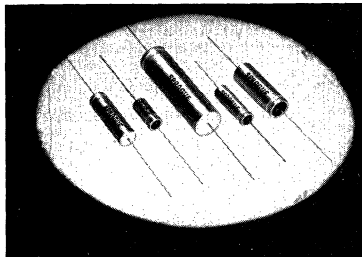
- Designed to Filter Low Voltage Power Supplies for Aircraft
- Solder Lug Terminals

μF	D. x L.	VDC	Catalog Number
1250	1 x 2 3/4	3NP	D16255 (S17377)†
3750	1 1/8 x 3 3/8	3NP	D3759 (S17378)†

†Please use "S" number when ordering.

SPRAGUE CAPACITORS

TYPE 39D POWERLYTIC® ELECTROLYTIC CAPACITORS



Designed for applications which require the greatest possible capacitance in small physical case sizes.

- Type 39D capacitors supplement the original Type 36D Can-type Powerlytic line by offering high-capacitance units in axial-lead tubular configuration.
- Welds at all critical anode and cathode terminals eliminate riveted or pressure connections to assure freedom from open circuit even during operation in the microvolt or millivolt signal range.
- Improved molded phenolic end seals.
- Furnished with outer plastic insulating sleeve.
- Operating temperature range, -20°C to +85°C.
- These capacitors are provided with a pressure-sensitive safety vent.
- Low ESR, low leakage currents.
- Service life, 10 yrs. or more in normal circuit applications.
- For complete technical data, see latest issue of Sprague Engineering Bulletin 3415.

CALL YOUR SPRAGUE INDUSTRIAL DISTRIBUTOR FOR CURRENT QUALITY PRICES

μF	Diam.xLength	Catalog Number*	μF	Diam.xLength	Catalog Number*	μF	Diam.xLength	Catalog Number*
3 WVDC, 4 VDC SURGE			10 WVDC, 12 VDC SURGE			25 WVDC, 30 VDC SURGE		
400	.562x1.250	39D407G003EE4	250	.562x1.250	39D257G010EE4	100	.562x1.250	39D107G025EE4
900	.562x1.750	39D907G003EJ4	500	.562x1.750	39D507G010EJ4	200	.562x1.750	39D207G025EJ4
1300	.562x2.250	39D138G003EL4	800	.562x2.250	39D807G010EL4	350	.562x2.250	39D357G025EL4
1400	.812x1.250	39D148G003GE4	850	.812x1.250	39D857G010GE4	450	.687x1.750	39D457G025FJ4
1800	.687x1.750	39D188G003FJ4	1000	.687x1.750	39D108G010FJ4	500	.937x1.250	39D507G025HE4
2100	.937x1.250	39D218G003HE4	1200	.937x1.250	39D128G010HE4	700	.687x2.250	39D707G025FL4
2700	.687x2.250	39D278G003FL4	1600	.687x2.250	39D168G010FL4	750	.812x1.750	39D757G025GJ4
2900	.812x1.750	39D298G003GJ4	1700	.812x1.750	39D178G010GJ4	800	1.062x1.250	39D807G025JE4
3000	1.062x1.250	39D308G003JE4	2100	.687x2.750	39D218G010FP4	950	.687x2.750	39D957G025FF4
3600	.687x2.750	39D368G003FP4	2500	.812x2.250	39D258G010GL4	1000	.812x2.250	39D108G025GL4
4200	.937x1.750	39D428G003HJ4	3400	.812x2.750	39D348G010GP4	1100	.937x1.750	39D118G025HJ4
4300	.812x2.250	39D438G003GL4	3500	1.062x1.250	39D358G010JJ4	1500	.812x2.750	39D158G025GP4
5700	.812x2.750	39D578G003GP4	5000	.937x2.750	39D508G010HP4	1600	1.062x1.750	39D168G025JJ4
6000	1.062x1.750	39D608G003JJ4	5200	1.062x2.250	39D528G010JL4	1700	.937x2.250	39D178G025HL4
8500	.937x2.750	39D858G003HP4	6300	.937x3.250	39D638G010HS4	2200	.937x2.750	39D228G025HP4
9000	1.062x2.250	39D908G003JL4	7100	1.062x2.750	39D718G010JP4	2400	1.062x2.250	39D248G025JL4
10000	.937x3.250	39D109G003HS4	8800	1.062x3.250	39D888G010JS4	2800	.937x3.250	39D288G025HS4
12000	1.062x2.750	39D129G003JP4	10000	1.062x3.750	39D109G010JT4	3200	1.062x2.750	39D328G025JP4
15000	1.062x3.250	39D159G003JS4				4000	1.062x3.250	39D408G025JS4
18000	1.062x3.750	39D189G003JT4				4700	1.062x3.750	39D478G025JT4
6 WVDC, 8 VDC SURGE			15 WVDC, 18 VDC SURGE			30 WVDC, 40 VDC SURGE		
300	.562x1.250	39D307G006EE4	200	.562x1.250	39D207G015EE4	75	.562x1.250	39D756G030EE4
600	.562x1.750	39D607G006EJ4	400	.562x1.750	39D407G015EJ4	150	.562x1.750	39D157G030EJ4
900	.562x2.250	39D907G006EL4	600	.562x2.250	39D607G015EL4	250	.562x2.250	39D257G030EL4
1000	.812x1.250	39D108G006GE4	800	.687x1.750	39D807G015FJ4	350	.687x1.750	39D357G030FJ4
1200	.687x1.750	39D128G006FJ4	950	.937x1.250	39D957G015HE4	400	.937x1.250	39D407G030HE4
1500	.937x1.250	39D158G006HE4	1200	.687x2.250	39D128G015FL4	500	.687x2.250	39D507G030FL4
1900	.687x2.250	39D198G006FL4	1300	.812x1.750	39D138G015GJ4	600	1.062x1.250	39D607G030JE4
2000	.687x2.250	39D208G006GJ4	1600	.687x2.750	39D168G015FP4	700	.687x2.750	39D707G030FP4
2100	1.062x1.250	39D218G006JE4	1900	.812x2.250	39D198G015GL4	850	.812x2.250	39D857G030GL4
2500	.687x2.750	39D258G006FP4	2500	.812x2.750	39D258G015GP4	1100	.812x2.750	39D118G030GP4
3000	.812x2.250	39D308G006GL4	2600	1.062x1.750	39D268G015JJ4	1200	.937x2.250	39D128G030HL4
4000	.812x2.750	39D408G006GP4	3800	.937x2.750	39D388G015HP4	1700	.937x2.750	39D178G030HP4
4200	1.062x1.750	39D428G006JL4	4000	1.062x2.250	39D408G015JL4	1800	1.062x2.250	39D188G030JL4
6000	.937x2.750	39D608G006HP4	4700	.937x3.250	39D478G015HS4	2100	.937x3.250	39D218G030HS4
6300	1.062x2.250	39D638G006JL4	5300	1.062x2.750	39D538G015JP4	2400	1.062x2.750	39D248G030JP4
7500	.937x3.250	39D758G006HS4	6600	1.062x3.250	39D668G015JS4	3000	1.062x3.250	39D308G030JS4
8500	1.062x2.750	39D858G006JP4	8000	1.062x3.750	39D808G015JT4	3600	1.062x3.750	39D368G030JT4
10000	1.062x3.250	39D109G006JS4						
12000	1.062x3.750	39D129G006JT4						

*These capacitors have outer insulation. For units with bare case, change last character in catalog number from 4 to 0, and subtract .062" from diameter and .125" from length.

Copyright 1974, Sprague Products Company

IND-EEM-16B-EFAF

Sizes subject to change without notice

SPRAGUE CAPACITORS

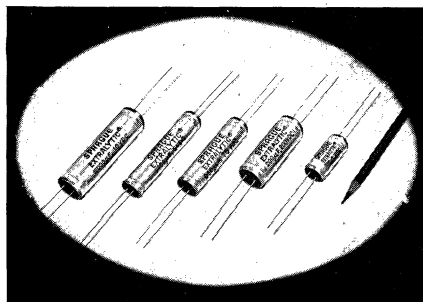
TYPE 39D POWERLYTIC® ELECTROLYTICS, continued

μF	Diam. x Length	Catalog Number*	μF	Diam. x Length	Catalog Number*	μF	Diam. x Length	Catalog Number*
40 WVDC, 50 VDC SURGE			100 WVDC, 125 VDC (cont.)			250 WVDC, 300 VDC SURGE (cont.)		
75	.562x1.250	39D756G040EE4	150	.687x2.750	39D157F100FP4	140	.937x2.750	39D147F250HP4
150	.562x1.750	39D157G040EJ4	180	.937x1.750	39D187F100HJ4	150	1.062x2.250	39D157F250JL4
200	.562x2.250	39D207G040EL4	190	.812x2.250	39D197F100GL4	180	.937x3.250	39D187F250HS4
250	.812x1.250	39D257G040GE4	250	.812x2.750	39D257F100GP4	200	1.062x2.750	39D207F250JP4
300	.687x1.750	39D307G040FJ4	260	1.062x1.750	39D267F100JJ4	250	1.062x3.250	39D257F250JS4
350	.937x1.250	39D357G040HE4	280	.937x2.250	39D287F100HL4	300	1.062x3.750	39D307F250JT4
450	.687x2.250	39D457G040FL4	370	.937x2.750	39D377F100HP4			
500	.812x1.750	39D507G004GJ4	390	1.062x2.250	39D397F100JL4	300 WVDC, 350 VDC SURGE		
600	.687x2.750	39D607G040FP4	460	.937x3.250	39D467F100HS4	5	.562x1.250	39D505F300EE4
750	.812x2.250	39D757G040GL4	520	1.062x2.750	39D527F100JP4	10	.562x1.750	39D106F300EJ4
1000	.812x2.750	39D108G040GP4	650	1.062x3.250	39D657F100JS4	15	.562x2.250	39D156F300EL4
1100	.937x2.250	39D118G040HL4	780	1.062x3.750	39D787F100JT4	20	.687x1.750	39D206F300FJ4
1500	.937x2.750	39D158G040HP4				25	.937x1.250	39D256F300HE4
1600	1.062x2.250	39D168G040JL4	150 WVDC, 175 VDC SURGE			30	.687x2.250	39D306F300FL4
1900	.937x3.250	39D198G040HS4	10	.562x1.250	39D106F150EE4	40	.687x2.750	39D406F300FP4
2100	1.062x2.750	39D218G040JP4	25	.562x1.750	39D256F150EJ4	50	.812x2.250	39D506F300GL4
2600	1.062x3.250	39D268G040JS4	40	.562x2.250	39D406F150EL4	65	.812x2.750	39D656F300GP4
3200	1.062x3.750	39D328G040JT4	50	.687x1.750	39D506F150FJ4	75	.937x2.250	39D756F300HL4
50 WVDC, 65 VDC SURGE			60	.937x1.250	39D606F150HE4	100	.937x2.750	39D107F300HP4
50	.562x1.250	39D506G050EE4	80	.687x2.250	39D806F150FL4	120	.937x3.250	39D127F300HS4
100	.562x1.750	39D107G050EJ4	85	.812x1.750	39D856F150GJ4	130	1.062x2.750	39D137F300JP4
150	.562x2.250	39D157G050EL4	88	1.062x1.250	39D886F150JE4	170	1.062x3.250	39D177F300JS4
200	.687x1.750	39D207G050FJ4	100	.687x2.750	39D107F150FP4	200	1.062x3.750	39D207F300JT4
250	.937x1.250	39D257G050HE4	120	.812x2.250	39D127F150GL4			
350	.687x2.250	39D357G050FL4	170	.812x2.750	39D177F150GP4	350 WVDC, 400 VDC SURGE		
450	.687x2.750	39D457G050FP4	190	.937x2.250	39D197F150HL4	4	.562x1.250	39D405F350EE4
500	.812x2.250	39D507G050GL4	250	.937x2.750	39D257F150HP4	8	.562x1.750	39D805F350EJ4
700	.812x2.750	39D707G050GP4	260	1.062x2.250	39D267F150JL4	12	.562x2.250	39D126F350EL4
750	1.062x1.750	39D757G050JJ4	310	.937x3.250	39D317F150HS4	15	.687x1.750	39D156F350FJ4
800	.937x2.250	39D807G050HL4	350	1.062x2.750	39D357F150JP4	20	.687x2.250	39D206F350FL4
1100	.937x2.750	39D118G050HP4	440	1.062x3.250	39D447F150JS4	25	.812x1.750	39D256F350GJ4
1300	.937x3.250	39D138G050HS4	530	1.062x3.750	39D537F150JT4	30	.687x2.750	39D306F350FP4
1500	1.062x2.750	39D158G050JP4				40	.812x2.250	39D406F350GL4
1900	1.062x3.250	39D198G050JS4	200 WVDC, 250 VDC SURGE			50	.812x2.750	39D506F350GP4
2300	1.062x3.750	39D238G050JT4	9	.562 x 1.250	39D905F200EE4	60	.937x2.250	39D606F350HL4
75 WVDC, 95 VDC SURGE			15	.562 x 1.750	39D156F200EJ4	80	.937x2.750	39D806F350HP4
30	.562x1.250	39D306G075EE4	25	.562 x 2.250	39D256F200EL4	100	.937x3.250	39D107F350HS4
75	.562x1.750	39D756G075EJ4	30	.812 x 1.250	39D306F200GE4	110	1.062x2.750	39D117F350JP4
100	.562x2.250	39D107G075EL4	35	.687 x 1.750	39D356F200FJ4	130	1.062x3.250	39D137F350JS4
150	.687x1.750	39D157G075FJ4	40	.937 x 1.250	39D406F200HE4	160	1.062x3.750	39D167F350JT4
200	.687x2.250	39D207G075FL4						
250	1.062x1.250	39D257G075JE4	55	.687 x 2.250	39D556F200FL4	400 WVDC, 475 VDC SURGE		
300	.687x2.750	39D307G075FP4	60	.812 x 1.750	39D606F200GJ4	2	.562x1.250	39D205F400EE4
350	.812x2.250	39D357G075GL4	75	.687 x 2.750	39D756F200FP4	5	.562x1.750	39D505F400EJ4
450	.812x2.750	39D457G075GP4	80	.937 x 1.750	39D806F200HJ4	10	.687x1.750	39D106F400FJ4
500	.937x2.250	39D507G075HL4	90	.812 x 2.250	39D906F200GL4	15	.687x2.250	39D156F400FL4
700	.937x2.750	39D707G075HP4				20	.687x2.750	39D206F400FP4
750	1.062x2.250	39D757G075JL4	120	.812 x 2.750	39D127F200GP4	25	.812x2.250	39D256F400GL4
850	.937x3.250	39D857G075HS4	130	.937 x 2.750	39D137F200HL4	35	.812x2.750	39D356F400GP4
1000	1.062x2.750	39D108G075JP4	170	.937 x 2.750	39D177F200HP4	40	.937x2.250	39D406F400HL4
1200	1.062x3.250	39D128G075JS4	180	1.062 x 2.250	39D187F200JL4	55	.937x2.750	39D556F400HP4
1500	1.062x3.750	39D158G075JT4	220	.937 x 3.250	39D227F200HS4	65	.937x3.250	39D656F400HS4
100 WVDC, 125 VDC SURGE			250	1.062 x 2.750	39D257F200JP4	75	1.062x2.750	39D756F400JP4
15	.562x1.250	39D156F100EE4	310	1.062 x 3.250	39D317F200JS4	90	1.062x3.250	39D906F400JS4
35	.562x1.750	39D356F100EJ4	370	1.062 x 3.750	39D377F200JT4	110	1.062x3.750	39D117F400JT4
55	.562x2.250	39D556F100EL4						
60	.812x1.250	39D606F100GE4	250 WVDC, 300 VDC SURGE			450 WVDC, 525 VDC SURGE		
75	.687x1.750	39D756F100FJ4	7	.562x1.250	39D705F250EE4	1	.562x1.250	39D105F450EE4
90	.937x1.250	39D906F100HE4	15	.562x1.750	39D156F250EJ4	3	.562x1.750	39D305F450EJ4
110	.687x2.250	39D117F100FL4	20	.562x2.250	39D206F250EL4	5	.562x2.250	39D505F450EL4
120	.812x1.750	39D127F100GJ4	30	.687x1.750	39D306F250FJ4	10	.687x2.250	39D106F450FL4
130	1.062x1.250	39D137F100JE4	35	.937x1.250	39D356F250HE4	15	.687x2.750	39D156F450FP4
			45	.687x2.250	39D456F250FL4	20	.812x2.250	39D206F450GL4
			50	1.062x1.250	39D506F250JE4	25	.812x2.750	39D256F450GP4
			60	.687x2.750	39D606F250FP4	35	.937x2.750	39D356F450HP4
			70	.812x2.250	39D706F250GL4	45	.937x3.250	39D456F450HS4
			95	.812x2.750	39D956F250GP4	50	1.062x2.750	39D506F450JP4
			100	.937x2.250	39D107F250HL4	65	1.062x3.250	39D656F450JS4
						75	1.062x3.750	39D756F450JT4

*These capacitors have outer insulation. For units with bare case, change last character in catalog number from 4 to 0, and subtract .062" from diameter and .125" from length.

SPRAGUE CAPACITORS

TYPE 604D 4-TERMINAL EXTRALYTIC[®] ALUMINUM ELECTROLYTIC CAPACITORS



- Premium-grade capacitors with true four-terminal construction, specifically designed for use in switching regulators and other high frequency applications.
- Low equivalent series resistance, low inductance, low impedance.
- Operating temperature range, -55°C to $+105^{\circ}\text{C}$.
- Guaranteed inductance limit of 2 nH, with typical values of less than 1 nH when used in the four-terminal mode.

- Impedance limits at 10 kHz are as low as 17 m Ω .
- Capacitance tolerance: 5- through 50-volt capacitors, $-10 +50\%$. Above 50 volts, $-10 +75\%$.
- Outer plastic film insulation with polymer-coated end seals which permit degreasing in halogenated solvents.
- For complete technical data, refer to latest issue of Engineering Bulletin 3458.

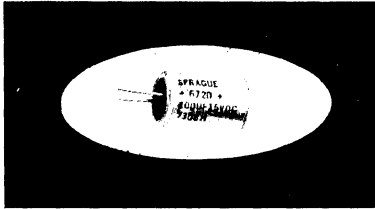
μF	Dia. x Length	Catalog Number
5 WVDC		
2400	.812 x 1.843	604D242G005GJ6
3300	.812 x 2.343	604D332G005GL6
3700	.937 x 1.843	604D372G005HJ6
4400	.812 x 2.843	604D442G005GP6
5000	.937 x 2.343	604D502G005HL6
5700	.812 x 3.343	604D572G005GS6
6200	.937 x 2.843	604D622G005HP6
7200	1.062 x 2.343	604D722G005JL6
8800	.937 x 3.343	604D882G005HS6
10000	1.062 x 2.843	604D103G005JP6
13000	1.062 x 3.343	604D133G005JS6
16000	1.062 x 3.843	604D163G005JT6
7.5 WVDC		
2000	.812 x 1.843	604D202G7R5GJ6
3000	.937 x 1.843	604D302G7R5HJ6
3800	.812 x 2.843	604D382G7R5GP6
4400	.937 x 2.343	604D442G7R5HL6
4800	1.062 x 1.843	604D482G7R5JJ6
5000	.812 x 3.343	604D502G7R5GS6
5800	.937 x 2.843	604D582G7R5HP6
6200	1.062 x 2.343	604D622G7R5JL6
7500	.937 x 3.343	604D752G7R5HS6
9000	1.062 x 2.843	604D902G7R5JP6
11000	1.062 x 3.343	604D113G7R5JS6
14000	1.062 x 3.843	604D143G7R5JT6
10 WVDC		
1700	.812 x 1.843	604D172G010GJ6
2300	.812 x 2.343	604D232G010GL6
2600	.937 x 1.843	604D262G010HJ6
3000	.812 x 2.843	604D302G010GP6
3600	.937 x 2.343	604D362G010HL6
4100	.812 x 3.343	604D412G010GS6
4800	.937 x 2.843	604D482G010HP6
5100	1.062 x 2.343	604D512G010JL6
6300	.937 x 3.343	604D632G010HS6
7500	1.062 x 2.843	604D752G010JP6
9700	1.062 x 3.343	604D972G010JS6
12000	1.062 x 3.843	604D123G010JT6
16 WVDC		
1400	.812 x 1.843	604D142G016GJ6
1900	.812 x 2.343	604D192G016GL6
2100	.937 x 1.843	604D212G016HJ6
2700	.937 x 2.343	604D272G016HL6

μF	Dia. x Length	Catalog Number
3400	.812 x 3.343	604D342G016GS6
4200	1.062 x 2.343	604D422G016JL6
5200	.937 x 3.343	604D522G016HS6
6100	1.062 x 2.843	604D612G016JP6
6400	.937 x 3.843	604D642G016HT6
8000	1.062 x 3.343	604D802G016JS6
10000	1.062 x 3.843	604D103G016JT6
20 WVDC		
1200	.812 x 1.843	604D122G020GJ6
1800	.937 x 1.843	604D182G020HJ6
2200	.812 x 2.843	604D222G020GP6
2400	.937 x 2.343	604D242G020HL6
2900	.812 x 3.343	604D292G020GS6
3400	.937 x 2.843	604D342G020HP6
3700	1.062 x 2.343	604D372G020JL6
4500	.937 x 3.343	604D452G020HS6
5300	1.062 x 2.843	604D532G020JP6
7000	1.062 x 3.343	604D702G020JS6
8600	1.062 x 3.843	604D862G020JT6
25 WVDC		
900	.812 x 1.843	604D901G025GJ6
1200	.812 x 2.343	604D122G025GL6
1600	.812 x 2.843	604D162G025GP6
2000	.937 x 2.343	604D202G025HL6
2500	1.062 x 2.343	604D252G025JL6
2800	.937 x 2.843	604D282G025HP6
3600	1.062 x 2.843	604D362G025JP6
4700	1.062 x 3.343	604D472G025JS6
5700	1.062 x 3.843	604D572G025JT6
30 WVDC		
700	.812 x 1.843	604D701G030GJ6
900	.812 x 2.343	604D901G030GL6
1300	.812 x 2.843	604D132G030GP6
1600	.937 x 2.343	604D162G030HL6
2000	1.062 x 2.343	604D202G030JL6
2200	.937 x 2.843	604D222G030HP6
2800	1.062 x 2.843	604D282G030JP6
3000	.937 x 3.343	604D302G030HS6
3600	1.062 x 3.343	604D362G030JS6
4500	1.062 x 3.843	604D452G030JT6
40 WVDC		
550	.812 x 1.843	604D551G040GJ6
700	.812 x 2.343	604D701G040GL6
900	.937 x 1.843	604D901G040HJ6
1200	.937 x 2.343	604D122G040HL6

μF	Dia. x Length	Cat. Number
1500	1.062 x 2.343	604D152G040JL6
1700	.937 x 2.843	604D172G040HP6
2300	.937 x 3.343	604D232G040HS6
2900	1.062 x 3.343	604D292G040JS6
3600	1.062 x 3.843	604D362G040JT6
50 WVDC		
300	.812 x 1.843	604D301G050GJ6
400	.812 x 2.343	604D401G050GL6
530	.937 x 1.843	604D531G050HJ6
700	.937 x 2.343	604D701G050HL6
870	1.062 x 2.343	604D871G050JL6
1000	.937 x 2.843	604D102G050HP6
1200	1.062 x 2.843	604D122G050JP6
1600	1.062 x 3.343	604D162G050JS6
2000	1.062 x 3.843	604D202G050JT6
75 WVDC		
200	.812 x 1.843	604D201F075GJ6
260	.812 x 2.343	604D261F075GL6
350	.937 x 1.843	604D351F075HJ6
450	.937 x 2.343	604D451F075HL6
570	1.062 x 2.343	604D571F075JL6
650	.937 x 2.843	604D651F075HP6
850	.937 x 3.343	604D851F075HS6
1000	1.062 x 3.343	604D102F075JS6
1300	1.062 x 3.843	604D132F075JT6
100 WVDC		
130	.812 x 1.843	604D131F100GJ6
170	.812 x 2.343	604D171F100GL6
230	.937 x 1.843	604D231F100HJ6
300	.937 x 2.343	604D301F100HL6
380	1.062 x 2.343	604D381F100JL6
430	.937 x 2.843	604D431F100HP6
550	1.062 x 2.843	604D551F100JP6
700	1.062 x 3.343	604D701F100JS6
850	1.062 x 3.843	604D851F100JT6
200 WVDC		
50	.812 x 1.843	604D500F200GJ6
85	.937 x 1.843	604D850F200HJ6
100	.937 x 2.343	604D101F200HL6
150	.937 x 2.843	604D151F200HP6
200	1.062 x 2.843	604D201F200JP6
250	.937 x 3.343	604D251F200HT6
320	1.062 x 3.843	604D321F200JT6

SPRAGUE CAPACITORS

TYPE 672D EXTRALYTIC® ALUMINUM ELECTROLYTICS



- Specifically designed for use in switching regulators and other high frequency applications.
- Miniature single-ended 'lytics feature low equivalent series resistance, inductance, and impedance.
- High capacitance values combined with low inductance and low ESR limits makes these capacitors very useful for bus bar decoupling in data processing applications.

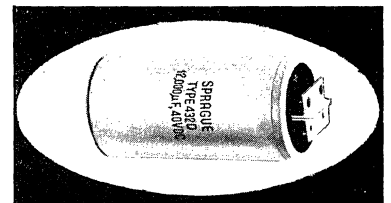
- Premium-grade capacitors offer guaranteed inductance limit of 20nH with typical values of less than 10nH.
- Furnished with outer plastic-film insulation with supplementary polymer coated end-seal.
- Capacitance tolerance, -10, +100%.
- Operating temperature range, -55 C to +105 C.
- For complete technical data, refer to latest issue of Sprague Engineering Bulletin 3452.

μF	Dia. x Length	Catalog Number	μF	Dia. x Length	Catalog Number	μF	Dia. x Length	Catalog Number
6.3 WVDC			20 WVDC			50 WVDC		
68	.336 x .630	672D686H6R3BB5C	33	.336 x .630	672D336H020BB5C	12	.336 x .630	672D126H050BB5C
120	.413 x .677	672D127H6R3CC5C	56	.413 x .677	672D566H020CC5C	18	.413 x .677	672D186H050CC5C
180	.413 x .740	672D187H6R3CD5C	82	.413 x .740	672D826H020CD5C	22	.413 x .740	672D226H050CD5C
220	.413 x .927	672D227H6R3CG5C	100	.413 x .927	672D107H020CG5C	27	.413 x .927	672D276H050CG5C
680	.500 x 1.165	672D687H6R3DM5C	330	.500 x 1.165	672D337H020DM5C	82	.500 x 1.165	672D826H050DM5C
820	.500 x 1.462	672D827H6R3DT5C	390	.500 x 1.462	672D397H020DT5C	120	.500 x 1.462	672D127H050DT5C
1200	.500 x 1.790	672D128H6R3DS5C	560	.500 x 1.790	672D567H020DS5C	180	.500 x 1.790	672D187H050DS5C
12 WVDC			25 WVDC			60 WVDC		
56	.336 x .630	672D566H012BB5C	27	.336 x .630	672D276H025BB5C	12	.413 x .677	672D126H060CC5C
100	.413 x .677	672D107H012CC5C	47	.413 x .677	672D476H025CC5C	18	.413 x .740	672D186H060CD5C
120	.413 x .740	672D127H012CD5C	68	.413 x .740	672D686H025CD5C	22	.413 x .927	672D226H060CG5C
180	.413 x .927	672D187H012CG5C	82	.413 x .927	672D826H025CG5C	68	.500 x 1.165	672D686H060DM5C
470	.500 x 1.165	672D477H012DM5C	270	.500 x 1.165	672D277H025DM5C	82	.500 x 1.462	672D826H060DT5C
680	.500 x 1.462	672D687H012DT5C	330	.500 x 1.462	672D337H025DT5C	120	.500 x 1.790	672D127H060DS5C
1000	.500 x 1.790	672D108H012DS5C	470	.500 x 1.790	672D477H025DS5C	100 WVDC		
15 WVDC			40 WVDC			4.7	.413 x .677	672D475H100CC5C
47	.336 x .630	672D476H015BB5C	18	.336 x .630	672D186H040BB5C	6.8	.413 x .740	672D685H100CD5C
82	.413 x .677	672D826H015CC5C	39	.413 x .677	672D396H040CC5C	8.2	.413 x .927	672D825H100CG5C
100	.413 x .740	672D107H015CD5C	47	.413 x .740	672D476H040CD5C	27	.500 x 1.165	672D276H100DM5C
150	.413 x .927	672D157H015CG5C	56	.413 x .927	672D566H040CG5C	39	.500 x 1.462	672D396H100DT5C
390	.500 x 1.165	672D397H015DM5C	180	.500 x 1.165	672D187H040DM5C	47	.500 x 1.790	672D476H100DS5C
560	.500 x 1.462	672D567H015DT5C	270	.500 x 1.462	672D277H040DT5C			
820	.500 x 1.790	672D827H015DS5C	390	.500 x 1.790	672D397H040DS5C			

TYPE 432D COMPULYTIC® ALUMINUM ELECTROLYTICS

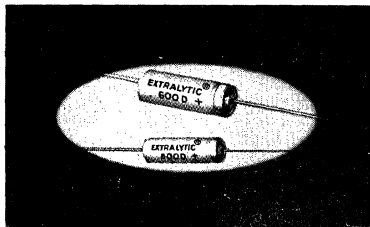
- Revolutionary electrolytic capacitors for ultra-low-impedance applications.
- Impedance limits at 10 kHz are as low as .001 ohm, with typical values of only half the specified limits.
- Special strip-line terminals are ideal for use with laminated-bus power distribution systems found in modern EDP equipment.

- Stacked-foil construction allows capacitance values to 100,000 μF with extremely low ESR of typically less than .001 ohm and inductance of only 1 nH.
- Operating temperature range, -40 C to +85 C.
- For complete technical data, refer to latest issue of Sprague Engineering Bulletin 3443.



μF	Dia. x Length	Catalog Number	μF	Dia. x Length	Catalog Number	μF	Dia. x Length	Catalog Number
6 WVDC			15 WVDC			30 WVDC		
3,900	1.453 x 2.250	432D392006AA2	1,800	1.453 x 2.250	432D182015AA2	820	1.453 x 2.250	432D821030AA2
10,000	1.453 x 4.250	432D103006AC2	4,700	1.453 x 4.250	432D472015AC2	2,200	1.453 x 4.250	432D222030AC2
56,000	3.078 x 4.250	432D563006DC2	27,000	3.078 x 4.250	432D273015DC2	12,000	3.078 x 4.250	432D123030DC2
100,000	3.078 x 5.750	432D104006DF2	39,000	3.078 x 5.750	432D393015DF2	18,000	3.078 x 5.750	432D183030DF2
7.5 WVDC			20 WVDC			40 WVDC		
2,700	1.453 x 2.250	432D2727R5AA2	1,200	1.453 x 2.250	432D122020AA2	560	1.453 x 2.250	432D561040AA2
6,800	1.453 x 4.250	432D6827R5AC2	3,300	1.453 x 4.250	432D332020AC2	1,500	1.453 x 4.250	432D152040AC2
47,000	3.078 x 4.250	432D4737R5DC2	18,000	3.078 x 4.250	432D183020DC2	8,200	3.078 x 4.250	432D822040DC2
68,000	3.078 x 5.750	432D6837R5DF2	27,000	3.078 x 5.750	432D273020DF2	12,000	3.078 x 5.750	432D123040DF2
10 WVDC			25 WVDC			50 WVDC		
2,200	1.453 x 2.250	432D222010AA2	1,000	1.453 x 2.250	432D102025AA2	470	1.453 x 2.250	432D471050AA2
5,600	1.453 x 4.250	432D562010AC2	2,700	1.453 x 4.250	432D272025AC2	1,000	1.453 x 4.250	432D102050AC2
33,000	3.078 x 4.250	432D333010DC2	15,000	3.078 x 4.250	432D153025DC2	6,800	3.078 x 4.250	432D682050DC2
56,000	3.078 x 5.750	432D563010DF2	22,000	3.078 x 5.750	432D223025DF2	10,000	3.078 x 5.750	432D103050DF2

SPRAGUE CAPACITORS



TYPE 600D EXTRALYTIC® ALUMINUM ELECTROLYTIC CAPACITORS

- Extended Operating Temperature Range From -55C to +125C
- Industrial version of CU12 and CU13 units
- Dual Rating Makes Possible Operation At Either 85C or 125C
- Voltage Ratings Up to 250 Volts D-C
- Improved Oxide Systems, Etching Techniques, and End Seals; a New Electrolyte Makes The Type 600D Equivalent to Or Better Than Comparable Foil Tantalum Capacitors.
- Lower Cost and One Third The Weight of Comparable Foil Tantalums

For Complete Technical Data, See Latest Issue of Sprague Engineering Bulletin 3455.

CALL YOUR SPRAGUE INDUSTRIAL DISTRIBUTOR FOR CURRENT QUANTITY PRICES

μF	Case Code	Catalog Number†
7 WVDC @ 85C, 5 WVDC @ 125C		
120	KD	600D127G007KD4
220	DD	600D227G007DD4
270	DE	600D277G007DE4
390	DG	600D397G007DG4
560	DJ	600D567G007DJ4
820	DL	600D827G007DL4
1000	DX	600D1087G007DX4

10 WVDC @ 85C, 7 WVDC @ 125C		
100	KD	600D107G010KD4
180	DD	600D187G010DD4
220	DE	600D227G010DE4
330	DG	600D337G010DG4
470	DJ	600D477G010DJ4
680	DL	600D687G010DL4
820	DX	600D827G010DX4

15 WVDC @ 85C, 10 WVDC @ 125C		
68	KD	600D686G015KD4
82	KD	600D826G015KD4
150	DD	600D157G015DD4
180	DE	600D187G015DE4
270	DG	600D277G015DG4
390	DJ	600D397G015DJ4
560	DL	600D567G015DL4
680	DX	600D687G015DX4

20 WVDC @ 85C, 15 WVDC @ 125C		
68	KD	600D686G020KD4
100	DD	600D107G020DD4
140	DE	600D147G020DE4
220	DG	600D227G020DG4

μF	Case Code	Catalog Number†
290	DJ	600D297G020DJ4
440	DL	600D447G020DL4
600	DX	600D607G020DX4

30 WVDC @ 85C, 20 WVDC @ 125C		
33	KD	600D336G030KD4
47	KD	600D476G030KD4
82	DD	600D826G030DD4
100	DE	600D107G030DE4
120	DG	600D127G030DG4
150	DG	600D157G030DG4
220	DJ	600D227G030DJ4
330	DL	600D337G030DL4
390	DX	600D397G030DX4

40 WVDC @ 85C, 30 WVDC @ 125C		
30	KD	600D306G040KD4
50	DD	600D506G040DD4
70	DE	600D706G040DE4
100	DG	600D107G040DG4
140	DJ	600D147G040DJ4
210	DL	600D217G040DL4
280	DX	600D287G040DX4

50 WVDC @ 85C, 40 WVDC @ 125C		
22	KD	600D226G050KD4
33	DD	600D336G050DD4
47	DE	600D476G050DE4
56	DG	600D566G050DG4
68	DG	600D686G050DG4
100	DJ	600D107G050DJ4
150	DL	600D157G050DL4
180	DX	600D187G050DX4

μF	Case Code	Catalog Number†
60 WVDC @ 85C, 50 WVDC @ 125C		
17	KD	600D176G060KD4
25	DD	600D256G060DD4
40	DE	600D406G060DE4
60	DG	600D606G060DG4
80	DJ	600D806G060DJ4
120	DL	600D127G060DL4
160	DX	600D167G060DX4

75 WVDC @ 85C, 60 WVDC @ 125C		
12	KD	600D126F075KD4
22	DD	600D226F075DD4
33	DE	600D336F075DE4
47	DG	600D476F075DG4
68	DJ	600D686F075DJ4
100	DL	600D107F075DL4
120	DX	600D127F075DX4

100 WVDC @ 85C, 75 WVDC @ 125C		
8.2	KD	600D825F100KD4
12	DD	600D126F100DD4
15	DE	600D156F100DE4
22	DG	600D226F100DG4
33	DJ	600D336F100DJ4
47	DL	600D476F100DL4
68	DX	600D686F100DX4

150 WVDC @ 85C, 100 WVDC @ 125C		
4.7	KD	600D475F150KD4
5.6	KD	600D565F150KD4
8.2	DD	600D825F150DD4
12	DE	600D126F150DE4

μF	Case Code	Catalog Number†
18	DG	600D186F150DG4
22	DJ	600D226F150DJ4
33	DL	600D336F150DL4
56	DX	600D566F150DX4

200 WVDC @ 85C, 150 WVDC @ 125C		
4	KD	600D405F200KD4
6	DD	600D605F200DD4
8	DE	600D805F200DE4
13	DG	600D136F200DG4
17	DJ	600D176F200DJ4
26	DL	600D266F200DL4
39	DX	600D396F200DX4

250 WVDC @ 85C, 200 WVDC @ 125C		
3.3	KD	600D335F250KD4
5.6	DD	600D565F250DD4
6.8	DE	600D685F250DE4
10	DG	600D106F250DG4
12	DJ	600D126F250DJ4
22	DL	600D226F250DL4
27	DX	600D276F250DX4

TABLE OF DIMENSIONS		
Case Code	With Outer Insulation	
	D	L
KD	.296	x 1.000
DD	.390	x 1.000
DE	.390	x 1.187
DG	.390	x 1.437
DJ	.390	x 1.687
DL	.390	x 2.249
DX	.390	x 2.749

†Catalog numbers listed are for capacitors with Outer Insulation. For units with bare case substitute "0" for "4" at the end of the catalog number, and subtract 1/64" from diameter and 1/16" from length.

TYPE 601D EXTRALYTIC® ALUMINUM ELECTROLYTIC CAPACITORS

- Supplement 600D With Higher Capacitance
- Industrial version of CU16 and CU17 units
- Pressure-sensitive Safety Vent
- Designed to Operate at a Temperature Range of -55C to +85C
- Unique New Electrolyte, High-gain Etched Foil, Improved Oxide System Provide Long Life With Superior Electrical Characteristics
- For Complete Technical Data, See Latest Issue of Sprague Engineering Bulletin 3456

Call Your Sprague Industrial Distributor For Current Quantity Prices

μF	D. x L.	Catalog Number*	μF	D. x L.	Catalog Number*	μF	D. x L.	Catalog Number*
5 WVDC, 7 WDV SURGE			7.5 WVDC, 10 VDC SURGE					
750	.687 x 1.250	601D757G005FE4	4300	.812 x 2.750	601D438G005GP4	650	.687 x 1.250	601D657G7R5FE4
1200	.812 x 1.250	601D128G005GE4	4700	1.062 x 1.750	601D478G005JJ4	1000	.812 x 1.250	601D108G7R5GE4
1500	.687 x 1.750	601D158G005FJ4	5200	.937 x 2.250	601D528G005HL4	1300	.687 x 1.750	601D138G7R5FJ4
1700	.937 x 1.250	601D178G005HE4	5500	.812 x 3.250	601D558G005GS4	1400	.937 x 1.250	601D148G7R5HE4
2300	.687 x 2.250	601D238G005FL4	6100	.937 x 2.750	601D618G005HP4	1900	.687 x 2.250	601D198G7R5FL4
2400	.812 x 1.750	601D248G005GJ4	6700	.812 x 3.750	601D678G005GT4	2000	.812 x 1.750	601D208G7R5GJ4
2700	.687 x 2.750	601D278G005FP4	7100	1.062 x 2.250	601D718G005JL4	2200	.687 x 2.750	601D228G7R5FP4
3500	.687 x 3.250	601D358G005FS4	7900	.937 x 3.250	601D798G005HS4	2900	.687 x 3.250	601D298G7R5FS4
3600	.812 x 2.250	601D368G005GL4	8300	1.062 x 2.750	601D838G005JP4	3000	.812 x 2.250	601D308G7R5GL4
4200	.687 x 3.750	601D428G005FT4	9600	.937 x 3.750	601D968G005HT4	3500	.687 x 3.750	601D358G7R5FT4
			10000	1.062 x 3.250	601D109G005JS4			
			13000	1.062 x 3.750	601D139G005JT4			

*Catalog numbers listed are for capacitors with outer insulation. For bare case change "4" to "0" at end of catalog number and subtract .062" from diameter and .125" from length.

SPRAGUE CAPACITORS

TYPE 601D EXTRALYTIC® ALUMINUM ELECTROLYTIC CAPACITORS, Continued

μF	D. x L.	Catalog Number*	μF	D. x L.	Catalog Number*	μF	D. x L.	Catalog Number*
3600	.812 x 2.750	601D368G7R5GP4	990	.687 x 3.250	601D997G025FS4	150	.812 x 1.750	601D157F075GJ4
4000	1.062 x 1.750	601D408G7R5JJ4	1000	.812 x 2.250	601D108G025GL4	160	.687 x 2.750	601D167F075FP4
4400	.937 x 2.250	601D448G7R5HL4	1200	.687 x 3.750	601D128G025FT4	210	.687 x 3.250	601D217F075FS4
4600	.812 x 3.250	601D468G7R5GS4	1300	1.062 x 1.750	601D138G025JJ4	220	.812 x 2.250	601D227F075GL4
5100	.937 x 2.750	601D518G7R5HP4	1500	.812 x 3.250	601D158G025GS4	260	.687 x 3.750	601D267F075FT4
5600	.812 x 3.750	601D568G7R5GT4	1700	.937 x 2.750	601D178G025HP4	290	1.062 x 1.750	601D297F075JJ4
6000	1.062 x 2.250	601D608G7R5JL4	1900	.812 x 3.750	601D198G025GT4	320	.937 x 2.250	601D327F075HL4
6600	.937 x 3.250	601D668G7R5HS4	2000	1.062 x 2.250	601D208G025JL4	340	.812 x 3.250	601D347F075GS4
7000	1.062 x 2.750	601D708G7R5JP4	2200	.937 x 3.250	601D228G025HS4	380	.937 x 2.750	601D387F075HP4
8100	.937 x 3.750	601D818G7R5HT4	2300	1.062 x 2.750	601D238G025JP4	400	.812 x 3.750	601D407F075GT4
9000	1.062 x 3.250	601D908G7R5JS4	2700	.937 x 3.750	601D278G025HT4	440	1.062 x 2.250	601D447F075JL4
11000	1.062 x 3.750	601D119G7R5JT4	3000	1.062 x 3.250	601D308G025JS4	490	.937 x 3.250	601D497F075HS4
			3700	1.062 x 3.750	601D378G025JT4	500	1.062 x 2.750	601D507F075JP4
						600	.937 x 3.750	601D607F075HT4
						660	1.062 x 3.250	601D667F075JS4
						800	1.062 x 3.750	601D807F075JT4
10 WVDC, 15 VDC SURGE			30 WVDC, 45 VDC SURGE			100 WVDC, 150 VDC SURGE		
540	.687 x 1.250	601D547G010FE4	190	.687 x 1.250	601D197G030FE4	25	.687 x 1.250	601D256F100FE4
850	.812 x 1.250	601D857G010GE4	310	.812 x 1.250	601D317G030GE4	45	.812 x 1.250	601D456F100GE4
1000	.687 x 1.750	601D108G010FJ4	390	.687 x 1.750	601D397G030FJ4	55	.687 x 1.750	601D556F100FJ4
1200	.937 x 1.250	601D128G010HE4	440	.937 x 1.250	601D447G030HE4	65	.937 x 1.250	601D656F100HE4
1600	.687 x 2.250	601D168G010FL4	580	.687 x 2.250	601D587G030FL4	80	.687 x 2.250	601D806F100FL4
1700	.812 x 1.750	601D178G010GJ4	600	1.062 x 1.250	601D607G030GJ4	90	.812 x 1.750	601D906F100GJ4
1800	.687 x 2.750	601D188G010FP4	620	.812 x 1.750	601D627G030FP4	95	.687 x 2.750	601D956F100FP4
2400	.687 x 3.250	601D248G010FS4	680	.687 x 2.750	601D687G030FS4	120	.687 x 3.250	601D127F100FS4
2500	.812 x 2.250	601D258G010GL4	870	.687 x 3.250	601D877G030FS4	130	.812 x 2.250	601D137F100GL4
2900	.687 x 3.750	601D298G010FT4	880	.937 x 1.750	601D887G030HJ4	150	.687 x 3.750	601D157F100FT4
3000	.812 x 2.750	601D308G010GP4	930	.812 x 2.250	601D937G030GL4	180	1.062 x 1.750	601D187F100JJ4
3300	1.062 x 1.750	601D338G010JJ4	1000	.687 x 3.750	601D108G030FT4	200	.812 x 3.250	601D207F100GS4
3600	.937 x 3.250	601D368G010HL4	1200	1.062 x 1.750	601D128G030JJ4	230	.937 x 2.750	601D237F100HP4
3800	.812 x 3.250	601D388G010GS4	1400	.812 x 3.250	601D148G030GS4	250	.812 x 3.750	601D257F100GT4
4200	.937 x 2.750	601D428G010HP4	1500	.937 x 2.750	601D158G030HP4	280	1.062 x 2.250	601D287F100JL4
4700	.812 x 3.750	601D478G010GT4	1700	.812 x 3.750	601D178G030GT4	300	.937 x 3.250	601D307F100HS4
5000	1.062 x 2.250	601D508G010JL4	1800	1.062 x 2.250	601D188G030JL4	320	1.062 x 2.750	601D327F100JP4
5500	.937 x 3.250	601D558G010HS4	2000	.937 x 3.250	601D208G030HS4	370	.937 x 3.750	601D377F100HT4
5800	1.062 x 2.750	601D588G010JP4	2100	1.062 x 2.750	601D218G030JP4	420	1.062 x 3.250	601D427F100JS4
6700	.937 x 3.750	601D678G010HT4	2400	.937 x 3.750	601D248G030HT4	500	1.062 x 3.750	601D507F100JT4
7500	1.062 x 3.250	601D758G010JS4	2700	1.062 x 3.250	601D278G030JS4			
9100	1.062 x 3.750	601D918G010JT4	3300	1.062 x 3.750	601D338G030JT4			
15 WVDC, 20 VDC SURGE			40 WVDC, 60 VDC SURGE			150 WVDC, 200 VDC SURGE		
400	.687 x 1.250	601D407G015FE4	140	.687 x 1.250	601D147G040FE4	18	.687 x 1.250	601D186F150FE4
650	.812 x 1.250	601D657G015GE4	220	.812 x 1.250	601D227G040GE4	30	.812 x 1.250	601D306F150GE4
800	.687 x 1.750	601D807G015FJ4	270	.687 x 1.750	601D277G040FJ4	35	.687 x 1.750	601D356F150FJ4
930	.937 x 1.250	601D937G015HE4	300	.937 x 1.250	601D307G040HE4	45	.937 x 1.250	601D456F150HE4
1200	.687 x 2.250	601D128G015FL4	400	.687 x 2.250	601D407G040FL4	55	.687 x 2.250	601D556F150FL4
1300	.812 x 1.750	601D138G015GJ4	430	1.062 x 1.250	601D437G040GJ4	60	.812 x 1.750	601D606F150GJ4
1400	.687 x 2.750	601D148G015FP4	440	.812 x 1.750	601D447G040GJ4	65	.687 x 2.750	601D656F150FP4
1800	.687 x 3.250	601D188G015FS4	480	.687 x 2.750	601D487G040FP4			
1900	.812 x 2.250	601D198G015GL4	620	.687 x 3.250	601D627G040FS4	85	.687 x 3.250	601D856F150FS4
2200	.687 x 3.750	601D228G015FT4	630	.937 x 1.750	601D637G040HJ4	90	.937 x 1.750	601D906F150HJ4
2500	1.062 x 1.750	601D258G015JJ4	660	.812 x 2.250	601D667G040GL4	95	.812 x 2.250	601D956F150GL4
2700	.937 x 2.250	601D278G015HL4	760	.687 x 3.750	601D767G040FT4	100	.687 x 3.750	601D107F150FT4
2900	.812 x 3.250	601D298G015GS4	770	.812 x 2.750	601D777G040GP4	100	1.062 x 1.750	601D137F150JL4
3200	.937 x 2.750	601D328G015HP4	860	1.062 x 1.750	601D867G040JJ4	140	.812 x 3.250	601D147F150GS4
3500	.812 x 3.750	601D358G015GT4	950	.937 x 2.250	601D957G040HL4	160	.937 x 2.750	601D167F150HP4
3800	1.062 x 2.250	601D388G015JL4	1000	.812 x 3.250	601D108G040GS4	170	.812 x 3.750	601D177F150GT4
4200	.937 x 3.250	601D428G015HS4	1100	.937 x 2.750	601D118G040HP4	190	1.062 x 2.250	601D197F150JL4
4400	1.062 x 2.750	601D448G015JP4	1200	.812 x 3.750	601D128G040GT4	210	.937 x 3.250	601D217F150HS4
5100	.937 x 3.750	601D518G015HT4	1400	.937 x 3.250	601D148G040HS4	230	1.062 x 2.750	601D237F150JP4
5700	1.062 x 3.250	601D578G015JS4	1500	1.062 x 2.750	601D158G040JP4	260	.937 x 3.750	601D267F150HT4
6900	1.062 x 3.750	601D698G015JT4	1700	.937 x 3.750	601D178G040HT4	290	1.062 x 3.250	601D297F150JS4
			1900	1.062 x 3.250	601D198G040JS4	360	1.062 x 3.750	601D367F150JT4
			2300	1.062 x 3.750	601D238G040JT4			
20 WVDC, 30 VDC SURGE			50 WVDC, 75 VDC SURGE			200 WVDC, 250 VDC SURGE		
290	.687 x 1.250	601D297G020FE4	110	.687 x 1.250	601D117G050FE4	16	.687 x 1.250	601D166F200FE4
460	.812 x 1.250	601D467G020GE4	170	.812 x 1.250	601D177G050GE4	25	.812 x 1.250	601D256F200GE4
580	.687 x 1.750	601D587G020FJ4	220	.687 x 1.750	601D227G050FJ4	30	.687 x 1.750	601D306F200FJ4
660	.937 x 1.250	601D667G020HE4	250	.937 x 1.250	601D257G050HE4	35	.937 x 1.250	601D356F200HE4
900	.812 x 1.750	601D907G020GJ4	330	.687 x 2.250	601D337G050FL4	45	.687 x 2.750	601D456F200FL4
1000	.687 x 2.750	601D108G020FP4	340	1.062 x 1.250	601D347G050JE4	50	.812 x 1.750	601D506F200GJ4
1300	.687 x 3.250	601D138G020FS4	350	.812 x 1.750	601D357G050GJ4	55	.687 x 2.750	601D556F200FP4
1600	.687 x 3.750	601D168G020FT4	380	.687 x 2.750	601D387G050FP4	70	.687 x 3.250	601D706F200FS4
1800	1.062 x 1.750	601D188G020JJ4	500	.687 x 3.250	601D507G050FS4	75	.812 x 2.250	601D756F200GL4
1900	.937 x 2.250	601D198G020HL4	600	.687 x 3.750	601D607G050FT4	85	.687 x 3.750	601D856F200FT4
2000	.937 x 3.250	601D208G020GS4	680	1.062 x 1.750	601D687G050JJ4	90	.812 x 2.750	601D906F200GJ4
2300	.812 x 3.750	601D238G020HP4	750	.937 x 2.250	601D757G050HL4	100	.812 x 3.250	601D107F200GS4
2500	.937 x 3.750	601D258G020GT4	790	.812 x 3.250	601D797G050GS4	110	.937 x 2.250	601D117F200HL4
2700	1.062 x 2.250	601D278G020JL4	870	.937 x 2.750	601D877G050HP4	130	.937 x 2.750	601D137F200HP4
2900	.937 x 3.250	601D298G020HS4	950	.812 x 3.750	601D957G050GT4	140	.812 x 3.750	601D147F200GT4
3100	1.062 x 2.750	601D318G020JP4	1000	1.062 x 2.250	601D108G050JL4	160	1.062 x 2.250	601D167F200JL4
3600	.937 x 3.750	601D368G020HT4	1100	.937 x 3.250	601D118G050HS4	170	.937 x 3.250	601D177F200HS4
4000	1.062 x 3.250	601D408G020JS4	1500	1.062 x 3.250	601D158G050JS4	180	1.062 x 2.750	601D187F200JP4
4900	1.062 x 3.750	601D498G020JT4	1800	1.062 x 3.750	601D188G050JT4	210	.937 x 3.750	601D217F200HT4
						240	1.062 x 3.250	601D247F200JS4
						290	1.062 x 3.750	601D297F200JT4
25 WVDC, 40 VDC SURGE			75 WVDC, 100 VDC SURGE					
220	.687 x 1.250	601D227G025FE4	45	.687 x 1.250	601D456F075FE4			
350	.812 x 1.250	601D357G025GE4	75	.812 x 1.250	601D756F075GE4			
440	.687 x 1.750	601D447G025FJ4	95	.687 x 1.750	601D956F075FJ4			
500	.937 x 1.250	601D507G025HS4	100	.937 x 1.250	601D107F075HE4			
660	.687 x 2.250	601D667G025FL4	140	.687 x 2.250	601D147F075FL4			
680	.812 x 1.250	601D687G025JE4						
700	.812 x 1.750	601D707G025GJ4						
770	.687 x 2.750	601D777G025FP4						

*Catalog numbers listed are for capacitors with outer insulation. For bare case change "4" to "0" at end of cat. no. and subtract .062" from D, and .125" from L.

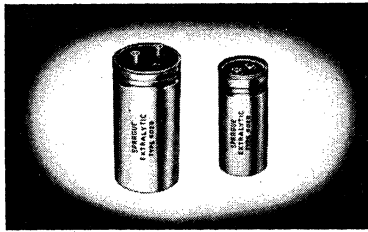
Copyright 1974, Sprague Products Company

IND-EEM-17A-EBAP

All sizes subject to change without notice.

SPRAGUE CAPACITORS

TYPE 602D EXTRALYTIC® ALUMINUM ELECTROLYTIC CAPACITORS



- Large Cylindrical Power Supply Filter Capacitors With Exceptional Performance Over Long and Trouble-free life
- High Ripple Current Capability
- Designed For Continuous Operation Over Temperature Range of —55 C to +85 C
- Extremely Useful on Input of Power Supply Filters, as They Will Safely Carry as Much as 10 amps of Ripple Current at 120 Hz
- Superior Humidity Seal
- For Complete Technical Data, See Latest Issue of Sprague Engineering Bulletin 3457

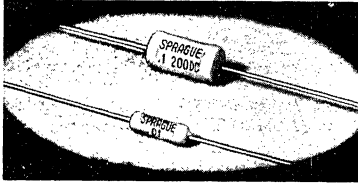
μF	Size Code	Cat. No.*	μF	Size Code	Cat. No.*	μF	Size Code	Cat. No.*	μF	Size Code	Cat. No.*	
5 WVDC, 7 V SURGE									75 WVDC, 100 V SURGE			
8,000	AA	602D802G005AA2A	51,000	CC	602D513G015CC2D	9,900	AF	602D992G030AF2A	530	AA	602D531F075AA2A	
17,000	AB	602D173G005AB2A	59,000	CD	602D593G015CD2D	10,000	BB	602D103G030BB2A	1,000	AB	602D102F075AB2A	
25,000	AC	602D253G005AC2A	68,000	CE	602D683G015CE2D	15,000	BC	602D153G030BC2A	1,600	AC	602D162F075AC2A	
29,000	AD	602D293G005AD2A	76,000	CF	602D763G015CF2D	17,000	BD	602D173G030BD2A	1,800	AD	602D182F075AD2A	
34,000	AE	602D343G005AE2A	76,000	DC	602D763G015DC2D	18,000	CB	602D183G030CB2D	2,000	AE	602D202F075AE2A	
37,000	AF	602D373G005AF2A	89,000	DD	602D893G015DD2D	20,000	BE	602D203G030BE2A	2,400	AF	602D242F075AF2A	
40,000	BB	602D403G005BB2A	100,000	DE	602D104G015DE2D	22,000	BF	602D223G030BF2A	2,600	BB	602D262F075BB2A	
60,000	BC	602D603G005BC2A	110,000	DF	602D114G015DF2D	26,000	CC	602D263G030CC2D	2,600	BC	602D262F075BB2A	
67,000	CB	602D673G005CB2D	20 WVDC, 30 V SURGE			30,000	CD	602D303G030CD2D	3,900	CB	602D392F075BC2A	
70,000	BD	602D703G005BD2D	2,800	AA	602D282G020AA2A	34,000	CE	602D343G030CE2D	4,400	BD	602D442F075CB2D	
80,000	BE	602D803G005BE2A	5,100	AB	602D512G020AB2A	38,000	DC	602D383G030DC2D	4,500	BE	602D452F075BD2A	
90,000	BF	602D903G005BF2A	8,600	AC	602D862G020AC2A	39,000	CF	602D393G030CF2D	5,000	BF	602D502F075BE2A	
100,000	CC	602D104G005CC2D	10,000	AD	602D103G020AD2A	45,000	DD	602D453G030DD2D	5,800	BF	602D582F075BF2A	
110,000	CD	602D114G005CD2D	11,000	AE	602D113G020AE2A	52,000	DE	602D523G030DE2D	6,600	CC	602D662F075CC2D	
130,000	CE	602D134G005CE2D	13,000	AF	602D133G020AF2A	58,000	DF	602D583G030DF2D	7,700	CD	602D772F075CD2D	
150,000	CF	602D154G005CF2D	20,000	BC	602D203G020BC2A	40 WVDC, 55 V SURGE			8,800	CE	602D882F075CE2D	
150,000	DC	602D154G005DC2D	23,000	BD	602D233G020BD2A	1,800	AA	602D182G040AA2A	9,500	DC	602D952F075DC2D	
170,000	DD	602D174G005DD2D	24,000	CB	602D243G020CB2D	3,700	AB	602D372G040AB2A	9,900	CF	602D992F075CF2D	
200,000	DE	602D204G005DE2D	26,000	BE	602D263G020BE2A	5,500	AC	602D552G040AC2A	11,000	DD	602D113F075DD2D	
220,000	DF	602D224G005DF2D	30,000	BF	602D303G020BF2A	6,400	AD	602D642G040AD2A	13,000	DE	602D133F075DE2D	
10 WVDC, 15 V SURGE			37,000	CC	602D373G020CC2D	7,400	AE	602D742G040AE2A	14,000	DF	602D143F075DF2D	
5,000	AA	602D502G010AA2A	43,000	CD	602D433G020CD2D	8,200	AF	602D822G040AF2A	100 WVDC, 150 V SURGE			
10,000	AB	602D103G010AB2A	47,000	CE	602D473G020CE2D	9,000	BB	602D902G040BB2A	250	AA	602D251F100AA2A	
15,000	AC	602D153G010AC2A	54,000	DC	602D543G020DC2D	13,000	BC	602D133G040BC2A	500	AB	602D501F100AB2A	
17,000	AD	602D173G010AD2A	55,000	CF	602D553G020CF2D	15,000	BD	602D153G040BD2A	800	AC	602D801F100AC2A	
20,000	AE	602D203G010AE2A	63,000	DD	602D633G020DD2D	15,000	CB	602D153G040CB2A	900	AD	602D901F100AD2A	
22,000	AF	602D223G010AF2A	73,000	DE	602D733G020DE2D	18,000	BE	602D183G040BE2A	1,000	AE	602D102F100AE2A	
24,000	BB	602D243G010BB2A	82,000	DF	602D823G020DF2D	19,000	BF	602D193G040BF2A	1,100	AF	602D112F100AF2A	
37,000	BC	602D373G010BC2A	25 WVDC, 40 V SURGE			22,000	CC	602D223G040CC2D	1,200	BB	602D122F100BB2A	
42,000	CB	602D423G010CB2D	2,500	AA	602D252G025AA2A	25,000	CD	602D253G040CD2D	1,800	BC	602D182F100BC2A	
43,000	BD	602D433G010BD2A	5,000	AB	602D502G025AB2A	28,000	CE	602D283G040CE2D	2,100	BD	602D212F100BD2A	
48,000	BE	602D483G010BE2A	7,500	AC	602D752G025AC2A	32,000	DC	602D323G040DC2D	2,100	CB	602D212F100CB2D	
55,000	BF	602D553G010BF2A	8,700	AD	602D872G025AD2A	33,000	CF	602D333G040CF2D	2,400	BE	602D242F100BE2A	
64,000	CC	602D643G010CC2D	10,000	AE	602D103G025AE2A	37,000	DD	602D373G040DD2D	2,600	BF	602D262F100BF2A	
75,000	CD	602D753G010CD2D	11,000	AF	602D113G025AF2A	43,000	DE	602D433G040DE2D	3,100	CC	602D312F100CC2D	
86,000	CE	602D863G010CE2D	17,000	BC	602D173G025BC2A	48,000	DF	602D483G040DF2D	3,600	CD	602D362F100CD2D	
94,000	DC	602D943G010DC2D	20,000	BD	602D203G025BD2A	50 WVDC, 75 V SURGE			4,100	CE	602D412F100CE2D	
96,000	CF	602D963G010CF2D	20,000	CB	602D203G025CB2D	1,400	AA	602D142G050AA2A	4,500	CF	602D452F100CF2D	
110,000	DD	602D114G010DD2D	23,000	BE	602D233G025BE2A	2,900	AB	602D292G050AB2A	4,600	DC	602D462F100DC2D	
120,000	DE	602D124G010DE2D	25,000	BF	602D253G025BF2A	4,400	AC	602D442G050AC2A	5,500	DD	602D552F100DD2D	
140,000	DF	602D144G010DF2D	30,000	CC	602D303G025CC2D	5,100	AD	602D512G050AD2A	6,000	DE	602D602F100DE2D	
15 WVDC, 20 V SURGE			35,000	CD	602D353G025CD2D	5,800	AE	602D582G050AE2A	6,700	DF	602D672F100DF2D	
4,000	AA	602D402G015AA2A	40,000	CE	602D403G025CE2D	6,600	AF	602D662G050AF2A	SIZE CODE			
8,000	AB	602D802G015AB2A	44,000	DC	602D443G025DC2D	9,000	BC	602D902G050BC2A	Code	D. x L.	Code	D. x L.
12,000	AC	602D123G015AC2A	45,000	CF	602D453G025CF2D	10,000	BD	602D103G050BD2A	AA	1.438 x 2.188	BF	2.062 x 5.688
14,000	AD	602D143G015AD2A	52,000	DD	602D523G025DD2D	11,000	CB	602D113G050CB2A	AB	1.438 x 3.188	CF	2.578 x 3.250
16,000	AE	602D163G015AE2A	60,000	DE	602D603G025DE2D	12,000	CC	602D123G050CC2D	AC	1.438 x 4.188	CC	2.578 x 4.250
18,000	AF	602D183G015AF2A	67,000	DF	602D673G025DF2D	13,000	BE	602D133G050BE2A	AD	1.438 x 4.688	CD	2.578 x 4.750
20,000	BB	602D203G015BB2A	30 WVDC, 40 V SURGE			15,000	BF	602D153G050BF2A	AE	1.438 x 5.188	CE	2.578 x 5.250
30,000	BC	602D303G015BC2A	2,200	AA	602D222G030AA2A	17,000	CC	602D173G050CC2D	AF	1.438 x 5.688	CF	2.578 x 5.750
35,000	BD	602D353G015BD2A	4,400	AB	602D442G030AB2A	20,000	CD	602D203G050CD2D	BB	2.062 x 3.188	DC	3.078 x 4.250
40,000	BE	602D403G015BE2A	6,600	AC	602D662G030AC2A	22,000	CE	602D223G050CE2D	BC	2.062 x 4.188	DD	3.078 x 4.250
42,000	CB	602D423G015CB2D	7,700	AD	602D772G030AD2A	25,000	CF	602D253G050CF2D	BD	2.062 x 4.688	DE	3.078 x 5.250
45,000	BF	602D453G015BF2A	8,800	AE	602D882G030AE2A	29,000	DF	602D393G050DF2D	BE	2.062 x 5.188	DF	3.078 x 5.750

SIZE CODE

Code	D. x L.	Code	D. x L.
AA	1.438 x 2.188	BF	2.062 x 5.688
AB	1.438 x 3.188	CB	2.578 x 3.250
AC	1.438 x 4.188	CC	2.578 x 4.250
AD	1.438 x 4.688	CD	2.578 x 4.750
AE	1.438 x 5.188	CE	2.578 x 5.250
AF	1.438 x 5.688	CF	2.578 x 5.750
BB	2.062 x 3.188	DC	3.078 x 4.250
BC	2.062 x 4.188	DD	3.078 x 4.750
BD	2.062 x 4.688	DE	3.078 x 5.250
BE	2.062 x 5.188	DF	3.078 x 5.750

*Catalog numbers listed are for capacitors with outer insulation. For bare case, change 14th character of cat. no. from "2" to "0" and subtract .063" from both diameter and length. Capacitors listed have low-screw insert terminals. For high-screw insert terminals, change last character of cat. no. from "A" to "B".

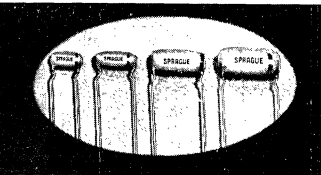
SPRAGUE CAPACITORS



TYPE 192P PACER® FILMITE® 'E' CAPACITORS

- Completely New Construction — Extended Foil Film Sections Terminate in End Caps with Wire Leads Assuring Best Possible Non-inductive Section.
- Controlled Dimensions Permit Use of Automatic Insertion Equipment for Installing Pacer Capacitors on Printed Wiring Boards.
- Entire Assembly Protected by Orange Heat Shrinkable Mylar Sleeve.
- Pacers are Wound with Ultra-thin Polyester Film Dielectric and Thin Gage Foil under Controlled Atmospheric Conditions.
- Rated for Operation from -55°C to $+85^{\circ}\text{C}$ (-67°F to $+185^{\circ}\text{F}$).
- Capacitance Tolerance: $\pm 10\%$.
- For complete data, see Engineering Bulletin 2066.

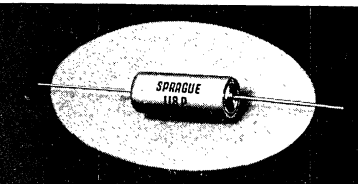
μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.
80 WVDC			200 WVDC			400 WVDC			600 WVDC		
.0022	9/64 x 5/16	192P2229R8	.22	21/64 x 5/8	192P2249R8	.0039	11/64 x 7/16	192P3929Z	.00068	11/64 x 3/8	192P68194
.0027	9/64 x 5/16	192P2729R8	.27	21/64 x 7/8	192P2749R8	.0047	11/64 x 7/16	192P4729Z	.00082	11/64 x 3/8	192P82194
.0033	9/64 x 5/16	192P3329R8	.33	21/64 x 1 3/16	192P3349R8	.0056	11/64 x 7/16	192P5629Z	.001	11/64 x 3/8	192P10294
.0039	9/64 x 5/16	192P3929R8	.39	21/64 x 1 3/16	192P3949R8	.0068	11/64 x 7/16	192P6829Z	.0012	11/64 x 3/8	192P12294
.0047	9/64 x 5/16	192P4729R8	.47*	21/64 x 1 3/16	192P4749R8*	.0082	11/64 x 1/2	192P8229Z	.0015	11/64 x 3/8	192P15294
.0056	11/64 x 3/8	192P5629R8	200 WVDC			.01	11/64 x 1/2	192P1039Z	.0018	11/64 x 7/16	192P18294
.0068	11/64 x 3/8	192P6829R8	.0001	9/64 x 5/16	192P1019Z	.012	7/32 x 7/16	192P1239Z	.0022	11/64 x 7/16	192P22294
.0082	11/64 x 3/8	192P8229R8	.00012	9/64 x 5/16	192P1219Z	.015	7/32 x 7/16	192P1539Z	.0027	7/32 x 7/16	192P27294
.01	11/64 x 3/8	192P1039R8	.00015	9/64 x 5/16	192P1519Z	.018	7/32 x 9/16	192P1839Z	.0033	7/32 x 7/16	192P33294
.012	11/64 x 7/16	192P1239R8	.00018	9/64 x 5/16	192P1819Z	.022	7/32 x 9/16	192P2239Z	.0039	7/32 x 7/16	192P39294
.015	11/64 x 7/16	192P1539R8	.00022	9/64 x 5/16	192P2219Z	.027	15/64 x 9/16	192P2739Z	.0047	7/32 x 7/16	192P47294
.018	11/64 x 1/2	192P1839R8	.00027	9/64 x 5/16	192P2719Z	.033	15/64 x 9/16	192P3339Z	.0056	15/64 x 9/16	192P56294
.022	11/64 x 1/2	192P2239R8	.00033	9/64 x 5/16	192P3319Z	.039	19/64 x 1/2	192P3939Z	.0068	15/64 x 9/16	192P68294
.027	7/32 x 7/16	192P2739R8	.00039	9/64 x 5/16	192P3919Z	.047	19/64 x 1/2	192P4739Z	.0082	15/64 x 9/16	192P82294
.033	7/32 x 7/16	192P3339R8	.00047	9/64 x 5/16	192P4719Z	.056	19/64 x 5/8	192P5639Z	.01	15/64 x 9/16	192P10394
.039	7/32 x 9/16	192P3939R8	.00056	9/64 x 5/16	192P5619Z	.068	19/64 x 5/8	192P6839Z	.012	19/64 x 1/2	192P12394
.047	7/32 x 9/16	192P4739R8	.00068	9/64 x 5/16	192P6819Z	.082	21/64 x 5/8	192P8239Z	.015	19/64 x 1/2	192P15394
.056	15/64 x 9/16	192P5639R8	.00082	9/64 x 5/16	192P8219Z	.1	21/64 x 5/8	192P1049Z	.018	19/64 x 5/8	192P18394
.068	15/64 x 9/16	192P6839R8	.001	9/64 x 5/16	192P1029Z	.12	21/64 x 7/8	192P1249Z	.022	19/64 x 5/8	192P22394
.082	19/64 x 1/2	192P8239R8	.0012	9/64 x 5/16	192P1229Z	.15	21/64 x 7/8	192P1549Z	.027	21/64 x 5/8	192P27394
.1	19/64 x 1/2	192P1049R8	.0015	9/64 x 5/16	192P1529Z	.18	21/64 x 1 3/16	192P1849Z	.033	21/64 x 5/8	192P33394
.12	19/64 x 5/8	192P1249R8	.0018	11/64 x 5/16	192P1829Z	.22	21/64 x 1 3/16	192P2249Z	.039	21/64 x 7/8	192P39394
.15	19/64 x 5/8	192P1549R8	.0022	11/64 x 5/16	192P2229Z	400 WVDC			.047	21/64 x 7/8	192P47394
.18	21/64 x 5/8	192P1849R8	.0027	11/64 x 5/16	192P2729Z	.00047	11/64 x 3/8	192P47194	.056	21/64 x 1 3/16	192P56394
			.0033	11/64 x 5/16	192P3329Z	.00056	11/64 x 3/8	192P56194	.068	21/64 x 1 3/16	192P68394



TYPE DF METALLIZED FILM ORANGE DROP® CAPACITORS

- Fit Easily into Tight Spots Because They're Smaller Than Other Types of Comparably-Rated Capacitors
- Extremely High Insulation Resistance Insures Peak Performance At Temperatures Up to $+85^{\circ}\text{C}$ (185°F)
- Radial Leads Are Extra Long For Point-to-Point Wiring and Crimped For Printed Board Insertion
- Double Dipped in Orange Epoxy Resin For Protection Against Heat And Humidity
- Capacitance Tolerance: $\pm 10\%$ ● Same as Sprague O.E.M. Type 277P
- For Complete Data, See Latest Issue of Sprague Engineering Bulletin 2040.

100 WVDC						200 WVDC																					
μF	H.	x	T.	x	L.	Cat. No.	μF	H.	x	T.	x	L.	Cat. No.	μF	H.	x	T.	x	L.	Cat. No.	μF	H.	x	T.	x	L.	Cat. No.
.15	15/32	x	1/4	x	13/16	1DF-P15	2.5	13/16	x	19/32	x	1 1/4	1DF-M2.5	.15	9/16	x	3/8	x	3/16	2DF-P15	2.5	11/16	x	13/16	x	1 1/4	2DF-M2.5
.22	1/2	x	1/4	x	13/16	1DF-P22	3.0	25/32	x	9/16	x	1 5/8	1DF-M3	.22	5/8	x	7/16	x	13/16	2DF-P22	3.0	15/16	x	11/16	x	1 5/8	2DF-M3
.33	17/32	x	5/16	x	13/16	1DF-P33	3.5	13/16	x	19/32	x	1 5/8	1DF-M3.5	.33	11/16	x	1/2	x	13/16	2DF-P33	3.5	1	x	3/4	x	1 5/8	2DF-M3.5
.47	5/8	x	13/32	x	13/16	1DF-P47	4.0	27/32	x	5/8	x	1 5/8	1DF-M4	.47	13/16	x	9/16	x	13/16	2DF-P47	4.0	1 1/16	x	13/16	x	1 5/8	2DF-M4
.68	9/16	x	11/32	x	1 1/4	1DF-P68	4.5	7/8	x	21/32	x	1 5/8	1DF-M4.5	.68	3/4	x	1/2	x	1 1/4	2DF-P68	4.5	1 1/8	x	7/8	x	1 5/8	2DF-M4.5
1.0	5/8	x	13/32	x	1 1/4	1DF-M1	5.0	29/32	x	11/16	x	1 5/8	1DF-M5	1.0	13/16	x	9/16	x	1 1/4	2DF-M1	5.0	1 1/8	x	7/8	x	1 5/8	2DF-M5
1.5	11/16	x	15/32	x	1 1/4	1DF-M1.5	5.5	15/16	x	23/32	x	1 5/8	1DF-M5.5	1.5	7/8	x	5/8	x	1 1/4	2DF-M1.5	5.5	1 3/16	x	15/16	x	1 5/8	2DF-M5.5
2.0	25/32	x	9/16	x	1 1/4	1DF-M2								2.0	15/16	x	11/16	x	1 1/4	2DF-M2							



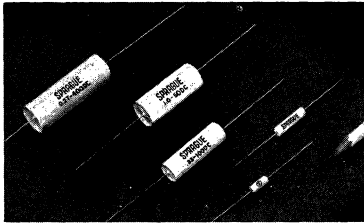
118P DIFILM® METALLIZED CAPACITORS

- Best of their type possible to produce at the present state of the art
- Rated for operation at 125°C WITHOUT VOLTAGE DERATING.
- May be used at extremely low voltages where metallized paper construction has previously been unsatisfactory.
- Capacitors listed below are ungrounded case (insulated section) units without outer insulating sleeves. For information on other styles consult your Sprague Industrial Distributor.
- For units with insulating sleeves, change last digit from "2" to "4."
- Cap. Tolerance $\pm 10\%$. For $\pm 20\%$ units, change 8th digit from "9" to "0."
- For complete data, see latest issue of Engineering Bulletin 2211.

μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.
200 WVDC			400 WVDC			600 WVDC			800 WVDC		
.01	.175 x .749	118P1039S2	.27	.400 x 1.124	118P2749S2	5.0	1.000 x 1.874	118P5059S2	.01	.312 x .874	118P1039S2
.015	.195 x .749	118P1539S2	.33	.400 x 1.124	118P3349S2	6.0	1.000 x 1.874	118P6059S2	.047	.400 x 1.124	118P4739S2
.022	.235 x .749	118P2239S2	.47	.500 x 1.124	118P4749S2	8.0	1.000 x 1.874	118P8059S2	.1	.500 x 1.124	118P1049S2
.033	.235 x .749	118P3339S2	.56	.500 x 1.124	118P5649S2	10.0	1.000 x 2.374	118P1069S2	.15	.562 x 1.124	118P1549S2
.047	.312 x .874	118P4739S2	.68	.500 x 1.124	118P6849S2	12.0	1.000 x 2.624	118P1269S2	.22	.562 x 1.374	118P2249S2
.068	.312 x .874	118P6839S2	.82	.562 x 1.124	118P8249S2				.33	.562 x 1.624	118P3349S2
.082	.312 x .874	118P8239S2	1.0	.562 x 1.124	118P1059S2	400 WVDC			.47	.670 x 1.624	118P4749S2
.1	.312 x .874	118P1049S2	1.5	.562 x 1.624	118P1559S2	.15	.500 x 1.124	118P1549S2	1.0	1.000 x 1.874	118P1059S2
.15	.312 x 1.124	118P1549S2	2.0	.670 x 1.624	118P2059S2	1.0	.750 x 1.874	118P1059S2	2.0	1.000 x 2.124	118P2059S2
.22	.400 x .874	118P2249S2	3.0	.670 x 1.874	118P3059S2	2.0	1.000 x 1.874	118P2059S2	2.5	1.000 x 2.624	118P2559S2
			4.0	.750 x 1.874	118P4059S2	3.0	1.000 x 2.624	118P3059S2			

SPRAGUE CAPACITORS

TYPE 416P YELLOW JACKET® FILMITE® 'E' CAPACITORS

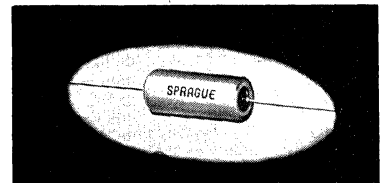


- Economy-priced for commercial applications. Made in Taiwan by Taiwan Sprague Corp.
- Extended-foil construction.
- Protected against moisture by outer wrap of polyester film and plastic resin end seals.
- Light-weight capacitors of minimum size.
- Rated for -55°C to $+85^{\circ}\text{C}$ operation (to $+105^{\circ}\text{C}$ with voltage derating).
- High insulation resistance.
- For complete technical data, refer to latest issue of Engineering Bulletin 2063C.

μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.
50 WVDC			See 200 WVDC Listing			See 200 WVDC Listing			See 200 WVDC Listing		
0.012	.190 x 0.531	416P1239R5	0.018	.190 x 0.718	416P27391	0.033	.190 x 0.844	416P33392	0.15	.405 x 1.562	416P15494
0.015	.190 x 0.531	416P1539R5	0.022	.190 x 0.718	416P33391	0.039	.210 x 0.844	416P39392	0.18	.480 x 1.562	416P18494
0.018	.200 x 0.594	416P1839R5	0.033	.190 x 0.718	416P33391	0.047	.210 x 0.844	416P47392	0.22	.480 x 1.562	416P22494
0.022	.200 x 0.594	416P2239R5	0.039	.215 x 0.718	416P39391	0.056	.240 x 0.844	416P56392	0.27	.650 x 1.750	416P27494
0.027	.210 x 0.656	416P2739R5	0.047	.215 x 0.718	416P47391	0.068	.240 x 0.844	416P68392	0.33	.650 x 1.750	416P33494
0.033	.210 x 0.656	416P3339R5	0.056	.215 x 0.844	416P56391	0.082	.275 x 0.969	416P82392	0.39	.725 x 1.937	416P39494
0.039	See 100 WVDC Listing		0.068	.215 x 0.844	416P68391	0.1	.275 x 0.969	416P10492	0.47	.725 x 1.937	416P47494
0.047	See 100 WVDC Listing		0.082	.245 x 0.844	416P82391	0.12	.345 x 1.000	416P12492	600 WVDC		
0.056	.250 x 0.718	416P5639R5	0.1	.245 x 0.844	416P10491	0.15	.345 x 1.000	416P15492	0.001	.190 x 0.718	416P10296
0.068	.250 x 0.718	416P6839R5	0.12	.285 x 0.844	416P12491	0.18	.355 x 1.250	416P18492	0.0012	.190 x 0.718	416P12296
0.082	.290 x 0.750	416P8239R5	0.15	.285 x 0.844	416P15491	0.22	.355 x 1.250	416P22492	0.0015	.190 x 0.718	416P15296
0.1	.290 x 0.750	416P1049R5	0.18	.290 x 1.250	416P18491	0.27	.425 x 1.250	416P33492	0.0018	.190 x 0.718	416P18296
0.12	.315 x 0.812	416P1249R5	0.22	.290 x 1.250	416P33491	0.39	.440 x 1.562	416P39492	0.0018	.190 x 0.718	416P22296
0.15	.315 x 0.812	416P1549R5	0.27	.325 x 1.250	416P27491	0.47	.440 x 1.562	416P47492	0.0022	.190 x 0.718	416P27296
0.18	.315 x 1.062	416P1849R5	0.33	.325 x 1.250	416P33491	0.56	.610 x 1.750	416P56492	0.0027	.205 x 0.718	416P33296
0.22	.315 x 1.062	416P2249R5	0.39	.380 x 1.250	416P39491	0.68	.610 x 1.750	416P68492	0.0033	.205 x 0.718	416P39296
0.27	.375 x 1.062	416P2749R5	0.47	.380 x 1.250	416P47491	0.82	.710 x 1.875	416P82492	0.0039	.235 x 0.718	416P47296
0.33	.375 x 1.062	416P3349R5	0.56	.455 x 1.562	416P56491	1.0	.710 x 1.875	416P10592	0.0047	.235 x 0.718	416P56296
0.39	.430 x 1.062	416P3949R5	0.68	.455 x 1.562	416P68491	400 WVDC			0.0056	.240 x 0.844	416P68296
0.47	.430 x 1.062	416P4749R5	0.82	.535 x 1.562	416P82491	0.0027	.190 x 0.718	416P27294	0.0068	.240 x 0.844	416P82296
0.56	.450 x 1.375	416P5649R5	1.0	.535 x 1.562	416P10591	0.0033	.190 x 0.718	416P33294	0.0082	.270 x 0.844	416P82296
0.68	.450 x 1.375	416P6849R5	200 WVDC			0.0039	.190 x 0.718	416P39294	0.01	.270 x 0.844	416P10396
0.82	.500 x 1.375	416P8249R5	0.001	.190 x 0.450	416P10292	0.0047	.190 x 0.718	416P47294	0.012	.315 x 0.875	416P12396
1.0	.500 x 1.375	416P1059R5	0.0012	.190 x 0.450	416P12292	0.0056	.200 x 0.718	416P56294	0.015	.315 x 0.875	416P15396
100 WVDC			0.0015	.190 x 0.450	416P15292	0.0068	.200 x 0.718	416P68294	0.018	.375 x 0.875	416P18396
0.001	See 200 WVDC Listing		0.0018	.190 x 0.450	416P18292	0.0082	.210 x 0.844	416P82294	0.022	.375 x 0.875	416P22396
0.0012	See 200 WVDC Listing		0.0022	.190 x 0.450	416P22292	0.01	.210 x 0.844	416P10394	0.027	.395 x 1.000	416P27396
0.0015	See 200 WVDC Listing		0.0027	.190 x 0.450	416P27292	0.012	.230 x 0.844	416P12394	0.033	.395 x 1.000	416P33396
0.0018	See 200 WVDC Listing		0.0033	.190 x 0.450	416P33292	0.015	.230 x 0.844	416P15394	0.039	.400 x 1.250	416P39396
0.0022	See 200 WVDC Listing		0.0039	.190 x 0.450	416P39292	0.018	.265 x 0.844	416P18394	0.047	.400 x 1.250	416P47396
0.0027	See 200 WVDC Listing		0.0047	.190 x 0.450	416P47292	0.022	.265 x 0.844	416P22394	0.056	.455 x 1.250	416P56396
0.0033	See 200 WVDC Listing		0.0056	.190 x 0.718	416P56292	0.027	.315 x 0.875	416P27394	0.068	.455 x 1.250	416P68396
0.0039	See 200 WVDC Listing		0.0068	.190 x 0.718	416P68292	0.033	.315 x 0.875	416P33394	0.082	.470 x 1.562	416P82396
0.0047	See 200 WVDC Listing		0.0082	.190 x 0.718	416P82292	0.039	.325 x 1.000	416P39394	0.1	.470 x 1.562	416P10496
0.0056	.190 x 0.450	416P56291	0.01	.190 x 0.718	416P10392	0.047	.325 x 1.000	416P47394	0.12	.545 x 1.562	416P12496
0.0068	.190 x 0.450	416P68291	0.012	.190 x 0.718	416P12392	0.056	.340 x 1.250	416P56394	0.15	.545 x 1.562	416P15496
0.0082	.190 x 0.450	416P82291	0.015	.190 x 0.718	416P15392	0.068	.340 x 1.250	416P68394	0.18	.590 x 1.937	416P18496
0.01	.190 x 0.450	416P10391	0.018	.190 x 0.718	416P18392	0.082	.400 x 1.250	416P82394	0.22	.590 x 1.937	416P22496
0.012	See 200 WVDC Listing		0.022	.190 x 0.718	416P22392	0.1	.400 x 1.250	416P10494	0.27	.800 x 1.937	416P27496
0.015	See 200 WVDC Listing		0.027	.190 x 0.844	416P27392	0.12	.405 x 1.562	416P12494	0.33	.800 x 1.937	416P33496

TYPE 260P METALLIZED FILMITE® 'K' CAPACITORS

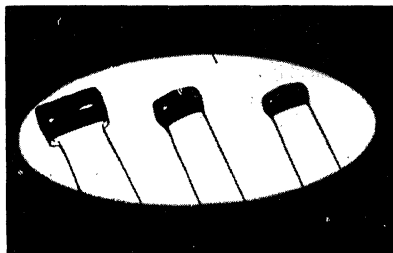
- Designed for applications such as low-frequency tuned circuits, analog computer reference capacitors and precision timing and integrated circuits.
- High insulation resistance, high stability, minimum capacitance change with temperature, low dielectric absorption, low dissipation factor.
- Capacitor sections are of non-inductive construction.
- Will operate at full rated voltage over the temperature range of -55°C to $+105^{\circ}\text{C}$.
- Capacitance tolerance, $\pm 5\%$.
- Voltage rating, 200 WVDC.
- For complete technical data, refer to latest issue of Engineering Bulletin 2705.



μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.
.01	.175 x 3/4	260P10352S4	.068	.312 x 7/8	260P68352S4	.47	.400 x 1 1/8	260P47452S4	4.0	.750 x 2 1/8	260P40552S4
.015	.195 x 3/4	260P15352S4	.1	.312 x 7/8	260P10452S4	.68	.562 x 1 1/8	260P68452S4	5.0	.750 x 2 3/8	260P50552S4
.022	.235 x 3/4	260P22352S4	.15	.312 x 1 1/8	260P15452S4	1.0	.562 x 1 3/8	260P10552S4	7.0	1.000 x 1 7/8	260P70552S4
.033	.235 x 3/4	260P33352S4	.22	.400 x 7/8	260P22452S4	2.0	.670 x 1 5/8	260P20552S4	8.0	1.000 x 2 1/8	260P80552S4
.047	.312 x 7/8	260P47352S4	.33	.400 x 1 1/8	260P33452S4	3.0	.750 x 1 7/8	260P30552S4	10.0	1.000 x 2 5/8	260P10652S4
.056	.312 x 7/8	260P56352S4									

SPRAGUE CAPACITORS

TYPE 225P FILMITE® 'E' ORANGE DROP® CAPACITORS



- Designed specifically for printed wiring board applications and are furnished with radial leads to facilitate insertion on boards.
- Find wide application in television receivers, radio sets, and commercial electronic equipment.
- Designed for operation at temperatures to 85 C.

- Capacitor sections are wound from polyester film and thin-gage foil under carefully controlled atmospheric conditions.
- Protected against moisture by a wax-free conformal coating of epoxy.
- Capacitance tolerance, $\pm 10\%$.
- For complete technical data, refer to latest issue of Sprague Engineering Bulletin 2062.

μF	H. x T. x L.	Cat. No.
100 WVDC		
.001	5/16 x 13/64 x 45/64	225P10291WD3
.0012	5/16 x 13/64 x 45/64	225P12291WD3
.0015	5/16 x 13/64 x 45/64	225P15291WD3
.0018	5/16 x 13/64 x 45/64	225P18291WD3
.0022	5/16 x 13/64 x 45/64	225P22291WD3
.0027	5/16 x 13/64 x 45/64	225P27291WD3
.0033	5/16 x 13/64 x 45/64	225P33291WD3
.0039	5/16 x 13/64 x 45/64	225P39291WD3
.0047	5/16 x 13/64 x 45/64	225P47291WD3
.0056	5/16 x 13/64 x 45/64	225P56291WD3
.0068	5/16 x 13/64 x 45/64	225P68291WD3
.0082	5/16 x 13/64 x 45/64	225P82291WD3
.01	5/16 x 13/64 x 45/64	225P10391WD3
.012	5/16 x 13/64 x 45/64	225P12391WD3
.015	5/16 x 13/64 x 45/64	225P15391WD3
.018	5/16 x 13/64 x 45/64	225P18391WD3
.022	5/16 x 13/64 x 45/64	225P22391WD3
.027	21/64 x 15/64 x 45/64	225P27391WD3
.033	21/64 x 15/64 x 45/64	225P33391WD3
.039	11/32 x 1/4 x 45/64	225P39391WD3
.047	11/32 x 1/4 x 45/64	225P47391WD3
.056	3/8 x 9/32 x 45/64	225P56391WD3
.068	3/8 x 9/32 x 45/64	225P68391WD3
.082	17/32 x 21/64 x 45/64	225P82391WD3

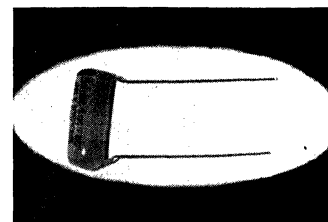
μF	H. x T. x L.	Cat. No.
.1	17/32 x 21/64 x 45/64	225P10491WD3
.12	19/32 x 3/8 x 13/16	225P12491XD3
.15	5/8 x 13/32 x 13/16	225P15491XD3
.18	11/16 x 7/16 x 13/16	225P18491XD3
.22	23/32 x 15/32 x 13/16	225P22491XD3
.27	3/4 x 1/2 x 13/16	225P27491XD3
.33	25/32 x 17/32 x 13/16	225P33491XD3
.39	13/16 x 9/16 x 13/16	225P39491XD3
.47	7/8 x 5/8 x 13/16	225P47491XD3
.56	57/64 x 9/16 x 1 3/16	225P56491YD3
.68	29/32 x 19/32 x 1 3/16	225P68491YD3
.82	61/64 x 21/32 x 1 3/16	225P82491YD3
1.0	63/64 x 47/64 x 1 3/16	225P10591YD3
200 WVDC		
.001	9/16 x 15/64 x 13/16	225P10292XD3
.0015	9/16 x 15/64 x 13/16	225P15292XD3
.0022	9/16 x 15/64 x 13/16	225P22292XD3
.0033	9/16 x 15/64 x 13/16	225P33292XD3
.0047	9/16 x 15/64 x 13/16	225P47292XD3
.0068	19/32 x 1/4 x 13/16	225P68292XD3
.01	19/32 x 1/4 x 13/16	225P10392XD3
.015	19/32 x 1/4 x 13/16	225P15392XD3
.022	19/32 x 1/4 x 13/16	225P22392XD3
.033	5/8 x 9/32 x 13/16	225P33392XD3
.047	5/8 x 9/32 x 13/16	225P47392XD3

μF	H. x T. x L.	Cat. No.
.068	41/64 x 5/16 x 13/16	225P68392XD3
.1	23/32 x 3/8 x 13/16	225P10492XD3
.15	3/4 x 27/64 x 13/16	225P15492XD3
.22	25/32 x 15/32 x 13/16	225P22492XD3
.33	23/32 x 27/64 x 1-3/16	225P33492YD3
.47	27/32 x 1/2 x 1-3/16	225P47492YD3
.68	1 9/64 x 27/32 x 1-3/16	225P68492YD3
400 WVDC		
.001	9/16 x 15/64 x 13/16	225P10294XD3
.0015	9/16 x 15/64 x 13/16	225P15294XD3
.0022	9/16 x 15/64 x 13/16	225P22294XD3
.0033	9/16 x 15/64 x 13/16	225P33294XD3
.0047	9/16 x 15/64 x 13/16	225P47294XD3
.0068	19/32 x 1/4 x 13/16	225P68294XD3
.01	19/32 x 1/4 x 13/16	225P10394XD3
.015	19/32 x 9/32 x 13/16	225P15394XD3
.022	19/32 x 5/16 x 13/16	225P22394XD3
.033	21/32 x 11/32 x 13/16	225P33394XD3
.047	21/32 x 27/64 x 13/16	225P47394XD3
.068	13/16 x 31/64 x 13/16	225P68394XD3
.1	27/32 x 17/32 x 13/16	225P10494XD3
.15	13/16 x 31/64 x 1-3/16	225P15494YD3
.22	57/64 x 9/16 x 1-3/16	225P22494YD3
.33	1 x 47/64 x 1-3/16	225P33494YD3
.47	1 9/64 x 27/32 x 1-3/16	225P47494YD3

TYPE 418P ORANGE DROP® FILMITE® 'E' CAPACITORS

- Widely used in TV, radio, and allied commercial equipment.
- Combine excellent electrical characteristics, compactness, and low cost.
- "Hockeystick" crimped radial-lead design for easy insertion on printed wiring boards.
- Wound with polyester film and thin gage foil under carefully controlled atmospheric conditions.

- Protected against moisture by wax-free conformal coating of epoxy.
- Designed for operation at temperatures to 85 C.
- May be operated to 125 C with voltage derating.
- Capacitance tolerance, $\pm 10\%$.
- For complete technical data, refer to latest issue of Sprague Engineering Bulletin 2062.



μF	D. x L.	Cat. No.
100 WVDC		
.033	.400 x .700	418P33391JD3
.039	.400 x .700	418P39391JD3
.047	.400 x .700	418P47391JD3
.056	.400 x .700	418P56391JD3
.068	.400 x .700	418P68391JD3
.082	.400 x .900	418P82391KD3
.10	.400 x .900	418P10491KD3
.12	.450 x .900	418P12491KD3
.15	.450 x .900	418P15491KD3
.18	.450 x 1.200	418P18491LD3
.22	.450 x 1.200	418P22491LD3
.27	.500 x 1.200	418P27491LD3

μF	D. x L.	Cat. No.
.33	.500 x 1.200	418P33491LD3
.39	.550 x 1.600	418P39491MD3
.47	.550 x 1.600	418P47491MD3
.56	.650 x 1.600	418P56491MD3
.68	.650 x 1.600	418P68491MD3
.82	.700 x 1.600	418P82491MD3
1.0	.700 x 1.600	418P10591MD3
200 WVDC		
.018	.400 x .700	418P18392JD3
.022	.400 x .700	418P22392JD3
.027	.400 x .700	418P27392JD3
.033	.400 x .900	418P33392KD3

μF	D. x L.	Cat. No.
.039	.400 x .900	418P39392KD3
.047	.400 x .900	418P47392KD3
.056	.400 x 1.200	418P56392LD3
.068	.400 x 1.200	418P68392LD3
.082	.450 x 1.200	418P82392LD3
.10	.450 x 1.200	418P10492LD3
.12	.500 x 1.200	418P12492LD3
.15	.500 x 1.200	418P15492LD3
.18	.550 x 1.200	418P18492LD3
.22	.550 x 1.200	418P22492LD3
.27	.500 x 1.600	418P27492MD3
.33	.500 x 1.600	418P33492MD3
.39	.550 x 1.600	418P39492MD3

SPRAGUE CAPACITORS

TYPE 418P ORANGE DROP CAPACITORS, continued

μ F	D. x L.	Cat. No.	μ F	D. x L.	Cat. No.	μ F	D. x L.	Cat. No.
.47	.550 x 1.600	418P47492MD3	.18	.600 x 1.600	418P18494MD3	.0068	.400 x .700	418P68296KD3
400 WVDC			.22	.600 x 1.600	418P22494MD3	.0082	.400 x .900	418P82296KD3
.0082	.400 x .700	418P82294JD3	.27	.650 x 1.600	418P27494MD3	.010	.400 x .900	418P10396KD3
.010	.400 x .700	418P10394JD3	.33	.650 x 1.600	418P33494MD3	.012	.400 x .900	418P12396KD3
.012	.400 x .700	418P12394JD3	.39	.720 x 1.600	418P39494MD3	.015	.400 x .900	418P15396KD3
.015	.400 x .700	418P15394JD3	.47	.720 x 1.600	418P47494MD3	.018	.450 x .900	418P18396KD3
.018	.400 x .900	418P18394KD3	600 WVDC			.022	.450 x .900	418P22396KD3
.022	.400 x .900	418P22394KD3	.0010	.400 x .700	418P10296JD3	.027	.450 x 1.200	418P27396LD3
.027	.400 x .900	418P27394KD3	.0012	.400 x .700	418P12296JD3	.033	.450 x 1.200	418P33396LD3
.033	.400 x .900	418P33394KD3	.0015	.400 x .700	418P15296JD3	.039	.550 x 1.200	418P39396LD3
.039	.450 x 1.200	418P39394LD3	.0018	.400 x .700	418P18296JD3	.047	.550 x 1.200	418P47396LD3
.047	.450 x 1.200	418P47394LD3	.0022	.400 x .700	418P22296JD3	.056	.600 x 1.200	418P56396LD3
.056	.500 x 1.200	418P56394LD3	.0027	.400 x .700	418P27296JD3	.068	.600 x 1.200	418P68396LD3
.068	.500 x 1.200	418P68394LD3	.0033	.400 x .700	418P33296JD3	.082	.650 x 1.200	418P82396LD3
.082	.550 x 1.200	418P82394LD3	.0039	.400 x .700	418P39296JD3	.10	.650 x 1.200	418P10496LD3
.10	.550 x 1.200	418P10494LD3	.0047	.400 x .700	418P47296JD3	.12	.700 x 1.600	418P12496MD3
.12	.600 x 1.200	418P12494LD3	.0056	.400 x .700	418P56296JD3	.15	.700 x 1.600	418P15496MD3
.15	.600 x 1.200	418P15494LD3				.18	.800 x 1.600	418P18496MD3
						.22	.800 x 1.600	418P22496MD3

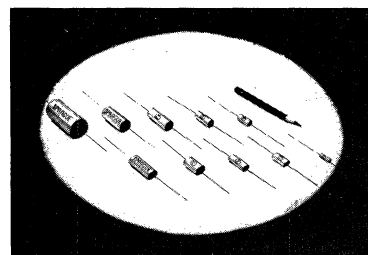
TYPE 431P METFILM® 'E' CAPACITORS

- Unique Construction Gives Definite Space Advantages Over Metal-Encased, Molded, or Wax-Coated Cardboard-Case Tubulars of Comparable Ratings.
- Axial-Lead Polyester-Film Capacitor Section Protected Against Moisture By An Outer Wrap of Polyester-Film Tape.
- An Improved End Seal of a Plastic Resin Which Bonds With the Film Wrap and the Tinned Leads Provides Superior Humidity Resistance.

- Because of Their Small Size, These Capacitors Are Particularly Well-Suited For Potting or Encapsulating in Electronic Sub-Assemblies.

- For Complete Technical Data, Refer to The Latest Issue of Sprague Engineering Bulletin 2445.

- Call Your Sprague Industrial Distributor For Current Quantity Prices.



μ F	T. x W. x L.	Cat. No.	μ F	T. x W. x L.	Cat. No.	μ F	T. x W. x L.	Cat. No.
50 WVDC			.15	7/32 x 11/32 x 3/4	431P15492	.15	5/16 x 17/32 x 1	431P15494
.047	3/32 x 3/16 x 5/8	431P4739R5	.22	1/4 x 13/32 x 3/4	431P22492	.22	13/32 x 19/32 x 1	431P22494
.068	1/8 x 7/32 x 5/8	431P6839R5	.33	7/32 x 13/32 x 1	431P33492	.33	11/32 x 9/16 x 1-1/2	431P33494
.10	5/32 x 7/32 x 5/8	431P1049R5	.47	7/32 x 13/32 x 1-1/4	431P47492	.47	3/8 x 9/16 x 1-3/4	431P47494
.15	3/16 x 1/4 x 5/8	431P1549R5	.68	5/16 x 17/32 x 1	431P68492	.68	15/32 x 21/32 x 1-3/4	431P68494
.22	5/32 x 9/32 x 3/4	431P2249R5	1.0	5/16 x 17/32 x 1-1/4	431P10592	1.0	1/2 x 23/32 x 2	431P10594
.33	3/16 x 5/16 x 3/4	431P3349R5	1.5	11/32 x 9/16 x 1-1/2	431P15592	1.5	1/2 x 25/32 x 2-1/2	431P15594
.47	3/16 x 5/16 x 1	431P4749R5	2.0	3/8 x 9/16 x 1-3/4	431P20592	600 WVDC		
.68	3/16 x 3/8 x 1	431P6849R5	2.5	15/32 x 21/32 x 1-1/2	431P25592	.0015	3/32 x 3/16 x 5/8	431P15296
1.0	1/4 x 13/32 x 1	431P1059R5	3.0	15/32 x 21/32 x 1-3/4	431P30592	.0022	1/8 x 3/16 x 5/8	431P22296
1.5	9/32 x 1/2 x 1	431P1559R5	4.0	17/32 x 3/4 x 1-3/4	431P40592	.0033	5/32 x 7/32 x 5/8	431P33296
2.0	3/8 x 9/16 x 1	431P2059R5	5.0	15/32 x 3/4 x 2-1/4	431P50592	.0047	1/8 x 1/4 x 3/4	431P47296
2.5	11/32 x 17/32 x 1-1/4	431P2559R5	6.0	15/32 x 25/32 x 2-1/2	431P60592	.0068	5/32 x 9/32 x 3/4	431P68296
3.0	3/8 x 19/32 x 1-1/4	431P3059R5	7.0	3/4 x 15/16 x 1-3/4	431P70592	.01	3/16 x 5/16 x 3/4	431P10396
4.0	3/8 x 19/32 x 1-1/2	431P4059R5	10.0	23/32 x 1 x 2-1/4	431P10692	.015	3/16 x 3/8 x 3/4	431P15396
5.0	13/32 x 19/32 x 1-3/4	431P5059R5	12.0	23/32 x 1 x 2-1/2	431P12692	.022	1/4 x 13/32 x 3/4	431P22396
6.0	15/32 x 11/16 x 1-1/2	431P6059R5	400 WVDC			.033	7/32 x 3/8 x 1	431P33396
7.0	15/32 x 11/16 x 1-3/4	431P7059R5	.0033	3/32 x 3/16 x 5/8	431P33294	.047	7/32 x 3/8 x 1-1/4	431P47396
10.0	9/16 x 25/32 x 1-3/4	431P1069R5	.0047	1/8 x 3/16 x 5/8	431P47294	.068	5/16 x 1/2 x 1	321P68396
12.0	1/2 x 13/16 x 2-1/4	431P1269R5	.0068	5/32 x 7/32 x 5/8	431P68294	.1	3/8 x 19/32 x 1	431P10496
200 WVDC			.01	3/16 x 1/4 x 5/8	431P10394	.15	3/8 x 19/32 x 1-1/4	431P15496
.015	3/32 x 3/16 x 5/8	431P15392	.015	5/32 x 9/32 x 3/4	431P15394	.22	11/32 x 9/16 x 1-3/4	431P22496
.022	1/8 x 3/16 x 5/8	431P22392	.022	3/16 x 5/16 x 3/4	431P22394	.33	7/16 x 21/32 x 1-3/4	431P33496
.033	1/8 x 7/32 x 5/8	431P33392	.033	7/32 x 11/32 x 3/4	431P33394	.47	9/16 x 3/4 x 1-3/4	431P47496
.047	5/32 x 1/4 x 5/8	431P47392	.047	1/4 x 13/32 x 3/4	431P47394	.68	15/32 x 25/32 x 2-1/2	431P68496
.068	5/32 x 9/32 x 3/4	431P68392	.068	7/32 x 3/8 x 1	431P68394	1.0	3/4 x 31/32 x 2	431P10596
.1	3/16 x 5/16 x 3/4	431P10492	.1	9/32 x 7/16 x 1	431P10494	1.5	3/4 x 1-1/16 x 2-1/2	431P15596

SPRAGUE CAPACITORS

ORANGE DROP® DIPPED TUBULARS

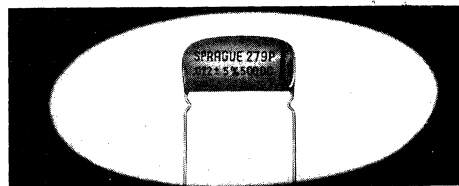


- Widely Used in TV, Radio and Allied Commercial Equipment
- Crimped Wire Leads for Correct Spacing When Mounted On Printed Wiring Boards.
- Outside Foil on All Units Identified by Black Striping
- Double Dipped in Bright Orange Epoxy Resin—Beats Heat and Humidity
- Won't Leak or Drip
- Capacitance Tolerance, $\pm 10\%$

μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.	μF	D. x L.	Cat. No.
200 WVDC			1000 WVDC			1600 WVDC		
.02	29 64 x 15 16	2PS-S20	.004	29 64 x 3 4	6PS-D40	.015	17 32 x 1 1 4	10PS-S15
.022	29 64 x 15 16	2PS-S22	.0047	29 64 x 3 4	6PS-D47	.022	37 64 x 1 3 8	10PS-S22
.047	33 64 x 15 16	2PS-S47	.005	29 64 x 3 4	6PS-D50	.033	19 32 x 1 3 8	10PS-S33
.05	33 64 x 15 16	2PS-S50	.0056	15 32 x 3 4	6PS-D56	.039	43 64 x 1 3 8	10PS-S39
.1	35 64 x 1 1 4	2PS-P10	.006	15 32 x 3 4	6PS-D60	.047	43 64 x 1 3 8	10PS-S47
.15	5 8 x 1 1 4	2PS-P15	.0068	15 32 x 3 4	6PS-D68	.056	47 64 x 1 1 1 16	10PS-S56
.2	43 64 x 1 3 8	2PS-P20	.0075	15 32 x 3 4	6PS-D75	.068	47 64 x 1 1 1 16	10PS-S68
.22	43 64 x 1 3 8	2PS-P22	.008	29 64 x 15 16	6PS-D80	.082	49 64 x 1 1 1 16	10PS-S82
.25	43 64 x 1 3 8	2PS-P25	.0082	29 64 x 15 16	6PS-D82	.1	49 64 x 1 1 1 16	10PS-P10
.33	11 16 x 1 1 1 16	2PS-P33	.01	29 64 x 15 16	6PS-S10	1600 WVDC		
.47	49 64 x 1 1 1 16	2PS-P47	.012	31 64 x 15 16	6PS-S12	.0005	1 2 x 7 8	16PS-T50*
.5	49 64 x 1 1 1 16	2PS-P50	.015	31 64 x 15 16	6PS-S15	.001	13 32 x 7 8	16PS-D10
400 WVDC			.02	35 64 x 15 16	6PS-S20	.0015	7 16 x 1 7 8	16PS-D15
.01	15 32 x 3 4	4PS-S10	.022	35 64 x 15 16	6PS-S22	.002	1 2 x 7 8	16PS-D20
.015	33 64 x 3 4	4PS-S15	.025	35 64 x 15 16	6PS-S25	.0022	1 2 x 7 8	16PS-D22
.02	31 64 x 15 16	4PS-S20	.027	17 32 x 1 1 4	6PS-S27	.003	7 16 x 1 1 8	16PS-D30
.022	31 64 x 15 16	4PS-S22	.03	17 32 x 1 1 4	6PS-S30	.0033	7 16 x 1 1 8	16PS-D33
.025	31 64 x 15 16	4PS-S25	.033	17 32 x 1 1 4	6PS-S33	.0039	31 64 x 1 1 8	16PS-D39
.03	17 32 x 15 16	4PS-S30	.035	17 32 x 1 1 4	6PS-S35	.004	31 64 x 1 1 8	16PS-D40
.033	17 32 x 15 16	4PS-S33	.039	19 32 x 1 1 4	6PS-S39	.0047	31 64 x 1 1 8	16PS-D47
.04	33 64 x 1 1 4	4PS-S40	.04	19 32 x 1 1 4	6PS-S40	.005	31 64 x 1 1 8	16PS-D50
.047	33 64 x 1 1 4	4PS-S47	.047	19 32 x 1 1 4	6PS-S47	.006	17 32 x 1 1 8	16PS-D60
.05	33 64 x 1 1 4	4PS-S50	.05	19 32 x 1 1 4	6PS-S50	.0068	17 32 x 1 1 8	16PS-D68
.056	37 64 x 1 1 4	4PS-S56	.056	41 64 x 1 1 4	6PS-S56	.007	17 32 x 1 1 8	16PS-D70
.068	37 64 x 1 1 4	4PS-S68	.06	41 64 x 1 1 4	6PS-S60	.0075	17 32 x 1 1 8	16PS-D75
.075	37 64 x 1 1 4	4PS-S75	.068	41 64 x 1 1 4	6PS-S68	.008	5 8 x 1 5 32	16PS-D80
.1	41 64 x 1 1 4	4PS-P10	.075	41 64 x 1 1 4	6PS-S75	.01	5 8 x 1 5 32	16PS-S10
.15	43 64 x 1 3 8	4PS-P15	.082	11 16 x 1 3 8	6PS-S82	.015	21 32 x 1 19 64	16PS-S15
.2	43 64 x 1 1 1 16	4PS-P20	.1	11 16 x 1 3 8	6PS-P10	.018	3 4 x 1 19 64	16PS-S18
.22	43 64 x 1 1 1 16	4PS-P22	.15	47 64 x 1 1 1 16	6PS-P15	.02	3 4 x 1 19 64	16PS-S20
.25	43 64 x 1 1 1 16	4PS-P25	.2	27 32 x 1 1 1 16	6PS-P20	.022	3 4 x 1 19 64	16PS-S22
600 WVDC			.22	27 32 x 1 1 1 16	6PS-P22	.03	3 4 x 1 39 64	16PS-S30
.001	25 64 x 3 4	6PS-D10	.25	27 32 x 1 1 1 16	6PS-P25	.033	3 4 x 1 39 64	16PS-S33
.0012	25 64 x 3 4	6PS-D12	.33	59 64 x 1 1 1 16	6PS-P33	.04	27 32 x 1 39 64	16PS-S40
.0015	25 64 x 3 4	6PS-D15	.47	1 1 64 x 1 1 1 16	6PS-P47	.047	27 32 x 1 39 64	16PS-S47
.0018	25 64 x 3 4	6PS-D18	2000 WVDC			.05	27 32 x 1 39 64	16PS-S50
.002	25 64 x 3 4	6PS-D20	.001	25 64 x 3 4	10PS-D10	.001	3 8 x 1 1 4	20PS-D10
.0022	25 64 x 3 4	6PS-D22	.0015	13 32 x 3 4	10PS-D15	.0015	27 64 x 1 1 8	20PS-D15
.0025	27 64 x 3 4	6PS-D25	.002	7 16 x 3 4	10PS-D20	.0022	15 32 x 1 1 8	20PS-D22
.0027	27 64 x 3 4	6PS-D27	.0022	7 16 x 3 4	10PS-D22	.0033	33 64 x 1 1 8	20PS-D33
.003	27 64 x 3 4	6PS-D30	.003	7 16 x 15 16	10PS-D30	.0047	1 2 x 1 3 8	20PS-D47
.0033	27 64 x 3 4	6PS-D33	.0033	7 16 x 15 16	10PS-D33	.0056	37 64 x 1 3 8	20PS-D56
.0039	29 64 x 3 4	6PS-D39	.004	15 32 x 15 16	10PS-D40	.0068	37 64 x 1 3 8	20PS-D68
			.0047	15 32 x 15 16	10PS-D47	.0082	39 64 x 1 3 8	20PS-D82
			.005	15 32 x 15 16	10PS-D50	.027	51 64 x 1 1 1 16	20PS-S27
			.0068	31 64 x 15 16	10PS-D68			
			.01	35 64 x 15 16	10PS-S10			

TYPE 279P* ISO FARAD[®] PLASTIC FILM CAPACITORS

- Isofarad Quality is a Must in Color TV Synchroguide Circuits, Horizontal and Vertical Oscillators, Bridge and Parallel-T Circuits and Other Tuned Circuit Applications Requiring Close Tolerance and Zero Temperature Coefficient of Capacitance
- Superior to Silvered Mica Capacitors, Yet Less Expensive
- Constant Capacitance Will Not Change More Than $\pm 0.2\%$ from Room Temperature to $+80^\circ\text{C}$ at a Maximum Rated Voltage. Will Withstand Operating Temperatures to 85°C (185°F)
- Capacitance Tolerance: $\pm 5\%$
- For complete data, see latest issue of Engineering Bulletin 2071

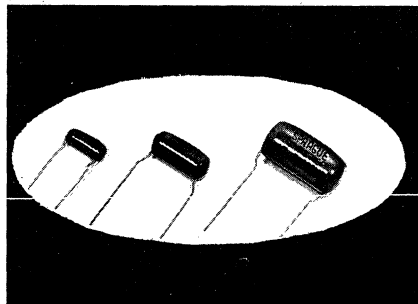


μF	WVDC	D. x L.	Cat. No.	μF	WVDC	D. x L.	Cat. No.
.001	500	3/8 x 1	279P10255VB3	.022	500	1/2 x 1-1/2	279P22355YB3
.0015	500	3/8 x 1	279P15255VB3	.033	500	1/2 x 1-1/2	279P33355YB3
.0068	500	3/8 x 1-1/4	279P68255WB3	.047	500	5/8 x 1-7/8	279P47355ZB3
.015	500	7/16 x 1-1/4	279P15355XB3	.068	500	5/8 x 1-7/8	279P68355ZB3

*Available until present stocks are exhausted.

SPRAGUE CAPACITORS

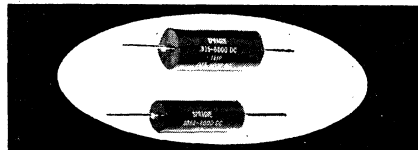
TYPE 715P FILMITE® 'L' ORANGE DROP® DIPPED TUBULARS



- Polypropylene film capacitors similar to polystyrene units with their high a-c current-carrying capability, but have added advantage of operating temperatures to 105 C and extremely low dissipation factor.
- Ideal for applications where high a-c current flow is found, as in certain solid-state TV vertical circuits, r-f generators, and pulse-forming networks.
- Exhibit capacitance change of less than 3% over entire operating temperature range.
- Temperature coefficient is negative and virtually linear at 180 ppm/°C over the temperature range of +25 C to +105 C, making capacitors suitable for matching with positive TC resistors and inductors to maintain circuit stability.
- Conformally coated with flame-retardant epoxy which also provides protection from humidity and mechanical damage.
- Capacitance tolerance, $\pm 5\%$.
- Furnished with 1.250" long "hockeystick" crimped leads.
- For complete technical data, refer to latest issue of Engineering Bulletin 2090.

μ F	Dia. x Length	Catalog Number	μ F	Dia. x Length	Catalog Number
400 WVDC			800 WVDC		
.01	.400 x .750	715P10354JD3	.015	.550 x 1.300	715P15358LD3
.015	.450 x .750	715P15354JD3	.022	.600 x 1.300	715P22358LD3
.033	.500 x .950	715P33354KD3	.033	.700 x 1.300	715P33358LD3
.15	.650 x 1.300	715P15454LD3	.068	.800 x 1.700	715P68358MD3
.22	.700 x 1.700	715P22454MD3			
.33	.800 x 1.700	715P33454MD3	.1	.900 x 1.700	715P10458MD3
.47	.900 x 1.700	715P47454MD3			
600 WVDC			1200 WVDC		
.001	.400 x .750	715P10256JD3	.015	.650 x 1.300	715P153512LD3
.0015	.400 x .750	715P15256JD3	.047	.850 x 1.700	715P473512MD3
.0022	.400 x .750	715P22256JD3			
.0033	.400 x .750	715P33256JD3	1600 WVDC		
.0047	.450 x .750	715P47256JD3	.0022	.500 x 1.300	715P222516LD3
.0068	.450 x .750	715P68256JD3	.0033	.550 x 1.300	715P332516LD3
.01	.450 x .950	715P10356KD3	.0047	.600 x 1.300	715P472516LD3
.015	.500 x .950	715P15356KD3	.0068	.650 x 1.300	715P682516LD3
.022	.550 x .950	715P22356KD3			
.047	.600 x 1.300	715P47356LD3	.01	.700 x 1.300	715P103516LD3
.068	.650 x 1.300	715P68356LD3	.015	.750 x 1.700	715P153516MD3
.1	.750 x 1.300	715P10456LD3	.022	.850 x 1.700	715P223516MD3
.15	.750 x 1.700	715P15456MD3	.033	.950 x 1.700	715P333516MD3
.22	.850 x 1.700	715P22456MD3			

TYPE 185P HIGH-VOLTAGE TELECAP® DIFILM® CAPACITORS



- Minimize corona in high-voltage circuits.
- Axial-lead premolded cases are rugged and non-flammable.
- Capacitance tolerance, $\pm 10\%$.
- Higher ripple voltage capability than conventional extended-foil non-inductive capacitors.
- For complete data, see latest issue of Engineering Bulletin 2011.

μ F	WVDC	D. x L.	Cat. No.	μ F	WVDC	D. x L.	Cat. No.	μ F	WVDC	D. x L.	Cat. No.
.047	6,000	1 3/8 x 2 3/4	185P473960	.0010	10,000	1 x 2 1/2	185P1029100	.0047	10,000	1 3/8 x 2 3/4	185P4729100
.033	7,000	1 3/8 x 2 3/4	185P333970	.0015	10,000	1 x 2 1/2	185P1529100	.0068	10,000	1 3/8 x 2 3/4	185P6829100
.022	8,000	1 3/8 x 2 3/4	185P223980	.0022	10,000	1 x 2 1/2	185P2229100	.010	10,000	1 3/8 x 2 3/4	185P1039100
.00047	10,000	3/4 x 2 1/4	18504719100	.0033	10,000	1 x 2 1/2	185P3329100	.015	10,000	1 3/8 x 2 3/4	185P1539100

*Available until present stocks are exhausted.

† At vendor's option, 5/16" dia. units may be furnished.

SPRAGUE CAPACITORS

TYPE CP53 CAPACITORS TO MIL-C-25

- Impregnated with specially processed mineral oil to exceed performance requirements of MIL-C-25A
- Hermetically sealed, with silicone rubber compression terminals
- Rated for—55°C to +85°C operation

- Drawn metal cases have mounting flanges as integral part of containers
- Single and dual capacitance units have insulated sections—triple capacitance units have grounded cases

Call Your Sprague Industrial Distributor
for Current Quantity Prices

NOTE: Capacitors listed below have capacitance tolerances of +20%, -10% (V) or ±10% (K).



μF	Volts	L. x W. x H.	Cat. No.	Call Your Sprague Distributor for Prices	μF	Volts	L. x W. x H.	Cat. No.	Call Your Sprague Distributor for Prices
Single Capacitance					Dual Capacitance				
.05	1000	1 13/16 x 1 x 3/4	CP53B1EG503K1		.1 + .1	600	1 13/16 x 1 x 3/4	CP53B4EF104V1	
.1	1000	1 13/16 x 1 x 3/4	CP53B1EG104K1		.1 + .1	1000	1 13/16 x 1 x 7/8	CP53B4EG104V1	
.25	600	1 13/16 x 1 x 3/4	CP53B1EF254K1		.25+ .25	600	1 13/16 x 1 x 1	CP53B4EF254V1	
.25	1000	1 13/16 x 1 x 7/8	CP53B1EG254K1		.25+ .25	1000	2 x 1 3/4 x 7/8	CP53B4EG254V1	
.5	600	1 13/16 x 1 x 1	CP53B1EF504K1		.5 + .5	600	2 x 1 3/4 x 1	CP53B4EF504V1	
.5	1000	2 x 1 3/4 x 7/8	CP53B1EG504K1		.5 + .5	1000	2 x 2 x 1 1/8	CP53B4EG504V1	
1.0	600	2 x 1 3/4 x 1	CP53B1EF105K1		1.0 + 1.0	600	2 x 2 x 1 1/8	CP53B4EF105V1	
1.0	1000	2 x 2 x 1 1/8	CP53B1EG105K1		Triple Capacitance				
2.0	200	2 x 2 x 1	CP53B1EC205K1*	.1+.1+.1	600	1 13/16 x 1 x 7/8	CP53B5EF104V1		
2.0	600	2 x 2 x 1 1/8	CP53B1EF205K1	.5+.5+.5	600	2 x 2 x 1 1/8	CP53B5EF504V1*		
4.0	100	2 x 2 x 1 1/8	CP53B1EB405K1*						



TYPE CP70*, CP72 CAPACITORS to MIL-C-25

- Ruggedly Designed for Heavy-Duty Applications
- Long Life and Reliable Service under High Ambient Temperatures
- Terminals have Ceramic Pillar Insulators (E) or Rubber Compression Seals (B)

- Impregnated with a Specially Processed Mineral Oil to Withstand Severe Operating Conditions
- Char. F Units Designed for Ground Equipment Where Low Temperatures are not Encountered

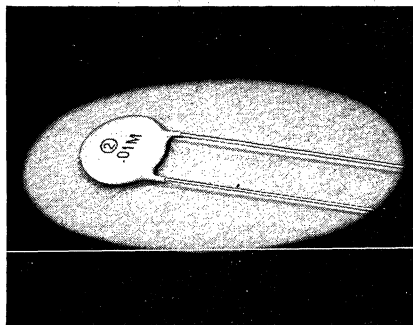
Call Your Sprague Industrial Distributor
for Current Quantity Prices

μF	WVDC	Char. E (E Term.)		Case Code	Char. F (B Term.)		Case Code	Char. E (B Term.)		Case Code	Dimensions W. x T. x H.	
		MIL-C-25A Cat. No.	MIL-C-25C Cat. No.		MIL-C-25C Cat. No.	MIL-C-25C Cat. No.		MIL-C-25A Cat. No.	MIL-C-25C Cat. No.			
.25	2000	—	CP72E1EJ254K1	B1	—	—	—	—	—	—	A2	1 13/16 x 1 1/16 x 2 1/4
.5	1000	—	CP72E1EG504K1	A2	—	—	—	—	—	—	A3	1 13/16 x 1 1/16 x 2 7/8
.5	1500	—	CP72E1EH504K1	A3	—	—	—	—	—	—	A4	1 13/16 x 1 1/16 x 3 1/4
1.0	600	—	CP72E1EF105K1	A2	—	—	—	—	—	—	A6	1 13/16 x 1 1/16 x 4 3/4
1.0	1000	—	CP72E1EG105K1	A3	—	—	—	—	CP72B1EG105K1*	A3		
1.0	2000	—	CP72E1EJ105K1	B6	—	—	—	—	—	—		
2.0	600	—	CP72E1EF205K1	A4	CP70B1FF205K	—	A4	—	—	—	B1	2 1/2 x 1 3/16 x 2 1/2
2.0	1000	—	CP72E1EG205K1	A6	—	—	—	CP70B1EG205K	CP72B1EG205K1	A6	B3	2 1/2 x 1 3/16 x 3 1/2
2.0	2500	CP70E1EK205K	—	E5	—	—	—	—	—	—	B4	2 1/2 x 1 3/16 x 3 7/8
4.0	600	—	CP72E1EF405K1	B4	CP70B1FF405K	—	B3	—	CP72B1EF405K1	B4	B6	2 1/2 x 1 3/16 x 4 3/4
4.0	1000	—	—	C2	CP70B1FG405K	—	B6	—	—	—	C2	3 3/4 x 1 1/4 x 3 7/8
4.0	1500	—	CP72E1EH405K1	D4	—	—	—	—	—	—	C3	3 3/4 x 1 1/4 x 4 1/4
4.0	2500	CP70E1EK405K	—	J2	—	—	—	—	—	—	C4	3 3/4 x 1 1/4 x 4 3/4
6.0	600	—	CP72E1EF605K1	C2	—	—	—	—	CP72B1EF605K1	C2	D3	3 3/4 x 1 3/4 x 4
6.0	1000	—	CP72E1EG605K1	D3	CP70B1FG605K	—	C4	CP70B1EG605K	—	D3	D4	3 3/4 x 1 3/4 x 4 1/4
6.0	1500	CP70E1EH605K	—	E5	CP70B1FH605K	—	E5	CP70B1EH605K	—	E5	D5	3 3/4 x 1 3/4 x 4 3/4
8.0	600	—	—	C3	—	—	—	—	—	—	E5	3 3/4 x 2 1/4 x 4 3/4
8.0	1000	—	CP72E1EG805K1	D5	—	—	—	CP70B1EG805K	—	C3	E6	3 3/4 x 2 1/4 x 5 1/8
8.0	1500	—	—	—	—	—	—	CP70B1EH805K	—	F2		
10.0	600	—	CP72E1EF106K1	D3	—	CP72B1FF106K1	C4	—	CP72B1EF106K1	D3	F2	3 3/4 x 2 1/2 x 5 3/4
10.0	1000	—	CP72E1EG106K1	E5	—	—	—	CP70B1EG106K	—	E5		
12.0	1000	—	—	E6	—	—	—	CP70B1EG126K	—	E6	J2	4 9/16 x 3 3/4 x 4 3/8

*Available until present stocks are exhausted.

SPRAGUE CAPACITORS

CERA-MITE® CERAMIC CAPACITORS



- Tiny, Tough, Dependable In Every Application
- Low Self-Inductance Of Silvered Flat-plate Design Means Very High By-pass Efficiency In All TV Circuits
- Flat-plate Construction Permits Higher Self-resonant Frequency Than Tubular Ceramic Or Molded Mica Capacitors
- Tough Moisture-proof Coating Protects Against Short-circuiting And Assures Good Performance Under Severe Conditions Of Humidity And Vibration
- Cera-mite Capacitors Easily Fit Into Tight Spaces, Even Across Subminiature Tube Sockets
- Designed For 85C (185F) Continuous Operation

Call your Sprague Industrial Distributor for Current Quantity Prices

GENERAL APPLICATION TYPES

- Excellent Where Temperature Coefficient Is Not Important, Such As By-pass and Coupling Applications in IF and RF Circuits
- EIA Designation: 5GA=Z5U, TG=Z5U
- Low Cost, Smallest Size 1 kV General Application Type Available
- Same Characteristics Available In High Voltage Ratings At Low Cost

pF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	pF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	pF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.
1000 WVDC $\pm 20\%$ Tol.				1000 WVDC (cont.)				3000 WVDC $\pm 20\%$ Tol.			
5.0	5GA-V50	C023B102E5ROM	$\frac{5}{16} \times \frac{5}{32}$	500	5GA-T50	C023B102E501M	$\frac{5}{16} \times \frac{5}{32}$	1.5	30GA-V15	C023B302E1R5M	$\frac{5}{16} \times \frac{5}{32}$
6.8	5GA-V68	C023B102E6R8M	$\frac{5}{16} \times \frac{5}{32}$	560	5GA-T56	C023B102E561M	$\frac{5}{16} \times \frac{5}{32}$	3.3	30GA-V33	C023B302E3R3M	$\frac{5}{16} \times \frac{5}{32}$
7.5	5GA-V75	C023B102E7R5M	$\frac{5}{16} \times \frac{5}{32}$	680	5GA-T68	C023B102E681M	$\frac{5}{16} \times \frac{5}{32}$	4.7	30GA-V47	C023B302E4R7M	$\frac{5}{16} \times \frac{5}{32}$
8.2	5GA-V82	C023B102E8R2M	$\frac{5}{16} \times \frac{5}{32}$	750	5GA-T75	C023B102E751M	$\frac{5}{16} \times \frac{5}{32}$	5.0	30GA-V50	C023B302E5R0M	$\frac{5}{16} \times \frac{5}{32}$
10	5GA-Q10	C023B102E100M	$\frac{5}{16} \times \frac{5}{32}$	800	5GA-T80	C023B102E801M	$\frac{5}{16} \times \frac{5}{32}$	6.0	30GA-V60	C023B302E6R0M	$\frac{5}{16} \times \frac{5}{32}$
12	5GA-Q12	C023B102E120M	$\frac{5}{16} \times \frac{5}{32}$	820	5GA-T82	C023B102E821M	$\frac{5}{16} \times \frac{5}{32}$	6.8	30GA-V68	C023B302E6R8M	$\frac{5}{16} \times \frac{5}{32}$
15	5GA-Q15	C023B102E150M	$\frac{5}{16} \times \frac{5}{32}$	.001 μ F	5GA-D10	C023B102E102M	$\frac{5}{16} \times \frac{5}{32}$	7.5	30GA-V75	C023B302E7R5M	$\frac{5}{16} \times \frac{5}{32}$
18	5GA-Q18	C023B102E180M	$\frac{5}{16} \times \frac{5}{32}$	.0012	5GA-D12	C023B102E122M	$\frac{5}{16} \times \frac{5}{32}$	8.2	30GA-V82	C023B302E8R2M	$\frac{5}{16} \times \frac{5}{32}$
20	5GA-Q20	C023B102E200M	$\frac{5}{16} \times \frac{5}{32}$	.0015	5GA-D15	C023B102E152M	$\frac{5}{16} \times \frac{5}{32}$	10	30GA-Q10	C023B302E100M	$\frac{5}{16} \times \frac{5}{32}$
22	5GA-Q22	C023B102E220M	$\frac{5}{16} \times \frac{5}{32}$	.0018	5GA-D18	C023B102E182M	$\frac{5}{16} \times \frac{5}{32}$	12	30GA-Q12	C023B302E120M	$\frac{5}{16} \times \frac{5}{32}$
25	5GA-Q25	C023B102E250M	$\frac{5}{16} \times \frac{5}{32}$	.002	5GA-D20	C023B102E202M	$\frac{5}{16} \times \frac{5}{32}$	15	30GA-Q15	C023B302E150M	$\frac{5}{16} \times \frac{5}{32}$
27	5GA-Q27	C023B102E270M	$\frac{5}{16} \times \frac{5}{32}$	.0022	5GA-D22	C023B102E222M	$\frac{3}{8} \times \frac{5}{32}$	18	30GA-Q18	C023B302E180M	$\frac{5}{16} \times \frac{5}{32}$
30	5GA-Q30	C023B102E300M	$\frac{5}{16} \times \frac{5}{32}$	.0025	5GA-D25	C023B102E252M	$\frac{3}{8} \times \frac{5}{32}$	20	30GA-Q20	C023B302E200M	$\frac{5}{16} \times \frac{5}{32}$
33	5GA-Q33	C023B102E330M	$\frac{5}{16} \times \frac{5}{32}$	.0027	5GA-D27	C023B102E272M	$\frac{3}{8} \times \frac{5}{32}$	22	30GA-Q22	C023B302E220M	$\frac{5}{16} \times \frac{5}{32}$
39	5GA-Q39	C023B102E390M	$\frac{5}{16} \times \frac{5}{32}$	.003	5GA-D30	C023B102F302M	$\frac{3}{8} \times \frac{5}{32}$	25	30GA-Q25	C023B302E250M	$\frac{5}{16} \times \frac{5}{32}$
47	5GA-Q47	C023B102E470M	$\frac{5}{16} \times \frac{5}{32}$	.0033	5GA-D33	C023B102F332M	$\frac{3}{8} \times \frac{5}{32}$	27	30GA-Q27	C023B302E270M	$\frac{5}{16} \times \frac{5}{32}$
50	5GA-Q50	C023B102E500M	$\frac{5}{16} \times \frac{5}{32}$	.0039	5GA-D39	C023B102G392M	$\frac{7}{16} \times \frac{5}{32}$	30	30GA-Q30	C023B302E300M	$\frac{5}{16} \times \frac{5}{32}$
56	5GA-Q56	C023B102E560M	$\frac{5}{16} \times \frac{5}{32}$	.004	5GA-D40	C023B102G402M	$\frac{7}{16} \times \frac{5}{32}$	33	30GA-Q33	C023B302E330M	$\frac{5}{16} \times \frac{5}{32}$
68	5GA-Q68	C023B102E680M	$\frac{5}{16} \times \frac{5}{32}$	.0047	5GA-D47	C023B102G472M	$\frac{7}{16} \times \frac{5}{32}$	39	30GA-Q39	C023B302E390M	$\frac{5}{16} \times \frac{5}{32}$
75	5GA-Q75	C023B102E750M	$\frac{5}{16} \times \frac{5}{32}$	.005	5GA-D50	C023B102G502M	$\frac{7}{16} \times \frac{5}{32}$	47	30GA-Q47	C023B302E470M	$\frac{5}{16} \times \frac{5}{32}$
82	5GA-Q82	C023B102E820M	$\frac{5}{16} \times \frac{5}{32}$	.0068	5GA-D68	C023A102H682M	$\frac{1}{2} \times \frac{5}{32}$	50	30GA-Q50	C023B302E500M	$\frac{5}{16} \times \frac{5}{32}$
100	5GA-T100	C023B102E101M	$\frac{5}{16} \times \frac{5}{32}$	.0082	5GA-D82	C023A102J822M	$\frac{5}{8} \times \frac{5}{32}$	56	30GA-Q56	C023B302E560M	$\frac{5}{16} \times \frac{5}{32}$
120	5GA-T12	C023B102E121M	$\frac{5}{16} \times \frac{5}{32}$	.01	5GA-S10	C023A102K103M	$\frac{5}{8} \times \frac{5}{32}$	60	30GA-Q60	C023B302E600M	$\frac{5}{16} \times \frac{5}{32}$
150	5GA-T15	C023B102E151M	$\frac{5}{16} \times \frac{5}{32}$	.015	5GA-S15	C023B102L153M	$1\frac{1}{16} \times \frac{5}{32}$	62	30GA-Q62	C023B302E620M	$\frac{5}{16} \times \frac{5}{32}$
180	5GA-T18	C023B102E181M	$\frac{5}{16} \times \frac{5}{32}$	.02	5GA-S20	C023B102P203M	$\frac{7}{8} \times \frac{5}{32}$	68	30GA-Q68	C023B302E680M	$\frac{5}{16} \times \frac{5}{32}$
200	5GA-T20	C023B102E201M	$\frac{5}{16} \times \frac{5}{32}$	500 WVDC $\pm 20\%$ Tol.				75	30GA-Q75	C023B302E750M	$\frac{5}{16} \times \frac{5}{32}$
220	5GA-T22	C023B102E221M	$\frac{5}{16} \times \frac{5}{32}$	.01 μ F	5GAS-S10	C023B501G103M	$\frac{7}{16} \times \frac{5}{32}$	82	30GA-Q82	C023B302E820M	$\frac{5}{16} \times \frac{5}{32}$
250	5GA-T25	C023B102E251M	$\frac{5}{16} \times \frac{5}{32}$	.02	5GAS-S20	C023A501J203M	$\frac{5}{8} \times \frac{5}{32}$	100	30GA-T10	C023B302E101M	$\frac{5}{16} \times \frac{5}{32}$
270	5GA-T27	C023B102E271M	$\frac{5}{16} \times \frac{5}{32}$	.025	5GA-S25	C023A501K253M	$\frac{5}{8} \times \frac{5}{32}$	120	30GA-T12	C023B302E121M	$\frac{5}{16} \times \frac{5}{32}$
300	5GA-T30	C023B102E301M	$\frac{5}{16} \times \frac{5}{32}$	.04	5GA-S40	C023A501P403M	$\frac{7}{8} \times \frac{5}{32}$	150	30GA-T15	C023B302E151M	$\frac{5}{16} \times \frac{5}{32}$
330	5GA-T33	C023B102E331M	$\frac{5}{16} \times \frac{5}{32}$	.05	5GA-S50	C023A501P503M	$\frac{7}{8} \times \frac{5}{32}$	180	30GA-T18	C023B302E181M	$\frac{5}{16} \times \frac{5}{32}$
360	5GA-T36	C023B102E361M	$\frac{5}{16} \times \frac{5}{32}$	.1	5GA-P10	41C92A10	$\frac{7}{8} \times \frac{5}{16}$	200	30GA-T20	C023B302E201M	$\frac{5}{16} \times \frac{5}{32}$
390	5GA-T39	C023B102E391M	$\frac{5}{16} \times \frac{5}{32}$								
470	5GA-T47	C023B102E471M	$\frac{5}{16} \times \frac{5}{32}$								

SPRAGUE CAPACITORS

CERA-MITE® CERAMIC CAPACITORS, continued

pF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	pF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	pF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.
3000 WVDC (cont.)				6000 WVDC (cont.)				7500 WVDC ±20% Tol.			
220	30GA-T22	C023B302E221M	5/16 x 3/32	250	60GA-T25	C023B602J251M	5/16 x 3/32	4.7	75GA-V47	C066A752L4R7M	1 1/16 x 3/32
250	30GA-T25	C023B302E251M	5/16 x 3/32	270	60GA-T27	C023B602J271M	5/16 x 3/32	8.2	75GA-V82	C066A752L8R2M	1 1/16 x 3/32
270	30GA-T27	C023B302E271M	5/16 x 3/32	300	60GA-T30	C023B602J301M	5/16 x 3/32	10	75GA-Q10	C066A752L100M	1 1/16 x 3/32
300	30GA-T30	C023B302E301M	5/16 x 3/32	330	60GA-T33	C023B602J331M	5/16 x 3/32	12	75GA-Q12	C066A752L120M	1 1/16 x 3/32
330	30GA-T33	C023B302E331M	5/16 x 3/32	390	60GA-T39	C023B602J391M	5/16 x 3/32	15	75GA-Q15	C066A752L150M	1 1/16 x 3/32
390	30GA-T39	C023B302E391M	5/16 x 3/32	400	60GA-T40	C023B602J401M	5/16 x 3/32	18	75GA-Q18	C066A752L180M	1 1/16 x 3/32
400	30GA-T40	C023B302E401M	5/16 x 3/32	470	60GA-T47	C023B602J471M	5/16 x 3/32	20	75GA-Q20	C066A752L200M	1 1/16 x 3/32
470	30GA-T47	C023B302E471M	5/16 x 3/32	500	60GA-T50	C023B602J501M	5/16 x 3/32	22	75GA-Q22	C066A752L220M	1 1/16 x 3/32
500	30GA-T50	C023B302E501M	5/16 x 3/32	560	60GA-T56	C023B602J561M	5/16 x 3/32	30	75GA-Q30	C066A752L300M	1 1/16 x 3/32
560	30GA-T56	C023B302E561M	5/16 x 3/32	680	60GA-T68	C023B602J681M	5/16 x 3/32	33	75GA-Q33	C066A752L330M	1 1/16 x 3/32
680	30GA-T68	C023B302F681M	3/8 x 3/32	750	60GA-T75	C023B602J751M	5/16 x 3/32	47	75GA-Q47	C066A752L470M	1 1/16 x 3/32
750	30GA-T75	C023B302F751M	3/8 x 3/32	820	60GA-T82	C023B602J821M	5/16 x 3/32	56	75GA-Q56	C066A752L560M	1 1/16 x 3/32
820	30GA-T82	C023B302F821M	3/8 x 3/32	.001 μF	60GA-D10	C023B602J102M	5/16 x 3/32	100	75GA-T10	C066A752L101M	1 1/16 x 3/32
.001 μF	30GA-D10	C023B302F102M	3/8 x 3/32	.0012	60GA-D12	C023B602J122M	5/16 x 3/32	220	75GA-T22	C066A752L221M	1 1/16 x 3/32
.0012	30GA-D12	C023B302F122M	5/16 x 3/32	.0015	60GA-D15	C023B602J152M	5/16 x 3/32	470	75GA-T47	C066A752L471M	1 1/16 x 3/32
.0015	30GA-D15	C023B302G152M	5/16 x 3/32	.0022	60GA-D22	C023B602K222M	5/8 x 3/32	500	75GA-T50	C066A752L501M	1 1/16 x 3/32
.002	30GA-D20	C023B302H202M	1/2 x 3/32	.0025	60GA-D25	C023B602L252M	1 1/16 x 3/32	560	75GA-T56	C066A752L561M	1 1/16 x 3/32
.0022	30GA-D22	C023B302H222M	1/2 x 3/32	.0027	60GA-D27	C023B602L272M	1 1/16 x 3/32	680	75GA-T68	C066A752L681M	1 1/16 x 3/32
.0025	30GA-D25	C023B302H252M	1/2 x 3/32	.003	60GA-D30	C023A602M302M	3/4 x 3/32	750	75GA-T75	C066A752L751M	1 1/16 x 3/32
.0027	30GA-D27	C023B302J272M	5/16 x 3/32	.0033	60GA-D33	C023A602M332M	3/4 x 3/32	820	75GA-T82	C066A752L821M	1 1/16 x 3/32
.003	30GA-D30	C023B302J302M	5/16 x 3/32	.0039	60GA-D39	C023A602P392M	7/8 x 3/32	.001 μF	75GA-D10	C066A752L102M	1 1/16 x 3/32
.0033	30GA-D33	C023B302J332M	5/16 x 3/32	.0047	60GA-D47	C023A602P472M	7/8 x 3/32	.0012	75GA-D12	C066A752L122M	1 1/16 x 3/32
.0039	30GA-D39	C023B302K392M	5/8 x 3/32					.0015	75GA-D15	C066A752L152M	1 1/16 x 3/32
.004	30GA-D40	C023B302K402M	5/8 x 3/32					.0018	75GA-D18	C023A752M182M	3/4 x 3/32
.0047	30GA-D47	C023B302L472M	1 1/16 x 3/32					.002	75GA-D20	C023A752P202M	7/8 x 3/32
.005	30GA-D50	C023B302L502M	1 1/16 x 3/32					.0022	75GA-D22	C023A752P222M	7/8 x 3/32
.006	30GA-D60	C023A302M602M	3/4 x 3/32					.0025	75GA-D25	C023A752P252M	7/8 x 3/32
.0068	30GA-D68	C023A302M682M	3/4 x 3/32								
.008	30GA-D80	C023A302P802M	7/8 x 3/32								
.0082	30GA-D82	C023A302P822M	7/8 x 3/32								
.01	30GA-S10	C023A302P103M	7/8 x 3/32								

HIGH-K TYPES

- Designed for By-Pass and Coupling Applications Where Additional Capacitance Will Not Affect Circuit Operation
- Smallest Physical Size
- EIA Designation: 5HK—Z5U
- 5HKS-S10 thru 5HK-P10, 500 WVDC, Capacitance Tolerance: ±80 —20%
- All Other 5HK are 1000 WVDC, Capacitance Tolerance: GMV

μF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	μF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.
6000 WVDC ±20% Tol.				SINGLE UNITS (cont.)			
1.5	60GA-V15	C023B602J1R5M	5/16 x 3/32	.02	5HK-S20	C023A501J203Z	5/16 x 3/32
4.7	60GA-V47	C023B602J4R7M	5/16 x 3/32	.025	5HK-S25	C023A501K253Z	5/8 x 3/32
6.8	60GA-V68	C023B602J6R8M	5/16 x 3/32	.04	5HK-S40	44C124A	1 1/16 x 3/16
8.2	60GA-V82	C023B602J8R2M	5/16 x 3/32	.05	5HK-S50	33C58	1 1/16 x 3/16
10	60GA-Q10	C023B602J100M	5/16 x 3/32	.1	5HK-P10	41C92	7/8 x 3/16
12	60GA-Q12	C023B602J120M	5/16 x 3/32				
15	60GA-Q15	C023B602J150M	5/16 x 3/32	DUAL UNITS			
18	60GA-Q18	C023B602J180M	5/16 x 3/32	2 x .001	5HK-2D10	20C253	7/16 x 3/32
20	60GA-Q20	C023B602J200M	5/16 x 3/32	2 x .0015	5HK-2D15	55C67	1/2 x 3/32
22	60GA-Q22	C023B602J220M	5/16 x 3/32	2 x .002	5HK-2D20	29C175	5/16 x 3/32
25	60GA-Q25	C023B602J250M	5/16 x 3/32	2 x .0022	5HK-2D22	29C27	5/16 x 3/32
27	60GA-Q27	C023B602J270M	5/16 x 3/32	2 x .0047	5HK-2D47	36C330	3/4 x 3/32
30	60GA-Q30	C023B602J300M	5/16 x 3/32	2 x .01	5HK-2S10	41C238	7/8 x 3/32
33	60GA-Q33	C023B602J330M	5/16 x 3/32	2 x .02	5HK-2S20	41C219	1 x 3/32
39	60GA-Q39	C023B602J390M	5/16 x 3/32				
47	60GA-Q47	C023B602J470M	5/16 x 3/32				
50	60GA-Q50	C023B602J500M	5/16 x 3/32				
56	60GA-Q56	C023B602J560M	5/16 x 3/32				
60	60GA-Q60	C023B602J600M	5/16 x 3/32				
68	60GA-Q68	C023B602J680M	5/16 x 3/32				
75	60GA-Q75	C023B602J750M	5/16 x 3/32				
82	60GA-Q82	C023B602J820M	5/16 x 3/32				
100	60GA-T10	C023B602J101M	5/16 x 3/32				
120	60GA-T12	C023B602J121M	5/16 x 3/32				
150	60GA-T15	C023B602J151M	5/16 x 3/32				
180	60GA-T18	C023B602J181M	5/16 x 3/32				
200	60GA-T20	C023B602J201M	5/16 x 3/32				
220	60GA-T22	C023B602J221M	5/16 x 3/32				

MINIATURIZED DISC CERAMIC CAPACITORS FOR TRANSISTORIZED CIRCUITRY

- Intended for Coupling and By-Pass Applications

Type TG Standard Tolerance ±20%

μF	Volts	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.
.005	100	TG-D50	C023B101E502M	5/16 x 3/32
.01	100	TG-S10	C023B101F103M	3/8 x 3/32
.02	100	TG-S20	C023B101H203M	1/2 x 3/32
.025	100	TG-S25	C023B101H253M	1/2 x 3/32
.03	100	TG-S30	C023B101J303M	5/8 x 3/32
.05	100	TG-S50	55C23A7	1/2 x 3/32
.1	100	TG-P10	33C41B6	1 1/16 x 3/32
.05	100	TGL-S50	C023B101L503M	1 1/16 x 3/32

SPRAGUE CAPACITORS

CERA-MITE® CERAMIC CAPACITORS, continued

FREQUENCY-STABLE TYPES

- Better Stability Than the General Application Types.
- Ideal for Replacing Other Types of Capacitors Such as Molded Micaps, Paper Tubulars, and Mylar Film Tubulars
- Available in IKV and a Smaller Size 250 Volt Rating
- Tighter Tolerance of $\pm 10\%$ is Better Than General Application Types
- Small Size, Low Cost
- EIA Designation: 10SS—Z5P, 2SS—Z5P

SEMI-STABLE 250 WVDC STANDARD TOLERANCE $\pm 10\%$

μF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	μF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	μF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.
750pF	2SS-T75	C055B251E751K	$\frac{5}{16} \times \frac{5}{32}$	.0022	2SS-D22	C055B251F222K	$\frac{3}{8} \times \frac{5}{32}$	.0068	2SS-D68	C055A251J682K	$\frac{1}{16} \times \frac{5}{32}$
820pF	2SS-T82	C055B251E821K	$\frac{5}{16} \times \frac{5}{32}$	.0027	2SS-D27	C055B251G272K	$\frac{3}{16} \times \frac{5}{32}$	.0082	2SS-D82	C055A251L822K	$\frac{1}{16} \times \frac{5}{32}$
.001	2SS-D10	C055B251E102K	$\frac{5}{16} \times \frac{5}{32}$	.0033	2SS-D33	C055B251G332K	$\frac{3}{16} \times \frac{5}{32}$	.01	2SS-S10	C055A251M103K	$\frac{3}{4} \times \frac{5}{32}$
.0012	2SS-D12	C055B251E122K	$\frac{5}{16} \times \frac{5}{32}$	.0039	2SS-D39	C055B251H392K	$\frac{1}{2} \times \frac{5}{32}$	.012	2SS-S12	29C527	$\frac{3}{4} \times \frac{5}{32}$
.0015	2SS-D15	C055B251F152K	$\frac{3}{8} \times \frac{5}{32}$	.0047	2SS-D47	C055B251H472K	$\frac{1}{2} \times \frac{5}{32}$	.015	2SS-S15	33C304	$\frac{1}{16} \times \frac{7}{32}$
.0018	2SS-D18	C055B251F182K	$\frac{3}{8} \times \frac{5}{32}$	.005	2SS-D50	C055B251H502K	$\frac{1}{2} \times \frac{5}{32}$	.018	2SS-S18	33C291	$\frac{1}{16} \times \frac{7}{32}$
.002	2SS-D20	C055B251F202K	$\frac{3}{8} \times \frac{5}{32}$	.0056	2SS-D56	C055A251J562K	$\frac{3}{8} \times \frac{5}{32}$	.02	2SS-S20	36C413	$\frac{3}{4} \times \frac{7}{32}$

SEMI-STABLE 1000 WVDC STANDARD TOLERANCE $\pm 10\%$

pF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	μF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	μF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.
470	10SS-T47	C055B102E471K	$\frac{5}{16} \times \frac{5}{32}$	.0018	10SS-D18	C055B102G182K	$\frac{3}{16} \times \frac{5}{32}$	.0068	10SS-D68	C055A102L682K	$\frac{1}{16} \times \frac{5}{32}$
500	10SS-T50	C055B102E501K	$\frac{5}{16} \times \frac{5}{32}$	.002	10SS-D20	C055B102G202K	$\frac{3}{16} \times \frac{5}{32}$	.0082	10SS-D82	C055A102M822K	$\frac{3}{4} \times \frac{5}{32}$
560	10SS-T56	C055B102E561K	$\frac{5}{16} \times \frac{5}{32}$	.0022	10SS-D22	C055B102G222K	$\frac{3}{16} \times \frac{5}{32}$	.010	10SS-S10	C055A102P103K	$\frac{3}{4} \times \frac{5}{32}$
680	10SS-T68	C055B102E681K	$\frac{5}{16} \times \frac{5}{32}$	.0027	10SS-D27	C055B102H272K	$\frac{1}{2} \times \frac{5}{32}$	.012	10SS-S12	33C249A	$\frac{3}{4} \times \frac{5}{32}$
750	10SS-T75	C055B102E751K	$\frac{5}{16} \times \frac{5}{32}$	.0033	10SS-D33	C055A102H332K	$\frac{1}{2} \times \frac{5}{32}$	.015	10SS-S15	41C299A	$\frac{1}{16} \times \frac{7}{32}$
820	10SS-T82	C055B102E821K	$\frac{5}{16} \times \frac{5}{32}$	.0039	10SS-D39	C055A102J392K	$\frac{3}{8} \times \frac{5}{32}$	.018	10SS-S18	41C300A1	$\frac{1}{16} \times \frac{7}{32}$
.001 μF	10SS-D10	C055B102F102K	$\frac{3}{8} \times \frac{5}{32}$	.0047	10SS-D47	C055A102K472K	$\frac{3}{8} \times \frac{5}{32}$	.02	10SS-S20	41C301A1	$\frac{1}{16} \times \frac{7}{32}$
.0012	10SS-D12	C055B102F122K	$\frac{3}{8} \times \frac{5}{32}$	.005	10SS-D50	C055A102K502K	$\frac{3}{8} \times \frac{5}{32}$	.022	10SS-S22	41C310A1	$\frac{1}{16} \times \frac{7}{32}$
.0015	10SS-D15	C055B102F152K	$\frac{3}{8} \times \frac{5}{32}$	.0056	10SS-D56	C055A102K562K	$\frac{3}{8} \times \frac{5}{32}$				

TEMPERATURE-STABLE TYPES

- Used Where Minimum Capacitance Change With Temperature Is An Important Consideration
- EIA Designation: 10TS—X5E
- Standard Capacitance Tolerance: $\pm 10\%$
- Rated at **1000 WVDC**

pF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	pF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	μF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.
3.3	10TS-V33	C072B102E3R3K	$\frac{5}{16} \times \frac{5}{32}$	75	10TS-Q75	C072B102E750K	$\frac{5}{16} \times \frac{5}{32}$	.001	10TS-D10	C072B102G102K	$\frac{3}{16} \times \frac{5}{32}$
5.0	10TS-V50	C072B102E5R0K	$\frac{5}{16} \times \frac{5}{32}$	82	10TS-Q82	C072B102E820K	$\frac{5}{16} \times \frac{5}{32}$	.0012	10TS-D12	C072B102G122K	$\frac{3}{16} \times \frac{5}{32}$
6.8	10TS-V68	C072B102E6R8K	$\frac{5}{16} \times \frac{5}{32}$	91	10TS-Q91	C072B102E910K	$\frac{5}{16} \times \frac{5}{32}$	.0015	10TS-D15	C072B102J152K	$\frac{3}{16} \times \frac{5}{32}$
7.5	10TS-V75	C072B102E7R5K	$\frac{5}{16} \times \frac{5}{32}$	100	10TS-T10	C072B102E101K	$\frac{5}{16} \times \frac{5}{32}$	.0018	10TS-D18	C072B102J182K	$\frac{3}{16} \times \frac{5}{32}$
8.2	10TS-V82	C072B102E8R2K	$\frac{5}{16} \times \frac{5}{32}$	120	10TS-T12	C072B102E121K	$\frac{5}{16} \times \frac{5}{32}$	.0020	10TS-D20	C072B102J202K	$\frac{3}{16} \times \frac{5}{32}$
10	10TS-Q10	C072B102E100K	$\frac{5}{16} \times \frac{5}{32}$	150	10TS-T15	C072B102E151K	$\frac{5}{16} \times \frac{5}{32}$	.0022	10TS-D22	C072B102J222K	$\frac{3}{16} \times \frac{5}{32}$
12	10TS-Q12	C072B102E120K	$\frac{5}{16} \times \frac{5}{32}$	180	10TS-T18	C072B102E181K	$\frac{5}{16} \times \frac{5}{32}$	.0025	10TS-D25	C072B102K252K	$\frac{3}{8} \times \frac{5}{32}$
15	10TS-Q15	C072B102E150K	$\frac{5}{16} \times \frac{5}{32}$	200	10TS-T20	C072B102E201K	$\frac{5}{16} \times \frac{5}{32}$	.0027	10TS-D27	C072B102K272K	$\frac{3}{8} \times \frac{5}{32}$
18	10TS-Q18	C072B102E180K	$\frac{5}{16} \times \frac{5}{32}$	220	10TS-T22	C072B102E221K	$\frac{5}{16} \times \frac{5}{32}$	.0030	10TS-D30	C072B102K302K	$\frac{3}{8} \times \frac{5}{32}$
20	10TS-Q20	C072B102E200K	$\frac{5}{16} \times \frac{5}{32}$	250	10TS-T25	C072B102E251K	$\frac{5}{16} \times \frac{5}{32}$	.0033	10TS-D33	C072B102L332K	$\frac{1}{16} \times \frac{7}{32}$
22	10TS-Q22	C072B102E220K	$\frac{5}{16} \times \frac{5}{32}$	270	10TS-T27	C072B102E271K	$\frac{5}{16} \times \frac{5}{32}$	.0039	10TS-D39	C072A102M392K	$\frac{3}{4} \times \frac{5}{32}$
25	10TS-Q25	C072B102E250K	$\frac{5}{16} \times \frac{5}{32}$	300	10TS-T30	C072B102E301K	$\frac{5}{16} \times \frac{5}{32}$	.0040	10TS-D40	C072A102M402K	$\frac{3}{4} \times \frac{5}{32}$
27	10TS-Q27	C072B102E270K	$\frac{5}{16} \times \frac{5}{32}$	330	10TS-T33	C072B102E331K	$\frac{5}{16} \times \frac{5}{32}$	.0047	10TS-D47	C072A102P472K	$\frac{3}{8} \times \frac{5}{32}$
30	10TS-Q30	C072B102E300K	$\frac{5}{16} \times \frac{5}{32}$	390	10TS-T39	C072B102E391K	$\frac{5}{16} \times \frac{5}{32}$	.0050	10TS-D50	C072A102P502K	$\frac{3}{8} \times \frac{5}{32}$
33	10TS-Q33	C072B102E330K	$\frac{5}{16} \times \frac{5}{32}$	470	10TS-T47	C072B102E471K	$\frac{5}{16} \times \frac{5}{32}$	.0056	10TS-D56	C072A102P562K	$\frac{3}{8} \times \frac{5}{32}$
39	10TS-Q39	C072B102E390K	$\frac{5}{16} \times \frac{5}{32}$	500	10TS-T50	C072B102E501K	$\frac{5}{16} \times \frac{5}{32}$	.0068	10TS-D68	36C108A	$\frac{1}{16} \times \frac{7}{32}$
47	10TS-Q47	C072B102E470K	$\frac{5}{16} \times \frac{5}{32}$	560	10TS-T56	C072B102F561K	$\frac{3}{8} \times \frac{5}{32}$	.0075	10TS-D75	36C395	$\frac{1}{16} \times \frac{7}{32}$
50	10TS-Q50	C072B102E500K	$\frac{5}{16} \times \frac{5}{32}$	680	10TS-T68	C072B102F681K	$\frac{3}{8} \times \frac{5}{32}$	.0082	10TS-D82	41C306A	$\frac{1}{16} \times \frac{7}{32}$
56	10TS-Q56	C072B102E560K	$\frac{5}{16} \times \frac{5}{32}$	750	10TS-T75	C072B102F751K	$\frac{3}{8} \times \frac{5}{32}$	.01	10TS-S10	41C121A1	$\frac{1}{16} \times \frac{7}{32}$
68	10TS-Q68	C072B102E680K	$\frac{5}{16} \times \frac{5}{32}$	820	10TS-T82	C072B102F821K	$\frac{3}{8} \times \frac{5}{32}$				

DISC CERAMICS FOR AC APPLICATIONS

- Rated at 125 VAC 60 Hz or 1400 VDC
- Standard Tolerance $\pm 20\%$
- For AC Line Bypass Application
- Heavy Duty for Long Life

μF	Sprague Products Catalog No.	Sprague O.E.M. Part No.	D. x T.
.001	125L-D10	19C251	$\frac{3}{8} \times \frac{7}{32}$
.0015	125L-D15	19C252	$\frac{3}{8} \times \frac{7}{32}$
.002	125L-D20	19C253	$\frac{3}{8} \times \frac{7}{32}$
.0047	125L-D47	29C145	$\frac{5}{16} \times \frac{7}{32}$
.005	125L-D50	29C145A	$\frac{5}{16} \times \frac{7}{32}$
.01	125L-S10	36C218	$\frac{3}{4} \times \frac{7}{32}$
.02	125L-S20	36C220	$\frac{3}{4} \times \frac{1}{4}$
2 x .005	125L-2D50	29C147	$\frac{5}{16} \times \frac{1}{4}$
2 x .01	125L-2S10	36C219	$\frac{3}{4} \times \frac{1}{4}$

DISC CERAMICS FOR BUFFER APPLICATIONS

- Rated at 2000 WVDC
- Standard Tolerance $\pm 20\%$

μF	Sprague Products Catalog No.	Sprague O.E.M. Part No.	D. x T.
.001	BL-D10	29C162	$\frac{3}{16} \times \frac{7}{32}$
.002	BL-D20	29C163	$\frac{3}{16} \times \frac{7}{32}$
.003	BL-D30	29C164	$\frac{3}{16} \times \frac{7}{32}$
.004	BL-D40	29C165	$\frac{3}{16} \times \frac{7}{32}$
.005	BL-D50	29C251	$\frac{3}{16} \times \frac{7}{32}$
.006	BL-D60	44C126	$\frac{1}{16} \times \frac{7}{32}$
.007	BL-D70	33C82	$\frac{1}{16} \times \frac{7}{32}$
.0075	BL-D75	33C81	$\frac{1}{16} \times \frac{7}{32}$
.008	BL-D80	33C84	$\frac{1}{16} \times \frac{7}{32}$
.01	BL-S10	36C151	$\frac{3}{4} \times \frac{7}{32}$

SPRAGUE CAPACITORS

CERA-MITE® CERAMIC CAPACITORS, continued

TEMPERATURE-COMPENSATING AND NPO TYPES

- Zero Temperature-coefficient Capacitors used Where Capacitance Change with Temperature is Undesirable
- Superior to Silvered-mica Types in Stability, High "Q", and IR
- Eliminate oscillator drift in TV, FM, VHF and AM receivers
- Negative Temperature Coefficient is 30 ppm/°C for N030 types, 80 ppm/°C for N080 types, 150 ppm/°C for N150 types, 220 ppm/°C for N220 types, 330 ppm/°C for N330 types, 470 ppm/°C for N470

types, 750 ppm/°C for N750 types, 1500 ppm/°C for N1500 types and 2200 ppm/°C for N2200 types.

- Capacitance Tolerance: 12 pF & up, $\pm 5\%$; 10 pF & below, $\pm 0.5\%$ pF
- Rated at 1000 WVDC
- For use in Tuned Circuits
- Temp-compensating Types Have a Linear Negative Coefficient Curve
- Available in Standard 5% Decade Values.

pF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	pF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.	pF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Size D. x T.
NPO				N470 (cont.)				N750, cont.			
1.0	10TCC-V10	C030B102S1R0D	3/8 x 1/4	18	10TCT-Q18	C035B102E180J	5/16 x 5/32	100	10TCU-T10	C036B102H101J	1/2 x 5/32
1.2	10TCC-V12	C030B102S1R2D	3/8 x 1/4	20	10TCT-Q20	C035B102E200J	5/16 x 5/32	120	10TCU-T12	C036B102H121J	1/2 x 5/32
1.5	10TCC-V15	C030B102S1R5D	3/8 x 1/4	22	10TCT-Q22	C035B102E220J	5/16 x 5/32	150	10TCU-T15	C036A102J151J	9/16 x 5/32
1.8	10TCC-V18	C030B102S1R8D	3/8 x 1/4	25	10TCT-Q25	C035B102F250J	3/8 x 5/32	180	10TCU-T18	C036A102K181J	5/8 x 5/32
2.2	10TCC-V22	C030B102S2R2D	3/8 x 1/4	27	10TCT-Q27	C035B102F270J	3/8 x 5/32	200	10TCU-T20	C036A102K201J	5/8 x 5/32
2.7	10TCC-V27	C030B102S2R7D	3/8 x 1/4	30	10TCT-Q30	C035B102F300J	3/8 x 5/32	220	10TCU-T22	C036A102K221J	5/8 x 5/32
3.0	10TCC-V30	C030B102S3R0D	3/8 x 1/4	33	10TCT-Q33	C035B102F330J	3/8 x 5/32	270	10TCU-T27	C036A102L271J	11/16 x 5/32
3.3	10TCC-V33	C030B102E3R3D	5/16 x 5/32	39	10TCT-Q39	C035B102F390J	3/8 x 5/32	300	10TCU-T30	C036A102M301J	3/4 x 5/32
3.9	10TCC-V39	C030B102E2R9D	5/16 x 5/32	47	10TCT-Q47	C035B102G470J	7/16 x 5/32	330	10TCU-T33	C036A102M331J	3/4 x 5/32
4.7	10TCC-V47	C030B102E4R7D	5/16 x 5/32	50	10TCT-Q50	C035B102G500J	7/16 x 5/32	390	10TCU-T39	C036A102P391J	7/8 x 5/32
5.0	10TCC-V50	C030B102E5R0D	5/16 x 5/32	56	10TCT-Q56	C035B102G560J	7/16 x 5/32	470	10TCU-T47	C036A102P471J	7/8 x 5/32
5.6	10TCC-V56	C030B102E5R6D	5/16 x 5/32	68	10TCT-Q68	C035B102H680J	1/2 x 5/32	560	10TCU-T56	33C238	3/4 x 7/32
6.8	10TCC-V68	C030B102E6R8D	5/16 x 5/32	75	10TCT-Q75	C035B102H750J	1/2 x 5/32	680	10TCU-T68	36C348	13/16 x 7/32
8.2	10TCC-V82	C030B102E8R2D	5/16 x 5/32	82	10TCT-Q82	C035B102H820J	1/2 x 5/32	750	10TCU-T75	41C293	15/16 x 7/32
10	10TCC-Q10	C030B102E100D	5/16 x 5/32	100	10TCT-T10	C035B102J101J	9/16 x 5/32	820	10TCU-T82	41C294	15/16 x 7/32
12	10TCC-Q12	C030B102E120J	5/16 x 5/32	120	10TCT-T12	C035A102J121J	9/16 x 5/32	1000	10TCU-D10	41C295	15/16 x 7/32
15	10TCC-Q15	C030B102E150J	5/16 x 5/32	150	10TCT-T15	C035A102K151J	5/8 x 5/32	N2200			
18	10TCC-Q18	C030B102E180J	5/16 x 5/32	180	10TCT-T18	C035A102L181J	11/16 x 5/32	10	10TCY-Q10	C041B102S100D	3/8 x 1/4
20	10TCC-Q20	C030B102E200J	5/16 x 5/32	200	10TCT-T20	C035A102L201J	11/16 x 5/32	12	10TCY-Q12	C041B102S120J	3/8 x 1/4
22	10TCC-Q22	C030B102E220J	5/16 x 5/32	220	10TCT-T22	C035A102M221J	3/4 x 5/32	15	10TCY-Q15	C041B102S150J	3/8 x 1/4
25	10TCC-Q25	C030B102E250J	5/16 x 5/32	270	10TCT-T27	C035A102P271J	7/8 x 5/32	18	10TCY-Q18	C041B102S180J	3/8 x 1/4
27	10TCC-Q27	C030B102E270J	5/16 x 5/32	300	10TCT-T30	C035A102P301J	7/8 x 5/32	20	10TCY-Q20	C041B102S200J	3/8 x 1/4
30	10TCC-Q30	C030B102F300J	3/8 x 5/32	330	10TCT-T33	C035A102P331J	7/8 x 5/32	22	10TCY-Q22	C041B102E220J	5/16 x 5/32
33	10TCC-Q33	C030B102F330J	3/8 x 5/32	390	10TCT-T39	C035A102P391J	7/8 x 5/32	25	10TCY-Q25	C041B102E250J	5/16 x 5/32
39	10TCC-Q39	C030B102F390J	3/8 x 5/32	470	10TCT-T47*	36C344	13/16 x 7/32	27	10TCY-Q27	C041B102E270J	5/16 x 5/32
47	10TCC-Q47	C030B102G470J	7/16 x 5/32	560	10TCT-T56*	41C248	15/16 x 7/32	30	10TCY-Q30	C041B102E300J	5/16 x 5/32
50	10TCC-Q50	C030B102G500J	7/16 x 5/32	680	10TCT-T68*	41C291	15/16 x 7/32	33	10TCY-Q33	C041B102E330J	5/16 x 5/32
56	10TCC-Q56	C030A102G560J	7/16 x 5/32	750	10TCT-T75*	41C292	15/16 x 7/32	39	10TCY-Q39	C041B102E390J	5/16 x 5/32
68	10TCC-Q68	C030A102G680J	7/16 x 5/32	N750				47	10TCY-Q47	C041B102E470J	5/16 x 5/32
75	10TCC-Q75	C030A102H750J	1/2 x 5/32	4.7	10TCU-V47	C036B102S47R0D	3/8 x 1/4	50	10TCY-Q50	C041B102E500J	5/16 x 5/32
82	10TCC-Q82	C030A102H820J	1/2 x 5/32	5.0	10TCU-V50	C036B102S50R0D	3/8 x 1/4	56	10TCY-Q56	C041B102E560J	5/16 x 5/32
100	10TCC-T10	C030A102H101J	1/2 x 5/32	5.6	10TCU-V56	C036B102S56R6D	3/8 x 1/4	68	10TCY-Q68	C041B102E680J	5/16 x 5/32
120	10TCC-T12	C030A102J121J	9/16 x 5/32	6.8	10TCU-V68	C036B102S68R0D	3/8 x 1/4	75	10TCY-Q75	C041B102E750J	5/16 x 5/32
150	10TCC-T15	C030A102K151J	9/16 x 5/32	8.2	10TCU-V82	C036B102S82R2D	3/8 x 1/4	82	10TCY-Q82	C041B102F820J	3/8 x 5/32
180	10TCC-T18	33C307	3/4 x 7/32	10	10TCU-Q10	C036B102S100D	3/8 x 1/4	100	10TCY-T10	C041B102F101J	3/8 x 5/32
200	10TCC-T20	33C308	3/4 x 7/32	12	10TCU-Q12	C036B102E120J	5/16 x 5/32	120	10TCY-T12	C041B102F121J	3/8 x 5/32
220	10TCC-T22	33C418	3/4 x 7/32	15	10TCU-Q15	C036B102E150J	5/16 x 5/32	150	10TCY-T15	C041B102G151J	7/16 x 5/32
270	10TCC-T27	41C410	13/16 x 7/32	18	10TCU-Q18	C026B102E180J	5/16 x 5/32	180	10TCY-T18	C041B102G181J	7/16 x 5/32
300	10TCC-T30	41C411	13/16 x 7/32	20	10TCU-Q20	C026B102E200J	5/16 x 5/32	200	10TCY-T20	C041B102G201J	7/16 x 5/32
330	10TCC-T33	41C412	15/16 x 7/32	22	10TCU-Q22	C026B102E220J	5/16 x 5/32	220	10TCY-T22	C041B102H221J	1/2 x 5/32
390	10TCC-T39	41C272	15/16 x 7/32	25	10TCU-Q25	C026B102E250J	5/16 x 5/32	270	10TCY-T27	C041B102H271J	1/2 x 5/32
N470				27	10TCU-Q27	C026B102E270J	5/16 x 5/32	300	10TCY-T30	C041A102J301J	9/16 x 5/32
3.0	10TCT-V30	C035B102S3R0D	3/8 x 1/4	30	10TCU-Q30	C026B102E300J	5/16 x 5/32	330	10TCY-T33	C041A102J331J	9/16 x 5/32
3.3	10TCT-V33	C035B102S3R3D	3/8 x 1/4	33	10TCU-Q33	C036B102E330J	5/16 x 5/32	390	10TCY-T39	C041A102J391J	9/16 x 5/32
3.9	10TCT-V39	C035B102S3R9D	3/8 x 1/4	39	10TCU-Q39	C036B102F390J	3/8 x 5/32	470	10TCY-T47	C041A102K471J	5/8 x 5/32
4.7	10TCT-V47	C035B102S4R7D	3/8 x 1/4	47	10TCU-Q47	C036B102F470J	3/8 x 5/32	560	10TCY-T56	C041A102L561J	11/16 x 5/32
5.0	10TCT-V50	C035B102S5R0D	3/8 x 1/4	50	10TCU-Q50	C036B102F500J	3/8 x 5/32	680	10TCY-T68	C041A102M681J	3/4 x 5/32
5.6	10TCT-V56	C035B102S5R6D	3/8 x 1/4	56	10TCU-Q56	C036B102F560J	3/8 x 5/32	750	10TCY-T75	C041A102M751J	3/4 x 5/32
6.8	10TCT-V68	C035B102S6R8D	3/8 x 1/4	68	10TCU-Q68	C036B102G680J	7/16 x 5/32	820	10TCY-T82	C041A102P821J	7/8 x 5/32
8.2	10TCT-V82	C035B102S8R2D	3/8 x 1/4	75	10TCU-Q75	C036B102G750J	7/16 x 5/32	1000	10TCY-D10	C041A102P101J	7/8 x 5/32
10	10TCT-Q10	C035B102E100D	5/16 x 5/32	82	10TCU-Q82	C036B102G820J	7/16 x 5/32	1200	10TCY-D12*	33C264	3/4 x 7/32
12	10TCT-Q12	C035B102E120J	5/16 x 5/32					1500	10TCY-D15*	36C365	13/16 x 7/32
15	10TCT-Q15	C035B102E150J	5/16 x 5/32					1800	10TCY-D18*	41C333	15/16 x 7/32
								2000	10TCY-D20*	41C334	15/16 x 7/32
								2200	10TCY-D22*	41C335	15/16 x 7/32

*Available until present stocks are exhausted.

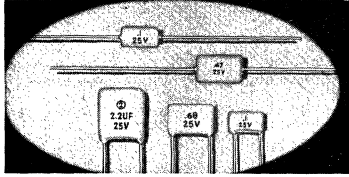
Copyright 1975, Sprague Products Company

EEM-87-EFAI

Sizes subject to change without notice.

SPRAGUE CAPACITORS

1C, 2C, 3C, 4C, and 5C MONOLYTHIC[®] CERAMIC CAPACITORS



- Proven Reliable in Wide Usage Over Many Years of Exacting Service.
- Available in a Variety of Body Formulations, Capacitance Values, and Sizes.
- Made By Spraying Alternate Layers of Ceramic Dielectric Material and Metallic Electrodes, then Firing Into a Single, All But Indestructible Homogeneous Block.
- Protected Against Mechanical Damage and Moisture by a Tough Resin Coating.
- For Complete Technical Data, See Latest Issue of Engineering Bulletin 6201.

Call Your Sprague Industrial Distributor
For Current Quantity Prices

NOTE: Capacitors listed in this section have radial leads. For axial-lead units, change "C4" or "C5" at end of Cat. No. to "B1."

TEMPERATURE CHARACTERISTICS

Formulation	Temp. Range	Max. Change over Temp. Range
NPO	-55C to +125C	NPO ± 60 ppm/ $^{\circ}$ C
N030	-55C to +125C	-30 ± 30 ppm/ $^{\circ}$ C
N750	-55C to +125C +25C to +85C	meets MIL-C-20 Char. UJ -750 ± 120 ppm/ $^{\circ}$ C
X7R	-55C to +125C	$\pm 15\%$
Z5U	+10C to +85C	+22, -56%

GENERAL-APPLICATION FORMULATION Z5U

μ F	Size Code	Cat. No.*	μ F	Size Code	Cat. No.*
TYPE 1C—50 WVDC					
.01	A	1C023103D8500C4	1.0	Q	5C023105D8500C5
.015	A	1C023153D8500C4	1.0	W	†*5C023105D8500B3
.022	A	1C023223D8500C4	1.5	S	5C023155D8500C5
.033	A	1C023333D8500C4	1.5	W	†*5C023155D8500B3
.047	A	1C023473D8500C4	2.2	U	5C023225D8500C5
.068	A	1C023683D8500C4	3.3	U	5C023335D8500C5
.10	B	1C023104D8500C4	†*TYPE 2C—25 WVDC		
TYPE 2C—50 WVDC					
.01	C	2C023103D8500C4	.01	E	2C023103D8250A3
.015	C	2C023153D8500C4	.015	E	2C023153D8250A3
.022	C	2C023223D8500C4	.022	E	2C023223D8250A3
.033	C	2C023333D8500C4	.033	E	2C023333D8250A3
.047	C	2C023473D8500C4	.047	E	2C023473D8250A3
.068	C	2C023683D8500C4	.068	E	2C023683D8250A3
.10	C	2C023104D8500C4	.10	E	2C023104D8250A3
.15	D	2C023154D8500C4	.15	E	2C023154D8250A3
.22	D	2C023224D8500C4	.22	E	2C023224D8250A3
.33	F	2C023334D8500C4	.33	G	2C023334D8250A3
.47	F	2C023474D8500C4	.47	G	2C023474D8250A3
.68	F	2C023684D8500C4	†*TYPE 3C—25 WVDC		
TYPE 3C—50 WVDC					
.01	H	3C023103D8500C5	.01	H	3C023103D8250A3
.015	H	3C023153D8500C5	.015	H	3C023153D8250A3
.022	H	3C023223D8500C5	.022	H	3C023223D8250A3
.033	H	3C023333D8500C5	.033	H	3C023333D8250A3
.047	H	3C023473D8500C5	.047	H	3C023473D8250A3
.068	H	3C023683D8500C5	.068	H	3C023683D8250A3
.10	H	3C023104D8500C5	.10	H	3C023104D8250A3
.15	H	3C023154D8500C5	.15	J	3C023154D8250A3
.22	H	3C023224D8500C5	.22	J	3C023224D8250A3
.33	I	3C023334D8500C5	.33	K	3C023334D8250A3
.47	I	3C023474D8500C5	.47	K	3C023474D8250A3
.68	M	3C023684D8500C5	†*TYPE 4C—25 WVDC		
1.0	M	3C023105D8500C5	.15	X	4C023154D8250A3
TYPE 5C—50 WVDC					
.10	N	5C023104D8500C5	.22	X	4C023224D8250A3
.10	T	†*5C023104D8500B3	.33	X	4C023334D8250A3
.15	N	5C023154D8500C5	.47	X	4C023474D8250A3
.15	T	†*5C023154D8500B3	.68	Y	4C023684D8250A3
.22	N	5C023224D8500C5	1.0	Z	4C023105D8250A3
.22	T	†*5C023224D8500B3	1.5	Z	4C023155D8250A3
.33	N	5C023334D8500C5	†*TYPE 5C—25 WVDC		
.33	T	†*5C023334D8500B3	.1	T	5C023104D8250B3
.47	O	5C023474D8500C5	.15	T	5C023154D8250B3
.47	U	†*5C023474D8500B3	.22	T	5C023224D8250B3
.68	O	5C023684D8500C5	.33	T	5C023334D8250B3
.68	U	†*5C023684D8500B3	.47	T	5C023474D8250B3
			.68	T	5C023684D8250B3
			1.0	V	5C023105D8250B3
			1.5	W	5C023155D8250B3
			2.2	W	5C023225D8250B3
			3.3	W	5C023335D8250B3

*Available until present stocks are exhausted.

†Available with radial leads only.

*Capacitors listed have cap. tol. of +80, -20%. For $\pm 20\%$ capacitors, change D8 in Cat. No. to X0.

**Capacitors listed above have cap. tol. of $\pm 20\%$. For $\pm 10\%$ capacitors, change X0 in Cat. No. to X9.

ΔMay be operated at 100 WVDC by derating to 85 C.

DIMENSIONS (in inches)

Size Code	Radial-Lead			Axial-Lead		
	L.	W.	T.	L.	W.	T.
A	.200	.200	.125	.200	.200	.156
B	.200	.200	.150	.200	.200	.156
C	.300	.200	.125	.300	.200	.156
D	.300	.200	.150	.300	.200	.156
E	.300	.300	.125	—	—	—
F	.300	.300	.150	.300	.300	.156
G	.300	.300	.238	—	—	—
H	.390	.200	.125	.390	.200	.156
I	.390	.200	.150	.390	.200	.156
J	.390	.200	.156	—	—	—
K	.390	.200	.238	—	—	—
L	.400	.400	.125	.390	.400	.156
M	.400	.400	.150	.390	.400	.156
N	.500	.200	.125	.500	.200	.156
O	.500	.200	.150	.500	.200	.156
P	.500	.296	.125	.500	.296	.156
Q	.500	.296	.150	.500	.296	.156
R	.500	.400	.125	.500	.400	.156
S	.500	.400	.150	.500	.400	.156
T	.500	.500	.125	.500	.500	.156
U	.500	.500	.150	.500	.200	.156
V	.500	.500	.156	—	—	—
W	.500	.500	.238	.500	.500	.156
X	.515	.296	.125	—	—	—
Y	.515	.296	.156	.515	.296	.156
Z	.515	.296	.238	—	—	—

TEMPERATURE-STABLE FORMULATION X7R

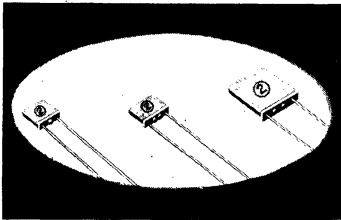
μ F	Size Code	Cat. No.**	μ F	Size Code	Cat. No.**
TYPE 1C—50 WVDC Δ					
.001	A	1C067102X0500C4	.010	H	3C067103X0500C5
.0012	A	1C067122X0500C4	.012	H	3C067123X0500C5
.0015	A	1C067152X0500C4	.015	H	3C067153X0500C5
.0022	A	1C067222X0500C4	.018	H	3C067183X0500C5
.0027	A	1C067272X0500C4	.022	H	3C067223X0500C5
.0033	A	1C067332X0500C4	.027	H	3C067273X0500C5
.0039	A	1C067392X0500C4	.033	H	3C067333X0500C5
.0047	A	1C067472X0500C4	.039	H	3C067393X0500C5
.0056	A	1C067562X0500C4	.047	H	3C067473X0500C5
.0068	A	1C067682X0500C4	.056	H	3C067563X0500C5
.0082	A	1C067822X0500C4	.068	H	3C067683X0500C5
.010	A	1C067103X0500C4	.082	H	3C067823X0500C5
.012	A	1C067123X0500C4	.10	H	3C067104X0500C5
.015	A	1C067153X0500C4	.12	M	3C067124X0500C5
.018	A	1C067183X0500C4	.15	M	3C067154X0500C5
.022	A	1C067223X0500C4	.18	M	3C067184X0500C5
.027	A	1C067273X0500C4	.22	M	3C067224X0500C5
.033	A	1C067333X0500C4	.27	M	3C067274X0500C5
			.33	M	3C067334X0500C5
TYPE 2C—50 WVDC Δ					
.010	C	2C067103X0500C4	TYPE 5C—50 WVDC Δ		
.012	C	2C067123X0500C4	.10	N	5C067104X0500C5
.015	C	2C067153X0500C4	.12	N	5C067124X0500C5
.018	C	2C067183X0500C4	.15	N	5C067154X0500C5
.022	C	2C067223X0500C4	.18	N	5C067184X0500C5
.033	C	2C067333X0500C4	.22	P	5C067224X0500C5
.039	C	2C067393X0500C4	.27	P	5C067274X0500C5
.047	E	2C067473X0500C4	.33	S	5C067334X0500C5
.056	E	2C067563X0500C4	.39	S	5C067394X0500C5
.068	E	2C067683X0500C4	.47	U	5C067474X0500C5
.082	E	2C067823X0500C4	.56	U	5C067564X0500C5
.10	E	2C067104X0500C4	.68	U	5C067684X0500C5
.12	F	2C067124X0500C4			
.15	F	2C067154X0500C4			

SPRAGUE CAPACITORS

TEMPERATURE-COMPENSATING FORMULATION NPO *Capacitance Tolerance, $\pm 10\%$. For $\pm 20\%$ units, change X9 in Cat. No. to X0.

pF	Size	Cat. No.*	pF	Size	Cat. No.*	pF	Size	Cat. No.*	pF	Size	Cat. No.*	pF	Size	Cat. No.*
TYPE 1C—50 WVDC			TYPE 2C—50 WVDC			TYPE 3C—50 WVDC			TYPE 5C—50 WVDC					
10	A	1C082100X9500C4	620	C	2C082621X9500C4	680	H	3C082681X9500C5	680	N	5C082681X9500C5	1100	N	5C082112X9500C5
11	A	1C082110X9500C4	680	C	2C082681X9500C4	750	H	3C082751X9500C5	750	N	5C082751X9500C5	1200	N	5C082122X9500C5
12	A	1C082120X9500C4	100	A	1C082101X9500C4	820	H	3C082821X9500C5	820	N	5C082821X9500C5	1300	N	5C082132X9500C5
13	A	1C082130X9500C4	110	A	1C082111X9500C4	910	H	3C082911X9500C5	910	N	5C082911X9500C5	1400	N	5C082142X9500C5
15	A	1C082150X9500C4	120	A	1C082121X9500C4	1000	H	3C082102X9500C5	1000	N	5C082102X9500C5	1500	N	5C082152X9500C5
16	A	1C082160X9500C4	130	A	1C082131X9500C4	1100	H	3C082112X9500C5	1100	N	5C082112X9500C5	1600	N	5C082162X9500C5
18	A	1C082180X9500C4	150	A	1C082151X9500C4	1200	H	3C082122X9500C5	1200	N	5C082122X9500C5	1700	N	5C082172X9500C5
20	A	1C082200X9500C4	160	A	1C082161X9500C4	1300	H	3C082132X9500C5	1300	N	5C082132X9500C5	1800	N	5C082182X9500C5
22	A	1C082220X9500C4	180	A	1C082181X9500C4	1500	H	3C082152X9500C5	1500	N	5C082152X9500C5	1900	N	5C082192X9500C5
24	A	1C082240X9500C4	200	A	1C082201X9500C4	1600	H	3C082162X9500C5	1600	N	5C082162X9500C5	2000	N	5C082202X9500C5
27	A	1C082270X9500C4	220	A	1C082221X9500C4	1800	H	3C082182X9500C5	1800	N	5C082182X9500C5	2100	N	5C082212X9500C5
30	A	1C082300X9500C4	240	A	1C082241X9500C4	2000	H	3C082202X9500C5	2000	N	5C082202X9500C5	2200	N	5C082222X9500C5
33	A	1C082330X9500C4	270	A	1C082271X9500C4	2200	E	3C082222X9500C5	2200	N	5C082222X9500C5	2300	N	5C082232X9500C5
36	A	1C082360X9500C4	300	A	1C082301X9500C4	2400	E	3C082242X9500C5	2400	N	5C082242X9500C5	2400	N	5C082242X9500C5
39	A	1C082390X9500C4	330	A	1C082331X9500C4	2700	E	3C082272X9500C5	2700	N	5C082272X9500C5	2500	N	5C082252X9500C5
43	A	1C082430X9500C4	360	A	1C082361X9500C4							2600	N	5C082262X9500C5
47	A	1C082470X9500C4	390	A	1C082391X9500C4							2700	N	5C082272X9500C5
51	A	1C082510X9500C4	430	A	1C082431X9500C4							2800	N	5C082282X9500C5
56	A	1C082560X9500C4	470	A	1C082471X9500C4							2900	N	5C082292X9500C5
62	A	1C082620X9500C4	510	A	1C082511X9500C4							3000	O	5C082302X9500C5
68	A	1C082680X9500C4	560	A	1C082561X9500C4							3300	O	5C082332X9500C5
75	A	1C082750X9500C4										3600	P	5C082362X9500C5
82	A	1C082820X9500C4										3900	P	5C082392X9500C5

TYPE 7C MONOLYTHIC[®] CERAMIC CAPACITORS



- All Capacitors Listed Rated at 50 WVDC.
- New Phenolic Terminal Base With Stand-Off "Feet" Provides these Advantages: No Resin Run-Down on Leads; Uniform Lead Spacing; No Dirt and Moisture Entrapment; Degreasing Fluid Flows Freely Between Capacitors and Board.
- Made by Spraying Alternate Layers of Ceramic Dielectric Material and Metallic Electrodes, Firing into a Homogeneous block,

then Coating with a Tough Phenolic Resin.

- For Complete Technical Data, See Latest Issue of Engineering Bulletin 6202.

DIMENSIONS

Case Code	L.	W.	T.
D	.390	.275	.160
E	.535	.550	.160
F	.535	.550	.260

TEMPERATURE-COMPENSATING FORMULATION NPO

pF	Size	Cat. No.†	pF	Size	Cat. No.†
51	D	7C082510X0500D	160	D	7C082161X0500D
56	D	7C082560X0500D	180	D	7C082181X0500D
62	D	7C082620X0500D	200	D	7C082201X0500D
68	D	7C082680X0500D	220	D	7C082221X0500D
			240	D	7C082241X0500D
			270	D	7C082271X0500D
75	D	7C082750X0500D	300	D	7C082301X0500D
82	D	7C082820X0500D	330	D	7C082331X0500D
91	D	7C082910X0500D	360	D	7C082361X0500D
			390	D	7C082391X0500D
100	D	7C082101X0500D	430	D	7C082431X0500D
110	D	7C082111X0500D	470	D	7C082471X0500D
120	D	7C082121X0500D	510	D	7C082511X0500D
130	D	7C082131X0500D			
150	D	7C082151X0500D			

TEMPERATURE-COMPENSATING FORMULATION X7R

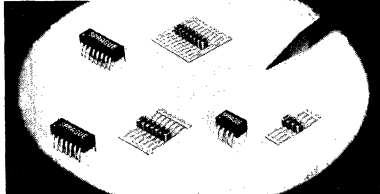
pF	Size	Cat. No.†
1200	D	7C067122X0500D
1500	D	7C067152X0500D
1800	D	7C067182X0500D
2200	D	7C067222X0500D
2700	D	7C067272X0500D
3300	D	7C067332X0500D
3900	D	7C067392X0500D
4700	D	7C067472X0500D
5600	D	7C067562X0500D
6800	D	7C067682X0500D
8200	D	7C067822X0500D

GENERAL-APPLICATION FORMULATION Z5U

μF	Size	Cat. No.†
.010	D	7C023103X0500D
.015	D	7C023153X0500D
.022	D	7C023223X0500D
.033	D	7C023333X0500D
.047	D	7C023473X0500D
.068	D	7C023683X0500D
.10	D	7C023104X0500D
.15	D	7C023154X0500D
.22	D	7C023224X0500D
.33	E	7C023334X0500E
.47	E	7C023474X0500E
.68	E	7C023684X0500E
1.0	E	7C023105X0500E
1.5	E	7C023155X0500E
2.2	F	7C023225X0500F

†Capacitors listed above have capacitance tolerance of $\pm 20\%$. Formulations NPO and X7R also available with tolerance of $\pm 10\%$... change X0 in Cat. No. to X9. Formulation Z5U also available with tolerance of ± 80 , -20% ... change X0 in Cat. No. to D8.

MULTI-COMP[®] DUAL IN-LINE MONOLYTHIC[®] CERAMIC CAPACITORS



- Monolithic construction - made by depositing alternate thin layers of metallic electrodes and ceramic dielectric material, then firing into an all but indestructible solid homogeneous block, which is molded in a tough plastic DIP package.
- Multiple-section units with 8, 14, and 16 leads.
- Rated at 100 WVDC over the operating temperature range of -55°C to $+70^{\circ}\text{C}$.
- Capacitance tolerance, $\pm 20\%$.

- For complete technical data, see latest issue of Engineering Bulletin 6242.

DIMENSIONS

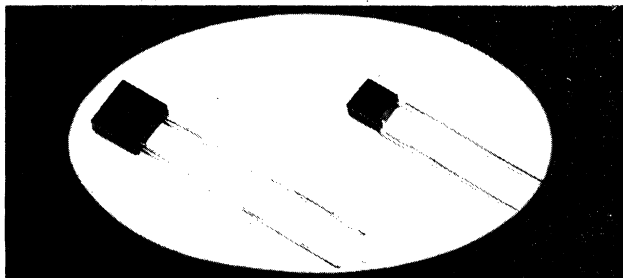
Type	L.	W.	T.
939C	.450	.260	.245
934C	.750	.260	.245
936C	.850	.260	.245

μF	No. of Sec.	Cat. No.	pF	No. of Sec.	Cat. No.	pF	No. of Sec.	Cat. No.	pF	No. of Sec.	Cat. No.	μF	No. of Sec.	Cat. No.
.01	4	939C103X0SR	18	8	936C180X0SR	150	8	936C151X0SR	1500	8	936C152X0SR	.015	8	936C153X0SR
.1	4	939C104X0SR	22	8	936C220X0SR	220	8	936C221X0SR	2200	8	936C222X0SR	.022	8	936C223X0SR
100pF	7	934C101X0SR	33	8	936C330X0SR	330	8	936C331X0SR	3300	8	936C332X0SR	.033	8	936C333X0SR
1000	7	934C102X0SR	47	8	936C470X0SR	470	8	936C471X0SR	4700	8	936C472X0SR	.047	8	936C473X0SR
.01μF	7	934C103X0SR	68	8	936C680X0SR	680	8	936C681X0SR	6800	8	936C682X0SR	.068	8	936C683X0SR
.047	7	934C473X0SR	82	8	936C820X0SR	820	8	936C821X0SR	8200	8	936C822X0SR	.082	8	936C823X0SR
.1	7	934C104X0SR	100	8	936C101X0SR	1000	8	936C102X0SR	10000	8	936C103X0SR	.1	8	936C104X0SR

SPRAGUE CAPACITORS

ESTABLISHED RELIABILITY MIL-C-39014

STYLE CKR05 and CKR06 MOLDED CERAMIC CAPACITORS



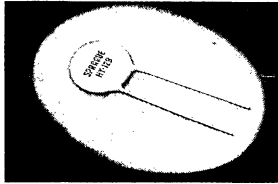
- Handled by Sprague and Sprague industrial distributors in full compliance with MIL-STD-790. Manufactured, marked, packed, shipped, received, inspected, stored in separate area, free from contamination or mix-up with other components.

- Ceramic dielectric, molded case. Operating temperature range, -55°C to $+125^{\circ}\text{C}$.
- General purpose – for use in applications where appreciable variations in capacitance with respect to temperature, voltage, frequency, and life can be tolerated.
- EIA temperature characteristic X7R, MIL characteristic BX.
- Case insulation will withstand 150% of d-c rated voltage.
- Lead spacing, .200" • "L" failure rate (2%).
- For complete technical data, refer to latest issue of Engineering Bulletin 6251.7.

MIL Type No.				MIL Type No.			
pF	WVDC	Cap. Tol. $\pm 10\%$	Cap. Tol. $\pm 20\%$	pF	WVDC	Cap. Tol. $\pm 10\%$	Cap. Tol. $\pm 20\%$
STYLE CKR05 (.190" wide x .190" high x .090" thick)							
10	200	CKR05BX100KL	CKR05BX100ML	1000	200	CKR05BX102KL	CKR05BX102ML
12	200	CKR05BX120KL	—	1200	100	CKR05BX122KL	—
15	200	CKR05BX150KL	CKR05BX150ML	1500	100	CKR05BX152KL	CKR05BX152ML
18	200	CKR05BX180KL	—	1800	100	CKR05BX182KL	—
22	200	CKR05BX220KL	CKR05BX220ML	2200	100	CKR05BX222KL	CKR05BX222ML
27	200	CKR05BX270KL	—	2700	100	CKR05BX272KL	—
				3300	100	CKR05BX332KL	CKR05BX332ML
33	200	CKR05BX330KL	CKR05BX330ML	3900	100	CKR05BX392KL	—
39	200	CKR05BX390KL	—	4700	100	CKR05BX472KL	CKR05BX472ML
47	200	CKR05BX470KL	CKR05BX470ML	5600	100	CKR05BX562KL	—
56	200	CKR05BX560KL	—	6800	100	CKR05BX682KL	CKR05BX682ML
68	200	CKR05BX680KL	CKR05BX680ML	8200	100	CKR05BX822KL	—
82	200	CKR05BX820KL	—	10000	100	CKR05BX103KL	CKR05BX103ML
100	200	CKR05BX101KL	CKR05BX101ML	12000	50	CKR05BX123KL	—
120	200	CKR05BX121KL	—	15000	50	CKR05BX153KL	CKR05BX153ML
150	200	CKR05BX151KL	CKR05BX151ML	18000	50	CKR05BX183KL	—
180	200	CKR05BX181KL	—	22000	50	CKR05BX223KL	CKR05BX223ML
220	200	CKR05BX221KL	CKR05BX221ML	27000	50	CKR05BX273KL	—
270	200	CKR05BX271KL	—	33000	50	CKR05BX333KL	CKR05BX333ML
330	200	CKR05BX331KL	CKR05BX331ML	39000	50	CKR05BX393KL	—
390	200	CKR05BX391KL	—	47000	50	CKR05BX473KL	CKR05BX473ML
470	200	CKR05BX471KL	CKR05BX471ML	56000	50	CKR05BX563KL	—
560	200	CKR05BX561KL	—	68000	50	CKR05BX683KL	CKR05BX683ML
680	200	CKR05BX681KL	CKR05BX681ML	82000	50	CKR05BX823KL	—
820	200	CKR05BX821KL	—	100000	50	CKR05BX104KL	CKR05BX104ML
STYLE CKR06 (.290" wide x .290" high x .090" thick)							
1200	200	CKR06BX122KL	—	18000	100	CKR06BX183KL	—
1500	200	CKR06BX152KL	CKR06BX152ML	22000	100	CKR06BX223KL	—
1800	200	CKR06BX182KL	—	27000	100	CKR06BX273KL	—
2200	200	CKR06BX222KL	CKR06BX222ML	33000	100	CKR06BX333KL	—
2700	200	CKR06BX272KL	—				
3300	200	CKR06BX332KL	CKR06BX332ML	39000	100	CKR06BX393KL	—
				47000	100	CKR06BX473KL	—
3900	200	CKR06BX392KL	—	56000	100	CKR06BX563KL	—
4700	200	CKR06BX472KL	CKR06BX472ML	68000	100	CKR06BX683KL	—
5600	200	CKR06BX562KL	—	82000	100	CKR06BX823KL	—
6800	200	CKR06BX682KL	CKR06BX682ML	100000	100	CKR06BX104KL	—
8200	200	CKR06BX822KL	—				
10000	200	CKR06BX103KL	CKR06BX103ML	120000	50	CKR06BX124KL	—
				150000	50	CKR06BX154KL	—
12000	100	CKR06BX123KL	—	180000	50	CKR06BX184KL	—
15000	100	CKR06BX153KL	—	220000	50	CKR06BX224KL	—

SPRAGUE CAPACITORS

HYPERCON® CERAMIC DISCS



- Superior to electrolytic capacitors of similar capacitance values due to very low power factor.
- Ultra-miniature . . . ideal for use in transistorized circuitry.
- For bypass and coupling, but particularly well-suited for any low-voltage use where high capacitance and low power factor are important.
- Capacitance tolerance: For catalog numbers ending Y . . . +50, -20% . . . For catalog numbers ending in Z . . . +80, -20%.
- For complete technical data, see latest issue of Engineering Bulletin 6141.

μF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	D. x T.
3 WVDC, Body Code C052*			
2.2	HY-150*	C052A3R0P225Z	7/8 x 5/32
12 WVDC, Body Code C092			
.022	HY-340	C092B120E223Y	5/16 x 5/32
.033	HY-345	C092B120F333Y	3/8 x 5/32
.047	HY-350	C092B120G473Y	7/16 x 5/32
.068	HY-355	C092B120G683Y	7/16 x 5/32
.1	HT-360	C092B120H104Y	1/2 x 5/32
.15	HY-365	C092B120K154Y	5/8 x 5/32
.22	HY-370	C092B120L224Y	11/16 x 5/32
.33	HY-375	C092A120P334Y	7/8 x 5/32
.47	HY-380	C092A120P474Y	7/8 x 5/32

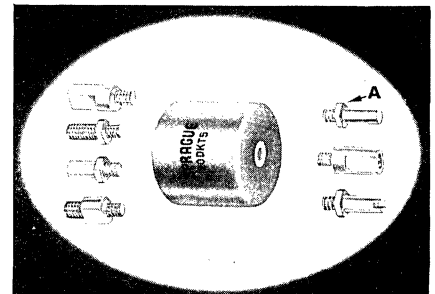
μF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	D. x T.
16 WVDC, Body Code C092			
.01	HY-420	C092B160C103Z	1/4 x 5/32
.022	HY-425	C092B160E223Z	5/16 x 5/32
.033	HY-430	C092B160F333Z	3/8 x 5/32
.047	HY-435	C092B160G473Z	7/16 x 5/32
.068	HY-440	C092B160G683Z	7/16 x 5/32
.1	HY-450	C092B160H104Z	1/2 x 5/32
.2	HY-470	C092B160L204Z	11/16 x 5/32
16 WVDC, Body Code C092			
.022	HY-625	C092B160E223Y	5/16 x 5/32
.033	HY-630	C092B160F333Y	3/8 x 5/32
.047	HY-635	C092B160G473Y	7/16 x 5/32
.068	HY-640	C092B160G683Y	7/16 x 5/32
.1	HY-650	C092B160H104Y	1/2 x 5/32
.15	HY-665	C092B160K154Y	5/8 x 5/32
.22	HY-670	C092B160L224Y	11/16 x 5/32
.33	HY-675	C092A160P334Y	7/8 x 5/32

μF	Sprague Products Cat. No.	Sprague O.E.M. Part No.	D. x T.
25 WVDC, Body Code C092			
.0047	HY-510	C092B250C472Z	1/4 x 5/32
.01	HY-520	C092B250C103Z	1/4 x 5/32
.022	HY-525	C092B250E223Z	5/16 x 5/32
.033	HY-530	C092B250F333Z	3/8 x 5/32
.047	HY-535	C092B250G473Z	7/16 x 5/32
.068	HY-540	C092B250G683Z	7/16 x 5/32
.1	HY-550	C092B250H104Z	1/2 x 5/32
25 WVDC, Body Code C092			
.015	HY-720	C092B250C153Y	1/4 x 5/32
.022	HY-725	C092B250E223Y	5/16 x 5/32
.033	HY-730	C092B250F333Y	3/8 x 5/32
.047	HY-735	C092B250G473Y	7/16 x 5/32
.068	HY-740	C092B250G683Y	7/16 x 5/32
.1	HY-750	C092B250H104Y	1/2 x 5/32
.15	HY-765	C092B250K154Y	5/8 x 5/32
.22	HY-770	C092B250L224Y	11/16 x 5/32

*AVAILABLE UNTIL PRESENT STOCKS ARE EXHAUSTED.

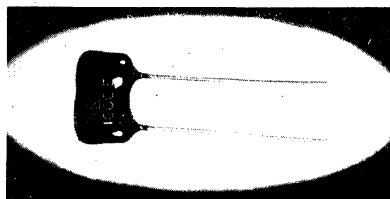
HIGH-VOLTAGE DOORKNOB CERAMICS

- For Bypass, Arc Suppression and Other High-Voltage Applications
- 20DK-T5 Comes Complete with 7 Terminals, as illustrated. (Packaged 2 per Plastic Box, with 14 terminals)
- 30DK-T5 is Supplied with 2 Terminals, as per Style Marked "A"
- Capacitor Body has Female Threads for interchangeable Screw-in Terminals



pF	KV	Diam. x Length	Sprague Products Cat. No.	Sprague O.E.M. Part No.	Call Your Sprague Distributor for Current Prices
500	20	1.000 x 1.122	20DK-T5	708C50	
500	30	1.312 x 1.312	30DK-T5	715C009501D8303BN	

- Cast in Non-Flammable, Moisture-resistant, Epoxy Resin



TYPE 424M* DIPPED MICA CAPACITORS

- Expressly Made for Applications Requiring Optimum Capacitance Stability and Retrace Characteristics.
- Designed For Continuous Operation at Temperatures Up to +85 C.
- Not Affected by High Relative Humidity.
- Critically-Tested Mica Dielectric With "Fired-On" Silver electrodes.
- Special Electrode Terminations to Minimize Capacitance Drift and Internal Noise.
- Resin-impregnated Multiple Phenolic Coating for High Moisture Resistance and Mechanical Strength.
- Capacitance Tolerance, $\pm 5\%$.
- For Complete Technical Data, See Latest Issue of Engineering Bulletin 1015.

500 WVDC			500 WVDC (Cont.)			500 WVDC (Cont.)		
pF	L. x W. x T.	Cat. No.	pF	L. x W. x T.	Cat. No.	pF	L. x W. x T.	Cat. No.
82	.640 x .500 x .190	424MC82R0J501	1200	.660 x .520 x .220	424ME1201J501	4300	.690 x .570 x .330	424ME4301J501
91	.640 x .500 x .190	424MC91R0J501	1300	.660 x .520 x .220	424ME1301J501	4700	.700 x .580 x .350	424ME4701J501
100	.640 x .500 x .190	424MC1000J501	1500	.660 x .520 x .230	424ME1501J501	5100	.710 x .590 x .370	424ME5101J501
110	.640 x .500 x .190	424MC1100J501	1600	.660 x .530 x .230	424ME1601J501	300 WVDC		
220	.640 x .500 x .190	424ME2200J501	2200	.670 x .530 x .250	424ME2201J501	5600	.680 x .550 x .310	424ME5601J301
510	.650 x .510 x .200	424ME5100J501	3000	.680 x .550 x .280	424ME3001J501			
1100	.650 x .520 x .220	424ME1101J501	3600	.680 x .560 x .300	424ME3601J501			

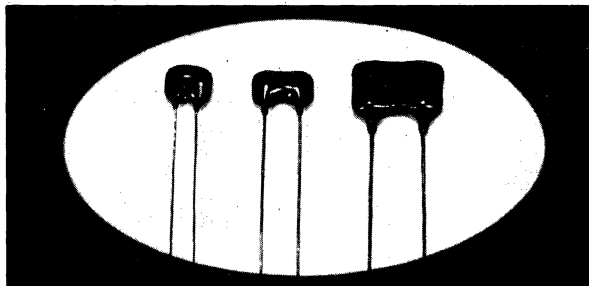
*Available until present stocks are exhausted.

IND-FFM-54-FFAI

All sizes subject to change without notice.

SPRAGUE CAPACITORS

TYPE MW and CM04/5/6 DIPPED MICA CAPACITORS



- Excellent electrical characteristics at low cost.
- For applications such as timing circuits and tuning circuits, where good capacitance stability and retrace are required.
- Operating temperature range: -55°C to $+125^{\circ}\text{C}$.

- Multiple dipped coatings of phenolic and epoxy resins for high moisture resistance.
- Rated for operation at voltages to 500 WVDC.
- Capacitance tolerance: thru 10pF, $\pm 1/2\text{pF}$; 12 pF and above, $\pm 5\%$.

DIMENSIONS (in inches)

Code	L	W	T	Code	L	W	T	Code	L	W	T	Code	L	W	T
A	.360	.330	.190	M	.450	.360	.180	Y	.650	.510	.200	KK	.670	.530	.240
B	.370	.330	.190	N	.460	.360	.180	Z	.650	.510	.200	LL	.670	.530	.250
C	.370	.340	.190	O	.460	.370	.180	AA	.650	.510	.210	MM	.670	.540	.260
D	.370	.340	.200	P	.460	.370	.190	BB	.650	.510	.210	NN	.680	.540	.270
E	.370	.350	.200	Q	.460	.380	.190	CC	.650	.510	.210	OO	.680	.550	.280
F	.380	.350	.200	R	.460	.380	.200	DD	.650	.520	.220	PP	.680	.550	.290
G	.380	.360	.200	S	.470	.390	.210	EE	.650	.520	.220	QQ	.680	.560	.300
H	.380	.360	.210	T	.470	.400	.220	FF	.660	.520	.220	RR	.690	.560	.310
I	.350	.370	.210	U	.480	.400	.230	GG	.660	.520	.220	SS	.690	.570	.330
J	.350	.380	.220	V	.480	.410	.230	HH	.660	.520	.230	TT	.700	.580	.350
K	.390	.380	.230	W	.490	.420	.240	II	.660	.530	.230	UU	.710	.590	.370
L	.450	.360	.170	X	.640	.510	.200	JJ	.670	.530	.240				

pF	Size Code	Industrial/Commercial Cat. No.	MIL-C-5 Part No.	pF	Size Code	Industrial/Commercial Cat. No.	MIL-C-5 Part No.	pF	Size Code	Industrial/Commercial Cat. No.	MIL-C-5 Part No.
----	-----------	--------------------------------	------------------	----	-----------	--------------------------------	------------------	----	-----------	--------------------------------	------------------

TYPE MWA and CM04 (Lead Spacing, 0.140")

1	A	MWA-010	CM04CD010D03	36	C	MWA-360	CM04ED360J03	150	H	MWA-151★	CM04FD151J03★
5	A	MWA-050★	CM04CD050D03★	39	C	MWA-390★	CM04ED390J03★	160	H	MWA-161	CM04FD161J03
6	A	MWA-060	CM04CD060D03	43	C	MWA-430★	CM04ED430J03★	180	I	MWA-181	CM04FD181J03
7	A	MWA-070	CM04CD070D03	47	C	MWA-470★	CM04ED470J03★	200	J	MWA-201★	CM04FD201J03★
8	A	MWA-080	CM04CD080D03	51	C	MWA-510★	CM04ED510J03★	220	J	MWA-221★	CM04FD221J03★
10	A	MWA-100★	CM04CD100D03★	56	C	MWA-560★	CM04ED560J03★	240	J	MWA-241★	CM04FD241J03★
12	A	MWA-120★	CM04CD120J03★	62	C	MWA-620★	CM04ED620J03★	300	J	MWA-301	—
15	A	MWA-150★	CM04CD150J03★	68	C	MWA-680★	CM04ED680J03★	330	J	MWA-331	—
18	A	MWA-180★	CM04CD180J03★	75	C	MWA-750★	CM04ED750J03★	360	J	MWA-361	—
20	A	MWA-200★	CM04ED200J03★	82	D	MWA-820★	CM04ED820J03★	390	J	MWA-391	—
22	A	MWA-220★	CM04ED220J03★	91	E	MWA-910★	CM04FD910J03★	430	K	MWA-431	—
24	A	MWA-240★	CM04ED240J03★	100	E	MWA-101★	CM04FD101J03★	470	K	MWA-471	—
27	B	MWA-270★	CM04ED270J03★	110	F	MWA-111★	CM04FD111J03★	510	K	MWA-511	—
30	C	MWA-300★	CM04ED300J03★	120	F	MWA-121★	CM04FD121J03★				
33	C	MWA-330★	CM04ED330J03★	130	G	MWA-131	CM04FD131J03				

TYPE MWB and CM05 (Lead Spacing, 0.234")

1	L	MWB-010	CM05CD010D03	36	L	MWB-360	CM05ED360J03★	150	P	MWB-151	CM05FD151J03★
5	L	MWB-050	CM05CD050D03★	39	L	MWB-390	CM05ED390J03★	160	P	MWB-161	CM05FD161J03★
6	L	MWB-060	CM05CD060D03	43	L	MWB-430	CM05ED430J03★	180	P	MWB-181	CM05FD181J03★
7	L	MWB-070	CM05CD070D03	47	L	MWB-470	CM05ED470J03★	200	Q	MWB-201	CM05FD201J03★
8	L	MWB-080	CM05CD080D03	51	L	MWB-510	CM05ED510J03★	220	R	MWB-221	CM05FD221J03★
10	L	MWB-100	CM05CD100D03★	56	L	MWB-560	CM05ED560J03★	240	R	MWB-241	CM05FD241J03
12	L	MWB-120	CM05CD120J03★	62	L	MWB-620	CM05ED620J03★	270	S	MWB-271★	CM05FD271J03★
15	L	MWB-150	CM05CD150J03★	68	M	MWB-680	CM05ED680J03★	300	S	MWB-301★	CM05FD301J03★
18	L	MWB-180	CM05CD180J03★	75	M	MWB-750	CM05ED750J03★	330	S	MWB-331★	CM05FD331J03★
20	L	MWB-200	CM05ED200J03★	82	M	MWB-820	CM05ED820J03★	360	T	MWB-361★	CM05FD361J03★
22	L	MWB-220	CM05ED220J03★	91	N	MWB-910	CM05FD910J03	390	T	MWB-391★	CM05FD391J03★
24	L	MWB-240	CM05ED240J03★	100	N	MWB-101	CM05FD101J03★	430	U	MWB-431	—
27	L	MWB-270	CM05ED270J03★	110	O	MWB-111	CM05FD111J03★	470	V	MWB-471	—
30	L	MWB-300	CM05ED300J03★	120	O	MWB-121	CM05FD121J03★	510	W	MWB-511	—
33	L	MWB-330	CM05ED330J03★	130	O	MWB-131	CM05FD131J03★				

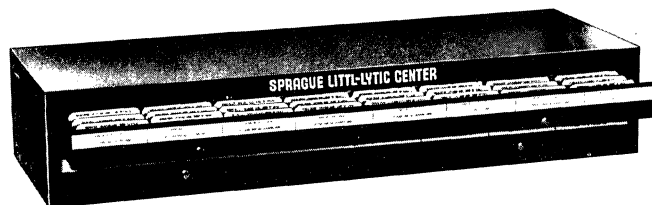
TYPE MWC and CM06 (Lead Spacing, 0.343")

430	X	MWC-431	CM06FD431J03	1000	DD	MWC-102★	CM06FD102J03★	2400	MM	MWC-242★	CM06FD242J03★
470	X	MWC-471★	CM06FD471J03★	1100	EE	MWC-112★	CM06FD112J03★	2700	NN	MWC-272★	CM06FD272J03★
510	Y	MWC-511	CM06FD511J03★	1200	FF	MWC-122★	CM06FD122J03★	3000	OO	MWC-302★	CM06FD302J03★
560	Y	MWC-561★	CM06FD561J03★	1300	GG	MWC-132	CM06FD132J03	3300	PP	MWC-332★	CM06FD332J03★
620	Z	MWC-621★	CM06FD621J03★	1500	HH	MWC-152★	CM06FD152J03★	3600	QQ	MWC-362★	CM06FD362J03★
680	AA	MWC-681★	CM06FD681J03★	1600	II	MWC-162★	CM06FD162J03★	3900	RR	MWC-392★	CM06FD392J03★
750	BB	MWC-751★	CM06FD751J03★	1800	JJ	MWC-182★	CM06FD182J03★	4300	SS	MWC-432	CM06FD432J03
820	BB	MWC-821★	CM06FD821J03★	2000	KK	MWC-202★	CM06FD202J03★	4700	TT	MWC-472★	CM06FD472J03★
910	CC	MWC-911★	CM06FD911J03★	2200	LL	MWC-222★	CM06FD222J03★	5100	UU	MWC-512	—

* Normally in stock, or readily available. Consult your Sprague distributor for availability of other capacitors.

SPRAGUE CAPACITORS

CAPACITOR SERVICENTERS in steel cabinets



- Custom-designed to put popular-rated capacitors at your fingertips.
- Capacitors 'filed' in compartmented drawers outfitted with pre-printed index cards.
- Rugged yet attractive... constructed of heavy-gage steel, finished in baked blue enamel.
- J-150 contains 795 disc ceramics. J-141 contains 200 miniature axial-lead tubular electrolytics. J-152 contains 392 single-ended electrolytics.

J-150 CERAMICENTER®

(See Sprague Cera-mite® Capacitor pages for detailed information on these capacitors)

Quan.	Cat. No.	pF	Quan.	Cat. No.	μF	Quan.	Cat. No.	μF	Quan.	Cat. No.	pF	Quan.	Cat. No.	μF
GA TYPES 1000 WVDC			10	5GA-T47	470	25	5HK-D50	.005	GA TYPES 100 WVDC			5	HY-365	.15
5	5GA-V50	5	10	5GA-T50	500	25	5HK-S10	.01	25	TG-D50	.005	5	HY-370	.22
10	5GA-Q10	10	5	5GA-T68	680	10	5HK-S20	.02	25	TG-S10	.01	5	HY-375	.33
5	5GA-Q15	15	5	5GA-T82	820	25	5HK-S50	.05	25	TG-S20	.02	5	HY-380	.47
5	5GA-Q22	22	25	5GA-D10	.001μF	25	5HK-P10	.1	25	TG-S25	.025	5	HY-420	.01
5	5GA-Q33	33	10	5GA-D15	.0015	TEMPERATURE-STABLE TYPES 1000 WVDC			25	TG-S30	.03	5	HY-425	.022
5	5GA-Q39	39	10	5GA-D20	.002	10	10TS-T10	100pF	25	TG-P10	.1	5	HY-430	.033
10	5GA-Q47	47	10	5GA-D33	.0033	10	10TS-T47	470	ULTRA-MINIATURE TYPES			5	HY-435	.047
10	5GA-Q50	50	10	5GA-D40	.004	10	10TS-T50	500	HY-300 Series, 12 WVDC			5	HY-440	.068
5	5GA-Q68	68	25	5GA-D47	.0047	5	10TS-T68	680	HY-400 Series, 16 WVDC			5	HY-450	.1
5	5GA-Q82	82	10	5GA-D50	.005	10	10TS-T82	820	HY-500 Series, 25 WVDC			5	HY-470	.2
10	5GA-T10	100	25	5GA-S10	.01	10	10TS-D10	.001μF	5	HY-340	.022	5	HY-510	.0047
5	5GA-T12	120	10	5GA-S15	.015	5	10TS-D15	.0015	5	HY-345	.033	5	HY-520	.01
10	5GA-T15	150	25	5GA-S20	.02	10	10TS-D20	.002	5	HY-350	.047	5	HY-525	.022
5	5GA-T22	220	HIGH-K TYPES Thru .01μF, 1000 WVDC .02 μF and up, 500 WVDC			10	10TS-D30	.003	5	HY-355	.068	5	HY-530	.033
5	5GA-T27	270	20	5HK-D10	.001	10	10TS-D50	.005	5	HY-360	.1	5	HY-535	.047
10	5GA-T33	330	10	5HK-D15	.0015	5	10TS-D68	.0068	5			5	HY-540	.068
5	5GA-T39	390				20	10TS-S10	.01						

J-141 LITTL-LYTIC® CENTER

(See Sprague Littl-Lytic Capacitor page for detailed information on these capacitors)

Quan.	Cat. No.	μF	Quan.	Cat. No.	μF
3 WVDC			25 WVDC, cont.		
5	TE-1059.5	100	5	TE-1204	10
5	TE-1064	200	5	TE-1205	15
5	TE-1068	500	5	TE-1207	25
6 WVDC			5	TE-1208	35
5	TE-1104	200	5	TE-1209	50
5	TE-1106	300	5	TE-1210	75
12 WVDC			5	TE-1211	100
5	TE-1127	5	50 WVDC		
5	TE-1133	50	5	TE-1300	1
5	TE-1135	100	5	TE-1301	2
5	TE-1137	200	5	TE-1302	3
5	TE-1138	250	5	TE-1302.1	4
16 WVDC			5	TE-1303	5
5	TE-1155	10	5	TE-1303.3	8
5	TE-1157	20	5	TE-1304	10
5	TE-1162	100	5	TE-1305	20
5	TE-1163	150	5	TE-1306	35
5	TE-1164	200	5	TE-1307	50
25 WVDC			100 WVDC		
5	TE-1200	1	5	TE-1407	10
5	TE-1201	2	5	TE-1409	20
5	TE-1202	5	150 WVDC		
5	TE-1203	6	5	TE-1504	5
			5	TE-1507	10

J-152 VERTI-LYTIC® CENTER

(See Sprague Verti-Lytic Capacitor page for detailed information on these capacitors)

Quan.	Cat. No.	μF	Quan.	Cat. No.	μF
0 - 6.3 WVDC			0 - 25 WVDC		
10	EV-1026	47	10	EV-1315	1.0
10	EV-1030	100	10	EV-1317	2.2
10	EV-1050	470	10	EV-1318	3.3
10	EV-1060	1000	10	EV-1319	4.7
0 - 10 WVDC			10	EV-1322	10
10	EV-1125	33	10	EV-1323	15
25	EV-1130	100	10	EV-1325	33
10	EV-1140	220	10	EV-1326	47
10	EV-1145	330	10	EV-1330	100
25	EV-1150	470	10	EV-1340	220
10	EV-1160	1000	10	EV-1345	330
0 - 16 WVDC			10	EV-1350	470
10	EV-1222	10	10	EV-1360	1000
10	EV-1224	22	0 - 35 WVDC		
10	EV-1226	47	10	EV-1450	450
10	EV-1230	100	0 - 50 WVDC		
10	EV-1240	220	10	EV-1519	4.7
10	EV-1245	330	0 - 63 WVDC		
10	EV-1250	470	10	EV-1615	1.0
12	EV-1260	1000	10	EV-1618	3.3
			10	EV-1622	10

**SPRAGUE-
GOODMAN**

CAPACITORS

PISTONCAP® PRECISION TRIMMER CAPACITORS

- Low Loss Glass or Quartz Dielectric.
- Fully Interchangeable with JFD and Erie.
- Simplified Long Life, Reliable Adjust Mechanism.
- High Stability Under Conditions of Changing Frequency, Voltage, Temperature, etc.
- Dielectric Strength, Twice Rated Voltage.
- Driving Torque, 1 to 10 ounce-inches.
- Insulation Resistance, 10^6 Megohms at +25 C.
(See Temperature Table for IR at Peak Temp.)
- Standard Sealed and Expanded Range Sealed Types Use Latest Design of Multi-lobed Seal at Adjust End.
- Types GER, GFR, GEL, and GFL Employ Embedded Electrode Construction for Expanded Capacitance Range.

MIL-C-14409C CAPACITORS

Sprague-Goodman is an approved supplier of the following Series:

Style	Character- istics	Style	Character- istics
PC38	H, J	PC43	All
PC39	All	PC48	H, J
PC40	H, J	PC50	H, J
PC41	H, J	PC51	H, J
PC42	H, J	PC52	H, J

Dielectric Material	Capacitance Range in pF		D-C Voltage Rating (Volts)	Minimum Quality Factor Q	Temp. Char. (See Table)	Panel Mounting		Printed Circuit Mounting	
	Min.	Max.				Length A	Cat. No.	Length A	Cat. No.

OPEN END STYLE

Standard Glass	0.8	4.5	750	500	J	.297	GGP4R500	.312	GGC4R500
Standard Glass	0.8	8.5	750	500	J	.547	GGP8R500	.562	GGC8R500
Standard Glass	0.8	12.0	750	500	H	.750	GGP12000	.766	GGC12000
Standard Glass	0.8	18.0	750	500	H	.984	GGP18000	1.000	GGC18000
Standard Glass	1.0	30.0	750	350	H	1.594	GGP30000	1.609	GGC30000
Hi-Range Glass	0.8	5.5	750	1000	J	.297	GHP5R500	.312	GHC5R500
Hi-Range Glass	0.8	11.0	750	900	J	.547	GHP11000	.562	GHC11000
Hi-Range Glass	0.8	16.0	750	800	H	.750	GHP16000	.766	GHC16000
Hi-Range Glass	0.8	23.0	750	700	H	.984	GHP23000	1.000	GHC23000
Hi-Range Glass	1.0	38.0	750	500	H	1.594	GHP38000	1.609	GHC38000
Quartz	0.6	1.8	750	1500	Q	.297	GQP1R800	.312	GQC1R800
Quartz	0.6	5.5	750	1500	Q	.547	GQP5R500	.562	GQC5R500
Quartz	0.6	9.5	750	1500	Q	.984	GQP9R500	1.000	GQC9R500
Quartz	0.8	16.0	750	1500	Q	1.594	GQP16000	1.609	GQC16000

STANDARD SEALED STYLE

Standard Glass	0.8	4.5	750	500	J	.359	GGR4R500	.656	GGL4R500
Standard Glass	0.8	8.5	1250	500	J	.594	GGR8R500	.906	GGL8R500
Standard Glass	0.8	12.0	1250	500	H	.812	GGR12000	1.109	GGL12000
Standard Glass	0.8	18.0	1250	500	H	1.062	GGR18000	1.359	GGL18000
Standard Glass	1.0	30.0	1250	350	H	1.656	GGR30000	1.953	GGL30000
Hi-Range Glass	0.8	5.5	750	1000	J	.359	GHR5R500	.656	GHL5R500
Hi-Range Glass	0.8	11.0	1250	900	J	.594	GHR11000	.906	GHL11000
Hi-Range Glass	0.8	16.0	1250	800	H	.812	GHR16000	1.109	GHL16000
Hi-Range Glass	0.8	23.0	1250	700	H	1.062	GHR13000	1.359	GHL23000
Hi-Range Glass	1.0	38.0	1250	500	H	1.656	GHR38000	1.953	GHL38000
Quartz	0.6	1.8	750	1500	Q	.359	GQR1R800	.656	GQL1R800
Quartz	0.6	5.5	1250	1500	Q	.625	GQR5R500	.922	GQL5R500
Quartz	0.6	9.5	1250	1500	Q	1.062	GQR9R500	1.359	GQL9R500
Quartz	0.8	16.0	1250	1500	Q	1.656	GQR16000	1.953	GQL16000

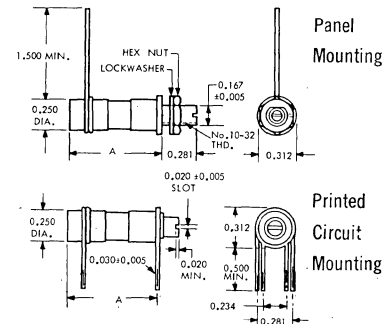
EXPANDED-RANGE SEALED STYLE

Standard Glass	1.0	14	1000	500	G	.469	GER14000	.780	GEL14000
Standard Glass	1.0	28	1000	350	G	.703	GER28000	1.020	GEL28000
Standard Glass	1.0	42	1000	250	G	.922	GER42000	1.235	GEL42000
Standard Glass	1.0	60	1000	250	G	1.172	GER60000	1.480	GEL60000
Standard Glass	1.0	90	1000	250	G	1.766	GER90000	2.080	GEL90000
Hi-Range Glass	1.0	16	1000	750	G	.469	GFR16000	.780	GFL16000
Hi-Range Glass	1.0	36	1000	550	G	.703	GFR36000	1.020	GFL36000
Hi-Range Glass	1.0	52	1000	350	G	.922	GFR52000	1.235	GFL52000
Hi-Range Glass	1.0	75	1000	250	G	1.172	GFR75000	1.480	GFL75000
Hi-Range Glass	1.0	120	1000	250	G	1.766	GFR12100	2.080	GFL12100

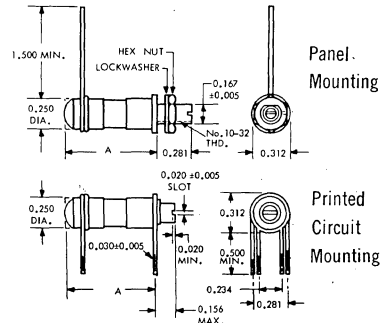
TEMPERATURE TABLE

Temp. Char.	Operating Temperature Range	Temp. Coefficient (ppm/°C)	IR at Peak Temp. (MΩ)
G	-55 C to +125 C	±150	10^5
H	-55 C to +125 C	±100	10^5
J	-55 C to +125 C	±50	10^5
Q	-55 C to +150 C	+50, -0	10^6

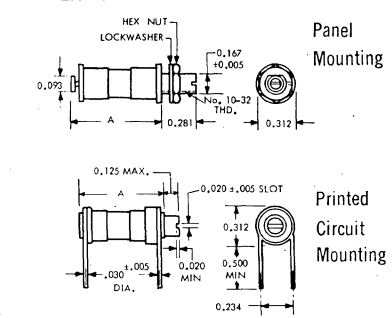
OPEN END STYLE



STANDARD SEALED STYLE



EXPANDED-RANGE SEALED STYLE

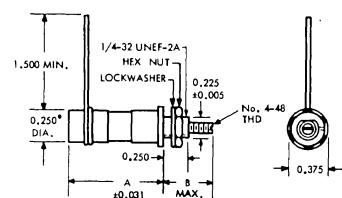


SPRAGUE-GOODMAN CAPACITORS

PISTONCAP® PRECISION TRIMMER CAPACITORS, continued

EXTENDED-SCREW STYLE								
Dielectric Material	Capacitance Range in pF Min. | Max.		D-C Voltage Rating	Minimum Q at 20 MHz	Temp. Coeff. in ppm/°C	Length A	Screw Extension B	Cat. No.
Standard Glass	0.5	3.0	750	500	±50	.484	.625	GGW3R000
Standard Glass	0.8	8.5	750	500	±75	.578	.625	GGW8R500
Standard Glass	0.7	9.0	750	500	±75	.656	.656	GGW9R000
Standard Glass	0.8	12.0	750	500	±100	.765	.750	GGW12000
Standard Glass	0.8	18.0	750	500	±100	1.000	.843	GGW18000
Standard Glass	0.8	30.0	750	500	±100	1.594	1.141	GGW30000
Standard Glass	0.7	9.0	750	500	+0, -150	.656	.765	GSG900
Standard Glass	0.6	14.0	750	500	+0, -150	1.000	1.000	GSG901
Standard Glass	0.8	18.0	750	500	+0, -150	1.000	.953	GSG902
Standard Glass	0.8	30.0	750	500	+0, -150	1.594	1.250	GSG903
Standard Glass	0.7	9.0	750	500	+400 ±100	.656	.797	GSG904
Standard Glass	0.8	18.0	750	500	+400 ±100	1.000	.938	GSG905
Standard Glass	0.8	30.0	750	500	+400 ±100	1.594	1.250	GSG906
Hi-Range Glass	0.5	4.5	750	1000	±100	.484	.625	GHW4R500
Hi-Range Glass	0.8	11.0	750	900	±100	.578	.625	GHW11000
Hi-Range Glass	0.8	13.0	750	900	±100	.609	.625	GHW13000
Hi-Range Glass	0.8	17.0	750	800	±100	.765	.750	GHW17000
Hi-Range Glass	1.0	24.0	750	700	±100	1.000	.812	GHW24000
Hi-Range Glass	1.0	40.0	750	500	±100	1.594	1.125	GHW40000
Quartz	0.6	5.5	750	1500	+50, -0	.563	.765	GQW5R500
Quartz	0.6	9.5	750	1500	+50, -0	1.000	.891	GQW9R500
Quartz	0.8	16.0	750	1500	+50, -0	1.594	1.250	GQW16000
Quartz	0.7	4.5	750	1500	+50, -0	.438	.546	GSG907
Quartz	0.6	6.0	750	1500	+50, -0	.625	.906	GSG908
Quartz	0.8	10.0	750	1500	+50, -0	1.000	.891	GSG909
Quartz	9.0	21.0	750	1500	+50, -0	1.594	1.000	GSG910

EXTENDED-SCREW STYLE

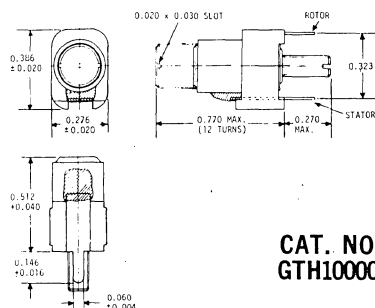


Panel Mounting

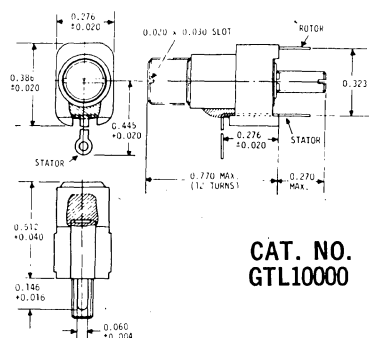
MULTI-TURN TEFLON* TRIMMER CAPACITORS

- Printed Circuit Mounting Type
- Top or Bottom Adjustment
- Straight Line Capacitance Curve
- Stable and Rugged Construction
- Excellent Characteristics at Low Cost
- Linear Temperature Coefficient
- Sensitive Multi-Turn Adjustment
- Capacitance Range: 2.0 to 10.0 pF
- Voltage Rating: 250 Volts D-C
- Dielectric Strength: 500 Volts D-C
- Q at 10 MHz: 1000 Min.
- Temp. Coeff.: NPO ±200 ppm/°C
- Driving Torque: 0.4 to 5.0 ounce-inches
- Operating Temp. Range: -40°C to +100°C

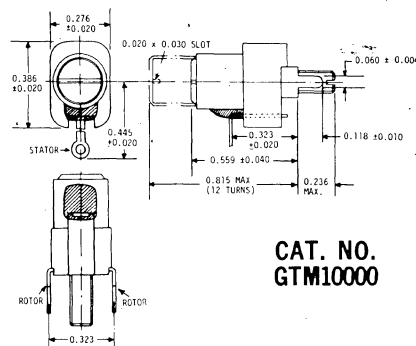
★ Trademark, E. I. DuPont



CAT. NO. GTH10000



CAT. NO. GTL10000



CAT. NO. GTM10000

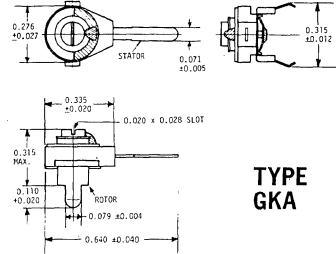
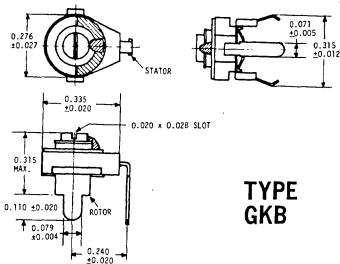
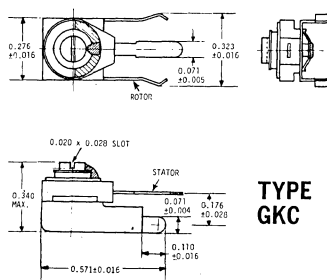
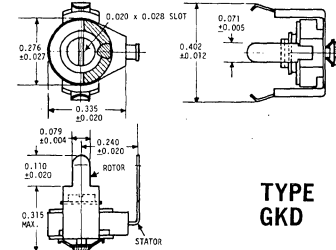
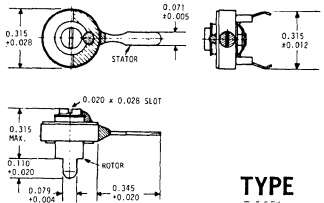
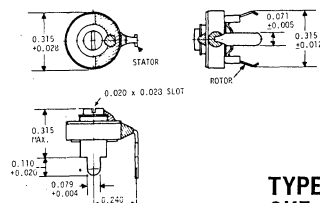
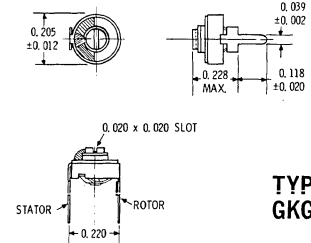
**SPRAGUE-
GOODMAN**

CAPACITORS

MINIATURE CERAMIC TRIMMER CAPACITORS

- Printed Circuit Mounting Type
- Compact Form Factor Conserves Mounting Space
- Straight Line Capacitance Curve
- Low Cost for Industrial and Commercial Applications
- Variety of Mounting Configurations
- Snap Fit in Printed Circuit Board

- Operating Temp. Range:
-55°C to +85°C
- Voltage Rating: 250 Volts D-C
- Dielectric Strength: 500 Volts D-C
- Insulation Resistance:
10³ Megohms Min. at +25°C
- Driving Torque:
0.5 to 2.5 ounce-inches (Types A-F)
0.4 to 2.0 ounce-inches (Type G)


**TYPE
GKA**

**TYPE
GKB**

**TYPE
GKC**

**TYPE
GKD**

**TYPE
GKE**

**TYPE
GKF**

**TYPE
GKG**

Cap. Range		Min. Q at 10 MHz	Temp.* Coeff. in ppm/°C	Cat. No.	Color Code	Cap. Range		Min. Q at 10 MHz	Temp.* Coeff. in ppm/°C	Cat. No.	Color Code
Min.	Max.					Min.	Max.				
1.5	4.0	300	NPO ±250	GKG4R000	Black	4.0	30.0	300	-750 ±250	GKA30000 GKB30000 GKC30000 GKD30000	Orange
2.0	6.0	300	NPO ±200	GKA6R000 GKB6R000 GKC6R000 GKD6R000	Red	5.1	40.0	200	-1400 ±800	GKA40000 GKB40000 GKC40000 GKD40000	Brown
2.0	6.0	300	-100 ±200	GKG6R000	Red	5.1	50.0	200	-1400 ±800	GKA50000 GKB50000 GKC50000 GKD50000	Green
2.0	10.0	300	NPO ±200	GKA10000 GKB10000 GKC10000 GKD10000	None	6.0	60.0	200	-1400 ±800	GKE60000 GKF60000	Pink
2.8	10.0	300	-600 ±300	GKG10000	None	6.0	70.0	200	-1400 ±800	GKE70000 GKF70000	Gray
3.3	18.0	300	-800 ±300	GKG18000	Blue						
2.5	20.0	500	-450 ±200	GKA20000 GKB20000 GKC20000 GKD20000	Blue						

*Temperature coefficient is measured over range of -20°C to +70°C for Types A-F and -25°C to +85°C for Type G.

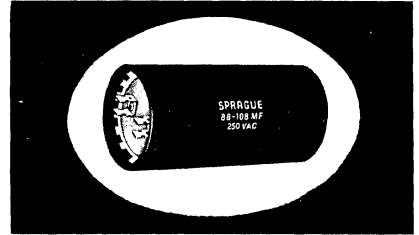
SPRAGUE A-C CAPACITORS

TYPE AB MOTOR-STARTING ELECTROLYTIC CAPACITORS

- Designed for intermittent duty cycles in motor-starting applications.
- Housed in molded phenolic cases for protection against moisture, dirt, and grease. Will not deteriorate in humid atmosphere, as is often the case with cardboard-encased capacitors.
- Universal terminals for use with quick-connect connectors. Terminals also have notches and

eyes for wrapping leads if connections are to be soldered.

- Operating temperature range, -30°C to $+65^{\circ}\text{C}$.
- Only a single end cap and clip-type bracket are needed for easy mounting on any modern motor.
- 2 clip-on terminal adapters included with each capacitor, for attaching lead wires without soldering.



μF Min.-Max.	D. x L.	Catalog Number	μF Min.-Max.	D. x L.	Catalog Number	μF Min.-Max.	D. x L.	Catalog Number	μF Min.-Max.	D. x L.	Catalog Number
125 VOLTS A-C, 60 CYCLES			165 VOLTS A-C, 60 CYCLES			250 VOLTS A-C, 60 CYCLES			330 VOLTS A-C, 60 CYCLES		
At 125 volts a-c . . . 120,000 starts min. with two 1/2-second starts per minute			At 165 volts a-c . . . 60,000 starts min. with one 1-second start per minute			At 250 volts a-c . . . 40,000 starts min. with forty 1-second starts per hour			At 330 volts a-c . . . 40,000 starts min. with forty 1-second starts per hour		
21-25	1 1/16 x 2 3/4	AB-1201	270-324	1 1/16 x 3 3/8	AB-1240	243-292	1 1/16 x 4 3/8	AB-1637	189-227	2 1/16 x 4 3/8	AB-2528
25-30	1 1/16 x 2 3/4	AB-1202	324-388	1 1/16 x 3 3/8	AB-1242	270-324	1 1/16 x 4 3/8	AB-1640	216-259	2 1/16 x 4 3/8	AB-2531
30-36	1 1/16 x 2 3/4	AB-1203	340-408	1 1/16 x 3 3/8	AB-1243	340-408	2 1/16 x 4 3/8	AB-1643	233-280	2 1/16 x 4 3/8	AB-2532
36-46	1 1/16 x 2 3/4	AB-1204	400-480	1 1/16 x 3 3/8	AB-1249	378-440	2 1/16 x 4 3/8	AB-1646	280-333	2 1/16 x 4 3/8	AB-2533
43-53	1 1/16 x 2 3/4	AB-1205	430-516	1 1/16 x 3 3/8	AB-1252	400-480	2 1/16 x 4 3/8	AB-1649			
53-64	1 1/16 x 2 3/4	AB-1207	460-552	1 1/16 x 3 3/8	AB-1255						
64-77	1 1/16 x 2 3/4	AB-1208	540-648	1 1/16 x 4 3/8	AB-1258	21-25	1 1/16 x 2 3/4	AB-2501	21-25	1 1/16 x 3 3/8	AB-3201
72-88	1 1/16 x 2 3/4	AB-1209	590-708	1 1/16 x 4 3/8	AB-1261	25-30	1 1/16 x 2 3/4	AB-2502	25-30	1 1/16 x 3 3/8	AB-3202
88-108	1 1/16 x 2 3/4	AB-1210	705-845	2 1/16 x 4 3/8	AB-1262	30-36	1 1/16 x 3 3/8	AB-2503	30-36	1 1/16 x 3 3/8	AB-3203
			800-920	2 1/16 x 4 3/8	AB-1263	36-43	1 1/16 x 3 3/8	AB-2504	36-43	1 1/16 x 3 3/8	AB-3204
			1000-1200	2 1/16 x 4 3/8	AB-1265	43-53	1 1/16 x 3 3/8	AB-2505	43-53	1 1/16 x 3 3/8	AB-3205
108-130	1 1/16 x 2 3/4	AB-1213				47-56	1 1/16 x 3 3/8	AB-2506	53-64	1 1/16 x 4 3/8	AB-3207
124-149	1 1/16 x 2 3/4	AB-1216				53-64	1 1/16 x 3 3/8	AB-2507	64-77	1 1/16 x 4 3/8	AB-3208
130-156	1 1/16 x 2 3/4	AB-1219	108-130	1 1/16 x 3 3/8	AB-1613	64-77	1 1/16 x 3 3/8	AB-2508	72-88	2 1/16 x 4 3/8	AB-3209
145-175	1 1/16 x 2 3/4	AB-1222	124-149	1 1/16 x 3 3/8	AB-1616	72-88	1 1/16 x 3 3/8	AB-2509	88-108	2 1/16 x 4 3/8	AB-3210
161-193	1 1/16 x 2 3/4	AB-1225	130-156	1 1/16 x 3 3/8	AB-1619	88-108	1 1/16 x 4 3/8	AB-2510	108-130	2 1/16 x 4 3/8	AB-3213
189-227	1 1/16 x 2 3/4	AB-1228	145-175	1 1/16 x 3 3/8	AB-1622	108-130	1 1/16 x 4 3/8	AB-2512	124-149	2 1/16 x 4 3/8	AB-3216
200-240	1 1/16 x 2 3/4	AB-1230	161-193	1 1/16 x 3 3/8	AB-1625	124-149	1 1/16 x 4 3/8	AB-2516	130-156	2 1/16 x 4 3/8	AB-3219
216-259	1 1/16 x 3 3/8	AB-1231	189-227	1 1/16 x 3 3/8	AB-1628	130-156	1 1/16 x 4 3/8	AB-2519	145-175	2 1/16 x 4 3/8	AB-3222
233-280	1 1/16 x 3 3/8	AB-1234	216-259	1 1/16 x 3 3/8	AB-1631	145-175	2 1/16 x 4 3/8	AB-2522	161-193	2 1/16 x 4 3/8	AB-3225
243-292	1 1/16 x 3 3/8	AB-1237	233-280	1 1/16 x 4 3/8	AB-1634	161-193	2 1/16 x 4 3/8	AB-2525	189-227	2 1/16 x 4 3/8	AB-3226
									216-259	2 1/16 x 4 3/8	AB-3227

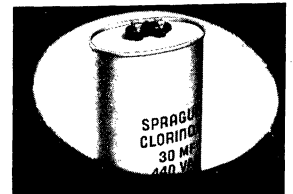
TYPE OV OVAL-CASE MOTOR-RUN CAPACITORS

- Impregnated with non-flammable synthetic askarel liquid which has low power factor, high dielectric constant, high dielectric strength.
- Mechanically rugged construction - will withstand severe motor vibration. Drawn metal case eliminates danger of leaky soldered seams.
- Terminals mechanically linked by molded phenolic dual insulating cup, which prevents individual ter-

minals from turning and forms a leak-proof seal.

- Universal terminals for use with female quick-connect terminations found on wiring harnesses. Terminals also have notches and eyes for wrapping leads if connections are to be soldered.

• T after cat. no. means internally-fused unit.



μF	W. x T. x H.	Catalog Number	μF	W. x T. x H.	Catalog Number	μF	W. x T. x H.	Catalog Number	μF	W. x T. x H.	Catalog Number
SINGLE SECTION CAPACITORS			440 VOLTS A-C, 60 CYCLES			DUAL SECTION CAPACITORS			440 VOLTS A-C, 60 CYCLES		
370 VOLTS A-C, 60 CYCLES			2	2 5/32 x 1 1/16 x 2	OV-4020	4	2 29/32 x 1 29/32 x 3 3/8	OV-6040	35+4	3 21/32 x 1 31/32 x 7	OVD-3354
2	2 5/32 x 1 1/16 x 1 1/8	OV-3020	3	2 5/32 x 1 1/16 x 2 3/8	OV-4030	5	2 29/32 x 1 29/32 x 3 3/8	OV-6050	35+5	3 21/32 x 1 31/32 x 7 1/8	OVD-3355
3	2 5/32 x 1 1/16 x 2	OV-3030	4	2 5/32 x 1 1/16 x 3	OV-4040	6	2 29/32 x 1 29/32 x 4 3/8	OV-6060	35+5	3 21/32 x 1 31/32 x 7 1/8	OVD-3355T
4	2 5/32 x 1 1/16 x 2 1/4	OV-3040	5	2 5/32 x 1 1/16 x 3 1/2	OV-4050	8	2 29/32 x 1 29/32 x 5 3/8	OV-6080	40+3	3 21/32 x 1 31/32 x 7 3/8	OVD-3403
5	2 5/32 x 1 1/16 x 2 1/2	OV-3050	6	2 5/32 x 1 1/16 x 4 1/8	OV-4060	TRIPLE SECTION CAPACITORS			370 VOLTS A-C, 60 CYCLES		
6	2 5/32 x 1 1/16 x 3	OV-3060	7.5	2 5/32 x 1 1/16 x 5	OV-4075	15+3	2 29/32 x 1 29/32 x 4 3/8	OVD-3153	5+4	2 29/32 x 1 29/32 x 3 3/8	OVD-4054
7.5	2 5/32 x 1 1/16 x 3 3/4	OV-3075	8	2 29/32 x 1 29/32 x 3 3/8	OV-4080	15+4	2 29/32 x 1 29/32 x 4 3/8	OVD-3154	10+3	2 29/32 x 1 29/32 x 4 1/2	OVD-4103
9	2 29/32 x 1 29/32 x 2 5/8	OV-3090	10	2 29/32 x 1 29/32 x 3 3/8	OV-4100	15+5	2 29/32 x 1 29/32 x 4 3/8	OVD-3155	10+4	2 29/32 x 1 29/32 x 4 3/8	OVD-4104
10	2 29/32 x 1 29/32 x 2 3/4	OV-3100	10	2 29/32 x 1 29/32 x 3 3/8	OV-4100T	15+10	2 29/32 x 1 29/32 x 5 3/8	OVD-3158	10+5	2 29/32 x 1 29/32 x 5 1/8	OVD-4105
12.5	2 29/32 x 1 29/32 x 3 1/4	OV-3125	12.5	2 29/32 x 1 29/32 x 4 3/8	OV-4125	15+5	2 29/32 x 1 29/32 x 4 3/8	OVD-3155	15+4	2 29/32 x 1 29/32 x 6 1/8	OVD-4154
15	2 29/32 x 1 29/32 x 3 3/4	OV-3150	15	2 29/32 x 1 29/32 x 5 1/4	OV-4150	15+10	2 29/32 x 1 29/32 x 5 3/8	OVD-3158	15+5	2 29/32 x 1 29/32 x 6 1/2	OVD-4155
15	2 29/32 x 1 29/32 x 3 3/4	OV-3150T	15	2 29/32 x 1 29/32 x 5 1/4	OV-4150T	17.5+4	2 29/32 x 1 29/32 x 5 1/8	OVD-3174	17.5+4	2 29/32 x 1 29/32 x 7	OVD-4174
15	2 29/32 x 1 29/32 x 3 3/4	OV-3150T	15	2 29/32 x 1 29/32 x 5 1/4	OV-4150T	17.5+5	2 29/32 x 1 29/32 x 5 1/8	OVD-3175	17.5+5	3 21/32 x 1 31/32 x 5 1/2	OVD-4175
17.5	2 29/32 x 1 29/32 x 4 1/4	OV-3175	17.5	2 29/32 x 1 29/32 x 6 1/2	OV-4175	17.5+10	2 29/32 x 1 29/32 x 5 3/8	OVD-3178	17.5+7.5	3 21/32 x 1 31/32 x 6	OVD-4177
17.5	2 29/32 x 1 29/32 x 4 1/4	OV-3175T	20	2 29/32 x 1 29/32 x 6 1/2	OV-4200	17.5+17.5	3 21/32 x 1 31/32 x 5 1/8	OVD-3178T	17.5+17.5	3 21/32 x 1 31/32 x 8 1/8	OVD-4178T
			20	2 29/32 x 1 29/32 x 6 1/2	OV-4200T	20+3	2 29/32 x 1 29/32 x 5 3/8	OVD-3203	20+4	3 21/32 x 1 31/32 x 8 1/8	OVD-4204
			20	2 29/32 x 1 29/32 x 6 1/2	OV-4200T	20+3	2 29/32 x 1 29/32 x 5 3/8	OVD-3203	20+5	3 21/32 x 1 31/32 x 8 1/8	OVD-4205
			22.5	2 29/32 x 1 29/32 x 6 1/2	OV-4225	20+4	2 29/32 x 1 29/32 x 5 1/2	OVD-3204	20+15	3 21/32 x 1 31/32 x 8	OVD-4208
			25	3 21/32 x 1 31/32 x 6	OV-4250	20+5	3 21/32 x 1 31/32 x 4 1/2	OVD-3205	25+4	3 21/32 x 1 31/32 x 6 3/8	OVD-4254
			25	3 21/32 x 1 31/32 x 6	OV-4250T	20+15	3 21/32 x 1 31/32 x 5 3/8	OVD-3208	27.5+4	3 21/32 x 1 31/32 x 7 3/8	OVD-4274
			30	3 21/32 x 1 31/32 x 7	OV-4300	25+3	3 21/32 x 1 31/32 x 4 3/8	OVD-3253	30+5	3 21/32 x 1 31/32 x 8 1/8	OVD-4305
			30	3 21/32 x 1 31/32 x 7	OV-4300T	25+4	3 21/32 x 1 31/32 x 5	OVD-3254	35+3	3 21/32 x 1 31/32 x 8 3/8	OVD-4353
			35	3 21/32 x 1 31/32 x 8 1/8	OV-4350	25+5	3 21/32 x 1 31/32 x 5 1/4	OVD-3255	35+4	3 21/32 x 1 31/32 x 9	OVD-4354
			35	3 21/32 x 1 31/32 x 8 1/8	OV-4350T	25+6	3 21/32 x 1 31/32 x 5 1/4	OVD-3256	35+5	3 21/32 x 1 31/32 x 9 1/8	OVD-4355
			40	3 21/32 x 1 31/32 x 9 1/4	OV-4400				35+5	3 21/32 x 1 31/32 x 9 1/8	OVD-4355T
			45	3 21/32 x 1 31/32 x 9 1/2	OV-4450				40+5	3 21/32 x 1 31/32 x 9 1/2	OVD-4405
						30+3	3 21/32 x 1 31/32 x 5 1/2	OVD-3303	TRIPLE SECTION CAPACITORS		
						30+4	3 21/32 x 1 31/32 x 5 3/8	OVD-3304	370 VOLTS A-C, 60 CYCLES		
						30+5	3 21/32 x 1 31/32 x 5 3/8	OVD-3305	15+3+2	3 21/32 x 1 31/32 x 3 3/8	OVT-31532
						35+3	3 21/32 x 1 31/32 x 6 1/4	OVD-3353	25+3+2	3 21/32 x 1 31/32 x 5 1/8	OVT-32532
									35+3+2	3 21/32 x 1 31/32 x 7 1/8	OVT-33532
									40+3+2	3 21/32 x 1 31/32 x 8	OVT-34032

SPRAGUE A-C CAPACITORS

TYPE OR RECTANGULAR-CASE MOTOR-RUN CAPACITORS

- Higher capacitance values than are usually found in oval or cylindrical units.
- Non-flammable synthetic askarel liquid impregnant is derived from halogenated aromatic hydrocarbons. This askarel impregnant has low power factor, a high dielectric constant, and high dielectric strength.
- Drawn seamless case eliminates the danger of leaky soldered seams. Double-rolled edges of

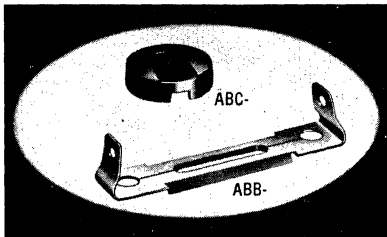
cover closure protect against 'popouts' and assure an extremely reliable seal between cover and can.

- Special terminal construction. The two terminals are mechanically linked by a molded phenolic dual insulating cup. This 'dogbone' shaped bushing prevents individual terminals from turning and, forms a reliable leakproof seal.
- Internally fused units have (T) suffix in Cat. No.



μ F	W. x T. x H.	Catalog Number	μ F	W. x T. x H.	Catalog Number	μ F	W. x T. x H.	Catalog Number	μ F	W. x T. x H.	Catalog Number
SINGLE SECTION CAPACITORS			440 VOLTS A-C, 60 CYCLES			660 VOLTS A-C, 60 CYCLES			DUAL SECTION CAPACITORS		
370 VOLTS A-C, 60 CYCLES			440 VOLTS A-C, 60 CYCLES			440 VOLTS A-C, 60 CYCLES			440 VOLTS A-C, 60 CYCLES		
25	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $3\frac{1}{16}$	OR-3250	17.5	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $3\frac{1}{16}$	OR-4175	40	$4\frac{1}{16}$ x $2\frac{7}{32}$ x 5	OR-4400T	65	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $8\frac{1}{4}$	OR-4650T
35	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $3\frac{3}{16}$	OR-3350	20	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $3\frac{1}{16}$	OR-4200	45	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $5\frac{1}{8}$	OR-4450	660 VOLTS A-C, 60 CYCLES		
40	$4\frac{1}{16}$ x $2\frac{7}{32}$ x 4	OR-3400	25	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $3\frac{1}{16}$	OR-4250	50	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $5\frac{1}{8}$	OR-4450T	10	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $3\frac{1}{16}$	OR-6100
45	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $4\frac{1}{8}$	OR-3450	30	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $3\frac{1}{2}$	OR-4300	50	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $6\frac{1}{4}$	OR-4500	12	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $3\frac{1}{16}$	OR-6120
50	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $4\frac{7}{8}$	OR-3500	35	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $4\frac{1}{2}$	OR-4350	55	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $6\frac{3}{4}$	OR-4500T	15	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $3\frac{1}{16}$	OR-6150
			40	$4\frac{1}{16}$ x $2\frac{7}{32}$ x 5	OR-4400	60	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $7\frac{1}{4}$	OR-4600	DUAL SECTION CAPACITORS		
									440 VOLTS A-C, 60 CYCLES		
									40+5	$4\frac{1}{16}$ x $2\frac{7}{32}$ x $5\frac{3}{4}$	ORD-4405

MOUNTING HARDWARE FOR TYPE AB CAPACITORS

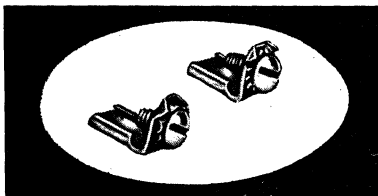


- Plastic end caps.
- Plated steel brackets.

Capacitor Size	Catalog Number
END CAPS	
$1\frac{1}{16}$ D.	ABC-1 (lead hole at top)
$1\frac{7}{16}$ D.	ABC-2 (lead hole at bot.)
$1\frac{1}{8}$ D.	ABC-3 (lead hole at top)
$1\frac{1}{4}$ D.	ABC-4 (lead hole at bot.)
$1\frac{3}{8}$ D.	ABC-5 (lead hole at top)
$2\frac{1}{8}$ D.	ABC-6 (lead hole at bot.)
$2\frac{1}{4}$ D.	ABC-7 (lead hole at top)
$2\frac{3}{8}$ D.	ABC-8 (lead hole at bot.)

Capacitor Size	Catalog Number
MOUNTING BRACKETS	
$1\frac{1}{16}$ D. x $2\frac{3}{4}$ L.	ABB-1
$1\frac{7}{16}$ D. x $3\frac{1}{8}$ L.	ABB-2
$1\frac{1}{4}$ D. x $3\frac{1}{8}$ L.	ABB-2
$1\frac{3}{8}$ D. x $4\frac{1}{8}$ L.	ABB-3
$2\frac{1}{8}$ D. x $4\frac{1}{8}$ L.	ABB-3
$2\frac{1}{4}$ D. x $4\frac{1}{8}$ L.	ABB-3

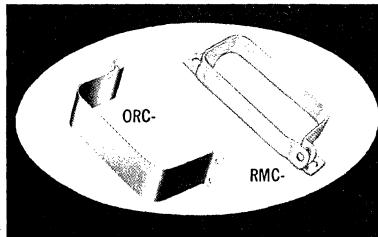
SCREW ADAPTERS FOR MOTOR-START CAPACITORS



- Clip-on terminal adapters, equipped with screws, for making lead wire connections without soldering.

Catalog Number..... 4-10-14

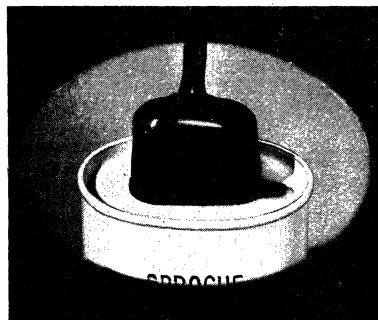
MOUNTING CLAMPS FOR TYPE OR CAPACITORS



- For rectangular capacitors.
- Plated steel.

Capacitor Size	Catalog Number
$4\frac{1}{16}$ W. x $2\frac{7}{32}$ T.	ORC-1
$1\frac{1}{8}$ W. x $1\frac{1}{16}$ T.	RMC-17
$2\frac{1}{2}$ W. x $1\frac{1}{8}$ T.	RMC-19
$3\frac{1}{4}$ W. x $1\frac{1}{4}$ T.	RMC-20
$3\frac{3}{4}$ W. x $1\frac{3}{4}$ T.	RMC-28
$2\frac{3}{16}$ W. x $2\frac{7}{32}$ T.	RMC-38
$4\frac{1}{16}$ W. x $2\frac{7}{32}$ T.	RMC-45

SAFETY BOOTS FOR TERMINALS OF MOTOR-RUN CAPACITORS

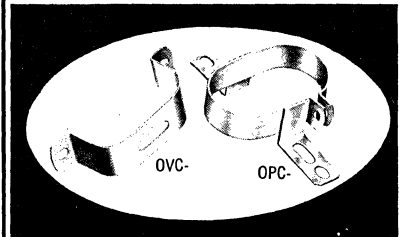


Oil-resistant neoprene rubber covers for terminal assemblies of Type OV and Type OR Clorinol® capacitors, a safety feature especially desirable in appliance applications.

For single-section capacitor, use one boot. For triple-section capacitor, two boots are required.

Catalog Number..... RG-1

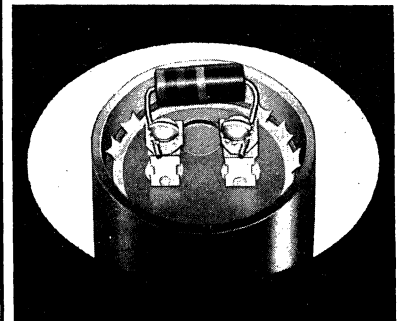
MOUNTING CLAMPS FOR TYPE OV CAPACITORS



- For oval capacitors.
- Plated steel.

Capacitor Size	Catalog Number
$2\frac{1}{32}$ W. x $1\frac{1}{16}$ T.	OPC-1
$2\frac{3}{32}$ W. x $1\frac{1}{16}$ T.	OVC-1
$2\frac{9}{32}$ W. x $1\frac{1}{8}$ T.	OVC-3
$3\frac{1}{32}$ W. x $1\frac{1}{8}$ T.	OVC-4

BLEEDER RESISTORS



Cat. No. 2BR-1530, 15,000 ohms @ 2 watts for Type AB motor-start capacitors. Cat. No. 1BR-2240, 220,000 ohms @ 1 watt, for Type OV and OR motor-run capacitors. Reduces feedback of surge voltage and bleeds capacitor voltage to safe level after power is turned off. Packaged 5 to a box.

Catalog Number	Ohms
2BR-1530	15,000
1BR-2240	220,000

SPRAGUE CAPACITORS

CAPACITOR MOUNTING HARDWARE

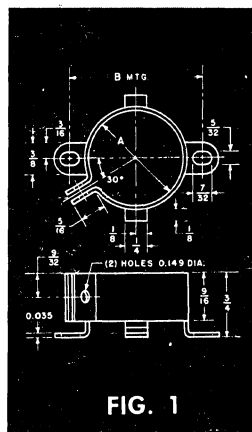


FIG. 1

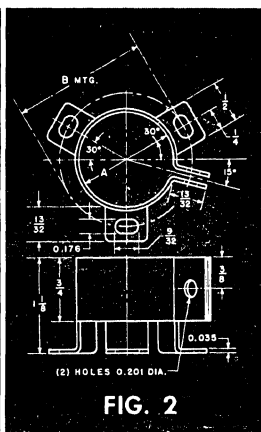


FIG. 2

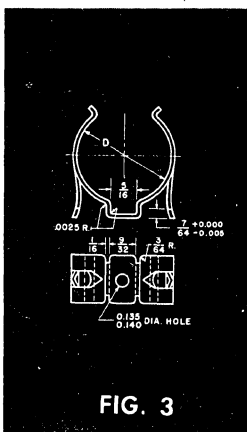


FIG. 3

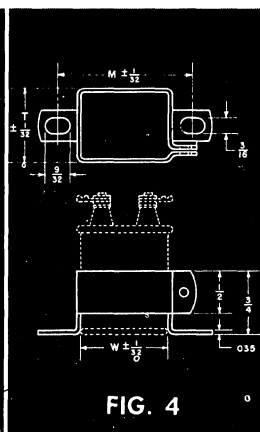


FIG. 4

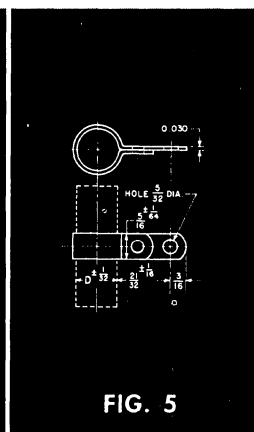


FIG. 5

VERTICAL MOUNTING CLAMPS FOR CYLINDRICAL CAPACITORS

Old Cat. No.	New Cat. No.	Fig. No.	A	B
CMC-16	4586-97	1	1"	1 1/8"
CMC-20	4586-97F	1	1 1/4"	1 1/8"
CMC-22	4586-97A	1	1 3/8"	1 3/8"
CMC-24	4586-97B	1	1 1/2"	1 1/8"
CMC-28	4586-97C	1	1 3/4"	2 3/8"
CMC-28A	4-36-14M	2	1 3/4"	2 3/8"
CMC-32	4586-48	2	2"	2 1/2"
CMC-33	4586-2B	2	2 1/8"	2 1/8"
CMC-40	4586-1	2	2 1/2"	3"
CMC-41	4586-2D	2	2 3/8"	3 1/8"
CMC-48	4586-2	2	3"	3 1/2"
CMC-49	4586-2A	2	3 1/8"	3 1/8"

HORIZONTAL MOUNTING CLIPS FOR CYLINDRICAL CAPACITORS

Old Cat. No.	New Cat. No.	Fig. No.	D
UMC-6	36-520N	3	3/8"
UMC-8	36-520J	3	1/2"
UMC-10	36-520K	3	5/8"
UMC-12	36-520L	3	3/4"
UMC-14	36-520M	3	7/8"
UMC-16	36-520G	3	1"
UMC-22	36-520H	3	1 3/8"

VERTICAL MOUNTING CLAMPS FOR RECTANGULAR CAPACITORS

Old Cat. No.	New Cat. No.	Fig. No.	T	W	M
RMC-17	36-627	4	1 1/8"	1 1/8"	2 1/4"
RMC-19	36-627A	4	1 3/8"	2 1/2"	3"
RMC-20	36-627B	4	1 1/4"	3 3/4"	4 3/8"
RMC-28	36-627C	4	1 3/4"	3 3/4"	4 3/8"
RMC-36	36-627D	4	2 1/4"	3 3/4"	4 3/8"
RMC-38	3-36-120	4	2 3/8"	2 3/8"	4 3/8"
RMC-40	36-627E	4	2 1/2"	3 3/4"	4 3/8"
RMC-45	3-36-119	4	2 3/8"	4 3/8"	4 3/8"
RMC-73	36-627Y	4	3 3/4"	4 3/8"	4 3/8"

MOUNTING STRAPS FOR TUBULAR COMPONENTS

Old Cat. No.	New Cat. No.	Fig. No.	D	Old Cat. No.	New Cat. No.	Fig. No.	D
TMS-4	36-68T	5	1/4"	TMS-14	36-59J	5	7/8"
TMS-5	36-59	5	3/8"	TMS-15	36-59K	5	1 1/8"
TMS-6	36-59A	5	3/8"	TMS-16	36-59L	5	1"
TMS-7	36-59B	5	7/16"	TMS-17	36-59M	5	1 1/16"
TMS-8	36-59C	5	1/2"	TMS-18	36-59N	5	1 1/8"
TMS-9	36-69D	5	9/16"	TMS-19	36-59P	5	1 3/16"
TMS-10	36-69E	5	5/8"	TMS-20	36-59R	5	1 1/4"
TMS-11	36-69F	5	1 1/16"	TMS-21	36-59S	5	1 3/16"
TMS-12	36-69G	5	3/4"	TMS-22	36-59T	5	1 3/8"
TMS-13	36-69H	5	13/16"				

KRAFTBOARD INSULATING TUBES

Tightly-fitting closed-top black Kraft. For "above-ground" use with can-type capacitors.

Old Cat. No.	New Cat. No.	Description	Old Cat. No.	New Cat. No.	Description
HKT-1	407-57A	For 1" x 2" can	HKT-7	407-57E	For 1 3/8" x 3" can
HKT-2	407-57N	For 1" x 2 1/2" can	HKT-8	407-57Z	For 1 3/8" x 3 1/2" can
HKT-3	407-57D	For 1" x 3" can	HKT-9	407-174C	For 1 3/8" x 4" can
HKT-4	407-174E	For 1" x 4" can	HKT-10	407-174P	For 1 3/8" x 4 1/2" can
HKT-5	407-57B	For 1 3/8" x 2" can	HKT-12	407-57	For 3/4" x 2" can
HKT-6	407-57R	For 1 3/8" x 2 1/2" can	HKT-14	407-57U	For 1" x 3 1/2" can

MOUNTING PLATES

For use with Twist-Lok® capacitors

Cat. No.	Description
36-17	Metal, for 1" D. capacitor
36-18	Metal, for 1 3/8" D. capacitor
36-19	Phenolic, for 3/4" D. capacitor
36-20	Phenolic, for 1" D. capacitor
36-21	Phenolic, for 1 3/8" D. capacitor

PRINTED WIRING BOARD ADAPTERS

Used on terminals and lugs of twist-prong-type units so that capacitors may be mounted on printed boards. Eight adapters per package, complete with instructions.

Package of 8... Cat. No. PC-8

TRW[®] CAPACITORS

- Fully Rated from -55°C to $+125^{\circ}\text{C}$
- Low Capacitance Change With Temperature
— Less Than $1\frac{1}{2}\%$ from -55°C thru $+125^{\circ}\text{C}$

SPECIFICATIONS

Insulation Resistance: Minimum values according to Table I.

TABLE I

Temperature	+25°C	+85°C	+125°C
Megohms X Microfarads	60,000	6,000	600
Need Not Exceed (Megohms)	200,000	50,000	5,000

Measured after 2 minutes electrification at rated voltage.

Dissipation Factor: Less than 0.3% at 25°C when measured at or referred to 1000 ± 20 Hz for capacitance values up to and including 10 mfd.

Dielectric Strength: Twice rated voltage for one minute through a limiting resistance of 100 ohms/volt.

Temperature Range: -55°C to $+125^{\circ}\text{C}$ with no voltage derating.

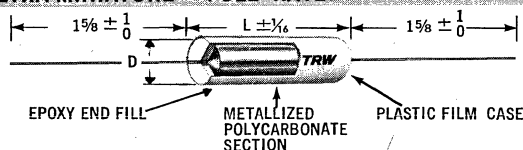
Humidity Resistance: No more than one failure allowed of 12 units tested when tested as outlined in MIL-STD-202C, Method 103B, Condition B, with 100 volts or rated voltage applied, whichever is less.

For Film Foil Polycarbonate TRW Type 463UW is Available

METALLIZED POLYCARBONATE

DIELECTRIC
TYPE X463UW CAPACITORS
ULTRA-MINIATURE — FULL RATED

X463UW



Lead Gauge: 24 AWG $\frac{1}{16}$ Length and Less 20 AWG 1 Through $1\frac{1}{2}$ Length
22 AWG $\frac{1}{16}$ Through $\frac{1}{8}$ Length 18 AWG $1\frac{1}{16}$ Length and Greater

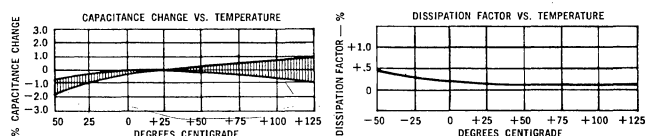
Dimensional Tolerances: Note: Diameters given in table below are nominal.

For Max. Dia. add the following:

.000 Thru .250 Dia.	+ .031
.251 Thru .350 Dia.	+ .047
.351 Thru .450 Dia.	+ .062
.451 Thru .550 Dia.	+ .094
.551 Thru .650 Dia.	+ .125
.651 Thru .750 Dia.	+ .156
.751 And Above Dia.	+ .188

Length: $\pm \frac{1}{4}$

TYPICAL CHARACTERISTIC CURVES



DIMENSIONS

CAP. IN MFDS.	50 VOLT D.C.		100 VOLT D.C.		200 VOLT D.C.		400 VOLT D.C.	
	D	L	D	L	D	L	D	L
.001	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$
.0012	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$
.0015	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$
.0018	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$
.0022	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$
.0027	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$
.0033	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.188	x $\frac{3}{16}$
.0039	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.188	x $\frac{3}{16}$
.0047	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.203	x $\frac{3}{16}$
.0056	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.219	x $\frac{3}{16}$
.0068	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.219	x $\frac{3}{16}$
.0082	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.203	x $\frac{3}{16}$
.010	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.172	x $\frac{3}{16}$	.219	x $\frac{3}{16}$
.012	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.188	x $\frac{3}{16}$	.234	x $\frac{3}{16}$
.015	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.203	x $\frac{3}{16}$	.250	x $\frac{3}{16}$
.018	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.219	x $\frac{3}{16}$	.266	x $\frac{3}{16}$
.022	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.234	x $\frac{3}{16}$	.297	x $\frac{3}{16}$
.027	.156	x $\frac{3}{16}$	.156	x $\frac{3}{16}$	.250	x $\frac{3}{16}$	.250	x $\frac{1}{8}$
.033	.156	x $\frac{3}{16}$	.172	x $\frac{3}{16}$	.266	x $\frac{3}{16}$	.297	x $\frac{1}{8}$
.039	.156	x $\frac{3}{16}$	.188	x $\frac{3}{16}$	.219	x $\frac{3}{16}$	.312	x $\frac{1}{8}$
.047	.156	x $\frac{3}{16}$	.203	x $\frac{3}{16}$	.234	x $\frac{3}{16}$	.328	x $\frac{1}{8}$
.056	.156	x $\frac{3}{16}$	.219	x $\frac{3}{16}$	.250	x $\frac{3}{16}$	.359	x $\frac{1}{8}$
.068	.172	x $\frac{3}{16}$	.234	x $\frac{3}{16}$	.266	x $\frac{3}{16}$	.328	x $\frac{1}{8}$
.082	.188	x $\frac{3}{16}$	.187	x $\frac{3}{16}$	.297	x $\frac{3}{16}$	.359	x $\frac{1}{8}$
.10	.203	x $\frac{3}{16}$	.203	x $\frac{3}{16}$	.250	x $\frac{1}{8}$	.391	x $\frac{1}{8}$
.12	.219	x $\frac{3}{16}$	.219	x $\frac{3}{16}$	.266	x $\frac{1}{8}$	.438	x $\frac{1}{8}$
.15	.219	x $\frac{3}{16}$	.234	x $\frac{3}{16}$	.297	x $\frac{1}{8}$	.438	x 1
.18	.234	x $\frac{3}{16}$	.250	x $\frac{3}{16}$	.328	x $\frac{1}{8}$	.469	x 1
.22	.203	x $\frac{3}{16}$	.266	x $\frac{3}{16}$	.344	x $\frac{1}{8}$	.516	x 1
.27	.203	x $\frac{3}{16}$	.281	x $\frac{1}{8}$	.344	x $\frac{1}{8}$	.562	x 1
.33	.219	x $\frac{3}{16}$	.312	x $\frac{1}{8}$	.359	x $\frac{1}{8}$	.547	x $1\frac{1}{4}$
.39	.234	x $\frac{3}{16}$	.328	x $\frac{1}{8}$	.391	x $\frac{1}{8}$	.594	x $1\frac{1}{4}$
.47	.250	x $\frac{3}{16}$	.359	x $\frac{1}{8}$	.421	x $\frac{1}{8}$	.641	x $1\frac{1}{4}$
.56	.266	x $\frac{3}{16}$	.375	x $\frac{1}{8}$	.421	x 1	.625	x $1\frac{1}{2}$
.68	.266	x $\frac{1}{8}$	.344	x $\frac{1}{8}$	.453	x 1	.672	x $1\frac{1}{2}$
.82	.281	x $\frac{1}{8}$	.359	x $\frac{1}{8}$	.484	x 1	.750	x $1\frac{1}{2}$
1.00	.312	x $\frac{1}{8}$	.391	x $\frac{1}{8}$	.531	x 1	.718	x $1\frac{1}{8}$
1.25	.328	x $\frac{1}{8}$	.422	x $\frac{1}{8}$	.500	x $1\frac{1}{4}$	.812	x $1\frac{1}{8}$
1.50	.359	x $\frac{1}{8}$	.453	x $\frac{1}{8}$	.547	x $1\frac{1}{4}$	.906	x $1\frac{1}{8}$
1.80	.344	x $\frac{1}{8}$	.453	x 1	.594	x $1\frac{1}{4}$	.984	x $1\frac{1}{8}$
2.00	.344	x $\frac{1}{8}$	.500	x 1	.625	x $1\frac{1}{4}$	.875	x $2\frac{3}{8}$
3.00	.406	x $\frac{1}{8}$	.547	x $1\frac{1}{4}$	.656	x $1\frac{1}{2}$	1.062	x $2\frac{3}{8}$
4.00	.453	x $\frac{1}{8}$	.625	x $1\frac{1}{4}$	.750	x $1\frac{1}{2}$	—	—
5.00	.469	x 1	.593	x $1\frac{1}{2}$	.750	x $1\frac{3}{8}$	—	—
8.00	.500	x $1\frac{1}{4}$	.641	x $1\frac{3}{8}$	.828	x $2\frac{3}{8}$	—	—
10.00	.547	x $1\frac{1}{4}$	.703	x $1\frac{3}{8}$	.922	x $2\frac{3}{8}$	—	—

TRW[®] CAPACITORS

- Minimum Possible Size — Lightweight
- Very Low Temperature Coefficient
- Fully Rated from -55°C to $+125^{\circ}\text{C}$
- High Insulation Resistance

SPECIFICATIONS

Voltage Rating: 50 VDC from -55°C to $+125^{\circ}\text{C}$.

Insulation Resistance: Greater than 500,000 megohms @ 25°C . Typical change of IR vs. Temp. is shown in the curve.

Dissipation Factor: Less than .3% at 1K Hz @ 25°C .

Capacitance Change with Temperature: a. Between 0°C and 125°C , as referenced to 25°C , capacity change will not exceed $+1/2 - 1/2\%$.

b. TC of capacitance characteristic is $0 +50 -150$ PPM/ $^{\circ}\text{C}$ between 0°C and 125°C .

Dielectric Strength: 200% of rated voltage applied for 2 minutes through limiting resistance of 100 ohm/volt.

Life Test: Tested in accordance with Mil-C-27287, 250 hrs., 125°C @ 1.4 RV. IR greater than 70% of original requirement, DF less than .3%, cap. change less than 1%.

Humidity Resistance: Tested in accordance with Mil-C-27287, 40°C , 95% RH, 240 hours. IR greater than 10 gigaohms @ 25°C . DF less than .3%.

Lead Pull Test: 5 lbs. in any direction.

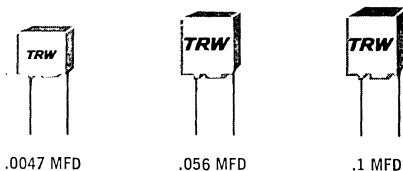
Construction: Metallized polycarbonate dielectric, non-inductive winding. Epoxy case with standoffs.

Leads: 24 gauge tinned solid wire on .2" centers.

METALLIZED POLYCARBONATE

DIELECTRIC
TYPE X440 CAPACITORS
MICRO-MINIATURE — LIGHT WEIGHT

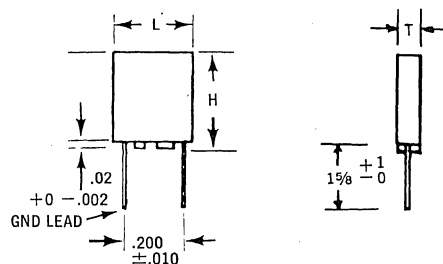
X440



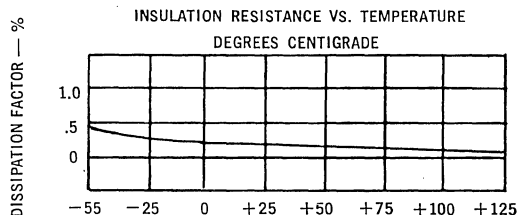
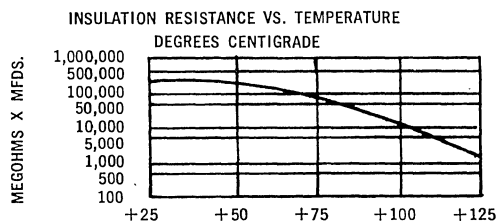
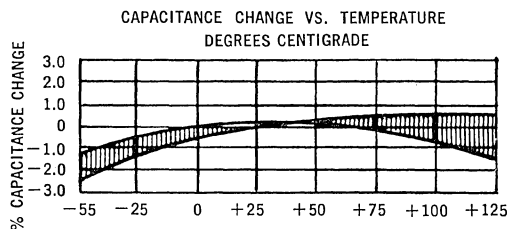
ACTUAL SIZE

The X440 has been specifically designed to be a real help in the ever increasing problem of fitting components in today's miniaturized designs. Its absolute minimum size (precision dimensions and the close tolerance lead spacing permit space savings impossible before). Additionally, the highly superior electrical properties of polycarbonate are of immense value in modern high performance circuitry.

Standoffs on the bottom of the premolded case provide for rigid, secure mounting and facilitate cleaning of the printed circuit boards. Leads are uniformly and accurately spaced on .200" centers.



TYPICAL CHARACTERISTIC CURVES



DIMENSIONS

50 VDC				50 VDC			
CAP IN MFDS.	T ±.005	H ±.005	L ±.005	CAP IN MFDS.	T ±.005	H ±.005	L ±.005
.001	.095	.245	.290	.010	.095	.320	.290
.0012	.095	.245	.290	.012	.095	.320	.290
.0015	.095	.245	.290	.015	.095	.320	.290
.0018	.095	.245	.290	.018	.095	.320	.290
.0022	.095	.245	.290	.022	.095	.320	.290
.0027	.095	.245	.290	.027	.095	.320	.290
.0033	.095	.245	.290	.033	.095	.320	.290
.0039	.095	.245	.290	.039	.095	.320	.290
.0047	.095	.245	.290	.047	.095	.320	.290
.0056	.095	.320	.290	.056	.095	.320	.290
.0068	.095	.320	.290	.068	.145	.320	.290
.0082	.095	.320	.290	.082	.145	.320	.290
				.10	.145	.320	.290

TRW[®] CAPACITORS

- Fully Rated to 125°C
- Excellent Stability
- High Insulation Resistance
- Tolerances to $\pm 1\%$

SPECIFICATIONS

Insulation Resistance: Minimum values according to Table I.

TABLE I

Temperature	+25°C	+85°C	+125°C
Megohms X Microfarads	100,000	15,000	1,000
Need Not Exceed (Megohms)	200,000	30,000	2,000

Measured after 2 minutes electrification at rated voltage.

Dissipation Factor: Less than 0.30% when measured at or referred to 1000 ± 20 Hz for capacitance values up to and including 10 MFD at 25 $\pm 5^\circ\text{C}$.

Environmental Properties: Temperature and Immersion Cycling, Vibration, Moisture Resistance, and Shock to meet requirements of Mil-C-18312.

Temperature Range: -55°C to 125°C with full rated voltage.

Dielectric Strength: Twice rated voltage (Terminal-to-Terminal) and Terminal-to-Case where case is not a terminal for 1 minute through a minimum resistance of 100 ohms/volt.

FOR FILM FOIL CONSTRUCTION TRW TYPE 482-483 IS AVAILABLE

X483

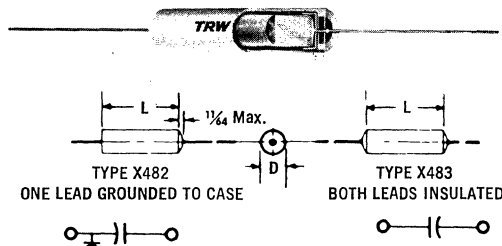
DIMENSIONS For Type X482 Sizes subtract $\frac{1}{16}$ " from X483 Length.

CAP. IN MFDS.	50 VOLT D.C.		100 VOLT D.C.		200 VOLT D.C.		400 VOLT D.C.	
	D	L	D	L	D	L	D	L
.0010	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$	
.0012	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$	
.0015	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$	
.0018	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$	
.0022	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$	
.0027	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$	
.0033	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$	
.0039	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$	
.0047	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$	
.0056	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$	
.0068	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$	
.0082	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$	
.010	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{5}{8}$		.235 x $\frac{1}{2}$	
.012	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{5}{8}$		.235 x $\frac{1}{2}$	
.015	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.175 x $\frac{5}{8}$		.235 x $\frac{1}{2}$	
.018	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.195 x $\frac{5}{8}$		.235 x $\frac{1}{2}$	
.022	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.195 x $\frac{5}{8}$		.312 x $\frac{1}{2}$	
.027	.175 x $\frac{3}{16}$		.175 x $\frac{5}{8}$		.235 x $\frac{5}{8}$		.312 x $\frac{1}{2}$	
.033	.175 x $\frac{3}{16}$		.175 x $\frac{5}{8}$		.235 x $\frac{5}{8}$		.312 x $\frac{1}{2}$	
.039	.175 x $\frac{3}{16}$		.175 x $\frac{5}{8}$		.235 x $\frac{1}{2}$		.312 x $\frac{1}{2}$	
.047	.175 x $\frac{3}{16}$		.195 x $\frac{5}{8}$		.235 x $\frac{1}{2}$		.400 x $\frac{1}{2}$	
.056	.175 x $\frac{3}{16}$		.195 x $\frac{5}{8}$		.312 x $\frac{5}{8}$		.400 x $\frac{1}{2}$	
.068	.175 x $\frac{3}{16}$		.235 x $\frac{5}{8}$		.312 x $\frac{5}{8}$		.400 x $\frac{1}{2}$	
.082	.175 x $\frac{5}{8}$		.235 x $\frac{5}{8}$		.312 x $\frac{1}{2}$		.400 x $\frac{1}{2}$	
.10	.175 x $\frac{5}{8}$		.235 x $\frac{1}{2}$		.312 x $\frac{1}{2}$		.400 x $\frac{1}{2}$	
.12	.175 x $\frac{5}{8}$		.235 x $\frac{1}{2}$		.312 x $\frac{1}{2}$		.400 x $\frac{1}{2}$	
.15	.195 x $\frac{5}{8}$		.312 x $\frac{5}{8}$		.312 x $\frac{1}{2}$		.400 x $\frac{1}{2}$	
.18	.195 x $\frac{5}{8}$		.312 x $\frac{5}{8}$		.400 x $\frac{1}{2}$		.562 x $\frac{1}{2}$	
.22	.235 x $\frac{5}{8}$		.312 x $\frac{1}{2}$		.400 x $\frac{1}{2}$		.562 x $\frac{1}{2}$	
.27	.235 x $\frac{5}{8}$		.312 x $\frac{1}{2}$		.400 x $\frac{1}{2}$		.562 x $\frac{1}{2}$	
.33	.312 x $\frac{5}{8}$		.312 x $\frac{1}{2}$		.400 x $\frac{1}{2}$		.562 x $\frac{1}{2}$	
.39	.312 x $\frac{5}{8}$		.312 x $\frac{1}{2}$		.400 x $\frac{1}{2}$		.562 x $\frac{1}{2}$	
.47	.312 x $\frac{5}{8}$		.400 x $\frac{1}{2}$		.400 x $\frac{1}{2}$		.562 x $\frac{1}{2}$	
.56	.312 x $\frac{5}{8}$		.400 x $\frac{1}{2}$		.500 x $\frac{1}{2}$		.670 x $\frac{1}{2}$	
.68	.312 x $\frac{1}{2}$		.400 x $\frac{1}{2}$		.500 x $\frac{1}{2}$		.670 x $\frac{1}{2}$	
.82	.312 x $\frac{1}{2}$		.400 x $\frac{1}{2}$		.562 x $\frac{1}{2}$		.750 x $\frac{1}{2}$	
1.0	.312 x $\frac{1}{2}$		.400 x $\frac{1}{2}$		.562 x $\frac{1}{2}$		.750 x $\frac{1}{2}$	
1.25	.400 x $\frac{1}{2}$		.400 x $\frac{1}{2}$		.562 x $\frac{1}{2}$		.750 x $\frac{1}{2}$	
1.50	.400 x $\frac{1}{2}$		.500 x $\frac{1}{2}$		.562 x $\frac{1}{2}$		1.000 x $\frac{1}{2}$	
2.00	.400 x $\frac{1}{2}$		.562 x $\frac{1}{2}$		.670 x $\frac{1}{2}$		1.000 x $\frac{1}{2}$	
3.00	.400 x $\frac{1}{2}$		.562 x $\frac{1}{2}$		.670 x $\frac{1}{2}$		—	
4.00	.500 x $\frac{1}{2}$		.562 x $\frac{1}{2}$		.750 x $\frac{1}{2}$		—	
5.00	.562 x $\frac{1}{2}$		.670 x $\frac{1}{2}$		.750 x $\frac{1}{2}$		—	
8.00	.562 x $\frac{1}{2}$		.750 x $\frac{1}{2}$		1.000 x $\frac{1}{2}$		—	
10.00	.670 x $\frac{1}{2}$		.750 x $\frac{1}{2}$		1.000 x $\frac{1}{2}$		—	

METALLIZED POLYCARBONATE

DIELECTRIC
TYPE X482 - X483 CAPACITORS
HERMETICALLY SEALED — SUB-MINIATURE

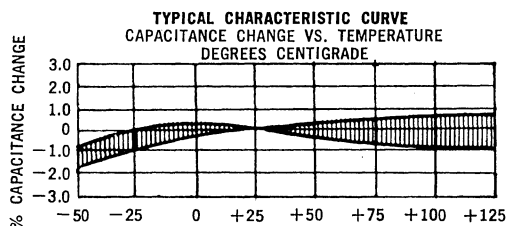
X482
X483



Dimensional Tolerances: Diameter: $+.015 - .005$. Length: $\pm .031$. Standard lead length $1\frac{1}{2} \pm 1, -0$.

Lead Gauge: 24 AWG .195 Diameter & Less
22 AWG .235 and .312 Diameter
20 AWG .400 Diameter & Greater

Insulated Cases: For insulated case sizes (Polyester Sleeve) add $\frac{1}{16}$ " to unit length and .020 to diameter. Tolerance on unit size (with insulated sleeve) is as follows: Diameter $\pm .015$ — Length $\pm .062$



TRW[®] CAPACITORS

- High Insulation Resistance
- Self-healing
- Long Stable Life
- Axial or Radial Leads

SPECIFICATIONS

Insulation Resistance: Minimum values according to Table I.

TABLE I

Temperature	+25°C	+85°C	+125°C
Megohms X Microfarads	30,000	3,000	50
Need Not Exceed (Megohms)	30,000	3,000	50

Measured after 2 minutes electrification at rated voltage.

Dissipation Factor: Less than 1.0%, when measured at or referred to 1,000 ± 20 Hz, for cap. values up to and including 1.0 mfd at $25 \pm 5^\circ\text{C}$. Except for units having a T. Dim. of .171 or less the D.F. shall not exceed 1.5%. Cap. values greater than 1.0 mfd measured at 60 ± 6 Hz.

Temperature Range: -55°C to 100° ; to $+125^\circ\text{C}$ with 50% derating; 50 volt capacitors full rated to 125°C .

Humidity Resistance: These designs comply with test requirements as outlined in MIL-STD-202C, method 103B, Condition B. IR no less than $\frac{1}{2}$ minimum values listed in Table I.

Dielectric Strength: Twice rated voltage for one minute through a limiting resistance of 100 ohms/volt.

Capacitance Tolerance: Standard tolerance $\pm 20\%$; also available in $\pm 10\%$, and $\pm 5\%$.

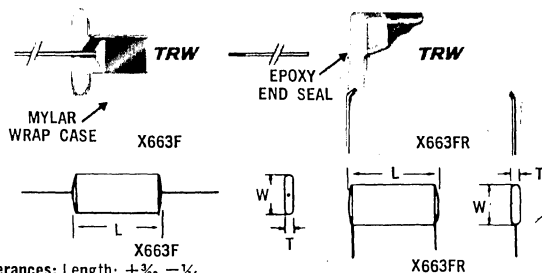
DIMENSIONS

CAP. IN MFDS.	50 WVDC (To 125°C)			100 & 200 VOLTS			400 VOLTS			600 VOLTS		
	T	W	L	T	W	L	T	W	L	T	W	L
.01				.125 x	.187 x	$\frac{1}{16}$	.140 x	.265 x	$\frac{1}{16}$	.187 x	.296 x	$\frac{1}{16}$
.012				.140 x	.203 x	$\frac{1}{16}$	.156 x	.281 x	$\frac{1}{16}$	.203 x	.328 x	$\frac{1}{16}$
.015				.140 x	.218 x	$\frac{1}{16}$	.171 x	.296 x	$\frac{1}{16}$	.218 x	.343 x	$\frac{1}{16}$
.018				.156 x	.234 x	$\frac{1}{16}$	.187 x	.312 x	$\frac{1}{16}$	.234 x	.406 x	$\frac{1}{16}$
.022				.171 x	.250 x	$\frac{1}{16}$	.203 x	.312 x	$\frac{1}{16}$	.250 x	.453 x	$\frac{1}{16}$
.027	.093 x	.187 x	$\frac{1}{16}$	.187 x	.250 x	$\frac{1}{16}$	.234 x	.343 x	$\frac{1}{16}$	.265 x	.468 x	$\frac{1}{16}$
.033	.109 x	.187 x	$\frac{1}{16}$	.187 x	.265 x	$\frac{1}{16}$	.250 x	.375 x	$\frac{1}{16}$	.296 x	.500 x	$\frac{1}{16}$
.039	.125 x	.203 x	$\frac{1}{16}$	.140 x	.250 x	$\frac{1}{16}$	.218 x	.296 x	$\frac{1}{16}$	.218 x	.406 x	$\frac{1}{16}$
.047	.140 x	.218 x	$\frac{1}{16}$	.156 x	.265 x	$\frac{1}{16}$	.218 x	.328 x	$\frac{1}{16}$	.234 x	.437 x	$\frac{1}{16}$
.056	.156 x	.234 x	$\frac{1}{16}$	.171 x	.281 x	$\frac{1}{16}$	.234 x	.375 x	$\frac{1}{16}$	.281 x	.484 x	$\frac{1}{16}$
.058	.156 x	.250 x	$\frac{1}{16}$	.187 x	.296 x	$\frac{1}{16}$	.234 x	.421 x	$\frac{1}{16}$	.312 x	.531 x	$\frac{1}{16}$
.082	.140 x	.265 x	$\frac{1}{16}$	.203 x	.312 x	$\frac{1}{16}$	.265 x	.453 x	$\frac{1}{16}$	.343 x	.562 x	$\frac{1}{16}$
.1	.156 x	.265 x	$\frac{1}{16}$	.218 x	.328 x	$\frac{1}{16}$	.296 x	.484 x	$\frac{1}{16}$	.375 x	.593 x	$\frac{1}{16}$
.12	.171 x	.296 x	$\frac{1}{16}$	.250 x	.359 x	$\frac{1}{16}$	.312 x	.531 x	$\frac{1}{16}$	.312 x	.562 x	$\frac{1}{16}$
.15	.187 x	.312 x	$\frac{1}{16}$	.265 x	.390 x	$\frac{1}{16}$	.343 x	.562 x	$\frac{1}{16}$	.343 x	.609 x	$\frac{1}{16}$
.18	.203 x	.328 x	$\frac{1}{16}$	.218 x	.343 x	$\frac{1}{16}$	.281 x	.531 x	$\frac{1}{16}$	.406 x	.656 x	$\frac{1}{16}$
.22	.140 x	.265 x	$\frac{1}{16}$	.234 x	.375 x	$\frac{1}{16}$	.296 x	.562 x	$\frac{1}{16}$	.453 x	.703 x	$\frac{1}{16}$
.27	.156 x	.281 x	$\frac{1}{16}$	.265 x	.421 x	$\frac{1}{16}$	.343 x	.546 x	$\frac{1}{16}$	.484 x	.781 x	$\frac{1}{16}$
.33	.187 x	.312 x	$\frac{1}{16}$	.281 x	.468 x	$\frac{1}{16}$	.359 x	.593 x	$\frac{1}{16}$	.515 x	.828 x	$\frac{1}{16}$
.39	.203 x	.328 x	$\frac{1}{16}$	.312 x	.484 x	$\frac{1}{16}$	.390 x	.671 x	$\frac{1}{16}$	.515 x	.859 x	$\frac{1}{16}$
.47	.218 x	.328 x	$\frac{1}{16}$	.343 x	.515 x	$\frac{1}{16}$	.406 x	.718 x	$\frac{1}{16}$	.515 x	.890 x	$\frac{1}{16}$
.56	.250 x	.343 x	$\frac{1}{16}$	.312 x	.484 x	$\frac{1}{16}$	.406 x	.812 x	$\frac{1}{16}$	.609 x	.968 x	$\frac{1}{16}$
.68	.265 x	.375 x	$\frac{1}{16}$	.328 x	.515 x	$\frac{1}{16}$	.421 x	.890 x	$\frac{1}{16}$	.671 x	1.031 x	$\frac{1}{16}$
.82	.218 x	.390 x	$\frac{1}{16}$	.359 x	.562 x	$\frac{1}{16}$	.500 x	.781 x	$\frac{1}{16}$	.625 x	1.093 x	$\frac{1}{16}$
1.00	.234 x	.406 x	$\frac{1}{16}$	.390 x	.578 x	$\frac{1}{16}$	.515 x	.875 x	$\frac{1}{16}$	.671 x	1.187 x	$\frac{1}{16}$
1.25	.281 x	.484 x	$\frac{1}{16}$	.375 x	.531 x	$\frac{1}{16}$	.546 x	1.000 x	$\frac{1}{16}$	.781 x	1.281 x	$\frac{1}{16}$
1.50	.281 x	.484 x	$\frac{1}{16}$	.406 x	.578 x	$\frac{1}{16}$	.562 x	1.125 x	$\frac{1}{16}$	.859 x	1.375 x	$\frac{1}{16}$
1.80	.312 x	.515 x	$\frac{1}{16}$	.406 x	.656 x	$\frac{1}{16}$	.671 x	1.125 x	$\frac{1}{16}$	.968 x	1.468 x	$\frac{1}{16}$
2.00	.328 x	.531 x	$\frac{1}{16}$	.406 x	.718 x	$\frac{1}{16}$	.765 x	1.125 x	$\frac{1}{16}$	1.032 x	1.515 x	$\frac{1}{16}$
3.00	.359 x	.562 x	$\frac{1}{16}$	.453 x	.765 x	$\frac{1}{16}$	.875 x	1.406 x	$\frac{1}{16}$	—	—	—
4.00	.328 x	.656 x	$\frac{1}{16}$	.500 x	.890 x	$\frac{1}{16}$	—	—	—	—	—	—
5.00	.390 x	.703 x	$\frac{1}{16}$	.515 x	.906 x	$\frac{1}{16}$	—	—	—	—	—	—
8.00	.437 x	.843 x	$\frac{1}{16}$	.687 x	1.187 x	$\frac{1}{16}$	—	—	—	—	—	—
10.00	.515 x	.921 x	$\frac{1}{16}$	.750 x	1.203 x	$\frac{1}{16}$	—	—	—	—	—	—

* DuPont's trademark for polyester film

METALLIZED MYLAR^{*} DIELECTRIC TYPE X663F - X663FR CAPACITORS FLAT FOR PREMIUM SPACE SAVINGS

X663F
X663FR



Tolerances: Length: $\pm \frac{1}{32}$ up thru $\frac{1}{16}$

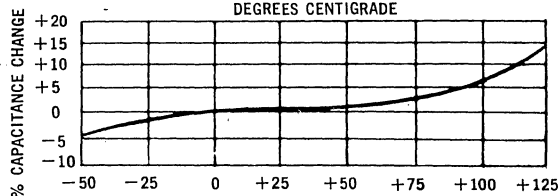
Thickness or width: $\pm .031$ up thru .218
 $\pm .046$ on .219 thru .500
 $\pm .062$ on .501 and greater

Lead Gauge: 24 AWG up to .203 thick.
22 AWG .204 thru .265 thick
20 AWG .266 thru .546 thick
18 AWG .547 thick and greater

Lead Spacing (X663FR Only): Center line to center line distance between leads shall equal nominal length of the capacitor plus $\frac{1}{2} \pm \frac{1}{16}$ when measured .062 below body line.

Lead Length: Type X663F — $1\% +1, -0$
Type X663FR — $1''$ min.

TYPICAL CHARACTERISTIC CURVE
CAPACITANCE CHANGE VS. TEMPERATURE
DEGREES CENTIGRADE



TRW[®] CAPACITORS

• Dipped Epoxy Coating

SPECIFICATIONS — 601PE - 601CPE

Insulation Resistance: Minimum values according to Table I.

TABLE I

Temperature	+25°C	+85°C	+125°C
Megohms X Microfarads	50,000	2,000	20
Need Not Exceed (Megohms)	100,000	5,000	100

Measured after 2 minutes electrification at 100 VDC or rated voltage, whichever is greater.

Dissipation Factor: Less than 1.0% when measured at or referred to 1000 $\pm$ 20 Hz for capacitance values up to and including 1.0 mfd. at 25°C $\pm$ 5°C. Capacitance values greater than 1.0 mfd. measured at 60 $\pm$ 6 Hz.

Dielectric Strength: Twice rated voltage for 1 minute through 100 ohms per volt limiting resistance.

Humidity Resistance: These designs comply with test requirements per MIL-STD-202C, method 103B, Condition B, no voltage applied. Minimum resistance after test, 15,000 megohms.

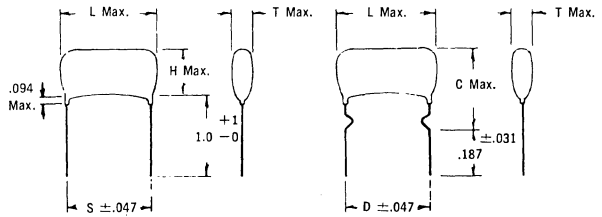
Capacitance Tolerance: Within specified tolerance when measured at 1000 $\pm$ 20 Hz, 25 $\pm$ 5°C (standard is 20%).

Temperature Range: May be operated at rated voltage from -55°C to +85°C. Derate to 50% when operating at 125°C.

METALLIZED MYLAR* & MYLAR* DIELECTRIC 601PE - X601PE TYPE 601PE - 601CPE — X601PE - X601CPE CAPACITORS SUB-MINIATURE IN A TOUGH RUGGED CASE

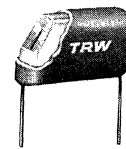
X601PE & 601PE

X601CPE & 601CPE



Lead Gauge

V.D.C.	#22 AWG TCW	#20 AWG TCW
35	.01 - .1	.15 - 1.0
50	.001-.068	.10 - 1.0
100	.001-.068	.10 - 1.0
200	.001-.022	.033- .47
400	.001-.0068	.010- .22
600	.001-.0068	.010- .15



LEAD
BEND DETAIL
20 Gauge .09
22 Gauge .08
-106-

TYPES 601PE - 601CPE DIMENSIONS

35 VOLTS						50 VOLTS					600 VOLTS				
CAP. IN MFDS.	Length A	Crimp Height B	Crimp Width D	Thick E	Height F	Length A	Crimp Height B	Crimp Width D	Thick E	Height F	Length A	Crimp Height B	Crimp Width D	Thick E	Height F
.001	—	—	—	—	—	.406	.450	.300	.156	.218	.593	.800	.400	.250	.562
.0015	—	—	—	—	—	.406	.500	.300	.156	.234	.593	.800	.400	.250	.562
.0022	—	—	—	—	—	.406	.500	.300	.187	.281	.593	.800	.400	.281	.562
.0033	—	—	—	—	—	.406	.550	.300	.187	.297	.593	.875	.400	.312	.625
.0047	—	—	—	—	—	.406	.550	.300	.187	.312	.593	.900	.400	.312	.656
.0068	—	—	—	—	—	.406	.550	.300	.203	.312	.718	.900	.400	.250	.656
.010	.406	.450	.300	.156	.218	.406	.600	.300	.203	.344	.718	.950	.400	.281	.687
.015	.406	.500	.300	.187	.250	.406	.600	.300	.203	.360	.718	.950	.400	.312	.718
.022	.406	.550	.300	.187	.312	.422	.650	.300	.203	.390	.718	1.000	.400	.343	.750
.033	.406	.600	.300	.187	.344	.531	.650	.300	.191	.406	.844	1.050	.600	.375	.812
.047	.406	.650	.300	.218	.406	.531	.700	.300	.203	.453	.844	1.100	.600	.406	.843
.068	.484	.750	.300	.218	.484	.531	.781	.300	.218	.500	.968	1.200	.700	.406	.937
.10	.562	.750	.400	.250	.562	.650	.850	.400	.235	.525	1.093	1.250	.800	.468	1.000
.15	.562	.850	.400	.250	.609	.671	.900	.400	.260	.650	1.218	1.400	1.000	.531	1.156
.22	.718	.900	.400	.265	.668	.728	.900	.400	.306	.687	—	—	—	—	—
.33	.718	.900	.400	.297	.668	.812	.950	.500	.312	.750	—	—	—	—	—
.47	.844	.950	.600	.312	.734	.937	1.000	.700	.344	.781	—	—	—	—	—
.68	.844	1.000	.600	.344	.781	1.109	1.125	.800	.375	.906	—	—	—	—	—
1.0	.953	1.000	.700	.422	.797	1.109	1.250	.800	.438	1.000	—	—	—	—	—

Note: Also available in 100, 200, & 400 VDC.

TYPES X601PE - X601CPE DIMENSIONS

SPECIFICATIONS — X601PE - X601CPE

Insulation Resistance: Minimum values according to Table I.

TABLE I

Temperature	+25°C	+85°C	+125°C
Megohms X Microfarads	20,000	2,000	20
Need Not Exceed (Megohms)	30,000	5,000	50

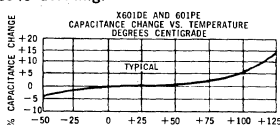
Measured after 2 minutes electrification at rated voltage.

Dissipation Factor: Less than 1.0% when measured at or referred to 1000 $\pm$ 20 Hz for capacitance values up to and including 1.0 mfd. at 25°C $\pm$ 5°C. Capacitance values greater than 1.0 mfd. measured at 60 $\pm$ 6 Hz.

Dielectric Strength: Twice rated voltage for 1 minute through 100 ohms per volt limiting resistance.

Humidity Resistance: Tested as outlined in MIL-STD-202C, Method 103B, Condition B, no voltage applied. After final conditioning, IR no less than 1/3 minimum values listed in Table I.

Temperature Range: -55°C to 100°C, to 125°C with 50% derating.



* DuPont's trademark for polyester film

100 VOLTS D.C.						200 VOLTS D.C.				
CAP. IN MFDS.	Length A	Thick E	Height F	Crimp Height B	Crimp Width D	Length A	Thick E	Height F	Crimp Height B	Crimp Width D
.01	—	—	—	—	—	.375	.205	.287	.500	.300
.012	—	—	—	—	—	.375	.220	.303	.550	.300
.015	—	—	—	—	—	.375	.220	.318	.550	.300
.018	—	—	—	—	—	.375	.236	.350	.600	.300
.022	—	—	—	—	—	.375	.251	.365	.600	.300
.027	.375	.173	.287	.500	.300	.375	.267	.365	.600	.300
.033	.375	.189	.287	.500	.300	.375	.267	.381	.650	.300
.039	.375	.205	.303	.550	.300	.500	.220	.365	.600	.400
.047	.375	.236	.318	.550	.300	.500	.236	.381	.650	.400
.056	.375	.236	.350	.600	.300	.500	.251	.396	.650	.400
.068	.375	.236	.365	.600	.300	.500	.267	.412	.650	.400
.082	.500	.220	.381	.650	.400	.500	.283	.428	.700	.400
.1	.500	.236	.381	.650	.400	.500	.298	.443	.700	.400
.12	.500	.251	.412	.650	.400	.500	.345	.475	.750	.400
.15	.500	.267	.428	.700	.400	.500	.361	.506	.750	.400
.18	.500	.283	.443	.700	.400	.656	.214	.459	.700	.500
.22	.656	.220	.381	.650	.500	.656	.330	.490	.750	.500
.27	.656	.236	.397	.650	.500	.656	.361	.537	.800	.500
.33	.656	.267	.428	.700	.500	.656	.377	.584	.850	.500
.39	.656	.283	.443	.700	.500	.756	.408	.600	.850	.500
.47	.656	.298	.443	.700	.500	.656	.439	.646	.900	.500
.56	.656	.345	.459	.700	.500	.906	.408	.600	.850	.700
.68	.656	.361	.490	.750	.500	.906	.423	.646	.900	.700
.82	.781	.298	.506	.750	.600	.906	.455	.693	.950	.700
1.00	.781	.330	.522	.750	.600	.906	.486	.709	.950	.700
1.25	.781	.377	.600	.850	.600	1.156	.470	.662	—	—
1.50	.906	.377	.600	.850	.700	1.156	.502	.709	—	—
1.80	.906	.408	.646	.900	.700	1.156	.502	.787	—	—
2.00	.906	.423	.662	.900	.700	1.156	.502	.850	—	—
3.00	1.156	.455	.693	—	—	1.437	.549	.896	—	—
4.00	1.437	.423	.787	—	—	1.437	.596	1.021	—	—
5.00	1.437	.486	.834	—	—	1.687	.620	1.037	—	—
8.00	1.687	.532	.974	—	—	1.687	.783	1.303	—	—
10.00	1.687	.626	1.052	—	—	1.687	.861	1.334	—	—

CRIMPED LEADS
NOT
RECOMMENDED

CRIMPED LEADS
NOT
RECOMMENDED

TRW[®] CAPACITORS

- Self Healing
- Long, Stable Life
- Military Grade
- Capacitance Values thru 12.0 mfd.
- Temperature Range -55°C thru $+125^{\circ}\text{C}$
(With Full Rated Voltage)
- High Insulation Resistance

SPECIFICATIONS

Insulation Resistance: Greater than 25,000 megohm-microfarads at 25°C but the IR need not exceed 50,000 megohms.

Dissipation Factor: Less than 1% when measured at or referred to 1000 ± 20 Hz for capacitance values up to and including 1.0 mfd at $25 \pm 5^{\circ}\text{C}$. Capacitors greater than 1.0 mfd measured at 60 ± 6 Hz.

Temperature Range: Full rated voltage from -55°C to $+125^{\circ}\text{C}$.

D-C Voltage Ratings: Standard ratings include 50, 200, 400 and 600 volts. Higher ratings are available on a special design basis.

Temperature and Immersion Cycling: Tested to paragraph 4.6.10 or MIL-C-18312 to meet paragraph 3.13 of same specification.

Moisture Resistance: Tested to paragraph 4.6.13 of MIL-C-18312 to meet paragraph 3.16 of same specification.

Construction: Non-inductive winding, metal enclosed, hermetically sealed.

X683

DIMENSIONS Note: For type X682 dimensions (one lead grounded to case) subtract $\frac{1}{4}$ " from type X683 length.

METALLIZED MYLAR*

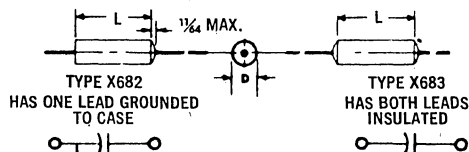
DIELECTRIC
TYPE X682 - X683 CAPACITORS
MINIATURE-METALLIZED MYLAR* —
HERMETICALLY SEALED

X682
X683



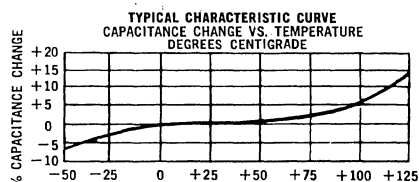
METALLIZED MYLAR

For insulated case styles 2 and 4, add .020 to diameter shown and change tolerance to $+.032 - .036$. Add .062 to length shown and change tolerance to $\pm .062$.



Dimensional Tolerances: Diameter: $+.015 - .005$. Length: $\pm .062$. Standard Lead Length $1\frac{1}{8}$ " $+1 - 0$

Lead Gauge: 24 AWG .195 and below case diameters
22 AWG .235 and .312 case diameters
20 AWG .400 and above case diameters



CAP. IN MFDS.	50 VOLT D.C.		200 VOLT D.C.		400 VOLT D.C.		600 VOLT D.C.	
	D	L	D	L	D	L	D	L
.010	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{3}{16}$		.312 x $\frac{13}{16}$	
.012	.175 x $\frac{3}{16}$		.175 x $\frac{3}{16}$		.235 x $\frac{3}{16}$		.312 x $\frac{13}{16}$	
.015	.175 x $\frac{3}{16}$		.195 x $\frac{3}{16}$		.235 x $\frac{3}{16}$		.312 x $\frac{13}{16}$	
.018	.175 x $\frac{3}{16}$		.195 x $\frac{3}{16}$		.235 x $\frac{3}{16}$		.312 x $\frac{13}{16}$	
.022	.175 x $\frac{3}{16}$		.195 x $\frac{3}{16}$		.235 x $\frac{3}{16}$		.312 x $\frac{13}{16}$	
.027	.175 x $\frac{3}{16}$		.235 x $\frac{3}{16}$		.312 x $\frac{13}{16}$		.312 x $\frac{13}{16}$	
.033	.175 x $\frac{3}{16}$		.235 x $\frac{3}{16}$		.312 x $\frac{13}{16}$		.312 x $\frac{13}{16}$	
.039	.195 x $\frac{3}{16}$		.235 x $\frac{3}{16}$		.312 x $\frac{13}{16}$		.400 x $\frac{13}{16}$	
.047	.195 x $\frac{3}{16}$		.235 x $\frac{3}{16}$		.312 x $\frac{13}{16}$		.400 x $\frac{13}{16}$	
.056	.235 x $\frac{3}{16}$		.312 x $\frac{7}{16}$		.400 x $\frac{13}{16}$		.400 x $\frac{13}{16}$	
.068	.235 x $\frac{3}{16}$		.312 x $\frac{7}{16}$		.400 x $\frac{13}{16}$		.400 x $\frac{13}{16}$	
.082	.235 x $\frac{3}{16}$		.312 x $\frac{7}{16}$		.400 x $\frac{13}{16}$		.500 x $\frac{13}{16}$	
.10	.235 x $\frac{3}{16}$		.312 x $\frac{7}{16}$		.400 x $\frac{13}{16}$		.500 x $\frac{13}{16}$	
.12	.235 x $\frac{7}{16}$		.312 x $\frac{11}{16}$		.500 x $\frac{13}{16}$		.562 x $\frac{13}{16}$	
.15	.235 x $\frac{7}{16}$		.312 x $\frac{11}{16}$		.500 x $\frac{13}{16}$		.562 x $\frac{13}{16}$	
.18	.312 x $\frac{7}{16}$		.312 x $\frac{11}{16}$		.562 x $\frac{13}{16}$		.562 x $\frac{13}{16}$	
.22	.312 x $\frac{7}{16}$		.312 x $\frac{11}{16}$		.562 x $\frac{13}{16}$		.562 x $\frac{13}{16}$	
.27	.312 x $\frac{7}{16}$		.400 x $\frac{13}{16}$		.562 x $\frac{13}{16}$		.562 x $\frac{13}{16}$	
.33	.312 x $\frac{7}{16}$		.400 x $\frac{13}{16}$		.562 x $\frac{13}{16}$		.562 x $\frac{13}{16}$	
.39	.312 x $\frac{11}{16}$		.400 x $\frac{13}{16}$		.562 x $\frac{13}{16}$		.670 x $\frac{13}{16}$	
.47	.312 x $\frac{11}{16}$		.400 x $\frac{13}{16}$		.562 x $\frac{13}{16}$		.670 x $\frac{13}{16}$	
.56	.400 x $\frac{13}{16}$		.500 x $\frac{13}{16}$		.670 x $\frac{13}{16}$		.750 x $\frac{13}{16}$	
.68	.400 x $\frac{13}{16}$		.500 x $\frac{13}{16}$		.670 x $\frac{13}{16}$		.750 x $\frac{13}{16}$	
.82	.400 x $\frac{13}{16}$		.562 x $\frac{13}{16}$		.750 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$	
1.00	.400 x $\frac{13}{16}$		.562 x $\frac{13}{16}$		.750 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$	
1.50	.500 x $\frac{13}{16}$		.562 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$	
2.20	.562 x $\frac{13}{16}$		.562 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$	
2.70	.562 x $\frac{13}{16}$		.670 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$		—	
3.30	.562 x $\frac{13}{16}$		.670 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$		—	
3.90	.562 x $\frac{13}{16}$		.750 x $\frac{13}{16}$		—		—	
4.70	.562 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$		—		—	
5.60	.670 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$		—		—	
6.80	.670 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$		—		—	
8.20	.750 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$		—		—	
10.00	.750 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$		—		—	
12.00	.750 x $\frac{13}{16}$		1.000 x $\frac{13}{16}$		—		—	

* DuPont's trademark for polyester film

OTHER TRW METAL ENCLOSED— HERMETICALLY SEALED MYLAR* CAPACITORS AVAILABLE

- TRW TYPE 616-617
- TRW TYPE 612-613
- TRW TYPE 682-683
- TRW TYPE 692-693 (CQ TYPES)

CONTACT FACTORY FOR CONSTRUCTION & DESIGN CHARACTERISTICS

TRW® CAPACITORS

- For Maximum Space Saving
- "Instrument" Quality
- Tough, Moisture Resisting Case
- Tolerance to $\pm 1\%$

SPECIFICATIONS

Dissipation Factor: Less than 1.0% when measured at or referred to 1000 ± 20 Hz for capacitance values up to and including 1.0 mfd. at 25°C $\pm 5^\circ\text{C}$. Capacitance values greater than 1.0 mfd. measured at 60 ± 6 Hz.

Insulation Resistance: Greater than 70,000 megohm-microfarads at 25°C, but the IR need not exceed 140,000 megohms. See separate curve for figures at higher temperatures.

Dielectric Strength: 2 times rated voltage for one minute through a limiting resistance of 100 ohms/volt.

Humidity Resistance: Will meet or exceed requirements of MIL-C-27287, Paragraph 3.12, when tested in accordance with MIL-Std.-202C, Method 103B, Condition B.

Temperature Range: May be operated at rated voltage from -55°C to $+85^\circ\text{C}$ and to $+125^\circ\text{C}$ with 50% derating.

Length Tolerance: $+\frac{1}{32}$, $-\frac{1}{16}$ — Standard lead length 1% $+1 -0$.

Diameter Tolerances: .218 and under $\pm .031$
 .219 to .500 $\pm .046$
 .501 and over $\pm .062$

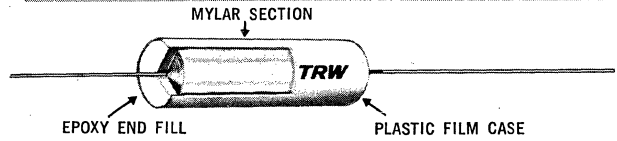
DIMENSIONS

CAP. IN MFD.	100 VOLTS		200 VOLTS		400 VOLTS		600 VOLTS		1000 VOLTS	
	D	L	D	L	D	L	D	L	D	L
.001	.156	x 1/2	.156	x 1/2	.156	x 5/8	.156	x 3/4	.218	x 3/4
.0012	.156	x 1/2	.156	x 1/2	.156	x 5/8	.171	x 3/4	.234	x 3/4
.0015	.156	x 1/2	.156	x 1/2	.156	x 5/8	.171	x 3/4	.234	x 3/4
.0018	.156	x 1/2	.156	x 1/2	.156	x 5/8	.187	x 3/4	.187	x 7/8
.0022	.156	x 1/2	.156	x 1/2	.156	x 5/8	.187	x 3/4	.203	x 7/8
.0027	.156	x 1/2	.156	x 1/2	.156	x 5/8	.203	x 3/4	.234	x 7/8
.0033	.156	x 1/2	.156	x 1/2	.156	x 5/8	.203	x 3/4	.250	x 7/8
.0039	.156	x 1/2	.156	x 1/2	.171	x 5/8	.218	x 3/4	.265	x 7/8
.0047	.156	x 1/2	.156	x 1/2	.187	x 5/8	.234	x 3/4	.281	x 7/8
.0056	.156	x 1/2	.156	x 1/2	.203	x 5/8	.250	x 3/4	.312	x 7/8
.0068	.156	x 1/2	.156	x 1/2	.218	x 5/8	.265	x 3/4	.328	x 7/8
.0082	.156	x 1/2	.156	x 1/2	.234	x 5/8	.281	x 3/4	.343	x 7/8
.01	.156	x 1/2	.171	x 1/2	.250	x 5/8	.312	x 3/4	.375	x 7/8
.012	.171	x 1/2	.187	x 1/2	.281	x 5/8	.281	x 7/8	.328	x 1
.015	.187	x 1/2	.203	x 1/2	.296	x 5/8	.312	x 7/8	.359	x 1
.018	.187	x 5/8	.234	x 5/8	.281	x 3/4	.343	x 7/8	.312	x 1 1/8
.022	.203	x 5/8	.250	x 5/8	.312	x 3/4	.375	x 7/8	.343	x 1 1/8
.027	.218	x 5/8	.265	x 5/8	.281	x 7/8	.359	x 1	.406	x 1 1/4
.033	.218	x 5/8	.250	x 3/4	.312	x 7/8	.406	x 1	.468	x 1 1/4
.039	.218	x 3/4	.265	x 3/4	.343	x 7/8	.437	x 1	.500	x 1 1/4
.047	.234	x 3/4	.296	x 3/4	.343	x 7/8	.453	x 1	.531	x 1 1/4
.056	.250	x 3/4	.328	x 3/4	.343	x 1	.500	x 1	.515	x 1 1/2
.068	.265	x 3/4	.343	x 3/4	.375	x 1	.531	x 1	.562	x 1 1/2
.082	.296	x 3/4	.375	x 3/4	.406	x 1	.515	x 1 1/4	.609	x 1 1/2
.1	.281	x 7/8	.375	x 7/8	.421	x 1	.562	x 1 1/8	.625	x 1 1/2
.12	.296	x 7/8	.390	x 7/8	.468	x 1	.609	x 1 1/8	.671	x 1 1/2
.15	.328	x 7/8	.453	x 7/8	.468	x 1 1/4	.671	x 1 1/8	.796	x 1 1/2
.18	.296	x 1	.406	x 1 1/8	.500	x 1 1/8	.656	x 1 1/8	.718	x 1 3/4
.22	.328	x 1	.432	x 1 1/8	.546	x 1 1/8	.718	x 1 1/8	.796	x 1 3/4
.27	.375	x 1 1/8	.453	x 1 1/8	.609	x 1 1/8	.781	x 1 1/8	.859	x 1 3/4
.33	.438	x 1 1/8	.500	x 1 1/8	.593	x 1 1/8	.765	x 2	.937	x 2
.39	.468	x 1 1/8	.515	x 1 1/4	.625	x 1 1/8	.812	x 2	1.015	x 2
.47	.468	x 1 1/4	.546	x 1 1/4	.671	x 1 1/8	.859	x 2	1.109	x 2
.56	.515	x 1 1/4	.609	x 1 1/8	.718	x 1 3/4	.937	x 2	1.062	x 2 1/4
.68	.562	x 1 1/4	.609	x 1 1/8	.796	x 1 3/4	1.015	x 2	1.125	x 2 1/4
.82	.625	x 1 1/4	.640	x 1 1/8	.812	x 1 7/8	.953	x 2 1/2	1.187	x 2 5/8
1.00	.593	x 1 1/2	.671	x 1 3/4	.812	x 2	1.125	x 2 1/2	1.296	x 2 5/8
1.25	.656	x 1 1/2	.750	x 1 3/4	.906	x 2	1.234	x 2 1/2	1.265	x 3
1.50	.718	x 1 3/4	.828	x 1 3/4	.921	x 2 1/4	1.234	x 3	1.359	x 3
1.80	.781	x 1 3/4	.828	x 1 7/8	1.015	x 2 1/4	1.375	x 3	1.453	x 3
2.00	.812	x 1 3/4	.875	x 2	1.093	x 2 1/4	1.421	x 3	1.609	x 3

* DuPont's trademark for polyester film

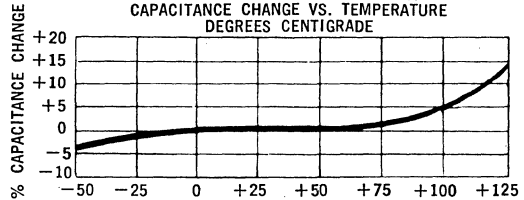
MYLAR* DIELECTRIC TYPE 663UW CAPACITORS LONG LIFE RELIABILITY — TAPE WRAPPED CASE

663UW

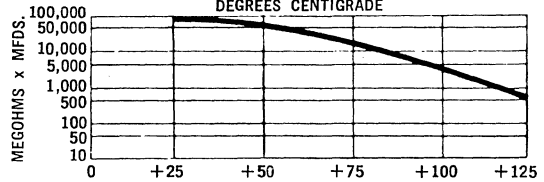


Lead Gauge: 24 AWG all diameters, up to and including .250.
 22 AWG all diameters, .251 thru .438.
 20 AWG all diameters, .439 thru .749.
 18 AWG all diameters, .750 and greater.

TYPICAL CHARACTERISTIC CURVES CAPACITANCE CHANGE VS. TEMPERATURE DEGREES CENTIGRADE



INSULATION RESISTANCE VS. TEMPERATURE DEGREES CENTIGRADE



OTHER TRW MYLAR* TAPE WRAPPED CAPACITORS
 TYPE 643UW (CTM) TYPE 663F & 663FR

TRW[®] CAPACITORS

- Exceptionally Small Size
- High Insulation Resistance
- Instrument Quality
- Tolerance to $\pm 1\%$

SPECIFICATIONS

Insulation Resistance: Minimum values according to Table I.

TABLE I

Temperature	+25°C	+85°C	+125°C
Megohms X Microfarads	50,000	1,000	25
Need Not Exceed (Megohms)	100,000	10,000	250

Measured after 2 minutes electrification at rated voltage.

Dissipation Factor: Less than 1.0% when measured at or referred to 1000 ± 20 Hz for capacitance values up to and including 1.0 mfd. at 25°C $\pm 5^\circ$ C. Capacitance values greater than 1.0 mfd. measured at 60 ± 6 Hz.

Dielectric Strength: Twice rated voltage for one minute through a limiting resistance of 100 ohms/volt.

Humidity Resistance: Will exceed requirements of MIL-C-27287, Paragraph 3.12, when tested at 40°C for 240 hours.

Temperature Range: May be operated at rated voltage from -55° C to $+85^\circ$ C and to 125° C with 50% derating.

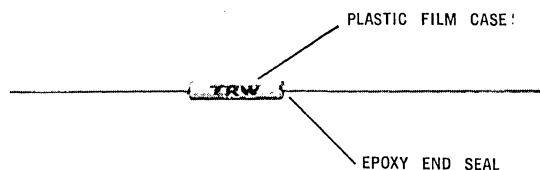
Winding Construction: Extended foil (Non-inductive).

Capacitance Tolerances: $\pm 20\%$ $\pm 10\%$ $\pm 5\%$ $\pm 1\%$.

MYLAR*

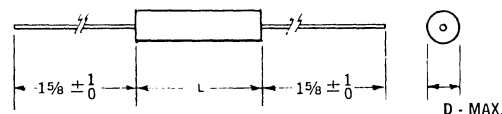
DIELECTRIC
TYPE 608 - 608T CAPACITORS
FOIL WOUND "MICROMINIATURE"
75% SMALLER THAN MIL-C-25
50% SMALLER THAN MIL-C-27287

608



NOTE: TYPE 608T

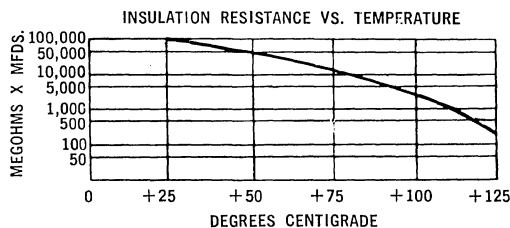
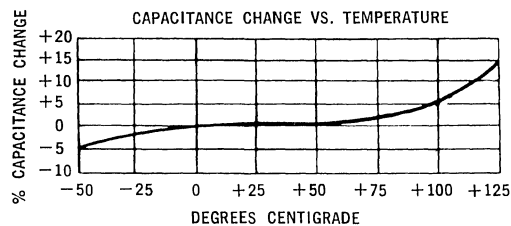
Available on request, 608T will meet all environmental requirements of MIL-C-27287.



Dimensional Tolerances: Length: $+.063 - .031$
Standard lead length $1\% +1 -0$.

Lead Gauge: 26 AWG .375 Length
24 AWG .531 thru .781 Length
22 AWG .937 thru 1.031 Length
20 AWG 1.188 thru 1.312 Length

TYPICAL CHARACTERISTIC CURVES



DIMENSIONS

CAP. IN MFDS.	50 VOLTS		100 VOLTS		CAP. IN MFDS.	50 VOLTS		100 VOLTS	
	D - MAX.	L	D - MAX.	L		D - MAX.	L	D - MAX.	L
.001	—	—	.111	.375	.056	.296	.375	.312	.531
.0012	—	—	.111	.375	.068	.296	.375	.343	.531
.0015	—	—	.118	.375	.082	.343	.375	.375	.531
.0018	—	—	.125	.375	.10	.375	.375	.375	.531
.0022	—	—	.125	.375	.12	.375	.531	—	—
.0027	—	—	.132	.375	.15	.375	.531	—	—
.0033	—	—	.132	.375	.18	.375	.531	—	—
.0039	—	—	.139	.375	.22	.375	.531	—	—
.0047	—	—	.139	.375	.27	.437	.781	—	—
.0056	—	—	.151	.375	.33	.437	.781	—	—
.0068	—	—	.151	.375	.39	.468	.937	—	—
.0082	—	—	.158	.375	.47	.468	.937	—	—
.010	—	—	.165	.375	.56	.515	1.031	—	—
.012	.171	.375	.185	.375	.68	.515	1.031	—	—
.015	.171	.375	.185	.375	.82	.562	1.188	—	—
.018	.203	.375	.206	.375	1.00	.562	1.188	—	—
.022	.203	.375	.206	.375	1.25	.671	1.188	—	—
.027	.218	.375	.245	.375	1.50	.718	1.188	—	—
.033	.234	.375	.245	.375	1.80	.750	1.312	—	—
.039	.250	.375	.282	.375	2.00	.797	1.312	—	—
.047	.250	.375	.282	.375					

* DuPont's trademark for polyester film

TRW[®] CAPACITORS

- Superior performance in a smaller package
- Available to $\pm 1\%$ tolerance
- Exceeds all environmental requirements of MIL-C-25
- Ideally suited for transistor circuitry

This series is based on years of experience in the design and construction of mylar dielectric capacitors. In addition, the use of high reliability techniques in manufacturing processes result in a design capable of replacing MIL-C-25 type units with very substantial size and weight savings.

The inherent stability of mylar dielectric capacitors makes them an ideal choice where freedom from drift under continuous duty is required. This characteristic also lends itself well to close initial tolerance requirements.

HIGH RELIABILITY REQUIREMENTS

These designs are capable of being produced to high reliability specifications comparable to MIL-C-14157 and MIL-C-19978.

Such customer applications are handled on a "project" basis, and the amount of premium cost varies depending on the level of performance required and on the lot acceptance testing specified.

SPECIFICATIONS

Insulation Resistance: Greater than 40,000 megohm-microfarads at 25°C, but the IR need not exceed 100,000 megohms. See separate curve for figures at higher temperatures.

Dissipation Factor: Less than 1% when measured at or referred to 1000 ± 20 Hz at 25 $\pm 5^\circ$ C.

Temperature Range: -55° C to $+85^\circ$ C; to $+125^\circ$ with 50% derating.

Moisture Resistance: Tested to paragraph 4.6.10 of MIL-C-25 or to paragraph 4.6.16 of MIL-C-19978.

Dielectric Strength: Twice rated voltage for one minute through limiting resistance of 100 ohms per volt.

Temperature and Immersion Cycling: These designs comply with test requirements of military specification MIL-C-25. Tested to paragraph 4.6.12 of MIL-C-19978.

Special Case Styles: Available in all case and mounting variations of MIL-C-25 tubular types CP04 through CP11.

Capacitance Tolerances: Standard tolerance $\pm 20\%$; also available in $\pm 10\%$, $\pm 5\%$ and $\pm 1\%$.

Voltage Range: 100, 200, 300, 400 and 600 volts. Type 682-683 also available in 50 volt sizes.

Vibration: These capacitors will meet the vibration test of military specification MIL-C-25. Tested to paragraph 4.6.10.2 of MIL-C-19978.

Life Test: 250 hours at $+85^\circ$ C and 125% of rated voltage. No more than 1 failure in 18 units tested.

Construction: Types 682 and 683 are extended foil.

APPLICATIONS

Airborne Instrumentation: The extremely miniature size and light weight of Types 682-683 are key advantages in airborne applications. Their use has contributed directly to the success of many instrument designers in achieving miniaturization goals.

Miniaturized Computers: Computers for commercial as well as military applications often require miniature capacitor designs. Where hermetically sealed types are needed, Types 682-683 offer appreciable space-savings over paper dielectric designs of equivalent ratings.

Transistor Circuitry: Miniaturized printed circuit chassis for computers and other similar applications capitalize on the space-saving feature of this design.

CROSS REFERENCE

MIL-C-25	Space Saving Alternates	MIL-C-25	Space Saving Alternates
CP08, Circ. 1	683, Style 2	CP09, Circ. 1	683, Style 4
CP08, Circ. 3	682, Style 1	CP09, Circ. 3	682, Style 3

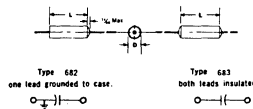
*DuPont's trademark for polyester film.

MYLAR[®]
DIELECTRIC
TYPE 682-683 CAPACITORS
METAL ENCLOSED,
HERMETICALLY SEALED.
SPACE SAVING REPLACEMENT FOR MIL-C-25

682-683



For insulated case styles 3 and 4, add .020 to diameter shown and change tolerance to $+.032 - .036$. Add .062 to length shown and change tolerance to $\pm .062$.



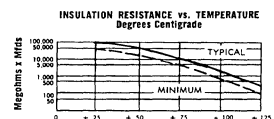
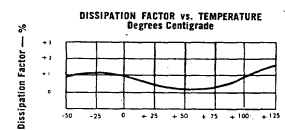
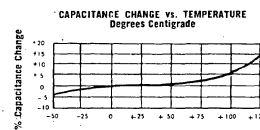
Dimensional Tolerances:

Diameter — $+.015 - .005$.
Length — $\pm .062$.
Standard lead length — $1\% +1 -0$.

Lead Gauge:

24 AWG up to and including .193.
22 AWG from .233 to .313.
20 AWG .400 and above.

TEMPERATURE TYPICAL CHARACTERISTIC CURVES



TYPE 683

DIMENSIONS (Sizes of Type 682 are $\frac{1}{16}$ " shorter than 683)

Capacitance in Mfds.	EXTENDED FOIL CONSTRUCTION			
	100 & 200 Volts		300 Volts	400 & 600 Volts
	D	L	D	L
.001	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.173 x $\frac{3}{32}$
.0012	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.173 x $\frac{3}{32}$
.0015	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.173 x $\frac{3}{32}$
.0018	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.173 x $\frac{3}{32}$
.0022	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.173 x $\frac{3}{32}$
.0027	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.173 x $\frac{3}{32}$
.0033	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.173 x $\frac{3}{32}$
.0039	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.173 x $\frac{3}{32}$
.0047	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.173 x $\frac{3}{32}$
.0056	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.193 x $\frac{3}{32}$
.0068	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.193 x $\frac{3}{32}$
.0082	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.193 x $\frac{3}{32}$
.01	.173 x $\frac{3}{32}$		.173 x $\frac{3}{32}$	.233 x $\frac{3}{32}$
.012	.193 x $\frac{3}{32}$		.173 x 1	.233 x $\frac{3}{32}$
.015	.193 x $\frac{3}{32}$		.173 x 1	.233 x $\frac{3}{32}$
.018	.233 x $\frac{3}{32}$		.233 x $\frac{1}{16}$	.313 x $\frac{3}{32}$
.022	.233 x $\frac{3}{32}$		.233 x $\frac{1}{16}$	.313 x $\frac{3}{32}$
.027	.233 x $\frac{3}{32}$		.233 x $\frac{1}{16}$	.313 x $\frac{3}{32}$
.033	.233 x $\frac{3}{32}$		.233 x 1	.313 x $\frac{3}{32}$
.039	.313 x $\frac{3}{32}$		.313 x $\frac{1}{16}$	.400 x $\frac{3}{32}$
.047	.313 x $\frac{3}{32}$		.313 x $\frac{1}{16}$	.400 x $\frac{3}{32}$
.056	.313 x $\frac{3}{32}$		.313 x 1	.400 x $\frac{1}{16}$
.068	.313 x $\frac{3}{32}$		.313 x 1	.400 x $\frac{1}{16}$
.082	.313 x $\frac{3}{32}$		.400 x $\frac{3}{4}$	.400 x $\frac{1}{16}$
.1	.313 x $\frac{3}{32}$		.400 x $\frac{1}{16}$	.400 x $\frac{1}{16}$
.12	.400 x $\frac{7}{8}$		.400 x 1	.400 x $\frac{1}{16}$
.15	.400 x $\frac{7}{8}$		.400 x $\frac{1}{16}$	.560 x $\frac{1}{16}$
.18	.400 x $\frac{1}{16}$		.400 x $\frac{1}{16}$	.560 x $\frac{1}{16}$
.22	.400 x $\frac{1}{16}$		.400 x $\frac{1}{16}$	.560 x $\frac{1}{16}$
.27	.400 x $\frac{1}{16}$		.500 x $\frac{1}{16}$	.560 x $\frac{1}{16}$
.33	.400 x $\frac{1}{16}$		.500 x $\frac{1}{16}$	.560 x $\frac{1}{16}$
.39	.500 x $\frac{1}{16}$		.560 x $\frac{1}{16}$	.668 x $\frac{1}{16}$
.47	.500 x $\frac{1}{16}$		.560 x $\frac{1}{16}$	.750 x $\frac{1}{16}$
.56	.560 x $\frac{1}{16}$		.560 x $\frac{1}{16}$	.750 x $\frac{1}{16}$
.68	.560 x $\frac{1}{16}$		.560 x $\frac{1}{16}$	.750 x $\frac{1}{16}$
.82	.560 x $\frac{1}{16}$		.560 x $\frac{1}{16}$	.750 x $\frac{1}{16}$
1.00	.560 x $\frac{1}{16}$		.668 x 2	.750 x $\frac{1}{16}$

TRW[®] CAPACITORS

- Maximum Space Savings
- Tolerance to $\pm 1\%$
- High Stability
- Extremely High IR
- Very Low Dielectric Absorption
- Excellent Retrace

As can be seen from the above design highlights, these TRW Polystyrene dielectric capacitors are ideally suited for use in computer and timing circuitry. Their plastic film case provides the ultimate subminiature size. The 863T, which combines the size of the 863UW with special production procedures, is capable of meeting the environmental requirements of MIL-C-27287 within 85°C and 200% of rated voltage.

The dielectric absorption, or accumulation of charge after discharge, is exceptionally low. This fact, coupled with the characteristics of high capacitance stability and high insulation resistance, make the 863UW/863T ideal for use in many critical applications.

Detailed application engineering service data is available for the best results in the use of Polystyrene capacitors for your particular circuit. Contact the TRW Capacitor Engineering Dept.

SPECIFICATIONS

Temperature Range: May be operated at rated voltage from -55°C to $+85^{\circ}\text{C}$.

Insulation Resistance: Greater than 300,000 megohm-microfarads at 25°C , but the IR need not exceed 500,000 megohms. See separate curve for figures at higher temperatures.

Dissipation Factor: Less than .10% when measured at or referred to 1000 $\pm 20\text{CPS}$.

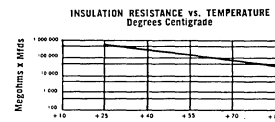
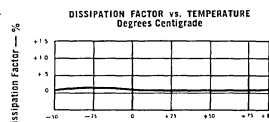
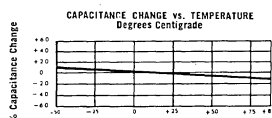
Dielectric Strength: Twice rated voltage for one minute through a limiting resistance of 100 ohms/volt.

Life Test: 250 hours at $+85^{\circ}\text{C}$ and 125% of rated voltage. No more than one failure allowed of 18 units tested.

Temperature Coefficient: -110 ± 30 parts/million/ $^{\circ}\text{C}$.

Humidity Resistance: Will meet or exceed requirements of MIL-C-27287, paragraph 3.12, when tested in accordance with MIL-STD-202C, Method 103B, Condition B. One failure allowed of 18 units tested.

TEMPERATURE TYPICAL CHARACTERISTIC CURVES



TYPES 863UW AND 863T

DIMENSIONS (Type 863T will meet all environmental requirements of MIL-C-27287 with two exceptions: 1. Temp. shall never exceed 85°C . 2. Dielectric strength shall never exceed 200% of rated voltage.)

Capacitance in Mfcs.	100 Volts		200 Volts		400 Volts		600 Volts	
	D	L	D	L	D	L	D	L
.001	.187	x 3/4	.187	x 3/4	.187	x 3/4	.234	x 3/4
.0012	.187	x 3/4	.187	x 3/4	.187	x 3/4	.250	x 3/4
.0015	.187	x 3/4	.187	x 3/4	.187	x 3/4	.250	x 3/4
.0018	.187	x 3/4	.187	x 3/4	.250	x 3/4	.281	x 3/4
.0022	.187	x 3/4	.187	x 3/4	.281	x 3/4	.281	x 3/4
.0027	.218	x 3/4	.218	x 3/4	.312	x 3/4	.312	x 3/4
.0033	.218	x 3/4	.218	x 3/4	.312	x 3/4	.312	x 3/4
.0039	.234	x 3/4	.234	x 3/4	.312	x 3/4	.312	x 7/8
.0047	.234	x 3/4	.234	x 3/4	.312	x 7/8	.312	x 7/8
.0056	.265	x 3/4	.265	x 3/4	.328	x 7/8	.328	x 7/8
.0068	.265	x 3/4	.265	x 3/4	.328	x 7/8	.328	x 7/8
.0082	.296	x 3/4	.281	x 7/8	.359	x 7/8	.375	x 7/8
.01	.296	x 3/4	.281	x 7/8	.359	x 7/8	.375	x 7/8
.012	.328	x 3/4	.312	x 7/8	.375	x 7/8	.406	x 7/8
.015	.343	x 3/4	.312	x 7/8	.390	x 7/8	.359	x 1 1/8
.018	.312	x 7/8	.359	x 7/8	.375	x 1 1/8	.437	x 1 1/8
.022	.312	x 7/8	.375	x 1 1/8	.375	x 1 1/8	.500	x 1 1/8
.027	.343	x 7/8	.375	x 1 1/8	.406	x 1 1/8	.531	x 1 1/8
.033	.343	x 7/8	.375	x 1 1/8	.453	x 1 1/8	.546	x 1 1/4
.039	.375	x 7/8	.406	x 1 1/8	.500	x 1 1/4	.593	x 1 1/4
.047	.390	x 7/8	.437	x 1 1/8	.562	x 1 1/4	.625	x 1 1/4
.056	.375	x 1 1/8	.453	x 1 1/4	.593	x 1 1/4	.656	x 1 3/8
.068	.375	x 1 1/8	.453	x 1 1/4	.625	x 1 1/4	.687	x 1 3/8
.082	.406	x 1 1/8	.500	x 1 1/4	.656	x 1 1/4	.687	x 1 3/4
.1	.421	x 1 1/8	.531	x 1 1/4	.562	x 1 3/4	.703	x 1 3/4
.12	.500	x 1 1/4	.546	x 1 3/4	.625	x 1 3/4	.781	x 1 3/4
.15	.531	x 1 1/4	.546	x 1 3/4	.687	x 1 3/4	.843	x 1 3/4
.18	.578	x 1 3/8	.593	x 1 3/4	.750	x 1 3/4	.843	x 2 1/8
.22	.609	x 1 3/8	.625	x 1 3/4	.781	x 1 3/4	.875	x 2 1/8
.27	.640	x 1 3/8	.718	x 1 3/4	.812	x 2 1/8	.937	x 2 1/8
.33	.656	x 1 3/8	.750	x 1 3/4	.890	x 2 1/8	.968	x 2 1/8
.39	.687	x 1 3/4	.812	x 2 1/8	.890	x 2 1/8	1.062	x 2 1/8
.47	.703	x 1 3/4	.828	x 2 1/8	.906	x 2 1/8	1.187	x 2 1/8
.56	.781	x 1 3/4	.875	x 2 1/8	1.062	x 2 1/8	1.281	x 2 1/8
.68	.812	x 1 3/4	.921	x 2 1/8	1.109	x 2 1/8	1.375	x 2 1/8
.82	.906	x 2 1/8	.953	x 2 1/8	1.250	x 2 1/8	1.500	x 2 1/8
1.0	.953	x 2 1/8	.984	x 2 1/8	1.375	x 2 1/8	1.687	x 2 1/8

POLYSTYRENE

DIELECTRIC

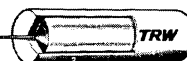
863UW-863T

TYPE 863UW AND 863T CAPACITORS

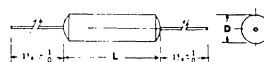
POLYSTYRENE HIGH QUALITY SUBMINIATURES

"SKIN-TIGHT" PLASTIC FILM CASE

Types 863UW and 863T have exceptionally low capacitance change with temperature. Their temperature coefficient is $-110 \pm \text{PPM}/^{\circ}\text{C}$.



CUT-AWAY SHOWS CONSTRUCTION.



Dimensional Tolerances:

Diameter — Max.
Length — $\pm \frac{1}{16}$
Standard lead length — 1 1/2
+1, -0.

Lead Gauge:

24 AWG .000 dia. thru .235 dia.
22 AWG .236 dia. thru .438 dia.
20 AWG .439 dia. thru .749 dia.
18 AWG .750 dia. and greater.

Capacitance Tolerances: Standard tolerance $\pm 20\%$. Also available in $\pm 10\%$, $\pm 5\%$, $\pm 2\%$, $\pm 1\%$.

Winding Construction: Extended Foil (Non-Inductive).

APPLICATIONS

Timing Circuits: The extremely low dielectric absorption of Polystyrene film capacitors is a main factor for consideration in its use in computers and timing circuits.

Precision Test and Measuring Equipment: Laboratory Standards Equipment and circuits which require a very minimum distortion call upon the Polystyrene capacitors in their design.

General: In general, capacitor users select Polystyrene types where the importance of low TC (negative) or low dielectric absorption is the controlling factor. These advantages are now available in a small package.

TRW[®] CAPACITORS

- Sub-miniature Size
- Skin-tight Non-metallic Case
- Require Minimum Chassis Area
- Low Silhouette for Transistorized Circuits
- High Insulation Resistance
- Available in Tolerances to $\pm 5\%$

SPECIFICATIONS

Dissipation Factor: Less than 1.0% when measured at or referred to 1000 ± 20 Hz for capacitance values up to and including 1.0 mfd. at $25^\circ\text{C} \pm 5^\circ\text{C}$. Capacitance values greater than 1.0 mfd. measured at 60 ± 6 Hz.

Insulation Resistance: Greater than 70,000 megohm-microfarads at 25°C , but the IR need not exceed 140,000 megohms. See separate curve for figures at higher temperatures.

Lead Pull Test: Capacitor Thickness — Force Applied*
Through .359" . . . 4 pounds. Over .359" . . . 8 pounds.
*axially for 663F — radially for 663FR.

Life Test: 250 hours at 85°C and 125% of rated voltage. No more than one failure allowed of 18 units tested.

Dielectric Strength: Twice rated voltage for one minute through a limiting resistance of 100 ohms/volt.

Humidity Resistance: Will meet or exceed requirements of MIL-C-27287, Paragraph 3.12, when tested in accordance with MIL-Std.-202C, Method 103B, Condition B. One failure allowed of 18 units tested.

Temperature Range: May be operated at rated voltage from -55°C to $+85^\circ\text{C}$ and to $+125^\circ\text{C}$ with 50% derating.

Winding Design: Extended foil construction.

APPLICATIONS

Mounting Flexibility: Sub-miniature size plus oval cross section helps solve many packaging problems where maximum space economy is required. This is of particular advantage in accomplishing last minute circuit changes.

Printed Circuits: Radial lead type 663FR provides leads that are pre-positioned for insertion into printed circuit boards. The tough mylar case is unaffected by the heat of dip-soldering.

Military Use: In addition to use in commercial and instrument grade products type 663F and 663FR are used in a wide variety of military items where hermetic sealing is not an absolute requirement. All versions of Type 663 are well suited for use in potted assemblies.

Capacitance Stability: Tests continued for 10,000 hours under rated operating conditions show that only negligible drift in capacitance and dissipation factor is encountered in these designs.

Transistor Circuits: Miniaturized printed circuit chassis for computers and other similar applications capitalize on the space-saving feature of this design.

DIMENSIONS

Capacitance in Mfds.	50 Volts			100 Volts			200 Volts			400 Volts			600 Volts			1,000 Volts		
	T	W	L	T	W	L	T	W	L	T	W	L	T	W	L	T	W	L
.001																		
.0012																		
.0015																		
.0018																		
.0022																		
.0027																		
.0033																		
.0039																		
.0047																		
.0056																		
.0068																		
.0082																		
.01																		
.012																		
.015																		
.018																		
.022																		
.027	.156 x .281 x 1/2			.171 x .297 x 5/8			.156 x .297 x 5/8			.219 x .359 x 5/8			.297 x .453 x 3/4			.297 x .484 x 7/8		
.033	.156 x .281 x 1/2			.171 x .297 x 5/8			.171 x .297 x 5/8			.219 x .359 x 5/8			.297 x .453 x 3/4			.297 x .484 x 7/8		
.039	.171 x .296 x 5/8			.171 x .296 x 5/8			.171 x .296 x 5/8			.219 x .359 x 5/8			.297 x .453 x 3/4			.297 x .484 x 7/8		
.047	.171 x .296 x 5/8			.171 x .296 x 5/8			.171 x .296 x 5/8			.219 x .359 x 5/8			.297 x .453 x 3/4			.297 x .484 x 7/8		
.056	.171 x .312 x 5/8			.171 x .312 x 5/8			.171 x .312 x 5/8			.219 x .359 x 5/8			.297 x .453 x 3/4			.297 x .484 x 7/8		
.068	.171 x .312 x 5/8			.171 x .312 x 5/8			.171 x .312 x 5/8			.219 x .359 x 5/8			.297 x .453 x 3/4			.297 x .484 x 7/8		
.082	.171 x .312 x 5/8			.171 x .312 x 5/8			.171 x .312 x 5/8			.219 x .359 x 5/8			.297 x .453 x 3/4			.297 x .484 x 7/8		
.1	.171 x .312 x 3/4			.203 x .328 x 7/8			.203 x .328 x 7/8			.297 x .484 x 7/8			.359 x .609 x 1			.484 x .859 x 1 1/2		
.12	.187 x .375 x 7/8			.234 x .375 x 7/8			.234 x .375 x 7/8			.328 x .516 x 7/8			.391 x .672 x 1			.547 x .922 x 1 1/2		
.15	.187 x .375 x 7/8			.250 x .421 x 7/8			.250 x .421 x 7/8			.359 x .609 x 7/8			.359 x .672 x 1 1/4			.547 x 1.109 x 1 1/2		
.18	.250 x .469 x 7/8			.250 x .437 x 1			.250 x .437 x 1			.281 x .500 x 1 1/8			.359 x .750 x 1 1/8			.500 x 1.093 x 1 3/4		
.22	.250 x .469 x 7/8			.281 x .468 x 1			.281 x .468 x 1			.328 x .578 x 1 1/8			.422 x .797 x 1 1/8			.578 x 1.109 x 1 3/4		
.27	.281 x .531 x 1			.312 x .531 x 1 1/8			.312 x .531 x 1 1/8			.391 x .609 x 1 1/8			.453 x .859 x 1 1/8			.672 x 1.171 x 1 3/4		
.33	.281 x .531 x 1			.328 x .562 x 1 1/8			.328 x .562 x 1 1/8			.422 x .672 x 1 1/8			.453 x .859 x 1 1/8			.672 x 1.234 x 2		
.39	.312 x .560 x 1			.358 x .593 x 1 1/8			.358 x .593 x 1 1/8			.453 x .734 x 1 1/4			.484 x .922 x 1 1/8			.703 x 1.484 x 2		
.47	.312 x .560 x 1			.328 x .672 x 1 1/4			.328 x .672 x 1 1/4			.422 x .797 x 1 1/4			.516 x .922 x 1 1/8			.734 x 1.484 x 2		
.56	.312 x .560 x 1 1/8			.358 x .703 x 1 1/4			.358 x .703 x 1 1/4			.453 x .859 x 1 1/8			.516 x 1.047 x 1 3/4			.797 x 1.547 x 2 1/4		
.68	.375 x .703 x 1 1/8			.358 x .765 x 1 1/4			.358 x .765 x 1 1/4			.578 x .859 x 1 1/8			.547 x 1.109 x 1 3/4			.859 x 1.672 x 2 1/4		
.82	.375 x .734 x 1 1/8			.391 x .843 x 1 1/4			.391 x .843 x 1 1/4			.609 x .922 x 1 1/8			.609 x 1.234 x 1 7/8			.797 x 1.609 x 2 5/8		
1.00	.406 x .750 x 1 1/4			.453 x .859 x 1 1/2			.453 x .859 x 1 1/2			.547 x .922 x 1 3/4			.640 x 1.171 x 2			.922 x 1.734 x 2 5/8		
1.25	.406 x .750 x 1 1/4			.484 x .922 x 1 1/2			.484 x .922 x 1 1/2			.547 x 1.171 x 1 3/4			.703 x 1.359 x 2			.891 x 1.672 x 3		
1.50	.406 x .797 x 1 1/2			.515 x .937 x 1 3/4			.515 x .937 x 1 3/4			.609 x 1.297 x 1 3/4			.734 x 1.359 x 2 1/4			.953 x 1.797 x 3		
1.80	.468 x .875 x 1 1/2			.531 x 1.125 x 1 3/4			.531 x 1.125 x 1 3/4			.672 x 1.297 x 1 3/4			.703 x 1.484 x 2 1/4			1.047 x 1.984 x 3		
2.00	.500 x .875 x 1 1/2			.546 x 1.171 x 1 3/4			.546 x 1.171 x 1 3/4			.734 x 1.297 x 1 3/4			.765 x 1.547 x 2 1/4			1.171 x 2.171 x 3		

*DuPont's trademark for polyester film.

MYLAR*

DIELECTRIC

TYPE 663F-663FR CAPACITORS

FLAT SHAPES THAT INVITE "CROWDING"

OVAL CROSS-SECTION AXIAL OR RADIAL LEADS

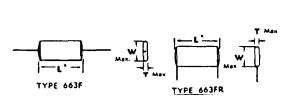
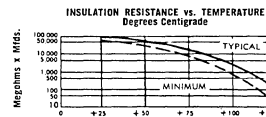
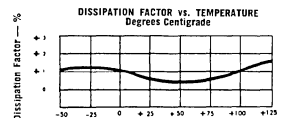
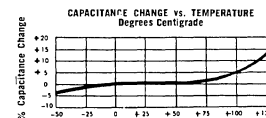


Special purpose types 663F and 663FR have all the electrical ruggedness and dependability of TRW basic Type 663UW. This capacitor design has wide acceptance in both military and high quality instrument applications backed up by years of dependable field service.

Size is minimized by use of space-saving Mylar dielectric for the capacitor element and of a tough, dense plastic film case of less than $\frac{1}{4}$ " thickness.

Shape of the 663F and 663FR is ideally adapted to layouts where chassis area is limited. The radial lead arrangement of Type 663FR finds best advantage in printed circuit chassis, and is well suited to dip-soldering techniques.

TEMPERATURE TYPICAL CHARACTERISTIC CURVES



Type 663F

Lead Gauge: 24 AWG 22 AWG all nom. lengths up to & including $\frac{3}{4}$ ".

22 AWG all nom. lengths $\frac{7}{8}$ " to $1\frac{1}{8}$ ".

20 AWG all nom. lengths $1\frac{1}{4}$ " to $1\frac{3}{4}$ ".

18 AWG all nom. lengths $1\frac{7}{8}$ " & above.

Lead Length: Type 663F — $1\frac{1}{2}$ " ± 1 — 0. Type 663FR — 1" minimum.

Tolerances: Length — $\pm \frac{1}{32}$ — $\frac{1}{16}$ ".

Lead Spacing (663FR Only): Center line to center line distance between leads shall equal nominal length of the capacitor, $\pm \frac{1}{16}$ " when measured $\frac{1}{16}$ " below body line. Lead spacing tolerance $\pm \frac{1}{16}$ ".

TRW[®] CAPACITORS

A WORD ABOUT TRW

- HIGH RELIABILITY
- CONDITIONED RELIABILITY

HIGH RELIABILITY

High Reliability at TRW Capacitors involves designing, manufacturing, conditioning and testing of parts to assure and predict a high level of performance. Manufacture under clean room conditions and raw material traceability are always included. TRW Capacitors has been deeply involved in High Reliability programs for many years, and has supplied to most missile, space and AEC systems, devices of demonstrated high performance built to specifications typically generated by joint effort with our customers.

Complete capability in clean room manufacturing and in environmental, qualification, screening, and life testing is available for the requirements of custom high reliability programs of varying complexities.

TYPICAL SCREENING-CONDITIONING SEQUENCE:

Burn-In

Temperature Cycling

Insulation Resistance at High Temperature
(85°C to 125°C)

Temperature Coefficient

Radiographic Inspections

Seal Test (Hermetically Sealed Units)

Capacitance Check

Dissipation Factor

Withstanding Voltage

The tests are conducted at various times and temperatures and the sequences and combinations can be performed to customer requirements.

CONDITIONED RELIABILITY

Where highest levels of reliability, with attendant extra expense and extended deliveries, are not required, Conditioned Reliability parts are often the ideal answer. Conditioned Reliability is a screening process of TRW standard or special devices on a 100% basis, using various tests and conditioning processes as required to attain an agreed upon predicted level of performance.

FACILITIES:

TRW Capacitors maintains a fully equipped testing facility for the complete Conditioned Reliability testing program. All equipment for both environmental and electrical testing and conditioning is capable of meeting all customer requirements.

QUALITY ASSURANCE:

Process and inspection data is maintained on file per NPC-200-3, MIL-Q-9858 Quality control standards and MIL - STD - 790 Reliability Assurance Program.

APPLICATIONS:

TRW Conditioned Reliability capacitors are used in high performance applications. Typical uses can be found in:

Instrumentation	Space Vehicles
Computers	Weapon Systems
Missiles	Communication Systems

All TRW product types are adaptable to reliability conditioning, and great flexibility is available for designing such processing to attain the performance level desired. The amount of premium cost involved varies with the product chosen and the conditioning program specified.

TRW[®] CAPACITORS

- Long Stable Life
- Very High Insulation Resistance
- Lowest Dissipation Factor
- Humidity Resistant
- Saves on Size and Weight
- Capacitance Tolerance to 1%

Used for a number of years in the non-precision power capacitor field, polypropylene has now been developed by TRW Capacitors as a dielectric for miniaturized precision capacitors exhibiting unique and outstanding electrical and environmental characteristics. Particularly worthy of note is its stability. The X363UW exhibits negligible shift in capacitance under long term exposure to humidity, operating life, and temperature cycling. Insulation resistance, dielectric absorption and dissipation factor properties are all the equivalent of or superior to those of polystyrene.

Humidity resistance is excellent, with little change in any parameter occurring with exposure to moisture.

Combined with metallized construction providing size and weight savings equivalent to those of metallized polycarbonate capacitors, these properties make the X363UW ideal for precision instrument, communications, and high density circuitry applications.

SPECIFICATIONS

Insulation Resistance: Minimum values according to table below.

Temperature	+25°C	+85°C	+105°C
Megohms x Microfarads	300,000	30,000	3,000
Need Not Exceed (Megohms)	500,000	50,000	5,000

Measured after two minutes electrification at 200 Volts.

Dissipation Factor: Less than 0.1% at 25°C when measured at or referred to 1000 $\pm$ 20 Hz for capacitance values up to and including 10.0 mfd.

Dielectric Strength: Twice rated voltage for one minute through a limiting resistance of 100 ohms/volt.

Dielectric Absorption: When tested per MIL-C-19978 the dielectric absorption shall not exceed .05%. Shorter test methods produce lower results. For further information, consult TRW Engineering.

Capacitance: Shall be within specified tolerance when measured at or referred to 1000 $\pm$ 20 Hz for values up to and including 10.0 mfd. at 25°C $\pm$ 5°C.

Temperature Range: -55°C to 105°C with no voltage derating.

Life: Tested for 1000 hours at 105°C and 150% of rated voltage. Insulation resistance and dissipation factor shall meet original requirements. No more than 1 failure permitted of 12 parts tested.

Humidity: When tested per Method 106 MIL-STD-202 (no voltage applied) the following post test limits shall apply: Insulation resistance shall be no less than 20% minimum values listed in above table. Dissipation factor shall not exceed .1% and capacitance change no more than .5%. No more than 1 failure permitted for 12 parts tested.

Case: White polyester tape wrap with epoxy endfill.

Lead Material: Tinned solid copper wire.

Lead Pull Test: Tested as outlined in MIL-STD-202, Method 211, Condition A. Will withstand force of the following magnitude:
4 1/2 lbs. — Diameters up to and including .359.
5 lbs. — Diameters over .359.

Instrumentation: Excellent stability plus outstanding electrical properties make the X363UW ideal for use in timing and integrating circuitry.

Severe Environments: The X363UW exhibits negligible capacitance drift and electrical property degradation under environmental conditions normally requiring hermetically sealed encasements with other dielectrics. Temperature, of course, must be limited to 105°C.

Close Tolerance: Where close tolerance capacitors are required, the X363UW is ideal because of inherent stability with service conditions and life.

Military Use: The inherent long life characteristics and reliable performance capability of the X363UW render it suitable for a wide variety of military applications where hermetic sealing or temperature capability higher than 105°C are not absolute requirements.

METALLIZED POLYPROPYLENE

DIELECTRIC

X363UW

TYPE X363UW CAPACITORS

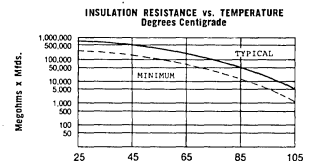
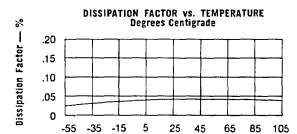
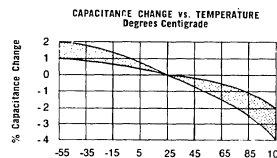
SUBMINIATURE... INSTRUMENT GRADE

PLASTIC FILM CASE



TEMPERATURE TYPICAL CHARACTERISTIC CURVES

TYPE X363UW



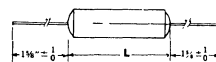
Dimensional Tolerances — Diameter:

000 thru .250 Dia. $\pm$.046, .251 thru .375 Dia. $\pm$.062, .376 thru .500 Dia. $\pm$.078, .501 thru .750 Dia. $\pm$.093, .751 and above $\pm$.125.

Lead Gauge:

Body Length	AWG
1/8" & Less	24
1/8" thru 1/4"	22
1/4" thru 1/2"	20
1/2" & Greater	18

Standard Lead Length: 1 5/8" $\pm$ 1 -0.

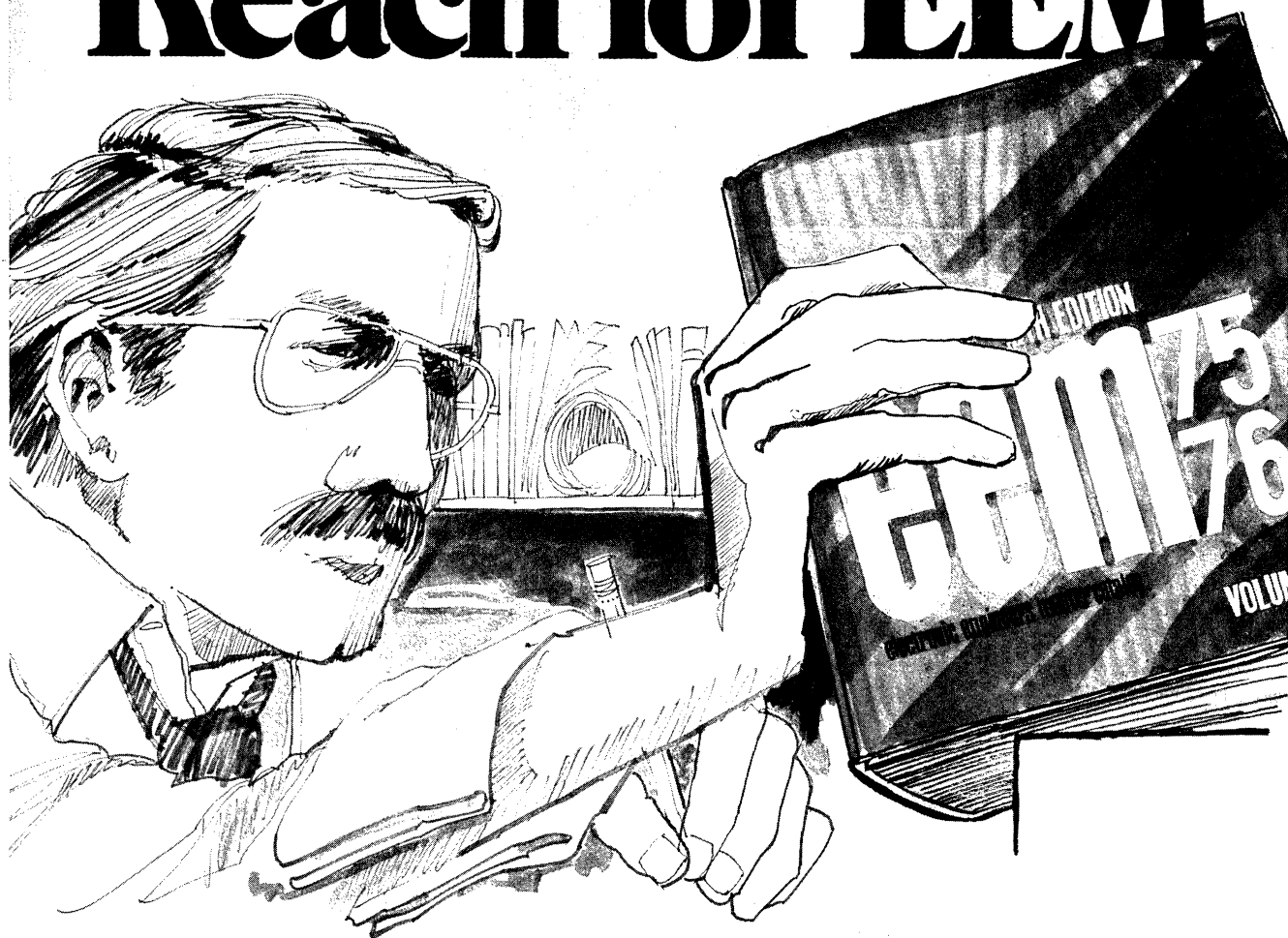


DIMENSIONS

Capacitance in Mfds.	200 VDC D L	400 VDC D L
.010	.188 x 1/16	.234 x 1/16
.012	.203 x 1/16	.250 x 1/16
.015	.219 x 1/16	.234 x 1/2
.018	.234 x 1/16	.250 x 1/2
.022	.203 x 1/2	.266 x 1/2
.027	.219 x 1/2	.250 x 1/16
.033	.234 x 1/2	.266 x 1/16
.039	.266 x 1/2	.297 x 1/16
.047	.250 x 1/16	.266 x 1/16
.056	.266 x 1/16	.281 x 1/16
.068	.281 x 1/16	.312 x 1/16
.082	.312 x 1/16	.328 x 1/16
.10	.281 x 1/16	.328 x 1/16
.12	.297 x 1/16	.344 x 1/16
.15	.328 x 1/16	.375 x 1/16
.18	.359 x 1/16	.406 x 1/16
.22	.391 x 1/16	.406 x 1/16
.27	.375 x 1/16	.453 x 1/16
.33	.406 x 1/16	.484 x 1/16
.39	.438 x 1/16	.531 x 1/16
.47	.422 x 1/16	.500 x 1/4
.56	.469 x 1/16	.516 x 1/4
.68	.500 x 1/16	.562 x 1/4
.82	.547 x 1/16	.625 x 1/4
1.00	.516 x 1/4	.609 x 1/2
1.25	.562 x 1/4	.672 x 1/2
1.50	.609 x 1/4	.734 x 1/2
1.80	.656 x 1/4	.719 x 1/4
2.00	.688 x 1/4	.766 x 1/4
3.00	.734 x 1/2	.922 x 1/4
4.00	.844 x 1/2	.875 x 2/4
5.00	.844 x 1/4	.984 x 2/4
8.00	.906 x 2/4	—
10.00	1.000 x 2/4	—

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM

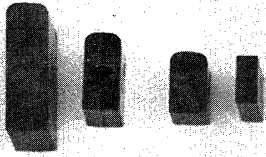


**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

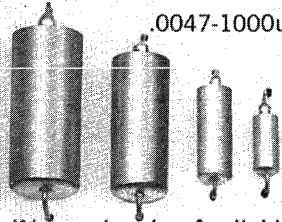
UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

KEMET® TANTALUM, CERAMIC & FILM CAPACITORS**T330 (P) Series**

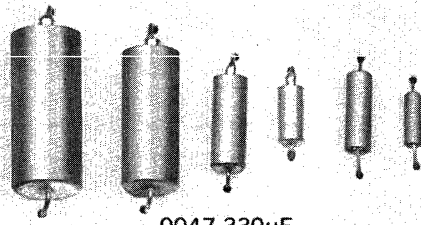
1.0-220uF

T110 (J) & T140 (A)

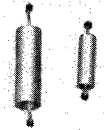
.0047-1000uF



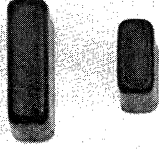
(Non-polar also Available)

High Reliability — (T210 & T220)

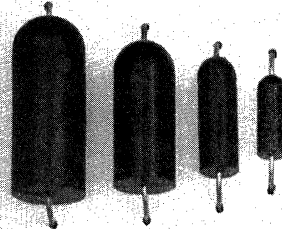
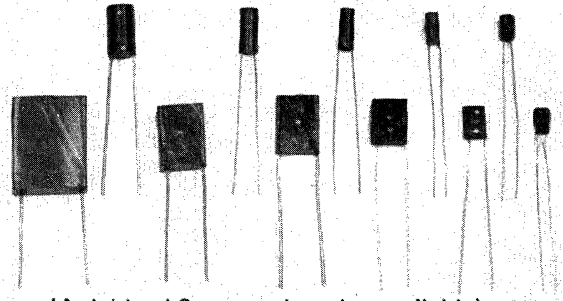
.0047-330uF

T120 (Z)

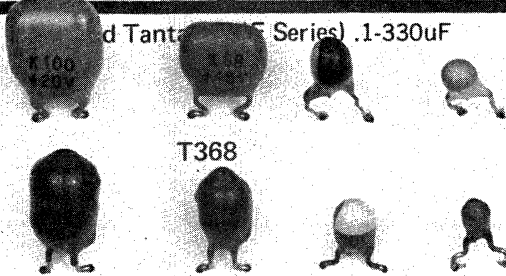
.0047-22uF

T130 (F) Series

.22-220uF

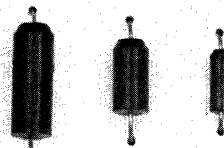
T310(C) Series .1-330.uF**Micron Series .001-220uF**

(Axial lead & non-polar, also available)

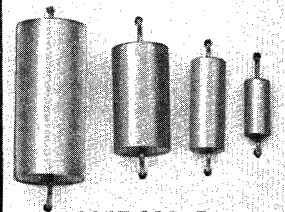
d Tantalum (F Series) .1-330uF

T368

T362

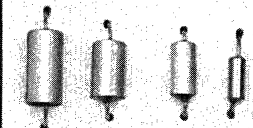
T320 (D) Series

.0047-68uF

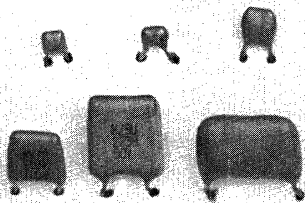
T314 Series

.0047-330uF

T324 Series



.0047-47uF

Dipped Ceramic"Blue Max"
2.2pF-4.7uF**Chip Capacitors**

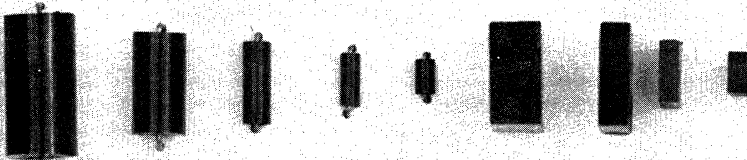
Tantalum (T411) .1-68uF



Tantalum (T421) .1-100uF

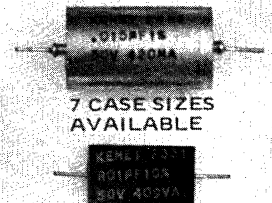


Ceramic 1pF-1.0uF

MOLDED CERAMIC 10pf - 3.3ufCK16
CKR16
C222CK15
CKR15
C202CK14
CKR14
C192CK13
CKR12
C124CK12
CKR11
C114

C522

C512

CK06
CKR06
C062CK05
CKR05
C0528
CASE
SIZES
AVAIL4
CASE
SIZES
AVAIL**FLAT KAP .001 - 1.0uF**8
CASE
SIZES
AVAILABLE

KEMET® TANTALUM, CERAMIC & FILM CAPACITORS

CAPACITOR REFERENCE

REQUEST
CATALOG

SOLID TANTALUM	HERMETIC SEAL	Standard and CSR13	T110 (J)	Popular military style — axial lead — 4 case sizes — high volumetric efficiency. Reference includes CSR13 capacitors which are available to S failure rate level.	.0047-330uF 6-125VDC	F-1851
		Non-Polar and CSR91	T111 (N)	Designed for applications where reversal of polarity is the prime consideration. Axial lead — 4 case sizes. Comparable performance to T110 Series.	.0023-160uF 6-125VDC	F-1852
		Miniature and CSR09	T120 (Z)	Compact especially designed for cordwood construction and packaging applications where space is a premium. Matches standard resistor and diode sizes.	.0047-22uF 6-125VDC	F-2028
		Radial-Lead	T130 (F)	Rectangular form permits maximum volumetric efficiency and packaging density. Meets or exceeds requirements of MIL-C-39003.	.22-220uF 6-75VDC	F-2628
		Extended Range and CSR23	T140 (A)	Extended range (to 1000uF-6V) in standard MIL cases. Also, available in T242 Series (CSR23) and in T141 Series (non-polar version).	.82-1000uF 6-60VDC	F-2138
		High Reliability	T210 (KG)	The ultimate in high reliability solid tantalums with failure rates as low as .001%/K hrs. Manufactured to KEMET's specification GR500 which outlines the most sophisticated and accurate reliability measurement method in the industry.	.0047-1000uF 6-125VDC	F-2697
	EPOXY	Molded-Axial	T310 (C)	Bullet shaped for positive polarity identification. 4 case sizes. Ideal for application in commercial and industrial electronic equipment.	.10-330uF 6-50VDC	F-2622
		Metal Case	T314 & T324	Metal Case with high impact, moisture resistant epoxy and seal in 4 miniature and 4 sub-miniature axial lead case sizes. Economical	.0047-330uF 6-50VDC	F-2791
		Molded Axial Miniature	T320 (D)	Molded axial cordwood size featuring extremely high capacitance-to-volume ratio. 3 case sizes. Precision dimensions permits use in high speed automatic insertion applications.	.0047-68uF 6-50VDC	F-2632
		Molded-Radial	T330 (P)	Compact precision molded space saving rectangular shape provides superior packing factor and space utilization in high density packaging applications.	.10-220uF 6-50VDC	F-1885
		Dipped Industrial	T362 T368 (E)	Economical — Radial lead — Dip coated epoxy encapsulation. Excellent performance characteristics over full temperature range. Available in .125" or .250 lead spacing.	.10-330uF 6-50VDC	F-2638
		Sub-Miniature Plastic Sealed	T370 Micron	Complete line of sub-miniature plastic sealed tantalums designed for use in hybrid & thick film circuits. Available in a variety of case styles, sizes, and lead configurations in polar & non-polar versions.	.001-220uF 2-50VDC	F-2710
		Dipped (Consumer)	T390 & T392	For consumer and commercial circuit applications. Low profile with .100" & .200" lead spacing for .1 inch PC board grids. 6 case sizes.	.1-680uF 3-50VDC	F-2816
	CHIP	Rectangular	T411 & T421	The ultimate in volumetric efficiency. Designed for hybrid circuits and P.C. board applications. Copper Counter-Electrode permits assembly temperatures to 300°C and continuous operating temperatures to 175°C.	.10-100uF 4-50VDC	F-2715
CERAMIC	LEADED	MIL-C-11015D	CK Series	Manufactured to MIL-C-11015D requirements. Includes CK05-CK06-CK12-CK13-CK14-CK15 and CK16 capacitors.	10pf-3.3uF 50-200VDC	F-2724
		MIL-C39014B	CKR Series	Established reliability — CKR05, CKR06, CKR11, CKR12, CKR14, CKR15, and CKR16 capacitors available to "R" (0.01%/K hrs.) failure rate level in most styles.	10pf-3.3uF 50-100VDC	F-2724
	KEMET	Dipped "Blue Max"	Dipped	Economical, radial lead, epoxy dipped maximum CV range monolithic Ceramic Capacitors in three dielectrics — COG Ultra-Stable; X7R Stable and Z5U General Purpose. 6 precision case sizes.	2.2pF-4.7uF 50,100 & 200 VDC	F-2795
		NPO & MIL-C-20	NPO	Ultra-stable monolithic ceramic capacitors in standard radial and axial lead MIL-CK/CKR sizes. 0 ± 30PPM/°C. MIL-C-20 styles CC & CCR.	1-82,000pf 50-200VDC	F-2793
	CHIPS	"Solder & Gold Guard"	0805 2225	8 standard sizes in two precision dielectrics — BX and NPO. Exclusive "Solder Guard" and "Gold Guard" end metalization, for high temperature assembly.	1-1,000,000p 50-100VDC	F2731
		MIL-C-55681	CDR	New military established reliability CDR01-CDR06 ceramic chip capacitors for critical applications — 6 case sizes.	10-470,000p 50-100VDC	F-2731
FILM		Flat Kap	F-300 Series	Ultra stable parylene film — available to 0 ± 50PPM/°C and capacitance tolerance to ± 1/2%. 8 case sizes radial and axial leads.	.001-1uF 50VDC	F-2274 F-2742

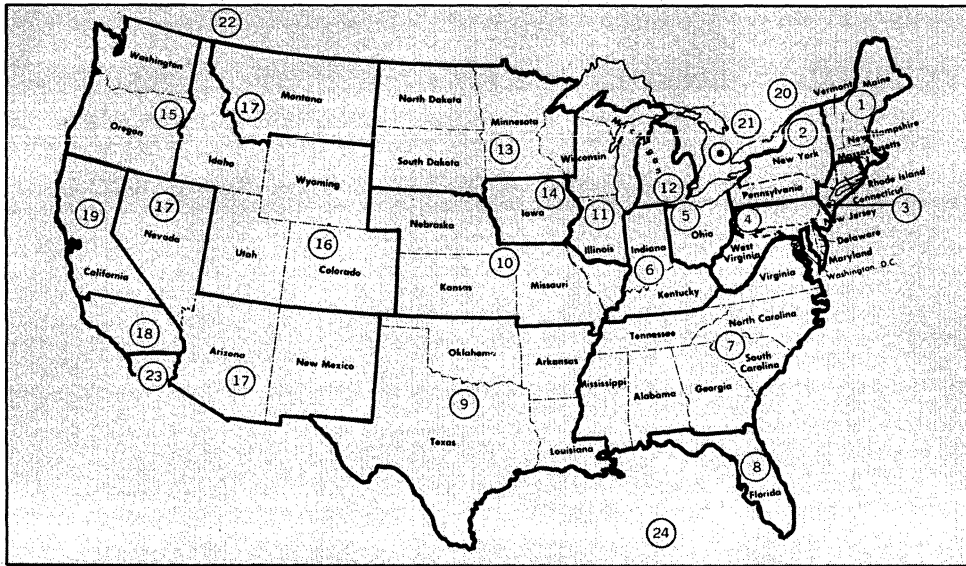


UNION CARBIDE CORP. • COMPONENTS DEPT.

P. O. Box 5928, Greenville, S. C. 29606 • Tel. (803) 963-6300 • TWX: 810-287-2536 • TELEX: 570496

FOR LISTING OF KEMET NATIONAL OEM SALES & DISTRIBUTION NETWORK REFER TO NEXT PAGE

KEMET® CAPACITOR OEM SALES REPRESENTATIVES

**1. UNION CARBIDE-COMPONENTS DEPARTMENT**

300 First Avenue
Needham Heights, Mass. 02194
Phone: 617-444-5400
TWX: 710-325-1329

2. UNION CARBIDE-COMPONENTS DEPARTMENT

300 Tulip Street
Liverpool, N. Y. 13088
Phone: 315-451-0720
TWX: 710-541-1595

3. UNION CARBIDE-COMPONENTS DEPARTMENT

Tarrytown Technical Center
Tarrytown, New York 10591
Phone: 914-345-2047
TWX: 710-567-1222

4. UNION CARBIDE-COMPONENTS DEPARTMENT

288 Lancaster Ave., Bldg. 2 Suite 1
Frazer, Pa. 19355
Phone: 215-644-8864
BAW 510-668-7598

5. BAEHR, GREENLEAF & ASSOCIATES, INC.

14700 Detroit Avenue
Lakewood, Ohio 44107
Phone: 216-221-9030
TELEX: 98-0524

9505 Montgomery Road
Cincinnati, Ohio 45385
Phone: 513-891-3826

2132 Arlington Avenue
Columbus, Ohio 43221
Phone: 614-486-4046

6. LESLIE M. DeVOE COMPANY

7172 N. Keystone Ave., Suite C
Indianapolis, Ind. 46240
Phone: 317-257-1227
TWX: 810-341-3284

7. UNION CARBIDE-COMPONENTS DEPARTMENT

Suite 120C, Century Plaza
211 Century Drive
Greenville, S. C. 29607
Phone: 803-271-7012
TWX: 810-281-2195

8. G. F. BOHMAN ASSOCIATES

2003 Palmridge Way
Orlando, Fla 32809
Phone: 305-855-0274
TWX: 810-850-4115

3000 N.E. 30th Place
Fort Lauderdale, Florida 33306
Phone: 305-564-3081

P. O. Box 600
Clearwater, Fla. 33517
Phone: 813-442-5606

9. PARVIN SALES COMPANY

P. O. Box 307, 15800 Addison Road
Addison, Texas 75001
Phone: 214-239-9148
TWX: 910-860-5132

6610 Harwin, Suite 158
Houston, Texas 77036
Phone: 713-784-9900
TWX: 910-881-2774

P. O. Box 12321
Oklahoma City, Oklahoma 73112
Phone: 405-942-4581

10. PALATINE ENGINEERING SALES, INC.

1573 N. Warson Road
St. Louis, Missouri 63132
Phone: 314-426-7055
TWX: 910-765-0936

7520 West 63rd Street, Suite 10
Overland Park, Kansas 66202
Phone: 913-262-5643
TWX: 910-743-6862

510 West Allison St.
Andover, Kansas 67002
Phone: 316-683-7512

11. UNION CARBIDE-COMPONENTS DEPARTMENT

10400 West Higgins Road, Suite 401
Rosemont, Illinois 60018
Phone: 312-298-8340
TWX: 910-233-2400

12. UNION CARBIDE-COMPONENTS DEPARTMENT

250 Martin Street
Birmingham, Michigan 48011
Phone: 313-642-9800
TWX: 810-232-4935

13. STAN CLOTHIER COMPANY

9701 Penn Avenue, S. Suite 109
Minneapolis, Minnesota 55431
Phone: 612-888-4666
TWX: 910-576-3415

14. SELTEC SALES CORPORATION

4300 1st Ave., Suite 401
Cedar Rapids, Iowa 52402
Phone: 319-393-1114
TWX: 910-525-1329

15. UNION CARBIDE-COMPONENTS DEPARTMENT

2680 Bayshore Frontage Road
Mt. View, California 94040
Phone: 415-969-9390
TWX: 910-379-6444

16. PARKER-WEBSTER COMPANY

3615 S. Tamarac Street, Suite 301
Denver, Colorado 80237
Phone: 303-770-1972
TWX: 910-935-0881

3333 S. 9th Street
Salt Lake City, Utah 84106
Phone: 801-486-3737

17. UNION CARBIDE-COMPONENTS DEPARTMENT

100 W. Clarendon Avenue, Suite 1660
Phoenix, Arizona 85013
Phone: 602-264-7332
TWX: 910-951-0630

18. UNION CARBIDE-COMPONENTS DEPARTMENT

Marina Airport Center Building
Suite 302
4676 Admiralty Way
Marina Del Rey, California 90291
Phone: 213-821-8824
TWX: 910-343-6244

19. UNION CARBIDE-COMPONENTS DEPARTMENT

2680 Bayshore Frontage Road
Mt. View, California 94040
Phone: 415-969-9390
TWX: 910-379-6444

20. DESKIN SALES CORP.

290 Benjamin Hudson St.
Ville St. Laurent, P.Q.
H4N 1J4, Canada
Phone: 514-331-2860
Telex: 05-827-584
TWX: 610-421-3793

21. DESKIN SALES CORP.

2759 Thamesgate Drive
Malton, Ontario
Phone: 416-677-5517
TWX: 610-492-4354

22. DESKIN SALES CORP.

272 SW Marine Dr.
Vancouver, B.C., Canada
Phone: 604-324-6331
TWX: 610-922-5036

23. CELTEC COMPANY

7380 Clairemont Mesa Blvd., Suite 109
San Diego, California 92111
Phone: 714-279-7961
TWX: 910-335-1512

24. CARIBBEAN AREA INQUIRIES —

SOUTHERN INTERNATIONAL SALES COMPANY
555 Rosales Street
Sancti Spiritus, Puerto Rico 00909
Phone: 809-722-0863
TELEX: 365384-SISCO

U. S. HEADQUARTERS:

UNION CARBIDE — COMPONENTS DEPARTMENT
P. O. Box 5928
Greenville, S. C. 29606
Phone: 803-963-6300
TWX: 810-287-2536
TELEX: 57-0496

IN EUROPE: UNION CARBIDE EUROPE, S.A.

5 Rue Pedro Meyan
1211 Geneva 17
Phone: 022/47-4411
TELEX: 845-2253


KEMET® DISTRIBUTORS


TANTALUM, CERAMIC & FILM CAPACITORS

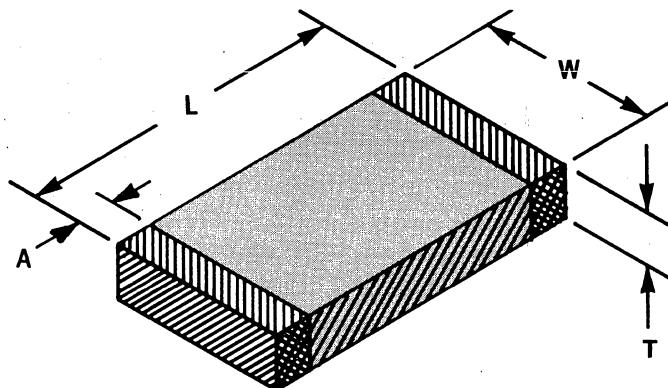
<u>STATE</u>	<u>NAME</u>	<u>PHONE</u>	<u>STATE</u>	<u>NAME</u>	<u>PHONE</u>
Alabama			Missouri		
Huntsville	Hamilton/Avnet Electronics	205-533-1170	Hazelwood	Hamilton/Avnet Electronics	314-731-1144
Arizona			N. Kansas City	L Comp-Kansas City, Inc.	816-221-2400
Phoenix	Hamilton/Avnet Electronics	602-275-7851	New Jersey		
California			Cedar Grove	Hamilton/Avnet Electronics	201-239-0800
Costa Mesa	Schweber Electronics	714-556-3880	Clifton	Wilshire Electronics	201-365-2600
Culver City	Hamilton Electro Sales	213-558-2131	Mt. Laurel	Hamilton/Avnet Electronics	609-234-2133
Mountain View	Hamilton/Avnet Electronics	415-961-7000	Somerset	Schweber Electronics	201-469-6008
San Diego	Hamilton/Avnet Electronics	714-279-2421	New Mexico		
Sunnyvale	Bell Electronics	408-734-8570	Albuquerque	Hamilton/Avnet Electronics	505-765-1500
Woodland Hills	JACO Electronics	213-887-6400	New York		
Colorado			Buffalo	Summit Distributors	716-884-3450
Denver	Hamilton/Avnet Electronics	303-534-1212	Hauppauge	JACO Electronics	516-273-5500
Connecticut			Rochester	Summit Distributors	716-334-8110
Danbury	Schweber Electronics	203-792-3500	Rochester	Hamilton/Avnet Electronics	716-442-7820
Georgetown	Hamilton/Avnet Electronics	203-762-0361	Rochester	Schweber Electronics	716-461-4000
Florida			E. Syracuse	Hamilton/Avnet Electronics	315-437-2642
Ft. Lauderdale	Hall-Mark Electronics	305-855-4020	Westbury	Hamilton/Avnet Electronics	516-333-5800
Hollywood	Schweber Electronics	305-927-0511	Westbury	Schweber Electronics	516-334-7474
Hollywood	Hamilton/Avnet Electronics	305-925-5401	North Carolina		
Georgia			Winston-Salem	Kirkman Electronics	919-724-0541
Atlanta	Schweber Electronics	404-449-9170	Ohio		
Atlanta	Hamilton/Avnet Electronics	404-448-0800	Beachwood	Schweber Electronics	216-464-2970
Illinois			Dayton	Pioneer/Dayton	513-236-9900
Elk Grove	Schweber Electronics	312-593-2740	Dayton	Hamilton/Avnet Electronics	513-433-0610
Schiller Park	Hamilton/Avnet Electronics	312-678-6310	Cleveland	Hamilton/Avnet Electronics	216-461-1400
Indiana			Pennsylvania		
Indianapolis	Graham Electronics Supply	317-634-8486	Huntington Valley	Hall-Mark Electronics	215-355-7300
Kansas			Texas		
Lenexa	Hamilton/Avnet Electronics	913-888-8900	Dallas	Hamilton/Avnet Electronics	214-661-8661
Maryland			Dallas	Schweber Electronics	214-661-5010
Baltimore	Technico	301-828-6416	Houston	Hamilton/Avnet Electronics	713-526-4661
Baltimore	Hamilton/Avnet Electronics	301-796-5000	Houston	Schweber Electronics	713-784-3600
Rockville	Schweber Electronics	301-881-2970	Utah		
Massachusetts			Salt Lake City	Hamilton/Avnet Electronics	801-262-8451
Burlington	Hamilton/Avnet Electronics	617-273-2120	Washington		
Lexington	Harvey Electronics	617-861-9200	Seattle	Hamilton/Avnet Electronics	206-746-8750
Waltham	Schweber Electronics	617-890-8484	Canada		
Michigan			Montreal	Hamilton/Avnet Electronics	514-331-6443
Livonia	Hamilton/Avnet Electronics	313-522-4700	Mississauga	Hamilton/Avnet Electronics	416-677-7432
Troy	Schweber Electronics	313-583-9242	Mississauga	Schweber Electronics	416-678-9050
Minnesota			Ottawa	Hamilton/Avnet Electronics	613-725-3071
Edina	Hamilton/Avnet Electronics	612-941-3801			
Edina	Schweber Electronics	612-941-5280			

UNION CARBIDE CORPORATION

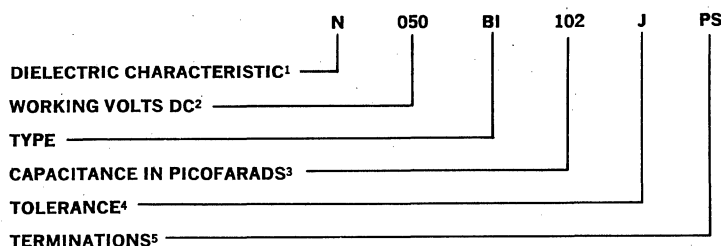
COMPONENTS DEPARTMENT

P. O. Box 5928 — Greenville, South Carolina 29606 — Telephone (803) 963-6300 — TELEX 57-0496

CERAMOLITHIC[®] chip capacitors



HOW TO ORDER



1. N = COG Dielectric
W = X7R Dielectric
Y = Y5V Dielectric
2. 050 = 50 WVDC
100 = 100 WVDC
200 = 200 WVDC
3. 102 = 1,000 pF (.001 Mfd); i.e., third digit signifies number of zeroes. For values below 10pF, use "R" in place of decimal point (1R5 = 1.5pF)
4. Minimum available capacitance tolerances:

D = ± 0.5 pF (1pF to 10pF)	COG Dielectric X7R Dielectric Y5V Dielectric
F = $\pm 1\%$ (56pF and above)	
G = $\pm 2\%$ (27pF and above)	
H = $\pm 3\%$ (18pF and above)	
J = $\pm 5\%$ (10pF and above)	
K = $\pm 10\%$ (5.6pF and above)	
M = $\pm 20\%$ (2.7pF and above)	
Z = +80%, -20%	
P = +100%, -0 (GMV)	
5. PS = Palladium Silver only
A = Silver only
S = Solder coat
G = Gold only

NOTE: Solder coating not available on BB size.

USCC will supply a solderable termination. If a specific termination material is required, see note "4" in ordering information. If solder coated parts are ordered, add .015 to the maximum part length and .010 to the maximum part width and thickness.

SPECIFICATIONS

WORKING VOLTAGES: 50/100/200 VDC for the COG dielectric, 50/100 VDC for the X7R and Y5V dielectrics.

TEMPERATURE COEFFICIENTS:

COG Dielectric - 0 ± 30 PPM/ $^{\circ}$ C, -55° C to $+125^{\circ}$ C
X7R Dielectric - $\pm 15\%$ TC, -55° C to $+125^{\circ}$ C
Y5V Dielectric - $+22\%$, -82% , -30° to $+85^{\circ}$ C

DISSIPATION FACTORS: .15% for the COG dielectric, 2.5% for the X7R and Y5V dielectrics; maximum at 1kHz, 25° C.

INSULATION RESISTANCE: 100k megohms or 100 megohm-microfarads for the COG dielectric and 100K megohms or 500 megohm-microfarads for the X7R and Y5V dielectrics; whichever is less at $+25^{\circ}$ C.

DIELECTRIC STRENGTH: 250% of the rated voltage for the COG and X7R dielectrics and 200% of the rated voltage for the Y5V dielectric; 50 ma maximum charging current.



USCC/Centralab

Electronics Division • Globe-Union Inc.

4561 Colorado Boulevard ■ Los Angeles, Ca. 90039

(213) 240-4880



CAPACITORS (ALL TYPES)

CERAMOLITHIC[®] chip capacitors

TYPE	BB	BC	BF	FH	BI	BJ	HJ	DJ	MJ	LL	FP
A MIN/MAX	.005/.015	.010/.030	.010/.035	.010/.035	.010/.035	.010/.035	.010/.035	.010/.035	.010/.035	.015/.040	.010/.035
L	.050±.006	.080±.010	.100±.010	.125±.010	.150±.010	.180±.015	.175±.015	.180±.015	.180±.015	.225±.015	.350±.015
W	.050±.006	.050±.010	.050±.010	.095±.010	.050±.010	.050±.015	.125±.015	.080±.015	.250±.015	.210±.015	.095±.010
T MAX	.040	.050	.060	.065	.065	.065	.065	.065	.065	.065	.070
CAP	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200
1.0 pF											
1.2											
1.5											
1.8											
2.2											
2.7											
3.3											
3.9											
4.7											
5.6											
6.8											
8.2											
10											
12											
15											
18											
22											
27											
33											
39											
47											
56											
68											
82											
100											
120 pF											
150											
180											
220											
270											
330											
390											
470											
560											
680											
820											
1000											
1200											
1500											
1800											
2200											
2700											
3300											
3900											
4700											
5600											
6800											
8200											
.01 Mfd											
.012											
.015											
.018											
.022											
.027											
.033											
.039											
.047											
.056											
.068											
.082											
.10											
.12											
.15											
.18											
.22											
.27											
.33											
.39											
.47											
.56											
.68											
.82											
1.0											
1.2											

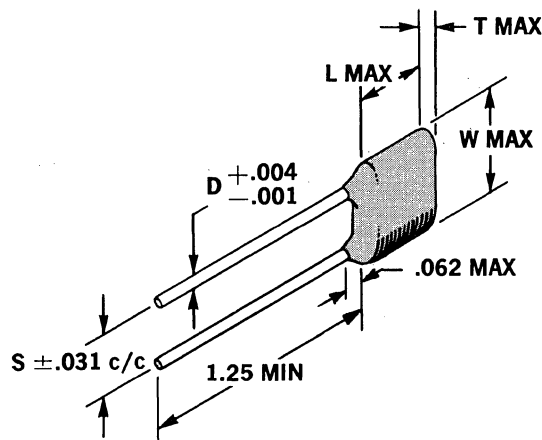
ALL DIMENSIONS ARE IN INCHES

COG Dielectric

X7R Dielectric

Y5V Dielectric

MONO-kap CERAMIC CAPACITORS



HOW TO ORDER

TYPE	CW20	C	103	K	2
WORKING VOLTS DC ¹					
CAPACITANCE IN PICO FARADS (pF) ²					
TOLERANCE ³					
SPECIAL LEAD SPACING ⁴					

1. WVDC AVAILABLE:

C = 50 VDC
 A = 100 VDC
 B = 200 VDC (Contact the factory for available capacitance values in 200 VDC units not listed in the catalog.)

2. 103 = 10,000 pF (.01Mfd); i.e., the third digit signifies number of zeros. For values below 10 pF use "R" in place of decimal point (4R7 = 4.7 pF)

3. MINIMUM AVAILABLE CAPACITANCE TOLERANCES:

D = ±0.5 pF (4.7 pF to 10 pF)
 F = ±1% (56 pF and above)
 G = ±2% (27 pF and above)
 H = ±3% (18 pF and above)
 J = ±5% (10 pF and above)
 K = ±10% (5.6 pF and above)
 M = ±20% (4.7 pF and above)
 Z = +80%, -20% (4.7 pF and above)
 P = +100%, -0% (GMV - all values)

4. Special lead spacing available on the .200 X .200 size only - S = .200 instead of .100. To order suffix the standard part number with a "2".

MECHANICAL SPECIFICATIONS

CASE: Epoxy coated

LEAD MATERIAL: Solder coated, copper clad steel.

TERMINAL STRENGTH: Method 211, MIL-STD-202, test condition A (5 pounds)

MARKING: As size permits, the following markings will be used (listed in order of preference)

Capacitance
 Mfg. Identification
 Tolerance
 Temperature Characteristic
 Voltage

NOTE: Where size is prohibitive, only capacitance will be indicated. Marking one side only.

ENVIRONMENTAL SPECIFICATIONS

BAROMETRIC PRESSURE: Method 105, MIL-STD-202, test condition E (150,000 feet), 100% of rated voltage applied for 5 seconds, current limited to 50 mA.

VIBRATION: Method 204, MIL-STD-202, test condition B (10-2,000 cps; 15 G)

SHOCK: Method 205, MIL-STD-202, test condition C (50 G; 11 ms)

TEMPERATURE CYCLING: Method 107, MIL-STD-202, -55°C to +125°C for COG and X7R dielectrics; -55°C to +85°C for Z5U and Y5V dielectrics.

IMMERSION CYCLING: Method 104, MIL-STD-202, test condition A (15 minutes in tap water)

MOISTURE RESISTANCE: Method 106, MIL-STD-202, 10 cycles without loading voltage applied.

LIFE: 200% of rated voltage at +125°C for COG and X7R dielectrics, 150% of rated voltage at +85°C for Z5U and Y5V dielectrics; for 1000 hours.



USCC/Centralab

Electronics Division • Globe-Union Inc.

4561 Colorado Boulevard ■ Los Angeles, Ca. 90039

(213) 240-4880



MONO-kapTM 100% MONOLITHIC CONSTRUCTION

COG (NPO) CHARACTERISTIC

WORKING VOLTAGE: 50/100/200 VDC

TEMPERATURE COEFFICIENT: 0±30 PPM/°C from -55°C to +125°C
(EIA Characteristic COG)

DISSIPATION FACTOR: .15% maximum at 1 kHz, 25°C

INSULATION RESISTANCE: 100 K megohms or 100 megohm-microfarads, whichever is less at 25°C, 100 VDC applied

DIELECTRIC STRENGTH: 250% rated voltage with 50 ma maximum charging current

CAPACITANCE TOLERANCES AVAILABLE: D, F, G, H, J, K, M

NOTE: CN10 J, K, and M only

TYPE	CN10	CN15	CN20	CN30	CN40	CN50
L	.100	.150	.200	.300	.400	.500
W	.100	.150	.200	.300	.400	.500
T	.100	.100	.125	.150	.150	.200
S	.100	.100	.100*	.200	.200	.400
D	.016	.016	.020	.020	.020	.025

CAP	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200	WVDC 50 100 200
4.7 pF						
5.6						
6.8						
8.2						
10						
12						
15						
18						
22						
27						
33						
39						
47						
56						
68 pF						
82						
100						
120						
150						
180						
220						
270						
330						
390						
470						
560						
680						
820						
1000						
1200						
1500						
1800						
2200						
2700						
3300						
3900						
4700						
5600						
6800						
8200						
.01 Mfd						
.012						
.015						
.018						
.022						
.027						
.033						
.039						
.047						
.056						
.068						
.082						
.10						
.12						
.15						
.18						
.22						
.27						
.33						
.39						
.47						
.56						
.68						
.82						
1.0						

*Special lead spacing, see note "4" in ordering information for complete details.

X7R CHARACTERISTIC

WORKING VOLTAGE: 50/100 VDC (Contact the factory for available capacitance values in 200 VDC units)

TEMPERATURE COEFFICIENT: ±15% from -55°C to +125°C, (EIA Characteristic X7R)

DISSIPATION FACTOR: 2.5% maximum at 1 kHz, 25°C

INSULATION RESISTANCE: 100 K megohms or 500 megohm-microfarads, whichever is less at 25°C, 100 VDC applied

DIELECTRIC STRENGTH: 250% rated voltage with 50 ma maximum charging current

CAPACITANCE TOLERANCES AVAILABLE: K, M, Z, P

TYPE	CW10	CW15	CW20	CW30	CW40	CW50
L	.100	.150	.200	.300	.400	.500
W	.100	.150	.200	.300	.400	.500
T	.100	.100	.125	.150	.150	.200
S	.100	.100	.100*	.200	.200	.400
D	.016	.016	.020	.020	.020	.025

CAP	WVDC 50 100	WVDC 50 100	WVDC 50 100	WVDC 50 100	WVDC 50 100	WVDC 50 100
68 pF						
82						
100						
120						
150						
180						
220						
270						
330						
390						
470						
560						
680						
820						
1000						
1200						
1500						
1800						
2200						
2700						
3300						
3900						
4700						
5600						
6800						
8200						
.01 Mfd						
.012						
.015						
.018						
.022						
.027						
.033						
.039						
.047						
.056						
.068						
.082						
.10						
.12						
.15						
.18						
.22						
.27						
.33						
.39						
.47						
.56						
.68						
.82						
1.0						

☐ DISTRIBUTOR PRODUCT ITEMS

ALL DIMENSIONS ARE IN INCHES

MONO-kapTM CERAMIC CAPACITORS

Z5U CHARACTERISTIC

WORKING VOLTAGE: 50/100 VDC (Contact the factory for available capacitance values in 200 VDC units.)

TEMPERATURE COEFFICIENT: +22%, -56% from +10°C to +85°C (EIA Characteristic Z5U) see graph on page 3.

DISSIPATION FACTOR: 2.5% maximum at 1 kHz, 25°C

INSULATION RESISTANCE: 100 K megohms or 500 megohm-microfarads, whichever is less at 25°C, 100 VDC applied

DIELECTRIC STRENGTH: 200% rated voltage with 50 ma maximum charging current

CAPACITANCE TOLERANCES AVAILABLE: M, Z, P

TYPE	CZ10	CZ15	CZ20	CZ30	CZ40	CZ50
L	.100	.150	.200	.300	.400	.500
W	.100	.150	.200	.300	.400	.500
T	.100	.100	.125	.150	.150	.200
S	.100	.100	.100*	.200	.200	.400
D	.016	.016	.020	.020	.020	.025

CAP	WVDC 50 100	WVDC 50 100	WVDC 50 100	WVDC 50 100	WVDC 50 100	WVDC 50 100
1000 pF						
1200						
1500						
1800						
2200						
3300						
3900						
4700						
5600						
6800						
8200						
.01 Mfd						
.012						
.015						
.018						
.022						
.033						
.039						
.047						
.056						
.068						
.082						
.100						
.12						
.15						
.18						
.22						
.33						
.39						
.47						
.56						
.68						
.82						
1.0						
1.2						
1.5						
1.8						
2.2						
3.3						
3.9						
4.7						

Y5V CHARACTERISTIC

WORKING VOLTAGE: 50/100 VDC (Contact the factory for available capacitance values in 200 VDC units.)

TEMPERATURE COEFFICIENT: +22%, -82% from -30° to +85°C (EIA Characteristic Y5V) see graph on page 3.

DISSIPATION FACTOR: 2.5% maximum at 1 kHz, 25°C

INSULATION RESISTANCE: 100 K megohms or 500 megohm-microfarads, whichever is less at 25°C, 100 VDC applied

DIELECTRIC STRENGTH: 200% rated voltage with 50 ma maximum charging current

CAPACITANCE TOLERANCES AVAILABLE: M, Z, P

TYPE	CY10	CY15	CY20	CY30	CY40	CY50
L	.100	.150	.200	.300	.400	.500
W	.100	.150	.200	.300	.400	.500
T	.100	.100	.125	.150	.150	.200
S	.100	.100	.100*	.200	.200	.400
D	.016	.016	.020	.020	.020	.025

CAP	WVDC 50 100	WVDC 50 100	WVDC 50 100	WVDC 50 100	WVDC 50 100	WVDC 50 100
270 pF						
330						
470						
680						
1000						
1500						
1800						
2200						
2700						
3300						
4700						
6800						
.01 Mfd						
.015						
.022						
.027						
.033						
.047						
.068						
.1						
.15						
.22						
.27						
.33						
.47						
.68						
1.0						
1.5						
2.2						
3.3						
4.7						
6.8						
10.0						

▣ DISTRIBUTOR PRODUCT ITEMS



USCC/Centralab

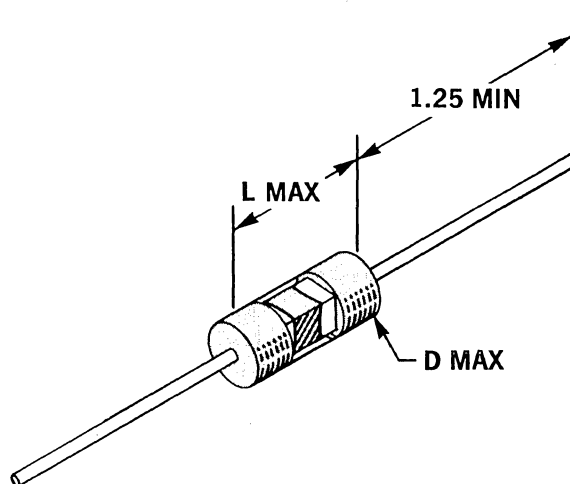
Electronics Division ■ Globe-Union Inc.

4561 Colorado Boulevard ■ Los Angeles, Ca. 90039
(213) 240-4880

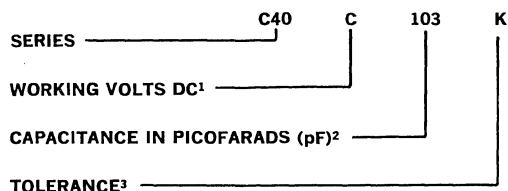


**ALL DIMENSIONS
ARE IN INCHES**

MONO-GLASS CERAMIC CAPACITORS



HOW TO ORDER



1. WVDC AVAILABLE:

C = 50 VDC
A = 100 VDC

2. 103 = 10,000 pF (.01 mfd); i.e., the third digit signifies number of zeros. For values below 10 pF use "R" in place of decimal point (4R7 = 4.7 pF)

3. MINIMUM AVAILABLE CAPACITANCE TOLERANCES:

D = ±0.5 pF (1-10 pF)
J = ±5% (10 pF and above)
K = ±10% (5.6 pF and above)
M = ±20% (2.7 pF and above)
Z = +80%, -20% (all values)
P = +100%, -0% (GMV — all values)

MECHANICAL SPECIFICATIONS

CASE: Glass to metal seal

LEAD MATERIAL: .025" dia. — Solderable lead

MARKING:

Parts will be marked with the following:

"USCC"

Capacitance

Tolerance Letter Designation

Voltage

NOTE: When space permits, the dielectric will be indicated.

ENVIRONMENTAL SPECIFICATIONS

BAROMETRIC PRESSURE: Method 105, MIL-STD-202, test condition E (150,000 feet), 100% of rated voltage applied for 5 seconds, current limited to 50 mA.

VIBRATION: Method 204, MIL-STD-202, test condition B (10-2,000 cps; 15 G)

SHOCK: Method 205, MIL-STD-202, test condition C (50 G; 11 ms)

TEMPERATURE CYCLING: Method 107, MIL-STD-202, -55°C to +125°C for COG and X7R dielectrics; -55°C +85°C for Z5U and Y5V dielectrics.

IMMERSION CYCLING: Method 104, MIL-STD-202, test condition A (15 minutes in tap water)

MOISTURE RESISTANCE: Method 106, MIL-STD-202, 10 cycles without loading voltage applied.

LIFE: 200% of rated voltage at +125°C for COG and X7R dielectrics; 150% of rated voltage at +85°C for Z5U and Y5V dielectrics; for 1000 hours.



USCC/Centralab

Electronics Division ■ Globe-Union Inc.

4561 Colorado Boulevard ■ Los Angeles, Ca. 90039

(213) 240-4880



MONO-GLASS

GLASS ENCAPSULATED
CERAMIC CAPACITOR

C40 SERIES

COG (NPO) CHARACTERISTIC

WORKING VOLTAGE: 50/100 VDC**TEMPERATURE COEFFICIENT:** 0 ± 30 PPM/ $^{\circ}$ C, -55° C to $+125^{\circ}$ C (EIA Characteristic COG);**DISSIPATION FACTOR:** .15% maximum at 1 kHz, 25° C**INSULATION RESISTANCE:** 100 K megohms or 100 megohm-microfarads, whichever is less at 25° C, at rated voltage**DIELECTRIC STRENGTH:** 250% rated voltage with 50 ma maximum charging current**CAPACITANCE TOLERANCES AVAILABLE:** D, J, K, M,**NOTE:** These represent the most competitive tolerances in standard case sizes. For tolerances below $\pm 5\%$ in capacitance values above 10pF, contact the factory for unit dimensions.

L MAX D MAX	.200 .100		.250 .100		.300 .150		.400 .150	
CAP	WVDC		WVDC		WVDC		WVDC	
	50	100	50	100	50	100	50	100
1.0 pF								
1.2								
1.5								
1.8								
2.2								
2.7								
3.3								
3.9								
4.7								
5.6								
6.8								
8.2								
10								
12								
15								
18								
22								
27								
33								
39								
47								
56								
68								
82								
100 pF								
120								
150								
180								
220								
270								
330								
390								
470								
560								
680								
820								
1000								
1200								
1500								
1800								
2200								
2700								
3300								
3900								
4700								
5600								
6800								
8200								
.01 Mfd								

C41 SERIES

X7R (W) CHARACTERISTICS

WORKING VOLTAGE: 50/100 VDC**TEMPERATURE COEFFICIENT:** $\pm 15\%$ from -55° C to $+125^{\circ}$ C (EIA Characteristic X7R)**DISSIPATION FACTOR:** 2.5% maximum at 1 kHz, 25° C**INSULATION RESISTANCE:** 100 K megohms or 500 megohm-microfarad whichever is less at 25° C, at rated voltage**DIELECTRIC STRENGTH:** 250% rated voltage with 50 ma maximum charging current**CAPACITANCE TOLERANCES AVAILABLE:** K, M, Z, P

L MAX D MAX	.200 .100		.250 .100		.300 .150		.400 .150	
CAP	WVDC		WVDC		WVDC		WVDC	
	50	100	50	100	50	100	50	100
100 pF								
120								
150								
180								
220								
270								
330								
390								
470								
560								
680								
820								
1000								
1200								
1500								
1800								
2200								
2700								
3300								
3900								
4700								
5600								
6800								
8200								
.01 Mfd								
.012								
.015								
.018								
.022								
.027								
.033								
.039								
.047								
.056								
.068								
.082								
.10								
.12								
.15								
.18								

ALL DIMENSIONS
ARE IN INCHES

MONO-GLASS CERAMIC CAPACITORS

C42 SERIES

Y5V CHARACTERISTIC

WORKING VOLTAGE: 50/100 VDC

TEMPERATURE COEFFICIENT: +22%, -82% from -30°C to +85°C (EIA Characteristic Y5V)

DISSIPATION FACTOR: 2.5% maximum at 1 kHz, 25°C

INSULATION RESISTANCE: 100 K megohms or 500 megohm-microfarad, whichever is less at 25°C, at rated voltage

DIELECTRIC STRENGTH: 200% rated voltage with 50 ma maximum charging current

CAPACITANCE TOLERANCES AVAILABLE: M, Z, P

L MAX D MAX	.200 .100		.250 .100		.300 .150		.400 .150	
CAP	WVDC 50 100		WVDC 50 100		WVDC 50 100		WVDC 50 100	
1000								
1200								
1500								
1800								
2200								
2700								
3300								
3900								
4700								
5600								
6800								
8200								
.01 Mfd								
.012								
.015								
.018								
.022								
.027								
.033								
.039								
.047								
.056								
.068								
.082								
.10								
.12								
.15								
.18								
.22								
.27								
.33								
.39								
.47								
.56								
.68								
.82								
1.0								

C43 SERIES

Z5U CHARACTERISTIC

WORKING VOLTAGE: 50/100 VDC

TEMPERATURE COEFFICIENT: +22%, -56% from +10°C to +85°C (EIA Characteristic Z5U)

DISSIPATION FACTOR: 2.5% maximum at 1 kHz, 25°C

INSULATION RESISTANCE: 100 K megohms or 500 megohm-microfarads, whichever is less at 25°C, 100 VDC applied

DIELECTRIC STRENGTH: 200% rated voltage with 50 ma maximum charging current

CAPACITANCE TOLERANCES AVAILABLE: M, Z, P

L MAX D MAX	.200 .100		.250 .100		.300 .150		.400 .150	
CAP	WVDC 50 100		WVDC 50 100		WVDC 50 100		WVDC 50 100	
560 pF								
680								
820								
1000								
1200								
1500								
1800								
2200								
2700								
3300								
3900								
4700								
5600								
6800								
8200								
.01 Mfd								
.012								
.015								
.018								
.022								
.027								
.033								
.039								
.047								
.056								
.068								
.082								
.10								
.12								
.15								
.18								
.22								
.27								
.33								
.39								
.47								
.56								
.68								



USCC/Centralab

Electronics Division • Globe-Union Inc.

4561 Colorado Boulevard ■ Los Angeles, Ca. 90039

(213) 240-4880



ALL DIMENSIONS
ARE IN INCHES



TYPE BP CAPACITORS ULTRA-STABLE NPO

SPECIFICATIONS

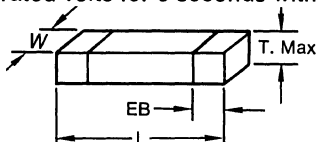
Capacitance: 1.0 pf thru 100 pf measured at 1.0 VRMS, 1.0 MHz. Over 100 pf measured at 1.0 VRMS, 1.0 KHz.

Dissipation Factor: 0.15% max. measured at 1.0 VRMS, 1.0 MHz, 1.0 pf thru 100 pf. Over 100 pf measured at 1.0 VRMS, 1.0 KHz.

Insulation Resistance: 100,000 Megohms or 1,000 Megohm-mfd whichever is less @ 25°C; 10,000 Megohms or 100 Megohm-mfd whichever is less @ 125°C.

Dielectric Strength: 250% rated volts for 5 seconds with 50 ma max current.

L = Length W = Width
T. Max = Thickness (max)
EB = Electrode Band



HOW TO ORDER

Size 3 BP 050 S 101 J ()
 Dielectric _____
 DC working volts (50 or 100) _____
 Chip capacitor _____
 Capacitance code, pf (ex 100 pf) _____
 Tolerance: K $\pm$ 10%, J $\pm$ 5%,
 G $\pm$ 2%, F $\pm$ 1%
 Under 10 pf, C $\pm$.25 pf, D $\pm$.5 pf
 Standard termination is silver.
 No letter required. For non-standard terminations use following:
 (D) Palladium Silver or (S) Solder coated readily available. (G) Gold and (P) Platinum Gold special order.

Size	1	2	3	4	5	6	18	10	14	Capacitance Code (EIA)
Length	.050 $\pm$.005	.075 $\pm$.005	.095 $\pm$.010	.150 $\pm$.010	.120 $\pm$.010	.170 $\pm$.010	.195 $\pm$.010	.220 $\pm$.015	.245 $\pm$.015	
Width	.050 $\pm$.005	.045 $\pm$.005	.050 $\pm$.010	.050 $\pm$.010	.095 $\pm$.010	.070 $\pm$.010	.125 $\pm$.010	.230 $\pm$.015	.225 $\pm$.015	
Thickness Max.	.050	.050	.060	.050	.065	.070	.070	.070	.080	
Electrode Band	.005/.020	.010/.030	.010/.030	.010/.030	.010/.030	.010/.035	.025/.045	.020/.050	.020/.050	
Volts	50 100	50 100	50 100	50 100	50 100	50 100	50 100	50 100	50 100	
1.0 8.2										100 8R2
10										100
12										120
15										150
18										180
22										220
27										270
33										330
39										390
47										470
56										560
68										680
82										820
100										101
120										121
150										151
180										181
220										221
270										271
330										331
390										391
470										471
560										561
680										681
820										821
1000										102
1200										122
1500										152
1800										182
2200										222
2700										272
3300										332
3900										392
4700										472
5600										562
6800										682
8200										822
.01 mfd										103
.012										123
.015										153
.018										183
.022										223
.027										273
.033										333
.039										393
.047										473
.056										563
.068										683
.082										823
.100										104

Note: Sizes shown are popular standards. Varadyne maintains in-depth stock of these sizes. Other sizes to .082 mfd in type BP are available on special order.



TYPE BX CHIP CAPACITORS STABLE ($\pm 15\%$) EIA CHAR. X7R

SPECIFICATIONS

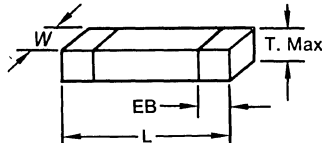
Capacitance: Per table measured at 1.0 VRMS, 1.0 KHz, 25°C.

Dissipation Factor: 2.0% max at 1.0 VRMS, 1.0 KHz, 25°C.

Insulation Resistance: 100,000 megohms or 1,000 megohm-mfd whichever is less @ 25°C; 10,000 megohms or 100 megohm-mfd whichever is less at 125°C.

Dielectric Strength: 250% rated volts for 5 seconds with 50 ma max current.

L = Length W = Width
T. Max = Thickness (max)
EB = Electrode Band



HOW TO ORDER

Size 3 BX 050 S 103 K ()
Dielectric _____
DC working volts (50 or 100) _____
Chip capacitor _____
Capacitance code, pf (ex 10,000pf) _____
Tolerance: J = $\pm 5\%$, K = $\pm 10\%$,
M = $\pm 20\%$

Standard termination is silver.

No letter required. For non-standard terminations use following:

(D) Palladium Silver or (S) Solder coated readily available. (G) Gold and (P) Platinum Gold special order.

Size	1	2	3	4	5	6	18	10	14	Capacitance Code (EIA)
Length	.050 $\pm$.005	.075 $\pm$.005	.095 $\pm$.010	.150 $\pm$.010	.120 $\pm$.010	.170 $\pm$.010	.195 $\pm$.010	.220 $\pm$.015	.245 $\pm$.015	
Width	.050 $\pm$.005	.045 $\pm$.005	.050 $\pm$.010	.050 $\pm$.010	.095 $\pm$.010	.070 $\pm$.010	.125 $\pm$.010	.230 $\pm$.015	.225 $\pm$.015	
Thickness Max.	.050	.050	.060	.050	.065	.070	.070	.070	.080	
Electrode Band	.005/.020	.010/.030	.010/.030	.010/.030	.010/.030	.010/.035	.025/.045	.020/.050	.020/.050	
Volts	50 100	50 100	50 100	50 100	50 100	50 100	50 100	50 100	50 100	
120 pf										121
150										151
180										181
220										221
270										271
330										331
390										391
470										471
560										561
680										681
820										821
1000										102
1200										122
1500										152
1800										182
2200										222
2700										272
3300										332
3900										392
4700										472
5600										562
6800										682
8200										822
.01 mfd										103
.012										123
.015										153
.018										183
.022										223
.027										273
.033										333
.039										393
.047										473
.056										563
.068										683
.082										823
.10										104
.12										124
.15										154
.18										184
.22										224
.27										274
.33										334
.39										394
.47										474
.56										564
.68										684
.82										824
1.0										105
1.2										125
1.5										155
1.8										185

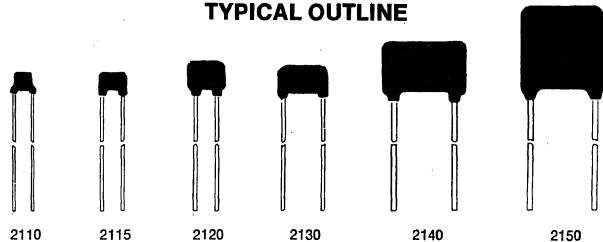
Note: Sizes shown are popular standards. Varadyne maintains in-depth stock of these sizes. Other sizes to 2.2 mfd in type BX are available on special order.



50 VOLT STABLE (15%TC) MONOLITHIC CAPACITORS

TYPICAL OUTLINE

Recommended where good stability of capacitance is required with changes in voltage, temperature and frequency.



CAP	VARADYNE PART NO.*		L	W	T	S*	D*
120	2110BR	050R121 K or M	.100	.100	.100	.100	.016
150	2110BR	050R151 K or M	.100	.100	.100	.100	.016
180	2110BR	050R181 K or M	.100	.100	.100	.100	.016
220	2110BR	050R221 K or M	.100	.100	.100	.100	.016
270	2110BR	050R271 K or M	.100	.100	.100	.100	.016
330	2110BR	050R331 K or M	.100	.100	.100	.100	.016
390	2115BR	050R391 K or M	.150	.150	.100	.100	.016
470	2115BR	050R471 K or M	.150	.150	.100	.100	.016
560	2115BR	050R561 K or M	.150	.150	.100	.100	.016
680	2115BR	050R681 K or M	.150	.150	.100	.100	.016
820	2115BR	050R821 K or M	.150	.150	.100	.100	.016
1000	2120BR	050R102 K or M	.200	.200	.125	.100 or .250	.016 or .020
1200	2120BR	050R122 K or M	.200	.200	.125	.100 or .250	.016 or .020
1500	2120BR	050R152 K or M	.200	.200	.125	.100 or .250	.016 or .020
1800	2120BR	050R182 K or M	.200	.200	.125	.100 or .250	.016 or .020
2200	2120BR	050R222 K or M	.200	.200	.125	.100 or .250	.016 or .020
2700	2120BR	050R272 K or M	.200	.200	.125	.100 or .250	.016 or .020
3300	2120BR	050R332 K or M	.200	.200	.125	.100 or .250	.016 or .020
3900	2120BR	050R392 K or M	.200	.200	.125	.100 or .250	.016 or .020
4700	2120BR	050R472 K or M	.200	.200	.125	.100 or .250	.016 or .020
5600	2120BR	050R562 K or M	.200	.200	.125	.100 or .250	.016 or .020
6800	2120BR	050R682 K or M	.200	.200	.125	.100 or .250	.016 or .020
8200	2120BR	050R822 K or M	.200	.200	.125	.100 or .250	.016 or .020
.01	2120BR	050R103 K or M	.200	.200	.125	.100 or .250	.016 or .020
.012	2130BR	050R123 K or M	.300	.300	.150	.200 or .375	.020 or .025
.015	2130BR	050R153 K or M	.300	.300	.150	.200 or .375	.020 or .025
.018	2130BR	050R183 K or M	.300	.300	.150	.200 or .375	.020 or .025
.022	2130BR	050R223 K or M	.300	.300	.150	.200 or .375	.020 or .025
.027	2130BR	050R273 K or M	.300	.300	.150	.200 or .375	.020 or .025
.033	2130BR	050R333 K or M	.300	.300	.150	.200 or .375	.020 or .025
.039	2130BR	050R393 K or M	.300	.300	.150	.200 or .375	.020 or .025
.047	2130BR	050R473 K or M	.300	.300	.150	.200 or .375	.020 or .025
.056	2130BR	050R563 K or M	.300	.300	.150	.200 or .375	.020 or .025
.068	2130BR	050R683 K or M	.300	.300	.150	.200 or .375	.020 or .025
.082	2130BR	050R823 K or M	.300	.300	.150	.200 or .375	.020 or .025
.1	2130BR	050R104 K or M	.300	.300	.150	.200 or .375	.020 or .025
.12	2130BR	050R124 K or M	.300	.300	.150	.200 or .375	.020 or .025
.15	2130BR	050R154 K or M	.300	.300	.150	.200 or .375	.020 or .025
.18	2130BR	050R184 K or M	.300	.300	.150	.200 or .375	.020 or .025
.22	2130BR	050R224 K or M	.300	.300	.150	.200 or .375	.020 or .025
.27	2140BR	050R274 K or M	.400	.400	.150	.200 or .375	.020 or .025
.33	2140BR	050R334 K or M	.400	.400	.150	.200 or .375	.020 or .025
.39	2140BR	050R394 K or M	.400	.400	.150	.200 or .375	.020 or .025
.47	2140BR	050R474 K or M	.400	.400	.150	.200 or .375	.020 or .025
.56	2140BR	050R564 K or M	.400	.400	.150	.200 or .375	.020 or .025
.68	2150BR	050R684 K or M	.500	.500	.200	.375 or .400	.020 or .025
.82	2150BR	050R824 K or M	.500	.500	.200	.375 or .400	.020 or .025
1.0	2150BR	050R105 K or M	.500	.500	.200	.375 or .400	.020 or .025

TEMPERATURE COEFFICIENT

±15% max. change (X7R)
-55° C to +125° C

INSULATION RESISTANCE

2500 Megohm-mfd or 100K
Megohms, whichever is
less at 25° C initial

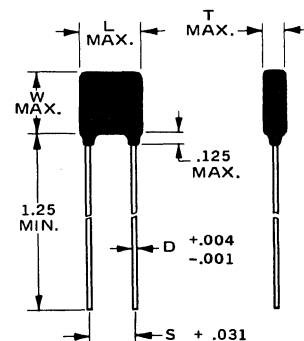
DISSIPATION FACTOR

2.0% MAX when measured
per MIL-C-11015

**AFTER LIFE TEST,
IMMERSION OR MOISTURE:**

Insulation Resistance = 250
Megohm-Mfd. or 10K Megohms,
whichever is less.

Dissipation Factor = Less Than
2.5%

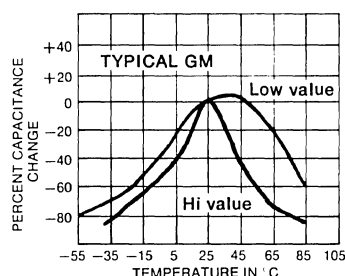
*** WHEN ORDERING SPECIFY:**

1. TOLERANCE K ±10%, M ±20%
2. LEAD SPACING
3. LEAD DIAMETER

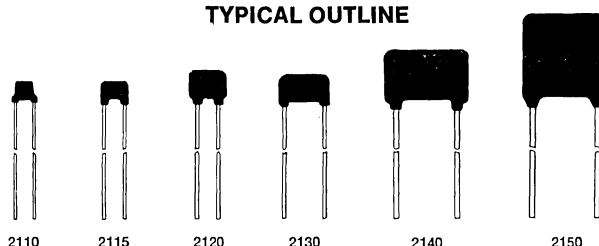


50 VOLT GENERAL PURPOSE MONOLITHIC CAPACITORS

Varadyne general purpose capacitors are designed for those applications requiring maximum capacitance in minimum case size where wide variations in capacitance due to temperature, voltage and frequency may be tolerated. Parts are made with Varadyne's multilayer monolithic capacitor elements and are epoxy coated for complete environmental protection.



TYPICAL OUTLINE



CAP	VARADYNE PART NO.*	L	W	T	S*	D*
470	2110GM 050R471 M or Z	.100	.100	.100	.100	.016
680	2110GM 050R681 M or Z	.100	.100	.100	.100	.016
1000	2110GM 050R102 M or Z	.100	.100	.100	.100	.016
1500	2110GM 050R152 M or Z	.100	.100	.100	.100	.016
1800	2110GM 050R182 M or Z	.100	.100	.100	.100	.016
2200	2115GM 050R222 M or Z	.150	.150	.100	.100	.016
2700	2115GM 050R272 M or Z	.150	.150	.100	.100	.016
3300	2115GM 050R332 M or Z	.150	.150	.100	.100	.016
4700	2115GM 050R472 M or Z	.150	.150	.100	.100	.016
6800	2120GM 050R682 M or Z	.200	.200	.125	.100 or .250	.016 or .020
.01	2120GM 050R103 M or Z	.200	.200	.125	.100 or .250	.016 or .020
.015	2120GM 050R153 M or Z	.200	.200	.125	.100 or .250	.016 or .020
.022	2120GM 050R223 M or Z	.200	.200	.125	.100 or .250	.016 or .020
.027	2120GM 050R273 M or Z	.200	.200	.125	.100 or .250	.016 or .020
.033	2120GM 050R333 M or Z	.200	.200	.125	.100 or .250	.016 or .020
.047	2120GM 050R473 M or Z	.200	.200	.125	.100 or .250	.016 or .020
.068	2120GM 050R683 M or Z	.200	.200	.125	.100 or .250	.016 or .020
.1	2120GM 050R104 M or Z	.200	.200	.125	.100 or .250	.016 or .020
.15	2120GM 050R154 M or Z	.200	.200	.125	.100 or .250	.016 or .020
.1	2130GM 050R104 M or Z	.300	.300	.150	.200 or .375	.020 or .025
.15	2130GM 050R154 M or Z	.300	.300	.150	.200 or .375	.020 or .025
.22	2130GM 050R224 M or Z	.300	.300	.150	.200 or .375	.020 or .025
.27	2130GM 050R274 M or Z	.300	.300	.150	.200 or .375	.020 or .025
.33	2130GM 050R334 M or Z	.300	.300	.150	.200 or .375	.020 or .025
.47	2130GM 050R474 M or Z	.300	.300	.150	.200 or .375	.020 or .025
.68	2130GM 050R684 M or Z	.300	.300	.150	.200 or .375	.020 or .025
1.0	2130GM 050R105 M or Z	.300	.300	.150	.200 or .375	.020 or .025
1.5	2140GM 050R155 M or Z	.400	.400	.150	.200 or .375	.020 or .025
2.2	2140GM 050R225 M or Z	.400	.400	.150	.200 or .375	.020 or .025
2.7	2140GM 050R275 M or Z	.400	.400	.150	.200 or .375	.020 or .025
3.3	2150GM 050R335 M or Z	.500	.500	.200	.375 or .400	.020 or .025
4.7	2150GM 050R475 M or Z	.500	.500	.200	.375 or .400	.020 or .025

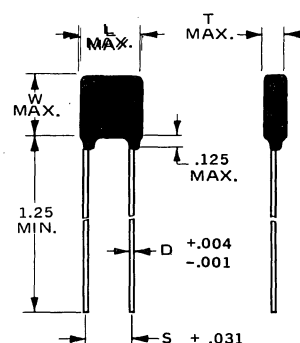
INSULATION RESISTANCE

2500 Megohm-mfd or 10K Megohms, whichever is less at 25° C initial

DISSIPATION FACTOR

2.5% MAX when measured per MIL-C-11015

AFTER LIFE TEST, IMMERSION OR MOISTURE:
Insulation Resistance = 250 Megohm-Mfd. or 1000 Megohms, whichever is less.
Dissipation Factor = Less Than 3%



* WHEN ORDERING SPECIFY:

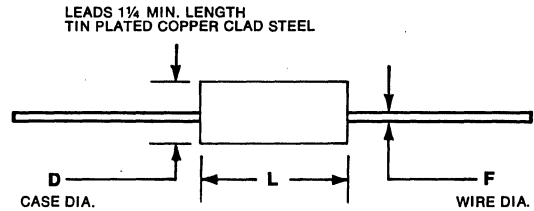
1. TOLERANCE $M \pm 20\%$, $Z \begin{smallmatrix} +80 \\ -20 \end{smallmatrix}$
2. LEAD SPACING
3. LEAD DIAMETER



AXIAL LEAD-GLASS CASE MONOLITHIC CERAMIC CAPACITORS

AVAILABLE IN THREE STANDARD CASE SIZES

Style	Dimensions		
	L Max.	D Max.	F
1801	.160	.100	.020 std. .016 opt.
1802	.260	.100	.020 std. .016 opt.
1803	.400	.155	.020 std.



CHOICE OF THREE CERAMIC FORMULATIONS

TYPE BN — ULTRA STABLE NPO

Where complete stability of capacitance is required when changes in temperature frequency and voltage are encountered. Also, where low loss and/or high Q are necessary.

Insulation Resistance: 100,000 megohms or 1,000 megohm-mfd, whichever is less, at 25°C.

10,000 megohms or 100 megohm-mfd, whichever is less at 125°C.

Dissipation Factor: 0.15% max. measured at 1.0 vrms. 1.0 MHz 10 pf through 100 pf. Over 100 pf measured at 1.0 KHz.

Dielectric Strength: 250% rated volts for 5 seconds with 50 ma max. current.

TYPE BR — STABLE X7R

In applications where moderate variations in capacitance due to changes in frequency, temperature and voltage may be tolerated.

Insulation Resistance: 100,000 megohms or 1,000 megohm-mfd, whichever is less at 25°C.

10,000 megohms or 100 megohm-mfd, whichever is less at 125°C.

Dissipation Factor: 2.0% max. measured at 1.0 vrms. 1.0 KHz at 25°C.

Dielectric Strength: 250% rated volts for 5 seconds with 50 ma max. current.

TYPE GM — GENERAL PURPOSE

For use in applications where wide variations in capacitance are acceptable (i.e., by-pass) or where the environment is closely controlled.

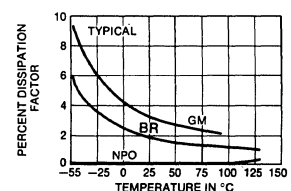
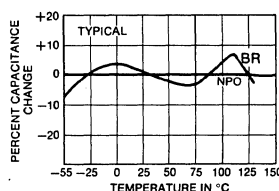
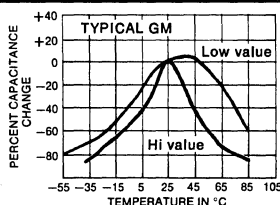
Insulation Resistance: 10,000 megohms or 100 megohm-mfd, whichever is less at 25°C.

1,000 megohms or 10 megohm-mfd, whichever is less at 85°C.

Dissipation Factor: 2.5% max. measured at 1.0 KHz at 25°C.

Dielectric Strength: 250% rated volts for 5 seconds with 50 ma max. current.

Temperature Effects



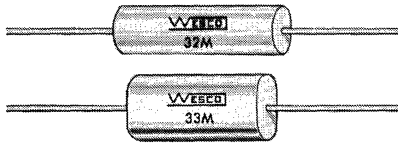


AXIAL LEAD-GLASS CASE MONOLITHIC CERAMIC CAPACITORS

CAP	ULTRA STABLE 50 VOLT NPO	STABLE (15% TC) 50 VOLT X7R	GENERAL PURPOSE 50 VOLT
10	1801 or 1802 BN 050A100 J or K		
12	1801 or 1802 BN 050A120 J or K		
15	1801 or 1802 BN 050A150 J or K		
18	1801 or 1802 BN 050A180 J or K		
22	1801 or 1802 BN 050A220 J or K		
27	1801 or 1802 BN 050A270 J or K		
33	1801 or 1802 BN 050A330 J or K		
39	1801 or 1802 BN 050A390 J or K		
47	1801 or 1802 BN 050A470 J or K		
56	1801 or 1802 BN 050A560 J or K		
68	1801 or 1802 BN 050A680 J or K		
82	1801 or 1802 BN 050A820 J or K		
100	1801 or 1802 BN 050A101 J or K		
120	1801 or 1802 BN 050A121 J or K	1801 or 1802 BR 050A121 K or M	
150	1801 or 1802 BN 050A151 J or K	1801 or 1802 BR 050A151 K or M	
180	1801 or 1802 BN 050A181 J or K	1801 or 1802 BR 050A181 K or M	
220	1801 or 1803 BN 050A221 J or K	1801 or 1802 BR 050A221 K or M	
270	1801 or 1802 BN 050A271 J or K	1801 or 1802 BR 050A271 K or M	
330	1801 or 1802 BN 050A331 J or K	1801 or 1802 BR 050A331 K or M	
390	1801 or 1802 BN 050A391 J or K	1801 or 1802 BR 050A391 K or M	
470	1801 or 1802 BN 050A471 J or K	1801 or 1802 BR 050A471 K or M	
560	1801 or 1802 BN 050A561 J or K	1801 or 1802 BR 050A561 K or M	
680	1801 or 1802 BN 050A681 J or K	1801 or 1802 BR 050A681 K or M	
820	1802 or 1803 BN 050A821 J or K	1801 or 1802 BR 050A821 K or M	
1000	1802 or 1803 BN 050A102 J or K	1801 or 1802 BR 050A102 K or M	
1200	1802 or 1803 BN 050A122 J or K	1801 or 1802 BR 050A122 K or M	
1500	1802 or 1803 BN 050A152 J or K	1801 or 1802 BR 050A152 K or M	
1800	1802 or 1803 BN 050A182 J or K	1801 or 1802 BR 050A182 K or M	
2200	1803 BN 050A222 J or K	1801 or 1802 BR 050A222 K or M	
2700	1803 BN 050A272 J or K	1801 or 1802 BR 050A272 K or M	
3300	1803 BN 050A332 J or K	1801 or 1802 BR 050A332 K or M	
3900	1803 BN 050A392 J or K	1801 or 1802 BR 050A392 K or M	
4700	1803 BN 050A472 J or K	1801 or 1802 BR 050A472 K or M	
5600	1803 BN 050A562 J or K	1801 or 1802 BR 050A562 K or M	
6800	1803 BN 050A682 J or K	1801 or 1802 BR 050A682 K or M	
8200	1803 BN 050A822 J or K	1801 or 1802 BR 050A822 K or M	
.01	1803 BN 050A103 J or K	1801 or 1802 BR 050A103 K or M	
.012		1801 or 1802 BR 050A123 K or M	1801 or 1802 GM 050A123 M or Z
.015		1801 or 1802 BR 050A153 K or M	1801 or 1802 GM 050A153 M or Z
.018		1802 BR 050A183 K or M	1801 or 1802 GM 050A183 M or Z
.022		1802 BR 050A223 K or M	1801 or 1802 GM 050A223 M or Z
.027		1802 BR 050A273 K or M	1801 or 1802 GM 050A273 M or Z
.033		1802 BR 050A333 K or M	1801 or 1802 GM 050A333 M or Z
.039		1802 BR 050A393 K or M	1801 or 1802 GM 050A393 M or Z
.047		1803 BR 050A473 K or M	1801 or 1802 GM 050A473 M or Z
.056		1803 BR 050A563 K or M	1802 or 1803 GM 050A563 M or Z
.068		1803 BR 050A683 K or M	1802 or 1803 GM 050A683 M or Z
.082		1803 BR 050A823 K or M	1802 or 1803 GM 050A823 M or Z
.1		1803 BR 050A104 K or M	1802 or 1803 GM 050A104 M or Z
.12		1803 BR 050A124 K or M	1802 or 1803 GM 050A124 M or Z
.15		1803 BR 050A154 K or M	1803 GM 050A154 M or Z
.18		1803 BR 050A184 K or M	1803 GM 050A184 M or Z
.22		1803 BR 050A224 K or M	1803 GM 050A224 M or Z
.27		1803 BR 050A274 K or M	1803 GM 050A274 M or Z
.33		1803 BR 050A334 K or M	1803 GM 050A334 M or Z
.39			1803 GM 050A394 M or Z
.47			1803 GM 050A474 M or Z
.56			1803 GM 050A564 M or Z
.68			1803 GM 050A684 M or Z
.82			1803 GM 050A824 M or Z
1.0			1803 GM 050A105 M or Z



MYLAR* FILM-FOIL CAPACITORS



TYPE 32M RATINGS AND DIMENSIONS

Capacity in Mfds.	100 VOLTS				200 VOLTS				400 VOLTS				600 VOLTS			
	D	L	Cat. No. — K-1		D	L	Cat. No. — K-2		D	L	Cat. No. — K-4		D	L	Cat. No. — K-6	
.001	.187	3/8	1001		.187	3/8	1001		.187	3/8	1001		.187	3/8	1001	
.0012	.187	3/8	1201		.187	3/8	1201		.187	3/8	1201		.187	3/8	1201	
.0015	.187	3/8	1501		.187	3/8	1501		.187	3/8	1501		.187	3/8	1501	
.0018	.187	3/8	1801		.187	3/8	1801		.187	3/8	1801		.187	3/8	1801	
.0022	.187	3/8	2201		.187	3/8	2201		.187	3/8	2201		.187	3/8	2201	
.0027	.187	3/8	2701		.187	3/8	2701		.187	3/8	2701		.203	3/8	2701	
.0033	.187	3/8	3301		.187	3/8	3301		.187	3/8	3301		.218	3/8	3301	
.0039	.187	3/8	3901		.187	3/8	3901		.187	3/8	3901		.218	3/8	3901	
.0047	.187	3/8	4701		.187	3/8	4701		.187	3/8	4701		.187	3/8	4701	
.0056	.187	3/8	5601		.187	3/8	5601		.187	3/8	5601		.203	3/8	5601	
.0068	.187	3/8	6801		.187	3/8	6801		.187	3/8	6801		.203	3/8	6801	
.0082	.187	3/8	8201		.187	3/8	8201		.203	3/8	8201		.218	3/8	8201	
.01	.187	3/8	1002		.203	3/8	1002		.218	3/8	1002		.234	3/8	1002	
.012	.187	3/8	1202		.234	3/8	1202		.234	3/8	1202		.265	3/8	1202	
.015	.203	3/8	1502		.250	3/8	1502		.265	3/8	1502		.281	3/8	1502	
.018	.218	3/8	1802		.203	3/8	1802		.218	3/8	1802		.265	3/8	1802	
.022	.234	3/8	2202		.218	3/8	2202		.250	3/8	2202		.281	3/8	2202	
.027	.265	3/8	2702		.234	3/8	2702		.234	3/8	2702		.312	3/8	2702	
.033	.218	3/8	3302		.218	3/8	3302		.265	3/8	3302		.296	3/8	3302	
.039	.187	3/8	3902		.234	3/8	3902		.281	3/8	3902		.328	3/8	3902	
.047	.203	3/8	4702		.250	3/8	4702		.312	3/8	4702		.359	3/8	4702	
.056	.218	3/8	5602		.281	3/8	5602		.296	3/8	5602		.375	3/8	5602	
.068	.250	3/8	6802		.312	3/8	6802		.328	3/8	6802		.421	3/8	6802	
.082	.265	3/8	8202		.296	3/8	8202		.343	3/8	8202		.375	3/8	8202	
.1	.265	3/8	1003		.328	3/8	1003		.390	3/8	1003		.421	3/8	1003	
.12	.281	3/8	1203		.328	3/8	1203		.359	3/8	1203		.453	3/8	1203	
.15	.312	3/8	1503		.359	3/8	1503		.390	3/8	1503		.500	3/8	1503	
.18	.312	3/8	1803		.359	3/8	1803		.437	3/8	1803		.515	3/8	1803	
.22	.343	3/8	2203		.390	3/8	2203		.484	3/8	2203		.562	3/8	2203	
.27	.343	3/8	2703		.406	3/8	2703		.468	3/8	2703		.562	3/8	2703	
.33	.375	3/8	3303		.437	3/8	3303		.515	3/8	3303		.578	3/8	3303	
.39	.375	3/8	3903		.468	3/8	3903		.562	3/8	3903		.625	3/8	3903	
.47	.406	3/8	4703		.515	3/8	4703		.609	3/8	4703		.687	3/8	4703	
.56	.437	3/8	5603		.531	3/8	5603		.640	3/8	5603		.750	3/8	5603	
.68	.484	3/8	6803		.515	3/8	6803		.703	3/8	6803		.796	3/8	6803	
.82	.531	3/8	8203		.578	3/8	8203		.734	3/8	8203		.828	3/8	8203	
1.0	.546	3/8	1004		.593	3/8	1004		.781	3/8	1004		.921	3/8	1004	
1.25	.578	3/8	1254		.671	3/8	1254		—	—	—		—	—	—	
1.50	.625	3/8	1504		.734	3/8	1504		—	—	—		—	—	—	
2.0	.687	3/8	2004		.812	3/8	2004		—	—	—		—	—	—	

TYPE 33M RATINGS AND DIMENSIONS

Capacity in Mfds.	100 VOLTS				200 VOLTS				400 VOLTS				600 VOLTS			
	T	W	L	Cat. No. — K-1	T	W	L	Cat. No. — K-2	T	W	L	Cat. No. — K-4	T	W	L	Cat. No. — K-6
.001	.125	.234	3/8	1001	.125	.234	3/8	1001	.109	.203	3/8	1001	.109	.203	3/8	1001
.0012	.125	.234	3/8	1201	.125	.234	3/8	1201	.109	.203	3/8	1201	.109	.203	3/8	1201
.0015	.125	.234	3/8	1501	.125	.234	3/8	1501	.125	.234	3/8	1501	.125	.234	3/8	1501
.0018	.125	.234	3/8	1801	.125	.234	3/8	1801	.125	.234	3/8	1801	.125	.234	3/8	1801
.0022	.125	.234	3/8	2201	.125	.234	3/8	2201	.125	.234	3/8	2201	.125	.234	3/8	2201
.0027	.125	.234	3/8	2701	.125	.234	3/8	2701	.125	.234	3/8	2701	.125	.234	3/8	2701
.0033	.125	.234	3/8	3301	.125	.234	3/8	3301	.125	.234	3/8	3301	.140	.281	3/8	3301
.0039	.125	.234	3/8	3901	.125	.234	3/8	3901	.125	.234	3/8	3901	.140	.265	3/8	3901
.0047	.125	.234	3/8	4701	.125	.234	3/8	4701	.125	.234	3/8	4701	.125	.265	3/8	4701
.0056	.125	.234	3/8	5601	.125	.234	3/8	5601	.125	.234	3/8	5601	.125	.250	3/8	5601
.0068	.125	.234	3/8	6801	.125	.234	3/8	6801	.125	.234	3/8	6801	.125	.250	3/8	6801
.0082	.125	.234	3/8	8201	.125	.234	3/8	8201	.140	.234	3/8	8201	.140	.265	3/8	8201
.01	.125	.234	3/8	1002	.140	.250	3/8	1002	.156	.250	3/8	1002	.156	.281	3/8	1002
.012	.125	.234	3/8	1202	.171	.265	3/8	1202	.171	.265	3/8	1202	.171	.312	3/8	1202
.015	.140	.234	3/8	1502	.187	.281	3/8	1502	.187	.312	3/8	1502	.203	.328	3/8	1502
.018	.156	.250	3/8	1802	.140	.234	3/8	1802	.140	.281	3/8	1802	.171	.312	3/8	1802
.022	.171	.281	3/8	2202	.156	.250	3/8	2202	.171	.296	3/8	2202	.203	.343	3/8	2202
.027	.203	.296	3/8	2702	.171	.281	3/8	2702	.156	.281	3/8	2702	.234	.359	3/8	2702
.033	.140	.250	3/8	3302	.156	.250	3/8	3302	.171	.312	3/8	3302	.218	.343	3/8	3302
.039	.125	.234	3/8	3902	.171	.265	3/8	3902	.203	.328	3/8	3902	.250	.375	3/8	3902
.047	.140	.250	3/8	4702	.171	.312	3/8	4702	.203	.375	3/8	4702	.281	.406	3/8	4702
.056	.156	.265	3/8	5602	.203	.328	3/8	5602	.187	.359	3/8	5602	.281	.453	3/8	5602
.068	.187	.281	3/8	6802	.218	.359	3/8	6802	.218	.390	3/8	6802	.312	.500	3/8	6802
.082	.187	.312	3/8	8202	.218	.343	3/8	8202	.250	.421	3/8	8202	.281	.453	3/8	8202
.1	.187	.312	3/8	1003	.234	.375	3/8	1003	.281	.453	3/8	1003	.312	.500	3/8	1003
.12	.203	.328	3/8	1203	.218	.390	3/8	1203	.250	.421	3/8	1203	.343	.515	3/8	1203
.15	.234	.359	3/8	1503	.250	.421	3/8	1503	.281	.484	3/8	1503	.390	.578	3/8	1503
.18	.218	.328	3/8	1803	.234	.437	3/8	1803	.312	.515	3/8	1803	.406	.578	3/8	1803
.22	.250	.359	3/8	2203	.265	.468	3/8	2203	.359	.562	3/8	2203	.468	.640	3/8	2203
.27	.234	.406	3/8	2703	.281	.484	3/8	2703	.343	.546	3/8	2703	.437	.640	3/8	2703
.33	.265	.437	3/8	3303	.328	.515	3/8	3303	.390	.593	3/8	3303	.468	.671	3/8	3303
.39	.265	.453	3/8	3903	.359	.562	3/8	3903	.437	.640	3/8	3903	.500	.703	3/8	3903
.47	.296	.500	3/8	4703	.406	.593	3/8	4703	.484	.687	3/8	4703	.562	.765	3/8	4703
.56	.328	.531	3/8	5603	.406	.609	3/8	5603	.515	.718	3/8	5603	.625	.828	3/8	5603
.68	.375	.562	3/8	6803	.406	.609	3/8	6803	.578	.781	3/8	6803	.656	.875	3/8	6803
.82	.421	.609	3/8	8203	.453	.656	3/8	8203	.609	.812	3/8	8203	.703	.906	3/8	8203
1.0	.437	.625	3/8	1004	.484	.687	3/8	1004	.656	.859	3/8	1004	.781	.984	3/8	1004
1.25	.453	.656	3/8	1254	.453	.859	3/8	1254	—	—	—		—	—	—	
1.50	.515	.718	3/8	1504	.515	.906	3/8	1504	—	—	—		—	—	—	
2.0	.468	.875	3/8	2004	.578	.984	3/8	2004	—	—	—		—	—	—	

STANDARD LEAD SIZES: #24 AWG TCW: up to and including .203" Dia.; #22 AWG TCW: from .204" thru .312" Dia.; #20 AWG TCW: .313" Dia. and over. CAPACITY TOLERANCE: STANDARD ... $\pm 10\%$ / OTHER ... from $\pm 20\%$ to $\pm 1\%$. Other values as well as voltage ratings are available on request.

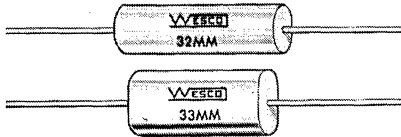
*DuPONT REGISTERED TRADEMARK

WESCO® ELECTRICAL COMPANY
201 MUNSON STREET • GREENFIELD, MASSACHUSETTS 01301 • PHONE: (413) 774-4358





METALIZED MYLAR* CAPACITORS



SPECIFICATIONS

DIELECTRIC WITHSTANDING VOLTAGE

200% of rated voltage applied through a minimum limiting resistance of 100 Ohms/Volt. Duration of voltage stress shall be 15 seconds minimum and 1 minute maximum at 25°C.

TEMPERATURE RANGE

-55°C to +85°C with full rated voltage applied. To +125°C with 50% of rated voltage.

INSULATION RESISTANCE

At 25°C after 2 minutes of electrification at rated voltage or 500 VDC, whichever is less, the minimum product of Insulation Resistance and Capacitance shall be 30,000 megohms-microfarads, but need not exceed 30,000 megohms.

DISSIPATION FACTOR

Shall not exceed 1.0% when measured at 25°C and 1000 Hz, ±20 Hz. See characteristic curves for D.F. ratings at other temperatures.

CAPACITANCE AND TOLERANCE

Shall be measured within the tolerance limits specified. Measurements will be made at 25°C and 1000 Hz, ±20 Hz.

LIFE TEST

Shall withstand 140% of rated voltage at 85°C for 250 hours. One failure in twelve shall be permitted.

CAPACITANCE STABILITY (DRIFT)

Less than 0.3% when measured in the following manner: three capacitance readings at 25°C, each made prior to and after temperature cycling from room to 85°C, and room to -55°C. The mathematical difference between the two extremes, divided by the intermediate value, and then multiplied by 100, yields the stability expressed in percent.

HUMIDITY RESISTANCE

Meets requirements of Mil-C-27287, Para. 3.12 when tested in accordance with Mil-STD-202C, Method 103 B, Condition B.

LEAD PULL AND BEND TEST

Steady pull of 5 pounds applied axially to leads for one minute. Bend test shall consist of one bend from the point of egress, first 90° in one direction, back to the original axial position, and then 90° in the opposite direction with no evidence of breakage.

FEATURES

- Wrap and fill construction
- Tubular and oval configuration for optimum space savings
- Extended foil design
- Miniature size — lightweight
- Low dissipation factor
- Excellent stability
- Quality control procedures per Mil-Q-9858

APPLICATIONS

- Data Processing Equipment
- Aircraft and Missile Systems
- Industrial Instrumentation
- Navigation and Distance Measuring Equipment
- Communications Equipment
- Tachometers
- Filters
- Peripheral Equipment

TYPE 32MM RATINGS AND DIMENSIONS

Capacity in Mfds.	100 VOLTS			200 VOLTS			400 VOLTS			600 VOLTS		
	D	L	Cat. No. 32MM — K-1	D	L	Cat. No. 32MM — K-2	D	L	Cat. No. 32MM — K-4	D	L	Cat. No. 32MM — K-6
.0068	—	—	—	—	—	—	.218	3/16	6801	.312	3/16	6801
.0082	—	—	—	—	—	—	.234	3/16	8201	.171	3/16	8201
.01	—	—	—	—	—	—	.265	3/16	1002	.250	3/16	1002
.012	—	—	—	—	—	—	.203	3/16	1202	.265	3/16	1202
.015	—	—	—	—	—	—	.218	3/16	1502	.296	3/16	1502
.018	—	—	—	.203	3/16	1802	.234	3/16	1802	.328	3/16	1802
.022	—	—	—	.218	3/16	2202	.250	3/16	2202	.375	3/16	2202
.027	.171	3/16	2702	.234	3/16	2702	.265	3/16	2702	.390	3/16	2702
.033	.187	3/16	3302	.265	3/16	3302	.296	3/16	3302	.437	3/16	3302
.039	.187	3/16	3902	.203	3/16	3902	.234	3/16	3902	.328	3/16	3902
.047	.203	3/16	4702	.218	3/16	4702	.265	3/16	4702	.375	3/16	4702
.056	.218	3/16	5602	.234	3/16	5602	.265	3/16	5602	.390	3/16	5602
.068	.250	3/16	6802	.250	3/16	6802	.296	3/16	6802	.437	3/16	6802
.082	.187	3/16	8202	.265	3/16	8202	.328	3/16	8202	.468	3/16	8202
.1	.203	3/16	1003	.281	3/16	1003	.343	3/16	1003	.515	3/16	1003
.12	.218	3/16	1203	.312	3/16	1203	.328	13/16	1203	.453	13/16	1203
.15	.234	3/16	1503	.343	3/16	1503	.343	13/16	1503	.515	13/16	1503
.18	.250	3/16	1803	.296	3/16	1803	.375	13/16	1803	.562	13/16	1803
.22	.234	3/16	2203	.328	3/16	2203	.406	13/16	2203	.625	13/16	2203
.27	.250	3/16	2703	.359	3/16	2703	.453	13/16	2703	.687	13/16	2703
.33	.265	3/16	3303	.406	3/16	3303	.437	13/16	3303	.656	13/16	3303
.39	.281	3/16	3903	.437	3/16	3903	.468	13/16	3903	.703	13/16	3903
.47	.312	3/16	4703	.468	3/16	4703	.515	13/16	4703	.781	13/16	4703
.56	.343	3/16	5603	.406	3/16	5603	.546	13/16	5603	.843	13/16	5603
.68	.375	3/16	6803	.437	3/16	6803	.609	13/16	6803	.921	13/16	6803
.82	.359	3/16	8203	.406	13/16	8203	.593	13/16	8203	.906	13/16	8203
1.0	.390	3/16	1004	.437	13/16	1004	.656	13/16	1004	1.000	13/16	1004
1.25	.421	3/16	1254	.500	13/16	1254	.734	13/16	1254	1.171	13/16	1254
1.50	.421	3/16	1504	.531	13/16	1504	.796	13/16	1504	1.265	13/16	1504
1.80	.453	3/16	1804	.593	13/16	1804	.875	13/16	1804	1.375	13/16	1804
2.0	.484	3/16	2004	.625	13/16	2004	.921	13/16	2004	1.406	13/16	2004
3.0	.484	13/16	3004	.656	13/16	3004	—	—	—	—	—	—
4.0	.562	13/16	4004	.750	13/16	4004	—	—	—	—	—	—
5.0	.625	13/16	5004	.765	13/16	5004	—	—	—	—	—	—
8.0	.703	13/16	8004	.828	23/16	8004	—	—	—	—	—	—
10.0	.781	13/16	1005	.921	23/16	1005	—	—	—	—	—	—

TYPE 33MM RATINGS & DIMENSIONS

Capacity in Mfds.	100 VOLTS			200 VOLTS			400 VOLTS			600 VOLTS		
	T	W	L	T	W	L	T	W	L	T	W	L
.0068	—	—	—	—	—	—	.140	.281	3/16	.234	.359	3/16
.0082	—	—	—	—	—	—	.156	.296	3/16	.078	.218	3/16
.01	—	—	—	—	—	—	.187	.312	3/16	.171	.296	3/16
.012	—	—	—	—	—	—	.125	.250	3/16	.140	.281	3/16
.015	—	—	—	—	—	—	.140	.265	3/16	.203	.343	3/16
.018	—	—	—	—	—	—	.156	.281	3/16	.218	.421	3/16
.022	—	—	—	.140	.281	3/16	.171	.312	3/16	.250	.437	3/16
.027	.109	.203	3/16	.156	.296	3/16	.203	.328	3/16	.281	.484	3/16
.033	.125	.218	3/16	.187	.312	3/16	.218	.359	3/16	.312	.531	3/16
.039	.125	.234	3/16	.125	.250	3/16	.156	.296	3/16	.218	.421	3/16
.047	.140	.250	3/16	.140	.265	3/16	.171	.312	3/16	.250	.437	3/16
.056	.156	.265	3/16	.156	.281	3/16	.187	.328	3/16	.265	.468	3/16
.068	.187	.281	3/16	.171	.296	3/16	.218	.343	3/16	.312	.515	3/16
.082	.109	.234	3/16	.187	.312	3/16	.218	.390	3/16	.343	.562	3/16
.1	.125	.250	3/16	.203	.343	3/16	.250	.421	3/16	.390	.593	3/16
.12	.140	.265	3/16	.234	.359	3/16	.218	.390	13/16	.343	.546	13/16
.15	.156	.281	3/16	.265	.390	3/16	.250	.421	13/16	.390	.596	13/16
.18	.187	.312	3/16	.234	.359	3/16	.281	.453	13/16	.437	.640	13/16
.22	.156	.281	3/16	.250	.390	3/16	.296	.500	13/16	.500	.687	13/16
.27	.171	.296	3/16	.281	.406	3/16	.343	.531	13/16	.562	.765	13/16
.33	.187	.312	3/16	.281	.484	3/16	.312	.515	13/16	.531	.734	13/16
.39	.218	.343	3/16	.312	.515	3/16	.343	.546	13/16	.578	.781	13/16
.47	.234	.359	3/16	.359	.562	3/16	.390	.578	13/16	.640	.843	13/16
.56	.250	.406	3/16	.281	.484	3/16	.437	.625	13/16	.718	.921	13/16
.68	.281	.437	3/16	.328	.515	3/16	.484	.687	13/16	.796	1.000	13/16
.82	.250	.421	3/16	.296	.484	13/16	.468	.671	13/16	.781	.984	13/16
1.0	.281	.453	3/16	.328	.531	13/16	.531	.734	13/16	.857	1.078	13/16
1.25	.312	.515	3/16	.375	.578	13/16	.609	.812	13/16	1.062	1.265	13/16
1.50	.296	.500	3/16	.421	.625	13/16	.671	.875	13/16	1.156	1.359	13/16
1.80	.328	.515	3/16	.406	.687	13/16	.750	.953	13/16	1.265	1.484	13/16
2.0	.359	.562	3/16	.421	.718	13/16	.796	1.000	13/16	1.281	1.484	13/16
3.0	.375	.578	13/16	.406	.812	13/16	—	—	—	—	—	—
4.0	.406	.703	13/16	.625	.828	13/16	—	—	—	—	—	—
5.0	.453	.750	13/16	.650	.828	13/16	—	—	—	—	—	—
8.0	.531	.828	13/16	.656	.953	23/16	—	—	—	—	—	—
10.0	.609	.906	13/16	.750	1.046	23/16	—	—	—	—	—	—

STANDARD LEAD SIZES: #24 AWG TCW: up to and including .203" Dia., #22 AWG TCW: from .204" thru .312" Dia., #20 AWG TCW: .313" Dia. and over. CAPACITY TOLERANCE: STANDARD . . . ±10% / OTHER . . . from ±20% to ±2%. Other values as well as voltage ratings are available on request.

*DuPONT REGISTERED TRADEMARK

WESCO® ELECTRICAL COMPANY

201 MUNSON STREET • GREENFIELD, MASSACHUSETTS 01301 • PHONE: (413) 774-4358





POLYSTYRENE CAPACITORS

SPECIFICATIONS

DIELECTRIC WITHSTANDING VOLTAGE

200% of rated voltage applied through a minimum limiting resistance of 100 Ohms/Volt. Duration of voltage stress shall be 15 seconds minimum and 1 minute maximum at 25°C.

INSULATION RESISTANCE

At 25°C after 2 minutes of electrification at rated voltage or 500 VDC, whichever is less, the minimum product of Insulation Resistance and Capacitance shall be 500,000 megohms-microfarads, but need not exceed 500,000 megohms.

DISSIPATION FACTOR

Shall not exceed .05% when measured at 25°C and 1000 Hz, $\pm$ Hz. See characteristic curves for D.F. ratings at other temperatures.

CAPACITANCE AND TOLERANCE

Shall be measured within the tolerance limits specified. Measurements will be made at 25°C and 1000 Hz, $\pm$ 20 Hz.

LIFE TEST

Shall withstand 140% of rated voltage at 85°C for 250 hours. One failure in twelve shall be permitted.

TEMPERATURE COEFFICIENT

Capacitance shall change linearly over operating temperature range at rate of -105 , $\pm$ 30 parts per million/°C.

CAPACITANCE STABILITY (DRIFT)

Less than .05% when measured in the following manner: three capacitance readings at 25°C, each made prior to and after temperature cycling from room to 85°C, and room to -55 °C. The mathematical difference between the two extremes, divided by the intermediate value, and then multiplied by 100, yields the stability expressed in percent.

HUMIDITY RESISTANCE

Meets requirements of Mil-C-27287, Para. 3.12 when tested in accordance with Mil-STD-202C, Method 103 B, Condition B.

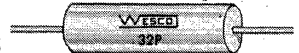
LEAD PULL AND BEND TEST

Steady pull of 5 pounds applied axially to leads for one minute. Bend test shall consist of one bend from the point of egress, first 90° in one direction, back to the original axial position, and then 90° in the opposite direction with no evidence of breakage.

TEMPERATURE RANGE

-55 °C to $+85$ °C with full rated voltage applied.

TYPE 32P RATINGS & DIMENSIONS



Capacity in Mfds.	100 VOLTS Cat. No. 32P — J-1			200 VOLTS 32P Cat. No. — J-2			400 VOLTS Cat. No. — J-4		
	D	L		D	L		D	L	
.001	.187	$\frac{3}{16}$	1001	.187	$\frac{3}{16}$	1001	.187	$\frac{3}{16}$	1001
.0012	.187	$\frac{3}{16}$	1201	.187	$\frac{3}{16}$	1201	.187	$\frac{3}{16}$	1201
.0015	.187	$\frac{3}{16}$	1501	.187	$\frac{3}{16}$	1501	.187	$\frac{3}{16}$	1501
.0018	.187	$\frac{3}{16}$	1801	.187	$\frac{3}{16}$	1801	.187	$\frac{3}{16}$	1801
.0022	.187	$\frac{3}{16}$	2201	.187	$\frac{3}{16}$	2201	.187	$\frac{3}{16}$	2201
.0027	.187	$\frac{1}{4}$	2701	.187	$\frac{1}{4}$	2701	.187	$\frac{1}{4}$	2701
.0033	.187	$\frac{1}{4}$	3301	.187	$\frac{1}{4}$	3301	.187	$\frac{1}{4}$	3301
.0039	.187	$\frac{1}{4}$	3901	.187	$\frac{1}{4}$	3901	.187	$\frac{1}{4}$	3901
.0047	.187	$\frac{1}{4}$	4701	.187	$\frac{1}{4}$	4701	.234	$\frac{1}{4}$	4701
.0056	.187	$\frac{1}{4}$	5601	.187	$\frac{1}{4}$	5601	.250	$\frac{1}{4}$	5601
.0068	.187	$\frac{1}{4}$	6801	.187	$\frac{1}{4}$	6801	.234	$\frac{1}{4}$	6801
.0082	.187	$\frac{1}{4}$	8201	.203	$\frac{1}{4}$	8201	.250	$\frac{1}{4}$	8201
.01	.203	$\frac{1}{4}$	1002	.234	$\frac{1}{4}$	1002	.265	$\frac{1}{4}$	1002
.012	.218	$\frac{1}{4}$	1202	.218	$\frac{1}{4}$	1202	.296	$\frac{1}{4}$	1202
.015	.234	$\frac{1}{4}$	1502	.250	$\frac{1}{4}$	1502	.328	$\frac{1}{4}$	1502
.018	.234	$\frac{1}{4}$	1802	.265	$\frac{1}{4}$	1802	.359	$\frac{1}{4}$	1802
.022	.250	$\frac{1}{4}$	2202	.281	$\frac{1}{4}$	2202	.343	$\frac{1}{4}$	2202
.027	.265	$\frac{1}{4}$	2702	.312	$\frac{1}{4}$	2702	.375	$\frac{1}{4}$	2702
.033	.286	$\frac{1}{4}$	3302	.343	$\frac{1}{4}$	3302	.406	$\frac{1}{4}$	3302
.039	.328	$\frac{1}{4}$	3902	.375	$\frac{1}{4}$	3902	.453	$\frac{1}{4}$	3902
.047	.343	$\frac{1}{4}$	4702	.359	$\frac{1}{4}$	4702	.437	$\frac{1}{4}$	4702
.056	.375	$\frac{1}{4}$	5602	.390	$\frac{1}{4}$	5602	.484	$\frac{1}{4}$	5602
.068	.375	$\frac{1}{4}$	6802	.421	$\frac{1}{4}$	6802	.484	$\frac{1}{4}$	6802
.082	.406	$\frac{1}{4}$	8202	.421	$\frac{1}{4}$	8202	.531	$\frac{1}{4}$	8202
.1	.453	$\frac{1}{4}$	1003	.468	$\frac{1}{4}$	1003	.578	$\frac{1}{4}$	1003
.12	.484	$\frac{1}{4}$	1203	.515	$\frac{1}{4}$	1203	.625	$\frac{1}{4}$	1203
.15	.500	$\frac{1}{4}$	1503	.531	$\frac{1}{4}$	1503	.656	$\frac{1}{4}$	1503
.18	.531	$\frac{1}{4}$	1803	.578	$\frac{1}{4}$	1803	.671	$\frac{1}{4}$	1803
.22	.546	$\frac{1}{4}$	2203	.640	$\frac{1}{4}$	2203	.671	$\frac{1}{4}$	2203
.27	.609	$\frac{1}{4}$	2703	.656	$\frac{1}{4}$	2703	.734	$\frac{1}{4}$	2703
.33	.625	$\frac{1}{4}$	3303	.687	$\frac{1}{4}$	3303	.812	$\frac{1}{4}$	3303
.39	.671	$\frac{1}{4}$	3903	.750	$\frac{1}{4}$	3903	—	—	—
.47	.703	$\frac{1}{4}$	4703	.734	$\frac{1}{4}$	4703	—	—	—

STANDARD LEAD SIZES: #24 AWG TCW: up to and including .203" Dia.
#22 AWG TCW: from .204" thru .312" Dia.
#20 AWG TCW: .313" Dia. and over

CAPACITY TOLERANCE: STANDARD... $\pm 5\%$ / OTHER... from $\pm 20\%$ to $\pm 1\%$
Other values as well as voltage ratings are available upon request.

METALIZED POLYCARBONATE CAPACITORS

SPECIFICATIONS

DIELECTRIC WITHSTANDING VOLTAGE

200% of rated voltage applied through a minimum limiting resistance of 100 Ohms/Volt. Duration of voltage stress shall be 15 seconds minimum and 1 minute maximum at 25°C.

TEMPERATURE RANGE

-55 °C to $+85$ °C with full rated voltage applied. To $+125$ °C with 50% of rated voltage.

INSULATION RESISTANCE

At 25°C after 2 minutes of electrification at rated voltage or 500 VDC, whichever is less, the minimum product of Insulation Resistance and Capacitance shall be 50,000 megohms-microfarads, but need not exceed 50,000 megohms.

DISSIPATION FACTOR

Shall not exceed 0.3% when measured at 25°C and 1000 Hz, $\pm$ 20 Hz. See characteristic curves for D.F. ratings at other temperatures.

CAPACITANCE AND TOLERANCE

Shall be measured within the tolerance limits specified. Measurements will be made at 25°C and 1000 Hz, $\pm$ 20 Hz.

LIFE TEST

Shall withstand 140% of rated voltage at 85°C for 250 hours. One failure in twelve shall be permitted.

CAPACITANCE STABILITY (DRIFT)

Less than 0.3% when measured in the following manner: three capacitance readings at 25°C, each made prior to and after temperature cycling from room to 85°C, and room to -55 °C. The mathematical difference between the two extremes, divided by the intermediate value, and then multiplied by 100, yields the stability expressed in percent.

HUMIDITY RESISTANCE

Meets requirements of Mil-C-27287, Para. 3.12 when tested in accordance with Mil-STD-202C, Method 103B, Condition B.

LEAD PULL AND BEND TEST

Steady pull of 5 pounds applied axially to leads for one minute. Bend test shall consist of one bend from the point of egress, first 90° in one direction, back to the original axial position, and then 90° in the opposite direction with no evidence of breakage.

TYPE 32MPC RATINGS & DIMENSIONS



Capacity in Mfds.	50 VOLTS Cat. No. 32MPC — K-05			100 VOLTS Cat. No. 32MPC — K-1			200 VOLTS Cat. No. 32MPC — K-2		
	D	L		D	L		D	L	
.012	—	—	—	—	—	—	.171	.40	1202
.015	—	—	—	—	—	—	.187	.40	1502
.018	—	—	—	—	—	—	.203	.40	1802
.022	—	—	—	.156	.40	2202	.218	.40	2202
.027	—	—	—	.171	.40	2702	.234	.40	2702
.033	—	—	—	.171	.40	3302	.250	.40	3302
.039	—	—	—	.187	.40	3902	.187	.53	3902
.047	—	—	—	.203	.40	4702	.203	.53	4702
.056	—	—	—	.218	.40	5602	.218	.53	5602
.068	—	—	—	.234	.40	6802	.234	.53	6802
.082	.156	.40	8202	.187	.53	8202	.265	.53	8202
.1	.171	.40	1003	.203	.53	1003	.234	.65	1003
.12	.187	.40	1203	.218	.53	1203	.250	.65	1203
.15	.203	.40	1503	.234	.53	1503	.281	.65	1503
.18	.218	.40	1803	.250	.53	1803	.296	.65	1803
.22	.171	.53	2203	.265	.53	2203	.328	.65	2203
.27	.187	.53	2703	.250	.65	2703	.312	.78	2703
.33	.203	.53	3303	.265	.65	3303	.343	.78	3303
.39	.203	.53	3903	.281	.65	3903	.359	.78	3903
.47	.218	.53	4703	.312	.65	4703	.406	.78	4703
.56	.250	.53	5603	.328	.65	5603	.390	.90	5603
.68	.218	.65	6803	.328	.78	6803	.421	.90	6803
.82	.234	.65	8203	.343	.78	8203	.468	.90	8203
1.0	.265	.65	1004	.375	.78	1004	.515	.90	1004
1.25	.296	.65	1254	.421	.78	1254	.484	1.18	1254
1.50	.312	.65	1504	.453	.78	1504	.531	1.18	1504
1.80	.328	.78	1804	.453	.90	1804	.578	1.18	1804
2.0	.343	.78	2004	.468	.90	2004	.609	1.18	2004
3.0	.390	.78	3004	.484	1.18	3004	.656	1.45	3004
4.0	.437	.78	4004	.546	1.18	4004	.750	1.45	4004
5.0	.437	.90	5004	.431	1.45	5004	.734	.178	5004
8.0	.468	1.18	8004	.593	1.78	8004	.859	2.06	8004
10.0	.515	1.18	1005	.656	1.78	1005	.953	2.06	1005

STANDARD LEAD SIZES: #24 AWG TCW: up to and including .203" Dia.
#22 AWG TCW: from .204" thru .312" Dia.
#20 AWG TCW: .313" Dia. and over

CAPACITY TOLERANCE: STANDARD... $\pm 10\%$ / OTHER... from $\pm 20\%$ to $\pm 2\%$
Other values as well as voltage ratings are available upon request.

WESCO® ELECTRICAL COMPANY

201 MUNSON STREET • GREENFIELD, MASSACHUSETTS 01301 • PHONE: (413) 774-4358





POLYPROPYLENE CAPACITORS

SPECIFICATIONS

DIELECTRIC WITHSTANDING VOLTAGE

200% of rated voltage applied through a minimum limiting resistance of 100 Ohms/Volt. Duration of voltage stress shall be 15 seconds minimum and 1 minute maximum at 25°C.

INSULATION RESISTANCE

At 25°C after 2 minutes of electrification at rated voltage or 500 VDC, whichever is less, the minimum product of Insulation Resistance and Capacitance shall be 250,000 megohms-microfarads, but need not exceed 250,000 megohms.

DISSIPATION FACTOR

Shall not exceed .05% when measured at 25°C and 1000 Hz, ± 20 Hz. See characteristic curves for D.F. ratings at other temperatures.

CAPACITANCE AND TOLERANCE

Shall be measured within the tolerance limits specified. Measurements will be made at 25°C and 1000 Hz, ± 20 Hz.

LIFE TEST

Shall withstand 140% of rated voltage at 105°C for 250 hours. One failure in twelve shall be permitted.

TEMPERATURE COEFFICIENT

Capacitance shall change linearly over operating temperature range of -55°C to +85°C at rate of -290, ± 75 parts per million/°C.

CAPACITANCE STABILITY (DRIFT)

Less than .2% when measured in the following manner: three capacitance readings at 25°C, each made prior to and after temperature cycling from room to 105°C, and room to -55°C. The mathematical difference between the two extremes, divided by the intermediate value, and then multiplied by 100, yields the stability expressed in percent.

HUMIDITY RESISTANCE

Meets requirements of Mil-C-27287, Para 3.12 when tested in accordance with Mil-STD-202C, Method 103 B, Condition B.

LEAD PULL AND BEND TEST

Steady pull of 5 pounds applied axially to leads for one minute. Bend test shall consist of one bend from the point of egress, first 90° in one direction, back to the original axial position, and then 90° in the opposite direction with no evidence of breakage.

TEMPERATURE RANGE

-55°C to +105°C with full rated voltage applied.

TYPE 32PL RATINGS & DIMENSIONS



Capacity in Mfds.	100 VOLTS			200 VOLTS			400 VOLTS		
	D	L	Cat. No. 32PL — K-1	D	L	Cat. No. 32PL — K-2	D	L	Cat. No. 32PL — K-4
.0010	.187	.406	1001	.187	.406	1001	.187	.406	1001
.0015	.187	.406	1501	.187	.406	1501	.203	.406	1501
.0022	.187	.406	2201	.187	.406	2201	.234	.406	2201
.0033	.187	.406	3301	.187	.406	3301	.187	.531	3301
.0039	.187	.406	3901	.203	.406	3901	.187	.531	3901
.0047	.187	.406	4701	.187	.531	4701	.203	.531	4701
.0056	.187	.406	5601	.187	.531	5601	.218	.531	5601
.0068	.187	.406	6801	.187	.531	6801	.234	.531	6801
.0082	.187	.406	8201	.187	.531	8201	.203	.656	8201
.0100	.204	.406	1002	.203	.531	1002	.218	.656	1002
.015	.219	.531	1502	.203	.656	1502	.265	.656	1502
.022	.250	.531	2202	.234	.656	2202	.312	.656	2202
.027	.265	.531	2702	.265	.656	2702	.328	.656	2702
.033	.234	.656	3302	.281	.656	3302	.328	.781	3302
.039	.250	.656	3902	.312	.656	3902	.359	.781	3902
.047	.281	.656	4702	.296	.781	4702	.390	.781	4702
.056	.281	.656	5602	.312	.781	5602	.421	.781	5602
.068	.296	.656	6802	.343	.781	6802	.406	.906	6802
.082	.312	.781	8202	.375	.781	8202	.437	.906	8202
.10	.344	.781	1003	.375	.906	1003	.484	.906	1003
.12	.375	.781	1203	.406	.906	1203	.453	1.156	1203
.15	.375	.906	1503	.453	.906	1503	.500	1.156	1503
.18	.406	.906	1803	.484	.906	1803	.546	1.156	1803
.22	.437	.906	2203	.484	1.031	2203	.687	1.156	2203
.27	.437	1.031	2703	.531	1.031	2703	.578	1.406	2703
.33	.500	1.031	3303	.593	1.031	3303	.640	1.406	3303
.39	.531	1.031	3903	.593	1.156	3903	.687	1.406	3903
.47	.531	1.156	4703	.656	1.156	4703	.750	1.406	4703
.56	.578	1.156	5603	.625	1.406	5603	.825	1.406	5603
.68	.625	1.156	6803	.687	1.406	6803	.825	1.656	6803
.82	.625	1.406	8203	.687	1.656	8203	.906	1.656	8203
1.0	.687	1.406	1004	.734	1.656	1004	1.000	1.656	1004

STANDARD LEAD SIZES: #24 AWG TCW: up to and including .203" Dia.
#22 AWG TCW: from .204" thru .312" Dia.
#20 AWG TCW: .313" Dia. and over

CAPACITY TOLERANCE: STANDARD ... $\pm 10\%$ / OTHER ... from 20% to $\pm 1\%$
Other values as well as voltage ratings are available upon request.

FEATURES

32P	32MPC	32PL
Wrap and fill construction	Wrap and fill construction	Wrap and fill construction
Excellent long-term stability	Micro-miniature — lightweight	Excellent long-term stability
Superior "Q" for tuned circuits	Low dissipation factor	Superior "Q" for tuned circuits
High insulation resistance	Zero TC ± 50 ppm/°C from +25°C to +55°C	High insulation resistance
Linear temperature coefficient	Extended foil design	Linear temperature coefficient (-55°C to +85°C)
Quality control procedures per Mil-Q-9858	Excellent stability	Quality control procedures per Mil-Q-9858
Extended foil design	Quality control procedures per Mil-Q-9858	Extended foil design

APPLICATIONS

32P & 32PL	32MPC	EXPLANATION OF CATALOG NUMBER
Computers	Data Processing Equipment	32 M 1002 K-1
Data Processing Equipment	Aircraft and Missile Systems	32 Round, Wrap and Fill, with epoxy seals.
Aircraft and Missile Systems	Industrial Instrumentation	M Mylar-Foil, Axial Leads*
Industrial Instrumentation	Navigation and Distance Measuring Equipment	1002 In Picofarads — first three digits are significant. Last digit specifies number of zeros, i.e., 1002 = 10,000 pfd. or 0.01 mfd.
Navigation and Distance Measuring Equipment	Communications Equipment	K Capacity Tolerance:
Communications Equipment	Tachometers	K = $\pm 10\%$ H = $\pm 20\%$ F = $\pm 1\%$
Timing and Retrace Circuits	Filters	M = $\pm 20\%$ J = $\pm 5\%$ G = $\pm 2\%$
Integrating Networks	Peripheral Equipment	1 DC Voltage Rating:
High "Q" Low Loss Filters		05 = 50 VDC 2 = 200 VDC 6 = 600 VDC
Peripheral Equipment		1 = 100 VDC 4 = 400 VDC etc.
		* For Radial Leads, add letter "R" at end of part number.

WESCO® ELECTRICAL COMPANY

201 MUNSON STREET • GREENFIELD, MASSACHUSETTS 01301 • PHONE: (413) 774-4358



HUMISEAL COATINGS

GENERAL CHART

Listed in this General Chart of Properties are ten of the most frequently used HumiSeal Protective Coatings and their principal properties. These have been tabulated in order to facilitate comparison of their characteristics and selection of the most suitable type for a specific application. In addition to these HumiSeal types we manufacture a variety of coatings for special purposes, including high temperature applications. Should none of the coatings listed in this chart fulfill your requirements, we suggest that you contact us for recommendations.

HumiSeal Type ¹	PROPERTIES OF LIQUID HumiSeal										THERMAL PROPERTIES		
	Specific Weight (lbs. per gallon) ²	Solids Content (% by weight) ³	Viscosity, with catalyst when applicable (centipoises) ⁴	Flash Point (°F) ⁵	Drying Time for Handling ⁶	Recommended Curing Conditions	Time Required to Reach Optimum Properties	Pot Life, at Room Temperature	Shelf Life, at Room Temperature	Coverage per gallon (in sq. ft.) After One Dip	Continuous Use Temperature Range (°F)	Thermal Shock Test ⁷	Solderability ⁸
1B12	7.3	20	30	40	10 min.	24 hrs. at room temp. or 30 min. at 170°F	24 hrs.	1 year	1 year	550	-75°F to +280°F	Passes	Good
1B15	7.6	35	470	30	10 min.	24 hrs. at room temp. or 30 min. at 170°F	24 hrs.	1 year	1 year	450	-75°F to +270°F	Passes	Good
1B31	7.6	35	160	30	10 min.	24 hrs. at room temp. or 30 min. at 170°F	24 hrs.	6 mos.	6 mos.	450	-75°F to +270°F	Passes	Good
1A20	8.5	50	120	60	60 min.	24 hrs. at room temp.	1 week	6 mos.	6 mos.	375	-70°F to +250°F	Passes	Excellent
1A27	8.0	50	5000	100	15 min.	24 hrs. at room temp.	1 week	1 year	1 year	450	-90°F to +250°F	Passes	Excellent
1A33	7.7	44	160	30	15 min.	24 hrs. at room temp.	1 week	6 mos.	6 mos.	300	-90°F to +250°F	Passes	Excellent
2A72	7.8	36	<20	70	60 min.	24 hrs. at room temp. or 2 hrs at 170°F	1 week	4 hrs.	6 mos.	650	-70°F to +250°F	Passes	Excellent
2B13	7.5	42	50	40	30 min.	90 min. at 200°F	1 week	24 hrs.	1 year	480	-70°F to +270°F	Passes	Poor
2A51	9.2	100	6000	non flammable	2 hrs.	24 hrs. at room temp. or 2 hrs. at 200°F	1 week	6 hrs.	6 mos.	200	-70°F to +250°F	Passes	Poor
2A53	7.8	54	300	70	30 min.	2 hrs. at 200°F	1 week	24 hrs.	6 mos.	400	-70°F to +250°F	Passes	Poor

HumiSeal TYPES LISTED IN BOLD PRINT COMPLY WITH THE REQUIREMENTS OF MIL-I-46058C

All technical data in this bulletin are based on test results using the stated standards and are believed to be correct. However, since the end use of HumiSeal materials (and the manner of storing and handling them) is beyond our control, we make no warranty — expressed or implied — as to the fitness of use, results to be obtained from or effects of use with respect to these materials. Their use shall be solely by the judgment of and at the risk of the end-user notwithstanding any statement contained in this bulletin.

1. The first digit in the type number specifies whether the product is a one-, or a two-component system.
2. Fed-Std 141a, Method 4184.
3. Fed-Std 141a, Method 4044.
4. Fed-Std 141a, Method 4287.
5. Fed-Std 141a, Method 4291.
6. Fed-Std 141a, Method 4061.
7. Mil-I-46058C.
8. Visual evaluation for ease of soldering with an 85 watt iron through a 2 mil film.
9. Fluorescent dye may be added if required.
10. Fed-Std 141a, Method 2121.
11. Fed-Std 406, Method 7031, Procedure A.
12. Fed-Std 141a, Method 6303.
13. ASTM-D150-65T, at 1 MHz and 25°C.
14. Mil-I-46058C Insulation resistance during 10th cycle, at 65°C and 98% RH.

FOR ELECTRONICS OF PROPERTIES

HumiSeal Protective Coatings are available in one-quart or one-gallon cans, five-gallon pails, or fifty-five gallon drums. HumiSeal types 1B15 and 1A27 are also available in 16-ounce aerosol containers. All HumiSeal types listed in this chart may be applied by dip, brush or spray. Literature on recommended techniques for the proper application of coatings and preparation of the substrate is available upon request.

PROPERTIES OF CURED HumiSeal COATING															HumiSeal Type¹
PHYSICAL PROPERTIES							ELECTRICAL PROPERTIES					CHEMICAL PROPERTIES			
Color⁹	Specific Gravity	Average Build After One Dip (mils)¹⁰	Water Absorption (%)¹¹	Flexibility⁷	Adhesion¹²	Mar Resistance¹²	Dielectric Constant¹³	Dissipation Factor¹³	Dielectric Strength (volts)⁷	Insulation Resistance (teraohms)⁷	Moisture Resistance (gigaohms)¹⁴	Main Constituent	Fungus Resistance⁷	Resistance to Solvents	
Water Clear	1.05	0.5	.18	Very Good	Ex-cellent	Very Good	2.8	.010	6000	250	30	Acrylic	Ex-cellent	Very Good	1B12
Water Clear	1.05	2	.20	Fair	Ex-cellent	Fair	2.3	.010	8000	350	40	Acrylic	Ex-cellent	Fair	1B15
Water Clear	1.06	2	.20	Ex-cellent	Ex-cellent	Very Good	2.5	.010	7500	800	60	Acrylic	Ex-cellent	Good	1B31
Light Straw	1.05	2	.30	Ex-cellent	Very Good	Ex-cellent	3.5	.028	8000	300	48	Poly-urethane	Ex-cellent	Ex-cellent	1A20
Green Tinge	1.05	5	.31	Ex-cellent	Ex-cellent	Fair	3.6	.020	7500	200	12	Poly-urethane	Fair	Good	1A27
Yellow Tinge	1.05	2	.31	Ex-cellent	Ex-cellent	Fair	3.6	.030	7500	200	16	Poly-urethane	Ex-cellent	Good	1A33
Yellow Tinge	1.09	0.5	.30	Ex-cellent	Ex-cellent	Good	3.6	.024	3500	300	56	Poly-urethane	Ex-cellent	Ex-cellent	2A72
Yellow Tinge	1.06	2	.20	Ex-cellent	Ex-cellent	Ex-cellent	3.0	.030	8000	300	33	Epoxy	Ex-cellent	Ex-cellent	2B13
Yellow Tinge	1.10	15	.31	Fair	Good	Good	3.0	.030	6000	400	6	Epoxy	Ex-cellent	Good	2A51
Yellow Tinge	0.95	1	.30	Ex-cellent	Ex-cellent	Ex-cellent	3.0	.030	8000	200	28	Epoxy	Ex-cellent	Ex-cellent	2A53

HUMISEAL DIVISION

COLUMBIA TECHNICAL CORPORATION

WOODSIDE, NEW YORK 11377

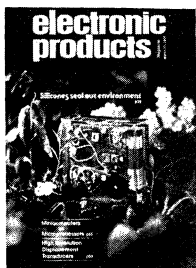
(212) 932-0800

PLEASE ASK FOR DEPT. 77

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



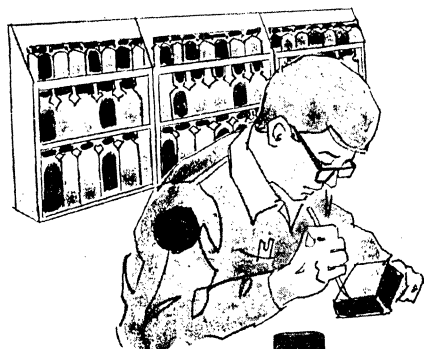
Sign up Now . . .

***Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530***



electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.



SPECIFY GC ELECTRONICS ... FOR ALL YOUR CHEMICAL NEEDS!

GC Electronics offers you the most complete line available anywhere. Whether it be cleaners, lubricants, adhesives, coolants, insulating compounds, finishes, printed circuit chemicals - - - GC offers them all in a wide variety of sizes and containers - - - bottles, tubes, aerosol cans, drums. For the finest quality and service, specify GC Electronics.

WRITE FOR CATALOG FR-75 FOR COMPLETE GC CHEMICAL LISTING



DRY KLEEN

Clean contacts, relays and other electronic devices. Leaves absolutely no deposits. Excellent degreaser for inks and gummy deposits on all electrical or mechanical apparatus. Non-flammable.

8669 16 oz. aerosol \$2.53

DE-OX-ID

The most powerful all-purpose TV-radio cleaner! Consists of active ingredients in a light oil base. Use on volume and tone controls, audio mixers, relays—restores noise free operation instantaneously. Highly concentrated—protects for months.

19-2	2 oz. bottle	\$1.38
19-6	6 oz. aerosol	2.48
19-16	16 oz. bottle	8.80

RELAY KLEEN

Cleans relays, contacts and other electronic devices where no oily, residual deposits are desired. Excellent degreaser and general solvent for gummy deposits on all electrical or mechanical equipment. Non-flammable; contains no carbon tetrachloride.

8682-3	3 oz. aerosol	\$1.23
8682	6 oz. aerosol	2.08
8682-16	16 oz. aerosol	3.84

EXTRA DRY SUPER FREEZE MIST

Cools circuits 3 times faster! Locates bad capacitors, transistors and oxidized joints by instantly cooling components. Non-toxic, odor free, leaves no liquid residue on parts.

10-702-3	3 oz. aerosol	\$.88
10-702	15 oz. aerosol	2.75

SPRA KLEEN

Eliminates noise due to dust, dirt and corrosion on electrical contacts. Cleans and lubricates contacts, controls, relays, switches and other sliding contact devices in one fast operation.

8666-3	3 oz. aerosol	\$.86
8666	6 oz. aerosol	1.18
8666-16	16 oz. aerosol	2.35

ZERO MIST CIRCUIT COOLER

Locates "intermittence" in electronic equipment caused by overheating of components. Cools components instantly pinpointing faulty capacitors, transistors, oxidized junctions.

8667	16 oz. aerosol	\$2.63
------	----------------	--------

NO-OX

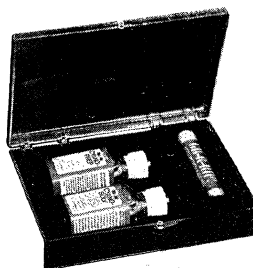
Electronic contact cleaner dissolves corrosion quickly without harsh solvents. Lubricates and protects slide contacts long after application. Recommended for maintenance of volume and tone controls, attenuators, relay contacts, patch-board jacks and similar equipment.

100-02	2 oz. bottle	\$1.38
100-06	6 oz. aerosol	2.48

SILI-SPRA

High quality silicone lubricant! Handy aerosol features exclusive 3-way valve that applies a light lubricating film that lasts and won't leave a residue buildup. Ideal for home, office or workshop.

10-600	6 oz. aerosol	\$1.53
--------	---------------	--------



Complete rapid bonding adhesive kit makes it possible to bond surfaces that before could not be bonded: Dupont Teflon, glass, polyethylene, vinyl or silicone rubber. Simply brush CYANO-PREP on surface to be bonded. CYANO-PREP evaporates immediately leaving the surface ready for bonding. Then apply GR-R-RIP!—a drop holds tons. To safely remove excess of adhesive from skin, clothes or tools, use CYANO-SOLV. Kit contains one each of:

(10-115)	GR-R-RIP!	(2 gram tube)
(10-125)	CYANO-PREP	(1 oz. bottle)
(10-130)	CYANO-SOLV	(1 oz. bottle)
10-135	MIRACLE ADHESIVE KIT	\$4.95

ALL ITEMS IN KIT AVAILABLE SEPARATELY



10-125	10-115	10-130
\$1.75	\$1.99	\$1.75

micro-circuits electrically conductive coatings

For Research and Production in: Electronics, Medicine, Aerospace, Electro-Mechanics, Communications

EVERY DESIGN AND RESEARCH ENGINEER SHOULD EVALUATE THESE TEN BASIC WAYS TO USE OUR CONDUCTIVE COATINGS

How many of **your** problems will they solve?

They are far from complete, but they certainly will suggest new approaches to your problems. The data folders in the Kits list the proper kit materials and suggested methods for solving each type of problem below.

- 1 Do you want to know exactly when something breaks, stretches, twists, slides, falls down, gets up, expands, shrinks, grows, vibrates, tears, cracks or smiles?

These effects, frequently correlated with an oscillograph record or record of applied force, usually depend upon the breaking of a current path through a conductive film painted on the surface under test.

- 2 Do you want to be warned or have something happen when it starts to rain, water rises, something boils over, a surface absorbs chemicals or moisture, a surface dries out, or wets its diaper?

These effects, which can be used to change the indication on an ohmmeter or to operate a relay, result from the enormous change in resistance which occurs when a drop of water or other chemical bridges the gap between two electrodes or grids painted on an insulating surface.

- 3 Do you need an easily-built working model of (or a less-expensive production replacement for) a complex, metallic, current-carrying part such as an antenna element, a fuse clip, a lamp socket, or 1001 other large and small pieces of conducting hardware?

Just make the part out of cardboard, bakelite, plaster of Paris, wood, lucite, glass tubing, or other material which is physically suitable; then brush, dip, or spray on a suitable conductive coating.

- 4 Do you need closely adhering terminals (temporary or permanent) on any surface for measuring volume or surface resistance, for determining the amount of salt water in a rock sample, or for measuring the capacitance or dielectric constant of materials?

- 5 Do you want to shield an instrument or component electrostatically or electromagnetically?

Often you can paint the shield right on the plastic case, glass envelope, or other surface.

- 6 Are you in a hurry to test a design change in a resistor, conductor, or capacitor in a printed or etched circuit; or would you like to draw a complete new printed circuit for your product?

- 7 Do you need a heating element for a chemical breaker, a crystal oven, a time-delay relay, or an aircraft gadget which needs heating or de-icing?

7 Continued

A wide range of accurately-adjusted resistance paints are available in the S31 KIT, and the instructions permit you to obtain fairly accurate resistance values with a minimum of experience.

- 8 Without requiring physical contact, would you like to:
See the amplitude or wave form at different points on a vibrating object?

Know when a certain amount of material has accumulated (such as dust on a refrigerator cooling radiator or material in a bin)?

Determine the per cent solids in foamed plastic, etc.?

Determine, rapidly and automatically, whether sheets or separate objects are thick enough, wide enough, or full enough?

These effects can be measured by measuring capacitance or dielectric constant changes with the aid of conductive-paint areas. Depending upon the problem, the effect can be measured on a capacitance bridge, seen on an oscilloscope, or used to vary the frequency of an oscillator.

- 9 Do you need a rapid method of building up worn conductive surfaces, grounding components, or connecting terminals on a terminal board?

- 10 Do you have problems involving sorting, timing, synchronizing, reversing, accepting, or rejecting?

Often it can be done by painting one or more conductive areas on a moving surface or object, so that stationary contact fingers will operate a relay or solenoid at the proper time. For example:

A dot of silver Micropaint at the end of a recording tape will operate a reversing mechanism.

Areas of low-cost resistance paint brushed on proper areas on the tops of boxes or other objects according to a pre-determined code will operate solenoids to push them off of a conveyor at the proper place.

A conductive area on a rotating disc or drum, on a tape, or on an object moving along a conveyor provides an easily-modified means of initiating a complex sequence of operating, holding, releasing, timing, counting, alerting, slowing down, speeding up, time delay, and revising functions.

NOTE: The above suggestions are rather general and are for illustration only. Specific applications may be patented or in process of being patented without our knowledge. We are not suggesting infringement of any patent and suggest that possible commercial applications be checked with your patent attorney.

micro-circuits co., inc.

DEPT.: EEM 2 • NEW BUFFALO, MICHIGAN 49117 • USA
PHONE: (616) 469-2727

micro-circuits

For Research and Production in: Electronics, Medicine, Aerospace, Electro-Mechanics, Communications

**ELECTRICALLY CONDUCTIVE SHIELDING,
RESISTOR, AND ANTI-STATIC COATINGS**

CONDUCTIVE COATINGS SELECTOR TABLE

Conductive Paint Catalog Numbers. See Descriptions Below	MOST FREQUENT USES							
	Static Shield	RF Shield	Aircraft Precipi- tation Static	High Voltage Stress Relief	Resistors Conductors 0-10 megs	Resistors 10 megs to 50,000 megs	Contacts Conductors Grounds	Sensors: Proximity, Bend- ing, Moisture, Cracking, Timing, etc.
SC12, 13, 15, 20	✓	✓			✓		✓	✓
SC17	✓	✓			✓		✓	✓
RS14	✓	✓			✓		✓	✓
RS17	✓				✓		✓	✓
RSE22	✓				✓		✓	✓
RSE100			✓	✓				
RS110			✓	✓				
RA-2			✓					
R-Series				✓	✓			✓
UHR-Series				✓		✓		

DESCRIPTIONS OF PAINTS LISTED ABOVE

NOTES ON DESCRIPTIONS OF PAINTS: Most of the coatings have been in use (with continuing improvement) for 5 to 20 years. They have many uses which are far removed from the uses which are mentioned. The indicated resistance per square is our production test value. Resistances obtained by the user may be varied by changing the thickness, by absorption into the substrate, by partial dissolving into undercoats or overcoats, etc. Resistance per square is the resistance measured between two opposite sides of a square area of the paint painted between parallel electrodes of substantially zero resistance. If paint thickness remains constant then resistance is independent of dimensions and a 1" square will have the same resistance as a 1 mile square.

We recommend a phone call to discuss proposed applications. These paints are usually available in production quantities on one or two day notice. We also have or can make a wide range of other conductive coatings.

SC12, SC13, AND SC15 AIR DRYING SILVER MICROPAINTS. These are highly conductive coatings for "wires," electromagnetic shielding, "soldering" fine wires, contacts on magnetic tape, coating of experimental parts of paper, plastic, wood, etc. to simulate metal parts, and a wide variety of other uses. They have been used by magicians and to indicate the fracture of rocks. Resistance of SC12 is less than 0.2 ohms per square. SC13 is more flexible but less conductive. Good adhesion. Stand 500°F. but soften below this. SC15 dries more slowly than SC12 and is suggested for ruling pen and silk screen application. Solvent SL14 for SC12 and SC13. Solvent SL-2 for SC15.

SC17 FLEXIBLE SILVER MICROPAIN. Very flexible. May be stretched up to 150%. For use on polyethylene, rubber, etc. where there are adhesion and flexibility problems. Has been used for skin contacts in medical tests but we have a superior substitute for this application. Imparts excellent rust-preventive conductive surface on steel for RF gaskets, door closures, etc. Prevents RF leakage at microwave plumbing joints simply by painting over the joints (SC13 is used for the same purpose). Resistance about 0.5 ohm per square or less as applied. Rises to about 10 ohms when stretched 100%. Brush or spray application. Solvent — SL14.

SC20. NEW SKIN CONTACT PAINT BONDS SILVER TO SKIN. New SC20 Silver Micropaint aids in the study of weak and elusive electrical body signals which may yield new discoveries. Accurate detailed recording requires a low level of distortion. Conventional skin-recorder interfaces vary due to skin movement, perspiration, and electrolytic action. The new SC20 silver electrode becomes part of the skin surface. Just paint it on and use within 1-2 minutes. Non-toxic, non-allergenic. No discomfort. Low cost per contact. Lasts up to two weeks with patient or research subject living, normal, active life. Remove with rubbing alcohol. May lead to discoveries based on long-term changes masked by conventional contacts.

RS17 FLEXIBLE SHIELDING MICROPAIN (formerly RS17B). Good adhesion to polyethylene, rubber, etc. Good weather resistance and rust preventive characteristics. Will stretch 30-50%. Uses are somewhat similar to those of SC17 but are determined by its higher resistance

of 150 ohms per square or lower and very much lower cost. Spray or brush. Solvent SL14.

RSE22 EPOXY SHIELDING MICROPAIN. Very good adhesion, abrasion resistance, and chemical resistance. Appears to be unaffected by continuous immersion in 10% salt solution at 200°F. Has many applications in forming ground surfaces, shielding, conductive corrosion protection, etc. 200 ohms per square or less. Curing agent (supplied) is mixed in before use. Pot life is 4 to 8 hours. Brush, spray, or dip. Solvents are SE100 (spray) or SE200 (brush).

RS110 AND RSE100 AIRCRAFT ANTI-STATIC MICROPAINTS (RAIN-EROSION-RESISTANT). Both coatings have a unique formulation which yields optimum anti-static characteristics under a wide range of application conditions and techniques. They may be depended upon to perform satisfactorily even when no equipment is available to test them after application. RS110 is a lacquer-base coating. Chief advantage is fast application and drying without curing agents. However customers have reported the service life to be in excess of 2000 hours without apparent loss of effectiveness on slow speed aircraft. RSE100 is an epoxy coating with very important advantages over neoprene anti-static coatings: Requires only two coats, no special primers, easily recoated and repaired. In accelerated laboratory tests under both dry and salt spray conditions RSE100 abrasion resistance equalled or exceeded that of neoprene anti-static coatings. Solvent SE100.

RA-2 ADDITIVE. This is added to commercially available decorative aircraft coatings. It permits decorative coatings to be applied over the black anti-static coatings on radomes and antenna covers without loss of anti-static effectiveness and without static puncture damage to the decorative coatings. RA-2 Additive is being used by U. S. and foreign air lines, aircraft manufacturers, and aircraft electronic manufacturers.

R-SERIES RESISTANCE MICROPAINTS. This is a series of five carefully adjusted resistance paints. It has been estimated that about 4000 ¼-watt resistors can be painted from one 25 cc (1 oz.) bottle. The stock numbers follow: The number following the stock number is the resistance in ohms per square: R01 — 125 ohms (per sq.), R11 — 500 ohms, R21 — 12,500 ohms, R31 — 0.31 megs, R41 — 3.1 megs. The paints may be mixed for intermediate values. By varying the ratio of length to width each stock paint will yield resistors varying from about ⅓th of the indicated value to about 5 or more times the indicated value. Maximum operating temperature is about 250°F. but they will stand much higher temperatures briefly. Brush, spray, ruling pen. Solvent SL14.

UHR-SERIES (ULTRA HIGH RESISTANCE) MICROPAINTS. These seven paints continue above the R-Series in resistance values. Use where a high meg resistor or a slow electrical leak is needed. May be applied with moderate precision with a ruling pen or artists brush. Can replace very expensive high meg resistors in non-critical applications for a fraction of a cent per resistor. Also used to equalize voltage gradients in high voltage insulators, etc. Made with a highly stable, moisture-resistant binder. Solvent SL14.

micro-circuits co., inc.

DEPT: EEM 2 • NEW BUFFALO, MICHIGAN 49117 • USA
PHONE: (616) 469-2727

Exacting Sprays for Exact Results by ...

KONTAKT CHEMIE

Imported
from
West
Germany

Cleaning, Protecting and Insulating Sprays for Electronic and Electrical Production and Maintenance

KONTAKT 60 OXIDE-DISSOLVING

The proven treatment agent for all electrical contact disturbances. Dissolves oxide and sulphide layers, dirt, oils, resins, fats, traces of metal abrasions, etc. ... leaves a protective microfilm. Eliminates high contact resistances due to atmospheric influences. Effective even under conditions of minimum current flow and lowest contact pressure. Safe on all types of constructional materials ... plastics, metals, hardboard, etc. Guaranteed trouble-free operation.

6 oz. and 16 oz. aerosol cans with flexible spray tube.
Also available in bulk liters.



NEW! TUNER 600 SUPER CLEANER

Immediately eliminates contact disturbances on channel switches without changing the capacitance and frequency response. Even sensitive tuners are not de-tuned. Eliminates disassembly, thereby reducing service time. Highest operational safety ... non-conductive. Harmless, non-flammable, instant drying, no residue.

6 oz. aerosol cans with flexible spray tube.

KONTAKT 61 "The Preserver" ANTI-CORROSION LUBE

A world renowned self-cleaning, anti-corrosion agent, formulated principally for application on, and precise lubrication of, new non-oxidized contact surfaces. Reduces mechanical abrasions of all surfaces by several orders of magnitude. Immeasurably increases service life and is perfectly safe on all construction materials. Guaranteed trouble-free operation.

6 oz. and 16 oz. aerosol cans with flexible spray tube.
Also available in bulk liters.



KONTAKT WL CLEANS AND DEGREASES

Fast, efficient results from KONTAKT'S multi-purpose solvent mix. Cleans and degreases badly soiled electrical contacts. Aids the excellent cleaning effect of "KONTAKT 60" by rapidly removing dissolved oxide particles. Safe, will not attack constructional materials ... plastics, metals, hardboard, etc.

6 oz. and 16 oz. aerosol cans with flexible spray tube.

NEW! KONTAFLO 85 "Greasefree Lubricant"

A suspension spray containing particles of polytetrafluorethyl (PTFE) as an effective constituent. It is a greasefree, waxlike lubricant and repelling agent practically invisible to the eye. It can be applied in all cases where oily substances (mineral or silicon oils) cannot be used, and where graphite or molybdenum sulphide cause excessive discoloration. Ideal for universal use.

6 oz. aerosol cans with flexible spray tube.



POLITUR 80 CLEANS AND POLISHES

Cleans and polishes in one process. For all wood, plastic or painted surfaces, and colors. Conceals and eliminates minor scratches and produces a high-gloss, durable coating.

6 oz. aerosol cans

PLASTIC SPRAY 70 INSULATING LACQUER

Resistant to dilute acids, caustic solutions, alcohol, oils, moisture and dust. Durable through -70°C to 100°C temperature extremes. High quality transparent coating with a wide range of applications.

6 oz. and 16 oz. aerosol cans



ISOLIER SPRAY 72 INSULATING OIL

High grade, high viscosity with a dielectric value of 20 Kv/mm. Silicone basis, will not dry out or cause sticking of parts. Stable through -50°C to 200°C temperature extremes. Moisture repellent and non-toxic. Contact surfaces, accidentally sprayed, will not be adversely affected.

6 oz. aerosol cans with flexible spray tube.

FLUID 101 MOISTURE PENETRATOR

Displaces moisture, penetrates under water and protects against corrosion! FLUID 101 assists wherever moisture is harmful. It prevents interruptions in electrical and electronic equipment caused by water condensation. Wet distributors, ignition cables or spark plugs are no longer a problem. Ideal for marine applications.

6 oz. and 16 oz. aerosol cans



NEW! OIL SPRAY 88 HIGH GRADE OIL

Lubricates the most inaccessible parts, simplifying maintenance. Acid free, remains fluid in -40°C to 175°C extremes of temperature. Inhibits oxidation.

6 oz. aerosol cans with flexible spray tube.

COLD SPRAY 75 INSTANT COLD

Cools to -42°C for rapid location of thermal breaks when repairing electronic equipment, saving time of dismantling and measurement of individual components. Prevents heat damage during soldering. Ideal for use in applications requiring rapidly reduced temperatures or freezing. Non-toxic, non-flammable and chemically inert; harmless to components.

6 oz. and 16 oz. aerosol cans with flexible spray tube.



ANTI STATIK SPRAY 100 STATIC ELIMINATOR

Prevents build up of static charges on all plastic products. Its uses include cleaning and preserving valuable recordings. Prevents dust deposits, formed as a result of static charges, on plastic products, remaining effective over a long period. Excellent for the treatment of television picture tubes and protection masks.

2½ oz. and 6 oz. aerosol cans.

VIDEO-SPRAY 90 MAGNETIC HEAD CLEANER

Dissolves even hardened dirt from the gaps of magnetic heads on video and sound tape recorders and data processing equipment. It is completely harmless, electrically non-conductive, non-flammable, dries quickly without leaving a residue and offers a high degree of safety in use.

2½ oz. and 6 oz. aerosol cans with flexible spray tube.



GRAPHIT SPRAY 33 CONDUCTIVE COATING

Provides a conductive and durable coating on non-conductive surfaces directly from the spray can. Its uses include the repair and renovation of damaged screens of cathode ray tubes. Eliminates static charges ... acts as an effective screen. Adheres to all smooth surfaces.

16 oz. aerosol cans

LOTILACK SK10 SOLDERING VARNISH

A protective coating/lacquer which prevents the oxidation of PC boards, thus permitting increased shelf-life. Also acts as a soldering flux with excellent soldering capabilities. SK10 is equally suitable for use in manufacturing and servicing.

16 oz. aerosol cans



POSITIV 20 PHOTO COPYING PAINT

Positive process coating for printed circuits for use by technicians and others concerned with the fabrication of single, or small runs of printed circuits. Transparent drawings of printed circuits can be copied directly on to a board coated with Positiv 20. The high resolution gives clear sharp edges. A large exposure range provides the required safety.

6 oz. aerosol cans

Send for
catalog, specifications and
price information

**REGMO DATA
CORPORATION**

6992 Oxford St.
Minneapolis, MN 55426
612/925-3800

P.C. BOARDS

We are manufacturers of quality printed circuit boards with many years of experience, and our service has satisfied numerous customers from Coast to Coast.

We are specialists in many diverse industries; such as Medical Electronics, Electronic Security, Instrumentation, Navigational, Aviation, Emergency Lighting, Computers, as well as many others.

With extensive experience, know-how, and modern facilities backing our organization, we are confident that we can supply and fulfill your requirements.

Some of our more general capabilities include:

<i>Single Sided</i>	<i>Gold Plating</i>
<i>Double Sided</i>	<i>Nickel Plating</i>
<i>Plated Thru</i>	<i>Tin Plating</i>
<i>Tape Drilling</i>	<i>Lead-Tin Plating</i>
<i>Pierce & Blanking</i>	<i>Reflow Solder</i>

Whether you have a requirement for prototypes or production quantities, or wish further information-call collect. We are willing and able to serve you.

**ACI**

APPLIED CIRCUITS INC.
31-24 14th Street, L.I.C. N.Y. 11106

Tel. (212) 274-6001

Members:



ACCUTRONICS

"STANDS FOR ACCURACY AND
CONTROL IN PRINTED CIRCUITRY"

SERVICE

SAVINGS

DELIVERY

QUALITY CONTROL

HERE IS HOW YOU BENEFIT

Complete **photography and prototype lab.**

Micro-adjustable silk screening equipment for plus or minus .001 **repeatability.**

Optical location of blank and pierce operations for close tolerance punch pattern registration. Plus or minus .005" or better.

All products receive constant in-process monitoring, 100% final inspection and final audit to assure **quality boards.**

Drill and route capability.

Normal lead time required, **2 weeks** — 24 hour service when needed.

Underwriters Laboratory process approved UL flame retardant material and **approved process.**

Manufacturing of boards with "Roll tinned" edge connectors as a possible **Sub\$titute for gold** (gold plating is available).

Exceptional solderability.

Over 50 years of combined management **experience.**

Member IPC.

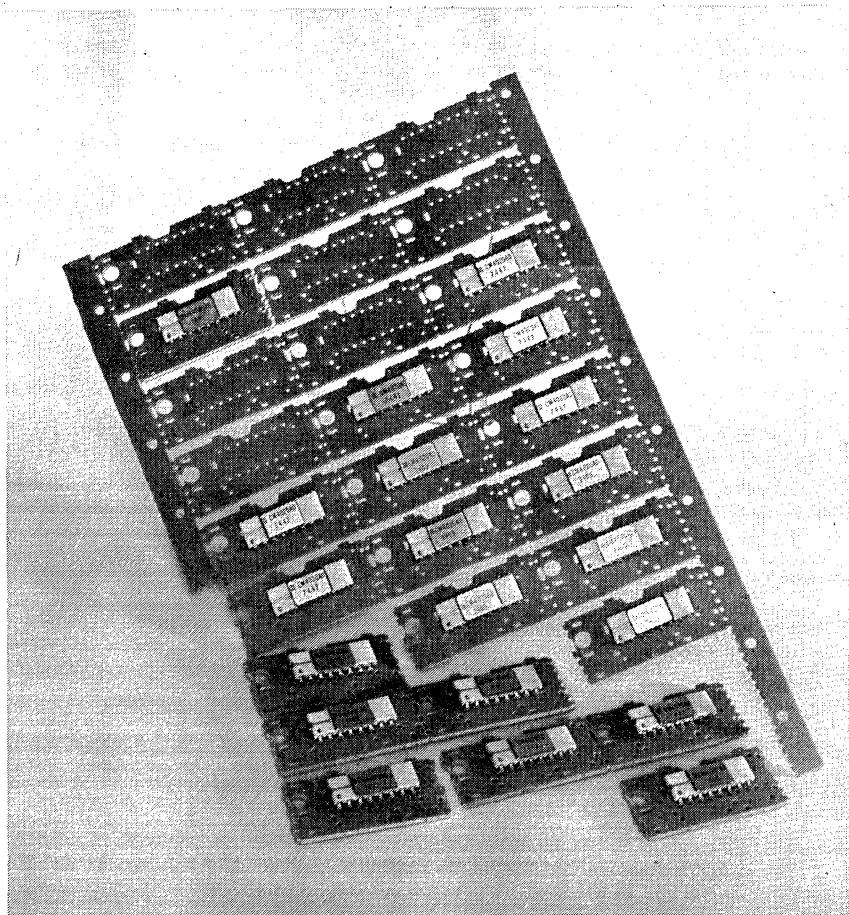
accutronics / printed circuit division

225 North First Street - Cary, Illinois 60013

Phone 312-639-2102 - TWX 910-237-1680 - Cable AKUTRONX

NEW PRINTED CIRCUIT BOARDS

SNAP-A-WAY : SNAP-A-WAY



SNAP-A-WAY SNAP-A-WAY

SNAP-A-WAY style boards can offer substantial savings for either **Manual** or **Machine** insertion operations • Board costs are reduced through skeletal scrap reduction • Assembly and soldering times are reduced through minimized handling • Snap-a-Way's are produced during the normal board production cycle and do not require the older costly scoring methods.

SNAP-A-WAY FOR HIGH VOLUME COST REDUCTIONS!!!

accutronics / printed circuit division

225 North First Street - Cary, Illinois 60013

Phone 312-639-2102 - TWX 910-237-1680 - Cable AKUTRONX

BUILD & TEST AS FAST AS

CSC
continental
specialties

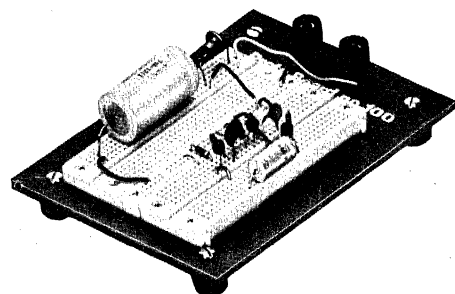
44 Kendall Street, Box 1942, New Haven, CT 06509 • 203/624-3103
West Coast Office: Box 7809, San Francisco, CA 94119 • 415/383-4207

Continental Specialties offers a total line of breadboard Prototest devices . . . everything from inexpensive kits to high-power professional units and logic monitors too. Available off-the-shelf from your local distributor or direct from the factory. These high quality, compact units come with a guarantee of complete satisfaction or your money back within 10 days.

Made in USA • *Patents Pending
Prices are subject to change.

Continental Specialties PROTO BOARD-100 is a complete Mini-Breadboard Budget Kit with full 10 IC capacity.

The PB-100 is a low cost, big 10 IC capacity breadboard kit with all the quality of Continental Specialties QT Sockets and the best of the Proto Board series. Each kit is complete down to the last nut, bolt and screw, including 2 QT-35S Sockets; 1 QT-35B Bus Strip; 2 5-way binding posts; 4 rubber feet; screws and easy assembly instructions. Measures 4.50" (114.3mm) wide x 6.00" (152.4mm) long x 1.35" (34.3mm) high. Order today off-the-shelf from CSC or your local distributor.



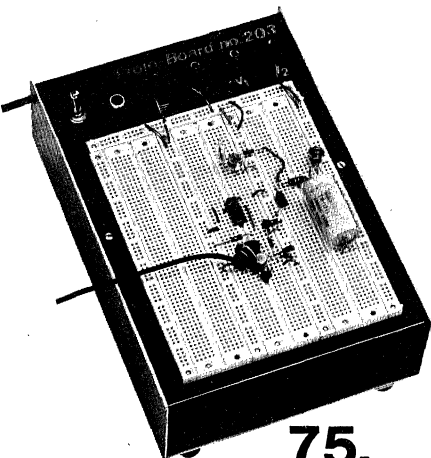
Complete Kit . . .

1995

Add \$1.50 shipping
and handling

PROTO BOARD 203 offers Power for The Professional. Breadboard and test with 5 Volt, 1 AMP regulated power supply.

The PB-203 is a total, ready-to-use power breadboard Prototest device with a built-in regulated, short-proof power supply. Just plug it in and start building! 2 extra floating 5-way binding posts are included for external signals. Self-contained, with a power switch indicator lamp and power fuse. Full 24 14-pin DIP capacity in an attractive two-tone quality case. All metal construction, measuring 6.60" (168mm) wide x 9.75" (248mm) long x 3.25" (82.6mm) high. Weighs 5 lbs. Order today off-the-shelf from CSC or local distributor.



75.

Add \$2.50 shipping and handling

FOR IMMEDIATE OFF-THE-SHELF DELIVERY

West Coast Office: Box 7809, San Francisco, CA 94119 • 415/383-4207

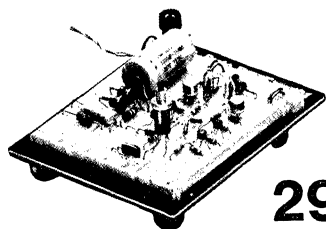
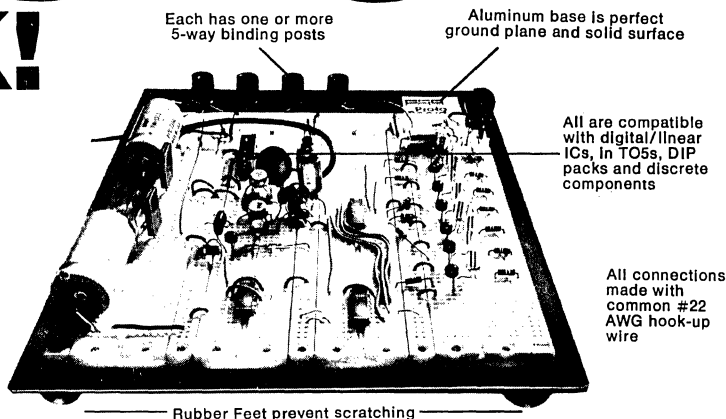
CHARGE ON BANKAMERICARD, MASTER CHARGE OR AMERICAN EXPRESS.

FOREIGN ORDERS ADD 15% FOR SHIPPING AND HANDLING.

CIRCUITS YOU THINK!

4 Versatile Breadboard Prototest Devices eliminate soldering and patch cords!

Continental Specialties PROTO BOARDS let you make all circuit and power interconnections with common #22 AWG solid hook-up wire, while power distribution buses make wiring a snap. Aluminum base plates offer solid work surfaces for perfect ground plane and rubber feet prevent scratching. Each PROTO BOARD features one or more 5-way binding posts to tie into system or power supply ground. All are compatible with digital or linear ICs in TO5s, DIP packs and discrete components. And each is completely assembled, ready-to-use. Order today off-the-shelf from CSC or your local distributor.



29⁹⁵

Continental Specialties PROTO BOARD No. 101

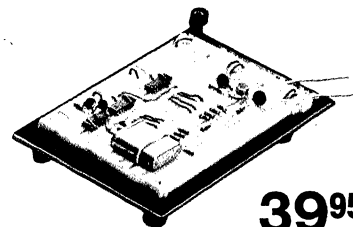
This compact, inexpensive model features 10 14-pin DIP capacity and measures only 5.8" long x 4.5" wide. Order today off-the-shelf from CSC or your local distributor.

Add \$2.00 for shipping and handling.

Continental Specialties PROTO BOARD No. 102

Here is another compact model, but with 12 14-pin DIP capacity, measuring 7" long x 4.5" wide. It offers considerably more versatility than PB-101. Order today off-the-shelf from CSC or your local distributor.

Add \$2.00 for shipping and handling.



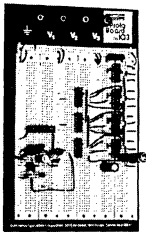
39⁹⁵

Continental Specialties PROTO BOARD No. 103

The PB-103 offers 2,250 solderless tie points, and four 5-way binding posts. This mid-size PROTO BOARD has a big 24 14-pin DIP capacity, and measures 9" long x 6" wide. Order today off-the-shelf from CSC or your local distributor.

Add \$2.50 for shipping and handling.

59⁹⁵

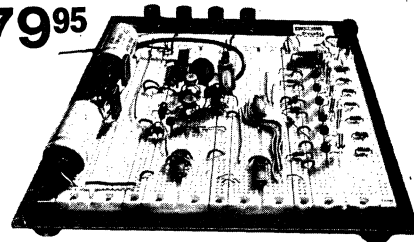


Continental Specialties PROTO BOARD No. 104

This big, versatile model features 3,060 solderless tie points, four 5-way binding posts, 32 14-pin DIP capacity, and measures 9.5" long x 8" wide. A big model for big testing jobs. Order today off-the-shelf from CSC or your local distributor.

Add \$2.50 for shipping and handling.

79⁹⁵



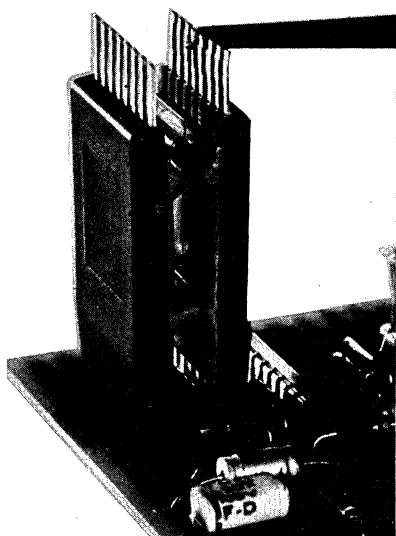
CALL CSC... (203) 624-3103

BUILD & TEST AS FAST AS

continental specialties



44 Kendall Street, Box 1942, New Haven, CT 06509 • 203/624-3103
West Coast Office: Box 7809, San Francisco, CA 94119 • 415/383-4207



Continental Specialties PROTO-CLIP offers Power-On/Hands-Off signal tracing ... yet costs under \$5.00!

Continental Specialties PROTO-CLIP lets you trace signals or troubleshoot fast. Plus you can inject signals or wire unused circuits into existing boards. Scope probes and test leads lock onto the unique toothed grips (see inset below). Flexible plastic web* construction eliminates springs and pivots. You'll get thousands of operations. Plus, the narrow throat is perfect for high density pc boards. Order today off-the-shelf from CSC or your local distributor.



PC-14 14-pin PROTO-CLIP: \$4.50 each
PC-16 16-pin PROTO-CLIP: \$4.75 each
Add \$1.00 for shipping and handling.

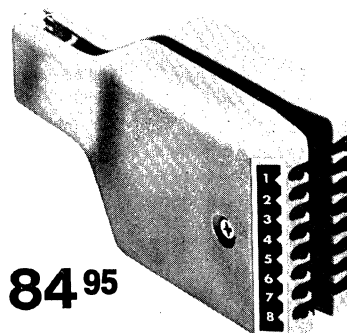
Continental Specialties LOGIC MONITOR brings ICs to life faster than a scope and safer than a voltmeter.

The amazing Continental Specialties LOGIC MONITOR is self-powered, self-contained and pocket-size. It requires no adjustments or calibrations as it simultaneously displays static and dynamic logic states of DTL, TTL, HTL or CMOS DIP ICs. Now you can watch your signals work their way through counters, shift registers, timers, adders, flip-flops, decoders, even entire systems.

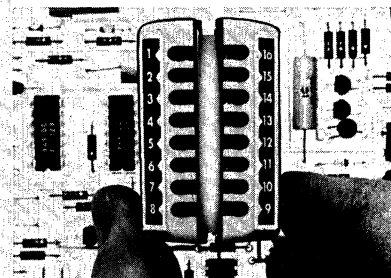
High intensity LEDs turn on when lead voltages exceed the 2V threshold. *No power supply is needed!* Power-seeking gate network locates DIP supply leads and feeds them into the LOGIC MONITOR.

Forget about grounds, pin counting or sync polarity. Simply clip the LOGIC MONITOR to any DIP IC up to 16 pins. Precision plastic guides and a flexible plastic web* insure positive connections between non-corrosive nickel/silver contacts and the IC leads. Logic levels appear instantly on 16 large (.125" dia.) high intensity LEDs. Logic "1" (high voltage)-LED ON. Logic "0" (low voltage or open circuit)-LED OFF. Order today off-the-shelf from CSC or your local distributor.

Add \$2.50 for shipping and handling.



84 95



*Patents Pending

FOR IMMEDIATE OFF-THE-SHELF DELIVERY

CHARGE ON BANKAMERICARD, MASTER CHARGE OR AMERICAN EXPRESS.

FOREIGN ORDERS ADD 15% FOR SHIPPING AND HANDLING.

CIRCUITS YOU THINK!

Continental Specialties QT[†] SOCKETS and BUS STRIPS let you breadboard circuits as fast as you can draw them! Plug-in. Wire. Test. Modify. Build. All without patch cords or solder!

Keep going non-stop, from idea stage to final design, using the same components over again without bending, twisting or loading with solder. The fast, reliable QTs let you try out new ideas or rejuvenate old ones with complete safety to your discrete and IC components and your fingers.

SIMPLE MOUNTING

Mounting holes in the housing let you top mount to any flat surface with 4-40 flat head screws, or 6-32F self-tapping screws for behind-the-panel mounting.

ACCEPTS ALL STANDARD COMPONENTS

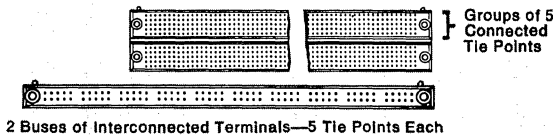
QTs conform to 1/10" grid and are DIP compatible. ICs, diodes, resistors, capacitors, transistors, etc. are plugged right into the socket and/or strip, without messy, time-consuming soldering.

HOOK-UP

All you need is a wire stripper and #22 AWG solid hook-up wire. Connect power and ground leads to your bus strip. Plug in your ICs, transistors, resistors, etc. Now interconnect components with #22 wire. Connect a signal source to bus strip or directly to input point of your circuit. Each socket has 5 tie points per terminal; each bus strip has 2 separate rows of interconnecting terminals. Turn on the power and signal source. Hook-up a scope probe, counter, etc. Then, if you have to add a wire, need another IC or component — just plug it in. You'll never burn your fingers or get solder shorts. And you don't need any special patch cords, either.

INTERCONNECTIONS

Each terminal consists of 5 connected solderless tie points formed from a prestressed, spring loaded noncorrosive alloy to insure secure mechanical and low resistance electrical connections.



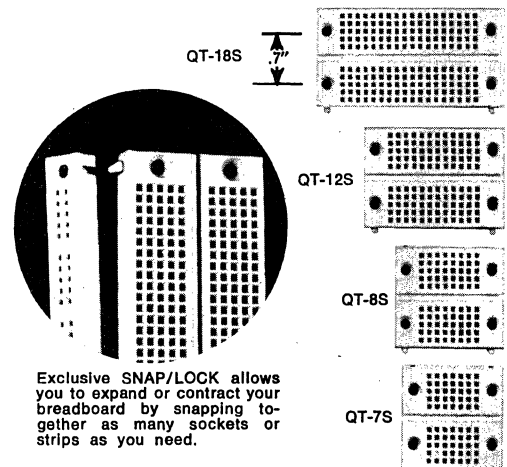
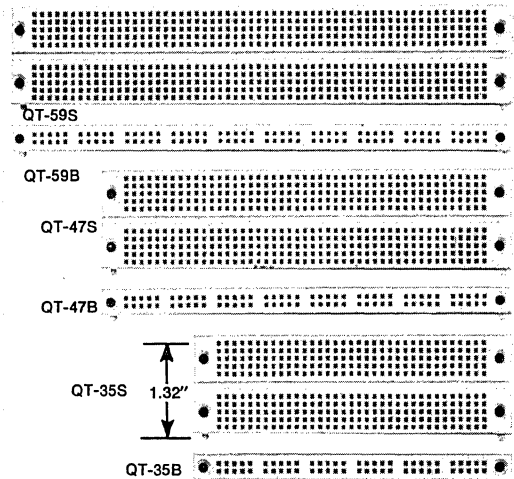
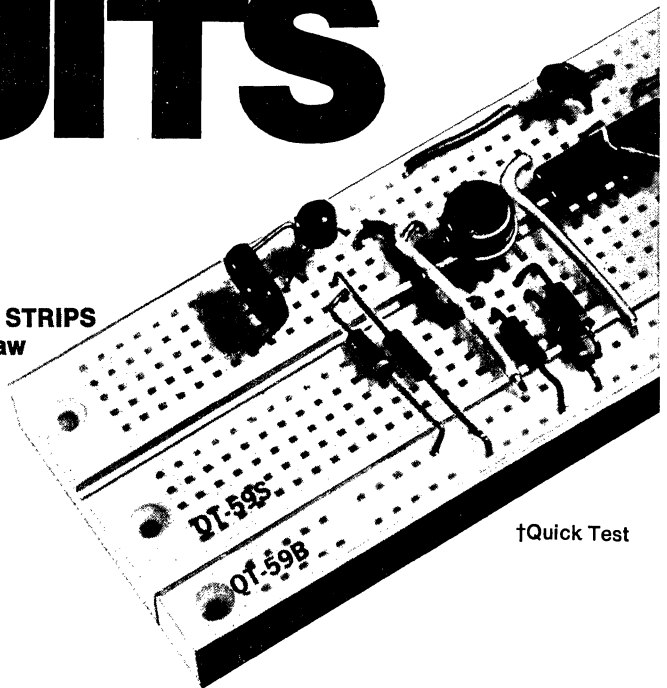
2 Buses of Interconnected Terminals—5 Tie Points Each

Simply push in your lead, wire or component and you've got a connection, quickly and easily, without damage to either the socket or your components. It's that simple!

All Sockets are 1.32" wide. All Bus Strips are .36" wide. All Sockets and Bus Strips are .33" thick. And all are great for high temperature operation — for worst case circuit design to 100°C.

Add \$1.50 for shipping and handling.

		Hole- Length to-Hole	Termi- nals	Unit	Price \$
QT-59S	6.5"	6.2"	118		12.50
QT-59B	6.5"	6.2"	20		2.50
QT-47S	5.3"	5.0"	94		10.00
QT-47B	5.3"	5.0"	16		2.25
QT-35S	4.1"	3.8"	70		8.50
QT-35B	4.1"	3.8"	12		2.00
QT-18S	2.4"	2.1"	36		4.75
QT-12S	1.8"	1.5"	24		3.75
QT-8S	1.4"	1.1"	16		3.25
QT-7S	1.3"	1.0"	14		3.00



Exclusive SNAP/LOCK allows you to expand or contract your breadboard by snapping together as many sockets or strips as you need.

CALL  ... (203) 624-3103



DEFIANCE CIRCUIT CORPORATION

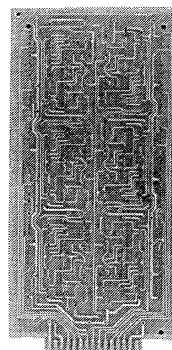
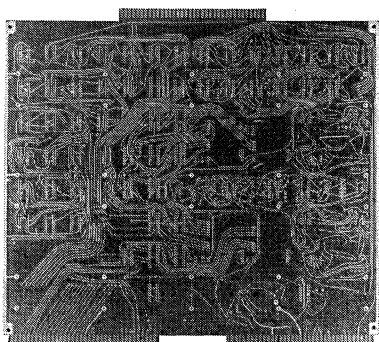


A SUBSIDIARY OF HFI INC.

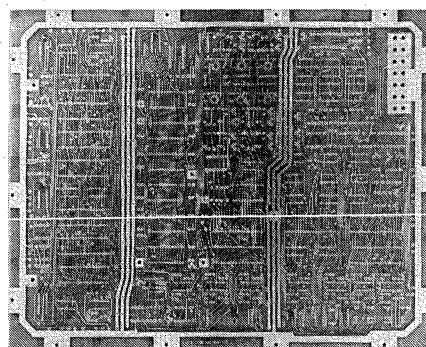
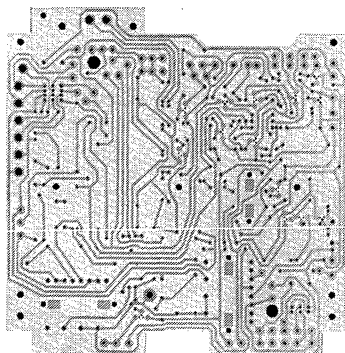
PRINTED CIRCUIT BOARDS FOR INDUSTRY

Our people are dedicated to supplying the quality you expect. Our complete and modern facility assures you of the latest technical advances in equipment and processes. Our computerized production control system eliminates production bottlenecks and insures on-time delivery. Our

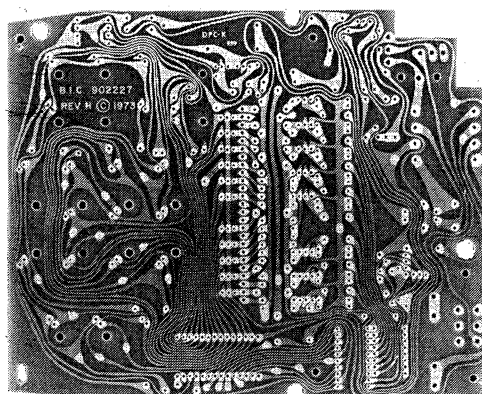
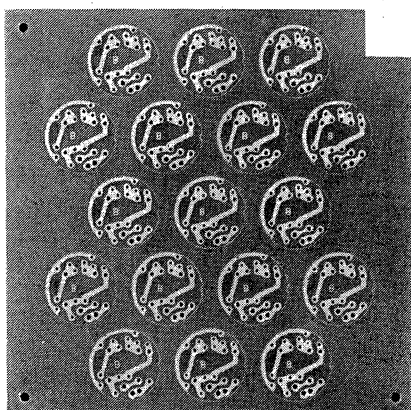
modern photo lab and chemical lab give us the tools and analysis without relying on outside sources. Our complete die tooling facility reduces both lead time and cost. Whatever your board requirements are, Defiance will respond with a prompt and competitive quotation.



DATA PROCESSING



COMMUNICATIONS



COMMERCIAL



DEFIANCE CIRCUIT CORPORATION



A SUBSIDIARY OF INC.



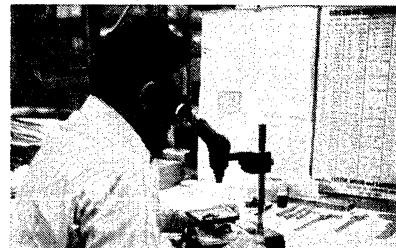
ENGINEERING

Over twenty years of experience assures compatibility inspection of all incoming artworks. The chemical lab monitors plating solutions for dependable process control.



QUALITY CONTROL

Competent employees and the latest in equipment and procedures in both in-process inspection and final inspection give you the product quality you expect.



DRILLING

Defiance was one of the first independent companies to employ numerical control drilling exclusively. We will compare drilling capability with anyone without hesitation.

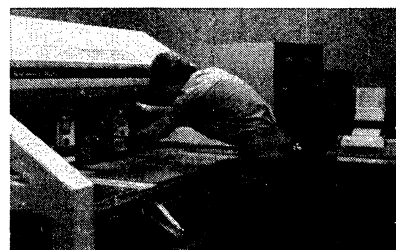
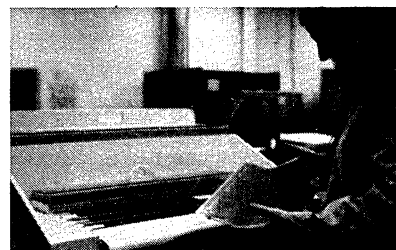


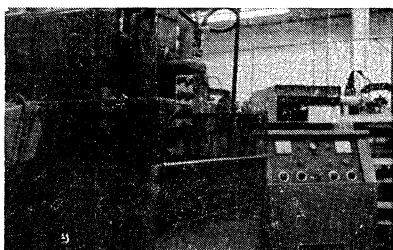
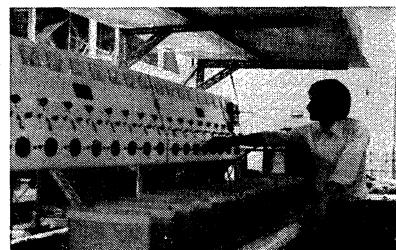
IMAGE DEPARTMENT

We utilize both the screening and dry film processes. Whether the requirements are simple or difficult, we are competitive due to our flexibility of equipment.



PLATING

Tight process control and trained personnel assure high quality. The gold plating tanks contain individual rectifiers per panel to more accurately control thickness.



FABRICATION

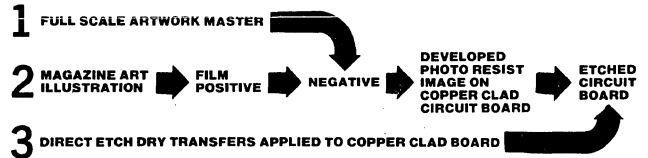
A complete tool and die department including EDM equipment give us a competitive edge in both cost and delivery. High volume runs are blanked. Low volume orders are routed.



printed circuit kits... DATAK

new photo etch kit..... *Makes printed circuits THREE WAYS*

Duplicate industrial techniques to make one or hundreds of identical printed circuits. Remarkable **POS-NEG[™]** (pat. pend.) system will photocopy 1:1 art directly from a magazine page. Make 1:1 artwork masters, negatives, positives. Sensitize ordinary copper clad circuit boards: use your negative to expose; then develop and etch the final circuit. **No camera. No darkroom.** No tracing, pasting or film cutting. All materials supplied except photoflood bulb available at any camera store.



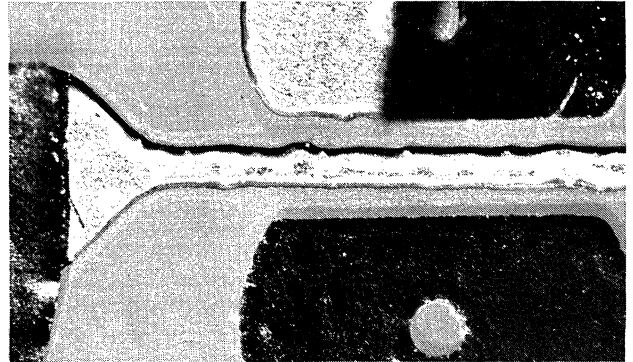
KIT CONTAINS: 5"x6" steel printing frame with plate glass and backboard, 4 sheets 5"x6" photocopy film, yellow filter, chemicals for 1 pint film developer and 1 pint film fixer, 5"x6" copper clad board, spray can photo etch resist, 1 pint resist developer, 2 sheets 8½"x11" layout film, 1 roll 1/16" and 1 roll 1/32" printed circuit tape, 8 sheets dry transfer direct etch PC patterns including pads, transistors, round can and flat pack ICs, DIP ICs, edge card connectors, lines, circles, jogs, etc., ¼ lb. anhydrous ferric chloride to make 1 pint etchant, instructions.

ER-4 COMPLETE PHOTO ETCH KIT \$24.95

direct etch printed circuit kit

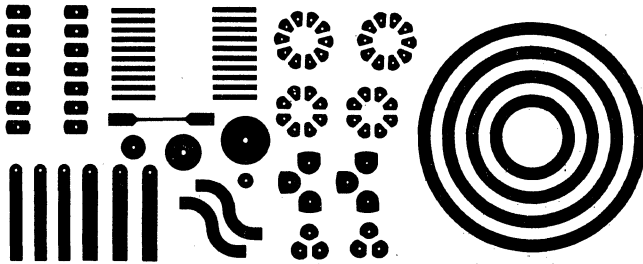
This one step kit uses a unique dry transfer resist that etches razor-sharp patterns. Lay out circuits directly on the copper board by rubbing down dry transfer patterns and lines. Connect with resist tape or leave unconnected for breadboards. Blow-up illustration shows 2 oz. copper circuit board made only with materials in kit. Black dry transfer resist is partly removed to show etched copper. Pattern is .015" squeeze-through wire transferred between 2 DIP pads. Pad edges are spaced .030" apart.

KIT CONTAINS: two 3"x4½" and two 2¼"x3" copper clad boards, 8 sheets direct etch PC patterns, 2 rolls PC resist tape (see ER-2 for description of patterns and tape), ¼ lb. anhydrous ferric chloride (makes 1 pint), combination storage box and etch tray, instructions.



ER-1 COMPLETE DIRECT ETCH KIT \$5.95

photo etch and direct etch refill kits



DIRECT ETCH RESIST PATTERNS

8 sheets 3"x5" 1:1 patterns include lines, circles, jogs, squeeze-throughs, TO-3 & TO-18 transistors, TO-99, TO-100, DIP & flatpack ICs, donut pads, roll of 1/16" and 1/32" resist tape. Withstands ferric chloride, ammonium persulfate, peroxide and other etch systems.

ER-2 DIRECT ETCH RESIST PATTERNS \$3.39

DRY CONCENTRATED ETCHANT

¼ lb. anhydrous ferric chloride in vapor tight package makes 1 pint etchant, enough for 200 sq. in. of copper board. Costs less than liquid etch solutions.

ER-3 DRY CONCENTRATED ETCHANT \$1.25

POS-NEG[™] PHOTOCOPY FILM

Polyester base film makes negatives or positives directly from opaque or translucent art in one step. Handle in subdued light. Expose with #2 photoflood.

ER-5 SIX SHEETS 5"x6" POS-NEG FILM \$3.39

FILM PROCESS CHEMICALS

3 chemical packets make 1 pint litho film developer and 1 pint acid fixer. Handles 15 sheets copy film.

ER-6 FILM PROCESS CHEMICALS \$1.79

PHOTO RESIST SPRAY

Photosensitive PC board coating. Unexposed coat is dissolved by resist developer. Exposed areas remain to act as an etch resist. Coats up to 400 sq. in.

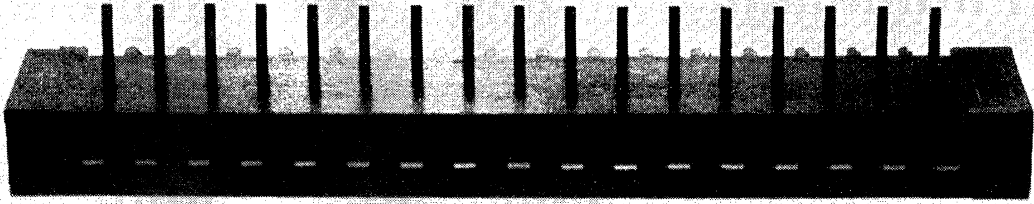
ER-7 PHOTO RESIST SPRAY (2.5 oz. net wt.) \$2.95

PHOTO RESIST DEVELOPER

Solvent blend develops exposed photoresist. Use with ER-7 spray resist.

ER-8 RESIST DEVELOPER (16 fl. oz.) \$2.95

the DATAK corporation • 65 71st Street • Guttenberg, N.J. 07093



Now Sheldahl flexcircuitry is affordable for even more applications.

Until today you may have ruled out flexcircuitry for some applications because of cost. The cost of the circuit itself. The cost of connecting it. Or both.

Today things have changed. With new pluggable edge connectors many flexcircuits can now be made of polyester film instead of materials up to 20 times more costly. And interfacing a flexcircuit with these new connectors reduces cost from 3-15¢ per contact down to an amazing 1¢ per contact in volume!

Flexcircuits, of course, are an engineer's answer to tough design problems involving limited space, circuitry needs on several planes and high or low volume needs. And now the cost of flexcircuitry needn't be a problem.

Using Sheldahl flexcircuits and new edge connectors you can have high reliability with great stability of resistance even in adverse environments without gold-plating.

Together, Sheldahl flexcircuits and new edge connectors provide the economy that opens the way to a much greater use of flexcircuitry for both large volume and limited run applications. For more information and free samples, just write or call us.



Sheldahl

Electrical Products Division
Northfield, Minnesota 55057
Phone: (507) 645-5633

SGL PRINTED CIRCUITS

PRINTED CIRCUIT BOARDS

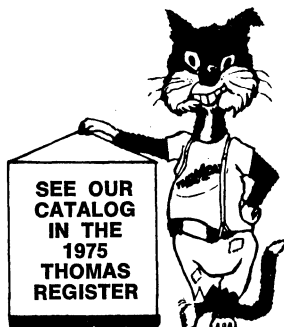
- SINGLE SIDED
- DOUBLE SIDED
- PLATED THROUGH HOLES
- MEET IPC AND MIL SPECS
- FAST PROTOTYPE DELIVERY

SGL Printed Circuits, with long experience and complete knowledge of latest production techniques, is a leader in printed circuit technology. Our modern, well-equipped facilities provide a quality manufacturing capability that assures you printed circuitry that meets your most exacting requirements.

The order you place with us is processed by skilled technicians whose standards of quality workmanship produce a superior product with on-time delivery. We maintain stocks in XXXP, FR-3, FR-4, G-10 and G-11, enabling us to assure supply and offer prompt shipments.

If you have a current need for printed circuits, we would appreciate your consideration of our company. If your specifications are fully developed, send them to us for quotation. They will receive prompt attention. If a personal visit to discuss the development or technical requirements of your printed board would be helpful, call us or write at the address below.

**Where
Quality
Matters
In Printed
Circuitry.**



SGL PRINTED CIRCUITS

A division of SGL INDUSTRIES, INC.

827 BLACK OAK RIDGE ROAD
WAYNE, NEW JERSEY 07470
(201) 835-2765

SGL WABER Electric

"U" Gr. OUTLET STRIPS And WHEELED CARTS



Model 900CB \$23.15

SGL WABER pre-wired outlet strips provide multiple outlets with switch, pilot light, and circuit breaker included in most models. Shown here are typical units from over 200 models available. Heavy-duty components are housed in sturdy steel cases. Rated at 15 amperes, 120 volts. Finished in hammertone gray.

Model 900CB — This unit has six outlets, lighted rocker switch, and circuit breaker. Made to fit standard 19" wide relay rack. Other models available with controls in front and outlets in back. 6' cord-set.

Model 602 — Highly useful where five "U" ground outlets only are needed. Rugged steel case. Tough 6' neoprene cord-set. Has mounting ears and measures 8 5/8" x 2 3/8" x 1 1/2".

Model 24CB — This popular unit offers circuit breaker protection, pilot light, on-off switch, six heavy duty "U" ground outlets, tough 6' neoprene cord-set, and mounting ears. Dimensions: 13 1/8" x 2 3/8" x 1 1/2".

Model 4309 — UL listed unit has nine "U" ground outlets and measures 36" x 1 1/2" x 1 3/8". Internally wired, ready to wire-in. Knockouts on either end and leads provided with wire-nuts for fast installation. Steel case.

Model 700CB — Eight rugged "U" ground outlets in a steel case measuring 49" x 2" x 1 1/2" with lighted rocker switch and circuit breaker protection. 6' neoprene cord-set.

Any of the above 6' cord-set models can be supplied in a 15' length at an additional cost of \$2.10.

Model
602
\$8.45

Model
24CB
\$16.90

Model
4309
\$18.15

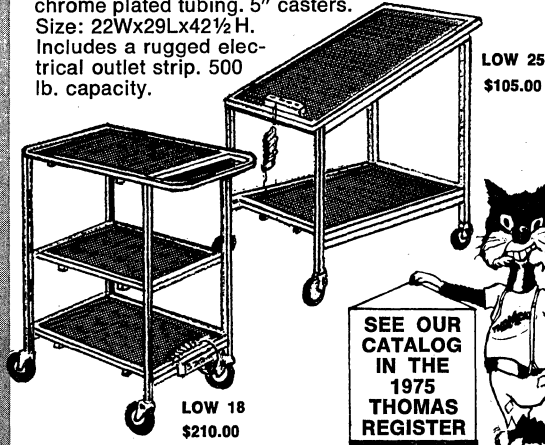
Model
700CB
\$28.65

SGL WABER SCOPE CART AND WHEELED CARRIER

LOW 25 — Welded steel construction. Adjustable stops. 3" swiveling casters. Complete with electrical outlet strip. Size: 21Wx31Lx33 1/2"H. Top shelf inclines 20°. 360 lb. capacity.

LOW 18 — One of the most versatile carriers available. Ideal for audio-visual, hospital, labs, etc. Constructed of 1" square steel chrome plated tubing. 5" casters.

Size: 22Wx29Lx42 1/2"H.
Includes a rugged electrical outlet strip. 500 lb. capacity.



LOW 25
\$105.00

LOW 18
\$210.00

SGL WABER Electric

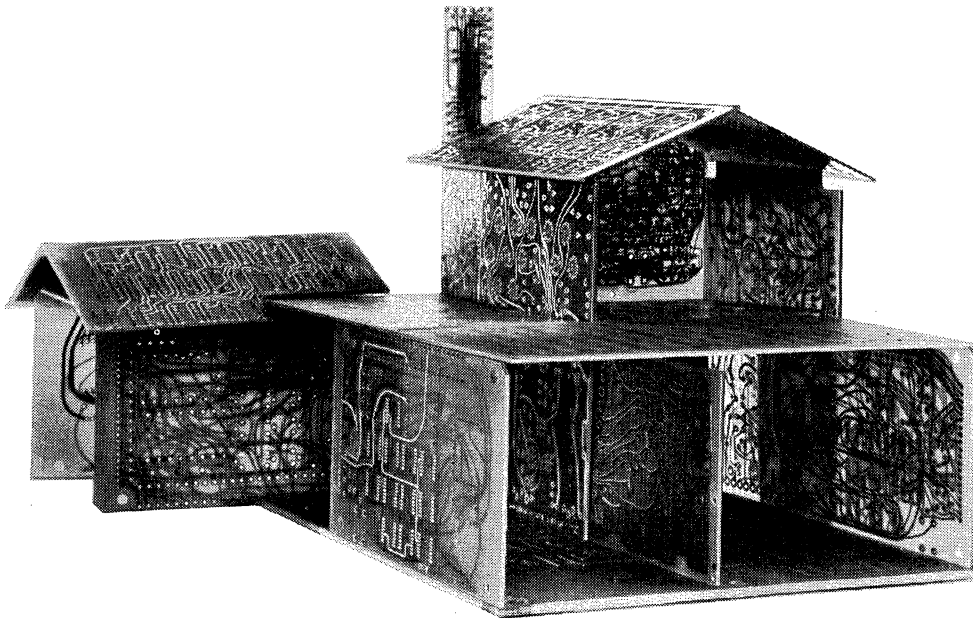
A division of SGL INDUSTRIES, INC.

300 HARVARD AVENUE
WESTVILLE, NEW JERSEY 08093
(609) 456-5400 TWX: 710-944-0758

Prices Subject To Change Without Notice

TRW[®] CINCH-GRAPIK

**High volume, production of P.C. boards
for automotive, data processing, communications,
instrumentation, aerospace and
military applications.**



**Single and double-sided printed circuit boards and
Precision multilayer printed circuit boards with plated-thru holes**

At TRW/Cinch Graphik you'll find the industry's most modern facilities combined with the industry's most knowledgeable, experienced people . . . the people that have made TRW/Cinch Graphik foremost in its field. These are the people who have devised and developed the innovations and techniques that enabled TRW/Cinch Graphik to develop the first through-hole plating and the first multilayer boards with 36 layers on automated equipment.

Perfection is a creed at TRW/Cinch Graphik . . . out of 800 people, one in every five is directly involved in inspection and quality control. To these people, meeting the requirements of Mili-

tary Specifications such as MIL-P-55110 and MIL-S-9858 has become second nature.

TRW/Cinch Graphik can handle your largest delivery requirements . . . our 125,000 square foot plant houses the most advanced precision production equipment in the industry. For high volume commercial, industrial, or military printed circuit boards, look to the leader in printed circuitry . . . look to TRW/Cinch Graphik.

Contact your nearest TRW/Cinch District Office listed in the manufacturers section, or contact TRW/Cinch Graphik, an Electronic Components Division of TRW Inc., 200 South Turnbull Canyon Road, City of Industry, California 91744. Phone (213) 333-1201.



Vector

VECTORBORD®—MICRO-VECTORBORD® PHOTO SENSITIZED BOARD

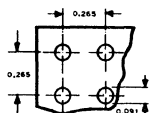
Vectorbord® and Micro-Vectorbord® prepunched terminal boards are time, work and money saving materials used throughout the electronic industry. Fire retardant material is precision punched in a wide variety of sizes, hole patterns, and thicknesses for later installation of terminals and components. Vector terminals in solder and wrapped wire models are available to fit all hole sizes. Pattern "A" or "AA" is good for experimental or other work where space is not critical. Pattern "B" is useful for work with small components such as resistors and capacitors. Pattern "G" is particularly useful for transistor usage. Patterns "H" and "P" are specially designed for use with integrated circuits and devices packaged with leads on 0.1 in. multiples. Special sizes and hole layouts can be made to order if one of the standard catalog items does not meet requirements. When ordering special size boards the following MAXIMUM BOARD WIDTHS apply:

Pattern "A" in phenolic & epoxy paper or glass laminates: 20"

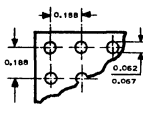
Pattern "B" all materials: 6"

Pattern "G" in phenolic & epoxy paper: 20". In epoxy glass: 16"

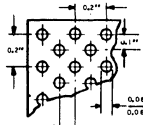
Pattern "H" in epoxy glass: 8.51" Pattern "P": 8.50"



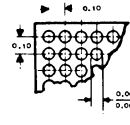
PATTERN "A"



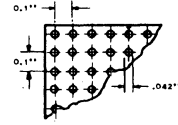
PATTERN "B"



PATTERN "G"



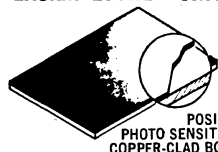
PATTERN "H"



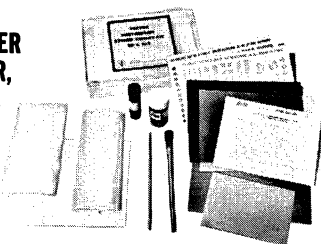
PATTERN "P"

Pattern	Material	Catalog No.	Length Inches	Width Inches	Thick. Inches	Copper Clad
A	Phenolic	18A18	4.8	4.8	1/16	None
		32A3	8.51	8.82	1/16	None
		32A9	8.51	2.41	1/16	None
		32A17	8.5	4.5	1/16	None
		32A18	8.51	4.8	1/16	None
		64A17	16.99	4.5	1/16	None
		64A18	16.99	4.80	1/16	None
		72A22	19.11	8.51	1/16	None
		32AA7	8.51	1.88	1/16	None
		32AA9	8.51	2.41	1/16	None
		32AA18	8.51	4.80	1/16	None
		64AA18	16.99	4.80	1/16	None
	Epoxy Paper	64AA32	16.99	8.51	1/16	None
		132A64EP	35.0	17.0	1/16	None
	Epoxy Glass	32A18WE	8.51	4.80	1/16	None
		64A18WE	16.99	4.80	1/16	None
B	Phenolic	45B30	8.51	5.69	1/16	None
		90B30	16.97	5.69	1/16	None
G	Phenolic	42G24	8.51	4.80	1/16	None
		42G42	8.51	8.51	1/16	None
		42G22	8.5	4.5	1/16	None
		85G22	16.99	4.5	1/16	None
		85G24	16.99	4.80	1/16	None
		85G42	16.99	8.51	1/16	None
		95G43	19.00	8.60	1/16	None
		95G87	19.00	17.40	1/16	None
		95G175	35.00	19.00	1/16	None
	Epoxy Paper	32G22EP	6.5	4.5	1/16	None
		42G22EP	8.5	4.5	1/16	None
		42G24EP	8.51	4.8	1/16	None
		85G22EP	16.99	4.5	1/16	None
		85G24EP	16.99	4.80	1/16	None
	Epoxy Glass	32G22WE	6.5	4.5	1/16	None
		42G22WE	8.5	4.5	1/16	None
		42G24WE	8.51	4.80	1/16	None
P	Epoxy Glass	42G22WEC1	8.5	4.5	1/16	One Side
		42G22WEC2	8.5	4.5	1/16	Two Sides
	Epoxy Glass	170H48WE	17.0	4.8	1/16	None
		29P29-062	3.0	3.0	1/16	None
		44P29-062	4.5	3.0	1/16	None
		59P19-032	6.0	2.0	1/16	None
		59P44-032	6.0	4.5	1/16	None
		64P44-016	6.5	4.5	1/16	None
		64P44-032	6.5	4.5	1/16	None
		64P44-062	6.5	4.5	1/16	None
		84P44-062	8.5	4.5	1/16	None
		169P26-062	17.0	2.73	1/16	None
		169P44-062	17.0	4.5	1/16	None
		169P59-016	17.0	6.0	1/16	None
		169P59-032	17.0	6.0	1/16	None
		169P59-047	17.0	6.0	1/16	None
		169P79-062	17.0	8.0	1/16	None
		169P84-062	17.0	8.5	1/16	None
		349P84-062	35.0	8.5	1/16	None
	Epoxy Paper	169P44-062C1	17.0	4.5	1/16	One Side
		169P59-032C1	17.0	6.0	1/16	One Side
		169P84-062C1	17.0	8.5	1/16	One Side
		169P44-062C2	17.0	4.5	1/16	Two Sides
		169P84-062C2	17.0	8.5	1/16	Two Sides
		64P44-062EP	6.5	4.5	1/16	None
		84P44-062EP	8.5	4.5	1/16	None
		138P42-062EP	13.9	4.5	1/16	None
		169P26-062EP	17.0	2.73	1/16	None
		169P44-062EP	17.0	4.5	1/16	None
P	Epoxy Paper	169P47-062EP	17.0	4.8	1/16	None
		169P84-062EP	17.0	8.5	1/16	None
		64P44-062EPC1	6.5	4.5	1/16	One Side
		169P44-062EPC1	17.0	4.5	1/16	One Side
		64P44-062EPC2	6.5	4.5	1/16	Two Sides
		169P44-062EPC2	17.0	4.5	1/16	Two Sides
	Phenolic	64P44-062XXXP	6.5	4.5	1/16	None
		169P44-062XXXP	17.0	4.5	1/16	None
		169P59-062XXXP	17.0	6.0	1/16	None

NEW—POSITIVE ACTING PHOTO SENSITIZED COPPER CLAD BOARD FOR FASTER, EASIER ETCHED CIRCUITS



POSITIVE PHOTO SENSITIZED COPPER-CLAD BOARD



32X POSITIVE PHOTO RESIST KIT

New Vector positive acting coated photosensitized board speeds etched circuit manufacture because boards are coated with positive acting resist. Positive artwork is used for the circuit master pattern making use of readily available positive drafting aids. No reversing step required. A finished etched circuit can be made in less than an hour and boards etch in any common etchant. Vector positive acting developer must be used after exposure of the boards under U.V. light source such as a photo flood lamp or sunlight.

Kits 32X or 32XA are recommended for trial evaluations of the system; later, purchase only boards and developer.

ORDERING INFORMATION

32X Kit: Contains 1 board 4 1/2"x6 1/2"x1/16" coated 2 sides; one 2.73"x4 1/2"x1/16" board coated 1 side; etching chemical and box; artwork patterns; developer; glass pressure plate; complete instructions.

32XA Kit: Contains above items plus 1 board 8"x9"x1/16" coated 1 side; 1 board 4 1/2"x6 1/2"x1/16" coated 1 side; 1 board 4 1/2"x7 1/4"x1/16" coated 1 side. Larger artwork assortment, more chemical.

1/16" THICK POSITIVE ACTING PHOTOSENSITIZED BOARDS

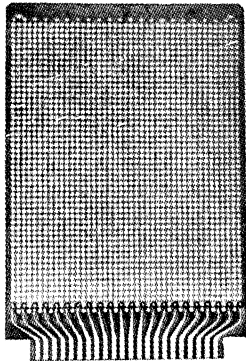
Catalog No.	Description			C. C. Coating	Pkg. Quan.
	Length	Width	Material		
CU90/80-1R	9	7.99	Phenolic	1 side	5
CU65/45-2R	6.5	4.5	Phenolic	2 sides	5
CU65/45-1R	6.5	4.5	Phenolic	1 side	5
CU45/27-1R	4.5	2.73	Phenolic	1 side	5
CU45/30WE-1R	4.5	3.0	Epoxy Glass	1 side	3
CU65/27WE-1R	6.5	2.73	Epoxy Glass	1 side	3
CU159/80WE-1R	15.85	7.98	Epoxy Glass	1 side	2

POSITIVE ACTING DEVELOPER

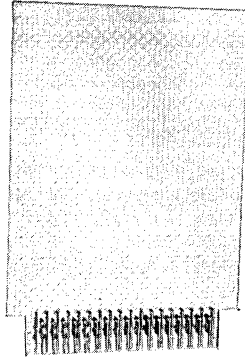
0088-21-15	1 oz. bottle
0088-21-16	8 oz. bottle


Vector

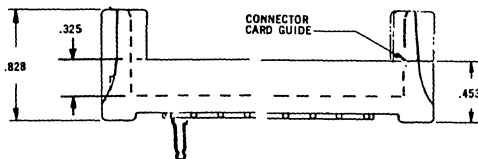
PLUGBORDS SAVE TIME — MONEY



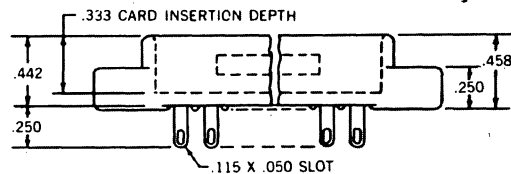
3662



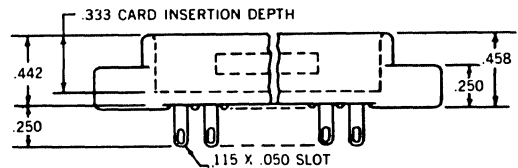
848WE



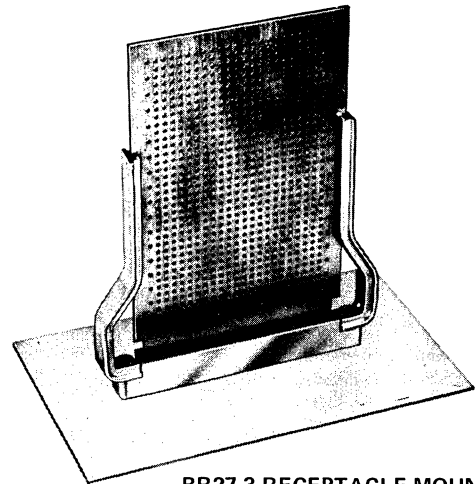
**R635 Receptacle, 35 Double-tier Contacts On 0.2 Centers
For Use With Vector 848WE And 848PWE Plugboards**



R630 P.C. Receptacle, 15/30 Contacts On .156 Centers



R644 P.C. Receptacle, 22/44 Contacts On .156 Centers



**BR27-3 RECEPTACLE MOUNTED
CARD GUIDE
(on R630 Receptacle with 2.73 in.
wide Plugboard)**

PLUGBORDS FOR GENERAL USE WITH CONTACTS But Without Matrix or Circuit Patterns

Use for building prototype, test and short run plug-in circuits with these Plugboards because almost any component from DIPs to large resistors can be mounted anywhere on the boards. Boards have an overall grid of prepunched holes, either 0.042 in. dia. on 0.1 in. centers (Pattern "P"), 0.062 in. dia. on alternate 0.1 in. centers (Pattern "G"), or 0.062 in. dia. on 0.1 in. centers (Pattern "H"). Boards are available with varied connector arrangements and mating connectors are listed. Back to back contacts on each etched side terminate in independent hole pads. Most boards have holes for attaching card ejectors.

CONTACT SPECIFICATIONS. Etched contacts:

Epoxy glass Plugboards — 2 oz. copper 0.0001 in. nickel, 0.00002 in. gold.
Phenolic Plugboards — 1 oz. copper solder coated.

Quality flame-retardant 1/16" thick board materials are the same as those used for Vectorbord® and Micro-Vectorbord®, see preceding page. Terminals to fit. See our pages Sect. 2100

Pat- tern	Board Size	Epoxy Paper	Epoxy Glass	Phen- olic	No. Style	Contacts Spacing	Mating Connectors Solder Plating Tail	Contacts Plating Tail
G 4.5"x6.5"	812	812WE	---	16	ElcoVar .2	Gold	R616-1	---
G 3"x4.5"	837	837WE	---	12	ElcoVar .2	Gold	R612-1	---
G 4.5"x6.5"	838	838WE	---	44	Etched .156	Tinned	R644	R644-3
G 4.5"x6.5"	838-1	838WE-1	---	44	Etched .156	Tinned	R644	R644-3
G 4.5"x6.5"	838A	838AWE	---	22	Etched .156	Tinned	R644	R644-3
G 4.5"x6.5"	838GN	838WEGN	---	44	Etched .156	NPGE	R644	R644-3
G 4.5"x6.5"	838A-1	838AWE-1	---	22	Etched .156	Tinned	R644	R644-3
G 4.5"x6.5"	---	838WE-1GN	---	44	Etched .156	NPGE	R644	R644-3
P 2.73"x4.5"	---	3796	---	30	Etched .156	NPGE	R630	---
P 4.5"x6.5"	---	848WE	---	35	ElcoVar .10	Gold	R635	---
P 3"x4.5"	---	837PWE	---	12	ElcoVar .2	Gold	R612-1	---
P 2.73"x4.5"	---	3795	---	44	Etched .1	NPGE	---	R644-2
P 2.73"x4.5"	---	---	---	44	Etched .1	Tinned	---	R644-2
P 2.73"x4.5"	---	3797	---	30	Etched .156	NPGE	R630	---
P 2.73"x4.5"	---	---	---	30	Etched .156	NPGE	R630	---
P 4.5"x9.6"	---	3719-1	---	72	Etched .1	Tinned	---	R636-1
P 4.5"x9.6"	---	3719-4	---	72	Etched .1	NPGE	---	R636-1
P 4.5"x6.5"	---	3662	---	44	Etched .156	NPGE	R644	R644-3
P 4.5"x6.5"	---	---	---	44	Etched .156	NPGE	R644	R644-3
P 4.5"x9.6"	---	3662-2	---	44	Etched .156	Tinned	R644	R644-3
P 7.98"x9.6"	---	3673	---	80	Etched .125	NPGE	---	R680

ElcoVar=Elco Varicon NPGE=Nickel Plated Gold Flashed

RECOMMENDED CARD CAGES See our pages Sect. 1400

For above Plugboards: 4.5"x6.5" - CCK3 or CCK3P; 4.5"x4.5" - CCK13A or CCK13AP; 7.98"x9.6" - CCK17; 4.5"x9.6" - CCK4, CCK14 or CCK14P.

RECEPTACLE MOUNTED CARD GUIDES

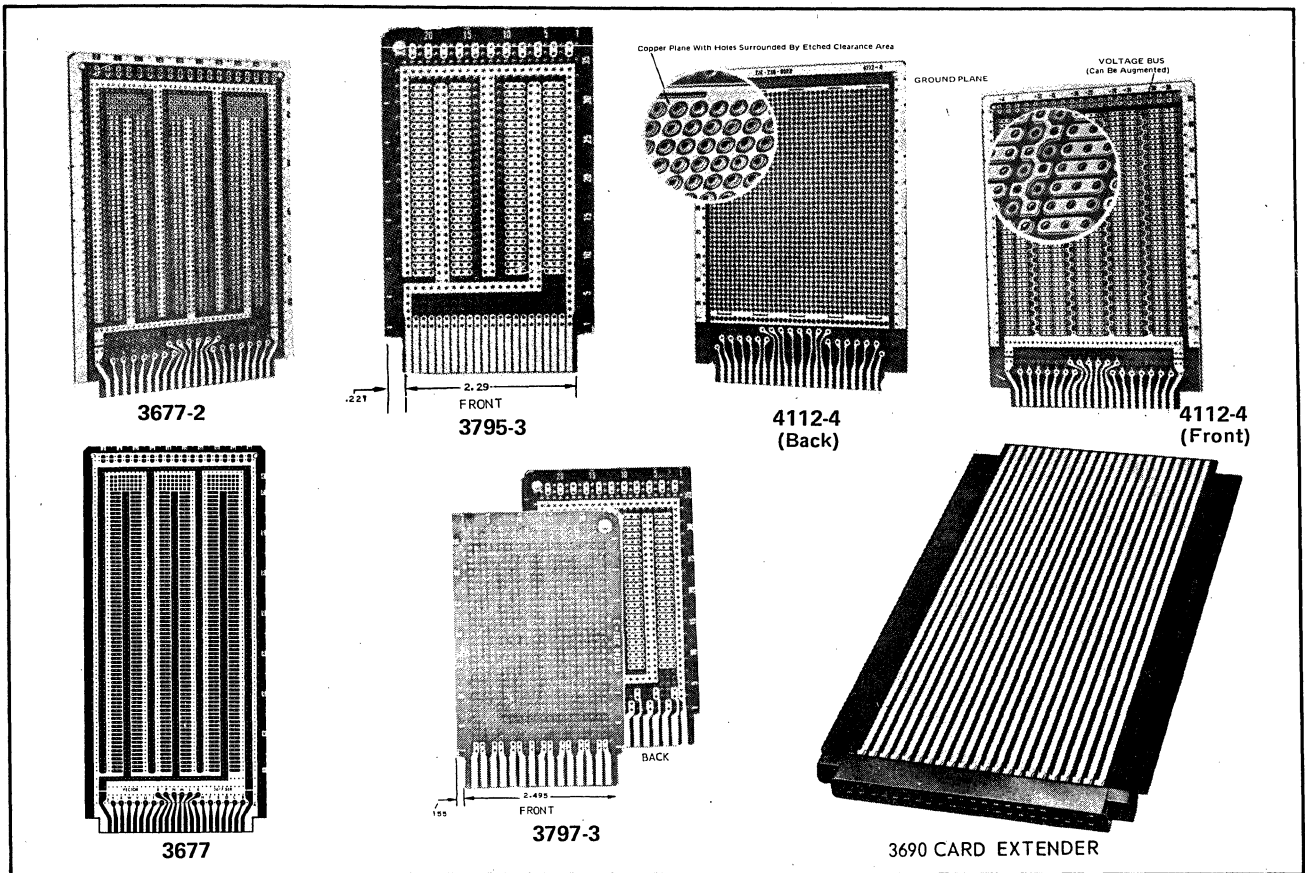
The BR27 Series Card Guides provide rugged support for 1/16 in. free-standing circuit boards and sure guidance while engaging board and receptacle. This arrangement is commonly found on "mother boards" and in units where space is at a premium. Package quantity all catalog numbers: 2 guides; 2 screws, 4/40; Pan Hd., 3/4 in. long; 2 flat washers; 2 lock washers; 2 hex nuts, 4/40. In bulk quantities (more than 50 prs.) fasteners packaged separately from guides. Material is aluminum alloy, clear anodized.

ORDERING INFORMATION

Guide No.	Connector	For Plugboard Types:
BR27	R644, R644-3 (0.156")	4.5" wide Plugboards with centered contacts, such as Vector 838-1, 3474, 3677, 3682 and 3662 Series.
BR27-1	R636-1 (0.1")	4.5" wide Plugboards with centered contacts, such as Vector 3719 Series.
BR27-3	R630 (0.156")	2.73" wide Plugboards with centered contacts, such as Vector 3796 and 3797 Series.
BR27-4	R644-2 (0.1")	2.73" wide Plugboards with centered contacts, such as Vector 3795.


Vector

PLUGBORDS FOR FLEXIBILITY



PLUGBORDS WITH ETCHED TINNED PADS AND BUSES

Use for prototype, test, and short run plug-in circuits. All boards have an overall hole grid of 0.042 in. holes on 0.1 in. centers (Pattern "P"). All etched circuitry above contact area is tinned for easy soldering. Boards are available with varied contact arrangements and mating connectors are listed. Back to back contacts on each etched side terminate in independent hole pads.

3677, 3797 and 3795 SERIES

These Plugboards have etched tinned buses, interleaved between pad areas. All models have tinned 3-hole pad groups for easy component mounting and interconnection. DIPs or components may be soldered directly to pads, or terminals installed in pads. Socket tabs may also be attached to the pads to facilitate making component changes. The heavy etched and tinned interleaved ground and voltage buses make complicated circuit construction quite easy, while providing great flexibility. The 3677 series has 96 individual pads for mounting T0-5 and T0-18 transistors or round case integrated circuits.

4112 SERIES

These Plugboards have groups of 3-hole pads, interleaved "zig-zag" voltage bus, plus an overall etched ground plane on opposite side. The "zig-zag" design permits installed pins to connect or bypass the bus as desired. Reduced impedance and noise can be achieved with addition of Vector's double overhead trolley bus. DIPs or components may be soldered directly to pads, or terminals installed in pads. Socket tabs may also be attached to the pads.

CONTACT SPECIFICATIONS. Etched contacts:

Epoxy glass Plugboards -- 2 oz. copper 0.0001 in. nickel, 0.00002 in. gold.
Phenolic Plugboards -- 1 oz. copper solder coated.

Quality flame-retardant 1/16" thick board materials are the same as those used for Vectorbord® and Micro-Vectorbord®, see preceding page. Terminals to fit. See our pages Sect. 2100

Board Size	Part No.	Accom.	No.	Spacing	Contacts - Etched	Plating	Mating Connectors Solder Tail	Connectors Wrapped Tail
2.73"x4.5"	3795-1 †	6	44	.1	NPGF	---	---	R644-2
2.73"x4.5"	3795-3 *	6	44	.1	Tinned	---	---	R644-2
2.73"x4.5"	3793-2 †	6	30	.156	NPGF	R630	---	---
2.73"x4.5"	3797-3 *	6	30	.156	Tinned	R630	---	---
4.5"x9.6"	3677 †	24	44	.156	NPGF	R644	R644-3	R644-3
4.5"x9.6"	3677-1 †	24	22	.156	NPGF	R644	R644-3	R644-3
4.5"x6.5"	3677-2 †	24	44	.156	NPGF	R644	R644-3	R644-3
4.5"x6.5"	4112-4 †	25	44	.156	NPGF	R644	R644-3	R644-3

*Phenolic †Epoxy Glass NPGF=Nickel Plated Gold Flashed
For above Plugboards: **RECOMMENDED CARD CAGES** our pgs. Sect. 1400
4.5"x6.5" -- CCK3 or CCK3P 4.5"x4.5" -- CCK13A or CCK13AP
7.98"x9.6" -- CCK17 4.5"x9.6" -- CCK4, CCK14 or CCK14P

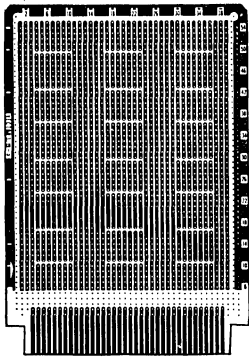
3690 SERIES CARD EXTENDERS

Card Extenders allow extension of operating cards beyond cages for tests. Quality epoxy glass with nickel plated gold flashed plug tips and high quality top connector where indicated.

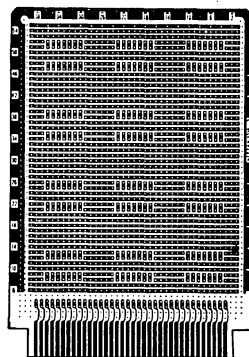
Model No.	Width-Length	Contacts	Spacing	Mounted Top Connector
3690	4.5"x6.5"	44	.156	Yes
3690-1	4.5"x6.5"	44	.156	No
3690-2	4.5"x11.0"	72	.10	Yes
3690-3	4.5"x11.0"	72	.10	No
3690-4	4.5"x7.5"	72	.10	Yes
3690-6	4.5"x11.0"	44	.156	Yes
3690-8	2.73"x5.5"	44	.100	Yes
3690-10	2.73"x5.5"	30	.156	Yes
3690-11	4.5"x8.0"	44	.156	No


Vector

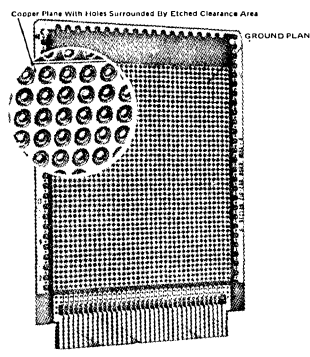
WRAPPABLE — MATRIX PLUGBORDS



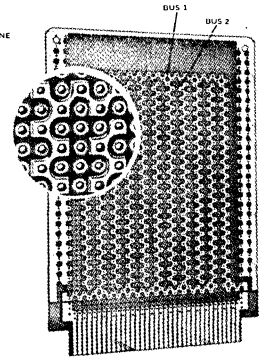
3719-3
(Y Side)



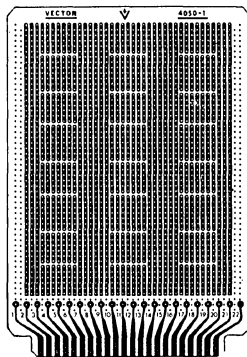
3719-3
(X Side)



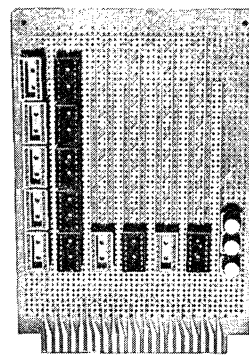
4066-4
(Back)



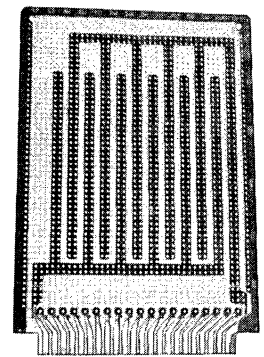
4066-4
(Front)



4050-1



3682-2
(Back)



3682-2
(Front)

MATRIX PLUGBORDS

All models listed have an overall grid of 0.042 in. dia. holes on 0.1 in. centers (Vector "P" Pattern). They provide a cost-saving approach to manufacture of plug-in circuit boards for small to medium quantity requirements. Wiring time is reduced because of the provided 2 oz. copper tinned etched conductors running vertically ("X") and horizontally ("Y") on some models. On the "X" side the lines are broken to permit mounting 14-pin DIPs. 16- and 24-pin DIPs can also be mounted by cutting the lines with Vector P139 Line Cutter or a hobby knife. Connections between board sides may readily be accomplished with any Vector pins for 0.042 in. holes and solder preforms which drop over the pins or Spring Bus Links T112. Boards are furnished with transparent layout paper printed in contrasting colors for "X" and "Y" sides. Board materials are 1/16 in. thick flame-retardant epoxy paper or epoxy glass. Card edge etched contacts are nickel plated and gold flashed. 3474 series has removable reinforcing aluminum "Kardej" on 3 sides which "tracks" in guides for 1/16 in. cards.

CONTACT SPECIFICATIONS. Etched contacts:

Epoxy Glass Plugboards — 2 oz. copper 0.0001 in. nickel, 0.00002 in. gold.
Phenolic Plugboards — 1 oz. copper solder coated.

Board Size	Material	Matrix	Part No.	Contacts - Etched		Mating Connectors
				Gold Plated	No. Spacing	Solder Tail
4.5"x6.5"	Epoxy.Glass	Y	3719-2	72	.1	---
4.5"x6.5"	"	X-Y	3719-3	72	.1	---
4.5"x6.5"	Epoxy.Paper	X-Y	3474	44	.156	R644
4.5"x6.5"	"	Y	3474-3	22	.156	R644
4.5"x6.5"	Epoxy.Glass	Y	4050-1	44	.156	R644
4.5"x6.5"	"	X-Y	4050-2	44	.156	R644

Quality flame-retardant 1/16" thick board materials are the same as those used for Vectorbord® and Micro-Vectorbord®, see preceding page. For terminals for boards listed this page, see our pages Sect. 2100

RECOMMENDED CARD CAGES See our pages Sect. 1400

For above Plugboards: 4.5"x6.5" - CCK3 or CCK3P; 4.5"x4.5" - CCK13A or CCK13AP; 7.98"x9.6" - CCK17; 4.5"x9.6" - CCK4, CCK14 or CCK14P.

WIRE WRAPPABLE PLUGBORDS

Vector wire wrappable Plugboards are furnished with an overall grid of 0.042 in. holes on 0.1 in. centers, tinned interleaved buses, and ground planes on one side of some models. DIP sockets and wire wrappable terminals or socket pins may be installed wherever required and connected however required. "Free" board areas without buses are provided on all models for mounting discretes or other large components. All boards are flame-retardant epoxy glass and furnished with the most popular edge connectors, nickel plated and gold flashed. Ejector holes are provided on all models, and a full line of supporting compatible card and module cages is available from Vector. "Special" features on some models are:

GROUND PLANES — A heavy overall 2 oz. tinned copper area on one board side can be used to reduce noise and transients, and to provide low impedance when used with buses on opposite side. A copper-free area surrounds each hole in the ground plane so installed terminals may be connected as required to one, or both, board side(s) as required.

ZIG-ZAG BUSES (on 4066 Series) — Two uniquely configured independent bus paths accommodate terminal tails for connections as required. Use of high capacitance Vector double overhead trolley bus series with zig-zag bus lowers impedance for high frequency circuits, such as encountered in ECL 10,000 series logic.

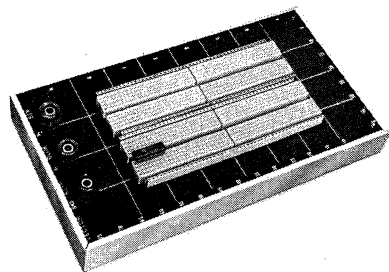
CONTACT SPECIFICATIONS. Same as listed for Matrix Plugboards.

Board Size	Part No.	No. Cont.	Spac.	Gnd. Plane	Accom.	No. Independent Buses		No. 14-p. Compo-Mating Connectors	
						Side	Side	Solder Tail	Wrapped Tail
4.5"x9.6"	3682	44	.156	No	54	2	---	R644	R644-3
4.5"x6.5"	3682-2	44	.156	No	30	2	---	R644	R644-3
4.5"x6.5"	3682-4	44	.156	Yes	30	2	1	R644	R644-3
4.5"x6.5"	4066-4	72	.100	Yes	34	2	1	---	R636-1
4.5"x4.5"	4066-5	72	.100	Yes	18	2	1	---	R636-1



Vector

KLIP-BLOK/STRIP BREADBOARDING SYSTEM



(Circuit elements not included in kit)

51X KLIP-BLOK KIT - Assembled

Accepts up to 12 DIPs, has 970 tie points. Consists of big $4\frac{1}{2}'' \times 8'' \times 1\frac{1}{16}''$ glass epoxy premarked Micro-Vectorbord® base, panel mounted on 1" high aluminum frame with eight 24-quad (T66-96) Klip-Blocks and four 48-contact Klip-Buses installed, ready for plugging in up to 12 DIPs and associated circuitry. Three 5-way binding posts are installed at one end. The Micro-Vectorbord panel provides space and facility for mounting extra large components. Kit includes stick-on MS9A and MS10A DIP contact Marker Strips, and special T49-1 Adapter Pins for plugging large components into Klip-Blocks/Strips.

51X-GP - Same as 51X, except has heavy overall copper ground plane on panel underside.

No Soldering

Use With DIPs, Other I.C.s and Discrete Components

No Wrapping

Build circuits quickly with Klip-Blocks, Klip-Strips and Klip-Buses. Simply insert components into these spring clip units and make interconnections with ordinary wire. Designing, modifying and testing the circuit is easily accomplished without the need of special patch cords or risk of damaging components.

Klip-Blocks, Strips and Buses consist of spring clips with four connected tie points or 'quads.' Klip-Strips and Buses utilize the quads in strips of various lengths, from 4 to 48 tie points with insulated casings, while Klip-Blocks have these quads encased in nylon shells, either 8 (T66-32) or 24 (T66-96) quads each. All Klip-Blocks, Strips and Buses are spaced on 0.1" grids for optimum I.C. breadboarding. Klip-Blocks, Strips and Buses accept leads from 0.015" to 0.032" dia. Ordinary 22 ga. wire (0.0253" dia.) is ideal for strapping. Components may be inserted into the clips from either top or bottom. The Blocks serve as sockets for components with extra tie points for interconnections. Accompanying Klip-Buses make voltage and ground readily accessible.

Contacts used in Klip-Blocks and Strips are tin lead coated beryllium copper for thousands of reliable connections. Plastic housings on Klip-Blocks are nylon, and insulated brass shells are used on Klip-Strips and Buses.

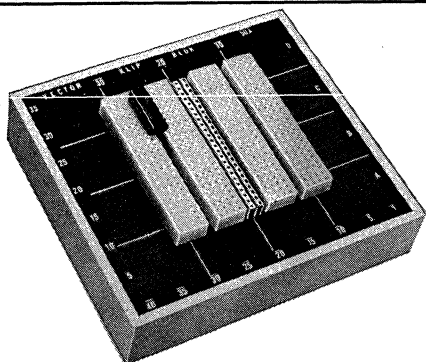
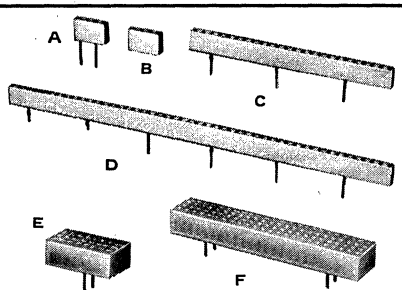
VERSATILE. Klip-Blocks, Strips and Buses fit "P" Pattern Micro-Vectorbord (0.042" dia. holes on 0.1" grid). Thus units may be "moved around" as needed with NO WASTED TIE POINTS. Plus, there is extra SPACE on the Vectorbord base to mount switches, pots, transformers—OR extra Klip units.

REUSABLE. Low-cost Klips and chassis panels may be used over and over again. Klips are good for thousands of insertions and may also be removed and replaced as desired.

EFFICIENT USE OF SPACE. Since components may be mounted on both top and bottom of the Vectorbord base, space is fully utilized. T49-1 Adapter Pins for leads to 0.050" dia. are available.

EXPANDABLE BREADBOARDS. $4\frac{1}{2}'' \times 8''$ modules may be coupled together or mounted in larger frames for up to multiples of 144 sq. inches of breadboarding area (see next page).

Fig.Part No.	Description	Pkg.Qty.
A T45-4	Klip-Strip w/mtg. pins	16, 100
B T45A-4	Patch-Klip - no mtg. pins	16, 100
- T45-8	Klip-Strip - two quads	2, 10
C T45-24	Klip-Bus	2, 10
D T45-48	Klip-Bus	2, 10
- P154-1	Insertion/Removal Tool for above Klip units	1
E T66-32	Klip-Blok (8-quad)	4, 16
F T66-96	Klip-Blok (24-quad)	2, 8
- P92B	Removal Prod for Blocks	1
- T49-1	Adapter Pins for leads to .050"	100
570G-1	Solderless Breadbd. Socket (2 8-qd. Klip-Blocks mounted on nylon base—for 14-or 16-pin DIP w/3 solderless connections, Stick-or screw-on.	1



(Circuit elements not included in kit)

50X KLIP-BLOK KIT - Assembled

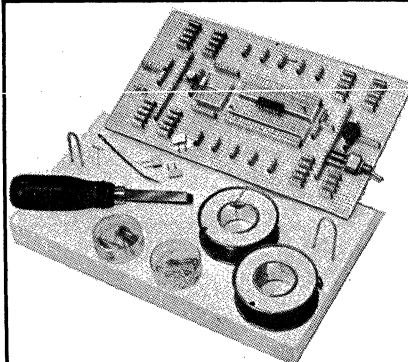
Accepts up to 6 DIPs, has 432 tie points. Micro-Vectorbord base size is $4'' \times 4\frac{1}{2}'' \times 1\frac{1}{16}''$ with printed registration for pin position identification. Includes four 24-quad (T66-96) Klip-Blocks, two T45-24 Klip-Buses, marker strips for 14- and 16-pin DIP identification, and extruded aluminum frame 1" high.

49X KLIP-BLOK KIT - Assembled

Accepts up to 3 DIPs, has 240 tie points. Micro-Vectorbord base is $2.7'' \times 4\frac{1}{2}'' \times 1\frac{1}{16}''$ with printed registration (2 sides), has two 24-quad (T66-96) Klip-Blocks, two T45-24 Klip-Buses, marker strips for DIP pin position, and extruded aluminum frame 1" high.

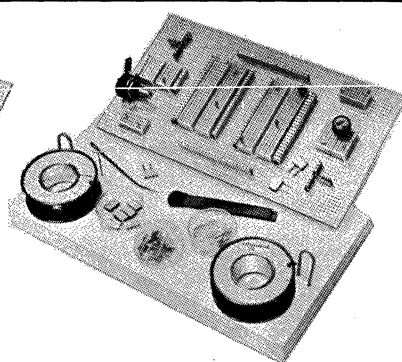
48X KLIP-BLOK KIT - Assembled

Starter kit has unperforated base $2.7'' \times 4\frac{1}{2}'' \times 1\frac{1}{16}''$ and 240 tie points (no bottom entry). Plus two 24-quad (T66-96) Klip-Blocks, two T45-24 Klip-Buses, DIP Marker Strips MS9A and MS10A. Base mounted on rubber bump feet.



33X KLIP-STRIP KIT

(Circuit elements not included in kits) 34X KLIP-BLOK KIT



CONVENIENT BREADBOARDING KITS

33X KLIP-STRIP KIT. For the circuit using DIPs and discrettes where flexible layout and component placement is desirable. Contains 70 total Klip-Strips and Buses, two 8-quad (T66-32) and two 24-quad (T66-96) Klip-Blocks, "P" Pattern Micro-Vectorbord ($4\frac{1}{2}'' \times 8'' \times 1\frac{1}{16}''$), support foam mounting pad, bare and insulated 22 ga. wire, assorted terminals and pins, mounting devices for switches, pots, etc., Insertion and removal tools. Plus complete instructions and application notes.

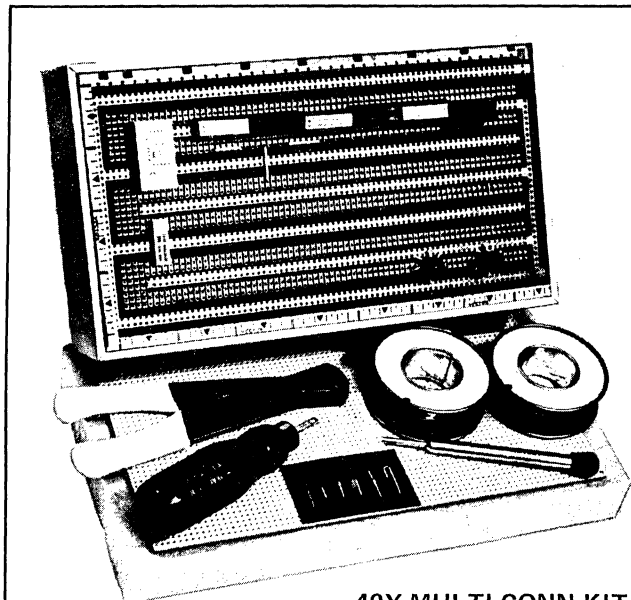
34X KLIP-BLOK KIT. A large assortment of Klip-Blocks (four 8-quad (T66-32) and four 24-quad (T66-96) makes this kit ideal for DIP circuitry. Also contains 16 Klip-Strips and Buses, "P" Pattern Micro-Vectorbord ($4\frac{1}{2}'' \times 8'' \times 1\frac{1}{16}''$), foam mounting pad, terminals and pins, bare and insulated 22 ga. wire, Insertion and removal tools, mounting devices for other components. Plus complete instructions and application notes.

39X MULTI-CONN KLIP-BLOK KIT. Features snap-in-out Micro-Vectorbord panel. Has two 8-quad (T66-32) and six 24-quad (T66-96) Klip-Blocks, 8 Klip-Strips and Buses, "P" Pattern Micro-Vectorbord ($4\frac{1}{2}'' \times 8'' \times 1\frac{1}{16}''$), terminals, Insertion and removal tools, switch and pot mounting loops, DIP marker strips, 75 ft. bare and insulated 22 ga. wire, 2" high aluminum chassis frame. Vectorbord simply snaps into chassis, holds firmly, yet easily removable.



Vector

NEW BREADBOARDING KITS



40X MULTI-CONN KIT
(Circuit elements not included in kit)

40X SOLDER KIT WITH P173 WIRING PENCIL

Unique new kit for faster circuit construction. Features the P173 Wiring Pencil and "solder-thru" insulated wire. The tool is used to route and draw 36 ga. wire around tabs or component leads from a self-contained spool. A touch of solder melts through the insulation, thus assuring fast, reliable connections. Kit contains P173 Tool; 1 "P" Pattern Padboard (4½"x8"x1/16") with etched, tinned copper oval pads and buses; 1 plain "P" Pattern Micro-Vectorbord® (4½"x8"x1/16"); over 300 assorted terminals and pins including solderable and wrappable types; six 16-pin DIP sockets; 2 round 8-pin I.C. sockets; two 570G-1 16-pin solderless breadboard sockets; 25 R41 Sockets for LEDs with .018" leads; solderless slip-on contacts for .040" pins; 100 ft. of bare and insulated 22 ga. wire; 400 ft. of 36 ga. "solder-thru" wire; wire jumpers; solder preforms; bus strips; DIP marker strips; foam mounting pad; pot and switch mounting loops; and 2" high aluminum chassis frame.

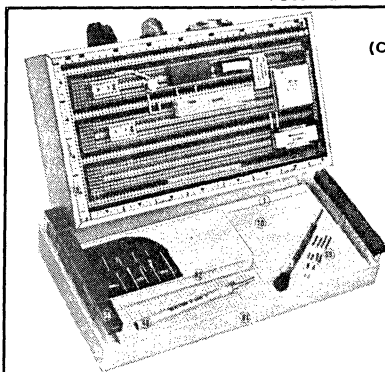
41X COMBINATION WIRE WRAPPING/SOLDER CONSTRUCTION KIT

Kit has almost everything needed to make wire wrapped circuit breadboards. Includes manual P160-2A Hand Wire Wrapping Tool for fast, reliable connections; 100 ft. of wire wrapping 22 ga. hook-up wire and 36 ga. "solder-thru" wire; "P" Pattern Micro-Vectorbord chassis (4½"x8"x1/16"); wire/cutter/stripper; over 300 terminals including 4 different .025" sq. types and some solder types; ten 16-pin wire wrap DIP sockets; R32 Socket Pins; socket contacts for .018" LEDs; bus strips; pot and switch mounting loops; terminal installing tools; alignment block; and 2" high aluminum chassis frame.

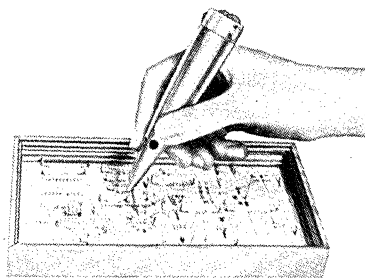
43X SERIES MULTI-CONN CHASSIS

All Multi-Conn Chassis are supplied assembled with 2" high extruded aluminum side frames for adjustable card positions and perforated aluminum bottom covers installed. Breadboards or covers snap into place in outer case grooves for insertion, and press out for easy removal. Boards mount in inner slots of chassis with the aid of supplied hardware. Rubber bump feet are included.

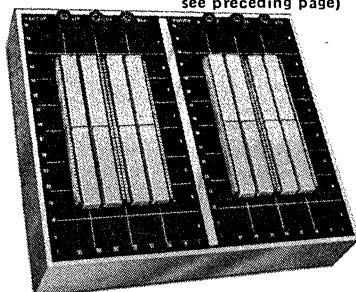
Boards listed may be used in 43X Series Chassis without purchase of additional joiner strips. Usable quantity for available area listed below:		43X-4	
Part No.	Description (Available Board Space in Chassis)	43X (8"x4½")	43X-2 (8"x9.4") (8"x9.24")
79P44-062PG-1	"P" Patt. (.042" h. on .1" ctrs.) Poly-glass, 4½"x8"x1/16", unclad	1	2
79A44-062PG-1	"A" Patt. (.093" h. on .1" ctrs.) Poly-glass, 4½"x8"x1/16", unclad	1	2
92A81PG	"A" Patt. Poly-glass, 9.24"x8"x1/16", unclad	1	1
92P81PG	"P" Patt. Poly-glass, 9.24"x8"x1/16", unclad	1	1
3677-6	"P" Patt. Epoxy glass Padboard, 4½"x8"x1/16", 1 side copperclad pads	1	2
3677-7	"P" Patt. Epoxy glass Padboard, 4½"x8"x1/16", 1 side copperclad ground plane	1	2
3677-8	"P" Patt. Epoxy glass Padboard, 4½"x8"x1/16", 2 sides copperclad, 1 side ground plane,	1	2
3677-9	other side copperclad per 3677-6	1	2
	"P" Patt. Epoxy glass Padboard, 4½"x8"x1/16", 2 sides copperclad, both sides have ground plane	1	2
	† Uses half of available space—allows choice of 8"x9.24" board for remaining space.		



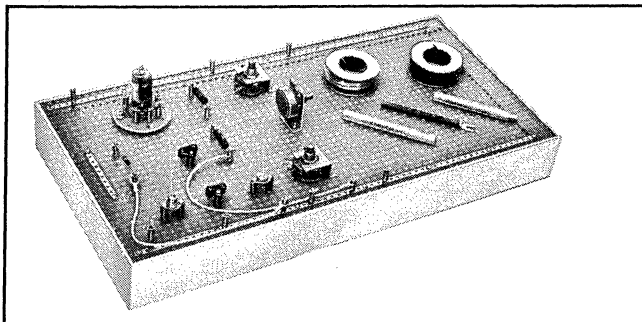
41X MULTI-CONN KIT
(Circuit elements not included in kit)



P173 WIRING PENCIL



43X-2 CHASSIS KIT
w/ two 51X Panels Installed
(for data on 51X,
see preceding page)



25X SOLDERLESS EXPERIMENTER'S DELUXE KIT FOR TUBES AND TRANSISTORS

Large kit has big 8½"x17"x3/32" perforated Vectorbord chassis with 3/32" dia. holes on .265" centers supported by 2" high aluminum frame. Kit is ideal for experimenting with tubes, transistors, and discrete components. Most connections can be made without solder, using the patented solderless spring U-clip terminals T32 or T30N-2 included in the kit. The large, strong chassis accommodates large, heavy components. Being solderless, most parts are reusable. Includes 2 power transistor sockets; 4 universal TO-5 type 4-lead transistor sockets; three 7- and 9-pin miniature tube sockets; two 8-pin octal tube sockets; over 100 solder terminals; bus strips; hook-up wire and patch leads; miscellaneous screws, nuts, spacers, brackets; layout paper.

VERO

VERO ELECTRONICS INC.

VERORACK 3A

VERORACK 3A KITS ARE EASY TO ASSEMBLE AND YET PROVIDE MAXIMUM VERSATILITY. SLOTTED END PLATES ACCEPT A VARIETY OF CARD WIDTHS AND LENGTHS WITHIN EACH STANDARD END PLATE HEIGHT. THE /5 MODELS ARE SUPPLIED WITH TWO 17" LONG MOLDED NYLON GUIDE BLOCKS WITH CARD SLOTS AT 0.5" CENTERS. UP TO 34 CARDS WITH A LENGTH OF EITHER 6.5" OR 8.0" CAN BE ACCOMMODATED. THE /V MODELS CONTAIN GUIDE LOCATION STRIPS WHICH PERMIT CUSTOM LOCATION OF CARDS AT ANY MULTIPLE OF 0.2" CENTERS. THREE LENGTHS OF SNAP-IN GUIDES ARE AVAILABLE FOR USE WITH /V MODELS. WHEN RECOMMENDED CARD LENGTHS ARE USED, CARDS ARE SUPPORTED OVER 85% OF THEIR LENGTH. RECOMMENDED CARD LENGTHS: G1B - 5.6", G2B - 6.5", G3B - 8.0". CONNECTOR MOUNTING RAILS & ASSOCIATED HARDWARE ARE INCLUDED IN KITS. ASSEMBLY CHARGE IS \$7.50.

3A FRAME KIT ORDERING INFORMATION

OVERALL DIMENSIONS CARD HEIGHT

PART NUMBER	PANEL HEIGHT	WIDTH	DEPTH	MAX.	MIN.	GUIDES INCLUDED	CARD SPACING	PRICE
VR3A/3U/.5/G2	5.25"	19"	11"	4.5"	2.75"	YES	.05"	\$30.80
VR3A/4U/.5/G2	7.0"	19"	11"	6.25"	4.5"	YES	.05"	32.23
VR3A/3U/V	5.25"	19"	11"	4.5"	2.75"	NO*	VARIABLE	22.62
VR3A/4U/V	7.0"	19"	11"	6.25"	4.5"	NO*	VARIABLE	25.03

*SNAP-IN GUIDES FOR USE IN /V FRAME KITS

PART NO.	GUIDE TYPE	RECOMMENDED CARD LENGTH	PRICE PER PKG. OF 10
13130	G1B	5.6"	\$1.10
12597	G2B	6.5"	1.70
14572	G3B	8.0" & 9.6"	2.10

HINGED PANEL KITS FOR USE WITH VERORACK 3A FRAMES

PART NO.	FRAME HEIGHT	PRICE
11935/1	3U	\$11.00 ea.
12935/2	4U	12.00 ea.

VERORACK 4

VERORACK 4 IS A FRAME DESIGNED TO ACCOMMODATE CARDS AND/OR MODULE UNITS. THESE FRAMES ARE RUGGEDLY CONSTRUCTED AND INCLUDE TWO ANODIZED ALUMINUM END PLATES AND FOUR EXTRUSIONS. CARD/MODULE GUIDES ARE 3A SNAP-IN TYPE (G2B). VERORACK 4 ACCEPTS 4.5" x 6.5" OR 3.94" x 6.3" CARDS AT ANY MULTIPLE OF 0.2" CENTERS.

PART NO. 4C/A/0.2

PRICE \$29.64

USE GUIDE NO. 12597

PRICE \$1.70 PER PKG. OF 10

VERORACK 4 CONVERSION KIT

VERORACK 4 CAN BE CONVERTED TO A FREE STANDING COVERED UNIT. THE FRAME END PLATE ANGLES ARE REMOVED AND REPLACED BY THE EXTRUSIONS AND PANELS AS SHOWN AT LEFT.

PART NO. 62194 PRICE/KIT \$18.74

VERORACK 4
CONNECTOR MOUNTING STRIPS

CONNECTOR MOUNTING STRIPS ARE ATTACHED TO THE REAR EXTRUSION OF VERORACK 4 FRAMES TO PERMIT MOUNTING OF CONNECTORS WITH 4.03" MOUNTING CENTERS.

PART NO. 61488 PRICE \$3.16

COMPATIBLE CONNECTORS:

PART NO.	CONTACTS	PRICE
2245	22	\$3.10
2245/2	44	3.96

VERORACK 4
SOCKET MOUNTING PLATES

SOCKET MOUNTING PLATES ARE ATTACHED TO THE REAR EXTRUSION OF VERORACK 4 TO PERMIT MOUNTING OF 24 CONTACT BLUE RIBBON RACK AND PANEL CONNECTORS.

PART NO. 61699 PRICE \$1.48

COMPATIBLE CONNECTORS:

PART NO.	CONTACTS	PRICE
RS 24	24	\$4.36

VERORACK 4 - MODULES

MODULE FRONT PANEL WIDTHS ARE MEASURED IN MULTIPLES OF 0.2". EACH FRAME WILL ACCEPT A TOTAL WIDTH OF 16.8". EACH MODULE KIT CONSISTS OF A FRONT PANEL WITH HANDLE, REAR PANEL, AND EITHER 2 OR 4 GUIDE RAIL EXTRUSIONS, PLUS HARDWARE.

PART NO.	PANEL "H"	"W"	"D"	PRICE
K3/3	5.25"	0.6"	6.32"	\$ 4.65
K3/4	5.25"	0.8"	6.32"	4.75
K3/6	5.25"	1.2"	6.32"	4.91
K3/12	5.25"	2.4"	6.32"	7.68
K3/14	5.25"	2.8"	6.32"	8.24
K3/18	5.25"	3.6"	6.32"	8.86
K3/24	5.25"	4.8"	6.32"	9.58
K3/42	5.25"	8.4"	6.32"	11.40
K3/60	5.25"	12.0"	6.32"	13.76
K3/84	5.25"	16.8"	6.32"	16.19

P.C. BOARDS (3.94 x 6.3) CAN BE MOUNTED ON SIDES OF MODULES, ALSO MODULES CAN BE ENCLOSED, DETAILS AVAILABLE ON REQUEST.

VERORACK 4 - FRONT PANELS
FRONT PANEL WIDTHS ARE MEASURED IN MULTIPLES OF 0.2". EACH FRAME WILL ACCEPT A TOTAL WIDTH OF 16.8". FRONT PANELS ARE SUPPLIED IN KIT FORM AND CONSIST OF A FRONT PANEL, HANDLE AND HARDWARE. CARD MOUNTING BRACKETS SHOULD BE ORDERED SEPARATELY.

PART NO.	PANEL "H"	"W"	PRICE
FP3/3	5.25"	0.6"	\$2.66
FP3/4	5.25"	0.8"	2.66
FP3/6	5.25"	1.2"	2.73
FP3/12	5.25"	2.4"	3.34
FP3/14	5.25"	2.8"	3.83
FP3/18	5.25"	3.6"	4.32
FP3/24	5.25"	4.8"	4.86
FP3/42	5.25"	8.4"	7.04
FP3/60	5.25"	12.0"	8.24
FP3/84	5.25"	16.8"	9.95

VERORACK 4
CARD RETENTION STRIP

FRONT PANELS CAN BE USED AS DUMMIES TO COVER SECTIONS OF FRAME FILLED WITH CARDS. CARD RETENTION STRIPS ARE LENGTHS OF SELF-ADHESIVE FOAM TO DAMPEN VIBRATION. SUPPLIED IN 16.7" LENGTHS.

PART NO. 62093 PRICE \$.45

CARD RETAINING CLIP: (FOR OPEN CARD FRAME CONDITIONS ONLY) CARDS MAY BE RETAINED INDIVIDUALLY BY CLIP #62185 PRICE \$1.50/PKG. OF 10

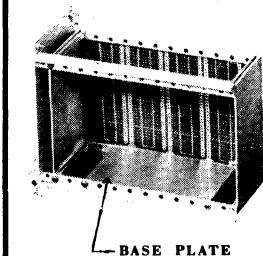
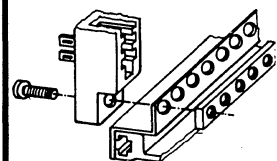
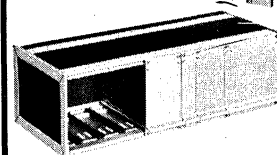
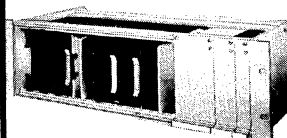
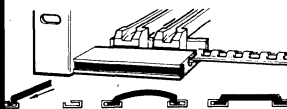
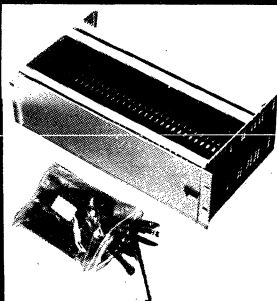
VERORACK 4 - MODULE BASE PLATES

EXTRUDED ALUMINUM BASE PLATES TO PROVIDE A SURFACE FOR COMPONENT MOUNTING ARE AVAILABLE FOR MODULES 2.4" WIDE AND GREATER. EACH BASE PLATE IS SUPPLIED WITH HARDWARE.

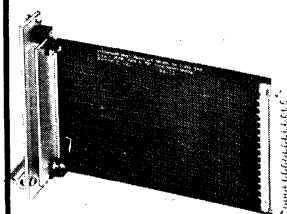
PART NO.	MODULE WIDTH	PRICE
62212	2.4"	\$.80
62214	2.8"	.89
62218	3.6"	1.00
62224	4.8"	1.20
62242	8.4"	1.57
62260	12.0"	2.02
62284	16.8"	2.52

CARD MOUNTING BRACKETS

CARD MOUNTING BRACKETS ARE USED TO ATTACH P.C. CARDS TO FRONT PANELS. PRICE INCLUDES HARDWARE. PART NO. 62099/F PRICE \$1.50/PKG. OF 10



BASE PLATE



VERO

171 E. BRIDGE ROAD,
HAUPPAUGE, N.Y.TEL: 516-234-0400
TWX: 510-227-8890IN CANADA CALL
613-549-5152

VERO

vero

VERO ELECTRONICS INC.

TERMINAL BOARDS

PRE-PUNCHED BOARDS ON A 0.1" x 0.1" HOLE MATRIX ARE AVAILABLE IN A VARIETY OF SIZES IN EITHER EPOXY GLASS OR XXXP PHENOLIC BASE. BOTH .040" AND .052" HOLE SIZES ARE OFFERED MAKING THESE BOARDS EQUALLY USEFUL FOR BOTH DISCREET COMPONENTS AND I.C.'s. A VARIETY OF TERMINAL AND SOCKET PINS ARE AVAILABLE FOR USE WITH THESE BOARDS.

PART NO.	LENGTH	WIDTH	HOLE DIA.	PRICE	/FG PRICE	COMPATIBLE TERMINALS
409*	6.4"	4.7"	.052"	\$1.52	\$3.72	
410*	9.4"	7.05"	.052"	2.88	3.72	TP/2140, TP/2143
523*	17.9"	4.5"	.052"	2.48	12.38	TP/2141
1010/FG	17.0"	4.8"	.052"	-	8.20	MT/11081
5033/1FG	17.0"	8.5"	.052"	-	9.64	
522*	17.9"	3.744"	.040"	2.30	-	TP/2144, TP/11032, TP/2142
+E600	6.3	3.94	.040	2.43	-	TP/11034, MT/11082
						MT/13378 MT/14909/1

*ALSO AVAILABLE IN EPOXY GLASS. TO SPECIFY, ADD /FG TO PART NO.

+Compatible with Verorack 4 Modules.

VEROBOARDS

VEROBOARD IS MANUFACTURED FROM .062" PHENOLIC OR EPOXY GLASS LAMINATE WITH 1 OZ. COPPER FOIL. THE BASE MATERIAL IS PUNCHED AND SOME OF THE COPPER IS REMOVED TO LEAVE PARALLEL, PUNCHED COPPER STRIPS. CIRCUIT ASSEMBLY IS ACCOMPLISHED BY INTERCONNECTING THE COPPER STRIPS WITH COMPONENTS AND BREAKING THE STRIPS WHERE NECESSARY WITH EITHER A SPOT FACE CUTTER (PART NO. 2022, PRICE \$1.79 EACH) OR DRILL. PLUG-IN VERSIONS WITH GOLD FLASHED CONTACTS ARE ALSO AVAILABLE. HOLE MATRIX IS 0.1x0.1" ON ALL BOARDS FOLLOWING.

	PART NO.	HOLE DIA.	LENGTH	WIDTH	PRICE	PRICE /FG	COMPATIBLE TERMINALS
FULLY	VB/122*	.040"	17.9"	3.74"	\$5.29	\$12.00	TP/2144, TP/2142, TP/11032,
PIERCED	VB/124	.040"	17.9"	7.05"	9.47	-	TP/11034, MT/11082
	VB/125	.040"	6.4"	3.97"	2.03	-	MT/13378 MT/14909/1
VEROBOARD	VB/126*	.040"	17.9"	4.7"	7.00	14.00	
	+E100	.040	6.3"	3.94"	3.60	-	

*ALSO AVAILABLE IN EPOXY GLASS. TO SPECIFY, ADD /FG TO PART NO. +Compatible with Verorack 4 Modules

PLUG-IN VEROBOARDS

PART NO.	MATRIX	HOLE DIA.	LENGTH	WIDTH	# CONTACT	A	PRICE	CONN.	COMPATIBLE TERMINALS
VB/310	0.1x0.1"	.040"	7.85"	4.99"	32	3.294"	\$6.24	2234	TP/2144, TP/11032, TP/2192
VB/11246	0.156x0.1"	.052"	6.5"	4.5"	22	3.590"	4.53	2245	TP/11034, MT/13378 MT/11082
									TP/2140, TP/2143, TP/2141
									MT/11081

FINGER BOARDS

VERO FINGER BOARDS ARE EPOXY GLASS BOARDS PIERCED WITH EITHER AN .052" OR .040" DIAMETER HOLES ON A 0.1"x0.1" MATRIX. EACH BOARD IS BASICALLY A TERMINAL BOARD PROVIDED WITH A ROW OF GOLD FLASHED COPPER CONTACT FINGERS AT ONE END TO BE USED WITH A STANDARD P.C. EDGE CONNECTOR. THESE BOARDS HANDLE BOTH DUAL IN LINE AND DISCRETE COMPONENTS, AND ARE IDEALLY SUITED FOR USE WITH WIRE WRAP I.C. SOCKET PINS.

PART NO.	HOLE DIA.	LENGTH	WIDTH	CONTACTS	SPACING	A	PRICE	CONN.	COMPATIBLE TERMINALS
10290	.052"	6.5"	4.5"	22/22	.156"	3.572"	\$7.84	2245/2	MT/11081
12846	.052"	6.5"	4.5"	40/40	.100"	4.029"	9.48	13565	
24928	.040"	6.5"	4.5"	22/22	.156"	3.572"	9.94	2245/2	TP/2144, TP/11032
50767	.040"	9.6"	4.5"	22/22	.156"	3.572"	11.16	2245/2	TP/2142, TP/11034,
50768	.040"	9.6"	4.5"	36/36	.100"	3.687"	17.75	-	MT/13378 MT/11082

VERO D.I.P. BOARDS

VERO D.I.P. BOARDS MAY BE USED FOR MOUNTING AND INTERCONNECTING DUAL-IN-LINE PACKAGES FOR R&D OR PRODUCTION RUNS. POWER AND GROUND RAILS ARE POSITIONED ADJACENT TO ALL D.I.P. LOCATIONS AND ARE CONNECTED TO THE EDGEBOARD CONTACTS. DUPLICATE POWER AND GROUND RAILS HAVE ALSO BEEN PROVIDED ON THE REVERSE SIDE IN ORDER TO REDUCE IMPEDANCE. D.I.P. BOARDS ARE PUNCHED OVERALL WITH A MATRIX OF .040 HOLES ON 0.1" CENTERS TO ACCEPT DUAL-IN-LINE PACKAGES OR I.C. SOCKETS AND THE HOLES OUTSIDE THE COPPER TRACKS MAY BE USED FOR TERMINAL PIN INTERCONNECTION. PACKAGING DENSITY IS SHOWN AS NUMBER OF 14 PIN DEVICES THAT FIT ON EACH BOARD.

PART NO.	LENGTH	WIDTH	CONTACTS	SPACING	A	DENSITY	PRICE	CONN.	COMPATIBLE TERMINALS
11820*	6.5"	4.5"	40	0.1"	4.025"	20	\$6.20	2236	
11821	6.5"	4.5"	40	0.1"	4.025"	20	9.10	2236	
11822*	6.5"	4.5"	42 + PCL	0.1"	4.5"	20	6.23	2238	
11823	6.5"	4.5"	42 + POL	0.1"	4.5"	20	9.13	2238	
11824*	6.5"	4.5"	22/22	0.156"	3.572"	20	7.25	2245/2	TP/2144, TP/2142
11825	6.5"	4.5"	22/22	0.156"	3.572"	20	9.26	2245/2	TP/11032, TP/11034
12498*	6.5"	4.5"	40/40	0.1"	4.025"	20	8.76	13565	MT/13378 MT/14909/1
12499	6.5"	4.5"	40/40	0.1"	4.025"	20	10.55	13565	MT/11082
12749	8.0"	4.5"	42 + POL	0.1"	4.5"	25	11.88	2238	
+E701	6.3"	3.94"	37	0.1"	3.94	16	8.57	CS700	

*XXXP MATERIAL-ALL OTHERS G10FR4 EPOXY GLASS

+Compatible with Verorack 4 Modules.

VERO P.C. EDGE CONNECTORS

STYLE	PART NO.	# CONTACTS	CONTACT SPACING	MOUNTING CENTERS	PRICE
B	2234	32	0.1"	3.70"	\$7.24
A	2236	40	0.1"	4.388"	4.76
A	2238	42	0.1"	4.888"	4.84
B	2245	22	0.156"	4.026"	3.10
B	2245/2	22/22	0.156"	4.026"	3.96
A	13565	40/40	0.1"	4.388"	5.26
A	CS700	37	0.1"	3.94"	3.24

®T.M. Gardner Denver

vero

171 E. BRIDGE ROAD,
HAUPPAUGE, N.Y.

TEL: 516-234-0400
TWX: 510-227-8890

IN CANADA CALL
613-549-5152

vero

VERO

VERO ELECTRONICS INC.

VERO HIGH RELIABILITY SOCKETS

VERO SOCKETS INCORPORATE HIGH RELIABILITY DUAL LEAF WIPING CONTACTS WITH A CHOICE OF SOLDER OR WIRE WRAP[®] TAILS. EACH SOCKET IS ALSO OFFERED WITH EITHER GOLD OR TIN PLATED TERMINATIONS. BODY MATERIAL IS GLASS FILLED NYLON AND CONTACTS ARE BERYLLIUM COPPER.

PART NO.	# OF CONTS.	A	B	C	TERMINATION	PLATE	PRICE 1-99	100-499	500-999	1000+
14954	8	.400"	.300"	.146"	SOLDER	GOLD	.62	.42	.39	.37
19147	8	.400"	.300"	.146"	SOLDER	TIN	.54	.36	.34	.32
14952	8	.400"	.300"	.674"	WRAP	GOLD	.74	.49	.46	.44
19146	8	.400"	.300"	.674"	WRAP	TIN	.63	.42	.39	.38
12490	14	.786"	.600"	.146"	SOLDER	GOLD	.79	.53	.49	.47
18736	14	.786"	.600"	.146"	SOLDER	TIN	.67	.45	.42	.40
14919	14	.786"	.600"	.674"	WRAP	GOLD	.90	.60	.56	.54
18738	14	.786"	.600"	.674"	WRAP	TIN	.79	.53	.49	.47
14296	16	.887"	.700"	.146"	SOLDER	GOLD	.85	.57	.53	.51
18737	16	.887"	.700"	.146"	SOLDER	TIN	.73	.49	.46	.44
14297	16	.887"	.700"	.674"	WRAP	GOLD	1.05	.70	.66	.63
18739	16	.887"	.700"	.674"	WRAP	TIN	.86	.58	.54	.52
14916	24	1.290"	1.100"	.146"	SOLDER	GOLD	1.82	1.22	1.14	1.09
19314	24	1.290"	1.100"	.146"	SOLDER	TIN	1.48	.99	.93	.89
14914	24	1.290"	1.100"	.674"	WRAP	GOLD	2.12	1.42	1.33	1.27
19313	24	1.290"	1.100"	.674"	WRAP	TIN	1.51	1.01	.94	.91

VERO TRANSISTOR SOCKETS

TYPE	PART NO.	FINISH	PRICE 1-99	100-499	500-999	1000+
TO5	22601/8	GOLD	.31	.21	.20	.19
TO5	22600/8	TIN	.26	.17	.16	.15
TO18	22599/8	GOLD	.31	.21	.20	.19
TO18	22598/8	TIN	.26	.17	.16	.15

NAME	PART NO.	HOLE DIA.	OVERALL LENGTH	# TOOL	PRICE
A TERMINAL PIN	TP/2144	0.040"	0.469"	IT/2151	12.47/K
	TP/2140/2073	0.052"	0.469"	IT/2150	14.97/H
B SHOULDERED TERMINAL PIN	TP/11032	0.040"	0.385"	IT/2151	10.88/H
	TP/2143	0.052"	0.470"	IT/2150	14.85/H
	TP/2142	0.040"	0.390"	IT/2151	10.88/H
C HALF PIN	TP/11034	0.040"	0.285"	IT/2151	13.18/H
	TP/2141	0.052"	0.285"	IT/2151	10.94/H
	TP/11036	0.040"	0.125"	IT/2151	10.94/H
D SHORTING PIN	TP/11037	0.052"	0.125"	IT/2150	10.94/H
E MINIATURE TERMINAL	MT/11081	0.052"	0.360"	IT/11772/4	7.96/20
	MT/11082	0.040"	0.360"	IT/11772/4	7.96/20
F MINIWAP TERMINAL	MT/13378	0.040	0.690	14477	15.84/50
G SIDE MINIWAP TERM	MT/14909/1	0.040	0.370	14477	19.98/50

MINIWAP TERMINAL AND SOCKET PINS

PIN #	NAME	PART NUMBER	COMPATIBLE HOLE DIA.	PRICE
PIN H	HEADER PIN	22580/3/2	Ø 0.052"	7.22/C
PIN I	HEADER PIN	22519/3/2	Ø 0.040"	7.22/C
PIN J	TERMINAL HEADER PIN	22579/2	Ø 0.052"	6.84/C
PIN K	TEST POINT PIN	23192/3/2	Ø 0.052"	5.30/C
PIN L	SOCKET PIN	22683/3/2	Ø 0.052"	11.13/C
PIN M	SOCKET PIN	22690/3/2	Ø 0.040"	14.99/C
PIN N	SINGLE SIDED PIN	22684/3/2	Ø 0.052"	4.91/C
PIN O	SINGLE SIDED PIN	23190/3/2	Ø 0.040"	4.76/C

PIN A TO E INCLUSIVE ARE PRODUCED FROM BRASS. PIN F IS PRODUCED FROM 36 S.W.G. BERYLLIUM COPPER. ALL PINS HAVE A FLOW BRIGHTENED TIN FINISH. A SPECIALLY DESIGNED PIN INSERTION TOOL IS AVAILABLE. ALL MINIWAP TERMINAL AND SOCKET PINS ARE MANUFACTURED FROM BRASS WITH A GOLD OVER NICKEL PLATING.

TERMINAL INSERTION TOOLS

PART NUMBER	PIN TYPE & SIZE	PRICE
IT/2150	ALL .052"	\$2.34
IT/2151	ALL .040"	2.34
IT/11772/4	.052 MINIATURE TERMINAL	2.34
IT/11772/5	.040 MINIATURE TERMINAL	2.34

VERO CARD HANDLES

MOLDED IN NORYL, THESE THREE ATTRACTIVELY STYLED CARD HANDLES ARE AVAILABLE IN SIX STANDARD COLORS AND EITHER RIVET/BOLT ON (10036) OR SNAP ON (10035 & 10037).

#	PART NO.	PRICE	A	B	C
1	10035	\$1.60/10	.38	.098	.420
2	10036	2.90/10	2.23	.130	.500
3	10037	2.90/10	2.23	.098	.500

FOR COLORS ADD SUFFIXES TO THE PART NUMBERS AS FOLLOWS: BLACK----, GRAY /1, RED /2, BLUE /3, GREEN /4, YELLOW /5

VERO CARD EJECTORS

DESIGNED TO BE USED WITH ANY .062" P.C. BOARD. AVAILABLE IN BLACK ONLY. PART NO.: 13301 PRICE: \$1.85/PKG. OF 10 (5 PCS. EACH LEFT & RIGHT) NOTE: MIN. CARD SPACING .400

VEROBOX-ALUMINUM

MANUFACTURED FROM EXTRUDED ALUMINUM SECTIONS, THESE ATTRACTIVELY STYLED MINI BOXES ARE SUPPLIED IN KIT FORM COMPLETE WITH HARDWARE AND FRONT AND REAR PANELS. STD. FINISH IS BLK. ANODIZE, AVAIL. UNFINISHED

PART NUMBER	"W"	"H"	"D"	PRICE	PART NUMBER	"W"	"H"	"D"	PRICE
AVB/F20-100/50	4"	2"	2"	\$3.52	AVB/F100-100/75	4"	4"	3"	\$5.19
AVB/F50-100/75	4"	2"	3"	3.92	AVB/F100-150-50	6"	4"	2"	2.78
AVB/F100-100/50	4"	4"	2"	4.65	AVB/F100-100/200	4"	4"	8"	7.93

VEROBOX-PLASTIC

THESE TWO-TONE GRAY PLASTIC BOXES ARE ACCURATELY MOLDED FROM HI-IMPACT POLYSTYRENE. FOUR THREADED INSERTS ARE MOLDED INTO THE LOWER SECTION OF EACH BOX AND THE TONGUE AND GROOVED SECTIONS PROVIDE TIGHT CLOSURE.

RECTANGULAR BOXES

PART NUMBER	WIDTH	HEIGHT	LENGTH	PRICE
90-10-087	1.969"	.984"	3.937"	\$2.68
90-11-087	1.969"	1.575"	3.937"	3.04
90-20-087	2.529"	1.575"	4.724"	3.38
90-80-087*	6.141"	3.937"	8.661"	9.70

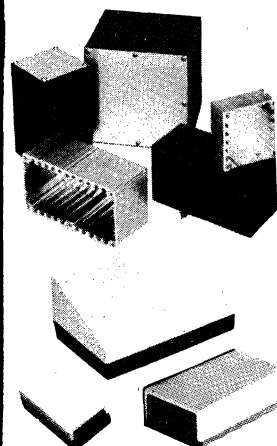
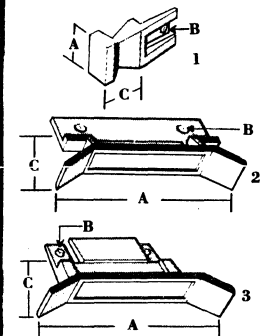
PART NUMBER	WIDTH	HEIGHT	LENGTH	PRICE
90-30-087	3.150"	1.969"	5.906"	\$3.86
90-40-087	4.331"	2.362"	7.402"	5.12

SLOPING UNITS

PART NUMBER	WIDTH	HEIGHT	LENGTH	PRICE
90-81-087+	6.141"	3.937"	8.661"	7.52

*WITH ANODIZED ALUMINUM FRONT PLATE. +WITH PLASTIC GRILL.

R.T.M. Gardner Denver



VERO

171 E. BRIDGE ROAD,
HAUPPAUGE, N.Y.

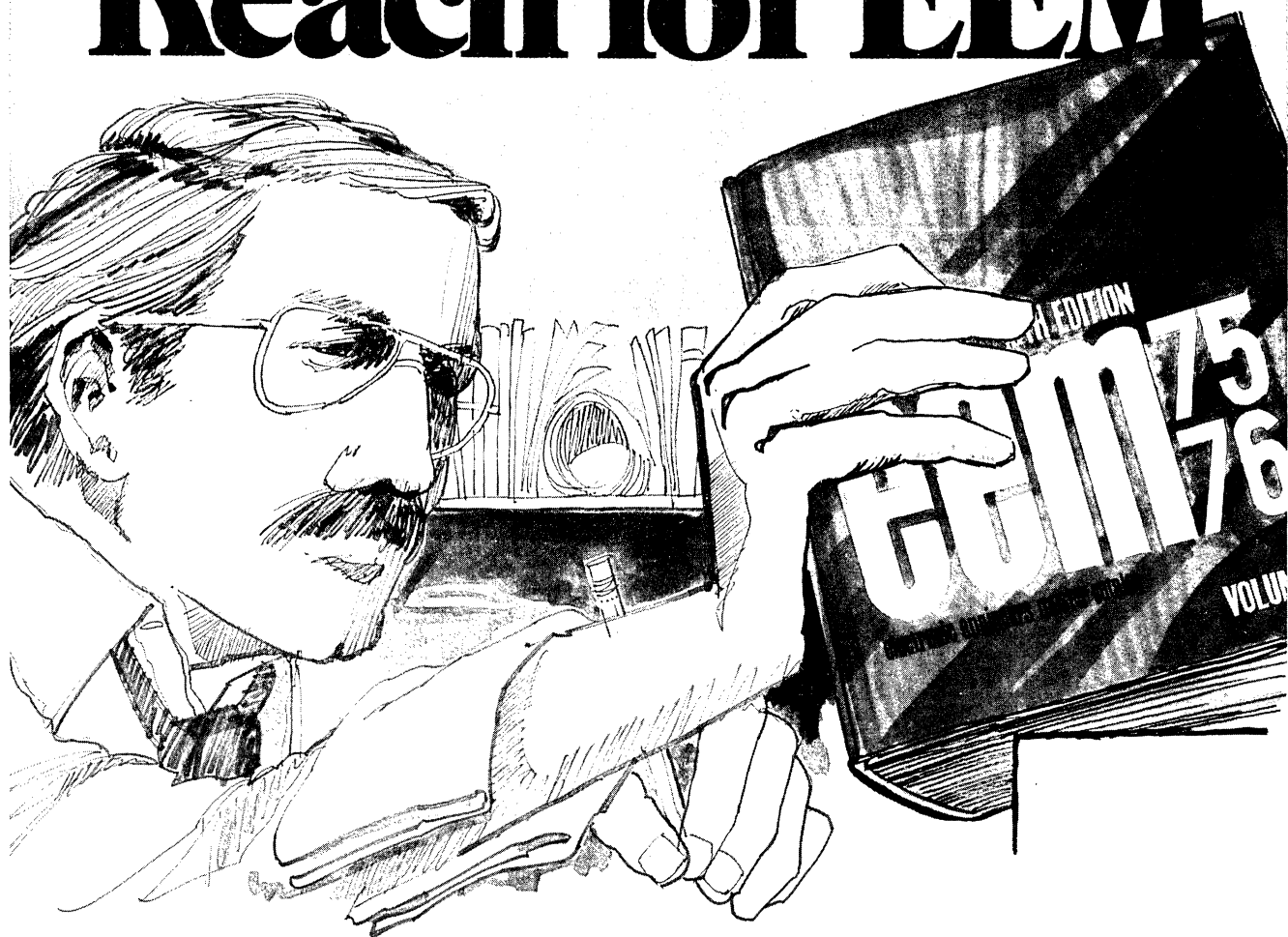
TEL: 516-234-0400
TWX: 510-227-8890

IN CANADA CALL
613-549-5152

VERO

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**

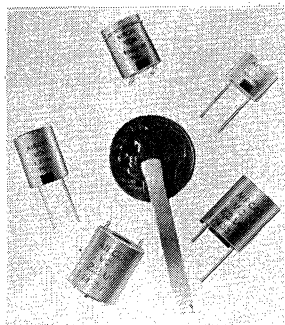


electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

AIRCO[®] Electronics

Bradford, Pa. (814) 362-5536



VARIABLE INDUCTORS SHIELDED OR UNSHIELDED HORIZONTAL AND VERTICAL MOUNTING

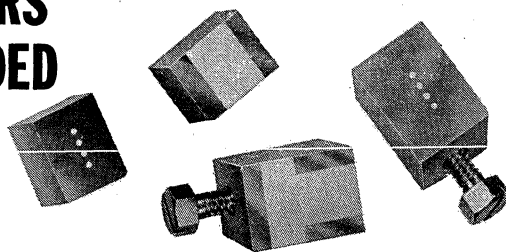
"UNITORQUE" CONSTRUCTION WITH 1 TO 4 IN-OZ TORQUE; NO MORE BROKEN CORES; 3% MAX. COUPLING

The "Versa Coils"

Airco Type	Inductance Range μ h	No. of Standard Values	"Q" Range Min.	Tunable Range	Dimensions (Inches)			Applicable Military Specifications
					Body (Nom.) Dia.	Length	Lead Wire	
VC (Unshielded)	.1-100,000	45	15-100	$\pm 10\%$ to $\pm 20\%$	.400	.500	.025 Dia. .250 Length	C15305 Grade 1 Class B
VCM (Shielded)	.1-100,000	73	60-120	$\pm 10\%$	.320	.400	.020 Dia. .375 Length	
VL (Shielded)	.1-100,000	73	60-120	Fixed	.320	.275	.020 Dia. .375 Length	

AIRCO[®] MOLDED CHIP INDUCTORS SHIELDED OR UNSHIELDED VARIABLE OR FIXED

These tiny coils are wirewound — NOT foil or other laminate construction. Pads for reflow soldering or conductive epoxy bonding. Suitable for vibratory bowl feeding. Designed to meet MIL-I-83446



Airco Type	Inductance Range μ h	Number of Standard Values	"Q" Range Min.	SRF Range Min. — MHz	Dimensions (Inches)		
					Body (Max.) Height	Length	Width
CM	.01-1000 $\pm 10\%$	61	25-45	20-250	.130	.150	.120
CV	.1-1000 variable	37	15-45	1.1-500	.160	.150	.200

Intermediate, non-standard values and specials available also — consult Bradford plant.

TINY SHIELDED MOLDED INDUCTORS

These are great space savers. A full product range for all your applications — shielded molded (10S),

molded unshielded (10) and conformal coated (05). Can be used in DIP packages and hybrid applications.

Airco Type	Inductance Range μ h	No. of Standard Values	"Q" Range Min.	SRF Range Min. — MHz	Dimensions (Inches)			Applicable Military Specifications
					Body (Nom.) Dia.	Length	Lead Wire	
10S (Shielded)	.1-1000 $\pm 10\%$	49	34-55	3.5-500	.105	.160	.016 Dia. 1.5 Length	MS-21397 MS-21396 MIL-C-15305
10 (Molded)	.1-1000 $\pm 10\%$	49	21-55	2.0-500	.105	.160		
05 (Conformal)	.1-1000 $\pm 10\%$	49	21-55	2.0-500	.055	.145		

For additional inductor information contact Airco Electronics, P.O. Box 547, Bradford, Pa. 16701. Phone (814) 362-5536, TWX 510-695-5921.



Nogales, Arizona (602) 287-5851

MOLDED RF INDUCTORS TO MILITARY SPECIFICATION

Airco Inductors are for Radio Frequency and Pulse Circuit applications. The standard inductors from 0.1 μ h through 10,000 μ h are designed to meet the requirements of MIL-C-15305. Our High Reliability

has been proven by over 253,470,000 unit test hours. You are always assured of uniformity of product, a result of stringent Quality and Inspection procedures at every production stage.

Airco Type	Inductance Range μ h	Number of Standard Values	"Q" Range Min.	SRF Range Min. — MHz	Dimensions (Inches)			Applicable Military Specifications
					Body (Nom.) Dia.	Length	Lead Wire	
09	.1 — 1,000	49	25 — 55	3.4 — 680	.095	.250	.020	MS 75083 MS 75084
15	.15 — 1,800	71	30 — 75	1.6 — 525	.156	.375	.025	MS 75085A MS 18130
19	.15 — 5,600	58	30 — 65	1.1 — 510	.190	.440	.025	MS 90538 MS 75008
22	.47 — 3,600	37	35 — 70	1.5 — 300	.220	.560	.025	MS 90539 MS90542
24	3,900 — 10,000	11	80	.95 — 1.45	.240	.740	.028 .032	MS 90540 MS 90541
25	47 — 150	7	18 — 75	8.3 — 13.5	.250	.560	.025	MS 75052
28	1.2 — 120	25	40 — 95	10 — 170	.280	.940	.028	MS 91189
31	180 — 390	5	75 — 80	3.9 — 6.0	.310	.560	.028	MS 75053
37	470 — 1,000	5	70 — 80	2.7 — 3.7	.375	.625	.028	MS 75054
46	1,500 — 10,000	5	70 — 85	.8 — 2.2	.468	.687	.028	MS 75055

SHIELDED MOLDED RF INDUCTORS

Shielded Inductors incorporate a low reluctance magnetic shield that practically eliminates the stray magnetic field of the usual solenoid inductor or

coil. Except for the shield, the materials, construction, product uniformity, etc., are the same as our other molded coils.

Airco Type	Inductance Range μ h	Number of Standard Values	"Q" Range Min.	SRF Range Min. — MHz	Dimensions (Inches)			Applicable Military Specifications
					Body (Nom.) Dia.	Length	Lead Wire	
15S	.1 — 68,000	71	23 — 60	.13 — 250	.162	.410	.025	MS 75087 MS 75088 MS 75089 MS 90537

SHIELDED CONFORMAL COATED RF INDUCTORS

A shielded inductor with a reasonable price, used in industrial and consumer products.

Airco Type	Inductance Range μ h	Number of Standard Values	"Q" Range Min.	SRF Range Min. — MHz	Dimensions (Inches)		
					Body (Max.) Dia.	Length	Lead Wire
14S	.1-56,000	70	25—71	1.56—500	.125 to .169*	.450	.025

*Varies with inductance.

CONFORMAL COATED RF INDUCTORS

These cords feature a varnish-epoxy coating, quality performance and reasonable prices for non-military products.

Airco Type	Inductance Range μ h	Number of Standard Values	"Q" Range Min.	SRF Range Min. — MHz	Dimensions (Inches)		
					Body (Max.) Dia.	Length	Lead Wire
08N	.1 — 1,000 $\pm$ 10%	49	30 — 45	3.4 — 680	.085	.200	.020
17N	.1 — 3,300 $\pm$ 10%	55	30 — 50	1.3 — 600	.175	.400	.025

In addition to these catalog items, we can supply various specialty coils for your requirements. Our capabilities include Pi winding, hash or high current, balun, ferrite bead and network types of inductors. Contact Airco Electronics, P.O. Box 1692, Grand plaza, Nogales, Arizona 85621 Phone (602) 287-5851 TWX 910-973-9794.

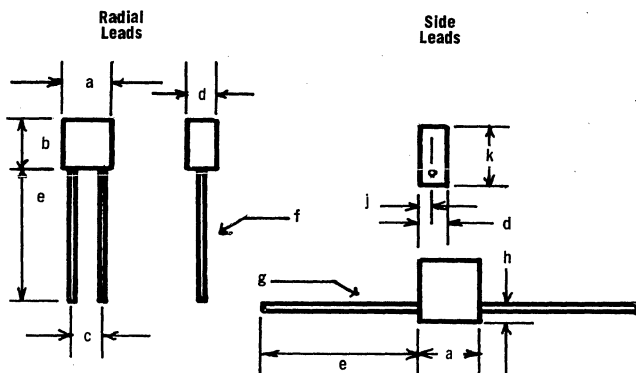
Encapsulated Subminiature and Miniature Toroidal Inductors

Features

- Applications: printed circuits and modules
- Environmental: designed to meet MIL-C-15305, Grade 1, Class B (-55°C to +125°C)
- Moisture and shock resistant, immersion proof
- Powdered iron toroidal core, low external magnetic field
- Identification: part number and inductance value printed in contrasting color

General Specifications (All Series)

Maximum operating temperature: 125°C
 Rated temperature rise (at 90°C): 35°C
 Dielectric withstanding voltage: 700 v rms
 Terminal pull: 5 pounds
 Altitude rating: 70,000 feet
 Overload current: 1.4 times the rated current
 Add Suffix -S to P/N for side leads configuration



T1 SERIES

Part Number	Apparent Induc., uH	Min. Q	Test freq., MHz	Max. DC resist., ohms	Rated DC current mA
100066	0.01	60	150	0.02	3000
100067	0.012	60	150	0.02	3000
100068	0.015	60	150	0.02	3000
100069	0.018	60	150	0.02	3000
100070	0.022	60	100	0.02	3000
100071	0.027	60	100	0.02	3000
100072	0.033	60	100	0.02	3000
100073	0.039	60	100	0.02	3000
100074	0.047	60	100	0.02	3000
100075	0.056	60	100	0.02	3000
100076	0.068	60	100	0.03	2500
100077	0.082	60	100	0.04	2200
100078	0.10	80	50	0.04	2200
100079	0.12	80	50	0.05	2000
100080	0.15	80	50	0.06	1800
100081	0.18	80	50	0.07	1600
100082	0.22	80	50	0.08	1500
100083	0.27	80	50	0.10	1400
100084	0.33	80	50	0.12	1300
100085	0.39	80	50	0.15	1150
100086	0.47	80	50	0.20	1000
100087	0.56	70	50	0.25	900
100088	0.68	70	50	0.30	800
100089	0.82	70	50	0.35	750
100090	1.0	70	50	0.40	700

a	b	c	d	e	f	g	h	j	k
.2	.2	.1	.1	1.0	#24	#26	.05	.05	.26

Inductance Tolerances: 0.01 to 0.082 uH, ±20%; 0.10 to 1.0 uH, ±10%

T3 SERIES

Part Number	Apparent Induc., uH	Min. Q	Test freq., MHz	Max. DC resist., ohms	Rated DC current mA
100117	10	75	2.5	1.1	550
100118	12	75	2.5	1.3	500
100119	15	75	2.5	1.5	450
100120	18	80	2.5	1.9	410
100121	22	80	2.5	2.3	380
100122	27	80	2.5	2.7	350
100123	33	80	2.5	3.3	320
100124	39	80	2.5	3.9	290
100125	47	80	2.5	4.7	260
100126	56	80	2.5	5.6	240
100127	68	80	2.5	6.8	220
100128	82	80	2.5	8.1	200
100129	100	80	2.5	9.7	180
100130	120	45	0.79	12	160
100131	150	45	0.79	14	150
100132	180	45	0.79	17	140
100133	220	50	0.79	20	130
100134	270	55	0.79	24	120
100135	330	55	0.79	19	130
100136	390	55	0.79	22	120
100137	470	55	0.79	27	110
100138	560	55	0.79	32	100
100139	680	55	0.79	19	130
100140	820	50	0.79	23	120
100141	1000	50	0.79	27	110

a	b	c	d	e	f	g	h	j	k
.27	.27	.2	.15	1.0	#22	#24	.05	.075	.33

Inductance Tolerance: ±5%; closer tolerances on request.

T2 SERIES

Part Number	Apparent Induc., uH	Min. Q	Test freq., MHz	Max. DC resist., ohms	Rated DC current mA
100092	0.10	55	25	0.04	2200
100093	0.12	60	25	0.05	2000
100094	0.15	60	25	0.06	1800
100095	0.18	60	25	0.07	1600
100096	0.22	65	25	0.08	1500
100097	0.27	65	25	0.10	1400
100098	0.33	65	25	0.11	1300
100099	0.39	65	25	0.14	1200
100100	0.47	65	25	0.17	1100
100101	0.56	70	25	0.22	1000
100102	0.68	70	25	0.27	900
100103	0.82	70	25	0.30	800
100104	1.0	70	25	0.35	750
100105	1.2	60	7.9	0.40	700
100106	1.5	60	7.9	0.50	630
100107	1.8	60	7.9	0.70	530
100108	2.2	60	7.9	0.90	470
100109	2.7	60	7.9	1.1	420
100110	3.3	60	7.9	1.3	390
100111	3.9	60	7.9	1.5	360
100112	4.7	60	7.9	1.8	330
100113	5.6	60	7.9	2.0	310
100114	6.8	60	7.9	2.2	300
100115	8.2	60	7.9	2.4	290
100116	10	60	7.9	2.6	280

a	b	c	d	e	f	g	h	j	k
.2	.2	.1	.1	1.0	#24	#26	.05	.05	.26

Inductance Tolerances: 0.10 to 0.82 uH, ±10%; 1.0 to 10 uH, ±5%.

T4 SERIES

Part Number	Apparent Induc., uH	Min. Q	Test freq., KHz	Max. DC resist., ohms	Rated DC current mA
100142	100	75	790	6	280
100143	120	75	790	7	260
100144	150	75	790	8	240
100145	180	75	790	10	220
100146	220	80	790	12	200
100147	270	80	790	14	180
100148	330	80	790	17	160
100149	390	80	790	20	150
100150	470	75	790	24	140
100151	560	75	790	28	130
100152	680	75	790	33	120
100153	820	75	790	39	110
100154	1000	75	790	45	100
100155	1200	45	250	31	120
100156	1500	45	250	37	110
100157	1800	50	250	44	100
100158	2200	50	250	52	90
100159	2700	50	250	61	85
100160	3300	50	250	71	80
100161	3900	50	250	82	75
100162	4700	50	250	93	70
100163	5600	45	250	105	65
100164	6800	40	250	140	60
100165	8200	40	250	160	55
100166	10000	50	250	180	50

a	b	c	d	e	f	g	h	j	k
.375	.375	.2	.187	1.0	#22	#24	.05	.093	.42

Inductance Tolerance: ±5%; closer tolerances on request.

COIL AND CHOKE ASSEMBLIES & FORMS

J. W. MILLER DIVISION, BELL INDUSTRIES / 19070 Reyes Ave., Compton, CA 90221 / (213) 537-5200

MOLDED SHIELDED MINIATURE R F CHOKES

An extremely useful series of chokes where extraneous coupling presents problems in dense packaging. Electromagnetic shielding limits coupling to less than 3% when two units are placed side by side.

Part Number	MS Type	Induct. Micro-henries $\pm 10\%$	D.C. Resistance Max.	Milli-amp Rating Max.
9250-101	90537-1	0.10	.025	2900
9250-121	90537-2	.12	.034	2800
9250-151	90537-3	.15	.037	2750
9250-181	90537-4	.18	.047	2200
9250-221	90537-5	.22	.067	1700
9250-271	90537-6	.27	.11	1500
9250-331	90537-7	.33	.13	1300
9250-391	90537-8	.39	.18	1100
9250-471	90537-9	.47	.25	1000
9250-561	90537-10	.56	.33	900
9250-681	90537-11	.68	.45	750
9250-821	90537-12	.82	.59	600
9250-102	90537-13	1.00	.07	1900
9250-122	90537-14	1.20	.093	1600
9250-152	90537-15	1.50	.12	1300
9250-182	90537-16	1.80	.14	1200
9250-222	90537-17	2.20	.19	1100
9250-272	90537-18	2.70	.28	950
9250-332	90537-19	3.30	.35	800
9250-392	90537-20	3.90	.40	750
9250-472	90537-21	4.70	.55	650
9250-562	90537-22	5.60	.72	550
9250-682	90537-23	6.80	1.02	500
9250-822	90537-24	8.20	1.32	475
9250-103	90537-25	10.0	1.62	450
9250-123	90537-26	12.0	2.00	400
9250-153	90537-27	15.0	.80	620
9250-183	90537-28	18.0	.89	610
9250-223	90537-29	22.0	.96	600
9250-273	90537-30	27.0	1.19	500
9250-333	90537-31	33.0	1.37	490
9250-393	90537-32	39.0	1.93	410
9250-473	90537-33	47.0	2.11	400
9250-563	90537-34	56.0	2.23	380
9250-683	90537-35	68.0	2.70	370
9250-823	90537-36	82.0	2.44	360
9250-104	90537-37	100.0	3.12	325
9250-124	90537-38	120.0	3.60	290
9250-154	90537-39	150.0	4.10	275
9250-184	90537-40	180.0	4.40	260
9250-224	90537-41	220.0	5.00	250
9250-274	90537-42	270.0	5.80	240
9250-334	90537-43	330.0	6.40	225
9250-394	90537-44	390.0	7.40	200
9250-474	90537-45	470.0	9.50	180
9250-564	90537-46	560.0	10.5	174
9250-684	90537-47	680.0	11.8	168
9250-824	90537-48	820.0	13.0	152
9250-105	90537-49	1,000.0	17.5	135
9250-125	90537-50	1,200.0	22.1	115
9250-155	90537-51	1,500.0	26.5	110
9250-185	90537-52	1,800.0	29.9	105
9250-225	90537-53	2,200.0	33.8	99
9250-275	90537-54	2,700.0	47.3	83
9250-335	90537-55	3,300.0	53.0	80
9250-395	90537-56	3,900.0	73.8	67
9250-475	90537-57	4,700.0	81.6	63
9250-565	90537-58	5,600.0	98.9	56
9250-685	90537-59	6,800.0	111.0	54
9250-825	90537-60	8,200.0	119.0	52
9250-106	90537-61	10,000.0	137.0	49

0.10 thru 0.82 uh — Phenolic Core

1.00 thru 12 uh — Iron Core

15 + uh — Ferrite Core

Size: .157 $\pm$.010 diameter; .395 $\pm$.020 length
Leads AWG #22TCW; 1.438 $\pm$.188 length

MICRO MITE MOLDED RF CHOKES

Nicknamed the "Micro-Mite", these rugged coils exhibit high Q and very low distributed capacity, all concentrated into an amazingly small package. Size reduction ranges up to 80% of equivalent standard molded chokes. The construction of these coils permits miniaturization without the use of ferrite materials, thus maintaining temperature stability.

Miller Part Number	MS Type	Induct. Micro-henries $\pm 5\%$	D.C. Resist. Max.	Milli-amp Rating Max.	Mold Size
9210-54	90538-01	36	2.50	180	D
9210-56	90538-02	39	2.60	176	D
9210-58	90538-03	43	2.70	172	D
9210-60	90538-04	47	2.75	170	D
9210-62	90538-05	51	2.85	167	D
9210-64	90538-06	56	3.00	164	D
9210-66	90538-07	62	3.15	160	D
9210-68	90538-08	68	3.30	156	D
9210-70	90538-09	75	3.70	147	D
9210-72	90538-10	82	3.90	143	D
9210-74	90538-11	91	4.30	136	D
9210-76	90538-12	100	4.50	133	D
9210-78	90538-13	110	4.90	128	D
9210-80	90538-14	120	5.20	124	D
9210-82	90538-15	130	5.45	121	D
9210-84	90538-16	150	6.05	114	D
9210-86	90538-17	160	6.40	111	D
9210-88	90538-18	180	6.75	108	D
9210-90	90538-19	200	7.10	106	D
9210-92	90538-20	220	7.45	103	D
9210-94	90538-21	240	7.80	101	D
9220-00	90539-01	270	8.2	110	A
9220-02	90539-02	300	8.7	107	A
9220-04	90539-03	330	9.1	105	A
9220-06	90539-04	360	9.6	102	A
9220-08	90539-05	390	10.0	100	A
9220-10	90539-06	430	10.6	97	A
9220-12	90539-07	470	11.1	95	A
9220-14	—	500	11.6	93	A
9220-15	90539-08	510	11.6	92	A
9220-16	90539-09	560	12.3	91	A
9220-18	90539-10	620	13.0	88	A
9220-20	90539-11	680	13.7	85	A
9220-22	90539-12	750	14.4	83	A
9220-24	90539-13	820	15.1	81	A
9220-26	90539-14	910	15.8	79	A
9220-28	90539-15	1000	16.5	78	A
9220-30	90540-01	1100	21.0	78	B
9220-32	90540-02	1200	22.0	76	B
9220-34	90540-03	1300	23.0	75	B
9220-36	90540-04	1500	25.0	72	B
9220-38	90540-05	1600	26.0	70	B
9220-40	90540-06	1800	28.0	68	B
9220-42	90540-07	2000	29.0	67	B
9220-44	90540-08	2200	30.0	66	B
9220-46	90540-09	2400	31.0	64	B
9220-48	90540-10	2700	33.0	62	B
9220-50	90540-11	3000	35.0	61	B
9220-52	90540-12	3300	38.0	58	B
9220-54	90540-13	3600	40.0	57	B
9220-56	90541-01	3900	44.0	61	C
9220-58	90541-02	4300	46.0	59	C
9220-60	90541-03	4700	48.0	58	C
9220-62	90541-04	5000	50.0	57	C
9220-64	90541-05	5600	53.0	56	C
9220-66	90541-06	6200	56.0	54	C
9220-68	90541-07	6800	59.0	52	C
9220-70	90541-08	7500	62.0	51	C
9220-72	90541-09	8200	65.0	50	C
9220-74	90541-10	9100	68.0	49	C
9220-76	90541-11	10000	72.0	47	C

Mold Size	Mold Diameter	Mold Length	Lead Size	Lead Length
A	.190 $\pm$.010	.440 $\pm$.010	AWG #22	1.44 $\pm$.188
B	.215 $\pm$.010	.560 $\pm$.010	AWG #21	1.44 $\pm$.188
C	.240 $\pm$.010	.740 $\pm$.010	AWG #20	1.44 $\pm$.188
D	.155 $\pm$.010	.375 $\pm$.010	AWG #22	1.44 $\pm$.188

MOLDED RF CHOKES

Miller Part Number	MS Type	Induct. Micro-henries*	D.C. Resist. Max.	Milli-amp Rating Max.
9310-00	18130-1	.15*	.03	2450
9310-02	18130-2	.22*	.055	1900
9310-04	18130-3	.33*	.09	1400
9310-06	18130-4	.47*	.12	1225
9310-07	18130-5	.56	.135	1220
9310-08	18130-6	.68	.15	1100
9310-10	18130-7	.82	.22	900
9310-12	18130-8	1.00	.29	830
9310-14	18130-9	1.20	.42	650
9310-16	18130-10	1.50	.50	600
9310-18	18130-11	1.80	.65	525
9310-20	18130-12	2.20	.95	435
9310-22	18130-13	2.70	1.20	385
9310-24	18130-14	3.30	2.00	300
9310-26	18130-15	3.90	2.30	280
9310-28	18130-16	4.70	2.60	260
9310-30	18130-17	5.60	3.2	750
9310-32	18130-18	6.80	.50	600
9310-34	18130-19	8.20	.60	545
9310-36	18130-20	10.0	.90	445
9310-38	18130-21	12.0	1.10	404
9310-40	18130-22	15.0	1.40	370
9310-42	18130-23	18.0	2.25	280
9310-44	18130-24	22.0	2.50	265
9310-46	—	24.0	2.50	265
9310-48	18130-25	27.0	2.60	260
9310-50	—	30.0	2.80	255
9310-52	18130-26	33.0	3.00	250

Mold Size: .156 $\pm$.010 Diameter; .375 $\pm$.010 Lgth. Leads: AWG #22 TCW; 1.437 $\pm$.188 Lgth.

Miller Part Number	MS Type	Induct. Micro-henries*	D.C. Resist. Max.	Milli-amp Rating Max.
9320-00	75008-21	.15*	.030	3000
9320-02	75008-22	.22*	.035	2800
9320-04	75008-23	.33*	.065	2000
9320-06	75008-24	.47*	.085	1700
9320-07	75008-25	.56	.125	1450
9320-08	75008-26	.68	.150	1300
9320-09	75008-27	.82	.205	1100
9320-10	75008-28	1.00	.290	930
9320-11	75008-29	1.20	.400	785
9320-12	75008-30	1.50	.485	700
9320-13	75008-31	1.80	.740	580
9320-14	75008-32	2.20	.970	505
9320-16	75008-33	2.70	1.20	460
9320-18	75008-34	3.30	.140	1350
9320-20	75008-35	3.90	.155	1250
9320-22	75008-36	4.70	.210	1100
9320-24	75008-37	5.60	.280	935
9320-26	75008-38	6.80	.375	810
9320-28	75008-39	8.20	.440	750
9320-30	75008-40	10.0	.605	640
9320-32	75008-41	12.0	1.05	490
9320-34	75008-42	15.0	1.20	460
9320-35	75008-43	18.0	1.95	360
9320-36	75008-44	22.0	2.20	335
9320-38	75008-45	27.0	2.75	300

Mold Size: .188 $\pm$.031 Diameter; 0.437 $\pm$.031 Lgth. Leads: AWG #22 TCW; 1.437 $\pm$.188 Lgth.

9330-00	90542-01	.47	.06	1970
9330-01	90542-02	.56	.08	1850
9330-02	90542-03	.68	.08	1700
9330-03	90542-04	.82	.11	1520
9330-04	90542-05	1.00	.14	1290
9330-05	90542-06	1.20	.19	1120
9330-06	90542-07	1.50	.28	925
9330-07	90542-08	1.80	.37	790
9330-08	90542-09	2.20	.50	680
9330-10	90542-10	2.70	.65	600
9330-12	90542-11	3.30	1.00	480
9330-14	90542-12	3.90	1.20	440
9330-16	90542-13	4.70	1.80	360
9330-18	90542-14	5.60	.13	1340
9330-20	90542-15	6.80	.20	1080
9330-22	90542-16	8.20	.22	1030
9330-24	90542-17	10.0	.26	950
9330-26	90542-18	12.0	.45	720
9330-28	90542-19	15.0	.52	670
9330-30	90542-20	18.0	.70	580
9330-32	90542-21	22.0	1.00	480
9330-34	90542-22	27.0	1.30	420
9330-36	90542-23	33.0	1.50	390
9330-38	90542-24	39.0	2.00	340

COIL AND CHOKE ASSEMBLIES & FORMS

J. W. MILLER DIVISION, BELL INDUSTRIES / 19070 Reyes Ave., Compton, CA 90221 / (213) 537-5200

MICRO-MINIATURE MOLDED RF CHOKES

We are pleased to offer the following series of molded RF chokes. They represent what we believe to be the smallest package for the current rating specified. Color Coding is per MIL-C-15305.

Miller Part Number	MS Type	Inductance Micro-Henries $\pm 10\%$	D.C. Resistance Max.	Milliamp Rating Max.
9230-94	75083-1	.10	.07	1100
9230-96	75083-2	.12	.08	1100
9230-00	75083-3	.15	.10	1100
9230-02	75083-4	.18	.12	1010
9230-04	75083-5	.22	.14	935
9230-06	75083-6	.27	.16	875
9230-08	75083-7	.33	.20	780
9230-10	75083-8	.39	.30	640
9230-12	75083-9	.47	.35	590
9230-14	75083-10	.56	.50	495
9230-16	75083-11	.68	.60	450
9230-18	75083-12	.82	.85	380
9230-20	75083-13	1.00	1.00	350
9230-22	75083-14	1.20	1.18	825
9230-24	75084-2	1.50	.22	745
9230-26	75084-3	1.80	.30	640
9230-28	75084-4	2.20	.40	550
9230-30	75084-5	2.70	.50	495
9230-32	75084-6	3.30	.85	380
9230-34	75084-7	3.90	1.00	350
9230-36	75084-8	4.70	1.20	320
9230-38	75084-9	5.60	1.80	260
9230-40	75084-10	6.80	2.00	245
9230-42	75084-11	8.20	2.70	210
9230-44	75084-12	10.0	3.70	180
9230-46	75084-13	12.0	2.70	210
9230-48	75084-14	15.0	2.80	195
9230-50	75084-15	18.0	3.10	195
9230-52	75084-16	22.0	3.30	190
9230-54	75084-17	27.0	3.50	185
9230-56	75085-1	33.0	3.40	187
9230-58	75085-2	39.0	3.60	180
9230-60	75085-3	47.0	4.50	165
9230-62	75085-4	56.0	5.70	145
9230-64	75085-5	68.0	6.70	135
9230-66	75085-6	82.0	7.30	130
9230-68	75085-7	100.0	8.00	125
9230-70	75085-8	120.0	13.00	97
9230-72	75085-9	150.0	15.00	85
9230-74	75085-10	180.0	17.00	79
9230-76	75085-11	220.0	21.00	73
9230-78	75085-12	270.0	25.00	65
9230-80	75085-13	330.0	28.00	62
9230-82	75085-14	390.0	35.00	55
9230-84	75085-15	470.0	42.00	50
9230-86	75085-16	560.0	46.00	48
9230-88	75085-17	680.0	60.00	42
9230-90	75085-18	820.0	65.00	40
9230-92	75085-19	1000.0	72.00	38

Mold Size: .095 $\pm$.010 Diameter; .250 $\pm$.010 Length.
Leads: AWG #24 TCW; 1.500 $\pm$.188 Length.

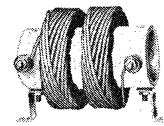
MOLDED RF CHOKES

Miller Part Number	MS Type	Micro-Henries $\pm 10\%$	D.C. Resist. Max.	Milli-amp Rating Max.	Mold Size
9340-00	91189-14	1.2	.075	2400	—
9340-02	91189-15	1.5	.090	2150	—
9340-03	91189-16	1.8	.135	1750	—
9340-04	91189-17	2.2	.160	1600	—
9340-06	91189-18	2.7	.220	1350	—
9340-08	91189-19	3.3	.305	1150	—
9340-10	91189-20	3.9	.45	955	—
9340-12	91189-21	4.7	.560	860	—
9340-14	91189-22	5.6	.745	745	—
9340-16	91189-23	6.8	1.05	635	—
9340-18	91189-24	8.2	1.4	550	—
9340-20	91189-25	10.0	1.9	460	—
9340-22	91189-26	12.0	2.65	385	—
9340-24	91189-27	15.0	3.25	355	—
9340-26	91189-28	18.0	4.15	315	—
9340-28	91189-29	22.0	.295	1150	—
9340-30	91189-30	27.0	.350	1050	—
9340-32	91189-31	33.0	.550	865	—
9340-34	91189-32	39.0	.65	820	—
9340-36	91189-33	47.0	1.0	640	—
9340-38	91189-34	56.0	1.15	610	—
9340-39	91189-35	68.0	1.85	470	—
9340-40	91189-36	82.0	2.10	440	—
9340-42	91189-37	100.0	2.50	405	—
9340-44	91189-38	120.0	4.10	315	—

Mold Size: 0.280 $\pm$.031 Diameter;
.940 $\pm$.062 Length.
Leads: AWG #21 TCW; 1.437 $\pm$.188 Length.

9350-00	75052-1	47.0	5.9	195	A
9350-02	75052-2	56.0	6.4	185	A
9350-04	75052-3	68.0	3.3	255	A
9350-06	75052-4	82.0	3.5	245	A
9350-08	75052-5	100.0	3.8	235	A
9350-10	75052-6	120.0	4.7	215	A
9350-12	75052-7	150.0	5.3	200	A
9350-14	75053-1	180.0	5.5	225	B
9350-16	75053-2	220.0	5.9	220	B
9350-18	75053-3	270.0	6.6	210	B
9350-20	75053-4	330.0	7.6	185	B
9350-22	75053-5	390.0	8.7	180	B
9350-24	75054-1	470.0	9.0	190	C
9350-26	75054-2	560.0	10.0	180	C
9350-28	75054-3	680.0	11.2	170	C
9350-30	75054-4	820.0	13.0	155	C
9350-32	75054-5	1000.0	14.5	145	C
9350-34	75055-1	1500.0	22.0	127	D
9350-36	75055-2	2000.0	26.0	125	D
9350-37	75055-2	2200.0	27.0	115	D
9350-38	75055-3	2500.0	30.0	115	D
9350-39	75055-3	2700.0	32.0	105	D
9350-40	75055-4	5000.0	65.0	78	D
9350-41	75055-4	5100.0	66.0	73	D
9350-44	75055-5	10000.0	70.0	71	D

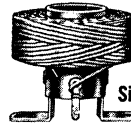
COIL DIMENSIONS	A	B	C	D
DIAMETER $\pm .010$	.250	.310	.375	.468
LENGTH $\pm .010$	.560	.560	.625	.687



DUAL LINE FILTER CHOKES

Miller Dual Duo-Lateral Line Filter Chokes are wound with two coils on one form, giving the advantage of small physical size in cases where space requirements are stringent and two single coils would occupy too much area. Identical in specifications, except for dimensions, to our single type Duo-Lateral chokes. They are wound on white ceramic forms 2" in diameter by 4 1/2" long.

Cat. No.	Amps.	Ohms	Uh.	Dimensions
D-7826	5	.28	570	4 1/2" x 4"
D-7827	10	.15	370	4 1/2" x 4"
D-7828	15	.085	200	4 1/2" x 4"
D-7829	20	.05	135	4 1/2" x 4"



LIGHT DUTY DUO-LATERAL LINE FILTER CHOKES

Single Line Filter Chokes

Dimensions: 1 7/8" x 1 3/4".

Cat. No.	Amperes	Ohms	Uh.
7825	2	.7	600
7825-3	3	.25	250
7825-5	5	.1	100
7825-8	8	.05	50

DUAL LINE FILTER CHOKES

Dimensions: 3 1/4" x 2 1/4".

Cat. No.	Amperes	Ohms	Uh.
D-7825	2	.7	600
D-7825-3	3	.25	250
D-7825-5	5	.1	100
D-7825-8	8	.05	50



HEAVY DUTY HASH CHOKES

Part No.	Uh. $\pm 20\%$	Ohms Max.	Amps.	Dimensions
5218	3.35	.010	20	1 1/2" x 1 1/4"
5219	4.9	.016	15	1 1/2" x 1 1/4"
5220	8.8	.021	10	1 1/2" x 1 1/4"
5230	4.0	.012	8	1 1/2" x 1 1/4"
5240	40.0	.082	3	1 1/2" x 1 1/4"
5248	68.0	.054	5	1 1/2" x 1 1/4"
5250	100.0	.216	2	1 1/2" x 1 1/4"
5252	125.0	.080	3.5	1 1/2" x 1 1/4"
5254	250.0	.170	2.5	1 1/2" x 1 1/4"
5256	500.0	.260	2.0	1 1/2" x 1 1/4"

SERIES S, M, L MOLDED RF CHOKES

Inductance Tolerance

0.1 to 22 uH, $\pm 10\%$ on Q-meter / 27 uH to 10,000, $\pm 5\%$ 1,000 bridge

Physical and Environmental Characteristics

Operating tem. -55° to +125°C terminal strength — meets five pound pull test per MIL-C-15305

All series meet requirements of MIL-C-15305, Grade 1, Class B

SERIES S				
Part Number	L-Micro-Henries	Max DC Res, Ohms	Max I mA	
100170	0.10	0.02	4000	
100171	0.12	0.025	3500	
100172	0.15	0.03	3000	
100173	0.18	0.03	3000	
100174	0.22	0.03	3000	
100175	0.27	0.04	2700	
100176	0.33	0.05	2500	
100177	0.39	0.08	2000	
100178	0.47	0.08	2000	
100179	0.56	0.10	1700	
100180	0.68	0.12	1500	
100181	0.82	0.18	1300	
100182	1.0	0.24	1100	
100183	1.2	0.35	1000	
100184	1.5	0.43	850	
100185	1.8	0.65	720	
100186	2.2	0.80	610	
100187	2.7	0.12	1600	
100188	3.3	0.15	1400	
100189	3.9	0.23	1200	
100190	4.7	0.30	1000	
100191	5.6	0.45	900	
100192	6.8	0.55	800	
100193	8.2	0.65	720	
100194	10.0	0.73	650	
100195	12.0	1.1	590	
100196	15.0	1.4	500	
100197	18.0	1.6	460	
100198	22.0	1.8	400	
100199	27.0	2.7	360	
100200	33.0	3.5	300	
100201	39.0	3.8	290	
100202	47.0	4.0	275	
100203	56.0	4.4	265	
100204	68.0	4.7	250	
100205	82.0	5.3	235	
100206	100.0	6.0	220	

SERIES M				
Part Number	L-Micro-Henries	Max DC Res, Ohms	Max I mA	
100207	1.0	0.04	2700	
100208	1.2	0.04	2700	
100209	1.5	0.04	2700	
100210	1.8	0.05	2500	
100211	2.2	0.05	2500	
100212	2.7	0.05	2500	
100213	3.3	0.05	2500	
100214	3.9	0.07	2100	
100215	4.7	0.09	1800	
100216	5.6	0.14	1500	
100217	6.8	0.17	1300	
100218	8.2	0.25	1150	
100219	10.0	0.32	1000	
100220	12.0	0.47	870	
100221	15.0	0.62	730	
100222	18.0	0.72	660	
100223	22.0	0.8	600	
100224	27.0	1.2	520	
100225	33.0	1.5	450	
100226	39.0	2.3	380	
100227	47.0	3.0	300	
100228	56.0	4.2	270	
100229	68.0	5.2	250	
100230	82.0	6.2	220	
100231	100.0	7.0	200	
100232	120.0	7.5	200	
100233	150.0	8.0	190	
100234	180.0	9.0	185	
100235	220.0	10.0	180	
100236	270.0	11.0	172	
100237	330.0	12.0	165	
100238	390.0	13.0	157	</

SUB-MINIATURE RF CHOKES

An extremely versatile series of iron core RF chokes designed to meet the industries' demand for high reliability, ultra-miniature components. The coils are ideally suited to network and filter design, delay lines, and computer applications. The coils are impregnated with a moisture resistant lacquer and on special order they can be fungus-proofed per JAN-T-152 using varnish per MIL-V-173A. They can also be encapsulated in epoxy resin to conform to Grade 1, Class B of MIL-C-15305.

Miller Part No.	Inductance Nominal*	D.C. Resistance Max.	Milliamp Rating Max.	Max. Winding Diam.	Form Length $\pm 1/32$
70F107AP	.10 uh★	.013	3922	.156	$3/16$
70F157AP	.15 uh★	.025	2828	.141	$3/16$
70F227AP	.22 uh★	.038	2294	.141	$3/16$
70F337AP	.33 uh★	.070	1690	.125	$3/16$
70F477AP	.47 uh★	.125	1264	.125	$3/16$
70F687AP	.68 uh★	.200	1000	.125	$3/16$
70F757AP	.75 uh★	.264	870	.125	$3/16$
70F827AP	.82 uh★	.290	830	.125	$3/16$
70F106AI	1.0 uh	.048	2041	.165	$1/4$
70F126AI	1.2 uh	.072	1666	.160	$1/4$
70F156AI	1.5 uh	.096	1443	.160	$1/4$
70F186AI	1.8 uh	.096	1443	.160	$1/4$
70F226AI	2.2 uh	.156	1132	.160	$1/4$
70F276AI	2.7 uh	.168	1091	.160	$1/4$
70F336AI	3.3 uh	.240	912	.150	$1/4$
70F396AI	3.9 uh	.264	870	.150	$1/4$
70F476AI	4.7 uh	.457	661	.150	$1/4$
70F566AI	5.6 uh	.492	637	.150	$1/4$
70F686AI	6.8 uh	.624	566	.150	$1/4$
70F756AI	7.5 uh	.624	566	.150	$1/4$
70F826AI	8.2 uh	.744	518	.150	$1/4$
70F916AI	9.1 uh	1.44	288	.160	$1/4$
70F105AI	10 uh	1.56	277	.160	$1/4$
70F125AI	12 uh	1.68	267	.160	$1/4$
70F155AI	15 uh	1.92	250	.165	$1/4$
70F185AI	18 uh	2.28	229	.165	$1/4$
70F225AI	22 uh	2.28	229	.165	$1/4$
70F255AI	25 uh	2.64	213	.170	$1/4$
70F275AI	27 uh	2.64	213	.170	$1/4$
70F335AI	33 uh	2.76	208	.170	$1/4$
70F395AI	39 uh	3.36	188	.175	$1/4$
70F475AI	47 uh	3.36	188	.175	$1/4$
70F565AI	56 uh	3.84	176	.180	$1/4$
70F685AI	68 uh	4.20	169	.180	$1/4$
70F755AI	75 uh	4.56	162	.185	$1/4$
70F825AI	82 uh	4.80	158	.185	$1/4$
70F915AI	91 uh	4.92	156	.185	$1/4$
70F104AI	100 uh	7.68	139	.165	$1/4$
70F124AI	120 uh	8.16	135	.165	$1/4$
70F154AI	150 uh	8.16	135	.165	$1/4$
70F184AI	180 uh	8.16	135	.170	$1/4$
70F204AI	200 uh	10.3	120	.170	$1/4$
70F224AI	220 uh	11.5	114	.170	$1/4$
70F254AI	250 uh	12.1	111	.170	$1/4$

*Tolerance 0.1 to 1.0 uh $\pm 20\%$, 1.1 to 15 uh $\pm 10\%$, over 15 uh $\pm 5\%$ ★Measured with leads $1/4$ " long from Q Meter binding posts

PHENOLIC CORE SINGLE LAYER WINDINGS

Dimensions of core: $3/8$ " diameter x $3/4$ " long. Leads are $1 1/2$ " long.

Miller Part Number	Inductance Nominal*	D. C. Resistance Maximum	Milliamp Rating Maximum	Diameter over Winding
4602	1.0 uh	.050	2000	.270
4604	1.5 uh	.093	1800	.270
4606	2.4 uh	.190	1500	.270
4608	3.9 uh	.450	1000	.270
4609	5.5 uh	.670	850	.270
4610	6.2 uh	.830	700	.270
4611	8.2 uh	1.20	600	.270
4612	10.0 uh	1.50	500	.270

*Tolerance 1.0 uh $\pm 20\%$, 1.1 to 10 uh $\pm 10\%$

IRON CORE SINGLE LAYER WINDINGS

Dimensions of core: $1/2$ " diameter x $7/8$ " long. Leads are $1 1/2$ " long.

Part No.	Inductance	D.C. Resistance	Milliamp Rating	Diameter over Winding
4622	10 uh $\pm 5\%$	.11	1500	.29
4624	15 uh $\pm 5\%$	.17	1000	.29
4626	24 uh $\pm 5\%$	.34	800	.29
4628	39 uh $\pm 5\%$	.65	600	.29
4629	55 uh $\pm 5\%$	1.0	500	.29
4630	62 uh $\pm 5\%$	1.2	475	.29
4631	82 uh $\pm 5\%$	1.9	450	.29
4632	100 uh $\pm 5\%$	3.0	400	.29

PHENOLIC CORE 3-SECTION WINDINGS

Dimensions of core: $3/8$ " diameter x $3/4$ " long. Leads are $1 1/2$ " long.

Part No.	Inductance	D.C. Resistance	Milliamp Rating	Diameter over Winding
4642	.10 mh $\pm 5\%$	5.4	160	.406
4644	.15 mh $\pm 5\%$	6.5	160	.406
4646	.24 mh $\pm 5\%$	8.5	160	.438
4648	.39 mh $\pm 5\%$	11	160	.500
4649	.55 mh $\pm 5\%$	13	160	.500
4650	.62 mh $\pm 5\%$	15	160	.531
4651	.75 mh $\pm 5\%$	16	160	.531
4652	1.0 mh $\pm 5\%$	19	160	.563

IRON CORE 3-SECTION WINDINGS

Dimensions of core: $1/2$ " diameter x $7/8$ " long. Leads are $1 1/2$ " long.

Miller Part Number	Inductance @ 1000 Hertz	D. C. Resistance Maximum	Milliamp Rating Maximum	Diameter over Winding
4662	1.0 mh $\pm 5\%$	8.6	160	.469
4664	1.5 mh $\pm 5\%$	11	160	.469
4666	2.4 mh $\pm 5\%$	15	160	.531
4668	3.9 mh $\pm 5\%$	20	160	.563
4669	5.5 mh $\pm 5\%$	25	160	.594
4670	6.2 mh $\pm 5\%$	37	100	.531
4671	8.2 mh $\pm 5\%$	46	100	.563
4672	10 mh $\pm 5\%$	50	100	.594

FERRITE CORE

3-SECTION WINDINGS

Dimensions of core: $1/4$ " diameter x $7/8$ " long. Leads are $1 1/2$ " long.

Part No.	Inductance	D.C. Resistance	Milliamp Rating	Diameter over Winding
6302	2.5 mh $\pm 5\%$	9.0	160	.469
6304	5.0 mh $\pm 5\%$	14	160	.531
6306	10 mh $\pm 5\%$	31	100	.531
6308	25 mh $\pm 5\%$	82	65	.531
6310	50 mh $\pm 5\%$	127	65	.625

SINGLE LAYER COLOR CODED RF CHOKES

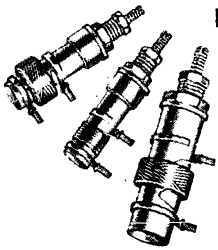
The following solenoid wound R.F. Chokes are impregnated with a thermosetting varnish and are color coded to EIA standards. Form Dimensions .156 x $1/2$ ".

Part No.	L*	R Ohms Max.	I Ma. Max.	Part No.	L*	R Ohms Max.	I Ma. Max.
74F106AP	1.0 uh	.20	1000	74F125AP	12 uh	3.60	200
74F126AP	1.2 uh	.22	950	74F155AP	15 uh	6.00	150
74F156AP	1.5 uh	.25	900	74F185AP	18 uh	7.50	100
74F186AP	1.8 uh	.28	850	74F225AI	22 uh	2.00	500
74F226AP	2.2 uh	.30	800	74F275AI	27 uh	1.85	450
74F276AP	2.7 uh	.50	700	74F335AI	33 uh	2.00	450
74F336AP	3.3 uh	.70	600	74F395AI	39 uh	2.60	400
74F396AP	3.9 uh	.80	500	74F475AI	47 uh	3.50	350
74F476AP	4.7 uh	1.00	400	74F565AI	56 uh	3.75	300
74F566AP	5.6 uh	1.80	350	74F685AI	68 uh	4.00	250
74F686AP	6.8 uh	1.85	300	74F825AI	82 uh	5.10	200
74F826AP	8.2 uh	1.90	275	74F104AI	100 uh	6.00	150
74F105AP	10 uh	3.00	250				

* Tolerance 1.0 to 2.2 uh. $\pm 20\%$. 2.7 to 100 uh. $\pm 10\%$

COIL AND CHOKE ASSEMBLIES & FORMS

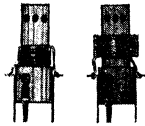
J. W. MILLER DIVISION, BELL INDUSTRIES / 19070 Reyes Ave., Compton, CA 90221 / (213) 537-5200



RESINITE ADJUSTABLE RF COILS

Resinite is a phenolic impregnated tubing which combines the mechanical and dielectric advantages of phenolics with the high dielectric strength, moisture resistance, and non-corrosive properties of cellulose acetate. Resinite can be certified to MIL-P-79B Type PBG. This series features an extremely wide choice of inductance ranges and utilizes only the highest quality commercial materials throughout. They find application where the severe moisture resistant characteristics of the encapsulated units and the mechanical properties of the ceramics are not required.

Miller Part No.	Inductance Min.	Inductance Max.	R Ohms Max.	Max. Current Ma.	Dia. over Winding
20A107RBI	.088 uh	.120 uh	.041	1600	.343
20A157RBI	.131 uh	.180 uh	.044	1600	.343
20A227RBI	.162 uh	.264 uh	.051	1600	.343
20A337RBI	.238 uh	.396 uh	.054	1000	.343
20A477RBI	.356 uh	.564 uh	.078	1000	.343
20A687RBI	.508 uh	.816 uh	.082	635	.343
20A827RBI	.735 uh	.984 uh	.090	635	.343
20A106RBI	.885 uh	1.20 uh	.135	400	.343
20A156RBI	1.08 uh	1.80 uh	.205	400	.343
20A226RBI	1.62 uh	2.64 uh	.522	100	.343
20A336RBI	2.38 uh	3.96 uh	.640	100	.343
20A476RBI	3.56 uh	5.64 uh	.770	100	.343
20A686RBI	5.08 uh	8.16 uh	.950	100	.343
20A826RBI	7.35 uh	9.84 uh	1.00	100	.343
20A105RBI	8.85 uh	12.0 uh	1.45	100	.343
20A155RBI	10.8 uh	18.0 uh	1.70	100	.343
20A225RBI	16.2 uh	26.4 uh	2.10	100	.343
20A335RBI	23.8 uh	39.6 uh	2.59	100	.343
20A475RBI	35.6 uh	56.4 uh	3.10	100	.343
20A685RBI	50.8 uh	81.6 uh	3.84	100	.343
20A825RBI	73.5 uh	98.4 uh	4.71	100	.375
20A104RBI	88.5 uh	120. uh	5.00	100	.406
20A154RBI	108. uh	180. uh	5.95	100	.406
20A224RBI	162. uh	264. uh	7.50	100	.406
20A334RBI	238. uh	396. uh	9.50	100	.437
20A474RBI	356. uh	564. uh	12.0	100	.500
20A684RBI	508. uh	816. uh	14.5	100	.500
20A824RBI	735. uh	984. uh	17.0	100	.562
20A103RBI	885. uh	1.20 mh	21.0	100	.594



VERTICAL MOUNTED PRINTED CIRCUIT VELVETORK ADJUSTABLE RF COILS

Dimensions (form only) Over Collar 3/8" Dia. x 3/4" long.

The coil form is Polyester impregnated Alpha-Cellulose tubing with internally bonded resilient ribs which provide both thread and torque control. Coils may be adjusted from either end of form.

Miller Part No.	Inductance Min.	Inductance Max.	R Ohms Max.	Max. Current Ma.	Dia. over Winding
23A107RPC	.095 uh	.125 uh	.02	4100	.40
23A157RPC	.130 uh	.170 uh	.02	1600	.37
23A227RPC	.185 uh	.265 uh	.02	1600	.37
23A337RPC	.285 uh	.410 uh	.03	1000	.37
23A477RPC	.420 uh	.580 uh	.03	2500	.37
23A687RPC	.540 uh	.850 uh	.03	1600	.37

IF COMPONENTS SUB MINIATURE

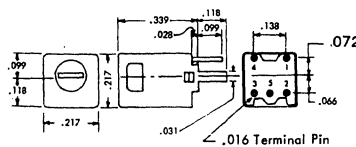


The transformers in this series represents the state of the art, as it relates to a commercial product. In both the 455 kc. and 10.7 Mc. groups there are a complete set of I.F. transformers as well as Ratio Detector and Discriminator transformers. Part No. 8814 incorporates a single section mechanical filter that sharpens the I.F. passband appreciably 4 kc. @ 6 db and 12 kc. @ 20 db. The physical dimensions of this unit are .415 wide .460 deep and .600 high.

Dimensions: 8849, 8850, 8851, 8805, 8806 & 8807 — 3/8" x 3/8" x 1/2" high.
8852, 8853 & 8854 — 1/2" sq. x 5/8" high.
8810, 8811, 8812 & 8813 — 1/2" sq. x 1/2" high.
8814 — 1/2" x 1/2" x 3/4".

Cat. No.	Specs.	Description
10.7 Mc. Transistor Transformers		
8849	500 kc. P/P	10.7 Mc. Ratio Detector
8850	300 kc. P/P	10.7 Mc. Discriminator
8851-A	6 db 300 kc.	10.7 Mc. Double Tuned IF
8852	100 K-300	10.7 Mc. Single Tuned IF
8853	20 K-500	10.7 Mc. Single Tuned IF
8854	25 K-500	10.7 Mc. Single Tuned IF
455 Kc. Transistor Transformers		
8805	20 kc. P/P	455 kc. Ratio Detector
8806	20 kc. P/P	455 kc. Discriminator
8807	6 db 15 kc.	455 kc. Double Tuned IF
8810	50 K-800	455 kc. Single Tuned IF
8811	30 K-500	455 kc. Single Tuned IF
8812	20 K-5 K	455 kc. Single Tuned IF
8813	Oscillator (455 kc. IF). (Tuning Cap. 78 to 110 pf. Max.)	
8814	70 K-800	455 kc. Single Tuned IF with Single Section Mechanical Filter

TRANSISTOR COILS... SMALLEST YET LESS THAN 1/4"



A complete set of 455 KHz IF transformers and matching Osc. coil, and a complete set of 10.7 MHz IF transformers and matching Discriminator coils... all so small as to be almost unbelievable.

Each unit measures only .217 x .217 x .339 and is for printed circuitry.

Cat. No.	Freq.	Impedance	Use
8855	10.7 MHz	20 K— 75 Ω	1st IF
8856	10.7 MHz	15 K—300 Ω	2nd & 3rd IF
8857	10.7 MHz	12 K— 3 K	Disc. Pri.
8858	10.7 MHz	— 12 K	Disc. Sec.
8815	455 KHz	50 K— 2 K	1st IF
8816	455 KHz	50 K— 2 K	2nd IF
8817	455 KHz	5 K— 5 K	3rd IF
8818	540-1600 KHz		BC Osc.

(Tuning capacitor 67-78 pF maximum)

SMALLEST YET STEREO MULTIPLEX



These recently developed Multiplex units when used with a Motorola IC #MC1304 FM Stereo Demodulator form a complete FM Stereo Decoder System. They provide excellent opportunity for OEM and Experimenter projects. Ask for "The Coil Forum" Application Note.

Each Multiplex System requires:

- 1 No. 1363 — PCB (PC Board)
- 2 No. 1359 and 1 No. 1360 or
- 2 No. 1361 and 1 No. 1362

Cat. No.	Description	Size
1359	19 KHz	.591 x .402 x .402
1360	38 KHz	.591 x .402 x .402
1361	19 KHz	.748 x .591 x .591
1362	38 KHz	.748 x .591 x .591

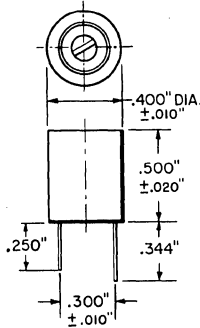
VL—SERIES VARIABLE INDUCTORS

Vertical Mount: Printed Circuit—
Mil C 15305.

Tunable Range: .10 uH $\pm$ 10%.
.15-.22 uH $\pm$ 15%. .33-4700 uH $\pm$ 20%.

Operating Temp.: -55°C to +125°C.

Leads: No. 22 TCW.



Part No.	L nom uH	max DCR at 25°C ohms
VL-R10	0.10	0.02
VL-R15	0.15	0.035
VL-R22	0.22	0.04
VL-R33	0.33	0.04
VL-R47	0.47	0.05
VL-R68	0.68	0.07
VL-1R0	1.00	0.13
VL-1R5	1.50	0.24
VL-2R2	2.20	0.30
VL-3R3	3.30	0.45
VL-4R7	4.70	0.80
VL-6R8	6.80	1.1
VL-100	10.0	1.9
VL-150	15.0	3.2
VL-220	22.0	3.4

Part No.	L nom uH	max DCR at 25°C ohms
VL-330	33.0	3.6
VL-470	47.0	4.5
VL-680	68.0	5.5
VL-101	100.0	6.7
VL-151	150.	11.0
VL-221	220.	13.0
VL-331	330.	16.0
VL-471	470.	18.0
VL-681	680.	21.0
VL-102	1000.	38.0
VL-152	1500.	54.0
VL-222	2200.	66.0
VL-332	3300.	85.0
VL-472	4700.	99.0

VLS SERIES VARIABLE INDUCTORS (SHIELDED)

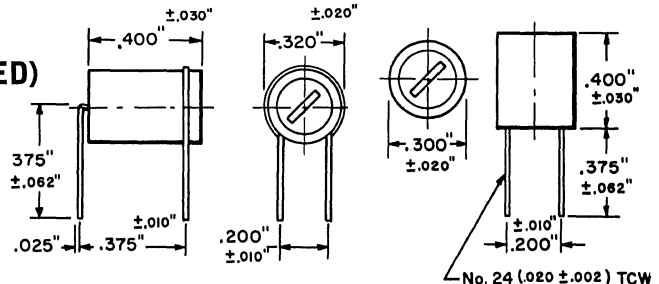
May be mounted either Vertically or
Horizontally.

Printed Circuit: Mil C 15305.

Tunable Range: .10 uH .12 uH $\pm$ 5%.
All others $\pm$ 10%.

Operating Temp.: -55°C to +125°C.

Leads: No. 24 TCW.



HORIZONTAL STYLE

VERTICAL STYLE

Part No.	Nom. Inductance	DCR 25°C, Max. ohms	Max. I mA
VLSR10	.10uH	0.030	2500
VLSR12	.12uH	0.030	2500
VLSR15	.15uH	0.030	2500
VLSR18	.18uH	0.035	2400
VLSR22	.22uH	0.038	2300
VLSR27	.27uH	0.040	2200
VLSR33	.33uH	0.040	2200
VLSR39	.39uH	0.045	2100
VLSR47	.47uH	0.045	2100
VLSR56	.56uH	0.050	2000
VLSR68	.68uH	0.055	1900
VLSR82	.82uH	0.060	1800
VLS1R0	1.00uH	0.070	1700
VLS1R2	1.2 uH	0.085	1670
VLS1R5	1.5 uH	0.100	1540
VLS1R8	1.8 uH	0.110	1470
VLS2R2	2.2 uH	0.120	1410
VLS2R7	2.7 uH	0.125	1380
VLS3R3	3.3 uH	0.165	1200
VLS3R9	3.9 uH	0.180	1135
VLS4R7	4.7 uH	0.245	985
VLS5R6	5.6 uH	0.265	950
VLS6R8	6.8 uH	0.330	853
VLS8R2	8.2 uH	0.460	720
VLS100	10. uH	0.640	620
VLS120	12. uH	0.800	545
VLS150	15. uH	0.865	520
VLS180	18. uH	0.940	504
VLS220	22. uH	1.03	460
VLS270	27. uH	1.18	418
VLS330	33. uH	1.30	398
VLS390	39. uH	1.41	385
VLS470	47. uH	1.61	350
VLS560	56. uH	2.08	330
VLS680	68. uH	2.20	320
VLS820	82. uH	2.42	300

Part No.	Nom. Inductance	DCR 25°C, Max. ohms	Max. I mA
VLS101	100. uH	2.15	333
VLS121	120. uH	2.38	316
VLS151	150. uH	2.52	306
VLS181	180. uH	2.88	288
VLS221	220. uH	3.18	273
VLS271	270. uH	3.50	260
VLS331	330. uH	4.80	222
VLS391	390. uH	5.44	209
VLS471	470. uH	5.90	201
VLS561	560. uH	6.30	194
VLS681	680. uH	7.20	181
VLS821	820. uH	8.00	172
VLS102	1,000. uH	12.0	141
VLS122	1,200. uH	13.5	132
VLS152	1,500. uH	16.5	119
VLS182	1,800. uH	18.0	114
VLS222	2,200. uH	20.5	107
VLS272	2,700. uH	22.5	102
VLS332	3,300. uH	42.0	76
VLS392	3,900. uH	47.5	71
VLS472	4,700. uH	53.0	67
VLS562	5,600. uH	62.5	65
VLS682	6,800. uH	69.5	58
VLS822	8,200. uH	75.0	56
VLS103	10,000. uH	100.0	49
VLS123	12,000. uH	64.0	60
VLS153	15,000. uH	84.0	52
VLS183	18,000. uH	93.0	50
VLS223	22,000. uH	104.0	45
VLS273	27,000. uH	173.0	35
VLS333	33,000. uH	187.0	32
VLS393	39,000. uH	220.0	30
VLS473	47,000. uH	253.0	28
VLS563	56,000. uH	285.0	26
VLS683	68,000. uH	311.0	24
VLS823	82,000. uH	385.0	22
VLS104	100,000. uH	420.0	20

9100 SERIES SHIELDED ADJUSTABLE R.F. COILS



These ultra compact adjustable coils offer a good inductance range with relatively small changes in Q. Tuning is accessible from either top or bottom of the assembly. Magnetic shielding is achieved by the use of cup cores while the copper shield offers effective electrostatic shielding. Printed circuit terminals on base and shield.

Dimensions: .440" Sq. x .550" High. Applications between 10 kHz and 200 MHz.

Part No.	L Min.	L Max.	Max. DC Resist. Ohms	Max. Current
9101	.099 uH	.134 uH	0.01	4.85 A
9102	.129 uH	.192 uH	0.01	4.43 A
9103	.165 uH	.258 uH	0.02	3.97 A
9104	.246 uH	.418 uH	0.02	3.83 A
9105	.366 uH	.627 uH	0.02	3.43 A
9106	.588 uH	.950 uH	0.90	516 mA
9107	.830 uH	1.54 uH	1.02	485 mA
9108	1.44 uH	2.94 uH	1.38	417 mA
9109	2.52 uH	5.70 uH	1.76	368 mA
9110	5.35 uH	13.49 uH	2.92	286 mA
9111	12.50 uH	29.45 uH	4.72	225 mA
9112	26.25 uH	71.25 uH	6.97	185 mA
9113	64.57 uH	163 uH	9.98	155 mA
9114	147 uH	430 uH	16.32	121 mA
9115	422 uH	1.10 mH	27.84	92 mA
9116	1.05 mH	3.74 mH	41.06	76 mA
9117	3.36 mH	11.12 mH	78.92	55 mA

CUSTOM WINDINGS A SPECIALTY

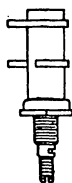
LET US QUOTE ON YOUR
REQUIREMENTS!

WRITE FOR
FULL LINE CATALOG '75

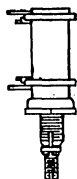
COIL FORMS

Ceramic, Phenolic, Nylon and Alpha Cellulose Coil Forms Printed Circuit and Bushing Mount

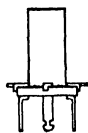
This short form listing of our adjustable coils forms tabulates the major parameters and available cores. All metal parts are plated for protection against corrosion and the powdered iron core materials are moisture proofed.



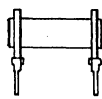
A



B



C



D



E



F



G



H

Miller Part Number	Style	Form Material	Form Dimensions	Mounting	Terminals
4300	A	Ceramic	.205 x .593	Bushing	2 Wire rings
60A022	B	Ceramic	.205 x .593	Bushing	2 Collars with 1 Terminal on each
60A024	B	Ceramic	.205 x .593	Bushing	2 Collars with 2 Terminals on each
4500	A	Ceramic	.260 x .858	Bushing	2 Wire rings
62A022	B	Ceramic	.260 x .858	Bushing	2 Collars with 1 Terminal on each
62A024	B	Ceramic	.260 x .858	Bushing	2 Collars with 2 Terminals on each
4400	A	Ceramic	.375 x 1.060	Bushing	2 Wire rings
64A022	B	Ceramic	.375 x 1.060	Bushing	2 Collars with 1 Terminal on each
64A024	B	Ceramic	.375 x 1.060	Bushing	2 Collars with 2 Terminals on each
20A000	A	Phenolic (PBG)	.250 x .860	Bushing	2 Wire rings
21A000	A	Phenolic (PBG)	.375 x 1.125	Bushing	2 Wire rings
27A013 (1)	C	Alpha Cellulose	.162 x .400	Printed Circuit	3 Terminals
27A014 (1)	C	Alpha Cellulose	.162 x .400	Printed Circuit	4 Terminals
26A024 (1)	D	Alpha Cellulose	.162 x .520	Printed Circuit	2 Collars with 2 Terminals on each
25A014 (1)	C	Alpha Cellulose	.211 x .625	Printed Circuit	4 Terminals
24A024 (1)	D	Alpha Cellulose	.211 x .680	Printed Circuit	2 Collars with 2 Terminals on each
46A013	C	Ceramic	.260 x .625	Printed Circuit	3 Terminals
46A014	C	Ceramic	.260 x .625	Printed Circuit	4 Terminals
47A024	D	Ceramic	.260 x .625	Printed Circuit	2 Collars with 2 Terminals on each
23A013*	E	Alpha Cellulose	.281 x .750	Printed Circuit	3 Terminals
23A014*	E	Alpha Cellulose	.281 x .750	Printed Circuit	4 Terminals
4200*	F	Nylon	.285 x 1.250	Clip	2 Terminals

The following cores are available for all above listed coil forms. Add the Core Dash No. after the Miller Part No., i.e. 4500-4.

Core Dash No.	Recommended Frequency Range	Material	Color Code
-0	Form only		
-1	0.2 — 1.5 MHz	Powdered Iron	Yellow
-2	1.0 — 20 MHz	Powdered Iron	Red
-3	20 — 50 MHz	Powdered Iron	Green
-4	50 — 200 MHz	Powdered Iron	White
-5	100 and up MHz	Brass	None
-6	2.0 — 25 MHz	Powdered Iron	Purple
-7	25 and up MHz	Powdered Iron	Blue
-8*	Under 25 MHz	Ferrite	None
(1) —6 and —7 cores are ferrite for these coil forms * Available for 23A013, 23A014 and 4200 forms only Mounting hardware supplied where required			
51A	G	The recommended frequency, core material and color code for this group will not be in agreement with the above table. For complete specifications see General Catalog 75.	
52A	H		
53A	H		
54A	H		
55A	H		
9100	G		

HIGH Q MOLDED ADJUSTABLE COILS

The 48A series of coils listed below may easily be tapped at $\frac{1}{8}$, $\frac{1}{4}$, $\frac{3}{8}$, $\frac{5}{8}$, $\frac{3}{4}$, $\frac{7}{8}$ turn if desired.

Frequency range 30 MHz to 250 MHz

Wire size: 20 AWG tinned copper

Form length: .73 inches

Coil OD: .310 inches

Lead spacing: .408 inches

Core: 10-32 x $\frac{3}{8}$ " Carbonyl J



Miller Part Number	Minimum Inductance	Maximum Inductance	D.C. Current
48A518mpc	.046 uH	.055 uH	2A
48A778mpc	.071 uH	.082 uH	2A
48A117mpc	.099 uH	.122 uH	2A
48A147mpc	.118 uH	.157 uH	2A
48A187mpc	.150 uH	.207 uH	2A
48A227mpc	.181 uH	.278 uH	2A
48A257mpc	.209 uH	.283 uH	2A
48A287mpc	.241 uH	.316 uH	2A
48A317mpc	.270 uH	.351 uH	2A

49A Series

Frequency range: 10 MHz to 250 MHz

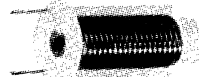
Wire size: 22 AWG single polyurethane coated with tinned leads

Form length: .87 inches except 49A146MPC

Coil OD: .285 inches

Lead Spacing: .324 inches

Core: 10-32 x $\frac{3}{8}$ " Carbonyl J

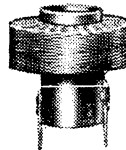


Miller Part Number	Minimum Inductance	Maximum Inductance	D.C. Current
49A678mpc	.060 uH	.074 uH	1.5A
49A127mpc	.100 uH	.132 uH	1.5A
49A167mpc	.134 uH	.194 uH	1.5A
49A217mpc	.170 uH	.258 uH	1.5A
49A347mpc	.250 uH	.415 uH	1.5A
49A537mpc	.393 uH	.657 uH	1.5A
49A757mpc	.600 uH	.900 uH	1.5A
49A997mpc	.810 uH	1.160 uH	1.5A
49A126mpc	.960 uH	1.340 uH	1.5A
49A146mpc*	1.180 uH	1.530 uH	1.5A

*Form Length 1.09 inches

AIR CORE PRINTED CIRCUIT R.F. CHOKES

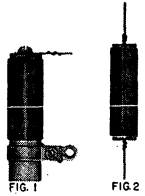
The following R.F. Chokes have been designed to offer a wide range of inductance values for use in printed circuit applications. Our standard stock of these coils is impregnated with a high grade coil varnish to prevent moisture absorption. On special orders we can supply these items treated with fungus resistant material, or encapsulated in epoxy resin to meet MIL-C-15305. Coil length: $\frac{7}{8}$ " on all items.



Miller Part Number	Measured on General Radio Inductance Bridge Type 1632-A Inductance @ 1000 Hertz	D.C. Resistance Maximum	Milliamp Rating Maximum
970	1.0 mh $\pm 5\%$	20.6	125
971	1.2 mh $\pm 5\%$	23.8	125
972	1.5 mh $\pm 5\%$	26.4	125
973	1.8 mh $\pm 5\%$	29.6	125
974	2.2 mh $\pm 5\%$	32.9	125
975	2.7 mh $\pm 5\%$	37.4	125
976	3.3 mh $\pm 5\%$	41.8	125
977	3.9 mh $\pm 5\%$	46.7	125
978	4.7 mh $\pm 5\%$	51.8	125
979	5.6 mh $\pm 5\%$	57.6	125
980	6.8 mh $\pm 5\%$	64.4	125
981	8.2 mh $\pm 5\%$	73.0	100
982	10.0 mh $\pm 5\%$	81.6	100
983	12.0 mh $\pm 5\%$	92.4	100
984	15.0 mh $\pm 5\%$	105.	100
985	18.0 mh $\pm 5\%$	117.	100
986	22.0 mh $\pm 5\%$	130.	75
987	27.0 mh $\pm 5\%$	145.	75
988	33.0 mh $\pm 5\%$	251.	75
989	39.0 mh $\pm 5\%$	277.	75
990	47.0 mh $\pm 5\%$	316.	50
991	56.0 mh $\pm 5\%$	351.	50
992	68.0 mh $\pm 5\%$	391.	50
993	82.0 mh $\pm 5\%$	442.	50
994	100.0 mh $\pm 5\%$	473.	50

FREQUENCY SELECTIVE R.F. CHOKES

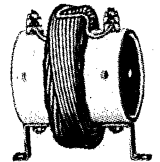
Designed for maximum efficiency and highest impedance at specific operating frequencies this group of R.F. chokes eliminates the designer's task of attempting to choose the best coil for a particular application from miscellaneous and often insufficient design data. Designed to cover the major Amateur and Industrial communication frequencies.



Part No.	Inductance $\pm 10\%$	Freq. Mc
RFC-3.5	266. uH	1.8-5
RFC-7	208. uH	3-13
RFC-14	84. uH	7-20
RFC-21	38.5 uH	15-30
RFC-28	24. uH	25-40
RFC-50	8.2 uH	30-90
RFC-144	1.72 uH	75-180
RFC-220	.82 uH	160-340
RFC-420	.22 uH	350-500

The above R.F. Chokes have a conservative rating of 600 ma.

MEDIUM DUTY DUO-LATERAL LINE FILTER CHOKES



Cat. No.	Amps.	Ohms	Induc.	Dimensions
7826	5	.28	570 uH	2 1/2" x 4"
7827	10	.15	370 uH	2 1/2" x 4"
7828	15	.085	200 uH	2 1/2" x 4"
7829	20	.05	135 uH	2 1/2" x 4"

SINGLE PI FERRITE CORE R.F. CHOKES



This series of single pi R.F. Chokes affords maximum Q with minimum resistance through the use of ferrite core material. The coils are impregnated in a fungus resistant lacquer. Form Dimensions .187 x $\frac{5}{8}$ "

Part Number	L $\pm 5\%$	Max. R Ohms	Max. Ma.
73F104AF	100. uH	2.0	250
73F124AF	120. uH	2.2	250
73F154AF	150. uH	2.5	250
73F184AF	180. uH	2.9	250
73F224AF	220. uH	3.2	250
73F274AF	270. uH	3.6	250
73F334AF	330. uH	3.8	250
73F394AF	390. uH	4.2	225
73F474AF	470. uH	4.8	200
73F564AF	560. uH	5.3	200
73F684AF	680. uH	6.0	200
73F824AF	820. uH	6.8	200
73F103AF	1.0 mh	7.5	150
73F123AF	1.2 mh	7.8	150
73F153AF	1.5 mh	8.8	150
73F183AF	1.8 mh	11.0	150
73F223AF	2.2 mh	12.0	150
73F273AF	2.7 mh	13.5	125
73F333AF	3.3 mh	15.1	125
73F393AF	3.9 mh	18.0	125
73F473AF	4.7 mh	21.5	100
73F563AF	5.6 mh	25.0	80
73F683AF	6.8 mh	29.0	80
73F823AF	8.2 mh	30.0	80
73F102AF	10.0 mh	34.0	80

COIL AND CHOKE ASSEMBLIES & FORMS

J. W. MILLER DIVISION, BELL INDUSTRIES / 19070 Reyes Ave., Compton, CA 90221 / (213) 537-5200

SINGLE PI R.F. CHOKES

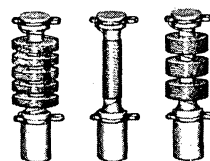
A series of Single Pi R.F. Chokes wound on phenolic forms with axial leads. They are rated at 250 ma. maximum current and are thoroughly impregnated with a moisture and fungus resistant varnish.



Part No.	L ±5%	Min. Fo.	Ohms Max.
72F105AP	10 uh	13	1.58
72F125AP	12 uh	12	1.69
72F155AP	15 uh	11	1.85
72F185AP	18 uh	9.8	2.08
72F225AP	22 uh	9.6	2.28
72F275AP	27 uh	8.9	2.54
72F335AP	33 uh	8.1	2.87
72F395AP	39 uh	7.5	3.14
72F475AP	47 uh	7.2	3.43
72F565AP	56 uh	6.5	3.72
72F685AP	68 uh	6.1	4.20
72F825AP	82 uh	5.8	4.44
72F104AP	100 uh	5.3	5.16
72F124AP	120 uh	5.0	5.64
72F154AP	150 uh	4.6	6.36
72F184AP	180 uh	4.3	7.02
72F224AP	220 uh	4.0	7.91
72F274AP	270 uh	3.5	8.94
72F334AP	330 uh	3.3	9.96
72F394AP	390 uh	3.1	10.9
72F474AP	470 uh	2.9	12.0
72F564AP	560 uh	2.6	13.2
72F684AP	680 uh	2.4	14.6
72F824AP	820 uh	2.2	16.1
72F103AP	1000 uh	1.9	19.1

CERAMIC FORM R.F. CHOKES

A series of high quality fixed coils wound on a silicone impregnated steatite form. The coils are the standoff type and are mounted by a single 6-32 screw. They find primary application in low power transmitters and associated equipment where relatively high current capacity and low distributed capacitance are important.

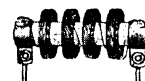


Form Dimensions:
1/4" Dia. x 1 1/4" long

Cat. Number	Inductance ±5% @ 1000 Cycles	Resistance Max.	Rated Current
4552	0.25 mh.	9.6	150 ma.
4553	0.50 mh.	14.4	150 ma.
4554	1.0 mh.	20.4	150 ma.
4555	2.5 mh.	33.6	150 ma.
4556	5.0 mh.	54.0	150 ma.
4557	0.25 mh.	4.20	300 ma.
4558	0.50 mh.	6.60	300 ma.
4559	1.0 mh.	11.5	300 ma.
4560	2.5 mh.	20.4	300 ma.
4561	5.0 mh.	22.8	300 ma.

CERAMIC CORE R.F. CHOKES

Miller ceramic core radio frequency chokes are the result of careful research and design, and present advantages found in no other comparable chokes. These chokes have extremely low distributed capacity.



Dimensions: (form) 1/4" diameter by 1 1/2" long. All chokes are impregnated with a moisture- and fungus-resistant varnish.

MULTIPLE PI WOUND CHOKES

Part No.	mh	Ohms Max.	ma
4531-0	.25	9.6	200
4531	.5	14.4	200
4531-1	1.	20.4	200
4532	1.5	25.2	200
4537	2.5	33.6	200
4538	5.	50.4	125
4539	7.5	98.4	125
4540	10.	114.	125
4541	25.	192.	125

MOLDED R.F. CHOKES



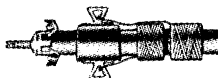
This series of molded chokes conforms to the requirements of Mil type LT8K. Mold Size: .281 ±.031 Diameter; .937 ±.0625 Length. Leads: 1.500 ±.125.

Measured on Model 260A Q-Meter

Miller Part Number	MS Type	Inductance Microhenries	D.C. Resistance Maximum	Milliamp Rating Maximum
9360-01	91189-1	1.1 ±20%	0.09	2800
9360-02	91189-2	2.2 ±20%	.20	1800
9360-03	91189-3	3.3 ±10%	.32	1500
9360-04	91189-4	4.7 ±10%	.60	1100
9360-05	91189-5	6.8 ±10%	1.10	800
9360-06	91189-6	10.0 ±10%	1.80	600
9360-07	91189-7	15.0 ±10%	3.00	500
9360-08	91189-8	22.0 ±10%	.30	1500
9360-09	91189-9	33.0 ±10%	.60	1100
9360-10	91189-10	47.0 ±10%	1.20	700
9360-11	91189-11	82.0 ±10%	2.20	600
9360-12	91189-12	100.0 ±10%	2.80	500
9360-13	91189-13	120.0 ±10%	4.00	400

ADJUSTABLE WIDE RANGE INDUCTORS

Due to the wide range of these coils they will find immediate application in many prototype designs where the exact value of the required inductance is not known.

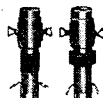


Dimensions: Max. dia. 7/8" x 2 1/4" long. Mtg. hole 5/16"

Miller Part Number	Inductance Minimum	Inductance Maximum	R Ohms Max.	Max. Current Ma.
9001	40. uh	.240 mh	2.04	250
9002	.180 mh	.800 mh	4.08	250
9003	.570 mh	2.80 mh	8.52	250
9004	2.10 mh	8.00 mh	15.4	250
9005	6.00 mh	16.0 mh	33.6	200
9006	12.0 mh	40.0 mh	91.2	125
9007	30.0 mh	105. mh	148.	75
9008	78.0 mh	240. mh	264.	75
9009	180. mh	750. mh	620.	50

ECONOMY ADJUSTABLE R.F. CHOKES

Through the use of a recently developed Nylon molding process we are able to offer an inexpensive line of adjustable chokes. These items feature a wide inductance range which has been achieved through the use of a threaded ferrite core. They can be adjusted from either the top or bottom. This lends a degree of flexibility to your design. Mounting is achieved by means of a metal clip in a 5/16" round hole or a special keyed hole. Instructions supplied with each coil.



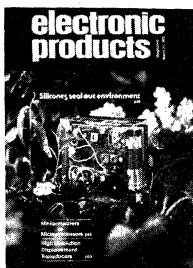
Dimensions:
3/8" x 1 1/8" long.

Miller Part Number	Inductance Minimum	Inductance Maximum	R Ohms Max.	Max. Current Ma.
4201	.300 uh	.580 uh	.04	636
4201-A	.550 uh	1.10 uh	.05	636
4202	1.00 uh	2.50 uh	.15	400
4203	2.00 uh	5.50 uh	.19	400
4204	5.00 uh	12.0 uh	1.1	126
4205	10.0 uh	25. uh	1.6	100
4206	20.0 uh	55. uh	2.3	100
4207	50.0 uh	140. uh	4.0	100
4208	120. uh	330. uh	6.6	100
4209	310. uh	860. uh	12.	100

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

**Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530**



electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.



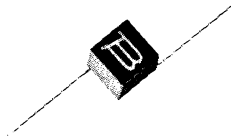
MAGNETICS DIVISION

MICROMINIATURE INDUCTORS

Standard Part Numbers — Stock Available

MODEL 4221 MICROINDUCTOR — .125" x .125" x .125"

Inductor P/N	Inductance* Hy(min) @ 1V, 1KHz	DCR Ω
4221-0001	0.5h	230
4221-0002	3.5h	2000
4221-0003	0.1h	53
4221-0004	1.0h	525



Standard Part Numbers — Stock Available

MODEL 4222 MICROINDUCTOR — .310" x .410" x .465"

ELECTRICAL

Inductance range 100μ Hy to 6 Hy
 Frequency 50 Hz to 50 KHz
 Voltage level 1 to 20 V
 DC current 0 to 20 ma
 DCR 10 to 5,000 ohms
 Q5 to 6.0
 Power dissipation 180 mw max for 40°C rise

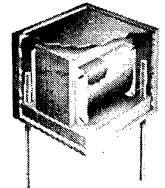


Inductor P/N	Inductance Hy(min) @ 300 Hz	Q-Min @ 1 V, 1 KHz	DCR Ω	DC ma
4222-0001	6 at 15 V	5.0	1200	2.0
4222-0002	3.5 at 5 V	4.0	1200	2.0
4222-0003	1.25 at 3 V	3.5	180	2.0
4222-0004	0.3 at 3 V	3.0	40	4.0
4222-0005	0.1 at 3 V	2.0	15	5.0

Standard Part Numbers — Stock Available

MODEL 4220 MICROINDUCTOR — .250" x .250" x .250"

Inductor P/N	Inductance Hy(min) @ 1 V, 1 KHz	Q-Min @ 1 V, 1 KHz	DCR Ω	DC ma*
4220-0001	.66	.75	2100	0
4220-0006	.2	.4	1495	2.0
4220-0007	.08	.5	25	4.0
4220-0008	.35	.35	1495	1.0
4220-0009	.60	.45	1495	.25
4220-0010	.1	.6	54	4.0
4220-0011	.1	.4	364	.25
4220-0012	.5	5.5	223	.75
4220-0013	50	.75	1495	0
4220-0014	.7	5.0	364	1.5
4220-0015	.2	5.0	38	1.5
4220-0016	4.5	3.5	1495	.75



Inductor P/N	Inductance Hy ±10% @ 1 V, 1 KHz, ODC	Q Min. @ 1 V, 1 KHz	DCR Ω ±20%	DC ma
4220-0030	.033	6.0	16	4.2
4220-0031	.047	6.0	24	3.4
4220-0032	.075	5.5	38	2.7
4220-0033	.120	5.5	64	2.1
4220-0034	.180	5.5	93	1.7
4220-0035	.300	5.0	155	1.3
4220-0036	.500	5.0	245	1.1
4220-0037	.750	5.0	385	.85
4220-0038	1.00	5.0	570	.75
4220-0039	2.00	4.5	980	.54
4220-0040	3.00	4.5	1550	.43
4220-0041	5.00	4.0	2480	.34
4220-0042	8.00	4.0	4010	.26

* With DC current applied — approximately — 10% drop in inductance occurs.



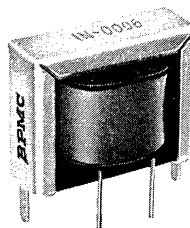
MAGNETICS DIVISION

INDUSTRIAL/COMMERCIAL INDUCTORS

Standard Part Numbers — Stock Available

IN-9000 SERIES / POWER INDUCTORS

Part No.	Inductance		DCR Ω	Dimensions
	MHY —10% ±40%	Ma DC		
IN-9025	3	1000	0.25	Fig. 1
IN-9026	8	350	0.2	1
IN-9027	11	1000	0.75	1
IN-9028	400	135	31	1
IN-9029	1500	20	85	1
IN-9030	2000	65	180	1
IN-9031	250	275	16	Fig. 2
IN-9032	700	135	40	2
IN-9033	2500	50	150	2
IN-9034	4500	50	325	2
IN-9035	7000	50	550	2
IN-9036	30	750	2	Fig. 3
IN-9037	15	750	3	3
IN-9038	125	550	6	3
IN-9039	400	275	22	3



Special Order Modifications Available

IN-9000 SERIES / DUAL MINIATURE INDUCTORS

- Can be Connected for Series or Parallel Operation

- Wide Inductance Range
- Miniature Size

Part No.	Inductance —10 ±40%				DCR Ω Typ Series Connected	Size
	Series Connection		Parallel Connection			
	HYS	DCMA	HYS	DCMA		
IN-9001	40	1	10	2	6700	Fig. 1
IN-9002	16	2	4	4	1100	1
IN-9003	8	4	2	8	600	1
IN-9004	3.6	4	.9	8	160	Fig. 2
IN-9005	1	20	.25	40	60	2
IN-9006	.6	40	.15	80	36	2
IN-9007	.4	60	.10	120	20	2
IN-9008	.06	80	.015	160	4	2

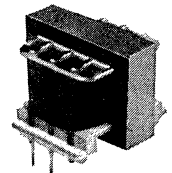
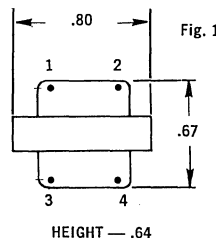
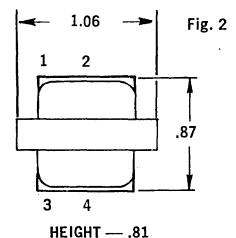


Fig. No.	L	W	H	Terminals	Mounting
1	1.47	.90	1.25	Pins	PC Tabs
2	1.74	1.10	1.39	Leads	Holes
3	1.98	1.48	1.65	Leads	Holes



HEIGHT — .64

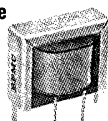


HEIGHT — .81

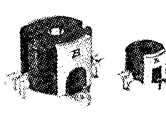
Toroidal Transformers & Inductors



Commercial/Industrial Filter Choke



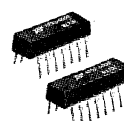
Ferrite Core Transformers & Inductors



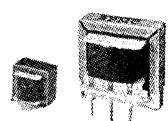
1/4" x 1/4" x 1/4" Micro Transformers & Inductors



Dual-In-Line Pulse Transformers



Transformers & Inductors Commercial/Industrial



MAGNETICS DIVISION

HIGH RELIABILITY • MIL SPEC • COMMERCIAL • INDUSTRIAL • MICRO AND STANDARD SIZE MAGNETIC COMPONENTS

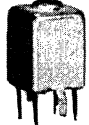
28151 HIGHWAY 74, ROMOLAND, CA. 92380 PHONE: 714 657-5195 TELEX: 67-6446

CADDELL-BURNS

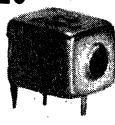
40 East 2nd Street, Mineola, N.Y. 11501 — Area Code 516 746-2310

MINIATURE SHIELDED VARIABLE INDUCTORS

TYPE 6319-6320



6319 6320
.420 Sq. x .575 L.

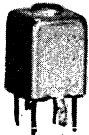


VERTICAL MOUNT

HORIZONTAL MOUNT

Electrical Specifications for Both Types are identical

Stock No.	Inductance Range Microhenries		Q'	Q''	Wire Size AWG
	Min.	Max.			
6320-1	.25	.65	90	50	26
6320-2	.5	1.2	87	68	30
6320-3	.9	2.3	90	63	32
6320-4	2.0	5.3	68	70	36
6320-5	4.4	10	56	102	7/44
6320-6	8	16	48	100	7/44
6320-7	13	29	70	97	7/44
6320-8	23	54	58	80	7/44
6320-9	45	95	60	70	7/44
6320-10	77	155	35	65	39
6320-11	125	290	41	60	39
6320-12	230	520	42	54	39
6320-13	420	860	41	47	39
6320-14	700	1200	39	52	39



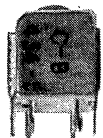
TYPE 435

Subminiature Variable Coil
Printed Circuit—Nylon Form

Shield .420 sq. x .575 h.

Stock No.	Inductance Range Microhenries		Q'	Q''	Wire Size AWG
	Min.	Max.			
435-1	0.25	0.5	90	60	26
435-2	0.48	1.0	85	60	30
435-3	0.9	2.1	85	60	32
435-4	1.7	3.9	55	65	36
435-5	3.5	8.5	60	50	38
435-6	7.5	17.0	60	50	38
435-7	16.5	35.0	55	60	7/44
435-8	33.0	70.0	50	50	7/44

Use #2102 Tuning Tool



TYPE 434

Miniature Variable Coil

Printed Circuit—Nylon Form—
Aluminum Shield .550 sq. x .580 h.

Stock No.	Inductance Range Microhenries		Q'	Q''	Wire Size AWG
	Min.	Max.			
434-1	0.55	0.9	105	95	28
434-2	0.9	1.45	100	80	30
434-3	1.4	2.4	70	85	32
434-4	2.2	4.1	70	90	36
434-5	3.9	7.7	65	70	36
434-6	7.5	11.0	45	85	7/44
434-7	11.0	17.5	65	90	7/44
434-8	17.5	27.5	65	90	7/44
434-9	27.0	42.0	65	85	7/44
434-10	42.0	64.0	65	85	7/44

Use #2102 Tuning Tool

LOW-COST PRINTED-CIRCUIT VARIABLE INDUCTORS



6460 6461 6462

TYPE 6460

Variable R.F. Inductors

Four Printed Circuit Terminals, Mounting—.5" x .8" Centers
Size 5/8" x 5/8" x .985 Long
Polyester Cellulose Coil Form

Stock No.	Inductance Range Microhenries		Q'	Q''	Nom. D.C. Res. Ohms	Wire Size AWG
	Min.	Max.				
6460-1	.06	.09	80	105	.008	22
6460-2	.09	.16	100	130	.010	22
6460-3	.15	.29	120	140	.011	22
6460-4	.19	.40	130	145	.012	22
6460-5	.32	.68	80	105	.08	20/44
6460-6	.60	1.35	80	125	.11	20/44
6460-7	1.14	2.5	90	135	.15	20/44
6460-8	2.0	4.0	100	140	.21	20/44
6460-9	3.1	5.6	110	120	.26	20/44
6460-10	4.5	8.1	48	85	.29	20/44
6460-11	7.0	11.4	43	150	.47	20/44
6460-12	9.7	16.4	80	140	.61	20/44
6460-13	15.6	26.2	90	155	.61	20/44
6460-14	19.2	44	80	110	1.80	7/44
6460-15	41	95	80	90	2.56	7/44
6460-16	70	183	65	100	3.24	7/44
6460-17	180	525	90	98	5.76	7/44
6460-18	445	1040	94	105	9.32	7/44

Note: Inductance & Q at various frequencies can be altered by changing type of core used (see parts section for cores available). Dash No. 1 thru 15 uses Powdered Iron Core 302—250—6R. Dash No. 16 thru 18 uses Ferrite Core 303—250—6R.

TYPE 6461

Variable R.F. Coil Series

Size 5/8" x 5/8" x .625 Long
0.5" P.C. Mounting

Stock No.	Inductance Range Microhenries		Q'	Q''	Nom. D.C. Res. Ohms	Wire Size AWG
	Min.	Max.				
6461-1	.09	.12	58	66	.007	22
6461-2	.1	.14	102	128	.009	22
6461-3	.14	.22	128	150	.01	22
6461-4	.18	.33	134	155	.011	22
6461-5	.23	.44	140	154	.013	22
6461-6	.37	.68	87	105	.102	7/41
6461-7	.58	1.1	87	100	.136	7/41
6461-8	1.1	2.2	72	115	.2	7/41
6461-9	2	4.4	80	112	.29	7/41
6461-10	3.3	8	96	140	.77	7/44
6461-11	7	13.6	70	130	1.02	7/44
6461-12	12.4	25.5	85	134	1.42	7/44
6461-13	22.5	49	90	127	1.93	7/44
6461-14	47	100	86	97	2.8	7/44
6461-15	99	174	75	142	4.2	7/44
6461-16	170	332	95	146	6.0	7/44
6461-17	322	570	102	140	8.5	7/44
6461-18	525	910	97	125	10.4	7/44

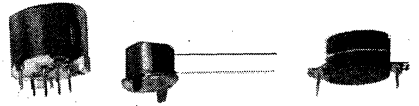
TYPE 6462

Variable R.F. Coil

with Powdered Iron Shield
Size 5/8" x 5/8" x .730 Long
0.5" P.C. Mounting

Stock No.	Inductance Range Microhenries		Q'	Q''	Nom. D.C. Res. Ohms	Wire Size AWG
	Min.	Max.				
6462-1	.08	.10	84	89	.007	22
6462-2	.4	.8	82	100	.11	7/41
6462-3	.6	1.3	85	105	.14	7/41
6462-4	1.1	2.6	71	115	.20	7/41
6462-5	2.1	5.1	85	145	.55	7/44
6462-6	3.4	8.6	96	145	.75	7/44
6462-7	8.0	16.9	70	150	1.14	7/44
6462-8	16.2	39.5	94	142	1.52	7/44
6462-9	34	84	86	110	2.21	7/44
6462-10	57	124	80	145	2.74	7/44
6462-11	67	141	80	148	3.16	7/44

FERRITE POT CORE INDUCTORS & TRANSFORMERS

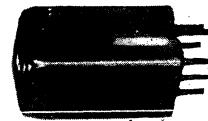


Caddell-Burns has complete facilities for winding and assembling all types of pot core assemblies, both fixed and variable. Write or telephone with your specifications.

TRANSFORMER DESIGN KIT

The C-B 6370 Multitran Assembly provides the engineer with a flexible approach to R.F. and I.F. transformer design. The 6370 assembly is available with a choice of shielding cups (powdered iron or ferrite) and tuning cores in a wide range of sizes and materials. Coils may be wound directly on the coil form; or type 6373 coils listed below, may be used. These coils are wound on slip-tubes and may be moved on the coil form permitting precise adjustment of coupling and bandwidth. Or the coils may be used singly for the design of tuned circuits, filters and traps. The parameters tabulated below are typical values for single coils mounted in the type 6370 assembly.

When an optimum design has been established, we will manufacture transformers, to specification, in any quantity.



TYPE 6370

.545 Sq. x 1.00 H.

TYPE 6373 COILS for C-B 6370 ASSEMBLY

Stock No.	Nom. Induct. Microhenries	Q ffl L Nom.	DCR Ohms
6373-1	.10	100	.007
6373-2	.25	110	.020
6373-3	.50	115	.032
6373-4	1.0	100	.060
6373-5	2.5	108	.240
6373-6	5.0	118	.310
6373-7	10	110	.919
6373-8	25	140	1.14
6373-9	50	135	1.45
6373-10	100	135	2.27
6373-11	250	145	3.70
6373-12	500	130	4.92
6373-13	1000	105	9.19
6373-14	2500	108	14.8
6373-15	5000	100	21.5
6373-16	10000	70	51.2

CONTINUED:

Stock No.	Inductance Range Min. Max.	Wire Size AWG
6373-1	.08 .14	22
6373-2	.22 .37	26
6373-3	.41 .73	26
6373-4	.37 1.25	30
6373-5	.90 3.30	10/44
6373-6	1.41 6.00	10/44
6373-7	4.20 17	7/44
6373-8	10 38	7/44
6373-9	14 60	7/44
6373-10	35 125	7/44
6373-11	96 330	7/44
6373-12	150 640	7/44
6373-13	215 1200	5/44
6373-14	610 3000	5/44
6373-15	1000 6000	5/44
6373-16	2450 12000	39

CADDELL-BURNS

40 East 2nd Street, Mineola, N.Y. 11501 — Area Code 516 746-2310

SHIELDED CHOKES

TYPES 6375, 6376



1 uH-5 mH • 10% Tolerance
.156 Dia. x .375 L

Stock No.	Induct. Microhenries	Q	SRF MHz	DCR Ohms	Wire Size AWG
6375-1	1	65	250	.005	34
6375-2	2.5	55	145	.008	34
6375-3	5	45	105	.012	34
6375-4	10	78	70	.042	39
6375-5	25	64	45	.066	39
6375-6	50	70	33	.125	40
6375-7	100	85	25	.284	40
6376-1	100	58	8	.530	36
6376-2	250	62	3.5	.800	36
6376-3	500	62	2.5	1.70	38
6376-4	1000	58	1.1	3.90	40
6376-5	2500	62	.700	6.30	40
6376-6	5000	55	.610	14.0	42



TYPE 1670

.25 mH-100 mH • 10% Tolerance
.250 Dia. x .500 L

Stock No.	Inductance Milli-henries	Min. Q	A.C. Test Volts	Max. D.C. Res. Ohms	Current Rating MA	Wire Size AWG
1670-1	.25	3.0	.007	.22	800	28
1670-2	.50	3.0	.014	.40	500	30
1670-3	1.0	3.0	.028	.75	315	32
1670-4	2.5	3.5	.07	2.2	250	33
1670-5	5.0	3.5	.14	3.9	200	34
1670-6	10.0	3.5	.15	7.0	125	36
1670-7	25.0	3.5	.30	18	125	36
1670-8	50.0	4.0	.40	35	75	38
1670-9	100.0	4.0	.24	60	50	40



TYPE 1662

5 mH - 1000 mH
10% Tolerance
.500 Dia. x .750 L

Stock No.	Inductance Milli-henries	Min. Q	A.C. Test Volts	Max. D.C. Res. Ohms	Current Rating MA	Wire Size AWG
1662-1	5.0	10.0	.14	.75	800	28
1662-2	10.0	10.0	.16	2.2	500	30
1662-3	25.0	10.0	.32	4.0	315	32
1662-4	50.0	10.0	.42	9.5	200	34
1662-5	100.0	10.0	.24	26	125	36
1662-6	250.0	10.0	.40	50	75	38
1662-7	500.0	10.0	.46	150	50	40
1662-8	1000.0	10.0	.25	220	30	42

ALL COILS ON THIS AND OPPOSITE PAGE ARE ALSO AVAILABLE:

- TO HIGHER, INTERMEDIATE, OR LOWER INDUCTANCES.
- ENCAPSULATED OR WITH SPECIAL COATINGS.



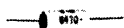
COIL WINDERS

IS NOW A DIVISION OF
CADDELL-BURNS MFG. CO.

LOW-RESISTANCE

CHOKES R.F. CHOKES

TYPE 6470



Ferrite Choke—10% Tolerance
Low D.C. Resistance
Size .230 Dia. x 1/2" Long

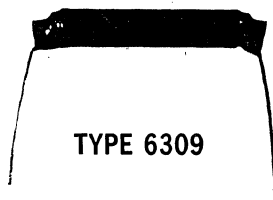
Stock No.	Inductance Microhenries	Nominal Q	Nominal D.C. Res. Ohms	Wire Size AWG
6470-1	4	14	.02	24
6470-2	6	12	.04	26
6470-3	8	12	.04	26
6470-4	10	30	.04	26
6470-5	15	27	.05	26
6470-6	20	26	.06	26
6470-7	25	27	.07	26
6470-8	50	23	.13	28
6470-9	75	18	.14	28
6470-10	100	27	.18	28
6470-11	250	34	.7	32
6470-12	500	20	.9	32
6470-13	750	15	1.2	32
6470-14	1000	67	2.4	34
6470-15	2500	35	4.0	34
6470-16	5000	47	9.2	37
6470-17	7500	28	10.8	37
6470-18	10000	19	12.2	37

TYPE 6310



Ferrite Choke—10% Tolerance
Low D.C. Resistance
Size 7/16" D. x 3/4" L

Stock No.	Nominal Inductance Microhenries	Nominal Q	Nominal D.C. Res. Ohms	Self Res. MHz	Current Rating Amps
6310-1	6.8	17	.013	30.0	5.0
6310-2	10	72	.021	21.0	3.2
6310-3	15	64	.028	16.7	3.2
6310-4	22	55	.032	11.0	3.2
6310-5	33	38	.039	6.6	3.2
6310-6	50	32	.065	5.2	2.0
6310-7	75	20	.072	3.7	2.0
6310-8	100	58	.103	2.8	2.0
6310-9	250	28	.228	1.7	1.3
6310-10	500	28	.485	1.45	.8
6310-11	750	22	.576	0.76	0.8
6310-12	1000	32	.944	0.51	0.6



TYPE 6309

Hi-Current Ferrite Choke Series
Inductance Tolerance 10% (L)

Stock No.	Inductance uH	Cur. Rating Amps.	DC. Res. Ohms	Nom. Length	Nom. O.D.
6309-1	13	52	.005	2.3	.58
6309-2	18	33	.007	2.3	.54
6309-3	31	20	.012	2.3	.50
6309-4	46	13	.019	2.3	.48
6309-5	79	8	.036	2.3	.46
6309-6	34	52	.008	3.7	.58
6309-7	53	33	.012	3.7	.54
6309-8	80	20	.019	3.7	.50
6309-9	120	13	.031	3.7	.48
6309-10	199	8	.058	3.7	.46
6309-11	64	52	.010	5.3	.58
6309-12	106	33	.014	5.3	.54
6309-13	146	20	.024	5.3	.50
6309-14	225	13	.042	5.3	.48
6309-15	410	8	.083	5.3	.46

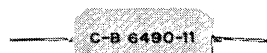
HIGH-CURRENT CHOKES



TYPE 6150

HIGH CURRENT, VINYL JACKETED CHOKE
.375 Dia. x 1.00 L
FERRITE FORM
10 uH - 100 uH • 10% Tolerance

Stock No.	Inductance Microhenries	Max. D.C. Res. Ohms	Current Rating Amps	Min. Q	Wire Size AWG
6150-1	10.0	0.020	10.0	32	18
6150-2	20.0	0.035	6.0	25	20
6150-3	30.0	0.060	4.0	28	22
6150-4	40.0	0.105	2.5	30	24
6150-5	50.0	0.110	2.5	20	24
6150-6	75.0	0.180	1.5	25	26
6150-7	100.0	0.360	1.0	30	28



TYPE 6490

High Current Choke, Vinyl Covered
Ferrite Form .437 Dia. x 1.25 L
10 uH - 1000 uH • 10% Tolerance

Stock No.	Inductance Microhenries at 1 kHz	Max. D.C. Res. Ohms	Current Rating Amps
6490-1	10	.008	20
6490-2	20	.015	13
6490-3	30	.027	8
6490-4	40	.042	5
6490-5	50	.065	4
6490-6	75	.12	2.5
6490-7	100	.05	8
6490-8	250	.12	5
6490-9	500	.26	3.2
6490-10	750	.48	2
6490-11	1000	.70	1.6



TYPE 6400

Hi-Current Chokes
Low D.C. Resistance
Vinyl Jacket
Ferrite Form 1/2" O.D. x 2 3/4" Long
#16 Leads 1 1/2" Long
10% Tolerance

Stock No.	Inductance Milli-henries*	Rating Amps+	Approx. D.C. Res.	Wire Size
6400-1	.08	13	.03	16
6400-2	.13	8	.06	18
6400-3	.22	5	.12	20
6400-4	.35	3.2	.23	22
6400-5	.56	2	.42	24
6400-6	.78	1.3	.8	26
6400-7	1.4	.8	1.7	28
6400-8	2	.5	3.2	30

*Chokes can be made to any intermediate inductance.
+Current ratings are conservative.

SEND FOR CATALOG
AND PRICE LIST

CADDELL - BURNS

40 East 2nd Street, Mineola, N.Y. 11501 — Area Code 516 746-2310

MINIATURE CHOKES

TYPE 660

Miniature Choke, Single Layer—10% Tol.
Phenolic Form .095" D. x 5/16" L.

Stock No.	Inductance Microhenries	Q	Self Res. M.C.	DC Res. Ohms	Wire Size AWG
660-1	0.1	65	...	.03	26
660-2	0.2	60	...	.03	28
660-3	0.3	55	...	.06	30
660-4	0.4	55	> 400	.06	30
660-5	0.5	55	360	.13	32
660-6	0.75	50	300	.22	34
660-7	1.0	30	260	.37	36
660-8	1.5	30	210	.72	38
660-9	2.0	30	180	.95	38

TYPE 620

Microminiature Ferrite Chokes—10% Tol.
Form Size .075" D x 11/32" D. L.

Stock No.	Inductance Microhenries	Q	Self Res. M.C.	DC Res. Ohms	Wire Size AWG
620-1	1	40	235	.12	36
620-2	2.5	40	150	.19	36
620-3	5	40	100	.26	36
620-4	7.5	40	90	.33	36
620-5	10	45	75	.38	36
620-6	15	60	60	.66	38
620-7	20	55	53	.80	38
620-8	25	50	49	.93	38
620-9	50	90	34	2.85	42
620-10	75	90	28	5.80	44
620-11	100	90	23	7.50	44

TYPE 659

Sub-Miniature Ferrite Chokes—10% Tol.
Form Size .107" D. x .330" L.

Stock No.	Inductance Microhenries	Q	Self Res. M.C.	DC Res. Ohms	Wire Size AWG
659-1	250	50	3	1.8	36
659-2	500	45	2	3.5	38
659-3	1000	60	...	10	40
659-4	2500	55	...	30	42
659-5	5000	50	...	40	44
659-6	10000	45	...	68	44



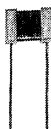
COIL

IS NOW A DIVISION OF
CADDELL-BURNS MFG. CO.

SEND FOR CATALOG AND PRICE LIST

PRINTED CIRCUIT CHOKES

P.C. CHOKES TYPE 6550



P.C. Choke—10% Tolerance
FERRITE FORM
300 Mounting Centers
.100 Wide x .375 L. x .250 H.

Stock No.	Induct. Microhenries	Q	SRF MHz	DCR Ohms
6550-1	1.0	100	215	.02
6550-2	2.5	70	135	.03
6550-3	5.0	75	115	.06
6550-4	7.5	80	87	.10
6550-5	10	90	82	.17
6550-6	25	100	42	.50
6550-7	50	90	14	1.0
6550-8	75	75	8.5	1.1
6550-9	100	100	4.6	1.4
6550-10	250	90	2.7	2.3
6550-11	500	65	1.9	3.3
6550-12	750	40	1.6	4.2
6550-13	1000	100	1.6	16
6550-14	2500	100	1.0	16
6550-15	5000	70	0.6	28
6550-16	7500	50	0.4	42
6550-17	10000	60	0.4	60

TYPE 6180

Encapsulated P.C. Chokes—10% Tol.
1/4" D. x 3/8" L. 0.1" Terminal Spacing

Stock No.	Inductance Millihenries	Min. Q (at 1 KHz)	D.C. Res. Ohms	Wire Size AWG
6180-1	.10	1.0	.5	32
6180-2	.25	1.0	1.3	34
6180-3	.50	1.0	2.8	36
6180-4	1.0	1.0	5.0	37
6180-5	2.5	1.0	13	39
6180-6	5.0	1.0	25	40
6180-7	10.0	1.0	56	42
6180-8	25.0	1.0	130	44
6180-9	50.0	1.0	250	45

TYPE 680

One End Chokes—5% Tol.
Phenolic Coil Form Size .218" D. x 1/2" L. Particularly adapted for close point to point and printed circuit wiring.

Stock No.	Inductance Microhenries	Q	Self Res. M.C.	DC Res. Ohms	Wire Size AWG
680-1	1.0	65	140	.06	26
680-2	2.5	70	85	.22	30
680-3	5.0	70	70	.70	34
680-4	7.5	70	50	.95	34
680-5	10	45	47	1.6	36
680-6	10	30	25	1.3	36
680-7	15	30	21	1.5	36
680-8	25	25	17	2.1	36
680-9	50	25	12	3.0	36
680-10	100	35	9	4.5	36
680-11	250	30	6	7.5	36
680-12	500	30	4.4	11.0	36
680-13	750	30	3.6	14.0	36
680-14	1000	40	2.2	17.0	36
680-15	2500	40	1.5	28.0	36

UNIVERSAL-WOUND CHOKES

TYPE 30

0.8 Ampere R.F. Choke—5% Tolerance
Molded Phenolic Form Size .250 D. x 1/2 L.

Stock No.	Nom. Inductance Microhenries	Q at 1 KHz	Nom. D.C. Res. Ohms	Self Res. MHz	Nom. O.D.
30-1	25	0.36	0.44	14.2	0.47
30-2	50	0.47	0.63	10.7	0.52
30-3	75	0.58	0.80	9.0	0.58
30-4	100	0.62	0.98	7.7	0.60
30-5	200	0.88	1.44	5.7	0.68
30-6	300	1.05	1.80	4.7	0.75
30-7	400	1.20	2.16	4.2	0.80
30-8	500	1.25	2.48	3.7	0.85

TYPE 40

0.8 Ampere R.F. Choke—5% Tolerance
Molded Powdered Iron Form Size .250 D. x 7/8 L.

Stock No.	Nom. Inductance Microhenries	Nom. Q	Nom. D.C. Res. Ohms	Self Res. MHz	Nom. O.D.
40-1	50	85	0.37	11.5	.38
40-2	100	56	0.55	7.5	.40
40-3	200	47	0.85	5.3	.46
40-4	300	42	1.06	4.5	.48
40-5	400	38	1.27	4.0	.51
40-6	500	36	1.47	3.6	.54
40-7	750	30	1.90	2.9	.58
40-8	1000	35	2.34	2.6	.64
40-9	1500	32	3.09	2.2	.70
40-10	2000	30	3.77	1.9	.77

TYPE 50

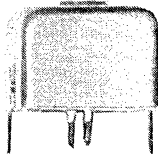
0.8 Ampere R.F. Choke—5% Tolerance
Ferrite Form Size .250 D. x 7/8 L.

Stock No.	Nom. Inductance Millihenries	Nom. Q	Nom. D.C. Res. Ohms	Self Res. MHz	Nom. O.D.
50-1	0.1	45	0.35	5.7	.38
50-2	0.25	35	0.58	3.7	.41
50-3	0.5	28	0.87	2.7	.45
50-4	0.75	23	1.13	2.2	.50
50-5	1.0	32	1.42	1.9	.54
50-6	1.5	28	1.87	1.6	.61
50-7	2.0	20	2.30	1.3	.64
50-8	2.5	25	2.67	1.2	.68
50-9	3.0	25	3.05	1.1	.70
50-10	4.0	25	3.74	1.0	.78

CADDELL - BURNS

40 East 2nd Street, Mineola, N.Y. 11501 — Area Code 516 746-2310

NEW!



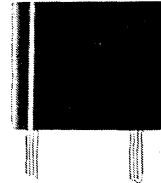
TYPE 6610

LOW-PROFILE LOW-RESISTANCE VARIABLE INDUCTORS

.790 Sq. x .625 H.
84 uH - 870 MH
10% Tolerance

Stock Number	Lmax.	Lmin.	DCR (Ohms)	Wire Size (AWG)	Current Rating (Amperes)
6610-1	84.0 uH	37.0 uH	0.10	22	4.0
6610-2	129	60.0	0.14	23	3.3
6610-3	168	78.0	0.20	24	2.5
6610-4	370	173	0.38	25	2.0
6610-5	600	275	0.60	26	1.5
6610-6	1.02 MH	470	1.02	27	1.1
6610-7	1.58	780	1.60	28	.800
6610-8	2.50	1.16 MH	2.80	29	.650
6610-9	3.60	1.68	3.75	30	.500
6610-10	5.00	2.30	5.40	31	.420
6610-11	8.30	3.80	8.80	32	.315
6610-12	11.8	5.60	13.6	33	.260
6610-13	19.5	8.30	21.4	34	.200
6610-14	27.0	12.0	31.0	35	.165
6610-15	35.0	16.0	47.0	36	.125
6610-16	72.0	35.0	80.0	37	.100
6610-17	117	54.0	125	38	.075
6610-18	210	95.0	230	39	.065
6610-19	375	162	410	40	.050
6610-20	580	275	620	41	.040
6610-21	870	400	90	42	.030

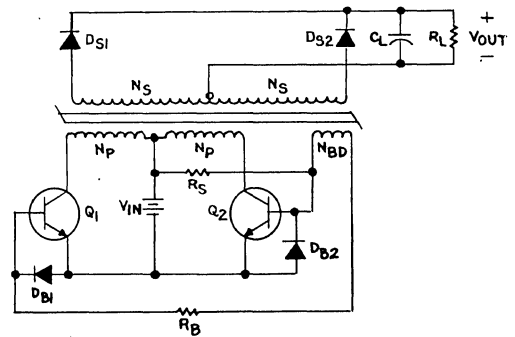
NEW!



TYPE 6600

DC-DC CONVERTER TRANSFORMERS

EPOXY ENCAPSULATED
.720 W. x .860 L. x .760 H.



$Q_1, Q_2 = \text{GE-D44C5}$

$D_{B1}, D_{B2} = \text{GE-DT230F}$

$D_{S1}, D_{S2} = \text{GE-A114D}$

$R_B = 18 \Omega$

$R_S = 820 \Omega$

$C_L = .039 \mu\text{f}$

$V_{IN} = 6 \text{ VOLTS}$

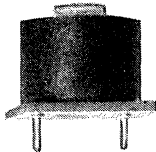
$V_{OUT} = 225 \text{ VOLTS}$

$P_{OUT} = 12 \text{ WATTS NOMINAL}$

$f = 55 \text{ KHz}$

OTHER VOLTAGES AVAILABLE—SEND FOR DATA SHEET WITH SUGGESTED CIRCUIT DIAGRAMS AND PERFORMANCE CURVES.

NEW!



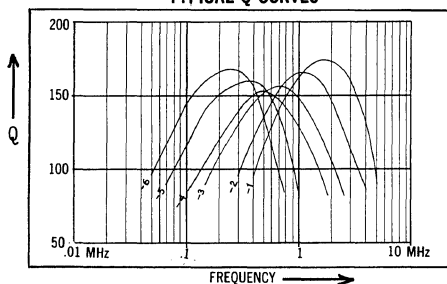
TYPE 6620

LOW-PROFILE HIGH-Q VARIABLE INDUCTORS

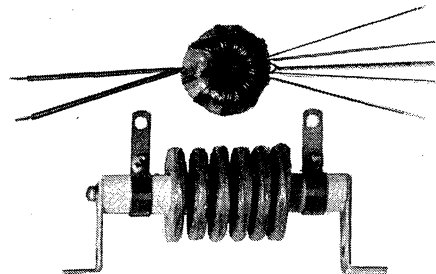
.730 Sq. x .625 H. 10 uH - 500 uH Variable $\pm 15\%$ Min.

Stock Number	Nominal Inductance (uH)	DCR (Ohms)	Current Rating (Amperes)
6620-1	10	0.15	0.60
6620-2	25	0.26	0.60
6620-3	50	0.35	0.60
6620-4	100	0.54	0.60
6620-5	250	0.90	0.60
6620-6	500	1.24	0.60

TYPICAL Q CURVES



CUSTOM WINDING



Caddell-Burns offers 29 years of experience in the design and manufacture of all types of coils, with complete facilities for custom winding to customer specification. Send us your requirements for a prompt quote.

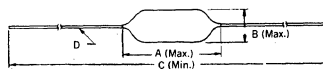
MODIFIED STOCK COILS

Any of the coils shown on these pages can be wound to intermediate inductance values, or modified to meet customer requirements, often at no additional cost.

DEPENDABLE**DALE****INDUCTORS****TYPE IR-2 and IR-4 EPOXY CONFORMAL COATED INDUCTORS**

- Models for precision and commercial applications
- Combines durability and low cost ■ Flame retardant coating

Standard Tolerance: $\pm 1\%$, $\pm 3\%$, $\pm 5\%$, $\pm 10\%$. Inductance Range: .10 μ H to 1000 μ H. 49 standard values. Q, self-resonant frequency, DC resistance, rated current and core material as specified for IM models below.

**DIMENSIONS**

MODEL NO.	A	B	C	D
IR-2	.350"	.135"	2.955"	24 AWG
IR-4	.450"	.200"	2.985"	22 AWG

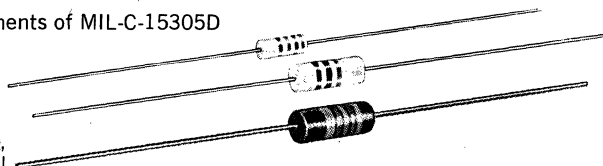
TYPE IM MOLDED INDUCTORS TYPE IMS MOLDED SHIELDED INDUCTORS

- Meets electrical, material, mechanical and environmental requirements of MIL-C-15305D
- Features precision performance, reliability
- Wide range of inductance values in a small package
- Flame retardant molded coating

Standard values IM-2 (49) and IM-4 (47). Tolerance, Q, test frequency L & Q, self-resonant frequency, DC resistance, DC current rating and core material per standards shown in the Inductance Range and Mil Standard Chart below.

INDUCTANCE RANGE

MODEL NO.	INDUCTANCE RANGE		CLASSIFICATION		MILITARY STANDARD
	FROM	TO	GRADE	CLASS	
IM-2	.10 μ H	1.00 μ H	1	B	MS-75083
	1.2 μ H	27. μ H	1	A	MS-75084
	33. μ H	1000. μ H	1	A	MS-75085
IM-4	.15 μ H	4.7 μ H	1	B	MS-18130
	5.6 μ H	33. μ H	1	A	MS-14046
	36. μ H	240. μ H	1	A	MS-90538
IMS-5	.10 μ H	.82 μ H	1	A	MS-75087
	1.0 μ H	12.0 μ H	1	A	MS-75088
	15.0 μ H	100,000 μ H	1	A	MS-75089

**DIMENSIONS**

MODEL NO.		A	B	C	D
IM-2	MAX.	.105	.260	1.626	.0215
	MIN.	.085	.240	1.250	.0185
IM-4	MAX.	.165	.385	1.626	.027
	MIN.	.145	.365	1.250	.023
IMS-5	MAX.	.172	.430	1.626	.027
	MIN.	.152	.390	1.250	.023

FILTER INDUCTORS (Toroidal) Type TE and TD

Choice of encapsulated (TE) or dipped (TD) styles. TE models are designed to meet MIL-T-27C, Type TF5SX20ZZ. TD models combine low cost with high performance in commercial applications. High Q and wide selection of Q vs frequency ranges, plus a large number of inductance values.

SPECIFICATIONS

DALE TYPE TE or TD	INDUCTANCE	STANDARD TOLERANCE
2Q0	50.0 μ H to 10.0 mH	$\pm 1\% > 2$ mH $\pm 2\% 0.05$ mH to 2.0 mH
2Q3	470 μ H to 120 mH	
2Q4	1.00 mH to 250 mH	
3Q0	50.0 μ H to 15 mH	$\pm 1\% > 2$ mH $\pm 2\% 154$ μ H to 2 mH $\pm 5\% < 150$ μ H
3Q3	500 μ H to 1 h	
3Q4	1 mH to 4 h	
4Q0	150 μ H to 20 mH	$\pm 1\% > 2$ mH $\pm 2\% < 2$ mH
4Q3	1 mH to 2 h	
4Q4	2 mH to 7.5 h	
5Q0	1 mH to 100 mH	$\pm 1\% > 2$ mH $\pm 2\% < 2$ mH
5Q3	5 mH to 2 h	
5Q4	10 mH to 20 h	

DIMENSIONS

TE-2 = .437" O.D. x .270" H., .300" terminal spacing
TD-2 = .437" O.D. x .25" H., 2" flexible leads
TE-3 = .685" O.D. x .385" H., .500" terminal spacing
TD-3 = .685" O.D. x .32" H., 3" flexible leads
TE-4 = 1.062" O.D. x .500" H., .900" terminal spacing
TD-4 = 1.062" O.D. x .437" H., 4" flexible leads
TE-5 = 1.32" O.D. x .725" H., 1" terminal spacing
TD-5 = 1.32" O.D. x .688" H., 6" flexible leads

TEMPERATURE COEFFICIENT CODE (APPLIES TO CORE ONLY)

T.C. CODE	TEMPERATURE COEFFICIENT	TEMPERATURE RANGE	TYPE	T.C. AVAILABILITY		
				Q0	Q3	Q4
TA	0 $\pm$ 1%	-55°C to +125°C	All		X	X
TB	0 $\pm$ 0.1%	+13°C to +35°C	TE-4 & 5		X	X
TD	0 $\pm$ 0.1%	0°C to +55°C	All		X	X
TE	0 $\pm$ 0.15%	0°C to +55°C	TE-4 & 5			X
TL*	+40 to +110 PPM/°C +85 to +185 PPM/°C	-55°C to +25°C +25°C to +85°C	TE-3, 4 and 5			X
TM	0 $\pm$ 0.25%	-65°C to +125°C	All		X	X
TR	50 PPM/°C (Typical)	-65°C to +125°C	All	X		
TW	0 $\pm$ 0.25%	-55°C to +85°C	All		X	X

Within the inductance ranges shown above, Dale offers a wide choice of standard values each of which is within one percent of the preceding and succeeding values.

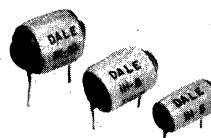
*Inverse of typical temperature coefficient of polystyrene capacitor.

HIGH CURRENT FILTER CHOKES Type IH

- Pre-tinned leads for printed circuit mounting ■ Flame retardant coating
- Meet a wide range of noise filtering needs.

SPECIFICATIONS

MODEL	I (Max.)	L @ 1 KHz	DC RESISTANCE (Max.)	SERIES RESONANT FREQUENCY (Min.)	WIDTH	DIA.	PIN SPACING	PIN SIZE
IH5-10	5 Amps	10 μ H $\pm 10\%$	.015 Ω	20 MHz	1-3/16 Max.	11/16 Max.	1 $\pm 1/16$	#16 AWG
IH5-100	5 Amps	100 μ H $\pm 10\%$	.050 Ω	2.5 MHz	1-3/8 Max.	7/8 Max.	1 $\pm 1/16$	#16 AWG
IH10-50	10 Amps	50 μ H $\pm 10\%$	.025 Ω	4.0 MHz	1-3/8 Max.	1 Max.	1 $\pm 1/16$	#14 AWG



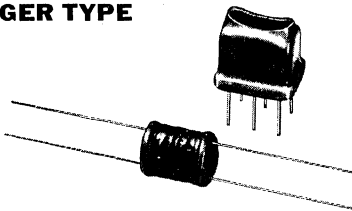
DEPENDABLE

DALE

TRANSFORMERS

TYPE PT10 and PT20 PULSE TRANSFORMERS—TRIGGER TYPE

- Designed for low cost trigger source isolation in half and full wave SCR power control circuits including motor speed controls, heater controls and incandescent lighting controls
- Choice of printed circuit or bobbin-type configurations
- Designed to transfer high amplitude or long duration pulses without saturation.



TRANSFORMER SPECIFICATIONS

Electrical

Primary Inductance Values: 200 μ h to 5000 μ h

Turns Ratio: 1:1, 1:1:1, 2:1, 2:1:1 and 5:1

Temperature Range: -10°C to +70°C

Dielectric Test @ 60 Hz: 1600 Volts RMS

AC Line Voltage @ 60 Hz: 240 Volts RMS Max.

Material

Bobbin: Nylon

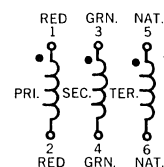
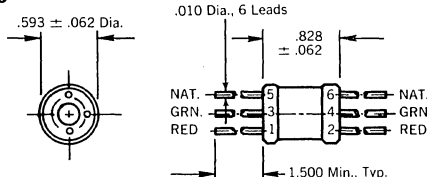
Leads: Tinned, solderable. PT10 = Polyurethane insulated magnet wire for clip or bracket mounting. PT20 = Tinned copper #20 AWG for printed circuit mounting.

Covering: Thermoplastic

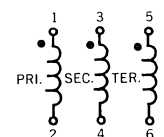
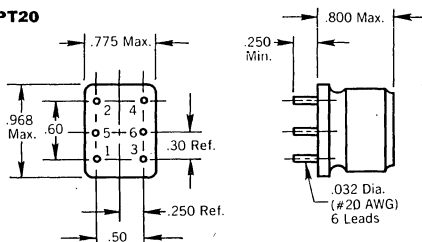
Header: Thermoset Plastic

Also available in standard models with 4 pins or leads for applications where only primary and secondary windings are required.

PT10



PT20



DC-DC CONVERTER TRANSFORMERS

TYPE ITC

- Designed especially for low power applications
- Uses include power supplies for battery-operated portable instruments, operational amplifiers, and gas discharge displays
- P.C. mounting ■ Available in open or encapsulated styles
- Easily custom-designed for specific applications.



ELECTRICAL DESIGN RANGE

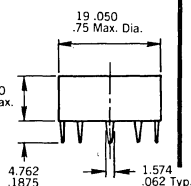
Input Voltages: 1.5-30 volts DC

Output Voltages: Up to 200 volts DC from rectifier

Power: Up to 3 watts

Operating Frequency: 10-20KHz typical design

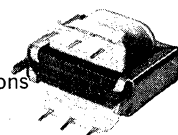
Power Efficiency: 50 to 80%, depending on design, power and voltage levels.



POWER TRANSFORMER

TYPE PL

- Control equipment and instrument applications
- Voltage step up or step down
- Provides isolation from power line
- P. C. Plug-in mounting design ■ Laminated construction
- Designed to meet U.L. requirements
- 8-pin dual primary model also available



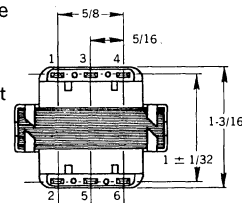
ELECTRICAL

Primary Voltage: 115 volts RMS 60 Hz

Available Output Voltages: 4 volts to 230 volts at 1.2 watts

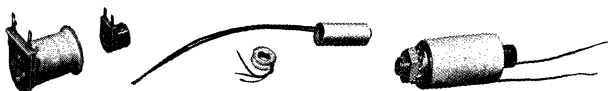
Dielectric Strength: 1250 volts 60 Hz primary-secondary core

Temperature Rise: 25°C maximum at rated load



CUSTOM BOBBIN COILS

- Statistical control on high volume production items
- Low initial tooling cost



CUSTOM TOROIDS

- Potted with case sizes to fit your specific designs
- Open wound using Dale-formulated coatings for extra protection
- Hermetically-sealed cans
- Pulse transformers, inverters, RF inductors and transformers with or without terminal boards. Unusual shapes and sizes a specialty.



DALE ELECTRONICS, INC., P.O. BOX 180, YANKTON, SOUTH DAKOTA 57078 PHONE 605-665-9301

A subsidiary of The Lionel Corporation



MOLDED RF

coils and inductive components

DELEVAN PARTS WILL MEET ALL REQUIREMENTS OF MIL-C-15305

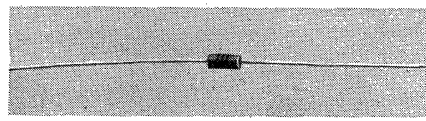
From Delevan's inception its product philosophy called for an extremely high degree of precision manufacturing to meet exacting performance levels required by quality-minded manufacturers of electronic systems. Delevan's engineering paces new product development in the coil industry, and its products are continually monitored by environmental testing to maintain consistently high standards.

With today's problems of miniaturization; hybrid circuits; and reliability,

both functional and process-wise, Delevan becomes even more prominent in the inductor and component industry. Our philosophies have not changed. Check with us for any inductive requirement—from chip inductors for hybrids to miniature axial leaded, shielded or non-shielded units for both Hi-Reliability or Commercial application. Our expanded environmental and x-ray capabilities guarantee performance.

SERIES 0819

MILITARY SPECIFICATIONS:
MIL-C-15305 (LT4K & LT10K)



PHYSICAL PARAMETERS —

Length: .200±.010
Diameter: .078±.008
Lead Size: AWG #26 TCW.
Lead Length: 1.5±.12

CURRENT RATING at 90°C AMB. —

LT4K: 35°C Rise.
LT10K: 15°C Rise.

OPERATING TEMPERATURE —

LT4K: -55°C to +125°C.
LT10K: -55°C to +105°C.

POWER DISSIPATION at 90°C —

LT4K: .145 Watts.
LT10K: .062 Watts.

WEIGHT IN GRAMS —

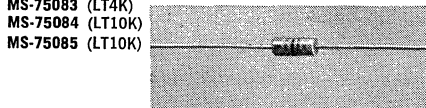
LT4K: .19 Max.
LT10K: .22 Max.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
CORE MATERIAL: PHENOLIC (LT4K)						
0819-00	.10±10%	35	25	680	.12	935
0819-02	.12±10%	35	25	650	.14	865
0819-04	.15±10%	35	25	560	.15	835
0819-06	.18±10%	35	25	540	.18	760
0819-08	.22±10%	30	25	500	.22	690
0819-10	.27±10%	30	25	440	.36	540
0819-12	.33±10%	25	25	410	.42	500
0819-14	.39±10%	25	25	380	.48	465
0819-16	.47±10%	25	25	340	.57	430
CORE MATERIAL: IRON (LT10K)						
0819-18	.56±10%	40	25	250	.15	560
0819-20	.68±10%	40	25	215	.16	545
0819-22	.82±10%	40	25	200	.18	515
0819-24	1.0±10%	40	25	190	.22	465
0819-26	1.2±10%	35	7.9	170	.25	435
0819-28	1.5±10%	40	7.9	150	.44	330
0819-30	1.8±10%	40	7.9	135	.48	315
0819-32	2.2±10%	45	7.9	130	.66	268
0819-34	2.7±10%	45	7.9	110	.78	247
0819-36	3.3±10%	45	7.9	100	1.1	208
0819-38	3.9±10%	50	7.9	95	1.2	198
0819-40	4.7±10%	55	7.9	88	1.9	158
0819-42	5.6±10%	55	7.9	78	2.5	138
0819-44	6.8±10%	55	7.9	69	2.9	128
0819-46	8.2±10%	55	7.9	62	4.0	109

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
CORE MATERIAL: IRON (LT10K) (Cont'd)						
0819-48	10±10%	55	7.9	58	4.6	102
0819-50	12±10%	40	2.5	31	3.0	126
0819-52	15±10%	40	2.5	26	3.4	118
0819-54	18±10%	40	2.5	23	3.8	112
0819-56	22±10%	45	2.5	20	4.1	108
0819-58	27±10%	45	2.5	17	4.5	103
0819-60	33±10%	45	2.5	15	5.0	97
0819-62	39±10%	45	2.5	13.5	6.8	83.5
0819-64	47±10%	45	2.5	12.5	7.4	80
0819-66	56±10%	45	2.5	11.5	10.0	69
0819-68	68±10%	45	2.5	10.5	11.5	64
0819-70	82±10%	45	2.5	10.0	16.0	54.5
0819-72	100±10%	45	2.5	9.5	17.5	52
CORE MATERIAL: FERRITE (LT10K)						
0819-74	120±10%	35	.79	8.9	16.0	54.5
0819-76	150±10%	35	.79	7.9	17.5	52
0819-78	180±10%	35	.79	7.5	19.0	50
0819-80	220±10%	35	.79	7.1	26.5	42.5
0819-82	270±10%	35	.79	6.6	28.5	41
0819-84	330±10%	35	.79	6.2	40.5	34
0819-86	390±10%	35	.79	5.9	43.0	33
0819-88	470±10%	35	.79	5.4	48.0	31.5
0819-90	560±10%	35	.79	5.0	60.0	28
0819-92	680±10%	35	.79	4.5	66.0	27
0819-94	820±10%	35	.79	3.9	72.0	25.5
0819-96	1000±10%	35	.79	3.3	79.0	24.5

SERIES 1025

MILITARY SPECIFICATIONS:
MS-75083 (LT4K)
MS-75084 (LT10K)
MS-75085 (LT10K)



PHYSICAL PARAMETERS —

Length: .250±.010
Diameter: .095±.010
Lead Size: AWG #24 TCW.
Lead Length: 1.5±.12

CURRENT RATING at 90°C AMB. —

LT4K: 35°C Rise.
LT10K: 15°C Rise.

OPERATING TEMPERATURE —

LT4K: -55°C to +125°C.
LT10K: -55°C to +105°C.

POWER DISSIPATION at 90°C —

LT4K: .21 Watts.
LT10K: .09 Watts.

WEIGHT IN GRAMS: .03 Max.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
CORE MATERIAL: PHENOLIC (LT4K)						
1025-94	.10±10%	40	25.0	680	.08	1380
1025-96	.12±10%	40	25.0	640	.09	1300
1025-00	.15±10%	38	25.0	600	.10	1230
1025-02	.18±10%	35	25.0	550	.12	1120
1025-04	.22±10%	33	25.0	510	.14	1040
1025-06	.27±10%	33	25.0	430	.16	975
1025-08	.33±10%	30	25.0	410	.22	830
1025-10	.39±10%	30	25.0	365	.30	710
1025-12	.47±10%	30	25.0	330	.35	660
1025-14	.56±10%	30	25.0	300	.50	550
1025-16	.68±10%	28	25.0	275	.60	500
1025-18	.82±10%	28	25.0	250	.85	420
1025-20	1.00±10%	25	25.0	230	1.00	390
CORE MATERIAL: IRON (LT10K)						
1025-22	1.20±10%	25	7.9	150	.18	620
1025-24	1.50±10%	28	7.9	140	.22	560
1025-26	1.80±10%	30	7.9	125	.30	480
1025-28	2.20±10%	30	7.9	115	.40	415
1025-30	2.70±10%	37	7.9	100	.55	355
1025-32	3.30±10%	45	7.9	90	.85	285
1025-34	3.90±10%	45	7.9	80	1.00	263
1025-36	4.70±10%	45	7.9	75	1.20	239
1025-38	5.60±10%	50	7.9	65	1.80	195
1025-40	6.80±10%	50	7.9	60	2.00	185
1025-42	8.20±10%	55	7.9	55	2.70	160

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
CORE MATERIAL: IRON (LT10K) (Cont'd)						
1025-44	10.0±10%	55	7.9	50	3.30	144
1025-46	12.0±10%	45	2.5	40	2.70	160
1025-48	15.0±10%	45	2.5	35	2.80	157
1025-50	18.0±10%	50	2.5	30	3.10	149
1025-52	22.0±10%	50	2.5	25	3.30	144
1025-54	27.0±10%	50	2.5	20	3.50	140
CORE MATERIAL: FERRITE (LT10K)						
1025-56	33.0±10%	45	2.5	24	3.40	142
1025-58	39.0±10%	45	2.5	22	3.60	138
1025-60	47.0±10%	45	2.5	20	4.50	124
1025-62	56.0±10%	45	2.5	18	5.70	110
1025-64	68.0±10%	50	2.5	15	6.70	102
1025-66	82.0±10%	50	2.5	14	7.30	97
1025-68	100.0±10%	50	2.5	13	8.00	93
1025-70	120.0±10%	30	.79	12	13.00	73
1025-72	150.0±10%	30	.79	11	15.00	68
1025-74	180.0±10%	30	.79	10	17.00	63
1025-76	220.0±10%	30	.79	9	21.00	57
1025-78	270.0±10%	30	.79	8	25.00	53
1025-80	330.0±10%	30	.79	7	28.00	50
1025-82	390.0±10%	30	.79	6.5	35.00	45
1025-84	470.0±10%	30	.79	6	42.00	40
1025-86	560.0±10%	30	.79	5	46.00	39
1025-88	680.0±10%	30	.79	4.2	60.00	34
1025-90	820.0±10%	30	.79	3.8	65.00	33
1025-92	1000.0±10%	30	.79	3.4	72.00	32



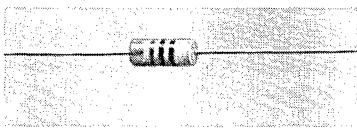
MOLDED RF

coils and inductive components

SERIES 1537

MILITARY SPECIFICATIONS:

MS-14046 (LT10K)
MS-18130 (LT4K)
MS-90538 (LT10K)



PHYSICAL PARAMETERS —

Length: .375±.010
Diameter: .155±.010
Lead Size: AWG #22 TCW.
Lead Length: 1.44±.12

CURRENT RATING at 90°C AMB. —

LT4K: 35°C Rise.
LT10K: 15°C Rise.

OPERATING TEMPERATURE —

LT4K: -55°C to +125°C.
LT10K: -55°C to +105°C.

POWER DISSIPATION at 90°C —

LT4K: .312 Watts.
LT10K: .134 Watts.

WEIGHT IN GRAMS: .9 Max.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
CORE MATERIAL: PHENOLIC (LT4K)						
1537-00	.15±20%	50	25.0	525	.03	2740
1537-02	.22±20%	50	25.0	450	.055	2020
1537-04	.33±20%	45	25.0	360	.09	1580
1537-06	.47±20%	45	25.0	310	.12	1370
1537-07	.56±10%	50	25.0	280	.135	1290
1537-08	.68±10%	50	25.0	250	.15	1220
1537-10	.82±10%	50	25.0	220	.22	1020
1537-12	1.00±10%	50	25.0	200	.29	880
1537-14	1.20±10%	33	7.9	180	.42	730
1537-16	1.50±10%	33	7.9	160	.50	670
1537-18	1.80±10%	33	7.9	150	.65	590
1537-20	2.20±10%	33	7.9	135	.95	485
1537-22	2.70±10%	33	7.9	120	1.20	430
1537-24	3.30±10%	33	7.9	110	2.00	335
1537-26	3.90±10%	33	7.9	100	2.30	310
1537-28	4.70±10%	33	7.9	90	2.60	294
CORE MATERIAL: IRON (LT10K)						
1537-30	5.60±10%	45	7.9	60	.32	565
1537-32	6.80±10%	50	7.9	55	.50	450
1537-34	8.20±10%	50	7.9	50	.60	410
1537-36	10.0±10%	55	7.9	45	.90	335
1537-38	12.0±10%	65	2.5	42	1.10	305
1537-40	15.0±10%	65	2.5	40	1.40	271
1537-42	18.0±10%	75	2.5	34	2.25	213
1537-44	22.0±10%	75	2.5	30	2.50	202
1537-46	24.0±5%	60	2.5	26	2.50	202

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
CORE MATERIAL: IRON (LT10K) (Cont'd)						
1537-47	27.0±10%	60	2.5	25	2.60	198
1537-48	27.0±5%	60	2.5	25	2.60	198
1537-50	30.0±5%	65	2.5	21	2.80	191
1537-51	33.0±10%	65	2.5	19	3.00	185
1537-52	33.0±5%	65	2.5	19	3.00	185
1537-54	36.0±5%	60	2.5	15.5	2.50	202
1537-56	39.0±5%	60	2.5	14.5	2.60	198
1537-58	43.0±5%	60	2.5	13.7	2.70	194
1537-60	47.0±5%	55	2.5	13.0	2.75	193
1537-62	51.0±5%	55	2.5	12.7	2.85	189
1537-64	56.0±5%	55	2.5	12.0	3.00	184
1537-66	62.0±5%	55	2.5	11.5	3.15	180
1537-68	68.0±5%	55	2.5	11.0	3.30	176
1537-70	75.0±5%	55	2.5	10.5	3.50	166
1537-72	82.0±5%	50	2.5	10.3	3.90	162
1537-74	91.0±5%	50	2.5	10.0	4.30	154
1537-76	100.0±5%	50	2.5	9.5	4.50	151
1537-78	110.0±5%	60	.79	8.9	4.90	144
1537-80	120.0±5%	65	.79	8.7	5.20	140
1537-82	130.0±5%	65	.79	8.5	5.45	137
1537-84	150.0±5%	65	.79	8.0	6.05	130
1537-86	160.0±5%	65	.79	7.5	6.40	126
1537-88	180.0±5%	65	.79	7.0	6.75	123
1537-90	200.0±5%	65	.79	6.5	7.10	120
1537-92	220.0±5%	65	.79	6.2	7.45	117
1537-94	240.0±5%	65	.79	5.9	7.80	115

SERIES 1840

MILITARY SPECIFICATIONS:

MS-75008 (LT4K)
MS-75101 (LT10K)



PHYSICAL PARAMETERS —

Length: .437±.010
Diameter: .187±.010
Lead Size: AWG #22 TCW.
Lead Length: 1.44±.12

CURRENT RATING at 90°C AMB. —

LT4K: 35°C Rise.
LT10K: 15°C Rise.

OPERATING TEMPERATURE —

LT4K: -55°C to +125°C.
LT10K: -55°C to +105°C.

POWER DISSIPATION at 90°C —

LT4K: .385 Watts.
LT10K: .165 Watts.

WEIGHT IN GRAMS: .95 Max.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
CORE MATERIAL: PHENOLIC (LT4K)						
1840-00	.15±20%	55	25.0	510	.030	3050
1840-02	.22±20%	55	25.0	415	.035	2820
1840-04	.33±20%	55	25.0	350	.050	2360
1840-06	.47±20%	55	25.0	300	.080	1860
1840-07	.56±10%	55	25.0	270	.100	1670
1840-08	.68±10%	55	25.0	250	.120	1520
1840-09	.82±10%	55	25.0	220	.180	1240
1840-10	1.00±10%	55	25.0	200	.250	1050
1840-11	1.20±10%	35	7.9	180	.400	835
1840-12	1.50±10%	35	7.9	170	.485	755
1840-13	1.80±10%	35	7.9	150	.740	610
1840-14	2.20±10%	35	7.9	140	.900	555
1840-16	2.70±10%	35	7.9	120	1.100	525

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
CORE MATERIAL: PHENOLIC (LT4K) (Cont'd)						
1840-18	3.30±10%	35	7.9	70	.120	1020
1840-20	3.90±10%	35	7.9	65	.155	900
1840-22	4.70±10%	35	7.9	60	.210	775
CORE MATERIAL: IRON (LT10K)						
1840-24	5.60±10%	35	7.9	50	.280	670
1840-26	6.80±10%	35	7.9	50	.375	580
1840-28	8.20±10%	35	7.9	48	.400	560
1840-30	10.0±10%	35	7.9	42	.600	455
1840-32	12.0±10%	50	2.5	36	.850	385
1840-34	15.0±10%	55	2.5	30	1.200	324
1840-35	18.0±10%	60	2.5	30	1.800	265
1840-36	22.0±10%	60	2.5	24	2.000	251
1840-38	27.0±10%	65	2.5	22	2.750	214

SERIES 2150

MILITARY SPECIFICATIONS:

MS-14052 (LT10K)
MS-90542 (LT4K)



PHYSICAL PARAMETERS —

Length: .560±.010
Diameter: .220±.010
Lead Size: AWG #22 TCW.
Lead Length: 1.44±.12

CURRENT RATING at 90°C AMB. —

LT4K: 35°C Rise.
LT10K: 15°C Rise.

OPERATING TEMPERATURE —

LT4K: -55°C to +125°C.
LT10K: -55°C to +105°C.

POWER DISSIPATION at 90°C —

LT4K: .427 Watts.
LT10K: .183 Watts.

WEIGHT IN GRAMS: 1.5 Max.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
CORE MATERIAL: PHENOLIC (LT4K)						
2150-00	.47±10%	65	25.0	300	.06	2270
2150-01	.56±10%	65	25.0	270	.07	2100
2150-02	.68±10%	65	25.0	240	.08	1960
2150-03	.82±10%	65	25.0	220	.11	1670
2150-04	1.00±10%	65	25.0	200	.14	1480
2150-05	1.20±10%	40	25.0	180	.19	1270
2150-06	1.50±10%	40	7.9	160	.28	1050
2150-07	1.80±10%	40	7.9	150	.37	915
2150-08	2.20±10%	40	7.9	135	.50	785
2150-10	2.70±10%	40	7.9	120	.65	690
2150-12	3.30±10%	40	7.9	105	1.00	555
2150-14	3.90±10%	40	7.9	100	1.20	505

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
CORE MATERIAL: PHENOLIC (LT4K) (Cont'd)						
2150-16	4.70±10%	40	7.9	90	1.80	415
2150-18	5.60±10%	35	7.9	55	.13	1040
2150-20	6.80±10%	35	7.9	50	.20	835
2150-22	8.20±10%	35	7.9	44	.22	795
CORE MATERIAL: IRON (LT10K)						
2150-24	10.0±10%	35	7.9	42	.26	735
2150-26	12.0±10%	45	2.5	34	.45	560
2150-28	15.0±10%	45	2.5	32	.52	520
2150-30	18.0±10%	50	2.5	28	.70	445
2150-32	22.0±10%	60	2.5	24	1.00	375
2150-34	27.0±10%	60	2.5	22	1.30	330
2150-36	33.0±10%	60	2.5	20	1.50	305
2150-38	39.0±10%	70	2.5	18	2.00	264



MOLDED RF

coils and inductive components

SERIES 2500

MILITARY SPECIFICATIONS:

MS-90539 (LT10K)

MS-90540 (LT10K)

MS-90541 (LT10K)



CURRENT RATING at 90°C AMB.: 15°C Rise.

OPERATING TEMPERATURE: -55°C to +105°C.

CORE MATERIAL: IRON (LT10K)

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)	Mold Size
2500-00	270±5%	65	.790	5.6	8.2	126	A
2500-02	300±5%	65	.790	5.3	8.7	122	A
2500-04	330±5%	65	.790	5.0	9.1	120	A
2500-06	360±5%	65	.790	4.7	9.6	115	A
2500-08	390±5%	65	.790	4.5	10.0	114	A
2500-10	430±5%	65	.790	4.3	10.6	111	A
2500-12	470±5%	65	.790	4.0	11.0	108	A
2500-14	500±5%	65	.790	3.7	11.3	106	A
2500-15	510±5%	65	.790	3.8	11.6	105	A
2500-16	560±5%	65	.790	3.6	12.3	104	A
2500-18	620±5%	60	.790	3.5	13.0	101	A
2500-20	680±5%	60	.790	3.4	13.7	97	A
2500-22	750±5%	60	.790	3.3	14.4	95	A
2500-24	820±5%	60	.790	3.1	15.1	92	A
2500-26	910±5%	60	.790	3.0	15.8	91	A
2500-28	1000±5%	60	.790	2.8	16.5	88	A
2500-30	1100±5%	60	.250	2.8	21	81	B
2500-32	1200±5%	60	.250	2.7	22	79	B
2500-34	1300±5%	60	.250	2.6	23	78	B
2500-36	1500±5%	65	.250	2.4	25	76	B
2500-38	1600±5%	65	.250	2.3	26	74	B
2500-40	1800±5%	65	.250	2.2	28	71	B
2500-42	2000±5%	65	.250	2.1	29	69	B
2500-44	2200±5%	70	.250	2.0	30	68	B
2500-46	2400±5%	70	.250	1.9	31	67	B
2500-48	2700±5%	70	.250	1.8	33	65	B

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)	Mold Size
2500-50	3000±5%	70	.250	1.7	35	63	B
2500-52	3300±5%	70	.250	1.6	38	61	B
2500-54	3600±5%	70	.250	1.5	40	59	B
2500-56	3900±5%	80	.250	1.45	44	62	C
2500-58	4300±5%	80	.250	1.40	46	60	C
2500-60	4700±5%	80	.250	1.35	48	59	C
2500-62	5000±5%	80	.250	1.3	50	58	C
2500-63	5100±5%	80	.250	1.3	50	58	C
2500-64	5600±5%	80	.250	1.25	53	56	C
2500-66	6200±5%	80	.250	1.2	56	55	C
2500-68	6800±5%	80	.250	1.15	59	54	C
2500-70	7500±5%	80	.250	1.10	62	52	C
2500-72	8200±5%	80	.250	1.05	65	51	C
2500-74	9100±5%	80	.250	1.0	68	49	C
2500-76	10000±5%	80	.250	.95	72	48	C

PHYSICAL PARAMETERS

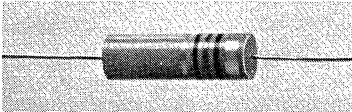
Mold Size	Diameter	Length	Lead Size & Type	Lead Length	Power Dissipation in Watts 90°C	Max. Weight in Grams
A	.190±.010	.440±.010	AWG #22 TCW	1.44±.12	.166	.95
B	.215±.010	.560±.010	AWG #21 TCW	1.44±.12	.182	1.5
C	.240±.010	.740±.010	AWG #20 TCW	1.44±.12	.213	2.5

SERIES 2890

MILITARY SPECIFICATIONS:

MS-75103 (LT10K)

MS-91189 (LT4K)



PHYSICAL PARAMETERS —

Length: .900±.010

Diameter: .280±.010

Lead Size: AWG #21 TCW.

Lead Length: 1.44±.12

CURRENT RATING at 90°C AMB. —

LT4K: 35°C Rise.

LT10K: 15°C Rise.

OPERATING TEMPERATURE —

LT4K: -55°C to +125°C.

LT10K: -55°C to +105°C.

POWER DISSIPATION at 90°C —

LT4K: .598 Watts.

LT10K: .256 Watts.

WEIGHT IN GRAMS: 3.9 Max.

CORE MATERIAL: PHENOLIC (LT4K)

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
2890-00	1.2±10%	60	7.9	170	.075	2400
2890-02	1.5±10%	60	7.9	160	.090	2190
2890-03	1.8±10%	60	7.9	140	.135	1790
2890-04	2.2±10%	60	7.9	125	.160	1640
2890-06	2.7±10%	60	7.9	115	.220	1400
2890-08	3.3±10%	60	7.9	100	.305	1190
2890-10	3.9±10%	60	7.9	95	.450	980
2890-12	4.7±10%	60	7.9	90	.560	880
2890-14	5.6±10%	60	7.9	80	.745	760
2890-16	6.8±10%	60	7.9	75	1.05	640
2890-18	8.2±10%	60	7.9	68	1.40	555
2890-20	10.0±10%	60	7.9	60	1.90	475
2890-22	12.0±10%	40	2.5	53	2.65	405
2890-24	15.0±10%	40	2.5	50	3.25	365
2890-26	18.0±10%	40	2.5	45	4.15	320

CORE MATERIAL: IRON (LT10K)

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
2890-28	22.0±10%	50	2.5	24	.295	815
2890-30	27.0±10%	45	2.5	22	.35	750
2890-32	33.0±10%	60	2.5	19	.55	595
2890-34	39.0±10%	55	2.5	18	.65	550
2890-36	47.0±10%	65	2.5	16	1.00	445
2890-38	56.0±10%	65	2.5	14	1.15	410
2890-39	68.0±10%	75	2.5	13	1.85	325
2890-40	82.0±10%	75	2.5	12	2.10	305
2890-42	100.0±10%	75	2.5	12	2.50	279
2890-44	120.0±10%	95	.79	10	4.10	219

SERIES 3500

MILITARY SPECIFICATIONS:

MS-14047 (LT10K)

MS-14048 (LT10K)

MS-14049 (LT10K)

MS-14050 (LT10K)

MS-75052 (LT4K)



CURRENT RATING at 90°C AMB. —

LT4K: 35°C Rise.

LT10K: 15°C Rise.

OPERATING TEMPERATURE —

LT4K: -55°C to +125°C.

LT10K: -55°C to +105°C.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)	Mold Size
3500-00	47±10%	18	2.5	13.5	5.9	225	A
3500-02	56±10%	18	2.5	13.0	6.4	216	A
3500-04	68±10%	70	2.5	13.0	3.3	210	A
3500-06	82±10%	65	2.5	11.7	3.5	196	A
3500-08	100±10%	65	2.5	10.7	3.8	188	A
CORE MATERIAL: IRON (LT10K)							
3500-10	120±10%	75	.79	9.3	4.7	169	A
3500-12	150±10%	75	.79	8.3	5.3	159	A
3500-14	180±10%	80	.79	6.0	5.5	171	A
3500-16	220±10%	80	.79	5.5	5.9	165	B
3500-18	270±10%	80	.79	5.1	6.6	156	B
3500-20	330±10%	75	.79	4.2	7.8	143	B
3500-22	390±10%	75	.79	3.9	8.7	136	B
3500-24	470±10%	80	.79	3.7	9.0	140	C
3500-26	560±10%	80	.79	3.5	10.0	133	C
3500-28	680±10%	75	.79	3.2	11.2	125	C
3500-30	820±10%	75	.79	3.0	13.0	116	C
3500-32	1000±10%	70	.79	2.7	14.5	110	C
3500-34	1500±10%	85	.25	2.2	22.0	93	D

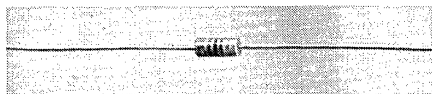
Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance (Ohms) Max.	Current Rating DC mA (Max.)	Mold Size
CORE MATERIAL: IRON (LT10K) (Cont'd)							
3500-36	2000±10%	85	.25	1.9	26.0	86	D
3500-37	2200±10%	85	.25	1.8	27.0	84	D
3500-38	2500±10%	85	.25	1.7	30.0	80	D
3500-39	2700±10%	85	.25	1.6	32.0	77	D
3500-40	5000±10%	70	.25	1.2	65.0	54	D
3500-41	5100±10%	70	.25	1.0	66.0	53	D
3500-42	10000±10%	70	.25	.8	70.0	52	D*
3500-44	10000±10%	70	.25	.8	70.0	52	D
PHYSICAL PARAMETERS							
Mold Size	Diameter	Length	Lead Size & Type	Lead Length	Power Dissipation in Watts 90°C	Max. Weight in Grams	
A	.250±.010	.560±.010	AWG #22 TCW	1.44±.12	LT4K .415	2.0	
B	.310±.010	.560±.010	AWG #21 TCW	1.44±.12	LT10K .175	2.8	
C	.375±.010	.625±.010	AWG #21 TCW	1.44±.12	.23	4.0	
D	.468±.010	.687±.010	AWG #21 TCW *(3500-42) AWG #20 TCW	1.44±.12	.25	6.4	



SHIELDED RF

coils and inductive components

SERIES 0925

MILITARY SPECIFICATIONS:
MIL-C-15305 (LT10K)

PHYSICAL PARAMETERS —

Length: .250±.010
Diameter: .095±.010
Lead Size: AWG #26 TCW.
Lead Length: 1.44±.188

CURRENT RATING at 90°C AMB.: 15°C Rise.

OPERATING TEMPERATURE: -55°C to +105°C.

POWER DISSIPATION at 90°C: 58.5 mW.

WEIGHT IN GRAMS: .25 Max.

INCREMENTAL CURRENT: Current level which causes a Max. of 5% decrease in inductance.

COUPLING: 3% Max.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)	Incremental Current DC mA (Max.)
0925-101	.10±10%	54	25.0	490	.10	670	670
0925-121	.12±10%	52	25.0	430	.11	635	635
0925-151	.15±10%	50	25.0	415	.12	610	610
0925-181	.18±10%	49	25.0	375	.13	585	585
0925-221	.22±10%	47	25.0	330	.15	545	545
0925-271	.27±10%	46	25.0	300	.16	530	530
0925-331	.33±10%	44	25.0	260	.18	495	495
0925-391	.39±10%	42	25.0	230	.19	485	485
0925-471	.47±10%	41	25.0	220	.21	460	460
0925-561	.56±10%	41	25.0	210	.23	440	440
0925-681	.68±10%	39	25.0	180	.24	430	430
0925-821	.82±10%	38	25.0	165	.27	405	405
0925-102	1.00±10%	37	25.0	150	.30	385	385
0925-122	1.20±10%	40	7.9	130	.73	247	247
0925-152	1.50±10%	41	7.9	115	.86	228	228
0925-182	1.80±10%	43	7.9	105	.95	217	217
0925-222	2.20±10%	45	7.9	95	1.10	202	202
0925-272	2.70±10%	48	7.9	90	1.20	193	193
0925-332	3.30±10%	49	7.9	80	1.30	185	185
0925-392	3.90±10%	50	7.9	75	1.50	173	173
0925-472	4.70±10%	53	7.9	70	2.40	136	136
0925-562	5.60±10%	54	7.9	60	2.90	124	124
0925-682	6.80±10%	55	7.9	55	3.20	118	118

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)	Incremental Current DC mA (Max.)
0925-822	8.2±10%	55	7.9	53	3.60	111	111
0925-103	10.0±10%	57	7.9	50	4.00	106	106
0925-123	12.0±10%	36	2.5	35	2.70	129	129
0925-153	15.0±10%	38	2.5	30	3.20	118	118
0925-183	18.0±10%	40	2.5	26	3.80	108	108
0925-223	22.0±10%	40	2.5	25	4.90	96	96
0925-273	27.0±10%	40	2.5	22	5.80	88	88
0925-333	33.0±10%	41	2.5	21	6.50	83	83
0925-393	39.0±10%	42	2.5	20	7.90	75	75
0925-473	47.0±10%	44	2.5	17	9.30	69	69
0925-563	56.0±10%	44	2.5	16	11.0	64	64
0925-683	68.0±10%	45	2.5	14	12.0	61	61
0925-823	82.0±10%	45	2.5	13	13.0	59	59
0925-104	100.0±10%	40	2.5	10.5	16.8	55	55
0925-124	120.0±10%	31	.79	13	5.80	88	27
0925-154	150.0±10%	33	.79	12	7.90	75	24
0925-184	180.0±10%	33	.79	11	9.40	69	22
0925-224	220.0±10%	35	.79	10	11.0	64	20
0925-274	270.0±10%	37	.79	9.0	12.0	61	18
0925-334	330.0±10%	40	.79	8.0	16.0	53	16
0925-394	390.0±10%	38	.79	7.8	21.0	46	14
0925-474	470.0±10%	36	.79	7.5	24.0	43	13
0925-564	560.0±10%	36	.79	7.0	28.0	40	12

SERIES 1537-700

MILITARY SPECIFICATIONS:
MIL-C-15305 (LT4K)

PHYSICAL PARAMETERS —

Length: .375±.010
Diameter: .156±.010
Lead Size: AWG #22 TCW.
Lead Length: 1.44±.12

CURRENT RATING at 90°C AMB.: 35°C Rise.

OPERATING TEMPERATURE: -55°C to +125°C.

POWER DISSIPATION at 90°C: .20 Watts Max.

WEIGHT IN GRAMS: .6 Max.

INCREMENTAL CURRENT: Current level which causes a Max. of 5% decrease in inductance.

COUPLING: 2% Max.

Part Number	Inductance Microhenries	Q Min.	Test Freq. L & Q (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)	Incremental Current DC mA (Max.)
1537-770	.10±10%	45	25	250	.019	2760	2760
1537-771	.12±10%	45	25	250	.023	2500	2500
1537-701	.15±10%	45	25	250	.028	2270	2270
1537-772	.18±10%	45	25	250	.032	2120	2120
1537-702	.22±10%	45	25	250	.039	1920	1920
1537-773	.27±10%	45	25	250	.048	1730	1730
1537-703	.33±10%	45	25	250	.054	1630	1630
1537-774	.39±10%	45	25	250	.058	1580	1580
1537-704	.47±10%	45	25	235	.062	1530	1530
1537-705	.56±10%	45	25	210	.088	1280	1280
1537-706	.68±10%	40	25	190	.093	1240	1240
1537-707	.82±10%	40	25	180	.12	1100	1100
1537-708	1.0 ±10%	40	25	150	.15	980	980
1537-709	1.2 ±10%	45	7.9	140	.08	1340	445
1537-710	1.5 ±10%	45	7.9	125	.10	1200	400
1537-711	1.8 ±10%	45	7.9	114	.12	1100	365
1537-712	2.2 ±10%	45	7.9	103	.15	980	355
1537-713	2.7 ±10%	50	7.9	94	.22	810	275
1537-714	3.3 ±10%	50	7.9	85	.27	730	210
1537-715	3.9 ±10%	50	7.9	79	.29	705	200
1537-716	4.7 ±10%	50	7.9	72	.32	670	185
1537-717	5.6 ±10%	50	7.9	67	.40	600	165
1537-718	6.8 ±10%	50	7.9	62	.50	540	150
1537-719	8.2 ±10%	50	7.9	58	.62	485	135
1537-720	10.0 ±10%	50	7.9	55	.78	430	125
1537-721	12.0 ±10%	45	2.5	50	.66	470	110
1537-722	15.0 ±10%	45	2.5	45	.75	440	100
1537-723	18.0 ±10%	45	2.5	40	.85	410	93
1537-724	22.0 ±10%	50	2.5	36	.95	390	87
1537-725	27.0 ±10%	50	2.5	32	1.1	360	73
1537-726	33.0 ±10%	50	2.5	29	1.7	291	68

Part Number	Inductance Microhenries	Q Min.	Test Freq. L & Q (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)	Incremental Current DC mA (Max.)
1537-727	39.0±10%	55	2.5	26	2.1	262	59
1537-728	47.0±10%	55	2.5	23	2.4	245	55
1537-729	56.0±10%	60	2.5	20	2.7	231	50
1537-730	68.0±10%	60	2.5	18	3.0	220	44
1537-731	82.0±10%	60	2.5	15	3.7	198	40
1537-732	100.0±10%	50	2.5	11	2.2	256	39
1537-733	120.0±10%	55	.79	10	2.5	240	31
1537-734	150.0±10%	55	.79	9.3	2.8	227	28
1537-735	180.0±10%	55	.79	9.0	3.2	215	25
1537-736	220.0±10%	55	.79	8.0	3.7	198	23
1537-737	270.0±10%	55	.79	7.3	4.6	177	21
1537-738	330.0±10%	55	.79	7.0	5.0	170	19
1537-739	390.0±10%	55	.79	6.0	5.5	162	18
1537-740	470.0±10%	60	.79	5.8	6.0	155	16
1537-741	560.0±10%	60	.79	5.5	7.5	139	15
1537-742	680.0±10%	60	.79	5.0	8.8	128	14
1537-743	820.0±10%	60	.79	4.3	11.0	115	13
1537-744	1000.0±10%	60	.79	4.2	14.0	102	12
1537-745	1200.0±10%	50	.25	3.6	17.0	92	10
1537-746	1500.0±10%	50	.25	3.2	23.0	79	9.5
1537-747	1800.0±10%	50	.25	2.9	27.0	73	8.5
1537-748	2200.0±10%	50	.25	2.6	30.0	69	8.0
1537-749	2700.0±10%	50	.25	2.3	36.0	63	7.0
1537-750	3300.0±10%	50	.25	2.1	45.0	57	6.5
1537-751	3900.0±10%	50	.25	1.9	52.0	53	6.0
1537-752	4700.0±10%	50	.25	1.7	65.0	47	5.0
1537-753	5600.0±10%	50	.25	1.6	76.0	44	4.8
1537-754	6800.0±10%	50	.25	1.5	87.0	41	4.7
1537-755	8200.0±10%	50	.25	1.4	115.0	35	4.1
1537-756	10000.0±10%	45	.25	1.3	142.0	32	3.6



SHIELDED RF

coils and inductive components

SERIES 1641

MILITARY SPECIFICATIONS:
MS-75087 (LT10K)
MS-75088 (LT10K)
MS-75089 (LT10K)

PHYSICAL PARAMETERS —
Length: .410±.020
Diameter: .162±.010
Lead Size: AWG #22 TCW.
Lead Length: 1.44±.12

CURRENT RATING at 90°C AMB.: 15°C Rise.

OPERATING TEMPERATURE: —55°C to +105°C.

POWER DISSIPATION at 90°C: .11 Watts Max.

WEIGHT IN GRAMS: 1.0 Max.

INCREMENTAL CURRENT: Current level which causes a Max. of 5% decrease in inductance.

COUPLING: 3% Max.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Self-Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)	Incremental Current DC mA (Max.)
1641-101	.10±10%	50	25	250	.025	1830	1830
1641-121	.12±10%	51	25	250	.034	1570	1570
1641-151	.15±10%	51	25	250	.037	1500	1500
1641-181	.18±10%	50	25	250	.047	1330	1330
1641-221	.22±10%	49	25	250	.067	1120	1120
1641-271	.27±10%	47	25	250	.11	870	870
1641-331	.33±10%	46	25	250	.13	800	800
1641-391	.39±10%	44	25	250	.18	680	680
1641-471	.47±10%	44	25	235	.25	580	580
1641-561	.56±10%	43	25	210	.33	505	505
1641-681	.68±10%	42	25	190	.45	430	430
1641-821	.82±10%	40	25	180	.59	375	375
1641-102	1.0±10%	44	25	140	.07	1090	1090
1641-122	1.2±10%	44	7.9	130	.10	900	900
1641-152	1.5±10%	44	7.9	115	.12	835	835
1641-182	1.8±10%	44	7.9	105	.14	775	775
1641-222	2.2±10%	44	7.9	100	.19	665	665
1641-272	2.7±10%	44	7.9	92	.28	545	545
1641-332	3.3±10%	44	7.9	85	.35	490	490
1641-392	3.9±10%	44	7.9	75	.40	455	455
1641-472	4.7±10%	44	7.9	70	.55	390	390
1641-562	5.6±10%	44	7.9	65	.72	340	340
1641-682	6.8±10%	50	7.9	55	1.02	285	285
1641-822	8.2±10%	50	7.9	50	1.32	250	250
1641-103	10.0±10%	50	7.9	46	1.62	228	228
1641-123	12.0±10%	55	2.5	44	2.00	205	205
1641-153	15.0±10%	45	2.5	49	.80	325	250
1641-183	18.0±10%	45	2.5	45	.89	305	235
1641-223	22.0±10%	45	2.5	41	.96	295	220
1641-273	27.0±10%	45	2.5	38	1.19	265	200
1641-333	33.0±10%	45	2.5	34	1.37	248	190

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Self-Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)	Incremental Current DC mA (Max.)
1641-393	39.0±10%	50	2.5	29	1.93	209	180
1641-473	47.0±10%	50	2.5	27	2.11	200	175
1641-563	56.0±10%	50	2.5	25	2.23	194	160
1641-683	68.0±10%	50	2.5	21	2.70	176	150
1641-823	82.0±10%	50	2.5	10.5	2.44	186	140
1641-104	100.0±10%	50	2.5	10.0	3.12	164	120
1641-124	120.0±10%	55	.79	9.7	3.60	153	95
1641-154	150.0±10%	55	.79	8.5	4.10	143	90
1641-184	180.0±10%	55	.79	8.0	4.40	138	85
1641-224	220.0±10%	55	.79	7.5	5.00	130	80
1641-274	270.0±10%	55	.79	7.0	5.80	120	70
1641-334	330.0±10%	55	.79	6.5	6.40	115	65
1641-394	390.0±10%	60	.79	6.2	7.40	107	60
1641-474	470.0±10%	60	.79	5.7	9.50	94	58
1641-564	560.0±10%	60	.79	4.7	10.5	90	55
1641-684	680.0±10%	60	.79	4.5	11.8	84	50
1641-824	820.0±10%	60	.79	4.2	13.0	80	45
1641-105	1000.0±10%	60	.79	3.8	17.5	70	40
1641-125	1200.0±10%	45	.25	1.5	22.1	62	35
1641-155	1500.0±10%	45	.25	1.2	26.5	56	33
1641-185	1800.0±10%	45	.25	1.0	29.9	53	30
1641-225	2200.0±10%	45	.25	.97	33.8	50	27
1641-275	2700.0±10%	45	.25	.92	47.3	42	25
1641-335	3300.0±10%	45	.25	.84	53.0	40	22
1641-395	3900.0±10%	45	.25	.80	73.8	34	20
1641-475	4700.0±10%	45	.25	.74	81.6	32	19
1641-565	5600.0±10%	44	.25	.73	98.9	29.0	17
1641-685	6800.0±10%	40	.25	.66	111.0	27.6	16
1641-825	8200.0±10%	40	.25	.54	119.0	26.6	15
1641-106	10000.0±10%	40	.25	.47	137.0	24.7	14

SERIES 2307

MILITARY SPECIFICATIONS:
MS-90537 (LT10K)

PHYSICAL PARAMETERS —
Length: .395±.020
Diameter: .157±.010
Lead Size: AWG #22 TCW.
Lead Length: 1.44±.12

CURRENT RATING at 90°C AMB.: 15°C Rise.

OPERATING TEMPERATURE: —55°C to +105°C.

POWER DISSIPATION at 90°C: .11 Watts Max.

WEIGHT IN GRAMS: .75 Max.

INCREMENTAL CURRENT: Current level which causes a Max. of 5% decrease in inductance.

COUPLING: 3% Max.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)	Incremental Current DC mA (Max.)
2307-101	.10±10%	50	25	250	.025	1830	1830
2307-121	.12±10%	51	25	250	.034	1570	1570
2307-151	.15±10%	51	25	250	.037	1500	1500
2307-181	.18±10%	50	25	250	.047	1330	1330
2307-221	.22±10%	49	25	250	.067	1120	1120
2307-271	.27±10%	47	25	250	.11	870	870
2307-331	.33±10%	46	25	250	.13	800	800
2307-391	.39±10%	44	25	250	.18	680	680
2307-471	.47±10%	44	25	235	.25	580	580
2307-561	.56±10%	43	25	210	.33	505	505
2307-681	.68±10%	42	25	190	.45	430	430
2307-821	.82±10%	40	25	180	.59	375	375
2307-102	1.00±10%	47	25	140	.07	1090	1090
2307-122	1.20±10%	46	7.9	130	.093	900	900
2307-152	1.50±10%	45	7.9	115	.12	835	835
2307-182	1.80±10%	43	7.9	105	.14	775	775
2307-222	2.20±10%	45	7.9	100	.19	665	665
2307-272	2.70±10%	46	7.9	92	.28	545	545
2307-332	3.30±10%	44	7.9	85	.35	490	490
2307-392	3.90±10%	44	7.9	75	.40	455	455
2307-472	4.70±10%	44	7.9	70	.55	390	390
2307-562	5.60±10%	47	7.9	65	.72	340	340
2307-682	6.80±10%	50	7.9	55	1.02	285	285
2307-822	8.20±10%	50	7.9	50	1.32	250	250
2307-103	10.0±10%	49	7.9	46	1.62	228	228
2307-123	12.0±10%	55	2.5	44	2.00	205	205
2307-153	15.0±10%	44	2.5	49	.80	325	250
2307-183	18.0±10%	45	2.5	45	.89	305	235
2307-223	22.0±10%	46	2.5	41	.96	295	220
2307-273	27.0±10%	49	2.5	38	1.19	265	200
2307-333	33.0±10%	45	2.5	34	1.37	248	190

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)	Incremental Current DC mA (Max.)
2307-393	39.0±10%	53	2.5	29	1.93	209	180
2307-473	47.0±10%	52	2.5	27	2.11	200	175
2307-563	56.0±10%	49	2.5	25	2.23	194	160
2307-683	68.0±10%	51	2.5	21	2.70	176	150
2307-823	82.0±10%	45	2.5	10.5	2.44	186	140
2307-104	100.0±10%	52	2.5	10.0	3.12	164	120
2307-124	120.0±10%	57	.79	9.7	3.60	153	95
2307-154	150.0±10%	56	.79	8.5	4.10	148	90
2307-184	180.0±10%	60	.79	8.0	4.40	138	85
2307-224	220.0±10%	58	.79	7.5	5.00	130	80
2307-274	270.0±10%	60	.79	7.0	5.80	120	70
2307-334	330.0±10%	54	.79	6.5	6.40	115	65
2307-394	390.0±10%	67	.79	6.2	7.40	107	60
2307-474	470.0±10%	60	.79	5.7	9.50	94	58
2307-564	560.0±10%	60	.79	4.7	10.5	90	55
2307-684	680.0±10%	60	.79	4.5	11.8	84	50
2307-824	820.0±10%	57	.79	4.2	13.0	80	45
2307-105	1000.0±10%	65	.79	3.8	17.5	70	40
2307-125	1200.0±10%	45	.25	1.5	22.1	62	35
2307-155	1500.0±10%	49	.25	1.2	26.5	56	33
2307-185	1800.0±10%	47	.25	1.0	29.9	53	30
2307-225	2200.0±10%	50	.25	.97	33.8	50	27
2307-275	2700.0±10%	47	.25	.92	47.3	42	25
2307-335	3300.0±10%	43	.25	.84	53.0	40	22
2307-395	3900.0±10%	43	.25	.80	73.8	35	20
2307-475	4700.0±10%	44	.25	.74	81.6	32	19
2307-565	5600.0±10%	45	.25	.73	98.9	29	17
2307-685	6800.0±10%	43	.25	.66	111.0	27.6	16
2307-825	8200.0±10%	42	.25	.54	119.0	26.6	15
2307-106	10000.0±10%	39	.25	.47	137.0	24.7	14

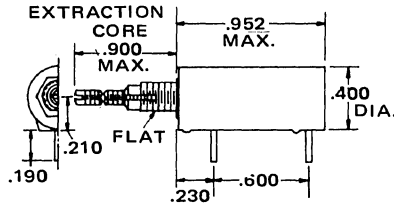


MOLDED VARIABLE RF

coils and inductive components

SERIES 4000 & 4100

MILITARY SPECIFICATIONS:
MS-90543 (LT12V)
MS-90546 (LT12V)



CURRENT RATING at 90°C AMB.: 15°C Rise.
OPERATING TEMPERATURE: -55°C to +105°C.
WEIGHT IN GRAMS: 7.0 Max.
CRIMP-ON TERMINAL —
Crimp-on terminals are available as an accessory.
Material: Tinned brass.
PHYSICAL PARAMETERS (Max.): .160" sq. x .075" High.

ORDERING INFORMATION:

- Chart shows Tork-Tite design P/N. For Taper-Lock design replace the 4000 prefix with a 4100 prefix.
- For optional crimp-on terminals — suffix total P/N with "TA."

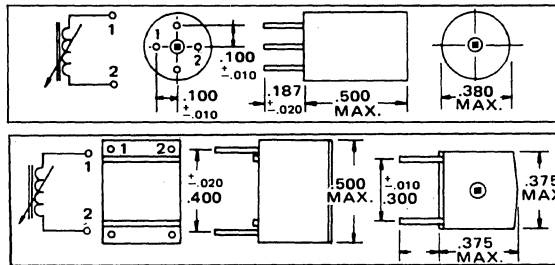
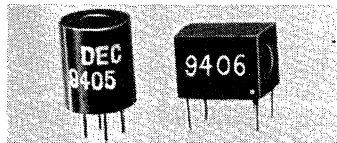
NOTE: Units can be used in either printed circuit or chassis mounted applications.

Part Number	Min. Core Position L Max. Q Min.	Test Freq. (MHz)	Max. Core Position L Min. Q Min.	SRF Min. (MHz)	DCR Max. (Ohms)	Current Rating DC mA (Max.)
POWER DISSIPATION AT 90°C: 213 Watts						
4000-00	.18 μ H 85	25	.28 μ H 100	225.0	.05	1800
4000-01	.23 μ H 90	25	.40 μ H 100	210.0	.05	1800
4000-02	.25 μ H 95	25	.38 μ H 110	200.0	.055	1720
4000-03	.29 μ H 95	25	.64 μ H 110	165.0	.055	1720
4000-04	.35 μ H 95	25	.52 μ H 110	185.0	.06	1650
4000-05	.37 μ H 100	25	.90 μ H 110	140.0	.06	1650
4000-06	.45 μ H 105	25	.70 μ H 110	165.0	.08	1430
4000-07	.50 μ H 105	25/7.9	1.2 μ H 95	125.0	.08	1430
4000-08	.62 μ H 110	25	1.0 μ H 110	125.0	.09	1340
4000-09	.70 μ H 105	25/7.9	1.8 μ H 90	95.0	.09	1340
4000-10	.83 μ H 100	25/7.9	1.6 μ H 65	100.0	.10	1280
4000-11	1.1 μ H 75	7.9	2.5 μ H 65	75.0	.10	1280
4000-12	1.3 μ H 65	7.9	2.5 μ H 80	78.0	.23	840
4000-13	1.3 μ H 65	7.9	3.6 μ H 65	68.0	.23	840
4000-14	1.7 μ H 70	7.9	3.4 μ H 85	62.0	.35	680
4000-15	2.0 μ H 70	7.9	6.0 μ H 75	56.0	.35	680
4000-16	2.6 μ H 70	7.9	5.5 μ H 95	52.0	.75	465
4000-17	3.0 μ H 80	7.9	9.0 μ H 100	45.0	.75	465
4000-18	3.8 μ H 80	7.9	7.3 μ H 95	42.0	1.00	405
4000-19	4.0 μ H 80	7.9/2.5	11.0 μ H 90	39.0	1.00	405
4000-20	5.8 μ H 85	7.9/2.5	11.0 μ H 90	34.0	1.4	340
4000-21	7.5 μ H 80	7.9/2.5	18.0 μ H 95	32.0	1.4	340
POWER DISSIPATION AT 90°C: 195 Watts						
4000-22	9.3 μ H 65	7.9/2.5	18.0 μ H 90	24.0	1.5	315
4000-23	12.0 μ H 70	2.5	30.0 μ H 100	21.0	1.5	315
4000-24	13.5 μ H 70	2.5	27.0 μ H 90	18.0	2.0	274
4000-25	15.0 μ H 70	2.5	44.0 μ H 90	16.0	2.0	274
4000-26	20.0 μ H 75	2.5	40.0 μ H 90	15.6	2.2	261
4000-27	25.0 μ H 75	2.5	65.0 μ H 90	13.0	2.2	261
4000-28	30.0 μ H 80	2.5	58.0 μ H 90	12.5	3.0	223
4000-29	35.0 μ H 80	2.5	90.0 μ H 85	10.0	3.0	223
4000-30	46.0 μ H 80	2.5	87.0 μ H 80	10.6	3.8	198

NOTE: All even dash numbers (-00, -02, -04 ...) utilize Powdered Iron Cores. Odd dash numbers (-01, -03, -05 ...) utilize Ferrite Cores.

SERIES 9405 & 9406

MILITARY SPECIFICATIONS:
MIL-C-15305C (LT6V)



LEADS: AWG #24 Tinned Copperweld.
TUNING TORQUE: 0.1 to 3.5 oz. in.
PIN #1: Identified by white dot.
CURRENT RATING at 90°C AMB.: 35°C Rise.
PHYSICAL PARAMETERS (Max.): .375" sq. x .500".
OPERATING TEMPERATURE: -55°C to +125°C.
POWER DISSIPATION at 90°C: .3 Watts.
WEIGHT IN GRAMS: 4.0 Max.
UNITS: Electro-magnetically shielded and tunable from either end.

Part Number 9405/9406	Nominal Inductance Microhenries	L Min. Microhenries	L Max. Microhenries	Test Freq. (MHz)	Q Min. at L Min.	Q Min. at L Max.	SRF Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)
-01	.10	.080	.120	25	45	43	250	.030	2690
-02	.15	.120	.180	25	53	50	198	.035	2490
-04	.22	.154	.286	25	55	52	195	.056	1970
-06	.33	.231	.429	25	51	49	142	.060	1900
-08	.47	.329	.611	25	53	51	110	.064	1840
-10	.68	.476	.884	25	51	48	130	.073	1720
-12	1.00	.700	1.30	25/7.9	51	67	95	.600	600
-14	1.50	1.05	1.95	7.9	55	82	76	.620	590
-16	2.20	1.54	2.86	7.9	65	103	57	.720	550
-18	3.30	2.31	4.29	7.9	70	91	39	1.05	455
-20	4.70	3.29	6.11	7.9	74	87	27	1.15	435
-22	6.80	4.76	8.84	7.9	72	88	27	1.30	410
-24	10.0	7.00	13.0	7.9/2.5	72	87	18	1.50	380
-26	15.0	10.5	19.5	2.5	66	93	16	2.35	305
-28	22.0	15.4	28.6	2.5	74	102	12	2.80	278
-30	33.0	23.1	42.9	2.5	83	110	11	3.00	269

Part Number 9405/9406	Nominal Inductance Microhenries	L Min. Microhenries	L Max. Microhenries	Test Freq. (MHz)	Q Min. at L Min.	Q Min. at L Max.	SRF Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating DC mA (Max.)
-32	47.0	32.9	61.1	2.5	76	96	8.0	3.70	242
-34	68.0	47.6	88.4	2.5	70	73	7.0	4.35	223
-36	100	70.0	130	2.5/7.9	65	67	6.5	5.50	198
-38	150	105	195	.79	53	81	4.5	9.20	153
-40	220	154	286	.79	61	83	3.5	9.70	149
-42	330	231	429	.79	42	57	3.2	14.0	129
-44	470	329	611	.79	48	67	3.1	15.0	120
-46	680	476	884	.79	45	57	2.4	20.0	104
-48	1000	700	1300	.79/2.5	48	52	1.9	24.5	94.0
-50	1500	1050	1950	.25	38	53	1.3	30.0	85.0
-52	2200	1540	2860	.25	42	65	1.2	38.0	75.5
-54	3300	2310	4290	.25	42	57	.85	45.0	69.5
-56	4700	3290	6110	.25	38	51	.68	70.0	55.5
-58	6800	4760	8840	.25	38	49	.60	100.0	46.5
-60	10000	7000	13000	.25/.079	40	40	.50	115.0	43.5

ORDERING INFORMATION

Vertical Coil = Dash No. prefixed by 9405.
Horizontal Coil = Dash No. prefixed by 9406.
Additionally: an electrostatic shield is available on custom basis.

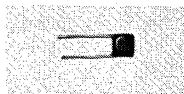


MICRO-I® COILS

coils and inductive components

SERIES 100

MILITARY SPECIFICATIONS:
MS-21367 (LT10K)



MECHANICAL CONFIGURATION:

- Units are epoxy encapsulated.
- Leads are tin-plated Beryllium Copper. (Gold plated leads available on special order.)

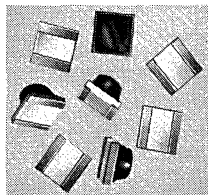
PHYSICAL PARAMETERS (Max.): .110" sq. x .065" High.
CURRENT RATING at 90°C: 15°C Rise.
OPERATING TEMPERATURE: -55°C to +105°C.
POWER DISSIPATION at 90°C: 20.5 mW.
WEIGHT IN GRAMS: .03 Max.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Self-Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. (mA) (Max.)
100-150	.015±30%	40	50	250	.065	492
100-220	.022±30%	40	50	250	.090	418
100-330	.033±30%	40	50	250	.115	370
100-470	.047±30%	40	50	250	.120	360
100-680	.068±30%	40	50	250	.150	324
100-101	.100±30%	40	50	250	.170	304
100-121	.12±20%	35	25	250	.140	335
100-151	.15±20%	40	25	250	.160	313
100-181	.18±20%	40	25	250	.190	287
100-221	.22±20%	40	25	250	.21	274
100-271	.27±20%	40	25	250	.24	256
100-331	.33±20%	40	25	250	.25	251
100-391	.39±20%	40	25	200	.28	237
100-471	.47±20%	40	25	175	.31	225
100-561	.56±20%	40	25	170	.45	185

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Self-Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. (mA) (Max.)
100-681	.68±20%	40	25	165	.62	159
100-821	.82±20%	35	25	160	.65	155
100-102	1.00±20%	35	25	135	.73	145
100-122	1.20±10%	35	7.9	120	1.00	125
100-152	1.50±10%	32	7.9	110	1.20	114
100-182	1.80±10%	32	7.9	95	1.50	102
100-222	2.20±10%	35	7.9	80	1.70	96
100-272	2.70±10%	35	7.9	70	2.00	89
100-332	3.30±10%	37	7.9	65	2.20	84
100-392	3.90±10%	37	7.9	60	2.80	75
100-472	4.70±10%	40	7.9	55	3.10	71
100-562	5.60±10%	40	7.9	50	3.30	69
100-682	6.80±10%	40	7.9	45	3.80	64
100-822	8.20±10%	40	7.9	43	5.00	56
100-103	10.0±10%	40	7.9	40	5.60	53

**CHIP INDUCTORS
SERIES 103**

MILITARY SPECIFICATIONS:
MIL-C-15305 (LT4K & LT10K)



CURRENT RATING at 90°C AMB —

Ferrite Core: 15°C Rise (LT10K)
Phenolic Core: 35°C Rise (LT4K).

WEIGHT MAX.: .03 Grams Max.

POWER DISSIPATION at 90°C: 75 mW Max.

THERMAL CONDUCTANCE: 5 mW/°C Min.

INSULATION RESISTANCE:
1000 Megohms Min. at 100 VDC.

PHYSICAL PARAMETERS (Max.): .110" sq. x .075" High.
Solder Rails both bottom and sides.
DIELECTRIC WITHSTANDING VOLTAGE:
Sea Level (14.7 psia) 140 Vrms.
Altitude 70K Ft. (.643 psia) 50 Vrms.

LOAD LIFE at 90°C: 2000 Hrs. at Rated Current.

PERCENT COUPLING: 3% Max.

MECHANICAL CONFIGURATION:

- Units have epoxy overcoat.
- Contact areas for reflow soldering are gold plated per MIL-G-45204 Type 1 - Grade A.

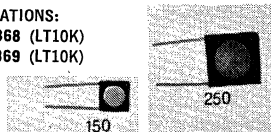
OPERATING TEMPERATURE —
LT4K: -55°C to +125°C.
LT10K: -55°C to +105°C.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Self-Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. (mA) (Max.)
CORE MATERIAL: PHENOLIC (LT4K)						
103-100M	.010±20%	60	50	250	.060	1490
103-150M	.015±20%	55	50	250	.078	1310
103-220M	.022±20%	50	50	250	.108	1110
103-330M	.033±20%	48	50	250	.120	1050
103-470M	.047±20%	42	50	250	.145	960
103-680M	.068±20%	36	50	250	.195	825
103-101M	.100±20%	32	50	250	.230	760
CORE MATERIAL: FERRITE (LT10K)						
103-121M	.12±20%	30	25	250	.125	675
103-151M	.15±20%	25	25	250	.175	570
103-181M	.18±20%	25	25	250	.200	535
103-221K	.22±10%	25	25	250	.220	510
103-271K	.27±10%	25	25	250	.230	500
103-331K	.33±10%	25	25	250	.235	490
103-391K	.39±10%	22	25	250	.240	485
103-471K	.47±10%	22	25	250	.260	470
103-561K	.56±10%	22	25	250	.278	455
103-681K	.68±10%	22	25	220	.520	330

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Self-Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. (mA) (Max.)
CORE MATERIAL: FERRITE (LT10K) (Cont'd)						
103-821K	.82±10%	22	25	200	.530	325
103-102K	1.0±10%	22	25	174	.540	320
103-122K	1.2±10%	22	7.9	154	.740	275
103-152K	1.5±10%	22	7.9	135	.840	260
103-182K	1.8±10%	22	7.9	117	.920	250
103-222K	2.2±10%	22	7.9	100	1.000	240
103-272K	2.7±10%	24	7.9	85	1.15	220
103-332K	3.3±10%	24	7.9	82	1.40	200
103-392K	3.9±10%	24	7.9	80	1.55	190
103-472K	4.7±10%	24	7.9	74	1.80	180
103-562K	5.6±10%	22	7.9	67	2.00	170
103-682K	6.8±10%	22	7.9	60	2.20	160
103-822K	8.2±10%	22	7.9	54	2.50	150
103-103K	10.0±10%	24	7.9	48	3.45	130
103-123K	12.0±10%	25	2.5	44	3.80	122
103-153K	15.0±10%	25	2.5	36	5.60	102
103-183K	18.0±10%	25	2.5	30	5.80	100
103-223K	22.0±10%	25	2.5	26	6.40	95
103-273K	27.0±10%	25	2.5	22	6.90	90

SERIES 150 & 250

MILITARY SPECIFICATIONS:
SERIES 150 MS-21368 (LT10K)
SERIES 250 MS-21369 (LT10K)



MECHANICAL CONFIGURATION:

- Units are epoxy encapsulated.
- Leads are tin-plated Beryllium Copper. (Gold plated leads available on special order.)

CURRENT RATING at 90°C: 15°C Rise.

OPERATING TEMPERATURE: -55°C to +105°C.

PHYSICAL PARAMETERS (Max.):
Series 150: .160" sq. x .065" High.
Series 250: .250" sq. x .065" High.

POWER DISSIPATION at 90°C —

Series 150: 22.5 mW.
Series 250: 37 mW.

WEIGHT IN GRAMS —

Series 150: .05 Max.
Series 250: .18 Max.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Self-Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. (mA) (Max.)
150-123	12.0±10%	45	2.5	32	3.50	70
150-153	15.0±10%	45	2.5	28	3.80	67
150-183	18.0±10%	45	2.5	24	4.50	62
150-223	22.0±10%	45	2.5	22	5.00	59
150-273	27.0±10%	45	2.5	20	6.30	52
150-333	33.0±10%	45	2.5	18	7.00	50
150-393	39.0±10%	45	2.5	16	8.20	46
150-473	47.0±10%	45	2.5	15	9.00	44
150-563	56.0±10%	45	2.5	13	13.0	36
150-683	68.0±10%	45	2.5	12	14.0	35
150-823	82.0±10%	45	2.5	11	19.0	30
150-104	100±10%	45	2.5	10	23.0	27

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Self-Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. (mA) (Max.)
250-124	120±10%	45	.79	6.0	10.0	53
250-154	150±10%	45	.79	5.5	16.0	42
250-184	180±10%	45	.79	5.0	18.0	40
250-224	220±10%	45	.79	4.3	20.0	38
250-274	270±10%	45	.79	3.6	22.0	36
250-334	330±10%	45	.79	3.3	24.0	34
250-394	390±10%	45	.79	3.0	26.0	33
250-474	470±10%	40	.79	2.7	31.0	30
250-564	560±10%	40	.79	2.4	36.0	28
250-684	680±10%	40	.79	2.2	41.0	26
250-824	820±10%	40	.79	2.0	47.0	25
250-105	1000±10%	35	.79	1.8	54.0	23

NOTES: 1. Measurement Techniques: L, Q and SRF measured on Boonton Q and Rx meters using special test fixtures. Details for fixtures available.
2. Marking: Part number and quantity will appear on package as units are too small for legible marking.


MOLDED MICRO-I® COILS
coils and inductive components
SERIES 155

 MILITARY SPECIFICATIONS:
 MIL-C-15305 (LT10K)


PHYSICAL PARAMETERS (Max.) .160" Sq. x .075" High.

CURRENT RATING at 90°C: 15°C Rise.

OPERATING TEMPERATURE: -55°C to +105°C.

POWER DISSIPATION at 90°C: 22.5 mW.

WEIGHT IN GRAMS: .15 Max.

Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Self-Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
155-150	.015±30%	40	50	250	.085	450
155-220	.022±30%	40	50	250	.090	440
155-330	.033±30%	40	50	250	.115	385
155-470	.047±30%	40	50	250	.120	380
155-680	.068±30%	40	50	250	.150	340
155-101	.100±30%	40	50	250	.170	320
155-121	.12 ±20%	35	25	250	.140	350
155-151	.15 ±20%	40	25	250	.160	330
155-181	.18 ±20%	40	25	250	.190	300
155-221	.22 ±20%	40	25	250	.21	286
155-271	.27 ±20%	40	25	250	.24	268
155-331	.33 ±20%	40	25	250	.25	262
155-391	.39 ±20%	40	25	200	.28	248
155-471	.47 ±20%	40	25	175	.31	235
155-561	.56 ±20%	40	25	170	.45	195
155-681	.68 ±20%	40	25	165	.62	166
155-821	.82 ±20%	40	25	135	.65	162
155-102	1.00 ±20%	40	25	120	.73	153
155-122	1.20 ±10%	40	7.9	105	1.00	131
155-152	1.50 ±10%	40	7.9	90	1.20	120
155-182	1.80 ±10%	40	7.9	75	1.50	107

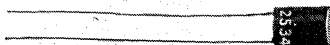
Part Number	Inductance Microhenries	Q Min.	Test Freq. (MHz)	Self-Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
155-222	2.20±10%	40	7.9	65	1.70	101
155-272	2.70±10%	40	7.9	60	2.00	93
155-332	3.30±10%	40	7.9	54	2.20	88
155-392	3.90±10%	40	7.9	50	2.80	78
155-472	4.70±10%	40	7.9	45	3.10	74
155-562	5.60±10%	40	7.9	42	3.30	72
155-682	6.80±10%	40	7.9	38	3.80	67
155-822	8.20±10%	40	7.9	35	5.00	58
155-103	10.0 ±10%	40	7.9	33	5.60	55
155-123	12.0 ±10%	45	2.5	32	3.50	69
155-153	15.0 ±10%	45	2.5	28	3.80	66
155-183	18.0 ±10%	45	2.5	24	4.50	61
155-223	22.0 ±10%	45	2.5	22	5.00	58
155-273	27.0 ±10%	45	2.5	20	6.30	52
155-333	33.0 ±10%	45	2.5	17	7.00	49
155-393	39.0 ±10%	45	2.5	16	8.20	45
155-473	47.0 ±10%	45	2.5	15	9.00	43
155-563	56.0 ±10%	45	2.5	13	13.00	36
155-683	68.0 ±10%	45	2.5	12	14.00	35
155-823	82.0 ±10%	45	2.5	11	19.00	30
155-104	100.0 ±10%	45	2.5	10	23.00	27

NOTES: 1. Coil terminations are thermal-compression bonded.

2. Measurement Techniques: L, Q and SRF measured in Boonton Q and Rx meters using special test fixtures. Measurements to be made between terminals 1 and 2. Details for fixtures available.

3. Marking: Delevan part number is printed on top surface. Terminals 1 and 2 are oriented to the right of part number.

POTTED COILS
SERIES 2534

 MILITARY SPECIFICATIONS:
 MIL-C-15305 (LT6K)


PHYSICAL PARAMETERS —

Height: .345 Max.

Diameter: .25±.010

Lead Size: AWG. #24 TCW.

Lead Length: 1.62±.12

Lead Spacing: .200 +.010—.030

CURRENT RATING at 90°C AMB.: 35°C Rise.

OPERATING TEMPERATURE: -55°C to +125°C.

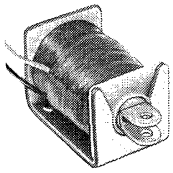
POWER DISSIPATION at 90°C: .23 Watts Max.

WEIGHT IN GRAMS: .86 Max.

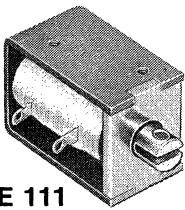
Part Number	Inductance Millihenries	Q Min.	Test Freq. (KHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
2534-00	.10±10%	80	790	3.6	1.8	305
2534-02	.12±10%	80	790	3.3	2.0	290
2534-04	.15±10%	75	790	3.2	2.1	283
2534-06	.18±10%	70	790	2.8	2.2	277
2534-08	.22±10%	65	790	2.5	2.4	265
2534-10	.27±10%	80	790	2.3	3.2	229
2534-12	.33±10%	75	790	2.2	3.6	216
2534-14	.39±10%	70	790	2.0	4.1	203
2534-16	.47±10%	65	790	1.9	4.5	193
2534-18	.56±10%	65	790	1.8	4.8	187
2534-20	.68±10%	60	790	1.7	5.5	175
2534-22	.82±10%	50	790	1.6	6.1	166
2534-24	1.00±10%	45	790	1.4	6.5	161
2534-26	1.20±10%	70	250	1.2	11	124
2534-28	1.50±10%	70	250	1.15	12	118
2534-30	1.80±10%	70	250	1.1	17	100
2534-32	2.20±10%	70	250	.95	18	97
2534-34	2.70±10%	65	250	.75	24	84
2534-36	3.30±10%	65	250	.72	27	79
2534-38	3.90±10%	65	250	.68	30	75

Part Number	Inductance Millihenries	Q Min.	Test Freq. (KHz)	Resonant Freq. Min. (MHz)	DC Resistance Max. (Ohms)	Current Rating D.C. mA (Max.)
2534-40	4.70±10%	60	250	.61	34	70
2534-42	5.60±10%	60	250	.60	37	68
2534-44	6.80±10%	55	250	.48	45	61
2534-46	8.20±10%	50	250	.47	48	59
2534-48	10.0 ±10%	45	250	.42	51	58
2534-50	12.0 ±15%	35	79	.41	105	40
2534-52	15.0 ±15%	35	79	.32	120	38
2534-54	18.0 ±15%	35	79	.30	140	35
2534-56	22.0 ±15%	35	79	.25	170	31.5
2534-58	27.0 ±15%	35	79	.24	245	26.2
2534-60	33.0 ±15%	30	79	.19	280	24.5
2534-62	39.0 ±15%	30	79	.18	330	22.6
2534-64	47.0 ±15%	30	79	.17	370	21.3
2534-66	56.0 ±15%	25	79	.16	460	19.1
2534-68	68.0 ±15%	20	79	.13	550	17.5
2534-70	82.0 ±15%	18	79	.12	610	16.6
2534-72	100.0 ±15%	15	79	.11	670	15.8
2534-74	120.0 ±15%	10	50	.09	1200	11.8
2534-76	150.0 ±15%	10	50	.06	1410	10.9

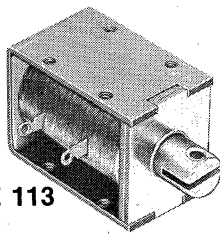
SOLENOIDS



E 109



E 111



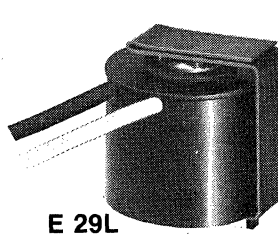
E 113

■ Voltages from 6 V to 230 V AC or DC ■ Custom lead lengths and terminal variations ■ Special plunger lengths and styles ■ Impregnated or encapsulated models

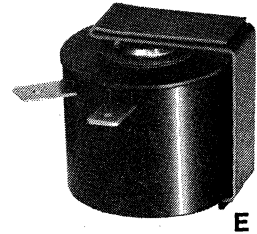
Specifications		
	Power Requirement Intermittent/Continuous (25%)	Pull (Continuous Only)
E 109	18 W/4.5 W	8 oz. @ .05" gap
E 111	20 W/5.2 W	20 oz. @ .05" gap
E 113	30 W/8 W	35 oz. @ .05" gap

■ All metal parts are zinc plated. ■ Staked yoke standard. You may specify conical or flat plungers on production orders. ■ Life expectancy at rated load: 5×10^6 .

BUZZERS



E 29L



E 29T

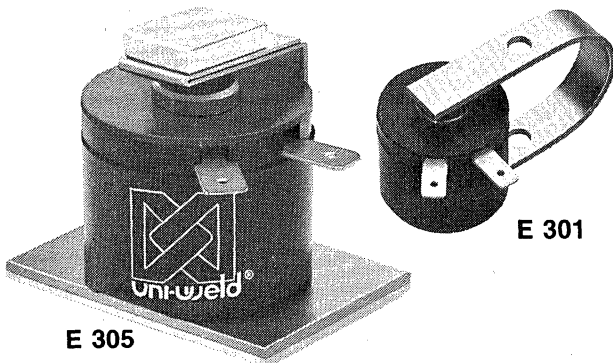
■ Produce loud, distinctive sound ■ Mount quickly, easily with single screw ■ Manufactured with exclusive Uni-Weld® process

Specifications Order by number code: E 29 or E 30	Terminals		Leads (5" Length Standard)	
	E 29	E 30	E 29	E 30
6 Volt, 60 Hz.	6E29T	6E30T	6E29L	6E30L
12 Volt, 60 Hz.	12E29T	12E30T	12E29L	12E30L
24 Volt, 60 Hz.	24E29T	24E30T	24E29L	24E30L
120 Volt, 60 Hz.	120E29T	120E30T	120E29L	120E30L

Ask about quantity prices.

Special voltages and terminals available.

VIBRATORS



E 305

E 301

■ Improve distribution and flow of solid or liquid materials ■ Long life ■ Noiseless ■ Adhesive mounting pad ■ Easy to install

Specifications

Model: Miniature Vibrator, E 305

Voltage: 115 V AC, continuous duty (other voltages to specification)

Input: 5 watts

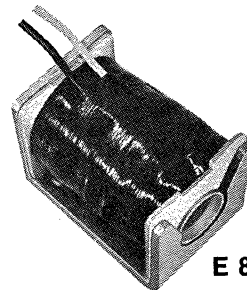
Vibrating Frequency: 120 cps.

Force: 2.5 g's

Size: 1.50" (3.81 cm) x 1.00" (2.54 cm) x 1.25" (3.18 cm)

Weight: 1.8 oz. (50 gms.)

CLICKERS



E 8600

■ Creates distinctive sound in electronic keyboards
■ Reduces chance of error on "silent", "soft-touch" keyboards

Specifications

Duty Cycle: Approx. 15% max.

Coil: 20 ohm

Coil Insulation: 1500 V AC, 60 Hz. to frame. Other voltages to specification. Special windings available to suit other operating conditions.

Recommended Conditions: 20 volt pulse for 5 millisecond duration. (Signal may be varied by changing the duration of applied pulse.)

Termination: 8" leads standard. Terminals available.

Coil products to your specifications

Coils for any application:

solenoids, power converters, relays, printers, reed switches, clocks, motors, clutches, tachometers, controls, transformers, vibrators, buzzers.

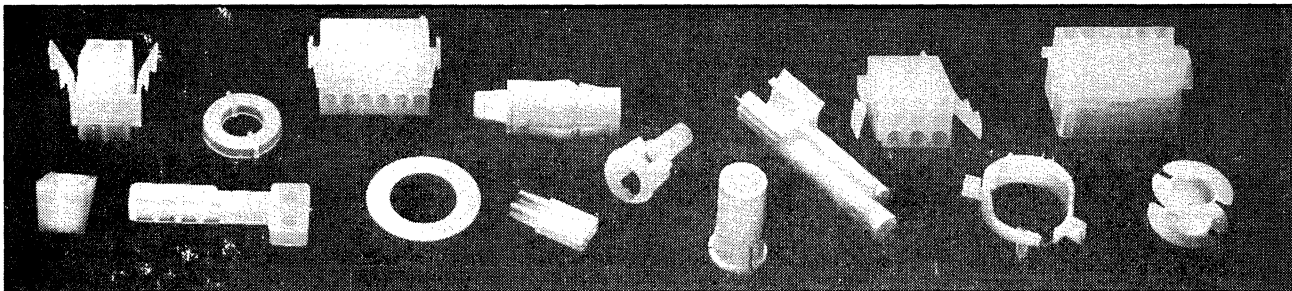
Check our capabilities:

random wound bobbin coils, thread interweave coils, coil assemblies, transfer molding, encapsulation, impregnation, fluidized bedcoating, ultrasonic welding.



ENDICOTT COIL CO., INC.

30 Charlotte Street
Binghamton, New York 13905
Phone (607) 797-1263



the buck stops here

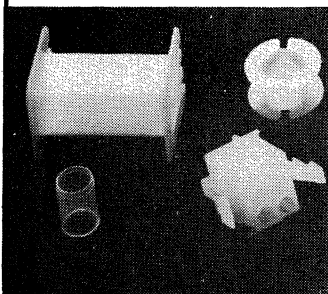
Single source responsibility with all in-plant facilities and services from concept to delivery. Complete design and engineering ability, precision tool making, production and quality control to meet or exceed customary tolerances.

Harbison does it all

Specializing in injection molding of electrical and electronic components including coil forms, bobbins and connector housings. Materials such as glass filled nylon, Zytel 101, Valox, Delrin, Noryl, and phenolics.

modular family molding !!!

The economies of multiple cavity molding with the precision and quality of custom molding . . . allow a mix or match with significant savings. All this and industry-beating delivery time!



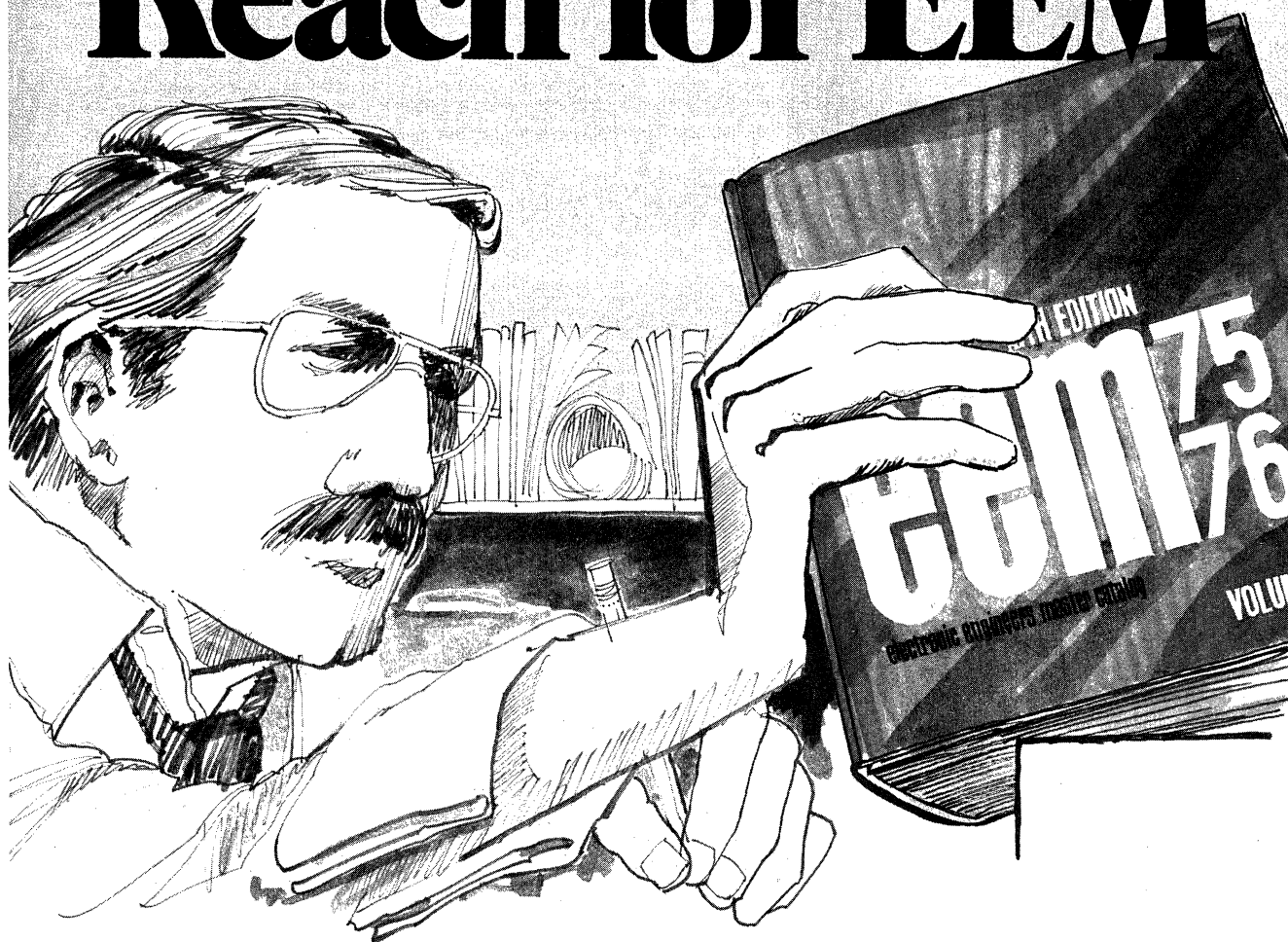
Harbison customers are sold but **never** forgotten

HARBISON Industrial Products, Inc.
7205 Hibbs Lane Levittown, Penna. 19057

...people with a part in the future of Plastics.

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

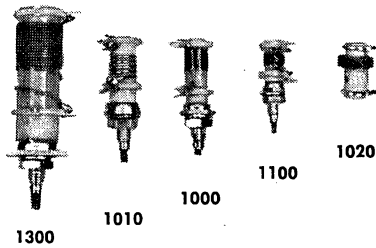
UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700



NORTH HILLS • HIGH-PERFORMANCE COILS, ADJUSTABLE & FIXED

TO COVER ALL FREQUENCY RANGES FROM AUDIO TO 200 MHZ

COILS ON CERAMIC FORMS PER MIL-I-10



Series No.	Dimensions (Inches) Dia. Length	Mfg. Hole Dia. (Inches)
1000	.50 .88	.196
1020	.50 .63	.050, .500 Apart
1100	.33 .63	.166
1300	.70 1.80	.252
1010	.43 .88	.196

Miniature 1000 Series

Part No.	Range Microhenries	Average Q
1000-A	1.0- 1.6	70 @ 7.9 MHz
1000-B	1.6- 2.7	80 @ 7.9 MHz
1000-C	2.7- 4.5	85 @ 7.9 MHz
1000-D	4.5- 8.5	85 @ 7.9 MHz
1000-E	8.5-14.5	75 @ 2.5 MHz
1000-F	14.5-22	65 @ 2.5 MHz
1000-G	22-29	65 @ 2.5 MHz
1000-H	29-55	85 @ 2.5 MHz
1000-I	55-110	80 @ 2.5 MHz
1000-J	110-185	85 @ .79 MHz
1000-K	185-305	85 @ .79 MHz
1000-L	305-515	85 @ .79 MHz
1000-M	515-820	85 @ .79 MHz
1000-N	820-1100	75 @ .79 MHz

RF Printed Circuit Coils

1020-A	0.41- 0.53	75 @ 25 MHz
1020-B	0.85- 1.15	65 @ 7.9 MHz
1020-C	1.87- 2.50	65 @ 7.9 MHz
1020-D	4.0 - 5.4	70 @ 7.9 MHz
1020-E	7.5-12.5	70 @ 2.5 MHz
1020-F	20 - 29	80 @ 2.5 MHz
1020-G	33 - 61	80 @ 2.5 MHz
1020-H	80 - 120	80 @ 0.79 MHz
1020-I	170 - 260	70 @ 0.79 MHz

Subminiature 1100 Series

1100-A	0.9- 1.4	60 @ 7.9 MHz
1100-B	1.4- 1.9	70 @ 7.9 MHz
1100-C	1.9- 2.6	65 @ 7.9 MHz
1100-D	2.6- 3.7	65 @ 7.9 MHz
1100-E	3.7- 5.5	65 @ 7.9 MHz
1100-F	5.5- 7.4	60 @ 7.9 MHz
1100-G	7.4-12.5	70 @ 7.9 MHz
1100-H	12.5-18.0	65 @ 2.5 MHz
1100-I	18.0-28.0	70 @ 2.5 MHz
1100-J	28.0-38.0	70 @ 2.5 MHz
1100-K	38.0-55.0	70 @ 2.5 MHz

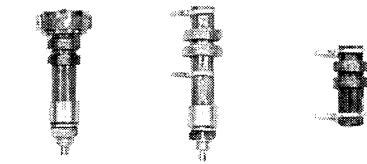
Transmitter 1300 Series

1300-A		For use from 90-200 MHz
1300-B		For use from 40-90 MHz
1300-C		For use from 20-40 MHz
1300-D	0.7- 1.1	170 @ 25 MHz
1300-E	1.1- 1.7	130 @ 7.9 MHz
1300-F	1.7- 2.7	140 @ 7.9 MHz
1300-G	2.7- 4.5	140 @ 7.9 MHz
1300-H	4.5- 6.8	140 @ 7.9 MHz
1300-I	6.8-10.8	140 @ 7.9 MHz
1300-J	10.8-17.0	110 @ 2.5 MHz
1300-K	17.0-29.0	95 @ 2.5 MHz
1300-L	29.0-45.0	100 @ 2.5 MHz
1300-M	45.0-75.0	100 @ 2.5 MHz

HF Coils, Variable Approx. $\pm 15\%$

1010-A	0.118	115 @ 50 MHz
1010-B	0.225	125 @ 25 MHz
1010-C	0.315	130 @ 25 MHz

WIDE ADJUSTMENT RANGE 120 SERIES



120 Series Mica-filled form
.75" O.D. x 1.3" H.
.196" dia. mtg. hole

PCS-120 Series Phenolic form
.5" O.D. x 1.25" L.
.05" Pins,
.70" Apart

PC-120 Series Phenolic form
.5" O.D. x 1.25" L.
.05" Pins,
.70" Apart

Part No.	Range Microhenries	Average Q
120-A	2-3	70 @ 7.9 MHz
120-B	3-5	80 @ 7.9 MHz
120-C	5-9	85 @ 7.9 MHz
120-D	9-18	65 @ 2.5 MHz
120-E	18-36	70 @ 2.5 MHz
120-F	36-64	65 @ 2.5 MHz
120-G	64-105	85 @ 2.5 MHz
120-H	105-200	80 @ .79 MHz
120-I	200-500	75 @ .79 MHz
120-J	500-1000	85 @ .79 MHz
120-K	1000-2000	50 @ .25 MHz



Subminiature 600 Series

- Variable $\pm 10\%$
- Shielded
- 0.3" O.D. x 0.4" H
- .020" Leads .30" Apart

Part No.	Nominal Microhenries	Average Q
600U1X0	1.0	120 @ 7.9 MHz
600U1X5	1.5	120 @ 7.9 MHz
600U2X2	2.2	120 @ 7.9 MHz
600U3X3	3.3	130 @ 7.9 MHz
600U4X7	4.7	125 @ 7.9 MHz
600U6X8	6.8	140 @ 7.9 MHz
600U10X	10	135 @ 7.9 MHz
600U15X	15	130 @ 2.5 MHz
600U22X	22	135 @ 2.5 MHz
600U33X	33	130 @ 2.5 MHz
600U47X	47	130 @ 2.5 MHz
600U68X	68	120 @ 2.5 MHz
600MX10	100	100 @ 2.5 MHz
600MX15	150	125 @ .79 MHz
600MX22	220	130 @ .79 MHz
600MX33	330	125 @ .79 MHz
600MX47	470	120 @ .79 MHz
600MX68	680	100 @ .79 MHz
600M1X0	1000	100 @ .79 MHz

High Q RF Coils, Fixed

- .75" O.D. x .63" H
- Hermetically sealed
- Complete shielding
- For printed circuitry
- For standard circuitry



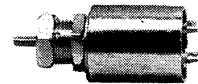
Part No.	Nominal Microhenries	Average Q
1219-A	0.47 $\pm 5\%$	90 @ 20 MHz
1219-B	1.0 $\pm 5\%$	100 @ 10 MHz
1219-C	2.2 $\pm 5\%$	130 @ 8 MHz
1219-D	4.7 $\pm 5\%$	130 @ 5 MHz
1219-E	10 $\pm 5\%$	130 @ 3 MHz
1219-F	22 $\pm 3\%$	185 @ 1.7 MHz
1219-G	47 $\pm 3\%$	185 @ 1 MHz
1219-H	100 $\pm 3\%$	200 @ 0.8 MHz
1219-I	220 $\pm 3\%$	225 @ 0.7 MHz
1219-J	470 $\pm 3\%$	250 @ 0.6 MHz
1219-K	1000 $\pm 3\%$	300 @ 0.5 MHz
1219-L	2200 $\pm 3\%$	300 @ 0.25 MHz

Hi Q 801, 802 Series, Adjustable $\pm 10\%$ 

801, 802 Series
1.18" O.D. x .93" H

Part No.	Nominal Millihenries	Peak Q
801M1X0	1.0	100 @ 10 kHz
801M1X5	1.5	100 @ 10 kHz
801M2X2	2.2	100 @ 10 kHz
801M3X3	3.3	100 @ 10 kHz
801M4X7	4.7	100 @ 10 kHz
801M6X8	6.8	100 @ 10 kHz
801M10X	10	200 @ 20 kHz
801M15X	15	200 @ 20 kHz
801M22X	22	200 @ 20 kHz
801M33X	33	200 @ 20 kHz
801M47X	47	200 @ 20 kHz
801M68X	68	200 @ 20 kHz
801HX10	100	300 @ 30 kHz
801HX15	150	300 @ 30 kHz
801HX22	220	300 @ 30 kHz
801HX33	330	250 @ 20 kHz
801HX47	470	250 @ 20 kHz
801HX68	680	250 @ 20 kHz
801H1X0	1000	150 @ 15 kHz
802M1X0	1.0	400 @ 100 kHz
802M1X5	1.5	400 @ 100 kHz
802M2X2	2.2	400 @ 100 kHz
802M3X3	3.3	400 @ 100 kHz
802M4X7	4.7	400 @ 100 kHz
802M6X8	6.8	400 @ 100 kHz
802M10X	10	400 @ 70 kHz
802M15X	15	400 @ 70 kHz
802M22X	22	400 @ 70 kHz
802M33X	33	400 @ 70 kHz
802M47X	47	400 @ 40 kHz

SHIELDED COILS



- Shielded
- Encapsulated

.44" Diameter 900 Series

Part No.	Range Microhenries	Average Q
900-A	0.5- 0.8	80 @ 25 MHz
900-B	0.8- 1.3	70 @ 18 MHz
900-C	1.3- 2.0	60 @ 15 MHz
900-D	2.0- 4.0	70 @ 8 MHz
900-E	4.0- 7.0	70 @ 5 MHz
900-F	7.0-12.0	70 @ 4 MHz
900-G	12.0-20.0	70 @ 3 MHz
900-H	20.0-35.0	70 @ 2.5 MHz
900-I	35.0-60.0	70 @ 2.0 MHz
900-J	60.0-100.0	70 @ 1.0 MHz

.63" Diameter 1500 Series

Part No.	Range Millihenries	Average Q
1500-A	.100- .175	80 @ 790 kHz
1500-B	.175- .300	80 @ 790 kHz
1500-C	.300- .500	80 @ 790 kHz
1500-D	.500- .800	75 @ 790 kHz
1500-E	.800-1.15	55 @ 500 kHz
1500-F	1.15-1.50	55 @ 250 kHz
1500-G	1.50-2.30	55 @ 250 kHz
1500-H	2.30-3.50	50 @ 250 kHz
1500-I	3.50-7.50	40 @ 250 kHz

For North Hills Wideband Transformers See Section 5600.



North Hills Electronics, INC.

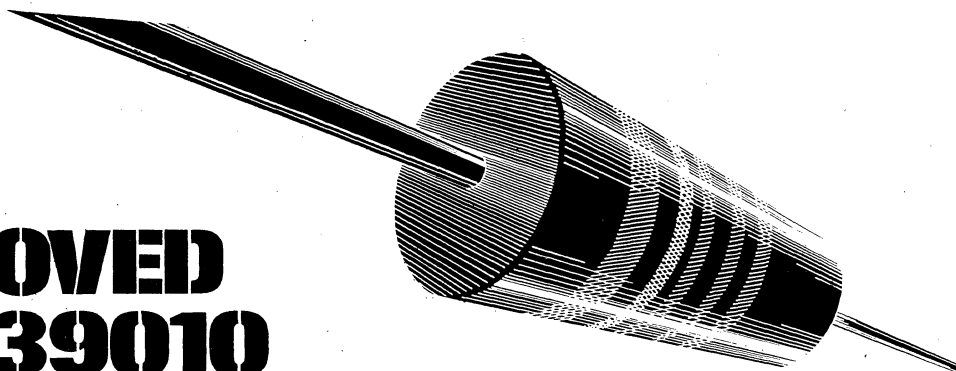
GLEN COVE, N.Y. 11542 • 516-671-5700


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

Inductors

APPROVED MIL-C-39010

FAILURE RATE "P" .1%/1000 HRS.


Nytronics' history of technical leadership in inductors has a new chapter. The first company to extend the standard line concept to variable inductors has remained ahead in every subsequent step of refinement and miniaturization.

Today, there's a new place for a familiar group of inductors under highest reliability military specifications—MIL-C-39010 (latest revision). The unique "T" lead construction eliminates fine wire con-

sideration that has previously concerned design engineers on critical circuitry.

With sizes ranging from the world's smallest shielded inductor to the most complex variable inductor... shielded, unshielded, chip and variable, in hundreds of off-the-shelf values... it makes good sense to check first with Nytronics or your local distributor.

Now tested and approved to highest reliability military specifications.

Nytronics Standard Inductor Part Number	Standard Military Series	New High Reliability Qualification
SWD	MS90537	MIL-C-39010-1A, 2A, + 3A
SWD	MS75087	MIL-C-39010-1A
SWD	MS75088	MIL-C-39010-2A
SWD	MS75089	MIL-C-39010-3A
RFC-S	MS75008	MIL-C-39010-4A
RFC-S	MS75101	MIL-C-39010-5A
RFC-SS	MS18130	MIL-C-39010-6A
RFC-SS	MS14046	MIL-C-39010-7A


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

Inductors

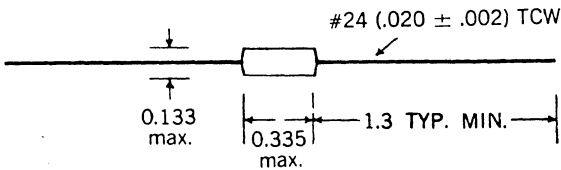
WEE-WEE-DUCTOR SERIES

The smallest shielded inductor for high density circuits 0.10 to 1,000 uh
 0.133" diameter x 0.335" length. We have 49 stock values.

WEE-WEE-DUCTOR STANDARD VALUES

The **WEE-WEE-DUCTOR** offers the Design Engineer a subminiature shielded inductor to solve special problems in density circuit application. This shielded inductor has great inductance-to-size ratio and is designed to meet the stringent requirements of MIL-C-15305 (latest revision).

0.10 to 10,000uH
 0.133" diameter x 0.335" length
 49 stock values



ELECTRICAL CHARACTERISTICS

Inductance Tolerance:	±10% (Q-Meter).
Dielectric Strength:	700 volts RMS at sea level.
Self-Resonant Frequency:	Minimum f_s to be not less than 80% of published data, and measured with full length leads on Q-Meter.
Rating:	1 maximum based on 1/3 watt dissipation.

DENSITY CHARACTERISTICS

Volume:	0.0041 cubic inches.
Weight:	0.50 grams maximum.
Shielding:	Less than 3% coupling with two units mounted side by side at 1000 cycles.

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature:	-55°C to +125°C.
Terminal Strength:	Meets five pound pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).
Moisture, Vibration and Shock Resistance:	Meets requirements of MIL-C-15305 (latest revision). High Frequency: 10 cps to 2000 cps @ 15G ±10% maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes. Shock: 50G, 11 MS.
Marking:	Color coded per MIL-C-15305 (latest revision).

NCG PART NO.	L		Q min.		approx. SRF	Max. DCR	Max. I	Incr.* I
	uH	MHz		MHz	MHz	(Ω)	mA	mA
WEE-WEE-0.10	0.10	42	25		500	.112	1720	>1720
WEE-WEE-0.12	0.12	42	25		500	.126	1630	>1630
WEE-WEE-0.15	0.15	42	25		500	.138	1550	>1550
WEE-WEE-0.18	0.18	42	25		458	.165	1420	>1420
WEE-WEE-0.22	0.22	42	25		414	.198	1330	>1330
WEE-WEE-0.27	0.27	42	25		373	.220	1230	>1230
WEE-WEE-0.33	0.33	42	25		360	.258	1140	>1140
WEE-WEE-0.39	0.39	42	25		339	.292	1060	>1060
WEE-WEE-0.47	0.47	41	25		309	.360	960	>960
WEE-WEE-0.56	0.56	39	25		295	.397	915	>915
WEE-WEE-0.68	0.68	36	25		270	.472	840	>840
WEE-WEE-0.82	0.82	35	25		250	.638	720	>720
WEE-WEE-1.0	1.0	42	25		170	.208	1260	>1260
WEE-WEE-1.2	1.2	38	7.9		150	.225	1210	>1210
WEE-WEE-1.5	1.5	38	7.9		139	.265	1120	>1120
WEE-WEE-1.8	1.8	38	7.9		129	.285	1080	>1080
WEE-WEE-2.2	2.2	36	7.9		118	.330	1000	>1000
WEE-WEE-2.7	2.7	38	7.9		106	.381	935	>935
WEE-WEE-3.3	3.3	38	7.9		98	.432	875	>875
WEE-WEE-3.9	3.9	40	7.9		91	.576	755	>755
WEE-WEE-4.7	4.7	42	7.9		83	.787	650	>650
WEE-WEE-5.6	5.6	42	7.9		77	1.04	565	>565
WEE-WEE-6.8	6.8	45	7.9		67	1.40	485	>485
WEE-WEE-8.2	8.2	47	7.9		62	1.68	440	>440
WEE-WEE-10	10	51	7.9		55	2.58	355	>355
WEE-WEE-12	12	51	2.5		49	3.65	300	>300
WEE-WEE-15	15	45	2.5		55	.862	620	>620
WEE-WEE-18	18	43	2.5		50	1.02	570	>570
WEE-WEE-22	22	42	2.5		45	1.12	545	>545
WEE-WEE-27	27	37	2.5		41	1.28	510	>510
WEE-WEE-33	33	46	2.5		37	1.70	440	>440
WEE-WEE-39	39	38	2.5		33	1.99	405	>405
WEE-WEE-47	47	42	2.5		29	2.41	370	>370
WEE-WEE-56	56	41	2.5		27	2.85	340	>340
WEE-WEE-68	68	46	2.5		23	3.21	320	>320
WEE-WEE-82	82	46	2.5		21	3.57	305	>305
WEE-WEE-100	100	43	2.5		19	4.10	280	>280
WEE-WEE-120	120	50	0.79		16	5.97	235	>235
WEE-WEE-150	150	49	0.79		15	7.05	215	>215
WEE-WEE-180	180	56	0.79		14	8.12	200	>200
WEE-WEE-220	220	53	0.79		12	14.8	150	>150
WEE-WEE-270	270	57	0.79		11.5	16.8	140	>140
WEE-WEE-330	330	57	0.79		10.5	18.6	130	>130
WEE-WEE-390	390	57	0.79		10.0	21.1	120	>120
WEE-WEE-470	470	50	0.79		8.5	32.2	100	>100
WEE-WEE-560	560	50	0.79		7.5	36.4	95	>95
WEE-WEE-680	680	56	0.79		7.0	41.1	90	>90
WEE-WEE-820	820	49	0.79		6.5	45.0	85	>85
WEE-WEE-1000	1000	49	0.79		6.0	52.0	80	>80

* Incremental Current: The D.C. current required to cause a maximum reduction of 5 percent from nominal inductance value.


Nytronics Components Group Inc.

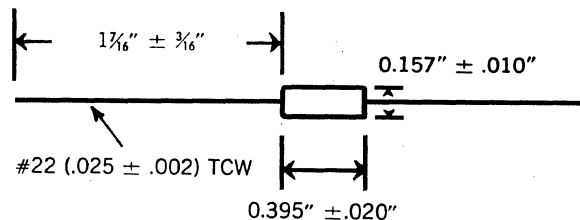
 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

Inductors

MS-INDUCTOR SERIES 75087, 75088, 75089 MOLDED SHIELDED INDUCTOR

 Ultra-Reliable Molded Shielded
 Miniature Inductor.
 Inductance Range: 0.1uH to 100,000uH.

The **MS-INDUCTOR SERIES** are R.F. Inductors specifically designed to meet the demanding requirements of MIL-C-15305 (latest revision). The MS-INDUCTOR Series epoxy molded envelope and shielding offers the design engineer reliability, electrical performance, and minimum coupling in high density packaging.



ELECTRICAL CHARACTERISTICS

Inductance Tolerance: $\pm 10\%$ over the entire inductance range.
Dielectric Strength: 700 volts RMS at sea level.
Self-Resonant Frequency: Measured per MIL-C-15305 (latest revision).
Q: Measured on a Q-Meter.
Maximum Current: Based on temperature rise not to exceed 15°C at 90°C ambient.

DENSITY CHARACTERISTICS

Volume: 0.0076 cubic inches
Weight: 0.75 grams maximum
Shielding: At 1000 cycles two units assembled side by side exhibit less than 3% coupling.

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: -55°C to $+105^\circ\text{C}$.

Terminal Strength: Meets five pound pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).

Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-15305 (latest revision), Grade 1, Class B. High frequency 10 cps to 2000 cps @ $15\text{G} \pm 10\%$ maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes. Shock: 50G, 11 MS.

Marking: Color coded per MIL-C-15305 (latest revision).

Material	MS No.	NCG P/N	L		Q min		Min. SRF	Max. DCR	Max. I	Incr.† I		Material	MS No.	NCG P/N	L		Q min		Min. SRF	Max. DCR	Max. I	Incr.† I
			uH	MHz	MHz	Ω									Ω	MHz	Ω	MHz					MHz
P H E N O L I C	MS75087-1	SWD	0.10	50	25	250	0.025	1790	>2900			F E R R I T E	MS75089-11	SWD	100	52	2.5	10.0	3.12	160	120	
	MS75087-2	SWD	0.12	51	25	250	0.034	1530	>2800				MS75089-12	SWD	120	57	0.79	9.7	3.60	150	95	
	MS75087-3	SWD	0.15	51	25	250	0.037	1470	>2750				MS75089-13	SWD	150	56	0.79	8.5	4.10	140	90	
	MS75087-4	SWD	0.18	50	25	250	0.047	1300	>2200				MS75089-14	SWD	180	60	0.79	8.0	4.40	135	85	
	MS75087-5	SWD	0.22	49	25	250	0.067	1100	>1700				MS75089-15	SWD	220	58	0.79	7.5	5.00	125	80	
	MS75087-6	SWD	0.27	47	25	250	0.11	855	>1500				MS75089-16	SWD	270	60	0.79	7.0	5.80	115	70	
	MS75087-7	SWD	0.33	46	25	250	0.13	780	>1300				MS75089-17	SWD	330	54	0.79	6.5	6.40	110	65	
	MS75087-8	SWD	0.39	44	25	250	0.18	670	>1100				MS75089-18	SWD	390	67	0.79	6.2	7.40	105	60	
	MS75087-9	SWD	0.47	44	25	235	0.25	565	>1000				MS75089-19	SWD	470	60	0.79	5.7	9.50	92	58	
	MS75087-10	SWD	0.56	43	25	210	0.33	490	> 900				MS75089-20	SWD	560	60	0.79	4.7	10.5	90	55	
	MS75087-11	SWD	0.68	42	25	190	0.45	420	> 750				MS75089-21	SWD	680	60	0.79	4.5	11.8	80	50	
	MS75087-12	SWD	0.82	40	25	180	0.59	370	> 600				MS75089-22	SWD	820	57	0.79	4.2	13.0	80	45	
I R O N	MS75088-1	SWD	1.0	44	25	140	0.070	1070	>1900			MS75089-23	SWD	1000	60	0.79	3.8	17.5	70	40		
	MS75088-2	SWD	1.2	44	7.9	130	0.093	895	>1600			MS75089-24	SWD	1200	45	0.25	1.5	22.1	60	35		
	MS75088-3	SWD	1.5	44	7.9	115	0.12	815	>1300			MS75089-25	SWD	1500	49	0.25	1.2	26.5	55	33		
	MS75088-4	SWD	1.8	44	7.9	105	0.14	775	>1200			MS75089-26	SWD	1800	47	0.25	1.0	29.9	50	30		
	MS75088-5	SWD	2.2	44	7.9	100	0.19	650	>1100			MS75089-27	SWD	2200	50	0.25	0.97	33.8	50	27		
	MS75088-6	SWD	2.7	44	7.9	92	0.28	535	> 950			MS75089-28	SWD	2700	47	0.25	0.92	47.3	40	25		
	MS75088-7	SWD	3.3	44	7.9	85	0.35	480	> 800			MS75089-29	SWD	3300	43	0.25	0.84	53.0	40	22		
	MS75088-8	SWD	3.9	44	7.9	75	0.40	450	> 750			MS75089-30	SWD	3900	43	0.25	0.80	73.8	35	20		
	MS75088-9	SWD	4.7	44	7.9	70	0.55	380	> 650			MS75089-31	SWD	4700	44	0.25	0.74	81.6	31	19		
	MS75088-10	SWD	5.6	44	7.9	65	0.72	335	> 550			MS75089-32	SWD	5600	45	0.25	0.73	98.9	28	17		
	MS75088-11	SWD	6.8	50	7.9	55	1.02	280	> 500			MS75089-33	SWD	6800	43	0.25	0.66	111.0	27	16		
	MS75088-12	SWD	8.2	50	7.9	50	1.32	250	> 475			MS75089-34	SWD	8200	42	0.25	0.54	119.0	26	15		
	MS75088-13	SWD	10	50	7.9	46	1.62	220	> 450			MS75089-35	SWD	10,000	39	0.25	0.47	137.0	24	14		
	MS75088-14	SWD	12	55	2.5	44	2.00	200	> 400			MS75089-36	SWD	12,000	31	0.079	0.33	143.0	23	13		
F E R R I T E	MS75089-1	SWD	15	44	2.5	49	0.80	315	250			MS75089-37	SWD	15,000	31	0.079	0.29	157.0	22	12		
	MS75089-2	SWD	18	45	2.5	45	0.89	300	235			MS75089-38	SWD	18,000	31	0.079	0.28	175.0	21	10		
	MS75089-3	SWD	22	46	2.5	41	0.96	290	220			MS75089-39	SWD	22,000	27	0.079	0.25	274.0	17	9		
	MS75089-4	SWD	27	49	2.5	38	1.19	260	200			MS75089-40	SWD	27,000	27	0.079	0.21	308.0	16	8		
	MS75089-5	SWD	33	45	2.5	34	1.37	240	190			MS75089-41	SWD	33,000	27	0.079	0.19	343.0	15	7.5		
	MS75089-6	SWD	39	53	2.5	29	1.93	205	180			MS75089-42	SWD	39,000	27	0.079	0.17	376.0	15	6.0		
	MS75089-7	SWD	47	52	2.5	27	2.11	195	175			MS75089-43	SWD	47,000	23	0.079	0.16	473.0	13	5.5		
	MS75089-8	SWD	56	49	2.5	25	2.23	190	160			MS75089-44	SWD	56,000	23	0.079	0.14	512.0	13	5.0		
	MS75089-9	SWD	68	51	2.5	21	2.70	170	150			MS75089-45	SWD	68,000	23	0.079	0.13	580.0	12	4.0		
	MS75089-10	SWD	82	45	2.5	10.5	2.44	180	140			MS75089-46	SWD	82,000	21	0.079	0.12	618.0	11	3.5		
											MS75089-47	SWD	100,000	18	0.079	0.11	678.0	11	3.0			

† INCREMENTAL CURRENT: The D.C. current required to cause a 5% reduction in the nominal inductance value.


Nytronics Components Group Inc.

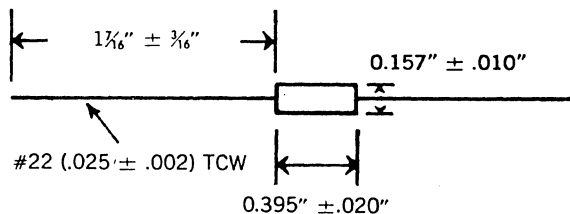
 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

Inductors

MS-INDUCTOR SERIES 90537 MOLDED SHIELDED INDUCTOR (Manufactured per MS-90537)

Ultra-Reliable Molded Shielded Miniature Inductor.
Inductance Range: 0.1uH to 100,000uH.
Unique "T" design eliminates Fine Wire considerations.

The MS-INDUCTOR SERIES are R.F. Inductors specifically designed to meet the demanding requirements of MIL-C-15305 (latest revision). The MS-INDUCTOR Series epoxy molded envelope and shielding offers the design engineer reliability, electrical performance, and minimum coupling in high density packaging.



ELECTRICAL CHARACTERISTICS

Inductance Tolerance: $\pm 10\%$ over the entire inductance range.
Dielectric Strength: 700 volts RMS at sea level.
Self-Resonant Frequency: Measured per MIL-C-15305 (latest revision).
Q: Measured on Q-Meter.
Maximum Current: Based on temperature rise not to exceed 35°C at 90°C ambient.

DENSITY CHARACTERISTICS

Volume: 0.0076 cubic inches Weight: 0.75 grams maximum
Shielding: At 1000 cycles two units assembled side by side exhibit less than 3% coupling.

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: -55°C to $+125^{\circ}\text{C}$.

Terminal Strength: Meets five pound pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).

Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-15305 D, Grade 1, Class B. High frequency 10 cps to 2000 cps @ 15G $\pm 10\%$ maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes. Shock: 50G, 11 MS.

Marking: Color coded per MIL-C-15305 (latest revision).

Material	MS Catalog No.	NCG P/N	L μH	Q Min. MHz	Min. SRF MHz	Max. DCR Ω	Max. I mA	Incr.** I mA
PHENOLIC	90537-1	SWD	0.10	50	25	250	0.025	2900
	90537-2	SWD	0.12	51	25	250	0.034	2800
	90537-3	SWD	0.15	51	25	250	0.037	2750
	90537-4	SWD	0.18	50	25	250	0.047	2200
	90537-5	SWD	0.22	49	25	250	0.067	1700
	90537-6	SWD	0.27	47	25	250	0.11	1500
	90537-7	SWD	0.33	46	25	250	0.13	1300
	90537-8	SWD	0.39	44	25	250	0.18	1100
	90537-9	SWD	0.47	44	25	235	0.25	1000
	90537-10	SWD	0.56	43	25	210	0.33	900
	90537-11	SWD	0.68	42	25	190	0.45	750
	90537-12	SWD	0.82	40	25	180	0.59	600
IRON	90537-13	SWD	1.0	47	25	140	0.070	1900
	90537-14	SWD	1.2	46	7.9	130	0.093	1600
	90537-15	SWD	1.5	45	7.9	115	0.12	1300
	90537-16	SWD	1.8	43	7.9	105	0.14	1200
	90537-17	SWD	2.2	45	7.9	100	0.19	1100
	90537-18	SWD	2.7	46	7.9	92	0.28	950
	90537-19	SWD	3.3	44	7.9	85	0.35	800
	90537-20	SWD	3.9	44	7.9	75	0.40	750
	90537-21	SWD	4.7	44	7.9	70	0.55	650
	90537-22	SWD	5.6	47	7.9	65	0.72	550
	90537-23	SWD	6.8	50	7.9	55	1.02	500
	90537-24	SWD	8.2	50	7.9	50	1.32	475
	90537-25	SWD	10	49	7.9	46	1.62	450
	90537-26	SWD	12	55	2.5	44	2.00	400
FERRITE	90537-27	SWD	15	44	2.5	49	0.80	620
	90537-28	SWD	18	45	2.5	45	0.89	610
	90537-29	SWD	22	46	2.5	41	0.96	600
	90537-30	SWD	27	49	2.5	38	1.19	500
	90537-31	SWD	33	45	2.5	34	1.37	490
	90537-32	SWD	39	53	2.5	29	1.93	410
	90537-33	SWD	47	52	2.5	27	2.11	400
	90537-34	SWD	56	49	2.5	25	2.23	380
	90537-35	SWD	68	51	2.5	21	2.70	370
	90537-36	SWD	82	45	2.5	10.5	2.44	360

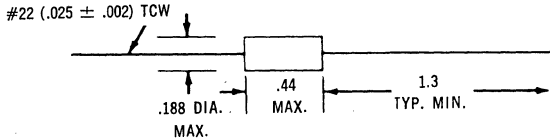
Material	MS Catalog No.	NCG P/N	L μH	Q Min. MHz	Min. SRF MHz	Max. DCR Ω	Max. I mA	Incr.** I mA
FERRITE	90537-37	SWD	100	52	2.5	10.0	3.12	325
	90537-38	SWD	120	57	.79	9.7	3.60	290
	90537-39	SWD	150	56	.79	8.5	4.10	275
	90537-40	SWD	180	60	.70	8.0	4.40	260
	90537-41	SWD	220	58	.79	7.5	5.00	250
	90537-42	SWD	270	60	.79	7.0	5.80	240
	90537-43	SWD	330	54	.79	6.5	6.40	225
	90537-44	SWD	390	67	.79	6.2	7.40	200
	90537-45	SWD	470	60	.79	5.7	9.50	180
	90537-46	SWD	560	60	.79	4.7	10.5	174
	90537-47	SWD	680	60	.79	4.5	11.8	168
	90537-48	SWD	820	57	.79	4.2	13.0	152
	90537-49	SWD	1000	65	.79	3.8	17.5	135
	90537-50	SWD	1200	45	.25	1.5	22.1	115
	90537-51	SWD	1500	49	.25	1.2	26.5	110
	90537-52	SWD	1800	47	.25	1.0	29.9	105
	90537-53	SWD	2200	50	.25	0.97	33.8	99
	90537-54	SWD	2700	47	.25	0.92	47.3	83
	90537-55	SWD	3300	43	.25	0.84	53.0	80
	90537-56	SWD	3900	43	.25	0.80	73.8	67
	90537-57	SWD	4700	44	.25	0.74	81.6	63
	90537-58	SWD	5600	45	.25	0.73	98.9	56
	90537-59	SWD	6800	43	.25	0.66	111.0	54
	90537-60	SWD	8200	42	.25	0.54	119.0	52
	90537-61	SWD	10,000	39	.25	0.47	137.0	49
	90537-62	SWD	12,000	31	.079	0.33	143.0	46
	90537-63	SWD	15,000	31	.079	0.29	157.0	45
	90537-64	SWD	18,000	31	.079	0.28	175.0	41
	90537-65	SWD	22,000	27	.079	0.25	274.0	33
	90537-66	SWD	27,000	27	.079	0.21	308.0	31
	90537-67	SWD	33,000	27	.079	0.19	343.0	30
	90537-68	SWD	39,000	27	.079	0.17	376.0	27
	90537-69	SWD	47,000	23	.079	0.16	473.0	26
	90537-70	SWD	56,000	23	.079	0.14	512.0	25
	90537-71	SWD	68,000	23	.079	0.13	580.0	24
	90537-72	SWD	82,000	21	.079	0.12	618.0	23
	90537-73	SWD	100,000	18	.079	0.11	678.0	22

**INCREMENTAL CURRENT — The D.C. current required to cause a 5% reduction in the nominal inductance value.

SPECIFICATIONS FIXED INDUCTORS RFC-S SERIES

Proven reliability molded inductors specifically designed to meet MIL-C-15305 (latest revision). Inductance 0.1 to 1000uH.

ACTUAL SIZE



ELECTRICAL CHARACTERISTICS

Inductance Tolerance:	0.1 to 22uH $\pm 10\%$ on Q-Meter 27uH to 1000 $\pm 5\%$ 1,000 cps bridge
Dielectric Strength:	120uH to 1000 uH $\pm 5\%$ on Q-Meter 700 volts RMS at sea level.
Self-Resonant Frequency:	Minimum f_0 to be not less than 80% of published data and measured with full length leads on Grid-Dip Meter.
Q:	Measured on Q-Meter.
Rating:	$\frac{1}{3}$ watt dissipation for series S

DENSITY CHARACTERISTICS

Volume:	S Type — 0.012 cu. in.
Weight:	S Type — 0.90 grams

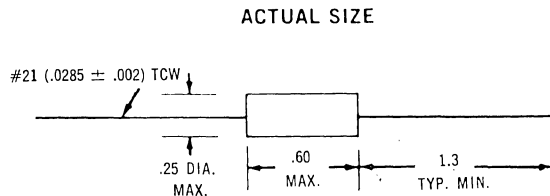
PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature:	—55°C to +125°C.
Terminal Strength:	Meets five pound pull test per MIL-C-15305. (latest revision).
Moisture, Vibration, and Shock Resistance:	Meets requirements of MIL-C-15305 Grade 1, Class B. High frequency 10 cps to 2000 cps @ 15G $\pm 10\%$ maximum for 12 logarithmic swings, each of 20 minute duration repeated for each of three mutually perpendicular planes. (body mounted)

MS NO.	NCG PART NO.	L		Q min		approx. SRF	Max. DCR	max. I	MATERIAL
		uH			MHz	MHz	Ω	mA	
MS21389-1	RFC-S- 0.10	0.10	85	50	500	.02	4000		PHENOLIC
MS21389-2	RFC-S- 0.12	0.12	85	50	500	0.25	3500		
MS21389-3	RFC-S- 0.15	0.15	85	50	500	.03	3000		
MS21389-4	RFC-S- 0.18	0.18	75	50	500	.03	3000		
MS21389-5	RFC-S- 0.22	0.22	75	50	500	.03	3000		
MS21389-6	RFC-S- 0.27	0.27	70	45	470	.04	2700		
MS21389-7	RFC-S- 0.33	0.33	70	40	440	.05	2500		
MS21389-8	RFC-S- 0.39	0.39	65	40	400	.08	2000		
MS21389-9	RFC-S- 0.47	0.47	60	25	360	.08	2000		
MS21389-10	RFC-S- 0.56	0.56	55	25	330	.10	1700		
MS21389-11	RFC-S- 0.68	0.68	55	25	300	.12	1500		
MS21389-12	RFC-S- 0.82	0.82	50	25	275	.18	1300		
MS21389-13	RFC-S- 1.0	1.0	50	20	250	.24	1100		
MS21389-14	RFC-S- 1.2	1.2	45	20	220	.35	1000		
MS21389-15	RFC-S- 1.5	1.5	45	15	200	.43	850		
MS21389-16	RFC-S- 1.8	1.8	45	15	180	.65	720		
MS21389-17	RFC-S- 2.2	2.2	45	15	165	.80	610		IRON
MS21390-1	RFC-S- 2.7	2.7	55	10	110	.12	1600		
MS21390-2	RFC-S- 3.3	3.3	55	10	100	.15	1400		
MS21390-3	RFC-S- 3.9	3.9	60	10	95	.23	1200		
MS21390-4	RFC-S- 4.7	4.7	70	7.9	90	.30	1000		
MS21390-5	RFC-S- 5.6	5.6	65	7.9	80	.45	900		
MS21390-6	RFC-S- 6.8	6.8	65	7.9	70	.55	800		
MS21390-7	RFC-S- 8.2	8.2	60	7.9	65	.65	720		
MS21390-8	RFC-S- 10	10	60	5	60	.73	650		
MS21390-9	RFC-S- 12	12	65	5	53	1.1	590		
MS21390-10	RFC-S- 15	15	80	2.5	47	1.4	500		
MS21390-11	RFC-S- 18	18	75	2.5	43	1.6	460		
MS21390-12	RFC-S- 22	22	75	2.5	40	1.8	430		
MS21390-13	RFC-S- 27	27	75	2.5	36	2.7	360		
MS21390-14	RFC-S- 33	33	85	2.5	32	3.5	300		
MS21390-15	RFC-S- 39	39	80	2.5	26	3.8	290		
MS21390-16	RFC-S- 47	47	80	2.5	22	4.0	275		
MS21390-17	RFC-S- 56	56	75	2.5	19	4.4	265		
MS21390-18	RFC-S- 68	68	75	2.5	16	4.7	250		
MS21390-19	RFC-S- 82	82	75	2.5	13	5.3	235		
MS21390-20	RFC-S- 100	100	75	1.5	10	6.0	220		
MS21390-21	RFC-S- 120	120	65	0.79	7.2	5.0	170		
MS21390-22	RFC-S- 150	150	65	0.79	6.7	5.8	164		
MS21390-23	RFC-S- 180	180	65	0.79	6.3	6.6	158		
MS21390-24	RFC-S- 220	220	65	0.79	5.9	7.4	155		
MS21390-25	RFC-S- 270	270	65	0.79	5.6	8.0	150		
MS21390-26	RFC-S- 300	300	65	0.79	5.3	8.6	145		
MS21390-27	RFC-S- 330	330	65	0.79	5.0	8.9	142		
MS21390-28	RFC-S- 360	360	65	0.79	4.7	9.6	137		
MS21390-29	RFC-S- 390	390	65	0.79	4.5	9.9	135		
MS21390-30	RFC-S- 430	430	65	0.79	4.3	10.4	131		
MS21390-31	RFC-S- 470	470	65	0.79	4.0	10.9	128		
MS21390-32	RFC-S- 510	510	65	0.79	3.8	11.6	124		
MS21390-33	RFC-S- 560	560	65	0.79	3.6	11.8	123		
MS21390-34	RFC-S- 620	620	60	0.79	3.5	12.5	120		
MS21390-35	RFC-S- 680	680	60	0.79	3.4	13.5	115		
MS21390-36	RFC-S- 750	750	60	0.79	3.3	14.0	113		
MS21390-37	RFC-S- 820	820	60	0.79	3.1	15.0	110		
MS21390-38	RFC-S- 910	910	60	0.79	3.0	15.5	107		
MS21390-39	RFC-S-1000	1000	60	0.79	2.8	16.5	104		

SPECIFICATIONS FIXED INDUCTORS RFC-M SERIES

Proven reliability molded inductors specifically designed to meet MIL-C-15305 (latest revision). Inductance 1.0 to 2200uH.



ELECTRICAL CHARACTERISTICS

Inductance Tolerance: 1.0 to 22uH ± 10% on Q-Meter
27uH to 2200 ± 5%
1,000 cps bridge

Dielectric Strength: 700 volts RMS at sea level.

Self-Resonant Frequency: Minimum f_0 to be not less than 80% of published data and measured with full length leads on Grid-Dip Meter.

Q: Measured on Q-Meter.

Rating: 1/3 watt dissipation for series M

DENSITY CHARACTERISTICS

Volume: M Type — 0.029 cu. in.

Weight: M Type — 2.00 grams

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: -55°C to +125°C.

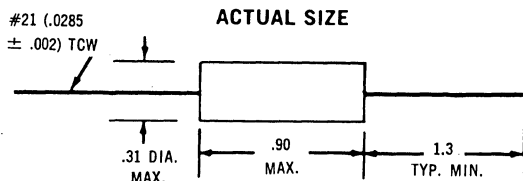
Terminal Strength: Meets five pound pull test per MIL-C-15305.

Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-15305 (latest revision). High frequency 10 cps to 2000 cps @ 15G ± 10% maximum for 12 logarithmic swings, each of 20 minute duration repeated for each of three mutually perpendicular planes. (body mounted)

MS NO.	NCG PART NO.	L		Q Min.		approx. SRF	Max. DCR	Max. I	MATERIAL
		uH		MHz		MHz	Ω	mA	
MS21388-1	RFC-M- 1.0	1.0	100	15		170	.04	2700	IRON
MS21388-2	RFC-M- 1.2	1.2	100	15		155	.04	2700	
MS21388-3	RFC-M- 1.5	1.5	100	10		140	.04	2700	
MS21388-4	RFC-M- 1.8	1.8	95	10		125	.05	2500	
MS21388-5	RFC-M- 2.2	2.2	95	10		110	.05	2500	
MS21388-6	RFC-M- 2.7	2.7	68	7.9		95	.05	2500	
MS21388-7	RFC-M- 3.3	3.3	60	7.9		90	.05	2500	
MS21388-8	RFC-M- 3.9	3.9	60	7.9		87	.07	2100	
MS21388-9	RFC-M- 4.7	4.7	60	7.9		75	.09	1800	
MS21388-10	RFC-M- 5.6	5.6	65	7.9		70	.14	1550	
MS21388-11	RFC-M- 6.8	6.8	70	7.9		65	.17	1300	
MS21388-12	RFC-M- 8.2	8.2	65	7.9		57	.25	1150	
MS21388-13	RFC-M- 10	10	65	5		50	.32	1000	
MS21388-14	RFC-M- 12	12	65	5		45	.47	870	
MS21388-15	RFC-M- 15	15	75	4		40	.62	730	
MS21388-16	RFC-M- 18	18	65	4		37	.72	660	
MS21388-17	RFC-M- 22	22	65	2.5		35	.8	600	
MS21388-18	RFC-M- 27	27	65	2.5		31	1.2	520	
MS21388-19	RFC-M- 33	33	80	2.5		27	1.5	450	
MS21388-20	RFC-M- 39	39	80	2.5		25	2.3	380	
MS21388-21	RFC-M- 47	47	100	2.5		24	3.0	300	
MS21388-22	RFC-M- 56	56	100	2.5		22	4.2	270	
MS21388-23	RFC-M- 68	68	100	2.5		20	5.2	250	
MS21388-24	RFC-M- 82	82	100	2.5		18	6.2	220	
MS21388-25	RFC-M- 100	100	100	1.5		17	7	200	
MS21388-26	RFC-M- 120	120	95	1.5		14	7.5	200	
MS21388-27	RFC-M- 150	150	90	1.0		11	8	190	
MS21388-28	RFC-M- 180	180	85	1.0		9	9	185	
MS21388-29	RFC-M- 220	220	85	1.0		7	10	180	
MS21388-30	RFC-M- 270	270	80	1.0		5.5	11	172	
MS21388-31	RFC-M- 330	330	80	.8		4.5	12	165	
MS21388-32	RFC-M- 390	390	75	.8		4.0	13	157	
MS21388-33	RFC-M- 470	470	75	.8		3.5	14	150	
MS21388-34	RFC-M- 560	560	65	.8		3.1	16	145	
MS21388-35	RFC-M- 680	680	65	.8		2.7	17	140	
MS21388-36	RFC-M- 820	820	65	.8		2.5	19	132	
MS21388-37	RFC-M-1000	1000	70	.5		2.3	21	125	
MS21388-38	RFC-M-1200	1200	60	.25		2.7	22	120	
MS21388-39	RFC-M-2200	2200	70	.25		2.0	30	100	

SPECIFICATIONS FIXED INDUCTORS RFC-L SERIES

Proven reliability molded inductors specifically designed to meet MIL-C-15305 (latest revision). Inductance 1.0 to 10,000uH.



ELECTRICAL CHARACTERISTICS

Inductance Tolerance:	0.1 to 22uH $\pm 10\%$ on Q-Meter 27uH to 10,000 $\pm 5\%$ 1,000 cps bridge
Dielectric Strength:	700 volts RMS at sea level.
Self-Resonant Frequency:	Minimum f_0 to be not less than 80% of published data and measured with full length leads on Grid-Dip Meter.
Q:	Measured on Q-Meter.
Rating:	$\frac{1}{2}$ watt dissipation for L series.

DENSITY CHARACTERISTICS

Volume:	L Type — 0.068 cu. in.
Weight:	L Type 4.10 grams

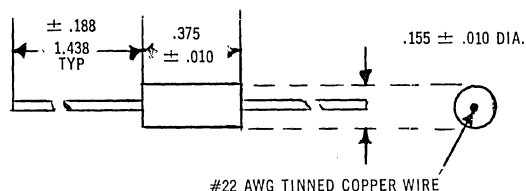
PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature:	-55°C to +125°C.
Terminal Strength:	Meets five pound pull test per MIL-C-15305 (latest revision).
Moisture, Vibration, and Shock Resistance:	Meets requirements of MIL-C-15305 (latest revision). High frequency 10 cps to 2000 cps @ 15G $\pm 10\%$ maximum for 12 logarithmic swings, each of 20 minute duration repeated for each of three mutually perpendicular planes. (body mounted)

MS NO.	NCG PART NO.	L	Q min		approx. SRF	Max. DCR	max. I	MAT.
			μ H	MHz	MHz	Ω	mA	
MS21380-1	RFC-L- 1.0	1.0	130	15	170	.03	4000	IRON
MS21380-2	RFC-L- 1.2	1.2	130	15	155	.03	4000	
MS21380-3	RFC-L- 1.5	1.5	130	10	140	.03	4000	
MS21380-4	RFC-L- 1.8	1.8	130	10	125	.03	4000	
MS21380-5	RFC-L- 2.2	2.2	130	10	115	.04	3500	
MS21380-6	RFC-L- 2.7	2.7	100	10	102	.04	3500	
MS21380-7	RFC-L- 3.3	3.3	100	7.9	90	.04	3500	
MS21380-8	RFC-L- 3.9	3.9	80	7.9	85	.05	3100	
MS21380-9	RFC-L- 4.7	4.7	75	7.9	80	.05	3100	
MS21380-10	RFC-L- 5.6	5.6	65	7.9	72	.06	3000	
MS21380-11	RFC-L- 6.8	6.8	65	7.9	65	.06	3000	
MS21380-12	RFC-L- 8.2	8.2	65	7.9	57	.11	2400	
MS21380-13	RFC-L- 10	10	75	5	50	.15	1800	
MS21380-14	RFC-L- 12	12	75	5	45	.23	1600	
MS21380-15	RFC-L- 15	15	75	5	40	.3	1300	
MS21380-16	RFC-L- 18	18	75	5	36	.4	1150	
MS21380-17	RFC-L- 22	22	75	2.5	32	.5	1000	
MS21380-18	RFC-L- 27	27	70	2.5	30	.6	900	
MS21380-19	RFC-L- 33	33	70	2.5	28	.7	850	
MS21380-20	RFC-L- 39	39	70	2.5	26	1.1	720	
MS21380-21	RFC-L- 47	47	75	2.5	25	1.3	620	
MS21380-22	RFC-L- 56	56	80	2.5	22	1.8	540	
MS21380-23	RFC-L- 68	68	100	2.5	20	2.4	450	
MS21380-24	RFC-L- 82	82	100	2.5	18	2.8	425	
MS21380-25	RFC-L- 100	100	100	1.5	17	3.2	400	
MS21380-26	RFC-L- 120	120	100	1.5	15	4.8	360	
MS21380-27	RFC-L- 150	150	100	1.0	14	6.4	280	
MS21380-28	RFC-L- 180	180	95	1.0	12	9.5	240	
MS21380-29	RFC-L- 220	220	95	1.0	11	12	200	
MS21380-30	RFC-L- 270	270	70	1.0	9	13	195	
MS21380-31	RFC-L- 330	330	65	.79	7.5	14	190	
MS21380-32	RFC-L- 390	390	65	.79	6.5	15.5	180	
MS21380-33	RFC-L- 470	470	60	.79	5.5	17	170	
MS21380-34	RFC-L- 560	560	75	.5	4	18.5	165	
MS21380-35	RFC-L- 680	680	75	.5	3.2	20	155	
MS21380-36	RFC-L- 820	820	75	.5	2.8	22	150	
MS21380-37	RFC-L- 1000	1000	75	.5	2.4	24	145	
MS21380-38	RFC-L- 1200	1200	75	.5	2.1	27	137	
MS21380-39	RFC-L- 1500	1500	75	.4	1.9	29	130	
MS21380-40	RFC-L- 1800	1800	65	.4	1.7	32	125	
MS21380-41	RFC-L- 2200	2200	65	.25	1.5	35	120	
MS21380-42	RFC-L- 2700	2700	65	.25	1.3	40	112	
MS21380-43	RFC-L- 3300	3300	65	.25	1.2	45	105	
MS21380-44	RFC-L- 3900	3900	65	.25	1.05	49	100	
MS21380-45	RFC-L- 4700	4700	65	.25	.95	53	95	
MS21380-46	RFC-L- 5600	5600	65	.25	.85	60	90	
MS21380-47	RFC-L- 6800	6800	65	.25	.75	67	85	
MS21380-48	RFC-L- 8200	8200	65	.25	.65	75	82	
MS21380-49	RFC-L-10000	10000	65	.15	.58	80	80	

SPECIFICATIONS FIXED INDUCTORS RFC-SS SERIES

Molded inductors specifically designed to meet MIL-C-15305 (latest revision). Inductance from 0.15 to 240uH.



ELECTRICAL CHARACTERISTICS

Inductance Tolerance: 0.15 to 330 uH $\pm 10\%$
360 to 2400 uH $\pm 5\%$
Measured on Q meter per MIL-C-15305 (latest revision).

Dielectric Strength: 700 volts RMS @ sea level

Rated Current: Based on max. temp. rise of 35°C (ambient 90°C) for RFC-SS-0.15 to -330
 15°C (ambient 90°C) for RFC-SS-36 to -240

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: Max. 125°C for RFC-SS-0.15 to -330
Max. 105°C for RFC-SS-36 to -240

Terminal Strength: Meets five pound pull test per MIL-C-15305 (latest revision).

Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-15305 (latest revision), high frequency 10 cps for 12 logarithmic swings, each of 20 minute duration repeated for each of three mutually perpendicular planes.

Printing: Color banded.

MS NO.	NCG PART NO.	L	Q Min.	@	Min. SRF	Max. DCR	Rated DC Cur.
		uH		MHz	MHz	Ω	mA
MS18130-1	RFC-SS-.15	0.15	50	25	525	0.03	2450
MS18130-2	RFC-SS-.22	0.22	50	25	450	0.05	1900
MS18130-3	RFC-SS-.33	0.33	45	25	360	0.09	1400
MS18130-4	RFC-SS-.47	0.47	45	25	310	0.12	1225
MS18130-5	RFC-SS-.56	0.56	50	25	280	0.13	1220
MS18130-6	RFC-SS-.68	0.68	50	25	250	0.15	1100
MS18130-7	RFC-SS-.82	0.82	50	25	220	0.22	900
MS18130-8	RFC-SS-1.00	1.00	50	25	200	0.29	830
MS18130-9	RFC-SS-1.20	1.20	33	7.9	180	0.42	650
MS18130-10	RFC-SS-1.50	1.5	33	7.9	160	0.50	600
MS18130-11	RFC-SS-1.80	1.8	33	7.9	150	0.65	525
MS18130-12	RFC-SS-2.2	2.2	33	7.9	135	0.95	435
MS18130-13	RFC-SS-2.7	2.7	33	7.9	120	1.20	385
MS18130-14	RFC-SS-3.3	3.3	33	7.9	110	2.00	300
MS18130-15	RFC-SS-3.9	3.9	33	7.9	100	2.30	280
MS18130-16	RFC-SS-4.7	4.7	33	7.9	90	2.60	260
MS14046-1	RFC-SS-5.6	5.6	45	7.9	60	0.32	750
MS14046-2	RFC-SS-6.8	6.8	50	7.9	55	0.50	600
MS14046-3	RFC-SS-8.2	8.2	50	7.9	50	0.60	545
MS14046-4	RFC-SS-10	10.0	55	7.9	45	0.90	445
MS14046-5	RFC-SS-12	12	65	2.5	42	1.10	404
MS14046-6	RFC-SS-15	15	65	2.5	40	1.40	370
MS14046-7	RFC-SS-18	18	75	2.5	34	2.25	280
MS14046-8	RFC-SS-22	22	75	2.5	30	2.50	265
MS14046-9	RFC-SS-27	27	60	2.5	25	2.60	260
MS14046-10	RFC-SS-33	33	65	2.5	19	3.00	250
MS90538-1	RFC-SS-36	36	60	2.5	15.5	2.50	180
MS90538-2	RFC-SS-39	39	60	2.5	14.5	2.60	176
MS90538-3	RFC-SS-43	43	60	2.5	13.7	2.70	172
MS90538-4	RFC-SS-47	47	55	2.5	13.0	2.75	170
MS90538-5	RFC-SS-51	51	55	2.5	12.7	2.85	167
MS90538-6	RFC-SS-56	56	55	2.5	12.0	3.00	164
MS90538-7	RFC-SS-62	62	55	2.5	11.5	3.15	160
MS90538-8	RFC-SS-68	68	55	2.5	11.0	3.30	156
MS90538-9	RFC-SS-75	75	55	2.5	10.5	3.70	147
MS90538-10	RFC-SS-82	82	50	2.5	10.3	3.9	143
MS90538-11	RFC-SS-91	91	50	2.5	10.0	4.3	136
MS90538-12	RFC-SS-100	100	50	2.5	9.5	4.5	133
MS90538-13	RFC-SS-110	110	60	0.79	8.9	4.9	128
MS90538-14	RFC-SS-120	120	65	0.79	8.7	5.2	124
MS90538-15	RFC-SS-130	130	65	0.79	8.5	5.45	121
MS90538-16	RFC-SS-150	150	65	0.79	8.0	6.05	114
MS90538-17	RFC-SS-160	160	65	0.79	7.5	6.40	111
MS90538-18	RFC-SS-180	180	65	0.79	7.0	6.75	108
MS90538-19	RFC-SS-200	200	65	0.79	6.5	7.10	106
MS90538-20	RFC-SS-220	220	65	0.79	6.2	7.45	103
MS90538-21	RFC-SS-240	240	65	0.79	5.9	7.8	101


Nytronics Components Group Inc.

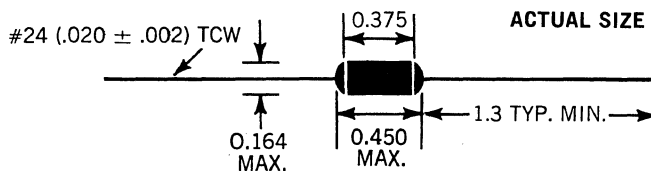
 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

Inductors

WEE-DUCTOR

 Miniature Shielded Inductor with high inductance-to-size ratio.
 0.10uH to 180,000uH in 76 values
 Designed to meet MIL-C-15305C.

The WEE-DUCTOR was the first miniature shielded inductor that Nytronics standardized for stock delivery. This encapsulated non-flammable shielded unit in a 0.164" diameter by 0.450" long envelope offers the design engineer extremely high inductance for density packaging. The WEE-DUCTOR is designed to meet the environmental requirements of MIL-C-15305 (latest revision).



ELECTRICAL CHARACTERISTICS

Inductance Tolerance: 0.1 to 22uH $\pm 10\%$ (Q-Meter); 27uH to 1,000 $\pm 5\%$ (1KC Bridge); 1,200uH to 56,000uH $\pm 10\%$ (1KC Bridge) 68,000uH to 180,000uH $\pm 20\%$ (1KC Bridge) measured at point on leads $\frac{1}{2}$ inch from body.

Dielectric Strength: 700 volts RMS at sea level.

Self-Resonant Frequency: Minimum f_0 to be not less than 80% of published data, and measured with full length leads on Q-Meter.

Q: Measured on Q-Meter.

Maximum Current: Based on temperature rise not to exceed 40°C at 85°C ambient.

DENSITY CHARACTERISTICS

Volume: 0.0087 cubic inches

Weight: 0.75 grams maximum
Shielding: Less than 3% coupling with two units measured side by side at 1000 cycles.

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: -55°C to +125°C.

Terminal Strength: Meets five pound pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).

Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-15305 (latest revision). Low frequency 10 to 55 cps @ .06" maximum total excursion at rate of 1 linear sweep per minute for 2 hours repeated for each of three mutually perpendicular planes. Shock: 50G, 11 I.S.

Marking: Printed with pertinent data.

MATERIAL	NCG PART NO.	L		Q min		Approx. SRF	approx. Cd	Max. DCR	Max. I	Incr* I
		μ H	MHz	μ H	MHz					
PHENOLIC	WEE- 0.10	0.10	63	25	>500	0.67	0.020	4000	4000	
	WEE- 0.12	0.12	61	25	>500	0.67	0.029	3350	3350	
	WEE- 0.15	0.15	59	25	>500	0.67	0.032	3000	3000	
	WEE- 0.18	0.18	57	25	458	0.67	0.040	2850	2850	
	WEE- 0.22	0.22	56	25	414	0.67	0.045	2700	2700	
	WEE- 0.27	0.27	50	25	373	0.67	0.08	2000	2000	
	WEE- 0.33	0.33	48	25	337	0.67	0.09	1900	1900	
	WEE- 0.39	0.39	48	25	310	0.67	0.16	1420	1420	
	WEE- 0.47	0.47	48	25	283	0.67	0.17	1400	1400	
	WEE- 0.56	0.56	45	25	258	0.67	0.36	960	960	
IRON	WEE- 0.68	0.68	45	25	235	0.67	0.37	940	940	
	WEE- 0.82	0.82	41	25	214	0.67	0.46	870	870	
	WEE- 1.0	1.0	42	7.9	164	0.92	0.062	2300	2300	
	WEE- 1.2	1.2	43	7.9	150	0.92	0.067	2200	2200	
	WEE- 1.5	1.5	41	7.9	135	0.92	0.16	1420	1420	
	WEE- 1.8	1.8	42	7.9	124	0.92	0.17	1370	1370	
	WEE- 2.2	2.2	42	7.9	112	0.92	0.19	1300	1300	
	WEE- 2.7	2.7	41	7.9	107	0.92	0.20	1270	1270	
	WEE- 3.3	3.3	40	7.9	91.5	0.92	0.31	1030	1030	
	WEE- 3.9	3.9	40	7.9	84.5	0.92	0.33	1000	1000	
FERRITE	WEE- 4.7	4.7	40	7.9	76.5	0.92	0.58	750	750	
	WEE- 5.6	5.6	40	7.9	69.5	0.92	0.64	710	710	
	WEE- 6.8	6.8	40	7.9	63.5	0.92	0.68	680	680	
	WEE- 8.2	8.2	45	7.9	57.5	0.92	1.3	500	500	
	WEE- 10	10	46	2.5	52.5	0.92	1.4	480	480	
	WEE- 12	12	47	2.5	47.5	0.92	1.5	460	460	
	WEE- 15	15	47	2.5	42.5	0.92	1.7	440	440	
	WEE- 18	18	45	2.5	53.5	0.49	0.88	610	235	
	WEE- 22	22	47	2.5	47.0	0.50	0.95	590	220	
	WEE- 27	27	42	2.5	44.0	0.48	1.15	530	200	
FERRITE	WEE- 33	33	43	2.5	40.0	0.48	1.2	520	193	
	WEE- 39	39	45	2.5	36.5	0.48	1.6	450	183	
	WEE- 47	47	46	2.5	33.0	0.49	1.8	420	177	
	WEE- 56	56	40	2.5	30.0	0.49	2.2	390	170	
	WEE- 68	68	40	2.5	27.0	0.50	2.3	375	165	
	WEE- 82	82	42	2.5	17.5	1.0	2.4	360	160	
	WEE- 100	100	63	.79	15.0	1.0	2.6	345	157	
	WEE- 120	120	62	.79	14.0	1.0	2.9	330	145	

MATERIAL	NCG PART NO.	L		Q min		Approx. SRF	approx. Cd	Max. DCR	Max. I	Incr* I
		μ H	MHz	μ H	MHz					
FERRITE	WEE- 150	150	63	.79	12.5	1.0	3.3	315	126	
	WEE- 180	180	60	.79	11.5	1.0	3.6	300	110	
	WEE- 220	220	57	.79	11.0	0.94	4.1	280	105	
	WEE- 270	270	52	.79	10.0	0.92	4.8	260	91	
	WEE- 330	330	50	.79	9.0	0.92	5.6	240	87	
	WEE- 390	390	43	.79	8.5	0.87	6.2	230	72	
	WEE- 470	470	66	.79	8.0	0.83	10.0	180	67	
	WEE- 560	560	64	.79	7.5	0.82	11.5	170	65	
	WEE- 680	680	71	.79	6.5	0.87	12.0	160	60	
	WEE- 820	820	67	.79	6.0	0.87	13.8	150	55	
	WEE- 1000	1000	62	.79	5.6	0.87	16.0	140	52	
	WEE- 1200	1200	52	.250	1.490	9.0	18.2	135	50	
	WEE- 1500	1500	51	.250	1.460	8.0	23.7	118	48	
	WEE- 1800	1800	51	.250	1.420	6.5	30.2	105	42	
	WEE- 2200	2200	50	.250	1.300	6.8	33.7	99	37	
	WEE- 2700	2700	51	.250	1.180	6.8	43.1	87	33	
	WEE- 3300	3300	52	.250	1.050	7.0	48.7	82	30	
	WEE- 3900	3900	48	.250	.960	7.0	62.7	72	29	
	WEE- 4700	4700	48	.250	.840	7.4	70.5	68	28	
	WEE- 5600	5600	48	.250	.810	6.8	104	56	24	
	WEE- 6800	6800	45	.250	.740	6.8	118	53	20	
	WEE- 8200	8200	38	.250	.580	9.2	146	47	18	
	WEE- 10,000	10,000	36	.079	.470	11.5	76.6	66	15	
	WEE- 12,000	12,000	36	.079	.370	15.0	109	55	14	
	WEE- 15,000	15,000	38	.079	.330	15.0	119	52	13	
	WEE- 18,000	18,000	38	.079	.305	15.0	138	49	13	
	WEE- 22,000	22,000	32	.079	.295	13.0	219	39	12	
	WEE- 27,000	27,000	32	.079	.270	13.0	259	35	12	
	WEE- 33,000	33,000	32	.079	.250	12.5	296	33	11	
	WEE- 39,000	39,000	30	.079	.215	14.0	395	29	10	
	WEE- 47,000	47,000	25	.079	.210	12.5	452	27	9	
	WEE- 56,000	56,000	25	.079	.195	12.0	499	26	8	
	WEE- 68,000	68,000	20	.079	.130	18.4	395	29	1.1	
	WEE- 82,000	82,000	20	.079	.125	16.5	452	27	1.1	
	WEE-100,000	100,000	20	.079	.115	16.2	499	26	1.1	
	WEE-120,000	120,000	20	.070	.105	16.8	540	23	1.1	
	WEE-150,000	150,000	20	.060	.098	13.4	750	20	1.0	
	WEE-180,000	180,000	20	.050	.094	13.4	880	18	0.8	

*Incremental Current: The D.C. current required to cause a maximum reduction of 5 percent from nominal inductance value.


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

VARIABLE INDUCTORS

WEE V-L

NOW MIL APPROVED MIL-C-15305
 (latest revision) — MS21381 & MS21402
 Subminiature Shielded Adjustable Inductor
 High Q Values

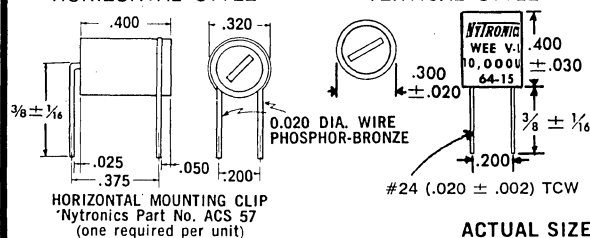
Vertical or Horizontal* Mounting
 Unitized Epoxy-Molded Construction

0.400" by 0.300"

0.10 to 100,000uH

HORIZONTAL STYLE

VERTICAL STYLE



The **WEE V-L** is designed to accommodate close inductance adjustments in high-density circuits that demand exceptional stability and high "Q" in the smallest size available. The **WEE V-L** is qualified MIL-C-15305 (latest revision). Printed board mounting is facilitated by 0.200 grid spacing and unit has shield construction to allow maximum density packaging. Standardized in 73 stock values.

ELECTRICAL CHARACTERISTICS

Adjustable Inductance Range:	±10%† over entire range as measured per MIL-C-15305 (latest revision).
Q and f _o Values:	Minimum not less than 80% of specified value at L nominal.
Dielectric Strength:	840 Volts R.M.S. at sea level.
Working Voltage:	300 Volts D.C.
Maximum Current:	Based on temperature rise not to exceed 15°C at 90°C ambient.
Incremental Current:	Defined as the DC current required to cause a five percent reduction in the nominal inductance value.

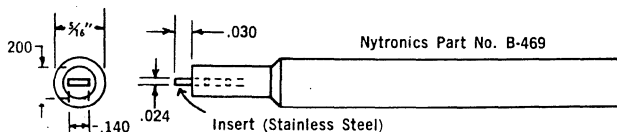
DENSITY CHARACTERISTICS

Weight:	1.5 grams maximum
Volume:	.0346 cubic inches
Shielding:	3% coupling maximum when two units are tested side by side.

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Use Nytronics Tuning Tool No. B-469 or equal.

Torque:	0.75 to 6.0 inch-oz.
Operating Temperature:	-55°C to +105°C.
Moisture, Vibration, and Shock Resistance:	Meet requirements of MIL-C-15305 (latest revision). Low frequency 10 to 55 cps @ .06" maximum total excursion at rate of 1 linear sweep per minute for 2 hours repeated for each of three mutually perpendicular planes. Shock: 50G, 11 MS. (body mounted)
Marking:	Manufacturer data printed.
Terminal Pull:	Three pounds.



MS No.	NCG Part No.	L nom.		f	Q nom.	SRF Nom.	Max. DCR	Max. I	Incr. I
		uH	MHz				ohms	m.a.	m.a.
MS21381-1	WEE V-L†	0.10	.10	25	70	>250	0.030	2500	2500
MS21381-2	WEE V-L†	0.12	.12	25	70	>250	0.030	2500	2500
MS21381-3	WEE V-L	0.15	.15	25	70	>250	0.030	2500	2500
MS21381-4	WEE V-L	0.18	.18	25	70	>250	0.035	2400	2400
MS21381-5	WEE V-L	0.22	.22	25	70	>250	0.038	2300	2300
MS21381-6	WEE V-L	0.27	.27	25	80	>250	0.040	2200	2200
MS21381-7	WEE V-L	0.33	.33	25	80	>250	0.040	2200	2200
MS21381-8	WEE V-L	0.39	.39	25	80	250	0.045	2100	2100
MS21381-9	WEE V-L	0.47	.47	25	80	230	0.045	2100	2100
MS21381-10	WEE V-L	0.56	.56	25	80	220	0.050	2000	2000
MS21381-11	WEE V-L	0.68	.68	25	80	190	0.055	1900	1900
MS21381-12	WEE V-L	0.82	.82	25	85	180	0.060	1800	1800
MS21381-13	WEE V-L	1.00	1.00	25	85	160	0.070	1700	1700
MS21381-14	WEE V-L	1.2	1.2	7.9	90	170	0.085	1670	1670
MS21381-15	WEE V-L	1.5	1.5	7.9	100	155	0.100	1540	1540
MS21381-16	WEE V-L	1.8	1.8	7.9	115	135	0.110	1470	1470
MS21381-17	WEE V-L	2.2	2.2	7.9	110	120	0.120	1410	1410
MS21381-18	WEE V-L	2.7	2.7	7.9	110	104	0.125	1380	1380
MS21381-19	WEE V-L	3.3	3.3	7.9	90	93.0	0.165	1200	1200
MS21381-20	WEE V-L	3.9	3.9	7.9	90	87.0	0.180	1135	1135
MS21381-21	WEE V-L	4.7	4.7	7.9	95	79.0	0.245	985	985
MS21381-22	WEE V-L	5.6	5.6	7.9	95	72.0	0.265	950	950
MS21381-23	WEE V-L	6.8	6.8	7.9	85	63.0	0.330	853	853
MS21381-24	WEE V-L	8.2	8.2	7.9	95	60.0	0.460	720	720
MS21381-25	WEE V-L	10	10	7.9	90	54.0	0.640	620	620
MS21381-26	WEE V-L	12	12	2.5	120	37.0	0.800	545	545
MS21381-27	WEE V-L	15	15	2.5	120	28.8	0.865	520	520
MS21381-28	WEE V-L	18	18	2.5	115	23.8	0.940	504	504
MS21381-29	WEE V-L	22	22	2.5	125	21.3	1.03	460	460
MS21381-30	WEE V-L	27	27	2.5	115	20.6	1.18	418	418
MS21381-31	WEE V-L	33	33	2.5	120	18.6	1.30	398	398
MS21381-32	WEE V-L	39	39	2.5	120	17.7	1.41	385	385
MS21381-33	WEE V-L	47	47	2.5	110	14.9	1.61	350	350
MS21381-34	WEE V-L	56	56	2.5	115	13.9	2.08	330	330
MS21381-35	WEE V-L	68	68	2.5	105	12.9	2.20	320	320
MS21402-1	WEE V-L	82	82	2.5	105	11.7	2.42	300	300
MS21402-2	WEE V-L	100	100	2.5	95	10.5	2.15	333	333
MS21402-3	WEE V-L	120	120	0.790	95	5.60	2.38	116	190
MS21402-4	WEE V-L	150	150	0.790	90	5.20	2.52	306	175
MS21402-5	WEE V-L	180	180	0.790	95	4.90	2.88	288	150
MS21402-6	WEE V-L	220	220	0.790	95	4.60	3.18	273	125
MS21402-7	WEE V-L	270	270	0.790	100	4.20	3.50	260	120
MS21402-8	WEE V-L	330	330	0.790	100	3.55	4.80	222	110
MS21402-9	WEE V-L	390	390	0.790	100	3.45	5.44	209	105
MS21402-10	WEE V-L	470	470	0.790	100	3.20	5.90	201	100
MS21402-11	WEE V-L	560	560	0.790	95	2.90	6.30	194	90
MS21402-12	WEE V-L	680	680	0.790	100	2.70	7.20	181	80
MS21402-13	WEE V-L	820	820	0.790	90	2.50	8.00	172	70
MS21402-14	WEE V-L	1,000	1,000	0.790	100	2.35	12.0	141	65
MS21402-15	WEE V-L	1,200	1,200	0.250	95	2.20	13.5	132	60
MS21402-16	WEE V-L	1,500	1,500	0.250	90	1.90	16.5	119	55
MS21402-17	WEE V-L	1,800	1,800	0.250	100	1.80	18.0	114	47
MS21402-18	WEE V-L	2,200	2,200	0.250	100	1.70	20.5	107	43
MS21402-19	WEE V-L	2,700	2,700	0.250	95	1.50	22.5	102	39
MS21402-20	WEE V-L	3,300	3,300	0.250	90	1.40	42.0	76	36
MS21402-21	WEE V-L	3,900	3,900	0.250	85	1.27	47.5	71	35
MS21402-22	WEE V-L	4,700	4,700	0.250	85	1.24	53.0	67	34
MS21402-23	WEE V-L	5,600	5,600	0.250	85	0.93	62.5	65	31
MS21402-24	WEE V-L	6,800	6,800	0.250	75	0.79	69.5	58	27
MS21402-25	WEE V-L	8,200	8,200	0.250	80	0.75	75.0	56	26
MS21402-26	WEE V-L	10,000	10,000	0.250	70	0.70	100.0	49	24
MS21402-27	WEE V-L	12,000	12,000	0.079	70	0.50	64	60	40
MS21402-28	WEE V-L	15,000	15,000	0.079	70	0.38	84	52	34
MS21402-29	WEE V-L	18,000	18,000	0.079	70	0.36	93	50	30
MS21402-30	WEE V-L	22,000	22,000	0.079	70	0.32	104	45	28
MS21402-31	WEE V-L	27,000	27,000	0.079	70	0.30	173	35	26
MS21402-32	WEE V-L	33,000	33,000	0.079	70	0.27	187	32	24
MS21402-33	WEE V-L	39,000	39,000	0.079	70	0.26	220	30	22
MS21402-34	WEE V-L	47,000	47,000	0.079	70	0.25	253	28	20
MS21402-35	WEE V-L	56,000	56,000	0.079	70	0.24	285	26	19
MS21402-36	WEE V-L	68,000	68,000	0.079	60	0.20	311	24	18
MS21402-37	WEE V-L	82,000	82,000	0.079	60	0.19	385	22	16
MS21402-38	WEE V-L	100,000	100,000	0.079	60	0.17	420	20	15

* For Horizontal mounting use Nytronics mounting clip No. ACS-57 or order with prefix H (i.e. H WEE V-L 0.10).

† Tunable range ±5.0% on 0.10uH & 0.12uH


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

Inductors

SUPER WEE-WEE-DUCTOR

The **SUPER WEE-WEE-DUCTOR**, a shielded miniaturized inductor, provides a greater inductance-to-size ratio in a molded epoxy envelope. Use of unique "T" lead construction on all values from .10 uH to 10,000 uH assures exceptional reliability in ranges where fine wire sizes are used. This MS inductor series is designed to meet the stringent requirements of MIL-C-15305 (latest revision). This provides the design engineer with utmost reliability, electrical performance, and minimum coupling in high density packaging.

ELECTRICAL CHARACTERISTICS

Inductance Tolerance: $\pm 10\%$ (Q-Meter).

Dielectric Strength: 700 volts RMS at sea level.

Self-Resonant Frequency: Measured with full length leads on Q-Meter.

Q: Measured on Q-Meter.

Rating: 1 maximum based on $\frac{1}{3}$ watt dissipation.

DENSITY CHARACTERISTICS

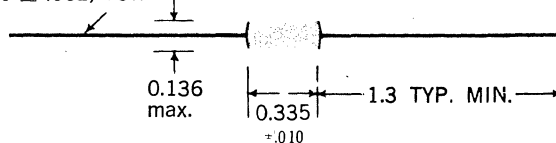
Volume: 0.0041 cubic inches.

Weight: 0.50 grams maximum.

Shielding: Less than 3% coupling with two units mounted side by side at 1000 cycles.

An Ultra-Reliable molded shielded inductor. Subminiature size for high density circuits. Great Inductance-to-size ratio. .10 uH to 10,000 uH. 0.136" diameter x 0.335" length. 61 stock values.

#24 (.020 $\pm$.002) TCW



PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: -55°C to $+125^{\circ}\text{C}$.

Terminal Strength: Meets five pounds pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).

Moisture, Vibration and Shock Resistance: Meets requirements of MIL-C-15305 (latest revision). High Frequency: 10 cps to 2000 cps @ 15G $\pm 10\%$ maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes.

Shock: 50G, 11 MS.

Marking: Color coded per MIL-C-15305 (latest revision).

SUPER WEE-WEE-DUCTOR STANDARD VALUES

Material	MS No.	NCG Part No.	L	Q min.		min. Fo	approx. Cd	Max. DCR	Max. I	Incr.* I
			μH		MHz	MHz	Pf	Ω	mA	mA
PHENOLIC	MS21399-1	SW-W-0.10	0.10	42	25	480	.70	.087	1650	>1650
	MS21399-2	SW-W-0.12	0.12	42	25	460	.63	.090	1630	>1630
	MS21399-3	SW-W-0.15	0.15	42	25	400	.66	.098	1550	>1550
	MS21399-4	SW-W-0.18	0.18	42	25	360	.62	.117	1420	>1420
	MS21399-5	SW-W-0.22	0.22	42	25	340	.63	.141	1330	>1330
	MS21399-6	SW-W-0.27	0.27	42	25	320	.59	.157	1230	>1230
	MS21399-7	SW-W-0.33	0.33	42	25	295	.55	.178	1140	>1140
	MS21399-8	SW-W-0.39	0.39	42	25	275	.55	.208	1060	>1060
	MS21399-9	SW-W-0.47	0.47	41	25	250	.56	.257	960	>960
	MS21399-10	SW-W-0.56	0.56	39	25	238	.52	.283	915	>915
	MS21399-11	SW-W-0.68	0.68	36	25	224	.50	.337	840	>840
	MS21399-12	SW-W-0.82	0.82	35	25	205	.50	.470	720	>720
IRON	MS21400-1	SW-W-1.0	1.0	38	25	135	.87	.170	1180	>1180
	MS21400-2	SW-W-1.2	1.2	38	7.9	124	.87	.190	1150	>1150
	MS21400-3	SW-W-1.5	1.5	38	7.9	114	.87	.212	1050	>1050
	MS21400-4	SW-W-1.8	1.8	38	7.9	105	.89	.242	990	>990
	MS21400-5	SW-W-2.2	2.2	38	7.9	95	.88	.263	950	>950
	MS21400-6	SW-W-2.7	2.7	38	7.9	85	.83	.320	880	>880
	MS21400-7	SW-W-3.3	3.3	38	7.9	78	.81	.345	820	>820
	MS21400-8	SW-W-3.9	3.9	42	7.9	74	.76	.411	755	>755
	MS21400-9	SW-W-4.7	4.7	42	7.9	68	.75	.562	650	>650
	MS21400-10	SW-W-5.6	5.6	42	7.9	62	.77	.742	565	>565
	MS21400-11	SW-W-6.8	6.8	45	7.9	55	.80	1.00	485	>485
	MS21400-12	SW-W-8.2	8.2	47	7.9	51	.78	1.20	440	>440
	MS21400-13	SW-W-10	10	51	7.9	45	.78	1.84	355	>355
	MS21400-14	SW-W-12	12	51	2.5	41	.85	2.60	300	>300
FERRITE "T" LEAD	MS21401-1	SW-W-15	15	45	2.5	48	.55	.635	610	200
	MS21401-2	SW-W-18	18	45	2.5	44	.55	.728	570	175
	MS21401-3	SW-W-22	22	45	2.5	37	.60	.825	530	160
	MS21401-4	SW-W-27	27	45	2.5	32	.65	.950	500	155
	MS21401-5	SW-W-33	33	46	2.5	30	.65	1.26	430	150
	MS21401-6	SW-W-39	39	46	2.5	27	.66	1.42	405	145
	MS21401-7	SW-W-47	47	46	2.5	23	.66	1.72	370	140
	MS21401-8	SW-W-56	56	48	2.5	21	.75	2.03	340	130
	MS21401-9	SW-W-68	68	48	2.5	18.5	.75	2.29	320	120
	MS21401-10	SW-W-82	82	46	2.5	17.0	.75	2.55	305	115
	MS21401-11	SW-W-100	100	46	2.5	15.5	.78	2.92	280	100
	MS21401-12	SW-W-120	120	53	0.79	14.5	.72	3.30	235	80
	MS21401-13	SW-W-150	130	53	0.79	13.0	.70	4.30	215	68
	MS21401-14	SW-W-180	180	53	0.79	11.5	.70	5.40	200	64
	MS21401-15	SW-W-220	220	55	0.79	10.0	.84	6.65	150	60
	MS21401-16	SW-W-270	270	57	0.79	9.50	.74	7.60	140	58
	MS21401-17	SW-W-330	330	57	0.79	8.50	.75	8.50	130	56
	MS21401-18	SW-W-390	390	57	0.79	8.00	.74	10.0	120	54
	MS21401-19	SW-W-470	470	57	0.79	7.20	.70	13.5	100	52
	MS21401-20	SW-W-560	560	61	0.79	6.40	.70	14.5	95	50
	MS21401-21	SW-W-680	680	61	0.79	5.80	.78	16.0	90	48
	MS21401-22	SW-W-820	820	58	0.79	5.30	.78	19.0	85	47
	MS21401-23	SW-W-1000	1000	58	0.79	4.80	.78	21.5	80	45
	MS21401-24	SW-W-1200	1200	55	0.25	2.90	1.9	23	100	40
	MS21401-25	SW-W-1500	1500	55	0.25	2.80	1.6	30	90	35
	MS21401-26	SW-W-1800	1800	55	0.25	2.60	1.5	33	86	32
	MS21401-27	SW-W-2200	2200	55	0.25	2.55	1.3	40	78	30
	MS21401-28	SW-W-2700	2700	55	0.25	2.40	1.2	43	74	28
	MS21401-29	SW-W-3300	3300	55	0.25	2.00	1.1	58	65	26
	MS21401-30	SW-W-3900	3900	55	0.25	1.95	1.1	76	56	23
	MS21401-31	SW-W-4700	4700	55	0.25	1.85	1.1	85	53	20
	MS21401-32	SW-W-5600	5600	55	0.25	1.75	1.0	100	48	18
	MS21401-33	SW-W-6800	6800	50	0.25	1.58	1.0	127	43	15
	MS21401-34	SW-W-8200	8200	50	0.25	1.55	1.0	150	40	12
	MS21401-35	SW-W-10,000	10,000	50	0.25	1.45	1.0	190	37	10

* INCREMENT CURRENT — The D.C. current required to cause a 5% reduction in the nominal inductance value.

SPECIFICATIONS ADJUSTOROID SERIES VARIABLE TOROIDAL INDUCTORS

This radically new development in the toroidal coil field offers a variable toroid in one of three case sizes as shown. The **ADJUSTOROID** was developed especially for printed circuit and similar lightweight applications. This unit is epoxy encapsulated, and there is no physical contact between the adjusting screw and the toroidal winding. Inductance adjustment is achieved through magnetic coupling.

**Variable Toroid
Stepless Adjustment
Very High "Q"
Available to 12 Henries
Epoxy Encapsulated
Fully Shielded**

ELECTRICAL CHARACTERISTICS:

Adjustable Inductance Range:

Not less than $\pm 5\%$ from nominal

Q and f_o values:

Minimum not less than 80% of specified value at nominal inductance.

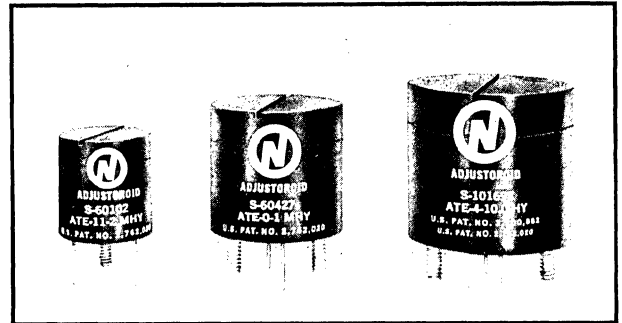
Incremental Current:

Defined as the D.C. current required to cause a 5% reduction in the nominal inductance value.

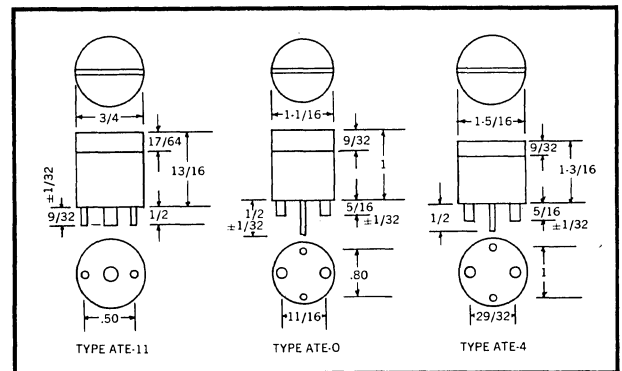
PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS:

Weight:

Type ATE-11: 0.83 oz.
Type ATE-0: 2.0 oz.
Type ATE-4: 4.0 oz.



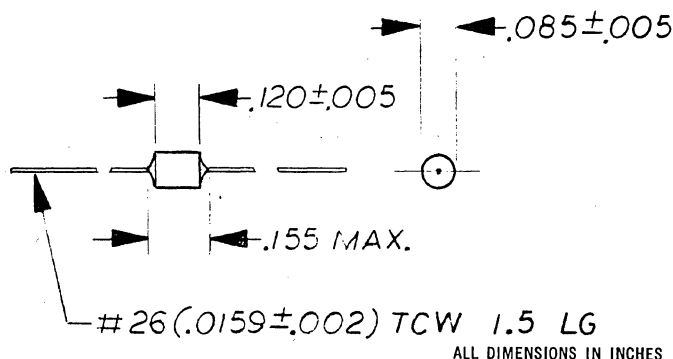
(U.S. Patent Numbers 2,762,020 and 3,100,882)



NCG Part No.	L nom. (Hy)	Q Nom.	Freq. (KHz)	Fo Nom. (KHz)	DCR Nom. (Ω)	Incr. I (Ma.)
ATE-11-0.010	.010	75	15	350	6	55
ATE-11-0.012	.012	75	15	300	8	51
ATE-11-0.015	.015	75	15	250	9	45
ATE-11-0.018	.018	75	15	250	10	41
ATE-11-0.022	.022	75	15	200	13	37
ATE-11-0.027	.027	75	15	200	14	34
ATE-11-0.033	.033	70	15	150	20	30
ATE-11-0.039	.039	70	15	150	22	28
ATE-11-0.047	.047	70	15	150	29	25
ATE-11-0.056	.056	70	15	100	32	23
ATE-11-0.068	.068	65	10	100	35	21
ATE-11-0.082	.082	65	10	100	48	19
ATE-11-0.100	.100	60	10	95	53	17
ATE-11-0.120	.120	60	10	90	58	16
ATE-11-0.150	.150	55	10	80	85	14
ATE-11-0.180	.180	55	10	70	92	13
ATE-0-0.220	.220	95	7	45	55	21
ATE-0-0.270	.270	95	7	40	76	19
ATE-0-0.330	.330	95	7	35	83	17
ATE-0-0.390	.390	90	6	35	111	16
ATE-0-0.470	.470	90	6	30	122	14
ATE-0-0.560	.560	90	6	25	181	12
ATE-0-0.680	.680	85	6	20	185	12
ATE-0-0.820	.820	85	6	20	202	11
ATE-0-1.00	1.00	85	5	20	291	10
ATE-0-1.20	1.20	80	5	20	320	9
ATE-0-1.50	1.50	80	5	15	358	8
ATE-4-1.80	1.80	100	4	13	198	14
ATE-4-2.20	2.20	90	3	12	220	13
ATE-4-2.70	2.70	90	3	11	300	11
ATE-4-3.30	3.30	90	3	9	331	10
ATE-4-3.90	3.90	80	2	8	455	9
ATE-4-4.70	4.70	80	2	7	500	8
ATE-4-5.60	5.60	80	2	7	545	8
ATE-4-6.80	6.80	60	1.5	6	785	7
ATE-4-8.20	8.20	60	1.5	5	862	6
ATE-4-10.0	10.0	40	1	5	1207	6
ATE-4-12.0	12.0	40	1	4	1323	5

SPECIFICATIONS FIXED INDUCTORS PEE-WEE SERIES

The amazing **PEE-WEE DUCTOR** represents a 66% size reduction from the smallest magnetically shielded axial leaded inductor series heretofore available anywhere. Furthermore, this size reduction was obtained with negligible loss of electrical performance by employing several unique concepts in RF coil design.



ELECTRICAL CHARACTERISTICS:

Inductance Tolerance: ± 10% (Std).

L, Q, F, values: Measurements per MIL-C-15305. (latest revision).

Incremental Current: Incremental current in table is for 5% reduction in inductance value.

Dielectric Strength: 300 Volts RMS @ Sea Level.

Temperature Coefficient of Inductance values: Temperature Range of -20°C to +80°C.

Inductance	Temp. Coefficient
0.10uH thru 1.0uH	+50 PPM/C
1.2uH thru 10uH	+100 PPM/C
12uH thru 100uH	+200 PPM/C
120uH thru 1000uH	+500 PPM/C

DENSITY CHARACTERISTICS:

Volume: .0007 Cubic Inches

Weight: 0.12 Grams

Shielding: 5% maximum coupling for two units side by side.

Marking: EIA color coded

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS:

Terminal pull: 3 lbs. minimum.

Environmental: Will meet the requirements of MIL-C-15305 (latest revision).

OPTIONS:

Inductance Values: Additional Inductance Values from .025 uH up to 10,000 uH available on special order.

PEE-WEE DUCTOR STANDARD VALUES

NCG PART NO.	L μ H	Q min. @	MHz	min. SRF MHz	Max. DCR Ω	Max. I mA	Incr. I mA
PW- 0.10	.10	52	25	500	.060	1500	*
PW- 0.12	.12	52	25	480	.070	1400	*
PW- 0.15	.15	52	25	450	.080	1300	*
PW- 0.18	.18	55	25	430	.090	1200	*
PW- 0.22	.22	55	25	390	.11	1100	*
PW- 0.27	.27	55	25	340	.12	1000	*
PW- 0.33	.33	52	25	310	.14	950	*
PW- 0.39	.39	52	25	280	.16	900	*
PW- 0.47	.47	50	25	250	.20	800	*
PW- 0.56	.56	50	25	220	.25	750	*
PW- 0.68	.68	48	25	200	.27	700	*
PW- 0.82	.82	48	25	180	.36	600	*
PW- 1.0	1.0	45	25	165	.40	525	*
PW- 1.2	1.2	45	7.9	150	.70	425	*
PW- 1.5	1.5	45	7.9	130	.80	400	*
PW- 1.8	1.8	45	7.9	120	.90	350	*
PW- 2.2	2.2	45	7.9	110	1.3	320	*
PW- 2.7	2.7	45	7.9	100	1.8	275	*
PW- 3.3	3.3	42	7.9	70	1.7	290	*
PW- 3.9	3.9	45	7.9	65	1.8	275	*
PW- 4.7	4.7	45	7.9	58	2.6	225	*
PW- 5.6	5.6	45	7.9	54	2.9	210	*
PW- 6.8	6.8	45	7.9	50	3.3	200	*
PW- 8.2	8.2	45	7.9	48	4.5	170	*
PW- 10	10	45	7.9	45	4.8	165	*
PW- 12	12	45	2.5	40	2.0	250	230
PW- 15	15	45	2.5	36	2.5	230	180
PW- 18	18	45	2.5	31	3.5	195	150
PW- 22	22	46	2.5	28	4.5	170	135
PW- 27	27	48	2.5	25	5.0	160	115
PW- 33	33	48	2.5	23	5.5	150	105
PW- 39	39	48	2.5	22	7.0	140	100
PW- 47	47	50	2.5	21	7.5	135	95
PW- 56	56	52	2.5	19	8.0	130	90
PW- 68	68	55	2.5	18	9.0	120	83
PW- 82	82	55	2.5	16	14	95	65
PW- 100	100	55	2.5	14	16	90	70
PW- 120	120	34	.79	9.5	10	115	40
PW- 150	150	34	.79	8.8	12	105	35
PW- 180	180	34	.79	8.1	15	90	32
PW- 220	220	36	.79	7.8	20	80	30
PW- 270	270	36	.79	7.3	23	75	27
PW- 330	330	36	.79	6.8	26	70	25
PW- 390	390	36	.79	6.0	35	65	23
PW- 470	470	38	.79	5.6	37	60	21
PW- 560	560	40	.79	5.0	40	58	20
PW- 680	680	40	.79	4.3	48	54	18
PW- 820	820	40	.79	3.8	54	47	17
PW-1000	1000	40	.79	3.5	65	43	15

* GREATER THAN MAX I


Nytronics Components Group Inc.

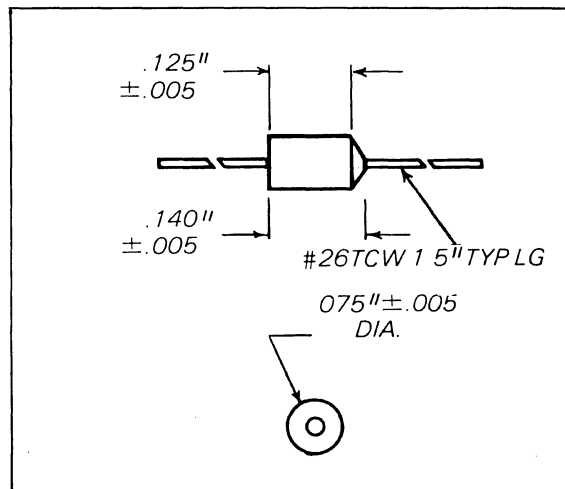
 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

Inductors

NEW Pee Dee Ductor Series

Marking: EIA color coded

The Pee Dee Ductor is a new, microminiature, axial-leaded RF inductor for hybrid circuit applications. It is significantly smaller than any unshielded inductor available anywhere. Designed to meet the requirements of MIL-C-15305 (latest revision), this reliable, high performance inductor has a standard inductance tolerance of $\pm 10\%$. Values below 0.1 μH and above 1000 μH are available on special order.



ELECTRICAL DATA

NCG Part No.	L μH	Q (Min.)	Test Freq. MHz	F ^o Min. MHz	DCR Max. Ohms	Rated Current mA
PD-0.10	0.10	42	25	500	0.2	600
PD-0.12	0.12	42	25	450	0.2	600
PD-0.15	0.15	42	25	400	0.25	575
PD-0.18	0.18	45	25	380	0.25	575
PD-0.22	0.22	45	25	360	0.30	565
PD-0.27	0.27	50	25	300	0.30	565
PD-0.33	0.33	45	25	280	0.35	560
PD-0.39	0.39	50	25	260	0.37	550
PD-0.47	0.47	50	25	250	0.39	535
PD-0.56	0.56	50	25	240	0.40	525
PD-0.68	0.68	50	25	220	0.45	500
PD-0.82	0.82	50	25	180	0.50	480
PD-1.0	1.0	50	25	170	0.60	450
PD-1.2	1.2	42	7.9	150	0.70	425
PD-1.5	1.5	45	7.9	130	0.80	400
PD-1.8	1.8	45	7.9	120	0.90	350
PD-2.2	2.2	45	7.9	110	1.3	320
PD-2.7	2.7	45	7.9	105	1.8	275
PD-3.3	3.3	35	7.9	100	1.1	340
PD-3.9	3.9	35	7.9	90	1.4	310
PD-4.7	4.7	35	7.9	85	1.6	290
PD-5.6	5.6	35	7.9	70	1.8	275
PD-6.8	6.8	40	7.9	65	2.0	250
PD-8.2	8.2	40	7.9	62	2.2	245
PD-10	10	45	7.9	60	3.0	210
PD-12	12	45	2.5	35	2.0	250
PD-15	15	45	2.5	30	2.2	245
PD-18	18	45	2.5	25	2.5	230
PD-22	22	45	2.5	23	2.7	220
PD-27	27	50	2.5	21	3.8	195
PD-33	33	50	2.5	20	4.5	170
PD-39	39	50	2.5	16	6.0	150
PD-47	47	50	2.5	14	6.5	145
PD-56	56	50	2.5	12	7.8	135
PD-68	68	55	2.5	10	8.6	130
PD-82	82	50	2.5	9.0	9.8	120
PD-100	100	55	2.5	8.0	11.5	110
PD-120	120	28	.79	7.0	15.0	90
PD-150	150	28	.79	6.0	16.5	88
PD-180	180	25	.79	5.5	22	75
PD-220	220	24	.79	5.2	31	62
PD-270	270	24	.79	5.0	38	56
PD-330	330	24	.79	4.8	42	53
PD-390	390	24	.79	3.6	58	47
PD-470	470	24	.79	3.4	60	45
PD-560	560	24	.79	3.2	65	43
PD-680	680	22	.79	3.0	90	36
PD-820	820	23	.79	2.5	95	34
PD-1000	1000	21	.79	2.0	130	30


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

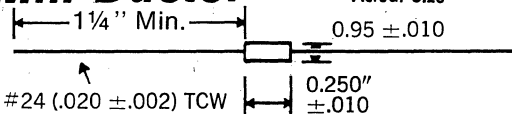
Inductors

NEW

— MS INDUCTOR SERIES

75083, 75084, 75085
**MOLDED INDUCTOR/0.100 uh
to 1000 uh**

Mili-Ductor



ELECTRICAL CHARACTERISTICS

Inductance Tolerance: $\pm 10\%$ over entire range.
 Dielectric Strength: 1000 volts RMS at sea level.
 Self-Resonant Frequency: Measured per MIL-C-15305 (latest revision).
 Rating: Maximum current based on: 35°C rise in 90° ambient for phenolic, 15°C rise in 90° ambient for iron, 35°C rise in 70° ambient for ferrite core inductors.

DENSITY CHARACTERISTICS

Volume: 0.002 cubic inches; Weight .030 grams.

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: -55°C to $+125^\circ\text{C}$ phenolic core, -55°C to $+105^\circ\text{C}$ iron and ferrite core.

Terminal Strength: Meets five pound pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).

Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-15305 (latest revision), 10 cps to 2000 cps @ $15\text{G} \pm 10\%$ maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes. Shock: 50G, 11 MS (body mounted).

The MS Inductor Series are RF Inductors specifically designed to meet the demanding requirements of MIL-C-15305 (latest revision). This MS Series is Epoxy Molded enveloped features reliability and uniformity in a Subminiature Inductor.

MS No.	NCG Part No.	$\pm 10\%$ Inductance	Q Min.	Test Frequency (L & O)	Self-resonant Frequency, Min.	DC Resistance Max.	Rated DC Current
		uh		MHz	MHz	Ohms	MA
MS75083-01	MD	.10	40	25.0	680	.08	1350
MS75083-02	MD	.12	40	25.0	640	.09	1270
MS75083-03	MD	.15	38	25.0	600	.10	1200
MS75083-04	MD	.18	35	25.0	550	.12	1105
MS75083-05	MD	.22	33	25.0	510	.14	1025
MS75083-06	MD	.27	33	25.0	430	.16	960
MS75083-07	MD	.33	30	25.0	410	.22	815
MS75083-08	MD	.39	30	25.0	365	.30	700
MS75083-09	MD	.47	30	25.0	330	.35	650
MS75083-10	MD	.56	30	25.0	300	.50	545
MS75083-11	MD	.68	28	25.0	275	.60	495
MS75083-12	MD	.82	28	25.0	250	.85	415
MS75083-13	MD	1.00	25	25.0	230	1.00	385
MS75084-01	MD	1.2	25	7.9	150	.18	590
MS75084-02	MD	1.5	28	7.9	140	.22	535
MS75084-03	MD	1.8	30	7.9	125	.30	455
MS75084-04	MD	2.2	30	7.9	115	.40	395
MS75084-05	MD	2.7	37	7.9	100	.55	355
MS75084-06	MD	3.3	45	7.9	90	.85	270
MS75084-07	MD	3.9	45	7.9	80	1.00	250
MS75084-08	MD	4.7	45	7.9	75	1.20	230
MS75084-09	MD	5.6	50	7.9	65	1.80	185
MS75084-10	MD	6.8	50	7.9	60	2.00	175
MS75084-11	MD	8.2	55	7.9	55	2.70	155
MS75084-12	MD	10	55	7.9	50	3.70	130
MS75084-13	MD	12	45	2.5	40	2.70	155
MS75084-14	MD	15	40	2.5	35	2.80	150
MS75084-15	MD	18	50	2.5	30	3.10	145
MS75084-16	MD	22	50	2.5	25	3.30	140
MS75084-17	MD	27	50	2.5	20	3.50	135
MS75085-01	MD	33	45	2.5	24	3.4	130
MS75085-02	MD	39	45	2.5	22	3.6	125
MS75085-03	MD	47	45	2.5	20	4.5	110
MS75085-04	MD	56	45	2.5	18	5.7	100
MS75085-05	MD	68	50	2.5	15	6.7	92
MS75085-06	MD	82	50	2.5	14	7.3	88
MS75085-07	MD	100	50	2.5	13	8	84
MS75085-08	MD	120	30	.79	12	13	66
MS75085-09	MD	150	30	.79	11	15	61
MS75085-10	MD	180	30	.79	10	17	57
MS75085-11	MD	220	30	.79	9	21	52
MS75085-12	MD	270	30	.79	8	25	47
MS75085-13	MD	330	30	.79	7	28	45
MS75085-14	MD	390	30	.79	6.5	35	40
MS75085-15	MD	470	30	.79	6	42	36
MS75085-16	MD	560	30	.79	5	46	35
MS75085-17	MD	680	30	.79	4	60	30
MS75085-18	MD	820	30	.79	3.8	65	29
MS75085-19	MD	1000	30	.79	3.4	72	28


Nytronics Components Group Inc.

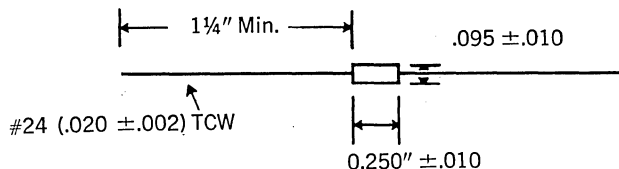
 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

Inductors

DECI-DUCTOR

 New Subminiature Inductor 0.10uH to 1000uH Range
 0.100" diameter by 0.250" length 49 STANDARD VALUES

The **DECI-DUCTOR** offers the design engineer epoxy-molded reliability and uniformity in a subminiature R.F. Inductor. This smallest of Nytronics growing R.F. Inductor line is designed to meet all the environmental specifications of MIL-C-15305 (latest revision).



ELECTRICAL CHARACTERISTICS

Inductance Tolerance: $\pm 10\%$ over entire range.

Dielectric Strength: 700 volts RMS at sea level.

Self-Resonant Frequency: Measured per MIL-C-15305 (latest revision).

Rating: Maximum Current based on 35°C rise in 90°C ambient.

DENSITY CHARACTERISTICS

Volume: 0.002 cubic inches

Weight: 0.35 grams

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: -55°C to $+125^{\circ}\text{C}$
Terminal Strength: Meets three pound pull test; five 360° rotations in alternate directions per MIL-C-15305 (latest revision).

Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-15305 (latest revision), 10 cps to 2000 cps @ 15 G $\pm 10\%$ maximum for 12 logarithmic swings each of 20 minute duration repeated for each of three mutually perpendicular planes. Shock: 50G, 11 MS (body mounted).

Marking: Color coded per MIL-C-15305 (latest revision).

	NCG Part No.	L	Q Min.		Min. SRF	Max. DCR	Max I.
		uH		MHz	MHz	Ohms	mA
P H E N O L I C	DD-0.10	0.10	40	25	690	0.07	2000
	DD-0.12	0.12	40	25	650	0.08	1900
	DD-0.15	0.15	38	25	600	0.09	1750
	DD-0.18	0.18	38	25	550	0.10	1600
	DD-0.22	0.22	35	25	510	0.11	1550
	DD-0.27	0.27	35	25	470	0.15	1350
	DD-0.33	0.33	32	25	410	0.21	1150
	DD-0.39	0.39	32	25	370	0.29	970
	DD-0.47	0.47	32	25	340	0.35	820
	DD-0.56	0.56	32	25	310	0.48	700
	DD-0.68	0.68	33	25	280	0.65	600
	DD-0.82	0.82	30	25	255	0.82	500
	DD-1.00	1.00	30	25	240	1.10	475
	DD-1.20	1.20	30	7.9	155	0.16	1200
I R O N	DD-1.50	1.50	32	7.9	140	0.20	1100
	DD-1.80	1.80	35	7.9	130	0.32	900
	DD-2.20	2.20	35	7.9	120	0.37	760
	DD-2.70	2.70	37	7.9	105	0.49	700
	DD-3.30	3.30	45	7.9	95	0.67	575
	DD-3.90	3.90	45	7.9	87	0.95	500
	DD-4.70	4.70	45	7.9	80	1.10	475
	DD-5.60	5.60	52	7.9	75	1.60	380
	DD-6.80	6.80	52	7.9	65	1.80	350
	DD-8.20	8.20	60	7.9	62	2.40	300
	DD-10.0	10.0	60	7.9	52	3.40	265
	DD-12.0	12.0	45	2.5	42	2.40	300
	DD-15.0	15.0	47	2.5	36	2.70	275
	DD-18.0	18.0	50	2.5	32	3.00	260
	DD-22.0	22.0	50	2.5	28	3.30	250
F E R R I T E	DD-27.0	27.0	50	2.5	25	3.80	240
	DD-33.0	33.0	50	2.5	30	3.80	260
	DD-39.0	39.0	50	2.5	26	4.10	240
	DD-47.0	47.0	50	2.5	24	4.40	210
	DD-56.0	56.0	50	2.5	22	5.70	205
	DD-68.0	68.0	52	2.5	19	6.50	180
	DD-82.0	82.0	52	2.5	17	7.30	175
	DD-100	100	50	2.5	15	8.20	165
	DD-120	120	28	0.79	14	14	110
	DD-150	150	28	0.79	13	16	105
	DD-180	180	28	0.79	12	18	100
	DD-220	220	26	0.79	11	25	90
	DD-270	270	26	0.79	10	33	75
	DD-330	330	26	0.79	9.0	37	70
	DD-390	390	25	0.79	8.0	51	60
	DD-470	470	27	0.79	7.0	56	58
	DD-560	560	27	0.79	6.5	61	55
	DD-680	680	28	0.79	6.0	70	50
	DD-820	820	28	0.79	5.5	91	45
	DD-1000	1000	28	0.79	5.2	102	40


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

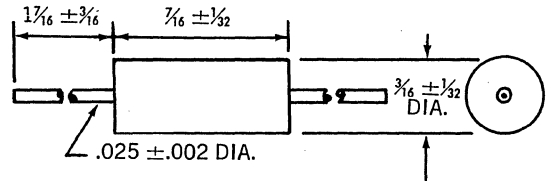
Inductors

MS-INDUCTOR SERIES

75008-75101

MOLDED INDUCTOR

(Manufactured per MS75008 - MS75101)



ALL DIMENSIONS IN INCHES

Proven reliability molded inductors designed to meet MS75008 and MIL-C-15305 (latest revision). Inductance 0.15 to 27.0 uhy.

ELECTRICAL CHARACTERISTICS

Inductance Tolerance: 0.15 to 0.47 uhy $\pm 20\%$;
 0.56 to 27.0 uhy $\pm 10\%$
 Dielectric Strength: 700 Volts RMS at sea level
 Max. Temp. Rise: 35°C

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature: -55°C to $+125^{\circ}\text{C}$.
 Terminal Strength: Meets five pound pull test per MIL-C-15305 (latest revision).
 Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-15305 (latest revision). High frequency 10 cps to 2000 cps @ 15G $\pm 10\%$ maximum for 12 logarithmic swings, each of 20 minute duration repeated for each of three mutually perpendicular planes. (body mounted)
 Volume: S Type — 0.012 cu. in.
 Weight: S Type — 0.90 grams
 Marking: Color banded per MIL-C-15305 (latest revision).

MS No.	NCG P/N	Inductance	Q; Min.	Test Frequency	Self-resonant Frequency, Min.	DC Resistance, Max.	Rated DC Current	Material
		uh		MHz	MHz	Ohms	ma	
75008-21	RFC-S	0.15 $\pm 20\%$	55	25.0	510	0.030	3,000	PHENOLIC
75008-22	RFC-S	0.22 $\pm 20\%$	50	25.0	415	0.035	2,800	
75008-23	RFC-S	0.33 $\pm 20\%$	50	25.0	350	0.065	2,000	
75008-24	RFC-S	0.47 $\pm 20\%$	50	25.0	300	0.085	1,700	
75008-25	RFC-S	0.56 $\pm 10\%$	50	25.0	270	0.125	1,450	
75008-26	RFC-S	0.68 $\pm 10\%$	45	25.0	250	0.150	1,300	
75008-27	RFC-S	0.82 $\pm 10\%$	40	25.0	210	0.205	1,100	
75008-28	RFC-S	1.00 $\pm 10\%$	40	25.0	200	0.290	930	
75008-29	RFC-S	1.20 $\pm 10\%$	30	7.9	180	0.400	785	
75008-30	RFC-S	1.50 $\pm 10\%$	30	7.9	170	0.485	700	
75008-31	RFC-S	1.80 $\pm 10\%$	30	7.9	150	0.740	580	
75008-32	RFC-S	2.20 $\pm 10\%$	30	7.9	140	0.970	505	
75008-33	RFC-S	2.70 $\pm 10\%$	30	7.9	120	1.20	460	IRON
MS75101-1	RFC-S	3.30 $\pm 10\%$	30	7.9	70	0.140	1,350	
MS75101-2	RFC-S	3.90 $\pm 10\%$	30	7.9	65	0.155	1,250	
MS75101-3	RFC-S	4.70 $\pm 10\%$	30	7.9	60	0.210	1,100	
MS75101-4	RFC-S	5.60 $\pm 10\%$	30	7.9	50	0.280	935	
MS75101-5	RFC-S	6.80 $\pm 10\%$	30	7.9	50	0.375	810	
MS75101-6	RFC-S	8.20 $\pm 10\%$	30	7.9	48	0.440	750	
MS75101-7	RFC-S	10.00 $\pm 10\%$	30	7.9	42	0.605	640	
MS75101-8	RFC-S	12.00 $\pm 10\%$	50	2.5	36	1.05	490	
MS75101-9	RFC-S	15.00 $\pm 10\%$	55	2.5	30	1.20	460	
MS75101-10	RFC-S	18.00 $\pm 10\%$	60	2.5	30	1.95	360	
MS75101-11	RFC-S	22.00 $\pm 10\%$	60	2.5	24	2.20	335	
MS75101-12	RFC-S	27.00 $\pm 10\%$	65	2.5	22	2.75	300	

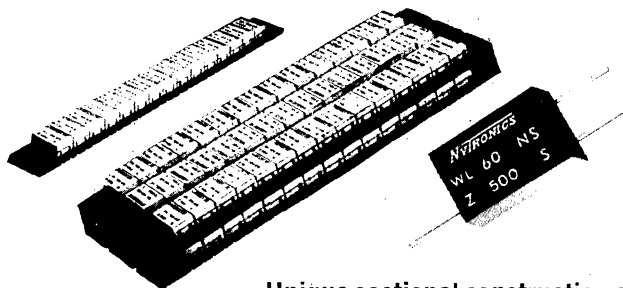


Nytronics, Inc.

ORANGE STREET, DARLINGTON, S. C. 29532
(803) 393-5421 • TWX 810-665-2182

Inductors

The Wee-Bit (Nytronics Delay Line Sections)



Unique sectional construction available utilizing individual pre-designed Wee-Bit Pulse Delay elements.
48 hour delivery not 8 weeks.
No tooling expenses.

The WEE-BIT offers the advantage of assembling a unique sectionalized delay line that reduces delivery on prototype delay lines from weeks to days and eliminates expensive tooling and design efforts. Consisting of pre-designed LC sections called Wee-Bits, a discrete value of delay time is offered. The aggregate number of Wee-Bits determines the total delay time and is a function of delay to rise time ratio. An assembly is made of selected Wee-Bits mounted on printed circuit boards that conform to MIL-P-13949B, stacked or single layer and permits increment of delay to be tapped without disturbing uniform pulse shape. Wee-Bit size 0.401" long by 0.625" wide by 0.230" height and are epoxy molded to meet environmental conditions of MIL-C-15305 (latest revision). Temperature range -55°C to 125°C. 300 VDC working voltage. Delay time available per Wee-Bit from 10 nanoseconds to 100 nanoseconds in 10 nanoseconds increments. Wee-Bits also stocked with 200 nanoseconds delay. This unique wee line sectionalized delay line concept allows reduction of approximately 40% in number of sections ordinarily required*, flexibility of design, and line tapping.

NCG Part No.	Delay Time N.S.	Delay Tolerance	Approximate Band Width MHz	DC Resistance (ohms) Max.	Std. Impedance ohms $\pm 10\%$
WL-10NS	10	$\pm 1\text{NS}$	25 MHz	0.70	500
WL-20NS	20	$\pm 5\%$	19 MHz	1.10	500
WL-30NS	30	$\pm 5\%$	13 MHz	1.40	500
WL-40NS	40	$\pm 5\%$	7.5 MHz	1.60	500
WL-50NS	50	$\pm 5\%$	6.5 MHz	1.90	500
WL-60NS	60	$\pm 5\%$	5.5 MHz	2.10	500
WL-70NS	70	$\pm 5\%$	4.5 MHz	2.25	500
WL-80NS	80	$\pm 5\%$	4.0 MHz	2.50	500
WL-90NS	90	$\pm 5\%$	3.75 MHz	2.60	500
WL-100NS	100	$\pm 5\%$	3.5 MHz	2.80	500
WL-200NS	200	$\pm 5\%$	1.5 MHz	4.20	500

NOTE: Other impedance values available upon request.

LEADING ELECTRICAL PARTICULARS

Delay Tolerance:	$\pm 5\%$
Risetime Tolerance:	$\pm 20\%$
Noise:	1 to 10%, less than 3% for most types
Ripple:	1 to 10%, less than 3% for most types
Attenuation:	0.2 db/usec. to 1.0 db/usec. most types 0.2 db/usec.
Temp. Coef.:	150 (10) ⁶ us/us $^{\circ}\text{C}$
Impedance:	500 ohms $\pm 5\%$
Operating Voltage:	300 Volts D.C.

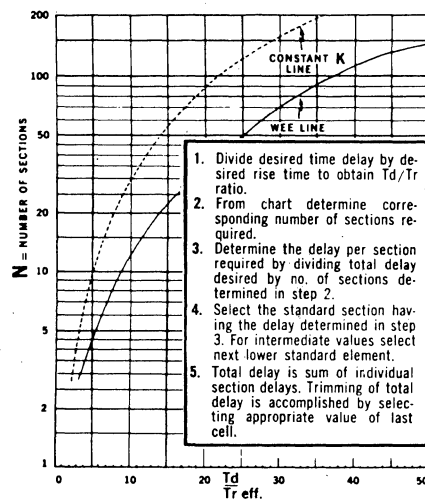
Tr MEASURED AT 10% & 90% and Td MEASURED AT 50% POINTS OF INPUT AND OUTPUT PULSES. Individual Sections furnished in $\pm 5\%$ Tolerance (or $\pm 1\text{NS}$, whichever is greater) and must be tested in accordance with Nytronics, Inc. DSI 394.

LEADING MECHANICAL PARTICULARS (for 15 section delay line)

Length of 15 cells:	6.125"
Length of 15 cells plus P.C. mounting board:	7.141"
Width of cells plus P.C. mounting board:	0.750"
Height of cells plus P.C. mounting board:	0.330"

Basic cell size:	Length — 0.401"
	Width — 0.625"
	Height — 0.230"

Temperature range and operation environmental conditions are covered by MIL-C-15305 (latest revision).



$$Tr_{eff} = \sqrt{Tr_{out}^2 - Tr_{in}^2}$$

if $Tr_{out} \geq 10 \times Tr_{in}$, $Tr_{eff} = Tr_{out}$

*Compared to constant K

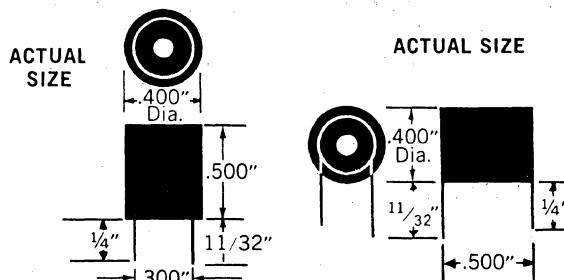

Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

VARIABLE INDUCTORS

VIV-VIH

Miniature with inductance range of 0.10 to 4700uH in 29 values.
 Encapsulated in epoxy resin for reliability.
 Designed to meet MIL-C-15305 (latest revision).



Terminal Leads #22 (.025 ± .002) VCW

VERTICAL STYLE

HORIZONTAL STYLE

The **VARIABLE INDUCTOR** offers high reliability and exceptional stability over extreme temperature variations. This small lightweight unit is furnished in vertical and horizontal styles to facilitate mounting on printed circuit boards. The unit is designed to meet the requirements of MIL-C-15305 (latest revision).

ELECTRICAL CHARACTERISTICS

Inductance Range: 0.33 to 4700uH Tunable Range ±20%
 0.15 to 0.22uH Tunable Range ±15%
 0.1 Tunable Range ±10%
 All measurements at 25°C on Q-Meter using miniature alligator clips mounted 1/2" from body.
 Q values ±20%

Self-Resonant Frequency: Minimum f_0 to be not less than 80% of published data as measured with Grid-Dip Meter

DENSITY CHARACTERISTICS

Volume: 0.063 cubic inches
Weight: 2.6 grams

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Torque: 0.75 to 5.0 inch-ounces
 Use Nytronics Tuning Tool No. B-305 or equal.

Operating Temperature: -55°C to +125°C

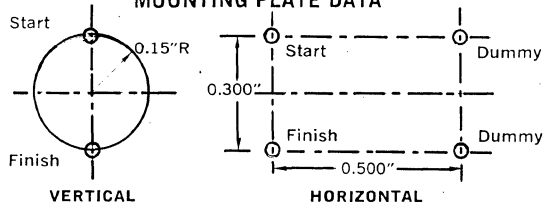
Terminal Strength: Meets five pound pull tests.

Moisture, Vibration, and Shock Resistance: Meets requirements of MIL-C-15305 (latest revision). Low frequency 10 cps to 55 cps @ .06" total excursion at rate of 1 linear sweep per minute for 2 hours repeated for each of 3 mutually perpendicular planes. Shock: 50G, 11ms.

Core Material: Iron
Marking: Manufacturer data printed.

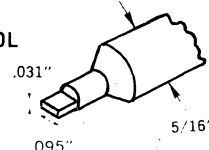
NCG PART NOS.		L nom	Q at L nom		Approx. SRF, L nom.	Max. DCR
VIV	VIH	μH		MHz	MHz	Ω
VIV- 0.10	VIH- 0.10	0.10	85	25.	> 500.	0.02
VIV- 0.15	VIH- 0.15	0.15	100	25.	> 500.	0.035
VIV- 0.22	VIH- 0.22	0.22	100	25.	> 500.	0.04
VIV- 0.33	VIH- 0.33	0.33	100	25.	334.	0.04
VIV- 0.47	VIH- 0.47	0.47	100	25.	285.	0.05
VIV- 0.68	VIH- 0.68	0.68	100	25.	237.	0.07
VIV- 1.00	VIH- 1.00	1.00	90	25.	205.	0.13
VIV- 1.50	VIH- 1.50	1.50	70	7.9	168.	0.24
VIV- 2.20	VIH- 2.20	2.20	73	7.9	135.	0.30
VIV- 3.30	VIH- 3.30	3.30	80	7.9	112.	0.45
VIV- 4.70	VIH- 4.70	4.70	75	7.9	100.0	0.80
VIV- 6.80	VIH- 6.80	6.80	80	7.9	80.0	1.1
VIV- 10.0	VIH- 10.0	10.0	82	7.9	67.0	1.9
VIV- 15.0	VIH- 15.0	15.0	65	2.5	54.2	3.2
VIV- 22.0	VIH- 22.0	22.0	55	2.5	17.5	3.4
VIV- 33.0	VIH- 33.0	33.0	54	2.5	15.0	3.6
VIV- 47.0	VIH- 47.0	47.0	51	2.5	13.2	4.5
VIV- 68.0	VIH- 68.0	68.0	55	2.5	12.0	5.5
VIV- 100	VIH- 100	100.0	50	2.5	10.5	6.7
VIV- 150	VIH- 150	150.	50	.79	3.0	11.0
VIV- 220	VIH- 220	220.	50	.79	2.70	13.0
VIV- 330	VIH- 330	330.	48	.79	2.24	16.0
VIV- 470	VIH- 470	470.	45	.79	1.90	18.0
VIV- 680	VIH- 680	680.	42	.79	1.70	21.0
VIV-1000	VIH-1000	1000.	40	.79	1.40	38.0
VIV-1500	VIH-1500	1500.	40	.25	1.14	54.0
VIV-2200	VIH-2200	2200.	44	.25	0.96	66.0
VIV-3300	VIH-3300	3300.	46	.25	0.86	85.0
VIV-4700	VIH-4700	4700.	48	.25	0.76	99.0

MOUNTING PLATE DATA



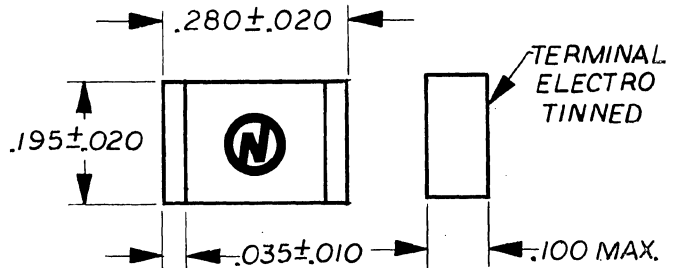
TYPICAL ALIGNING TOOL

B-305



SPECIFICATIONS CHIP INDUCTORS WEE-CHIP SERIES

The Wee-Chip Inductor is a magnetically shielded miniaturized fixed inductor made especially for mounting on substrates. The inductor body is constructed of high stability, low loss ferrite, combined with a coil cavity of optimum cross sectional area and mean radius, producing a unit having excellent "Q" factor. Copper terminations are of the wrap-around type for the greatest degree of mounting flexibility.



ELECTRICAL DATA

ELECTRICAL CHARACTERISTICS

Inductance Tolerance: $\pm 10\%$ over entire range; standard.

Dielectric Strength: 500 VRMS

DENSITY CHARACTERISTICS

Volume: 0.0055 Cubic Inches.

Weight: 0.35 grams (Max.)

Marking: Manufacturer Data Printed

NCG PART NO.	L $U_h \pm 10\%$	Q (MIN)	TEST FREQ. MHz	SRF MIN. MHz	DCR (MAX) OHMS	CURRENT (MAX) MA
WCI - 15	15	70	2.5	21.5	1.75	345
WCI - 18	18	70	2.5	19.0	1.90	335
WCI - 22	22	75	2.5	17.5	2.20	325
WCI - 27	27	75	2.5	16.0	2.40	310
WCI - 33	33	75	2.5	15.0	2.60	300
WCI - 39	39	75	2.5	14.5	2.75	295
WCI - 47	47	75	2.5	13.0	2.95	285
WCI - 56	56	75	2.5	12.0	3.25	270
WCI - 68	68	75	2.5	11.0	3.50	255
WCI - 82	82	75	2.5	10.5	4.00	235
WCI - 100	100	70	2.5	9.0	4.25	225
WCI - 120	120	70	0.79	8.5	4.50	215
WCI - 150	150	70	0.79	7.0	5.50	200
WCI - 180	180	75	0.79	6.5	6.50	190
WCI - 220	220	75	0.79	6.0	8.00	170
WCI - 270	270	75	0.79	5.5	12.0	140
WCI - 330	330	75	0.79	5.0	13.0	130
WCI - 390	390	75	0.79	4.5	14.0	120
WCI - 470	470	75	0.79	4.0	15.0	115
WCI - 560	560	75	0.79	3.5	22.0	100
WCI - 680	680	70	0.79	3.0	24.0	95
WCI - 820	820	70	0.79	2.5	26.0	90
WCI - 1000	1000	70	0.79	2.0	36.0	75

- (1) Shielding: 2% max. coupling when two units are tested side by side.
- (2) Designed to meet the requirements of MIL-C-15305, Grade 2, Class B.
- (3) Stability: Temp. coefficient of inductance ranges from 100 to 500 ppm/°C depending on inductance.
- (4) Current Ratings: Based on a 35°C temperature rise from an ambient temp. of 90°C.
- (5) L, Q & F₀ measurements made using Boonton 260-A Q-meter.
- (6) Other values & tolerances available on special order.

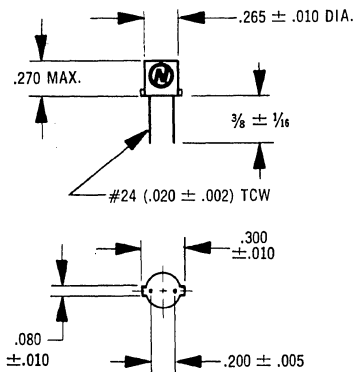
SPECIFICATIONS FIXED INDUCTORS PEE-CEE DUCTOR SERIES

The PEE-CEE is designed to meet MIL-C-15305 (latest revision), Grade 1, Class B. Printed board mounting is facilitated by 0.200 grid spacing and unit has shielded construction to allow maximum density packaging. Standardized in 73 stock values.

**Subminiature Shielded
High Q Values**

**Radial Lead Fixed Inductor
0.10 to 100,000uH**

Unitized Epoxy-Molded Construction



All dimensions in inches

ELECTRICAL CHARACTERISTICS

Inductance:	$\pm 10\%$ over entire range as measured per MIL-C-15305 (latest revision).
Q and f_s Values:	Minimum not less than 80% of specified value
Dielectric Strength:	840 Volts R.M.S. at sea level.
Working Voltage:	300 Volts D.C.
Maximum Current:	Based on temperature rise not to exceed 35°C at 90°C ambient.
Incremental Current:	Defined as the DC current required to cause a five percent reduction in the nominal inductance value.

DENSITY CHARACTERISTICS

Weight:	1.5 grams maximum
Volume:	.015 cubic inches
Shielding:	3% coupling maximum when two units are tested side by side.

PHYSICAL AND ENVIRONMENTAL CHARACTERISTICS

Operating Temperature:	-55°C to $+125^\circ\text{C}$.
Moisture, Vibration, and Shock Resistance:	Meet requirements of MIL-C-15305 (latest revision). Low frequency 10 to 55 cps @ .06" maximum total excursion at rate of 1 linear sweep per minute for 2 hours repeated for each of three mutually perpendicular planes. Shock: 50G, 11 MS. (body mounted)
Marking:	Manufacturer data printed.
Terminal Pull:	Three pounds.

PEE-CEE DUCTOR STANDARD VALUES

NCG Part No.	L	Test Freq.	Q nom.	SRF nom.	D. C. R. Max.	Max. I	Incr. I
	μh	MHz		MHz	ohms	m.a.	m.a.
PC 0.10	.10	25	70	>250	0.030	2500	2500
PC 0.12	.12	25	70	>250	0.030	2500	2500
PC 0.15	.15	25	70	>250	0.030	2500	2500
PC 0.18	.18	25	70	>250	0.035	2400	2400
PC 0.22	.22	25	70	>250	0.038	2300	2300
PC 0.27	.27	25	80	>250	0.040	2200	2200
PC 0.33	.33	25	80	>250	0.040	2200	2200
PC 0.39	.39	25	80	250	0.045	2100	2100
PC 0.47	.47	25	80	230	0.045	2100	2100
PC 0.56	.56	25	80	220	0.050	2000	2000
PC 0.68	.68	25	80	190	0.055	1900	1900
PC 0.82	.82	25	85	180	0.060	1800	1800
PC 1.00	1.00	25	85	160	0.070	1700	1700
PC 1.2	1.2	7.9	90	170	0.085	1670	1670
PC 1.5	1.5	7.9	100	155	0.100	1540	1540
PC 1.8	1.8	7.9	115	135	0.110	1470	1470
PC 2.2	2.2	7.9	110	120	0.120	1410	1410
PC 2.7	2.7	7.9	110	104	0.125	1380	1380
PC 3.3	3.3	7.9	90	93.0	0.165	1200	1200
PC 3.9	3.9	7.9	90	87.0	0.180	1135	1135
PC 4.7	4.7	7.9	95	79.0	0.245	985	985
PC 5.6	5.6	7.9	95	72.0	0.265	950	950
PC 6.8	6.8	7.9	85	63.0	0.330	853	853
PC 8.2	8.2	7.9	95	60.0	0.460	720	720
PC 10	10	7.9	90	54.0	0.640	620	620
PC 12	12	2.5	120	37.0	0.800	545	545
PC 15	15	2.5	120	28.8	0.865	520	520
PC 18	18	2.5	115	23.8	0.940	504	504
PC 22	22	2.5	125	21.3	1.03	460	460
PC 27	27	2.5	115	20.6	1.18	418	418
PC 33	33	2.5	120	18.6	1.30	398	398
PC 39	39	2.5	120	17.7	1.41	385	385
PC 47	47	2.5	110	14.9	1.61	350	350
PC 56	56	2.5	115	13.9	2.08	330	330
PC 68	68	2.5	105	12.9	2.20	320	320
PC 82	82	2.5	105	11.7	2.42	300	300
PC 100	100	2.5	95	10.5	2.15	333	333
PC 120	120	0.790	95	5.60	2.38	316	190
PC 150	150	0.790	90	5.20	2.52	306	175
PC 180	180	0.790	95	4.90	2.88	288	150
PC 220	220	0.790	95	4.60	3.18	273	125
PC 270	270	0.790	100	4.20	3.50	260	120
PC 330	330	0.790	100	3.55	4.80	222	110
PC 390	390	0.790	100	3.45	5.44	209	105
PC 470	470	0.790	100	3.20	5.90	201	100
PC 560	560	0.790	95	2.90	6.30	194	90
PC 680	680	0.790	100	2.70	7.20	181	80
PC 820	820	0.790	90	2.50	8.00	172	70
PC 1,000	1,000	0.790	100	2.35	12.0	141	65
PC 1,200	1,200	0.250	95	2.20	13.5	132	60
PC 1,500	1,500	0.250	90	1.90	16.5	119	55
PC 1,800	1,800	0.250	100	1.80	18.0	114	47
PC 2,200	2,200	0.250	100	1.70	20.5	107	43
PC 2,700	2,700	0.250	95	1.50	22.5	102	39
PC 3,300	3,300	0.250	90	1.40	42.0	76	36
PC 3,900	3,900	0.250	85	1.27	47.5	71	35
PC 4,700	4,700	0.250	85	1.24	53.0	67	34
PC 5,600	5,600	0.250	85	0.93	62.5	65	31
PC 6,800	6,800	0.250	75	0.79	69.5	58	27
PC 8,200	8,200	0.250	80	0.75	75.0	56	26
PC 10,000	10,000	0.250	70	0.70	100.0	49	24
PC 12,000	12,000	0.079	70	.50	64	60	40
PC 15,000	15,000	0.079	70	.38	84	52	34
PC 18,000	18,000	0.079	70	.36	93	50	30
PC 22,000	22,000	0.079	70	.32	104	45	28
PC 27,000	27,000	0.079	70	.30	173	35	26
PC 33,000	33,000	0.079	70	.27	187	32	24
PC 39,000	39,000	0.079	70	.26	220	30	22
PC 47,000	47,000	0.079	70	.25	253	28	20
PC 56,000	56,000	0.079	70	.24	285	26	19
PC 68,000	68,000	0.079	60	.20	311	24	18
PC 82,000	82,000	0.079	60	.19	385	22	16
PC 100,000	100,000	0.079	60	.17	420	20	15


Nytronics Components Group Inc.

 ORANGE STREET, DARLINGTON, S. C. 29532
 (803) 393-5421 • TWX 810-665-2182

Inductors

NEW Variable, Magnetically Shielded, Electrostatically Shielded Inductor

**DESIGNED TO MEET REQUIREMENTS
OF MIL-C-15305 (LATEST REVISION)**

ELECTRICAL:

Tuning Range > 10%.
 Flat Q Response Across Tuning Range.
 Low DCR to L Ratio.

INDUCTANCE:

< 1uh to > 1000uh available in 10% Retma values each with > 10% tuning range.

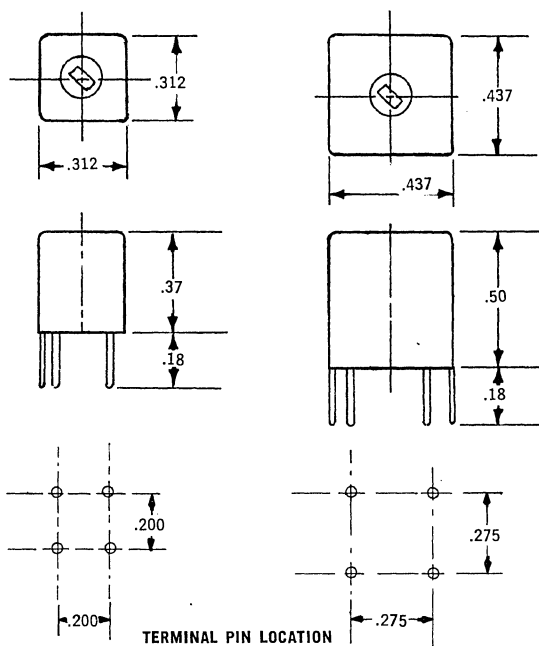
OPERATING TEMPERATURE RANGE:

-55°C to 125°C (higher on request).

TYPICAL TEMPERATURE COEFFICIENT:

30 to 65 ppm/°C positive.

MECHANICAL:



Specific information available upon request.

Customer Specification

PRECISION COILS

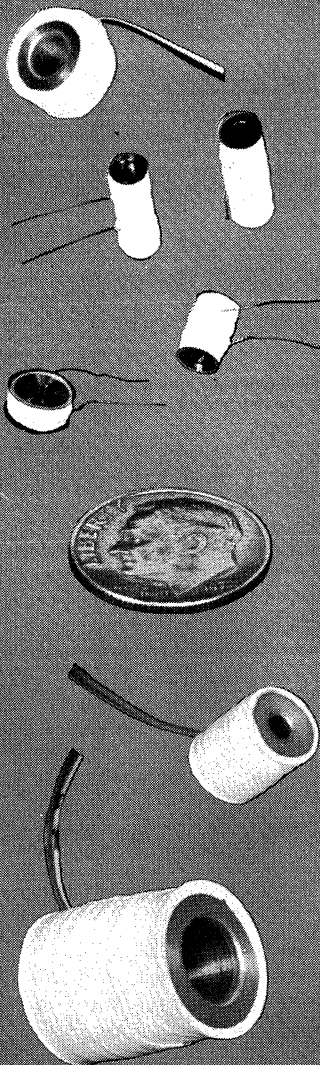
10 years' experience
makes us specialists
in winding

**THIN-WALL
HIGH EFFICIENCY
COILS**

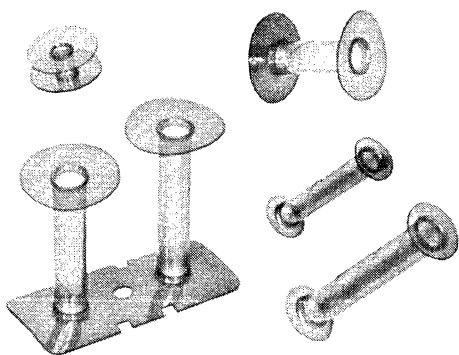
Let us help you
develop the
ideal coil for
your application.

Dia-Netics, INC.

18823 NAPA STREET
NORTHRIDGE • CALIFORNIA 91324
(213) 886-2616



Extra Power **Added Sensitivity**



KAPTON ***THIN-WALL*** **FABRICATED** **BOBBINS**

THIN-WALL STRUCTURE

Provides maximum winding space with added turns at the inside small diameter.

KAPTON MATERIAL

Solvent resistant.
Withstands temperatures from
— 296°C to + 400°C.
Will not fuse or melt in flames.
Radiation resistant.
Maintains physical, chemical and
electrical properties over a wide
range of temperature and frequency.

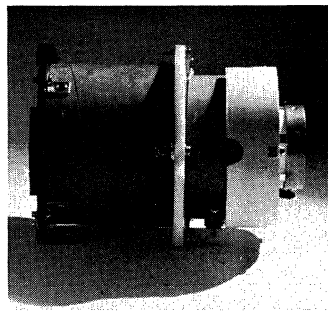
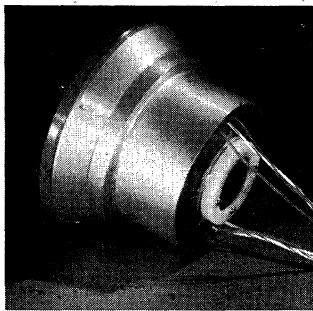
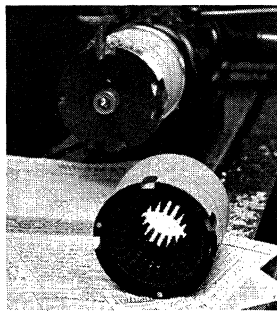
DIA-NETICS SERVICE

Assures a dependable source of
space-saving bobbins or complete
coils at low initial setup cost.
Send us a print or description for
immediate attention.



Dia-Netics, INC.

18823 NAPA ST.
NORTHRIDGE, CALIF. 91324
(213) 886-2616

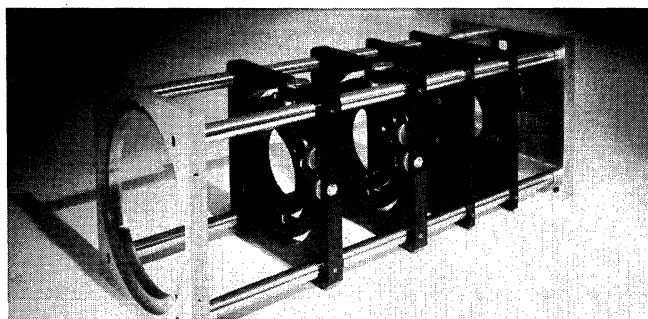
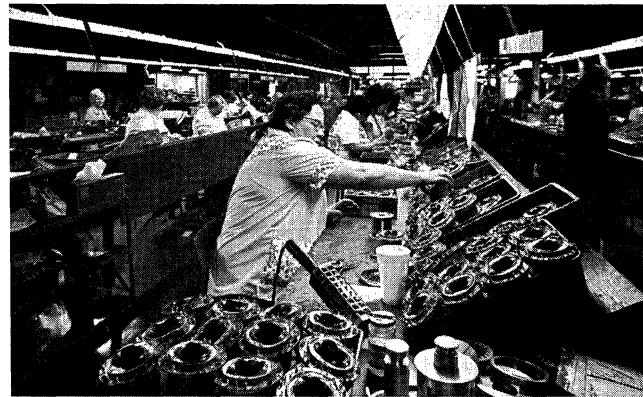
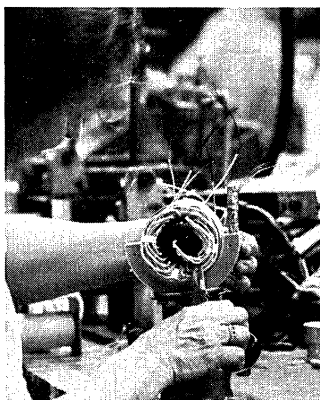


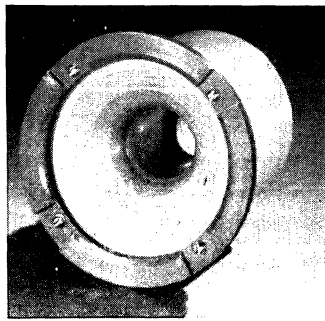
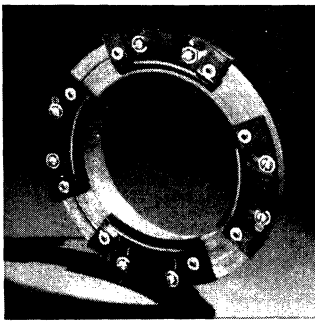
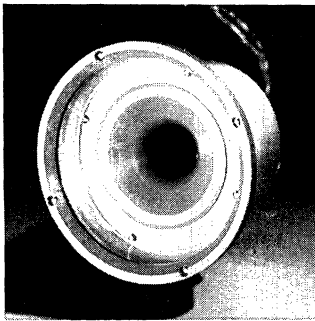
syntronic product index

COMPLETE LINE OF YOKES & COILS FOR PRECISION CRT DISPLAYS

Syntronic Instruments, Inc., founded in 1949 is one of the pioneers in the development of CRT precision yokes. We offer a wide selection of standard deflection yokes and coils designed and fabricated to meet industrial and military specifications. Our most popular styles and sizes are listed in the product index shown on the next three pages. Catalog pages and/or engineering drawings showing performance characteristics, electrical data and dimensions are available on request.

As the largest manufacturer of precision yokes we have developed our engineering, prototype and production capabilities to meet the needs of the information display engineer. If the component you need is not listed among our standard items, we invite you to contact one of our field sales engineers—or call one of our yoke specialists at (312) 543-6444. Here's how we will go to work to help you with your CRT display design problem. First we develop an idea, making something tailored for your application. Then, you may want 10 pieces to perform just like the prototype. Then 100 or 1,000. We have the production flexibility and the know-how to make one part or a thousand. We have the whole package... ideas and good repetitive products—yokes, coils, accessories, assemblies. Your exact requirements can be met for cameras, flying spot scanners, scanning electron microscopes, storage devices, etc. If you are designing or building a display, ask us to put our 25 years of experience to work for you.





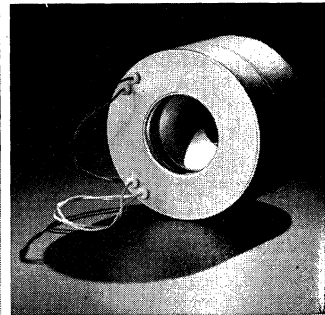
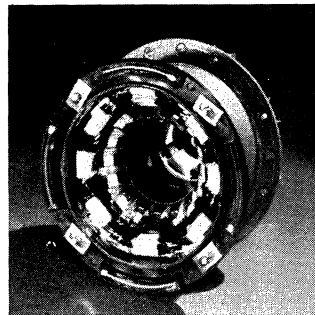
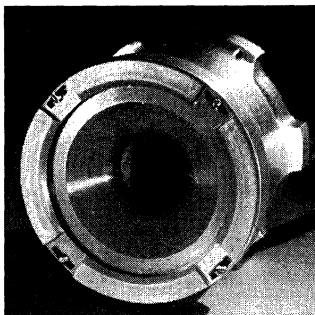
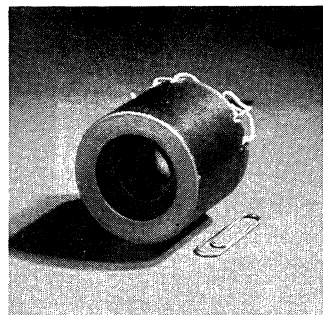
YOKES

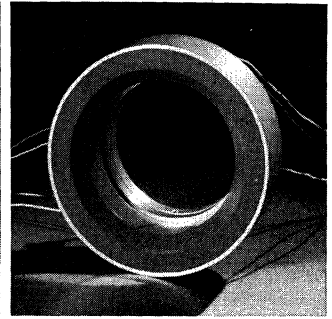
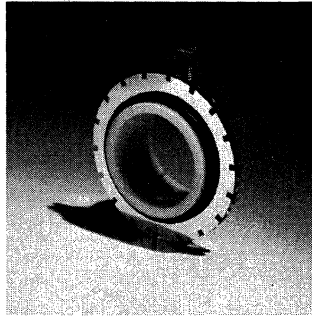
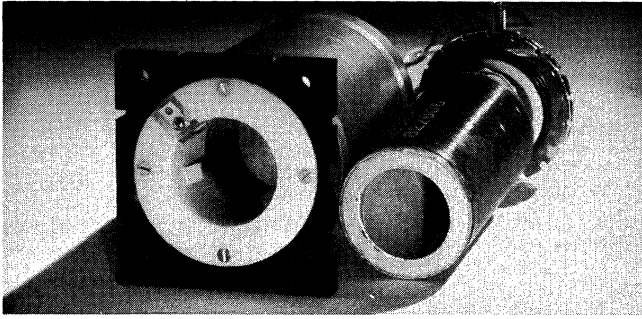
INSIDE DIAMETER (INCHES)	DEFLECTION ANGLE				SINGLE ENDED PUSH-PULL	HIGH EFFICIENCY	HIGH Q	RAPID SETTLING	HIGH RESOLUTION	PRECISE GEOMETRY	LOW RESIDUAL	LINE SCAN	LIGHTWEIGHT	LOW COST	PART NUMBER
	42°	52°	70°	90°											
.500/ .600															C6201
															C6202
															C6203
															C6204
															C8900
															C7400
.900															C7770
															C7810
															C7840
															C8010
															C8075
															C8080
															C8190
															C8221
															C8325
															C8395
															C8420
															C8515
															C8530
															C8575
1.075/ 1.080															C8735
															C4190
															C4220
															C7290
															C7300
															C8065
															C8225
															C8275
															C8365
															C8414
1.125/ 1.187															C8610
															C8645
															C8685
															C8995
															C8110
															C8120
															C8175
															C8202
															C8270
															C8285
															C8290

■ DENOTES CHARACTERISTIC OF PART

YOKES

INSIDE DIAMETER (INCHES)	DEFLECTION ANGLE				SINGLE ENDED PUSH-PULL	HIGH EFFICIENCY	HIGH Q	RAPID SETTLING	HIGH RESOLUTION	PRECISE GEOMETRY	LOW RESIDUAL	LINE SCAN	LIGHTWEIGHT	LOW COST	PART NUMBER
	42°	52°	70°	90°											
1.125/ 1.187															C8599
															C8640
															C8650
															C8665
															C8925
															C2875
1.515/ 1.520															C2877
															C3311
															C3331
															C3411
															C3431
															C3511
															C3531
															C5380
															C6767
															C7075
															C7665
															C7720
															C7730
															C7777
															C7785
															C7794
															C7815
															D7850
															C7875
															C7880
															C7885
															C7890
															C7895
															C7900
															C7905
															C7910
															C7960
															C7975
															C7990
															C8025
															C8035
															C8055
															C8070
															C8115
															C8130





YOKES

INSIDE DIAMETER (INCHES)	42°	52°	70°	90°	SINGLE ENDED	PUSH-PULL	HIGH EFFICIENCY	HIGH Q	RAPID SETTLING	HIGH RESOLUTION	PRECISE GEOMETRY	LOW RESIDUAL	LINE SCAN	LIGHTWEIGHT	LOW COST	PART NUMBER
1.515/ 1.520																C8160
																C8180
																C8195
																C8240
																C8250
																D8295
																C8330
																C8350
																C8356
																C8370
																C8415
																C8445
																C8460
																C8485
																C8509
																C8555
																C8560
																C8580
																C8655
																C8660
2.000																C8670
																C8683
																C8715
																C8725
																C8730
																C8740
																C8777
																C8780
																C8785
																C8850
																C8895
																C8905
																C8950
																C8955
																C8960
																C4061
																C4081
																C6610
																C7926
																C8145
																C8335

■ DENOTES CHARACTERISTIC OF PART

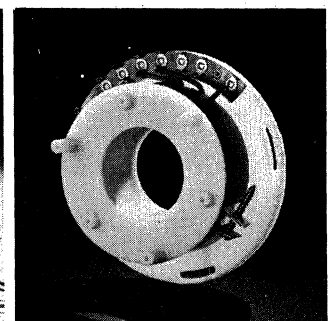
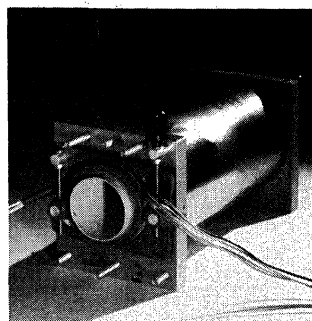
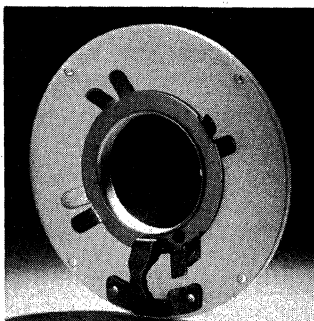
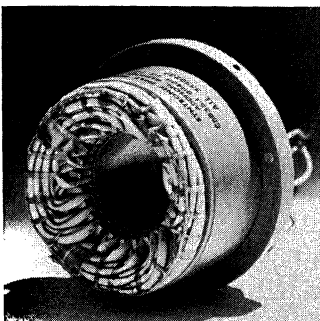
ROTATING COIL ASSEMBLY

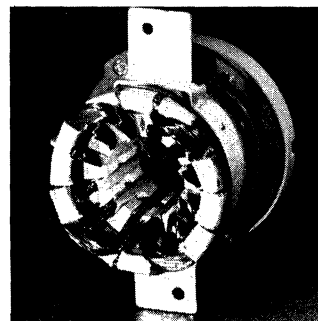
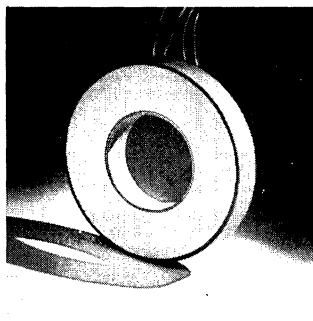
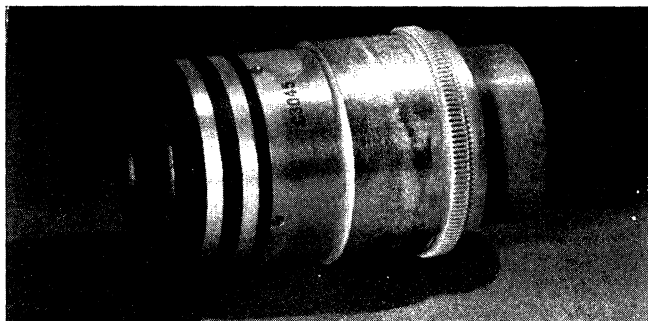
INSIDE DIAMETER (INCHES)	42°	50°	70°	SINGLE AXIS	TWO AXIS	ALIGNMENT COIL	OFF-CENTERING COIL	OFF-CENTERING MAGNET	CONTACT BRUSHES & OUTER HOUSING	SMALL SIZE	PART NUMBER
0.97											D2649
1.00											CX10352
1.12											C3045
1.50											D3975
											D4120
1.61											C1199
											C2105
											D2540
1.63											C3132
											DX10099

IMMERSION OPTICS

INSIDE DIAMETER (INCHES)	EM FOCUS	ES FOCUS	ALIGNMENT COIL	VIDICON TYPE	PLUMBICON TYPE	SEC TYPE	IMAGE ORTHON	IMAGE DISSECTOR	SCAN CONVERTER	COLOR CAMERA	HIGH RESOLUTION	PRECISE GEOMETRY	ORTHO ADJUSTMENT	RAPID RECOVERY	MINIATURE	LOW COST	PART NUMBER
1.01																	D4401
1.05																	C4567
																	C4350
1.06																	C4763
																	D6490
																	C4024
																	C4025
																	*C3742
																	C3743
																	*C4022
																	C4250
																	*C4020
																	C4021
1.07																	D5465
1.09																	C8185
1.10																	C8265
1.39																	C8658
1.44																	C6144
4.38																	C7520
																	C4930

*USED IN PAIRS





FOCUS COILS

INSIDE DIAMETER (INCHES)	STATIC	STATIC/DYNAMIC	SINGLE GAP	DOUBLE GAP	HIGH SPEED DYNAMIC	LOW RESIDUAL	LOW ASTIGMATISM	MINIMUM DYNAMIC SPOT SHIFT	HIGH POWER	COLOR SWITCHING	FLYING SPOT SCANNER	SCAN CONVERTERS	PART NUMBER
0.60													B4845
0.65													C4834
1.00													C3138
													C5215
1.19													C5315
													C6240
													C8440
													C1552
													C2612
1.56													C3062
													C7375
													C7380
													C8745
													C8990
1.62													C8045
													C8480
2.10													C8150
2.13													C1517

ACCESSORY COILS

INSIDE DIAMETER (INCHES)	WRITING (DIDDLE) SINGLE AXIS	WRITING (DIDDLE) TWO AXIS	BEAM ALIGNMENT (CENTERING)	ASTIGMATISM CORRECTION	PINCUSHION CORRECTION	ELECTRON BEAM MACHINE	PART NUMBER
1.025							C8425
							C7495
1.18							C7440
							C8345
1.52							B3072
							C6050
1.53							C8435
							C5903
1.56							C4848
2.14							C7965
							C7970
3.31							C4330
3.68							C4254

PERMANENT MAGNET ACCESSORIES

B4118 Anti-Pincushion Device for 7/8" and 1" CRT necks. Mounts on front of yoke. Ideal for airborne or other lightweight displays.

C4077 Anti-Pincushion Device for 1 7/16" CRT necks. Eliminates geometric distortions over entire CRT face when used with independent circuit correction of horizontal and vertical traces.

B5129 Beam Centering Magnet Assemblies for 7/8" Dia. neck CRT's. A series of easily adjustable devices available in 9 different ranges of flux density. Screwdriver adjustment.

B4323 Beam Centering Assemblies. Available in various magnet strengths for 1 7/8" neck CRT's. Screwdriver adjustment.

C4268 Beam Centering Device. A simple, low cost unit for 1 1/2" neck CRT's. Adjusts by moving tabs. Available in various magnet strengths. Locks securely. Corrects gun misalignment and poor aperture flooding.

MECHANICAL ACCESSORIES

D8300 CRT mount for 5" round tube. Maximum stability. Quick CRT removal. Rugged four-rod frame comes with **D7450** or **D7675** micropositioner(s) and optional **C7755** fixed coil positioners. Available with or without electromagnetic shielding.

D8305 CRT mount for 7" round tube. Similar design to **D8300**, using standard positioners.

D8310 CRT mount for 10" round tube. Similar design to **D8300**, with stepped front. Uses standard positioners.

Special CRT mounts for large CRT's up through 36" diameters are available by special order. Standard four-rod frame.

D7450 (for 3.50" O.D. coils)/**D7675** (for 4.00" O.D. coils). Micropositioner for deflection yoke, focus coil or lens. Moderate cost, minimum backlash. Independent fine adjustments with locks for: pitch, yaw, horizontal and vertical translation. Use with any standard four-rod mount assembly.

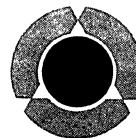
C8795 Yoke rotator for **D7450**/**D7675** micropositioner. For easy alignment of yoke's deflection axis to a fixed mechanical axis. Rotational range $\pm 5^\circ$ from center position. Screwdriver adjustment.

C7755 Fixed coil positioner. Holds magnetic components, such as centering coils or astigmatism correction coils, rigidly and accurately. Use with any standard four-rod mount assembly.

C8450 Low-cost coil positioner for 4" O.D. coils. Horizontal and vertical translation only. Use with standard four-rod mount assembly.

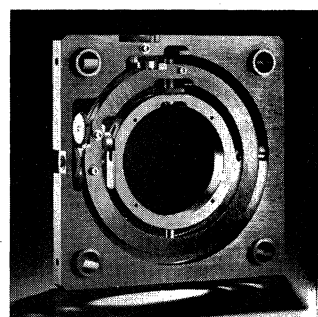
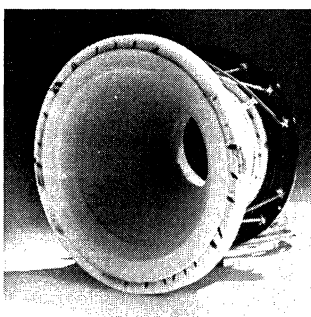
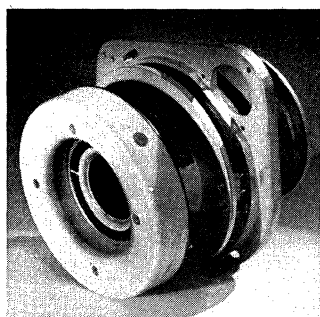
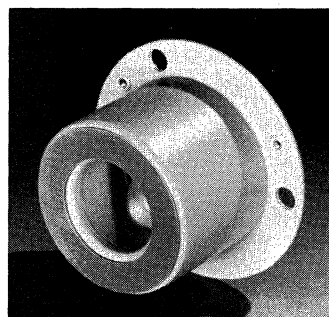
D4499 Micrometer-controlled precision aligner. For fast accurate alignment of deflection yokes, focus coils and pincushion correctors. Bench mount design ideal for laboratory research and prototype evaluation.

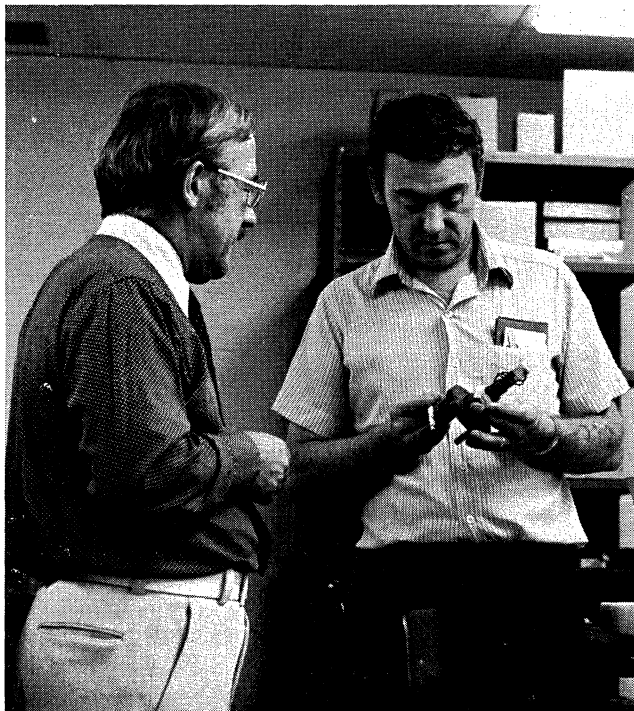
C6161 Yoke rotator for **D4499** micropositioner for easy alignment of yoke's deflection axis to a fixed mechanical axis. Rotational range $\pm 5^\circ$ from center position. Screwdriver adjustment.



syntronic

SYNTRONIC INSTRUMENTS, INC.
100 Industrial Road, Addison IL 60101
Phone (312) 543-6444





syntronic

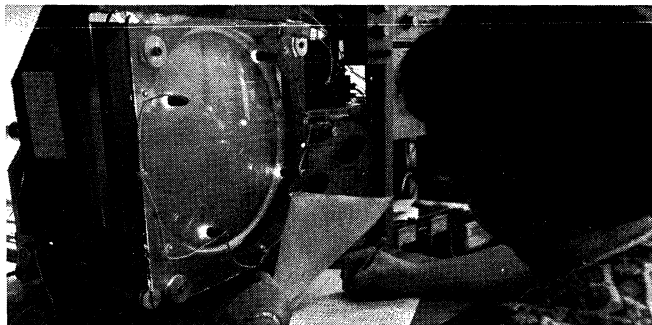
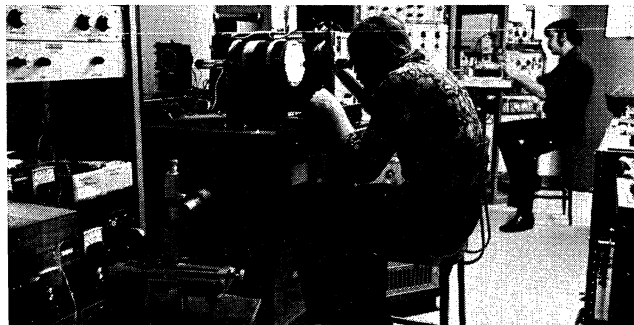
yoke application checklist

Yoke selection involves consideration of many interacting factors: the requirements of the display system, the cathode ray tube to be used, and the circuitry involved.

The Yoke Application Checklist on the opposite page, based on our twenty-five years of experience in the design and manufacture of yokes, has been developed to illustrate some of these interactions, and to provide you with a checklist of information to be evaluated by our yoke specialists.

As a result of thorough evaluation, a yoke of more reasonable cost and superior performance can often be used when it is possible to allow some small trade-off variations in these interacting factors.

When working with Syntronic Instruments, Inc., it is not necessary for you to become deeply involved in the design of the yoke. By merely filling out the checklist in whole or in part and submitting a copy to our engineers, you can be sure that all factors will be considered and that we will be able to recommend a yoke design that will be best suited for your application.

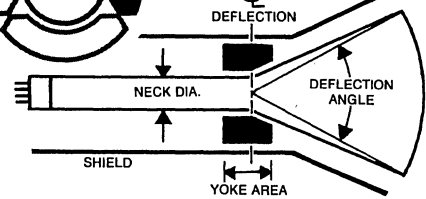
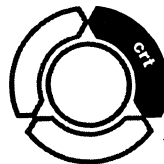


NAME _____ TITLE _____
 COMPANY _____
 ADDRESS _____ CITY _____ STATE _____ ZIP _____
 PHONE _____

YOKE APPLICATION CHECKLIST

syntronic

SYNTRONIC INSTRUMENTS, INC.
 100 Industrial Road, Addison, Ill. 60101
 (312) 543-6444



CRT SPECIFICATIONS

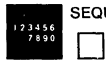
ACCELERATION VOLTAGE _____ ☐ NOT YET SPECIFIED
 DEFLECTION ANGLE _____ ☐
 NECK DIAMETER _____ ☐
☐ ELECTROSTATIC FOCUS _____ ☐
☐ MAGNETIC FOCUS _____ ☐
 TYPE: _____
 MFG. NO. _____ SIZE _____ ☐
 LINE WIDTH _____ CENTER SPOT SIZE _____ ☐
 FACE ☐ FLAT ☐ TUBE ☐ ROUND
☐ CURVED ☐ RECTANGULAR

MECHANICAL LIMITATIONS

☐ CRT SHIELD REQUIRED _____ ☐
 SHIELD I.D. IN YOKE AREA _____ ☐
 YOKE ☐ FIXED ☐ ROTATING

DISPLAY

ALPHANUMERIC AND/OR SYMBOLS



SEQUENTIAL ☐



RANDOM ☐

GRAPHIC



VECTORS ☐



LARGE SYMBOLS ☐

RADAR



PPI ☐



A SCOPE ☐



B SCOPE ☐



Az El ☐



TV RASTER ☐

☐ SCAN CONVERTER/STORAGE

OTHER _____

VIEWING CIRCUMSTANCES

AMBIENT LIGHT CONDITIONS



PHOTOGRAPHIC RECORDING ☐

OTHER _____

DISPLAY ACCURACY

KEY CONSIDERATIONS FOR ACCURACY OF IMAGE



MAXIMUM SPOT SIZE AT CENTER



MAXIMUM SPOT SIZE AT CORNERS



GEOMETRY AT CORNERS

OTHER _____

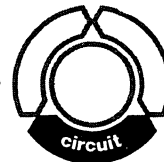
PRIMARY CONSIDERATIONS

(POSSIBLE TRADEOFFS)

☐ POWER _____
☐ WEIGHT _____
☐ PRECISION _____
☐ RESOLUTION _____
☐ ENVIRONMENT _____
☐ PRICE _____
☐ OTHER _____

GENERAL CLASS OF APPLICATION

☐ MILITARY ☐ COMMERCIAL ☐ INDUSTRIAL
☐ AIRBORNE ☐ CONSUMER ☐ MARINE
☐ GROUND ☐ SHIPBOARD



SCAN

SWEEP RATE (IF SAWTOOTH) _____ ☐ NOT YET SPECIFIED
 WAVE FORM (IF UNUSUAL) _____
 MINIMUM RETRACE TIMES _____ ☐
 BLANKING TIME _____ ☐
 SETTling TIME _____ ☐

CIRCUIT CONSIDERATION

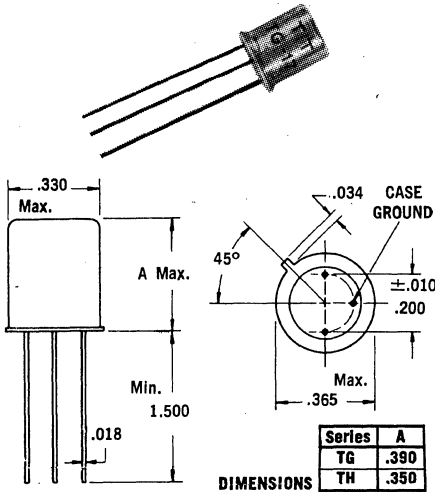
SINGLE-ENDED _____ ☐
 OR
 PUSH-PULL _____ ☐
 MAXIMUM VOLTAGE ACROSS YOKE _____ ☐
 MAXIMUM CURRENT TO YOKE _____ ☐
 RESONANT SCAN _____ ☐
 OPERATIONAL AMPLIFIER SCAN _____ ☐
 RESONANT FREQUENCY OF YOKE _____ ☐



13402 SOUTH 71 HIGHWAY, GRANDVIEW, MO. 64030

PHONE: (816) 761-6314 TWX 910-777-7037

MINI-L HERMETICALLY SEALED R.F. INDUCTORS — TG, TH SERIES



TG SERIES

- HERMETICALLY SEALED, HIGH "Q" INDUCTOR IN A TO-5 TRANSISTOR CONFIGURATION.
- LOW EXTERNAL MAGNETIC AND ELECTROSTATIC FIELD.

Part No.	Inductance (MH)	Inductance Test Freq. (KHz)	"Q" Test Freq. (KHz)	DCR Max. (ohms)	Min. SRF (MHz)	DC Curr. (ma)
TG-1	1.0	10	120	3.3	1500	123
TG-2	1.2	10	120	3.6	1300	118
TG-3	1.5	10	120	4.8	1160	102
TG-4	1.75	10	120	5.2	1080	98
TG-5	2.0	10	120	5.7	1000	94
TG-6	2.4	10	120	7.9	920	80
TG-7	3.0	10	120	8.9	820	75
TG-8	3.6	10	120	9.8	730	71
TG-9	4.3	10	120	13.7	660	60
TG-10	5.0	10	120	14.7	600	58
TG-11	6.0	10	120	20.0	540	50
TG-12	7.2	10	120	21.8	480	48
TG-13	8.6	10	100	24.0	430	45
TG-14	10.0	10	100	32.4	400	39
TG-15	12.0	10	100	34.8	360	38
TG-16	15.0	10	100	39.1	320	36
TG-17	17.5	10	85	55.0	300	30
TG-18	20.0	10	85	60.0	280	29
TG-19	24.0	10	85	64.7	250	28
TG-20	30.0	10	85	86.3	220	24
TG-21	36.0	10	85	95.8	195	23
TG-22	43.0	10	85	132	185	19
TG-23	50.0	10	85	143	165	18
TG-24	60.0	10	75	155	145	18
TG-25	72.0	10	75	172	130	17
TG-26	86.0	10	75	233	125	15
TG-27	100	10	75	252	115	14
TG-28	120	5	75	290	105	13
TG-29	150	5	50	323	95	13
TG-30	175	5	50	350	85	12
TG-31	200	5	50	477	80	10
TG-32	240	5	50	693	71	10
TG-33	300	5	50	735	63	8
TG-34	360	5	30	1005	57	7
TG-35	430	5	30	1100	51	6.5
TG-36	500	5	30	1200	48	6.5

TH SERIES

- AMBIENT TEMPERATURE RANGE: -55°C to $+130^{\circ}\text{C}$.
- DIELECTRIC WITHSTANDING VOLTAGE: 100 volts rms.
- INSULATION RESISTANCE: 10,000 meg. ohms Min.

Part No.	Inductance (uh)	Inductance Test Freq. (KHz)	"Q" Test Freq. (KHz)	DCR Max. (ohms)	Min. SRF (MHz)	DC Curr. (ma)
TH-7	10	1000	75	2500	2.4	35.0
TH-8	12	1000	75	2500	2.5	30.0
TH-9	15	1000	75	2500	2.6	25.0
TH-10	18	1000	75	2500	2.7	23.0
TH-11	22	1000	75	2500	2.8	20.0
TH-12	27	1000	75	2500	2.9	17.0
TH-13	33	1000	75	2500	3.0	14.0
TH-14	39	500	70	2500	3.1	11.0
TH-15	47	500	70	2500	3.2	10.0
TH-16	56	500	70	2500	3.3	9.5
TH-17	68	500	70	2500	3.4	9.0
TH-18	82	500	70	2500	4.5	8.0
TH-19	100	500	70	1500	5.1	7.5
TH-20	110	500	70	1500	6.0	7.0
TH-21	120	500	70	1500	6.2	6.5
TH-22	130	500	70	1500	6.4	6.0
TH-23	150	500	70	1500	6.6	5.5
TH-24	160	500	60	790	8.6	5.3
TH-25	180	500	60	790	9.0	5.0
TH-26	200	500	60	790	9.5	4.5
TH-27	220	250	60	790	10.0	4.0
TH-28	240	250	60	790	10.6	3.8
TH-29	270	250	60	790	11.2	3.6
TH-30	300	250	60	790	14.2	3.4
TH-31	330	250	60	790	14.6	3.2
TH-32	360	250	60	790	15.0	3.0
TH-33	390	250	60	790	15.6	2.9
TH-34	430	250	60	790	16.4	2.8
TH-35	470	250	60	790	20.4	2.7
TH-36	510	250	60	790	21.8	2.6
TH-37	560	250	60	790	23.6	2.5
TH-38	620	250	60	790	24.6	2.3
TH-39	680	250	50	790	25.8	2.1
TH-40	750	250	50	790	26.8	1.9
TH-41	820	250	50	790	38.4	1.7
TH-42	910	250	50	790	40.8	1.5
TH-43	1000	250	50	790	42.6	1.4

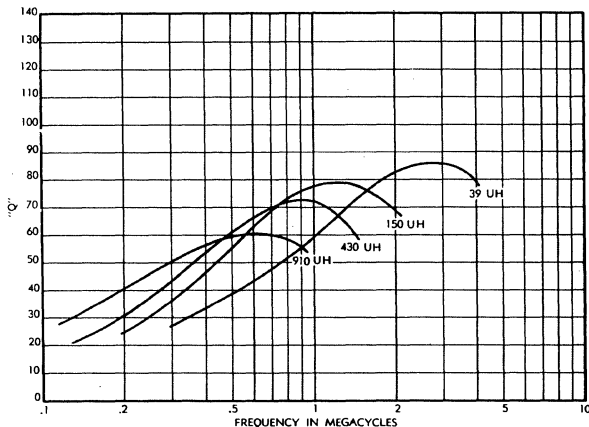
TG SERIES

- DESIGNED TO MEET THE REQUIREMENTS OF MIL-T-27, GRADE 4, CLASS S.
- FREQUENCY RANGE: 10 to 500 KHz.
- INDUCTANCE RANGE: 1 to 500 mh.
- INDUCTANCE TOLERANCES: $\pm 5\%$.
- INDUCTANCE STABILITY: $\pm 2\%$ (-20°C to $+85^{\circ}\text{C}$).

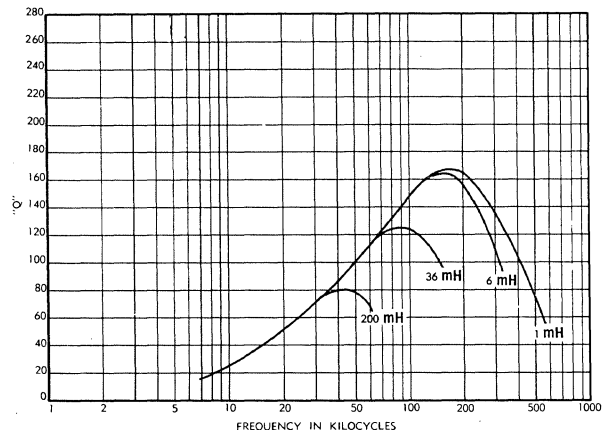
TH SERIES

- DESIGNED TO MEET THE REQUIREMENTS OF MIL-C-150305, GRADE 1, CLASS 0.
- FREQUENCY RANGE: 100 KHz to 10 MHz.
- INDUCTANCE RANGE: 10 uh to 1000 uh.
- INDUCTANCE TOLERANCES: 10 uh through 33 uh $\pm 10\%$, 39 uh through 130 uh $\pm 5\%$, greater than and including 150 uh $\pm 3\%$.
- INDUCTANCE STABILITY: $\pm 2\%$ (-20°C to $+85^{\circ}\text{C}$).

TH TYPICAL "Q" VS FREQUENCY



TG TYPICAL "Q" VS FREQUENCY

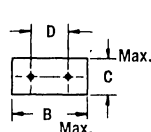
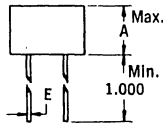




13402 SOUTH 71 HIGHWAY, GRANDVIEW, MO. 64030

PHONE: (816) 761-6314 TWX 910-777-7037

MINI-L ENCAPSULATED R.F. INDUCTORS — TA, TF, TB & TD SERIES



DIMENSIONS

Series	A	B	C	D	E	Max. Power
TA	.225	.210	.110	.100	.020	0.2 Watt
TB	.300	.280	.160	.200	.025	0.33 Watt
TD	.390	.390	.197	.200	.025	0.5 Watt
TF	.225	.210	.110	.100	.020	0.2 Watt

TA SERIES

- MIN. "Q": 60 to 70.
- INDUCTANCE RANGE: .1 uh to 10 uh.
- FREQUENCY RANGE: 1 to 50 MHz.
- INDUCTANCE TOLERANCES: Less than 1.0 uh, $\pm 10\%$. Greater than or equal to 1.0 uh, $\pm 5\%$. Closer tolerances available by special request.
- INDUCTANCE TC: $+50$ PPM/ $^{\circ}$ C maximum.
- MAXIMUM POWER DISSIPATION: 0.2 watt.

TF SERIES

- MIN. "Q": 60 to 80.
- FREQUENCY RANGE: 20 to 300 MHz.
- INDUCTANCE RANGE: .01 to 1 uh.
- INDUCTANCE TOLERANCES: Less than 0.1 uh, $\pm 20\%$. Greater than or equal to 0.1 uh, $\pm 10\%$. Closer tolerances available by special request.
- INDUCTANCE TC: $+200$ PPM/ $^{\circ}$ C maximum.
- MAXIMUM POWER DISSIPATION: 0.2 watt.

TD SERIES

- MIN. "Q": 40 to 80.
- INDUCTANCE RANGE: 100 to 10,000 uh.
- RECOMMENDED FREQUENCY RANGE: 50 kHz to 10 MHz.
- INDUCTANCE TOLERANCE: $\pm 5\%$. Closer tolerances available by special request.
- INDUCTANCE TC: From $+60$ PPM/ $^{\circ}$ C, maximum to $+300$ PPM/ $^{\circ}$ C maximum, depending upon inductance value.
- MAXIMUM POWER DISSIPATION: .50 watt.

TB SERIES

- MIN. "Q": 50 to 80.
- RECOMMENDED FREQUENCY RANGE: 50 kHz to 35 MHz.
- INDUCTANCE RANGE: 10 to 1,000 uh.
- INDUCTANCE TOLERANCE: $\pm 5\%$. Closer tolerances available by special request.
- INDUCTANCE TC: From $+60$ PPM/ $^{\circ}$ C maximum to $+300$ PPM/ $^{\circ}$ C maximum, depending upon inductance value.
- MAXIMUM POWER DISSIPATION: .33 watt.

- DESIGNED TO MEET THE REQUIREMENTS OF MIL-C-15305, GRADE 1, CLASS B (-55° C to $+125^{\circ}$ C).
- DIELECTRIC WITHSTANDING VOLTAGE: 700 volts rms.

TA SERIES

Part No.	Apparent Inductance (uh)	Min. "Q"	Test Freq. (MHz)	Min. SRF (MHz)	Max. DCR (ohms)	DC Curr. (ma)
TA-1	0.10	60	25	450	0.04	2230
TA-2	0.12	60	25	410	0.05	2000
TA-3	0.15	65	25	350	0.06	1825
TA-4	0.18	65	25	325	0.07	1675
TA-5	0.22	65	25	300	0.08	1550
TA-6	0.27	65	25	280	0.09	1475
TA-7	0.33	65	25	260	0.10	1400
TA-8	0.39	70	25	240	0.11	1325
TA-9	0.47	70	25	220	0.15	1125
TA-10	0.56	70	25	200	0.20	1000
TA-11	0.68	70	25	180	0.25	900
TA-12	0.82	70	25	165	0.30	810
TA-13	1.0	70	25	150	0.35	750
TA-14	1.2	65	7.9	130	0.25	875
TA-15	1.5	65	7.9	120	0.30	800
TA-16	1.8	65	7.9	110	0.50	600
TA-17	2.2	65	7.9	100	0.75	500
TA-18	2.7	65	7.9	90	0.90	450
TA-19	3.3	65	7.9	70	1.0	425
TA-20	3.9	65	7.9	60	1.2	400
TA-21	4.7	60	7.9	50	1.5	350
TA-22	5.6	60	7.9	45	1.7	325
TA-23	6.8	60	7.9	40	2.0	300
TA-24	8.2	60	7.9	37	2.4	290
TA-25	10.0	60	7.9	35	2.6	280

TB SERIES

Part No.	Apparent Inductance (uh)	Min. "Q"	Test Freq. (MHz)	Min. SRF (MHz)	Max. DCR (ohms)	DC Curr. (ma)
TB-1	10	75	2.5	35	1.1	550
TB-2	12	75	2.5	31	1.3	500
TB-3	15	75	2.5	27	1.5	460
TB-4	18	80	2.5	25	1.9	410
TB-5	22	80	2.5	22	2.2	380
TB-6	27	80	2.5	20	2.6	350
TB-7	33	80	2.5	18	3.3	320
TB-8	39	80	2.5	16	3.8	290
TB-9	47	80	2.5	14	4.6	260
TB-10	56	80	2.5	12	5.6	240
TB-11	68	80	2.5	11	6.7	220
TB-12	82	80	2.5	10	8.1	200
TB-13	100	80	2.5	9.1	9.6	180
TB-14	120	50	0.79	8.2	10.0	175
TB-15	150	50	0.79	7.5	11.0	160
TB-16	180	50	0.19	6.5	12.0	155
TB-17	220	50	0.79	5.6	13.0	150
TB-18	270	55	0.79	5.0	17.0	125
TB-19	330	55	0.79	4.5	19.0	130
TB-20	390	55	0.79	4.0	21.0	120
TB-21	470	55	0.79	3.5	22.0	115
TB-22	560	55	0.79	3.0	24.0	110
TB-23	680	55	0.79	2.8	19.0	130
TB-24	820	50	0.79	2.5	23.0	120
TB-25	1,000	50	0.79	2.5	26.0	110

- RATED TEMPERATURE RISE: 35° C at an ambient temperature of 90° C.

- LEADS: Tinned Copper. Weldable leads available by special order.

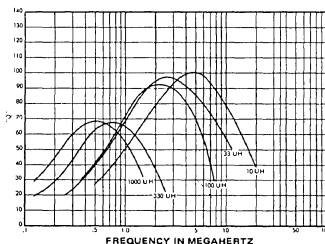
TF SERIES

Part No.	Apparent Inductance (uh)	Min. "Q"	Test Freq. (MHz)	Min. SRF (MHz)	Max. DCR (ohms)	DC Curr. (ma)
TF-1	0.01	60	150	1000	0.02	3100
TF-2	0.012	60	150	1000	0.02	3100
TF-3	0.015	60	150	1000	0.02	3100
TF-4	0.018	60	150	1000	0.02	3100
TF-5	0.022	60	100	900	0.02	3100
TF-6	0.027	60	100	800	0.02	3100
TF-7	0.033	60	100	750	0.02	3100
TF-8	0.039	60	100	700	0.02	3100
TF-9	0.047	60	100	650	0.02	3100
TF-10	0.056	60	100	600	0.02	3100
TF-11	0.068	60	100	550	0.03	2500
TF-12	0.082	60	100	500	0.03	2500
TF-13	0.10	80	50	450	0.04	2200
TF-14	0.12	80	50	400	0.05	2000
TF-15	0.15	80	50	350	0.06	1800
TF-16	0.18	80	50	320	0.07	1650
TF-17	0.22	80	50	300	0.08	1500
TF-18	0.27	80	50	280	0.10	1400
TF-19	0.33	80	50	260	0.12	1300
TF-20	0.39	80	50	240	0.15	1150
TF-21	0.47	80	50	220	0.20	1000
TF-22	0.56	70	50	200	0.25	900
TF-23	0.68	70	50	180	0.30	800
TF-24	0.82	70	50	160	0.35	750
TF-25	1.0	70	50	150	0.40	700

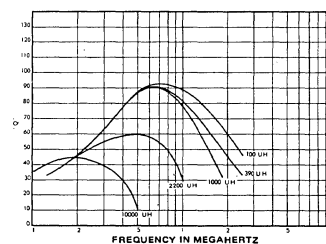
TD SERIES

Part No.	Apparent Inductance (uh)	Min. "Q"	Test Freq. (MHz)	Min. SRF (MHz)	Max. DCR (ohms)	DC Curr. (ma)
TD-1	100	75	790	8.4	6	280
TD-2	120	75	790	7.5	7	260
TD-3	150	75	790	6.8	8	240
TD-4	180	75	790	6.1	10	220
TD-5	220	80	790	5.4	12	200
TD-6	270	80	790	4.7	14	180
TD-7	330	80	790	4.2	17	165
TD-8	390	80	790	3.8	20	150
TD-9	470	75	790	3.4	24	140
TD-10	560	75	790	3.1	28	130
TD-11	680	75	790	2.8	33	120
TD-12	820	75	790	2.5	40	110
TD-13	1,000	75	790	2.2	46	100
TD-14	1,200	45	250	1.9	30	120
TD-15	1,500	45	250	1.6	35	110
TD-16	1,800	50	250	1.4	40	105
TD-17	2,200	50	250	1.3	50	95
TD-18	2,700	50	250	1.2	60	85
TD-19	3,300	50	250	1.1	70	80
TD-20	3,900	50	250	1.0	80	75
TD-21	4,700	50	250	.9	90	70
TD-22	5,600	45	250	.8	100	65
TD-23	6,800	40	250	.7	140	60
TD-24	8,200	40	250	.6	160	55
TD-25	10,000	40	250	.6	175	50

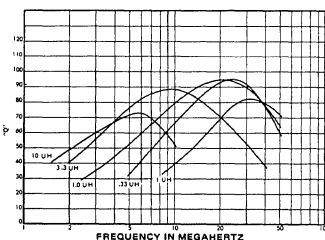
TB TYPICAL "Q" VS FREQUENCY



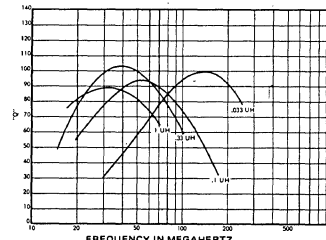
TD TYPICAL "Q" VS FREQUENCY



TA TYPICAL "Q" VS FREQUENCY



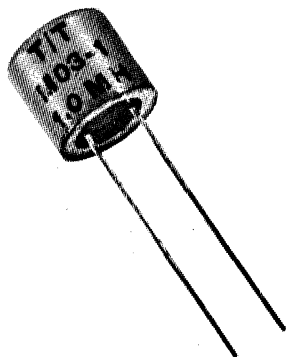
TF TYPICAL "Q" VS FREQUENCY



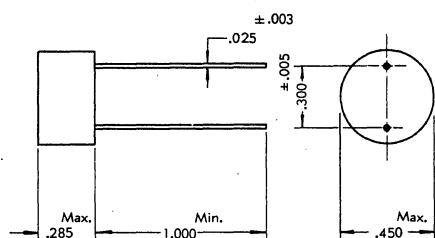


13402 SOUTH 71 HIGHWAY, GRANDVIEW, MO. 64030

PHONE: (816) 761-6314 TWX 910-777-7037

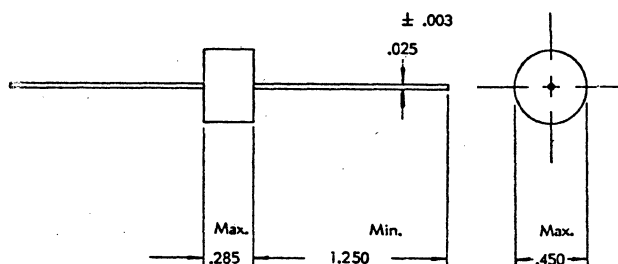


When ordering add the prefix P, PA or M to the part number for the case type desired.



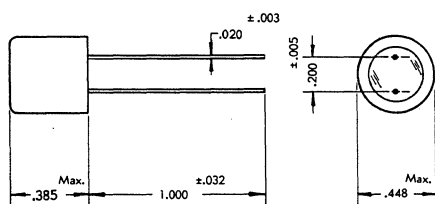
TYPE P

Epoxy Encapsulated
MIL-T-27C, Grade 5, Class 5



TYPE PA

Axial Lead Epoxy Encapsulated

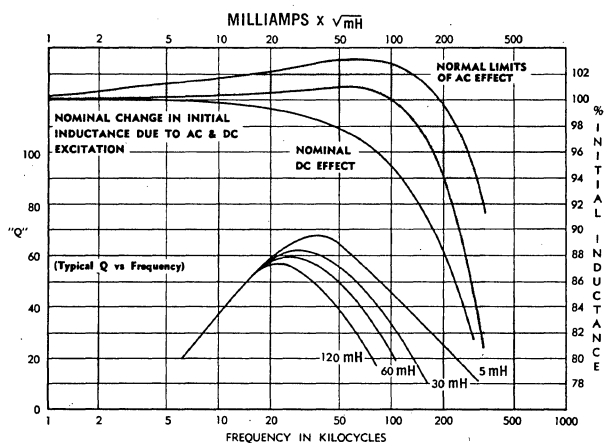


TYPE M

Metal Cased
MIL-T-27C, Grade 4, Class R

CORE NO. 03

- Recommended Frequency: Up to 50 kHz
- Maximum Inductance: 250 mH
- Standard Tolerance: $\pm 1.0\%$



Inductance (mH)	Part Number	DC Resistance (ohms)	TYPICAL Distributed Capacity (pf)
1.0	03-1	1.5	14
1.25	03-2	1.7	14
1.5	03-3	2.4	18
1.75	03-4	2.6	20
2.0	03-5	2.7	20
2.4	03-6	3.7	22
2.5	03-7	3.8	22
3.0	03-8	4.0	24
3.6	03-9	5.7	24
4.3	03-10	6.2	24
5.0	03-11	6.7	26
6.0	03-12	9.3	26
7.2	03-13	10.0	26
7.5	03-14	10.5	28
8.0	03-15	11.0	28
8.6	03-16	14.0	28
10.0	03-17	15.0	30
12.0	03-18	15.5	32
12.5	03-19	16.0	34
15.0	03-20	23.0	36
17.5	03-21	25.0	38
20.0	03-22	26.0	40
24.0	03-23	35.0	42
30.0	03-24	39.0	44
36.0	03-25	58.0	46
43.0	03-26	64.0	48
50.0	03-27	69.0	50
60.0	03-28	78.0	52
72.0	03-29	106.	54
75.0	03-30	108.	56
86.0	03-31	140.	58
100.0	03-32	150.	60
120.0	03-33	155.	62
150.0	03-34	228.	64
175.0	03-35	246.	66
178.0	03-36	248.	66
200.0	03-37	333.	68
250.0	03-38	373.	70

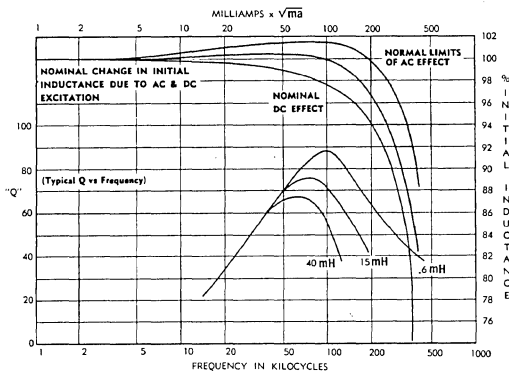


13402 SOUTH 71 HIGHWAY, GRANDVIEW, MO. 64030

PHONE: (816) 761-6314 TWX 910-777-7037

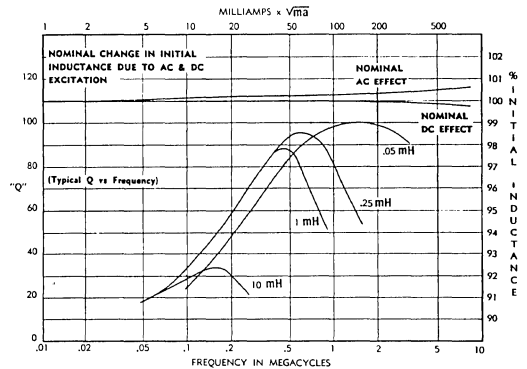
CORE NO. 13

- Recommended Frequency: 10 kHz to 200 kHz
- Maximum Inductance: 100 mH
- Standard Tolerance: $\pm 1.0\%$



CORE NO. 29

- Recommended Frequency: 50 kHz to 5 MHz
- Maximum Inductance: 15 mH
- Standard Tolerance: $\pm 1.0\%$



When ordering add the prefix P, M or PA to the part number for the case type desired.

Inductance (mH)	Part Number	DC Resistance (ohms)	TYPICAL Distributed Capacity (pf)
.50	13-1	1.5	14
.60	13-2	1.6	14
.72	13-3	2.4	14
.86	13-4	2.6	14
1.0	13-5	2.8	16
1.25	13-6	3.9	16
1.5	13-7	4.1	18
1.75	13-8	5.7	18
2.0	13-9	6.1	20
2.4	13-10	6.7	22
2.5	13-11	6.8	24
3.0	13-12	9.5	24
3.6	13-13	10.5	26
4.3	13-14	14.7	28
5.0	13-15	15.5	30
6.0	13-16	16.0	30
7.2	13-17	24.0	32
8.6	13-18	26.0	34
10.0	13-19	27.0	36
12.0	13-20	39.0	38
15.0	13-21	41.0	40
17.5	13-22	59.0	40
20.0	13-23	63.0	42
24.0	13-24	67.0	42
25.0	13-25	68.0	44
30.0	13-26	100.	44
36.0	13-27	103.	46
40.0	13-28	108.	46
43.0	13-29	142.	48
50.0	13-30	154.	48
60.0	13-31	168.	50
72.0	13-32	228.	50
86.0	13-33	250.	52
100.0	13-34	340.	52

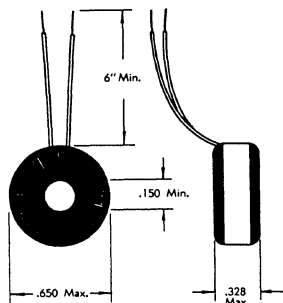
Inductance (mH)	Part Number	DC Resistance (ohms)	TYPICAL Distributed Capacity (pf)
.05	29-1	1.2	10
.06	29-2	1.6	10
.072	29-3	1.8	10
.075	29-4	1.8	12
.086	29-5	1.9	12
.100	29-6	2.1	12
.120	29-7	2.3	12
.125	29-8	3.0	12
.150	29-9	3.3	12
.175	29-10	3.5	14
.200	29-11	4.5	14
.240	29-12	4.9	14
.250	29-13	5.0	14
.300	29-14	7.0	14
.360	29-15	7.7	14
.400	29-16	8.1	16
.430	29-17	10.5	16
.500	29-18	12.3	16
.600	29-19	13.5	16
.720	29-20	16.2	16
.750	29-21	16.5	18
.860	29-22	17.7	18
1.00	29-23	19.1	18
1.20	29-24	25.9	20
1.25	29-25	26.4	20
1.50	29-26	29.0	22
1.75	29-27	37.6	22
2.00	29-28	40.3	24
2.40	29-29	44.0	24
2.50	29-30	45.0	26
3.00	29-31	64.	28
3.60	29-32	69.	28
4.00	29-33	73.	30
4.30	29-34	76.	32
5.00	29-35	102.	34
6.00	29-36	112.	34
7.20	29-37	122.	36
7.50	29-38	125.	38
8.60	29-39	162.	40
10.0	29-40	175.	42



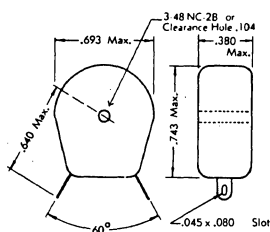
13402 SOUTH 71 HIGHWAY, GRANDVIEW, MO. 64030

PHONE: (816) 761-6314 TWX 910-777-7037

**UNCASED —
TYPE U**
Wt. .25 oz.



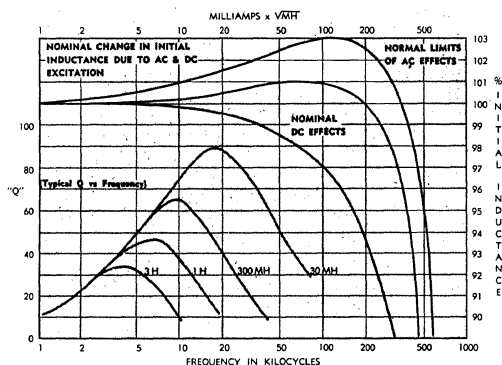
**COMPRESSION
MOLDED —
TYPE P**
Wt. .35 oz.



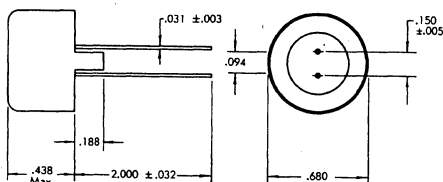
SUB-MINIATURE

CORE NO. 50

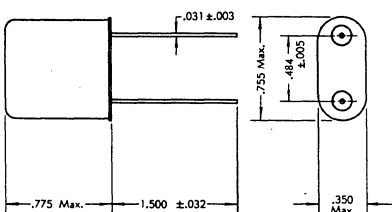
- Recommended Frequency: Up to 20 kHz
- Maximum Inductance: 4.5 H
- Tolerance: $\pm 1\%$
- Special Core Stabilization Available: D, L, M, W
- Mechanical Tolerance: $\pm .015$ unless otherwise indicated



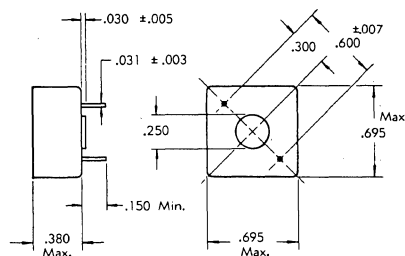
**METAL CASED —
TYPE M**
Wt. .45 oz.



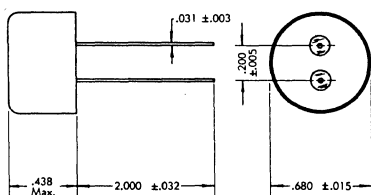
**METAL CASED —
TYPE MC**
Wt. .45 oz.



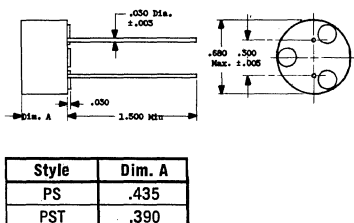
**PRINTED CIRCUIT —
TYPE S**
Wt. .35 oz.



**METAL CASED-GRID
SPACING —
TYPE MG**
Wt. .45 oz.

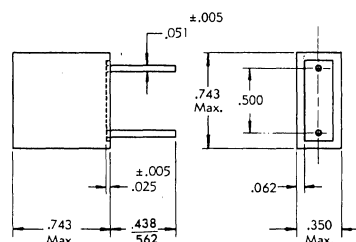


**PRINTED CIRCUIT
TYPE PS & PST**
Wt. 3.5 oz.



Style	Dim. A
PS	.435
PST	.390

**PRINTED CIRCUIT
TYPE PC**
Wt. 3.5 oz.





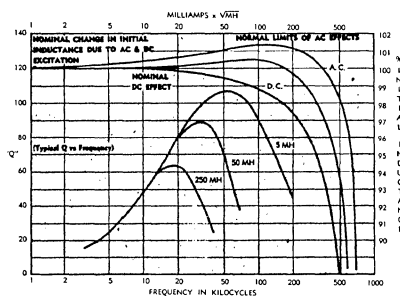
13402 SOUTH 71 HIGHWAY, GRANDVIEW, MO. 64030

PHONE: (816) 761-6314 TWX 910-777-7037

CORE NO. 51

- Recommended Frequency: 10kHz to 100 kHz
- Maximum Inductance: 1 H
- Tolerance: $\pm 1\%$
- Special Core Stabilization Available: D, M, W
- Mechanical Tolerance: $\pm .015$ unless otherwise indicated

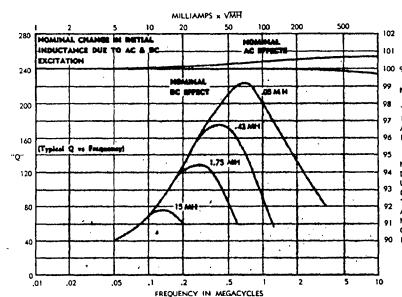
STOCKED FOR IMMEDIATE DELIVERY



CORE NO. 53

- Recommended Frequency: 50 kHz to 8 MHz
- Maximum Inductance: 20 mH
- Tolerance: $\pm 1\%$
- Only Core Stabilization Available: H
- Mechanical Tolerance: $\pm .015$ unless otherwise indicated

STOCKED FOR IMMEDIATE DELIVERY



CORE NO. 50

STANDARD
INDUCTANCE VALUES

Inductance	Part Number	DC Resistance (ohms)	TYPICAL Distributed Capacity (pf)
1.0 mH	50-1	.6	30
2.5 mH	50-2	1.4	31
5.0 mH	50-3	2.8	31
6.0 mH	50-40	3.3	32
7.2 mH	50-41	3.9	32
7.5 mH	50-4	4.1	32
8.6 mH	50-42	4.7	33
10.0 mH	50-5	5.4	33
12. mH	50-43	6.5	33
12.5 mH	50-6	6.6	33
15. mH	50-7	7.5	34
17.5 mH	50-44	9.4	34
20. mH	50-8	10.7	34
24. mH	50-45	12.9	34
25. mH	50-9	13.5	34
30. mH	50-10	16.1	35
36. mH	50-46	19.4	35
40. mH	50-11	21.5	35
43. mH	50-47	23.1	36
50. mH	50-12	27.3	36
60. mH	50-48	32.6	36
72. mH	50-49	38.9	37
75. mH	50-13	41.	37
86. mH	50-50	47.	38
100. mH	50-14	54.	38
120. mH	50-51	66.	38
125. mH	50-15	68.	39
150. mH	50-16	81.	39
175. mH	50-53	95.	40
200. mH	50-17	108.	40
240. mH	50-54	130.	41
250. mH	50-52	135.	41
300. mH	50-18	161.	42
360. mH	50-55	194.	42
400. mH	50-19	215.	43
430. mH	50-56	231.	43
500. mH	50-20	268.	44
600. mH	50-57	321.	44
720. mH	50-58	387.	45
750. mH	50-21	403.	45
860. mH	50-59	461.	46
1.0 H	50-22	536.	46
1.2 H	50-60	643.	47
1.25 H	50-61	672.	47
1.5 H	50-62	804.	48
1.75 H	50-63	938.	48
2.0 H	50-64	1103.	49
2.4 H	50-67	1286.	50
2.5 H	50-66	1339.	50
3.0 H	50-65	1607.	51
3.6 H	50-68	1928.	52
4. H	50-69	2142.	53

STANDARD INDUCTANCE VALUES

U—Uncased

P—Compression Molded†

S—Printed Circuit

M—Metal Cased

When ordering add case prefix to part number for package type desired.
(Example: MC-53-43)

MG—Metal Cased-Grid Spacing

MC—Metal Cased

PS, PST

PC—Printed Circuit

CORE NO. 51

STANDARD
INDUCTANCE VALUES

Inductance	Part Number	DC Resistance (ohms)	TYPICAL Distributed Capacity (pf)
1.0 mH	51-1	1.2	25
1.2 mH	51-2	1.3	25
1.5 mH	51-3	1.7	26
1.75 mH	51-4	1.9	26
2.0 mH	51-5	2.5	26
2.4 mH	51-6	2.7	26
3.0 mH	51-7	3.3	27
3.6 mH	51-8	4.4	27
4.3 mH	51-9	4.7	27
5.0 mH	51-10	5.5	28
6.0 mH	51-11	6.6	28
7.2 mH	51-12	7.8	28
8.6 mH	51-13	9.4	28
10. mH	51-14	10.9	28
12. mH	51-15	13.1	28
15. mH	51-16	16.3	29
17.5 mH	51-17	18.9	29
20. mH	51-18	21.7	29
24. mH	51-19	26.0	29
30. mH	51-20	33.	29
36. mH	51-21	39.	29
43. mH	51-22	47.	29
50. mH	51-23	55.	30
60. mH	51-24	66.	30
72. mH	51-25	78.	30
86. mH	51-26	94.	30
100. mH	51-27	109.	31
120. mH	51-28	130.	31
150. mH	51-29	162.	31
175. mH	51-30	189.	31
200. mH	51-31	217.	32
240. mH	51-32	260.	32
300. mH	51-33	325.	33
360. mH	51-34	389.	33
430. mH	51-35	466.	34
500. mH	51-36	546.	35

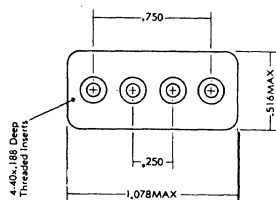
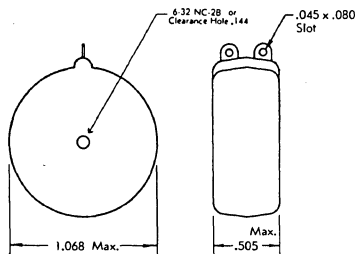
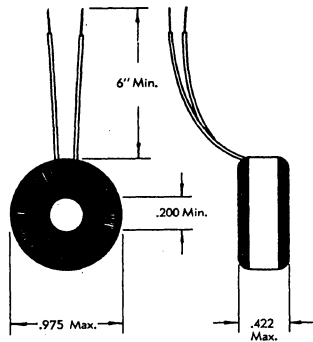
CORE NO. 53

STANDARD
INDUCTANCE VALUES

Inductance	Part Number	DC Resistance (ohms)	TYPICAL Distributed Capacity (pf)
0.05 mH	53-1	.42	6
0.06 mH	53-2	.50	6
0.072 mH	53-3	.60	6
0.075 mH	53-4	.61	6
0.086 mH	53-5	.72	6
0.10 mH	53-6	.78	6
0.12 mH	53-7	.89	6
0.125 mH	53-8	.94	6
0.15 mH	53-9	1.17	7
0.175 mH	53-10	1.26	7
0.20 mH	53-11	1.72	7
0.24 mH	53-12	2.02	7
0.25 mH	53-13	2.08	8
0.30 mH	53-14	2.28	8
0.36 mH	53-15	2.44	8
0.40 mH	53-16	3.2	8
0.43 mH	53-17	3.3	8
0.50 mH	53-18	4.8	8
0.60 mH	53-19	5.6	8
0.72 mH	53-20	5.9	8
0.75 mH	53-21	7.4	8
0.86 mH	53-22	7.5	8
1.0 mH	53-23	10.1	8
1.2 mH	53-24	11.3	8
1.25 mH	53-25	11.4	8
1.5 mH	53-26	12.5	8
1.75 mH	53-27	13.5	9
2.0 mH	53-28	18.2	9
2.4 mH	53-29	19.9	9
2.5 mH	53-30	20.8	9
3.0 mH	53-31	23.1	9
3.6 mH	53-32	23.2	9
4.0 mH	53-33	25.9	9
4.3 mH	53-34	27.1	9
5.0 mH	53-35	36.	9
6.0 mH	53-36	39.	9
7.2 mH	53-37	51.	9
7.5 mH	53-38	52.	9
8.6 mH	53-39	57.	9
10.0 mH	53-40	64.	9
12.0 mH	53-41	86.	9
12.5 mH	53-42	94.	9
15.0 mH	53-43	104.	9

†Add "C" to part number of molded inductor if clearance hole is desired.

PHONE: (816) 761-6314 TWX 910-777-7037



The graph illustrates the relationship between frequency and inductive reactance. The x-axis represents Frequency in Kilocycles on a logarithmic scale from 0.1 to 100. The y-axis represents % INDUCTIVE on a logarithmic scale from 10 to 140. A shaded region indicates the 'NOMINAL LIMITS OF AC EFFECTS', which broadens as frequency increases. A solid line represents 'NOMINAL DC EFFECTS'. Four curves are shown for different frequencies: 1 Hz, 3.6 Hz, 360 MHz, and 15 MHz. A label 'Typical Q vs Frequency' points to these curves.

TOROTEL
PC06-12
100 MH
6631



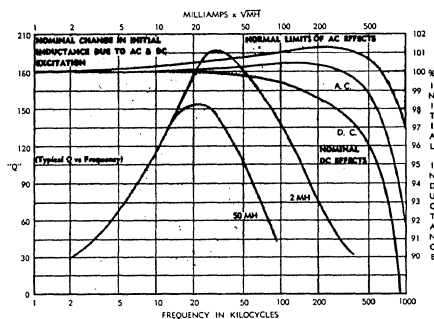
13402 SOUTH 71 HIGHWAY, GRANDVIEW, MO. 64030

PHONE: (816) 761-6314 TWX 910-777-7037

CORE NO. 48

- Recommended Frequency: Up to 100 kHz
- Maximum Inductance: 1 H
- Tolerance: $\pm 1\%$
- Special Core Stabilization Available: B, D, E, M, W
- Studs are available on the "M" Series on special request
- Mechanical Tolerance: $\pm .015$ unless otherwise indicated

STOCKED FOR IMMEDIATE DELIVERY



CORE NO. 06

STANDARD
INDUCTANCE VALUES

Inductance	Part Number	TYPICAL	
		DC Resistance (ohms)	Distributed Capacity (pf)
5.0 mH	06-1	1.05	40
6.0 mH	06-40	1.26	42
7.2 mH	06-41	1.51	43
7.5 mH	06-2	1.58	43
8.6 mH	06-42	1.80	43
10. mH	06-3	2.10	44
12. mH	06-43	2.52	44
12.5 mH	06-4	2.63	44
15. mH	06-5	3.15	44
17.5 mH	06-44	3.67	45
20. mH	06-6	4.20	45
24. mH	06-45	5.04	45
25. mH	06-7	5.25	46
30. mH	06-8	6.30	46
36. mH	06-46	7.56	47
40. mH	06-9	8.40	48
43. mH	06-47	9.03	48
50. mH	06-10	10.5	48
60. mH	06-48	12.6	49
72. mH	06-49	15.1	49
75. mH	06-11	15.8	49
86. mH	06-50	18.0	49
100. mH	06-12	21.0	50
120. mH	06-51	25.2	50
125. mH	06-13	26.3	51
150. mH	06-14	31.5	51
175. mH	06-53	36.8	51
200. mH	06-15	42.0	52
240. mH	06-54	50.4	52
250. mH	06-52	52.5	52
300. mH	06-16	63.0	53
360. mH	06-55	75.6	53
400. mH	06-17	84.0	54
430. mH	06-56	90.3	54
500. mH	06-18	105.	55
600. mH	06-57	126.	55
720. mH	06-58	151.	55
750. mH	06-19	158.	56
860. mH	06-59	180.	56
1.0 H	06-20	210.	57
1.2 H	06-60	252.	57
1.25 H	06-21	263.	57
1.5 H	06-22	315.	58
1.75 H	06-61	368.	58
2.0 H	06-23	420.	58
2.4 H	06-62	504.	59
2.5 H	06-69	525.	59
3.0 H	06-24	630.	59
3.6 H	06-70	756.	60
4.3 H	06-71	840.	60
5.0 H	06-72	903.	61
6.0 H	06-73	1260.	62
7.2 H	06-74	1512.	62

U—Uncased

P—Compression Molded†

When ordering add case prefix to part number for package type desired.
(Example: P06-1)

PC—Printed Circuit

M—Metal Cased

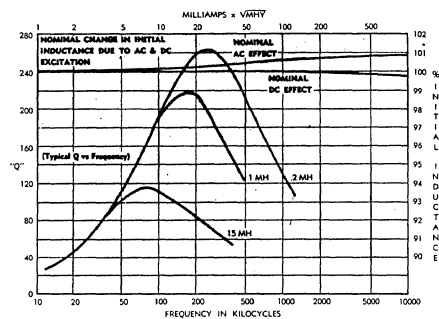
CORE NO. 48

STANDARD
INDUCTANCE VALUES

Inductance	Part Number	TYPICAL	
		DC Resistance (ohms)	Distributed Capacity (pf)
2.0 mH	48-1	0.84	30
2.4 mH	48-2	1.01	31
3.0 mH	48-3	1.26	31
3.6 mH	48-4	1.51	32
4.3 mH	48-5	1.80	32
5.0 mH	48-6	2.10	33
6.0 mH	48-7	2.50	33
7.2 mH	48-8	3.02	34
8.6 mH	48-9	3.61	34
10. mH	48-10	4.20	35
12. mH	48-11	5.05	35
15. mH	48-12	6.30	36
17.5 mH	48-13	7.35	36
20. mH	48-14	8.40	37
24. mH	48-15	10.1	37
30. mH	48-16	12.6	38
36. mH	48-17	15.1	39
43. mH	48-18	18.0	39
50. mH	48-19	21.0	40
60. mH	48-20	25.2	41
72. mH	48-21	30.2	42
86. mH	48-22	36.1	43
100. mH	48-23	42.0	44
120. mH	48-24	50.4	45
150. mH	48-25	63.0	46
175. mH	48-26	73.5	47
200. mH	48-27	84.0	48
240. mH	48-28	101.	49
300. mH	48-29	126.	50
360. mH	48-30	151.	51
430. mH	48-31	180.	52
500. mH	48-32	210.	53
600. mH	48-33	252.	54

CORE NO. 73

- Recommended Frequency: 50 kHz to 1 MHz
- Maximum Inductance: 30 mH
- Tolerance: $\pm 1\%$
- Only Core Stabilization Available: H
- Studs are available on the "M" Series on special request
- Mechanical Tolerance: $\pm .015$ unless otherwise indicated



CORE NO. 73

STANDARD
INDUCTANCE VALUES

Inductance	Part Number	TYPICAL	
		DC Resistance (ohms)	Distributed Capacity (pf)
0.1 mH	73-1	0.22	12
0.12 mH	73-2	0.26	12
0.125 mH	73-3	0.28	13
0.15 mH	73-4	0.33	13
0.175 mH	73-5	0.39	13
0.20 mH	73-6	0.44	14
0.24 mH	73-7	0.53	14
0.25 mH	73-8	0.55	14
0.3 mH	73-9	0.66	14
0.36 mH	73-10	0.79	14
0.4 mH	73-11	0.88	14
0.43 mH	73-12	0.95	14
0.5 mH	73-13	1.10	14
0.6 mH	73-14	1.32	14
0.72 mH	73-15	1.58	15
0.75 mH	73-16	1.65	15
0.86 mH	73-17	1.89	15
1.0 mH	73-18	2.2	15
1.2 mH	73-19	2.6	15
1.25 mH	73-20	2.7	16
1.5 mH	73-21	3.3	16
1.75 mH	73-22	3.9	16
2.0 mH	73-23	4.4	16
2.4 mH	73-24	5.3	17
2.5 mH	73-25	5.5	17
3.0 mH	73-26	6.6	17
3.6 mH	73-27	7.9	17
4.0 mH	73-28	8.8	18
4.3 mH	73-29	9.5	18
5.0 mH	73-30	11.0	19
6.0 mH	73-31	13.2	19
7.2 mH	73-32	15.8	19
7.5 mH	73-33	16.5	20
8.6 mH	73-34	18.9	20
10.0 mH	73-35	22.0	20
12.0 mH	73-36	26.4	21
12.25 mH	73-37	27.5	21
15.0 mH	73-38	33.0	22
17.5 mH	73-39	38.5	22
20. mH	73-40	44.0	23

†Add "C" to part number of molded inductor if clearance hole is desired.

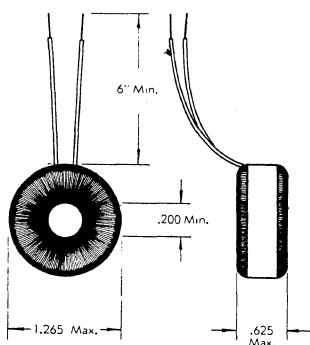
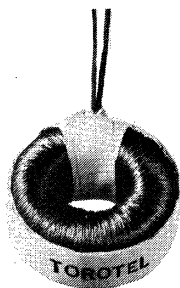


13402 SOUTH 71 HIGHWAY, GRANDVIEW, MO. 64030

PHONE: (816) 761-6314 TWX 910-777-7037

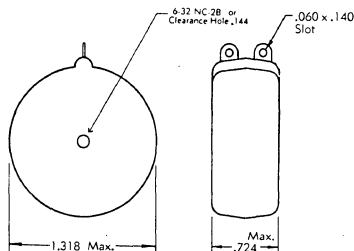
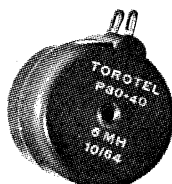
UNCASED —

TYPE U
Wt. 1.6 oz.



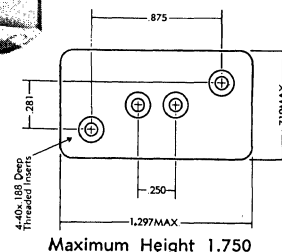
COMPRESSION MOLDED —

TYPE P
Wt. 2.5 oz.



METAL CASED —

TYPE M
Wt. 3.5 oz.

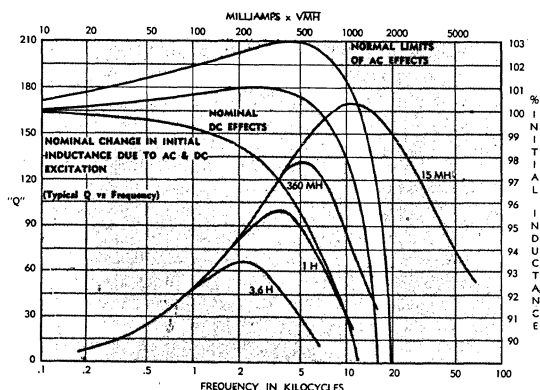


CORE NO. 30

CORE NO. 30

- Recommended Frequency: Up to 20 kHz
- Maximum Inductance: 17.5 H
- Tolerance: $\pm 1\%$
- Special Core Stabilization Available: B, D, E, G, L, M, W
- Studs are available on the "M" Series on special request
- Mechanical Tolerance: $\pm .015$ unless otherwise indicated

STOCKED FOR IMMEDIATE DELIVERY



STANDARD INDUCTANCE VALUES

Inductance	Uncased Type	Compression Molded	Metal Cased	TYPICAL	
				DC Resistance (Ohms)	Distributed Capacity (pf)
5.0 mH	U30-1	P30-1	M30-1	0.53	63
6.0 mH	U30-40	P30-40	M30-40	0.63	64
7.2 mH	U30-41	P30-41	M30-41	0.76	65
7.5 mH	U30-2	P30-2	M30-2	0.79	66
8.6 mH	U30-42	P30-42	M30-42	0.90	67
10. mH	U30-3	P30-3	M30-3	1.05	68
12. mH	U30-43	P30-43	M30-43	1.26	69
12.5 mH	U30-4	P30-4	M30-4	1.31	69
15. mH	U30-5	P30-5	M30-5	1.58	70
17.5 mH	U30-44	P30-44	M30-44	1.84	71
20. mH	U30-6	P30-6	M30-6	2.10	72
24. mH	U30-45	P30-45	M30-45	2.52	73
25. mH	U30-7	P30-7	M30-7	2.63	73
30. mH	U30-8	P30-8	M30-8	3.15	75
36. mH	U30-46	P30-46	M30-46	3.78	76
40. mH	U30-9	P30-9	M30-9	4.20	77
43. mH	U30-47	P30-47	M30-47	4.52	78
50. mH	U30-10	P30-10	M30-10	5.25	79
60. mH	U30-48	P30-48	M30-48	6.30	80
72. mH	U30-49	P30-49	M30-49	7.56	81
75. mH	U30-11	P30-11	M30-11	7.86	81
86. mH	U30-50	P30-50	M30-50	9.03	82
100. mH	U30-12	P30-12	M30-12	10.5	83
120. mH	U30-51	P30-51	M30-51	12.6	84
125. mH	U30-13	P30-13	M30-13	13.1	84
150. mH	U30-14	P30-14	M30-14	15.8	85
175. mH	U30-53	P30-53	M30-53	18.4	86
200. mH	U30-15	P30-15	M30-15	21.0	87
240. mH	U30-54	P30-54	M30-54	25.2	88
250. mH	U30-52	P30-52	M30-52	26.3	88
300. mH	U30-16	P30-16	M30-16	31.5	89
360. mH	U30-55	P30-55	M30-55	37.8	90
400. mH	U30-17	P30-17	M30-17	42.0	91
430. mH	U30-56	P30-56	M30-56	45.2	91
500. mH	U30-18	P30-18	M30-18	52.5	92
600. mH	U30-57	P30-57	M30-57	63.0	93
720. mH	U30-58	P30-58	M30-58	75.6	94
750. mH	U30-19	P30-19	M30-19	78.7	96
860. mH	U30-59	P30-59	M30-59	90.3	97
1.0 H	U30-20	P30-20	M30-20	105.0	98
1.2 H	U30-60	P30-60	M30-60	126.0	99
1.25 H	U30-21	P30-21	M30-21	131.3	99
1.5 H	U30-22	P30-22	M30-22	157.5	100
1.75 H	U30-61	P30-61	M30-61	183.8	101
2.0 H	U30-23	P30-23	M30-23	210.0	102
2.4 H	U30-62	P30-62	M30-62	252.0	103
2.5 H	U30-69	P30-69	M30-69	262.5	103
3.0 H	U30-24	P30-24	M30-24	315.0	104
3.6 H	U30-63	P30-63	M30-63	378.0	106
4.0 H	U30-25	P30-25	M30-25	420.0	107
4.3 H	U30-64	P30-64	M30-64	451.5	108
5.0 H	U30-26	P30-26	M30-26	525.0	109
6.0 H	U30-65	P30-65	M30-65	630.0	110
7.2 H	U30-66	P30-66	M30-66	756.0	111
7.5 H	U30-27	P30-27	M30-27	787.5	112
8.6 H	U30-67	P30-67	M30-67	903.0	113
10.0 H	U30-28	P30-28	M30-28	1050.0	114
12.0 H	U30-68	P30-68	M30-68	1260.0	115
12.5 H	U30-29	P30-29	M30-29	1312.5	116
15.0 H	U30-30	P30-30	M30-30	1575.0	117
17.5 H	U30-31	P30-31	M30-31	1837.5	118

†Add "C" to part number of molded inductor if clearance hole is desired.

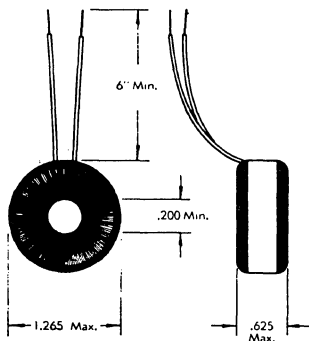
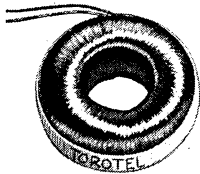


13402 SOUTH 71 HIGHWAY, GRANDVIEW, MO. 64030

PHONE: (816) 761-6314 TWX 910-777-7037

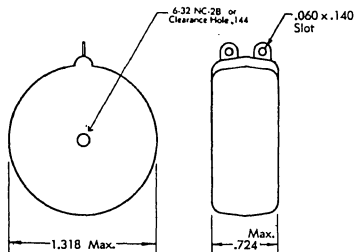
UNCASED —

TYPE U
Wt. 1.6 oz.



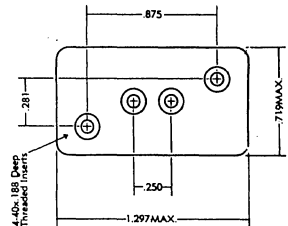
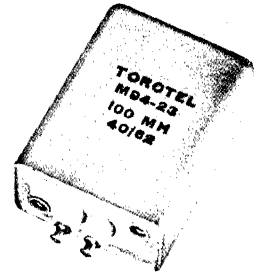
COMPRESSION MOLDED —

TYPE P
Wt. 2.5 oz.



METAL CASED —

TYPE M
Wt. 3.5 oz.



Maximum Height 1.750

CORE NO. 94

- Recommended Frequency: Up to 75 kHz
- Maximum Inductance: 1 H
- Tolerance: $\pm 1\%$
- Special Core Stabilization Available: B, D, M, W
- Studs are available on the "M" Series on special request
- Mechanical Tolerance: $\pm .015$ unless otherwise indicated

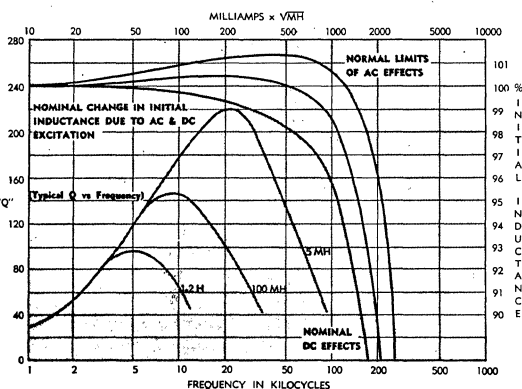
STOCKED FOR IMMEDIATE DELIVERY

CORE NO. 94

STANDARD INDUCTANCE VALUES

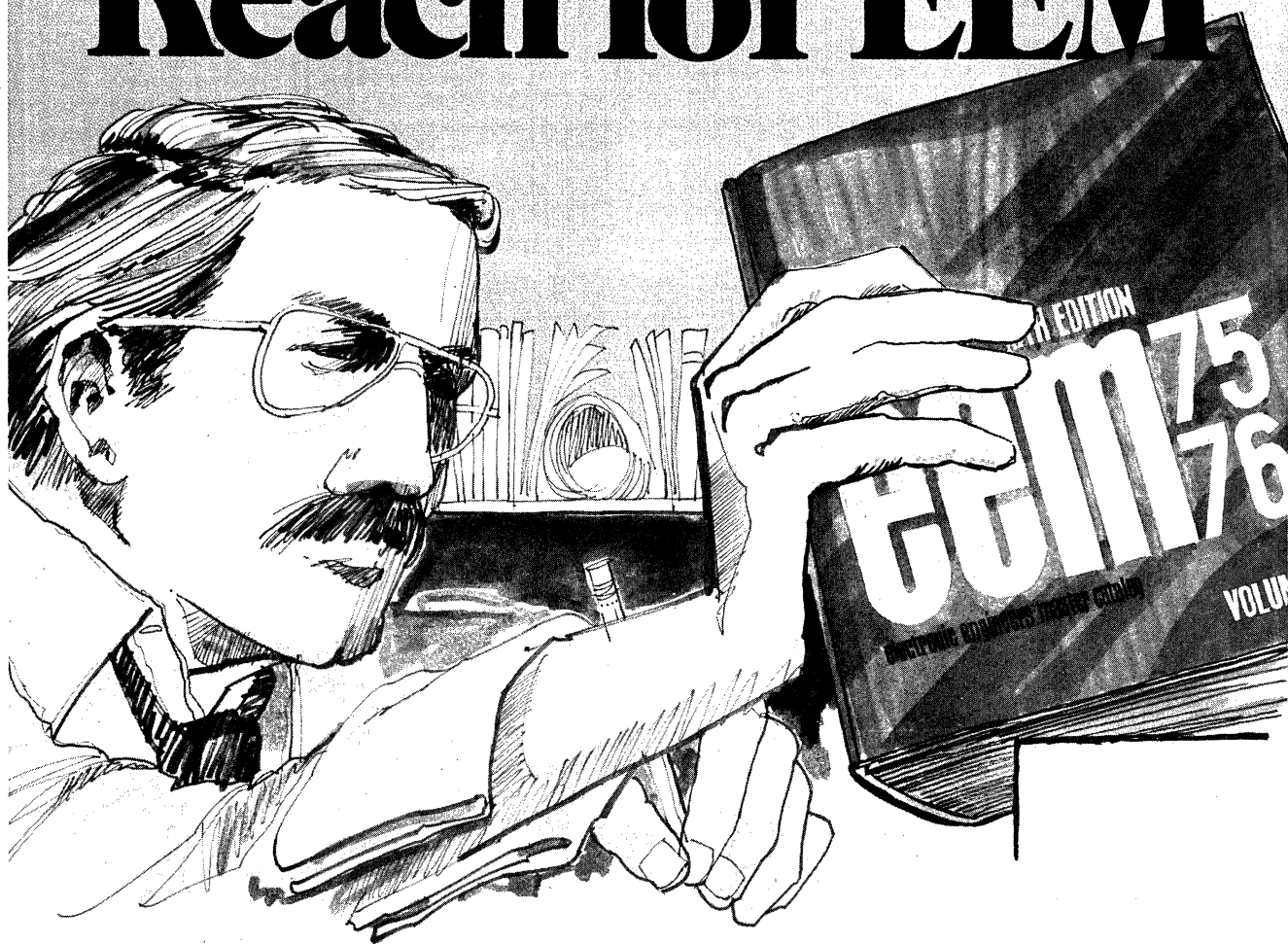
Inductance	Uncased Type	Compression Molded	Metal Cased	TYPICAL	
				DC Resistance (Ohms)	Distributed Capacity (pf)
5.0 mH	U94-1	P94-1	M94-1	1.05	32
6.0 mH	U94-2	P94-2	M94-2	1.26	32
7.2 mH	U94-3	P94-3	M94-3	1.51	33
7.5 mH	U94-4	P94-4	M94-4	1.58	34
8.6 mH	U94-5	P94-5	M94-5	1.80	35
10.0 mH	U94-6	P94-6	M94-6	2.10	35
12.0 mH	U94-7	P94-7	M94-7	2.52	36
12.5 mH	U94-8	P94-8	M94-8	2.63	37
15.0 mH	U94-9	P94-9	M94-9	3.15	38
17.5 mH	U94-10	P94-10	M94-10	3.67	39
20.0 mH	U94-11	P94-11	M94-11	4.20	40
24.0 mH	U94-12	P94-12	M94-12	5.04	41
25.0 mH	U94-13	P94-13	M94-13	5.25	41
30.0 mH	U94-14	P94-14	M94-14	6.30	42
36.0 mH	U94-15	P94-15	M94-15	7.56	43
40.0 mH	U94-16	P94-16	M94-16	8.40	44
43.0 mH	U94-17	P94-17	M94-17	9.03	44
50.0 mH	U94-18	P94-18	M94-18	10.5	45
60.0 mH	U94-19	P94-19	M94-19	12.6	46
72.0 mH	U94-20	P94-20	M94-20	15.1	46
75.0 mH	U94-21	P94-21	M94-21	15.8	47
86.0 mH	U94-22	P94-22	M94-22	18.0	47
100. mH	U94-23	P94-23	M94-23	21.0	48
120. mH	U94-24	P94-24	M94-24	25.2	49
125. mH	U94-25	P94-25	M94-25	26.3	49
150. mH	U94-26	P94-26	M94-26	31.5	50
175. mH	U94-27	P94-27	M94-27	36.8	51
200. mH	U94-28	P94-28	M94-28	42.0	52
240. mH	U94-29	P94-29	M94-29	50.4	53
250. mH	U94-30	P94-30	M94-30	52.5	54
300. mH	U94-31	P94-31	M94-31	63.0	54
360. mH	U94-32	P94-32	M94-32	75.6	56
400. mH	U94-33	P94-33	M94-33	84.0	57
430. mH	U94-34	P94-34	M94-34	90.0	57
500. mH	U94-35	P94-35	M94-35	105.0	57
600. mH	U94-36	P94-36	M94-36	126.0	58
720. mH	U94-37	P94-37	M94-37	151.0	58
750. mH	U94-38	P94-38	M94-38	158.0	59
860. mH	U94-39	P94-39	M94-39	181.0	59

†Add "C" to part number of molded inductor if clearance hole is desired.



**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**

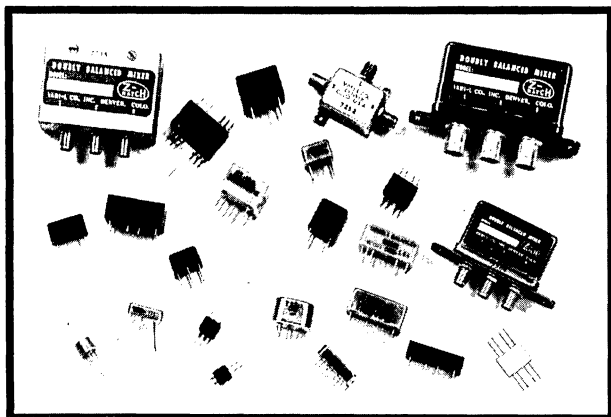


electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

HAVE YOU MET OUR FAMILY...

... OF **Z-MATCH** WIDEBAND SIGNAL PROCESSING COMPONENTS?



Call or send for our complete catalog of
wideband components

- DOUBLY BALANCED MIXERS
- VOLTAGE TUNED FILTERS
- POWER DIVIDERS/COMBINERS
- WIDEBAND RF CHOKES
- WIDEBAND TRANSFORMERS
- SOLID STATE SWITCHES
- HYBRIDS 0 - 180° AND QUADRATURE TYPES
- ELECTRICALLY VARIABLE INDUCTORS

PLEASE CONTACT OUR REGIONAL REPRESENTATIVES FOR DETAILED INFORMATION ON OUR COMPLETE LINE OF WIDEBAND COMPONENTS.

UNITED STATES

Asco Electronics, Inc.
Tuckahoe, New York
(914) 779-8110/8111

Tritek, Incorporated
Burlington, Massachusetts
(617) 272-4550

Graydon-Sherman, Inc.
Fayetteville, New York
(315) 637-9861

Applied Engineering
Consultants, Inc.
Ellicott City, Maryland
(301) 465-1272

Applied Engineering
Consultants, Inc.
Clementon, New Jersey
(609) 627-7290

Saber Associates, Inc.
Huntsville, Alabama
(205) 534-3387

Cleveland Enterprises, Inc.
Phoenix, Arizona
(602) 996-6130

Cleveland Enterprises, Inc.
Arvada, Colorado
(303) 423-3707

Dura Electronics Sales
Cupertino, California
(408) 255-2084

CEM
Santa Ana, California
(714) 835-2702

CEM
Canoga Park, California
(213) 884-7867

Saber Associates, Inc.
Lighthouse Point, Florida
(305) 943-3076

Saber Associates, Inc.
Longwood, Florida
(305) 831-0742

Saber Associates, Inc.
Raleigh, North Carolina
(919) 834-3961

Luebbe Sales
Cincinnati, Ohio
(513) 791-5420

Luebbe Sales
Dayton, Ohio
(513) 294-0426

Luebbe Sales
Cleveland, Ohio
(216) 333-0425

Luebbe Sales
Southfield, Michigan
(313) 357-0355

Luebbe Sales
Delmont, Pennsylvania
(412) 468-4019

Howard R. Brown
Sales Company
Cedar Rapids, Iowa
(319) 366-0635

H. C. Heyde Company
Leawood, Kansas
(913) 649-8628

Texas Avionics
Dallas, Texas
(214) 368-3566

Cleveland Enterprises, Inc.
Albuquerque, New Mexico
(505) 298-7671

AUSTRIA

Gotele
Tel: (0222) 56-23-18

BELGIUM

Heijnen B. V.
Tel: 011-25467

CANADA - TORONTO

Wilson Enterprises
Tel: (416) 766-0510

CANADA - OTTAWA

Wilson Enterprises
Tel: (613) 224-9878

DENMARK

K. Kamuk
Tel: (01) 88 38 33

ENGLAND

Tony Chapman
Electronics Ltd.
Tel:
Epping (STD 78) 76138-9

FRANCE

Radio Television Francaise
Tel: 722-70-40

FRANCE - US OFFICE

Pantronics
Fairfield, New Jersey
Tel: (201) 575-1177

GERMANY

Ginsbury Electronic
Tel: 0811/60 3252

HOLLAND

Heijnen N. V.
Tel: 08851-1956

INDIA

Forbes, Forbes, Campbell
and Company Ltd.
Tel: 268081

ISRAEL

Pacom Electronics
Company Ltd.
Tel: 44316-7-8

ITALY

Motordiesel
Tel: 36.232

JAPAN

Midoriya Electronic
Company Ltd.
Tel: 561-8851

NORWAY

Umi Elektronikk A.S.
Tel: 4733-16266

SWEDEN

Civilingenjor
Tel: 0141/122 18, 122 29

SWITZERLAND

Gotele
Tel: Frauenfeld 2
054 3 3551

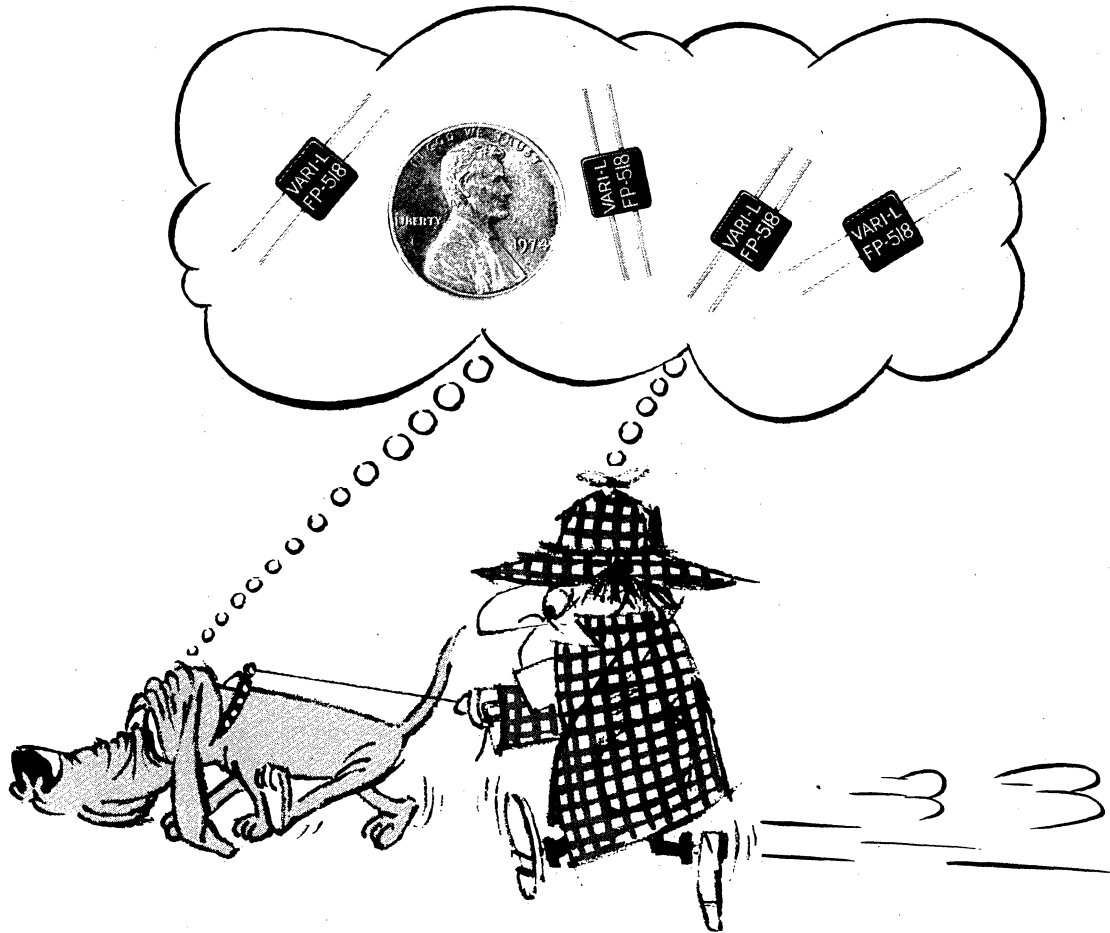
**SEE OUR AD IN SECTIONS
3450, 5600, & 2700**



VARI-L COMPANY, inc.

3883 Monaco Parkway ■ Denver, Colorado 80207 ■ Phone: (303) 321-1151 ■ TWX: 910-931-0590

SEARCHING FOR . . . RELIABILITY AND PERFORMANCE IN TINY WIDEBAND TRANSFORMERS?



Discover Vari-L's new substrate compatible flatpack wideband transformers.

- Subminiature size — $\frac{1}{4}$ " x $\frac{1}{4}$ " x $\frac{1}{8}$ "
- 0.5 Db Insertion loss
- Ribbon leads
- 12.5 to 600 ohm impedance range
- Up to 1 GHz bandwidth
- MIC Substrate compatible
- Balanced & unbalanced configurations

Their small size, easily solderable or weldable planar ribbon leads, and high performance/high reliability design makes them ideal for MIC substrate and conventional printed circuit applications.

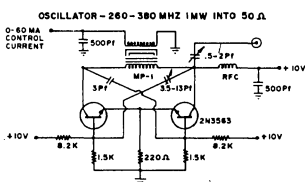
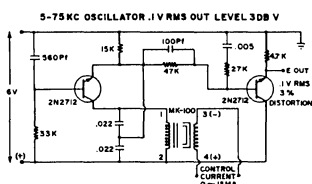
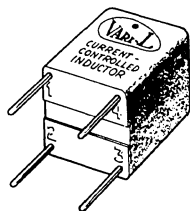
CALL OR WRITE FOR COMPLETE INFORMATION

SEE OUR AD IN SECTION 5600

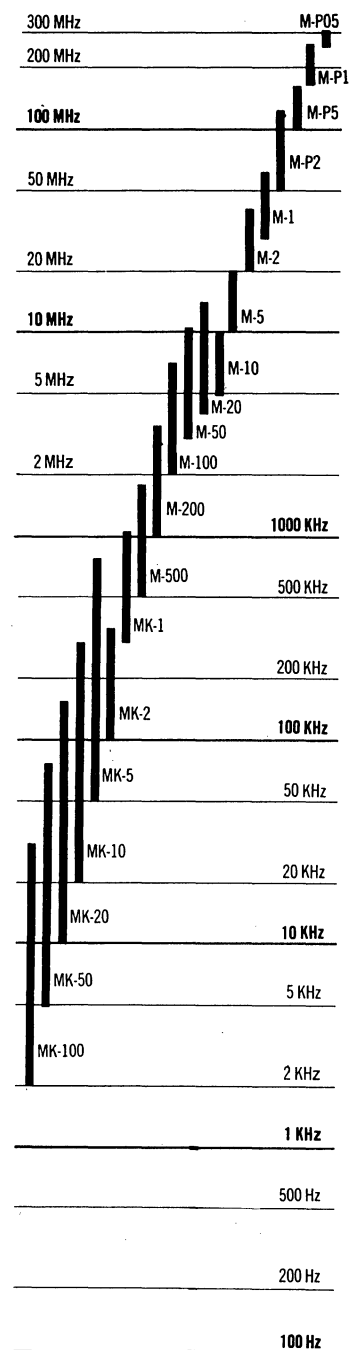


VARI-L COMPANY, Inc.

3883 Monaco Parkway ■ Denver, Colorado 80207 ■ Phone: (303) 321-1511 ■ TWX: 910-931-0590



MODEL	INDUCTANCE AT ZERO CONTROL CURRENT ±10% (L ₀)	INDUCTANCE AT MAX. RECOMMENDED CONTROL CURRENT (L _{sat})	TYP. FREQ.† AT ZERO CONTROL CURRENT (F ₀)	HIGH-FREQ. END OF RANGE WITH F. SHOWN (F _{sat})	CONTROL WINDING INDUCTANCE ±20% (L _c)	PRICE 1 - 9
MK-100	100 MH	.445 MH	2 KHz	30 KHz	450 MH	\$22.10
MK-50	50 MH	.223 MH	5 KHz	75 KHz	450 MH	\$22.10
MK-20	20 MH	.089 MH	10 KHz	150 KHz	450 MH	\$22.10
MK-10	10 MH	.045 MH	20 KHz	300 KHz	450 MH	\$22.10
MK-5	5 MH	.022 MH	50 KHz	750 KHz	450 MH	\$22.10
MK-2	2 MH	.163 MH	.1 MHz	.35 MHz	160 MH	\$22.10
MK-1	1 MH	.082 MH	.3 MHz	1.05 MHz	160 MH	\$22.10
M-500	500 μH	40.8 μH	.5 MHz	1.75 MHz	160 MH	\$22.65
M-200	200 μH	16.3 μH	1 MHz	3.5 MHz	160 MH	\$21.65
M-100	100 μH	8.15 μH	2 MHz	7 MHz	160 MH	\$21.65
M-50	50 μH	4.08 μH	3 MHz	10.5 MHz	160 MH	\$21.65
M-20	20 μH	1.63 μH	4 MHz	14 MHz	160 MH	\$21.65
M-10	10 μH	2.5 μH	5 MHz	10 MHz	80 MH	\$21.65
M-5	5 μH	1.25 μH	10 MHz	20 MHz	80 MH	\$21.65
M-2	2 μH	.5 μH	20 MHz	40 MHz	80 MH	\$21.65
M-1	1 μH	.25 μH	30 MHz	60 MHz	75 MH	\$21.65
M-P5	.5 μH	.125 μH	60 MHz	120 MHz	75 MH	\$21.65
M-P2	.2 μH	.078 μH	100 MHz	160 MHz	55 MH	\$21.65
M-P1	.1 μH	.051 μH	170 MHz	240 MHz	55 MH	\$21.65
M-P05	.05 μH	.035 μH	250 MHz	300 MHz	55 MH	\$21.65



Bantam Jack Panels

Bantam Jack Panels are designed to satisfy the increasing demand for more compact patchfields in modern electronic and communication equipment. Bantam Jack Panels, with miniaturized jacks, provide twice the number of jacks in a standard size panel. They require only $\frac{1}{2}$ the rack space previously used by conventional panels. The new panel assemblies weigh 65% less when compared to an assembly using an equivalent number

specifications

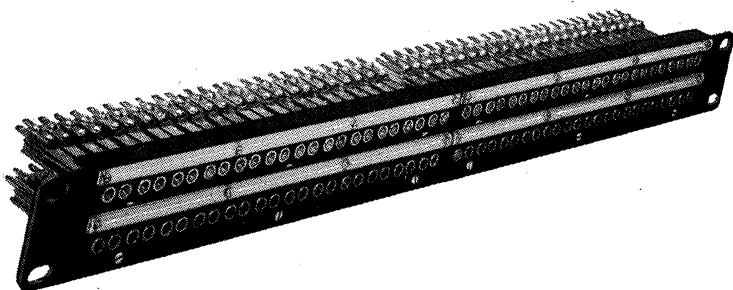
1. **Panel:** Aluminum alloy, extruded. Finished black anodized per Mil-A-8625A. Overall dimensions $1\frac{3}{4} \times 19$ —Standard EIA mounting centers.
2. **Jack Mounting:** Four moulded plastic inserts, each provides for 24 jacks. Pairs of jacks on $\frac{3}{8}$ inch centers. Double-row panel provides 96 jacks total. Blank inserts can be furnished where only single row of jacks is required.
3. **Designation Strip:** Extruded clear plastic.
4. Panel assemblies are available with a wide variety of two and three-conductor jacks. See listing of Bantam jacks for complete details.

of jacks on a conventional jack panel. ■ Bantam Jack Panels are compact, lightweight, and yet provide the same dependable service as the long established telephone types. This new design offers 96 jacks (48 pairs) in a $1\frac{3}{4}$ inch x 19 inch standard sized panel. The jacks on this panel are spaced to prevent the cross patching of adjacent circuits when using double plugs.

- PJ-731 Double row panel, assembly less jacks, holds 96 jacks.
 PJ-737 Double row panel, with 48 pair (96 total) PJ-818 jacks.
 PJ-739 Double row panel, with 48 pair (96 total) PJ-839 jacks.
 PJ-724 Panel inserts, less jacks, 24 holes.
 PJ-700 Panel inserts, blank (same as PJ-724 without holes).
 PJ-736* Double row panel, with 104 PJ-818 jacks.
 PJ-738* Double row panel, with 104 PJ-839 jacks.

*Panels with 104 jacks (26 per insert, jacks all on $\frac{3}{8}$ inch centers) are available on special order.

Custom panel assemblies with up to 104 jacks are available on special order.



Bantam Triple Row Jack Panel

Bantam Triple Row Jack Panels provides 144 jacks in a $2\frac{5}{8}$ inch x 19 inch size panel. The specification and construction of this panel is the same as Bantam Double Row Panels except width of panel is one and one-half the standard panel size. Mounting centers conform to standard EIA rack spacing. Three rows of jacks with 48 jacks in each row. These three rows are particularly desirable for use in 2 wire and 4 wire VF Circuit applications where space can be saved by having three verticle jacks appear as a jack set.



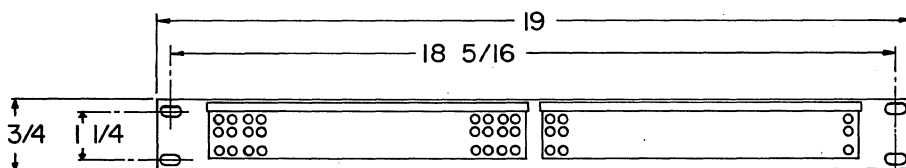
"BANTAM TRIPLE ROW JACK PANEL — $2\frac{5}{8}$ " WIDE"

BANTAM TRIPLE ROW JACK PANEL

- PJ-732 Triple Row Panel Assembly, less jacks, holds 144 jacks
 PJ-733 Triple Row Panel, with 144 PJ-818 Jacks
 PJ-734 Triple Row Panel, with 144 PJ-839 Jacks
 PJ-735 Triple Row Panel, with 96 PJ-839 Jacks (top and middle row)
 48 PJ-838 Jacks (bottom row).

Bantam 2 + 1 Jack Panels

Bantam 2 + 1 Jack Panels are the newest development in the ADC line of Bantam components which offer the maximum in patching density. These unique three row panels feature three miniature jacks on a single frame, which effectively requires $\frac{1}{3}$ less space than regular Bantam jacks. The Bantam 2+1 panels include 48 of these three conductor jacks, in a standard size $1\frac{3}{4}$ inch wide by 19 inch long panel. These panels were especially designed to provide vertically positioned jack sets such as the "Line", "Equipment" and "Monitor" jacks in a Voice Frequency Circuit. The Bantam 2+1 Jacks provided in these panels are available with solder type terminals and with wire wrap terminals.



"BANTAM 2 + 1 JACK PANEL — $1\frac{3}{4}$ " WIDE"

- PJ-721 Panel Assembly, with 48 PJ-821 Jacks
 PJ-721W Panel Assembly, with 48 PJ-821W Jacks

ADC PRODUCTS

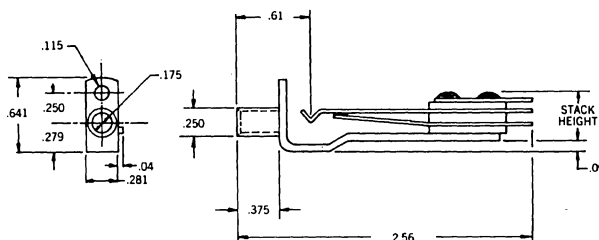
Division of MAGNETIC CONTROLS COMPANY
 4900 West 78th Street, Minneapolis, Minnesota 55435
 Tel: (612) 835-6800 — TWX: 910-576-2832 — TELEX: 29-032



Bantam Jacks

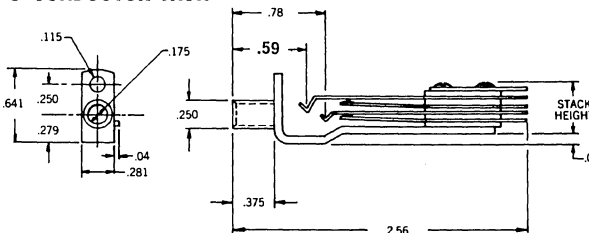
Bantam Jacks will meet the electrical, mechanical and environmental requirements of the military specification for long frame telephone jacks. Although reduced in size these jacks will provide the same reliable service equal to that expected from regular size telephone jacks. These jacks are available in a variety of two and three conductor types, with isolated circuit contacts as well as normalling contacts.

FOR COMPLETE LINE OF
BANTAM LITES, SWITCHES,
ACCESSORIES, SEE ADC
COMMUNICATIONS COMPONENTS
CATALOG.



2 CONDUCTOR JACK

3 CONDUCTOR JACK



SCHEMATIC DIAGRAM	PART NO.	STACK HEIGHT (Inches)
	PJ-803	13/32
	PJ-808	43/64
	PJ-815	35/64
	PJ-816	35/64
	PJ-818	13/32
	PJ-823	27/64
	PJ-836	5/8
	PJ-805	43/64
	PJ-824	43/64
	PJ-838	35/64
	PJ-839	17/32
	PJ-841	43/64
	PJ-880	3/4

specifications

Frame: Steel, Cadmium plate with chromate conversion coating to withstand 50 hours of salt spray.

Springs: Nickel silver.

Contacts: W. E. #1 gold alloy, cross-bar contacts are welded to springs.

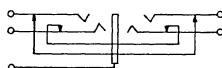
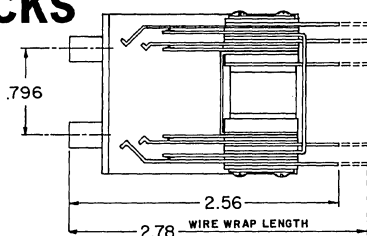
Insulation: Spacers, Phenolic Type PBE-P per MIL-P-3115B.

Bushing: Brass, silver soldered to frame. Finish same as frame.

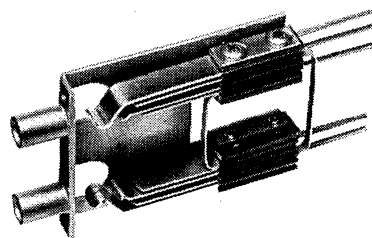
If gold plating is required for all surfaces, jacks should be ordered as the PJ number with a "G" suffix. ADC uses .00005 gold per MIL-G-45204, TYPE II. The solder lugs are not tinned for gold plated jacks. Any requirements other than those described require special notation.

Bantam Twin Jacks

Bantam Twin Jacks are the miniature equivalent of the ADC PJ-482 or the WE 482A. These three conductor type jacks have normal contacts on both the tip and ring springs strapped, thereby reducing and simplifying wiring. The Bantam Twin Jacks are designed with sleeves on .796 inch centers and are made to mount in the ADC PJ-731 Double Row Panels and the PJ-732 Triple Row Panels. Bantam Twin Jacks are available with solder terminals and wire wrap terminals.



SCHEMATIC

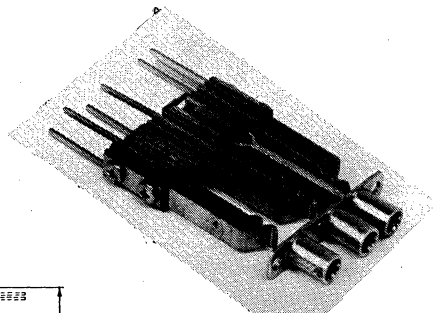
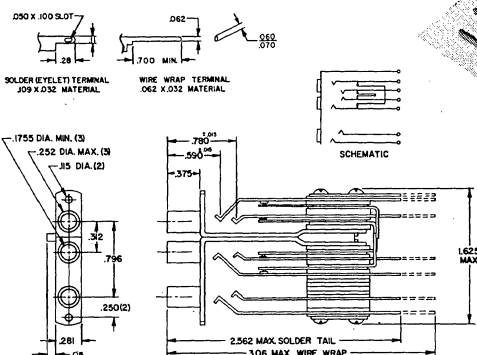


PJ-882 Bantam Twin Jack —
Solder Terminals

PJ-882W Bantam Twin Jack —
Wire Wrap Terminals

Bantam 2 + 1 Jacks

Bantam 2 + 1 Jacks offer almost unbelievable space saving advantages... Savings even greater than regular Bantam jacks. Bantam 2 + 1 Jacks literally permits tripling of the patching density of a 1 3/4 inch wide panel. This unique design features three jacks on a single frame. The jacks are three conductor types. Two of the jacks have normal contacts on both tip and ring springs. These normal contacts are strapped to simplify wiring. Ideally suited to VF Circuit applications where two of the jacks would function as "Line" and "Equipment" jacks and the third as a "Monitor" jack. Up to 48 Bantam 2 + 1 Jacks can be mounted on a 1 3/4 inch wide by 19 inch long panel, Bantam 2 + 1 Jacks are available with solder type terminals, with wire wrap terminals. These very remarkable miniature jacks are specifically designed to mount in the Bantam 2 + 1 Panel PJ-721.



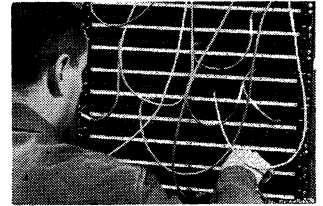
PJ-831W
(Wire Wrap Terminals)

Bantam Patch Cords

Bantam Patch Cords are plastic jacketed, shielded cords complete with molded-on plugs. The plugs are made with molded insulation between conductors. Bantam Patch Cords are avail-

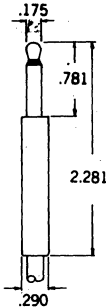
able with single and double two and three conductor plugs. A cord strain relief feature is included in the plug construction.

Bantam plugs may be gold plated on special order per MIL-G-45204, Type II, .00005 inches thick.



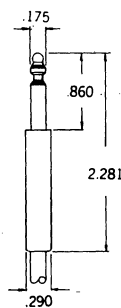
2 CONDUCTOR SINGLE PLUG

Length (see Note 1)	Single (2) Conductor Plug
6 inch	PJ-701
12 inch	PJ-702
18 inch	PJ-703
24 inch	PJ-704
30 inch	PJ-705
36 inch	PJ-706
48 inch	PJ-708
60 inch	PJ-710



3 CONDUCTOR SINGLE PLUG

Length (see Note 1)	Single (3) Conductor Plug
6 inch	PJ-711
12 inch	PJ-712
18 inch	PJ-713
24 inch	PJ-714
30 inch	PJ-715
36 inch	PJ-716
48 inch	PJ-718
60 inch	PJ-720



specifications

Cord: Plastic jacketed, stranded copper conductors, braided shield. Jacket color—gray.

Plugs: Conductor parts are brass, finished to 32 microinch finish maximum.

Plug Insulation: Molded nylon.

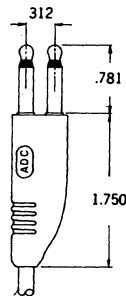
Internal Connections: Soldered.

Plug Shell: Plastic, black, rigid thermoplastic.

NOTE 1: Length is measured from the rear of the plug shell to rear of plug shell on opposite end.

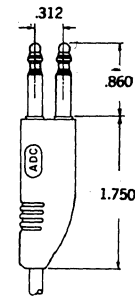
2 CONDUCTOR (DOUBLE)

Length	Double (2) Conductor Plug
6 inch	PJ-751
12 inch	PJ-752
18 inch	PJ-753
24 inch	PJ-754
30 inch	PJ-755
36 inch	PJ-756
48 inch	PJ-758
60 inch	PJ-760



3 CONDUCTOR (DOUBLE)

Length	Double (3) Conductor Plug
6 inch	PJ-761
12 inch	PJ-762
18 inch	PJ-763
24 inch	PJ-764
30 inch	PJ-765
36 inch	PJ-766
48 inch	PJ-768
60 inch	PJ-770



specifications

Cord: Plastic jacketed, stranded copper conductors, braided shield. Jacket color—gray.

Plugs: Conductor parts are brass, finished to 32 microinch finish maximum.

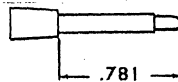
Plug Insulation: Molded nylon.

Internal Connections: Soldered.

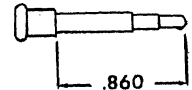
Plug Shell: Plastic, gray, flexible thermoplastic.

Dummy Plugs

Plugs are used to actuate Bantam Jacks. They are constructed of an insulating plastic material.



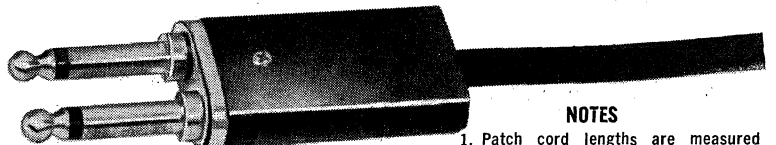
2 CONDUCTOR PJ-747



3 CONDUCTOR PJ-748

Patch Cords

ADC Patch Cords have become standards in the communications industry. The heavy Nylon braided jacket excels in abrasion resistance. All cords have been designed to give the ultimate combination of durability, flexibility and reliability. ADC has numerous combinations of special cord assemblies using virtually every plug combination required. You are invited to submit your requests or requirements for quotations.



PATCH CORD LENGTH

6 inch
1 foot
2 feet
3 feet
4 feet
5 feet
6 feet
10 feet

TOLERANCE

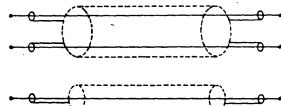
+ .375" —.00"
+ .75" —.00"
+ 1.125" —.00"
+ 1.375" —.00"
+ 1.625" —.00"
+ 2.0" —.00"
+ 2.25" —.00"
+ 2.625" —.00"

NOTES

1. Patch cord lengths are measured from backs of plug shells.
2. All cords and cord assemblies will withstand 500 V, 60 Hz PBT between all conductor. Cordage is designed to have minimum leakage resistance of 50 Megohms with 100 volts applied.

2 CONDUCTOR SHIELDED, CORD ASSEMBLIES

Length	Cord w/ PJ-1 Plugs
6 inch	PJ-10½
1 foot	PJ-11
2 feet	PJ-12
3 feet	PJ-13
4 feet	PJ-14
5 feet	PJ-15
6 feet	PJ-16
10 feet	PJ-10



These cords provide two tinsel wire conductors plus a braided shield. The overall jacket is braided nylon. Black nylon is standard.

3 CONDUCTOR SHIELDED, CORD ASSEMBLIES

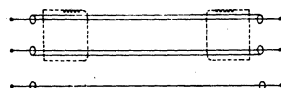
Length	Cord w/ PJ-2 Plugs	Cord w/ PJ-051R Plugs
1 foot	PJ-71	PJ-81
2 feet	PJ-72	PJ-82
3 feet	PJ-73	PJ-83
4 feet	PJ-74	PJ-84
5 feet	PJ-75	PJ-85
6 feet	PJ-76	PJ-86



These cords provide two tinsel wire conductors plus a braided shield. Overall jacket is braided nylon. Black nylon is standard.

2 CONDUCTOR UNSHIELDED, CORD ASSEMBLIES

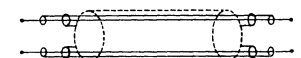
Patch Cords Length	Cord w/ PJ-047R Plugs
1 foot	PJ-471
2 feet	PJ-472
3 feet	PJ-473
4 feet	PJ-474
5 feet	PJ-475
6 feet	PJ-476



The PJ-180 and PJ-470 series cords offer tinsel wire conductors, thermo plastic insulated. Standard color for PJ-180 series patch cords is slate. The standard color for the PJ-470 series cords is red.

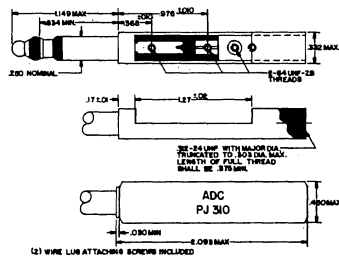
3 CONDUCTOR SHIELDED, CORD ASSEMBLIES

Length	Cord w/ PJ-7 Plugs	Cord w/ PJ-8 Plugs
1 foot	PJ-171	PJ-91
2 feet	PJ-172	PJ-92
3 feet	PJ-173	PJ-93
4 feet	PJ-174	PJ-94
5 feet	PJ-175	PJ-95
6 feet	PJ-176	PJ-96



The PJ-90 and PJ-170 series cords provide four tinsel wire conductors, plus a shield common to both sleeves on the plugs. Standard color for these cords is black.

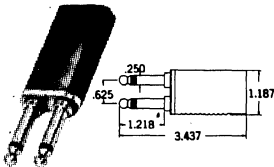
Plugs



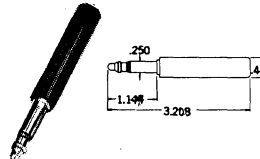
ADC PRODUCTS

Division of MAGNETIC CONTROLS COMPANY
4900 West 78th Street, Minneapolis, Minnesota 55435
Tel: (612) 835-6800 — TWX: 910-576-2832 — TELEX: 29-032

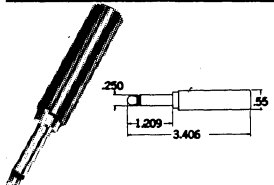
PJ-310 — Manufactured under license from Western Electric. Introducing ADC's PJ-310 — equivalent to WECO's popular 310 plug. Designed for use with 1/4" diameter tip, ring, and sleeve jacks. Profiled construction allows for close contour tolerances. Nylon insulation provides long life wear resistance.



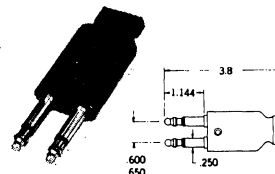
PJ-1 — Equivalent WE-241. Heavy duty die cast frame. Black phenolic shell. Has self-aligning plug sleeves on 5/8" centers for use with all standard jack panels. Two tip conductors, plus sleeve connection common to both sleeves.



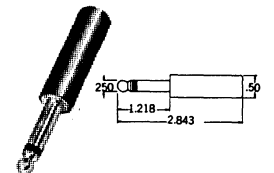
PJ-2 — Equivalent WE-291A. Designed for use with 1/4" diameter tip, ring and sleeve jacks. Especially designed cone-shaped tip to prevent momentary shorting of tip and ring conductors when used with ADC PJ-339, WE-239A or similar three circuit jacks.



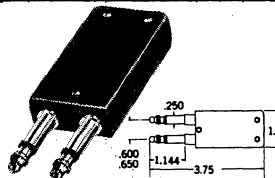
PJ-047R,B — Equivalent WE-347. Designed for use with tip and sleeve jacks. Molded insulation, red (R) or black (B) plastic handle, design and construction in accordance with MIL-P-642B specifications.



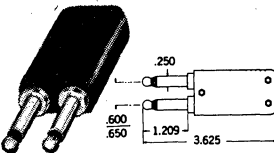
PJ-4 — Looping plug, dual three conductor type. Same conductor configuration as PJ-051 except has conductors wired internally, tip to tip, ring to ring and sleeve to sleeve. Black plastic shell.



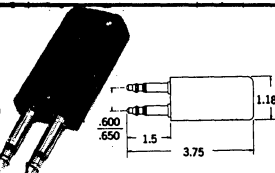
PJ-055B,M,R — Formerly ADC PJ-5, fits 1/4" phone jacks. Black (B) or red (R) plastic or Metal (M) shell. Screw terminals, designed and manufactured in accordance with MIL-P-642B.



PJ-7 — Equivalent WE-425. Twin type plug with tip, ring and sleeve conductors on 5/8" centers for use with all standard jack panels. Designed to mate with three conductor jacks having 1/4" diameter sleeves. Molded insulation, Black phenolic shell is notched to indicate polarity.

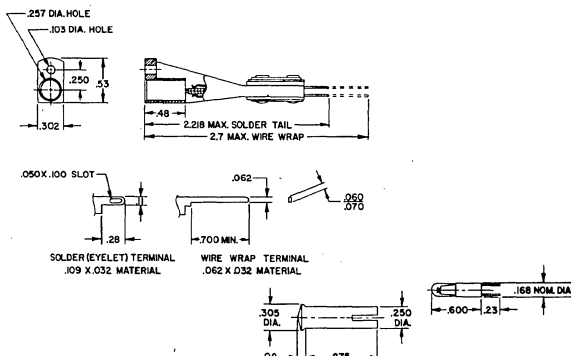


PJ-327 — Equivalent WE-327. Twin plug provides two electrically independent 2 conductor plugs in a black phenolic shell which is notched to indicate polarity. Self-aligning plug sleeves are on 5/8" centers. Designed and constructed in accordance with specification MIL-P-642B.



PJ-8 — Dual three conductor type with same conductor configuration as PJ-2, designed for non-shorting of tip and ring circuits when used with PJ-339, WE-239A or similar jacks. Black plastic handle notched to indicate polarity.

Bantam Lamp Socket



Bantam Lamp Sockets accepts T-1 1/4 style Bi-Pin base incandescent lamps and the ADC Bantam LED module. Both lamps and LED's are available in 6, 14, and 28 volt ratings and in red, green, amber, and white colors (lamp caps for the incandescent lamps). Bantam lamp sockets mount in panels in the same manner as bantam jacks.

SPECIFICATIONS:

Case is glass filled nylon. Conductor lugs are die formed of nickel silver with tin-dipped solder lugs.

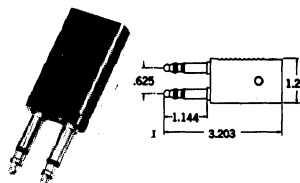
PJ-850 Solder Lamp Socket

PJ-850W...Wire Wrap Lamp Socket

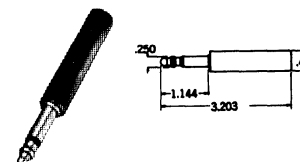
PJ-729W,R,G,A Lamp Cap

PJ-860, 861, 862 Incandescent Lamps

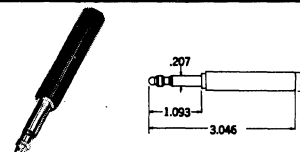
4-25979-XXXX LED Module



PJ-9 — Equivalent WE-338. Designed for applications requiring two separate 3 conductor circuits. Will mate with three-conductor jacks having 1/4" diameter sleeves. Molded insulation, black plastic handle notched to indicate polarity. Self-aligning plug sleeves on 5/8" centers. Has two separate cord entry holes and requires "Y" type cord or two separate cords.



PJ-051R,B — Equivalent WE-310. Designed for use with 1/4" tip, ring and sleeve jacks. Molded insulation, red or black plastic shell, three conductor. Is in accordance with MIL-P-642B.



PJ-309 — Equivalent WE-309. Three conductor type. Has .207 diameter sleeve (small diameter). Intended for use with ADC PJ-246, PJ-249 and similar three circuit jacks which have .210 I.D. sleeves. Molded insulation — red plastic handle. Designed and constructed per MIL-P-642B.

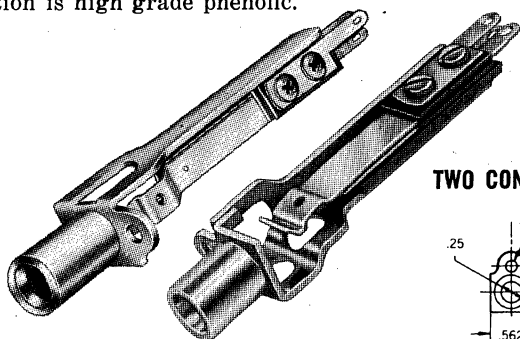
FOR COMPLETE LINE OF COAXIAL PLUGS, SEE ADC COMMUNICATIONS COMPONENTS CATALOG.



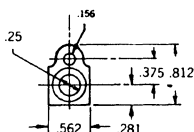
Jacks

TELEPHONE TYPE

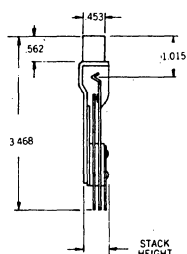
ADC is recognized as a leading supplier of long frame, telephone type jacks. As evidence of their outstanding quality, ADC jacks are used by the country's foremost manufacturers of communication equipment. The unique, ADC one-piece frame is strong, dimensionally stable and readily interchangeable both mechanically and electrically with commonly used jacks. Plating withstands 50-hour salt spray tests. W. E. #1 gold alloy contacts are welded to nickel silver springs. Lugs are hot tin dipped. Insulation is high grade phenolic.



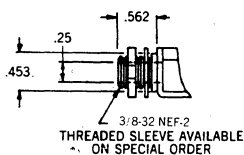
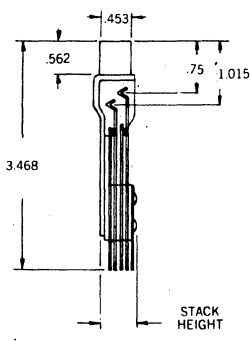
TWO CONDUCTOR



Schematic Diagram	Jacks	WE Equiv.	Frame Style	Stack Height (Inches)
	PJ-115	215-A	A	5/8
	PJ-116	216-A	A	5/8
	PJ-117	217-A	A	9/16
	PJ-123	223-A	A	7/16
	PJ-125	225-A	A	27/32
	PJ-202	None	C	3/4
	PJ-203	303-A	A	9/16
	PJ-204**	None	A	3/4
	PJ-205**	240-A	A	3/4
	PJ-206**	242-A	A	3/4
	PJ-207**	285-A	A	27/32
	PJ-208**	284-A	A	63/64
	PJ-209**	411-A	A	27/32
	PJ-226	226-A	A	5/8
	PJ-237	237-A	A	15/32
	PJ-238	238-A	A	9/16
	PJ-240	240-C	C	3/4
	PJ-241**	241-A	A	3/4
	PJ-242	242-C	C	3/4
	PJ-280	280-C	C	23/32
	PJ-318	218-A	A	1/2
	PJ-336	236-C	C	19/32
	PJ-338	438-C	C	13/16
	PJ-339	239-A	A	9/16
	PJ-418	218-C	C	1/2
	PJ-246*	246-A	A	9/16
	PJ-248*	248-A	A	9/16
	PJ-249*	249-A	A	9/16



THREE CONDUCTOR



SPECIFICATIONS:

Frame: Steel, plated to withstand 50 hours salt spray per Mil-STD-202, Method. Sleeve: Brass, nickel plated. Springs: Nickel silver with tinned lugs. Insulators: Phenolic, per Mil-P-3115 B type.

MILITARY JACKS

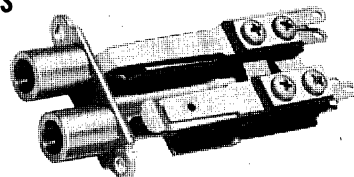
Designed to meet the rugged, exacting requirements of military applications. These ADC jacks are made in accordance with Mil-J-641B specifications. Highest quality materials and closely held tolerances on dimensions conform with military specifications.

Schematic Diagram	MIL Jacks	Frame Style	Stack Height (Inches)	Schematic Diagram	MIL Jacks	Frame Style	Stack Height (Inches)
	JJ-015	C	3/4		JJ-073**	A	3/4
	JJ-016	A	9/16		JJ-074	A	3/4
	JJ-017**	A	3/4		JJ-075**	A	3/4
	JJ-019	C	11/16		JJ-077	A	27/32
	JJ-022	A	9/16		JJ-078**	A	63/64
	JJ-024	A	1/2		JJ-084	A	5/8
	JJ-035	A	5/8		JJ-085	A	9/16
	JJ-042	A	9/16		JJ-086	A	9/16
	JJ-072	A	5/8		JJ-087**	A	27/32

*For use with PJ-309 or other similar type plugs having .207" diameter sleeves.

**Caution — Because of Stack Height these "A" frame jacks cannot be installed on 5/8" centers. "C" Frame version if not listed can be furnished on special order.

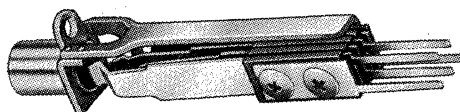
TWIN JACKS



ADC Twin Jacks are essentially two jacks with a common mounting frame. Jack sleeves are on 5/8" centers for vertical mounting in standard jack panels. Normal springs are cross-connected or strapped. Jack sleeves are brass, nickel plated. Die formed springs are nickel silver. Frame and hardware are steel, cadmium-chromate plated to withstand 50 hours salt spray.

Part No.	WE Equivalent	No. Cond.	Use With Plug
PJ-410	410A	2	PJ-327, PJ-047, PJ-1
PJ-482	482A	3	PJ-051, PJ-7
PJ-482W	—	3	PJ-051, PJ-7

WRAPID JACKS (For Wrapped Solderless Connections)



ADC offers a variety of Wrapid Jacks with .032" by .062" rectangular terminals for wrapped wire connections. These jacks feature cross-bar contacts. Overall length is 3.825" maximum, otherwise, dimensionally the same as telephone jacks.

Schematic Diagram	Wrapid Jack	Frame Style
	PJ-238W	A
	PJ-240W	C
	PJ-241W	A
	PJ-242W	C
	PJ-339W	A
	PJ-246W	A

SPECIFICATIONS

Mounting Brackets: PJ-31 and PJ-33: Die cast zinc, finished black lacquer. PJ-30, PJ-35, PJ-36, PJ-37: Steel, finished cadmium + chromate per Mil-F-14072 #M262, Type II.

*The jack panels as illustrated are equipped with ADC standard designation strips as shown. PJ-30, PJ-35, PJ-36 and PJ-37 type panels can be supplied with the reinforcement strips drilled and tapped to accommodate the Western Electric equivalent designation strips (PJ-899A, PJ-899B, PJ-903A and PJ-903B). The suffix "A" added to the part number denotes panels which are modified to accommodate these alternate type designation strips. Designation strips are to be ordered separately.



Double Panel. Holds 52 jacks — requires 13¼" panel space. Double designation strip. Brackets for flush rack mounting. All jack mounting holes on 5/8" centers.



PJ-33

Single Panel. Holds 24 jacks. Holes are spaced to prevent patching adjacent circuits. Requires 1 3/4" panel space.

FOR LAMP SOCKET AND CAPS,
SEE ADC COMMUNICATIONS COMPONENTS CATALOG

PJ-35 Same as PJ-30, except has 7" standoff mounting brackets.



PJ-31

Double Panel. Holds 48 jacks. Holes are spaced to prevent patching adjacent circuits. Requires 2 1/8" panel space.



PJ-36

Single Panel. Holds 26 jacks — requires 13 1/4" panel space. Brackets for flush rack mounting. All jack mounting holes on 5/8" centers.

PANELS LESS JACKS	PJ-30	PJ-30A	PJ-31	PJ-33	PJ-35	PJ-35A	PJ-36	PJ-36A
PANEL WITH PJ-318	PJ-340	PJ-340A	PJ-341	PJ-343	PJ-350	PJ-350A	PJ-360	PJ-360A
PANEL WITH PJ-339	PJ-390	PJ-390A	PJ-391	PJ-393	PJ-395	PJ-395A	PJ-396	PJ-396A

Molded Terminal Blocks

ADC Pin Terminal Blocks are molded of durable, black thermoset plastic per Military specifications MIL-P-14F. Terminals are brass with electro-tin plating for lasting solderability. The PJ-101 series blocks have terminals graduated in length for ease of wiring. All Terminal Blocks are numbered along the top row for easy terminal identification.

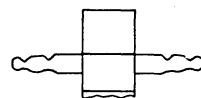
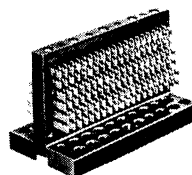


Fig. 1
SOLDER/SOLDER

No. Rows	Catalog No.*	No. Terminals	Catalog No.	No. Terminals	Height
1	PJ-101	20	PJ-660-1	26	1.906
2	PJ-102	40	PJ-660-2	52	2.250
3	PJ-103	60	PJ-660-3	78	2.593
4	PJ-104	80	PJ-660-4	104	2.937
5	PJ-105	100	PJ-660-5	130	3.281
6	PJ-106	120	PJ-660-6	156	3.625
7	PJ-107	140	PJ-660-7	182	3.968
8	PJ-108	160	PJ-660-8	208	4.312
9	PJ-109	180	PJ-660-9	234	4.656
10	PJ-110	200	PJ-660-10	260	4.968
11	PJ-111	220	PJ-660-11	286	5.281
12	PJ-112	240	PJ-660-12	312	5.593

*Solder/Solder (See Fig. 1) Add "SW" to Cat. No. for solder/wire wrap (Fig. 2). Add "WW" to Cat. No. for Wire Wrap/Wire Wrap (Fig. 3).

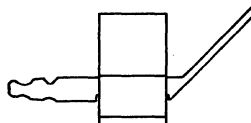


Fig. 2
SOLDER/WIRE WRAP

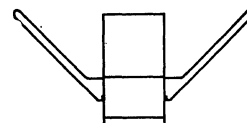
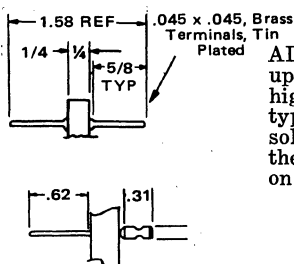


Fig. 3
WIRE WRAP/WIRE WRAP

“WRAPID” Terminal Blocks

No. of Terminals	Wrapped Solderless Application Fig. 1 Terminal	Solder or Solderless Application Fig. 2 Terminal	Height
40	PJ-604	PJ-644	1.75
60	PJ-606	PJ-646	2.25
80	PJ-608	PJ-648	2.75
100	PJ-610	PJ-650	3.25
120	PJ-612	PJ-652	3.75



ADC Products "Wrapid" Terminal Blocks provide for up to 120 connections in a space of 2½" wide by 3¾" high (max.). Ten models in two series offer the proper type and number of connectors for either wrapped solderless or wrapped solder terminals on one side of the block to solder or solderless (wrapped) terminals on the other side.

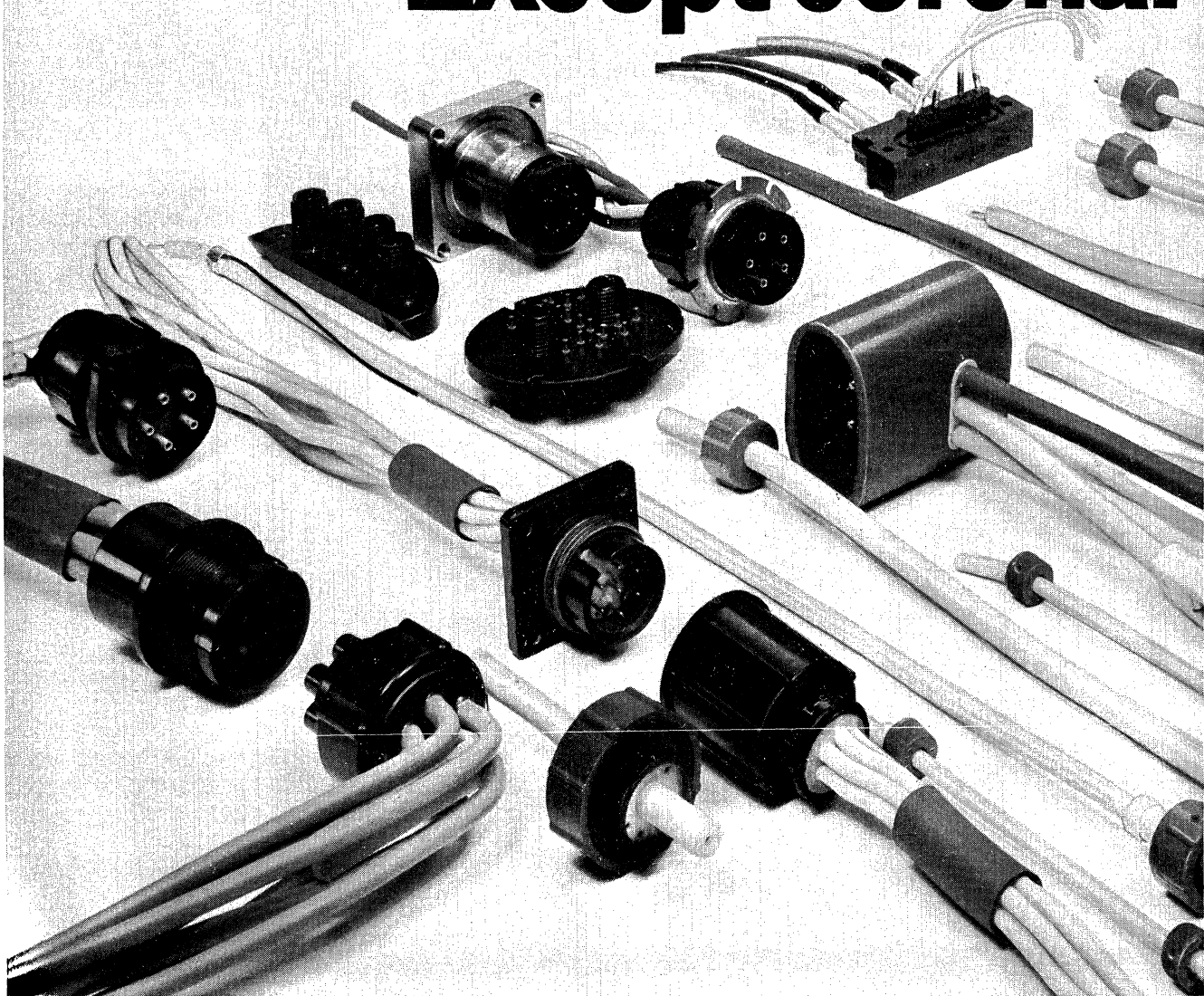
ADC PRODUCTS

Division of MAGNETIC CONTROLS COMPANY
4900 West 78th Street, Minneapolis, Minnesota 55435
Tel: (612) 835-6800 — TWX: 910-576-2832 — TELEX: 29-032



Our high-voltage connectors and lead assemblies have everything.

Except corona.



We designed that out, right at the start. For safety's sake. And while we were at it, we designed-in compactness, light weight, quick-disconnectability...and reliability.

We're AMP Capatron Division, a leading designer and manufacturer of custom high-voltage, high-altitude, high-temperature hermetic connectors, lead assemblies and receptacles. For commercial and military applications.

We put a lot of effort into research and development of high-voltage interconnection products. And make it work for you on power supplies, modulators, pulse-forming networks, high-voltage transformers, magnetrons, klystrons, traveling wave tubes and cathode ray tubes.

Here are some key features of our products. If you'd like further information, please call 717-367-1105. Or write AMP Capatron Division, Elizabethtown, Pa. 17022.

Hermetic connectors

- Safe—no exposed high voltage parts
- Space saving—maximum performance from the minimum size and weight
- Color coded for easy identification
- Fast connect and disconnect
- Wide temperature range (-55°C to +125°C)
- Positive mating of lead into receptacle
- RFI shielding—optional
- Fungus, moisture, oil, and chemical resistant
- High altitude operation—up to 80,000 feet without voltage derating
- Excellent mechanical strength—resistant to vibration and shock
- High dielectric strength
- Preamsembled—no tools required
- High reliability—operates under extreme environmental conditions
- Versatile—top access, splice or bulkhead application
- Voltage rating: to 150,000 VDC.
- One through nine positions
- Radiation resistant
- Lead wire remains flexible from -62°C to +250°C
- Meets applicable military specifications
- Quick, easy installation

Lead assemblies and receptacles

- Lightweight, space saving, safe
- Wide temperature range: -55°C to +125°C (-67°F to +257°F)*
- Voltage ratings: to 50,000 volts DC†
- Easy to install—no tools needed
- Insulation: extruded silicone rubber
- Receptacles: ceramic or glass epoxy
- Quick disconnect
- High dielectric and mechanical strength
- Hermetically sealed and corona-resistant
- High altitude operation: up to 70,000 ft. without derating
- Meets applicable mil. specs. for shock and vibration resistance
- RFI shielding optional

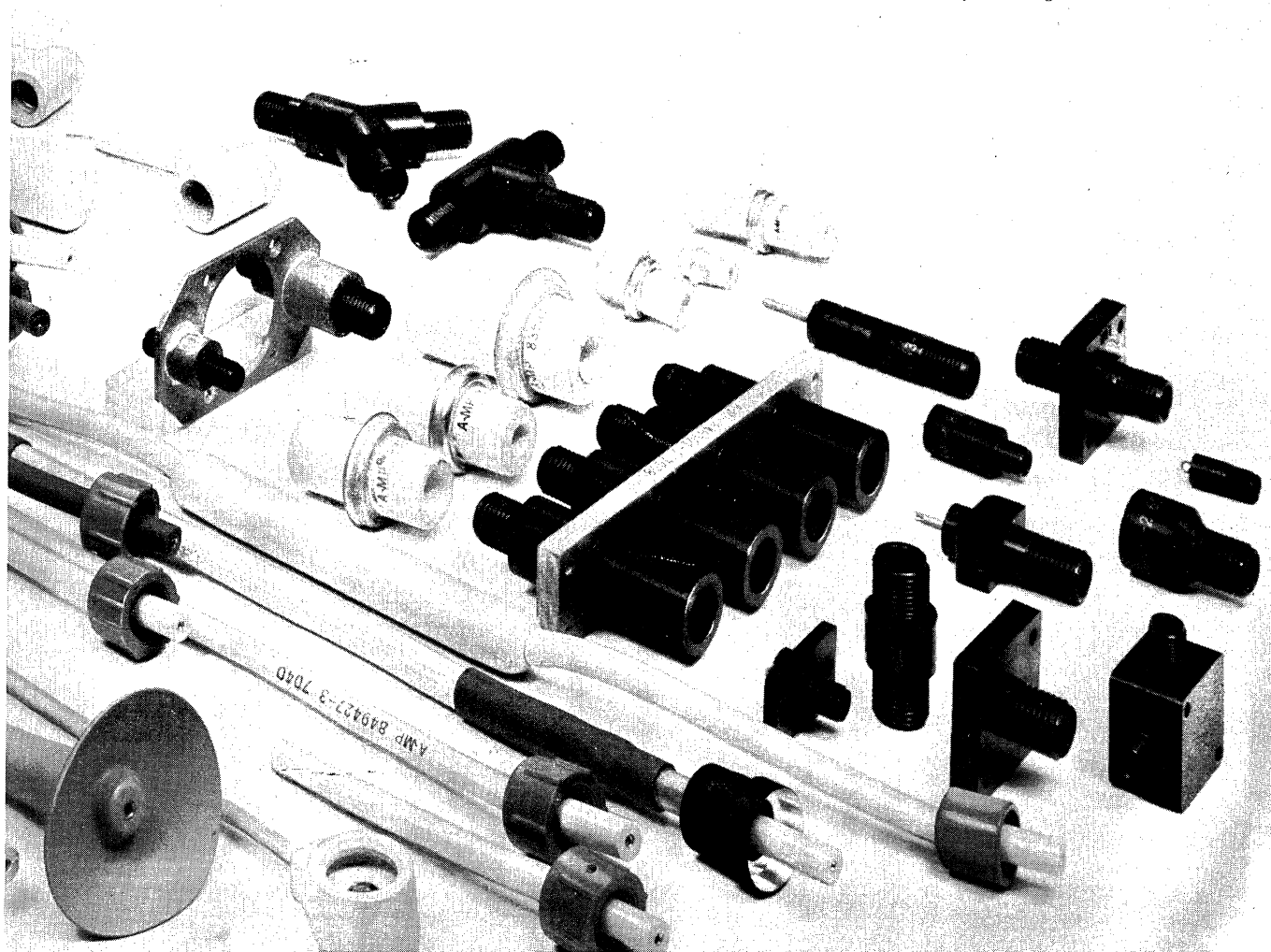
* Higher temperature components up to +200°C (+392°F) on request.

† Special designs to 200,000 volts DC on request.

AMP

INCORPORATED

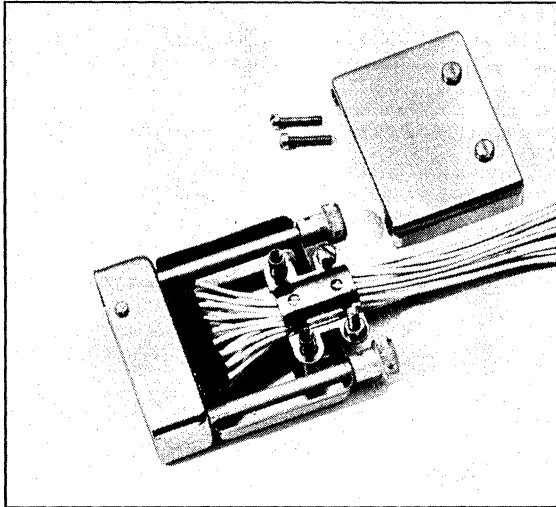
AMP is a trademark of AMP Incorporated.
Data subject to change without notice.



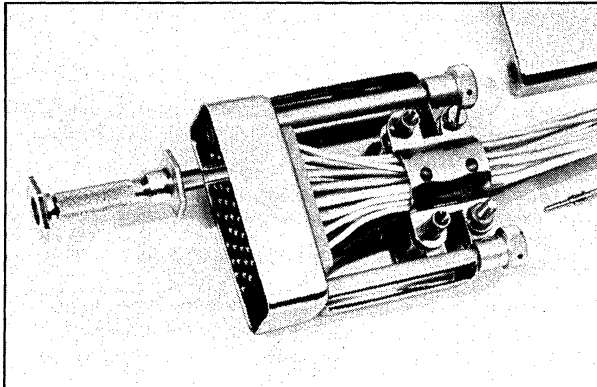
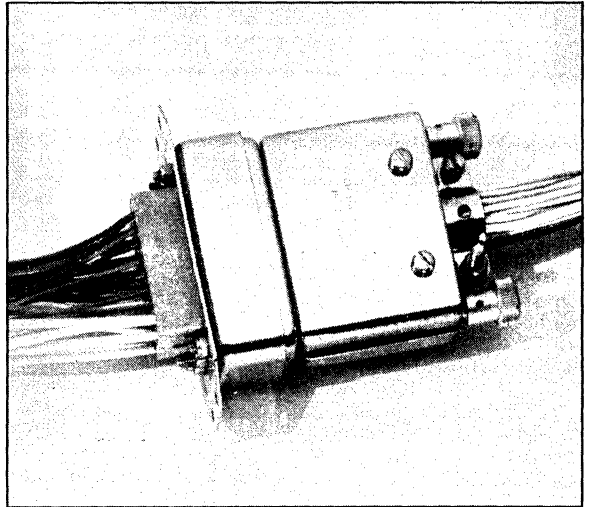
AirBorn builds versatility.

**Available in any AirBorn
miniature or subminiature
electronic connector.**

Removable Hood



Stainless Steel Construction



Removable Crimp Contacts
as well as standard solder cups

Crimp, Removable Contacts
50 lb. minimum resistance to push out.
Stainless steel shells, mounting plates, and split hoods optional.
Sizes: 18, 34, 42, 50, 66, 75, 104.

Soldercup Contacts
retained in molding.
Rugged .0625 dia pins. Stainless steel shells, mounting plates, and split hoods optional.
Sizes: 14, 20, 34, 42, 50, 50-8, 66, 75, 104.



AirBorn, Inc.

4321 AirBorn Drive, Addison, Texas 75001

AirBorn connectors

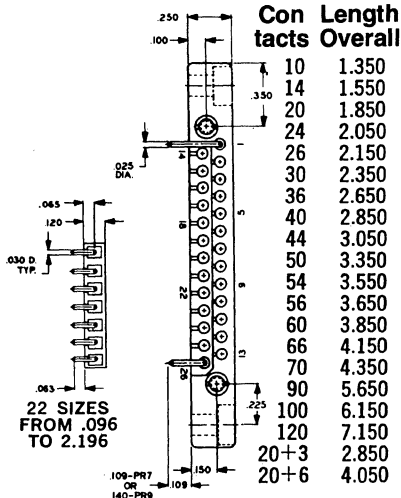
AirBorn Connectors for PC Card to Chassis or Mother Board Connections

Two series of subminiature, right-angle .030" dia. BeCu pin to socket connectors.

Series WT: Single-row connectors on .100" centers.

Series WTB: Double-row connectors on .100" centers, offset .050". Three or six 50-ohm Coax available with 20-contact connectors.

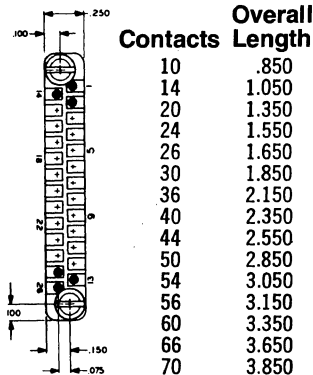
Terminations: Soldercup, wave solder, Wire-Wrap*, and crimp insertable.



AirBorn Connectors for PC Board Input-Output, Cable to Panel and Cable to Chassis Connections

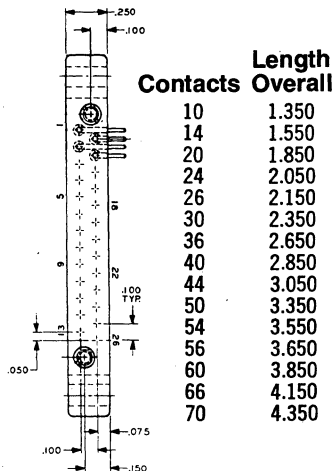
Series WTA: Subminiature, rectangular plug and receptacle, .100" centers, two rows offset .050", .030" dia. BeCu contacts.

Terminations: Soldercup, wave solder, and Wire-Wrap*.

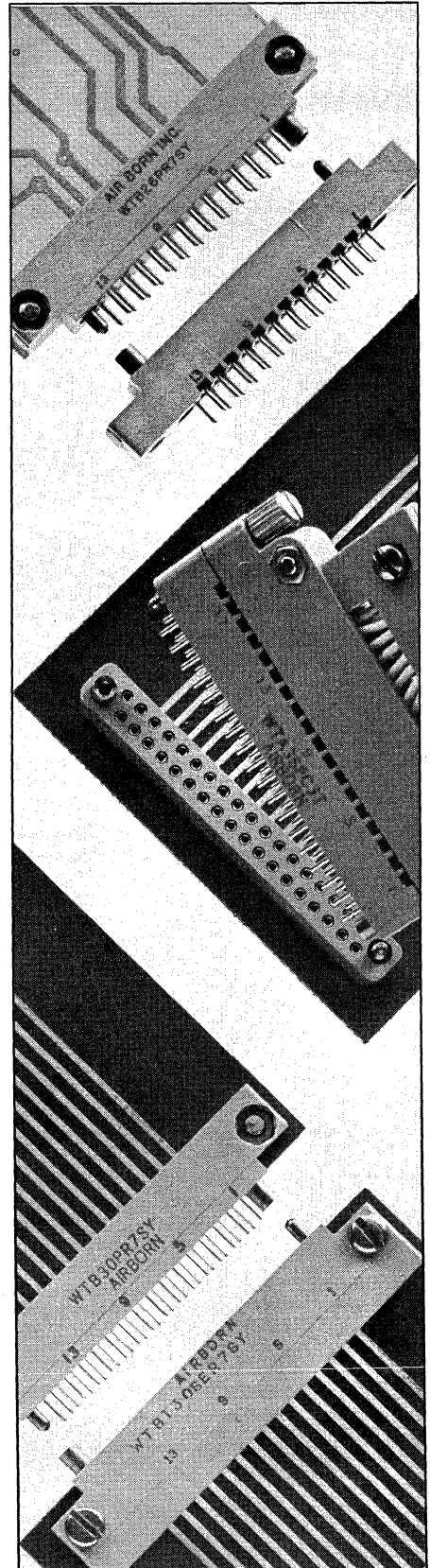


AirBorn Connectors for Extender Board and Test Applications

Series WTB: Right angle receptacles combine with right angle plugs for extender board applications. Available in combinations from 10 to 70 contacts. Choice of .109" or .140" termination lengths. Also provides a test vehicle using conventional plugs with guiding or jackscrew locking devices.



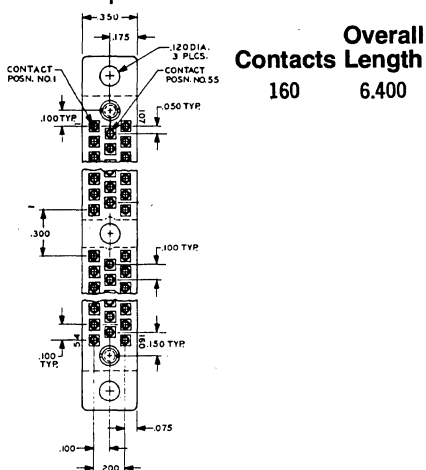
Check with us on status of parts to:
MIL-C-55302/55, 56,
57, 58, 59, 60, 61, 62,
63, 64, 65, 66.



160 Dip Pin Contacts in a Right-Angle PC Board Connector

Series WG: Only 6.4" long. Three rows staggered with contacts centered on .100"; terminations on .125" centers.

Terminations: Receptacles have solder cup, dip pin, or Wire-Wrap*.

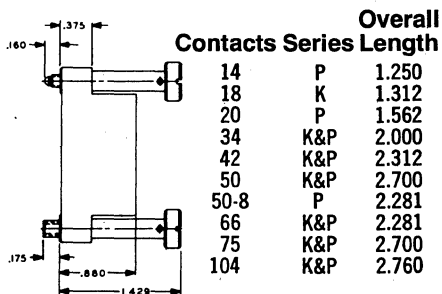


AirBorn Connectors for Inter-equipment Connections— Cable to Panel, Cable to Cable, and Drawer to Cabinet

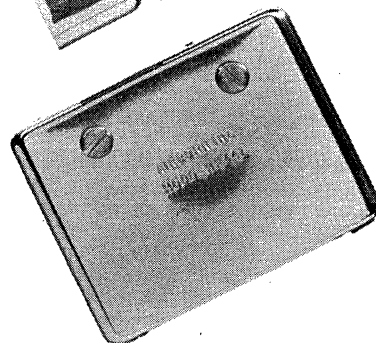
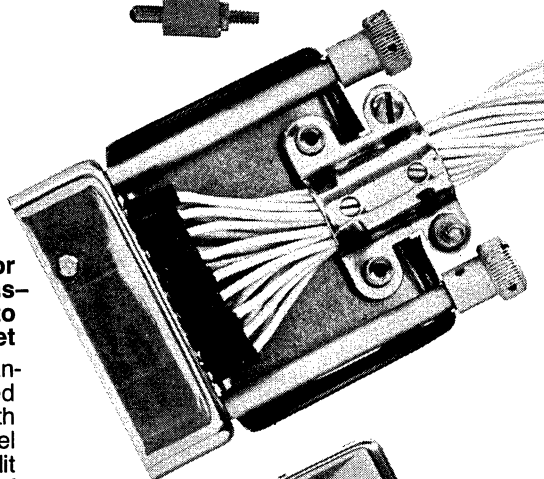
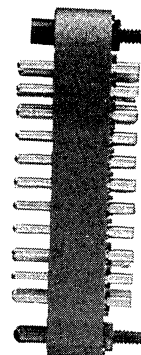
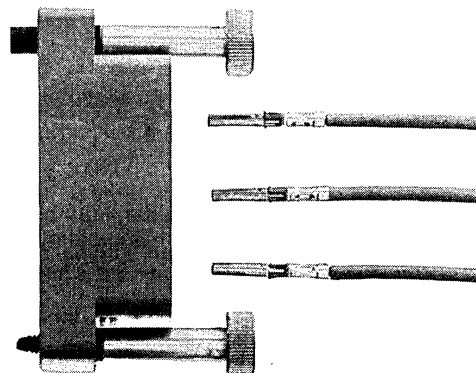
Two series of miniature, rectangular connectors with rugged .0625" dia. contacts. Both available with stainless steel shells, mounting plates, split hoods, and environment-proof features.

Series K, EK: Features crimp, removable contacts with 50 lb. minimum resistance to push-out.

Series P, EP: Features solder-cup contacts retained in molding.



*Registered TM of Gardner-Denver Company.

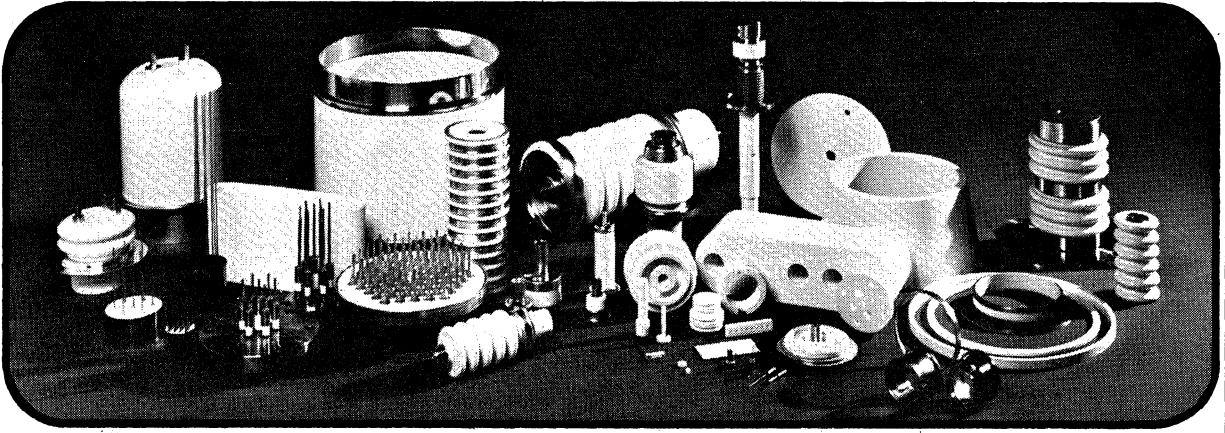


AirBorn, Inc.

4321 AirBorn Drive,
Addison, Texas 75001

ALBEROX ... For outstanding performance in high temperature, hermetic terminals.

We're SPECIALISTS in brazing METAL parts to high alumina CERAMICS for demanding HIGH TEMPERATURE, HERMETIC applications.



Since 1961, we have designed and produced a wide variety of seals for custom applications in diverse components such as ...

VACUUM FEEDTHRU TERMINALS
CERAMIC ELECTRON TUBE AND VACUUM SWITCH ENVELOPES
NUCLEAR REACTOR PENETRATOR FEEDTHRU TERMINALS and INSULATORS
SQUIBB and DETONATOR CONNECTORS
POWER SEMICONDUCTOR HOUSINGS
SPACE FLIGHT HERMETIC CONNECTORS
JET ENGINE THERMOCOUPLE COMPONENTS
HIGH PRESSURE OIL WELL LOGGING FEEDTHRUS
CAPACITORS and TRANSFORMER TERMINALS

In addition to the above, Alberox has designed and produced state-of-the-art components for critical nuclear devices.

The Alberox plant was designed and built specifically for the efficient production of ceramic-to-metal seals. We manufacture our own A-950 high alumina ceramic, which enables us to optimize on the best metalizing process for this ceramic; thus we can provide superior seals. By making our own ceramic, our customers benefit by fast delivery on custom designs.

Another important feature of Alberox is that all of the plating requirements are met "in-house", including nickel, gold, copper, silver, bright tin and solder plating!

We have several types of BRAZING FURNACES for brazing ceramic-to-metal and metal-to-metal parts in HIGH VACUUM, or HYDROGEN, ARGON or any other specified atmosphere! The standard operating procedure is to custom program the brazing cycle, taking into account the ceramic, the types of metals, braze materials and the atmosphere.

Alberox exercises complete control, from the design stage right through all manufacturing operations — to meet or exceed the highest quality standards and maintain the fastest delivery in the industry. Products made by Alberox are assured to outperform all design parameters set for them!

CUSTOM HERMETIC CONNECTORS Multipin hermetic connectors for demanding vacuum and space applications requiring 400°C. bakeout — conditions where glass connectors won't stand up — are being produced in a variety of configurations. To save cost, Alberox can also provide connector sub-assemblies such as pin decks to be brazed or welded into shells or flanges by the customer.

MINIATURE TUBE AND PIN SEALS Many high temperature applications require insulated pin or tube feedthrus. These are available with weldable or brazeable metal parts, and can be added to covers or flanges, etc. All Alberox feedthrus are suitable for cryogenic environments.

HIGH PRESSURE FEEDTHRUS Alberox A-950 Alumina has extraordinarily high compressive strength (350,000 psi). By using this strength to its best advantage, ceramic-to-metal seals can be produced to withstand high static or dynamic pressures. Thousands of these seals have been manufactured by Alberox.

MULTITERMINAL FEEDTHRUS Multiterminal feedthrus differ from multipin connectors in that individual feedthru terminals are brazed or welded into a metal deck or flange. These feedthrus are generally used for higher voltage applications than can be accommodated by a regular ceramic pin deck or connector. Alberox has an extensive line of catalog tubular terminal bushings which are often used for the individual feedthrus. In this way, custom multiterminal feedthrus can be delivered quickly.

POWER FEEDTHRUS Copper, or just about any other type of metal, from 1/8 inch to over 1 inch in diameter can be provided in power feedthrus. Modifications of our standard catalog tubular and fluted terminal bushings are often perfectly suited, and custom ceramic-to-metal seal designs can be easily accommodated. Weldable or brazeable flanges also can be added to the feedthrus to allow easy installation on existing flanges or bulkheads.

INSULATORS AND STANDOFFS Insulators and standoffs can be supplied in tubular or fluted shapes, bare or glazed, with or without metal adapters or studs. Alberox manufactures plain ceramic parts for use as spacers, insulators, supports, isolators, decks, or washers. Metalized and glazed cylinders are also available for envelopes of high power electron tubes such as Thyratrons or for vacuum switches.

CATALOG HIGH VOLTAGE BUSHINGS Alberox stocks the largest variety of high voltage tubular and fluted high alumina terminal bushings in the industry. Modifications to these catalog items are easily made. Typical modifications are: special studs, brazed-in-center conductors, different metal parts, finishes and ceramic dimensional changes. Fast delivery at reasonable prices can still be maintained. Ask for Catalog #472 which illustrates details of these parts.

Alberox is ready to assist you with your ceramic-to-metal seal design requirements. When you need FAST DELIVERY of SUPERB ceramic-to-metal seals, at realistic prices — contact ALBEROX.

ALBEROX CORPORATION

Industrial Park
New Bedford, Massachusetts 02745
Phone 617-995-1725



AMATOM

CONNECTORS, TERMINALS, SOCKETS

ELECTRONIC HARDWARE

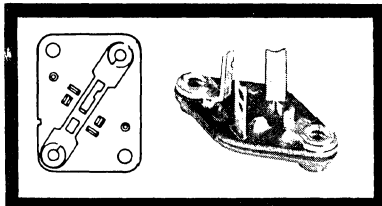
a Division of MITE Corporation
446 Blake Street · New Haven · Conn. 06515

(203) 397-3311
Telex: 96-3419



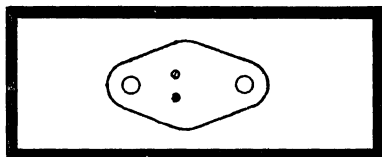
Manufacturer of Standard Hardware for the Electric and Electronic Industries

Largest Stock of "OFF THE SHELF" Items Available Anywhere



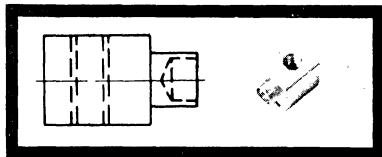
TRANSISTOR SOCKETS

Phenolic or Nylon sockets for TO-3 and TO-66 cases.



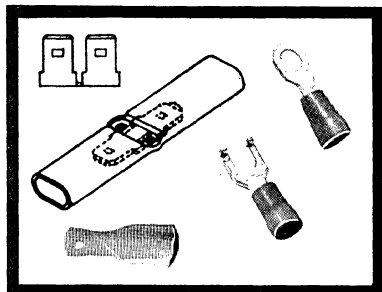
MICA INSULATORS

Precision stamped mica insulators for high electric strength, low dielectric loss, high surface and volume resistivities and excellent thermal stability. It is infusible and non-flammable.



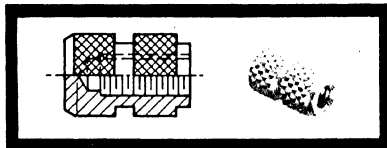
CHASSIS FASTENERS

Available in Brass and Aluminum, 1/4 and 5/16" square. Threads: 4-40 and 6-32. For chassis from 1/32 through 1/4 thick.



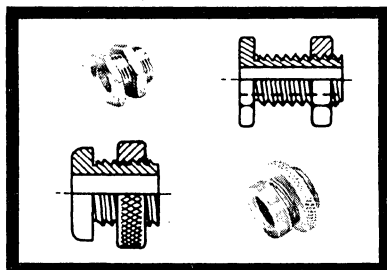
SOLDERLESS TERMINALS

Pre-insulated spade and ring terminals for 22-18 and 16-14 wire sizes in various stud sizes. Fully insulated female quick connect terminals in .250 series for 14-16, 18-20 wire sizes and .187 series for 18-20 wire sizes. All insulation color coded for appropriate wire size. Also—Quick connect stationary male terminals; adaptors and fully insulated line connector.



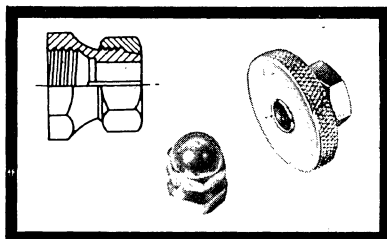
INSERTS

Brass or Stainless Steel inserts designed to provide metal threads in plastic materials. Available as a standard part in two lengths. Also available to your drawing on special order. Threads: 2-56 through 3/8-24. Lengths: .219 through .812.



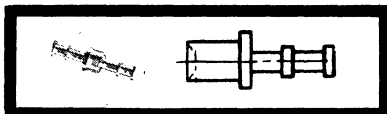
PANEL BUSHINGS

INSULATING
METAL (SCREW TYPE)
METAL (SWAGE TYPE)
POTENTIOMETER



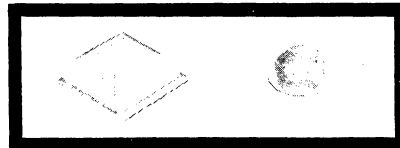
SHAFT LOCKS

HAND TYPE
Cap Nut
Open End
WRENCH TYPE
Cap Nut
Open End



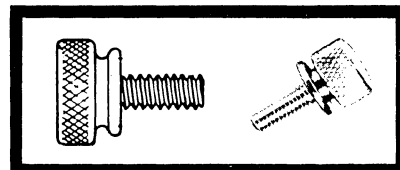
SOLDER TERMINALS

SCREW TYPE
SWAGE TYPE
SINGLE TURRET
DOUBLE TURRET
TRIPLE TURRET
FEED THRU
SINGLE END
DOUBLE END
HOLLOW
FORKED
MILLED



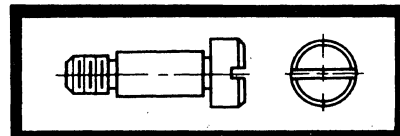
ADHESIVE BACKED POLYURETHANE BUMPERS

No costly screws, rivets or time-consuming mechanical fastener operation. Just "bump-it-on." High tack adhesive grabs immediately. Speeds assembly. Saves on labor costs.



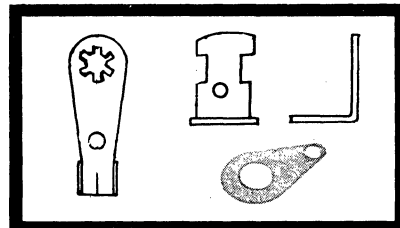
THUMB SCREWS

Available in Brass, Aluminum, Stainless Steel. Head diameters: 3/8 through 1/2. Threads: 6-32 through 1/4-20.



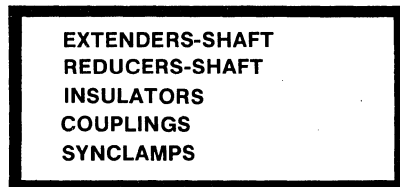
PRECISION SHOULDER SCREWS

Available in Brass, Aluminum, Stainless Steel. Barrel diameters: 1/8 through 1/4. Barrel lengths: 1/8 through 1-1/2. Threads: 4-40, 8-32, 10-32.



SOLDER LUGS

Wide variety of lugs, terminals, wire clips, brackets, jumpers etc.



EXTENDERS-SHAFT
REDUCERS-SHAFT
INSULATORS
COUPLINGS
SYNCLAMPS

Full Line Catalog Available on Request



ALLIED SYSTEMS

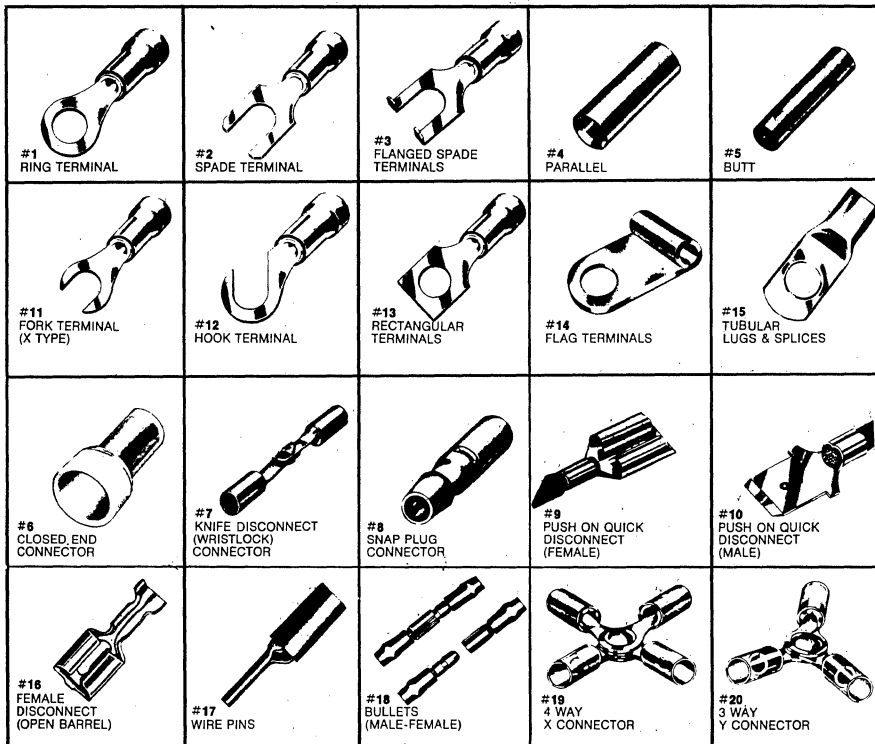
CORPORATION

P. O. Box 11005 / Greensboro, North Carolina 27409

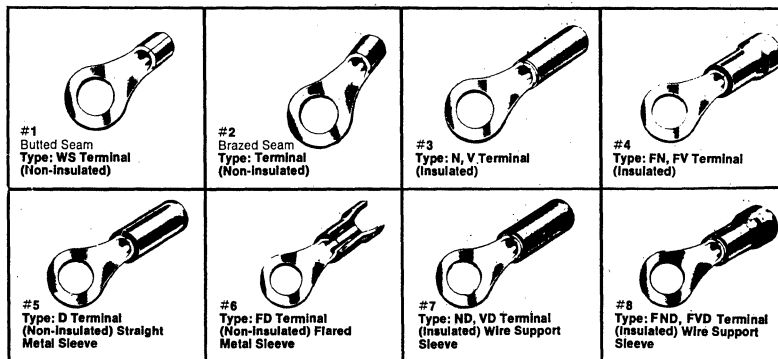
INDUSTRIAL PRODUCTS

Solderless Terminals & Connectors

Body Styles



Barrel Types



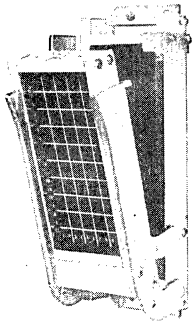
BARREL TYPE #	PREFIX	EXPLANATION OF TYPES
(1)	WS	NON-INSULATED BUTTED SEAM
(2)	NONE	NON-INSULATED BRAZED SEAM
(3)	V OR N	INSULATED, STRAIGHT PLASTIC
(4)	FV OR FN	INSULATED, FLARED PLASTIC
(5)	D	NON-INSULATED WITH STRAIGHT COPPER SLEEVE (INSULATION GRIP)
(6)	FD	NON-INSULATED WITH FLARED COPPER SLEEVE

BARREL TYPE #	PREFIX	EXPLANATION OF TYPES
(7)	VD	INSULATED WITH STRAIGHT PLASTIC OVER COPPER SLEEVE (INSULATION GRIP)
(8)	FVD	INSULATED WITH FLARED PLASTIC OVER COPPER SLEEVE (INSULATION GRIP)
(9)	NONE	SEAMLESS — NON-INSULATED
(10)		TYPE (3) WITH SEAMLESS INSERT
(11)		TYPE (4) WITH SEAMLESS INSERT

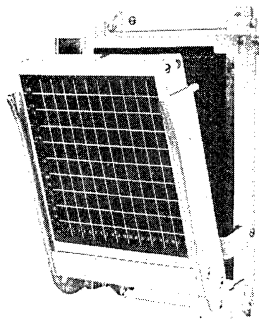


ALLIED SYSTEMS CORPORATION

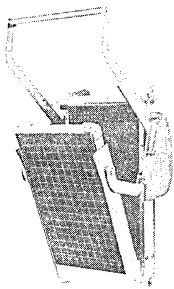
Patchboard Programming Systems



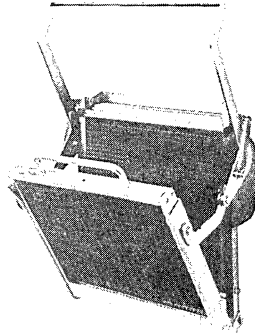
MODEL 902 200 POSITIONS



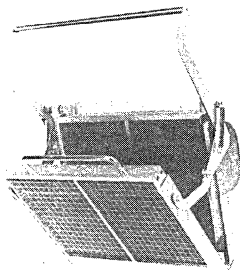
MODEL 904 440 POSITIONS



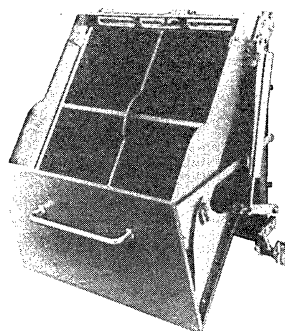
MODEL 901 680 POSITIONS



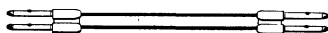
MODEL 922 1280 POSITIONS



MODEL 921 1600 POSITIONS



MODEL 910 5120 POSITIONS



Allied Systems now offers two complete lines of patchcord programming systems, with more than twenty-one sizes available. Allied also supplies associated patch cords and hardware for both lines.

Catalog 567 covers IBM style systems which normally have a contact spacing of .250 X .281 or .281 X .281. These systems use larger taper pins for rear panel wiring.

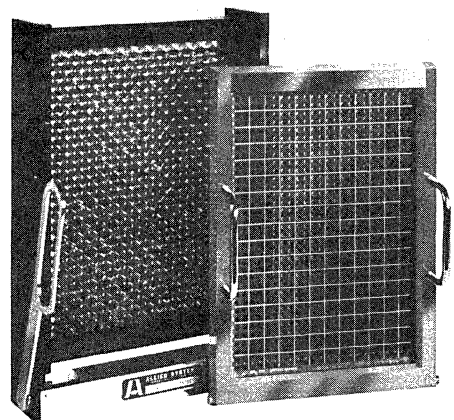
Catalog 667 covers hook type systems which have a contact spacing of .250 X .250. These systems are available for taper pin, wire wrap or locking latch type rear panel wiring.

Patch cords are available in a variety of types: single conductor, coax, two conductor shielded, etc., to fit any programming requirement.

Thirteen sizes of *fixed* programming systems are available in both types of systems, ranging in size from 200 to 3264 contacts.

The extremely competitive pricing of the Allied Systems lines, plus the unexcelled quality of their products, gives you, the user, a competitive edge in the design and pricing of your system.

Call your nearest Allied Rep. or Home Office for application help in using Allied Systems patch panels and programming systems, or for prices.



MODEL 816

4 Tri-Port Circle Phone (919) 299-2294 P. O. Box 11005 Greensboro, N. C. 27409

EEM INDEX



AMPHENOL

THE LEADING NAME IN CONNECTORS, POTENTIOMETERS, SWITCHES, CONTROLS, AND INTERCONNECTION SYSTEMS

Series	Description	Page
--------	-------------	------

AMPHENOL SALES DIVISION — VOL. 2

—	Division Addresses	2•462
—	Distributor Listing	2•463

RF COAXIAL CONNECTORS — VOL. 2

—	Military to Amphenol Cross Reference	2•568
ALC-5	Sub-Mini Coax Connector	2•573
Subminax	Subminax® Connectors	2•575
SMA	Sub-Miniature Semi-Precision Connectors	2•577
MB	Bayonet Lock Connectors for Subminiature and Miniature Cables	2•581
BNC	Isolated BNC Connectors	2•583
BNC	31 Series Connectors	2•585
TNC	31 Series Connectors	2•590
MHV	Bayonet Lock, Small, High Voltage Connectors	2•594
UHF	83 Series Connectors	2•595
N	Series N MIL-Crimp, MIL Clamp Connectors	2•598
HN	Threaded Coupling, Medium Size, High Voltage Connectors	2•603
SC & C	SC and C Connectors	2•605
Twin	Twin Contact Connectors	2•608
Triax	Threaded Coupling Connectors for Triaxial Cables	2•610
LC	Large High Voltage Connectors	2•611
—	Between Series Adapters	2•612
227	Crimp Tools	2•614
—	Coax Connector Selection and Assembly Guide	2•615
—	Custom Cable Assembly Capability	2•618

RF COAXIAL SWITCHES — VOL. 1

303	High Isolation, Miniature and Standard Switches	1•1928
315-325	Coaxial Relays	1•1930
360	Dynaform® Switches	1•1931

MICROPHONE CONNECTORS, TUBE SOCKETS, HARDWARE, PLUGS, CONNECTORS — VOL. 2

—	General Information	2•504
3	Caps	2•521
5	Tube Shields 7 and 9 Pin	2•566
49	Steatite Magnal Sockets	2•510
50	Relay and Tube Bases	2•513
59	Rectangular Solder Eyelet and PC Contact Relay Sockets	2•511, 516, 517, 519

Series	Description	Page
--------	-------------	------

MICROPHONE CONNECTORS, TUBE SOCKETS, HARDWARE, PLUGS, CONNECTORS — (Cont'd)

60	110/220 Volt Plugs and Receptacles - 3 Prong	2•533
61	110/220 Volt Plugs and Receptacles - 2 Prong	2•533
71	Miniature Speaker Plug	2•515
75	Single Contact Miniature Connector	2•528
77	MIP Solder	2•506
77	MIP, PC, Wire	2•507
78	"S" Type, Mounting Plate Type Connectors	2•508
78	Miniature Speaker Receptacles, Standard PC and Wire Wrap	2•509
78	Miniature Tube Socket	2•514
78	Socket/Cable Connectors	2•520
80	Single and Double Connectors	2•529
86	Plugs CP Type Replacement	2•512
86	Miniature 7 and 9 Pin Plugs	2•516
86	Rubber Grommets Cable Clamps	2•517
88	Compact MIP Sockets	2•512
91	Excelite® QWIK Thread Coupling Connectors	2•524
91	Cable Receptacles	2•520
98	Lamp Sockets	2•523
146	Relay/Industrial Tube Sockets	2•518
146	Heavy Duty Side Mount Sockets	2•523
147	Miniature Standard Bottom, Shield Base Top Mount Sockets	2•516
160	110/220 Volt Plugs and Receptacles	2•532
350	Tip Jacks	2•522

RACK AND PANEL CONNECTORS — VOL. 2

17	Min Rac® Connectors	2•556
26	Blue Ribbon™ Connectors	2•561
32	Commercial Electronic Connectors	2•554
57	Micro-Ribbon® Connectors	2•560
115	Blade and Spring Contact Connectors	2•564
126	Rectangular and Hex Miniature Connectors	2•563
220	Micro-Rac® Connectors	2•552
221	Strip Connectors	2•552
222	Mighty-Mite® Connectors	2•553
223	Tiny Tim® Modular Connectors	2•553
223	Hermaphroditic Connectors	2•555
356-357	Crimping, Insertion Tool for 17, 220 Series	2•558
359	Crimping Machines (Automatic and Semi-Automatic)	2•559

AMPHENOL SALES DIVISION • 2875 S. 25th AVENUE • BROADVIEW, ILLINOIS 60153
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

EEM INDEX



AMPHENOL

Series	Description	Page
--------	-------------	------

PRINTED CIRCUIT CONNECTORS — VOL. 2

64	Micro-Edge® Edge Board Receptacles	2•543
127	High Density Connectors	2•547
133	Printed Circuit Board Adapters	2•548
143	Printed Circuit Receptacles	2•550
225	Commercial Connectors	2•534
225	Military Connectors (MIL-C-21097C/21)	2•542
261	Low-Cost Edge Board Connectors	2•544

POWER CONNECTORS — VOL. 2

44	Environment Resistant Transportation Connectors	2•492
48	Miniature Environment Resistant Connectors	2•478
67	MinniE® Environment Resistant Connectors	2•487
89	Submersion Proof Connectors	2•497
97	Standard Circular Connectors	2•468
115	Subminiature Connectors	2•491
118	Merlin I® MIL-C-26482 and MIL-C-83723	2•475
165	Miniature MS-Type Connectors	2•489
217	Rack and Panel Connectors	2•498
229	Power Distribution Connectors	2•494
246	Standard Circular Connectors	2•474
348	Astro/348® High Density Subminiature Connectors	2•482
—	Poke-Home Contacts and Tool Applications	2•500

INTERCONNECTION SYSTEMS — VOL. 2 2•465**SEMI-AUTOMATIC WIRE WRAPPING — VOL. 2** 2•464**INTEGRATED CIRCUIT COMPONENTS — VOL. 2**

821	Dual-In-Line Production Sockets	2•565
831	T.O. Can Production Sockets	2•566
851	Planar Plug-In Connectors	2•566

POTENTIOMETERS, TRIMMERS, DIALS — VOL. 2

—	Microdial® Counting Dials	2•1122
—	Micropot® Wirewound Trimming Potentiometers	2•1592
—	Micropot® Infinite Resolution Trimming Potentiometers (Film-Met)	2•1596

Series	Description	Page
--------	-------------	------

POTENTIOMETERS, TRIMMERS, DIALS — VOL. 2 (Cont'd)

—	Micropot® Infinite Resolution Trimming Potentiometers (Special Options)	2•1597
—	Micropot® Precision Single Turn Potentiometers	2•1598
—	Micropot® Precision 3 and 10 Turn Potentiometers	2•1600
—	Scot Pot® 10 Turn Compact Potentiometer	2•1601
205	Precision Potentiometers	2•1602
900	Precision Potentiometers	2•1603
2305	Trimming Potentiometers	2•1606
2850	Trimming Potentiometers	2•1608
2851	Trimming Potentiometers	2•1609
2855	Trimming Potentiometers	2•1604
2901	Trimming Potentiometers	2•1607
2905	Trimming Potentiometers	2•1605
3810	Wirewound Trimming Potentiometers	2•1595
6034	Cermet Trimming Potentiometers	2•1594

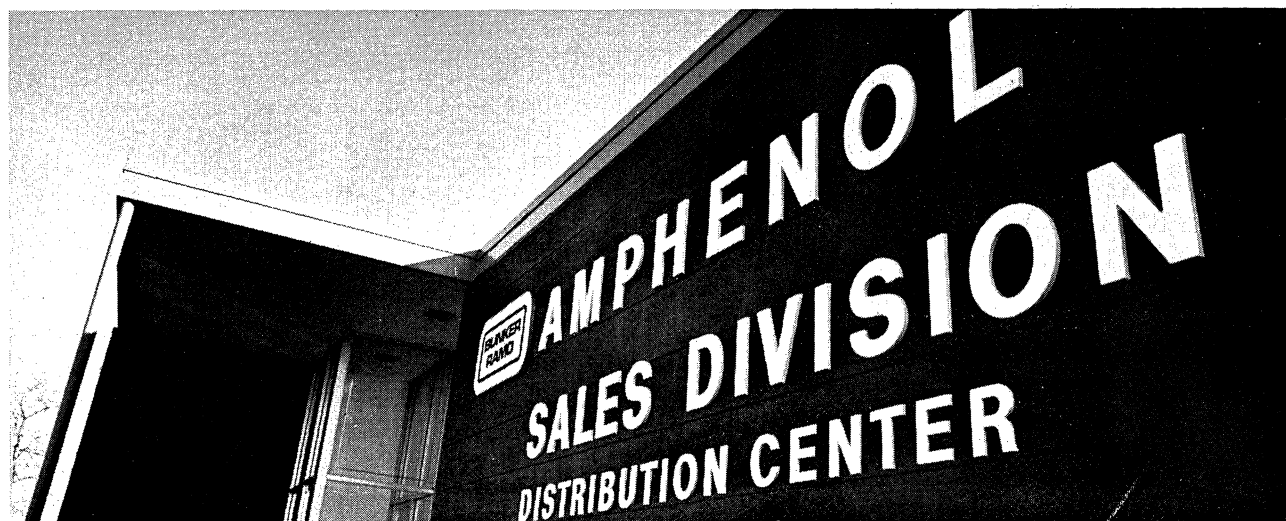
PRESSURE SWITCHES — VOL. 2 2•1599**PRESSURE TRANSDUCERS — VOL. 1** 1•2334**SPECIAL PURPOSE CONNECTORS, UMBILICAL STAGING, NUCLEAR PENETRATION ASSEMBLIES — VOL. 2** 2•467**FANS — VOL. 1**

—	Fan Selection Guide	1•472
390	Power Axial Fans	1•477
390	"Gusto" Power Axial Fans	1•478
390	"Brute" Power Axial Fans	1•479
390	"Demi-Brute" Power Axial Fans	1•480
390	"Bare Bones Brute" Power Axial Fans	1•481
390	"Bare Bones Demi-Brute" Power Axial Fans	1•482
390	"Mini-Brute" Power Axial Fans	1•483
390	"Bare Bones Mini-Brute" Power Axial Fans	1•484
760	Power Axial Fans — Model 126	1•473
760	Tube Axial Fans	1•474
—	Axial Fan Accessories, C/R, Index	1•485

POWER SUPPLIES — VOL. 1 1•1106

AMPHENOL SALES DIVISION • 2875 S. 25th AVENUE • BROADVIEW, ILLINOIS 60153
 FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

AMPHENOL DOES IT BETTER!



Amphenol Sales Division maintains a unique Distribution Center
THE BIGGEST ELECTRONIC COMPONENT PARTS STORE IN THE WORLD
Gets our products to our customers the fastest way possible.

These are our manufacturing divisions and the products they produce to stock the store.

CONNECTOR DIVISION

2801 South 25th Avenue, Broadview, Illinois 60153

Standard Cylindrical MIL-C-5015 type connectors
Miniature Cylindrical Environmental Resistant
connectors, Mil-C-83723/Mil-C-26482
High Reliability Environmental Miniature
Cylindrical connectors
Miniature MS type connectors
High Density Environmental connectors, Mil-C-81511
Environmental Rack & Panel connectors, Mil-C-26518
High Environmental Cable assemblies

CONTROLS OPERATION

120 South Main Street, Janesville, Wisconsin 53545

Precision Potentiometers
Turns Counting Dials
Trimmers

R F Division

33 East Franklin Street, Danbury, Connecticut 06810

Coaxial Connectors
Standard U.G. connectors
Miniature R F connectors
Mil-C-39012 connectors
Coaxial Switches

INDUSTRIAL DIVISION

1830 South 54th Avenue, Cicero, Illinois 60650

Plugs & Sockets
P.C. Connectors
I.C. Sockets
Sub miniature connectors
Microphone connectors
Telephone Bridging adapters
Rack & Panel connectors
AC Power Plugs
Relay Sockets

CADRE DIVISION

20 Valley Street, Endicott, New York 13760

Industrial Cable assemblies

AMPHENOL SALES DIVISION

2875 South 25th Avenue
Broadview, Illinois 60153

DIVISIONS OF BUNKER RAMO CORPORATION

Our Sales Offices are listed in this volume, and Amphenol Products are sold by franchised distributors from coast to coast. For catalogs and product literature, contact Amphenol Sales Division — 2875 South 25th Avenue, Broadview, Illinois 60153 PH: (312) 345-4260 TWX: 910-266-1961 or the proper division for information on particular products.



AMPHENOL

FAST DELIVERY ON QUALITY AMPHENOL PRODUCTS FROM OUR DISTRIBUTORS LISTED BELOW

State	City	Distributor	Phone Number
AZ	Phoenix	Liberty	(602) 257-1272
AZ	Phoenix	Moltronics	(602) 272-7951
CA	Sunnyvale	Bell Industries	(408) 734-8570
CA	Irvine	Cramer/LA	(213) 771-8300
CA	Mountain View	Elmar Electronics	(415) 961-3611
CA	Los Angeles	Kierulff Electronics	(213) 685-5511
CA	San Diego	Kierulff Electronics	(714) 278-2112
CA	El Segundo	Liberty Electronics	(213) 322-8100
CA	San Diego	Liberty Electronics	(714) 565-9171
CA	San Diego	Moltronics	(714) 278-5020
CA	South Gate	Moltronics	(213) 773-6521
CA	San Carlos	Sterling Electronics	(415) 592-2353
CO	Denver	Newark-Denver Elec. Supply	(303) 757-3351
CT	New Haven	Connector Corp. of America	(203) 624-0127
CT	Hamden	Wilshire Electronics	(203) 281-1166
DC	Baltimore	Arrow Electronics	(301) 247-5200
DC	Gaithersburg	Cramer/EW, Inc.	(301) 948-0110
DC	Gaithersburg	Pioneer Electronics	(301) 948-0710
FL	Hollywood	Cramer/EW, Inc.	(305) 923-8181
FL	Orlando	Cramer/EW, Inc.	(305) 894-1511
IL	Elgin	Allied Electronics	(312) 421-2400
IL	Skokie	Bell Industries	(312) 965-7500
IL	Peoria	Klaus Radio, Inc.	(309) 691-4840
IL	Chicago	Newark Electronics Corp.	(312) 638-4411
IL	Palatine	Ohm/Electronics, Inc.	(312) 359-5500
IN	Indianapolis	Graham Electronics Supply	(317) 634-8202
IN	South Bend	Radio Distributing Co., Inc.	(219) 287-2911
KA	Wichita	Interstate Electronic Supply	(316) 264-6317
MD	—(See District of Columbia)—		
MA	Newton Centre	Cramer Electronics, Inc.	(617) 969-7700
MA	N. Wilbraham	Industrial Components Corp.	(413) 596-3854
MA	Waltham	Schweber Electronics	(617) 890-8484
MA	Burlington	Wilshire Electronics	(617) 272-8200
MI	Wyoming	Newark Industrial Elecs.	(616) 241-6681
MI	Detroit	R.S. Electronics	(313) 491-1000
MI	Ann Arbor	Wedemeyer Electronic Sply.	(313) 665-8611
MN	Edina	Cramer/Bonn Co.	(612) 835-7811

State	City	Distributor	Phone Number
MN	Minneapolis	Newark-Minneapolis Elec. Corp.	(612) 331-6350
MO	University City	Olive Industrial Elec. Inc.	(314) 863-7800
MO	Kansas City	Walter Radio Supply, Inc.	(816) 531-7015
NJ	—(See New York City/Philadelphia Area)—		
NY	East Syracuse	Cramer/Eastern	(315) 437-6671
NY	Farmingdale	DRW Electronic Corp.	(516) 249-2660
NY	Binghamton	Federal Electronics, Inc.	(607) 748-8211
NY	Buffalo	Genesee Radio Parts Co., Inc.	(716) 873-9661
NY	Plainview	Progress Electronics Co.	(516) 433-1700
NY	Somerset, NJ	Schweber Electronics	(201) 469-6008
NY	Westbury	Schweber Electronics	(516) 334-7474
NY	Rochester	Simcona Electronics Corp.	(716) 328-3230
NY	Buffalo	Summit Distributors	(716) 884-3450
NY	Clifton, NJ	Wilshire Electronics/NJ	(201) 365-2600
NC	Winston-Salem	Cramer/EW	(919) 725-8711
OH	Cleveland	Pioneer/Cleveland Div. of Pioneer Std. Electronics, Inc.	(216) 587-3600
OH	Dayton	Pioneer/Dayton Div. of Pioneer Std. Electronics, Inc.	(513) 236-9900
OH	Cincinnati	Schuster Electric Co.	(513) 984-1600
OH	Beachwood	Schweber Electronics	(216) 464-2970
PA	Philadelphia	Almo Electronics Corp.	(215) 698-4000
PA	Pittsburgh	Cameradio Co.	(412) 288-2600
PA	Montgomeryville	Pyttronic Industries, Inc.	(215) 643-2850
PA	Pennsauken, NJ	Radio Electric Service Co.	(215) 925-6900
TN	Nashville	Electra Distributing Co.	(615) 329-3971
TX	Dallas	Hamilton/Avnet Electronics	(214) 661-8661
TX	Houston	Hamilton/Avnet Electronics	(713) 526-4661
TX	Dallas	Sterling Electronics	(214) 357-9131
TX	Houston	Sterling Electronics	(713) 627-9800
TX	Dallas	Texas Instrument Supply Co.	(214) 238-6821
UT	Salt Lake City	W. H. Bintz Co.	(801) 363-5821
WA	Bellevue	Bell Industries	(206) 747-1515
WA	Seattle	Liberty Electronics	(206) 763-8200
WI	Milwaukee	Electronic Expeditors, Inc.	(414) 228-8100

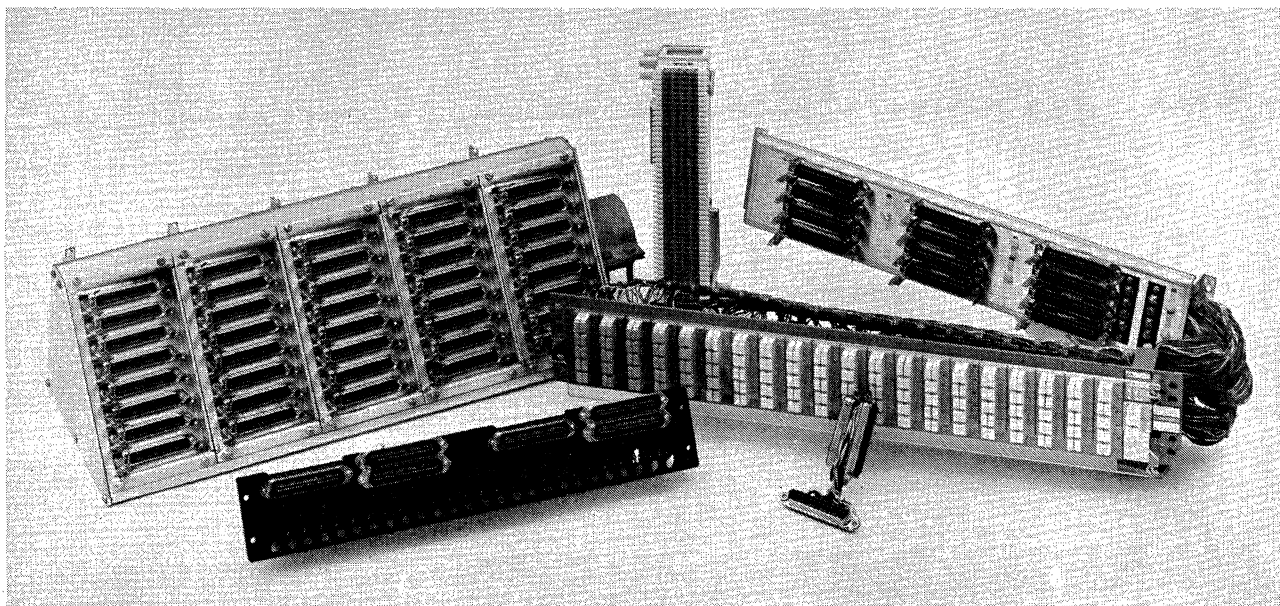
BUNKER RAMO **AMPHENOL**

Amphenol Sales Division
2875 South 25th Avenue, Broadview, Illinois 60153
PH: (312) 345-4260 TWX: 910-266-1961

TELEPHONE SPECIAL PRODUCTS

BUNKER
RAMO

AMPHENOL



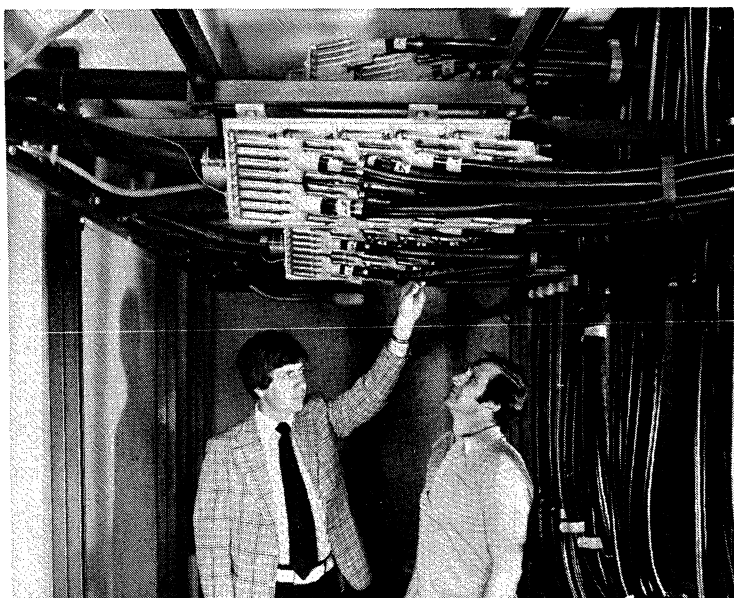
Program board developed and manufactured by Sealectro Corporation, Inc., Mamaroneck, N.Y.

No matter what your interconnection requirements, Amphenol Cadre has the facilities and the technology available to help you meet your needs. For example, the Sealectro Corporation program panel shown above was custom-wired and connectorized by Cadre to meet the needs of one telephone company. The other field-proved components were either developed by Cadre and telephone company engineers, or they were Cadre-customized to meet specific installation requirements. Each

is a custom solution to an interconnection problem as unique as your own. And each is economical and efficient.

If you represent a telephone operating or interconnecting company, or a telephone equipment manufacturer, call Cadre's technology to work for you. From a single component to an entire system, Cadre has the total capability to help you. Amphenol Cadre Division, Endicott, New York 13760. (607) 754-4444.

Rochester Telephone installation with Delta Splice Chambers mounted overhead. 25-pair ribbon connectors in triangular chamber mate with pre-terminated cables to replace time-consuming random splicing. Result: less congestion, quick connect-disconnect capability and substantial reductions in labor costs.



FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

SEMI-AUTOMATIC WIRE-WRAPPING; AUTOMATIC TEST

BUNKER
RAMO

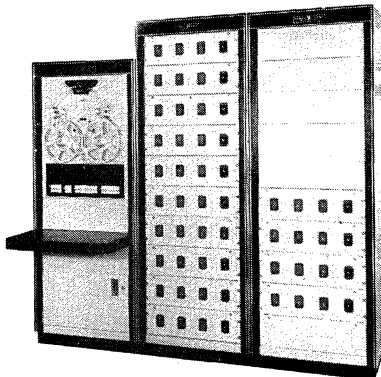
AMPHENOL



We can handle your complete back-panel wire-wrapping including all inventories right up to and including final inspection. You just have to bolt it in. And you can be sure of a completely tested, 100%-error-free back panel.

All your back panels can be tested with an Omnitester 900 Wiring Analyzer. This unit, pictured here in the center, has forward scan capabilities to determine, for example, whether a missing wire went to some other point. It then identifies that point.

The unit further tests for continuity resistance, insulation resistance, DC hipot,



and features programmable dwell time.

All this at a price less than in-house fabrication. No costly inventories, no capital tied to costly equipment. You can furnish the back panels or we can supply our own.

Delivery? Just 2 to 8 weeks, depending on the job and material availability. And we have two locations: Longmont, Colorado or Endicott, New York. For more details just call your nearest Amphenol sales office or write us direct. Amphenol Cadre Division, Bunker Ramo Corporation, 20 Valley St., Endicott, N. Y. 13760.

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

INTERCONNECTION SYSTEMS

BUNKER
RAMO

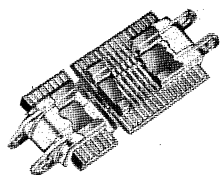
AMPHENOL

Running Cables and Wired Products

Wired running cable assemblies offer the telephone industry the answer to one of its biggest operating questions: how to save time, effort, and money. Amphenol Cadre Division's wired running cables for key set installations are factory-wired.

With the plug-ended concept, the installer merely mates the Amphenol Micro-Ribbon® connectors (or plugs) on either end of the cable with another running cable key set, bridging adaptor or additional system component connectors. It takes seconds, is elementary, and is low in cost.

The Micro-Ribbon Connector



More than 100 million Micro-Ribbon Amphenol 57 Series Connectors are in use today, without a single reported failure.

Unlike pin-and-socket connectors, the Micro-Ribbon contacts are self-cleaning; all foreign matter is dislodged during insertion. Greater contact continuity is assured. And the ribbon type is less expensive, too, with off-the-shelf availability.

The Cable

Amphenol Cadre running cable is constructed of solid, annealed, bare copper wire insulated with high-density, heat-stabilized, color-coded, semi-rigid polyvinyl chloride. To minimize crosstalk, individual conductors are twisted in color-coded pairs. Outer jacket consists of polyvinyl chloride or equivalent material, resistant to moisture, weathering, abrasion, corrosion, heat, and environmental cracking. A nylon ripcord inserted between jacket and conductors allows free stripping of jacket without damage to conductors.

Electrical Characteristics

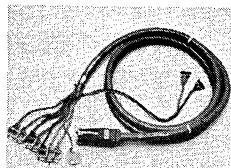
Conductor Size	24 AWG.
Maximum Conductor resistance at 68F (ohms/M ft.)	27.5
Average Mutual capacitance at 1 kHz (mf/M ft.)	0.17
Minimum Insulation resistance (megohms/M ft.)	100

25-Pair Running Cable Description — Also Typical of 50, 75 & 100 Pair Running Cable

Type No.	One End	Overall Cable Assembly Length (feet)	Other End	Type No.	One End	Overall Cable Assembly Length (feet)	Other End	Type No.	One End	Overall Cable Assembly Length (feet)	Other End
AC-A25B-SE-3	Connector	3.5	Raw-ended	AC-A25D-DE-15	Plug	15	Plug	AC-A25D-SE-75	Raw-ended	75	Plug
AC-A25B-DE-3	Connector	3.5	Connector	AC-B25A-DE-15	Connector	15	Plug	AC-A25B-SE-100	Connector	100	Raw-ended
AC-A25D-DE-3	Plug	3.5	Plug	AC-A25D-SE-15	Raw-ended	15	Plug	AC-A25B-DE-100	Connector	100	Connector
AC-B25A-DE-3	Connector	3.5	Plug	AC-A25B-DE-25	Connector	25	Raw-ended	AC-A25D-DE-100	Plug	100	Plug
AC-A25D-SE-3	Raw-ended	3.5	Plug	AC-A25B-DE-25	Connector	25	Connector	AC-B25A-DE-100	Connector	100	Plug
AC-A25B-SE-5	Connector	5	Raw-ended	AC-A25D-DE-25	Plug	25	Plug	AC-A25B-SE-100	Raw-ended	100	Plug
AC-A25B-DE-5	Connector	5	Connector	AC-B25A-DE-25	Connector	25	Plug	AC-A25B-SE-150	Connector	150	Raw-ended
AC-A25D-DE-5	Plug	5	Plug	AC-A25D-SE-25	Raw-ended	25	Plug	AC-A25B-DE-150	Connector	150	Connector
AC-B25A-DE-5	Connector	5	Plug	AC-A25B-SE-50	Connector	50	Raw-ended	AC-A25D-DE-150	Plug	150	Plug
AC-A25D-SE-5	Raw-ended	5	Plug	AC-A25B-DE-50	Connector	50	Connector	AC-B25A-DE-150	Connector	150	Plug
AC-A25B-SE-10	Connector	10	Raw-ended	AC-A25D-DE-50	Plug	50	Plug	AC-A25D-SE-150	Raw-ended	150	Plug
AC-A25B-DE-10	Connector	10	Connector	AC-B25A-DE-50	Connector	50	Plug	AC-A25B-SE-200	Connector	200	Raw-ended
AC-A25D-DE-10	Plug	10	Plug	AC-A25D-SE-50	Raw-ended	50	Plug	AC-A25B-DE-200	Connector	200	Connector
AC-B25A-DE-10	Connector	10	Plug	AC-A25B-SE-75	Connector	75	Raw-ended	AC-A25D-DE-200	Plug	200	Plug
AC-A25D-SE-10	Raw-ended	10	Plug	AC-A25B-DE-75	Connector	75	Connector	AC-B25A-DE-200	Connector	200	Plug
AC-A25B-SE-15	Connector	15	Raw-ended	AC-A25D-DE-75	Plug	75	Plug	AC-A25D-SE-200	Raw-ended	200	Plug
AC-A25B-DE-15	Connector	15	Connector	AC-B25A-DE-75	Connector	75	Plug				

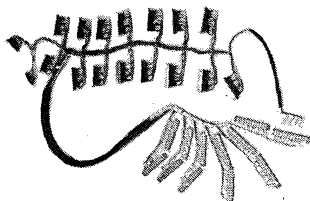
NOTE: The connector referred to in the table is Amphenol Part No. 57-10500-7, the plug is Amphenol Part No. 57-20500-14

Multi-Conductor Cables



Amphenol Cadre specializes in multi-conductor cables and is expert in every phase of production. Each cable must meet rigidly controlled quality standards at every stage of production. Just before shipment, each cable is again completely tested on custom-modified automatic inspection equipment.

Harness Assembly



Amphenol Cadre has years of experience in harness manufacturing. One result has been a large accumulation of harness know-how. Many customers come to Amphenol Cadre for redesign of point-to-point wiring in engineering prototypes; others for high volume production of complex harness systems.

When advanced programs require optimum-reliability intra-unit connections, many defense contractors turn to Amphenol Cadre for high environmental harness systems.

Electromechanical Assemblies

Amphenol Cadre can help keep you on schedule and your costs in line. Temporary plant overloads not only delay shipments but also tie up valuable time and material in process. Extended overtime and decreased efficiency rapidly begin to cut into profits. One way to avoid these problems and stay on schedule is by subcontracting the over-capacity production.

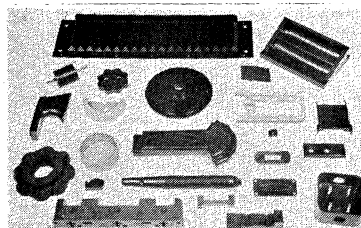
Amphenol Cadre's reaction time is such that we can quickly absorb short-term plant overloads usually at a price less than in-house cost.

Working closely with a customer's engineering laboratory, our production design people can competently turn engineering models into practical production realities.

Our design recommendations on chassis and printed circuit board layout, harness and cable configurations, molded plastic alternates for costly hardware, and connector and termination approaches have saved many manufacturers expensive trial and error prototype production and redesign.

Custom Molding

POLYSTYRENE • POLYPROPYLENE • POLYCARBONATES • ACETALS • POLY-VINYL-CHLORIDE • POLYETHELENE • NYLONS • ACRILONITRILE-BUTADIENE-STYRENE • Others



DECAPSULATION SERVICES



AMPHENOL

The ACCESS™ Process for Safe, Selective Decapsulation

What is the ACCESS™ Process?

A service of Amphenol Cadre Division to selectively decapsulate or de-pot components such as molded cable assemblies, connectors, electronic modules, printed circuit boards.

Why Should the ACCESS Process be Used?

It saves money — typically 50% of new equipment cost — by salvaging potted components now being scrapped or expensively reworked.

When Should the ACCESS Process be Used?

When existing equipment needs modification, repair, or reworking to give it new life and usefulness.

What Kinds of Equipment Does the ACCESS Process Work On?

The ACCESS process effects economical recovery, repair, and re-use of encapsulated components for aircraft, aerospace interconnection systems, oceanographic equipment, automatic equipment, and sealed assemblies used in communications, data processing, medical electronics, and marine retrofit programs.

Who Performs the ACCESS Process?

Amphenol Cadre Division can conduct decapsulation in their Endicott, N.Y. or Longmont, Colorado facilities.

Will ACCESS Affect Reuse?

There is absolutely no residue left from the process that will affect remaining elements such as insulated wire, metal parts, connector parts, or plating.

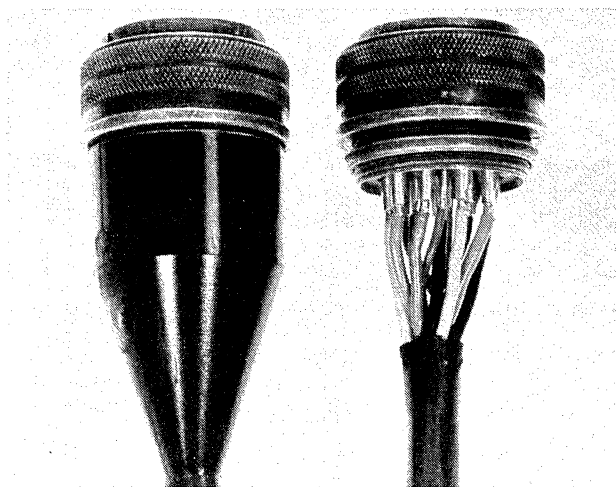
Will the ACCESS Process Remove Any Kind of Potting or Sealant?

The ACCESS process will selectively remove polyurethanes, polysulfides, silicone rubbers, butyl compounds, epoxies, foams, and room temperature vulcanizers, without damaging components.

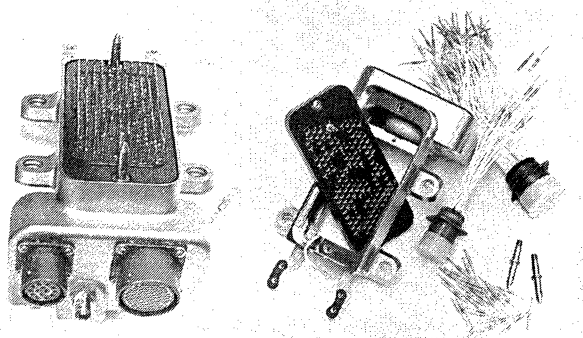
Where has the ACCESS Process been Used?

Here are some of the assemblies that Cadre and the ACCESS process have brought back to life.

In addition, Cadre has successfully used the ACCESS process on electrical penetration assemblies, miniaturized computers, missile filters, electronic sensors, relay racks, and many others.



This cable harness termination, potted in polyurethane, was decapsulated using the ACCESS process, with no damage to insulation, jacketing, inserts, metal parts or plating. In and out of Cadre's plant in 5 days, this connector's refurbishment saved its owner 60% of total replacement cost.



Here's a launcher umbilical assembly, potted with epoxy compound and filled with polyurethane. After the ACCESS process: a total recovery of components, and a saving of 40% of new component cost.

FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

STANDARD CIRCULAR CONNECTORS

BUNKER
RAMO

AMPHENOL

97 SERIES CONNECTORS

- PROVEN
- LOW COST
- RELIABLE

ONLY AMPHENOL GIVES YOU ...

FASTER, EASIER TERMINATIONS

Amphenol 97 Series connector contacts do not rotate within the insert. They're factory-aligned to uniformly position the solder cups for easy soldering. Why waste valuable assembly time positioning contacts? — Amphenol's exclusive non-rotating contact design simplifies soldering and lowers termination costs.

DEPENDABLE, LONG-LASTING TERMINATIONS

- Our blue diallyl-phthalate inserts provide high insulating resistance and dimensional stability in the presence of both high humidity and high temperature ... performance

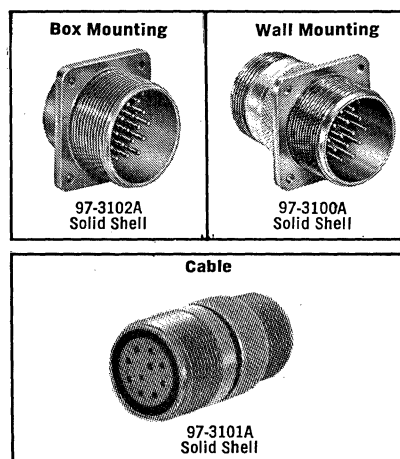
unmatched by melamine or neoprene materials.

- Only Amphenol 97 Series inserts feature molded barriers between each contact. The barriers increase the surface distance between contacts, thus increasing the insert's voltage rating.
- For added strength, Amphenol pin inserts in sizes 20 and larger have additional dielectric thickness.
- Amphenol coupling rings are machined from solid bar stock. This exclusive feature provides extra strength.

PLUGS



RECEPTACLES



A cure for the connector part number problem.

1

How many wires are you going to connect? What gauge?

These two questions are important, because they indicate which insert you need. There are literally hundreds to choose from.

The insert chart illustrates the 203 inserts with 43 inserts most often used are bracketed. Chances are the one you need is there.

Here's an example of how to use the chart. Say you want to connect eight 16-ga. wires. Just find the section of the chart marked 8 contacts. Insert number 20-7 is the one you want because it contains eight 16-ga. contacts

and is one of the most often used. The one you choose might depend on your space or voltage requirements. The voltage capacity of each insert is listed under its diagram.

If you have more than one wire size to connect, the method is essentially the same. Actually, the insert configurations for multiple-size wires are a lot more flexible than they appear. That's because you can always solder a smaller wire to a larger contact. However, soldering a large wire to a small contact isn't recommended because of size and current requirements.

2

What if several identical connectors have different functions?

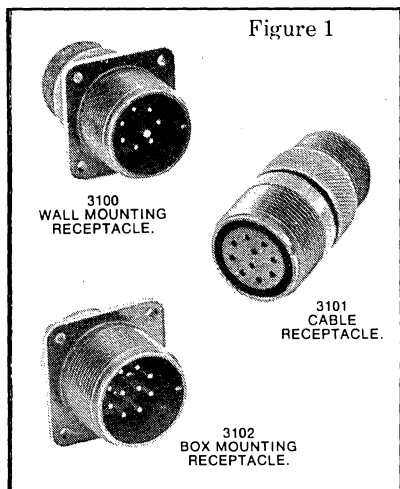
Here's a situation to watch out for. You have four identical receptacles on a panel. One carries high current loads. The others have low current functions. A plug mated with the wrong receptacle (cross-mating) could ruin your valuable equipment.

To avoid cross-mating, you can order identical inserts positioned in both the plugs and receptacles at various angles from standard. These variations from standard position are called Alternate Insert Positions.

STANDARD CIRCULAR CONNECTORS

BUNKER
RAMO

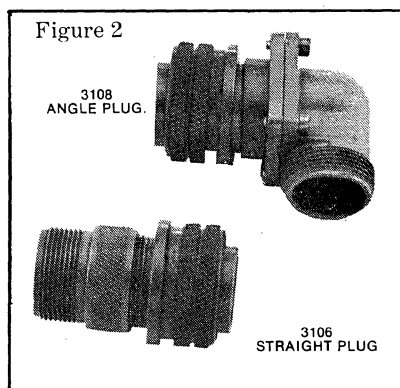
AMPHENOL

3 What kind of receptacle do you need?

For wall mounting. Figure 1 shows a Wall Receptacle, type 3100. The elongated back of this receptacle extends through thick wall material. It is threaded to accept standard hardware fittings.

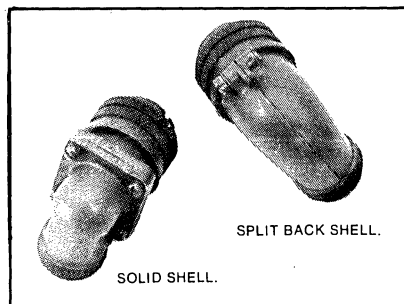
For unmounted applications. Use the Cable Receptacle, type 3101, shown in Figure 1.

For box or panel mounting. Use the Box Receptacle, type 3102. This receptacle's back is short to conserve space. It is not threaded on the back end and is used when no accessories such as clamps are needed.

4 What kind of plug do you need?

For ordinary situations. The Straight Plug, type 3106 (Figure 2), meets most connector requirements. However ...

When space is critical. You may want to consider using an Angle Plug, type 3108. This type plug, shown in Figure 2, lets the cable enter your equipment at a right angle.

5 Do you need a plug with Solid or Split Back Shell?

You can get both straight and angle plugs in solid or split back shell designs. With the solid shell, you have greater strength. You save space, too. On the other hand, the split shell design lets you quickly inspect the solder terminals when you need to. This feature could be pretty important if you'll be subjecting the connector to rough handling and heavy use.

The type identification for solid shell construction is the letter A immediately after the main shell type number: i.e. 3106A or 3108A. Likewise, the type identification for split back shell construction is B: i.e. 3106B or 3108B. Because of application, receptacles are made in solid back shell construction only. Their type identification is 3100A, 3101A and 3102A.

6 Which connector gets the socket? The receptacle or the plug?

You're at the point where you designate which inserts are used with which shells. Since either pin or socket inserts can be used with plugs or receptacles, now's the time to make your choice.

Here's a good rule of thumb. Order the sockets for the connector at the "hot" side of the circuit. By having sockets at the power source, there's little chance that a wayward finger or screwdriver will short the circuit or cause personal injury.

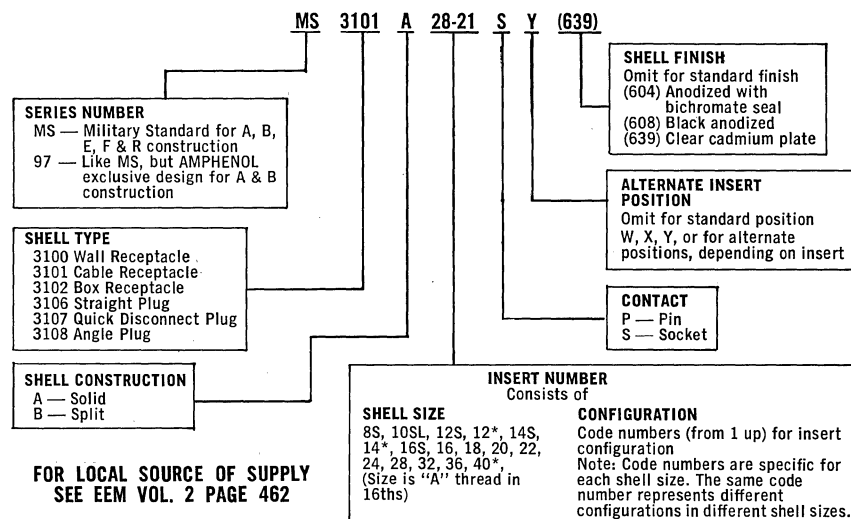
The code for Sockets is simply S following the insert code number. For Pins, it is P. Therefore, 20-7P insert would have pin contacts while a 20-7S insert would have socket contacts.

7 Do you need a non-reflective finish or a shiny finish?

If you prefer the standard dull-olive cadmium plate finish, which is non-reflective, then no suffix number is needed. If you would rather have the shiny, clear cadmium plate finish, just add the suffix (639) at the end of your part number.

Both finishes give you the same high conductivity and resistance to corrosion.

HOW TO ASSEMBLE MS CONNECTOR PART NUMBERS



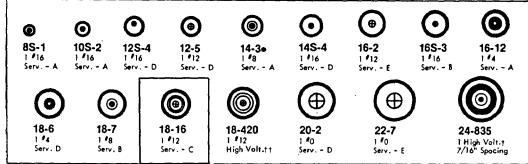
STANDARD CIRCULAR CONNECTORS

BUNKER
RAMO

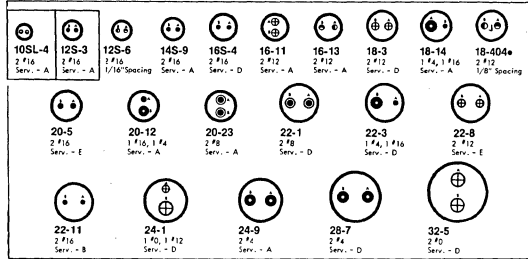
AMPHENOL

97 Series — Insert Arrangements

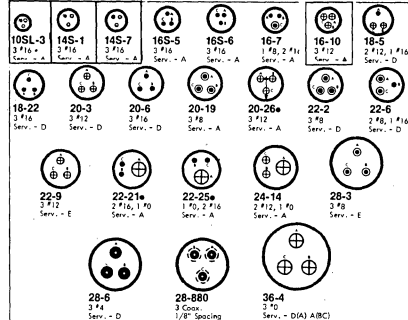
1 Contact



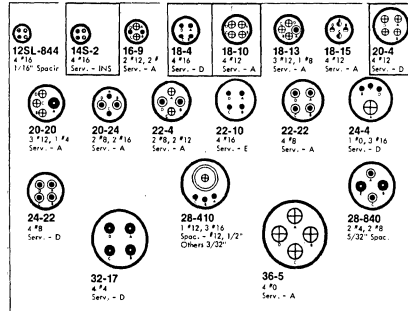
2 Contacts



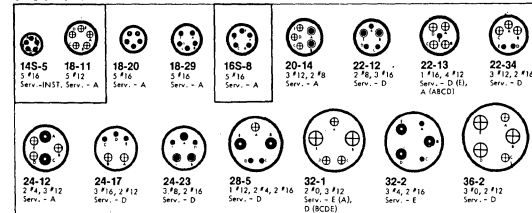
3 Contacts



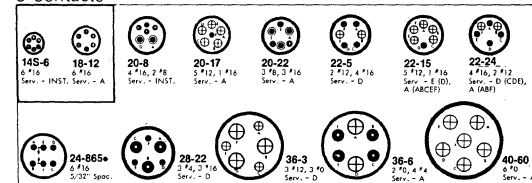
4 Contacts



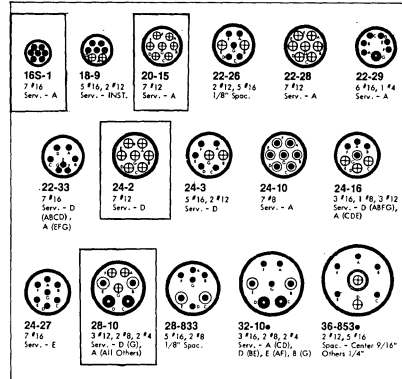
5 Contacts



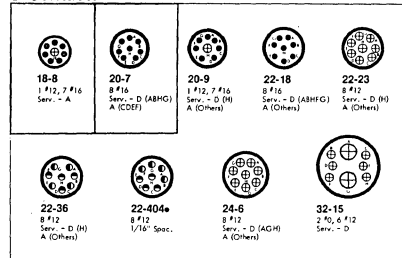
6 Contacts



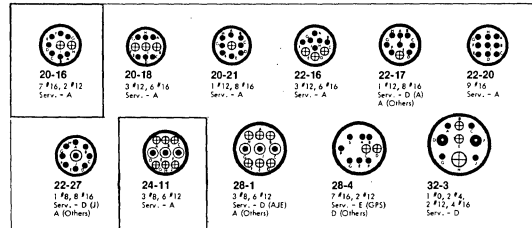
7 Contacts



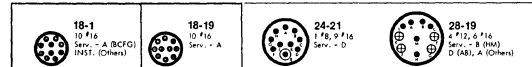
8 Contacts



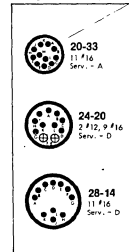
9 Contacts



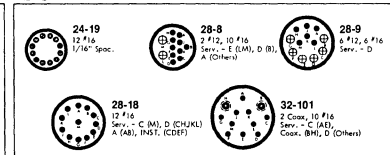
10 Contacts



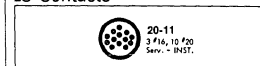
11 Contacts



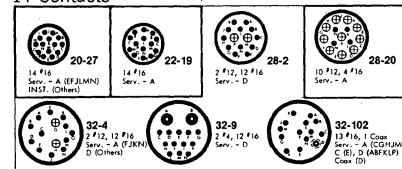
12 Contacts



13 Contacts



14 Contacts



STANDARD CIRCULAR CONNECTORS

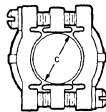
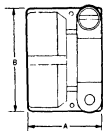
BUNKER
RAMO

AMPHENOL

97 Connector Accessories

Cable Clamp

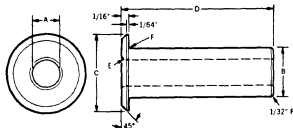
For jacketed cable or wires protected by tubing. On MS3057A Cable Clamp, both clamping halves float, so that cable is always centered, affording maximum strain relief. With unjacketed cable or wire bundles without tubing, use corresponding MS3420 bushing. To order clamp with bushing, add -1 to the Amphenol part number. With shell sizes 16 and larger, two telescoping bushings are furnished.



MS Number	Amphenol Number	Shell Size	Max. O.D. Cable	Dimensions — Inches			
				A	B	C	Threads
MS3057-4A	97-3057-1004	10SL, 12S	5/16	.795	.842	5/16	5/8-24
MS3057-6A	97-3057-1007	14, 14S	3/8	.850	.995	3/8	3/4-20
MS3057-8A	97-3057-1008	16, 16S	1/2	.920	1.120	1/2	7/8-20
MS3057-10A	97-3057-1010	18	5/8	.920	1.216	5/8	1 -20
MS3057-12A	97-3057-1012	20, 22	3/4	.927	1.403	3/4	1 1/4-18
MS3057-16A	97-3057-1016	24, 28	7/8	1.015	1.683	7/8	1 1/2-18
MS3057-20A	97-3057-1020	32	1 1/4	1.095	2.050	1 1/4	1 3/4-18
MS3057-24A	97-3057-1024	36	1 3/8	1.156	2.245	1 3/8	2 -18

Bushing

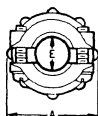
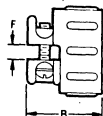
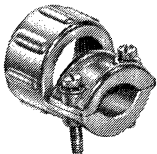
Rubber bushing specifically designed for MS3057A Cable Clamp. Protects wire bundles and unjacketed cables from possible damage by cable clamp. Can also be used as reducing bushing.



MS	Part Number	Amphenol	Dimensions — Inches					
			A Dia.	B Dia.	C Dia.	D	E Rad	F Rad
3420-3	9779-513-3		.130	2.10	.374	2.875	1/32	1/32
3420-4	9779-513-4		.220	.302	.500	2.750	1/32	1/32
3420-6	9779-513-6		.312	.427	.614	2.625	1/32	1/32
3420-8	9779-513-8		.437	.552	.739	2.500	1/16	1/16
3420-10	9779-513-10		.562	.615	.864	2.375	1/16	1/16
3420-12	9779-513-12		.625	.740	1.059	2.250	1/16	1/16
3420-16	9779-513-16		.750	.927	1.039	2.125	1/16	1/16
3420-20	9779-513-20		.937	1.240	1.591	2.000	1/16	1/16
3420-24	9779-513-24		1.250	1.365	1.842	1.875	1/16	1/16

Cable Clamp

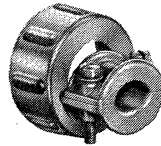
For jacketed cable or wires protected by tubing. To provide for the most firm grip, the cable or wires should be centered in the jaws of the clamp. A vinyl or rubber bushing or sleeve may be used for this purpose. In applications where the cable is subject to considerable flexing, the resilient sleeve should project for several inches along the wire. This reinforcement lengthens the life of the cable. For centering and sealing, one resilient washer and two fiber washers are included with each clamp.



AN Number	Fits Shell Size	Fits AN Fitting Size	Max. O.D. Cable	Dimensions — Inches					Weight Lbs. per 100
				A	B	E	F	Threads	
AN3057-3	8S, 10S	3	1/4	1 1/16	1	3/4	1/8	1 1/2-28	1.89
AN3057-4	10SL, 12S	4	3/8	1 1/8	1 1/8	5/8	3/8	5/8-24	2.12
AN3057-6	14, 14S	6	1/2	1 1/4	1 1/4	3/4	3/4	3/4-20	2.94
AN3057-8	16, 16S	8	5/8	1 1/2	1 1/2	7/8	7/8	7/8-20	3.44
AN3057-10	18	10	3/4	1 3/4	1 3/4	1	1	1 -20	4.72
AN3057-12	20, 22	12	7/8	1 7/8	1 7/8	1 1/8	1 1/8	1 1/8-18	6.10
AN3057-16	24, 28	16	1 1/8	2 1/8	2 1/8	1 3/8	1 3/8	1 3/8-18	8.71
AN3057-20	32	20	1 3/4	2 3/4	2 3/4	1 7/8	1 7/8	1 7/8-18	14.85
AN3057-24	36	24	1 7/8	2 7/8	2 7/8	2	2	2 -18	18.15
AN3057-28	40	28	2	3	3	2 1/4	2 1/4	2 1/4-16	21.50

† Clamps for connectors size 12 are the same as for sizes 10SL and 12S.

Step Down Cable Clamp — 97-3057



Like the AN3057 except for the step down feature that accommodates smaller cable than that for which AN3057 was designed.

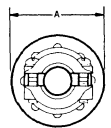
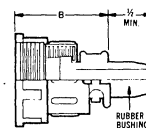
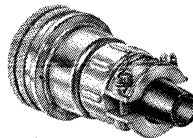
Amphenol Number	Fits Shell Size	Fits AN Fitting Size	Max. O.D. Cable	Dimensions — Inches					Weight Lbs. per 100
				A	B	E	F	Threads	
97-3057-10-6	18	10	1/2	1 1/8	1 1/8	3/4	3/4	1 -20	3.94
97-3057-12-6	20, 22	12	1/2	1 3/8	1 3/8	7/8	7/8	1 1/4-18	4.40

NOTE: The selection of fittings for connection to MS connectors is based on the connector size AND the cable or conduit size. For other connections, such as terminations and couplings, fitting sizes correspond to the size of the cable or conduit used.

Waterproof Cable Clamps

The complete waterproof cable clamp assembly No. 9767 (for use with MS connectors) consists of an AN3057 Cable Clamp, a rubber bushing, washer and an AN3055 Adapter. It is available for all sizes MS and 97 plugs. The sectional view of Amphenol 9767 Waterproof Cable Clamp shows the parts of the clamp.

To assure the watertight integrity of this clamp when assembled to an MS plug, the plug must be ordered with deviation (417) which supplies a W washer cemented to the shoulder of the plug shell.



Max. Cable O.D. Inches	Amphenol Number	Connector Size	Dimensions — Inches			Weight Lbs. per 100
			A	B	Threads	
1/32	9767-12-3	10SL, 12S, 12	1 1/8	1 1/8	5/8-24	3.19
1/16	9767-10-4	8S, 10S	1 1/8	1 1/8	1/2-28	3.46
	9767-12-4	10SL, 12S, 12	1 1/8	1 1/8	5/8-24	3.82
	9767-14-4	12SL, 14S, 14	1 1/8	1 1/8	3/4-20	3.87
	9767-16-4	16S, 16	1 1/8	1 1/8	7/8-20	4.00
1/8	9767-14-6	12SL, 14S, 14	1 1/8	1 1/8	3/4-20	5.54
	9767-16-6	16S, 16	1 1/8	1 1/8	7/8-20	5.84
	9767-18-6	18	1 1/8	1 1/8	1 -20	5.94
3/16	9767-16-8	16S, 16	1 1/8	1 1/8	7/8-20	6.92
	9767-18-8	18	1 1/8	1 1/8	1 -20	7.10
	9767-22-8	20, 22	1 3/8	1 3/8	1 1/4-18	7.27
1/4	9767-18-10	18	1 3/8	1 3/8	1 -20	8.79
	9767-22-10	20, 22	1 3/8	1 3/8	1 1/4-18	8.97
	9767-28-10	24, 28	1 3/8	1 3/8	1 3/4-18	9.12
1/2	9767-22-12	20, 22	1 3/8	1 3/8	1 1/4-18	12.65
	9767-28-12	24, 28	1 3/8	1 3/8	1 1/4-18	12.86
	9767-32-12	32	1 3/8	1 3/8	1 3/4-18	13.05
5/8	9767-28-16	24, 28	1 3/8	1 3/8	1 1/4-18	14.95
	9767-32-16	32	1 3/8	1 3/8	1 3/4-18	16.13
	9767-36-16	36	2 1/8	2 1/8	2 -18	16.26
1 1/8	9767-32-20	32	1 3/8	1 3/8	1 3/4-18	22.27
	9767-36-20	36	2 1/8	2 1/8	2 -18	22.41
	9767-40-20	40	2 1/8	2 1/8	2 1/4-16	22.61
1 3/8	9767-36-24	36	2 1/8	2 1/8	2 -18	29.85

For AN Fittings

When selecting a cable clamp for a connection with fittings, the 9767 Waterproof Cable Clamp without the adapter may be used. AN fittings have the required inside tapered surface for seating the special rubber bushing.

Max. Cable O.D. Inches	Amphenol Number	Fitting Size	Dimensions — Inches			Weight Lbs. per 100
			A	B	Threads	
1/32	9767-3	3	1 1/8	1	1/2-28	2.09
1/16	9767-4	4	1 1/8	1	5/8-24	2.45
1/8	9769-6	6	1 1/8	1 1/8	3/4-20	3.94
3/16	9767-8	8	1 1/8	1 1/8	7/8-20	4.57
1/4	9767-10	10	1 3/8	1 3/8	1 -20	5.97
5/16	9767-12	12	1 3/8	1 3/8	1 1/4-18	7.85
3/8	9767-16	16	1 3/8	1 3/8	1 3/4-18	9.53
1/2	9767-20	20	1 3/8	1 3/8	1 7/8-18	16.41
5/8	9767-24	24	2 1/8	2 1/8	2 -18	22.40

STANDARD CIRCULAR CONNECTORS

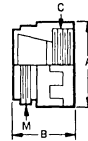
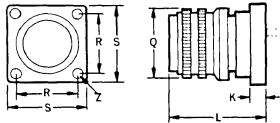
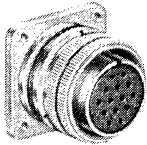
BUNKER
RAMO

AMPHENOL

97 Series — Special Purpose Connectors

Box Type Plugs — (97-5105 Construction)

Square flange for mounting directly on box or housing. Provides a means of directly connecting two pieces of equipment without interconnecting wires. Available in all sizes with either male or female inserts. To order, complete the part number (97-5105) by adding the proper insert number. (See other pages for insert information.) Example: 97-510528-20S. To prevent connectors from rotating, order deviation 205 (a single stake, with swivel ring pinned) or 206 (double staking, with both swivel plate and swivel ring pinned); for example: 97-510528-20S(205) or 97-510528-20S(206).



Adapter — AN3055

The AN3055 adapter is used with standard MS connectors as a reducing or extending bushing.

Connector Size	Dimensions — Inches					Z Mounting Threads
	K	L	Q	R	S	
8S	1/8	7/8	3/4	3/16	23/32	4-36
10S	1/8	7/8	7/8	3/16	23/32	4-36
12S	3/32	3/2	1	13/16	1 1/16	4-36
12	3/32	1 3/8	1	13/16	1 1/16	4-36
14S	3/32	3/2	1 1/8	13/16	1 1/16	4-36
14	3/32	1 3/8	1 1/8	13/16	1 1/16	4-36
16S	3/32	1 3/2	1 1/4	1	1 1/16	6-32
16	3/32	1 1/2	1 1/4	1	1 1/16	6-32
18	3/32	1 1/2	1 1/2	1	1 1/16	6-32
20	3/16	1 1/2	1 1/2	1 1/4	1 5/8	10-24
22	3/16	1 1/2	1 1/2	1 1/4	1 5/8	10-24
24	3/16	1 1/2	1 1/2	1 1/4	2	10-24
28	3/16	1 1/2	1 1/2	1 1/4	2	10-24
32	1/4	1 1/2	2 1/2	1 3/8	2 1/2	10-24
36	1/4	1 1/2	2 1/2	1 3/8	2 1/2	10-24

Conduit Size Inches*	AN Number	Used on Connector Sizes	Dimensions — Inches				Weight Lbs. per 100
			A	B	C Threads	M Threads	
3/16	AN3055-12-3	12S, 12	23/32	7/8	5/8-24	1/2-28	1.10
	AN3055-12-4	12S, 12	23/32	7/8	5/8-24	5/8-24	1.37
1/4	AN3055-14-4	14S, 14	23/32	7/8	3/4-20	5/8-24	1.42
	AN3055-16-4	16S, 16	1 1/16	7/8	7/8-20	5/8-24	1.55
	AN3055-14-6	14S, 14	23/32	7/8	3/4-20	3/4-20	1.60
3/8	AN3055-16-6	16S, 16	1 1/16	7/8	7/8-20	3/4-20	1.90
	AN3055-18-6	18	1 1/16	7/8	1 -20	3/4-20	2.00
	AN3055-16-8	16S, 16	1 1/16	7/8	7/8-20	7/8-20	2.35
1/2	AN3055-18-8	18	1 1/16	7/8	1 -20	7/8-20	2.53
	AN3055-22-8	20, 22	1 3/8	7/8	1 3/8-18	7/8-20	2.70
	AN3055-18-10	18	1 1/16	7/8	1 -20	7/8-20	2.82
5/8	AN3055-22-10	20, 22	1 3/8	7/8	1 3/8-18	1 -20	3.00
	AN3055-28-10	24, 28	1 5/8	7/8	1 5/8-18	1 -20	3.15
	AN3055-22-12	20, 22	1 3/8	7/8	1 3/8-18	1 3/8-18	4.80
3/4	AN3055-28-12	24, 28	1 5/8	7/8	1 5/8-18	1 3/8-18	5.01
	AN3055-32-12	32	1 5/8	1 1/8	1 3/4-18	1 3/8-18	5.20
	AN3055-28-16	24, 28	1 5/8	7/8	1 5/8-18	1 3/8-18	5.42
1	AN3055-32-16	32	1 5/8	1 1/8	1 3/4-18	1 3/8-18	5.60
	AN3055-36-16	36	2 1/8	1 1/8	2 -18	1 3/8-18	5.73
	AN3055-32-20	32	1 7/8	1 1/8	1 3/4-18	1 3/4-18	5.86
1 1/4	AN3055-36-20	36	2 1/8	1 1/8	2 -18	1 3/4-18	6.00
	AN3055-40-20	40	2 1/8	1 1/8	2 1/4-16	1 3/4-18	6.20
1 1/2	AN3055-36-24	36	2 1/8	1 1/8	2 -18	2 -18	7.45

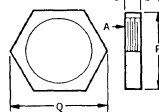
* Indicates nominal inside diameter of flexible Shielding Conduit No. AN-WW-C-561 or outside diameter of rigid aluminum conduit No. AND-10101. Brass or other conduit of similar size may be used with these fittings.

Conduit Box Connectors — AN3064

Used with AN3066 conduit coupling locknut to form a termination at conduit boxes or panel. The conduit box connector may also be used with AN3057 cable clamp to relieve strain on wiring cable terminals.

Conduit Size Inches*	AN Number	Use Conduit Coupling Lock Nut Size	Use Conduit Coupling Nut No.	Dimensions — Inches				Weight Lbs. per 100
				A Threads	B	F	P	
3/16	AN3064-3	AN3066-3	AN3054-3	1/2-28	3/4	1/8	1 1/16	1.17
1/4	AN3064-4	AN3066-4	AN3054-4	5/8-24	3/4	1/8	1 1/16	1.75
3/8	AN3064-6	AN3066-6	AN3054-6	3/4-20	3/4	1/8	1 1/16	2.18
1/2	AN3064-8	AN3066-8	AN3054-8	7/8-20	7/8	3/8	1 1/4	3.15
5/8	AN3064-10	AN3066-10	AN3054-10	1 -20	7/8	3/8	1 1/4	3.94
3/4	AN3064-12	AN3066-12	AN3054-12	1 1/4-18	7/8	3/8	1 3/8	4.98
1	AN3064-16	AN3066-16	AN3054-16	1 3/4-18	7/8	3/8	1 3/8	5.75
1 1/4	AN3064-20	AN3066-20	AN3054-20	1 3/4-18	1 1/8	3/8	2	9.17

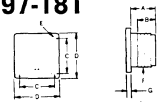
Lock Nut — AN3066



Conduit Size Inches*	AN Number	Dimensions — Inches				Weight Lbs. per 100
		A Threads	F	P	Q	
3/16	AN3066-3	1/2-28	1/8	1 1/16	5/16	.28
1/4	AN3066-4	5/8-24	1/8	1 1/16	5/16	.36
3/8	AN3066-6	3/4-20	1/8	1 1/16	13/32	.41
1/2	AN3066-8	7/8-20	3/8	1 1/4	1 1/4	.72
5/8	AN3066-10	1 -20	3/8	1 1/4	1 1/4	.86
3/4	AN3066-12	1 1/4-18	3/8	1 3/8	1 1/2	1.01
1	AN3066-16	1 3/4-18	3/8	1 3/8	1 3/8	1.25
1 1/4	AN3066-20	1 3/4-18	3/8	2	2 1/8	1.85
1 1/2	AN3066-24	2 -18	3/8	2 1/8	2 1/2	2.04

Dummy Receptacle Shells — 97-181

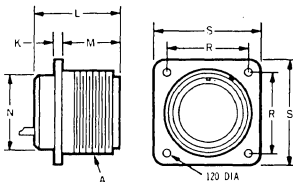
Same as standard MS receptacle without installation or contacts. Used for anchoring straight or angle type MS plugs when they are not in use.



For Connector Size	MS Number	Amphenol Number	Dimensions — Inches						Mtg. Flange Thickness Max./Min.	Wt. Lbs. per 100	
			A	B	C	D	E Dia.	F Threads			
8S	MS3105-8S	97-181-8S	.562	.375	.594	.875	.120	1/2-28	.156	.078	1.01
10S	MS3105-10S	97-181-10S	.562	.375	.719	1.000	.120	5/8-24	.156	.078	1.10
12S	MS3105-12S	97-181-12S	.562	.375	.812	1.094	.120	3/4-20	.156	.078	1.73
14S	MS3105-14S	97-181-14S	.750	.625	.812	1.094	.120	3/4-20	.156	.078	2.00
16S	MS3105-16S	97-181-16S	.562	.375	.906	1.188	.120	7/8-20	.156	.078	2.35
12	MS3105-12	97-181-12	.750	.625	.906	1.188	.120	7/8-20	.156	.078	2.30
14	MS3105-14	97-181-14	.562	.375	.969	1.281	.120	1 -20	.156	.078	2.41
16	MS3105-16	97-181-16	.750	.625	.969	1.281	.120	1 -20	.156	.078	3.10
18	MS3105-18	97-181-18	.750	.625	1.062	1.375	.120	1 1/8-16	.203	.094	3.18
20	MS3105-20	97-181-20	.750	.625	1.156	1.500	.120	1 1/4-18	.203	.094	3.80
22	MS3105-22	97-181-22	.750	.625	1.250	1.625	.120	1 3/8-18	.203	.094	4.50
24	MS3105-24	97-181-24	.812	.625	1.375	1.750	.147	1 1/2-18	.203	.094	5.00
28	MS3105-28	97-181-28	.812	.625	1.562	2.000	.147	1 3/4-18	.203	.094	6.58
32	MS3105-32	97-181-32	.875	.625	1.750	2.250	.173	2 -18	.359	.125	9.75
36	MS3105-36	97-181-36	.875	.625	1.933	2.500	.173	2 1/4-16	.359	.125	11.90
40	MS3105-40	97-181-40	.875	.625	2.188	2.750	.173	2 1/2-16	.359	.125	14.25

Small Flange Receptacles — (115 Construction)

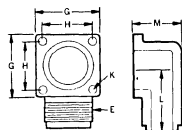
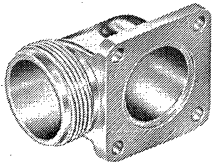
Receptacles are available in sizes 12S and 14S with pin or socket inserts and in size 10SL with pin contacts only. To order, complete part number (97-3102) by adding proper insert and construction number (115).



Connector Size	Coupling Threads A	Dimensions — Inches				
		K	L	M	N	S
10SL	5/8-24	5/4	5 3/4	5/8	5/8	1 1/16
12S	3/4-20	23/32	2 1/2	1/8	5/8	7/8
14S	7/8-20	23/32	2 1/2	1/8	23/32	1 1/16

Junction Shells — 9784

These junction shells may be used as panel terminations to hold cable harnesses when not in use or as right-angle feed-throughs similar to the AN3064. Adding the AN3057 cable clamps provides strain relief.



Amphenol Number	Use Fitting Size	Dimensions — Inches						Weight Lbs. per 100
		E Threads	G	H	K Dia.	L	M	
9784-10S	3	1/2-28	23/32	3/16	.120	7/8	5/8	1.20
9784-12	4	5/8-24	1 1/16	13/16	.125	1	23/32	1.20
9784-14	6	3/4-20	1 1/16	13/16	.125	1	23/32	2.34
9784-16	8	7/8-18	1 1/16	1	.141	1 1/8	31/32	2.84
9784-18	10	1 -20	1 1/16	1	.141	1 1/8	1 1/2	3.98
9784-22	12	1 1/8-18	1 5/8	1 1/4	.203	1 3/8	1 1/4	6.60
9784-28	16	1 1/8-18	2	1 1/8	.203	1 1/2	1 3/4	12.47
9784-32	20	1 3/4-18	2 1/2	1 1/8	.203	1 3/2	2 1/4	12.47
9784-36	24	2 -18	2 1/2	1 1/8	.203	1 3/2	2 1/4	20.01

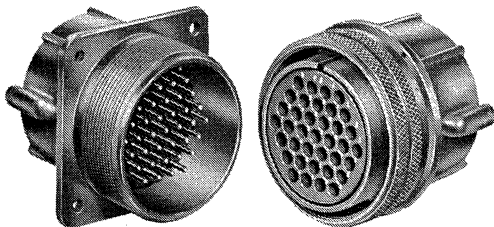
STANDARD CIRCULAR CONNECTORS



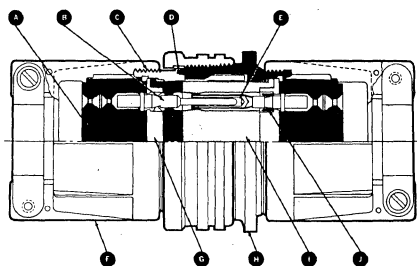
AMPHENOL

246 SERIES

ENVIRONMENT RESISTANT CONNECTORS



246-3100R & 246-3106R



246-3106F & 246-3100F

- A ENVIRONMENTAL SEALING GROMMET
- B MS90453 PIN CONTACT
- C PLUG SHELL
- D STATIC "O" RING
- E MS90454 HOODED SOCKET CONTACT
- F MS(F) CABLE SUPPORT
- G ANTI-DEFLECTION CONTACT RETENTION DISK
- H RECEPTACLE SHELL
- I BONDED MONOBLOCK CONSTRUCTION
- J SERVICEABLE SHROUDED CONTACT RETENTION CLIP

MIL-C-5015 Performance, MS Contacts Plus "Poke-Home" Speed and Reliability

Amphenol 246 Series connectors simplify and speed wiring changes by providing the combination of rear insertable, front removable, crimp Poke-Home contacts. The MS90453 pin contact and MS90454 socket contact were recently standardized and will be included in proposed procurement Specification MIL-C-23216. They can be crimped with the standard MS tool, M22520/1-01, Amphenol No. 294-542 with turret head M22520/1-02, Amphenol No. 294-1889-XX.

Damage-Resistance Contact Retention System

Metal retaining clips combine with a shrouded retention disk to prevent damage to the contact system. The metal retaining clips, identical in both male and female insert assemblies, can be removed and replaced in the field. They are shrouded to minimize damage by untrained personnel. Forces as high as 50 pounds with the removal tool cocked at angles of 10° can be applied without damaging the clip. At angles of more than 10°, the tip of the tool rides out the retention disk. In addition, the shrouded contact retention prevents excessive skewing of contacts that might prevent proper connector mating.

Contact retention force exceeds the requirements of MIL-C-26482 and MIL-C-26500. The forces required for contact insertion and removal are kept down to a low level for ease in servicing.

Interchangeable Contacts

The 246 Series uses the contacts recently standardized by proposed specification MIL-C-39029. This specification, which covers the contacts for all crimp Poke-Home MIL-C-5015 connectors, eliminates the long and short versions of the contacts. Instead, it provides one standard length contact to be used in both standard length and short-shell connectors. This enables both the 16S-1 and the 18-1 shells, for example, to use the same contact.

The 246 Series connectors are interchangeable and intermateable with all other MIL-C-5015 connectors. They meet or exceed all the requirements of MIL-C-5015.

INSERT CONFIGURATIONS

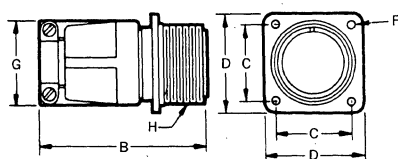
Insert	Contacts	Insert	Contacts	Insert	Contacts	Insert	Contacts	Insert	Contacts
10SL-3	3 #16	16S-1	7 #16	18-19	10 #16	20-33	11 #16	28-12	26 #16
10SL-4	2 #16	18-1	10 #16	18-22	3 #16	22-8	2 #12	28-15	35 #16
12S-3	2 #16	18-4	4 #16	20-4	4 #12	22-14	19 #16	28-21	37 #16
12-5	1 #12	18-9	(2 #12 15 #16)	20-6	3 #16	22-19	14 #16	32-7	(7 #12 28 #16)
14S-2	4 #16	18-10	4 #12	20-17	(5 #12 1 #16)	24-20	(2 #12 9 #16)	32-17	4 #4
14S-5	5 #16	18-11	5 #12	20-27	14 #16	24-27	7 #16	36-5	4 #0
14S-7	3 #16	18-12	6 #16	20-29	17 #16	24-28	24 #16	36-10	48 #16

ACCESSORY TOOLS

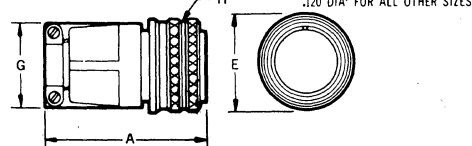
294-542	M22520/1-01 Univ. Crimp Tool
294-229	#12 Contact Insertion Tool
294-230	#12 Contact Removal Tool
294-192	#16 Contact Insertion Tool
294-219	#16 Contact Removal Tool

DIMENSIONS (Inches)

246-3100F



246-3106F



MOUNTING HOLES
.173 DIA. FOR SIZES 32 AND 36
.147 DIA. FOR SIZES 24 AND 28
.120 DIA. FOR ALL OTHER SIZES

Size	A Max.	B Max.	C ±.005	D ±.031	E Dia. Max.	F ±.005	G ±.031	H Thread
10SL	2.067	2.067	.719	1.000	.876	.120	.865	5/8"-24UNEF
12S	2.067	2.067	.812	1.094	1.001	.120	.865	3/4"-20UNEF
14S	2.129	2.129	.906	1.188	1.126	.120	.990	7/8"-20UNEF
16S	2.129	2.129	.969	1.281	1.251	.120	1.120	1"-20UNEF
16	2.375	2.281	.969	1.281	1.251	.120	1.120	1"-20UNEF
18	2.437	2.343	1.062	1.375	1.345	.120	1.211	1 1/8"-18UNEF
20	2.497	2.403	1.156	1.500	1.469	.120	1.468	1 1/4"-18UNEF
22	2.497	2.403	1.250	1.625	1.595	.120	1.468	1 3/8"-18UNEF
24	2.673	2.579	1.375	1.750	1.719	.147	1.750	1 1/2"-18UNEF
28	2.673	2.579	1.562	2.000	1.969	.147	1.750	1 3/4"-18NS
32	2.779	2.675	1.750	2.250	2.219	.173	2.056	2"-18NS
36	2.779	2.675	1.938	2.500	2.469	.173	2.250	2 1/4"-16UN

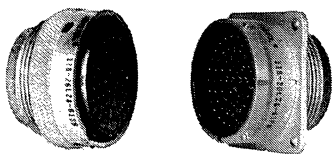
MINIATURE ENVIRONMENTAL CONNECTORS

BUNKER
RAMO

AMPHENOL

MERLIN I Rear Release 118 Series Connectors

Qualified to MIL-C-83723 & MIL-C-26482



Advanced State of the Art

Amphenol's MERLIN I is a rear-release, polymer retention, upgraded version of MIL-C-83723/0026482 connector representing a true advance in rear release design. Amphenol design has improved the quality while reducing the weight and offering the greater dielectric spacing by the elimination of metal contact retention clips. These 118 Series connectors are qualified to MIL-C-83723 and MIL-C-0026482.

Retention System

Merlin I connectors utilize an all polymer retention disc with integrally molded polymer contact retention clips. This design results in lower cost and higher integrity in that the metal clip system requires close dimensional control of twice as many dimensions as does the comparable all dielectric system.

New Materials

Amphenol has had extensive experience with Astrel P360*. It has been used successfully in the Astro 348® Series (MIL-C-81511C) and now upgraded for individual contact retention and release. This thermoplastic polymer possesses outstanding mechanical and electrical properties and is resistant to alkalis, acids, fuels and solvents.

Military/Industrial Specifications

The Merlin I connectors are the first of its kind to meet and exceed performance requirements of all three of the following standard specifications:

NAVY — MIL-C-0026482 (175° Class L fluid resistant)

MIL-C-0026482 (200° Class E)

AIR FORCE — MIL-C-83723A (200°C Class R fluid resistant)

AERONAUTICS INDUSTRIES ASSOCIATION — NAS 1599

Typical Applications

- Process control systems or oil industry where fluid resistance is essential.

- Paving equipment where constant temperatures of 200°C are reached.
- Portable communications equipment or traffic control where weight and size are major factors.
- Ideal to upgrade MIL-C-26482E installations, through retrofit and replacement.
- Ground support equipment where cylindrical connector applications are required.
- Marine equipment where cylindrical connector applications are required.

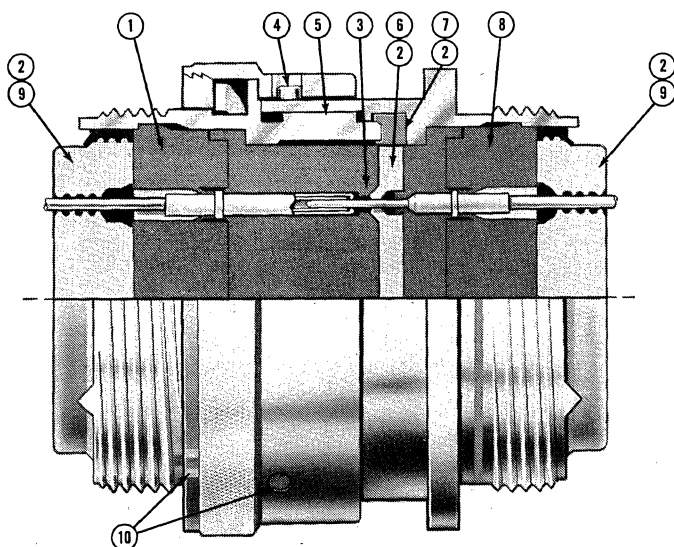
User Benefits

- $\frac{7}{16}$ " shorter, up to 40% lighter for total system weight reduction and lower cost per pound.
- 62% increased dielectric separation reduces outgassing and weight loss improving connector temperature life.
- Reduced number of connector parts, up to 122, decreases failure modes while increasing reliability.
- Resistant to fuels, oils and cleaning solutions for longer life.
- Mis-mating due to bent pins eliminated by hard front closed entry socket insert with a hooded two-tinned, prod-proof socket contact.
- Intermateable and intermountable with existing circuitry reducing replacement and upgrading costs.

* Registered Trademark of 3M Co.

® Registered Trademark of Bunker Ramo Corp.

DESIGN FEATURES



- 1 Molded One-Piece Polymer Contact Retention Disc — Fewer connector parts — Greater reliability
- 2 Fluorosilicone Fluid Resistant Seal Material — Allows one connector to meet stringent fluid requirements of various specifications
- 3 Closed Entry Socket Insert and Contacts — Eliminates mis-mating due to bent pins — System reliability
- 4 Bayonet Coupling System — Quick mating of connectors — Lowers operating costs
- 5 5 Key Shell Polarization — Assures positive contact alignment prior to mating
- 6 Interfacial Mating Seal — Maintains system integrity
- 7 Static Peripheral Shell Seal — Maintains system integrity
- 8 Monoblock Construction — Inserts Bonded to Shells — Helps to assure complete connector reliability
- 9 Self-Sealing Rear Grommets — Assures environmental sealing with or without rear hardware
- 10 Visual Mating Indicators — Quick indication that connector is fully mated
- 11 Shell to Shell Grounding Fingers*
- 12 $\frac{7}{16}$ " shorter, 40% lighter weight
- 13 Accepts standard NAS 1599, MIL-C-0026482, and MIL-C-83723 Hardware
- 14 Durable Conductive Shell Finish

* Consult factory

MINIATURE ENVIRONMENTAL CONNECTORS

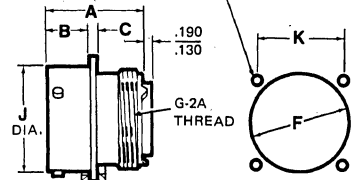
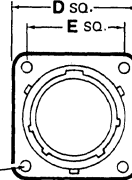
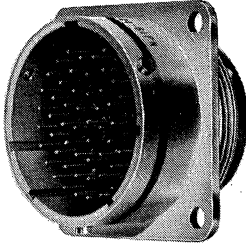
BUNKER
RAMO

AMPHENOL

MERLIN Rear Release 118 Series Connectors

Shell Styles and Dimensions

Square Flange Receptacle



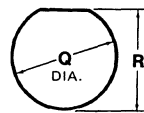
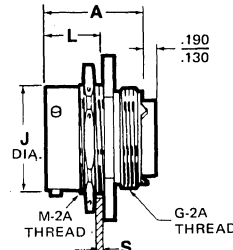
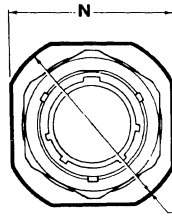
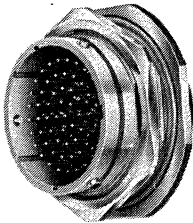
DRILL OR TAP FOR NO. 4 SCREW
(SIZES 10 THRU 22)
DRILL OR TAP FOR NO. 6 SCREW
(SIZE 24)

.125 (3.18) DIA. SIZES 10 THRU 22
.116 (2.95) DIA. SIZES 10 THRU 22
.152 (3.86) DIA. SIZE 24
.143 (3.63) DIA. SIZE 24

H MAX.
PANEL THICKNESS
BACK MOUNTED
PANEL THICKNESS
FRONT MOUNTED

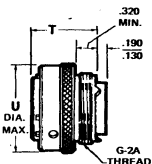
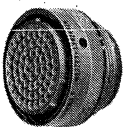
Shell Size	A		B		C		D Max.		E		F		G Thread	H Max.		J Dia.		K		L Max.	
	Inches	MM	Inches	MM	Inches	MM	Inches	MM	Inches	MM	Inches	MM		Inches	MM	Inches	MM	Inches	MM	Inches	MM
10							.954	24.23	.719	18.26	.690	17.53	1/8-24 NEF			.591	15.01	.724	18.39	1.082	27.48
12							1.047	26.59	.812	20.62	.869	22.07	3/4-20 UNEF			.751	19.08	.817	20.75	1.176	29.87
14	1.040	26.42	.442	11.23	.056	1.42	1.141	28.98	.906	23.01	.994	25.24	7/8-20 UNEF	.087	2.21	.876	22.25	.911	23.14	1.270	32.36
16	1.023	25.98	.431	10.95	.046	1.17	1.234	31.34	.969	24.61	1.118	28.40	1-20 UNEF			1.001	25.43	.974	24.74	1.364	34.65
18							1.328	33.73	1.062	26.97	1.243	31.57	1 1/4-18 NEF			1.126	28.60	1.067	27.10	1.458	37.03
20							1.453	36.91	1.156	29.36	1.368	34.75	1 1/2-18 NEF			1.251	31.78	1.161	29.49	1.582	40.18
22	1.103	28.02	.567	14.40	.088	2.24	1.578	40.08	1.250	31.75	1.493	37.92	1 3/8-18 NEF	.212	5.38	1.376	34.95	1.255	31.88	1.708	43.38
24	1.086	27.58	.600	15.24	.078	1.98	1.703	43.26	1.375	34.93	1.610	40.89	1 1/2-18 NEF			1.501	38.13	1.380	35.05	1.832	46.53
			.589	14.96												1.495	37.97	1.370	34.80		

Single Hole Mount Receptacle



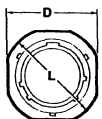
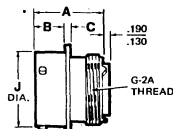
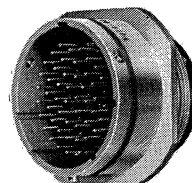
Shell Size	A		G		J Dia.		L		M Thread		N		P Dia.		Q Dia.		R		S	
	Inches	MM	Thd.		Inches	MM	Inches	MM			Inches	MM	Inches	MM	Inches	MM	Inches	MM	Inches	MM
10			5/8-24 NEF	.591	15.01				1/4-24 NEF	1.078	27.38	1.203	30.56	.702	17.83	.666	16.92			
12			3/4-20 UNEF	.751	19.08				7/8-20 UNEF	1.266	32.16	1.391	35.33	.900	22.86	.829	21.06			
14	1.040	26.42	7/8-20 UNEF	.876	22.25	.664	16.87	1.20	1-20 UNEF	1.391	35.33	1.516	38.51	1.015	25.78	.953	24.21	.187	4.75	
16	1.023	25.98	1-20 UNEF	.995	25.27	.658	16.71	1.360	1 1/8-18 NEF	1.485	37.72	1.610	40.89	1.005	25.53	.943	23.95	.062	1.57	
18			1 1/4-18 NEF	1.126	28.60			1.641	1 1/2-18 NEF	1.610	40.89	1.735	44.07	1.255	31.88	1.192	30.28			
20			1 1/2-18 NEF	1.251	31.78			1.828	1 3/8-18 NEF	1.797	45.64	1.923	48.84	1.380	35.05	1.317	33.45	.250	6.35	
22	1.103	28.02	1 3/8-18 NEF	1.376	34.95	.727	18.47	1.954	1 1/2-18 NEF	1.923	48.84	2.047	51.99	1.505	38.23	1.442	36.63	.062	1.57	
24	1.086	27.58	1 1/2-18 NEF	1.501	38.13	.721	18.31	2.078	1 3/4-18 NEF	2.047	51.99	2.172	55.17	1.630	41.40	1.567	39.80	.062	1.57	

PLUG



Shell Size	T		U Dia. Max.		G Thread
	Inches	MM	Inches	MM	
10			.871	22.12	5/8-24 NEF
12			1.001	25.43	3/4-20 UNEF
14			1.133	28.79	7/8-20 UNEF
16	1.035	26.29	1.290	32.77	1-20 UNEF
18	1.014	25.76	1.350	34.29	1 1/4-18 NEF
20			1.470	37.34	1 1/2-18 NEF
22			1.602	40.69	1 3/8-18 NEF
24			1.711	43.46	1 1/2-18 NEF

CABLE RECEPTACLE



MINIATURE ENVIRONMENTAL CONNECTORS

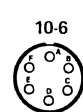
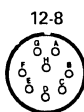
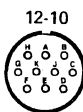
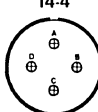
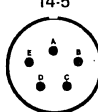
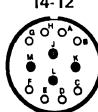
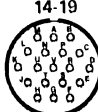
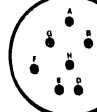
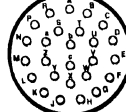
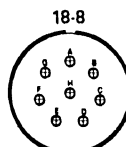
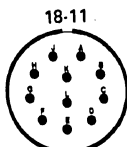
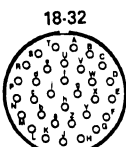
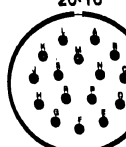
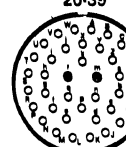
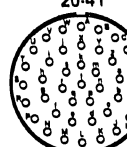
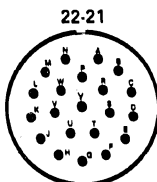
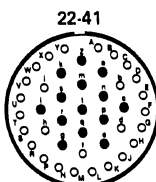
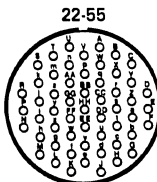
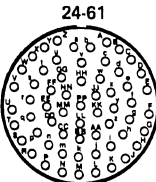
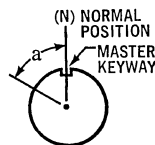
BUNKER
RAMO

AMPHENOL

MERLIN

Rear Release 118 Series Connectors

Insert Arrangements

6#20
Service Rating I8#20
Service Rating I10#20
Service Rating I4#12
Service Rating I5#16
Service Rating II8#20, 4#16
Service Rating I14#20, 1#16
Service Rating I10#20
Service Rating I8#16
Service Rating II26#20
Service Rating I8#12
Service Rating I11#16
Service Rating II32#20
Service Rating I16#16
Service Rating II37#20, 2#16
Service Rating I41#20
Service Rating I21#16
Service Rating II27#20, 14#16
Service Rating I55#20
Service Rating I61#20
Service Rating I

(N) NORMAL POSITION
MASTER KEYWAY
VERTICAL C/L OF INSERT
ROTATED IN RESPECT
TO MASTER KEYWAY

Alternate Insert Positions

Shell Size	Insert Arrangement	a				
		N	W	X	Y	Z
10	-6	0°	90°	—	—	—
12	-8	0°	90°	112°	203°	292°
12	-10	0°	60°	155°	270°	295°
14	-4	0°	45°	—	—	—
14	-5	0°	40°	92°	184°	273°
14	-12	0°	43°	90°	—	—
14	-15	0°	17°	110°	155°	234°
14	-19	0°	30°	165°	315°	—
16	-8	0°	54°	152°	180°	331°
16	-26	0°	60°	—	275°	338°
18	-8	0°	180°	—	—	—
18	-11	0°	62°	119°	241°	340°
18	-32	0°	35°	138°	222°	265°
20	-16	0°	238°	318°	333°	347°
20	-39	0°	63°	144°	252°	333°
20	-41	0°	45°	126°	225°	—
22	-21	0°	16°	135°	175°	349°
22	-41	0°	39°	135°	264°	—
22	-55	0°	30°	142°	226°	314°
24	-61	0°	30°	180°	270°	324°

* Socket Insert Shown (Pin Insert Opposite)

Contact identification is for front face of pin insert (Socket insert opposite).

How to Order

Military Standard Part Number for MIL-C-83723 Connectors

MIL-C-83723, Revision B connectors can be ordered by the Military part numbers. The connector part number is per the following example:

M 8 3 7 2 3 — 0 2 R 2 2 5 5 N

Specification Number

Shell and Contact Style

- 01 — Narrow Square Flange with socket contacts
- 02 — Narrow Square Flange with pin contacts
- 05 — Single Hole Mount with socket contacts
- 06 — Single Hole Mount with pin contacts
- 07 — Cable Receptacle with socket contacts
- 08 — Cable Receptacle with pin contacts
- 13 — Straight Plug with socket contacts
- 14 — Straight Plug with pin contacts

Connector Class

R — Fluid Resistant 200°C, conductive finish

Alternate Insert Position
N, W, X, Y, Z
As per table aboveInsert Arrangement
See above

Shell Size

10 12 14 16 18 20 22 24

Military Standard Part Number for MIL-C-26482 Connectors

MIL-C-26482 connectors can be ordered by the Military part numbers. The connector part number is per the following example:

M S 3 4 7 0 — L 2 2 5 5 P N

Specification Number

- MS3470 — Receptacle, narrow flange mount
- MS3471 — Receptacle, cable connecting
- MS3474 — Receptacle, rear mounting jam nut
- MS3476 — Plug, straight

Connector Class

- L — Fluid Resistant, 175°C, conductive finish
- E* — Non-fluid resistant, 200°C, conductive finish

Shell Size

10 12 14 16 18 20 22 24

Alternate Insert Position
N, W, X, Y, Z
As per table above

Contact Type*

- P — Pin Contact
- S — Socket Contact

*For non-power contact applications substitute "A" for "P" and "B" for "S"

Insert Arrangement
See above

* Amphenol Class E Connector is Fluid Resistant

Part Numbers Merlin 118 Connectors

To order the specific Merlin 118 connectors you want, the connector part number is per the following example:

1 1 8 — 1 0 R 2 2 — 5 5 P N

Series Designation

Military Specification

- 1 — MIL-C-83723
- 2 — MIL-C-26482

Shell Style

- 0 — Square Flange Receptacle
- 1 — Cable Connecting Receptacle
- 3 — Single Hole Mounting Receptacle
- 6 — Straight Plug

Connector Class

- R — Fluid Resistant, 200°C, conductive finish (MIL-C-83723)
- L — Fluid Resistant, 175°C, conductive finish (MIL-C-26482)
- E — Fluid Resistant, 200°C, conductive finish (MIL-C-26482)

Shell Size

10 12 14 16 18 20 22 24

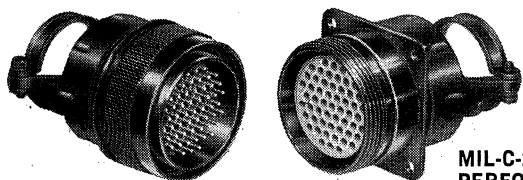
Alternate Insert Position
N, W, X, Y, Z
As per table aboveContact Type
P — Pin Contact
S — Socket ContactInsert Arrangement
See above

MINIATURE CIRCULAR CONNECTORS

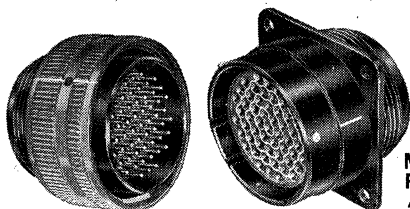
BUNKER
RAMO

AMPHENOL

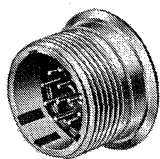
48 Series High-Reliability, Environment-Resistant Connectors



**MIL-C-26500
PERFORMANCE
48 Series Regular**



**MIL-C-38300
PERFORMANCE
48 Series
Ultra-Mate®**



Hermetically Sealed
Receptacle

SIGNIFICANT ADVANCE IN STATE-OF-THE-ART

On the ground or in space, wherever there is a requirement for superior environmental protection, high reliability, and minimum weight and bulk, 48 Series miniature environment-resistant connectors are the answer.

In developing this series, Amphenol faced the problem of satisfying reliability, logistics, and present and anticipated environmental requirements for connector usage. To solve the problem, Amphenol had to generate advanced design concepts, formulate materials specifically for connector usage, and work out new production techniques. The resulting connectors exceed the stringent requirements of MIL-C-26500(USAF) and MIL-C-38300(USAF) for performance and reliability.

FULL PERFORMANCE IN EXTREME ENVIRONMENTS

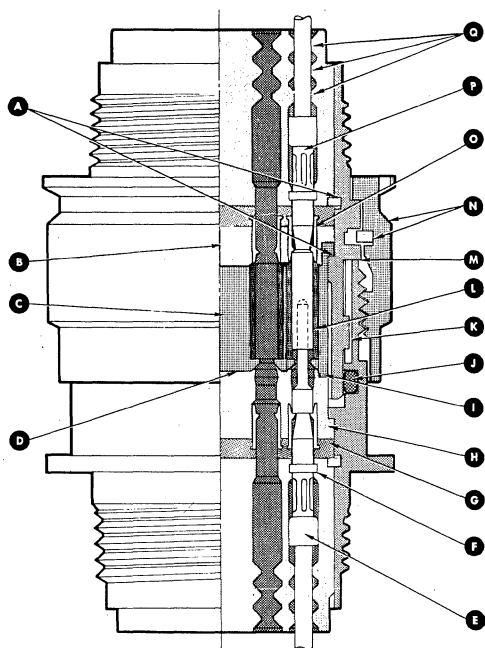
Advance materials technology and complete environmental sealing enable these remarkable connectors to:

- Operate continuously at 200°C (392°F)
- Withstand thermal shock cycling from -55°C (-67°F) to 260°C (500°F)
- Support 1500V RMS from sea level to 350,000 ft., mated
- Maintain environmental and electrical integrity during and after 0 to 2000 CPS vibration during exposure to 200°C (392°F) and -55°C (-67°F)
- Withstand physical shock of 100 gravity units
- Resist corrosion, ozone, sand and dust

ULTRA-MATE® CLOSED ENTRY AND FRONT SERVICING

Ultra-Mate connectors are identical to the other connectors in the 48 Series, but the socket inserts have a hard face of glass-filled epoxy. They are the first to combine the positive reliability of closed entry with the speed and convenience of front servicing. In addition, the MIL-C-26636 contacts are tamper proof. Wrong-size contacts or oversize test prods cannot be inserted in the hard dielectric contact entryways on the socket inserts.

OUTSTANDING DESIGN FEATURES



- A. POSITIVE LOCATION CAPTIVATED INSERT (MECHANICAL INTERLOCK)
- B. RESILIENT REAR INSERT
- C. CLOSED ENTRY HARD DIELECTRIC "ULTRAMATE" FRONT INSERT
- D. INSERT STATIC FACE SEAL
- E. PIN CONTACT, MIL-C-26636
- F. CONTACT PRESSURIZING SEAL
- G. ANTI-DEFLECTION DISC
- H. RESILIENT PIN INSERT
- I. INSERT RIM SEAL

- J. DYNAMIC "O" RING SHELL SEAL
- K. FIVE KEY SHELL POLARIZATION
- L. RELEASING SLEEVE
- M. METAL TO METAL SHOULDER
- N. BAYONET OR THREADED COUPLING, PERMANENT CAPTIVATION
- O. CONTACT RETENTION CLIP
- P. SOCKET CONTACT, MIL-C-26636
- Q. SELF-SEALING, THREE-RISER REAR GROMMET

COMPLETE ENVIRONMENTAL SEALING

48 Series connectors are fully sealed against extreme environmental conditions.

Amphenol-developed, silicone rubber dielectric provides resilience and unsurpassed resistance to tear, compression set, fluids and high temperatures.

When the connectors are mated, insert faces compress to form a resilient dielectric seal around each individual contact. A continuous barrier on the periphery of the socket insert mates with a recess around the pin insert to form an additional compression seal. A dynamic "O" ring seal between mated shells constitutes still another barrier to dirt and moisture, and protects the integrity of the face seals. Together with monoblock construction, this puts void-free, continuous dielectric around each contact through the entire connector length.

Monoblock construction, with bonded interfaces between the dielectric components (insert, anti-deflection disc, and grommet) eliminates air voids and protects connectors from degrading moisture and altitude conditions. A pressurizing seal around each contact at the major O.D. prevents the passage of air or moisture through the contact hole, and triple sealing riser design at each wire hole in the grommet seals each individual wire.

GO/NO-GO RELIABILITY

When an Ultra-Mate connector is mated, you can be sure there is proper contact. The socket contacts are closely surrounded by hard dielectric with a chamfered entry to guide in the pins accurately. However, if the pins are bent, the hard dielectric presents a closed entry and prevents mating.

LIGHT WEIGHT AND HIGH CONTACT DENSITY

Connector shells are impact-extruded aluminum forgings with a high strength-to-weight ratio. The insert arrangement is designed for the maximum number of contacts within the area available.

POKE-HOME® CONTACTS

Poke-home contacts (front release, rear insertable) provide for easy servicing of connector circuits without disassembling the connector from its mounting, or disturbing adjacent contacts. MIL-C-26636 contacts are crimped quickly, consistently, and reliably with either hand or power tools. They have high electrical conductivity, present a smooth configuration, and completely protect electrical contact pressure-members from environmental and handling damage. The contacts come in sizes 20, 16, 12 and shielded, with rhodium-over-silver plating. Other platings such as gold are available; write factory for details.)

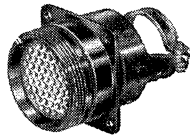
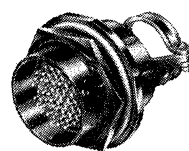
MINIATURE CIRCULAR CONNECTORS

BUNKER
RAMO

AMPHENOL

48 Series High-Reliability, Environment-Resistant Connectors (Continued)

Shell Types

Threaded Plug
48-06RXX-XXX
MS24266RXTXXXThreaded Square
Flange Receptacle
48-00RXX-XXX
MS24264RXTXXXThreaded Single Hole
Mounting Receptacle
48-03RXX-XXX
MS24265RXTXXXBayonet Plug
48-16RXX-XXX
MS24266RXXBXXXBayonet Single Hole
Mounting Receptacle
48-13RXX-XXX
MS24265RXXBXXXBayonet Square
Flange Receptacle
48-10RXX-XXX
MS24264RXXBXXX

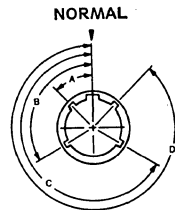
Alternate Shell Positions

	For Connectors Size 8 and 10				For Connectors Size 12, 14, 16, 18, 20, 22, and 24			
Position	A	B	C	D	A	B	C	D
Normal	105°	140°	215°	265°	105°	140°	215°	265°
6*	102°	132°	248°	320°	18°	149°	192°	259°
7	80°	118°	230°	312°	92°	152°	222°	342°
9	64°	155°	234°	304°	24°	135°	199°	240°
8	35°	140°	205°	275°	84°	152°	204°	334°
10*	25°	115°	220°	270°	98°	152°	268°	338°

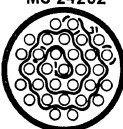
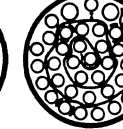
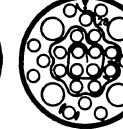
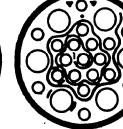
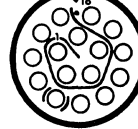
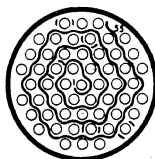
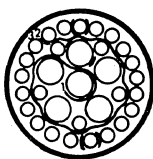
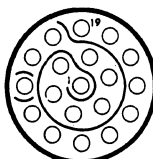
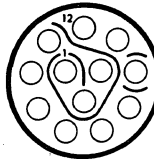
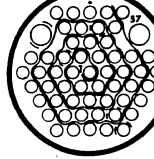
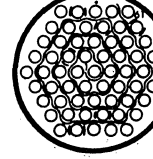
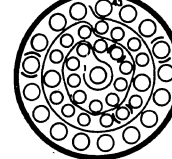
* Position 10 not available in size 8 connector.

Front Face of Receptacle Shown

Note: Alternate positions 6 through 10 incorporate special shell polarizing key and key-ways. All inserts remain in the normal position.



Inserts Available (Showing front face of socket insert)

SHELL SIZE — 8
MS-275612 #20 contacts
Insert 8-2*3 #20 contacts
Insert 8-35 #20 contacts
Insert 10-5†2 #20 contacts
Insert 10-2*2 #16 contacts
Insert 10-20*SHELL SIZE — 12
MS-2426012 #20 contacts
Insert 12-12†3 #16 contacts
Insert 12-3SHELL SIZE — 14
MS-2426015 #20 contacts
Insert 14-15†9 #20 contacts
3 #16 contacts
Insert 14-12*7 #16 contacts
Insert 14-7†4 #12 contacts
Insert 14-4†2 #16 contacts
1 #2 shielded contact
Insert 14-3SHELL SIZE — 16
MS-2426124 #20 contacts
Insert 16-24†10 #16 contacts
Insert 16-10*SHELL SIZE — 18
MS-2426231 #20 contacts
Insert 18-31†14 #16 contacts
Insert 18-1410 #16 contacts
1 #2 shielded contact
Insert 18-118 #12 contacts
Insert 18-8†41 #20 contacts
Insert 20-41†*37 #20 contacts
2 #16 contacts
Insert 20-39*24 #20 contacts
4 #12 contacts
Insert 20-28†19 #20 contacts
6 #12 contacts
Insert 20-25†16 #16 contacts
Insert 20-16*SHELL SIZE — 22
MS-2426355 #20 contacts
Insert 22-55†26 #20 contacts
6 #12 contacts
Insert 22-32†*19 #16 contacts
Insert 22-19†12 #12 contacts
Insert 22-12†SHELL SIZE — 24
MS-275612 #12 contacts
55 #20 contacts
Insert 24-57†*61 #20 contacts
Insert 24-61†*23 #20 contacts
20 #16 contacts
Insert 24-43*

† Available with hard-dielectric face socket inserts for Ultra-Mate (MIL-C-38300) connectors. Pin inserts for MIL-C-38300 connectors have a resilient face and, except for marking, are identical to MIL-C-26500 pin inserts.

* Not included MS-2426X at time of printing.

† #1 shielded contact is interchangeable with #12 power contact

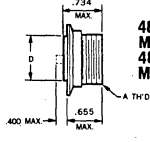
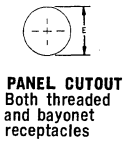
MINIATURE CIRCULAR CONNECTORS

BUNKER
RAMO AMPHENOL

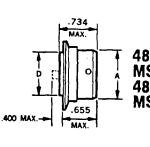
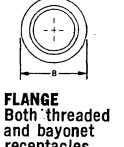
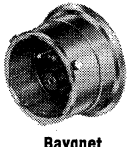
48 Series High-Reliability, Environment-Resistant Connectors (Continued)

Hermetic Receptacles

SOLDER FLANGE

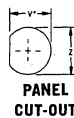
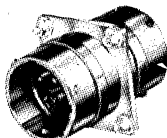
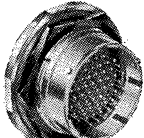
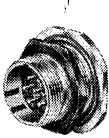


48-05HXX-XXP(108)
MS27034HXXT-XXP
48-05HXX-XXP
MS27034YXXT-XXP



48-15HXX-XXP(108)
MS27034H-XXB-XXP
48-15HXX-XXP
MS27034Y-XXB-XXP

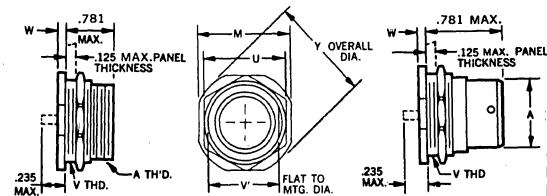
SINGLE HOLE MOUNTING



THREADED

BAYONET

48-7005



48-03HX-XXX
*MS24265HXXT-XXX
**MS24265HXXTXEX
or CX

FLANGE AND NUT
BOTH THREADED AND
BAYONET RECEPTILES

48-13HXX-XXX
*MS24265HXXB-XXX
**MS24265HXXTXEX CX
or CX

* Specify whether solder pocket or eyelet contact tail is desired.
** E = Eyelet Contact C = Solder Pocket Contact

Hermetically sealed receptacles in the 48 Series have a leakage rate of less than .01 micron cubic foot of helium per hour with one atmosphere differential. To simplify contact identification, Amphenol puts contact spiral markings on the glass dielectric as well as on the face seal. It uses its exclusive identoseal process to mark the glass.

The receptacles are available with either threaded or bayonet coupling in either of two shell styles: solder flange or single hole hex nut mounting shells. They take most of the 48 Series pin inserts shown on these pages. The part numbers to use in ordering are shown in the table on the following page.

The shells are non-magnetic stainless steel. The contacts are made of 52 alloy and are rhodium plated, flattened and pierced. Solder cups are furnished when you order deviation (108).

Amphenol 48 Series Hermetics are built to the specifications of MIL-C-26500. The temperature and electrical capabilities correspond directly to the 48 Series Resilient Connector.

Shell Size	A +.000 -.005	A Thrd.	B Max.	D Max.	+ .010 -.000 E
10	.659	1 1/16-24	.860	.557	.567
12	.829	7/8-20	1.065	.750	.755
14	.898	1 1/8-20	1.110	.807	.817
16	1.025	1 1/4-18	1.230	.933	.942
18	1.131	1 1/2-18	1.360	1.057	1.067
22	1.381	1 3/4-18	1.610	1.307	1.317

Write factory for information on sizes 8, 20 and 24.

HERMETICALLY SEALED RECEPTACES

Hermetically sealed, feed-through connector. Has bayonet coupling, mates with 48-16R14-3S or 48-16R14-21S.

Offers all features of MIL-C-26500B (USAF), including continuous operation at 200°C; interfacial insert seal; insert rim seal, and dynamic O ring between shells; visual full engagement indicators for mating; and five polarizing keys in alternate positions to prevent mismatching.

SPECIFICATIONS

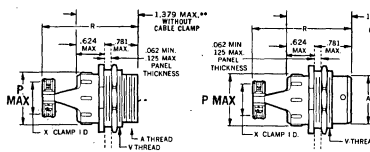
Derated current ratings at continuous operation for contacts of #52 alloy

Contact Size	Amps.	For AWG Wire Size
20	5	24-22-20
16	10	18-16
12	20	14-12
#2 Shielded	5	

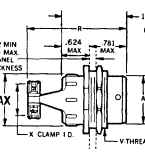
Shell Size	A +.000 -.005	A Thrd.	Y Max.	M Max.	U Max.	V Thrd.	V' ±.003	V'' ±.005	W Max.	Z ±.005
10	.659	1 1/16-24	1.192	1.109	.953	3/4-20	.718	.730	.137	.760
12	.829	7/8-20	1.380	1.296	1.140	1 1/8-20	.905	.917	.137	.947
14	.898	1 1/8-20	1.505	1.396	1.250	1-20	.968	.980	.137	1.010
16	1.025	1 1/4-18	1.630	1.521	1.329	1 1/8-20	1.093	1.105	.137	1.135
18	1.131	1 1/2-18	1.740	1.646	1.455	1 1/4-20	1.217	1.225	.137	1.260
22	1.381	1 3/4-18	2.040	1.959	1.705	1 1/2-20	1.467	1.475	.137	1.510

Write factory for information on sizes 18 and 24.

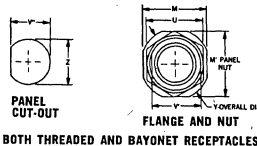
Single Hole Mounting Receptacles



THREADED RECEPTACLE
48-03RXX-XXX
MS24265RXXT-XXX



BAYONET RECEPTACLE
48-13RXX-XXX
MS24265RXXB-XXX



PANEL CUT-OUT
BOTH THREADED AND BAYONET RECEPTILES

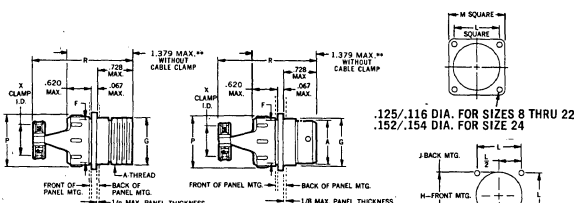
Shell Size	A Thrd.	A +.000 -.005	M Max.	M' Max.	P Max.*	U Max.	V Thrd.	V' ±.003	V'' ±.005	X ±.015	Y Max.	Z ±.005	R Max.
8	1/8-24	.536	.984	.938	.582	.828	5/8-20	.593	.605	.180	1.068	.635	1.890
10	1 1/16-24	.659	1.109	1.082	.731	.953	3/4-20	.718	.730	.270	1.192	.760	1.890
12	7/8-20	.829	1.296	1.299	.919	1.140	1 1/8-20	.905	.917	.400	1.380	.947	1.890
14	1 1/8-20	.898	1.396	1.371	.981	1.250	1-20	.968	.980	.460	1.505	1.010	2.125
16	1 1/4-18	1.025	1.521	1.515	1.106	1.329	1 1/8-20	1.093	1.105	.610	1.630	1.135	2.125
18	1 1/2-18	1.131	1.646	1.660	1.231	1.455	1 1/4-20	1.217	1.225	.690	1.740	1.260	2.125
20	1 3/4-18	1.256	1.771	1.770	1.356	1.642	1 1/2-20	1.342	1.350	.830	1.860	1.385	2.125
22	1 3/4-18	1.381	1.959	1.948	1.481	1.705	1 1/2-20	1.467	1.475	.940	2.040	1.510	2.125
24	1 3/4-18	1.506	2.084	2.084	1.606	1.892	1 1/2-18	1.592	1.600	1.040	2.160	1.635	2.125

**Add .042 for Ultra-Mate connectors with socket inserts.

Recommended Minimum Torque for Jam Nut

Shell Size	8	10	12	14	16	18	20	22	24
Torque (Inch/Lbs.)	28	36	56	64.5	69	81	102	122.5	144

Square Flange Receptacles



THREADED RECEPTACLE
48-00RXX-XXX
MS24264RXXT-XXX

BAYONET RECEPTACLE
48-10RXX-XXX
MS24264RXXB-XXX

.132/.122 DIA. FOR SIZES 8 THRU 22
.159/.149 DIA. FOR SIZE 24
PANEL CUT-OUT DIMENSIONS
FOR BOTH THREADED AND
BAYONET RECEPTILES

Shell Size	A Thrd.	A +.000 -.005	F Max.	G Max.	H Min.	J Min.	L ±.005	M ±.005	P Max.	X ±.015	R Max.
8	1/8-24	.536	.437	.561	.447	.620	.594	.812	.582	.180	1.890
10	1 1/16-24	.659	.562	.696	.572	.748	.719	.937	.731	.270	1.890
12	7/8-20	.829	.750	.875	.760	.913	.812	1.031	.919	.400	1.890
14	1 1/8-20	.898	.812	.935	.822	.980	.906	1.125	.981	.460	2.125
16	1 1/4-18	1.025	.938	1.062	.948	1.107	.969	1.250	1.106	.610	2.125
18	1 1/2-18	1.131	1.062	1.187	1.072	1.209	1.062	1.343	1.231	.690	2.125
20	1 3/4-18	1.256	1.182	1.312	1.192	1.337	1.156	1.437	1.356	.830	2.125
22	1 3/4-18	1.381	1.312	1.437	1.322	1.452	1.250	1.562	1.481	.940	2.125
24	1 3/4-18	1.506	1.432	1.562	1.442	1.577	1.375	1.703	1.606	1.040	2.125

**Add .042 for Ultra-Mate connectors with socket inserts.

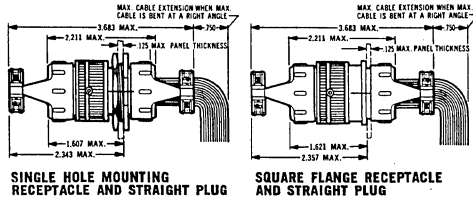
MINIATURE CIRCULAR CONNECTORS

BUNKER
RAMO

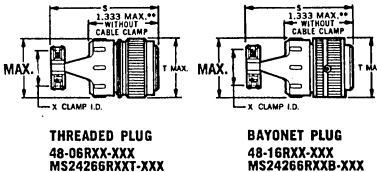
AMPHENOL

48 Series High-Reliability, Environment-Resistant Connectors (Continued)
Single Hole Mounting Hermetic Receptacles

Mated Pairs Threaded or Bayonet Coupling



Plugs



Shell Size	P Max.*	T Max.*		X ±.015	S Max.
		Thrd.	Bay.		
8	.582	.708	.766	.180	1.832
10	.731	.836	.906	.270	1.832
12	.919	1.025	1.078	.400	1.832
14	.981	1.125	1.141	.460	2.067
16	1.106	1.250	1.266	.610	2.067
18	1.231	1.375	1.375	.690	2.067
20	1.356	1.510	1.510	.830	2.067
22	1.481	1.625	1.625	.940	2.067
24	1.606	1.760	1.760	1.040	2.067

How to Order:

Amphenol Numbers

To get the specific 48 Series connector you want, put together the part number as per the following typical example.

48 - 0 6 R 22 - 55 P 6 - (102)

SERIES DESIGNATION	COUPLING TYPE	SHELL STYLE	ENVIRONMENTAL CLASS	SHELL SIZE	NUMBER OF CONTACTS	CONTACT STYLE	Alternate Shell Positions	DEVIATIONS
48-	0—Threaded 1—Bayonet	0—Square Flange Receptacle 3—Single Hole Mounting Receptacle † 5—Solder Flange Mounting Receptacle (Hermetic only) † 6—Straight Plug	R—Meets MIL-C-26500 (USAF) Hard Socket Insert *C—Meets MIL-C-38300 (USAF) H—Hermetically Sealed † G—Grounding F—Fluid Resistant	8, 10, 12, 14, 16, 18, 20, 22, 24	2, 3, 4, 5, 7, 8, 10, 11, 12, 14, 15, 16, 19, 24, 25, 28, 31, 32, 39, 41, 43, 55, 57, or 61	P—Pin S—Socket	6, 7, 8, 9, 10 as per table	(100) Connector for Potting (102) Connector Less Cable Support † (105) Connector Less Contacts † (106) Connector Less Contacts and Less Cable Support † (108) Hermetic Receptacle with Solder Cup Contact (135) Gold Iridite Finish on Shell — 48-XXGXX-XX(135) *(145) MIL-C-38300 Resilient Insert "P" contact only

See Table of available inserts

†Hermetics are available in receptacle shell style "X3" (MS24265) and "X5" (MS27034).

*The 48 Series part numbers for Ultra-Mate connectors (MIL-C-38300) are 48-XXCXX-XXSX and 48-XXRXX-XXPX(145). MIL-C-38300 connectors are furnished without cable clamp. If a cable support is desired, it must be ordered separately.

†Marked with MS part number per MIL-C-26500C.

Military Standard Part Numbers

You can use MS as well as Amphenol part numbers in ordering 48 Series connectors. The MS part numbers for MIL-C-26500 connectors are worked out on the basis shown in the table below. Please take special note that MIL-C-26500D Revision has eliminated the cable support from the callout. Amphenol allows 48 Series connectors to be ordered by either MIL-C-26500 Rev C or Rev. D in order to alleviate the many logistic problems that were

created by Revision D. To eliminate delays please specify to what MIL-C-26500 revision level the connectors are being ordered.

The part numbers for MIL-C-38300 connectors start off with the identification M38300/ and take the form M38300/XXX-XXX. To determine the specific M numbers, refer to military specification MIL-C-38300.

MS24266 R 22 T 55 P 6 X							
MS SHELL DRAWING	ENVIRONMENTAL CLASS	SHELL SIZE	COUPLING TYPE	NUMBER OF CONTACTS	CONTACT STYLE	Alternate Shell Positions	CABLE SUPPORT
MS24264—Square Flange Receptacle MS24265—Single Hole Mounting Receptacle † MS24266—Straight Plug MS27034—Solder Flange Mounting Receptacle (Hermetic only)	R—Meets MIL-C-26500 (USAF) †G—Grounding H—Hermetically Sealed † Solder Pocket Contacts Y—Hermetically Sealed † Flattened and Pierced Contacts	8, 10, 12, 14, 16, 18, 20, 22, or 24	T—Threaded B—Bayonet	2, 3, 4, 5, 7, 8, 10, 11, 12, 14, 15, 16, 19, 24, 25, 28, 31, 32, 39, 41, 43, 55, 57, or 61	P—Pin S—Socket C—Solder Pocket E—Eyelet	6, 7, 8, 9, 10	X—Less cable support (Omit if cable support is desired) Applies only when ordering to MIL-C-26500C

Part numbers, both Amphenol and Military Standard, for the contacts and assembly tools are listed below.

†Hermetics are available in receptacle shell style (MS24265) and (MS27034).

†Contact nearest Amphenol sales office for availability.

Poke-Home Contacts and Tool Applications

CONTACTS—When you order 48 Series connectors with contacts, the contact package contains enough contacts to complete the insert arrangement and have at least 2 spares left. The package also includes enough sealing plugs for at least 15% of the contacts in the insert, in any case a minimum of 3 sealing plugs. To provide proper sealing, insert unwired contacts and sealing plugs in all unused holes. (Use a #12 contact for a

#1 shielded hole.) To order contacts and sealing plugs separately use the part numbers in the table below. Contacts may also be ordered in reels for use with automatic crimping tools.

TOOLS—Note that various tools are available for crimping, inserting, and removing each size contact.

Contact Size	Wire Size AWG	Max. Current Rating Amps.	AMPHENOL Part No.		MS Part No.		Crimping Tool	Bushing (Positoner)	Crimp Jaw Setting Dia. (Insp.)	Insertion Tool	Removal Tool	
			Pin	Socket	Pin	Socket					Standard Connector	Ultra-Mate Connector
No. 20	24 22 20	3.0 5.0 7.5	48-1595-02	248-136-2001S-02	MS24254-20P	MS24255-20S	294-126 294-186 294-243 294-293 294-358 294-506	Included 294-1266 Turret Hd. Turret Hd. 294-444 Automatic	.031-.041 .031-.041 .031-.041	294-88 (MS24256A20)	294-89 (MS24256R20)	294-203, (MS24256RH20)
No. 16	18 16	16 22	48-1825-02	48-100-1600S-02 OR 248-136-1600S-02	MS24254-16P	MS24255-16S	294-126 294-243 294-293 294-358 294-506	Included 294-243 Turret Hd. Turret Hd. 294-901 Automatic	.041-.053 .041-.053	294-96 (MS24256A16)	294-97 (MS24256R16)	294-180, (MS24256RH16)
No. 12	14 12	32 41	48-1827-02	48-1215-02 OR 248-136-1200S-02	MS24254-12P	MS24255-12S	294-86 294-126 294-243 294-293 294-358 294-506	Included 294-903 Turret Hd. Turret Hd. 294-903 Automatic	.0625 .062-.072 .062-.072	294-72 (MS24256A12)	294-73 (MS24256R12)	294-183, (MS24256RH12)

CONTACT FACTORY FOR INFORMATION AND SPECIFICATIONS ON SHIELDED CONTACTS

HIGH-DENSITY CONNECTORS

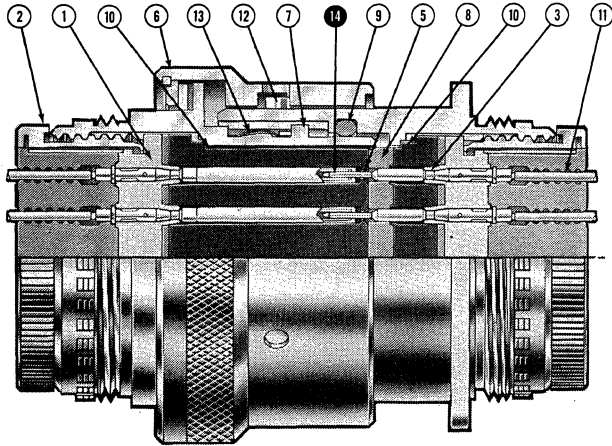
BUNKER
RAMO

AMPHENOL

ASTRO/348

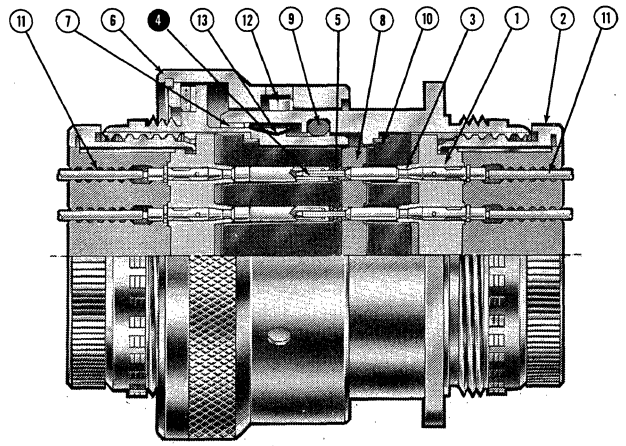
DESIGN FEATURES — CIRCULAR CONNECTORS

SERIES 1



Series 1 Construction

SERIES 2

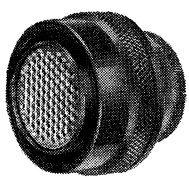


Series 2 Construction

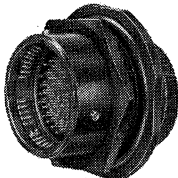
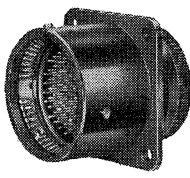
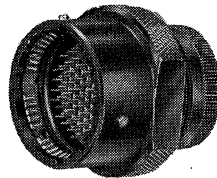
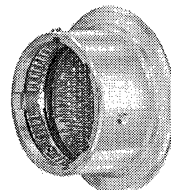
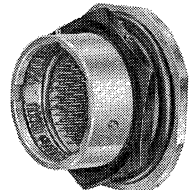
- 1 Molded One-Piece Contact Retention Disc.
- 2 Captivated Rear-Locking Nut (Metal to Metal Bottoming).
- 3 Individual Contact Risers.
- 4 Anti-Scoop Recessed Pin Contacts (in receptacle).
- 5 Closed Entry Socket Insert and Contacts.
- 6 Captivated Triple Bayonet Coupling System.
- 7 5 Key Shell Polarization. (Series 2 size 8 has 2 keys.)
- 8 Interfacial Mating Seal.
- 9 Dynamic "O" Ring Peripheral Shell Ring.
- 10 Monoblock Construction — Inserts Bonded to Shells.

- 11 Self-Sealing Rear Grommets.
- 12 Visual Mating Indicator.
- 13 Shell to Shell Grounding Fingers.
- 14 Anti-Scoop Recessed Pin Contacts (in Plug and Receptacle).
- 15 Connectors will accommodate $\frac{1}{8}$ " (.375 to .500) variation in gap between mounting surfaces.
- 16 Connectors will accommodate radial misalignment of up to .031 — (.062 total float).
- 17 Conical float spring maintains interfacial seal.
- 18 2 Key Shell polarization.

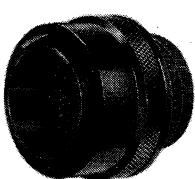
Shell Constructions — Series 2



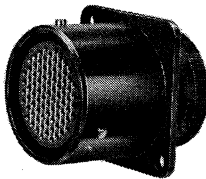
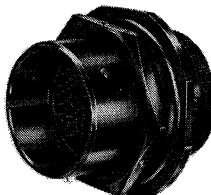
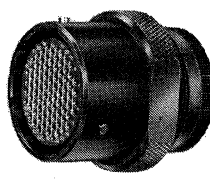
Plug

Single Hole
Mtg. ReceptacleSquare
Flange
ReceptacleCable
ReceptacleHermetic Seal —
Solder Flange
ReceptacleHermetic Seal —
Receptacle
Single Hole Mtg.

Series 1



Plug

Square Flange
ReceptacleSingle Hole
Mtg. Receptacle

Cable Receptacle

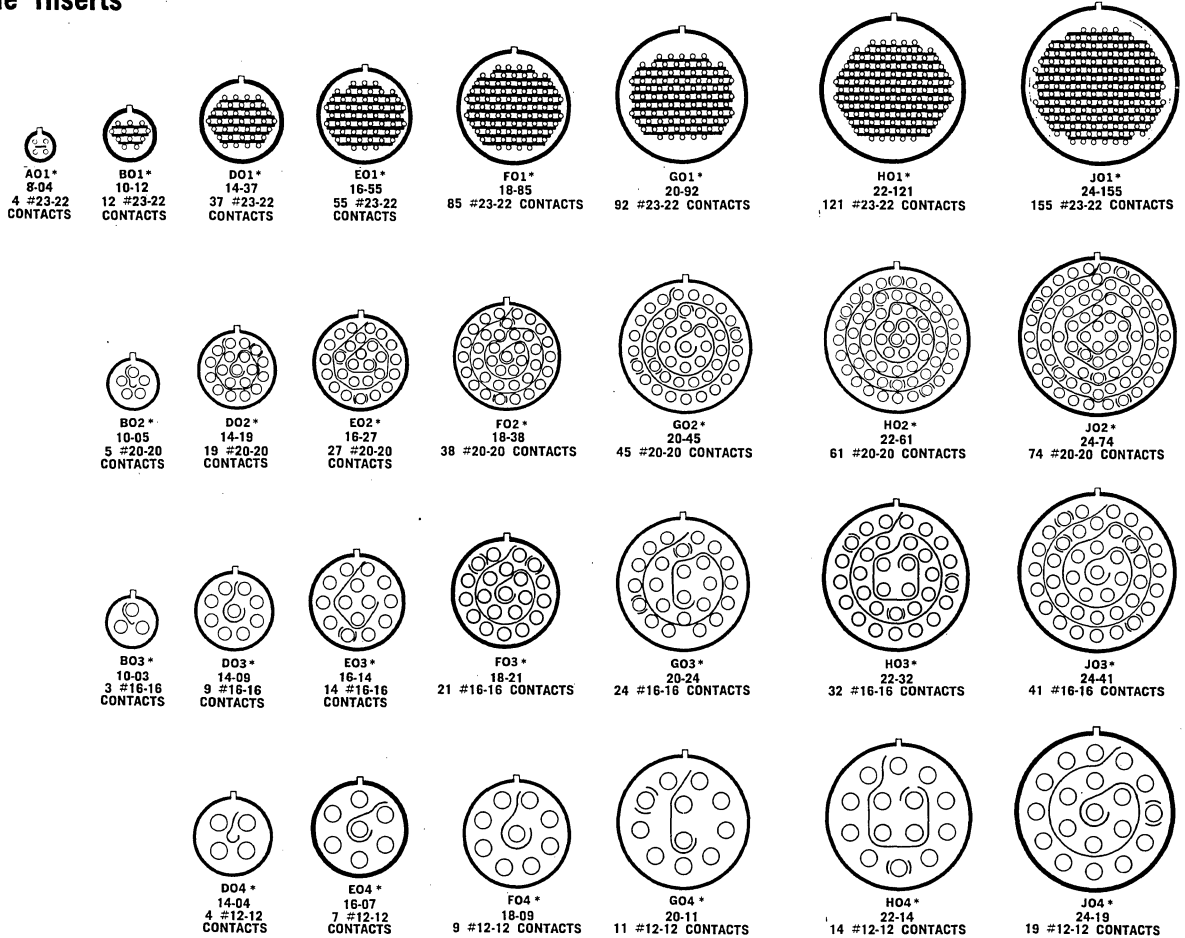
HIGH-DENSITY CONNECTORS

BUNKER
RAMO

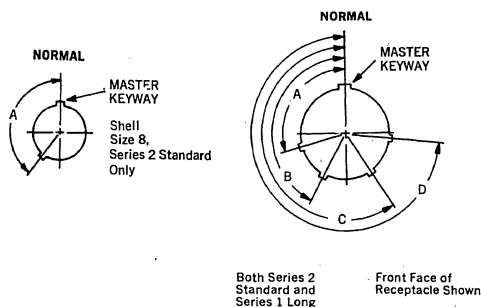
AMPHENOL

Amphenol ASTRO/348 High Density Connectors (Continued)

Available Inserts



ALTERNATE SHELL POSITIONS

STANDARD
SERIES 2
(Angular Location)

Key and Keyway Arrangement	Shell Size 8				Shell Sizes 10 and 14				Shell Sizes 16 and 18			
	A	B	C	D	A	B	C	D	A	B	C	D
1	128°	105°	140°	215°	265°	105°	140°	215°	265°			
2	190°	102°	132°	248°	320°	18°	149°	192°	259°			
3	205°	80°	118°	230°	312°	92°	152°	222°	342°			
4	220°	35°	140°	205°	275°	84°	152°	204°	334°			
5	235°	64°	155°	235°	304°	24°	135°	199°	240°			
6	250°	35°	115°	220°	270°	98°	152°	268°	338°			

LONG
SERIES 1
(Angular Location)

Key and Keyway Arrangement	Shell Size 8				Shell Sizes 10 and 14				Shell Sizes 16, 18, 20, 22, 24			
	A	B	C	D	A	B	C	D	A	B	C	D
1	105°	140°	215°	265°	95°	141°	208°	236°	80°	142°	196°	293°
2	102°	132°	248°	320°	113°	156°	182°	292°	135°	170°	200°	310°
3	80°	118°	230°	312°	90°	145°	195°	252°	49°	169°	200°	244°
4	35°	140°	205°	275°	53°	156°	220°	255°	66°	140°	200°	257°
5	64°	155°	234°	304°	119°	146°	176°	298°	62°	145°	180°	280°
6	91°	131°	197°	240°	51°	141°	184°	242°	79°	153°	197°	272°

GROUNDING FINGERS

SERIES 2



SERIES 1



Shell-to-shell grounding is established by beryllium spring fingers permanently fixed to the Series 2 receptacle shell and permanently fixed to the Series 1 plug shell. These spring fingers, spaced at a minimum of 6 per inch (except at key-ways in Series 2 construction), make contact at least .090 inch before pin-socket electrical engagement occurs during mating and maintain contact at least .090 inch after pin-socket disengagement during unmating.

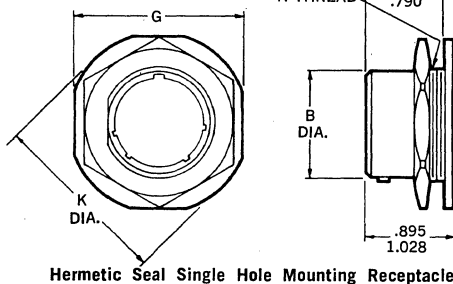
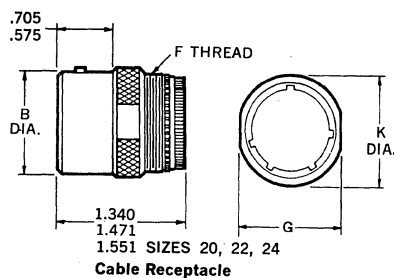
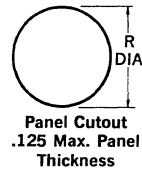
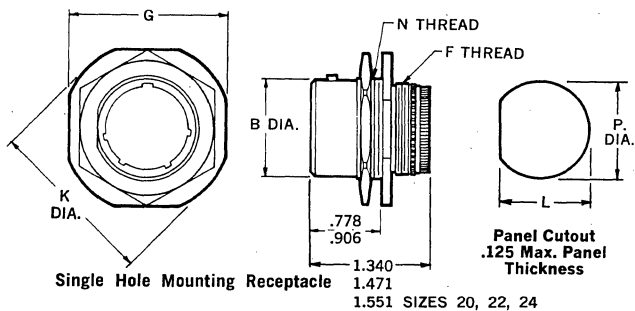
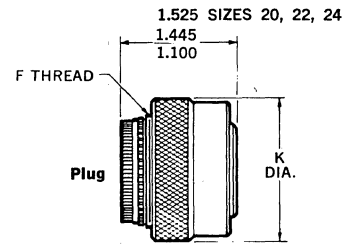
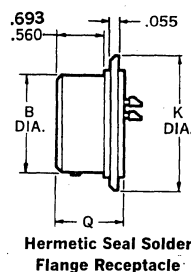
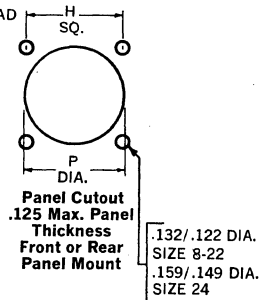
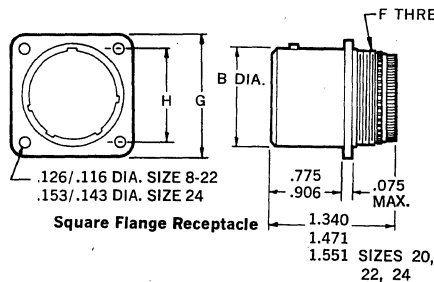
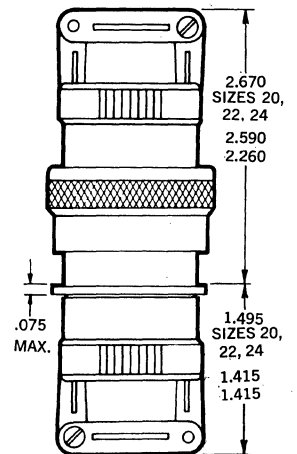
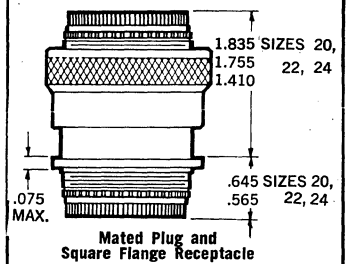
HIGH-DENSITY CONNECTORS

BUNKER
RAMO

AMPHENOL

Amphenol ASTRO/348 High Density Connectors (Continued)

Shell Style and Dimensions (inches) All dimensions are shown as MAX.

Mated Connectors
Dimensions (inches)

Dimension	SHELL SIZE												
	8- Standard Series 2	8-Long Series 1	10- Standard Series 2	10-Long Series 1	14- Standard Series 2	14-Long Series 1	16- Standard Series 2	16-Long Series 1	18- Standard Series 2	18-Long Series 1	20-Long Series 1	22-Long Series 1	24-Long Series 1
B Dia. Max.	.553	.553	.678	.678	.928	.928	1.054	1.054	1.178	1.178	1.303	1.428	1.553
F Thread	½-28	½-28	¾-28	¾-28	7⁄8-28	7⁄8-28	1-28	1-28	1⅛-28	1⅛-28	1¼-28	1⅝-28	1½-28
G Max. Sq. Flange Recept.	.820	.820	.945	.945	1.133	1.133	1.258	1.258	1.351	1.351	1.475	1.570	1.711
G Max. Cable Recept. Flats	.565	.565	.690	.690	.940	.940	1.066	1.066	1.190	1.190	1.315	1.440	1.565
G Single Hole Mtg. Recept. & Herm. Seal "D" Hole Recept.	.989	.989	1.114	1.114	1.401	1.401	1.526	1.526	1.651	1.651	1.776	1.901	2.026
H ±.005	.594	.594	.719	.719	.906	.906	.969	.969	1.062	1.062	1.156	1.250	1.375
K Dia. Max. Cable Recept.	.780	.780	.900	.900	1.150	1.150	1.280	1.280	1.400	1.400	1.525	1.650	1.775
K Dia. Max. Single Hole Mtg. Recept. & Herm. Seal Single Hole	1.072	1.072	1.197	1.197	1.510	1.510	1.635	1.635	1.745	1.745	1.870	1.995	2.120
K Dia. Max. Plug	.850	.850	.975	.975	1.225	1.225	1.350	1.350	1.475	1.475	1.624	1.749	1.874
K Dia. Max. Herm. Seal Solder Flange Recept.	.945	.945	1.070	1.070	1.320	1.320	1.446	1.446	1.570	1.570	1.816	1.941	2.066
L ±.005	.605	.605	.730	.730	.980	.980	1.105	1.105	1.230	1.230	1.355	1.480	1.605
N Thread	⅝-20	⅝-20	¾-20	¾-20	1-20	1-20	1⅛-20	1⅛-20	1¼-20	1¼-20	1⅝-20	1½-20	1⅞-20
P Dia. ±.005	.635	.635	.760	.760	1.010	1.010	1.135	1.135	1.260	1.260	1.385	1.510	1.635
Q Max.	.710	.843	.710	.843	.710	.843	.710	.843	7.40	.873	.903	.903	.903
R Dia. ±.005	.661	.661	.786	.786	1.036	1.036	1.162	1.162	1.286	1.286	1.411	1.536	1.661

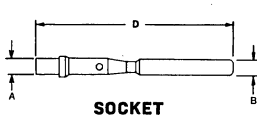
HIGH-DENSITY CONNECTORS



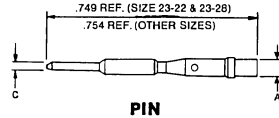
AMPHENOL

ASTRO/348
CONTACTS

DIMENSIONS



SOCKET



PIN

Size	A Max.		B Max.		C Max.		D Ref.		Current Rating
	Series 2	Series 1	Series 2	Series 1	Series 2	Series 1	Series 2	Series 1	
23-22	.050	.050	.051	.051	.028	.028	.713	1.043	5.0 Amps
23-28	.050	.050	.051	.051	.028	.028	.713	1.043	1.5 Amps
20-20	.078	.078	.078	.078	.041	.041	.718	1.048	7.5 Amps
16-16	.103	.103	.113	.113	.063	.063	.718	1.048	13.0 Amps
12-12	.158	.158	.161	.161	.095	.095	.718	1.048	23.0 Amps

TABLE OF POWER CONTACTS

Contact Size	Wire Size	Amphenol Part Number		MS Part Number	
		Socket	Pin	Socket	Pin
23-22	#22, #24, #26	348-100-2201S-02	348-100-2202P-02	MS90460A23-22	MS90461A23-22
23-28	#28, #30, #32	348-100-5047S-02	348-100-5047P-02	MS90460A23-28	MS90461A23-28
20-20	#20, #22, #24	348-100-2000S-02	348-100-2000P-02	MS90460A20-20	MS90461A20-20
16-16	#16, #18, #20	348-100-1600S-02	348-100-1600P-02	MS90460A16-16	MS90461A16-16
12-12	#12, #14	348-100-1200S-02	348-100-1200P-02	MS90460A12-12	MS90461A12-12
23-22	#22, #24, #26	348-100-2203S-02	348-100-2202P-02	MS3343A23-22	MS90461A23-22
23-28	#28, #30, #32	348-100-5048S-02	348-100-5047P-02	MS3343A23-28	MS90461A23-28
20-20	#20, #22, #24	348-100-2003S-02	348-100-2000P-02	MS3343A20-20	MS90461A20-20
16-16	#16, #18, #20	348-100-1603S-02	348-100-1600P-02	MS3343A16-16	MS90461A16-16
12-12	#12, #14	348-100-1203S-02	348-100-1200P-02	MS3343A12-12	MS90461A12-12

Note: Shielded and thermocouple contacts available, consult factory.

TABLE OF THERMOCOUPLE CONTACTS

Contact Size		Material	Wire Size	Amphenol Part Number	
				Socket	Pin
20-20	SERIES 2	LEADED COPPER	#20, #22, #24	348-100-5014S	348-100-5014P
	SERIES 1	COPPER		348-100-5019S	348-100-5014P
	SERIES 2	ALUMEL		348-100-5015S	348-100-5015P
	SERIES 1			348-100-5020S	348-100-5015P
	SERIES 2	CHROMEL		348-100-5016S	348-100-5016P
	SERIES 1			348-100-5021S	348-100-5016P
	SERIES 2	IRON		348-100-5017S	348-100-5017P
	SERIES 1			348-100-5022S	348-100-5017P
	SERIES 2	CONSTANTAN		348-100-5018S	348-100-5018P
	SERIES 1			348-100-5023S	348-100-5018P

WIRE RANGE ACCOMMODATIONS

Wire Barrel Size	Wire Size	O.D. of Finished Wire, (Inch) 1/		Oversize Wire 2/	Wire Number (reference) 3/
28	32	0.030 min.	.042 nominal	0.064 max.	MIL-W-16878
	30	0.054 max.			
22	26	0.030 min.	.042 nominal	0.064 max.	MS21985 MIL-W-81381 MIL-W-16878
	24	0.054 max.			
20	24	0.041 min.	.062 nominal	0.085 max.	MS21985 MS21985 MIL-W-81044
	22	0.081 max.			
16	18	0.066 min.	.083 nominal	0.109 max.	MS21985 MIL-W-81044
	16	0.101 max.			
12	14	0.097 min.	.126 nominal	0.170 max.	MS18133 MIL-W-81044
	12	0.155 max.			

Shielded Contacts

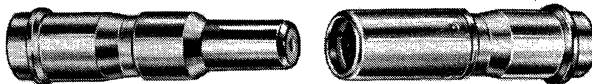


TABLE OF SHIELDED CONTACTS — Dimens. Same as Power Contacts 16-16 & 12-12.

Contact Size	Cable* Accommodation	Amphenol Part Number		MS Part Number	Pin
		Socket	Pin		
16	RG-178A/U RG-196A/U	348-100-6010S-02	348-100-6010P-02	N/A	N/A
		348-100-6011S-02	348-100-6010P-02	N/A	N/A
16	REVERE WH-95623	348-100-6014S-02	348-100-6014P-02	N/A	N/A
		348-100-6015S-02	348-100-6014P-02	N/A	N/A
12	RG-187A/U RG-188A/U RG-179B/U	348-100-6000S-02	348-100-6000P-02	N/A	N/A
		348-100-6005S-02	348-100-6000P-02	N/A	N/A
12	RAYCHEM 48-950	348-100-6001S-02	348-100-6001P-02	N/A	N/A
		348-100-6006S-02	348-100-6001P-02	N/A	N/A
12	RG-180B/U RG-195A/U MICRODOT 293-3922	348-100-6002S-02	348-100-6002P-02	N/A	N/A
		348-100-6007S-02	348-100-6002P-02	N/A	N/A
12	MICRODOT 250-4070	348-100-6003S-02	348-100-6003P-02	N/A	N/A
		348-100-6008S-02	348-100-6003P-02	N/A	N/A
12	RAYCHEM 48-502	348-100-6004S-02	348-100-6004P-02	N/A	N/A
		348-100-6009S-02	348-100-6004P-02	N/A	N/A
12	REVERE WH-95623	348-100-6013S-02	348-100-6012P-02	N/A	N/A
		348-100-6012S-02	348-100-6012P-02	N/A	N/A

* Cables shown are typical for that contact pin. Consult factory for contact section if your cable requirements are not shown.

- 1/ All contacts may be assembled with either minimum or maximum diameter wire as shown or in any combination thereof. When using groupings of oversize wire, they shall be randomly distributed.
- 2/ 50 percent of the contacts in a given insert arrangement may be assembled with oversize wire up to and including the maximum diameter shown; however, the remaining 50 percent shall not exceed the nominal finished wire diameter nor shall they be less than the minimum finished wire diameters.
- 3/ Wire numbers are for reference only and are not intended to restrict the use of acceptable wire-types with these connectors.

HIGH-DENSITY CONNECTORS

BUNKER
RAMO

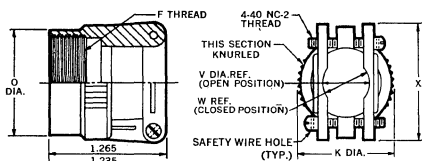
AMPHENOL

ASTRO/348 HARDWARE ACCESSORIES

STRAIGHT CABLE CLAMPS

Dimensions in inches.

Dimensions are the same for Series 1 and Series 2 Connectors.
Cable clamp usage is recommended to prevent excessive strain from being applied to the wire terminations.

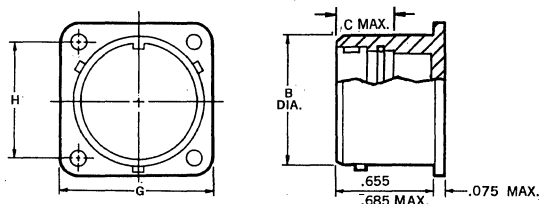


Notes: 1. Dimensions are after plating.

DUMMY RECEPTACLE

Dimensions in inches.

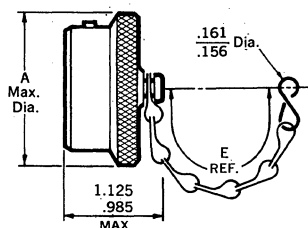
Note: Series 1 = Long Design



Notes: 1. Dimensions are after plating.
2. Dummy Receptacles are aluminum with finish noted.

CAPS AND CHAINS Metal caps seal face of unmated connectors and keep out dirt and foreign materials.

PLUG CAP

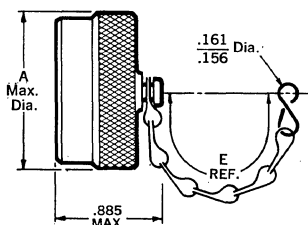


Note: Caps are aluminum. Chains (flat links) and eyelets are stainless steel.
Series 1 = Long Design.

BASIC MILITARY PART NUMBER M81511/17
(Series 2) M81511/29 (Series 1)

Amphenol Part No.	Shell Size	A Max.	E Ref.
348-139-08001	8	.845	3.0
348-289-08001	8	.845	3.0
348-139-10001	10	.970	3.0
348-289-10001	10	.970	3.0
348-139-14001	14	1.220	3.5
348-289-14001	14	1.220	3.5
348-139-16001	16	1.345	3.5
348-289-16001	16	1.345	3.5
348-139-18001	18	1.470	3.5
348-289-18001	18	1.470	3.5
348-289-20001	20	1.595	3.5
348-289-22001	22	1.720	3.5
348-289-24001	24	1.845	3.5

1 Indicates Olive Drab Chromate Finish (150°C. Conn's.)
2 Indicates Dull Chromium Finish (175° and 200°C. Conn's.)

RECEPTACLE CAP
(For both Standard and Long)

BASIC MILITARY PART NUMBER M81511/18

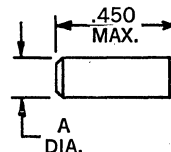
Amphenol Part No.	Shell Size	A Max.	E Ref.
348-140-08001	8	.845	3.0
348-140-10001	10	.970	3.0
348-140-14001	14	1.220	3.5
348-140-16001	16	1.345	3.5
348-140-18001	18	1.470	3.5
348-140-20001	20	1.595	3.5
348-140-22001	22	1.720	3.5
348-140-24001	24	1.845	3.5

1 Indicates Olive Drab Chromate Finish (150°C. Conn's.)
2 Indicates Dull Chromium Finish (175° and 200°C. Conn's.)

CONTACT SEALING PLUGS

Use with both Series 2 — Standard and Series 1 — Long Connectors.

Teflon sealing plugs assure proper connector sealing whenever all contacts are not employed.



BASIC MILITARY PART NUMBER 81511/15

Contact Size	Amphenol Part No.	A Dia. Max.	Color Code
23-22/28	348-132-22000	.050	White
20-20	348-132-20000	.070	Red
16-16	348-132-16000	.095	Blue
12-12	348-132-12000	.145	Yellow

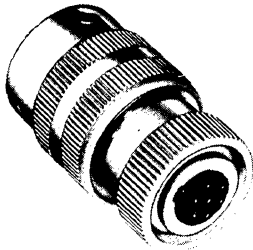
STANDARD CIRCULAR CONNECTORS

BUNKER
RAMO

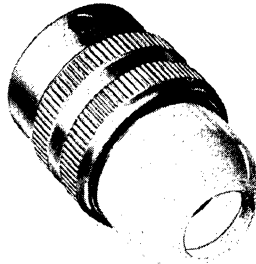
AMPHENOL

67 Series MinnieE® Environment Resistant Connectors

Miniature, Quick-Disconnect, Bayonet-Lock Connectors

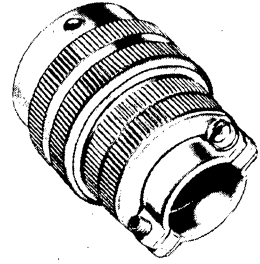


E

With unitized grommet
for individual use seal

P

Includes potting mold



C

Vise action with
two screw strain relief

Environmentally Sealed

- Choice of unitized back end grommet or provision for potting. Both exceed moisture resistance requirements of MIL-C-5015.
- Face seal gasket has individual barriers to isolate each contact.
- No derating for altitude is required up to 70,000 feet if the sealed connectors are mated.
- Sealed connectors take 1500 V RMS at 70,000 feet.
- Vibration resistance per Method 204, MIL-STD-202A is 10 to 2,000 cps at 20 G's.
- Temperature cycling range per MIL-C-5015 is -67°F to $+257^{\circ}\text{F}$.

Lightweight and Convenient

- Flattened incline angle of bayonet slots makes mating easier.
- Clamp and grommet combine to form a unitized seal for ease of assembly and maintenance.
- Connectors convert easily from E style to P style and vice versa.
- Yellow ring on receptacle shell gives visual indication of connector engagement.
- Weight is about half that of standard connectors with same number of contacts.

- Eighteen different insert configurations are available.
- Alternate insert positions are available.

Efficient and Long-Lasting

- Spring-loaded coupling ring provides positive locking action in bayonet slot and a constant compensating force to counteract compression set of resilient face seal.
- Stainless steel bayonet slots and pins reduce wear and friction. Three-pin bayonet coupling minimizes rocking action of the mated plug and receptacle.
- Hooded female contacts resist test prod damage.
- Hard insert dielectric and resilient face seal on pin inserts positively retain contacts so there is no possibility of their being pushed out of the insert.

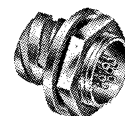
Hermetically Sealed

Hermetically sealed 67 Series connectors are available in two shell styles — hex nut mounted receptacles. Each shell style is available in 11 different insert configurations with up to 48 contacts.

Wide Variety for Wide Range of Applications

	Plugs	Cable-to-Cable Receptacles	Wall Receptacles	Panel Mounting Receptacles	Round Flange Receptacles
With Grommet for Individual Wire Seal	 67-06E	 67-01E	 67-00E	 67-02E	 67-03E
With Form for Potting Seal	 67-06P	 67-01P	 67-00P		
With Standard Type Cable Clamp for Unjacketed Individual Wire Leads	 67-06C	 67-01C	 67-00C		

Hermetically Sealed



67-04H
Hermetically Sealed
Round Flange
Receptacle
Front Mount



67-04H(105)
Hermetically Sealed
Round Flange
Receptacle —
Stake-on Solder
Flange
Front Mount

STANDARD CIRCULAR CONNECTORS

BUNKER
RAMO

AMPHENOL

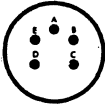
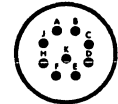
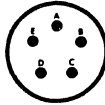
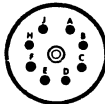
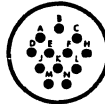
67 Series Minnie Environment Resistant Connectors (Continued)

Inserts Available (showing front face of pin insert)

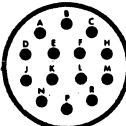
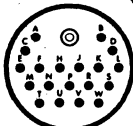
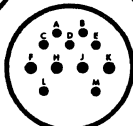
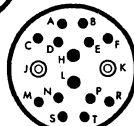
SIZE 12 INSERTS

*12-60
3 #16 contacts*12-7
7 #20 contacts

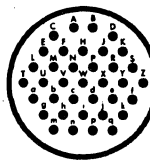
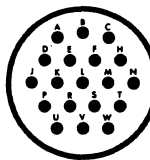
SIZE 14 INSERTS

*14-5
5 #20 contacts14-63
5 #16 contacts*14-9
9 #20 contacts*14-61
8 #20 plus
1 shielded contact*14-12**
12 #20 contacts

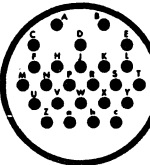
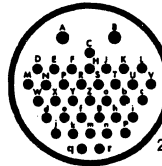
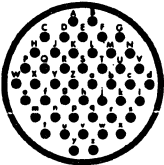
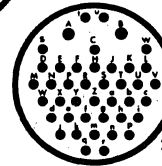
SIZE 18 INSERTS

*18-64
14 #16 contacts*18-24**
24 #20 contacts*18-62
19 #20 plus
1 shielded contact18-65
7 #20 and
4 #16 contacts18-16
2 shielded contacts
2 #16 contacts
12 #20 contacts

SIZE 20 INSERTS

*20-37**
37 #20 contacts20-66
19 #16 contacts

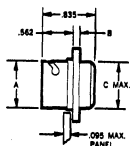
SIZE 22 INSERTS

22-67
25 #16 contacts*22-48
48 #20 contacts22-68
36 #20 and
2 #16 contacts22-69
40 #20 and
2 #16 contacts

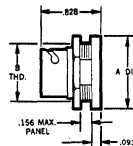
*Available in hermetically sealed receptacles.
 **Also available with Poke-Home contact insert.
 Current rating—#20 contact: 7.5 amps, #16 contact: 12 amps.
 Shielded contact: 7.5 amps.

All inserts listed here are available for all shell styles and classes except hermetics. Inserts available in hermetically sealed receptacles are indicated by an asterisk. (The first two digits of the insert number show the shell size; the 3rd and 4th digits are a code for the insert configuration.)

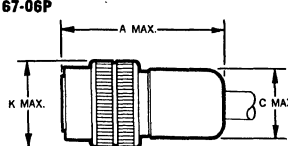
67-02E



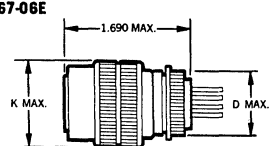
67-03E



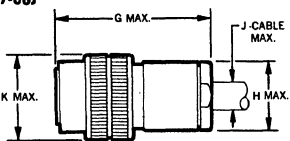
67-06P



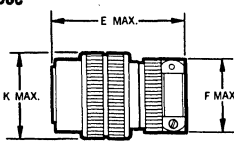
67-06E



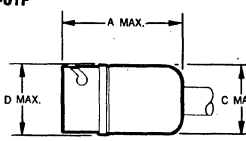
67-06J



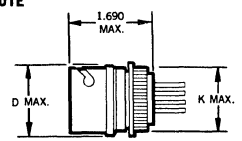
67-06C



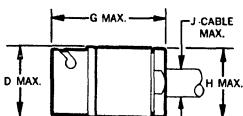
67-01P



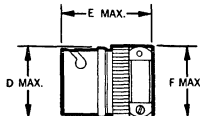
67-01E



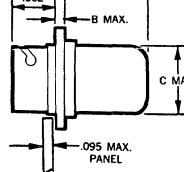
67-01J



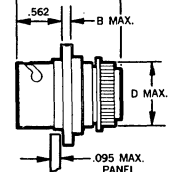
67-01C



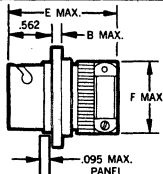
67-00P



67-00E



67-00C



Connector Size	A	B	C	D	E	F	G	H	J	K
12	1.687	.062	.795	.895	1.870	.817	1.937	.706	.250	.957
14	1.687	.093	.920	1.000	1.870	.967	1.937	.812	.375	1.082
18	1.687	.093	1.170	1.250	1.870	1.185	1.937	1.062	.656	1.375
20	1.734	.093	1.223	1.375	1.970	1.312	2.312	1.187	.750	1.500
22	1.734	.093	1.352	1.468	1.970	1.440	2.312	1.317	.875	1.625

STANDARD CIRCULAR CONNECTORS

BUNKER
RAMO

AMPHENOL

165 Series Miniature MS-Type Connectors

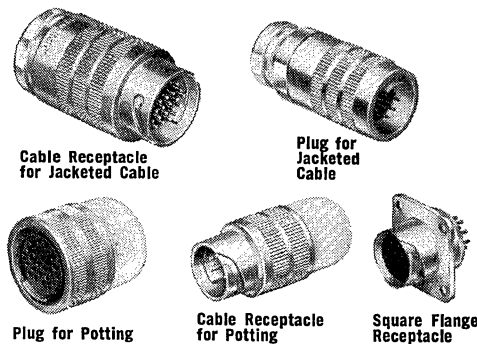
COMPACT AND CONVENIENT

Connectors in the 165 Series are only about one-third the size and weight of standard MS connectors with the same number of contacts.

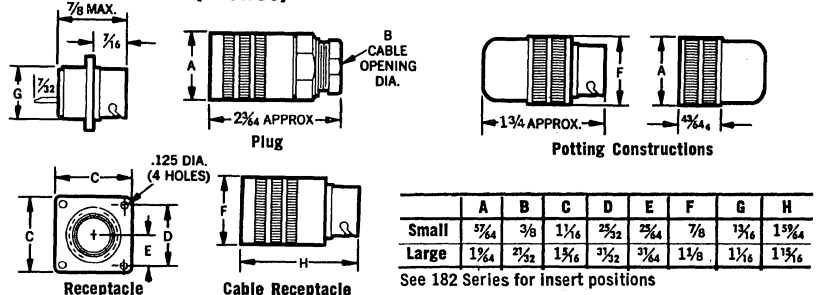
Bayonet coupling provides quick disconnect.

WIDELY APPLICABLE

Eight different insert configurations and five different shell styles in two sizes — large and small — provide enough variations for a wide range of applications.



Dimensions (Inches)

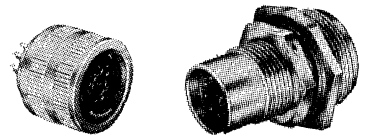


Connectors with Shielded Contact and Ground Shield

- Important in aircraft and instrumentation applications, for example, fuel gaging.
- Shield continuity was recently upgraded by addition of heat treated beryllium copper finger pressure members to the socket shield.
- Available in a number of shell styles, including potting construction plug and cable receptacle, plugs with spring-loaded coupling ring, and square flange receptacle.
- Available also in combination of environmentally sealed and cable clamp construction.

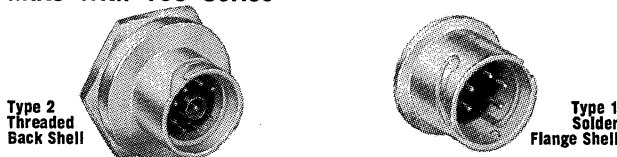
- Two different insert configurations

Eight #20 contacts,
1 shielded contact
Nineteen #20 contacts,
1 shielded contact



182 Series Hermetic Miniature MS-Type Connectors

Mate With 165 Series



HIGHLY RELIABLE

The 182 Series features a rugged compression seal which is extremely strong and highly resistant to thermal shock; it also has very high insulation resistance. To assure strictest adherence to requirements, 182 Series receptacles are tested by mass spectrometer at the maximum sensitivity of the instrument.

WIDELY APPLICABLE

Like 165 Series connectors, 182 Series receptacles come in two sizes — large and small — and are available in most 165 Series insert configurations. There are two shell styles — Type I, Solder Flange, and Type II, Threaded Back Shell, with and without O ring. There are two types of contacts available: solder pocket, and flat and pierced. Alternate insert positions (shown at right) allow for gang mounting.

Alternate Insert Positions

Applicable to both 165 and 182 Series

	Normal	Position X	Position W
Small			
Large			

Dimensions (Inches)

	A	B	C	D	E	F
Type I	±.006	±.006	±.003	±.002	±.006	—
Small	.641	.841	.685	.042	.109	—
Large	.641	1.082	.926	.042	.204	—
Type II	±.009	±.006	C-Thrd.	±.006	±.006	±.006
Small 182-1	.791	1.064	$1\frac{1}{8}$ -28	.688	.127	.439
182-1-1001	.791	1.064	$1\frac{1}{8}$ -28	.688	.127	.439
182-1-1008	.791	1.064	$1\frac{1}{8}$ -28	.688	.127	.439
182-15-1002	.791	1.064	$1\frac{1}{8}$ -28	.688	.127	.439
All Others	.783	.877	$\frac{3}{4}$ -20	.688	.074	.534
Large	.822	1.439	$1\frac{1}{4}$ -18	.925	.127	.439

STANDARD CIRCULAR CONNECTORS



AMPHENOL

165 and 182 Series Availability and Ordering Information

Showing front face of pin insert, socket insert is reversed.

	INSERT ARRANGEMENTS (Approx. 3/5 actual size)	Insert Style	Plug	Receptacle Sq. Flange	Cable Receptacle	Hermetic Seal Receptacles				Potting Constructions	
						Type 1— Solder Flange Shell		Type 2— Threaded Back Shell		Plug	Cable Recep- tacles
						Flat & Pierced Contacts	Solder Pocket Contacts	Flat & Pierced Contacts	Solder Pocket Contacts		
	5 #20 contacts Current rating (Amperes) 7.5 Voltage rating (Volts RMS at sea level) 600	PIN	165-33	165-35	165-35-1002	182-35-1000	182-35-1001	182-35	182-35-1002	165-33-1000	165-35-1000
		SOCKET	165-34	165-36	165-36-1003	—	—	—	—	165-34-1000	165-36-1000
	9 #20 contacts Current rating (Amperes) 7.5 Voltage Rating (Volts RMS at sea level) 500	PIN	165-13	165-15	165-15-1002	182-15	182-15-1000	182-15-1001	182-15-1002*	165-13-1000	165-15-1000
		SOCKET	165-14	165-16	165-16-1003	—	—	—	—	165-14-1000	165-16-1000
	8 #20 contacts 1 Shielded Current rating (Amperes) 10 Voltage rating (Volts RMS at sea level) 500	PIN	165-82	165-73	165-73-1001	182-1-1007	182-1-1000	182-1-1008*	182-1-1001*	165-82-1000	165-73-1000
		SOCKET	165-61-1008	165-83	165-83-1001	—	—	—	—	165-61	165-83-1000
	12 #20 contacts Current rating (Amperes) 7.5 Voltage rating (Volts RMS at sea level) 500	PIN	165-9	165-11	165-11-1002	182-11-1001	182-11	182-11-1005	182-11-1002	165-9-1000	165-11-1000
		SOCKET	165-10	165-12	165-12-1002	—	—	—	—	165-10-1000	165-12-1000
	7 #20 contacts 4 #16 contacts Current rating (Amperes) no. 20 7.5 no. 16 17 Voltage rating (Volts RMS at sea level) 500	PIN	165-17	165-19	165-19-1002	—	—	—	—	165-17-1000	165-19-1000
		SOCKET	165-18	165-20	165-20-1003	—	—	—	—	165-18-1000	165-20-1000
	14 #16 contacts Current rating (Amperes) 17 Voltage rating (Volts RMS at sea level) 500	PIN	165-29	165-31	165-31-1003	182-31	182-31-1002	182-31-1003*	182-31-1001*	165-29-1000	165-31-1000
		SOCKET	165-30	165-32	165-32-1006	—	—	—	—	165-30-1000	165-32-1000
	19 #20 contacts 1 Shielded Current rating (Amperes) 10 Voltage rating (Volts RMS at sea level) 500	PIN	165-86	165-84	165-84-1001	182-2-1004	182-2-1000	182-2-1005*	182-2-1001*	165-86-1000	165-84-1000
		FEMALE	165-62-1007	165-85	165-85-1001	—	—	—	—	165-62	165-85-1000
	24 #20 contacts Current rating (Amperes) 7.5 Voltage rating (Volts RMS at sea level) 500	PIN	165-25	165-27	165-27-1005	182-27-1000	182-27-1006	182-27*	182-27-1005*	165-25-1000	165-27-1000
		SOCKET	165-26	165-28	165-28-1003	—	—	—	—	165-26-1000	165-28-1000

*Supplied with "O" ring.

MULTI-PURPOSE SUBMINIATURE CONNECTORS

BUNKER
RAMO

AMPHENOL

115 SERIES

In transducers, pressure switches, vibration monitors, accelerometers, constant speed drives... in aerospace, oceanographic, or medical instrumentation... wherever lightweight, rugged, high-reliability connectors are needed to withstand very high temperatures, severe vibration and corrosion, 115 Series subminiatures are the connectors to consider.

Tiny and Tough Standard Version

Designed to stand up under grueling conditions, 115 Series 2 Contact connectors are subminiature in size but "big" in performance. Most of the connectors in this series weigh less than 1/2 ounce and, when mated, are less than 1 1/4 inch long. Yet their current rating is 7.5 amps and their voltage rating is 1500V (RMS). In the standard version, some of the connectors have an operating range of -54°C (-65°F) to 204°C (400°F).

Fuel-resistant Viton "B" face seals, flame-retardant diallyl isophthalate inserts, and corrosion-resistant rhodium over silver plated contacts enable these connectors to work well even under adverse conditions.

SPECIFICATIONS

STANDARD VERSION

Shell	Nickel Plated Brass.
Contacts	Brass, rhodium over silverplate. Solder cups to take #20 AWG wire, except on 115-5050 plug which has crimped contacts which accept #18 wire.
Inserts	Diallyl isophthalate.
Face Seal	Viton "B", 65 durometer, on receptacles.
Current Rating	7.5 Amps.
Voltage Rating	1500V (RMS).
Insulation Resistance	5000 Megohms (min.) when tested as per MIL-STD-202, Method 302, Condition B.
Altitude Immersion	Meets requirements of Par. 4.6.11 MIL-C-26500B (USAF) when potted and mated.
Temperature Range	-54°C (-65°F) to 260°C (500°F).

Application Tools for No. 20 Crimp Socket Contacts on 115-5050 Connectors

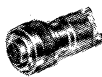
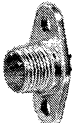
• Crimp Tool — 294-1166 • Bushing Positioner — For 18 Ga. Wire, 294-1468 — For 20 Ga. Wire, 294-1469.

CONNECTOR AVAILABILITY

The connectors shown below constitute only a representative selection of the 115 Series subminiature connectors available. Through rearrangement or modification of components, many other configurations can be produced to match your specific requirements. Consult your Amphenol representative for the answers to your particular application.

STANDARD VERSION

2 CONTACTS

 115-5035 Plug .562 dia. x .843 Mating Connectors: 115-5036, -5037, -5038, -5042, -5043 and -5060 Stainless steel, passivated, coupling ring.	 115-5050 Plug .700 dia. x 1.500 Mating Connectors: 115-5036, -5037, -5038, -5042, -5043 and -5060 Improved version of 115-5053, including coupling ring locking mechanism & crimp Poke Home contacts.	 115-5038 Receptacle 1.210 x .640 x .687 Mating Connectors: 115-5035, -5050 and 115-5035-1001 Nickel plated elliptical steel flange silver brazed to connector.	 115-5043 Receptacle .532 dia. x .687 Mating Connectors: 115-5035, -5050 and 115-5035-1001 No notch on flange.
 115-5035-1000 Plug (Same as 115-5035 except for keyway) .562 dia. x .843 Mating Connector: 115-5043-1000 Keyway 30° counterclockwise. Stainless steel, passivated, coupling ring.	 115-5036 Receptacle .532 dia. x .687 Mating Connectors: 115-5035, -5050 and 115-5035-1001 Flange notched 90° clockwise.	 115-5042 Receptacle 3/4-27NS-2A x .687 Mating Connectors: 115-5035, -5050 and 115-5035-1001 Threaded shell (flangeless).	 115-5060 Receptacle .875 x .875 x .687 115-5060-1000 Receptacle .750 x .750 x .687 Mating Connector: 115-5035, -5050 and 115-5035-1001 Nickel plated square steel flange silver brazed to connector.
 115-5035-1001 Plug .687 dia. x 1.300 Mating Connectors: 115-5036, -5037, -5038, -5042, -5043 and -5060 Same as 115-5035 but has a mechanical strain relief clamp.	 115-5037 Receptacle .559 dia. x .687 Mating Connectors: 115-5035, -5050 and 115-5035-1001 Nickel plated steel housing silver brazed to connector.	 115-5040 Receptacle .624 dia. x .776 Mating Connector: 115-5041 Hermetically sealed. Leakage less than .1 micron cu. ft. per hour.	 115-5041 Plug .625 dia. x .650 Mating Connector: 115-5040 Stainless steel, passivated, coupling ring.

HIGH TEMPERATURE VERSION

 115-5059 Plug .645 dia. x 1.460 For braided stainless steel armor wire.	 115-5059-1 Plug .645 dia. x 1.460 For 1/8" diameter 2-conductor hard-line cable.	 115-5061 Plug .562 Hex x 1.300 Like 115-5059-1 but smaller & lighter.	 115-5066 Plug .562 hex x 1.900 Like 115-5059-1 but good for 600°F and crimp contacts.
---	--	---	---

When waterproofing is necessary, any of the 115 Series subminiature connectors can be potted.

Pin contacts are molded in, and socket contacts are held in place with "C" washers. The inserts are held in the shells by spinning and/or bonding. Alternate insert positions are available.

The 115-5050 plug features a foolproof coupling ring locking mechanism that keeps the connector fully mated even under extreme vibration. It also features contacts which can be quickly crimped with the MS3191 tool, Amphenol No. 294-1166 with special positioners. Insertion and removal tools are not needed for the contacts.

1000°F High-Temperature Version

In addition to the many advantages offered by the standard version, the 115 Series high-temperature version provides for exceptionally high ranges of temperature. With stainless steel shells, contacts and hardware and with inserts of Amphenol ceramic, 115 Series high-temperature plugs serve excellently in temperatures up to 1000°F (538°C) or more.

HIGH-TEMPERATURE VERSION

Shell	Stainless Steel.
Contacts	Stainless Steel. Terminal ends have flats to facilitate welding or brazing of conductors.
Inserts	Ceramic.
Face Seal	
Current Rating	1.0 Amp.
Voltage Rating	2000V AC minimum @ 60 Hz.
Insulation Resistance	200,000 Megohms @ 50V DC @ 73°F. 400 Megohms @ 900°F.
Altitude Immersion	Not applicable.
Temperature Range	-73°C (-100°F) to 538°C (1000°F) and more.

ALL DIMENSIONS SHOWN IN INCHES

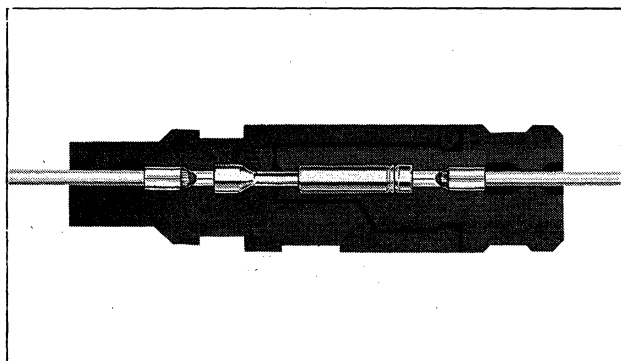
ENVIRONMENTAL-RESISTANT TRANSPORTATION CONNECTOR

BUNKER
RAMO

AMPHENOL

TRANSCON 44: BREAKTHROUGH IN DESIGN

Amphenol's 44 Series is an all resilient, one piece, waterproof connector. Amphenol design has incorporated crimp Poke-Home® contacts in five insert configurations. These 44 Series connectors offer high performance along with low cost, making this connector ideally suited for those applications where an environmentally sealed yet inexpensive connector is needed.



USER BENEFITS

- **Environmentally Sealed.** Waterproof seals prevent liquids from entering the connector to cause electrical or electronic circuit failures.
- **Longer Service Life.** The unique one-piece shell and insert construction minimize the number of parts and failure modes for predictably longer service life.
- **Durable.** The resilient connector body is abrasion resistant and is impervious to water, lubricants, fuel, ozone, and road salts.
- **Lower Installed Cost.** Punch-press contacts enable the use of automated stripping and crimping equipment resulting in a lower on-line production and installed assembly cost.
- **High Reliability.** The use of hooded female contacts in addition to the molded-in polarizing flat assures proper contact/connector alignment and eliminates the possibility of lost or cross-wired circuits.
- **Low Maintenance Cost.** Should the need arise, the connectors can be easily serviced in the field with the use of inexpensive hand crimp and insertion tools. This minimizes equipment down-time and required maintenance time.
- **Easy Mating.** Simple, positive, push-pull coupling and disconnect of connectors requires no special assembly instructions. Obvious visual and mechanical mating indicators help avoid damage to components resulting in lost or intermittent circuits.

NEW MATERIALS

Amphenol has incorporated a resilient material in the 44 Series which allows the insulator to be molded as one complete unit. This material proved to be the most successful under such conditions as salt spraying, vibration and shock. Added to this are Amphenol's Poke-Home® contacts made of a copper alloy with electro-tin plating. This combination makes the 44 Series not only highly reliable but less costly to use.

OPERATIONAL CHARACTERISTICS

Voltage Rating: Limiting operating voltage at sea level - DC 250 Volts, AC 200 Volts RMS.

Current Rating: 5 amps continuous, 7-10 amp surge.

Temperature Range: Continuous operation from -40°F to +255°F (-40°C to +125°C)

TERMINATION

- A. Punch-press contacts utilize Essex type crimping equipment.
- B. Contacts accept wire sizes of 14 AWG, 16 AWG, and 18 AWG with an overall wire insulation diameter range of .080 to .130 inches.
- C. Standard contact packaging: 5,000 unit reels for semi-automatic machine crimping.
- D. Contacts individually packaged for hand tool crimping applications.

TYPICAL APPLICATIONS

- 44 Series connectors can be used as truck accessory disconnects under the hood or frame, on axles or near the engine.
- Automotive applications could call for the 44 Series in systems such as anti-skid, brake warning, pressure warning or speed indication.
- Periphery equipment like toll booths, traffic signals or highway safety and lighting equipment also could have a need fulfilled by the 44 Series.
- Marine industry applications such as starter motors, distributors, batteries, controls and even fuel injection systems.
- Amphenol 44 Series connectors have excellent opportunities in the recreational vehicle where manufacturers are continually looking for better means of inter-connecting cars to trailer/campers.

AVAILABILITY

Amphenol's 44 Series connector family is available now. The 44 Series family now includes 2, 3, 4, 5, and 6 contact configurations.

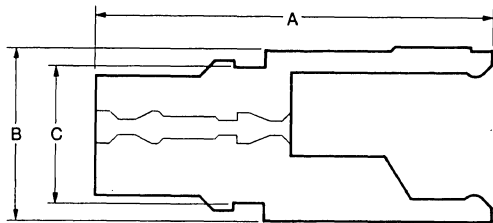
© Registered trademark of Bunker Ramo Corporation.

ENVIRONMENTAL-RESISTANT TRANSPORTATION CONNECTOR

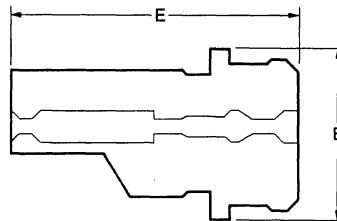
BUNKER
RAMO

AMPHENOL

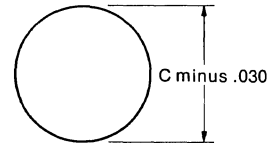
DIMENSIONS



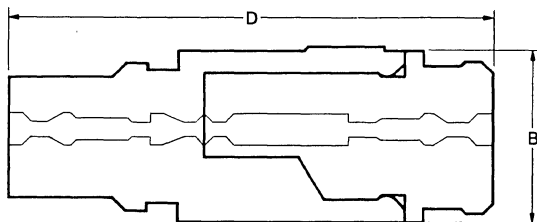
RECEPTACLE



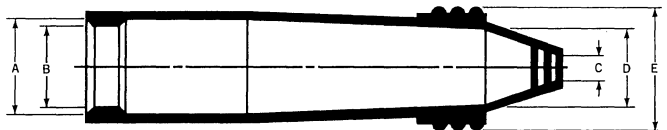
PLUG



PANEL CUTOUT



MATED



NEOPRENE BOOT

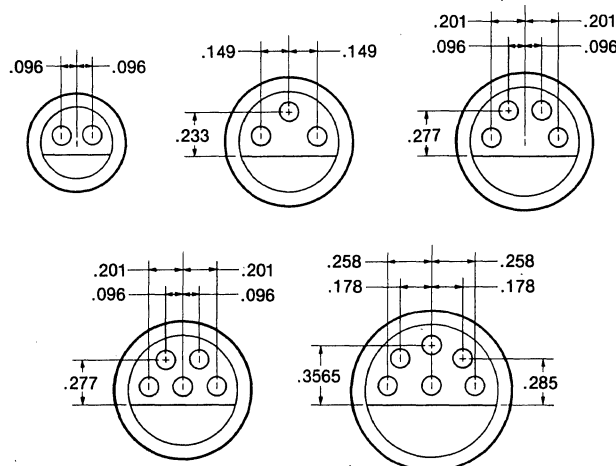
CONNECTORS

NUMBER OF CONTACTS	A Max.	B Max.	C $\pm .005$	D Max.	E Max.
2	1.780	.620	.470	2.220	1.282
3	1.780	.721	.571	2.220	1.282
4	1.780	.832	.682	2.220	1.282
5	1.780	.832	.682	2.220	1.282
6	1.780	.946	.796	2.220	1.282

NEOPRENE BOOT (For Jacketed-Cable Applications)

NUMBER OF CONTACTS	A Max.	B Max.	C Max.	D Max.	E Max.
2	.456	.405	.127	.376	.600
3	.557	.506	.229	.457	.700

INSERT CONFIGURATIONS



PART NUMBERING CONFIGURATION

No. of Contacts	Receptacles	Plugs	Boots
2	44-104-10002-02	44-103-10002	44-105-10002-02
3	44-104-10003-02	44-103-10003	44-105-10003-02
4	44-104-10104-02	44-103-10004	N/A
5	44-104-10105-02	44-103-10005	N/A
6	44-104-10006-02	44-103-10006	N/A

CONTACTS:

Pin Contact — Part Number 44-100-1414P — Used In Receptacles Only.
 Socket Contact — Part Number 44-102-1414S — Used In Plugs Only.

TEMPERATURE RANGE:

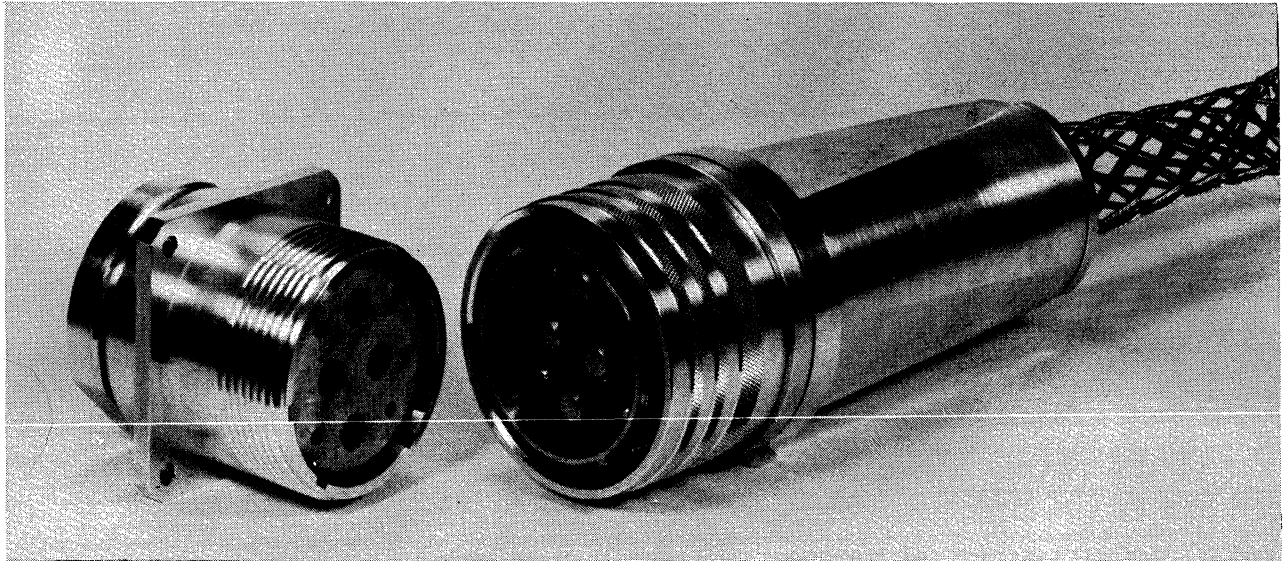
Continuous operation from -40°F to $+256^{\circ}\text{F}$
 (-40°C to $+125^{\circ}\text{C}$).

POWER-DISTRIBUTION INTERCONNECT

BUNKER
RAMO

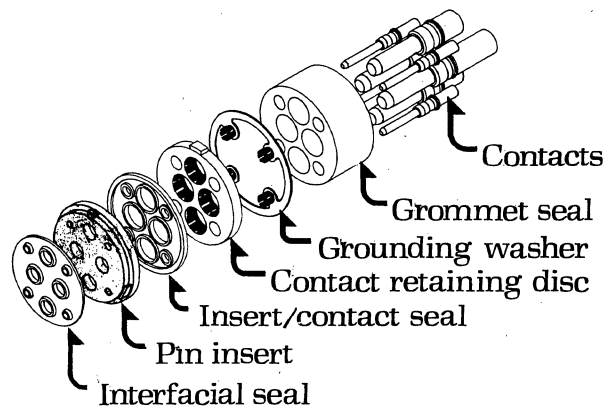
AMPHENOL

229 SERIES

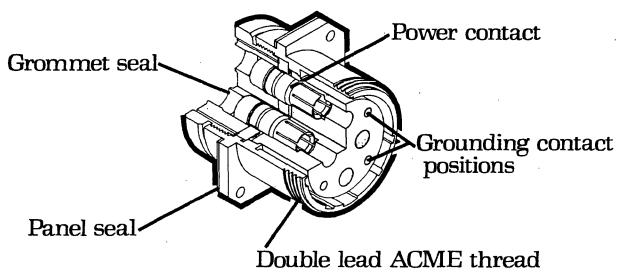


These Class L Connectors are a special design for power distribution using portable power cable. They are intended for use where they will be subjected to severe impact, such as dropping on concrete, run over by vehicles or subjected to extremes of field-service use. They are quenching if inadvertently separated under full load. They are waterproof when mated or unmated, capped or uncapped. They are designed to meet all OSHA and National Electrical Code requirements for grounding. They use insertable crimp-type contacts.

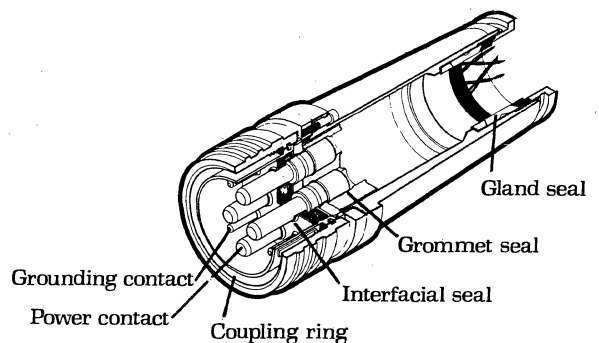
INTERNAL COMPONENTS



WALL MOUNT RECEPTACLE



STRAIGHT PLUG



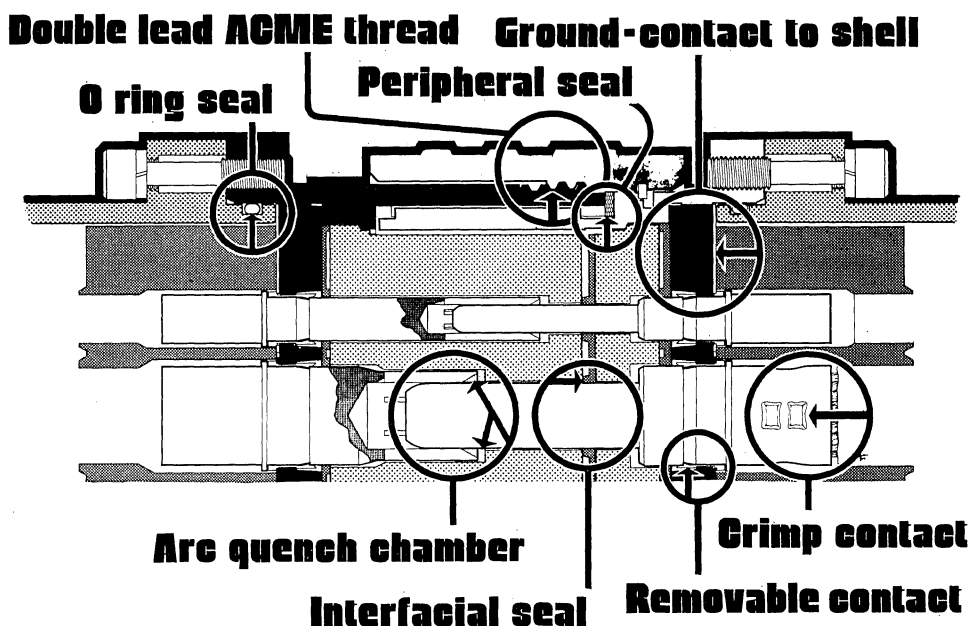
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

POWER-DISTRIBUTION INTERCONNECT

BUNKER
RAMO

AMPHENOL

229 SERIES



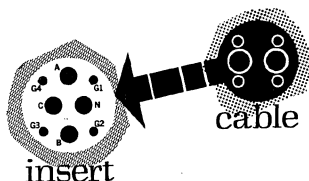
FEATURES

- **SAFETY** — Complete protection for personnel and using equipment whether connectors are mated or unmated under rated load.
- **ARC QUENCHING** — Socket contacts are recessed within the socket insert to provide an arc-suppressing chamber within the connector. This assures positive safety for the user.
- **ENVIRONMENT RESISTANT** — Connector design and materials withstand the most severe operating conditions. See specifics in the Environmental Highlights Table.
- **CRIMP CONTACTS** — Connector design permits cable termination to contacts by solder or crimp method. Contacts are removable for repair or maintenance.

- **ACME-THREAD COUPLING** — Modified Acme thread will not clog under adverse conditions such as ice, snow, sand or mud. Quick coupling is an additional feature.
- **COMPLETELY WATERPROOF** — These connectors are completely waterproof assemblies regardless whether mated, or unmated, capped or uncapped. Sealing is accomplished by:

Main-Joint Gasket
"O"-Ring Seal
Interfacial Seal
Cable-Gland Seal
Grommet Seal for Individual Conductors

INSERT PATTERNS



- **MATCHED CONNECTOR/CABLE-CROSS SECTION PATTERNS** — Connector-insert patterns are designed to resemble and match cable cross sections. This feature greatly facilitates cable termination.
- **NO CROSS MATING** — Connector design is foolproof, with mating polarization detailed for specific voltage, current, frequency, phase and grounding requirements. Five-key shell polarizing prevents mating with a connector of different power characteristics.
- **RUGGED** — All metal parts are high-strength aluminum. End connectors meet a cable-assembly drop test from a height of 6". Molded parts are of high-strength materials designed to withstand heavy and severe usage.

Shell size	Current rating (amps)	Conductor size
28	40	6
32	60	4
44	100	1/0
* 48	150	2/0
52	200	4/0

*Consult factory for availability.

- **HIGH CURRENT CAPACITY** — Five current ratings are available to 200 amperes in a 52 shell-size connector having four each #4/0 power contacts and four each #4 ground contacts.

POWER-DISTRIBUTION INTERCONNECT

BUNKER
RAMO

AMPHENOL

229 SERIES

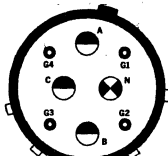
INSERT ARRANGEMENTS



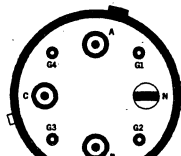
28-12



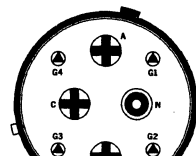
32-12



44-12



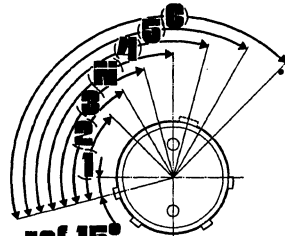
48-12*



52-12

code of contact sizes

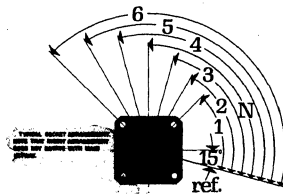
1/8	4	4/8N
1/8N	4G	6
2/8	4N	6G
2/8N	4/G	6N



ref. 15°
shell main key positions

VOLTAGE, PHASE AND GROUND CONTROL

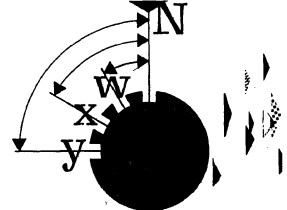
Grounding assemblies
Conductive finish



shell main key positions					
60 Hz & 400 Hz					
1 phase AO			3 phase AO		
120V	240V	120/240V	120/208V	240/416V	277/480V
4(120°)	5(135°)	4(120°)	4(120°)	5(135°)	6(150°)

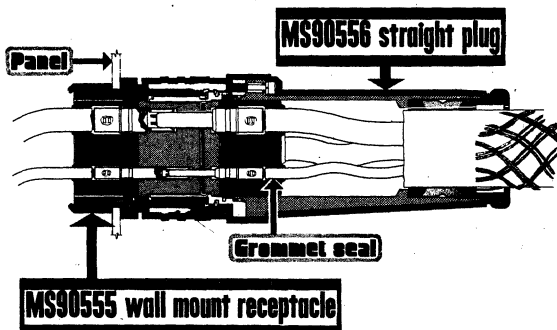
FREQUENCY CONTROL

INSERT KEYING POSITION LOCATION-DEGREES

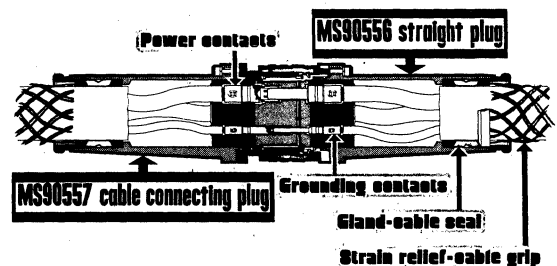


Normal keying position used for DC and 60 Hz AC.
WXY positions for 400 Hz AC.

CABLE TO WALL MOUNT



CABLE TO CABLE MOUNT



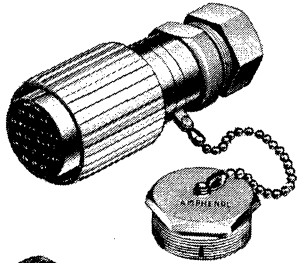
* Consult Factory for Availability.

SUBMERSION-PROOF CONNECTORS

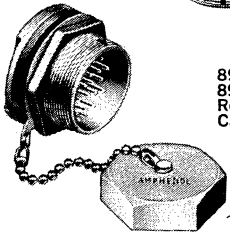
BUNKER
RAMO

AMPHENOL

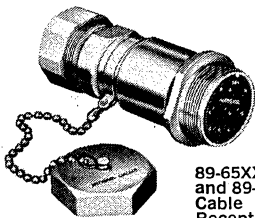
89 SERIES



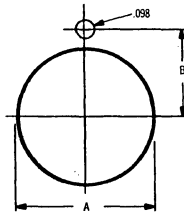
89-61XX-XX (XX)
and 89-1XX-XX (XX)
Plug Assembly with
Cap and Chain.
Mates with
89-2XX-XX or
89-5XX-XX.



89-62XX-XX and
89-2XX-XX Panel
Receptacle with
Cap and Chain



89-65XX-XX (XX)
and 89-5XX-XX (XX)
Cable
Receptacle with
Cap and Chain.



Dimensions — Inches			
Shell Size	A + .010 — .000	B ± .002	
22	1.385	.796	
28	1.760	.984	
32	2.010	1.109	

Connectors used in Ground Support Equipment must be rugged and reliable—and easy to handle under all conditions. Fully meeting these particulars, Amphenol's popular 89 series GSE connectors are used in many top missile projects. In fact, nearly every basic industry around the world depends on these heavy duty connectors. The growing list includes agriculture, mining, transportation, petroleum, marine, construction, and basic metals production. In short, they're a must wherever a rugged, completely waterproof electrical connection is required.

GSE connectors are completely waterproof and provide dependable service even when submerged in mud, ice or water. An internal rubber gasket in the cable clamp adapter, a type "W" washer at the mating faces and another washer used with panel mounting receptacles provide assured protection. Shells and cable clamp adapters are machined from top quality aluminum bar stock to achieve far greater strength than is possible to obtain with die cast methods.

For rough weather handling, coupling rings are extra-long and heavily grooved. Flats are conveniently located for field-servicing with standard open-end wrenches. Caps and chains are standard on all connectors.

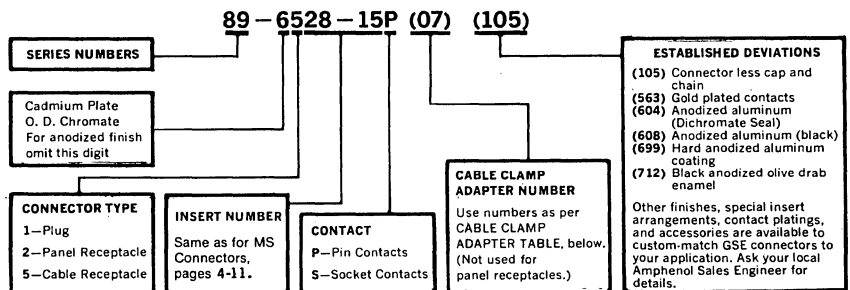
Amphenol GSE connectors are available in a large number of standard MS inserts. They are interchangeable with AN/MS connectors with the same shell size and insert arrangement. Connectors exceed the water immersion requirements of MIL-C-12520. Inserts conform to MIL-C-5015.

Shell Size	Dimensions — Inches							
	89-1		89-2		89-5		Min. Chassis Hole Dia.	Max. Chassis Thickness
	Length*	Dia.	Length*	Dia.	Length*	Dia.		
22	5 $\frac{1}{16}$	1 $\frac{1}{32}$	1 $\frac{1}{32}$	1 $\frac{1}{8}$	5	1 $\frac{3}{4}$	1 $\frac{15}{16}$	$\frac{5}{16}$
28	5 $\frac{1}{16}$	2 $\frac{1}{32}$	1 $\frac{1}{32}$	2 $\frac{1}{4}$	5	2 $\frac{1}{8}$	1 $\frac{14}{16}$	$\frac{5}{16}$
32	5 $\frac{1}{16}$	2 $\frac{1}{16}$	1 $\frac{1}{32}$	2 $\frac{1}{2}$	5 $\frac{1}{8}$	2 $\frac{3}{8}$	2 $\frac{1}{4}$	$\frac{5}{16}$

* Includes cable clamp adapter

HOW TO ORDER 89 SERIES CONNECTORS

- Select the 89 series connector to match the application: plug, panel receptacle, or cable receptacle.
- Select the insert. Amphenol 89 Series inserts have the same size and arrangement as MS connector inserts of the same designation. Select the insert to meet your requirements from the Insert Configuration Table, pages 4-11. Then check this insert number against the 89 Series Insert Availability Table below to make sure it is available for Submersion-Proof Connectors.
- From the table of cable clamp adapters below find the cable clamp adapter to fit the cable O.D. you will use.
- Put together the part number as per the following typical example:



EXAMPLES: To get a plug with a 32-6 insert, pin contacts, and cable clamp adapter that will take a .319" to .375" (tolerance included) cable jacket, you would order 89-132-6P(06). To get the same plug cadmium plated with an olive drab chromate conversion coating, you would order 89-6132-6P(06). To get the same cadmium plated O.D. finish plug with socket contacts, you would order 89-6132-6S(06).

If you don't want the cap and chain, add (105) to the part number. For example, to order the same cadmium plated O.D. finish plug with socket contacts as above but without cap and chain, you would order 89-6132-6S(06)(105).

89 SERIES INSERT AVAILABILITY

Insert Number	No. of Contacts	Insert Number	No. of Contacts	Insert Number	No. of Contacts	Insert Number	No. of Contacts
22-1	2	22-20	9	28-6	3	28-880	3
22-2	3	22-21	3	28-7	2	32-1	5
22-3	2	22-22	4	28-8	12	32-2	5
22-4	4	22-23	8	28-9	12	32-3	9
22-5	6	22-24	6	28-10	7	32-4	14
22-6	3	22-25	3	28-11	22	32-5	2
22-7	1	22-26	7	28-12	26	32-6	23
22-8	2	22-27	9	28-14	11	32-7	35
22-9	3	22-28	7	28-15	35	32-8	30
22-10	4	22-29	7	28-16	20	32-9	14
22-11	2	22-30	7	28-17	15	32-10	7
22-12	5	22-31	5	28-18	12	32-12	15
22-13	5	22-32	8	28-19	10	32-13	23
22-14	19	22-404	8	28-20	14	32-15	8
22-15	6	28-1	9	28-21	37	32-17	4
22-16	9	28-2	14	28-22	6	32-101	12
22-17	9	28-3	3	28-410	4	32-102	14
22-18	8	28-4	9	28-833	7	32-414	52
22-19	14	28-5	5	28-840	4		

CABLE CLAMP ADAPTERS

Cable Clamp Adapter No.	Will Take Cable O.D. of	Mates With Connector Size	Cable Clamp Adapter No.	Will Take Cable O.D. of	Mates With Connector Size
		22 28 32			22 28 32
(04)	.188 to .250	X X X	(14)	.813 to .875	X X
(05)	.250 to .312	X X X	(15)	.875 to .937	X X
(06)	.313 to .375	X X X	(16)	.938 to 1.000	X X
(07)	.375 to .437	X X X	(17)	1.000 to 1.062	X X
(08)	.438 to .500	X X X	(18)	1.063 to 1.125	X X
(09)	.500 to .562	X X X	(19)	1.125 to 1.187	X
(10)	.563 to .625	X X X	(20)	1.188 to 1.250	X
(11)	.625 to .687	X X X	(21)	1.250 to 1.312	X
(12)	.688 to .750	X X X	(22)	1.313 to 1.375	X
(13)	.750 to .812	X X			

Clearance between maximum cable O.D. and minimum clamp I.D. has been allowed.

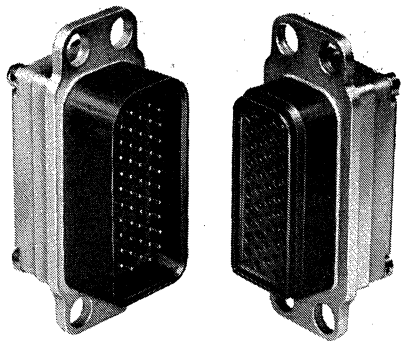
RACK AND PANEL CONNECTORS

BUNKER
RAMO

AMPHENOL

217 SERIES - MIL-C-26518

MINIATURE ENVIRONMENT RESISTANT CONNECTORS



A SIGNIFICANT ADVANCE IN THE STATE-OF-THE-ART — On the ground or in space, wherever there is a requirement for superior environmental protection, high performance, and minimum weight and bulk, 217 Series miniature environment resistant connectors are the answer.

In developing the 217 Series, Amphenol faced the problem of satisfying reliability, logistics, and present and anticipated environmental requirements for connector usage. To solve the problem, Amphenol had to generate advanced design concepts, formulate materials specifically for connector usage, and work out new production techniques. The resulting 217 Series connectors exceed the stringent requirements of both MIL-C-26518 (USAF) and MIL-C-38300 (USAF) for performance and reliability.

TWO VERSIONS — 217 Series connectors are available in two different versions:

1. Both mating faces in silicone rubber, conforming to MIL-C-26518 (USAF).
2. The plug (with socket contacts) incorporating the Amphenol Ultra-Mate® principle — a hard dielectric face conforming to MIL-C-38300 (USAF).

Since the receptacle (with pin contacts) is identical in both versions, there is complete inter-mateability with either the standard resilient plug or the Ultra-Mate.

COMPLETE ENVIRONMENTAL SEALING — Monoblock construction, with bonded interfaces between the three dielectric components (insert, anti-deflection disc, and grommet) eliminates air voids and protects connectors from degrading moisture and altitude conditions. Amphenol-developed silicone rubber dielectric provides resilience and unsurpassed resistance to tear, compression set, fluids, and high temperatures. On mating, insert faces compress to form a resilient dielectric seal around each individual contact. Together with monoblock construction, this puts void-free, continuous dielectric around each contact through the entire connector length.

A pressurizing seal around each contact prevents the passage of air or moisture through the contact hole, and twin sealing risers at each wire hole in the grommet double-seal each individual wire. A continuous barrier on the periphery of the socket insert mates with a recess around the pin insert to form an additional compression seal. A dynamic lip seal between mated shells constitutes still another barrier to dirt and moisture, and protects the integrity of the face seals.

GO/NO-GO RELIABILITY — When an Ultra-Mate connector mates, you can be sure there is proper electrical contact. In Ultra-Mate connectors of the 217 Series, the socket contacts are closely surrounded by hard dielectric. Where connector pins are slightly misaligned, the beveled entry of Ultra-Mate connectors guides them in right. However, if the pins are badly bent, the hard dielectric presents a closed entry and prevents mating. To insure contact seal, there is an additional resilient layer behind the hard face.

LIGHT WEIGHT AND HIGH CONTACT DENSITY — Connector shells are of high-strength, impact-extruded aluminum forgings with a high strength-to-weight ratio. The insert arrangement is designed for the maximum number of contacts within the area available.

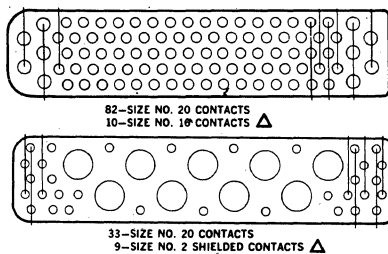
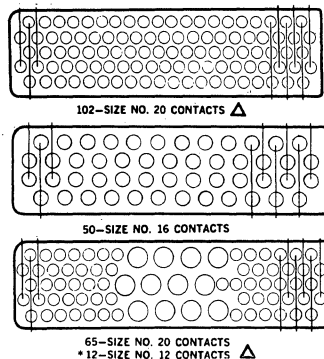
POKE-HOME® CONTACTS — The Poke-Home contacts can be individually inserted or removed without disassembling the connector or disturbing adjacent contacts. Even in the Ultra-Mate connectors, which have a hard dielectric face, they can be released from the front. These high temperature, MIL-C-26636 contacts are crimped quickly, consistently, and reliably with either hand or power tools, shown on page 2•500. They have high electrical conductivity, present a smooth configuration, and completely protect electrical contact pressure-members from environmental and handling damage. The contacts come in sizes 12, 16, 20, and shielded, with rhodium-over-silver plating.

VARIETY OF CONFIGURATIONS — Plugs and receptacles are available in two shell sizes with various contact arrangements. Contacts are crimp applied. Connectors are mated under tension by dual spring-loaded mounting assemblies and fixed bushings. Either the plug or the receptacle may be spring loaded. The receptacle mounts on the panel front or rear.

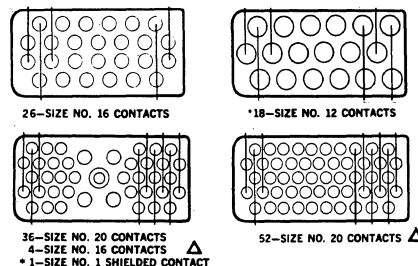
AVAILABLE INSERT ARRANGEMENTS

Showing Rear Face of Pin Inserts

SIZE A SHELL



SIZE B SHELL



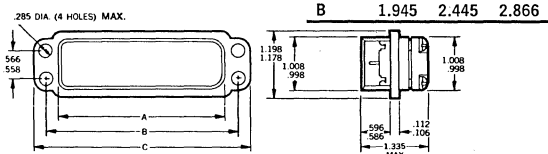
No. 1 Shielded contact is interchangeable with size no. 12 contact.

△ Available in closed entry hard dielectric "ULTRAMATE."

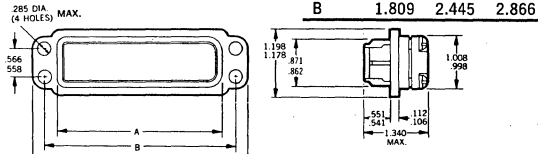
Special insert arrangements and coupling mechanisms may be obtained by contacting Amphenol Connector Division.

DIMENSIONS

STYLE P (PIN INSERT) RECEPTACLES



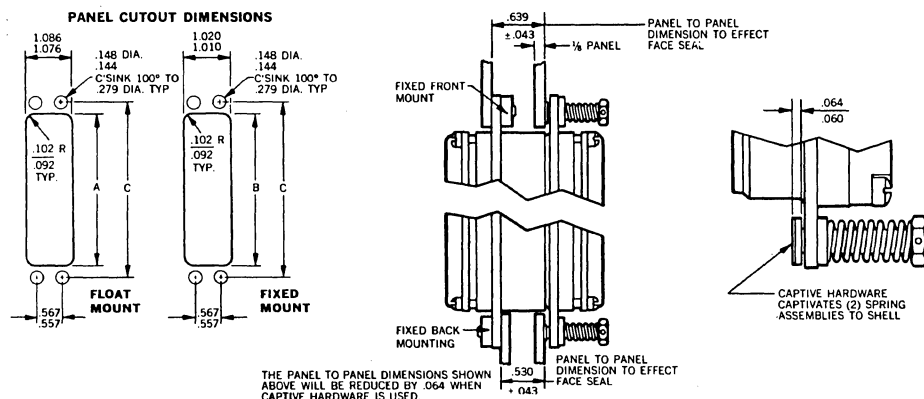
STYLE S (SOCKET INSERT) PLUGS



RACK AND PANEL CONNECTORS

BUNKER RAMO AMPHENOL

MOUNTING DIMENSIONS



Shell Size	Dimensions		
	A	B	C
A	3.459 3.449	3.393 3.383	3.880 3.870
B	2.030 2.020	1.964 1.954	2.450 2.440

HOW TO ORDER 217 SERIES CONNECTORS

217-24C-A077S-10

SERIES DESIGNATION 217-			COMPONENTS INCLUDED																																																													
SHELL AND CONTACT TYPE Use number in appropriate column below. <table border="1"> <thead> <tr> <th>Socket Contacts (Plug)</th> <th>Pin Contacts (Receptacle)</th> <th>Number of Contacts</th> </tr> </thead> <tbody> <tr><td>20</td><td>21</td><td>102</td></tr> <tr><td>22</td><td>23</td><td>92</td></tr> <tr><td>24</td><td>25</td><td>77</td></tr> <tr><td>28</td><td>29</td><td>52</td></tr> <tr><td>30</td><td>31</td><td>26</td></tr> <tr><td>32</td><td>33</td><td>18</td></tr> <tr><td>48</td><td>49</td><td>50</td></tr> <tr><td>50</td><td>51</td><td>42</td></tr> <tr><td>54</td><td>55</td><td>41</td></tr> </tbody> </table>			Socket Contacts (Plug)	Pin Contacts (Receptacle)	Number of Contacts	20	21	102	22	23	92	24	25	77	28	29	52	30	31	26	32	33	18	48	49	50	50	51	42	54	55	41	0 Plug or Receptacle Connector with contacts and spare sealing plugs. 1 Plug or Receptacle Connector without contacts. 2 Connector with captive retainer and spring mounting assemblies assembled to connector without contacts. 3 Same as 2 except with contacts included, packaged separately. 4 Connector, without contacts, with retainer nuts (MS* Fixed bushing) packaged separately. 5 Same as 4 except with contacts included, packaged separately. 6 Connector, without contacts, with spring loaded mounting assembly (MS**) packaged separately. 7 Same as 6 except with contacts included, packaged separately. 8 Connector without contacts, with retainer nuts (stainless) (MS* Fixed Bushing) packaged separately. 9 Same as 8 except with contacts included, packaged separately. *Fixed Bushing: MS No. AMPHENOL No. MS 24700-1 217-537 (Set of 4) Aluminum MS 24700-2 217-955 (Set of 4) Stainless **Spring Loaded Mounting Assembly: MS 24695-1 217-678 (A Size) (Set of 4) MS 24695-2 217-679 (B Size) (Set of 4)																															
Socket Contacts (Plug)	Pin Contacts (Receptacle)	Number of Contacts																																																														
20	21	102																																																														
22	23	92																																																														
24	25	77																																																														
28	29	52																																																														
30	31	26																																																														
32	33	18																																																														
48	49	50																																																														
50	51	42																																																														
54	55	41																																																														
INSERT CONSTRUCTION C—Closed Entry, Hard Dielectric, Ultra-Mate R—Resilient Front																																																																
SHELL SIZE A, B																																																																
TOTAL NUMBER OF CONTACTS <table border="1"> <thead> <tr> <th></th> <th>20</th> <th>16</th> <th>12</th> <th>No. 1 Shielded</th> <th>No. 2 Shielded</th> </tr> </thead> <tbody> <tr><td>102</td><td>102</td><td></td><td></td><td></td><td></td></tr> <tr><td>092</td><td>82</td><td>10</td><td></td><td></td><td></td></tr> <tr><td>077</td><td>65</td><td></td><td>12</td><td></td><td></td></tr> <tr><td>052</td><td>52</td><td></td><td></td><td></td><td></td></tr> <tr><td>026</td><td></td><td>26</td><td>18</td><td></td><td></td></tr> <tr><td>018</td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td>042</td><td>33</td><td></td><td></td><td></td><td>9</td></tr> <tr><td>041</td><td>36</td><td>4</td><td></td><td></td><td></td></tr> <tr><td>050</td><td></td><td>50</td><td></td><td>1</td><td></td></tr> </tbody> </table>				20	16	12	No. 1 Shielded	No. 2 Shielded	102	102					092	82	10				077	65		12			052	52					026		26	18			018						042	33				9	041	36	4				050		50		1		TYPE OF CONTACT P—Pin S—Socket	
	20	16	12	No. 1 Shielded	No. 2 Shielded																																																											
102	102																																																															
092	82	10																																																														
077	65		12																																																													
052	52																																																															
026		26	18																																																													
018																																																																
042	33				9																																																											
041	36	4																																																														
050		50		1																																																												
			SHELL FINISH 1 MIL-C-26518 hard coat anodize on front of shell, gold iridite on flange and on grommet ferrule 5 Gold Iridite 6 Black Anodize																																																													

The part numbering system has been set up to provide a complete and exact description through the part number. To find the Amphenol part number to order, put together the four groups of digits and letters that specify the particular 217 Series connector you want, as per the following example.

CONTACT DATA

Contact Size	Max. Current Rating	Wire Size	AMPHENOL Part No.		MS Part No.	
			Pin	Socket	Pin	Socket
No. 20	7.5 amps	24-22-20 AWG	48-1595-02	248-136-2001S-02	MS24254-20P	MS24255-20S
No. 16	22 amps	18-16 AWG	48-1825-02	248-136-1600S-02	MS24254-16P	MS24255-16S
No. 12	41 amps	14-12 AWG	48-1827-02	248-136-1200S-02	MS24254-12P	MS24255-12S
No. 1 (shielded)*						
Resilient	3 amps	**	48-1226-02	48-1227-02	MS27184-22P	MS27185-22S
Hard Front	3 amps	**	—	48-1227-50	—	MS27450-22S
No. 2 (shielded)						
Resilient	7.5 amps	***	48-2187-02	48-2188-02	MS27184-20P	MS27185-20S
Hard Front	1 amp	RG-195/U	48-2187-50	48-2188-50	—	—

* Replaces No. 12 power contact. Can accommodate cables RG179/U, RG179A/U, RG187/U, RG188/U and RG161/U as well as shielded contacts. Cables RG195/U, RG178/U, RG178A/U and RG196/U can also be accommodated with modification to shielded contacts.

** Cable MIL-C-27500-22KIN6 (Extruded) or 22 AWG per MIL-C-7078 type II.

*** Cable MIL-C-27500-22KIN6; 20KIN6; 18KIN6 (Extruded) or 22, 20, 18 AWG per MIL-C-7078 type II.

STANDARD CIRCULAR CONNECTOR TOOLS

**BUNKER
RAMO**
AMPHENOL

ASTRO/348® SERIES POWER CONTACTS AND SHIELDED CONTACTS

Amphenol Connector Division has a complete tool department maintained as a benefit to our connector customers. These tools are designed for Amphenol's Poke-Home® contacts used in rear insertion/front removable connectors.

Contact Size	Wire Size AWG	Max. Current Rating Amps	AMPHENOL Part No.		Crimping Tool	Contact Locator or Positioner	Crimp Jaw Setting	Insertion Tool	Removal Tool
			Pin	Socket					
12-12	14 12	23	348-100-1200S-XX	348-100-1200P-XX	294-1462 † or 294-1718 *	294-1722-01 or 294-1722-02	See Data Plate	294-33 (Pin) (MS3342-12) 294-35 (SKT) (MS3344-12)	294-34 (Pin) (MS3342-12) 294-35 (SKT) (MS3344-12)
			348-100-1600S-XX	348-100-1600P-XX	294-1462 † or 294-1718 *	294-1722-01 or 294-1722-02	See Data Plate	294-30 (Pin) (MS3342-16) 294-32 (SKT) (MS3344-16)	
16-16	20 18 16	13	348-100-2000S-XX	348-100-2000P-XX	294-1462 † or 294-1718 *	294-1722-01 or 294-1722-02	See Data Plate	294-27 (Pin) (MS3342-20) 294-29 (SKT) (MS3344-20)	294-34 (Pin) (MS3342-12) 294-35 (SKT) (MS3344-12)
			348-100-2200S-XX	348-100-2200P-XX	294-1462 † or 294-1718 *	294-1722-01 or 294-1722-02	See Data Plate	294-27 (Pin) (MS3342-20) 294-29 (SKT) (MS3344-20)	
20-20	24 22 20	7.5	348-100-2400S-XX	348-100-2400P-XX	294-1462 † or 294-1718 *	294-1722-01 or 294-1722-02	See Data Plate	294-27 (Pin) (MS3342-20) 294-29 (SKT) (MS3344-20)	294-34 (Pin) (MS3342-12) 294-35 (SKT) (MS3344-12)
			348-100-2600S-XX	348-100-2600P-XX	294-1462 † or 294-1718 *	294-1722-01 or 294-1722-02	See Data Plate	294-27 (Pin) (MS3342-20) 294-29 (SKT) (MS3344-20)	
23-22	26 24 22	5	348-100-2800S-XX	348-100-2800P-XX	294-1462 † or 294-1718 *	294-1722-01 or 294-1722-02	See Data Plate	294-27 (Pin) (MS3342-20) 294-29 (SKT) (MS3344-20)	294-34 (Pin) (MS3342-12) 294-35 (SKT) (MS3344-12)
			348-100-3000S-XX	348-100-3000P-XX	294-1462 † or 294-1718 *	294-1722-01 or 294-1722-02	See Data Plate	294-27 (Pin) (MS3342-20) 294-29 (SKT) (MS3344-20)	

Size 12 Shielded Contact	Outer Body Hex Crimp Tool (Includes Hex Die Set)	Center Pin Tools		Insertion Tool	Removal Tool
		Crimping Tool	Bushing		
348-100-6000P-XX -5000S-XX -5001P-XX -5001S-XX -6002P-XX -6002S-XX -6003P-XX -6003S-XX -6004P-XX -6004S-XX	294-525	294-297 (MS3198-1)	294-1816-01	294-33 †	294-34 (Pin) (MS3342-12) 294-35 (SKT) (MS3344-12)
348-100-6005S-XX -6006S-XX -6007S-XX -6008S-XX -6009S-XX -6010P-XX -6012P-XX -6012S-XX -6013S-XX	294-525	294-297 (MS3198-1)	294-1816-01	294-33 †	294-34 (Pin) (MS3342-12) 294-35 (SKT) (MS3344-12)

Size 16 Shielded Contact	Outer Body Hex Crimp Tool (Includes Hex Die Set)	Center Pin Tools		Insertion Tool	Removal Tool
		Crimping Tool	Bushing		
348-100-6010P-XX -6010S-XX -6011S-XX	294-532	294-297 (MS3198-1)	294-1817-01	294-30 †	294-31 (Pin) (MS3342-16) 294-32 (SKT) (MS3344-16)

POKE-HOME CONTACTS AND TOOL APPLICATIONS

48 AND 248 SERIES CONTACTS FOR 48 AND 217 SERIES CONNECTORS

CONTACTS

When you order 48 or 217 Series connectors with contacts, the contact package contains enough contacts to complete the insert arrangement and have at least 2 spares left. The package also includes enough sealing plugs for at least 15% of the contacts in the insert, in any case a minimum of 3 sealing plugs. To order contacts and sealing plugs separately use the part numbers in the table below. Contacts may also be ordered in reels or bowls for use with automatic/feed crimping tools.

TOOLS

Note that various tools are available for crimping, inserting, and removing each size contact. However, the recommended tools are indicated in red.

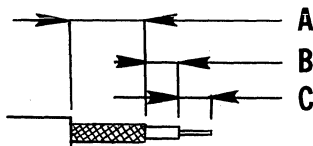
Contact Size	Wire Size AWG	Max. Current Rating Amps	AMPHENOL Part No.		MS Part No.		Crimping Tool	Contact Locator or Positioner	Crimp Jaw Setting Dia.	Insertion Tool	Removal Tool	
			Pin	Socket	Pin	Socket					Standard Connector	Ultra-Mate Connector
No. 20	24 22 20	3.0 5.0 7.5	48-1595-02	48-100-2000S-02 or 248-136-2001S-02	MS24254-20P	MS24255-20S	294-90 294-126 294-186 294-243 294-293 294-358 294-444 294-506 294-1166 294-1264	Included Included Included Turret Hd. Turret Hd. Turret Hd. Auto/Feed Auto/Feed Auto/Feed Auto/Feed	0335 030-.041 Data Plate 041-.053 030-.041 030-.041 030-.041 030-.041 030-.041	294-88 (MS24256A20)	294-89 (MS24256B20)	294-203 (MS24256RH20)
No. 16	18 16 22	16 22	48-1825-02	48-100-1600S-02 or 248-136-1600S-02	MS24254-16P	MS24255-16S	294-85 294-126 294-243 294-293 294-358 294-444 294-506 294-1166	Included Included Included Turret Hd. Turret Hd. Turret Hd. Auto/Feed Auto/Feed Auto/Feed	0415 Data Plate 041-.053 041-.053 041-.053 041-.053 041-.053	294-96 (MS24256A16)	294-97 (MS24256B16)	294-180 (MS24256RH16)
No. 12	14 12 12	32 41	48-1827-02	48-1215-02 or 248-136-1200S-02	MS24254-12P	MS24255-12S	294-86 294-126 294-243 294-293 294-358 294-444 294-506 294-1166	Included Included Included Turret Hd. Turret Hd. Turret Hd. Auto/Feed Auto/Feed Auto/Feed	0625 Data Plate 062-.072 062-.072 062-.072 062-.072 062-.072 062-.072	294-72 (MS24256A12)	294-73 (MS24256B12)	294-183 (MS24256RH12)
No. 1 (Shielded) Resilient Hard Front	** ** **	3 3 3	48-1226-02 — 48-1227-50	48-1227-02 48-1227-50	MS27184-22P — MS27185-22S	MS27185-22S MS27185-22S MS27185-22S	See Below			294-72 † (MS24256A12)	294-73 † (MS24256B12)	294-264
No. 2 (Shielded) Resilient Hard Front	** ** **	7.5	48-2187-02 48-2188-02 48-2188-50	48-2188-02 48-2188-50	MS27184-20P MS27185-20S MS27185-20S							

* Replaces No. 12 power contact. ** See cable application table below

† These tools are applicable to all #1 and #2 shielded contacts, respectively, not just contacts listed here.

NOTE: To maintain the environmental seal and to prevent the other contacts from becoming misaligned, insert a #12 contact, pin or socket as applicable, into any empty connector holes intended for a #1 shielded contact but left unused. Then seal with a sealing plug.

SHIELDED CONTACT CRIMPING



Shielded Contact Size	Shielded Contact	Contact Pin or Sockets	Cable Stripping Dimensions (See Diagram)			Crimp Tools		Outer Ferrule Crimp Tool (Includes Hex Dies)	Cable Application
			A	B	C	Tool	Contact Locator or Positioner		
#1 Shielded	48-1226-02 48-1227-02 48-1227-50	P S S	7/32	5/64	7/64	294-289	294-1631	See Data Plate	#22 AWG per MIL-C-7078, Type II and RG-174/U, -188/U, -187/U, -179/U, -179A/U, -187/U
	48-1226-57 48-1227-51 48-1227-54	P S S	7/32	5/64	7/64	294-289	294-1631	See Data Plate	Raychem 9530A11
#1 Shielded	48-1226-51 48-1227-51 48-1227-54	P S S	7/32	1/32	5/32	294-289	294-1631	See Data Plate	RG-180/U, -180A/U, -180B/U, -195/U
	48-1226-55 48-1227-55	P S	15/64	1/32	5/32	294-289	294-1631	See Data Plate	RG-178/U, -178A/U, -178B/U, -196/U
#2 Shielded	48-2187-02 48-2188-02 48-2188-50	P S S	7/32	7/64	9/64	294-126* 294-1014 294-1166* 294-1166*	294-1014 294-1015 294-1630 294-1630	031-.035 See Data Plate	#18, 20, 22 AWG per MIL-C-7078, Type II and MIL-C-27500-18, -20, -22 Kins Extruded Jacket
	48-2187-50 48-2188-50 48-2188-54	P S S	7/32	7/64	9/64	294-1166* 294-1014 294-1015 294-1630	294-1014 294-1015 294-1630 294-1630	031-.035 See Data Plate	RG-180/U, -180A/U, -180B/U, -195/U
#2 Shielded	48-2187-52 48-2188-52	P S	5/16	7/64	9/64	294-358 294-289	294-1015 294-1630	031-.035 See Data Plate	RG-59/U and 21-541
	48-1292-02 48-1293-02	P S	7/32	7/64	9/64	294-1166 294-1014	031-.035 See Data Plate	294-528	Boeing Co. BMS 13-5D, Type III Class A and BMS 13-18 Type III Class I. Sizes #22, #20, #18

* Conforms to MIL STD-MS3191-1. Inactive for new Navy procurement. † Same as 294-126, less positioners.

STANDARD CIRCULAR CONNECTOR TOOLS

BUNKER
RAMO

AMPHENOL

48 AND 248 MODIFIED CONTACTS FOR 48 AND 217 SERIES CONNECTORS

48 SERIES CONTACTS

Part Number	Contact Style	Contact Size	Wire Size	Insulation Wire O.D. (Inches)	Crimping Tool	Contact Locator or Positioner	Insertion Tool	Removal Tool Standard Connector	Ultra-Mate Connector
48-100-5008P-02	Pin	20	18	.090 Max.	294-1166 *	294-1505	294-88 *	294-89 ☉	294-203 ☉
48-100-5008S-02	Socket	20	18	.090 Max.	294-1166 *	294-1505	294-88 *	294-89 ☉	294-203 ☉
48-100-5007P-02	Pin	20	16	.090 Max.	294-1166 *	294-1140	294-96 ☉	294-89 ☉	294-203 ☉
48-100-5007S-02	Socket	20	16	.090 Max.	294-1166 *	294-1140	294-96 ☉	294-89 ☉	294-203 ☉
48-100-5017P-02	Pin	20	26, 28, 30	.040 Min.	294-126 †	Included	294-88 *	294-89 ☉	294-203 ☉
48-100-5017S-02	Socket	20	26, 28, 30	.040 Min.	294-126 †	Included	294-88 *	294-89 ☉	294-203 ☉
48-100-5021P-02	Pin	16	14	.130 Max.	294-358	294-901	294-96 ☉	294-97 ☉	294-180 ☉
48-100-5020P-02	Pin	12	10	.170 Max.	294-1166 *	294-1668	294-284	294-73 ☉	294-183 ☉

248 SERIES CONTACTS

The modified 248 Series contacts are designed to accept larger wire sizes.

Part Number	Contact Style	Contact Size	Wire Size	Insulation Wire O.D. (Inches)	Crimping Tool	Contact Locator or Positioner	Insertion Tool	Removal Tool Standard Connector	Ultra-Mate Connector
248-136-2018S-02	Socket	20	18	.090 Max.	294-1166 *	294-1505	294-88 *	294-89 ☉	294-203 ☉
248-136-2016S-02	Socket	20	16	.090 Max.	294-1166 *	294-1140	294-96 ☉	294-89 ☉	294-203 ☉
248-136-1614S-02	Socket	16	14	.130 Max.	294-358	294-901	294-96 ☉	294-97 ☉	294-180 ☉
248-136-1210S-02	Socket	12	10	.170 Max.	294-1166 *	294-1668	294-284	294-73 ☉	294-183 ☉

67 AND 69 SERIES CONTACTS

Contact Size	Wire Size AWG	Current Rating Amps	AMPHENOL Part No.		Crimping Tool	Contact Locator or Positioner	Crimp Jaw Setting	Insertion and Removal Tool
			Pin	Socket				
20	24 22 20	3.0 5.0 7.5	67-1890	67-1772	294-358 294-506 294-1166 *	294-1035 Automatic Feed 294-1081	.033-.041 .033-.041 .031-.041 .031-.041	294-152
20	24 22 20	3.0 5.0 7.5	18-313	175-257	294-358 294-506 294-1166 *	294-1035 Automatic Feed 294-1081	.033-.41 .033-.041 .031-.041 .031-.041	294-193
16 16S	16-18 20	22	69-1120 or 69-1125	69-1105 or 69-1110	294-293 ☉ 294-358 294-243 ☉	Included 294-901 Included	See Data Plate .062-.072 See Data Plate	294-39
12	12 14	41	69-1115	69-1100	294-293 ☉ 294-358 294-243 ☉	Included 294-903 Included	See Data Plate .041-.053 See Data Plate	294-40
Coax			69-14500	69-14501		Center Contact Soldered Outer Ferrule Crimped with 294-531		294-71

246 SERIES CONTACTS

Contact Size	Wire Size AWG	Max. Current Rating Amps.	AMPHENOL Part No.		Crimping Tool	Contact Locator or Positioner	Crimp Jaw Setting	Insertion Tool	Removal Tool
			Pin	Socket					
16	20 18 16	22	246-12600-16000—XX	246-12800-16000—XX	294-243 ☉ 294-293 ☉ 294-1166 * 294-126 †	Included Included 294-1170 Included	See Data Plate See Data Plate .041-.053 .041-.053	294-192 (MS90455-1)	294-219 (MS90456-1)
12	14 12	41	246-12600-12000—XX	246-12800-12000—XX	294-243 ☉ 294-293 ☉ 294-1166 * 294-126 †	Included Included 294-1171 Included	See Data Plate See Data Plate .062-.072 .062-.072	294-229 (MS90455-2)	294-230 (MS90456-2)
8	10 8	73	246-12600-08000—XX	246-12800-08000—XX	Pico ** #400-B	Pico Die Assy. ** #414DA-8N	Pico** Locator #4066-2	294-237 (MS90455-3)	294-240 (MS90456-3)
4	6 4	135	246-12600-04000—XX	246-12800-04000—XX	Pico ** #400-B	Pico Die Assy. ** #414DA-4N	Pico** Locator #4066-1	294-236 (MS90455-4)	294-239 (MS90456-4)
0	2 0	245	246-12600-01000—XX	246-12800-01000—XX	Pico ** #400-B	Pico Die Assy. ** #414DA-"O" N	Pico** Locator #4066	294-235 (MS90455-5)	294-241 (MS90456-5)

ELECTRICAL INTERCONNECTION SYSTEMS

BUNKER
RAMO

AMPHENOL

SAMS

Amphenol Connector Division
— SAMS Operation —

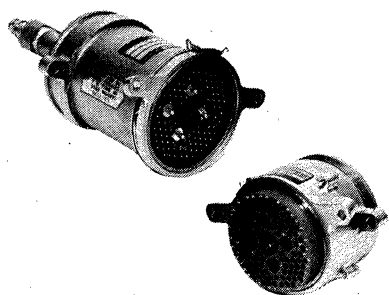
For an answer to your inter-connection problems call on the best — call on Amphenol.

Amphenol SAMS Division, pioneers in high reliability interconnection systems for the Aerospace industry, produces a wide variety of electrical interconnects for aircraft, nuclear power plants, naval vessels, ground vehicles and equipment, and missile/ordnance systems.

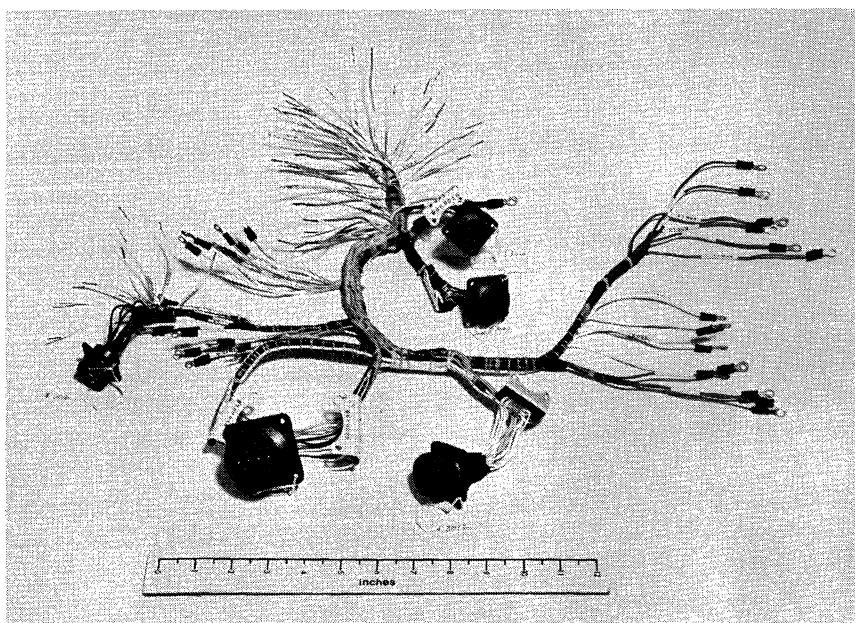
The solution to your problem, whether a simple wire harness assembly for a Military combat vehicle, or a sophisticated cable system for missile guidance and control, can be produced to your specifications or can be custom designed to meet your performance requirements.

We have provided some of the most complex, EMI/RFI shielded multi-element interconnection systems ever produced/designed, manufactured and tested to standards never before achieved, for programs where technical skills are paramount —

Yet, as many have learned, our skills at saving you money in a design-to-cost effort are just as sharply honed.

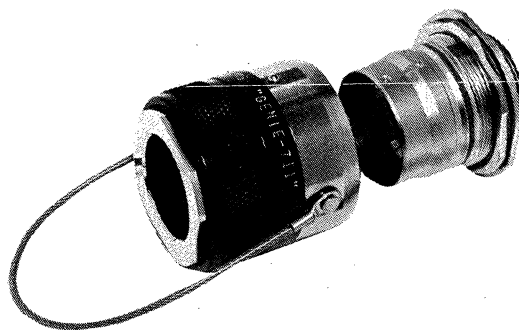


HAWK LAUNCHER HARNESS



SPECIALIZED CAPABILITIES

GENIE 711 SERIES is an example of our specialized capabilities. This new reliable design configuration is for multiple applications of quick-disconnect, umbilical electrical connections. Mate by a straight axial push! disconnect any one of three ways: 1.) Standard lanyard quick-disconnect with optional manual release; 2.) Lanyard quick-disconnect with safety-latching provision and 3.) Conventional disconnect.



SPECIAL PURPOSE CONNECTORS NUCLEAR POWER PRODUCTS

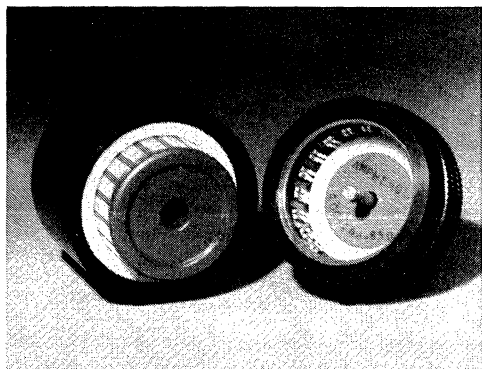
BUNKER
RAMO

AMPHENOL

SAMS

Amphenol Connector Division
— SAMS Operation —

SPECIAL PURPOSE CONNECTORS



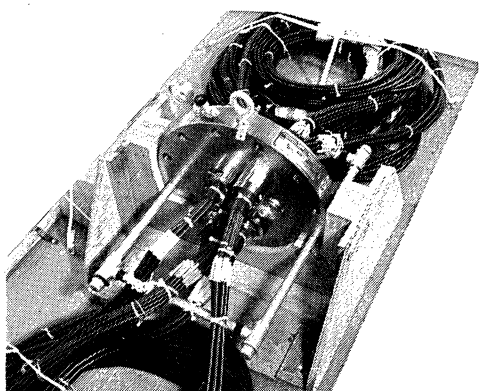
WHEN THE CONNECTOR YOU NEED IS NOT IN A CATALOG...

...SAMS is the place to call! One of our primary concerns is finding new approaches to disconnect methods, contact design and interconnection assembly.

Even harsh environments such as EMI/RFI/EMP exposure to nuclear radiation are challenges successfully met numerous times by SAMS! Years of experience in the aerospace and missile fields have enabled SAMS to solve connector problems never encountered by most connector manufacturers, and have permitted us to accumulate a background of specialized knowledge available nowhere else in the industry.

If your connector is not a catalog item, call SAMS. Ours aren't either!

NUCLEAR POWER PRODUCTS



HELPING TO SOLVE THE ENERGY CRISIS...

...is one of SAMS' more important activities, and we have pioneered the field of electrical interconnections for nuclear reactor plants. You'll find SAMS-designed electrical penetration assemblies (EPA's) in many major nuclear projects in the United States today. They're engineered to meet not only the electrical/electronic requirements of the interface between the reactor and its surroundings, but also to withstand the hostile environment of the reactor itself.

In addition to EPA's, SAMS produces radiation-resistant instrumentation, power and special connectors, splices and other pre-fabricated nuclear interconnection devices for use within this most destructive environment.

If your interconnection needs are nuclear oriented, whether in power plants, test or research facilities, you'll find expert assistance at Amphenol SAMS.

INDUSTRIAL INTERCONNECTIONS

BUNKER
RAMO

AMPHENOL

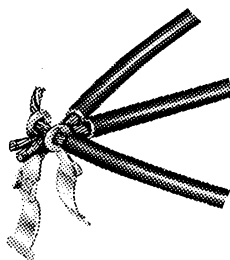
USEFUL INFORMATION ABOUT AMPHENOL INDUSTRIAL INTERCONNECTIONS

Amphenol Industrial Division offers the most comprehensive line of industrial interconnections obtainable anywhere. The information here covers Amphenol's complete line of industrial **standard** interconnections, ordinarily available from stock.

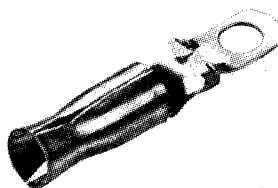
Amphenol also has a large selection of **non-standard** industrial interconnections, too numerous to classify. If you do not see what you require, contact the factory for availability and full information.

THIS INFORMATION WILL HELP YOU MAKE
THE MOST EFFICIENT USE OF THE FOLLOWING PAGES

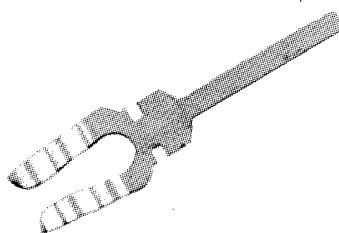
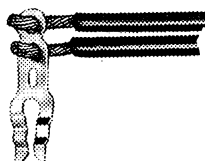
CONTACTS FOR LOW-RESISTANCE SERVICE

**"A" CONTACT**

Used for all standard-size Amphenol sockets with 4, 5, 6 or 7 contacts. Provides a firm grip on large tube or relay prongs and permits soldering several wires to one lug. Wire-hole diameter: .078".

**"B" CONTACT**

Used for all standard-size Amphenol sockets with 8, 9, 10 or 11 contacts, except loktal types. Commonly called "tuning-fork" contacts, they form a low-resistance contact with tube or relay prongs. A series of waves along the two tines assure excellent wiping action to remove films and foreign matter. Wire-hole diameter: .082".

**WRAP-AROUND CONTACT**

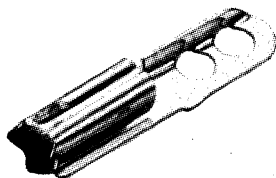
Used in several standard tube and relay sockets and audio-type connectors. Furnishes a full 360° of contact with the mating pin for high conductivity. Solder tail has one .093" x .078" wire hole.

WIRE-WRAPABLE CONTACTS

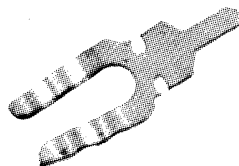
are available for all 77-MIP and 78-S-type sockets having 8 or more contacts. Two post sizes are offered—.016"x.062" for up to 22 AWG wire; .025"x.062" for up to 16 gauge. Both half-inch-long tails accept two wrap levels.

PRINTED-BOARD CONTACTS

are a standard option for all 77-MIP- and 78-S-type sockets with 8 contacts or more. They are easily inserted into .0625"-diameter plated-through holes in printed boards and dip or wave soldered into place. Usable tail length is 1/8" with a tapered tip for fast insertion. The contact shoulder rests on the board to maintain a 1/16" clearance for ventilation or cleaning.

**CLOVER-LEAF CONTACT**

Used for octal socket 59-103 (page 2-512). Patented design provides superior retention on mating plug to resist vibration and shock in severe-service applications. Solder tail has two .093" wire holes.



CHOICE OF MOUNTINGS

MIP (MOLDED-IN-PLATE)

Sturdy steel mounting plate is molded directly into phenolic body to eliminate breakage frequently encountered when riveting laminated type sockets. Designed for above chassis mounting, but can also be mounted below chassis.

RETAINER RING

Sockets mount quickly and easily without screws or rivets. Retainer rings are easily assembled with the Amphenol Retainer-Ring Hand Tool (see p. 2-514). Sockets with multiple notches may be positioned to line up contacts for most convenient wiring.

REPLACEMENT TYPE

Steel mounting plate is firmly assembled to socket with retainer ring. Sockets with multiple notches may be positioned to line up contacts with original wiring.

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

INDUSTRIAL INTERCONNECTIONS

BUNKER
RAMO

AMPHENOL

SELECT YOUR DIELECTRIC AND CONTACT MATERIALS

Many tube/relay sockets, plugs and other industrial interconnections are used for applications for which they were not originally intended. To assure reliable service, these non-standard uses should be analyzed prior to ordering to determine the best combination

of contact and dielectric materials for the application. To aid in selection, the information that follows outlines electrical and mechanical properties of contact and dielectric material available from Amphenol.

CONTACT MATERIALS

BRASS

Brass has high conductivity and is relatively low in cost. However, it age-hardens or crystallizes under stress; thus will not stand up to repeated insertion/withdrawal cycles. Brass contacts can change in form and spring qualities over a period of time.

PHOSPHOR BRONZE

In the medium-cost area, approximately 50% higher than brass. Spring quality is good. However, it has lower conductivity in comparison with other copper alloys.

LUBALLOY

A 90% copper, 8.25% zinc, 1.75% silver alloy which is relatively low in cost with fairly good conductivity characteristics. Its spring quality is less than that of phosphor bronze.

BERYLLIUM-COPPER

After proper heat treatment, beryllium-copper contacts have substantially greater life-cycle characteristics and will withstand more insertion and withdrawal cycles over a wider range of pin sizes than any other commercial non-ferrous spring material. Sockets utilizing beryllium-copper contacts are ideally adapted to test equipment and other applications where changing of tubes, relays or plugs is frequent. The material does not age-harden or crystallize over a reasonable period of time.

DIELECTRIC MATERIALS

GENERAL-PURPOSE PHENOLIC

Black, wood-flour-filled phenolic for applications requiring good electrical qualities with mechanical characteristics better than the acceptable minimum.

MICA-FILLED PHENOLIC

Tan/yellow, low-loss, low-water-absorption, mineral-filled phenolic compound for applications requiring superior dielectric properties.

CERAMIC

Grey/white, withstands high temperatures, is non-hygroscopic, has low-loss factor. Recommended for high-frequency work, in transmitters and amplifiers where output is greater than 20 watts. Also recommended for relays or other apparatus which are located in or near high-temperature equipment.

DIALLYL PHTHALATE

Blue, mineral-filled for use where close dimensional tolerances must be met, dimensional stability is a must and where high arc- and insulation-resistance are required. Especially recommended where electrical and mechanical characteristics must be maintained under operating conditions involving extreme humidity and temperature. A superior dielectric material available on special order.

DIELECTRIC MATERIALS
ELECTRICAL/MECHANICAL CHARACTERISTICS

Molding Compound →	General Purpose Phenolic	Mica Filled Phenolic	Ceramic	Diallyl Phthalate
MIL Spec—Type	MIL-M-14F CFG	MIL-M-14F MFE	—	MIL-M-14 MDG
Max. Opr. Temperature (Continuous)	300°F	300°F	1400°F	300°F
Insulation Resistance (Volume Megs.-CMS)	10 ³	10 ⁶	10 ⁸	4 x 7 ¹⁰
Water Absorption (ASTM 24 Hrs.)	1.31%	.61%	0.00%	.45%
Tensile Strength (Lbs./Sq. In.)	6100	5400	8500	5500
Dielectric Strength (Volts/MIL)	346	475	400	360
Loss Factor (Not %)	.178 @ 1,000,000 cycles	.040 @ 1,000,000 cycles	.007	.02

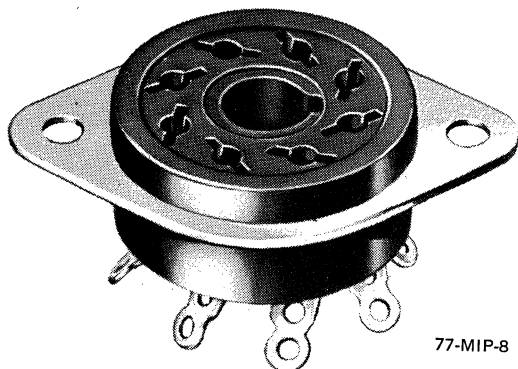
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

TUBE/RELAY SOCKETS

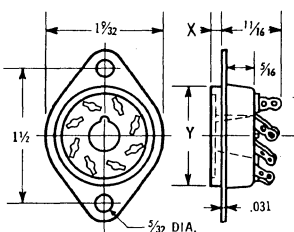
BUNKER
RAMO

AMPHENOL

77-"MIP" MOLDED-IN-PLATE SERIES Solder Termination



77-MIP-8



$X = \frac{3}{32}$ on MIP-4-5-6-7S & 7L
 $X = .145$ on MIP-8-9-11-12
 $Y = 1\frac{1}{4}$ on MIP-4-5-6-7S
 $Y = 1\frac{1}{4}$ on MIP-7L-20
 $Y = 1\frac{1}{4}$ on MIP-11-12

These sockets have a steel plate molded directly into the solid phenolic body to assure secure, reliable mounting. The steel plate also eliminates the possibility of breaking ordinary laminated sockets while riveting them to the chassis or crimped-on plates loosening in service.

Contacts are spaced for easy, fast wiring. Two holes in each contact tail provide wiring and anchoring points for resistors, capacitors, chokes and other components.

These sockets are intended for above-chassis mounting in round holes $1\frac{3}{16}$ " diameter. 77-MIP-20 only requires a $1\frac{1}{16}$ " hole. Design also allows for below-chassis mounting.

Standard sockets are molded in general-purpose black phenolic; mounting plate is nickel-plated steel; contacts are cadmium-plated copper alloy. Optional materials and finishes available from stock include mica-filled phenolic, phosphor-bronze, silver-plated contacts with stainless-steel mounting plate; or tinned contact tails on special order. See ordering information.

ORDERING INFORMATION

Part No.	Contacts			Pin Circle Diameter	Voltage Rating (RMS)	Current Rating (Amps)	Mating Plug (p. 2-512)
	No.	Material	Type (p. 2-504)				
77-MIP-4	4	Brass	A	.640	2000	5	86-CP4
77-MIP-5	5	Brass	A	.750	1250	5	86-CP5
77-MIP-6	6	Brass	A	.750	1250	5	86-CP6
77-MIP-7S	7 Std.	Brass	A	.750	1250	5	86-CP7S
77-MIP-8	8 Octal	Lubaloy	B	.687	1250	3	86-CP8
77-MIP-9	9	Lubaloy	B	.687	1250	3	86-CP9
77-MIP-11	11	Lubaloy	B	.750	500	3	86-CP11
77-MIP-12	12	Lubaloy	B	.750	500	3	86-CP12
77-MIP-20	20	Brass	Wrap Around	1.000 Outer .687 Inner	500	3	71-20

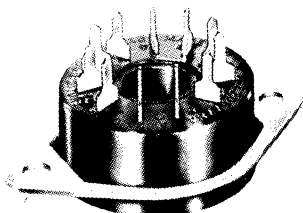
For deviations from standard, put deviation letter or number **after** part number above as follows: T—mica-filled phenolic; M—phosphor-bronze, silver-plated contacts and stainless-steel mounting plate; 1—tinned contact tails. Example: 77-MIP-9TM 1.

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

TUBE/RELAY SOCKETS

BUNKER
RAMO

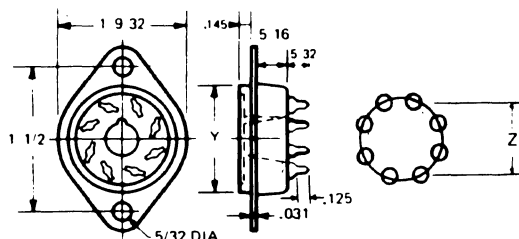
AMPHENOL

77 "MIP" MOLDED-IN-PLATE
PRINTED-BOARD TERMINATIONS

Simplify production of printed boards requiring vacuum tubes or plug-in relays. Simply insert sockets into .0625"-diameter plated-through holes in boards and flow- or wave-solder into place. The molded-in-plate reduces strain on the terminals during tube or relay insertion or withdrawal when the mounting plate is fastened to the board with screws and spacers.

Tapered "lead-in" terminals assist in fast insertion and each has a shoulder allowing .016" clearance above the board for better air circulation and ease of cleaning.

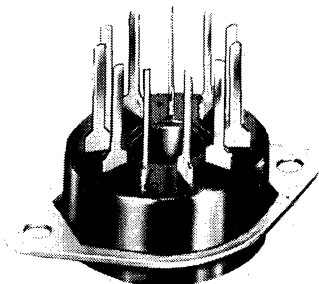
Contacts are cadmium-plated Lubaloy. Their tuning-fork design provides positive wiping action on the pins for low-contact resistance and high retention force. Tails are $\frac{1}{8}$ " long, $\frac{1}{16}$ " wide, .016" thick. Mount on printed boards up to $\frac{1}{8}$ " thick. Each contact is rated 3 amp continuous. Dielectric is general-purpose black phenolic.



DIMENSIONS AND ORDERING INFORMATION

Number of Contacts	Part Number	(Z) Pin Circle Diameter	Y
8	77-MIP8W-0125	.687	1 $\frac{1}{4}$ "
9	77-MIP9W-0125	.687	1 $\frac{1}{4}$ "
11	77-MIP11W-0125	.750	1 $\frac{1}{4}$ "
12	77-MIP12W-0125	.750	1 $\frac{1}{4}$ "
20	77-MIP20W-0125	outer 1.000 inner .687	1 $\frac{15}{64}$ "

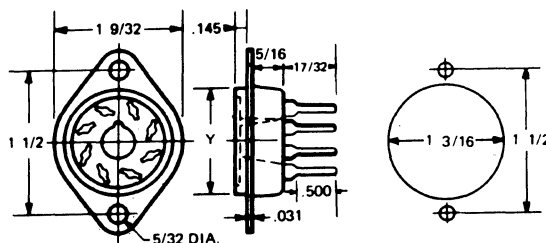
WIRE-WRAPPING TERMINATIONS



Here is real convenience for users of hand and/or semi-automatic wire-wrapping equipment. Terminate tube or relay sockets in the same operation as other components to eliminate the extra soldering operation.

Dielectric is general-purpose black phenolic. Contacts are cadmium-plated copper alloy for resistance to oxidation and improved conductivity. All tails are $\frac{1}{2}$ " long and $\frac{1}{16}$ " wide. Two thicknesses are available for different amperages and wire sizes, as follows:

	Standard Contact	Heavy-Duty Contact
Thickness	.016"	.025"
Current Rating	3 amp. cont.	7.5 amp. cont.
Contact Retention Force (One .093" dia. pin)	3 oz. min.	5 oz. min.
Wire size	Accepts 2 wraps of 22 AWG wire	Accepts 2 wraps of up to 16 AWG wire



ORDERING INFORMATION

Number of Contacts	Standard Contact	Heavy-Duty Contact
8	77-MIP8W-0500	77-MIP8W-0525
9	77-MIP9W-0500	77-MIP9W-0525
11	77-MIP11W-0500	77-MIP11W-0525
12	77-MIP12W-0500	77-MIP12W-0525

FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

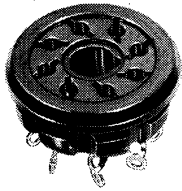
TUBE/RELAY SOCKETS

BUNKER
RAMO

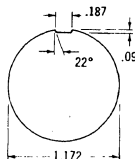
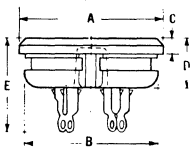
AMPHENOL

78 "S" SERIES

with retainer-ring mounting and solder-eyelet termination



78-S8

Recommended
Panel
Cutout

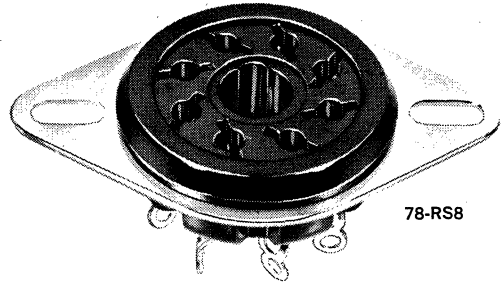
DIMENSIONS

Sockets	A	B	C	D	E
78-S4,-S5,-S6,-S7S	1 1/4	1 1/2	.135	.420	2 1/2 Approx.
78-S8,-S9,-S11,-S12, -S16	1 1/4	1 1/2	.145	.490	7/8 Approx.

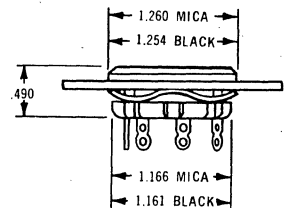
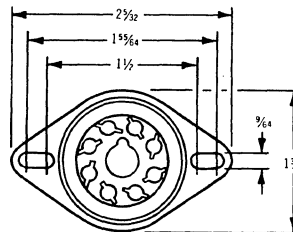
Aside from mounting provisions, 78S Series Sockets are identical to the 77-MIP Series described on pgs. 2•506 and 2•507, both in characteristics and deviations available. The 78S Series features retainer-ring mounting for quick, easy, secure fastening to the chassis or panel without screws or rivets. Mount them either with a screwdriver or Amphenol Hand Tool 51-3 (see p. 2•513). 78S Series Sockets are notched around their circumference to permit positioning and mounting in the location that allows the most convenient wiring. One retainer ring is furnished with each 78S Series Socket.

These sockets can also be used with 86 CP type plugs and 3 Series plug caps to make reliable, low-cost cable assemblies.

IMPORTANT: Specify chassis thickness. Unless otherwise specified, 78S Series Sockets are grooved to fit from 22 gauge (.031") to 18 gauge (.050") panels or chassis. This standard grooving also fits standard plug caps (p. 2•521). To assure a secure mount when chassis or panel is outside the 22 to 18 gauge limit, specify exact thickness and then the sockets will be grooved to order. Non-standard groove locations are available to fit up to 13 gauge (.093") panel thickness.



78-RS8



REPLACEMENT SOCKETS

These sockets are ideal for all replacements, especially as substitutes for broken and noisy wafer types. They are standard 78S Series Sockets, but with a sturdy, nickel-plated steel mounting plate fastened by a retainer ring.

Slotted mounting holes fit all centers from 1 1/2" to 1 5/4". Other dimensions and characteristics are identical to the 78S Series Sockets above.

ORDERING INFORMATION

To order 78-RS Series Sockets, put together the part number as in the following example:

78 Series

78 — R S 4 T M 1

Type
RS—Replacement

S—"S" Type

Number of Contacts

4-4 8-8 Octal

5-5 8L-8 Loktal

6-6 9-9

7S-7 std. 11-11

16-16

FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

DEVIATIONS

Where no deviations are specified, mounting plate is steel, contacts are cadmium-plated brass, contact tails are not tinned, and dielectric is black phenolic. To specify any of the following deviations, add these designations at the end of the part number:

T—Mica-filled phenolic

M—Phosphor-bronze, silver-plated contacts

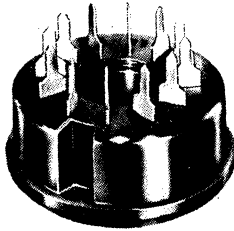
1—Contact tails tinned

TUBE/RELAY SOCKETS

BUNKER
RAMO

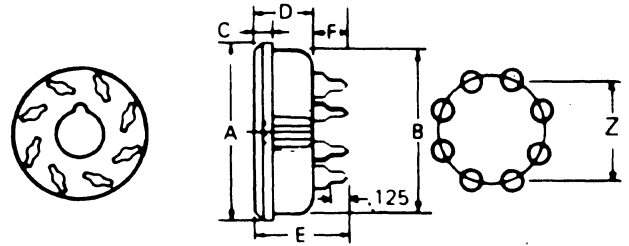
AMPHENOL

PRINTED-BOARD TERMINATIONS



Where vacuum tubes or plug-in relays must be mounted on printed boards, these are the sockets to use for fast, trouble-free production. Simply insert contact tails into .065"-diameter plated-through holes in board and wave- or flow-solder in place. Contacts have tapered tips on tails to facilitate insertion and a .016"-deep shoulder which provides clearance between the socket and board for improved air circulation and easier cleaning.

Contacts are cadmium-plated Lubaloy. Tuning-fork design provides unmatched wiping action for low contact resistance and high retention force. Contact tails are $\frac{1}{8}$ " long (exclusive of tapered lead-in portion), $\frac{1}{16}$ " wide and .016" thick. Easily mounts on boards up to $\frac{1}{8}$ " (.125") thick. Current rating: 3 amp continuous. Dielectric is general-purpose black phenolic.



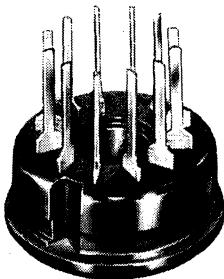
DIMENSIONS AND MOUNTING INFORMATION

Sockets	A	B	C	D	E	F
All	1 $\frac{1}{4}$	1 $\frac{3}{32}$	.145	.490	Approx. .646	$\frac{5}{32}$

ORDERING INFORMATION

Number of Contacts	Part Number	(Z) Pin Circle Diameter
8	78-S8W-0125	.687
9	78-S9W-0125	.687
11	78-S11W-0125	.750
12	78-S12W-0125	.750
16	78-S16W-0125	outer .750 inner eccentric

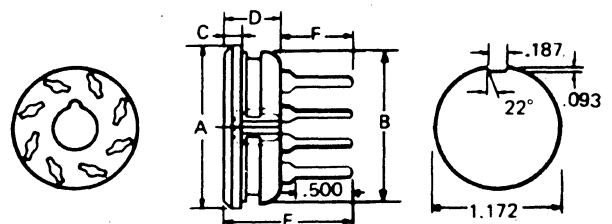
WIRE-WRAPPABLE TERMINATIONS



Users of wire-wrapping equipment can simplify their production operations with these sockets. Hand or semi-automatic-wrap vacuum tube or relay sockets at the same time other components are wire-wrapped, thereby eliminating additional soldering steps. Sockets are easily mounted in panels .031" to .050" thick with Amphenol Retainer Ring hand tool (p. 2-513).

Dielectric is general-purpose black phenolic, with contacts of cadmium-plated copper alloy. Tails are $\frac{1}{2}$ " long and $\frac{1}{16}$ " wide. Two tail thicknesses are available, as shown below:

	Standard Contact	Heavy Duty Contact
Thickness	.016 in.	.025 in.
Current Rating	3 amps continuous	7.5 amps continuous
Contact Retention Force (Single .093" dia. pin)	3 oz. min.	5 oz. min.
Wire Gauge	Accepts 2 wraps of 22 gauge wire	Accepts 2 wraps of up to 16 gauge wire

Recommended
Panel Cutout

DIMENSIONS AND MOUNTING INFORMATION

Sockets	A	B	C	D	E	F
All	1 $\frac{1}{4}$	1 $\frac{3}{32}$	.145	.490	1 $\frac{1}{2}$	$\frac{9}{16}$

FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

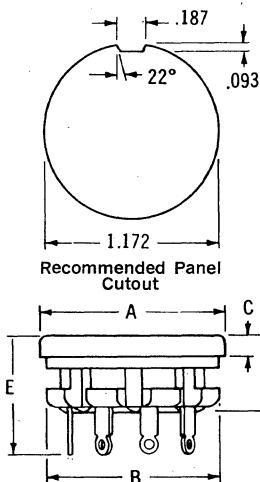
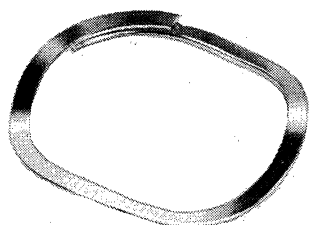
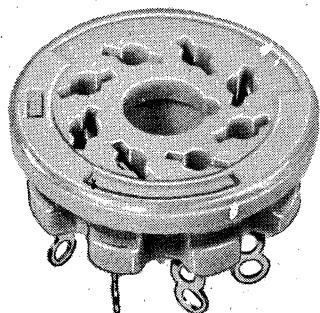
ORDERING INFORMATION

Number of Contacts	Standard Contact	Heavy-Duty Contact
8	78-S8W-0500	78-S8W-0525
9	78-S9W-0500	78-S9W-0525
11	78-S11W-0500	78-S11W-0525
12	78-S12W-0500	78-S12W-0525

TUBE/RELAY SOCKETS

BUNKER
RAMO

AMPHENOL



Dimensions

A	B	C	D	E approx.
1 1/4	1 5/32	.135	.420	27/32
1 1/4	1 5/32	.145	.490	7/8

CERAMIC 49SS SERIES

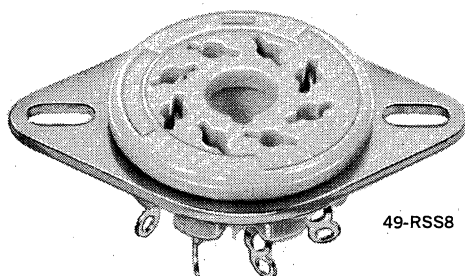
Designed for high-temperature applications, these 49SS Series Sockets are non-hygroscopic and have low-loss factor. Amphenol ceramic will withstand continuous operating temperatures of 1400°F. Contacts are silver-plated phosphor-bronze for continued high retention.

These sockets feature Amphenol Retainer-Ring design for fast, easy, compact mounting with a screwdriver or the Retainer-Ring Hand Tool (p. 2•513). They are grooved to fit up to .093" chassis or panel thickness. A spacer washer furnished with each socket permits the unit to be mounted firmly to any chassis from 1/32" to 1/16" thick.

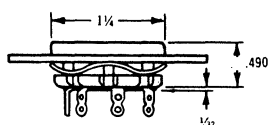
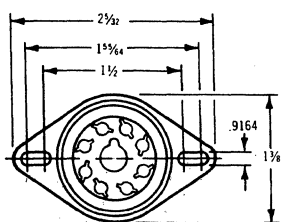
ORDERING INFORMATION

Part no.	Contacts		Pin Circle Diameter	Voltage Rating (RMS at Sea Level)	Current Rating (Amps)
	No.	Type (p. 2•504)			
49-SS4	4	A	.640	2000	5
49-SS8	8	B	.687	1250	3

49RSS CERAMIC REPLACEMENT SOCKETS



49-RSS8



Ideal for high temperature and humidity applications where other sockets fail, these ceramic replacement units have an already-assembled retainer ring and nickel-plated-steel mounting plate. Slotted mounting holes permit mounting screws or rivets on centers from 1 1/2" to 1 55/64" to make installation quick and easy. A chassis or panel cutout of 1 3/32" is required for mounting the socket. Contact material and type, pin-circle diameter and electrical characteristics are identical to the 49SS Series above with a corresponding number of contacts.

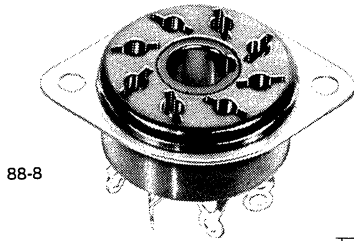
ORDERING INFORMATION

49-RSS4	4-contact Ceramic Replacement Socket
49-RSS8	8-contact Ceramic Replacement Socket

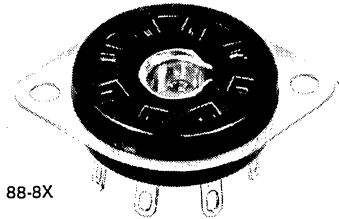
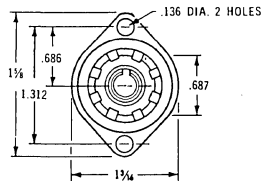
TUBE/RELAY SOCKETS

BUNKER
RAMO AMPHENOL

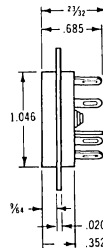
88 SERIES COMPACT "MIP" SOCKETS



88-8



88-8X



These 8-contact sockets have rugged molded-in mounting plates and mount in 1 1/2"-diameter round holes.

The 88-8 socket mates with standard "Octal" plug bases and its smaller size requires less space. The 88-8X "Loktal" socket incorporates a center ground contact to grip the pilot post of the tube. Outer contacts accept .040" to .050"-diameter pins.

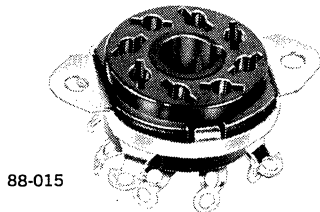
Both styles have cadmium-plated phosphor-bronze con-

tacts. Dielectric is general-purpose black phenolic. They are rated 1250 volts (RMS at sea level), 3 amp. per contact.

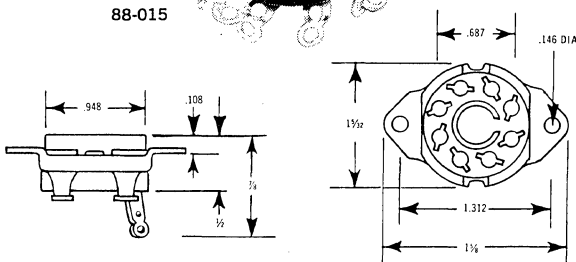
ORDERING INFORMATION

88-8	Octal Compact "MIP" Socket
88-8X	Loktal Compact "MIP" Socket

88 SERIES SADDLE-TYPE OCTAL SOCKET



88-015

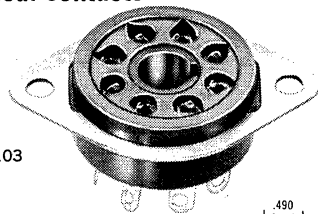


Economical sockets with 4 lugs for easy below-chassis mounting. Choice of either wrap-around or tuning-fork contacts (see p. 2-504). "Clinched-on" mounting plate has two .140"-diameter mounting holes. Socket mounts through 1"-diameter round hole. Black, general-purpose-phenolic dielectric. Mica-filled dielectric also available on special order.

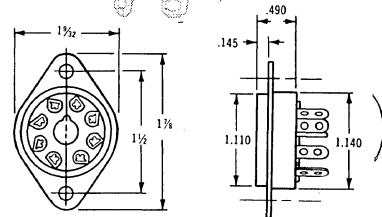
Rated 1250 volts (RMS at sea level), 3 amp per contact maximum.

ORDERING INFORMATION

Part No.	No.	Contacts	
		Material	Type (p. 2-504)
88-001	8	Brass	Wrap-around
88-015	8	Lubaloy	B

59 SERIES HEAVY-DUTY OCTAL SOCKET
with clover-leaf contacts

59-103



Intended for extended-service conditions — for example, repeated insertion/withdrawal cycles and high retention forces in spite of shock or vibration — this rugged socket is an exact replacement for 77-MIP-8 (p. 2-506). Cloverleaf-type contacts are silver-plated phosphor-bronze and ultra-reliable. Stainless-steel mounting plate is molded directly into mica-filled phenolic body. Rated 1250 volts (RMS, sea level), 3 amp.

ORDERING INFORMATION

59-103	Heavy-Duty Octal Socket
--------	-------------------------

FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

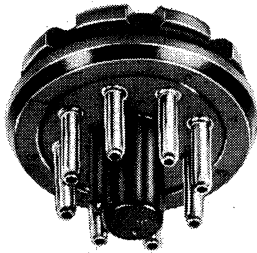
STANDARD PLUGS

BUNKER
RAMO

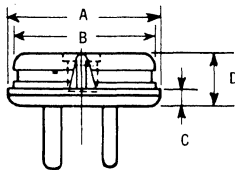
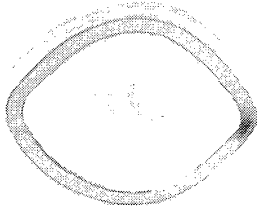
AMPHENOL

86-CP SERIES

with retainer-ring mounting



86-CP8



DIMENSIONS

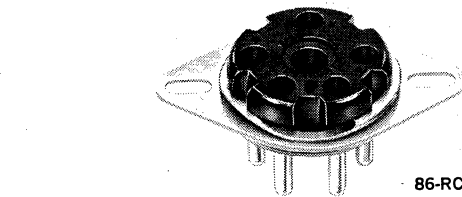
Part No.	A	B	C	D
86-CP4, -CP5, -CP6, -CP7S	1 $\frac{1}{4}$	1 $\frac{3}{32}$	$\frac{3}{32}$	$\frac{7}{16}$
86-CP8, -CP9, -CP11, -CP12, -CP16	1 $\frac{1}{4}$	1 $\frac{3}{32}$	.145	$\frac{7}{16}$

No screws or rivets required for 86-CP Series plugs, but mounting is secure and reliable nonetheless with the Amphenol Retainer Ring. One is furnished with each plug. Retainer ring is easily assembled with the 51-3 Hand Tool (opposite page).

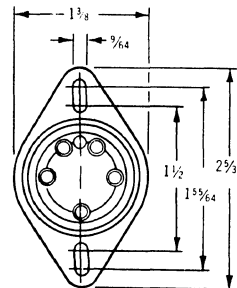
Use as chassis connectors with plug-in units; or as inexpensive cable connectors. They can also be assembled into plug caps or receptacle shells (both p. 2-521). Guide posts are omitted on plugs with 4 to 7 contacts, but they are positively polarized by the use of two pins with larger diameter than the others.

Contacts are nickel-plated brass. Standard dielectric is general-purpose black phenolic. All 86-CP Series Plugs are also available in mica-filled phenolic on special order. To order mica-filled, add "T" to part number. Example: 86-CP8T.

IMPORTANT: Specify chassis thickness. Unless otherwise specified, plugs are grooved to fit 22 gauge (.031") to 18 gauge (.050") panels or chassis.



86-RCP-5



This standard grooving also fits plug caps (page). To assure secure mounting on chassis or panel of gauges outside these limits, specify exact thickness and plugs will be grooved to order. Plugs can be grooved to fit up to 13 gauge (.093").

86-RCP SERIES REPLACEMENT-TYPE PLUGS

These are standard 86-CP Series Plugs with an already-assembled retainer ring holding a nickel-plated-steel mounting plate.

Slotted mounting-plate holes accommodate rivets or screws on 1 $\frac{1}{2}$ " to 1 $\frac{5}{64}$ " centers.

86-RCP ORDERING INFORMATION

To order 86-RCP Series Replacement-type plugs, insert "R" in standard part numbers in chart below. Example: 86-RCP8. Standard dielectric is general-purpose black phenolic, but mica-filled phenolic is also available on special order. To order mica-filled, add "T" to part number below. Example: 86-RCP8T.

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

ORDERING INFORMATION

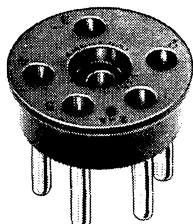
Part No.	Contacts	Pin Circle Diameter	Voltage Rating (RMS)	Current Rating (Amps)	Mating Sockets	
					Ret. Ring Type	"MIP" Type
86-CP4	4	.640	2000	5	78-S4	77-MIP4
86-CP5	5	.750	1250	5	78-S5	77-MIP5
86-CP6	6	.750	1250	5	78-S6	77-MIP6
86-CP7S	7 Std.	.750	1250	5	78-S7S	77-MIP7S
86-CP8	8 Octal	.687	1250	5	78-S8	77-MIP8
86-CP9	9	.687	1250	5	78-S9	77-MIP9
86-CP11	11	.750	500	5	78-S11	77-MIP11
86-CP12	12	.750	500	3	78-S12	77-MIP12
86-CP16	16	Outer: .750 Inner: Eccentric	500	5	78-S16	—

PLUGS/BASES/HAND TOOLS

BUNKER
RAMO

AMPHENOL

71 SERIES MOLDED SPEAKER-TYPE PLUGS



71-5

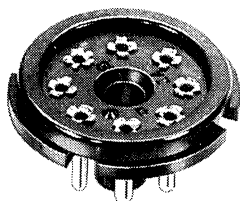
Originally designed as speaker plugs, but are also useful for many other purposes—test panels, intercommunications systems, public-address systems, etc.

Contacts are rigidly secured in the dielectric—cannot work loose or get out of alignment. All plugs are positively polarized and each contact is numbered for correct wiring. Plugs with 4 and 5 contacts have molded finger-grips; units with more contacts have straight sides. Dielectric is general-purpose black phenolic; contacts are nickel-plated brass.

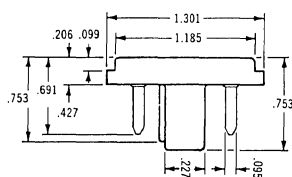
ORDERING INFORMATION

Part No.	Contacts	Pin Circle Diameter	Voltage Rating (RMS)	Current Rating (Amps)	Mating Sockets	
					"S" Type (p. 2•508)	"MIP" Type (p. 2•506)
71-4	4	.640	2000	5	78-S4	77-MIP-4
71-5	5	.750	1250	5	78-S5	77-MIP-5
71-8	8	.687	1250	5	78-S8	77-MIP-8
71-9	9	.687	1250	5	78-S9	77-MIP-9
71-12	12	.750	500	5	78-S12	77-MIP-12
71-20	20	1.000 Outer .687 Inner	500	5	—	77-MIP-20

50 SERIES RELAY AND TUBE BASES



50-801

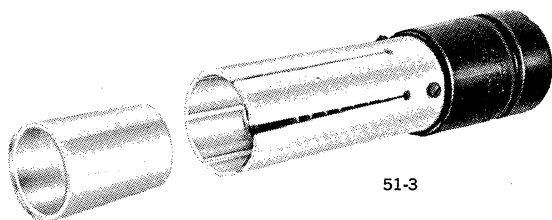


For all standard-size 8- and 11-pin tube/relay sockets. Four notches around circumference of dielectric permit quick staking of relay plate to either 8- or 11-pin plug base. Base is general-purpose black phenolic; contacts are nickel-plated brass. Rated 1250 volts (RMS at sea level), 5 amp.

ORDERING INFORMATION

50-801	8-contact Relay and Tube Base
50-820	11-contact Relay and Tube Base

RETAINER-RING HAND MOUNTING TOOL



51-3

Permits mounting retainer-ring-type sockets, plugs and receptacles to chassis and panels at production-line speeds. For all 78S and 49SS Series Sockets, 86-CP Series plugs and 60, 61 and 160 Series line plugs and receptacles. Requires approximately 6½" minimum clearance to operate.

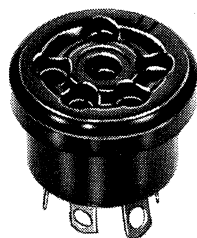
ORDERING INFORMATION

51-3	Retainer-Ring Hand Mounting Tool
------	----------------------------------

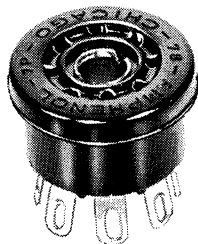
MINIATURE TUBE SOCKETS

BUNKER
RAMO

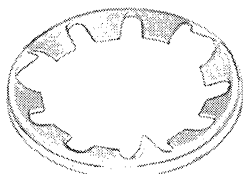
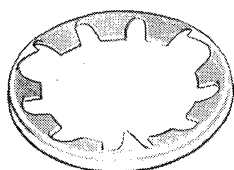
AMPHENOL

78 SERIES MINIATURE
with retainer-ring mounting

78-S6S



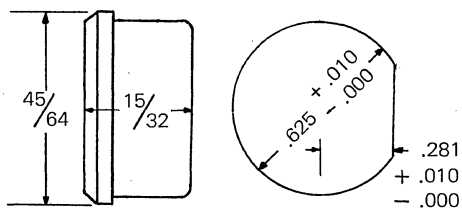
78-7P



Designed for limited-space applications, these sockets are similar to the 78S Series type, but are less than half their size.

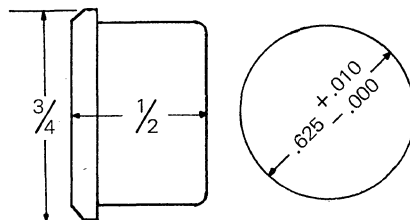
Mount them without screws or rivets in either $\frac{5}{8}$ " round or, for anti-rotation, in "D"-shaped holes, as shown. One friction-type retainer ring is furnished with each socket and is easily assembled to make rigid, secure mounting. Standard dielectric is general-purpose black phenolic; please specify if mica-filled phenolic is desired. All contacts rated 500 volts (RMS at sea level), 3 amp.

DIMENSIONS AND MOUNTING INFORMATION



Size and mounting hole for No. 78-7P, 78-S3S and 78-S4S.

Laboratory and servicemen can mount socket in plain round hole.



Size and mounting hole for No. 78-S5S and 78-S6S.

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462.

ORDERING INFORMATION

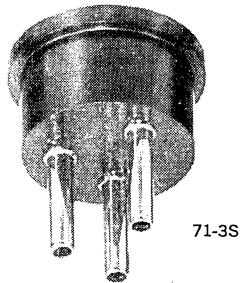
Part No.	Contacts		Pin Circle Diameter	Mating Plugs (pgs. 2-515, 518, 520)	
	No.	Type		Unshielded	Shielded
78-S3S	3	B	.344	71-3S	91-MPM3L
78-S4S	4	B	.406	71-4S	91-MPM4L
78-S5S	5	Wrap-around	.406	71-5S	91-MPM5L
78-S6S	6	Wrap-around	.406	71-6S	91-MPM6L
78-7P	7	Wrap-around	.375	86-896	86-895

MINIATURE PLUGS

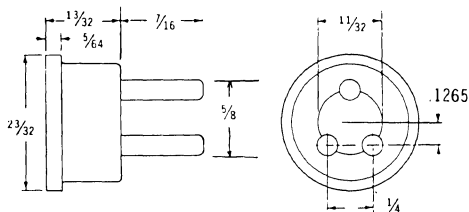
BUNKER RAMO **AMPHENOL**

MINIATURE UNSHIELDED PLUGS

SERIES 71 CABLE-END PLUGS



71-3S

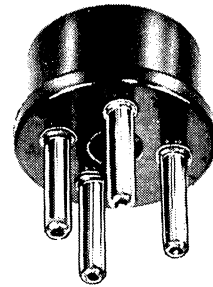


Compact plugs are useful for connecting bookshelf and other small-size speakers. Also ideal for all types of plug-in connections where space is limited. Body is general-purpose black phenolic with molded-in nickel-plated brass contacts that will not work loose or get out of alignment. Contacts are deeply recessed in body to prevent shorts from pulled-back insulation. Mate accurately with miniature sockets (preceding page). Rated 500 volts (RMS at sea level), 5 amp.

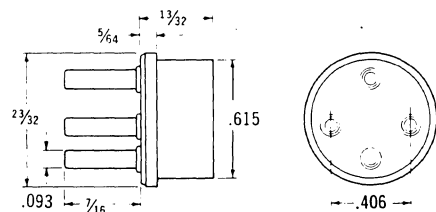
ORDERING INFORMATION

Part no.	Contacts	Pin Circle Diameter	Mating Socket Unshielded (p. 2•514)
71-3S	3	.343	78-S3S
71-4S	4	.406	78-S4S
71-5S	5	.406	78-S5S
71-6S	6	.406	78-S6S

86 SERIES CHASSIS-MOUNT PLUGS



86-CP-4S



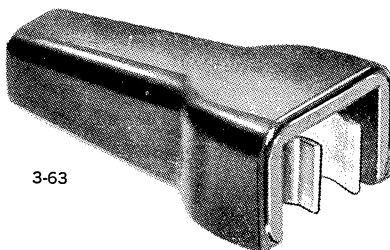
Friction-type retainer ring assembles easily and holds plug securely in panel or chassis. Ideal for connecting speakers, carbon microphones, test equipment or other units in limited-space areas.

Plugs are general-purpose black phenolic and mount in $\frac{5}{8}$ " round hole. Contacts are nickel-plated brass. Rated 500 volts (RMS at sea level), 5 amp.

ORDERING INFORMATION

Part no.	Contacts	Pin Circle Diameter	Mating Socket Shielded (p. 2•520)
86-CP-3S	3	.343	91-MPF3S
86-CP-4S	4	.406	91-MPF4S
86-CP-5S	5	.406	91-MPF5S
86-CP-6S	6	.406	91-MPF6S

UNIVERSAL GRID CAP



3-63

Easily snaps onto and securely holds tube-grid studs from $\frac{1}{4}$ " to $\frac{1}{2}$ " diameter on both metal and glass tubes. General-purpose black phenolic with spring-brass holding contact.

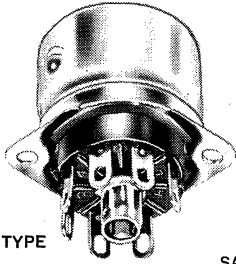
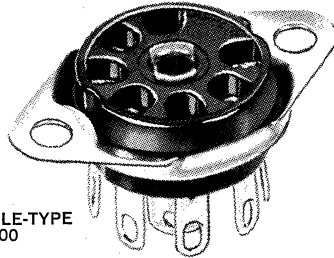
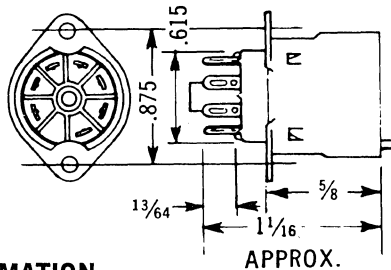
ORDERING INFORMATION

3-63	Universal Grid Cap
------	--------------------

MINIATURE TUBE SOCKETS

BUNKER
RAMO

AMPHENOL

7 AND 9-CONTACT MINIATURE SOCKETS
147 SERIES—7 CONTACTSSHIELD BASE TYPE
147-905SADDLE-TYPE
147-500

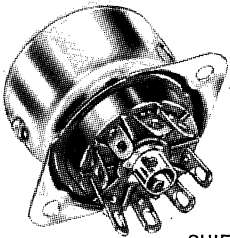
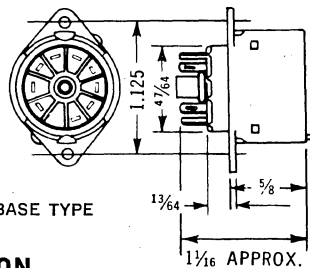
ORDERING INFORMATION

SHIELD BASE TYPE

Insulator Material	Part No.		Mtg. Hole Dia. Saddle	Center Shield
	Phosphor Bronze Cadmium Plated Contacts	Beryllium Copper Silver Plated Contacts		
Black	147-905	*	.095	Large
Mica	147-913	*	.095	Small
Mica	—	147-916	.125	Small

*Must be specified

59 SERIES—9 CONTACTS

SHIELD BASE TYPE
59-407

ORDERING INFORMATION

SHIELD BASE TYPE

Insulator Material	Part No.		Mtg. Hole Dia. Saddle	Center Shield
	Phosphor Bronze Cadmium Plated Contacts	Beryllium Copper Silver Plated Contacts		
Mica	*	59-403	.125	Large
Mica	59-405	*	.095	None
Black	59-406	*	.095	Large
Mica	59-407	*	.095	Large

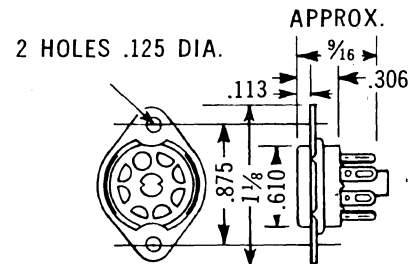
*Must be specified

For mating sockets see p. 2-517

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

147 and 59 Series Sockets are designed for all 7- and 9-contact miniature tube applications. They are available with or without tube-shield base or center shield and for either above- or below chassis mounting.

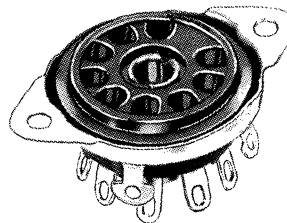
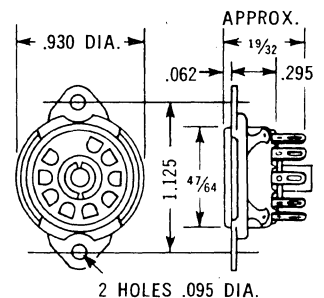
Interchangeable with corresponding military types (MIL-S-12883A). Dielectric is either general-purpose-black or low-loss, mica-filled phenolic. All sockets are rated 500 volts (RMS at sea level), 1 amp. per contact.



SADDLE TYPE—Cadmium-plated, phosphor-bronze contacts only.

For bottom mounting (Top mounting available when specified).

Insulator Material	Part No.	Mtg. Hole Dia. Saddle	Center Shield
G. P. Phenolic	147-500	.125	Large
G. P. Phenolic	147-504	.125	None
Mica	147-505	.125	Small

SADDLE TYPE
59-409

SADDLE TYPE—Cadmium-plated, phosphor-bronze contacts only.

For bottom mounting.

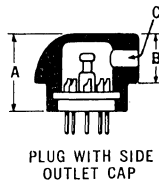
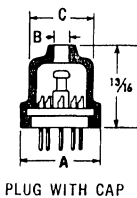
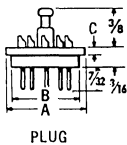
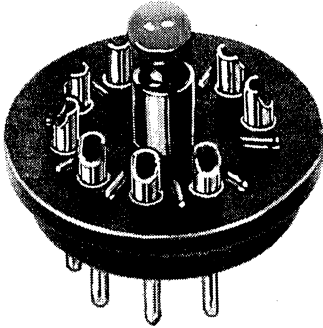
Insulator Material	Part No.	Mtg. Hole Dia. Saddle	Center Shield
G. P. Phenolic	59-409	.095	Large
Mica	59-410	.095	Large

MINIATURE PLUGS

BUNKER
RAMO AMPHENOL

86 SERIES MINIATURE CABLE-TYPE PLUGS

to mate with 147 and 59 Series Sockets



These space-saving miniature plugs are especially intended for use with the miniature tube sockets on the opposite page. They are meant for applications where a highly reliable, top-quality plug is required.

86 Series Plugs are molded from blue diallyl phthalate, a superior dielectric material. Contacts are brass, overplated with gold over silver. A center strain-relief post is molded-in to aid in relieving stress on solder connections.

Plugs can be provided with or without rubber plug caps. Caps are available with end cable outlet or side cable outlet. See ordering information below.

ELECTRICAL AND MECHANICAL SPECIFICATIONS

Voltage Rating: 1500 volts (RMS at sea level)

Current Rating: 5 Amps

Insulation: Diallyl Phthalate per MIL-M-14 Type MDG

Insulation Resistance (min.): 100,000 megohms

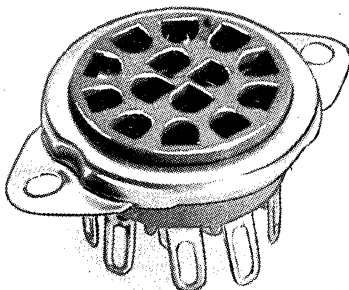
Contact Pins: .040" dia., SAE #72 brass

ORDERING INFORMATION

Part No.	Description	A	B	C	Pin Circle Diameter
86-896	7-Pin Plug	.685	.575	.070	.375
86-893	9-Pin Plug	.778	.668	.070	.468
86-895	7-Pin Plug with Cap	.781	.171	.625	.375
86-897	9-Pin Plug with Cap	.875	.285	.718	.468
86-894	7-Pin Plug with Side Outlet Cap	.750	.468	.171	.375

59 SERIES RELAY SOCKETS

14-CONTACT RELAY SOCKET



Premium wrap-around-type contacts provide low-resistance mating. Contact material is silver-plated phosphor bronze with hot-tin-dipped tails. Tails are slotted for easy wiring. Dielectric is mica-filled phenolic. Cadmium-steel mounting plate has two .125"-dia. holes on 1.125" centers. Fits .750" minimum-diameter mounting hole. Mates with 14-contact relay plugs.

ORDERING INFORMATION

59-106	14-Contact Relay Socket
--------	-------------------------

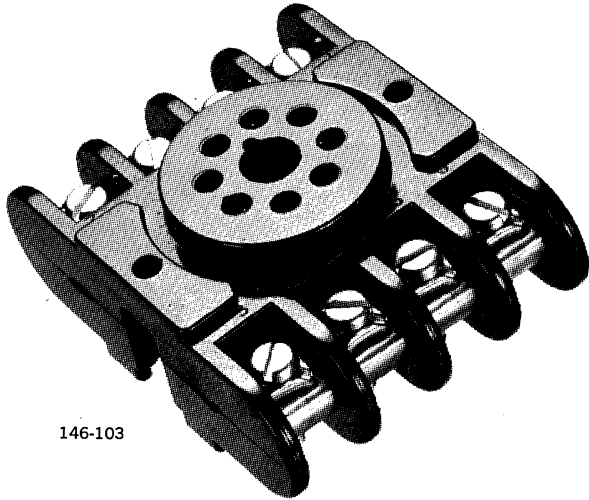
INDUSTRIAL RELAY SOCKETS

BUNKER
RAMO

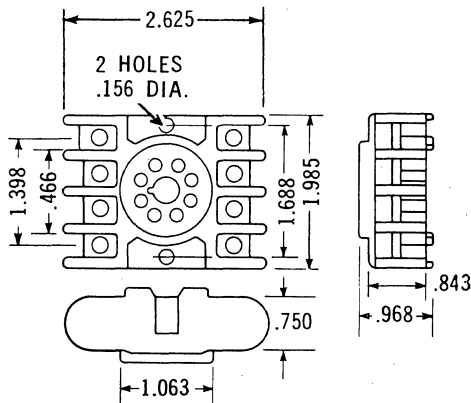
AMPHENOL

U/L RECOGNIZED 146 SERIES INDUSTRIAL OCTAL SOCKETS

U/L File no. E 56473



146-103



Many design improvements at no extra cost make these a top value in octal relay sockets. Long screws with captivated pressure plate allow termination of bare wire, solid or stranded, from 20 to 12 AWG without attaching rings or spade-type lugs. The design holds the wire securely and prevents shearing when tightened. The longer screw permits clamping more than one wire or lug without difficulty. Binding screws withstand 45 in.-lb. torque to prevent strip-out when tightening.

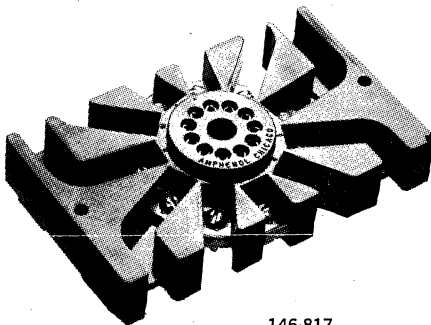
Molded in one-piece phenolic, this relay socket operates dependably despite continuous temperatures of 300°F. Cloverleaf contacts provide 4 lines of contact for minimum resistance and hold the relay in place despite severe vibration and shock. Insulating barriers provide long creepage paths between contacts and ground for utmost reliability, RETMA-numbered terminals. Sockets may be gang-mounted.

A unique design feature permits reversing the screw terminals to allow the socket to be mounted and wired from the bottom. Rated 10 Amp per contact at 1250 volts (RMS at sea level).

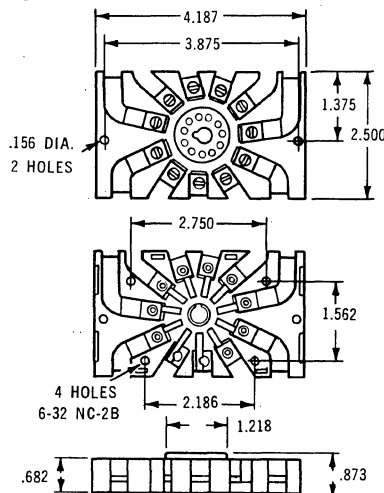
ORDERING INFORMATION

Part No.	Description
146-103	Standard Socket—surface mounted
146-104	Socket with 4 self-tapping screws for tie points—Top mounted
146-203	Same as 146-103 except for bottom mounting
146-204	Same as 146-104 except for bottom mounting

11-CONTACT INDUSTRIAL RELAY SOCKET



146-817



All the features of the octal socket shown above, with 360° wrap-around contacts instead of cloverleaf type. This socket also has 4 self-tapping screws for tie points. Rated 10 Amps maximum per contact, 600 volts (RMS at sea level).

ORDERING INFORMATION

146-817	11-Contact Industrial Relay Socket
---------	------------------------------------

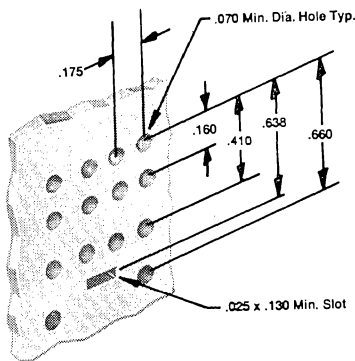
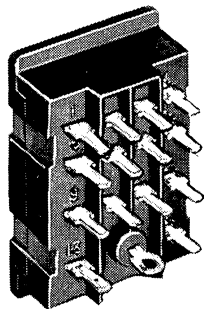
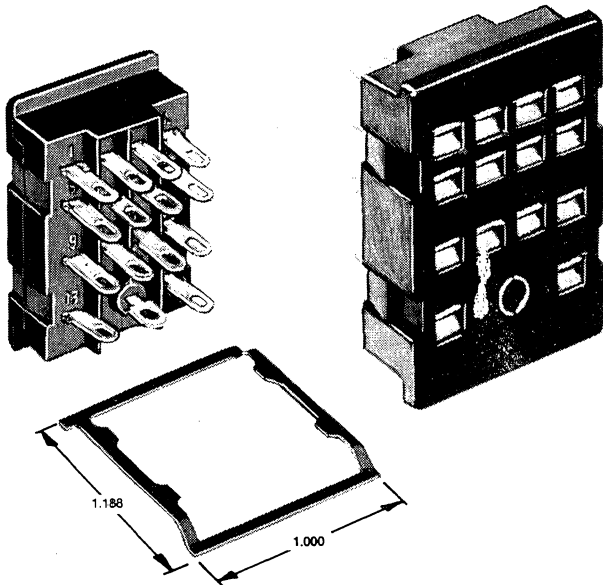
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

MINIATURE RELAY SOCKETS

BUNKER
RAMO

AMPHENOL

U/L RECOGNIZED 59 SERIES
14-CONTACT MINIATURE RELAY SOCKETS
 U/L File no. E 12869



Amphenol's rectangular 14-contact relay sockets are designed for the popular 4PDT general-purpose miniature relay. These sturdy sockets increase flexibility of equipment design and assembly procedures and provide easier testing and servicing. They offer an unusual range of high-quality features at very low cost. Conforming to electronic industry standards, they replace many higher-cost sockets without any modifications.

Sockets are available with either printed-board or solder-eyelet contact tails. A spring-steel mounting clip is furnished with each solder-type socket that makes mounting fast, easy and secure.

An optional relay hold-down spring (P/N 59-1002) permits other than vertical mounting and also assures reliable relay operation in applications where vibration is present. It mounts over the relay and attaches to small notches in the socket flange.

14-contact miniature sockets are ideal for applications that use miniaturized components such as computer and data-processing equipment, business machines, communications equipment, etc.

SPECIFICATIONS

Current rating: 5 amp.

Voltage rating: 250 volts (RMS at sea level)

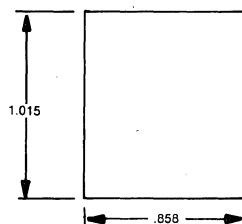
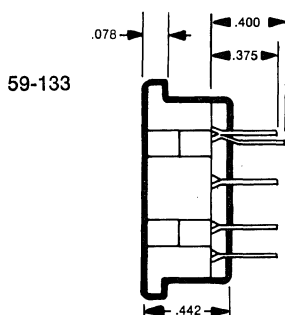
Contacts: Cadmium-plated brass

Dielectric: General-purpose black phenolic

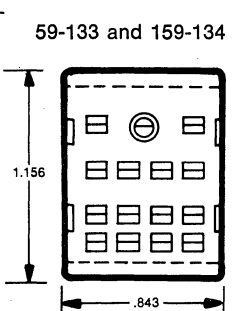
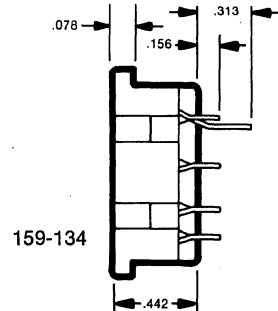
ORDERING INFORMATION

59-133*	14-contact miniature relay, Solder-eyelet tails
59-134	14-contact miniature relay, Printed-board tails

*Includes spring-steel mounting clip



59-133 Panel Cutout
 Panel Thickness: .031 to .062
 Punch for cutout may
 be ordered from Greenlee
 Tool Co., Rockford, Ill.
 Type #731R



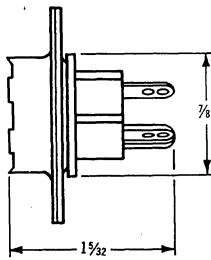
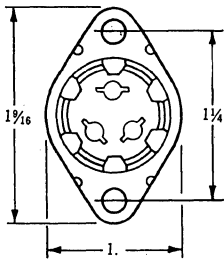
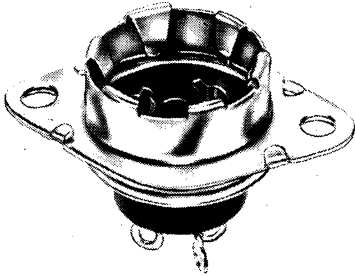
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

SOCKETS/CABLE CONNECTORS

BUNKER
RAMO

AMPHENOL

78 SERIES SHIELDED-CHASSIS SOCKETS



Consists of a standard 78 Series miniature socket (p. 2-514), assembled in a cadmium-plated, drawn-steel mounting plate and shield. Spring contacts on shield wipe mating connector shell and assure good electrical continuity between shield, shell and mounting surface. They also hold shell firmly to prevent accidental disconnect. The assembly is sturdily constructed to withstand the action of high-speed riveting machines on production lines.

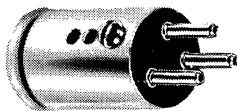
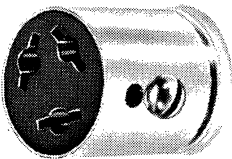
Mount these 78 Series sockets either on surface or below chassis or panel through 7/8"-dia. hole. Mounting holes are on 1 1/4" centers.

Use these economical receptacles for either shielded or unshielded cable. Recommended for lower-amperage applications on appliances and test panels; for auto-radio connection; and for audio and RF connections for microphones, speakers and antennas. For a fully shielded connection mate with 91 Series Long-Shell Shielded Plugs below. Rated 500 volts (RMS at sea level) 3 amps. max.

ORDERING INFORMATION

Part No.	Contacts		Pin Circle Diameter	Mating Plugs Shielded
	No.	Type (p. 2-504)		
78-PCG3	3	B	.344	91-MPM3L
78-PCG4	4	B	.406	91-MPM4L
78-PCG5	5	Wrap-around	.406	91-MPM5L
78-PCG6	6	Wrap-around	.406	91-MPM6L

91 SERIES CABLE CONNECTORS



Compact, reliable connectors for either shielded or unshielded cable. Recommended as battery, antenna or inexpensive microphone connectors. Accommodates cables up to 1/4" diameter.

Bodies are general-purpose black phenolic, housed in cadmium-plated brass shells held in place by set screws. Polarized contact spacing assures correct insertion. All connectors rated 500 volts (RMS at sea level), 3 amps. max.

ORDERING INFORMATION

CABLE PLUGS

Short Shell 1 1/16" Long	Long Shell 1 3/16" Long	Mating Sockets			
		Cable Socket Short 1 1/16"	Cable Socket Long 1 3/16"	Chassis Shielded (with Long Shell only)	Chassis Unshielded
91-MPM3S	91-MPM3L	91-MPF3S	91-MPF3L	78-PCG3	78-S3S
91-MPM4S	91-MPM4L	91-MPF4S	91-MPF4L	78-PCG4	78-S4S
91-MPM5S	91-MPM5L	91-MPF5S	91-MPF5L	78-PCG5	78-S5S
91-MPM6S	91-MPM6L	91-MPF6S	91-MPF6L	78-PCG6	78-S6S

CABLE SOCKETS

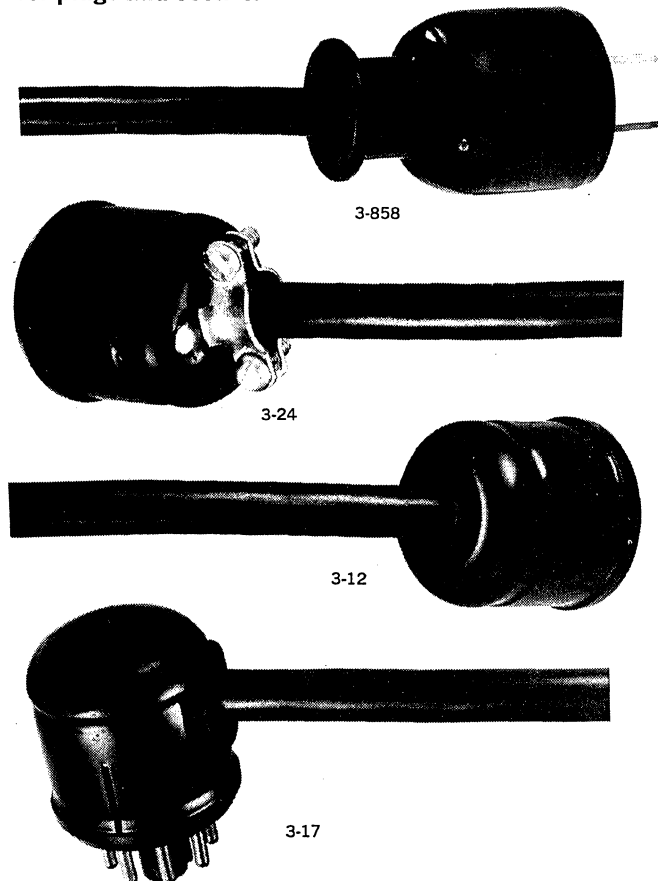
Short Shell 1 1/16" Long	Long Shell 1 3/16" Long	Mating Plugs		
		Cable Plug Short 1 1/16"	Cable Plug Long 1 3/16"	Chassis Unshielded
91-MPF3S	91-MPF3L	91-MPM3S	91-MPM3L	86-CP3S
91-MPF4S	91-MPF4L	91-MPM4S	91-MPM4L	86-CP4S
91-MPF5S	91-MPF5L	91-MPM5S	91-MPM5L	86-CP5S
91-MPF6S	91-MPF6L	91-MPM6S	91-MPM6L	86-CP6S

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

HARDWARE AND ACCESSORIES

BUNKER
RAMO

AMPHENOL

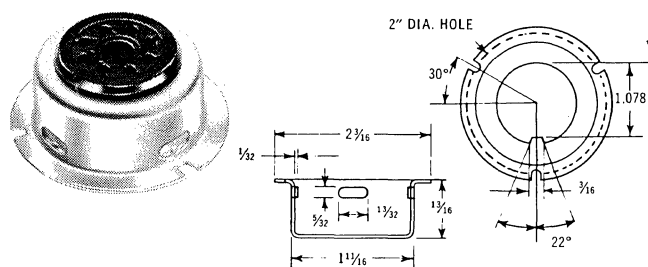
3 SERIES SHIELDED END CAPS
for plugs and sockets

These sturdy end caps fit all retainer-ring-type plugs and sockets, including 49SS, 60, 61, 78S, 86CP and 160 Series. They provide a protected, attractive cable termination and are intended for applications where connectors must be mated and unmated. Molded thermoplastic caps are two-piece construction for ease of assembly and have molded-in, handy finger-grips to aid mating and unmating. When assembled, end cap is securely anchored to plug or socket. Metal caps quickly snap onto all standard grooved plugs and sockets.

ORDERING INFORMATION

Part no.	Description	Finish	Length
3-10	Steel, no cable outlet, no insulator	Black epoxy	1"
3-12	Steel, end outlet, $\frac{5}{16}$ " I.D. insulator	Black epoxy	1"
3-13	Steel, end outlet, $\frac{7}{16}$ " I.D. insulator	Black epoxy	1"
3-17	Steel, side outlet, rubber grommet, $\frac{1}{16}$ " I.D. insulator	Black epoxy	1"
3-24	Steel, cable clamp for up to $\frac{3}{8}$ " wire, insulator	Black epoxy	1 $\frac{1}{16}$ "
3-858	Thermoplastic, end outlet, strain relief, $\frac{5}{16}$ " O.D. wire	Black styrene	1 $\frac{3}{4}$ "
3-CC4	Cable clamp only as used on 3-24 above	Cadmium	—

RECEPTACLE SHELLS

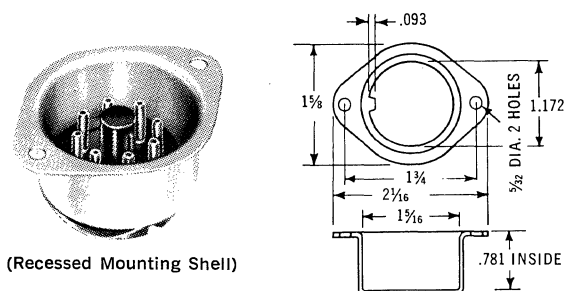


Aluminum shells raise 49SS, 78S Sockets, 86-CP plugs and power-line-type connectors $\frac{13}{16}$ " above surface of panel or chassis. Permits wiring from top of chassis or panel—knockouts on all 4 sides provide convenient wiring entrances. Mount through $1\frac{3}{4}$ " hole; 3 mounting notches accept #6 screws.

ORDERING INFORMATION

61-23	Receptacle Shell
-------	------------------

RECESSED-MOUNTING SHELLS



(Recessed Mounting Shell)

Used where flush mounting of standard grooved plugs or sockets is needed. These sturdy cadmium-plated steel shells permit mounting of 49SS, 78S Sockets, 86-CP Plugs and power-line-type connectors $\frac{13}{16}$ " below surface of panel or chassis. Mounts in $1\frac{1}{8}$ " hole; is held through two $\frac{3}{32}$ " screw holes on $1\frac{3}{4}$ " centers.

ORDERING INFORMATION

61-61	Recessed Mounting Shell
-------	-------------------------

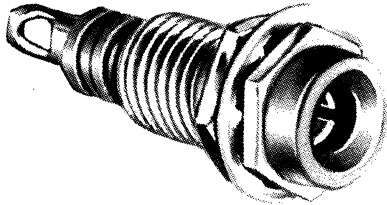
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

MISCELLANEOUS HARDWARE

BUNKER
RAMO

AMPHENOL

350 SERIES COMMERCIAL TIP JACKS for .080"-dia. plug



350-61001-X

These tip jacks accommodate a wide variety of applications. They are designed to fit .080"-dia. plugs. $\frac{5}{16}$ " long and mount through a $\frac{1}{4}$ " hole. Seven colors are available for coding — please specify colors desired.

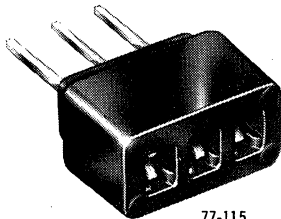
MATERIAL AND ELECTRICAL SPECIFICATIONS

Dielectric: Nylon (Zytel 101)
 Mounting Shell: Nickel-plated brass
 Hex Nut: Nickel-plated .062" brass
 Lockwasher: Nickel-plated steel
 Contacts: Silver-plated beryllium copper
 Rated Current: 5 amp.
 Rated Voltage: 1000 volts max. (RMS at sea level)
 Voltage Drop: 20 millivolts max. at rated current
 Insulation Resistance: 5000 megohms min.
 Operating Temperature: 256°F max.

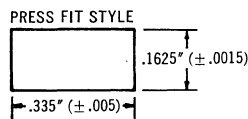
ORDERING INFORMATION

350-61001-X Commercial Tip Jack
 (Replace "X" with number for color desired, as follows: —1 Red, —2 Black, —3 Brown, —4 Green, —5 Orange, —6 White, —7 Blue)

77 SERIES SCR SOCKETS



77-115



These inexpensive sockets permit fast, easy installation, withdrawal and replacement of silicon-controlled rectifiers, such as the GE C106 or other equivalent flat-pack SCR's with 3 leads. SCR simply plugs in—no riveting or soldering. Contact tails are for either wire-wrapping or printed-board termination. Socket is designed to be press-fitted into panel cut-out shown or soldered to printed board. Rated 500 volts (RMS at sea level), 5 amps per contact.

SPECIFICATIONS

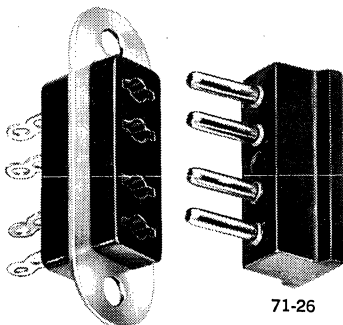
Contacts: Nickel-silver, .323" long and .020" square.
 Three contacts on .100 centers with mating depth of .160".

Dielectric: Black Nylon, type 6

ORDERING INFORMATION

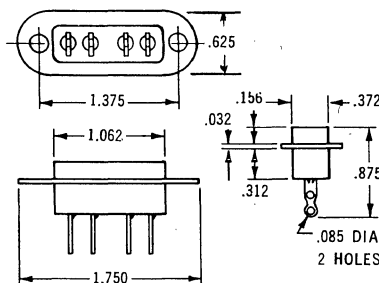
77-115	SCR Socket
--------	------------

4-CONTACT RECTANGULAR PLUG AND SOCKET



77-26

71-26



For many types of compact apparatus. Plugs are frequently used as self-sustaining coil form. Receptacle has molded-in mounting plate. Two .085" holes in socket contact tail permit easy wiring. Dielectric is general-purpose black phenolic. Rated 500 volts (RMS at sea level), 3 amps per contact.

ORDERING INFORMATION

71-26	4-Contact Rectangular Plug
77-26	4-Contact Rectangular Receptacle

INDUSTRIAL SOCKETS/**BUNKER
RAMO****AMPHENOL****146 SERIES INDUSTRIAL ANGLE-TYPE SOCKET**

146-106

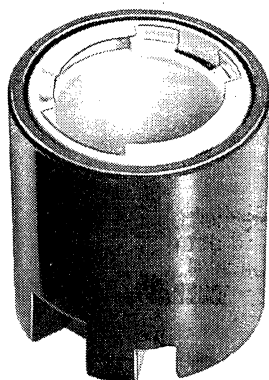
For super-jumbo 4-pin industrial-type tubes. Provides vertical-tube panel mounting, without need for horizontal supporting structure. Sturdy, heavy-wall construction with rugged mounting bracket furnished. Includes retaining clip to hold tube securely during vibration and shock.

ORDERING INFORMATION

146-106	Industrial Angle-type Socket
---------	------------------------------

98 SERIES PREFOCUSED LAMP RECEPTACLE

U/L Listed

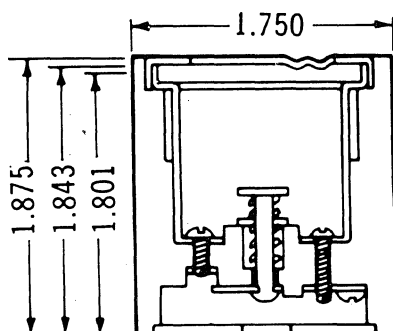


98-8

Can be installed in most 8 and 16mm movie projectors using medium-base prefocused lamps and high-wattage floodlights, beacons, etc. without drilling new holes. Rated 1000 watts, 110-250 volts. Heavy-duty contacts continue to assure minimum resistance for maximum light intensity. Special heat-resistant phenolic body withstands temperatures to 450°F; ceramic body is available for higher temperature service. Heavy fiber insulator is included; covers terminals after wiring. U/L recognized.

ORDERING INFORMATION

98-8	Prefocused Lamp Receptacle, Phenolic
98-1	Prefocused Lamp Receptacle, Ceramic



FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

AUDIO-TYPE CONNECTORS

BUNKER
RAMO

AMPHENOL

91 SERIES EXCELLITE® CONNECTORS

Low-cost, sturdy audio-type connectors with latch-lock couplings that provide easy, positive mating and unmating. Intermateable and interchangeable with both Switchcraft and Cannon XLR type units (see p. 2•527), they are made of rugged, molded ABS with lustrous nickel plating to permanently retain their handsome good looks. Also available in black, high-impact, unplated ABS for applications that do not require shielding (p. 2•526). Excellite® Connectors have unusual resistance to denting, chipping, cracking, peeling and tarnishing. They are obtainable in both cable plugs and panel receptacles, all with 3, 4, 5 and 6 contacts, as required. Only Amphenol Excellite Connectors combine all these features.

Save time and money. Cost less to buy initially; save installation time, as well as time for servicing or field repairs if ever required.

Lighter and more rugged. Excellite Connectors are considerably lighter than comparable zinc die-cast units. They also lack the inherent brittleness of zinc to provide longer, trouble-free service.

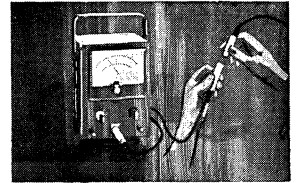
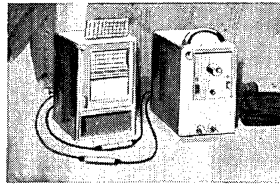
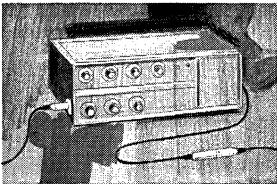
Fool-proof polarization. Key on receptacle and lock-in keying on plug positively prevent accidental mismatching.

Positive ground. In all Excellite Connectors, contact #1 engages first and is intended for use as a ground contact. By grounding before electrical connection, possible damage to delicate solid-state equipment or microphones is prevented.

Easier wiring. Shell, button and insert are all one assembly. This unitized insert is easily removed to expose the solder-cup-type contacts to permit quick, positive termination.

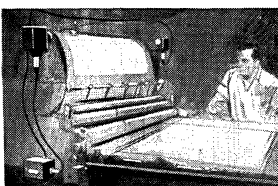
TYPICAL APPLICATIONS

Excellite Connectors have a multitude of uses in many types of industrial, commercial and consumer equipment. Among these are:

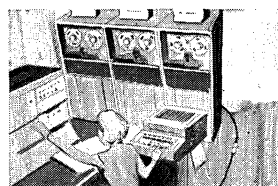


Audio Equipment — microphones, amplifiers, pre-amps, mixers, speakers, record players, tape decks, recorders, intercoms, 2-way radio, broadcast-studio equipment, sound movie projectors, film-strip projectors, video-recording systems, patch cords.

Test Instruments — analyzers, bridges, comparators, decade boxes, gauges and indicators, meters, standards, test probes, medical-electronics instruments, x-ray equipment, scientific recording and measuring devices.



Control System — counters, detectors, alarms, transducers, servos, photo-electric cells, gauges, timers, regulators.



Other — computer peripheral equipment, educational equipment, nuclear equipment, entertainment systems.

AUDIO-TYPE CONNECTORS

BUNKER
RAMO

AMPHENOL

91 SERIES EXCELLITE® CONNECTORS

Nickel-plated shells

Material Specifications:

Shell and Cable Clamp — Molded, plateable-grade

ABS with bright nickel plate over copper base

Insert Dielectric—Molded Type 6 Nylon

Contacts—Copper-alloy, silver-plated and chromate dipped. Solder-cup termination

Cable Relief — General-purpose 40-60 durometer Neoprene

Mechanical Specifications:

Cable Clamp — Cable clamp and gland accept all commonly used .250" to .313"-dia. cable. Optional boot for cable from .189" to .250" diameter available on special order.

Operating Temperatures—20° to 160°F

Vibration—Conforms to MIL-STD-202 method 204, test condition D

Durability—Withstands 500 coupling cycles without any significant mechanical or electrical effects. Mated pair withstands applied force of 275 lb.

Corrosion Resistance — Withstands standard MIL-STD-202 48-hr salt-spray test without damage or corrosion.

Electrical Specifications

Rated Voltage—133 volts (RMS at sea level)

Rated Amperage—3 Contact, 15 amp.

4 Contact, 10 amp.

5 Contact, 7.5 amp.

6 Contact, 7.5 amp.

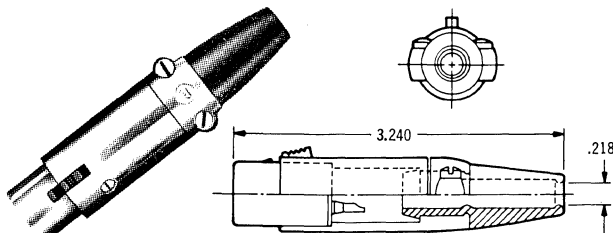
Dielectric Withstanding Voltage—1400 volts at 60 Hz for one minute between any two contacts or between any contact and connector shell.

Dielectric Resistance—Exceeds 100 megohms

Contact Resistance—Voltage drop is between 45-55 millivolts at rated current, depending on contact and wire size.

ORDERING INFORMATION FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

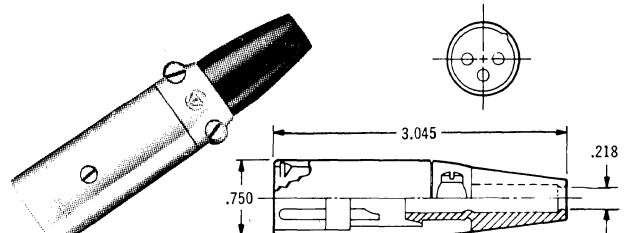
Straight Cord Plugs



Socket Contacts

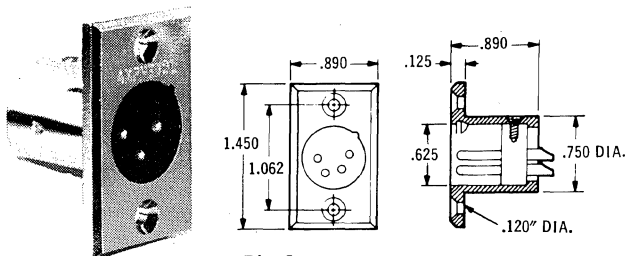
Number of Contacts	3	4	5	6
Part Number	91-454	91-458	91-462	91-465

Panel Mounting Receptacles



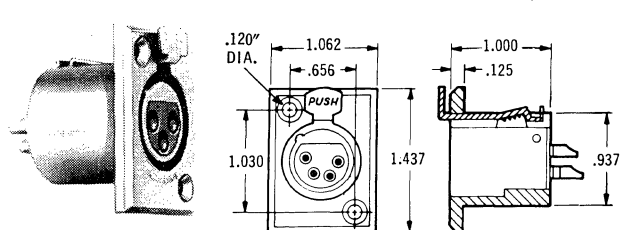
Pin Contacts

Number of Contacts	3	4	5	6
Part Number	91-455	91-459	91-463	91-467



Pin Contacts

Number of Contacts	3	4	5	6
Part Number	91-453	91-457	91-461	91-466



Socket Contacts

Number of Contacts	3	4	5	6
Part Number	91-456	91-460	91-464	91-469

AUDIO-TYPE CONNECTORS**AMPHENOL**
91 SERIES EXCELLITE® CONNECTORS
 with low-cost, unplated shells

These connectors are identical in materials, mechanical and electrical specifications and contact arrangement to the 91 Series Excellite Connectors shown on p. 2•525, but have unplated low lustre black shells. They are, therefore, offered at lower

cost. Ideal for power connections where RF or EMI shielding is not required or for use in budget-priced units. These unplated connectors are completely intermateable and intermountable with the connectors shown on the preceding page.

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

ORDERING INFORMATION

Straight Cord Plugs, unplated

**Socket Contacts**

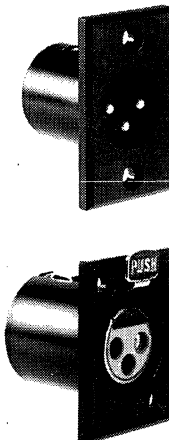
No. of Contacts	3	4	5	6
Part Number	91-404	91-408	91-416	91-471

Pin Contacts

No. of Contacts	3	4	5	6
Part Number	91-403	91-407	91-411	91-470

ORDERING INFORMATION

Panel Mounting Receptacles, unplated

**Pin Contacts**

No. of Contacts	3	4	5	6
Part Number	91-405	91-409	91-413	91-472

Socket Contacts

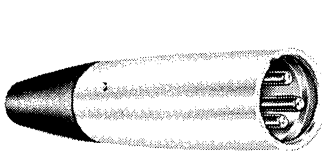
No. of Contacts	3	4	5	6
Part Number	91-406	91-410	91-414	

AUDIO-TYPE CONNECTORS

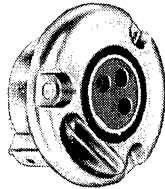
BUNKER
RAMO

AMPHENOL

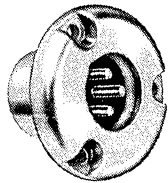
91 SERIES QWIKS



91-853



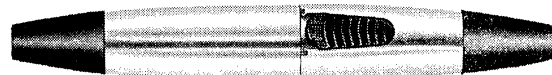
91-856



91-855



91-854



91-853

91-854

Easy-to-operate, quick-disconnect units that are ideal for microphones or other equipment that is moved frequently. Disconnect by simply pressing a button and pulling apart. Connect by merely pressing plug or jack into receptacle until they "click" together. Units stay securely mated until you decide otherwise. Cable plug and jack also mate. All are intermateable with Excellite and other industry standard audio connectors.

Qwiks have bodies of high-grade zinc alloy and are finished in attractive and corrosion-resistant satin-finish nickel. Contacts are a copper base alloy and are gold plated for resistance to oxidation and continued high conductivity. Dielectric is premium diallyl phthalate.

ORDERING INFORMATION

Part no.		Description
3 Contact	4 Contact	
91-853	91-857	Male Cable Plug
91-854	91-858	Female Cable Plug
91-855	91-859	Male Chassis Receptacle
91-856	91-860	Female Chassis Receptacle

91 SERIES EXCELLITE INTERCHANGEABILITY AND INTERMATEABILITY CROSS-REFERENCE

This cross-reference will assist in selecting Amphenol 91 Series Excellite Connector part numbers for equivalent Switchcraft, Cannon and Amphenol Qwik types. All Excellite Connectors shown are electrically equivalent and mechanically interchangeable to

the other types. Excellite part numbers shown are for plated connectors; for unplated types (also intermountable, intermateable, and interchangeable) see opposite page.

3. All connectors at left intermate with Excellite Part Number:

1. To replace any of these:

2. Use this Excellite part number

Cannon	Switchcraft	Amphenol Qwik	Amphenol Excellite	Description	Panel Mount	Cord Plug
XLR-3-11C	A3F	91-854	91-454	3-contact Female Cord Plug	91-455	91-453
XLR-3-12C	A3M	91-853	91-453	3-contact Male Cord Plug	91-456	91-454
XLR-3-31	D3F	91-856	91-456	3-contact Female Panel Mount	—	91-453
XLR-3-32	D3M	91-855	91-455	3-contact Male Panel Mount	—	91-454
XLR-4-11C	A4F	91-858	91-458	4-contact Female Cord Plug	91-459	91-457
XLR-4-12C	A4M	91-857	91-457	4-contact Male Cord Plug	91-460	91-458
XLR-4-31	D4F	91-860	91-460	4-Contact Female Panel Mount	—	91-457
XLR-4-32	D4M	91-859	91-459	4-contact Male Panel Mount	—	91-458
XLR-5-11C	A5F	—	91-462	5-contact Female Cord Plug	91-463	91-461
XLR-5-12C	A5M	—	91-461	5-contact Male Cord Plug	91-464	91-462
XLR-5-31	D5F	—	91-464	5-contact Female Panel Mount	—	91-461
XLR-5-32	D5M	—	91-463	5-contact Male Panel Mount	—	91-462
—	A6F	—	91-465	6-contact Female Cord Plug	91-467	91-466
—	A6M	—	91-466	6-contact Male Cord Plug	91-469	91-465
—	D6F	—	91-469	6-contact Female Panel Mount	—	91-466
—	D6M	—	91-467	6-contact Male Panel Mount	—	91-465

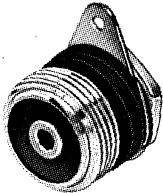
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

MICROPHONE CONNECTORS

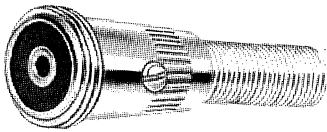
BUNKER
RAMO

AMPHENOL

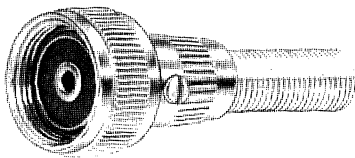
75 SERIES SINGLE-CONTACT CONNECTORS



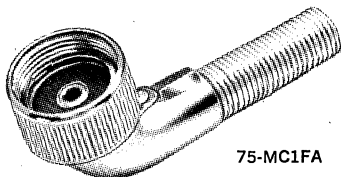
75-PC1M



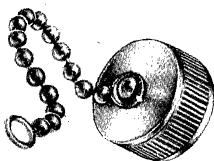
75-MC1M



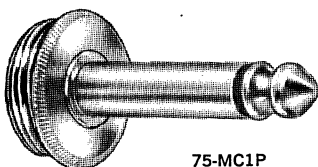
75-MC1F



75-MC1FA



75-CCC1



75-MC1P

Widely used by leading manufacturers for many types of equipment including amplifiers, transmitters, recorders, speakers, headphones, security alarms, juke boxes, vending machines and other devices.

Shielded-cable-type connector is chrome-plated brass and is practically unbreakable. The threaded ends engage with the coupling to make a physically secure, electrical noise-free and leak-proof connection—the center contacts remain firmly together when mated. Spring cord protectors prevent undue cable flexing and breakage; accept cables up to 1/4"-diameter. For grounding to chassis, mount receptacle in .385" hole; .500"-dia. hole for ungrounded two-circuit applications. Receptacle can be screwed directly into housing or stand by means of 3/8"-24 tapped hole.

Use the 75-MC1F straight plug as a cable jack by merely unscrewing the coupling ring and sliding it back over the cord. The 75-CCC1 Cap and Chain is recommended for covering the receptacle to keep it free from dust and foreign matter when not in use.

ORDERING INFORMATION

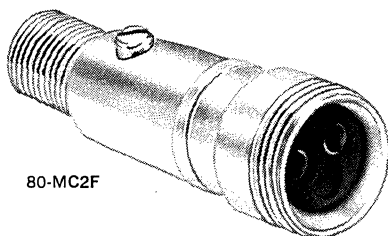
Part No.	Description
75-PC1M	Locknut Receptacle
75-MC1M	Cable Jack
75-MC1F	Straight Plug
75-MC1FA	Angle Plug
75-MC1P	Phone Plug Adapter
75-CCC1	Cap and Chain

MICROPHONE CONNECTORS

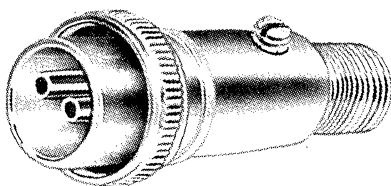
BUNKER
RAMO

AMPHENOL

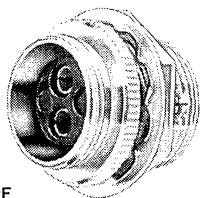
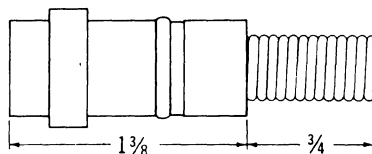
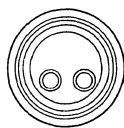
80 SERIES SINGLE- AND DOUBLE-CONTACT CONNECTORS



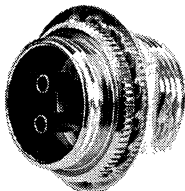
80-MC2F



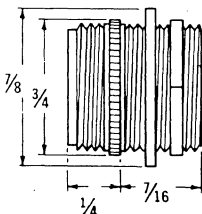
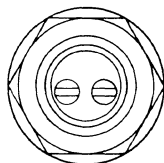
80-MC2M



80-PC2F



80-PC2M



These one-and two-contact connectors have a wide variety of applications such as shielded and microphone cables, twisted pairs, photo-cell leads, patch cords, electronic instruments and similar equipment.

Dielectric is general-purpose black phenolic; shells are attractively finished in polished chrome. Both plugs and receptacles are precision-constructed to assure positive connections free from electrical noise, leaks or shorts.

Both cable plugs and panel receptacles are available with either male or female contacts. All mount through $\frac{5}{8}$ "-diameter holes. Maximum panel thickness for lock-nut-type receptacle is $\frac{1}{32}$ ". Threaded housings permit mounting directly on mike body with $\frac{5}{8}$ "-24 tapped hole for a neat installation. Spring cable guard protects against flexing and wear; accepts cables up to $\frac{5}{16}$ "-diameter. Cap and chain 75-CCC1 (opposite page) also fits 80 Series Connectors to protect from dust and foreign matter when not in use. Assemblies are polarized to prevent mis-mating. Plug and socket inserts are interchangeable in all shell styles.

ELECTRICAL SPECIFICATIONS

	Single Contact		Double Contact	
	Male	Female	Male	Female
Voltage Rating (RMS at Sea Level)	1250 v.	1250 v.	600 v.	600 v.
Current Rating (amps)	5	3	3	3
Voltage Breakdown between terminals and ground	3000 v.	4000 v.	2000 v.	2000 v.

ORDERING INFORMATION

No. contacts	Cable Plug	Mating Connectors	
		Cable-to-Cable	Cable-to-Panel
1 Male	80-M	80-F	80-C
1 Male	80-M1	80-F1	—
1 Female	80-F	80-M	—
1 Female	80-F1	80-M1	80-C1
2 Male	80-MC2M	80-MC2F	80-PC2F
2 Male	80-MC2M1	80-MC2F1	—
2 Female	80-MC2F	80-MC2M	—
2 Female	80-MC2F1	80-MC2M1	80-PC2M

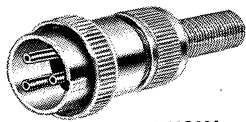
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

MICROPHONE CONNECTORS

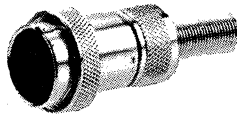
BUNKER
RAMO

AMPHENOL

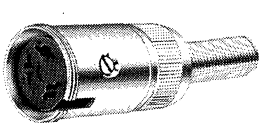
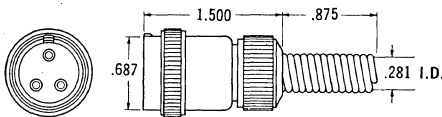
91 SERIES CONNECTORS



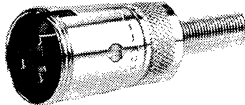
91-MC3M



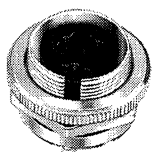
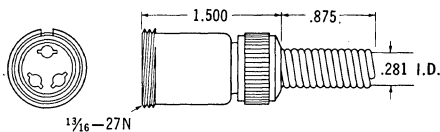
MC3F1



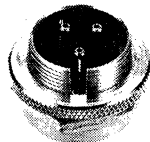
91-MC3F



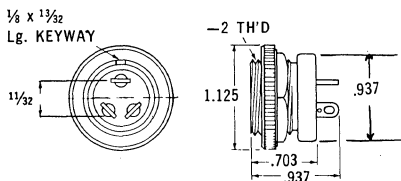
91-MC3M1



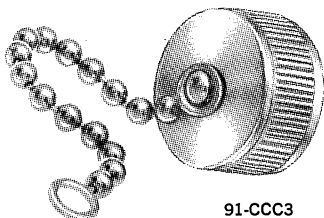
91-PC3F



91-PC3M



PROTECTIVE CAP AND CHAIN



91-CCC3

While these 3, 4 and 6-contact connectors are intended primarily for audio equipment, they are also widely used where components must be connected and disconnected from portable equipment.

The screw-type coupling-ring connection prevents accidental disconnects. A squeeze-type clamp grips the cable firmly after assembly and prevents strain on the soldered terminations.

Dielectric is molded general-purpose black phenolic. Cable shells are finished in high lustre chrome plate. Cord-protector springs for 3-contact style have .281" I.D., 4- and 6-contact types have .385 I.D. Chassis receptacles mount in $\frac{7}{32}$ "-dia. holes with maximum chassis thickness of $\frac{1}{8}$ ". Their service end accepts either a cable plug coupling ring or the protective cap and chain shown below. All assemblies have keyed polarization to prevent mis-mating.

ELECTRICAL SPECIFICATIONS

	3-contact		4-contact		6-contact	
	Female	Male	Female	Male	Female	Male
Voltage Rating (RMS Sea Level)	600v.	800v.	600v.	600v.	600v.	600v.
Current Rating (amps)	5	5	3	3	3	3
Voltage Breakdown (RMS) between Terminal and Ground (volts)	2000	2000	2000	2000	2000	2000

ORDERING INFORMATION

Contacts no. and type	Cable Plug	Mating Connectors	
		Cable-to-Cable	Cable-to-Panel
3 Male	91-MC3M	91-MC3F	91-PC3F
3 Male	91-MC3M1	91-MC3F1	—
3 Female	91-MC3F	91-MC3M	—
3 Female	91-MC3F1	91-MC3M1	91-PC3M
4 Male	91-MC4M	91-MC4F	91-PC4F
4 Male	91-MC4M1	91-MC4F1	—
4 Female	91-MC4F	91-MC4M	—
4 Female	91-MC4F1	91-MC4M1	91-PC4M
6 Male	91-MC6M	91-MC6F	91-PC6F
6 Male	91-MC6M1	91-MC6F1	—
6 Female	91-MC6F	91-MC6M	—
6 Female	91-MC6F1	91-MC6M1	91-PC6M

Seals all chassis-type receptacles shown above against dirt and tampering. Ruggedly constructed with chrome-plated, heavy brass cap and sturdy brass-nickel-plated bead chain.

ORDERING INFORMATION

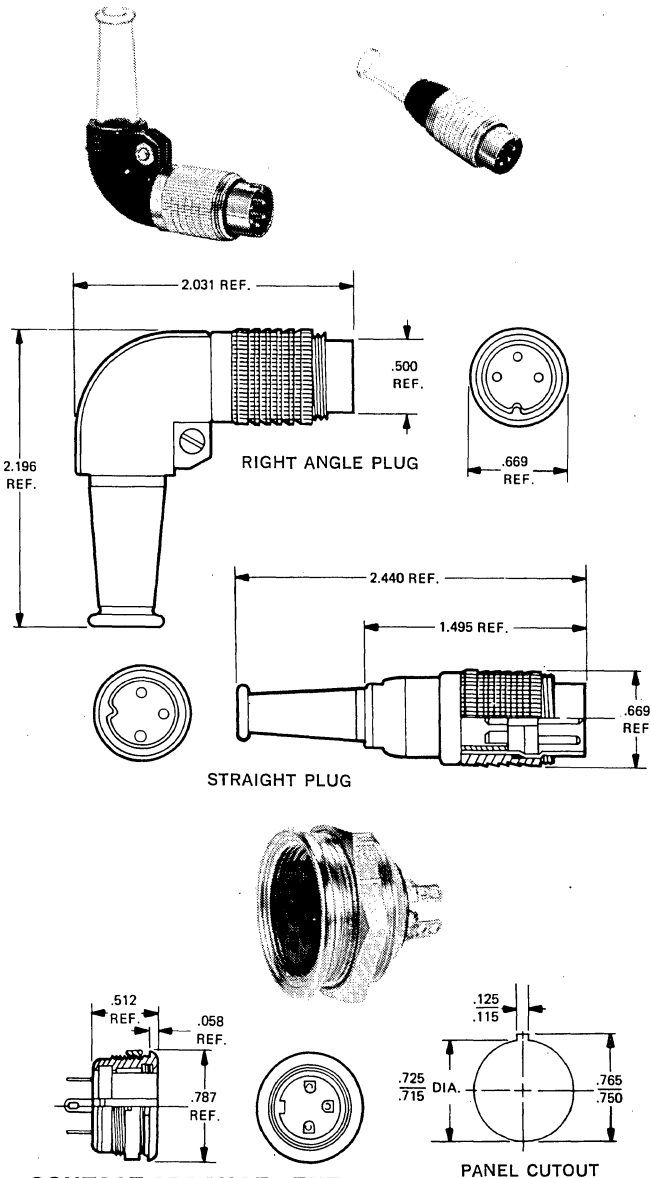
91-CCC3	Protective Cap and Chain
---------	--------------------------

MICROPHONE CONNECTORS



AMPHENOL

91-T SERIES MINIATURE CONNECTORS



CONTACT ARRANGEMENT

PANEL CUTOUT

These miniature audio/electronic cable-to-panel connectors are approximately $\frac{1}{3}$ smaller than the standard 91 Series coupling-ring connectors shown on the opposite page. Seven styles are available with 2, 3, 4, 5, 6, 7 and 12 contacts. They are useful everywhere a reliable, space-saving interconnection is desired.

Cable plugs are obtainable in either straight or right-angle styles. Both have molded black polycarbonate dielectric insert and bushing; bright nickel-plated shell and coupling ring. Strain relief is clear PVC plastic; accepts cable up to $\frac{7}{32}$ " O.D. Pin contacts with solder-cup tails are standard. Socket contacts are available on special order.

Panel receptacles have a nickel-plated brass shell and hex nut; dielectric is also black polycarbonate. The receptacle securely mounts in a .720"-dia. keyed panel opening by means of the hex-type nut. Socket contacts with pre-tinned solder-eyelet tails are standard; pin contacts are obtainable on special order.

The screw-lock coupling securely holds the connector halves together to withstand shock and vibration to prevent accidental disconnects. Polarization to prevent mis-mating is achieved two ways—by a key in the shell and by contact arrangement.

SPECIFICATIONS

Current Rating: 3 amps max. per contact

Voltage Rating: 2-7 contacts incl. 120v. (RMS at Sea Level) 12-contact, 60v. (RMS at Sea Level)

Dielectric: Black polycarbonate

Contacts: Socket—Silverplated phosphor bronze

Pin—Silver-plated brass

Accommodates Wire Size: 20 AWG

ORDERING INFORMATION

No. of Contacts	Cable Plugs		Panel Receptacles
	Straight	Right-Angle	
2	91-T-3200-1	91-T-3200-6	91-T-3203-9
3	91-T-3260-1	91-T-3260-6	91-T-3263-9
4	91-T-3300-1	91-T-3300-6	91-T-3303-9
5	91-T-3360-1	91-T-3360-6	91-T-3363-9
6	91-T-3400-1	91-T-3400-6	91-T-3403-9
7	91-T-3475-1	91-T-3475-6	91-T-3478-9
12	91-T-3635-1	91-T-3635-6	91-T-3638-9

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

POWER-CORD PLUGS

BUNKER
RAMO AMPHENOL

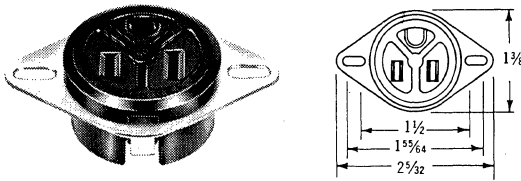
U/L LISTED 160 SERIES 2-POLE GROUNDED CONNECTORS

U/L File no. 12869

Dual-rated, heavy-duty plugs and receptacles—for either 15 amp, 125 volt or 10 amp, 250 volt. Meet U/L requirements for grounding home appliances

and tools, as well as single-phase industrial equipment. All plugs and receptacles incorporate both terminal screws and solder-eyelet terminations.

WITH MOUNTING PLATE

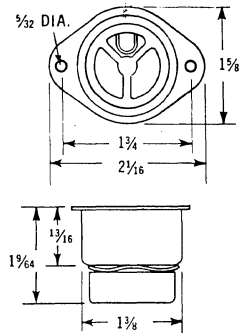
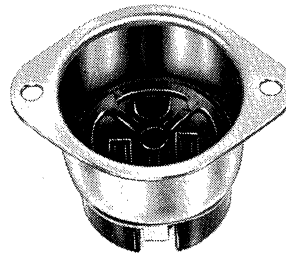


Nickel-plated-steel mounting plate assembled to molded thermoplastic body. Mounting requires $1\frac{1}{32}$ "-dia. center hole and two $\frac{5}{32}$ "-dia. holes on $1\frac{1}{2}$ " to $1\frac{5}{16}$ " centers. Contacts and grounding prong are brass. Plug is U/L listed. Receptacle is recognized under the U/L component program.

ORDERING INFORMATION

160-2-N	2-pole Receptacle
160-3-N	2-pole Plug

FLUSH MOTOR TYPE

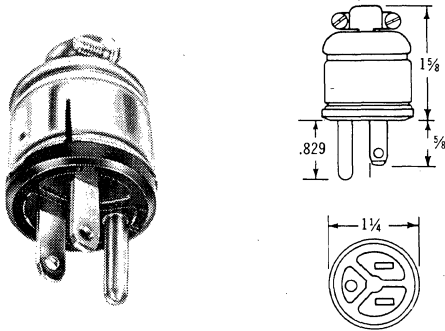


Consists of 160-10 and 160-11 inserts (below) assembled in cadmium-plated steel shells for below-surface mounting. Mount in $1\frac{1}{16}$ "-dia. hole with two $\frac{5}{32}$ " screw holes on $1\frac{1}{4}$ " centers. Plug is U/L Listed. Receptacle is recognized under the U/L component program.

ORDERING INFORMATION

160-4-N	2-pole Flush Motor Receptacle
160-5-N	2-pole Flush Motor Plug

SHIELDED TYPE

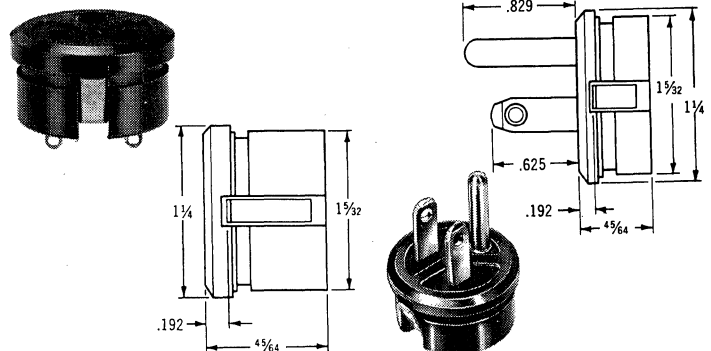


Consists of 160-10 and 160-11 inserts (below) with sturdy steel plug caps finished in black epoxy. Caps are $1\frac{1}{16}$ " long. End rubber grommet has $\frac{5}{16}$ " I.D. Cable clamp fits cable up to $\frac{3}{8}$ " O.D. All plugs and receptacles are U/L Listed.

ORDERING INFORMATION

160-6-N	2-pole Shielded Receptacle with Rubber Grommet
160-7-N	2-pole Shielded Plug with Rubber Grommet
160-8-N	2-pole Shielded Receptacle with Cable Clamp
160-9-N	2-pole Shielded Plug with Cable Clamp

PLUG AND RECEPTACLE INSERTS



Inserts have high-temperature-resistant thermoplastic bodies with cadmium-plated carbon-steel retainer rings. Contacts and grounding prong are copper alloy. Mount in $1\frac{1}{16}$ "-dia. keyed hole. Unless specified otherwise, both plug and receptacle inserts are grooved to fit .031" to .050"-thick panels, but they can be furnished on special order to fit panels or chassis up to .125" thick. Plug and receptacle are **not** U/L approved, since ground connection after installation requires U/L approval.

ORDERING INFORMATION

160-10-N	2-pole Receptacle Insert
160-11-N	2-pole Plug Insert

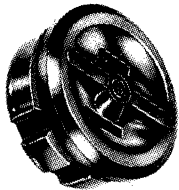
POWER-CORD PLUGS

BUNKER
RAMO

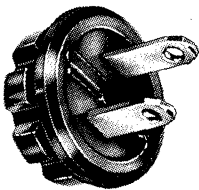
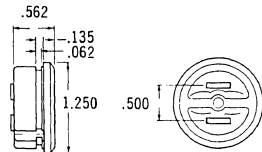
AMPHENOL

U/L LISTED 60 AND 61 SERIES
TWO- AND THREE-POLE CONNECTORS

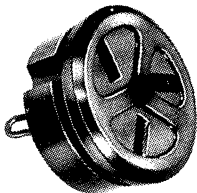
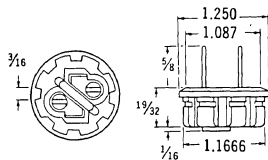
U/L File no. 12869



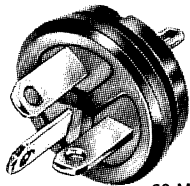
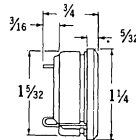
61-F



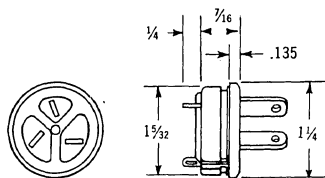
61-M



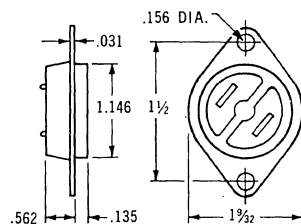
60-F



60-M



MOLDED-IN-PLATE RECEPTACLE



Quality 110-volt receptacle identical to 60-F (above) except that steel mounting plate is molded directly into phenolic body. Mounts in $1\frac{3}{16}$ "-dia. hole. Mounting holes are $\frac{5}{32}$ "-dia. on $1\frac{1}{2}$ " centers. Receptacle is at angle to plate for close spacing or vertical mounting.

ORDERING INFORMATION

61-MIP-61F	2-pole Molded-in-Plate Receptacle
------------	-----------------------------------

PLUG AND RECEPTACLE INSERTS

All dual rated at either 15 amp., 125 volts or 10 amp., 250 volts and constructed to meet U/L standards. These compact plug and receptacle bodies are ruggedly molded in general-purpose black phenolic. They are available in either retainer-ring or already-assembled mounting-plate types. All sockets have dual termination, with both solder eyelets and terminal screws.

Assemble retainer-ring type plugs and receptacles to panels or chassis with the Amphenol Retainer-Ring Hand Tool (p. 2•513) or to plug caps (p. 2•521). They mount in $1\frac{1}{4}$ "-dia. keyed holes in chassis. Standard parts are grooved to fit .031" to .050" thick panels but they can be furnished on special order to fit panels up to .125" thick. The mounting-plate style requires a $1\frac{1}{2}$ "-dia. hole with holding screws or rivets on $1\frac{1}{2}$ " to $1\frac{5}{8}$ " centers.

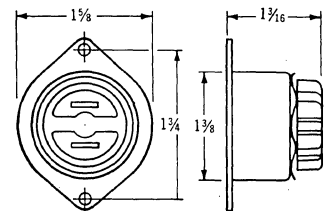
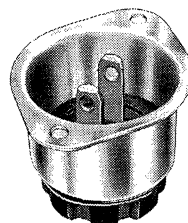
Two-pole receptacles accept all standard 125 volt plugs. Contacts for three-pole receptacles are arranged so that 60-M and 60-M1 plugs can be inserted only one way.

ORDERING INFORMATION

Part no.

Retainer Ring Type	Mounting Plate Type	Description
PLUGS		
61-M	61-M1	2-pole, Standard
60-M	60-M1	3-pole, Polarized
RECEPTACLES		
61-F	61-F1	2-pole, Universal
60-F	60-F1	3-pole, Polarized

FLUSH MOTOR PLUG AND RECEPTACLE



Compact plug or receptacle already assembled in No. 61-61 steel shell for below-surface mounting. Mounts in $1\frac{1}{16}$ "-dia. hole; has two $\frac{5}{32}$ " screw holes on $1\frac{3}{4}$ " centers.

ORDERING INFORMATION

Part no.	Description
60-F10	3-pole Polarized Receptacle
60-M10	3-pole Polarized Plug
61-F10	2-pole Universal Receptacle
61-M10	2-pole Standard Plug

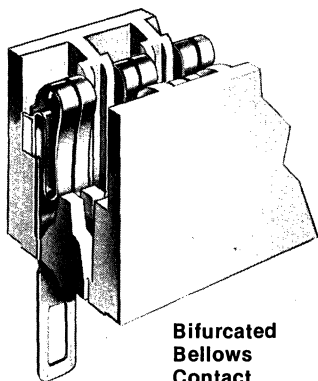
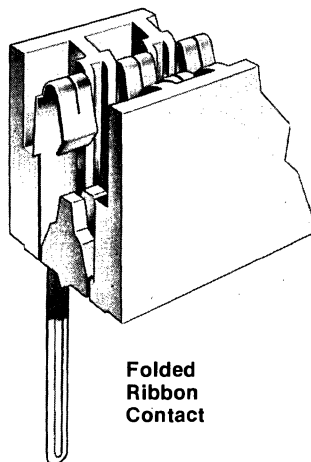
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

PRINTED CIRCUIT CONNECTORS

BUNKER
RAMO

AMPHENOL

225 Series

Bifurcated
Bellows
ContactFolded
Ribbon
Contact**Low Contact Resistance**

225 Series Connectors assure positive contact with regular or irregular board surfaces. Two types of contacts are employed.

225 Series Industrial and Military Types utilize a bifurcated bellows contact that incorporates two important features—bifurcation and convexity. Bifurcation (slotting) assures two points of contact at all times. The convex face concentrates bearing pressure on the mating surface and assures a positive wiping action that removes semi-conductive films on insertion.

225 Series solder-type Commercial Connectors use a slotted, folded-ribbon contact that flexes into the connector-block cavity on insertion. The wide ribbon provides a large contact area and excellent conductivity.

Excellent Protection for Mating Surfaces

A wide flexing range gives 225 Series contacts in both bellows and ribbon types an extremely low-friction mating with printed circuit surfaces—enables them to withstand repeated insertions and withdrawals. Double plating the contact surface with two dense metals provides protection against wear from hard usage.

Will Not Deform Under Stress

Because these contacts have an excellent compliance, they will not deform or “set” under hard usage. Warped or rocked boards will not permanently deform the contact by squeezing it against a stop and exceeding the elastic limits of the material.

Rugged, One-Piece Connector Body

The industrial- and military-type connector body is molded from flame-retardant diallyl phthalate which is

glass-fiber reinforced to resist physical and thermal shock. Commercial 225 Series Connectors are molded from electrical-grade phenolic which gives excellent service in most applications. Both are produced by Amphenol's process of controlled-transfer molding, insuring uniformity and dimensional stability.

The card slot is designed to provide easy guidance for mis-aligned boards and permits fast entry even in blind applications where visual alignment is not possible.

Get Almost Any Combination You Need

Amphenol 225 Series Connectors offer an extreme range of options to meet your individual requirements:

Application Types: Commercial, Industrial, Military

Contact Styles: Removable (Crimp) or permanent; two contact rows for independent opposed circuits or single row for single circuits; two rows bridged for redundant PC boards.

Contact Positions: 6, 10, 12, 15, 18, 22, 25, 28, 30, 36, 43, 50.

Terminations: Solder (closed eyelet; open eyelet; long, medium, short, right-angle dip), Wire-wrappable, Crimp Poke-Home®, Taper Pin.

Contacts: Copper-alloy base metal with .000020 (0,000508) minimum gold or bright tin-lead* over copper flash; Phosphor-bronze base metal with .000020 (0,000508), .000030 (0,000762), .000050 (0,00127) minimum gold or bright tin-lead* over copper flash; Beryllium-copper base metal with .000030 (0,000762), .000050 (0,00127) minimum gold over copper flash.

Mounting Provisions: Clearance hole .128 (3,25) and .142 (3,61). Float bushing clearance for #4 screw. Molded-in threaded bushing for 4-40 screw.

Polarization: Between-the-contact keying; over-the-contact keying.

*Bright tin-lead-plated contacts require use of bright tin-lead-plated pads on printed circuit board.

COMMERCIAL CONNECTORS

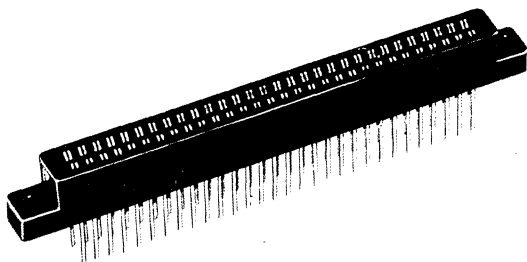
BUNKER
RAMO

AMPHENOL

225 Series

Wire-Wrappable Terminations

Bifurcated Bellows Contacts



AMPHENOL 225 Series Printed Circuit Commercial Connectors with wire-wrappable terminations provide an economical and reliable connector for either automatic or hand-wire-wrapping applications.

Contacts are on a .100 x .200 (2,54 mm x 5,08 mm) or .125 x .250 (3,18 mm x 6,35 mm) grid spacing. Connectors are available in 22-, 30-, 40-, 43- and 50-position models with either grid spacing. The .025 (0,64 mm) square posts will accept a minimum of 3 wraps of #26 AWG wire.

SPECIFICATIONS

Operating Voltage:	600 VAC (RMS) at sea level 150 VAC (RMS) at 70,000 ft.
Current Rating:	5 amps
Dielectric Material:	Electrical Grade Phenolic, Black
Insulation Resistance:	5,000 megohms minimum
Contact Material:	Phosphor bronze plated .000020 (0,000508) min. gold over copper
Contact Resistance:	30 millivolts maximum at rated current
Board Thickness:	.054 (1,37) to .071 (1,80)

POLARIZING KEYS



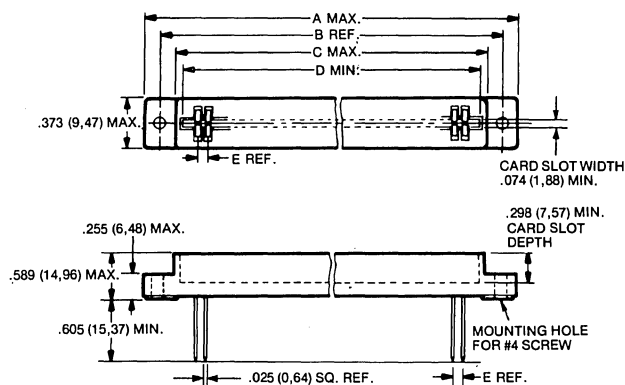
225-645

Over contact key can be used with 225 Series wire-wrappable connectors on .100 (2,54) and .125 (3,18) centers.



225-594

Between contact key may be used with .125 (3,18) center wire-wrappable connectors.



ALL DIMENSIONS REFERENCE ONLY

DIMENSIONS AND ORDERING INFORMATION

Part Number	Positions/Contacts	A Max.	B Ref.	C Max.	D Min.	E Ref.
.125 (3,18) CONTACT CENTERS						
225-804-22	22/44	3.690 (93,73)	3.380 (85,85)	3.090 (78,49)	2.940 (74,68)	.125 (3,18)
225-804-30	30/60	4.690 (119,13)	4.380 (111,25)	4.090 (103,89)	3.940 (100,08)	.125 (3,18)
225-804-40	40/80	5.815 (147,70)	5.545 (140,84)	5.295 (134,49)	5.120 (130,05)	.125 (3,18)
225-804-43	43/86	6.318 (160,48)	6.005 (152,53)	5.715 (145,16)	5.565 (141,35)	.125 (3,18)
225-804-50	50/100	7.190 (182,63)	6.880 (174,75)	6.590 (167,39)	6.440 (163,58)	.125 (3,18)
.100 (2,54) CONTACT CENTERS						
225-805-22	22/44	3.165 (80,39)	2.855 (72,52)	2.565 (65,15)	2.415 (61,34)	.100 (2,54)
225-805-30	30/60	3.965 (100,71)	3.653 (92,79)	3.365 (85,47)	3.215 (81,66)	.100 (2,54)
225-805-40	40/80	4.845 (123,06)	4.575 (116,21)	4.270 (108,46)	4.095 (104,01)	.100 (2,54)
225-805-43	43/86	5.265 (133,73)	4.955 (125,86)	4.665 (118,49)	4.515 (114,68)	.100 (2,54)
225-805-50	50/100	5.958 (151,33)	5.655 (143,64)	5.365 (136,27)	5.215 (132,46)	.100 (2,54)

NOTE: For 4-40 NC Threaded Hole Mounting use Deviation (122). Example: 225-8XX-XX(122).

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

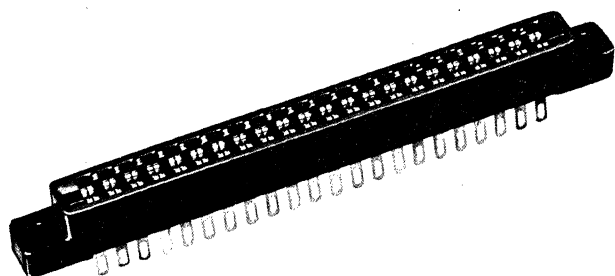
COMMERCIAL CONNECTORS



AMPHENOL

225 Series

Solder Terminations



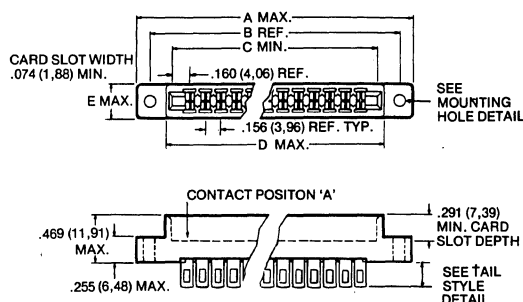
225 Series Printed Circuit Commercial Connectors with solder terminations are intended for flush installation on printed circuit boards with pads and spacer barriers that permit thorough flux washing.

Four different tail styles provide unusual termination flexibility—one eyelet and three straight tails. The eyelet accepts up to three #20 AWG wires at each terminal; the others are for dip or flow soldering. With 2-tail bridged or common contacts, you can connect 6 wires to one point on a printed circuit board. You can also obtain two 2-tail configurations—one with bridged terminals for single or common-contact (redundant) boards; the other with dual contact terminals for independent opposing circuits.

All dip-solder terminals are designed for .043 (1.09 mm) min. diameter holes.

SPECIFICATIONS

Operating Voltage:	600 VAC (RMS) at sea level 150 VAC (RMS) at 70,000 ft.
Current Rating:	5 amps
Dielectric Material:	Electrical Grade Phenolic, Black
Insulation Resistance:	5,000 megohms minimum
Contact Material:	Copper alloy with .000020 (0.000508) min. gold over copper
Contact Resistance:	30 millivolts maximum at rated current
Board Thickness:	.054 (1.37) to .071 (1.80)



ALL DIMENSIONS REFERENCE ONLY

DIMENSIONS

SIZES	A MAX.	B REF.	C MIN.	D MAX.	E MAX.
06	1.854 (47,09)	1.532 (38,91)	1.095 (27,81)	1.240 (31,50)	.346 (8,79)
10	2.478 (62,94)	2.156 (54,76)	1.719 (43,66)	1.864 (47,35)	.346 (8,79)
12	2.790 (70,87)	2.468 (62,69)	2.034 (51,66)	2.176 (55,27)	.346 (8,79)
15	3.258 (82,75)	2.938 (74,63)	2.499 (63,47)	2.646 (67,21)	.346 (8,79)
18	3.726 (94,64)	3.406 (86,51)	2.967 (75,36)	3.115 (79,12)	.346 (8,79)
22	4.360 (110,74)	4.032 (102,41)	3.584 (91,03)	3.750 (95,25)	.350 (8,89)
25	4.820 (122,43)	4.500 (114,30)	4.054 (102,97)	4.204 (106,78)	.346 (8,79)
28	5.274 (133,96)	4.969 (126,21)	4.512 (114,60)	4.662 (118,41)	.503 (12,78)
36	6.522 (165,66)	6.219 (157,96)	5.765 (146,43)	5.910 (150,11)	.503 (12,78)
43	7.610 (193,29)	7.302 (185,47)	6.854 (174,09)	7.010 (178,05)	.506 (12,85)

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

PRINTED CIRCUIT CONNECTORS

BUNKER
RAMO

AMPHENOL

225 Series
Folded-Ribbon Contacts

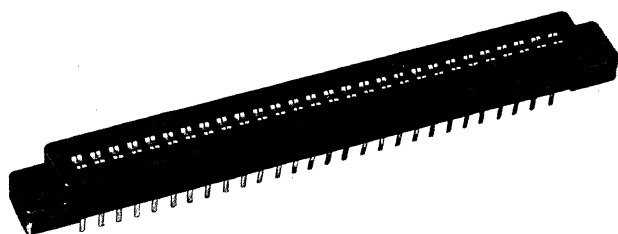
ORDERING INFORMATION

To order the specific 225 Series connector you want, put together the part number as per the following example:

SERIES NUMBER 225-		DEVIATIONS (117) Commercial Type	
TERMINATION CLASS Digit Termination 2 Solder		TAIL STYLE All contacts on .156 (3,96) REF. centers 01 Style Eyelet Type Solder Termination 01 Style Eyelet Type Down-the-Center 04 Dip Solder 04 Down-the-Center	
CONTACT POSITIONS Digit No. of Group Contacts 06 6 or 12 10 10 or 20 12 12 or 24 15 15 or 30 18 18 or 36 22 22 or 44 25 25 or 50 28 28 or 56 36 36 or 72 43 43 or 86		CONTACT CONFIGURATION 1 Single row connector with back-up springs. 2 Two rows of independent contacts. 5* Two rows of bridged contacts with one tail. *Available in Solder Eyelet (01) and .235 (5,97) Dip Solder (04) Terminations only	
CONTACT CONFIGURATION		MOUNTING PROVISIONS 1 MOUNTING HOLE FOR #4 SCREW 2 FLOAT MOUNTING FOR #4 SCREW 3 THREADED HOLE 4 MOUNTING HOLE FOR #6 SCREW *Available in Solder Eyelet (01) Termination only	
RECOMMENDED 225 SERIES PC BOARD CUTOUTS 		CONTACT PLATING Digit Plating 4 .000020(0,000508) min. Gold over Copper 6 Bright Tin/Lead	
POLARIZING KEYS 225-559 Over contact key must be ordered separately. 225-594 Between contact key. One included for each connector. Packed separately in bulk. Polarization can be achieved by using either of these types of polarizing keys on all eyelet and dip solder 225 Series Connectors.			

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

INDUSTRIAL CONNECTORS

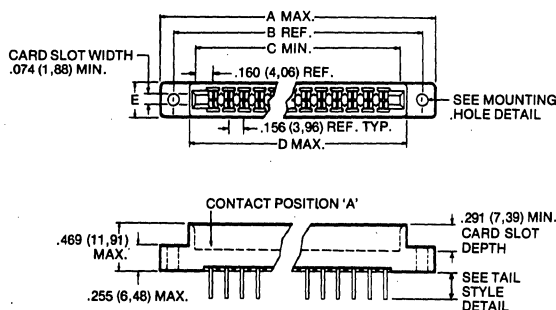
BUNKER
RAMO AMPHENOL225 Series
Solder Terminations

Here is real flexibility in termination with six different tail styles—three straight, one right-angle and two eyelet (open and closed) tails. All are intended for flush installation on PC boards with pads and spacer barriers that permit complete flux washing. The straight and right-angle types are intended for dip or flow soldering; eyelet types will accept up to three #20 AWG wires at each terminal.

Two tail configurations include bridged terminals for common-contact PC boards and dual-contact terminals for independent opposing circuits.

SPECIFICATIONS

Operating Voltage:	600 VAC (RMS) at sea level 150 VAC (RMS) at 70,000 feet.
Current Rating:	5 amps continuous.
Dielectric Material:	Glass-fiber-reinforced diallyl phthalate. Type SDG-F per MIL-M-14.
Insulation Resistance:	5,000 megohms minimum.
Contact Material:	All beryllium copper except phosphor bronze for bridged contact with one tail.
Contact Resistance:	30 millivolts maximum at rated current.
Board Thickness:	Accepts P.C. boards .054 (1,37) to .071 (1,80) thick.



ALL DIMENSIONS REFERENCE ONLY

DIMENSIONS

SIZES	A Max.	B Ref.	C Min.	D Max.	E Max.
06	1.854 (47,09)	1.532 (38,91)	1.095 (27,81)	1.240 (31,50)	.346 (8,79)
10	2.478 (62,94)	2.156 (54,76)	1.719 (43,66)	1.864 (47,35)	.346 (8,79)
12	2.790 (70,87)	2.468 (62,69)	2.034 (51,66)	2.176 (55,27)	.346 (8,79)
15	3.258 (82,75)	2.938 (74,63)	2.499 (63,47)	2.646 (67,21)	.346 (8,79)
18	3.726 (94,64)	3.406 (86,51)	2.967 (75,36)	3.115 (79,12)	.346 (8,79)
22	4.360 (110,74)	4.032 (102,41)	3.584 (91,03)	3.750 (95,25)	.350 (8,89)
25	4.820 (122,43)	4.500 (114,30)	4.054 (102,97)	4.204 (106,78)	.346 (8,79)
28	5.274 (133,96)	4.969 (126,21)	4.512 (114,60)	4.662 (118,41)	.503 (12,78)
36	6.522 (165,66)	6.219 (157,96)	5.765 (146,43)	5.910 (150,11)	.503 (12,78)
43	7.610 (193,29)	7.302 (185,47)	6.854 (174,09)	7.010 (178,05)	.506 (12,85)

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

PRINTED CIRCUIT CONNECTORS

BUNKER
RAMO

AMPHENOL

225 Series

Bifurcated Bellows Contacts

SERIES NUMBER 225-	
2 2 5 - 2 0 6 2 1 - 1 01	

TERMINATION CLASS	
Digit	Termination
2	Solder

CONTACT POSITIONS	
Digit Group	No. of Contacts
06	6 or 12
10	10 or 20
12	12 or 24
15	15 or 30
18	18 or 36
22	22 or 44
25	25 or 50
28	28 or 56
36	36 or 72
43	43 or 86

CONTACT CONFIGURATION	
1	Single row connector with back-up springs.
2	Two rows of independent contacts.
3*	Two rows of bridged contacts with two tails.
4	Two rows of bridged contacts with one tail.
5**	Two rows of bridged contacts with one tail.

* Available in Solder Eyelet Tail style only.
** Available in Phosphor Bronze only

MOUNTING PROVISIONS	
MOUNTING HOLE FOR #4 SCREW 	
FLOAT MOUNTING FOR #4 SCREW 	
THREADED HOLE 	
MOUNTING HOLE FOR #6 SCREW 	

TAIL STYLES	
All contacts on .156 (3,96) REF. centers	
01 Solder Eyelet	
03 Long Dip Solder	
04 Down-the-Center Dip Solder	
05 Short Dip Solder	
11 Right Angle Dip Solder	
12 Open Solder Eyelet	

CONTACT PLATING	
Digit	
1	.000030 (0,000762) min. Gold over Copper
2	.000050 (0,00127) min. Gold over Copper

POLARIZING KEYS	
	225-559 Over-contact key must be ordered separately.
	225-594 Between-contact key. One included for each connector. Packed separately in bulk.

Polarization can be achieved by using either of these types of polarizing keys on all eyelet and dip solder 225 Series Connectors.

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

INDUSTRIAL CONNECTORS

BUNKER RAMO AMPHENOL

225 Series

Taper Pin and Crimp Poke-Home® Terminations

TAPER PIN TERMINATION

Taper pin terminations provide fast, flexible assembly along with simple circuit modification and repair.

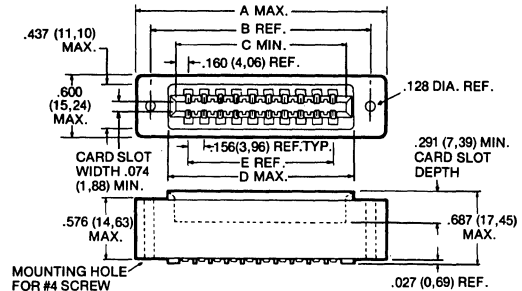
Contacts are fixed in the dielectric material, but wired taper pins can easily be installed, removed and reinserted. Taper pins are securely seated with an impact tool setting of only 13 lb. (5.9 kg.). Average pin retention for the #53 standard pin is 20 lb. (9.1 kg.).

Dielectric is blue diallyl phthalate only.

Polarizing key for taper pin termination
P/N 225-529

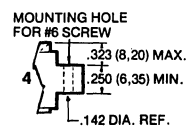
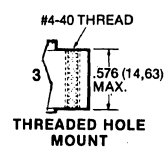
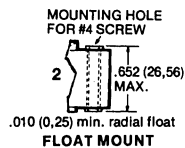


Tail style 00 accepts #53 pins. Contacts available in beryllium copper only.



MOUNTING PROVISION 1

ADDITIONAL MOUNTING PROVISIONS



CRIMP POKE-HOME® TERMINATION

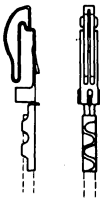
Here's the economy of crimp termination with the flexibility of removable contacts.

Termination is separate from the connector body—a convenient and time-saving arrangement in many cases. Each contact accepts one #18 or #20, one or two #22 or #24 or two #26 or #28 AWG wires. The wire is crimped and the insulation securely gripped.

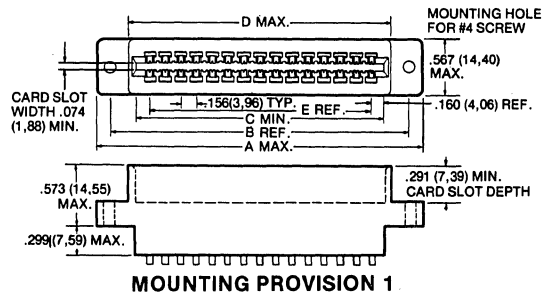
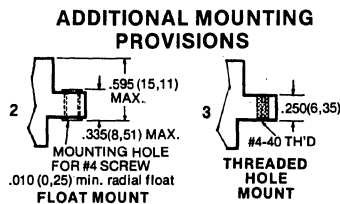
Available blue diallyl phthalate or black phenolic (117 deviation).

See opposite page for Amphenol's complete line of crimping accessories.

Polarizing key for crimp termination
P/N 225-529



Tail style 00 available in beryllium copper only.



MOUNTING PROVISION 1

CRIMP CONTACT ORDERING INFORMATION

Crimp contacts are available in standard beryllium copper with .000030 (0,000762) gold plating either in bulk or on reels. Loose contacts—Order part number 225-676-xx.* Reel contacts (4000 contacts on reel) Order part number 225-676-54000-xx.*

* Contact factory for plating desired.

DIMENSIONS

SIZE	A MAX.	B REF.	C MIN.	D MAX.	E REF.
06	1.842 (46,79)	1.532 (38,91)	1.093 (27,76)	1.230 (31,24)	.780 (19,81)
10	2.465 (62,61)	2.156 (54,76)	1.718 (43,64)	1.854 (47,09)	1.404 (35,66)
15	3.246 (82,45)	2.938 (74,63)	2.497 (63,42)	2.634 (66,90)	2.184 (55,47)
18	3.714 (94,34)	3.406 (86,51)	2.955 (75,06)	3.102 (78,79)	2.652 (67,36)
22	4.338 (110,19)	4.032 (102,41)	3.592 (91,24)	3.726 (94,64)	3.226 (83,21)
28	5.274 (133,96)	4.969 (126,21)	4.535 (115,19)	4.662 (118,41)	4.212 (106,98)
36	6.522 (165,66)	6.219 (157,96)	5.773 (146,63)	5.910 (150,11)	5.460 (138,68)
43	7.615 (193,42)	7.302 (185,47)	6.866 (174,40)	7.010 (178,05)	6.552 (166,42)

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

PRINTED CIRCUIT CONNECTORS

BUNKER
RAMO

AMPHENOL

225 Series

Bifurcated Bellows Contacts

ORDERING INFORMATION

To order the specific 225 Series connector you want, put together the part number as per the following example:

SERIES NUMBER 225-		2 2 5 - 4 0 6 2 1 - 1 00 (117)										DEVIATION (117) Black Phenolic. Copper Alloy Contact with .000020 (0,000508) min. gold plating. Crimp Poke-Home only.
TERMINATION CLASS												POLARIZATION (optional) If factory insertion of polarizing key is desired, add position of key as suffix here. Key will be inserted to right of contact position shown. Example: 225-40621-10003. Key to right of contact #3.
Digit	Termination											TAIL STYLE
3	Taper Pin											Digit Group
4	Crimp											Style
CONTACT POSITIONS												CONTACT PLATING
Digit Group	No. of Contacts											Digit
06	6 or 12											Plating
10	10 or 20											1
15	15 or 30											000030 (0,000762) min. gold over copper (industrial)
18	18 or 36											2
22	22 or 44											.000050 (0,00127) min. gold over copper
28	28 or 56											MOUNTING PROVISIONS
36	36 or 72											Digit
43	43 or 86											Provision
												1
												Mounting hole for #4 screw
												2
												Float bushings for #4 screws
												3
												Threaded bushings (4-40)
												4
												.250 (6,35) mounting ears (taper pin)

CONTACT CONFIGURATION		
Digit	Poke-Home Type	Taper Pin Type
0	Insert less contacts.	—
1	Insert plus loose contacts for one row plus back-up springs.	Single row connector with back-up springs.
2	Insert plus loose contacts for two rows.	Two rows of independent contacts.

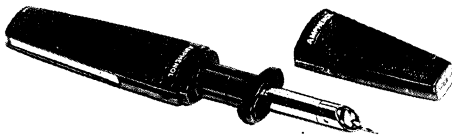


1



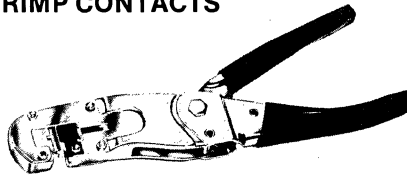
2

ACCESSORY TOOLS FOR 225 SERIES CRIMP CONTACTS

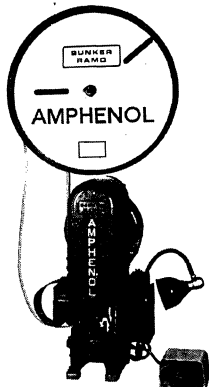


356-201 CONTACT REMOVAL TOOL

Permits easy removal of crimp contacts without damage. Allows repairs or circuit modifications without costly unsoldering or replacing connector.

357-550
HAND CRIMPING TOOL

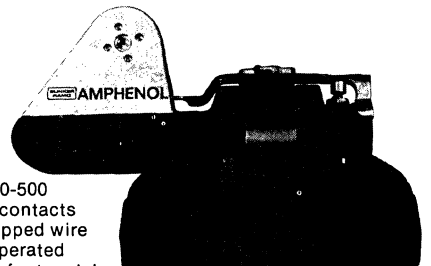
Two-position tool accommodates all 225 Series Crimp Contacts. Contacts are positioned, then locked in the tool to facilitate insertion of the pre-stripped wire. Positive stops and easy contact release prevent contact damage and assure better crimps. First position crimps #18, #20, #22 or two #22 AWG wires. Second position crimps one #24, two #24, two #26 or two #28 AWG wires.

359-205
SEMI-AUTOMATIC
CRIMPING MACHINE

Even an unskilled operator can crimp over 1,000 contacts per hour. Simply insert pre-stripped wire into the safety wire-feed slot and press a pedal—the machine does the rest. Contacts are furnished on integral carrier strips in reels of 4,000 for easy, convenient loading. Will crimp one each of #18, #20, #22, or #24, or two #22, #24, #26 or #28 AWG wires.

359-102
PNEUMATIC HAND
CRIMPING MACHINE

Full-cycle, double-action hand tool assures a positive crimp to required specifications. Crimps 400-500 contacts per hour. Loose contacts are placed in unit, pre-stripped wire inserted and the trigger operated either by hand or optional foot pedal. Can be set to crimp #18, #20, one or two #22 or #24, or two #26 or #28 AWG wires (please specify when ordering). Can be hand held or optionally bench mounted as shown. For bench mount, order 359-102 tool and 359-1000 bench-mount assembly.



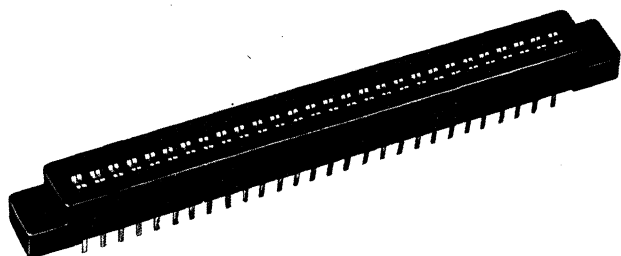
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

MILITARY CONNECTORS

BUNKER
RAMO AMPHENOL

225 Series

Qualified to MIL-C-21097 C/21



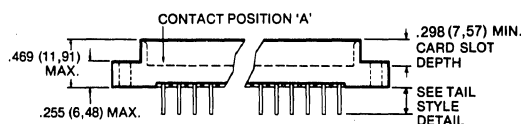
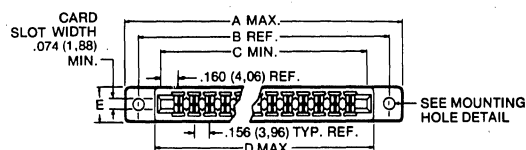
Series 225 PC Connectors that conform to military specifications are available in two solder terminations—solder eyelet and medium tail for dip or flow soldering. Row spacing for the military dip solder connector is .200 (5,08) as opposed to .140 (3,56) for most industrial and commercial connectors.

The solder eyelet termination provides a choice of two tail configurations—a bridged terminal for single or common contacts (redundant) PC boards, and dual contact terminals for independent opposing circuits.

The facing page cross references 225 Series Amphenol part numbers with corresponding MIL-C-21097C/21 numbers.

SPECIFICATIONS

Operating Voltage:	600 VAC (RMS) at sea level 150 VAC (RMS) at 70,000 feet.
Current Rating:	5 amps continuous.
Dielectric Material:	Glass-fiber-reinforced diallyl phthalate. Type SDG-F per MIL-M-14.
Insulation Resistance:	5,000 megohms minimum.
Contact Material:	All beryllium copper except phosphor bronze for bridged contact with one tail.
Contact Resistance:	30 millivolts maximum at rated current.
Board Thickness:	Accepts P.C. boards .054 (1,37) to .071 (1,80) thick.



ALL DIMENSIONS REFERENCE ONLY

DIMENSIONS

Sizes	A Max.	B Ref.	C Min.	D Max.	E Max.
06	1.854 (47,09)	1.532 (38,91)	1.095 (27,81)	1.204 (31,50)	.346 (8,79)
10	2.478 (62,94)	2.156 (54,76)	1.719 (43,66)	1.864 (47,35)	.346 (8,79)
15	3.258 (82,75)	2.938 (74,63)	2.499 (63,47)	2.646 (67,21)	.346 (8,79)
18	3.726 (94,64)	3.406 (86,51)	2.967 (75,36)	3.115 (79,12)	.346 (8,79)
22	4.360 (110,74)	4.032 (102,41)	3.584 (91,03)	3.750 (95,25)	.350 (8,89)
28	5.274 (133,96)	4.969 (126,21)	4.512 (114,60)	4.662 (118,41)	.503 (12,78)
36	6.522 (165,66)	6.219 (157,96)	5.765 (146,43)	5.910 (150,11)	.503 (12,78)
43	7.610 (193,29)	7.302 (185,47)	6.854 (174,09)	7.010 (178,05)	.506 (12,85)

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

PRINTED CIRCUIT CONNECTORS

BUNKER
RAMO

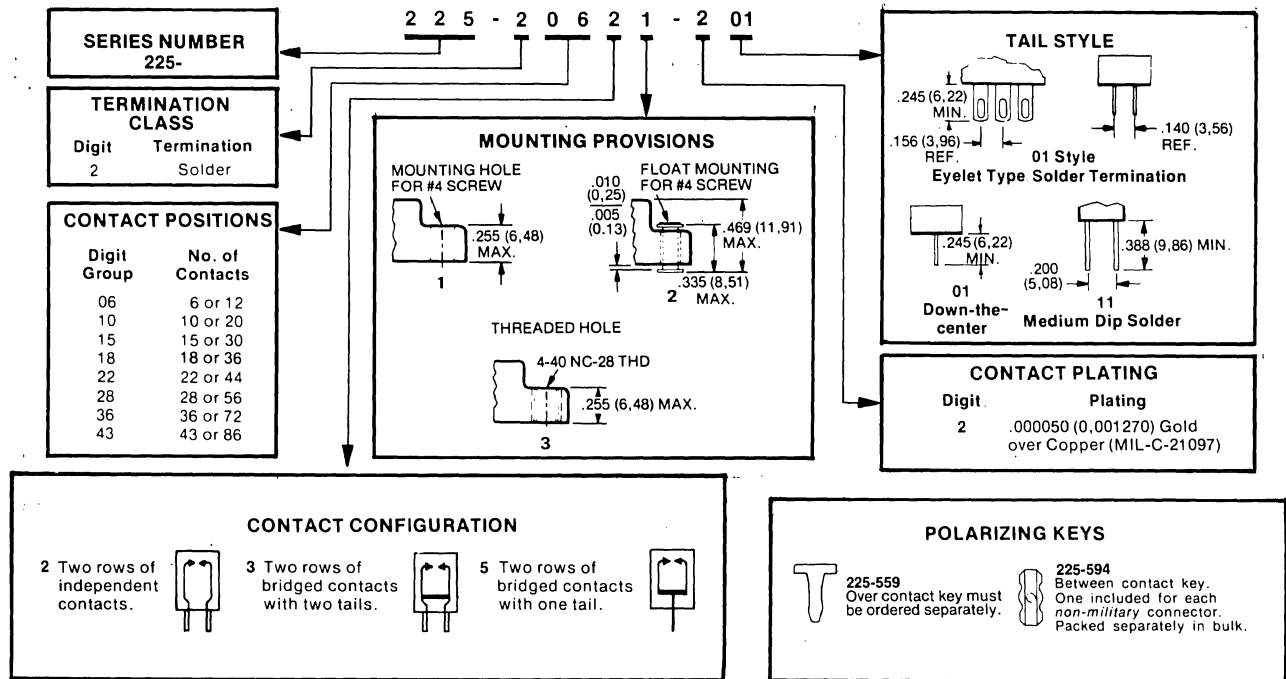
AMPHENOL

225 Series

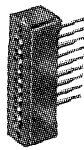
Bifurcated Bellows Contacts

ORDERING INFORMATION

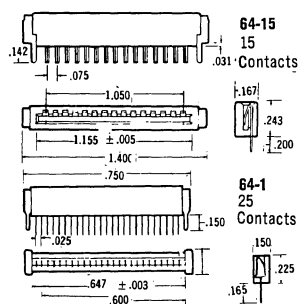
To order the specific 225 Series connector you want, put together the part number as per the following example:

64 Series Micro-Edge®
Edge Board Receptacles

Micro-Edge contacts will not set. The Micro-Edge will accept even warped boards with firm contact action. Contacts are rounded and will not scrape or injure delicate circuits.

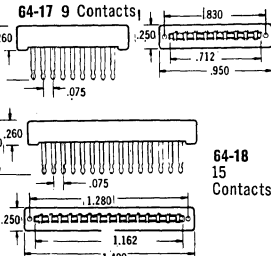


REGULAR TYPE



ECONOMY TYPE

(For .032" ± .004" Thick Boards)



	64-1	64-15	Economy Units	
No. of Contacts	25	15	64-17	64-18
Overall Length	.75	1.40	.950	1.40
Contact Centers	.025"	.075"	.075"	.075"
Contact Diameter	.008"	.010"		
Contact Resistance, Ohms	.020-.030	.010-.020	.010	.010
P.C. Board Width Thickness	.647 .020 ± .003	1.155 .032 ± .004	.712 1/2	1.162 1/2
Current Rating, Amperes	.5	.5	1	1
Voltage Rating	200 V AC (RMS) at sea level		750 V VAC (RMS) at sea level	
Contact Material	.008" and .010" gold plated copper alloy wire		.00002" gold over copper strike, heat treated beryllium copper	
Dielectric Material	Glass-filled diallyl phthalate, Type GDI-30 per MIL-M-19833		Mineral-filled diallyl phthalate per MIL-M-14E-MDG	

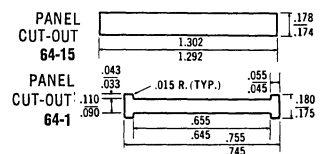
BOARD SIZE

Printed Board or Wiring thickness to mate with this connector.

64-15 .032 ± .004

64-17 .020 ± .003

64-18 .020 ± .003



FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

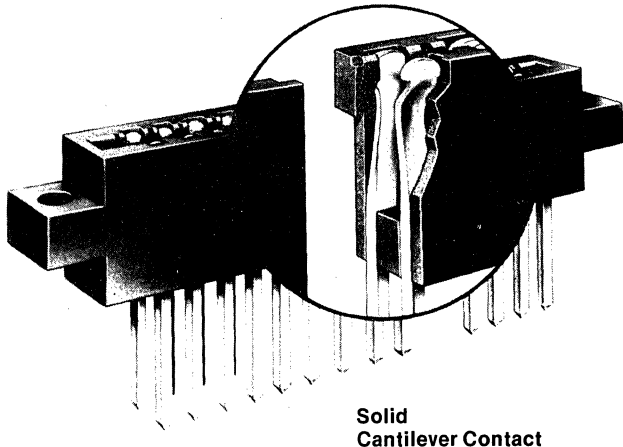
COMMERCIAL CARD EDGE CONNECTORS

BUNKER
RAMO

AMPHENOL

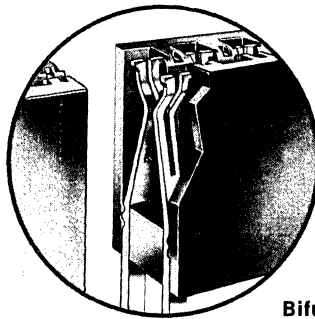
261 Series

Solid and Bifurcated Cantilever Contacts



Solid
Cantilever Contact

**Accurate Positioning for
Solderless-Wrap Termination
by hand or on Semi-Automatic
Wrapping Machines**



Bifurcated
Cantilever Contact

These edgeboard connectors provide single or dual readout of double-sided PC boards. Pre-loaded solid or bifurcated cantilever contacts are assembled in the dielectric with precise spacing to permit trouble-free semi-automatic solderless-wrap termination. Low contact resistance is assured by a minimum of .000030 (0,00076) gold at the contact area for the solid contact and .000050 (0,00127) gold for the bifurcated. The solid cantilever contact is designed to provide more than 500 insertions and withdrawal without loss of continuity or significant increase in resistance. Where many insertion and withdrawal cycles are required, the bifurcated contact is recommended.

DEPENDABLE

Both types of contacts will give long service—will not “set” even under repeated use. In addition, there is always a definite contact separation between rows with both solid and bifurcated types to prohibit shorting.

EASY, ECONOMICAL APPLICATION

Close dimensional tolerances minimize mounting and automatic terminating problems. Contacts exert sufficient wiping pressure to break through surface contaminating films and assure good electrical continuity, yet not so much as to damage board lands.

SPACE-SAVING

High contact density—with contacts spaced as close as .100 (2,54) on center—permits a large number of contacts in a small space. In addition, connector blocks can be stacked side-by-side in frames and the connectors back-wired or flow-soldered to a motherboard.

VERSATILE APPLICATION

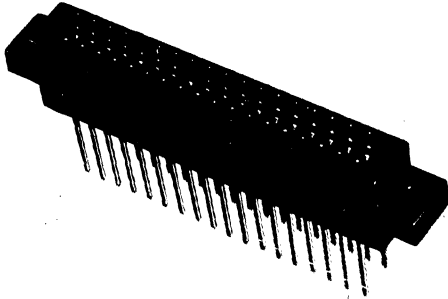
261 Series Connectors offer a wide variety of sizes, five different contact center spacings, choice of bifurcated or solid cantilever contacts, and large selection in number of positions to make them useful in almost any PC board application. 261 Series Connectors are also available in factory-produced plate assemblies, completely wired, if desired. Contact the factory for full information.

PRINTED CIRCUIT CONNECTORS



AMPHENOL

261 Series



AN EXTENSIVE LINE

- 15 to 43 positions providing up to 86 contacts
- Choice of .100 (2,54), .125 (3,18), .150 (3,81), .156 (3,96) or .200 (5,08) spacing
- Choice of tail sizes: .025 (0,64) sq., .035 (0,89) sq., or .035 (0,89) x .050 (1,27)
- Solid or bifurcated contacts.
- Accepts boards .054 (1,37) to .071 (1,80) thick

SPECIFICATIONS

Dielectric Material: Electrical grade phenolic, medium impact, black.

Contact Materials: .100 (2,54) and .125 (3,18) centers utilize phosphor-bronze base metal with tin tinalate plate and a Precious Metal Tip (PMT) on the contacting surface. .150 (3,81), .156 (3,96) and .200 (5,08) centers use phosphor-bronze base with copper flash and .000030 (0,00076) min. gold plate overall.

Tail Length: Sufficient for three wire wraps, plus space for bussing or PC board next to block (see dimension G). Tails may be cut as short as .100 (2,54) at the factory for wave-solder applications.

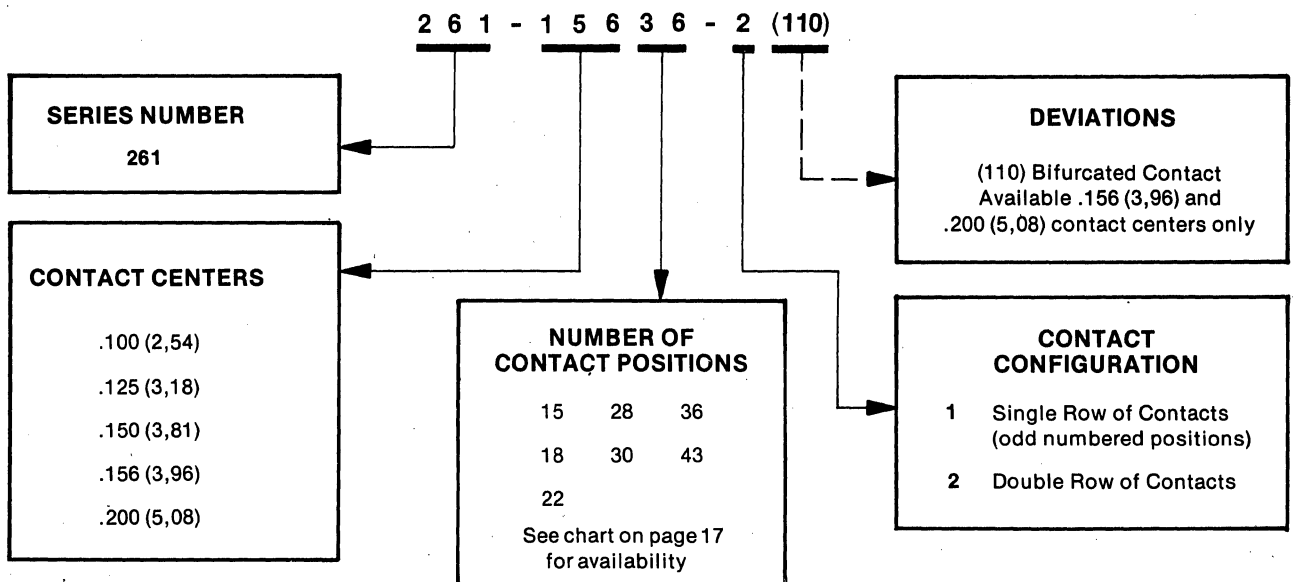
Polarization: Polarizing key (P/N 261-70005) may be used on all 261 Series. Fits between contacts on .150 (3,81), .156 (3,96) and .200 (5,08) centers; replaces one pair of contacts on .100 (2,54) and .125 (3,18) centers.

ELECTRICAL CHARACTERISTICS

Contact Spacing	Current Rating (Max.) Amps	Contact Resistance (Max.) Milliohms	Voltage Rating (Sea Level)	Voltage Breakdown (Min.)
.100 (2,54) on Center	5.0	6.0	300 V RMS	1800 V RMS
.125 (3,18) on Center	5.0	6.0	350 V RMS	2000 V RMS
.150 (3,81) on Center	6.0	5.5	400 V RMS	2500 V RMS
.156 (3,96) on Center	7.5	5.0	400 V RMS	2500 V RMS
.200 (5,08) on Center	7.5	4.5	500 V RMS	4500 V RMS

ORDERING INFORMATION

To order the specific 261 Series Connector you want, put together the part number as per the following example:



FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

PRINTED CIRCUIT CONNECTORS

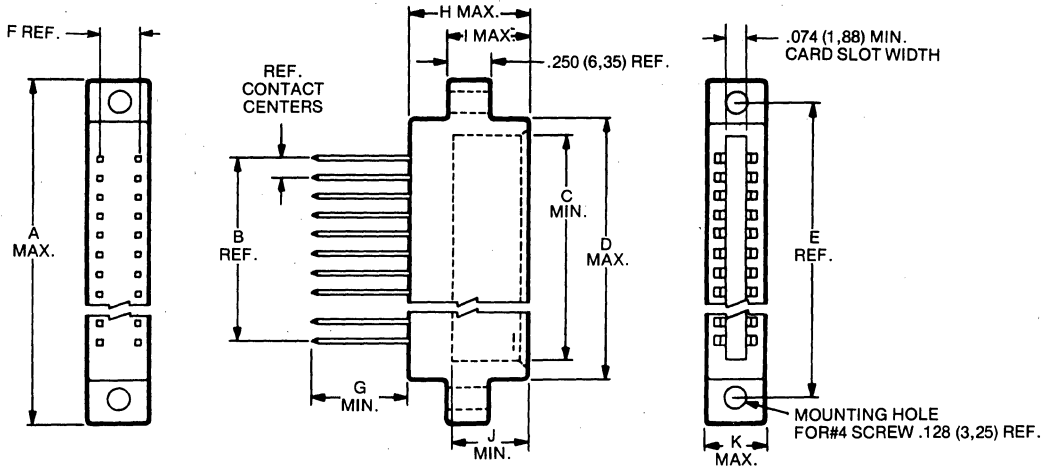
BUNKER
RAMO

AMPHENOL

261 Series

Solid and Bifurcated Cantilever Contacts

DIMENSIONS



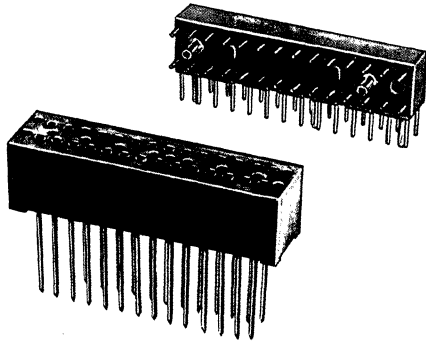
Ref. Contact Centers	Contact Description	No. Contact Positions	A Max.	B Ref.	C Min.	D Max.	E Ref.	F Ref.	G Min.	H Max.	I Max.	J Min.	K Max.
.100 (2,54)	Single Cantilever PMT .025 (0,64) square tail	15	2.479 (62,97)	1.400 (35,56)	1.714 (43,54)	1.884 (47,85)	2.156 (54,76)	.200 (5,08)	.615 (15,62)	.735 (18,67)	.494 (12,55)	.460 (11,68)	.348 (8,84)
		18	2.779 (70,59)	1.700 (43,18)	2.014 (51,16)	2.184 (55,47)	2.456 (62,38)						
		22	3.179 (80,75)	2.100 (53,34)	2.414 (61,32)	2.574 (65,38)	2.856 (72,54)						
		30	3.979 (101,07)	2.900 (73,66)	3.214 (81,64)	3.389 (86,08)	3.656 (92,86)						
		36	4.585 (116,46)	3.500 (88,90)	3.690 (93,73)	3.994 (101,45)	4.256 (108,10)						
		43	5.279 (134,09)	4.200 (106,68)	4.514 (114,66)	4.684 (118,97)	4.956 (125,88)						
.125 (3,18)	Single Cantilever PMT .025 (0,64) square tail	15	2.829 (71,86)	1.750 (44,45)	2.064 (52,43)	2.234 (56,74)	2.506 (63,65)	.246 (6,25)		.738 (18,75)	.496 (12,60)	.460 (11,68)	.370 (9,40)
		18	3.204 (81,38)	2.125 (53,98)	2.439 (61,95)	2.609 (66,27)	2.881 (73,18)						
		22	3.704 (94,08)	2.625 (66,68)	2.939 (74,65)	3.109 (78,97)	3.381 (85,88)						
		28	4.454 (113,13)	3.375 (85,72)	3.689 (93,70)	3.859 (98,02)	4.131 (104,93)						
		36	5.454 (138,53)	4.375 (111,13)	4.689 (119,10)	4.859 (123,42)	5.131 (130,33)						
		43	6.329 (160,76)	5.250 (133,35)	5.564 (141,33)	5.734 (145,64)	6.006 (152,55)						
.150 (3,81)	Single Cantilever Gold Plated .035 (0,89) square tail	18	3.629 (92,18)	2.550 (64,77)	2.866 (72,80)	3.038 (77,17)	3.306 (83,97)	.296 (7,52)	.750 (19,05)	.770 (19,56)	.512 (13,00)	.495 (12,57)	.448 (11,38)
		28	5.129 (130,28)	4.050 (102,87)	4.364 (110,85)	4.534 (115,16)	4.806 (122,07)						
		43	7.379 (187,43)	6.300 (160,02)	6.614 (168,00)	6.784 (172,31)	7.056 (179,22)						
.156 (3,96)	Single Cantilever Gold Plated or Bifurcated .035 (0,89) x .050 (1,27) tail	15	3.263 (82,88)	2.184 (55,47)	2.498 (63,45)	2.675 (67,94)	2.940 (74,68)	.196 (4,98)	.750 (19,05)	.770 (19,56)	.512 (13,00)	.495 (12,57)	.348 (8,84)
		18	3.731 (94,77)	2.652 (67,36)	2.966 (75,34)	3.136 (79,65)	3.408 (86,56)						
		22	4.355 (110,62)	3.276 (83,21)	3.590 (91,19)	3.760 (95,50)	4.032 (102,41)						
		28	5.291 (134,39)	4.212 (106,98)	4.526 (114,96)	4.696 (119,28)	4.968 (126,19)						
		36	6.549 (166,34)	5.460 (138,68)	5.774 (146,66)	5.944 (150,98)	6.216 (157,89)						
		43	7.631 (193,83)	6.552 (166,42)	6.866 (174,40)	7.036 (178,71)	7.308 (185,62)						
.200 (5,08)		22	5.279 (134,09)	4.200 (106,68)	4.516 (114,71)	4.684 (118,97)	4.956 (125,88)						
		36	8.079 (205,21)	7.000 (177,80)	7.314 (185,78)	7.484 (190,09)	7.756 (197,00)						

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

HIGH-DENSITY CONNECTORS

BUNKER
RAMO

AMPHENOL

127 Series
Box Connectors

SPECIFICATIONS

(Conform to MIL-C-55302)

Current Rating: 3 amperes, max.**Operating Voltage:** 500 VAC(RMS), max.**Dielectric****Withstanding Voltage:** Sea Level—1,500 VAC(RMS), 60 Hz
High Altitude—750 VAC(RMS), 60 Hz**Contact Resistance:** Less than .010 ohm average for all contact pairs, and less than .020 ohm any individual contact pair.PIN AND SOCKET CONNECTORS
WITH MIL-C-55302 PERFORMANCE

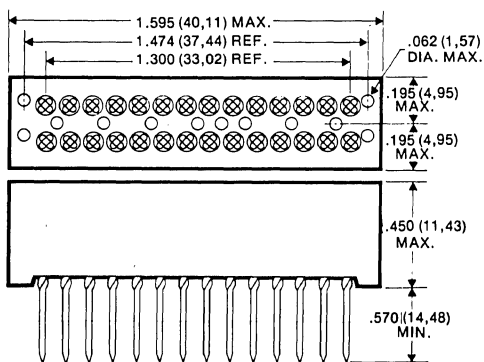
These compact, sturdy plugs and receptacles are designed for numerous printed circuit applications that require the space-saving advantages of multiple-row direct entry connectors. Though small in size, they provide 28 contact positions to meet the requirements of a wide range of communications, computer, and airborne applications. They also meet or exceed the electrical and physical requirements of MIL-C-55302.

127 Series plugs have molded-in pin contacts with dip solder terminations and two rivets for secure and positive attachment to the printed circuit board. Contacts are spaced at .100 (2,54) intervals on .150 (3,81) row spacing. Three molded-in guide pins and provision for up to five polarizing pins assure correct mating every time.

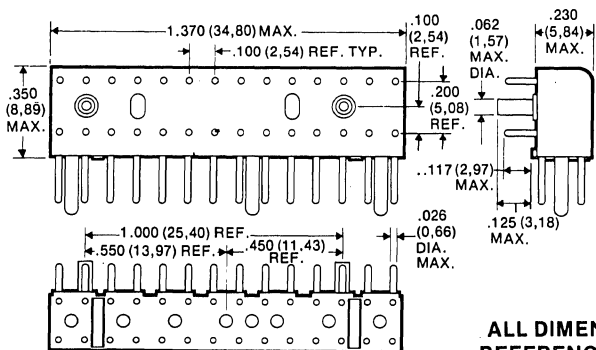
127 Series receptacles have replaceable socket contacts with solderless wrap or flow solder terminations. The socket contacts provide excellent performance even under conditions of severe physical stress and vibration.

Connector blocks are formed of glass-fiber-filled diallyl phthalate. Contact numbers and guide pin letters are molded prominently on both connectors.

DIMENSIONS



127 SERIES RECEPTACLE

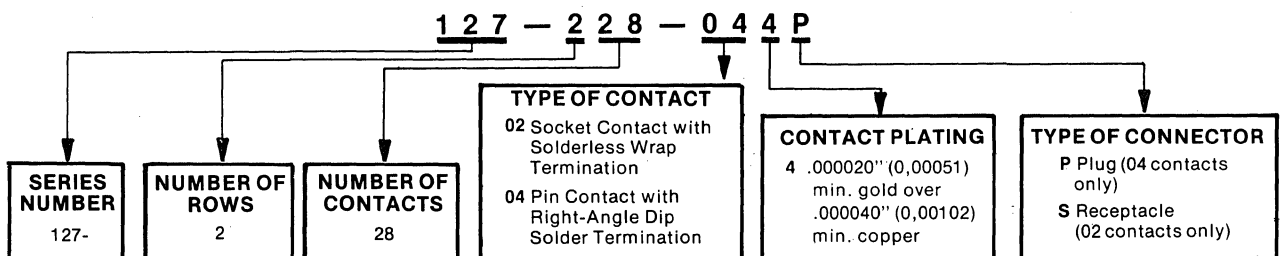


127 SERIES PLUG

ALL DIMENSIONS
REFERENCE ONLY

ORDERING INFORMATION

To order the 127 Series connector you want, put together the part number as per the following example:



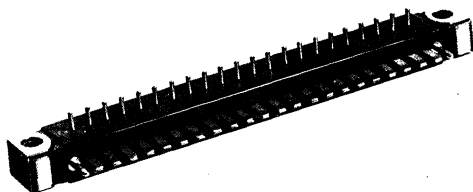
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

COMMERCIAL AND INDUSTRIAL CONNECTORS

BUNKER
RAMO

AMPHENOL

133/143 Series



Here are sturdy, reliable, highly-efficient connectors that help prolong the life of printed circuit boards. 133 Series Connectors are essentially male plug adapters for PC boards. They are especially useful in situations involving other than normal 1/16 (1,57 mm) thick PC boards. 143 Series Connectors are receptacles that accept either .054 to .070 (1,37 mm to 1,78 mm) PC boards or 133 Series Plugs.

133/143 Series Industrial Connectors are molded from mineral-filled diallyl phthalate. 133/143 Series Commercial Connectors (117 deviation) are molded from mineral-filled electrical-grade black phenolic.

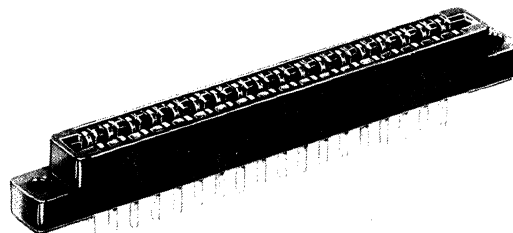
These connectors are manufactured to Amphenol rather than military specifications. They can, therefore, be readily modified to your special requirements. Many combinations of dielectric materials, number of contacts, tail styles, platings and polarization methods are available.

LONG-LIFE, TUNING-FORK-TYPE CONTACTS

The tuning-fork-type contact used for 143 Series Connectors offers an exceptional combination of reliability, durability, versatility and performance. The extra-long spring base of the contact and resiliance of the contact material provide a wide flexing range with sufficient elastic reserve to prevent the contacts from being "set".

SPECIFICATIONS

Current Rating:	5 amp
Operating Voltage Rating:	600 VAC (RMS) at sea level
Dielectric Resistance:	5000 megohms min.
Contact Resistance (Voltage Drop):	25 millivolts at rated current
Dielectric Material:	Industrial type — mineral-filled diallyl phthalate per MIL-M-14 Type MDG, color blue Commercial type (117 deviation) — Mineral-filled phenolic, electrical grade, color black



Contacts have excellent protection against corrosion through deposition of two dense metals over all contact surfaces—a base plating of copper followed by an over-plate of gold.



EASY INSERTION AND WITHDRAWAL

The rounded 143 Series contact surface provides easy, smooth, low-force insertions and withdrawals. Controlled lateral float of the contacts permits the accommodation of warped boards while maintaining positive continuity of all circuits.

UNUSUALLY LOW CONTACT RESISTANCE

The contact spring design assures uniform distribution of contact forces and firm contact action, even on PC boards at the extremes of thickness tolerance. The wiping action of the contact cleans the mating surface to provide more positive contact—and voltage losses are held to a minimum. For example, at 5 amperes, the average voltage drop is less than 25 millivolts.

Contact Material:	133 - Brass 143 - Phosphor bronze
Contact Plating:	Standard — .000020 (0,000508) min. gold over copper (101 deviation) — .00010 (0,00254) min. gold over copper Gold Plating is per MIL-G-45204 (Type I on 143 Series, Type II on 133 Series) Copper Plating is per MIL-C-14550, Class 3 (102 deviation) — .000030 (0,000762) min. gold over nickel
Guide Pin Material:	Cadmium-plated brass
End-Cap Material:	Stainless Steel (Passivated)

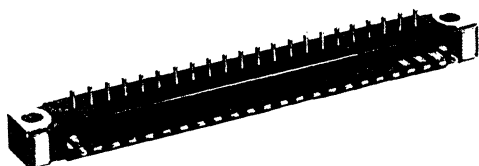
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

PLUGS

BUNKER
RAMO

AMPHENOL

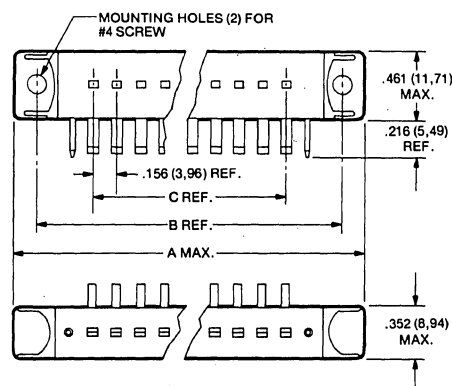
133 Series



Amphenol 133 Series Plugs combine excellent electrical performance with mechanical sturdiness. Repeated matings, even at an angle, will not cause deformation of the rugged contacts. Amphenol's process of controlled-transfer molding assures uniformity and dimensional stability. The assembled body is rigidly held together by the rolled-over ends of the guide pins. End caps prevent damage to mounting holes when mounting screws are tightened. Contact identification is prominently molded into both front and rear body surfaces.

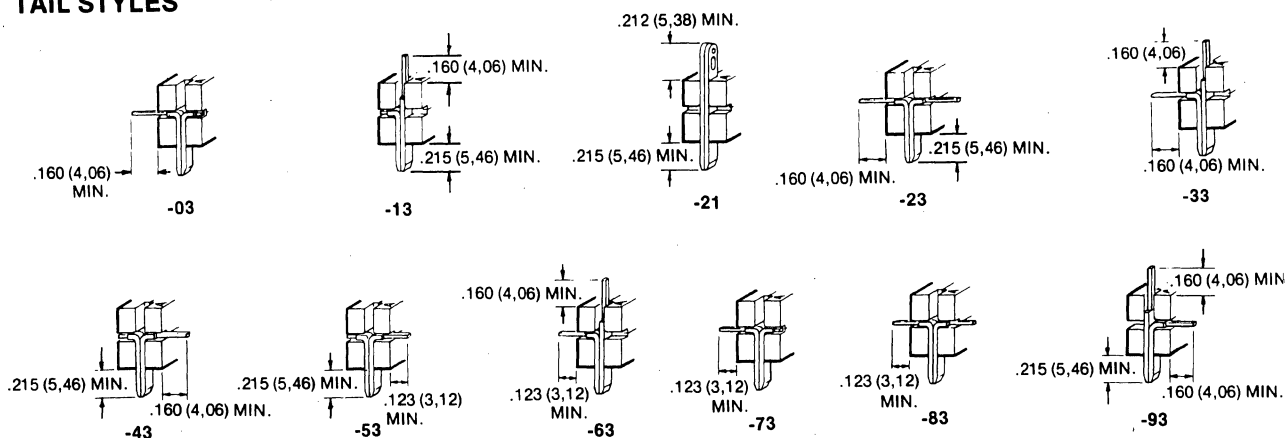
DIMENSIONS

No. of Contact Positions	A Max.	B Ref.	C Ref.
6	1.852 (47,04)	1.531 (38,89)	0.781 (19,84)
10	2.477 (62,92)	2.156 (54,76)	1.406 (35,91)
12	2.790 (70,87)	2.468 (62,69)	1.718 (43,64)
15	3.257 (82,73)	2.937 (74,60)	2.187 (55,55)
18	3.727 (94,67)	3.406 (86,51)	2.656 (67,46)
22	4.352 (110,54)	4.031 (102,39)	3.281 (83,38)



ALL DIMENSIONS REFERENCE ONLY

TAIL STYLES



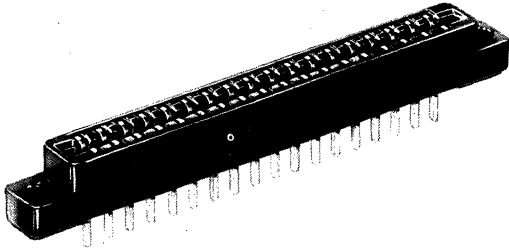
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RECEPTACLES

BUNKER
RAMO

AMPHENOL

143 Series



Even at extremes of temperature and vibration, 143 Series Connectors keep voltage losses at an absolute minimum through the strong, firm action of their tuning-fork-type contacts. With their connector-body

design and contact "float", 143 Series Connectors prevent board rocking. In addition, the design assures that warped boards will not affect performance.

Extra-strong contact faces slide readily over the mating surfaces of the PC board and conductivity remains virtually unaffected for at least 500 cycles of insertion and withdrawal. Where more cycling is anticipated, a 133 Series Plug can be attached to the board and mated with a 143 Series Connector.

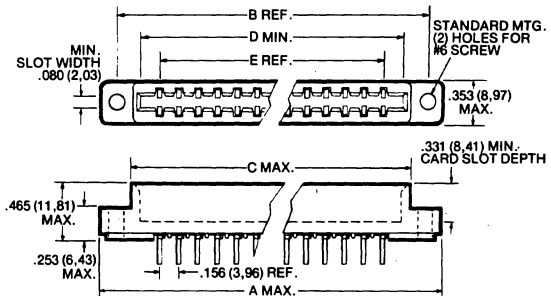
The molded connector body in either mineral-filled diallyl phthalate or phenolic (117 deviation) is dimensionally stable. It is designed for flush mounting and can be mounted either on the front or rear of the panel. Contact identification letters are molded in both the top face and terminal surface. See page 27 for ordering information.

DIMENSIONS

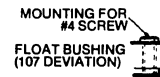
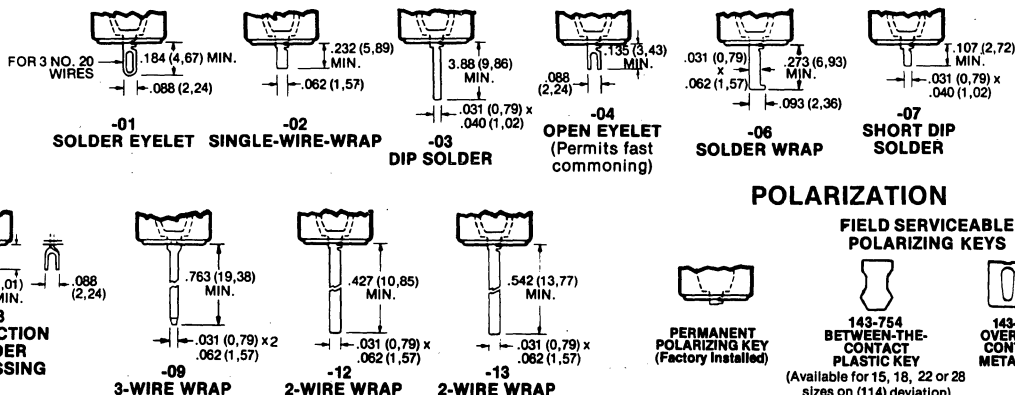
No. of Contact Positions	A Max.	B Ref.	C Max.	D Min.	E Ref.
6	1.784 (45,31)	1.531 (38,89)	1.242 (31,55)	1.093 (27,76)	.781 (19,84)
10	2.411 (61,24)	2.156 (54,76)	1.868 (47,45)	1.719 (43,66)	1.406 (35,71)
12	2.724 (69,19)	2.468 (62,69)	2.181 (55,40)	2.031 (51,59)	1.718 (43,64)
15	3.194 (81,13)	2.937 (74,60)	2.650 (67,31)	2.500 (63,50)	2.187 (55,55)
18	3.664 (93,07)	3.406 (86,51)	3.120 (79,25)	2.968 (75,36)	2.656 (67,46)
22	4.291 (108,99)	4.031 (102,39)	3.747 (95,17)	3.593 (91,26)	3.281 (83,34)
*28	5.227 (132,77)	4.968 (126,19)	4.683 (118,95)	4.529 (115,04)	4.219 (107,16)
**36	6.475 (164,46)	6.210 (157,73)	5.928 (150,57)	5.766 (146,46)	5.490 (139,45)

*Also available in this size on .125 (3,18) centers.

** .36 card slot contains two .056 (1,42) barriers: one between contacts N&P, and one between contacts b&c.



OTHER MOUNTING PROVISIONS

TAIL
STYLES

POLARIZATION

FIELD SERVICEABLE
POLARIZING KEYS

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

PRINTED CIRCUIT CONNECTORS

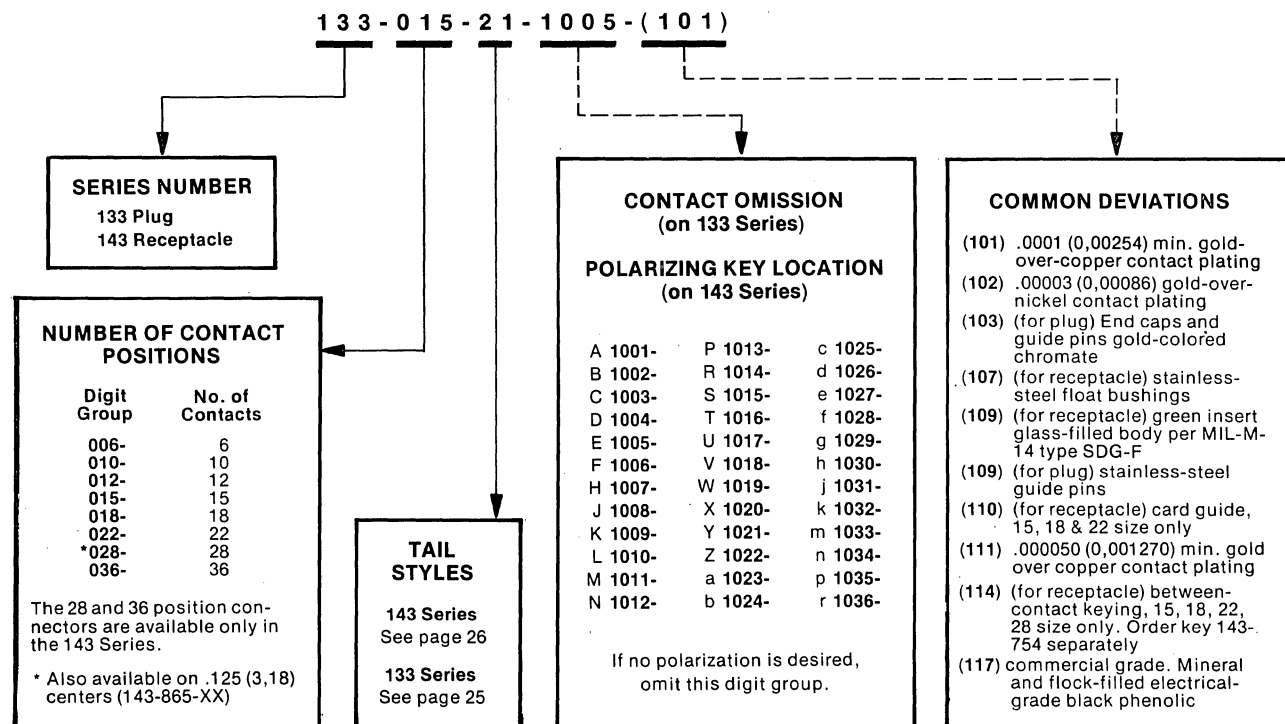
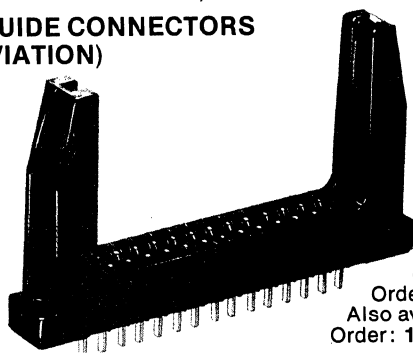
BUNKER
RAMO

AMPHENOL

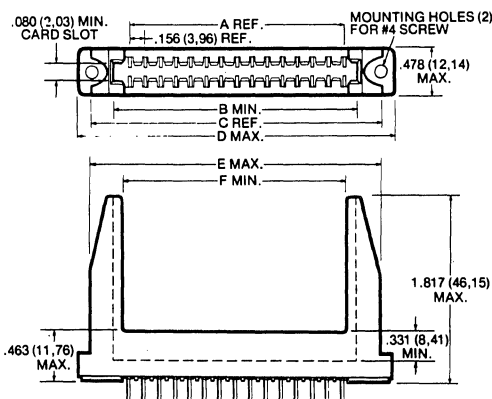
133/143 Series

ORDERING INFORMATION

To get the specific connector you want, put together the part number as per the following example.

CARD-GUIDE CONNECTORS
(110 DEVIATION)

Blue mineral-filled diallyl phthalate
Order: 143-0XX-XX (110)
Also available black phenolic
Order: 143-0XX-XX (110)(117)



Card guides extend 1-3/8" (34,92 mm) above main body of connector. These integral card guides provide positive alignment in blind installations and prevent board rocking. Has .100 (2,54 mm) more block width than standard 143 line. Available in 15, 18 and 22 position sizes with slots between contacts for plastic keys (P/N 143-754) to permit polarization without loss of contacts.

DIMENSIONS

Positions	A Ref.	B Min.	C Ref.	D Max.	E Max.	F Min.
15	2.184 (55,47)	2.500 (63,50)	2.937 (74,60)	3.201 (81,31)	2.645 (67,18)	2.250 (57,15)
18	2.652 (67,36)	2.968 (75,39)	3.406 (87,51)	3.664 (93,07)	3.114 (79,10)	2.728 (69,29)
22	3.276 (83,21)	3.593 (91,26)	4.031 (102,39)	4.291 (108,99)	3.739 (94,97)	3.350 (85,09)

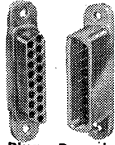
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

MINIATURE CONNECTORS

BUNKER
RAMO

AMPHENOL

223 Series Tiny Tim® Connectors

5 TO 33 CONTACTS
POLY CARBONATE OR NYLON CONSTRUCTIONPlug Receptacle
(Relia-Tac Contacts
Illustrated)

Exceptional interconnections for circuit modules, either potted-in or surface mounted, and can also be used as micro-miniature rack-and-panel, cable-to-cable, and cable-to-panel connectors.

The positive mating is the result of the snap latch engagement locking device molded into the connector body. Contact identification numbers are also molded in.

Trapezoidal mating faces are used for polarization. Guide pins provide keying. Contact spacing is .100" on centers on each row.

SPECIFICATIONS

Temperature Range:

-55°C to +125°C

Current Rating:

5 amps

Voltage Rating:

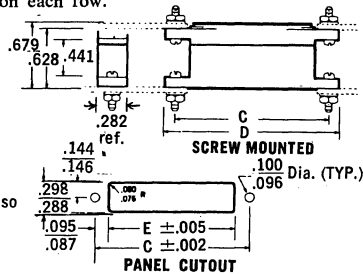
1500 VAC (RMS) at sea level.

375 VAC (RMS) at 70,000 ft.

Dielectric:

Polycarbonate resin. (Nylon also available).

Contact factor for performance specifications



No. of Contacts	E Length of Cutout	C Mounting Centers	D ref. Overall Length
5	.410	.593	.843
9	.610	.793	1.043
17	1.015	1.193	1.443
25	1.410	1.593	1.843
33	1.810	1.993	2.243

Strain Relief

Thermoplastic cable clamp strain relief housings for use with above connectors:

Contact Size	Part No.	Contact Size	Part No.
9	223-714-09	25	223-714-25
17	223-714-17	33	223-714-33

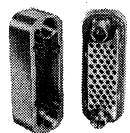
Ordering Information



NOTE: Order Contacts Separately

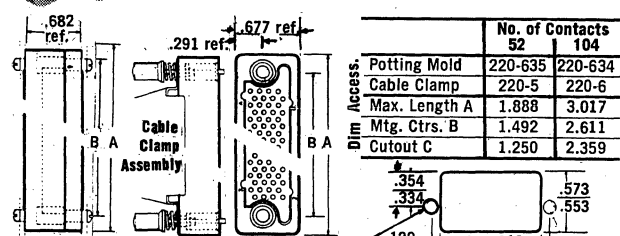
Use Relia-Tac pin contacts for receptacles, socket contacts for plugs.

220 Series Micro-Rac®

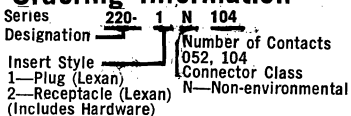
RACK AND PANEL APPLICATIONS: 52 AND 104 CONTACTS
FLOAT MOUNTED: LOW COST HIGH CONTACT DENSITY

Mono-block construction. Contact identification numbers are molded in. Polarization is achieved by a trapezoidal mating area and keying with the use of guide pins or keying by molded-in slot-and-key arrangements.

Cable clamp assemblies are available for both sizes. Special size connectors can be supplied if needed. Environmental resistance can be added.



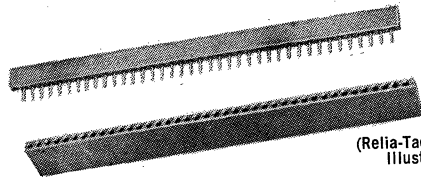
Ordering Information



NOTE: Order Contacts Separately
Use Relia-Tac pin contacts for receptacles, socket contacts for plugs.

221 Series Strip Connectors

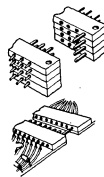
ADAPTABLE TO ANY SHAPE: STACK, CUT, CUT AND STACK, USE AS IS...HIGH CONTACT DENSITY,

(Relia-Tac Contacts
Illustrated)

AMPHENOL Strip Connectors are highly reliable, low cost micro-miniatures with great application versatility. They are furnished in 4" and 6" lengths, but you can cut and stack them to whatever configuration you need to satisfy your various application requirements.

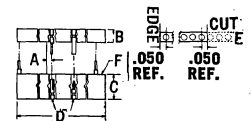
Strip connectors use Poke-Home contacts and perform superbly. Where keying is desired, guide pins are inserted in two or more plug strip contact holes.

Because Strip connectors are injection molded, special configurations can be produced quickly and inexpensively.



Strips can be used in stacked arrangement. Should be stacked parallel only.

PC board application using strip connectors.

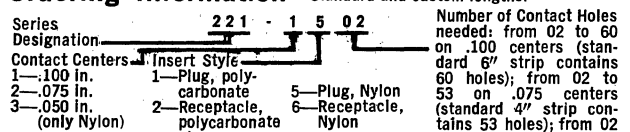


CUSTOM LENGTH
Number of holes multiplied by contact center dimension equals approximate length of strip.

Description	A Contact Centers	B	C	D	E	F Contact Positions
6" Plug Strip	.100	—	.456	6.00	.105	60
6" Receptacle Strip	.100	.230	—	6.00	.105	60
4" Plug Strip	.075	—	.456	4.00	.105	53
4" Receptacle Strip	.075	.230	—	4.00	.105	53
4" Plug Strip	.050	—	.281	4.00	.075	80
4" Receptacle Strip	.050	.218	—	4.00	.075	80

Ordering Information

Standard and custom lengths.



Note: Order Contacts Separately

Use Relia-Tac pin contacts for receptacles; socket contacts for plugs.

Note: Must use 2 digits.

Strain Relief Strips Protect Wire

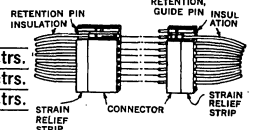
AMPHENOL has a solution to the problem of excessive flexing that breaks wire strands in cable-terminated applications. Strain relief strips are available to encase and protect the wire in the crimp area at the rear of the strips. Molded in black Nylon 6/6 material, the strips can be ordered to match any Amphenol strip connector. Held in place by retention pins, which can also be used as a guide pin.

Ordering Information

221-9160—for use with strip connectors on .100 ctrs.

221-9253—for use with strip connectors on .075 ctrs.

221-9380—for use with strip connectors on .050 ctrs.

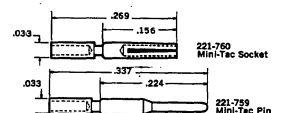


Mini-Tac Contacts

(Sub-miniature Relia-Tac contacts for .050" center mini-strip connectors only).

Current Rating: 3 Amps.

Wire Size: 26 to 32 ga. stranded wire.



Poke-Home® Guide Pins

Poke-Home guide pins when seated in plug inserts serve functions of polarizing, keying or connector alignment. They can be used in conjunction with Relia-Tac contacts. Contact factory for information.

CIRCULAR INDUSTRIAL CONNECTORS

BUNKER
RAMO

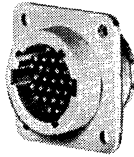
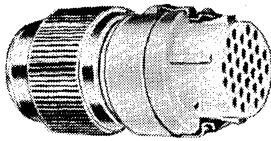
AMPHENOL

222 Series Mighty-Mite® Connectors

7 to 61 Contacts — .085 Contact Centers
CABLE APPLICATIONS — 222-11N31

222-22N31

222-519



Superior Performance at Low Cost

AMPHENOL Mighty-Mite connectors are low cost, highly reliable micro-miniature connectors designed to serve an exceptionally wide range of cable-to-cable and cable-to-chassis applications.

Mighty-Mite connectors are available as straight plugs, single hole mounting, square flange, and cable receptacles. Standard connectors are molded of one-piece, rugged polycarbonate.

ARRANGEMENTS

INSERTS AVAILABLE (Showing front face of plug insert)

Shell Size	10	12	14	18
Size 22 contacts rated 5 amperes for wire sizes 22-24-26-28 solid and 24-26-28 stranded				
	7 contacts 10-7	19 contacts 12-19	31 contacts 14-31	61 contacts 18-61

Ordering Information

Series Designation 222

Method of Mounting

1—Flangeless

2—4 hole mount receptacle

3—Single hole mount Receptacle (includes retaining ring)

NOTE: Order Contacts Separately.

Use Relia-Tac pin contacts for receptacles, socket contacts for plugs.

222- 1 1 N 61

Number of Contacts 07, 19, 31, 61

Connector Class: N—Non-environmental

Insert Style

1—Plug (Lexan)

2—Receptacle (Lexan)

220 Series Contacts

FOR 220, 221, 222, 223 SERIES CONNECTOR

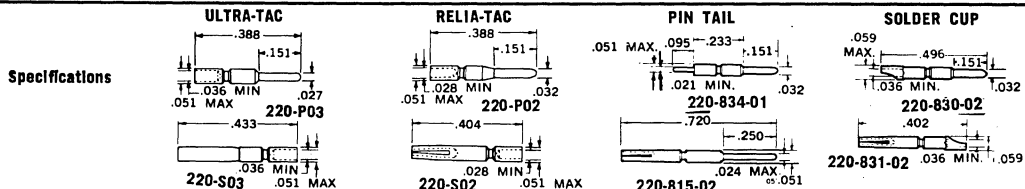
Ultra-Tac Contacts

Top quality micro-miniature contacts. The socket contacts are hooded to resist test prod damage.

Relia-Tac Contacts

Durable, customer-proven contacts.

Part Number	Description
220-P02 (Pin)	Standard, See specifications below
220-S02 (Socket)	
220-844-02 (Pin)	Same as above, except heavy gold plating and inspection hole in crimp area
220-845-02 (Socket)	



Current (Amps) Rating	5	5	5	5
Contact Resistance* (ohms)	.0060	.0060	.0050 to .0060	.0060
Wire Range (Ga.) (Solid & Stranded)	22, 24, 26	24, 26, 28	N/A	24, 26, 28
Contact Finish	Gold-over-Copper on Copper Alloy Bodies	Gold-over-Copper on Copper Alloy Bodies	Gold-over-Copper on Copper Alloy Bodies	Gold-over-Copper on Copper Alloy Bodies

* Constant to a minimum of 100 cycles of insertion and withdrawal.

Ordering Information

Minimum order quantity is 100 pieces.

Contacts can be supplied on reels for use in semi-automatic crimp machines. Contact factory.

NOTE: All socket contacts are completely shrouded within the plug inserts for optimum protection against damage. Pin contacts are normally exposed when assembled into receptacle inserts.

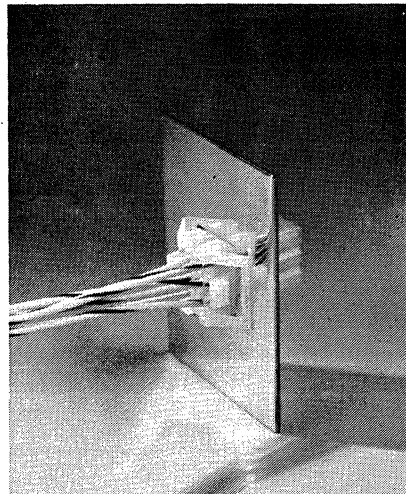
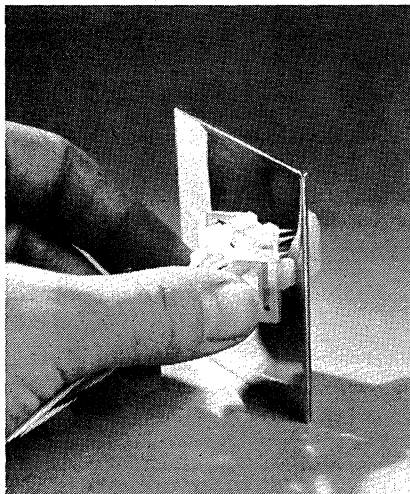
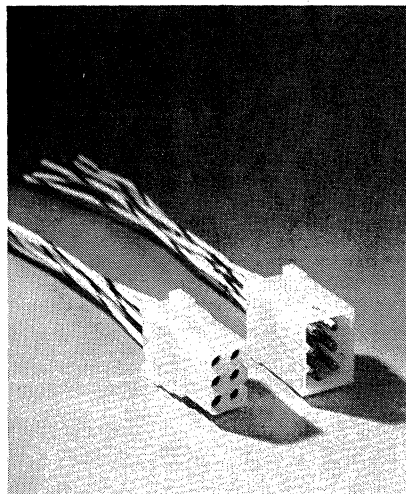
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

COMMERCIAL ELECTRONIC CONNECTORS

BUNKER
RAMO

AMPHENOL

32 Series Connectors



- Flame Retardant Material
- Low Cost
- Rugged and Reliable
- 3-6-9-12-15 contact sizes
- Intermateable and interchangeable with competitive connectors
- Panel mount and cable connector styles

Amphenol's Commercial Electronics Connector provides reliable interconnections with real cost saving potential. Low initial procurement cost; automatic crimp contact termination; fast, easy assembly into panels; and quick, simple removal and replacement for field servicing, if necessary. They are ideal for appliances, home entertainment equipment, coin operated machines, business machines... anywhere.

The rugged connector housings are single-piece molded nylon meeting UL Class SE-O flammability requirements. Also available in regular SE-2 nylon for greater economy. They are polarized to prevent mismatching. Contact wire pockets are recessed to prevent exposed wires and possible electrical failure or shock hazard. Available in 3, 6, 9, 12, and 15 contact sizes. Fully intermateable and intermountable with many competitive types.

Panel mounted connectors have a unique locking feature that provides simple, secure mounting in panels from .032" to .093"

ORDERING INFORMATION

FLAME RETARDANT NYLON. Contact Factory for Regular Nylon Material.

Receptacles

Number of Contacts	With Panel Mounting Wings	Cable Connector
3	32-03S22-11	32-03S22-21
6	32-06S22-11	32-06S22-21
9	32-09S22-11	32-09S22-21
12	32-12S22-11	32-12S22-21
15	32-15S22-11	32-15S22-21

Plugs

Number of Contacts	With Panel Mounting Wings	Cable Connector
3	32-03P22-11	32-03P22-21
6	32-06P22-11	32-06P22-21
9	32-09P22-11	32-09P22-21
12	32-12P22-11	32-12P22-21
15	32-15P22-11	32-15P22-21

PIN AND SOCKET TERMINALS

(Tin plated. Gold plating available on request.)

Wire Size	Type	Reel	Bag
14-16	Pin	32-1416P-05000RT	32-1416P-00100BT
14-16	Socket	32-1416S-05000RT	32-1416S-00100BT
16-20	Pin	32-1620P-06000RT	32-1620P-00100BT
16-20	Socket	32-1620S-06000RT	32-1620S-00100BT
22-30	Pin	32-2230P-10000RT	32-2230P-00100BT
22-30	Socket	32-2230S-10000RT	32-2230S-00100BT

thick. A simple push sets the connector automatically, no tools, no struggle. The locking wings hold it firmly in place. If necessary to remove the connector, simply press the locking tab from the rear and the connector slips out. The sturdy wings do not break off or come loose, even after repeated mounting cycles.

To conserve space and improve appearance, cable to cable connectors do not have panel mounting wings. Fully mated connectors lock together to prevent loosening under vibration.

32 Series contacts are furnished on reels for use with high volume semi-automatic production crimping presses, or individually in small quantities for manual wire termination. The contacts can be crimped to 14 through 30 gauge insulated wire. There are three wire barrel sizes to assure the correct combination of wire and contact for the strongest and most reliable crimp termination. Contacts are easily inserted into the housing by hand and locked in place. No tool is required. The contacts can be removed using an inexpensive extraction tool.

The standard-size .093" diameter contacts are completely interchangeable with other contacts. Pin and socket contacts can be assembled in either the plug or the receptacle for quick "hot side" changes or for additional polarization. Normally the pin contacts are used in the plug and socket contacts are used in the mating receptacle.

COMMERCIAL ELECTRONIC CONNECTORS SPECIFICATIONS

Temperature Range: -55°C to 105°C

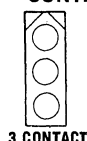
Voltage Rating: 250 Volts AC

Current Rating: 14-16 ga. wire, 12 amps; 16-20 ga. wire, 9 amps; 22-30 ga. wire 7½ amps

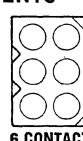
Contact Resistance: 3 milliohms max.

See p. 2-559 for crimping equipment.

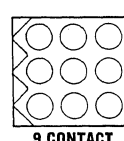
CONTACT ARRANGEMENTS



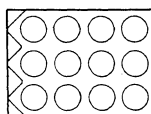
3 CONTACT



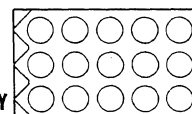
6 CONTACT



9 CONTACT



12 CONTACT



15 CONTACT

FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

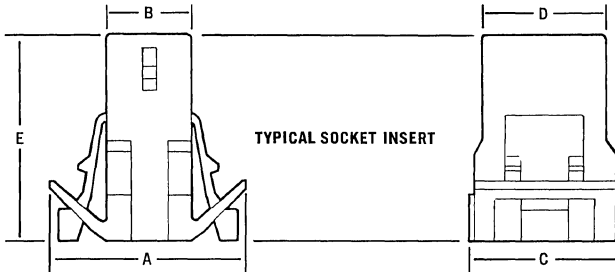
COMMERCIAL ELECTRONIC CONNECTORS

BUNKER
RAMO

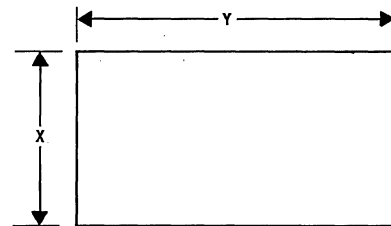
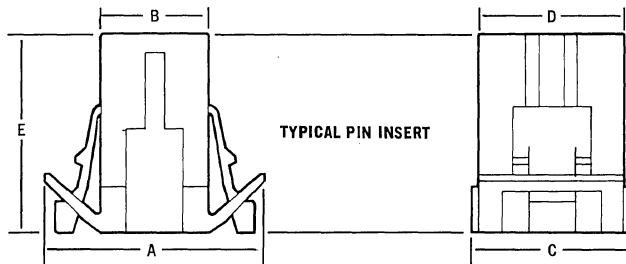
AMPHENOL

32 Series Connectors (Cont'd)

DIMENSIONS

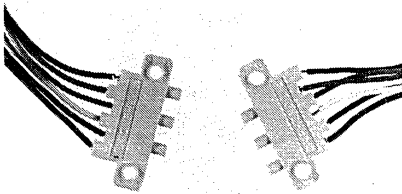


No. of Pins	Dimension					Panel Cutout	
	A	B	C	D	E	X	Y
SOCKET	3	1.225	.676	.420	.234	1.060	.312
	6	.998	.434	.772	.632	1.060	.600
	9	1.220	.666	.772	.621	1.060	.828
	12	1.424	.870	.772	.633	1.060	1.050
	15	1.621	1.067	.772	.632	1.060	1.240
PIN	3	1.327	.773	.420	.338	1.035	.375
	6	1.090	.536	.802	.734	1.035	.695
	9	1.329	.775	.772	.713	1.035	.937
	12	1.529	.975	.819	.737	1.035	1.155
	15	1.723	1.169	.822	.737	1.035	1.343



PANEL CUT-OUT

223 Series Hermaphroditic Connector



- Miniature, Modular Connector serves as plug or receptacle
- Six contacts—3 male—3 female in each module
- Can be stacked in multiples
- Saves assembly time
- Only 3 parts to stock

Amphenol's new 223 Series Connector features a unique design which serves as either plug or receptacle. Each module houses 3 male and 3 female contacts. Contacts are standard #24 crimp Poke-Home® type. Individual six contact modules can be snapped together to form larger assemblies, if desired.

Only 3 parts need be stocked to perform a multitude of connecting tasks. Assembly is simple, fast and foolproof.

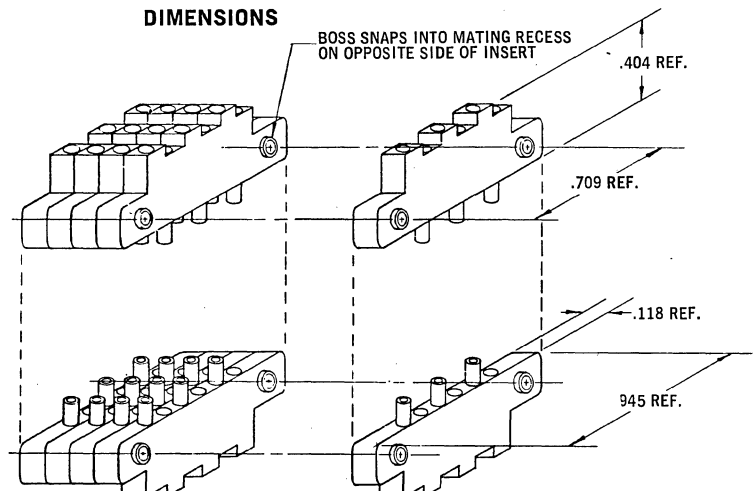
Dielectric is glass-filled thermoplastic. Contacts are copper alloy with gold plating.

ORDERING INFORMATION

Description	Part Number
Connector Housing Only	223-716
Male Contact	220-P03
Female Contact	223-715-02
Packaged Assembly: Includes 1 connector, 3 male & 3 female contacts	223-2706

FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

DIMENSIONS



MIN RAC CONNECTORS

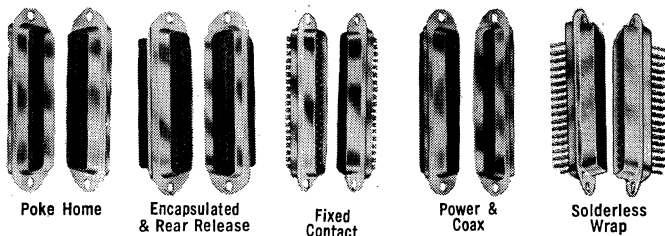
BUNKER
RAMO

AMPHENOL

17 Series Min Rac® Connectors

- Sub Miniature Rack and Panel
- Choice of Fixed or Removable Contacts.
- Eight Styles — Unlimited Variety
- Intermates with all "D" Shaped Sub Miniatures.

A complete line of versatile connectors offering 9 to 50 contacts in a choice of arrangements and dielectrics. Cable housings are available for cable-to-panel or cable-to-cable applications, and several locking devices are offered. These lightweight, miniature con-



Poke Home

Encapsulated
& Rear ReleaseFixed
ContactPower
& CoaxSolderless
Wrap

nectors are ideal for computers, telecommunications, instrumentation and avionics systems not requiring environmental capability. Meets EIA Standard RS-232C for data communications input output connectors.

Contact Arrangements

FOR ORIGINAL POKE HOME, REAR RELEASE, FIXED CONTACT, SOLDERLESS WRAP AND ENCAPSULATED CONTACT



9 CONTACTS

15 CONTACTS

25 CONTACTS



37 CONTACTS

50 CONTACTS

FOR POWER AND COAX COMBINATION



3 COAX CONTACTS

1 COAX CONTACT
20 NO. 20 CONTACTS2 COAX CONTACTS
15 NO. 20 CONTACTS5 COAX CONTACTS
12 NO. 20 CONTACTS2 COAX CONTACTS
25 NO. 20 CONTACTS7 COAX CONTACTS
17 NO. 20 CONTACTS

Additional insert configurations are available.
Refer to factory for information.

Specifications

ORIGINAL POKE HOME & ENCAPSULATED CONTACT

Temperature Range: -55°C to $+125^{\circ}\text{C}$.

Current Rating: 7.5 Amps.

Voltage Rating: 500 VAC (RMS) at sea level. 150 VAC (RMS) at 90,000 ft.

Dielectric: Zytel 101 nylon per Mil-P-20693.

Shells: Cadmium-plated cold-rolled steel with clear chromate finish.

Contacts: Crimp Type — .00002" min. gold over copper plated silnic bronze.

Solder type — .00002" min. gold over copper plated brass.

Wire Size: Solder: Up to #20; crimp #20, #22 and #24 AWG.

FIXED CONTACTS AND POWER & COAX.

Temperature Range: -55°C to $+125^{\circ}\text{C}$.

Current Rating: 7.5 Amps.

Voltage Rating: 500 VAC (RMS) at sea level. 150 VAC (RMS) at 70,000 ft.

Dielectric: Glass-filled nylon.

Shells: Same as above.

Contacts: Power; Screw machine type — .00002" min. gold over copper plated brass. Punch press type — Stamped from phosphor bronze and plated .00002" gold over copper flash. Wire wrap type — .00002" min. gold over copper plated brass. .500" Lg. x .025" Sq. Coax; #1 Shielded contacts are gold plated.

Wire Size: Up to #20 wire.

Rear Removable Contacts

Temperature Range: -55°C to $+125^{\circ}\text{C}$.

Current Rating: 7.5 amps.

Voltage Rating: 500 VAC at sea level. 125 VAC at 70,000 ft.

Dielectric: Glass-filled nylon.

Shells: Same as above.

Contact Type: Crimp Poke-Home, rear insertion, rear release.

Contact Material: Machined contacts — silnic bronze. Strip formed contacts — beryllium copper.

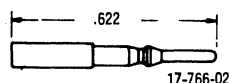
Contact Finish: .000030" gold over copper plating

Contact Wire Sizes: Machined contacts — 20 to 24 AWG. Strip formed contacts — 22 to 26 AWG.

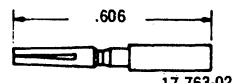
Contacts

For Original Poke Home Line Only

Standard Crimp Type Contacts

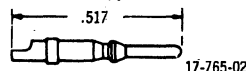


17-766-02

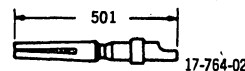


17-763-02

Standard Solder Type Contacts

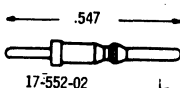


17-765-02

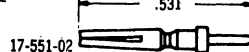


17-764-02

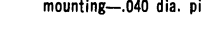
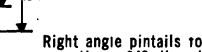
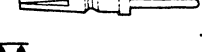
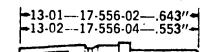
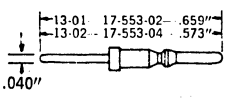
Pintail Contacts for P.C. Mounting



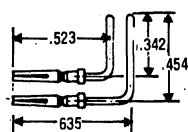
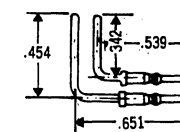
17-552-02



17-551-02

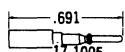


— .023 Dia. of Pintail

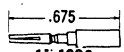


Right angle pintails for P.C. mounting—.040 dia. pintails

Optional Contacts



17-1005

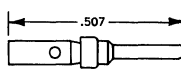


17-1006

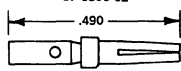
Over-size crimp barrel contacts for 16 ga. wire

For Rear Release Contact Line Only

MACHINED

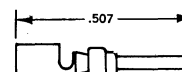


17-1390-02

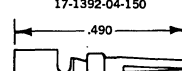


17-1389-02

STRIP-FORMED



17-1392-04-150

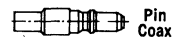


17-1391-04-150

Machined — Included when connectors ordered by deviation —17. Order bulk quantities separately for use with connector bodies ordered by deviation —18.

Stamped and Formed — Available only on reels of 15,000 contacts for use with connector bodies ordered by deviation —18.

For Power & Coax Combination Only



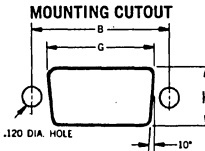
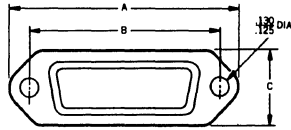
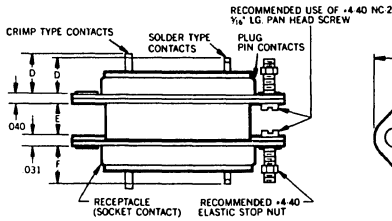
Pin	Cables	Socket
17-1112-01	For RG195/U and RG195A/U cable	17-1113-01
17-1132-01	For RG178B/U, RG196/U and RG196A/U cable	17-1130-01
17-1264-01	For RG58/U, RG141/U, RG141A/U, and RG303/U	17-1265-01

MIN RAC CONNECTORS

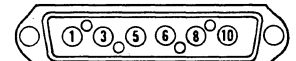
BUNKER
RAMO

AMPHENOL

17 Series Min Rac® Connectors



HIGH VOLTAGE CONNECTOR



ORDERING INFORMATION

17-800 Plug

17-801 Receptacle

DIMENSIONS

Con- nector Size	All Lines			D (1)	D (2)	D (3)	D Encapsu- lated Contact Line Only	D Rear Release	D Power & Coax. Comb. Only	E All Lines	F (1)	F (2)	F (3)	F Encapsu- lated Contact Line Only	F Rear Release	F Power & Coax. Comb. Only	Mounting Dimensions—All Lines			
	A Max.	B	C Max.														G (Min.)		H (Min.)	
9	1.239	.984	.515	25/64	3/32	45/64	29/64	29/64	13/16	15/64	13/32	17/64	13/16	25/64	25/64	3/4	.798	.830	.448	.505
15	1.567	1.312	.515	25/64	3/32	45/64	29/64	29/64	13/16	15/64	13/32	17/64	13/16	25/64	25/64	3/4	1.116	1.161	.448	.505
25	2.114	1.852	.515	25/64	3/32	45/64	29/64	29/64	13/16	15/64	13/32	17/64	13/16	25/64	25/64	3/4	1.654	1.701	.448	.505
37	2.754	2.500	.515	25/64	3/32	45/64	29/64	29/64	13/16	15/64	13/32	17/64	13/16	25/64	25/64	3/4	2.304	2.348	.448	.505
50	2.661	2.406	.626	25/64	3/32	45/64	29/64	29/64	13/16	15/64	13/32	17/64	13/16	25/64	25/64	3/4	2.210	2.285	.559	.645

- (1) Original Poke-Home with Crimp Contacts.
 (2) Original Poke-Home and Fixed Contacts with Solder Contacts.
 (3) Fixed Contacts with Solderless wrap tails only.

17 Series Min Rac Accessories

Plastic Backshell

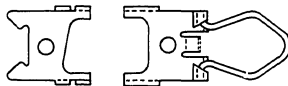
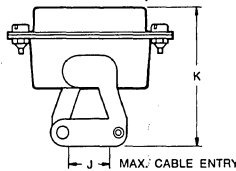
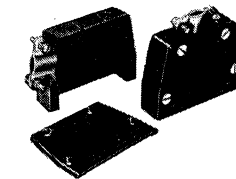
A versatile accessory for all Min Rac connectors. Protects connector terminations and provides cable strain relief. Unique removable side panel allows attachment even after cable has been terminated. Can easily be removed for servicing in field. Deep recess accepts all connector styles, even encapsulated and power and coax lines. Interchangeable insert and cable clamp allows choice of top or side cable entry. Made of glass-filled nylon with cadmium plated steel clamp.

Metal Cable Housing

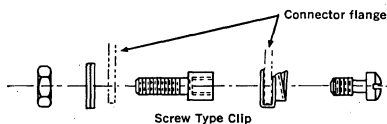
Used to adapt connector for cable to panel or cable to cable applications. Easily attached to connector by two screws. Available in clear chromate or gold iridite finish to match connector shells.

DIMENSIONS

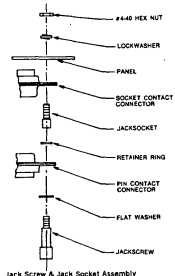
	Size 9	15	25	37	50
J	1 1/32	1 1/32	1 1/32	2 1/32	2 1/32
K	1 1/4	1 1/4	1 1/4	1 1/4	1 1/4



Spring Latch



Screw Type Clip



Jack Screw & Jack Socket Assembly

PART NUMBERS

Shell Size	Backshell & Cable Housings		Spring Latch Locking Device		Screw Latch Locking Device		Jack Screw & Socket Assembly		Potting Molds
	Plastic	Metal	Clear Chromate	Gold Iridite	Clear Chromate	Gold Iridite	Clear Finish Only	Clear Finish Only	
9	17-1370	17-310-01	17-310-02	17-529	17-847	17-768	17-848	17-895	17-886-09
15	17-1371	17-311-01	17-311-02	17-529	17-847	17-768	17-848	17-895	17-886-15
25	17-1372	17-312-01	17-312-02	17-529	17-847	17-768	17-848	17-895	17-886-25
37	17-1373	17-313-01	17-313-02	17-529	17-847	17-768	17-848	17-895	17-886-37
50	17-1374	17-314-01	17-314-02	17-770	17-850	17-768	17-848	17-895	17-886-50

How to Order 17 Series Min Rac Connectors

17-1 1 09 0-1

DEVIATIONS

- 0 Solder Contacts
- 1 Crimp Contacts, Male or Female
- 5 Solder Contact and Float Mtd. (Female only)
- 6 Crimp Contact and Float Mtd. (Female only)
- 11 .023 Dia. .138 Pin Tail Contacts for Nylon inserts only
- 13-01 .040" Dia. Pin Tail Contacts with .225" usable tail length (for orig. Poke-Home Line only)
- 13-02 .040" Dia. Pin Tail Contacts with .140" usable tail length (for orig. Poke-Home Line only)
- 15 Low cost punch press type fixed contacts
- 16 Screw machine type fixed contacts
- 17 Rear Release Connectors with screw machined Poke-Home contacts
- 18 Rear Release Connector body only
- 19 01 Wire wrap type tails .300" Lg. x .025" Sq.
- 19 02 Wire wrap type tails .500" Lg. x .025" Sq.

COAX CONTACTS

(Must be ordered separately).

- 0 - None
- 1 - 1 Coax.
- 2 - 2 Coax.
- etc.

NUMBER OF POWER CONTACTS

- 09 - 9 contacts
- 15 - 15 contacts

FINISH

- 0 Cadmium w/clear chromate
- 1 Cadmium w/gold iridite

CONNECTOR TYPE

- 1 Receptacle (Zytel) Socket Contacts
- 2 Plug (Zytel) Pin Contacts
- 8 Receptacle (Glass-Filled Nylon) Socket Contacts
- 9 Plug (Glass-Filled Nylon) Pin Contacts

SERIES NUMBER 17

FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

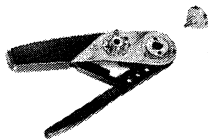
TOOLS

BUNKER
RAMO

AMPHENOL

Crimping and Insertion Tools for 17 Series Min Rac and 220 Series Micro-Miniature Contacts

NO. 357-100 — HAND CRIMPING TOOL



Adjustable 4-indent miniature to MIL-T-22520. Requires contact locator bushing for specific contact used. (See below.)

17 Series		Micro-Miniature	
Contact Locator	Contact	Contact Locator	Contact
357-300-2	17-763, 766, 1037, 1038	357-300-01	220-S01, 220-S02, 220-P01
357-300-5	17-1105, 1108	357-300-03	220-S03
357-300-11	17-1389, 1390	357-300-08	220-P02, 220-P03

No. 357-552 — Hand Crimp Tool for Coax Connectors

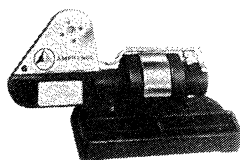


Cycle-controlled hexagon crimp action for reliable termination of outer ferrule of coax contacts. Used for 17-1130 and 17-1132 coax contacts, with RG 178/U cable. (357-100 or 357-104 crimp tool required to terminate center conductor of coax cables.)

No. 357-553 — Hand Crimp Tool

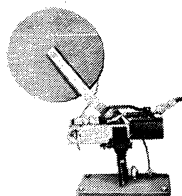
Same as above except for 17-1112 and 17-1113 coax contacts used with RG 195/U cable.

No. 359-400 — Manual Feed, Pneumatic Crimp Tool



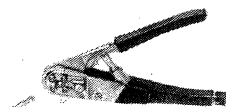
4-indent cycle-controlled crimping tool. Consult factory for correct settings, nest bushings and accessories.

No. 359-900 — Semi-Automatic Feed Crimp Tool



4-indent cycle-controlled crimping. Contacts supplied on carrier strips wound on reel for fast, easy crimping. Consult factory for available contacts and accessories.

NO. 357-104 — HAND CRIMPING TOOL



Miniature step adjustable. Requires contact locator. (See below.)

17 Series		Micro-Miniature	
Contact Locator	Contact	Contact Locator	Contact
357-304-6	17-763, 766, 1037, 1038	357-304-02	220-S01, 220-S02, 220-P01
357-304-7	17-1105, 1108, Coax Contact Center Cond.	357-304-03	220-S03
357-304-11	17-1389, 1390	357-304-10	220-P02, 220-P03

No. 356-200 — Insertion and Removal Tool Handle

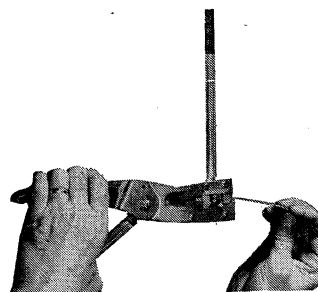


Select correct insertion bit or removal bit to accommodate desired contact.

17 Series			Micro-Miniature		
Contact	Insertion Bit	Removal Bit	Contact	Insertion Bit	Removal Bit
17-763	356-400-1	356-400-5	220-S02 (Relia-Tac) and 220-S03 (Ultra-Tac) 220-831-02, 220-815-00.		
17-766	356-400-1	356-400-6			
17-1005	356-400-2	356-400-6			
17-1006	356-400-2	356-400-5			
17-1112	356-400-3	356-400-7	220-P02 (Relia-Tac) and 220-P03 (Ultra-Tac) 220-830-02, 220-834-07.		
17-1113	356-400-3	356-400-8			
17-1130	356-400-19	356-400-8			
17-1132	356-400-19	356-400-7			
17-1389	—	356-214			
17-1390	—	356-214			
17-1391	—	356-214			
17-1392	—	356-214			
			356-400-11	356-400-14	
			221-756-01	None	356-400-17 (Plug strips)
			221-756-01	None	356-400-18 (Receptacle strips)
			221-756-02	None	356-400-16 (Receptacle strips only)

FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

No. 357-557 — Hand Crimp Tool



For crimping stamped and formed rear release contacts 18-1391; 17-1392.

CRIMPING MACHINES



AMPHENOL

Production Contact Crimping Machine

AUTOMATIC FEEDING, SEMI-AUTOMATIC OPERATION



HIGH VOLUME PRODUCTION CRIMPING

Compact, economical, and simple to use, Amphenol's production crimping machine provides automatic contact feeding and semi-automatic operation. The unit produces eight-indent crimped terminations of consistently high quality as fast as the operator can insert the wires and press a pedal switch.

The machine features a vibratory contact feed system that automatically arranges the contacts in the correct crimping position and feeds them to the crimp mechanism. A dependable pneumatic system completes the crimping cycle. Up to four thousand bulk-packaged contacts may be poured into the vibratory bowl at one time, depending on the size and shape of the contacts.

MINIMUM OPERATOR TRAINING

No special skills are required to perform the fast 1-2-3 procedure: insert the wire, operate the pedal switch, and remove the terminated wire. It's as easy as that.

To meet specific applications, the crimp depth adjustment may be preset to accommodate different wire sizes.

SPECIFICATIONS

CRIMPING SPEED: Up to 1600 terminations per hour

CONTACTS: 17-766-02 and 17-763-02

WIRE SIZES: #20 — #24 AWG

DIMENSIONS: 16" wide x 18" deep x 14" high

WEIGHT: 54 lbs.

EXTERNAL AIR LINE: 80 - 100 PSI

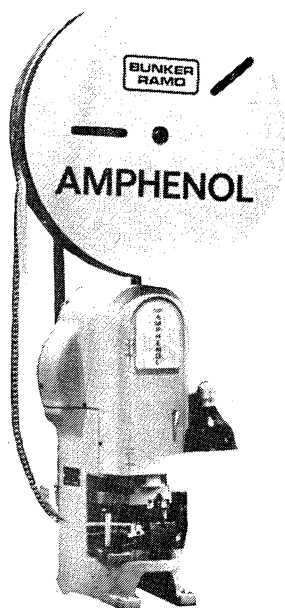
ELECTRICAL POWER: 117V AC, standard 3-wire grounded supply

ORDERING INFORMATION

359-801: For crimping standard 17-766 and 17-763 contacts

Semi-Automatic Reel-Fed Crimping Press

For Stamped and Formed Contacts for 17 and 32 Series



This press is similar to those used to crimp wire terminals. It comes with an applicator designed to crimp Stamped and Formed Contacts on a carrier strip. Capable of operating at over 1,000 terminations per hour, the press firmly attaches Contacts onto pre-stripped wire. Use of the reel-fed press and applicator permits even greater economy from Amphenol's low cost stamped and formed contacts.

SPECIFICATIONS

CRIMPING SPEED: Up to 1,000 terminations per hour.

CONTACTS: 17-1391 and 17-1392 stamped and formed rear release contacts. 32 Series contacts see p. 2-554.

WIRE SIZES: 14 to 30 AWG.

CONNECTIONS REQUIRED: 110 V AC standard 3 wire grounded supply.

ORDERING INFORMATION

359-201: Reel-fed Press and Applicator for 17 Series Stamped and Formed Rear Release Contacts.

359-202: Press and applicator for 32-1416 P or S 0500 RT Contacts.

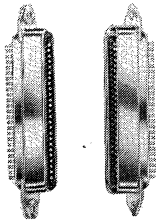
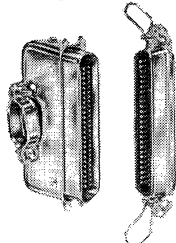
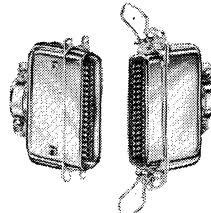
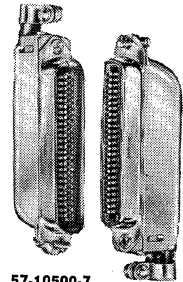
359-203: Press and Applicator for 32-1620 P or S 0600 RT Contacts.

359-204: Press and Applicator for 32-2230 P or S 10000 RT Contacts.

FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

MICRO RIBBON[®] CONNECTORSBUNKER
RAMO AMPHENOL57 Series Micro-Ribbon[®] Connectors

High Contact Density — 14 to 64 Contacts Protective Polarized Shell

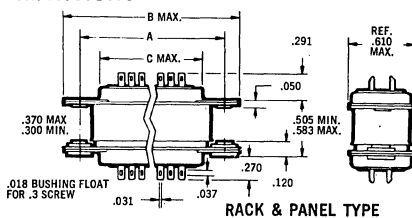
57-10500
RACK & PANEL57-50500 57-40500
SIDE CABLE ENTRY57-30360 57-60360
TOP CABLE ENTRY57-10500-7 57-20500-7
LOW PROFILE HOOD

All of the advantages of ribbon contacts apply to Micro Ribbon Connectors. This includes the self-cleaning, self-wiping action of the contacts and extremely low insertion and withdrawal forces. Dielectric is improved diallyl phthalate with high impact strength and low moisture absorbency characteristics. Trapezoidal shells provide polarization, and are made of zinc plated brass with a clear chromate conversion seal. Small size makes the Amphenol Micro Ribbon Connector ideal for high density miniature modules as well as rack and panel applications. Connectors may be top or bottom mounted. Rated 700V DC at sea level; 200 VDC at 70,000 feet.

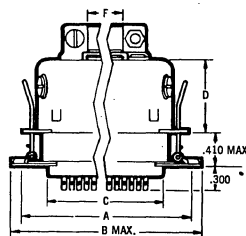
Rack and Panel and Module Applications. Receptacle mounting plate includes float bushings to allow a float of .020 in each direction. This facilitates blind mating and minimizes the need for critical mounting dimensions.

Cable-To-Panel Application. Panel receptacles are equipped with sturdy spring latches which are guided and retained by cutouts in the plug's flanges. Receptacles must be top mounted. Cable entry at top side, as desired.

DIMENSIONS

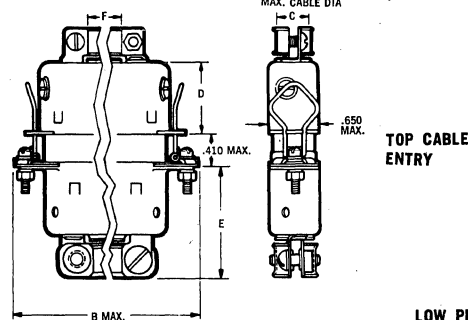


RACK & PANEL TYPE



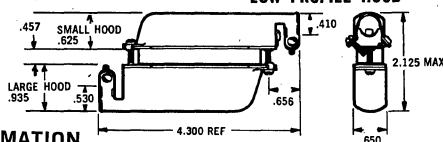
CABLE-TO-PANEL TYPE

CABLE-TO-CABLE TYPE



TOP CABLE ENTRY

LOW PROFILE HOOD



SPECIFICATIONS

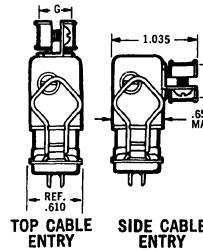
(Meets requirements of SCL-6020A)

Current Capacity — 5 amps per contact.**Voltage Rating** — 700 volts D.C. at sea level.
200 volts D.C. at 70,000 ft.**Operating Temperature** — -55°C to $+105^{\circ}\text{C}$
 -67°F to $+221^{\circ}\text{F}$ **Wire Sizes** — Solid — 22 gauge max.

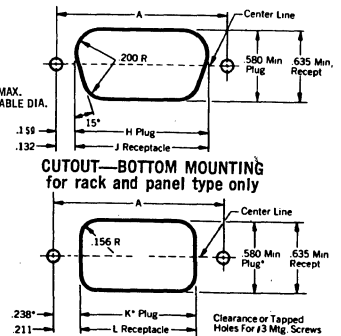
Stranded — 24 gauge max.

Contacts — .000030" gold plated over copper flash on cadmium copper base.**Dielectric** — Diallyl phthalate per Mil-M-14F Type MDG**Shells** — Zinc plated brass with clear chromate coating, trapezoidal shape for polarization. Gold iridescent chromate finish also available.

MAX. CABLE DIA.



TOP CABLE ENTRY SIDE CABLE ENTRY

CUTOUT—BOTTOM MOUNTING
for rack and panel type onlyCUTOUT—TOP MOUNTING
for both types

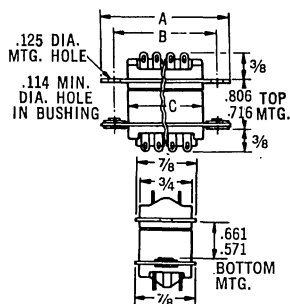
DIMENSIONS

		14 Contacts	24 Contacts	36 Contacts	50 Contacts	64 Contacts
BOTH TYPES	A	1.417	1.842	2.352	2.947	3.542
	B	1.750	2.175	2.685	3.270	3.875
	C	.910	1.335	1.845	2.440	3.035
CABLE TO CHASSIS TYPE ONLY	D	.843	.825	.905	.995	—
	E	1.243	1.225	1.305	1.395	—
	F	.301	.468	.629	.756	—
	G	.412	.468	.468	.468	—
BOTTOM MOUNTING FOR RACK & PANEL TYPE ONLY	H	1.098	1.523	2.033	2.628	3.224
	J	1.153	1.578	2.088	2.683	3.278
TOP MOUNTING FOR BOTH TYPES	K	.940	1.365	1.875	2.470	3.065
	L	.955	1.420	1.930	2.525	3.120

ORDERING INFORMATION

Con- tacts	Rack and Panel Applications				Cable to Panel Applications				Cable-To-Cable Application		Low Profile
	Plugs	Re- ceptacles	Plugs	Re- ceptacles	Top Entry Cable Plugs	Side Entry Cable Plugs	Re- ceptacles	Plugs	Re- ceptacles	Low Profile	
14	57-10140	57-20140	57-10140-4	57-20140-8	57-30140	57-50140	57-40140	See Cable to Panel Listing	57-60140	50 contacts only. Receptacle — 57-20500-7 Plug — 57-10500-7	
24	57-10240	57-20240	57-10240-3	57-20240-8	57-30240	57-50240	57-40240		57-60240		
36	57-10360	57-20360	57-10360-13	57-20360-9	57-30360	57-50360	57-40360		57-60360		
50	57-10500	57-20500	57-10500-27	57-20500-31	57-30500	57-50500	57-40500		57-60500		
64	57-10640	57-20640	—	—	—	—	—		—		

26.4100.24P



BOTTOM MTG.

MAX. CLEARANCE OR TAPPED HOLES FOR #4 MTG. SCREWS

MIN. CLEARANCE OR TAPPED HOLES FOR #4 MTG. SCREWS

TOP MTG.

MAX. CLEARANCE OR TAPPED HOLES FOR #4 MTG. SCREWS

MIN. CLEARANCE OR TAPPED HOLES FOR #4 MTG. SCREWS

26-182 and 26-183 only

Contacts	Plugs	Mating Receptacles	DIMENSIONS			
			A	B	C	D
8	26-4100-8P	26-4200-8S	1.719	1.375	1.036	1.120
16	26-4100-16P	26-4200-16S	2.469	2.125	1.784	1.868
24	26-4100-24P	26-4200-24S	3.219	2.875	2.536	2.620
32	26-4100-32P	26-4200-32S	3.969	3.625	3.286	3.370
8	26-182	26-183	—	—	—	—

Plugs and receptacles are molded of high impact diallyl phthalate dielectric with molded-in mounting plates of corrosion resistant passivated stainless steel.

26-159-24

PANEL SPACING FOR TOP MOUNTING
PANEL SPACING FOR BOTTOM MTG.

.710 .555
.800 .645

$\frac{1}{16}$.121
.111

$\frac{1}{16}$.039

$\frac{1}{16}$.116 DIA. HOLE

$\frac{1}{32}$.5/8

A B

NOTE: THIS MOUNTING LAYOUT SHOWS HOLES AS VIEWED FROM FRONT OF RECEPTACLE OR REAR OF PLUG

.091

.460 .400
.250

.140R MAX.
 $\frac{1}{32}$ R .235R
.240

MIN. CLEARANCE REQUIRED

CLEARANCE OR TAPPED HOLES FOR NO. 4 MTG. SCREWS

$\frac{3}{4}$

$\frac{7}{8}$

Contacts	Plug	Receptacle	DIMENSIONS		
			A	B	C
16	26-159-16	26-190-16	2.442	1.842	2.024
24	26-159-24	26-190-24	3.118	2.522	2.704
32	26-159-32	26-190-32	3.798	3.202	3.384

26-4101-24S

DIMENSIONS

	A	B	C	D
8 contact	1.719	1.375	1.036	1.120
16 contact	2.469	2.125	1.784	1.868
24 contact	3.219	2.875	2.536	2.620
32 contact	3.969	3.625	3.286	3.370

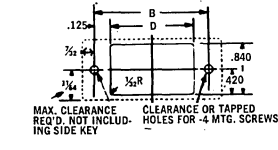
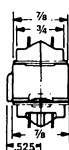
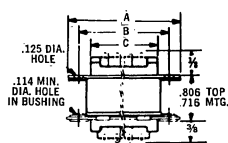
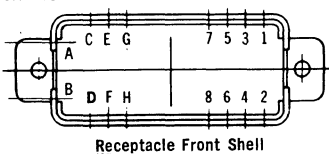


Diagram of the Plug Front Shell showing pin connections:

Pin Label	Pin Number
B D F H	8 6 4 2
A C E G	7 5 3 1

Plug Front Shell



Contacts	Plug	Receptacle	Position	Shell Keys	
				Letters	Number
8	26-4101-8P	26-4201-8S	1	A	1
	26-4102-8P	26-4202-8S	2	A	2
	26-4103-8P	26-4203-8S	3	B	1
	26-4104-8P	26-4204-8S	4	B	2
16	26-4101-16P	26-4201-16S	1	A-C	3-6
	26-4102-16P	26-4202-16S	2	A-D	2-5
	26-4103-16P	26-4203-16S	3	A-E	5-6
	26-4104-16P	26-4204-16S	4	A-F	4-5
	26-4105-16P	26-4205-16S	5	B-C	1-6
	26-4106-16P	26-4206-16S	6	B-D	1-2
	26-4107-16P	26-4207-16S	7	B-E	1-4
	26-4108-16P	26-4208-16S	8	B-F	2-3
24	26-4101-24P	26-4201-24S	1	A-C	3-6
	26-4102-24P	26-4202-24S	2	A-D	4-7
	26-4103-24P	26-4203-24S	3	A-E	5-6
	26-4104-24P	26-4204-24S	4	A-F	4-5
	26-4105-24P	26-4205-24S	5	A-G	6-7
	26-4106-24P	26-4206-24S	6	A-H	1-6
	26-4107-24P	26-4207-24S	7	B-C	2-7
	26-4108-24P	26-4208-24S	8	B-D	1-2
	26-4109-24P	26-4209-24S	9	B-E	1-4
	26-4110-24P	26-4210-24S	10	B-F	2-3
	26-4111-24P	26-4211-24S	11	B-G	3-4
	26-4112-24P	26-4212-24S	12	B-H	2-5
32	26-4101-32P	26-4201-32S	1	A-C	3-6
	26-4102-32P	26-4202-32S	2	A-D	4-7
	26-4103-32P	26-4203-32S	3	A-E	5-6
	26-4104-32P	26-4204-32S	4	A-F	4-5
	26-4105-32P	26-4205-32S	5	A-G	6-7
	26-4106-32P	26-4206-32S	6	A-H	1-6
	26-4107-32P	26-4207-32S	7	B-C	2-7
	26-4108-32P	26-4208-32S	8	B-D	1-2
	26-4109-32P	26-4209-32S	9	B-E	1-4
	26-4110-32P	26-4210-32S	10	B-F	2-3
	26-4111-32P	26-4211-32S	11	B-G	3-4
	26-4112-32P	26-4212-32S	12	B-H	2-5

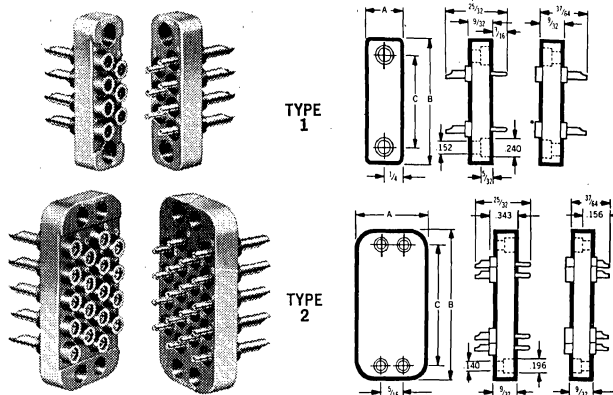
RACK AND PANEL CONNECTORS

BUNKER
RAMO

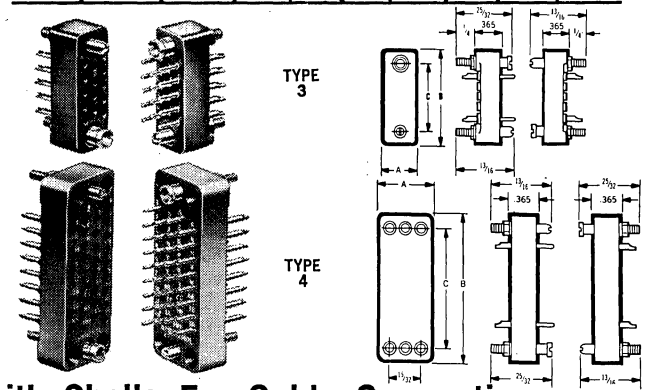
AMPHENOL

126 Series Miniature Rack and Panel Connectors

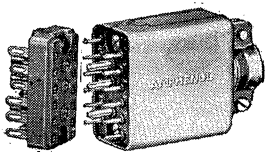
Heavy duty, reliable, time proven connectors. Dielectric is of melamine. Contacts are gold over silver plated. Voltage rating of types 1 and 2 is 700V RMS between contacts and 600V RMS between contacts and ground with a current rating of 17 amperes. Voltage rating of types 3 and 4 is 600V RMS with a current rating of 7½ amperes.



Connectors Type	Pin Part Number	Socket Part Number	No. of Contacts	Amps	Wire Gauge	Wire Gauge Solid Strand	Width A	Length B	Mount'g Centers C
1	126-016	126-017	7	17	12	14	.500	1.625	1.250
	126-204	126-205	15	17	12	14	.500	2.600	2.225
2	126-206	126-207	18	17	12	14	1.000	2.000	1.688
	126-173	126-174	14	7½	18	20	.437	1.250	.937
3	126-199	126-189	18	7½	18	20	.562	1.312	1.000
	126-171	126-172	21	7½	18	20	.375	2.250	1.937
4	126-188	126-187	34	7½	18	20	.750	2.000	1.687



126 Series Rectangular Rack & Panel with Shells For Cable Connections



Rated a full 900V RMS, contacts are gold, over silver. Four contact configurations are available with 3 contact sizes. Contact size 12 is rated 23 amperes; size No. 16 is rated 13 amperes; size 20 is 7½ amperes. Dielectric is mica filled phenolic. Aluminum housing with mechanical strain relief is available for cable applications. Gold over silver plated contacts.

No. of Contacts		Pin Contacts		Socket Contacts		Mounting Screw Size No.	Shell Height	
Size 12	Size 16	Insert Only	With Housing	Insert Only	With Housing			
2	—	9	126-804	126-809	126-805	126-808	4	1.75
3	—	12	126-151	126-152	126-150	126-153	6	2.06
4	—	16	126-806	126-811	126-807	126-810	4	2.06
—	20	—	126-813	—	126-812	—	4	—

INSERTS	A	B	C	D	E	F
126-804	1.171	.937	1.181	.120	.864	.120
126-805	1.171	⁹ / ₁₆	1.181	.120	.864	.120
126-151	1.500	.937	1.510	.115	1.188	.145
126-150	1.500	⁹ / ₁₆	1.510	.115	1.188	.145
126-806	1.932	.937	1.947	.120	1.620	.120
126-807	1.937	⁹ / ₁₆	1.947	.120	1.620	.120

Military Version

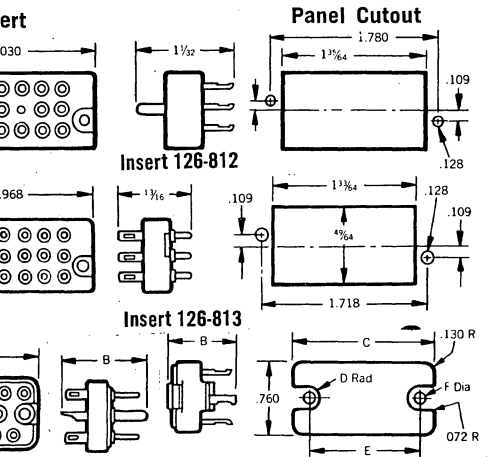
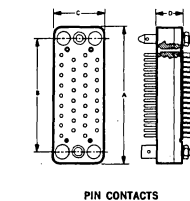
A family of miniature connectors which meets MIL-C-8384.

SPECIFICATIONS

Current Rating: 7.5 amps.
Voltage Rating: 500V A.C. (RMS).
Temperature Range: -55°C to +125°C.
Dielectric: Molded epoxy type thermo-set plastic.
Pin Contacts: Brass alloy with gold over nickel plating.
Socket Contacts: Beryllium copper with gold over silver plating.
Guide Hardware: Gold-plated brass with 4-40 thread.
Wire Size: 18AWG solid - 20AWG stranded.

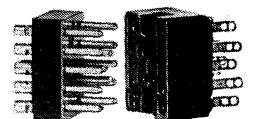
DIMENSIONS AND ORDERING INFORMATION

No. of Contacts	Part Numbers		Dimensions			
	Pin Contacts	Socket Contacts	A	B	C	D
7	126-T-2628	126-T-2629	1.218	.904	.381	.362
9	126-T-2630	126-T-2631	1.309	.998	.381	.362
14	126-T-2626	126-T-2627	1.248	.935	.439	.362
20	126-T-2619	126-T-2620	1.556	1.248	.439	.362
26	126-T-2632	126-T-2633	1.627	1.312	.558	.362
34	126-T-2621	126-T-2622	1.996	1.684	.749	.362

All Others
Cubic Connector

SPECIFICATIONS

Current Rating: 3 amps.
Voltage Rating: 125 volts A.C. (RMS).
Temperature Range: -25°C to +85°C.
Dielectric: Black Phenolic.
Pin Contacts: Brass alloy with nickel plating.
Socket Contacts: Phosphor bronze with silver plating.
Wire Size: 20 AWG solid - 22AWG stranded.



Contacts	Part Numbers	
	Pin	Socket
13	126-T-2655	126-T-2656-3

RACK AND PANEL CONNECTORS

BUNKER
RAMO AMPHENOL

126 Series

Micro Miniature Rectangular

This group of four connectors provides more contacts in less space than the 126 Series miniatures. A unique spring type socket contact is used which provides excellent wiping action and firm pressure on 6 points along the pin to insure a positive electrical connection everytime.

SPECIFICATIONS

Current Rating: 3 amps.

Voltage Rating: 60 volts. A.C. (RMS)

Temperature Range: -55°C to +125°C.

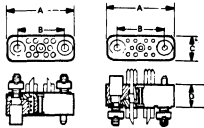
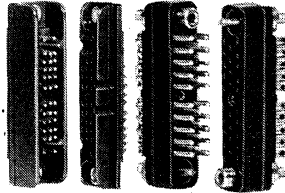
Dielectric: Molded epoxy type thermo-set plastic.

Pin Contacts: Brass alloy with gold over nickel plating.

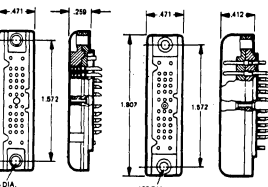
Socket Contacts: Beryllium copper with gold over silver plating.

Guide Pins: Nickel-plated brass.

Wire Size: 22 AWG solid. 24 AWG stranded.



ALL OTHERS



126-T-2669-1 ONLY

126-T-2668 ONLY

Number of Contacts	Part Numbers		Dimensions			
	Pin Contacts	Socket Contacts	A	B	C	D
10	126-T-2609	126-T-2610-1	.746	.530	.275	.235
16	126-T-2664	126-T-2665-1	.904	.687	.275	.235
28	126-T-2666	126-T-2667-1	1.218	1.002	.275	.235
34	126-T-2668	126-T-2669-1	1.807	1.572	.471	.412

Cable Connector

SPECIFICATIONS

Current Rating: 3 amps.

Voltage Rating: 380V. A.C. (RMS)

Temperature Range: -40°C to +85°C.

Dielectric: Black nylon thermo-plastic.

Pin Contacts: Brass alloy with silver plating.

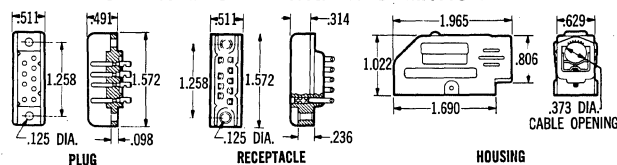
Socket Contacts: Phosphor bronze with silver plating.

Wire Sizes: 18 AWG solid. 20 AWG stranded.

Housing: Gray polycarbonate plastic.

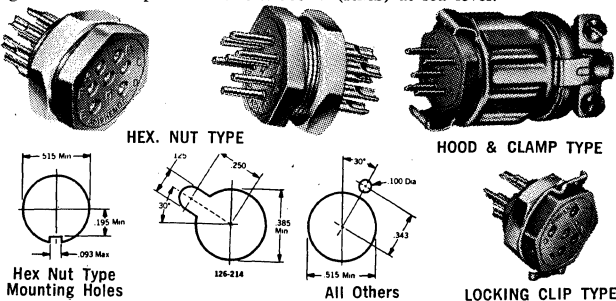
Contacts	Part Numbers		
	Plug	Receptacle	Housing
9	126-T-2560	126-T-2561	126-T-2870

DIMENSIONS AND ORDERING INFORMATION



126 Series Hex Connectors 4 to 9 Contacts

Popular hexagon rack and panel connectors. Diallyl phthalate dielectric, gold over silver plated contacts. 500 V (RMS) at sea level.



Contacts	Hex Nut Panel Mount	Panel Mount With Locking Clip	With Hood and Cable Clamp
4 Pin	126-1431	126-214	126-214 - 1000
4 Socket	126-3815	126-233	126-215 (Hood Only)
5 Pin	126-010	126-216	126-217
5 Socket	126-011	126-218	126-223
7 Pin	126-191	126-197	126-195
7 Socket	126-192	126-198	126-196
9 Pin	126-012	126-219	126-220
9 Socket	126-013	126-221	126-222

115 Series Blade & Spring Contact Line

A complete line of rugged connectors utilizing a flat blade male contact and a female spring contact with multiple rows of gripping fingers. The blade enters the opening in the "C" shaped spring, forcing it apart.

SPECIFICATIONS

Current Rating: 10 amps (2 contact model, 8 amps).

Voltage Rating: 2, 6, 8 contacts 125V. A.C. (RMS).

4, 7, (8 with guide pins) 12, 16, 30 380V. A.C. (RMS).

26 contact 127V. A.C. (RMS).

Temperature Range: -20°C to +85°C.

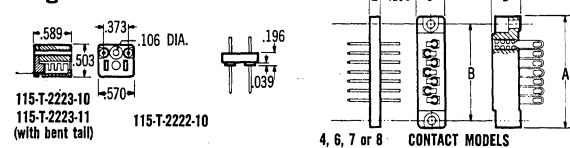
Dielectric: Black phenolic.

Pin Contacts: Flat brass blade with silver plating.

Socket Contacts: Phosphor bronze with silver plating.

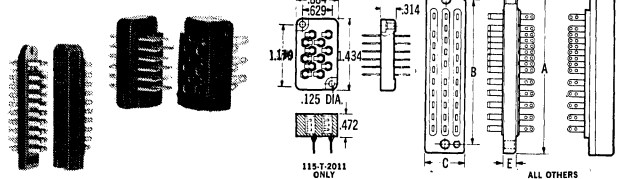
Wire Size: 16 AWG solid. 18 AWG stranded.

Single Row



Contacts	Part Numbers		Dimensions				
	Blade Contacts	Socket Contacts	A	B	C	D	E
2	115-T-2222-10	115-T-2223-10	.570	.295	.503	.589	.196
4	115-T-2301	115-T-2302	1.611	1.364	.550	.550	.118
6	115-T-2410	115-T-2411	1.611	1.364	.550	.550	.118
7	115-T-2060	115-T-2061	1.886	1.611	.472	.483	.196
8	115-T-2014	115-T-2015	1.709	1.454	.590	.550	.118
8	115-T-2002	115-T-2001	2.130	1.886	.479	.472	.393
	(with polarizing guide pins)						

Multi-Row



Contacts	Part Numbers		Dimensions				
	Blade Contacts	Socket Contacts	A	B	C	D	E
8	115-T-2024-8	115-T-2025-8	1.847	1.493	.590	.491	.236
12	115-T-2008-12	115-T-2009-12	2.319	1.965	.590	.491	.236
12 (2 rows)							
12 (3 rows)	115-T-2010	115-T-2011	1.434	1.179	.884	.472	.314
16	115-T-2670-16	115-T-2671-16	2.790	2.437	.590	.491	.236
20	115-T-2660-20	115-T-2661-20	3.262	2.908	.590	.491	.236
26	115-T-2056-26	115-T-2057-26	3.262	2.908	.590	.491	.236
30	115-T-2070-30	115-T-2071-30	3.262	2.908	.786	.491	.236

115 Series Hinge Action Mating

Amphenol 115 Series connectors accommodate 50 or 100 No. 16 wires and are nominally rated at 750 volts RMS 60CPS at sea level.

The vise action of the screw lock provides the leverage for easy attaching and disengaging of the plug. The two-piece inserts have molded-in numbers to facilitate wiring and checking of circuits.

100 CONTACTS	Crimp-On Contacts	Taper Pin Contacts	Solder Cup Contacts
Male Plug	115-30P	115-30P(432)	115-30P-1000
Female Receptacle	115-31S	115-31S(432)	115-31C-1000
Female Plug	115-30S	115-30S(432)	115-32S
Male Receptacle	115-31P	115-31P(432)	115-32P

50 CONTACTS	Taper Pin Contacts	Solder Cup Contacts
Male Plug	115-114P(432)	115-114P
Female Receptacle	115-115S(432)	115-115S
Female Plug	115-114S(432)	115-114S
Male Receptacle	115-115P(432)	115-115P

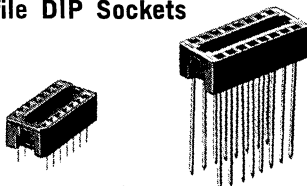
PRODUCTION SOCKETS

BUNKER RAMO **AMPHENOL**

Dual-In-Line IC Production Sockets

The 821-25, 821-20 and 821-40 Series are high reliability production mounting sockets for Dual-In-Line I.C. devices. They are most useful in production applications where it is desirable to provide easy replacement of individual DIP devices without the risk of unsoldering them from P.C. boards or the expense of replacing entire boards.

Standard Profile DIP Sockets



Standard profile sockets have replaceable, one piece contacts with dual-wiping action for round or flat I.C. leads. Removable lid provides closed entry and chamfered lead-in. Available in anti-wicking solder tab or solid square post for solderless wrap termination.

SPECIFICATIONS

Contact Material: 30 micro inch gold over 50 micro inch nickel over phosphor bronze

Contact Resistance: 5 milliohms

Contact Rating: 1 amp

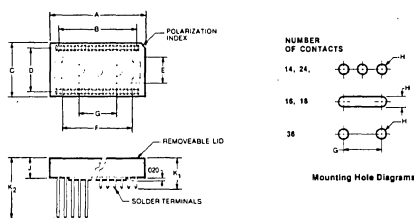
Voltage Breakdown: 1800 volts

Terminations: Choice of solderless wrap with up to 3 complete wraps of 30 AWG wire, short solderless wrap for 2 wraps, or solder tab.

Body Material: Molded glass filled nylon

Temperature Rating: -55° to +125°C

Mounting: Press fit, hex nut and screw, direct solder, or epoxy



DIMENSIONS

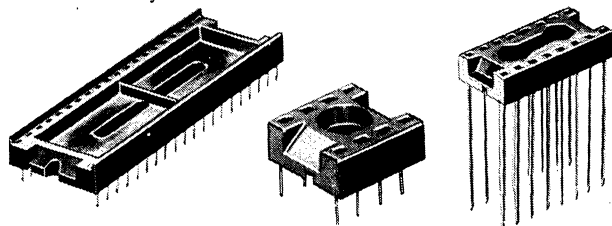
Number of Contacts	A	B	C	D	E	F	G	H	J	K1 Solder Terminals	K2 Solderless Terminals
14	.795	.600	.395	.300	.160	.630	.312	.078	.230	.390	.930
16	.895	.700	.395	.300	.160	.730	.412	.078	.230	.390	.930
18	1.000	.800	.395	.300	.160	.830	.512	.078	.230	.390	.930
24	1.290	1.100	.695	.500	.330	.975	.500	.120	.260	.340	.980
24	1.290	1.100	.695	.600	.330	.975	.500	.120	.260	.340	.980
36	1.890	1.700	.695	.600	.330	1.575	.900	.120	.260	.340	.980

ORDERING INFORMATION

Amphenol Number	Number of Contacts	Lead Row Spacing	Termination
821-25011-144	14	.300	Solder
821-25011-164	16	.300	Solder
821-25011-184	18	.300	Solder
821-25012-144	14	.300	Solderless Wrap
821-25012-164	16	.300	Solderless Wrap
821-25012-184	18	.300	Solderless Wrap
821-40002-244	24	.500	Solderless Wrap
821-40004-244	24	.600	Solderless Wrap
821-40012-244	24	.500	Solderless Wrap
821-40014-244	24	.600	Solderless Wrap
821-40021-364	36	.600	Solderless Wrap
821-40023-364	36	.600	Solderless Wrap

Low Profile DIP Sockets

Designed for low cost, reliable, high density connections. Overall height is only .160" above board, allowing closer stacking. Also permits side-by-side mounting on .100" x .300" and with no wasted space between sockets. Large sockets include lead guides and closed entry.



SPECIFICATIONS

Contact Material: 30 micro inch gold over 50 micro inch nickel over phosphor bronze, or beryllium copper

Contact Resistance: .005 ohms

Contact Rating: 1 amp max.

Voltage Breakdown: 1800 volts

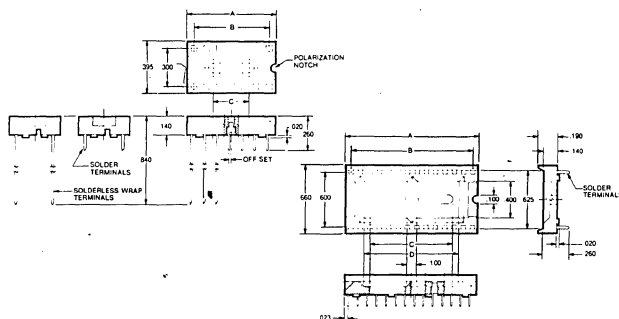
Terminations: Choice of solderless wrap with up to 3 complete wraps of 30 AWG wire, or solder tab

Body Material: Molded glass filled nylon

Temperature Rating: -55° to +125°C

Mounting: Press fit, hex nut and screw, direct solder, or epoxy

Mating Leads: Contacts accept standard IC leads up to .024" square, rectangular or .024" diameter



Number of Contacts	A	B	C
8	.395	.300	—
14	.695	.600	.312
16	.795	.700	.312
18	.895	.800	.400

Number of Contacts	A	B	C	D
24	1.190	1.100	.700	.820
28	1.390	1.300	.900	1.020
40	1.990	1.900	1.500	1.620

ORDERING INFORMATION

Amphenol Number	No. of Contacts	Lead Row Spacing	Termination	Contact Material
821-20012-084	8	.300	Solder	Beryllium Copper
821-20011-144	14	.300	Solder	Phosphor Bronze
821-20012-144	14	.300	Solder	Beryllium Copper
821-20013-144	14	.300	Solderless Wrap	Beryllium Copper
821-20011-164	16	.300	Solder	Phosphor Bronze
821-20012-164	16	.300	Solder	Beryllium Copper
821-20013-164	16	.300	Solderless Wrap	Beryllium Copper
821-20041-184	18	.300	Solderless Wrap	Beryllium Copper
821-20042-184	18	.300	Solderless Wrap	Phosphor Bronze
821-23011-244	24	.600	Solder	Phosphor Bronze
821-23013-244	24	.600	Solder	Beryllium Copper
821-23011-284	28	.600	Solder	Phosphor Bronze
821-23013-284	28	.600	Solder	Beryllium Copper
821-23011-404	40	.600	Solder	Phosphor Bronze
821-23013-404	40	.600	Solder	Beryllium Copper

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

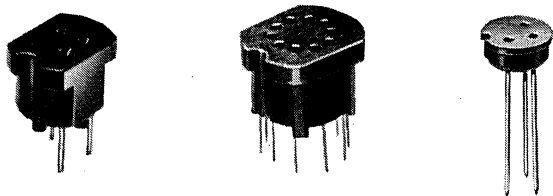
PRODUCTION SOCKETS

BUNKER
RAMO

AMPHENOL

TO-5 and TO-18 Production Sockets

Economical sockets for TO-5 and TO-18 I.C. packages. Dual-wipe tuning fork contacts with chamfered lead entries for fast insertion, low contact resistance, and long life. Anti-wicking solder tab or solderless wrap termination. Mount in circular or double "D" shaped hole.



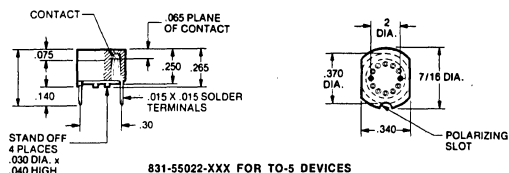
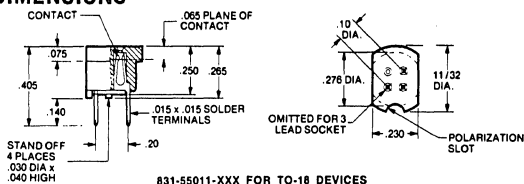
SPECIFICATIONS

Contact Rating: 1 amp

Body Material: Nylon 6/6

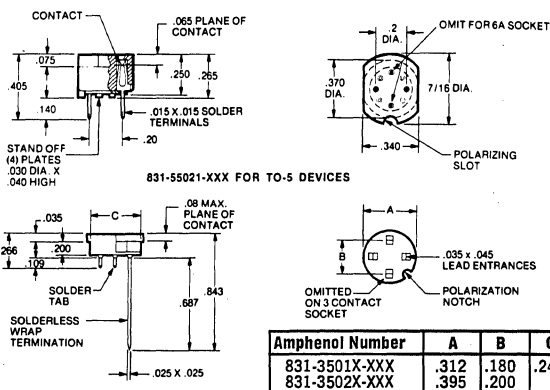
Contact Material: Phosphor bronze or beryllium copper, plated gold over nickel

DIMENSIONS

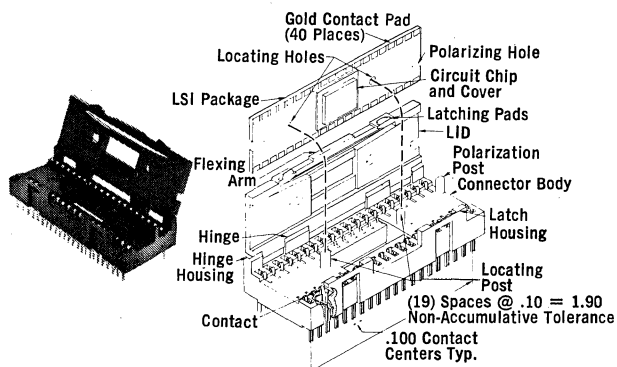


ORDERING INFORMATION

Amphenol Number	No. of Leads	Pin Circle	Terminal Circle	Contact Material	Termination
831-35011-034	3	.180	.180	Phosphor Bronze	Solder Tab
831-35011-044	4	.180	.180	Phosphor Bronze	Solder Tab
831-35012-034	3	.180	.180	Beryllium Copper	Solderless Wrap
831-35012-044	4	.180	.180	Beryllium Copper	Solderless Wrap
831-35021-034	3	.200	.200	Phosphor Bronze	Solder Tab
831-35021-044	4	.200	.200	Phosphor Bronze	Solder Tab
831-35022-034	3	.200	.200	Beryllium Copper	Solderless Wrap
831-35022-044	4	.200	.200	Beryllium Copper	Solderless Wrap
831-55011-034	3	.100	.200	Phosphor Bronze	Solder Tab
831-55011-044	4	.100	.200	Phosphor Bronze	Solder Tab
831-55021-034	3	.200	.200	Phosphor Bronze	Solder Tab
831-55021-044	4	.200	.200	Phosphor Bronze	Solder Tab
831-55021-064	6A	.200	.200	Phosphor Bronze	Solder Tab
831-55021-084	8	.200	.200	Phosphor Bronze	Solder Tab
831-55022-034	3	.200	.300	Phosphor Bronze	Solder Tab
831-55022-044	4	.200	.300	Phosphor Bronze	Solder Tab
831-55022-064	6A	.200	.300	Phosphor Bronze	Solder Tab
831-55022-084	8	.200	.300	Phosphor Bronze	Solder Tab
831-55022-104	10	.200	.300	Phosphor Bronze	Solder Tab
831-55022-124	12	.200	.300	Phosphor Bronze	Solder Tab



851 Series PPI — Planar Plug-In Connector



- For Leadless MOS/LSI Planar Packages
- 40 Contacts — Chip up or Chip down
- Unitized Construction — no hardware or tools needed
- Improved performance at lower total cost

SPECIFICATIONS

Temperature Range: -65°C to $+125^{\circ}\text{C}$

Voltage Rating: 500V DC at sea level

Amphenol's Planar Plug-in Connector provides a low cost, reliable means of interconnecting 40 contact leadless MOS/LSI planar ceramic packages. The IC packages are held firmly but gently, with excellent electrical contact, yet can easily be removed and replaced, for field servicing.

Planar I.C. packages cost less, offsetting the cost of the connector, a net reduction in total system cost.

The PPI Connector can be soldered to the board by automatic, high speed production processes without danger to delicate I.C. devices. Insertion of the package is fast and easy, requiring no force or effort.

The hinged lid is permanently attached to the glass-filled nylon body. No screws or clips. Latch allows the lid to snap into place, hold firmly and pop open without tools. Contacts are located on .100" centers and .600" row spacing. The chevron shaped contact tails are .150" long and fit into a .042" diam. plated hole. Eight standoffs provide .020" clearance.

Current Rating: 1 amp per contact

Dielectric Material: Glass filled nylon

Contacts: Beryllium copper alloy

Plating: .000020" gold over .000050" nickel

Device Accepted: 40 contact leadless ceramic package

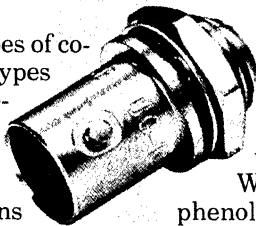
ORDERING INFORMATION

851-10012-404.. Planar Plug-In Connector — for use with .060" thick 40 contact ceramic substrates

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

We stock more than 1,000 different types of coaxial connectors. From low-cost UHF types to the latest MIL-C-39012 designs. Subminiature SMA and SUB-Minax 27 Series, BNC, TNC and N Series.

But if that doesn't solve your problem, we've got more designs and options available than anyone else. Our vast file of engineering drawings and design variations



means that a call to us can literally put you in touch with as many as 90,000 different microwave interconnections. And if you still need something special, we'll custom-design it for you.

We mean business. Call your local Amphenol sales office, distributor or Amphenol RF division, Bunker Ramo Corporation, Danbury, Connecticut 06810. 203/743-9272.



AMPHENOL

**One call will put you in touch
with 90,000 different RF connectors.**



RF CONNECTORS

BUNKER
RAMO

AMPHENOL

CONTENTS/RF

MILITARY CROSS-REFERENCE	2-568
ALC-5	2-573
SUB-Minax 27	2-575
SMA/Stainless Steel	2-577
SMA/Beryllium Copper	2-578
MB SERIES	2-581
BNC/Isolated Receptacle	2-583
BNC SERIES	2-584
TNC SERIES	2-590
PLUG-IN	2-593
MHV SERIES	2-593
UHF SERIES	2-595
N SERIES	2-598
BN SERIES	2-602
HN SERIES	2-603
SC SERIES	2-605
C SERIES	2-605
TWIN SERIES	2-608
TRIAx	2-610
LC SERIES	2-611
ADAPTERS BETWEEN SERIES	2-612
CRIMP TOOLS	2-614
COAXIAL CONNECTOR SELECTION AND ASSEMBLY	2-615
CUSTOM CABLE ASSEMBLIES	2-618
OTHER PRODUCTS AND CAPABILITIES	2-618

MILITARY TO AMPHENOL CROSS REFERENCE GUIDE

CW-()/U No.	Amphenol No.	Type	Description	Page
123	31-008	BNC	Male Cap	589
123A	31-007	BNC	Replaced by M39012/25-0006	589
155	31-027	BNC	Male Cap	589
155A	31-017	BNC	Male Sh. Cap	589
282	31-210	BNC	Female Cap	589
DA-()/U No.	Amphenol No.	Type	Description	Page
12	9550	HN	Res. Term. Cap	*
NT-() No.	Amphenol No.	Type	Description	Page
49188	83-2SP	TWIN	See UG-106/U	608
49189	83-2J	TWIN	See UG-105/U	609
49190	83-1SP	UHF	See PL-259	595
49191	83-822	UHF	See PL-259	595
49191	83-1J	UHF	See PL-259	596
49192	83-1AP	UHF	See UG-646/U	596
49192A	83-58	UHF	See M-359A	596
49193	83-1H	UHF	See UG-106/U	597
49194	83-1RTY	UHF	See SO-239	595
49194	83-1R	UHF	See SO-239	595
49195	83-1SPN	UHF	See PL-259A	595
49195	83-758	UHF	See PL-259A	595
49196	83-2R	TWIN	See UG-1057/U	608
49199	83-1T	UHF	See M-358	596
49287	3500	N	See UG-19/U	*
49288	48000	N	See UG-23/U	*
49289	42000	N	See UG-20/U	*
49451	15000	N	See UG-29/U	*
49482	83-776	UHF	See UG-203/U	*
491049	83-1F	UHF	See UG-363/U	*
M-() No.	Amphenol No.	Type	Description	Page
358	83-1T	UHF	Tee Adapter	596
359A	83-58	UHF	Angle Adapter	596
MT-()/U No.	Amphenol No.	Type	Description	Page
412	1600	BNC	Nut Strap	589
MX-()/U No.	Amphenol No.	Type	Description	Page
103	103-301	—	Taper Tool	*
195	10900	BNC	Hood	589
195A	87175	BNC	Hood	589
367	10925	BNC	Hood	589
539	5375	UHF	Hood	597
543	5475	UHF	Hood	597
554	4700	BNC	Res. Term. Cap	589
554A	39575	BNC	Res. Term. Cap	589
564	82-48	HN/N	Armor Clamp	602
564A	82-109	HN/N	Armor Clamp	602
913	82-106	N	Male Cap	607
1142	82-512	C	Male Cap	607
1143	82-513	C	Female Cap	607
1286	82-517	C/N/HN	Armor Clamp	*
1441	92100	C/N/HN	Armor Clamp	*
1462	16850	C/N/HN	Armor Clamp	602
1530	1050	TERM.	Blkh. Cable Term.	*
1530A	78525	TERM.	Blkh. Cable Term.	*
1531	4275	TERM.	Strap Cable Term.	*
1554	1075	TERM.	Blkh. Cable Term.	*
1554	1025	TERM.	Blkh. Cable Term.	*
1684	20475	TERM.	Blkh. Cable Term.	*
1744	3975	TERM.	Strap Cable Term.	*
1744A	21100	TERM.	Strap Cable Term.	*
1801	4025	TERM.	Strap Cable Term.	*
1802	6375	TERM.	Strap Cable Term.	*
1802A	55950	TERM.	Strap Cable Term.	*
PL-() No.	Amphenol No.	Type	Description	Page
275	83-22F	TWIN	Blkh. Adapter	609
258	83-1J	UHF	Adapter	596
259	83-1SP	UHF	Plug	595
259	83-822	UHF	Plug	595
259A	83-1SPN	UHF	Plug	595
259A	83-756	UHF	Plug	595
SO-() No.	Amphenol No.	Type	Description	Page
239	83-1R	UHF	Panel Recept.	595
239	83-1RTY	UHF	Panel Recept.	595
239A	83-798	UHF	Panel Recept.	595
UG-()/U No.	Amphenol No.	Type	Description	Page
18	3400	N	Plug	*
18B	82-86	N	Plug	*
18C	82-203	N	Plug	*
18D	82-3203	N	Plug	*
19	3500	N	Replaced by M39012/01-0001	598
19B	82-87	N	Panel Jack	*
19C	82-207	N	Panel Jack	*
19D	82-3207	N	Panel Jack	*
19F	—	—	Replaced by M39012/02-0004	600
20	42000	N	Jack	*
20B	82-88	N	Jack	599
20C	82-210	N	Jack	*
20D	82-3210	N	Jack	*
20F	—	—	Replaced by M39012/02-0001	599
21	3900	N	Plug	*
21B	82-61	N	Plug	598
21C	82-96	N	Plug	*
21D	82-202	N	Plug	598
21E	82-3202	N	Plug	598

*Available but not shown.

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

UG- ()/U No.	Amphenol No.	Type	Description	Page	UG- ()/U No.	Amphenol No.	Type	Description	Page
21H			Replaced by M39012/01-0002	*	260F			Replaced by M39012/16-0002	*
22B	82-62	N	Panel Jack	*	261	31-015	BNC	Jack	585
22C	82-95	N	Panel Jack	*	261A	31-022	BNC	Jack	585
22D	82-208	N	Panel Jack	*	261B	31-215	BNC	Jack	585
22E	82-3208	N	Panel Jack	600	261C	31-2215	BNC	Jack	585
22B			Replaced by M39012/02-0005	*	262	31-011	BNC	Panel Jack	586
23	48000	N	Jack	*	262A	31-023	BNC	Panel Jack	*
23A	7600	N	Jack	*	262B	31-211	BNC	Panel Jack	586
23B	82-63	N	Jack	599	262C	31-2211	BNC	Panel Jack	586
23C	82-94	N	Jack	*	262D			Replaced by M39012/18-0001	586
23D	82-209	N	Jack	599	264	25750	PULSE	Panel Recept.	*
23E	82-3209	N	Jack	599	266	4575	UHF	Blkh. Recept.	596
23G			Replaced by M39012/02-0002	599	271A	55000	LC/N	Adapter	613
27A	82-64	N	Angle Adapter	601	273	31-028	BNC/UHF	Adapter	612
27B	82-98	N	Angle Adapter	*	274	31-008	BNC	Tee Adapter	588
27C	82-213	N	Angle Adapter	601	274A	31-208	BNC	Tee Adapter	588
28A	82-99	N	Tee Adapter	601	274B	31-2208	BNC	Tee Adapter	588
29	15000	N	Adapter	*	287	43000	LC	Panel Adapter	*
29A	82-65	N	Adapter	*	287B	51525	LC	Panel Adapter	611
29B	82-101	N	Adapter	601	290	31-003	BNC	Panel Recept.	587
30	82-66	N	Blkh. Adapter	601	290A	31-203	BNC	Panel Recept.	587
30C	82-201	N	Blkh. Adapter	601	290B			Replaced by M39012/22-0001	587
30D	91100	N	Blkh. Adapter	601	291	31-001	BNC	Panel Jack	586
57A	45250	N	Adapter	*	291A	31-020	BNC	Panel Jack	586
57B	82-100	N	Adapter	601	291B	31-201	BNC	Panel Jack	586
58	82-24	N	Panel Recept.	601	291C	31-2201	BNC	Panel Jack	586
58A	82-97	N	Panel Recept.	601	291D			Replaced by M39012/18-0002	586
58B			Replaced by M39012/04-0002	601	306	31-009	BNC	Angle Adapter	588
59A	82-38	HN	Plug	*	306A	31-209	BNC	Angle Adapter	588
59B	82-804	HN	Plug	603	306B	31-2209	BNC	Angle Adapter	588
59D	17900	HN	Plug	*	309	8900	BNC/HN	Adapter	612
60A	82-39	HN	Jack	*	318	26700	N/UHF	Adapter	612
60B	82-814	HN	Jack	603	332	58000	UHF	Binding Post	597
61A	82-40	HN	Panel Jack	*	333	82-55	HN	Jack	603
61B	82-815	HN	Panel Jack	603	333A	82-107	HN	Jack	603
61C	11150	HN	Panel Jack	*	333B	44025	HN	Jack	*
83	14000	N/UHF	Adapter	612	334	82-57	HN	Panel Jack	603
83B	34125	N/UHF	Adapter	612	334A	82-108	HN	Panel Jack	603
85	82-21	BN	Plug	602	335	3025	BNC/N	Adapter	613
87	82-42	BN	Panel Recept.	602	347A	7250	PLUG-IN	Plug	*
88	31-002	BNC	Plug	584	348A	7350	PLUG-IN	Jack	*
88A	14525	BNC	Plug	584	349	2975	BNC/N	Adapter	612
88B	31-018	BNC	Plug	584	349A	31-217	BNC/N	Adapter	612
88C	31-202	BNC	Plug	584	352	82-80	LC	Panel Recept.	611
88D	31-2202	BNC	Plug	584	352A	82-110	LC	Panel Recept.	611
88E	31-3202	BNC	Plug	584	352B	850	LC	Panel Recept.	611
88G			Replaced by M39012/16-0001	585	357	83-21R	UHF	Panel Recept.	595
89	31-005	BNC	Jack	585	358	83-21SP	UHF	Plug	595
89A	31-019	BNC	Jack	585	360	83-21J	UHF	Adapter	596
89B	31-205	BNC	Jack	585	363	83-1F	UHF	Blkh. Adapter	596
89C	31-2205	BNC	Jack	585	372	83-1HP	UHF	Hood	597
89D			Replaced by M39012/17-0001	585	413	9950	HN	Tee Adapter	*
90	1300	BNC	Panel Jack	586	414	47000	BNC	Panel Adapter	588
91A	7200	N	Plug	598	414A	47025	BNC	Panel Adapter	588
92A	7700	N	Jack	599	421	6275	TWIN	Plug	608
93A	7800	N	Panel Jack	600	421B	32225	TWIN	Plug	608
94A	82-84	N	Plug	598	422	6225	TWIN	Panel Recept.	608
95A	82-89	N	Jack	600	423	6175	TWIN	Panel Jack	*
96A	82-90	N	Panel Jack	600	423B	32200	TWIN	Panel Jack	608
102	83-22SP	TWIN	Plug	608	447	31-817	BNC	Panel Recept.	587
103	83-22R	TWIN	Panel Recept.	608	491	8425	BNC	Adapter	588
104	83-22AP	TWIN	Angle Adapter	609	491A	31-218	BNC	Adapter	588
105	83-22J	TWIN	Adapter	609	491B	31-2218	BNC	Adapter	588
106	83-1H	UHF	Hood	597	492A	31-220	BNC	Blkh. Adapter	588
107	4800	N	Tee Adapter	*	492B	31-2220	BNC	Blkh. Adapter	588
107A	82-36	N	Tee Adapter	*	492D	31-3220	BNC	Blkh. Adapter	588
107B	82-102	N	Tee Adapter	601	493A	7925	TWIN	Blkh. Adapter	588
111	83-750	UHF	Holder	595	494	8125	HN	Plug	603
119A/UP	4400	C/R	HOLDER	612	495A	82-111	HN	Plug	*
146	4400	N/UHF	Adapter	612	495D	30350	HN	Plug	*
154	82-59	LC	Plug	611	496	82-92	HN	Panel Recept.	604
155	8325	LC	Adapter	*	498	6050	PLUG-IN	Jack	*
159B	15550	N	Blkh. Jack	*	498A	7650	PLUG-IN	Plug	*
159D			Replaced by M39012/03-0001	600	535	5675	BNC	Angle Panel Recept.	587
160A	82-67	N	Blkh. Jack	*	536	34000	N	Plug	*
160B	82-93	N	Blkh. Jack	600	536B	34025	N	Plug	598
160D	91025	N	Blkh. Jack	*	544	22225	TWIN	Plug	*
160E			Replaced by M39012/03-0002	600	556	35250	N	Blkh. Jack	608
167A	82-104	N	Plug	598	556B	35275	N	Blkh. Jack	613
167D	82-215	N	Plug	598	560	17750	BNC/HN	Adapter	600
167F	82-3215	N	Plug	598	564	82-805	HN	Panel Recept.	604
175	83-185	UHF	Reducing Adapter	597	564	82-508	C/N	Adapter	612
176	83-168	UHF	Reducing Adapter	597	565A	82-540	C/N	Adapter	612
177	83-765	UHF	Hood	597	566A	82-536	C	Tee Adapter	607
177	83-765-1000	UHF	Hood	*	567A	82-535	C	Angle Adapter	607
181A	5450	PULSE	Blkh. Jack	*	568	82-504	C	Panel Recept.	606
182A	5550	PULSE	Plug	*	569	82-505	C	Blkh. Recept.	606
185	4500	BNC	Panel Recept.	587	570	82-502	C	Blkh. Jack	606
188	23250	N	Plug	*	570A	82-614	C	Panel Jack	606
196	83-221	TWIN	Tee Adapter	609	571	82-501	C	Jack	606
201	31-830	BNC/N	Adapter	612	572	82-503	C	Plug	605
201A	31-216	BNC/N	Adapter	612	573A	82-530	C	Plug	605
203	83-776	UHF	Plug	595	573B	28650	C	Plug	*
204A	82-105	N	Plug	*	593	35500	N	Panel Jack	600
204C	82-214	N	Plug	598	594A	15425	N	Angle Plug	599
212A	82-91	HN	Angle Adapter	*	594C			Replaced by M39012/05-0001	599
212B	12100	HN	Angle Adapter	*	602	38500	N	Jack	599
212C	82-115	HN	Angle Adapter	604	603	34500	N	Plug	*
215	3000	LC	Adapter	611	603A	34525	N	Plug	598
216	4350	LC	Angle Adapter	611	624	2075	BNC	Blkh. Recept.	587
224	28500	UHF	Blkh. Adapter	596	625	5575	BNC	Blkh. Recept.	587
231	2750	HN/LC	Panel Recept.	612	625B	31-236	BNC	Blkh. Recept.	587
252	2625	N	Adapter	612	625C			Replaced by M39012/21-0001	587
254A	31-016	BNC	Blkh. Recept.	587	626A	80025	C	Plug	605
255	2900	BNC/UHF	Adapter	612	627A	82-548	C	Plug	605
259A	2500	HN/LC	Adapter	613	628A	82-532	C	Plug	605
280	31-012	BNC	Plug	584	632	82-521	C	Blkh. Jack	606
260A	31-021	BNC	Plug	584	634	82-515	C	Blkh. Recept.	606
260B	31-212	BNC	Plug	584	635	83175	BNC/C	Adapter	612
260C	31-2212	BNC	Plug	584	636A	83200	BNC/C	Adapter	612
260D	31-3212	BNC	Plug	584					

*Available but not shown.

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

UG-()/U No.	Amphenol No.	Type	Description	Page
637	83225	C/UHF	Adapter.	612
642A	83150	C	Adapter.	607
643	82-514	C	Adapter.	607
646	83-1AP	UHF	Angle Adapter.	596
657	31-102	BNC	Bkhh. Recept.	587
657A	31-239	BNC	Bkhh. Recept.	587
680	82-811	N	Bkhh. Recept.	601
680B		Replaced by M39012/04-0001		613
691	89250	BNC/SM	Adapter.	613
692	89125	SM	Plug	*
693	89000	SM	Plug	*
697	89025	SM	Bkhh. Recept.	*
699	89175	SM	Plug	*
700	89200	SM	Bkhh. Jack	*
701	83050	C	Bkhh. Adapter	607
702	83350	C/HN	Adapter.	612
703A	83400	C/HN	Adapter.	612
704	81175	C	Bkhh. Jack	606
704A	74475	C	Bkhh. Jack	*
705	82-511	C	Bkhh. Recept.	606
706	82125	C	Bkhh. Recept.	606
707A	82-533	C	Plug	605
708A	80075	C	Plug	605
709A	82-534	C	Plug	605
710A	82-531	C	Angle Plug	605
711A	80200	C	Plug	605
909	31-208	BNC	Bkhh. Jack	586
909A	31-2205	BNC	Bkhh. Jack	586
909B	31-3206	BNC	Bkhh. Jack	586
909C		Replaced by M39012/19-0001		586
910	31-207	BNC	Bkhh. Jack	586
910A	31-2207	BNC	Bkhh. Jack	586
910B	31-3207	BNC	Bkhh. Jack	586
910C		Replaced by M39012/19-0002		586
911A	31-237	BNC	Bkhh. Recept.	*
912	31-238	BNC	Bkhh. Recept.	587
912A	31-2238	BNC	Bkhh. Recept.	*
913	31-204	BNC	Angle Plug	585
913A	31-2204	BNC	Angle Plug	585
913B		Replaced by M39012/20-0001		585
914	31-219	BNC	Adapter.	588
925	9375	HN	Plug	603
927	33250	HN	Jack	603
928	1100	BNC	Panel Recept.	587
931	27000	MHV	Panel Recept.	594
932	28000	MHV	Plug	593
932A	27975	MHV	Plug	593
935A	82-211	N	Panel Jack	600
935B	82-3211	N	Panel Jack	600
937	82-522	C	Bkhh. Jack	606
938	82-523	C	Panel Jack	606
940A	82-212	N	Jack	599
940B	82-3212	N	Jack	*
941A	82-204	N	Plug	*
941B	82-3204	N	Plug	598
943A	82-538	C	Plug	605
959	6775	BNC	Plug	584
961	28225	MHV	Panel Jack	594
961A	28175	MHV	Panel Jack	*
981	4175	TWIN	Angle Adapter.	609
982	32125	N	Plug	598
997A	8975	N	Angle Panel Recept.	601
1003	12400	N	Plug	598
1016	28250	MHV	Jack	*
1016A	27075	MHV	Jack	594
1019	11050	HN	Bkhh. Adapter	604
1033	84975	BNC	Plug	584
1033G		Replaced by M39012/16-0003		584
1034	5225	BNC/N	Adapter.	612
1050	2225	PLUG-IN	Plug	*
1050A	30775	PLUG-IN	Plug	*
1051	2175	PLUG-IN	Plug	*
1052	36000	N	Panel Jack	*
1055		Replaced by M39012/18-0003		586
1056	84650	BNC	Jack	*
1057	83-2R	TWIN	Panel Recept.	608
1059	83-2J	TWIN	Adapter.	609
1060	83-2SP	TWIN	Plug	608
1094	31-221	BNC	Bkhh. Recept.	587
1094A	31-2221	BNC	Bkhh. Recept.	587
1094B		Replaced by M39012/21-0002		587
1095A	36250	N	Panel Jack	600
1098	31-222	BNC	Bkhh. Angle Rec	587
1098A	31-2222	BNC	Bkhh. Angle Rec	587
1185	82-312	N	Plug	598
1185A	82-3312	N	Plug	598
1185B		Replaced by M39012/01-0005		598
1186	82-313	N	Jack	599
1186B		Replaced by M39012/02-0003		599
1187	82-314	N	Panel Jack	600
1187B		Replaced by M39012/02-0008		*
1213	82-320	HN	Plug	*
1214	82-321	HN	Jack	*
1215	82-324	HN	Panel Jack	*
1460	27-104	SUB.27	Plug	575
1462	27-107	SUB.27	Jack	575
1463	27-102	SUB.27	Bkhh. Jack	575
1464	27-108	SUB.27	Bkhh. Recept.	576
1465	27-106	SUB.27	Plug	575
1467	27-105	SUB.27	Jack	575
1468	27-103	SUB.27	Bkhh. Jack	575
1819	27-101	SUB.27	Bkhh. Recept.	576
1880		Replaced by M39012/01-0006		*
1881		Replaced by M39012/01-0007		*
1882		Replaced by M39012/01-0008		*
1887		Replaced by M39012/02-0007		599
1888		Replaced by M39012/02-0008		*
1889		Replaced by M39012/02-0009		*
1694		Replaced by M39012/02-0014		599
1695		Replaced by M39012/01-0013		598
1696		Replaced by M39012/02-0015		600

UG-()/U No.	Amphenol No.	Type	Description	Page
1697		Replaced by M39012/02-0016		*
1698		Replaced by M39012/02-0017		*
1699		Replaced by M39012/03-0003		600
1700		Replaced by M39012/03-0004		*
1701		Replaced by M39012/03-0005		*
1706		Replaced by M39012/03-0010		600
1707		Replaced by M39012/05-0002		*
1708		Replaced by M39012/05-0003		*
1812		Replaced by M39012/20-0002		585
1813		Replaced by M39012/20-0003		585
M22520() No.	Amphenol No.	Type	Description	Page
5-01	227-944	Tool	Frame Only	614
5-09	227-1221-09	Die Set	BNC/TNC/SMA	614
5-11	227-1221-11	Die Set	BNC/TNC/MHV/UHF/SMA	614
5-13	227-1221-13	Die Set	BNC/TNC/UHF	614
5-15	227-1221-15	Die Set	BNC/TNC	614
5-23	227-1221-23	Die Set	UHF	614
5-25	227-1221-25	Die Set	N	614
5-29	227-1221-29	Die Set	N	614
5-57	227-1221-57	Die Set	N	614
5-59	227-1221-59	Die Set	N	614
M23329() No.	Amphenol No.	Type	Description	Page
3-01-03	31-320	BNC	Plug	*
3-02-04	31-325	BNC	Plug	*
3-05	31-321	BNC	Plug	*
3-06	31-324	BNC	Plug	*
3-07	31-323	BNC	Plug	584
3-08	31-327	BNC	Jack	*
3-09	31-333	BNC	Jack	*
3-12	31-328	BNC	Jack	*
3-13	31-331	BNC	Jack	*
3-14	31-330	BNC	Jack	585
3-15	31-342	BNC	Bkhh. Jack	*
3-16	31-341	BNC	Bkhh. Jack	*
3-19	31-343	BNC	Bkhh. Jack	*
3-20	31-345	BNC	Bkhh. Jack	*
3-21	31-345	BNC	Bkhh. Jack	586
4-01-03	31-2367	TNC	Plug	590
4-02-04	31-2373	TNC	Plug	590
4-05	31-2368	TNC	Plug	590
4-06	31-2370	TNC	Plug	590
4-07	31-2374	TNC	Jack	591
4-08-10	31-2380	TNC	Jack	591
4-11	31-2375	TNC	Jack	591
4-12	31-2377	TNC	Jack	591
4-13	31-2389	TNC	Bkhh. Jack	591
4-14	31-2388	TNC	Bkhh. Jack	591
4-17	31-2390	TNC	Bkhh. Jack	591
4-18	31-2392	TNC	Bkhh. Jack	591
M39012() No.	Amphenol No.	Type	Description	Page
01-0001	82-354	N	Plug	598
01-0002	82-352-1	N	Plug	598
01-0003	82-4365	N	Plug	*
01-0004	82-4366	N	Plug	*
01-0005	82-352	N	Plug	598
01-0006	82-4352	N	Plug	*
01-0007	82-341	N	Plug	*
01-0008	82-340	N	Plug	*
01-0009	82-332	N	Plug	*
01-0011	82-391	N	Plug	*
01-0012	82-392	N	Plug	*
01-0013	82-342	N	Plug	598
01-0015	82-4368	N	Plug	*
01-0025	82-4367	N	Plug	*
01-0501	82-4425	N	Plug	*
01-0502	82-4426	N	Plug	*
01-0503	82-4427	N	Plug	*
02-0001	82-358	N	Jack	599
02-0002	82-356-1	N	Jack	599
02-0002	82-4356-1	N	Jack	*
02-0003	82-356	N	Jack	599
02-0003	82-4356	N	Jack	*
02-0004	82-362	N	Panel Jack	600
02-0005	82-360-1	N	Panel Jack	600
02-0005	82-4360-1	N	Panel Jack	600
02-0006	82-360	N	Panel Jack	600
02-0006	82-4360	N	Panel Jack	*
02-0007	82-338	N	Jack	599
02-0008	82-337	N	Jack	*
02-0009	82-333	N	Jack	*
02-0012	82-394	N	Jack	*
02-0013	82-385	N	Jack	*
02-0014	82-339	N	Jack	599
02-0015	82-344	N	Panel Jack	600
02-0016	82-343	N	Panel Jack	*
02-0017	82-334	N	Panel Jack	*
02-0020	82-4357	N	Jack	599
02-0501	82-4429	N	Jack	*
02-0502	82-4430	N	Jack	*
02-0503	82-4431	N	Jack	*
02-0511	82-4432	N	Panel Jack	*
02-0512	82-4433	N	Panel Jack	*
02-0513	82-4434	N	Panel Jack	*
03-0001	82-366	N	Bulkhead Jack	600
03-0002	82-364	N	Bulkhead Jack	600
03-0002	82-4364	N	Bulkhead Jack	*
03-0003	82-347	N	Bulkhead Jack	600
03-0004	82-346	N	Bulkhead Jack	*
03-0005	82-335	N	Bulkhead Jack	*
03-0008	82-397	N	Bulkhead Jack	*
03-0009	82-398	N	Bulkhead Jack	*
03-0010	82-348	N	Bulkhead Jack	600
03-0012	82-4369	N	Bulkhead Jack	*
03-0501	82-4436	N	Bulkhead Jack	*
03-0502	82-4437	N	Bulkhead Jack	*

*Available but not shown.

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

M39012/() No.	Amphenol No.	Type	Description	Page	M39012/() No.	Amphenol No.	Type	Description	Page
03-0503	82-4438	N	Bulkhead Jack	*	25-0016	31-3017	BNC	Male Shorting Cap.	*
04-0001	82-369	N	Bulkhead Recept.	584	26-0010	31-2252	TNC	Plug	*
04-0002	82-368	N	Panel Receptacle	601	26-0011	31-2253	TNC	Plug	*
05-0001	82-357	N	Angle Plug	599	26-0012	31-2254	TNC	Plug	*
05-0002	82-349	N	Angle Plug	*	26-0013	31-3414	TNC	Plug	*
05-0003	82-336	N	Angle Plug	*	26-0014	31-3415	TNC	Plug	*
05-0501	82-4440	N	Angle Plug	*	26-0501	31-4450	TNC	Plug	*
05-0502	82-4441	N	Angle Plug	*	26-0502	31-4451	TNC	Plug	*
05-0503	82-4442	N	Angle Plug	*	26-0503	31-4452	TNC	Plug	*
16-0001	31-3301	BNC	Plug	584	27-0010	31-2257	TNC	Jack	*
16-0002	31-3302	BNC	Plug	584	27-0011	31-2258	TNC	Jack	*
16-0003	31-3303	BNC	Plug	584	27-0012	31-2259	TNC	Jack	*
16-0004	31-4320-2000	BNC	Plug	*	27-0013	31-3416	TNC	Jack	*
16-0005	31-4326-2000	BNC	Plug	*	27-0014	31-3417	TNC	Jack	*
16-0006	31-4320-2001	BNC	Plug	*	27-0501	31-4454	TNC	Jack	*
16-0007	31-4326-2001	BNC	Plug	*	27-0502	31-4455	TNC	Jack	*
16-0008	31-4321-2000	BNC	Plug	*	27-0503	31-4456	TNC	Jack	*
16-0009	31-4324-2000	BNC	Plug	*	28-0010	31-2262	TNC	Bulkhead Jack	*
16-0012	31-4322-2000	BNC	Plug	*	28-0011	31-2263	TNC	Bulkhead Jack	*
16-0013	31-4320	BNC	Plug	584	28-0012	31-2264	TNC	Bulkhead Jack	*
16-0014	31-4326	BNC	Plug	584	28-0013	31-3418	TNC	Bulkhead Jack	*
16-0015	31-4321	BNC	Plug	584	28-0014	31-3419	TNC	Bulkhead Jack	*
16-0016	31-4324	BNC	Plug	584	28-0501	31-4458	TNC	Bulkhead Jack	*
16-0017	31-4322	BNC	Plug	584	28-0502	31-4459	TNC	Bulkhead Jack	*
16-0019	31-4240-2000	BNC	Plug	*	28-0503	31-4460	TNC	Bulkhead Jack	*
16-0020	31-4240	BNC	Plug	*	29-0010	31-2267	TNC	Panel Jack	*
16-0501	31-4425	BNC	Plug	*	29-0011	31-2268	TNC	Panel Jack	*
16-0502	31-4426	BNC	Plug	*	29-0012	31-2269	TNC	Panel Jack	*
16-0503	31-4427	BNC	Plug	*	29-0013	31-3420	TNC	Panel Jack	*
17-0001	31-3319	BNC	Jack	585	29-0014	31-3421	TNC	Panel Jack	*
17-0002	31-3320	BNC	Jack	585	29-0501	31-4462	TNC	Panel Jack	*
17-0003	31-3321	BNC	Jack	585	29-0502	31-4463	TNC	Panel Jack	*
17-0004	31-4327-2000	BNC	Jack	*	29-0503	31-4464	TNC	Panel Jack	*
17-0005	31-4333-2000	BNC	Jack	*	30-0010	31-2272	TNC	Angle Plug	*
17-0006	31-4327-2001	BNC	Jack	*	30-0011	31-2273	TNC	Angle Plug	*
17-0007	31-4333-2001	BNC	Jack	*	30-0012	31-2274	TNC	Angle Plug	*
17-0008	31-4328-2000	BNC	Jack	*	30-0013	31-4200	TNC	Angle Plug	*
17-0009	31-4331-2000	BNC	Jack	*	30-0014	31-4201	TNC	Angle Plug	*
17-0012	31-4329-2000	BNC	Jack	*	30-0501	31-4473	TNC	Angle Plug	*
17-0013	31-4327	BNC	Jack	585	30-0503	31-4474	TNC	Angle Plug	*
17-0014	31-4333	BNC	Jack	585	31-0001	31-2275	TNC	Bulkhead Recept.	*
17-0015	31-4328	BNC	Jack	585	31-0002	31-2276	TNC	Bulkhead Recept.	*
17-0016	31-4331	BNC	Jack	585	32-0001	31-2277	TNC	Bulkhead Recept.	*
17-0017	31-4329	BNC	Jack	585	34-0001	31-2278	TNC	Bulkhead Recept.	*
17-0019	31-4241-2000	BNC	Jack	*	34-0002	31-2279	TNC	Bulkhead Recept.	*
17-0020	31-4241	BNC	Jack	*	35-0006	82-4509-2001	SC	Plug	*
17-0501	31-4429	BNC	Jack	*	35-0007	82-4551-2001	SC	Plug	*
17-0502	31-4430	BNC	Jack	*	35-0008	82-4510-2001	SC	Plug	*
17-0503	31-4431	BNC	Jack	*	35-0009	82-4511-2000	SC	Plug	*
18-0001	31-3334	BNC	Panel Jack	586	35-0023	82-4508-2000	SC	Plug	*
18-0002	31-3333	BNC	Panel Jack	586	35-0024	82-4551-2000	SC	Plug	*
18-0003	31-3335	BNC	Panel Jack	586	35-0025	82-4510-2000	SC	Plug	*
18-0004	31-4242-2000	BNC	Panel Jack	*	35-0026	82-4511-2001	SC	Plug	*
18-0005	31-4243-2000	BNC	Panel Jack	*	35-0027	82-4512-2000	SC	Plug	*
18-0006	31-4242-2001	BNC	Panel Jack	*	35-0501	82-4450	SC	Plug	605
18-0007	31-4243-2001	BNC	Panel Jack	*	35-0503	82-4451	SC	Plug	605
18-0008	31-4244-2000	BNC	Panel Jack	*	36-0003	82-4552-2001	SC	Jack	*
18-0009	31-4245-2000	BNC	Panel Jack	*	36-0004	82-4513-2000	SC	Jack	*
18-0012	31-4246-2000	BNC	Panel Jack	*	36-0005	82-4514-2000	SC	Jack	*
18-0013	31-4242	BNC	Panel Jack	*	36-0006	82-4515-2000	SC	Jack	*
18-0014	31-4243	BNC	Panel Jack	*	36-0022	82-4552-2000	SC	Jack	*
18-0015	31-4244	BNC	Panel Jack	*	36-0023	82-4513-2001	SC	Jack	*
18-0016	31-4245	BNC	Panel Jack	*	36-0024	82-4514-2001	SC	Jack	*
18-0017	31-4246	BNC	Panel Jack	*	36-0025	82-4515-2001	SC	Jack	*
18-0019	31-4247-2000	BNC	Panel Jack	*	36-0026	82-4516-2000	SC	Jack	*
18-0020	31-4247	BNC	Panel Jack	*	36-0501	82-4457	SC	Jack	605
18-0501	31-4433	BNC	Panel Jack	*	36-0502	82-4458	SC	Jack	605
18-0502	31-4434	BNC	Panel Jack	*	38-0003	82-4553-2001	SC	Panel Jack	*
18-0503	31-4435	BNC	Panel Jack	*	38-0004	82-4517-2000	SC	Panel Jack	*
19-0001	31-3347	BNC	Bulkhead Jack	586	38-0005	82-4518-2000	SC	Panel Jack	*
19-0002	31-3348	BNC	Bulkhead Jack	586	38-0014	82-4553-2000	SC	Panel Jack	*
19-0003	31-4342-2000	BNC	Bulkhead Jack	*	38-0015	82-4517-2001	SC	Panel Jack	*
19-0004	31-4341-2000	BNC	Bulkhead Jack	*	38-0016	82-4518-2001	SC	Panel Jack	*
19-0005	31-4342-2001	BNC	Bulkhead Jack	*	38-0017	82-4519-2000	SC	Panel Jack	*
19-0006	31-4341-2001	BNC	Bulkhead Jack	*	38-0501	82-4460	SC	Panel Jack	*
19-0007	31-4343-2000	BNC	Bulkhead Jack	*	38-0503	82-4461	SC	Panel Jack	*
19-0008	31-4346-2000	BNC	Bulkhead Jack	*	39-0002	82-4554-2000	SC	Angle Plug	*
19-0010	84725	BNC	Bulkhead Jack	586	39-0003	82-4520-2000	SC	Angle Plug	*
19-0012	31-4344-2000	BNC	Bulkhead Jack	*	39-0008	82-4521-2000	SC	Angle Plug	*
19-0013	31-4342	BNC	Bulkhead Jack	586	39-0501	82-4474	SC	Angle Plug	605
19-0014	31-4341	BNC	Bulkhead Jack	586	39-0503	82-4475	SC	Angle Plug	605
19-0015	31-4343	BNC	Bulkhead Jack	586	40-0001	82-4522-2000	SC	Bulkhead Jack	*
19-0016	31-4346	BNC	Bulkhead Jack	586	40-0007	82-4555-2001	SC	Bulkhead Jack	*
19-0017	31-4344	BNC	Bulkhead Jack	586	40-0008	82-4523-2000	SC	Bulkhead Jack	*
19-0019	31-4248-2000	BNC	Bulkhead Jack	*	40-0009	82-4525-2000	SC	Bulkhead Jack	*
19-0020	31-4248	BNC	Bulkhead Jack	*	40-0012	82-4527-2000	SC	Bulkhead Jack	*
19-0501	31-4437	BNC	Bulkhead Jack	*	40-0013	82-4524-2000	SC	Bulkhead Jack	*
19-0502	31-4438	BNC	Bulkhead Jack	*	40-0029	82-4522-2001	SC	Bulkhead Jack	*
19-0503	31-4439	BNC	Bulkhead Jack	*	40-0030	82-4555-2000	SC	Bulkhead Jack	*
20-0001	31-3361	BNC	Angle Plug	585	40-0031	82-4523-2001	SC	Bulkhead Jack	*
20-0002	31-3364	BNC	Angle Plug	585	40-0032	82-4525-2001	SC	Bulkhead Jack	*
20-0003	31-3365	BNC	Angle Plug	585	40-0033	82-4527-2001	SC	Bulkhead Jack	*
20-0501	31-4444	BNC	Angle Plug	*	40-0034	82-4524-2001	SC	Bulkhead Jack	*
20-0502	31-4445	BNC	Angle Plug	*	40-0035	82-4528-2000	SC	Bulkhead Jack	*
20-0503	31-4446	BNC	Angle Plug	*	40-0501	82-4454	SC	Bulkhead Jack	605
21-0001	31-3375	BNC	Bulkhead Receptacle	587	40-0502	82-4455	SC	Bulkhead Jack	*
21-0002	31-3376	BNC	Bulkhead Receptacle	587	55-4001	901-242-12	SMA	Plug	*
21-0003	31-3312	BNC	Bulkhead Receptacle	*	55-4002	901-128-12	SMA	Plug	*
22-0001	31-3377	BNC	Panel Receptacle	587	55-4003	901-243-12	SMA	Plug	*
24-0001	31-4237	BNC	Bulkhead Receptacle	587	55-4004	901-103-12	SMA	Plug	*
24-0002	31-4238	BNC	Bulkhead Receptacle	587	55-4005	901-244-12	SMA	Plug	*
25-0001	82-51	C	Male Cap	*	55-4006	901-242-11	SMA	Plug	*
25-0003	82-49	C	Female Cap	*	55-4007	901-128-11	SMA	Plug	*
25-0006	31-026	BNC	Male Cap	589	55-4008	901-243-11	SMA	Plug	*
25-0008	31-3210	BNC	Female Cap	*	55-4009	901-103-11	SMA	Plug	*
25-0010	99150	BNC	Hood	*	55-4010	901-244-11	SMA	Plug	*
25-0011	82-3106	N	Male Cap	*	55-4011	901-245-12	SMA	Plug	*
25-0013	82-3517	C-HN-N	Armor Clamp	602	55-4012	901-155-12	SMA	Plug	*
25-0014	99175	C-HN-N	Armor Clamp	602	55-4013	901-246-12	SMA	Plug	*
25-0015	31-3027	BNC	Male Cap	*					

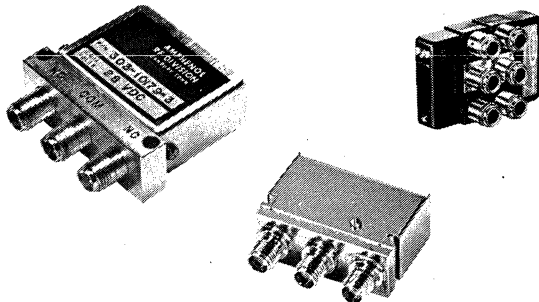
*Available but not shown.

CONNECTORS, TERMINALS, SOCKETS

M39012/() No.	Amphenol No.	Type	Description	Page
55-4014	901-109-12	SMA	Plug	*
55-4015	901-101-12	SMA	Plug	*
55-4016	901-101-14	SMA	Plug	*
55-4017	901-109-14	SMA	Plug	*
55-4018	901-245-11	SMA	Plug	*
55-4019	901-155-11	SMA	Plug	*
55-4020	901-246-11	SMA	Plug	*
55-4021	901-109-11	SMA	Plug	*
55-4022	901-101-11	SMA	Plug	*
55-4024	901-109-13	SMA	Plug	*
55-4025	901-109-15	SMA	Plug	*
55-4026	901-155-11	SMA	Plug	*
55-4027	901-246-11	SMA	Plug	*
55-4028	901-101-11	SMA	Plug	*
55-4029	901-109-11	SMA	Plug	*
55-4502	901-101-15	SMA	Plug	*
56-4001	901-367-12	SMA	Angle Plug	*
56-4002	901-368-12	SMA	Angle Plug	*
56-4003	901-369-12	SMA	Angle Plug	*
56-4004	901-130-12	SMA	Angle Plug	*
56-4005	901-370-12	SMA	Angle Plug	*
56-4006	901-367-11	SMA	Angle Plug	*
56-4007	901-368-11	SMA	Angle Plug	*
56-4008	901-369-11	SMA	Angle Plug	*
56-4009	901-130-11	SMA	Angle Plug	*
56-4010	901-370-11	SMA	Angle Plug	*
56-4502	901-148-15	SMA	Angle Plug	*
57-4001	901-247-12	SMA	Jack	*
57-4002	901-129-12	SMA	Jack	*
57-4003	901-248-12	SMA	Jack	*
57-4004	901-104-12	SMA	Jack	*
57-4005	901-249-12	SMA	Jack	*
57-4006	901-247-11	SMA	Jack	*
57-4007	901-129-11	SMA	Jack	*
57-4008	901-248-11	SMA	Jack	*
57-4009	901-104-11	SMA	Jack	*
57-4010	901-249-11	SMA	Jack	*
57-4011	901-250-12	SMA	Jack	*
57-4012	901-155-12	SMA	Jack	*
57-4013	901-251-12	SMA	Jack	*
57-4014	901-110-12	SMA	Jack	*
57-4015	901-102-12	SMA	Jack	*
57-4016	901-102-14	SMA	Jack	*
57-4017	901-110-14	SMA	Jack	*
57-4018	901-250-11	SMA	Jack	*
57-4019	901-156-11	SMA	Jack	*
57-4020	901-251-11	SMA	Jack	*
57-4021	901-110-11	SMA	Jack	*
57-4022	901-102-11	SMA	Jack	*
57-4023	901-102-13	SMA	Jack	*
57-4024	901-110-13	SMA	Jack	*
57-4025	901-250-11	SMA	Jack	*
57-4026	901-156-11	SMA	Jack	*
57-4027	901-251-11	SMA	Jack	*
57-4028	901-102-11	SMA	Jack	*
57-4029	901-110-11	SMA	Jack	*
57-4502	901-102-15	SMA	Jack	*
58-4001	901-252-12	SMA	Panel Jack	*
58-4002	901-150-12	SMA	Panel Jack	*
58-4003	901-253-12	SMA	Panel Jack	*
58-4004	901-121-12	SMA	Panel Jack	*
58-4005	901-254-12	SMA	Panel Jack	*
58-4006	901-252-11	SMA	Panel Jack	*
58-4007	901-150-11	SMA	Panel Jack	*
58-4008	901-253-11	SMA	Panel Jack	*
58-4009	901-121-11	SMA	Panel Jack	*
58-4010	901-254-11	SMA	Panel Jack	*
58-4502	901-152-15	SMA	Panel Jack	*
59-4001	901-255-12	SMA	Bulkhead Jack	*
59-4002	901-256-12	SMA	Bulkhead Jack	*
59-4003	901-257-12	SMA	Bulkhead Jack	*
59-4004	901-122-12	SMA	Bulkhead Jack	*
59-4005	901-258-12	SMA	Bulkhead Jack	*
59-4006	901-255-11	SMA	Bulkhead Jack	*
59-4007	901-256-11	SMA	Bulkhead Jack	*
59-4008	901-257-11	SMA	Bulkhead Jack	*
59-4009	901-122-11	SMA	Bulkhead Jack	*
59-4010	901-258-11	SMA	Bulkhead Jack	*
59-4502	901-291-15	SMA	Bulkhead Jack	*
60-4001	901-112	SMA	Panel Receptacle	*
61-4001	901-116	SMA	Bulkhead Receptacle	*
61-4002	901-117	SMA	Bulkhead Receptacle	*
62-4001	901-161	SMA	Bulkhead Receptacle	*
62-4002	901-162	SMA	Bulkhead Receptacle	*

*Available but not shown.

**FOR AMPHENOL RF SWITCHES
SEE EEM VOL. 1 PAGE 1928**



*When you can connect it
and forget it,
that's quality.*

AMPHENOL

**BUNKER
RAMO**

RF CONNECTORS

BUNKER
RAMO

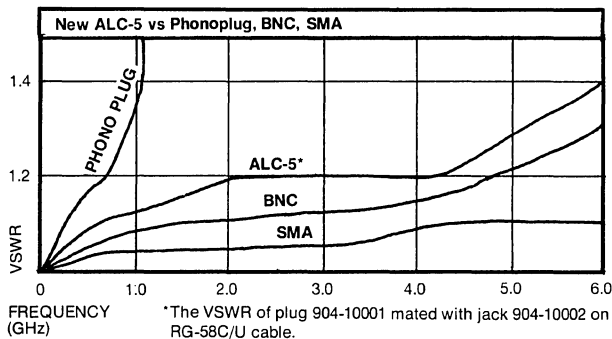
AMPHENOL

New Cost Efficient Sub-Miniature Coax Connector...the ALC-5

Here is the first sub-miniature connector family (under 1" long mated) to combine low price with top performance. Designed for medium to high frequency mobile radio, test equipment and telecommunications applications, the ALC-5 rivals the phono plug in assembled cost and the SUB-Minax 27 Series in size and low reflection performance. VSWR for a mated pair with 2' of RG-58C/U cable is less than 1.22:1 at 1 GHz and under 1.40:1 at 6 GHz.

All ALC-5 cable connectors are crimped to cable. Center contact can be crimped or soldered making possible the use of automated procedures eliminating time-consuming soldering. Hand crimp tools are available incorporating both outer ferrule and center contact dies.

You may have your choice of push-on or snap-on style mating. And, because of the universal design of the ALC-5 jack and receptacle mating faces, they can either slide or lock into position depending upon the plug chosen.



ELECTRICAL

Impedance	50 Ohm nominal
Frequency	0-6. GHz
Voltage Rating	500 VRMS
Dielectric Withstanding Voltage	1500 Volts RMS
VSWR typical mated	0-2. GHz 1.20
cable	2-4. GHz 1.25
assemblies	4-6. GHz 1.40
Insulation Resistance	500 Megohms

ENVIRONMENTAL

Thermal Limits	-67° to 390°F (-55° to 199°C)
Shock (Snap-ons)	MIL-STD-202 Method 107

MECHANICAL

Mating	Push-on or snap-on
Cable affixment to braid or jacket	Crimp
Cable affixment to center conductor	Crimp or solder
Captivated contact	Yes
Cable Assembly	Use Amphenol crimp tool 227-525 Outer ferrule cavity A Center contact cavity B

MATERIAL

Contacts	Male-Brass Female-Beryllium Copper
Other metal parts	Half hard brass
Plating	Center contacts—tin plate Other metal parts—Astroplate
Insulators	Teflon
Crimp Ferrules	Copper—Astroplate

ALC-5 Receptacles

	DESCRIPTION	PART NUMBER	DIMENSIONS INCHES			MAX. PANEL	MTC. HOLE OR DIA.
			A	B	C		
	BLKH. RECEPTACLE PUSH-ON (Plug) FEMALE (Jack) SNAP-ON (Plug)	904-10007	.760	.312	.250	.125	W
		904-10006	.730	.312	.250	.125	W
		904-11007	.760	.312	.250	.125	W
	PANEL RECEPTACLE OVAL FLANGE 2 HOLE MOUNT FEMALE CONTACT	904-10010	.730	.312	.310	—	Y
	PRINTED CIRCUIT RECEPTACLE FEMALE CONTACT	904-10008	.350	.210	.260	.050	Z
	FLUSH MOUNT MALE BLKH. RECEPTACLES PUSH-ON SNAP-ON	904-10027	.814	.500	—	.188	.453
		904-11027	.814	.500	—	.188	.453

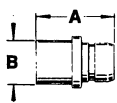
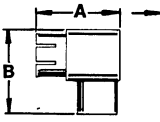
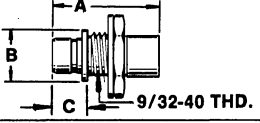
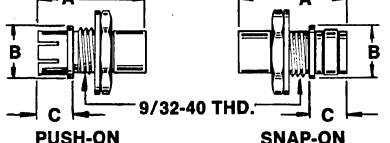
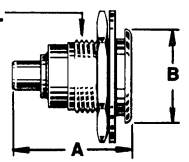
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

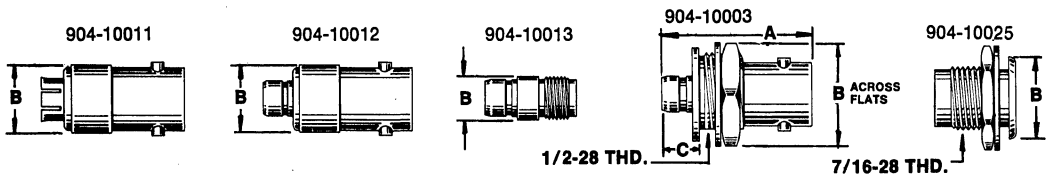
BUNKER
RAMO

AMPHENOL

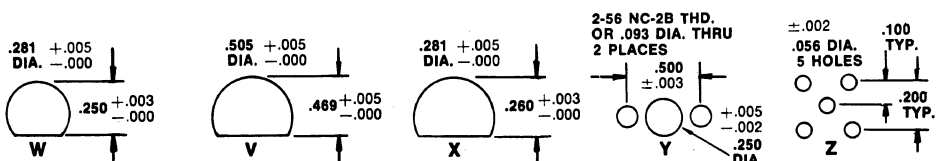
ALC-5 Cable
Connectors

	DESCRIPTION	PART NUMBER	DIMENSIONS INCHES			MAX. PANEL	MTG. HOLE OR DIA.
			A	B	C		
 PUSH-ON PLUG	STRAIGHT PLUGS PUSH-ON RG-58 PUSH-ON RG-188 SNAP-ON RG-58 SNAP-ON RG-188	904-10001 904-10018 904-11001 904-11018	.725 .725 .725 .725	.281 .281 .281 .281	— — — —	— — — —	— — — —
 JACK	STRAIGHT JACK RG-58 RG-188	904-10002 904-10019	.530 .565	.281 .281	— —	— —	— —
 RIGHT ANGLE PUSH-ON	RIGHT ANGLE PLUG PUSH-ON RG-58 PUSH-ON RG-188 SNAP-ON RG-58 SNAP-ON RG-188	904-10009 904-10020 904-11009 904-11020	.550 .550 .550 .550	.580 .612 .580 .612	— — — —	— — — —	— — — —
 BLKH. JACK	BULKHEAD JACK RG-58 RG-188	904-10004 904-10022	.755 .790	.312 .312	.250 .250	.125 .125	W W
 PUSH-ON	BULKHEAD PLUG PUSH-ON RG-58 PUSH-ON RG-188 SNAP-ON RG-58 SNAP-ON RG-188	904-10005 904-10021 904-11005 904-11021	.915 .950 .915 .950	.312 .312 .312 .312	.250 .250 .250 .250	.125 .125 .125 .125	W W W W
 7/16-28 THD.	FLUSH MOUNT BULKHEAD PLUGS PUSH-ON RG-58 PUSH-ON RG-188 SNAP-ON RG-58 SNAP-ON RG-188	904-10026 904-10028 904-11026 904-11028	.970 1.010 .970 1.010	.500 .500 .500 .500	— — — —	.188 .188 .188 .188	.453 .453 .453 .453

Adapters



DESCRIPTION	PART NUMBER	DIMENSIONS INCHES				
		A	B	C	MAX PANEL THICKNESS	MTG. HOLE
ALC-5 PLUG—BNC JACK	904-10011	.920	.390	—	—	—
ALC-5 JACK—BNC JACK	904-10012	.960	.390	—	—	—
ALC-5 JACK—SMA JACK	904-10013	.570	.250	—	—	—
ALC-5 JACK—BNC BULKHEAD JACK	904-10003	.950	.620	.250	.125	V
FLUSH MOUNT BLKH. ADAPTER	904-10025	.500	.500	—	.188	.453 DIA.

MOUNTING
HOLE DIMS.

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

Subminax 27 series connectors are constant impedance (50 or 75 ohm) types with a voltage rating of 500 volts peak and a frequency limit of 10GHZ.

Two types of coupling mechanisms are available: snap-on (push-on) for frequent fast mating and limited space; and screw-on, for vibration type applications, or where maintaining contact is critical. The two types do not intermate nor do 50 and 75 ohm types intermate.

STRAIGHT PLUGS/Teflon Insulation • Female Contacts • Gold Plated

RG-()/U Cables	Military Part Number	Dimensions, inches			Imped- ance (ohms)	Type	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c					
174, 179, 187, 188	—	$\frac{1}{32}$	$\frac{3}{16}$	.120	50	Snap-on	S	Radial Crimp	27-1
	—	$\frac{1}{32}$	$\frac{1}{4}$	.120	50	Screw-on	S	Radial Crimp	27-7
	UG1465/U	$\frac{27}{32}$	$\frac{1}{4}$	.120	50	Screw-on	S	Field Serviceable	27-106
180, 195	—	$\frac{5}{16}$	$\frac{3}{32}$	.165	75	Snap-on	S	Radial Crimp	27-13
	—	$\frac{1}{32}$	$\frac{3}{8}$	.165	75	Screw-on	S	Radial Crimp	27-19
178, 196	—	$\frac{25}{32}$	$\frac{3}{32}$	.090	50	Snap-on	S	Field Serviceable	27-30
	—	$\frac{25}{32}$	$\frac{1}{4}$	.090	50	Screw-on	S	Field Serviceable	27-34
	UG1460/U	$\frac{27}{32}$	$\frac{1}{4}$	.090	50	Screw-on	S	Field Serviceable	27-104

ANGLE PLUGS/Teflon-Kel-F Insulation • Female contacts • Gold Plated

RG-()/U Cables	Military Part Number	Dimensions, inches				Imped- ance (ohms)	Type	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c	d					
174, 179, 187, 188	—	$\frac{3}{16}$	$\frac{3}{16}$	.120	$\frac{15}{32}$	50	Snap-on	S	Radial Crimp	27-6
	—	$\frac{35}{64}$	$\frac{1}{4}$	.120	$\frac{15}{32}$	50	Screw-on	S	Radial Crimp	27-26
180, 195	—	$\frac{35}{64}$	$\frac{3}{32}$	.165	$\frac{17}{32}$	75	Snap-on	S	Radial Crimp	27-18
	—	$\frac{5}{8}$	$\frac{3}{8}$	.165	$\frac{17}{32}$	75	Screw-on	S	Radial Crimp	27-25
178, 196	—	$\frac{3}{16}$	$\frac{3}{16}$	.090	$\frac{1}{16}$	50	Snap-on	S	Field Serviceable	27-33
	—	$\frac{35}{64}$	$\frac{1}{4}$	.090	$\frac{1}{16}$	50	Screw-on	S	Field Serviceable	27-37

STRAIGHT JACKS/Teflon Insulation • Male Contacts • Gold Plated

RG-()/U Cables	Military Part Number	Dimensions, inches			Imped- ance (ohms)	Type	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c					
174, 179, 187, 188	—	$\frac{35}{64}$	$\frac{3}{16}$	.120	50	Snap-on	S	Radial Crimp	27-2
	—	$\frac{1}{32}$	$\frac{3}{16}$	.120	50	Screw-on	S	Radial Crimp	27-8
	UG1467/U	$\frac{3}{4}$	$\frac{1}{4}$	.120	50	Screw-on	S	Field Serviceable	27-105
180, 195	—	$\frac{1}{16}$	$\frac{1}{4}$	.165	75	Snap-on	S	Radial Crimp	27-14
	—	$\frac{1}{32}$	$\frac{3}{16}$	.165	75	Screw-on	S	Radial Crimp	27-20
178, 196	—	$\frac{47}{64}$	$\frac{3}{16}$	.090	50	Snap-on	S	Field Serviceable	27-31
	—	$\frac{3}{4}$	$\frac{3}{16}$	.090	50	Screw-on	S	Field Serviceable	27-35
	UG1462/U	$\frac{3}{4}$	$\frac{1}{4}$	.090	50	Screw-on	N	Field Serviceable	27-107

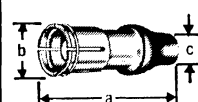
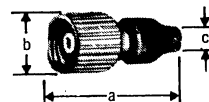
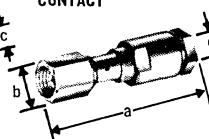
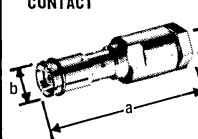
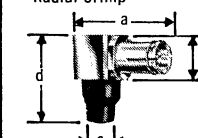
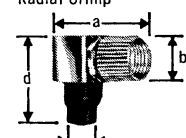
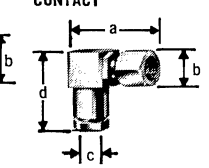
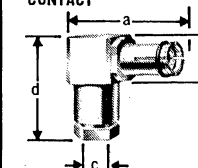
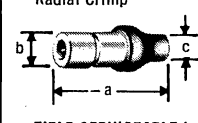
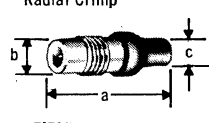
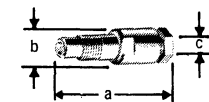
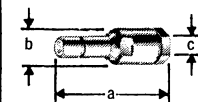
BULKHEAD JACKS

Teflon Insulation • Male Contacts • Gold Plated • $\frac{3}{32}$ " Max. Panel Thickness (e Dim.)

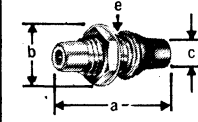
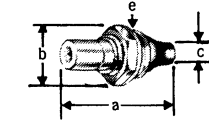
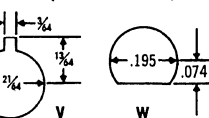
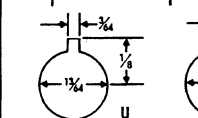
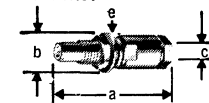
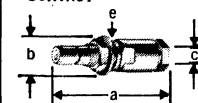
RG-()/U Cables	Military Part Number	Dimensions, inches			Imped- ance (ohms)	Type	Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c						
174, 179, 187, 188	—	$\frac{41}{64}$	$\frac{1}{4}$	.120	50	Snap-on	U	S	Radial Crimp	27-4
	—	$\frac{21}{32}$	$\frac{15}{64}$	.120	50	Screw-on	U	S	Radial Crimp	27-10
	UG1468/U	$\frac{7}{8}$	$\frac{1}{4}$	.120	50	Screw-on	W	S	Field Serviceable	27-103
180, 195	—	$\frac{41}{64}$	$\frac{3}{8}$	.165	75	Snap-on	V	S	Radial Crimp	27-16
	—	$\frac{21}{32}$	$\frac{3}{8}$	.165	75	Screw-on	V	S	Radial Crimp	27-22
178, 196	—	$\frac{13}{16}$	$\frac{15}{64}$	.090	50	Snap-on	U	S	Field Serviceable	27-32
	—	$\frac{53}{64}$	$\frac{15}{64}$	.090	50	Screw-on	U	S	Field Serviceable	27-36
	UG1463/U	$\frac{7}{8}$	$\frac{1}{4}$	.090	50	Screw-on	W	N	Field Serviceable	27-102

*Stock Code: S = Stock N = Non Stock

SUBMINAX 27

SNAP-ON
Radial CrimpFIELD SERVICEABLE/
SEMI-CAPTIVATED
CONTACTSCREW-ON
Radial CrimpFIELD SERVICEABLE/
SEMI-CAPTIVATED
CONTACTSNAP-ON
Radial CrimpFIELD SERVICEABLE/
SEMI-CAPTIVATED
CONTACTSCREW-ON
Radial CrimpFIELD SERVICEABLE/
SEMI-CAPTIVATED
CONTACTSNAP-ON
Radial CrimpFIELD SERVICEABLE/
SEMI-CAPTIVATED
CONTACTSCREW-ON
Radial CrimpFIELD SERVICEABLE/
SEMI-CAPTIVATED
CONTACT

BULKHEAD JACKS

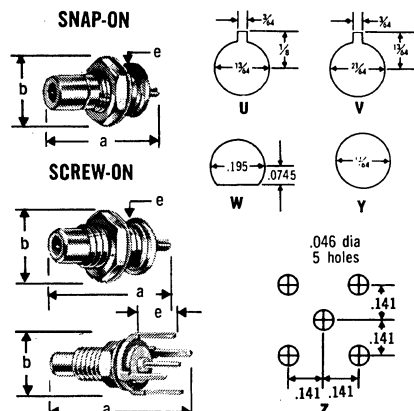
SNAP-ON
Radial CrimpFIELD SERVICEABLE/
SEMI-CAPTIVATED
CONTACTSCREW-ON
Radial CrimpFIELD SERVICEABLE/
SEMI-CAPTIVATED
CONTACT

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

SUBMINAX 27



BULKHEAD RECEPTACLES

Teflon Insulation • Male Contacts • Gold Plated • Rear Mount

Military Part Number	Dimensions, inches			Impedance (Ohms)	Type	Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
	a	b	Max. Panel Thickness e						
—	37/64	1/4	3/32	50	Snap-on	U	S	—	27-3
—	45/64	11/32	3/32	50	Snap-on	Y	S	Hermetically Sealed	27-27
—	19/32	15/64	3/32	50	Screw-on	U	S	—	27-9
—	47/64	11/32	3/32	50	Screw-on	Y	S	Hermetically Sealed	27-12
UG1619/U	5/8	1/4	3/32	50	Screw-on	W	S	—	27-101
—	37/64	3/8	3/32	75	Snap-on	V	S	—	27-15
—	23/32	15/32	3/32	75	Snap-on	—	S	Hermetically Sealed Mtg. Hole 3/4 dia.	27-45
—	19/32	3/8	3/32	75	Screw-on	V	S	—	27-21
—	11/16	15/32	3/32	75	Screw-on	—	S	Hermetically Sealed Mtg. Hole 2 1/4 dia.	27-24
UG1464/U	41/64	1/4	3/32	50	Screw-on	W	S	Front Mount	27-108
—	43/64	19/64	3/16	50	Screw-on	Z	S	Printed Circuit	27-800

BULKHEAD ADAPTERS/Teflon Insulation • Gold Plated

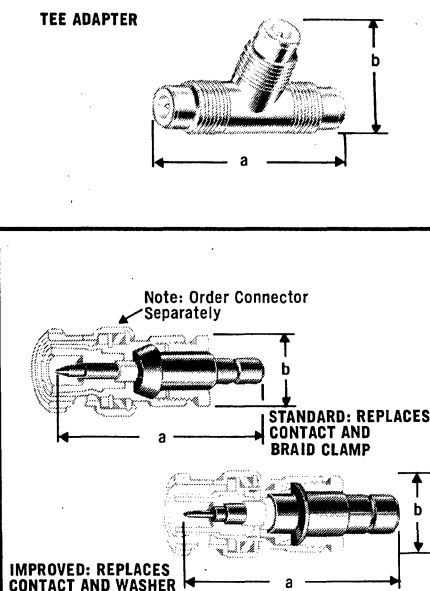
Dimensions, inches			Impedance (Ohms)	Type	Adapter Ends	Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
a	b	Max. Panel Thickness e							
5/8	1/4	3/32	50	Snap-on	Jack-Jack	U	S	—	27-5
2 1/2	15/64	3/32	50	Screw-on	Jack-Jack	U	S	—	27-11
5/8	3/8	3/32	75	Snap-on	Jack-Jack	V	S	—	27-17
2 1/2	3/8	3/32	75	Screw-on	Jack-Jack	V	S	—	27-23

TEE ADAPTERS/Teflon Insulation • Male Contacts • Gold Plated

Dimensions, inches			Impedance (Ohms)	Type	Adapter Ends	Stock Code *	Notes	Amphenol Part Number
a	b							
1.050	.681		75	Screw-on	Jack-Jack-Jack	S	—	27-70

SUBMINAX 27 TO BNC & TNC ADAPTERS/Teflon Insulation

Dimensions, inches		Adapter Ends		Use With Connector No.	Construction	Stock Code *	Notes	Amphenol Part Number
a	b	Subminax Jack	To					
1 1/16	.333	50 Ohm Screw-on	BNC Plug	31-002(UG88/U)	UG Standard	S	—	27-28
1 1/16	.333		BNC Jack	31-005(UG89/U)	UG Standard	S	—	27-40
1 1/16	.333		BNC Panel Jack	31-001(UG291/U)	UG Standard	S	—	27-40
1 1/16	.333	50 Ohm Snap-on	BNC Plug	31-002(UG88/U)	UG Standard	S	—	27-29
1 1/16	.333		BNC Plug	31-212(UG260B/U)	Improved	S	—	27-805
1.355	.393		BNC Jack	31-215(UG261B/U)	Improved	N	—	27-42
1.355	.393	75 Ohm Screw-on	BNC Panel Jack	31-211(UG262B/U)	Improved	N	—	27-42
1 1/16	.393		TNC Plug	79525	Improved	S	—	27-805
1.355	.393		TNC Jack	79500	Improved	N	—	27-42
1 1/4	.395	75 Ohm Snap-on	BNC Plug	31-212(UG260B/U)	Improved	S	—	27-41
1 1/4	.395		TNC Jack	79525	Improved	S	—	27-41



AMPHENOL SUBMINAX 27 Series adapters quickly convert standard or improved type BNC and TNC plugs and jacks into between series adapters. The adapter replaces the contact and braid clamp in connectors with standard-type clamping parts. In the improved versions, the adapter replaces the contact and washer. No solder or crimping is required...modification is quick and easy.

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

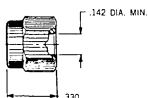
RF CONNECTORS

BUNKER
RAMO

AMPHENOL

CABLE CONNECTORS/Stainless Steel

.141 Dia. Semi-Rigid Cable



STRAIGHT PLUG
P/N 901-9183-1

A unique solder-type plug for copper jacketed cable. It is extremely short, designed for applications where space is critical and minimum bend radius is required. This connector uses the cable center conductor and TFE insulation as its mating face.

SMA SERIES

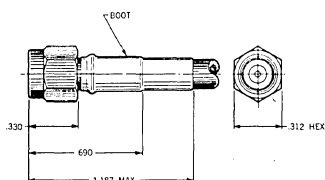
SMA's are 50 ohm, semi-precision, sub-miniature (3mm), high-frequency (0-18 GHz) connectors with 1/4-36 threaded coupling. They meet all MIL-C-39012 requirements for SMA connectors and are available in stainless steel or beryllium copper.

RG-174, 188A, 316/U CABLE/Solder Type • Captivated Contact



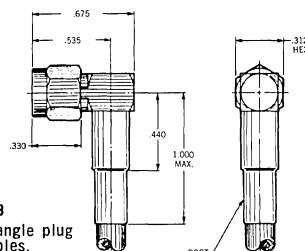
STRAIGHT PLUG
P/N 901-9501-3

A solder type plug for flexible cables.



ANGLE PLUG
P/N 901-9521-3

A solder type angle plug for flexible cables.

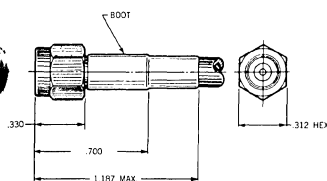


RG-174, 188A, 316/U CABLE/Crimp Type • Captivated Contact



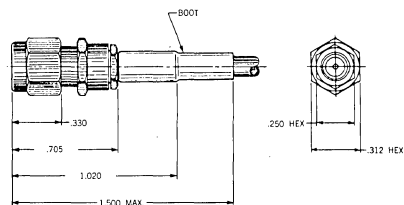
STRAIGHT PLUG
P/N 901-9511-3

A crimp type plug for flexible cables.



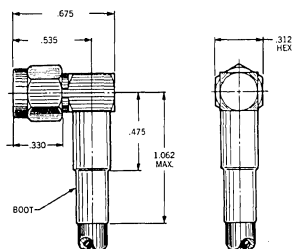
STRAIGHT PLUG
P/N 901-9601-3

A crimp type plug for flexible cables.



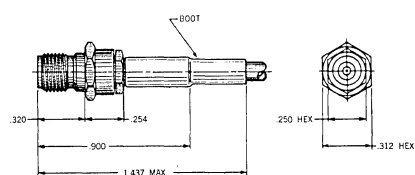
ANGLE PLUG
P/N 901-9531-3

A crimp type angle plug for flexible cables.

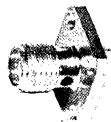


STRAIGHT JACK
P/N 901-9602-3

A crimp type jack for flexible cables.



RECEPTACLES/Stainless Steel • Epoxy Captivated Contacts



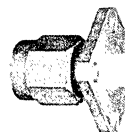
SQ. FLANGE MTD.
P/N 901-9204CC

TFE insulation and blunt terminal exposed in rear for direct substrate or circuit board affixment.



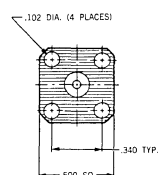
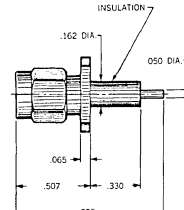
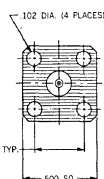
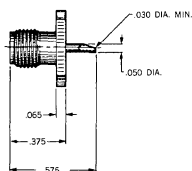
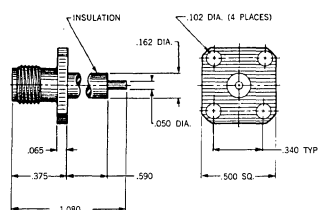
SQ. FLANGE MTD.
P/N 901-9215

Solder cup terminal exposed in rear for direct wire or cable affixment.



SQ. FLANGE MTD.
P/N 901-9214CC

TFE insulation and blunt terminal exposed in rear for direct substrate or circuit board affixment.



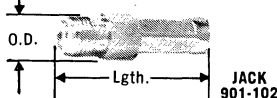
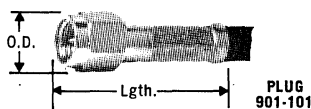
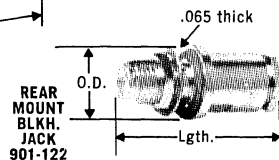
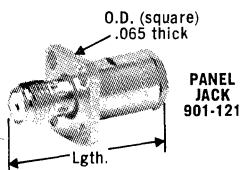
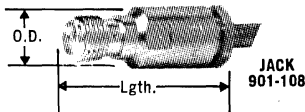
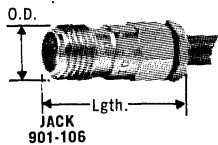
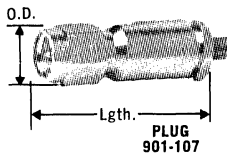
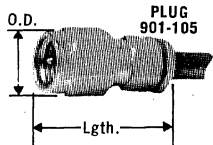
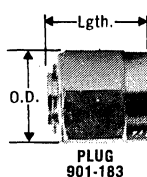
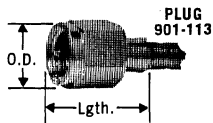
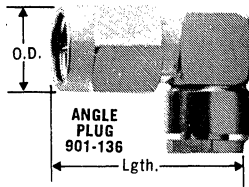
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

SMA SERIES



CABLE CONNECTORS/Beryllium Copper

Dimensions, inches		Cable Entry	Mtg. Hole	Config- uration	Cable Affixment	Description	Amphenol Part Number
Length	O.D.						

.085" DIA. SEMI-RIGID CABLE

$\frac{43}{64}$	$\frac{5}{16}$ hex	.088	—	Plug	Solder	With contact & insulator	901-126
$\frac{11}{16}$	$\frac{5}{16}$ hex	.088	—	Plug	Solder	Angle	901-136■
$\frac{41}{64}$	$\frac{1}{4}$ hex	.088	—	Jack	Solder	Straight	901-127
$\frac{41}{64}$	$\frac{1}{2}$ sq.	.088	Y	Jack	Solder	Panel mounted	901-151
$\frac{41}{64}$	$\frac{7}{16}$ hex	.088	Z	Jack	Solder	Bulkhead mounted, rear	901-158
$\frac{57}{64}$	$\frac{3}{8}$ hex	.088	X	Jack	Solder	Bulkhead mounted, rear	901-193

.141" DIA. SEMI-RIGID CABLE

$\frac{1}{2}$	$\frac{5}{16}$ hex	.144	—	Plug	Solder	Less contact & insulator	901-113■
$\frac{21}{64}$	$\frac{5}{16}$ hex	.144	—	Plug	Solder	Less C & I, short skirt	901-183■
$\frac{43}{64}$	$\frac{5}{16}$ hex	.144	—	Plug	Solder	With contact & insulator	901-105■
$\frac{21}{32}$	$\frac{5}{16}$ hex	.144	—	Plug	Solder	Angle, with C & I	901-142
$\frac{63}{64}$	$\frac{11}{32}$ dia.	.144	—	Plug	Clamp	Less contact & insulator	901-111
$\frac{63}{64}$	$\frac{11}{32}$ dia.	.144	—	Plug	Clamp	With contact & insulator	901-107■
$\frac{41}{64}$	$\frac{1}{4}$ hex	.144	—	Jack	Solder	Straight	901-106■
$\frac{41}{64}$	$\frac{1}{2}$ sq.	.144	Y	Jack	Solder	Panel mounted	901-141
$\frac{41}{64}$	$\frac{7}{16}$ hex	.144	Z	Jack	Solder	Bulkhead mounted, rear	901-157
$\frac{57}{64}$	$\frac{3}{8}$ hex	.144	X	Jack	Solder	Bulkhead mounted, rear	901-195
$\frac{59}{64}$	$\frac{11}{32}$ dia.	.144	—	Jack	Clamp	Straight	901-108■
$\frac{59}{64}$	$\frac{7}{16}$ dia.	.144	Z	Jack	Clamp	Bulkhead mounted, rear	901-159

RG-55, 58, 141, 142, 223/U CABLE (Clamp Type)

$\frac{31}{32}$	$\frac{11}{32}$ dia.	.219	—	Plug	Clamp	Straight	901-103
$\frac{11}{16}$	$\frac{5}{16}$ hex	.220	—	Plug	Clamp	Angle	901-130
$\frac{15}{16}$	$\frac{11}{32}$ dia.	.219	—	Jack	Clamp	Straight	901-104
$\frac{15}{16}$	$\frac{1}{2}$ sq.	.219	Y	Jack	Clamp	Panel mounted	901-121■
$\frac{15}{16}$	$\frac{7}{16}$ dia.	.219	Z	Jack	Clamp	Bulkhead mounted, rear	901-122■

Dimensions, inches		Cable Entry	Mtg. Hole	Config- uration	Cable Affixment	Description	Amphenol Part Number
Length	O.D.						

RG-55, 142, 223/U CABLE (Crimp Type)

$\frac{11}{32}$	$\frac{5}{16}$ hex	.220	—	Plug	Crimp	Straight	901-101■
1	$\frac{1}{4}$ hex	.220	—	Jack	Crimp	Straight	901-102■
1	$\frac{1}{2}$ sq.	.220	Y	Jack	Crimp	Panel mounted	901-152

RG-58, 141, 303/U CABLE (Crimp Type)

$\frac{29}{32}$	$\frac{5}{16}$ hex	.206	—	Plug	Crimp	Straight	901-109
$\frac{7}{8}$	$\frac{1}{4}$ hex	.206	—	Jack	Crimp	Straight	901-110
1	$\frac{1}{2}$ sq.	.206	Y	Jack	Crimp	Panel mounted	901-153

RG-174, 188, 316/U CABLE

$\frac{15}{16}$	$\frac{11}{32}$ dia.	.114	—	Plug	Clamp	Straight	901-129
$\frac{63}{64}$	$\frac{11}{32}$ dia.	.114	—	Plug	Clamp	Straight	901-128
$\frac{11}{16}$	$\frac{5}{16}$ hex	.114	—	Plug	Clamp	Angle	901-140

RG-180, 195/U CABLE

$\frac{63}{64}$	$\frac{11}{32}$ dia.	.158	—	Plug	Clamp	Straight	901-139
$\frac{3}{4}$	$\frac{5}{16}$ hex	.175	—	Plug	Crimp	Straight	901-192
$\frac{15}{16}$	$\frac{1}{2}$ sq.	.158	Y	Jack	Clamp	Panel mounted	901-220

DOUBLE BRAIDED RG-188 TYPE (.126 Max. Dia.)

$\frac{63}{64}$	$\frac{11}{32}$ dia.	.130	—	Plug	Clamp	Straight	901-174
$\frac{11}{16}$	$\frac{5}{16}$ hex	.130	—	Plug	Clamp	Angle	901-172
$1\frac{1}{2}$	$\frac{3}{8}$ hex	.130	X	Jack	Clamp	Bulkhead mounted, rear	901-173

■ Illustrated

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

RECEPTACLES Beryllium Copper

Dimensions, inches			☐ Mtg. Hole	Description	Amphenol Part Number
Length	O.D.	Max. Panel Thickness			

STRIP TRANSMISSION LINE

.548	$\frac{5}{16}$ dia.	—	U	Plug for .031 board	901-132-1
.580	$\frac{5}{16}$ dia.	—	U	Plug for .063 board	901-132-2
.642	$\frac{5}{16}$ dia.	—	U	Plug for .125 board	901-132-3
$\frac{7}{16}$	$\frac{1}{4}$ dia.	—	U	Angle jack .031 board	901-133-1
$\frac{7}{16}$	$\frac{1}{4}$ dia.	—	U	Angle jack .063 board	901-133-2
$\frac{7}{16}$	$\frac{1}{4}$ dia.	—	U	Angle jack .125 board	901-133-3
.416	$\frac{5}{16}$ dia.	—	U	Jack for .031 board	901-131-1
.448	$\frac{5}{16}$ dia.	—	U	Jack for .063 board	901-131-2
.510	$\frac{5}{16}$ dia.	—	U	Jack for .125 board	901-131-3
.416	$\frac{13}{32}$ dia.	—	V	Jack for .031 board	901-182-1
.448	$\frac{13}{32}$ dia.	—	V	Jack for .063 board	901-182-2
.510	$\frac{13}{32}$ dia.	—	V	Jack for .125 board	901-182-3

PRINTED CIRCUIT RECEPTACLES

$\frac{1}{32}$	$\frac{1}{4}$ sq.	$\frac{5}{32}$ pins	T	Straight receptacle	901-144
.585	$\frac{1}{4}$ sq.	$\frac{5}{32}$ pins	T	Angle receptacle	901-143

RECEPTACLES/PANEL MOUNTED (Standard Square Flange)

$1\frac{1}{4}$	$\frac{1}{2}$ sq.	—	Y	.590 insulated blunt terminal	901-176-1
$1\frac{1}{4}$	$\frac{1}{2}$ sq.	—	Y	with captivated contact	901-176-2
1	$\frac{1}{2}$ sq.	—	Y	Plug, .330 insulated blunt terminal	901-196-1
1	$\frac{1}{2}$ sq.	—	Y	with captivated contact	901-196-2
$\frac{15}{32}$	$\frac{1}{2}$ sq.	—	Y	Tab terminal	901-197-1
$\frac{15}{32}$	$\frac{1}{2}$ sq.	—	Y	with captivated contact	901-197-2
$\frac{5}{16}$	$\frac{1}{2}$ sq.	—	Y	Solder cup, captivated contact	901-112
$\frac{45}{64}$	$\frac{1}{2}$ sq.	—	Y	Angle solder cup	901-124

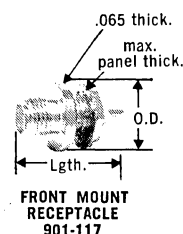
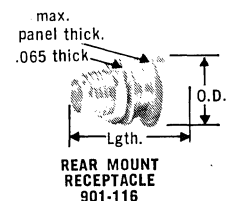
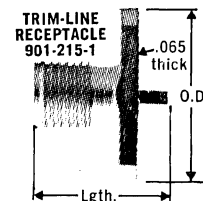
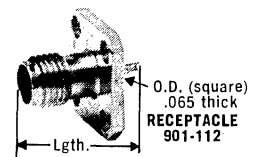
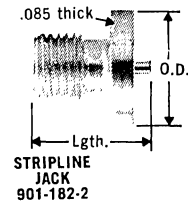
RECEPTACLES/PANEL MOUNTED (Trim-Line Flange)

$\frac{5}{8}$	$\frac{5}{8}$	—	W	Slotted terminal	901-213
$\frac{37}{64}$	$\frac{5}{8}$	—	W	Solder cup, captivated contact	901-214
$\frac{15}{32}$	$\frac{5}{8}$	—	W	Tab terminal	901-215-1
$\frac{15}{32}$	$\frac{5}{8}$	—	W	with captivated contact	901-215-2

RECEPTACLES/BULKHEAD MOUNTED

$2\frac{1}{32}$	$\frac{1}{8}$ dia.	.103	Z	Rear, solder cup, gasket	901-116
$2\frac{1}{32}$	$\frac{1}{8}$ dia.	.103	Z	Rear, solder cup	901-134
$\frac{43}{64}$	$\frac{5}{16}$ hex	.125	X	Rear, solder cup	901-190
$2\frac{1}{32}$	$\frac{1}{8}$ dia.	.103	Z	Rear, hermetic, flat & pierced	901-161
$1\frac{1}{16}$	$\frac{1}{8}$ dia.	.103	Z	Front, hermetic, flat & pierced	901-162
$1\frac{1}{16}$	$\frac{1}{8}$ dia.	.103	Z	Front, solder cup, gasket, cc	901-117
$2\frac{1}{32}$	$\frac{5}{16}$ hex	—	$\frac{1}{4}$ -36	Front, blunt terminal, $\frac{1}{4}$ -36 thread, cc	901-206

SMA SERIES

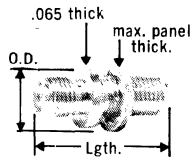
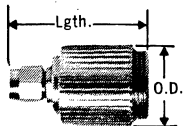
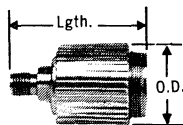
☐ Mtg. Hole Dimensions on Following Page.FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

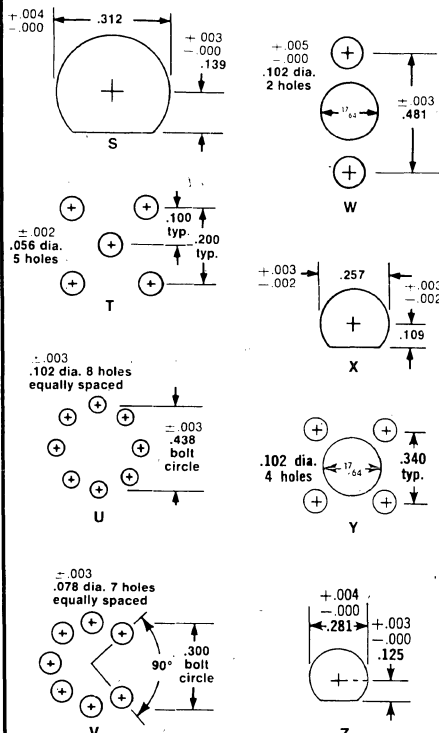
BUNKER
RAMO

AMPHENOL

SMA SERIES

ADAPTER
901-120APC-7
ADAPTER
131-1028APC-7
ADAPTER
131-1038

SMA MTG. HOLE DIMENSIONS



ADAPTERS

Dimensions, inches			Mtg. Hole	Description	Amphenol Part Number
Length	O.D.	Max. Panel Thickness			

ADAPTERS WITHIN SERIES

$\frac{5}{64}$	$\frac{5}{16}$ hex	—	—	Straight, plug-plug	901-118
$\frac{1}{32}$	$\frac{1}{4}$ dia.	—	—	Straight, jack-jack	901-119
$\frac{1}{16}$	$\frac{3}{8}$ dia.	.103	Z	Bulkhead, jack-jack	901-120■
$\frac{7}{8}$	$\frac{3}{8}$ hex	.250	Z	Bulkhead, jack-jack	901-191
$\frac{7}{8}$	$\frac{3}{16}$ hex	.187	S	Bulkhead, herm., jack-jack	901-160
$\frac{5}{8}$	$\frac{5}{16}$ hex	—	—	Angle, plug-jack	901-125

ADAPTERS BETWEEN SERIES

$1\frac{1}{32}$	$\frac{1}{16}$	—	—	APC-7 — SMA jack	131-1028■
$1\frac{3}{8}$	$\frac{1}{16}$	—	—	APC-7 — SMA plug	131-1038■
$1\frac{3}{4}$	$\frac{1}{16}$	—	—	APC-N plug — SMA plug	131-1074
$1\frac{5}{8}$	$\frac{1}{16}$	—	—	APC-N plug — SMA jack	131-1075
$1\frac{23}{64}$	$\frac{5}{8}$	—	—	APC-N-jack — SMA plug	131-1076
$1\frac{1}{32}$	$\frac{5}{8}$	—	—	APC-N jack — SMA jack	131-1077
$1\frac{3}{32}$	$\frac{5}{16}$	—	—	BNC plug — SMA plug	901-164
$1\frac{1}{16}$	$\frac{5}{16}$	—	—	BNC plug — SMA jack	901-165
$1\frac{5}{32}$	$\frac{5}{16}$	—	—	BNC jack — SMA plug	901-166
$1\frac{1}{8}$	$\frac{5}{16}$	—	—	BNC jack — SMA jack	901-167
$1\frac{1}{8}$	$\frac{1}{32}$	—	—	TNC plug — SMA plug	901-168
$1\frac{3}{32}$	$\frac{1}{32}$	—	—	TNC plug — SMA jack	901-169
$1\frac{5}{32}$	$\frac{5}{16}$	—	—	TNC jack — SMA plug	901-170
$1\frac{1}{8}$	$\frac{5}{16}$	—	—	TNC jack — SMA jack	901-171

ACCESSORIES

CAP AND CHAIN P/N 901-163. Non shorting, plug, $\frac{29}{64}$ long by $\frac{5}{16}$ hex, 2" long chain with .130 dia. eyelet.

TOOL KIT P/N 901-2500. Contains recommended jacket and dielectric trim tools for precise cable preparation required to obtain the electrical performance specified. Accessory Tool P/N 901-2400 available for Cujak center conductor trimming.

CABLE ASSEMBLIES. Custom semi-precision cable assemblies are available with .141" and .085" dia. semi-rigid Cujak cable fitted with SMA connectors. Contact factory with your specifications.

■ Illustrated

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

MB series are very small bayonet-lock connectors which are used with subminiature and miniature cables. These connectors offer good electrical and mechanical performance at low cost. They are non-constant impedance connectors and have a peak voltage rating of 500 V and a frequency limit of 500 MHZ.

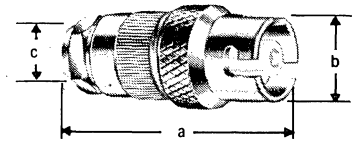
Solderless contacts are available in some connectors, as noted and are merely assembled to the center conductor (friction fit).

Crimp designs are offered which require only a simple pair of standard pliers for the crimping operation.

STRAIGHT PLUGS

Non-constant impedance • Female contacts • Non-weatherproof

RG-()/U Cable	Dimensions, inches			Construction	Insulation	Stock Code *	Notes	Amphenol Part Number
	a	b	Max. Cable O.D. c					
55, 58, 141, 152	$\frac{1}{32}$	$\frac{3}{8}$	.214	Jacket Clamp	Kel-F	S	—	49200
58, 141	$\frac{23}{32}$	$\frac{3}{8}$	.203	Standard Clamp	Nylon	S	—	45050
	$\frac{23}{32}$	$\frac{3}{8}$	.203	Standard Clamp	Kel-F	S	—	45525
58	$\frac{23}{32}$	$\frac{3}{8}$	.203	Standard Clamp	Nylon	S	Solderless Contact	45000
59, 62, 140, 210	$\frac{27}{32}$	$\frac{3}{8}$	.255	Standard Clamp	Kel-F	N	—	44800
	$\frac{27}{32}$	$\frac{3}{8}$	.255	Hooded Clamp	Kel-F	S	—	45550
59, 140	$\frac{1}{32}$	$\frac{3}{8}$	.255	Jacket Clamp	Kel-F	N	Solderless Contact	47800
122, 180, 195	$\frac{23}{32}$	$\frac{3}{8}$	.177	Standard Clamp	Nylon	S	—	45075
180	$\frac{23}{32}$	$\frac{3}{8}$	.148	Standard Clamp	Kel-F	S	—	45700
180, 195	$\frac{25}{32}$	$\frac{3}{8}$	.158	Crimp	Kel-F	S	—	48850
174, 179, 187, 188	$\frac{13}{16}$	$\frac{3}{8}$	.126	Crimp	Kel-F	S	—	44950
	$\frac{23}{32}$	$\frac{3}{8}$	.126	Crimp	Nylon	S	—	45125
	$\frac{25}{32}$	$\frac{3}{8}$	.119	Crimp	Kel-F	S	—	48825
174, 179	$\frac{23}{32}$	$\frac{3}{8}$	.104	Crimp	Nylon	S	—	45650
179, 187, 188	$\frac{47}{64}$	$\frac{3}{8}$	.128	Crimp	Kel-F	S	—	47750
178, 196	$\frac{25}{32}$	$\frac{3}{8}$	.081	Crimp	Nylon	S	—	45100
	$\frac{23}{32}$	$\frac{3}{8}$	.091	Crimp	Nylon	S	—	45175

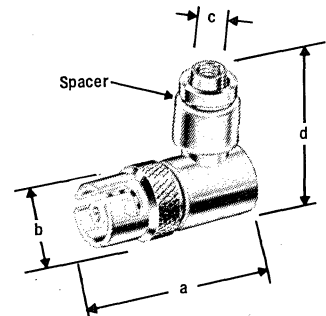


ANGLE PLUGS

Non-constant Impedance • Female Captivated Contacts • Non-weatherproof

RG-()/U Cable	Dimensions, inches				Construction	Insulation	Stock Code *	Notes	Amphenol Part Number
	a	b	Max. Cable O.D. c	d					
55, 58, 141, 142	$\frac{3}{4}$	$\frac{3}{8}$	.214	1	Jacket Clamp	Kel-F	S	—	49225
58, 141	$\frac{3}{4}$	$\frac{3}{8}$	.197	$\frac{27}{32}$	Standard Clamp	Kel-F	N	—	45350
	$\frac{3}{4}$	$\frac{3}{8}$	.207	$\frac{25}{32}$	Hooded Clamp	Nylon	S	—	53000
59, 62, 140, 210	$\frac{3}{4}$	$\frac{3}{8}$	.255	$\frac{31}{32}$	Jacket Clamp	Kel-F	S	—	48150
	$\frac{3}{4}$	$\frac{3}{8}$	.255	$\frac{13}{16}$	Hooded Clamp	Kel-F	S	—	53525
174	$\frac{3}{4}$	$\frac{3}{8}$	.104	$\frac{27}{32}$	Crimp	Kel-F	S	—	45775
174, 179, 187, 188	$\frac{3}{4}$	$\frac{3}{8}$	.119	$\frac{25}{32}$	Crimp	Kel-F	S	—	48800
178, 196	$\frac{3}{4}$	$\frac{3}{8}$	.091	$\frac{27}{32}$	Crimp	Kel-F	N	—	45400
180, 195	$\frac{3}{4}$	$\frac{3}{8}$	.158	$\frac{23}{32}$	Crimp	Kel-F	S	—	49600

*Stock Code: S = Stock N = Non Stock

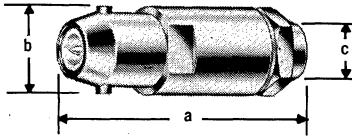
FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

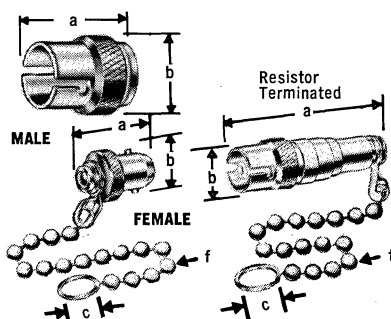
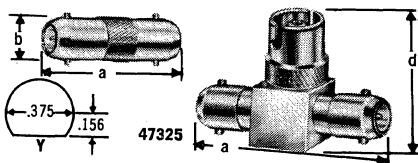
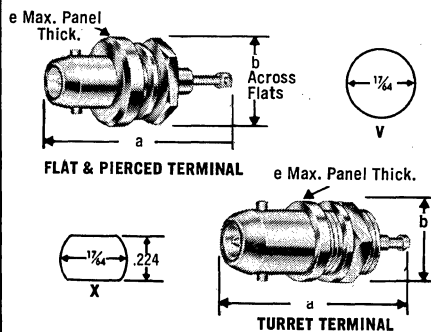
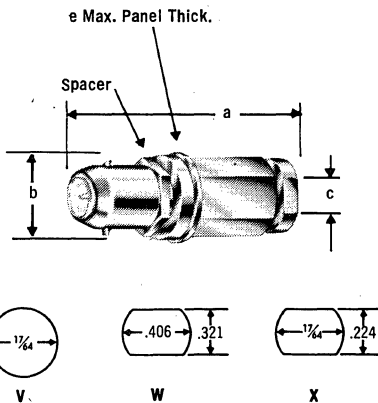
BUNKER
RAMO

AMPHENOL

MB SERIES



Straight



STRAIGHT JACKS

Non-constant Impedance • Male Contacts • Non-weatherproof

RG-(-)/U Cable	Dimensions, inches			Construction	Insulation	Stock Code *	Notes	Amphenol Part Number
	a	b	Max. Cable O.D. c					
55, 58, 141, 142	1 ⁵ / ₁₆	5 ¹ / ₁₆	.214	Jacket Clamp	Kel-F	N	—	49825
58, 141	3 ¹ / ₄	5 ¹ / ₁₆	.203	Standard Clamp	Kel-F	N	—	46700
59, 62, 140, 210	1 ⁵ / ₁₆	5 ¹ / ₁₆	.255	Hooded Clamp	Kel-F	N	—	46775
174, 179, 187, 188	3 ¹ / ₄	5 ¹ / ₁₆	.119	Crimp	Kel-F	N	—	48950
180, 195	3 ¹ / ₄	5 ¹ / ₁₆	.157	Crimp	Kel-F	S	—	48975

BULKHEAD JACKS

Non-constant Impedance • Male Contacts • Non-weatherproof • Rear Mounting

RG-(-)/U Cable	Dimensions, inches						Construction	Insulation	Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
	a	b	Max. Cable O.D. c	With Spacer e	W.O. Spacer e							
55, 58, 141, 142	1 ⁵ / ₁₆	7 ¹ / ₁₆	.214	.171	—	Jacket Clamp	Kel-F	W	N	—	—	49300
58, 141	2 ⁵ / ₃₂	7 ¹ / ₁₆	.203	.080	.130	Std. Clamp	Nylon	V	N	—	—	46200
59, 62, 140, 210	1 ⁵ / ₁₆	1 ¹ / ₃₂	.255	.080	.130	Jacket Clamp	Kel-F	X	N	—	—	46875
122, 180, 195	2 ⁵ / ₃₂	7 ¹ / ₁₆	.177	.080	.130	Std. Clamp	Nylon	V	N	Split Mount	—	46375
174	2 ⁵ / ₃₂	7 ¹ / ₁₆	.104	.080	.130	Crimp	Kel-F	X	S	—	—	46625
178, 196	3 ⁷ / ₆₄	7 ¹ / ₁₆	.091	.080	.130	Crimp	Kel-F	X	N	Split Mount	—	46475
180	2 ⁵ / ₃₂	7 ¹ / ₁₆	.148	—	.150	Crimp	Kel-F	W	N	—	—	49775
180, 195	1 ³ / ₁₆	7 ¹ / ₃₂	.119	.080	.130	Crimp	Kel-F	V	N	Capt. Cont.	—	48925
174, 179, 187, 188	2 ⁵ / ₃₂	7 ¹ / ₁₆	.158	.171	—	Crimp	Kel-F	W	S	—	—	49700

*Stock Code: S = Stock N = Non Stock

BULKHEAD RECEPTACLES

Non-constant Impedance • Male Contacts • Non-weatherproof • Front Mounted

Dimensions, inches			Insulation	Terminal	Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
a	b	e						
1 ¹ / ₁₆	5 ¹ / ₁₆	.125	Kel-F	Turret	V	S	—	45925
2 ⁵ / ₃₂	7 ¹ / ₁₆	.156	Glass-Teflon	Flat & Pierce	V	S	Hermetically Sealed	45975
1 ¹ / ₁₆	5 ¹ / ₁₆	.140	Nylon	Turret	V	S	—	46000
1 ¹ / ₁₆	5 ¹ / ₁₆	.125	Kel-F	Turret	X	S	—	46025
1 ¹ / ₁₆	5 ¹ / ₁₆	.140	Nylon	Turret	V	S	—	46175
1 ¹ / ₁₆	5 ¹ / ₁₆	.125	Teflon	Turret	V	S	—	53475

ADAPTERS/Non-constant Impedance • Non-weatherproof

Dimensions, inches				Insulation	Adapter Ends	Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
a	b	d	e						
1 ³ / ₁₆	5 ¹ / ₁₆	—	—	Nylon	Jack-Jack	—	S	Straight	47225
1 ³ / ₁₆	5 ¹ / ₁₆	—	—	Glass-Teflon	Jack-Jack	Y	S	Blkd. Mount, Hermetic	47300
1 ¹ / ₃₂	3 ¹ / ₄	—	—	Kel-F	Jack-Plug-Jack	—	S	Tee	47325

CAPS/Non-weatherproof

Dimensions, inches				Chain Length f	Stock Code *	Notes	Amphenol Part Number
a	b	c					
1 ¹ / ₃₂	3 ¹ / ₁₆	.144	3 ¹ / ₄	N	Resistor Terminated, See Note Below	—	48600
3 ¹ / ₁₆	3 ¹ / ₁₆	.281	1 ¹ / ₂	S	Male	—	48225
2 ³ / ₃₂	3 ¹ / ₁₆	.281	1 ¹ / ₂	N	Male, Shorting Male Contact	—	48250
1 ¹ / ₂	3 ¹ / ₁₆	.130	1 ¹ / ₂	N	Female	—	47550

For resistor terminated cap: to order without resistor, add -1 to part number; to order with resistor, add resistor value to part number. 1/2 watt $\pm 5\%$ resistor values (ohms) stocked: 47, 51, 68, 75, 82, 91, 100, 120, 130, 150, 180, 240, 270, 300, 470, 510, 560, 680, 750, 820, 1000, 1500, 3900, 4700, 10000, 150000.

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

NEW ISOLATED BNC RECEPTACLE

APPLICATION NOTES

Amphenol's new BNC receptacle, part number 31-010*, was designed for applications requiring isolation of the cable braid from the chassis ground. Dimensionally equivalent to the popular UG-1094/U and UG-1094A/U receptacles, the new 31-010 unit has a molded thermoplastic body which prevents metallic contact between the body of the connector and the panel. An extra contact, i.e., braid grounding tab, is molded into the insulating body and provides a convenient means by which the cable braid can be neatly secured and connected directly to the connector outer conductor, thus bypassing the mounting panel or ground.

Installations of this type usually employ the standard UG receptacle noted above separated from the surrounding panel by a special insulating bushing and washer. In addition to the extra parts to be purchased and handled, an oversize, non-standard hole must be cut in the panel to accommodate the larger diameter of the insulating bushing accompanied by an appropriate reduction in allowable panel thickness.

ADVANTAGES

The new 31-010 incorporates many economies: lower initial cost, nearly equal to that of the standard UG-1094/U and one fourth the cost of functionally equivalent types, plus lower installed cost. And, once installed, the assembly will have a more workmanlike appearance coupled with the convenience of silver plating on parts involving solder operations and long life luster of Amphenol's tarnish-free finish, ASTROplate, on all other external metal surfaces.

Your equipment will look better longer, and your component cost will decrease dramatically... Specify Amphenol's 31-010 isolated BNC receptacle. Contact your local Amphenol sales office, distributor or the factory direct. Available for immediate delivery.

ELECTRICAL

Impedance	Non-Constant
Voltage Rating	500 Volts peak

ENVIRONMENTAL

Thermal limits	-50° to 250°F
	-45.6° to 121°C
Shock	MIL-Std-202 method 202
Vibration	MIL-Std-202 method 204 (test cond. D)
Moisture Resistance	MIL-Std-202 method 106
Corrosion	MIL-Std-202 method 101 (test cond. B)
Altitude	MIL-Std-202 method 105 (test cond. C)

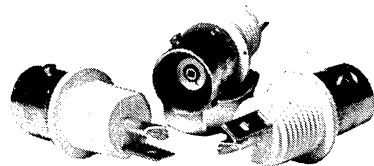
MECHANICAL

Mating	2-stud bayonet lock
Cable Affixment	See Illustration
Terminal Style	Solder Cup
Panel Mounting	Front Mounted (torque of 12 inch-pounds max. may be applied to hex nut)
Lockwasher	Internal Tooth

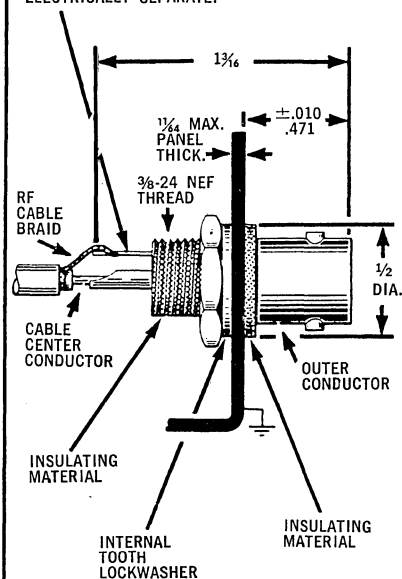
MATERIAL & PLATING

Threaded Rear Body & Connector	White, thermoplastic, UL Class SE-1
Insulation (one-piece construction)	flammability rating
Center Contact	Beryllium copper, silver plated
Braid Grounding Tab	Brass, silver plated
Other Metal Parts	Brass with ASTROplate

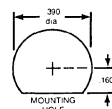
BNC SERIES

AMPHENOL
P/N 31-010

BRAID GROUNDING TAB CONNECTS CABLE BRAID THROUGH INSULATING MATERIAL TO CONNECTOR OUTER CONDUCTOR. CHASSIS AND BRAID ARE ELECTRICALLY SEPARATE.



(CABLE SHOWN FOR REFERENCE)

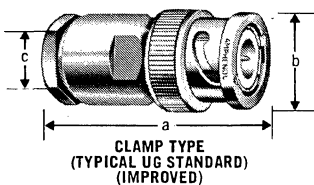
FOR LOCAL SOURCE OF SUPPLY
SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

BNC SERIES



BNC connectors are small, light in weight, and have a quick disconnect bayonet lock coupling arrangement particularly useful for test equipment.

CRIMP TYPE

MIL-Crimps are recommended as the optimum BNC connector, giving optimum operating performance at low installed cost. Using standard crimping tools, these units can be assembled in a fraction of the time usually required for braid clamp type connectors by eliminating critical assembly and soldering operations and reducing the parts to handle. These connectors are weather-proof and have completely captivated gold-plated contacts.

IMPROVED TYPE

Constant 50 ohm impedance connectors which provide excellent performance through X-band frequencies. Mechanically sturdier than unimproved types. The improved clamping mechanism utilizes a threaded nut, flat washer, "V" groove gasket and peaked braid clamping, providing a superior metal-to-metal clamp.

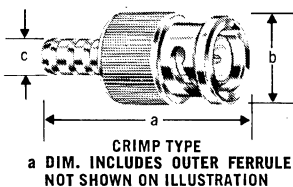
CLAMP TYPE (UG-STANDARD)

Non-constant impedance connectors that can be used effectively at lower frequencies (below 300 MHz) where no serious mismatch is introduced by the connectors. The clamping mechanism utilizes a threaded nut, flat compression gasket and a tapered braid clamp.

* Patent Pending

STRAIGHT PLUGS

Teflon Insulation • Male Contacts • Weatherproof • 50 Ohm Impedance



RG-/U Cable	Military Part Number	Dimensions, inches			Construction	Stock Code *	Notes	Amphenol Part Number
		Length a	O.D. b	Max. Cable O.D. c				
6	—	1 1/4	1/16	.348	UG Std.	S	Rexolite Insulator	9350
8, 9	UG959/U	1 1/2	1/16	.437	UG Std.	S	"B" Dim. is body O.D.	6775
55, 142, 223	M39012/16-0014	1 3/2	1/16	.220	Crimp	S	—	31-4326
55, 58, 141, 142	UG88/U	1 1/2	1/16	.212	UG Std.	S	—	31-002
	UG88A/U	1	1/16	.212	UG Std.	S	—	14525
	UG88B/U	1 3/2	1/16	.212	UG Std.	S	Non-weatherproof	31-018
	—	1	1/16	.212	UG Std.	S	Female Contact (Polarized)	14625
55, 55A, 58, 141, 142, 223	UG88C/U	1 1/6	1/16	.224	Imp	S	—	31-202
	UG88D/U	1 3/2	1/16	.224	Imp	S	Beryl. Outer Contact	31-2202
	UG88E/U	1 3/2	1/16	.224	Imp	S	Beryl. Outer Contact	31-3202
	—	1 3/2	1/16	.219	Imp	S	Capt. Contact	31-301
	M39012/16-0001	1 1/6	1/16	.224	Clamp	S	—	31-3301
58, 141, 303	M39012/16-0013	1 3/2	1/16	.206	Crimp	S	—	31-4320
59, 62, 140, 210	M39012/16-0015	1 3/2	1/16	.261	Crimp	S	—	31-4321
	UG260/U	1 3/2	1/16	.258	UG Std.	S	Rexolite Insulator	31-012
	UG260A/U	1	1/16	.258	UG Std.	S	Rexolite Insulator Non-weatherproof	31-021
	UG260B/U	1 1/6	1/16	.255	Imp	S	—	31-212
	UG260C/U	1 3/2	1/16	.255	Imp	S	Beryl. Outer Contact	31-2212
	UG260D/U	1 3/2	1/16	.255	Imp	S	Beryl. Outer Contact	31-3212
	—	1 3/2	1/16	.255	Imp	S	Capt. Contact	31-304
	—	1 1/6	1/16	.257	Imp	S	75 Ohm	86475
	M39012/16-0002	1 1/6	1/16	.255	Clamp	S	—	31-3302
71	M39012/16-0017	1 3/2	1/16	.275	Crimp	N	—	31-4322
114A	—	1 3/2	1/16	.437	UG Std.	S	"B" Dim. is body O.D.	17400
122	M39012/16-0016	1 3/2	1/16	.175	Crimp	N	—	31-4324
122, 195	UG1033/U	1 1/6	1/16	.177	Imp	S	—	84975
180, 195	—	1 3/4	1/16	.175	Crimp	S	—	31-323
122, 180, 195	M39012/16-0003	1 3/2	1/16	.177	Clamp	S	—	31-3303
174, 188	—	1 1/6	1/16	.115	Crimp	S	—	31-315
179, 187	—	1 3/16	1/16	.115	Crimp	S	—	31-242
174, 179, 187, 188	—	1 1/6	1/16	.116	Imp	S	—	69475
178, 196	—	1	1/16	.094	UG Std.	S	—	15875
180	—	1	1/16	.150	UG Std.	S	—	16300
Essex 21-597	—	1 3/4	1/16	.175	Crimp	S	—	31-325

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

ANGLE PLUGS

Teflon Insulation • Male Contacts • Weatherproof • 50 Ohm Impedance

RG-()/U Cable	Military Part Number	Dimensions, inches				Construc- tion	Fig.	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c	d					
55, 142, 223	M39012/ 20-0003	1 $\frac{3}{32}$	$\frac{5}{16}$	.220	1 $\frac{1}{32}$	Crimp	B	S	—	31-3365
55, 58, 141, 142	—	1 $\frac{1}{4}$	$\frac{5}{16}$	.212	1	UG Std.	C	S	—	8525
55, 55A, 58, 141, 142, 223	UG913/U	1 $\frac{3}{32}$	$\frac{5}{16}$	.224	1 $\frac{1}{16}$	UG Std.	A	S	—	31-204
	UG913A/U	1 $\frac{3}{32}$	$\frac{5}{16}$	.224	1 $\frac{5}{8}$	Imp	A	S	Beryl. Outer Contact	31-2204
	M39012/ 20-0001	1 $\frac{3}{32}$	$\frac{5}{16}$	.224	1 $\frac{5}{8}$	Clamp	A	S	—	31-3361
58, 141	M39012/ 20-0002	1 $\frac{1}{8}$	$\frac{5}{16}$	.206	1 $\frac{1}{32}$	Crimp	B	S	—	31-3364
59, 62, 140, 210	—	1 $\frac{3}{16}$	$\frac{5}{16}$	.261	1 $\frac{1}{32}$	Crimp	B	S	—	31-336
59, 62, 71, 140, 210	—	1 $\frac{1}{4}$	$\frac{5}{16}$	.258	1 $\frac{1}{32}$	UG Std.	C	S	Rexolite Insulator	31-850
	—	1 $\frac{1}{4}$	$\frac{5}{16}$	.259	1	UG Std.	C	S	—	8575
	—	1 $\frac{1}{16}$	$\frac{5}{16}$	.257	1 $\frac{1}{16}$	Imp	A	S	—	86225
71	—	1 $\frac{3}{16}$	$\frac{5}{16}$	.275	1 $\frac{1}{32}$	Crimp	B	N	—	31-337
122	—	1 $\frac{3}{16}$	$\frac{5}{16}$	.175	1 $\frac{1}{32}$	Crimp	B	S	—	31-339
122, 180, 195	—	1 $\frac{3}{16}$	$\frac{5}{16}$	.175	1 $\frac{1}{32}$	Crimp	B	S	—	31-338
174, 188	—	1 $\frac{3}{16}$	$\frac{5}{16}$	.115	1 $\frac{1}{32}$	Crimp	B	S	—	31-316
179, 187	—	1 $\frac{3}{16}$	$\frac{5}{16}$	.115	1 $\frac{1}{32}$	Crimp	B	N	—	31-243
174, 179, 187, 188	—	1 $\frac{1}{4}$	$\frac{5}{16}$	.115	1	UG Std.	C	S	—	33275
178, 196	—	1 $\frac{1}{4}$	$\frac{5}{16}$	.096	1	UG Std.	C	N	—	21975
Essex 21-597	—	1 $\frac{3}{16}$	$\frac{5}{16}$	.175	1 $\frac{1}{32}$	Crimp	B	N	—	31-340

STRAIGHT JACKS

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance

RG-()/U Cable	Military Part Number	Dimensions, inches				Construc- tion	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c	d				
55, 142, 223	M39012/17-0014	1 $\frac{1}{16}$	$\frac{5}{16}$	.220	Crimp	S	—	—	31-4333
55, 58, 141, 142	UG89/U	1 $\frac{1}{8}$	$\frac{5}{16}$	.212	UG Std.	S	—	—	31-005
	UG89A/U	1 $\frac{3}{64}$	$\frac{5}{16}$	.212	UG Std.	S	Non- weatherproof	—	31-019
55, 55A, 58, 141, 142, 223	UG89B/U	1 $\frac{3}{64}$	$\frac{5}{16}$	.224	Imp	S	—	—	31-205
	UG89C/U	1 $\frac{3}{64}$	$\frac{5}{16}$	.224	Imp	S	—	—	31-2205
	M39012/17-0001	1 $\frac{3}{64}$	$\frac{5}{16}$	.212	Clamp	S	—	—	31-3319
58, 141, 303	M39012/17-0013	1 $\frac{1}{16}$	$\frac{5}{16}$	.206	Crimp	S	—	—	31-4327
59, 62, 140, 210	M39012/17-0015	1 $\frac{1}{16}$	$\frac{5}{16}$	.261	Crimp	S	—	—	31-4328
59, 62, 71, 140, 210	UG261/U	1 $\frac{1}{8}$	$\frac{5}{16}$	.258	UG Std.	S	Rexolite insulator 70 Ohm	—	31-015
	UG261A/U	1 $\frac{3}{64}$	$\frac{5}{16}$	.258	UG Std.	S	Rexolite insulator, 70 Ohm, Non- weatherproof	—	31-022
	UG261B/U	1 $\frac{3}{64}$	$\frac{5}{16}$	.258	Imp	S	—	—	31-215
	UG261C/U	1 $\frac{3}{64}$	$\frac{5}{16}$	.258	Imp	S	—	—	31-2215
	M39012/17-0002	1 $\frac{3}{64}$	$\frac{5}{16}$	.258	Clamp	S	—	—	31-3320
	M39012/17-0003	1 $\frac{3}{64}$	$\frac{5}{16}$	.258	Clamp	S	—	—	31-3321
71	M39012/17-0017	1 $\frac{1}{16}$	$\frac{5}{16}$	.275	Crimp	N	—	—	31-4329
122	M39012/17-0016	1 $\frac{1}{16}$	$\frac{5}{16}$	.175	Crimp	N	—	—	31-4331
122, 180, 195	—	1 $\frac{3}{16}$	$\frac{5}{16}$	.175	Crimp	S	—	—	31-330
180, 195	—	1 $\frac{25}{64}$	$\frac{5}{16}$	.175	Crimp	S	—	—	31-317
174, 188	—	1 $\frac{25}{64}$	$\frac{5}{16}$	.115	Crimp	S	—	—	31-244
179, 187	—	1 $\frac{25}{64}$	$\frac{5}{16}$	.115	Crimp	S	—	—	31-332
Essex 21-597	—	1 $\frac{25}{64}$	$\frac{5}{16}$	.175	Crimp	S	—	—	31-332

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

BNC SERIES

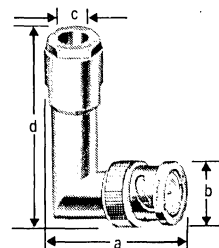


FIG. A: MITRE CONFIGURATION

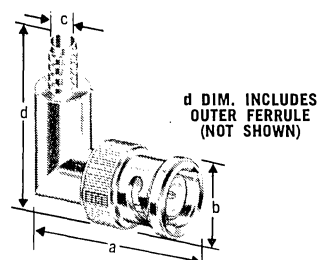


FIG. B: MIL-CRIMP CONFIGURATION

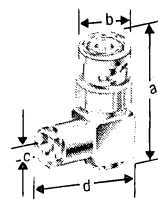
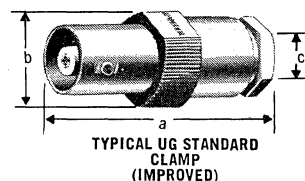
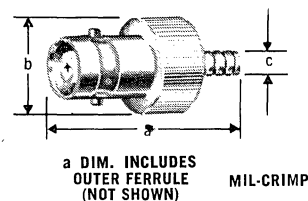


FIG. C: CUBIC CONFIGURATION

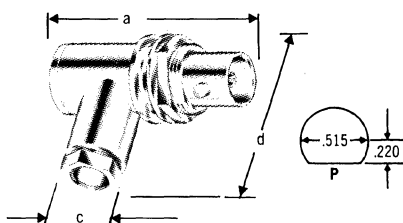
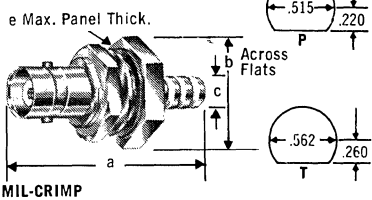
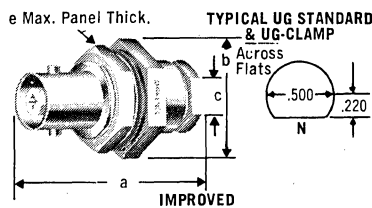
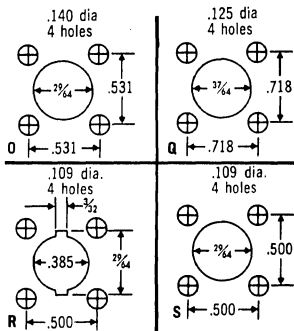
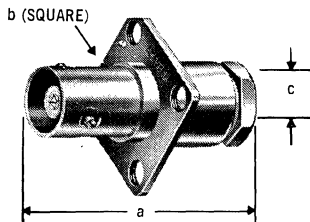
TYPICAL UG STANDARD
CLAMP
(IMPROVED)a DIM. INCLUDES
OUTER FERRULE
(NOT SHOWN) MIL-CRIMP

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

BNC SERIES



PANEL JACKS

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance
#3-56 Tapped Flange Holes • Rear Mounted

RG-()/U Cable	Military Part Number	Dimensions, inches			Construc- tion	Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c					
8	—	1 $\frac{13}{32}$	1	.438	UG Std.	Q	S	.125 dia. Flange Holes	6750
55, 58, 141, 142	UG291/U	1 $\frac{1}{8}$	$\frac{1}{16}$	.214	UG Std.	R or S	S	—	31-001
	UG291A/U	1 $\frac{1}{4}$	$\frac{1}{16}$	.214	UG Std.	R or S	S	Non- weather- proof	31-020
	UG291B/U	1 $\frac{1}{4}$	$\frac{1}{16}$	.214	Imp.	S	S	—	31-201
	UG90/U	1 $\frac{1}{4}$	$\frac{3}{4}$	.214	UG Std.	O	S	.136 dia. Flange Holes	1300
55, 55A, 58, 141, 142, 223	UG291C/U	1 $\frac{1}{4}$	$\frac{1}{16}$	.221	Imp.	S	S	—	31-2201
	M39012/ 18-0002	1 $\frac{1}{4}$	$\frac{1}{16}$	.221	MIL Clamp	R or S	S	—	31-3333
59, 62, 71, 140, 210	UG262/U	1 $\frac{1}{8}$	$\frac{1}{16}$	.259	UG Std.	R or S	S	Rexolite Insulator	31-011
	UG262B/U	1 $\frac{1}{4}$	$\frac{1}{16}$	.258	Imp.	S	S	—	31-211
	UG262C/U	1 $\frac{1}{4}$	$\frac{1}{16}$	.258	Imp.	S	S	—	31-2211
	M39012/ 18-0001	1 $\frac{1}{4}$	$\frac{1}{16}$	.258	MIL Clamp	R or S	S	—	31-3334
122, 180, 195	M39012/ 18-0003	1 $\frac{1}{4}$	$\frac{1}{16}$	.177	MIL Clamp	R or S	S	—	31-3335
174, 179, 187, 188	—	1 $\frac{1}{4}$	$\frac{1}{16}$	.177	Imp.	S	S	—	86425

BULKHEAD JACKS

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance • Rear Mounted

RG-()/U Cable	Military Part Number	Dimensions, inches				Construc- tion	Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c	e					
55, 142, 223	M39012/ 19-0014	1 $\frac{13}{32}$	$\frac{1}{16}$	.220	.127	Crimp	N	S	—	31-4341
55, 58, 141, 142	UG909/U	1 $\frac{1}{8}$	$\frac{1}{16}$	.212	.114	Imp	P	S	—	31-206
	—	1 $\frac{1}{8}$	$\frac{5}{8}$	.212	.135	UG Std.	T	S	Front Mount	2475
55, 55A, 58, 141, 142, 223	UG909B/U	1 $\frac{1}{4}$	$\frac{3}{4}$	.224	.221	Imp	P	S	—	31-3206
	—	1 $\frac{49}{64}$	$\frac{5}{8}$	.219	.171	Imp	P	N	Herm. Sealed	17725
	M39012/ 19-0001	1 $\frac{1}{4}$	$\frac{1}{16}$	.224	.221	Clamp	N	S	—	31-3347
58, 141	M39012/ 19-0013	1 $\frac{13}{32}$	$\frac{1}{16}$	.206	.115	Crimp	N	S	—	31-4342
59, 62, 140, 210	M39012/ 19-0015	1 $\frac{13}{32}$	$\frac{1}{16}$	.261	.115	Crimp	N	S	—	31-4343
59, 62, 71, 140, 210	UG910/U	1 $\frac{1}{8}$	$\frac{1}{16}$	.258	.096	Imp	P	S	—	31-207
	UG910B/U	1 $\frac{1}{4}$	$\frac{1}{16}$	.258	.221	Imp	P	S	—	31-3207
	M39012/ 19-0002	1 $\frac{1}{4}$	$\frac{1}{16}$	.258	.221	Clamp	N	S	—	31-3348
	UG624/U	1 $\frac{1}{16}$	$\frac{5}{8}$	.258	.135	UG Std.	T	S	Front Mount Rexolite Insulator	2075
71	M39012/ 19-0017	1 $\frac{13}{32}$	$\frac{1}{16}$	.275	.115	Crimp	N	N	—	31-4344
122	M39012/ 19-0016	1 $\frac{13}{32}$	$\frac{1}{16}$	.175	.125	Crimp	N	N	—	31-4346
122, 180, 195	—	1 $\frac{1}{4}$	$\frac{1}{16}$	.177	.240	Imp	N	S	—	84725
180, 195	—	1 $\frac{1}{8}$	$\frac{1}{16}$	.175	.125	Crimp	N	S	—	31-345
174, 188	—	1 $\frac{1}{8}$	$\frac{1}{16}$	.115	.125	Crimp	N	S	—	31-318
179, 187	—	1 $\frac{1}{8}$	$\frac{1}{16}$	.115	.125	Crimp	N	S	—	31-245
174, 179, 187, 188	—	1 $\frac{1}{4}$	$\frac{1}{16}$	.126	.240	UG Std.	N	S	—	86350
178, 196	—	1 $\frac{1}{4}$	$\frac{1}{16}$	.098	.240	Imp	N	N	—	86850
179	—	1 $\frac{1}{4}$	$\frac{5}{8}$	.094	.135	UG Std.	T	S	Front Mount	17825
Essex 21-597	—	1 $\frac{1}{8}$	$\frac{1}{16}$	.175	.115	Crimp	N	S	—	31-347

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

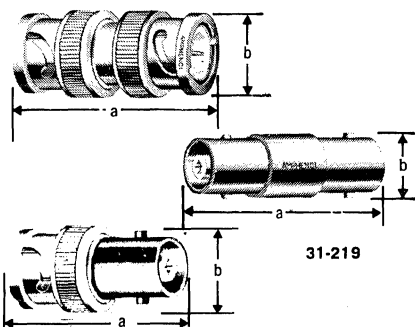
2-587

RF CONNECTORS

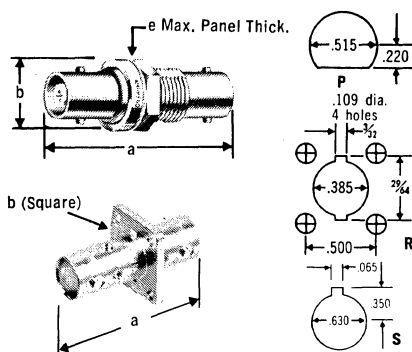
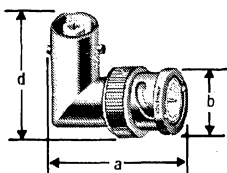
BUNKER
RAMO

AMPHENOL

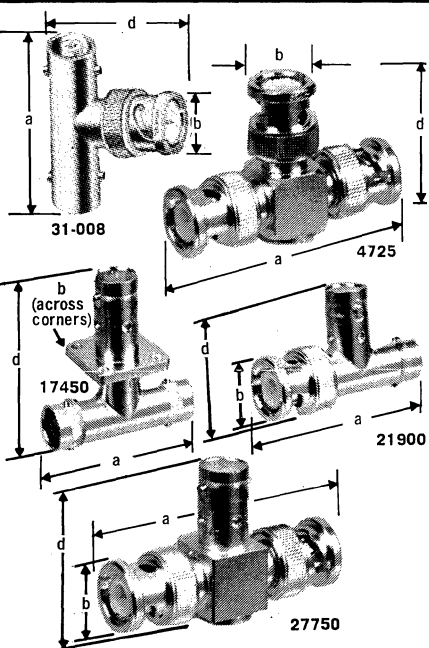
BNC SERIES



31-219



b (Square)



31-008

4725

17450

21900

27750

STRAIGHT ADAPTERS/Teflon Insulation • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches		Stock Code *	Adapter Ends	Notes	Amphenol Part Number
	a	b				
UG491A/U	1¼	⅞	S	Plug-Plug	—	31-218
UG914/U	1½	⅞	S	Jack-Jack	—	31-219
UG491B/U	1¼	⅞	S	Plug-Plug	Beryl. Outer Contact	31-2218
UG491/U	1¼	⅞	S	Plug-Plug	—	8425
—	1½	⅞	S	Plug-Jack	—	21925
—	1½	⅞	S	Jack-Jack	—	75000

ANGLE ADAPTERS/Teflon Insulation • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches			Stock Code *	Adapter Ends	Notes	Amphenol Part Number
	a	b	d				
UG306/U	1	⅞	⅜	S	Jack-Plug	Beryl. Outer Contact	31-2209
UG306A/U	1½	⅞	⅝	S	Jack-Plug	—	31-009
UG306B/U	1½	⅞	⅝	S	Jack-Plug	Beryl. Outer Contact	31-209

BULKHEAD & PANEL ADAPTERS/Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches			Stock Code *	Mtg. Hole	Adapter Ends	Notes	Amphenol Part Number
	a	b	e					
UG492A/U	1½	⅞	.181	S	P	Jack-Jack	Herm. Sealed	31-220
UG492B/U	1½	⅞	.163	S	P	Jack-Jack	Herm. Sealed/O Ring	31-2220
UG492D/U	1½	⅞	.275	S	P	Jack-Jack	Herm. Sealed/O Ring	31-3220
UG414/U	1½	⅞	.250	S	R	Jack-Jack	Panel Mount	47000
UG414A/U	1½	⅞	.260	S	R	Jack-Jack	Panel Mount	47025
—	1½	⅞	.185	N	S	Plug-Plug	Herm. Sealed	75500

Insulation: Panel Mount Type — Teflon. Bulkhead Mount Type — Glass-Teflon

TEE ADAPTERS/Teflon Insulation • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches			Stock Code *	Adapter Ends	Notes	Amphenol Part Number
	a	b	d				
UG274/U	1½	⅞	⅜	S	Jack-Plug-Jack	Rexolite Insulator	31-008
UG274A/U	1½	⅞	1⅞	S	Jack-Plug-Jack	Beryl. Outer Contact	31-208
UG274B/U	1½	⅞	1⅞	S	Jack-Plug-Jack	Beryl. Outer Contact	31-2208
—	1½	⅞	1⅞	S	Plug-Plug-Plug	—	4725
—	1½	⅞	1⅞	S	Jack-Jack-Jack	Panel Mt., Mtg. Hole R Rexolite Insulator	17450
—	1½	⅞	1	S	Plug-Jack-Jack	—	21900
—	1½	⅞	1⅞	S	Plug-Jack-Plug	—	27750
—	1¾	⅞	⅜	S	Cable-Plug-Cable	RG58/U Cable Syn. Rubber Clamp	33725

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

CAPS/ Weatherproof

Military Part Number	Dimensions, inches				Chain Length f	Stock Code *	Notes	Amphenol Part Number
	a	b	c					

MALE

CW123/U	$1\frac{1}{16}$	$\frac{3}{16}$	.142	2 1/4	S	—	—	31-006
CW155/U	$\frac{37}{64}$	$\frac{1}{16}$	—	—	S	—	—	31-007
CW159/U	$1\frac{1}{16}$	$\frac{1}{16}$	.144	2 1/4	S	Shorting Male Contact	—	31-017
M39012/25-0006	$\frac{45}{64}$	$\frac{3}{16}$	.130	2 1/4	S	—	—	31-026
CW155A/U	$\frac{37}{64}$	$\frac{1}{16}$	—	—	S	—	—	31-027
—	$\frac{23}{32}$	$\frac{1}{16}$	$\frac{3}{8}$	3 1/2	S	—	—	900
—	$\frac{19}{32}$	$\frac{1}{16}$	—	—	S	Shorting Male Contact	—	5275
—	$\frac{23}{32}$	$\frac{1}{16}$	.510	2 1/2	S	Solder Lug	—	87300

FEMALE

CW282/U	$1\frac{1}{16}$	$\frac{1}{2}$	$\frac{3}{32}$	3	S	—	—	31-210
—	$\frac{25}{32}$	$\frac{3}{16}$	—	—	N	—	—	1750
—	$\frac{25}{32}$	$\frac{3}{16}$	—	—	S	Shorting Female Contact	—	15300

RESISTOR TERMINATED CAPS/ Male Contacts • Weatherproof

Military Part Number	Dimensions, inches				Chain Length f	Stock Code *	Notes	Amphenol Part Number
	a	b	c					
MX554	$1\frac{1}{4}$	$\frac{1}{16}$	.144	$3\frac{1}{2}$	S	▲	—	4700
MX554A	$1\frac{1}{4}$	$\frac{1}{16}$	.144	$3\frac{1}{2}$	S	▲	100 Ohm Resistor	39575
—	$1\frac{1}{4}$	$\frac{1}{16}$	.144	$3\frac{1}{2}$	S	▲	—	35650
—	$1\frac{13}{64}$	$\frac{1}{16}$	—	—	S	▲	—	35725
—	$1\frac{1}{2}$	$\frac{1}{16}$	—	—	S	▲	51 or 75 Ohm, 1 Watt Resistor	46650

▲To order without resistor, add -1 to part number; to order with resistor, add resistor value to part number. 1/2 watt 5% resistor values (ohms) 47, 51, 68, 75, 82, 91, 100, 120, 130, 150, 180, 240, 270, 300, 470, 510, 560, 680, 750, 820, 1000, 1500, 3900, 4700, 10000, 100000, 150000

HOODS & ACCESSORIES/ Non-Weatherproof

Military Part Number	Dimensions, inches				Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
	a	b	c	d				

HOODS

MX195	$\frac{7}{8}$	$1\frac{1}{16}$	$\frac{3}{32}$	—	R or S	S	RG55, 58, 62/U Cables, Plug-in	87175
MX367	$\frac{7}{8}$	$1\frac{1}{16}$	$\frac{17}{64}$	—	R or S	S	RG55, 62/U Cable, Square Flange	10925
MX195A	$1\frac{1}{16}$	$1\frac{1}{32}$	$\frac{3}{16}$	—	—	N	RG55, 58/U Cable, Square Flange	10900

NUT STRAP

MT412	$\frac{3}{4}$	.081	$\frac{1}{16}$	.200	0	S	4 Holes with 4-40 NC-28 threads	1600
-------	---------------	------	----------------	------	---	---	---------------------------------	------

SHIELD GROUNDING LUG

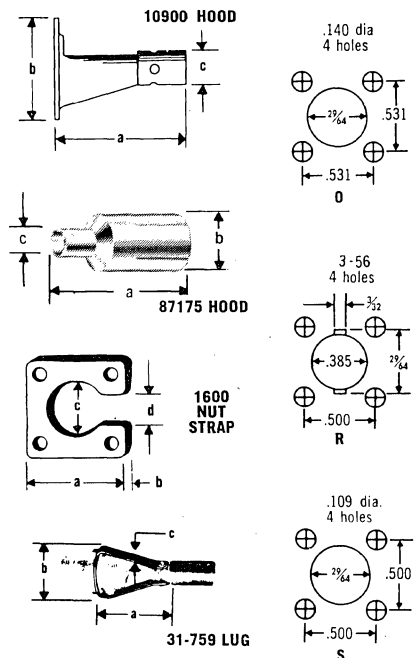
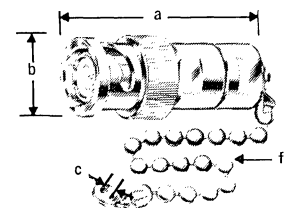
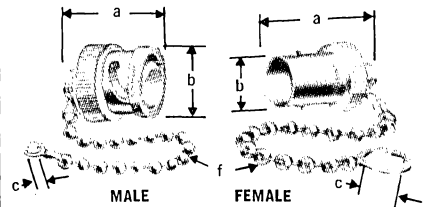
—	$\frac{29}{32}$	$\frac{25}{64}$	$\frac{1}{8}$	—	—	S	Use on Front Mount Receptacle	31-759
---	-----------------	-----------------	---------------	---	---	---	-------------------------------	--------

CUJAK ADAPTER KIT for 421-668 cable (.141 dia.)

—	Includes clamp nut, gasket, compression clamp, and bushing to replace standard clamping components of improved type BNC connectors				N	—	—	31-885
---	--	--	--	--	---	---	---	--------

*Stock Code: S = Stock N = Non Stock

BNC SERIES



RF CONNECTORS

BUNKER
RAMO

AMPHENOL

TNC SERIES

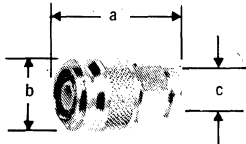


FIG. A

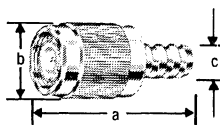
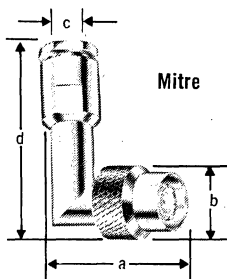
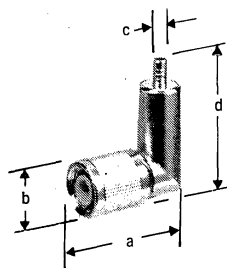


FIG. B

a DIM. INCLUDES OUTER FERRULE
NOT SHOWN ON ILLUSTRATION



Mitre



MIL-CRIMP
d DIM. INCLUDES
OUTER FERRULE
(NOT SHOWN)

Threaded coupling TNC Connectors are designed for aircraft, missile and other applications in which extreme vibration may be encountered. They are small, weatherproof types and have a constant impedance of 50 ohms.

Mil-Crimps are recommended as the optimum TNC connector, especially for high-volume production assemblies. They are designed to give maximum operating performance at lowest possible installed cost. These units assemble in a fraction of the time normally required for standard braid-clamp type connectors by eliminating critical assembly and soldering operation and reducing the number of parts to handle. The cable retention of the crimps are superior to the field serviceable types.

STRAIGHT PLUGS

Teflon Insulation • Male Contacts • Weatherproof • 50 Ohm Impedance

RG-()/U Cable	Military Part Number	Dimensions, inches			Fig.	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c				
55, 142, 223	M23329/4-02-04	1 $\frac{1}{32}$	$\frac{9}{16}$	.220	B	S	Mil Crimp△	31-2373
55, 58, 141, 142, 223	—	1 $\frac{1}{8}$	$\frac{9}{16}$	.219	A	S	Gold Plated Contact Safety Wiring	76175
	—	1 $\frac{1}{8}$	$\frac{9}{16}$	.219	A	S	—	77175
	—	1 $\frac{1}{8}$	$\frac{9}{16}$	.219	A	S	Female Contact (Polarized)	79050
58, 141	M23329/4-01-03	1 $\frac{1}{32}$	$\frac{9}{16}$	.206	B	S	Mil Crimp△	31-2367
59, 62, 140, 210	M23329/4-05	1 $\frac{1}{32}$	$\frac{9}{16}$	.261	B	S	Mil Crimp△	31-2368
59, 62, 71 140, 210	—	1 $\frac{1}{8}$	$\frac{9}{16}$	.257	A	S	Female Contact (Polarized)	79475
71	—	1 $\frac{1}{32}$	$\frac{9}{16}$	.257	B	S	Mil Crimp△	31-2369
122	—	1 $\frac{1}{32}$	$\frac{9}{16}$	.175	B	N	Mil Crimp△	31-2371
122, 195	—	1 $\frac{1}{8}$	$\frac{9}{16}$	.177	A	N	—	79725
180, 195	M23349/4-06	1 $\frac{1}{32}$	$\frac{9}{16}$	.175	B	S	Mil Crimp△	31-2370
174, 188	—	1 $\frac{1}{32}$	$\frac{9}{16}$	.115	B	S	Mil Crimp△	31-2315
174, 179, 187, 188	—	1 $\frac{1}{16}$	1 $\frac{1}{32}$	.126	A	S	Spring Brass Outer Contact	73475
179, 187	—	1 $\frac{1}{32}$	$\frac{9}{16}$	.115	B	N	Mil Crimp△	31-2242
180	—	1	1 $\frac{1}{32}$	.150	A	N	Spring Brass Outer Contact	78625
Essex 21-597	—	1 $\frac{1}{32}$	$\frac{9}{16}$	.175	B	N	Mil Crimp△	31-2372

ANGLE PLUGS Teflon Insulation • Male Contacts • Weatherproof • 50 Ohm Impedance • Capt. Contact, Gold Plated

RG-()/U Cable	Military Part Number	Dimensions, inches				Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c	d			
55, 142, 223	—	1 $\frac{1}{16}$	$\frac{9}{16}$	.220	1 $\frac{3}{64}$	S	MIL Crimp△	31-2381
55, 58, 141, 142, 223	—	1 $\frac{1}{8}$	1 $\frac{1}{32}$	.219	1 $\frac{3}{64}$	S	Mitre	79075
58, 141	—	1 $\frac{1}{16}$	$\frac{9}{16}$	.206	1 $\frac{3}{64}$	S	MIL Crimp△	31-2382
59, 62, 140, 210	—	1 $\frac{1}{16}$	$\frac{9}{16}$	.261	1 $\frac{3}{64}$	N	MIL Crimp△	31-2383
59, 62, 71, 140, 210	—	1 $\frac{1}{32}$	$\frac{9}{16}$	.257	1 $\frac{29}{32}$	N	Mitre	79400
71	—	1 $\frac{1}{16}$	$\frac{9}{16}$	.275	1 $\frac{3}{64}$	N	MIL Crimp△	31-2384
122	—	1 $\frac{1}{16}$	$\frac{9}{16}$	.175	1 $\frac{3}{64}$	N	MIL Crimp△	31-2386
174, 188	—	1 $\frac{1}{16}$	$\frac{9}{16}$	.115	1 $\frac{3}{64}$	S	MIL Crimp△	31-2316
179, 187	—	1 $\frac{1}{16}$	$\frac{9}{16}$	.115	1 $\frac{3}{64}$	N	MIL Crimp△	31-2243
180, 195	—	1 $\frac{1}{16}$	$\frac{9}{16}$	.175	1 $\frac{3}{64}$	N	MIL Crimp△	31-2385
Essex 21-597	—	1 $\frac{1}{16}$	$\frac{9}{16}$	.175	1 $\frac{3}{64}$	N	MIL Crimp△	31-2387

△ Add -1000 to Part Number for safety wiring holes. b dimension increases to $\frac{1}{8}$.

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

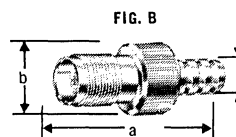
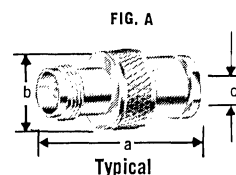
AMPHENOL

TNC SERIES

STRAIGHT JACKS

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance

RG-()/U Cable	Military Part Number	Dimensions, inches			Fig.	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c				
55, 142, 223	M23329/4-08	1 $\frac{3}{8}$	$\frac{5}{16}$	.220	B	S	MIL Crimp	31-2380
55, 58, 141, 142, 223	—	1 $\frac{1}{4}$	$\frac{5}{8}$	.219	A	S	Gold Pltd. Cont.	79600
58, 141	M23329/4-07	1 $\frac{3}{8}$	$\frac{5}{16}$	.206	B	S	MIL Crimp	31-2374
59, 62, 140, 210	M23329/4-11	1 $\frac{3}{8}$	$\frac{5}{16}$	.261	B	N	MIL Crimp	31-2375
59, 62, 71, 140, 210	—	1 $\frac{3}{4}$	$\frac{5}{8}$	.257	A	N	Male Contact (Polarized)	79450
122	—	1 $\frac{3}{8}$	$\frac{5}{16}$	.175	B	N	MIL Crimp	31-2378
174, 188	—	1 $\frac{3}{8}$	$\frac{5}{16}$	.115	B	S	MIL Crimp	31-2317
179, 187	—	1 $\frac{3}{8}$	$\frac{5}{16}$	.115	B	N	MIL Crimp	31-2244
180, 195	M23329/4-12	1 $\frac{3}{8}$	$\frac{5}{16}$	.175	B	S	MIL Crimp	31-2377
180	—	1 $\frac{3}{4}$	$\frac{5}{8}$	.150	A	N	—	77050
Essex 21-597	—	1 $\frac{3}{8}$	$\frac{5}{16}$	.175	B	N	MIL Crimp	31-2379



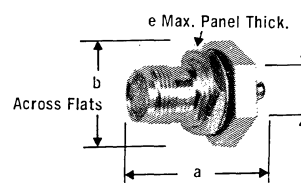
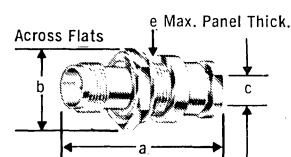
MIL-CRIMP
a DIM. INCLUDES
OUTER FERRULE
(NOT SHOWN)

BULKHEAD JACKS

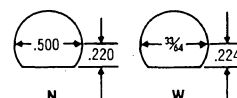
Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance • Rear Mounted

RG-()/U Cable	Military Part Number	Dimensions, inches				Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c	e				
55, 142, 223	M23329/4-14	1 $\frac{3}{8}$	1 $\frac{1}{16}$	.220	.115	N	S	MIL Crimp	31-2388
55, 58, 141, 142, 223	—	1 $\frac{1}{4}$	1 $\frac{1}{16}$	.224	.109	W	S	Gold Pltd. Cont. ¹	79425
58, 141	M23329/4-13	1 $\frac{3}{8}$	1 $\frac{1}{16}$	.206	.115	N	S	MIL Crimp	31-2389
59, 62, 141, 210	M23329/4-17	1 $\frac{3}{8}$	1 $\frac{1}{16}$	.261	.115	N	S	MIL Crimp	31-2390
59, 62, 71, 141, 210	—	1 $\frac{7}{32}$	$\frac{3}{4}$	.257	.171	W	N	Herm. Sealed ¹	77350
122	—	1 $\frac{3}{8}$	1 $\frac{1}{16}$	.175	.115	N	N	MIL Crimp	31-2393
180, 195	M23329/4-18	1 $\frac{3}{8}$	1 $\frac{1}{16}$	.175	.115	N	S	MIL Crimp	31-2392
174, 188	—	1 $\frac{3}{8}$	1 $\frac{1}{16}$	.115	.115	N	S	MIL Crimp	31-2318
179, 187	—	1 $\frac{3}{8}$	1 $\frac{1}{16}$	.115	.115	N	S	MIL Crimp	31-2245
180	—	1 $\frac{1}{32}$	1 $\frac{1}{32}$	.150	.187	W	N	—	77100
Essex 21-597	—	1 $\frac{3}{8}$	1 $\frac{1}{16}$	.175	.115	N	N	MIL Crimp	31-2394

TYPICAL



a DIM. INCLUDES
OUTER FERRULE
(NOT SHOWN)



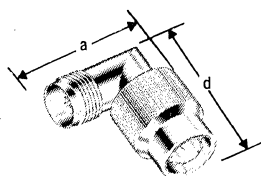
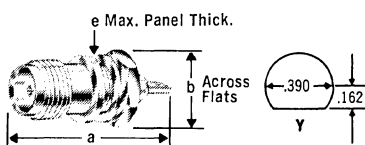
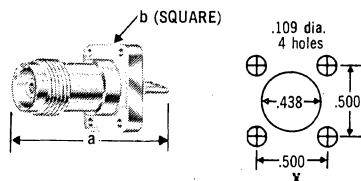
¹ Add -1000 to part number for safety wiring holes, b dimension increases to 1 $\frac{1}{16}$

*Stock Code: S = Stock N = Non Stock

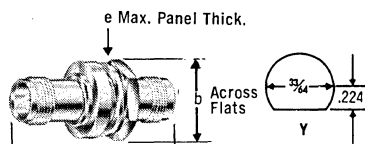
RF CONNECTORS

BUNKER RAMO AMPHENOL

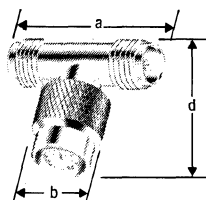
TNC SERIES



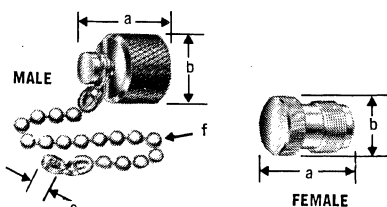
79125



79100



79700



PANEL RECEPTACLES / MTG. HOLE X

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance
#3-56 Tapped Flange Holes

Military Part Number	Dimensions, inches		Stock Code *	Notes	Amphenol Part Number
	a	b			
—	1 1/16	1 1/16	S	Gold Plated Contact	31-2300
—	1 1/16	1 1/16	N	Male, Silver Plated Contact (Polarized)	78200
—	3/4	1 1/16	S	Silver Plated Contact, Herm. Sealed	79750

BULKHEAD RECEPTACLES / MTG. HOLE Y

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance • Front Mounting

Military Part Number	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
	a	b	e			
—	1 1/16	1/2	.140	S	Gold Plated Contact	31-2301
—	7/32	1/2	.109	S	Gold Plated Contact & Body	77300
—	1 1/16	5/8	.187	S	Silver Plated Contact, Herm. Sealed	79800

ANGLE ADAPTERS

Teflon Insulation • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches		Stock Code *	Adapter Ends	Notes	Amphenol Part Number
	a	d				
—	1 1/32	1 1/32	S	Plug-Jack	—	79125

BULKHEAD ADAPTER/50 Ohm Impedance

Military Part Number	Dimensions, inches			Stock Code *	Adapter Ends	Notes	Amphenol Part Number
	a	b	e				
—	1 13/32	3/4	.171	S	Jack-Jack	Hermetically Sealed	79100

TEE ADAPTER/Teflon Insulation • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches			Stock Code *	Adapter Ends	Notes	Amphenol Part Number
	a	b	d				
—	1 1/32	5/8	1 1/16	S	Jack-Plug-Jack	—	79700

CAPS/Weatherproof

Military Part Number	Dimensions, inches				Stock Code *	Notes	Amphenol Part Number
	a	b	c	Chain Length f			
—	3/8	9/16	.130	4	S	Male	78750
—	37/64	1/2	—	—	S	Female	78400

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

PATCH-CORD PLUGS

Non-constant Impedance • Male Contacts • Non-weatherproof

RG-()/U Cables	Dimensions, inches				Insulation	Stock Code *	Notes	Amphenol Part Number
	a	b	Max. Cable O.D. c	e				
58, 141	5/8	2 1/4	.150	—	Rexolite	S	—	82-830
	5/8	2 1/4	.150	—	Teflon	S	—	82-842
	1 1/16	1/2	.150	.093	Teflon	S	Bulkhead Plug	82-845
59, 62, 71	5/8	2 1/4	.150	—	Rexolite	S	—	82-832

PATCH-CORD BULKHEAD JACKS/Teflon Insulation • Non-weatherproof

RG-()/U Cables	Dimensions, inches				Stock Code *	Notes	Amphenol Part Number
	a	b	Max. Cable O.D. c	e			
58, 141	4 3/4	1/2	.150	.093	S	—	82-846

PATCH-CORD BULKHEAD RECEPTACLES/

Non-constant Impedance • Female contacts • Non-weatherproof

Dimensions, inches			Insulation	Stock Code *	Notes	Amphenol Part Number
a	b	e				
1 5/16	1/2	.093	Rexolite	S	—	82-831
1 5/16	1/2	.093	Teflon	S	—	82-841

*Stock Code: S = Stock N = Non Stock

Bayonet-lock coupling MHV series connectors are small, high voltage types which may be used up to 5000 volts peak at frequencies up to 50 MHz. Impedance is non-constant. These series are similar to the BNC series; however, they are not designed to intermate.

PLUGS

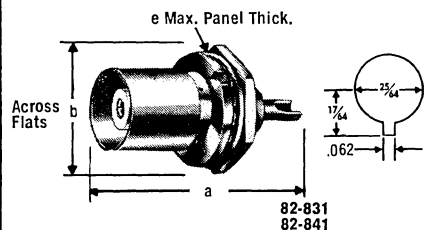
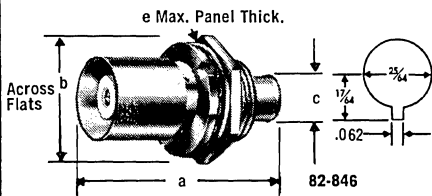
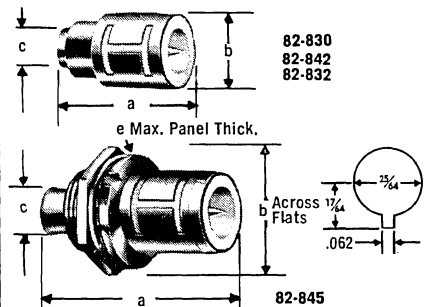
Teflon Insulation • Non-constant Impedance • Male Contacts • Weatherproof

RG-()/U Cable	Military Part Number	Dimensions, inches				Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c	d			
54A	—	1 33/64	1/2	.257	—	S	Improved Straight Plug	28375
55, 58, 141, 142	—	1 1/2	5/16	.212	—	S	Straight Plug	29100
59, 62, 71,	UG932/U	1 1/2	5/16	.257	—	S	Straight Plug	28000
140, 210	UG932A/U	1 33/64	1/2	.257	—	S	Improved Straight Plug	27975
55, 58, 141, 142	—	1 1/16	5/16	.212	1 1/4	S	Angle Plug, 2000 Volts Peak	28100
59, 62, 71, 140, 210	—	1 1/16	5/16	.258	1 1/4	S	Angle Plug, 2000 Volts Peak	28125

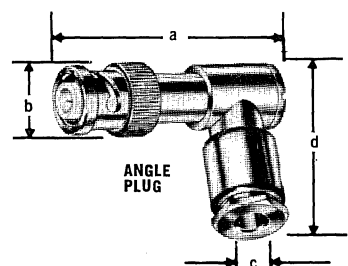
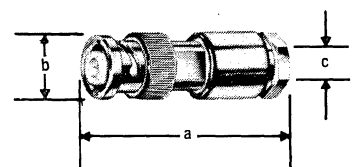
*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

PLUG-IN



MHV SERIES

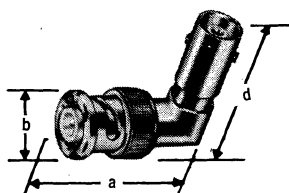
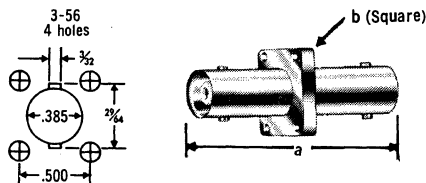
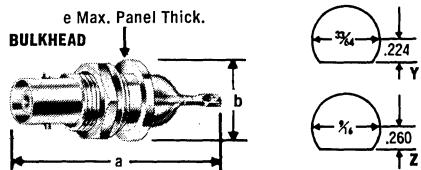
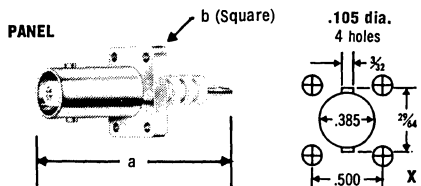
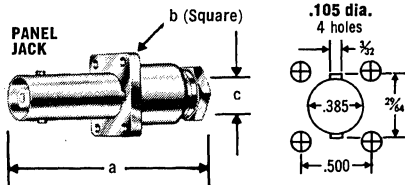
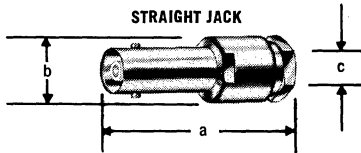


RF CONNECTORS

BUNKER
RAMO

AMPHENOL

MHV SERIES



JACKS

Teflon Insulation • Non-constant Impedance • Male Contacts • Weatherproof

RG-()/U Cable	Military Part Number	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c			
55, 58, 141, 142	—	1 15/32	5/16	.212	S	Straight Jack	28325
59, 62, 71, 140, 210	UG1016A/U	1 1/8	1/2	.257	S	Improved Straight Jack	27075
55, 58, 141, 142	—	1 1/8	1 1/16	.212	S	Panel Jack▲	28275
59, 62, 71, 140, 210	UG961/U	1 1/8	1 1/16	.257	S	Panel Jack▲	28225

▲Panel Jacks have #3-56 tapped flange holes; rear mounted

RECEPTACLES

Teflon Insulation • Non-constant Impedance • Female Contacts • Weatherproof • Rear Mounted

Military Part Number	Dimensions, inches			Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
	a	b	e				
UG931/U	1 1/8	1 1/16	—	X	S	Panel Type, #3-56 Tapped Flange Holes	27000
—	1 11/16	1 1/16	.250	Y	S	Bulkhead Type, Hermetically Sealed	10400
—	1 1/8	5/8	.109	Z	S	Bulkhead Type	27025
—	1 11/16	1 1/16	.328	Y	S	Bulkhead Type, Hermetically Sealed	28400

ADAPTERS

Teflon Insulation • Non-constant Impedance • Weatherproof

Military Part Number	Dimensions, inches			Stock Code *	Adapter Ends	Notes	Amphenol Part Number
	a	b	d				
—	1 1/2	1 1/16	—	S	Plug-Jack	Panel Mount Adapter	12650
—	1 1/2	5/16	1 1/16	S	Jack-Jack	Angle Adapter	10425

*Stock Code: S = Stock N = Non Stock

NOTE: Use BNC Caps for MHV Connectors.

RF CONNECTORS

BUNKER
RAMO AMPHENOL

Threaded coupling UHF series are low-cost, general purpose connectors used in applications at lower frequency where no serious mismatch is introduced. They will operate satisfactorily at frequencies up to 300 MHz and have a peak voltage rating of 500 volts.

While most UHF Connectors have conventional solder-type cable affixment, Quick-Crimp* connectors feature Amphenol's patented hex crimp design which permits faster, easier and more reliable assembly.

Except as noted, UHF connectors have small size bodies; large sizes are noted, and will not mate with the small connectors.

* U.S. Patent 3,054,981

STRAIGHT PLUGS

Non-constant Impedance • Male Contacts • Non-weatherproof

RG-()/U Cable	Military Part Number	Dimensions, inches			Insulation	Stock Code *	Notes	Amphenol Part Number
		Length a	Larg- est O.D. b	Max. Cable O.D. c				
8, 11, 149, 213	—	1 $\frac{1}{32}$	$\frac{3}{4}$	.418	Bakelite	S	Crimp	83-8SP
8,9, 11, 13, 63,	PL-259	1 $\frac{1}{2}$	$\frac{3}{4}$	.444	Filled Bakelite	S	UG Standard	83-1SP
87, 149, 213,	PL-259	1 $\frac{1}{2}$	1 $\frac{1}{16}$	.437	Teflon	S	UG Standard	83-822
214, 216, 225	PL-259A	1 $\frac{1}{6}$	2 $\frac{3}{32}$	.444	Filled Bakelite	S	Clamp Set Screw	83-1SPN
	PL-259A	1 $\frac{1}{6}$	1 $\frac{3}{16}$	.450	Teflon	S	Clamp Set Screw	83-756
	—	1 $\frac{1}{2}$	$\frac{3}{4}$	.444	Filled Bakelite	N	UG Standard, Dip Solder Contact	83-1SP- 1002
	—	1 $\frac{43}{64}$	$\frac{3}{4}$	.444	Filled Bakelite	S	Solderless Braid Clamp	83-851
	—	1 $\frac{1}{2}$	2 $\frac{3}{32}$	.444	Filled Bakelite	S	Push-on	83-5SP
11,149	—	1 $\frac{43}{64}$	$\frac{3}{4}$	.437	Filled Bakelite	S	Solderless Braid Clamp & Contact	83-850
17, 218	—	2 $\frac{1}{8}$	1 $\frac{5}{16}$	.625	Teflon	S	UG Standard	83-86
	—	2 $\frac{1}{8}$	1 $\frac{5}{16}$	.625	Rexolite	S	UG Standard	10450
34	UG358/U	1 $\frac{13}{16}$	1 $\frac{1}{8}$	.625	Filled Bakelite	S	Large Body, Weatherproof	83-21SP
55, 142, 223	—	1 $\frac{1}{32}$	$\frac{3}{4}$	.220	Bakelite	N	Crimp	83-55SP
58, 141	—	1 $\frac{1}{32}$	$\frac{3}{4}$	.206	Bakelite	S	Crimp	83-58SP
	UG203/U	1 $\frac{1}{6}$	2 $\frac{3}{32}$	.214	Filled Bakelite	S	Clamp Set Screw	83-776
59, 62, 71, 140, 210	UG111/U	1 $\frac{1}{16}$	2 $\frac{5}{32}$	.257	Filled Bakelite	S	UG Standard	83-750
59, 62, 140, 210	—	1 $\frac{1}{32}$	$\frac{3}{4}$	.251	Bakelite	N	Crimp	83-59SP

ANGLE PLUGS/ Non-constant Impedance • Male Contacts • Non-weatherproof

RG-()/U Cable	Dimensions, inches				Insulation	Stock Code *	Notes	Amphenol Part Number
	a	b	Max. Cable O.D. c	d				
8, 9, 11, 13, 63, 87,	1 $\frac{3}{8}$	$\frac{3}{4}$	.444	1 $\frac{35}{64}$	Teflon	S	—	83-67
149, 213, 214, 216, 225	1 $\frac{3}{8}$	$\frac{3}{4}$	.444	1 $\frac{35}{64}$	Polystyrene	S	—	83-59

PANEL RECEPTACLES

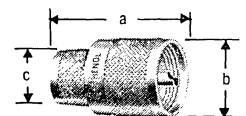
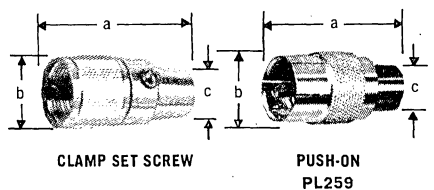
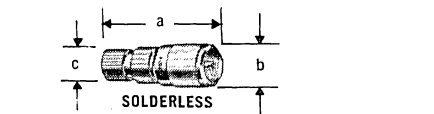
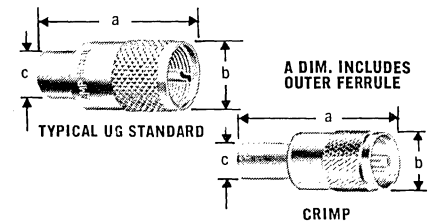
Non-constant Impedance • Female Contacts • Non-weatherproof • .125 Dia. Flange Holes

Military Part Number	Dimensions, inches		Mtg. Hole	Insulation	Stock Code *	Notes	Amphenol Part Number
	a	b					
SO-239	1 $\frac{1}{6}$	1	X	Filled Bakelite	S	Square Flange	83-1R
SO-239	1 $\frac{1}{6}$	1	X	Polystyrene	S	Square Flange	83-1RTY
SO-239	1 $\frac{1}{6}$	1	X	Teflon	S	Square Flange	83-798
—	1 $\frac{1}{6}$	1	X	Ceramic	S	Square Flange, Pressurized	83-716
—	1 $\frac{1}{6}$	1 $\frac{9}{64}$	Z	Filled Bakelite	N	Oval Flange	83-876
UG357/U	1 $\frac{5}{64}$	1 $\frac{1}{32}$	Y	Filled Bakelite	S	Large Body	83-21R

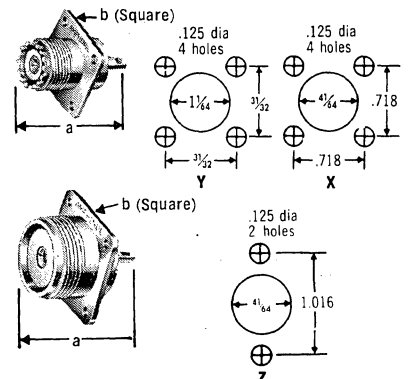
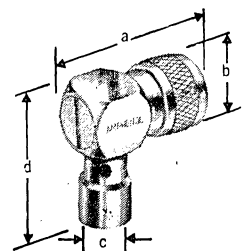
*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

UHF SERIES



LARGE SIZE 83-21SP



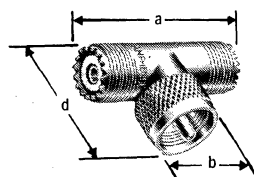
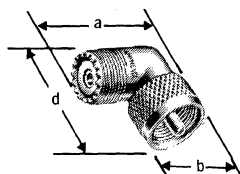
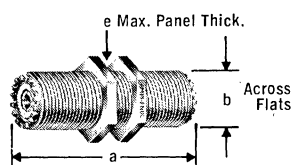
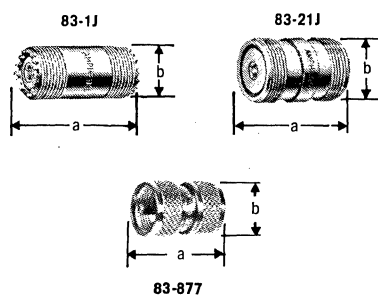
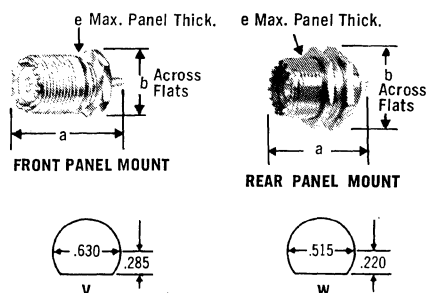
LARGE SIZE 83-21R

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

UHF SERIES



BULKHEAD RECEPTACLES

Non-constant Impedance • Female Contacts • Non-weatherproof

Military Part Number	Dimensions, inches			Mtg. Hole	Insulation	Stock Code *	Notes	Amphenol Part Number
	a	b	e					
—	1 $\frac{3}{32}$	$\frac{5}{16}$	.156	W	Rexolite-Teflon	S	Front Panel Mount	83-875
—	1 $\frac{3}{32}$	$\frac{5}{16}$	.156	W	Filled Bakelite	S	Front Panel Mount	83-875-1002
—	1 $\frac{1}{16}$	$\frac{3}{4}$	.093	V	Filled Bakelite	S	Rear Panel Mount	83-878
UG266/U	1 $\frac{13}{32}$	$\frac{7}{8}$	.515	4 $\frac{1}{64}$ Dia.	Rexolite	S	Rear Panel Mount, Pressurized	4575
—	1 $\frac{13}{32}$	$\frac{7}{8}$	.515	4 $\frac{1}{64}$ Dia.	Glass-Teflon	S	Rear Panel Mount, Hermetic	74525

STRAIGHT ADAPTERS/Non-constant Impedance • Non-weatherproof

Military Part Number	Dimensions, inches		Insulation	Adapter Ends	Stock Code *	Notes	Amphenol Part Number
	a	b					
PL-258	1 $\frac{1}{8}$	$\frac{5}{8}$	Polystyrene	Jack-Jack	S	—	83-1J
—	1 $\frac{1}{8}$	$\frac{5}{8}$	Teflon	Jack-Jack	S	—	11850
—	1 $\frac{5}{16}$	$\frac{25}{32}$	Polystyrene	Plug-Plug	S	—	83-877
UG360/U	1 $\frac{1}{8}$	1	Polystyrene	Jack-Jack	N	Large Body	83-21J

BULKHEAD ADAPTERS/Non-constant Impedance • Non-weatherproof

Military Part Number	Dimensions, inches			Mtg. Hole Diameter	Insulation	Adapter Ends	Stock Code *	Notes	Amphenol Part Number
	a	b	e						
UG363/U	2	$\frac{5}{8}$	$\frac{57}{64}$	4 $\frac{1}{64}$	Polystyrene	Jack-Jack	S	—	83-1F
UG224/U	1 $\frac{3}{8}$	$\frac{5}{8}$	$\frac{9}{32}$	4 $\frac{1}{64}$	Rexolite	Jack-Jack	S	—	29500

ANGLE ADAPTERS/Non-constant Impedance • Non-weatherproof

Military Part Number	Dimensions, inches			Insulation	Adapter Ends	Stock Code *	Notes	Amphenol Part Number
	a	b	d					
UG646/U	1 $\frac{1}{32}$	$\frac{3}{4}$	1 $\frac{1}{16}$	Polystyrene	Jack-Plug	S	—	83-1AP
M-359A	1 $\frac{1}{32}$	$\frac{3}{4}$	1 $\frac{1}{16}$	Polystyrene	Jack-Plug	S	—	83-58

TEE ADAPTERS/Non-constant Impedance • Non-weatherproof

Military Part Number	Dimensions, inches			Insulation	Adapter Ends	Stock Code *	Notes	Amphenol Part Number
	a	b	d					
M-358	1 $\frac{1}{8}$	$\frac{3}{4}$	1 $\frac{13}{64}$	Polystyrene	Jack-Plug-Jack	S	—	83-1T

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

REDUCING ADAPTERS

Non-weatherproof • For use with 83-1SP, -1SP-1002, -59, -67, -750, -822, -850, -851

RG-()/U Cables	Military Part Number	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c			
55, 58, 141, 142 (except 55A)	UG175/U	1	$\frac{7}{16}$	.209	S	—	83-185
59, 62, 71, 140, 210	UG176/U	1	$\frac{7}{16}$	.257	S	—	83-168

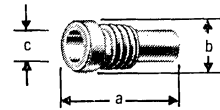
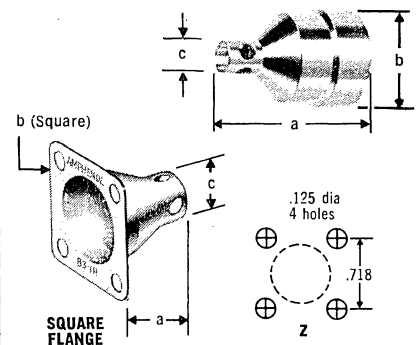
HOODS

Non-weatherproof

RG-()/U Cables	Military Part Number	Dimensions, inches			Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Braid Dia. c				
8, 10, 11, 12, 63, 79, 115, 149, 213, 215	UG106/U	$\frac{3}{4}$	1	.345	Z	S	Sq. Flange	83-1H
8, 9, 10, 11, 12, 63, 79, 87, 115, 149, 213, 215	UG372/U	$\frac{7}{8}$	1	.360	Z	S	Sq. Flange	83-1HP
	MX-543	1	$1\frac{1}{16}$	.359	▲	N	Threaded	5475
58, 141	UG177/U	$\frac{3}{4}$	1	.155	Z	S	Sq. Flange	83-765
55, 59, 140, 142, 223	MX-539	1	$1\frac{1}{16}$	.201	▲	S	Gold Plate Thd.	5375

▲ Threaded for mounting on bulkhead receptacles p/n 4575 and 74525

UHF SERIES

THREADED HOOD
($\frac{5}{16}$ -24 THD's)

CAPS

Weatherproof

Dimensions, inches				Stock Code *	Notes	Amphenol Part Number
a	b	c	Chain Length f			
$\frac{15}{32}$	$\frac{3}{4}$	.130	$4\frac{1}{16}$	S	Male Cap	83-1AC
$\frac{11}{16}$	$\frac{5}{8}$	$\frac{3}{16}$	$4\frac{1}{4}$	S	Female Cap	83-1BC

BINDING POSTS

Non-Weatherproof • Male Contact

Military Part Number	Dimensions, inches		Insulation	Stock Code *	Notes	Amphenol Part Number
	a	b				
UG332/U	$1\frac{7}{8}$	$\frac{23}{32}$	Rexolite	S	—	58000

*Stock Code: S = Stock N = Non Stock

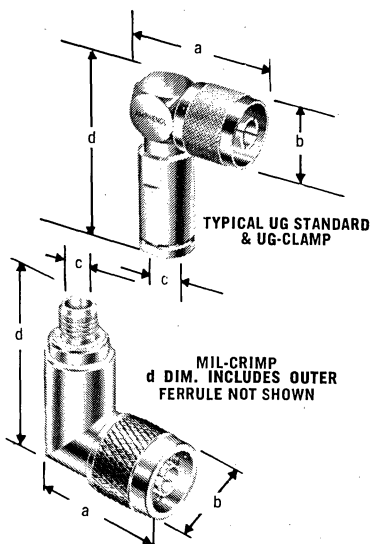
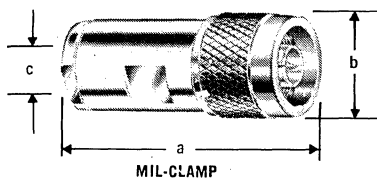
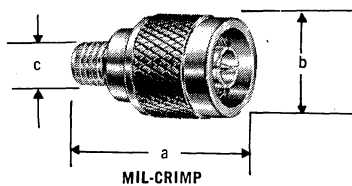
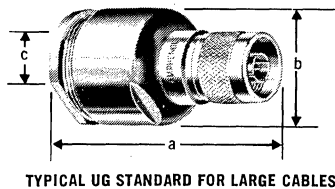
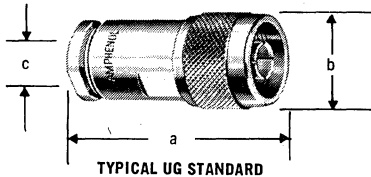
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

N SERIES



(See Next Page)

Series N connectors are medium size, weatherproof, threaded coupling units with a frequency limit of 11GHZ. They have a peak voltage rating of 1500 volts and are impedance matched to either 50 or 70 ohm cables as listed.

Clamp type as well as crimp type designs are available.

STRAIGHT PLUGS

Teflon Insulation • Male Contacts • Weatherproof • 50 Ohm Impedance

RG-() / U Cables	Military Part Number	Dimensions, inches			Configu- ration	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c				
5, 21, 143, 212, 222	—	1 ³ / ₄	1 ³ / ₁₆	.342	MIL Crimp	N	—	82-4341
	UG18F/U	1 ²⁵ / ₃₂	1 ³ / ₁₆	.346	MIL Clamp	S	—	82-354
6	UG-91A/U	1 ³ / ₄	1 ³ / ₁₆	.357	UG Std.	S	70 Ohm Impedance	7200
8, 213	—	1 ²⁹ / ₆₄	1 ³ / ₁₆	.418	MIL Crimp	N	—	82-4340
9, 214	—	1 ²⁹ / ₆₄	1 ³ / ₁₆	.438	MIL Crimp	N	—	82-4332
8, 9, 213, 214	M39012/ 01-0005	1 ²⁵ / ₃₂	1 ³ / ₁₆	.444	MIL Clamp	S	—	82-352
	M39012/ 01-0002	1 ²⁵ / ₃₂	1 ³ / ₁₆	.444	MIL Clamp	S	—	82-352-1
8, 9, 87, 213, 214, 225	UG21B/U	1 ⁷ / ₈	1 ³ / ₁₆	.444	UG Std.	S	—	82-61
	UC21D/U	1 ¹ / ₂	2 ⁵ / ₃₂	.444	UG Std.	S	Safety Wire Holes	82-202
	UG21E/U	1 ¹ / ₂	1 ³ / ₁₆	.444	UG Std.	S	Safety Wire Holes	82-3202
	UG1185/U	1 ¹ / ₂	2 ⁵ / ₃₂	.444	UG Std.	S	Capt. Cont.	82-312
	UG1185A/U	1 ¹ / ₂	2 ⁵ / ₃₂	.444	UG Std.	S	Capt. Cont.	82-3312
10, 12, 116, 215, 227	UG941B/U	2 ¹ / ₈	1 ³ / ₁₆	.511	UG Std.	S	Armor Clamp	82-3204
11, 149	UG1695/U	1 ³ / ₄	1 ³ / ₁₆	.418	MIL Crimp	S	—	82-342
11, 13, 149, 216	UG94A/U	1 ⁷ / ₈	1 ³ / ₁₆	.444	UG Std.	S	70 Ohm Impedance	82-84
14, 217	UG204C/U	1 ²³ / ₃₂	7/ ₈	.557	UG Std.	S	—	82-214
17, 218	UG167A/U	2 ³ / ₈	1 ⁵ / ₁₆	.900	UG Std.	S	—	82-104
	UG167D/U	2 ¹ / ₈	1 ⁵ / ₁₆	.900	UG Std.	S	Safety Wire Holes	82-215
	UG167F/U	2 ¹ / ₈	1 ⁵ / ₁₆	.900	UG Std.	S	Safety Wire Holes	82-3215
18, 219	UG982/U	3	1 ⁵ / ₁₆	.963	UG Std.	N	Armor Clamp	92125
35	—	2 ³ / ₈	1 ⁵ / ₁₆	.900	UG Std.	N	Armor Clamp, 70 Ohm Impedance	82-113
55, 142, 223	—	1 ³ / ₄	1 ³ / ₁₆	.220	MIL Crimp	S	—	82-5370
58, 141	—	1 ³ / ₄	1 ³ / ₁₆	.206	MIL Crimp	S	—	82-5375
55, 58, 141, 142 (except 55A)	UG536B/U	1 ³ / ₈	1 ³ / ₁₆	.214	UG Std.	S	—	34025
55, 58, 141, 142, 223	—	1 ²⁵ / ₃₂	1 ³ / ₁₆	.219	MIL Clamp	S	—	82-5381
59, 62, 71, 140, 210	—	1 ³ / ₄	1 ³ / ₁₆	.261	MIL Crimp	S	—	82-5380
	UG603A/U	1 ³ / ₈	1 ³ / ₁₆	.257	UG Std.	S	—	34525
	—	1 ⁵ / ₈	1 ³ / ₁₆	.257	UG Std.	S	70 Ohm Impedance	34750
63, 114	UG1003/U	1 ³ / ₄	1 ³ / ₁₆	.435	UG Std.	S	—	12400

ANGLE PLUGS

Teflon Insulation • Male Contacts • Weatherproof • 50 Ohm Impedance

RG-() / U Cable	Military Part Number	Dimensions, inches				Configu- ration	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c	d				
5, 21, 143, 212, 222	—	1 ¹ / ₁₆	1 ³ / ₁₆	.342	2 ¹ / ₄	MIL Crimp	N	—	82-5350
	—	1 ³ / ₈	1 ³ / ₁₆	.343	1 ⁵ / ₈	UG Std.	S	—	15950
8, 213	—	1 ¹ / ₁₆	1 ³ / ₁₆	.418	2 ¹ / ₄	MIL Crimp	N	—	82-4349
9, 214	—	1 ¹ / ₁₆	1 ³ / ₁₆	.438	2 ¹ / ₄	MIL Crimp	N	—	82-4336

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

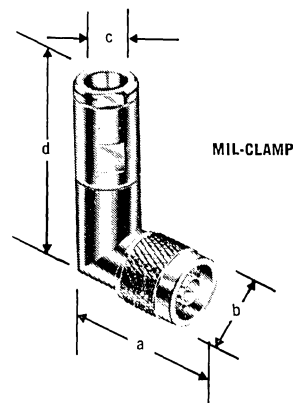
BUNKER
RAMO

AMPHENOL

N SERIES

ANGLE PLUGS (Cont'd)

RG-()/U Cable	Military Part Number	Dimensions, inches				Configu- ration	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c	d				
8, 9, 213, 214	M39012/ 05-0001	1½	1⅜	.444	2¼	Mil Clamp	S	—	82-357
8, 9, 87, 213, 214, 225	—	1⅝	1⅜	.444	1⅝	UG Std.	S	Capt. Cont.	82-326
	—	1⅞	1⅜	.437	1⅞	UG Std.	S	—	82-835
	—	1⅝	1⅜	.437	1⅞	UG Std.	S	—	6875
	UG594A/U	1⅞	1⅜	.437	2⅜	UG Std.	S	—	15425
11, 149	—	1⅞	1⅜	.418	2⅜	MIL Crimp	N	—	82-5351
11, 13, 149, 216	—	1½	1⅜	.444	2¼	Mil Clamp	N	—	82-5353
	—	1⅝	1⅜	.437	1⅞	UG Std.	S	70 Ohm Impedance	17025
55, 142, 223	—	1⅞	1⅜	.220	2¼	Mil Crimp	S	—	82-5374
58, 141	—	1⅞	1⅜	.206	2¼	Mil Crimp	S	—	82-5379
55, 58, 141, 142 except 55A	—	1⅝	1⅜	.210	1⅜	UG Std.	S	—	18750
59, 62, 71, 140, 210	—	1⅝	1⅜	.257	1⅜	UG Std.	S	—	19250

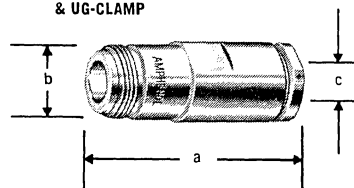


STRAIGHT JACKS

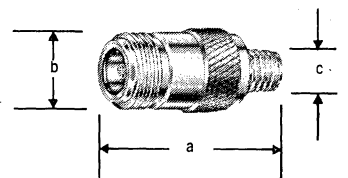
Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance

RG-()/U Cable	Military Part Number	Dimensions, inches			Configu- ration	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c				
5, 21, 143, 212, 222	UG1687/U	1⅞	1⅞	.342	MIL Crimp	N	—	82-338
	UG20B/U	1⅞	1⅞	.357	UG Std.	S	—	82-88
	UG20F/U	1⅞	1⅞	.346	MIL Clamp	S	—	82-358
6	UG92A/U	1⅞	1⅞	.357	UG Std.	S	70 Ohm Imp.	7700
8, 213	M39012/ 02-0020	1⅞	1⅞	.418	MIL Crimp	N	—	82-4337
9, 214	—	1⅞	1⅞	.438	MIL Crimp	N	—	82-4333
8, 9, 213, 214	M39012/ 02-0003	1⅞	1⅞	.444	MIL Clamp	S	—	82-356
	M39012/ 02-0002	1⅞	1⅞	.444	MIL Clamp	S	—	82-356-1
8, 9, 87, 213, 214, 225	UG23B/U	1⅞	1⅞	.437	UG Std.	S	—	82-63
	UG23D/U	1⅞	¾	.444	UG Std.	S	—	82-209
	UG23E/U	1⅞	¾	.444	UG Std.	S	—	82-3209
	UG1186/U	1⅞	¾	.444	UG Std.	S	Capt. Cont.	82-313
10, 12, 116, 215, 227	UG940A/U	2¼	¾	.444	UG Std.	S	Armor Clamp	82-212
11, 149	UG1694/U	1⅞	1⅞	.418	MIL Crimp	N	—	82-339
11, 13, 149, 216	—	1⅞	1⅞	.444	MIL Clamp	N	—	82-5359
	UG95A/U	1⅞	1⅞	.437	UG Std.	S	70 Ohm Imp.	82-89
17	—	2⅞	1⅞	.900	UG Std.	S	—	14850
55, 142, 223	—	1⅞	1⅞	.220	MIL Crimp	S	—	82-5371
55, 58, 141, 142, 223	—	1⅞	1⅞	.219	MIL Clamp	S	—	82-5382
55, 58, 141, 142 (except 55A)	—	1½	¾	.214	UG Std.	S	—	35025
58, 141	—	1⅞	1⅞	.206	MIL Crimp	S	—	82-5376
59, 62, 71, 140, 210	UG602/U	1⅞	1⅞	.257	UG Std.	S	Rexolite Insul.	36500

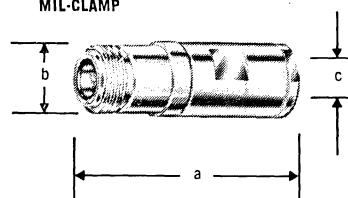
*Stock Code: S = Stock N = Non Stock

TYPICAL UG STANDARD
& UG-CLAMP

MIL-CRIMP

a DIM. INCLUDES OUTER FERRULE
NOT SHOWN

MIL-CLAMP



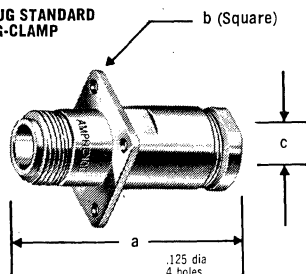
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

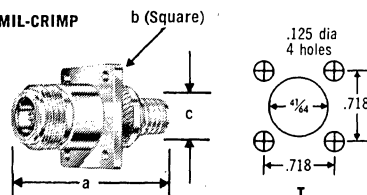
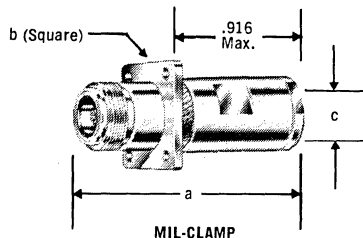
BUNKER
RAMO

AMPHENOL

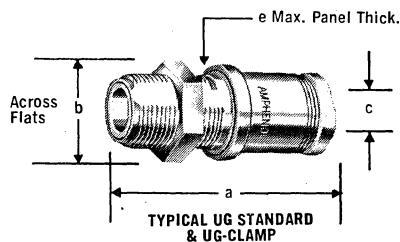
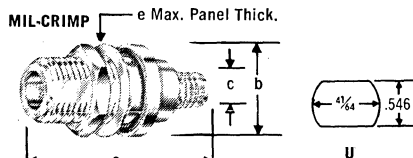
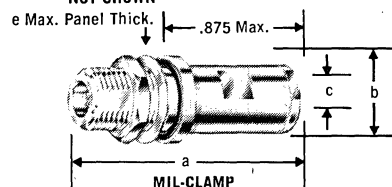
N SERIES

TYPICAL UG STANDARD
& UG-CLAMP

MIL-CRIMP

a DIM. INCLUDES OUTER FERRULE
NOT SHOWN

MIL-CLAMP

TYPICAL UG STANDARD
& UG-CLAMPa DIM. INCLUDES OUTER FERRULE
NOT SHOWN

MIL-CLAMP

PANEL JACKS

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm • .125 Dia. Flange Holes
Mounting Hole "T" • Rear Mounted

RG-()/U Cable	Military Part Number	Dimensions, inches			Configu- ration	Stock Code *	Notes	Amphenol Part Number
		a	b	Max Cable O.D. c				
5, 21, 143, 212, 222	UG1696/U	1 $\frac{1}{32}$	1	.342	MIL Crimp	N	—	82-344
	UG19F/U	1 $\frac{1}{32}$	1	.346	MIL Clamp	S	—	82-362
6	UG93A/U	1 $\frac{7}{8}$	1	.357	UG Std.	S	70 Ohm Imp.	7800
8, 213	—	1 $\frac{1}{32}$	1	.418	MIL Crimp	N	—	82-4343
8, 9, 213, 214	M39012/ 02-0006	1 $\frac{1}{32}$	1	.444	MIL Clamp	S	—	82-360
	M39012/ 02-0005	1 $\frac{1}{32}$	1	.444	MIL Clamp	S	—	82-360-1
9, 214	—	1 $\frac{1}{32}$	1	.438	MIL Crimp	N	—	82-4334
8, 9, 87, 213, 214, 225	UG22E/U	1 $\frac{1}{8}$	1	.444	UG Std.	S	—	82-3208
	UG1187/U	1 $\frac{1}{8}$	1	.444	UG Std.	S	Capt. Cont.	82-314
10, 12, 116, 215, 227	UG935B/U	2 $\frac{1}{4}$	1	.444	UG Std.	N	Armor Clamp	82-3211
11, 149	—	1 $\frac{1}{8}$	1	.418	MIL Crimp	N	—	82-5345
11, 13, 149, 216	—	1 $\frac{1}{32}$	1	.444	MIL Clamp	N	—	82-5363
	UG96A/U	1 $\frac{3}{16}$	1	.437	UG Std.	S	70 Ohm Imp.	82-90
55, 142, 223	—	1 $\frac{1}{8}$	1	.220	MIL Crimp	S	—	82-5372
55, 58, 141, 142, 223	—	1 $\frac{1}{32}$	1	.219	MIL Clamp	N	—	82-5383
	UG1095A/U	1 $\frac{1}{2}$	1	.224	UG Std.	S	—	36250
58, 141	—	1 $\frac{1}{8}$	1	.206	MIL Crimp	N	—	82-5377
59, 62, 71, 140, 210	UG593/U	1 $\frac{3}{16}$	1	.257	UG Std.	S	Rexolite Insul.	35500
	—	1 $\frac{1}{2}$	1	.257	UG Std.	N	70 Ohm Imp.	91250

BULKHEAD JACKS

Female Contacts • Weatherproof • 50 Ohm Impedance • Mounting Hole "U" • Rear Mounted

RG-()/U Cable	Military Part Number	Dimensions, inches				Configu- ration	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c	e				
5, 21, 143, 212, 222	UG1699/U	1 $\frac{7}{32}$	$\frac{7}{8}$	.342	.250	MIL Crimp	N	—	82-347
	UG159D/U	1 $\frac{5}{16}$	$\frac{7}{8}$	.346	.250	MIL Clamp	N	—	82-366
8, 213	—	1 $\frac{5}{16}$	$\frac{7}{8}$	.418	.250	MIL Crimp	N	—	82-4346
8, 9, 213, 214	M39012/ 03-0002	1 $\frac{5}{16}$	$\frac{7}{8}$	.444	.250	MIL Clamp	S	—	82-364
9, 214	—	1 $\frac{5}{16}$	$\frac{7}{8}$	.438	.250	MIL Crimp	N	—	82-4335
8, 9, 87, 213, 214, 225	UG160B/U	1 $\frac{1}{8}$	$\frac{1}{2}$	.437	.343	UG Std.	S	—	82-93
11, 149	UG1706/U	1 $\frac{7}{32}$	$\frac{7}{8}$	.418	.250	MIL Crimp	N	—	82-348
11, 13, 149, 216	—	1 $\frac{5}{16}$	$\frac{7}{8}$	.444	.250	MIL Clamp	N	—	82-5365
55, 142, 223	—	1 $\frac{7}{32}$	$\frac{7}{8}$	.220	.250	MIL Crimp	S	—	82-5373
55, 58, 141, 142, 223	—	1 $\frac{5}{16}$	$\frac{7}{8}$	.219	.250	MIL Clamp	N	—	82-5384
	UG556B/U	1 $\frac{4}{16}$	$\frac{1}{2}$	.222	.317	UG Std.	S	—	35275
58, 141	—	1 $\frac{7}{32}$	$\frac{7}{8}$	.206	.250	MIL Crimp	N	—	82-5378
59, 62, 71, 140, 210	—	1 $\frac{7}{32}$	$\frac{1}{2}$	.257	.294	UG Std.	S	Rexolite Insul.	18250

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

PANEL RECEPTACLES

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance • Front Mount

Military Part Number	Dimensions, inches		Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
	a	b				
UG58/U	1 $\frac{1}{4}$	1	T	S	—	82-24
UG58A/U	1 $\frac{1}{4}$	1	T	S	—	82-97
M39012/04-0002	1 $\frac{1}{4}$	1	T	S	—	82-368
—	1 $\frac{1}{8}$	1	T	S	70 Ohm Impedance	82-112
—	1 $\frac{1}{4}$	$\frac{3}{4}$	W	S	.100 Flange Holes	9575
—	1 $\frac{3}{32}$	1	V	S	Male Receptacle, Male Contact, Rexolite Ins.	49000

BULKHEAD RECEPTACLES

Hermetically Sealed • 50 Ohm Impedance • Front Mount

Military Part Number	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
	a	b	c			
UG680/U	1 $\frac{37}{64}$	1 $\frac{13}{16}$	.209	S	Female Receptacle, Female Contact	82-811
M39012/04-0001	1 $\frac{37}{64}$	1 $\frac{13}{16}$	.250	S	Female Receptacle, Female Contact	82-369
—	1 $\frac{1}{16}$	1 $\frac{13}{16}$	—	S	Male Receptacle, Male Contact	19550

□ To ground cable shield specify Amphenol accessory lug 82-1275

ANGLE PANEL RECEPTACLES

Teflon Insulation • Female Contacts • 50 Ohm Impedance • .125 Dia. Flange Holes

Military Part Number	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
	a	b	d			
UG997A/U	1 $\frac{1}{16}$	1	1 $\frac{29}{64}$	S	1 $\frac{1}{16}$ " Above Panel Clearance	8975
—	1 $\frac{1}{16}$	1	1 $\frac{29}{64}$	N	$\frac{3}{4}$ " Above Panel Clearance	23775

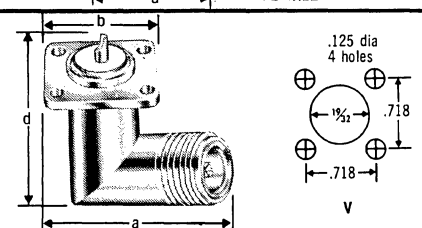
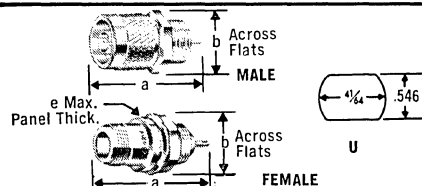
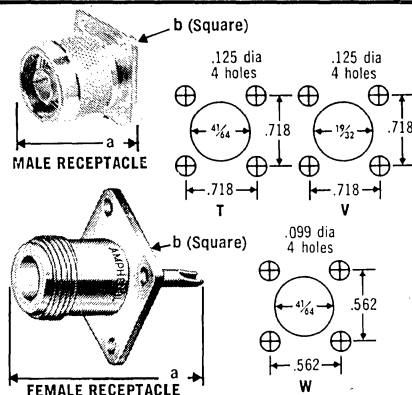
ADAPTERS/Teflon Insulation • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches				Configuration	Adapter Ends	Stock Code *	Notes	Amphenol Part Number
	a	b	d	e					
UG57B/U	1 $\frac{1}{32}$	1 $\frac{1}{16}$	—	—	Straight	P-P	S	—	82-100
UG29B/U	1 $\frac{3}{4}$	2 $\frac{1}{32}$	—	—	Straight	J-J	S	—	82-101
—	1 $\frac{1}{32}$	1 $\frac{1}{16}$	—	—	Straight	P-P	S	70 Ohm Impedance	17075
—	1 $\frac{3}{4}$	2 $\frac{1}{32}$	—	—	Straight	J-J	S	70 Ohm Impedance	21650
UG27A/U	1 $\frac{1}{16}$	1 $\frac{1}{16}$	—	1 $\frac{3}{8}$	Angle	J-P	S	Mitre	82-64
UG27C/U	1 $\frac{1}{16}$	1 $\frac{1}{16}$	—	1 $\frac{13}{32}$	Angle	J-P	S	Cubic	82 213
UG30/U	1 $\frac{5}{8}$	1 $\frac{1}{16}$	—	.312	Bulkhead	J-J	S	Rexolite Insulation Pressurized	82-66
UG30D/U	1 $\frac{1}{32}$	$\frac{7}{8}$	—	.339	Bulkhead	J-J	S	Hermetically Sealed "O" Ring	91100
UG28A/U	1 $\frac{3}{4}$	—	1 $\frac{1}{32}$	—	Tee	J-J-J	S	—	82-99
UG107B/U	1 $\frac{3}{4}$	—	1 $\frac{13}{64}$	—	Tee	J-P-J	S	—	82-102
—	2 $\frac{11}{32}$	—	1 $\frac{13}{64}$	—	Tee	P-P-P	N	—	4850
—	2 $\frac{1}{4}$	—	2 $\frac{1}{4}$	—	Cross	J-J-J-J	N	—	17125

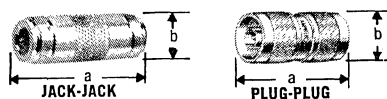
*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

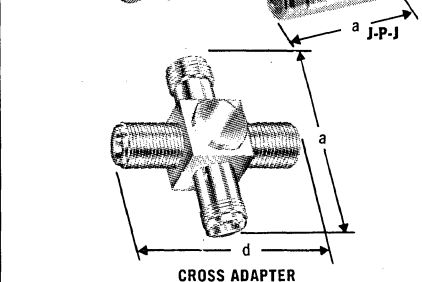
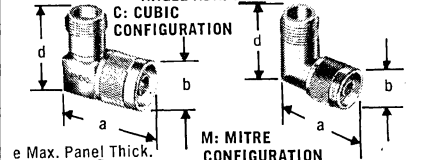
N SERIES



STRAIGHT ADAPTERS



ANGLE ADAPTERS

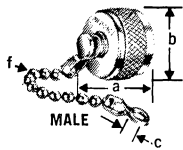


RF CONNECTORS

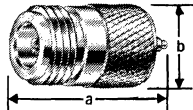
BUNKER
RAMO

AMPHENOL

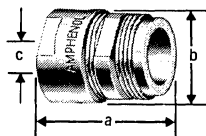
N SERIES



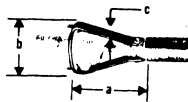
MALE



FEMALE

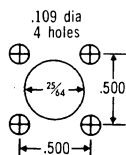
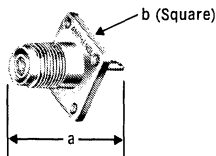
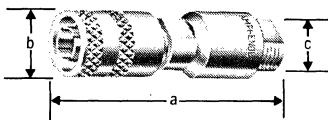


ARMOR CLAMP



LUG

BN SERIES



MTG. HOLE

CAPS/Weatherproof

Military Part Number	Dimensions, inches				Stock Code *	Notes	Amphenol Part Number
	a	b	c	Chain Length f			
MX913	$\frac{9}{16}$	$\frac{3}{4}$	.144	1 $\frac{1}{4}$	S	Male Cap	82-106
—	$\frac{27}{32}$	$\frac{13}{16}$	.144	2 $\frac{1}{2}$	S	Male Cap, Shorting Male Contact	13700
—	$\frac{31}{32}$	$\frac{5}{8}$	$\frac{3}{16}$	2 $\frac{1}{4}$	S	Female Cap	6950
—	1	$\frac{5}{8}$	—	—	S	Female Cap, Shorting Female Contact	13675

ARMOR CLAMPS

Assemble to Connectors Designed for Identical Cable Without Armor

RG-()/U Cables	Military Part Number	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c			
10, 12, 79,	MX-564A	1 $\frac{1}{16}$	$\frac{1}{16}$	.511	S	—	82-109
116, 215, 227	M39012/25-0013	1 $\frac{1}{8}$	$\frac{3}{4}$	.511	N	—	82-3517
18, 219	M39012/25-0014	1 $\frac{3}{8}$	1 $\frac{1}{16}$	.963	N	—	99175
74, 224	MX-1462	1 $\frac{3}{16}$	$\frac{7}{8}$	.625	N	—	16850

SHIELD GROUNDING LUG

Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
a	b	c			
1	$\frac{37}{64}$	$\frac{1}{8}$	S	Used on Front Mount Receptacles as Shown	82-1275

*Stock Code: S = Stock N = Non Stock

Threaded coupling BN Series connectors are used in video, trigger-pulse and other low-power RF applications. They are not recommended for use at frequencies above 200 MHz. They may be used at peak voltages up to 250 volts. Impedance is non-constant.

STRAIGHT PLUG/Rexolite Insulation • Male Contacts • Weatherproof

RG-()/U Cable	Military Part Number	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c			
55, 58, 59, 62, 71, 140, 141, 142, 210, 223	UG85/U	1 $\frac{11}{16}$	$\frac{15}{32}$	.257	S	—	82-21

PANEL RECEPTACLE/Female Contacts • Non-weatherproof

Military Part Number	Dimensions, inches		Stock Code *	Notes	Amphenol Part Number
	a	b			
UG87/U	$\frac{55}{64}$	1 $\frac{1}{16}$	S	—	82-42

*Stock Code: S = Stock N = Non Stock

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

Series HN connectors are medium sized, 50 ohm constant impedance, high voltage, threaded coupling types. This series has a frequency limit of 4GHZ and a voltage rating of 1500 volts peak. Dielectric withstanding voltage is 5000 volts RMS.

STRAIGHT/ANGLE PLUGS

Male Contacts • Weatherproof • 50 Ohm Impedance

RG-()/U Cables	Military Part Number	Dimensions, inches				Insulation	Configu- ration	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c	d					
8, 9, 87, 213, 214, 225	UG59B/U	2 $\frac{3}{8}$	$\frac{7}{8}$	.444	—	Teflon	Straight	S	▲	82-804
	—	1 $\frac{1}{2}$	$\frac{7}{8}$	.444	2 $\frac{5}{16}$	Rexolite	Angle	S	—	82-833
	—	1 $\frac{1}{2}$	$\frac{7}{8}$	.444	2 $\frac{5}{16}$	Teflon	Angle	S	—	82-856
10, 12, 116, 215, 227	UG925/U	2 $\frac{9}{16}$	2 $\frac{7}{32}$	.511	—	Teflon	Straight	N	Armor Clamp	9375
14, 217	UG494/U	2	1	.562	—	Rexolite	Straight	S	—	8125
17	—	2 $\frac{1}{16}$	1 $\frac{1}{16}$	.900	—	Rexolite	Straight	S	Capt. Cont.	82-325
54A	—	1 $\frac{1}{16}$	$\frac{7}{8}$	.257	—	Teflon	Straight	S	—	82-816
55, 58, 141, 142	—	1 $\frac{1}{16}$	2 $\frac{7}{32}$	.214	—	Teflon	Straight	S	—	16750
	—	1 $\frac{3}{8}$	$\frac{7}{8}$	.214	1 $\frac{1}{32}$	Teflon	Angle	N	1500 VRMS	19625

STRAIGHT/PANEL JACKS

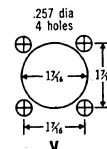
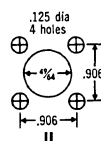
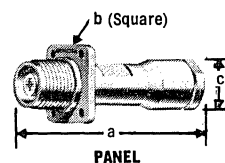
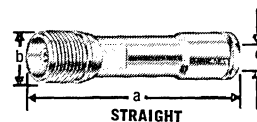
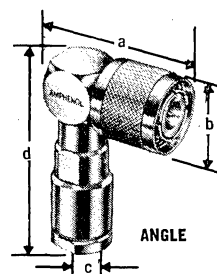
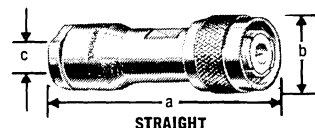
Female Contacts • Weatherproof • 50 Ohm Impedance

RG-()/U Cables	Military Part Number	Dimensions, inches			Insula- tion	Configu- ration	Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c						
8, 9, 87, 213, 214, 225	UG60B/U	2 $\frac{1}{2}$	1 $\frac{1}{16}$	.444	Teflon	Straight	—	S	▲	82-814
	UG61B/U	2 $\frac{1}{2}$	1 $\frac{1}{16}$	.444	Teflon	Panel	U	S	▲	82-815
10, 12, 116, 215, 227	UG927/U	3	$\frac{3}{4}$	—	Teflon	Straight	—	N	Armor Clamp	33250
17	UG333A/U	2 $\frac{1}{16}$	1 $\frac{1}{16}$	.960	Rexolite	Straight	—	S	—	82-107
	UG334A/U	2 $\frac{1}{16}$	1 $\frac{1}{16}$	.900	Rexolite	Panel	U	N	—	82-108
18	UG333/U	2 $\frac{3}{4}$	1 $\frac{1}{16}$	.900	Rexolite	Straight	—	N	Armor Clamp	82-56
	UG334/U	2 $\frac{3}{4}$	2	.984	Rexolite	Panel	V	N	Armor Clamp	82-57

▲Amphenol adapter kit 82-887 will adapt connector for use with ALJAK/CUJAK metal jacketed cables

*Stock Code: S = Stock N = Non Stock

HN SERIES

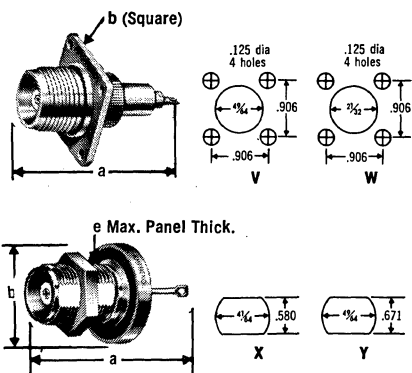


RF CONNECTORS

BUNKER
RAMO

AMPHENOL

HN SERIES



RECEPTACLES/Female Contacts • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches			Insulation	Configuration	Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
	a	b	e						
UG496/U	1 $\frac{17}{32}$	1 $\frac{1}{16}$	—	Rexolite	Panel	V	S	—	82-92
UG560/U	1 $\frac{7}{8}$	1 $\frac{1}{16}$	—	Teflon	Panel	W	S	—	82-805
—	1 $\frac{3}{4}$	1 $\frac{1}{16}$	.187	Glass-Teflon	Bulkhead	X	S	Hermetic, Front Mtg.	82-836
—	1 $\frac{49}{64}$	1 $\frac{1}{4}$	.187	Glass-Teflon	Bulkhead	Y	S	Hermetic, Rear Mtg.	82-843

ADAPTERS/Teflon Insulation • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches				Configuration	Adapter Ends	Stock Code *	Notes	Amphenol Part Number
	a	b	d	e					
—	2 $\frac{1}{8}$	$\frac{7}{8}$	—	—	Straight	Plug-Plug	S	—	16800
UG212C/U	1 $\frac{15}{32}$	$\frac{7}{8}$	1 $\frac{1}{2}$	—	Angle	Jack-Plug	S	—	82-115
UG1019/U	1 $\frac{31}{32}$	1	—	.343	Bulkhead	Jack-Jack	S	Use Mtg. Hole Z	11050
—	1 $\frac{15}{16}$	—	1 $\frac{1}{16}$	—	Tee	Jack-Jack-Jack	S	—	11950

ARMOR CLAMPS/Assemble to Connectors Designed for Identical Cable Without Armor

RG-()/U Cables	Military Part Number	Dimensions, inches		Max. Cable O.D. c	Stock Code *	Notes	Amphenol Part Number
		a	b				
10, 12, 79, 116, 215, 227	MX-564A	1 $\frac{1}{16}$	1 $\frac{1}{16}$	.511	S	—	82-109
18, 219	M39012/25-0014	1 $\frac{3}{8}$	1 $\frac{1}{16}$	.963	N	—	99175

CAPS/Weatherproof

Dimensions, inches				Stock Code *	Notes	Amphenol Part Number
a	b	c	Chain Length f			
1 $\frac{1}{32}$	$\frac{7}{8}$	.144	2 $\frac{1}{16}$	S	Male Cap	82-130
2 $\frac{9}{32}$	$\frac{7}{8}$	1 $\frac{1}{16}$	4	S	Female Cap	13650

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

Series SC are medium size, weatherproof constant 50 ohm impedance connectors with threaded coupling. Standard connectors have a peak voltage rating of 1500 volts and provide good electrical performance up to 10 GHz.

These connectors are manufactured to M39012/35 meeting mechanical and electrical requirements of Limited Coordination Specification as generated by the Air Force.

STRAIGHT PLUGS

Captivated Contacts • Crimp-Crimp • Teflon Insulation • Safety Wire Holes

RG-()/U Cable	Military Part Number	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c			
9, 214, 225, 393	M39012/35-0501	1 $\frac{1}{16}$	$\frac{5}{16}$	.444	N	Crimp with 227-944/1221-25	82-4450
142B, 400	M39012/35-0503	1 $\frac{1}{16}$	$\frac{5}{16}$	.195	N	Crimp with 227-944/1221-57	82-4451

ANGLE PLUGS

Captivated Contacts • Crimp-Crimp • Teflon Insulation • Safety Wire Holes

9, 214, 225, 393	M39012/39-0501	1 $\frac{1}{2}$	$\frac{5}{16}$	.444	N	2 $\frac{1}{8}$ " long. Crimp with 227-944/1221-25	82-4474
142B, 400	M39012/39-0503	1 $\frac{1}{2}$	$\frac{5}{16}$	.195	N	2 $\frac{1}{8}$ " long. Crimp with 227-944/1221-57	82-4475

STRAIGHT JACKS

Captivated Contacts • Crimp-Crimp • Teflon Insulation

9, 214, 225, 393	M39012/36-0501	1 $\frac{1}{16}$	$\frac{1}{16}$	.444	N	Crimp with 227-944/1221-25	82-4457
142B, 400	M39012/36-0502	1 $\frac{1}{16}$	$\frac{1}{16}$	.195	N	Crimp with 227-944/1221-57	82-4458

BULKHEAD JACKS

Captivated Contacts • Crimp-Crimp • Teflon Insulation

9, 214, 225, 393	M39012/40-0501	1 $\frac{3}{32}$	$\frac{1}{16}$	.444	N	$\frac{5}{16}$ " max. panel thick- ness, mtg. hole W. Crimp with 227-944/1221-25	82-4454
------------------	----------------	------------------	----------------	------	---	---	---------

Series C connectors are medium size, weatherproof types of constant 50 ohm impedance with two-stud bayonet lock coupling. Standard connectors have a peak voltage rating of 1500 volts and provide good electrical performance up to 10GHz. As noted, 4000 volt units are available with good performance up to 2GHz.

STRAIGHT PLUGS

Teflon Insulation • Male Contacts • Weatherproof • 50 Ohm Impedance

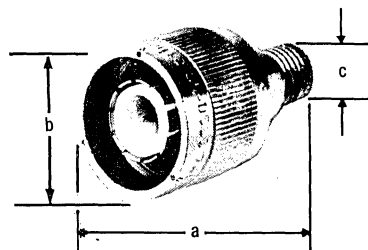
RG-()/U Cable	Military Part Number	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c			
5, 21, 143, 212, 222	UG626A/U	1 $\frac{3}{16}$	$\frac{3}{4}$	.343	N	—	80025
6	—	1 $\frac{3}{16}$	$\frac{3}{4}$	.342	N	75 Ohm Impedance	74775
8, 9, 87, 213, 214, 225	UG573A/U	1 $\frac{3}{16}$	$\frac{3}{4}$	.444	S	▲	82-530
	UG628A/U	1 $\frac{3}{4}$	$\frac{3}{4}$	.444	S	4000 Volts Peak▲	82-532
10, 12, 116, 215, 227	UG943A/U	2 $\frac{1}{8}$	$\frac{3}{4}$	—	N	MX-1286/U Armor Clamp▲	82-538
14, 217	UG707A/U	1 $\frac{1}{16}$	$\frac{7}{8}$	.569	S	—	82-533
17, 218	UG708A/U	2 $\frac{3}{32}$	1 $\frac{1}{16}$	.900	N	—	80075
55, 58, 141, 142, 223	UG709A/U	1 $\frac{1}{16}$	$\frac{3}{4}$	.219	S	—	82-534
59, 62, 71, 140, 210	—	1 $\frac{1}{16}$	$\frac{3}{4}$	.257	S	4000 Volts Peak	80375
	UG627A/U	1 $\frac{1}{32}$	$\frac{3}{4}$	.257	S	—	82-548
63, 114	—	1 $\frac{3}{16}$	$\frac{3}{4}$	.444	S	—	80300
117, 118	UG711A/U	2 $\frac{3}{32}$	1 $\frac{1}{16}$	.750	N	—	80200

ANGLE PLUGS

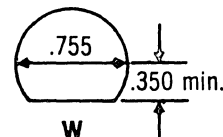
Teflon Insulation • Male Contacts • Weatherproof • 50 Ohm Impedance

8, 9, 87, 213, 214, 225	UG710A/U	1 $\frac{1}{16}$	$\frac{3}{4}$	.444	S	▲	82-531
55, 58, 141, 142, 143	—	1 $\frac{1}{16}$	$\frac{3}{4}$	.219	S	—	80775

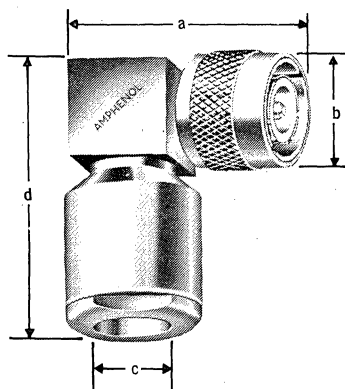
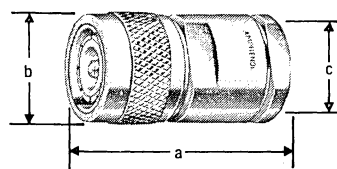
SC SERIES



a Dim. includes outer ferrule not on illustration



C SERIES



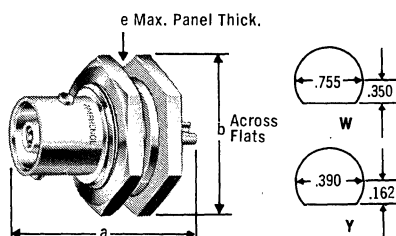
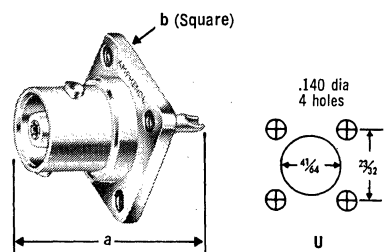
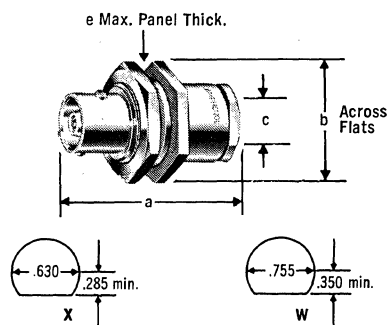
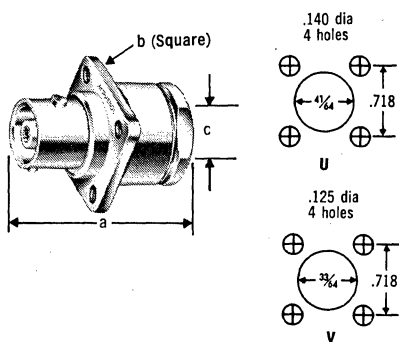
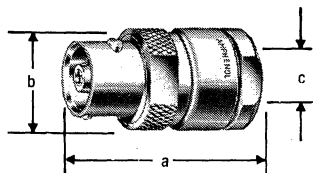
*Stock Code: S = Stock N = Non Stock

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

C SERIES



STRAIGHT JACKS

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance

RG-()/U Cable	Military Part Number	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c			
8, 9, 87, 213, 214, 225	UG572/U	1 1/32	3/4	.444	S	▲	82-503
55, 58, 141, 142, 223	—	1 1/4	5/8	.219	N	—	81575
59, 62, 71, 140, 210	—	1 1/4	5/8	.257	N	—	81550

PANEL JACKS

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance
#6-32 Tapped Flange Holes • Rear Mounted

RG-()/U Cable	Military Part Number	Dimensions, inches			Stock Code *	Mtg. Hole	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c				
8, 9, 87, 213, 214, 225	UG571/U	1 1/32	1	.444	S	U	▲	82-501
10, 12, 116, 215, 227	UG938/U	2	1	—	N	U	MX-1286/U Armor Clamp▲	82-523
14, 217	—	2	1	.564	S	U	—	81275
55, 58, 141, 142	—	1 1/4	1	.212	S	U	—	74675
	—	1 1/4	1	.212	S	V	.125 dia. Flange Holes Front Mounting	81150
59, 62, 71, 140, 210	—	1 1/4	1	.257	S	V	.125 dia. Flange Holes Front Mounting	81100

BULKHEAD JACKS

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance • Rear Mounted

RG-()/U Cable	Military Part Number	Dimensions, inches				Stock Code *	Mtg. Hole	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c	e				
8, 9, 87, 213, 214, 225	UG570/U	1 $\frac{1}{32}$	1	.444	.140	S	W	▲	82-502
	UG632/U	1 $\frac{1}{16}$	1	.444	.140	S	W	4000 Volts Peak▲	82-521
10, 12, 116, 215, 227	UG937/U	2	1	.521	.140	N	W	MX-1286/U Armor Clamp	82-522
55, 58, 141, 142	UG704/U	1 $\frac{1}{4}$	$\frac{3}{4}$	.214	.203	S	X	Front Mounting	81175
	—	1 $\frac{7}{8}$	1	.214	.140	N	W	Herm. Sealed Glass-Teflon Insul.	81425
59, 62, 71, 140, 210	—	1 $\frac{1}{32}$	$\frac{3}{4}$	.257	.203	N	X	4000 Volts Peak Front Mounting	81600

PANEL RECEPTACLES

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches		Stock Code *	Mtg. Hole	Notes	Amphenol Part Number
	a	b				
UG568/U	1 1/32	1	S	U	#6-32 Tapped Flange Holes	82-504
—	1 1/16	1	S	U	4000 Volts Peak/.152 dia. Flange Holes	82275

BULKHEAD RECEPTACLES

Teflon Insulation • Female Contacts • Weatherproof • 50 Ohm Impedance • Rear Mounted

Military Part Number	Dimensions, inches			Stock Code *	Mtg. Hole	Notes	Amphenol Part Number
	a	b	e				
UG569/U	1 1/32	1	.156	S	W	—	82-505
UG705/U	1 1/16	1	.218	S	W	Herm. Sealed/Glass-Teflon Insul.	82-511
UG634/U	1 1/16	1	.156	S	W	4000 Volts Peak	82-515
UG706/U	1 1/32	1 1/16	.140	S	Y	Front Mounting	82125

▲Amphenol adapter kit. ▲82-888 will adapt connector for use with ALJAK/CUJAK metal jacketed cables.

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO AMPHENOL

STRAIGHT ADAPTERS/Teflon Insulation • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches		Stock Code *	Adapter Ends	Notes	Amphenol Part Number
	a	b				
UG643/U	1 $\frac{1}{32}$	$\frac{3}{4}$	S	Jack-Jack	Non-Weatherproof	82-514
UG642A/U	1 $\frac{3}{64}$	$\frac{3}{4}$	S	Plug-Plug	—	83150

ANGLE ADAPTERS/Teflon Insulation • Non-weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches			Stock Code *	Adapter Ends	Notes	Amphenol Part Number
	a	b	d				
UG567A/U	1 $\frac{1}{4}$	4 $\frac{3}{64}$	1 $\frac{1}{4}$	S	Jack-Plug	—	82-535

BULKHEAD ADAPTERS

Glass/Teflon Insulation • Hermetically Sealed • 50 Ohm Impedance

Military Part Number	Dimensions, inches			Stock Code *	Mtg. Hole	Adapter Ends	Notes	Amphenol Part Number
	a	b	e					
—	2 $\frac{1}{32}$	1	.203	S	4 $\frac{3}{64}$	Jack-Jack	4000 Volts Peak	82250
UG701/U	1 $\frac{1}{16}$	1	.203	S	W	Jack-Jack	—	83050

TEE ADAPTERS/Teflon Insulation • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches			Stock Code *	Adapter Ends	Notes	Amphenol Part Number
	a	b	d				
UG566A/U	1 $\frac{33}{64}$	4 $\frac{3}{64}$	1 $\frac{1}{4}$	S	Jack-Plug-Jack	—	82-536

RESISTOR TERMINATED CAP

Teflon Insulation • ½ Watt 5% Resistor • Male Contacts

Military Part Number	Dimensions, inches				Stock Code *	Notes	Amphenol Part Number
	a	b	c	f			
—	1 $\frac{1}{16}$	$\frac{3}{4}$	.144	3 $\frac{1}{2}$	N	▲	83925

▲To order without resistor, add -1 to part number; to order with resistor, add resistor value to part number. ½ watt 5% resistor values (ohms) stocked: 47, 51, 75, 82, 91, 100, 120, 130, 150, 180, 240, 270, 300, 470, 510, 560, 680, 750, 820, 1000, 1500, 3900, 4700, 10000, 150000

CAPS/Weatherproof

Military Part Number	Dimensions, inches				Stock Code *	Notes	Amphenol Part Number
	a	b	c	f			

MALE

MX1142	5 $\frac{1}{64}$	$\frac{3}{4}$	.144	2 $\frac{1}{2}$	S	—	82-512
—	7 $\frac{1}{8}$	$\frac{3}{4}$	.144	3 $\frac{1}{2}$	N	Shorting Male Contact	83675

FEMALE

MX1143	2 $\frac{7}{32}$	$\frac{3}{4}$	.144	3 $\frac{1}{2}$	S	—	82-513
—	1 $\frac{1}{16}$	5 $\frac{1}{8}$	.144	3 $\frac{1}{2}$	N	Shorting Female Contact	83700

HOODS/Non-weatherproof

Military Part Number	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
	a	b	c			
—	$\frac{3}{4}$	1	1 $\frac{1}{32}$	S	Four .149 dia. Holes, .719 Centers	82-510

ARMOR CLAMPS

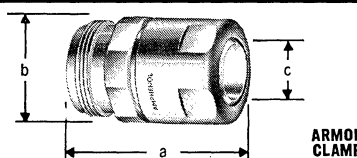
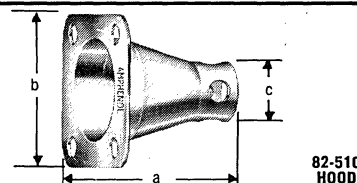
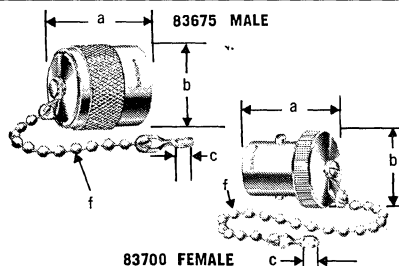
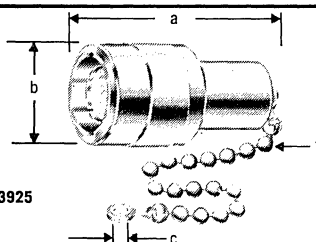
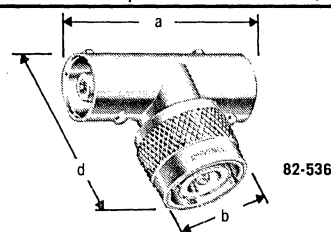
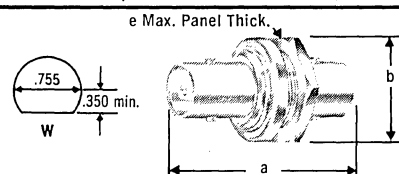
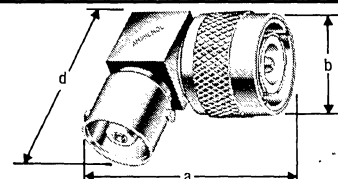
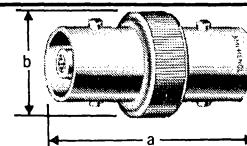
Improved • Assemble to Connectors Designed for Identical Cable Without Armor

RG-()/U Cable	Military Part Number	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
		a	b	c			
10, 12, 79, 116, 215, 227	M39012/25-0013	1 $\frac{1}{8}$	$\frac{3}{4}$	.511	N	—	82-3517
18, 219	M39012/25-0014	1 $\frac{1}{8}$	1 $\frac{1}{16}$	.963	N	—	99175
74, 224	MX1462	1 $\frac{1}{8}$	7 $\frac{1}{8}$	.625	N	—	16850

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

C SERIES

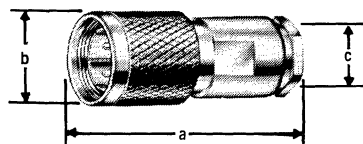
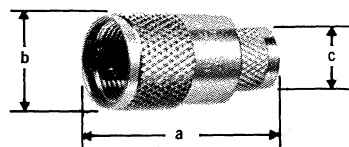
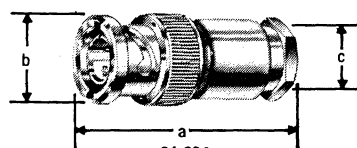
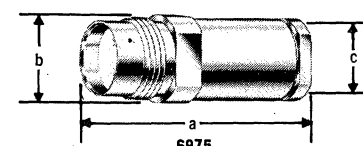


RF CONNECTORS

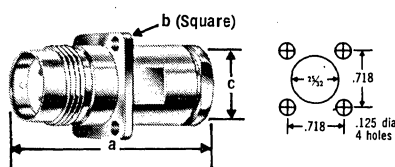
BUNKER
RAMO

AMPHENOL

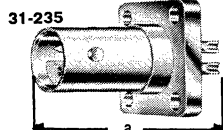
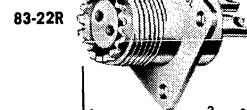
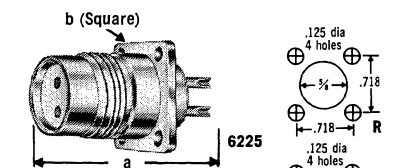
TWIN

32225
TWINAX83-22SP
UHF-TYPE31-224
BNC-TYPE

6975



6225



TWIN CONTACT connectors are used with 78 and 95 ohm twin conductor cables. These connectors are generally used in balanced low level and high sensitivity circuits, due to the improved shielding characteristics possible (> 30 db).

Three different constructions are available. They do not intermate.

TWINAX — Has polarized key and keyway construction. Frequency limit is 200MHZ and voltage rating is 500 volts peak.

UHF TYPE — Non-polarized, these connectors provide an inexpensive connecting device for laboratory and radio equipment devices. Frequency limit is 200MHZ and voltage rating is 500 volts peak.

BNC TYPE — These connectors utilize a polarized contact design in which plugs and mating receptacles each have one male and one female contact. Frequency limit is 100MHZ and voltage rating is 100 volts peak.

STRAIGHT PLUGS/Non-constant Impedance • Twin Male Contacts • Weatherproof

RG-()/U Cables	Military Part Number	Dimensions, inches			Insulation	Polarization (degrees from key)	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c					
22	UG421B/U	1 3/4	3/4	.444	Rexolite	Keyed 90°	S	—	32225
22 except 22A, 22B	UG102/U	1 1/2	3/4	.437	Filled Bakelite	—	S	Small, Non-weatherproof	83-22SP
	—	1 1/2	1 1/8	.437	Teflon	—	S	Small, Non-weatherproof	83-821
57, 130	UG1060/U	1 3/4	1 1/8	.625	Filled Bakelite	—	S	Large	83-2SP
108A	—	1 7/8	7/8	.260	Rexolite	Keyed 90°	S	—	22275
	—	1 5/8	3/4	.255	Rexolite	Contact Polar.	S	1 Male, 1 Female Cont.	31-224
	—	1 3/8	3/4	.255	Teflon	Contact Polar.	S	1 Male, 1 Female Cont.	31-2226

Mating Notes:

31- prefix plugs (BNC-type) mate only with receptacles and adapters bearing the same prefix.

83- prefix plugs (UHF-type) mate only with receptacles and adapters of the same size; i.e., "small" or "large" as indicated in "exceptions/notes" column.

All other plugs (TWINAX) mate with jacks/receptacles/adapters possessing the same polarization as indicated in "polarization" column.

JACKS

Rexolite Insulation • Twin Female Contacts • Weatherproof • Non-constant Impedance

RG-()/U Cables	Military Part Number	Dimensions, inches			Polarization	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c				
22	—	1 3/4	3/4	.437	Keyed 90°	S	Straight Jack	6975
22	UG423B/U	1 3/4	1	.444	Keyed 90°	S	Bulkhead Jack	32200

PANEL RECEPTACLES

Twin Female Contacts • Weatherproof • Non-constant Impedance

Military Part Number	Dimensions, inches		Mtg. Hole	Insulation	Polarization	Stock Code *	Notes	Amphenol Part Number
	a	b						
UG422/U	1 3/8	1	R	Rexolite	Keyed 90°	S	—	6225
UG-103/U	1 1/2	1	X	Filled Bakelite	—	S	Small, Non-weatherproof	83-22R
UG1057/U	1 3/8	1 3/8	W	Filled Bakelite	—	N	Large, Non-weatherproof	83-2R
—	1 1/2	1 1/8	V	Rexolite	Contact Polar.	S	1 Female, 1 Male Contact	31-235

*Stock Code: S = Stock N = Non Stock

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

BULKHEAD RECEPTACLES

Contact Polarization • Weatherproof • Non-constant Impedance • Front Mounted

Dimensions, inches			Insulation	Polarization	Stock Code *	Notes	Amphenol Part Number
a	b	e					
1 $\frac{1}{32}$	$\frac{1}{2}$	.106	Rexolite	Contact Polar.	S	1 Female, 1 Male Contact	31-223
1 $\frac{1}{32}$	$\frac{1}{2}$	.106	Teflon	Contact Polar.	S	1 Female, 1 Male Contact	31-2225

ADAPTERS/Rexolite Insulation • Non-constant Impedance • Weatherproof

Military Part Number	Dimensions, inches				Polarization	Config-uration	Stock Code *	Notes	Amphenol Part Number
	a	b	d	e					
UG981/U	1 $\frac{1}{32}$	$\frac{7}{8}$	1 $\frac{7}{8}$	—	Keyed 90°	Angle	S	—	4775
UG493A/U	1 $\frac{1}{8}$	1	—	.343	Keyed 90°	Blkd.	S	Mounting Hole dia. $\frac{4}{64}$	7925
—	2 $\frac{1}{32}$	—	1 $\frac{7}{8}$	—	Keyed 90°	Tee	S	Teflon Insulation	26850
UG105/U	1 $\frac{1}{8}$	$\frac{5}{8}$	—	—	—	Straight	S	Small, Non-weatherproof	83-22J
UG104/U	1 $\frac{1}{32}$	$\frac{3}{4}$	1 $\frac{1}{8}$	—	—	Angle	S	Small, Non-weatherproof	83-22AP
PL-275	2	$\frac{5}{8}$	—	1 $\frac{1}{2}$	—	Blkd.	S	Small, Non-weatherproof	83-22F
UG196/U	1 $\frac{5}{8}$	—	1 $\frac{1}{4}$	—	—	Tee	S	Small, Non-weatherproof	83-22T
UP1059/U	1 $\frac{1}{8}$	1	—	—	—	Straight	S	Large, Non-weatherproof	83-2J

REDUCING ADAPTERS/Non-weatherproof

RG-()/U Cable	Dimensions, inches			Stock Code *	Notes	Amphenol Part Number
	a	b	Max. Cable O.D. c			
108A	1	$\frac{7}{8}$	.257	S	Use With 82-22SP and 83-821	83-65

CAPS/Weatherproof

Dimensions, inches				Stock Code *	Notes	Amphenol Part Number
a	b	c	f			
1 $\frac{1}{8}$	2 $\frac{7}{32}$	.144	3 $\frac{1}{2}$	S	Male, Shorting Male Contacts	6350
2 $\frac{7}{32}$	1 $\frac{3}{8}$	.144	3 $\frac{1}{2}$	S	Female	22250

Mating Notes:

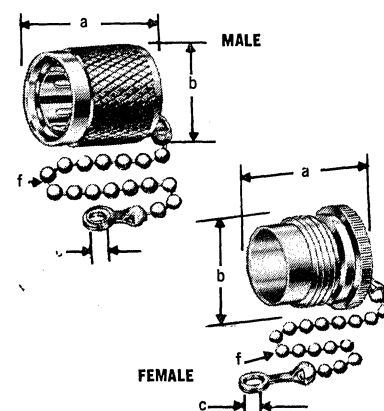
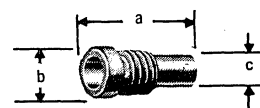
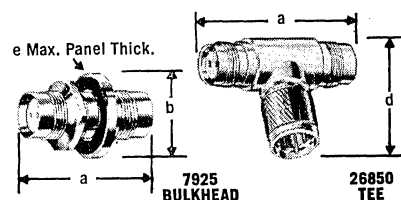
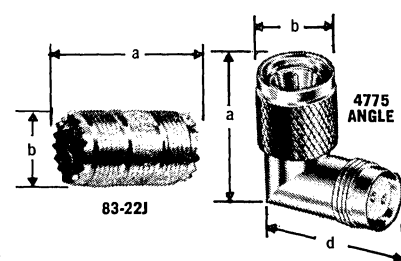
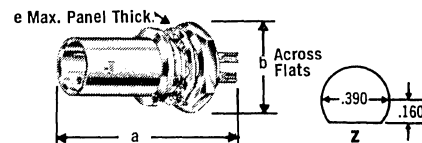
31- prefix plugs (BNC-type) mate only with receptacles and adapters bearing the same prefix.

83- prefix plugs (UHF-type) mate only with receptacles and adapters of the same size; i.e., "small" or "large" as indicated in "exceptions/notes" column.

All other plugs (TWINAX) mate with jacks/receptacles/adapters possessing the same polarization as indicated in "polarization" column.

*Stock Code: S = Stock N = Non Stock

TWIN



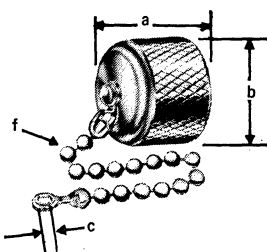
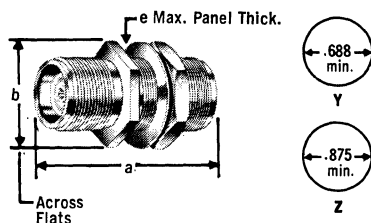
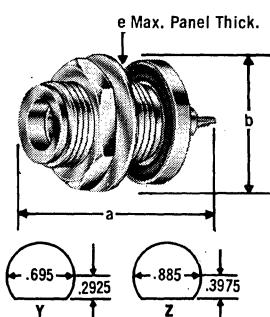
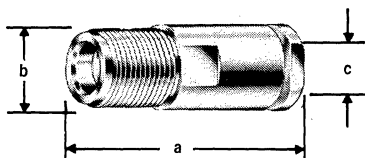
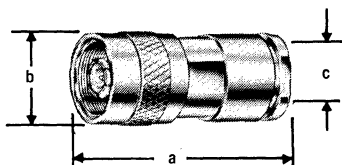
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

TRIAx



TRIAx connectors are used in transmission line applications where maximum RF shielding and minimum noise radiation are required. They are used with triaxial cables. These connectors have an impedance of 50 ohms, but can be used, and are so listed, with 75 ohm cable where impedance matching is not critical. Connector mating ends have different threading, as listed, and will not intermate. Frequency limit is 10GHZ and voltage rating is 1900-5000 volts depending on cable being used.

STRAIGHT PLUGS

Teflon Insulation • 50 Ohm Impedance • Male Contacts • Weatherproof

RG-()/U Type Cable	Dimensions, inches			Mating Threads	Stock Code *	Notes	Amphenol Part Number
	a	b	Max. Cable O.D. c				
RG-8 type	2 $\frac{3}{4}$	1	.505	$\frac{7}{8}$ -20	S	—	53250
RG-11 type	2 $\frac{3}{4}$	1	.475	$\frac{7}{8}$ -20	S	—	53175
RG-58A type	1 $\frac{1}{2}$	2 $\frac{5}{32}$	.296	$\frac{1}{16}$ -24	S	Gold Plated Contact	53150
RG-59 type	1 $\frac{1}{2}$	2 $\frac{5}{32}$	.332	$\frac{1}{16}$ -24	S	—	53100

STRAIGHT JACKS

Teflon Insulation • 50 Ohm Impedance • Female Contacts • Weatherproof

RG-()/U Type Cable	Dimensions, inches			Mating Threads	Stock Code *	Notes	Amphenol Part Number
	a	b	Max. Cable O.D. c				
RG-8 type	2	$\frac{7}{8}$	.505	$\frac{7}{8}$ -20	N	Rexolite Insulator	34425
RG-11 type	2	$\frac{7}{8}$	.475	$\frac{7}{8}$ -20	S	—	52975
RG-58A type	1 $\frac{3}{4}$	$\frac{3}{4}$	.296	$\frac{1}{16}$ -24	S	—	34375
RG-59 type	1 $\frac{3}{4}$	$\frac{3}{4}$	.332	$\frac{1}{16}$ -24	N	—	34400

BULKHEAD RECEPTACLES

Teflon Insulation • 50 Ohm Impedance • Female Contacts • Weatherproof • Rear Mounted

Dimensions, inches			Mating Threads	Mtg. Hole	Stock Code *	Notes	Amphenol Part Number
a	b	e					
1 $\frac{3}{32}$	1	.156	$\frac{1}{16}$ -24	Y	S	—	34450
1 $\frac{3}{32}$	1 $\frac{1}{4}$	.156	$\frac{7}{8}$ -20	Z	S	—	34475

BULKHEAD ADAPTERS/Teflon Insulation • 50 Ohm Impedance • Weatherproof

Dimensions, inches			Mating Threads	Mtg. Hole	Adapter Ends	Stock Code *	Notes	Amphenol Part Number
a	b	e						
1 $\frac{3}{4}$	1 $\frac{1}{4}$	.709	$\frac{7}{8}$ -20	Z	Jack-Jack	S	—	53200
1 $\frac{3}{4}$	1 $\frac{5}{16}$	.709	$\frac{1}{16}$ -24	Y	Jack-Jack	S	—	53225

MALE CAPS/Weatherproof

Dimensions, inches			Chain Length f	Mating Threads	Stock Code *	Notes	Amphenol Part Number
a	b	c					
1 $\frac{3}{16}$	1	.144	5	$\frac{7}{8}$ -20	N	—	34275
2 $\frac{5}{32}$	1 $\frac{3}{16}$	.144	5	$\frac{1}{16}$ -24	S	—	34300

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

Series LC connectors are large, 50 ohm constant impedance, weatherproof types designed for high voltage applications. Frequency range is 1GHz and voltage rating is 5000 volts peak.

STRAIGHT PLUGS/Male Contacts • Weatherproof • 50 Ohm Impedance

RG-()/U Cables	Military Part Number	Dimensions, inches			Clamp Gasket	Stock Code *	Notes	Amphenol Part Number
		a	b	Max. Cable O.D. c				
17, 18	UG154/U	3 $\frac{1}{16}$	1 $\frac{1}{2}$	1	Syn. Rubber	S	Uses Cable Center Conductor and Insulation	82-59

PANEL RECEPTACLES/Female Contacts • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches		Insulation	Stock Code *	Notes	Amphenol Part Number
	a	b				
UG352/U	2 $\frac{1}{4}$	2	Teflon	S	—	82-80
UG352A/U	3 $\frac{1}{16}$	2	Rexolite	S	Pressurized	82-110

STRAIGHT ADAPTERS

Polystyrene Insulation • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches		Adapter Ends	Stock Code *	Notes	Amphenol Part Number
	a	b				
UG215/U	2 $\frac{1}{2}$	1 $\frac{1}{32}$	Jack-Jack	S	—	3000

ANGLE ADAPTERS

Polystyrene Insulation • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches		Adapter Ends	Stock Code *	Notes	Amphenol Part Number
	a	b				
UG216/U	2 $\frac{3}{4}$	2 $\frac{1}{2}$	Plug-Jack	S	—	4350

PANEL ADAPTERS/Polystyrene Insulation • Weatherproof • 50 Ohm Impedance

Military Part Number	Dimensions, inches		Adapter Ends	Stock Code *	Notes	Amphenol Part Number
	a	b				
UG287B/U	2 $\frac{1}{2}$	2	Jack-Jack	N	—	51525

TEE ADAPTERS/Polystyrene Insulation • Weatherproof • 50 Ohm Impedance

Dimensions, inches		Adapter Ends	Stock Code *	Notes	Amphenol Part Number
a	b				
2 $\frac{3}{4}$	3 $\frac{1}{32}$	Jack-Plug-Jack	N	—	28800

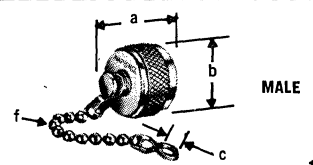
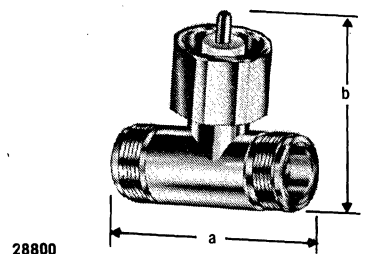
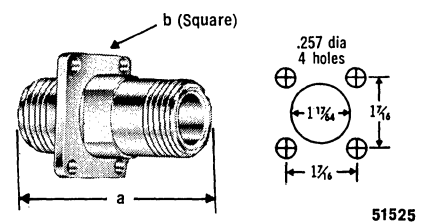
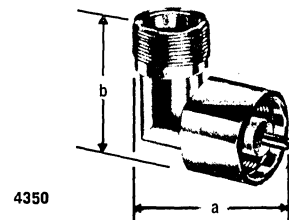
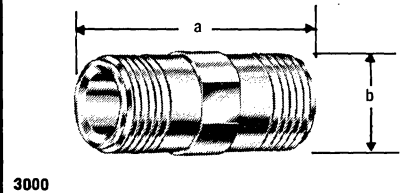
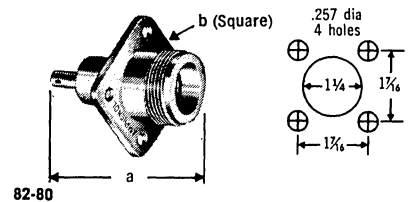
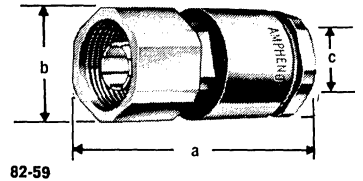
MALE CAP/Weatherproof

Dimensions, inches				Stock Code *	Notes	Amphenol Part Number
a	b	c	Chain Length f			
2 $\frac{3}{32}$	1 $\frac{3}{8}$	.281	4 $\frac{1}{4}$	S	—	14825

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

LC SERIES



RF CONNECTORS

BUNKER
RAMO

AMPHENOL

Many different combinations of between series adapters are made by Amphenol. They are of non-constant impedance, but designed so that inherent electrical discontinuities are minimal.

ADAPTERS BETWEEN SERIES

STRAIGHT ADAPTERS/Weatherproof

Adapter Ends		Military Part Number	Dimensions, inches		Insulation	Impedance (ohms)	Stock Code*	Notes	Amphenol Part Number
			Length a	Largest O.D. b					
BNC Plug	C Jack	UG635/U	1 $\frac{1}{32}$	1 $\frac{1}{32}$	Teflon	50	S	—	83175
BNC Plug	HN Jack	—	1 $\frac{1}{32}$	$\frac{3}{4}$	Rex./Teflon	—	S	—	32750
BNC Plug	MB Jack	—	1	$\frac{1}{8}$	Kel-F	50	S	—	47275
BNC Plug	N Jack	UG349A/U	1 $\frac{1}{8}$	3 $\frac{3}{64}$	Teflon	—	S	—	31-217
BNC Plug	N Jack	UG349/U	1 $\frac{3}{4}$	$\frac{5}{8}$	Rex./Teflon	50	S	—	2975
BNC Plug	SMA Jack	—	1 $\frac{1}{8}$	$\frac{1}{8}$	Teflon	50	S	—	901-165
BNC Plug	TNC Jack	—	1 $\frac{1}{4}$	$\frac{5}{8}$	Teflon	50	S	—	79025
BNC Plug	UHF Jack	UG255/U	1 $\frac{1}{8}$	$\frac{5}{8}$	Rexolite	50	S	—	2900
BNC Plug	UHF Jack	—	1 $\frac{1}{8}$	$\frac{5}{8}$	Teflon	50	S	—	2925
C Plug	BNC Jack	UG636A/U	1 $\frac{1}{8}$	$\frac{3}{4}$	Teflon	50	S	—	83200
C Plug	HN Jack	UG703A/U	1 $\frac{1}{2}$	$\frac{3}{4}$	Teflon	—	N	—	83400
C Plug	N Jack	UG565A/U	1 $\frac{1}{32}$	$\frac{3}{4}$	Teflon	50	S	—	82-540
HN Plug	BNC Jack	UG309/U	1 $\frac{1}{2}$	2 $\frac{1}{32}$	Teflon	50	S	—	8900
HN Plug	C Jack	UG702/U	1 $\frac{1}{2}$	2 $\frac{1}{32}$	Teflon	—	S	—	83350
HN Plug	MHV Jack	—	1 $\frac{1}{2}$	2 $\frac{1}{32}$	Teflon	50	S	—	20625
HN Plug	N Jack	—	1 $\frac{1}{8}$	$\frac{7}{8}$	Teflon	50	S	—	16050
LC Plug	HN Jack	UG252/U	2 $\frac{1}{32}$	1 $\frac{1}{8}$	Polystyrene	—	N	—	2625
MB Plug	BNC Jack	—	1 $\frac{1}{8}$	$\frac{1}{8}$	Kel-F	50	S	—	47250
MHV Plug	UHF Jack	—	1 $\frac{1}{8}$	$\frac{5}{8}$	Teflon	—	S	—	28075
N Plug	BNC Jack	UG201A/U	1 $\frac{1}{8}$	1 $\frac{1}{8}$	Teflon	—	S	—	31-216
N Plug	BNC Jack	UG201/U	1 $\frac{1}{32}$	1 $\frac{1}{8}$	Teflon	—	S	—	31-830
N Plug	BNC Jack	—	1 $\frac{1}{8}$	$\frac{3}{4}$	Teflon	70	S	—	4250
N Plug	C Jack	UG564/U	1 $\frac{1}{8}$	1 $\frac{1}{8}$	Teflon	50	S	—	82-508
N Plug	HN Jack	—	1 $\frac{1}{8}$	1 $\frac{1}{8}$	Teflon	50	S	—	16075
N Plug	SMA Jack	—	1 $\frac{1}{32}$	1 $\frac{1}{8}$	Teflon	50	S	—	901-294
N Plug	TNC Jack	—	1 $\frac{1}{8}$	1 $\frac{1}{8}$	Teflon	50	S	—	78800
N Plug	UHF Jack	UG146/U	1 $\frac{1}{32}$	1 $\frac{1}{8}$	Rexolite	—	S	Non-Weatherproof	4400
N Plug	UHF Jack	—	1 $\frac{1}{32}$	1 $\frac{1}{8}$	Teflon	—	S	Non-Weatherproof	14650
SMA Plug	BNC Jack	—	1 $\frac{1}{32}$	$\frac{1}{8}$	Teflon	50	S	—	901-166
SMA Plug	N Jack	—	1 $\frac{1}{8}$	$\frac{5}{8}$	Teflon	50	S	—	901-293
SMA Plug	TNC Jack	—	1 $\frac{1}{32}$	$\frac{1}{8}$	Teflon	50	S	—	901-170
TNC Plug	BNC Jack	—	1 $\frac{1}{4}$	$\frac{5}{8}$	Teflon	50	S	—	79675
TNC Plug	N Jack	—	1 $\frac{1}{32}$	$\frac{5}{8}$	Teflon	50	S	—	79825
TNC Plug	SMA Jack	—	1 $\frac{1}{32}$	1 $\frac{1}{32}$	Teflon	50	S	—	901-169
UHF Plug	BNC Jack	UG273/U	1 $\frac{1}{8}$	2 $\frac{1}{32}$	Rexolite	—	S	—	31-028
UHF Plug	BNC Jack	—	1 $\frac{1}{32}$	$\frac{3}{4}$	Teflon	50	S	—	12025
UHF Plug	C Jack	UG637/U	1 $\frac{1}{8}$	1 $\frac{1}{8}$	Teflon	—	S	Non-Weatherproof	83225
UHF Plug	MB Jack	—	1 $\frac{1}{32}$	$\frac{3}{4}$	Teflon	—	N	Non-Weatherproof	47400
UHF Plug	MHV Jack	—	1 $\frac{1}{32}$	$\frac{3}{4}$	Teflon	—	S	—	28050
UHF Plug	N Jack	UG83/U	1 $\frac{1}{8}$	$\frac{3}{4}$	Teflon-Rex.	—	S	—	14000
UHF Plug	N Jack	UG83B/U	1 $\frac{1}{8}$	1 $\frac{1}{8}$	Teflon	—	S	—	34125
BNC Plug	N Plug	UG1034/U	1 $\frac{1}{2}$	1 $\frac{1}{8}$	Teflon	50	S	—	5225
BNC Plug	SMA Plug	—	1 $\frac{1}{32}$	$\frac{1}{8}$	Teflon	50	S	—	901-164
N Plug	SMA Plug	—	1 $\frac{1}{8}$	1 $\frac{1}{8}$	Teflon	50	S	—	901-292
N Plug	TNC Plug	—	1 $\frac{1}{32}$	1 $\frac{1}{8}$	Teflon	50	S	—	78875
N Plug	UHF Plug	UG318/U	1 $\frac{1}{8}$	$\frac{3}{4}$	Rexolite	—	S	—	26700
SMA Plug	TNC Plug	—	1 $\frac{1}{8}$	1 $\frac{1}{32}$	Teflon	50	S	—	901-168
TNC Plug	N Plug	—	1 $\frac{1}{8}$	1 $\frac{1}{8}$	Teflon	50	S	—	79850
BNC Jack	SMA Jack	—	1 $\frac{1}{8}$	$\frac{1}{8}$	Teflon	50	S	—	901-167
BNC Jack	TNC Jack	—	1 $\frac{1}{32}$	$\frac{1}{8}$	Teflon	50	S	—	76400
C Jack	LC Jack	—	3 $\frac{3}{64}$	1 $\frac{1}{4}$	Teflon	—	N	—	82350
HN Jack	N Jack	—	1 $\frac{1}{8}$	$\frac{3}{4}$	Rex./Teflon	50	S	—	16100
MB Jack	N Jack	—	1 $\frac{1}{4}$	$\frac{5}{8}$	Teflon	50	N	—	47375
N Jack	SMA Jack	—	1 $\frac{1}{32}$	$\frac{5}{8}$	Teflon	50	S	—	901-295
N Jack	TNC Jack	—	1 $\frac{1}{8}$	$\frac{5}{8}$	Teflon	50	S	—	78825
SMA Jack	TNC Jack	—	1 $\frac{1}{8}$	$\frac{1}{8}$	Teflon	50	S	—	901-171

*Stock Code: S = Stock N = Non Stock

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

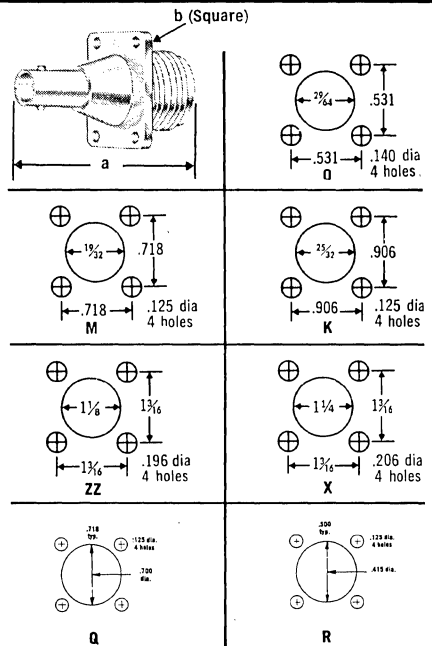
BUNKER
RAMO

AMPHENOL

PANEL MOUNT ADAPTERS

Weatherproof

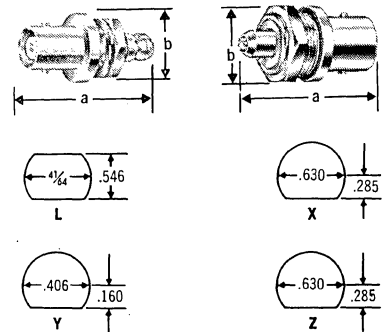
Adapter Ends — To —		Military Part Number	Dimensions, inches			Insula- tion	Imped- ance (Ω)	Stock Code *	Notes	Amphenol Part Number
			a	b	Mtg. Hole					
BNC Jack	HN Jack	—	1 $\frac{3}{8}$	$\frac{3}{4}$	K	Teflon	50	S	Front or Rear Mtg.	35050
BNC Jack	MB Jack	—	1 $\frac{5}{32}$	.377	O	Kel-F	50	S	Front or Rear Mtg.	33200
BNC Jack	N Jack	—	1 $\frac{7}{16}$	1	M	Teflon	50	S	Angle/Rear Mtg.	2800
BNC Plug	N Jack	UG335/U	1 $\frac{3}{4}$	1	M	Rexolite- Teflon	50	S	Rear Mtg.	3025
BNC Jack	N Jack	—	1 $\frac{1}{2}$	1	M	Rexolite	50	S	Rear Mtg.	21850
HN Jack	LC Jack	UG259A/U	2 $\frac{13}{64}$	1 $\frac{1}{4}$	ZZ	Teflon	—	S	—	2500
LC Jack	N Jack	UG271A/U	2 $\frac{13}{64}$	1 $\frac{1}{8}$	X	Poly- ethylene	50	N	—	55000
SMA Plug	N Jack	—	1 $\frac{45}{64}$	1	Q	Teflon	50	S	—	901-278
SMA Plug	TNC Jack	—	1 $\frac{15}{32}$	$\frac{1}{8}$	R	Teflon	50	S	—	901-279
SMA Jack	TNC Jack	—	1 $\frac{27}{64}$	$\frac{1}{8}$	R	Teflon	50	S	—	901-280

ADAPTERS
BETWEEN SERIES

BULKHEAD MOUNT ADAPTERS

Weatherproof

Adapter Ends — To —		Military Part Number	Dimensions, inches			Insula- tion	Imped- ance (Ω)	Stock Code *	Notes	Amphenol Part Number
			a	b	Mtg. Hole					
BNC Jack	N Jack	—	1 $\frac{27}{32}$	$\frac{13}{16}$	Z	Rexolite- Teflon	50	S	Front Mtg., Pressurized	5850
BNC Jack	N Jack	—	1 $\frac{11}{16}$	$\frac{13}{16}$	L	Glass- Teflon	—	S	Herm. Sealed	93075
BNC Jack	SM Jack	UG691/U	1 $\frac{1}{8}$	$\frac{1}{32}$	Y	Glass- Teflon	—	N	Herm. Sealed Rear Mtg.	89250
C Jack	MB Jack	—	1 $\frac{7}{32}$	$\frac{3}{4}$	X	Glass- Teflon	—	N	Herm. Sealed	83950
BNC Jack	MB Jack	—	1 $\frac{1}{8}$	.595	Y	Glass- Teflon	50	S	Herm. Sealed Rear Mtg.	47200

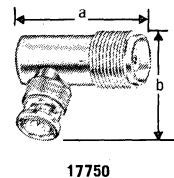


ANGLE ADAPTERS

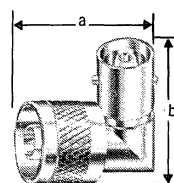
Weatherproof

Adapter Ends — To —		Military Part Number	Dimensions, inches		Insulation	Imped- ance (Ohms)	Stock Code *	Notes	Amphenol Part Number
			a	b					
BNC Plug	HN Jack	UG559/U	1 $\frac{1}{2}$	$\frac{1}{32}$	Rexolite	50	N	—	17750
N Plug	C Jack	—	1 $\frac{1}{32}$	1 $\frac{1}{32}$	Teflon	50	S	—	83875
BNC Jack	N Jack	—	1 $\frac{1}{8}$	1	Teflon	50	S	Panel Mount	2800

*Stock Code: S = Stock N = Non Stock



17750



83875

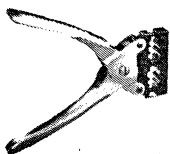
FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

CRIMP TOOLS

227-944 FRAME
SHOWN WITH DIE227-900 (227-901)
RADIAL CRIMP TOOL227-911
INNER BRAID TOOL227-926
CENTER CONTACT TOOL

R F CRIMP TOOLS

Amphenol crimp connectors incorporate the latest technique in connector design, and are readily available in many series. Amphenol MIL-Crimps are the highest quality crimps available and are presently offered in the N, BNC and TNC Series. In addition to providing superior performance, Amphenol crimp connectors are quick and easy to assemble. Using standard crimping tools, they assemble in approximately one-tenth the time normally needed for connectors requiring conventional cable clamping techniques. Crimp force is controlled automatically by the tool. Tedious braid combing, trimming, forming operations and soldering are eliminated as is the need for a specially skilled operator. Connectors are assembled uniformly from day-to-day and from worker to worker. Most of these connectors are also designed and tested to the applicable military specifications, including MIL-C-39012, the military specification which will eventually obsolete most existing RF connector specs.

In general, cable retention is significantly improved through the use of back-end crimping. This is most frequently accomplished by crimping directly to the cable braid rather than the cable jacket. Crimping to the braid also assures improved electrical conductivity of the cable shield to the connector. Most braid crimps are of a hex configuration. Crimping of center contacts provides equally fast assembly and in many cases provides SWR results equivalent to those of soldered contacts. Most center contact crimps are of a four-indent configuration, although center contact hex crimps are also available.

R F CRIMP TOOLS

Connector Series	For Use With RG- () U Cables	Hex Size Across Flats (.003)		Military Part Number	Amphenol Part Number
		Cavity A (Braid)	Cavity B (Contact)		
Various	Frame Only for All 227-1221-XX Die Sets			M22520/5-01	227-944
N (Braid & Contact)	55, 58, 141, 142, 223, 303, 400	.213	.100	M22520/5-57	227-1221-57
	59, 62, 140, 210	.255	.100	M22520/5-59	227-1221-59
	5, 6, 21, 143, 212, 222, 304	.324	.100	M22520/5-29	227-1221-29
	8, 9, 11, 87A, 149, 165, 213, 214, 216, 225, 393	.429	.100	M22520/5-25	227-1221-25
BNC/TNC (Braid & Contact)	122, 174, 179, 180, 187, 188, 195, Essex 21-597	.178	.068	M22520/5-09	227-1221-09
	55, 58, 141, 142, 223, 303, 400	.213	.068	M22520/5-11	227-1221-11
	59, 62, 140, 210	.255	.068	M22520/5-13	227-1221-13
	71	.263	.068	M22520/5-15	227-1221-15
MHV (Braid Only)	55, 58, 141, 142, 223, 303, 400	.213	Solder Contact	M22520/5-11	227-1221-11
UHF (Braid Only)	55, 58, 141, 142, 223, 303, 400	.213	Solder Contact	M22520/5-11	227-1221-11
	59, 62, 140, 210	.255	Solder Contact	M22520/5-13	227-1221-13
	8, 11, 149, 213	.384	Solder Contact	M22520/5-23	227-1221-23
SMA (Braid Only)	122, 174, 179, 180, 187, 188, 195	.178	Solder Contact	M22520/5-09	227-1221-09
	55, 58, 141, 142, 223, 303, 400	.213	Solder Contact	M22520/5-11	227-1221-11
ALC-5 (Braid & Contact)	58, 188	—	—	—	227-1228
	Economy Tool	—	—	—	227-525
27 (Braid Only)	174, 179, 187, 188	—	Solder Contact	—	227-900
	180, 195	—	Solder Contact	—	227-901
		—	Solder Contact	—	227-902
	Adapter for Part Number 27-14 (Only)			—	227-913
	Adapter for Part Number 27-4, 27-8, 27-10			—	227-914
5116 (Braid Only)	180, 195	Cavity A	—	—	227-911
	174, 179, 187, 188	Cavity B	—	—	227-911
	178, 196	Cavity C	—	—	227-911
	174, 178, 179, 180, 187, 188, 195, 196	.034	N/A	—	227-926

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

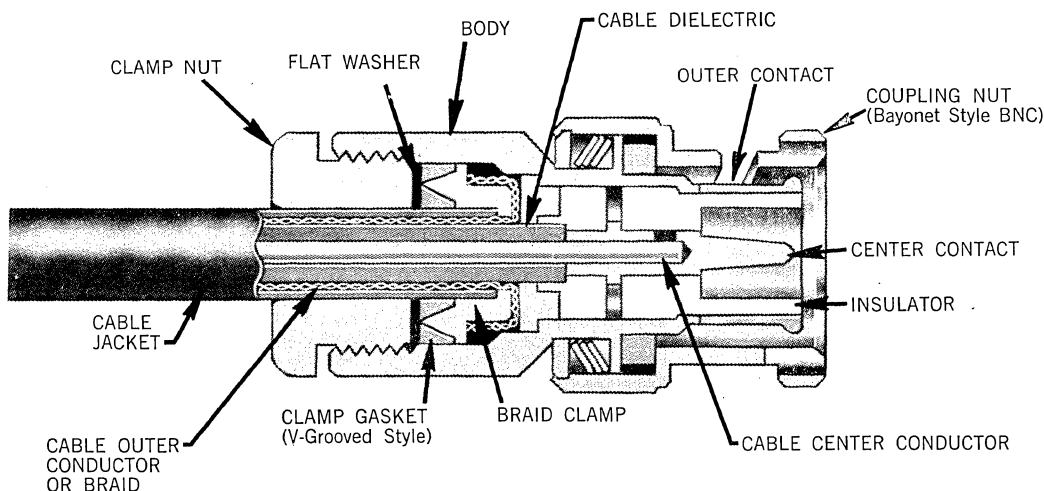
AMPHENOL

COAXIAL CONNECTOR
SELECTION & ASSEMBLY

THE VITAL LINK TO TOP PERFORMANCE

When selecting connectors, there are several important considerations: the physical and electrical size of the cable; the connector type, mating interface or coupling style; and, finally, the method of cable retention and assembly.

TYPICAL CONNECTOR CROSS-SECTION
(Clamp Type with Captivated Contact)



CABLE

Coaxial cable consists of two concentric conductors separated by a dielectric layer (insulating material). An outer covering, or jacket, protects the cable from physical environmental damage.

The cable center conductor can be a single solid wire or many thin strands twisted together. In flexible cables, the outer conductor, or shield is a layer of thin strands of braided wire between the dielectric and jacket. In semi-rigid cables, the outer conductor and jacket layer are combined into a thin sheath of copper or aluminum to which a termination is usually soldered.

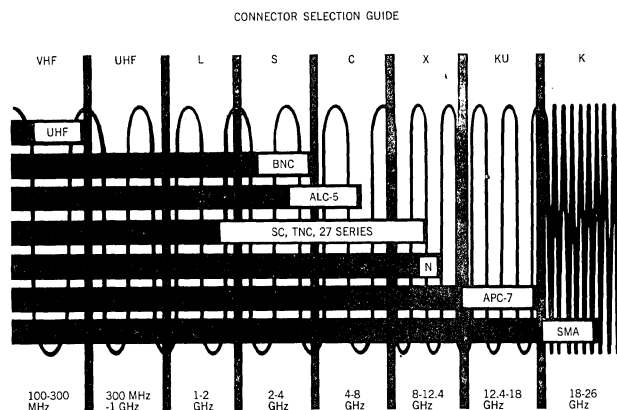
Each cable package is designed to carry a signal with predictable efficiency. Military nomenclature, such as RG-58/U, is usually used to identify one cable from another. Some cables are designated by their outer dimension such as .141" diameter semi-rigid metal jacketed cable. Other special application cables are described by their manufacturer's part number.

The physical size of the cable and the signal carrying capacity required for your application are the first parameters to evaluate before an appropriate termination or interconnection can be selected.

CONNECTOR TYPE OR SERIES

The chart below shows the popular connector types or series categorized by the optimum frequency range across which the units were designed to operate. The chart is further sub-

divided into convenient band widths with associated designations assigned by the FCC. Generally, as the optimum frequency range of operation increases, so does the cost. Therefore, it is important to observe certain disciplines in the selection process to avoid burdening your product with the excessive costs of performance for which there will be no foreseeable demand.



FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

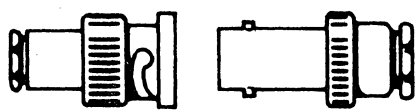
RF CONNECTORS

BUNKER
RAMO

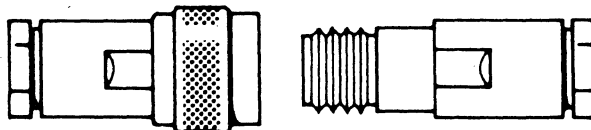
AMPHENOL

COUPLING METHOD

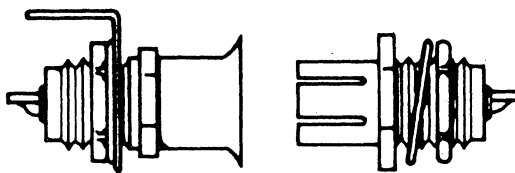
Connectors mate or couple to each other in three basic ways: twist-lock bayonet, screw threads and push-pull action.



BAYONET



THREADED



PUSH ON

Twist Lock. Bayonet coupling provides a push-twist-lock connection. The jacks and receptacles have two or three circular protrusions on the exterior of the body, referred to as bayonet ears or studs. The plugs have slanted slots on the coupling nut into which the studs slide and lock.

Threaded. Jacks and receptacles have external screw-threads on the body. Plugs have matching internal threads in the coupling nut.

Push-Pull. Called by several names, push-on, snap-on, and plug-in, this method simply pushes to mate and pulls to un-mate. The connectors are held together by the pressure of a press fit, by spring fingers, or by a spring-loaded detent.

In some cases, a connector series has its own distinctive mating style. BNC, for instance, has twist-lock bayonet type coupling as opposed to the TNC series which is held together by means of screw threads. Where time is a factor, the BNC would be chosen. It is quick to couple and uncouple and very strong once joined. But, if your piece of equipment were to be subjected to excessive movement or vibration, the TNC would be a better choice to avoid any circuit noise that might be generated by the two-stud bayonet arrangement of the BNC. Other connector series offer a choice of coupling styles. For example, the new sub-miniature ALC-5 series offers a push-on version and a snap-on version for applications where a more secure mechanical joint is desirable.

CABLE RETENTION METHODS

Again, there are three basic methods of securing or attaching the cable to the connector: soldering, clamping and crimping.

Soldering. The relatively unsophisticated procedure of soldering the connector body directly to the braid of flexible cable can still be found in the UHF series. For semi-rigid metal jacketed cable, however, the solder-type cable retention method employed reflects appropriate state-of-the-art advances. Applying too much heat that might deform the cable dielectric is a real danger. Amphenol endeavors to minimize this problem by incorporating appropriate safeguards in its connector design and cable assembly instructions. With SMA solder-type connectors, the design is such that the dielectric is trimmed after the solder operation is completed.

Clamping. This method employs the braid clamp, the sealing gasket, (originally a flat rubber gasket but improved to a V-grooved gasket or chevron seal), a flat washer and the clamp nut. This is the part that gives the force needed to secure the cable to the connector.

The old style clamps sealed and clamped by compressing the flat gasket, giving a fairly adequate seal but cable retention, being dependent on a rubber gasket, was weak. In the improved clamp, the V gasket is split as the clamp nut is

tightened to the peaked portion of the braid clamp. This gasket shearing gives a better moisture seal and provides strong metal-to-metal cable retention.

Crimping. The latest cable retention method is crimping. With this method the braid clamp, gasket, washer, and clamp nut are replaced by a ferrule clamp nut assembly or a ferrule that's an extension of the connector body. The cable dielectric and center conductor are inserted into the ferrule, which is then crimped to the cable braid by a special tool. The inner ferrule is brass but the outer ferrule is a soft copper alloy because it must be deformed.

The crimping assembly method is much easier to perform than clamping. Connectors are assembled uniformly from day to day and from worker to worker. Cable stripping dimensions are not as critical and braid combing isn't required. The problems of torque tightening, necessary to obtain satisfactory cable retention with the clamp method, are eliminated. While special tools are required, the repeatable performance crimped assemblies demonstrate and the speed with which the assembly operation can be performed (approximately one-tenth the time required for clamping techniques) is well worth the relatively small tool investment.

RF CONNECTORS

BUNKER
RAMO AMPHENOL

CABLE-TO-CONNECTOR ASSEMBLY

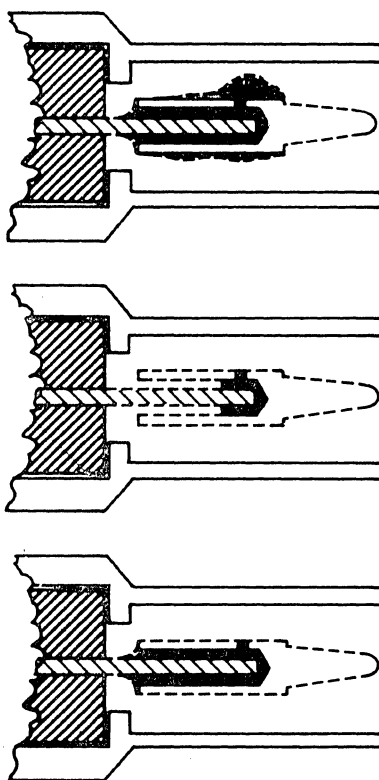
Assuming a connector is properly designed and manufactured to the required tolerances, the most important contributions to high VSWR are those variables associated with the assembly of the connector to the cable. The importance of this operation cannot be over-emphasized. Any air gap between the cable core and the connector insulator introduces an impedance discontinuity that can greatly increase the VSWR of the assembly. Similar effects are present when the connector contact is not butted against a square cut of the cable dielectric. In high voltage cable assemblies, air pockets reduce the peak voltage capability.

Precautions should be taken during assembly to be certain the center contact of the connector is at the proper lateral position. In most connectors, the lateral distance between

terminals' shunt capacitance. Both affect high frequency performance by changing the connectors' impedance.

Small sized connectors are troubled most by this change in pin size. Since the thickness of an excess solder film is relatively constant, and the connectors' dimensions are reduced, the diameter ratio variation has a greater impact on the connectors' impedance. Subminiature connectors are particularly susceptible to this assembly problem. They are also sensitive to cable deformations. Off-centered coax, or cable with pinched dielectric, is often the cause of poor performance. These troubles start with the choice of assembly method.

Connector assembly methods vary widely among users. For many, it's the most costly step in making their product. Trad-



A) Too much solder increases center conductor diameter, thus increasing shunt capacitance.

B) Too little solder increases the current path, thus increasing series inductance.

C) The proper amount of solder is needed to bring the maximum high frequency performance from a connector.

SOLDER IMPEDES RF

a point on the connector shell and the pin is important to maintain an electrical match. Lateral misalignment is a common assembly problem resulting from assembling connectors to both ends of a relatively long cable while the cable is still coiled. When uncoiled, the ends of the center conductor assume a different position with respect to the ends of the outer braid. For similar reasons, a connector should not be assembled to cable exposed to temperature extremes.

When soldered center pins are used, two major problems occur; not enough solder inside the pin, or too much solder on the outside. The first lengthens the path of current in the center conductor and increases inductance. The latter enlarges the diameter of the center pin, increasing the connec-

ing up in acquisition cost to an improved clamp or crimp connector that gives speedier assembly and fewer operations, can lower the actual total connector cost.

Wherever possible, the assembly operation should be automated to reduce variations caused by hand assembly. It's best to make up in-house operating procedures based on the connector manufacturer's assembly instructions. Cutting guides, the choice of thermal or knife-edge stripping of insulation, etc., should depend on the tooling at hand and the skill level of the operators. Greater care and planning at the assembly stations result in a more reliable and better performing connector.

FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

RF CONNECTORS

BUNKER
RAMO

AMPHENOL

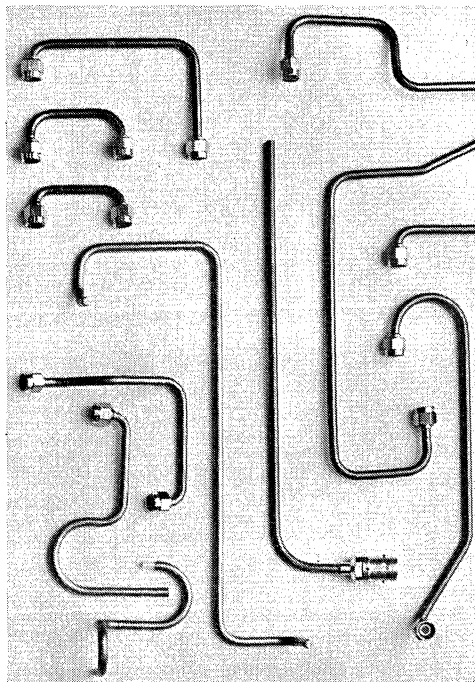
CUSTOM CONTOURED CABLE ASSEMBLIES
TERMINATED TO YOUR SPECIFICATIONS

Amphenol has recognized the rapidly growing need for engineered cable assemblies. Not connectors casually hung on the ends of a length of cable. But units that are capable of passing sophisticated mechanical and electrical tests. Engineered to do a specific job well. Manufactured and assembled under the kind of controlled conditions that assure repeatable performance.

Total capability. Total responsibility. Total accountability. One complete job in one plant for increased efficiency, closer coordination and better quality.

Every Amphenol cable assembly is precisely assembled and 100% tested mechanically and electrically by highly skilled personnel providing the ultimate in RF quality and reliability.

More important. Known total cost. No unexpected surprises. No hidden costs. No unplanned in-house burden rates. Call your nearest Amphenol sales engineer or the RF division for additional information.



OTHER PRODUCTS AND CAPABILITIES

Amphenol RF Division of The Bunker-Ramo Corporation manufactures components and sub-systems for the generation, transmission, reception and utilization of RF and microwave energy. Coaxial connectors, coaxial switches, and custom microwave components comprise our major areas of product activity.

Divisional general offices, manufacturing and assembly facilities occupy 140,000 square feet in Danbury, Connecticut.

This coordinated complex aided by a distribution and warehousing facility in Broadview, Illinois, permits a unique and often instantaneous reaction to the coaxial connector market's demands.

Our capability is further strengthened by automated high-speed manufacturing equipment in conjunction with a consistent uncompromising attitude toward quality.

Not only is pin-point surveillance exercised at every phase of fabrication, but most sub-components are manufactured by Amphenol itself from raw stock. Even plastic dielectric insulators are produced by the RF Division in its own injection molders.

Procedures like these make for maximum design flexibility and fast delivery. They also give us positive control at every step, assuring that all sub-components are perfectly matched from electrical and mechanical standpoints.

Extensive facilities for the measurement and analysis of Amphenol connectors under all applicable environmental and electrical parameters, backed by built-in quality assurance controls at each step of fabrication, recommend the highest degree of confidence in the reliability of these components.

Broadband Capability

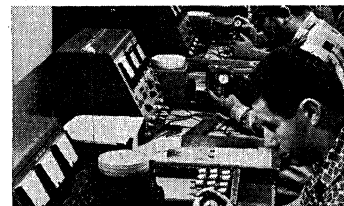
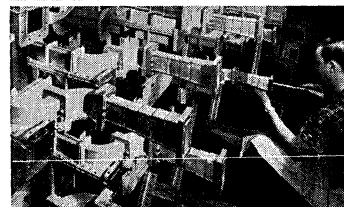
Amphenol RF Division capability is diverse and deep. It ranges from a fundamental RF component like coaxial connectors to development and production of advanced microwave devices. Whatever the product, the job or the service — all are unified by their common base in RF theory and practice.

Custom Microwave Components

For over a decade Amphenol RF Division has been one of the nation's largest producers of microwave hardware and apparatus for large commercial and military systems.

Coaxial Switches

Amphenol RF Division designs, manufactures and sells more coaxial switches than anyone else in the world. Whether complex phased array types or simple antenna switches, you can be sure of rugged design and precision performance. Scores of models in miniature, hermetically-sealed and multi-position designs are available.



FOR LOCAL SOURCE OF SUPPLY SEE EEM VOL. 2 PAGE 462

CONNECTORS

GOLD OR ULTRAPLATE P.C. BOARD, SOLDER EYE OR WIRE WRAP TERMINATIONS

- Glass filled polyester type SE-0 body.
- Contact spacing either .100 or .156.
- Standard number of contacts 15/30; 22/44; 36/72; 43/86; 50/100.
- **VOLTAGE RATING:** 600 VAC
- **CURRENT RATING:** .100 spacing 3 amps
.156 spacing 5 amps
- **VOLTAGE DROP:** 30 millivolts @ rated current
- **TEMPERATURE RANGE:** -65°C to +125°C.
- Polarizing keys available
- Connectors accommodates standard .054" to .071" thick printed circuit boards.
- Features pre-loaded bifurcated contacts.
- Low insertion forces and high contact forces.
- Various mounting styles.

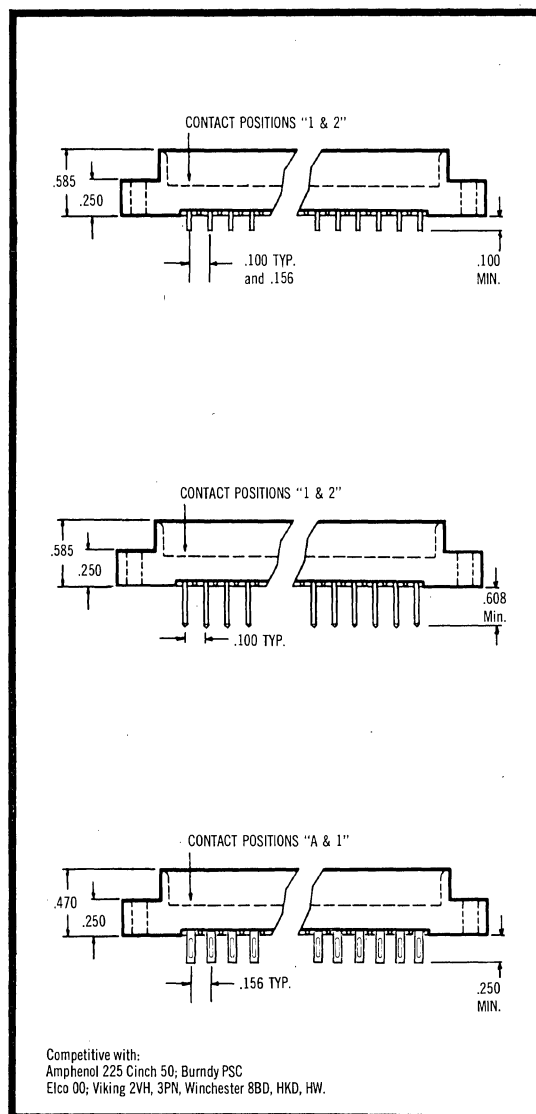
ULTRAPLATE:

Plating:

These connectors feature "ULTRAPLATE", a totally new plating alloy and plating process specifically designed for wiping contacts that permit connector performance comparable to that of gold plated contacts. The contact resistance is less than 10 millivolts making it suitable for use in all non "Dry Circuit" applications.

FEATURES

- low contact resistance
- excellent corrosion resistance
- low insertion forces
- excellent solderability
- low cost



SEE OUR OTHER PAGE ON CONNECTOR PRODUCTS PAGE 2-39

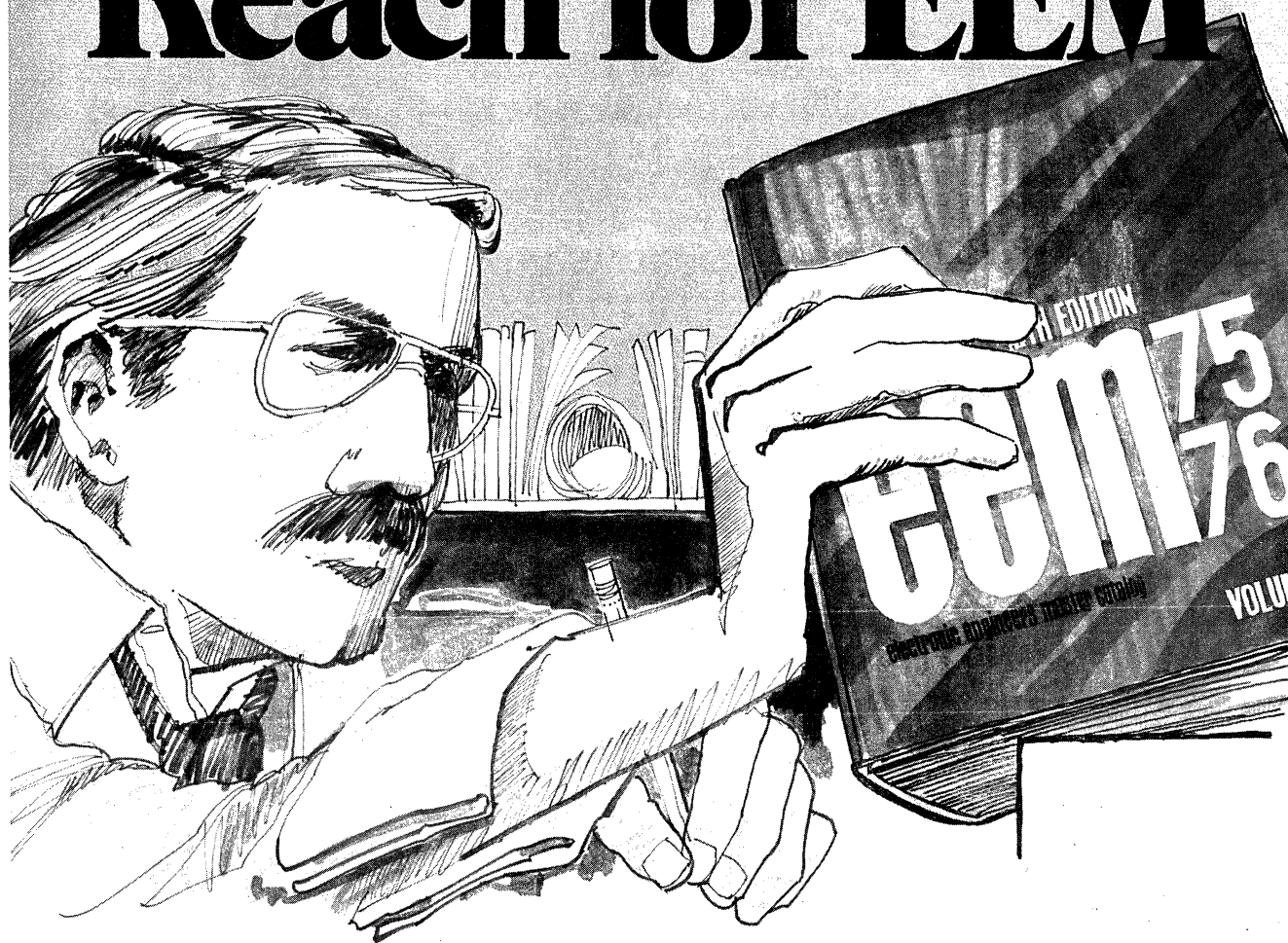
REQUEST ENGINEERING PRODUCT BULLETINS FROM ARCO

CONTACT YOUR LOCAL **Arco** DISTRIBUTOR FOR CATALOGS AND SPECIFICATIONS

ELECTRONIC COMPONENTS FOR INDUSTRY SOLD NATIONALLY THROUGH **Arco** DISTRIBUTORS

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700



WIRING DEVICES

We are pleased to present these ARROW-HART Wiring Devices. Incorporated in the data presented are the latest ARROW-HART products in accordance with Underwriters Laboratories, CSA, NEMA, and OSHA.

Most important consideration in the data presentation is the arrangement of product groupings to assure easy product selection.

SETTING THE PACE

ARROW-HART WIRING DEVICE FOR INDUSTRY

No one knows your tough OEM Wiring Device requirements better than ARROW-HART.

For many years the ARROW-HART name has made the highest quality available in Wiring Devices for industry. Industry requires products built to withstand tough abuse. ARROW-HART puts more into Wiring Devices so that you will be able to get more out. We offer products that are reliable and maintenance free once in use. They are easy to install.

The following pages include locking and non-locking receptacles, caps, connectors, inlets, and outlets that meet the 1975 National Electrical Code and NEMA Configuration requirements.

For medical equipment "Hospital Grade" Wiring Devices are shown which meet the latest Underwriters' Laboratories standards.

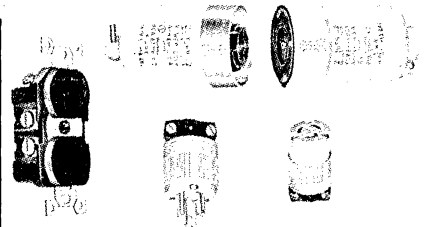
We put more in. You get more out.

ARROW-HART WIRING DEVICES ARE AVAILABLE AT A NATIONWIDE NETWORK OF AUTHORIZED ELECTRICAL DISTRIBUTORS

As near to you as your phone, Authorized ARROW-HART Distributors maintain in-depth inventories of our products, and are staffed and equipped to provide prompt, efficient service. ARROW-HART Distributors are businessmen whose major interest is the marketing of electrical supplies at the wholesale level. They are specialists in the ARROW-HART line of Wiring Devices as well as other electrical equipment you need. They fully understand your electrical problems and can recommend quality products to meet your requirements. The next time you need dependable product information, plus a reliable source of supply, you'll get them both with a single phone call to your nearest ARROW-HART Distributor. He's waiting to hear from you, and ready to help.

DON'T MISS THESE OTHER A-H PRODUCTS IN EEM

Relays p. 1-1580
Contactors p. 1-1584
Switches p. 1-1934
Timers p. 1-233



SELECTION GUIDE FOR ARROW-HART DEVICES PUBLISHED IN EEM*

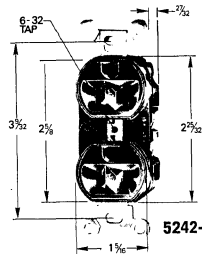
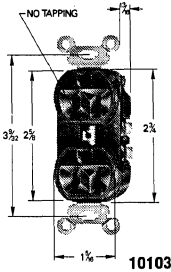
NEMA NON-LOCKING PLUGS AND RECEPTACLES						HOSPITAL GRADE / NON-LOCKING					
2 POLE / 3 WIRE GROUNDING	125V	15 AMP		20 AMP		15 AMP		20 AMP			
		RECEPTACLES	PLUGS	RECEPTACLES	PLUGS	RECEPTACLES	PLUGS	RECEPTACLES	PLUGS		
											
		5-15R	5-15P	5-20R	5-20P	5-15R	5-15P	5-20R	5-20P		
		PAGE 2-622	PAGE 2-622	PAGE 2-622	PAGE 2-622	PAGE 2-629	PAGE 2-629	PAGE 2-629	PAGE 2-629		
NEMA LOCKING TYPE PLUGS AND RECEPTACLES						HOSPITAL ONLY / LOCKING					
2 POLE / 3 WIRE GROUNDING	125V	15 AMP		20 AMP		30 AMP		20 AMP			
		RECEPTACLES	PLUGS	RECEPTACLES	PLUGS	RECEPTACLES	PLUGS	RECEPTACLES	PLUGS		
											
	L5-15R	L5-15P	L5-20R	L5-20P	L5-30R	L5-30P					
	PAGE 2-623	PAGE 2-623	PAGE 2-624	PAGE 2-624	PAGE 2-625	PAGE 2-625	PAGE 2-629	PAGE 2-629			
	250V							NEMA MIDGET / LOCKING TYPE			
		L6-15R	L6-15P	L6-20R	L6-20P	L6-30R	L6-30P				
		PAGE 2-623	PAGE 2-623	PAGE 2-624	PAGE 2-624	PAGE 2-625	PAGE 2-625				
	277 VAC			—	—	—	—	15 AMP			
		L7-15R	L7-15P								
		PAGE 2-623	PAGE 2-623	PAGE —	PAGE —	PAGE —	PAGE —	RECEPTACLES	PLUGS		
3 POLE / 4 WIRE GROUNDING	125/250V	—	—					2 POLE / 3 WIRE GROUNDING	125V		
		PAGE —	PAGE —	L14-20R	L14-20P	L14-30R	L14-30P			ML2-R	ML2-P
		PAGE —	PAGE —	PAGE 2-626	PAGE 2-626	PAGE 2-626	PAGE 2-626			PAGE 2-628	PAGE 2-628
4 POLE / 5 WIRE GROUNDING	120V 208V 3φY	—	—					3 POLE / 3 WIRE GROUNDING	125/250V		
				L23-20R	L23-20P	L23-30R	L23-30P			ML3-R	ML3-P
		PAGE —	PAGE —	PAGE 2-627	PAGE 2-627	PAGE 2-627	PAGE 2-627			PAGE 2-628	PAGE 2-628

*For complete identification of all NEMA devices from Arrow-Hart see pages 2-630 and 2-631.



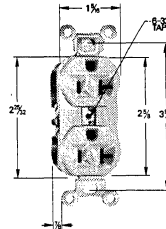
WIRING DEVICES

NON-LOCKING / 2 POLE — 3 WIRE GROUNDING

RECEPTACLES
15A/125V — DUPLEXNEMA
5-15RBINDING SCREW TYPE
FOR SIDE WIRING5242-S* — Brown
5242-S1 — IvoryQUICK-CONNECT
TERMINALS10103 — Brown with 4
.250-.032 Male Tabs
*For other colors, add
Suffix BL for Black; GR for Gray; W for White.

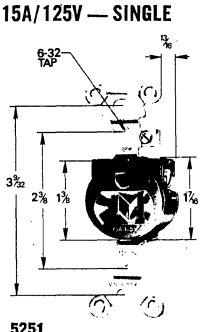
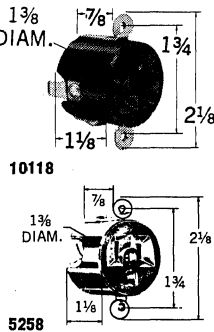
10103

20A/125V — DUPLEX

5735-S* — Brown
5735-S1 — Ivory*For other colors, add
Suffix BL for Black; GR for Gray; W for White;
RED for Red.NEMA
5-20R

5735-S1

15A/125V — SINGLE

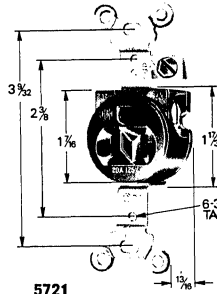
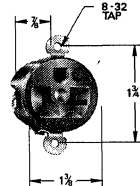
NEMA
5-15R5251* — Brown
5251-1* — Ivory
5258 — Brown on Short
Strap, 1 3/4" Screw.
Spacing with No. 8-32
Screws.
For other colors, add
suffix BL for Black,
GRY for Gray, W for
White, RED for Red.
(Red not available on
Cat. No. 5251)QUICK-CONNECT
TERMINALS10118 — Same as 5258
.250 x .032 Male Tabs

10118

5258

5251

20A/125V — SINGLE

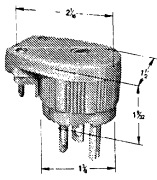
NEMA
5-20R5721* — Brown
5721-1 — Ivory
5733 — Brown on Short
strap, 1 1/4" Screw Hole,
Spacing with 8-32 Screw
5777 — Brown on Short
Strap, 1 3/4" Screw Hole,
Spacing with 8-32 ScrewFor other colors, add
suffix BL for Black,
GRY for Gray, W for
White, RED for Red.
(Red not available on
Cat. No. 5721)

5777

5721

CAPS

15A/125V — "DEAD FRONT"

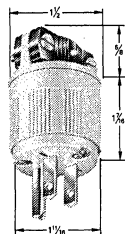
NEMA
5-15P

6265

BACK-WIRED

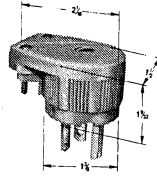
6266 — Gray Nylon/Lexan,
Safety-Grip Type
5212 — Black Neoprene,
Finger Grip Type,
with Nylon Cord Grip

ANGLE TYPE — 4 POSITION

6265-CL — Clear Lexan,
Safety-Grip Type
6265-LL — Clear Lexan,
Safety-Grip Type

6266

20A/125V

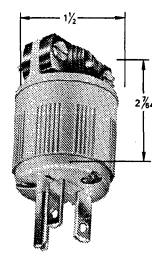
NEMA
5-20P

6765

BACK-WIRED

6766 — Gray Nylon/Lexan,
Safety-Grip Type
5775 — Black Rubber,
5776 — Finger Grip Type
with Cord Grip

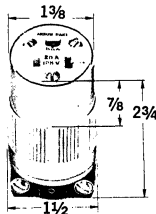
ANGLE TYPE — 4 POSITION

6765 — Gray Nylon/Lexan,
Safety-Grip Type
6765-CL — Clear Lexan,
Safety-Grip Type

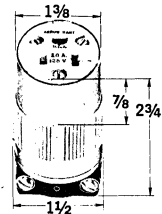
6766

CONNECTORS

15A/125V

NEMA
5-15R6269 — Cord Hole .250-
.656. Gray Nylon/Lexan,
Safety-Grip Type.

20A/125V

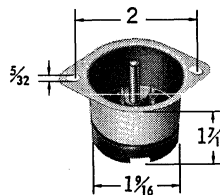
NEMA
5-20R6769 — Cord Hole .250-
.656 Gray Nylon/Lexan,
Safety-Grip Type.

INLET

15A/125V

NEMA
5-15P

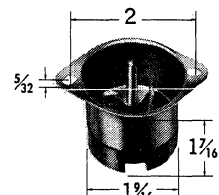
5278 — Flanged Inlet.



20A/125V

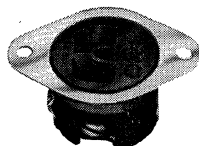
NEMA
5-20P

5778 — Flanged Inlet



OUTLET

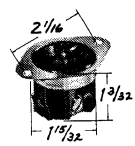
15A/125V

NEMA
5-15R5246 — Flanged Outlet
Side Wired

20A/125V

NEMA
5-20R

5787 — Flanged Outlet





WIRING DEVICE PRODUCTS

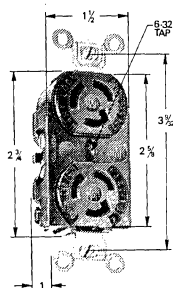
LOCKING / 2 POLE — 3 WIRE GROUNDING / STANDARD SIZE / 15 AMP

RECEPTACLES

15A/125V — DUPLEX

NEMA
L5-15R

- 4700 — Brown Bakelite
4700-1 — Ivory
4702 — Brown Bakelite,
2-Circuit, 2 Feeds, 1
Return.
4703 — Brown Bakelite,
2-Circuit, 2 Feeds, 2
Returns.

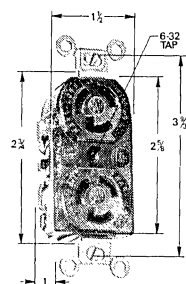


4700

15A/277VAC — DUPLEX

NEMA
L7-15R

- 4750 — Brown Bakelite
4752 — Brown Bakelite,
2-Circuit, 2 Feeds,
1 Return.
4753 — Brown Bakelite,
1-Circuit, 2 Feeds,
2 Returns.

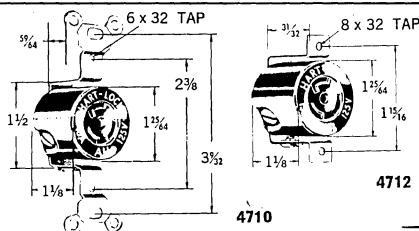


4750

15A/125V — SINGLE

NEMA
L5-15S

- 4710 — Brown Bakelite
4711 — Brown Bakelite
on 4" Cover.
4712 — Same as 4762
4713 — Same as 4763

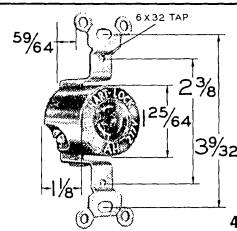


4712

15A/277VAC — SINGLE

NEMA
L7-15S

- 4760 — Brown Bakelite
4761 — With 4" Metal
Cover.
4762 — With Short Mtg.
Strap 1 1/4" Screw Spacing
4763 — With Short Mtg.
Strap 1 3/4" Screw Spacing



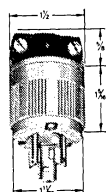
4760

CAPS

15A/125V — "DEAD FRONT"

NEMA
L5-15P

- 4721 — Cord Hole .250-
.656 Gray Nylon/Lexan

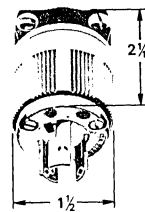


4721

15A/277VAC — "DEAD FRONT"

NEMA
L7-15P

- 4771 — Cord Hole .250-
.656 Gray Nylon/Lexan.



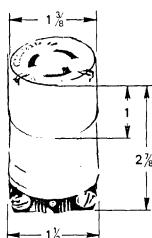
4771

CONNECTORS

15A/125V

NEMA
L5-15R

- 4731 — Cord Hole .250-
.656 Gray Nylon/Lexan
4730 — Cord Hole .296-
.625 Brown Bakelite
with Cord Grip

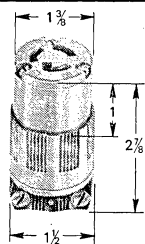


4731

15A/277VAC

NEMA
L7-15R

- 4772 — Cord Hole .250-
.656 Gray Nylon/Lexan
4780 — Cord Hole .296-
.625 Brown Bakelite
with Cord Grip



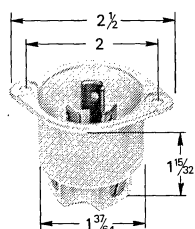
4772

INLET

15A/125V

NEMA
L5-15P

- 4716 — Flanged Inlet

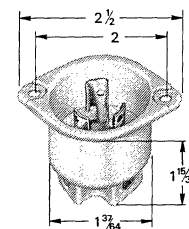


4716

15A/277VAC

NEMA
L7-15P

- 4785 — Flanged Inlet



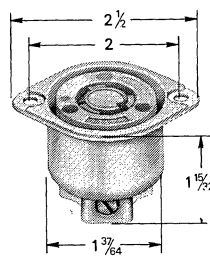
4786

OUTLET

15A/125V

NEMA
L5-15R

- 4715 — Flanged Outlet

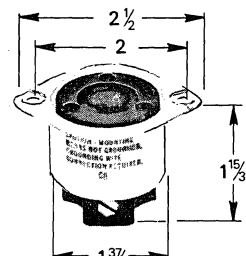


4715

15A/277VAC

NEMA
L5-15R

- 4785 — Flanged Outlet



4785

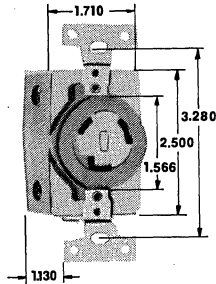


WIRING DEVICES

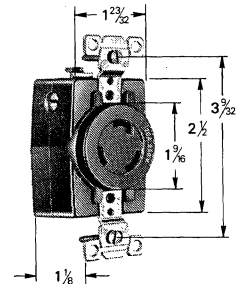
LOCKING / 2 POLE — 3 WIRE GROUNDING / STANDARD SIZE / 20 AMP

RECEPTACLES

20A/125V — SINGLE

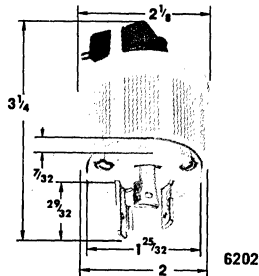
6200 — Black Melamine,
Back Wired

20A/250V — SINGLE

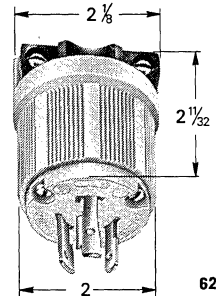
NEMA
L6-20R6210 — Black Melamine,
Back Wired

CAPS

20A/125V — "DEAD FRONT"

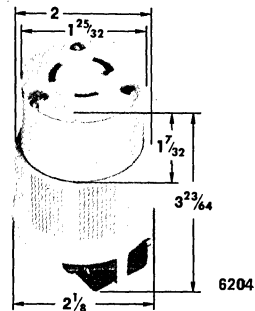
6201 — Cord Hole .375-
1.000 Nylon/Lexan
6202 — Cord Hole .375-
1.000 Nylon/Lexan with
Neoprene Seal.

20A/250V — "DEAD FRONT"

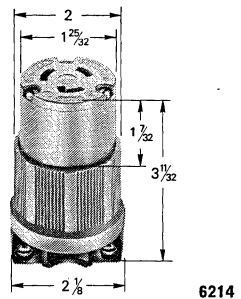
6211 — Cord Hole .375-
1.000 Nylon/Lexan
6212 — Cord Hole .375-
1.000 Nylon/Lexan with
Neoprene Seal.

CONNECTORS

20A/125V

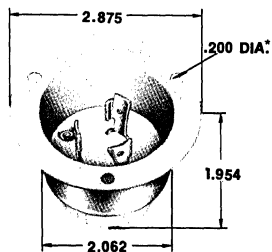
6203 — Cord Hole .375-
1.000 Nylon/Lexan
6204 — Cord Hole .375-
1.000 Nylon/Lexan with
Neoprene Seal

20A/250V

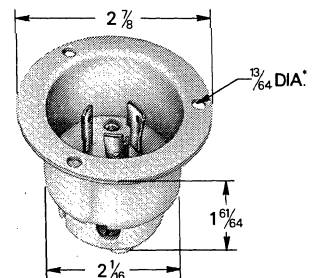
6213 — Cord Hole .375-
1.000 Nylon/Lexan
6214 — Cord Hole .375-
1.000 Nylon/Lexan with
Neoprene Seal

INLET

20A/125V

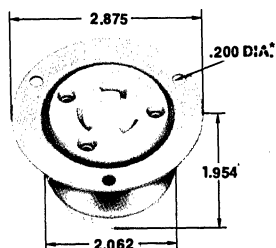
NEMA
L5-20P6205 — Flanged Inlet
*3 Holes Equally Spaced
on 2 1/2" Dia. Bolt Circle

20A/250V

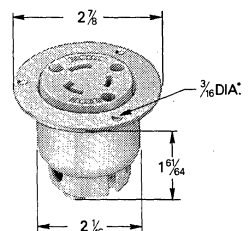
NEMA
L6-20P6215 — Flanged Inlet
*3 Holes Equally Spaced
on 2 1/2" Dia. Bolt Circle

OUTLET

20A/125V

NEMA
L5-20R6206 — Flanged Outlet
*3 Holes Equally Spaced
on 2 1/2" Dia. Bolt Circle

20A/250V

NEMA
L6-20R6216 — Flanged Outlet
*3 Holes Equally Spaced
on 2 1/2" Dia. Bolt Circle

ARROW HART

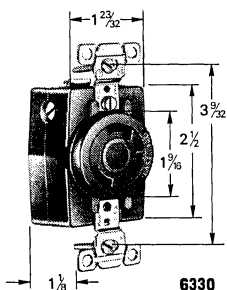
WIRING DEVICES

LOCKING / 2 POLE — 3 WIRE GROUNDING / STANDARD SIZE / 30 AMP

RECEPTACLES

30A/125V

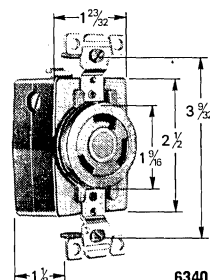
6330 — Black Melamine
Back Wired
3120 — Black Porcelain
Side Wired

NEMA
L5-30R

6330

30A/250V

6340 — Black Melamine
Back Wired

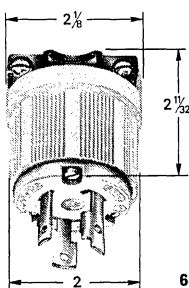
NEMA
L6-30R

6340

CAPS

30A/125V

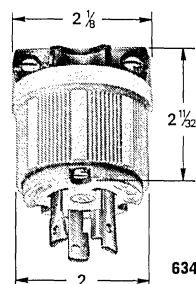
6331 — Cord Hole .375-
1.000 Nylon/Lexan
6332 — Cord Hole .375-
1.000 Nylon/Lexan
with Neoprene Seal

NEMA
L5-30P

6332

30A/250V

6341 — Cord Hole .375-
1.000 Nylon/Lexan
6342 — Cord Hole .375-
1.000 Nylon/Lexan
with Neoprene Seal

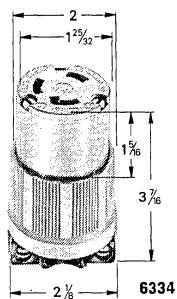
NEMA
L6-30P

6342

CONNECTORS

30A/125V

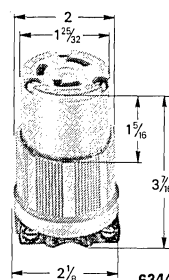
6333 — Cord Hole .375-
1.000 Nylon/Lexan
6334 — Cord Hole .375-
1.000 Nylon/Lexan
with Neoprene Seal

NEMA
L5-30R

6334

30A/250V

6343 — Cord Hole .375-
1.000 Nylon/Lexan
6344 — Cord Hole .375-
1.000 Nylon/Lexan
with Neoprene Seal

NEMA
L6-30R

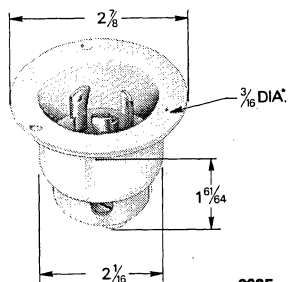
6344

INLET

30A/125V

NEMA
L5-30P

6335 — Flanged Inlet
6336 — Flanged Outlet
*3 Holes Equally Spaced
on 2 1/2" Dia. Bolt Circle.

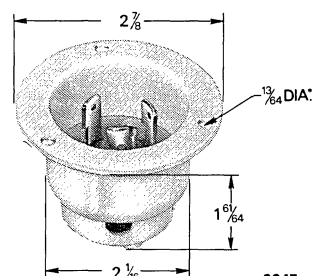


6335

30A/250V

NEMA
L6-30P

6345 — Flanged Inlet
*3 Holes Equally Spaced
on 2 1/2" Dia. Bolt Circle.



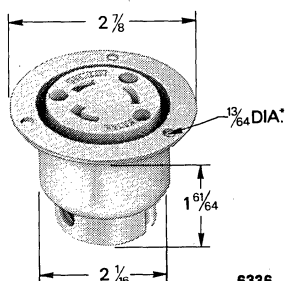
6345

OUTLET

30A/125V

NEMA
L5-30R

6336 — Flanged Outlet
*3 Holes Equally Spaced
on 2 1/2" Dia. Bolt Circle.

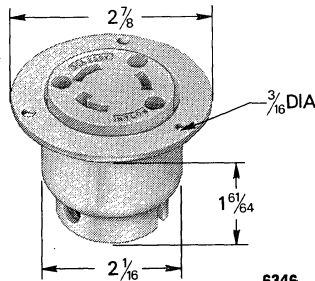


6336

30A/250V

NEMA
L6-30R

6346 — Flanged Outlet
*3 Holes Equally Spaced
on 2 1/2" Dia. Bolt Circle



6346



WIRING DEVICES

LOCKING / 3 POLE — 4 WIRE GROUNDING / STANDARD SIZE

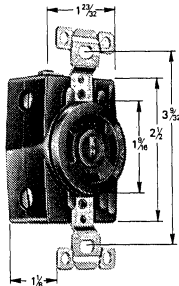
RECEPTACLES

20A/125V/250V

NEMA
L14-20R



6400 — Black Melamine
Back Wired



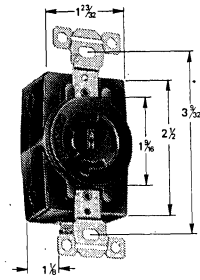
6400

30A/125V/250V

NEMA
L14-30R



6510 — Black Melamine
Back Wired



6510

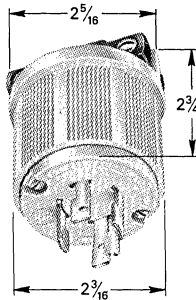
CAPS

20A/125V/250V

NEMA
L14-20P



6401 — Cord Hole .625-
1.156 Nylon/Lexan
6402 — Cord Hole .625-
1.156 Nylon/Lexan with
Neoprene Seal



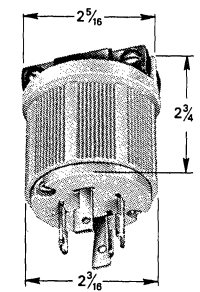
6402

30A/125V/250V

NEMA
L14-30P



6511 — Cord Hole .625-
1.156 Nylon/Lexan
6512 — Cord Hole .625-
1.156 Nylon/Lexan with
Neoprene Seal



6512

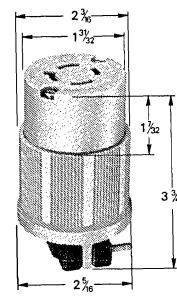
CONNECTORS

20A/125V/250V

NEMA
L14-20R



6403 — Cord Hole .625-
1.156 Nylon/Lexan
6404 — Cord Hole .625-
1.156 Nylon/Lexan with
Neoprene Seal



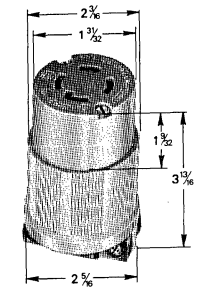
6404

30A/125V/250V

NEMA
L14-30R



6513 — Cord Hole .625-
1.156 Nylon/Lexan
6514 — Cord Hole .625-
1.156 Nylon/Lexan with
Neoprene Seal



6514

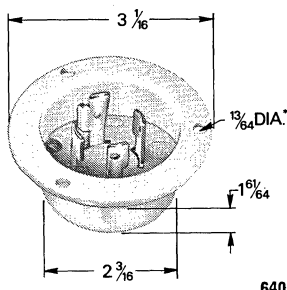
INLET

20A/125V/250V

NEMA
L14-20P



6405 — Flanged Inlet
*3 holes equally spaced
on 2 1/16" dia. bolt circle



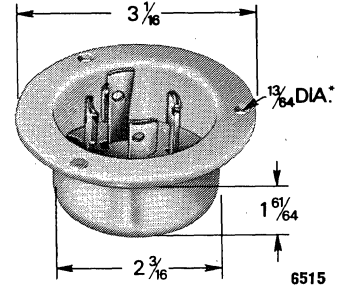
6405

30A/125V/250V

NEMA
L14-30P



6515 — Flanged Inlet
*3 holes equally spaced
on 2 1/16" dia. bolt circle



6515

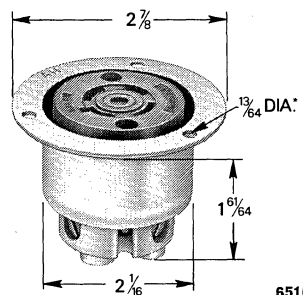
OUTLET

20A/125V/250V

NEMA
L14-30R



6516 — Flanged Outlet
*3 holes equally spaced
on 2 1/16" dia. bolt circle



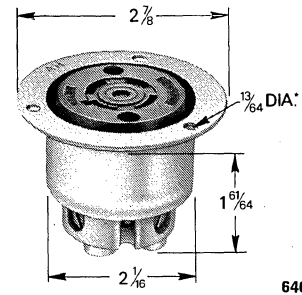
6516

30A/125V/250V

NEMA
L14-20R



6405 — Flanged Outlet
*3 holes equally spaced
on 2 1/16" dia. bolt circle



6405

**ARROW
HART**

WIRING DEVICES

LOCKING / 4 POLE — 5 WIRE GROUNDING / STANDARD SIZE

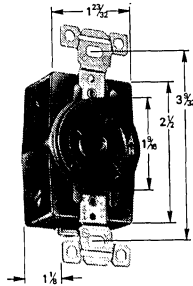
RECEPTACLES

20A/120/208V 3 ϕ Y

NEMA
L21-20R



6470 — Black Melamine
Back Wired

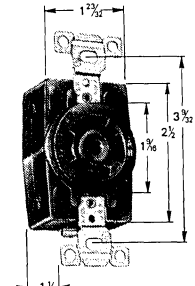


30A/120/208V 3 ϕ Y

NEMA
L21-30R



6610 — Black Melamine
Back Wired



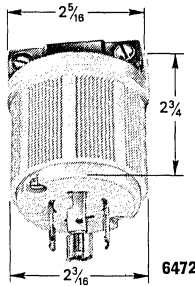
CAPS

20A/120/208V 3 ϕ Y

NEMA
L21-20P



6471 — Cord Hole .625-
1.156 Nylon/Lexan
6472 — Cord Hole .625-
1.156 Nylon/Lexan with
Neoprene Seal

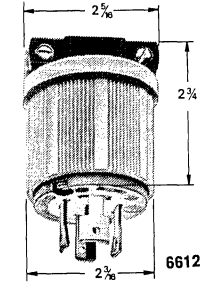


30A/120/208V 3 ϕ Y

NEMA
L21-30P



6611 — Cord Hole .625-
1.156 Nylon/Lexan
6612 — Cord Hole .625-
1.156 Nylon/Lexan with
Neoprene Seal



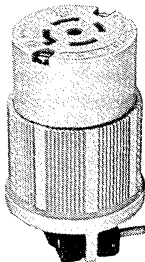
CONNECTORS

20A/120/208V 3 ϕ Y

NEMA
L21-20R



6473 — Cord Hole .625-
1.156 Nylon/Lexan
6474 — Cord Hole .625-
1.156 Nylon/Lexan with
Neoprene Seal

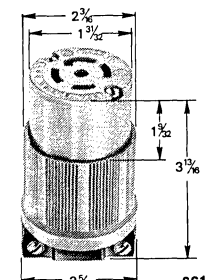


30A/120/208V 3 ϕ Y

NEMA
L21-30R



6613 — Cord Hole .625-
1.156 Nylon/Lexan
6614 — Cord Hole .625-
1.156 Nylon/Lexan with
Neoprene Seal



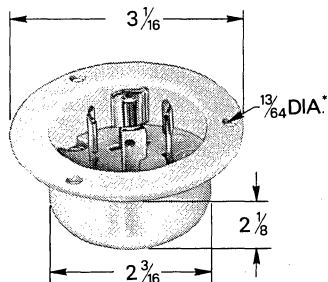
INLET

20A/120/208V 3 ϕ Y

NEMA
L21-20P



6475 — Flanged Inlet

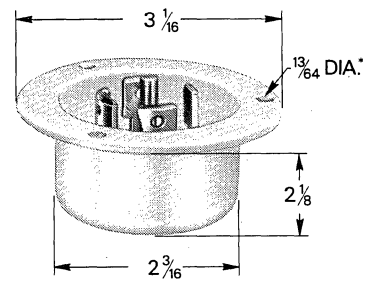


30A/120/208V 3 ϕ Y

NEMA
L21-30P



6615 — Flanged Inlet



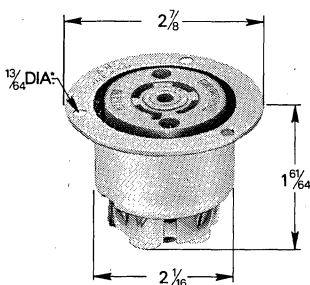
OUTLET

20A/120/208V 3 ϕ Y

NEMA
L21-20R



6476 — Flanged Outlet

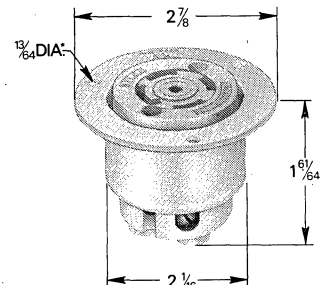


30A/120/208V 3 ϕ Y

NEMA
L21-30R



6616 — Flanged Outlet





WIRING DEVICES

MIDGET / LOCKING

2 POLE / 2 WIRE NEMA ML1-R NEMA ML1-P	2 POLE / 3 WIRE GROUNDING NEMA ML2-R NEMA ML2-P	3 POLE / 3 WIRE NEMA ML3-R NEMA ML3-P
CAPS 15A/125V 7465 7465 — Cord Hole .218-.312 Black Bakelite @ Cord Grip 7428 — Cord Hole .312-.500 Black Bakelite @ Cord Grip 7479 — Cord Hole .218-.312 Black Bakelite, Polarized @ Cord Grip 7429 — Cord Hole .312-.500 Black Bakelite, Polarized @ Cord Grip	15A/125V 6485 6482 — Cord Hole .500, Black Bakelite 6485 — Cord Hole .281-.421 Black Bakelite with Cord Grip	15A/125/250V 7485 7482 — .500 Cord Hole, Black Bakelite 7485 — .281-.421 Cord Hole Black Bakelite with Cord Grip
CONNECTORS 15A/125V 7464 7464 — Cord Hole .218-.312 Black Bakelite with Cord Grip 7427 — Cord Hole .312-.500 Black Bakelite with Cord Grip	15A/125V 6484 6481 — Cord Hole .500 Black Bakelite 6484 — Cord Hole .281-.421 Black Bakelite with Cord Grip	15A/125/250V 7484 7481 — Cord Hole .500 Black Bakelite 7484 — Cord Hole .281-.421 Black Bakelite with Cord Grip
INLET 15A/125V 7466 7466 — Flanged Inlet 7467 — Flanged Inlet, Polarized	15A/125V 6486 6486 — Flanged Inlet	15A/125/250V 7486 7486 — Flanged Inlet
OUTLET 15A/125V 7468 7468 — Flanged Outlet 7471 — Flanged Outlet, Covered Terminals without Cord Grip 7472 — Flanged Outlet, Covered Terminals with Cord Grip .218-.312 Range	15A/125V 6487 6487 — Flanged Outlet 6489 — Flanged Outlet with Covered Terminals and Cord Grip; Cord Hole .281-.421 6488 — No. 6489 Less Cord Grip Cord Hole .500	15A/125/250V 7487 7487 — Flanged Outlet 7489 — Flanged Outlet with Covered Terminals and Cord Grip; Cord Hole .281-.421 7487-A — Flanged Outlet with Binding Screws in Bulk 7487-GA — Flanged Outlet with 2 No. 6-32 Mounting Bushings in Dull Nickel Shell, Binding Screws in Bulk 7487-C — 7487 Flanged Outlet with Binding Screws not Staked



WIRING DEVICES

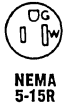
HOSPITAL GRADE

NON-LOCKING / 2 POLE 3 WIRE GROUNDING

All of the units listed below are verified by U.L. Inc. as complying with Federal Spec. W-C-596-C and meet NEMA WD1-1971. Devices are listed as "Hospital Grade" by U.L. and meet U.L. 544 and U.L. 498 Standards.

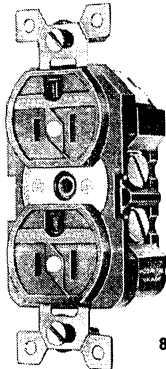
RECEPTACLES

15A/125V



8200* — Brown
8200-I — Ivory

Available in colors.
Add suffix RED for Red, GRY for Gray,
W for White, BL for Black.

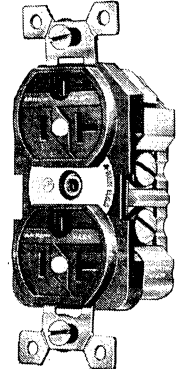


20A/125V



8300* — Brown
8300-I — Ivory

Available in colors.
Add suffix RED for Red, GRY for Gray,
W for White, BL for Black.

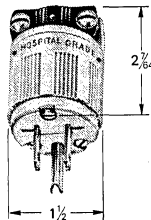


CONNECTORS

15A/125V



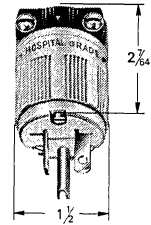
6266 HG — Gray, Cord Hole .250-.656



20A/125V



6766-HG — Gray, Cord Hole .250-.656



LOCKING / 2 POLE, 3 WIRE GROUNDING / POWER-LOCK

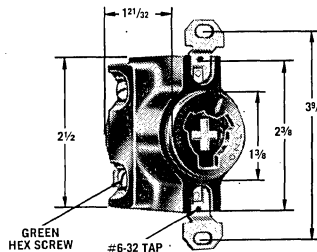
"Hospital Only" type — these units are designed for use in non-hazardous hospital locations.

RECEPTACLES

20A/125V



23050 — Black Bakelite

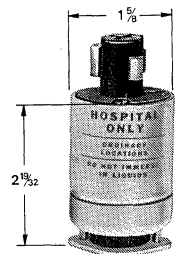


CAPS

20A/125V



23056 — Armored Steel Shell
with Rubber Cord Grip

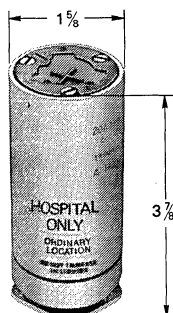


CONNECTORS

20A/125V



23054 — Armored Steel
Shell with Rubber Cord
Grip

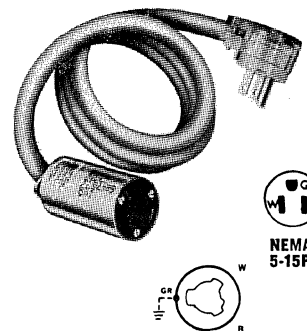


ADAPTER

215A/125V to 20A/125V

Converts standard 2-pole,
3-wire, 15A, 125V receptacle
to 20A, 125V, 2-pole, 3-wire
"HOSPITAL ONLY" configuration.
Allows equipment with
"HOSPITAL ONLY" plug
configuration to be used in
other locations.

23058 — Cord Set Consisting
of Cat. No. 6265-CL
Angle Cap and Cat. No.
23054 Connector with
6 Ft. of Yellow Cord.





WIRING DEVICES

NEMA GENERAL-PURPOSE NONLOCKING PLUGS AND RECEPTACLES

			15 AMPERE		20 AMPERE		30 AMPERE		50 AMPERE	
			▲ RECEPTACLE	▲ PLUG	▲ RECEPTACLE	▲ PLUG	▲ RECEPTACLE	▲ PLUG	▲ RECEPTACLE	▲ PLUG
2-POLE 2-WIRE	125V	1	D/9754 1-15R	C/3486 1-15P						
	250V	2		2-15P	A/8245 D/8283	C/7847*	A/8345	C/LH*		
2-POLE 3-WIRE GROUNDING	125V	5	A/5261 B/5262-S or 8200 Hosp. Grade D/6269 F/5246 5-15R	C/5265 or 8266-HG Hosp. Grade E/5278 5-15P	A/5361 B/5739-S or 8300 Hosp. Grade D/6769 F/5787 5-20R	C/6766 or 6766-H G Hosp. Grade E/5778 5-20P	A/5716 D/6716 5-30R	C/5717	A/5711 D/6711 5-50R	C/5712
	250V	6	A/5661 B/5662-S D/6669 6-15R	C/5666 E/5678 6-15P	A/5861 B/5862-S D/6869 6-20R	C/6866 E/5878 6-20P	A/5700 D/6700 6-30R	C/5701	A/5709 D/6709 6-50R	C/5710
	277VAC	7	B/5718 7-15R	C/5766 7-15P	A/7621 D/7625 7-20R	C/7626*	A/5795 D/6795 7-30R	C/5703	A/5796 D/6796 7-50R	C/5705
3-POLE 3-WIRE	125/250V	10			A/9140 D/9168 10-20R	C/9151*	A/9344 D/9341 10-30R	C/9337	A/7985 D/4526 10-50R	C/4524
	3Ø 250V	11	11-15R	11-15P	11-20R	11-20P	11-30R	11-30P	11-50R	11-50P
3-POLE 4-WIRE GROUNDING	125/250V	14	14-15R	14-15P	A/5759 14-20R	C/5757*	A/5744 14-30R	C/5746	A/5754 14-50R	C/5745
	3Ø 250V	15	15-15R	15-15P	A/5781 15-20R	C/5783*	A/8430 15-30R	C/8432	A/8450 15-50R	C/8452
4-POLE 4-WIRE	3Ø Y 120/208V	18	18-15R	18-15P	A/7250 18-20R	C/7251*	18-30R	18-30P	18-50R	18-50P

ARROW-HART LOCKING TYPE PLUGS AND RECEPTACLES

		RATINGS		▲ RECEPTACLE	▲ PLUG
2-POLE 3-WIRE GROUNDING	20A, 125V AC-DC "Hospital Only"	A/23050 D/23054			C/23056
	20A, 125V AC-DC	A/23030 D/23032			C/23035
	50A, 250 V.D.C. 600 V .A.C.	A/ 7381 D/ 7762			C/ 7763 E/ 7961
	50A, 250 V.D.C. 600 V .A.C.	A/ 3771 D/ 3762			C/ 3763 E/ 3777
	50A, 125V. Marine Devices	A/ 63CR70 D/ 63CR60			C/ 63CR61 E/ 63CR72
	50A, 250V. Construction Site Devices	A/ CS8269 D/ CS8264			C/ CS8265 E/ CS8275
3-POLE 3-WIRE	10A, 250V DC, 460V AC, 20A 125V AC-DC	A/23000 D/23002			C/23005
	20A, 125/250V	A/7310-B D/ 6314 F/ 3326			C/ 6312 F/ 7327
	30A 250V	A/3330 D/ 3333			C/ 3331* E/ 3337
	50A, 250 V .D.C. 600 V .A.C.	A/3770 D/3760			C/3761 E/3776
	50A, 250 V .D.C. 600 V .A.C.	A/7380 D/7760			C/7761 E/7960
3-POLE 4-WIRE EQUIP. GROUND	20A, 250V DC, 30A 600V AC	A/20403 D/20414			C/20415 E/20418
	30A, 480V AC	A/20443 D/20444			C/20445
	50A, 250 V .D.C. 600 V .A.C.	A/ 3769 D/ 3764			C/ 3765 E/ 3775
	50A, 250 V .D.C. 600 V .A.C.	A/ 7379 D/ 7764			C/ 7765 E/ 7768
	50A, 125/250V. Marine Devices	A/ 63CR69 D/ 63CR64			C/ 63CR65 E/ 63CR74
	50A, 480V. 3Ø Construction Site Devices	A/ CS8169 D/ CS8164			C/ CS8165 E/ CS8175
4-POLE 4-WIRE EQUIP. GROUND	50A, 125/250V. Construction Site Devices	A/ CS6369 D/ CS6364			C/ CS6365 E/ CS6375
	60A, 600V AC	A/26420 D/26414 F/26414-A			C/26415 E/26415-A
	20A, 250V AC-DC, 10A 600V AC	A/7310-B D/ 6314 F/ 7327			C/ 6312 F/ 7327
	30A, 250V AC-DC, 30A 600V AC	A/3430 D/ 3433			C/3431 E/3434
	20A, 250V DC, 30A 600V AC	A/25250 D/25414 F/25403			C/25415 E/25418
	60A, 600V AC	A/26520 D/26514 F/26514-A			C/26515 E/26515-A



WIRING DEVICES

NEMA LOCKING TYPE PLUGS AND RECEPTACLES

15 AMPERE		20 AMPERE		30 AMPERE				
RECEPTACLE	PLUG	RECEPTACLE	PLUG	RECEPTACLE	PLUG			
A/7535 B/7540 D/7688 L1-15R	C/7548 E/7523 L1-15P					L1	125V	2-POLE 2-WIRE
		A/7210-B D/7101 L2-20R	C/7102* E/8809 L2-20P			L2	250V	
A/4710 B/4700 D/4731 F/4715 L5-15R	C/4721 E/4716 L5-15P	A/6200 D/6204 F/6206 L5-20R	C/6202 E/6205 L5-20P	A/6330 D/6334 F/6336 L5-30R	C/6332 E/6335 L5-30P	L5	125V	2-POLE 3-WIRE GROUNDING
A/6560 B/6550 D/6566 F/6565 L6-15R	C/6565 E/6566 L6-15P	A/6210 D/6214 F/6216 L6-20R	C/6212 E/6215 L6-20P	A/6340 D/6344 F/6346 L6-30R	C/6342 E/6345 L6-30P	L6	250V	
A/4750 B/4750 D/4772 F/4785 L7-15R	C/4771 E/4786 L7-15P	A/6220 D/6224 F/6226 L7-20R	C/6222 E/6225 L7-20P	A/6360 D/6364 F/6366 L7-30R	C/6362 E/6365 L7-30P	L7	277VAC	
		A/6230 D/6234 F/6236 L8-20R	C/6232 E/6235 L8-20P	A/6370 D/6374 F/6376 L8-30R	C/6372 E/6375 L8-30P	L8	480VAC	
						L9	600VAC	3-POLE 3-WIRE
		A/6240 D/6244 F/6246 L10-20R	C/6242 E/6245 L10-20P	A/6380 D/6384 F/6386 L10-30R	C/6382 E/6385 L10-30P	L10	125/250V	
A/6560 D/6564 F/6566 L11-15R	C/6565 E/6566 L11-15P	A/6250 D/6254 F/6256 L11-20R	C/6252 E/6255 L11-20P	A/6390 D/6394 F/6396 L11-30R	C/6392 E/6395 L11-30P	L11	3 ϕ 250V	
						L12	3 ϕ 480V	
						L13	3 ϕ 600V	3-POLE 4-WIRE GROUNDING
		A/6400 D/6404 F/6406 L14-20R	C/6402 E/6405 L14-20P	A/6510 D/6514 F/6516 L14-30R	C/6512 E/6515 L14-30P	L14	125/250V	
		A/6420 D/6424 F/6426 L15-20R	C/6422 E/6425 L15-20P	A/6520 D/6524 F/6526 L15-30R	C/6522 E/6525 L15-30P	L15	3 ϕ 250V	
		A/6430 D/6434 F/6436 L16-20R	C/6432 E/6435 L16-20P	A/6530 D/6534 F/6536 L16-30R	C/6532 E/6535 L16-30P	L16	3 ϕ 480V	
				A/6540 D/6544 F/6546 L17-30R	C/6542 E/6545 L17-30P	L17	3 ϕ 600V	4-POLE 4-WIRE
		A/6440 D/6444 F/6446 L18-20R	C/6442 E/6445 L18-20P	A/6570 D/6574 F/6576 L18-30R	C/6572 E/6575 L18-30P	L18	3 ϕ Y 120/208V	
		A/6450 D/6454 F/6456 L19-20R	C/6452 E/6455 L19-20P	A/6580 D/6584 F/6586 L19-30R	C/6582 E/6585 L19-30P	L19	3 ϕ Y 277/480V	
		A/6460 D/6464 F/6466 L20-20R	C/6462 E/6465 L20-20P	A/6600 D/6604 F/6606 L20-30R	C/6602 E/6605 L20-30P	L20	3 ϕ Y 347/600V	
		A/6470 D/6474 F/6476 L21-20R	C/6472 E/6475 L21-20P	A/6610 D/6614 F/6616 L21-30R	C/6612 E/6615 L21-30P	L21	3 ϕ Y 120/208V	4-POLE 5-WIRE GROUNDING
		A/6490 D/6494 F/6496 L22-20R	C/6492 E/6495 L22-20P	A/6620 D/6624 F/6626 L22-30R	C/6622 E/6625 L22-30P	L22	3 ϕ Y 277/480V	
		A/6500 D/6504 F/6506 L23-20R	C/6502 E/6505 L23-20P	A/6630 D/6634 F/6636 L23-30R	C/6632 E/6635 L23-30P	L23	3 ϕ Y 347/600V	

HOW TO USE THIS CHART:

ARROW-HART catalog designation indicated by number. Letter indicates product classification. See product classification index.

EXAMPLE

A/5261
B/5262-S
or 8200 Hosp. Grade
D/6269
F/5246



NEMA configuration →

▲ PRODUCT CLASSIFICATION—MASTER INDEX

A/=SINGLE RECEPTACLE D/=CONNECTOR
B/=DUPEX RECEPTACLE E/=FLANGED INLET
C/=CAP F/=FLANGED OUTLET

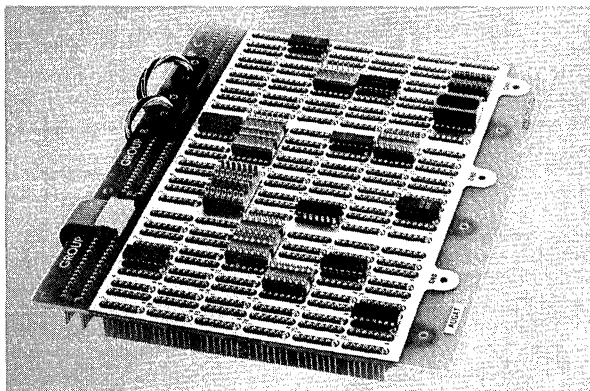
*FRONT WIRED CAPS. ALL OTHER CAPS ARE BACK WIRED
"DEAD FRONT" DESIGN

ARROW-HART INC. / WIRING DEVICE PRODUCTS /
103 HAWTHORN STREET / HARTFORD, CONN. 06106 / (203) 249-8471

NEMA MIGET LOCKING TYPE PLUGS AND RECEPTACLES

15 AMPERE				
RECEPTACLE	PLUG			
D/7484 F/7486 ML1-R	C/7485* E/7486 ML1-P	ML1	125V	2-POLE 2-WIRE
D/6484 F/6487 ML2-R	C/6485 E/6486 ML2-P	ML2	125V	2-POLE 3-WIRE GNDG.
D/7484 F/7487 ML3-R	C/7485 E/7486 ML3-P	ML3	125/250V	3-POLE 3-WIRE

AUGAT® Panels



P-Series: • Accepts 14 and 16 lead dip I.C.'s • Plane mounted • Modular construction, multiple of 30 patterns (up to 180 patterns) • Each 30 pattern section accepts 3 interfacing plugs or two 26 position flat cable plug for I.O. connections.

OVERALL SIZE: (30 pattern section) approx.

$$\frac{177.80 \pm 0.63\text{mm}}{7.000 \pm .025} \times \frac{67.94 \pm 0.63\text{mm}}{2.675 \pm .025}$$

HOW TO ORDER: Socket/terminal options – for wrap length and plating, see table below.

*Part Number	Suffix Added to Number	Socket/Terminal Length	Plating	
			Gold Contact Gold Sleeve	Gold Contact Tin Sleeve
8136-PG1-30	None	12.95mm/.510in. (3 level)	X	
8136-PG1-30-TG	-TG	12.95mm/.510in. (3 level)		X
8136-PG1-30-2	-2	9.40mm/.370in. (2 level)	X	
8136-PG1-30-2TG	-2TG	9.40mm/.370in. (2 level)		X

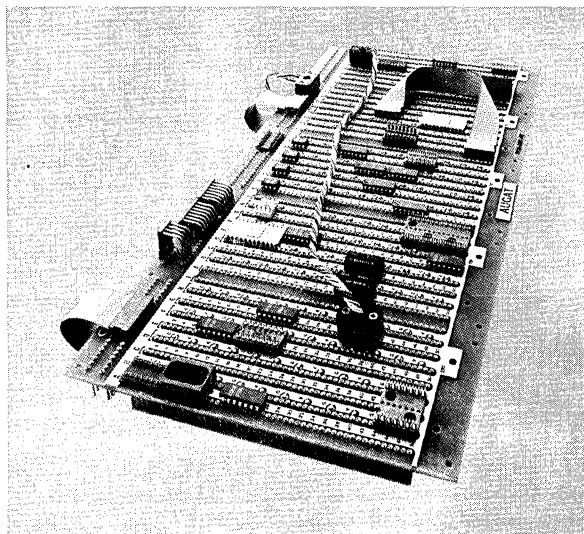
*May be purchased in any multiples of 30 patterns (up to 180 patterns) indicated by suffix number.

EXAMPLE: 8136-PG1-90 90 patterns.

Part Number *Series	Socket/Terminals Per Pattern	Voltage and Gnd. Connections	I.O. Termination
8136-PG1	14 .300" x .100" spacing	7 & 14	Socket/Terminal
8136-PG18		Socket/Terminal	Feed Thru
8136-PG3		V & G Dummy Terminal	Socket/Terminal
8136-PG122		V & G Socket/Terminal	Socket/Terminal
8136-PG19	14 + 2 (V & G) .300" x .100" spacing	V & G Dummy Terminal	Feed Thru
8136-PG113		V & G Socket/Terminal	Feed Thru
8136-PG5		8 & 16	Socket/Terminal
8136-PG20	16 + 2 (V & G) .300" x .100" spacing	Socket/Terminal	Feed Thru
8136-PG13		V & G Dummy Terminal	Socket/Terminal
8136-PG29		V & G Socket/Terminal	Socket/Terminal
8136-PG21		V & G Dummy Terminal	Feed Thru
8136-PG51		V & G Socket/Terminal	Feed Thru

Materials: BOARD: 1/8" glass epoxy, 2 oz. copper Circuitry, both sides tin plated

Socket/Terminal: TERMINAL: Brass, gold over nickel or tin plated.
FEMALE CONTACT: Beryllium copper, gold over nickel plated.



U-Series: • Accepts any combination of 14 thru 40 lead dip I.C.'s • Multiple of nine rows up to 54 rows • Each 9 row section accepts 3 interfacing plugs or two 26 position flat cable plugs for I.O. connections.

OVERALL SIZE: (9 row section)

$$\frac{174.62 \pm 0.63\text{mm}}{6.875 \pm .025} \times \frac{67.94 \pm 0.63\text{mm}}{2.675 \pm .025}$$

HOW TO ORDER: Socket/terminal options – for wrap length and plating, see table below.

*Part Number	Suffix Added to Number	Socket/Terminal Length	Plating	
			Gold Contact Gold Sleeve	Gold Contact Tin Sleeve
8136-UG1-18	None	12.95mm/.510in. (3 level)	X	
8136-UG1-18-TG	-TG	12.95mm/.510in. (3 level)		X
8136-UG1-18-2	-2	9.40mm/.370in. (2 level)	X	
8136-UG1-18-2TG	-2TG	9.40mm/.370in. (2 level)		X

*May be purchased in any multiple of 9 rows (up to 54 rows) indicated by suffix number.

EXAMPLE: 8136-UG1-27 27 rows

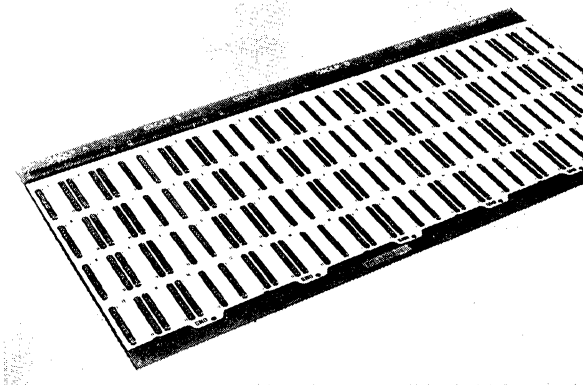
NOTE: Rows are .300" on center.

Part Number *Series	Voltage and Gnd. Connections	I.O. Termination
8136-UG1	Dummy Terminal	Socket/Terminal
8136-UG56	Socket/Terminal	
8136-UG6	Dummy Terminal	
8136-UG61	Socket/Terminal	Feed Thru

Materials: BOARD: 1/8" glass epoxy, 2 oz. copper Circuitry, both sides tin plated.

Socket/Terminal: TERMINAL: Brass, gold over nickel or tin plated.
FEMALE CONTACT: Beryllium copper, gold over nickel plated.

AUGAT® Panels



LSI Series: • Accepts 24 lead dip I.C.'s • Plane mounted • Modular construction, multiple of 12 patterns (up to 72 patterns) • Each 12 pattern section accepts 3 interfacing plugs or two 26 position flat cable plugs for I.O. connections.

OVERALL SIZE: (12 pattern section)

$$\frac{189.9 \pm 0.63\text{mm}}{7.475 \pm .025} \times \frac{67.94 \pm 0.63\text{mm}}{2.675 \pm .025}$$

HOW TO ORDER: Socket/terminal options – for wrap length and plating, see table below.

*Part Number	Suffix Added to Number	Socket/Terminal Length	Plating	
			Gold Contact Gold Sleeve	Gold Contact Tin Sleeve
8136-PG142-72	None	12.95mm/.510in. (3 level)	X	
8136-PG142-72-TG	-TG	12.95mm/.510in. (3 level)		X
8136-PG142-72-2	-2	9.40mm/.370in. (2 level)	X	
8136-PG142-72-2TG	-2TG	9.40mm/.370in. (2 level)		X

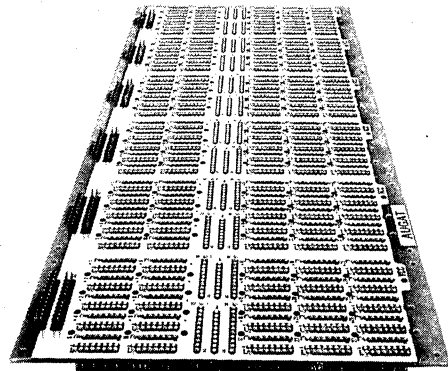
*May be purchased in any multiple of 12 patterns (up to 72 patterns) indicated by suffix number.

Example: 8136-PG142-24 24 patterns

Part Number *Series	Socket/Terminals Per Pattern	Voltage and Gnd. Connections	I.O. Termination
8136-PG142	24 .600" x .100" spacing	12 & 24	Socket/Terminal
8136-PG173			Feed Thru

Materials: BOARD: 1/8" glass epoxy, 2 oz. copper circuitry, both sides tin plated.

Socket/Terminal: TERMINAL: Brass, gold over nickel or tin plated.
FEMALE CONTACT: Beryllium copper, gold over nickel plated.



E.C.L. Logic: Accepts 16 lead dip E.C.L. 10K logic • Vcc, Vee and Vtt planes • Modular construction, multiple of 30 patterns (up to 180 patterns) • Provisions for line terminating resistors and decoupling capacitors • Panels also available for Schottky logic.

OVERALL SIZE: (30 pattern section)

$$\frac{189.9 \pm 0.635\text{mm}}{7.475 \pm .025} \times \frac{67.94 \pm 0.635\text{mm}}{2.675 \pm .025}$$

HOW TO ORDER: Plating Options – See table below.

*Part Number	Suffix Added to Number	Socket/Terminal Length	Plating	
			Gold Contact Gold Sleeve	Gold Contact Gold Sleeve
8136-ECL1-60-2	None	9.40mm/.370in. (2 level)	X	
8136-ECL1-60-2TG	-2TG	9.40mm/.370in. (2 level)		X

*ECL1 and ECL6 Series may be purchased in any multiple of 30 patterns (up to 180 patterns) indicated by suffix number.

EXAMPLE: 8136-ECL1-60-2 60 patterns

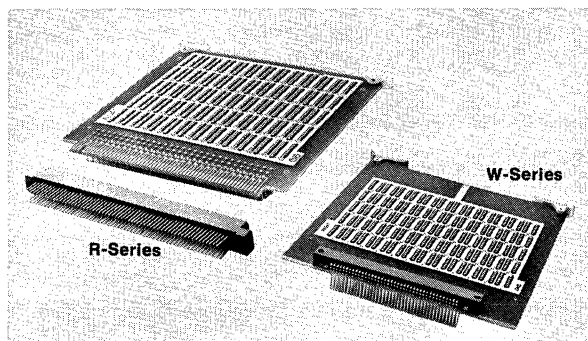
*ECL5 may be purchased in any multiple of 27 patterns (up to 162 patterns).

Part Number *Series	Socket/Terminals Per Pattern	Voltage and Gnd. Connections	I.O. Termination
8136-ECL1	16 .300" x .100" spacing	(Vcc) 1 + 16 (Vee) 8	Feed Thru
8136-ECL6			
8136-ECL5	16 and 24 .300" x .100" spacing	(Vcc) 1 + 16 (Vee) 8 (Vcc) 1 + 24 (Vee) 12	Feed Thru

Materials: BOARD: 1/8" glass epoxy, 2 oz. copper circuitry (3 layers) tin plated.

Socket/Terminal: TERMINAL: Brass, gold over nickel or tin plated.
FEMALE CONTACT: Beryllium copper, gold over nickel plated.

AUGAT® Panels



R-Series: • Accepts 14 and 16 lead dip I.C.'s • 60 patterns standard • Edge connector take-off (60 dual contact, 120 termination) 1/8 inch or 1/16 inch panel thickness • Universal style.

$$\text{OVERALL SIZE: } \frac{186.86 \pm 0.38\text{mm}}{7.353 \pm .015} \times \frac{177.80 \pm 0.38\text{mm}}{7.000 \pm .015}$$

HOW TO ORDER: Socket/terminal options – for wrap length and plating, see table below.

*Part Number	Suffix Added to Number	Socket/Terminal Length	Plating	
			Gold Contact Gold Sleeve	Gold Contact Tin Sleeve
8136-RG1	None	12.95mm/.510in. (3 level)	X	
8136-RG1-TG	-TG	12.95mm/.510in. (3 level)		X
8136-RG1-2	-2	9.40mm/.370in. (2 level)	X	
8136-RG1-2TG	-2TG	9.40mm/.370in. (2 level)		X

Part Number *Series	Socket/Terminals Per Pattern	Board Thickness	Voltage and Gnd. Connections
8136-RG1	14 .300" x .100" spacing	1/8"	7 + 14 socket/terminal
8136-RG2			V + G dummy terminal
8136-RG14			V + G socket/terminal
8136-RG7		1/16"	7 + 14 socket/terminal
8136-RG8	16 .300" x .100" spacing	1/8"	V + G dummy terminal
8136-RG13			V + G socket/terminal
8136-RG3		1/16"	8 + 16 socket/terminal
8136-RG4			V + G dummy terminal
8136-RG13	Blank card	1/8"	V + G socket/terminal
8136-RG9		1/16"	8 + 16 socket/terminal
8136-RG10			V + G dummy terminal
8136-RG15		1/16"	V + G socket/terminal
8136-RG58	Extender card	1/8"	
8136-RG85		1/16"	
8136-138G1		1/8"	
8136-RG86		1/16"	

Universal Type			
Part Number Series	No. of Rows	Board Thickness	Voltage and Gnd. Connection
8136-URG1	20 rows of 50 contacts on .300" centers	1/8"	V + G socket/terminal
8138-URG14		1/16"	

NOTE: Same blank and extender cards as R-Series.

Materials: BOARD: Glass epoxy, 2 oz. copper circuitry both sides. Tin plated connector fingers – gold over nickel plated.

Socket/Terminal: TERMINAL: Brass, gold over nickel or tin plated. FEMALE CONTACT: Beryllium copper, gold over nickel plated. EJECTOR KEYS: Nylon.

W-Series: • Accepts 14 and 16 lead dip I.C.'s • 60 and 72 patterns standard • Pin and socket take off • 1/8 inch or 1/16 inch panel thickness • Universal style.

$$\text{OVERALL SIZE: } \frac{186.86 \pm 0.38\text{mm}}{7.353 \pm .015} \times \frac{176.53 \pm 0.38\text{mm}}{6.950 \pm .015}$$

Part Number *Series	No. of Patterns	Socket/ Terminals Per Pattern	Board Thickness	Voltage and Gnd. Connections
8136-WG1	60	14 .300" x .100" spacing	1/8"	7 + 14 socket/terminal
8136-WG2				V + G dummy terminal
8136-WG14				V + G socket/terminal
8136-WG3		8 + 16 socket/terminal		
8136-WG4		V + G dummy terminal		
8136-WG13		V + G socket/terminal		
8136-WG7	60	14 .300" x .100" spacing	1/16"	7 + 14 socket/terminal
8136-WG8				V + G dummy terminal
8136-WG16				V + G socket/terminal
8136-WG9		8 + 16 socket/terminal		
8136-WG10		V + G dummy terminal		
8136-WG15		V + G socket/terminal		
8136-WG201	72	14 .300" x .100" spacing	1/8"	7 + 14 socket/terminal
8136-WG202				V + G dummy terminal
8136-WG214				V + G socket/terminal
8136-WG203		8 + 16 socket/terminal		
8136-WG204		V + G dummy terminal		
8136-WG213		V + G socket/terminal		
8136-WG207	72	14 .300" x .100" spacing	1/16"	7 + 14 socket/terminal
8136-WG208				V + G dummy terminal
8136-WG216				V + G socket/terminal
8136-WG209		8 + 16 socket/terminal		
8136-WG210		V + G dummy terminal		
8136-WG215		V + G socket/terminal		
8136-WG58	Blank card		1/8"	
8136-WG85			1/16"	
8136-WG53	Extender card		1/8"	
8136-WG86			1/16"	

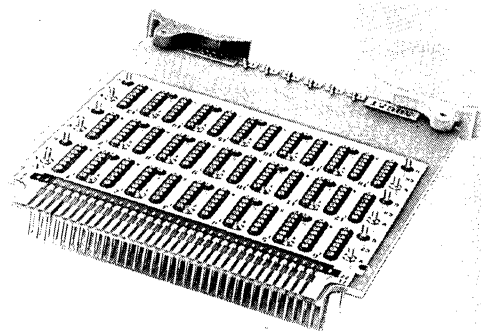
Universal Type				
Part Number Series	No. of Rows	Socket/Terminals Per Row	Board Thickness	Voltage and Gnd. Connections
8136-UWG1	20 on .300" x .100" spacing	50	1/8"	V + G socket/terminal
8136-UWG12		58	1/8"	
8136-UWG18		58	1/16"	

NOTE: Same blank and extender cards as W-SERIES.

Materials: BOARD: Glass epoxy, 2 oz. copper circuitry, both sides tin plated

Socket/Terminal: TERMINAL: Brass, gold over nickel or tin plated. FEMALE CONTACT: Beryllium copper, gold over nickel plated.

AUGAT® Panels



M-Series: • Accepts 14 and 16 lead dip I.C.'s • 12, 18, or 24 patterns, also universal style • Designed for mini rack standard assemblies • Additional pins for mounting discrete components.

$$\text{OVERALL SIZE: } \frac{111.12 \pm 0.38\text{mm}}{4.375 \pm .015} \times \frac{123.49 \pm 0.38\text{mm}}{4.862 \pm .015}$$

HOW TO ORDER: Socket/terminal options – for wrap length and plating, see table below.

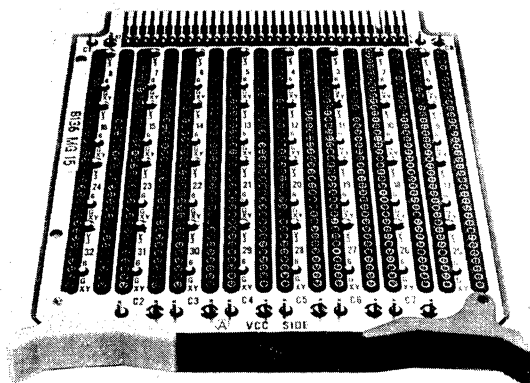
*Part Number	Suffix Added to Number	Socket/Terminal Length	Plating	
			Gold Contact Gold Sleeve	Gold Contact Tin Sleeve
8136-MG1	None	12.95mm/.510in. (3 level)	X	
8136-MG1-TG	-TG	12.95mm/.510in. (3 level)		X
8136-MG1-2	-2	9.40mm/.370in. (2 level)	X	
8136-MG1-2TG	-2TG	9.40mm/.370in. (2 level)		X

Part Number *Series	Socket/Terminals Per Pattern	Patterns Per Panel	Voltage and Gnd. Connections
8136-MG1	14 .300" x .100" spacing	24	7 + 14 socket/terminal
8136-MG2			V + G socket/terminal
8136-MG3	16 .300" x .100" spacing		8 + 16 socket/terminal
8136-MG4			V + G socket/terminal
8136-MG5	14 .300" x .100" spacing	18	7 + 14 socket/terminal
8136-MG6			V + G socket/terminal
8136-MG7	16 .300" x .100" spacing		8 + 16 socket/terminal
8136-MG8			V + G socket/terminal
8136-MG9	14 .300" x .100" spacing	12	7 + 14 socket/terminal
8136-MG10			V + G socket/terminal
8136-MG11	16 .300" x .100" spacing		8 + 16 socket/terminal
8136-MG12			V + G socket/terminal
8136-MG13	Extender card		
8136-MG14	Blank card		

Part no. 8136-UMG1 (Universale style) 12 rows of 35 contacts on .300" centers.

Materials: BOARD: ½" Glass epoxy, 2 oz. copper circuitry both sides tin plated. Connector fingers – gold over nickel plated.

Socket/Terminal: TERMINAL: Brass, gold over nickel or tin plated. FEMALE CONTACT: Beryllium copper, gold over nickel plated. EJECTOR KEYS: Nylon I.O. PINS: Phosphor bronze gold over (2 rows of 36) nickel plated.



High Density Socket Panels: • Accepts 14, 16 and 18 lead dips I.C.'s • Additional slotted pins for mounting discrete components • Edge connector take off • UMG3-V + G connections are preselected in each I.C. row, MG15-V + G connections located outside of I.C. row.

$$\text{OVERALL SIZE: } \frac{111.12 \pm 0.38\text{mm}}{4.375 \pm .015} \times \frac{123.49 \pm 0.38\text{mm}}{4.862 \pm .015}$$

HOW TO ORDER: Socket/terminal options – for wrap length and plating, see table below.

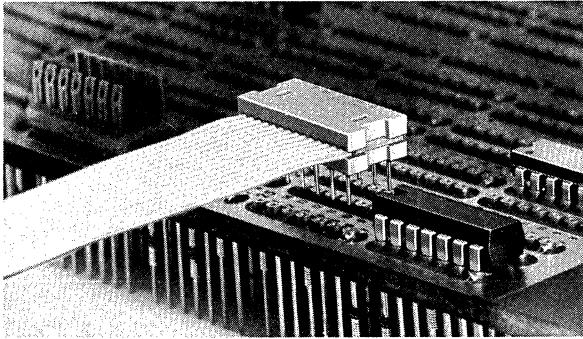
*Part Number	Suffix Added to Number	Socket/Terminal Length	Plating	
			Gold Contact Gold Sleeve	Gold Contact Tin Sleeve
8136-MG15	None	12.95mm/.510in. (3 level)	X	
8136-MG15-TG	-2	12.95mm/.510in. (3 level)		X
8136-MG15-2	-TG	9.40mm/.370in. (2 level)	X	
8136-MG15-2TG	-2TG	9.40mm/.370in. (2 level)		X

Part Number *Series	No. of Rows	Socket/Terminals Per Row	Voltage and Gnd. Connections
8136-MG15	8 on .300" x .100" spacing	35	V + G socket/terminal
8136-UMG3	10 on .300" x .100" spacing	35	

Materials: BOARD: ½" Glass epoxy, 2 oz. copper circuitry both sides tin plated. Connector pads – gold over nickel plated.

Socket/Terminal: TERMINAL: Brass, gold over nickel or tin plated. FEMALE CONTACT: Beryllium copper, gold over nickel plated. EJECTOR KEY: Nylon I.O. PINS: Phosphor bronze gold over nickel plated. (2 rows of 27)

AUGAT® Panel Accessories



Flat Cable Plug Assemblies: • Plugs directly into I.C. patterns • Unique contact design eliminates cutting and stripping of cable • 14 and 16 pin terminator • Cable is stranded copper wire, P.V.C. insulated.

Part Number	No. of Pins	Cable Length
2P14-1R12-1	14	12 in.
2P14-1R24-1	14	24 in.
2P14-1R36-1	14	36 in.

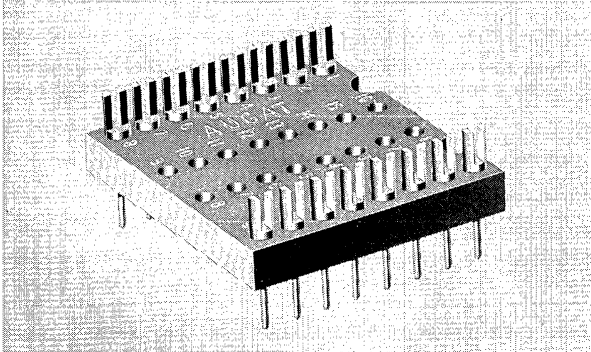
.300" x .100" Pin Spacing

For double ended assemblies, replace -1 suffix with -2.

EXAMPLE: 2P14-1R12 -2

For 16 pin assemblies, replace 14 with 16

EXAMPLE: 2P16



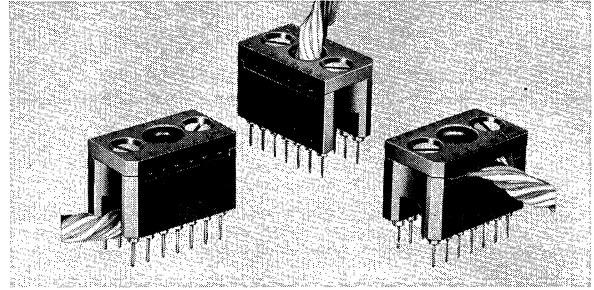
Adaptor Plugs: • 14 thru 40 pin with round, solder pocket or slotted connection • same dimension as I.C. pattern.

Standard Type			
Part Number*	No. of Pins	Pin Spacing	Pin Style
614-AG1	14	two .300" x .100"	Round
616-AG1	16		
628-AG1	28		
632-AG1	32		
614-AG2	14	.800" x .100"	
616-AG2	16		

*Substitute correct letter in part number for pin style variations (A – Round, B – Solder Pocket, C – Slotted).

EXAMPLE: (Solder Pocket Style) 614-BG1

Universal Type			
Part Number*	No. of Pins	Pin Spacing	Pin Style
614-AG3	14	.600" x .100"	Round
616-AG3	16		
624-AG1	24		
628-AG2	28		
636-AG1	36		
640-AG1	40		



Interfacing Plug Assemblies: • For I.O. connections, interfacing and testing • Same dimensions as I.C. pattern • 14 and 16 pin • Top, side or bottom entry of wires • Stranded wire; Teflon insulated • Pat. No. 3506945.

Part Number	No. of Pins	Pin Dia.	Wire Length
1P14-3T12-1	14	.018	12 in.
1P14-3T24-1			24 in.
1P14-3T36-1			36 in.
1P14-4T12-1	14	.023	12 in.
1P14-4T24-1			24 in.
1P14-4T36-1			36 in.

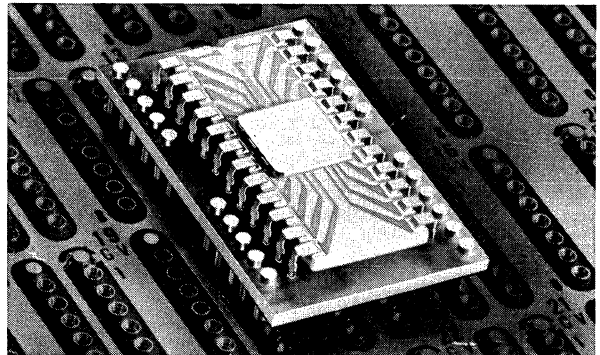
.300" x .100" pin spacing

For double ended assemblies, replace -1 suffix with -2.

EXAMPLE: 1P14-3T12 -2

For 16 pin assemblies, replace 14 and 16

EXAMPLE: 1P16

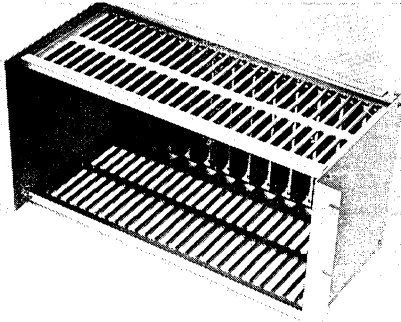


L.S.I. Adaptor Plug: • Accepts up to 40 lead L.S.I. dip I.C.'s • Interposing L.S.I. circuits on 14 and 16 pattern Augat panels • Dips are soldered into adaptor which plugs into panel • Adaptor pins are located to prevent improper positioning on panel.

Part Number	Application
628-HG16	Up to 28 pins .600" x .100" spacing
640-HG16	Up to 40 pins .600" x .100" spacing

Materials: BOARD: 1/16" glass epoxy, electro tin plated.
PIN: Phosphor bronze, gold over nickel plated.

AUGAT® Rack Assemblies



R-Series Rack Assembly: • Mounts up to 13 R or UR type panels • Designed for 19" relay rack mounting • Back panel removable for automatic wire wrapping • Provisions for mounting additional panels or P.C. boards on .600" spacing • Enclosure available.

OVERALL SIZE:

Enclosure

$$\frac{431.80 \pm 0.76\text{mm}}{17.000 \pm .030} \times \frac{463.55 \pm 0.76\text{mm}}{18.250 \pm .030} \times \frac{222.25 \pm 0.76\text{mm}}{8.750 \pm .030}$$

Rack

$$\frac{482.60 \pm 0.76\text{mm}}{19.000 \pm .030} \times \frac{215.90 \pm 0.76\text{mm}}{8.500 \pm .030} \times \frac{220.64 \pm 0.76\text{mm}}{8.687 \pm .030}$$

Part Number	Accepts Panel Thk.	Description
8170-EG1	$\frac{1}{8}"$ or $\frac{1}{16}"$	Enclosure Only
8160-EG10	$\frac{1}{8}"$	Back Panel Only
8160-EG21	$\frac{1}{16}"$	(with 13 connectors)
8170-RG1	$\frac{1}{8}"$	Panel Rack with back panel and mounting ears on side plates.
8170-RG14	$\frac{1}{16}"$	
8170-RG3	$\frac{1}{8}"$	Same as RG1 or RG14, except without back panel.
8170-RG16	$\frac{1}{16}"$	
8170-RG2	$\frac{1}{8}"$	Panel Rack with back panel and side plates for enclosure mounting.
8170-RG15	$\frac{1}{16}"$	
8170-RG4	$\frac{1}{8}"$	Same as RG2 or RG15 except without back panel.
8170-RG17	$\frac{1}{16}"$	

NOTE: Connector Only – Part No. 14005-1P1 ($\frac{1}{8}"$) 14005-19P1 ($\frac{1}{16}"$) (120 contact – 60 dual row).

Materials: (R&W Back and Enclosure)

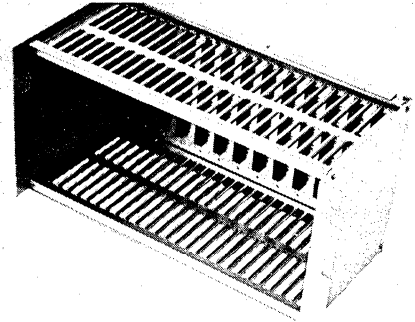
ENCLOSURE – Aluminum, painted blue

RACK – End plate – aluminum, gold iridite

(R&W) Guide plate – steel, cad.-plate, gold iridite

BACK PANEL – Glass epoxy

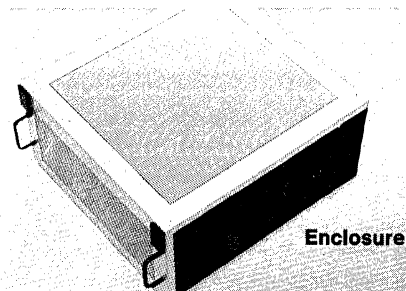
SOLDER LUGS – Brass, tin plated



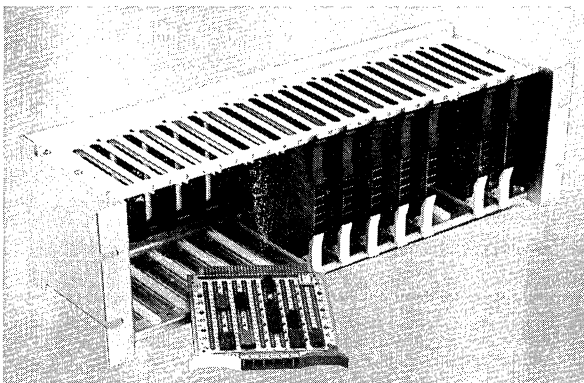
W-Series Rack Assembly: • Same design features as R-Series rack except back panel has pin and socket type connectors.

Part Number	Accepts Panel Thk.	Description
8170-EG1	$\frac{1}{8}"$ or $\frac{1}{16}"$	Enclosure Only
8160-WG1	$\frac{1}{8}"$	Back Panel Only
8160-WG3	$\frac{1}{16}"$	(with 13 connectors)
8170-RG6	$\frac{1}{8}"$	Panel Rack with back panel and side plates for enclosure mounting.
8170-RG18	$\frac{1}{16}"$	
8170-RG4	$\frac{1}{8}"$	Same as RG6 or RG18 except without back panel.
8170-RG17	$\frac{1}{16}"$	
8170-RG7	$\frac{1}{8}"$	Panel Rack with back panel and mounting ears on side plates.
8170-RG19	$\frac{1}{16}"$	
8170-RG3	$\frac{1}{8}"$	Same as RG7 or RG19 except without back panel.
8170-RG16	$\frac{1}{16}"$	

NOTE: Connector Only – Part No. 14005-13P1 (Male) ($\frac{1}{8}$ or $\frac{1}{16}$) 14005-14P1 (Female) 120 Contact (3 rows of 40)



Enclosure



M-Series Rack Assembly: • Accepts up to 13 M-series Logic Panels • Provision for mounting additional panels or P.C. boards on .600" center • Removable back panel for automatic wire wrapping. Designed for 19" relay rack mounting.

OVERALL SIZE:

$$\frac{482.60 \pm 0.76\text{mm}}{19.000 \pm .030} \times \frac{152.40 \pm 0.76\text{mm}}{6.000 \pm .030} \times \frac{127.79 \pm 0.76\text{mm}}{5.110 \pm .030}$$

Part Number	Description
8160-EG20	Back Panel Only (with 13 connectors)
8170-MG1	Panel Rack with back panel and mounting ears on side plates.

NOTE: Connector Only – Part No. 14005-17P3 ($\frac{1}{16}"$ only) (72 Contact – 36 dual row)

Materials: RACK – Aluminum, gold iridite.

GUIDES – Nylon.

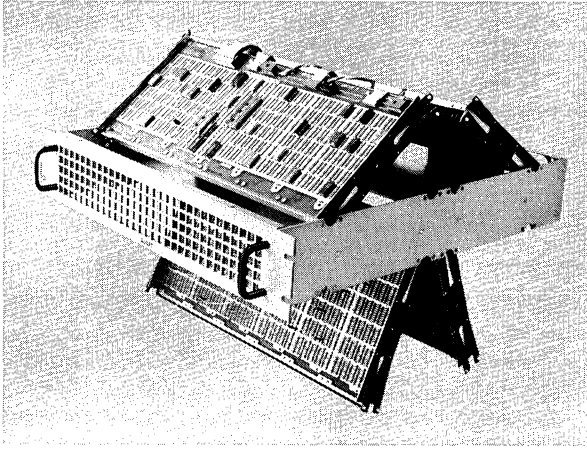
BACK PANEL – $\frac{1}{16}"$ glass epoxy.

SOLDER LUGS – Brass, tin plated.

Augat Inc., 33 Perry Avenue, Attleboro, Massachusetts 02703 / 617-222-2202. Note: Request Augat Catalog No. 266

AUGAT® Drawers

Sockets



Full Drawer Assembly: • Accepts up to four plane mount panels, up to 720 dip I.C.'s • Frames are hinged either side for accessibility and easy removal • Dust covers furnished • Designed for 19" rack mounting • Optional perforated or solid end plates.

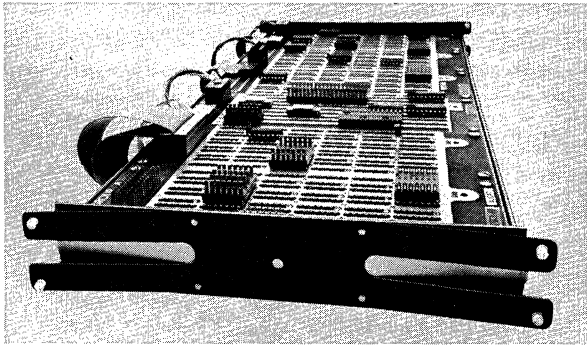
OVERALL SIZE:

$$\frac{482.60 \pm 0.38\text{mm}}{19.000 \pm .015} \times \frac{518.79 \pm 0.76\text{mm}}{20.425 \pm .030} \times \frac{88.90 \pm 0.76\text{mm}}{3.500 \pm .030}$$

Part Number	Description
8170-DG1	Drawer assembly with fan cutout rear plate and perforated front plate. (Accepts 4 panel frames)
8170-DG2	Drawer assembly with rear blank plate and front blank plate. (Accepts 4 panel frames)

NOTE: Order panel frames separately.

Materials: (Full drawer & half drawer)
All Frame members are aluminum, gold iridite, Front plate is painted blue.



Panel Frames: • Hinged at both ends with spring latch permitting accessibility and removal. Mounts full 180 pattern panel or a combination of panel styles up to 180 patterns. $(16.175 \pm .025)$ $410.84 \pm 0.63\text{mm}$.

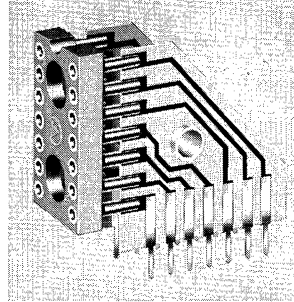
Part No. 8170-14G1 accepts the following panel series:

8136 - PG1	8136 - PG113
PG18	PG5
PG3	PG20
PG122	8136 - UG1
PG19	UG56
	UG6
	UG61

Part No. 8170-14G2 accepts the following panel series:

8136 - PG13	8136 - PG21
PG29	PG51

45°, 60° and 90° L.E.D. Numeric Display Socket (.300" between rows)



Material: SOCKET – Glass filled nylon

Socket/Terminal: CONTACT – Beryllium Copper, gold over nickel plated

SLEEVE – Brass, tin plated

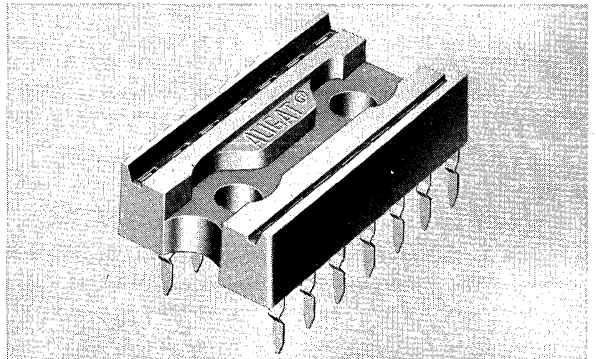
P.C. Board/Terminal Assembly: BOARD – Glass epoxy, tin plated copper circuitry

TERMINAL – Phosphor bronze, solder coated

SPACER – Delrin

Part Number	No of Contacts	Angle of Socket
514-AG21D	14	90°
514-AG25D		45°
514-AG26D		60°
516-AG21D		90°
516-AG25D	16	45°
516-AG26D		60°

NEW LOW PROFILE DIP SOCKET (.300" between rows)



- Low cost.
- Low profile – .160 (4.06mm) above PC board (I.C. Seating Plane)
- Continuous X & Y .100 (2.54mm) grid spacing.
- P.C. tail retains the socket in 1/16 (1.58mm) board during wave soldering.
- Designed for automatic board insertion.
- .020 (.508mm) between insulator and P.C. board for cleaning and proper clearance.
- Recommended mounting hole $.035 \pm .002$ (.889 $\pm$.050mm) dia.
- U.L. rated, SE-O glass filled thermoplastic.
- Gold or tin plated contacts.

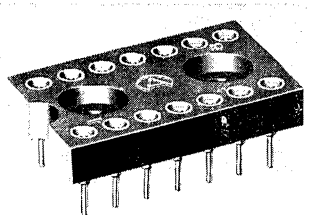
Part Number	No of Contacts	Contact Plating	Termination
314-AG25D	14	Tin over Copper	Printed Circuit
314-AG26D		Gold over Nickel	
316-AG25D	16	Tin over Copper	
316-AG26D		Gold over Nickel	

Material: INSULATOR – Glass filled Thermoplastic

CONTACT – Beryllium Copper, gold over nickel or tin over copper plated (see part block)

AUGAT® Sockets

8, 14, 16, 18 (.300" between rows) and 22 Contact
(.400" between rows)



Ultra Low Profile – Precision Machined Contact

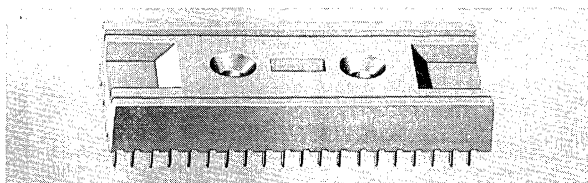
- Two piece socket terminal. Machined inner contact – beryllium copper, gold plated. Machined outer sleeve – brass, gold or tin plated.

Part Number	No. of Contacts	Contact Plating	Sleeve Plating	Termination
508-AG1D	8	Gold	Gold	Printed Circuit
508-AG11D		Gold	Tin	
508-AG1F		Gold	Gold	Wire Wrap
508-AG11F		Gold	Tin	
514-AG10D	14	Gold	Gold	Printed Circuit
514-AG11D		Gold	Tin	
514-AG10F		Gold	Gold	Wire Wrap
514-AG11F		Gold	Tin	
516-AG10D	16	Gold	Gold	Printed Circuit
516-AG11D		Gold	Tin	
516-AG10F		Gold	Gold	Wire Wrap
516-AG11F		Gold	Tin	
518-AG1D	18	Gold	Gold	Printed Circuit
518-AG11D		Gold	Tin	
518-AG1F		Gold	Gold	Wire Wrap
518-AG11F		Gold	Tin	
522-AG10D	22	Gold	Gold	Printed Circuit
522-AG11D		Gold	Tin	
522-AG10F		Gold	Gold	Wire Wrap
522-AG11F		Gold	Tin	

Material: INSULATOR – Glass filled nylon

Socket/Terminal: CONTACT – Beryllium copper, gold over nickel plated
SLEEVE – Brass, gold over nickel or tin plated (see part block)

24, 36 and 40 Contact LSI Sockets
(.600" between rows)



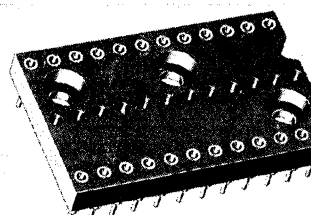
- Available in printed circuit, solder pocket or wire wrap termination.

Part Number	No. of Contacts	Termination
324-AG2A	24	Solder Pocket
324-AG2D		Printed Circuit
324-AG2F		Wire Wrap
336-AG2A	36	Solder Pocket
336-AG2D		Printed Circuit
336-AG2F		Wire Wrap
340-AG5A	40	Solder Pocket
340-AG5D		Printed Circuit
340-AG5F		Wire Wrap

Materials: INSULATOR – (24+36 Contact) Diallyl Phthalate
(40 Contact) Glass filled polyester

CONTACT – (wire wrap) Phosphor Bronze, gold over nickel plated
(printed circuit & solder pocket) Beryllium copper, gold over nickel plated

24, 28, 36 and 40 Contact, Low Profile LSI Sockets
(.600" between rows)



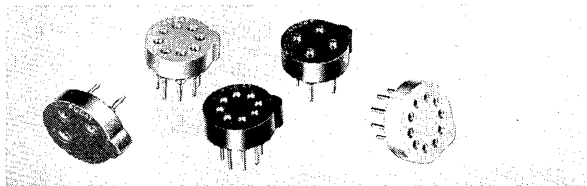
- Socket accepts flat I.C. leads or round leads .016"-.020" diameter.

Part Number	No. of Contacts	Contact Plating	Sleeve Plating	Termination
524-AG1D	24	Gold	Gold	Printed Circuit
524-AG11D		Gold	Tin	
524-AG1F		Gold	Gold	Wire Wrap
524-AG11F		Gold	Tin	
528-AG1D	28	Gold	Gold	Printed Circuit
528-AG11D		Gold	Tin	
528-AG1F		Gold	Gold	Wire Wrap
528-AG11F		Gold	Tin	
536-AG1D	36	Gold	Gold	Printed Circuit
536-AG11D		Gold	Tin	
536-AG1F		Gold	Gold	Wire Wrap
536-AG11F		Gold	Tin	
540-AG1D	40	Gold	Gold	Printed Circuit
540-AG11D		Gold	Tin	
540-AG1F		Gold	Gold	Wire Wrap
540-AG11F		Gold	Tin	

Material: INSULATOR – Glass filled nylon

Socket/Terminal: CONTACT – Beryllium copper, gold over nickel plated
SLEEVE – Brass, gold over nickel or tin plated (see part block)

Transistor and IC Sockets
(accept .016"-.020" diameter leads)



- Sockets accept .016"-.020" diameter leads.
- Molded insulator and automated contact assembly – save you money.
- Ultra low profile – precision machined contact assembly.
- Various insulator colors available.

Part Number	Pin Circle Diameter	No. of Contacts	Contact Plating	Sleeve Plating	Insulator Color
8059-2G1	.200"	3	Gold	Gold	Red
8059-2G2			Gold	Tin	
8059-2G3			Gold	Gold	
8059-2G4	.200"	4	Gold	Tin	Blue
8059-2G5			Gold	Gold	
8059-2G6			Gold	Tin	
8059-2G7	.230"	8	Gold	Gold	Orange
8059-2G8			Gold	Tin	
8059-2G9			Gold	Gold	
8059-2G10	.230"	10	Gold	Tin	Yellow

NOTE: All sockets printed circuit termination.

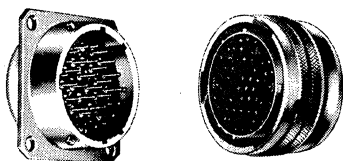
Material: INSULATOR – Glass filled nylon

Socket/Terminal: CONTACT – Beryllium copper, gold over nickel plated
SLEEVE – Brass, gold over nickel or tin plated (see part block)

Augat Inc., 33 Perry Avenue, Attleboro, Massachusetts 02703 / 617-222-2202. Note: Request Augat Catalog No. 166

Bendix Electrical Connectors

SUBMINIATURE MIL-C-38999, MIL-C-27599 types



Design Characteristics

- lightweight, compact, hi-contact density
- environmental resistant
- quick positive coupling
- visual coupling confirmation
- mismatching eliminated by 5 key/keyway design
- error proof alternate positioning

Customer Options

- five mounting styles
- 56 different contact arrangements, 3 to 128 circuits
- solder or crimp rear release contacts
- accept 26 - 12 AWG wire
- eight protective finishes
- coaxial (shielded) contacts available
- hermetic seal (glass fusion) receptacles available

JT, MS-JT

For applications requiring maximum weight/space savings and reliability. Also available in MIL-C-38999 (crimp) and MIL-C-27599 (solder) types.
Catalog 12-090

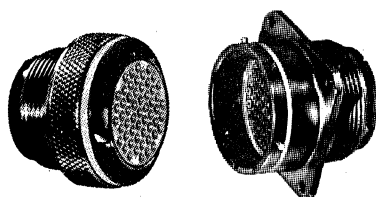
LJT

Popular 100% "scoop-proof" (recessed pins) version of the JT family. Offers maximum contact protection against bending. Available in MIL-C-38999 and MIL-C-27599 types.
Catalog 12-090

SJT

Further expansion of the basic JT family incorporating the 100% LJT scoop-proof feature and standard JT/PT mounting dimensions.
Catalog 12-091

MINIATURE MIL-C-26482, MIL-C-83723 types



Design Characteristics

- medium sized, widely used
- environmental resistant
- quick positive coupling
- mismatching eliminated by 5 key/keyway design

Customer Options

- 7 mounting styles
- solder or crimp front and rear release contacts
- accept 20 - 12 AWG wire
- 6 protective finishes
- coaxial (shielded) and thermocouple contacts available
- hermetic seal (glass fusion) receptacles available
- alternate positioning

PT, MS-PT

Basis of popular Bendix PYGMY line incorporating bayonet coupling and solder contacts. Approved to MIL-C-26482.
Catalog 12-072

PT-CE

Lowest cost PYGMY type, featuring crimp front release contacts and a voidless insert and grommet assembly, offering continuous dielectric separation between contacts.
Catalog 12-075

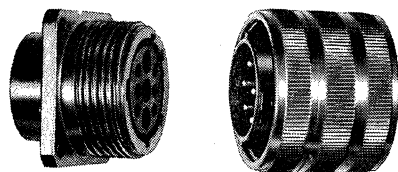
PTS-DR, MS-PTS-DR

Featuring the latest innovations in connector technology including dielectric retention, crimp rear release contacts and closed entry socket design.
Catalog 12-076

PT-SE, MS-PT-SE

A derivative of the PYGMY line incorporating crimp, front release contacts with a metal clip retention system.
Catalog 12-075

HEAVY DUTY MIL-C-22992 types



Design Characteristics

- 9 mounting styles
- multiple contact arrangements, 1-104 circuits
- solder or crimp contacts
- accept 20-0 AWG wire
- designed for use with jacketed cable
- alternate positioning

Customer Options

- largest size cylindrical
- environmental resistant
- quick mating, vibration resistant, easily maintainable threaded coupling

QWLD

Waterproof series for power and control circuits, with 5 key polarization.
Catalog 12-052

QWL

Compact heavy duty connector with single key polarization.
Catalog 12-052

QDP

Crimp contacts in heavy shells.
Product Data Sheet 65

Accessories

Complete line of cable adapters, protection caps, and application tools for heavy duty type connectors.
Catalog 12-052

Contact Sidney Plant for referenced catalogs. (607) 563-9511
Request Brochure SL-100 for a description of the complete Bendix Connector line.

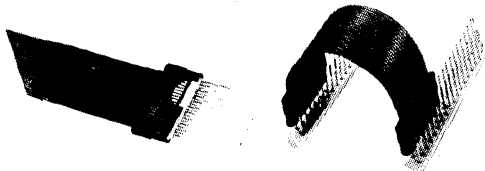


**Electrical
Components
Division**

Sidney, N.Y. 13838

Bendix Electrical Connectors

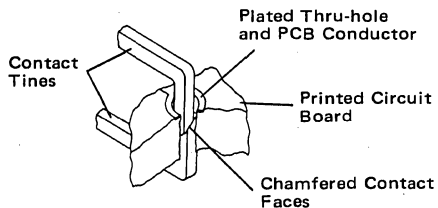
RECTANGULAR, NEW DEVELOPMENTS



Flat Cable

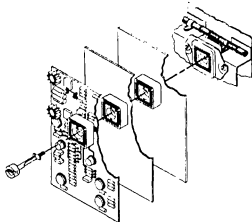
Low profile, highly reliable connector and a new terminating technique allows simultaneous gang termination without stripping or other wire preparation. True compatibility between flat cable usage and interconnection method now exists.

Brochure SL-287



Board Grabber

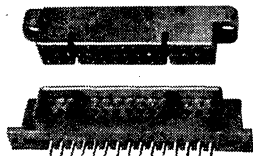
A unique concept for connection to printed circuit boards. The BOARD GRABBER contact utilizes plated thru-holes thus eliminating the need for gold plated board fingers, while offering zero card insertion force. Multipoint electrical contact and positive card retention offer excellent integrity and reliability even under vibration and shock. Consult Sidney Plant



Centre

A printed circuit board connector series designed to mount at or near the center of printed circuit boards to provide a greater number of electrical connections between boards, shorter PCB conductor runs, eliminate cross-overs and minimize multi-layer buildups. The Centre packaging concept offers a simple, rugged method of mounting and interconnecting boards and chassis, reduces back panel wiring, and acts as an exit/entry point for external interconnections.

Brochure SL-286



Automotive

A developing line of connectors for transportation, commercial, and industrial markets designed to provide excellent electrical/mechanical characteristics and reliability at low cost.

Consult Sidney Plant

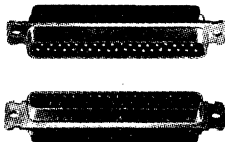


Brush Contact

A totally new idea in contact design, offering low mating forces, redundant circuits and wide positional error allowances. Each contact is comprised of a number of small wires, forming a brush like unit applicable to virtually any application where pin and socket contacts are used. The meshing of the brush like contacts provides a multiplicity of circuit paths and low contact resistance.

Product Data Sheet 91

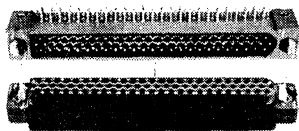
RECTANGULAR, RACK AND PANEL



Designed for use when the coupling requirements of cylindrical connectors are impractical, such as blind or inaccessible mating applications. Available in a variety of shell styles and mounting options, with crimp and solder contacts in various insert arrangements, MIL, ARINC, AIMS and filtered types are also available.

Catalog 12-032

RECTANGULAR, PRINTED CIRCUIT BOARD



Designed to provide reliable interconnection means with printed circuit boards. Available in a variety of contact spacings with crimp, solder or printed circuit contacts. Accessory polarization, floating contacts and other options are available to extend versatility.

Catalog 12-032

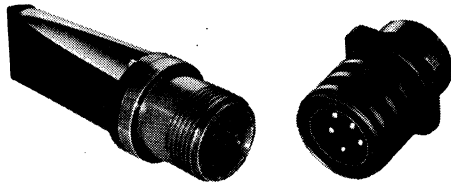
Contact Sidney Plant for referenced catalogs. (607) 563-9511
Request Brochure SL-100 for a description of the complete Bendix Connector line.



**Electrical
Components
Division**
Sidney, N. Y. 13838

Bendix Electrical Connectors

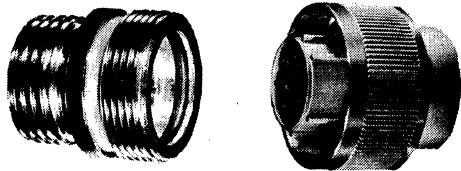
SPECIAL PURPOSE CYLINDRICAL



Heavy Power

Power "L", designed with safety in mind for heavy power interconnections in commercial, industrial or military applications. Features arc quenching capabilities, non-mating of incompatible power sources, and other safety assurances to make this an ideal connector for power applications up to 200 amp. Meets requirements of MIL-C-22992, Class L.

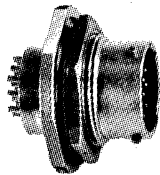
Catalog 12-052



Immersible

The Aquacon connector series is designed for oceanic or fluid immersion applications; offering 1500 PSI capability, metal to metal coupling, visual mating indicator and design flexibility, at low cost. Available in a wide range of circuit configurations.

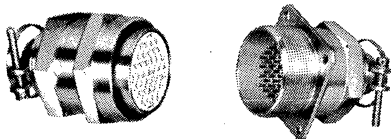
Brochure SL-280



Filter

Designed to provide EMI protection for circuitry. Each circuit is individually filtered within the connector, eliminating the need for costly and bulky exterior network filters. Filter contacts in MF, HF, VHF and UHF ranges are available for a wide selection of connector types.

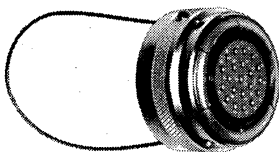
Catalog 12-120



High Temperature

Firewall connectors suitable for applications requiring continuous temperature operation to 1000°F. Components also provide suitable resistance to radiation and oxidizing environments.

Catalog 12-101

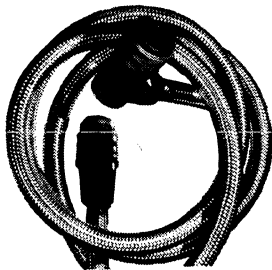


Breakaway

Designed to provide quick disconnect of a connector plug and receptacle, with axial pull. Mating is accomplished in normal fashion while disconnect is by axial pull on the coupling nut (via lanyard or other means) or manual rotational unmating.

Brochure SL-102

CUSTOM CABLING



The Electrical Components Division maintains a custom cabling department to design and manufacture high quality cabling for industrial, commercial, aerospace, oceanic and military applications. Skilled, experienced personnel are available to assist you with your cabling needs; with careful consideration given to all aspects of a particular installation.

Consult Sidney Plant

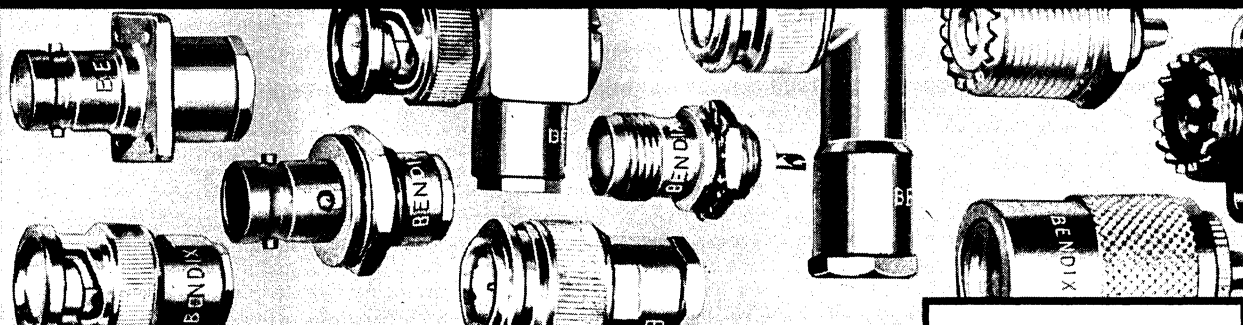
Contact Sidney Plant for referenced catalogs. (607) 563-9511
Request Brochure SL-100 for a description of the complete Bendix Connector line.



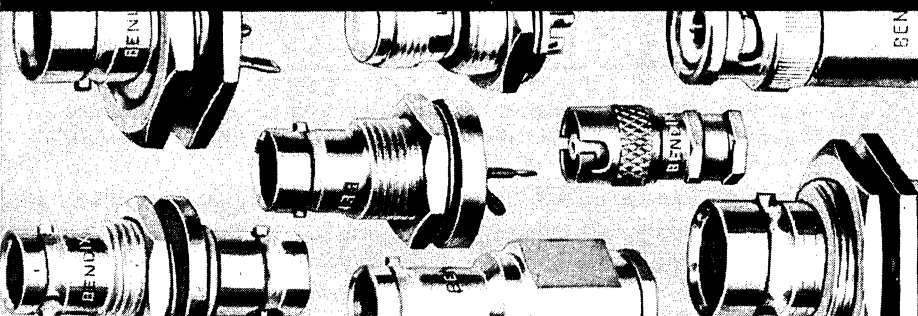
**Electrical
Components
Division**
Sidney, N. Y. 13838

RF CONNECTORS

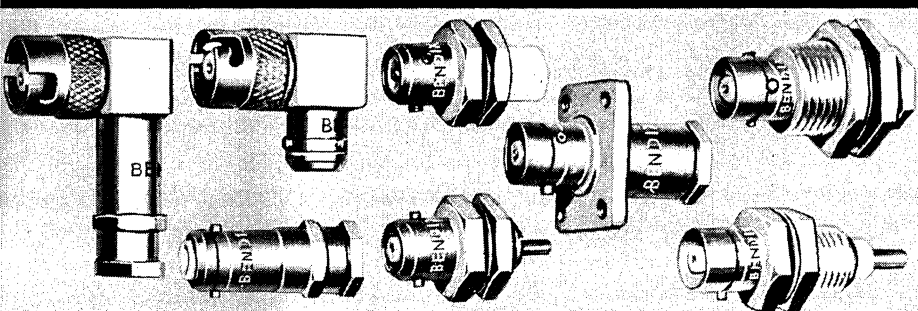
STANDARD—BNC / TNC / N / C / SC / UHF / UG



TRIAx—BNC / TNC / C / DM



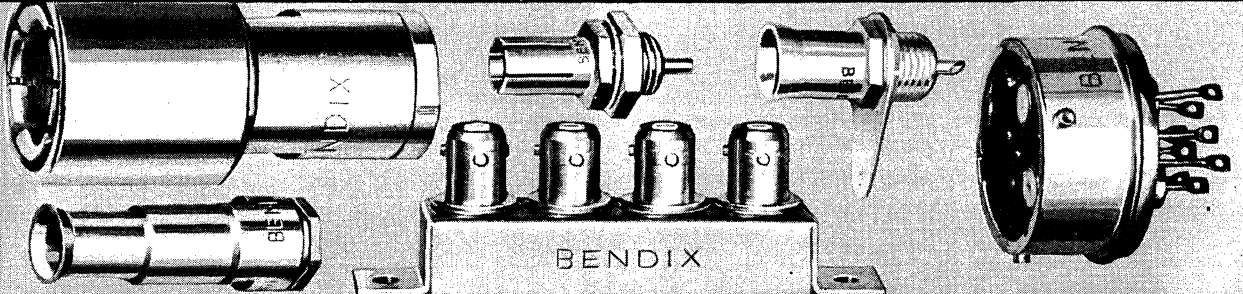
MINIATURE—TPS / DM / ADM



SUB-MINIATURE—SMMA / SMA / SMB / SMC



CUSTOM—HERMETIC SEALED / ISOLATED GROUND / TWINAX / PUSH-ON
SNAP-ON / HI-VOLTAGE / CABLE ASSEMBLIES / JUNCTIONS



MILITARY SPECIFICATIONS:

MIL-C-39012
MIL-C-25516
MIL-C-22557
MIL-C-55235
MIL-A-55339

FEATURES:

(All Series)

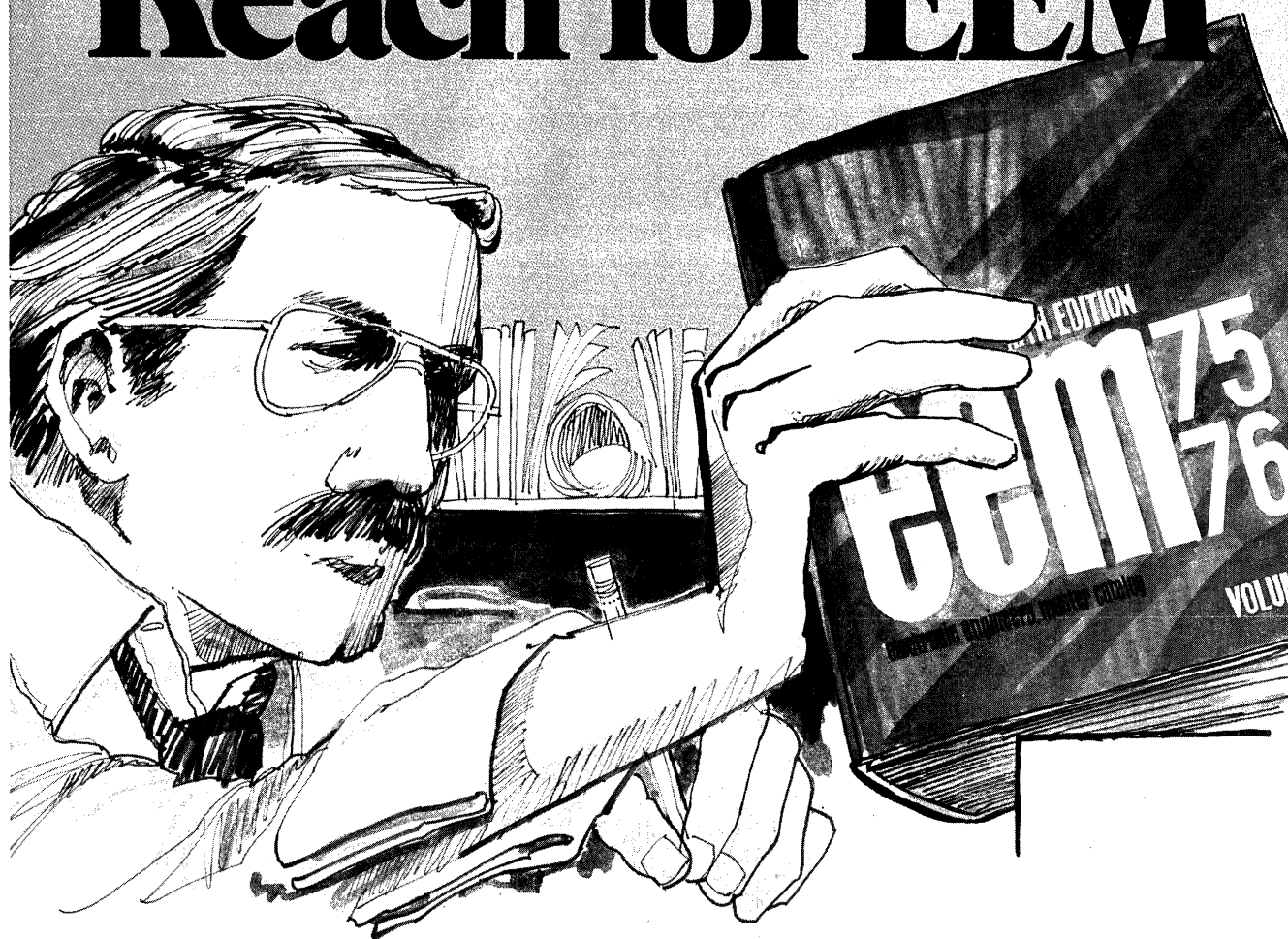
CLAMPING HARDWARE
CRIMP-ON
SQUARE CUT

For information call your representative or write direct to Microwave Devices. The Bendix Corporation, Hurricane Road, Franklin, Indiana 46131. Phone (317) 736-6136.



**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

Berg / product review

100
BULLETIN

INTERCONNECTION SYSTEMS

COMPONENT TERMINALS

P.C. BOARD PRODUCTS

WIRE AND CABLE CONNECTORS

SOCKETS

ASSEMBLY MACHINES

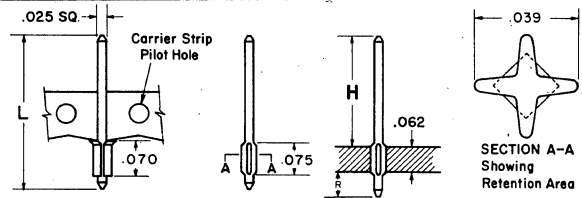
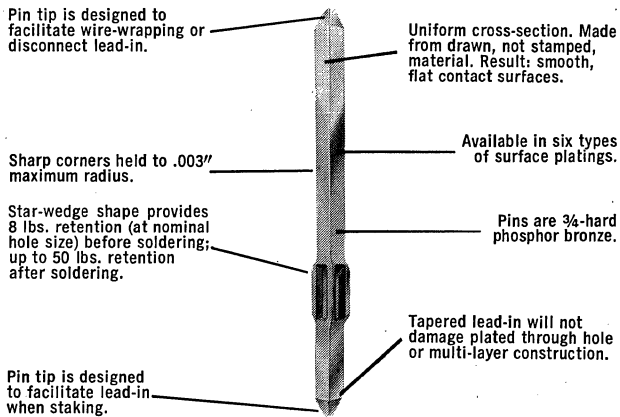
BERG
ELECTRONICS
Division EPT du Pont de Nemours & Co. (Inc.)

BergCon™ .025" SQUARE MODULAR INTERCONNECTION SYSTEM

BergCon is a complete, versatile system offering high density .100" grid stacking... end-to-end or side-to-side... across a wide range of connector types.

BergPin MALE TERMINALS FOR DISCONNECT AND WIRE-WRAPPING

System provides a fast, reliable method for staking pins in circuitboard. Here are the features that distinguish BergPin terminals from ordinary wire-wrapping pins:



Part Number	Plating	Underplating	Material
75401-	30 mill min. gold*	50 mill min. nickel	Phosphor-bronze (3/4 hard) ASTM B159-66
75402-	50 mill min. gold**	10 mill copper flash	Phosphor-bronze (3/4 hard) ASTM B159-66
75403-	50 mill min. gold**	50 mill min. nickel	Phosphor-bronze (3/4 hard) ASTM B159-66
75404-	150 min. acid tin***	none	Phosphor-bronze (3/4 hard) ASTM B159-66
75405-	100 mill min. gold	50 mill min. nickel	Phosphor-bronze (3/4 hard) ASTM B159-66
75406-	100 min. gold	100 min. copper	Phosphor-bronze (3/4 hard) ASTM B159-66
75407-	PLAIN	none	Phosphor-bronze (3/4 hard) ASTM B159-66
75408-	PLAIN	none	Phosphor-bronze (3/4 hard) ASTM B159-66 Cupro-Nickel C.D.A. No 725

*MIL-G-45204 Type 2 **MIL-G-45204 Type 1 Class 1 ***MIL-T-10727A Type 1

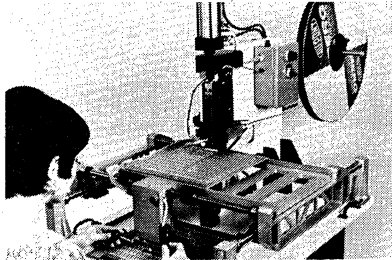
This listing gives the material, plating and underplating; it does not show the pin length or height above board. For these dimensions, we refer you to Berg Bulletin 105 which is available upon request.

BergPin STAKING MACHINES CUT COSTS, CONTROL QUALITY



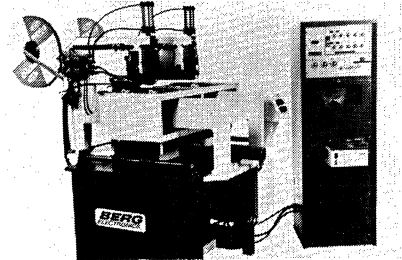
PRODUCTION MACHINE (Model BP-161)

For staking boards with limited number of pins or boards with varying pin configurations. Operator manually locates hole position and initiates staking cycle for up to 2000 insertions per hour.



PANTOGRAPH MACHINE (Model BP-151)

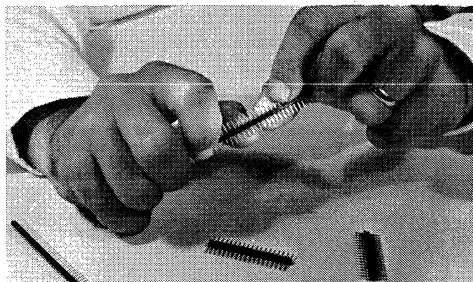
Ideal for straight-line insertion in boards or for high quantities of identical boards. Stakes up to 3500 pins per hour.



NUMERICALLY-CONTROLLED MACHINE (Model NC)

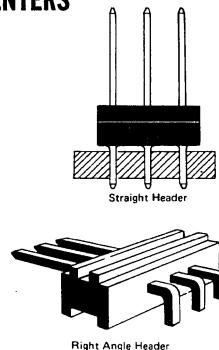
For high-speed automatic staking. Features a numerically-controlled, X-Y positioning system for programming pin-to-pin spacing and row patterns. Twin insertion heads simultaneously stake two identical boards at rates up to 12,000 per hour.

BergStik STRAIGHT AND RIGHT ANGLE HEADERS ON .100", .125" AND .150" CENTERS



IT'S A SNAP! Headers can be broken to desired length by hand.

An inexpensive new method for inserting .025" sq. pins in boards for wire-wrapping or input/output usage. Suitable for high-volume production as well as prototyping. Supplied in many lengths and in choice of platings. Stackable to grid pattern on their respective pin centers. BergStik Headers are notched to allow user to break to any desired number of positions.



See Bulletin 140 for complete details.

BERG ELECTRONICS/DIV. E. I. du PONT de NEMOURS & CO., INC./NEW CUMBERLAND, PA. 17070/TEL.: (717) 938-6711

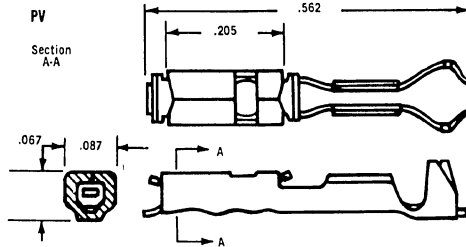
BergCon™ .025" SQUARE MODULAR INTERCONNECTION SYSTEM

DUAL-METAL PV RECEPTACLES PROVIDE SUPERIOR ELECTRICAL AND MECHANICAL PROPERTIES (Beryllium copper spring; 1/4-hard brass body)

PV RECEPTACLES

... mate with .025" square pins on .125" grid or greater

The Berg "PV" connector is the most reliable .025" post receptacle in use today. This unique terminal provides a virtually constant retention force even after repeated cycles on a male pin. The spring of the PV is available in a choice of thicknesses enabling you to "design in" a retention force that is tailored to the application.



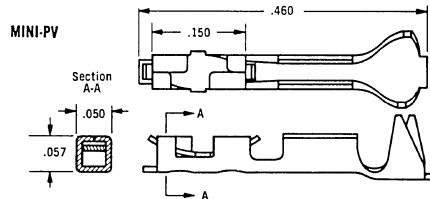
PV RECEPTACLE PART NUMBERS (CONTINUOUS STRIP)

Wire Gage, AWG	#18, #20, or two #22, two #24			#22, #24, #26, or two #26			#28, #30, #32		
Spring thickness	.005"	.006"	.008"	.005"	.006"	.008"	.005"	.006"	.008"
Finish:									
Gold, 40 u-in. over Ni	46226	46221	46223	46236	46231	46233	46246	46241	46243
Gold, 75 u-in. over Ni	46228	46220	46222	46238	46230	46232	46248	46240	46242
BERGflo solder coat	47736	47388	46580	47737	47389	46590	47738	47390	46600
SPOT O' GOLD	75694	75694	75694	75694	75694	75694	75694	75694	75694
	-001	-002	-003	-004	-005	-006	-007	-008	-009

MINI-PV RECEPTACLES

... mate with .025" square pins on .100" grid spacing

The smaller version of the PV is of similar two-piece design for lasting retention after repeated disconnects. The Mini-PV is available in 4 varieties of platings including SPOT O' GOLD. (The latter gives you the electrical and mechanical properties of gold where you need it — in the contact area and in the spring.) Install the Mini-PV in a latch housing for 1 through 72 simultaneous connections. See application machines below.



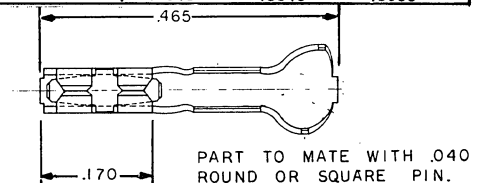
Sizes shown are representative of line. See Bulletin 101 for additional listings.

MINI-PV RECEPTACLE PART NUMBERS (CONTINUOUS STRIP)

Wire Gage, AWG	#20, or two #22, two #24		#22, #24, #26, or two #26, two #28			#28, #30, #32, two #30, two #32		
Spring thickness	.005"	.0065"	.0035"	.005"	.0065"	.0035"	.005"	.0065"
Finish:								
Gold, 40 u-in. over Ni	47444	47566	47457	47439	47565	47456	47437	47564
Gold, 75 u-in. over Ni	47220	—	47784	47216	—	47883	47212	—
BERGflo solder coat	47221	47648	47445	47217	47649	47446	47213	47650
SPOT O' GOLD	48047	48052	48049	48046	48051	48048	48045	48050

JUMBO-PV RECEPTACLES

This female disconnect is designed for use with .040" (1mm) or .045" square or round pins. Maximum contact resistance: 1.5 milliohms. Current rating: 7 amperes minimum. Standard spring thickness — .0065"



MATES WITH .040" (1mm) PIN				MATES WITH .045" (1mm) PIN			
Wire Gage, AWG	#18, #20, #22	#22, #24, #26	#28, #30, #32	Wire Gage, AWG	#18, #20, #22	#22, #24, #26	#28, #30, #32
Spring Thickness	.0065"	.0065"	.0065"	Spring Thickness	.0065"	.0065"	.0065"
Finish:				Finish:			
Gold, 40 u-in.	75369-003	74369-002	75369-001	Gold, 40 u-in.	75375-003	75375-002	75375-001
Tin Lead, 20 u-in.	75369-006	75369-005	75369-004	Tin Lead, 20 u-in.	75375-006	75375-005	75375-004

Insertion Force* — Series 75369 — 750 grams max. Series 75375 — 700 grams max.
Withdrawal force* — Series 75369 — 200 grams max. Series 75375 — 300 grams max.

*Gold Contacts Only

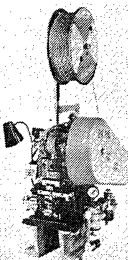
For complete details, contact your local Berg Sales Engineer.

APPLYING PV RECEPTACLES

MODEL 200 PV CRIMPER

This electrically-operated bench press provides 1500 or more quality crimps per hour. Machine has 2 1/2 ton capacity and features a short press stroke and direct clutch linkage. Size: 29" high x 26" long x 16" wide. Weight: 150 lbs. Power Requirements: 80-100 psi air; 120 V electrical.

SEE BULLETIN 101 FOR ADDITIONAL INFORMATION

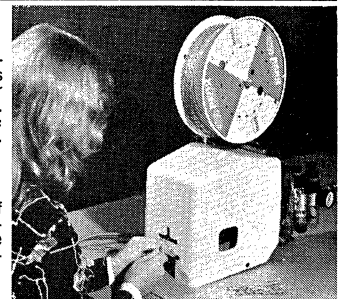


MODEL 250 PV CRIMPER

Air-powered unit is compact, delivers approximately 1000 terminals per hour (depending on operator dexterity.) Operates on 80 psi air. Uses 110 V for light source. Size: 26 1/2" high x 18" long x 10" wide. Weight 50 lbs.

HAND TOOL (not shown)

Sturdy. Duplicates the quality of crimping machines. Features a positive ratchet that does not release until full crimping pressure is applied to a terminal.



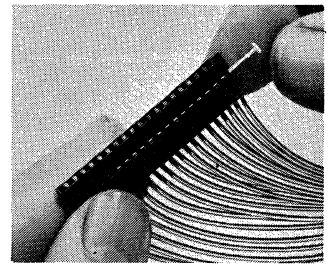
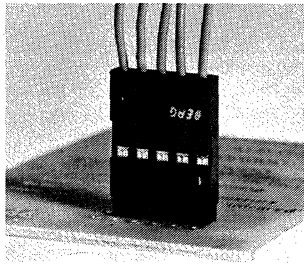
BergCon™ .025" SQUARE MODULAR INTERCONNECTION SYSTEM

HOUSING (LATCH OR ROD TYPE)

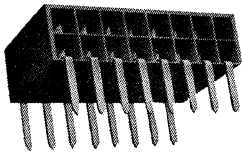
Berg Mini-Latch Housings allow simultaneous connection of as many as 72 Mini-PV terminated conductors; are available in many standard sizes.

Berg Lock-Rod Housings employ a lock rod to retain the terminal; ideal for applications requiring frequent wiring changes or for prototyping. Lock-Rod Housings connect as many as 31 Mini-PV terminated conductors in a single row — up to 62 in twin rows on .001" grid. Supplied 31 single row for .150" centers.

(See Bulletin 101 for complete details.)

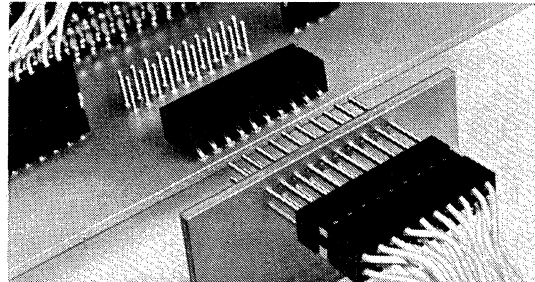


PV CARD CONNECTORS — HORIZONTAL



These PV card connector blocks are right-angle designs precisely molded to mate with .100" or .150" grids of .025" square pins. They are suitable for horizontal mounting and are available in single or double row configurations. For example, the Berg card connector for .100" spacing accepts 5 through 52 terminations in a single row or up to 130 in double row. Housings for .150" spacing accepts 5 through 30 terminations in a single row of 10 through 86 in double row.

(For complete details on this complete line, request Bulletin 112.)



BergPin .025" square post and ferrule assemblies mate with Berg PV card connectors.

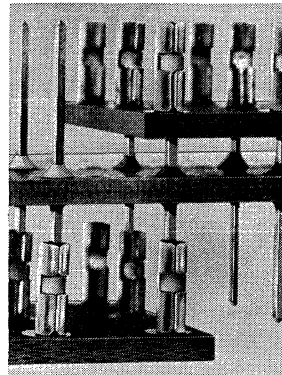
VERTICAL STAKE-TO-BOARD PV RECEPTACLE

Receptacle stakes to PC board allowing dense packaging configuration by parallel mounting $\frac{1}{16}$ " glass-epoxy circuit boards. Features top or bottom entry which gives greater flexibility in placement on circuit board. Two-piece design provides lasting retention even after repeated cycling. Reliable application machines substantially reduce applied cost.

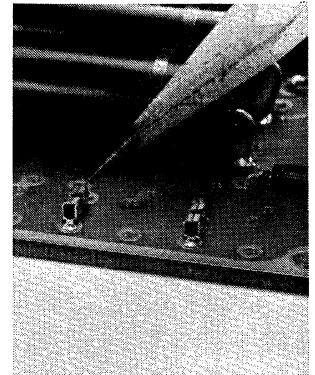
(See Bulletin 118 for additional information.)

HORIZONTAL STAKE-TO-BOARD PV RECEPTACLE

This version of the Berg PV receptacle is staked to the PC board, then wave soldered. Its design allows for dense packaging configurations in vertical mounting $\frac{1}{16}$ " glass-epoxy circuit boards. Horizontal PV receptacles can be employed with BergPin terminals to provide quick pluggability. Receptacles are supplied in strip form for high-speed machine staking. (Write for additional information.)

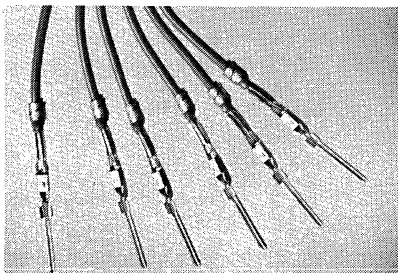


VERTICAL PV RECEPTACLE



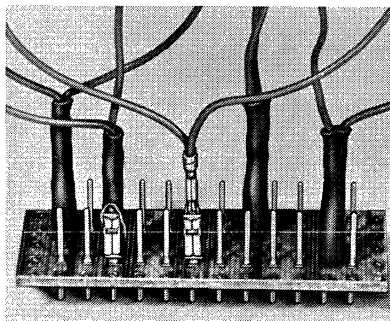
HORIZONTAL PV RECEPTACLE

CRIMP-TO-WIRE MALE PIN



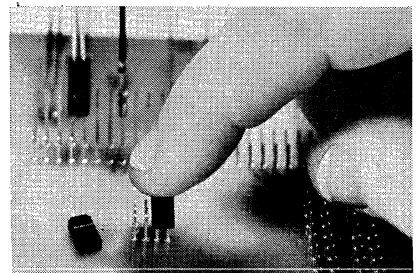
Compatible with BergCon .025" square interconnection system. Makes flying-type connector when mated with Berg Mini-PV receptacle and used with Mini-latch housing. Maximum current rating: 5 amperes. 5.0 milliohms maximum contact resistance when mated with a Mini PV contact. (Write for additional information.)

DAISY CHAIN FOR PRE-TESTING LAYOUTS



Here's a back-panel wiring system in easy-to-handle reel form. Consists of a continuous length of #28 gauge stranded wire with 250 insulated PV's crimped at constant intervals ($2\frac{1}{2}$ " to 5" center-to-center spacing). Eliminates wire measuring, stripping, soldering, or expensive handtool terminating in your plant. (See Bulletin 101.)

MINI-JUMP CONNECTOR



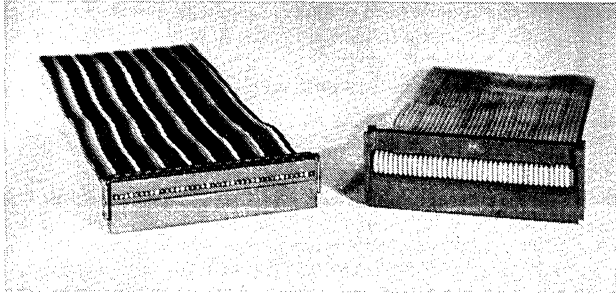
MINI-JUMP, provides flexibility in circuit programming of mini-computers, card readers, printers, modems, and POS equipment. It allows for high density packaging; is stackable in both directions on .100" centers and up. Low-profile design permits tight packaging in the vertical plane. Mates with industry standard .025" square pins or .028" round pins. MINI-JUMP, which features Berg dual-metal receptacles, is supplied in a variety of package sizes. (See your Berg Sales Engineer for additional information.)

POSITIVE-LATCH Quickie

CONNECTORS TERMINATE MULTI-LEAD CABLE IN ABOUT 10 SECONDS

The Berg QUICKIE series of connectors is designed to interface with flat, flexible round conductor cable on .050" centers. Connectors in this series eliminate the time problems and expense of pre-stripping.

STANDARD FEMALE CONNECTOR



This form is used to interface flat flexible round conductor cable on .050" centers to .025 square wire-wrapping pins on .100" square grid. (It also mates with .028" round pins.) The standard QUICKIE Connector consists of two basic parts — the housing and the cover. A third part — the strain relief — is not essential in all uses.

QUICKIE ASSEMBLIES SUPPLIED WITH STRAIN RELIEFS

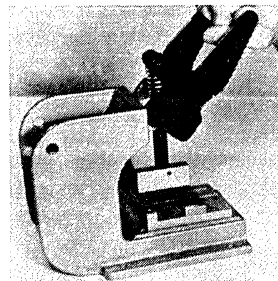
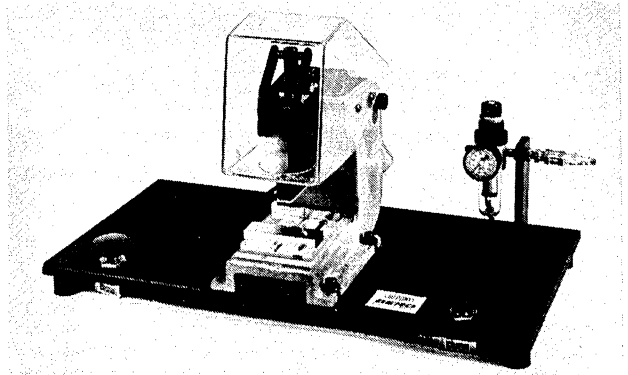
Type	Part Number	Cover Style
2 X 10	65484-005	A
2 X 10	65484-007	B
2 X 13	65484-009	A
2 X 13	65484-011	B
2 X 17	65484-013	A
2 X 17	65484-015	B
2 X 20	65484-017	A
2 X 20	65484-019	B
2 X 15	65484-021	A
2 X 15	65484-023	B

QUICKIE ASSEMBLIES SUPPLIED WITHOUT STRAIN RELIEF

Type	Part Number	Cover Style
2 X 10	65485-005	A
2 X 10	65485-007	B
2 X 13	65485-009	A
2 X 13	65485-011	B
2 X 17	65485-013	A
2 X 17	65485-015	B
2 X 20	65485-017	A
2 X 20	65485-019	B
2 X 25	65485-021	A
2 X 25	65485-023	B

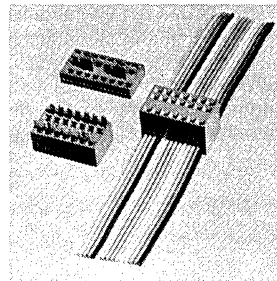
Notes: A — Closed end cover style
B — Thru end cover style

QUICKIE ASSEMBLY EQUIPMENT



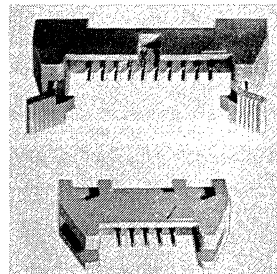
A hand-powered assembly tool and an air-powered machine are available to meet your specific production requirements. Both machines accommodate the various forms of the QUICKIE Connector.

QUICKIE DIP AND IC CONNECTORS



Female IC and Male DIP versions of the QUICKIE Connector are useful for system wiring interconnections and for test applications. Both types incorporate the same cable piercing action as the standard female QUICKIE Connector. For complete details, contact your Berg Electronics Sales Engineer.

QUICKIE SHIELDED RIGHT-ANGLE HEADERS

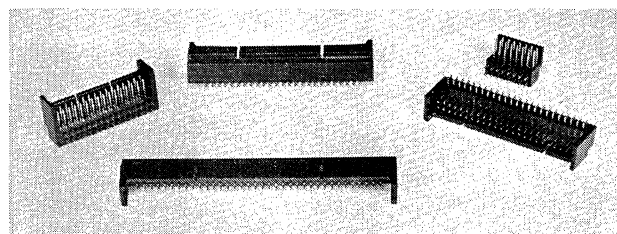


These headers which feature a positive-latch design, mate with standard female QUICKIE to provide round-pin termination on a .100" grid. Shielding protects contact from damage while disconnected. Supplied in six sizes. (Also available without latches but with mounting holes.)

See Bulletin 131 for a comprehensive listing of the various forms of the QUICKIE Connector.

SHIELDED RIGHT ANGLE HEADERS FOR .100", .125" OR .150" GRID

Headers consist of glass-reinforced Nylon housings having .025" square pins on .100 grid which are molded in position for maximum strength. The configuration provides an integral top shield that serves to protect the pins from damage, plus side shields that prevent pin bending when female housings are removed. See Bulletin 150.



BergLok MODULAR INTERCONNECTION BLOCKS

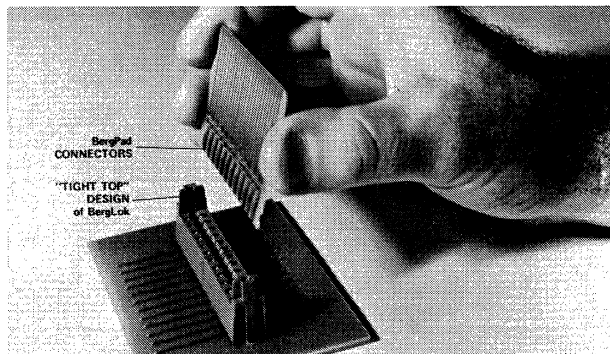
... A SIMPLE, RELIABLE WAY TO MOUNT REPLACEABLE DAUGHTER-BOARD MODULES IN ELECTRONIC ASSEMBLIES

BergLok Connector Blocks provide a vertical mounting system for logic cards, ceramic substrates, and printed circuit cards, single or double sided. These blocks afford complete pluggability of modules into any conventional PC mother board, $\frac{1}{16}$ " thick. Standard center-to-center spacing is .200".

These connector blocks can be mounted in any position on the mother board and, thus, permit complete flexibility in packaging design and assembly. In most applications, BergLok Interconnection Blocks resist impact, shock and vibration without supplementary support devices.

Blocks have snap-lock base to anchor connectors firmly in mother board prior to wave soldering. No tools or fixtures needed. End-block latches lock daughter-boards firmly in place during handling and shipping. Yet boards can be easily removed for servicing or replacement.

(For complete details, request Bulletin 116.)



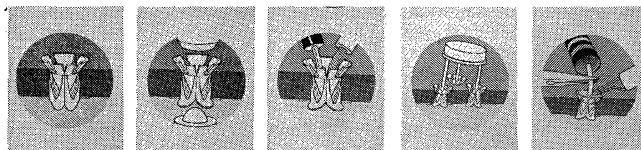
The tightly-controlled card guide that guarantees the stabilization of .062" daughter board in BergLok blocks is known as "Tight-Top."

"BergPad," a terminal which is applied to the edge of P.C. board to replace copper-clad fingers, eliminates the problems of peel strength and wave solder thickness control. BergPad terminals can be applied to one side of the standard .062" board or to both sides of .031" to .045" board. (Write for details or see your local Berg Electronics Sales Engineer.)

Griplet® LEAD-HOLDING CONNECTOR FOR PC BOARDS...

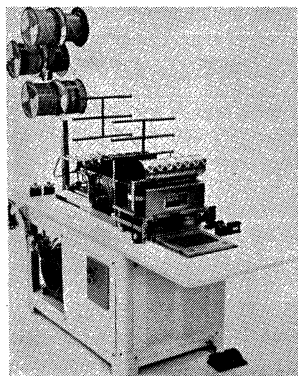
... MACHINE-INSERTABLE AT RATES UP TO 100,000 PER HOUR

The Griplet connector is inserted into holes in a PC board in order to hold component leads or wires at a desired depth. It protects the pads, firmly retains the inserted conductor and promotes a more reliable solder joint... while providing faster circuit assembly. Griplets are also used as a mechanical means of obtaining an electrical connection between two sides of a PC board.



MULTIGRIP MACHINE

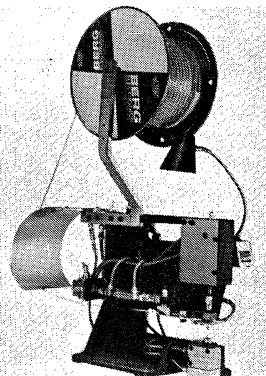
The Multigrip is designed for multiple inserting and staking of Griplet connectors in large quantities of identical boards. Rate: approximately eight boards per minute; inserts up to 70,000 Griplet connectors per hour. Berg also has several other Griplet model machines. (See applicable product bulletin for complete details.)



MODEL K

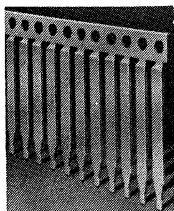
Semi-Automatic Machine. Designed for economy and reliability. Inserts and stakes one connector per cycle. Rate: approximately 1,800 per operator-hour.

(See Bulletin 301 for complete listing.)



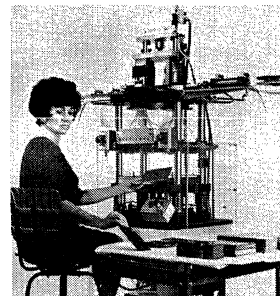
BergLance LOW-COST WIRE-WRAPPING POSTS...

... FOR RAPID, RELIABLE STAKING IN CIRCUIT BOARD



BergLance posts and application machines provide high-speed staking of termination points in circuit boards for radio, TV, electronic organ, and similar consumer electronic products. Available in 2 basic cross-sections (.025" x .061" and .025" square) and with choice of lengths. Terminals, which are supplied in strip form for automatic insertion, have solder pre-coat and high-quality 60-40 tin lead finish.

(See Bulletin 107 for additional information.)



Berg "Shotgun" Machine has staking potential of up to 150,000 pins/day. Board area — 11" x 12". Many other machines available to meet production needs.

Minisert™ LOW PROFILE, MINIATURE PC SOCKET

PROVIDES REPEATED PLUGGABILITY

The Berg MINISERT is a superior pluggable socket that assures positive retention in the circuit board prior to soldering, and spring-to-board electrical contact after soldering. The unique design of the MINISERT cup and spring extension allows solder to be drawn to the top surface of a two-sided board, producing a solder fillet on the top pad without overflow into the socket.

An elastomeric seal keeps foreign matter out of the socket before and after the component lead has been inserted. This seal remains in place throughout the life of the socket.

The MINISERT accepts round leads ranging from .012" to .022" diameter, or flat leads .008" to .015" thick by .015" to .023" wide. Sockets will fit a hole size ranging from .050" to .058" and are furnished on a metal carrier strip for insertion by the Berg MS-105 Machine. This machine provides substantial savings in time and in total applied cost.

The MINISERT socket is also supplied in Kapton tape; it can be clipped to length for manual insertion in dual-in-line pattern or for terminating flat cable PC board jumpers. Those sockets are on .100" centers. Supplied on reels of 25,000 or 5,000 socket quantities.

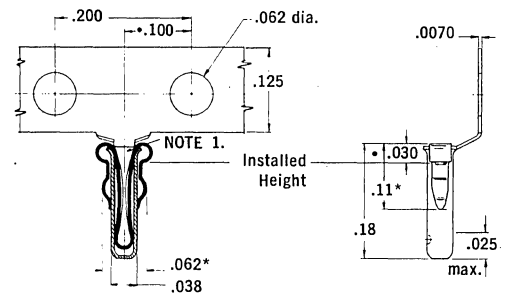
FEATURES

- Low-Profile — Extends only .030" above and .088" below a 1/16" board.
- Fits wide range of hole sizes; accepts many sizes of round or flat leads.
- Provides repeated pluggability for dual-in-line packages, LED's, lamps, transistors, etc.

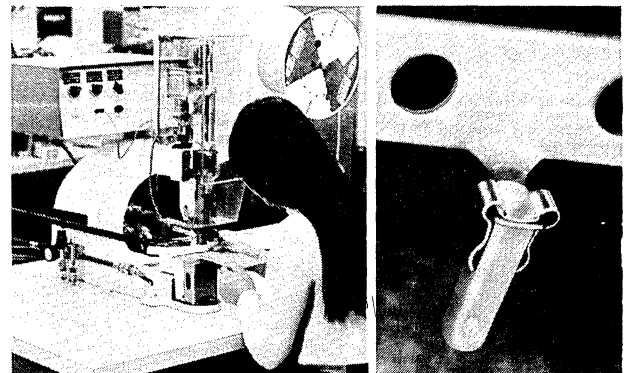
Part Number	Standard Packaging	Recommended Applicator
75060-007	25M per reel	MS-105
75060-008	5M per reel	MS-100
75315-001	Loose piece	Hand Tool
75540-001	25M reel (KAPTON)	Hand Inserted
75540-002	5M reel (KAPTON)	Hand Inserted

(See Bulletin 120 for complete details.)

Minisert dimensions



NOTE 1. Elastomeric Seal keeps foreign matter out of the socket before and after component lead has been inserted. This seal remains in place throughout the life of the socket.



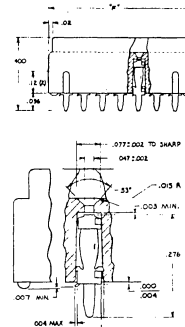
Berg pneumatically operated MS-105 machine inserts approximately 2,000 sockets per hour. A hand-operated (MS-100) insertion device is available for small runs; rate 800-1,000 per hour. A handtool kit can be purchased for prototyping purposes.

DUAL-IN-LINE SOCKET FOR IC PACKAGING ON .600" CENTERS

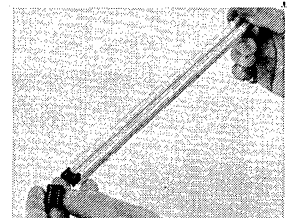
Designed for low-cost, high-density production packaging, these sockets have universal mounting and packaging capabilities. They are available in solder-tail with 14, 16, 18, 22, 24, 28 and 40-lead configurations. Sockets will fit .040" to .045" diameter board holes.

Terminal material is .006 ASTM, 510 Phos. Bronze 3/4-hard. Terminal platings are available in .0001-.0003 thick bright acid-tin pre-plating, or 13K gold inlay .0005 thick over .0005 nickel underplate with .00010 gold-flash over all.

One-piece socket bodies are precision molded of thermo-set phenolic resin which has excellent electrical, mechanical and thermal characteristics. A notch at one end of the body provides polarization. Standard color: black. Sockets are packaged in special IC tube carrier to facilitate feed to automatic equipment.



1071 BLOW UP OF CAVITY BREAKAWAY SECTION

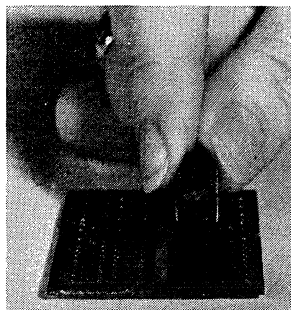


Dual-In-Line Sockets are packaged in special plastic tube carriers which serve to protect the sockets and to facilitate feed to automatic equipment. (Tubes can be used with Universal and Gardner-Denver Equipment).

LOW-PROFILE DUAL-BEAM IC SOCKET

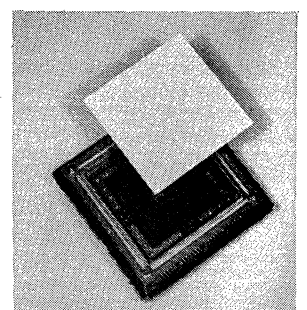
This new dual-in-line receptacle is compact and of low-profile design. It meets EIA standard RS-415; is low cost and available with Tin or Gold plating. It is designed to prevent solder wicking and to accept .015 x .040 leads. Features include press-fit terminal leg .033 ± .003 diameter-ventilated molding with dimples to allow easy cleaning of the completed PC board assembly.

(Write for complete details.)



LEADLESS RECEPTACLES

Berg Electronics is active in packaging designs which mate a leadless package to the mother-board thus giving a "wiping-pressure" type connection surface. This leadless receptacle system avoids "plated-thru-holes" in a board, and allows for the widest choice interconnection media. These packages simplify component assembly and/or replacement and eliminate the danger of damaging costly components with hot solder.



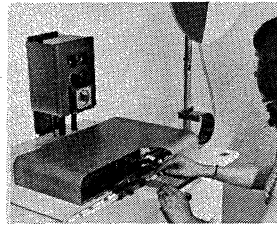
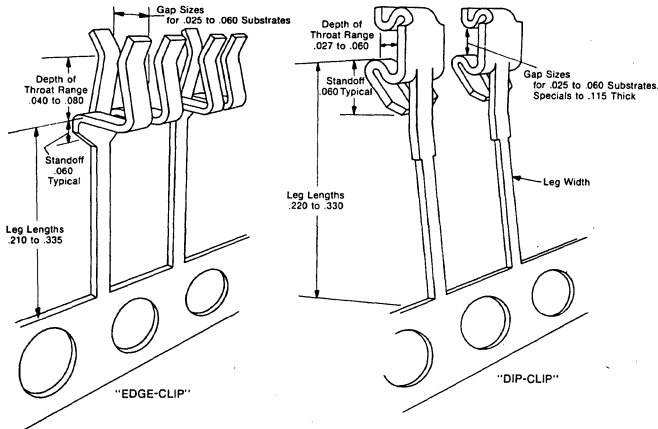
Write for additional information.

Solok* TERMINATIONS FOR CERAMIC HYBRID MICROCIRCUITS

Solok* Terminations clip onto substrate rather than into holes drilled through it. They mechanically hold their position until soldered for a permanent connection. Berg offers a complete terminal application machine system. Its broad standard line is backed by an unusual custom design capability.

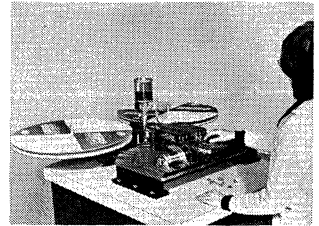
*DuPont Trademark

TWO BASIC TYPES . . . MANY CONFIGURATIONS



EDGE-CLIP MACHINE

This machine is used for single edge-mounted terminals. It can be programmed to install terminals at any given pad location or to skip terminals in an area where there is no pad. Rate: Up to 1500 packages per hour.



DIP-CLIP MACHINE

This semi-automatic machine is used for DIP type terminations; it, too, operates at rates up to 1500 substrates per hour. (Terminals must be ordered "left" and "right" handed for this machine.)

DEFINITION OF TERMS

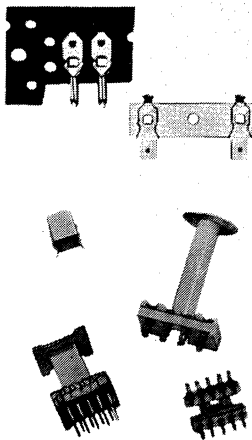
1. **Depth of Throat** — Distance from edge of substrate to point where terminal contacts pad.
2. **Standoff** — Distance that terminal will hold substrate away from mounting board.
3. **Leg Length** — Distance from substrate to end of leg with carrier strip removed.
4. **Gap Size** — Opening in clip area of terminal designed to assure a mechanical hold on the substrate.

For complete details and specifications, contact your local Berg Sales Engineer or request Bulletin 124.

Lugs and Tie Points

FOR BOBBINS, COIL FORMS, SHIELD CANS, ETC.

Strip terminals and machines matched for rapid and uniform staking



THRU-LUG TERMINALS — are precision stamped with sections that, when staked, clinch the terminal securely to both sides of the board. Catalog Section #406.

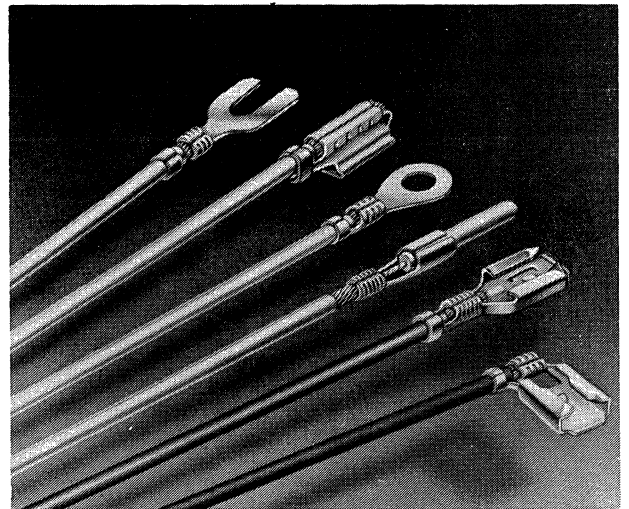
EXTRUDED COLUMN LUGS — designed for high-strength retention in circuit and terminal boards. Job-matched machines rapidly stake as many as six lugs simultaneously. Catalog Section #407.

COIL FORM AND BUTTERFLY TERMINALS — feature specially designed tips for rapid insertion and immediate retention in circuit boards. Provide wrapping and soldering points for coil winding wire. Catalog Section #202.

CAN LUGGING SYSTEMS — Berg offers a complete line of lugs for mounting shield cans to circuit boards. Designs include flat-sided or cylindrical can types for flush or elevated mounting and four styles to automatically key cans. Catalog Section #203.

BOBBIN TERMINATIONS — Berg's system for inserting lugs into molded bobbins eliminates costly insert molding and provides secure connection points. Available in thru-lug and blind-pocket types. Catalog Section #204.

Truon™ CRIMP-TO-WIRE TERMINALS AND SPLICES



Berg's Truon™ terminals are available in a full range of designs, including: straight and flag female receptacles, male tabs, rings, spades, taper pins and splices. All styles have matched application tooling for high-rate production with uniform, highly-reliable crimping with a gas-tight connection. See Bulletin #201.

REGIONAL SALES OFFICES

Northeastern
Condominium East
264 Main Street
East Longmeadow,
Massachusetts 01028
(413) 525-4228

Southeastern
1309 Bridge Street
New Cumberland,
Pennsylvania 17070
(717) 232-8656

Midwestern
7250 N. Cicero Ave.
Lincolnwood,
Illinois 60468
(312) 982-4280

Central
Suite 104
7710 Computer Ave.
Minneapolis,
Minnesota 55345
(612) 835-4820

Western
21241 Ventura Blvd.
Woodland Hills,
California 91364
(213) 347-8830



BERG
ELECTRONICS
Division E. I. du Pont de Nemours & Co. (Inc.)

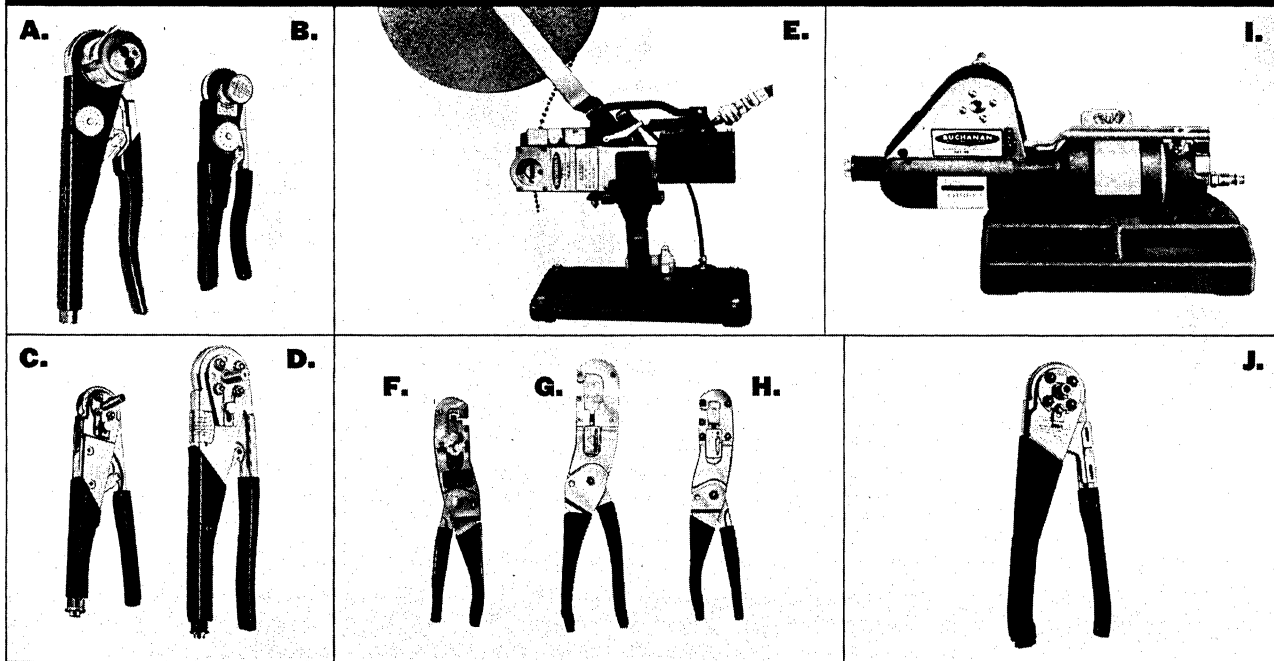
NEW CUMBERLAND, PENNSYLVANIA 17070 • TELEPHONE (717) 938-6711 / IN EUROPE: 's-HERTOGENBOSCH, NETHERLANDS • TELEPHONE 073-123432

PRINTED IN U.S.A.

BERG ELECTRONICS/DIV. E. I. du PONT de NEMOURS & CO., INC./NEW CUMBERLAND, PA. 17070/TEL.: (717) 938-6711

BUCHANAN

Headquarters for universal crimping tools



8-STEP ADJUSTABLE HAND TOOLS

Available in Standard and Miniature sizes which meet all the design and performance requirements of MIL-C-22520. Reliable, cycle-controlled tools with turret/positioner or "eyeball" operation, 8 crimp depths and octadent crimp.

A. Standard Tool (Cat. No. 615708) for wire barrel sizes #12 through #22 and wire sizes #12 through #26 AWG.

B. Miniature Tool (Cat. No. 615717) for barrel sizes 20 through 28 and wire sizes 20 through 32 AWG.

MICROCRIMP TOOLS

Available in Standard and Miniature sizes which meet all the performance requirements of MIL-C-22520. Infinitely adjustable cycle-controlled tools with direct reading indicators and octadent crimp.

C. Miniature Microcrimp Tool (Cat. No. 612118) for most miniature pin and socket contacts #20 and smaller and wire sizes #20 through #30 AWG.

D. Standard Microcrimp Tool (Cat. No. 612548) for pin and socket contacts #12 and smaller and wire sizes #12 through #26 AWG.

E. AUTOMATIC FEED PNEUMATIC CRIMP TOOL

Meets performance requirements of MIL-C-22520. An octadent tool that automatically feeds contacts from disposable carriers. For portable or bench applications with proprietary or military contacts. Wire sizes #12 through #28 AWG. Contacts #12 through #20. Available with standard or miniature indenters.

Standard—Cat. No. 11148

Mini—Cat. No. 612916

C-FRAME TOOLS

Light weight, easy to operate, compact, cycle controlled. Available with various dies.

CTS Standard Size, Cat. No. 11545, for terminals 12-10 through 26-24. Meets performance requirements of MIL-T-22910.

F. CTM Miniature, Cat. No. 11707-1, for sizes 16-14 through 26-24. MS 90413-1A. Listed under QPL MIL-T-22910 CLASS 1.

G. CHS Standard Size, Cat. No. 612648. Pop-in die. M22910/7-1. Listed under QPL MIL-T-22910 CLASS 1.

H. CHM Miniature, Cat. No. 612845. Fixed die. MS 90487. Listed under QPL MIL-T-22910 CLASS 1.

CD Tools. Special dies for special custom applications. Standard size (CDS) and miniature size (CDM). C-Frame or closed frame models.

I. EXTERNALLY ADJUSTABLE MANUAL FEED PNEUMATIC CRIMP TOOL

Meets performance requirements of MIL-C-22520.

Manual, cycle-controlled portable tool can be bench mounted (with a foot pedal). Octadent crimp. Wire sizes #12 through #30 AWG. Contacts #12 through #22. Size 8 contacts accommodated on application. Available with standard or miniature indenters. Uses MS 3191 or M22520/1 turrets for locating contacts. **Standard**—Cat. No. 612141 **Mini**—Cat. No. 615250

J. POSITIONER CONTROLLED TOOL

Conforms to MS 3191. This MIL Standard, non-operator adjustable, 4-indent cycle controlled tool crimps most proprietary and MS contacts, using inexpensive positioners.

Standard Positioner Controlled Tool Frame, MS 3191-A (Cat. No. 11210) wire sizes #12 through #26 AWG, for contacts #12 through 22.

MS 3191-1 and MS 3191-2 (Cat. Nos. 10692 and 11234) also available.

BUCHANAN®
Crimp Tool Products

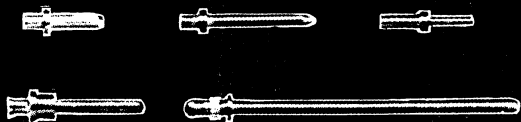
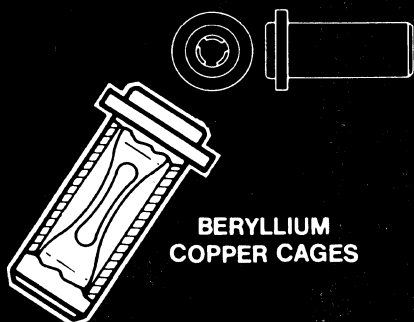
(201) 289-2225

Amerace Corporation
Control Products Division
1065 Floral Avenue
Union, New Jersey 07083

SAME DAY SHIPMENTS-FROM STOCK STANDARDIZED & CUSTOM

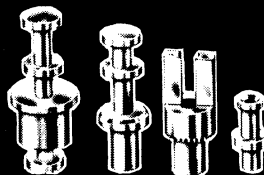
MIL SPEC PLATING & MATERIALS • WE CROSS REFERENCE MOST MANUFACTURERS

PRINTED CIRCUIT JACKS & PINS



TERMINALS

INSULATED/MICRO MINI/SUB MINI
STANDARD/PRINTED CIRCUIT
BRASS SOLDER



**Hundreds of
configurations
in stock**

WE PRECISION-MANUFACTURE AND PLATE TO
MIL SPEC IN GOLD, SILVER, TIN, SOLDER, AND
OTHERS TO ORDER.

SWISS AUTOMATIC SCREW MACHINE PRODUCTS

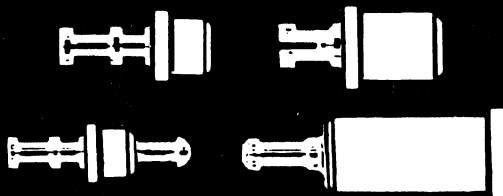


SPACERS STANDOFFS

Competitive Pricing.

TEFLON* INSULATED TERMINALS

MODULE AND CONNECTOR PINS



HANDLES HARDWARE



QUICK DELIVERIES!

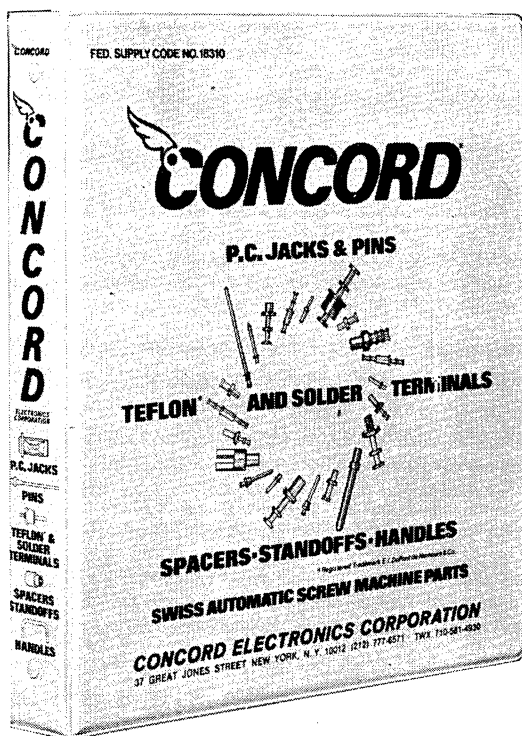
CONCORD ELECTRONICS CORPORATION

DEPT. JEM

37 GREAT JONES STREET NEW YORK, N.Y. 10012 (212) 777-6571 • TWX 710-581-4930

* T.M. DuPont

CONCORD ELECTRONICS CORPORATION



FREE
COMPREHENSIVE CATALOG
AND UP-TO-DATE
CROSS-REFERENCE INCLUDING
MIL-T, M.S. AND N.A.S. STANDARDS

QUICK DELIVERIES!
 **CONCORD** **ELECTRONICS**
CORPORATION

37 GREAT JONES STREET NEW YORK, N.Y. 10012 (212) 777-6571 TWX 710-581-4930



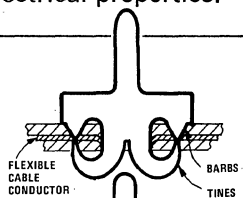
Cee Wee[†] CONNECTORS

FOR FLAT FLEXIBLE CABLES

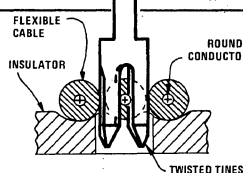
For Complete Switch Specifications Request Catalog

- Connection made without stripping cable, no nicks or scratches.
- Extremely rapid connection achieved easily.
- Built in strain relief, a standard.
- All connections made at the same time.
- Cold connections made; no heat damage possible.
- High temperature resistant thermoplastic insulator having outstanding chemical and electrical properties.

†T.M. Appl. for

CONTACT
TAIL
CLINCHED
TO CABLE**SERIES FOR FLAT FLEXIBLE CABLE WITH FLAT CONDUCTORS***

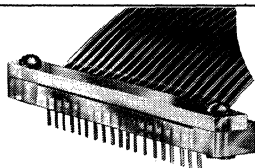
Contact is a special alloy stamping. Initially, the tines are vertical and unbent. A tool presses them through the cable. Contact is "in line" with conductor. A double clinch (from the two tines) is achieved for reliability. Very close (adjacent) centers possible.

CONTACT
TAIL
CUT INTO
CABLE**SERIES FOR FLAT FLEXIBLE CABLE WITH ROUND CONDUCTORS***

Tine edge bites through cable and into conductor for a good, clean contact. Conductor is thus twisted and placed in tension. Reaction forces assure continued additional firm contact of tines against conductor.

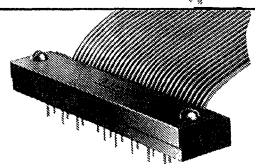
*Pat. applied for

CF002-01

**CF002-01 SERIES FOR FLAT FLEXIBLE CABLE WITH FLAT CONDUCTORS**

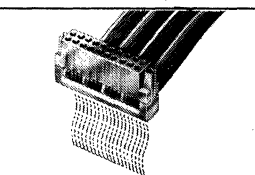
Standard centers are .100"; closer centers are obtainable. Each contact tail makes multi-connections above and below each conductor.

CF006-01

**CF006-01 SERIES FOR RIBBON CABLE WITH ROUND CONDUCTORS**

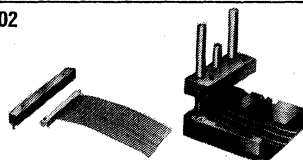
Standard centers are .050"; closer centers are achievable. Specially shaped contact tails assure constant reaction forces for reliable connections.

CF008-01

**CF008-01 SERIES FOR RIBBON CABLE WITH ROUND CONDUCTORS ON .050" CENTERS**

Tail uses standard CEE WEE pretwisted tines for connecting to Ribbon Cable. Contact nose has double leaf to accept .025" x .025" pins and .020 diameter pins. Built-in strain relief allows cable to come off vertically or horizontally.

CT002

**UNIVERSAL FLAT CABLE ASSEMBLY TOOL — CT002**

Compact, rugged, low-priced. Interchangeable parts adapt it to flat and round cable connectors. Fits standard arbor presses. Similar geared CT003 has built-in device to actuate upper ram.

Other components manufactured by CW INDUSTRIES include Slide, Toggle and Rocker Switches which are described in EEM Section 5100 and fully detailed in Catalog 2096. These include multi-purpose switches featuring miniaturization, having from 1 to 6 poles designed for loads up to 15.0 amps at 125 volts. Other CW components are Wire Wound Potentiometers detailed in Bulletin 2080 (3/4" diameter) and Precision Film Resistors available in 1/10 watt through 1/4 watt (RN55, RN60) and RN65). CW research and engineering facilities are always at your service, for consultation on any engineering or development problem.



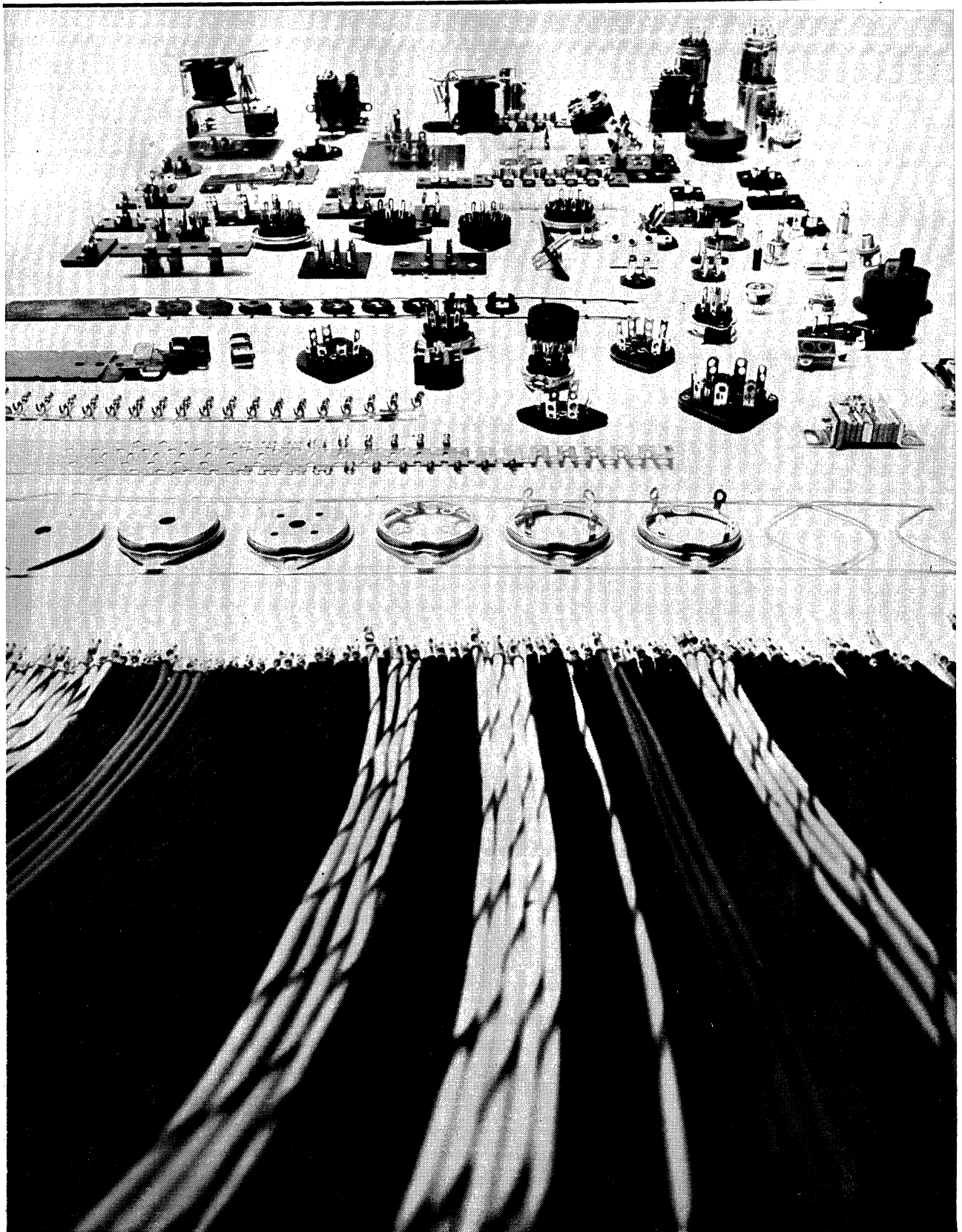
550 DAVISVILLE ROAD, WARMINSTER, PA. 18974
PHONE 215-355-7080 • TWX 510-667-1875
QUALITY PRODUCTS THROUGH CREATIVE ENGINEERING

CONNECTORS, TERMINALS, SOCKETS



CONNECTOR CORPORATION

6027 N. KEYSTONE AVENUE • CHICAGO, ILLINOIS 60646 • TELEPHONE: (312) 539-3108





CONNECTOR CORPORATION

6025 N. KEYSTONE AVENUE • CHICAGO, ILLINOIS 60646 • TELEPHONE: 312, 539-3108

For many years the electronic industry has relied on the wide range of products, engineering services, and consistent production quality of Connector Corporation.

A limited cross section of Connector Corporation's line is illustrated. Your specific requirement can be exactly met and mass produced with good delivery. Many items can be supplied with leads attached and

color coded, offering production savings for your assembly. Special items can be designed or developed at relatively low cost. Just let us know what you need.

Products are available in a wide range of insulations and contact materials:

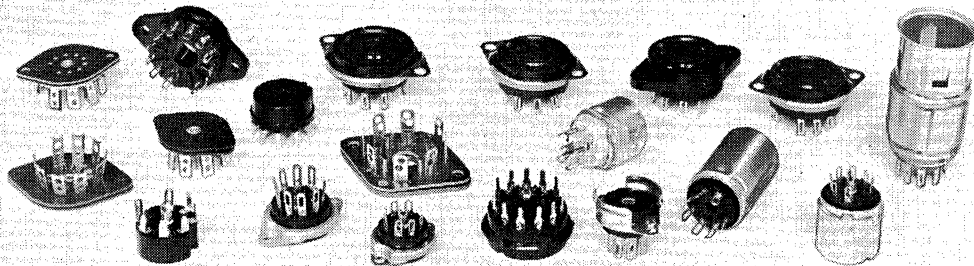
Insulations include: general purpose or mica-filled low loss Phenolic, glass filled

alkyd, polypropylene, ceramic, etc., in molded versions. Laminated types include XP, XXP, XXXP Phenolics, X2B Hard Rubber, Glass Epoxy, Glass alkyd.

Contacts and Platings include: High tensile brass, phosphor bronze or beryllium copper with cadmium, electro tin, silver, hot tin dipped, silver-gold flash, gold plating, etc.

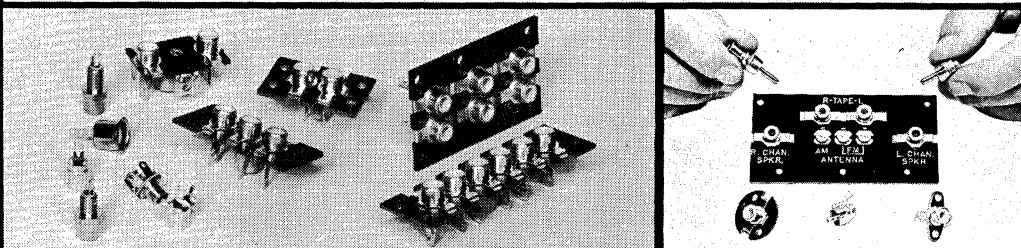
TUBE SOCKETS

Most standard and many special molded & ceramic configurations available as well as laminated socket types. Fixed or collapsible types of shielding are available.



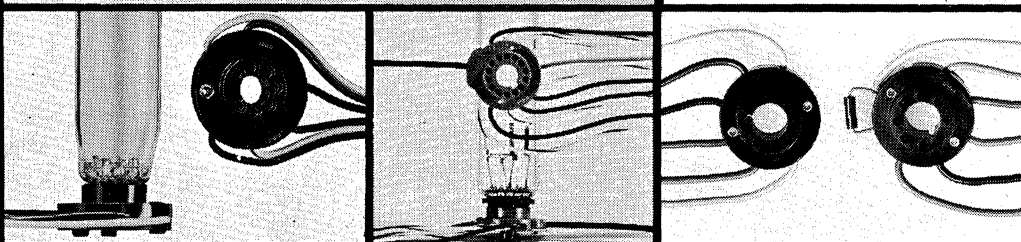
MULTI PURPOSE PHONO CONNECTORS

Sockets available in multiples up to 12 per section. Broad line of individual male and female types in a variety of mountings. Highly reliable for dependable repeated use.



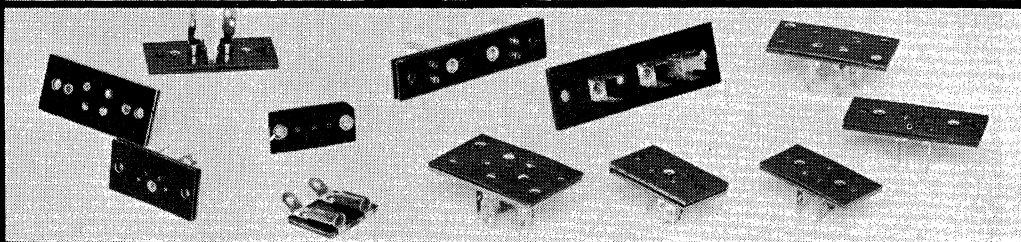
KINESCOPE SOCKET ASSEMBLIES

Include: Miniature Di Heptal Socket for 90° color tubes, 110° Eightar CRT sockets, miniature types for JEDEC E7-91, B7-247 basing (HEPTAL). Many special configurations and types may be furnished in quantity lots.



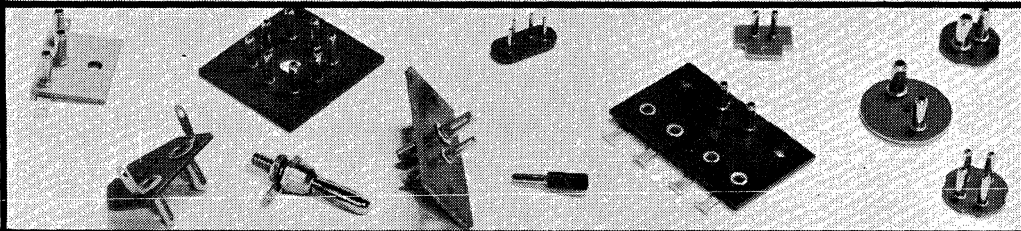
RECEPTACLES

Numerous varieties. Available in molded or laminated construction. Reliable contacts offer positive electrical and mechanical mating.



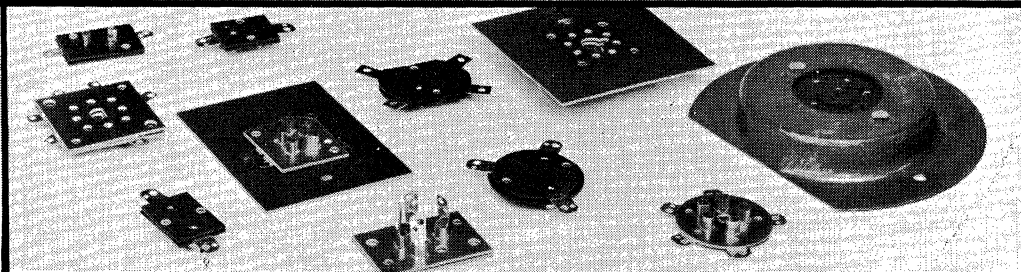
PLUGS

Numerous types available, with molded or laminated phenolic insulations. Leads may be supplied to specification.



BATTERY SOCKETS

Complete line for commercial & military batteries. Custom designed to your requirements.





CONNECTOR CORPORATION

6025 N. KEYSTONE AVENUE • CHICAGO, ILLINOIS 60646 • TELEPHONE: 312, 539-3108

TRANSISTOR SOCKETS

3- or 4-pin on .100 or .200 centers. TO3 power transistors.

NUVISTOR SOCKETS

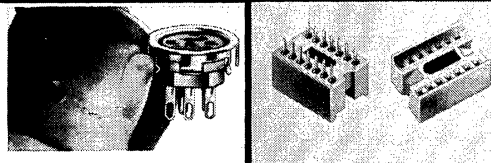
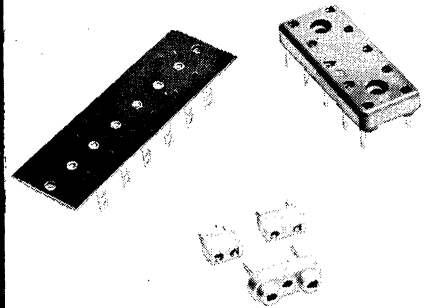
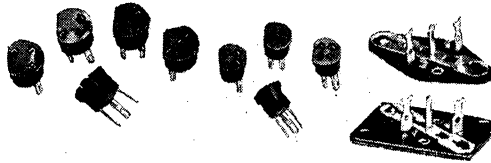
Miniature positive contact.

IC SOCKETS

14-pin dual in-line on .100 centers.

CRYSTAL SOCKETS

Accommodate single and multiple crystals. Both p.c. and solder lug versions for crystals with .486, .273 and .192 pin centers and with .050 or .040 pin diameters. Available to MIL Specs.

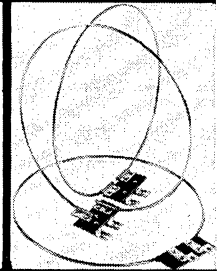
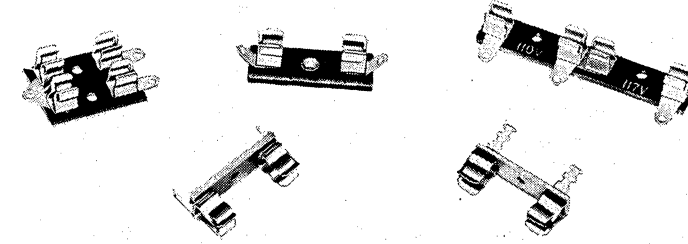


FUSE HOLDERS

Positive grip open type. Features: easy solderability, and versatility of construction which permit multiples or variations to your spec at reasonable cost.

UHF TV ANTENNAE

Attaches easily. Can be rotated in many different planes for optimum performance. Long life, trouble-free operation.

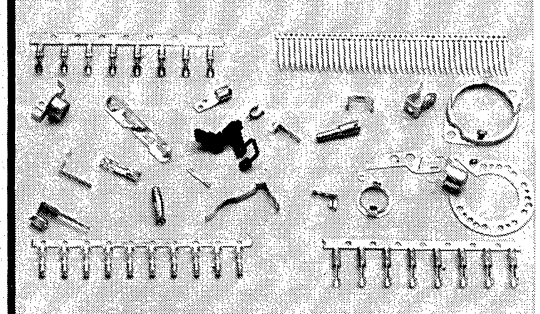
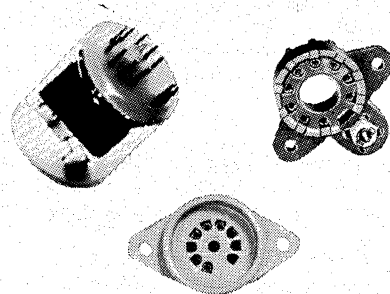


TRANSMITTER & HIGH VOLTAGE TUBE SOCKETS

Low loss at very high frequencies. Vented for maximum cooling of tube base and anode contact area by convection. Voltage breakdown characteristics are enhanced by barriers between contact positions.

PRECISION METAL STAMPINGS

Bulk or chain type contacts, terminals and flat stampings for your high production needs.

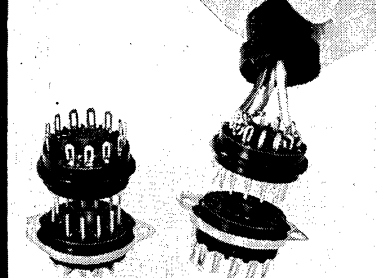
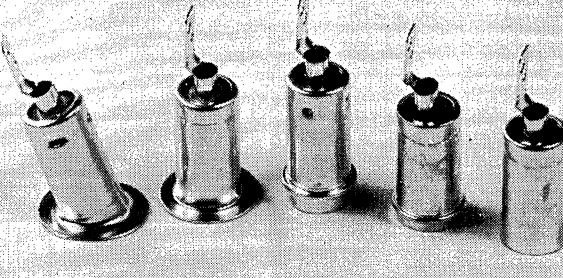


RF COAXIAL ANTENNA CONNECTORS

For auto receivers & similar applications. Rugged construction. Excellent contact resistance and retention.

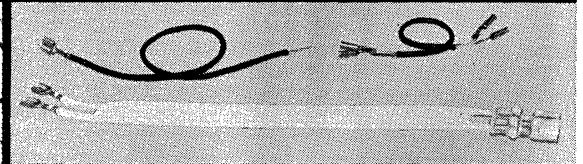
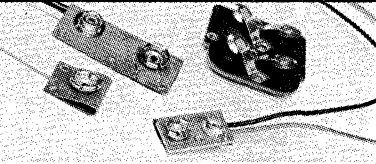
MULTI-PIN MALE/FEMALE CONNECTORS

Provide quick reliable connect and disconnect for cable assemblies. Insert and extract easily, yet have reliable contact retention and resistance.



BATTERY CONNECTORS AND WIRE ASSEMBLIES

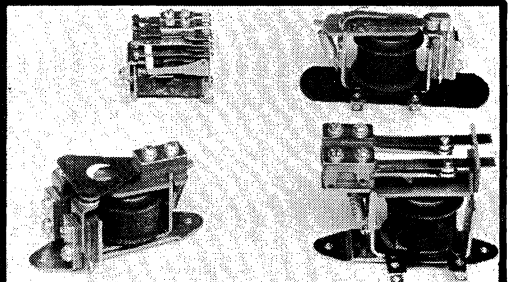
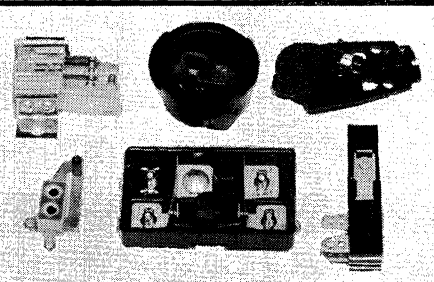
Snap-on and positive contact types available with wired leads if desired. Wire assemblies furnished to your specifications as to type of wire, length and termination attachments.



SEAELECTRIC

SEAELECTRIC SWITCHES AND RELAYS

For standard & special applications, send us your requirements.





CONNECTOR CORPORATION

6025 N. KEYSTONE AVENUE • CHICAGO, ILLINOIS 60646 • TELEPHONE: 312, 539-3108

Pictured below are additional items from our extensive standard product line, including some of our more recent designs and developments.

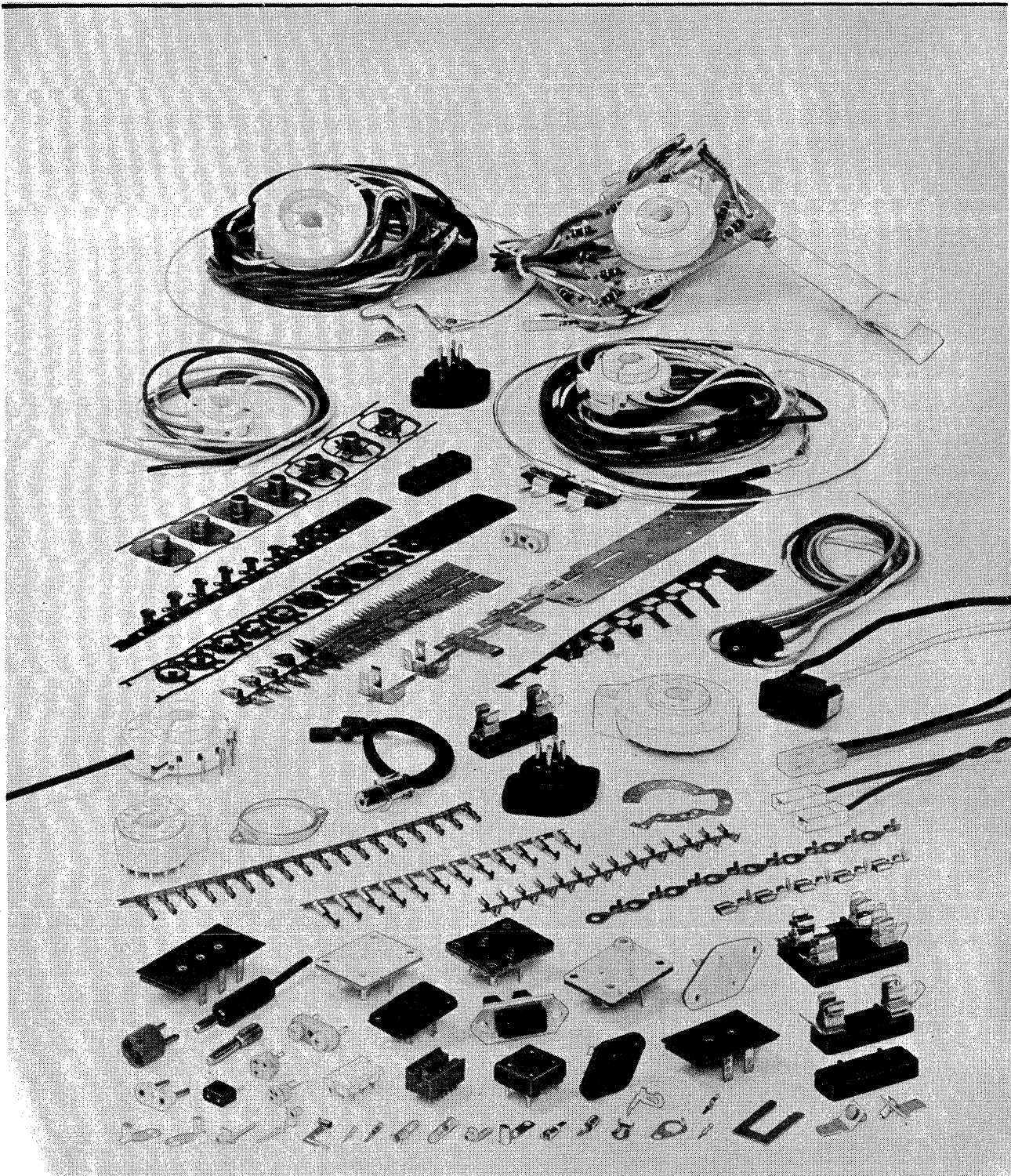
Just couple your requirements with our engineering expertise and precision tool, molding, metal and plastic fabricating capabilities.

The design and resulting product will fulfill your needs at the lowest possible cost. Either we'll modify one of our

existing products for you, or design a new one to your specs — whichever meets your needs best.

The final product will be 100% produced in our own complete manufacturing facility with consistent quality control throughout.

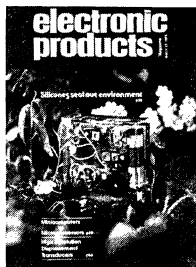
For several decades, we have satisfied industry's needs for engineering expertise and manufacturing to precision quality at lowest cost.



OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

***Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530***



electronic products magazine

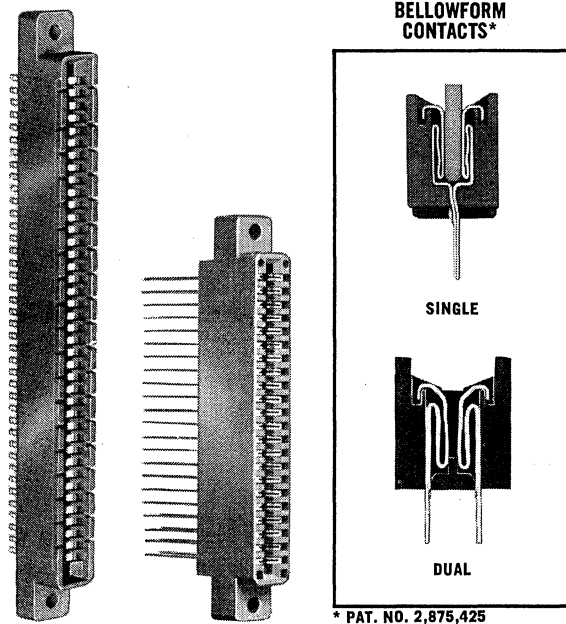
Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.



CONTINENTAL CONNECTORS

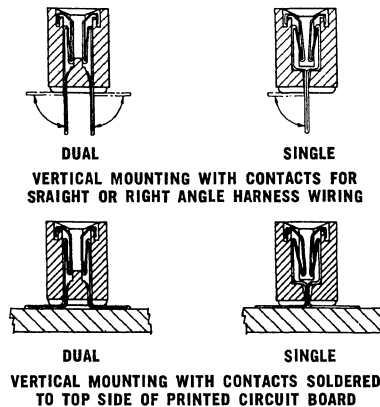
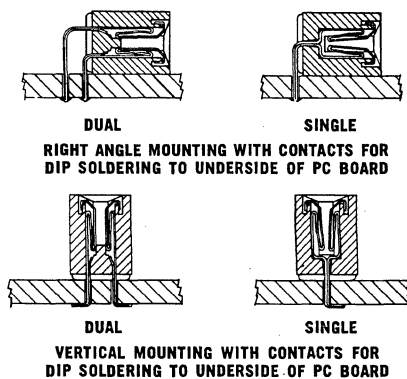
Precision Electronic Connectors For Commercial & Military Applications

SERIES 600 CARD-EDGE CONNECTORS FOR PRINTED CIRCUITRY



Connector body molding material is made of a variety of compounds such as Diallyl Phthalate, for commercial and military applications. Contacts are gold plated phosphor bronze of beryllium copper with optional plating in accordance with all MIL SPECS or special customer requirements. These contacts, with "bellowform" construction, are durable and capable of withstanding thousands of insertions and withdrawals without failure; they are virtually indestructible.

PRINTED CIRCUIT APPLICATIONS



Series 600 printed circuit connectors represent one of the most extensive lines of receptacle or card-edge types. A wide variety of single readout and double readout construction, with sizes from three to 210 contacts are available.

CONTACT CENTERS:

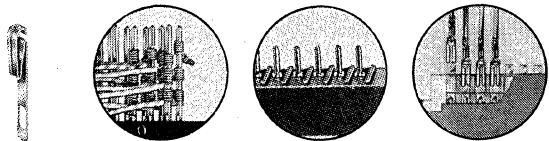
.050", .075", .100", .125", .140", .150", .156" and .200"

BOARD THICKNESS:

$\frac{1}{32}$ ", $\frac{3}{64}$ ", $\frac{1}{16}$ ", $\frac{3}{32}$ " and $\frac{1}{8}$ "

WIRING STYLES:

Eyelet lug for soldering, solderless-wrap terminations for wire-wrapping technique, contacts for dip or flow soldering and taper tab solderless wiring



EYELET LUG

SOLDERLESS-WRAP

DIP SOLDER

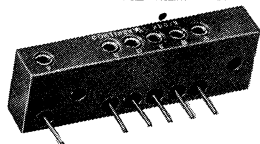
TAPER TAB

MIL SPECS:

Continental Printed Circuit Connectors meet or exceed applicable MIL-C-21097 specifications. They withstand a 50-hour salt spray test and ambient temperature range of -55°C to $+125^{\circ}\text{C}$.

SELECTIVE PLATING — Continental's continuous process selective plating deposits an equal amount of gold on each contact. The contacts pass through various cleaning and plating baths, resulting in a controlled amount of gold uniformly deposited on the critical contact area. By plating gold on the contact surface only, selective plating automatically brings down your connector cost enormously.

PC TEST POINT



SERIES 672. Provide conveniently located test points to check printed circuitry. Available with 4, 5, 6, 8, 10, 11, 20, 21, 28, 30, 42 and 63 contacts which grip and hold securely a standard .080" test probe. Connectors have recessed and floating pin terminals mounted at right angle to the test socket. Pins dip solder to printed circuit board.



CONTINENTAL CONNECTORS

Precision Electronic Connectors For Commercial & Military Applications

SERIES 600 CARD-EDGE CONNECTORS FOR PRINTED CIRCUITRY

.025" or .045" SQUARE SOLDERLESS-WRAP TERMINALS

CONTACT CENTERS:

.100", .125", .156", .200"

WIRING STYLES:

.025" and .045" square wire-wrapping terminals

BOARD THICKNESS:

Accepts .054" to .071" ($\frac{1}{16}$ ") board

TERMINATION:

Dual readout with various sizes from four to 100 contacts

PLATING:

Gold or tin

SERIES 600-100. .025" SQUARE TERMINATIONS

12 to 100 terminals with .100" contact centers

SERIES 6125-250. .025" SQUARE TERMINATIONS

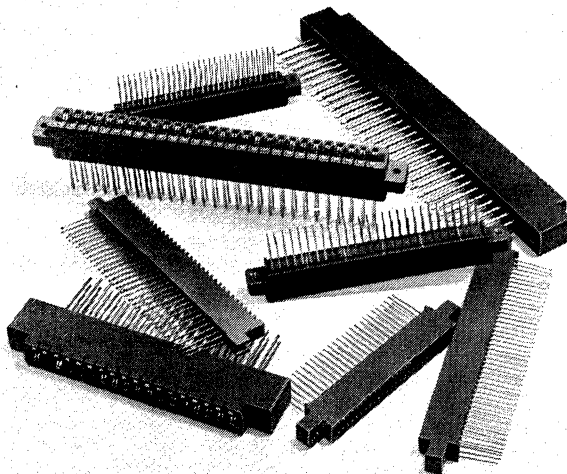
Four to 100 terminals with .125" contact centers

SERIES 600-156. .045" SQUARE TERMINATIONS

56, 60, 72 terminals with .156" contact centers

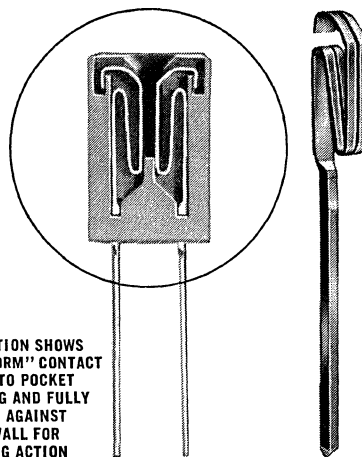
SERIES 600-83. .045" SQUARE TERMINATIONS

36, 56, 64 terminals with .200" contact centers



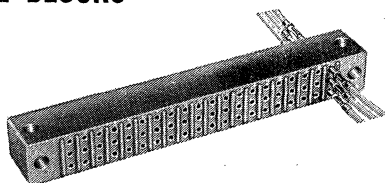
"Bellowform" Contacts have a coil spring action grip that clasps board firmly over 100% of the contact area. Exclusive design permits use of undersized or oversized board tolerances while maintaining low contact resistance. The contact "rides" with the pc board under extreme vibration conditions or misalignment. Our patented "bellowform" contacts are also ideal for microelectronic circuits where damage can occur with frequent insertions into cantilever type pc connectors, and for circuits with ceramic substrates that can wear conventional contacts.

Contacts are held in place mechanically with a 90° twist at the base of the molding. They can be replaced easily with a simple tool supplied by Continental Connector. We are the only company that manufactures printed circuit connectors with "bellowform" contacts for wire-wrapping applications using either .025" or .045" square terminations.



CROSS-SECTION SHOWS "BELLOWFORM" CONTACT HOOKED INTO POCKET OF MOLDING AND FULLY SUPPORTED AGAINST MOLDING WALL FOR COIL SPRING ACTION

TERMINAL BLOCKS



SERIES 145-58, 145-50 AND 145-48. Precision reamed solderless taper pin receptacles in single, dual and triple row construction, molded-in for highest durability. Available in any combination of feedthru individual or shorting terminals. Internal bus between any combination of terminals eliminates external wiring. Mounting holes for stacking, right angle and perpendicular mounting. Molding is glass filled Diallyl Phthalate, Type GDI-30 per MIL-M-14 specifications.



CONTINENTAL CONNECTORS

Precision Electronic Connectors For Commercial & Military Applications

RIGHT ANGLE SERIES PLUG & SOCKET TYPES FOR PRINTED CIRCUITRY

IN ACCORDANCE WITH MIL-C-55302,
MIL-E-5400, MIL-C-28747 SPECIFICATIONS

.050", .100", .156", .200" CONTACT CENTERS

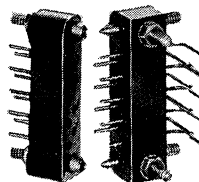
SERIES 145-5. 7, 9, 11, 15, 19, 23 contacts. Solder cup on socket, dip solder pin for plug. For use in airborne electronic equipment in accordance with MIL-C-55302 specs.

SERIES 600-1-45. 45 contacts on .050" center spacing. Right angle configuration of three rows of dip solder contacts.

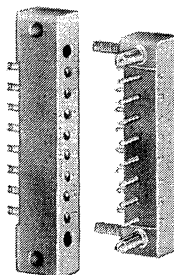
SERIES 600-1-50. 50 contacts on .100" center spacing.

SERIES 600-70. 4, 8, 10, 12, 13, 22, 28 single row contacts on .156" center spacing. Guide pins in plug and guide bushings in socket provide polarized mating of parts.

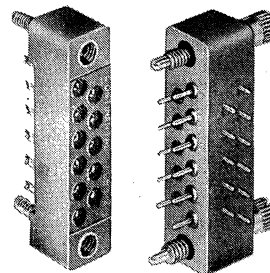
SERIES 683. 11, 18, 19, 23, 33, 38 with polarizing screwlocks or guidepins and guide sockets. Meet aircraft requirements for vibration and high altitude.



SERIES 145-5



SERIES 600-70



SERIES 683

SERIES J RIGHT ANGLE OR STRAIGHT THRU WIRING — .100" CONTACT CENTERS

11, 21, 31, 51 CONTACTS

IN ACCORDANCE WITH MIL-E-5400 SPECS

These plug and socket connectors are widely used in all electronic systems. Their small size and rugged construction make them particularly adaptable to aircraft applications. They can be used for mounting on single or dual sided printed circuit boards of varying thickness. The contact configuration is excellent for flat cable use. Plug contacts are integrally molded into the rugged body material and are protected by a high strength, single piece molded shell of glass fiber reinforced phenolic. Molding configuration prevents mismatching of plug and socket.

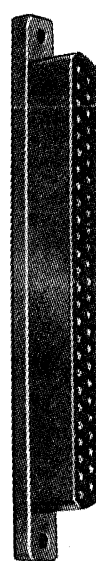
Socket contacts are wire crimp removable and free floating. They feature a self-wiping action that eliminates the need for precious metal plating such as gold. Excellent conductivity and a low millivolt drop that meets MIL-SPEC requirements are assured.

ELECTRICAL AND MECHANICAL RATINGS:

Voltages	Breakdown	Recommended Test
At Sea Level	2000V. RMS	1325V. RMS
At 70,000 Ft.	400V. RMS	300V. RMS
Current Rating: 3 Amps Continuous		5 Amps Max.
Minimum Creepage Between Contacts		.047"
Minimum Air Space Between Contacts		.047"
Male Contact Pin Diameter		.030"
Crimp Barrel for Socket Contact: Accommodates #22, #24, #26 AWG Wire		

NOTES:

1. Body Material: Glass fiber reinforced phenolic Type MFE per MIL-M-14F.
2. Contact Material: Copper alloy, gold plated.
3. Socket contact 2500-S2A22-39 must be ordered separately.
4. For electroplated tin contact add suffix "SN" to connector part number (J21P90-15-SN).



J51S RECEPTACLE
USES REMOVABLE
SOCKET CONTACTS



J51P90-15 PLUG
RIGHT ANGLE
WIRING & MOUNTING



ENLARGED VIEW OF REMOVABLE
SOCKET CONTACT SHOWS DETAIL
OF CLOSED ENTRY CONSTRUCTION



CONTINENTAL CONNECTORS

Precision Electronic Connectors For Commercial & Military Applications

RACK AND PANEL CONNECTORS FOR VARIOUS EQUIPMENT

A complete line of high-reliability connectors for computers, missile, aircraft, communications and other critical electronic applications. In addition to standard specifications, these connec-

tors can be supplied with such optional accessories as aluminum hoods, protective shells, polarizing screwlocks* and solder filled contacts. Various molding compounds are also available.

* PATENT NO. 2,746,022

MICROMINIATURE AND MINIATURE WITH CRIMP REMOVABLE CONTACTS

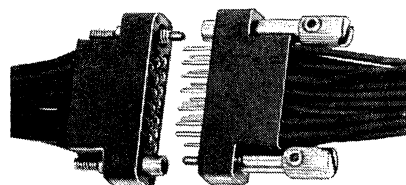
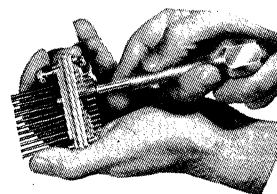
AVAILABLE WITH 7, 9, 14, 18, 20, 26, 34, 42, 50, 66, 75, 104 & 152 CONTACTS
CONFORM TO MIL-C-22857 SPECIFICATIONS

Continental Connector's removable contacts and wire crimp terminations eliminate all connector soldering operations. Contacts are supplied separately and wired independently of connector body, and can be readily replaced with simple, low cost hand tools. Connectors are available with guide pins and sockets or screwlock hardware.

SERIES 25. Removable contact connectors are interchangeable with our Series 20 fixed contact types. .025" and .045" square solderless-wrap terminations with .062" or .040" pin diameters are also available. Optional aluminum hoods, protective shells and mounting plates can be supplied. Shielded crimp removable contacts for RG-178B/U and RG-196A/U coaxial cable can be intermixed in any combination with the standard type contacts. Select guide pins and sockets or polarizing screwlocks for mating hardware.

SERIES MMM. Five thru 75 contact sizes. Interchangeable with Series MM-22 fixed contact types. Can be supplied with guide pins and guide sockets, polarizing screwlocks and aluminum hoods.

SERIES 25MM. Center screwlock locking device. Available with 50, 76, 100 and 200 contact sizes. Contacts are on .100" centers.



FIXED CONTACT MICROMINIATURE, SUBMINIATURE, MINIATURE

SERIES MM-22 MICROMINIATURE. Five to 104 contacts. Ruggedized to withstand shock and vibration extremes. Meet MIL-C-28748 specs or commercial type. Available with guide pins and guide sockets, polarizing screwlocks, cable brackets and aluminum hoods.

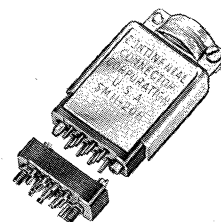
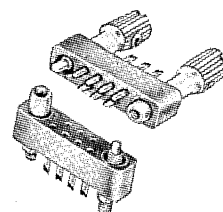
Breakdown Voltage (sea level), 2000V. RMS • Current Rating, 3A • Minimum Creepage Between Contacts, .070" • Minimum Air Space Between Contacts, .040" • Contact Center Spacing, .093" • Pin Diameter, .030" • Solder Cup, #22 AWG wire.

SERIES SM-20 SUBMINIATURE. Five to 104 contacts. Meet MIL-C-28748 specs or commercial type. Optional features include guide pins and guide sockets, polarizing screwlocks, protective shells and aluminum hoods.

Breakdown Voltage (sea level), 2000V. RMS • Current Rating, 5A Continuous, 7.5A Maximum • Minimum Creepage Between Contacts, .078" • Minimum Air Space Between Contacts, .045" • Contact Center Spacing, .125" • Pin Diameter, .040" • Solder Cup, #20 AWG wire.

SERIES 20 MINIATURE. Five to 104 contacts. Similar to above except larger size. Meet MIL-C-28748 specs or commercial type. Hexagonal configuration with 1, 4, 5, 7, 9 and 10 contacts is also available.

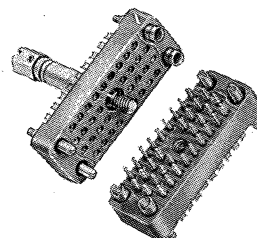
Breakdown Voltage (sea level), 3000V. RMS • Current Rating, 5A Continuous, 7.5A Maximum • Minimum Creepage Between Contacts, .125" • Minimum Air Space Between Contacts, .070" • Contact Center Spacing, .150" • Pin Diameter, .040" • Solder Cup, #20 AWG wire.



CENTER SCREWLOCK

SERIES 1900. 10, 22, 34, 50, 78, 104 and 152 contacts. Double lead thread action screwlock, stainless steel side channels and closed entry contacts for maximum reliability. Series 2500 available with 152 removable contacts.

Breakdown Voltage (sea level), 3000V. RMS • Current Rating, 10A Continuous, 13A Maximum • Pin Diameter, .062" • Minimum Creepage Between Contacts, .110" • Minimum Air Space Between Contacts, .050" • Contact Center Spacing, .150" • Solder Cup (also solderless-wrap and taper pin) #16 AWG wire.



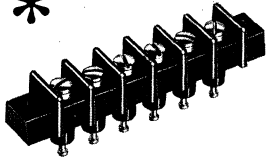
FOR COMPLETE CATALOG ON ANY SERIES WRITE OR PHONE:

CONTINENTAL CONNECTOR CORPORATION / 34-63 56th STREET, WOODSIDE, NEW YORK 11377 / PHONE SALES: (212) 899-4422

Curtis® terminal blocks

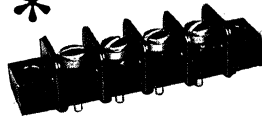
low, medium, high current types-hundreds of variations for electronic and electrical control applications.

GFT Series



fully insulated feed-thru terminal blocks

GB Series



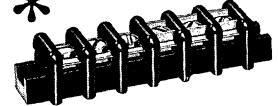
feed-thru, printed circuit and surface connection terminal blocks

FT Series



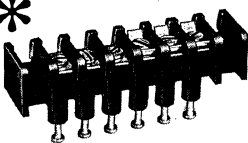
modular feed-thru terminal blocks

E Series



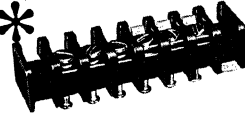
feed-thru, printed circuit and surface connection terminal blocks

SEI Series



fully insulated miniature feed-thru terminal blocks

SE Series



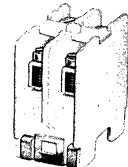
miniature feed-thru printed-circuit and surface-connection terminal blocks

W Series



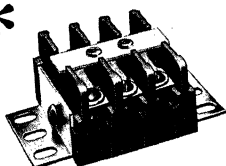
versatile labor saving, snap-in track-type terminal blocks

Types SW and SWI



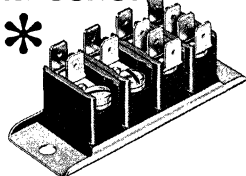
high density, labor saving, snap in track-type terminal blocks

Types CDM, CDMQ and CT



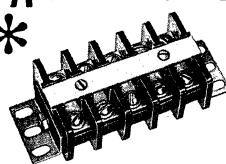
versatile medium power terminal blocks

M Series



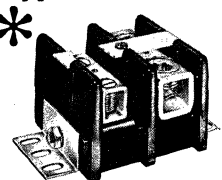
compact modular terminal blocks for low power circuits

Types H and BT



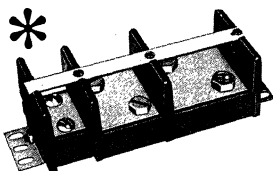
modular, high and medium power terminal blocks

Types T and U



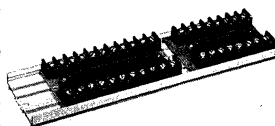
high current terminal blocks

Types L, O and S



high current terminal blocks

PS Series



printed-circuit board edge-connector assemblies

CFT Series

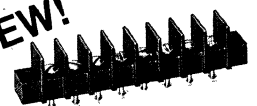
NEW!



unbreakable, compact, fully insulated feed-thru terminal blocks

CB Series

NEW!



compact, unbreakable feed-thru, printed circuit and surface connection terminal blocks



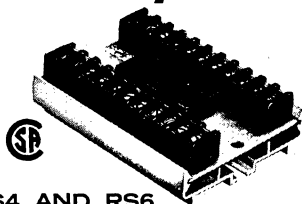
*Some units within these series are recognized under the Components Program of Underwriter's Laboratories, Inc.

CURTIS

INDUSTRIES, INC.

8000 West Tower Avenue, Milwaukee, Wisconsin 53223 Phone (414) 354-1500

Curtis[®] relay socket assemblies

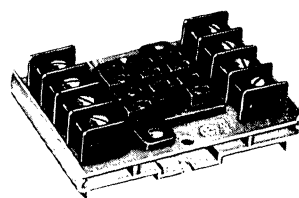


TYPES RS2, RS4 AND RS6

For popular cradle relays. Designed for applications with relatively low power requirements, Curtis type RS2, 4 and 6 relay sockets are rated for 5 amps at 125 volts. These compact relay sockets feature a maximum profile of only $\frac{29}{32}$ ". Relay sockets are mounted on high quality printed circuit board material. Barrier type terminal blocks have #2-56 terminal screws with surface clamps handling up to #16 wire, AWG. Track is type TR1, pre-punched vinyl.

SPECIFICATIONS

Model	Overall Dimension (OD)	Units per 48" Track	Receptacle Type	For Use With
RS2	2"	24	10-pin	2 P.D.T. relays with 2 coil leads
RS4	2 $\frac{1}{4}$ "	21	16-pin	4 P.D.T. relays with 2 coil leads
RS6	3"	16	22-pin	6 P.D.T. relays with 2 coil leads

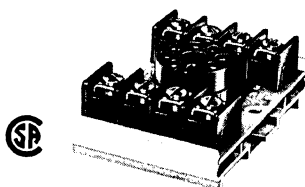


TYPES RS12 AND RS16

Accommodates modern, blade terminal relays. Mounted in TR3, pre-punched, vinyl track, these 8-pin and 11-pin socket assemblies can be snapped in or removed vertically without disturbing adjacent units. Capacity of RS12 and RS16 relay socket assemblies is 10 amps at 250 volts. Wave-soldered, coated circuit boards terminate in barrier type blocks with #6-32, nickel-plated screws to handle #12 AWG wire. Center distance of connectors is $\frac{7}{16}$ ".

SPECIFICATIONS

Model	Overall Dimension (OD)	Units per 48" Track	Receptacle Type	For Use With
RS12	2 $\frac{7}{8}$ "	16	11-pin	3 P.D.T. relays with 2 coil leads
RS16	2 $\frac{1}{4}$ "	22	8-pin	2 P.D.T. relays with 2 coil leads

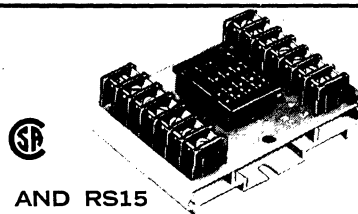


TYPES RS8 AND RS11

Octal base and 11-pin relay socket assemblies in TR2, pre-punched, vinyl track save mounting time — tracks need just 2 or 3 mounting screws per 4-foot length. Recessed, slotted center chamber permits rocking relay without fracturing center post. Clearance hole in printed circuit board accommodates relay center posts. Barrier type blocks have #6-32 screws for #12 wire. Ratings are 10 amps, 250 volts.

SPECIFICATIONS

Model	Overall Dimension (OD)	Units per 48" Track	Receptacle Type	For Use With
RS8	2"	24	Octal	Standard industrial 2 pole relays
RS11	2 $\frac{7}{8}$ "	16	11-pin	Standard industrial 3 pole relays



TYPES RS14 AND RS15

Miniature relay sockets RS14 and RS15 incorporate miniature, SE series, barrier type terminal blocks. #2-56 screws and clamps for up to #16 wire (AWG) eliminate lugging and looping. Capacity is 5 amps, 125 volts. Terminal center-to-center distance is $\frac{1}{4}$ ". Assemblies mount in pre-punched, vinyl track — RS15 in TR1, RS14 in TR2. As with all Curtis relay socket assemblies, the base is high quality printed circuit board material, wave-soldered and coated.

SPECIFICATIONS

Model	Overall Dimension (OD)	Units per 48" Track	Receptacle Type	For Use With
RS14	2"	24	14-pin	Miniature 4 P.D.T. relays with 2 coil leads (no ground)
RS15	2 $\frac{1}{4}$ "	21	15-pin	Miniature 4 P.D.T. relays with 2 coil leads and ground

TRACK

Type TR1
Vinyl track 2 $\frac{1}{4}$ " wide with mounting holes $\frac{3}{16}$ " x $\frac{5}{16}$ " on 2" centers. For relay socket types RS2, RS4, RS6 and RS15, 48" lengths.

Type TR2
For relay socket types RS8, RS11 and RS14, 48" lengths, vinyl with $\frac{3}{16}$ " x $\frac{5}{16}$ " holes on 2" centers. 2 $\frac{7}{8}$ " width.

Type TR3
Heavy vinyl track, 3 $\frac{3}{4}$ " wide, with $\frac{3}{16}$ " x $\frac{5}{16}$ " holes on 2" centers. Used with relay sockets RS12 and RS16.

NEW! CUS 8, 12 and 16 RELAY SOCKET ASSEMBLIES

- For octal-base or square-base, barrier type plug-in relays and timers
- Economical, yet virtually unbreakable (Molded of UL recognized white nylon)
- Compact, unitized design saves space
- 10 amp, 250/300 volt ratings
- Base mount or snap into TR2 or TR3 track
- Handles wire sizes up to No. 12AWG, without lugging



CURTIS INDUSTRIES, INC.

8000 West Tower Avenue, Milwaukee, Wisconsin 53223 Phone (414) 354-1500

DEPENDABLE**DALE****CONNECTORS****SERIES EBT 156****PHYSICAL and ELECTRICAL**

Number of Contacts: 6, 8, 10, 12, 15, 18 or 22

Contact Spacing: .156"

Board Thickness: .054" to .070"

Board Slot Depth: .330" Current Rating: 5 amps

Test Voltage between Contacts: At Sea Level: 1800 VRMS
At 70,000 feet: 450 VRMS

Insulation Resistance: 5000 meg. min.

Contact Resistance: 30 millivolts max. at rated current

COMPONENT MATERIAL

Body: Glass-filled phenolic per MIL-M-14, Type MFH, black

Contacts: Nickel silver per

QQ-C-585, alloy 770, spring temper. Gold flash or tin plate optional.

Polarizing Key: Glass-filled nylon

Optional Threaded Mounting Insert: Nickel plated brass. (Type Y)

Optional Floating Mounting Bushing: Cadmium plated brass. (Type Z)

APPLICATION For use with 1/16" printed circuit boards requiring an edgeboard type connector on .156" centers.**SERIES 303****PHYSICAL and ELECTRICAL**

303S-45

Number of Contacts: 45

Contact Gauge: #22 AWG

Minimum Creepage between Contacts: 1/16"

Minimum Air Space between Contacts: 1/64"

Contacts, Center to Center: .050"

Voltage Breakdown, Contact to Contact and Contact to Ground:

At Sea Level: 1200 VRMS • At 70,000 feet: 325 VRMS

Current Rating: 3 amps

COMPONENT MATERIAL

Contact: Phosphor Bronze, Gold Plated

Contact Plating: Gold Plated

Studs, Pilot Pins, Washers, Nuts:

Corrosion-resistant steel, passivated

Standard Body: Glass-filled diallyl phthalate per MIL-M-19833, Type GDI-30F, green

APPLICATION For use in equipment requiring printed circuit connectors of the dip solder type with mating female connector.**SERIES SPC 155**

(Choice of even or staggered contacts)

PHYSICAL and ELECTRICAL

Number of Contacts: 33 per side

Contact Spacing: .100"

Card Thickness: .056"-.068" (1/16")

Card Slot Depth: .200"

Current Rating: 0.5 amp.

Test Voltage between Contacts: At Sea Level: 1200 VRMS
At 50,000 feet: 675 VRMS

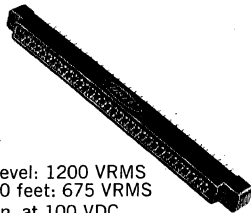
Insulation Resistance: 5000 megohms min. at 100 VDC

Contact Resistance: 20 millivolts max. at rated current with gold plating

COMPONENT MATERIAL

Body: Glass-filled phenolic per MIL-M-14, Type MFH, black

Contacts: Beryllium copper, gold plate per MIL-G-45204; gold flash or tin plate per MIL-T-10727

APPLICATION For use with 1/16" printed circuit boards. Contacts can be located opposite each other or staggered. Ideal for "mother board" applications.**SERIES 315****PHYSICAL and ELECTRICAL**

315 PR-50

Number of Contacts: 50

Contact Termination: Male contacts available in right angle dip solder, or solder cup termination

Contact Spacing: 0.200", staggered rows provide a 0.100" grid

Contact Gauge: #20 AWG

Minimum Creepage Path between Contacts: 7/64"

Minimum Air Space between Contacts: 1/16"

Current Rating: 7.5 amps

Breakdown Voltage, Contact to Contact: At Sea Level: 2500 VRMS
At 70,000 feet: 600 VRMS**COMPONENT MATERIAL**

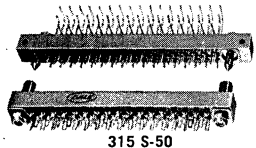
Contact Pin: Phosphor Bronze, Gold Plated

Contact (closed entry)

Socket: Phosphor Bronze, Gold Plated

Guides and Hardware: Stainless steel, passivated

Body: Glass-filled diallyl phthalate per MIL-P-19833, Type GDI-30F, green

APPLICATION Designed for dip solder printed circuit applications requiring 50 contacts. Also available with solder cup termination for rack and panel applications.**SERIES EBT 050****PHYSICAL and ELECTRICAL**

Number of Contacts: 8, 16, 20, 25, 32, 50 or 64 per side

Contact Spacing: .050"

Board Thickness: Size 1 = .027"-.035"
Size 2 = .056"-.068"

Board Slot Depth: .200" Current Rating: 0.5 amp

Test Voltage between Contacts: At Sea Level: 1200 VRMS
At 50,000 feet: 675 VRMS

Insulation Resistance: 5000 meg. min.

Contact Resistance: 10 millivolts max. at rated current

COMPONENT MATERIAL

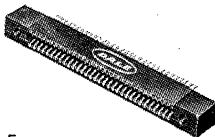
Body: Glass-filled phenolic per MIL-M-14, Type MFH, black

Contact Backer Strips: Epoxy

glass laminate per MIL-P-18177, Type GEE, black

Contacts: Beryllium copper per QQ-C-533, alloy 172. Gold plate per MIL-G-45204.

Polarizing Key: Polycarbonate

APPLICATION For use with 1/32" and 1/16" printed circuit boards in integrated thin film, and semiconductor circuitry with .050" contact spacing.**SERIES 330****PHYSICAL and ELECTRICAL**

330 PR-12-3

Number of Contacts: 12

Contact Spring: .150"

Contact Size: .040" dia.

Minimum Creepage Path between Contacts: 7/64"

Minimum Air Space between Contacts: 7/64"

Current Rating: 7.5 amps

Breakdown Voltage: At Sea Level: 2500 VRMS
At 70,000 feet: 600 VRMS**COMPONENT MATERIAL**

Contact Pin: Phosphor Bronze, Gold Plated

Contact Socket: Phosphor Bronze, Gold Plated

Eyelets: Brass, Cadmium Plated

Body: Phenolic, CFG (black)

APPLICATION Where permanent mounting of male connector to a printed circuit board is required with mating female connector available. Polarization available.**SERIES 300****PHYSICAL and ELECTRICAL**

Number of Contacts: 7, 15, 19 and 25

Contact Spacing: 0.250", staggered rows provide a .125" grid.

Contact Gauge: #20 AWG

Minimum Creepage Path between Contacts: 5/32"

Minimum Air Space between Contacts: 7/64" Current Rating: 7.5 amps

Breakdown Voltage: At Sea Level: 3600 VRMS
At 70,000 feet: 975 VRMS**COMPONENT MATERIAL**

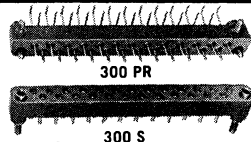
Contact Pin: Phosphor Bronze

Contact Socket: Phosphor Bronze

Contact Plating: Gold Plated

Guide Pins: Stainless steel, passivated

Standard Body: Glass-filled diallyl phthalate per MIL-P-19833, Type GDI-30F, green. Other body material supplied upon request.

APPLICATION Where permanent mounting of male connector to printed circuit board is required with mating female connector available.**SERIES G20 & G16****PHYSICAL and ELECTRICAL**

Minimum Creepage Path between Contacts: G20 = 1/4"; G16 = 13/64"

Minimum Air Space between Contacts: G20 = 3/16"; G16 = 5/32"

Breakdown Voltage:

At Sea Level - 6100 VRMS (G20); 4900 VRMS (G16)

At 70,000 feet - 1100 VRMS (G20); 950 VRMS (G16)

Current Rating: G20 = 7.5 amps; G16 = 13 amps

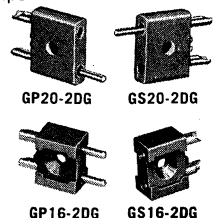
COMPONENT MATERIAL

Standard Body: Glass-filled diallyl phthalate per MIL-M-19833, Type GDI-30 green

Pin Contacts: Brass

Socket Contacts: Phosphor Bronze

Contact Plating: Gold over Nickel

APPLICATIONS Broad... thru hole permits use of building block technique or flat mounting. Locking device on G16 permits secure mounting. Optional G16 hood provides "short out" protection.

DEPENDABLE**DALE®****CONNECTORS****SERIES SM20****PHYSICAL and ELECTRICAL**

Number of Contacts: 5, 7, 11, 14, 20, 26, 34, 42, 50, 75

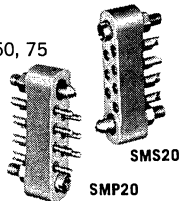
Contact Spacing: 0.125"

Contact Gauge: #20 AWG

Minimum Creepage Path between Contacts: 5/64"

Minimum Air Space between Contacts: 3/64"

Current Rating: 7.5 amps

Breakdown Voltage: At Sea Level: 2000 VRMS
At 70,000 feet: 500 VRMS

SMS20

SMP20

COMPONENT MATERIAL

Contact Pin: Brass

Contact Socket: Phosphor Bronze.

Beryllium copper also available.

Contact Plating: Gold Plated

Guides: Stainless steel, passivated

Screwlocks: Stainless steel, passivated

Standard Body: Glass-filled diallyl phthalate per MIL-P-19833, Type GDI-30F, green. Other body material supplied upon request.

APPLICATIONS For use wherever space is at a premium and a high quality connector is required in avionics, automation, communications, controls, instrumentation, missiles, computers and guidance systems.**SERIES MM22 and MM24****PHYSICAL and ELECTRICAL**

Number of Contacts: 5, 7, 9, 11, 14, 20, 26, 29, 34 and 44

Contact Spacing: 3/32"

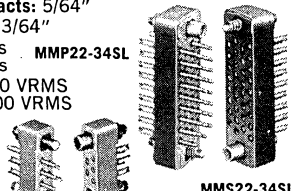
Contact Gauge: MM22 Series = 22 gauge. • MM24 = 24 gauge

Minimum Creepage Path between contacts: 5/64"

Minimum Air Space between contacts: 3/64"

Current Rating: MM22 Series = 5 amps

MM24 Series = 3 amps

Breakdown Voltage: At Sea Level: 2000 VRMS
At 70,000 feet: 500 VRMS

MMP22-34SL

MMS22-34SL

COMPONENT MATERIAL

Contact Pin: Phosphor Bronze

Contact Socket: Phosphor Bronze

Contact Plating: Gold Plated

Screwlocks: Stainless steel, passivated

Guides: Brass, gold plated

Standard Body: Glass-filled diallyl phthalate per MIL-P-19833, Type GDI-30F, green. Other body material supplied upon request.

APPLICATIONS Especially suited for use in airborne, instrumentation and portable equipment applications or wherever the following requirements must be met: Minimum space and weight without sacrifice of performance, high quality materials, long service life, high vibration and shock resistance, and positive locking.**SERIES PJ****PHYSICAL and ELECTRICAL**

Current Rating: 7.5 amps

Socket Contact Engages: 0.080" dia. probe

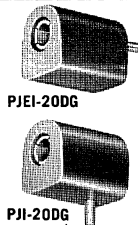
COMPONENT MATERIAL

Standard Body: Glass-filled diallyl phthalate per MIL-M-19833, Type GDI-30F, green.

Pin Contacts: Brass

Socket Contacts: Phosphor Bronze

Contact Plating: Gold Plated

APPLICATION Printed circuit checkout and testing.

PJEI-20DG

PJI-20DG

MODEL 500 SR5**PHYSICAL and ELECTRICAL**

Number of Contacts: 5

Contact Spacing: 0.150"

Contact: Accepts .080" dia. probe

Current Rating: 5 amps

Breakdown Voltage: At Sea Level: 3000 VRMS
At 70,000 feet: 676 VRMS**COMPONENT MATERIAL**

Contact Socket: Phosphor Bronze

Contact Plating: Gold Plated

Standard Body: Glass-filled diallyl phthalate per MIL-P-19833, Type GDI-30F, green. Other materials available upon request.

APPLICATION Permanent or semi-permanent test points for checkout and testing of printed circuits.**SERIES QX32****PHYSICAL and ELECTRICAL**

Minimum Creepage between Contacts: 9/64"

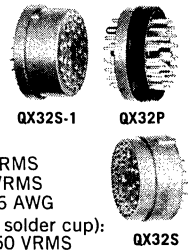
Minimum Air Space between Contacts: 7/64"

All male contacts are .093" in diameter. Current ratings vary only because some solder cups are made for #12 AWG and others for #16 AWG.

Voltage Breakdown Contact to Contact

(#12 AWG solder cup): At Sea Level: 3300 VRMS
At 70,000 feet: 712 VRMS

Current Rating: 23 amps #12 AWG • 13 amps #16 AWG

Voltage Breakdown Contact to Contact (#16 AWG solder cup):
At Sea Level: 3600 VRMS • At 70,000 feet: 750 VRMS

QX32S-1

QX32P

QX32S

COMPONENT MATERIALClosed Entry Socket Contacts: Phosphor Bronze*, Gold Plated
Inserts and Hardware: Stainless steel, passivated*

"O" Ring: Synthetic rubber Boot: Neoprene

Body Material: Glass-filled diallyl phthalate per MIL-M-19833, Type GDI-30F, green. Consult factory for other materials.

For use with QX32S, a shorting plug to ground static electricity is available. Contact factory for details.

*Contact factory. Beryllium copper can be specified to ordinance drawing 10182288.

APPLICATION Used in the firing system of missiles.**SERIES 400 and 401****PHYSICAL and ELECTRICAL**

Voltage Breakdown, contact to contact:

At Sea Level: 2000 VRMS

At 70,000 feet: 500 VRMS

Minimum Creepage Path between Contacts: 5/64"

Minimum Air Space between Contacts: 3/32"

Contacts, center to center: .150"

COMPONENT MATERIAL

Molded Body: Glass-filled diallyl phthalate per MIL-M-19833, Type GDI-30F, green. For other materials, contact factory.

Hood: Aluminum, anodized (on 401PF)

Shells, Mounting Nut and Coupling Nut: Aluminum, clear anodized.

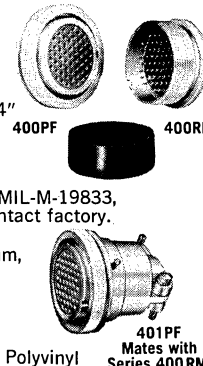
Contact Pins: Brass, Gold Plated

Contact Socket: Phosphor Bronze, Gold Plated

Lock Ring: Brass, cadmium plated

Retaining Ring: Stainless steel Protective Cap: Polyvinyl

401PF Mates with Series 400RM

APPLICATION Series 400: For use in equipment requiring a 41, 51 or 55 pin sealed connector, with a mating non-sealed female connector. Series 401: For identical applications where hood is required. Mates with Series 400RM connectors.

400PF

400RM

401PF

SERIES S20**COMPONENT MATERIAL**

Molded Body: Orlon-filled diallyl phthalate per MIL-M-14F, Type SDI-5 (blue), furnished as standard.

Contact Pin: Brass, Gold Plated

Contact Socket: 4 tine beryllium copper, gold plated

Coaxial Insulator: Teflon

Coaxial Socket Body: Brass, silver plating standard. Gold also available.

Coaxial Socket Contact: Beryllium copper, gold plated

Shell and Retaining Plate: Aluminum, cadmium plated and gold iridized

Coaxial Contacts are for use with Adapter No. 2710-10 by Cannon or No. 5988 by Greybar and fit RG 188/U cable.

S20P-41 and S20S-41**PHYSICAL and ELECTRICAL**

Minimum Creepage Path between Contacts: 1/8"

Minimum Air Space between Contacts: 1/16"

Contacts, center to center: 3/32"

Ambient Temperature Range: -67° F to +250° F

Approximate Weight: S20S-41 = 1.5 oz.

S20P-41 = 1.0 oz.

Voltage Breakdown, contact to contact: At Sea Level: 2500 VRMS
At 70,000 feet: 600 VRMS

Current Rating: 10 amps

S20P-13-4R and S20S-13-4R**PHYSICAL CHARACTERISTICS**

Minimum Creepage Path between Contacts: 7/64"

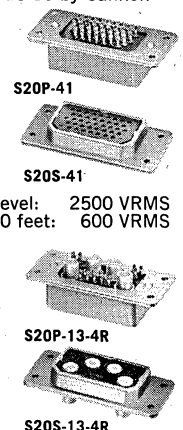
Minimum Air Space between Contacts: 1/16"

Contacts, center to center: .150"

Ambient Temperature Range: -67° F to +250° F

Approximate Weight: S20P-13-4R = 1.8 oz.

S20S-13-4R = 1.3 oz.



S20P-41

S20S-41

S20P-13-4R

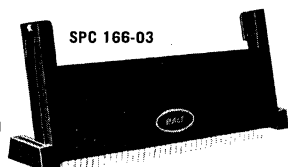
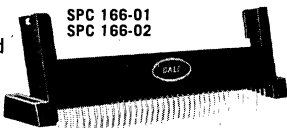
S20S-13-4R

For complete information, write or phone:

DALE ELECTRONICS, INC.P. O. Box 180 • YANKTON, SOUTH DAKOTA 57078
PHONE: 605-665-9301

DEPENDABLE**DALE®****CONNECTORS****SPECIAL DISPLAY STYLES****SERIES SPC 166****Liquid Crystal Digital Display (LCD) Connectors**

- Compatible with 8 Digit LCD displays manufactured by Rockwell International Microelectronics, Inc., American Microsystems, Inc., and Hamlin Inc.
- Integral card guides for support of LCD
- Guide spring to provide LCD registration at right edge of connectors
- Custom height and angle variations can be provided at moderate tooling cost
- Low unit cost. Specifically developed for high volume calculator applications
- Staggered grid termination (.100 x .100) for ease of wave soldering.

**PHYSICAL CHARACTERISTICS****Number of Contacts:** 80 maximum**Contact Spacing:** .050"**Slot Depth:** .230"

Display Thickness: Connector accommodates LCD with an overall thickness of .125" $\pm$.015" and a thickness of .057" to .065" in the insertion area.

ELECTRICAL CHARACTERISTICS**Current Rating:** .5 amp.**Test Voltage between Contacts:**

Sea Level—1,200 VRMS
50,000 feet—675 VRMS

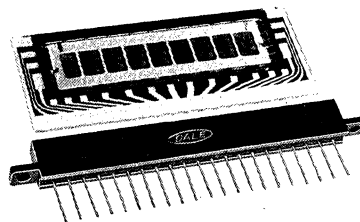
Insulation Resistance: 5,000 Megohms
at 100 VDC

COMPONENT MATERIAL

Body: Glass-filled phenolic per MIL-M-14,
Type MFH, black

Contacts: Beryllium copper

Contact Plating: Electro-deposited tin,
200 micro-inches minimum.

SERIES SPC-173**Gas Discharge Display Connectors
Accepts NDP.1252-8 Display**

- Compatible with 8 Digit gas discharge displays manufactured by National Electronics, Inc., Geneva, Illinois
- Models available with flange or without mounting flange
- Low unit cost. Specifically developed for high volume calculator applications.

PHYSICAL CHARACTERISTICS**Number of Contacts:** 21**Contact Spacing:** .156"**Slot Depth:** .300"

Display Thickness: Connector accommodates
display .050" to .068"

ELECTRICAL CHARACTERISTICS**Current Rating:** .5 amp.**Test Voltage between Contacts:**

Sea Level—1,200 VRMS
50,000 feet—675 VRMS

Insulation Resistance: 5,000 Megohms
at 100 VDC

COMPONENT MATERIAL**Body:** Glass-filled nylon, black**Contacts:** Beryllium copper

Contact Plating: Electro-deposited tin,
200 micro-inches minimum.

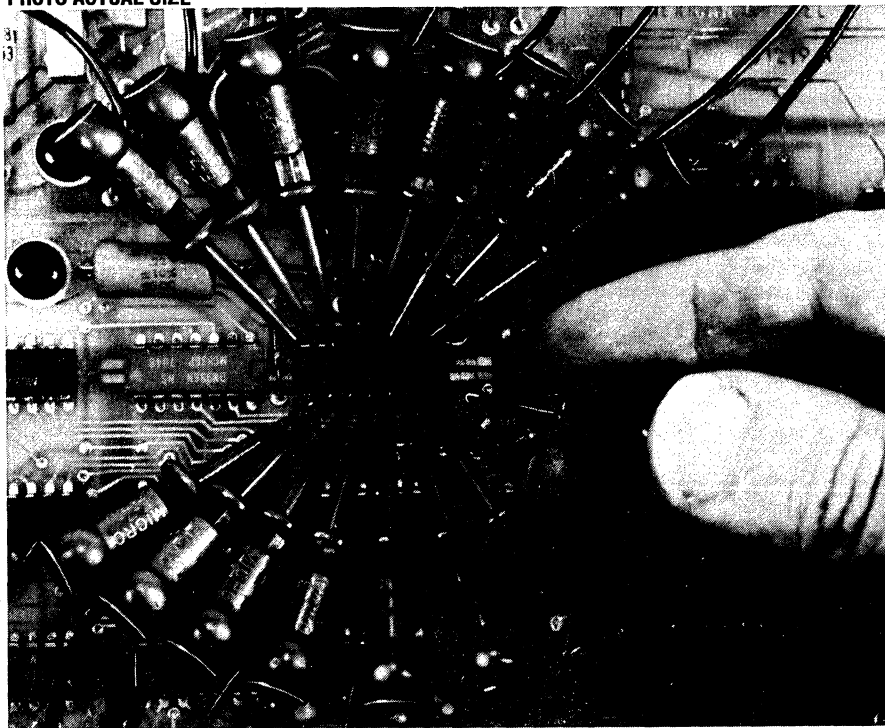
For complete information, write or phone:

DALE ELECTRONICS, INC.

P.O. Box 180 • Yankton, South Dakota 57078 • Phone: 605-665-9301

E-Z-HOOK® ...THE PROBLEM SOLVERS

PHOTO ACTUAL SIZE



THE NEW MICRO XM-1 TROUBLE SHOOTER ADDS A LITTLE LENGTH TO OUR LINE

(1.75" — 4.45 cm) long and VERY little weight (less than 1 gram). Ideal for difficult IC testing. Connect DIRECT to IC... Reduce resistance build-up. Same high quality construction as our models X-100W. (2.25" — 5.7 cm) and XL-1, (5" — 12.7 cm): Durable heat and chemical resistant nylon body, Gold-plated Beryllium copper contact, Stainless steel spring. Single contact point makes fast, safe, short-free connections... assures accurate readings.

AVAILABLE IN 10 RETMA COLORS:

Red, Black, Blue, Green, Orange, Yellow, White, Violet, Brown or Gray.

INDIVIDUAL TEST CONNECTORS



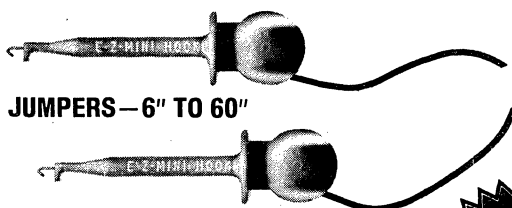
XM-1



X-100W



XL-1



JUMPERS—6" TO 60"

SCOPE CABLE PROBES

NEW PISTOL-GRIP PROBE

with terminal board for easy addition of circuitry. Available pre-cabled to all popular interface connectors. No. XP uses X-100W body. No. XLP uses XL-1 body.



**E-Z-HOOK COMPONENTS
FEATURE
COMPLETE
FIELD
SERVICING**



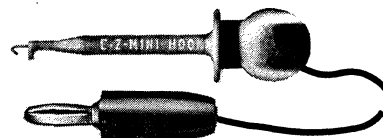
No. 5400 SERIES

Pen style probe with inside terminal board. Pre-cabled to all popular interface connectors.

TEST LEADS to popular interface connectors.

No. 200 SERIES with thermoplastic lead

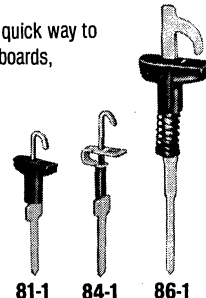
No. 300 SERIES with teflon lead



NAILCLIPS The quick way to Breadboards, Harnessboards, Pretest Boards, Burn-in Boards.

Perf-eze adaptors available for 81-1 & 84-1 styles.

86-1, heavy-duty drives like a nail.



81-1

84-1

86-1

THE FULL-LINE SOURCE FOR ALL YOUR TEST CONNECTION PROBLEMS

FOR COMPLETE INFORMATION, WRITE OR CALL FOR CATALOG AND PRICE LIST

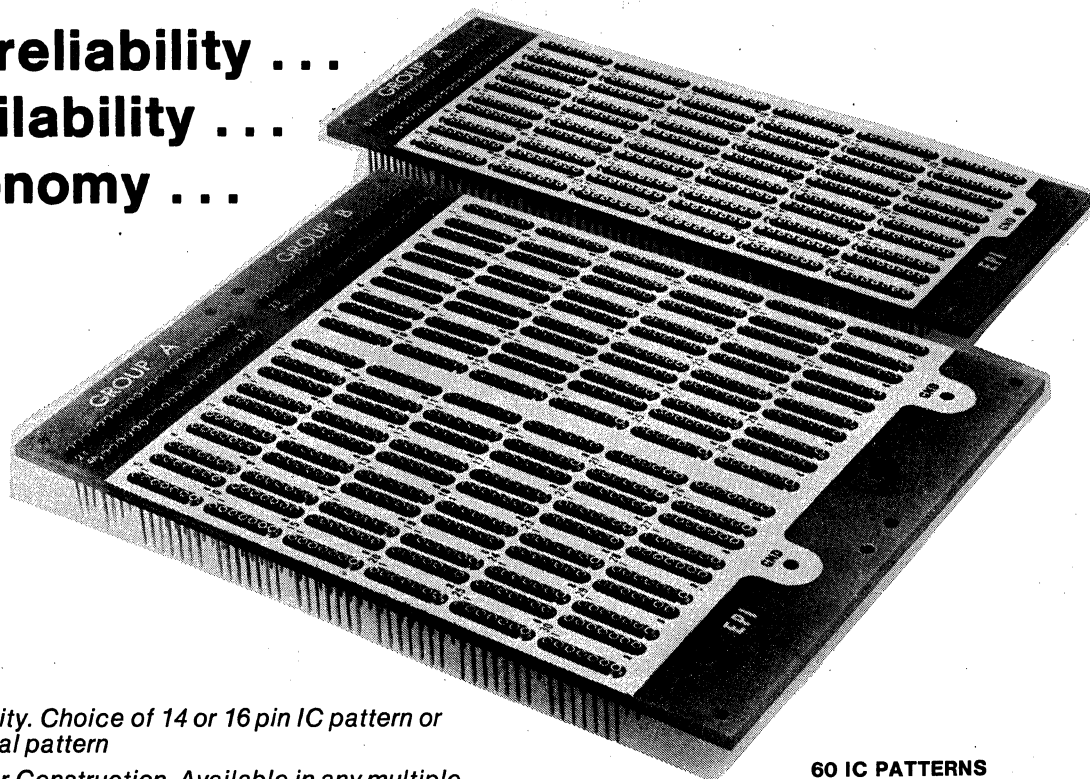
E-Z-HOOK®

P. O. BOX 450, ARCADIA, CALIFORNIA 91006
PHONE: (213) 446-6175 TWX 910 582 1614

IC PACKAGE PANELS

eipi

**for reliability ...
availability ...
economy ...**



- *Flexibility. Choice of 14 or 16 pin IC pattern or universal pattern*
- *Modular Construction. Available in any multiple of 30 IC patterns, up to 240 patterns, or from 9 to 54 rows of the universal pattern*
- *Ground and power distributed to each IC pattern*
- *Gold plated beryllium copper contacts for reliable retention of IC leads*

60 IC PATTERNS

Electro Packaging, Inc. manufactures a complete line of standard and custom IC panels for a wide variety of applications in the OEM industry. As a subsidiary of Electro Circuits, Inc., a long established PC board manufacturer, EPI has extensive capability for custom service, large inventories of

standard augat compatible panels, excellent quality, competitive pricing and excellent delivery. Pricing and other information may be obtained by contacting your nearest EPI representative or call direct to our factory.

DETAILED SPECIFICATIONS AND ORDERING INFORMATION OF FOLLOWING PAGES

ELECTRO PACKAGING, INC

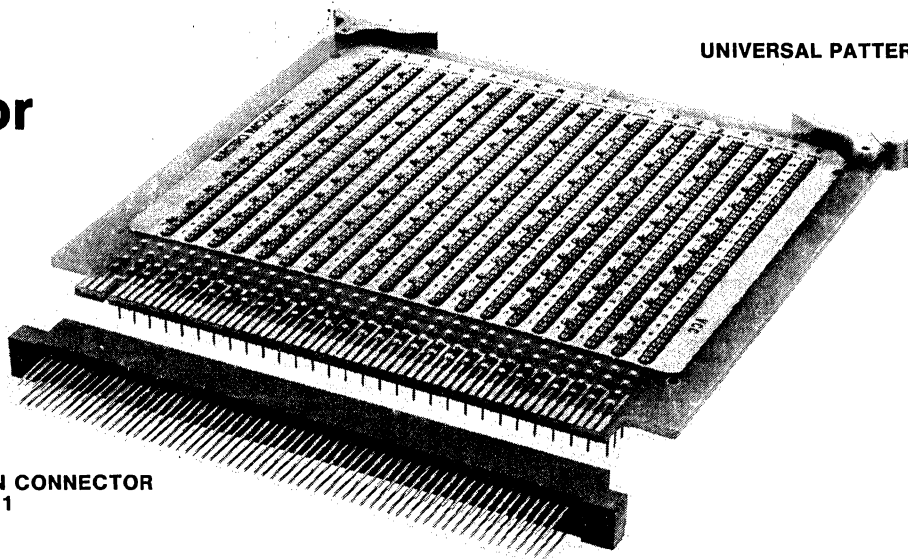
176 Walker Street, Lowell, Massachusetts 01854
Phone Area Code (617) 459-3731

epi

**IC
PACKAGE
PANELS**

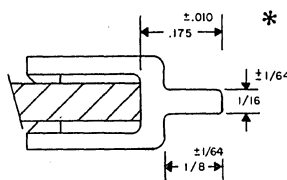
edge connector type

UNIVERSAL PATTERN



**60 POSITION CONNECTOR
9014-S-120-1**

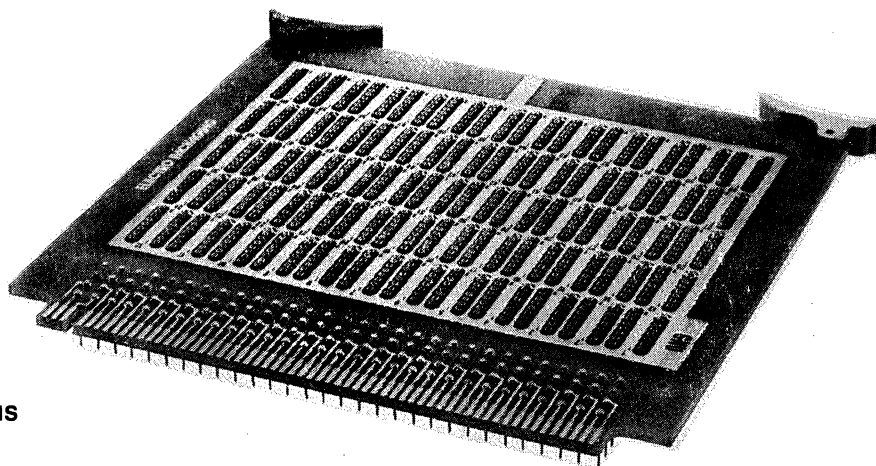
- *Flexibility. Standard 60 IC pattern (14 or 16 pin) or 20 ROW universal pattern (accepts any combination of 14 thru 40 pin IC's)*
- *Ground and power distributed to each IC pattern*
- *Gold plated beryllium copper contacts for reliable retention of IC leads*
- *Edge connector take off (accepts 9014-S-120-1 edge connector, 60 dual position, 120 terminations)*



CARD GUIDE ADAPTER

Supplied on all 1/8 inch panels. For use with Standard Card Guides. Plastic extrusion may be removed if not required.

Part No. 9014-PGI



60 IC PATTERNS

ELECTRO PACKAGING, INC

176 Walker Street, Lowell, Massachusetts 01854

Phone Area Code (617) 459-3731

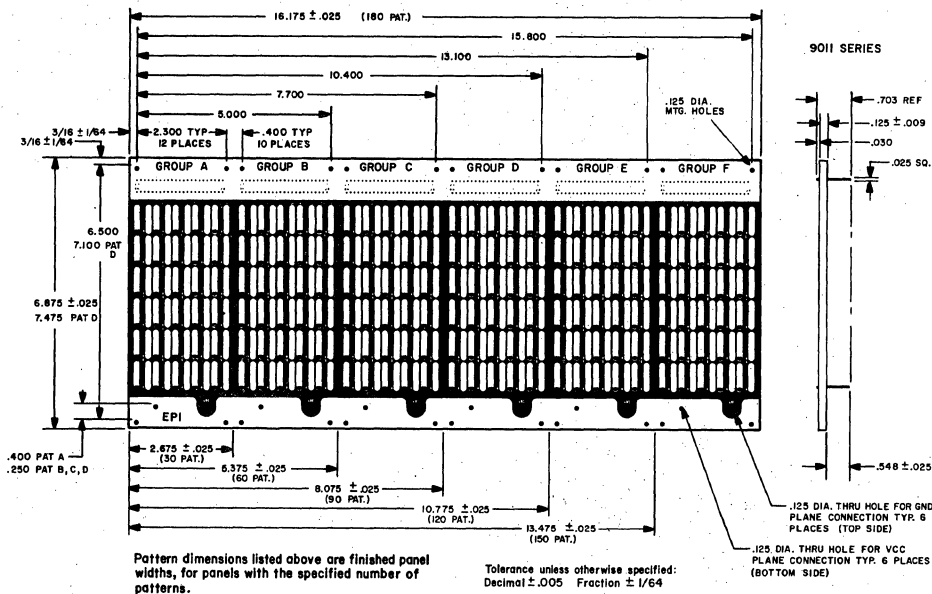
IC PACKAGE PANELS

eipi

series 9011/9012

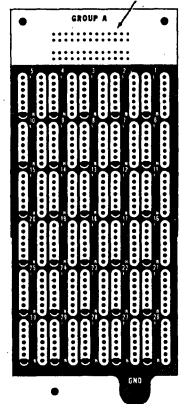
9011—with socket terminal input/output

9012—with feed thru terminal input/output



9012 SERIES (INPUT/OUTPUT DETAIL)

2 sets of 26 Feed
Thru Terminals for
I/O Connector



series 9014

with Edge Connector take off

MATERIALS:

P/C Board 1/8 or 1/16 thick glass epoxy. 2 oz. copper circuitry, both sides solder plated.

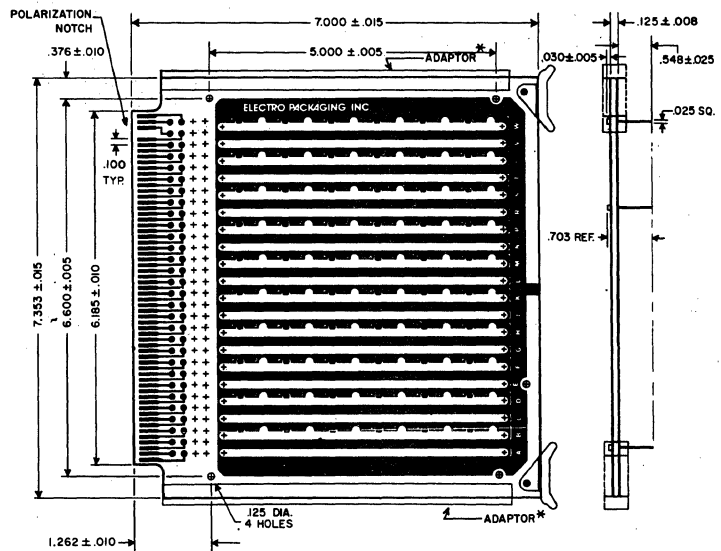
Socket Terminal Assembly:

Socket Terminal:

Brass, gold over nickel plated. Note: Fine plating also available. To order, add suffix "T" to part no.

Female Contact Insert:

Beryllium copper, gold (MIL-G-45204) over nickel (QQ-N-290) plated. Accepts .016 to .023 leads.



ELECTRO PACKAGING, INC

176 Walker Street, Lowell, Massachusetts 01854

Phone Area Code (617) 459-3731



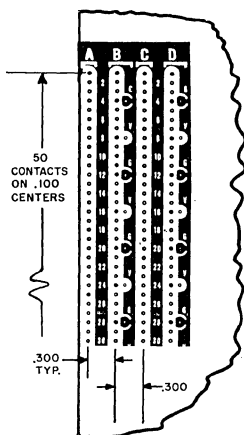
IC PACKAGE PANELS

ORDERING INFORMATION

SERIES 9014—PART NUMBER DATA

PATTERN	BOARD TH.	2 WRAP LEVELS	3 WRAP LEVELS
A*	1/8"	9014-A-12	9014-A-13
	1/16"	9014-A-22	9014-A-23
B	1/8"	9014-B-12	9014-B-13
	1/16"	9014-B-22	9014-B-23
C	1/8"	9014-C-12	9014-C-13
	1/16"	9014-C-22	9014-C-23
D	1/8"	9014-D-12	9014-D-13
	1/16"	9014-D-22	9014-D-23
UNIVERSAL	1/8"	9014-U-12	9014-U-13
	1/16"	9014-U-22	9014-U-23
MATING EDGE CONNECTOR (Supplied Separately)	1/8"	9014-S-120-1	
	1/16"	9014-S-120-2	

*Note: Pattern A also available with 1 row of pattern C.
Specify M in place of A in part no.



UNIVERSAL PATTERN

Additional wire wrap terminals are connected to ground and power planes outside of contact rows.

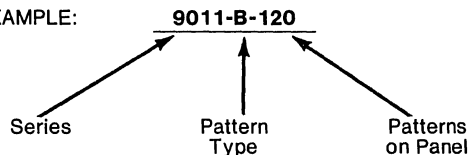
SERIES 9011/9012—PART NUMBER DATA

PART NUMBER	PINS PER PATTERN	POWER AND GND. PINS	I.O. TERMINATION
9011-A	14	7 + 14	Female Contact
9012-A			W/W Feed Thru
9011-B		V + G	Female Contact
9012-B		Dummies	W/W Feed Thru
9011-C	16	8 + 16	Female Contact
9012-C			W/W Feed Thru
9011-D		V + G	Female Contact
9012-D		Dummies	W/W Feed Thru
9011-U	Universal Pattern		Female Contact
9012-U	50 Pins Per Row, Separate V&G Pins		W/W Feed Thru

Note: For TIN PLATED Socket Terminals (with gold plated contacts) on Series 9011, 9012, 9014, add suffix "T" to part number.

Boards may be purchased in any multiple of 30 IC patterns (up to 240) or any multiple of 9 rows of the Universal pattern (up to 54) indicated by suffix number.

EXAMPLE:

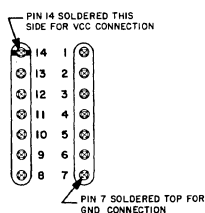


PARTIAL INTERCHANGEABILITY LIST—AUGAT/EPI

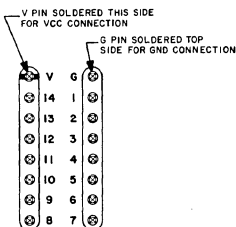
AUGAT	EPI	AUGAT	EPI
8136-PG1-30	9011-A-30	8136-RG1	9014-A-13
8136-PG3-30	9011-B-30	8136-RG2	9014-B-13
8136-PG5-30	9011-C-30	8136-RG3	9014-C-13
8136-PG13-30	9011-D-30	8136-RG4	9014-D-13
8136-PG18-30	9012-A-30	8136-URG1	9014-4-13
8136-PG19-30	9012-B-30	8136-MRG1	9014-M-13
8136-PG20-30	9012-C-30	8136-140P4	9014-PG1
8136-PG21-30	9012-D-30	14005-IPI	9014-S-120-1
8136-UG1-9	9011-U-9	1400S-19PI	9014-S-120-2
8136-UG6-9	9012-U-9	8160-EG10	9016BP-1
		8170-RG1	9017BP-1
		8170-RG2	9017BP-2

For pricing, delivery and any other information, contact your nearest EPI representative or factory.

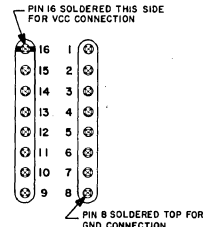
VCC (BOTTOM) SIDE SHOWN



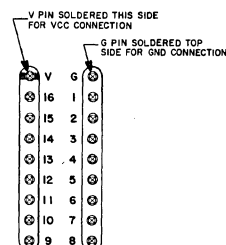
PATTERN A



PATTERN B



PATTERN C



PATTERN D

ELECTRO PACKAGING, INC

176 Walker Street, Lowell, Massachusetts 01854
Phone Area Code (617) 459-3731



CUSTOMIZED WIRE-WRAP® PANELS for any application...

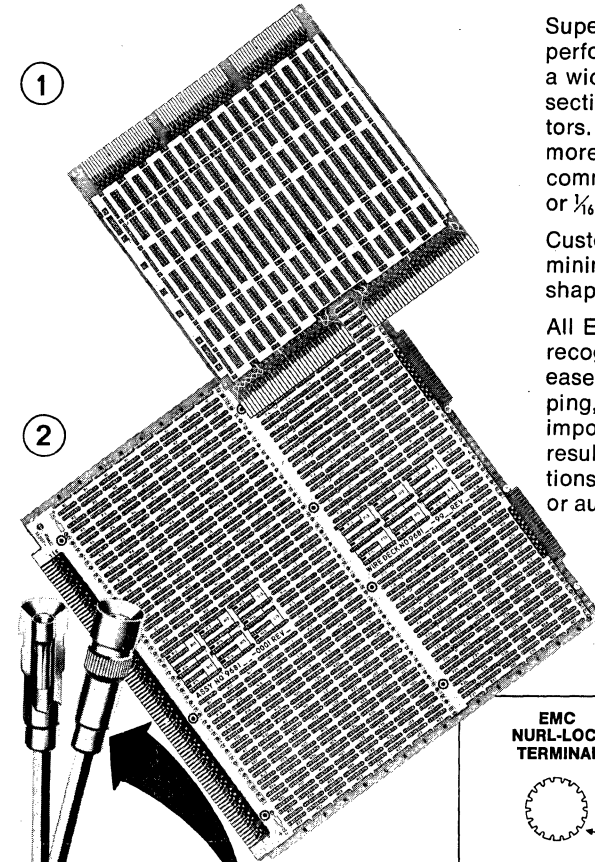
Superior design and superb construction result in EMC's unsurpassed performance in pin-in-board packaging panels. The EMC line includes a wide selection of hi-density Wire-Wrap® panels, with input/output sections for male/female cable assemblies or plug-in edge connectors. EMC panels are available in 2 or 3 levels of wrap, with 12 to 180 or more positions. Five patterns are standard (14 or 16 pin, with V and G committed or uncommitted, plus universal). Board thicknesses of $\frac{1}{8}$ " or $\frac{1}{16}$ ", as well as a variety of terminal plating styles, are available.

Custom panels are designed to reduce wrapping costs to an absolute minimum, to conform to special I/O requirements, and in layouts and shapes to complement existing systems.

All EMC panels utilize patented* Nurl-Loc® Funnel-Entry terminals, recognized throughout the industry for superior holding power and ease of assembly. The Nurl-Loc design prevents twisting during wrapping, and greatly simplifies terminal replacement, if needed. Most important, Nurl-Loc spreads stress evenly throughout the board, resulting in flatter non-warping panels with more accurate true positions of terminals. The Funnel-Entry feature vastly simplifies manual or automatic I.C. lead insertion.

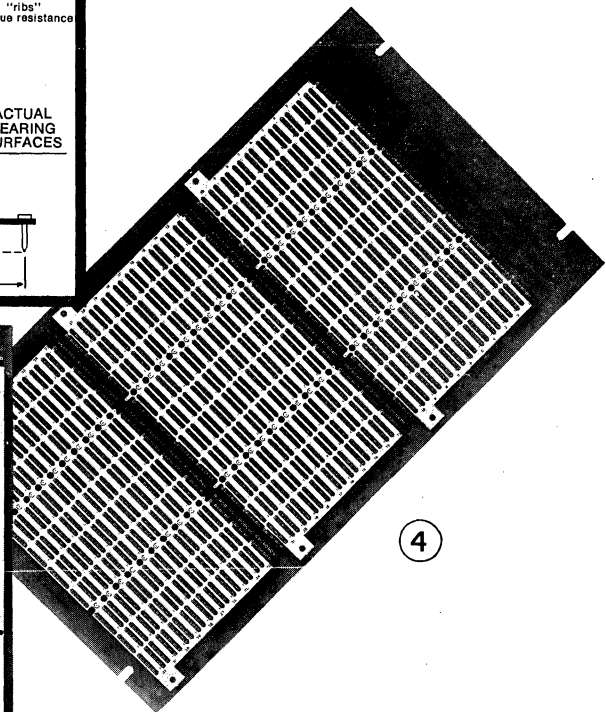
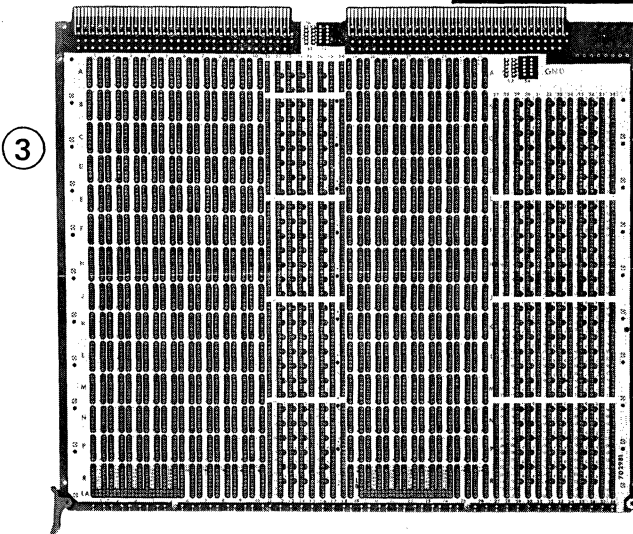
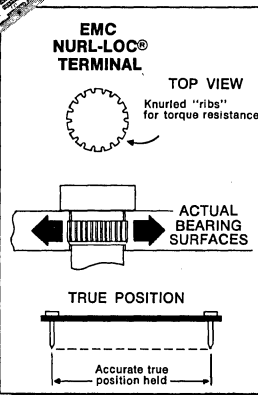
*U.S. Pat. No. D-223,109 Nurl-Loc® Electronic Molding Corp.
Wire-Wrap® Gardner-Denver Co.

1. $\frac{1}{16}$ " P.C.B., 9.9" X 10.2",
2,703 TERMINALS, 140 POSITIONS
2. $\frac{1}{16}$ " P.C.B., 14" X 14.6",
5,648 TERMINALS, 352 POSITIONS
3. $\frac{1}{8}$ " P.C.B., 13.9" X 16.4",
6,748 TERMINALS, 376 POSITIONS
4. $\frac{1}{8}$ " P.C.B., 10.48" X 19",
4,800 TERMINALS, 320 POSITIONS



**PATENTED Nurl-Loc®
MAKES THE DIFFERENCE**

**HERE'S WHY IT'S
TECHNICALLY SUPERIOR**



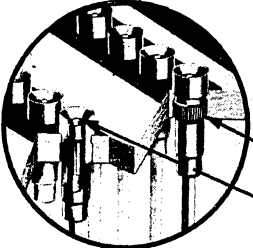
**If you are packaging IC's in any
volume, contact EMC for a fast
engineering appraisal.**



EMC

Interconnection Specialists

HIGH DENSITY NURL-LOC® I.C. PANEL IN 2 & 3 LEVELS OF WIRE-WRAP®



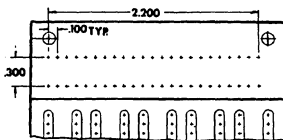
EMC Panels utilize non-warping, glass-epoxy board, in $\frac{1}{16}$ " or $\frac{1}{8}$ " thicknesses, 30 to 360 IC positions, with I/O sections of edgeboard tabs or connector clusters, power and ground planes, in many combinations.

NURL-LOC® Terminals (patented) prevent twisting during wrapping.

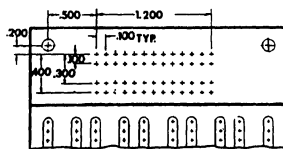
Funnel-Entry simplifies manual or automatic insertion of I.C. leads.

Consult factory for Customized Panels for any application.

INPUT / OUTPUT PINS



TYPE 'A' INPUT-OUTPUT CLUSTERS
46 PINS PER GROUP



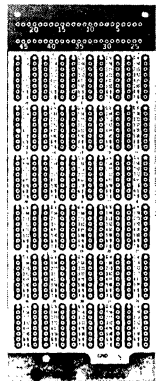
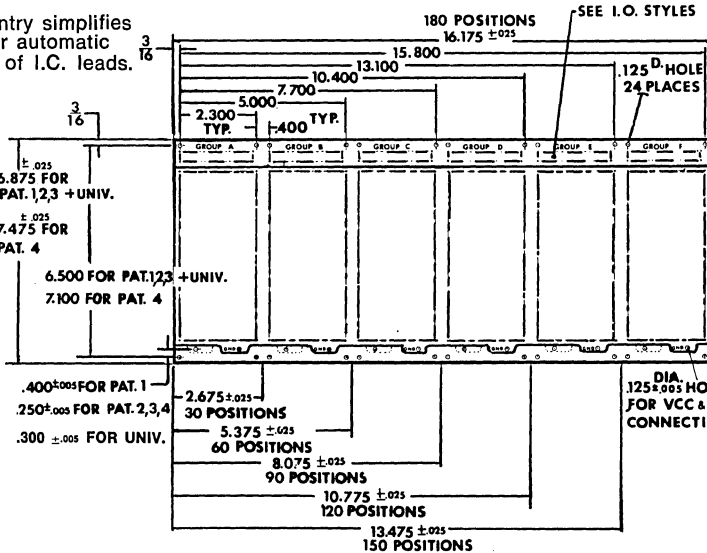
TYPE 'B' INPUT-OUTPUT CLUSTERS
52 PINS PER GROUP



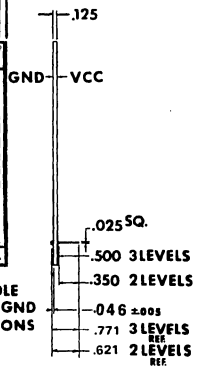
TYPE 'A' PIN



TYPE 'B' PIN

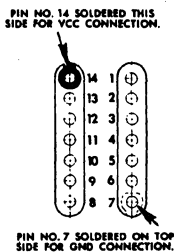


TYP. GROUP

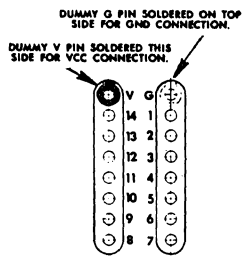


TYPE A
I/O SHOWN

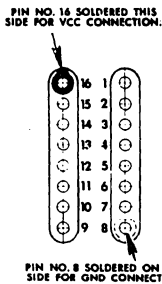
PATTERN STYLES: VCC (Bottom) Side Shown



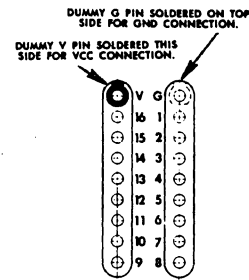
PATTERN #1



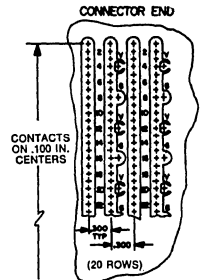
PATTERN #2



PATTERN #3



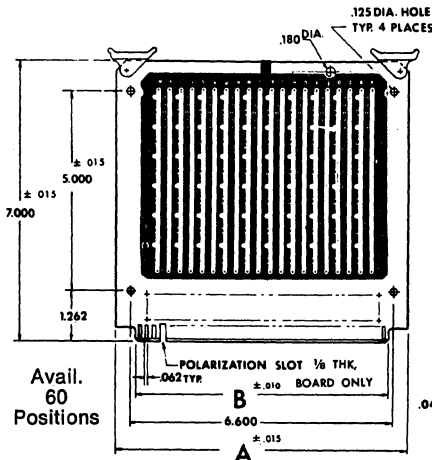
PATTERN #4



UNIVERSAL

PLUG-IN WIRE-WRAP I.C. PACKAGING PANELS

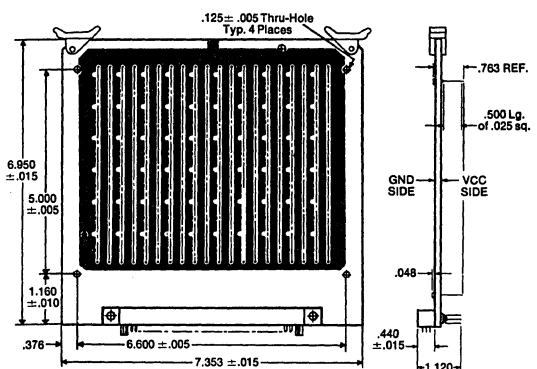
EDGE CONNECTOR SERIES with 120 contact fingers



BOARD THICKNESS	A	B
$\frac{1}{8}$	7.353	6.180
$\frac{1}{16}$	7.718	6.080

Patterns (Universal shown) and specifications as above. Mating connectors are available.

MOLDED 120-PIN CONNECTOR SERIES



Avail. 60 or 72 Positions

ELECTRONIC MOLDING CORP. 96 Mill St., Woonsocket, R. I. 02895

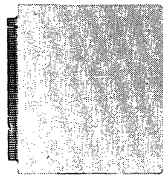
EMC PANEL ACCESSORIES

PANEL RACKS

for 1/8" and 1/16" IC Panels

Accommodate up to 13 IC Panels. Available as complete assemblies or separate elements. Back Panels include Nuri-Loc® Wire-Wrap® Terminals. Choice of flat or flanged (shown) end plates.

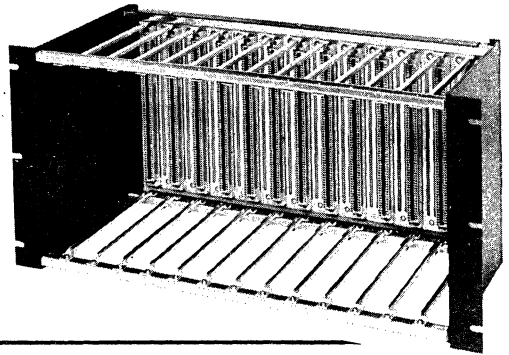
RACK MATERIALS: Side plates aluminum, black anodized. Guides steel, nickel plated. Bars steel, cadmium plated, gold plated.



BLANK CARD



EXTENSION CARD

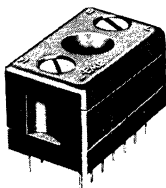


I.C. EXTRACTOR TOOL



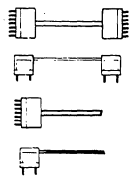
INTERFACING PLUGS

Top (shown) or side entry interconnect plugs.



CABLE ASSEMBLIES

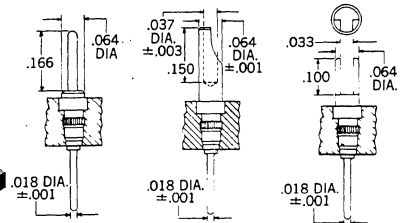
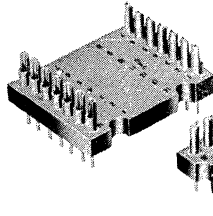
Using top or side entry plugs, 14 or 16 pins. Std. lengths 12", 18", 24" or 36". Custom assem. avail.



ADAPTOR PLUGS

for mounting discrete components into all EMC panels.

Glass-filled phenolic insulation will not melt during soldering. Six body configurations, each in 3 pin styles.



* Round Pin No. 7341-P23

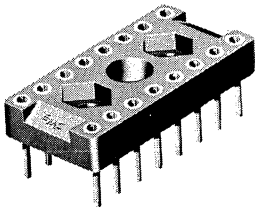
* Solder Pocket No. 7324-P23

* Slotted Pin No. 7342-P23

LO-PAC TRANSISTOR, IC DIP, AND OP AMP SOCKETS

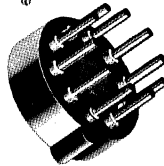
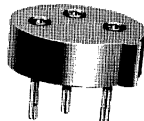
DIP SOCKETS

Avail. with 8 to 36 pins



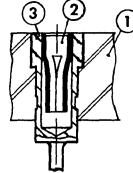
TO-5 OP AMP SOCKETS

Avail. with 3 to 12 pins



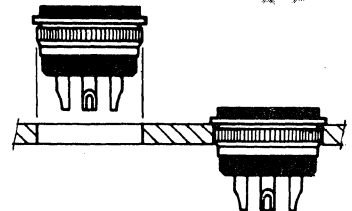
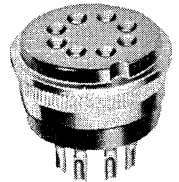
MATERIALS

1. INSULATION — Glass Filled Phenolic
2. CONTACT — Beryllium Copper .000030 Gold Over Nickel
3. TERMINAL — Brass .000030 Min. Gold Over Nickel, or Brass, Tin Plated



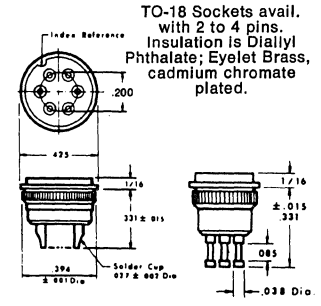
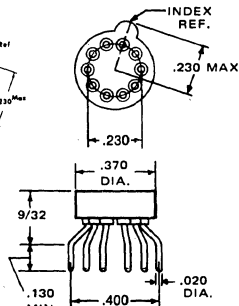
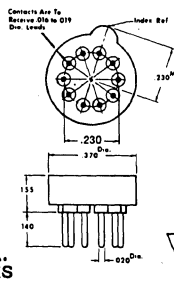
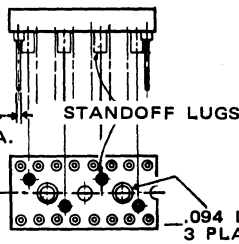
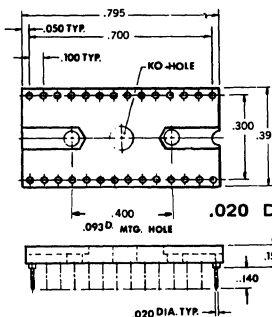
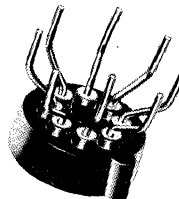
PRESS-IN TYPE NURL-LOC® MOUNTINGS

TO-5 Sockets Avail. with 3 to 12 pins



TO-5 TO-18 BENT LEAD SOCKETS

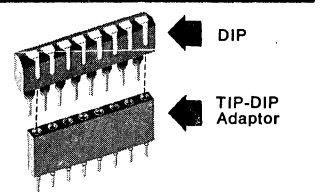
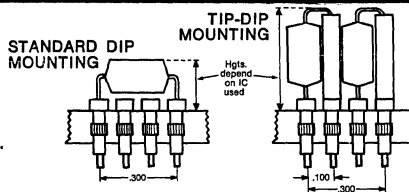
Avail. with 3 to 12 pins



NEW TIP-DIP™ IC PANELS

for Ultra-High Density Wire-Wrap® Packaging

Add new IC's without redesigning or tooling for new pc panel. Tip-Dip Panels fit existing racks. Press available for bending dip leads. Contact factory for complete details.



ELECTRONIC MOLDING CORPORATION

96 MILL STREET/WOONSOCKET, R. I. 02895 U.S.A.

PHONE (401) 769-3800 TWX 710-387-1350

Nuri-Loc®Trademark Electronic Molding Corporation

WIRE-WRAP®Trademark Gardner-Denver Co.



CONNECTORS, TERMINALS, SOCKETS



ELECTRONIC MOLDING CORPORATION

96 MILL STREET/WOONSOCKET, R. I. 02895 U.S.A.
PHONE (401) 769-3800 TWX 710-387-1350

SUPPLEMENT TO TERMINALS CATALOG NO. 73

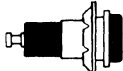
This ready-reference lists the most widely applied components from the catalog. For convenience in selection, each popular item is both pictorially shown and tabulated according to its specific plating, material and color combinations available for immediate delivery from stock.

For detailed specifications on components consult the catalog

page called out in the tabulation. Information on mounting tools is found on Page 3 of Catalog No. 73.

Contact the factory for details and catalog.

TYPE NO.	PART NO.	MTG. TOOL	PAGE
STANDOFF TERMINALS			
	2772-4-1	2873-2	8
	2772-14-1	2873-2	8
	4632-14-1	2873-1	8
	2938-14-1	2873-5	11
	2938-17-1	2873-5	11
	2939-14-1	2873-5	11
	2940-14-1	2873-5	11
105	5144-5-1	4408	16
FEED THRU			
119	5446-4-1	2873-1	15
FEED THRU-THRU HOLE			
	2497-4-1,-9	2873-1	8
	2598-4-1	2873-2	8
	2894-14-1	2873-3	14
	2925-4-1	2873-3	14
	2927-4-1	2873-3	14
	3097-4-1	2873-3	14
	4479-16-1	2873-3	14
	4487-4-1	2873-3	14
FEED THRU			
3	4639-4-1	2873-2	9
7	4616-4-1	2873-3	12
	4616-16-1	2873-3	12
	5129-4-1	2873-1	12
13	5979-4-1	2873-5	11
9	2819-5-1	2873-4	18
	2819-8-1	2873-4	18
135	5141-5-1	4408	18
ULTRA MINIATURE			
	4547-4-1	4126	17
	4547-14-1	4126	17
12	3337-4-1	4127	17
117	5428-17-1	4126	17
FEED THRU END HOLE			
6	2803-14-1	2873-3	10
8	2795-4-1	2873-1	13
	5128-4-1	2873-1	13
51	4338-67-0,-1	4665	18
THREADED NURL-LOC FEED THRU			
37	4179-148-1	4648	20
70	4806-165-1	4799	20
BINDING POSTS			
	5595-175-0,-2	—	21
MOLDED STANDOFF TERMINALS			
	2385-91-5	—	40
	2376-87-1	—	40
	2055-52-5	—	40
	4024-91-1	—	41
	2522-91-1	—	41
	2162-91-1	—	41
	5627-7-1	—	42
	5629-52-6	—	43
	4077-91-6	—	43
	2723-186-1	—	43
	4662-87-1	—	43
	5702-52-6	—	36
92	4551-91-1	—	44

TYPE NO.	PART NO.	MTG. TOOL	PAGE
TEST JACKS			
	6220-217-2	4882	23
	Also -3,-4,-5,-6	4882	23
85	6304-243-2	—	26
	Also -3,-4,-5,-6,-8 & -9	—	26
76	4836-165-0	4883	22
	Also -2,-4,-6	—	22
78	4928-113-9	4644	22
77	4879-125-0	—	24
	Also -2,-3,-4,-5,-6 & -9	—	24
104	5173-125-0	—	24
	Also -2,-5 & -9	—	24
	5173-143-2	—	24
88	5075-139-1 & -5	—	24
INSULATED SPACERS			
83	3329-53-5	—	53
84	3328-53-5	—	53
MIL-T-55155 TERMINALS			
	2989-52-0	—	30
	Also -1,-5,-6 & -9	—	30
	2990-52-5	—	30
THREADED FEED THRU			
32	4363-54-5	—	30
33	3376-67-1	—	30
MOLDED STANDOFF TERMINALS (cont.)			
	2014-91-1	—	31
	2014-67-1	—	31
	2020-5-1	—	31
	2503-186-6	—	32
	2310-67-1	—	38
Single turret	2333-91-1	—	38
	2013-91-1 & -5	—	38
	2019-91-1 & -5	—	38
	5684-52-6 & -9	—	38
	5684-186-6	—	38
	5685-52-6	—	38
	2321-91-5	—	38
	2037-91-1	—	38
	2003-91-1	—	45
	2003-255-1	—	45
	2762-255-1	—	45
	6051-52-6	—	45
	4602-255-1	—	45
	4604-255-1	—	45
	2304-91-1	—	48
Straight pin	Also -4,-5	—	48
	2840-91-1 & -5	—	48
	2308-91-1	—	48
	Also -4 & -5	—	48
	2308-209-1	—	48
	3340-91-1	—	48
	3340-52-1	—	48
	4999-33-1	—	48
	2871-91-5	—	48
Bifurcated	5774-52-6	—	51
100			



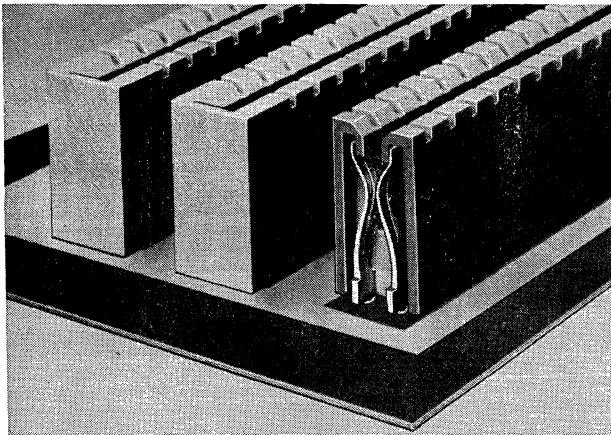
BACKPANEL CONNECTOR SYSTEMS

PACKAGING WITH EDGE-PAC® AND MULTI-PAC®

ELFAB CORPORATION exemplifies the concept of total back-panel packaging. Utilizing its own resources and technological development, ELFAB stands out as an innovative leader in solderless press-fit glass planar systems. All the elements of the back plane — printed circuit boards, contacts, plating and molding of insulators — are controlled and produced in

EDGE-PAC® SYSTEMS

The ELFAB EDGE-PAC® SYSTEM is a card edge backpanel concept which offers a bifurcated, pre-loaded, precision stamped contact rigidly mounted into a printed circuit board. The insulator is designed to lay over the contacts and is of a nature which permits unlimited sizes of connectors to be specified.



MULTI-PAC® SYSTEMS

The use of the MULTI-PAC® PROCESS on backpanels results in cost savings by the reduction or elimination of external wiring. The backpanel material is glass-epoxy board so that wiring can be etched on the surface in place of the external point-to-point wiring, thereby reducing costs. The MULTI-PAC® PACKAGING SYSTEM permits using up to eight planes of circuitry without the cost and problems of conventional multi-layer boards. Discrete two-sided, plated-thru boards are used and sandwiched together utilizing high force press-fit contacts, offering gas tight interfaces between the contacts and the plated-thru hole, in each board.

our modern facility. Our patented EDGE-PAC® and MULTI-PAC® P.C. connector backpanels were developed during 1968-69 and have been in production since early 1970. Our connector grid systems offer maximum design flexibility in replacing your existing discrete or metal plate connector assemblies.

The EDGE-PAC® Connector is designed to accept a .062 thick printed circuit card and terminates with a .025 square post on a .100, .125, .150, and .156 grid for automatic and semi-automatic wiring. Custom designed Backpanel Interconnect Systems can be specified using the design information shown below.

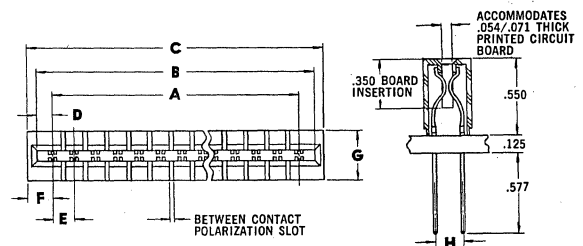
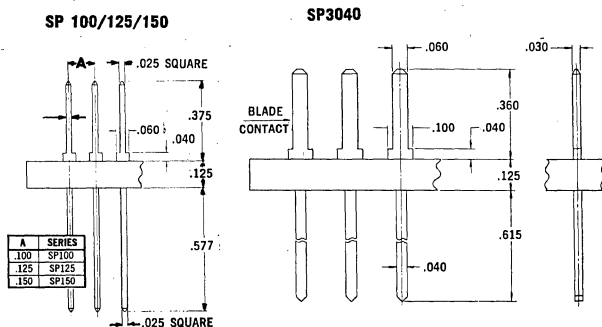
FEATURES

1. Contacts are press-fitted directly into a P.C. board, making the board or boards a structural part of the connector.
2. Contact is preloaded to guarantee minimum contact pressure under worst case conditions.
3. Ground planes, voltage buses and signal lands can be etched directly into the structural P.C. board member.
4. All or part of the wiring can be eliminated by etched circuits. See Multi-Pac® features.
5. Insulator is held on by interference fit with the base shoulder of each contact, therefore, allowing modular construction to give any length of connector desired without tooling.
6. Insulator design provides closed entry for complete protection of contacts.
7. Electrical connection is made between P.C. board and contact by press-fitting into plated-thru holes (no soldering required). Result is a highly reliable gas tight connection.
8. Connectors can be spaced at .375 minimum center to center for 1212, 1515 and 1562 Series.
9. The .025 square tail is positioned accurately for automatic wiring of backpanel assembly.
10. Total cost reduction.

CONNECTOR DESIGN PARAMETERS

SPACING AVAILABLE				DIMENSIONS						
Series	Grid Spacing	A	B	C	D	E	F	G	H	Polarizing Tab Part No.
EP1020	.100x.200	No. of Contacts Minus One Times E A + (2 Times D) A + (2 Times F)			.100	.100	.180	.382	.200	EP1022
EP1212	.125x.125				.115	.125	.180	.294	.125	EP1002
EP1225	.125x.250				.125	.125	.180	.354	.250	EP1227
EP1515	.150x.150				.145	.150	.210	.315	.150	EP1502
EP1562	.156x.200				.156	.156	.218	.294	.200	EP1563

SP SERIES I/O FEED THRU POSTS



Patent No. 3,660,726 3,676,926 3,671,917

ELFAB

762 WILEY POST ROAD / P.O. BOX 34555 / DALLAS, TEXAS 75234 / PHONE: (214) 233-3033

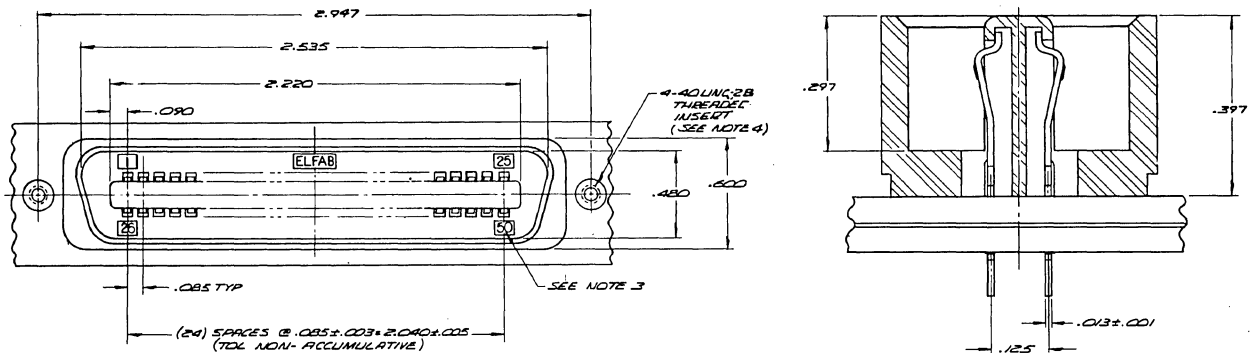
TELE-PAC™ 8500 Series

Telephone and Communications I/O Connectors

Developed by ELFAB as an extension of our reliable press-fit contact system, the 8500 series receptacle is mateable with standard telephone 25 pair connectors. Utilizing similar design fea-

tures of EDGE-PAC®, the contacts make solderless, gas tight connections with the plated-thru hole. Can be used with single, two and three board MULTI-PAC® SYSTEM assemblies.

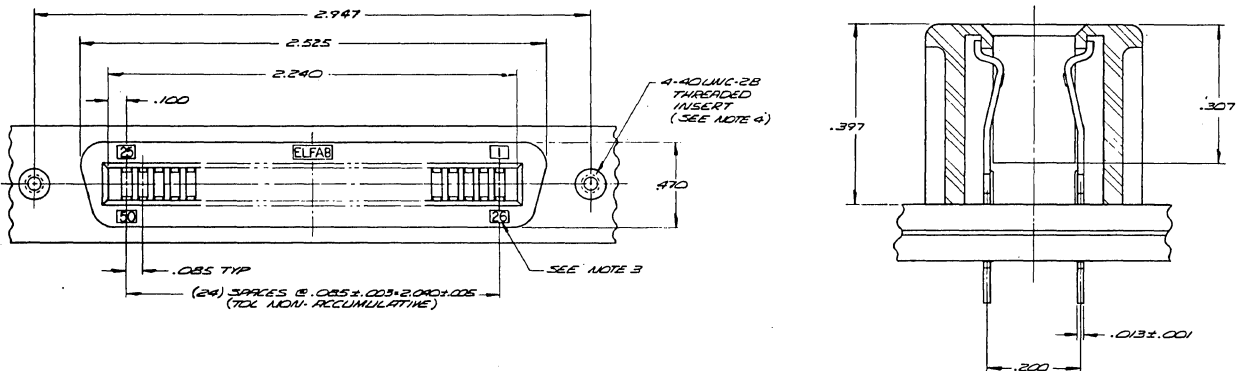
TP 8500-M



NOTES:

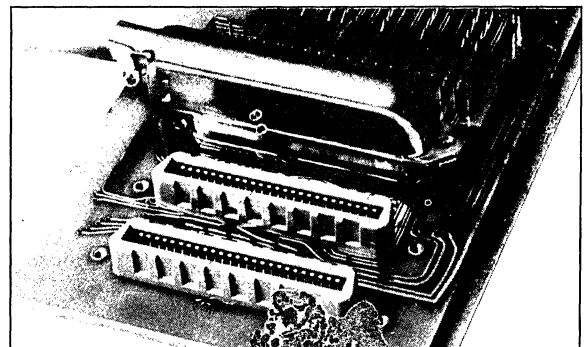
1. INSULATED MATERIAL: THERMOPLASTIC, POLYCARBONATE COLOR: GRAY
2. CONTACT MATERIAL & FINISH:
MATERIAL: PHOS BRONZE PER QQ-B-750
FINISH: GOLD PER MIL-C-45208 TYPE II
(.00010 MIN THK) GRADE C, OVER
NICKEL (.00003 MIN THK)
3. CHARACTERS ARE TO BE MOLDED (.06 HIGH,
RAISED (.003/.008) ON A .010 DEPRESSION
SURFACE. TO BE LOCATED AS SHOWN
4. MOUNTING OPTION FOR MATING PLUS
CONNECTORS IS THREADED INSERTS
NO. 4-40 INTO P.C. SUBSTRATE

TP 8500-F



Features

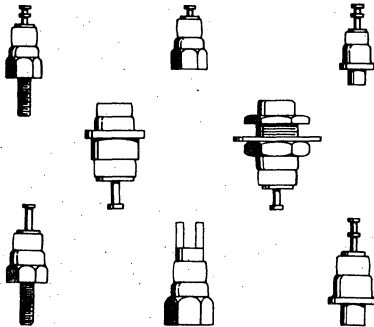
- Mates with telephone 25 pair connectors.
- Eliminates external wiring.
- Solderless interconnects.
- Complete repair of contacts and insulator.
- Reliable gas tight interface of contact and plated-thru hole.





manufacture and design of circuit components

Teflon[†] Insulated * One-Piece * Terminals and Test Jacks



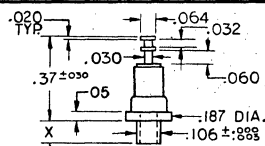
*** DELIVERY** Immediate—from stock on catalog items.

*** QUALITY** QPL facility, insuring highest product reliability. Complete traceability on all raw material and processes.

*** PRODUCTION** Precision Swiss automatic machines—long or short runs to customer design and specifications.

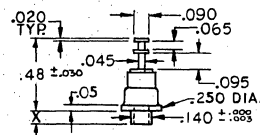
* ONE-PIECE *

Teflon[†] Insulated Male-Female Threads and Swage Types and Test Jacks



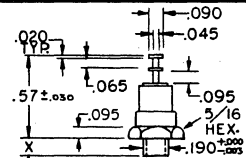
Single Turret also available
O/A Height above Board: .30 ±.030
P/N TS-111-A/-4

Part No.	X	Board Thickness
TS-112-A	.055	1/64
TS-112-0	.075	1/32
TS-112-1	.095	.050
TS-112-2	.105	1/16
TS-112-3	.135	3/32
TS-112-4	.165	1/8



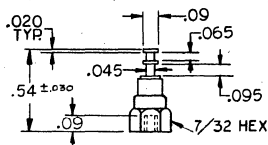
Single Turret also available
O/A Height above Board: .39 ±.030
P/N TS-231-0/-4

Part No.	X	Board Thickness
TS-232-0	.075	1.32
TS-232-1	.095	.050
TS-232-2	.105	1/16
TS-232-3	.135	3/32
TS-232-4	.175	1/8



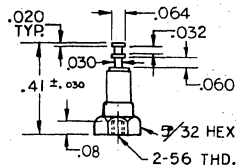
Single Turret also available
O/A Height above Board: .50 ±.030
P/N TS-351-0/-4

Part No.	X	Board Thickness
TS-352-0	.075	1/32
TS-352-1	.095	.050
TS-352-2	.105	1/16
TS-352-3	.135	3/32
TS-352-4	.165	1/8



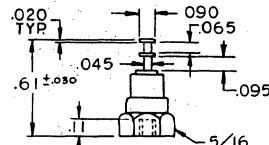
Part No.	Thread
TS-232-8F	4-40
TS-232-9F	6-32

Single Turret also available
O/A Length: .47 ±.030
P/N TS-231-8F/-9F



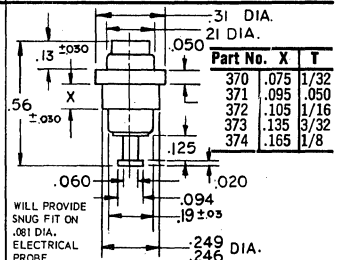
Part No.	Thread
TS-112-6F	2-56

Single Turret also available
O/A Length: .35 ±.030
P/N TS-111-6F



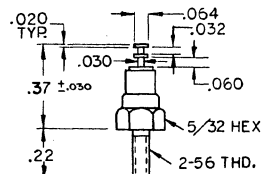
Part No.	Thread
TS-352-8F	4-40
TS-352-9F	6-32

Single Turret also available
O/A Length: .54 ±.030
P/N TS-351-8F/-9F



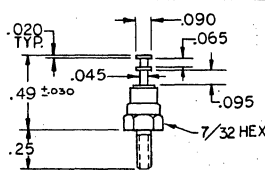
SWAGE TEST JACK
Available in 10 Standard E.I.A. colors

Part No.	X	Y
370	.075	1/32
371	.095	.050
372	.105	1/16
373	.135	3/32
374	.165	1/8



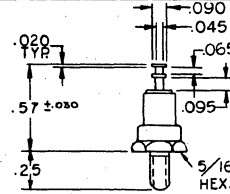
Part No.	Thread
TS-112-6M	2-56

Single Turret also available
O/A Height above Board: .34 ±.030
P/N TS-111-6M



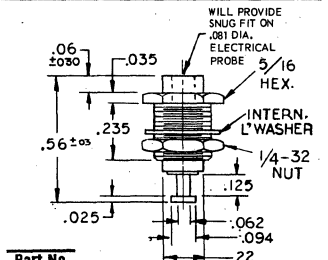
Part No.	Thread
TS-232-8M	4-40
TS-232-9M	6-32

Single Turret also available
O/A Height above Board: .42 ±.030
P/N TS-231-8M/-9M

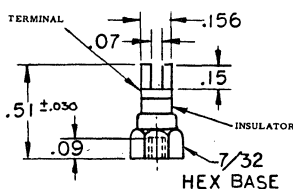


Part No.	Thread
TS-352-8M	4-40
TS-352-9M	6-32

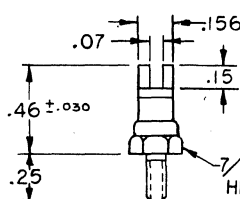
Single Turret also available
O/A Height above Board: .50 ±.030
P/N TS-351-8M/-9M



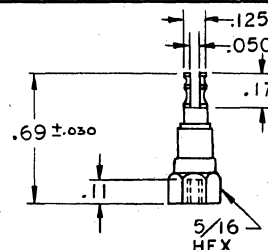
THREADED TEST JACK
Part No. 375



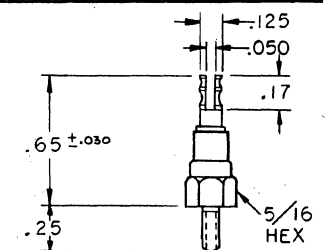
Part No.	Thread
TS-233-8F	4-40
TS-233-9F	6-32



Part No.	Thread
TS-233-8M	4-40
TS-233-9M	6-32



Part No.	Thread
338-2050	6-32



Part No.	Thread
335-2050	6-32



Teflon[†] Insulated * Press-Type * Terminals and Test Jacks

TEFLON[†]

(TFE-FLUOROCARBON) per MIL-P-19468 has outstanding mechanical and electrical properties over a wide range of frequencies and temperatures (-100°C to +250°C), extreme chemical inertness, high heat resistance, zero water absorption and complete anti-hesiveness which make it a superior insulation.

TERMINALS

MATERIAL: Half-hard Brass per QQ-B-626, Comp 22.

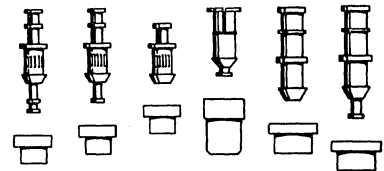
FINISH: Standard plating is Gold per MIL-G-45204. Other finishes supplied on request.

INSTALLATION TOOLS

Tools are available for all HIRAM JONES components. Specify Part Number and prefix "S." Example: S-602 Assembly Tool.

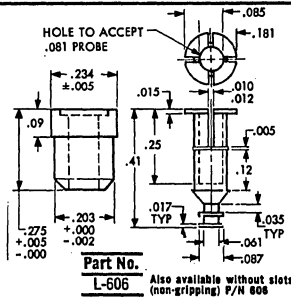
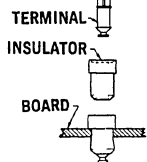
* PRESS-TYPE *

For simple, fast
economical installation



* PRESS-TYPE *

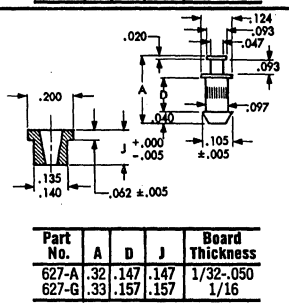
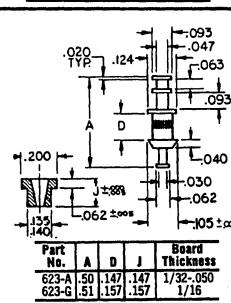
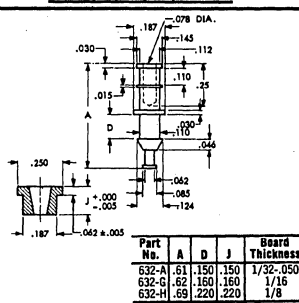
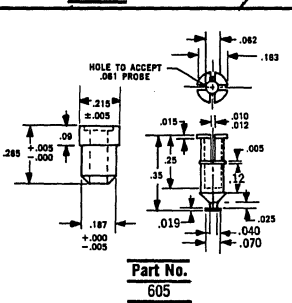
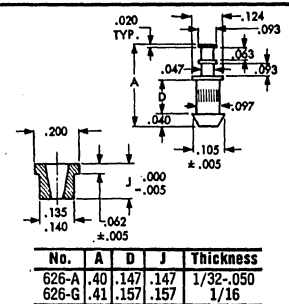
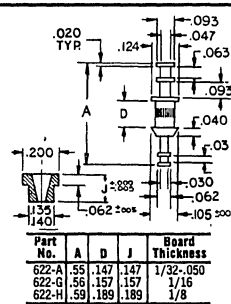
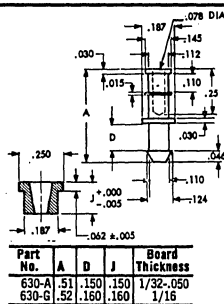
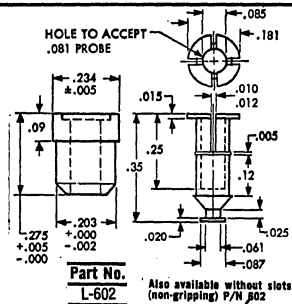
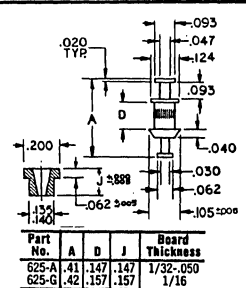
Teflon[†] Insulated Test Jacks



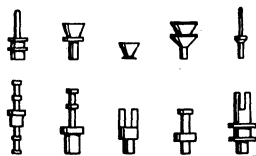
* PRESS-TYPE *

Teflon[†] Insulated Feed-Thrus and Standoffs

Available in Ten
Standard E.I.A.
Colors



Other Hiram Jones Products:
Non-Insulated Terminals, Test Jacks and Contacts
Printed Circuit, MS and MIL-T-55155 Terminals



11607 Vanowen Street
North Hollywood, California. 91605
(213) 875-0213

[†]Reg. Trademark, E.I. DuPont de Nemours and Co.



manufacture and design of circuit components



WIRE TERMINATION SYSTEM

Design Features

SOLDER-WICKING BARRIER

The design of HIRAM JONES 9W Wire Termination Systems provides a solder-wicking barrier, assuring flexibility of the wire and thus minimizing wire failures due to fatigue.

Wires are inserted in the 9W Crimp Terminals and crimped in place. Full engagement of the wire is determined by means of the inspection hole provided in each crimp terminal. The 9W Crimp Terminals are then attached to their mating Terminal Posts and soldered in place.

The entire termination is made without application of solder to the wire itself. It is, therefore, impossible for solder to "wick" up the wire.

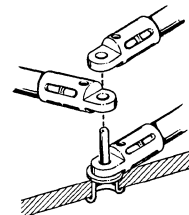
EQUIPMENT SERVICEABILITY

HIRAM JONES 9W Wire Termination System provides all the advantages of a hard wired system without the disadvantages of foreshortening of the service loop when disconnection and reconnection is required. The ease with which connec-

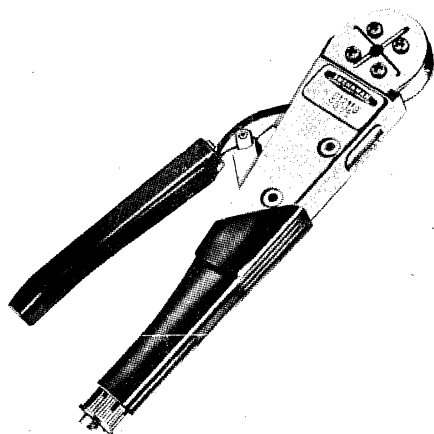
tions are made is a feature which is particularly advantageous in systems where connectors are undesirable, yet assemblies or sub-assemblies must be disconnected from time to time for service or replacement. To disconnect HIRAM JONES 9W Crimp Terminals, simply heat and lift off the mating terminal post. Reconnect by resoldering the 9W Crimp Terminals to the terminal post. Neither the mechanical nor electrical joint is affected by repeated removal and resoldering.

Increased Production Efficiency

By permitting pre-assembly of wires by unskilled operators, HIRAM JONES 9W Wire Termination Systems reduce production costs. Wires may be cut to length, stripped, and the 9W Crimp Terminals crimped in place. Final assembly consists of simply laying the pre-assembled Crimp Terminal on its mating terminal post and soldering in place.



MINIATURE MICROCRIMP TOOL



The 9W Miniature Microcrimp Tool (Buchanan No. 612118) is cycle-controlled to assure crimping to the selected depth. Once the crimping operation is started, the tool cannot be opened without completing its cycle.

9W LOCATORS — Specially designed locators are available for each of HIRAM JONES 9W Crimp Terminals. The use of one 9W Miniature Microcrimp Tool and the custom-designed 9W Locators is recommended to guarantee the precise crimp depth setting for each Crimp Terminal. When ordering, specify part number — i.e., 9W-206 Locator.

OCTADENT CRIMP — The 9W Miniature Microcrimp Tool produces an octadent configuration which provides uniform displacement of wire and crimp terminal material. The wire strands and the crimp terminal material are formed together in a solid mass with little or no reduction of the mil area of the wire strands.

CROSS-SECTION OCTADENT CONFIGURATION





HIRAM JONES

11607 Vanowen Street, North Hollywood, California 91605



WIRE TERMINATION SYSTEM COMPONENTS

CRIMP TERMINAL

AWG WIRE SIZES

MATING TERMINAL POST

9W-206

NO. 20 AND NO. 22

9W-507-1 STANDOFF
9W-507-5 STANDOFF
9W-510-1 FEED-THRU
9W-510-3 FEED-THRU

9W-207

NO. 24 AND NO. 26

9W-507-3 STANDOFF
9W-507-7 STANDOFF
9W-510-2 FEED-THRU
9W-510-4 FEED-THRU

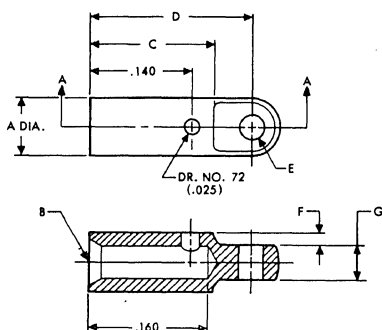
9W-230

NO. 16 AND NO. 18

MATERIAL: Brass per QQ-B-626, 1/2 Hard, Composition 22.

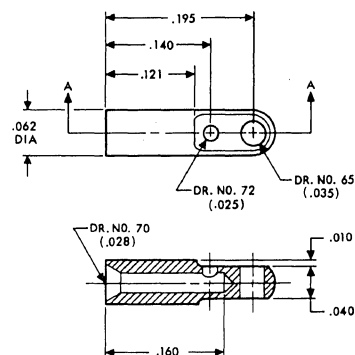
FINISH: Electrodeposited Solder Plate over Copper Plate.

CRIMP TERMINAL



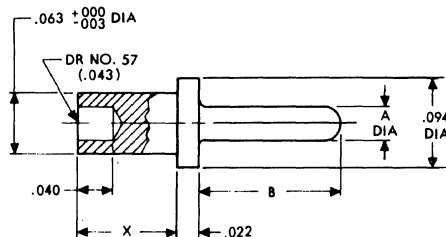
Part No.	A DIA.	B DRILL	C	D	E DRILL	F	G
9W-206	.078	$\frac{3}{4}$	.170	.220	.035	.017	.044
9W-230	.094	$\frac{1}{4}$	.175	.235	.046	.020	.054

CRIMP TERMINAL



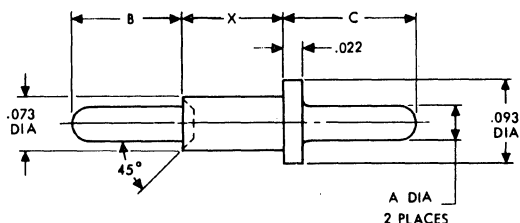
PART NO.
9W.207

STANDOFF TERMINAL



Part No.	A ±.001	B ±.010	X +.004 -.000	T
9W-507-1	.031	.187	.115	$\frac{3}{32}''$
9W-507-3	.041	.225	.115	$\frac{3}{32}''$
9W-507-5	.031	.187	.084	$\frac{1}{16}''$
9W-507-7	.041	.225	.084	$\frac{3}{16}''$

FEED-THRU TERMINAL



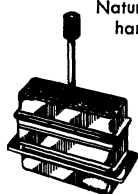
Part No.	A ±.001	B ±.010	C ±.010	X +.004 -.000	T
9W-510-1	.031	.187	.209	.115	3/32"
9W-510-2	.041	.225	.247	.115	3/32"
9W-510-3	.031	.187	.209	.084	1/8"
9W-510-4	.041	.225	.247	.084	1/8"

TOLERANCES: $\pm .005$ Unless Otherwise Noted.
X = Shank Length T = Board Thickness

Other Sizes Available.
Contact Factory.

HUGHES HIGH TECHNOLOGY CONNECTORS and CABLES FOR THE TOUGHEST JOBS.

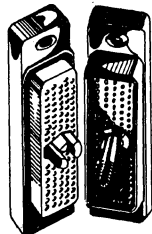
MINIATURE SERIES



Nature gives armadillos hard shell protection. We give it to our D series connectors. Stainless steel armor to keep 'em foolproof. They align perfectly. Fully environmental. 5 sizes.

- High density miniature using 20 gauge contacts.
- "Wrap-around" stainless steel shell for maximum protection in a minimum profile.
- Flanged or unflanged configuration.
- Contact arrangements of 18, 38, 66, 90, and 138 contacts.
- One-piece diallyl phthalate body.
- Silicone seals.
- Proven PolarHex center jackscrew.
- Available in non-environmental, environmental, and potting versions.

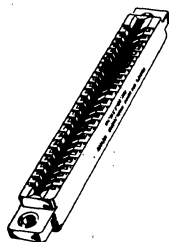
SUBMINIATURE SERIES



The way we make subminiatures, they're more subminiature. More fully packed. Same contact size and spacing, only we get 110 contacts to the inch.

- Highest contact density available — 110 size 22 contacts per square inch.
- Proven PolarHex center jackscrew coupling mechanism.
- Contact arrangement of 38, 88, 108, 132, and 244 contacts.
- Crimp removable front release, rear release, fixed contact and fixed filter contact — all intermatable.
- Available in non-environmental, environmental, and potting versions.

PRINTED CIRCUIT CONNECTORS



Miniature and subminiature printed circuit connectors in 10 sizes with 10 to 96 contacts. We're good at the numbers game.

- Withstand vibration, shock, and warping without losing electrical continuity.
- Bifurcated dual-socket contacts.
- 50 mil, 100 mil and 156 mil centers.
- Contact arrangements of 10, 20, 30, 40, and 50 positions, double readout (EPC submin. version).
- Contact arrangements of 15, 20, 30, 43, 48, and 68 positions, dbl. readout (EMS miniature, 100 mil ctrs; ERS miniature 156 mil ctrs).
- Bussing characteristics.
- Through or threaded mounting inserts available.
- PC board keying capabilities.

UNIVERSAL SERIES



You decide what goes where. The crimp removable contacts are interchangeable in either body. The big difference at Hughes is the positive way they get together. The PolarHex way.

- Pin and/or socket contacts in the same body.
- Proven PolarHex center jackscrew.
- Glass-filled diallyl phthalate body.
- Standard contacts and coax contacts in same body.
- 12 available configurations with up to a maximum of 321 contacts in a variety of combinations of #16, #18 and #20 gauge contacts and coax (or #8 gauge) contacts.

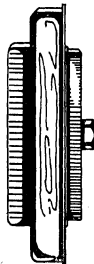
SUBMINIATURE BULLS-EYE SERIES



We invented the Bulls-Eye™ Connector and created a reputation as circular subminiature specialists. Shows you what a little concentration can do: 102 contacts in a #18 shell.

- Highest contact density in a circular subminiature with no decrease in contact spacing—50% to 200% higher density than comparable connectors.
- Mounts in standard MS cutouts.
- Proven PolarHex center jackscrew.
- Lightweight stainless steel shell; diallyl phthalate body.
- Standard MS configurations. But with differences in contact density: Six shell sizes/contact density arrangements: 8/14, 10/30, 12/48, 14/66, 16/72 and 18/102.
- Cable or flanged configurations.
- Crimp snap-in size 22 contacts.
- Available in non-environmental, environmental, and potting versions.

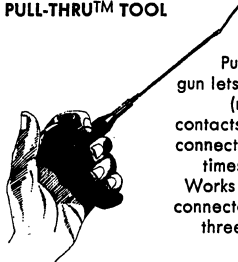
SUBMINIATURE FILTER CONNECTORS



Filter pin connectors in both rectangular and circular subminiatures. Nobody else guarantees a 100,000 to 1 reduction of RF energy.

- High contact density—110 size 22 crimp removable contacts/sq. in.
- Complete RFI protection.
- Glass-filled diallyl phthalate bodies.
- Proven PolarHex center jackscrew.
- Contact arrangements of 38, 88, 108, 132, and 244 contacts.
- Working voltage: 200 vdc (25° & 85°C) 150 vdc (—55° & 125°C) Dielectric Withstanding Voltage (HI-Pot): 500 vdc (for 5 sec, 50 ma max charging current). Feed-Thru Current: 3.0 amp. RF Current: 0.25 amp max. Insul. Resist.: 10,000 megohms, min. (After 2 min electrification at 200 vdc, 1 megohm current limiting resistor.). Capacitance: 1750 pf, nominal. Atten., min.: 40 db @ 100 MHz, 50 db @ 200 MHz to 10 GHz.

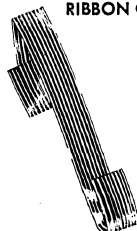
PULL-THRU™ TOOL



New Pull-Thru™ gun lets you pull (not push) contacts through connectors. Four times as fast. Works on many connectors. With three contact sizes.

- Covers three contact sizes: 16, 20, and 22 gauges.
- Permits desired contact cavity to be loaded from front face of connector.
- Grasps the contact body... not the wire — eliminating damage during insertion.
- Positive contact alignment through seals and block.
- Can use wire sizes equal in diam. to rear of the contact.
- Allows connector wiring at least four times faster than with conventional tools.

FLEXIBLE FLAT CABLE AND RIBBON CABLE



Contour Cable™ happened here first: Flexible circuitry. Flat, conductor cable. Ribbon cable. Custom cable/harness assemblies.

- Flat conductor cable in similar or varied cross sections—with uniform or non-uniform spacing, varying insulation thickness, with different insulation materials on the two sides.
- Flexible circuitry ideal for conductor system requiring circuits with 3-dimensional routing in a flat medium, or when point-to-point wiring must exhibit simple or complex flexibility in a flat plan—or both.
- Ribbon cable in 2 to 100 conductors wide. Sizes 22 to 28 AWG, solid or stranded, with color-coded PVC insulation.

A lot of companies can provide you with cables and connectors to solve your simple requirements. Including Hughes.

But if you're not sure about your needs, or if you require quality, don't gamble. Involve Hughes.

High technology through design excellence is our specialty. And it may even cost less in the long run.

Hughes Connecting Devices, 17150 Von Karman Avenue, Irvine, CA 92705. (714) 549-5701.

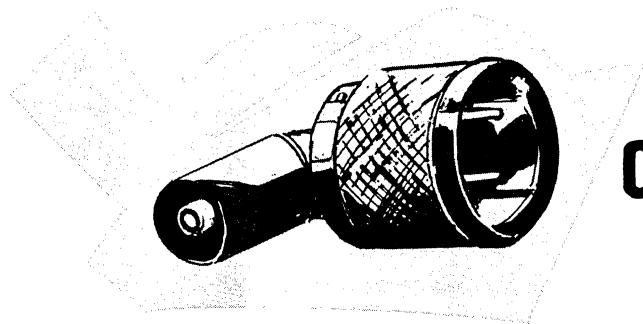
HUGHES

HUGHES AIRCRAFT COMPANY
CONNECTING DEVICES DIV.

CONNECTOR SELECTION GUIDE

This guide lists some of the more popular connector configurations, both standard and special.

It is designed to help you select the proper connector series and the appropriate catalog from which to specify your requirements. Determine your basic application: Rectangular, Rack/Panel, Circular, Microminiature, Printed Circuit, Input/Output, Filters, or Special Application connectors.



CANNON ITT

Go to the appropriate heading in the chart. Below each heading are several blocks listing the various connector series. Check these requirements with the data on the right side of each block. Write or telephone ITT Cannon Electric, 666 E. Dyer Rd., Santa Ana, California 92702, (714) 557-4700, for the proper catalog for detailed product data and ordering information, or consult your nearest ITT Cannon sales office.

Your Application Requirement

Rectangular Rack/Panel

D Subminiature Series economical D subminiatures for commercial/industrial application



D* — original D, solder contacts
D*C — general purpose economy
version of popular D Sub-
miniature; rear release of
crimp snap-in contacts

D*C CATALOG

For general military/aerospace application



D*M — monobloc insulator, solder
contacts
D*MA — rear release of crimp
snap-in contacts.
MIL-C-24308 — Full QPL

DM/DMA CATALOG

9-50 CONTACTS

Contact/Wire Size
20

Size 18-20 contacts
one #18 or two #20

CRIMP TERMINATION

9-50 CONTACTS

Contact/Wire Size
20

Coax. contacts avail.
SOLDER OR CRIMP
TERMINATION

DPX Series — small, rugged, general purpose, single gang



DPXA — single shell
DPXAF — float mount DPXA
DPXB — polarized ARINC shell
DPXL — large flange
DPXLF — float mount DPXL
DPXAMA — LITTLE CAESAR® contact
assembly
DPXAME — LITTLE CAESAR® contact
assembly environmental

2-106 CONTACTS

Contact/Wire Size
22
20
16
2
8
4

Coax. contacts avail.
SOLDER OR
CRIMP TERMINATION

DPGM/DPJM — general purpose, environmental



DPGM — short shell, economical
ring-type contact retention
DPJM — same as DPGM except
shell is longer
DPJMB — rear insertion/release
of crimp snap-in contacts

DPGM/DPJM CATALOG

12-98 CONTACTS

Contact/Wire Size
20
16
12

Coax. contacts avail.
CRIMP TERMINATION

DPX2 — two gang DPX



DPX2 — two gang DPX
DPX2A — ARINC A shell
DPX2B — ARINC B shell
DPX2MA — LITTLE CAESAR® contact
assembly
DPX2ME — LITTLE CAESAR® contact
assembly environmental

4-212 CONTACTS

DPK — high performance, environmental, MIL-C-B3733



Environmental sealing, thermal
resistant connector with rear release
of crimp snap-in contacts per
PV/KJ circular series.

DPK CATALOG

18-185 CONTACTS

Contact/Wire Size
12
16
20
22
22D

Coax. contacts avail.
CRIMP TERMINATION

DPX3 — three gang DPX



DPX3 — three gang DPX
DPX3MA — LITTLE CAESAR® contact
assembly
DPX3ME — LITTLE CAESAR® contact
assembly environmental

6-318 CONTACTS

DPX4 — four gang DPX



DPX4 — four gang DPX
DPX4MA — LITTLE CAESAR® contact
assembly
DPX4ME — LITTLE CAESAR® contact
assembly environmental

8-424 CONTACTS

DPX CATALOG

DJS — environmental, high density, rugged



Single gang, two gang, size 22D KJ
crimp snap-in contacts, miniature

DJS CATALOG

78-128 CONTACTS

Contact/Wire Size
22
24
26
28

CRIMP TERMINATION

DPD Series — general purpose single gang



DPD — standard rack/panel con-
nector with widest range
of contact arrangements
DPDMA — rear release of crimp
snap-in contacts

2-128 CONTACTS

(single gang)

4-256 CONTACTS

(two gang)

Contact/Wire Size

20
16
14
10
8
6
4
2
0

Coax. contacts avail.
SOLDER OR
CRIMP TERMINATION



— two gang DPD

DPD2 — two gang DPD
DPD2MA — two gang DPD with rear
release of crimp snap-in
contacts

DPD CATALOG

LEGEND

- Environmental version only
- Environmental versions available. Consult factory.
- Hermetic versions available. For information please write for applicable hermetic catalogs, or consult the factory.

Circular

KJ — subminiature high density, MIL-C-38999



Bayonet Coupling

High performance, high density, lightweight, compact, environment-resistant connectors; rear release of crimp snap-in contacts.

KJ CATALOG

3-128 CONTACTS

Contact/Wire Size

22M
22D
22
20
16

CRIMP TERMINATION

CVA — standard circular MIL-C-83723



Threaded Coupling

High performance, intermates with MIL-C-5015 thread coupled connectors. Environment and fluid resistant, rear release crimp snap-in contacts.

CVA/83723 CATALOG

1-48 CONTACTS

Contact/Wire Size

16
12
8
4
0

CRIMP TERMINATION

PV — miniature circular MIL-C-83723/MIL-0026482F



Bayonet Coupling

Mates with MIL-C-0026482F and NAS 1599 bayonet coupled connectors. High performance, environmentally sealed; fluid resistant; rear release crimp snap-in contacts

PV CATALOG

3-61 CONTACTS

Contact/Wire Size

20
16
12

CRIMP TERMINATION

K — standard lightweight, rugged general purpose



Quick Coupling

K — with special Acme thread coupling nut

K CATALOG

1-75 CONTACTS

Contact/Wire Size

20
16
14
10
8
6
4
2
0

Coax. contacts avail.
SOLDER TERMINATION

KPT/KPTM/KPSE — miniature general purpose, MIL-C-0026482F Series I



Bayonet Coupling

KPT — Solder termination
KPTM — Crimp contacts in DUAL-SHORE® insulator
KPSE — Crimp contacts in integrally molded insulator, front release.

KPT/KPTM/KPSE CATALOG

2-61 CONTACTS

Contact/Wire Size

20
16

SOLDER OR CRIMP TERMINATION

KO — rugged lightweight



Acme Threads

Miniature environmental version of standard K connector with special Acme threads.

MC CATALOG

3-50 CONTACTS

Contact/Wire Size

20
16
12

SOLDER TERMINATION

MC — subminiature, sealed connectors



Rugged

Designed to withstand severe handling and environmental conditions.

MC CATALOG

3-12 CONTACTS

Contact/Wire Size

20

SOLDER TERMINATION

MIL-C-005015F — standard circular, crimp



Threaded Coupling

The latest military design, high performance 5015 connectors with crimp removable contacts.

MS-005015 CATALOG

1-48 CONTACTS

Contact/Wire Size

16
12
8
4
0

CRIMP TERMINATION

MS — general purpose, MIL-C-5015



Threaded Coupling

MS-A — solid shell
MS-B — split shell
MS-E — environmental, cable clamp
MS-F — MSE with "O" ring
MS-R — environmental, endbell, and "O" ring

MS CATALOG

Note: Catalog also includes connectors for potting, bulkhead, quick disconnect and weatherproof applications.

1-100 CONTACTS

Contact/Wire Size

16
12
8
4
0

SOLDER TERMINATION
Crimp Term. Avail.
High Voltage Cartridges and Coax. Cartridges available.

CV — general purpose connector



Threaded Coupling

High performance connectors designed to MIL-C-5015; rear release crimp snap-in contacts.

CV CATALOG

1-48 CONTACTS

Contact/Wire Size

16
12
8
4
0

CRIMP TERMINATION

Microminiature

ALL MICROMINIATURE CONNECTORS USE TWIST PIN CONTACTS*

MICRO-D connectors

plastic shells



.050" Centers

- MD — Clip mounting, diallyl phthalate insulator
MDA — Clip mounting, polycarbonate insulator
MDB — Screw mounting, diallyl phthalate insulator
MDC — Screw mounting, polycarbonate insulator
MDN — Clip mounting, nylon insulator
MDNB — Screw mounting, nylon insulator

MD CATALOG

9-51 CONTACTS

Amps

3
SOLID OR STRANDED LEADS
SOLDER POT TERMINATION
(Fixed Contacts)

MICRO-D connectors

metal shells



.050" Centers

- MDM — Screw mounting, diecast aluminum shell, diallyl phthalate insulator, interfacial sealing printed circuit board, coaxial and power combination layouts available

MDM CATALOG

9-51 CONTACTS

Amps

3
SOLID OR STRANDED LEADS
SOLDER POT TERMINATION
(Fixed Contacts)

2D — double density D



- D subminiature shell and hardware; 19, 31, 52, 79 or 100 crimp removable contacts on .075" centers.

CENTI-LOC® connectors — strip



.075" or .100" Centers

- Low cost, commercial strip connector available in "yardage" form for up to 53 crimp snap-in contacts on .075" centers and up to 60 contacts on .100" centers.

CTA-2D CATALOG

19-100 CONTACTS

Wire Size

22 thru 30
CRIMP REMOVABLE

1-60 CONTACTS

Contact/Wire Size

22 thru 30
(P.C. tails avail.)
CRIMP REMOVABLE

MICRO-K connectors — circular



Threaded Couplings

- High density connectors on .050" centers; 75% smaller/80% lighter per contact than MIL-C-26482 types.

- MIK — Metal plug, plastic receptacle
MIKM — Metal shell



Push Pull Couplings

- High density miniature circular connectors on .050" centers with cable grip and grounding clamp.

MIKQ

MIK CATALOG

7-55-85 CONTACTS

Amps

3
SOLID OR STRANDED LEADS
(Fixed Contacts)

7-19 CONTACTS

Amps

3
SOLID OR STRANDED LEADS
(Fixed Contacts)

NANO connectors — strip and center jack screw



.025" Centers

- A high density connector using twist pins on .025" centers. Available in various configurations including center jackscrew version.

NC CATALOG

1-40 CONTACTS

Amps

1
SOLID OR STRANDED LEADS
WIRE SIZE #32 and smaller
(Fixed Contacts)

CENTI-K connectors — circular

Environmental



Bayonet Coupling

- 20% smaller/50% lighter than MIL-C-26482 type with same number of contacts. A high density connector using MIL-C-26482 hardware with contacts on .100" centers. Rear release.

- Non-environmental versions are available; consult factory.

CK CATALOG

10-32 CONTACTS

Amps

5
CRIMP REMOVABLE TERMINATION
Wire Size 22 thru 30

Printed Circuit/Input Output

ADAPTA-CON connectors



- Low-force receptacle and post interconnections for P.C. and I/O applications, custom made to any size or configuration, .025" square tail mounting plate posts for wire-wrapping termination.

ACBP CATALOG

UBC UP TO 130 CONTACTS

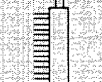
UBC UP TO 86 CONTACTS

Contact/Wire Size

24 thru 28

SOLDER, CRIMP
WIRE-WRAPPING
TERMINATIONS

EC connectors



- Economical, versatile, high reliability, pre-loaded removable "bifurcated" contacts and .025" square tails on .100" centers.

EC CATALOG

CONTACTS

22/24, 25/50,

30/60, 36/72,

43/86, 48/96

WIRE-WRAPPING
TERMINATION

ECS connectors



- Single-beam preloaded contacts on .100", .125" and .150" centers, mounted on custom-made precision-punched aluminum panels. Integrally molded card guides of 3/4" and 2" heights.

ECS CATALOG

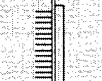
CONTACTS

Any number of

contacts available

WIRE-WRAPPING
TERMINATION

PRESS-T-MATE™ — backpanel packaging system



- Custom backpanel packaging using inherent reliability of P.C. interconnections with latest cardedge connectors, contacts in .100" x .100", .100" x .200", .125" x .125" and .125" x .250" center spacings feed-thru .025" post contacts are available.

PTM CATALOG

CONTACTS

By Request

WIRE-WRAPPING
TERMINATION

DL connectors



- Low mating force, high performance, cam-actuated spring contacts on .100" centers. I/O, cord-to-cord, cord-to-panel applications.

DL CATALOG

UP TO 156 CONTACTS

Contact/Wire Size

18 thru 30

CRIMP OR
WIRE-WRAPPING
TERMINATION

Dual In-Line Sockets for IC's



- Economically designed, low cost, low profile sockets that unplug. Size 14, 16, 24, 28, and 40 contact layouts in solder pin versions. Size 14 and 16 contact layouts with wire-wrapping terminations.

DICA CATALOG

14-40 CONTACTS

Amps

3

SOLDER OR
WIRE-WRAPPING
TERMINATIONS

MEB connectors — 2 pc. edgecard metal shells



- Mother/Daughter board, diecast aluminum shell on .050" centers for printed circuit edgecard applications to meet MIL-E-5400 "K"

MEB CATALOG

128 and 184 CONTACTS

Amps

3

SOLID OR STRANDED LEADS
PRINTED CIRCUIT
TERMINATIONS
WIRE WRAP TAILS
(Fixed Contacts)

50-MIL STRIP connectors



.050" or .100" Centers

- For edge mounting on PC boards and encapsulation in modules.

MTA — polycarbonate insulator

(up to 120 contacts)

MTB — diallyl phthalate

(up to 81 contacts)

MTN — Nylon insulation, up to 120 contacts (special configurations are available; consult factory)

MTA CATALOG

UP TO 120 CONTACTS

Amps

3

SOLID OR STRANDED LEADS
(Fixed Contacts)

Special Applications

AUDIO/ELECTRONIC connectors



Used on microphones, tape recorders, amplifiers, test instrumentation, computers and other low level circuit applications.

AUD CATALOG

CABLE TELEVISION connectors



All-weather resistant coaxial connectors used for CATV application. Exceptional long-life RFI leakage provided.

CATV CATALOG

LKTMA/B connectors



Designed for use in combination color/monochrome television cameras.

LKTMA/B CATALOG

MR — standard weatherproof, submersible



Rugged environmental MIL-C-5015 type, designed to MIL-C-12520B

Submersible

MR CATALOG

HIGH TEMPERATURE connectors



HRM — 1300° F, nuclear radiation-resistant miniature circular connector
CA-HR — 650° & 1000° F, radiation-resistant



Threaded Coupling

HT CATALOG

FIREWALL CONNECTORS



MS-K — 350° F, meets MIL-C-5015 fireproof test, crimp contacts
CA-KE — 350° F, moisture-resistant, for sealable wires, meets MIL-C-5015 fireproof test or 350° F continuous
FRF — Firewall connector with front release crimp snap-in MS90453, MS90454 contacts; moisture sealed, exceeds MIL-C-5015 fireproof requirements; 400°F continuous, 800°F shorter term.



Threaded Coupling

FW CATALOG

RF COAXIAL connectors



Plugs, jacks, receptacles, adapters, and terminations, microwave components, coaxial components, special cable assemblies.

RF CATALOG

FLEXIBLE ETCHED CIRCUIT CABLE systems



A design capability guide for flexible, semi-flexible, and rigid etched circuitry and its applications.

FDG CATALOG

FLAT FLEXIBLE CABLE terminations



Highly reliable, vibration-resistant cable assembly. Long flex life, effective shielding. Space and weight savings.

FCT CATALOG

SURE SEAL™ connectors



High performance, low cost environmentally sealed connectors with rugged multiple moisture seals. Meets automotive/industrial standards including vibration, shock, temp. cycling, salt water spray and immersion, petroleum derivatives, and industrial gases.

SS CATALOG

Filters — RFI/EMI

DPXJ



Rack/panel filter connectors in single, two, three or four gang shells interchangeable with standard DPX, DPXMA, DPXME and meets requirements of ARINC 404. Provide optimum attenuation of RFI/EMI.

FDPXJ CATALOG

D*J



Rectangular subminiature filter connectors interchangeable with standard D subminiature and MIL-C-24308 types. Optimum RFI/EMI attenuation provided.

FDJ CATALOG

PVJ



Bayonet Coupling

Miniature circular filter connectors provide optimum attenuation of RFI/EMI. KPJ equivalents to MIL-C-26482 types, KPAJ equivalents to MIL-C-83723 types for existing programs. PVJ new nomenclature

PVJ CATALOG

CONTACTS

Contact/Wire Size

22
20
16

Coax. contacts avail.
SOLDER TERMINATION
Consult factory for availability of crimp filter contacts.

CONTACTS

Contact/Wire Size

20

Coax. contacts avail.
SOLDER TERMINATION
Consult factory for availability of crimp filter contacts.

CONTACTS

Contact/Wire Size

20
16

SOLDER TERMINATION
Consult factory for availability of crimp filter contacts.

Other Special Connectors...

Battery connectors
Backplane assemblies
Buffet connectors
CAM-RAC™ modules
Cable television
Cupronickel connectors
Custom harnessing
Edgeboard connectors
Electrical interconnections
Environment-resistant connectors (see legend)
Hermetically sealed connectors (see legend)
High voltage contacts
Hydrospace connectors
Non-magnetic connectors
Nuclear penetrator connectors
Missile and space interstage and umbilical connectors
RFI shielding
Special finishes
Special insulator materials
Stainless steel connectors
Thermocouple contacts
Universal Interconnect System

DOMESTIC SALES/ ENGINEERING OFFICES

ALABAMA

Brandel-Stephens & Company, Inc.
Huntsville, 35802
Ph: 205/883-0445 • TELEX 59-4440

ALASKA: See Washington

ARKANSAS See Kansas (Wichita)
or Missouri

ARIZONA

ITT Cannon Electric
Phoenix, 85034
Ph: 602/273-0755 • TELEX 66-7327

CALIFORNIA

Recht Associates
Los Altos, 94022
Ph: 415/941-0336 • TWX 910-370-7454

ΔLo Dan Inc.

San Carlos, 94070
Ph: 415/592-4600

ITT Cannon Electric
San Diego, 92069
Ph: 714/743-4554

ITT Cannon Electric
Santa Ana, 92702
Ph: 714/557-4700

COLORADO

ΔCamel Electronics
Denver, 80222
Ph: 303/757-6191

ITT Cannon Electric
Englewood (Denver), 80110
Ph: 303/770-1631 • TELEX 45-5813

CONNECTICUT

ITT Cannon Electric
Tolland, 06084
Ph: 203/872-2119 • TELEX 99-399

DELAWARE: See Pennsylvania (Philadelphia)

FLORIDA (Northern)

Brandel-Stephens & Company, Inc.
Orlando, 32801
Ph: 305/425-3202 • TELEX 56-4419

FLORIDA (Southern)

Brandel-Stephens & Company, Inc.
Deerfield Beach, 33441
Ph: 305/427-8558 • TELEX 51-9397

GEORGIA

Brandel-Stephens & Company, Inc.
Atlanta, 30305
Ph: 404/261-7579 • TELEX 54-9644

IDAHO: See Colorado or Washington

ILLINOIS (Northern)

ITT Cannon Electric
Des Plaines, 60018
Ph: 312/297-3150 • TELEX 72-6461

ILLINOIS (Southern): See Missouri

INDIANA

ITT Cannon Electric
Muncie, 47302
Ph: 317/257-7879

IOWA: See Minnesota or Illinois

KANSAS

Thunderbird Technical Sales & Services, Inc.
Leawood, 66206
Ph: 913/642-7220

Thunderbird Technical Sales & Services, Inc.
Wichita, 67207
Ph: 316/684-3941

KENTUCKY: See Ohio (Kettering)

LOUISIANA: See Alabama

MAINE: See Massachusetts

MARYLAND: See Virginia (Alexandria)
for ITT Cannon

MASSACHUSETTS

ITT Cannon Electric
Swampscott, 01907
Ph: 617/729-8950 • TELEX 94-9401

MICHIGAN

ITT Cannon Electric
Detroit, 48240
Ph: 313/534-0360

MINNESOTA

ITT Cannon Electric
Minneapolis, 55420
Ph: 612/854-1973

MISSISSIPPI: See Alabama

MISSOURI

Thunderbird Technical Sales & Services, Inc.
St. Louis, 63141
Ph: 314/567-6488

MONTANA: See Washington

NEBRASKA: See Kansas (Leawood)

NEVADA: See California (Los Altos)
or Arizona

NEW HAMPSHIRE: See Massachusetts

NEW JERSEY: (Northern): See New York
(Elmsford)

NEW JERSEY: (Southern): See Pennsylvania
(Philadelphia)

NEW MEXICO: See Arizona

NEW YORK

Tri Tech Electronics, Inc.
Dewitt, 13214
Ph: 315/446-2881 • TWX 710-541-0604

Tri Tech Electronics, Inc.
Larchmont, 10538
Ph: 914/834-4423

Tri Tech Electronics, Inc.
East Rochester, 14445
Ph: 716/381-2722

ITT Cannon Electric
Elmsford, 10523
Ph: 914/592-2505

NORTH CAROLINA: See Georgia

NORTH DAKOTA: See Minnesota (St. Paul)

OHIO (Northern)

ITT Cannon Electric
Solon, 44139
Ph: 216/248-8800 • TELEX 98-5597

OHIO (Southern)

ITT Cannon Electric
Kettering, 45429
Ph: 513/434-8181 • TELEX 28-8051

OKLAHOMA: See Kansas (Wichita)

OREGON: See Washington

PENNSYLVANIA (Eastern)

Professional Service Associates
Feasterville, 19047
Ph: 215/355-6244 • TELEX 83-4506

PENNSYLVANIA (Western): See Ohio (Bedford)

SOUTH CAROLINA: See Georgia

SOUTH DAKOTA: See Minnesota

TENNESSEE: See Alabama

TEXAS

ITT Cannon Electric
Dallas, 75234
Ph: 214/661-0302/661-0303 • TELEX 73-0208

ITT Cannon Electric
Houston, 77035
Ph: 713/721-3999

UTAH: See Denver, Colorado

VERMONT: See Massachusetts

VIRGINIA

ITT Cannon Electric
Alexandria, 22304
Ph: 703/370-5733 • TELEX 89-674

WASHINGTON

ITT Cannon Electric
Bellevue (Seattle), 98005
Ph: 206/454-3903 • TELEX 32-9530

WASHINGTON, D.C.: See Virginia (Alexandria)

WISCONSIN (Eastern): See Illinois (Des Plaines)
For ITT Cannon

ΔDe Vos-Prinz Sales Corp.
Milwaukee, 53203
Ph: 414/272-0356

WISCONSIN (Western): See Minnesota

WYOMING: See Colorado

WEST VIRGINIA: See Ohio (Kettering)

REGIONAL SALES/ ENGINEERING OFFICES

Western Region
Merle McKinley, Manager

SANTA ANA, CALIFORNIA 92702
666 E. Dyer Road
Ph: 714/557-4700

Central Region
Robert Meade, Manager

DES PLAINES, ILLINOIS 60018
O'Hare Office Center
3166 River Road
TELEX 72-6461
Ph: 312/297-3150

Eastern Region
Steve Wilson, Manager

FORT WASHINGTON, PA 19034
200 Office Center, #106
275 Commerce Drive
TELEX 84-6442
Ph: 215/646-2801

U.S. FACTORIES

SANTA ANA, CALIFORNIA 92702
666 E. Dyer Road
TWX 910-595-1131
Ph: 714/557-4700

PHOENIX, ARIZONA 85034
2801 Air Lane
TWX 910-951-1325
Ph: 602/275-4792

SOLON, OHIO 44139
29000 Aurora Road
TWX 810-427-9404
Ph: 216/248-8800

Δ ETC Products Only

ITT CANNON ELECTRIC / 666 E. DYER ROAD / SANTA ANA, CALIFORNIA 92702

TELEPHONE: (714) 557-4700 / TWX: 910-595-1131 / TELEX: 65-5358

A DIVISION OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

AUTHORIZED DISTRIBUTORS

ALABAMA

HALL-MARK ELECTRONICS CORP.
Huntsville, 35805 Δ
Ph: 205/837-8700 • TWX 810-726-2187

ARIZONA

LIBERTY ELECTRONICS/ARIZONA
Phoenix, 85017 Δ BB
Ph: 602/257-1272 • TWX 910-951-4282

CALIFORNIA

CRAMER ELECTRONICS, INC.
San Diego, 92123 Δ
Ph: 714/565-1881 • TWX 910-335-1195

*KIERULFF ELECTRONICS, INC.

Los Angeles, 90022 Δ H
Ph: 213/685-5511 • TLX 691368

KIERULFF ELECTRONICS, INC.

Palo Alto, 94303 Δ D
Ph: 415/968-6292 • TWX 910-379-6430

*LIBERTY ELECTRONICS

El Segundo, 90245 Δ A
Ph: 213/322-8100 • TWX 910-348-7111

*RICHEY ELECTRONICS, INC.

Sun Valley, 91352 Δ R
Ph: 213/875-2862, 983-0222

*TIME ELECTRONICS WEST, INC.

Inglewood, 90301 Δ Z
Ph: 213/649-6900 • TLX 653511

LIBERTY ELECTRONICS/SAN DIEGO

San Diego, 92111 Δ BR
Ph: 714/565-9171 • TWX 910-335-2035

COLORADO

*CRAMER ELECTRONICS, INC.

Denver, 80222 Δ G
Ph: 303/758-2100 • TLX 45705

CONNECTICUT

*A.S.I./CONNECTOR CORPORATION

OF AMERICA
New Haven, 06511 Δ BC
Ph: 203/624-0127

FLORIDA

HALL-MARK ELECTRONICS CORP.
Orlando, 32809 Δ
Ph: 305/855-4020

GEORGIA

*ELECTRO AIR CORP.

Atlanta, 30325 Δ E
Ph: 404/351-3545 • TLX 542127

ILLINOIS

CRAMER ELECTRONICS, INC.
Mt. Prospect, 60056 Δ
Ph: 312/593-0230

RADIO DISTRIBUTING COMPANY, INC.

Chicago, 60635 Δ
Ph: 312/237-1105

HALL-MARK ELECTRONICS CORP.

Eik Grove Village, 60007
Ph: 312/437-8800 • TWX 910-222-2859

INDIANA

*RADIO DISTRIBUTING COMPANY, INC.

South Bend, 46624 Δ O
Ph: 219/287-2911 • TWX 810-299-2583

KANSAS

HALL-MARK ELECTRONICS CORP.

Lenexa, 66215 Δ
Ph: 913/888-4747 • TWX 910-749-6620

MARYLAND

SCHWEBER ELECTRONICS

Rockville, 20852 Δ BL
Ph: 301/881-3300

MASSACHUSETTS

CRAMER ELECTRONICS, INC.

Newton, 02159 Δ
Ph: 617/969-7700 • TLX 922486

SCHWEBER ELECTRONICS

Waltham, 02154 Δ B
Ph: 617/890-8484

*TIME ELECTRONICS/NEW ENGLAND

Woburn, 01801 Δ X
Ph: 617/935-8080 • TWX 710-393-0171

MINNESOTA

CRAMER/BONN

Minneapolis, 55435 Δ
Ph: 612/941-2770

HALL-MARK ELECTRONICS CORP.

Bloomington, 55431 Δ
Ph: 612/884-9056

MISSOURI

HALL-MARK ELECTRONICS CORP.

Earth City, 63045
Ph: 314/291-5350 • TWX 910-760-0671

NEW MEXICO

CRAMER ELECTRONICS, INC.

Albuquerque, 87108 Δ
Ph: 505/265-5767 • TWX 910-989-1679

NEW YORK

*A.S.I./PROGRESS ELECTRONICS CO., INC.

Plainview, L.I. 11803 Δ P
Ph: 516/433-1700 • TWX 510-221-1896

*SCHWEBER ELECTRONICS

Westbury, L.I. 11590 Δ S
Ph: 516/334-7474 • TWX 510-222-3660

*SUMMIT DISTRIBUTORS, INC.

Buffalo, 14202 Δ J
Ph: 716/884-3450 • TWX 710-522-1692

*TIME ELECTRONIC SALES

Hauppauge, L.I. 11787 Δ T
Ph: 516/273-0100 • TLX 967827

OHIO

RADIO DISTRIBUTING COMPANY, INC.

Cleveland, 44143 Δ
Ph: 216/461-9090

OKLAHOMA

HALL-MARK ELECTRONICS CORP.

Tulsa, 74145 Δ
Ph: 918/835-8458 • TWX 910-845-2290

PENNSYLVANIA

*TIME/MID-ATLANTIC

Clifton Heights, 19018 (Philadelphia) Δ N
Ph: 215/622-2500 • TLX 845317

PHILADELPHIA ELECTRONICS, INC.

Philadelphia, 19107 $\bullet$ BI
Ph: 215/568-7400

TEXAS

*HALL-MARK ELECTRONICS CORP.

Dallas, 75231 Δ M
Ph: 214/231-5101 • TWX 910-867-4721

HALL-MARK ELECTRONICS CORP.

Houston, 77042 Δ
Ph: 713/781-6100 • TWX 910-881-2711

*HARRISON EQUIPMENT CO., INC.

Houston, 77001 Δ AH
Phone: 713/224-9131 • TWX 910-881-2601

UTAH

CRAMER ELECTRONICS, INC.

Salt Lake City, 84115 Δ
Ph: 801/487-4131 • TWX 910-925-5958

WASHINGTON

KIERULFF ELECTRONICS, INC.

Seattle, 98108 Δ AT
Ph: 206/763-1550 • TWX 910-444-2034

WISCONSIN

CRAMER ELECTRONICS, INC.

Oak Creek, 53154
Ph: 414/764-1700 • TWX 910-262-3301

HALL-MARK ELECTRONICS CORP.

West Allis, 53214 Δ
Ph: 414/476-1270 • TWX 910-262-3083

* Bold face type indicates the main CAPS office.

Δ CAPS Distributor (Cannon Authorized Plug Specialist) Complete assembly facilities.

Δ CAPS Branch

$\bullet$ C.I.D. Distributor (Cannon Industrial Distributor). Limited assembly facilities.

Mint Mark Symbol used by Assembling Distributor.

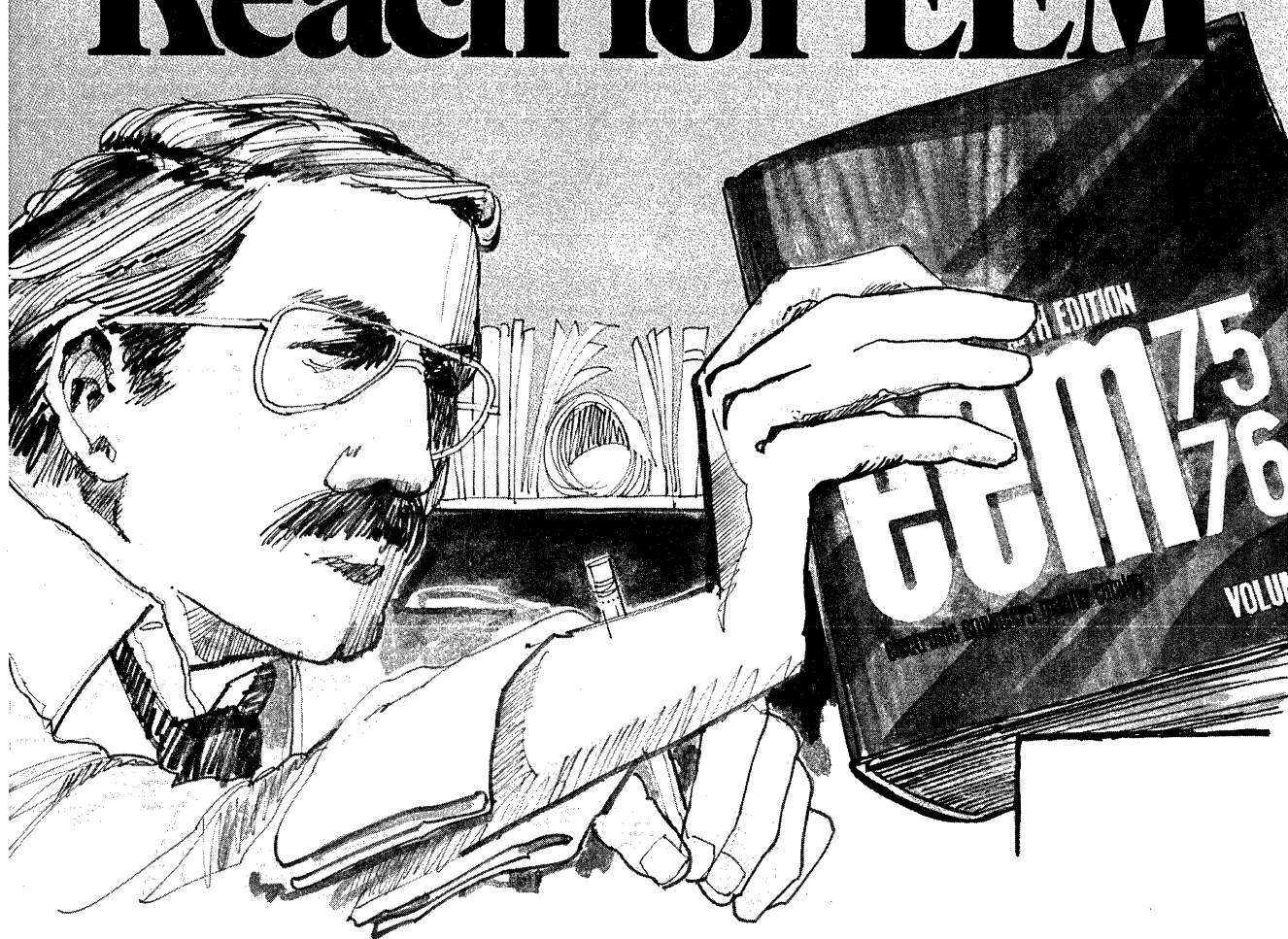
ITT CANNON ELECTRIC / 666 E. DYER ROAD / SANTA ANA, CALIFORNIA 92702

TELEPHONE: (714) 557-4700 / TWX: 910-595-1131 / TELEX: 65-5358

A DIVISION OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



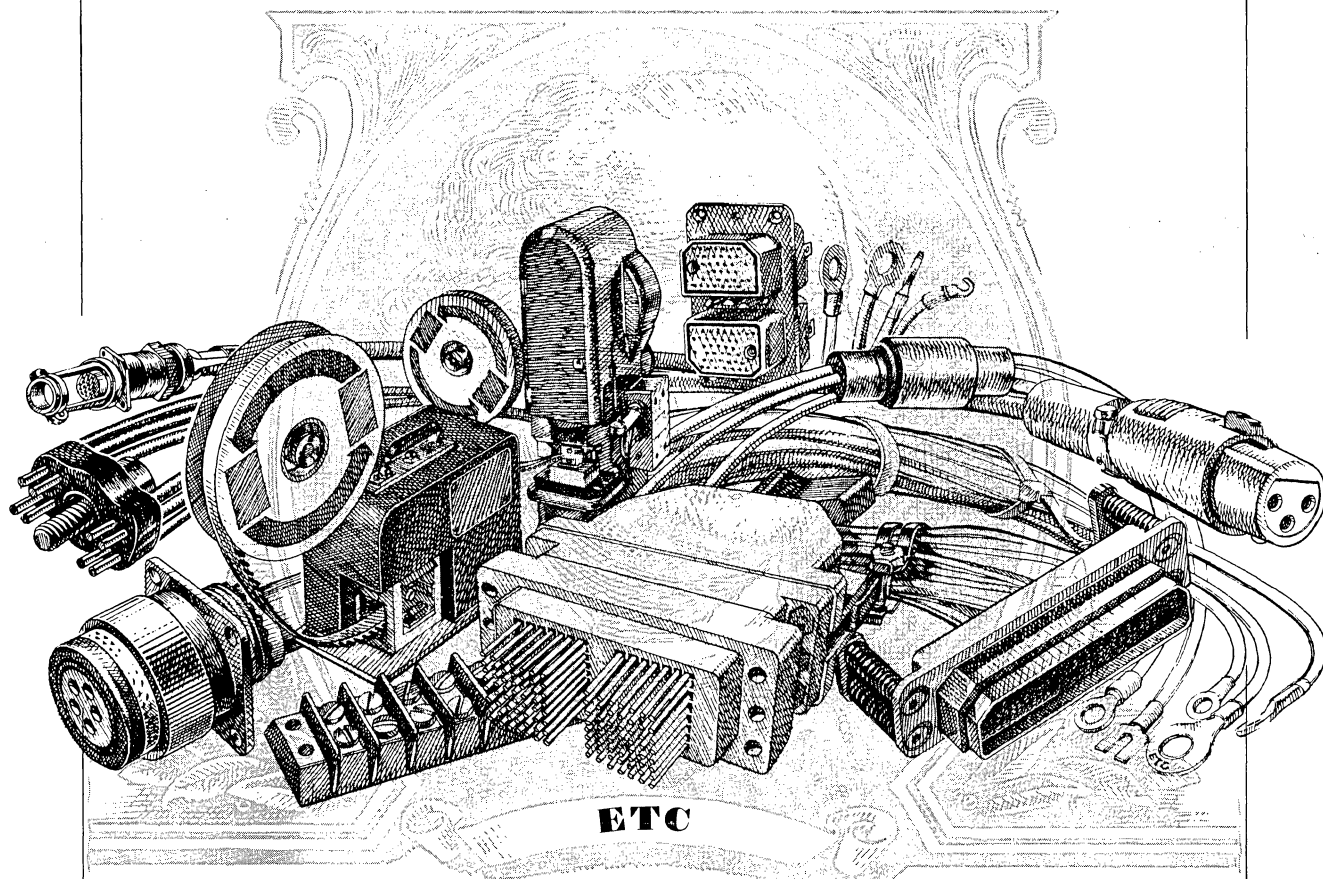
**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

ETC JOINS CANNON



Loose Piece Terminals • Continuous Strip Terminals • Barrier-type Terminal Blocks (closed and open back) • Cable Ties • Low-cost Commercial Connectors • Hand Crimp, Semi-automatic Tape & Continuous Strip Automatic Tooling.
With common marketing goals, distribution and

manufacturing techniques, the former ETC/ELECTRIX Division, leader in termination products, tooling and general purpose connectors, has been fully integrated as Cannon's new ETC Terminal Products Unit. Its products are available through a national network of stocking distributors. Now, in more areas than ever, the name to look for is Cannon.

For further information,

contact Cannon's ETC Terminal Products Unit, ITT Cannon Electric, 29000 Aurora Road, Solon, Ohio 44139; or ITT Cannon Electric, International Telephone and Telegraph Corporation, 666 E. Dyer Rd., Santa Ana, CA 92702. (714) 557-4700.

**CANNON
ENGINEERING
LOWERS
YOUR COST.**

CANNON ITT

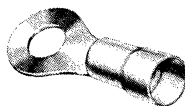
Connecting devices for every need

Terminals

- Wire Ranges: #26 thru #4/0 AWG, Loose Piece. Mounted on Tape or in Continuous Strips in #26 thru 10 sizes.
- Tongue Types: Ring, Rectangular, Spade, Flanged Spade, Hook, Slotted Ring and Snap Spade.
- Approvals: Terminals are covered by UL, CSA and Military Specifications, where Applicable.



AVIKRIMP® — Tin-plated brass sleeve strengthens barrel. Color coded Nylon insulating sleeve adds more wire protection. Operating temperatures: continuous duty — -40°F to 250°F, intermittent duty — to 350°F. WIRE RANGE: #26-10 Also available on tape.



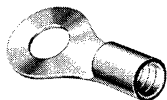
INSULKRIMP® — PVC insulation sleeve permanently attached to butted seam barrel (#22-10) or brazed seam barrel (#8-2). Operating temperatures: continuous duty — -40°F to 167°F, intermittent — to 300°F. WIRE RANGE: #22-2 Also available on tape.



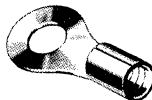
NYLAKRIMP™ — Ideal for larger wire applications involving temperature extremes and vibration. Rigid, overhanging Nylon insulating sleeve covers silver-brazed barrel. Withstands continuous duty temperatures from -60°F to 250°F. WIRE RANGE: #8-4/0



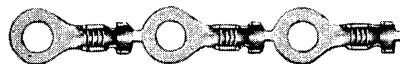
VIBRAKRIMP® — Made for excessive vibration applications. Seamless tin-plated brass sleeve covers basic KRIMPTITE barrel. Its overhang prevents wire flex. Single crimp terminates wire. WIRE RANGE: #22-10 Also available on tape.



VERSAKRIMP™ — Has silver brazed barrel. Seam will not open under stress or wire pull. Crimps using many types of tooling. Ideal for solid or stranded wires. WIRE RANGE: #22-4/0 Also available on tape.



KRIMPTITE® — One piece, non-insulated design. Ideal general purpose terminal for uses where special features are unnecessary. Full length barrel makes crimping easy. WIRE RANGE: #26-10 Also available on tape.



AUTOMATED STRIP AND TAPED TERMINALS, quick disconnects and magnet wire splices from #26 thru #10 AWG sizes. Popular tongue types, barrels insulated or open with insulation support. Quick disconnects available in straight or flag designs.

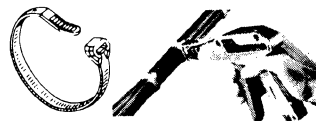
Quick Connects

- Female Receptacles and Male Tabs



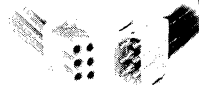
PDQ™ quick connect receptacle terminals handle 26-12 AWG wires and .110 x .020, .110 x .032, .187 x .020 and .250 x .032 inch male tabs. Insulated or non-insulated barrels. Available loose piece, on tape or continuous strip. Meet N.E.M.A. and U.L. standards. Male tabs and single or twin tab lugs are .250 thru .110 inches wide for PDQ female receptacles.

Cable Ties



NYLON CABLE TIES are one-piece self-locking straps that quickly and safely speed harness assemblies. Different sizes handle bundle diameters up to 4". Rugged application tools provide the right tension and cut ties flush with tie heads.

Connectors & Splices



GENERAL PURPOSE CONNECTORS quickly connect 1 to 36 circuits. Snap-in pin/socket contacts for #30-14 AWG wire sizes, .093 and .062 pin diameters. Molded nylon housing. Panel mounted or free hanging.



CLOSED-END CONNECTORS feature tin-plated connector insert protected by a translucent nylon insulation. A single crimp secures stripped wire. WIRE RANGE: #22-10



BUTT AND PARALLEL SPLICES — Stripped wires insert at each end of splice. A crimp at each end on butt splices, a single center crimp on parallel splices, provides a secure connection. Available in insulated and non-insulated styles. WIRE RANGE: #22-4/0.

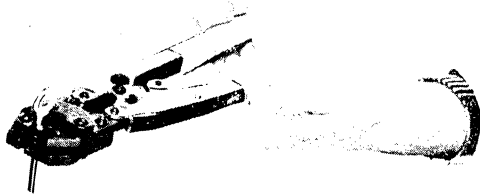
ETC Terminal Products Unit

CANNON ITT

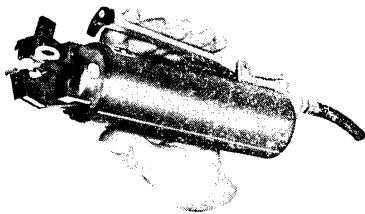
Connecting devices for every need

Crimping Tools

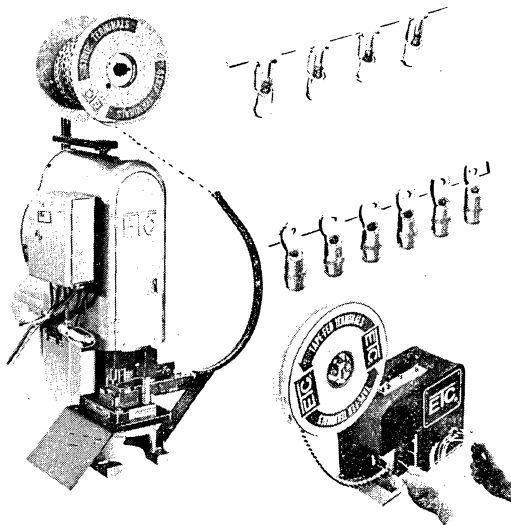
- Hand Operated and Semi-automatic
- ... Matched-to-terminal Designs ...
- Free 30-day Evaluation Trials



RATCHET HAND TOOLS — Special ratchet mechanism won't allow terminal to be released until fully crimped. Handles terminals and splices from #26 thru #10 AWG.



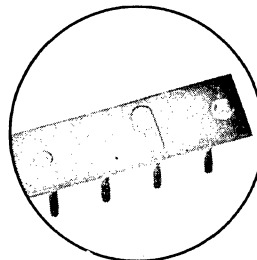
PORTABLE AIR TOOLS — 27 oz. AT-200 hand tool uses standard air pressure to crimp #26 thru #6 AWG terminals and splices. Bench adapter accessories available.



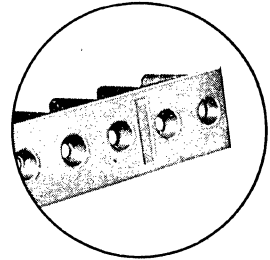
AUTOMATIC FEED TAPE AND STRIP PRESSES — Terminals are loaded into crimping dies automatically. Cycled for up to 3,600 terminations per hour. Crimps #26 thru #10 AWG sizes. Air and electrically operated models.

Terminal Blocks

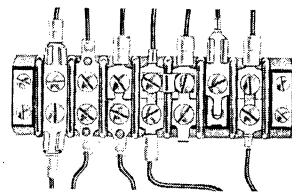
- Closed Back ... Open Back ... Military Blocks



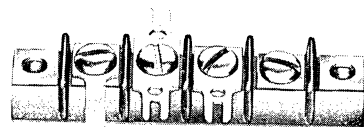
Closed Back



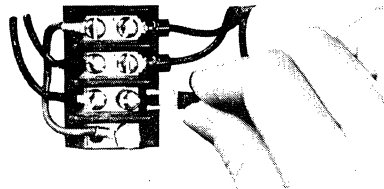
Open Back



TWIN SCREW — Choose closed back design with molded-in plates and protected mounting holes. Or open back design. Rated 5 to 30 amps. Complete selection of lugs and hardware.



SINGLE SCREW — These blocks weigh less and occupy less space. Same design features as their twin screw counterparts. 5 to 30 amp. rating. Full selection of lugs and hardware.



TERMINAL BLOCK TERMINALS — Match-fitting to blocks assures reliability in sizes 26 thru 10 AWG. Spade, Flanged Spade and Rectangular tongues are $\frac{3}{16}$ ", $\frac{1}{8}$ ", $\frac{2}{64}$ " or $\frac{2}{64}$ " wide.

ETC Terminal Products Unit
CANNON ITT

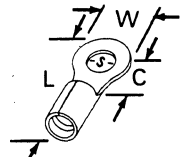
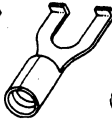
ETC[®]**SOLDERLESS TERMINALS**

Fig. A



B



C



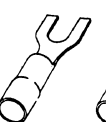
D



E



F



G



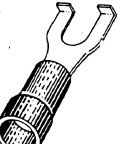
H



I



J



K

UNINSULATED TERMINALS**INSULATED TERMINALS****KRIMPIT[®]BUTTED SEAM BARREL RING TONGUE (Fig. A)**

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#26-24 AWG wire.				
M-1122-02	2	9/64	1/8	23/64
M-1113-04	4	11/32	7/32	31/64
M-1113-06	6	13/64	7/32	31/64
M-1118-06	6	1/4	19/64	37/64
M-1118-08	8	1/4	19/64	37/64
M-1118-10	10	1/4	19/64	37/64
#22-18 AWG wire.				
AA-120-04	4	7/32	5/32	27/64
AA-132-04	4	1/4	1/4	35/64
AA-120-06	6	7/32	5/32	27/64
AA-132-06	6	1/4	1/4	35/64
AA-132-08	8	1/4	1/4	35/64
AA-121-08	8	5/16	5/16	5/8
AA-121-10	10	5/16	5/16	5/8
#16-14 AWG wire.				
BB-123-06	6	1/4	7/32	1/2
BB-139-08	8	11/32	5/16	41/64
BB-137-10	10	5/16	9/32	39/64
BB-139-10	10	11/32	5/16	41/64
BB-125-14	1/4	15/32	13/32	51/64
BB-125-16	5/16	15/32	13/32	51/64

SPADE TONGUE (Fig. B)

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#26-24 AWG wire.				
M-1123-00	0	9/64	1/8	11/32
M-1116-02	2	3/16	7/32	31/64
M-1121-04	4	13/64	7/32	31/64

FLANGED SPADE TONGUE (Fig. C)

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#22-18 AWG wire.				
AA-115-06	6	19/64	7/32	17/32
AA-115-08	8	19/64	7/32	17/32

SNAP SPADE TONGUE (Fig. D)

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#22-18 AWG wire.				
AA-1190-06	6	1/4	1/4	5/8
AA-1191-08	8	9/32	1/4	5/8
AA-1192-10	10	21/64	1/4	11/16
#16-14 AWG wire.				
BB-1193-06	6	1/4	1/4	5/8
BB-1194-08	8	9/32	1/4	5/8
BB-1195-10	10	21/64	1/4	11/16

RECTANGULAR TONGUE (Fig. E)

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#22-18 AWG wire.				
AA-114-06	6	19/64	7/32	9/16
AA-114-08	8	19/64	7/32	9/16
#16-14 AWG wire.				
BB-113-06	6	19/64	7/32	49/64
BB-113-08	8	19/64	7/32	49/64
BB-188-10	10	21/64	1/4	5/8

SLOTTED RING TONGUE (Fig. F)

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#26-24 AWG wire.				
M-1120-06	6	1/4	19/64	37/64

VERSAKRIMP[®]BRAZED SEAM BARREL RING TONGUE (Fig. A)

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#22-18 AWG wire.				
A-320-04	4	7/32	5/32	33/64
AA-320-04	4	7/32	5/32	27/64
A-332-04	4	1/4	1/4	41/64
AA-332-04	4	1/4	1/4	35/64
A-320-06	6	7/32	5/32	33/64
AA-320-06	6	7/32	5/32	27/64
A-332-06	6	1/4	1/4	41/64
AA-332-06	6	1/4	1/4	35/64
A-332-08	8	1/4	1/4	41/64
AA-332-08	8	1/4	1/4	35/64
A-321-08	8	5/16	5/16	23/32
AA-321-08	8	5/16	5/16	23/32
A-321-10	10	5/16	5/16	23/32
AA-321-10	10	5/16	5/16	23/32
A-322-14	1/4	15/32	13/32	57/64
AA-322-14	1/4	15/32	13/32	57/64
A-322-56	5/16	15/32	13/32	57/64

VERSAKRIMP[®]BRAZED SEAM BARREL RING TONGUE

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#16-14 AWG wire.				
B-323-06	6	1/4	7/32	19/32
BB-323-06	6	1/4	7/32	1/2
B-337-08	8	5/16	9/32	45/64
BB-337-08	8	5/16	9/32	45/64
B-337-10	10	5/16	9/32	45/64
BB-337-10	10	5/16	9/32	39/64
B-339-10	10	11/32	5/16	47/64
BB-339-10	10	11/32	5/16	41/64
B-325-14	1/4	15/32	13/32	57/64
BB-325-14	1/4	15/32	13/32	51/64
B-325-56	5/16	15/32	13/32	57/64
BB-325-56	5/16	15/32	13/32	51/64
#12-10 AWG wire.				
C-328-10	10	3/8	5/16	3/4
C-330-14†	1/4	17/32	13/32	59/64
C-330-56	5/16	17/32	13/32	59/64
C-340-38	3/8	19/32	31/64	1. 1/32
#8 AWG wire.				
D-350-10	10	15/32	11/32	61/64
D-350-14	1/4	15/32	11/32	61/64

SPADE TONGUE (Fig. B)

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#22-18 AWG wire.				
AA-3109-02	2	3/16	13/64	1/2
AA-338-04	4	1/4	7/32	17/32
A-338-06	6	1/4	7/32	5/8
AA-338-06	6	1/4	7/32	17/32
A-334-06	6	19/64	7/32	5/8
AA-334-06	6	19/64	7/32	17/32
A-335-06	6	5/16	5/16	3/4
AA-334-08	8	19/64	7/32	17/32
A-335-08	8	5/16	5/16	3/4
AA-335-10	10	5/16	5/16	3/4
#16-14 AWG wire.				
B-324-06	6	19/64	7/32	5/8
BB-324-06	6	19/64	7/32	17/32
B-324-08	8	19/64	7/32	5/8
BB-324-08	8	19/64	7/32	17/32
B-327-10	10	23/64	9/32	3/4
BB-327-10	10	23/64	9/32	21/32
#12-10 AWG wire.				
C-341-08	8	3/8	5/16	25/32
C-341-10	10	3/8	5/16	25/32

FLANGED SPADE TONGUE (Fig. C)

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#22-18 AWG wire.				
A-315-06	6	19/64	7/32	5/8
AA-315-06	6	19/64	7/32	17/32
A-315-08	8	19/64	7/32	5/8
AA-315-08	8	19/64	7/32	17/32
#16-14 AWG wire.				
B-316-06	6	19/64	7/32	5/8
B-316-08	8	19/64	7/32	5/8
B-383-10	10	3/8	1/4	23/32

RECTANGULAR TONGUE (Fig. E)

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#22-18 AWG wire.				
A-314-06	6	19/64	7/32	5/8
A-314-08	8	19/64	7/32	5/8

VIBRAKIMP[®]INSULATION SUPPORT TIN PLATED BRASS SLEEVE SPADE TONGUE (Fig. G)

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#22-18 AWG wire.				
AA-434-06	6	19/64	7/32	11/16
AA-434-08	8	19/64	7/32	11/16

FLANGED SPADE TONGUE (Fig. H)

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#16-14 AWG wire.				
BB-416-06	6	19/64	7/32	11/16
BB-416-08	8	19/64	7/32	11/16
BB-483-10	10	3/8	1/4	25/32

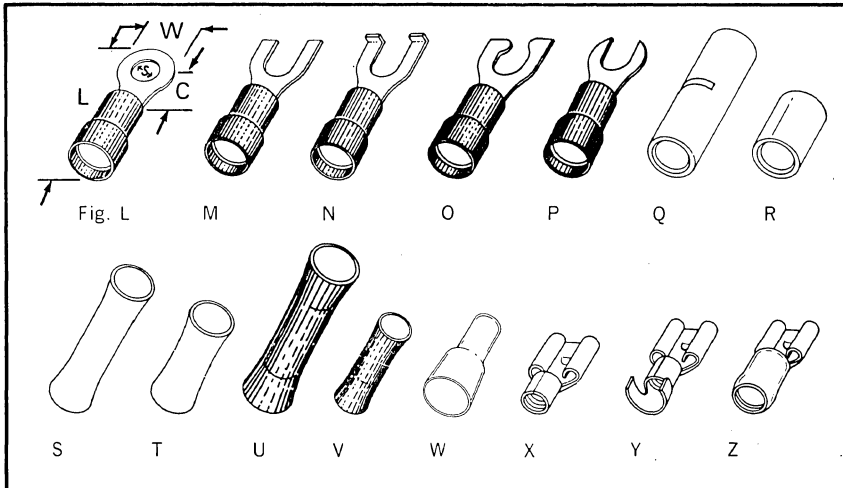
1500 terminals per reel.
Parts not available on tape.

INSULKRIMP[®]PVC INSULATION RING TONGUE (Fig. I)

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
#22-18 AWG wire.				
A-220-04X	4	7/32	5/32	45/64
AA-220-04X	4	7/32	5/32	5/8
A-232-04X	4	1/4	1/4	53/64
AA-232-04X	4	1/4	1/4	3/4
A-220-06X	6	7/32	5/32	45/64
AA-220-06X	6	7/32	5/32	5/8
A-232-06X	6	1/4	1/4	53/64
AA-232-06X	6	1/4	1/4	3/4
A-232-08X	8	1/4	1/4	53/64
AA-232-08X	8	1/4	1/4	3/4
A-221-08X	8	5/16	5/16	29/32
AA-221-08X	8	5/16	5/16	53/64
A-221-10X	10	5/16	5/16	29/32
AA-221-10X	10	5/16	5/16	53/64
A-222-14X	1/4	15/32	13/32	1. 5/64
AA-222-14X	5/16	15/32	13/32	1. 5/64
#16-14 AWG wire.				
B-223-06X	6	1/4	7/32	25/32
BB-223-06X	6	1/4	7/32	45/64
B-237-08X	8	5/16	9/32	57/64
BB-237-08X	8	5/16	9/32	27/32
B-228-08HDX†	8	3/8	5/16	1. 1/16
B-237-10X	10	5/16	9/32	57/64
BB-237-10X	10	5/16	9/32	13/16
B-239-10X	10	11/32	5/16	59/64
BB-239-10X	10	11/32	5/16	27/32
B-228-10HDX†	10	3/8	5/16	1. 1/16
A-225-14X	1/4	15/32	13/32	1. 5/64
BB-225-14X	1/4	15/32	13/32	1. 5/64
BB-225-56X	5/16	15/32	13/32	1. 5/64
#12-10 AWG wire.				
C-228-10X	10	3/8	5/16	1. 1/16
C-230-14X†	1/4	17/32	13/32	1.15/64
C-230-56X	5/16	17/32	13/32	1.15/64
C-240-38X	3/8	19/32	31/64	1.11/32
#8 AWG wire.				
D-650-10	10	15/32	11/32	1.17/64
D-656-10	10	3/8	11/32	1. 7/32
D-650-14	1/4	15/32	11/32	1.17/64
D-656-14	1/4	3/8	11/32	1. 7/32

SPADE TONGUE (Fig. J)

# 16-14 AWG wire.				
B-224-06X	6	19/64	7/32	13/16
B-224-08X	8	19/64	7/32	13/16
B-227-10X	10	23/64	9/32	15/16

ETC[®]**SOLDERLESS TERMINALS, SPLICES****INSULATED TERMINALS****AVIKRIMP[®] NYLON INSULATED VIBRATION SUPPORT RING TONGUE (Fig. L)**

26-24 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
M-8122-02	2	9/64	1/8	33/64
M-8113-04	4	13/64	7/32	21/32
M-8113-06	6	13/64	7/32	21/32
M-8118-06	6	1/4	19/64	3/4
M-8118-08	8	1/4	19/64	3/4
M-8118-10	10	1/4	19/64	3/4

22-18 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
A-520-04	4	7/32	5/32	45/64
AA-820-04	4	7/32	5/32	5/8
A-532-04	4	1/4	1/4	53/64
AA-832-04	4	1/4	1/4	3/4
A-520-06	6	7/32	5/32	45/64
AA-820-06	6	7/32	5/32	5/8
A-532-08	8	1/4	1/4	53/64
AA-832-08	8	1/4	1/4	3/4
A-521-08	8	5/16	5/16	29/32
AA-821-08	8	5/16	5/16	53/64
A-521-10	10	5/16	5/16	29/32
AA-821-10	10	5/16	5/16	53/64
A-522-14	1/4	15/32	13/32	1.5/64
A-522-56	5/16	15/32	13/32	1.5/64

16-14 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
B-523-06	6	1/4	7/32	25/32
BB-823-06	6	1/4	7/32	45/64
B-537-08	8	5/16	9/32	57/64
BB-837-08	8	11/32	7/32	57/64
B-537-10	10	5/16	9/32	57/64
BB-837-10	10	5/16	9/32	13/16
B-539-10	10	11/32	5/16	59/64
BB-839-10	10	11/32	5/16	27/32
B-525-14	1/4	15/32	13/32	1.5/64
BB-825-14	1/4	15/32	13/32	1
B-525-56	5/16	15/32	13/32	1.5/64
BB-825-56	5/16	15/32	13/32	1

12-10 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
C-828-10	10	3/8	5/16	1.3/64
C-830-14†	1/4	17/32	13/32	1.21/64
C-830-56†	5/16	17/32	13/32	1.7/32
C-840-38*	3/8	19/32	31/64	1.21/64

SPADE TONGUE (Fig. M)

26-24 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
M-8123-00	0	9/64	1/8	1/2
M-8116-02	2	3/16	7/32	21/32
M-8121-04	4	13/64	7/32	41/64

22-18 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
AA-8109-02	2	3/16	13/64	45/64
AA-838-04	4	1/4	7/32	47/64
A-538-06	6	1/4	7/32	13/16
AA-838-06	6	1/4	7/32	47/64
A-534-06	6	1/4	7/32	13/16
AA-834-06	6	19/64	7/32	47/64
A-535-06	6	5/16	5/16	15/16
A-535-08	8	5/16	5/16	15/16
A-535-10	10	5/16	5/16	15/16

16-14 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
B-524-06	6	19/64	7/32	13/16
BB-824-06	6	19/64	7/32	47/64
B-524-08	8	19/64	7/32	13/16
BB-824-08	8	19/64	7/32	47/64
B-527-10	10	23/64	9/32	15/16
BB-827-10	10	23/64	9/32	55/64

12-10 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
C-841-08	8	3/8	5/16	1.5/64
C-841-10	10	3/8	5/16	1.5/64

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
--------------	-------------	---------	----------------------------	----------

FLANGED SPADE TONGUE (Fig. N)

22-18 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
A-515-06	6	19/64	7/32	13/16
AA-815-06	6	19/64	7/32	47/64
A-515-08	8	19/64	7/32	13/16
AA-815-08	8	19/64	7/32	47/64

16-14 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
B-516-06	6	19/64	7/32	13/16
BB-816-06	6	19/64	7/32	47/64
B-516-08	8	19/64	7/32	13/16
BB-816-08	8	19/64	7/32	47/64
B-583-10	10	3/8	1/4	29/32
BB-883-10	10	3/8	1/4	53/64

SNAP SPADE (Fig. O)

22-18 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
AA-5190-06	6	1/4	1/4	53/64
AA-5191-08	8	9/32	1/4	53/64
AA-5192-10	10	21/64	1/4	57/64

16-14 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
BB-5193-06	6	1/4	1/4	53/64
BB-5194-08	8	9/32	1/4	53/64
BB-5195-10	10	21/64	1/4	57/64

SLOTTED RING (Fig. P)

26-24 AWG wire.

ETC Part No.	Stud Size S	Width W	Dimen., Inches Clearance C	Length L
M-8120-06	6	1/4	19/64	3/4

Max. Wire Insul. Dia.:

26-24: .075 # 16-14: .170

22-18: .140 # 12-10: .235

UNINSULATED SPLICES**VERSAKRIMP[™] SEAMLESS BUTT SPLICE (Fig. Q)**

ETC Number	Wire Range	Length Inch
AS-345*	22-18	21/32
BS-331*	16-14	21/32
CS-346*	12-10	13/16

PARALLEL SPLICE (Fig. R)

ETC Number	Wire Range	Length Inch
AS-302*	22-18	5/16
BS-304*	16-14	5/16
CS-303*	12-10	5/16

CRIMPING TOOL

ABC-550 for # 22-10 AWG, insulated and non-insulated terminals. Strips and cuts wire; slices bolts.

* Parts not available on tape.
 + Heavy duty parts have .050 copper stock in # 16-14 wire range and should be crimped by tooling.
 † 500 terminals per reel.

INSULATED SPLICES**INSULKRIMP[®] PVC INSULATED BUTT SPLICE (Fig. S)**

ETC Number	Wire Range	Length Inch	Max. Wire Insul. Dia.
A-245X†	22-18	1.1/64	.145
B-231X†	16-14	1.1/16	.175
C-246X†	12-10	1.15/16	.255

PARALLEL SPLICE (Fig. T)

ETC Number	Wire Range	Length Inch	Max. Wire Insul. Dia.
A-202X*	22-18	11/16	.145
B-204X*	16-14	11/16	.175
C-203X*	12-10	25/32	.255

NYLAKRIMP[™] NYLON INSULATED BUTT SPLICE (Fig. U)

ETC Number	Wire Range	Length Inch	Max. Wire Insul. Dia.
AS-N-345†	22-18	1.1/64	.120
BS-N-331†	16-14	1.1/16	.150
CS-N-346†	12-10	1.15/64	.210

PARALLEL SPLICE (Fig. V)

ETC Number	Wire Range	Length Inch	Max. Wire Insul. Dia.
AS-N-302*	22-18	5/8	.120
BS-N-304*	16-14	5/8	.150
CS-N-303*	12-10	5/8	.210

NYLON CLOSED END CONNECTORS (Fig. W)

ETC Number	Wire Range	Circular Mil Area
NC-2214*	22-14	600—5,180
NC-1610*	16-10	2400—13,100

QUICK DISCONNECTS**KRIMPITE[®] UNINSULATED BUTTED SEAM BARREL (Fig. X)**

ETC Number	Wire Range	Fits Tab Size,
AA-1140	22-18	.250 x .032
BB-1141	16-14	.250 x .032
P-1142	14-12	.250 x .032
AA-1137	22-18	.187 x .020
BB-1138	16-14	.187 x .020

VIBRAKRIMP[®] VIBRATION SUPPORT BARREL (Fig. Y)

ETC Number	Wire Range	Fits Tab Size,
AA-4176	22-18	.250 x .032
BB-4177	16-14	.250 x .032
P-4178	14-12	.250 x .032
AA-4173	22-18	.187 x .020
BB-4174	16-14	.187 x .020

Max. Wire Insul. Dia.:

22-18: .060/.125

16-14: .085/.145

14-12: .100/.175

AVIKRIMP[®] NYLON INSULATED AND VIBRATION SUPPORT (Fig. Z)

ETC Number	Wire Range	Fits Tab Size,
AA-8140	22-18	.250 x .032
BB-8141	16-14	.250 x .032
P-8142	14-12	.250 x .032
AA-8137	22-18	.187 x .020
BB-8138	16-14	.187 x .020

Max. Wire Insul. Dia.:

22-18: .125

16-14: .142

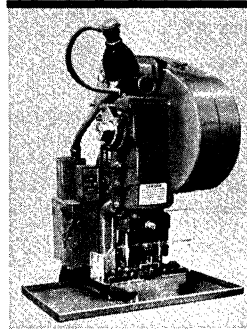
14-12: .170

TAPE-FED PARTS

Terminals, Splices and Quick Disconnects are available on Tape for automated crimping. To order Tape-Fed parts, suffix the part number with a "T". Example: A-320-04-T.

ETC Terminal Products Unit**CANNON ITT**

Here's a sampling of Connecting Devices from Cannon... and there's more where these came from!



Customer Tooling

Lower your *total installed cost* by installing a high speed crimping press and using continuous strip terminals, quick connects, blades, tabs and the other wire connecting devices shown.

Press shown with OSHA required guards and protective devices.

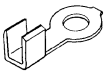
TERMINALS

#10 to #24 AWG. Non-insulated or with insulation supports where vibration is excessive. Tin and other platings available.

Ring Tongues



Part No. RX-20
Basic part: .020 brass,
#16-20 AWG.



Part No. RX-100
Basic part: .030 brass,
#14-18 AWG.

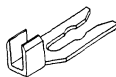


Part No. R-81
Basic part: .020 brass,
Insul. Range: .120-
.170, #14-18 AWG.

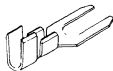


Part No. R-98
Basic part: .030 brass,
Insul. Range: .140-
.200, #10-12 AWG.

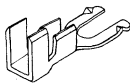
Spade Tongues



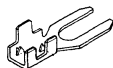
Part No. S-300
Marine Application
Basic part: .032 brass,
#12-16 AWG.



Part No. S-2
Standard Spade,
Basic part: .020 brass,
Insul. Range: .060-
.100, #18-20 AWG.



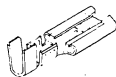
Part No. SG-17
Grip design tongue
Basic part: .025 brass,
Insul. Range: .130-
.180, #14-18 AWG.



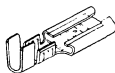
Part No. SP-60
Insulation Piercing for
Tele/Communication
Equip., Insul. Range:
.055-.090,
#20-24 AWG.

Quick Connects

General use on
appliances: fits .187
and .250 mating tabs.



Part No. Q-6
For .032 x .250 tab,
Insul. Range: .120-
.170, #14-18 AWG.



Part No. Q-95
For .188 x .020 tab,
Insul. Range: .090-
.130, #16-20 AWG.



Part No. QJ11
For .020 x .205 tab,
Insul. Range: .085-
.125, #18-22 AWG.



Part No. Q-25R
For .250 x .020 tab,
Insul. Range: .090-
.170, #16-20 AWG.

Automotive Connecting Devices

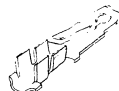
Wide range of devices
in wire ranges to cover
most applications.



Part No. MT-740
Multiple Connector
Insul. Range: .090-
.190, #12-18 AWG.



Part No. BC-55
Bulb Contact for
head/stop lights.
Insul. Range: .075-
.121, #18-16 AWG.



Part No. 89
Multiple Connector
Insul. Range: .075-
.160, #14-20 AWG.



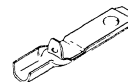
Part No. Q-220
Multiple Connector
for .250 x .032 tab,
Insul. Range: .109-
.187, #12-18 AWG.



Part No. F-60
Multiple Connector
Insul. Range: .090-
.190, #12-20 AWG.

Blades

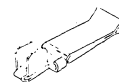
Male, female and grounding contact blades for
cord and live set mfgs; #14-20 AWG. Male
blades are available polarized.



Part No.
6MBHX44-247
Material: Brass
#16-20 AWG.

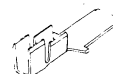


Part No.
11MBH44-250
Material: Brass
#18-20 AWG.

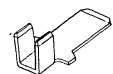


Part No. F-288
Wiper Blade, Material: Brass, #14-18 AWG.

Tabs



Part No. T-80
1/4 Male Tab,
with or without
insulation supports,
#14-18 AWG.



Part No. TX-83
.187 Male Tab,
with or without
insulation supports,
#14-18 AWG.

OTHER CONNECTING DEVICES



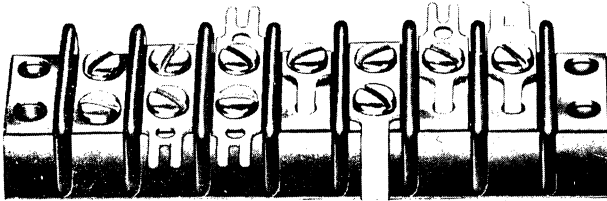
Part No. PF-401
Printed Circuit Contact
Insul. Dia: .065
#22 AWG.



Part No. CC-140
Crown Crimp
Screw Sizes: 6, 8, 10
#16-18 AWG.

ETC Terminal Products Unit
CANNON ITT

ETC[®] TERMINAL BLOCKS—CLOSED and OPEN BACK



STYLE A	STYLE B	STYLE C	STYLE D	STYLE E	STYLE F	STYLE G
Twin Screw	Standard Lug	Single Solder	Double Solder	Internal Feedthru	Solder/Internal Feedthru	Push-on/Internal Feedthru

ETC Terminal Blocks are available with closed or open backs. The part number tables on these pages show the closed back number. See tables for ordering open back version. Standard block material is general purpose phenolic. Other materials available that meet or exceed Mil. Spec. requirements: MIL-M-14F and MIL-M-19833.

Open Back Blocks are available with Lugs and Quick Disconnect Blades permanently riveted to the Block. Lugs available with rivets are: Double Solder Lug; Solder/Internal Feedthru; Push-on Internal Feedthru. To order riveted version, change first digit of Open Back Block from "2" to "1".

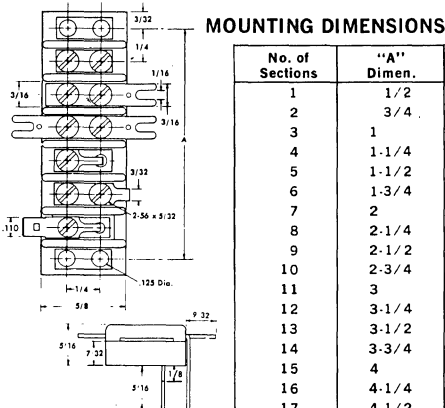
57000 SERIES: A 6-32 x 3/16" binder head screw version of the 27000 Series is available. Use 57000 in place of 27000.

67000 SERIES: A 6-32 x 3/16" binder head screw version of the 37000 Series is available. Use 67000 in place of 37000.

5 amp Twin Screw

CLOSED BACK ONLY: 1 to 26 terminal sections. (52 screws). Standard screws are 2-56 x 5/32" binder head brass nickel-plated.

No. Sections	A	B	C	D	E	G
1	33001	33101	33201	33301	33401	33601
2	33002	33102	33202	33302	33402	33602
3	33003	33103	33203	33303	33403	33603
4	33004	33104	33204	33304	33404	33604
5	33005	33105	33205	33305	33405	33605
6	33006	33106	33206	33306	33406	33606
7	33007	33107	33207	33307	33407	33607
8	33008	33108	33208	33308	33408	33608
9	33009	33109	33209	33309	33409	33609
10	33010	33110	33210	33310	33410	33610
11	33011	33111	33211	33311	33411	33611
12	33012	33112	33212	33312	33412	33612
13	33013	33113	33213	33313	33413	33613
14	33014	33114	33214	33314	33414	33614
15	33015	33115	33215	33315	33415	33615
16	33016	33116	33216	33316	33416	33616
17	33017	33117	33217	33317	33417	33617
18	33018	33118	33218	33318	33418	33618
19	33019	33119	33219	33319	33419	33619
20	33020	33120	33220	33320	33420	33620
21	33021	33121	33221	33321	33421	33621
22	33022	33122	33222	33322	33422	33622
23	33023	33123	33223	33323	33423	33623
24	33024	33124	33224	33324	33424	33624
25	33025	33125	33225	33325	33425	33625
26	33026	33126	33226	33326	33426	33626



ELECTRICAL RATING

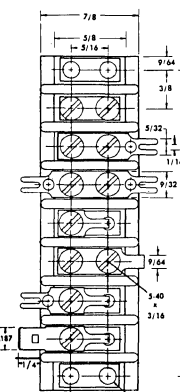
- Breakdown Volts RMS Closed Back ... 2500
- Rated Current (Amps) ... 5
- Rated Volts ... 100
- Suggested Wire Range with ETC Lug ... #26-22 AWG

No. of Sections	"A" Dimen.
1	1/2
2	3/4
3	1
4	1-1/4
5	1-1/2
6	1-3/4
7	2
8	2-1/4
9	2-1/2
10	2-3/4
11	3
12	3-1/4
13	3-1/2
14	3-3/4
15	4
16	4-1/4
17	4-1/2
18	4-3/4
19	5
20	5-1/4
21	5-1/2
22	5-3/4
23	6
24	6-1/4
25	6-1/2
26	6-3/4

15 amp Twin Screw

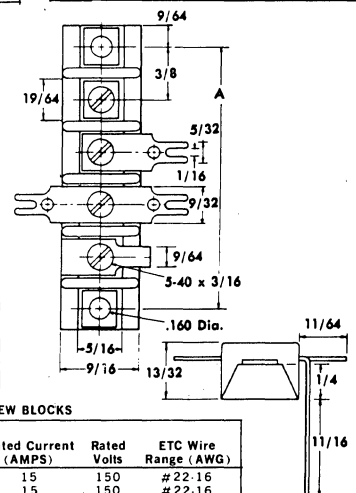
CLOSED BACK Part Numbers shown in table below. To order OPEN BACK version, replace first digit (3) with "2". Standard screw is 5-40 x 3/16" binder head brass nickel-plated.

No. Sections	A	B	C	D	E	F	G
1	37001	37101	37201	37301	37401	37501	37601
2	37002	37102	37202	37302	37402	37502	37602
3	37003	37103	37203	37303	37403	37503	37603
4	37004	37104	37204	37304	37404	37504	37604
5	37005	37105	37205	37305	37405	37505	37605
6	37006	37106	37206	37306	37406	37506	37606
7	37007	37107	37207	37307	37407	37507	37607
8	37008	37108	37208	37308	37408	37508	37608
9	37009	37109	37209	37309	37409	37509	37609
10	37010	37110	37210	37310	37410	37510	37610
11	37011	37111	37211	37311	37411	37511	37611
12	37012	37112	37212	37312	37412	37512	37612
13	37013	37113	37213	37313	37413	37513	37613
14	37014	37114	37214	37314	37414	37514	37614
15	37015	37115	37215	37315	37415	37515	37615
16	37016	37116	37216	37316	37416	37516	37616
17	37017	37117	37217	37317	37417	37517	37617
18	37018	37118	37218	37318	37418	37518	37618
19	37019	37119	37219	37319	37419	37519	37619
20	37020	37120	37220	37320	37420	37520	37620
21	37021	37121	37221	37321	37421	37521	37621
22	37022	37122	37222	37322	37422	37522	37622
23	37023	37123	37223	37323	37423	37523	37623
24	37024	37124	37224	37324	37424	37524	37624
25	37025	37125	37225	37325	37425	37525	37625
26	37026	37126	37226	37326	37426	37526	37626
27	37027	37127	37227	37327	37427	37527	37627
28	37028	37128	37228	37328	37428	37528	37628
29	37029	37129	37229	37329	37429	37529	37629
30	37030	37130	37230	37330	37430	37530	37630
31	37031	37131	37231	37331	37431	37531	37631



TWIN/SINGLE SCREW MOUNTING DIMENSIONS

No. of Sec.	"A" Dim.	No. of Sec.	"A" Dim.
1	3/4	17	6-3/4
2	1-1/8	18	7-1/8
3	1-1/2	19	7-1/2
4	1-7/8	20	7-7/8
5	2-1/4	21	8-1/4
6	2-5/8	22	8-5/8
7	3	23	9
8	3-3/8	24	9-3/8
9	3-3/4	25	9-3/4
10	4-1/8	26	10-1/8
11	4-1/2	27	10-1/2
12	4-7/8	28	10-7/8
13	5-1/4	29	11-1/4
14	5-5/8	30	11-5/8
15	6	31	12

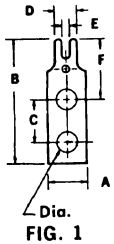


ELECTRICAL RATING FOR TWIN AND SINGLE SCREW BLOCKS

Term. Block Series	Breakdown Volts RMS Without Marker Strip	Breakdown Volts RMS With Marker Strip	Breakdown Volts RMS—Closed Back	Rated Current (AMPS)	Rated Volts	ETC Wire Range (AWG)
14000	1100	1200	—	15	150	#22-16
27000	1100	1200	—	15	150	#22-16
34000	—	—	3000	15	150	#22-16
37000	—	—	3000	15	150	#22-16

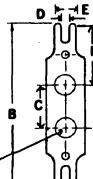
ETC[®] TERMINAL BLOCK LUGS, QUICK DISCONNECTS

Lugs available loose-piece. Prime quality brass. per Mil Spec QQ-B-613, hot-dip plated in electrolytic tin for easy soldering. Note in tables below that Lugs are for both Open and Closed back blocks.



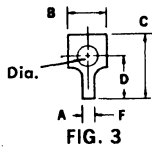
SINGLE SOLDER LUG, FIG. 1
FITS TWIN AND SINGLE SCREW BLOCKS

Fits Block No.	Lug No.	Dia.	A	B	C	D	E	F
14000, 34000	3401	.156	9/32	37/64	—	1/16	5/32	29/64
15000, 35000	3501	.162	5/16	47/64	—	1/16	3/16	37/64
16000, 36000	3601	.192	13/32	7/8	—	3/32	9/32	11/16
27000, 37000	3701	.156	9/32	57/64	5/16	5/32	1/16	29/64
28000, 38000	3801	.162	5/16	1. 5/32	27/64	3/16	1/16	37/64
29000, 39000	3901	.192	13/32	1. 3/8	1/2	9/32	3/32	11/16
33000	3301	.095	—	13/16	1/4	3/16	1/16	15/32



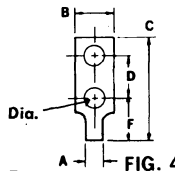
DOUBLE SOLDER LUG, FIG. 2
FITS TWIN AND SINGLE SCREW BLOCKS

Fits Block No.	Lug No.	Dia.	A	B	C	D	E	F
14000, 34000	3402	.156	9/32	29/32	—	1/16	5/32	29/64
15000, 35000	3502	.162	5/16	1. 5/32	—	1/16	3/16	37/64
16000, 36000	3602	.192	13/32	1. 3/8	—	3/32	9/32	11/16
27000, 37000	3702	.156	9/32	1. 7/32	5/16	5/32	1/16	29/64
28000, 38000	3802	.162	5/16	1. 37/64	27/64	3/16	1/16	37/64
29000, 39000	3902	.192	13/32	1. 7/8	1/2	9/32	3/32	11/16
33000	3302	.095	—	1. 3/16	1/4	3/16	1/16	15/32



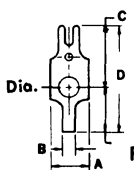
INTERNAL FEEDTHRU LUG, FIG. 3

Fits Block No.	Lug No.	Dia.	A	B	C	D	E*
27000, 37000	3703	.156	3/32	9/32	29/64	21/64	23/32
	3734	.156	3/32	9/32	29/64	21/64	13/32
	3735	.156	3/32	9/32	29/64	21/64	15/32
	3736	.156	3/32	9/32	29/64	21/64	31/32
28000, 38000	3803	.162	7/64	5/16	19/32	7/16	15/32
	3834	.162	7/64	5/16	19/32	7/16	17/32
	3835	.162	7/64	5/16	19/32	7/16	1. 1/16
	3836	.162	7/64	5/16	19/32	7/16	1. 1/16
29000, 39000	3903	.192	1/8	13/32	45/64	33/64	1. 17/32
33000	3303	.095	1/16	3/16	23/64	17/64	9/16



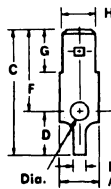
EXTERNAL FEEDTHRU LUG, FIG. 4
FITS TWIN AND SINGLE SCREW BLOCKS

Fits Block No.	Lug No.	Dia.	A	B	C	D	E*	F
14000, 34000	3404	.156	9/64	9/32	15/32	—	31/32	11/32
15000, 35000	3504	.162	5/32	5/16	37/64	—	1. 1/32	25/64
16000, 36000	3604	.192	13/64	13/32	21/32	—	1. 1/8	15/32
27000, 37000	3704	.156	9/64	9/32	25/32	5/16	31/32	11/32
28000, 38000	3804	.162	5/32	5/16	1	27/64	1. 1/32	27/64
29000, 39000	3904	.192	13/64	13/32	1. 5/32	1/2	1. 1/8	15/32
33000	3304	.095	3/32	3/16	37/64	1/4	9/16	15/64



SOLDER INTERNAL FEED THRU LUG, FIG. 5

Fits Block No.	Lug No.	Dia.	A	B	C	D	E*	F
27000, 37000	3705	.156	9/32	3/32	29/64	25/32	23/32	21/64
28000, 38000	3805	.162	5/16	7/64	37/64	1. 1/64	31/32	7/16
29000, 39000	3905	.192	13/32	1/8	11/16	1. 13/64	1. 1/32	33/64



PUSH-ON INTERNAL FEEDTHRU LUG, FIG. 6

Fits Block No.	Lug No.	Dia.	A	B	C	D	E*	F	G	H
27000, 37000	3706	.156	9/32	3/32	55/64	21/64	15/32	17/32	1/4	.187
28000, 38000	3806	.162	5/16	7/64	1. 3/64	7/16	17/32	39/64	5/16	.250
29000, 39000	3906	.192	13/32	1/8	1. 11/64	33/64	19/32	21/32	5/16	.250
33000	3306	.095	3/16	1/16	47/64	1/4	3/8	15/32	1/4	.110

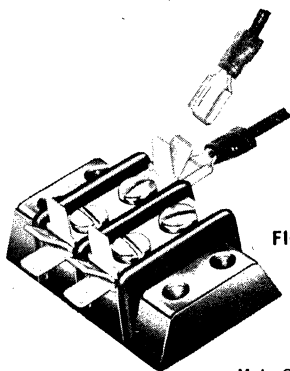


FIG. 1

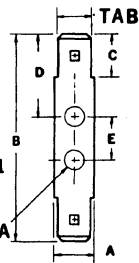


FIG. 2

Male Quick Disconnect Blades are brass electroplated with tin. Complete last two digits of Blade series in chart based on illustrations and corresponding last two digits above. To order, suffix the number to the block number, e.g., 27012-3722.

FIG. 1

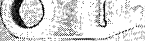
Fits Block No.	Tab Size	Blade Series	Dia.	A	B	C	D	E
14000, 34000	.187	34--	.156	9/32	21/32	1/4	17/32	—
15000, 35000	.250	35--	.162	5/16	1. 7/32	5/16	39/64	—
16000, 36000	.250	36--	.192	13/32	1. 5/16	5/16	21/32	—
27000, 37000	.187	37--	.156	9/32	1. 3/8	1/4	17/32	5/16
28000, 38000	.250	38--	.162	5/16	1. 41/64	5/16	39/64	27/64
29000, 39000	.250	39--	.192	13/32	1. 13/16	5/16	21/32	1/2
33000	.110	33--	.095	3/16	1. 3/16	1/4	15/32	1/4

FIG. 2

Fits Block No.	Tab Size	Blade Series	Dia.	A	B	C	D	E
14000, 34000	.187	34--	.156	9/32	21/32	1/4	17/32	—
15000, 35000	.250	35--	.162	5/16	49/64	5/16	39/64	—
16000, 36000	.250	36--	.192	13/32	27/32	5/16	21/32	—
27000, 37000	.187	37--	.156	9/32	31/32	1/4	17/32	5/16
28000, 38000	.250	38--	.162	5/16	1. 3/16	5/16	39/64	27/64
29000, 39000	.250	39--	.192	13/32	1. 11/32	5/16	21/32	1/2
33000	.110	33--	.095	3/16	1. 3/16	1/4	15/32	1/4

SELF-LOCKING NYLON CABLE TIES

STANDARD
SELF-
LOCKING

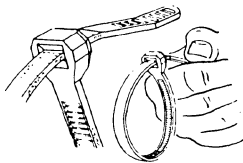
	PART NO.	WIDTH	BUNDLE DIA.	LENGTH	MILITARY STANDARDS	MINIMUM LOOP TENSILE STRENGTH	USE CABLE TYING TOOL CATALOG NUMBER
	N-4-D Miniature	.100	0-15/16"	4 1/16"	MS-3367-4 MS-17821-4 MS-18034-4	18 lb.	CT-100
	N-5-C Intermediate	.145	0-1 1/4"	5 3/8"	MS-3367-5 MS-18034-5	30 lb.	CT-100
	N-7-B Standard	.187	0-1 3/4"	7"	MS-3367-1 MS-17821-1 MS-18034-1	50 lb.	CT-100 or CT-200
	N-11-C Intermediate	.145	0-3"	10 15/16"		30 lb.	CT-100
	N-13-A Large	.300	0-3 1/2"	13"	MS-3367-3 MS-17821-3 MS-18034-3	120 lb.	CT-200
	N-14-B Standard	.187	0-4"	14 1/16"		50 lb.	CT-100 or CT-200
 No. 10 screw	N-14-MB Standard	.187	0-4"	14 17/32"	—	50 lb.	CT-100 or CT-200
 1/4" screw	N-13-MA Large	.300	0-3 1/2"	13 5/8"	—	120 lb.	CT-200
 No. 8 screw	N-11-MC Intermediate	.145	0-3"	11 5/16"	—	30 lb.	CT-100
 No. 10 screw	N-7-MB Standard	.187	0-1 3/4"	7 7/16"	—	50 lb.	CT-100 or CT-200
 No. 8 screw	N-5-MC Intermediate	.145	0-1 1/4"	5 3/4"	—	30 lb.	CT-100
 No. 4 screw	N-4-MD Miniature	.100	0-15/16"	4 3/8"	—	18 lb.	CT-100

LOCKING
MOUNTING
CLAMPS

TIES CAN BE COLOR CODED AS PER MILITARY SPECIFICATION. CONSULT FACTORY FOR COLOR CODING INFORMATION.

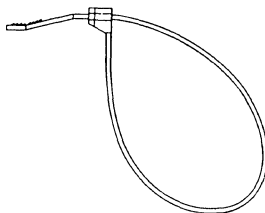
The "Can Do" Cable Ties...With These Quality Features

SELF-LOCKING HEAD



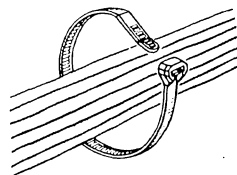
Easy application by tool or by hand.
Will not loosen when pulled tight.

COMPACT, ONE-PIECE DESIGN



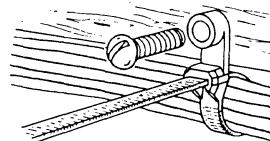
Rugged Nylon with no metal parts.
Designed to exceed MIL-S-23190C.
Installation tool cuts off excess
tie automatically, for low-profile
configuration with no protruding edges.

RELEASABLE LOCATING TIP



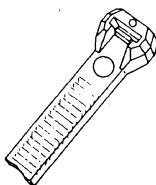
Double-bend tip locates around wires.
Guides operator's hand for easy 90°
insertion, even in confined areas.
Second bend prevents snagging.
Tip can be inserted in head and
later released. Makes for easier
positioning of ties on bundle.

SINGLE-UNIT MOUNTING HEAD



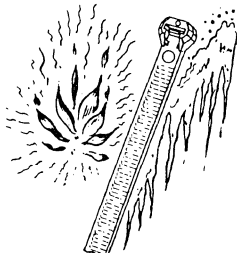
Mounting clamp is integral part
of tie head for quick attachment
to panel or chassis with screw,
rivet or bolt.

WIDE BUNDLE-GRIPPING SERRATIONS



Hug wires tightly. Won't pierce wire
insulation as with string, or narrower
ties.

ALL-ENVIRONMENT NYLON



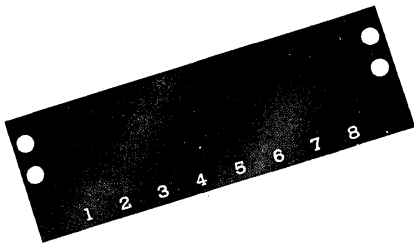
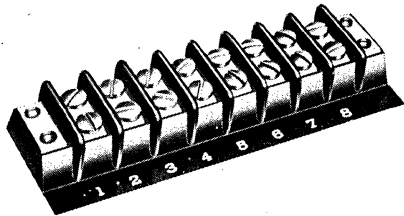
100% Nylon (MIL-M-20693). Tough,
resistant to temperature extremes,
diluted acids, solvents, grease,
alkalies, and fungus growth.

*Patents Pending

ETC Terminal Products Unit
ITT CANNON ELECTRIC
29000 AURORA ROAD, SOLON, OHIO 44139
A DIVISION OF INTERNATIONAL TELEPHONE AND TELEGRAPH CORPORATION

TELEPHONE: (216) 248-8800

ETC[®] MARKER STRIPS



ETC Marker Strips serve the dual purpose of affording additional insulation protection and serving as a method of terminal identification. Numbers are $\frac{1}{8}$ " high and are imprinted in white on a dark surface. Twin or Single Screw Blocks. Insulating Strips — Open-back blocks are available with permanently bonded insulating strips. Suffix ".88" to block part number. To order unbonded insulating strip, do not suffix printing style code (see ordering system below).

Permanently Bonded Marker Strips: To order, suffix ".91" for a printed marker strip bonded to block. Suffix ".92" for an unprinted marker strip bonded to block.

Available material:

XP Paper base phenolic (black)
VF Comm. grade vulcanized fiber (black): MIL-F-1148
XXXP Paper base phenolic (black): L-P-513
NPG Nylon cloth phenolic: MIL-P-15047
GMG Fiberglass, Melamine: MIL-P-15037
GEE Fiberglass, Epoxy: MIL-P-18177

NOTE: A special moisture and fungus-proof varnish can be provided to seal the surfaces and edges of the Marker Strips, in accordance with MIL-V-173A.

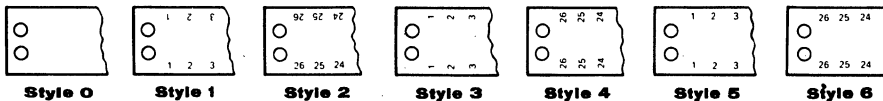
ORDERING SYSTEM (Example: 2772-18-XP—Style 5)

TERMINAL BLOCK SERIES	NO. OF TERMINALS	MATERIAL	PRINTING STYLE
27	72	18	XP
			5

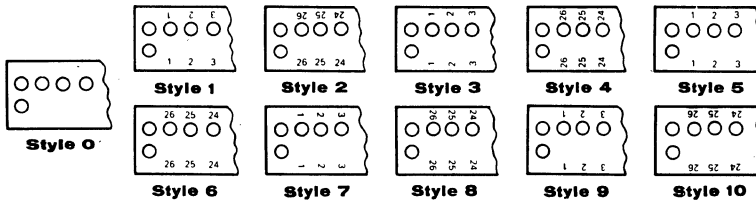
STRIP WIDTH

BLOCK SERIES	STRIP NO.				
	70	71	72	73	74
33	$1\frac{1}{8}$	$1\frac{1}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$
34	$1\frac{1}{8}$	$1\frac{1}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$
35	$1\frac{1}{8}$	$1\frac{1}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$
36	$1\frac{1}{8}$	$1\frac{1}{8}$	$\frac{7}{8}$	$\frac{7}{8}$	$\frac{7}{8}$
37 & 27	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
38 & 28	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$
39 & 29	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$	$1\frac{1}{8}$

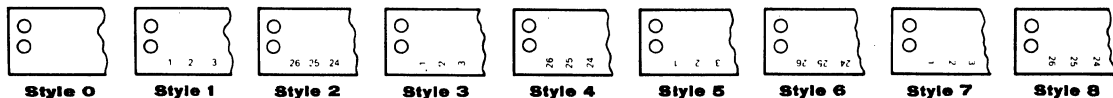
Double Side Marking — Standard Block — 70 (Fill in First Two Digits with Series Block No., examples: 2770, 2870, etc.)



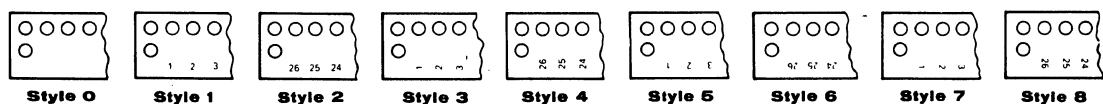
Double Side Marking — Feedthru Block — 71 (Fill in First Two Digits with Series Block No., examples: 2771, 2871, etc.)



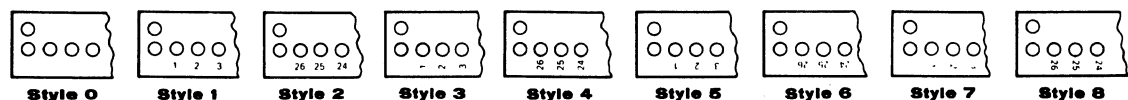
Single Side Marking — Standard Block — 72 (Fill in First Two Digits with Series Block No., examples: 2772, 2872, etc.)



Single Side Marking — Feedthru Block — 73 (Fill in First Two Digits with Series Block No., examples: 2773, 2873, etc.)



Single Side Marking — Feedthru Block — 74 (Fill in First Two Digits with Series Block No., examples: 2774, 2874, etc.)



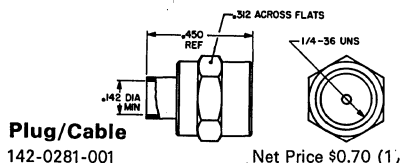
Jack/Cable
142-0284-001

Net Price \$1.00 (1)

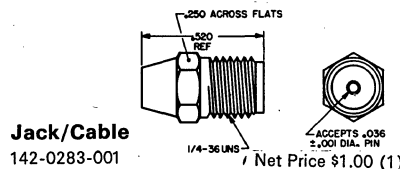


CONNECTORS

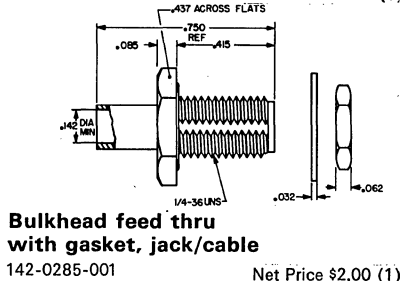
E. F. JOHNSON COMPANY



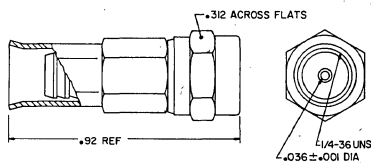
Plug/Cable
142-0281-001 Net Price \$0.70 (1)



Jack/Cable
142-0283-001 Net Price \$1.00 (1)

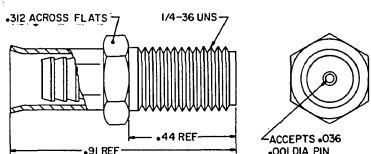


Bulkhead feed thru with gasket, jack/cable
142-0285-001 Net Price \$2.00 (1)



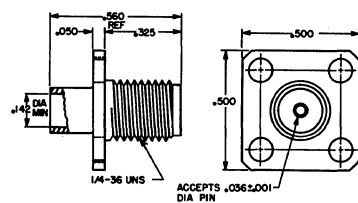
Straight Crimp Type Cable Plug

Cable Group	Net Price	Part Number
I	(2)	142-0301-001
II	\$1.70 (1)	142-0321-001
III	\$1.80 (1)	142-0361-001

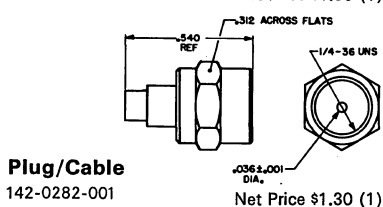


Straight Crimp Type Cable Jack

Cable Group	Net Price	Part Number
I	(2)	142-0311-001
II	\$1.70 (1)	142-0331-001
III	\$1.80 (1)	142-0371-001



4-hole flange mount, cable/jack
142-0286-001 Net Price \$1.35 (1)



Plug/Cable
142-0282-001 Net Price \$1.30 (1)

- 1) 1000 pc price approximately 40% off list; 5000 pc price approximately 50% off list. Contact factory for complete pricing.
2) Prices available on request.

MATERIAL

Center Contact.....
Other metal parts.....
Insulators.....
Plating: Center contact.....
Other metal parts.....

Beryllium Copper, heat treated
Half hard brass
TFE Fluorocarbon per MIL-P-19468
copper flash, gold plated. 000025
copper flash, gold plated. 000025
or copper flash, nickel plated. 0001

*Electrical performance depends on cable size, frequency, and connector type. For JCM mated pair connecting RG 58 A/U cable, VSWR averages less than 1.15 at 4GHz. Test reports available on request.

CRIMP EQUIPMENT

Buchanan Elec Prod. Corp.
1065 Floral Ave.
Union, N.J. 07083
Buchanan
Part Number

E.F. Johnson
Part Number

Daniels Mfg. Corp.
2266 Franklin Rd.
Bloomfield Hills, Mich. 48013
Daniels
Part Number

E.F. Johnson
Part Number

Crimp Tool.....	612648	251-0118-024	HX4	251-0118-020
Crimp Dies				
Group I.....(1)....	612734	251-0118-025	Y192	251-0118-021
Group II.....(1)....	612778	251-0118-026	Y187	251-0118-022
Group III....(1)....	712763	251-0118-027	Y188	251-0118-023

Tools and dies can be purchased directly from Buchanan or Daniels. (1) See below for cable groupings.

CABLE GROUPS

GROUP I

RG-178/U.....	.0079" O.D.
RG-178A/U.....	.0075" O.D.
RG-178B/U.....	.0075" O.D.
RG-196/U.....	.0080" O.D.
RG-196A/U.....	.0080" O.D.

GROUP II

RG-174/U.....	.0100" O.D.
RG-188/U.....	.0110" O.D.
RG-188A/U.....	.0110" O.D.
RG-316/U.....	.0102" O.D.

GROUP III

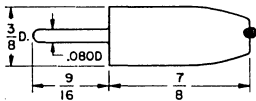
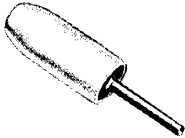
RG-55/U.....	.0206" O.D.
RG-55A/U.....	.0216" O.D.
RG-55B/U.....	.0206" O.D.
RG-58/U.....	.0195" O.D.
RG-58A/U.....	.0195" O.D.
RG-58B/U.....	.0195" O.D.
RG-58C/U.....	.0195" O.D.

RG-141/U.....	.0190" O.D.
RG-141A/U.....	.0190" O.D.
RG-142/U.....	.0206" O.D.
RG-142A/U.....	.0206" O.D.
RG-142B/U.....	.0195" O.D.
RG-223/U.....	.0216" O.D.


**E. F. JOHNSON
COMPANY**

Tip plugs and Printed circuit connectors

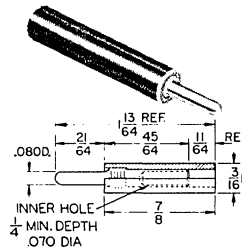
Tip plugs



Solderless Tip Plug

Completely insulated, molded sleeve. Recessed metal head prevents exposure of metal surfaces when engaged in any standard tip jack. All metal parts are nickel-plated brass. Designed for solderless connection of up to 16 gauge stranded wire. Fits all standard tip jacks. Current rating: 10 amps.

Cat. No. 105-0300-001. Net \$0.25
(See color chart under Tip Jacks)



Sub-miniature Tip Plug

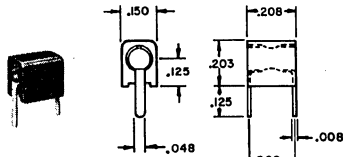
For use with miniature jack, .080" dia. tip. Nickel-plated machined brass body, solder type lead connection.

Cat. No. 105-0770-001. Net \$0.25
(See color chart under Tip Jacks)

Printed circuit connectors

The sub-miniature Tip Jacks and Tip Plugs described below are rated at 5 amperes maximum current capacity. Operating voltage is 1500 volts RMS at sea level and 350 volts RMS at 50,000 feet. Contact resistance is less than 2 milliohms; capacitance between two adjacent

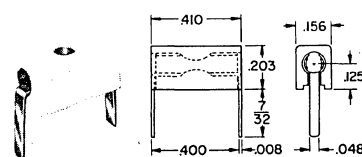
jacks less than one pF. at 1 MHz. Body material is made of tough, low-loss polyamide per MIL-M-20693A; able to stand extremely hard usage. Tip Plugs have a one-piece machined contact. Jacks equipped with beryllium copper contacts. Jack contacts and terminals are silver-plated.



New Horizontal Jack

New design accepts .080" diameter tip plug in either end. Silver-plated and irridited beryllium-copper formed contact. Two terminals. Approximately one-half size of standard Tip Jack.

Cat. No. 105-1100-001. Net \$0.10
(See color chart under Tip Jacks)



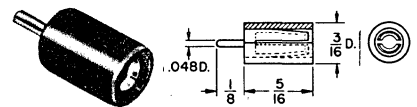
Horizontal Jack

(U.S. Patent No. 3,208,027)

Unique design accepts .080" diameter tip plug in either end, or from top or bottom! Silver-plated beryllium copper formed contact. Two terminals.

Note: Available as a special in production quantities without cross hole.

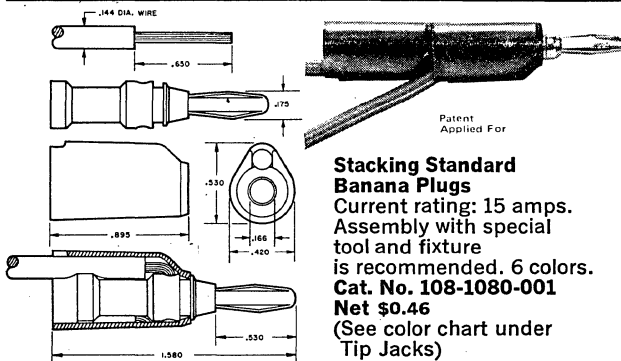
Cat. No. 105-0750-001. Net \$0.12
(See color chart under Tip Jacks)



Vertical Jack

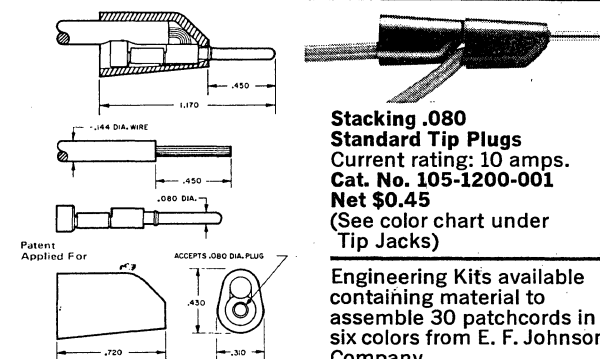
Mounts through single .052" hole, requires minimum mounting area. Silver-plated, machined beryllium copper contact.

Cat. No. 105-0850-001. Net \$0.18
(See color chart under Tip Jacks)



Stacking Standard Banana Plugs

Current rating: 15 amps. Assembly with special tool and fixture is recommended. 6 colors.
Cat. No. 108-1080-001
Net \$0.46
(See color chart under Tip Jacks)



Stacking .080 Standard Tip Plugs

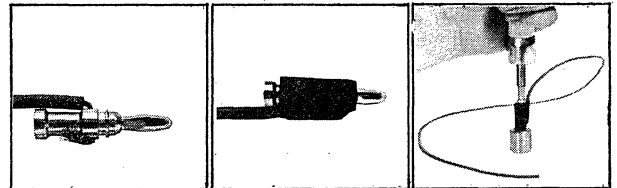
Current rating: 10 amps.
Cat. No. 105-1200-001
Net \$0.45
(See color chart under Tip Jacks)

Engineering Kits available containing material to assemble 30 patchcords in six colors from E. F. Johnson Company.

Patchcord Stacking Plugs

Developed for custom patchcord assembly and replacement of damaged molded patchcord plugs. Allows assembly of patchcords with any length and color. Used with standard 0.144" diameter rubber or extra-flexible polyvinyl insulated wire. Plug body precision machined brass with 0.0002" nickel plating. Polyamide housing available in 6 colors. Operating temperature range -55°C to +105°C.

ASSEMBLY PROCEDURE



1. Feed stripped wire through cross-hole of metal contact.

2. Insert contact and wire into housing.

3. Place into fixture. Place tip of tool into rear of contact. Snap contact into place.

**Standard Banana Patchcord
Stacking Plug
Engineering Kit**
Cat. No. 108-1299-001
Net \$24.95

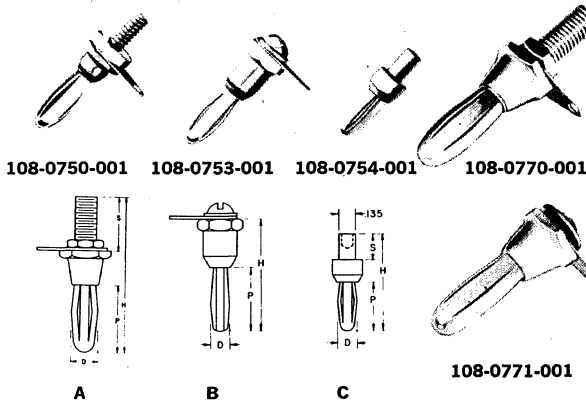
**Standard .080 Tip Patchcord
Stacking Plug
Engineering Kit**
Cat. No. 105-1299-001
Net \$24.95


E. F. JOHNSON
 COMPANY

Banana jacks and plugs

STANDARD BANANA PLUGS

This group of standard banana plugs has accurately machined brass studs which extend the full length of the plugs, providing extra strength. Springs are nickel-silver—highly resistant to corrosion. Bodies and hardware .0001 nickel-plated. All banana plugs listed below are available with beryllium copper springs and nickel, cadmium, or silver plating, when desired. A wide selection of miniature solder-type plugs is also available on special order—however, quantities in special platings or plugs should be sufficiently large for economical production runs. Solder terminal and nut or screw furnished.



Cat. No.	Dwg.	S	P	D	H	Thread	Net Price
108-0750-001	A	3/8"	17/32"	.175"	1 1/8"	6-32	\$0.25
108-0750-002	A	3/4"	17/32"	.175"	1 1/2"	6-32	.26
108-0753-001	B	—	17/32"	.175"	1 5/16"	6-32	.28
108-0754-001	C	7/32"	13/32"	.155"	1 3/16"	—	\$0.21
108-0770-001	A	3/8"	3/4"	.300"	1 25/32"	1/4"-28	\$0.60
108-0771-001	B	—	3/4"	.300"	1 1/8"	10-32	.90

This banana plug is similar to the standard types listed above, except that it is designed for riveting. Springs are beryllium copper, cadmium-plated.

Jumbo type banana plugs with accurately machined brass studs extending full length of the pins. Nickel-silver springs. Bodies and hardware .0001 nickel-plated. With solder lug and nut or screw.

MINIATURE BANANA PLUGS

Extremely small insulated banana plugs with precision machined phosphor bronze body, nickel-plated. One-piece springs are beryllium copper, nickel-plated, .120" dia. Polyamide sleeve. Current rating: 5 amps.

Cat. No. 108-1000-001..... **Net Price \$0.42**
 (6 colors—see chart)

STANDARD BANANA JACKS

High quality, machined brass banana jack. Nickel-plated. Furnished complete with solder terminal and nut.

Cat. No.	F	D	S	H	Hole Dia.	Thread	Net Price
108-0740-001	3/8"	1/4"	17/32"	5/8"	.166"	1/4"-28	\$0.24
108-0760-001	1/16"	3/8"	21/32"	1"	.277"	3/8"-32	\$0.76

Completely insulated molded body with cadmium-plated insert. Accommodates banana plugs of nominal .175" diameter. Voltage breakdown: 10,000 volts DC. Capacity to 1/16" panel: 2.4 mmf. nominal. Mounts in 2 1/4" diameter circular, "D", or double flat hole (1/4" across flats). Single nut furnished for mounting—no other mounting hardware needed.

Cat. No. 108-0900-001..... **Net Price \$0.16**
 (See Color Chart under tip jacks)

RIB-LOC® PRESS-IN BANANA JACKS

Johnson RIB-LOC design permits substantial production line savings—no mounting hardware to handle and assemble. RIB-LOC banana jacks install by pressing into proper size chassis hole. Accept .120" tip plug in recessed contact. Silver-plated brass contact. Brass solder terminal silver-plated and iridized for good solderability. Insulating body molded of low-loss polyamide. Current rating: 10 amps. Peak withstanding voltage: 5,000 volts. Capacity to 1/8" panel: 1.4 pF nominal.

Cat. No. 108-1100-001..... **Net Price \$0.13**
 (6 colors—see chart)

JUMBO INSULATED BANANA PLUGS

These jumbo size insulated banana plugs are similar in design to the standard types listed above, but are somewhat larger in size. With brass nickel-plated bodies, and nickel-silver springs. The 108-0772-001 has a black plastic handle—the 108-0772-002 has a red plastic handle.

Cat. No.	S	P	D	H	G	O	Net Price
108-0772-001	1 3/4"	3/4"	.300"	2 25/32"	3/8"	5/8"	\$1.35
108-0772-002	1 3/4"	3/4"	.300"	2 25/32"	3/8"	5/8"	1.35

SOLDERLESS BANANA PLUGS

Compact, high voltage insulated plug for a wide variety of applications. Designed for fast, solderless connection of up to 16 gauge stranded wire. Body and pin are constructed of one-piece, nickel-plated brass with high grade nickel-silver springs. Sleeve is molded. Current rating: 15 amps.

Cat. No. 108-0300-001..... **Net Price \$0.29**
 (See Color Chart under tip jacks)

DUAL BANANA PLUGS

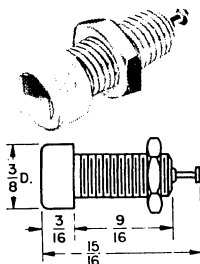
Extremely versatile dual banana plug for solderless connection. Molded body incorporates polarity indication and strain relief hole for wire leads. Springs are high quality nickel-silver—bodies are nickel plated. Accurately machined brass studs extend full length of pins for extra strength. Voltage breakdown: 10,000 VDC. Capacity plug to plug: 1.3 pf. Current rating: 15 amps.

Cat. No. 108-0200-001 (solderless)..... **Net Price \$1.15**
 (See Color Chart under tip jacks)



E. F. JOHNSON COMPANY

Tip jacks

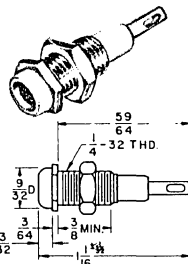


DELUXE TIP JACK

(U.S. Patent No. 2,704,357)

Molded body with recessed closed entry design contact. Silver-plated beryllium copper contact spring. Brass solder terminal is hot tin dipped. Current rating: 10 amps. Voltage breakdown: 11,000 VDC. Capacity to 1/8" panel: 2.0 pf. 1/4-32 nut furnished.

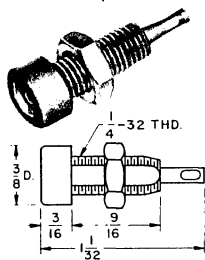
Cat. No. 105-0600-001. Net Price \$0.27
(See color chart below)



METAL-CLAD TIP JACKS—STANDARD

Molded body, nickel-plated machined brass jacket. Formed, silver-plated phosphor bronze contact. Current rating: 10 amps. Voltage breakdown: 7,000 volts DC. Capacity to $\frac{1}{8}$ " panel: 3.8 pf. $\frac{1}{4}$ "-32 nut furnished.

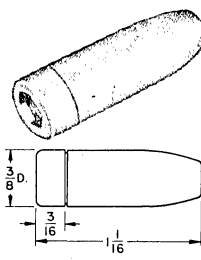
Cat. No. 105-0250-001. Net Price \$0.25
(See color chart below)



STANDARD TIP JACK

Molded body with recessed, cadmium-plated formed phosphor bronze contact. Current rating: 10 amps. Voltage breakdown: 9,000 volts DC. Capacity to 1/8" panels: 2.0 mmf. 1/4"-32 nut furnished.

Cat. No. 105-0800-001. Net Price \$0.16
(See color chart below)

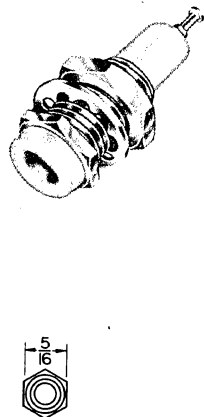


JACK AND SLEEVE ASSEMBLY

(U.S. Pat. No. 2,704,357)

Includes Deluxe Tip Jack (105-0601-001 to 105-0613-001), less mounting nut, with inside threaded molded sleeve. Ideal for patch cords, or insulated rear connection of panel mounted tip jack.

Cat. No. 105-0700-001. Net Price \$0.35
(See color chart below)

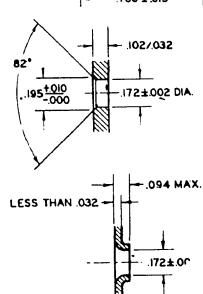
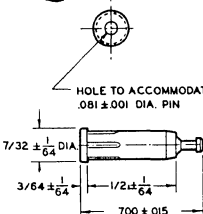
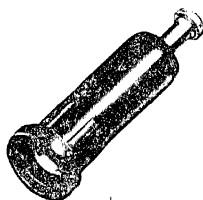


METAL-CLAD TIP JACKS—MILITARY

High reliability tip jack for military use or demanding industrial applications. Highest quality materials — withstand severe environmental temperature, vibration and salt spray conditions. Complies with MS-16108, Rev. F of MIL-STD-242A. Closed entry contact design prohibits entry of tip plug .085" or larger—prevents accidental contact damage by careless probe insertion. Heavy nickel-plated brass jacket. Gold-plated beryllium copper contact spring greatly exceeds minimum insertion/withdrawal cycle requirements of MS-16108. Current rating: 5 amps. Voltage breakdown: 8,000 volts DC. Capacity to 1/8" panel: 3.8 pf. 1/4"-32 nut and lock washer furnished. Terminal Style: "A". (Terminal Style "C" per MS-16108 available on special order in production quantities.) Brass solder terminal is gold-plated.

Cat. No. 105-0200-200, Net Price \$0.56

Mil. Std. Number	Color	E. F. Johnson Number
MS16108-1A	White	105-0201-200
MS16108-2A	Red	105-0202-200
MS16108-3A	Black	105-0203-200
MS16108-4A	Brown	105-0208-200
MS16108-5A	Green	105-0204-200
MS16108-6A	Orange	105-0206-200
MS16108-7A	Blue	105-0210-200
MS16108-8A	Yellow	105-0207-200
MS16108-9A	Gray	105-0213-200
MS16108-10A	Violet	105-0212-200



RIB-LOC™ PRESS-IN TIP JACKS

Johnson Rib-Loc design permits substantial production line savings—no mounting hardware to handle and assemble. Rib-Loc tip jacks install by pressing into proper size chassis hole. Accept .080" tip plug in recessed, closed-entry type contact that rejects plugs .085" or larger to prevent accidental contact damage. Silver-plated beryllium copper contact spring. Brass solder terminal silver-plated and Iridized for good solderability. Insulating body molded of low-loss polyamide. Current rating: 10 amps. Voltage breakdown: 5,000 VDC. Capacity to ½" panel: 1.4 pf nominal.

Cat. No. 105-1040-001. Net Price \$0.20
(See color chart below)

COLOR CHART

NOTE: Connectors, unless otherwise specified, are available in 6 molded colors to Federal Standard 595. Other colors listed are available as specials. Catalog number for color desired is determined by adding color numbers on chart below to 6th and 7th digits of catalog number listed for series. EXAMPLE: 105-0800-001 in Violet, add color number for Violet (12) to 6th and 7th digits of series number, and order 105-0812-001. To order 105-1040-001 in Violet, add 12 to 6th and 7th digits of series number and order 105-1052-001.

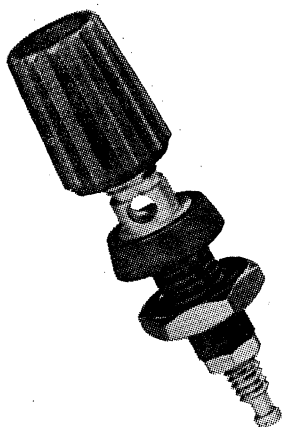
Color	No.	Color	No.	Color	No.
White*	01	Orange	06	Violet	12
Red*	02	Yellow*	07	Grey	13
Black*	03	Brown	08		
Green*	04	Blue*	10		

*Indicates colors available from stock. Other colors listed are, for some items, available as specials.


**E. F. JOHNSON
COMPANY**

Binding posts

Compact, insulated, pre-assembled binding posts with molded body and silver-plated shank. Fluted thumb nut self-captivated. Connection made at solder stud, or lug may be slipped over threaded portion and secured with a nut. Single tip plug fits hole in top of miniature binding post; banana plug accepted by two larger binding posts. Insulation resistance greater than 200 meg. after MIL-T-5422B humidity test. (U.S. Pat. No. 2,806,999.)

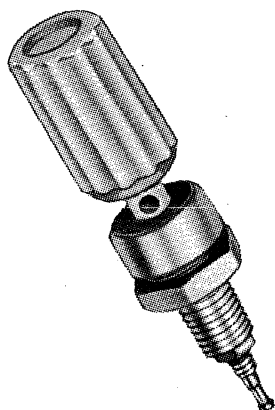
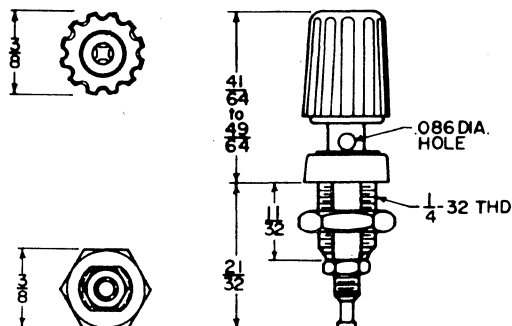


New miniature binding post designed for compact test equipment applications. Rated at 15 amps. thumb nut to terminal, 5 amps. tip jack to terminal. Voltage breakdown: 5,000 volts DC. Capacitance to $\frac{1}{8}$ " panel; 3 pf. Mounts in $\frac{17}{64}$ " diameter circular hole; "D" or double flat hole—.219" across flats. Equipped with single $\frac{1}{4}$ "-32 nut for fast mounting—no time-consuming spacers or mounting hardware required. No. 111-0200 accepts .080" dia. pin probe. No. 111-0400 accepts .120" dia. banana plug.

Available in 6 colors: white, red, black, green, yellow, and blue.

Cat. No. 111-0200-001.....Net Price \$0.80

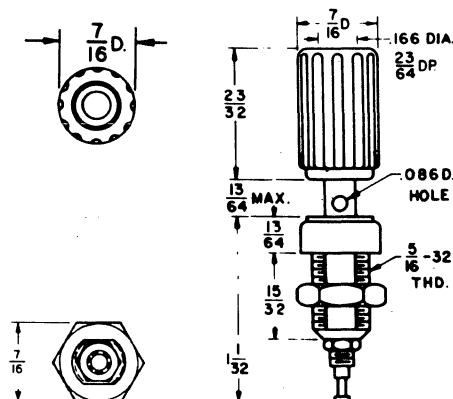
Cat. No. 111-0400-001.....Net Price .58



Rated at 15 amps. Current carrying capacity. Voltage breakdown: 8,000 volts DC. Capacitance to $\frac{1}{8}$ panel: 3.3 pf. Mounts in $\frac{21}{64}$ " diameter circular hole; "D" or double flat hole— $\frac{1}{4}$ " across flats. Single $\frac{5}{16}$ -32 mounting nut furnished—no other hardware required.

Cat. No. 111-0100-001.....Net Price \$0.50

(10 colors available—see color chart)



STANDARDIZED TERMINAL BOARDS

STANDARDIZED TURRET TERMINAL BOARDS

Cut your production cost by eliminating the tooling and setup charge usually applied to nonstandardized boards. Terminals are securely riveted and hot tinned for easy soldering.

TERMINALS: Your choice of most popular types.

Made of Brass: QQ-626, comp. 22, 1/2 hard.

Hot Dip Solder finish: Mil-F-14072 Type 221.

MATERIAL: Your choice of either PBE or GEE Phenolic.

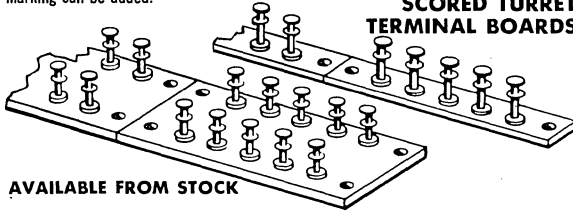
PBE: Paper base electrical, Mil-P-3115C, Temp. 250° F max. Type XXXP.

GEE: Glass Epoxy, Mil-P-18177, Temp. 300° F max. Type G-10.

Five sections SCORED for easy separation M'tg. holes in each section.

These boards CAN BE MODIFIED with terminals staked in all holes, scoring eliminated. Marking can be added.

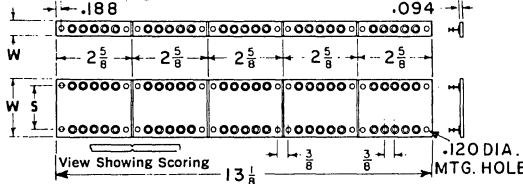
SCORED TURRET TERMINAL BOARDS



AVAILABLE FROM STOCK

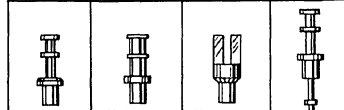
3/8" SPACING AND SCORED

3/32" THICK PHENOLIC — Choice of 4 Types of Terminals
 Overall Length of Board 13 1/8", FIVE 2 5/8" Sections.



Five sections SCORED for easy operation.
 M'tg. holes in each section.

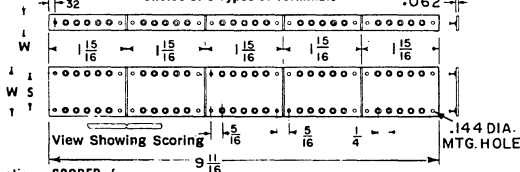
CHOICE OF TERMINALS



W	S	No. of Terms.	Material	With 1503 Term. Cat. No.	With 1509 Term. Cat. No.	With 1507 Term. Cat. No.	With 1545 Term. Cat. No.
1/2	Single Row	25	PBE	15031	15091	15071	15041
			GEE	15231	15291	15271	15241
1 1/2	1	50	PBE	15032	15092	15072	15042
			GEE	15232	15292	15272	15242
1 1/2	1 1/4	50	PBE	15036	15096	15076	15046
			GEE	15236	15296	15276	15246
2	1 1/2	50	PBE	15033	15093	15073	15043
			GEE	15233	15293	15273	15243
2 1/2	2	50	PBE	15034	15094	15074	15044
			GEE	15234	15294	15274	15244
3	2 1/2	50	PBE	15035	15095	15075	15045
			GEE	15235	15295	15275	15245

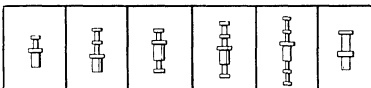
MINIATURE TURRET TERMINAL BOARDS

1/4" SPACING AND SCORED — 1/16" THICK PHENOLIC
 Overall Length of Board is 9 1/16", Five 1 5/16" Sections
 Choice of 6 Types of Terminals



Five sections SCORED for easy operation.
 M'tg. holes in each section.

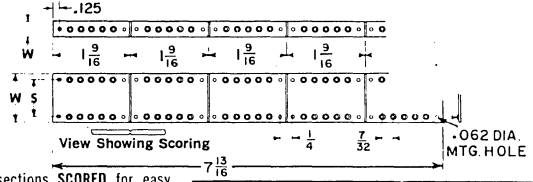
CHOICE OF TERMINALS



W	S	No. of Terms.	Material	With 1572 Term. Cat. No.	With 1573 Term. Cat. No.	With 1574 Term. Cat. No.	With 1575 Term. Cat. No.	With 1583 Term. Cat. No.	With 1559 Term. Cat. No.
5/16	Single Row	25	PBE	15047	15057	15067	15077	15087	15097
			GEE	15247	15257	15267	15277	15287	15297
7/8	9/16	50	PBE	15048	15058	15068	15078	15088	15098
			GEE	15248	15258	15268	15278	15288	15298
1 1/8	13/16	50	PBE	15049	15059	15069	15079	15089	15099
			GEE	15249	15259	15269	15279	15289	15299

MINIATURE TURRET TERMINAL

7/32" SPACING AND SCORED — 1/16" THICK
 Overall Length of Board 7 1/8", Five 1 1/8" Sections



Five sections SCORED for easy operation.
 M'tg. holes in each section.

CHOICE OF TERMINALS

W	S	No. of Terms.	Material	With 1502 Term. Cat. No.	With 1562 Term. Cat. No.	With 1526 Term. Cat. No.	With 1512 Term. Cat. No.	With 1533 Term. Cat. No.
5/16	Single Row	25	PBE	15021	15023	15025	15063	15053
			GEE	15221	15223	15225	15263	15253
3/4	1/2	50	PBE	15028	15029	15026	15064	15054
			GEE	15228	15229	15226	15264	15254
1	3/4	50	PBE	15022	15024	15020	15065	15056
			GEE	15222	15224	15230	15265	15256

UNIVERSAL TERMINAL BOARDS

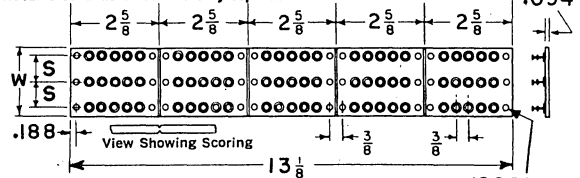
Designed for production or experimental use, these standardized boards are well suited for any electronic application requiring a sturdy mounting surface for resistors, condensers and components.

TERMINAL: 1503-3 HOT TIN DIP finish for easier soldering and infinite shelf life.

MATERIALS: PBE (Paper Base Elect. Mil-P-3115C type XXXP)

GEE (Glass Epoxy Mil-P-18177 type G-10)

NOTE: 5 Sections Scored for easy separation. 3 Rows of Terminals.



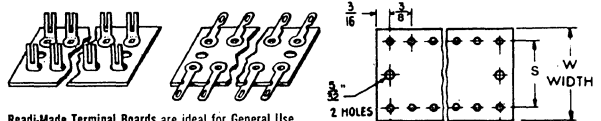
MODIFICATIONS: Other materials and terminals of your choice supplied. Marking may be added.



W	S	Total No. of Terms.	Material	Cat. No.
2 1/2	1	75	PBE	15332
			GEE	15342
3 1/2	1 1/2	75	PBE	15333
			GEE	15343

READI-MADE TERMINAL BOARDS

- ECONOMICAL • SAVE TOOLING COST
- DELIVERY FROM STOCK • RANGE OF SIZES • APPROVED MATERIALS



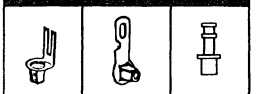
Read-made Terminal Boards are ideal for General Use.
 Excellent for mounting resistors, condensers, etc.
 Choice of Terminals.

MATERIAL: 1/16" thick Bakelite (Mil Spec 3115C-Pbe-P grade).

TERMINALS: 1204 and 1268 are stamped from .023 thick brass. 1539 is turned from 3/16" dia. brass rod.

PLATING: 1204 is Cadmium plated. 1268 and 1539 are Hot Tinned for easy soldering.

CHOICE OF TERMINALS



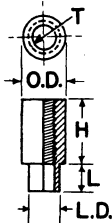
W	L	S	A	Terminals Each Side	With 1268 Term. Cat. No.	With 1204 Term. Cat. No.	With 1539 Term. Cat. No.
1	1 1/4	1/4	1 1/2	5	1268-10	1204-10	1239-10
1	2 1/4	1/4	1 3/4	6	1268-12	1204-12	1239-12
1	3 1/4	1/4	2 1/4	14	1268-28	1204-28	1239-28
1 1/4	3 3/4	1/4	3 1/4	10	1268-20	1204-20	1239-20
1 1/2	4 1/4	1/4	3 3/4	11	1268-22	1204-22	1239-22
1 3/4	7 1/4	1/4	6 1/4	19	1268-38	1204-38	1239-38
1 1/2	7 1/4	Single Row	6 1/4	19	1268-19	1204-19	1239-19

STANDOFFS & SPACERS



SWAGE TYPE THREADED STANDOFFS

ROUND



HEX



Nickel Plate MIL-F-14072 QQ-N-290 Type VII.

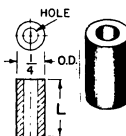
Cadmium plate per QQ-P-416 Type 2 Class B and clear chromate.

Material: MADE OF: BRASS MIL SPEC. QQ-B-626A COMP. 22-1/2 HARD.

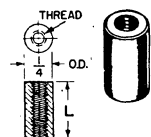
ROUND Nickel Plated Cat. No.	H Height Above Panel	L	For Panel Thick- ness	LD	OD	T Thread	HEX Cadmium Plated Cat. No.
1589-2	1/8	.109	1/16	.125	3/32	2-56	—
1589-3	1/8	.140	1/16	.125	3/32	2-56	—
1590-2	3/16	.109	1/16	.125	3/32	2-56	—
1590-3	3/16	.140	1/16	.125	3/32	2-56	—
1591-2	1/4	.109	1/16	.125	3/32	2-56	—
1591-3	1/4	.140	1/16	.125	3/32	2-56	—
1596-2	3/8	.109	1/16	.125	3/32	2-56	—
1596-3	3/8	.140	1/16	.125	3/32	2-56	—
1560 A	1/8	.109	1/16	.187	1/4	4-40	1653-2
1560 F	1/8	.140	1/16	.187	1/4	4-40	1653-3
1650-2	1/4	.109	1/16	.187	1/4	4-40	1627-2
1650-3	1/4	.140	1/16	.187	1/4	4-40	1627-3
1651-2	3/8	.109	1/16	.187	1/4	4-40	1628-2
1651-3	3/8	.140	1/16	.187	1/4	4-40	1628-3
1623-2	1/2	.109	1/16	.187	1/4	4-40	1629-2
1623-3	1/2	.140	1/16	.187	1/4	4-40	1629-3
1624-2	5/8	.109	1/16	.187	1/4	4-40	1654-2
1624-3	5/8	.140	1/16	.187	1/4	4-40	1654-3
1625-2	3/4	.109	1/16	.187	1/4	4-40	1655-2
1625-3	3/4	.140	1/16	.187	1/4	4-40	1655-3
1652-2	1	.109	1/16	.187	1/4	4-40	1630-2
1652-3	1	.140	1/16	.187	1/4	4-40	1630-3
1560 B	1/8	.109	1/16	.187	1/4	6-32	1620-2
1560 C	1/8	.140	1/16	.187	1/4	6-32	1620-3
1560 D	1/8	.171	1/8	.187	1/4	6-32	1620-4
1612-2	3/16	.109	1/16	.187	1/4	6-32	—
1612-3	3/16	.140	1/16	.187	1/4	6-32	—
1612-4	3/16	.171	1/8	.187	1/4	6-32	—
1546	1/4	.109	1/16	.187	1/4	6-32	1621-2
1546 B	1/4	.140	1/16	.187	1/4	6-32	1621-3
1546 D	1/4	.171	1/8	.187	1/4	6-32	1621-4
1561 B	3/8	.109	1/16	.187	1/4	6-32	1622-2
1561 C	3/8	.140	1/16	.187	1/4	6-32	1622-3
1561 D	3/8	.171	1/8	.187	1/4	6-32	1622-4
1604-2	1/2	.109	1/16	.187	1/4	6-32	—
1604-3	1/2	.140	1/16	.187	1/4	6-32	—
1604-4	1/2	.171	1/8	.187	1/4	6-32	—
1605-2	5/8	.109	1/16	.187	1/4	6-32	—
1605-3	5/8	.140	1/16	.187	1/4	6-32	—
1605-4	5/8	.171	1/8	.187	1/4	6-32	—
1608-2	3/4	.109	1/16	.187	1/4	6-32	—
1608-3	3/4	.140	1/16	.187	1/4	6-32	—
1608-4	3/4	.171	1/8	.187	1/4	6-32	—
1609-2	1	.109	1/16	.187	1/4	6-32	—
1609-3	1	.140	1/16	.187	1/4	6-32	—
1609-4	1	.171	1/8	.187	1/4	6-32	—

ALUMINUM SPACERS

WITH IRIDITE FINISH PER SPEC MIL-C-5541



- Lightweight
- Round — Clear Hole
- Spacers — Drilled Hole Only



- Non-magnetic
- Round — Tapped Hole
- Spacers — with Tapped Hole

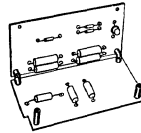
SPACERS — DRILLED HOLE ONLY

SPACERS — WITH TAPPED HOLE

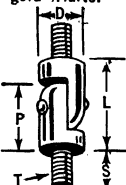
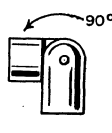
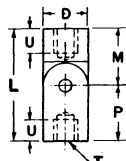
Length Inches	For #4 Screw Cat. No.	For #6 Screw Cat. No.	For #8 Screw Cat. No.	Length Inches	4-40 Thread Cat. No.	6-32 Thread Cat. No.	8-32 Thread Cat. No.
1/4 (.250)	3457	3464	3471	1/4 (.250)	3478	3485	3492
3/8 (.375)	3458	3465	3472	3/8 (.375)	3479	3486	3493
1/2 (.500)	3459	3466	3473	1/2 (.500)	3480	3487	3494
3/4 (.750)	3460	3467	3474	3/4 (.750)	3481	3488	3495
1 (1.000)	3461	3468	3475	1 (1.000)	3482	3489	3496
1 1/2 (1.500)	3462	3469	3476	1 1/2 (1.500)	3483	3490	3497
2 (2.000)	3463	3470	3477	2 (2.000)	3484	3491	3498

1.500 and 2" are tapped 3/8 deep each end

HINGED STANDOFFS FOR TERMINAL BOARDS



Only 2 screws used to fasten board in place or open the hinged board.



These standoffs mount at front of the board.

- APPLICATIONS UNLIMITED • TIME SAVER
- CUT COST OF SERVICING • SPACE SAVER
- INTERCONNECT CIRCUITS OR SERVICES WITHOUT DANGER OF SHORTING • WIRING EXPOSED FOR EASY TEST

Material: Made of Brass MIL Spec. QQ-B-626A Comp. 22-1/2 Hard.

Finishes: Cadmium plate per QQ-P-416 Type 2 Class 2 and gold Iridite.

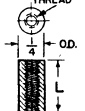
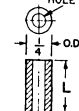
Hinge Cat. No.	T Thread	D Diam.	L Length	U	M	P	Standoff Only Cat. No.
351	4-40	.187	3/4	.172	.375	.375	1657A
352	4-40	.187	1	.250	.375	.625	1657B
353	6-32	.250	3/4	.172	.375	.375	1548E
354	6-32	.250	1	.250	.375	.625	1548F
355	8-32	.250	3/4	.172	.375	.375	1692D
356	8-32	.250	1	.250	.375	.625	1692E

Hinge Cat. No.	T Thread	L Length	D Diam.	S	P	Standoff Only For Front of Board Cat. No.
357	4-40	1/2	.187	1/4	1/4	1657
358	6-32	1/2	.250	3/8	1/4	1548C
359	8-32	1/2	.250	3/8	1/4	1692C

PHENOLIC SPACERS

- GOOD MECHANICAL STRENGTH • RESISTS ABRASIONS & CHEMICALS
- EXCELLENT DIELECTRIC • LOW MOISTURE ABSORPTION

Material: PBE Grade MIL-P-79A Natural Color Phenolic — Special Sizes Made to Order — Promptly Quoted.



SPACERS — DRILLED HOLE ONLY

SPACERS — WITH TAPPED HOLE

Length Inches	For #4 Screw Cat. No.	For #6 Screw Cat. No.	For #8 Screw Cat. No.	4-40 Thread Cat. No.	6-32 Thread Cat. No.	8-32 Thread Cat. No.
1/4 (.250)	360	367	1490	376	383	390
3/8 (.375)	361	368	1491	377	384	391
1/2 (.500)	362	369	1492	378	385	392
3/4 (.750)	363	370	1493	379	386	393
1 (1.000)	364	371	1494	380	387	394
1 1/2 (1.500)	365	372	374	381	389	395
2 (2.000)	366	373	375	382	389	396

1.500 and 2" are tapped 3/8 deep each end.

ALUMINUM ECONOMY SPACERS

FOR No. 4, 6 or 8 SCREWS

- PRECISION FORMED • NO BURRS

Made of flat strip aluminum and rolled on precision equipment. Assures maximum bearing surface, square ends.



Description and Tolerance

Spacer For	I.D. ±.005	O.D. ±.007
#4	.125	.167
#6	.151	.193
#8	.178	.232

L Length Inches	For #4 Cat. No.	For #6 Cat. No.	For #8 Cat. No.	L Length Inches	For #4 Cat. No.	For #6 Cat. No.	For #8 Cat. No.
3/8	397	—	—	3/4	418	425	432
1/4	398	405	412	7/8	419	426	433
3/16	399	406	413	1	420	427	434
1/2	400	407	414	1 1/4	421	428	435
3/8	401	408	415	1 1/2	422	429	436
1/2	402	409	416	1 3/4	—	430	437
5/8	403	410	417	2	—	—	438

ELECTRONIC COMPONENTS

PLUG IN HOUSINGS

Enhance the appearance and give that professional look to your products using these molded housings. Ideally suited for packaging relays, logic packages, networks and miniature circuitry. Durable, lightweight covers that will withstand vibrations and rough usage.

HEADERS: Molded of GP black phenolic and fit standard sockets. Pins are brass. Nickel plated guide hole tapped 8-32 for terminal board mounting stud.

- Variety of molded materials
- Good chemical resistance

MATERIAL CHARACTERISTICS:

Polystyrene: For general purpose use where high impact strength is not required and temperature would not exceed 170°F.

Butyrate: 3 times the impact strength of Polystyrene and excellent electrical properties, use wherever temperatures of 210°F exist.

Nylon: Impact strength slightly less than Butyrate but recommended for use where temperatures are as high as 300°F.

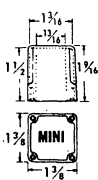


FIG. 1

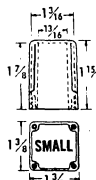


FIG. 2

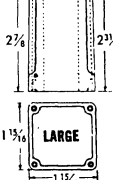


FIG. 3

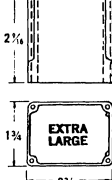


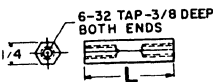
FIG. 4

Housing with Octal Header & 4 Screws Cat. No.	Housing Only Cat. No.	Fig. No.	Type	Material	Color
660	670	1	Mini	Butyrate	Clear
661	671	1	Mini	Nylon	White
662	672	1	Mini	Polystyrene	Clear
641	645	1	Mini	Polystyrene	Opaque Black
642	646	1	Mini	Polystyrene	Transp Red
663	673	2	Small	Butyrate	Clear
664	674	2	Small	Nylon	White
665	676	2	Small	Polystyrene	Clear
643	647	2	Small	Polystyrene	Opaque Black
644	648	2	Small	Polystyrene	Transp Red
650	649	3	Large	Butyrate	Clear
668	679	3	Large	Polystyrene	Clear
677	686	3	Large	Polystyrene	Opaque Black
678	667	3	Large	Polystyrene	Transp Red
639	640	4	Xtra-Lge	Polystyrene	Clear
710	711	4	Xtra-Lge	Polystyrene	Opaque Black
712	713	4	Xtra-Lge	Butyrate	Clear

HEX SPACERS 6-32 TAPPED BOTH ENDS

Extra long length spacers ideal as standoff legs for Keystone pre-punched boards or your special application.

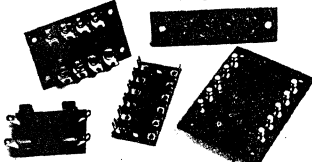
Brass cadmium plated and chrome. 1/4" O.D. with 6-32 x 3/8" deep tapped holes both ends.



Cat. No.	Length
1635	1
1636	1 1/4
1637	1 1/2
1638	1 3/4
1639	2
1642	2 1/4
1643	2 1/2

TERMINAL BOARDS

READ-MADE



CUSTOM FABRICATED



NEW FREE
CATALOG
ON REQUEST

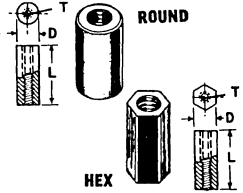
THREADED SPACERS

Material: ALL HARDWARE ON THIS PAGE IS MADE OF: BRASS MIL SPEC. QQ-B-626A COMP. 22 — 1/2 HARD.

Finishes: Nickel Plate Mil-F-14072 QQ-N-290 Type V.

Cadmium plate per QQ-P-416 Type 2 Class B and clear chromate. Other finishes available on special order.

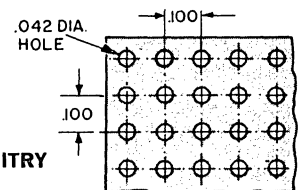
Threaded spacers 1/4" O.D. threaded 4-40, 6-32, 8-32 available either in round or hex. Round type is nickel plated, hex type is cadmium.



HEX Cadmium Plated Cat. No.	D	L	T Thread	ROUND Nickel Plated Cat. No.
1450	3/16	1/4	4-40	1547
1656	3/16	1/2	4-40	1657
1656A	3/16	3/4	4-40	1657A
1656B	3/16	1	4-40	1657B
1450A	1/4	1/4	4-40	1547A
1450B	1/4	3/8	4-40	1547B
1450C	1/4	1/2	4-40	1547C
1450D	1/4	3/4	4-40	1547D
1450E	1/4	1	4-40	1547E
1451A	1/4	1/4	6-32	1548A
1451B	1/4	3/8	6-32	1548B
1451C	1/4	1/2	6-32	1548C
1451D	1/4	3/4	6-32	1548D
1451E	1/4	1	6-32	1548E
1635	1/4	1	6-32	1548F
1474A	1/4	1/4	8-32	1692A
1474B	1/4	3/8	8-32	1692B
1474C	1/4	1/2	8-32	1692C
1474D	1/4	3/4	8-32	1692D
1474E	1/4	1	8-32	1692E
1452A	3/8	3/8	8-32	1549A
1452B	3/8	1/2	8-32	1549B
1452C	3/8	3/4	8-32	1549C
1452D	3/8	1	8-32	1549D
1452E	3/8	1	8-32	1549E

MICRO-MINIATURE KEYBOARDS

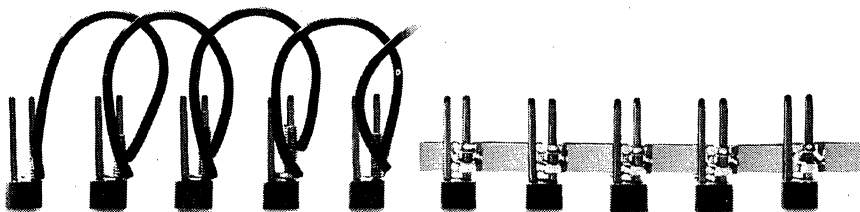
- FOR MODULE STACKS
- SMALLER PLUG-IN CARDS POSSIBLE
- PERMITS HIGHER COMPONENT DENSITY FOR SUBMINIATURE CIRCUITRY



"P" PATTERN .042 HOLES .100 x .100

Width & Length	No. Holes W & L	Glass Epoxy	Glass Epoxy Cop. Clad (1 Side)	XXXP Natural Phenolic
1/32 THICK MATERIAL		Cat. No.	Cat. No.	Cat. No.
2 x 4 1/2	19 x 44	4225	4234	—
2 x 6	19 x 59	4226	4235	—
4 1/2 x 6	44 x 59	4227	4236	—
6 x 17	59 x 169	4228	4237	—
3/4 THICK MATERIAL		Cat. No.	Cat. No.	Cat. No.
2 x 4 1/2	19 x 44	4229	4238	—
2 x 6	19 x 59	4230	4239	—
4 1/2 x 6	44 x 59	4231	4240	—
6 x 17	59 x 169	4232	4241	—
1/8 THICK MATERIAL		Cat. No.	Cat. No.	Cat. No.
2 x 4 1/2	19 x 44	3405	3415	3396
2 x 6	19 x 59	3406	3416	3397
2.73 x 17	26 x 169	3407	3417	3398
3 x 4 1/2	29 x 44	3408	3418	3399
4 1/2 x 6	44 x 59	3409	3419	3400
4 1/2 x 6 1/2	44 x 64	3410	3420	3404
4 1/2 x 8 1/2	44 x 84	3411	3421	3425
4 1/2 x 17	44 x 169	3412	3422	3426
6 x 17	59 x 169	3413	3423	3427

One termination method is surer, faster and costs less.



Obviously.

Engineers nationwide are switching from wire wrap to a new, simpler way of connecting common spaced pins in electronic chassis. The Lear Siegler Pin Bar.

The reasons are clear:

Terminations are surer because each Pin Bar is "spec" built to fit your pins precisely. No chance for human error. Pin Bars mean 100 percent reliable gas tight terminations that will outlast the life of the chassis.

Assembly is faster because each bus terminates all pins at once—with a remarkably simple tool.

That adds up to low cost terminations. Pin Bars can cut your wire wrap costs in half. Typically from 10 cents down to 3-6 cents per pin. One major manufacturer has already demonstrated a \$68 savings per chassis using Pin Bars. You may, too. Write for more information and free Pin Bar samples to:

LEAR
SIEGLER,
INC.


ELECTRONIC
INSTRUMENTATION
DIVISION
714 N. Brookhurst St.
Anaheim, Calif. 92803
TWX 910-591-1157
Telephone: (714) 774-1010

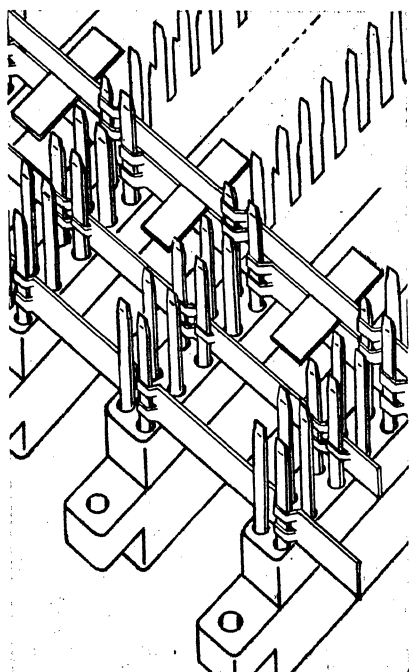
**Pin
Bars**



**The
Money-Saving
Connection**



Pin Bar® means:



- Thousands of "hi-rel" solderless bussing connections per hour at a fraction the cost of your present bussing method.
- Fast, simple, "foolproof" connections that lower production costs — eliminate continuity checks.
- Low uniform contact resistance that will electrically enhance any circuit — especially frequency applications.
- Efficient back panel design (greater pin exposure, increased discrete wiring area and easier checkout).
- A "spec" performance electrical component produced to your exact requirements.

solderless bus bar for common connections

SPECIFICATIONS

Terminal Spacing and Length: Selectable.

Spacing Tolerance: $\pm 0.010"$ between terminals — ± 0.020 /foot cumulative.

Material: 1000, 1200 Series: Beryllium Copper Alloy #172 per QQ-C-533.
1100 Series: Beryllium Copper Alloy #175 per QQ-C-533.

Standard Finishes:

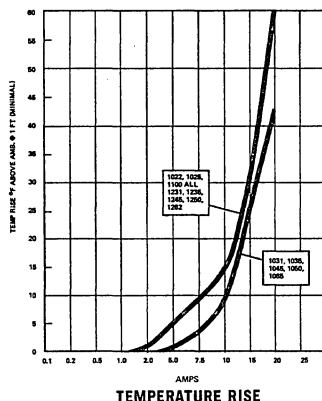
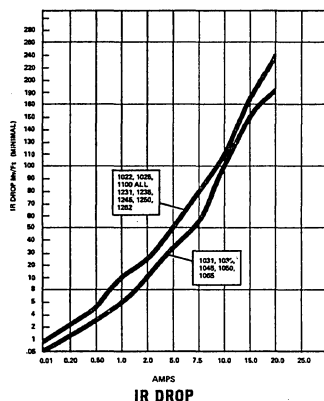
Tin: Electro-tin plate, fused, per MIL-T-10727, Type I, 0.0003" thickness.

Gold: Gold plate per MIL-G-45204, Type II, 0.000050" minimum thickness over nickel plate per QQ-N290, 0.000050" minimum thickness.

Options: Insulation, special finishes, unique end configurations.

Insertion: Manual or semi-automatic insertion equipment available.

PERFORMANCE DATA



The following performance data meets or exceeds MIL-STD-202 "D" (Full Report Available).

Thermal Shock: Method 107, Condition A.

Mechanical Shock:

Method 213, Condition H.

Vibration: Method 201.

Corrosion Resistance: Method 101, Condition B 48 Hour Exposure Salt Spray.

Contact Voltage Drop:

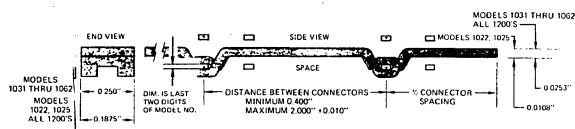
0.533 millivolts maximum per amp.

Gas Tight Contact: 10 minutes of 1:1 hydrochloric/nitric acid followed by 10 minutes of ammonium sulfide fumes.

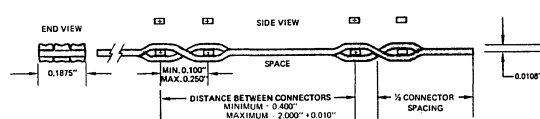
DESIRED PIN BAR CONFIGURATION

Alternate Pins (Series 1000 & 1200)	Connector Pin Size	Adjacent Pins (Series 1100)
1022	.022" x .036"	1122
1025	.025" x .025"	1125
1031 1231	.031" x .062"	1131
1035 1235	.035" x .050"	1135
1045 1245	.045" x .045"	1145
1050 1250	.050" x .035"	1150
1062 1262	.062" x .031"	1162

MODEL 1000 & 1200 SERIES ALTERNATE PIN BUSS



MODEL 1100 SERIES ADJACENT PIN BUSS



NOTE: 1100-0400 MODELS WILL PICK UP A PIN EVERY 0.200" ON CENTER

LEAR SIEGLER, INC.



LSI Pin Bar Products

ELECTRONIC INSTRUMENTATION DIVISION

714 NORTH BROOKHURST STREET • ANAHEIM, CALIFORNIA 92803

(714) 774-1010 TWX — 910-591-1157 • TLX — 65-5444

mueller clips

a complete line of

ALLIGATOR TEST & BATTERY CLIPS

Mueller Electric Co. CLEVELAND, OHIO 44114



"60 SERIES" ALLIGATOR CLIPS

U.S. Patent No. 3,321,736

No. 60—CONVENTIONAL TYPE

New slim design with full-meshing teeth. Convenient, round thumb grip, barrel connection for banana plug. Equipped with small soldering lip. Strong spring with a hard bite. Cadmium plated, 2" long.



EACH NET.....\$0.14 LOTS OF 10.....\$0.102

No. 60-S—SCREW CONNECTION

Eliminates necessity for soldering. Otherwise same as No. 60.



EACH NET....\$0.16 LOTS OF 10...\$0.118

No. 60-NS—ALLIGATOR NEEDLE CLIP

Like No. 60-S, but with insulation piercing needle in one jaw. Screw connection, 2" long. 10 per box.

EACH NET.....\$0.30 LOTS OF 10.....\$0.228

No. 60-CS—COPPER ALLIGATOR CLIP

Solid copper version of No. 60-S. Screw connection, 2" long. 10 per box.

EACH NET.....\$0.25 LOTS OF 10.....\$0.187

No. 60PR-2—SPECIAL BARREL

FOR TEST PROD OR PHONE TIP

Barrel crimped to provide friction fit on standard test prod or phone tip. Holds prod on test, frees hand for other work.



EACH NET.....\$0.20 LOTS OF 10.....\$0.151

No. 62 FLEXIBLE VINYL INSULATOR

Red and black insulators for Alligator Clips 60, 60-S, 60-CS, 60PR-2, 60-NS.



EACH NET.....\$0.09 LOTS OF 10.....\$0.071

No. 60-HS—STEEL ALLIGATOR CLIP WITH INSULATED HANDLE

Same as No. 60-S except equipped with red and black insulating sleeves on end. Very convenient for distinguishing leads. Has screw connection also. Cadmium plated, 2 1/4" long. Shipped half red, half black.



EACH NET.....\$0.22 LOTS OF 10.....\$0.164

No. 60-CHS—COPPER ALLIGATOR CLIP, INSULATED HANDLE

Solid copper version of No. 60-HS. Screw connection. Shipped with half red, half black insulating sleeves. 10 per box.

EACH NET.....\$0.30 LOTS OF 10.....\$0.228

"70 SERIES" ALLIGATOR CLIPS

U.S. Patent No. 2,762,028

Features simplified design, fast connection of wire with cord strain relief ears, patented hinge construction and lower cost.

No. 70—FOR SOLDERED CONNECTION

Steel, cadmium plated, 1 1/4" long.



EACH NET....\$0.11 LOTS OF 10.....\$0.081

No. 70-S—SCREW CONNECTION

Otherwise same as No. 70.

EACH NET.....\$0.13 LOTS OF 10.....\$0.098

No. 70-CS—COPPER SCREW CONNECTION

Solid copper version of No. 70-S.



EACH NET.....\$0.22 LOTS OF 10.....\$0.168

No. 72—SKIN-TIGHT INSULATOR

FOR 70 SERIES ALLIGATOR CLIPS!



For the first time complete, skin-tight, one-piece insulation for a standard size Alligator Clip! Covers entire clip right down to nose. Special tip slot permits full jaw opening without exposing teeth.

EACH NET.....\$0.08 LOTS OF 10.....\$0.061

MICRO-GATOR CLIP

(Smallest Insulated Clip Ever Made)

U.S. Patent No. 2,762,028

Trademark Reg.



Micro-Gator



Micro-Gator with Insulator

The alligator clip with the microscopic tip! This is the alligator clip you now can use where no other clip will do... on printed circuits, in tight spots and on tiny terminals too crowded for anything but its microscopic tip. Including separate skin-tight insulator the tip is no bigger than the head of a pin! Yet the Micro-gator has ample thumb grip, and plenty of bite to stand up straight on the smallest terminals. Ample 1/4" jaw spread, 1 1/2" long. Solder connection, Skin-tight flexible vinyl insulator (sold separately) has "lip-action" tip slot so that jaws stay covered whether open or closed.

No. 34 (Steel, cadmium plated)
EACH NET.....\$0.09 LOTS OF 10.....\$0.066

No. 34-C (Solid Copper)
EACH NET.....\$0.12 LOTS OF 10.....\$0.086

No. 36 (Insulator for Nos. 34 and 34-C)
EACH NET.....\$0.06 LOTS OF 10.....\$0.044

MINI-GATOR CLIP

U.S. Patent No. 3,321,736

Trademark Reg.



Mini-gator



Mini-gator with Insulator

Indispensable for testing or incorporation into miniaturized equipment. New design features rivet hinge for greater strength, full-meshing teeth to grip finest wires. Skin-tight flexible Vinyl insulator (sold separately) covers completely — has slotted "lip action" tip. Clip weighs 1/20th oz., has tiny 1/4" O.D. nose, but ample 3/4" jaw spread 1 3/4" long. Crimping ears. Solder connection. Surprisingly strong bite penetrates corrosion and coatings.

No. 30 (Steel, cadmium plated)
EACH NET.....\$0.11 LOTS OF 10.....\$0.082

No. 30-C (Solid Copper)
EACH NET.....\$0.13 LOTS OF 10.....\$0.10

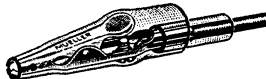
No. 32 (Insulator for Nos. 30 and 30-C)
EACH NET.....\$0.06 LOTS OF 10.....\$0.044

COMPLETELY INSULATED ALLIGATOR CLIPS

Patent Pending

No. 63 or 63-C Clip

Sold only as a unit, with factory-applied insulators.



Completely insulated right down to the nose. Flexible 2-piece skin-type vinyl insulator of high dielectric strength, with "lip action" slotted tip that permits opening of clip without exposing metal. Insulator nose is only 13/64" O.D. The tight fitting sheath preserves all the slimmest of the Alligator Clip, still giving complete protection against shorts in even the tightest spots. Screw connection easily made by slipping insulator forward. 2 1/4" long.

No. 63—INSULATED ALLIGATOR CLIP (STEEL)

Composed of Mueller No. 60-S Alligator Clip steel, cadmium plated, screw connection, complete with 2-piece vinyl insulator. Shipped half with red insulators, half black. 10 per box.

EACH NET.....\$0.30 LOTS OF 10.....\$0.228

No. 63-C—INSULATED ALLIGATOR CLIP (COPPER)

Composed of Mueller No. 60-CS Alligator Clip, solid copper, screw connection. Shipped half with red insulators, half black. 10 per box.

EACH NET.....\$0.36 LOTS OF 10.....\$0.273

CROCODILE CLIPS



No. 85 or 85-C Clip with No. 87 Insulator



No. 85-T Clip

No. 85—A very small clip with slender, elongated jaws for getting into tight places in radio or electrical test work. Screw connection, 2 1/4" long.
EACH NET.....\$0.16 LOTS OF 10.....\$0.12

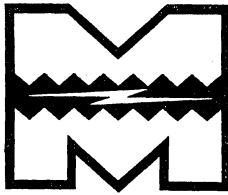
No. 85-C—Same as No. 85, except solid copper with phosphor bronze spring, brass screw. A radio frequency, entirely non-ferrous test clip. 10 per box.

EACH NET.....\$0.32 LOTS OF 10.....\$0.243

No. 85-T—Crocodile "Tip-Clip"—equipped with standard phone tip on one jaw, otherwise same as No. 85. Ideal for use as a prod, for ordinary clip connections and for connections to insulated binding posts having non-removable heads. 2 1/4" long. 10 per box.

EACH NET.....\$0.42 LOTS OF 10.....\$0.314

Use No. 87 Insulators for clips 85, 85-C and 85-T. Red and Black. Cover entire clip except nose. Protect against short and shock. Help to distinguish leads.



mueller clips

a complete line of
ALLIGATOR TEST & BATTERY CLIPS
Mueller Electric Co. CLEVELAND, OHIO 44114

TEST CLIPS



No. 45 PEE WEE

A very small test clip for radio, ignition, meter and similar work. $1\frac{1}{2}$ " long. Jaw spread $\frac{1}{8}$ ". Steel, cadmium plated.

EACH NET.....\$0.14 LOTS OF 10.....\$0.104



**No. 45-C Clip
No. 47 Insulator**

EACH NET.....\$0.26 LOTS OF 10.....\$0.196

Use No. 47 Insulator for clips 45 and 45-C.



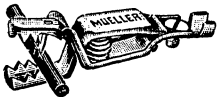
No. 48-B

A small test and battery clip for radio use and general testing purposes. 2" long. Jaw spread $\frac{1}{2}$ ". Steel, cadmium plated. 10 per box.

EACH NET.....\$0.22 LOTS OF 10.....\$0.168

No. 48C—Solid Copper. Same size as 48-B.

EACH NET.....\$0.32 LOTS OF 10.....\$0.238



No. 50-C Needle Clip

Solid copper. Needle pierces insulation of wire for quick test contact. $2\frac{1}{4}$ " long. 10 per box.

EACH NET.....\$0.50 LOTS OF 10.....\$0.374

No. 51-C—Large crocodile clip. Same as 50-C but without needle. 10 per box.

EACH NET.....\$0.36 LOTS OF 10.....\$0.272

Use No. 49 Insulator for Clips 48-B, 48-C, 50-C and 51-C.



No. 27

A high grade test clip with meshing teeth on three sides of jaws. For laboratory and shop test work $2\frac{1}{2}$ " long. Jaw spread $\frac{1}{2}$ ". Steel, cadmium plated. 10 per box.

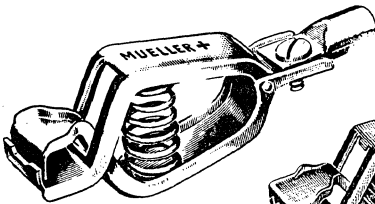
EACH NET.....\$0.26 LOTS OF 10.....\$0.196

No. 27-C—Solid copper. Same size as No. 27. 10 per box.

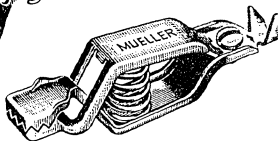
EACH NET.....\$0.46 LOTS OF 10.....\$0.342

Use No. 29 Insulator for clips 27 and 27-C.

LARGER SIZES OF CLIPS



No. 21-C



No. 25-C

All packed 10 per box.

	Each Net	Lots of 10
No. 24-A — 25 Amp. Steel, lead plated, $2\frac{1}{2}$ " long.....	\$0.44	\$0.33
No. 25 — 40 Amp. Steel, cadmium plated, 3" long....	.39	.29
No. 25-C — 75 Amp. Solid Copper, 3" long.....	.76	.57
No. 21-A — 50 Amp. Steel, lead plated, 4" long.....	.78	.59
No. 21-C — 100 Amp. Solid Copper, $4\frac{1}{2}$ " long.....	1.92	1.44
No. 11-A — 100 Amp. Steel, lead plated, 6" long.....	2.22	1.66
No. 11-C — 200 Amp. Solid Copper, 6" long.....	3.88	2.91
No. 33-C — 300 Amp. Solid Copper, $7\frac{1}{4}$ " long.....	7.25	5.45

(*Furnished with detachable lug connection for easy securing to large cables.)

GROUND CLAMP



**CLAMPPIPE
No. 58**

The ClampPipe will not spread, bend or lop over when applied. Point of large screw bites through corrosion into clean metal to insure good contact. Applicable to pipe $\frac{1}{2}$ " to $1\frac{1}{2}$ " O.D. The best ground clamp on the market!

EACH NET.....\$0.44 LOTS OF 10.....\$0.328

FLEXIBLE INSULATORS FOR CLIPS



A convenient protection against short circuit and electric shock. Colors help to distinguish leads. Packed half red and half black to indicate polarity. Long tail prevents breakage of wire. Constructed so that clip is held in firmly. NOW AVAILABLE also in blue, white, yellow and green at 10% above regular price are insulators marked * below.

Insulator No.	For Use with Clip No.	Each Net	Lots of 10
13*	11-A, 11-C	\$1.39	\$1.05
23*	21-A, 21-C	.71	.53
29*	24-A, 25, 25-C	.49	.365
32*	27, 27-C	.30	.227
33*	30, 30-C	.06	.044
35	33-C	3.99	2.99
36*	34, 34-C	.06	.044
47*	45, 45-C	.11	.086
49*	48-B, 48-C, 50-C, 51-C	.21	.159
62*	60, 60-S, 60-CS, 60PR-2, 60-NS (also 70 Series)	.09	.071
72*	70, 70-S, 70-CS	.08	.061
87*	85, 85-C, 85-T	.11	.082

*Also available in blue, white yellow and green.

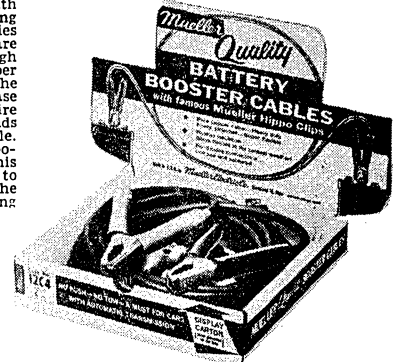
MUELLER QUALITY BATTERY BOOSTER CABLES

Highest quality cables, equipped with famous Hippo-Clips, for boosting "dead" 6 or 12-volt vehicle batteries with an external battery. Cables are pure copper, finely stranded for high flexibility and covered with rubber insulation which stays flexible in the coldest weather and resists oil, grease and acid. 413 strands of No. 30 wire in the 4-gauge cable and 259 strands of No. 30 wire in the 6-gauge cable. The many fine features of the Hippo-Clips alone are listed elsewhere on this page. The clips are both soldered to the cable and clinched around the cable insulation by means of clinching ears.

Packaged: pair of cables with clips in a bright, attractive display carton. Standard shipping container 10 cartons.

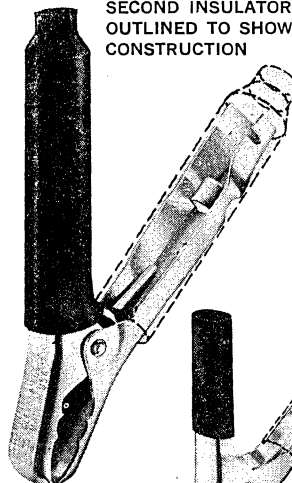
No. 8A6—8 ft., 6-gauge, with No. 41A Hippo-Clips (Steel, bright copper plated)
NET PRICE PER PAIR.....\$11.10

No. 12A6—12 ft., 6-gauge, with No. 41A Hippo-Clips (Steel, bright copper plated)
NET PRICE PER PAIR.....\$14.70



No. 12C4—12 ft., 4-gauge, with No. 41C Hippo-Clips (Solid Copper)
NET PRICE PER PAIR.....\$24.00

SECOND INSULATOR OUTLINED TO SHOW CONSTRUCTION



SECOND INSULATOR OUTLINED TO SHOW CONSTRUCTION

HIPPO-CLIP

HIPPO-CLIP—For battery booster cables and fast chargers. Proved higher quality and superior design. Built-in solder strap and clinching ears for fast, sure cable connection. Supplied with vinyl handle insulators in red or black. Full 1-9/16" jaw spread. 6" long.

Net price ea.

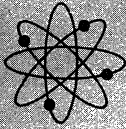
No. 41-A Steel, bright copper plated, 100 amp.\$0.90
No. 41-C Solid Copper, 200 amp. ... 2.40

PIGMY HIPPO-CLIP

PIGMY HIPPO-CLIP—A new small plier clip for battery operated equipment and automotive test. Flat, wide handle allows positive grip. Won't "squirt away". Built-in solder strap and wire clinching ears. Supplied with vinyl handle insulators in red or black. Ample $1\frac{1}{4}$ " jaw spread. 3" long.

Net price ea.

No. 46-A Steel, bright copper plated, 50 amp.\$0.26
No. 46-C Solid Copper, 75 amp.44



ntt

NATIONAL TEL-TRONICS

STATE ROAD HILL, MEADVILLE, PA. 16325

A division of Electro-Audio Dynamics, Inc. (814) 724-6440

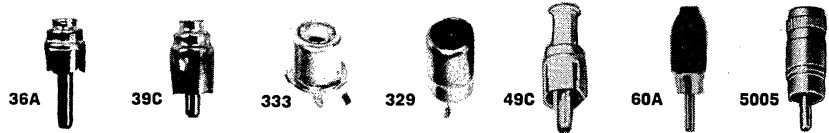
For all your connector and component needs, there is no larger or more reliable source than National Tel-Tronics. Having produced parts for over twenty-five years for all the major OEM equipment manufacturers, National Tel-Tronics

has a vast background of component and connector experience on which to draw. Complete tool shop, stamping facilities and in house production capability enable us to have the flexibility to rapidly produce a vast range of electronic

connectors and components, either standard or to the customer's specific requirements. Many of our standard parts are listed here. If you don't see your specific requirement, contact our company for a fast and reliable quotation.

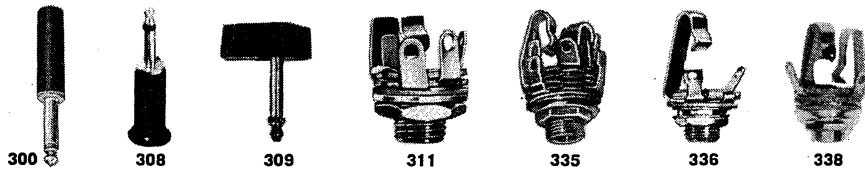
PHONO PLUGS AND JACKS

Choose from the largest selection of types; solder, all-crimp, shielded, short and long shell, handled and insulated versions.



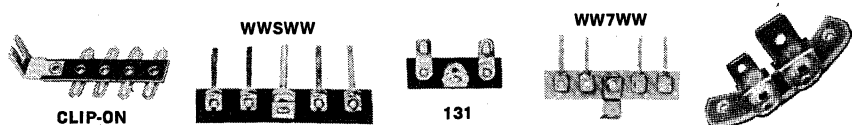
PHONE PLUGS AND JACKS

All standard 2 and 3 circuit jacks and plugs including stereo circuit types are stock items. Ultra-miniature, miniature and standard size jacks are available in both enclosed and standard wafer types. Phone Plugs include both screw and solder type and are available in military versions per MIL-P-642.



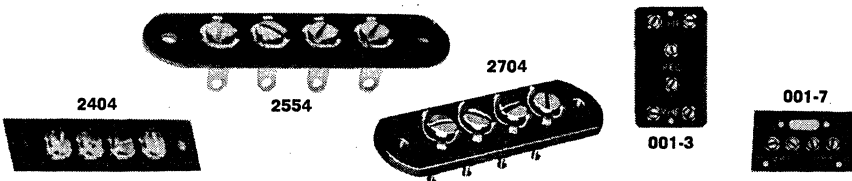
TERMINAL STRIPS

Thousands of configurations available in XP phenolic or UL approved flame retardant materials. $\frac{3}{8}$ " or $\frac{1}{2}$ " spacing is standard. Solder-type, wrap-around, quick disconnect, miniature and sub-miniature types are all standard.



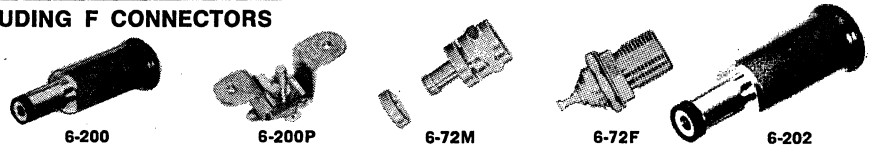
BINDING POST BOARDS

6-32 screw type binding post boards manufactured to standard and custom configurations. Standards include 1 through 12 lug positions in $\frac{3}{8}$ " or $\frac{1}{2}$ " spacing. Heavy-duty $\frac{3}{8}$ " boards and heavy-duty binding post lugs also available. Can be manufactured to custom configurations with silk-screening, hot stamping, fungus resistant finishes and other special requirements.



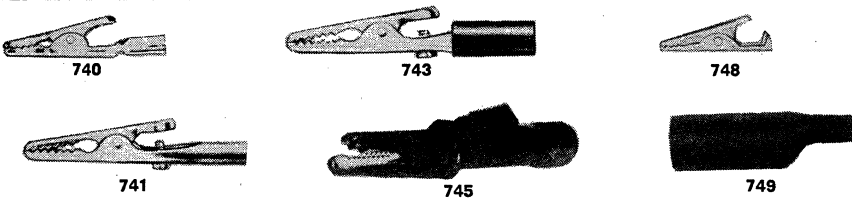
COAXIAL PLUG AND JACKS, INCLUDING F CONNECTORS

Standard coaxial connectors for battery chargers, AC adapters, calculators, etc. Available in .218 and .195 O.D.'s. Male mating plugs also available. F connectors available in both male and female versions for RG cable. Also have solderless type for RG 58 and 59 versions and PL-259 variations.



ALLIGATOR CLIPS

Available in both standard high-grade plated steel and in copper construction for extra low resistance. Standard type have $\frac{3}{8}$ " jaw opening and will accept banana plug in the rear. Both screw and solder versions are standard. Also available in insulated handle versions and in screw and solder types, tip plug adapters, miniature versions for space saving applications and vinyl insulators in six colors for both the standard and the miniature versions.



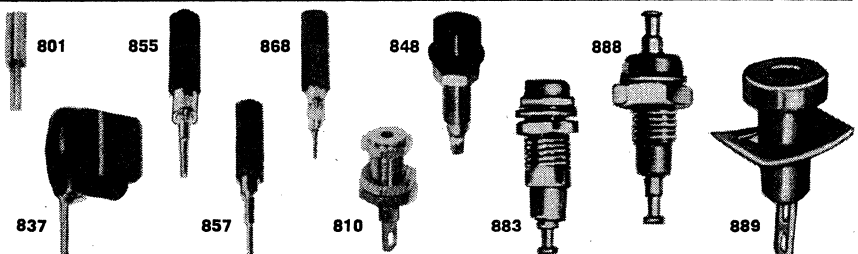
4 AND 5 WAY BINDING POSTS

All metal and insulated molded posts are standard items. Available in nickel and gold plating in both 10-32 and 8-32 threads. Dual binding posts in red or black combinations and $\frac{3}{4}$ " spring also standard.



TIP PLUGS AND JACKS

.080 tip plugs are available in a full selection of both solder and solderless types, insulated and non-insulated, including the needle tip and chuck versions. Fully insulated push button meter type plug is also standard for rapid assembly. Molded handles in 1", 4" and 5 $\frac{1}{2}$ " lengths, both threaded and force fit are standard for creating insulated plugs or test probes. Tip jacks are available in insulated and non-insulated types in a variety of colors. Molded nylon tip jacks with metal shell or all nylon shells are also available, including a speed clip type for inexpensive and rapid assembly.



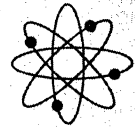
NATIONAL TEL-TRONICS

STATE ROAD HILL, MEADVILLE, PA. 16325

A division of Electro-Audio Dynamics, Inc.

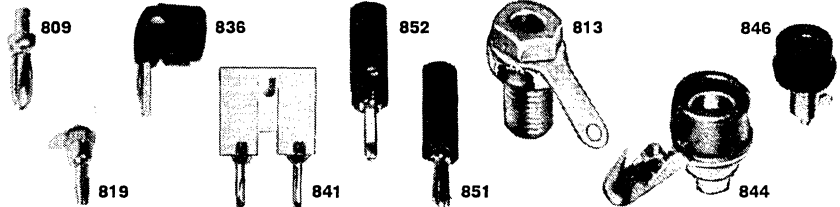
(814) 724-6440

ntt



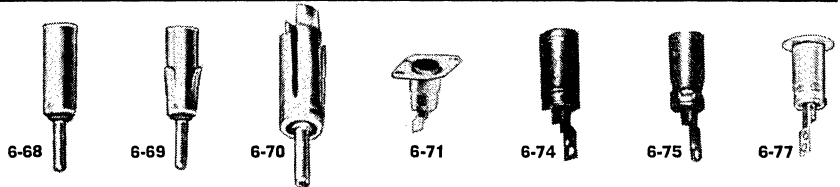
BANANA PLUGS AND JACKS

A full variety of standard and miniature banana plugs with nickel-plated brass bodies and phosphor bronze springs are standard, including side screw and top hex stud mounting version. Insulated handles are available for all plugs. Insulated push-button meter type plug is also standard. Included in the standard line are stacking banana plugs in both single and dual fully molded versions. Banana jacks are available in insulated and non-insulated types in a variety of colors.



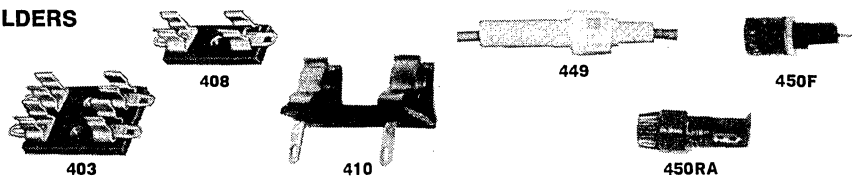
ANTENNA PLUGS AND JACKS

National Tel-Tronics is a prime supplier to the major automotive car radio manufacturers as well as to CATV-MATV industry. All standard antenna plugs and jacks are available. The standard 4 prong Motorola type plug as well as less expensive 2 and 3 prong plugs are manufactured to exacting standards. A great variation in shell and contact design on the antenna jacks is available from our inventory.



FUSE MOUNTING BASES AND HOLDERS

Designed for 3AG type fuses, fuse mounting bases are available in a variety of materials from $\frac{1}{4}$ " to $\frac{3}{4}$ " XP phenolic and UL rated FR materials, in both single and multiple configurations. Panel mount fuse holders for 3AG short type fuses are available in both straight and space-saving right-angle configurations with ribbed and fluted caps. The panel mounted fuse holder parts are CSA and UL approved.



ANODE AND HIGH VOLTAGE CONNECTORS

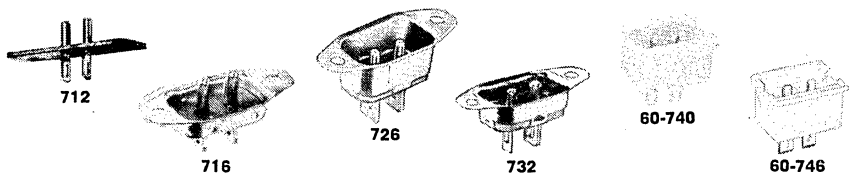
Anode connectors to 40 KV rating for BW and color television, and oscilloscopes, are available in a variety of configurations. Spring clips and solderless stainless-steel clips assure continuity. Anode

cups are standard in neoprene rubber, flame retardant grade PVC or silicone rubber variations in sizes of $1\frac{1}{2}$ ", $1\frac{3}{4}$ " and 3". Anode connectors are UL approved.



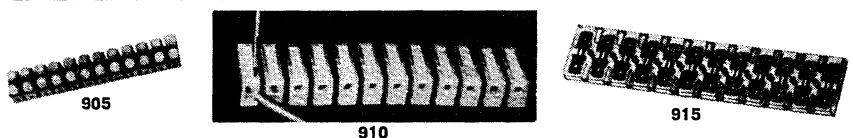
INTERLOCK RECEPTACLES

Both flush and bathtub type receptacles for AC connections are standard in a variety of materials from XP phenolic through UL approved flame retardant materials. Solder type, polarized and quick disconnect type pins are standard. Molded snap-in types are also available in flame retardant materials. All the interlocks are approved by Underwriter's Laboratories and Canadian Standard Assn.



MOLDED TERMINAL BLOCKS

A variety of molded terminal blocks in flexible PVC are available as standard items. Screw type connections, screw driver slot, and .250 quick disconnect connections are standard. Standard size blocks are in a 12 position configuration but can be cut to smaller size if desired.



COMPRESSION TYPE TERMINAL BOARDS AND BLOCKS

Two types of compression type boards are available from stock. Series 927 features push-button multi-covered terminals which are mounted on phenolic or FR type boards. Available in six different

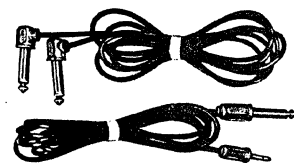
colors in single or multi-roll configurations. A white molded PVC terminal block with red push-button is also available in a 12 position length. This can also be cut to smaller sizes if desired.



MOLDED CABLE AND HARNESS ASSEMBLIES

A complete molding facility allows great flexibility in providing the audio and electronics industry with a variety of molded cable assemblies. Standard molds includes phone plugs and jacks in 2 and 3 conductor configurations, phono plugs and jacks, miniature phono plugs and miniature jacks, mike connectors, ultra-miniature plugs, coaxial connec-

tors and various adapters. Coaxial and zip cord cables are readily available as well as those for more special applications. Custom assemblies include molds designed to customer specifications and also include capability of amp and molex crimp type assemblies, wire harnesses and multiple conductor assemblies.

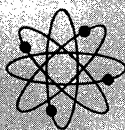


DIN CONNECTORS

NTT European style "Europlugs" are available in two, three and five contact arrangements in both male and female versions. In-line and panel mounted types are standard in both flush and extended barrel configurations.



This listing will give you some indication of the capabilities of National Tel-Tronics. For more details and specifications, send for our complete catalog.



ntt

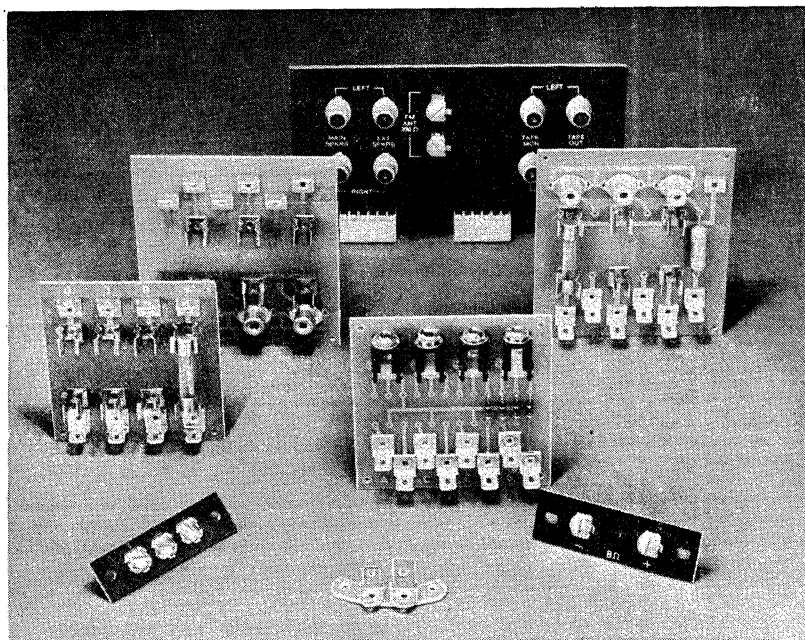
NATIONAL TEL-TRONICS

STATE ROAD HILL, MEADVILLE, PA. 16325

A division of Electro-Audio Dynamics, Inc.

(814) 724-6440

PRINTED CIRCUIT BOARDS AND ASSOCIATED HARDWARE SUPPLIED COMPLETELY ASSEMBLED



One-call, one-source for your printed circuit boards completely assembled with your choice of hardware... delivered to you all ready for component insertion. This unique exclusive single-source service saves you valuable dollars in costs and countless hours in long lead times. Prototypes can be supplied in as little as *48 hours if standard hardware is specified.

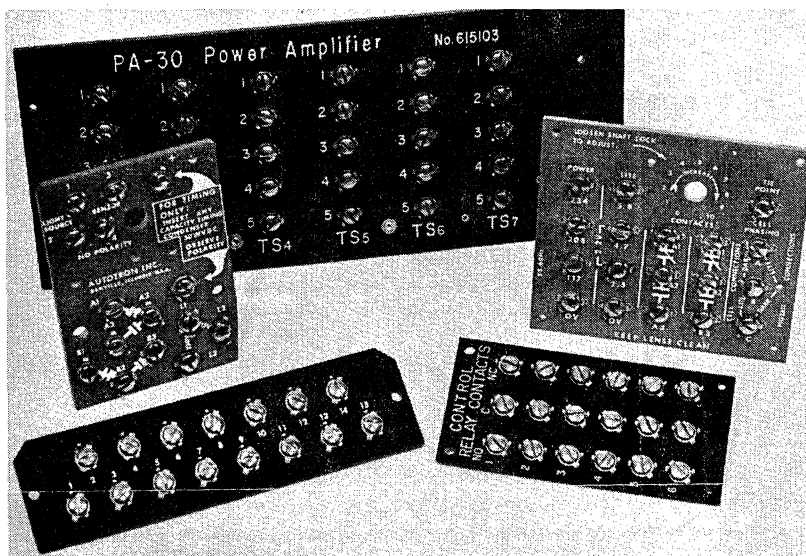


You get superior quality printed circuit boards manufactured to the highest industry standards by Astro Circuit's new F.E.P.® "Fast-Etch-Process." Simple or extremely complex PC boards to your exact requirements including single-sided, double-sided, plated through holes and infra-red reflow.

Completely assembled terminal boards in any combination of insulating materials and hardware can be supplied in *rapid time and at very competitive prices. All grades of laminated phenolics and fibers including UL/FR materials can be supplied.

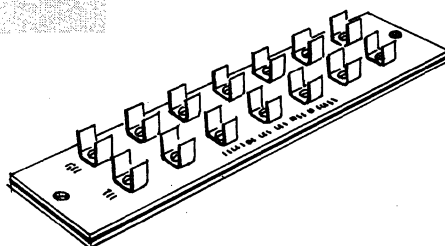
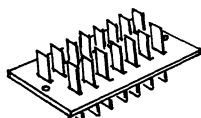
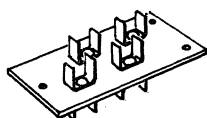
* S.O.S. — Speed Order Service

TERMINAL BOARD ASSEMBLIES



Whether it be for an existing part, or a new design, NT-T is your best source for total service for terminal board assemblies. Faster deliveries and cost savings are yours because of our years of engineering know-how and manufacturing experience.

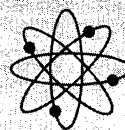
We offer a wide selection of stock tooling configurations to produce terminal boards to your requirements. For special configurations and designs our special tooling charges are nominal. Board materials are stocked in most grades of paper based materials up to XXXP. Glass epoxy, glass polyester, glass melamine and FR grades are available upon request. Boards can be printed or embossed to your requirements. A wide variety of quick connect/disconnect terminals, screw-terminals, lugs and clips are available and can be provided in any combination desired.



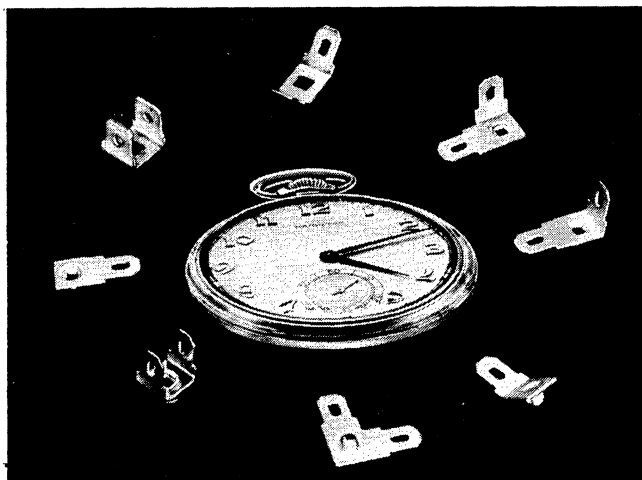
NATIONAL TEL-TRONICS

STATE ROAD HILL, MEADVILLE, PA. 16325

A division of Electro-Audio Dynamics, Inc. (814) 724-6440



ntt

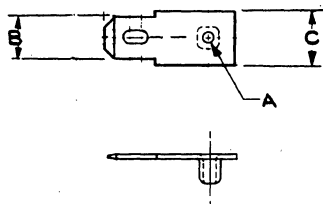


QUICK-DISCONNECT TYPE TERMINALS AND TERMINAL BOARD ASSEMBLIES

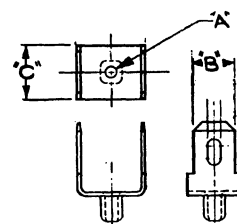
Choose from a virtually limitless selection of National Tel-Tronics quick-connect/disconnect terminals and other component holding and/or mounting hardware. Standard configurations include multiple blade terminals. All terminals are available in .020" and .032" thicknesses with electro-tin plating over brass. Special terminal designs available to your exact specifications including special plating, etc. All variations can be assembled on standard size strips as well as panels to customers specifications.

QUICK-DISCONNECT TYPE TERMINALS

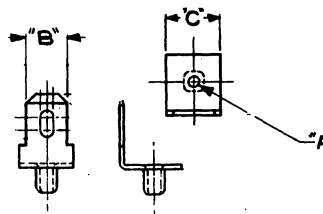
	"A"	"B"	"C"
4201	.020 Brass 7/64 Sq. Barrel	.205	.270
4220	.020 Brass 7/64 Sq. Hole	.205	.270
4231	.020 Brass 7/64 Sq. Barrel	.250	.312
4236	.020 Brass 7/64 Sq. Hole	.250	.312
4250	.032 Brass 7/64 Sq. Hole	.205	.270
4258	.032 Brass 7/64 Sq. Hole	.250	.312
4450	.020 Brass 7/64 Sq. Barrel	.187	.270
4455	.020 Brass 7/64 Sq. Hole	.187	.270
4466	.032 Brass 7/64 Sq. Hole	.187	.270



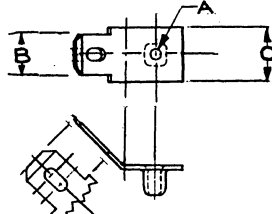
	"A"	"B"	"C"
4205	.020 Brass 7/64 Sq. Barrel	.205	.270
4224	.020 Brass 7/64 Sq. Hole	.205	.270
4235	.020 Brass 7/64 Sq. Barrel	.250	.312
4240	.020 Brass 7/64 Sq. Hole	.250	.312
4254	.032 Brass 7/64 Sq. Hole	.205	.270
4262	.032 Brass 7/64 Sq. Hole	.250	.312
4270	.032 Brass 7/64 Sq. Hole	.187	.270
4454	.020 Brass 7/64 Sq. Barrel	.187	.270
4459	.020 Brass 7/64 Sq. Hole	.187	.270



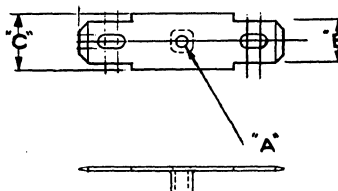
	"A"	"B"	"C"
4202	.020 Brass 7/64 Sq. Barrel	.205	.270
4221	.020 Brass 7/64 Sq. Hole	.205	.270
4232	.020 Brass 7/64 Sq. Barrel	.250	.312
4237	.020 Brass 7/64 Sq. Hole	.250	.312
4251	.032 Brass 7/64 Sq. Hole	.205	.270
4259	.032 Brass 7/64 Sq. Hole	.250	.312
4451	.020 Brass 7/64 Sq. Barrel	.187	.270
4456	.020 Brass 7/64 Sq. Hole	.187	.270
4467	.032 Brass 7/64 Sq. Hole	.187	.270



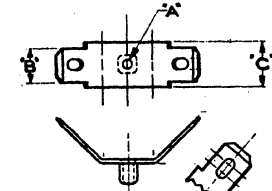
	"A"	"B"	"C"
4225	.020 Brass 7/64 Sq. Barrel	.205	.270
4228	.020 Brass 7/64 Sq. Hole	.205	.270
4241	.020 Brass 7/64 Sq. Barrel	.250	.312
4245	.020 Brass 7/64 Sq. Hole	.250	.312
4255	.032 Brass 7/64 Sq. Hole	.205	.270
4263	.032 Brass 7/64 Sq. Hole	.250	.312
4271	.032 Brass 7/64 Sq. Hole	.187	.270
4460	.020 Brass 7/64 Sq. Barrel	.187	.270
4463	.020 Brass 7/64 Sq. Hole	.187	.270



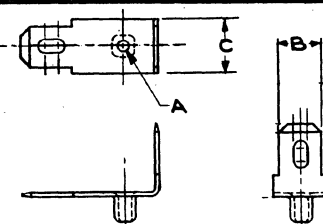
	"A"	"B"	"C"
4203	.020 Brass 7/64 Sq. Barrel	.205	.270
4222	.020 Brass 7/64 Sq. Hole	.205	.270
4233	.020 Brass 7/64 Sq. Barrel	.250	.312
4238	.020 Brass 7/64 Sq. Hole	.250	.312
4252	.032 Brass 7/64 Sq. Hole	.205	.270
4260	.032 Brass 7/64 Sq. Hole	.250	.312
4452	.020 Brass 7/64 Sq. Barrel	.187	.270
4457	.020 Brass 7/64 Sq. Hole	.187	.270
4468	.032 Brass 7/64 Sq. Hole	.187	.270



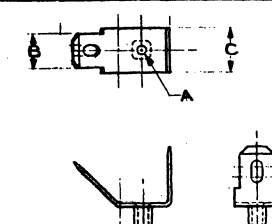
	"A"	"B"	"C"
4226	.020 Brass 7/64 Sq. Barrel	.205	.270
4229	.020 Brass 7/64 Sq. Hole	.205	.270
4242	.020 Brass 7/64 Sq. Barrel	.250	.312
4246	.020 Brass 7/64 Sq. Hole	.250	.312
4256	.032 Brass 7/64 Sq. Hole	.205	.270
4264	.032 Brass 7/64 Sq. Hole	.250	.312
4272	.032 Brass 7/64 Sq. Hole	.187	.270
4461	.020 Brass 7/64 Sq. Barrel	.187	.270
4464	.020 Brass 7/64 Sq. Hole	.187	.270



	"A"	"B"	"C"
4204	.020 Brass 7/64 Sq. Barrel	.205	.270
4223	.020 Brass 7/64 Sq. Hole	.205	.270
4234	.020 Brass 7/64 Sq. Barrel	.250	.312
4239	.020 Brass 7/64 Sq. Hole	.250	.312
4253	.032 Brass 7/64 Sq. Hole	.205	.270
4261	.032 Brass 7/64 Sq. Hole	.250	.312
4269	.032 Brass 7/64 Sq. Hole	.187	.270
4453	.020 Brass 7/64 Sq. Barrel	.187	.270
4458	.020 Brass 7/64 Sq. Hole	.187	.270

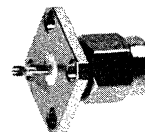
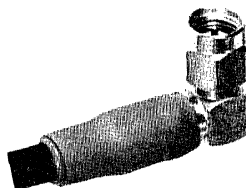


	"A"	"B"	"C"
4227	.020 Brass 7/64 Sq. Barrel	.205	.270
4230	.020 Brass 7/64 Sq. Hole	.205	.270
4243	.020 Brass 7/64 Sq. Barrel	.250	.312
4247	.020 Brass 7/64 Sq. Hole	.250	.312
4257	.032 Brass 7/64 Sq. Hole	.205	.270
4265	.032 Brass 7/64 Sq. Hole	.250	.312
4273	.032 Brass 7/64 Sq. Hole	.187	.270
4462	.020 Brass 7/64 Sq. Barrel	.187	.270
4465	.020 Brass 7/64 Sq. Hole	.187	.270
4484	.032 Brass 7/64 Sq. Barrel	.250	



OSM**COAXIAL CONNECTORS
and ADAPTERS****OSM**

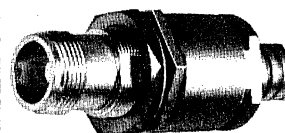
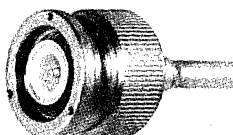
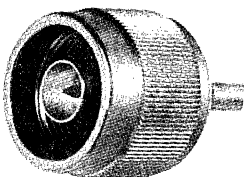
Miniature, high performance, reliable, low VSWR connectors. Dc to 26 GHz. For use on 50 ohm small and medium size semi-rigid and flexible cable. Military designation is SMA.

**OMQ/OSO**

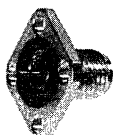
New miniature and subminiature quick connect, positive interlock series, Dc to 5.0 GHz. Low cost. All crimp assembly. For use on both semi-rigid and 50, 75 and 95 ohm flexible cable.

**TYPES N, TNC, SC**

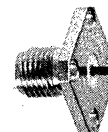
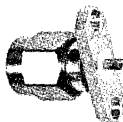
Reliable, low VSWR connectors designed to maximize performance at higher frequencies. For use on 50 ohm semi-rigid cables. Bulkhead feedthrough and right angle models available.

**HERMETIC SEAL TYPES**

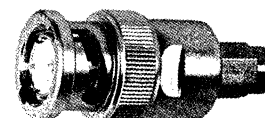
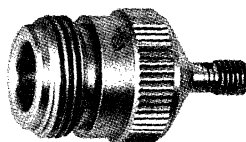
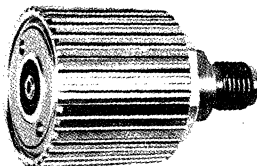
OSM and OSSM connectors meet many applications including launches to microstrip in sealed packages. Flange mount, bulkhead feedthrough, MIC and in-series adapters.

**MIC TYPES (OSM & OSSM)**

Low VSWR connectors for use with microstrip integrated circuits. Also usable with strip transmission line. Many configurations available to provide design versatility.

**BETWEEN-SERIES ADAPTERS**

Over 125 combinations for interconnection between 14 connector series. 100% computer tested to assure low VSWR and reliability.



Send for 1975 catalogs of OSM Connectors, Adapters and Components. Included are specifications, detailed outline drawings and applications data.

Omni**Spectra, Inc. MICHIGAN DIVISION**

24600 Hallwood Ct. • Farmington, Michigan 48024 • Tel. (313) 477-1234 • TWX 810-242-1463

Opt for reliability and performance Select Omni Spectra Components

With Omni Spectra components, you get in-depth engineering experience, superior design, applications knowhow, proven product performance.

Send for your Omni Spectra components catalog. We think you'll find what you need. If not, talk to us.

Broadband coverage to 18GHz



Dividers

Couplers

Attenuators-Terminations

Detectors

Omni

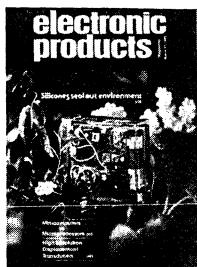
Spectra, Inc. MICHIGAN DIVISION

24600 Hallwood Ct.
Farmington, Michigan 48024
Tel. (313) 477-1234 • TWX 810-242-1463

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

***Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530***



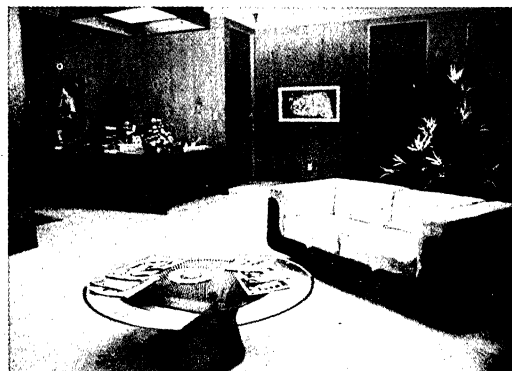
electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.

at POMONA ELECTRONICS

We are proud of the service and quality of the products we manufacture.

Customers and others having an interest in our products are welcome to visit us at any time.



POMONA TEST ACCESSORIES...

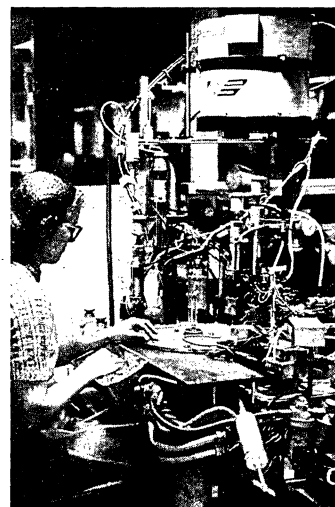
Designed to Meet Rigid Industrial and Military Applications

Pomona Electronics provides an extremely broad, versatile line of electronic test accessories, usable by virtually anyone working with any electronic equipment.

Specialization in items such as molded patch cords, cable assemblies, test socket adaptors, $\frac{3}{4}$ " spaced molded accessories, molded test leads, connecting leads and other design accessories make Pomona Electronics your best source for electronic test accessories.

Our complete engineering facilities are geared to assuring excellent product quality. Every item is the result of choosing the best in materials, and carefully planning the processing and assembly.

We offer wide distribution and off-the-shelf delivery at all times. Our processing and shipping facilities are geared to fast, accurate deliveries to meet your most demanding delivery schedule.



POMONA ELECTRONICS A Division of International Telephone and Telegraph Corporation
1500 East Ninth St. • Pomona, Calif. 91766 • Phone: (714) 623-3463 TWX: 910-581-3822

QUANTITY PRICE DISCOUNT SCHEDULE

For the convenience of our many industrial customers who purchase Pomona products in quantities, we offer a simplified ordering procedure.

You will find a code letter printed next to the single-item net price of every model listed in the general catalog. This code refers to the particular quantity discount price schedule that applies to each individual item.

To find the quantity discount price for a specific model, simply note the net price, and quantity discount schedule code letter listed for the item in the catalog. Then, referring to the industrial price list, locate the net price in the left-hand column, and the code letter in one of the right-hand columns. This will give you the quantity discount price for that particular item.

ADAPTER

MODEL 1432
(Specify Color)

BANANA JACK TO PIN TIP

Permits standard single banana plug patch cords to be used with equipment having tip jacks.

UPPER: Banana jack, .166 dia. Brass, nickel plated.

LOWER: Pin tip, .080 dia. Brass, nickel plated. Cross hole (.166 dia.) in body provides side Stack Up connection.

COLORS: Black, Red.

QUANTITY DISC. CODE **A**

Standard Package: 10 (per-color) **NET .20**

NET PRICES	(A)				(B)			
	1-24	25-49	50-99	100-249	1-9	10-24	25-49	50-99
.10	.10	.09	.08	.07				
.15	.15	.14	.13	.11				
.20	.20	.18	.17	.14				
.22	.22	.20	.19	.15				
.25	.25	.23	.21	.18				
.29	.29	.26	.25	.20				
.35	.35	.32	.30	.25				
.45	.45	.41	.38	.32				

3/4" SPACED MOLDED BANANA PLUGS

General Specifications listed below apply to items using banana plugs in this catalog.

FEATURES . . .

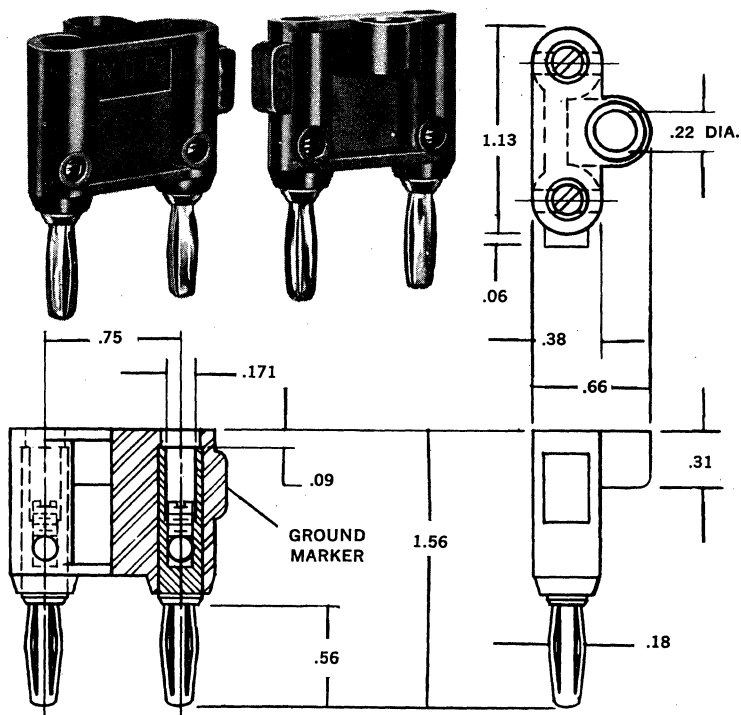
- One piece beryllium copper heat treated spring for maximum long life.
- Rounded spring design results in maximum contact area.
- STACK-UP feature allows an unlimited number of connections at the same electrical point.
- Tough thermoplastic molded directly on to the metal body of the plugs and connectors.

SPECIFICATIONS . . .

- Fits standard 0.166 dia. banana jacks.
- Spring, beryllium copper alloy 170 per QQ-C-533.
- Plug body, Brass per QQ-B-626, Alloy #360.
- Nickel plated per QQ-N-290, Class 2.
- Contact resistance less than 0.001 ohms per banana plug.

RATINGS	Models: MDP; MDP-ST; 1330; 1330-ST; 2970
■ Capacity :	0.8 pf to 10 MC
■ Current :	15 Amps. Cont., 30 Amps. Int.
■ Voltage :	5000 W.V. D.C.
■ Temperature :	-25°C to +85°C, operating temp.

ACTUAL SIZE



DOUBLE BANANA PLUG

Double banana plug on 3/4" centers; set screws secure leads; simplifies cable construction or component mounting; banana jacks permit top Stack-Up for multiple connections.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

MODEL MDP (Specify Color) QUANTITY DISC. CODE **A** NET .85

COMPONENT MOUNTING DOUBLE BANANA PLUG

Double banana plug on 3/4" centers; set screws secure leads; features recess for mounting small components; banana jacks permit top Stack-Up for multiple connections.

COLORS: Black, Red

MODEL 1330 (Specify Color) QUANTITY DISC. CODE **A** NET .85

DOUBLE BANANA PLUG WITH SOLDER TURRET TERMINALS

Similar to Model MDP, except has solder turret terminals for permanent noise-free connections of cables and components. Double banana plug on 3/4" centers; banana jacks permit top Stack-Up for multiple connections.

COLOR: Black

MODEL MDP-ST QUANTITY DISC. CODE **A** NET 1.00

COMPONENT PLUG WITH SOLDER TURRET TERMINALS

Similar to Model 1330, except has solder turret terminals for permanent noise-free connections of components, etc. Double banana plug on 3/4" centers; Banana jacks permit top Stack-Up for multiple connections.

COLORS: Black, Red.

MODEL 1330-ST (Specify Color) QUANTITY DISC. CODE **A** NET 1.00

TRIPLE BANANA PLUG

Triple banana plug on 3/4" centers; set screws secure leads. Ideal for balanced line 2 conductor shielded cable assemblies. Banana jacks permit top Stack-up for multiple connections.

COLORS: Black, Red.

MODEL 2970 (Specify Color) QUANTITY DISC. CODE **A** NET 1.75

BINDING POSTS TO TRIPLE BANANA PLUG

Features insulated binding posts on 3/4" centers for rapid mounting and interchangeability of components. Binding posts allow top Stack-Up for multiple connections. Side Stack-Up provided by thru-holes in plug body.

UPPER: Insulated Triple binding posts, on 3/4" centers. Cross holed (.166 dia.) in body provide side Stack-Up connections.

LOWER: Triple banana plug, on 3/4" centers.

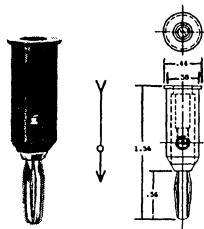
COLORS: Body, Black. Binding Posts, Red/Black/Black.

MODEL 3405 QUANTITY DISC. CODE **A** NET 4.95

BANANA PLUG ACCESSORIES



SOLDERLESS BANANA PLUG —STACK-UP



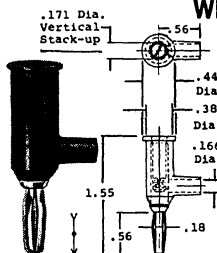
Wire firmly held in place with internal set screw, eliminating soldering. Assembly of test leads simplified.

UPPER: Banana jack, .171 dia.; Brass, nickel plated.
LOWER: Banana plug, one piece nickel plated beryllium copper spring for use with standard 0.166 dia. banana jack.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

MODEL 1325 (Specify color) QUANTITY DISC. CODE **A** NET .60

SOLDERLESS BANANA PLUG WITH SAFETY COLLAR —STACK-UP



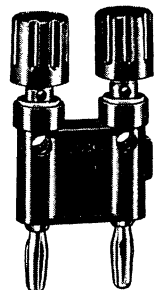
Features: Integral safety collar insulates exposed wire leads. Wire firmly held in place with internal set screw, eliminating soldering. Assembly of test leads simplified.

UPPER: Banana jack, .166 dia.; Brass, nickel plated.
LOWER: Banana plug, one piece nickel plated beryllium copper spring for use with standard 0.166 dia. banana jack.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

MODEL 1825 (Specify Color) QUANTITY DISC. CODE **A** NET .60

BINDING POSTS TO DOUBLE BANANA PLUG



Features: Insulated binding posts on $\frac{3}{4}$ " centers for rapid mounting and interchangeability of components. Binding posts allow top Stack-Up for multiple connections. Side Stack-Up provided by thru-holes in plug body.

UPPER: Insulated double binding posts, on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide side Stack-Up connections.
LOWER: Double banana plug, on $\frac{3}{4}$ " centers.

COLORS: Body, Black. Binding Posts, Black/Red.

MODEL 1286 QUANTITY DISC. CODE **A** NET 2.75

BINDING POST TO SINGLE BANANA PLUG



Features: Insulated binding post. Binding post allows top Stack-Up for multiple connections. Side Stack-Up provided by thru-hole in plug body.

UPPER: Insulated binding post. Cross hole (.166 dia.) in body provides side Stack-Up connections.
LOWER: Single banana plug, one piece nickel plated beryllium copper spring for use with standard 0.166 dia. banana jack.

COLORS: Black, Red.

MODEL 2894 (Specify color) QUANTITY DISC. CODE **A** NET 1.75

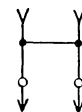
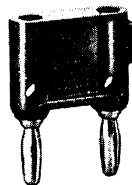
METAL SHORTING BAR



Low profile, nickel plated brass shorting bar. Double banana plugs on $\frac{3}{4}$ " centers swaged to $\frac{3}{32}$ " thick brass bar. Resistance, less than 1.5 milliohms installed. Current rating: 15 Amps. Cont., 30 Amps. Int.

MODEL 1855 QUANTITY DISC. CODE **A** NET 1.25

INSULATED SHORTING BAR

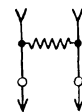
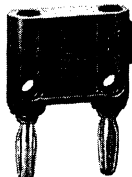


Ideal as a connecting link for use with $\frac{3}{4}$ " spaced banana jacks. Banana plugs internally solder-bonded with #14 AWG wire. Banana jacks provide top Stack-Up. Cross holes (.166 dia.) in body provide side Stack-Up connections. Resistance less than 1.5 milliohms installed. Current rating 15 Amps. Cont., 30 Amps. Int. "Shorting Bar" marked on top of plug.

COLORS: Natural, Black, Red.

MODEL MDP-S (Specify Color) QUANTITY DISC. CODE **A** NET 1.25

MOLDED PRECISION RESISTOR

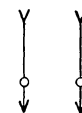
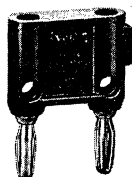


Ideal where rapid interchange of resistance values is required. Used in breadboarding, R & D labs., Standards, Terminations, etc. Deposited carbon 1% resistor, $\frac{1}{2}$ watt, molded internally. Resistor soldered to double banana plug, on $\frac{3}{4}$ " centers. Top Stack-Up provided for multiple connections. Cross holes (.166 dia.) in body provide side Stack-Up connections. Resistance value stamped on top of plug.

(OHMS)	50	200	1K	100K	1 Meg.
	75	250	5K	200K	2 Meg.
	120	500	10K	250K	5 Meg.
	130	600	20K	500K	10 Meg.
	150	900	50K		

MODEL MDP-R (Specify Value) QUANTITY DISC. CODE **A** NET 3.25

ADAPTER — .080 TIP JACKS TO DOUBLE BANANA PLUG



Permits .080 Tip plugs to be used with equipment having banana jacks.

UPPER: Tip jacks, beryllium copper, gold flashed; spaced on $\frac{3}{4}$ " centers to accept .080 dia. pin tip plugs.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers, nickel plated. Cross holes (.166 dia.) in body provide side Stack-Up connections.
COLOR: Black.

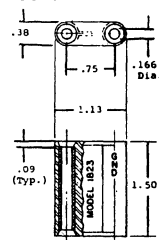
MODEL 1845 QUANTITY DISC. CODE **A** NET 1.25

DOUBLE BANANA PLUG SPlice



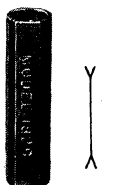
Provides rapid method for splicing cables. Reduces necessity of storing extra long cables. Molded thermo-plastic body eliminates shock hazard by completely enclosing banana plug contact. Brass, nickel plated banana jacks. .166 dia., on $\frac{3}{4}$ " centers.

COLORS: Black, Red.



MODEL 1823 (Specify color) QUANTITY DISC. CODE **A** NET .75

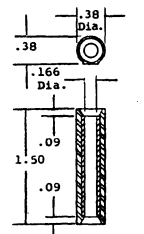
SINGLE BANANA PLUG SPlice



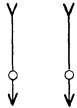
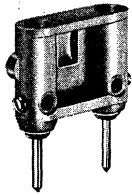
Provides rapid method for splicing single banana plug patch cords. Reduces the necessity of storing extra long patch cords. Molded thermo-plastic body eliminates shock hazard by completely enclosing banana plug contact. Brass, nickel plated banana jack, .166 dia.

COLORS: Black, Red.

Standard Package: 10 Black or 10 Red (Specify)



MODEL 1829 (Specify color) QUANTITY DISC. CODE **A** NET .40

.080 PIN TIP PLUG ACCESSORIES**COMPONENT MOUNTING — TIP JACKS TO DOUBLE PIN TIP PLUG — SET SCREWS**

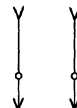
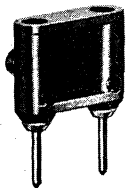
Features set screws on side of body to secure leads or components. Recess permits mounting of small component parts.

UPPER: Tip jacks, beryllium copper, gold flashed, spaced on $\frac{3}{4}$ " centers, to accept .080 dia. pin tip plugs.

LOWER: Pin tips, .080 dia. on $\frac{3}{4}$ " centers. Brass, nickel plated.

COLORS: Black, Red.

MODEL 2192 (Specify color) QUANTITY DISC. CODE **A** NET 2.25

COMPONENT MOUNTING PLUG—BANANA JACKS TO DOUBLE PIN TIP —SET SCREWS

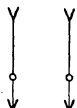
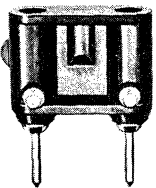
Permits single or double banana plugs to be used in equipment having tip jacks. Features recess for component mounting. Internal set screws firmly secure wire leads.

UPPER: Banana jacks, .166 dia., on $\frac{3}{4}$ " centers. Brass, nickel plated.

LOWER: Pin tips, .080 dia. on $\frac{3}{4}$ " centers. Brass, nickel plated.

COLOR: Black.

MODEL 1858 QUANTITY DISC. CODE **A** NET .95

PLUG — COMPONENT MOUNTING — DOUBLE PIN TIP PLUG—SOLDER TURRETS

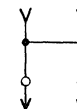
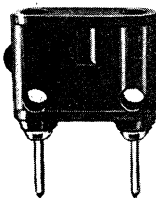
Features recess for mounting components. Gold flashed solder turrent terminals for permanent noise-free connections.

UPPER: Tip jacks, beryllium copper, gold flashed; spaced on $\frac{3}{4}$ " centers to accept .080 dia. pin tip plugs.

LOWER: Pin tips, .080 dia. brass, nickel plated.

COLORS: Black, Red.

MODEL 1904 (Specify color) QUANTITY DISC. CODE **A** NET 1.75

INSULATED SHORTING BAR

Used as a connecting link with equipment having tip jacks. Plugs internally solder bonded with 14 AWG wire. Top stack-up feature.

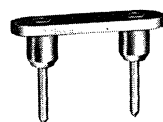
Current rating: 5 AMPS. cont., 10 AMPS. int. "Shorting Bar" marked on top of plug.

UPPER: Banana jacks, .166 dia. on $\frac{3}{4}$ " centers. Brass, nickel plated.

LOWER: Pin tips, .080 dia. on $\frac{3}{4}$ " centers. Brass, nickel plated. Cross holes (.166 dia.) in body provide side Stack-Up connections.

COLORS: Black, Red.

MODEL 1730 (Specify color) QUANTITY DISC. CODE **A** NET 1.50

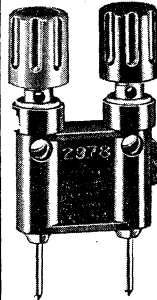
METAL SHORTING BAR

Used as a connecting link with equipment having tip jacks. Low profile, nickel plated brass shorting bar. Double pin tip plugs on $\frac{3}{4}$ " centers swaged to $\frac{3}{32}$ " thick brass bar.

RESISTANCE: Less than 1.5 milliohms installed.

CURRENT RATING: 5 Amps Cont., 10 Amps Int.

MODEL 2072 QUANTITY DISC. CODE **A** NET 1.25

BINDING POSTS TO DOUBLE PIN TIP PLUG

Features insulated binding posts on $\frac{3}{4}$ " centers for rapid mounting and interchangeability of components. Binding posts allow top Stack-Up for multiple connections. Side Stack-Up provided by thru-holes in plug body.

UPPER: Insulated double binding posts on $\frac{3}{4}$ " centers. Top and side stack-up connectors (.166 dia.). Cross holes (.166 dia.) in body provide side Stack-Up connections.

LOWER: Pin tips, .080 dia. on $\frac{3}{4}$ " centers. Brass, nickel plated.

COLORS: Body, Black, Binding Posts, Black/Red.

MODEL 2978 QUANTITY DISC. CODE **A** NET 2.95

BINDING POST TO SINGLE PIN TIP PLUG

Features insulated binding post. Binding post allows top Stack-Up for multiple connections. Side Stack-Up provided by thru-holes in plug body.

UPPER: Insulated binding post. Top and side Stack-Up connectors (.166 dia.). Cross hole (.166 dia.) in body provide side Stack-Up connections.

LOWER: Pin tip, .080 dia. brass, nickel plated.

COLORS: Black, Red.

MODEL 2953 (Specify color) QUANTITY DISC. CODE **A** NET 1.50

SOLDERLESS PIN TIP PLUG—STACK-UP

Wire firmly held in place with internal set screw, eliminating soldering. Assembly of test leads simplified.

UPPER: Tip jack, beryllium copper, gold flashed; accepts .080 dia. pin.

LOWER: Pin tip, .080 dia., brass, nickel plated.

COLORS: Black, Red.

MODEL 1922 (Specify color) QUANTITY DISC. CODE **A** NET 1.25

ADAPTER — BANANA JACK TO PIN TIP

Permits standard single banana plug patch cords to be used with equipment having tip jacks.

UPPER: Banana jack, .166 dia. Brass, nickel plated.

LOWER: Pin tip, .080 dia. Brass, nickel plated. Cross hole (.166 dia.) in body provides side Stack-Up connection.

COLORS: Black, Red. Standard Package: 10 Black or 10 Red (Specify)

MODEL 1432 (Specify Color) QUANTITY DISC. CODE **A** NET .35 ea.

ADAPTER — .080 TIP JACK TO BANANA PLUG

Permits .080 dia. pin tip patch cords to be used with equipment having banana jacks. Insulation molded to plug body.

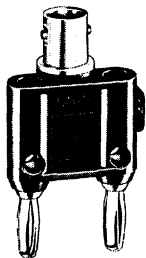
UPPER: Tip jack, beryllium copper, gold flashed. Accepts .080 dia. pin.

LOWER: Banana plug, one piece nickel plated beryllium copper spring for use with standard 0.166 dia. banana jack. Cross hole (.166 dia.) in body provides side Stack-Up connection.

COLORS: Black, Red.

MODEL 1809 (Specify Color) QUANTITY DISC. CODE **A** NET .75

BNC TEST ADAPTERS



ADAPTER — BNC RECEPTACLE TO DOUBLE BANANA PLUG

Permits BNC plug to be used with equipment having banana jacks. Excellent for adapting laboratory VTVM, oscilloscopes and signal generator inputs to readily available coaxial cables.

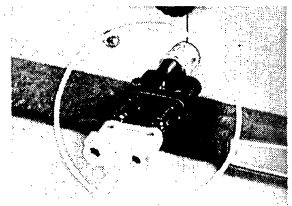
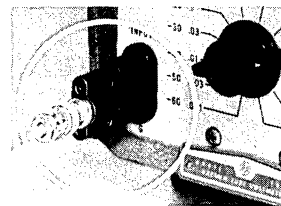
UPPER: BNC receptacle.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide side Stack-Up connections.

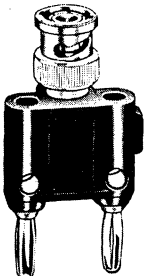
COLOR: Black.

MODEL 1269

QUANTITY DISC. CODE **A** NET 3.50



Now! Increase the flexibility of your laboratory with the use of POMONA Molded test accessories. Minimize the necessity of stocking a large quantity and variety of coaxial cables by using POMONA molded adapters. Tough thermo-plastic material molded to plug body or connectors insures maximum strength, moisture resistance and excellent insulative properties.



ADAPTER — BNC PLUG TO DOUBLE BANANA PLUG

Permits BNC receptacle to be used with equipment having banana jacks. Minimizes number of coaxial connections for maximum efficiency.

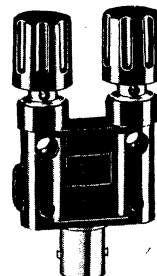
UPPER: BNC plug.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide side Stack-Up connections.

COLOR: Black.

MODEL 1270

QUANTITY DISC. CODE **A** NET 4.25



ADAPTER — BINDING POSTS TO BNC RECEPTACLE

Permits single or double banana plugs to be used with equipment having BNC plug.

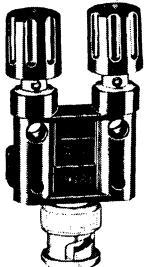
UPPER: Insulated binding posts, on $\frac{3}{4}$ " centers with .166 dia. banana jacks. Cross holes (.166 dia.) in body provide side Stack-Up connections.

LOWER: BNC receptacle.

COLOR: Body, Black. Binding Posts: Black/Red.

MODEL 1452

QUANTITY DISC. CODE **A** NET 4.95



ADAPTER — BINDING POSTS TO BNC PLUG

Permits single or double banana plugs to be used with equipment having BNC receptacle. Excellent for use with laboratory oscilloscopes.

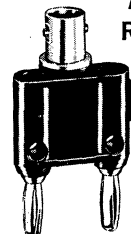
UPPER: Insulated binding posts, on $\frac{3}{4}$ " centers with .166 dia. banana jacks. Cross holes (.166 dia.) in body provide side Stack-Up connections.

LOWER: BNC plug.

COLOR: Body, Black. Binding Posts: Black/Red.

MODEL 1296

QUANTITY DISC. CODE **A** NET 5.25



ADAPTER — SIGNAL ISOLATOR — BNC RECEPTACLE TO DOUBLE BANANA PLUG

Permits BNC male connector to be used with equipment having banana jacks. General purpose ceramic capacitor molded internally. Rated @ .01 mfd $\pm 20\%$, 200 WVDC. Insulation resistance 10,000 megohms min. Ideal for isolating DC signals from VTVM inputs and signal generator outputs.

UPPER: BNC receptacle.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide side Stack-Up connections.

COLOR: Blue.

MODEL 1868

QUANTITY DISC. CODE **A** NET 8.50

ADAPTER — SINGLE BINDING POST TO BNC PLUG



Permits single banana plug to be used with equipment having a BNC receptacle. Connector body features a Non-Tarnish finish.

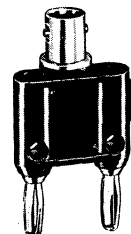
UPPER: Insulated binding post for multiple stacking.

LOWER: BNC Plug.

COLOR: Binding Post: Black or Red (specify)

MODEL 3430 (Specify color)

QUANTITY DISC. CODE **A** NET 2.50



ADAPTER — BNC MATCHING PAD

Adapts 600 OHM sources to 50, 75 or 93 OHM cables. Excellent for matching signal generators and VTVM's to standard coaxial cables. Ideal for receiver alignment. Molded in deposited carbon resistors 1%, $\frac{1}{4}$ W.

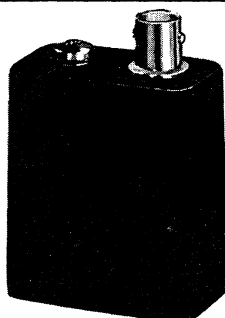
UPPER: BNC receptacle.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide side Stack-Up connections.

RANGE — OHMS	NET	QUANTITY DISC. CODE
600 to 50	12.50	A
600 to 75	12.50	
600 to 93	12.50	
300 to 50	12.50	

MODEL 1656-1
1656-2
1656-3
1656-4

COLOR
Yellow
Red
White
Blue



ADAPTER — BNC RECEPTACLE TO SHIELDED BANANA PLUGS

Permits BNC plug to be used with equipment having banana jack binding posts. Black anodized aluminum shield reduces noise Pick-up more than 70 DB. Ideal for low level inputs to oscilloscopes, wave analyzers, etc.

UPPER: BNC receptacle.

LOWER: Shielded double banana plug, on $\frac{3}{4}$ " centers.

MODEL 1645

QUANTITY DISC. CODE **A** NET 4.85



ADAPTER — BNC RECEPTACLE TO SHIELDED BANANA JACKS

Permits BNC plug to be used with equipment having banana plugs. Black anodized aluminum shield reduces noise pick-up more than 70 DB. Ideal for low level inputs to oscilloscopes, wave analyzers, etc.

UPPER: BNC receptacle.

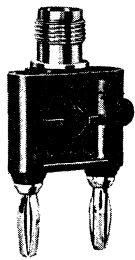
LOWER: Shielded double banana jacks, on $\frac{3}{4}$ " centers.

COLOR: Black.

MODEL 1681

QUANTITY DISC. CODE **A** NET 4.85

TNC & TYPE N ADAPTERS



ADAPTER — TNC RECEPTACLE TO DOUBLE BANANA PLUG

Permits TNC plug to be used with equipment having banana jacks. Perfect for connecting modern control systems to laboratory test equipment.

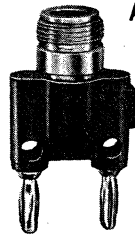
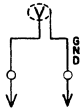
UPPER: TNC receptacle.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide side Stack-Up connections.

COLOR: Black.

MODEL 1340

QUANTITY DISC. CODE **A** NET 8.85



ADAPTER — TYPE "N" RECEPTACLE TO DOUBLE BANANA PLUG

Permits Type "N" plug to be used with equipment having banana jacks. Ideal for connecting R.F. equipment to conventional test equipment.

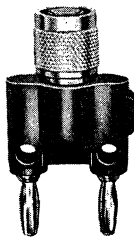
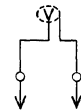
UPPER: Type "N" receptacle.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide side Stack-Up connections.

COLOR: Black.

MODEL 1740

QUANTITY DISC. CODE **A** NET 7.50



ADAPTER — TNC PLUG TO DOUBLE BANANA PLUG

Permits TNC receptacle to be used with equipment having banana jacks. Minimizes your stock of coaxial cables.

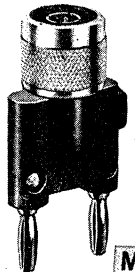
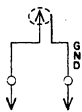
UPPER: TNC plug.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide side Stack-Up connections.

COLOR: Black.

MODEL 1981

QUANTITY DISC. CODE **A** NET 8.85



ADAPTER — TYPE "N" PLUG TO DOUBLE BANANA PLUG

Permits type "N" receptacle to be used with equipment having banana jacks.

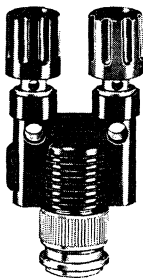
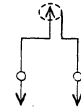
UPPER: Type "N" plug.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide side Stack-Up connections.

COLOR: Black.

MODEL 1770

QUANTITY DISC. CODE **A** NET 9.50



ADAPTER — BINDING POSTS TO TNC PLUG

Permits single or double banana plugs to be used with equipment having a TNC receptacle. Exceptional for signal insertion with rapid interchangeability of terminations.

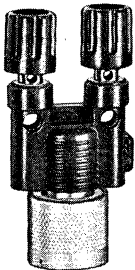
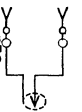
UPPER: Insulated binding posts, on $\frac{3}{4}$ " centers with .166 dia. banana jacks. Cross holes (.166 dia.) in body provide side Stack-Up connections.

LOWER: TNC plug.

COLOR: Body, Black. Binding Posts: Black/Red.

MODEL 1982

QUANTITY DISC. CODE **A** NET 8.85



ADAPTER — BINDING POSTS TO TYPE "N" PLUG

Permits single or double banana plugs to be used with equipment having Type "N" receptacle. Binding posts allow component insertion.

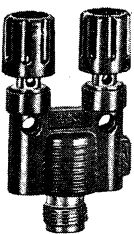
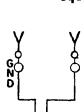
UPPER: Insulated binding posts, on $\frac{3}{4}$ " centers with .166 dia. banana jacks. Cross holes (.166 dia.) in body provide side Stack-Up connections.

LOWER: Type "N" plug.

COLOR: Black. Binding Posts: Black/Red.

MODEL 1796

QUANTITY DISC. CODE **A** NET 9.50



ADAPTER — BINDING POSTS TO TNC RECEPTACLE

Permits single or double banana plugs to be used with equipment having TNC plug. Useful for rapid interconnection of systems and components.

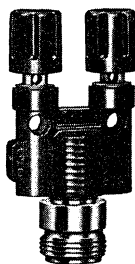
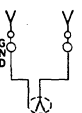
UPPER: Insulated binding posts, on $\frac{3}{4}$ " centers with .166 dia. banana jacks. Cross holes (.166 dia.) in body provide side Stack-Up connections.

LOWER: TNC receptacle.

COLOR: Body, Black. Binding Posts: Black/Red.

MODEL 1976

QUANTITY DISC. CODE **A** NET 7.85



ADAPTER — BINDING POSTS TO TYPE "N" RECEPTACLE

Permits single or double banana plugs to be used with equipment having type "N" plug. Useful for rapid interconnection of systems and components.

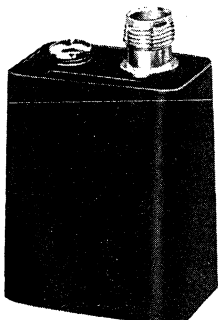
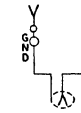
UPPER: Insulated binding posts, on $\frac{3}{4}$ " centers with .166 dia. banana jacks. Cross holes (.166 dia.) in body provide side Stack-Up connections.

LOWER: Type "N" receptacle.

COLOR: Body, Black. Binding Posts: Black/Red.

MODEL 1992

QUANTITY DISC. CODE **A** NET 7.85



ADAPTER — TNC RECEPTACLE TO SHIELDED BANANA PLUGS

Permits TNC plug to be used with equipment having banana jack binding posts. Black anodized aluminum shield reduces noise pick-up more than 70 DB.

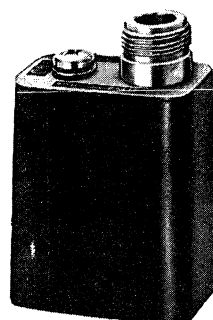
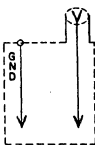
UPPER: TNC receptacle.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers.

COLOR: Black.

MODEL 1975

QUANTITY DISC. CODE **A** NET 7.85



ADAPTER — TYPE "N" RECEPTACLE TO SHIELDED BANANA PLUGS

Permits type "N" plug to be used with equipment having banana jack binding posts. Black anodized aluminum shield reduces noise pick-up more than 70 DB.

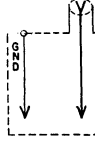
UPPER: Type "N" receptacle.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers.

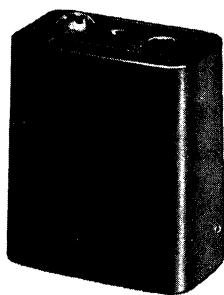
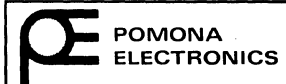
COLOR: Black.

MODEL 1983

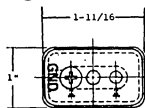
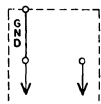
QUANTITY DISC. CODE **A** NET 7.85



SHIELDED BANANA PLUGS & UHF ADAPTERS

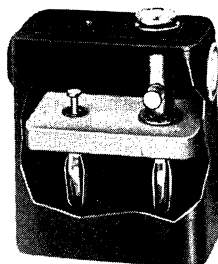
SHIELDED DOUBLE BANANA PLUG
IN-LINE CABLE ENTRY

RATED: 15A CONTINUOUS
1200 WVDC
3400 VDC BREAKDOWN
2.5 PF @ 1 MC

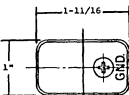
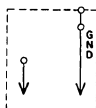


- Shielded double plug, $\frac{3}{4}$ " spaced
- Die cast aluminum shell, black anodized
- Noise pick-up reduced 70 DB
- Gold flashed solder turret terminals for positive reliable cable connections
- One piece nickel plated beryllium copper springs for use with standard 0.166 dia. banana jack binding posts.
- Rounded banana spring design results in maximum contact area and minimum contact resistance
- GND clearly molded in shell
- Cable opening, $\frac{7}{32}$ " diameter

MODEL 1433

QUANTITY DISC. CODE **A** NET 3.95SHIELDED DOUBLE BANANA PLUG
RIGHT ANGLE CABLE ENTRY

RATED: 15A CONTINUOUS
2800 PEAK WV
5000 VDC BREAKDOWN
2.0 PF @ 1 MC.



- Shielded double plug, $\frac{3}{4}$ " spaced
- Polycarbonate insulating base
- Die cast aluminum shell, black anodized
- GND clearly molded in shell
- Noise pick-up reduced 70 DB
- One piece nickel plated beryllium copper springs for use with 0.166 diameter banana jack binding posts.
- Rounded banana spring design results in maximum contact area and minimum contact resistance
- Vinyl grommet and nickel plated snap button supplied

MODEL 1791

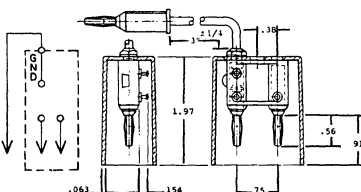
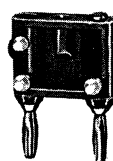
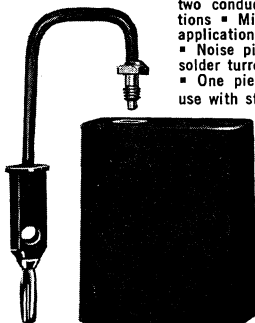
QUANTITY DISC. CODE **A** NET 4.95

BALANCED LINE SHIELDED DOUBLE BANANA PLUG

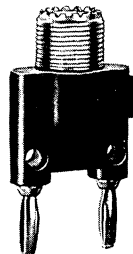
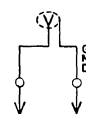
- Unique 3 terminal design allows connection to shielded two conductor cable while maintaining balanced conditions
- Minimizes ground loop errors in low signal level applications
- Die cast aluminum shell, black anodized
- Noise pick-up reduced at least 70 DB
- Gold flashed solder turret terminals for reliable noise free connections
- One piece nickel plated beryllium copper springs for use with standard 0.166 dia. banana jack binding posts.

RATED: 15A Continuous
1000 WV Peak; line to shield
2000 WV peak; line to line
2500 V peak break-down; line to shield

5000 V peak break-down, line to line
2.0 pf @ 1 MC Capacity; line to line
3.0 pf @ 1 MC. capacity; both lines to shield.



MODEL 1921

QUANTITY DISC. CODE **A** NET 7.50ADAPTER — UHF RECEPTACLE
TO DOUBLE BANANA PLUG

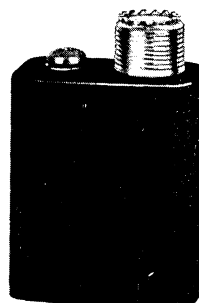
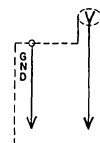
Permits UHF plug to be used with equipment having banana jacks.

UPPER: UHF receptacle, $\frac{5}{8}$ " dia.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide side Stack-Up connections.

COLOR: Black.

MODEL 1707

QUANTITY DISC. CODE **A** NET 5.85ADAPTER — UHF RECEPTACLE
TO SHIELDED BANANA PLUGS

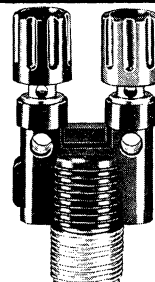
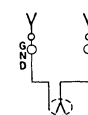
Permits UHF plug to be used with equipment having banana jack binding posts. Black anodized shield reduces noise pick-up at least 70 DB.

UPPER: UHF receptacle, $\frac{5}{8}$ " dia.

LOWER: Double banana plug on $\frac{3}{4}$ " centers.

COLOR: Black.

MODEL 1708

QUANTITY DISC. CODE **A** NET 7.50ADAPTER — BINDING POSTS
TO UHF RECEPTACLE

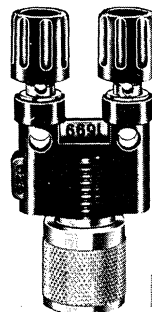
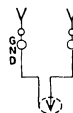
Permits single or double banana plugs to be used with equipment having UHF plug.

UPPER: Insulated binding posts, on $\frac{3}{4}$ " centers with .166 dia. jacks. Cross holes (.166 dia.) in body provide side Stack-Up connections.

LOWER: UHF receptacle, $\frac{5}{8}$ " dia.

COLOR: Body, Black. Binding posts: Black/Red.

MODEL 1792

QUANTITY DISC. CODE **A** NET 7.50ADAPTER — BINDING POSTS
TO UHF PLUG

Permits single or double banana plugs to be used with equipment having a UHF receptacle, $\frac{5}{8}$ " dia.

Convenient for use with modern oscilloscopes. Center conductor binding post Red; Ground, Black.

UPPER: Insulated binding posts, on $\frac{3}{4}$ " centers with .166 dia. jacks.

LOWER: UHF plug.

MODEL 1699

QUANTITY DISC. CODE **A** NET 5.85ADAPTER — BINDING POST
TO UHF PLUG

Permits single banana plug to be used with equipment having a UHF receptacle, $\frac{5}{8}$ " dia. Adds flexibility to your oscilloscope.

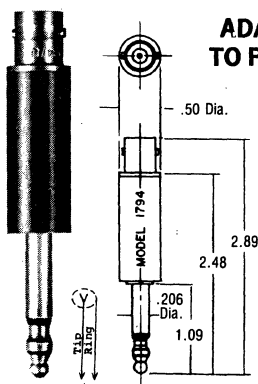
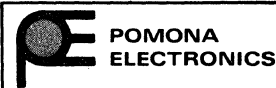
UPPER: Insulated binding post with .166 dia. banana jack.

LOWER: UHF plug.

MODEL 1698

QUANTITY DISC. CODE **A** NET 4.85

PHONE PLUG TEST ADAPTERS

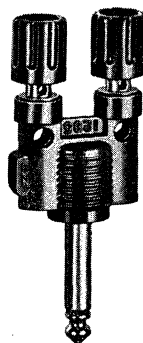

**ADAPTER — BNC RECEPTACLE
TO PJ-068/WE-309* PHONE PLUG**

Permits BNC plug to be used with equipment having three circuit phone jacks for .206 dia. phone plugs. Readily adapts equipment to available BNC coaxial cables. Tip connected to inner contact of connector and Ring connected to shell. Sleeve, no connection.

UPPER: BNC receptacle, UG1094/U.
LOWER: Phone Plug, PJ-068/WE-309*
COLOR: Black.

*WE-309 Interchangeable with PJ-068.

MODEL 1794

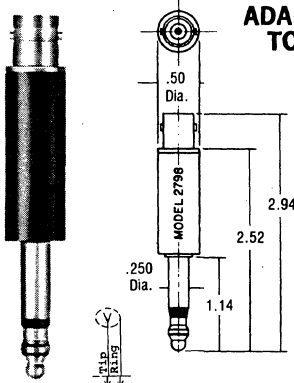
 QUANTITY **A** NET 8.85
DISC. CODE

**ADAPTER — BINDING POSTS
TO PHONE PLUG**

Permits single or double banana plug to be used with equipment having phone jacks. Ideal for rapid mounting of components and test leads.

UPPER: Insulated binding posts, on $\frac{3}{4}$ " centers with .166 dia. banana jacks. Cross holes (.166 dia.) in body provide side stack-up connections.

LOWER: Standard $\frac{1}{4}$ " dia. phone plug, $1\frac{1}{4}$ " long.
COLOR: Body, Black.
BINDING POSTS: Black/Red.

MODEL 1285

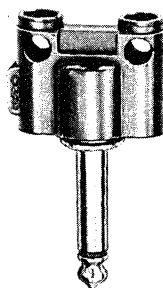
 QUANTITY **A** NET 4.85
DISC. CODE

**ADAPTER — BNC RECEPTACLE
TO PJ-051* PHONE PLUG**

Permits BNC plug to be used with equipment having three circuit phone jacks for .250 dia. phone plugs. Readily adapts equipment to available BNC coaxial cables. Tip connected to inner contact of connector and Ring connected to shell. Sleeve, no connection.

UPPER: BNC receptacle, UG1094/U.
LOWER: Phone Plug, PJ-051*
COLOR: Black.

*PJ-051 Interchangeable with WE-310

MODEL 2798

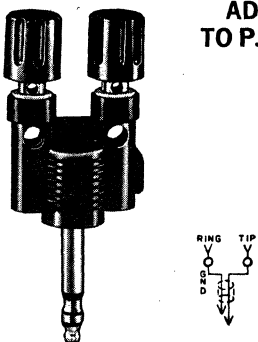
 QUANTITY **A** NET 7.85
DISC. CODE

**ADAPTER — BANANA JACKS
TO PHONE PLUG**

Permits single or double banana plugs to be used with equipment having phone jacks.

UPPER: Double banana jack, on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide side stack-up connections.

LOWER: Standard $\frac{1}{4}$ " dia. phone plug, $1\frac{1}{4}$ " long.
COLOR: Black.

MODEL 1980

 QUANTITY **A** NET 4.50
DISC. CODE

**ADAPTER — BINDING POSTS
TO PJ-068/WE-309* PHONE PLUG**

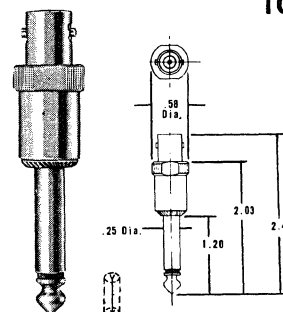
Permits single or double banana plug to be used with equipment having three circuit phone jacks for .206 dia. phone plugs. Ideal for rapid mounting of components and test leads. The PJ-068 and WE-309 Plug have the same mechanical dimensions.

UPPER: Insulated binding posts on $\frac{3}{4}$ " centers with .166 dia. banana jacks. Cross holes (.166 dia.) in body provide side stack-up.

LOWER: Phone Plug, PJ-068/WE-309*
COLOR: Body, Black. Binding Posts: Black/Red.

*WE-309 Interchangeable with PJ-068.

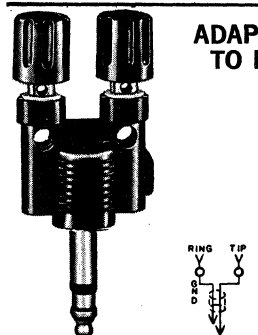
MODEL 3365

 QUANTITY **A** NET 8.85
DISC. CODE

**ADAPTER — BNC RECEPTACLE
TO PHONE PLUG**

Permits BNC plug to be used with equipment having standard $\frac{1}{4}$ " dia. phone jacks. Readily adapts equipment to available BNC coaxial cables. All metal construction to insure proper shielding.

UPPER: BNC receptacle, UG1094/U.
LOWER: Standard $\frac{1}{4}$ " dia. phone plug, $1\frac{1}{4}$ " long.

MODEL 1297

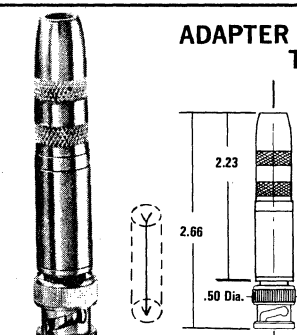
 QUANTITY **A** NET 5.85
DISC. CODE

**ADAPTER — BINDING POSTS
TO PJ-051* PHONE PLUG**

Permits single or double banana plugs to be used with equipment having three circuit phone jacks for .250 dia. phone plugs. Tip connected to hot side of adapter and Ring connected to ground side. Sleeve, no connection.

UPPER: Insulated binding posts on $\frac{3}{4}$ " centers with .166 dia. banana jacks. Cross holes (.166 dia.) in body provide side stack-up.
LOWER: Phone Plug, PJ-051*
COLOR: Black

*PJ-051 interchangeable with WE-310

MODEL 2112

 QUANTITY **A** NET 7.85
DISC. CODE

**ADAPTER — PHONE PLUG JACK
TO BNC PLUG**

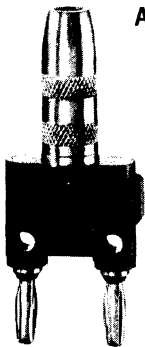
Permits a standard 2 conductor $\frac{1}{4}$ " dia. phone plug to be used with equipment having BNC receptacle. All metal construction to insure proper shielding.

UPPER: Phone plug jack, accepts standard $\frac{1}{4}$ " dia. phone plug, $1\frac{1}{4}$ " long.
LOWER: BNC Plug.

MODEL 4043

 QUANTITY **A** NET 7.85
DISC. CODE

MISCELLANEOUS TEST ADAPTERS


**ADAPTER — PHONE PLUG JACK
TO DOUBLE BANANA PLUG**

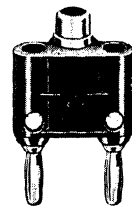
Permits a standard 2 conductor $\frac{1}{4}$ " dia. phone plug to be used with equipment having banana jacks or binding posts.

UPPER: Phone plug jack, accepts standard $\frac{1}{4}$ " dia. phone plug, $1\frac{1}{8}$ " long.

LOWER: Double banana plug on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide side stack-up connections.

COLOR: Black.


MODEL 4044

 QUANTITY
DISC. CODE **A** NET 6.85

**ADAPTER — PHONO JACK
TO DOUBLE BANANA PLUG**

Permits Phono plug to be used with equipment having banana jacks or binding posts. Quickly converts a cable with a phono plug to a double banana plug.

UPPER: Phono jack.

LOWER: Double Banana plug, on $\frac{3}{4}$ " centers. Cross holes (.166 dia.) in body provide Side Stack-Up connections.

COLOR: Black.


MODEL 1442

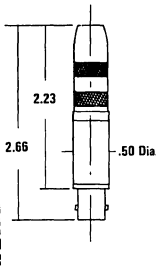
 QUANTITY
DISC. CODE **A** NET 4.85

**ADAPTER — PHONE PLUG JACK
TO BNC RECEPTACLE**

This adapter allows a cable with a 2 conductor $\frac{1}{4}$ " dia. phone plug to be attached to a cable with a BNC plug. All metal construction for proper shielding.

UPPER: Phone plug jack, accepts standard $\frac{1}{4}$ " dia. phone plug, $1\frac{1}{8}$ " long.

LOWER: BNC receptacle UG1094/U.


MODEL 4026

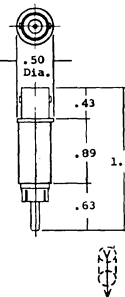
 QUANTITY
DISC. CODE **A** NET 6.85

**ADAPTER — BNC RECEPTACLE
TO PHONO PLUG**

Permits BNC plug to be used with equipment having phono jacks. Readily adapts equipment to available BNC coaxial cables. All metal construction to insure proper shielding.

UPPER: BNC receptacle UG1094/U.

LOWER: Phono plug.


MODEL 2957

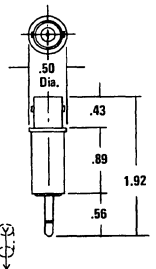
 QUANTITY
DISC. CODE **A** NET 3.95

**ADAPTER — BNC RECEPTACLE
TO TINI-PLUG**

Permits BNC plugs to be used with equipment having Tini-Jacks. Readily adapts equipment to available BNC coaxial cables. All metal construction to insure proper shielding.

UPPER: BNC receptacle UG1094/U.

LOWER: 2 conductor Tini-Plug.


MODEL 3837

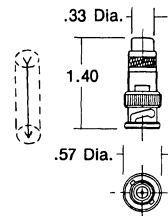
 QUANTITY
DISC. CODE **A** NET 4.85

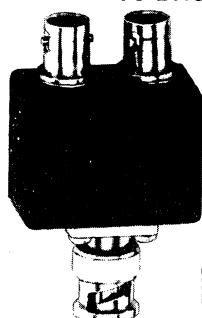
**ADAPTER — PHONO JACK
TO BNC PLUG**

Permits phono plug to be used with equipment having BNC receptacles. Quickly converts a cable with a phono plug to a BNC plug. All metal construction to insure proper shielding.

UPPER: Phono jack.

LOWER: BNC plug.


MODEL 4054

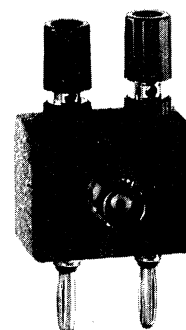
 QUANTITY
DISC. CODE **A** NET 3.85

**ADAPTER — TWO BNC JACKS
TO BNC PLUG — "IN LINE T"**

Excellent for use where space requires cables to come straight out instead of at a right angle. Die cast aluminum housing with baked enamel finish. All metal construction to insure proper shielding.

UPPER: (2) BNC receptacles UG1094/U.

LOWER: BNC plug UG1104A/U.

COLOR: Blue.


 QUANTITY
DISC. CODE **A** NET 14.85

**ADAPTER — BINDING POSTS TO DOUBLE
BANANA PLUG WITH BNC JACK**

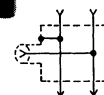
With this combination adapter it is possible to connect to equipment, cables with both, double banana plugs and BNC plugs. Excellent for use with signal generators. Die cast aluminum housing with baked enamel finish.

UPPER: Insulated binding posts on $\frac{3}{4}$ " centers. Black/Red.

CENTER: BNC receptacle, UG1094/U.

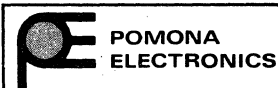
LOWER: Banana plugs on $\frac{3}{4}$ " centers, nickel plated.

COLOR: Blue.

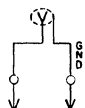
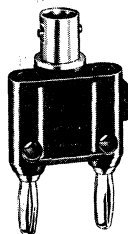

MODEL 4060

 QUANTITY
DISC. CODE **A** NET 14.85

MISCELLANEOUS TEST ACCESSORIES



ADAPTER—MHV RECEPTACLE TO DOUBLE BANANA PLUG



This adapter allows an MHV Plug to be used with equipment having $\frac{3}{4}$ " spaced banana jacks.

UPPER: MHV receptacle.

LOWER: Double banana plug, on $\frac{3}{4}$ " centers. Cross holes (.166 Dia.) in body provide side Stack-Up connections.

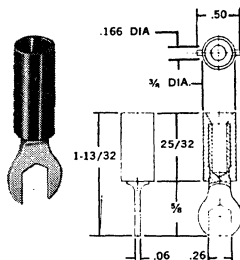
VOLTAGE RATING: 5,000 Volts Peak

COLOR: Black.

MODEL 3290

QUANTITY DISC. CODE A NET 8.85

INSULATED SPADE LUG ADAPTER



Permits single banana plug to be used with equipment having binding posts. Tough thermoplastic molded to body for maximum reliability and low shock hazard. Spade lug body, one piece machined brass, nickel plated.

UPPER: Banana jack, .166 dia.

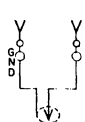
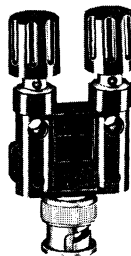
LOWER: Spade lug, .26 opening.

COLORS: Black, Red.

MODEL 1614

(Specify color) QUANTITY DISC. CODE A NET .45

ADAPTER—BINDING POSTS TO MHV PLUG



This adapter converts a MHV Receptacle to standard $\frac{3}{4}$ " 5 way binding posts.

UPPER: Insulated binding posts on $\frac{3}{4}$ " centers with (.166 dia.) banana jacks. Cross holes (.166 dia.) in body provide side Stack-Up connections.

LOWER: MHV plug.

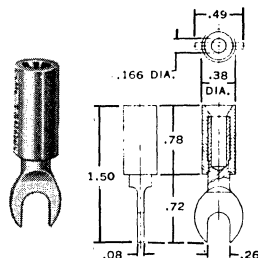
VOLTAGE RATING: 5,000 Volts Peak

COLOR: Black.

MODEL 3291

QUANTITY DISC. CODE A NET 11.85

TELLURIUM COPPER INSULATED SPADE LUG ADAPTER



Permits single banana plug to be used with equipment having binding posts. Tough thermoplastic molded to body for maximum reliability and low shock hazard. Spade lug body, one piece machined tellurium copper, gold plated per MIL-G-45204, Type 11, Class 1.

UPPER: Banana jack, .166 dia.

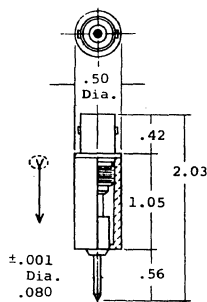
LOWER: Spade lug, .26 opening.

COLORS: Black, Red.

MODEL 2305

(Specify Color) QUANTITY DISC. CODE A NET 1.25

ADAPTER—BNC RECEPTACLE TO SINGLE PIN TIP PLUG



Permits BNC plug to be used with equipment having .080 dia. pin tip jacks. Inner conductor connected only. Excellent for adapting laboratory VTVM, oscilloscopes and signal generator inputs to readily available coaxial cables.

UPPER: BNC receptacle, UG1094/U.

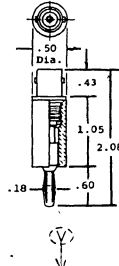
LOWER: Single Pin Tip Plug .080 dia.

COLOR: Black.

MODEL 3415

QUANTITY DISC. CODE A NET 2.85

ADAPTER—BNC RECEPTACLE TO SINGLE BANANA PLUG



Permits BNC plug to be used with equipment having banana jacks. Inner conductor connected only. Excellent for adapting laboratory VTVM, oscilloscopes and signal generator inputs to readily available coaxial cables.

UPPER: BNC receptacle, UG1094/U.

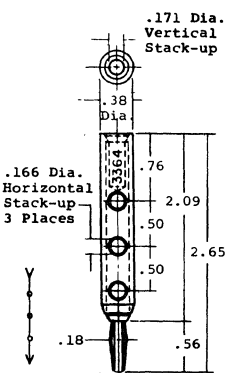
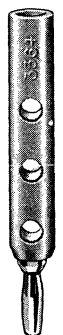
LOWER: Single Banana Plug.

COLOR: Black.

MODEL 1894

QUANTITY DISC. CODE A NET 2.75

QUAD STACKING PLUG



Features four parallel connectors to the same point. Excellent for use when many test points must be tied together.

UPPER: Banana jack, .166 dia. Brass, nickel plated.

CENTER: 3 Crossholes, .166 dia. in body provide side stack-up connection.

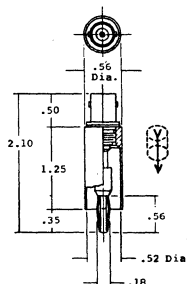
LOWER: Banana plug, one piece heat treated beryllium copper spring, nickel plated, for use with .166 dia. banana jack.

COLORS: Black, Red.

MODEL 3364 (Specify color)

QUANTITY DISC. CODE A NET 1.25

ADAPTER—BNC RECEPTACLE TO SHIELDED BANANA PLUG



Permits BNC plug to be used with equipment having banana jacks or binding posts. Ideal for use when shielding of single banana jacks is needed. All metal construction for proper shielding.

UPPER: BNC Receptacle, UG1094/U.

LOWER: Shielded single banana plug.

MODEL 2990

QUANTITY DISC. CODE A NET 2.95

COAXIAL TEST ACCESSORIES



ADAPTER — BNC JACK TO JACK



Allows the interconnection of two coaxial cables with BNC plugs.

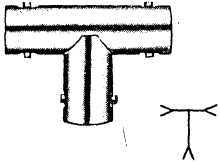
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Gold flashed beryllium copper contacts.

MODEL 3283

QUANTITY DISC. CODE **A** NET 1.85

ADAPTER — BNC "T" — 3 JACKS



Allows the interconnection of three coaxial cables with BNC plugs.

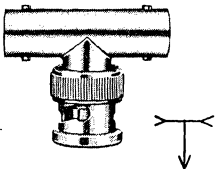
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Gold flashed beryllium copper contacts.

MODEL 3284

QUANTITY DISC. CODE **A** NET 6.25

ADAPTER — BNC "T" JACK — PLUG — JACK



With this adapter, equipment or coaxial cables having a single BNC jack are changed to two BNC jacks.

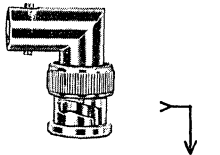
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Gold flashed beryllium copper female and outer male contact.

MODEL 3285

QUANTITY DISC. CODE **A** NET 4.50

ADAPTER — RIGHT ANGLE BNC JACK TO BNC PLUG



Adapts straight BNC plug to right angle BNC plug.

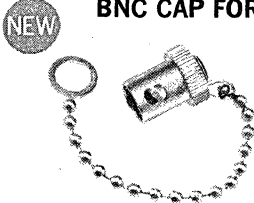
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Beryllium copper female and outer finger contact.
- Gold flashed female and male contact.

MODEL 3534

QUANTITY DISC. CODE **A** NET 3.95

BNC CAP FOR PLUGS — WITH BEAD CHAIN



Female dust cap for protection of BNC plugs from dirt and accidental shorting.

FEATURES:

- Non-Tarnish Finish
- 3 1/8" Bead Chain
- .28 Dia. hole in lug

MODEL 4157

QUANTITY DISC. CODE **A** NET 1.50

BNC CAP FOR JACKS — WITH BEAD CHAIN



Male dust cap for protection of BNC jacks from dirt and accidental shorting.

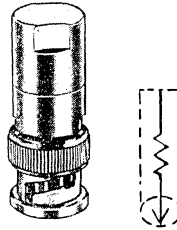
FEATURES:

- Non-Tarnish finish.
- 2 1/4" Bead Chain.
- .14" Dia. hole in lug.

MODEL 3839

QUANTITY DISC. CODE **A** NET 1.25

RESISTOR TERMINATED PLUG



Ideal for terminating coaxial lines etc.

FEATURES:

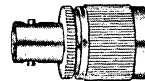
- 1% resistor, 1/2 watt.
- Resistance value stamped on body.
- Non-Tarnish finish.
- Teflon insulation.
- Gold plated male contact.

(Ohms) 50, 75, 93, 100, 600

MODEL 3840 (Specify Value)

QUANTITY DISC. CODE **A** NET 4.50

ADAPTER — BNC JACK TO UHF PLUG



Allows the use of a BNC plug on equipment having a UHF Jack.

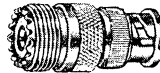
FEATURES:

- Non-Tarnish finish.
- Rexolite insulation.
- Gold flashed beryllium copper female contact.
- Gold flashed male contact.

MODEL 3286

QUANTITY DISC. CODE **A** NET 2.50

ADAPTER — UHF JACK TO BNC PLUG



Allows the use of a UHF Plug on equipment having a BNC Jack.

FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Rexolite insulation.
- Gold flashed Phosphor Bronze female UHF and male BNC contacts.

MODEL 3287

QUANTITY DISC. CODE **A** NET 3.85

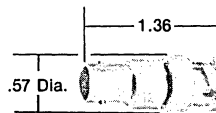
BNC 50-OHM FEED-THRU TERMINATION

Ideal for terminating PULSE, MICROWAVE or UHF instruments in their characteristic impedance.

- 1st end: Female BNC
- 2nd end: Male BNC
- 50-Ohm termination resistor, 1%, 1/2 W.

FEATURES:

- Non-Tarnish Finish.
- Teflon Insulation.
- Gold Plated Contacts.
- Maximum VSWR: DC to 250 MHz: 1.1
- 250 MHz to 500 MHz: 1.2



MODEL 4119

QUANTITY DISC. CODE **A** NET 14.85

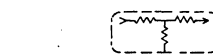
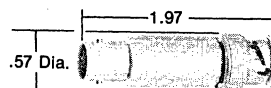
BNC 50-OHM ATTENUATORS

For use with PULSE, MICROWAVE, or UHF instruments.

- 1st end: Female BNC
- 2nd end: Male BNC
- 50-Ohm, 2-Watt T-Pad Network

FEATURES:

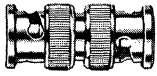
- Non-Tarnish Finish
- Teflon Insulation
- Gold Plated Contacts



MODEL	ATTENUATION	VSWR	ATTENUATION (LIMITS)
4108-1	3 db	1.1 to 1 GHz	±0.4 db to 1 GHz
4108-2	6 db	1.2 to 2 GHz	±0.45 db to 2 GHz
4108-3	10 db	1.35 to 4 GHz	±0.65 db to 4 GHz
4108-4	14 db	1.45 to 6 GHz	±0.75 db to 6 GHz
4108-5	20 db	1.65 to 8 GHz	±0.9 db to 8 GHz

MODEL 4108

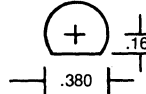
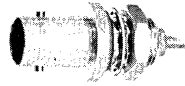
QUANTITY DISC. CODE **A** NET 24.95

ADAPTER — BNC PLUG TO PLUG

Allows the interconnection of two coaxial cables with BNC Jacks.

FEATURES:

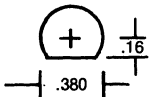
- Non-Tarnish finish.
- 50-Ohm impedance.
- Teflon insulation.
- Beryllium copper outer finger contacts.
- Gold flashed male contacts.

MODEL 3533QUANTITY DISC. CODE **A** NET 3.75**BNC PRESSURIZED BULKHEAD RECEPTACLE** NEW

Excellent for use with equipment which requires pressure differences. Front hole mounting.

FEATURES:

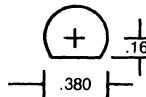
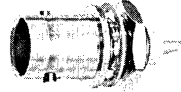
- Non-Tarnish finish.
- 50-Ohm impedance.
- Teflon insulation.
- Gold flashed Beryllium copper contacts.
- Silicone rubber O-Ring.
- Mounts in panels up to .242 thick.

MODEL 4158QUANTITY DISC. CODE **A** NET 4.25**BNC HERMETIC SEALED BULKHEAD RECEPTACLE**

Excellent for use with equipment which requires a hermetic seal for pressure differences. Front hole mounting.

FEATURES:

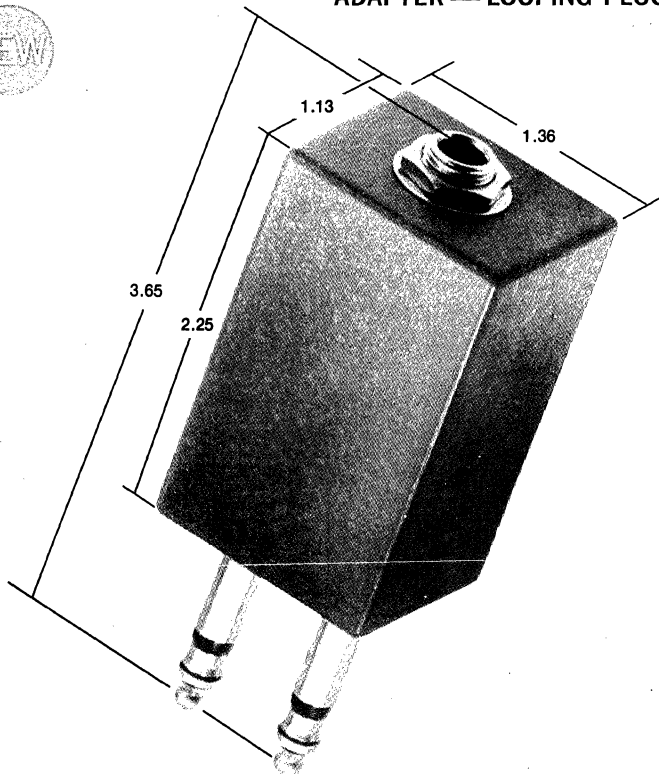
- Non-Tarnish finish.
- 50-Ohm impedance.
- Teflon insulation.
- Gold flashed Beryllium copper contacts.
- Mounts in panels up to .369 thick.

MODEL 4159QUANTITY DISC. CODE **A** NET 4.95**BNC BULKHEAD RECEPTACLE** NEW

Ideal for use where space requirements between connectors are at a premium.

FEATURES:

- Non-Tarnish finish.
- 50-Ohm impedance.
- Teflon insulation.
- Gold flashed Beryllium copper contacts.
- Mounts in panels up to .134 thick.

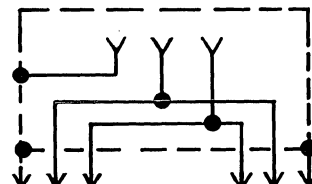
MODEL 4160QUANTITY DISC. CODE **A** NET 1.50**ADAPTER — LOOPING PLUG WITH MONITOR JACK**

With this combination adapter it is possible to monitor the looping plug circuit. Die cast aluminum housing with baked enamel finish.

UPPER: Phone Jack (Accepts 1/4" Dia. PJ-051 Plug).

LOWER: (2) Phone Plugs, PJ-051 on 5/8" Centers (Equivalent to WE-310).

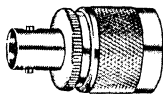
COLOR: Blue

**SCHEMATIC****MODEL 4104**QUANTITY DISC. CODE **A** NET 24.95

COAXIAL TEST ADAPTERS



ADAPTER — BNC JACK TO TYPE "N" PLUG



Allows the use of a BNC Plug on equipment having a type "N" jack.

FEATURES:

- Non-Tarnish finish.
- Teflon insulation.
- Gold flashed contacts.

MODEL 3288

QUANTITY
DISC. CODE A NET 2.50

ADAPTER — TYPE "N" JACK TO BNC PLUG



Allows the use of a Type "N" plug on equipment having a BNC jack.

FEATURES:

- Non-Tarnish finish.
- Teflon insulation.
- Beryllium copper female "N" contact and BNC outer finger contact.
- Gold flashed female "N" and male BNC contact.

MODEL 3535

QUANTITY
DISC. CODE A NET 3.95

ADAPTER — TYPE "N" JACK TO JACK



Allows the interconnection of two coaxial cables with Type "N" Plugs.

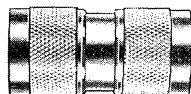
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Gold flashed beryllium copper contacts.

MODEL 3841

QUANTITY
DISC. CODE A NET 2.75

ADAPTER — TYPE "N" PLUG TO PLUG



Allows the interconnection of two coaxial cables with type "N" Jacks.

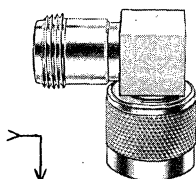
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Phosphor Bronze outer finger contacts. Gold flashed male contacts.

MODEL 3842

QUANTITY
DISC. CODE A NET 3.50

ADAPTER — RIGHT ANGLE TYPE "N" JACK TO TYPE "N" PLUG



Adapts straight type "N" plug to right angle type "N" plug.

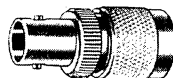
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Phosphor Bronze outer finger contact.
- Gold flashed beryllium copper female and male contact.

MODEL 3843

QUANTITY
DISC. CODE A NET 4.95

ADAPTER — BNC JACK TO TNC PLUG



Allows the use of a BNC plug on equipment having a TNC jack.

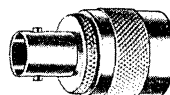
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Beryllium copper outer finger TNC contact.
- Gold flashed beryllium copper female BNC and TNC male contact.

MODEL 3844

QUANTITY
DISC. CODE A NET 6.85

ADAPTER — BNC JACK TO TYPE "C" PLUG



Allows the use of a BNC plug on equipment having a type "C" jack.

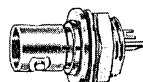
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Beryllium copper type "C" outer finger contact.
- Gold flashed beryllium copper female BNC and TNC male contact.

MODEL 3845

QUANTITY
DISC. CODE A NET 4.95

BNC — ISOLATED GROUND BULKHEAD RECEPTACLE



This connector has the outer conductor isolated from the panel. Excellent for use with equipment requiring a floating input.

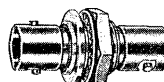
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Gold flashed beryllium copper contact.
- Mounts in panels up to .175" thick.

MODEL 3778

QUANTITY
DISC. CODE A NET 4.95

ADAPTER — ISOLATED GROUND BNC JACK TO JACK



Outer conductor is isolated from the panel. Excellent for feeding through panels which require a floating shield.

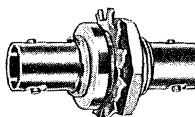
FEATURES:

- Non-Tarnish finish.
- 50-Ohm impedance.
- Teflon insulation.
- Gold flashed beryllium copper contacts.
- Mounts in panels up to .175" thick.

MODEL 3846

QUANTITY
DISC. CODE A NET 8.25

ADAPTER — HERMETIC SEALED BNC JACK TO JACK



Excellent for use with equipment which requires a hermetic seal for pressure differences.

FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Gold flashed beryllium copper contacts.
- Silicone rubber O-ring. Mounts in panels up to .279" thick.

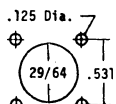
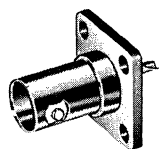
MODEL 3847

QUANTITY
DISC. CODE A NET 4.95

PANEL RECEPTACLES— TWINAX JACKS, PLUGS & PATCH CORDS



BNC FEMALE PANEL RECEPTACLE



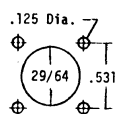
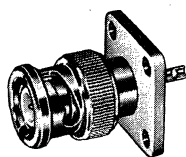
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Gold flashed beryllium copper contact.
- Beryllium copper outer finger contact.
- Solder cup connection.

MODEL 2451

 QUANTITY DISC. CODE **A** NET 1.65

BNC MALE PANEL RECEPTACLE



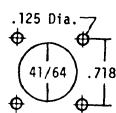
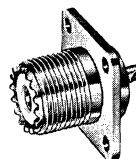
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Beryllium copper outer finger contact.
- Gold flashed male contact.
- Solder cup connection.

MODEL 2447

 QUANTITY DISC. CODE **A** NET 3.25

UHF FEMALE PANEL RECEPTACLE



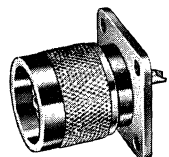
FEATURES:

- Non-Tarnish finish.
- Teflon insulation.
- Gold flashed phosphor bronze contact.
- Solder cup connection.

MODEL 2449

 QUANTITY DISC. CODE **A** NET 3.50

UHF MALE PANEL RECEPTACLE



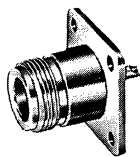
FEATURES:

- Non-Tarnish finish.
- Teflon insulation.
- Gold flashed male contact.
- Solder cup connection.

MODEL 2450

 QUANTITY DISC. CODE **A** NET 6.50

TYPE "N" FEMALE PANEL RECEPTACLE



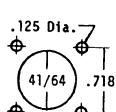
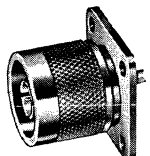
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Gold flashed beryllium copper contact.
- Solder cup connection.

MODEL 2455

 QUANTITY DISC. CODE **A** NET 2.95

TYPE "N" MALE PANEL RECEPTACLE



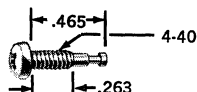
FEATURES:

- Non-Tarnish finish.
- 50 Ohm impedance.
- Teflon insulation.
- Beryllium copper outer finger contact.
- Gold flashed male contact.
- Solder cup connection.

MODEL 2454

 QUANTITY DISC. CODE **A** NET 5.85

SOLDER TURRET TERMINAL SCREW



Excellent for mounting of panel receptacles. Turret on end of screw for soldering. #4-40, Phillips head, steel, cadmium plated.

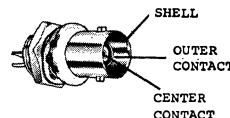
MODEL 2352

Std. Pkg. 100 NET per Pkg. 10.00

TWINAX JACKS, PLUGS AND PATCH CORDS

Due to the ever increasing need for low level signal patching and balanced line applications, Pomona introduces Twinax Patch cords and jacks. For use with 2 conductor shielded cable.

These connectors feature a concentric design with a center contact, outer contact and outer shell (see dwg.). This concentric design does not require matching of halves such as the Polarized stepped insulator connectors.



MATERIAL:

- Bodies and Fittings: Brass per QQ-B-626, Alloy #360.
- Insulators: Teflon per MIL-P-19468.
- Center Contacts:
 - Female — Beryllium copper per QQ-C-530 Cond. H.
 - Male — Brass per QQ-B-626, Alloy #360.
- Outer Contacts: Beryllium copper per QQ-C-530 Cond. H.

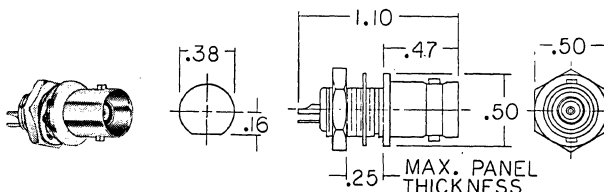
FINISH:

- Bodies and Fittings: Non-Tarnish.
- Center Contacts: Gold over copper plate.
- Outer Contacts: Gold over copper plate.

RATING:

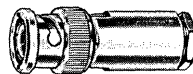
- 500 VRMS

BULKHEAD RECEPTACLE

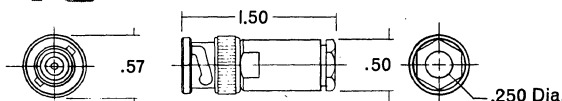

MODEL 3580

 QUANTITY DISC. CODE **A** NET 6.95

CABLE PLUG

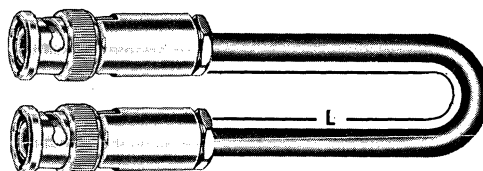


For use with RG 108A/U and Belden 9272.


MODEL 3600

 QUANTITY DISC. CODE **A** NET 7.50

TWINAX CABLE PLUG BOTH ENDS



CABLE DESCRIPTION:

- Belden 9272.
- Impedance — 78 Ohm.
- 2 Conductor shielded.
- Conductors — 20 AWG (7 x 28) with polyethylene insulation.
- Shield — tinned copper.
- Jacket — Blue vinyl, .242" O.D.
- Capacitance—Between conductors, 19 Pf/ft.

 QUANTITY DISC. CODE **B**

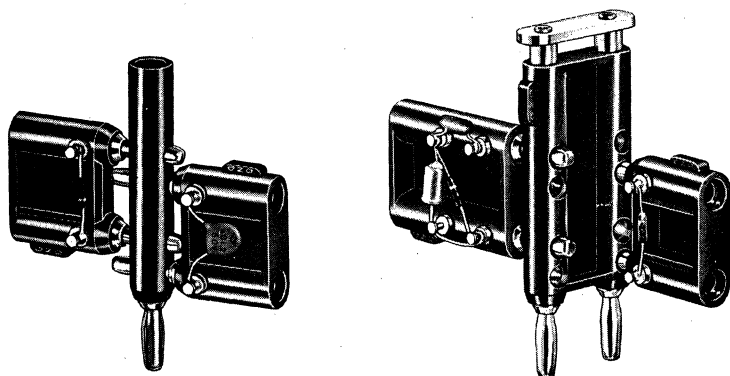
MODEL	LENGTH	NET
3581-CC-18	18"	19.95
3581-CC-24	24"	19.95
3581-CC-36	36"	19.95
3581-CC-48	48"	19.95
3581-CC-60	60"	19.95

MODEL 3581

SERIES PARALLEL ISOLATION PLUGS & CONNECTOR TEST ADAPTERS



SERIES PARALLEL ISOLATION PLUGS



MODEL 3501

MODEL 3502

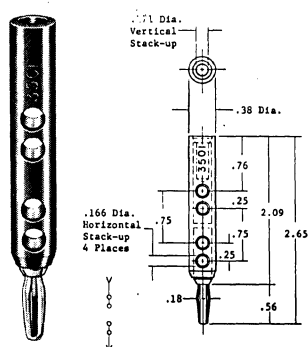
These plugs enable you to build unlimited combinations of series parallel networks eg., voltage dividers attenuator and etc.

Upper crossholes spaced $\frac{3}{4}$ " on centers from lower crossholes to allow connection of double banana plugs. Double banana plugs may be plugged in from both sides.

FEATURES:

- Fits .166 dia. Banana jacks.
- Spring, heat treated beryllium copper alloy 170 per QQ-C-533.
- Plug bodies and jacks, Brass, nickel plated per QQ-N-290 class 2.
- Tough thermoplastic molded to banana jacks and plug bodies.

SERIES-PARALLEL ISOLATION PLUG



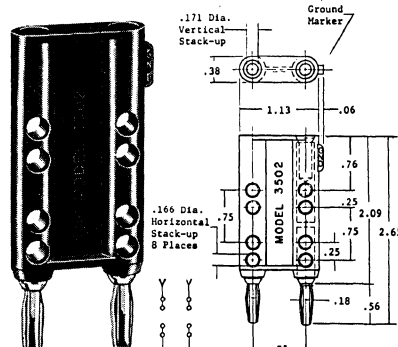
Top banana jack and upper pair of crossholes isolated from lower pair of crossholes and banana plug.

UPPER: Banana jack .166 dia.
CENTER: 4 crossholes .166 dia.
LOWER: Banana Plug.
COLOR: Red.

MODEL 3501

QUANTITY DISC. CODE **A** NET 2.25

DUAL SERIES-PARALLEL ISOLATION PLUG



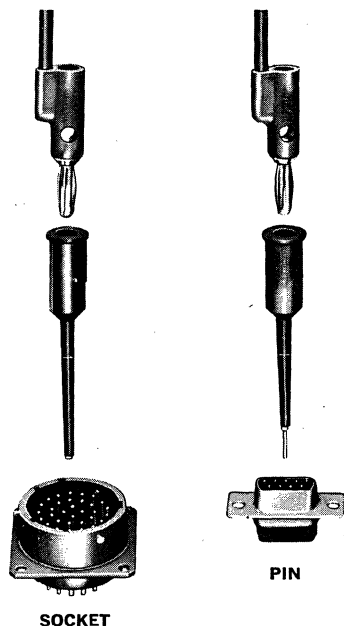
Excellent for building attenuators, voltage dividers, isolation networks, etc. Top banana jacks and upper pair of crossholes isolated from lower pair of crossholes and banana plugs.

UPPER: Double banana jack .166 dia., on $\frac{3}{4}$ " centers.
CENTER: 8 crossholes .166 dia.
LOWER: Double banana plug on $\frac{3}{4}$ " centers.
COLOR: Red.

MODEL 3502

QUANTITY DISC. CODE **A** NET 3.95

TYPICAL APPLICATION



CONNECTOR TEST ADAPTERS

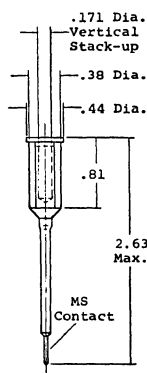
An ideal test adapter for the rapid testing of the hard to get at contacts of multi-pin MS type connectors such as miniature circular, standard circular and rack and panel. Excellent for testing of continuity, voltage and signal on individual contacts. Test adapter available in Pin and socket contacts sizes of 20, 16 and 12.

- Gold flashed contacts conform to "MS" Dimensions.
- Flexible tip prevents damage to connector contacts if test adapter is accidentally bent.
- Flexible tip allows testing of adjacent contacts.
- Fully insulated to prevent accidental shorting.
- Accepts standard banana plug.

UPPER: Banana jack, .166 dia., brass, nickel plated.

LOWER: "MS" style contact, gold flashed, see tab block.

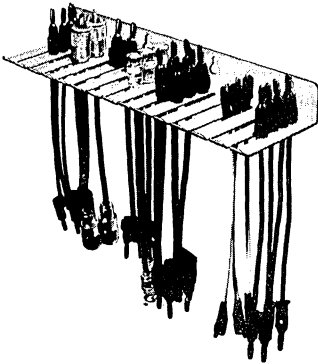
Color: See tab block. (Specify Color).



MODEL (Specify color)	CONTACT SIZE	TYPE	COLOR (Specify color)	NET
3560	20	Pin	Red, Black	1.50
3561	20 (.040 dia.)	Socket	Red, Black	1.50
3562	16	Pin	Red, Black	1.75
3563	16 (.063 dia.)	Socket	Red, Black	1.50
3564	12	Pin	Red, Black	2.50
3565	12 (.093 dia.)	Socket	Red, Black	1.50

QUANTITY DISC. CODE **A**

MISCELLANEOUS ACCESSORIES



TEST LEAD HOLDER

No need to spend time searching for a particular test lead. With this new rack, all of your patch cords and cable assemblies can be conveniently filed for instant selection — within easy reach. Holder mounts quickly on any vertical surface. Test leads are easy to store, easy to remove. Two models to choose from for different size cables.

MATERIAL: Cold Rolled Steel.
FINISH: Baked Enamel.

MODEL 1508
MODEL 2708

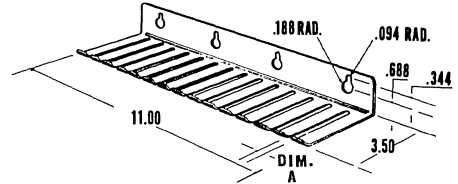
MAX. CABLE
DIA. (DIM. A)
.210"
.450"

COLOR
Orange
Blue

NET
3.85
3.85

QUANTITY
DISC. CODE A

SEE PAGE 66 FOR TEST SOCKET ADAPTER HOLDER

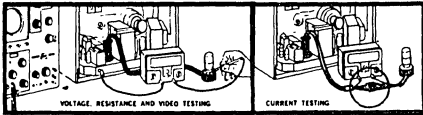


Universal Harness

TESTING ADAPTER

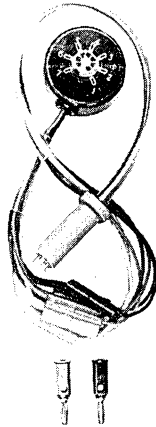
Takes the Trouble out of Trouble Shooting!

TEST SOCKET: Extended test tabs, phosphor bronze contacts, heavy duty molded phenolic base with easy-to-read socket connections. **CURRENT MEASUREMENT CONNECTIONS:** Fully insulated, molded .080 phone tip plugs. **INSULATED PLUG:** Fits either shielded or unshielded tube sockets.

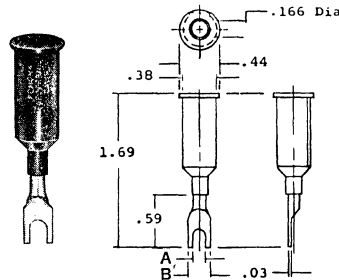


MODEL 1737 (7 Pin)
MODEL 1738 (8 Pin)
MODEL 1739 (9 Pin)

QUANTITY
DISC. CODE D
NET 14.95



INSULATED BARRIER STRIP SPADE LUG ADAPTERS



Permits single banana plug to be used with equipment having barrier strips. Lugs fit a No. 4, 5, 6, 8, or 10 screw (see listing). Tough Thermoplastic molded to body for maximum reliability.

UPPER: Banana Jack, .166 dia. Brass, nickel plated.

LOWER: Spade lug, (see listing). Copper, electro-tin plated.

COLORS: Black, Red.

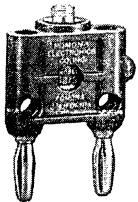
*(Specify Color)

MODEL	LUG SIZE	DIM	
		A	B
3744	4, 5 & 6	.15	.24
3777	8 & 10	.19	.30

QUANTITY
DISC. CODE A

NET .75

ADAPTER — MICRODOT RECEPTACLE TO DOUBLE BANANA PLUG

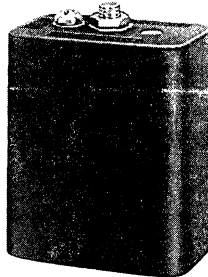


Permits Microdot miniature coaxial plug to be used with equipment having banana jacks. Cross holes in body provide side Stack-Up connections.

UPPER: Microdot receptacle, Screw-On Type.
LOWER: Double banana plug, on 3/4" centers. Cross holes (.166 dia.) in body provide side Stack-Up connections.

MODEL	TYPE (Ohms)	BODY COLOR	RECEPTACLE TYPE	NET	QUANTITY DISC. CODE
1275	50	Green	10-32 thread	12.50	A
1276	50	Black	Slide-on	12.50	
1277	70	Violet	12-32 thread	12.50	
1279	93	White	1/4-32 thread	12.50	

ADAPTER—MICRODOT RECEPTACLE TO SHIELDED BANANA PLUGS



Permits Microdot miniature coaxial plug, 50 ohm, to be used with equipment having banana jack binding posts. Black anodized aluminum shield reduces noise pick-up more than 70 DB. Ideal for noise reduction in low level acceleration systems.

UPPER: Microdot Receptacle, Screw-On Type, Receptacle Thread 10-32.

LOWER: Shielded Double banana plug, on 3/4" centers.

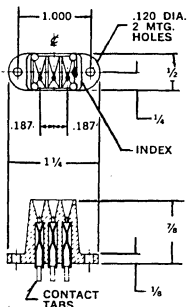
COLOR: Black.

QUANTITY
DISC. CODE A

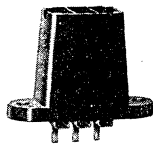
NET 14.85

MODEL 1575

TRANSISTOR SOCKET



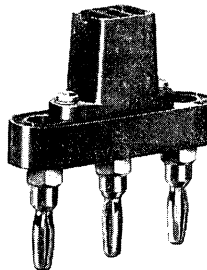
For use in testing 3 lead transistors with .017 dia. leads. Beryllium copper springs for long life. Ideal for aging racks, incoming inspection, life testing, etc.



MODEL TS-187 **QUANTITY DISC. CODE** A

MODEL	TEMP. RANGE	INSULATION RESISTANCE	COLOR	NET
TS187	-100°C To +200°C.	1 x 10 ⁵ Megohms Min. @ 500 V.D.C. @ 40% R.H., 24°C.	Black	2.50

ADAPTER — TRANSISTOR TEST SOCKET



Permits the insertion of transistors with .017 dia. leads into equipment having banana jacks on 3/4" centers. Ideal for incoming inspection. Transistor socket contact and banana spring made of beryllium copper. Heavy duty phenolic construction. Insulation resistance: 1 x 10⁵ megohms min. @ 500 V.D.C., at 40% R.H., 24°C.

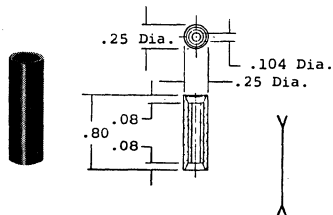
QUANTITY
DISC. CODE A **NET 7.85**

MODEL 1472

SPLICES & MINIATURE TEST PROBES



SINGLE MINIATURE BANANA PLUG SPLICE



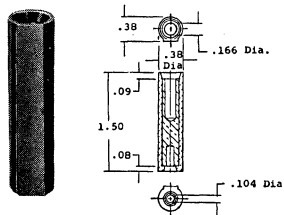
Permits splicing of single miniature banana plugs. Tough Thermoplastic molded onto the body eliminates shock hazard by enclosing plugs.

UPPER: Miniature banana jack, .104 dia. Brass, nickel plated.
LOWER: Same as upper.
COLORS: Black, Red.

MODEL 3833 (Specify Color)

QUANTITY DISC. CODE **A** NET .95

STANDARD BANANA PLUG TO MINIATURE BANANA PLUG SPLICE



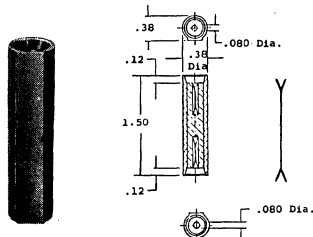
This splice accepts a standard banana plug on one end and a miniature banana plug on the other end. Tough Thermoplastic molded onto the body eliminates shock hazard by enclosing the plugs.

UPPER: Standard banana jack, .166 dia. Brass, nickel plated.
LOWER: Miniature banana jack, .104 dia. Brass, nickel plated.
COLORS: Black, Red.

MODEL 3835 (Specify Color)

QUANTITY DISC. CODE **A** NET .50

SINGLE .080 PIN TIP PLUG SPLICE



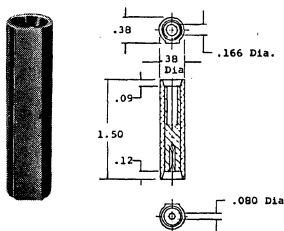
Permits splicing of single .080 dia. pin tip patch cords. Tough Thermoplastic molded onto the body eliminates shock hazard by enclosing plugs.

UPPER: Tip jack, beryllium copper, gold plated, accepts .080 dia. pin.
LOWER: Same as upper.
COLORS: Black, Red.

MODEL 3832 (Specify Color)

QUANTITY DISC. CODE **A** NET .95

STANDARD BANANA PLUG TO .080 PIN TIP PLUG SPLICE



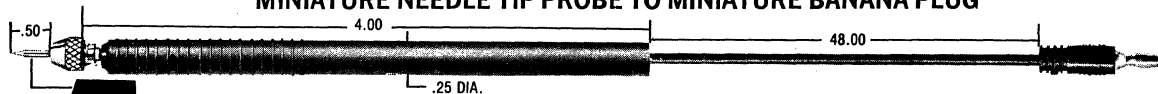
This splice accepts a standard banana plug on one end and a .080 pin tip plug on the other end. Tough Thermoplastic molded onto the body eliminates shock hazard by enclosing plugs.

UPPER: Standard banana jack, .166 dia. Brass, nickel plated.
LOWER: Tip jack, beryllium copper, gold plated, accepts .080 dia. pin.
COLORS: Black, Red.

MODEL 3834 (Specify Color)

QUANTITY DISC. CODE **A** NET .65

MINIATURE NEEDLE TIP PROBE TO MINIATURE BANANA PLUG



This slim miniature test probe features a sharp replaceable needle tip. The tip easily pierces varnish or plating to give a good electrical reading. Tough Thermoplastic is molded directly onto probe tip and wire lead providing a strong, reliable integral unit.
NEEDLE TIP: Replaceable, stainless steel.

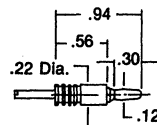
WIRE: 20 AWG, strand 41 x 36 T.C. extra flexible polyvinyl insulation .087" O.D.

MINIATURE BANANA PLUG: Fits 0.104 dia. miniature banana jacks. Spring, one piece heat treated beryllium copper. Plug body, brass per QQ-B-626, Alloy #360. Gold plated. Tough Thermoplastic molded onto plug body and wire.

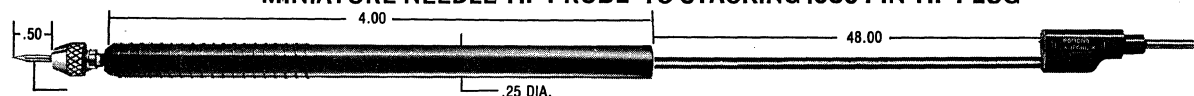
OPERATING TEMP.: -0° C to +105° C.
COLORS: Black, Red.

MODEL LENGTH COLOR
4071-48 48" (Specify)

QUANTITY DISC. CODE **A** NET 2.50



MINIATURE NEEDLE TIP PROBE TO STACKING .080 PIN TIP PLUG



This slim miniature test probe features a sharp replaceable needle tip. The tip easily pierces varnish or plating to give a good electrical reading. Tough Thermoplastic is molded directly onto probe tip and wire lead providing a strong, reliable integral unit.
NEEDLE TIP: Replaceable, stainless steel.

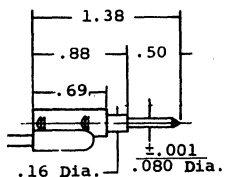
WIRE: 20 AWG, strand 41 x 36 T.C. extra flexible polyvinyl insulation .087" O.D.

PIN TIP PLUG: .080 dia. Brass, gold plated. Tough Thermoplastic molded onto plug body and wire.

STACK-UP: Beryllium copper spring, gold plated, accepts .080 dia. pin.
OPERATING TEMP.: -25° C to +105° C.
COLORS: Black, Red.

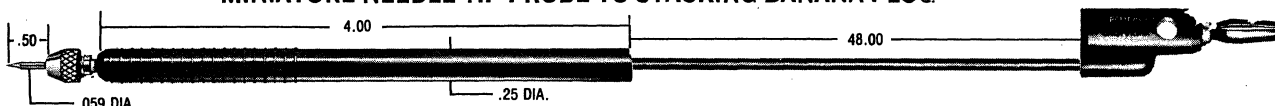
MODEL LENGTH COLOR
3860-48 48" (Specify)

QUANTITY DISC. CODE **A** NET 2.50



STACK-UP

MINIATURE NEEDLE TIP PROBE TO STACKING BANANA PLUG



This slim miniature test probe features a sharp replaceable needle tip. The tip easily pierces varnish or plating to give a good electrical reading. Tough Thermoplastic is molded directly onto probe tip and wire lead providing a strong, reliable integral unit.
NEEDLE TIP: Replaceable, stainless steel.

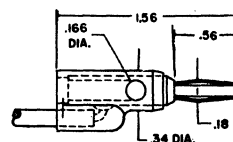
WIRE: 20 AWG, strand 41 x 36 T.C. extra flexible polyvinyl insulation .087" O.D.

BANANA PLUG: Spring one piece beryllium copper, heat treated, nickel plated. Tough Thermoplastic molded onto plug body and wire.

OPERATING TEMP.: -25° C to +105° C.
COLORS: Black, Red.

MODEL LENGTH COLOR
3861-48 48" (Specify)

QUANTITY DISC. CODE **A** NET 2.50

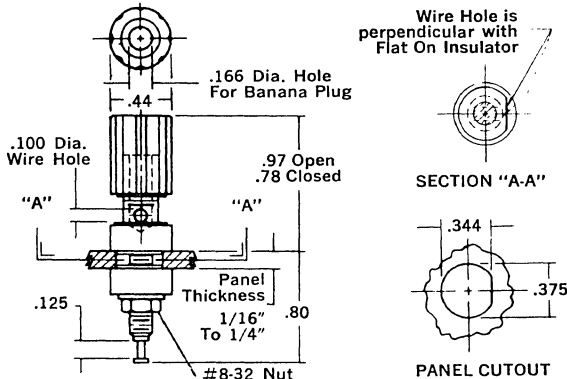


INSULATED BINDING POSTS AND RELAY SOCKETS



INSULATED LEXAN* POLYCARBONATE BINDING POSTS

The insulated Lexan* Binding Posts fill the needs of most critical requirements. The plastic molding on these units is Lexan* Polycarbonate which has high impact strength, low loss, low power factor and high insulation resistance. Thin line design for hi-density packaging.



FEATURES:

- Polycarbonate insulation.
- Thin line design.
- Standard and low thermal EMF types available.
- 5 way Binding Post.
- Accepts std. Banana Plug.
- Captive thumb nut.
- Gold or nickel plated.

RATINGS:

- Operating Temp.: -65°C. to +150°C.
- Working Voltage: 1500 VDC.
- Current: 15 Amps Cont., 30 Amps Int.

LOW THERMAL EMF STANDARD TYPE



Copper Body and Thumb nut insert, GOLD FLASHED per MIL-G-45204. Excellent for use when thermoplastic effects are a significant source of error. Gold flashed for high conductivity.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

MODEL 3770 (Specify Color) QUANTITY DISC. CODE **A** NET 2.50

STANDARD TYPE



BRASS body and thumb nut insert, available GOLD FLASHED per MIL-G-45204 (or) NICKEL PLATED per QQ-N-290 class 2.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

MODEL 3750

(Specify Color)
Gold Flashed

NET 1.35

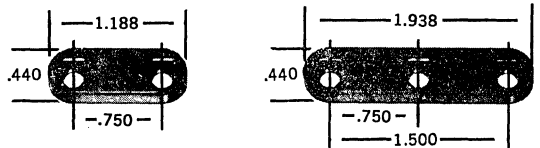
MODEL 3760

(Specify Color)
Nickel plated

NET 1.10

DOUBLE AND TRIPLE MOUNTING BASES

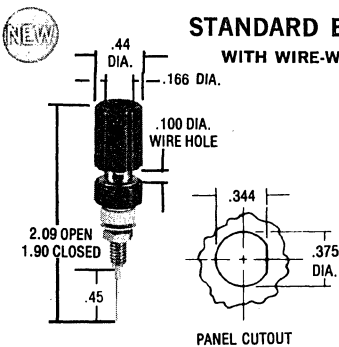
Lexan* Polycarbonate bases which may be used with models 3750, 3760 or 3770. Colors: Black, Red.



MODEL 3862-Double (Specify Color) QUANTITY DISC. CODE **A** NET .25
MODEL 3863-Triple (Specify Color) QUANTITY DISC. CODE **A** NET .30

STANDARD BINDING POST

WITH WIRE-WRAP TERMINAL



MODEL 4098 QUANTITY DISC. CODE **A** NET 1.50

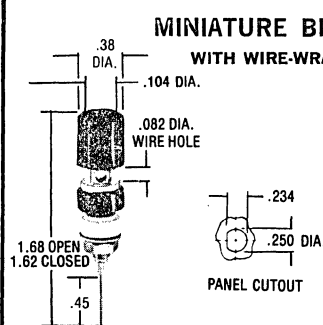
Excellent for rapid connection of wires using Wire Wrapping tools or machines.

FEATURES:

- Lexan Polycarbonate Insulation.
- 5 Way Binding Post.
- Accepts Standard Banana Plug.
- Captive thumb nut and body, brass, nickel plated.
- Mounts in Panels 1/16 to 1/4" thick.
- 8-32 Hex Nut and Lockwasher included.
- Gold plated Beryllium copper .025 wire wrap terminal.
- Colors: Black, Red, Yellow, Green, Blue, Gray, White.
- Rated: 1500 VDC, 15A Cont., 30A Int.
- Operating Temp: -65°C. to +150°C.

MINIATURE BINDING POST

WITH WIRE-WRAP TERMINAL



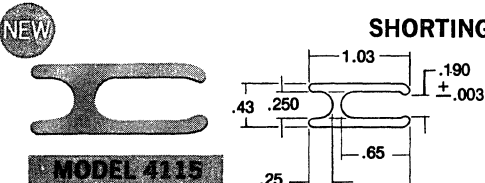
MODEL 4101 QUANTITY DISC. CODE **A** NET 1.25

Excellent for rapid connection of wires using Wire Wrapping tools or machines.

FEATURES:

- Lexan Polycarbonate Insulation.
- 5 Way Binding Post.
- Accepts Miniature Banana Plug.
- Captive Thumb Nut and Body, Brass, Nickel Plated.
- Mounts in Panels up to 3/16" thick.
- 8-32 Hex Nut and Lockwasher included.
- Gold plated Beryllium Copper .025 wire wrap terminal.
- Colors: Black, Red, Yellow, Green, Blue, Gray, White.
- Rated: 1500 VDC, 5A Cont., 10A Int.
- Operating Temp: -65°C. to +150°C.

SHORTING LINK FOR STANDARD BINDING POSTS



Shorting Link for Standard Binding Posts on 3/4" centers. A snap-on feature holds Link on post when short not needed. **MATERIAL:** Brass .031 thick. **FINISH:** Nickel Plated per QQ-N-290 class 2.

QUANTITY DISC. CODE **A**

Std. Pkg. 10

(Nickel Plated) NET .15

* Lexan is a trademark of General Electric

INSULATED BANANA JACKS, PIN TIP JACKS AND BANANA POSTS ADAPTERS



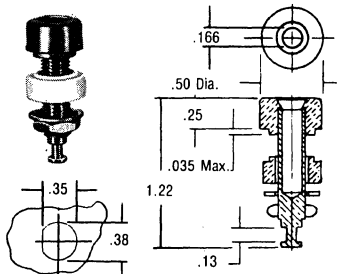
INSULATED LEXAN POLYCARBONATE BANANA JACKS AND .080 PIN TIP JACKS

These jacks are molded of Lexan Polycarbonate thermoplastic which has high impact strength, low loss, low power factor and high insulation resistance.

FEATURES: (All Models)

- Insulator head molded directly to one piece brass body.
- Panel insulator molded of Lexan Polycarbonate.
- Solder turret or Wire-Wrap terminal.
- Nickel plated lockwasher and hex nut included unassembled.

BANANA JACK — SILVER PLATED



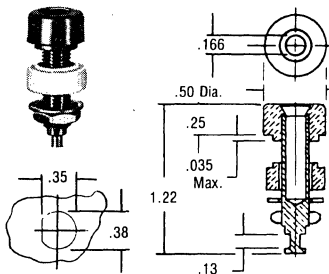
- Silver plated brass body.
- Closed entry receptacle, .166 dia.
- Rated 2,500 WVDC 15 AMPS. cont., 30 AMPS. int.
- Mounts in panels from .035" to .375" thick.
- 1/4-32 thread.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

STD. PKG. 10 (per color) unassembled.

MODEL 1581 (Specify color) QUANTITY DISC. CODE **A** NET .35 ea.

BANANA JACK — GOLD PLATED



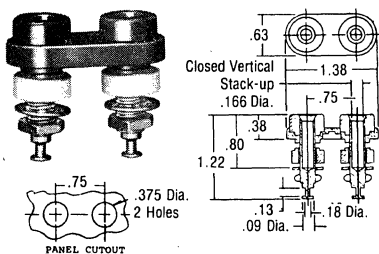
- Gold plated brass body.
- Closed entry receptacle, .166 dia.
- Rated 2,500 WVDC 15 AMPS. cont., 30 AMPS. int.
- Mounts in panels from .035" to .375" thick.
- 1/4-32 thread.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

STD. PKG. 10 (per color) unassembled.

MODEL 2854 (Specify color) QUANTITY DISC. CODE **A** NET .50 ea.

DOUBLE BANANA JACK — SILVER PLATED

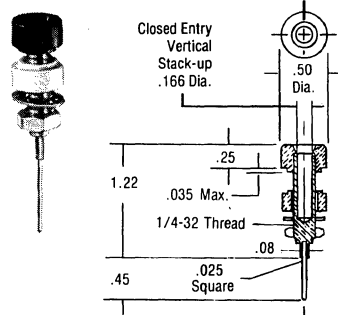


- Silver plated brass bodies.
- Closed entry receptacles, .166 dia.
- Rated 2,500 WVDC 15 AMPS. cont., 30 AMPS. int.
- Mounts in panels from .035" to .275" thick.
- One Red and one Black jack.
- Choice of Black or Red plate.
- 1/4-32 thread.

MODEL 2269 Black Plate
MODEL 2269-2 Red Plate

MODEL 2269 (Specify color) QUANTITY DISC. CODE **A** NET .95

BANANA JACK — WITH WIRE-WRAP TERMINAL



Excellent for rapid connection of wires using wire wrapping tools or machines.

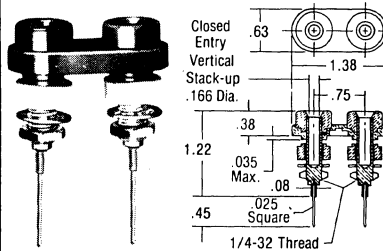
- Gold plated beryllium copper .025 wire wrap terminal.
- Nickel plated brass body.
- Closed entry receptacle .166 dia.
- Rated 2,500 WVDC 15 AMPS. cont., 30 AMPS. int.
- Mounts in panels from .035" to .375" thick.
- 1/4-32 thread.

COLORS: Black, Red, Yellow, Green, Blue, Gray, White.

STD. PKG. 10 (per color) unassembled.

MODEL 4005 (Specify Color) QUANTITY DISC. CODE **A** NET .75 ea.

DOUBLE BANANA JACK — WITH WIRE-WRAP TERMINAL



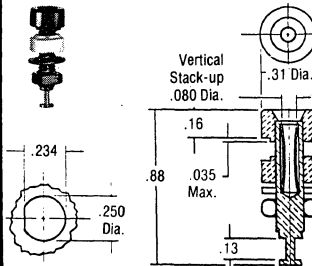
Excellent for rapid connection of wires using wire wrapping tools or machines.

- Gold plated beryllium copper .025 wire wrap terminal.
- Nickel plated brass bodies.
- Closed entry receptacles, .166 dia.
- Rated 2,500 WVDC 15 AMPS. cont., 30 AMPS. int.
- Mounts in panels from .035" to .275" thick.
- One Red and one Black jack.
- Choice of Black or Red plate.
- 1/4-32 thread.

MODEL 4069 Black Plate
MODEL 4069-2 Red Plate

MODEL 4069 (Specify color) QUANTITY DISC. CODE **A** NET 1.75

.080 DIA. PIN TIP JACK



- Gold plated brass body.
- Contact spring, heat treated beryllium copper, gold flashed.
- Rated 1,500 WVDC 5 AMPS. cont., 10 AMPS. int.
- Mounts in Panels from .035" to .250" thick.
- 8-32 thread.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

STD. PKG. 10 (per color)

MODEL 3542 (Specify color) QUANTITY DISC. CODE **A** NET .45 ea.

BINDING POST TO SINGLE BANANA PLUG



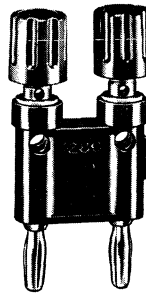
Features insulated binding post. Binding post allows top Stack-Up for multiple connections. Side Stack-Up provided by thru-hole in plug body.

UPPER: Insulated binding post. Cross hole (.166 dia.) in body provides side Stack-Up connections.
LOWER: Single banana plug, one piece nickel plated beryllium copper spring for use with standard .0166 dia. banana jack.

COLORS: Black, Red.

MODEL 2894 (Specify color) QUANTITY DISC. CODE **A** NET 1.75

BINDING POSTS TO DOUBLE BANANA PLUG



Binding posts on 3/4" centers for rapid mounting of components and top Stack-Up for multiple connections.

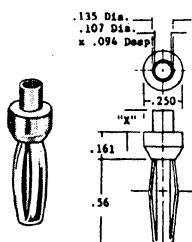
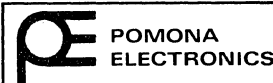
UPPER: Insulated double binding posts, on 3/4" centers. Cross holes (.166 dia.) in body provide side Stack-Up connections.

LOWER: Double banana plug, on 3/4" centers.

COLORS: Body, Black. Binding Posts, Black/Red.

MODEL 1286 QUANTITY DISC. CODE **A** NET 2.75

STANDARD & MINIATURE BANANA PLUGS & JACKS



RIVET TYPE BANANA PLUG

Excellent for riveting to panels or boards. Used with standard .166 dia. banana jacks.

- Spring, one piece heat treated beryllium copper, alloy 170 per QQ-C-533.
- Jack body, Brass per QQ-B-626, Alloy #360.
- Plating, Nickel per QQ-N-290 class 2.
- Rated, 15A, Cont., 30A. Int.

(SWAGING TOOL NO. 3518 NET 23.95)

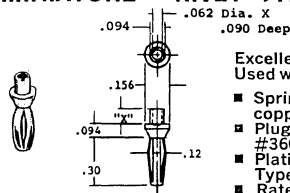
MODEL "X" DIM. PANEL

MODEL 3257
3258
3259

.094 1/16"
.125 3/32"
.156 1/8"

Std. Pkg. 10
QUANTITY DISC. CODE A NET .37 ea.

MINIATURE — RIVET TYPE BANANA PLUG



Excellent for riveting to panels or boards. Used with miniature .104 dia. banana jacks.

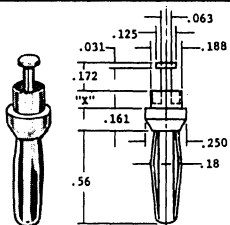
- Spring, one piece heat treated beryllium copper, alloy 170 per QQ-C-533.
- Plug body, Brass per QQ-B-626, Alloy #360.
- Plating, Gold flashed per MIL-G-45204 Type II (.00001/.00002).
- Rated, 5A, Cont., 10A. Int.

MODEL "X" DIM. PANEL (SWAGING TOOL NO. 3520 NET 23.95)

MODEL 3268
3271
3272

.094 1/16"
.125 3/32"
.156 1/8"

Std. Pkg. 10
QUANTITY DISC. CODE A NET .32 ea.



RIVET TYPE BANANA PLUG WITH TURRET

Excellent for riveting to panels or boards. Solder turret for rapid attachment of wires. Used with standard .166 dia. banana jacks.

- Spring, one piece heat treated beryllium copper, alloy 170 per QQ-C-533.
- Plug body, Brass per QQ-B-626, Alloy #360.
- Plating, Nickel per QQ-N-290, class 2.
- Rated, 15A, Cont., 30A. Int.

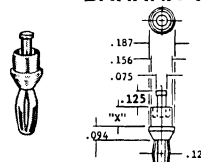
(SWAGING TOOL NO. 3519 NET 23.95)

MODEL "X" DIM. PANEL

MODEL 3260
3261
3262

.105 1/16"
.135 3/32"
.165 1/8"

Std. Pkg. 10
QUANTITY DISC. CODE A NET .37 ea.



MINIATURE — RIVET TYPE BANANA PLUG WITH TURRET

Excellent for riveting to panels or boards. Solder turret for rapid attachment of wires. Used with miniature .104 dia. banana jacks.

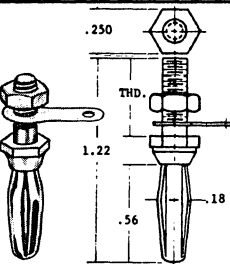
- Spring, one piece heat treated beryllium copper, alloy 170 per QQ-C-533.
- Plug body, Brass per QQ-B-626, Alloy #360.
- Plating, Gold flashed per MIL-G-45204 Type II (.00001/.00002).
- Rated, 5A, Cont., 10A. Int.

MODEL "X" DIM. PANEL (SWAGING TOOL NO. 3521 NET 23.95)

MODEL 3273
3274
3275

.105 1/16"
.135 3/32"
.165 1/8"

Std. Pkg. 10
QUANTITY DISC. CODE A NET .42 ea.



BANANA PLUG WITH THREADED STUD

Threaded stud for rapid mounting. Used with standard .166 dia. banana jacks. Furnished with hex nut and solder lug.

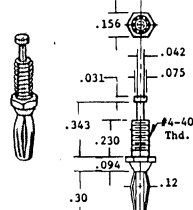
- Spring, one piece heat treated beryllium copper, alloy 170 per QQ-C-533.
- Plug body, Brass per QQ-B-626, Alloy #360.
- Plating, Nickel per QQ-N-290, class 2.
- Rated, 15A, Cont., 30A. Int.

Standard Package 10
Unassembled

MODEL 3263
3264

THREAD 6-32 x 1/2"
8-32 x 1/2"

QUANTITY DISC. CODE A NET .42 ea.



MINIATURE — BANANA PLUG WITH THREADED STUD

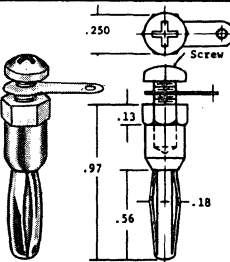
Threaded stud for rapid mounting. Solder turret for attachment of wires. Used with .104 dia. miniature banana jacks.

- Spring, one piece heat treated beryllium copper, alloy 170 per QQ-C-533.
- Plug body, Brass per QQ-B-626, Alloy #360.
- Plating, Gold flashed per MIL-G-45204 Type II (.00001/.00002).
- Rated, 5A, Cont., 10A. Int.

Standard Package 10

MODEL 3276

QUANTITY DISC. CODE A NET .32 ea.



BANANA PLUG WITH SCREW

Mounts to various size panels. Used with standard .166 dia. banana jacks. Furnished with screw and solder lug.

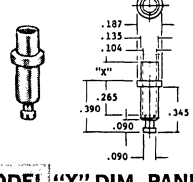
- Spring, one piece heat treated beryllium copper, alloy 170 per QQ-C-533.
- Plug body, Brass per QQ-B-626, Alloy #360.
- Plating, Nickel per QQ-N-290, class 2.
- Rated, 15A, Cont., 30A. Int.

Standard Package 10
Unassembled

MODEL 3265
3266

SCREW 6-32 x 1/4"
8-32 x 1/4"

QUANTITY DISC. CODE A NET .42 ea.



MINIATURE — RIVET TYPE BANANA JACK WITH TURRET

Excellent for riveting to panels or boards. Solder turret for rapid attachment of wires. .104 dia. jack accepts miniature banana plug.

- Jack body, Brass per QQ-B-626, Alloy #360.
- Plating, Gold flashed per MIL-G-45204 Type II (.00001/.00002).
- Rated, 5A, Cont., 10A. Int.

(SWAGING TOOL NO. 3522 NET 23.95)

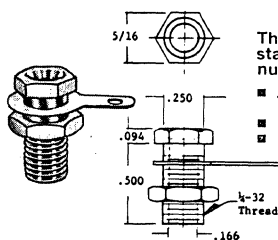
MODEL "X" DIM. PANEL

MODEL 3277
3278
3279

.105 1/16"
.135 3/32"
.165 1/8"

Std. Pkg. 10
QUANTITY DISC. CODE A NET .22 ea.

UNINSULATED — BANANA JACK



Threaded for rapid mounting. Used with standard banana plugs. Furnished with hex nut and solder lug.

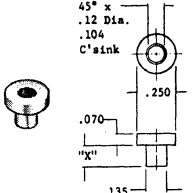
- Jack body, Brass per QQ-B-626, Alloy #360.
- Plating, Nickel per QQ-N-290, class 2.
- Rated, 15A, Cont., 30A. Int.

Standard Package 10
Unassembled

MODEL 3267

QUANTITY DISC. CODE A NET .25 ea.

MINIATURE — RIVET TYPE BANANA JACK



Excellent for riveting to panels or boards. .104 dia. jack accepts miniature banana plug.

- Jack body, Brass per QQ-B-626, Alloy #360.
- Plating, Gold flashed per MIL-G-45204 Type II (.00001/.00002).
- Rated, 5A, Cont., 10A. Int.

(SWAGING TOOL NO. 3523 NET 23.95)

MODEL "X" DIM. PANEL

MODEL 3280
3281
3282

.105 1/16"
.135 3/32"
.165 1/8"

Std. Pkg. 10
QUANTITY DISC. CODE A NET .15 ea.

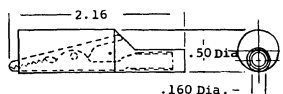
TEST CLIPS & 1/2" SPACED PIN TIP PLUGS



INSULATED ALLIGATOR CLIP TO BANANA JACK



Clip, No. 60 Mueller, Steel, Cadmium Plated Vinyl insulators, No. 62 (5 Red, 5 Black). Unassembled.



Standard Package of 10 clips and 10 insulators.

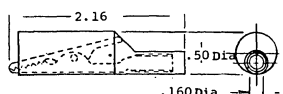
MODEL 2240

QUANTITY DISC. CODE **A** NET .25 ea.

GOLD PLATED—INSULATED ALLIGATOR CLIP TO BANANA JACK



Alligator Clip, solid Copper, Gold plated. Vinyl insulators (5 Red, 5 Black). Unassembled.



Standard Package of 10 clips and 10 insulators.

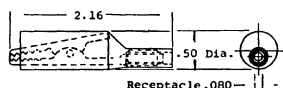
MODEL 3289

QUANTITY DISC. CODE **A** NET .85 ea.

INSULATED ALLIGATOR CLIP TO PIN TIP JACK



Alligator Clip, Steel, Cadmium Plated. Tip Jack, Beryllium Copper, Gold Flashed, accepts .080 dia. Pin tip plug. Vinyl insulators (5 Red, 5 Black). Unassembled.



Standard Package of 10 clips and 10 insulators.

MODEL 1437

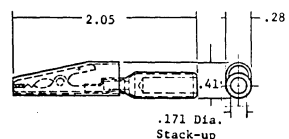
QUANTITY DISC. CODE **A** NET .95 ea.

INSULATED MINIGATOR CLIP TO BANANA JACK



This minigator clip accepts a standard banana plug in the rear. Clip is steel, cadmium plated. Banana jack, brass, nickel plated. Pinned hinge construction with full-meshing jaws for small wires. Vinyl insulators (5 red, 5 black). Unassembled.

Standard Package of 10 clips and 10 insulators.



MODEL 3448

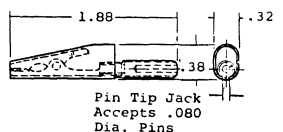
QUANTITY DISC. CODE **A** NET .95 ea.

INSULATED MINIGATOR CLIP TO PIN TIP JACK



This Minigator clip accepts a .080 dia. pin tip plug. Clip is steel, cadmium plated. Tip jack, Beryllium copper, gold flashed. Pinned hinge construction with full-meshing jaws for small wires. Vinyl insulators (5 red, 5 black). Unassembled.

Standard Package of 10 clips and 10 insulators.



MODEL 3491

QUANTITY DISC. CODE **A** NET 1.25 ea.

1/2" SPACED MINIATURE PIN TIP PLUGS

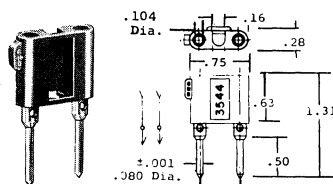
FEATURES:

- Fits .080 dia. pin tip jacks.
- Plug Bodies brass, Gold flashed per MIL-G-45204 Type 2 (.00001/.00002).
- Stack-up spring, beryllium copper alloy 170 per QQ-C-533, Gold flashed.
- Tough Thermoplastic molded directly to plug bodies.

RATINGS:

- Operating Temp.: -25°C to +85°C.
- Working Voltage: 2500 VDC.
- Current: 5 amps cont., 10 amps. int.

MINIATURE—DOUBLE PIN TIP PLUG WITH SET SCREWS



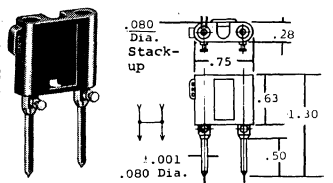
Miniature double pin tip plug on 1/2" centers. Set screws secure cable or component leads.

COLORS: Black, Red.

(Screwdriver No. 3736 NET .50)

MODEL 3544 (Specify color) QUANTITY DISC. CODE **A** NET 1.25

MINIATURE—DOUBLE PIN TIP PLUG WITH SOLDER TURRET TERMINALS

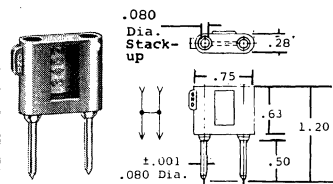


Miniature double Pin Tip plug on 1/2" centers. Gold flashed solder turret terminals for permanent noise-free connection of cables. .080 Tip jacks on 1/2" centers permit top stacking.

COLORS: Black, Red.

MODEL 3545 (Specify color) QUANTITY DISC. CODE **A** NET 1.50

MINIATURE—DOUBLE PIN TIP PLUG WITH SHORTING BAR

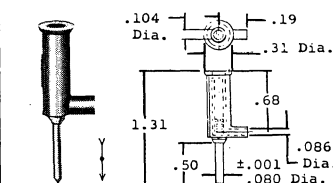


Ideal as a connecting link for use with 1/2" spaced pin tip jacks. .080 dia. Tip jacks on 1/2" center permit top stacking. Banana plugs internally solder-bonded with #20 AWG wire. "Shorting Bar" stamped on plug.

COLORS: Black, Red.

MODEL 3452 (Specify color) QUANTITY DISC. CODE **A** NET 1.75

MINIATURE—SOLDERLESS PIN TIP PLUG WITH SAFETY COLLAR



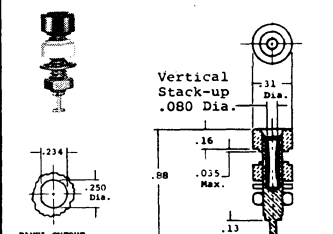
This integral collar insulates exposed wire leads and acts as a strain relief by preventing the flexing of the lead at the set screw. Wire firmly held in place with internal set screw, eliminating soldering.

COLORS: Black, Red.

(Screwdriver No. 3736 NET .50)

MODEL 3548 (Specify color) QUANTITY DISC. CODE **A** NET .75

MINIATURE—PIN TIP JACK .080 DIA.



Miniature jack accepts .080 dia. pin tip plugs. Polycarbonate Thermoplastic insulated head molded directly to gold flashed brass body. Contact spring, heat treated beryllium copper, gold flashed. 8-32 Hex Nut and Lockwasher included unassembled.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White. Panels .035" to .250" thick.

Std. Pkg. (10 per color).

MODEL 3542 (Specify color) QUANTITY DISC. CODE **A** NET .45 ea.

1/2" SPACED MINIATURE BANANA PLUGS

ONE-THIRD SMALLER Miniature Banana Plugs, a state-of-the-art development for the ever increasing demand for miniaturized test equipment.

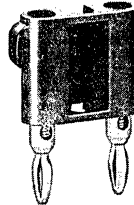
Banana plug springs are precision formed of one-piece beryllium copper, heat treated for maximum life and low contact resistance. Tough thermoplastic molded to plug bodies.

SPECIFICATIONS:

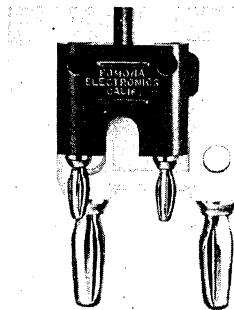
- Fits 0.104 dia. miniature banana jacks.
- Plug body brass, per QQ-B-626, Alloy #360.
- Gold flashed per MIL-G-45204 Type 11 (.00001/.00002).
- Spring, beryllium copper alloy 170 per QQ-C-533.

RATINGS:

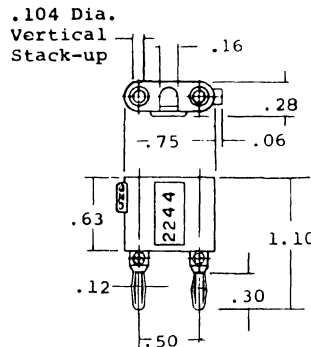
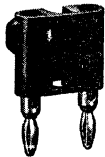
- Operating temp.: -25°C to +85°C.
- Working voltage: 2500 VDC.
- Current: 5 amps cont., 10 amps. int.



ACTUAL SIZE



ACTUAL SIZE

**MINIATURE—DOUBLE BANANA PLUG WITH SET SCREWS**

Miniature double banana plug on 1/2" centers. Internal set screws to secure cable or component leads. .104 dia. banana jacks on 1/2" centers permit top Stack-Up for multiple connections.

COLORS: Black, Red.

MODEL 2244 Black
MODEL 2244-2 Red

MODEL 2244

QUANTITY **A** NET 1.25
DISC. CODE

MINIATURE—DOUBLE BANANA PLUG WITH SOLDER TURRET TERMINALS

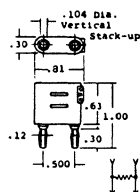
Miniature double banana plug on 1/2" centers. Solder turret terminals for permanent noise-free connections of cables or components. .104 dia. banana jacks on 1/2" centers permit top Stack-Up for multiple connections.

COLORS: Black, Red

MODEL 2245 Black
MODEL 2245-2 Red

MODEL 2245

QUANTITY **A** NET 1.50
DISC. CODE

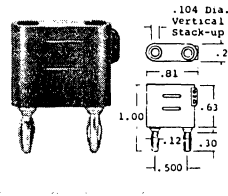
MINIATURE—DOUBLE BANANA PLUG WITH MOLDED PRECISION RESISTOR

Ideal where rapid interchange of resistance values is required. Deposited carbon 1% 1/4 watt, molded internally. .104 dia. banana jacks on 1/2" centers permit top Stack-Up for multiple connections. Resistance value stamped on plug.

COLOR: Blue

50	10K	200K
(OHMS)	20K	250K
1K	50K	500K
5K	100K	1 MEG

MODEL 2246 (Specify Value) QUANTITY **A** NET 4.95
DISC. CODE

MINIATURE—DOUBLE BANANA PLUG WITH SHORTING BAR

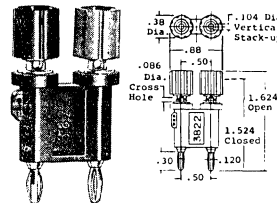
Ideal as a connecting link for use with 1/2" spaced banana jacks. .104 dia. banana jacks on 1/2" centers permit top Stack-Up for multiple connections. Banana plugs internally solder-bonded with #18 AWG wire. "Shorting Bar" stamped on plug.

COLORS: Black, Red.

MODEL 2035 Black
MODEL 2035-2 Red

MODEL 2035

QUANTITY **A** NET 1.50
DISC. CODE

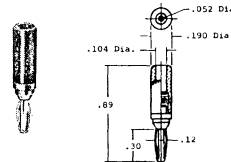
ADAPTER—MINIATURE BINDING POSTS TO MINIATURE DOUBLE BANANA PLUG

This adapter converts miniature Banana Jacks to miniature Binding Posts. Excellent for attaching wires or components. Insulated gold flashed 5 way Binding Posts. Gold flashed one piece heat treated beryllium copper spring.

COLOR: Body, Black. Binding Posts, Black/Red.

MODEL 3822

QUANTITY **A** NET 4.25
DISC. CODE

MINIATURE SOLDER TYPE BANANA PLUG

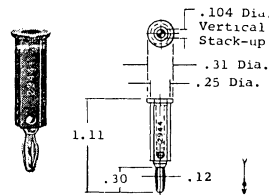
Miniature in line plug for use with miniature binding posts or banana jacks. Wire is soldered directly to the threaded plug. Nylon insulated handle.

COLORS: Black, Red.

MODEL 3690-0 Black
MODEL 3690-2 Red

MODEL 3690

QUANTITY **A** NET .55
DISC. CODE

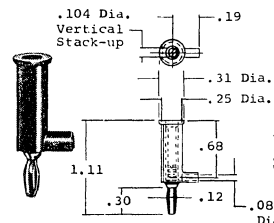
MINIATURE SOLDERLESS BANANA PLUG-STACK-UP

Miniature banana plug for rapid assembly of test leads. For use with miniature binding posts or banana jacks. Wire firmly held in place with internal set screw, eliminating soldering.

MODEL 2944-0 Black
MODEL 2944-2 Red

MODEL 2944

QUANTITY **A** NET .85
DISC. CODE

MINIATURE SOLDERLESS BANANA PLUG WITH SAFETY COLLAR-STACK-UP

This integral collar insulates exposed wire leads and acts as a strain relief by preventing the flexing of the lead at the set screw. Wire firmly held in place with internal set screw, eliminating soldering.

MODEL 2945-0 Black
MODEL 2945-2 Red

MODEL 2945

QUANTITY **A** NET .85
DISC. CODE

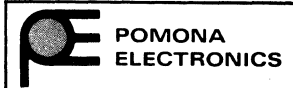
MINIATURE SCREWDRIVER FOR SET SCREWS

A specially designed screwdriver with slender tip for tightening of set screws on miniature Plugs.

MODEL 3736

NET .75

1/2" SPACED MINIATURE BINDING POSTS & JACKS



MINIATURE BINDING POSTS

A complete 5-way Binding Post in "Miniature." Captive Thumb Nut and Binding Post Body, machined brass; gold or nickel plated. Thumb Nut, Mounting Base and Shouldered Insulation molded of High Impact Polycarbonate Thermoplastic. 8-32 Hex Nut and Lockwasher included, unassembled, nickel plated.

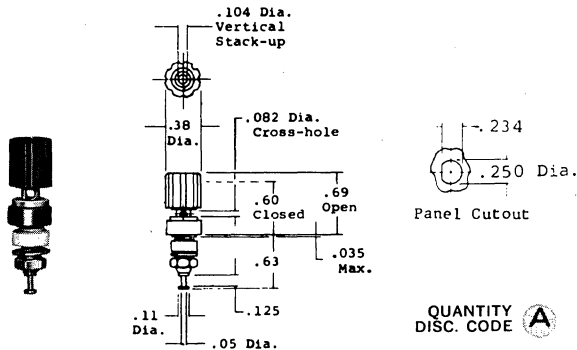
SPECIFICATIONS:

■ 5-way Binding Post ■ Mounts 1/4" dia. "D" hole ■ Panels up to 3/16" thick ■ Captive Thumb Nut ■ .082 dia. Cross hole ■ Thumb Nut and Binding Post Body — Gold Flashed per MIL-G-45204 Type 2 OR Nickel Plated per QQ-N-290 Class 2.

RATINGS:

■ Operating Temp.: -65°C to +150°C.
■ Working Voltage: 1500 VDC.
■ Current: 5 Amps Cont., 10 Amps Int.

MINIATURE—INSULATED BINDING POST



QUANTITY
DISC. CODE **A**

MODEL 2382*

*(Specify Color)
Gold Flashed
Assembly

NET 1.15

MODEL 2439*

*(Specify Color)
Nickel Plated
Assembly

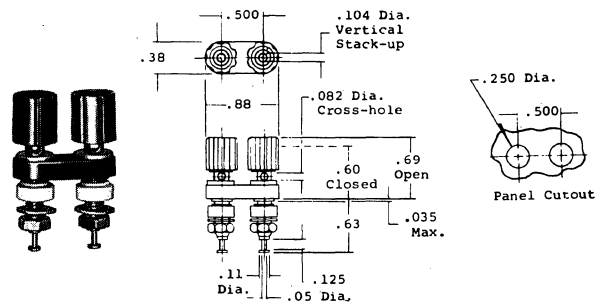
NET .85

(*) COLORS

-0 Black -5 Green
-1 Brown -6 Blue
-2 Red -7 Violet
-3 Orange -8 Gray
-4 Yellow -9 White

MINIATURE—INSULATED DOUBLE BINDING POST

Double binding post body on 1/2" centers with one Red and one Black binding post. Choice of Black or Red plate.



QUANTITY
DISC. CODE **A**

(*) COLORS

-0 Black Plate
-2 Red Plate

MODEL 2383*

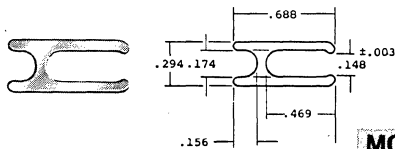
*(Specify Color)
Gold Flashed
Assembly

NET 2.25

MODEL 2440*

*(Specify Color)
Nickel Plated
Assembly

NET 1.70



SHORTING LINK FOR MINIATURE BINDING POSTS

Shorting Link for miniature Binding Posts on 1/2" centers. A snap-on feature holds Link on post when short not needed.
MATERIAL: Brass .031 thick. **FINISH:** Nickel Plated per QQ-N-290 class 2 or Gold Flashed per MIL-G-45204 Type 2.

QUANTITY
DISC. CODE **A**

Std. Pkg. 10

MODEL 3478 (Gold Flashed) **NET .25 ea.** **MODEL 3479** (Nickel Plated)

Std. Pkg. 10
NET .15 ea.

MINIATURE BANANA JACKS

Insulator head and Shouldered Washer molded of High Impact Polycarbonate Thermoplastic. Banana Jack body, machined brass, gold flashed on 2142 and 2143, nickel plated on 4022. 8-32 Hex Nut and Lockwasher included, unassembled, nickel plated.

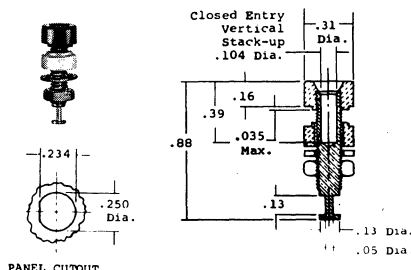
SPECIFICATIONS:

■ Closed entry jack .104 dia. ■ Insulator head molded to body.
■ Mounts in 1/4" dia. hole. Model 2142 and 4022, Panels up to 1/4" thick. Model 2143, Panels up to 3/16" thick. Solder turret or wire wrap terminal.

RATINGS:

■ Operating Temp.: -65°C to +150°C.
■ Working Voltage: 1500 VDC.
■ Current: 5 Amps Cont., 10 Amps Int.

MINIATURE—INSULATED BANANA JACK

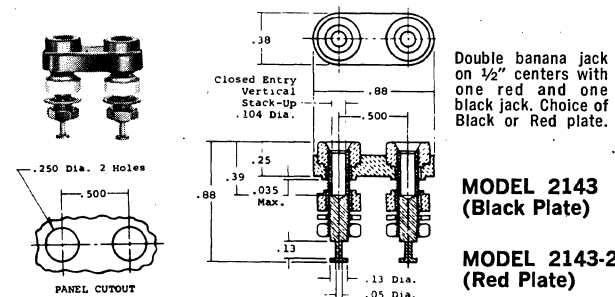


MODEL 2142

Standard Package: QUANTITY
10 (per color) DISC. CODE **A** **NET .35 ea.**

2142 —BLACK
2142-1—BROWN
2142-2—RED
2142-3—ORANGE
2142-4—YELLOW
2142-5—GREEN
2142-6—BLUE
2142-7—VIOLET
2142-8—GRAY
2142-9—WHITE

MINIATURE—INSULATED DOUBLE BANANA JACK



Double banana jack on 1/2" centers with one red and one black jack. Choice of Black or Red plate.

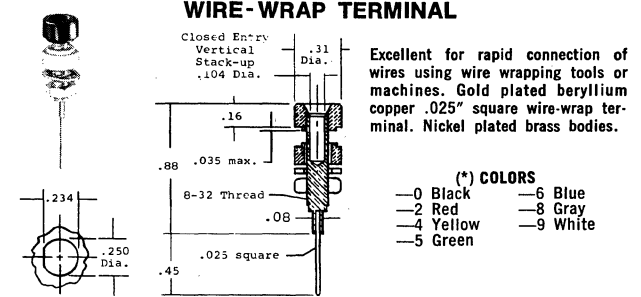
MODEL 2143 (Black Plate)

MODEL 2143-2 (Red Plate)

MODEL 2143

QUANTITY
DISC. CODE **A** **NET .95**

MINIATURE—INSULATED BANANA JACK WITH WIRE-WRAP TERMINAL



Excellent for rapid connection of wires using wire wrapping tools or machines. Gold plated beryllium copper .025" square wire-wrap terminal. Nickel plated brass bodies.

(*) COLORS

—0 Black —6 Blue
—2 Red —8 Gray
—4 Yellow —9 White
—5 Green

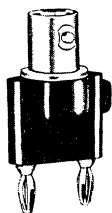
MODEL 4022*

Standard Package: QUANTITY
10 (per color) DISC. CODE **A** **NET .75 ea.**

1/2" SPACED MINIATURE BANANA PLUG ADAPTERS & ACCESSORIES



ADAPTER — BNC RECEPTACLE TO MINIATURE DOUBLE BANANA PLUG



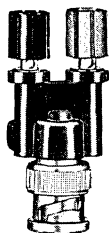
This adapter allows a BNC plug to be used with equipment having 1/2" spaced miniature .104 dia. banana jacks. Excellent for adapting test equipment to standard coaxial cables.

UPPER: BNC receptacle, UG 1094/U.
LOWER: Miniature double banana plug on 1/2" centers, for use with .104 dia. miniature jacks. Gold flashed one piece heat treated beryllium copper springs.
COLOR: Black.

MODEL 3269

QUANTITY DISC. CODE A NET 4.25

ADAPTER — MINIATURE BINDING POSTS TO BNC PLUG



This adapter converts a BNC receptacle to miniature 1/2" spaced 5 way binding posts.

UPPER: Insulated, gold flashed miniature 5 way binding posts on 1/2" centers with .104 dia. miniature banana jacks.
LOWER: BNC plug.
COLOR: Black.

MODEL 3296

QUANTITY DISC. CODE A NET 5.85

ADAPTER — BNC PLUG TO MINIATURE DOUBLE BANANA PLUG



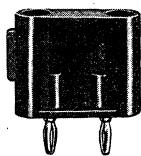
Allows a BNC cable jack to be used on equipment having 1/2" spaced .104 dia. banana jacks.

UPPER: BNC plug.
LOWER: Miniature double banana plug on 1/2" centers, for use with .104 dia. miniature jacks. Gold flashed one piece heat treated beryllium copper springs.
COLOR: Black.

MODEL 3270

QUANTITY DISC. CODE A NET 5.85

ADAPTER — STANDARD DOUBLE BANANA JACK TO MINIATURE DOUBLE BANANA PLUG



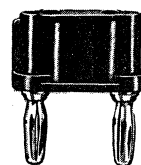
Permits standard double banana plug on 3/4" centers to be used with equipment having miniature double banana jacks on 1/2" centers.

UPPER: Standard double banana jacks .166 dia. on 3/4" centers. Brass, nickel plated.
LOWER: Miniature double banana plug on 1/2" centers. One piece nickel plated beryllium copper spring for use with .104 dia. miniature banana jacks.
COLOR: Black.

MODEL 2952

QUANTITY DISC. CODE A NET 1.95

ADAPTER — MINIATURE DOUBLE BANANA JACK TO STANDARD DOUBLE BANANA PLUG



Permits miniature double banana plug on 1/2" centers to be used with equipment having standard double banana jacks on 3/4" centers.

UPPER: Miniature double banana jacks, .104 dia. on 1/2" centers. Brass, nickel plated.
LOWER: Standard double banana plug on 3/4" centers. One piece nickel plated beryllium copper spring for use with .166 dia. standard banana jacks.
COLOR: Black.

MODEL 2943

QUANTITY DISC. CODE A NET 1.95

ADAPTER — STANDARD BANANA JACK TO MINIATURE BANANA PLUG



Permits standard banana plug to be used with equipment having miniature banana jacks.

UPPER: Banana jack, .166 dia.; Brass, nickel plated.

LOWER: Miniature banana plug, one piece nickel plated beryllium copper spring for use with .104 dia. miniature banana jacks.

MODEL 2138

COLORS: Black, Red.
2138-0 Black
2138-2 Red

NET .75

QUANTITY DISC. CODE A

ADAPTER — MINIATURE BANANA JACK TO STANDARD BANANA PLUG



Permits miniature banana plugs to be used with equipment having standard banana jacks.

UPPER: Miniature banana jack, .104 dia.; Brass, nickel plated.

LOWER: Standard banana plug, one piece nickel plated beryllium copper spring for use with .166 dia. banana jacks.

MODEL 2477

COLORS: Black, Red.
2477-0 Black
2477-2 Red

NET .65

QUANTITY DISC. CODE A

MINIATURE — METAL SHORTING BAR

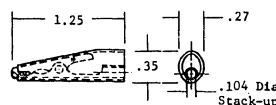


Low profile, gold flashed, brass shorting bar. Miniature banana plugs on 1/2" centers swaged to 1/16" thick brass bar. Center hole accepts #4-40 screw for easy removal. Current rating 5 Amps. cont., 10 Amps INT.

MODEL 3030

QUANTITY DISC. CODE A NET 1.10

INSULATED MINIGATOR CLIP TO MINIATURE BANANA JACK



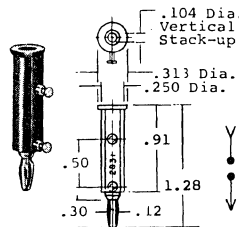
This Minigator clip accepts a miniature banana plug in the rear. Clip is steel, cadmium plated. Pinned hinge construction with full-meshing jaws for small wires. Vinyl insulators (5 red, 5 black). Unassembled.

Standard Package of 10 clips and 10 insulators.

MODEL 3217

QUANTITY DISC. CODE A NET .22 ea.

MINIATURE — SINGLE BANANA PLUG ISOLATION



Provides two terminal isolation. Allows for addition of series components. Excellent for circuit design and testing. Gold flashed solder turret terminals for permanent noise-free connections.

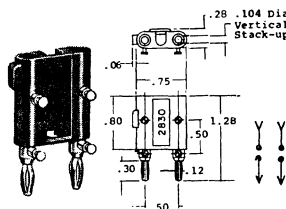
UPPER: Miniature banana jack, .104 dia. Brass, gold flashed.

LOWER: Miniature banana plug, one piece gold flashed beryllium copper spring.

COLOR: Black, Red.

MODEL 2831 (specify color) QUANTITY DISC. CODE A NET 1.95

MINIATURE — DOUBLE BANANA PLUG — 4 TERMINAL ISOLATION



Provides four terminal isolation. Top Stack-up receptacles isolated from lower plugs. Ideal for insertion of matching networks in computer boards, circuit design and testing. Gold flashed solder turret terminals for permanent noise-free connections.

UPPER: Miniature double banana jack, .104 dia. Brass, gold flashed.

LOWER: Miniature double banana plug on 1/2" centers. Gold flashed one piece beryllium copper spring.

COLOR: Red.

MODEL 2830

QUANTITY DISC. CODE A NET 3.85

MINIATURE BANANA PLUG PATCH CORDS



Miniature patch cords for use with .104 dia. miniature banana jacks. Excellent for miniaturization of test equipment and high density packaging for patch systems.

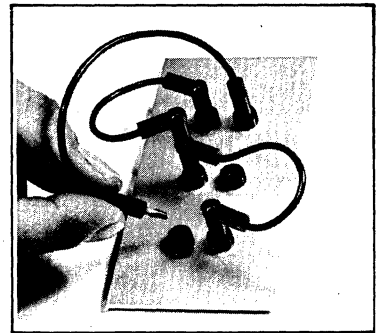
Banana plug springs precision formed of one piece beryllium copper, heat treated for maximum life and low contact resistance. Tough thermoplastic molded to plug body and wire.

FEATURES:

- Fits .104 dia. miniature banana jacks ■ Plug body brass, per QQ-B-626, Alloy #360.
- Gold flashed per MIL-G-45204 Type II (.00001/.00002). ■ Spring, one piece heat treated beryllium copper, alloy 170 per QQ-C-533.

SPECIFICATIONS:

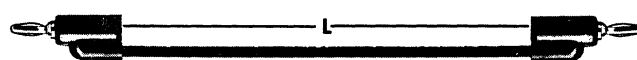
- WIRE: 20 AWG, Strand. 41 x 36 T.C. Extra flexible polyvinyl insulation .087" O.D.
- RATED: 5 A. Cont., 10 A. Int., 5,000 V.D.C. ■ OPERATING TEMP.: -0°C to +105°C



MODEL	LENGTH	NET
1081-4	4"	1.80
1081-8	8"	1.80
1081-12	12"	1.80
1081-18	18"	1.80
1081-24	24"	1.80
1081-36	36"	1.80
1081-48	48"	1.90
1081-60	60"	2.00



MINIATURE — BANANA PLUG STACK-UP PATCH CORD

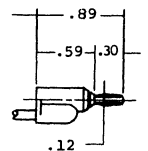


COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

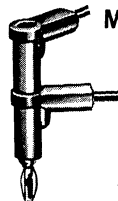
MODEL 1081

(Specify Color)

★ QUANTITY DISC. CODE **A**



MODEL	LENGTH	NET
2860-4	4"	1.80
2860-8	8"	1.80
2860-12	12"	1.80
2860-18	18"	1.80
2860-24	24"	1.80
2860-36	36"	1.80
2860-48	48"	1.90
2860-60	60"	2.00



MINIATURE — RIGHT ANGLE BANANA PLUG PATCH CORD STACK-UP

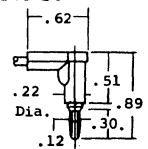


COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

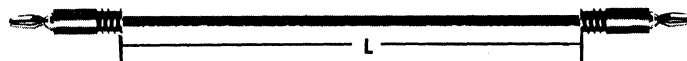
MODEL 2860

(Specify Color)

★ QUANTITY DISC. CODE **A**



MODEL	LENGTH	NET
2842-4	4"	1.50
2842-8	8"	1.50
2842-12	12"	1.50
2842-18	18"	1.50
2842-24	24"	1.50
2842-36	36"	1.50
2842-48	48"	1.60
2842-60	60"	1.70

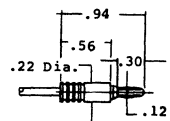


MINIATURE — BANANA PLUG PATCH CORD

MODEL 2842

(Specify Color)

★ QUANTITY DISC. CODE **A**



MINIATURE — BANANA PLUG TO IN LINE JACK PATCH CORD

MODEL	LENGTH	NET
3969-12	12"	2.25
3969-24	24"	2.25
3969-36	36"	2.25
3969-48	48"	2.35
3969-60	60"	2.45



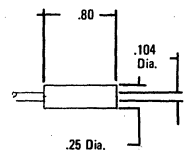
Tough thermoplastic molded to gold plated brass jack and wire.

COLORS: Black, Red.

MODEL 3969

(Specify Color)

★ QUANTITY DISC. CODE **A**



STANDARD BANANA PLUG TO MINIATURE BANANA PLUG PATCH CORD

MODEL	LENGTH	NET
3014-12	12"	1.80
3014-18	18"	1.80
3014-24	24"	1.80
3014-36	36"	1.80
3014-48	48"	1.90
3014-60	60"	2.00



STANDARD BANANA PLUG: Spring, Beryllium copper, nickel plated.

COLORS: Black, Red.

MODEL 3014

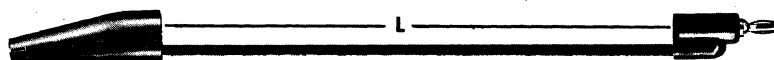
(Specify Color)

★ QUANTITY DISC. CODE **A**



INSULATED MINIGATOR CLIP TO MINIATURE BANANA PLUG

MODEL	LENGTH	NET
3222-12	12"	1.50
3222-18	18"	1.50
3222-24	24"	1.50
3222-36	36"	1.50
3222-48	48"	1.60
3222-60	60"	1.70



CLIP: Minigator, steel, cadmium plated. INSULATOR: Vinyl, red with red wire, black with black wire.

COLORS: Black, Red.

MODEL 3222

(Specify Color)

★ QUANTITY DISC. CODE **A**



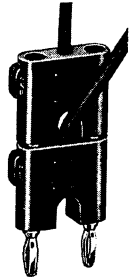
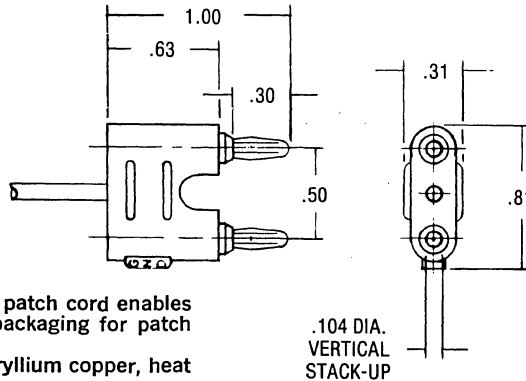
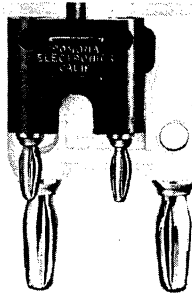
★ Various lengths may be aggregated for best quantity price. Other lengths available to order.

1/2" SPACED MINIATURE DOUBLE BANANA PLUG PATCH CORDS



MOLDED MINIATURE DOUBLE BANANA PLUG PATCH CORDS

ACTUAL SIZE



STACK-UP

1/3 smaller...

A miniature double banana plug on 1/2" centers. This patch cord enables miniaturization of test equipment and high density packaging for patch systems.

Banana plug springs precision formed of one piece beryllium copper, heat treated for maximum life and low contact resistance.

FEATURES...

- One piece beryllium copper heat treated spring for long life.
- Rounded spring design results in maximum contact area.
- GND., clearly molded on plug body and shell.
- Solder-bonded noise-free connections.

SPECIFICATIONS...

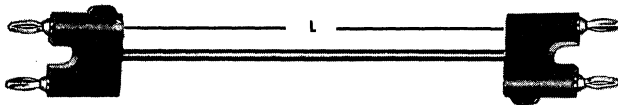
- Fits standard 0.104 dia. banana jacks, on 1/2" centers.
- Spring beryllium copper alloy 170 per QQ-C-533.
- Plug body brass per QQ-B-626, Alloy #360.
- Gold flashed per MIL-G-45204, type II.

CABLE DESCRIPTION:

Shielded coax., RG174/U. Polyethylene insulation, Vinyl jacket. Nom. cap. 29.5 pf/ft. Nom. Imp. 50 Ohms. Nom. O.D. .100". Color: Black.

NOTE: Molded double plug matches color of cable.

MINIATURE — DOUBLE BANANA PLUG BOTH ENDS



CONN: 1st END } Miniature Double Banana plug on 1/2" centers.

CABLE: Shielded Coax., RG174/U.

CONN: 2nd END } Miniature double banana plug on 1/2" centers.

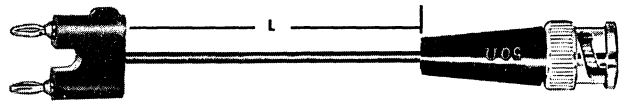
MODEL LENGTH

2247-K-12	12"
2247-K-24	24"
2247-K-36	36"
2247-K-48	48"
2247-K-60	60"

MODEL 2247

QUANTITY DISC. CODE B NET 5.95

MINIATURE-DOUBLE BANANA PLUG TO BNC MALE



CONN: 1st END } Miniature Double Banana Plug on 1/2" centers

CABLE: Shielded Coax., RG174/U

CONN: 2nd END } Male BNC

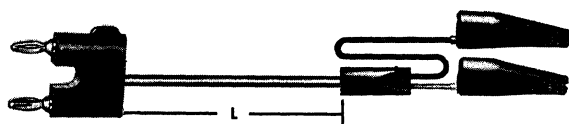
MODEL LENGTH

2248-K-12	12"
2248-K-24	24"
2248-K-36	36"
2248-K-48	48"
2248-K-60	60"

MODEL 2248

QUANTITY DISC. CODE B NET 6.95

MINIATURE — DOUBLE BANANA PLUG TO MINIGATOR CLIPS



CONN: 1st END } Miniature Double Banana plug on 1/2" centers.

CABLE: Shielded Coax., RG174/U.

CONN: 2nd END } Minigator Clips, Steel, cad plated Insulators, Vinyl: Black/Red.

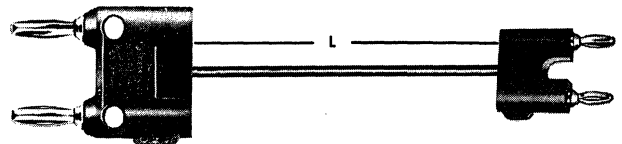
MODEL LENGTH

3027-K-12	12"
3027-K-24	24"
3027-K-36	36"
3027-K-48	48"
3027-K-60	60"

MODEL 3027

QUANTITY DISC. CODE B NET 6.50

DOUBLE BANANA PLUG TO MINIATURE DOUBLE BANANA PLUG



CONN: 1st END } Double Banana Plug, on 3/4" Centers.

CABLE: Shielded Coax., RG174/U.

CONN: 2nd END } Miniature double banana plug on 1/2" Centers.

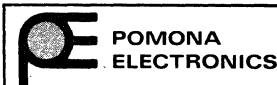
MODEL LENGTH

2443-K-12	12"
2443-K-24	24"
2443-K-36	36"
2443-K-48	48"
2443-K-60	60"

MODEL 2443

QUANTITY DISC. CODE B NET 5.85

PHENOLIC "BLACK BOXES"

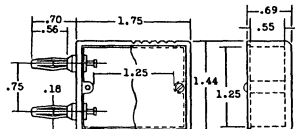
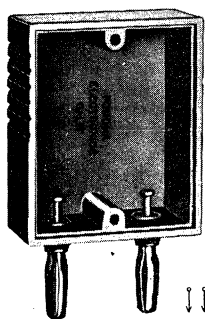


CREATE passive and active networks, voltage dividers, isolation networks or attenuators with these units. Solder turret terminals for permanent noise-free connection of components, etc. Entire unit may be potted or encapsulated.

APPLICABLE SPECIFICATIONS:

Operating Temp: -25°C to $+125^{\circ}\text{C}$. Working Voltage: 5000 VDC. Current: 15 Amps Cont., 30 Amps Int.

COMPONENT MOUNTING—ACROSS BANANA PLUGS



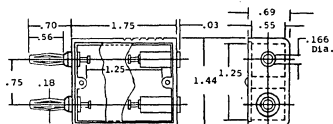
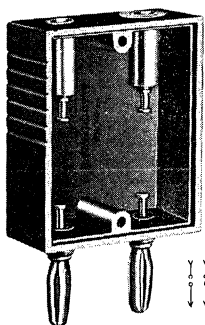
UPPER: No Connection.

LOWER: Banana plugs on $\frac{3}{4}$ " centers. One piece beryllium copper spring, heat treated, nickel plated. Plug body and solder turret terminals, brass, nickel plated. For use with standard .166" dia. banana jacks.

MODEL 2096

QUANTITY DISC. CODE A NET 2.50

COMPONENT MOUNTING—BANANA JACKS TO DOUBLE BANANA PLUG—JUNIOR SIZE



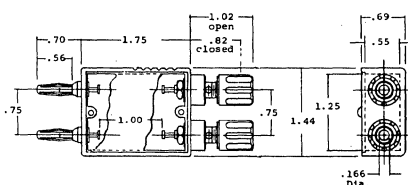
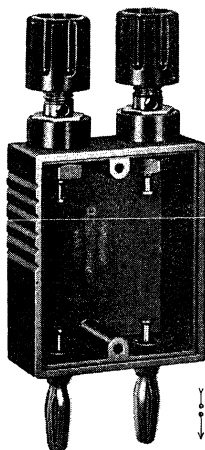
UPPER: Banana jacks, .166" dia. and solder turret terminals on $\frac{3}{4}$ " centers. Brass, nickel plated. Polarity indicator on top, color, RED.

LOWER: Banana plugs on $\frac{3}{4}$ " centers. One piece beryllium copper spring, heat treated, nickel plated. Plug body and solder turret terminals, brass, nickel plated. For use with standard .166" dia. banana jacks.

MODEL 2098

QUANTITY DISC. CODE A NET 4.25

COMPONENT MOUNTING—BINDING POSTS TO DOUBLE BANANA PLUG—JUNIOR SIZE

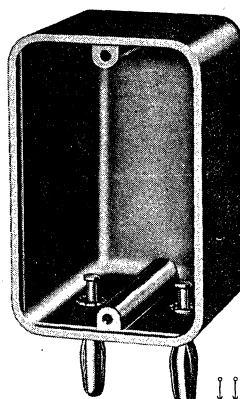


UPPER: Banana jack binding posts with solder turret terminals, on $\frac{3}{4}$ " centers. Red and Black.

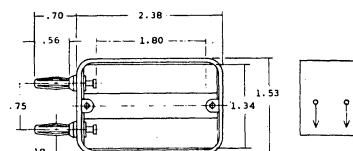
LOWER: Banana plugs on $\frac{3}{4}$ " centers. One piece beryllium copper spring, heat treated, nickel plated. Plug body and solder turret terminals, brass, nickel plated. For use with standard .166" dia. banana jacks.

MODEL 2259

QUANTITY DISC. CODE A NET 5.95



COMPONENT MOUNTING—ACROSS BANANA PLUGS—KING SIZE

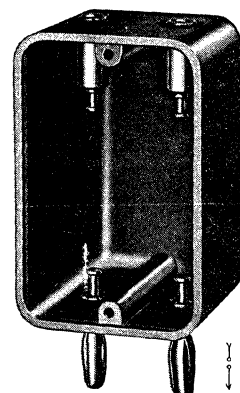


UPPER: No Connection.

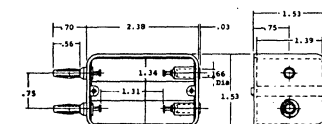
LOWER: Banana plugs on $\frac{3}{4}$ " centers. One piece beryllium copper spring, heat treated, nickel plated. Plug body and solder turret terminals, brass, nickel plated. For use with standard .166" dia. banana jacks.

MODEL 1177

QUANTITY DISC. CODE A NET 2.50



COMPONENT MOUNTING—BANANA JACKS TO DOUBLE BANANA PLUG—KING SIZE

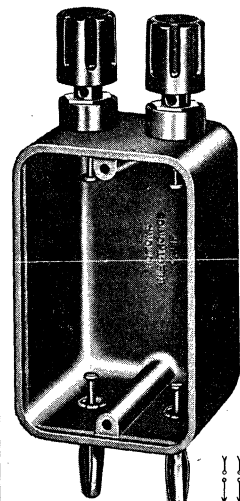


UPPER: Banana jacks, .166" dia. and solder turret terminals on $\frac{3}{4}$ " centers. Brass, nickel plated. Polarity indicator on top, color, RED.

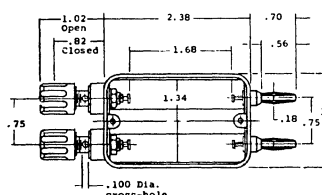
LOWER: Banana plugs on $\frac{3}{4}$ " centers. One piece beryllium copper spring, heat treated, nickel plated. Plug body and solder turret terminals, brass, nickel plated. For use with standard .166" dia. banana jacks.

MODEL 2224

QUANTITY DISC. CODE A NET 3.85



COMPONENT MOUNTING—BINDING POSTS TO DOUBLE BANANA PLUG—KING SIZE



UPPER: Banana jack binding posts with solder turret terminals, on $\frac{3}{4}$ " centers. Red and Black.

LOWER: Banana plugs on $\frac{3}{4}$ " centers. One piece beryllium copper spring, heat treated, nickel plated. Plug body and solder turret terminals, brass, nickel plated. For use with standard .166" dia. banana jacks.

MODEL 2262

QUANTITY DISC. CODE A NET 5.95

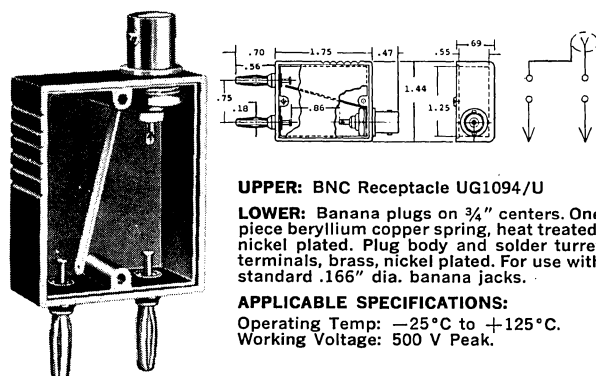
PHENOLIC "BLACK BOXES"



CREATE passive and active networks, voltage dividers, isolation networks or attenuators with these units. Solder turret terminals for permanent noise-free connection of components, etc. Entire unit may be potted or encapsulated.

Housing molded of thermosetting electrical grade phenolic. Cover, punched XXP laminated paper base phenolic. Color, housing and cover, BLACK. Cover plate and 2 each #2-56 cover screws included.

COMPONENT MOUNTING—BNC RECEPTACLE TO DOUBLE BANANA PLUG



UPPER: BNC Receptacle UG1094/U

LOWER: Banana plugs on $\frac{3}{4}$ " centers. One piece beryllium copper spring, heat treated, nickel plated. Plug body and solder turret terminals, brass, nickel plated. For use with standard .166" dia. banana jacks.

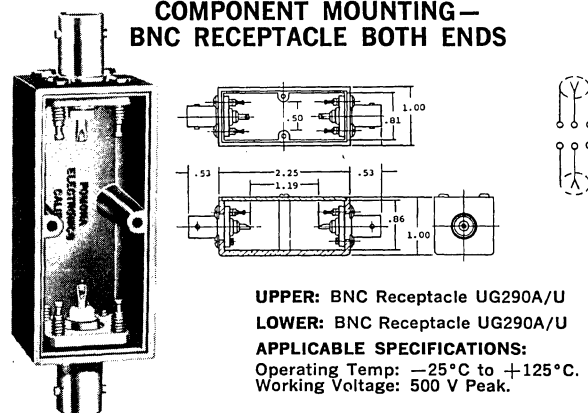
APPLICABLE SPECIFICATIONS:

Operating Temp: -25°C to $+125^{\circ}\text{C}$.
Working Voltage: 500 V Peak.

MODEL 2097

QUANTITY DISC. CODE A NET 4.95

COMPONENT MOUNTING—BNC RECEPTACLE BOTH ENDS



UPPER: BNC Receptacle UG290A/U

LOWER: BNC Receptacle UG290A/U

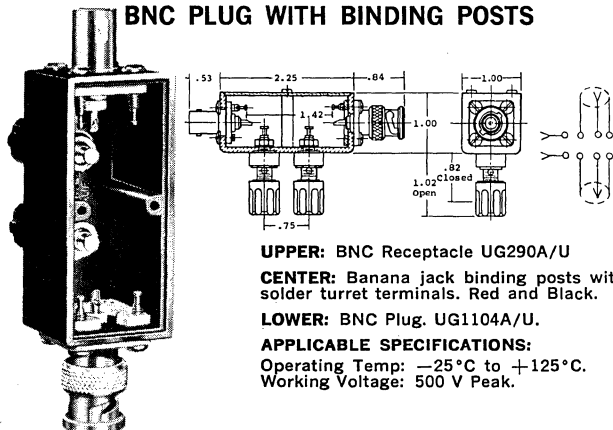
APPLICABLE SPECIFICATIONS:

Operating Temp: -25°C to $+125^{\circ}\text{C}$.
Working Voltage: 500 V Peak.

MODEL 2101

QUANTITY DISC. CODE A NET 8.50

COMPONENT MOUNTING—BNC RECEPTACLE TO BNC PLUG WITH BINDING POSTS



UPPER: BNC Receptacle UG290A/U

CENTER: Banana jack binding posts with solder turret terminals. Red and Black.

LOWER: BNC Plug. UG1104A/U.

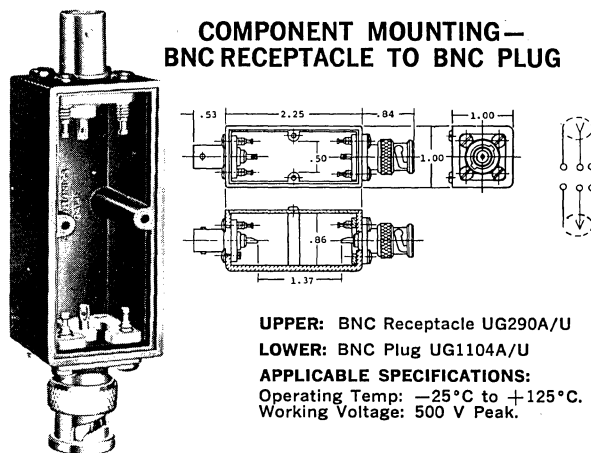
APPLICABLE SPECIFICATIONS:

Operating Temp: -25°C to $+125^{\circ}\text{C}$.
Working Voltage: 500 V Peak.

MODEL 2100

QUANTITY DISC. CODE A NET 12.85

COMPONENT MOUNTING—BNC RECEPTACLE TO BNC PLUG



UPPER: BNC Receptacle UG290A/U

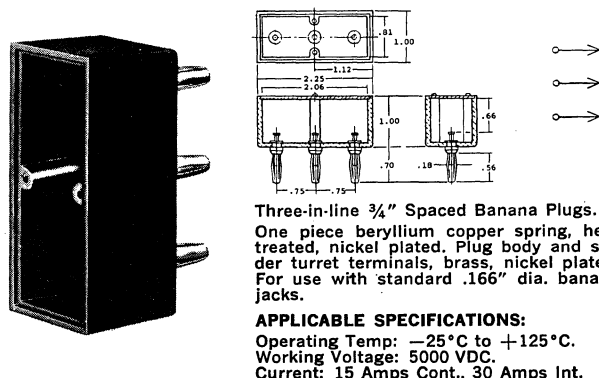
LOWER: BNC Plug UG1104A/U

APPLICABLE SPECIFICATIONS:

Operating Temp: -25°C to $+125^{\circ}\text{C}$.
Working Voltage: 500 V Peak.

MODEL 2099

QUANTITY DISC. CODE A NET 9.85

COMPONENT MOUNTING—(3) $\frac{3}{4}$ " SPACED BANANA PLUGS

Three-in-line $\frac{3}{4}$ " Spaced Banana Plugs.

One piece beryllium copper spring, heat treated, nickel plated. Plug body and solder turret terminals, brass, nickel plated. For use with standard .166" dia. banana jacks.

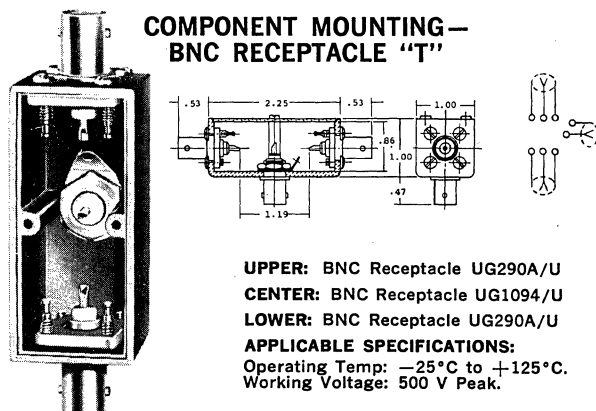
APPLICABLE SPECIFICATIONS:

Operating Temp: -25°C to $+125^{\circ}\text{C}$.
Working Voltage: 5000 VDC.
Current: 15 Amps Cont., 30 Amps Int.

MODEL 2095

QUANTITY DISC. CODE A NET 2.95

COMPONENT MOUNTING—BNC RECEPTACLE "T"



UPPER: BNC Receptacle UG290A/U

CENTER: BNC Receptacle UG1094/U

LOWER: BNC Receptacle UG290A/U

APPLICABLE SPECIFICATIONS:

Operating Temp: -25°C to $+125^{\circ}\text{C}$.
Working Voltage: 500 V Peak.

MODEL 2102

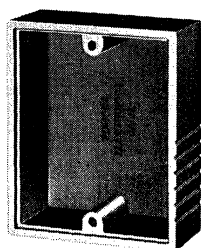
QUANTITY DISC. CODE A NET 11.50

PHENOLIC & THERMOPLASTIC "BLACK BOXES"

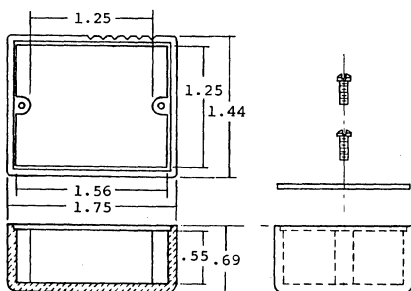


Boxes of unlimited uses for packaging of components and circuitry. Also ideal for potting and encapsulating. Available in three sizes as shown below. Housing molded of thermosetting electrical grade phenolic. Cover, punched XXP laminated paper base phenolic. Color, Housing: Black, Red or Green (specify). Cover, Black. Cover plate and 2 each #2-56 cover screws included.

Operating Temperature: -25°C to $+125^{\circ}\text{C}$.



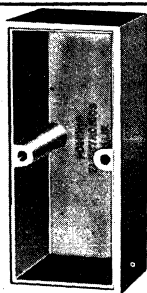
BLACK BOX—JUNIOR SIZE



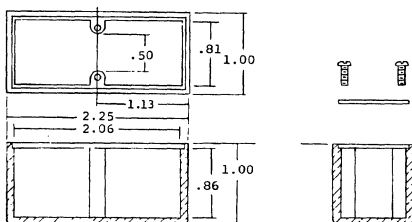
MODEL	COLOR
2105	Black
3720	Red
3721	Green

QUANTITY
DISC. CODE **A**

NET .95



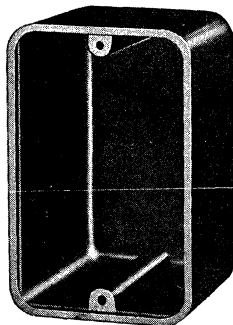
BLACK BOX—QUEEN SIZE



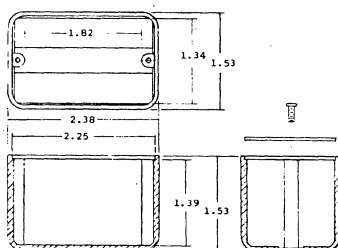
MODEL	COLOR
2103	Black
3722	Red
3723	Green

QUANTITY
DISC. CODE **A**

NET .95



BLACK BOX—KING SIZE



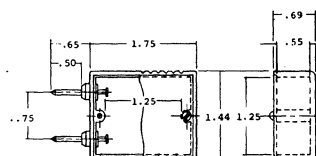
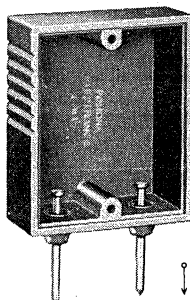
MODEL	COLOR
2104	Black
3724	Red
3725	Green

QUANTITY
DISC. CODE **A**

NET .95

CREATE passive and active networks, voltage dividers, isolation networks or attenuators with these units. Solder turret terminals for permanent noise-free connection of components, etc. Entire unit may be potted or encapsulated.

COMPONENT MOUNTING—ACROSS PIN TIP PLUGS



UPPER: No Connection.

LOWER: Pin tip plugs, .080 dia. on $\frac{3}{4}$ " centers. Plug bodies and solder turret terminals, brass, nickel plated.

APPLICABLE SPECIFICATIONS:

Operating Temp.: -25°C to $+125^{\circ}\text{C}$.

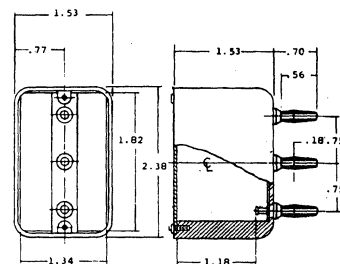
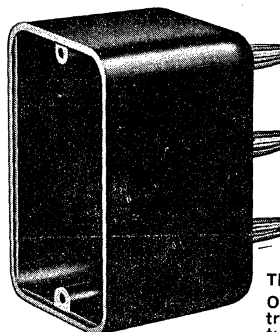
Working Voltage: 5000 VDC.

Current: 5 Amps Cont., 10 Amps Int.

MODEL 2268

QUANTITY
DISC. CODE **A**

NET 2.25

COMPONENT MOUNTING —
(3) $\frac{3}{4}$ " SPACED BANANA PLUGS — KING SIZE

Three-in-line $\frac{3}{4}$ " Spaced Banana Plugs.

One piece beryllium copper spring, heat treated, nickel plated. Plug body and solder turret terminals, brass, nickel plated. For use with standard .166" dia. banana jacks.

APPLICABLE SPECIFICATIONS:

Operating Temp.: -25°C to $+125^{\circ}\text{C}$.

Working Voltage: 5000 VDC.

Current: 15 Amps Cont., 30 Amps In.

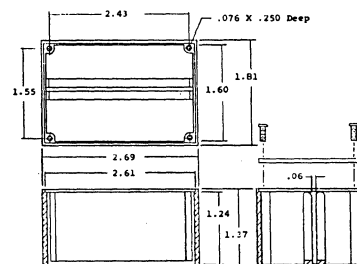
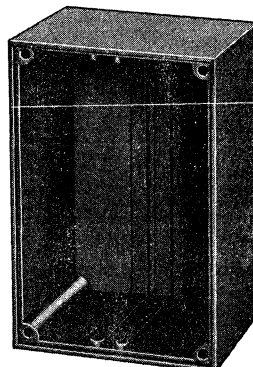
MODEL 1943

QUANTITY
DISC. CODE **A**

NET 3.75

MOLDED ABS THERMOPLASTIC BOX
WITH CARD GUIDE

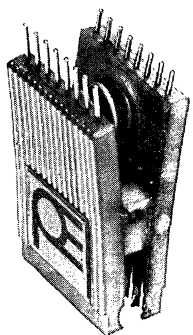
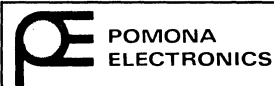
The box and cover are molded of high impact ABS Thermoplastic and are almost unbreakable under normal use. Box and cover are easily machined. A single slot is provided for $\frac{1}{16}$ " circuit board. Color: Box and cover, Blue. Cover and 4 each #2-56 cover screws included.



MODEL 3850

QUANTITY
DISC. CODE **A**

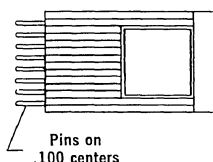
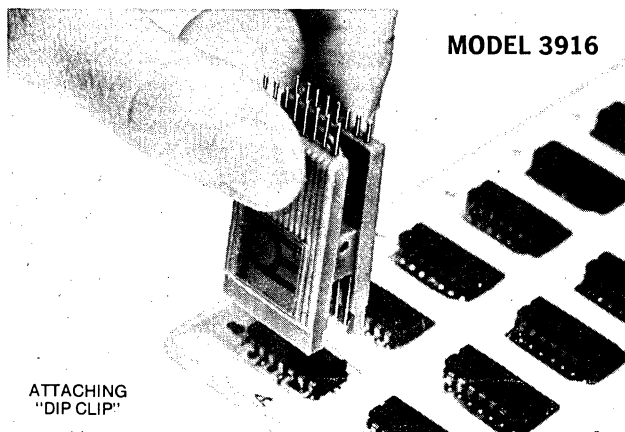
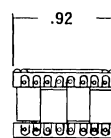
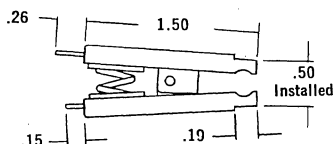
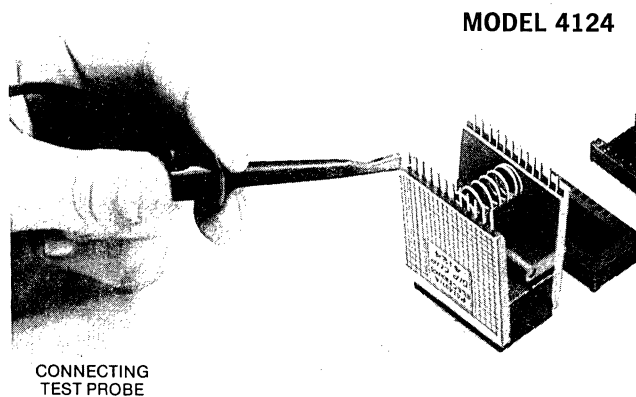
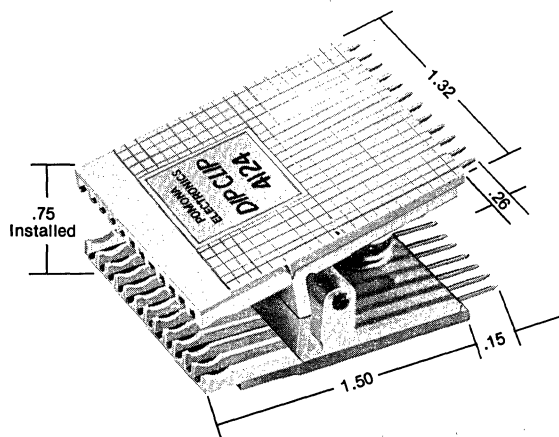
NET .95

"DIP CLIP" IC TEST CLIP
T.M.ACTUAL
SIZE**MODEL 3916**QUANTITY
DISC. CODE **C** NET 5.75**FOR 14 OR 16 DUAL-IN-LINE PACKAGES**

The "Dip-Clip" is specially designed to allow the attachment of test-probes to 14 or 16 lead DIPs. The clip greatly reduces the possibility of accidental shorting while testing live circuits. Numerous test probes may be quickly connected for hands-free testing.

FEATURES:

- Used on 14 or 16 pin lead DIP.
- Nickel Silver contacts.
- Spring loaded wiping action of contact pins gives good electrical connection.
- Provides hands-free testing of DIP.
- Special contact design gives positive positioning, preventing accident shorting of adjacent leads.
- Special friction-grip contacts.

Pins on
.100 centers**MODEL 3916**ATTACHING
"DIP CLIP"**MODEL 4124**CONNECTING
TEST PROBE**MODEL 4124**QUANTITY DISC. CODE **C** NET 13.85**FOR 24 PIN DUAL-IN-LINE PACKAGES**

The "Dip-Clip" is specially designed to allow the attachment of test probes to 24 Pin lead DIPs. The clip greatly reduces the possibility of accidental shorting while testing live circuits. Numerous test probes may be quickly connected for hands-free testing.

FEATURES:

- Used on 24 pin lead DIP.
- Nickel Silver contacts.
- Spring loaded wiping action of contact pins gives good electrical connection.
- Provides hands-free testing of DIP.
- Special contact design gives positive positioning, preventing accident shorting of adjacent leads.
- Special friction-grip contacts.

DO IT YOURSELF GRABBER



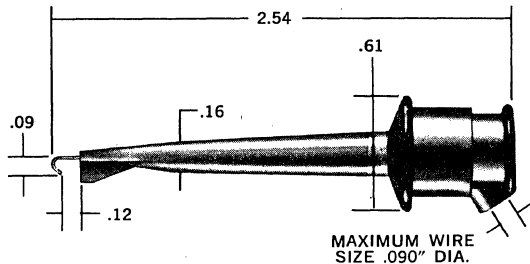
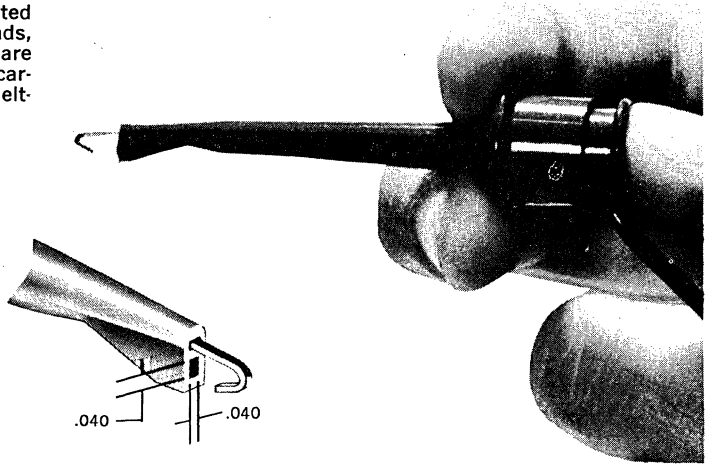
This Do-It-Yourself Grabber provides the user with the ability to build his own leads. The unit is completely field serviceable and features a simplified assembly procedure. The gold plated contact hook can be connected rapidly to component leads, and the specially designed tip slides down over .025 square Wire-Wrap pins. The entire unit is molded of Lexan® Polycarbonate thermoplastic for strength and less chance of melting when soldering lead.

FEATURES:

- Plunger type action between thumb and two fingers
- Comfortable finger grip operation.
- Positive connection that won't pop off.
- No sharp teeth to damage or nick wires.
- Simplified assembly procedure.
- High temperature material that resists melting when soldering.
- Accepts wire up to .090" Dia.

MATERIALS:

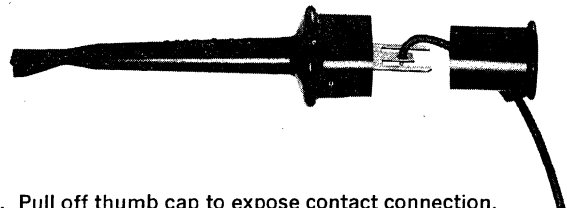
- Molded Lexan® Polycarbonate body.
- Beryllium copper contact per QQ-C-533, Alloy 170.
- Gold plated per MIL-G-45204 type 1.
- Stainless steel spring.



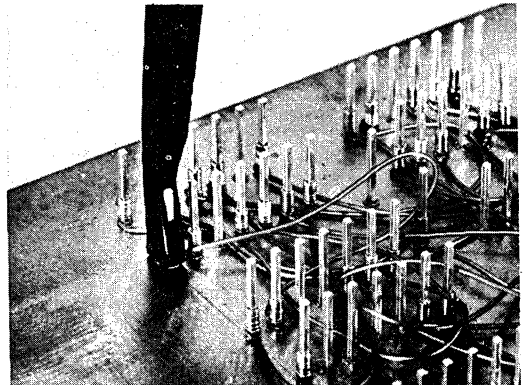
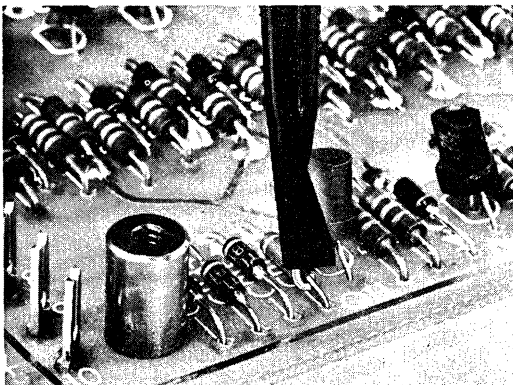
COLORS: Black, Red, Yellow, Green, Blue, White.

MODEL 3925 (Specify Color) QUANTITY DISC. CODE **A** NET .85

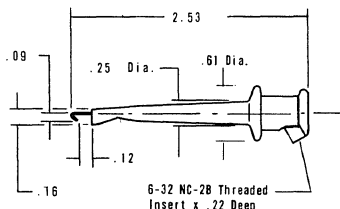
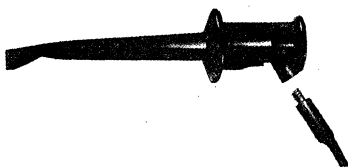
SIMPLIFIED ASSEMBLY PROCEDURE



1. Pull off thumb cap to expose contact connection.
2. Thread wire through thumb cap and strip $\frac{1}{8}$ ".
3. Insert stripped end through tapered hole on contact, and solder.
NOTE: Stripped end should be placed into the large opening of the tapered hole.
4. Slide thumb cap back onto contact.



"GRABBER" WITH 6-32 THREAD



This "Grabber" can be used with oscilloscopes and leads equipped with a 6-32 screw on tip.

- Gold plated hook tip and threaded insert.
- Stainless steel spring.
- Molded nylon body per MIL-P-20693.
- COLORS: Black, Red.

MODEL 4011 (Specify Color) QUANTITY DISC. CODE **A** NET 1.50

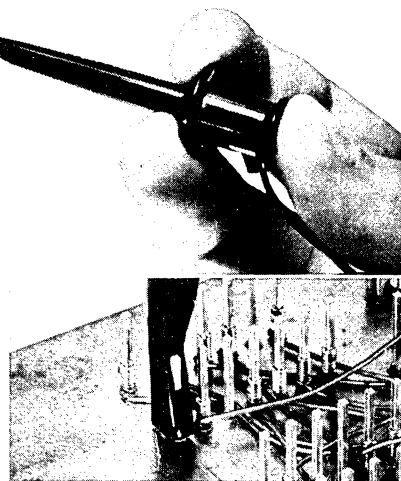
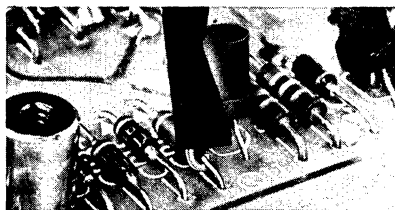
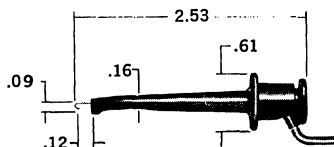
MINI TEST CLIP GRABBER



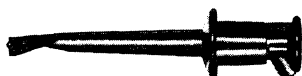
These plunger type action clips are called "grabbers." The gold plated contact hook can be connected rapidly to component leads and the specially designed tip slides down over .025 square Wire-Wrap pins. Nylon insulation molded directly onto clip and wire providing a strong, reliable integral unit. Clip is completely insulated to point of connection.

FEATURES:

- Plunger type action between thumb and two fingers.
- Comfortable finger grip operation.
- Positive connection that won't pop off.
- No sharp teeth to damage or nick wires.
- Beryllium copper conductor alloy 170 per QQ-C-533; gold plated per MIL-G-45204 Type I.
- Stainless steel spring.
- Molded nylon insulator per MIL-P-20693.



MODEL	LENGTH	NET
3780-8	8"	1.00
3780-12	12"	1.00
3780-24	24"	1.00
3780-36	36"	1.00
3780-48	48"	1.05
3780-60	60"	1.10



MINI-TEST CLIP GRABBER — ONE END ONLY

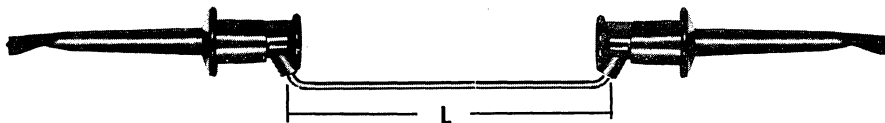
Miniature Test Clip with wire connected one end only. No connector on opposite end allows connection of various components. Nylon insulation is molded directly onto clip and wire.

MINI-TEST CLIP: Beryllium copper gold plated hook tip. Nylon insulation molded directly onto clip and wire.
WIRE: 20 AWG, stranded 41 x 36 T.C. Extra flexible polyvinyl insulation .087" O.D.
OPERATING TEMP.: -25°C. to +105°C.
COLORS: Black, Red.

MODEL 3780 (Specify Color) QUANTITY DISC. CODE **A** ★

MODEL	LENGTH	NET
3781-8	8"	1.65
3781-12	12"	1.65
3781-18	18"	1.65
3781-24	24"	1.65
3781-36	36"	1.65
3781-48	48"	1.70
3781-60	60"	1.75

MINI-TEST CLIP GRABBER — BOTH ENDS



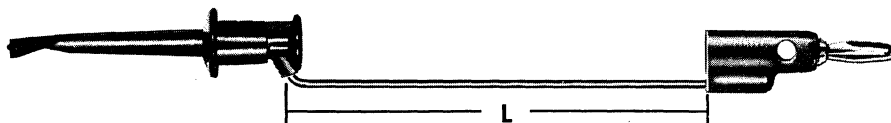
Miniature test clip on both ends for rapid interconnection of test points. Connects quickly and gently to test points without damage from sharp teeth.

MINI-TEST CLIP: Beryllium copper gold plated hook tip. Nylon insulation molded directly onto clip and wire.
WIRE: 20 AWG, stranded 41 x 36 T.C. Extra flexible polyvinyl insulation .087" O.D.
OPERATING TEMP.: -25°C. to +105°C.
COLORS: Black, Red.

MODEL 3781 (Specify Color) QUANTITY DISC. CODE **A** ★

MINI-TEST CLIP GRABBER — TO STACKING BANANA PLUG

MODEL	LENGTH	NET
3782-12	12"	1.65
3782-24	24"	1.65
3782-36	36"	1.65
3782-48	48"	1.70
3782-60	60"	1.75



Miniature Test Clip lead adapts to equipment using standard banana jacks.

MINI-TEST CLIP: Beryllium copper gold plated hook tip. Nylon insulation molded directly onto clip and wire.

WIRE: 20 AWG, stranded 41 x 36 T.C. Extra flexible polyvinyl insulation .087" O.D.
BANANA PLUG: Spring, one piece beryllium copper, heat treated, gold flashed. Tough Thermoplastic molded to plug body and wire.
OPERATING TEMP.: -25°C. to +105°C.
COLORS: Black, Red.

MODEL 3782 (Specify Color) QUANTITY DISC. CODE **A** ★

MINI-TEST CLIP GRABBER — TO STACKING MINIATURE BANANA PLUG

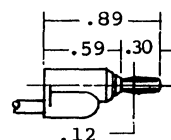
MODEL	LENGTH	NET
3784-12	12"	1.85
3784-24	24"	1.85
3784-36	36"	1.85
3784-48	48"	1.95
3784-60	60"	2.05



Miniature test clip adapts to equipment using miniature banana jacks.

MINI-TEST CLIP: Beryllium copper gold plated hook tip. Nylon insulation molded directly onto clip and wire.

WIRE: 20 AWG, stranded 41 x 36 T.C. Extra flexible polyvinyl insulation .087" O.D.
MINIATURE BANANA PLUG: Spring, one piece beryllium copper, heat treated, gold flashed. Tough thermoplastic molded to plug body and wire.
OPERATING TEMP.: -25°C. to +105°C.
COLORS: Black, Red.



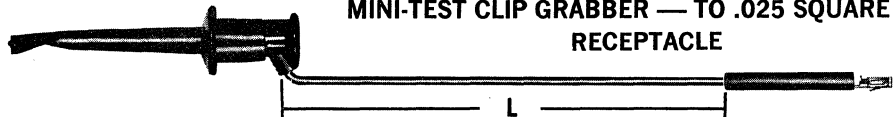
MODEL 3784 (Specify Color) QUANTITY DISC. CODE **A** ★

★ Various lengths may be aggregated for best quantity price. Other lengths available to order.

MINI TEST CLIP GRABBER



MODEL	LENGTH	NET
3783-12	12"	2.25
3783-24	24"	2.25
3783-36	36"	2.25
3783-48	48"	2.35
3783-60	60"	2.45


MINI-TEST CLIP GRABBER — TO .025 SQUARE PIN RECEPTACLE

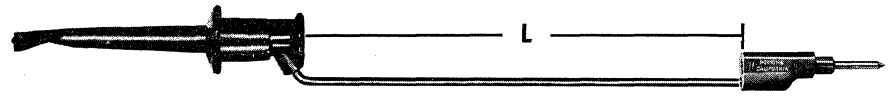
This miniature test clip lead has a .025 square pin receptacle which slides over .025 square pins.
MINI-TEST CLIP: Beryllium copper gold plated hook tip. Nylon insulation molded directly onto clip and wire.

WIRE: 20 AWG, stranded 41 x 36 T.C. Extra flexible polyvinyl insulation .087" O.D.
.025 PIN RECEPTACLE: Gold plated phosphor bronze contact.
OPERATING TEMP.: -25°C. to +105°C.
COLORS: Black, Red.

MODEL 3783 (Specify Color) QUANTITY DISC. CODE **A** ★

MINI-TEST CLIP GRABBER — TO STACKING PIN TIP PLUG

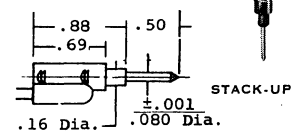
MODEL	LENGTH	NET
3785-12	12"	1.85
3785-24	24"	1.85
3785-36	36"	1.85
3785-48	48"	1.95
3785-60	60"	2.05



Miniature test clip adapts to equipment using standard pin tip jacks.

MINI-TEST CLIP: Beryllium copper gold plated hook tip. Nylon insulation molded directly onto clip and wire.

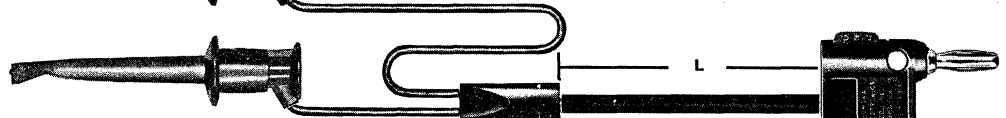
WIRE: 20AWG, stranded 41 x 36 T.C. Extra flexible polyvinyl insulation .087" O.D.
PIN TIP PLUG: .080 dia., 1/2" long, brass, gold flashed. **STACK-UP:** Beryllium copper, gold flashed. Accepts .080 dia. pin.
OPERATING TEMP.: -25°C. to +105°C.
COLORS: Black, Red.



MODEL 3785 (Specify Color) QUANTITY DISC. CODE **A** ★

MINI-TEST CLIPS GRABBER — TO DOUBLE BANANA PLUG

MODEL	LENGTH	NET
3786-C-18	18"	6.50
3786-C-24	24"	6.50
3786-C-36	36"	6.50
3786-C-48	48"	6.50
3786-C-60	60"	6.50



For use with equipment having standard binding posts or banana jacks.

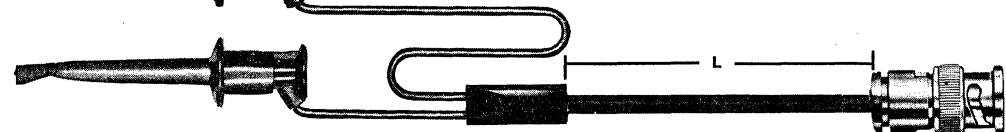
MINI-TEST CLIPS: Beryllium copper gold plated hook tip. Nylon insulation molded directly onto clip and wire. One red, one black.

CABLE: Shielded coax., RG58C/U, .195" O.D., Nom. Cap. 28.5 pf./ft. Color, black.
DOUBLE BANANA PLUG: On 3/4" center. Spring, one piece beryllium copper, heat treated, nickel plated. Tough thermoplastic molded onto double plug body and cable. Color, black.

MODEL 3786 QUANTITY DISC. CODE **B** ★

MINI-TEST CLIPS GRABBER — TO BNC MALE

MODEL	LENGTH	NET
3787-C-18	18"	6.50
3787-C-24	24"	6.50
3787-C-36	36"	6.50
3787-C-48	48"	6.50
3787-C-60	60"	6.50



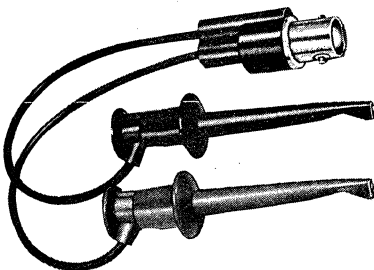
For use with equipment having BNC Receptacles.

MINI-TEST CLIPS: Beryllium copper gold plated hook tip. Nylon insulation molded directly onto clip and wire. One red, one black.

CABLE: Shielded coax., RG58C/U, .195" O.D., Nom. Cap. 28.5 pf./ft. Color, black.
CONNECTOR: BNC Male, M39012/16-0001 with non-tarnish finish.

MODEL 3787 QUANTITY DISC. CODE **B** ★

MINI-TEST CLIPS GRABBER — TO BNC RECEPTACLE



This molded breakout converts a coaxial cable with a male plug to a test cable with clips.

MINI-TEST CLIPS: Beryllium copper gold plated hook tip. Nylon insulation molded directly onto clip and wire. 1 Black, 1 Red.

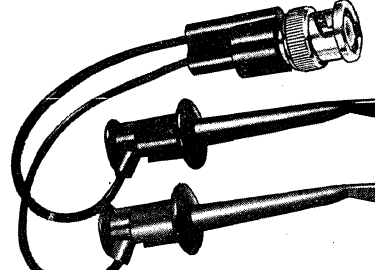
WIRE: 20 AWG, Stranded 41 x 36 T.C. PVC insulation .087" O.D.

CONNECTOR: BNC Receptacle UG1094/U with non-tarnish finish.
INSULATION: Tough thermoplastic molded to connector and wire.

OVERALL LENGTH 7"

MODEL 3788 QUANTITY DISC. CODE **A** NET 3.95

MINI-TEST CLIPS GRABBER — TO BNC PLUG



This molded breakout converts a coaxial cable with a BNC Receptacle to a test cable with clips.

MINI-TEST CLIPS: Beryllium copper gold plated hook tip. Nylon insulation molded directly onto clip and wire. 1 Black, 1 Red.

WIRE: 20 AWG, Stranded 41 x 36 T.C. PVC insulation .087" O.D.

CONNECTOR: BNC Plug with non-tarnish finish.
INSULATION: Tough thermoplastic molded to connector and wire.

OVERALL LENGTH 7"

MODEL 3789 QUANTITY DISC. CODE **A** NET 4.95

★ Various lengths may be aggregated for best quantity price. Other lengths available to order.

SHIELDED "BLACK BOXES" MINIATURE SIZE



NOW AVAILABLE, *SHIELDED "BLACK BOXES."* Boxes that fulfill the requirement for RF applications.

Ideal for compact packaging, eg., voltage dividers, isolation networks, impedance matching networks, and other varied uses.

Cover and self-tapping screws included.

APPLICABLE SPECIFICATIONS: (ALL MODELS)

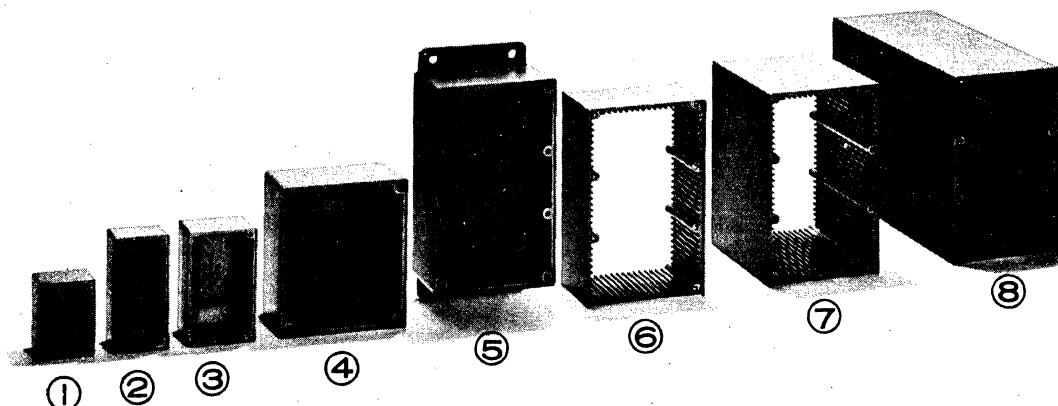
Operating Temp.: -55°C to +150°C.

Working Voltage: 500 V Peak (Model 2415, 1500 V Peak).

Noise Rejection: Greater than 70DB.

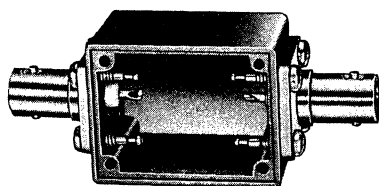
FEATURES:

- SHIELDED HOUSING; Die Cast Aluminum. FINISH: Blue baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.
- COVER; .040 Thick Aluminum #6061-T6 with clear anodized finish per MIL-A-8625A.
- Four screws secure cover for proper shielding.
- Solder turret terminals for permanent noise free connection of components.

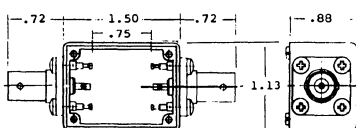


- ① MINIATURE SIZE—Page 39 ② SIZE "A"—Pages 40 & 44 ③ SIZE "B"—Pages 41, 42, 43 & 44 ④ SIZE "D"—Page 46 ⑤ SIZE "C"—Page 45 ⑥ CARD GUIDE 1½" Deep—Pages 47 & 48 ⑦ CARD GUIDE 3" Deep—Page 49 ⑧ CARD GUIDE 6" Deep—Page 49

COMPONENT MOUNTING— BNC RECEPTACLE BOTH ENDS



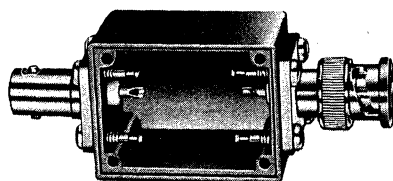
CONN: } BNC Receptacle Jack,
1st END } UG290A/U.
CONN: } BNC Receptacle Jack,
2nd END } UG290A/U.



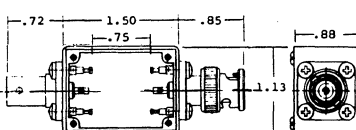
MODEL 3751

QUANTITY DISC. CODE **A** NET 8.95

COMPONENT MOUNTING— BNC RECEPTACLE TO BNC PLUG



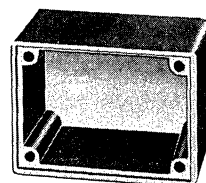
CONN: } BNC Receptacle Jack,
1st END } UG290A/U.
CONN: } BNC Receptacle Plug,
2nd END } UG1104A/U.



MODEL 3752

QUANTITY DISC. CODE **A** NET 9.95

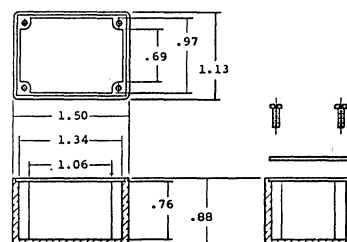
EMPTY — SHIELDED "BLACK BOX"



MINIATURE
SIZE

MODEL 3753
FINISH: Blue Baked Enamel.
Includes cover with part number on cover and four cover screws.

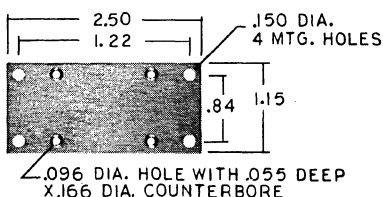
MODEL 3754
FINISH: None
Includes unmarked cover and four cover screws.



MODEL 3753
MODEL 3754

QUANTITY DISC. CODE **A** NET 1.95

LARGER COVER PLATE FOR MOUNTING MINIATURE SIZE BOXES



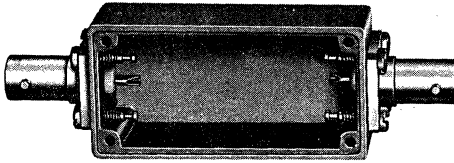
This larger plate, when attached to the box, provides flanges for mounting.

MATERIAL: .080 Aluminum #6061-T6, clear anodized per MIL-A-8625A.

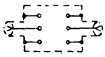
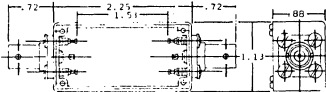
MODEL 3729 (plate only)

QUANTITY DISC. CODE **A** NET .85

SHIELDED "BLACK BOXES"—SIZE "A"

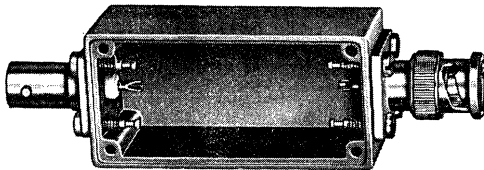
COMPONENT MOUNTING—
BNC RECEPTACLE BOTH ENDS

CONN: } BNC Receptacle Jack,
1st END } UG290A/U.
CONN: } BNC Receptacle Jack,
2nd END } UG290A/U.

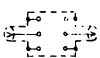
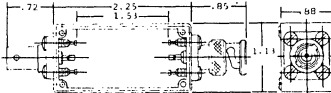


MODEL 2390

QUANTITY DISC. CODE A NET 8.85

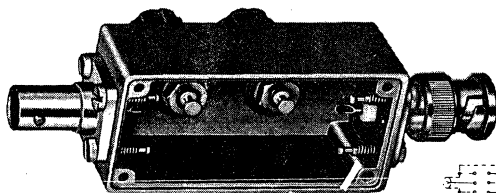
COMPONENT MOUNTING—
BNC RECEPTACLE TO BNC PLUG

CONN: } BNC Receptacle Jack,
1st END } UG290A/U.
CONN: } BNC Receptacle Plug,
2nd END } UG1104A/U.

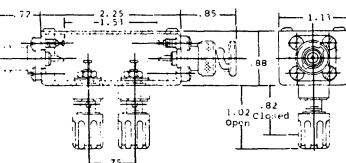


MODEL 2391

QUANTITY DISC. CODE A NET 9.85

COMPONENT MOUNTING—BNC RECEPTACLE TO
BNC PLUG WITH BINDING POSTS

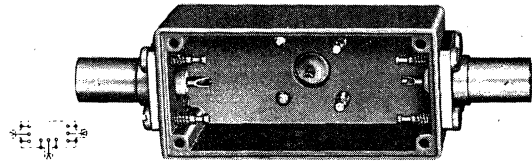
CONN: } BNC Receptacle Jack,
1st END } UG290A/U.
CENTER: Banana jack binding
posts with solder turret
terminals. Red and Black.
CONN: } BNC Receptacle Plug,
2nd END } UG1104A/U.



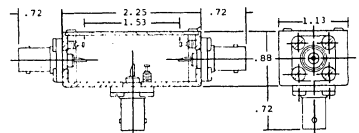
MODEL 2393

QUANTITY DISC. CODE A NET 12.85

COMPONENT MOUNTING—BNC RECEPTACLE "T"

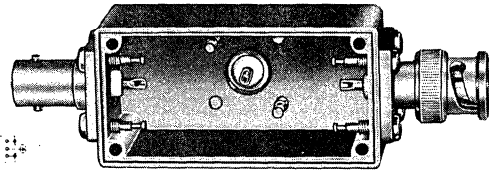


CONN: } BNC Receptacle Jack,
1st END } UG290A/U.
CENTER: BNC Receptacle Jack,
UG290A/U.
CONN: } BNC Receptacle Jack,
2nd END } UG290A/U.

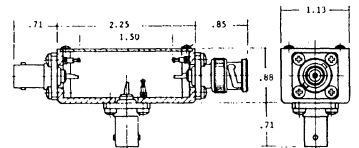


MODEL 2392

QUANTITY DISC. CODE A NET 11.50

COMPONENT MOUNTING — "T" TWO BNC
RECEPTACLES TO BNC PLUG

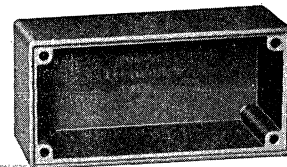
CONN: } BNC Receptacle Jack,
1st END } UG290A/U.
CENTER: BNC Receptacle Jack,
UG290A/U.
CONN: } BNC Receptacle Plug,
2nd END } UG1104A/U.



MODEL 2401

QUANTITY DISC. CODE A NET 12.85

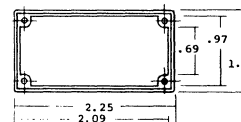
EMPTY — SHIELDED "BLACK BOX"



SIZE "A"

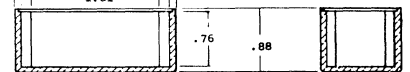
MODEL 2397

FINISH: Blue Baked
Enamel.
Includes cover with
part number on
cover and four
cover screws.

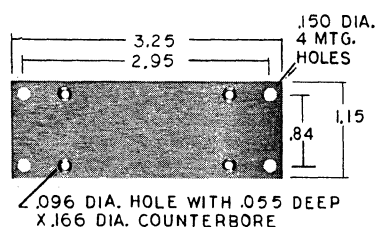


MODEL 2400

FINISH: None
Includes unmarked
cover and four
cover screws.



QUANTITY DISC. CODE A NET 1.95

LARGER COVER PLATE FOR MOUNTING
SIZE "A" BOXES

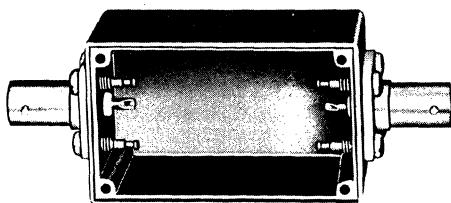
This larger plate, when
attached to the box, pro-
vides flanges for mount-
ing.

MATERIAL: .080 Alumi-
num #6061-T6, clear an-
odized per MIL-A-8625A.

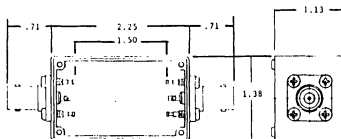
MODEL 3728 (plate only)

QUANTITY DISC. CODE A NET .85

SHIELDED "BLACK BOXES"—SIZE "B"

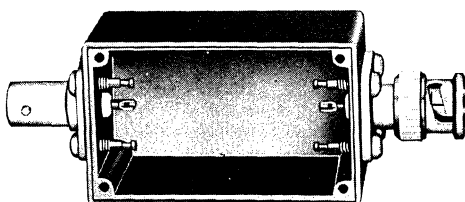
COMPONENT MOUNTING —
BNC RECEPTACLE BOTH ENDS

CONN: } BNC Receptacle Jack,
1st END } UG290A/U.
CONN: } BNC Receptacle Jack,
2nd END } UG290A/U.

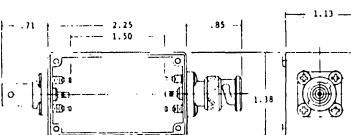


MODEL 3230

QUANTITY DISC. CODE A NET 8.85

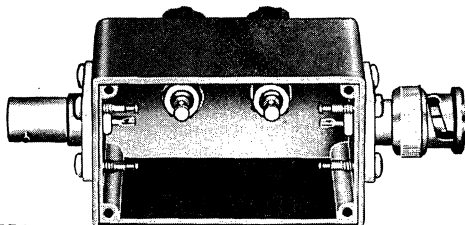
COMPONENT MOUNTING —
BNC RECEPTACLE TO BNC PLUG

CONN: } BNC Receptacle Jack,
1st END } UG290A/U.
CONN: } BNC Receptacle Plug,
2nd END } UG1104A/U.

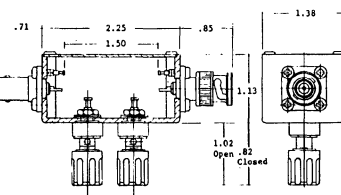


MODEL 3231

QUANTITY DISC. CODE A NET 9.85

COMPONENT MOUNTING — BNC RECEPTACLE TO
BNC PLUG WITH BINDING POSTS

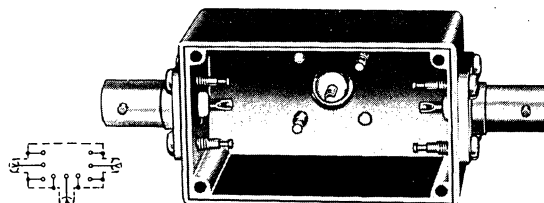
CONN. } BNC Receptacle Jack,
1st END } UG290A/U.
CENTER: Banana jack binding
posts with solder turret
terminals. Red and Black.
CONN: } BNC Receptacle Plug,
2nd END } UG1104A/U.



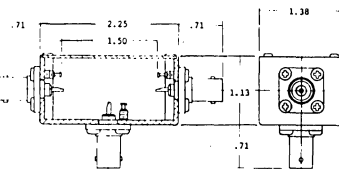
MODEL 3233

QUANTITY DISC. CODE A NET 12.85

COMPONENT MOUNTING — BNC RECEPTACLE "T"

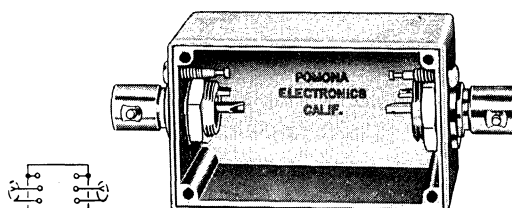


CONN: } BNC Receptacle Jack,
1st END } UG290A/U.
CENTER: BNC Receptacle Jack,
UG290A/U.
CONN: } BNC Receptacle Jack,
2nd END } UG290A/U.

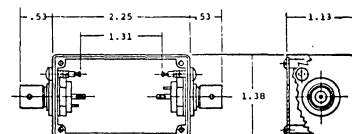


MODEL 3232

QUANTITY DISC. CODE A NET 11.50

COMPONENT MOUNTING —
ISOLATED BNC RECEPTACLE BOTH ENDS

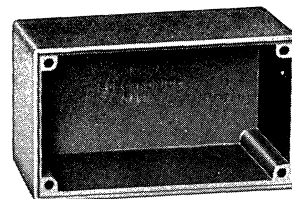
CONN: } Isolated BNC
1st END } Receptacle Jack
CONN: } Isolated BNC
2nd END } Receptacle Jack



MODEL 3239

QUANTITY DISC. CODE A NET 14.85

EMPTY — SHIELDED "BLACK BOX"



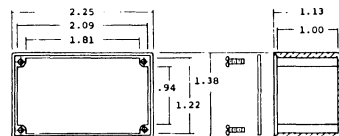
SIZE "B"

MODEL 2417

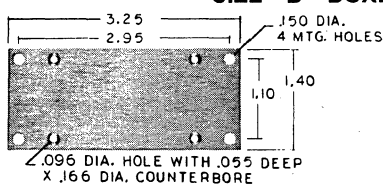
FINISH: Blue Baked
Enamel.
Includes cover with
part number on
cover and four
cover screws.

MODEL 2428

FINISH: None
Includes unmarked
cover and four
cover screws.



QUANTITY DISC. CODE A NET 1.95

LARGER COVER PLATE FOR MOUNTING
SIZE "B" BOXES

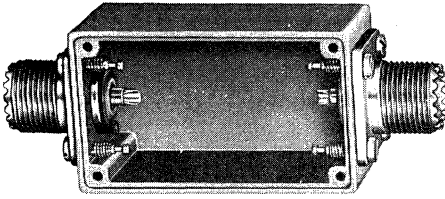
This larger plate, when
attached to the box, pro-
vides flanges for mount-
ing.

MATERIAL: .080 Alumi-
num #6061-T6, clear an-
odized per MIL-A-8625A.

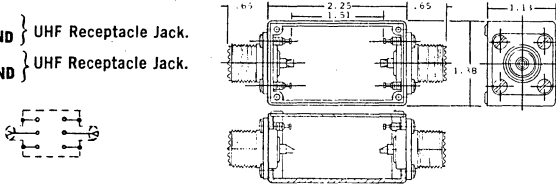
MODEL 3719 (plate only)

QUANTITY DISC. CODE A NET .95

SHIELDED "BLACK BOXES"—SIZE "B"

COMPONENT MOUNTING—
UHF RECEPTACLE BOTH ENDS

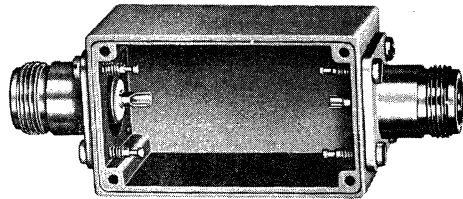
CONN: } UHF Receptacle Jack.
1st END }
CONN: } UHF Receptacle Jack.
2nd END }



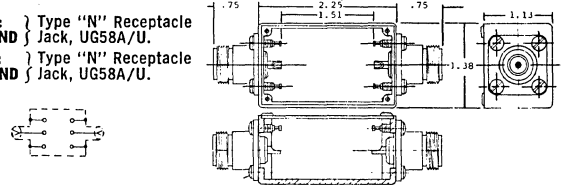
MODEL 2412

QUANTITY
DISC. CODE A

NET 9.85

COMPONENT MOUNTING—
TYPE "N" RECEPTACLE BOTH ENDS

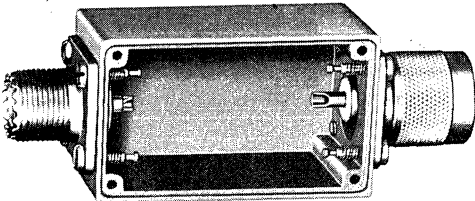
CONN: } Type "N" Receptacle
1st END } Jack, UG58A/U.
CONN: } Type "N" Receptacle
2nd END } Jack, UG58A/U.



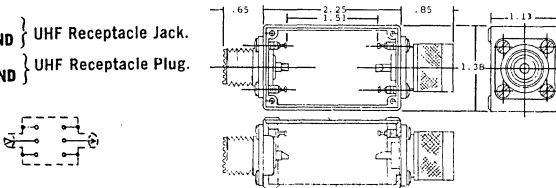
MODEL 2410

QUANTITY
DISC. CODE A

NET 9.85

COMPONENT MOUNTING—
UHF RECEPTACLE TO UHF PLUG

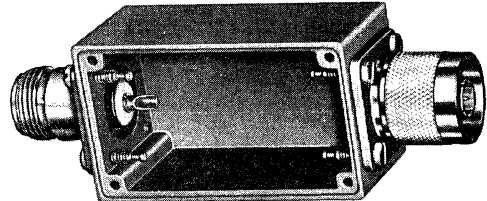
CONN: } UHF Receptacle Jack.
1st END }
CONN: } UHF Receptacle Plug.
2nd END }



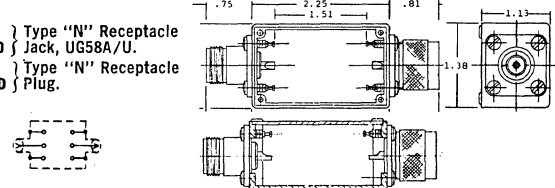
MODEL 2413

QUANTITY
DISC. CODE A

NET 12.85

COMPONENT MOUNTING—
TYPE "N" RECEPTACLE TO TYPE "N" PLUG

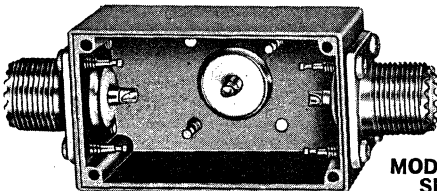
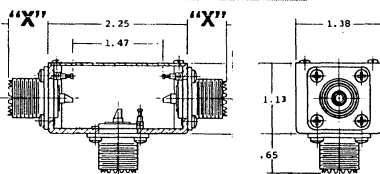
CONN: } Type "N" Receptacle
1st END } Jack, UG58A/U.
CONN: } Type "N" Receptacle
2nd END } Plug.



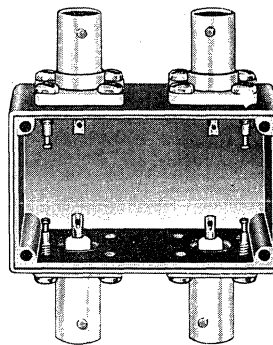
MODEL 2411

QUANTITY
DISC. CODE A

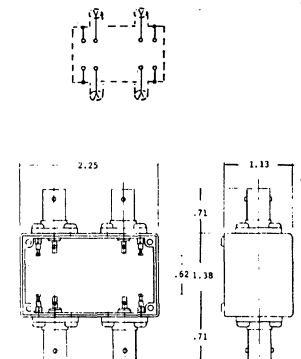
NET 12.85

COMPONENT MOUNTING —
UHF AND TYPE "N" RECEPTACLE "T"MODEL 2418
SHOWN

COMPONENT MOUNTING — CROSS CONNECTIONS



CONN: 4 each BNC Receptacle Jacks,
UG290A/U.



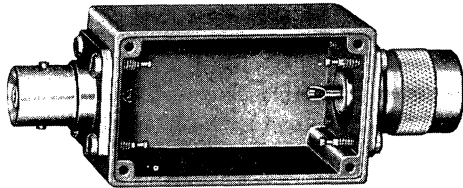
MODEL 3234

QUANTITY
DISC. CODE A

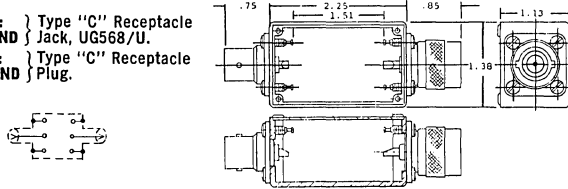
NET 12.50

MODEL	CONNECTORS	"X" DIM.	Quantity Disc. Code	NET
2418	(3) UHF Receptacle Jacks.	.65	A	13.85
2419	(3) Type "N" Receptacle Jacks, UG58A/U.	.75	A	12.50

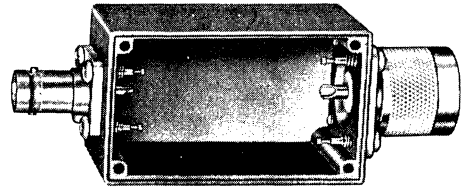
SHIELDED "BLACK BOXES"—SIZE "B"

COMPONENT MOUNTING—
TYPE "C" RECEPTACLE TO TYPE "C" PLUG

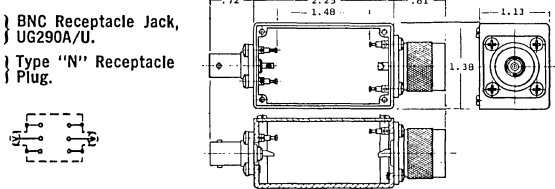
CONN: } Type "C" Receptacle
1st END } Jack, UG568/U.
CONN: } Type "C" Receptacle
2nd END } Plug.



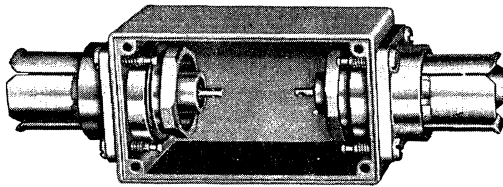
MODEL 2415

QUANTITY
DISC. CODE A NET 19.95COMPONENT MOUNTING—
BNC RECEPTACLE TO TYPE "N" PLUG

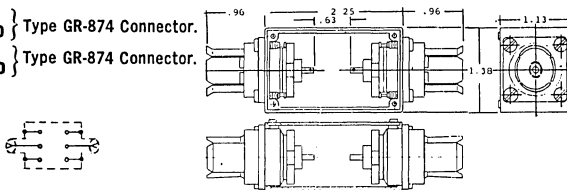
CONN: } BNC Receptacle Jack,
1st END } UG290A/U.
CONN: } Type "N" Receptacle
2nd END } Plug.



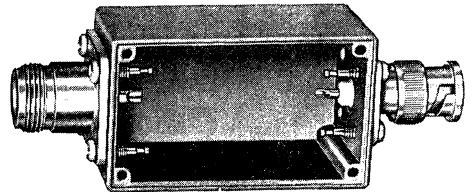
MODEL 2420

QUANTITY
DISC. CODE A NET 11.85COMPONENT MOUNTING—
GR-874 CONNECTOR BOTH ENDS

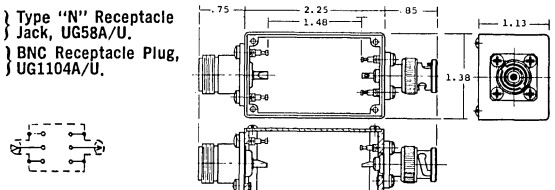
CONN: } Type GR-874 Connector.
1st END }
CONN: } Type GR-874 Connector.
2nd END }



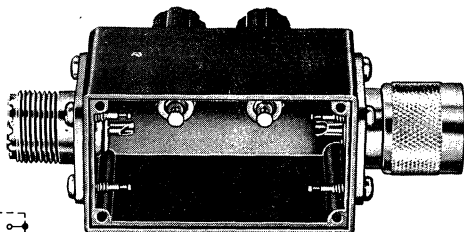
MODEL 2416

QUANTITY
DISC. CODE D NET 34.50COMPONENT MOUNTING—
TYPE "N" RECEPTACLE TO BNC PLUG

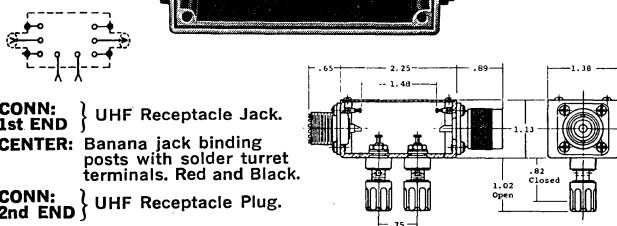
CONN: } Type "N" Receptacle
1st END } Jack, UG58A/U.
CONN: } BNC Receptacle Plug,
2nd END } UG1104A/U.



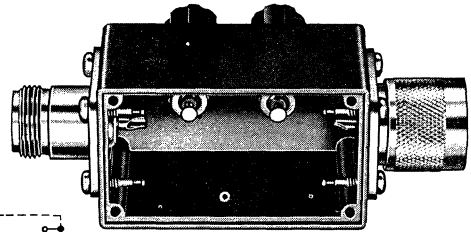
MODEL 2421

QUANTITY
DISC. CODE A NET 9.85COMPONENT MOUNTING—UHF RECEPTACLE
TO UHF PLUG WITH BINDING POSTS

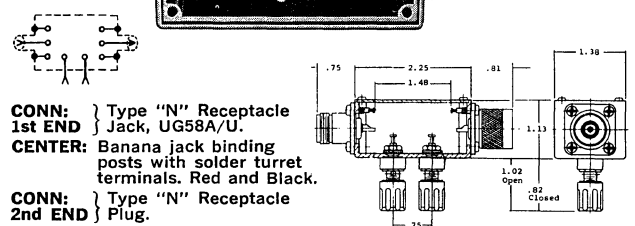
CONN: } UHF Receptacle Jack.
1st END }
CENTER: Banana jack binding
posts with solder turret
terminals. Red and Black.
CONN: } UHF Receptacle Plug.
2nd END }



MODEL 2422

QUANTITY
DISC. CODE A NET 14.85COMPONENT MOUNTING TYPE "N" RECEPTACLE
TO TYPE "N" PLUG WITH BINDING POSTS

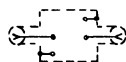
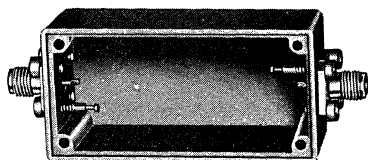
CONN: } Type "N" Receptacle
1st END } Jack, UG58A/U.
CENTER: Banana jack binding
posts with solder turret
terminals. Red and Black.
CONN: } Type "N" Receptacle
2nd END } Plug.



MODEL 2423

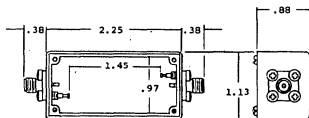
QUANTITY
DISC. CODE A NET 16.85

SHIELDED "BLACK BOXES"

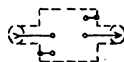
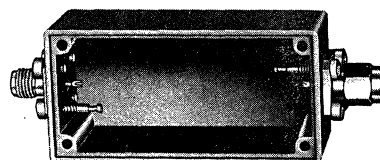
COMPONENT MOUNTING —
OSM* RECEPTACLE BOTH ENDS

CONN: } OSM Receptacle Jack.
1st END }
CONN: } OSM Receptacle Jack.
2nd END }

MODEL 2399

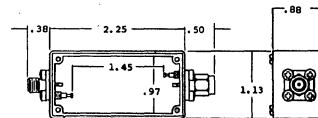


QUANTITY
DISC. CODE A NET 19.95

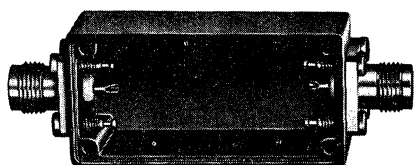
COMPONENT MOUNTING —
OSM* RECEPTACLE TO OSM* PLUG

CONN: } OSM Receptacle Jack.
1st END }
CONN: } OSM Receptacle Plug.
2nd END }

MODEL 2398

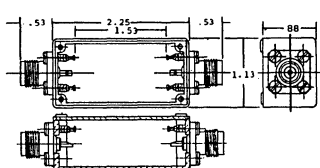


QUANTITY
DISC. CODE A NET 24.95

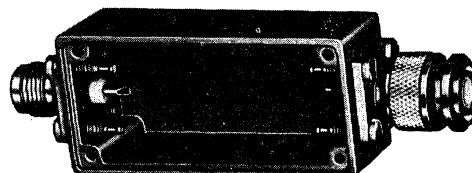
COMPONENT MOUNTING —
TNC RECEPTACLE BOTH ENDS

CONN: } TNC Receptacle Jack.
1st END }
CONN: } TNC Receptacle Jack.
2nd END }

MODEL 2396

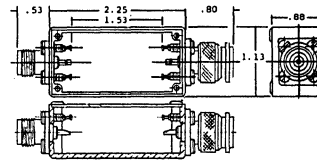


QUANTITY
DISC. CODE A NET 10.85

COMPONENT MOUNTING —
TNC RECEPTACLE TO TNC PLUG

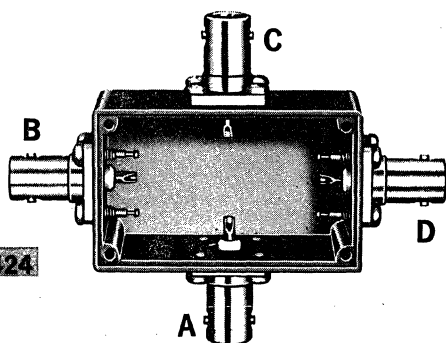
CONN: } TNC Receptacle Jack.
1st END }
CONN: } TNC Receptacle Plug.
2nd END }

MODEL 2395

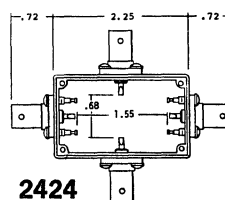


QUANTITY
DISC. CODE A NET 13.85

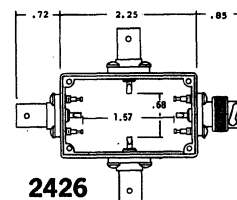
COMPONENT MOUNTING — CROSS CONNECTIONS



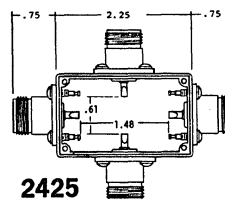
MODEL 2424



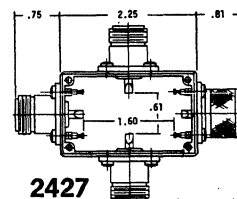
2424



2426

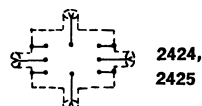
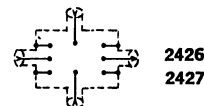


2425

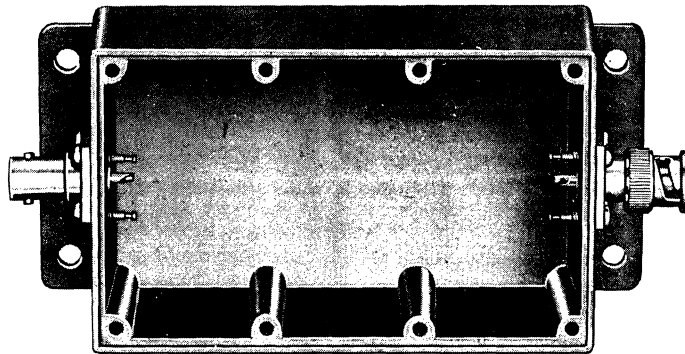


2427

MODEL	CONNECTION A, B AND C	CONNECTION D	Quantity Disc. Code	NET
2424	BNC Receptacle Jack, UG290A/U.	BNC Receptacle Jack, UG290A/U.	A	12.50
2425	Type "N" Receptacle Jack, UG58A/U.	Type "N" Receptacle Jack, UG58A/U.	A	13.85
2426	BNC Receptacle Jack, UG290A/U.	BNC Receptacle Plug, UG1104A/U.	A	13.85
2427	Type "N" Receptacle Jack, UG58A/U.	Type "N" Receptacle Plug.	A	16.85

2424,
24252426,
2427

SHIELDED "BLACK BOXES"—SIZE "C"



MODEL 2903

(Shown 2/3
actual size)

A NEW Series of LARGER shielded "BLACK BOXES."

These larger boxes are excellent for compact packaging of voltage dividers, isolation networks and many other applications.

APPLICABLE SPECIFICATIONS: (All Models)

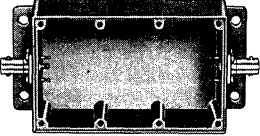
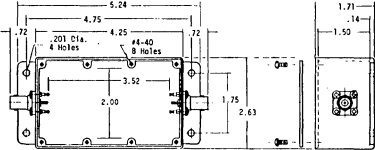
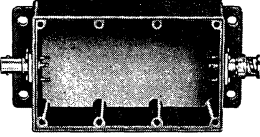
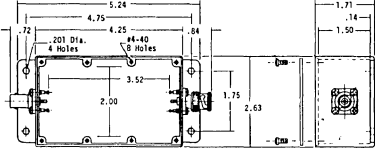
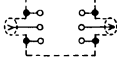
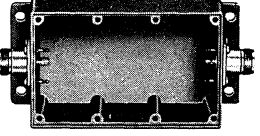
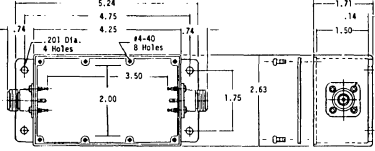
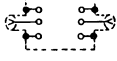
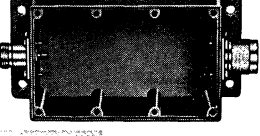
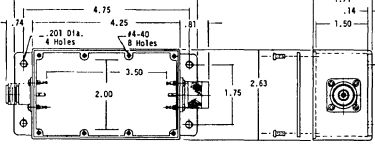
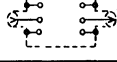
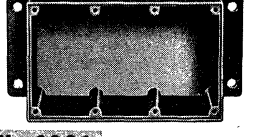
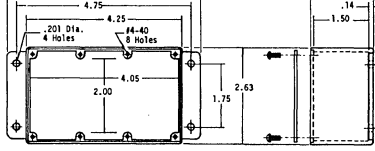
Operating Temp.: -55°C to $+150^{\circ}\text{C}$.

Working Voltage: 500 Peak.

Noise Rejection: Greater than 70DB

FEATURES:

- SHIELDED HOUSING; Die Cast Aluminum, Alloy #A380, FINISH: BLUE baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.
- COVER: .080 Thick Aluminum #6061-T6 with clear anodized finish per MIL-A-8625A.
- 8 ea. #4-40 x $\frac{1}{4}$ " screws secure cover for proper shielding.
- Solder turret terminals for permanent noise free connection of components.
- 2 flanges for easy mounting of box.

MODEL	CONN. 1st END	CONN. 2nd END			
 MODEL 2902	BNC Receptacle Jack UG290A/U	BNC Receptacle Jack UG290A/U			QUANTITY DISC. CODE A NET 10.85
 MODEL 2903	BNC Receptacle Jack UG290A/U	BNC Receptacle Plug UG1104A/U			QUANTITY DISC. CODE A NET 11.85
 MODEL 2904	TYPE "N" Receptacle Jack UG58A/U	TYPE "N" Receptacle Jack UG58A/U			QUANTITY DISC. CODE A NET 12.85
 MODEL 2905	TYPE "N" Receptacle Jack UG58A/U	TYPE "N" Receptacle Plug			QUANTITY DISC. CODE A NET 16.85
 MODEL 2901	NONE	NONE			QUANTITY DISC. CODE A NET 6.50
MODEL 2906 SEE 2901	NONE	NONE	Same as Model 2901 except box is unpainted and cover is unmarked.		QUANTITY DISC. CODE A NET 6.50

SHIELDED "BLACK BOXES"—SIZE "D"



Another new series of shielded "Black Boxes." These boxes fill the need between the size "B" and "C" boxes. These boxes are excellent for compact packaging of voltage dividers, isolation networks and many other applications.

APPLICABLE SPECIFICATIONS: (All Models)

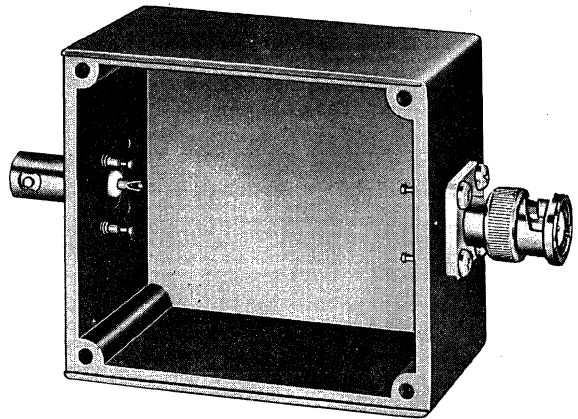
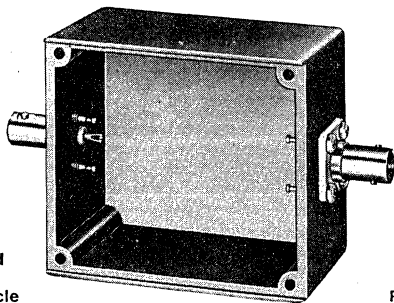
Operating Temp.: -55°C to $+150^{\circ}\text{C}$.

Working Voltage: 500 Peak.

Noise Rejection: Greater than 70DB

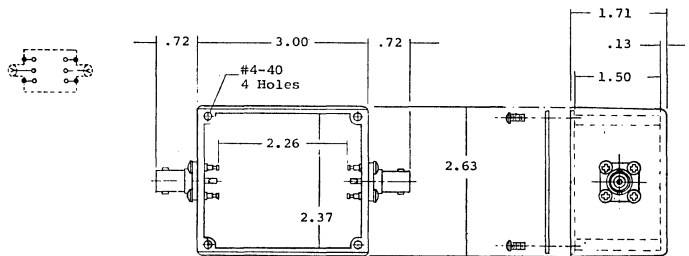
FEATURES:

- **SHIELDED HOUSING:** Die Cast Aluminum, Alloy #A380, FINISH: BLUE baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.
- **COVER:** .063 Thick Aluminum #6061-T6 with clear anodized finish per MIL-A-8625A.
- 4 ea. #4-40 x $\frac{1}{4}$ " screws secure cover for proper shielding.
- Solder turret terminals for permanent noise free connection of components.

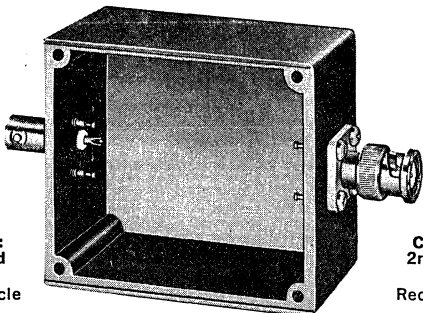
**MODEL 3603** (Shown 2/3 actual size)

CONN:
1st End
BNC
Receptacle
Jack
UG290A/U

CONN:
2nd End
BNC
Receptacle
Jack
UG290A/U

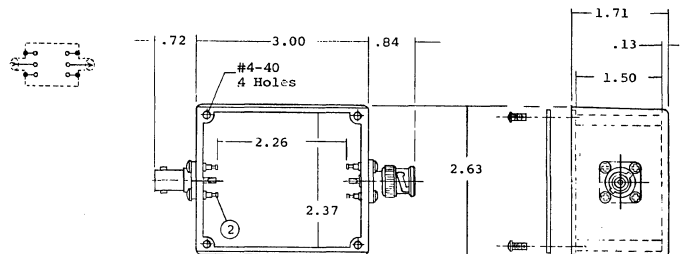
MODEL 3602

QUANTITY
DISC. CODE **A**

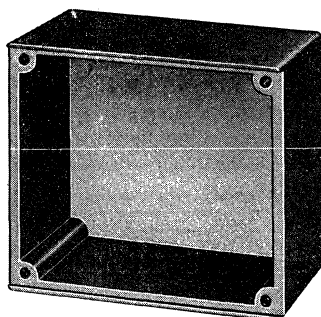
NET 9.85

CONN:
1st End
BNC
Receptacle
Jack
UG290A/U

CONN:
2nd End
BNC
Receptacle
Plug
UG1104A/U

MODEL 3603

QUANTITY
DISC. CODE **A**

NET 10.85

CONN:
1st End
None

CONN:
2nd End
None

NET 4.50

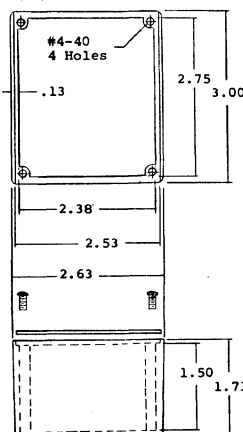
QUANTITY
DISC. CODE **A**

MODEL 3601

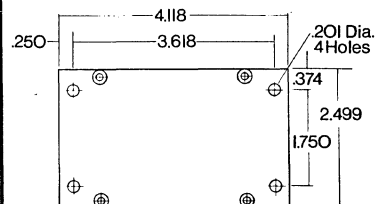
FINISH: Blue Baked Enamel. Includes cover with part number on cover and four cover screws.

MODEL 3606

FINISH: None. Includes unmarked cover and four cover screws.

**LARGER BOTTOM PLATE FOR MOUNTING**

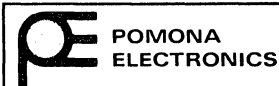
This larger plate, when attached to the box provides flanges for mounting. Four #4-40 flat head screws included. **MATERIAL:** .080 Aluminum #6061-T6, clear anodized per MIL-A-8625A.



QUANTITY DISC. CODE **A**

MODEL 3958**NET 1.50**

SHIELDED "BLACK BOXES" WITH CARD GUIDES—1½" DEEP



SHIELDED "BLACK BOXES" WITH CARD GUIDES

Aluminum boxes, slotted to accept 1/16" circuit boards and shielding dividers. Excellent for packaging electronic circuitry. Boxes have removable top and bottom covers. Useable inside space: 4" x 2" x 1½".

APPLICABLE SPECIFICATIONS: (All Models)

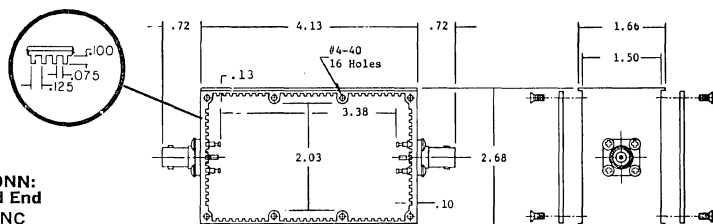
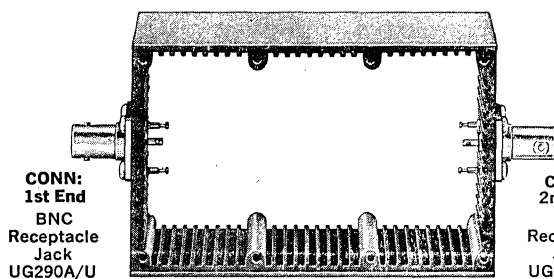
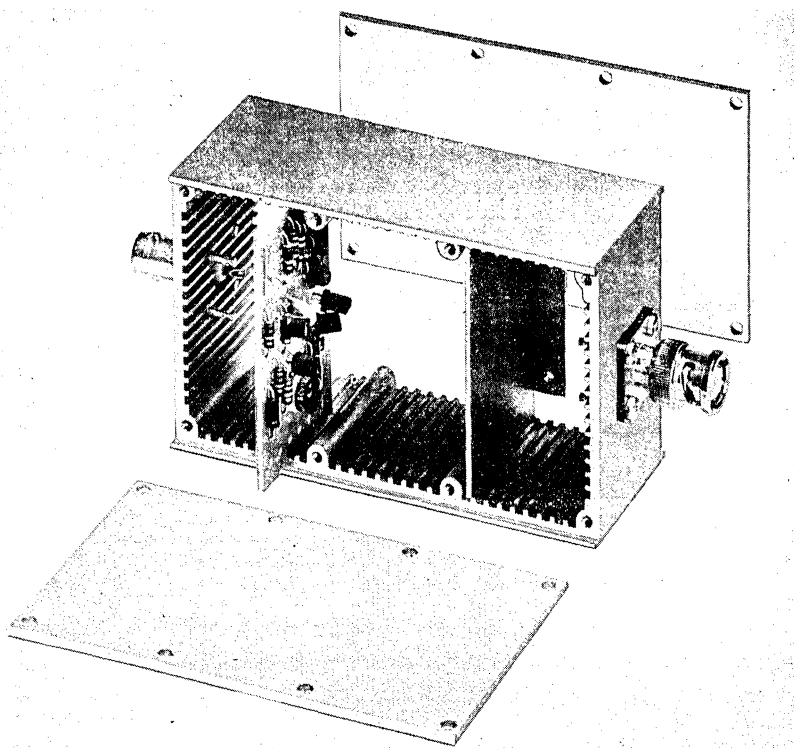
Operating Temp.: -55°C to +150°C.

Working Voltage: 500 Peak.

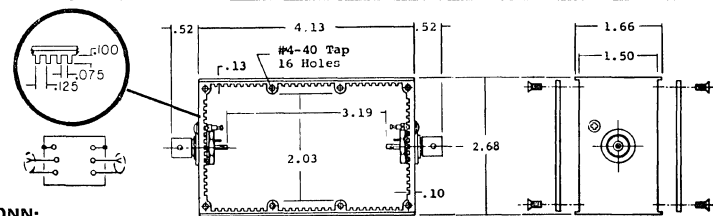
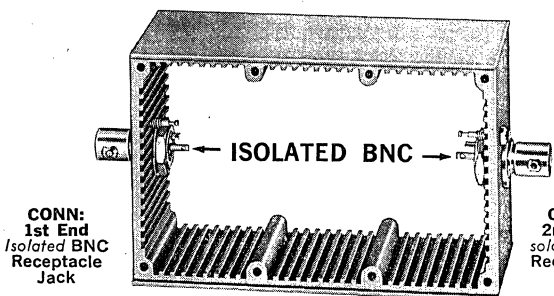
Noise Rejection: Greater than 70DB

FEATURES:

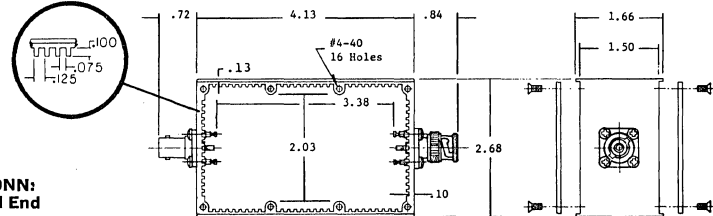
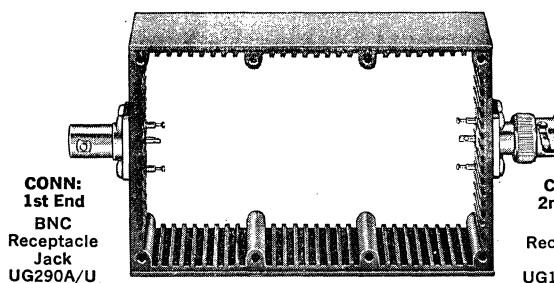
- **SHIELDED HOUSING:** Extruded Aluminum, Alloy #6061-T6. FINISH: BLUE baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.
- **COVERS:** Top and bottom, .080 thick Aluminum #6061-T6 with clear anodized Finish per MIL-A-8625A.
- **COVER SCREWS:** 16 EA #4-40x1¼" screws secure top and bottom cover for proper shielding.
- Solder turret terminals for permanent noise free connection of components.



MODEL 3302 QUANTITY DISC. CODE **A** NET 13.50

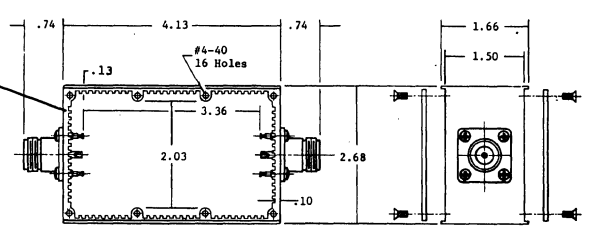
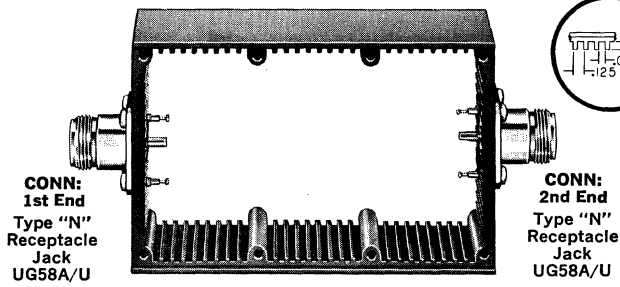


MODEL 3307 QUANTITY DISC. CODE **A** NET 22.95

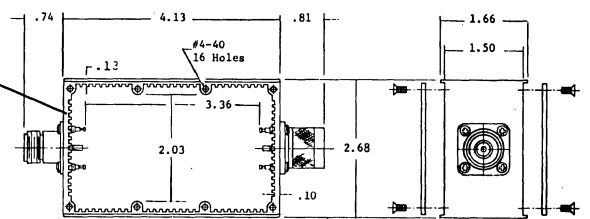
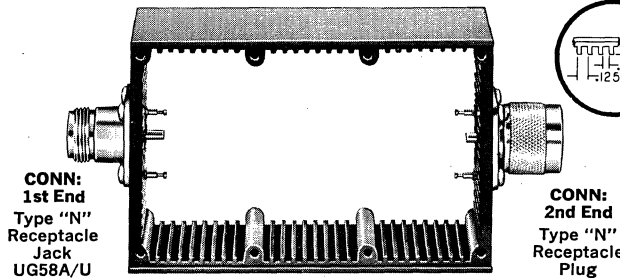


MODEL 3303 QUANTITY DISC. CODE **A** NET 14.85

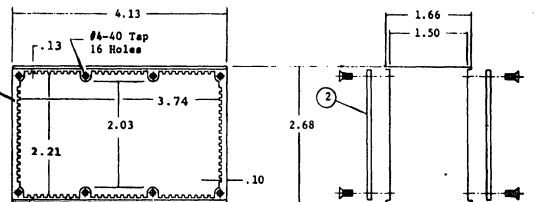
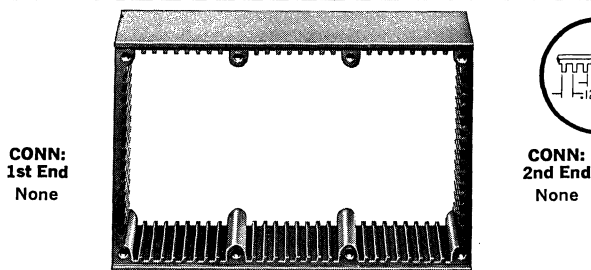
SHIELDED "BLACK BOXES" WITH CARD GUIDES—1½" DEEP



MODEL 3304 QUANTITY DISC. CODE **A** NET 16.85



MODEL 3305 QUANTITY DISC. CODE **A** NET 17.85



MODEL 3301

FINISH: Blue Baked Enamel. Includes top and bottom covers with part number on one and 16 cover screws.

MODEL 3306

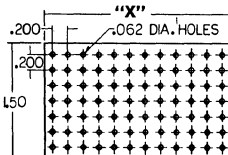
FINISH: None. Includes unmarked top and bottom covers with 16 cover screws.

QUANTITY DISC. CODE **A** NET 9.50

CIRCUIT MOUNTING BOARDS

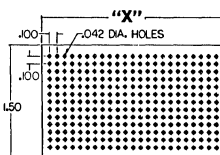
Two sizes of various types of punched and blank circuit boards for rapid assembly of components. Pre-cut to the proper size. Boards slide easily into the box card guides. All boards are 1/16" thick.

- Boards 1.50 x 2.39 used laterally.
- Boards 1.50 x 3.90 used lengthwise.



BOARD A

QUANTITY DISC. CODE **A**



BOARD B

BRD.	MODEL	NO. OF HOLES	"X" DIM.	MATERIAL	NET
A	3321	12 x 7	2.39	Paper-Epoxy (PEE)	.60
A	3322	NONE	2.39	Paper-Epoxy (PEE)	.45
A	3323	12 x 7	2.39	Glass-Epoxy (GEE)	.75
A	3324	NONE	2.39	Glass-Epoxy (GEE)	.55
A	3325	12 x 7	2.39	Glass-Epoxy (GEE) COP. CLAD 1 Side	.95
B	3326	24 x 15	2.39	Glass-Epoxy (GEE)	.95
A	3330	19 x 7	3.90	Paper-Epoxy (PEE)	.75
A	3331	19 x 7	3.90	Glass-Epoxy (GEE)	.95
A	3332	19 x 7	3.90	Glass-Epoxy (GEE) COP. CLAD 1 Side	1.50
B	3333	38 x 15	3.90	Glass-Epoxy (GEE)	1.25

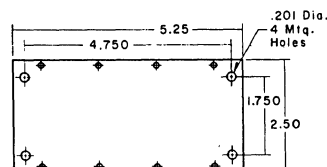
SHIELDING DIVIDERS

Two sizes of Aluminum dividers for dividing the box into shielded compartments. **MATERIAL:** .063 Aluminum, clear anodized per MIL-A-8625A.

- Divider 1.50 x 2.39 used laterally.
- Divider 1.50 x 3.90 used lengthwise.

MODEL	"X" DIM.	NET
3327	2.39	1.30
3334	3.90	1.60

LARGER BOTTOM PLATE FOR MOUNTING



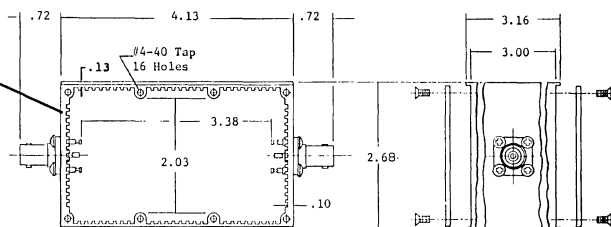
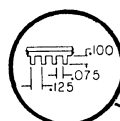
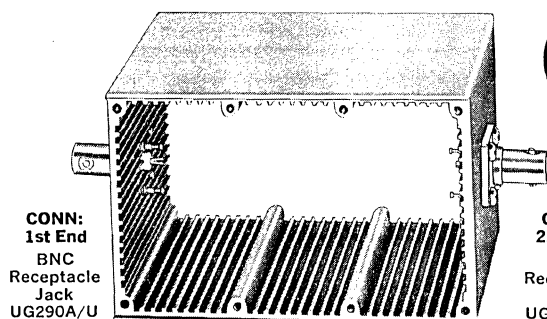
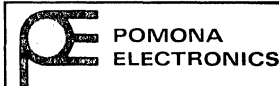
This larger plate, when attached to the box, provides flanges for mounting.

MATERIAL: .080 Aluminum #6061-T6, clear anodized per MIL-A-8625A.

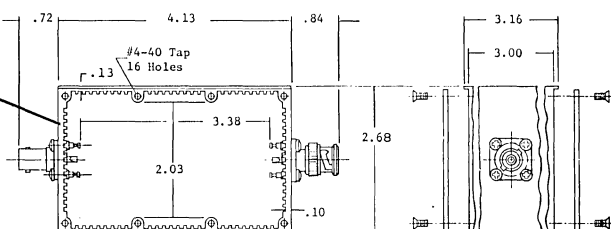
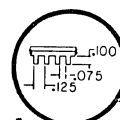
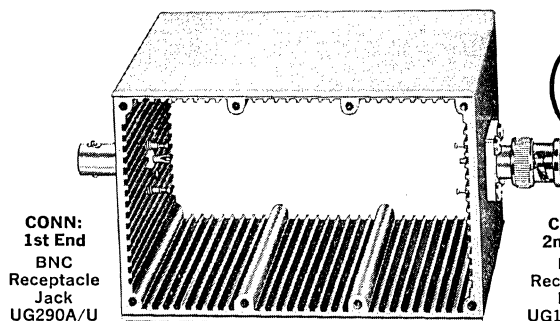
MODEL 3328 (Plate only)

QUANTITY DISC. CODE **A** NET 1.50

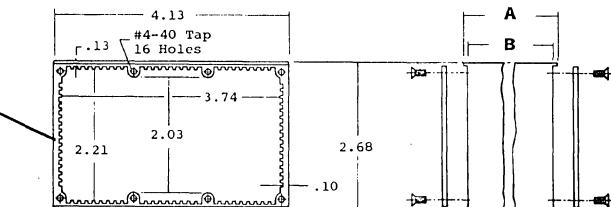
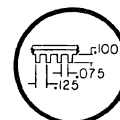
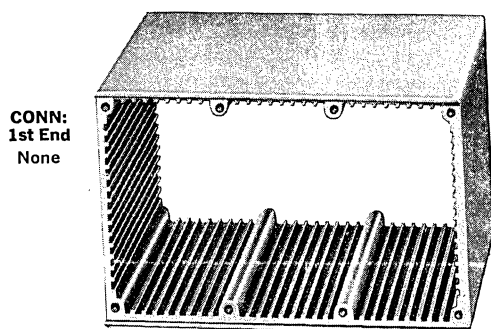
SHIELDED "BLACK BOXES" WITH CARD GUIDES—3' & 6' DEEP



MODEL 3312 QUANTITY DISC. CODE A NET 14.85



MODEL 3313 QUANTITY DISC. CODE A NET 16.85



MODEL 3311 & 3742

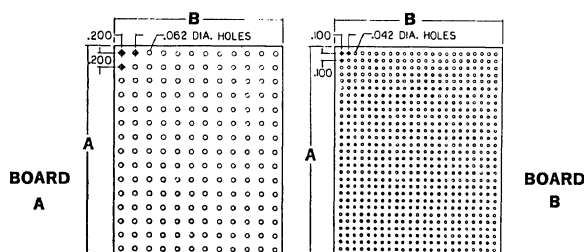
FINISH: Blue baked enamel. Includes top and bottom cover with part no. on one.

MODEL 3316 & 3743

FINISH: None. Unmarked covers.

QUANTITY DISC. CODE A

MODEL	DIM.		NET
	A	B	
3311	3.16	3.00	10.85
3316	3.16	3.00	10.85
3742	6.16	6.00	13.85
3743	6.16	6.00	13.85



3" AND 6" BOX CIRCUIT MOUNTING BOARDS

Various sizes and types of punched and blank circuit boards for rapid assembly of components. Pre-cut to the proper size. Boards slide easily into the box card guides. All boards are $\frac{1}{16}$ " thick.

- Boards 3.00 & 6.00 x 2.39 used laterally.
- Boards 3.00 & 6.00 x 3.90 used lengthwise.

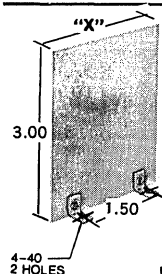
QUANTITY DISC. CODE A

BRD.	MODEL	NO. OF HOLES	DIM.		MATERIAL	NET
			A	B		
A	3550	12 x 15	3.00	2.39	Paper Epoxy (PEE)	1.15
A	3551	12 x 15	3.00	2.39	Glass-Epoxy (GEE)	1.50
A	3552	12 x 15	3.00	2.39	Glass-Epoxy (GEE) COP. CLAD 1 Side	1.95
B	3553	23 x 30	3.00	2.39	Glass-Epoxy (GEE)	1.95
A	3554	19 x 15	3.00	3.90	Paper Epoxy (PEE)	1.15
A	3556	19 x 15	3.00	3.90	Glass-Epoxy (GEE) COP. CLAD 1 Side	1.95
B	3557	39 x 30	3.00	3.90	Glass-Epoxy (GEE)	1.95
B	3726	23 x 60	6.00	2.39	Glass-Epoxy (GEE)	3.25
B	3727	39 x 60	6.00	3.90	Glass-Epoxy (GEE)	3.25

3" BOX SHIELDING DIVIDERS

Two sizes of Aluminum dividers for dividing the box into shielded compartments. MATERIAL: .063 Aluminum, clear anodized per MIL-A-8625A.

- Divider 3.00 x 2.39 used laterally.
- Divider 3.00 x 3.90 used lengthwise.



MODEL	"X" DIM.	NET
3558	2.39	1.75
3559	3.90	1.95

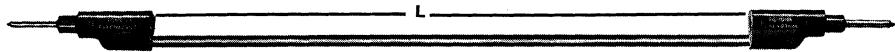
QUANTITY DISC. CODE A

.080 PIN TIP PATCH CORDS

MODEL	LENGTH	NET
P-4	4"	1.85
P-8	8"	1.85
P-12	12"	1.85
P-18	18"	1.85
P-24	24"	1.85
P-36	36"	1.85
P-48	48"	1.95
P-60	60"	2.05

MODEL P

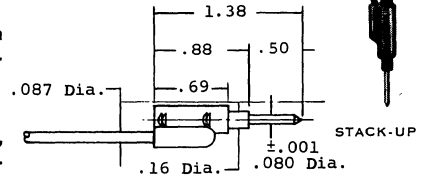
(Specify Color)

★ QUANTITY DISC. CODE **A****PIN TIP VERTICAL STACKING PATCH CORD**

A must in circuit designing and testing, with instruments that utilize tip jacks. **PIN TIP:** .080 dia., 1/2" long, brass, gold flashed.

TIP JACK, STACK-UP: Beryllium copper, gold flashed. Accepts .080 dia. pin.

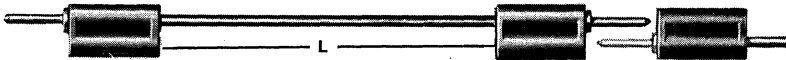
WIRE: 20 AWG, Strand. 41 x 36 T.C. Extra flexible polyvinyl insulation .087" O.D.
RATED: 5 A. Cont., 10 A. Int.
5,000 W.V.D.C.
OPERATING TEMP.: -0°C to +105°C.
COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.



MODEL	LENGTH	NET
1727-4	4"	1.95
1727-8	8"	1.95
1727-12	12"	1.95
1727-18	18"	1.95
1727-24	24"	1.95
1727-36	36"	1.95
1727-48	48"	2.05
1727-60	60"	2.15

MODEL 1727

(Specify Color)

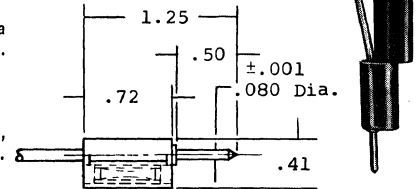
★ QUANTITY DISC. CODE **A****PIN TIP EXTENSION STACKING PATCH CORD**

Dual purpose, insulates exposed leads when used as an extension cord. Endless extension coupling possible. Also provides stacking from .080 jack.

PIN TIP: .080 dia., 1/2" long, brass, gold flashed.

TIP JACK: Beryllium copper, gold flashed. Accepts .080 dia. pin.

WIRE: 20 AWG, Strand. 41 x 36 T.C. Extra flexible polyvinyl insulation .087" O.D.
RATED: 5 A. Cont., 10 A. Int.
5,000 W.V.D.C.
OPERATING TEMP.: -0°C to +105°C.
COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.



MODEL	LENGTH	NET
1990-4	4"	1.60
1990-8	8"	1.60
1990-12	12"	1.60
1990-18	18"	1.60
1990-24	24"	1.60
1990-36	36"	1.60
1990-48	48"	1.70
1990-60	60"	1.80

MODEL 1990

(Specify Color)

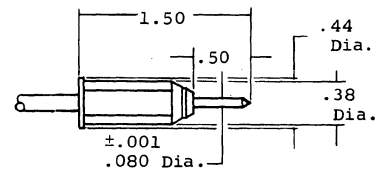
PIN TIP PATCH CORD

Heavy Duty patch cord. Excellent for general lab work. Permits interconnection between test instruments that utilize tip jacks.

PIN TIP: .080 dia., 1/2" long, brass, nickel plated.

WIRE: 18 AWG, Strand. 65 x 36 T.C. Extra flexible polyvinyl insulation .144" O.D.

RATED: 5 A. Cont., 10 A. Int.
10,000 W.V.D.C.
OPERATING TEMP.: -0°C to +105°C.
COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

**.040 AND .080 PIN TIP PATCH CORDS**

MODEL	LENGTH	NET
3959-4	4"	1.05
3959-8	8"	1.05
3959-12	12"	1.05
3959-18	18"	1.05
3959-24	24"	1.05
3959-36	36"	1.05
3959-48	48"	1.15
3959-60	60"	1.25

COLORS: 3959 and PM080-Red and Black only.

PT080 - Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

MODEL 3959, PT & PM

(Specify Color)

PIN TIP: 3959-
 Leaded Copper.
 PT080 & PM080 -
 Brass. All pins gold
 flashed.
WIRE: 22 AWG,
 Strand. 19 x 34 T.C.
 Insulation, polyvinyl
 .064" O.D.
RATED: 3 A. Cont.,
 7.5 A. Int.
1,000 W.V.D.C.
OPERATING TEMP.:
 -0°C to +105°C.

★ QUANTITY DISC. CODE **A****MODEL 3959-PIN .040 DIA. x 3/16" LONG****MODEL PT 080 - PIN .080 DIA. X 1/2" LONG****MODEL PM 080 - PIN .080 DIA. X 1/4" LONG**

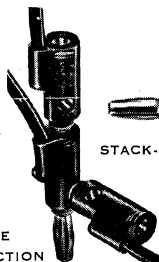
Small body style permits usage in equipment having receptacles spaced closely together. Three models shown.

MODEL	LENGTH	NET
1126-4	4"	1.95
1126-8	8"	1.95
1126-12	12"	1.95
1126-18	18"	1.95
1126-24	24"	1.95
1126-36	36"	1.95
1126-48	48"	2.05
1126-60	60"	2.15

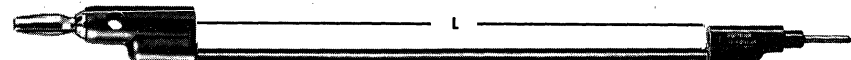
MODEL 1126

(Specify Color)

SIDE CONNECTION

**BANANA PLUG TO PIN TIP STACK-UP PATCH CORD**

Adapts to equipment using banana jacks and pin jacks. Banana plug and pin tip allow vertical stack-up.



BANANA PLUG: Spring, one piece beryllium copper, heat treated, nickel plated.

PIN TIP: .080 dia., 1/2" long, brass, gold flashed.

TIP JACK, STACK-UP: Beryllium copper, gold flashed. Accepts .080 Dia. pin.
WIRE: 20 AWG, Strand. 41 x 36 T.C. Extra flexible

polyvinyl insulation .087" O.D.
RATED: 5 A. Cont., 10 A. Int.
5,000 W.V.D.C.
OPERATING TEMP.: -0°C to +105°C.
COLORS: Black, Red.

★ QUANTITY DISC. CODE **A**

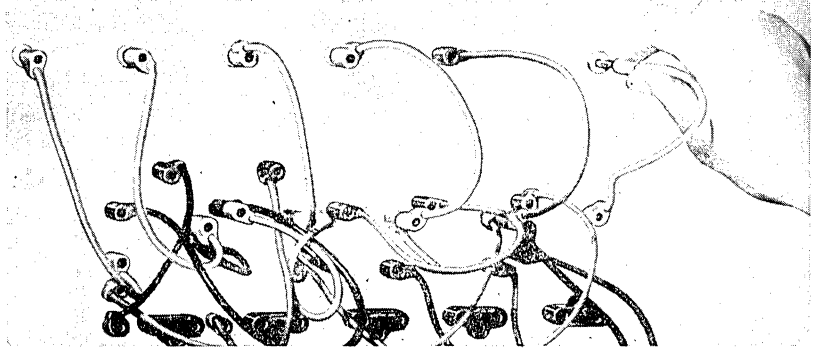
★ Various lengths may be aggregated for best quantity price. Other lengths available to order.

STANDARD BANANA PLUG PATCH CORDS



POMONA BANANA PLUG PATCH CORDS

Tough thermoplastic insulation molds the plug and leads into a strong moisture resistant integral unit. Excellent for computer board and test equipment applications. Used by leading industries in applications where extreme reliability is of prime importance.



FEATURES

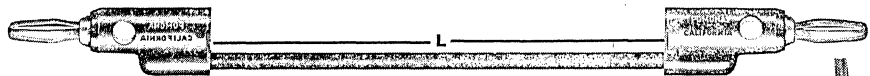
- One piece beryllium copper heat treated spring for maximum long life.
- Rounded spring design results in maximum contact area.
- Extra flexible polyvinyl insulation used on all leads.

SPECIFICATIONS

- Fits standard 0.166 dia. banana jacks.
- Spring, beryllium copper alloy 170 per QQ-C-533.
- Plug body, brass per QQ-B-626, Alloy #360.
- Nickel plated per QQ-N-290, Class 2.
- Contact resistance less than 0.001 ohms per banana plug.
- Operating Temp.: -0°C to $+105^{\circ}\text{C}$.
- Wire, 18 AWG, stranding 65 x 36 T.C.
- Insulation, polyvinyl .144" O.D.
- Ratings: 15 A. Cont., 30 A. Int. 10,000 W.V.D.C.

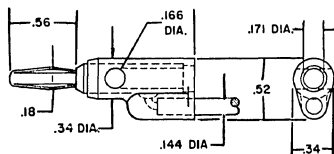
MODEL	LENGTH	NET
B-4	4"	1.80
B-8	8"	1.80
B-12	12"	1.80
B-18	18"	1.80
B-24	24"	1.80
B-36	36"	1.80
B-48	48"	1.90
B-60	60"	2.00

STACK-UP BANANA PLUG PATCH CORD



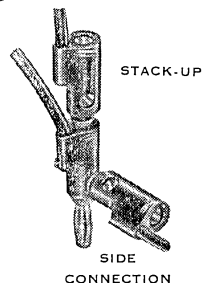
Multiple stacking feature accommodates the most complex stacking; keeps circuitry neater. Greatly simplifies circuit connections and changes. Reliable solder-bonded connections withstand pull test in excess of 50 lbs. Banana plugs both ends.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.



MODEL B

(Specify Color)

QUANTITY
DISC. CODE

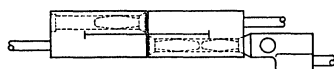
MODEL	LENGTH	NET
HB-4	4"	2.25
HB-8	8"	2.25
HB-12	12"	2.25
HB-18	18"	2.25
HB-24	24"	2.25
HB-36	36"	2.25
HB-48	48"	2.35
HB-60	60"	2.45

EXTENSION STACKING BANANA PLUG PATCH CORD



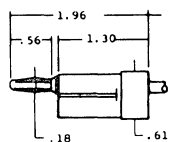
Dual purpose. Insulates all hot leads when used as an extension cord. Endless extension couplings possible with any banana plug patch cord. Provides vertical stacking from any jack. Reliable solder-bonded connections withstand pull test in excess of 50 lbs. Banana plugs both ends.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.



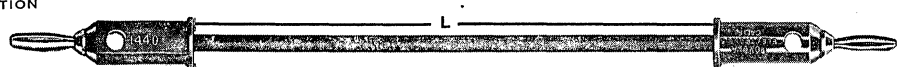
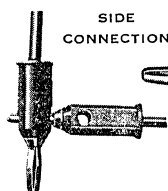
MODEL HB

(Specify Color)

QUANTITY
DISC. CODE

MODEL	LENGTH	NET
1440-4	4"	1.60
1440-8	8"	1.60
1440-12	12"	1.60
1440-18	18"	1.60
1440-24	24"	1.60
1440-36	36"	1.60
1440-48	48"	1.70
1440-60	60"	1.80

HORIZONTAL STACKING BANANA PLUG PATCH CORD

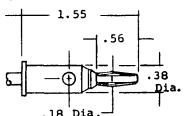


Ideal as an interconnecting lead between power supplies, test equipment, etc. Horizontal stacking feature. Banana plugs on both ends.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

MODEL 1440

(Specify Color)

QUANTITY
DISC. CODE

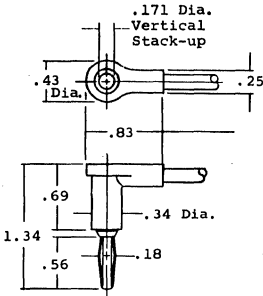
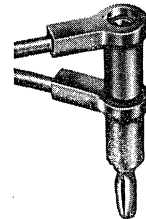
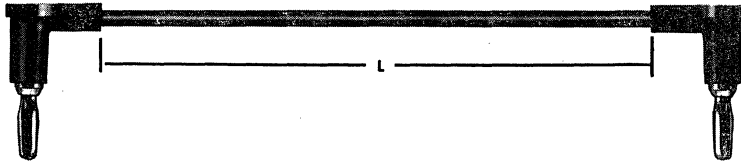
★ Various lengths may be aggregated for best quantity price. Other lengths available to order.

STANDARD BANANA PLUG PATCH CORDS



MODEL	LENGTH	NET
2864-4	4"	1.80
2864-8	8"	1.80
2864-12	12"	1.80
2864-18	18"	1.80
2864-24	24"	1.80
2864-36	36"	1.80
2864-48	48"	1.90
2864-60	60"	2.00

STACK-UP RIGHT ANGLE BANANA PLUG PATCH CORD



Vertical Stacking feature allows endless circuit connections and the right angle design keeps wires close to the chassis. An oversize shoulder allows easy connect and disconnect.

BANANA PLUGS: Spring, one piece beryllium copper, heat treated, nickel plated. Tough thermoplastic molded to plug body and wire.

WIRE: 18 AWG, Strand. 65 x 36 T.C. Extra flexible polyvinyl insulation, .144" O.D.

OPERATING TEMP.: -0°C to +105°C.

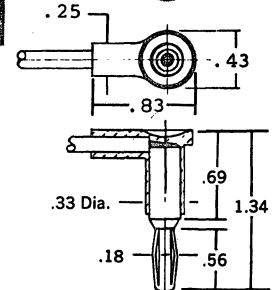
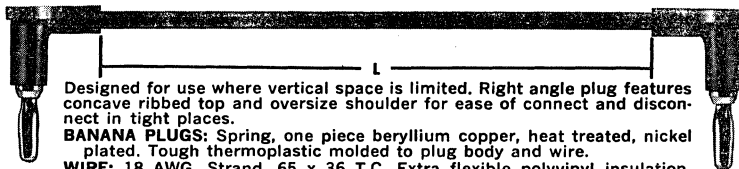
RATED: 15 A. Cont., 30 A. Int. 10,000 W.V.D.C.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

MODEL 2864 (Specify Color) QUANTITY DISC. CODE **A** ★

RIGHT ANGLE BANANA PLUG PATCH CORD

MODEL	LENGTH	NET
2700-4	4"	1.50
2700-8	8"	1.50
2700-12	12"	1.50
2700-18	18"	1.50
2700-24	24"	1.50
2700-36	36"	1.50
2700-48	48"	1.60
2700-60	60"	1.70



Designed for use where vertical space is limited. Right angle plug features concave ribbed top and oversize shoulder for ease of connect and disconnect in tight places.

BANANA PLUGS: Spring, one piece beryllium copper, heat treated, nickel plated. Tough thermoplastic molded to plug body and wire.

WIRE: 18 AWG, Strand. 65 x 36 T.C. Extra flexible polyvinyl insulation, .144" O.D.

OPERATING TEMP.: -0°C to +105°C.

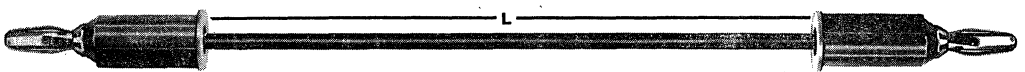
RATED: 15 A. Cont., 30 A. Int. 10,000 W.V.D.C.

COLORS: Black, Red

MODEL 2700 (Specify Color) QUANTITY DISC. CODE **A** ★

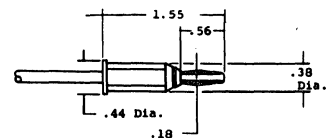
BANANA PLUG PATCH CORD

MODEL	LENGTH	NET
1985-4	4"	1.60
1985-8	8"	1.60
1985-12	12"	1.60
1985-18	18"	1.60
1985-24	24"	1.60
1985-36	36"	1.60
1985-48	48"	1.70
1985-60	60"	1.80



Excellent for general lab work. Permits interconnection between test instruments, etc. Banana plugs both ends.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.



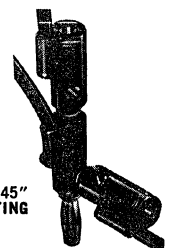
MODEL 1985 (Specify Color) QUANTITY DISC. CODE **A** ★

RETRACTILE (COILED) PATCH CORD—WITH STACK-UP BANANA PLUGS



Permits the use of one size patch cord in place of many various lengths. **BANANA PLUGS:** Spring, one piece beryllium copper heat treated, nickel plated. Tough thermoplastic molded to body and wire. **WIRE:** 20 AWG;

Stranding 41 x 36 tinned copper; rubber insulation .145" O.D. **RATED:** 4 A. Cont., 10 A. Int./5000 WVDC. **OPERATING TEMP.:** -20°C to +60°C. **COLOR:** Black, Red.

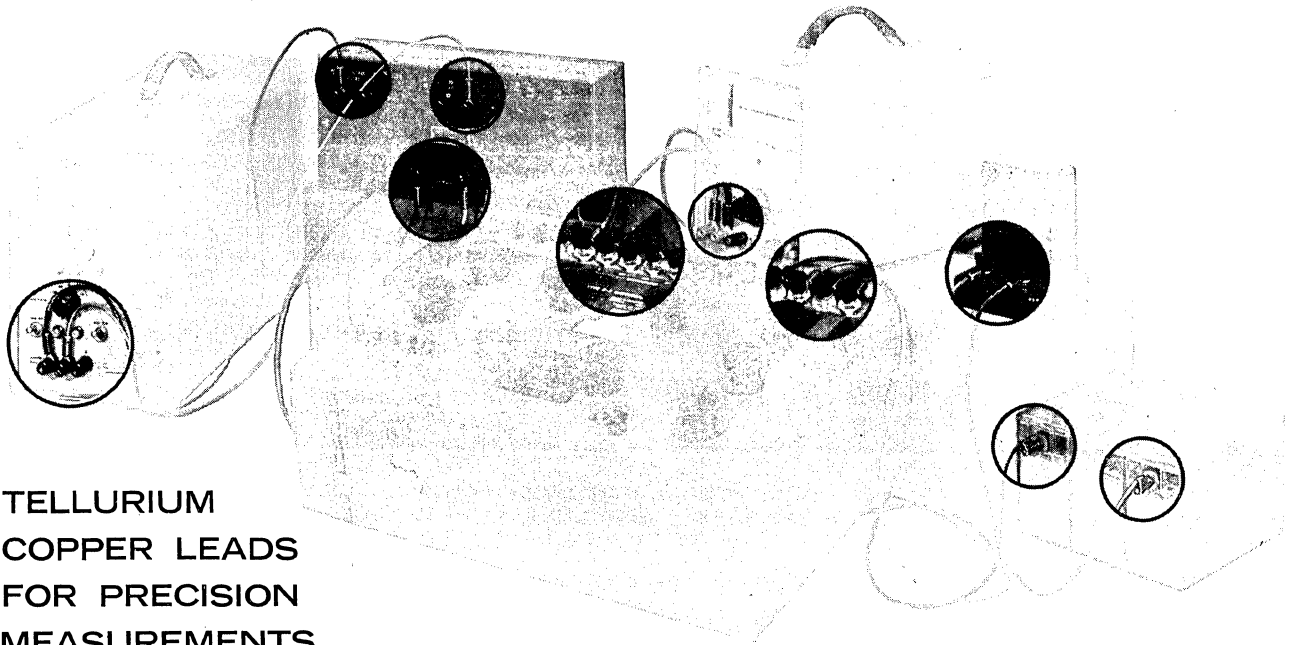


MODEL 2484-36 (Specify Color) QUANTITY DISC. CODE **A** ★

NET 3.85

★ Various lengths may be aggregated for best quantity price. Other lengths available to order.

LOW THERMAL E.M.F. SPADE LUG JUMPERS



TELLURIUM COPPER LEADS FOR PRECISION MEASUREMENTS

POMONA ELECTRONICS has advanced the state of the art in measurements where Thermoelectric Effects are significant sources of error. Comparators designed for use with the Kelvin-Varley voltage divider and microvolt leads were tested with Primary Standards Laboratory equipment.

Thermoelectric voltages were not detected until the most sensitive galvanometer range was used.

THERMOELECTRIC PROPERTIES—Tellurium copper gold plated spade lugs cold-staked to multi-stranded

12 gauge CUPPER wire minimize thermoelectric effects—an absolute necessity for low voltage, high precision measurements.

LOW RESISTANCE—12 gauge multi-stranded CUPPER wire results in extremely low cable resistance. Spade lugs plated with 50 micro inches gold for minimum contact resistance and minimum thermal EMF when using copper binding posts. (Less than $0.01 \mu\text{V}/^\circ\text{C}$).

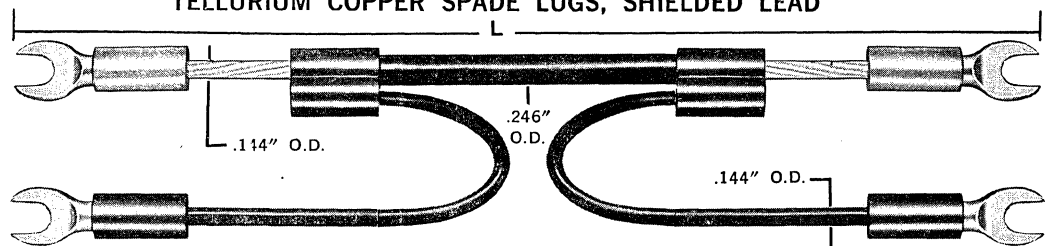
TELLURIUM COPPER SPADE LUGS, SHIELDED LEAD

MODEL	LENGTH
1756-24	24"
1756-48	48"

MODEL 1756
(Specify Length)

★ QUANTITY DISC. CODE **A**

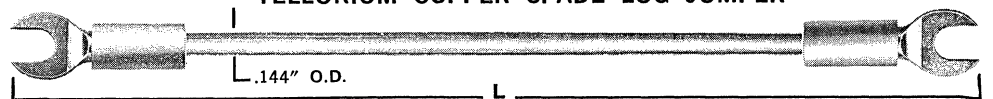
NET 14.85



Designed for use with Kelvin Varley voltage dividers where extreme precision is required for low voltage measurements. Features guard shield to effectively reduce shunt resistance. Tough thermo-plastic molded to spade lug body, color; center conductor lug red, shield lug black. Tellurium copper heavy duty one piece machined spade lug gold plated per MIL-G-45204, Type II, Class I. Center conductor 12 AWG multi-stranded bare copper, shield lead wire, 18 AWG, stranded. Polyethylene primary insulation. Braided shield bare copper. Polyvinyl jacket, color black, per MIL-C-17C Type IIA.

MODEL	LENGTH	NET
1693-12	12"	3.85
1693-18	18"	3.85
1693-24	24"	3.85
1693-36	36"	3.85
1693-48	48"	3.85
1693-60	60"	3.85

TELLURIUM COPPER SPADE LUG JUMPER



Single conductor tellurium copper spade lug jumper used in applications where guard shield is not required. Tough thermo-plastic molded to spade lug body. Color matches wire. Tellurium Copper heavy duty one piece machined spade lug gold plated per MIL-G-45204, Type II, Class I. Conductor, 12 AWG multi-stranded bare copper. Insulation polyvinyl, 105°C, .144" O.D.

COLORS: Black, Red, Green.

MODEL 1693 (Specify Color) QUANTITY DISC. CODE **A**

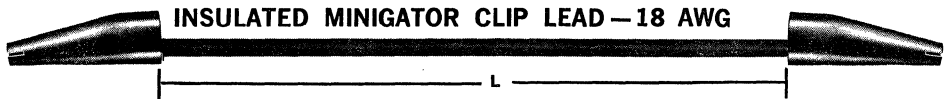
★ Various lengths may be aggregated for best quantity price.

CLIP LEADS & SPADE LUG JUMPERS



MODEL	LENGTH	NET
MG-B-4	4"	1.25
MG-B-8	8"	1.25
MG-B-12	12"	1.25
MG-B-24	24"	1.25
MG-B-36	36"	1.25
MG-B-48	48"	1.35
MG-B-60	60"	1.45

QUANTITY
DISC. CODE



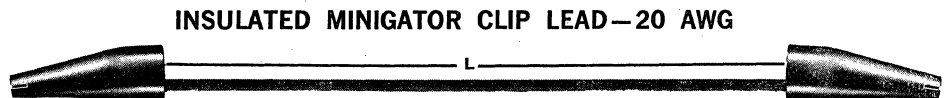
CLIP: Minigator, steel, cad plated.
WIRE: 18 AWG, Strand. 65 x 36 T.C. Extra flexible
polyvinyl insulation .144" O.D.

INSULATOR: Red vinyl with red wire. Black on all other colors.
OPERATING TEMP.: -25°C to +105°C.
COLORS: Black, Red.

MODEL MG-B (Specify Color) ★

MODEL	LENGTH	NET
1236-4	4"	1.25
1236-8	8"	1.25
1236-12	12"	1.25
1236-24	24"	1.25
1236-36	36"	1.25
1236-48	48"	1.35
1236-60	60"	1.45

QUANTITY
DISC. CODE



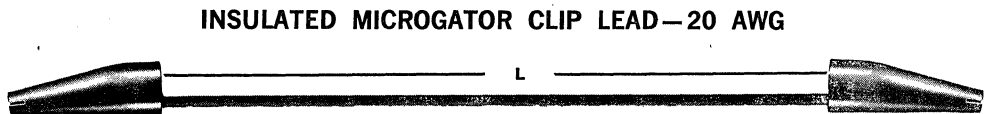
CLIP: Minigator, steel, cad. plated.
WIRE: 20 AWG, Strand. 41 x 36 T.C. Extra flexible
polyvinyl insulation, .087" O.D.

INSULATOR: Red Vinyl with Red Wire. Black on all other colors.
OPERATING TEMP.: -25°C to +105°C.
COLORS: Black, Red.

MODEL 1236 (Specify Color) ★

MODEL	LENGTH	NET
1613-4	4"	1.25
1613-8	8"	1.25
1613-12	12"	1.25
1613-24	24"	1.25
1613-36	36"	1.25
1613-48	48"	1.35
1613-60	60"	1.45

QUANTITY
DISC. CODE



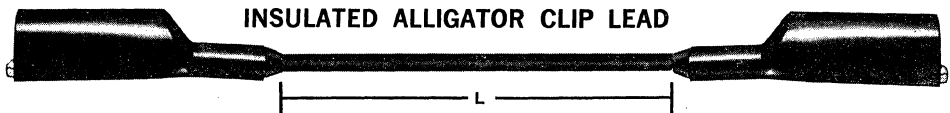
CLIP: Microgator, solid copper.
WIRE: 20 AWG, Strand. 41 x 36 T.C. Extra flexible
polyvinyl insulation, .087" O.D.

INSULATOR: Red Vinyl with Red Wire. Black on all other colors.
OPERATING TEMP.: -25°C to +105°C.
COLORS: Black, Red.

MODEL 1613 (Specify Color) ★

MODEL	LENGTH	NET
AL-B-4	4"	1.40
AL-B-8	8"	1.40
AL-B-12	12"	1.40
AL-B-24	24"	1.40
AL-B-36	36"	1.40
AL-B-48	48"	1.50
AL-B-60	60"	1.60

QUANTITY
DISC. CODE



CLIP: Alligator, steel, cad plated.
WIRE: 18 AWG, Strand. 65 x 36 T.C. Extra flexible
polyvinyl insulation .144" O.D.

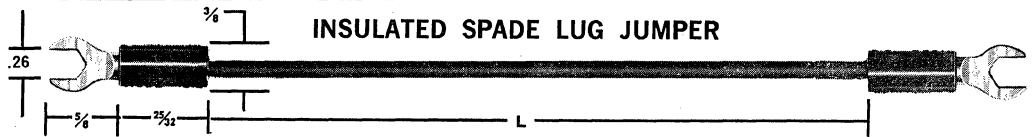
INSULATOR: Red vinyl with red wire. Black on all other colors.
OPERATING TEMP.: -25°C to +105°C.
COLORS: Black, Red.

MODEL AL-B (Specify Color) ★

MODEL	LENGTH	NET
1743-12	12"	1.80
1743-24	24"	1.80
1743-36	36"	1.80
1743-48	48"	1.90
1743-60	60"	2.00

(Typical Dimensions
spade lug)

QUANTITY
DISC. CODE



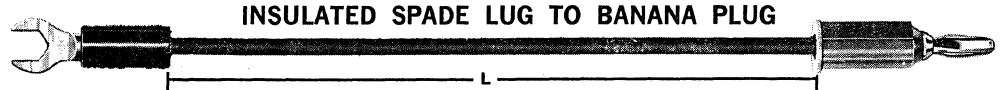
Spade lug heavy duty machined one piece brass. Tough thermo-plastic molded to spade lug body.
SPADE LUGS: Brass $\frac{3}{16}$ " thick, nickel plated.
WIRE: 18 AWG, Strand. 65 x 36 T.C. Extra flexible
polyvinyl insulation .144" O.D.

RATED: 15 A. Cont., 30 A Int. 10,000 W.V.D.C.
OPERATING TEMP.: -25°C to +105°C.
COLORS: Black, Red, Green, White.

MODEL 1743 (Specify Color) ★

MODEL	LENGTH	NET
1987-12	12"	1.80
1987-24	24"	1.80
1987-36	36"	1.80
1987-48	48"	1.90
1987-60	60"	2.00

QUANTITY
DISC. CODE



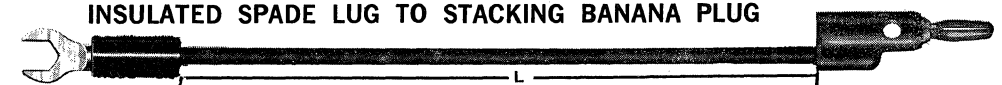
Spade lug, heavy duty machined one piece brass. Tough thermo-plastic molded to spade lug and banana plug body.
SPADE LUG: Brass $\frac{3}{16}$ " thick, nickel plated.
BANANA PLUG: Spring one piece beryllium copper heat treated, nickel plated.

WIRE: 18 AWG, Strand. 65 x 36 T.C. Extra flexible polyvinyl insulation .144" O.D.
RATED: 15 A. Cont., 30 A. Int. 10,000 W.V.D.C.
OPERATING TEMP.: -25°C to +105°C.
COLORS: Black, Red

MODEL 1987 (Specify Color) ★

MODEL	LENGTH	NET
1370-12	12"	1.80
1370-24	24"	1.80
1370-36	36"	1.80
1370-48	48"	1.90
1370-60	60"	2.00

QUANTITY
DISC. CODE



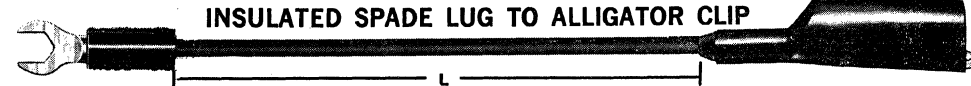
Spade lug, heavy duty machined one piece brass. Tough thermo-plastic molded to spade lug and banana plug body.
SPADE LUG: Brass $\frac{3}{16}$ " thick, nickel plated.
BANANA PLUG: Spring one piece beryllium copper heat treated, nickel plated.

WIRE: 18 AWG, Strand. 65 x 36 T.C. Extra flexible polyvinyl insulation .144" O.D.
RATED: 15 A. Cont., 30 A. Int. 10,000 W.V.D.C.
OPERATING TEMP.: -25°C to +105°C.
COLORS: Black, Red, Green, White.

MODEL 1370 (Specify color) ★

MODEL	LENGTH	NET
1960-12	12"	1.80
1960-24	24"	1.80
1960-36	36"	1.80
1960-48	48"	1.90
1960-60	60"	2.00

QUANTITY
DISC. CODE



Spade lug, heavy duty machined one piece brass. Tough thermo-plastic molded to spade lug body.
SPADE LUG: Brass $\frac{3}{16}$ " thick, nickel plated.
CLIP: Alligator, steel, cad plated.

INSULATOR: Red vinyl with red wire. Black on all other colors.
WIRE: 18 AWG, Strand. 65 x 36 T.C. Extra flexible polyvinyl insulation .144" O.D.
OPERATING TEMP.: -25°C to +105°C.
COLORS: Black, Red

MODEL 1960 (Specify color) ★

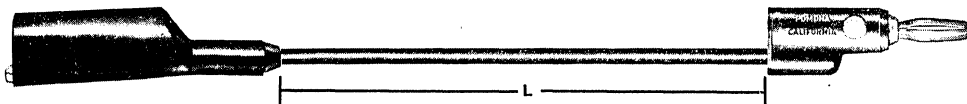
★ Various lengths may be aggregated for best quantity price. Other lengths available to order.

CLIP LEADS & TEST PROBES



ALLIGATOR CLIP TO STACKING BANANA PLUG

MODEL	LENGTH	NET
1166-4	4"	1.75
1166-8	8"	1.75
1166-12	12"	1.75
1166-24	24"	1.75
1166-36	36"	1.75
1166-48	48"	1.85
1166-60	60"	1.95



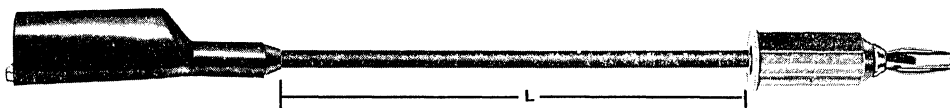
Adapts to equipment using standard banana jacks.
CLIP: Alligator, Steel, cadmium plated
BANANA PLUG: Spring, one piece beryllium copper, heat treated, nickel plated. Tough thermoplastic molded to plug body and wire.

INSULATOR: Red vinyl with red wire. Black on all other colors.
WIRE: 18 AWG, Strand. 65 x 36 T.C. Extra flexible polyvinyl insulation .144" O.D.
OPERATING TEMP.: -25°C to +105°C.
COLORS: Black, Red.

MODEL 1166 (Specify Color) QUANTITY DISC. CODE **A** ★

ALLIGATOR CLIP LEAD TO BANANA PLUG

MODEL	LENGTH	NET
1959-4	4"	1.75
1959-8	8"	1.75
1959-12	12"	1.75
1959-24	24"	1.75
1959-36	36"	1.75
1959-48	48"	1.85
1959-60	60"	1.95



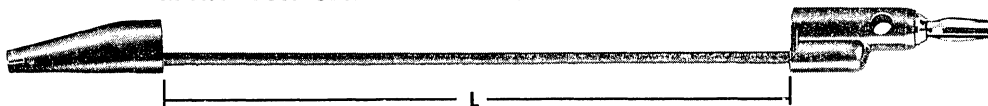
Adapts to equipment using standard banana jacks.
CLIP: Alligator, Steel, cadmium plated
BANANA PLUG: Spring, one piece beryllium copper, heat treated, nickel plated. Tough thermoplastic molded to plug body.

INSULATOR: Red vinyl with red wire. Black on all other colors.
WIRE: 18 AWG, Strand. 65 x 36 T.C. Extra flexible polyvinyl insulation .087" O.D.
OPERATING TEMP.: -25°C to +105°C.
COLORS: Black, Red.

MODEL 1959 (Specify Color) QUANTITY DISC. CODE **A** ★

MINIGATOR CLIP TO STACKING BANANA PLUG

MODEL	LENGTH	NET
3220-4	4"	1.50
3220-8	8"	1.50
3220-12	12"	1.50
3220-24	24"	1.50
3220-36	36"	1.50
3220-48	48"	1.60
3220-60	60"	1.70

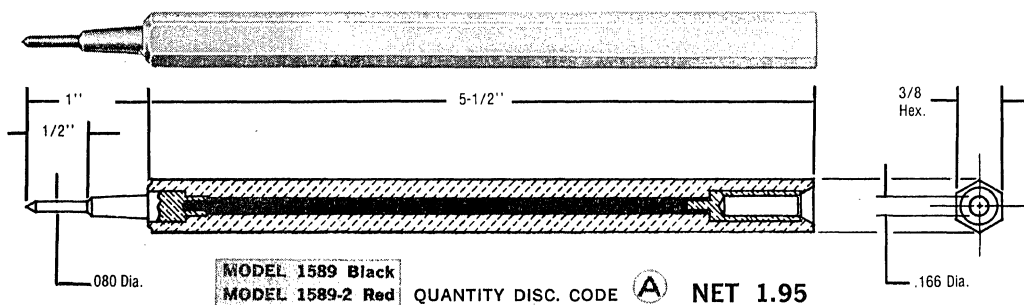


Adapts to equipment using standard banana jacks.
CLIP: Minigator, Steel, cadmium plated.
BANANA PLUG: Spring, one piece beryllium copper, heat treated, nickel plated. Tough thermoplastic molded to plug body and wire.

INSULATOR: Red vinyl with red wire. Black on all other colors.
WIRE: 20 AWG, Strand. 41 x 36 T.C. Extra flexible polyvinyl insulation .087" O.D.
OPERATING TEMP.: -25°C to +105°C.
COLORS: Black, Red.

MODEL 3220 (Specify Color) QUANTITY DISC. CODE **A** ★

TEST PROBE TO BANANA JACK



MODEL 1589 Black
MODEL 1589-2 Red

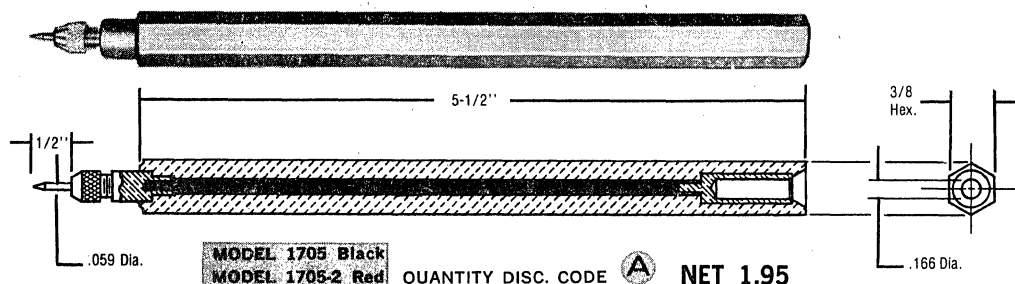
QUANTITY DISC. CODE **A** NET 1.95

Banana jack in handle connected to tip. Permits use of standard banana plugs for circuit testing as a test prod. Heavy duty insulated handle molded to banana jack and tip.

PIN TIP: .080 dia. x 1/2" long, brass nickel plated.

BANANA JACK: .166 dia. Brass nickel plated. Accepts standard banana plug.

NEEDLE TIP PROBE TO BANANA JACK



MODEL 1705 Black
MODEL 1705-2 Red

QUANTITY DISC. CODE **A** NET 1.95

Sharp replaceable needle tip allows testing of encapsulated circuits. Banana jack in handle connected to tip. Permits use of standard banana plugs for circuit testing as a test prod. Heavy duty insulated handle molded to banana jack and tip.

PIN TIP: Replaceable needle tip, stainless steel.

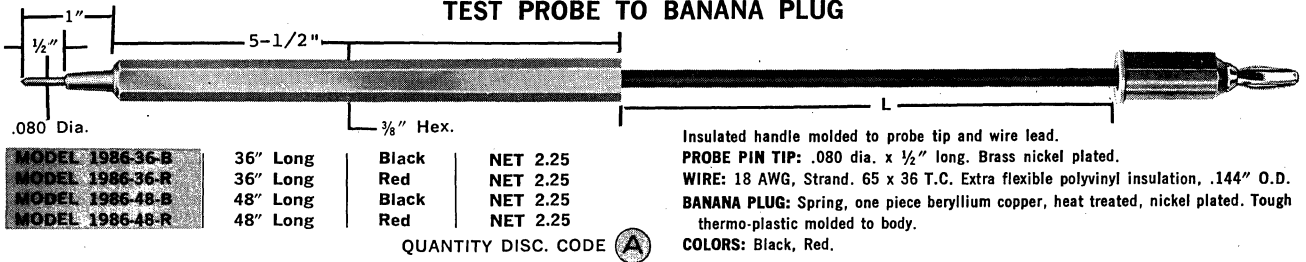
BANANA JACK: .166 dia. Brass nickel plated. Accepts standard banana plug.

★ Various lengths may be aggregated for best quantity price. Other lengths available to order.

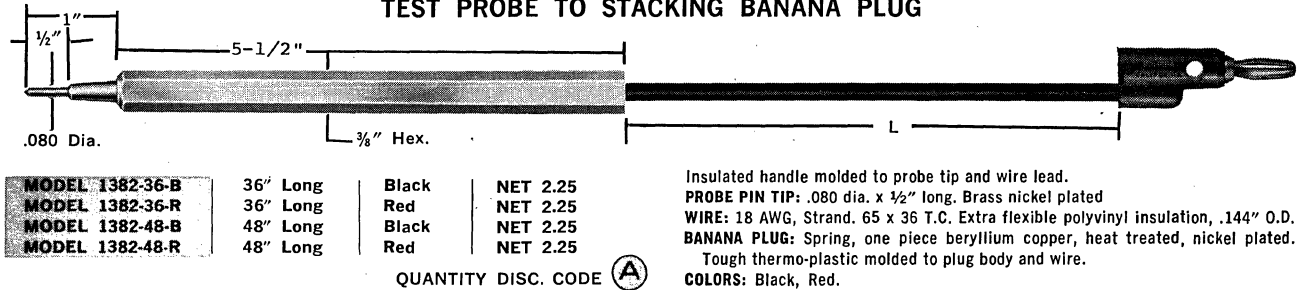
TEST PROBES



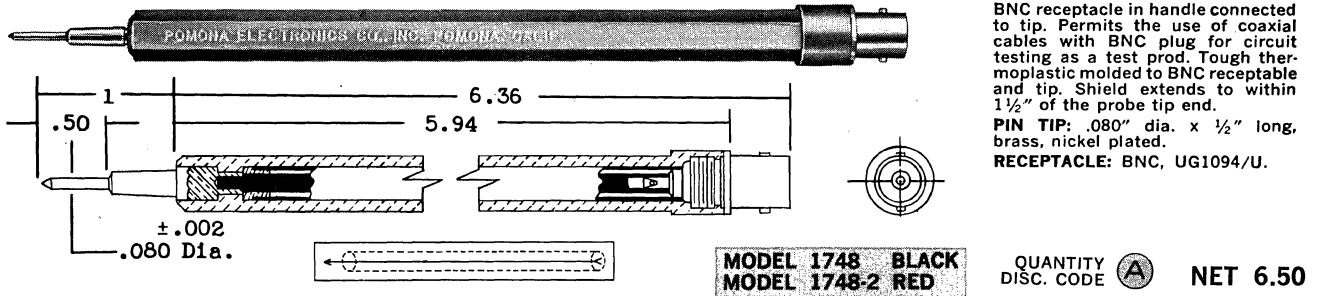
TEST PROBE TO BANANA PLUG



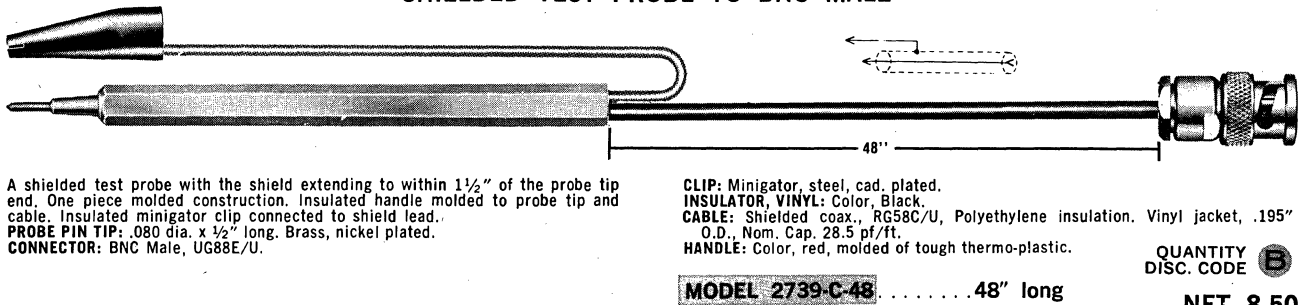
TEST PROBE TO STACKING BANANA PLUG



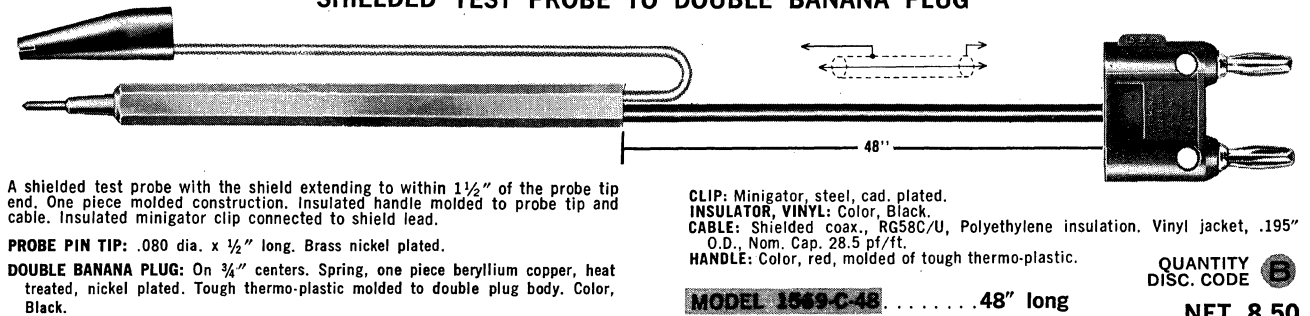
TEST PROBE TO BNC RECEPTACLE



SHIELDED TEST PROBE TO BNC MALE



SHIELDED TEST PROBE TO DOUBLE BANANA PLUG

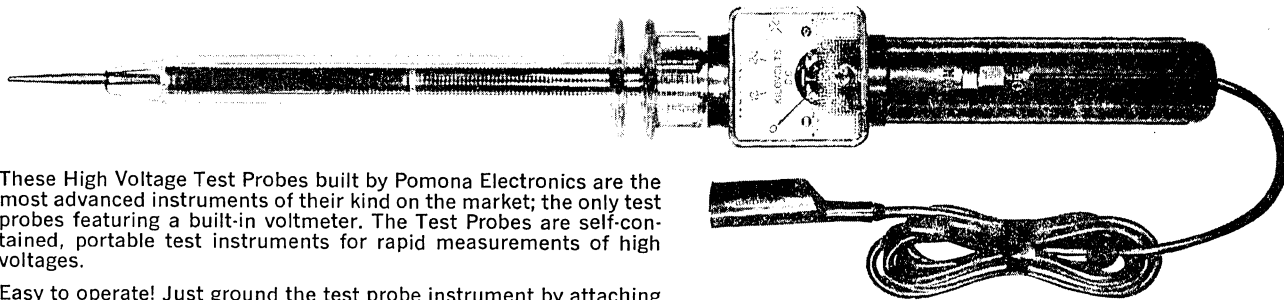


Other lengths available to order.

HIGH VOLTAGE TEST PROBES



DC HIGH VOLTAGE TEST PROBES WITH BUILT-IN METER



These High Voltage Test Probes built by Pomona Electronics are the most advanced instruments of their kind on the market; the only test probes featuring a built-in voltmeter. The Test Probes are self-contained, portable test instruments for rapid measurements of high voltages.

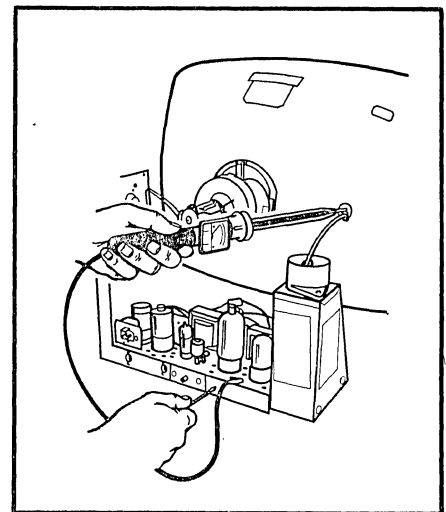
Easy to operate! Just ground the test probe instrument by attaching alligator clip to chassis, contact test probe tip to high voltage being measured and read voltage from the built-in meter. No warm-up time. No batteries.

SPECIFICATIONS:

RANGE: See below. **SENSITIVITY:** 20,000 ohms/volt (50 ua) movement. **ACCURACY:** $\pm 3\%$ full scale. **MULTIPLIER RESISTANCE:** See below. **MATERIAL:** Handle—high impact thermoplastic. Probe—high impact polystyrene. **LENGTH:** 14 $\frac{3}{4}$ " overall. **WEIGHT:** 8 ounces.

REPLACEMENT PARTS LIST FOR MODEL 4000			
Description	Net	Part Number	
Clear plastic Probe Body	3.95	2872	
Black Handle Assembly	4.25	3997	
Meter (0-50 ua. DC)	9.85	3995	
Clear plastic Meter Cover	.75	3493	
Multiplier resistor (720 megohms $\pm 2\%$)	4.25	3996	
MODEL	VOLTS Full Scale	MULTIPLIER RESISTANCE	NET
4000	36,000	720 Megohm	24.95
3157(*)	15,000	300 Megohm	34.50
3163(*)	6,000	120 Megohm	34.50
4036(**)	36,000	720 Megohm	14.50

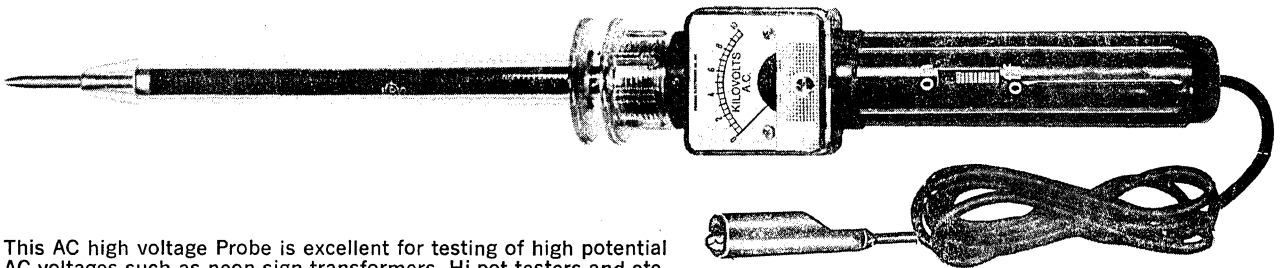
QUANTITY
DISC. CODE



* Models 3157 and 3163 are supplied with Model 3295 carrying case.

** Model 4036 MODIFICATION KIT — For Converting Model 2900 D.C. High Voltage Test Probe 30K.V. To 36K.V.

10 KV AC HIGH VOLTAGE TEST PROBE WITH BUILT-IN METER



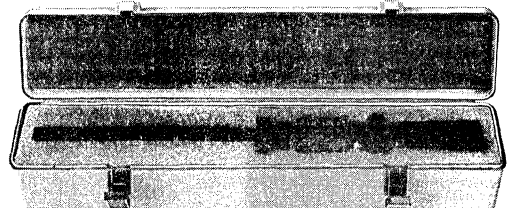
This AC high voltage Probe is excellent for testing of high potential AC voltages such as neon sign transformers, Hi-pot testers and etc. Shielded meter movement for protection from stray magnetic fields. PROBE IS SUPPLIED WITH MODEL 3295 CARRYING CASE.

Easy to operate! Just ground the test probe instrument by attaching alligator clip to chassis, contact test probe tip to high voltage being measured and read voltage from the built-in meter. No warm-up time. No batteries.

SPECIFICATIONS:

RANGE: 10,000 Volts AC. **SENSITIVITY:** 2,000 Ohms/Volt (500 UA) movement. **ACCURACY:** $\pm 3\%$ 30 cps to 1000 cps. **MULTIPLIER RESISTANCE:** 20 Megohm $\pm 2\%$. **MATERIAL:** Handle—high impact thermoplastic. Probe — high impact polystyrene. **LENGTH:** 14 $\frac{3}{4}$ " overall. **WEIGHT:** 8 ounces.

CARRYING CASE FOR HIGH VOLTAGE PROBES



A quality built carrying case for protection of your high voltage probe. The case is made of tough thermoplastic. The inside is lined with soft, shock absorbing material.

MODEL 3200

QUANTITY DISC. CODE



NET 34.50

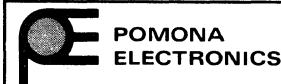
MODEL 3295

QUANTITY DISC. CODE



NET 5.95

MOLDED BREAKOUTS

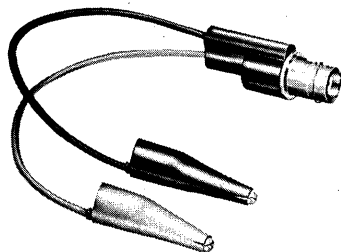


A new series of "Breakouts", designed to convert standard coaxial cables to test cables. By connecting proper Breakout receptacle or plug to corresponding cable plug or receptacle, any standard coaxial cable becomes a test cable equipped with clip leads. All connections feature a non-tarnish finish, and tough molded thermoplastic insulation molded to connector and wire.

APPLICABLE SPECIFICATIONS:

Wire: (With Alligator Clips) 18 AWG, Strand. 65 x 36 T.C.
Extra flexible polyvinyl insulation, .144" O.D.
Wire: (With Minigator Clips) 20 AWG, Strand. 41 x 36 T.C.
Extra flexible polyvinyl insulation, .087" O.D.
Operating Temp.: -25°C to +85°C.
Working Voltage: 500 V Peak.

BNC RECEPTACLE TO TEST CLIPS

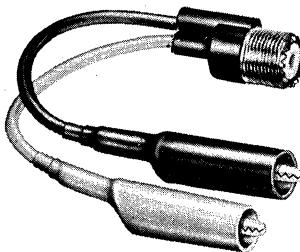


CONNECTOR: BNC Receptacle, UG1094/U.
INSULATION: Tough thermoplastic molded to connector and wire.
WIRE: See above.
TEST CLIPS: Minigator or Alligator, Steel, cad. plated, Insulators, Vinyl: 1 Black, 1 Red.

OVERALL LENGTH 7"

MODEL 2630 (ALLIGATOR CLIPS) **QUANTITY** **A** **NET 3.75**
MODEL 2631 (MINIGATOR CLIPS) **DISC. CODE**

UHF RECEPTACLE TO TEST CLIPS

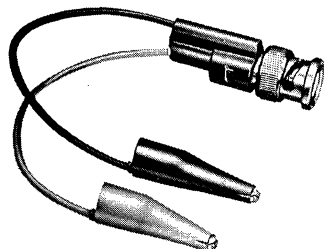


CONNECTOR: UHF Receptacle Jack.
INSULATION: Tough thermoplastic molded to connector and wire.
WIRE: See above.
TEST CLIPS: Alligator, Steel, cad. plated, Insulators, Vinyl: 1 Black, 1 Red.

OVERALL LENGTH 7"

MODEL 2632 **QUANTITY** **A** **NET 4.50**
DISC. CODE

BNC PLUG TO TEST CLIPS

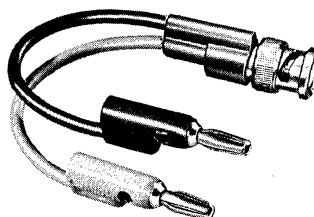


CONNECTOR: BNC Plug.
INSULATION: Tough thermoplastic molded to connector and wire.
WIRE: See above.
TEST CLIPS: Minigator or Alligator, Steel, cad. plated, Insulators, Vinyl: 1 Black, 1 Red.

OVERALL LENGTH 7"

MODEL 2885 (ALLIGATOR CLIPS) **QUANTITY** **A** **NET 4.50**
MODEL 2886 (MINIGATOR CLIPS) **DISC. CODE**

BNC PLUG TO STACKING BANANA PLUGS

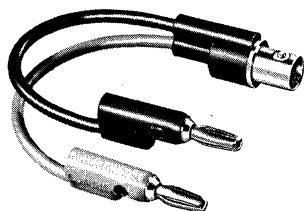


CONNECTOR: BNC Plug.
INSULATION: Tough thermoplastic molded to connector and wire.
WIRE: See above, 18 AWG.
STACKING BANANA PLUGS: Spring, one piece heat-treated beryllium copper, nickel plated: 1 Black, 1 Red.

OVERALL LENGTH 7"

MODEL 3957 **QUANTITY** **A** **NET 4.95**
DISC. CODE

BNC RECEPTACLE TO STACKING BANANA PLUGS

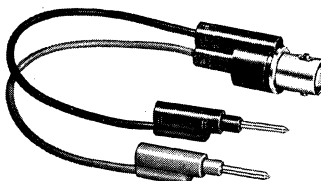


CONNECTOR: BNC Receptacle, UG1094/U.
INSULATION: Tough thermoplastic molded to connector and wire.
WIRE: See above, 18 AWG.
STACKING BANANA PLUGS: Spring, one piece heat-treated beryllium copper, nickel plated: 1 Black, 1 Red.

OVERALL LENGTH 7"

MODEL 3073 **QUANTITY** **A** **NET 3.85**
DISC. CODE

BNC RECEPTACLE TO STACKING PIN TIP PLUGS

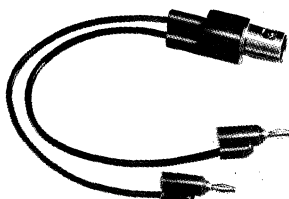


CONNECTOR: BNC Receptacle, UG1094/U.
INSULATION: Tough thermoplastic molded to connector and wire.
WIRE: See above, 20 AWG.
STACKING PIN TIP PLUGS: 2 single plugs, .080 dia.: 1 Black, 1 Red.

OVERALL LENGTH 7"

MODEL 3221 **QUANTITY** **A** **NET 3.85**
DISC. CODE

BNC RECEPTACLE TO MINIATURE STACKING BANANA PLUGS

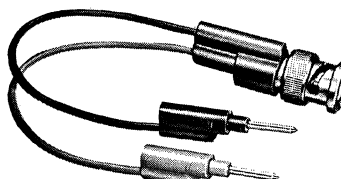


CONNECTOR: BNC Receptacle, UG1094/U.
INSULATION: Tough thermoplastic molded to connector and wire.
WIRE: See above, 20 AWG.
MINIATURE STACKING BANANA PLUGS: For use with .104 dia. jacks. Spring, one piece beryllium copper, gold plated: 1 Black, 1 Red.

OVERALL LENGTH 7"

MODEL 3966 **QUANTITY** **A** **NET 4.50**
DISC. CODE

BNC PLUG TO STACKING PIN TIP PLUGS



CONNECTOR: BNC Plug.
INSULATION: Tough thermoplastic molded to connector and wire.
WIRE: See above, 20 AWG.
STACKING PIN TIP PLUGS: 2 single plugs, .080 dia.: 1 Black, 1 Red.

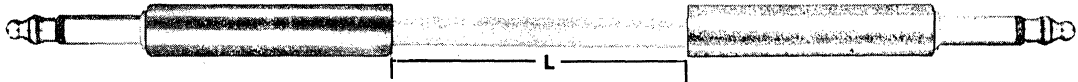
OVERALL LENGTH 7"

MODEL 3901 **QUANTITY** **A** **NET 4.95**
DISC. CODE

PATCH CORDS & CABLE ASSEMBLIES



PJ-051* PHONE PLUG BOTH ENDS



*PJ-051 INTERCHANGEABLE WITH WE310

WIRED TIP AND RING BOTH ENDS

WIRED TIP, RING AND SLEEVE BOTH ENDS

CABLE DESCRIPTION

Two Cond. Twisted pair, 18 AWG, Strand.
65 x 36 T.C. Vinyl Insulation, Vinyl Jacket
.250" O.D., Nom. Cap. 30 pf/ft.
COLOR: Cable, Gray. Phone Plug Handle,
Red.

MODEL	LENGTH	NET
2524-A-18	18"	9.85
2524-A-24	24"	9.85
2524-A-36	36"	9.85
2524-A-48	48"	9.85
2524-A-60	60"	9.85

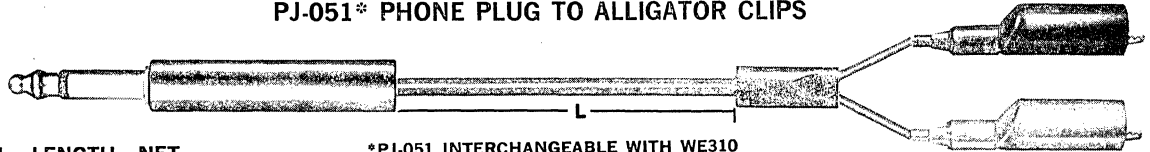
CABLE DESCRIPTION

2 Cond. shielded microphone cable. Polyethylene insulation. Vinyl jacket. .231" O.D. Nom. Cap. between one cond. 18 pf/ft. Nom. Cap. between one cond. and remaining cond. connected to shield, 32 pf/ft.
COLOR: Cable, Gray. Phone Plug Handle Red.

MODEL	LENGTH	NET
2524-J-18	18"	12.85
2524-J-24	24"	12.85
2524-J-36	36"	12.85
2524-J-48	48"	12.85
2524-J-60	60"	12.85

MODEL 2524 ★QUANTITY DISC. CODE B

PJ-051* PHONE PLUG TO ALLIGATOR CLIPS



*PJ-051 INTERCHANGEABLE WITH WE310

MODEL	LENGTH	NET
3352-A-36	36"	11.50
3352-A-60	60"	11.50
3352-A-84	84"	13.50
3352-A-120	120"	14.85

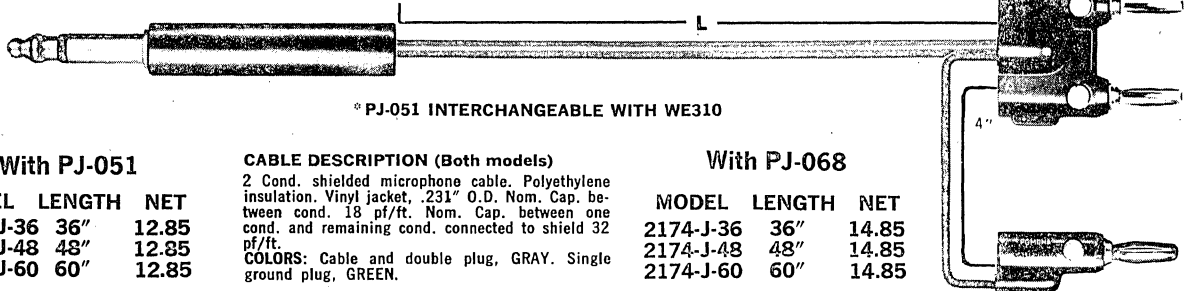
Plug wired Tip to Red Alligator and Ring to black alligator.
PHONE PLUG: PJ-051 with red handle.
CLIPS: Alligator, steel, cadmium plated.
INSULATORS: Vinyl, 1 red and 1 black.

CABLE DESCRIPTION:

Two Cond. Twisted pair, 18 AWG, Strand.
65 x 36 T.C. Vinyl Insulation, Vinyl Jacket
.250" O.D., Nom. Cap. 30 pf/ft.
COLOR: Cable, Gray.

MODEL 3352 ★QUANTITY DISC. CODE B

PJ-051* OR PJ-068 TO DOUBLE PLUG BALANCED LINE



*PJ-051 INTERCHANGEABLE WITH WE310

With PJ-051

MODEL	LENGTH	NET
2977-J-36	36"	12.85
2977-J-48	48"	12.85
2977-J-60	60"	12.85

CABLE DESCRIPTION (Both models)

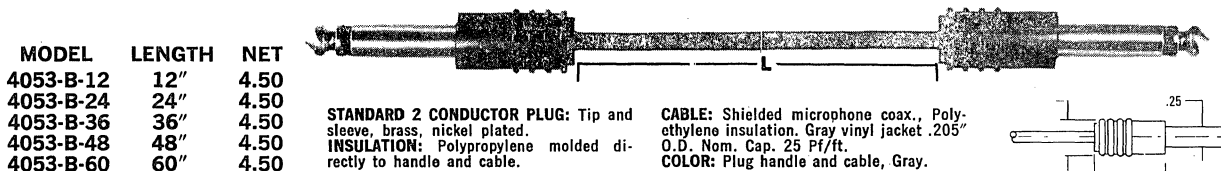
2 Cond. shielded microphone cable. Polyethylene insulation. Vinyl jacket. .231" O.D. Nom. Cap. between one cond. 18 pf/ft. Nom. Cap. between one cond. and remaining cond. connected to shield 32 pf/ft.
COLORS: Cable and double plug, GRAY. Single ground plug, GREEN.

With PJ-068

MODEL	LENGTH	NET
2174-J-36	36"	14.85
2174-J-48	48"	14.85
2174-J-60	60"	14.85

MODEL 2977 & 2174 ★QUANTITY DISC. CODE B

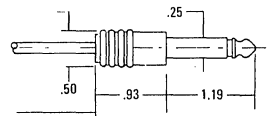
STANDARD PHONE PLUG BOTH ENDS



MODEL	LENGTH	NET
4053-B-12	12"	4.50
4053-B-24	24"	4.50
4053-B-36	36"	4.50
4053-B-48	48"	4.50
4053-B-60	60"	4.50

STANDARD 2 CONDUCTOR PLUG: Tip and sleeve, brass, nickel plated.
INSULATION: Polypropylene molded directly to handle and cable.

CABLE: Shielded microphone coax., Polyethylene insulation. Gray vinyl jacket .205" O.D. Nom. Cap. 25 Pf/ft.
COLOR: Plug handle and cable, Gray.



MODEL 4053 ★QUANTITY DISC. CODE B

PJ-068* PHONE PLUG BOTH ENDS



*PJ-068 INTERCHANGEABLE WITH WE-309

MODEL NO.	LENGTH	NET
4095-J-18	18"	12.85
4095-J-24	24"	12.85
4095-J-36	36"	12.85
4095-J-48	48"	12.85
4095-J-60	60"	12.85

CABLE DESCRIPTION

2 Cond. shielded microphone cable. Polyethylene insulation. Vinyl jacket. .231" O.D. Nom. Cap. between one cond. 18 pf/ft. Nom. Cap. between one cond. and remaining cond. connected to shield, 32 pf/ft.
COLOR: Cable, Gray. Phone Plug Handle, Red.

MODEL 4095 ★QUANTITY DISC. CODE B

3/4" DOUBLE BANANA PLUG PATCH CORDS

These patch cords are indispensable for bridge transformer connections, three terminal capacitor measurements and general hook-up for two wire systems. They are horizontally and vertically stackable in parallel.

Tough thermoplastic material molded to plug body and cable insures maximum strength, moisture resistance and excellent insulative properties.

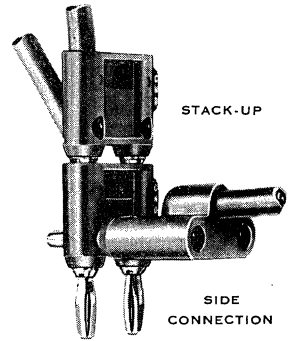
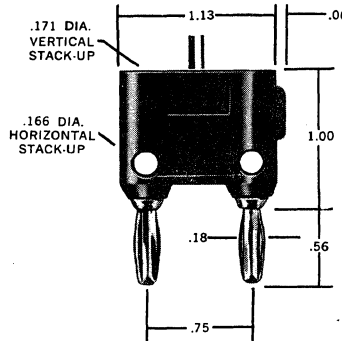
Used by leading industries in applications where extreme reliability is of prime importance.

FEATURES . . .

- One piece beryllium copper heat treated spring for long life.
- Rounded spring design results in maximum contact area.
- GND., clearly molded on plug body and shell.
- Solder-bonded noise-free connections.

SPECIFICATIONS . . .

- Fits standard 0.166 dia. banana jacks, on 3/4" centers.
- Contact resistance less than 0.001 ohms per plug.
- Spring beryllium copper alloy 170 per QQ-C-533.
- Plug body brass per QQ-B-625, Alloy #360.
- Nickel plated per QQ-N-290, Class 2.

**CABLE TYPE DESCRIPTION**

TWO COND. TWISTED PAIR: 18 AWG, Strand. 65 x 36 T.C. Vinyl insulation. Vinyl jacket, .250" O.D. Nom. Cap. 30 pf/ft. **COLOR:** Gray.

SHIELDED MICROPHONE CABLE: Polyethylene insulation. Vinyl jacket, .205" O.D. Nom. Cap. 25 pf/ft. **COLOR:** Gray

NOTE: Molded double plug matches color of cable. Two cond. Twisted pair, GRAY. Shielded mic. cable, GRAY. Coaxial RG58C/U Cable, BLACK.

SHIELDED COAXIAL CABLE
Polyethylene insulation, Vinyl jacket

TYPES	RG58C/U	RG59B/U	RG62A/U
Color	Black	Black	Black
Nom. Imp.	50	75	93
CAP. pf./ft.	30	21	13.5
O.D.	.195	.242	.242

DOUBLE PLUG BOTH ENDS*

TWO COND. TWISTED PR.	SHIELDED MIC. CABLE	RG58C/U	RG59B/U	LENGTH	NET
2BA-18	2BB-18	2BC-18	2BE-18	18"	5.95
2BA-24	2BB-24	2BC-24	2BE-24	24"	5.95
2BA-30	2BB-30	2BC-30	2BE-30	30"	5.95
2BA-36	2BB-36	2BC-36	2BE-36	36"	5.95
2BA-48	2BB-48	2BC-48	2BE-48	48"	5.95
2BA-60	2BB-60	2BC-60	2BE-60	60"	5.95

★ QUANTITY DISC. CODE

SHIELDED DOUBLE PLUG BOTH ENDS

Shielded Double Plug—black anodized aluminum

SHIELDED COAX. CABLE	LENGTH	NET
1550-C-18	18"	9.85
1550-C-24	24"	9.85
1550-C-30	30"	9.85
1550-C-36	36"	9.85
1550-C-48	48"	9.85
1550-C-60	60"	9.85

★ QUANTITY DISC. CODE

TWO COND. SHIELDED BALANCED LINE

NOTE: For BNC type TWINAX Patch cords and jacks, see Page 16.

CABLE DESCRIPTION	MODEL	LENGTH	NET
2-Cond. shielded mic. cable. Polyethylene insulation. Vinyl jacket, .231" O.D. Nom. Cap. between cond. 18 pf./ft. Nom. Cap. between one cond. and remaining cond. connected to shield, 32 pf./ft. COLOR: Cable and double plug, Gray. Single ground plug, Green.	1167-18	18"	9.85
	1167-24	24"	9.85
	1167-30	30"	9.85
	1167-36	36"	9.85
	1167-48	48"	9.85
	1167-60	60"	9.85

★ QUANTITY DISC. CODE

DOUBLE PLUG TO SINGLE BANANA PLUGS

CABLE DESCRIPTION	MODEL	LENGTH	NET
TWO COND. TWISTED PAIR	1368-A-18	18"	7.50
18 AWG, Strand. 65 x 36 T.C. Vinyl insulation. Vinyl jacket, .250" O.D. Nom. Cap. 30 pf/ft. COLOR: Double Plug: Gray Single Plugs: Red, Black	1368-A-24	24"	7.50
	1368-A-30	30"	7.50
	1368-A-36	36"	7.50
	1368-A-48	48"	7.50
	1368-A-60	60"	7.50

★ QUANTITY DISC. CODE

RETRACTILE (COILED) PATCH CORD — WITH DOUBLE BANANA PLUGS

This one size cord can be used in place of many various lengths. Staking double plug on both ends with a shielded microphone cable. **DOUBLE BANANA PLUGS:** On 3/4" centers. Spring, one piece beryllium copper, heat treated, nickel plated. Tough Thermoplastic molded to plug bodies and cable. **COLOR:** Black. **CABLE:** Shielded microphone. Center conductor 24 AWG (45 x 40), rubber insulated. Spiral T.C. shield with neoprene jacket .160 O.D. **COLOR:** Black.

QUANTITY DISC. CODE
NET 9.85

★ Various lengths may be aggregated for best quantity price.

BNC CABLE ASSEMBLIES & PATCH CORDS

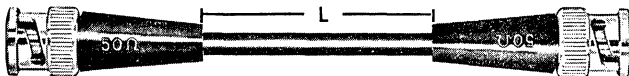
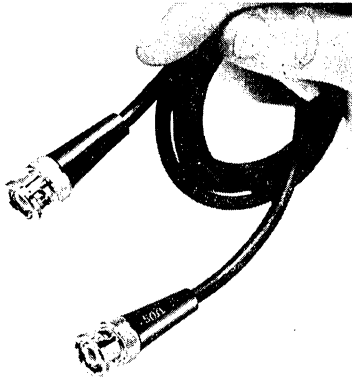
STRESS RELIEVED AND WEATHERPROOFED
CRIMP BNC CABLE ASSEMBLIES

These new cable assemblies feature polyethylene collars which are injection molded directly onto cable jacket and connector body. The resulting encapsulation offers two outstanding advantages.

STRESS PROTECTION
against failure from excess bending, flexing, and twisting.

WEATHERPROOF SEAL
between cable and connector.

Connectors have non-tarnish finish and conform to MIL-C-39012.

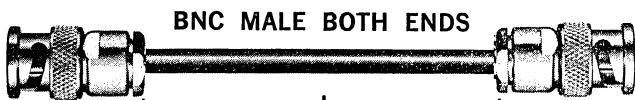


CONN: } Crimp Male BNC (Comparable to UG88E/U) CABLE: Shielded Coax., RG58C/U. CONN: } Crimp Male BNC (Comparable to UG88E/U)

CONN: } Crimp Male BNC (Comparable to UG260R/U) CABLE: Shielded Coax., RG59B/U or RG62A/U. CONN: } Crimp Male BNC (Comparable to UG260B/U)

RG58C/U 50 OHM	RG59B/U 75 OHM	NET	RG62A/U 93 OHM	NET	LENGTH
2249-C-12	2249-E-12	5.95	2249-M-12	6.85	12"
2249-C-24	2249-E-24	5.95	2249-M-24	6.85	24"
2249-C-36	2249-E-36	5.95	2249-M-36	6.85	36"
2249-C-48	2249-E-48	5.95	2249-M-48	6.85	48"
2249-C-60	2249-E-60	5.95	2249-M-60	6.85	60"

★ QUANTITY DISC. CODE (B)



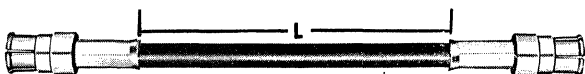
CONN: } M39012/16-0001 CABLE: Shielded Coax., RG58C/U. CONN: } M39012/16-0001 1st END } Male BNC 2nd END } Male BNC

CONN: } M39012/16-0002 CABLE: Shielded Coax., RG59B/U or RG62A/U. CONN: } M39012/16-0002 1st END } Male BNC 2nd END } Male BNC

SHEATHED MIC. CABLE 50 OHM	RG58C/U 50 OHM	RG59B/U 75 OHM	NET	RG62A/U 93 OHM	NET	LENGTH
BNC-B-18	BNC-C-18	BNC-E-18	6.50	BNC-M-18	6.95	18"
BNC-B-24	BNC-C-24	BNC-E-24	6.50	BNC-M-24	6.95	24"
BNC-B-30	BNC-C-30	BNC-E-30	6.50	BNC-M-30	6.95	30"
BNC-B-36	BNC-C-36	BNC-E-36	6.50	BNC-M-36	6.95	36"
BNC-B-48	BNC-C-48	BNC-E-48	6.50	BNC-M-48	6.95	48"
BNC-B-60	BNC-C-60	BNC-E-60	6.50	BNC-M-60	6.95	60"

★ QUANTITY DISC. CODE (B)

"PUSH ON" BNC MALE BOTH ENDS



CONN: } Crimp "PUSH ON" CABLE: Shielded Coax., RG58C/U. CONN: } Crimp "PUSH ON" 1st END } BNC, Male. 2nd END } BNC, Male.

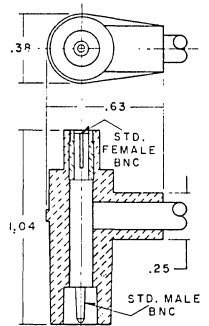
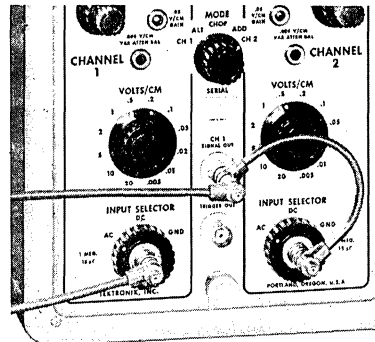
A test cable for rapid interconnection of equipment. Connector is pushed on and requires no twisting. Beryllium copper outer fingers maintain continuity of shield. Excellent for those hard to get at places.

MODEL	LENGTH
3199-C-12	12"
3199-C-24	24"
3199-C-36	36"
3199-C-48	48"
3199-C-60	60"

MODEL 3199 ★ QUANTITY DISC. CODE (B) NET 5.50

"PUSH ON" STACKING BNC PATCH CORDS

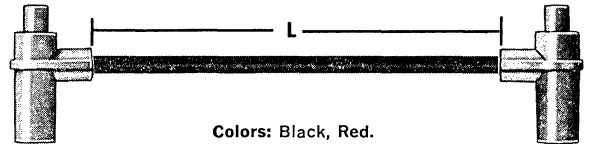
These multiple stacking patch cords connect the center conductors of BNC jacks having a common chassis. Excellent for use with instruments such as oscilloscopes. Stacking feature enables an endless number of connections to the same point.



FEATURES:

- CONTACT: Male and Female, one piece heat treated beryllium copper, gold flashed.
- WIRE: 18 AWG., stranded 65 x 36 T.C., polyvinyl insulation.
- INSULATION: Tough thermoplastic, polypropylene, molded around contact and wire.
- OPERATING TEMP.: -25° C to + 125° C.

"PUSH ON" STACKING BNC MALE BOTH ENDS



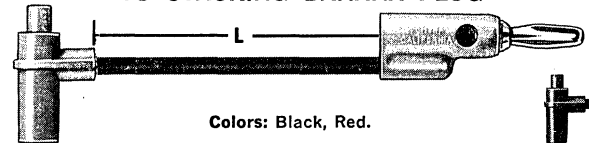
Colors: Black, Red.

MODEL	LENGTH	MODEL	LENGTH
3201-4	4"	3201-24	24"
3201-8	8"	3201-36	36"
3201-12	12"	3201-48	48"
3201-18	18"	3201-60	60"

★ QUANTITY DISC. CODE (B)

MODEL 3201 (Specify Color)

NET 2.50

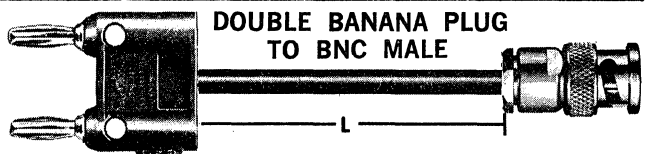
"PUSH ON" STACKING BNC MALE
TO STACKING BANANA PLUG

Colors: Black, Red.

MODEL	LENGTH	MODEL	LENGTH
3202-4	4"	3202-24	24"
3202-8	8"	3202-36	36"
3202-12	12"	3202-48	48"
3202-18	18"	3202-60	60"

★ QUANTITY DISC. CODE (B) NET 2.50

MODEL 3202 (Specify Color)

DOUBLE BANANA PLUG
TO BNC MALE

CONN.: } Double Banana Plug, CABLE: Shielded coax., CONN.: } M39012/16-0001 1ST END } on 3/4" Centers. RG58C/U. 2ND END } Male BNC

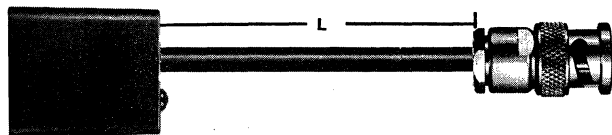
SHEATHED MIC. CABLE	SHIELDED COAX. CABLE	LENGTH	NET
2BB-BNC-18	2BC-BNC-18	18"	6.95
2BB-BNC-24	2BC-BNC-24	24"	6.95
2BB-BNC-30	2BC-BNC-30	30"	6.95
2BB-BNC-36	2BC-BNC-36	36"	6.95
2BB-BNC-48	2BC-BNC-48	48"	6.95
2BB-BNC-60	2BC-BNC-60	60"	6.95

★ QUANTITY DISC. CODE (B)

BNC CABLE ASSEMBLIES & PATCH CORDS



SHIELDED DOUBLE PLUG TO BNC MALE



Shielded Double plug,
on 3/4" centers. Black
anodized aluminum.

CABLE: Shielded coax.,
RG58C/U

CONN.: } UG88E/U,
2ND END } Male BNC

SHIELDED COAX. CABLE	LENGTH	SHIELDED COAX. CABLE	LENGTH
1555-C-18	18"	1555-C-36	36"
1555-C-24	24"	1555-C-48	48"
1555-C-30	30"	1555-C-60	60"

MODEL 1555

★ QUANTITY DISC. CODE **B** NET 9.85

BNC MALE ONE END ONLY



CONN.: } M39012/16-0001
1st END } Male BNC

CABLE: Shielded Coax.,
RG58C/U

CONN.: } None
2nd END }

CONN.: } UG260B/U
1st END } Male BNC

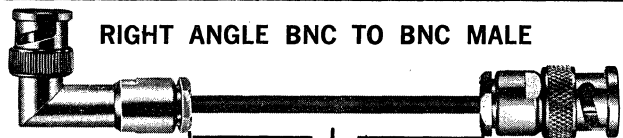
Cable: Shielded Coax., RG59B/U
or RG62A/U

CONN.: } None
2nd END }

RG58C/U	RG59B/U	NET	RG62A/U	NET	LENGTH
1661-C-12	1661-E-12	3.95	1661-M-12	4.60	12"
1661-C-24	1661-E-24	3.95	1661-M-24	4.60	24"
1661-C-36	1661-E-36	3.95	1661-M-36	4.60	36"
1661-C-48	1661-E-48	3.95	1661-M-48	4.60	48"
1661-C-60	1661-E-60	3.95	1661-M-60	4.60	60"

★ QUANTITY DISC. CODE **B**

RIGHT ANGLE BNC TO BNC MALE



CONN.: } UG913A/U,
1ST END } Angle Male BNC

CABLE: Shielded Coax.,
RG58C/U

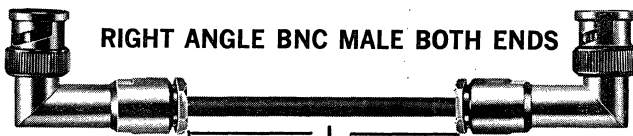
CONN.: } M39012/16-0001
2ND END } Male BNC

SHIELDED COAX. CABLE	LENGTH	SHIELDED COAX. CABLE	LENGTH
1383-C-18	18"	1383-C-36	36"
1383-C-24	24"	1383-C-48	48"
		1383-C-60	60"

MODEL 1383

★ QUANTITY DISC. CODE **B** NET 9.95

RIGHT ANGLE BNC MALE BOTH ENDS



CONN.: } UG913A/U,
1ST END } Angle Male BNC

CABLE: Shielded Coax.,
RG58C/U

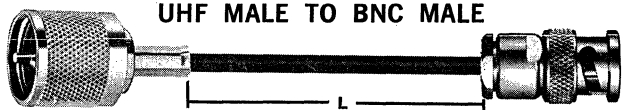
CONN.: } UG913A/U,
2ND END } Angle Male BNC

SHIELDED COAX. CABLE	LENGTH	SHIELDED COAX. CABLE	LENGTH
1155-C-18	18"	1155-C-36	36"
1155-C-24	24"	1155-C-48	48"
		1155-C-60	60"

MODEL 1155

★ QUANTITY DISC. CODE **B** NET 12.85

UHF MALE TO BNC MALE



CONN.: } CRIMP
1ST END } UHF Male

CABLE: Shielded Coax.,
RG58C/U

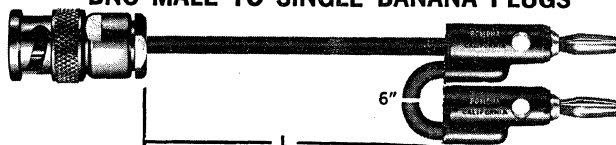
CONN.: } M39012/16-0001
2ND END } Male BNC

SHIELDED COAX. CABLE	LENGTH	SHIELDED COAX. CABLE	LENGTH
1367-C-18	18"	1367-C-36	36"
1367-C-24	24"	1367-C-48	48"
		1367-C-60	60"

MODEL 1367

★ QUANTITY DISC. CODE **B** NET 6.95

BNC MALE TO SINGLE BANANA PLUGS



CONN.: } M39012/16-0001
1st END } Male BNC

CABLE: Shielded
Coax., RG58C/U

CONN.: } Single Banana Plugs
2nd END } Color: 1 Black, 1 Red.

CABLE DESCRIPTION:

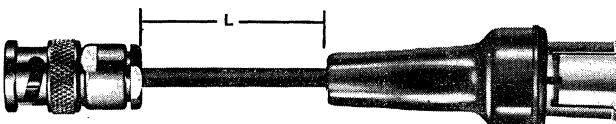
Shielded coax., RG58C/U, Polyethy-
lene insulation. Vinyl jacket, .195"
O.D. Nom. Cap. 28.5 pf/ft.

★ QUANTITY DISC. CODE **B**

MODEL LENGTH NET

2241-C-18	18"	7.50
2241-C-24	24"	7.50
2241-C-36	36"	7.50
2241-C-48	48"	7.50

BNC MALE TO GR-874



CONN.: } M39012/16-0001
1st END } Male BNC

CABLE: Shielded Coax.,
RG58C/U

CONN.: } GR-874
2nd END }

CABLE DESCRIPTION:

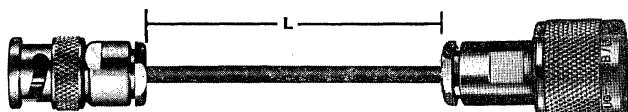
Shielded coax., RG58C/U, Polyethy-
lene insulation. Vinyl jacket, .195"
O.D. Nom. Cap. 28.5 pf/ft.

★ QUANTITY DISC. CODE **D**

MODEL LENGTH NET

1703-C-24	24"	14.85
1703-C-36	36"	14.85
1703-C-48	48"	14.85

BNC MALE TO SERIES "N" MALE



CONN.: } M39012/16-0001
1st END } Male BNC

CABLE: Shielded coax.,
RG58C/U

CONN.: } UG536B/U
2nd END } "N" Male

CABLE DESCRIPTION:

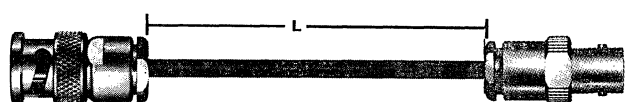
Shielded coax., RG58C/U, Polyethy-
lene insulation. Vinyl jacket, .195"
O.D. Nom. Cap. 28.5 pf/ft.

★ QUANTITY DISC. CODE **B**

MODEL LENGTH NET

1366-C-24	24"	7.85
1366-C-36	36"	7.85
1366-C-48	48"	7.85

BNC MALE TO BNC FEMALE



CONN.: } M39012/16-0001
1st END } Male BNC

CABLE: Shielded coax.,
RG58C/U

CONN.: } UG89C/U
2nd END } Female BNC

CABLE DESCRIPTION:

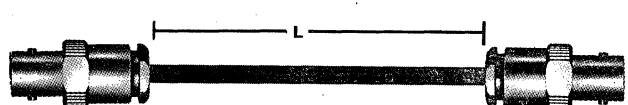
Shielded Coax., RG58C/U, Polyethy-
lene insulation. Vinyl jacket, .195"
O.D. Nom. Cap. 28.5 pf/ft.

★ QUANTITY DISC. CODE **B**

MODEL LENGTH NET

2223-C-12	12"	7.50
2223-C-24	24"	7.50
2223-C-36	36"	7.50
2223-C-48	48"	7.50
2223-C-60	60"	7.50

BNC FEMALE BOTH ENDS



CONN.: } UG89C/U
1st END } Female BNC

CABLE: Shielded Coax.,
RG58C/U

CONN.: } UG89C/U
2nd END } Female BNC

CABLE DESCRIPTION:

Shielded coax., RG58C/U, Polyethy-
lene insulation. Vinyl jacket, .195"
O.D. Nom. Cap. 28.5 pf/ft.

★ QUANTITY DISC. CODE **B**

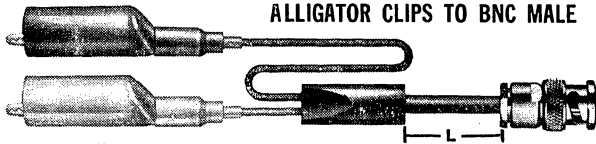
MODEL LENGTH NET

1808-C-12	12"	7.50
1808-C-24	24"	7.50
1808-C-36	36"	7.50
1808-C-48	48"	7.50
1808-C-60	60"	7.50

PATCH CORDS & CABLE ASSEMBLIES



ALLIGATOR CLIPS TO BNC MALE



CONN.: } Alligator Clips, Steel,
1ST END } cad plated.
INSULATORS, VINYL: }
Black/Red. CABLE: Shielded Mic. or SHIELDED COAX, RG58C/U 2ND END } BNC, Male. CONN.: } M39012/16-0001

SHIELDED MIC. CABLE	SHIELDED COAX. CABLE	LENGTH	NET
AL-B-BNC-18	AL-C-BNC-18	18"	6.50
AL-B-BNC-24	AL-C-BNC-24	24"	6.50
AL-B-BNC-30	AL-C-BNC-30	30"	6.50
AL-B-BNC-36	AL-C-BNC-36	36"	6.50
AL-B-BNC-48	AL-C-BNC-48	48"	6.50
AL-B-BNC-60	AL-C-BNC-60	60"	6.50

★ QUANTITY DISC. CODE (B)

MINIGATOR CLIPS TO BNC MALE

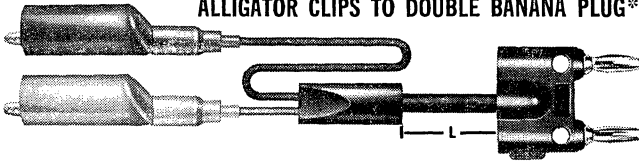


CONN.: } Minigator Clips,
1ST END } Steel, cad plated
INSULATORS, VINYL: }
Black/Red. CABLE: Shielded Mic. or SHIELDED COAX, RG58C/U 2ND END } BNC, Male Male CONN.: } M39012/16-0001

SHIELDED MIC. CABLE	SHIELDED COAX. CABLE	LENGTH	NET
MG-B-BNC-18	MG-C-BNC-18	18"	6.50
MG-B-BNC-24	MG-C-BNC-24	24"	6.50
MG-B-BNC-30	MG-C-BNC-30	30"	6.50
MG-B-BNC-36	MG-C-BNC-36	36"	6.50
MG-B-BNC-48	MG-C-BNC-48	48"	6.50
MG-B-BNC-60	MG-C-BNC-60	60"	6.50

★ QUANTITY DISC. CODE (B)

ALLIGATOR CLIPS TO DOUBLE BANANA PLUG*

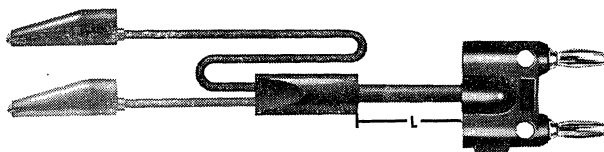


CONN.: } Alligator Clips,
1ST END } Steel, cad plated
INSULATORS, VINYL: }
Black/Red. CABLE: Two Cond. Twisted Pair, Shielded Mic. or SHIELDED COAX, RG58C/U 2ND END } Double Banana Plug, on 3/4" centers. CONN.: }

TWO COND. TWISTED PAIR	SHIELDED MIC. CABLE	SHIELDED COAX. CABLE	LENGTH	NET
2BA-AL-18	2BB-AL-18	2BC-AL-18	18"	6.95
2BA-AL-24	2BB-AL-24	2BC-AL-24	24"	6.95
2BA-AL-30	2BB-AL-30	2BC-AL-30	30"	6.95
2BA-AL-36	2BB-AL-36	2BC-AL-36	36"	6.95
2BA-AL-48	2BB-AL-48	2BC-AL-48	48"	6.95
2BA-AL-60	2BB-AL-60	2BC-AL-60	60"	6.95

★ QUANTITY DISC. CODE (B)

MINIGATOR CLIPS TO DOUBLE BANANA PLUG*

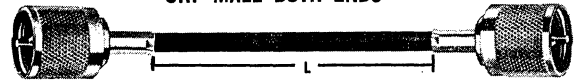


CONN.: } Minigator Clips,
1ST END } Steel, cad plated
INSULATORS, VINYL: }
Black/Red. CABLE: Two Cond. Twisted pair, Shielded Mic. or SHIELDED COAX, RG58C/U 2ND END } Double Banana Plug, on 3/4" centers. CONN.: }

TWO COND. TWISTED PAIR	SHIELDED MIC. CABLE	SHIELDED COAX. CABLE	LENGTH	NET
2BA-MG-18	2BB-MG-18	2BC-MG-18	18"	6.95
2BA-MG-24	2BB-MG-24	2BC-MG-24	24"	6.95
2BA-MG-30	2BB-MG-30	2BC-MG-30	30"	6.95
2BA-MG-36	2BB-MG-36	2BC-MG-36	36"	6.95
2BA-MG-48	2BB-MG-48	2BC-MG-48	48"	6.95
2BA-MG-60	2BB-MG-60	2BC-MG-60	60"	6.95

★ QUANTITY DISC. CODE (B)

UHF MALE BOTH ENDS



CONN.: } CRIMP
1ST END } UHF, Male

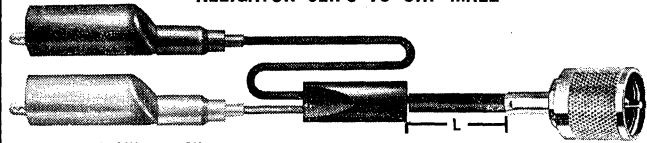
CABLE: Shielded coax.,
RG58C/U

CONN.: } CRIMP
2ND END } UHF, Male

SHIELDED COAX. CABLE	LENGTH	NET
UHF-C-18	18"	6.85
UHF-C-24	24"	6.85
UHF-C-36	36"	6.85
UHF-C-48	48"	6.85
UHF-C-60	60"	6.85

★ QUANTITY DISC. CODE (B)

ALLIGATOR CLIPS TO UHF MALE



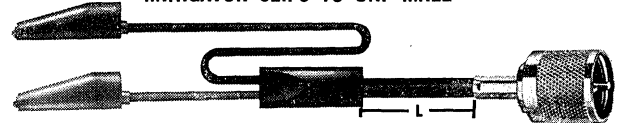
CONN.: } Alligator Clips,
1ST END } Steel, cad plated
INSULATORS, VINYL: }
Black/Red. CABLE: Shielded coax.,
RG58C/U

CONN.: } CRIMP
2ND END } UHF, Male

SHIELDED COAX. CABLE	LENGTH	NET
AL-C-UHF-18	18"	6.50
AL-C-UHF-24	24"	6.50
AL-C-UHF-36	36"	6.50
AL-C-UHF-48	48"	6.50
AL-C-UHF-60	60"	6.50

★ QUANTITY DISC. CODE (B)

MINIGATOR CLIPS TO UHF MALE



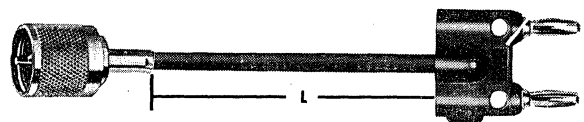
CONN.: } Minigator Clips,
1ST END } Steel, cad plated
INSULATORS, VINYL: }
Black/Red. CABLE: Shielded Coax.,
RG58C/U

CONN.: } CRIMP
2ND END } UHF, Male

SHIELDED COAX. CABLE	LENGTH	NET
MG-C-UHF-18	18"	6.50
MG-C-UHF-24	24"	6.50
MG-C-UHF-36	36"	6.50
MG-C-UHF-48	48"	6.50
MG-C-UHF-60	60"	6.50

★ QUANTITY DISC. CODE (B)

UHF MALE TO DOUBLE BANANA PLUG*



CONN.: } CRIMP
1ST END } UHF, Male

CABLE: Shielded Coax.,
RG58C/U

CONN.: } Double Banana Plug,
2ND END } on 3/4" centers.

SHIELDED COAX. CABLE	LENGTH	NET
2BC-UHF-18	18"	6.95
2BC-UHF-24	24"	6.95
2BC-UHF-36	36"	6.95
2BC-UHF-48	48"	6.95
2BC-UHF-60	60"	6.95

★ QUANTITY DISC. CODE (B)

*NOTE: Molded double plug matches color of cable. Two cond. Twisted pair, GRAY. Shielded mic. cable, GRAY. Coaxial RG58C/U cable, BLACK.

1. Other CABLE COLORS available to order on the Two Cond. Twisted Pair and Shielded Mic. cable models, with plug to match.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Violet, Gray, White.

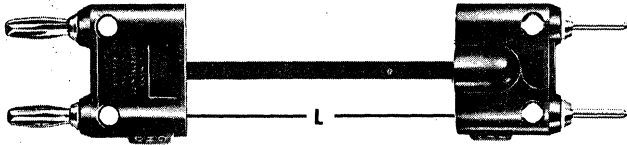
2. Other lengths and cable types available to order.

★ Various lengths may be aggregated for best quantity price.

PATCH CORDS & CABLE ASSEMBLIES



DOUBLE BANANA PLUG TO DOUBLE PIN TIP PLUG



CONN: } Double Banana Plug, on 3/4" Centers
1st END }
CABLE: Shielded Coax., RG58C/U
CONN: } Double Pin Tip Plug, .080 Dia. on 3/4" Centers
2nd END }

CABLE DESCRIPTION:

Shielded coax., RG58C/U, Polyethylene insulation. Vinyl jacket, .195" O.D., Nom. Cap. 28.5 pf/ft.

MODEL LENGTH

2288-C-18 18"
2288-C-24 24"
2288-C-36 36"
2288-C-48 48"
2288-C-60 60"

MODEL 2288 ★ QUANTITY DISC. CODE NET 5.95

BNC MALE TO STACK-UP PIN TIPS



CONN: } M39012/16-0001 CABLE: Shielded Coax., RG58C/U CONN: } Single Stack-Up Pin Tip Plugs, .080 Dia.; Color: 1 Black, 1 Red.
1st END } Male BNC 2nd END }

CABLE DESCRIPTION:

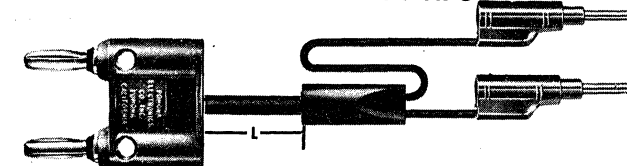
Shielded coax., RG58C/U, Polyethylene insulation. Vinyl jacket, .195" O.D., Nom. Cap. 28.5 pf/ft.

MODEL LENGTH

2882-C-18 18"
2882-C-24 24"
2882-C-36 36"
2882-C-48 48"
2882-C-60 60"

MODEL 2882 ★ QUANTITY DISC. CODE NET 7.50

DOUBLE PLUG TO STACK-UP PIN TIPS



CONN: } Double Banana Plug, on 3/4" Centers. CABLE: Shielded Coax., RG58C/U CONN: } Single Stack-Up Pin Tip Plugs, .080 Dia.; Color: 1 Black, 1 Red.
1st END } 2nd END }

CABLE DESCRIPTION

Shielded coax., RG58C/U, Polyethylene insulation. Vinyl jacket, .195" O.D., Nom. Cap. 28.5 pf/ft.

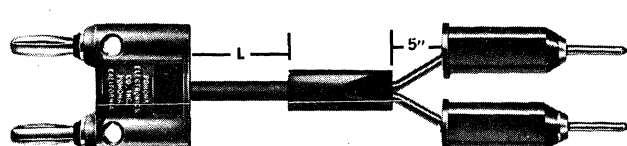
COLOR: Cable and Double Plug, Black.

MODEL LENGTH NET

28C-PP-18 18" 7.50
28C-PP-24 24" 7.50
28C-PP-36 36" 7.50
28C-PP-48 48" 7.50
28C-PP-60 60" 7.50

★ QUANTITY DISC. CODE

DOUBLE PLUG TO SINGLE PIN TIPS



CONN: } Double Banana Plug, on 3/4" Centers. CABLE: Two Cond. Twisted Pair CONN: } Single Pin Tip Plugs, .080 Dia.; Color: 1 Black, 1 Red.
1st END } 2nd END }

CABLE DESCRIPTION

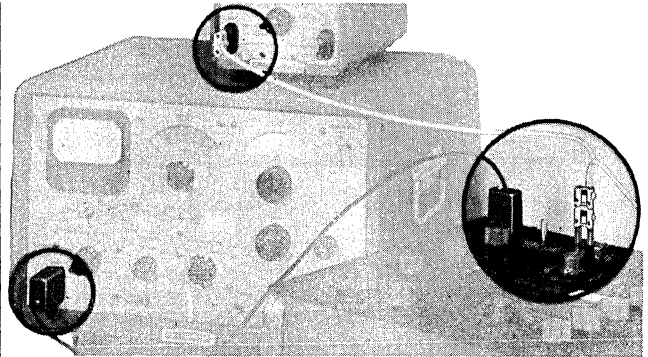
Two Cond. Twisted pair. 18 AWG, Strand. 65 x 36 T.C. Vinyl insulation, vinyl jacket, .250" O.D. Nom. Cap. 30 pf/ft.

MODEL LENGTH NET

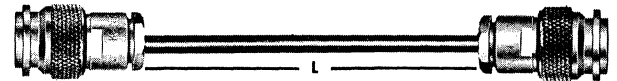
2184-A-24 24" 7.85
2184-A-36 36" 7.85
2184-A-48 48" 7.85
2184-A-60 60" 7.85

COLOR: Cable and Double plug, Gray.

★ QUANTITY DISC. CODE



TNC MALE BOTH ENDS



CONN: } Male TNC CABLE: Shielded coax., RG58C/U CONN: } Male TNC
1st END } 2nd END }

CABLE DESCRIPTION

Shielded coax., RG58C/U, Polyethylene insulation. Vinyl jacket, .195" O.D., Nom. Cap. 28.5 pf/ft.

MODEL

1944-C-12 12"
1944-C-24 24"
1944-C-36 36"
1944-C-48 48"
1944-C-60 60"

LENGTH

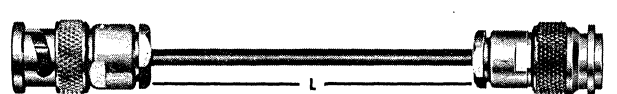
12"
24"
36"
48"
60"

NET

8.85
8.85
8.85
8.85
8.85

★ QUANTITY DISC. CODE

BNC MALE TO TNC MALE



CONN: } M39012/16-0001 CABLE: Shielded coax., RG58C/U CONN: } Male TNC
1st END } Male BNC 2nd END }

CABLE DESCRIPTION:

Shielded coax., RG58C/U, Polyethylene insulation. Vinyl jacket, .195" O.D., Nom. Cap. 28.5 pf/ft.

MODEL

1948-C-12 12"
1948-C-24 24"
1948-C-36 36"
1948-C-48 48"
1948-C-60 60"

LENGTH

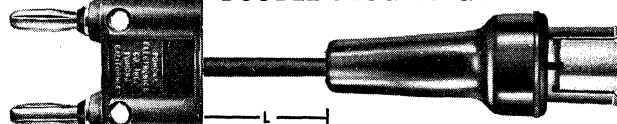
12"
24"
36"
48"
60"

NET

7.85
7.85
7.85
7.85
7.85

★ QUANTITY DISC. CODE

DOUBLE PLUG TO GR-874



CONN: } Double Banana Plug, on 3/4" Centers. CABLE: Shielded Coax., RG58C/U CONN: } GR-874
1st END } 2nd END }

CABLE DESCRIPTION

Shielded coax., RG58C/U, Polyethylene insulation. Vinyl jacket, .195" O.D., Nom. Cap. 28.5 pf/ft.

MODEL

2243-C-24 24"
2243-C-36 36"
2243-C-48 48"

LENGTH

24"
36"
48"

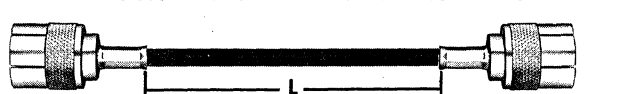
NET

14.85
14.85
14.85

COLOR: Cable and double plug, Black.

★ QUANTITY DISC. CODE

PUSH ON UHF MALE BOTH ENDS



CONN: } Crimp Push on UHF, Male. CABLE: Shielded Coax., RG58C/U CONN: } Crimp Push on UHF, Male.
1st END } 2nd END }

A test cable for rapid interconnection of equipment. Connector is pushed on and requires no screwing on of shell. Continuity of shield is maintained. Excellent for those hard to get at places.

MODEL

3137-C-12 12"
3137-C-24 24"
3137-C-36 36"
3137-C-48 48"
3137-C-60 60"

LENGTH

12"
24"
36"
48"
60"

NET

7.85
7.85
7.85
7.85
7.85

MODEL 3137 ★ QUANTITY DISC. CODE

NET 7.85

PATCH CORDS & CABLE ASSEMBLIES



SERIES "N" MALE BOTH ENDS



CONN: } UG536B/U 1st END } "N" Male	CABLE: Shielded Coax., RG58C/U.	CONN: } UG536B/U 2nd END } "N" Male
CABLE DESCRIPTION:		
Shielded coax., RG58C/U Polyethylene insulation. Vinyl jacket, .195" O.D., Nom. Cap. 28.5 pf/ft.		
	MODEL	LENGTH
	2256-C-24	24"
	2256-C-36	36"
	2256-C-48	48"
	2256-C-60	60"

MODEL 2256 ★ QUANTITY DISC. CODE **B** NET 8.50

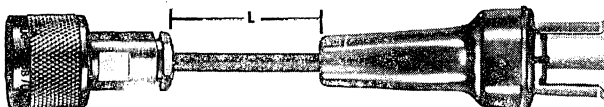
SERIES "N" MALE BOTH ENDS



CONN: } UG21E/U 1st END } "N" Male	CABLE: Coax., RG213/U or RG214/U	CONN: } UG21E/U 2nd END } "N" Male
CABLE TYPES		
RG213/U	NET	LENGTH
1658-S-18	12.50	18"
1658-S-24	12.50	24"
1658-S-36	12.50	36"
1658-S-48	13.25	48"
1658-S-60	14.00	60"
RG214/U	NET	LENGTH
1658-T-18	16.85	18"
1658-T-24	16.85	24"
1658-T-36	16.85	36"
1658-T-48	18.60	48"
1658-T-60	20.35	60"

MODEL 1658 ★ QUANTITY DISC. CODE **B**

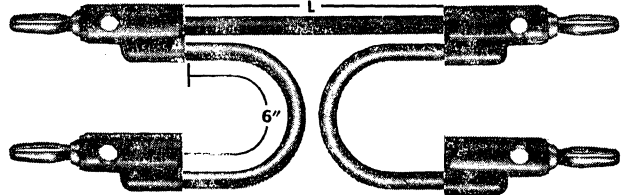
SERIES "N" MALE TO GR-874



CONN: } UG536B/U 1st END } "N" Male	CABLE: Shielded Coax., RG58C/U	CONN: } GR-874 2nd END }
CABLE DESCRIPTION:		
Shielded coax., RG58C/U, Polyethylene insulation. Vinyl jacket, .195" O.D., Nom. Cap. 28.5 pf/ft.		
	MODEL	LENGTH
	2438-C-24	24"
	2438-C-36	36"
	2438-C-48	48"
	2438-C-60	60"

MODEL 2438 ★ QUANTITY DISC. CODE **D** NET 16.85

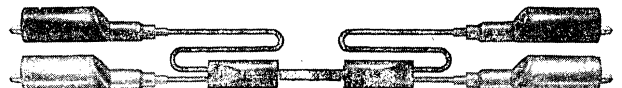
SINGLE BANANA PLUGS BOTH ENDS



CONN: } Single Banana 1st END } Plugs Colors: Inner Conductor plug, Red. Ground Plug, Black.	CABLE: Shielded Coax., RG122/U	CONN: } Single Banana Plugs. 2nd END } Colors: Inner Conductor Plug, Red. Ground Plug, Black.
CABLE DESCRIPTION:		
Shielded coax., RG122/U polyethylene insulation. Vinyl jacket, .160" O.D., Nom. Cap. 29.5 pf/ft.		
	MODEL	LENGTH
	2239-R-24	24"
	2239-R-36	36"
	2239-R-48	48"
	2239-R-60	60"

MODEL 2239 ★ QUANTITY DISC. CODE **B** NET 7.85

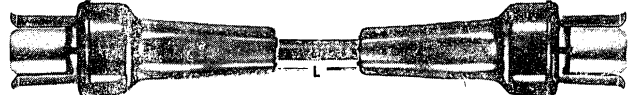
ALLIGATOR CLIPS BOTH ENDS



CONN: } Alligator Clips, 1st END } Steel, cad plated Insulators, Vinyl: Black/Red.	CABLE: Shielded Coax., RG58C/U	CONN: } Alligator Clips, 2nd END } Steel, cad plated Insulators, Vinyl: Black/Red.
CABLE DESCRIPTION:		
Shielded coax., RG58C/U, Polyethylene insulation. Vinyl jacket, .195" O.D., Nom. Cap. 28.5 pf/ft.		
	MODEL	LENGTH
	1152-C-12	12"
	1152-C-24	24"
	1152-C-36	36"
	1152-C-48	48"
	1152-C-60	60"

MODEL 1152 ★ QUANTITY DISC. CODE **P** NET 7.50

GR-874 TO GR-874



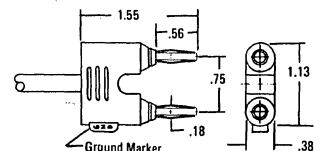
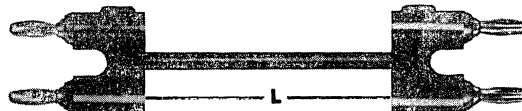
CONN: } GR-874 1st END }	CABLE: Shielded coax., RG58C/U	CONN: } GR-874 2nd END }
CABLE DESCRIPTION:		
Shielded coax., RG58C/U, Polyethylene insulation. Vinyl jacket, .195" O.D., Nom. Cap. 28.5 pf/ft.		
	MODEL	LENGTH
	2316-C-24	24"
	2316-C-36	36"
	2316-C-48	48"
	2316-C-60	60"

MODEL 2316 ★ QUANTITY DISC. CODE **D** NET 29.95

NON-STACKING DOUBLE PLUG BOTH ENDS

This non-stacking cable is excellent for those applications requiring no exposed metal when inserted. There is no side or top stacking.

DOUBLE BANANA PLUG: On 3/4" center. Spring, one-piece beryllium copper, heat treated, nickel plated. Tough thermoplastic molded onto double plug body and cable.



A—CABLE DESCRIPTION
Two Cond. Twisted pair, 18 AWG, Strand. 65 x 36 T.C. Vinyl Insulation, Vinyl Jacket .250" O.D., Nom. Cap. 30 pf/ft.
COLOR: Cable and Double Plug, Gray.

C—CABLE DESCRIPTION
Shielded coax., RG58C/U, Polyethylene insulation, Vinyl jacket, .195" O.D., Nom. Cap. 30 pf/ft.
COLOR: Cable & Double Plug, Black.

E—CABLE DESCRIPTION
Shielded coax. RG59B/U, Polyethylene insulation, Vinyl jacket, .242 O.D. Nom. Cap. 21 pf/ft.
COLOR: Cable & Double Plug, Black.

MODEL 4059

★ QUANTITY DISC. CODE **B**

MODEL	LENGTH
4059-A-12	12"
4059-A-24	24"
4059-A-36	36"
4059-A-48	48"
4059-A-60	60"

NEW

MODEL	LENGTH
4059-C-12	12"
4059-C-24	24"
4059-C-36	36"
4059-C-48	48"
4059-C-60	60"

NEW

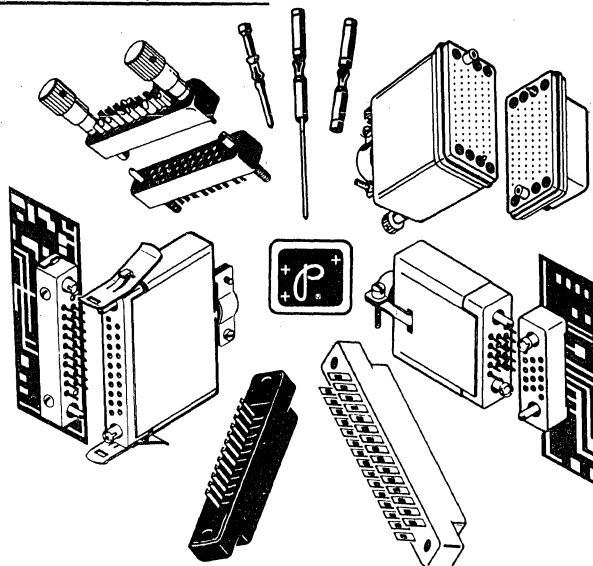
MODEL	LENGTH	NET
4059-E-12	12"	5.45
4059-E-24	24"	5.45
4059-E-36	36"	5.45
4059-E-48	48"	5.45
4059-E-60	60"	5.45

★ Various lengths may be aggregated for best quantity price. Other lengths available to order.



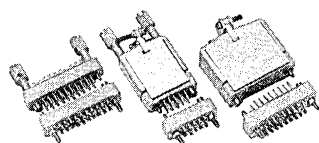
**POSITRONIC
INDUSTRIES, INC.**

Positronics' complete in-house manufacturing and design capabilities offer the best price, product and delivery in the industry. Send for free samples and catalogs. 10 day delivery.



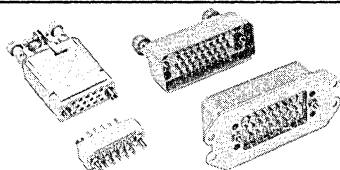
STANDARD CONNECTORS

RECTANGULAR, RACK & PANEL CONNECTORS



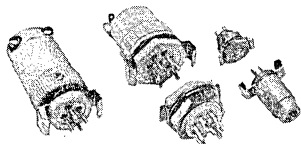
SGM AND SLM, SUB-MINIATURE RECTANGULAR CONNECTORS

Number of Contacts — 5, 7, 9, 14, 20, 26, 29, 34, 44, & 50.
Contacts — Copper Alloy, Gold Plated, 5 & 3 AMP Rated.
Insulator — Glass Filled DAP, SDG-F
Polarization — Guides or Rotating and Fixed Threadlocks, as Desired.
Termination — Solder Cup, Accepts 22 AWG Wire
Hoods — Available for Most Sizes



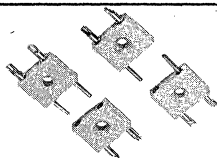
GM AND XGM SERIES, MINIATURE RECTANGULAR

Number of Contacts — 7, 8, 9, 14, 18, 20, 21, 26, 34, 41, & 50.
Contacts — Copper Alloy, Gold Plated, 7.5 AMP Rated.
Insulator — Glass Filled DAP, SDG-F
Polarization — Guides or Rotating and Fixed Threadlocks, as Desired.
Termination — Solder Cup, 20 AWG Wire, and Turret Style.
Hoods & Shells — Available on All Size Connectors. Hoods Have Both Top & Side Cable Opening:
Underwriters' Laboratory Listed*



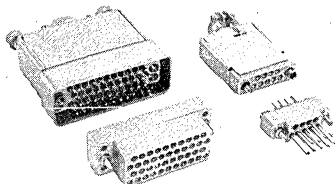
GH & MGH SERIES, MINIATURE AND SUB-MINIATURE HEXAGONAL

Number of Contacts — 4, 5, 7, 9, and 10, Miniature, 3 for Sub-Miniature.
Contacts — Copper Alloy, Gold Plated, 5 & 7.5 AMPS.
Termination — Solder Cup Accepts 20 & 22 AWG Wire
Insulator — Glass filled DAP, SDG-F
Polarization — Contact Placement Permits Proper Engagement.
Hoods — Glass Filled DAP, SDG-F & Aluminum.
 Order With or Without Strain Relief.
Accessories — Vibration Locks, Mounting Nuts and Lock Washers.



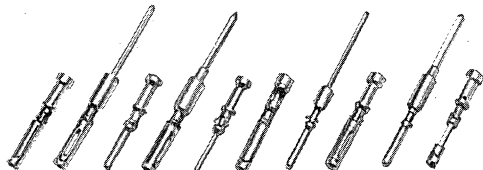
GF SERIES, MINIATURE, SIDE MOUNTING

Number of Contacts — 2 and 4.
Contacts — Copper Alloy, Gold Plated, 7.5 AMP Rated.
Termination — Solder Cup, Accepts 20 AWG Wire, Dip Solder, .025 Dia. for P.C. Mount.
Insulator — Glass Filled DAP, SDG-F and Glass Phenolic.
Polarization — Contact Arrangement Provides Polarization
Optional — Closed Entry Contacts



GMCT SERIES, MINIATURE RECTANGULAR REMOVABLE CONTACT CONNECTORS

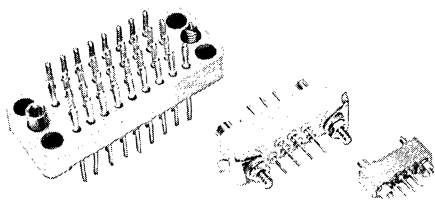
Number of Contacts — 9, 14, 18, 20, 26, 34, 42, 50, 66, 75 & 104.
Removable Contacts — Copper Alloy, Gold Plated, 13 & 7.5 AMP Rated
Contact Termination — Solder, Dip Solder, Crimp and Wire Wrap
 Wire Size, 14 to 30 AWG
Insulator — Glass Filled DAP, SDG-F
Polarization — Guides or Fixed, and Rotating Threadlocks, as Desired
Hoods & Shells — Aluminum, Available for all Sizes.
Underwriters' Laboratory Listed*



CONTACTS, REMOVABLE, SOLDER, DIP SOLDER, CRIMP AND WIRE WRAP

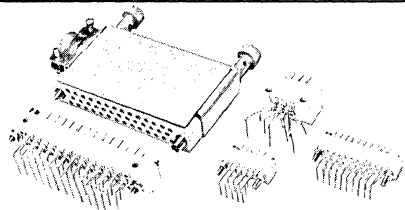
Removable contacts are for use with GMCT Series connector bodies. Contacts are machined copper alloy, gold plated over copper flash. Crimp and solder styles are sized to accept 14 to 30 AWG wire. Wire wrap terminations are .045 and .025 Sq.-dip solder terminations are .026 dia. Crimp and solder styles are available in both .062 and .040 pin diameters. Wire wrap and dip solder are .062 dia. Contacts may be purchased on reels of 2,000 for automatic installation. Contact crimping tools, insertion tools, and removal tools are available from stock.

PRINTED CIRCUIT CONNECTORS



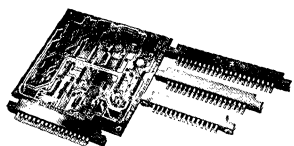
GM AND SGM SERIES, PERPENDICULAR MOUNTED ON P.C. BOARD, PIN OR SOCKET

Number of Contacts — 7, 8, 9, 14, 18, 20, 21, 26, 34, 41, and 50, GM Series.
— 5, 7, 9, 14, 20, 26, 29, 34, 44 and 50, SGM Series.
Contacts — Rated 5 AMPS for GM Series, and 3 AMPS for SGM Series.
Copper Alloy, Gold Plated, Available Pin or Socket Type.
Termination — Dip Solder, .025 Dia. Tails, 4/32, 5/32 and 6/32 Long.
Spacing — .150 Between Contact Spacing for GM Series and .094 between Contacts on SGM Series.
Insulator — Glass filled DAP, SDG-F
Polarization — Guides and Threadlocks, Also May Be Used For Mechanical Mounting of Connector P.C. Board
Hoods — Available for Most Sizes of Mating Cable Connector
Underwriters' Laboratory Listed for GM Series*



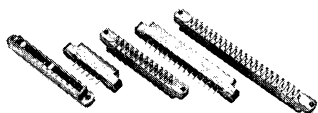
GMPL AND SMPL SERIES, PARALLEL MOUNTED ON P.C. BOARD

Number of Contacts — 7, 8, 10, 14, 16, 19, 24, and 37 for GMPL Series.
— 5, 7, 9, 14, 20, 26, and 29 for SMPL Series.
Contacts — Available in Pin Type Only. 5 AMP Rating for GMPL Series and 3 AMPS for SMPL Series. Copper Alloy, Gold Plated.
Termination — Dip Solder, .040 and .025 Dia. for GMPL, .020 Dia. for SMPL Series
Spacing — .150 Between contact Spacing on Board for GMPL Series, and .094 Between Contacts for SMPL Series.
Insulator — Glass Filled, DAP, SDG-F.
Polarization — Guides and Threadlocks for Positive Alignment and Lock.
Mounting — Holes In Connector Body Allow For Fastener Mounting to P.C. Board. Also May Be Cemented to Board.
Mating Connector — Socket Cable. Select from GM or GMCT Series for GMPL and SGM Series for SMPL.



GDP, GKD, AND GQD SERIES, DOUBLE ROW, CARD RECEPTACLE, .156 CENTERS

Number of Contacts — 10/20, 15/30, 18/36 and 22/44.
Contacts — Bellows, Gold Plated, Phosphor Bronze for GDP Series and Beryllium Copper for GKD and GQD Series. 5 AMP Rated.
Termination — Dip Solder or Eyelet Styles
Insulator — Glass Filled DAP, SDG-F For GDP and GQD Series. Phenolic For GKD Series.
Board Thickness — To Accommodate .054 through .071 P.C. Board Thickness.
Polarization — Between Contact Keys
Mounting — .128 Clearance Holes, Bushings or Threaded Inserts.



GPC SERIES, SINGLE ROW CARD RECEPTACLE, .156 CENTERS

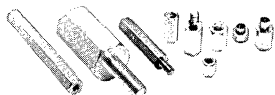
Number of Contacts — 6, 10, 12, 15 and 22.
Contacts — Leaf Type, Gold Plated, Beryllium Copper. 5 AMP Rated.
Termination — Dip Solder or Eyelet Styles
Insulator — Glass Filled Phenolic.
Board Thickness — To Accommodate .054 Through .071 P.C. Board Thickness.
Polarization — In Contact and Between Contact Keys
Mounting — .128 Clearance Holes and Floating Bushings.

ELECTRONIC HARDWARE



HANDLES — INTERNALLY THREADED, ROUND, OVAL FOLDING 90° AND 180°, 45° OFFSET AND SLANT STYLE.

Material — Aluminum, Brass and Stainless Steel
Finish — Anodize, Oxide, Nickel and Passivate.
Lengths — Sixteenth Inch Increments.
Leg Height — 1 Inch Minimum
(Specials Will Be Considered)



SPACERS — CLEARANCE HOLE, THREADED, STANDOFFS, MOUNTING POST, HEX AND ROUND
Material — Aluminum, Brass, Nylon, and Stainless Steel.
Finish — Anodize, Cadmium, Nickel and Passivate.
Lengths — Based on Sixteenth Inch Increments
(Most Sizes, Lengths and Threads are Stocked)



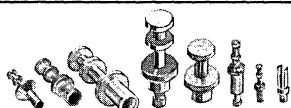
CLINCHON NUTS AND STUDS. FLUSH, STANDOFF, EXTENSION AND STANDARD

Material — Stainless Steel
Finish — Passivate
Diameters — 3/16", 1/4", 5/16" and 7/16".
Panel Thickness — .040, .062, .093, .125, .156, .187, .250 and .312



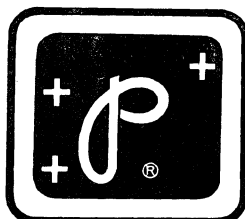
CONTACTS — PIN AND SOCKET, FLEXIBLE CIRCUIT AND PRINTED CIRCUIT

Material — Copper Alloy
Finish — Gold, Electrolytic Tin & Silver.
Termination — Swage, Solder, Crimp, Dip Solder and *Wire Wrap*
(Specials Will Be Considered)



TERMINALS — TURRET, FEED-THRU, BIFURCATED AND HOLLOW, NON-INSULATED
Applications — MIL-T55155, Industrial Standards, Micro-Miniature, Sub-Miniature, Miniature and Standard Sizes. NAS Also Available
Material — Copper Alloy
Finish — Electro-Tin, Silver, Tin-Lead and Hot Solder Dip
Termination — Solder and Swage.

Wire Wrap is Regis. Mark of Garner-Denver Corp.



Representatives and Distributors located in all principal cities.

POSITRONIC INDUSTRIES, INC.

1906 S. Stewart • Springfield, Mo. 65804 USA telephone 417 883-3434 • telex 436445

DUAL CONTACT RELAY TEST SOCKETS

FOR USE WITH

RELAYS, SWITCHES, TRANSFORMERS, LAMPS, TRANSISTORS, HYBRIDS, ETC.

GENERAL INFORMATION

These test sockets are dual-contact (Kelvin type) with two mutually insulated contacts for each terminal. They permit precise contact resistance measurements by the four terminal method.

Qualco is now the sole manufacturer of this line of dual-contact relay test sockets and the model RT-905 Relay Tester.....formerly manufactured by Electronic Engineering Company of California (EECO) and, then, Photologic Company. We are manufacturing all of the old EECO and Photologic part numbers, as well as adding new types

to keep up with today's demands. Some of the new standard types available are dual-contact sockets to fit most of the popular 0.100 in. grid relays, and some of the TO-5 transistor case relays. Also, some of the new DIP packages are available.

The socket line now includes more than 500 different configurations. Since 1960, the AS series sockets have been used by many of the major relay manufacturers, as well as relay users. Areas of use include QC, receiving inspection, production test and evaluation. Environmental testing is being done with the high temperature sockets.

Many standard sockets are maintained in stock for immediate delivery, and all standard sockets are available in two weeks or less. Should you desire a socket not shown on our list....that is, a special....it requires about 30 days and a small set-up charge.

SOCKET FEATURES

- ▶ Available in more than 500 different configurations.
- ▶ Accepts all types of terminals including solder hooks, flattened and pierced, rectangular, round, turret, etc.
- ▶ Permits precise relay contact resistance measurement by the four terminal method.
- ▶ Plug-in testing of any type solder terminal component.
- ▶ 0.1 inch grid dual contact sockets are now available.

SOCKET SPECIFICATIONS

CONTACTS=Gold plated beryllium copper. Two mutually insulated contacts for each terminal on the relay header.

BODY MAT'L= Molded epoxy.

OPERATING= -40 to 175 degrees F (standard)

TEMPERATURE= -100 to 350 degrees F (extra cost).

SERVICE LIFE= More than 30,000 insertions.

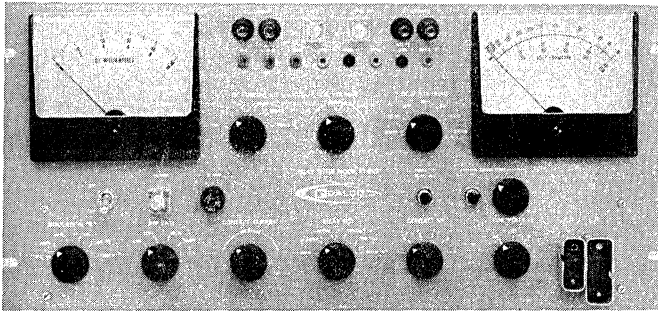
CURRENT HANDLING= Up to ten amperes.

DIELECTRIC STRENGTH= 400 volts.mil.

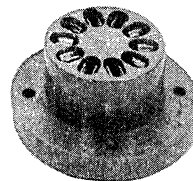
SOME TYPICAL SOCKETS SELECTED FROM MORE THAN 500 DIFFERENT CONFIGURATIONS.

Relay Manufacturer	Manufacturers Part Number and/or Description
Allied Control	WA-6D, 8 pin plugin
Allied Control	WA-6D, 8 pin 1½ inch leads
Babcock Relays	BR10, Term. Code A,C,E,G,plug
Babcock Relays	BR10, Term. Code B, F, hooks
Babcock Relays	BR10, Term. Code D,H, 1½ leads
Bourns, Inc.	3111, Term. Type H, plugin
Bourns, Inc.	3111, Term. Type J, hooks
Bourns, Inc.	3111, Term. Type L, 1½ leads
C. P. Clare	MF Type, 8 pin hook
C. P. Clare	MF Type, 8 pin plugin
C. P. Clare	MF Type, 8 pin, 1½ inch leads
Couch Ordinance	Type 1X, Term. Type B, plugin
Couch Ordinance	Type 1X, Term. Type C, 1½ leads
Couch Ordinance	Type 1X, Term. Type A, hooks
Couch Ordinance	Type 2X, Term. Type A, hooks
Couch Ordinance	Type 2X, Term. Type B, plugin
Couch Ordinance	Type 2X, Term. Type C, 1½ inch
Hi-Spec Electronics	HD Style, 8 pin, 1½ inch
WABCO	Model 900, 5 pin solder hook
WABCO	Model 900, 5 pin plugin
WABCO	Model 900, 5 pin, 1½ inch leads

MODEL RT-905 RELAY TESTER



The RT-905 is a versatile and economical test set for checking moderate quantities of relays. It is ideal for incoming inspection service where tests must be made on many different types and styles of relays with a minimum of set-up time. Measures pull-in and drop-out voltage and current, contact resistance, coil resistance and contact operation. Provides automatic operation of the relay under test with outputs for oscilloscope measurement of contact bounce and pull-in and drop-out times. Also provides switching for insulation resistance tests. Complete specifications are available on request.



TYPICAL DUAL-CONTACT SOCKET

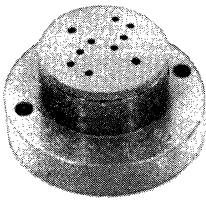
Qualco Part Number: AS-280-10
Mates with .040 inch diameter pin or solder hook terminals, 10-pin, such as Electrical Industries 73SF/40W-HP-10 header or A. W. Haydon A32662.



PHONE OR WRITE
FOR
LISTING OF OVER 500 SOCKETS

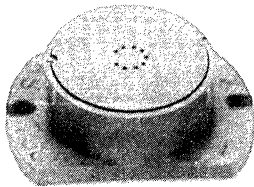
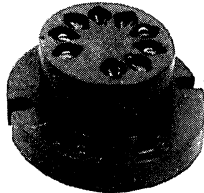
One First Street
P. O. Box 1319K
Los Altos, Calif. 94022
415-964-7666

SOME TYPICAL TEST SOCKETS FROM OUR MORE THAN 500 DIFFERENT CONFIGURATIONS



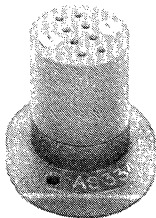
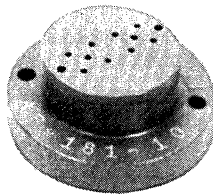
Qualco Part Number: AS-109-8X
Mates with: 8-pin lazy S, .030 dia. straight pin terminals, such as: Electronic Specialties 68 Series.

Qualco Part Number: AS-607-9
Mates with: 9-pin, .040 solder hooks, located every 36 degrees, such as: Fusite S3-800-40H/FP/9A



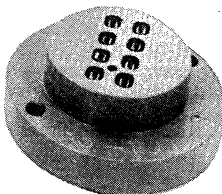
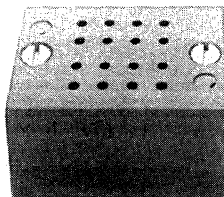
Qualco Part Number: AS-700-9X
Mates with: TO-5 type transistor case, 9-pin, .017 wire leads, 1 1/2 inch long, such as: Teledyne 420.

Qualco Part Number: AS-181-10X
Mates with: 9.2 inch grid, 10-pin, .030 dia. straight pin terminals, such as: Electronic Specialties Series 55R.



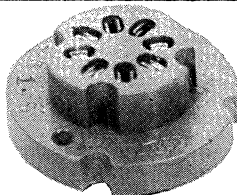
Qualco Part Number: AS-334-8X
Mates with: 0.2 inch grid, 8-pin, .040 wire leads, 1 1/2 inch long, such as: General Electric 3SAF.

Qualco Part Number: AS-1202-16X
Mates with: 0.2 inch grid, 16-pin, .050 dia. straight pin terminals, such as: Babcock BR14-D13.



Qualco Part Number: AS-101-8
Mates with: 0.2 inch grid, 8-pin, .030 dia. in-line solder hooks, such as: Babcock BR-7, header code B.

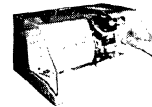
Qualco Part Number: AS-231-8
Mates with: 8-pin, .040 dia. solder hooks, located at 45 degrees, such as: Automatic Electric FP6603.2.



UNIQUE PRODUCTS

FOR THE MICROELECTRONICS INDUSTRY

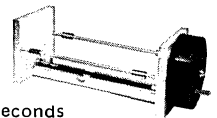
TC BONDER HOODS



Solves Torch Problems Caused By Air Conditioning And Drafts

WAFER-FLAT ORIENTERS

Aligns All Wafer Flats In A Cassette In Less Than 3 Seconds



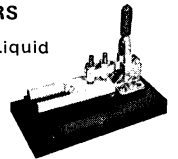
MAGNETIC WRENCH



Prevents Capillary Tip Breakage Due To Dropping ... Can't Fall Out

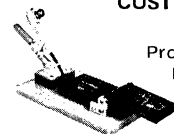
LCD CONTACTORS

Makes Testing Of Liquid Crystal Displays A Snap ... Long-lived, Reliable



CUSTOM CONTACTORS

Provides You A Source For Custom Testers For Hybrids and IC Packages



DIP TEST SOCKETS

Gives Dual Contacts For Each Terminal ... Kelvin-Type Measurements Possible

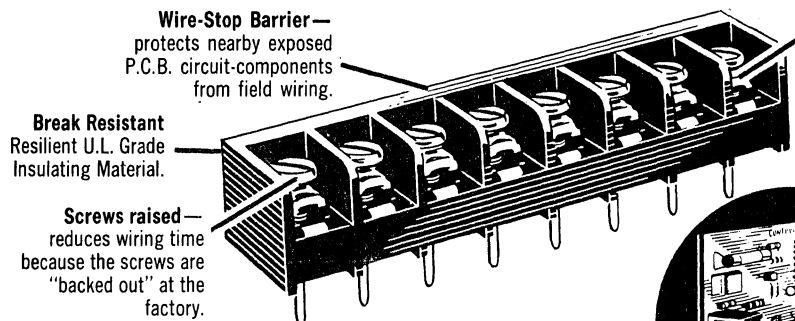


ELECTROLYTIC ETCHERS

Etches Aluminum Automatically With Superior Edge Definition



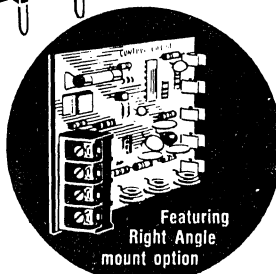
ONE FIRST STREET
P. O. BOX 1319S
LOS ALTOS, CALIF. 94022
415-964-7666

RDI/Reed Devices Inc.**A fresh approach to field wiring . . .****RDI Barrier Terminal Strips**

Captive (travels with screw) Wire Clamps . . . for fast, secure wire connection without auxiliary terminals. Holds two different size wires under one clamp.

3 SIZES: #4 Screws on .325" ctrs.
#6 Screws on .375" ctrs.
#8 Screws on .4375" ctrs.

A choice of standard and right angle mounting offers new packaging design opportunities. Molded of flame retardant polypropylene. Standard terminals are bright-tin plated steel; brass for certain U.L. applications. Standard screws feature captive wire-clamps. Dielectric is 2500V.



Wide Choice of Styles . . .



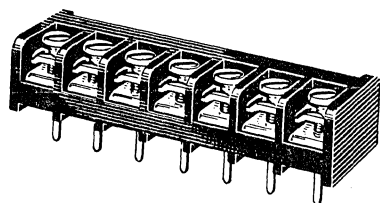
Solderless Wrap

P.C. Pins

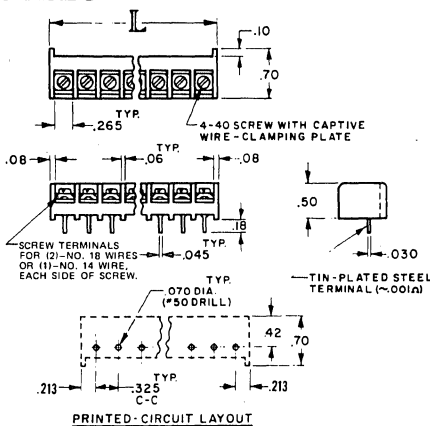
Solder Turret

SPACE SAVING 4PCV SERIES—**P.C. PINS**

#4 Screws on .325" centers.
Rated 10A., 300V.



CSA & UL recognized

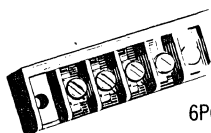
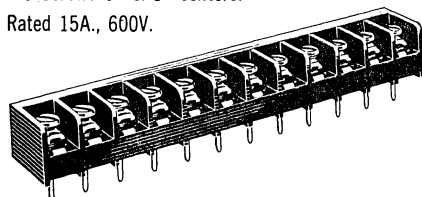


No. of Positions	L Length (Inches)	Catalog Number
4	1.400	4PCV-04
5	1.725	4PCV-05
6	2.050	4PCV-06
7	2.375	4PCV-07
8	2.700	4PCV-08
9	3.025	4PCV-09
10	3.350	4PCV-10
11	3.675	4PCV-11

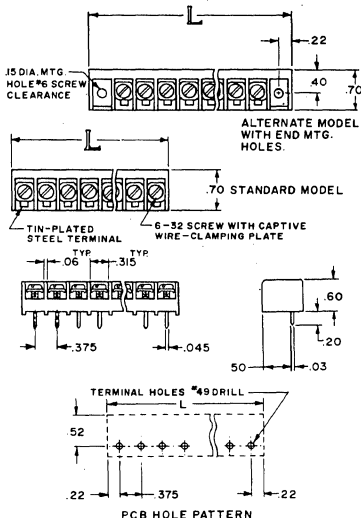
Also available without clamping plates. Consult factory.

UNIVERSAL 6PCV SERIES—P.C. PINS

#6 Screws on 3/8" centers.
Rated 15A., 600V.



CSA & UL recognized

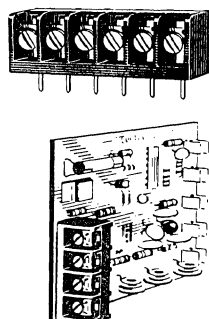


No. of Positions	STANDARD		END MOUNTING	
	L Length (Inches)	Catalog Number	L Length (Inches)	Catalog Number
2	.815	6PCV-02	1.565	6PCV-02-004
3	1.190	6PCV-03	1.940	6PCV-03-004
4	1.565	6PCV-04	2.310	6PCV-04-004
5	1.940	6PCV-05	2.685	6PCV-05-004
6	2.310	6PCV-06	3.060	6PCV-06-004
7	2.685	6PCV-07	3.44	6PCV-07-004
8	3.060	6PCV-08	3.81	6PCV-08-004
9	3.44	6PCV-09	4.19	6PCV-09-004
10	3.81	6PCV-10	4.56	6PCV-10-004
11	4.19	6PCV-11	4.94	6PCV-11-004
12	4.56	6PCV-12	5.31	6PCV-12-004
13	4.94	6PCV-13	5.69	6PCV-13-004
14	5.31	6PCV-14	6.06	6PCV-14-004
15	5.69	6PCV-15	6.44	6PCV-15-004
16	6.06	6PCV-16	6.81	6PCV-16-004
17	6.44	6PCV-17	7.19	6PCV-17-004
18	6.81	6PCV-18	7.56	6PCV-18-004
19	7.19	6PCV-19	7.94	6PCV-19-004
20	7.56	6PCV-20	8.31	6PCV-20-004
21	7.94	6PCV-21	8.69	6PCV-21-004
22	8.31	6PCV-22	9.08	6PCV-22-004
23	8.69	6PCV-23	—	—
24	9.08	6PCV-24	—	—

To specify no-clamp plates, add suffix -.001 to Cat. No., e.g. 6PCV-03-001.

To specify no-clamp plates, substitute -.005 for -.004 in Cat. No. suffix.

#6 Screws on 3/8" centers.
Rated 15A., 600V.

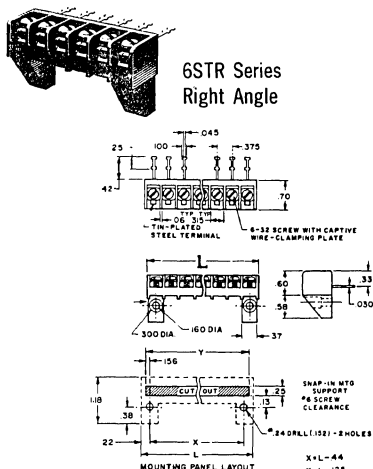


No. of Positions	L Length (Inches)	Catalog Number	No. of Positions	L Length (Inches)	Catalog Number
2	.815	6PCR-02	14	5.31	6PCR-14
3	1.190	6PCR-03	15	5.69	6PCR-15
4	1.565	6PCR-04	16	6.06	6PCR-16
5	1.940	6PCR-05	17	6.44	6PCR-17
6	2.310	6PCR-06	18	6.81	6PCR-18
7	2.685	6PCR-07	19	7.19	6PCR-19
8	3.060	6PCR-08	20	7.56	6PCR-20
9	3.44	6PCR-09	21	7.94	6PCR-21
10	3.81	6PCR-10	22	8.31	6PCR-22
11	4.19	6PCR-11	23	8.69	6PCR-23
12	4.56	6PCR-12	24	9.08	6PCR-24
13	4.94	6PCR-13			

Also available without wire clamp plates on special order. To specify add suffix -001 to Cat. No., e.g. 6PCR-03-001.

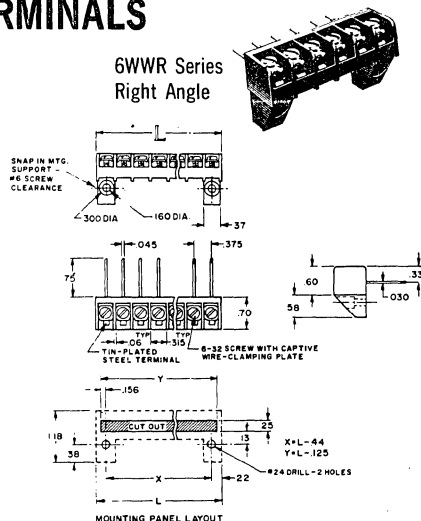
CSA & UL recognized

#6 Screws on 3/8" centers.
Rated 15A.. 600V.



CSA & UL recognized

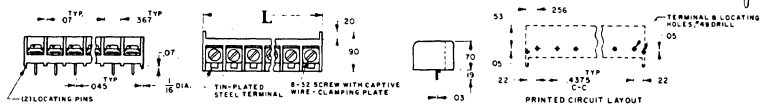
#6 Screws on 3/8" centers.
Rated 15A., 600V.



CSA & UL
recognized

#8 Screws on 7/16" centers.
Rated 20A., 600V.

CSA & UL recognized



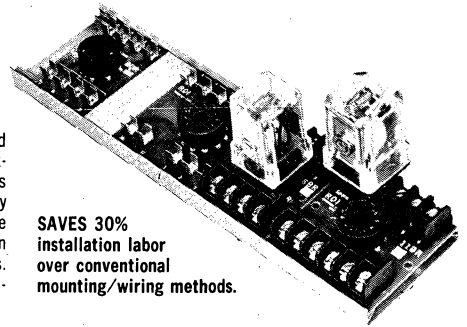
No. of Positions	L Length (Inches)	Catalog Number
3	1.40	8PCV-03
4	1.82	8PCV-04
5	2.26	8PCV-05
6	2.70	8PCV-06

Available without wire clamp plates on special order. To specify, add 001 to Cat. No., e.g. 8PCV-03-001.

RDI/Reed Devices Inc.

SNAPTRACK™ MOUNTING SYSTEM

The SNAPTRACK™ mounting system provides a low cost convenient method for installing plug-in relays, timers and tubes in control equipment. Socket assemblies snap into position along continuous sections of SNAPTRACK, an extruded PVC, non-conductive mounting track, 3-5/32" wide and new 2-7/8" wide. The track may be installed with rivets or screws. Socket assemblies consist of a socket mounted to a G-10 epoxy glass P.C. board with choice of specially designed U.L. grade P.P. barrier type screw terminal blocks or 1/4" quick-connect tabs. The assembly is then wave soldered for circuit reliability. Terminal points are clearly numbered with epoxy ink. Screws are in the raised position and feature captive wire clamps which eliminate need for bending of, or attaching hook or ring terminals to wires. Wired-in 120V, 240V neon lamp to indicate power at coil terminals available as option. Add "1" or "2" to Catalog Number.



**SAVES 30%
installation labor
over conventional
mounting/wiring methods.**

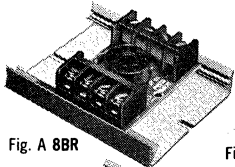


Fig. A 8BR

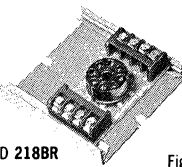


Fig. D 218BR

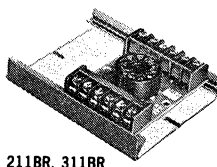


Fig. H 211BR, 311BR

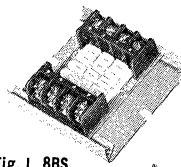


Fig. L 8BS

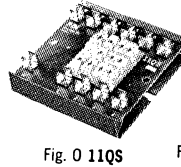


Fig. O 11QS

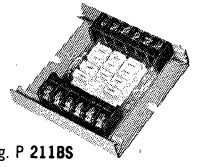


Fig. P 211BS

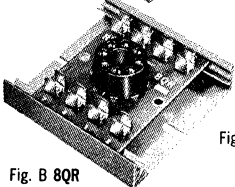


Fig. B 8QR

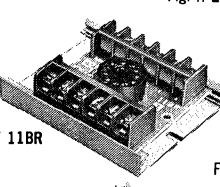


Fig. F 11BR

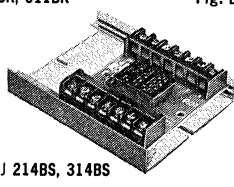


Fig. J 214BS, 314BS

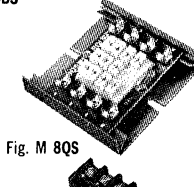


Fig. M 8QS

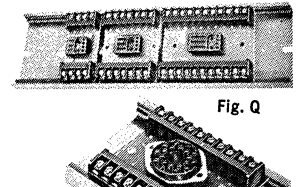


Fig. Q

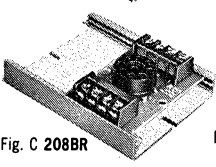


Fig. C 208BR

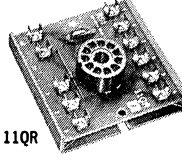


Fig. G 11QR

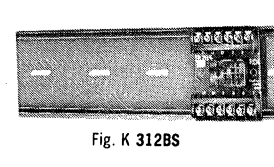


Fig. K 312BS

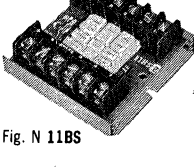


Fig. N 11BS

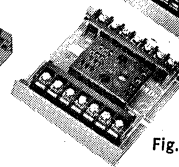


Fig. S

Fig. R

RDI Cat. No.	Fig.	Description	Length (Inches)	Fits Track Series
Octal (8-Pin) Socket Assemblies				
8BR	A	#8-32 screws, 10A, 250 VAC	2	TK
8BR-1	A	Same, 120 VAC Neon Lamp	2	TK
8BR-2	A	Same, 240 VAC Neon Lamp	2	TK
8QR	B	1/4" Double Quick Connect Tabs	2	TK
8QR-1	B	Same except 120 VAC Neon Lamp	2	TK
8QR-2	B	Same except 240 VAC Neon Lamp	2	TK
208BR	C	#4-40 screws, holes for baifs	2	TK
208BR-1	C	Same, 120 VAC Neon Lamp	2	TK
218BR	D	Space Saver — #4-40 screws	1.5	TK
218BR-1	D	Same, 120 VAC Neon Lamp	1.5	TK
228BR	—	Double octal sockets	3	TK
318BR	D	Space Saver — narrow track	1.5	2TK
318BR-1	D	Same except 120 VAC Neon Lamp	1.5	2TK
11-Pin Round Socket Assemblies				
11BR	F	#8-32 screws, 10A, 240 VAC	3	TK
11BR-1	F	Same, 120 VAC Lamp	3	TK
11BR-2	F	Same, 240 VAC Lamp	3	TK
11QR	G	1/4" Double Quick Connect Tabs	3	TK
11QR-1	G	Same, 120 VAC Lamp	3	TK
11QR-2	G	Same, 240 VAC Lamp	3	TK
211BR	H	Space Saver — #4-40 screws	2-1/8	TK
211BR-1	H	Same, 120 VAC Lamp	2-1/8	TK
311BR	H	Space Saver — narrow track	2-1/8	2TK
311BR-1	H	Same, 120 VAC Lamp	2-1/8	2TK
Miniature Relay Socket Assemblies 5A, 150 VAC				
214BS	J	4PDT	2.5	TK
214BS-1	J	Same, 120 VAC Lamp	2.5	TK
312BS	K	Two N.O., two SPDT contact forms	2-1/8	2TK
312BS-1	K	Same, 120 VAC Lamp	2-1/8	2TK
314BS	J	4 PDT	2.5	2TK
314BS-1	J	Same, 120 VAC Lamp	2.5	2TK

RDI Cat. No.	Fig.	Description	Length (Inches)	Fits Track Series
Square Base Socket Assemblies				
8BS	L	2PDT #8-32 screws, 10A, 250 VAC	2	TK
8QS	M	1/4" Double Quick Connect tabs	2	TK
8QS-1	M	Same, 120 VAC Lamp	2	TK
8QS-2	M	Same, 240 VAC Lamp	2	TK
11BS	N	3PDT, #8-32 screws, 10A, 250 VAC	3	TK
11BS-1	N	Same, 120 VAC Lamp	3	TK
11BS-2	N	Same, 240 VAC Lamp	3	TK
11QS	O	1/4" Double Quick Connect tabs	3	TK
11QS-1	O	Same, 120 VAC Lamp	3	TK
11QS-2	O	Same, 240 VAC Lamp	3	TK
211BS	P	Space Saver #4-40 screws	2-1/8	TK
211BS-1	P	Same, 120 VAC Lamp	2-1/8	TK
Sub-Miniature Relay Socket Assemblies 5A, 150 VAC				
202BS	Q	2PDT	1.5	TK
202BS-1	Q	Same, 120 VAC Lamp	1.5	TK
204BS	Q	4PDT	2.5	TK
204BS-1	Q	Same, 120 VAC Lamp	2.5	TK
206BS	Q	6PDT	3-3/4	TK
206BS-1	Q	Same, 120 VAC Lamp	3-3/4	TK
Specialty Assemblies				
220BR	R	20-Pin Round	3.5	TK
220BR-1	R	Same, 120 VAC Lamp	3.5	TK
414BS	S	Telephone Type 4PDT	2.5	TK
414BS-1	S	Same, 120 VAC Lamp	2.5	TK
416BS	S	Telephone Type 6PDT	2-13/16	TK
416BS-1	S	Same, 120 VAC Lamp	2-13/16	TK

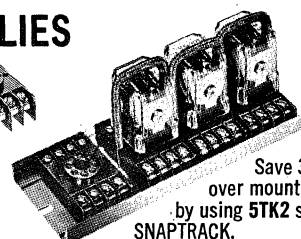
SNAPTRACK™ MOLDED SOCKET ASSEMBLIES

FEATURES

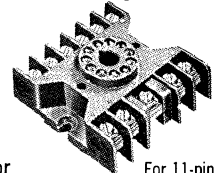
- **Rugged.** Molded of break and chip resistant U.L. recognized Lexan.
- **Positive Contact.** Phosphor bronze socket contacts.
- **Fast Wiring.** Screws feature captive wire-clamp plates, eliminate need for crimp-on terminals.
- **Versatile Mounting.** Mount singly or gang via optional 5TK2 series SNAPTRACK.

Rated 10 Amp., 300 Volts. Wire Range: 12 through 20 AWG.

For octal
relays and timers.
SM8-C (Screws
w/wire-clamps)
SM8-A w/binder
head screws.



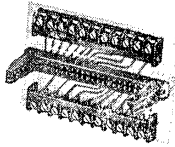
Save 30% labor
over mounting singly
by using 5TK2 series
SNAPTRACK.



For 11-pin
relays and timers.
SM11-C.
Screws have wire clamps.

EDGE CONNECTOR ASSEMBLIES**22PC**

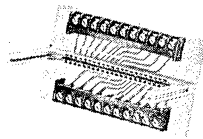
For single-sided straight cards. Utilizes Amphenol type 143 22-pin connector.



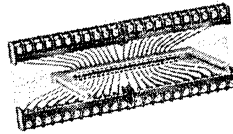
Designed to conveniently panel mount 22-pin single and double-sided printed circuit cards with pins on .158" ctrs. Convert edge connectors to screw terminal wiring. The assemblies mount into SNAPTRACK mounting channel which also serve to insulate the board.

22PCB

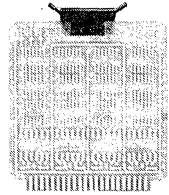
For single-sided, notched cards. Utilizes Elco type 6022 22-pin connector.

**44PCB & 44PCA**

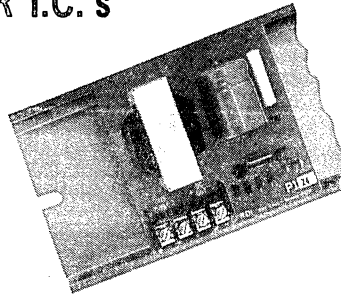
For double-sided, notched cards with 44 output pins. Utilizes Elco type 6022 connector. 44PCB has terminals numbered thru 44; 44PCA, A thru Z and 1 thru 22.

**KLUGE CARD**

A 22-pin universal G10 pcb compatible with the 22PCB assembly. Ideal for one-of-a-kind circuits requiring up to 12 I.C.'s (14-pin DIP) and 8 transistors. Handle included. Size: 4.5" w x 4.5" h x 1/16" th. Cat. No. KB22.

**D.C. POWER SUPPLIES FOR I.C.'s**

- DRIVE I.C.'s, REED RELAYS
- REGULATED
- MOUNT ON SNAPTRACK MOUNTING PANEL



Designed to drive small I.C. interface circuits, reed relays, photoelectric controls, etc. requiring regulated D.C. to 1.5 watts. Built-in overload and short circuit protection. Snaps into TK2 series SNAPTRACK for fast installation.

SPECIFICATIONS

Input: 105-135 VAC, 50/60 Hz., 80mA.
Regulation: $\pm 1\%$ for 10% line/load.
Overload Protection: Twice current.
Size: 3 x 3 x 2-7/8" high.

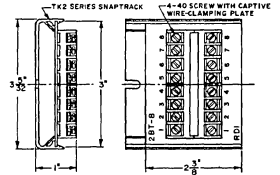
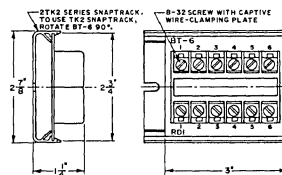
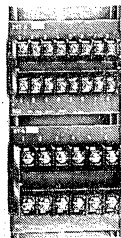
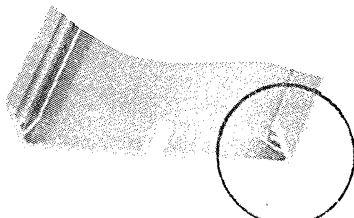
ORDERING INFORMATION

VOLTS DC $\pm 5\%$	OUTPUT AMPS (Max.)	Surge Current	RDI Cat. No.
5	250mA	300mA	P105
6	250mA	300mA	P106
10	125mA	175mA	P110
12	125mA	175mA	P112
15	75mA	90mA	P115
24	63mA	75mA	P124

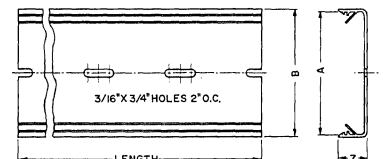
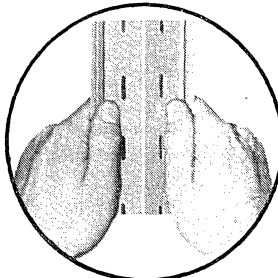
SNAPTRACK™ TERMINAL BLOCKS

Designed to snap into either of two SNAPTRACK widths, the BT series offer a choice of two screw sizes to fit all wire sizes from 22 to 12 AWG. Captive wire-clamp plates provide fast, secure connection without need for auxiliary terminals.

Terminal strips are wave soldered to a G-10 epoxy glass pcb. Space is provided for terminal identification between strips. BT-6 provides 6 pairs of terminals utilizing #8-32 screws. 2BT-8 provides 8 pairs of terminals utilizing #4-40 screws. See Page 6 to order SNAPTRACK mounting channel.

**SNAPTRACK™ MOUNTING CHANNEL**

Patented Wings hold pcb securely.



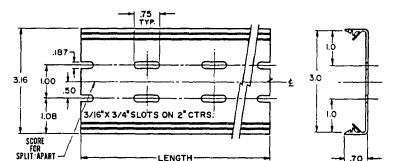
TK2, 2TK2 & 3TK2.

SNAPTRACK is a non-conductive, rigid extruded PVC chassis for mounting custom circuit boards. Available in a variety of fixed widths and a new Split-Apart model for wider pcb's, SNAPTRACK mounts to panels quickly with rivets or screws. P.C. Boards are simply snapped-in from front and are held securely via patented wings which also act as shock absorbers when pcb's are flexed. P.C.B.'s can be quickly removed from SNAPTRACK for field service. Slots on 2-inch centers are provided for fast, easy installation.

ORDERING INFORMATION

Dim. A Nominal P.C.B. Width (inches)	Dim. B Overall Track Width (inches)	RDI Cat. No. (48" lg.)
2.75	2.90	TK2-48
3.00	3.16	TK2-48
3.25	3.40	3TK2-48
Split-Apart		4TK2-48

To specify lengths of 6, 12, or 24 inches, substitute 6, 12, or 24 in place of "48".
Example: TK2-24 is 24 inches long.

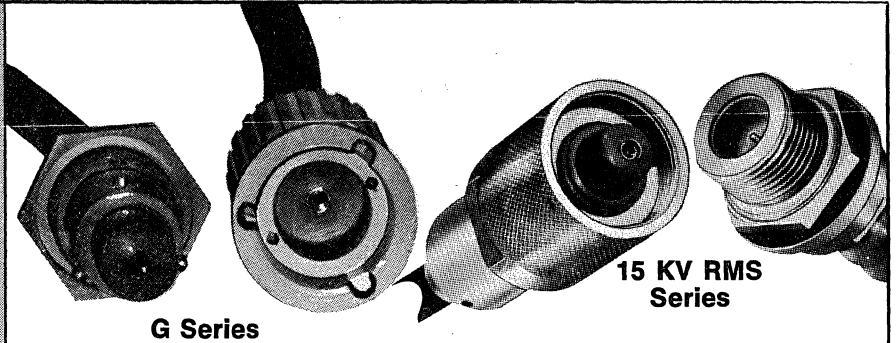


4TK2-48

Rowe Coaxial

Connectors and Cable Assemblies

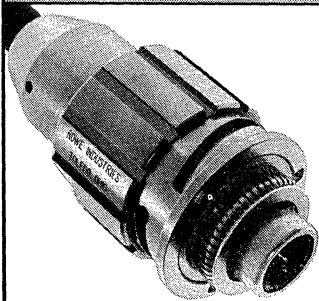
Employ high-voltage, corona-free design techniques. They are ideal for use in pulse as well as DC voltage applications, through 150 KV. A wide variety of molded-on or field assembly types are offered. Available in quick disconnect or screw couplings.



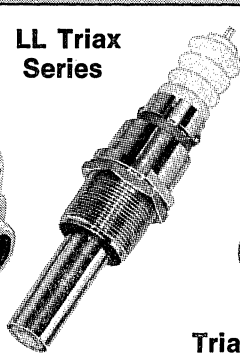
G Series

15 KV RMS
Series

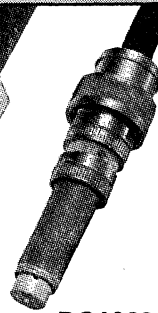
LL Triax
Series



RC1072



RG8
Triax Series



RC1068

Rowe Triaxial

Connectors and Cable Assemblies

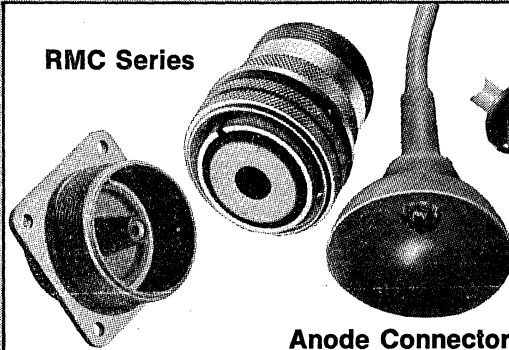
A full spectrum of both molded-on and field assembly types are available for a wide variety of cable types such as the triaxial version of RG-8, up through and including specialized construction for operation in excess of 100 KV.

Rowe Single Contact

Connectors and Cable Assemblies

Offered is an extensive listing of single contact high-voltage assemblies, which include anode connectors, in-line disconnects and others which are used unshielded to solve your simple high-voltage interconnection problems.

RMC Series



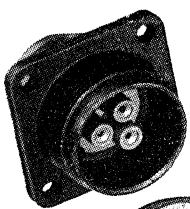
In-Line
Disconnects

Anode Connectors

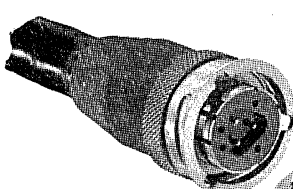
Rowe Multiple Contact

Connectors and Cable Assemblies

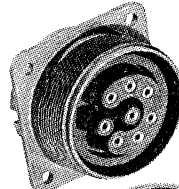
Offer contact arrangements from one to thirty contacts, panel receptacles, cable plugs, rack and panel combinations, in-line types and many others. Both field assemblies and molded-on types are standard in this line.



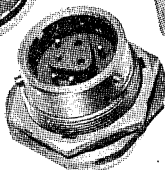
RMC
Series



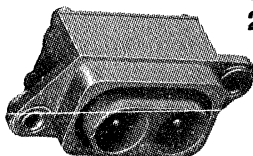
4RC3147



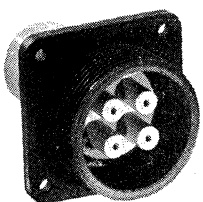
RMC
Series



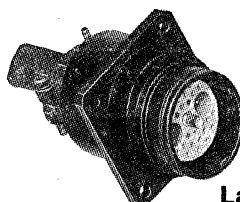
2RC3146



Rack and Panel Connector



RMC Series

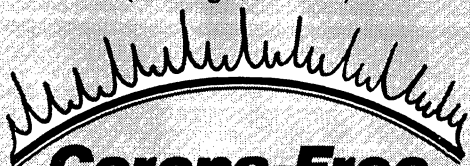


Lanyard Series

Rowe Industries has designed and developed over 700 specialized interconnections for which tooling is available.

World's Leader in High-Voltage

(through 200 KV)



Corona-Free CONNECTORS and CABLE ASSEMBLIES

"FOREMOST IN SPECIALIZED INTERCONNECTIONS"

ROWE INDUSTRIES



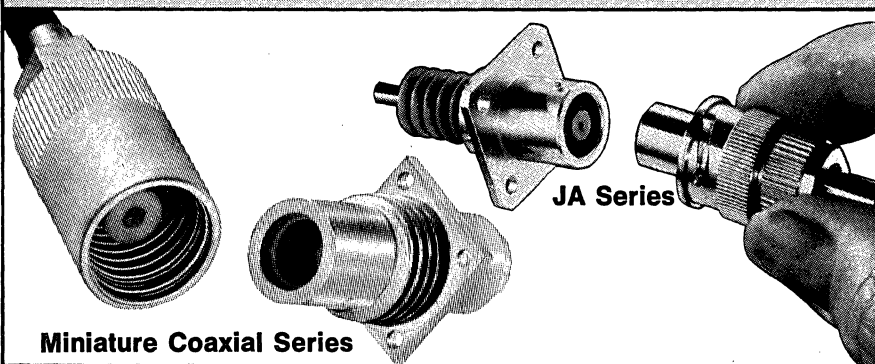
6100 BENORE ROAD, TOLEDO, OHIO 43612
PHONE (419) 729-9761. TWX 810-442-1734
or contact rep (listed under "Sales Offices")
(West Coast, phone (213) 235-2070)

DESIGN — DEVELOPMENT — MANUFACTURING

PHONE NOW

(419) 729-9761

FOR YOUR COMMERCIAL, INDUSTRIAL
OR MILITARY DESIGN NEEDS



Miniature Coaxial Series

JA Series

Rowe Miniature Coaxial Connectors and Cable Assemblies

Employ the same high-voltage design techniques as the coaxial series, but are much smaller in size for use in restricted spaces. Available in quick disconnect and screw couplings (the JA Series can be adapted to such standard type cables as RG 58 and RG 59).

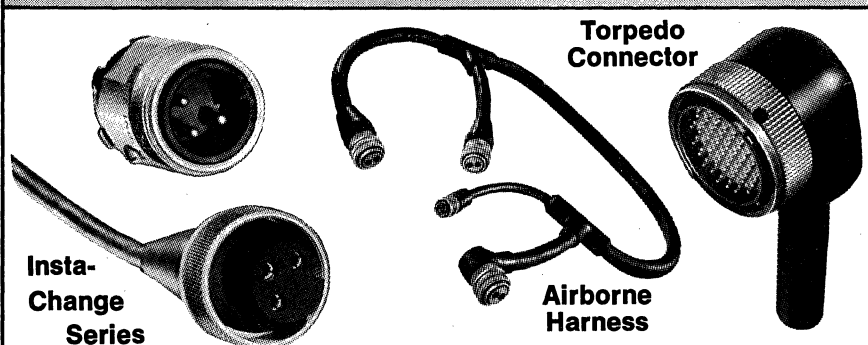
Rowe Subminiature Coaxial Connectors and Cable Assemblies

Are ideally suited for use where space is at a premium. Employing the traditional Rowe high capability features, the subminiature sizes offer unusually high voltage operating capabilities, through 20 KV.



Subminiature Coaxial Series

Pancake Series



Insta-Change Series

Torpedo Connector

Airborne Harness

Rowe Low-Voltage, Molded-On Connectors and Cable Assemblies

For use in severe environments. We can mold standard connectors to cable for an environmental seal and provide a molded strain relief. Our exclusive Insta-Change series was designed for factory, mining, nuclear and oil well use.

● Design ● Development ● Manufacturing ● Testing of

"FOREMOST IN HIGH VOLTAGE CONNECTORS"

ROWE INDUSTRIES



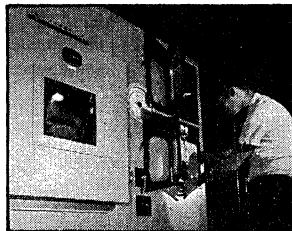
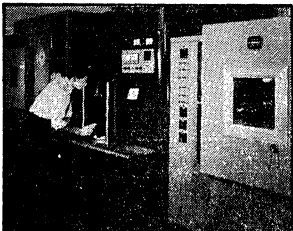
6100 BENOIRE ROAD, TOLEDO, OHIO 43612
PHONE (419) 729-9761. TWX 810-442-1734
or contact rep (listed under "Sales Offices")
(West Coast, phone (213) 235-2070)

Specialized Connectors and Cable Assemblies

Since 1947, Rowe Industries has been foremost in the design and manufacture of high voltage, corona free and other specialized connectors and cable assemblies. So far, Rowe engineers have expanded the state of the art by designing and developing over 700 specialized interconnections for which tooling is available.

Modern facilities coupled with excellent engineering capabilities provide you with the fastest, most exacting and up-to-date specifications in the industry. Production equipment operated by skilled personnel provide you with quality components to exacting specifications.

Call us today — your specialized problem is our specialized challenge.



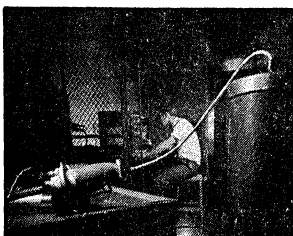
World's Leader in HIGH-VOLTAGE, CORONA-FREE INTERCONNECTIONS



ELECTRIC TESTING: Dielectric strength, Corona inception/extinction, Contact resistance, Continuity, RFI/EMI, DIT-MCO random access testing.

MECHANICAL TESTING: Insertion/withdrawal forces, Pressure/vacuum tests, Shock/vibration, X-Ray.

ENVIRONMENTAL TESTING: Altitude, Temperature/humidity, Corrosive atmospheres, Hydrostatic pressure ... and many other related aspects.



APPLICATIONS:

Instrumentation	Avionics	Power Supply
Pulse Voltage	Laser	Flash Tubes
RF Energy	Radar	Display Systems
X-Ray Equipment	Deep Space	Atom Smashers

● Send for Rowe technical literature. See complete list and mail coupon on the third page of our advertising in the wire section.

A Prime Source of LOW-VOLTAGE, MOLDED-ON INTERCONNECTIONS

Rowe Industries can supply any type of connective device with molded, crimped or soldered type terminations.

APPLICATIONS:

Underwater Instrumentation
Extreme Environments
High-Pressure Feed-Thru

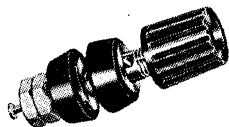
Nuclear Reactor
Deep Submergence
Hydrophone

Oil Well
Sonar
Mining

Phone Rowe (419-729-9761) for information

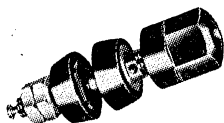
5-way® BINDING POSTS

5 WAYS TO CONNECT • GOLD-PLATED BRASS PARTS • RANGE OF COLORS



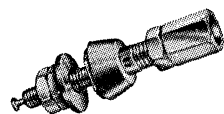
FLUTED NUT TYPES

Plastic parts of standard (not miniature) size types molded of Lexan polycarbonate resin; brass parts are gold-plated. Rated for 30 amperes, 1000 volts working. Nickel-plated brass types available on special order.



HEX NUT TYPES

Rated for 30 amperes, 1000 volts working. Brass parts are gold-plated; plastic parts are of nylon compounded to meet military specifications MIL-P-20693A, Type IV. Nickel-plated brass types available on order.



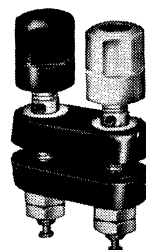
GROUNDING TYPE

For making rapid connections to ground. Made of finely machined brass nickel-plated and polished. Panel grounding collar frozen to shaft has "D" type shoulder for locking in keyed panel hole.



MINIATURE TYPES

Fluted nut design only. Rated for 15 amperes, 1000 volts working. Gold-plated brass parts; nylon plastic parts compounded to meet military specification MIL-P-20693A, Type IV. Types with nickel-plated brass available also.



DOUBLE ASSEMBLY TYPES

For instrument and equipment panels requiring binding posts mounted on 3/4" centers. Rated for a current capacity of 30 amperes and a working voltage of 1000 volts. Brass parts are gold-plated; panel insulators in black only. Rugged, self-contained assembly makes mounting more accurate,

faster and easier than two individual binding posts and gives maximum strength where connections are frequently made.

STYLE	TYPE
BINDING POSTS	
FLUTED NUT — STANDARD	DF31*
HEX NUT — STANDARD	DF30*
GROUNDING — ALL METAL	GP30NC
FLUTED NUT — MINIATURE	DF21*

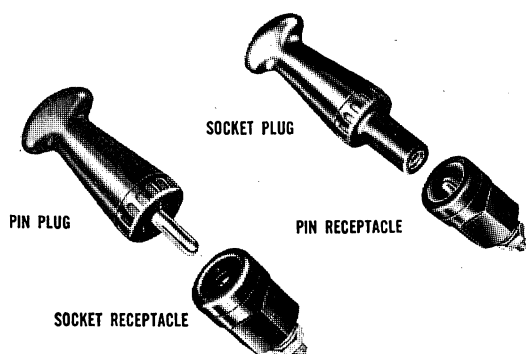
STYLE	TYPE
DOUBLE ASSEMBLY TYPES	
BLACK & RED HEX NUTS	DF30-2-BRC

*Add desired color suffix to series designation number:

BC (black), BLC (blue), RC (red), WTC (white),

YC (yellow), GNC (green). For example: DF21BLC.

SUPERCON® ELECTRICAL CONNECTORS



Nylon plastic parts; gold-plated brass current-carrying parts. Wiring connections to the same plug can be either soldered or solderless. Plug cable-fastening screws permit a wide range of cable sizes. Plug grips are of a simple, two-piece threaded construction for quick assembly. All receptacle plastic parts are molded of the same color to permit more rapid and accurate circuit identification front and back of panel when installed. The 25, 50 and 100 ampere types are listed by Underwriters' Laboratories, Inc.

AMPERES	PIN PLUGS TYPE†	SOCKET RECEPTACLES TYPE†	SOCKET PLUGS TYPE†	PIN RECEPTACLES TYPE†
25	PP25G	RS25G	PS25G	RP25G
50	PP50G	RS50G	PS50G	RP50G
100	PP100G	RS100G	PS100G	RP100G
250	PP250G	RS250G	PS250G	RP250G

†Add desired color suffix to series designation number: B (black), BL (blue), R (red), WT (white), Y (yellow), GN (green). For example: PS25GNWT.



THE SUPERIOR ELECTRIC COMPANY

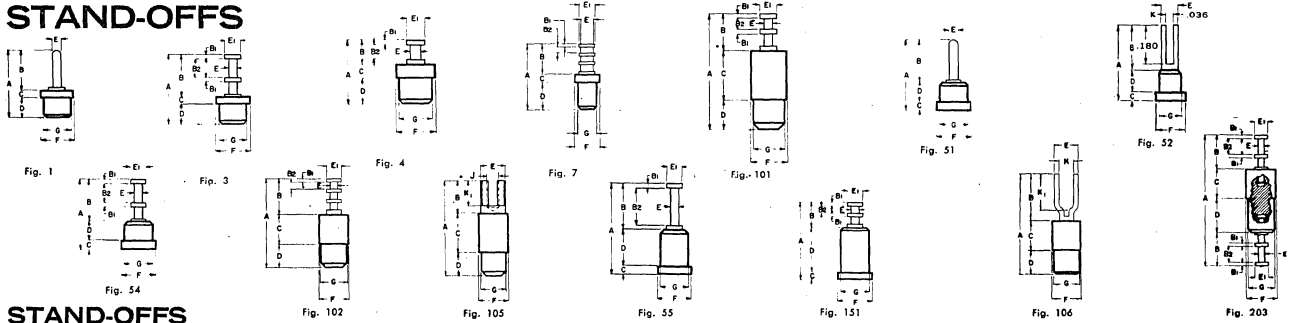
1000 MIDDLE STREET • BRISTOL, CONN. 06010 • PHONE: (203) 582-9561



SEALECTRO PRESS-FIT® TEFLON* TERMINALS

*Reg. Trademark, E. I. Du Pont de Nemours & Co.

STAND-OFFS



STAND-OFFS

Fig.	Old Part No.	New Part No.	Tool No.	Capacitance mmf	V _{RMS} 60 Hz		A	B	B ₁	B ₂	C	D	E Dia.	E ₁ Dia.	F Dia.	+ .002 - .000 G Dia.
					Nominal Rating	Flashover Sea Level										
1	ST-SM-1	013-1000	B-8	0.45	1000	3000	.350	.210			.040	.100	.040		.172	.148
1	ST-SM-1C2	013-1001	B-8	0.50	1000	3000	.410	.210			.040	.160	.040		.172	.148
1	ST-SM-1L10	013-1009	B-8	0.50	1000	3000	.590	.450			.040	.100	.040		.172	.148
1	ST-SM-1L12	013-1010	B-8	0.40	1000	3000	.460	.320			.040	.100	.040		.172	.148
1	ST-SM-2C4	013-1014	B-8	0.40	1000	3000	.370	.210			.050	.110	.040		.172	.148
1	ST-SM-3C1-L6	003-1004	B3-10	0.35	750	2500	.213	.093			.031	.089	.040		.125	.093
1	ST-SM-7	003-1007	B3-1	0.30	1000	3000	.262	.147			.040	.075	.040		.125	.093
1	ST-SM-7L2	003-1008	B3-1	0.40	1000	3000	.299	.174			.040	.085	.040		.125	.093
1	ST-SM-8	013-1023	B-8	0.45	1000	3000	.370	.210			.040	.120	.040		.172	.148
1	ST-SM-16	003-1009	B3-1	0.60	1000	3000	.350	.210			.040	.100	.040		.125	.093
1	ST-SM-19	013-1028	B-8	0.45	1000	3000	.365	.193			.040	.132	.040		.172	.148
3	ST-MM-10TUR	003-2000	B3-2C	0.40	1000	3000	.310	.170	.020	.060	.040	.100	.030	.060	.125	.093
3	ST-SM-1TUR	013-2001	B-8	0.40	1000	3000	.350	.210	.020	.100	.040	.100	.040	.080	.172	.148
3	ST-SM-1TUR-C2	013-2003	B-8	0.50	1000	3000	.375	.210	.020	.100	.040	.125	.040	.080	.172	.148
3	ST-SM-1TUR-C4	013-2004	B-8	0.40	1000	3000	.360	.210	.020	.100	.040	.110	.040	.080	.172	.148
3	ST-SM-16TUR	003-2003	B3-2B	0.60	1000	3000	.350	.210	.020	.100	.040	.100	.040	.080	.125	.093
3	ST-SM-19TUR-C2	013-2007	B-8	0.55	1000	3000	.500	.210	.020	.100	.040	.250	.040	.080	.172	.148
3	ST-SM-21TUR	013-2009	B-18	0.40	1000	3000	.375	.210	.020	.100	.040	.125	.040	.080	.218	.185
3	ST-SM-22TUR	013-2011	B-8	0.50	1700	4500	.428	.210	.020	.100	.093	.125	.040	.080	.172	.148
3	ST-SM-22TUR-C2	013-2013	B-8	0.30	1700	4500	.461	.210	.020	.100	.093	.158	.040	.080	.172	.148
3	ST-SM-25TUR	013-2016	B-8	0.50	1000	3000	.334	.154	.020	.047	.040	.140	.046	.093	.172	.148
3	ST-SM-25TUR-C2	013-2017	B-8	0.35	1000	3000	.254	.154	.020	.047	.040	.060	.046	.093	.172	.148
3	ST-SM-29TUR	013-2019	B-8	0.50	1000	3000	.455	.250	.020	.093	.040	.165	.040	.093	.172	.148
3	ST-SM-29TUR-C2	013-2020	B-8	0.60	1000	3000	.540	.250	.020	.093	.040	.250	.040	.093	.172	.148
4	ST-SM-352TUR	013-2041	B-8	0.30	1000	3000	.250	.110	.020	.080	.040	.100	.040	.080	.172	.148
7	ST-SM-42TUR	003-2004	B3-2A	0.40	1000	3000	.334	.153	.015	.031	.041	.140	.068	.078	.125	.093
*101	ST-210	003-2007	B3-A	0.50	1500	4000	.346	.156	.020	.046	.103	.087	.046	.093	.125	.104
*101	ST-230L2	013-2045	B9-3	0.50	2500	6000	.482	.250	.020	.093	.125	.110	.040	.093	.172	.148
*101	ST-250	013-2046	B12	0.30	2500	6000	.431	.156	.020	.046	.125	.150	.046	.093	.187	.165
*101	ST-250L2	013-2048	B12	0.50	2500	6000	.522	.246	.020	.093	.125	.150	.040	.093	.187	.165
*101	ST-250L3	013-2049	B12-2	0.60	2000	5000	.556	.281	.031	.093	.125	.150	.046	.125	.187	.165
*101	ST-250L4	013-2051	B12-2	0.60	2000	5000	.556	.281	.031	.093	.125	.150	.062	.125	.187	.171
*101	ST-250L5	013-2053	B12	0.50	2500	6000	.485	.210	.020	.100	.125	.150	.040	.080	.218	.171
*101	ST-1000	013-2058	B13	0.20	2800	6700	.493	.156	.020	.046	.187	.150	.046	.093	.187	.165
*101	ST-1000C1	013-2059	B13	0.20	2800	6700	.493	.156	.020	.046	.187	.150	.046	.093	.187	.171
*101	ST-1000L2	013-2060	B13	0.30	2800	6700	.583	.246	.020	.093	.187	.150	.040	.093	.187	.165
*101	ST-1000L2-C1	013-2061	B13	0.35	2800	6700	.584	.250	.020	.093	.187	.147	.040	.093	.187	.171
*101	ST-1000L3	013-2062	B13-3B	0.65	2500	6000	.618	.281	.031	.093	.187	.150	.046	.125	.187	.165
*101	ST-1050DTUR	023-2004	B-24	0.30	2800	6700	.649	.250	.020	.093	.187	.212	.050	.093	.250	.204
*101	ST-1175L2	013-2065	B9-3	0.30	3200	7500	.598	.250	.020	.093	.187	.165	.040	.093	.172	.148
*101	ST-1500	013-2069	B12-3	0.20	3100	7300	.556	.156	.020	.046	.250	.150	.046	.093	.187	.165

* Plating: Silver

Fig.	Old Part No.	New Part No.	Tool No.	Capacitance mmf	V _{RMS} 60 Hz		A	B	B ₁	B ₂	C	D	E Dia.	E ₁ Dia.	F Dia.	+ .002 - .000 G Dia.	J Dia.	K	K ₁
					Nominal Rating	Flashover Sea Level													
102	ST-1150	013-2064	B12	0.60	2500	6000	.555	.218	.020	.046	.187	.150	.046	.093	.187	.171			
105	ST-250SL	013-3005	B11	0.70	2000	5000	.478	.203			.125	.150	.148		.187	.171	.078		.156
105	ST-1000SL	013-3007	B11	0.70	2300	5600	.540	.203			.187	.150	.148		.187	.171	.078		.156
105	ST-1000SL-1L	013-3008	B11	0.70	2300	5600	.540	.203			.187	.150	.148		.187	.171	.046		.156
105	ST-1500SL	013-3013	B11	0.45	2700	6500	.603	.203			.250	.150	.148		.187	.171	.078		.156
105	ST-2000SL	013-3016	B11	0.30	4200	9500	.753	.203			.400	.150	.148		.187	.171	.078		.156
106	ST-35SML	013-3019	B11-C	0.85	2000	5000	.633	.296			.187	.150	.150		.187	.171		.090	.234
151	RST-1	014-2020	B18-1B	0.40	3000	7000	.487	.154	.020	.047	.046	.287	.047	.094	.218	.185†			
151	RST-1L2	014-2021	B18-1B	0.20	3000	7000	.583	.250	.020	.094	.046	.287	.047	.094	.218	.185†			
203	DST-1000C2	015-2003	B13	0.20	2000	5000	.819	.210	.020	.100	.187	.212	.040	.080	.187	.148			
203	DST-SM-105TUR*	015-2000	B17	0.20	1000	3000	.640	.210	.020	.100	.050	.170	.040	.080	.205	.169			

Standard Plating: Silver. * Plating: Tin or Tin/Lead. † ±.001.

REVERSE STAND-OFFS

Fig.	Old Part No.	New Part No.	Tool No.	Capacitance mmf	V _{RMS} 60 Hz		A	B	B ₁	B ₂	C	D	E Dia.	E ₁ Dia.	F Dia.	+ .002 - .000 G Dia.
					Nominal Rating	Flashover Sea Level										
51	RST-SM-1	014-1000	B8-X1	0.40	1200	3500	.350	.210			.040	.100	.040		.172	.148
51	RST-SM-1C6	014-1004	B8-X1	0.40	2000	5000	.500	.210			.040	.250	.040		.172	.148
51	RST-SM-3-C1	004-1001	B-3-B	0.40	500	2000	.250	.130			.031	.089	.040		.125	.093
51	RST-SM-16	004-1007	B-3-2X	0.40	500	2000	.350	.210			.040	.100	.040		.125	.093
52	RST-SM-3SL	004-3000	B3-2X	0.50	500	2000	.350	.210			.040	.100	.080		.125	.104
54	RST-MM-10TUR	004-2000	B1-2	0.40	500	2000	.310	.170	.020	.060	.040	.100	.030	.060	.125	.093
54	RST-SM-1TUR	014-2001	B8-X-1	0.40	1200	3500	.350	.210	.020	.100	.040	.100	.040	.080	.172	.148
54	RST-SM-21TUR	014-2007	B18	0.30	1700	4500	.375	.210	.020	.100	.040	.125	.040	.080	.218	.185
54	RST-SM-25TUR-C4	014-2009	B8-X-1	0.40	1500	4000	.296	.156	.020	.046	.040	.100	.046	.093	.172	.148
54	RST-SM-38TUR	014-2015	B10-X	0.40	1500	4000	.405	.210	.020	.100	.040	.155	.040	.080	.188	.171
55	RST-SM-31TUR	014-2011	B8-X-1	0.50	1700	4500	.455	.227	.020	.187	.040	.187	.040	.080	.172	.148



SEALECTRO

PRESS-FIT®

TEFLON* TERMINALS

*Reg. Trademark, E. I. Du Pont de Nemours & Co.

FEED-THRU

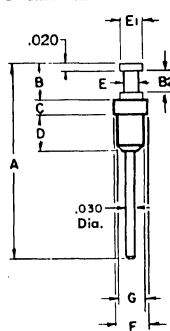


Fig. 302

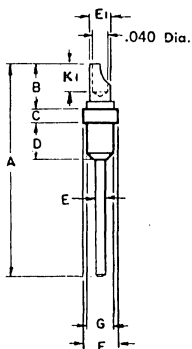


Fig. 305

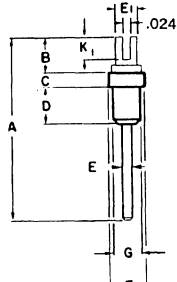


Fig. 303

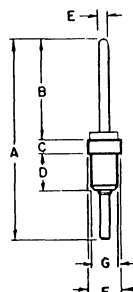


Fig. 306

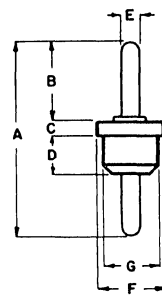


Fig. 351

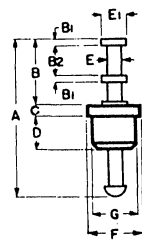


Fig. 360

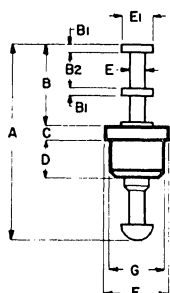


Fig. 362

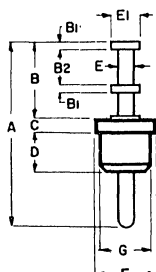


Fig. 363

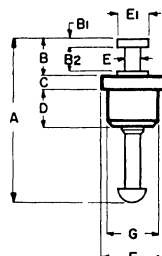


Fig. 364

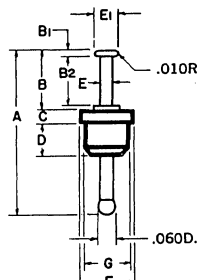


Fig. 364A

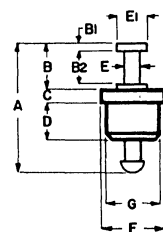


Fig. 365

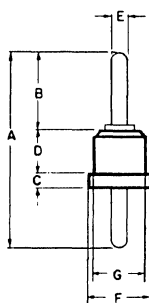


Fig. 452

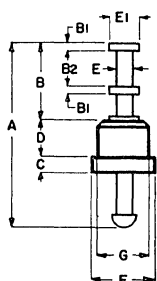


Fig. 454

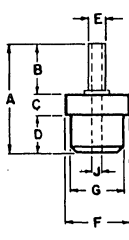


Fig. 501

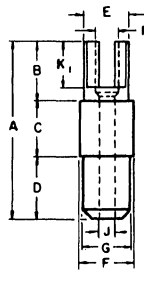


Fig. 506

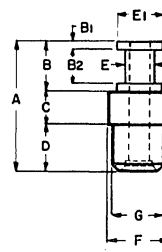


Fig. 511

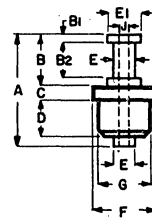


Fig. 512

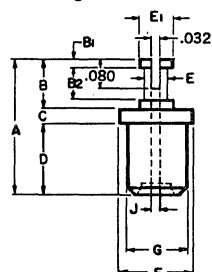


Fig. 513

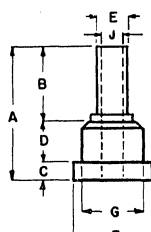


Fig. 551

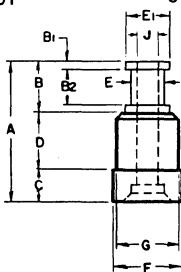


Fig. 554

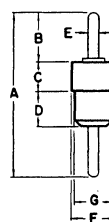


Fig. 601

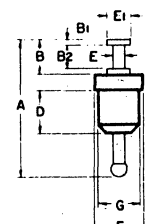


Fig. 605A

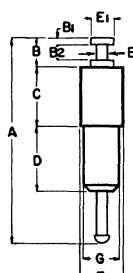


Fig. 607

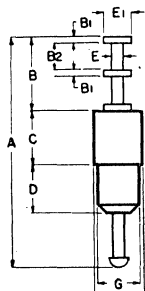


Fig. 608

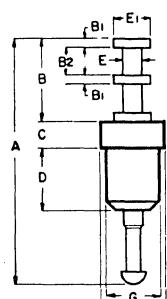


Fig. 609

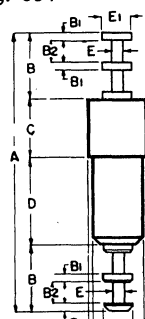


Fig. 610

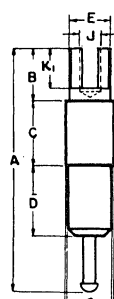


Fig. 616

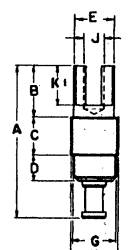


Fig. 617



SEALECTRO PRESS-FIT® TEFLON* TERMINALS

*Reg. Trademark, E. I. Du Pont de Nemours & Co.

Fig.	Old Part No.	New Part No.	Tool No.	Capacitance mmf	V _{RMS} 60 Hz Nominal Rating	Flashover Sea Level	A	B	B ₁	B ₂	C	D	E Dia.	E ₁ Dia.	F Dia.	+ .002 - .000 G Dia.	J Dia.	K	K ₁
FEED-THRUS																			
302	FT-MM-5TUR	001-2013	B0	0.70	400	1800	.510	.100		.060	.040	.100	.040	.060	.093	.075			
303	FT-MM-5SL	001-3012	B0-1	0.70	400	1800	.510	.100			.040	.100	.030	.060	.093	.075			.080
305	FT-MM-7ML	001-6024	B0-1	0.70	400	1800	.588	.120			.040	.100	.030	.060	.093	.075			.080
306	FT-MM-16L2	001-1038	B0-2	0.70	400	1800	.550	.275			.040	.100	.030		.093	.075			
351	FT-SM-022	011-1001	B8	0.65	1000	3000	.630	.210			.040	.170	.040		.172	.148			
351	FT-SM-1	011-1004	B8-16	0.50	1000	3000	.515	.210			.040	.100	.040		.172	.148			
351	FT-SM-1C6	011-1006	B8	0.70	1000	3000	.710	.210			.040	.250	.040		.172	.148			
351	FT-SM-1L2	011-1008	B8-16	0.50	1000	3000	.443	.210			.040	.100	.040		.172	.148			
351	FT-SM-1L3	011-1009	B8-16	0.70	1000	3000	.725	.210			.040	.100	.040		.172	.148			
351	FT-SM-1L6	011-1011	B8-16	0.55	1000	3000	.562	.210			.040	.100	.040		.172	.148			
351	FT-SM-2C4	011-1015	B8-18	0.50	1200	3500	.535	.210			.050	.110	.040		.172	.148			
351	FT-SM-5	021-1000	B22	0.50	1200	3500	.515	.210			.040	.100	.040		.250	.218			
351	FT-SM-7	001-1002	B3-1	0.50	500	2000	.375	.147			.040	.075	.040		.125	.093			
351	FT-SM-8	011-1021	B8-16	0.60	1000	3000	.535	.210			.040	.120	.040		.172	.148			
351	FT-SM-9	011-1023	B8-16	0.50	1000	3000	.535	.210			.040	.132	.040		.172	.148			
351	FT-SM-9L2	011-1025	B8-16	0.50	1000	3000	.407	.125			.040	.132	.040		.172	.148			
351	FT-SM-14	011-4021	B8-16	0.50	1000	3000	.375	.125			.040	.100	.040		.172	.148			
351	FT-SM-16	001-1007	B3-1	0.75	500	2000	.515	.210			.040	.100	.040		.125	.093			
351	FT-SM-16L2	001-1008	B3-1	0.65	500	2000	.453	.156			.040	.100	.040		.125	.093			
351	FT-SM-19	011-1038	B8-16	0.60	1000	3000	.535	.210			.040	.160	.040		.172	.148			
360	FT-SM-028TUR	011-2002	B8	0.60	1000	3000	.550	.245	.020	.070	.040	.125	.040	.080	.172	.148			
360	FT-SM-029TUR	011-2003	B8	0.50	1000	3000	.812	.210	.020	.100	.040	.165	.040	.080	.172	.148			
360	FT-SM-1TUR	011-2004	B8	0.50	1000	3000	.500	.210	.020	.100	.040	.100	.040	.080	.172	.148			
360	FT-SM-1TUR-C4	011-2007	B8	0.50	1000	3000	.500	.210	.020	.100	.040	.100	.040	.080	.172	.148			
360	FT-SM-16TUR	001-2004	B-3-2B	0.70	500	2000	.500	.210	.020	.100	.040	.165	.040	.080	.125	.093			
362	FT-SM-025TUR	011-2000	B8	0.65	1000	3000	.609	.210	.020	.100	.040	.165	.040	.080	.172	.148			
362	FT-SM-2TUR	011-2013	B8	0.70	1000	3000	.531	.210	.020	.100	.040	.100	.040	.080	.172	.148			
362	FT-SM-2TUR-C2	011-2014	B8	0.70	1000	3000	.531	.210	.020	.100	.040	.125	.040	.080	.172	.148			
362	FT-SM-21TUR	011-2022	B18	0.65	1200	3500	.531	.210	.020	.100	.040	.125	.040	.080	.218	.185			
362	FT-SM-22TUR	011-2023	B9	0.65	1200	3500	.609	.210	.020	.100	.093	.125	.040	.080	.172	.148			
363	FT-04-9-B-02A	011-2103	B9-3	0.85	1500	4000	.836	.250	.020	.093	.125	.230	.040	.093	.172	.148			
363	FT-SM-1TUR-L4	011-2011	B8	0.50	1000	3000	.500	.210	.020	.100	.040	.100	.040	.080	.172	.148			
364	FT-SM-18TUR	011-2017	B8	0.60	1000	3000	.443	.093	.020	.062	.040	.100	.040	.080	.172	.148			
364A	FT-SM-18TUR-L3	011-2019	B8	0.60	1000	3000	.520	.190	.020	.160	.040	.100	.040	.080	.172	.148			
364	FT-SM-36TUR	011-2028	B16	0.60	1200	3500	.500	.120	.020	.080	.075	.125	.048	.090	.200	.172			
365	FT-SM-16TUR-L2	001-2005	B3-5	0.60	500	2000	.350	.125	.020	.085	.040	.100	.040	.080	.125	.093			
365	FT-SM-32TUR	011-2025	B8	0.50	1000	3000	.350	.125	.020	.095	.040	.100	.040	.080	.172	.148			
452	RFT-SM1	012-1000	B8	0.50	1000	3000	.515	.210			.040	.100	.040		.172	.148			
454	RFT-SM-1TUR	012-2000	B8	0.50	1000	3000	.500	.210	.020	.100	.040	.100	.040	.080	.172	.148			
454	RFT-SM-16TUR	002-2000	B3-12	0.85	500	2000	.500	.210	.020	.100	.040	.100	.040	.080	.125	.093			
501	FT-SM-54	001-6001	B4-1	0.40	750	2500	.310	.207			.050	.053	.040		.130	.120	.030		
501	FT-SM-59	001-6033	B3-1	0.40	500	2000	.225	.125			.040	.060	.040		.125	.093	.030		
501	FT-SM-60	011-6011	B18-1	0.70	1000	3000	.367	.207			.050	.110	.085		.218	.171	.063		
501	FT-SM-62	011-6015	B8-13-A	0.75	750	2500	.367	.207			.050	.110	.085		.172	.148	.063		
506	FT-1025SL†	011-3017	B11	0.90	2000	5000	.602	.203			.187	.212	.148		.187	.171	.052	.078	.156
511	FT-SM-74	011-6033	B9-1	0.75	1000	3000	.351	.133	.020	.093	.093	.125	.082	.125	.172	.148	.062		
512	FT-SM-71	011-6022	B8	0.50	1000	3000	.303	.133	.020	.093	.040	.100	.060	.090	.172	.148	.030		
513	FT-SM-76SL	011-3007	B17	0.75	1200	3500	.333	.133	.020	.093	.040	.160	.060	.093	.205	.169	.030		

† Plating: Silver plated.

* ±.002 † ±.001

MINIATURE FEED-THRUS

551	RFT-SM-40	002-6000	B6-C	0.30	750	2500	.193	.105			.025	.063	.050		.150	.125	.030		
551	RFT-SM-62	012-6004	B8-X-2	0.70	1000	3000	.367	.207			.050	.110	.085		.172	.148	.063		
554	RFT-SM-77	012-6014	B10	0.60	1200	3500	.381	.133	.020	.093	.093	.155	.090	.125	.188	.177	.062		
601	FT-800-L5†	011-1065	B12	0.60	1700	4500	.675	.200			.125	.150	.040		.187	.165			
605A	FT-310	011-2049	B10	0.75	1700	4500	.540	.133	.020	.093	.063	.171	.046	.093	.187	.171			
607	FT-400	011-2053	B19-A	0.80	2000	5000	.640	.133	.020	.093	.093	.210	.046	.093	.215	.185*			
607	FT-1000	011-2062	B13	0.70	2200	5500	.740	.125	.031	.062	.187	.212	.050	.093	.187	.171			
607	FT-1500	011-2072	B12-3	0.70	3000	7000	.865	.125	.031	.062	.250	.275	.050	.093	.187	.171			
608	FT-990-DTUR	011-2059	B9-3	0.80	1500	4000	.836	.250	.020	.093	.187	.165	.050	.093	.172	.148			
608	FT-995-DTUR	011-2061	B9-3	0.85	1500	4000	.836	.250	.020	.093	.187	.230	.050	.093	.172	.148			
608	FT-996-DTUR	021-2006	B19-A	1.00	2500	6000	.828	.281	.031	.093	.187	.212	.062	.125	.218	.187			
608	FT-1000-DTUR	011-2064	B13-3B	0.80	2000	5000	.836	.250	.020	.093	.187	.212	.050	.093	.187	.171			
609	FT-940-DTUR	011-2055	B19-A	1.00	1200	3500	.828	.281	.031	.093	.094	.210	.062	.125	.218	.185*			
609	FT-950-DTUR	011-2057	B12	1.00	1500	4000	.828	.281	.032	.093	.125	.200	.062	.125	.187	.171			
610	FT-1550-DTUR	021-2010	B24-A	1.25	3000	7000	1.187	.281	.031	.093	.250	.375	.062	.125	.250	.218			
616	FT-1000SL	011-3014	B11	0.80	2000	5000	.821	.203			.187	.212	.148		.187	.171	.078		.156
617	FT-900SL	011-3028	B11	0.90	1000	3000	.594	.203			.150	.100	.148		.187	.171	.078		.156

† Plating: Tin or Tin/Lead. Terminal Lug: Brass, Standard Plating Silver. Other platings available on special order. * ±.001

PROBES AND PLUGS

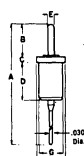


Fig. 801

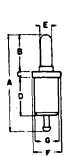


Fig. 804

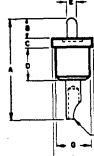


Fig. 807

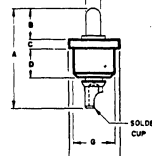


Fig. 808

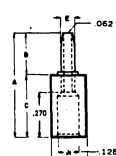


Fig. 809

801	FT-M-9L6	011-4037	B18-1B	1.00	1000	3000	1.500	.250				.046	.141	.050*		.218	.185*			
804	FT-M-7	011-4029	B18-1B	0.80	1000	3000	.739	.281				.046	.287	.081*		.218	.185*			
804	FT-M-8	011-4031	B18-1B	0.90	1000	3000	.562	.250				.046	.141	.050*		.218	.185			
807	PR-10	011-4000	B8-14	0.70	1000	3000	.538	.130				.046	.175	.040*		.172	.148			
808	PR-800■	011-4605	B-23A	0.70	1200	3500	.559	.187				.065	.169	.080*		.250	.185*			
809	PR-300§	021-4002					.645	.270				.375		.080*		.218				



SEALECTRO PRESS-FIT® TEFLON* TERMINALS

*Reg. Trademark, E. I. Du Pont de Nemours & Co.

TEST POINT JACKS

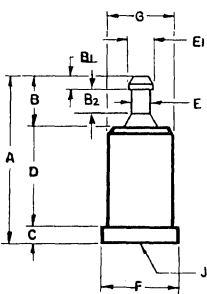


Fig. 701

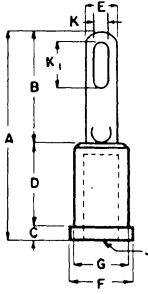


Fig. 703

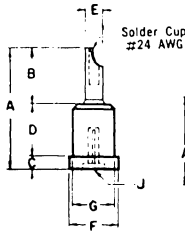


Fig. 706

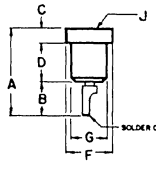


Fig. 713

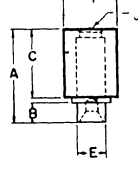


Fig. 714

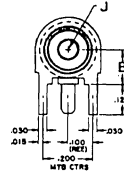


Fig. 732

Fig.	Old Part No.	New Part No.	Tool No.	Capacitance mmf	V _{RMS} 60 Hz Nominal Rating	Flashover Sea Level	Ref. A	B	B ₁	B ₂	C	D	E Dia.	E ₁ Dia.	F Dia.	+ .002 - .000 G Dia.	± .001 J Probe Dia.	Probe Length	K	K ₁
701	SKT-2BC	016-2025	S2	0.70	1000	3000	.437	.120	.037	.046	.046	.271	.054	.074	.218	.185*	.090	.195		
701	SKT-5BC	016-2000	S2	0.60	1000	3000	.437	.120	.037	.046	.046	.271	.054	.074	.218	.185*	.080	.195		
701	SKT-10	016-2003	S1	0.70	1200	3500	.640	.187	.037	.111	.050	.400	.054	.074	.218	.185*	.080	.280		
701	SKT-13C3	006-2000	S13-1	0.45	500	2000	.203	.060	.010	.040	.030	.113	.046	.080	.150	.120	.040	.078		
701	SKT-14	016-2008	S5	0.35	1000	3000	.345	.120	.023	.071	.046	.179	.040	.060	.172	.148	.040	.140		
701	SKT-22	006-2001	S4	0.20	1500	4000	.449	.120	.023	.071	.046	.283	.040	.060	.142	.120	.040	.245		
701	SKT-22C2	006-2002	S22	0.30	1500	4000	.410	.120	.023	.071	.046	.244	.040	.060	.142	.120	.040	.205		
701	SKT-41	016-2016	S2	0.55	1200	3500	.467	.120	.035	.047	.046	.301	.054	.074	.218	.185*	.080	.225		
701	SKT-0930	026-2006	S37	1.10	3200	7500	.834	.187	.035	.114	.230	.417	.054	.074	.375	.200	.093	.518		
703	SKT-1	016-8000	S31	0.55	1200	3500	.687	.354			.046	.287	.115		.218	.185*	.050	.250	.062	.156
703	SKT-4	016-8001	S30	0.40	1200	3500	.687	.354			.046	.287	.104		.218	.185*	.041	.250	.052	.140
706	SKT-31	016-6001	S17	0.45	1000	3000	.408	.187			.046	.175	.060		.172	.148	.040	.135		
713	SKT-400†	016-6600	S17	0.50	1000	3000	.359	.140			.065	.154			.187	.148	.040	.125		
713	SKT-401†	016-6601	S17	0.50	1000	3000	.359	.140			.065	.154			.172	.148	.040	.125		
713	SKT-800†	016-6606	S18	0.60	1200	3500	.437	.156			.065	.216			.250	.185*	.080	.187		
714	SKT-113PC†	026-4011					.381	.090			.281		.062		.187		.080	.250		
714	SKT-114PC†	026-4012					.376	.085			.281		.066		.187		.080	.200		
732	SKT-102PC†	026-4003		0.45	1200	3500	.500	.140	.125			.378	.050	.080	.218	.187†	.080	.250		
732	SKT-103PC†	026-4005		0.50	1200	3500	.400	.140	.125			.378	.050	.080	.218	.187†	.080	.250		
732	SKT-103PC-L1†	026-4006		0.50	1200	3500	.400	.140	.187			.378	.035	.080	.218	.187†	.080	.250		

Terminal Lug: Beryllium Copper. Standard plating: Gold over Silver. Other platings available on special order.
 ‡ Floating contact † For printed circuit application. * ±.001 † Tolerance ±.005

SKT-0804/016-8010 GUIDED ENTRY TEST POINT JACK FOR INCREASED CHASSIS PULL-OUT STRENGTH

Featuring a beryllium-copper formed lug, the SKT-0804 test point jack offers greater pull-out strength and high torque resistance. The jack is designed to provide guided-entry for an .080" diameter probe.

Cap. 0.75 mmf. Nominal: 1000 V_{RMS}
Flashover S.L.: 3000 V_{RMS}
INSERTION TOOL NO. S-38

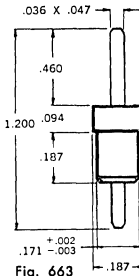
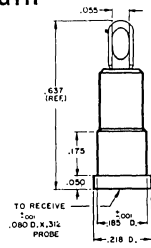


Fig. 663

FEED-THRUS AND STAND-OFFS FOR WIREWRAP APPLICATIONS

Fig.	Old Part No.	New Part No.	Tool No.	Capacitance mmf	V _{RMS} 60 Hz Nominal Rating	Flashover Sea Level
663	FT-WJ-200	011-8000	B-13-5	0.90	1500	4000

Material: Phosphor Bronze. Plating: Tin or Tin/Lead.

METAL BASED INSULATED TEFLON STAND-OFFS

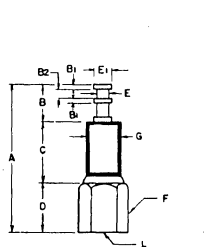


Fig. 902

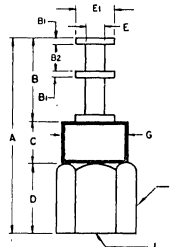


Fig. 904

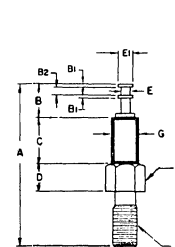


Fig. 907

Fig.	Old Part No.	New Part No.	Capacitance mmf	V _{RMS} 60 Hz Nominal Rating	Flashover Sea Level	A	B	B ₁	B ₂	C	D	E Dia.	E ₁ Dia.	F Hex	G Dia.	L Thrd.	Depth of Thrd.
902	TF-304TUR	003-5701	0.50	1700	4500	35/64	.136	.018	.031	.229	.181	.045	.066	5/32	.125	4-40	.093
904	TF-302TUR-T1	023-5702	0.60	2200	5500	7/32	.305	.025	.100	.156	.258	.069	.140	1/4	.245	6-32	.156
907	TM-300TUR	003-5700	0.55	2200	5500	3/4	.156	.018	.031	.218	.218	.045	.066	5/32	.125	4-40	
907	TM-301TUR-C1	023-5701	0.65	2200	5500	7/64	.295	.025	.100	.165	.180	.069	.140	1/4	.245	6-32	
907	SE9-09-E01**	003-5707	0.55	2200	5500	3/4	.156	.018	.031	.218	.218	.045	.066	5/32	.125	4-40	
907	SE9-09-E02**	023-5705	0.65	2200	5500	7/64	.295	.025	.100	.165	.180	.069	.140	1/4	.245	6-32	

Insulation: Teflon. Lug: Brass. Plating: Lug: Standard Plating Tin or Tin/Lead. Other Platings on special order. Base: Brass, Cadmium with Chromate Coating.
 ** Supplied with Military Specifications Mounting Hardware.



SEALECTRO PRESS-FIT® TEFLON* TERMINALS

* Reg. Trademark, E. I. Du Pont de Nemours & Co.

TEFLON BUSHINGS

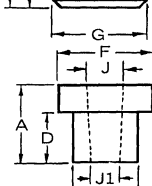
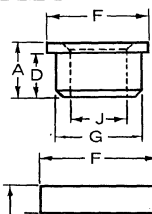
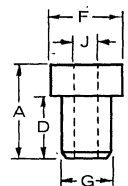
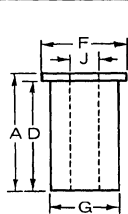
SINGLE SHOULDER

Descrip.	Part No.	G	A	D	J	F
B-1585	019-0187	.203	.062	.031	.144	.320

Descrip.	Part No.	G	A	D	J	F
B-1440	019-0040	.093	.140	.100	.040	.125
B-1440-1	019-0041	.093	.140	.100	.035	.125
B-1441	019-0042	.093	.100	.060	.037	.125
B-1464	019-0066	.093	.100	.080	.038	.125
B-1553	019-0155	.093	.100	.080	.048	.125
B-1414	019-0014	.148	.140	.100	.060	.172
B-1475	019-0078	.148	.140	.100	.073	.172

SINGLE SHOULDER, COUNTER-SUNK HOLE

Descrip.	Part No.	G	A	D	J	F
B-1522	019-0124	.185	.250	.204	.140	.250
B-1565	019-0167	.185	.108	.083	.120	.218



SINGLE SHOULDER, NO HOLE

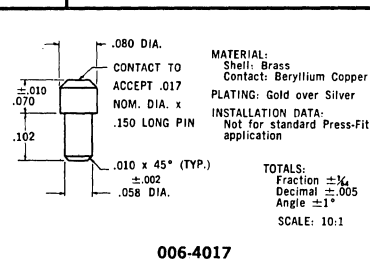
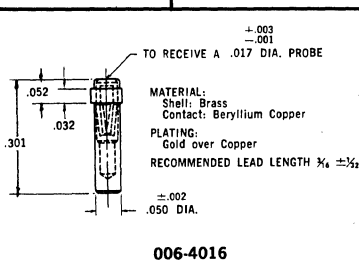
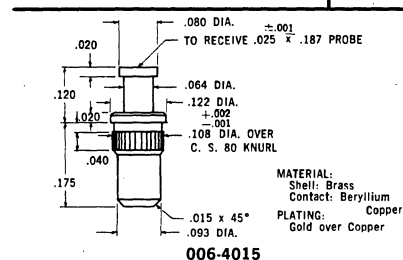
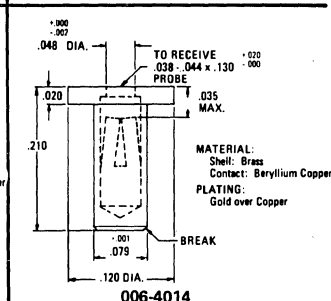
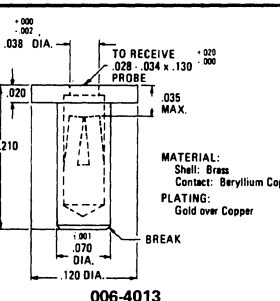
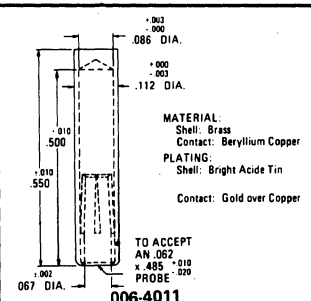
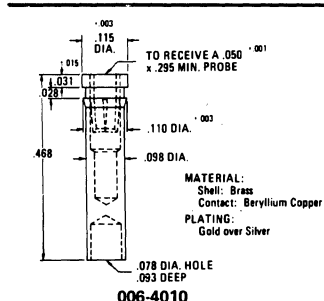
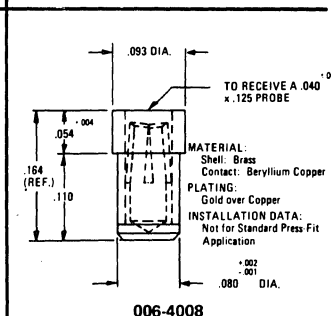
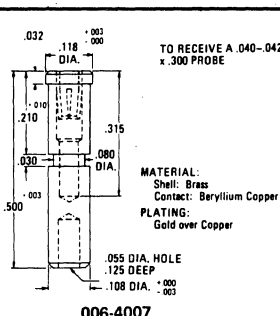
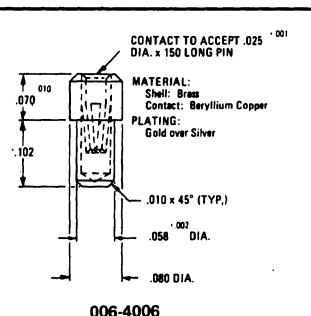
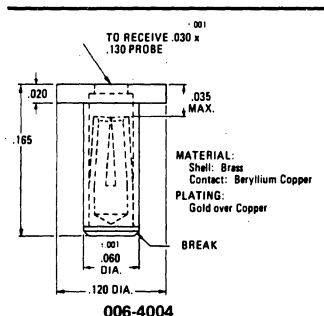
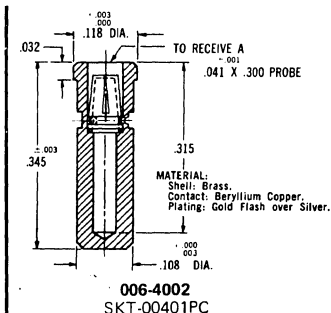
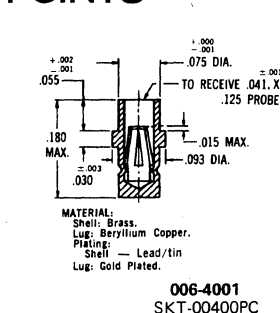
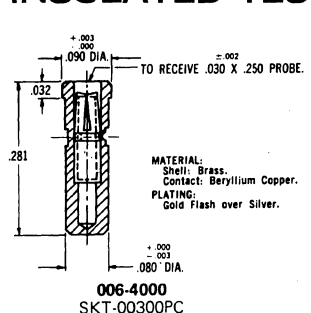
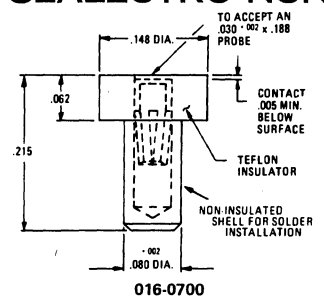
Descrip.	Part No.	G	A	D	J	F
B-1541	019-0143	.185	.672	.626		.218

SINGLE SHOULDER, TAPERED HOLE

Descrip.	Part No.	G	A	D	F	J1
B-1505	019-0107	.156	.153	.108	.200	.102 .064

Description	Part No.	A	C	Insert Tool
227298	019-0710	1.021	.750	B-44-4
227294	019-0709	.958	.687	B-44-4
227290	019-0708	.896	.625	B-44-3
227286	019-0707	.833	.562	B-44-3
227282	019-0706	.771	.500	B-44-3
227278	019-0705	.708	.437	B-44-2
227274	019-0704	.646	.375	B-44-2
227270	019-0703	.583	.312	B-44-2
227266	019-0702	.521	.250	B-44-1
227262	019-0701	.458	.187	B-44-1
227258	019-0700	.396	.125	B-44-1

SEALECTRO NON-INSULATED TEST POINTS





SEAELECTRO PRESS-FIT[®] TEFLON* TERMINALS

*Reg. Trademark, E. I. Du Pont de Nemours & Co.

NEW! For chamfered or non-chamfered holes

Rivet-Loc[™]

patented

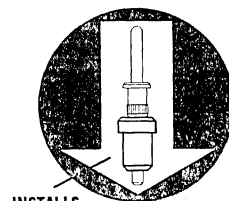
TEFLON INSULATED TERMINALS

Rivet-Loc terminals overcome all the inherent shortcomings of the older semi-assembled design which assembles by pushing the metal lug into the minor diameter of the Teflon bushing. Whereas the original semi-assembled design depended upon the mass of the metal lug displacing the Teflon, the Rivet-Loc employs a simple Riveting and Locking of the Teflon bushing assuring a better finished installation.

Rivet-Loc is installed in one simple, smooth operation with all insertion forces working together, instead of against each other as in the case of the previous semi-assembled design. Thus, the final seating and locking of the terminal in the chassis is uniform, even with wide parameters of tool settings.

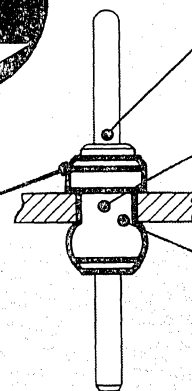
Proved in millions of installations, Rivet-Loc not only offers far superior mechanical characteristics, it also has proved more dependable electrically. The smaller metal lug mass in proportion to the Teflon bushing provides far better dielectric strength. This extra protection of pure virgin Teflon enhances the dependability and performance of your equipment.

The numbers listed here are currently considered standard. However, new numbers are being added constantly. Virtually any terminal configuration or requirement can be met with the Rivet-Loc concept. Submit your requirements to Sealectro.



INSTALLS THE RIGHT WAY — from the major diameter side.

POSITIVE, UNIFORM, ABOVE-CHASSIS HEIGHT. Seating flange locates positively on major diameter of Teflon bushing.



FASTEST, EASIEST INSTALLATION — automatic or manual.

KNURLED PORTION OF LUG always locates in chassis area for greater stability

MORE TEFLON INSULATION for better mechanical and electrical characteristics.

FEED-THRU Rivet-Loc[™] patented

Fig.	Part No.	Insertion Tool Number	A	B	C	D	E Dia.	F Dia.	±.002 G Dia.	±.015 R	Insertion Hole ±.002
1	001-3400	R3-A3	.387	.140	.040	.125	.040	.130	.107	.045	.109
1	001-3401	R3-A3	.434	.140	.040	.172	.040	.130	.107	.075	.109
2	001-1401	R4-A2	.515	.210	.040	.125	.040	.125	.084	.045	.086
2	001-1400	R2-A4	.656	.235	.040	.125	.030	.135	.113	.040	.117
2	011-1400	R5-A1	.687	.265	.075	.160	.050	.172	.134	.045	.136
2	011-1401	R5-A1	.887	.465	.075	.160	.050	.172	.134	.045	.136
2	011-1402	R5-A1	.730	.465	.075	.160	.050	.172	.134	.045	.136
2	011-1403	R4-A1	.570	.210	.040	.150	.040	.172	.134	.045	.136
2	011-1404	R4-A1	.515	.210	.040	.180	.040	.172	.134	.075	.136
3	011-2400	R1-A1	.500	.210	.040	.150	.040	.172	.134	.045	.136
3	011-2401	R1-A1	.530	.210	.040	.180	.040	.172	.134	.075	.136
3	011-2402	R1-A1	.458	.210	.040	.150	.040	.172	.134	.045	.136

Plating: Bright electro-tin a smooth finish featuring extraordinary soldering characteristics and shelf life is standard. Other finishes including all MIL-Spec numbers, are available upon special order.

*T. M., E. I. DuPont DeNemours & Co.

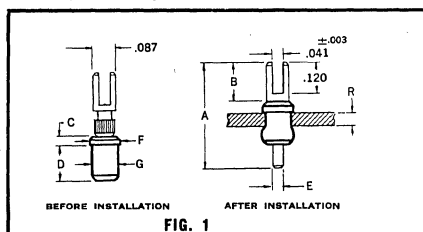


FIG. 1

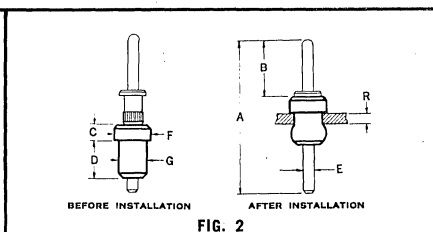


FIG. 2

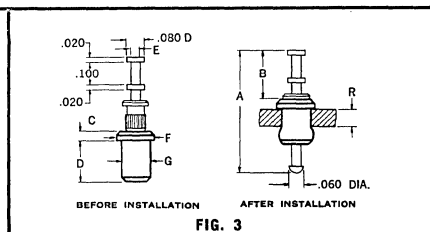


FIG. 3

STAND-OFFS Rivet-Loc[™]

Fig.	Part No.	Insertion Tool Number	A	B	C	D	E Dia.	F Dia.	±.002 G Dia.	±.015 R	Insertion Hole ±.002
4	003-3400	R3-A3	.275	.140	.040	.125	.087	.130	.107	.075	.109
4	003-3401	R3-A3	.322	.140	.040	.172	.087	.130	.107	.075	.109
5	003-1400	R4-A2	.345	.210	.040	.125	.040	.125	.084	.045	.086
5	013-1400	R4-A1	.370	.210	.040	.150	.040	.172	.134	.045	.136
5	013-1401	R4-A1	.405	.210	.040	.180	.040	.172	.134	.075	.136
6	013-2400	R1-A1	.370	.210	.040	.150	.040	.172	.134	.045	.136
6	013-2401	R1-A1	.400	.210	.040	.180	.040	.172	.134	.075	.136

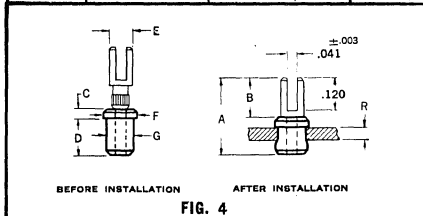


FIG. 4

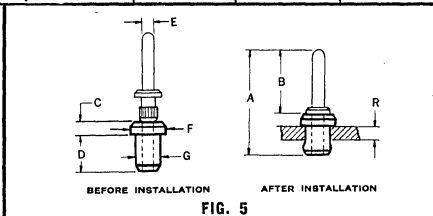


FIG. 5

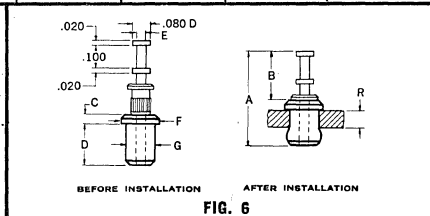


FIG. 6



SEAELECTRO PRESS-FIT®

TEFLON* TERMINALS

*Reg. Trademark, E. I. Du Pont de Nemours & Co.

Sealectro MIL Spec Terminals and Transistor/IC Hardware

•MIL-T-55155 Terminals TEFLON**INSULATED

MIL Part No.	New Sealectro Part No.	Old Part No.
FT-03-9-B-01A	011-4021	FT-SM-14
FT-03-9-B-02A	011-1004	FT-SM-1
FT-03-9-B-03A	011-1065	FT-800-L5
FT-03-9-B-04A	001-1007	FT-SM-16
FT-03-9-B-05A	001-1015	FT-SM-16-L16
FT-04-9-B-01A	011-2011	FT-SM-TUR-L4
FT-04-9-B-02A	011-2103	011-2103
FT-04-9-B-03A	001-2004	FT-SM-16-TUR
FT-05-9-B-01	001-6033	FT-SM-59
FT-05-9-B-02	001-6001	FT-SM-54
FT-05-9-B-03	011-6015	FT-SM-62
FT-06-9-B-01	002-6000	RFT-SM-40
FT-06-9-B-02	012-6004	RFT-SM-62
SE-07-9-B-01	013-2004	ST-SM-1-TUR-C4
SE-07-9-B-02	013-2046	ST-250
SE-07-9-B-03	003-2003	ST-SM-16-TUR
SE-08-9-B-01	013-1000	ST-SM-1
SE-08-9-B-02	003-1009	ST-SM-16
SE-09-9-E-01	003-5707	003-5707*
SE-09-9-E-02	023-5705	023-5705*
SE-10-9-D-01	003-5701	TF-304-TUR
SE-10-9-D-02	023-5702	TF-302-TUR-T1

NON-INSULATED

MIL Part No.	Sealectro Part No.	MIL Part No.	Sealectro Part No.	MIL Part No.	Sealectro Part No.
SE-11 x C01	229-2015	SE-14 x C01A	229-2036	SE-17 x C01A	229-6012
SE-11 x C02	229-2016	SE-14 x C02A	229-2037	SE-17 x C02A	229-6013
SE-11 x C03	229-2017	SE-14 x C03A	229-2038	SE-17 x C03A	229-6014
SE-12 x C01A	229-2018	SE-14 x C04A	229-2039	SE-23 x C01	229-2027
SE-12 x C02A	229-2019	SE-14 x C05A	229-2040	SE-23 x C02	229-2014
SE-12 x C03A	229-2020	SE-14 x C06A	229-2041	SE-23 x C03	229-2028
SE-12 x C04A	229-2021	SE-15 x C01A	229-2042	SE-23 x C04	229-2029
SE-12 x C05A	229-2022	SE-15 x C02A	229-2043	SE-24 x C01	229-6036
SE-12 x C06A	229-2023	SE-15 x C03A	229-2044	SE-24 x C02	229-6037
SE-12 x C07A	229-2024	SE-15 x C07A	229-2048	SE-24 x C03	229-6038
SE-12 x C08A	229-2025	SE-15 x C08A	229-2049	SE-24 x C04	229-6039
SE-12 x C09A	229-2026	SE-15 x C09A	229-2050	SE-25 x C01	229-2056
SE-13 x C01A	229-2030	SE-16 x C01A	229-6005	SE-25 x C02	229-2057
SE-13 x C02A	229-2031	SE-16 x C02A	229-6010	SE-25 x C03	229-2058
SE-13 x C03A	229-2032	SE-16 x C03A	229-6011	SE-25 x C04	229-2059
SE-13 x C04A	229-2033				
SE-13 x C05A	229-2034				
SE-13 x C06A	229-2035				

* Supplied with MIL Spec. mounting hardware. If desired without mounting hardware, please specify:

SE-099E-01
SE-099E-02TM-300-TUR
TM-301-TUR-C1

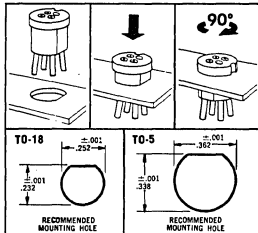
•Transistor and IC Hardware

Needs no mounting hardware. Provides full insulation from metal chassis.

PRESS-FIT® ¼ TURN Supercon TRANSISTOR AND IC SOCKETS

- Supercon high retention precision Contacts.

- D-hole mounting without interference fit or loose hardware.

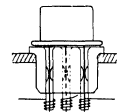


An exclusive Sealectro design that can save tremendous time and money on the assembly line. Merely drop ¼ turn unit through D-hole and manual or automatic tooling automatically turns it 90°. Flatted portion turns free, while rounded area is grooved against D-Flat, producing a positive locking action in chassis.

MATERIAL:

Insulator: Teflon
Shell: Brass
Contact: Beryllium Copper
Std. Plating: Gold over Copper

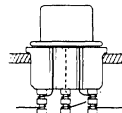
Supercon transistor and I.C. hardware features high-retention precision contacts. Allows fast easy replacement of transistor or I.C. Maintains retention, in excess of 50 grams per lead, through shock and vibration and repeated component insertions. Permits transistor or I.C. device interface into associated circuitry without electrical noise or signal dissipation due to contact resistance build-up.



PRESS-FIT SERIES 60:

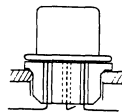
Transistor and I.C. sockets

Low-cost, high precision series 60 sockets. Permit plug-in and removal of TO-5, TO-18 cans and I.C. packages at will. Precise contact design provides a positive mechanical grip while making electrical contact with minimum resistance.



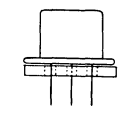
PRESS-FIT TRANSISTOR AND IC HOLDERS

Provides insulated chassis mounting with thru holes and soldering lugs for transistor leads and circuit connections.



PRESS-FIT TRANSISTOR AND IC BUSHINGS

Press-fit or grommet-type chassis mounting. Provides support for transistor can and thru-chassis hole plus strain relief for leads.

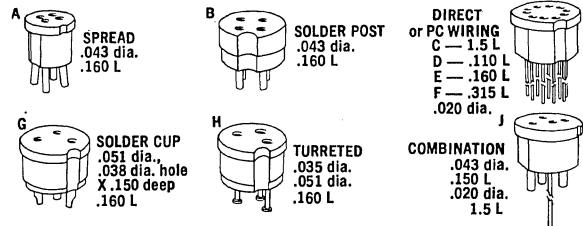


PRESS-FIT TRANSISTOR AND IC PADS

Provides insulation from mounting surface and strain relief for glass seals.

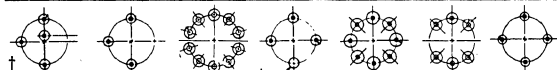
Sealectro Transistor and IC Socket and mounting devices provide the excellent electrical and mechanical characteristics of Teflon, and eliminate the need for loose mounting hardware such as quick-nuts, seating rings, screws, washers, etc. Electrically, only the finest contact metals and platings are employed to assure lowest electrical noise, maximum contact retention and longest service life.

— Free 12 page catalog details all above transistor and IC hardware.



SUPERCON TRANSISTOR AND IC SOCKETS

Part No.	Leads	Pitch Circle	Contacts	Fig.	Mtg. Hole
¼ TURN					
027-1705	4	.100	4	A	I
027-1706	3	.100	4*	A	I
027-1700	4	.200	4	B	II
027-1701	3	.200	3	B	II
027-1702	3	.200	4*	B	II
027-1703	4	.200	4†	J	II
027-1707	8	.200	8	C	II
027-1708	6	.200	6	C	II
027-1709	10	.230	10	C	II
027-1704	3	.100	3	A	I
PRESS FIT					
027-1712	3	.100	3	E	.215
027-1727	4	.100	4	E	.215
027-1728	3	.100	3	E	.250
027-1729	4	.100	4	A	.250
027-1730	3	.100	4*	A	.250
027-1731	3	.100	3	E	.215
027-1732	4	.100	4	E	.215
027-6700	3	.100	3	G	.215
027-6701	3	.100	3	G	.215
027-6702	4	.100	3	G	.215
027-1713	3	.200	3	D	.360
027-1716	4	.200	4	B	.360
027-1717	3	.200	3	B	.360
027-1718	3	.200	4*	B	.360
027-1719	4	.200	4†	J	.360
027-1720	4	.200	4	F	.360
027-1721	3	.200	3	F	.360
027-2700	3	.200	3	H	.360
027-2701	4	.200	4	H	.360
027-6710	4	.200	4	H	.360
027-6703	3	.200	3	G	.360
027-6711	3	.200	3	H	.360
027-6712	4	.200	4	H	.360
027-1714	10	.230	10	D	.360
027-1715	8	.200	8	D	.360
027-1722	6	.200	6	F	.360
027-1723	10	.230	10	F	.360
027-1724	8	.200	8	F	.360
027-1725	6	.200	6	C	.360
027-1726	10	.230	10	C	.360
027-2702	6	.200	6	H	.360
027-2703	8	.200	8	H	.360
027-2704	10	.230	10	H	.360
027-6704	8	.200	8	G	.360
027-6705	6	.200	6	G	.360
027-6713	10	.230	10	G	.360
027-6714	8	.200	8	H	.360
027-6715	6	.200	6	H	.360
027-6716	10	.230	10	H	.360



PRESS-FIT:

For chassis thickness .040" and over use 60° countersink. Use 82° countersink under .040".

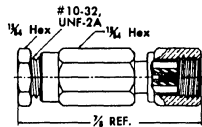
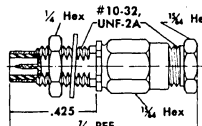
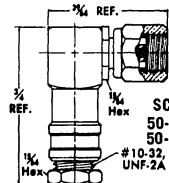
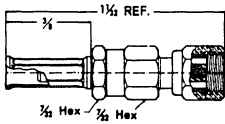
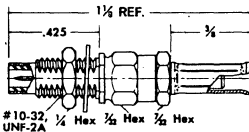
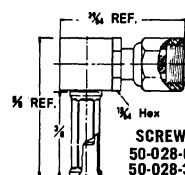
Hole Dia.	Entrance Dia.
.215	.234
.250	.280
.360	.380



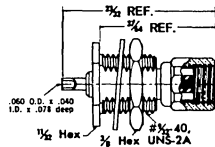
SEALECTRO

CONHEX SUBMINIATURE
R.F. CONNECTORS50 OHM
SCREW-ON & SNAP-ON
CABLE CONNECTORS

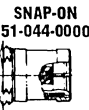
"0000" CLAMP-TYPE connectors accept RG-161/U, 174/U, 188/U and 316/U cables.
 "3196" CLAMP-TYPE and CRIMP-TYPE connectors accept RG-178/U and 196/U cables.
 "0000" CRIMP-TYPE connectors accept RG-161/U, 174/U, 179/U, 187/U, 188/U and 316/U cables.

SCREW-ON
50-007-0000
50-007-3196SNAP-ON
51-007-0000
51-007-3196CLAMP-TYPE
Straight PlugsSCREW-ON
50-010-0000
50-010-3196SNAP-ON
51-010-0000
51-010-3196CLAMP-TYPE
Bulkhead JacksCLAMP-TYPE
Right Angle PlugsSNAP-ON
51-011-0000
51-011-3196SCREW-ON
50-024-0000
50-024-3196SNAP-ON
51-024-0000
51-024-3196CRIMP-TYPE
Straight PlugsSCREW-ON
50-027-0000
50-027-3196SNAP-ON
51-027-0000
51-027-3196CRIMP-TYPE
Bulkhead JacksCRIMP-TYPE
Right Angle PlugsSNAP-ON
51-028-0000
51-028-319650 OHM
SCREW-ON & SNAP-ON
RECEPTACLES

BULKHEAD MOUNT

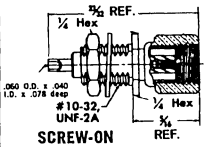


SCREW-ON 50-044-0000



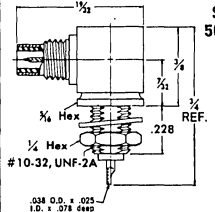
SNAP-ON 51-044-0000

REAR MOUNT PLUG

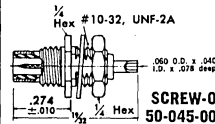
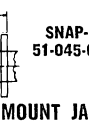
SCREW-ON
50-046-0000

SNAP-ON 51-046-0000

FRONT MOUNT PLUG

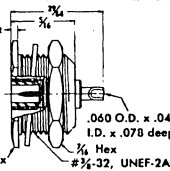
SCREW-ON
50-047-0000

SNAP-ON 51-047-0000

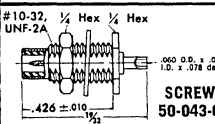
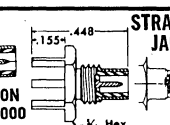
RIGHT ANGLE
JACKSCREW-ON
50-045-0000

SNAP-ON 51-045-0000

REAR MOUNT JACK

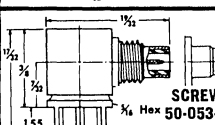
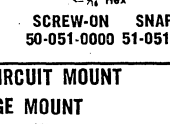
RECESSED
JACKSNAP-ON
51-049-0000

SNAP-ON 51-043-0000

FRONT MOUNT
JACKSCREW-ON
50-043-0000

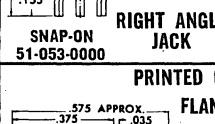
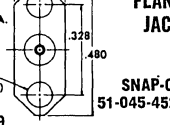
SNAP-ON 51-051-0000

SNAP-ON 51-051-0000

STRAIGHT
JACKSCREW-ON
50-053-0000

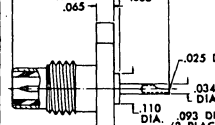
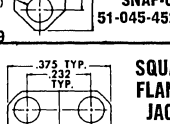
SNAP-ON 51-045-4524-89

SNAP-ON 51-045-4524-89

NARROW
FLANGE
JACKSCREW-ON
50-045-4524-89

SNAP-ON 51-045-4504-89

SNAP-ON 51-045-4504-89

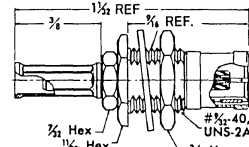
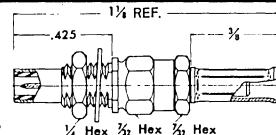
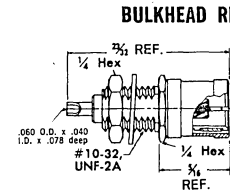
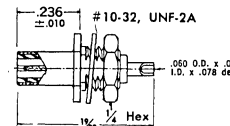
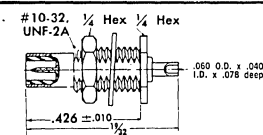
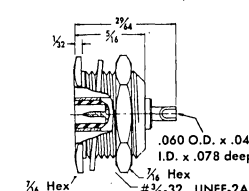
SQUARE
FLANGE
JACKSCREW-ON
50-045-4504-89

SNAP-ON 51-045-4504-89

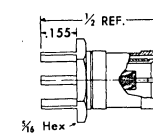
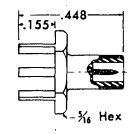
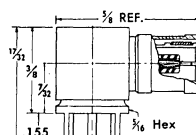
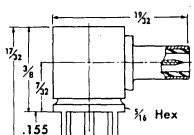
SNAP-ON 51-045-4504-89

SQUARE
FLANGE
JACK50 OHM SLIDE-ON
CABLE CONNECTORS & RECEPTACLES

"0000" CRIMP-TYPE connectors accept RG-161/U, 174/U, 179/U, 188/U and 316/U cables.

CRIMP-TYPE
Bulkhead Plug
SLIDE-ON
52-026-0000CRIMP-TYPE
Bulkhead Jack
SLIDE-ON
52-027-0000PLUG
SLIDE-ON
52-046-0000JACK
SLIDE-ON
52-045-0000JACK
SLIDE-ON
52-043-0000JACK
SLIDE-ON
52-049-0000

PRINTED CIRCUIT RECEPTACLES

PLUG
SLIDE-ON
52-052-0000JACK
SLIDE-ON
52-051-0000PLUG
SLIDE-ON
52-054-0000JACK
SLIDE-ON
52-053-0000



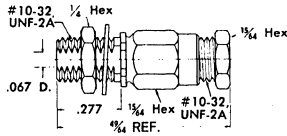
CONHEX SUBMINIATURE R.F. CONNECTORS

50 OHM ACCESSORIES

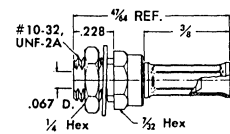
"-0000" CLAMP-TYPE connectors accept RG-161/U, 174/U, 188/U and 316/U cables.

"-0000" CRIMP-TYPE connectors accept RG-161/U, 174/U, 179/U, 187/U, 188/U and 316/U cables.

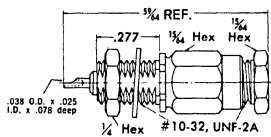
BULKHEAD CABLE FEED-THRU



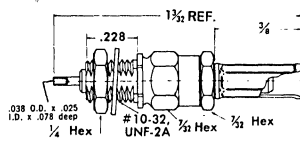
CLAMP-TYPE
55-013-0000



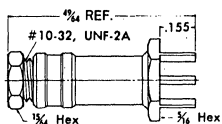
CRIMP-TYPE
55-031-0000



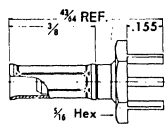
CLAMP-TYPE
55-018-0000



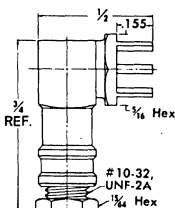
CRIMP-TYPE
55-036-0000



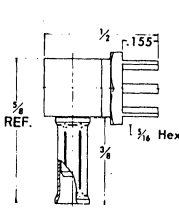
CLAMP-TYPE
55-020-0000



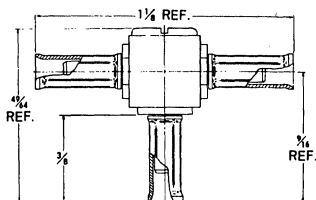
CRIMP-TYPE
55-038-0000



CLAMP-TYPE
55-021-0000



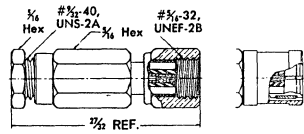
CRIMP-TYPE
55-039-0000



CRIMP-TYPE
55-069-0000

75 OHM CABLE CONNECTORS & RECEPTACLES

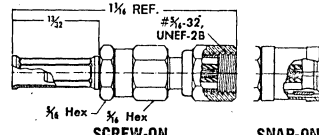
75 ohm "-0000" connectors accept RG-180/U, 195/U and Surprenant #9872 cables.



SCREW-ON
50-107-0000

SNAP-ON
51-107-0000

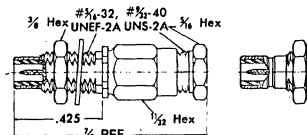
CLAMP-TYPE
Straight Plugs



SCREW-ON
50-124-0000

SNAP-ON
51-124-0000

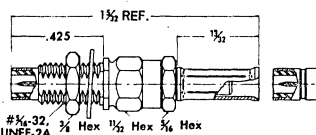
CRIMP-TYPE
Straight Plugs



SCREW-ON
50-110-0000

SNAP-ON
51-110-0000

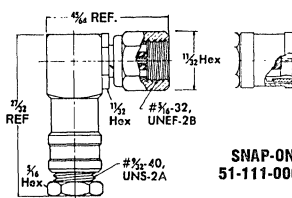
CLAMP-TYPE
Bulkhead Jacks



SCREW-ON
50-127-0000

SNAP-ON
51-127-0000

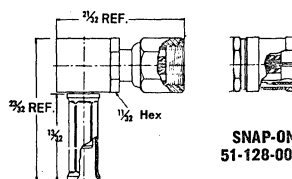
CRIMP-TYPE
Bulkhead Jacks



SCREW-ON
50-111-0000

SNAP-ON
51-111-0000

CLAMP-TYPE
Right-Angle Plugs

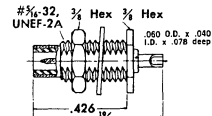


SCREW-ON
50-128-0000

SNAP-ON
51-128-0000

CRIMP-TYPE
Right-Angle Plugs

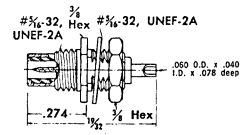
BULKHEAD RECEPTACLES



SCREW-ON
50-143-0000

SNAP-ON
51-143-0000

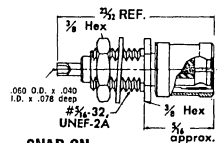
REAR MOUNT



SCREW-ON
50-145-0000

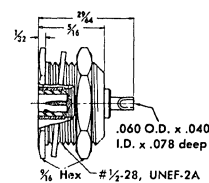
SNAP-ON
51-145-0000

FRONT MOUNT



SCREW-ON
51-146-0000

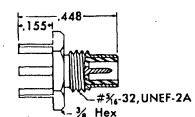
FRONT MOUNT PLUG



SNAP-ON
51-149-0000

RECESSED JACK

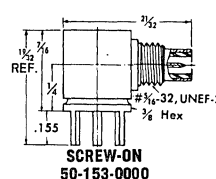
PRINTED CIRCUIT RECEPTACLES



SCREW-ON
50-151-0000

SNAP-ON
51-151-0000

STRAIGHT JACK



SCREW-ON
50-153-0000

SNAP-ON
51-153-0000

RIGHT ANGLE JACK



SEALECTRO

CONNECTORS, TERMINALS, SOCKETS



3mm MINIATURE R.F. CONNECTORS

DIRECT SOLDER TYPE FOR .141" SEMI-RIGID COAX

The Direct-Solder Type straight plugs shown below utilize the .036" (.914mm) diameter center conductor of the cable as the male contact for optimum electrical performance.

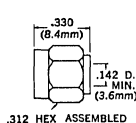
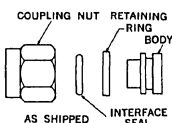
STANDARD For .141" Cable



THIN-WALL
55-607-3703-31



THICK-WALL
55-624-3703-31



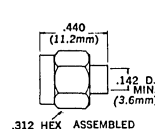
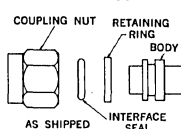
RECOMMENDED For .141" Cable



THIN-WALL
55-607-2003-31



THICK-WALL
55-624-2003-31



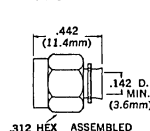
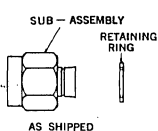
RETRACTABLE NUT For .141" Cable



THIN-WALL
55-607-3073-31

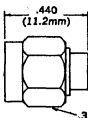


THICK-WALL
55-624-3073-31

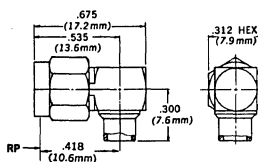


CABLE CONNECTORS FOR SEMI-RIGID CABLE

* For .1400/.1420 diameter 50 ohms cable.
** For .0840/.0875 diameter 50 ohm cable.



**STANDARD
With Contact**
55-607-2203-31*
55-607-3702-31**



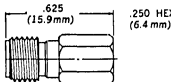
**RIGHT ANGLE
PLUG**
55-611-3702-31**
55-611-3703-31*

RECOMMENDED CABLE JACK .141" Cable

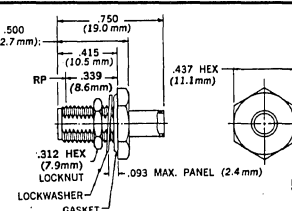


55-608-2003-31*

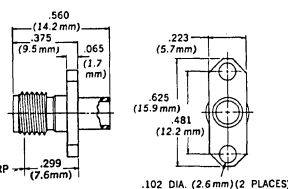
CABLE CONNECTORS FOR SEMI-RIGID CABLE (Cont'd)



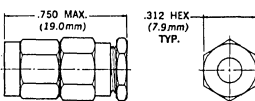
**STANDARD CABLE
JACK**
.141" Cable
55-608-3703-31*



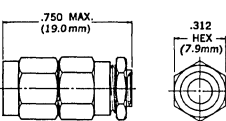
**BULKHEAD
JACK**
55-610-3703-31**
55-610-3702-31**



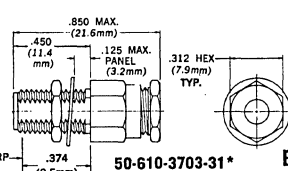
PANEL JACK
.141" Cable
55-604-9073-31*



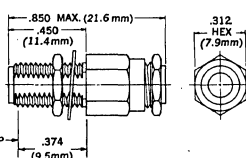
**CLAMP-TYPE
STRAIGHT PLUG**
.141" Cable
50-607-3703-31*



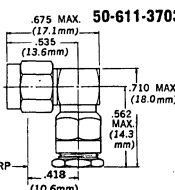
**SOLDER-CLAMP-TYPE
STRAIGHT PLUG**
.141" Cable
50-607-9703-31*



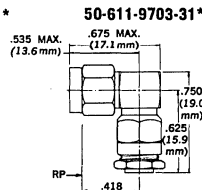
**CLAMP-TYPE
BULKHEAD JACK**
.141" Cable
50-610-3703-31*



**SOLDER-CLAMP-TYPE
BULKHEAD JACK**
.141" Cable
50-610-9703-31*



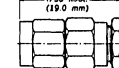
**CLAMP-TYPE
RIGHT ANGLE PLUG**
.141" Cable



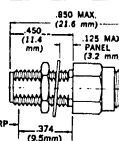
**SOLDER-CLAMP-TYPE
RIGHT ANGLE PLUG**
.141" Cable

CABLE CONNECTORS FOR BRAIDED COAXIAL CABLE

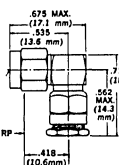
All contacts are captivated unless otherwise specified.
** RG-55/U, -58/U, -141/U, -142/U, -233/U, -303/U.
** RG-174/U, -179/U, -187/U, -188/U, -316/U.



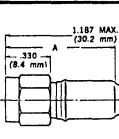
**CLAMP-TYPE
Straight Plug**
50-607-3141-31*
50-607-3188-31**



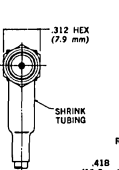
**CLAMP-TYPE
Bulkhead Jacks**
50-610-3141-31*
50-610-3188-31**



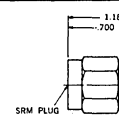
**CLAMP-TYPE
Right Angle Plug**
50-611-3141-31*
50-611-3188-31**



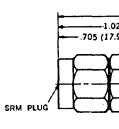
**DIRECT-SOLDER-TYPE
Straight Plug
Non-captive
Contact**
55-622-9141-31*
55-622-9188-31**



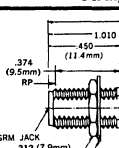
**DIRECT-SOLDER-TYPE
Right Angle Plug**
55-628-9141-31*
55-628-9188-31**



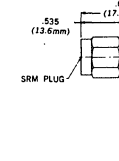
**CRIMP-TYPE
Straight Plug Non-captive Contact**
50-622-9142-31
50-622-8188-31



**CRIMP-TYPE
Straight Plug**
50-624-9142-31
50-624-9188-31



**CRIMP-TYPE
Bulkhead Jacks**
50-627-9142-31
50-627-9188-31



**CRIMP-TYPE
Right Angle Plug**
50-628-9142-31
50-628-9188-31



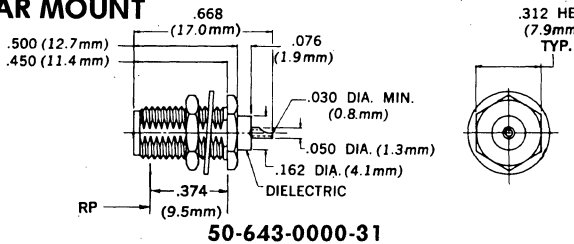
SEAELECTRO

3mm MINIATURE
R.F. CONNECTORS

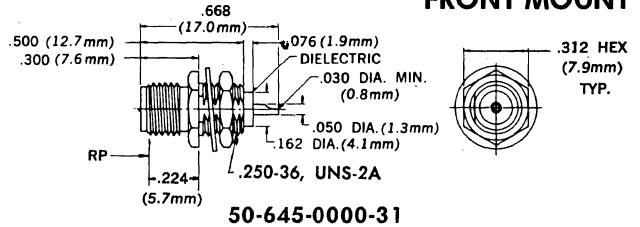
* BULKHEAD AND PANEL RECEPTACLES

All contacts are captivated unless otherwise specified.

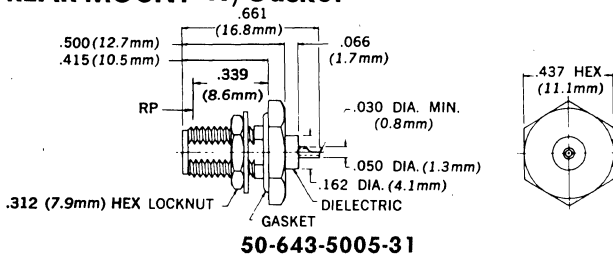
REAR MOUNT



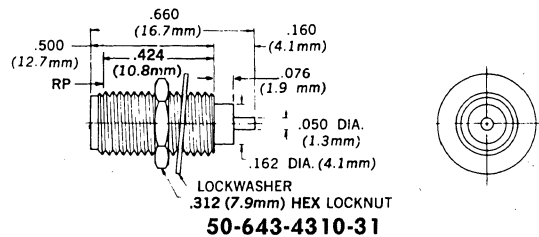
FRONT MOUNT



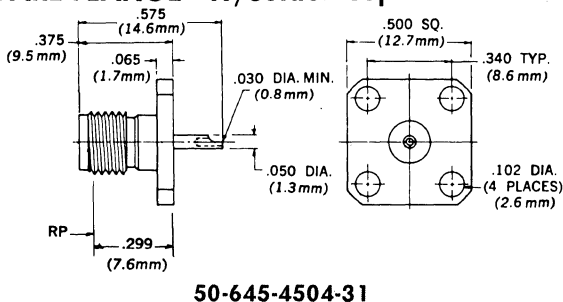
REAR MOUNT W/Gasket



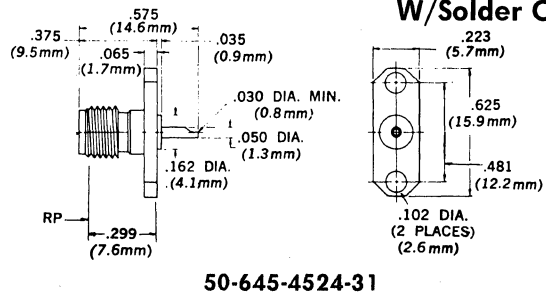
STUB CONTACT



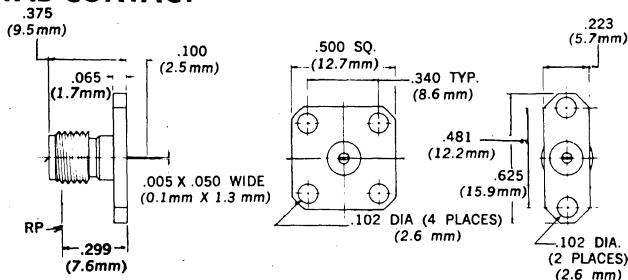
SQUARE FLANGE W/Solder Cup



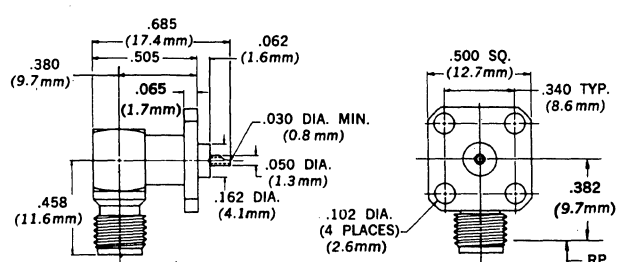
NARROW FLANGE W/Solder Cup



TAB CONTACT



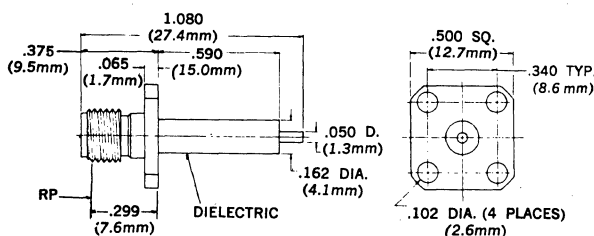
RIGHT ANGLE



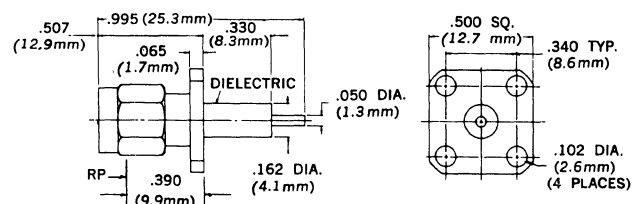
50-647-4504-31

	SQUARE FLANGE	NARROW FLANGE
Removable Contact	50-645-4575-31	50-645-4528-31
Captivated Contact	50-645-4576-31	50-645-4518-31

EXTENDED DIELECTRIC JACK



EXTENDED DIELECTRIC PLUG





SEAELECTRO

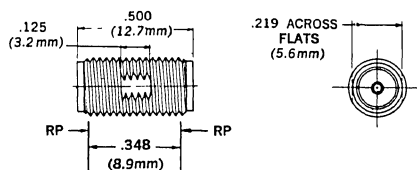
CONNECTORS, TERMINALS, SOCKETS



3mm MINIATURE R.F. CONNECTORS

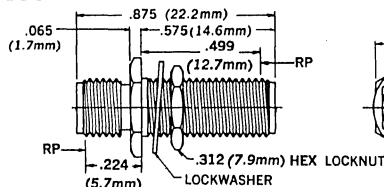
ADAPTORS

JACK-JACK



50-672-0000-31

In-Series



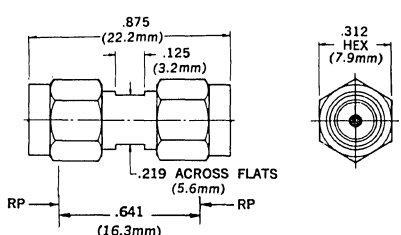
50-675-0000-31

For .265" round hole mounting

BULKHEAD Jack-Jack

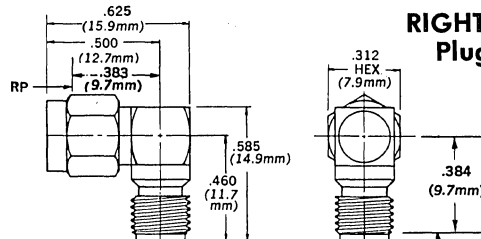


PLUG-PLUG



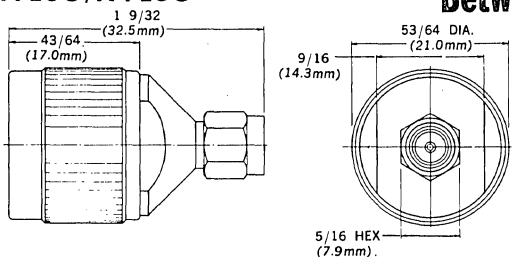
50-673-0000-31

RIGHT ANGLE Plug-Jack



50-678-0000-31

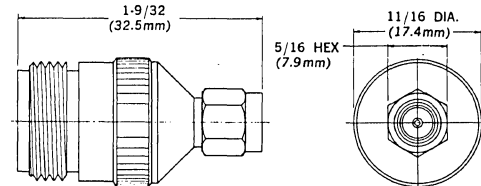
SRM PLUG/N-PLUG



VSWR = 1.04 +.005 f(GHz) 0-11 GHz

50-673-6700-89

Between-Series

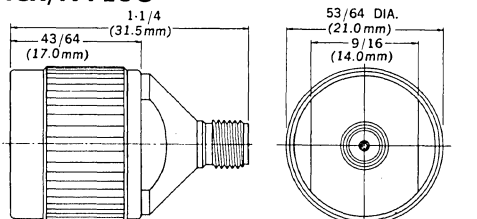


50-674-6701-89

VSWR = 1.04 +.005 f(GHz) 0-11 GHz

SRM PLUG/N-JACK

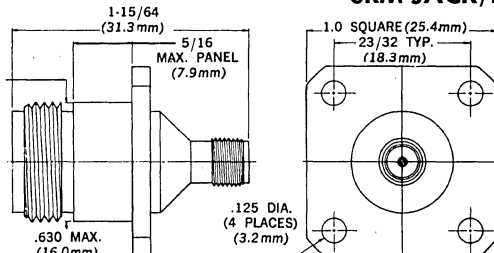
SRM JACK/N-PLUG



VSWR = 1.06 +.005 f(GHz) 0-11 GHz

50-674-6700-89

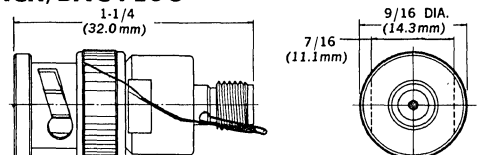
SRM JACK/N-JACK



50-675-6701-89

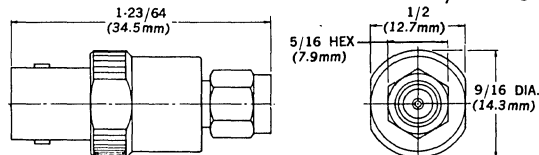
VSWR = 1.06 +.005 f(GHz) 0-11 GHz

SRM JACK/BNC PLUG



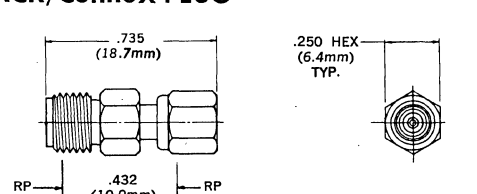
50-674-6800-89

SRM PLUG/BNC JACK



50-674-6801-89

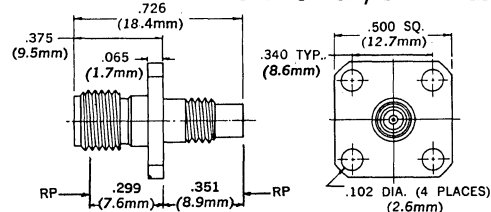
SRM JACK/ConheX PLUG



VSWR = 1.04 +.007 f(0-12.4 GHz)

50-074-6201-31

SRM JACK/CONHEX JACK



50-075-6201-31

VSWR = 1.04 +.007 f(0-12.4 GHz)

SMITH INSULATED BINDING POSTS

MOLDED LEXAN* MEETS FED. SPEC. L-P-393A

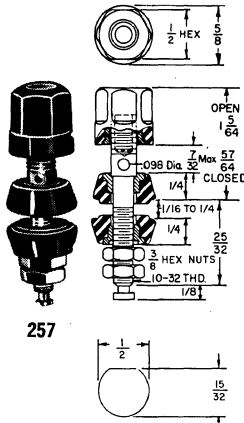
STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

LEXAN 5-WAY BINDING POSTS

*Lexan is a GE Trademark

HEX AND FLUTED HEADS

HEX HEAD



257

HEAD: CAPTIVE MOLDED LEXAN, WITH BRASS, GOLD PLATED INSERT.**BODY:** Brass, Gold Plated**WASHERS:** Molded Lexan, with Gold-Plated Brass insert.**RATINGS:** 30 Amps AC for 10°C Temp. rise, continuous duty, 2 KV AC, 60 Hertz, continuous working voltage, 5.0 pf. capacitance to 1/8" thick aluminum panel.**ACCEPTS:** Phone tip plug, spade lug, banana plug, alligator clip, stranded or solid wire up to 14 awg.**DESCR:** Captivated Lexan head to prevent loss. Keyed, Lexan base washers completely insulate post from panel and prevent turning. Mounts in 1/2" round or single "D" hole as indicated. Wires directly to wrap-around solder turret, or to solder lug (not supplied) between nuts.**COLORS:** Red, black, yellow, green, blue, white.

Std. Pkg. 100

No.	Type	NET Per C
257	Hex Head	\$65.00
459	Fluted Head	\$65.00

MIL-SPEC BINDING POSTS per MIL-P-55149/1

Same as Types 257 and 459 above, except meets requirements of MIL-P-55149/1, Dtd. 1 Nov. 1961. Brass per QQ-B-626, Comp. 22. Includes gold-plated flat washer and internal tooth lockwasher.

No.	Type	Head	NET Per C
267-102 (Red)	PBOIFA03	Hex	\$70.00
267-103 (Black)	PBOIFA04	Hex	70.00
495-102 (Red)	PBOIFA03	Fluted	70.00
495-103 (Black)	PBOIFA04	Fluted	70.00

ECONOMY TYPE BINDING POSTS

Same as Types 257 and 459, except utilizes solid molded lexan keyed back-up washer, instead of brass-insert washer. Provides same usage and features with added economy. Colors: Red, black, yellow, green, blue and white.

No.	Type	NET Per C
1257	Hex Head	\$55.00
1259	Fluted Head	55.00

COMMERCIAL TYPE BINDING POSTS

Same as Types 257 and 459, except all metal parts are nickel plated, instead of gold. Supplied in red and black only.

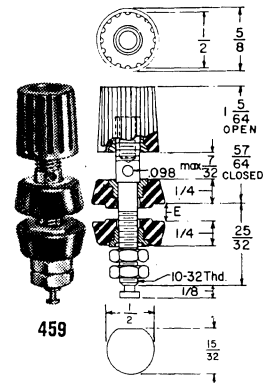
No.	Type	NET Per C
899	Hex Head	\$50.00
799	Fluted Head	50.00

COMMERCIAL TYPE with LEXAN WASHER

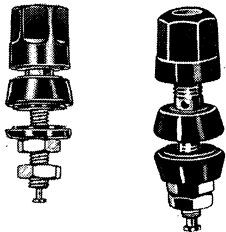
Same as Types 257 and 459, except all metal parts are nickel plated instead of gold, and utilizes solid molded lexan keyed back-up washer, instead of brass-insert washer. Provides same usages and features with maximum economy. Supplied in red and black only.

No.	Type	NET Per C
898	Hex Head	\$48.00
897	Fluted Head	48.00

FLUTED HEAD



459

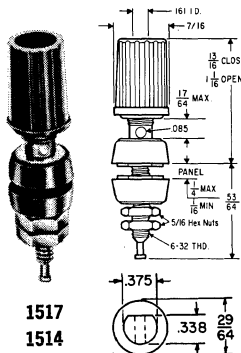
1257
898

899

1259
897

799

LEXAN BINDING POST

HEAD: CAPTIVE, MOLDED LEXAN, with brass Gold-Plated Insert.**BODY:** Brass, Gold Plated.**WASHERS:** MOLDED LEXAN, with brass Gold-plated inserts.**ACCEPTS:** Phone tip plug, spade lug, banana plug, alligator clip, or wire strand.**RATING:** 15 Amps AC for 10°C Temp. rise, continuous duty, 1 KV Volts 60 cycle AC continuous working voltage. CAPACITANCE 3.0 pf.**DESCR.:** Molded washers completely insulate post from panel. Miniature washers and narrow fluted head require minimum panel space. Mounts in 3/8" round or "D" hole in panel as indicated. Wrap-around solder terminal on stud for direct connection.**COLORS:** Red, Black, Yellow, Green, Blue, White. SPECIFY COLORStd. Pkg. 100
NET Per C
\$65.001517
1514

MIL-SPEC BINDING POSTS per MIL-P-55149/1

Same as Type 1517 above, except meets requirements of MIL-P-55149/1, Dtd. 1 Nov. 1961. Brass per QQ-B-626, Comp. 22. Includes gold-plated flat washer and internal tooth lockwasher. Behind-panel length is .690" instead of 53/64".

No.	Type No.	NET Per C
1514-102 (Red)	PBOIFA01	\$70.00
1514-103 (Black)	PBOIFA02	70.00

ECONOMY TYPE BINDING POSTS

Same as Type 1517, except utilizes solid molded lexan keyed back-up washer, instead of brass-insert washer. Provides same usage and features with added economy. Red, black, yellow, green, blue, and white. Specify color, as coded above.

No.	NET Per C
1277	\$55.00

COMMERCIAL TYPE BINDING POSTS

Same as Type 1517, except all metal parts are nickel plated, instead of gold. Supplied in red and black only.

No.	NET Per C
1275	\$50.00

COMMERCIAL TYPE LEXAN WASHER

Same as Type 1517, except all metal parts are nickel plated, instead of gold, and utilizes solid molded lexan keyed back-up washer, instead of brass-insert washer. Provides same usages and features with maximum economy. Supplied in red and black only.

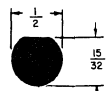
No.	NET Per C
1276	\$48.00

"D" PUNCH

Designed to punch a "D" HOLE 1/2" x 15/32" for use with all binding posts on top half of page.

No. 3837

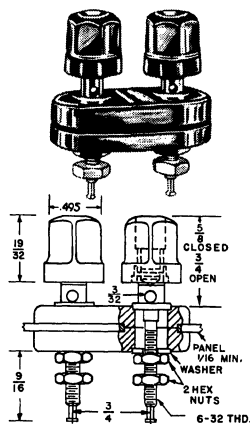
*.835 Ea.

1276
1277

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH DUAL BINDING POSTS

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE



DUAL ASSEMBLY Nylon

INSUL.: MOLDED black STYRENE, cross slotted (+) to accept standard phone tips in post either forward, or sideways.

BODY: Brass, nickel plated.

HEAD: Captive: MOLDED LEXAN

RATING: 15 Amps AC for 10°C Temp., rise, continuous duty. 2 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 2.0 pf. between conductors, 3.0 pf. to panel.

DESCR.: Mounts in two 1/2" holes on 3/4" mounting centers in panels up to 1/4" thick. Accommodates single or dual banana plugs. Supplied with 4 hex nuts, 2 flat washers.

Std. Pkg. 25

No.	Description	NET PER C
269BB	Two Black Heads	\$115.00
269RR	Two Red Heads	115.00
269RB	One Red, One Black Head	115.00

DUAL BINDING POST

INSUL.: MOLDED black STYRENE, cross slotted (+) to accept standard phone tips in post either forward, or sideways.

BODY: Brass, nickel plated.

HEAD: CAPTIVE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red or Black. SPECIFY COLOR

RATING: 15 Amps AC for 10°C Temp., rise, continuous duty. 2 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 2.0 pf. between conductors, 3.0 pf. to panel.

DESCR.: Mounts in two 1/2" holes on 3/4" mounting centers in panels up to 1/4" thick. Accommodates single or dual banana plugs. Supplied with 4 hex nuts, 2 flat washers.

Std. Pkg. 25

No.	Description	NET PER C
224BB	Two Black Heads	\$95.00
224RR	Two Red Heads	\$95.00
224RB	One Red, One Black Head	\$95.00

Same as above with brass nickel plated insert in head

263BB	Two Black Heads	\$125.00
263RR	Two Red Heads	\$125.00
263RB	One Red, One Black Head	\$125.00

DUAL NYLON BINDING POST

INSUL.: MOLDED black STYRENE, cross slotted (+) to accept standard phone tips in post either forward, or sideways.

BODY: Brass, nickel plated.

HEAD: Captive: MOLDED NYLON, per MIL-P-20693A, with molded in brass insert.

RATING: 15 Amps AC for 10°C Temp., rise, continuous duty. 2 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 2.0 pf. between conductors, 3.0 pf. to panel.

DESCR.: Mounts in two 1/2" holes on 3/4" mounting centers in panels up to 1/4" thick. Supplied with 4 hex nuts, 2 flat washers.

Std. Pkg. 25

No.	Description	NET PER C
284BB	Two Black Heads	\$95.00
284RR	Two Red Heads	\$95.00
284RB	One Red, One Black Head	\$95.00

INSULATED SPADE LUG

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black. SPECIFY COLOR

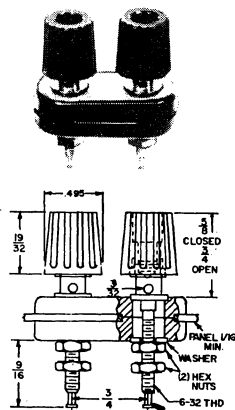
LUG: Brass, .050 thick, nickel plated.

RATING: 30 Amps AC for 10°C Temp., rise, continuous duty.

DESCR.: 1/4" I.D. fits all standard Multi-purpose binding posts. Accepts up to #10 insulated wire, which solders in front hole.

Std. Pkg. 100

No.	NET PER C
400	\$15.00



DUAL ASSEMBLY Nylon

INSUL.: MOLDED black STYRENE, cross slotted (+) to accept standard phone tips in post either forward, or sideways.

BODY: Brass, Gold finish.

HEAD: Captive: MOLDED LEXAN

RATING: 15 Amps AC for 10°C Temp., rise, continuous duty. 2 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 2.0 pf. between conductors, 3.0 pf. to panel.

DESCR.: Mounts in two 1/2" holes on 3/4" mounting centers in panels up to 1/4" thick. Accommodates single or dual banana plugs. Supplied with 4 hex nuts, 2 flat washers.

Std. Pkg. 25

No.	Description	NET PER C
1813BB	Two Black Heads	\$115.00
1813RR	Two Red Heads	\$115.00
1813RB	One Red, One Black Head	\$115.00

DUAL ASSEMBLY Nylon

INSUL.: MOLDED black STYRENE, cross slotted (+) to accept standard phone tips in post either forward, or sideways.

BODY: Brass, Gold finish.

HEAD: Captive: MOLDED LEXAN

RATING: 15 Amps AC for 10°C Temp., rise, continuous duty. 2 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 2.0 pf. between conductors, 3.0 pf. to panel.

DESCR.: Mounts in two 1/2" holes on 3/4" mounting centers in panels up to 1/4" thick. Accommodates single or dual banana plugs. Supplied with 4 hex nuts, 2 flat washers.

Std. Pkg. 25

No.	Description	NET PER C
1814BB	Two Black Heads	\$115.00
1814RR	Two Red Heads	\$115.00
1814RB	One Red, One Black Head	\$115.00

MINIATURE DUAL BINDING POST ASSEMBLY

INSUL.: MOLDED Black STYRENE, octagonal-keyed to align cross-holes at alternate 90° positions.

BODIES: Brass, Gold plated.

HEADS: CAPTIVE: MOLDED NYLON, per MIL-P-20693A, with Brass Gold plated inserts.

HARDWARE: Brass, Gold plated.

RATING: 5 Amps AC for 10°C Temp., rise, continuous duty. 2 KV 60 cycle AC, continuous working voltage. Capacitance 3.5 pf between conductors, 3.0 pf to panel.

DESCR.: Compact Dual Binding Post designed for use with miniaturized equipment. Mounts in two 1/4" round, single or double "D" holes on 1/2" centers, in panels up to 1/4" thick. 1/2" center spacing designed for use with miniature dual connectors. Also accepts single miniature banana plugs, .080" phone tips, #6 spade lugs, alligator clips or wire. Wrap-around solder turret for direct wire connections. Supplied with two hex nuts and flat washers.

Std. Pkg. 25

No.	Description	Net per C
3016BB	Two Black Heads	\$115.00
3016RR	Two Red Heads	\$115.00
3016RB	One Red, One Black Head	\$115.00

COMBINATION POST- PLUG

HEAD: Captive, brass nickel plated.

CAP: Molded Styrene, black.

BODY: Brass, nickel plated.

SPRING: Four-leaved Phosphor bronze, nickel plated.

RATING: 15 Amps AC for 10°C Temp., rise, continuous duty.

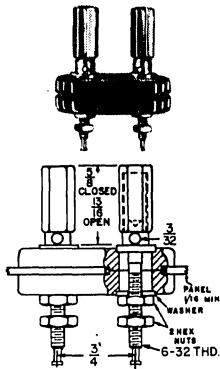
DESCR.: Converts any panel-mounted banana jack into a spring loaded push-post. Accepts standard phone tip, solid or stranded wire, and locks them in place on release of pressure on cap.

Std. Pkg. 25

No.	NET PER C
2714	\$83.00

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

ECONOMY BINDING POSTS SMITH



DUAL METAL BINDING POST

INSUL.: MOLDED black STYRENE, cross slotted (+) to accept standard phone tips in post either forward, or sideways.

BODY: Brass, nickel plated.

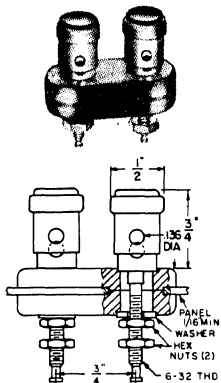
HEAD: Captive: Hex brass, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 2 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 2.0 pf. between conductors, 3.0 pf. to panel.

DESCR.: Mounts in two 1/2" holes on 3/4" mounting centers in panels up to 1/4" thick. Accommodates single or dual banana plugs. Supplied with 4 hex nuts, 2 flat washers.

Std. Pkg. 25

No. 209 NET Per C \$135.00



DUAL SPRING-LOADED BINDING POST

INSUL.: MOLDED black STYRENE, cross slotted (+) to accept standard phone tips in post either forward or sideways. Supplied in colors on special order.

HEAD: Captive, brass, nickel plated.

CAP: Molded black styrene.

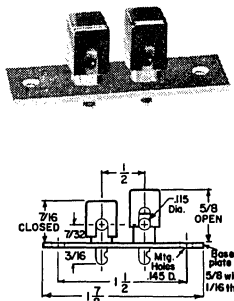
BODY: Brass, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 5 KV 60 cycle AC continuous working voltage. CAPACITANCE 4.0 pf. between conductors, 3.0 pf. to panel.

DESCR.: Mounts in two 1/2" holes on 3/4" mounting centers in panels up to 1/4" thick. Accepts standard phone tips or wires in side holes, and locks them in place when pressure on cap is released. Supplied with 4 hex nuts, 2 flat washers.

Std. Pkg. 25

No. 2713 NET Per C \$175.00



DUAL ECONOMY PUSH-POST

CAPS: Red or black ABS, 11/32" square.

BASE: XP Bakelite.

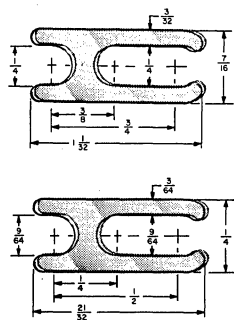
BODY: Stamped Brass, nickel plate.

RATING: 10 Amps AC for 10°C temp. rise, continuous duty. 5 Kv 60 Hz continuous working voltage. Capacitance 5 pf between posts, 2 pf to panel.

DESCR.: Mounts over 3/8" x 1" slot or two 3/8" holes on 1/2" centers in panel. Accepts wires up to 14 gauge, or phone tips, locking in place when pressure is released. Excellent for speaker connections, bridge test points, etc.

Std. Pkg. 50

No. Description NET Per C
1815BB Two Black Heads \$50.00
1815RR Two Red Heads 50.00
1815RB One Red One Black Head 50.00



SLIDE-TYPE SHORTING LINK

MATERIAL: Spring brass, nickel plated, .031 thick.

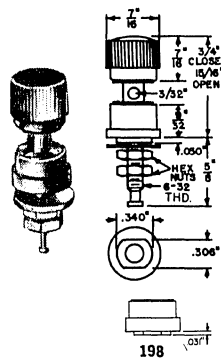
RATING: 50 Amps A.C. continuous duty, for 10°C Temp. rise (#1828)

25 Amps A.C. continuous duty, for 10°C Temp. rise (#1829)

DESCR.: Snaps over contact barrels of standard (3/4" centers) or miniature (1/2" centers) dual binding posts for positive shorting. Retaining feature allows link to slide on one post for temporary un-shorting without falling while loose.

STD. PKG. 100

No. Descr. NET Per C
1828 Standard for 3/4" Posts \$7.00
1829 Miniature for 1/2" Posts 7.00



NYLON BINDING POST

Insulated

HEAD: CAPTIVE: MOLDED NYLON, per MIL-L-20693A. Red or Black with brass nickel plated insert. SPECIFY COLOR

WASHER: Molded nylon with brass nickel plated insert.

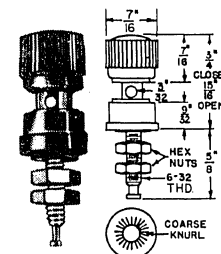
BODY: Brass, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 1 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 4.0 pf.

DESCR.: Supplied with two hex nuts. Boss washer insulates post from chassis when used with bakelite washer supplied.

Std. Pkg. 100

No. Min. Panel Thickness NET per C
378 1/16" \$60.00
198 1/32" \$60.00



NYLON BINDING POST

Grounded

HEAD: CAPTIVE: MOLDED NYLON, per MIL-P-20693A. Red or Black with brass nickel plated insert. SPECIFY COLOR

WASHER: Molded nylon with brass nickel plated insert.

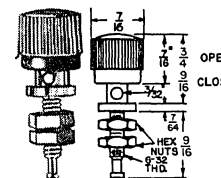
BODY: Brass, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 1 K Volts 60 cycle AC continuous working voltage, when insulated from panel as recommended. CAPACITANCE 6.0 pf.

DESCR.: Supplied with 2 hex nuts. Grounds to panel but supplied with nylon washer for uniformity of height with No. 378 when used on same panel. Can be insulated from panel by using our No. 2150 shoulder washer.

Std. Pkg. 100

No. NET Per C
377 \$60.00



NYLON BINDING POST

Grounded

HEAD: CAPTIVE: MOLDED NYLON, per MIL-P-20693A. Red or Black with brass nickel plated insert. SPECIFY COLOR

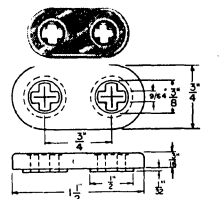
BODY: Brass, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 1 K Volts 60 cycle AC continuous working voltage, when insulated from panel as recommended. CAPACITANCE 7.0 pf.

DESCR.: Supplied with two hex nuts. Can be insulated from panel by using our No. 2150 shoulder washer and 2162 flat washer.

Std. Pkg. 100

No. NET Per C
379 \$55.00



BLACK STYRENE INSULATOR

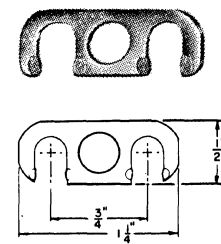
INSUL.: STYRENE, Black.

RATING: 2 K Volts 60 cycle AC continuous working voltage.

DESCR.: Mounts in two 1/2" holes on 3/4" mounting centers in panels up to 1/4" thick.

Std. Pkg. 100

No. NET Per C
207 \$ 7.00



SHORTING LINK

MATERIAL: Spring brass, nickel plated, .033" thick.

RATING: 50 Amps. AC continuous duty, for 10°C Temp. rise.

DESCR.: Snaps over contact barrels of dual binding posts with standard 3/4" mounting centers for positive shorting. Snap-in feature allows use in any position without falling off. Rotates on either post for open-circuit use, retaining snap-in feature. Center hole allows easy insertion or removal.

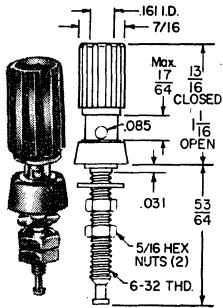
Std. Pkg. 100

No. NET Per C
327 \$7.00

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH METAL BINDING POSTS

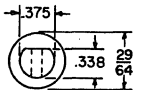
STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE



METAL BINDING POST Grounded

HEAD: CAPTIVE, Fluted Brass, Gold-plated.
BODY: Brass, Gold-plated.
WASHER: MOLDED BLACK NYLON, per MIL-P-20693A, with brass Gold-plated insert.
ACCEPTS: Phone tip plug, spade lug, banana plug, alligator clip, or wire strand.
RATING: 15 Amps AC for 10°C temp. rise, continuous duty.
DESCR.: Fluted-head metal post to match our No. 1517. For use where direct ground connection is made to panel or chassis. Supplied with brass, gold-plated flat metal washer for grounding.

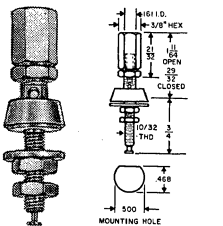
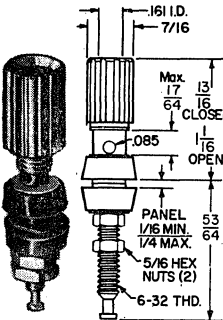
No. 1518
NET Per C \$90.00



METAL BINDING POST Insulated

HEAD: CAPTIVE, Fluted Brass, Gold-plated.
BODY: Brass, Gold-plated.
WASHER: MOLDED BLACK NYLON, per MIL-P-20693A, with brass Gold-plated insert.
ACCEPTS: Phone tip plug, spade lug, banana plug, alligator clip, or wire strand.
RATING: 15 Amps AC for 10°C temp. rise, continuous duty. 1 K Volts, 60 cycle AC continuous working voltage. CAPACITANCE 3.0 pf.
DESCR.: Fluted-head metal post to match our No. 1517. Mounts in 3/8" round or "D" hole in panel. Molded washers insulate post from panel for use where internal ground circuit is isolated from chassis or panel.

No. 1519
NET Per C \$95.00



METAL BINDING POST

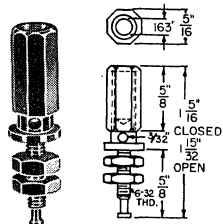
HEAD: Captive, Hex Brass, Nickel plated.
BODY: Brass, Nickel plated.
ACCEPTS: Phone tip plug, spade lug, banana plug, alligator clip or wire strand.
RATING: 30 Amps AC for 10°C temp. rise, continuous duty.
DESCR.: Mounts in a 1/2" round or "D" hole. For use where direct ground connection is made to panel or chassis 1/2 to 3/8 max. thickness. Supplied with Nickel plated flat metal washer for grounding and 2-10/32 Nickel plated nuts.

No. 1835
NET per C \$65.00

METAL BINDING POST

HEAD: CAPTIVE: Octagonal, nickel plated.
BODY: Brass, nickel plated.
ACCEPTS: Phone tip, spade lug, banana plug, alligator clip or wire strand.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 1 K Volts 60 cycle AC continuous working voltage, when insulated from panel as recommended. CAPACITANCE 5.0 mmfd.
DESCR.: Can be completely insulated from panel by using our 2150 and 2162 fibre washers. Supplied with two hex nuts.

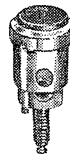
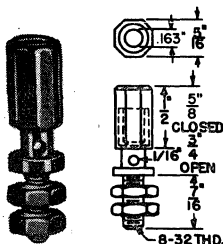
No. 208
Description Wrap-around
NET Per C \$65.00



METAL BINDING POST

HEAD: CAPTIVE: Octagonal, nickel plated.
BODY: Brass, nickel plated.
ACCEPTS: Phone tip, spade lug, banana plug, alligator clip or wire strand.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 1 K Volts 60 cycle AC continuous working voltage, when insulated from panel as recommended. CAPACITANCE 5.0 mmfd.
DESCR.: Can be completely insulated from panel by using our 2155 and 2163 fibre washers. Supplied with two hex nuts.

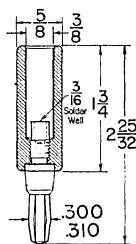
No. 137
Description Standard
NET Per C \$50.00



STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

GIANT PLUGS & JACKS

SMITH



INS. GIANT BANANA PLUG

HANDLE: MACHINED PHENOLIC plastic, Red or Black. SPECIFY COLOR
BODY: Brass, nickel plated.
SPRING: Six-leaved, phosphor bronze, nickel plated.
RATING: 25 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Large deep internal well for soldering heavy duty wire. Recessed so that no metal portions are exposed when plugged into mating jack, in order to prevent shocks or grounding. Std. Pkg. 50

No. 285 NET PER C \$130.00

INS. GIANT BANANA JACK

HEAD: MACHINED BUTYRATE, per Fed. Spec. L-P344, Type I, class MH. Red or Black. SPECIFY COLOR
BODY: Hex brass, nickel plated.
RATING: 25 Amps AC for 10°C Temp. rise, continuous duty. 1 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 7.0 pf.
DESCR.: Supplied with hex nut, fibre washer, lockwasher, screw and tinned copper lug. Jack body recessed for snug contact. Mounts in 1/2" hole in panel up to 3/4" thick. Std. Pkg. 50

No. 286 NET PER C \$95.00

INS. GIANT BANANA JACK

HEAD: MACHINED BUTYRATE, per Fed. Spec. L-P344, Type I, class MH. Red or Black. SPECIFY COLOR
BODY: Brass, nickel plated.
RATING: 25 Amps AC for 10°C Temp. rise, continuous duty. 1 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 7.0 pf.
DESCR.: Supplied with hex nut, fibre washer, lockwasher, and brass tinned lug. Jack body recessed for snug contact. Mounts in 1/2" hole in panel up to 3/4" thick. Std. Pkg. 50

No. 287 NET PER C \$95.00

GIANT BANANA PLUG

BODY: HEX BRASS, nickel plated.
SPRING: Six-leaved phosphor bronze, nickel plated.
RATING: 25 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Supplied with hex nut and brass tinned lug. Large deep internal well for soldering heavy duty wire. Std. Pkg. 50

No. 185 NET PER C \$90.00

GIANT BANANA PLUG

BODY: HEX BRASS, nickel plated.
SPRING: Six-leaved phosphor bronze, nickel plated.
RATING: 25 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Supplied with screw and brass tinned lug. Internal female thread permits use on all size panels. Std. Pkg. 50

No. 186 NET PER C \$80.00

GIANT BANANA PLUG

BODY: HEX BRASS, nickel plated.
SPRING: Six-leaved phosphor bronze, nickel plated.
RATING: 25 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Supplied with screw and brass tinned lug. Internal female thread permits use on all size panels. Std. Pkg. 50

No. 188 NET PER C \$65.00

GIANT BANANA JACK

BODY: HEX BRASS, nickel plated.
RATING: 25 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Supplied with hex nut and brass tinned lug. Std. Pkg. 50

No.	Mtg. Hole	Panel	NET PER C
187	3/8"	1/2"	\$60.00
157	1/2"	3/8"	\$70.00

MICROPHONE CONNECTORS

MICROPHONE CONNECTORS

BODY: BRASS, chrome plated.
SPRING: Steel, cadmium plated.
INSUL.: XXXP PHENOLIC.
EYELET: Brass, hot tinned for easy soldering.
DESCR.: Designed for use with single conductor cable. Microphone connectors provided with flexible protector spring. Cable clamped firmly to connector by hollow point set screw. Std. Pkg. 50

MICROPHONE CONNECTORS

No.	Type	NET PER C
115	Single Contact Male	\$39.00
116	Single Contact Female	65.00

CHASSIS CONNECTORS

Mount in .385 hole grounded; .500 hole insulated with shoulder washer.

No.	Type	Std. Pkg.	NET PER C
117	Single Contact Male	25	\$60.00

PHONE PLUG ADAPTER

BODY: Body, tip, sleeve—Brass, nickel plated.
INSUL.: XXXP PHENOLIC.
RATING: 5 Amps AC for 10°C Temp. rise, continuous duty. 750 Volts 60 cycle AC continuous working voltage.
DESCR.: Assembled to insure positive contact with input wire of mating microphone connector. Molded styrene separator insures maximum insulation between conductors. Mates with No. 116 microphone connector. Fits standard phone jacks. Std. Pkg. 25

No. 113 NET PER C \$47.00

CAP and CHAIN
Brass Nickel Plated
Std. Pkg. 25

No. 118 NET PER C \$110.00

"Your SPECIALS are STANDARD with SMITH!"

The Jacks, Plugs and Binding Posts shown on this and other pages are considered "standard" catalog items, and are available for immediate delivery in quantity.

For VARIATIONS of these standard parts to meet your SPECIAL requirements, or for entirely NEW parts made to your specifications, WE WELCOME YOUR INQUIRY!

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH INSULATED BANANA PLUGS

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

INSULATED BANANA PLUG

HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR

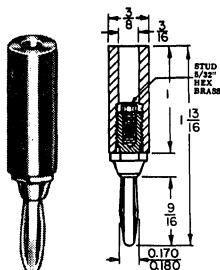
PLUG: Hex brass, nickel or silver plated.

SPRING: Four-leaved phosphor bronze or beryllium copper, nickel or silver plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Wire can be soldered to brass stud or directly into plug itself. Stud also locks wire to plug for solderless connection. Fits standard banana jacks. Std. Pkg. 100

No.	Spring Material	Plating	NET Per C
212	Phosphor Bronze	Nickel	\$35.00
232	Phosphor Bronze	Silver	\$39.00
242	Beryllium Copper	Nickel	\$41.00
262	Beryllium Copper	Silver	\$44.00



INSULATED BANANA PLUG With Side Screw

HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR

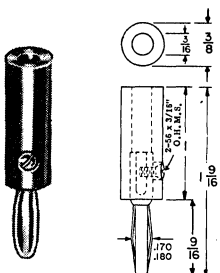
PLUG: Brass, nickel plated.

SPRING: Four-leaved phosphor bronze or beryllium copper, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Set screw secures wire without soldering. Fits standard banana jacks. Std. Pkg. 100

No.	Spring	NET Per C
204	Phosphor Bronze	\$30.00
254	Beryllium Copper	\$35.00



INSULATED BANANA PLUG

HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR

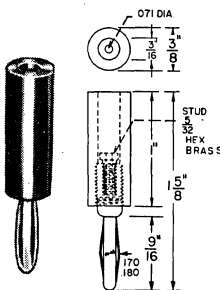
PLUG: Brass, nickel or silver plated.

SPRING: Four-leaved phosphor bronze or beryllium copper, nickel or silver plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Wire can be soldered to brass stud or directly into plug itself. Stud also locks wire to plug for solderless connection. Fits standard banana jacks. Std. Pkg. 100

No.	Spring Material	Plating	NET Per C
211	Phosphor Bronze	Nickel	\$30.00
261	Phosphor Bronze	Silver	\$33.00
271	Beryllium Copper	Nickel	\$35.00
281	Beryllium Copper	Silver	\$39.00



HIGH TEMPERATURE BANANA PLUG

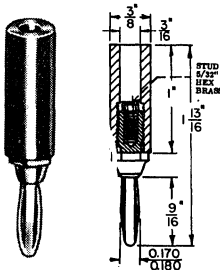
HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR

PLUG: Hex brass, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Withstands temperature to 1200 degrees F. Full resiliency—non-oxidizing. Excellent for thermo-couple connection on plastic extruding die heads. Std. Pkg. 10

No.	NET Per C
388	\$120.00



METER BANANA PLUG

HANDLE: MOLDED PHENOLIC plastic, Red and Black. SPECIFY COLOR

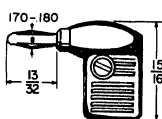
PLUG: Brass, nickel plated.

SPRING: Four-leaved phosphor bronze, nickel plated.

RATING: 10 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Molded in two halves for easy assembly with screw and nut. Fits standard banana jacks. Std. Pkg. 50

No.	Type	NET Per C
255		\$48.00



INSULATED BANANA PLUG Solderless

HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR

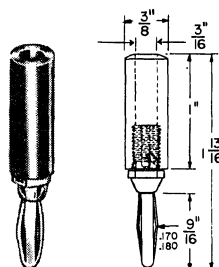
PLUG: Hex brass, nickel or silver plated.

SPRING: Four-leaved phosphor bronze or beryllium copper, nickel or silver plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Solderless: Wire fits through handle and body of tip then wrapped around screw portion. Fits standard banana jacks. Std. Pkg. 100

No.	Spring Material	Plating	NET Per C
295	Phosphor Bronze	Nickel	\$42.00
296	Phosphor Bronze	Silver	\$46.00
297	Beryllium Copper	Nickel	\$48.00
298	Beryllium Copper	Silver	\$51.00



INSULATED BANANA PLUG Split Type With Side Screw

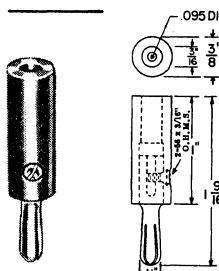
HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR

PLUG: Brass, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Cross-slotted for spring tension. Set screw secures wire, without soldering. Fits standard banana jacks. Std. Pkg. 100

No.	NET Per C
213	\$28.00



INSULATED BANANA PLUG Split Type With Internal Stud

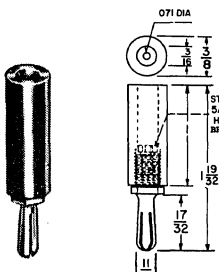
HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR

PLUG: Brass, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Cross-slotted for spring tension. Wire can be soldered to brass stud or directly into plug itself. Stud also locks wire to plug for solderless connection. Fits standard banana jacks. Std. Pkg. 100

No.	NET Per C
253	\$32.00



INSULATED BANANA PLUG Solderless

HANDLE: MACHINED BUTYRATE, per MIL-P-10408A, Type I, Class II. Red or Black. SPECIFY COLOR

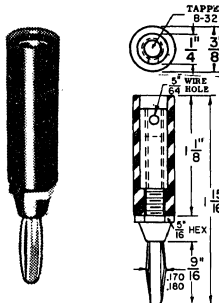
PLUG: Hex brass, nickel plated with mating brass spacer.

SPRING: Four-leaved phosphor bronze, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Cross drilled hole in spacer enables quick solderless connection of wire to plug. Fits standard banana jacks. Std. Pkg. 100

No.	NET Per C
236	\$62.00



INSULATED BANANA PLUG Midget Type

HANDLE: MACHINED BUTYRATE, per MIL-P-10408A, Type I, Class II. Red or Black. SPECIFY COLOR

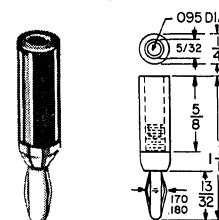
PLUG: Brass, nickel or silver plated.

SPRING: Phosphor bronze or beryllium copper, nickel or silver plated.

RATING: 10 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Wire soldered directly into stud. Fits standard banana jacks. Std. Pkg. 100

No.	Spring Material	Plating	NET Per C
291	Phosphor Bronze	Nickel	\$30.00
292	Phosphor Bronze	Silver	\$33.00
293	Beryllium Copper	Nickel	\$35.00
294	Beryllium Copper	Silver	\$39.00



IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

INSULATED BANANA PLUGS **SPECIFY SMITH**

NYLON BANANA PLUG

HANDLE: MOLDED NYLON, per MIL-P-20693A.
COLORS: Available in 10 std. colors as coded above. (Specify color)

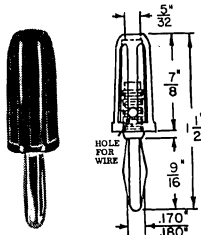
PLUG: Brass, nickel plated.

SPRING: Phosphor bronze or beryllium copper nickel or silver plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Wire can be soldered to brass stud or directly into plug itself. Stud also locks wire to plug for solderless connection. Fits standard banana jacks. Std. Pkg. 100

No.	Spring Material	Plating	NET Per C
476	Phosphor Bronze	Nickel	\$31.00
477	Phosphor Bronze	Silver	\$34.00
478	Beryllium Copper	Nickel	\$37.00
479	Beryllium Copper	Silver	\$40.00



NYLON BANANA PLUG Split Type

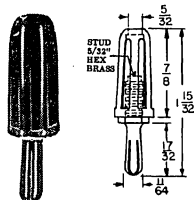
HANDLE: MOLDED NYLON, per MIL-P-20693A.
COLORS: Available in 10 std. colors as coded above. (Specify color)

PLUG: Brass, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Cross-slotted for spring tension. Wire can be soldered to brass stud or directly into plug itself. Stud also locks wire to plug for solderless connection. Fits standard banana jacks. Std. Pkg. 100

No.	NET Per C
494	\$28.00



NYLON BANANA PLUG Short Spring

HANDLE: MOLDED NYLON, per MIL-P-20693A.
COLORS: Available in 10 std. colors as coded above. (Specify color)

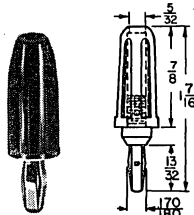
PLUG: Brass, nickel or silver plated.

SPRING: Phosphor bronze or beryllium copper nickel or silver plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Wire soldered directly into stud. Fits standard banana jacks. Std. Pkg. 100

No.	Spring Material	Plating	NET Per C
426	Phosphor Bronze	Nickel	\$28.00
427	Phosphor Bronze	Silver	\$31.00
428	Beryllium Copper	Nickel	\$33.00
429	Beryllium Copper	Silver	\$37.00



NYLON BANANA PLUG Solderless

HANDLE: MOLDED NYLON, per MIL-P-20693A.
COLORS: Available in 10 std. colors as coded above. (Specify color)

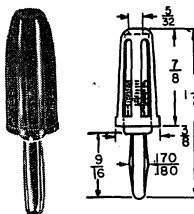
PLUG: Brass, nickel or silver plated.

SPRING: Phosphor bronze or beryllium copper nickel or silver plated.

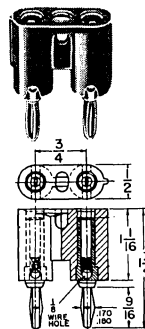
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Solderless: Wire fits through handle and body of tip then wrapped around screw portion. Inserts flush to handle, no metal exposed, eliminates possibility of shock or grounding. Fits standard banana jacks. Std. Pkg. 100

No.	Spring Material	Plating	NET Per C
455	Phosphor Bronze	Nickel	\$31.00
456	Phosphor Bronze	Silver	\$34.00
457	Beryllium Copper	Nickel	\$37.00
458	Beryllium Copper	Silver	\$40.00



USE OUR MANUFACTURING AND ENGINEERING FACILITIES for variations and for special parts which we will be happy to manufacture TO YOUR SPECIFICATIONS!



DUAL BANANA PLUG

BODY: MOLDED POLYSTYRENE, Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

SPRING: Four-leaved phosphor bronze, nickel plated.

SCREW: Steel, cadmium plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 5K Volts 60 cycle AC continuous working voltage. CAPACITANCE 1.0 pf. between conductors.

DESCR.: Mates with standard dual binding post 3/4" centers. Polarity indicated on top and side. Wire held with internal set screw. Can be stacked for multiple connections. Std. Pkg. 25

No.	NET Per C
210	\$100.00

DUAL SHORTING PLUG

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS, Red, Black, Yellow, Green, Blue, White Assemblies. SPECIFY COLOR

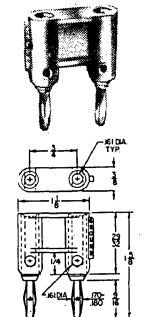
PLUG: Brass, nickel plated.

SPRING: Four-leaved beryllium copper, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 5 KV 60 cycle AC continuous working voltage.

DESCR.: Internally shorted plug mates with standard dual binding posts on 3/4" centers. Used for grounding or shorting input and output connections. Can be stacked for additional current rating. Rear banana jack holes allow connection to shorted posts. Std. Pkg. 25

No.	NET Per C
1516	\$120.00



STACK BANANA PLUG

BODY: MOLDED POLYSTYRENE, Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

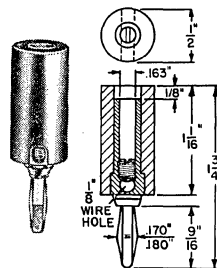
SPRING: Four-leaved phosphor bronze, nickel plated.

SCREW: Steel, cadmium plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Internal set screw for wire or phone tip connection. Can be stacked for multiple connections. Std. Pkg. 50

No.	NET Per C
324	\$58.00



STACK BANANA PLUG Solderless

HANDLE: MACHINED BUTYRATE, per MIL-P-10408A, Type I, Class II. Red, Black, Yellow or Green. SPECIFY COLOR

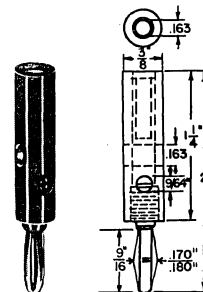
BODY: Brass, nickel plated.

SPRING: Four-leaved phosphor bronze or beryllium copper, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Solderless connection. Accepts standard banana plugs in top and side. Interconnects unlimited amount of multiple circuits. Std. Pkg. 50

No.	Spring Material	NET Per C
1511	Phosphor Bronze	\$65.00
1512	Beryllium Copper	\$73.00



MINIATURE INSULATED BANANA PLUG Midget Type

HANDLE: MACHINED BUTYRATE, per MIL-P-10408A, Type I, Class II. Red or Black. SPECIFY COLOR

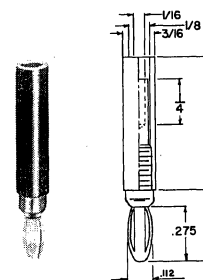
PLUG: Brass, nickel plated.

SPRING: Beryllium Copper, nickel plated.

RATING: 2 Amps AC for 10°C Temp. rise, continuous duty.

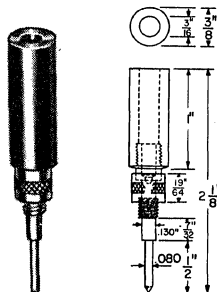
DESCR.: Wire soldered directly into stud. Fits miniature banana jacks. Std. Pkg. 100

No.	NET Per C
268	\$30.00



IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

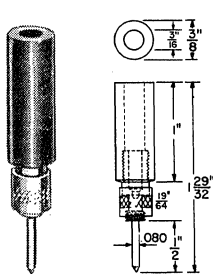
SMITH INSULATED PHONE TIP PLUGS



INSULATED TIP PLUG Solderless

HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
PLUG: Brass, nickel plated.
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Solderless: wire fits through body of tip then wrapped around screw portion and tightened with knurled collar. Threaded type. Fits standard phone tip jacks. Std. Pkg. 100

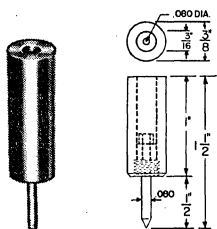
No.	Type	NET Per C
200	Senior	\$25.00



INSULATED TIP PLUG Solderless

HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
PLUG: Brass, nickel plated.
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Solderless: wire fits through body of tip then wrapped around screw portion and tightened with knurled collar. Threaded type. Fits standard phone tip jacks. Std. Pkg. 100

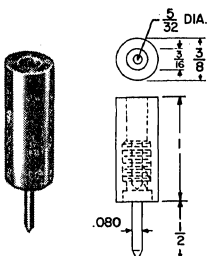
No.	Type	NET Per C
201	Junior	\$25.00



INSULATED SHORT TIP PLUG

HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
PLUG: Brass, nickel plated.
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Inserts flush to insulated handle, no metal exposed; eliminates possibility of shock or grounding. Fits standard phone tip jacks. Std. Pkg. 100

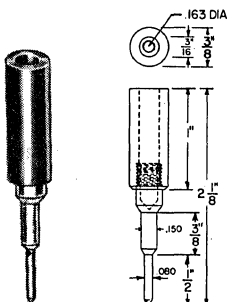
No.	NET Per C
203	\$22.00



INSULATED SHORT TIP PLUG Solderless

HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
PLUG: Brass, nickel plated.
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Solderless: wire fits through handle and body of tip then wrapped around screw portion. Inserts flush to insulated handle, no metal exposed, eliminates possibility of shock or grounding. Fits standard phone tip jacks. Std. Pkg. 100

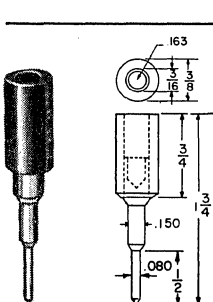
No.	NET Per C
283	\$22.00



INSULATED TIP PLUG Heavy Duty Type

HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
PLUG: Brass, nickel plated.
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Large diameter well enables soldering of heavy duty wire directly into plug. Fits standard phone tip jacks. Std. Pkg. 100

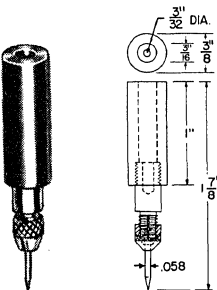
No.	NET Per C
229	\$26.00



ADAPTER Banana Plug to Tip Plug

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.
PLUG: Brass, nickel plated.
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Accepts standard banana plugs, adapts to standard tip plug. Std. Pkg. 100

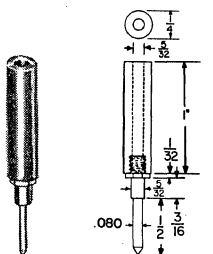
No.	NET Per C
215	\$26.00



INSULATED TIP PLUG Phono Needle

HANDLE: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
PLUG: Brass, nickel plated.
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Removable chuck for easy replacement of broken needle. Needle pierces corrosion or plating for positive reading. Std. Pkg. 100

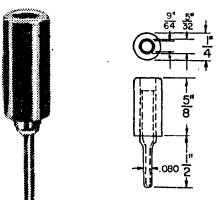
No.	Net Per C
216	\$34.00



SUB-MINIATURE TIP PLUG

HANDLE: FIBRE, per MIL-F-1148A, Grade CH. Red, Black. SPECIFY COLOR
PLUG: Brass, nickel plated.
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Ideally suited for checking sub-miniature equipment. Fits standard phone tip jacks. Std. Pkg. 100

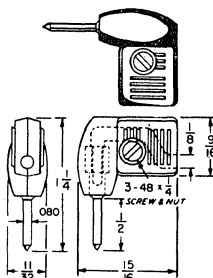
No.	NET Per C
270	\$30.00



INSULATED TIP PLUG Solder Type

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black. SPECIFY COLOR
PLUG: Brass, nickel plated our No. 158.
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Drawn hollow tip for easy soldering. Fits standard phone tip jack. Std. Pkg. 100

No.	NET Per C
237	\$10.00



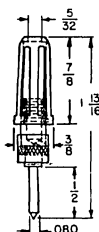
METER TIP PLUG

HANDLE: MOLDED PHENOLIC plastic, Red and Black. SPECIFY COLOR
PLUG: Brass, nickel plated.
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Molded in two halves for easy assembly with screw and nut. Fits standard phone tip jacks. Std. Pkg. 50

No.	NET Per C
235	\$35.00

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

INSULATED PHONE TIP PLUGS **SMITH**



NYLON TIP PLUG Solderless

HANDLE: MOLDED NYLON, per MIL-P-20693A. Specify color as coded above.

PLUG: Brass, nickel plated.

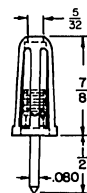
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Solderless: wire fits through body of tip then wrapped around screw portions and tightened with knurled collar. Threaded type. Fits standard phone tip jacks.

Std. Pkg. 100

No. 490

NET Per C \$25.00



NYLON SHORT TIP PLUG Solderless

HANDLE: MOLDED NYLON, per MIL-P-20693A. Specify color as coded above.

PLUG: Brass, Nickel plated.

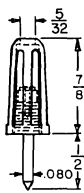
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Solderless: Wire fits through handle and body of tip then wrapped around screw portion. Inserts flush to handle, no metal exposed, eliminates possibility of shock or grounding. Fits standard phone tip jacks.

Std. Pkg. 100

No. 492

NET Per C \$23.00



NYLON SHORT TIP PLUG

HANDLE: MOLDED NYLON, per MIL-P-20693A. Specify color as coded above.

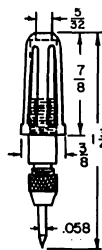
PLUG: Brass, nickel plated.

RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Inserts flush to insulated handle, no metal exposed; eliminates possibility of shock or grounding. Fits standard phone tip jacks.

NET Per C \$23.00

No. 491



NYLON TIP PLUG Phono Needle

HANDLE: MOLDED NYLON, per MIL-P-20693A. Specify color as coded above.

PLUG: Brass, nickel plated.

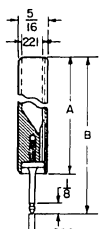
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Removable chuck for easy replacement of broken needles. Needle pierces corrosion or plating for positive reading.

Std. Pkg. 100

No. 493

NET Per C \$35.00



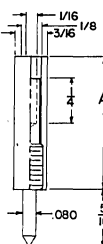
MINIATURE TIP PLUG AND TEST PROD

HANDLE: Molded Nylon, per MIL-P-20693A. Available in Red or Black. SPECIFY COLOR

TIP: Brass, Silver plated.

DESCR.: Solderless assembly. Ideal for use with sub-miniature printed-circuit tip jacks. Sharp tip breaks flux or oxide coating on printed-circuit pattern for positive contact when used as prod. Grooved head of prod makes positive contact when laid across wires. Fits all standard .080" tip jacks.

No.	Handle (A)	Overall (B)	Std. Pkg.	NET Per C
348	1 inch	1 3/4"	100	\$40.00
349	4 inches	4 3/4"	25	50.00



MINIATURE TIP PLUG AND TEST PROD

HANDLE: MACHINED BUTYRATE, per Mil-P-10408A, Type I, Class II. Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

RATING: 2 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Ideally suited for checking sub-miniature equipment. Fits standard phone tip jacks.

No.	Length (A)	Std. Pkg.	NET Per C
244	3/4"	100	\$20.00
666	3"	25	33.00

STANDARD (3/4" CENTERS) DUAL TIP JACK ASSEMBLY

INSULA.: MOLDED black STYRENE.

BODY: Recessed, brass, nickel plated.

CONTACT: Phosphor bronze.

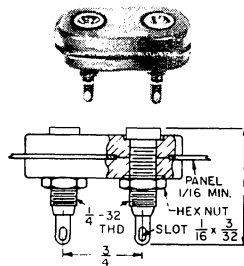
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 2 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 2.0 pf. between conductors, 4.0 pf. to panel.

DESCR.: Mounts in two 1/2" holes on 3/4" mounting centers in panels up to 1/4" thick. Accommodates standard phone tip plugs. Supplied with two hex nuts.

Std. Pkg. 10

No. 488

NET Per C \$65.00



DUAL BANANA JACK ASSEMBLY

INSULA.: MOLDED black STYRENE.

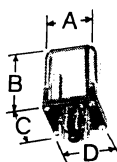
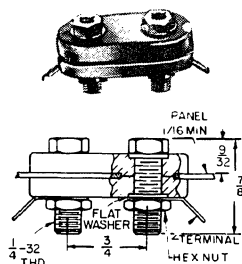
BODY: Brass, nickel plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 2 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 2.0 pf. between conductors, 4.0 pf. to panel.

DESCR.: Mounts in two 1/2" holes on 3/4" mounting centers in panels up to 1/4" thick. Accommodates standard and dual banana plugs. Supplied with two hex nuts, 4 flat washers and brass tinned lugs.

NET Per C \$65.00

No. 489



PLUG-IN MODULE HOUSINGS

Molded plastic housings and pin headers fit standard tube sockets. For use in packaging relays, networks, miniature interchangeable circuits in plug-in, replaceable modules. Available in three sizes and materials for a wide range of temperature and environmental applications.

Std. Pkg. 25

HEADERS	A	B	C	D
MIN.	13/16	19/16	13/8	13/8
STD.	13/16	115/16	13/8	13/8
LGE.	13/4	215/16	131/32	131/32

HEADER BLACK	STYRENE BLACK	BUTYRATE BLACK	NYLON NATURAL
Cat. No.	Net. Ea.	Cat. No.	Net. Ea.

MINIATURE

8 Pin	2437-08	\$.75	2421-08	\$.90	2424-08	\$.80
9 Pin	2437-09	.90	2421-09	1.00	2424-09	1.00
11 Pin	2437-11	.90	2421-11	1.00	2424-11	1.00
20 Pin	2437-20	1.00	2421-20	1.15	2424-20	1.15

STANDARD

8 Pin	2438-08	\$.75	2422-08	\$.75	2432-08	\$.90
9 Pin	2438-09	.80	2422-09	.90	2432-09	1.00
11 Pin	2438-11	.80	2422-11	.90	2432-11	1.00
20 Pin	2438-20	1.00	2422-20	1.00	2432-20	1.15

LARGE

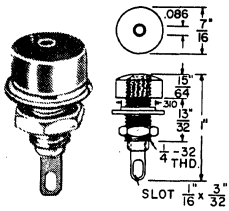
8 Pin	2439-08	\$.95	2423-08	\$ 1.40		
11 Pin	2439-11	1.00	2423-11	1.45		
20 Pin	2439-20	1.35	2423-20	1.70		

For VARIATIONS of these standard parts to meet your SPECIAL requirements, or for entirely NEW parts made to your specifications, WE WELCOME YOUR INQUIRY!

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH INSULATED PHONE TIP JACKS

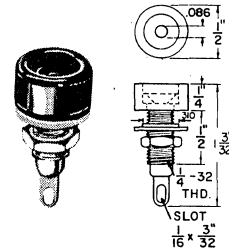
INSULATED PHONE TIP JACK



HEAD: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
BODY: Brass, nickel plated.
CONTACT: Phosphor bronze.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 750 Volts 60 cycle AC continuous working voltage. CAPACITANCE 4.0 pf.
DESCR.: Positive contact with standard phone tip plugs. Supplied complete with hex nut and fibre washer. Mounts in 5/16" hole in panels up to 3/8" thick. Accepts standard phone tip plugs. Std. Pkg. 100

No. 202
 NET Per C \$24.00

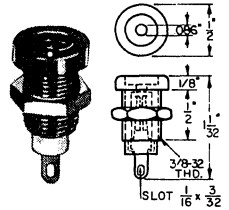
INSULATED TIP JACK Meter Type



HEAD: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
BODY: Brass, nickel plated.
CONTACT: Phosphor bronze.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 750 Volts 60 cycle AC continuous working voltage. CAPACITANCE 4.0 pf.
DESCR.: Supplied complete with hex nut and fibre washer. Mounts in 5/16" hole in panels up to 3/8" thick. Recessed jack body prevents possibility of shock or grounding. Accepts standard phone tip plugs. Std. Pkg. 100

No. 202
 NET Per C \$35.00

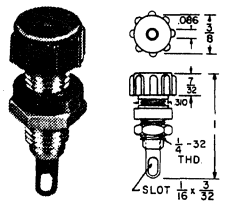
NYLON PHONE TIP JACK



BODY: MOLDED NYLON, per MIL-P-20693A. Red, Black. SPECIFY COLOR
CONTACT: Phosphor bronze.
CAP: Brass, nickel plated.
RATING: 10 Amps AC for 10°C Temp. rise, continuous duty. 5 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 3.0 pf.
DESCR.: Mounts in 3/8" hole in panels up to 5/16" thick. Accepts standard phone tip plugs. Std. Pkg. 100

No. 240
 NET Per C \$25.00

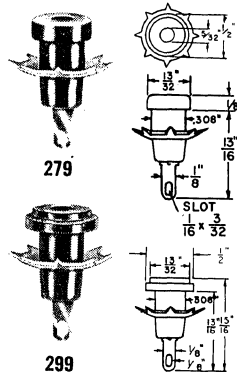
NYLON PHONE TIP JACK



HEAD: MOLDED NYLON, per MIL-P-20693A. With molded nylon washer. Red, Black, Yellow, Green, Blue. SPECIFY COLOR
BODY: Brass, nickel plated.
CONTACT: Phosphor bronze.
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty. 750 Volts 60 cycle AC continuous working voltage. CAPACITANCE 4.0 pf.
DESCR.: Extruded portion of head and washer provides excellent insulation from panel. Supplied with hex nut. Mounts in 5/16" hole in panels up to 1/4" thick. Accepts standard tip plugs. Std. Pkg. 100

No. 241
 NET Per C \$38.00

SEE OUR COMPLETE LINE OF
 TEFLON TERMINALS AND TEST
 JACKS STARTING ON PAGE 2-885



"SPEEDI-MOUNT" TIP JACKS

BODY: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
CONTACT: Phosphor bronze.

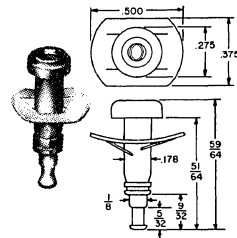
WASHER: Steel cadmium plated, internal and external tooth.

RATING: 12 Amps AC for 10°C Temp. rise, continuous duty. 3 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 3.0 pf.

DESCR.: Unusual dished lockwasher permits fast assembly. Teeth embed into jack and panels, prevents pulling out and turning. Mounts in 5/16" hole in panels up to 3/16" thick. Accepts standard phone tip plugs. Std. Pkg. 100

No.	Description	NET Per C
279	Small Head 13/32" Dia.	\$10.00
299	Large Head 1/2" Dia.	\$10.00

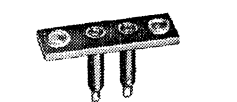
NYLON TEST TIP JACK



BODY: Nylon, Grade FM 10001.
 Specify color as coded above, 10 colors.
CONTACT: phosphor bronze, gold plated.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 3 KV 60 cycle AC continuous working voltage. CAPACITANCE 4.0 pf.
DESCR.: Mounts in 3/8" hole, with Tinnerman Speed Nut for fast permanent assembly. Teeth embed into jack body, preventing pulling out and turning. Accepts standard phone tip plugs. Std. Pkg. 25

No. 1598
 NET Per C \$17.00

PIN JACK STRIPS



STRIP: LAMINATED PHENOLIC, XP, Black.
BODY: Brass, nickel plated.
SPRING: Phosphor bronze.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 1 KV, 60 cycle AC continuous working voltage.
DESCR.: From 2 to 10 pin jacks assembled on 3/8" centers on a heavy-duty board. Provides positive contact with standard phone tip plugs. Mounting holes accept screws up to #8. Std. Pkg. 25

No.	Jacks	Mtg. Ctrs. ("A")	Length ("B")	NET Per C
1982	2	1 1/8"	1 1/2"	\$36.00
1983	3	1 1/2"	1 7/8"	\$47.00
1984	4	1 7/8"	2 1/4"	\$61.00
1985	5	2 1/4"	2 5/8"	\$75.00
1986	6	2 5/8"	3"	\$83.00
1987	7	3"	3 3/8"	\$98.00
1988	8	3 3/8"	3 3/4"	\$112.00
1989	9	3 3/4"	4 1/8"	\$121.00
1990	10	4 1/8"	4 1/2"	\$135.00

BANANA JACK STRIPS



STRIP: LAMINATED PHENOLIC, XP, Black.
BODY: Brass, nickel plated.
SPRING: Phosphor bronze.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 1 KV, 60 cycle AC continuous working voltage.

DESCR.: From 2 to 10 Banana jacks assembled on 3/8" centers on a heavy-duty board. Provides positive contact with standard banana plugs. Mounting holes accept screws up to #8. Std. Pkg. 25

No.	Jacks	Mtg. Ctrs. ("A")	Length ("B")	NET Per C
1972	2	1 1/8"	1 1/2"	\$34.00
1973	3	1 1/2"	1 7/8"	\$43.00
1974	4	1 7/8"	2 1/4"	\$57.00
1975	5	2 1/4"	2 5/8"	\$71.00
1976	6	2 5/8"	3"	\$80.00
1977	7	3"	3 3/8"	\$105.00
1978	8	3 3/8"	3 3/4"	\$109.00
1979	9	3 3/4"	4 1/8"	\$118.00
1980	10	4 1/8"	4 1/2"	\$134.00

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

NYLON TIP & P.C. TEST JACKS SMITH

NYLON TIP JACK With Metal Shell

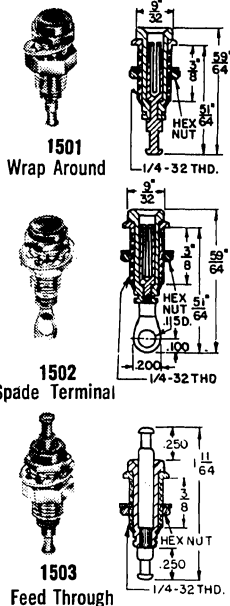
Made to Meet MS-16108 Rev. C.

COLORS: Available in White, Red, Black, Green, Blue, Orange, Yellow, Brown, Purple and Grey. Specify color as coded above.

Molded Nylon Tip Jack. Metal shell eliminates possibility of stripping threads during assembly. Meets following requirements:

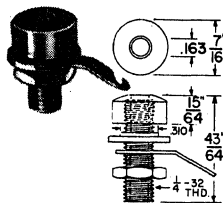
1. Salt Spray Test — Withstands 100 hours
2. Rating: 15 Amps AC for 10°C Temp. rise, continuous duty. 2 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 10.0 pf.
3. Insulation Resistance — 5000 megohms
4. Operating Conditions —
 - A. Continuous: 23 hours on, 1 hour off
 - B. Elevation: Up to 5,000 feet
 - C. Temperature: -55 to +85°C
 - D. Humidity: Up to 95%
5. Material Specifications —
 - A. Insulator: Molded Nylon, per MIL-P-20693A. Specify color as coded above.
 - B. Shell and Nut: Brass Nickel Plated Per QQ-N-290, type V (FC).
 - C. Lockwasher: Phosphor Bronze Nickel Plated Per QQ-N-290, type V (FC).
 - D. Center Contact: Heat treated Beryllium Copper, Silver plated per QQ-S-365, Gold plated overall.
6. Non-Operating Conditions —
 - A. Elevation: Up to 50,000 feet
 - B. Temperature: Continuous exposure for 72 hours at +160°F and 240 hours at -80°F.
 - C. Humidity: Up to 100%

No.	Type	Std. Pkg.	NET Per C
1501	Wrap Around	100	\$36.00
1502	Spade Terminal	50	\$50.00
1503	Feed Through	50	\$47.00



SMITH INSULATED BANANA JACKS

INSULATED BANANA JACK

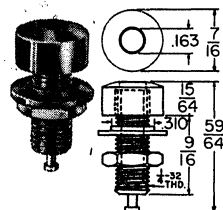


HEAD: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
BODY: Brass, nickel plated.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 750 Volts 60 cycle AC continuous working voltage. CAPACITANCE 4.0 pf.
DESCR.: Supplied with hex nut, fibre washer, and brass tinned lug. Mounts in 5/16" hole in panels up to 3/8" thick. Accepts standard banana plugs. Std. Pkg. 100

No. 205

NET Per C
\$20.00

INSULATED BANANA JACK With Turret Terminal

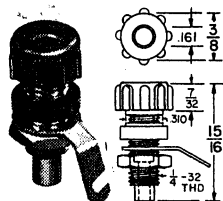


HEAD: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
BODY: Brass, nickel plated.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 750 Volts 60 cycle AC continuous working voltage. CAPACITANCE 4.0 pf.
DESCR.: Supplied with hex nut & fibre washer. Mounts in 5/16" hole in panels up to 5/8" thick. Solder direct to turret terminal. Accepts standard banana plugs. Std. Pkg. 100

No. 256

NET Per C
\$27.00

NYLON BANANA JACK

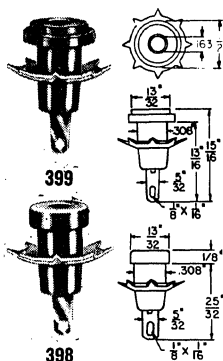


HEAD: MOLDED NYLON, per MIL-P-20693A. With molded nylon washer. Red, Black, Yellow, Green, Blue. SPECIFY COLOR
BODY: Brass, nickel plated.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 1 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 4.0 pf.
DESCR.: Extruded portion of head and washer provides excellent insulation from panel. Supplied with hex nut, brass tinned lug. Mounts in 5/16" hole in panels up to 1/4" thick. Accepts standard banana plugs. Std. Pkg. 100

No. 221

NET Per C
\$38.00

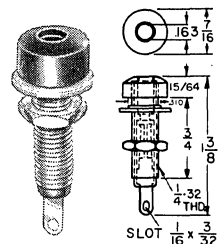
"SPEEDI-MOUNT" BANANA JACKS



BODY: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
CONTACT: Brass, cadmium plated.
WASHER: Steel cadmium plated, internal and external tooth.
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty. 3 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 4.0 pf.
DESCR.: Unusual dished lockwasher permits fast assembly. Teeth embossed into jack and panels, prevent pulling out and turning. Mounts in 5/16" hole in panels up to 3/16" thick. Accepts standard banana plug. Std. Pkg. 100

No.	Description	NET Per C
398	Small Head 1 3/32" Dia.	\$10.00
399	Large Head 1/2" Dia.	\$10.00

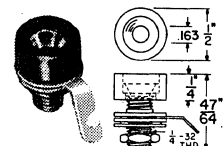
INSULATED JACK Combination Type



HEAD: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
BODY: Brass, nickel plated.
SPRING: Phosphor bronze.
CONTACT: 12 Amps AC for 10°C Temp. rise, continuous duty. 750 Volts 60 cycle AC continuous working voltage. CAPACITANCE 4.0 mmfd.
DESCR.: Supplied with hex nut & fibre washer. Accepts standard phone tip plugs or standard banana plugs. Mounts in 5/16" hole in panels up to 1/2" thick. Std. Pkg. 100

No.	NET Per C
206	\$32.00

INSULATED BANANA JACK

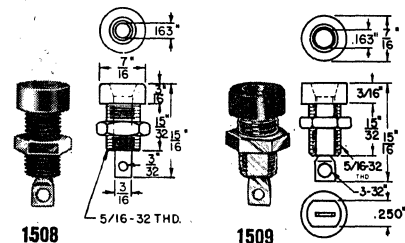


HEAD: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White. SPECIFY COLOR
BODY: Brass, nickel plated.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 750 Volts 60 cycle AC continuous working voltage. CAPACITANCE 4.0 pf.
DESCR.: Supplied with hex nut, fibre washer, lockwasher and brass tinned lug. Mounts in 5/16" hole in panels up to 3/8" thick. Jack body recessed for snug contact. Accepts standard banana plugs. Std. Pkg. 100

No.	NET Per C
219	\$28.00

NYLON BANANA JACKS

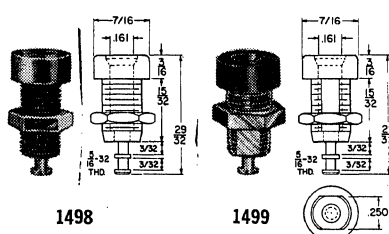
PIERCED TERMINAL



BODY: MOLDED NYLON, per MIL-P-20693A.
COLORS: Available in White, Red, Black, Green, Blue, Orange, Yellow, Brown, Purple and Grey. Specify color as coded above.
CONTACT: Brass, Cadmium plated.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 1 K Volts 60 cycle AC continuous working voltage. CAPACITANCE 5.0 pf.
DESCR.: Mounts in 5/16" hole in panels up to 5/16" thick. Accepts standard banana plugs. Wide temperature and humidity range. Std. Pkg. 100

No.	Body	NET Per C
1508	Full-Round	\$15.00
1509	"Double-D"	\$15.00

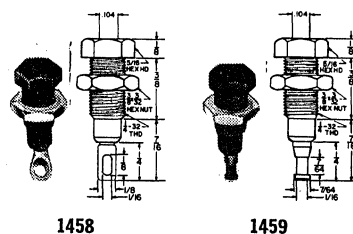
TURRET TERMINAL



BODY: MOLDED NYLON, Per MIL-P-20693A.
COLORS: Available in 10 colors as coded above. Specify color by adding color code suffix to basic catalog number.
CONTACT: Brass, electro-tin plated.
RATING: 15 Amps. A.C. for 10° C. Temp. rise, continuous duty. 1 Kv., 60 cycle A.C. continuous Working Voltage. Capacitance 5.0 Pf.
DESCR.: Mounts in 5/16" hole in panels up to 5/16" thick. Accepts standard banana plugs. One-piece turret terminal contact allows sealed panel entry hole. Std. Pkg. 100

No.	Body	NET Per C
1498	Full-Round	\$18.00
1499	"Double-D"	\$18.00

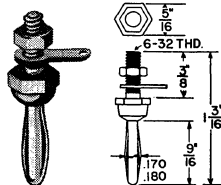
MINIATURE



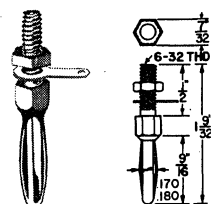
BODY: MOLDED NYLON, per MIL-P-20693A.
COLORS: Available in 10 colors as coded above. Specify color by adding color code suffix to basic catalog number.
CONTACT: Brass, gold washed.
RATING: 10 Amps. AC for 10° C. Temp. rise, continuous duty. 2 KV 60 cycle AC continuous working voltage. Capacitance 3.0 pf.
DESCR.: Mounts in 1/4" hole in panels up to 1/4" thick. Accepts subminiature banana plugs. One-piece contact allows sealed panel entry hole. Hex head for ease in mounting. Recessed contact provides for full seating of plug with no exposed metal. Std. Pkg. 100

No.	Terminal	NET Per C
1458	Pierced	\$33.00
1459	Turret	23.00

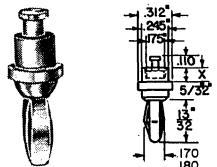
IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH**BANANA PLUGS**STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE**BANANA PLUG**

BODY: HEX BRASS, nickel plated.
SPRING: Four-leaved phosphor bronze, nickel plated.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Supplied with hex nut and phosphor bronze tinned lug. Threaded stud for panel mounting. Fits standard banana jacks.
 Std. Pkg. 100
 No. 102 NET Per C \$34.00

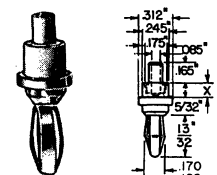
**BANANA PLUG**

BODY: HEX BRASS, nickel plated.
SPRING: Four-leaved phosphor bronze, nickel plated.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Supplied with hex nut and phosphor bronze tinned lug. Threaded stud for panel mounting. Fits standard banana jacks.
 Std. Pkg. 100
 No. 103 NET Per C \$29.00

RIVET TYPE BANANA PLUG
Wrap Around Type

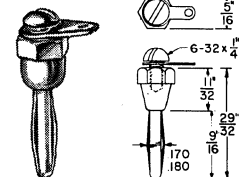
BODY: BRASS, nickel plated.
SPRING: Four leaved, beryllium copper, nickel plated.
RATING: 10 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Rivets to panel or bakelite board. Wire wraps around stud and is then soldered.
 Std. Pkg. 100

No.	"X" Dim.	Panel	NET Per C
2082	.105	1/16"	\$33.00
2083	.135	3/32"	\$33.00
2084	.165	1/8"	\$33.00

Solder Well Type

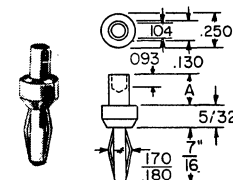
BODY: BRASS, nickel plated.
SPRING: Four-leaved beryllium copper, nickel plated.
RATING: 10 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Rivets to panel or bakelite board. Wire solders to well in rear of plug.
 Std. Pkg. 100

No.	"X" Dim.	Panel	NET Per C
2067	.105	1/16"	\$33.00
2068	.135	3/32"	\$33.00
2069	.165	1/8"	\$33.00

BANANA PLUG

BODY: HEX BRASS, nickel plated.
SPRING: Four-leaved phosphor bronze or beryllium copper, nickel plated.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Supplied with screw & phosphor bronze tinned lug. Internal female permits use on all size panels. Fits standard banana jacks.
 Std. Pkg. 100

No.	Spring Material	NET Per C
100	Phosphor Bronze	\$33.00
190	Beryllium Copper	40.00

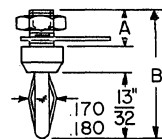
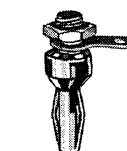
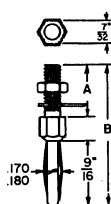
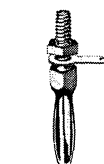
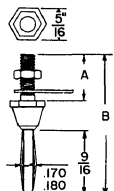
MIDGET BANANA PLUG
Rivet Type

BODY: Brass, silver plated.
SPRING: Four-leaved phosphor bronze, silver plated.
RATING: 10 Amps AC for 10°C Temp. Rise, continuous duty.
DESCR.: Rivet body can be flanged into countersunk hole in chassis for flush mount, or curled for thinner chassis plates.
 Std. Pkg. 100

No.	Rivet Length "A"	NET Per C
121	3/32"	\$22.00
143	1/16"	\$22.00
139	1/8"	\$22.00

MIL SPEC. TYPE

Same as above, but with Beryllium Copper spring, silver plated, made to meet Signal Corps Drawing SC-C-2231.
 122 0.261 \$25.00
 No. 3875 Staking Tool for above plugs
 NET Ea. \$1.50

**BANANA PLUG**

BODY: HEX BRASS, nickel or silver plated.
SPRING: Phosphor bronze or beryllium copper. Nickel or silver plated.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Supplied with hex nut and tinned phosphor bronze lug. Threaded stud for panel mounting. Fits standard banana jacks.
 Std. Pkg. 100

PHOS. BR. SPRING Nickel Plated Overall				BERYL. COP. SPRING Nickel Plated Overall			
No.	NET Per C	A	B	No.	NET Per C	A	B
431	\$34.00	6-32x3/8"	1 1/4"	443	\$39.00	6-32x1/2"	1 1/4"
432	\$37.00	6-32x1/2"	1 1/4"	444	\$42.00	6-32x3/4"	1 1/4"
433	\$40.00	6-32x3/4"	1 1/4"	445	\$45.00	8-32x3/8"	1 1/4"
434	\$34.00	8-32x3/8"	1 1/4"	446	\$39.00	8-32x1/2"	1 1/4"
435	\$37.00	8-32x1/2"	1 1/4"	447	\$42.00	8-32x3/4"	1 1/4"
436	\$40.00	8-32x3/4"	1 1/4"	448	\$45.00		

PHOS. BR. SPRING Silver Plated Overall				BERYL. COP. SPRING Silver Plated Overall			
No.	NET Per C	A	B	No.	NET Per C	A	B
437	\$37.00	6-32x3/8"	1 1/4"	449	\$42.00	6-32x1/2"	1 1/4"
438	\$40.00	6-32x1/2"	1 1/4"	450	\$45.00	6-32x3/4"	1 1/4"
439	\$43.00	6-32x3/4"	1 1/4"	451	\$48.00	8-32x3/8"	1 1/4"
440	\$37.00	8-32x3/8"	1 1/4"	452	\$42.00	8-32x1/2"	1 1/4"
441	\$40.00	8-32x1/2"	1 1/4"	453	\$45.00	8-32x3/4"	1 1/4"
442	\$43.00	8-32x3/4"	1 1/4"	454	\$48.00		

BANANA PLUG

BODY: HEX BRASS, nickel or silver plated.
SPRING: Phosphor bronze or beryllium copper. Nickel or silver plated.
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Supplied with hex nut and tinned phosphor bronze lug. Threaded stud for panel mounting. Fits standard banana jacks.
 Std. Pkg. 100

PHOS. BR. SPRING Nickel Plated Overall				BERYL. COP. SPRING Nickel Plated Overall			
No.	NET Per C	A	B	No.	NET Per C	A	B
401	\$28.00	6-32x3/8"	1 1/4"	414	\$31.00	6-32x1/2"	1 1/4"
403	\$29.00	6-32x1/2"	1 1/4"	415	\$34.00	6-32x3/4"	1 1/4"
404	\$33.00	6-32x3/4"	1 1/4"	416	\$39.00	8-32x3/8"	1 1/4"
405	\$28.00	8-32x3/8"	1 1/4"	417	\$31.00	8-32x1/2"	1 1/4"
406	\$29.00	8-32x1/2"	1 1/4"	418	\$34.00	8-32x3/4"	1 1/4"
407	\$33.00	8-32x3/4"	1 1/4"	419	\$39.00		

PHOS. BR. SPRING Silver Plated Overall				BERYL. COP. SPRING Silver Plated Overall			
No.	NET Per C	A	B	No.	NET Per C	A	B
408	\$31.00	6-32x3/8"	1 1/4"	420	\$34.00	6-32x1/2"	1 1/4"
409	\$32.00	6-32x1/2"	1 1/4"	421	\$37.00	6-32x3/4"	1 1/4"
410	\$36.00	6-32x3/4"	1 1/4"	422	\$42.00	8-32x3/8"	1 1/4"
411	\$31.00	8-32x3/8"	1 1/4"	423	\$34.00	8-32x1/2"	1 1/4"
412	\$32.00	8-32x1/2"	1 1/4"	424	\$37.00	8-32x3/4"	1 1/4"
413	\$36.00	8-32x3/4"	1 1/4"	425	\$42.00		

MIDGET BANANA PLUG

BODY: BRASS, nickel or silver plated.
SPRING: Phosphor bronze or beryllium copper. Nickel or silver plated.
RATING: 10 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Supplied with hex nut and tinned phosphor bronze lug. Threaded stud for panel mounting. Fits standard banana jacks.
 Std. Pkg. 100

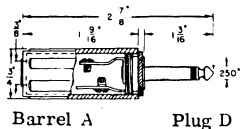
PHOS. BR. SPRING Nickel Plated Overall				BERYL. COP. SPRING Nickel Plated Overall			
No.	NET Per C	A	B	No.	NET Per C	A	B
460	\$29.00	4-40x3/8"	1 1/4"	468	\$33.00	4-40x1/2"	1 1/4"
461	\$29.00	4-40x1/2"	1 1/4"	469	\$33.00	4-40x3/4"	1 1/4"
462	\$29.00	6-32x3/8"	1 1/4"	470	\$33.00	6-32x1/2"	1 1/4"
463	\$29.00	6-32x1/2"	1 1/4"	471	\$33.00		

PHOS. BR. SPRING Silver Plated Overall				BERYL. COP. SPRING Silver Plated Overall			
No.	NET Per C	A	B	No.	NET Per C	A	B
464	\$32.00	4-40x3/8"	1 1/4"	472	\$36.00	4-40x1/2"	1 1/4"
465	\$32.00	4-40x1/2"	1 1/4"	473	\$36.00	4-40x3/4"	1 1/4"
466	\$32.00	6-32x3/8"	1 1/4"	474	\$36.00	6-32x1/2"	1 1/4"
467	\$32.00	6-32x1/2"	1 1/4"	475	\$36.00		

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

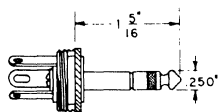
SMITH TELEPHONE PLUGS & JACKS

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

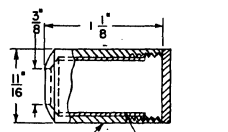


Barrel A

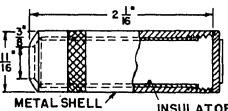
Plug D



Plug E



Barrel B



Barrel C

STANDARD PHONE PLUGS

BODY: Body, tip, and sleeve—Brass, nickel plated.

RATING: 5 Amps AC for 10°C Temp. rise, continuous duty. 750 Volts 60 cycle AC working voltage.

DESCR.: Fits standard phone jacks. Molded styrene separator insures maximum insulation between elements.

LUGS: 2 circuit plugs are screw terminals with ribbed clips and cord anchor. 3 circuit plugs are solder lugs. Std. Pkg. 50



Phenolic Barrel

BARREL: MOLDED PHENOLIC plastic, Red and Black. SPECIFY COLOR

Std. Pkg. 50					NET
No.	Circuit	Terminals	Plug	Barrel	Per C
222	2	Screw	D	A	\$ 75.00
227	3	Solder	E	A	102.00



Shielded Barrel

BARREL: BRASS, nickel plated with tubular insert.

Std. Pkg. 25					NET
No.	Circuit	Terminals	Plug	Barrel	Per C
252	2	Screw	D	B	\$ 99.00
272	2	Screw	D	C	102.00
228	3	Solder	E	B	147.00
238	3	Solder	E	C	150.00

PJ055 AND PJ068 PLUGS

BARREL: MOLDED plastic.

BODY: Body, tip, sleeve, machined brass.

TERM.: Brass, hot tinned.

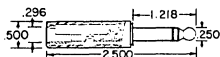
INSUL.: Ethyl cellulose type EM-1 per MIL-P3412.

RATING: Meets MIL Spec. JAN-P-642.

DESCR.: Designed especially for high quality communications equipment and to meet the exacting requirements of the armed services. Parts are assembled together in a mold, providing a finished plug with complete continuity of thermo plastic insulation between the tip rod and plug sleeve.

Std. Pkg. 25

No.	Type	NET Per C
217	PJ055B	\$245.00
247	PJ068B	355.00

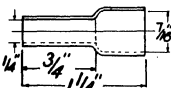


TELEPHONE CORD SLEEVE

MATERIAL: Neoprene in accordance with Grade SC415AFF per MIL-R-3065. Black.

DESCR.: Used on Government cord assemblies. for Strain Relief, Dust and Moisture Seal. Std. Pkg. 100

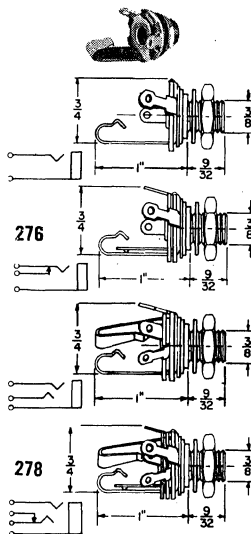
No.	NET Per C
748	\$11.00



SPECIAL REQUIREMENTS?

Use our Engineering and Production Facilities to design and develop new products or modify existing components to meet your specific needs. "Specials are Standard with SMITH!"

TELEPHONE JACKS



BUSHING: BRASS, nickel plated.

INSUL.: Phenolic, type PBE-P per MIL-P-3115B.

SPRING: Nickel-Silver alloy, spring temper. New tapered design provides for ease of insertion while eliminating possibility of shorts.

SLEEVE TERM.: Brass, hot tinned.

RATING: 10 Amps AC for 10°C Temp. rise, continuous duty. 1.2 K Volts 60 cycle AC continuous working voltage.

DESCR.: Notched insulating washers accurately locate all parts, and eliminate possibility of shorts and arc-over. Springs designed for firm, low-resistance electrical contact. Bushings 1/4" long, threaded 3/8"-32. Mounts in 3/8" hole in panels up to 5/32" thick. Overall diameter 7/8", requires 1" clearance behind panel. Supplied with 1/2" hex brass nut and 3/8" steel panel washer, all nickel plated. Std. Pkg. 50

No.	Circuit	NET Per C
275	Two Conductor Open	\$42.00
276	Two Conductor Closed	50.00
277	Three Conductor Open	55.00
278	Three Conductor Closed	75.00

IN-LINE EXTENSION JACK Phenolic Barrel

BARREL: MOLDED PHENOLIC plastic, Red and Black. SPECIFY COLOR

BODY: Brass, nickel plated.

RATING: 10 Amps AC for 10°C Temp. rise, continuous duty. 1 K Volts 60 cycle AC continuous working voltage.

SPRING: Nickel, silver, special alloy, spring temper.

INSUL.: XPP PHENOLIC.

DESCR.: For microphone and Hi-Fi extension cords. Mates with standard phone plugs. Std. Pkg. 25

No.	Circuit	Terminals	NET Per C
274	2	Solder	\$ 99.00
288	2	Screw	108.00

Shielded Barrel

BARREL: Brass, nickel plated, with tubular insulator.

BODY: Brass, nickel plated.

RATING: 10 Amps AC for 10°C Temp. rise, continuous duty. 1 K Volts 60 cycle AC continuous working voltage.

SPRING: Nickel, silver, special alloy, spring temper.

INSUL.: XPP PHENOLIC.

DESCR.: For microphone and Hi-Fi extension cords. Mates with standard phone plugs. Std. Pkg. 25

No.	Circuit	Terminals	NET Per C
273	2	Solder	\$132.00
289	2	Screw	144.00

PHONE PLUG ADAPTER

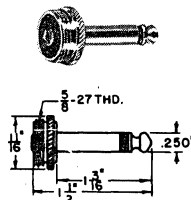
BODY: Body, tip, sleeve—Brass, nickel plated.

INSUL.: XXXF PHENOLIC.

RATING: 5 Amps AC for 10°C Temp. rise, continuous duty. 750 Volts 60 cycle AC continuous working voltage.

DESCR.: Assembled to insure positive contact with input wire of mating microphone connector. Molded styrene separator insures maximum insulation between conductors. Mates with No. 116 microphone connector. Fits standard phone jacks. Std. Pkg. 25

No.	NET Per C
113	\$47.00

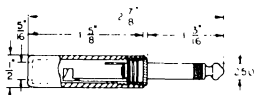


USE OUR MOLDING AND SCREW MACHINE FACILITIES for variations and for special parts which we will be happy to manufacture TO YOUR SPECIFICATIONS!

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

TELEPHONE PLUGS & JACKS SMITH



Barrel G

Plug F

SLIM PHONE PLUGS

BODY: Body, tip, and sleeve—Brass, nickel plated.

RATING: 5 Amps AC for 10°C Temp. rise, continuous duty. 750 Volts 60 cycle AC continuous working voltage.

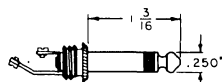
DESCR.: Fits standard phone jacks. Molded styrene separator insures maximum insulation between elements. Std. Pkg. 50



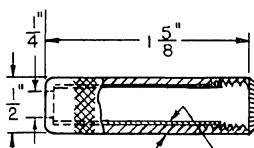
Phenolic Barrel

BARREL: MOLDED PHENOLIC plastic, Red and Black. SPECIFY COLOR

No.	Circuit	Terminals	Plug	Barrel	NET Per C
225	2	Solder	F	G	\$ 72.00
307	2	Screw	H	G	75.00



Plug H



METAL SHELL
INSULATOR
Barrel J

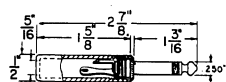
Shielded Barrel

BARREL: BRASS, nickel plated with tubular insert.

No.	Circuit	Terminals	Plug	Barrel	NET Per C
226	2	Solder	F	J	\$102.00
316	2	Screw	H	J	105.00

ECONOMY TYPE

DESCR.: An inexpensive modified version of our popular #225 and 226 plugs shown above. Features two small solder lugs. Std. Pkg. 50



Plug O

Phenolic Barrel

BARREL: MOLDED PHENOLIC plastic, Red and Black. SPECIFY COLOR

No.	Circuit	Terminals	Plug	Barrel	NET Per C
320	2	Solder	O	G	\$60.00

Shielded Barrel

Std. Pkg. 25

BARREL: BRASS, nickel plated with tubular insert. Std. Pkg. 50

No.	Circuit	Terminals	Plug	Barrel	NET Per C
330	2	Solder	O	J	\$75.00

MINIATURE PHONE PLUG

BARREL: MOLDED plastic. Black.

BODY: Body, tip, sleeve—Brass, nickel plated.

TERM.: Brass, hot tin dipped.

RATING: 5 Amps AC for 10°C Temp. rise, continuous duty. 350 Volts 60 cycle AC continuous working voltage.

DESCR.: Designed for use with small radios, tape recorders, etc. Solder terminals. Std. Pkg. 50

No.	Circuit	NET Per C
480	Two Conductor	\$85.00

Shielded Barrel

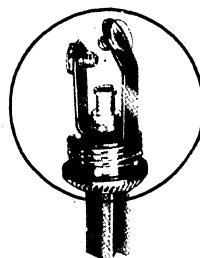
BARREL: BRASS, nickel plated with tubular insulator.

BODY: Body, tip, sleeve—Brass, nickel plated.

RATING: 5 Amps AC for 10°C Temp. rise, continuous duty. 350 Volts 60 cycle AC continuous working voltage.

DESCR.: Designed for use with small radios, tape recorders, etc. Solder terminals. Std. Pkg. 25

No.	Circuit	NET Per C
481	Two Conductor	\$120.00



IMPROVED "TURRET-CENTER" STYLE

BODY: Body, Tip, Ring, and sleeve—Brass, nickel plated.

RATING: 5 Amps AC for 10°C Temp. rise, continuous duty. 1.5 KV 60 cycle AC continuous working voltage.

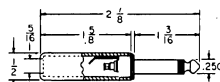
DESCR.: New, improved construction has co-axial "turret-terminal" tip lug and widely separated contacts for maximum voltage ratings. Styrene separator, Mylar sleeves, and Nylon bushings used for increased performance. Fits standard phone jacks. Std. Pkg. 50



Phenolic Barrel

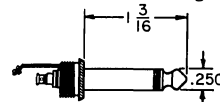
BARREL: MOLDED PHENOLIC plastic, Red and Black. SPECIFY COLOR

No.	Circuit	Terminals	Plug	Barrel	NET Per C
171	2	Solder	K	G	\$ 77.00
172	2	Screw	L	G	80.00
308	3	Solder	M	G	117.00
309	3	Screw	N	G	120.00

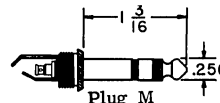


Barrel G

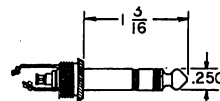
Plug K



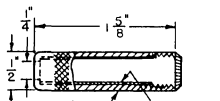
Plug L



Plug M



Plug N



Barrel J

Shielded Barrel

BARREL: BRASS, nickel plated with tubular insert.

No.	Circuit	Terminals	Plug	Barrel	NET Per C
173	2	Solder	K	J	\$107.00
174	2	Screw	L	J	110.00
311	3	Solder	M	J	135.00
312	3	Screw	N	J	138.00

MINIATURE TELEPHONE JACKS

BUSHING: BRASS, nickel plated.

INSUL.: XXXP Phenolic, type PBE-P per MIL-P-3115A.

SPRING: Nickel silver alloy, spring temper.

TERM.: Brass, hot tinned.

RATING: 5 Amps AC for 10°C Temp. rise, continuous duty. 500 Volts 60 cycle AC continuous working voltage.

DESCR.: Notched insulation washers interlock springs and lugs, eliminate possibility of shifting which result in electrical shorts. Springs firmly hold mating plug. Supplied with hex brass nut and steel mounting washer, all nickel plated. Std. Pkg. 50

No.	Circuit	NET Per C
482	Two Conductor, Open	\$50.00
483	Two Conductor, Closed	55.00



482



483

MINIATURE EXTENSION JACK Shielded

BARREL: Brass, nickel plated.

BODY: Brass, nickel plated.

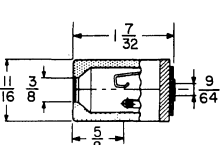
SPRING: Nickel silver alloy, spring temper.

INSUL.: Phenolic.

RATING: 5 Amps AC for 10°C Temp. rise, continuous duty. 500 Volts 60 cycle AC continuous working voltage.

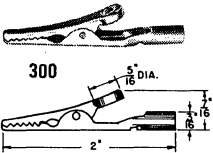
DESCR.: Mates with Miniature Phone Plugs. Std. Pkg. 25

No.	Circuit	Terminals	NET Per C
487	2	Solder	\$135.00



IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH ALLIGATOR & BATTERY CLIPS



ALLIGATOR CLIPS

RATING: 5 Amps AC for 10°C Temp. rise, continuous duty.

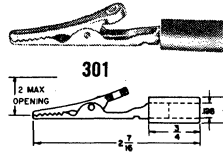
DESCR.: 1/2" jaw opening. Jaws match accurately and grip securely, accepts standard banana plug in rear. Std. Pkg. 100

Solder Connection

No.	Type	NET Per C
300	Steel, Cad. Pl.	\$ 7.10
380	Solid Copper	9.60
332	Brass N.P.	11.50

Screw Connection

No.	Type	NET Per C
350	Steel, Cad. Pl.	\$ 8.10
360	Solid Copper	12.20
339	Brass N.P.	13.80



INSULATED ALLIGATOR CLIPS

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black. SPECIFY COLOR

RATING: 5 Amps AC for 10°C Temp. rise, continuous duty.

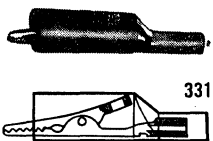
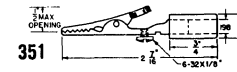
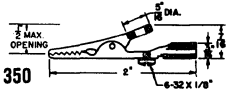
DESCR.: 1/2" jaw opening. Jaws match accurately and grip securely, accepts standard banana plug in rear. Std. Pkg. 100

Solder Connection

No.	Type	NET Per C
301	Steel, Cad. Pl.	\$10.30
381	Solid Copper	12.00
354	Brass N.P.	13.80

Screw Connection

No.	Type	NET per C
351	Steel, Cad. Pl.	\$10.80
361	Solid Copper	16.00
362	Brass N.P.	16.00



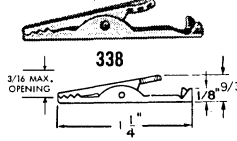
ALLIGATOR CLIP BOOTS

MATERIAL: MOLDED VINYL PLASTIC, Red, Black, Yellow, Green, Blue or White. SPECIFY COLOR

RATING: 1 K Volts 60 cycle AC continuous working voltage.

DESCR.: Fully insulates clip while allowing maximum jaw opening. Std. Pkg. 100

No.	Type	For Clip Length	NET Per C
331	Standard	2"	\$3.70
389	Midget	1 1/4"	2.90

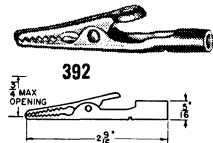


MINIATURE ALLIGATOR CLIP

RATING: 1 Amp AC for 10° C Temp. rise, continuous duty.

DESCR.: 3/4" jaw opening, jaws match accurately and grip securely. Unique SMITH spring construction. Solder connection and ears for crimping. Std. Pkg. 100

No.	Type	NET per C
338	Steel, Cad. Pl.	\$5.50
367	Copper	6.80



JUMBO ALLIGATOR CLIPS

RATING: STEEL: 10 Amps AC for 10°C Temp. rise, continuous duty.

COPPER: 15 Amps AC for 10°C Temp. rise, continuous duty.

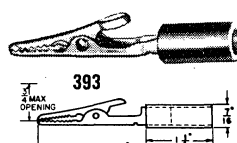
DESCR.: 3/4" jaw opening. Jaws match accurately. For heavy terminal use. Std. Pkg. 100

Solder Connection

No.	Type	NET Per C
392	Steel, Cad. Pl.	\$19.00
396	Solid Copper	22.70

Screw Connection

No.	Type	NET per C
368	Steel, Cad. Pl.	\$22.70
356	Solid Copper	27.70



INSULATED JUMBO ALLIGATOR CLIPS

HANDLE: MACHINED BUTYRATE, per MIL-P-10408A, Type I, Class II. Red or Black. SPECIFY COLOR

RATING: STEEL: 10 Amps AC for 10°C Temp. rise, continuous duty.

COPPER: 15 Amps AC for 10°C Temp. rise, continuous duty.

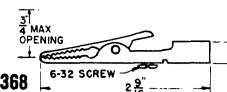
DESCR.: 3/4" jaw opening. Jaws match accurately. For heavy terminal use. Std. Pkg. 25

Solder Connection

No.	Type	NET per C
393	Steel, Cad. Pl.	\$26.50
397	Solid Copper	31.60

Screw Connection

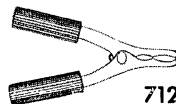
No.	Type	NET per C
369	Steel, Cad. Pl.	\$30.30
357	Solid Copper	35.60



BATTERY CLIPS

No.	Current Capacity	Spread Jaw	Length	Spring	Std. Pkg.	NET Per C
STEEL, ELECTROPLATED						
365	5 Amp.	3/8"	1 5/8"	7 lbs.	100	11.00
366	10 Amp.	3/8"	2"	10 lbs.	100	11.00
701	25 Amp.	1"	2 1/2"	17 lbs.	10	20.00
702	50 Amp.	1 1/2"	3 7/8"	33 lbs.	5	30.00
704	100 Amp.	1 3/8"	5"	40 lbs.	5	90.00
SOLID COPPER						
703	50 Amp.	1"	2 1/2"	17 lbs.	5	30.00
705	100 Amp.	1 1/4"	4 3/4"	33 lbs.	5	90.00
706	200 Amp.	1 3/8"	5 3/4"	40 lbs.	5	170.00

SEE OUR STANDARD LINE OF ALLIGATOR CLIP TEST LEADS AND JUMPERS on pages 2-835 and 2-836. Contact us for your special requirements.



PLIER TYPE BATTERY CLIPS

Insulated Vinylite Handles, Red or Black. SPECIFY COLOR

No.	Amps.	Material	Overall Size	Std. Pkg.	NET Per C
712	35	Steel, Cop. Pl.	3 1/4"	5	\$25.00
713	75	Steel, Cop. Pl.	4 1/2"	5	35.00
714	100	Steel, Cop. Pl.	7 1/2"	5	60.00
721	300	Solid Copper	7 1/2"	5	180.00



BATTERY CLIP INSULATORS

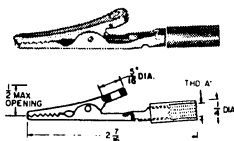
Red or Black. SPECIFY COLOR

No.	Made to fit Smith Clip #	Material	Std. Pkg.	NET per C
331	365	Vinyl	100	3.70
710	704, 706	H.D. Rubber	10	75.00

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

ALLIGATOR CLIPS & ADAPTERS **SMITH**

PHONE TIP TO ALLIGATOR CLIP



BUSHING: Brass, nickel plated.
CLIP: Steel cadmium plated.
RATING: 5 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Adapts standard solderless tips to alligator clip. This novel quick-adapter is a must for all types of bench work.
 Std. Pkg. 50

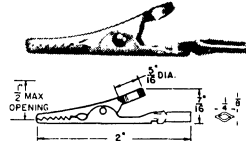
No.	Thd. "A"	NET Per C
310	10-32	\$25.00
720	8-32	25.00

ALLIGATOR CLIP ADAPTERS

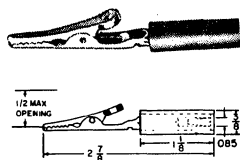
CLIP: Steel, cadmium plated.
RATING: 5 Amps AC for 10°C Temp. rise, Continuous duty.
DESCR.: 1/2" jaw opening. Jaws match accurately and grip securely. Accepts standard phone tip in rear. Crimped for spring tension. Std. pkg. 100

No.	Type	NET Per C
333	Steel, Cad. Pl.	\$10.30

PHONE TIP TO ALLIGATOR CLIP



PHONE TIP TO ALLIGATOR CLIP



INSULATED ALLIGATOR CLIP ADAPTERS

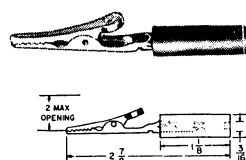
HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black. SPECIFY COLOR
CLIP: Steel, cadmium plated or solid copper.
BODY: Brass.
CONTACT: Phosphor bronze.
RATING: 5 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Jack in rear permits adapting standard phone tip plug to alligator clips.
 Std. Pkg. 50

No.	Type	NET per C
304	Steel Clip	\$40.00
334	Copper Clip	44.00

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black. SPECIFY COLOR
CLIP: Steel, cadmium plated or solid copper.
BODY: Brass.
CONTACT: Phosphor bronze.
RATING: 5 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: Combination jack in rear, permits the adapting standard phone tip plug or banana plug to alligator clip.
 Std. Pkg. 50

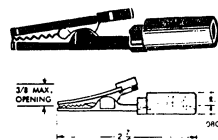
No.	Type	NET Per C
305	Steel Clip	\$47.00
335	Copper Clip	51.00

PHONE TIP OR BANANA PLUG TO ALLIGATOR CLIP



ALL INSULATED ADAPTER

PHONE TIP TO ALLIGATOR CLIP



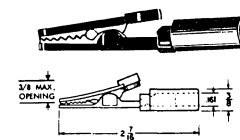
INSULA.: MOLDED BUTYRATE, per Fed. Spec. L-349A, Type 3, Class MS. Red or Black. SPECIFY COLOR
CLIP: Steel, cadmium plated.
BODY: Brass.
CONTACT: Phosphor bronze.
RATING: 5 Amps AC for 10°C Temp. rise, continuous duty.
DESCR.: All metal parts fully insulated with molded plastic. Insures against shock or grounding. Jack in rear permits adapting standard phone tip plugs to alligator clips.
 Std. Pkg. 50

No.	NET per C
336	\$43.00

ALL INSULATED ALLIGATOR CLIP

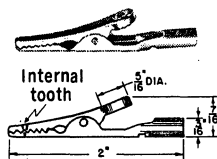
INSULA.: MOLDED BUTYRATE, per Fed. Spec. L-349A, Type 3, Class MS. Red or Black. SPECIFY COLOR
CLIP: Steel cadmium plated.
RATING: 5 Amps AC for 10°C Temp. rise, continuous duty. 1 K Volts 60 cycle AC continuous working voltage.
DESCR.: All metal parts fully insulated with molded plastic. Insures against shock or grounding. Solder type connection.
 Std. Pkg. 50

No.	NET Per C
337	\$29.00



STANDARD

INSULATION PIERCING CLIPS



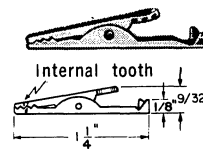
CLIP: Steel, cadmium plated.
RATING: 5 Amps AC for 10° C Temp. rise, continuous duty.
DESCR.: 1/2" jaw opening. Jaws match accurately and grip securely. Internal tooth for piercing wire insulation. Accepts standard banana plug in rear.
 Std. Pkg. 100

No.	NET per C
347	\$15.00

CLIP: Steel, cadmium plated.
RATING: 1 Amp AC for 10° C Temp. rise, continuous duty.
DESCR.: 3/16" jaw opening. Jaws match accurately and grip securely. Internal tooth for piercing wire insulation. Solder connection and ears for crimping.
 Std. pkg. 100

No.	NET per C
326	\$10.00

MINIATURE



You'll find these SMITH products on the shelves of leading industrial Electronic Distributors, throughout U.S.A. For your production runs, draw directly on our large plant inventories of standard components.

SPECIAL REQUIREMENTS?

Use our Engineering and Production Facilities to design and develop new products or modify existing components to meet your specific needs.

"Specials are Standard with SMITH!"

MINIATURE ALLIGATOR CLIP ADAPTERS

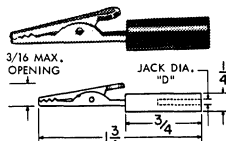
HANDLE: MOLDED BUTYRATE, Per Fed. Spec. L-P-349-A, Type 3, Class MS, Red or Black. SPECIFY COLOR
CONTACT: Beryllium Copper (Tip Jack only).
RATING: 1 Amp for 10°C Temp. rise, cont. duty.
DESCR.: Jack in rear adapts miniature alligator clip to phone tip plug, miniature banana plug or standard banana plug.
 Std. Pkg. 50

STEEL, CADMIUM PLATED

No.	Type	Jack Dia. "D"	NET per
1320	Tip Plug	.080"	\$39.00
1321	Min. Banana Jack	.104"	39.00
1322	Std. Banana Jack	.151"	39.00

COPPER

1323	Tip Plug	.080"	\$44.00
1324	Min. Banana Jack	.104"	44.00
1325	Std. Banana Jack	.161"	44.00

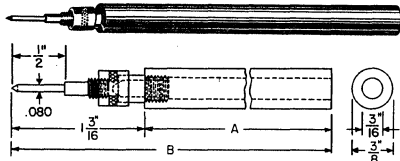


IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH

TEST PRODS

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE



SOLDERLESS TEST PROD—Threaded Type

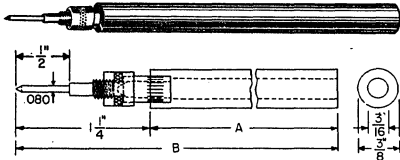
HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Solderless: Wire fits through handle and body of plug, then wraps around screw portion and is tightened with knurled collar. Std. Pkg. 25

No.	Handle (A)	Overall (B)	NET Per C
302	4"	5 1/4"	\$33.00
303	5 1/2"	6 3/4"	36.00



SOLDERLESS TEST PROD—Force Fit Type

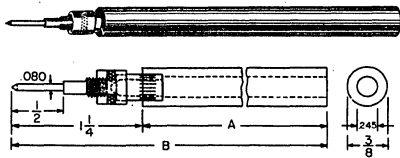
HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Solderless: Wire fits through handle and body of plug, then wraps around screw portion and is tightened with knurled collar. Std. Pkg. 25

No.	Handle (A)	Overall (B)	NET Per C
382	4"	5 1/4"	\$33.00
383	5 1/2"	6 3/4"	36.00



SOLDERLESS TEST PROD—Force Fit Type Large Inside Diameter

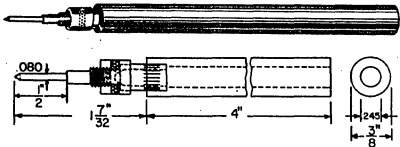
HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Solderless: Wire fits through handle and body of plug, then wraps around screw portion and is tightened with knurled collar. Extra large I.D. for heavy duty wire. Std. Pkg. 25

No.	Handle (A)	Overall (B)	NET Per C
352	4"	5 1/4"	\$33.00
353	5 1/2"	6 3/4"	36.00



SOLDERLESS FIBRE TEST PROD

Large Inside Diameter

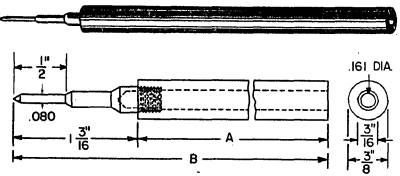
HANDLE: FIBRE, per MIL-F-1148A, Grade CH. Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Solderless: Wire fits through handle and body of plug, then wraps around screw portion and is tightened with knurled collar. Large I.D. permits use of heavy duty wire. Std. Pkg. 25

No.	Handle (A)	Overall (B)	NET Per C
323	4"	5 1/4"	\$39.00



HEAVY DUTY TEST PROD—Threaded Type

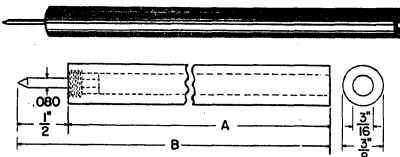
HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Large diameter well enables soldering of heavy duty wire directly into plug. Fits standard phone tip jacks. Std. Pkg. 25

No.	Handle (A)	Overall (B)	NET Per C
319	4"	5 3/4"	\$33.00
329	5 1/2"	6 1 1/2"	36.00



SHORT TIP TEST PROD

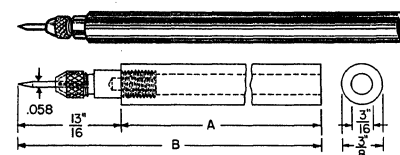
HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Inserts flush with insulated handle, no metal exposed; eliminates possibility of shock or grounding. Fits standard phone tip jacks. Std. Pkg. 25

No.	Handle (A)	Overall (B)	NET Per C
363	4"	4 1/2"	\$28.00
364	5 1/2"	6"	31.00



PHONO NEEDLE TEST PROD

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Removable chuck for easy replacement or broken needles. Needle pierces corrosion or plating for positive reading. Std. Pkg. 25

No.	Handle (A)	Overall (B)	NET Per C
317	4"	4 13/16"	\$36.00
318	5 1/2"	6 1/16"	42.00

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

TEST PRODS

SMITH

SOLDERLESS PHONO NEEDLE TEST PROD

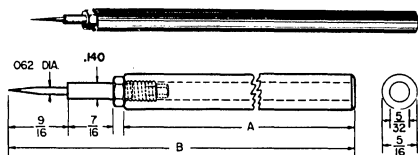
HANDLE: XXXP Phenolic lacquered, per MIL-P-79, Form TR. Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

NEEDLE: Phono needle, steel.

RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Wire can be soldered to brass stud or directly into plug itself. Stud also locks wire to pellet for solderless connections. Std. Pkg. 25



No.	Handle (A)	Overall (B)	NET Per C
314	4"	5 3/4"	\$83.00
313	6"	7 3/4"	90.00

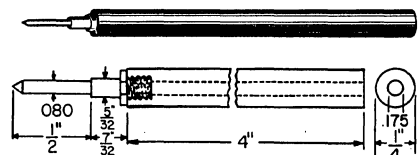
MINIATURE TEST PROD

HANDLE: FIBRE, per MIL-F-1148A, Grade CH. Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Threaded for easy assembly ideally suited for checking all types sub-miniature equipment. Std. Pkg. 25



No.	NET Per C
322	\$39.00

PENCIL TYPE SOLDERLESS TEST PROD

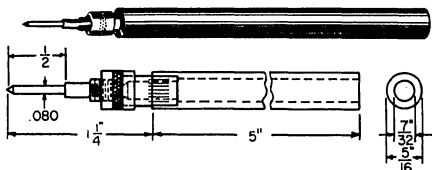
Force Fit Type

HANDLE: MACHINED BUTYRATE, per MIL-P-10408A, Type 1, Class 2. Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Solderless: Wire fits through handle and body of plug, then wraps around screw portion and is tightened with knurled collar. Std. Pkg. 25



No.	NET Per C
384	\$33.00

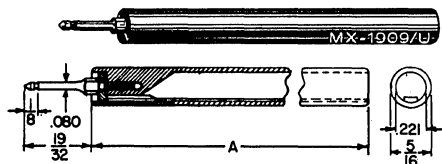
NYLON HANDLE PRODS & TIPS

HANDLE: MOLDED NYLON, per MIL-P-20693A. Red or Black. SPECIFY COLOR

TIP: Brass, silver plated.

RATING: 10 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Solderless. Made to meet Signal Corps Drawing SC-C-82761. Std. Pkg. 25



No.	Sig. Corps. Part No.	Size ("A")	Color	NET Per C
176	MX-1906/U	1"	Red	\$40.00
177	MX-1907/U	1"	Black	40.00
178	MX-1909/U	4"	Red	50.00
179	MX-1910/U	4"	Black	50.00

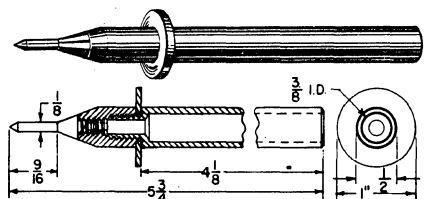
TEST PROBE High Voltage Type

HANDLE: FIBRE, per MIL-F-1148A, Grade CH. Red or Black. SPECIFY COLOR

PROBE: Brass, nickel plated.

RATING: 12 Amps, AC for 10°C Temp. rise, continuous duty. 15 KV 60 cycle AC continuous working voltage.

DESCR.: Heavy insulated fibre probe with flash-over shield for high-voltage applications. Large internal I.D. accommodates shielded cable or R.F. networks. Heavy duty removable tip. Std. Pkg. 10



No.	NET per C
630	\$125.00

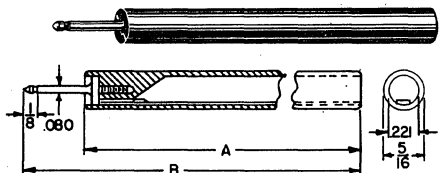
MINIATURE TIP PLUG AND TEST PROD

HANDLE: Molded Nylon, per MIL-P-20693A. Available in Red or Black. SPECIFY COLOR

TIP: Brass, Silver plated.

RATING: 10 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Solderless assembly. Ideal for use with sub-miniature printed-circuit tip jacks. Sharp tip breaks flux or oxide coating on printed-circuit pattern for positive contact when used as prod. Grooved head or prod makes positive contact when laid across wires. Fits all standard .080" tip jacks.



No.	Std. Pkg.	Handle (A)	Length (B)	NET Per C
348	100	1 inch	1-5/16"	\$40.00
349	25	4 inches	4-5/16"	50.00

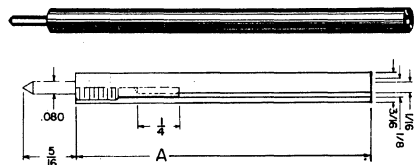
MINIATURE TIP PLUG AND TEST PROD

HANDLE: MACHINED BUTYRATE, per Mil-P-10408A, Type I, Class II, Red or Black. SPECIFY COLOR.

PLUG: Brass, nickel plated.

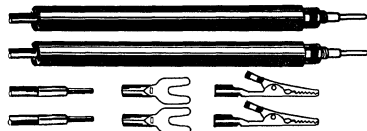
RATING: 2 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Ideally suited for checking sub-miniature equipment. Fits standard phone tip jacks.



No.	Std. Pkg.	Length (A)	NET Per C
244	100	3/4"	\$20.00
666	25	3"	33.00

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

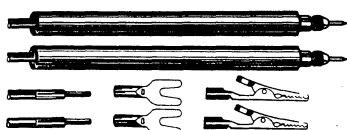
SMITH**TEST LEADS**STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE**SOLDERLESS TIP TEST LEAD**

600 601 602

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.

TIP: Solderless: Brass, nickel plated. Std. Pkg. 12

No.	Meter End	NET Per Pr.
600	Phone Tips	\$1.25
601	Spade Lugs	1.25
602	Alligator Clips	1.30

PHONO NEEDLE TEST LEAD

613 614 615

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.

BODY: Brass, nickel plated.

NEEDLE: Steel, nickel plated. Std. Pkg. 12

No.	Meter End	NET Per Pr.
613	Phone Tips	\$1.25
614	Spade Lugs	1.25
615	Alligator Clips	1.30

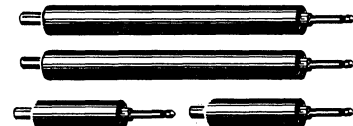
ALL SOLDERLESS TEST LEAD

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.

PLUG: MOLDED THERMOSETTING plastic, Red and Black per MIL-M-14 CFG.

TIP: Solderless: Brass, nickel plated. Std. Pkg. 12

No.	NET Per Pr.
603	\$1.60

SOLDERLESS PHONE TIP TEST LEAD SLIM HANDLES

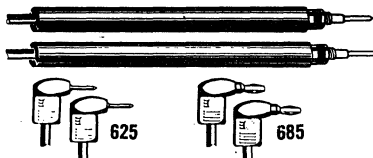
HANDLE: MOLDED NYLON, per MIL-P-20693A 1/4" O.D. RED and BLACK.

TIP: Brass, Silver Plated with front retention groove.

WIRE: #18 AWG, 65/36 to an O.D. of .140, rubber covered, 10,000 volts.

DESCR: Wire slips thru molded hole in handles and is held securely by washer under tip.

No.	NET Per Pr.
684	\$2.00

**METER TEST LEADS
Solderless Prod**

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.

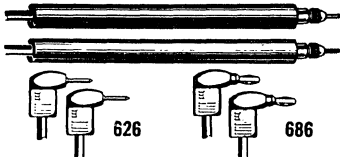
TIP: Solderless: Brass, nickel plated.

ELBOW: MOLDED PHENOLIC plastic, Red and Black.

BODY: Brass, nickel plated.

SPRING: Four leaved, phosphor bronze, nickel plated. Std. Pkg. 12

No.	Type	NET Per Pr.
625	Phone Tip Meter Tip	\$1.80
685	Banana Meter Tip	2.05

Needle Prod

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.

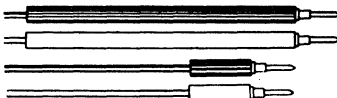
NEEDLE: Steel, nickel plated.

ELBOW: MOLDED PHENOLIC PLASTIC, Red and Black.

BODY: Brass, nickel plated.

SPRING: Four leaved, phosphor bronze, nickel plated. Std. Pkg. 12

No.	Type	NET Per Pr.
626	Phone Tip Meter Tip	\$1.80
686	Banana Meter Tip	2.05

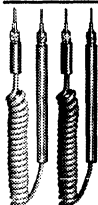
SLIM HANDLE TEST LEAD

HANDLE: FIBRE, per MIL-F-1148A, Grade CH. Red, Black, 1/4" O.D.

PLUG: FIBRE, per MIL-F-1148A, Grade CH. Red, Black, 1/4" O.D.

TIPS: Brass, nickel plated. Std. Pkg. 12

No.	NET Per Pr.
678	\$2.45

**KOIL-KORD****TEST LEAD****ALL SOLDERLESS**

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.

PLUG: MOLDED PHENOLIC plastic, Red and Black.

TIP: Solderless: Brass, nickel plated.

WIRE: #20 gauge, 41/36 strand, 4000 volt, nominal O.D. .165. Retracted length 12 inches, extended length 6-ft. Std. Pkg. 6

No.	NET Per Pr.
618	\$3.65

BANANA PLUG TEST LEAD

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.

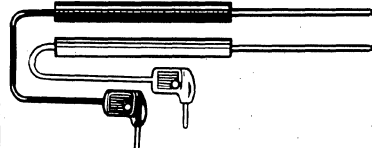
PLUG: MOLDED PHENOLIC plastic, Red and Black.

TIP PLUG: Solderless: Brass, nickel plated.

BODY: Brass, nickel plated.

SPRING: Four leaved phosphor bronze, nickel plated. Std. Pkg. 12

No.	NET per Pr.
623	\$1.80

SLIM JIM TEST LEAD

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.

PROBE: Steel, cadmium plated.

INSULATOR: Vinyl spaghetti tubing, Red and Black.

ELBOWS: MOLDED PHENOLIC plastic. Red and Black.

TIPS: Brass, nickel plated. Std. Pkg. 12

No.	NET per Pr.
698	\$1.75

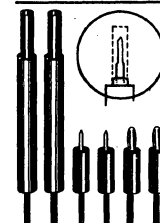
SHORT TIP TEST LEAD

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.

PLUG: MOLDED PHENOLIC plastic, Red and Black.

TIP: Brass, nickel plated. Std. Pkg. 12

No.	NET Per Pr.
624	1.35

**RETRACTABLE
SHIELDED
TEST
LEADS**

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.

TIP: Prod tip brass, nickel plated. Meter end, see type.

DESCR.: Plugs insert flush to insulated handle. Prods have retractable cover leaving no metal exposed. Eliminates possibility of shock or grounding. Supplied with either phone tip or banana plug meter ends. Other variations on special order. Std. Pkg. 6

No.	Type	NET Per Pr.
616	Phone Tip End	\$2.30
617	Banana Plug End	2.45

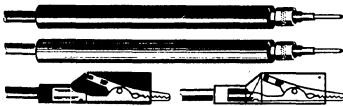
IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

TEST LEADS

SMITH

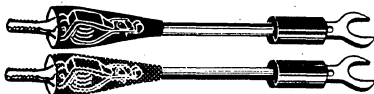
ALLIGATOR CLIP TEST LEAD



HANDLES: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.
TIPS: Solderless: Brass, nickel plated.
CLIPS: Steel, cadmium plated.
BOOT: Vinyl Plastic Red and Black.

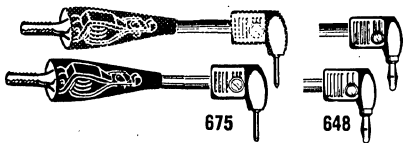
No.	Std. Pkg. 12
672	NET Per Pr. \$155

CROCODILE CLIP TEST LEAD



CLIPS: STEEL, Cadmium Plated.
BOOT: Vinyl Plastic, Red and Black.
HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.
LUG: Brass, Nickel Plated. Std. Pkg. 12

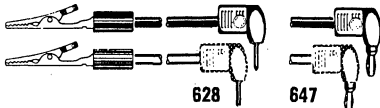
No.	NET Per Pr.
671	\$1.45



CLIPS: STEEL, Cadmium Plated.
BOOT: Vinyl Plastic, Red and Black.
ELBOWS: MOLDED PHENOLIC plastic, Red and Black.
TIPS: Brass, Nickel Plated.
SPRING: Four leaved, phosphor bronze, nickel plated.

No.	Type	Std. Pkg. 12
675	Phone Tip Meter Tip	NET Per Pr. \$1.50
648	Banana Meter Tip	1.60

ALLIGATOR CLIP TEST LEAD



CLIP HANDLES: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.
CLIPS: Steel, Cadmium Plated.
ELBOWS: MOLDED PHENOLIC plastic, Red and Black.
TIPS: Brass, Nickel Plated.
SPRING: Four-leaved phosphor bronze, nickel plated.

No.	Std. Pkg. 12
628	NET Per Pr. \$1.50
647	1.60

MINIATURE TEST LEAD

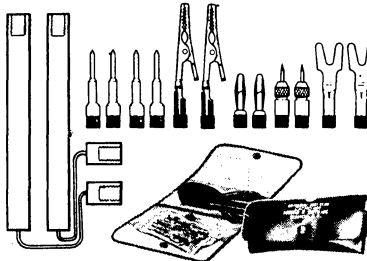


HANDLE: MACHINED BUTYRATE, 3/16" O.D., 3" long, per MIL-P-10408A, Type I, Class II, Red and Black.

PLUG: MACHINED BUTYRATE, 3/16" O.D., 3/4" long, per MIL-P-10408A, Type I, Class II.
TIPS: Brass, nickel plated. Std. Pkg. 12

No.	NET per Pr.
660	\$1.20

"UNIVERSAL" TEST LEAD Completely Interchangeable

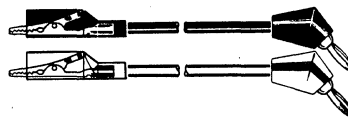


Fifty Leads in One! One lead can make any required test lead combination. All parts adapt into prod handle or tip handle. Complete as shown. With plastic kit.

WIRE: 5 KV rubber covered, 26 strands #34 copper, #20 AWG insulated to an O.D. of .125". Std. Pkg. 6

No.	Description	NET Ea.
699	Standard	\$ 5.00
679	Miniature	5.00

ALLIGATOR CLIP TEST LEAD FOR STANDARD BANANA JACKS

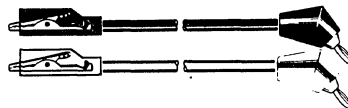


CLIPS: Steel, Cadmium Plated, Standard.
BOOTS: Vinyl Plastic, Red and Black.
BODIES: Brass, Nickel Plated, and Aluminum.
SPRING: Four-leaved Beryllium copper, Nickel Plated.

WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, #18 AWG, insulated to an O.D. of .140"

No.	NET Per Pr.
1332	\$1.60

FOR MINIATURE BANANA JACKS

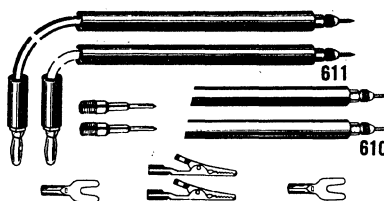


Same as above, except:

WIRE: 5 KV PVC Flexible Wire, 19 strands #36 copper, #24 AWG, insulated to an O.D. of .090"

No.	NET Per Pr.
1342	\$1.60

TEST LEAD KIT

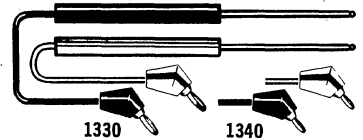


DESCR.: Each kit is supplied with one pair of test leads. One end test prods, other end ins. banana plugs.

FITTINGS: Two each: Phone tips, alligator clips, spade lugs. Std. Pkg. 6

No.	Type	NET Ea.
611	Solderless Prods	\$2.50
	Needle Tip Prods	2.50

SLIM JIM TEST LEAD FOR STANDARD BANANA JACKS



HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.

PROBE: Steel, Cadmium Plated.

INSULATOR: Vinyl Spaghetti Tubing, Red and Black.

BODIES: Brass nickel plated, and Aluminum.
SPRING: Four-leaved Beryllium copper, nickel plated.

WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, #18 AWG, insulated to an O.D. of .140"

No.	NET Per Pr.
1330	\$2.00

FOR MINIATURE BANANA JACKS

Same as above, except:

WIRE: 5 KV PVC Flexible Wire, 19 strands #36 copper, #24 AWG, insulated to an O.D. of .090"

No.	NET Per Pr.
1340	\$2.00

PHONO NEEDLE TEST LEAD FOR STANDARD BANANA JACKS



HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.
BODIES: Brass, Nickel Plated, and Aluminum.
NEEDLE: Steel, Nickel Plated.

SPRING: Four-leaved Beryllium copper, Nickel Plated.

WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, #18 AWG, insulated to an O.D. of .140"

No.	NET Per Pr.
1331	\$2.00

FOR MINIATURE BANANA JACKS

Same as above, except:

WIRE: 5 KV PVC Flexible Wire, 19 strands #36 copper, #24 AWG, insulated to an O.D. of .090"

No.	NET Per Pr.
1341	\$2.00

SLIM HANDLE TEST LEAD



HANDLES: MACHINED BUTYRATE, per MIL-P-10408A, type 1, class 2. Red and Black 3/16" O.D.

TIPS: Prod: Brass, Nickel Plated. Meter End: Drawn Brass Nickel Plated.

No.	Std. Pkg. 12
670	NET Per Pr. \$1.25

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

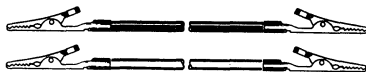
SMITH TEST LEADS & JUMPERS

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

WIRE SPECIFICATIONS

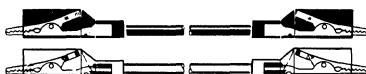
#20 Wire, 26/34 strands, 5000 Volts, .125" O.D.
All Test Leads on this page are supplied with extra-flexible rubber-covered kinkless wire, 50 inches long, unless specified otherwise.

ALLIGATOR CLIP TEST LEAD



CLIPS: STEEL, cadmium plated.	Std. Pkg. 12
No.	Wire
604	12 inches
605	24 inches
606	36 inches
607	48 inches
	NET Per Pr.
	\$1.00
	1.05
	1.10
	1.15

ALLIGATOR CLIP TEST LEAD With Boots



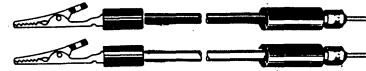
CLIPS: Steel, Cadmium Plated.	Std. Pkg. 12
BOOTS: Vinyl plastic Red and Black.	NET Per Pr.
No.	Wire
624	12 inches
657	24 inches
658	36 inches
659	48 inches
	\$1.10
	1.15
	1.20
	1.25

MIDGET ALLIGATOR CLIP TEST LEAD



CLIPS: Steel, Cadmium Plated.	Std. Pkg. 12
BOOTS: Vinyl plastic Red and Black.	NET Per Pr.
No.	Wire
716	12 inches
717	18 inches
718	24 inches
719	36 inches
	\$1.10
	1.15
	1.20
	1.25

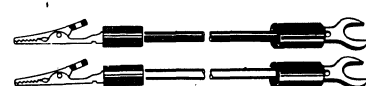
ALLIGATOR CLIP TEST LEAD



CLIP HANDLES: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.	Std. Pkg. 12
PLUG HANDLES: MOLDED PHENOLIC PLASTIC, Red and Black.	NET Per Pr.
No.	Wire
716	12 inches
717	18 inches
718	24 inches
719	36 inches
	\$1.10
	1.15
	1.20
	1.25

CLIPS: Steel, Cadmium Plated.	Std. Pkg. 12
TIPS: Solderless, Brass, Nickel Plated.	NET Per Pr.
No.	Wire
627	12 inches
	\$1.30

ALLIGATOR CLIP TEST LEAD



CLIP HANDLES: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red and Black.	Std. Pkg. 12
CLIPS: Steel, Cadmium Plated.	NET Per Pr.
LUGS: Brass, Nickel Plated.	
No.	Wire
649	12 inches
	\$1.30

STANDARD ALLIGATOR CLIP BOTH ENDS



CLIPS: STEEL, Cadmium plated (No. 300)	Std. Pkg. 10
BOOTS: Vinyl plastic. Boot colors match wire.	NET Ea.
RATING: 5 Amps AC for 10°C Temp. rise, continuous duty.	
WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, #18 AWG, insulated to an O.D. of .140". Available in Red, Black, Yellow, Green, Blue, and White. SPECIFY COLOR.	
No.	Length
1596-12	12 inches
1596-24	24 inches
1596-36	36 inches
1596-48	48 inches
1596-60	60 inches
	\$.63
	.65
	.67
	.69
	.71

MINIATURE ALLIGATOR CLIP BOTH ENDS



CLIPS: STEEL, Cadmium plated (No. 338).	Std. Pkg. 10
BOOTS: Vinyl plastic. Boot colors match wire.	NET Ea.
RATING: 5 Amps AC for 10°C Temp. rise, continuous duty.	
WIRE: General purpose, PVC insulated, 1/64" wall, #18 AWG, 16/30 stranded conductor. Available in Red, Black, Yellow, Green, Blue, and White. SPECIFY COLOR.	
No.	Length
1597-12	12 inches
1597-18	18 inches
1597-24	24 inches
1597-36	36 inches
1597-48	48 inches
1597-60	60 inches
	\$.63
	.64
	.65
	.67
	.69
	.71

STANDARD ALLIGATOR CLIP TO SPADE LUG



HANDLES: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red or Black.	Std. Pkg. 10
LUG: Brass, Nickel Plated, .050 thick.	NET Ea.
CLIPS: STEEL, Cadmium plated	
BOOTS: Vinyl plastic. Boot colors match wire.	
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.	
WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, #18 AWG, insulated to an O.D. of .140".	
No.	Length
1867-12	12 inches
1867-24	24 inches
1867-36	36 inches
1867-48	48 inches
1867-60	60 inches
	\$.60
	.68
	.75
	.82
	.90

SPECIALS
are
STANDARD
with
SMITH

STANDARD ALLIGATOR CLIP TO STACK BANANA PLUG



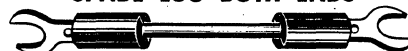
HANDLES: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White.	Std. Pkg. 10
PLUG: Hex brass, nickel plated.	NET Ea.
SPRING: Four-leaved phosphor bronze, nickel plated.	
CLIPS: STEEL, Cadmium plated	
BOOTS: Vinyl plastic. Boot colors match wire.	
RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.	
WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, #18 AWG, insulated to an O.D. of .140".	
No.	Length
1866-12	12 inches
1866-24	24 inches
1866-36	36 inches
1866-48	48 inches
1866-60	60 inches
	\$.99
	1.02
	1.05
	1.07
	1.10

STANDARD ALLIGATOR CLIP TO STACK PIN PLUG



HANDLES: MOLDED PHENOLIC plastic, Red, Black, Yellow, Green, Blue, White.	Std. Pkg. 10
PLUG: Brass, nickel plated.	NET Ea.
CLIPS: STEEL, Cadmium plated	
BOOTS: Vinyl plastic. Boot colors match wire.	
RATING: 12 Amps AC for 10°C Temp. rise, continuous duty.	
WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, #18 AWG insulated to an O.D. of .140".	
No.	Length
1865-12	12 inches
1865-24	24 inches
1865-36	36 inches
1865-48	48 inches
1865-60	60 inches
	\$.96
	.98
	1.00
	1.02
	1.04

SPADE LUG BOTH ENDS



HANDLES: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red or Black.	Std. Pkg. 10
LUG: Brass, Nickel Plated, .050 thick.	NET Ea.
RATING: 25 Amps AC for 10°C Temp. rise, continuous duty.	
WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, #18 AWG, insulated to an O.D. of .140".	
No.	Length
1864-12	12 inches
1864-24	24 inches
1864-36	36 inches
1864-48	48 inches
1864-60	60 inches
	\$.71
	.78
	.86
	.93
	1.00

FOR YOUR SPECIAL REQUIREMENTS

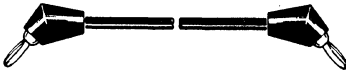
We are equipped to manufacture all types of Jumpers in various combinations using Alligator and Battery clips.

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

JUMPERS & RF PATCH CORDS

SMITH

BANANA PLUG JUMPERS STANDARD



HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red, Black, Yellow, Green, Blue, White. **SPECIFY COLOR**

BODY: Brass Nickel Plated and Aluminum.

SPRING: Four-leaved Beryllium copper, nickel plated.

WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, #18 AWG, insulated to an O.D. of .140" Std. Pkg. 10

No.	Length ("A")	NET Each
1334-8	8 inches	\$.82
1334-12	12 inches	.82
1334-24	24 inches	.88
1334-36	36 inches	.93

MINIATURE

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red, Black, Yellow, Green, Blue, White. **SPECIFY COLOR**

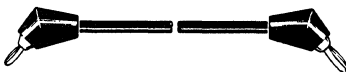
BODY: Brass Nickel Plated and Aluminum.

SPRING: Four-leaved Beryllium copper, nickel plated.

WIRE: 5 KV PVC Flexible Wire, 19 strands #36 copper, #24 AWG, insulated to an O.D. of .090" Std. Pkg. 10

No.	Length ("A")	NET Each
1344-8	8 inches	\$.82
1344-12	12 inches	.82
1344-24	24 inches	.88
1344-36	36 inches	.93

MINIATURE TO STANDARD



HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red, Black, Yellow, Green, Blue, White. **SPECIFY COLOR**

BODIES: Brass Nickel Plated, and Aluminum

SPRING: Four-leaved Beryllium copper, nickel plated.

WIRE: 5 KV PVC Flexible Wire, 19 strands #36 copper, #24 AWG, insulated to an O.D. of .090" Std. Pkg. 10

No.	Length ("A")	NET Each
1349-8	8 inches	\$.82
1349-12	12 inches	.82
1349-24	24 inches	.88
1349-36	36 inches	.93

MODERN FACILITIES

We invite you to utilize our modern manufacturing facilities and methods for your molding, screw-machine, stamping or sub-assemblies. We are equipped for both the long run and the short run. From raw material to finished part, SMITH detailed workmanship and production efficiency assure a quality product, speedily and economically made.

CROSS PATCH JUMPERS STANDARD BANANA PLUGS



HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red, Black, Yellow, Green, Blue, White. **SPECIFY COLOR**

BODY: Brass Nickel Plated and Aluminum.

SPRING: Four-leaved Beryllium copper, nickel plated.

WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, #18 AWG, insulated to an O.D. of .140" Std. Pkg. 10

No.	Length ("A")	NET Each
1335-8	8 inches	\$1.21
1335-12	12 inches	1.21
1335-24	24 inches	1.27
1335-36	36 inches	1.32

MINIATURE BANANA PLUGS



HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red, Black, Yellow, Green, Blue, White. **SPECIFY COLOR**

BODY: Brass Nickel Plated and Aluminum.

SPRING: Four-leaved Beryllium copper, nickel plated.

WIRE: 5 KV PVC Flexible Wire, 19 strands #36 copper, #24 AWG, insulated to an O.D. of .090" Std. Pkg. 10

No.	Length ("A")	NET Each
1345-8	8 inches	\$1.21
1345-12	12 inches	1.21
1345-24	24 inches	1.27
1345-36	36 inches	1.32

STANDARD BANANA PLUG TO PHONE TIP



HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red, Black, Yellow, Green, Blue, White. **SPECIFY COLOR**

BODY: Brass Nickel Plated and Aluminum.

SPRING: Four-leaved Beryllium copper, nickel plated.

WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, #18 AWG, insulated to an O.D. of .140" Std. Pkg. 10

No.	Length ("A")	NET Each
1336-8	8 inches	\$1.21
1336-12	12 inches	1.21
1336-24	24 inches	1.27
1336-36	36 inches	1.32

You'll find these SMITH products on the shelves of leading industrial Electronic Distributors, throughout the U.S.A. For your production runs, draw directly on our large plant inventories of standard components.

UHF MALE TO INSULATED MINI CLIPS



CLIP: Steel, Cadmium plated, No. 338.

INSULATOR: Molded Vinyl plastic, No. 384.

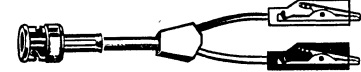
WIRE: RG-174/U coaxial cable.

DESCR.: For testing wave patterns, etc.

One end terminates with UHF male, other end with insulated mini clips, one red, one black. Std. Pkg. 10

No.	Length	Net Ea.
1790-12	12 inches	\$5.35
1790-24	24 inches	5.45
1790-36	36 inches	5.55
1790-48	48 inches	5.65
1790-60	60 inches	5.75

BNC MALE TO INSULATED MINI CLIPS



CLIPS: Steel, Cadmium plated, No. 338.

INSULATOR: Molded Vinyl plastic, No. 389.

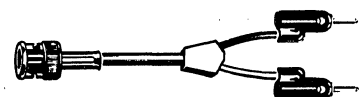
WIRE: RG-174/U coaxial cable.

DESCR.: For testing wave patterns, etc.

One end terminates with BNC male, other end with insulated mini clips, one red, one black. Std. Pkg. 10

No.	Length	Net Ea.
1791-12	12 inches	\$5.35
1791-24	24 inches	5.45
1791-36	36 inches	5.55
1791-48	48 inches	5.65
1791-60	60 inches	5.75

BNC MALE TO STACK TIP PLUGS



WIRE: RG-58/U coaxial cable.

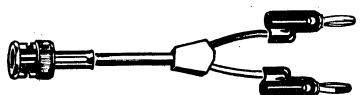
PLUGS: No. 1595, one Red, one Black.

DESCR.: For testing wave patterns, etc.

One end terminates with BNC male, other end with cross patch tip plugs, one red, one black. Std. Pkg. 10

No.	Length	Net Ea.
1792-12	12 inches	\$5.50
1792-24	24 inches	5.75
1792-36	36 inches	6.00
1792-48	48 inches	6.25
1792-60	60 inches	6.50

BNC MALE TO STACK BANANA PLUGS



WIRE: RG-58/U coaxial cable

PLUGS: No. 1510, one red, one black

DESCR.: For testing wave patterns, etc.

One end terminates with BNC male, other end with cross patch standard banana plugs, one red, one black. Std. Pkg. 10

No.	Length	Net Ea.
1793-12	12 inches	\$5.50
1793-24	24 inches	5.75
1793-36	36 inches	6.00
1793-48	48 inches	6.25
1793-60	60 inches	6.50

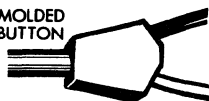
IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH

RF PATCH CORDS

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

MOLDED
BUTTON



**CABLE TYPES
AVAILABLE**

DESCRIPTION
INSULATION
JACKET
NOM. CAP.

WIRE
RG58/U Coaxial cable.
Polyethylene
Vinyl
50 Ohm Impedance.

BNC MALE BOTH ENDS



WIRE:	As specified above.	Std. Pkg. 10
No.	Length	NET Ea.
1589-12	12"	\$5.35
1589-24	24"	5.45
1589-36	36"	5.55
1589-48	48"	5.65
1589-60	60"	5.75

BNC FEMALE BOTH ENDS



No.	Length	Std. Pkg. 10
		Net Ea.
1869-12	12 inches	\$6.10
1869-24	24 inches	6.20
1869-36	36 inches	6.30
1869-48	48 inches	6.40
1869-60	60 inches	6.50



WIRE:	As specified above.	Std. Pkg. 10
No.	Length	NET Ea.
1588-12	12"	\$10.00
1588-24	24"	10.10
1588-36	36"	10.20
1588-48	48"	10.30
1588-60	60"	10.40

BNC FEMALE TO BNC MALE



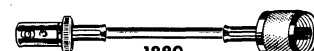
No.	Length	Std. Pkg. 10
		Net Ea.
1878-12	12 inches	\$5.60
1878-24	24 inches	5.70
1878-36	36 inches	5.80
1878-48	48 inches	5.90
1878-60	60 inches	6.00

BNC MALE TO UHF MALE



No.	Length	Std. Pkg. 10
		Net Ea.
1879-12	12 inches	\$5.35
1879-24	24 inches	5.45
1879-36	36 inches	5.55
1879-48	48 inches	5.65
1879-60	60 inches	5.75

BNC FEMALE TO UHF MALE



No.	Length	Std. Pkg. 10
		Net Ea.
1880-12	12 inches	\$5.35
1880-24	24 inches	5.45
1880-36	36 inches	5.55
1880-48	48 inches	5.65
1880-60	60 inches	5.75

UHF MALE BOTH ENDS



No.	Length	Std. Pkg. 10
		Net Ea.
1871-12	12"	\$5.35
1871-24	24"	5.45
1871-36	36"	5.55
1871-48	48"	5.65
1871-60	60"	5.75

BNC MALE TO ALLIGATOR CLIPS



No.	Length	Std. Pkg. 10
		Net Ea.
1587-12	12"	\$5.35
1587-24	24"	5.45
1587-36	36"	5.55
1587-48	48"	5.65
1587-60	60"	5.75

CLIPS: Steel Cad. Plated (#300).

INSUL.: Molded Vinyl (#331).

WIRE: As specified above.

DESCR.: For testing wave patterns etc. One end terminates with BNC Male Plug, other end with insulated alligator clips, one red, one black.

BNC MALE TO DOUBLE PLUG



No.	Length	Std. Pkg. 10
		Net Ea.
1584-12	12"	\$5.35
1584-24	24"	5.45
1584-36	36"	5.55
1584-48	48"	5.65
1584-60	60"	5.75

HANDLES: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Black or Grey to match wire.

PLUG: Brass, nickel plated.

SPRING: Four-leaved beryllium copper, nickel plated.

DESCR.: Mates with standard dual binding post having 3/4" center. Polarity indicated by the word GROUND molded on side. One end terminates with double banana plug, other end with BNC Male Plug.

WIRE: As specified above.

BNC FEMALE TO TEST PROBE



HANDLE: Molded Butyrate, per Federal Spec. L-P349A, Type 3, Class MS. BLACK.

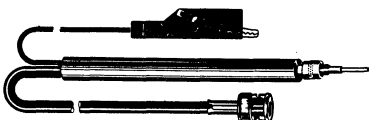
TIP: .080 Brass Nickel Plated.

CONNECTOR: BNC Female.

DESCR.: Permits the use of coaxial cables terminated with a BNC Male for all circuit testing. Probe shielded within 1" from tip.

No.	Length	Std. Pkg. 1
		Net Ea.
1797	48"	\$4.85

BNC MALE TO TEST PROBE



HANDLE: Molded Butyrate per Federal Spec. L-P349A, Type 3, Class MS. RED.

TIP: .080 Brass Nickel Plated.

CONNECTOR: BNC Male.

WIRE: RG-58/U, 48" long.

CLIP: Miniature steel alligator clip, cadmium plated with black insulator.

DESCR.: Permits the use of probe testing with any equipment utilizing a BNC female termination. Probe shielded within 1" from tip.

No.	Length	Std. Pkg. 1
		Net Ea.
1798	48"	\$5.85

UHF MALE TO ALLIGATOR CLIPS



No.	Length	Std. Pkg. 10
		Net Ea.
1586-12	12"	\$5.35
1586-24	24"	5.45
1586-36	36"	5.55
1586-48	48"	5.65
1586-60	60"	5.75

CLIPS: Steel Cad. Plated (#300).

INSUL.: Molded Vinyl (#331).

DESCR.: For testing wave patterns, etc. One end terminates with UHF Male, other end with insulated alligator clips one red, one black.

WIRE: As specified above.

UHF MALE TO DOUBLE PLUG



No.	Length	Std. Pkg. 10
		Net Ea.
1585-12	12"	\$5.35
1585-24	24"	5.45
1585-36	36"	5.55
1585-48	48"	5.65
1585-60	60"	5.75

HANDLES: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Black or Grey to match wire.

PLUG: Brass, nickel plated.

SPRING: Four-leaved beryllium copper, nickel plated.

DESCR.: Mates with standard dual binding post having 3/4" center. Polarity indicated by the word GROUND molded on side. One end terminates with double banana plug, other end with UHF Male Plug.

WIRE: As specified above.

SEE
R.F. CONNECTORS
AND ADAPTERS
ON PAGE 2-848

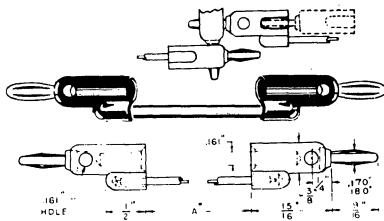
IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

PATCH CORDS

SMITH

CROSS PATCH BANANA PLUG CORD



HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red, Black, Yellow, Green, Blue, White

BODY: Brass, nickel plated. **SPECIFY COLOR**
SPRING: Four-leaved beryllium copper, nickel plated.

WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, #18 AWG, insulated to an O.D. of .140"

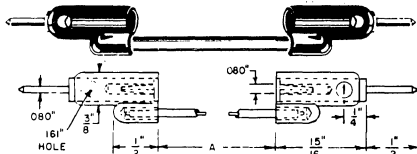
DESCR.: Interconnects unlimited number of multiple circuits. Positive, lasting contact for all banana plugs on top and side.

Std. Pkg. 10

With Plug Spring 9/16" Long

No.	Length ("A")	Net Ea.
1510-8	8 inches	\$ 1.30
1510-12	12 inches	1.30
1510-24	24 inches	1.35
1510-36	36 inches	1.40

CROSS PATCH PIN TIP CORD



HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red, Black, Yellow, Green, Blue, White **SPECIFY COLOR**

BODY: Brass, nickel plated.

CONTACT: Beryllium copper.

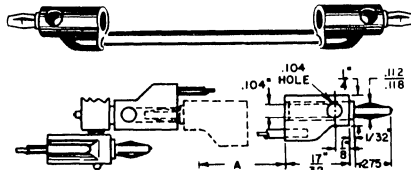
WIRE: 10 KV PVC flexible wire, 65 strands #36 copper, insulated to an O.D. of .140"

DESCR.: Interconnects an unlimited number of multiple circuits. .080" tip plug and female jack in rear of body fits all standard phone tips and jacks. Side holes accept standard banana plugs.

Std. Pkg. 10

No.	Length ("A")	NET Ea.
1595-8	8"	\$ 1.40
1595-12	12"	1.40
1595-24	24"	1.45
1595-36	36"	1.50

MINIATURE BANANA PLUG CROSS PATCH CORD



HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red, Black, Yellow, Green, Blue, White, Orange, Brown, Purple and Grey.

BODY: Brass, nickel plated.

SPRING: Four-leaved beryllium copper, nickel plated.

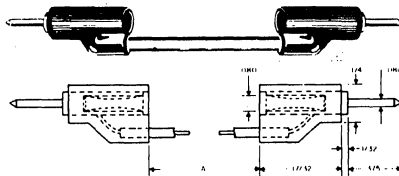
WIRE: General purpose, PVC insulated, 1/64" wall, #18 AWG, 41/34 stranded conductor. Voltage rating up to 1 KV RMS.

DESCR.: Interconnects unlimited number of multiple circuits. Positive, lasting contact for banana plugs on top and side. Special lengths on request.

Std. Pkg. 10

No.	Length ("A")	NET Ea.
1590-6	6 inches	\$ 1.30
1590-12	12 inches	1.30
1590-18	18 inches	1.35
1590-24	24 inches	1.40

PHONE TIP PATCH CORD



HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P39A, Type 3, Class MS. Available in 10 colors as coded above. **SPECIFY COLOR**

BODY: BRASS, NICKEL PLATED.

CONTACT: BERYLLIUM COPPER, GOLD FLASHED

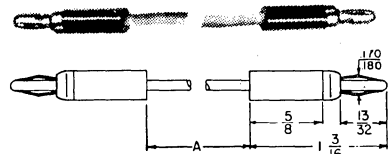
WIRE: 5 KV PVC FLEXIBLE WIRE, 19 strands #36 copper, #24 awg, insulated to an O.D. of .090"

DESCR.: Short phone tip plug for fully insulated insertion in miniature jacks. Captive cage jack in rear for unlimited stack-up. Special lengths on request.

Std. Pkg. 10

No.	Length ("A")	NET Ea.
1591-6	6 inches	\$1.25
1591-12	12 inches	1.25
1591-18	18 inches	1.30
1591-24	24 inches	1.35

MOLDED BANANA PLUG PATCH CORD



HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red, Yellow, Black, Green, assemblies. **SPECIFY COLOR.**

BODY: Brass, nickel plated.

SPRING: Four-leaved beryllium copper, nickel plated.

WIRE: 10 Kv PVC flexible wire, 65 strands #36 copper, insulated to an O.D. of .140"

DESCR.: Interconnects banana jacks on closely spaced centers where space is at a premium. Fits standard banana jacks. Std. Pkg. 10

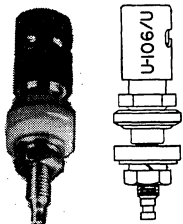
No.	Length ("A")	NET Ea.
1860-8	8 inches	\$.75
1860-12	12 inches	.75
1860-24	24 inches	.80
1860-36	36 inches	.85

NEED NEW PRODUCT DESIGN AND ASSEMBLY?

Herman H.
Smith Inc.
has it all.

- Engineering and Design
 - Precision Turning
 - Stamping
 - Molding
 - Assembly
 - Quality Finishing
- Contact the Smith Engineering Rep in your area or call us, direct.

MIL-SPEC BINDING POST MADE TO MEET MIL-P - 55149/B



HEAD & BODY: BRASS, SILVER PLATED

SPRING & CONTACT PLATE: STEEL

WASHERS: MOLDED NYLON

O-RINGS AND CAP: Silicon Rubber. Red or Black Cap, **SPECIFY COLOR.**

DESCR.: Style U-106/U binding post (Stg. Corp. Dwg. SC-C-16495). Meets requirements of MIL-P-55149/B, DTD 30 Sep 1963. Mounts in 5/16" hole, in panels from 1/16" to 1/18" thick. "O" ring seals provide waterproof seal in panel. Push on cap opens slot in which wire is inserted. Releasing cap grips wire with heavy spring pressure on serrated steel plates for minimum contact resistance. Provided with either red or black silicon rubber insulating cap boot.

Std. Pkg. 5

No.	Type	NET Ea.
1837-102 (Red)	PB08NA02	\$5.00
1837-103 (Black)	PB08NA01	5.00

JUST ADDED AT PRESS TIME

"THE HOOKON"

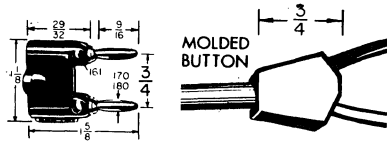
PROBE FOR HIGH DENSITY
CIRCUITS. SEE PAGE 2-849

SEE OUR COMPLETE LINE OF
TEFLON TERMINALS AND TEST
JACKS STARTING ON PAGE 2-885

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH STANDARD DUAL BANANA PLUG PATCH CORDS (3/4") CENTERS

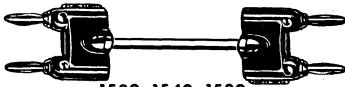
STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE



CABLE TYPES AVAILABLE

	WIRE "A"	WIRE "B"
DESCRIPTION	2-cond. tw. 18 ga. 65/36 str.	RG58/U Coaxial cable.
INSULATION	Vinyl	Polyethylene
JACKET	Vinyl	Vinyl
NOM. CAP.	30 pf./ft.	50 Ohm Impedance.

DOUBLE PLUG BOTH ENDS



1530, 1540, 1580

HANDLES: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Black or Grey to match wire.

PLUG: Brass, nickel plated.

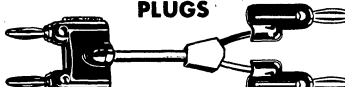
SPRING: Four-leaved beryllium copper, nickel plated.

WIRE: As specified above.

DESCR.: Mates with standard dual binding post having 3/4" center. Polarity indicated by the word GROUND molded on side. Interconnects unlimited number of multiple circuits top and side. Each end terminates with molded double banana plug.

No. Wire "A"	No. Wire "B"	Lgth.	NET Ea.
1530-12	1580-12	12"	\$4.35
1530-24	1580-24	24"	4.45
1530-36	1580-36	36"	4.55
1530-48	1580-48	48"	4.65
1530-60	1580-60	60"	4.75

DOUBLE PLUG TO "CROSS-PATCH" PLUGS



1523, 1524, 1525

HANDLES: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Black or Grey to match wire.

BODY: Brass, nickel plated.

SPRING: Four-leaved beryllium copper, nickel plated.

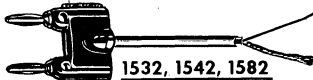
WIRE: As specified above.

PLUG: Our No. 1510. Red and black.

DESCR.: Mates with standard dual binding post having 3/4" center. Polarity indicated by the word GROUND molded on side. Interconnects unlimited number of multiple circuits on top and side. One end terminates with double banana plug, other end with "Cross-Patch" banana plugs, color coded Red and Black.

No. Wire "A"	No. Wire "B"	Lgth.	NET Ea.
1523-12	1525-12	12"	\$5.35
1523-24	1525-24	24"	5.45
1523-36	1525-36	36"	5.55
1523-48	1525-48	48"	5.65
1523-60	1525-60	60"	5.75

DOUBLE PLUG TO TINNED LEADS



1532, 1542, 1582

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS.

PLUG: Brass, nickel plated.

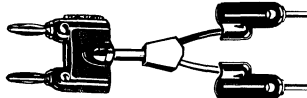
SPRING: Four-leaved beryllium copper, nickel plated.

WIRE: As specified above.

DESCR.: Mates with standard dual binding post having 3/4" center. Polarity indicated by the word GROUND molded on the side. One end terminates with double banana plug, other end stripped and tinned.

No. Wire "A"	No. Wire "B"	Lgth.	NET Ea.
1532-12	1582-12	12"	\$3.35
1532-24	1582-24	24"	3.45
1532-36	1582-36	36"	3.55
1532-48	1582-48	48"	3.65
1532-60	1582-60	60"	3.75

DOUBLE PLUG TO "CROSS-PATCH" PIN PLUGS



1592, 1593, 1594

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS.

WIRE: As specified above.

PLUG: Our No. 1595. Red and black.

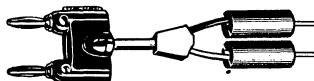
BODY: Brass, nickel plated.

SPRING: Four-leaved beryllium copper, nickel plated.

DESCR.: Mates with standard dual binding post having 3/4" center. Polarity indicated by the word GROUND molded on side. Interconnects unlimited number of multiple circuits on top and side. One end terminates with double banana plug, other end with "Cross-Patch" Pin plugs with standard .080" tip and jack in rear, banana jack in side, color coded Red and Black.

No. Wire "A"	No. Wire "B"	Lgth.	NET Ea.
1592-12	1594-12	12"	\$5.35
1592-24	1594-24	24"	5.45
1592-36	1594-36	36"	5.55
1592-48	1594-48	48"	5.65
1592-60	1594-60	60"	5.75

DOUBLE PLUG TO PHONE TIP



1533, 1543, 1583

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS.

BODY: Brass, nickel plated.

SPRING: Four-leaved beryllium copper, nickel plated.

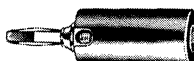
WIRE: As specified above.

PLUG: Our No. 203. Red and black.

DESCR.: Mates with standard dual binding post having 3/4" center. Polarity indicated by the word GROUND molded on side. One end terminates with double banana plug, other end with insulated tip plug, one red and one black.

No. Wire "A"	No. Wire "B"	Lgth.	NET Ea.
1533-12	1583-12	12"	\$ 4.70
1533-24	1583-24	24"	4.80
1533-36	1583-36	36"	4.90
1533-48	1583-48	48"	5.00
1533-60	1583-60	60"	5.10

STACK BANANA PLUG



BODY: MOLDED POLYSTYRENE, Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

SPRING: Four-leaved phosphor bronze, nickel plated.

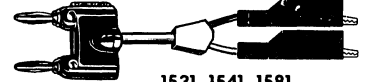
SCREW: Steel, cadmium plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty.

DESCR.: Internal set screw for wire or phone tip connection. Can be stacked for multiple connections.

No.	NET Per C.
324	\$58.00

DOUBLE PLUG TO ALLIGATOR CLIPS



1531, 1541, 1581

HANDLES: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Black or Grey to match wire.

PLUG: Brass, nickel plated.

SPRING: Four-leaved beryllium copper, nickel plated.

CLIP: Steel cadmium plated (No. 300)

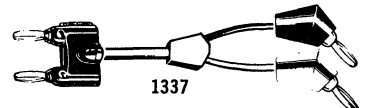
INSUL.: Molded vinyl plastic (No. 331).

WIRE: As specified above.

DESCR.: Mates with standard dual binding post having 3/4" center. Polarity indicated by the word GROUND molded on side. One end terminates with double banana plug, other end with insulated alligator clips, one red, one black.

No. Wire "A"	No. Wire "B"	Lgth.	NET Ea.
1531-12	1581-12	12"	\$5.35
1531-24	1581-24	24"	5.45
1531-36	1581-36	36"	5.55
1531-48	1581-48	48"	5.65
1531-60	1581-60	60"	5.75

STANDARD DUAL BANANA PLUG TO STANDARD BANANA PLUGS



1337

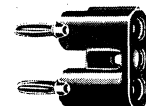
HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Black.

BODIES: Brass - Nickel Plated, and Aluminum

SPRING: Four-leaved Beryllium copper, nickel plated.

WIRE: RG58/U Coaxial Cable	Std. Pkg. 10
No. Length	NET Ea.
1337-12 12 inches	\$5.00
1337-24 24 inches	5.10
1337-36 36 inches	5.20
1337-48 48 inches	5.30
1337-60 60 inches	5.40

DUAL BANANA PLUG



BODY: MOLDED POLYSTYRENE, Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

SPRING: Four-leaved phosphor bronze, nickel plated.

SCREW: Steel, cadmium plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 5K Volts 60 cycle AC continuous working voltage. CAPACITANCE 1.0 pf. between conductors.

DESCR.: Mates with standard dual binding post 3/4" centers. Polarity indicated on top and side. Wire held with internal set screw. Can be stacked for multiple connections.

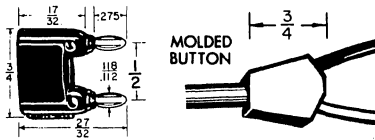
No.	NET Per C.
210	\$100.00

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

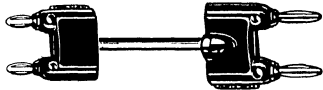
MINIATURE DUAL BANANA PLUG PATCH CORDS (1/2" CENTERS)

SMITH



All standard and miniature dual banana plug patch cords and instrument test adapters are molded to exacting specifications, in our plant. We welcome your inquiries for any variations to fit your special requirements.

MINIATURE DUAL BANANA PLUG TO STANDARD DUAL BANANA PLUG



HANDLES: Molded Butyrate, per Fed. Spec. L-P349A, Type 3, Class MS.

PLUGS: Brass, Nickel plated.

SPRING: Four-leaved Beryllium Copper, Nickel plated.

DESCR.: Mates with standard or miniature banana jacks or binding posts having 1/2" center or 3/4" center. Polarity indicated by the word GROUND molded on side. Interconnects unlimited number of multiple circuits top and side. One end terminates in a miniature dual banana plug, 1/2" center, other end in a standard dual banana plug 3/4" center.

WIRE: RG-174 Coaxial wire. Std. Pkg. 10

No.	Length	NET Ea.
1729-12	12"	\$4.35
1729-24	24"	4.45
1729-36	36"	4.55
1729-48	48"	4.65
1729-60	60"	4.75

MINIATURE DUAL BANANA PLUG BOTH ENDS



HANDLES: Molded BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS.

PLUGS: Brass, Nickel plated.

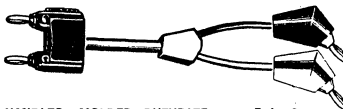
SPRING: Four-leaved Beryllium Copper, Nickel plated.

DESCR.: Mates with miniature dual binding posts or banana jacks having 1/2" centers. Polarity indicated by word GROUND molded on side. Interconnects unlimited number of multiple circuits on top and side. Each end terminated with molded double banana plug.

WIRE: RG-174/U Coaxial cable. Std. Pkg. 10

No.	Length	NET Ea.
1599-12	12"	\$4.35
1599-24	24"	4.45
1599-36	36"	4.55
1599-48	48"	4.65
1599-60	60"	4.75

MINIATURE DUAL BANANA PLUG TO MINIATURE BANANA PLUGS



HANDLES: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Black or Grey to match wire.

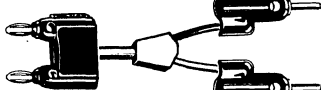
BODIES: Brass Nickel Plated, and Aluminum

SPRING: Four-leaved Beryllium copper, nickel plated.

WIRE: RG174/U Coaxial Cable Std. Pkg. 10

No.	Length	NET Ea.
1347-12	12 inches	\$5.00
1347-24	24 inches	5.10
1347-36	36 inches	5.20
1347-48	48 inches	5.30
1347-60	60 inches	5.40

MINIATURE DUAL BANANA PLUG TO STANDARD CROSS PATCH PIN PLUGS



HANDLES: Molded BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS.

BODIES: Brass, Nickel plated.

SPRING: Four-leaved Beryllium Copper, Nickel plated.

WIRE: RG-174/U Coaxial cable.

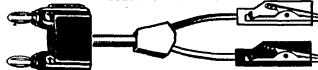
PLUGS: Our No. 1595, Red and Black.

DESCR.: Mates with miniature dual binding posts or banana jacks having 1/2" centers. Polarity indicated by word GROUND molded on side. Interconnects unlimited number of multiple circuits on top and side. One end terminates with double banana plug, other end with cross-patch pin plugs with standard .080" tip and jack in rear, banana jack in side, color coded Red and Black.

Std. Pkg. 10

No.	Length	NET Ea.
1535-12	12"	\$5.35
1535-24	24"	5.45
1535-36	36"	5.55
1535-48	48"	5.65
1535-60	60"	5.75

MINIATURE DUAL BANANA PLUG TO INSULATED MINI-CLIPS



HANDLES: Molded BUTYRATE, per Fed. Spec. L-P348A, Class MS.

BODIES: Brass, Nickel plated.

SPRING: Four-leaved Beryllium Copper, Nickel plated.

CLIP: Steel cadmium plated (No. 338).

INSULATOR: Molded vinyl plastic (No. 389)

DESCR.: Mates with miniature dual binding posts or banana jacks having 1/2" centers. Polarity indicated by the word GROUND molded on side. One end terminates with double banana plug, other end with insulated miniature clips.

WIRE: RG-174/U Coaxial cable. Std. Pkg. 10

No.	Length	NET Ea.
1739-12	12"	\$5.35
1739-24	24"	5.45
1739-36	36"	5.55
1739-48	48"	5.65
1739-60	60"	5.75

"OFF-THE-SHELF"

SMITH Standard Products are stocked nationally on the shelves of every major Parts Distributor. That's ONE reason why Engineers and Purchasing Agents agree: "It's Sound Planning to SPECIFY SMITH!"

MINIATURE DUAL BANANA PLUG TO TINNED LEADS



HANDLE: Molded BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS.

BODIES: Brass, Nickel plated.

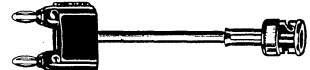
SPRING: Four-leaved Beryllium Copper, Nickel plated.

DESCR.: Mates with miniature dual binding posts or banana jacks having 1/2" centers. Polarity indicated by the word GROUND molded on side. One end terminates with double banana plug, other end stripped and tinned.

WIRE: RG-174/U Coaxial cable. Std. Pkg. 10

No.	Length	NET Ea.
1534-12	12"	\$3.35
1534-24	24"	3.45
1534-36	36"	3.55
1534-48	48"	3.65
1534-60	60"	3.75

MINIATURE DUAL BANANA PLUG TO BNC MALE



HANDLES: Molded Butyrate, per Fed. Spec. L-P349A, Type 3, Class MS.

PLUG: Brass, Nickel plated.

SPRING: Four-leaved Beryllium Copper, Nickel plated.

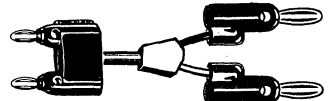
CONN.: BNC male.

DESCR.: Mates with miniature dual binding posts or banana jacks having 1/2" center. Polarity indicated by the word GROUND molded on side. One end terminates with the double banana plug, other end with BNC male conn.

WIRE: RG-174/U Coaxial cable. Std. Pkg. 10

No.	Length	NET Ea.
1748-12	12"	\$5.35
1748-24	24"	5.45
1748-36	36"	5.55
1748-48	48"	5.65
1748-60	60"	5.75

MINIATURE DUAL BANANA PLUG TO MINIATURE CROSS PATCH BANANA PLUGS



HANDLES: Molded BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS.

BODIES: Brass, Nickel Plated.

SPRING: Four-leaved Beryllium Copper, Nickel plated.

PLUGS: Our No. 1590, Red and Black.

DESCR.: Mates with miniature dual binding posts or banana jacks having 1/2" centers. Polarity indicated by word GROUND molded on side. Interconnects unlimited number of multiple circuits on top and side. One end terminates with double banana plug, other end with Cross-Patch banana plugs, color coded Red and Black.

WIRE: RG-174/U Coaxial cable. Std. Pkg. 10

No.	Length	NET Ea.
1738-12	12"	\$5.35
1738-24	24"	5.45
1738-36	36"	5.55
1738-48	48"	5.65
1738-60	60"	5.75

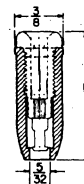
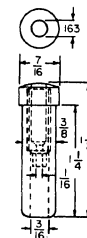
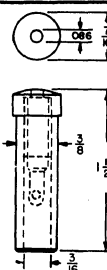
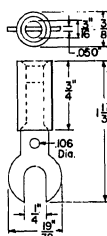
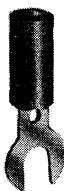
IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

**STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE**

Technical drawing of a mechanical part, showing a perspective view and a cross-sectional view with dimensions.

Dimensions:

- Top diameter: $\frac{1}{2}$ DIA
- Top section height: $\frac{3}{16}$
- Top section outer diameter: $\frac{3}{8}$
- Top section inner diameter: $\frac{1}{8}$
- Top section total height: $\frac{3}{4}$
- Top section outer diameter: $\frac{39}{64}$
- Top section inner diameter: $\frac{7}{16}$
- Top section total height: $\frac{1}{2}$
- Top section outer diameter: $\frac{1}{2}$



STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

SINGLE INSTRUMENT TEST ADAPTERS

SMITH

MATERIALS:

BODIES MACHINED: Butyrate, per MIL-P-10408A, Type 1, Class 2. Color Black or Red. Specify color by adding color code suffix to basic part No. as coded above.
CONDUCTORS: Brass, per QQ-B-626, Comp. 22, half hard.
SPRINGS: Four-leaved beryllium copper, heat-treated.
HEADS: Molded Nylon, Per MIL-P-20693A.
SCREWS: Steel, cadmium plated.

FINISHES:

CONDUCTORS: Nickel Plate, per QQ-N-290, Class I, Type VII.
SPRING: Nickel Plate, as above.
TERMINAL: Gold washed.

MECHANICAL:

PHONE TIP:
BANANA PLUG:
Standard Adapters
.080 Dia. x 1/2" long
.180/.170 Dia. x 3/4" long
PHONE JACKS:
BANANA JACKS:
BODIES:
.080 Dia.
.161 Dia.
3/8" Dia.

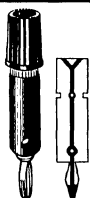
Miniature Adapters

.080 Dia. x 3/8" long
.118/.112 Dia. x 1/2" long
.080 Dia.
.104 Dia.
1/4" Dia.

RATINGS:

CURRENT: 15 Amps (Standard), 5 Amps (Miniature) AC for 10°C Temp. Rise, Continuous Duty, except where limited by co-axial connector.
VOLTAGE: 5 KV (Standard), 2 KV (Miniature) 60 cycle AC Continuous Working Voltage, except where limited by co-axial connector.
RESISTANCE: 1 Milliohm or less when seated, in proper mating connectors.

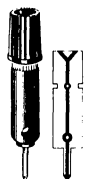
Colors: Red or Black, specify by adding Color Code Suffix



BINDING POST TO BANANA PLUG

REAR: Insulated 5-way binding post.
FRONT: Standard or Miniature Banana plug.
Banana jack hole for side stacking.

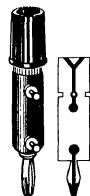
No.	Description	NET Per C
5025	Standard Adapter	\$110.00
5035	Miniature Adapter	110.00



BINDING POST TO PHONE TIP

REAR: Insulated 5-way binding post.
FRONT: Standard .080 phone tip. Banana jack hole for side stacking.

No.	Description	NET Per C
5026	Standard Adapter	\$100.00
5036	Miniature Adapter	100.00

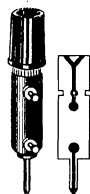


BINDING POST TO ISOLATED BANANA PLUG

REAR: Insulated 5-way binding post.
CENTER: Turret-terminal connections to isolated front and rear conductors allow insertion of component in series input circuit.

FRONT: Standard or miniature banana plug.

No.	Description	NET Per C
5027	Standard Adapter	\$110.00
5037	Miniature Adapter	110.00

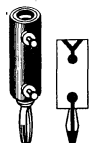


BINDING POST TO ISOLATED PHONE TIP

REAR: Insulated 5-way binding post.
CENTER: Turret-terminal connections to isolated front and rear conductors allow insertion of component in series input circuit.

FRONT: Standard .080 phone tip.

No.	Description	NET Per C
5028	Standard Adapter	\$100.00
5038	Miniature Adapter	100.00

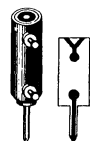


BANANA JACK TO ISOLATED BANANA PLUG

REAR: Standard or Miniature Banana Jack.
CENTER: Turret-terminal connections to isolated front and rear conductors allow insertion of component in series input circuit.

FRONT: Standard or miniature banana plug.

No.	Description	NET Per C
5029	Standard Adapter	\$100.00
5039	Miniature Adapter	100.00

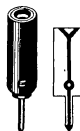


TIP JACK TO ISOLATED PHONE TIP

REAR: Standard .080 tip jack.
CENTER: Turret-terminal connections to isolated front and rear conductors allow insertion of component in series input circuit.

FRONT: Standard .080 phone tip.

No.	Description	NET Per C
5030	Standard Adapter	\$95.00
5040	Miniature Adapter	95.00



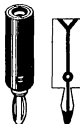
STACKING SOLDERLESS PHONE TIP

REAR: Standard or miniature banana jack for stacking.

SIDE: Wire-lead hole secures test lead with internal set-screw.

FRONT: Standard .080 phone tip.

No.	Description	NET Per C
5031	Standard Adapter	\$70.00
5041	Miniature Adapter	70.00



STACKING SOLDERLESS BANANA PLUG

REAR: Miniature Banana jack for stacking.

SIDE: Wire lead hole secures test lead with internal set-screw.

FRONT: Miniature banana plug.

No.	Description	NET Per C
5042	Miniature Adapter	\$65.00
5021	Standard Adapter	65.00



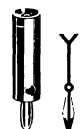
BNC SERIES JACK TO BANANA PLUG

REAR: BNC Series co-axial jack.

SIDE: Banana jack hole for side stacking.

FRONT: Standard banana plug.

No.	Description	NET Per C
5032	Standard Adapter	\$200.00

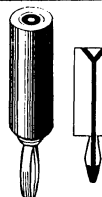


TIP JACK TO BANANA PLUG

REAR: Standard .080 phone tip jack.

FRONT: Standard or miniature banana plug.
Banana jack hole for side stacking.

No.	Description	NET Per C
214	Standard Adapter	\$50.00
5033	Miniature Adapter	50.00



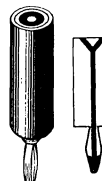
MINIATURE BANANA JACK TO STANDARD BANANA PLUG ADAPTER

REAR: Miniature banana jack.

FRONT: Standard banana plug.

COLOR: Available in red or black.

No.	Description	NET Per C
5075	Standard Adapter	\$50.00



STANDARD BANANA JACK TO MINIATURE BANANA PLUG ADAPTER

REAR: Standard banana jack.

FRONT: Miniature banana plug.

COLOR: Available in red or black.

No.	Description	NET Per C
5076	Standard Adapter	\$50.00



COMBINATION SPLICE Phone Tip to Banana Plug

HANDLE: MOLDED BUTYRATE, per Fed. Spec. L-P349A, Type 3, Class MS. Red or Black Specify Color

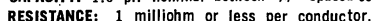
BODY: Brass.

CONTACT: Beryllium copper, gold washed.

DESCR: Invaluable for quick splice of test leads. Accepts standard Banana plug one end, .080 phone tip other end.

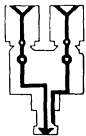
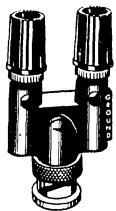
No.	Description	NET Per C
496	Standard banana to tip jack	\$33.00
5044	Miniature banana to tip jack	33.00

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING



STANDARD DUAL INSTRUMENT TEST ADAPTERS (3/4" CENTERS)

SMITH



DUAL BINDING POST ADAPTERS

BINDING POSTS TO BNC MALE

Meets UG-144 I/U

REAR: Insulated dual 5-way binding posts, Red and Black heads on 3/4" centers. Banana jack holes for side stacking.

FRONT: BNC series co-axial plug. Std. Pkg. 1

No.	Black body	NET Ea.
1688		\$4.60

BINDING POSTS TO ISOLATED BNC MALE

REAR: Insulated dual 5-way binding posts, Red and Black heads on 3/4" centers.

CENTER: Turret-terminal connections to isolated front and rear conductors in both GND and HOT circuits allow insertion of matching pad or other 4-terminal networks in input circuits.

FRONT: BNC series co-axial plug. Std. Pkg. 1

No.	Black body	NET Ea.
1698		\$10.00

BINDING POSTS TO BNC FEMALE

REAR: Insulated dual 5-way binding posts, Red and Black heads on 3/4" centers. Banana jack holes for side stacking.

FRONT: BNC series co-axial jack. Std. Pkg. 1

No.	Black body	NET Ea.
1689		\$4.60

BINDING POSTS TO TNC MALE

REAR: Insulated dual 5-way binding posts, Red and Black heads on 3/4" centers. Banana jack holes for side stacking.

FRONT: TNC series co-axial plug. Std. Pkg. 1

No.	Black body	NET Ea.
1776		\$ 7.00

BINDING POSTS TO TNC FEMALE

REAR: Insulated dual 5-way binding posts, Red and Black heads on 3/4" centers. Banana jack holes for side stacking.

FRONT: TNC series co-axial jack. Std. Pkg. 1

No.	Black body	NET Ea.
1777		\$ 6.00

BINDING POSTS TO TYPE N MALE

REAR: Insulated dual 5-way binding posts, Red and Black heads on 3/4" centers. Banana jack holes for side stacking.

FRONT: Type N co-axial plug. Std. Pkg. 1

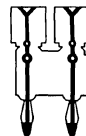
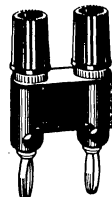
No.	Black body	NET Ea.
1780		\$ 7.00

BINDING POSTS TO TYPE N FEMALE

REAR: Insulated dual 5-way binding posts, Red and Black heads on 3/4" centers. Banana jack holes for side stacking.

FRONT: Type N co-axial jack. Std. Pkg. 1

No.	Black body	NET Ea.
1781		\$ 6.00



DUAL BINDING POST ADAPTERS

BINDING POSTS TO DUAL BANANA PLUGS

REAR: Insulated dual 5-way binding posts, Red and Black heads on 3/4" centers. Banana jack holes for side stacking.

FRONT: Dual banana plugs on 3/4" centers. Std. Pkg. 1

No.	Black body	NET Ea.
1682		\$2.25

BINDING POSTS TO 2-CIRCUIT PHONE PLUG

REAR: Insulated dual 5-way binding posts, Red and Black heads on 3/4" centers. Banana jack holes for side stacking.

FRONT: Standard 1/4" 2-circuit phone plug.

No.	Std. Pkg. 1	NET Ea.
1684	Black body	\$4.60

BINDING POSTS TO UHF MALE

REAR: Insulated dual 5-way binding posts, Red and Black heads on 3/4" centers. Banana jack holes for side stacking.

FRONT: UHF series co-axial plug. Std. Pkg. 1

No.	Black body	NET Ea.
1695		\$ 5.00

BINDING POSTS TO UHF FEMALE

REAR: Insulated dual 5-way binding posts, Red and Black heads on 3/4" centers. Banana jack holes for side stacking.

FRONT: UHF series co-axial jack. Std. Pkg. 1

No.	Black body	NET Ea.
1691		\$ 5.25

DUAL BANANA PLUG

BODY: MOLDED POLYSTYRENE, Red or Black. SPECIFY COLOR

PLUG: Brass, nickel plated.

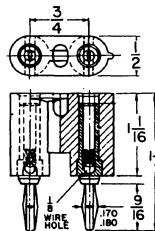
SPRING: Four-leaved phosphor bronze, nickel plated.

SCREW: Steel, cadmium plated.

RATING: 15 Amps AC for 10°C Temp. rise, continuous duty. 5K Volts 60 cycle AC continuous working voltage. CAPACITANCE 1.0 mmfd. between conductors.

DESCR.: Mates with standard dual binding post 3/4" centers. Polarity indicated on top and side. Wire held with internal set screw. Can be stacked for multiple connections. Std. Pkg. 25

No.	NET Per C
210	\$88.00



UTILIZE OUR IN-HOUSE INJECTION MOLDING FACILITIES for small or large quantities of insert molding on cables or components to your special requirements.

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH STANDARD DUAL INSTRUMENT TEST ADAPTERS (3/4") CENTERS

COAXIAL CONNECTOR ADAPTERS

BNC FEMALE TO BANANA PLUGS

REAR: BNC series co-axial jack.
Banana jack holes for side stacking.
FRONT: Dual banana plugs on 3/4" centers.
Banana jack holes for side stacking.

No.	Std. Pkg. 1	NET Ea.
1686	Black body	\$2.60

BNC MALE TO BANANA PLUGS

REAR: BNC series co-axial plug.
FRONT: Dual banana plugs on 3/4" centers.
Banana jack holes for side stacking.

No.	Std. Pkg. 1	NET Ea.
1687	Black body	\$3.60

TNC FEMALE TO BANANA PLUGS

REAR: TNC series co-axial jack.
FRONT: Dual banana plugs on 3/4" centers.
Banana jack holes for side stacking.

No.	Std. Pkg. 1	NET Ea.
1774	Black body	\$5.25

TNC MALE TO BANANA PLUGS

REAR: TNC series co-axial plug.
FRONT: Dual banana plugs on 3/4" centers.
Banana jack holes for side stacking.

No.	Std. Pkg. 1	NET Ea.
1775	Black body	\$6.00

TYPE N FEMALE TO BANANA PLUGS

REAR: Type N co-axial jack.
FRONT: Dual banana plugs on 3/4" centers.
Banana jack holes for side stacking.

No.	Std. Pkg. 1	NET Ea.
1778	Black body	\$5.25

TYPE N MALE TO BANANA PLUGS

REAR: Type N co-axial plug.
FRONT: Dual banana plugs on 3/4" centers.
Banana jack holes for side stacking.

No.	Std. Pkg. 1	NET Ea.
1779	Black body	\$6.00

UHF FEMALE TO BANANA PLUGS

REAR: UHF series co-axial jack.
FRONT: Dual banana plugs on 3/4" centers.
Banana jack holes for side stacking.

No.	Std. Pkg. 1	NET Ea.
1690	Black body	\$4.60

BNC FEMALE TO ISOLATED DUAL BANANA PLUGS

REAR: BNC series co-axial jack.
CENTER: Turret-terminal connections to isolated front and rear conductors in both GND and HOT circuits allow insertion of matching pad or other 4-terminal networks in input circuits.
FRONT: Dual banana plugs on 3/4" centers.

No.	Std. Pkg. 1	NET Ea.
1697	Black body	\$9.00

SHIELDED CO-AXIAL CONNECTOR ADAPTERS

BNC FEMALE TO DUAL BANANA PLUGS

REAR: BNC series co-axial jack.
FRONT: Dual banana plugs on 3/4" centers.
SHIELD: Aluminum shield electrically connected to GND conductor fully encloses plug and mating binding posts to reduce noise pickup.

No.	Std. Pkg. 1	NET Ea.
1783	Black body	\$3.25

BNC FEMALE TO DUAL BANANA JACKS

REAR: BNC series co-axial jack.
FRONT: Dual banana plugs on 3/4" centers.
SHIELD: Aluminum shield electrically connected to GND conductor fully encloses jacks and mating plug to reduce noise pickup.

No.	Std. Pkg. 1	NET Ea.
1784	Black body	\$3.25

TNC FEMALE TO DUAL BANANA PLUGS

REAR: TNC series co-axial jack.
FRONT: Dual banana plugs on 3/4" centers.
SHIELD: Aluminum shield electrically connected to GND conductor fully encloses plug and binding posts to reduce noise pickup.

No.	Std. Pkg. 1	NET Ea.
1785	Black body	\$ 5.25

TYPE N FEMALE TO DUAL BANANA PLUGS

REAR: Type N co-axial jack.
FRONT: Dual banana plugs on 3/4" centers.
SHIELD: Aluminum shield electrically connected to GND conductor fully encloses plug and binding posts to reduce noise pickup.

No.	Std. Pkg. 1	NET Ea.
1786	Black body	\$ 5.25

UHF FEMALE TO DUAL BANANA PLUGS

REAR: UHF series co-axial jack.
FRONT: Dual banana plugs on 3/4" centers.
SHIELD: Aluminum shield electrically connected to GND conductor fully encloses plug and mating binding posts to reduce noise pickup.

No.	Std. Pkg. 1	NET Ea.
1788	Black body	\$4.50

ADAPTERS

DUAL BANANA JACKS TO 2-CIRCUIT PHONE PLUG

REAR: Dual banana jacks on 3/4" centers, rear and side, for stacking.
FRONT: Standard 3/4" 2-circuit phone plug.

No.	Std. Pkg. 1	NET Ea.
1685	Black body	\$2.60

DUAL PHONE-TIP TO DUAL BANANA PLUGS

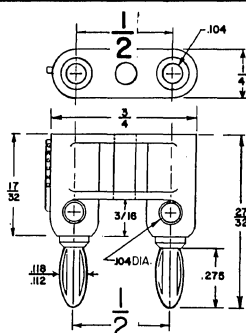
REAR: Dual .080" phone tip jacks on 3/4" centers.
FRONT: Dual banana plugs on 3/4" centers.
Banana jack holes for side stacking.

No.	Std. Pkg. 10	NET Ea.
1679	Black body	\$.85

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

MINIATURE DUAL INSTRUMENT TEST ADAPTERS (1/2" CENTERS)

SMITH



SPECIFICATIONS

MATERIALS:

BODY: Molded Butyrate, per Fed. Spec. L-P349A, Type 3, Class MS. Colors as specified.
CONDUCTOR: Brass, per QQ-B-626, Comp. 22, 1/2 hard.

SPRING: Four-leaved beryllium copper, heat treated.

HEAD: Molded Nylon, per MIL-P-20693A.

SCREWS: Steel, cadmium plated.

FINISHES:

CONDUCTOR: Nickel plate, per QQ-N-290, Class I, Type VII.

SPRING: Nickel plated.

TERMINAL: Gold washed.

CONNECTOR: TR-5 Non-tarnish Plate.

RATINGS:

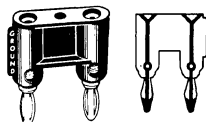
CURRENT: 5 Amps AC for 10°C Temp. Rise, continuous duty, except where limited by co-axial connectors.

VOLTAGE: 2 KV, 60 cycle AC continuous working voltage, except where limited by co-axial connectors.

CAPACITY: 3.0 pf. nominal between 1/2" spaced conductors.

RESISTANCE: 1 milliohm or less per conductor.

SET SCREW CONNECTION BANANA PLUGS



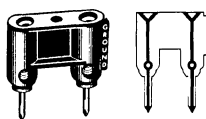
REAR: Dual banana jacks on 1/2" centers for stacking.

FRONT: Dual banana plugs on 1/2" centers. Set-screws secure leads to conductors.

COLORS: Available in Red or Black (Specify color.)

No. 1749 **NET Ea.** \$.75

SET SCREW CONNECTION PHONE TIP



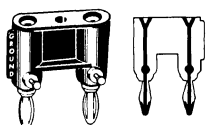
REAR: Dual banana jacks on 1/2" centers for stacking.

FRONT: Dual .080" phone tips on 1/2" centers. Set-screws secure component leads to conductors.

COLORS: Available in Red or Black (Specify color.)

No. 1754 **NET Ea.** \$.75

TURRET TERMINAL CONNECTION



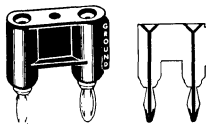
REAR: Dual banana jacks on 1/2" centers for stacking.

FRONT: Dual banana plugs on 1/2" centers. Turret terminals for permanent solder connection of component leads.

COLORS: Available in Red or Black (Specify color.)

No. 1750 **NET Ea.** \$.85

PHONE TIP ADAPTER



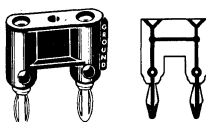
REAR: Dual .080" phone tip jacks on 1/2" centers for stacking.

FRONT: Dual banana plugs on 1/2" centers.

COLORS: Available in Red or Black (Specify color.)

No. 1751 **NET Ea.** \$.85

MOLDED-IN SHORTING TYPE BANANA PLUGS



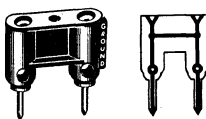
REAR: Dual banana jacks on 1/2" centers for stacking.

INTERNAL: Busbar shorted across line.
FRONT: Dual banana plugs on 1/2" centers. Banana jack holes for side stacking.

COLORS: Available in Red or Black (Specify color.)

No. 1752 **NET Ea.** \$.75

MOLDED-IN SHORTING TYPE .080 PHONE TIP



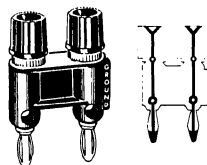
REAR: Dual banana jacks on 1/2" centers for stacking.

INTERNAL: Busbar shorted across line.
FRONT: Dual .080 phone tips on 1/2" centers. Banana jack holes for side stacking.

COLORS: Available in Red or Black (Specify color.)

No. 1753 **NET Ea.** \$.75

BINDING POSTS TO DUAL BANANA PLUGS

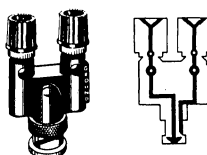


REAR: Insulated dual 5-way binding posts, Red and Black heads on 1/2" centers. Banana jack holes for side stacking.

FRONT: Dual banana plugs on 1/2" centers.

No. 1755 **NET Ea.** \$2.25

BINDING POSTS TO BNC MALE

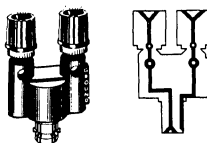


REAR: Insulated dual 5-way binding posts, Red and Black heads on 1/2" centers. Banana jack holes for side stacking.

FRONT: BNC series co-axial plug.

No. 1756 **NET Ea.** \$4.60

BINDING POSTS TO BNC FEMALE

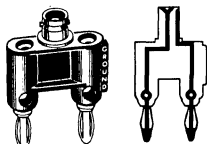


REAR: Insulated dual 5-way binding posts, Red and Black heads on 1/2" centers. Banana jack holes for side stacking.

FRONT: BNC series co-axial jack.

No. 1757 **NET Ea.** \$4.60

BNC FEMALE TO BANANA PLUGS

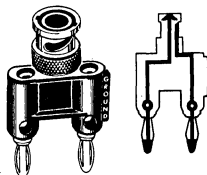


REAR: BNC series co-axial jack. Banana jack holes for stacking.

FRONT: Dual banana plugs on 1/2" centers. Banana jack holes for side stacking.

No. 1758 **NET Ea.** \$ 3.00

BNC MALE TO BANANA PLUGS

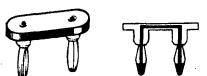


REAR: BNC series co-axial plug.

FRONT: Dual banana plugs on 1/2" centers. Banana jack holes for side stacking.

No. 1759 **NET Ea.** \$ 3.95

METAL SHORTING BAR TYPE



REAR: 3/32" thick brass busbar, 15 Amps, continuous duty.

FRONT: Dual miniature banana plugs on 1/2" centers. Unit sits flush to panel.

No. 1795 **NET Ea.** \$66.00

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH R.F. CONNECTORS & ADAPTERS

MALE CABLE CONNECTORS

Crimp Type



FIG. 1



FIG. 2

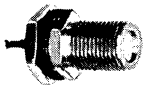


FIG. 3

Designed to crimp onto cable, and use the center conductor of the cable for the male pin. For use with RG-59/U, RG-11/U and RG-6/U cable.

Std. Pkg. 25

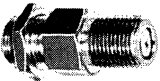
No.	Style	Fig.	Descr.	NET Each
1652	C-52	1	RG-59/U Separate Ring	\$.48
1816	F-59	2	RG-59/U Separate Ring	.30
1817	F-59A	3	RG-59/U Separate Ring	.35
1818	F-56	2	RG-6/U Separate Ring	.35
1819	F-11	2	RG-11/U Separate Ring	.60



FEMALE CHASSIS FITTINGS

Designed to accept above "C" and "F" series connectors. Supplied with nut and washer. Std. Pkg. 25

No.	Style	Descr.	NET Each
1660	C-61	Mounts in 3/4" hole	\$.90
1820	F-61	Mounts in 3/8" hole	.50



CABLE COUPLINGS

Female splice fittings for joining two cables with above series "C" and "F" connectors. Can also be used as bulkhead thru fittings. Supplied with nut for bulkhead mount.

Std. Pkg. 25

No.	Style	Descr.	NET Each
1680	C-81	Mounts in 1/4" hole	\$.90
1821	F-81	Mounts in 3/8" hole	.70

ACCESSORIES

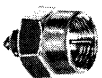


FIG. 4

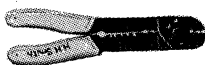


FIG. 5

Fig. 4 "F" Series 75-ohm termination, 1/4 Watt 5%. No. 1822 Std. Pkg. 25 NET Each \$.75

Fig. 5 No.	Crimp Ring for:	Std. Pkg.	NET Per C
1823	RG-59/U Cable	100	\$2.50
1824	RG-11/U Cable	100	4.50
1825	RG-6/U Cable	100	3.50

CRIMPING TOOL



Combination crimp and stripping tool for above connectors. Std. Pkg. 1 No. 1826 NET Each \$3.60

**SEE R.F. PATCH CORDS
PAGES 2-837 AND 2-838.**

COAXIAL CONNECTORS

R.F. Connectors for use with RG-6, 8, 11, 58 and 59/U coaxial cables.



STRAIGHT Solder Type

No.	Type	Std. Pkg 10	NET Ea.
1713	PL-259		\$.80



CHASSIS TYPE

No.	Type	Std. Pkg. 10	NET Ea.
1715	SO-239		\$.80



JUNCTION

No.	Type	Std. Pkg. 10	NET Ea.
1716	PL-258		\$1.22

CABLE REDUCING ADAPTER



No.	Type	Wire	NET per C
1719	UG-175 U	58/U	\$27.00
1711	UG-176 U	59/U	27.00



BNC FEMALE JACK

No.	Type	Descr.	NET Ea.
1768	UG-1094/U	Single Hole Jack	\$1.00

BNC FEMALE TO TEST PROBE



HANDLE: Molded Butyrate, per Federal Spec. L-P349A, Type 3, Class MS. BLACK.

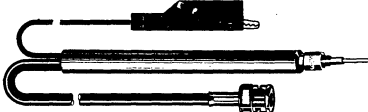
TIP: .080 Brass Nickel Plated.

CONNECTOR: BNC Female.

DESCR.: Permits the use of coaxial cables terminated with a BNC Male for all circuit testing. Probe shielded within 1" from tip.

No.	Std. Pkg. 1	NET Ea.
1797		\$4.85

BNC MALE TO TEST PROBE



HANDLE: Molded Butyrate per Federal Spec. L-P349A, Type 3, Class MS. RED.

TIP: .080 Brass Nickel Plated.

CONNECTOR: BNC Male.

WIRE: RG-58/U, 48" long.

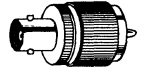
CLIP: Miniature steel alligator clip, cadmium plated with black insulator.

DESCR.: Permits the use of probe testing with any equipment utilizing a BNC female termination. Probe shielded within 1" from tip.

No.	Std. Pkg. 1	NET Ea.
1798		\$5.85

ADAPTERS

BNC FEMALE TO UHF MALE



FRONT: UHF plug.

REAR: BNC jack.

DESCR.: Permits the use of a BNC plug on equipment using a UHF jack. Std. Pkg. 1

No.	NET Ea.
1703	\$2.50

UHF FEMALE TO BNC MALE



FRONT: BNC plug.

REAR: UHF jack.

DESCR.: Permits the use of a UHF plug to equipment using a BNC jack. Std. Pkg. 1

No.	NET Ea.
1700	\$4.00

BINDING POST TO UHF MALE



FRONT: UHF male.

REAR: Insulated 5-way binding post.

DESCR.: Permits the adaptation of a 5-way insulated binding post to equipment using a UHF jack. Available in Red or Black. Std. Pkg. 1

No.	NET Ea.
1706	\$3.50

BINDING POST TO BNC MALE



FRONT: BNC male.

REAR: Insulated 5-way binding post.

DESCR.: Permits adaptation of a 5-way insulated binding post to equipment using a BNC jack. Available in Red or Black. Std. Pkg. 1

No.	NET Ea.
1705	\$3.50

BNC MALE TO BNC MALE



FRONT: BNC plug.

REAR: BNC plug.

DESCR.: Permits interconnection between cable terminations with BNC jacks. Std. Pkg. 1

No.	NET Ea.
1704	\$4.40

BNC FEMALE TO TYPE "N" MALE



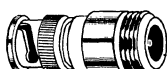
FRONT: Type "N" plug.

REAR: BNC jack.

DESCR.: Permits the use of a BNC plug on equipment using a Type "N" jack. Std. Pkg. 1

No.	NET Ea.
1701	\$2.50

TYPE "N" FEMALE TO BNC MALE



FRONT: BNC plug.

REAR: Type "N" jack.

DESCR.: Permits the use of a type "N" plug on equipment using a BNC jack. Std. Pkg. 1

No.	NET Ea.
1702	\$4.40

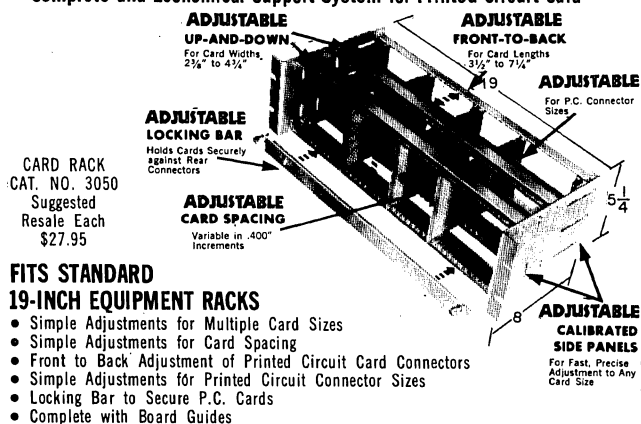
IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

P.C. CARD RACK & "HOOKON" SMITH

UNIVERSALLY ADJUSTABLE, STACKABLE PRINTED CIRCUIT CARD RACK

Complete and Economical Support System for Printed Circuit Card



FITS STANDARD

19-INCH EQUIPMENT RACKS

- Simple Adjustments for Multiple Card Sizes
- Simple Adjustments for Card Spacing
- Front to Back Adjustment of Printed Circuit Card Connectors
- Simple Adjustments for Printed Circuit Connector Sizes
- Locking Bar to Secure P.C. Cards
- Complete with Board Guides

SPECIFICATIONS

CARD CAPACITY Up to 39 cards, depending on component height.

CARD SIZES 1/16" thick standard

With Locking Bar Feature:

Maximum Card Width: 4 3/4"

Maximum Card Length: 6 1/2"

Minimum Card Width: 2 3/8"

Minimum Card Length: 4 3/8"

Without Front Card Lock:

Maximum Card Length: 7 1/4"

Minimum Card Length: 3 1/2"

CARD SPACING .400" Min. Centers. Adjustable in .400" increments.

CARD GUIDES Precision Molded Plastic. Four guides provided for each card to insure location accuracy. Guides nest together in staggered holes for minimum practical card spacing

ADJUSTABILITY All card guide and connector rails slide smoothly on Nylon bushings for ease in adjusting. Card rails adjust symmetrically to keep cards centered in rack. Connector rails adjust front-to-back to keep cards against locking rail. Adjust index marks permanently stamped on side plates for standard card sizes.

CONNECTOR SPACING Accommodates card-edge connectors with mounting centers from 0.936" minimum to 4.437" maximum.

CONSTRUCTION Heavy-gauge clear Anodized aluminum. Guide and alignment members are extrusions for maximum precision of fits.

DIMENSIONS Designed to fit standard 19" equipment racks, 5 1/4" panel space. Length 19"; Width 5 1/4"; Depth 8".

ASSEMBLY Supplied knocked-down. All hardware, card guides, and complete assembly instructions included.

SPECIAL FEATURES

LOCKING BAR Front locking bar holds cards securely against rear connectors. Held in place with captive screws for rapid card change. Card identification marking available on front of locking bar.

STACKING Can be stacked for wider panels in multiples of 5 1/4". Accessory brackets available for free-standing stacking.

SPECIALS Special color anodized finishes available on request. Non-standard sizes available on special order.

REPLACEMENT PARTS

Cat. No.	Description	NET Ea.	Cat. No.	Description	NET Ea.
3050-1	Guide Rail	\$2.50	3050-10	Screw, 6-32 x 3/4, Type F Phillips	.01
3050-2	Guide Rail Bracket	.50	3050-11	Hex Nut, 4-40 x 1/4	.01
3050-3	Connector Rail Bracket	1.25	3050-12	Lockwasher, Int. Tooth, #4	.01
3050-4	Connector Rail	1.00	3050-13	Nylon Guide Bushing	.02
3050-5	Side Plate	2.50	3050-14	Captive Screw	.15
3050-6	Locking Bar Bracket	.50	3050-16	Nylon Washer	.02
3050-7	Locking Bar	1.50	3050-17	Plastic Card Guide	.05
3050-8	Screw, 4-40 x 1/4, Type F Phillips	.01	3050-18	Instructions	.50
3050-9	Screw, 4-40 x 3/8, Type F Phillips	.01			

P.C. CARD RACK BLANK END PLATES

Anodized aluminum blank-end plates for P.C. card racks. Designed for use with the standard No. 3050 hardware, to design custom rack sizes. Flanged and notched for RETMA mounting. Drill templates furnished with each pair of end plates to facilitate drilling within the P.C. card size limitations. Available in pairs.

No.	Length	Height	Centers	Std. Pkge. 1 Pair	Net Per Pair
3052	7.812	5.219	1.125	\$4.80	5.80
3053	9.000	6.970	2.000	5.80	7.00
3054	11.000	8.718	2.875	7.00	8.00
3055	12.000	5.219	1.125	5.80	7.00
3056	12.000	10.470	3.750	9.00	

P.C. CARD RACK STACKING PLATES

Designed to stack one or more No. 3050 card racks. Can also be used to create a double size card rack to accommodate larger size cards. Made of anodized aluminum, supplied with mounting hardware, available in pairs.

No.	Std. Pkge. 1 Pair	Net Per Pair
3057		\$3.50

"HOOKON"

PROBE FOR HIGH DENSITY AREAS.

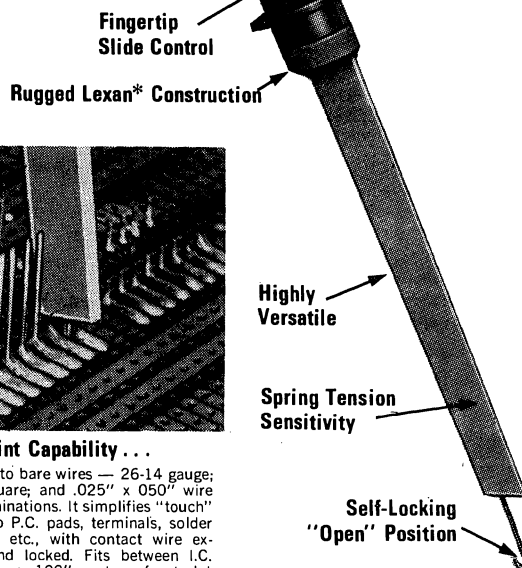
Easy to use . . . Versatile . . .
Reaches into the densest wiring areas, quickly

Universal Input Application

"The Hookon" accepts and adapts to existing terminations and banana plugs; phone tips, test prods and wire. When used with test prods, the overall length is increased to further reach into deeply restricted areas. All metal parts are completely enclosed.

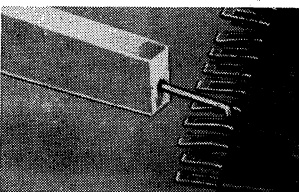
No. 3070
NET EA.
\$3.00

Standard Packaging:
1 each in individual plastic display sleeve.



Test Point Capability . . .

connects to bare wires — 26-14 gauge; .025" square; and .025" x .050" wire wrap terminations. It simplifies "touch" contact to P.C. pads, terminals, solder junctions, etc., with contact wire extended and locked. Fits between I.C. terminals on .100" centers; front slot accepts tails without extending contact.

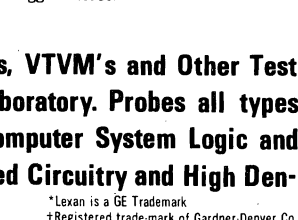


Contact Sensitivity . . .

"The Hookon" offers positive tensioned contact to all terminations without danger of damage or marring. The contact is made of corrosion resistant steel, while the entire unit is precision molded of sturdy Lexan* for long term durability, heat resistance and high levels of insulation. The slide button is in white and the body mold in red.

Use Vertically or Laterally . . .

"The Hookon" reaches through the densest wire jungles and hooks onto leads, pins, square wire wraps for safe, sure connections. The fingertip slide control includes a self-locking open position and a "no hands spring grip" upon trigger release.



Designed for Scopes, DVM's, VTVM's and Other Test Gear; for Use in Field, or Laboratory. Probes all types of Discrete Components, Computer System Logic and Matrix P.C. Boards; Integrated Circuitry and High Density Electronic Circuitry.

*Lexan is a GE Trademark

†Registered trade-mark of Gardner-Denver Co.

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH P.C. PRE-PUNCH BOARDS

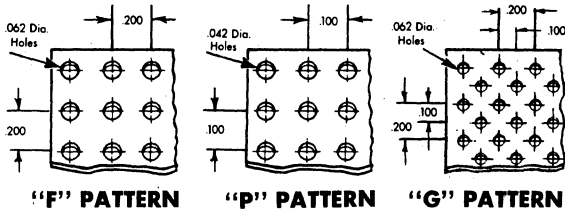
STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

SPECIFICATIONS

All boards are precision-punched and pre-cut to size with various spacings to accommodate and provide economical mounting of components in Electronic circuitry. They are ideal for production and prototype uses. They can be etched as required, drilled, punched or sawed. The following specifications apply:

XXXXP—Phenolic unclad, Type PBE-P per MIL-P-3115, 250° F Max.
EXXXP — Epoxy Paper, Type PEE per MIL-P-22324, 250° F Max.
XXXXPC — Phenolic, Copper Clad, Type PP per MIL-P-13949, 250° F Max.
G-10 — Epoxy Glass, unclad, Type GEE per MIL-P-18177, 300° F Max.
G-10 — Epoxy Glass, Copper Clad, Type GE per MIL-P-13949B, 300° F Max.

Many Others Available — Specials — Inquire



"F" PATTERN

.062 Holes .200 Centers 1/16" Thickness Std. Pkg. 10

		XXXXP		G-10		XXXXP 1 Side Copper Clad		G-10 1 Side Copper Clad	
Size	No. of Holes	No.	NET Per C	No.	NET Per C	No.	NET Per C	No.	NET Per C
3x4	15x20	6001	28.00	6014	72.00	6027	39.00	6040	100.00
3x4.5	15x22	6002	35.00	6015	81.00	6028	45.00	6041	110.00
3x6	15x30	6003	45.00	6016	105.00	6029	60.00	6042	150.00
3x6.5	15x32	6004	48.00	6017	115.00	6030	62.00	6043	160.00
3.5x4	17x20	6005	33.00	6018	82.00	6031	45.00	6044	114.00
3.5x4.5	17x22	6006	36.50	6019	91.00	6032	50.00	6045	127.00
3.5x6	17x30	6007	50.50	6020	120.00	6033	67.00	6046	155.00
3.5x6.5	17x32	6008	55.50	6021	131.00	6034	73.00	6047	183.00
4x4.5	20x22	6009	45.00	6022	108.00	6035	60.00	6048	150.00
4x6	20x30	6010	56.00	6023	138.00	6036	75.00	6049	192.00
4x6.5	20x32	6011	60.00	6024	147.00	6037	81.00	6050	207.00
4.5x6	22x30	6012	61.50	6025	152.00	6038	83.00	6051	207.00
4.5x6.5	22x32	6013	66.00	6026	162.00	6039	88.00	6052	230.00

"P" PATTERN

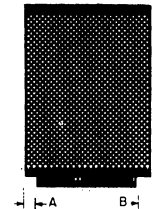
.042 Holes .100 Centers 3/64" Thickness Std. Pkg. 10

		G-10		G-10 1 Side Copper Clad	
Size	No. of Holes	No.	NET Per C	No.	NET Per C
2.5x4	25x40	6092	66.00	6109	90.00
2.5x4.5	25x45	6093	74.00	6110	100.00
2.5x6	25x60	6094	99.00	6111	134.00
2.5x6.5	25x65	6095	105.00	6112	142.00
3x4	30x40	6096	77.00	6113	105.00
3x4.5	30x45	6097	85.00	6114	115.00
3x6	30x60	6098	110.00	6115	155.00
3x6.5	30x65	6099	122.00	6116	165.00
3.5x4	35x40	6100	88.00	6117	119.00
3.5x4.5	35x45	6101	96.00	6118	132.00
3.5x6	35x60	6102	127.00	6119	177.00
3.5x6.5	35x65	6103	135.00	6120	184.00
4x4.5	40x45	6104	114.00	6121	155.00
4x6	40x60	6105	144.00	6122	197.00
4x6.5	40x65	6106	152.00	6123	212.00
4.5x6	45x60	6107	157.00	6124	220.00
4.5x6.5	45x65	6108	168.00	6125	235.00

"G" PATTERN

.100 x .200 .062 Holes Alternate Centers 1/16" Thickness Std. Pkg. 10

		XXXXP		G-10		G-10 1 Side Copper Clad	
Size	No. of Hole	No.	NET Per C	No.	NET Per C	No.	NET Per C
3x4	(15x20)2	6053	30.00	6066	72.00	6079	100.00
3x4.5	(15x22)2	6054	32.50	6067	81.00	6080	110.00
3x6	(15x30)2	6055	45.00	6068	105.00	6081	150.00
3x6.5	(15x32)2	6056	48.00	6069	115.00	6082	160.00
3.5x4	(17x20)2	6057	37.00	6070	80.00	6083	114.00
3.5x4.5	(17x22)2	6058	36.50	6071	91.00	6084	127.00
3.5x6	(17x30)2	6059	50.50	6072	120.00	6085	155.00
3.5x6.5	(17x32)2	6060	55.50	6073	131.00	6086	183.00
4x4.5	(20x22)2	6061	45.00	6074	108.00	6087	150.00
4x6	(20x30)2	6062	56.00	6075	138.00	6088	192.00
4x6.5	(20x32)2	6063	60.00	6076	147.00	6089	207.00
4.5x6	(22x30)2	6064	61.50	6077	152.00	6090	207.00
4.5x6.5	(22x32)2	6065	66.00	6078	162.00	6091	230.00



4.5" x 6.5" PLUG-IN CARDS WITH ETCHED FINGERS

		.062 Holes. .100 x .200 Alternate Centers. .156 Spacing. 1/16" Thickness. Std. Pkg. 5			
Total	1 or 2	G-10		XXXXP	
Con-	Sides	Fig. A	Fig. B	No.	NET Ea.
43	2	.408	.508	6126	6.40
43	2	.458	.458	6127	5.80
22	1	.408	.508	6128	4.90
22	1	.458	.458	6129	4.90

CONNECTOR INFORMATION:

With Plug-In Cards SMITH Nos.	Use SMITH Connector Commercial No.	Use Elco Connector Military No.
6126 and 6130	6227	6212
6127 and 6131	6227	6212
6128 and 6132	6220	6204
6129 and 6133	6220	6204



FIG. 1

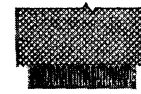


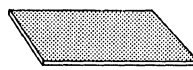
FIG. 2

PLUG-IN CARDS WITH ELCO "VARICON" CONTACTS

		.062 Holes. .100 x .200 Alternate Centers. 1/16" Thickness. Std. Pkg. 1			
No.	Fig.	No. of Con-tacts	Size	Material	NET Ea.
6134	1	16	4.5x6.5	Paper Epoxy	5.20
6135	1	16	4.5x6.5	Glass Epoxy	5.50
6136	1	12	3x4.5	Paper Epoxy	3.90
6137	1	12	3x4.5	Glass Epoxy	4.20
6138	1	14	3x4.5	Paper Epoxy	3.90
6139	1	14	3x4.5	Glass Epoxy	4.50
6140	2	35	4.5x6.5	Glass Epoxy	9.80
6141	2	35	4.5x6.5	Paper Epoxy	8.50

CONNECTOR INFORMATION:

Plug-In Cards, SMITH Nos.	Use Elco Connector No.
6134 and 6135	5009-016-156-001
6136 and 6137	5009-012-156-001
6138 and 6139	5004-014-103-002
6140	7008-035-146-001
6141	7001-035-146-001



BLANK PANELS

1 and 2 Sides Copper. 1/16" Thickness. Std. Pkg. 5

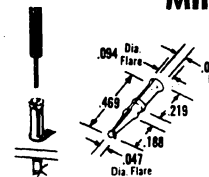
		XXXXP		G-10		G-10	
		Copper 1 Side		Copper 2 Sides		Copper 1 Side	
Size		No.	NET Per C	No.	NET Per C	No.	NET Per C
3x4.5		6142	38.00	6144	51.00	6146	88.00
4.5x6.5		6143	70.00	6145	98.00	6147	170.00
						6148	98.00
						6149	193.00

MINIATURE TUBULAR TERMINALS

For .062-.067 Diam. Hole

For printed circuits. Suitable for mounting transistors, resistors, neon, etc. Tapered section retains wire leads. Positive locking in hole, no staking required. Firmly holds wires of .010 to .050 diam.

Material: .006 thick brass, precision-formed and pre-tinned. Std. Pkg. 100 No. 6160 NET Per C \$2.00



INSERTION TOOL, for hand insertion. No. 6161 Std. Pkg. 6 NET Each \$1.25

PUSH-IN TERMINALS For .062 Diam. Holes



Miniature type, excellent for point-to-point or feed-thru wiring. Serrated slot grips transistor or heavier leads. Multiple connections quickly and easily made. Material: .008 thick Beryllium Copper. Finish: Fused Tin Plate. Std. Pkg. 100 No. 6162 NET Per C \$2.20

INSERTION TOOL, for hand insertion. No. 6163 Std. Pkg. 6 NET Each \$1.35

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

P.C. CONNECTORS, ACCESS. SMITH

PRINTED CIRCUIT CONNECTORS

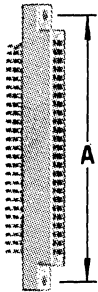
COMMERCIAL

INSULATOR: Glass filled blue Alkyd.
CONTACTS: Beryl Copper .00001 gold flash;
pierced terminal.
ACCEPTS: 1/16" Printed Circuit Cards.
MTG. HOLE: .125 Clearance.
DESCR.: Bifurcated bellows action assures positive electrical contact.

.156 SPACING

.125 Mtg. Hole Clearance.
Pierced Terminal Std. Pkg. 5

Smith No.	No. of Con-tacts	Single or Double	A Mtg. Centers	NET Ea.
6216	6	S	1.531	1.85
6217	10	S	2.156	1.95
6218	15	S	2.937	1.80
6219	18	S	3.406	2.70
6220	22	S	4.031	2.80
6221	28	S	5.046	4.75
6222	36	S	6.219	3.70
6223	12	D	1.531	1.90
6224	20	D	2.156	1.95
6225	30	D	2.937	1.85
6226	36	D	3.406	2.75
6227	44	D	4.031	2.80
6228	56	D	5.046	4.75
6229	72	D	6.219	3.80
6230	86	D	7.302	4.35



MILITARY - MIL-C-21097

INSULATOR: Diallyl Phthalate, Green, Type GDI-30 per MIL-P-19833.
CONTACTS: Beryl Copper .000031 gold per MIL-G-45204, Type II over .0005 silver per QQ-5-365, pierced terminal.

.156 SPACING

.125 Mtg. Hole Clearance.
Pierced Terminal Std. Pkg. 5

No. Smith	No. of Con-tacts	Single or Double	A Mtg. Centers	NET Ea.
6200	6	S	1.531	3.10
6201	10	S	2.156	3.30
6202	15	S	2.937	3.65
6203	18	S	3.406	4.15
6204	22	S	4.031	4.35
6205	28	S	5.046	4.75
6206	36	S	6.219	5.20
6207	43	S	7.302	8.00
6208	12	D	1.531	3.25
6209	20	D	2.156	3.35
6210	30	D	2.937	3.65
6211	36	D	3.406	4.15
6212	44	D	4.031	4.35
6213	56	D	5.046	4.75
6214	72	D	6.219	8.00
6215	86	D	7.302	8.50

ACCEPTS: 1/16" Printed Circuit Cards.
MTG. HOLE: .125 Clearance.
DESCR.: Bifurcated bellows action assures positive electrical contact.

.100 SPACING

.125 Mtg. Hole Clearance.
Pierced Terminal Std. Pkg. 1

Smith No.	No. of Con-tacts	Single or Double	A Mtg. Centers	NET Ea.
6231	40	D	2.625	7.55
6232	60	D	—	8.40
6233	70	D	4.125	9.40
6234	80	D	4.625	10.35
6235	100	D	—	11.10
6236	120	D	6.625	11.30

.050 SPACING

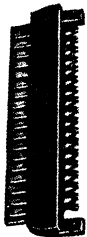
.125 Mtg. Hole Clearance.
Dip Solder Terminal Std. Pkg. 1

Smith No.	No. of Con-tacts	Single or Double	A Mtg. Centers	NET Ea.
6237	40	D	1.500	11.50
6238	60	D	2.000	13.45
6239	80	D	2.500	14.00
6240	100	D	3.000	15.80
6241	110	D	3.250	16.25
6242	120	D	3.500	17.35

PRINTED CIRCUIT EDGE STRIPS

Convert any P.C. Board for plug-in applications. Can also be used where high reliability is required. Molded diallyl phthalate body with gold plated contacts. .125 Micro-inch. Available in single or double sided. For 1/16" boards. Std. Pkg. 1

No.	Contacts	Single or Double	NET Each
6254	6	S	\$ 4.40
6255	10	S	5.10
6256	15	S	6.10
6257	18	S	6.60
6258	22	S	7.15
6259	12	D	5.55
6260	20	D	6.80
6261	30	D	8.30
6262	36	D	9.35
6263	44	D	10.75



P. C. PROTOTYPE ETCHING EQUIPMENT

FOR SCREEN CUTTING

Photo layout film for hand-cutting mechanical negatives. A red film is laminated to a transparent backing sheet. When knife-cut, the red film laminate is peeled back to permit light to penetrate only through the cut-away area; the remainder is light-safe. Supplied in 8" x 10" sheets. Std. Pkg. 6 No. 6268 NET Each \$1.00

SWIVEL CUTTING KNIFE for cutting circles and curves. Also locks tight for cutting straight lines. Std. Pkg. 6 No. 6269 NET Each \$1.00

EXTRA BLADES for above. Std. Pkg. 12 No. 6270 NET Each \$5.50

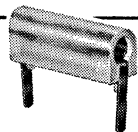
PARALLEL LINE-CUTTING KNIFE, for cutting parallel lines up to 1/2" in width. Std. Pkg. 1 No. 6271 NET Each \$3.50

FOR ETCHING

A low cost kit to enable the engineer to quickly etch copper-clad boards in minutes. The kit contains a unique felt-tip Resist Ink pen to apply the Resist-Ink as easily as writing. Also included is a 2-oz. bottle of Resist-Ink solvent and a 6-oz. bottle of ferric-chloride etchant solution. Std. Pkg. 1 No. 6272 NET Each \$3.95



FOR PRINTED CIRCUIT JACKS SEE PAGE 2-823



NYLON P.C. CARD HANDLE

Designed for use as a permanent handle or puller for quick and easy card insertion and removal.

Std. Pkg. 100

No. 6298

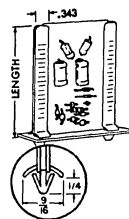
NET Per C \$40.00



PRINTED CIRCUIT BOARD GUIDES

Position P.C. Boards of any width. Made of Natural Nylon, snaps into place. Double 'channeled' for stacking and available in three sizes. Accepts board thicknesses from .030" to .075"; fits into panel hole .175" x .310". Std. Pkg. 100

No.	Length	NET Per C
6249	1"	\$17.00
6250	2"	18.50
6251	3"	20.00

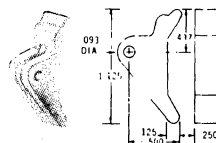


NYLON P.C. CARD EJECTOR

Designed for easy and quick removal of circuit boards. Lever action prevents damage to card and components. For use with cards up to 1/16" thick, supplied with mounting pins.

No. 6297

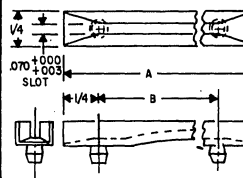
NET Per C \$35.00



RACK CARD GUIDES

Guides may be used horizontally or vertically for mounting circuit boards in rack chassis. Guides snap into .125" dia. hole at both ends. Four lengths in natural nylon. Std. Pkg. 50

No.	A	B	NET Per C
6339	3"	2 1/2"	\$34.00
6340	4"	3 1/2"	39.00
6341	6"	5 1/2"	42.00
6342	8 1/2"	8"	45.00



JUST ADDED AT PRESS TIME

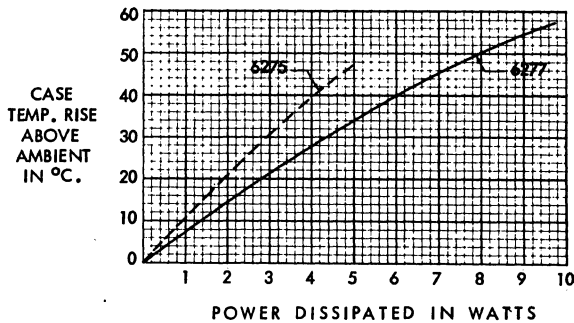
"THE HOOKON"

PROBE FOR HIGH DENSITY CIRCUITS. SEE PAGE 2-849

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

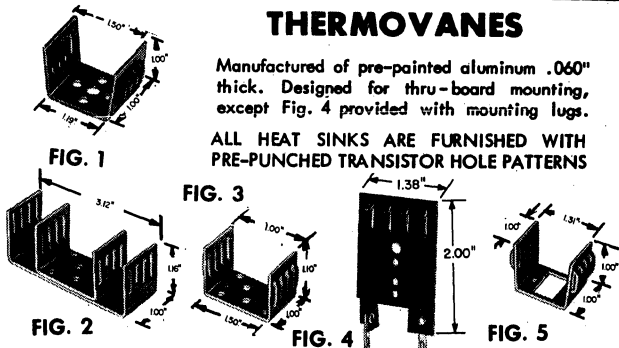
SMITH**HEAT SINKS**STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE**LIGHTWEIGHT - ECONOMICAL - VERSATILE
HEAT SINKS FOR SEMI-CONDUCTOR CIRCUITRY**

The θ_{ca} figures represent natural convection situations in a sea level atmosphere. Actual performance in individual situations depends upon air flow, proximity of interfering objects, thermal conductive effects of the chassis, and heat radiated or convected from other components.

**THERMOVANES**

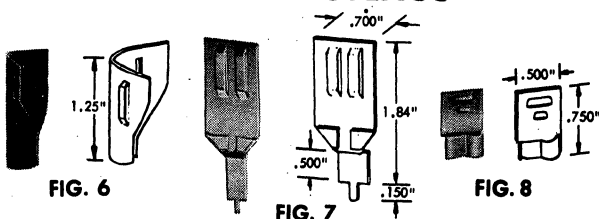
Manufactured of pre-painted aluminum .060" thick. Designed for thru-board mounting, except Fig. 4 provided with mounting lugs.

ALL HEAT SINKS ARE FURNISHED WITH PRE-PUNCHED TRANSISTOR HOLE PATTERNS



SMITH NO.	FIG. NO.	CASE STYLE	THERMAL* RES. °C/W	WEIGHT IN GRAMS	STD. PKG.	RESALE Per C
6275	1	TO-3	9.5	9.8	100	30.00
6276	1	TO-66, MD-17	9.5	9.8	100	30.00
6277	2	TO-3	5.6	23.4	50	65.00
6278	5	I.C., -V21-675, Case 675	9.5	9.8	100	30.00
6279	2	TO-66, MD-17	5.6	23.4	50	65.00
6280	3	TO-36, Stud Mtd Types 1/2" max.	10.0	10.8	100	30.00
6281	4	Flat Packs, Plastic or Tab	15.1	7.0	50	45.00

* Thermal Resistance measured in free air; lower when chassis-mounted.

THERMOFLAGS

Manufactured of silver-bearing copper, except Fig. 6 pre-painted aluminum .018" thick. Designed for self support, except Fig. 7 provided with mounting lug.

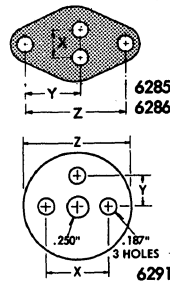
SMITH NO.	FIG. NO.	CASE STYLE	THERMAL* RES. °C/W	WEIGHT IN GRAMS	STD. PKG.	RESALE Per C
6282	6	TO-5, 0.325" Case Dia.	46	1.0	100	15.00
6283	7	152, Tab Mtd Flat Packs	40-43	1.6	100	29.00
6284	8	TO-92, TO-98, All "D" Shape Styles	72	1.0	100	14.00

* Thermal Resistance measured in free air.

MICA INSULATING WAFERS

FOR TO-3, TO-66 AND TO-36 CASE STYLES

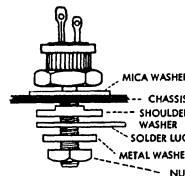
When installed between semi-conductor and chassis or heat dissipator, it yields a lower thermal resistance. Std. Pkg. 100



SMITH NO.	CASE STYLE	X	Y	Z	NET Per C
6285	TO-3	.430"	.665"	1.187"	\$5.00
6286	TO-66	.200"	.580"	.960"	5.00
6291	TO-36	.690"	.345"	1.187"	5.00

STUD TRANSISTOR MOUNTING HARDWARE

A complete listing of required mounting hardware for stud type transistors from #10 to #1/4 stud. Std. Pkg. 100

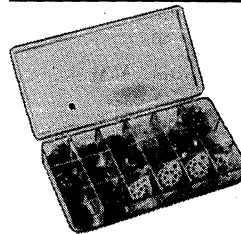


No.	Description	NET Per C
1153	#10 Mica Washer	\$3.40
1154	#1/4 Mica Washer	3.40
2666	#10 Nylon Shoulder Washer	2.50
2664	#1/4 Nylon Shoulder Washer	2.40
1410-10	#10 Solder Lug	1.50
1468	#1/4 Solder Lug	1.50
1152	#10 Metal Washer	.95
1147	#1/4 Metal Washer	.90
1367	#10-32 Nut	.90
1368	#1/4-20 Nut	1.45
1399	#1/4-28 Nut	1.80

ENGINEERING TRANSISTOR MOUNT HARDWARE KIT

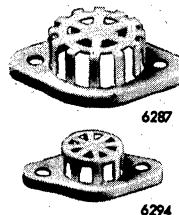
Contains all hardware necessary to mount and insulate stud mount transistors and TO-3, TO-66 types. Includes: 25 each of Smith Nos. 6285, 6286, 6291, 2666, 2664, 1410-10, 1468, 1152, 1147, 1367, 1368; 5 each of Smith Nos. 6287, 6294; 25 each of #10 mica washers, #1/4 mica washers and 1/4-28 nuts. Packaged in a clear plastic hinged box. Std. Pkg. 1

No. 1319 NET Each \$12.00

**NYLON PROTECTIVE COVER**

FOR TO-3 CASE STYLE

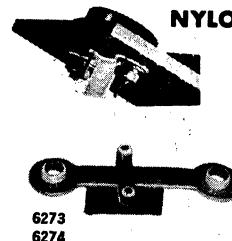
Insulates case from electrical shock and thermal contact. Webbed construction for free air flow. Std. Pkg. 100



No.	For Case Style	NET Per C
6287	TO-3	\$30.00
6294	TO-66	30.00
6295	TO-5	4.50
6296	TO-18	4.50

NYLON POWER TRANSISTOR MOUNTS

One-piece Nylon transistor mount replaces six pieces of conventional insulation when mounting power transistors. Built-in barrier separates and insulates base and emitter pins from each other. Screw insulators require 3/4" clearance holes, pin insulators .113 dia. clearance. Mounting centers are standard for types TO-3 and TO-66 power transistors. Std. Pkg. 100



No.	Transistor Type	NET Per C
6273	TO-3	\$4.00
6274	TO-66	4.00

HIGH TEMPERATURE TRANSISTOR MOUNTS

Heavy Duty, Made of Celanese 917 J101 Polyester. Designed for excessive temperature and electrical requirements. Rated SE-O UL, 400° F Cont.



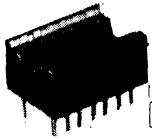
No.	Transistor Type	NET Per C
6292	TO-3	8.00
6293	TO-66	8.00

**MORE THAN TEN THOUSAND ITEMS
MANUFACTURED UNDER ONE ROOF**

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

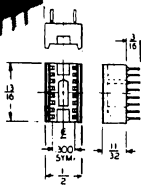
I.C. TRANSISTOR SOCKETS SMITH



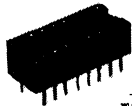
INTEGRATED SOCKETS DUAL IN-LINE

For 14 and 16 pin in-line Hybrid packages having .100" x .300" grid spacing. Accepts round or flat pins. Body of general purpose phenolic. Brass electro plated contacts.

Std. Pkg. 50

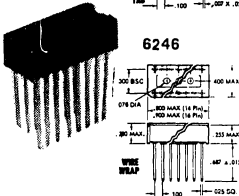


No.	Pins	NET Per C
6252	14	\$66.00
6253	16	66.00



LOW PROFILE I.C. SOCKETS WIRE WRAP and SOLDER TAB

Provided with removable cover for closed entry and contact replacement, polarity guide for assembly alignment. Made of glass filled Black Nylon, phosphor bronze (QQ 13-750 Comp A) contacts, 10-20 microinches gold over 30-100 microinches silver. Available in 14 and 16 pin, wire wrap and solder tab terminals. Std. Pkg. 50



No.	Pins	Contacts	Thick.	Body	NET Per C
6245	14	.687"	.025" Sq.	Wire Wrp	\$80.00
6246	16	.687"	.025" Sq.	Wire Wrp	85.00
6247	14	.156"	.025x.007"	Sldr Tab	70.00
6248	16	.156"	.025x.007"	Sldr Tab	75.00



10 PIN IC SOCKET

Contacts are Brass, Cadmium Plated. Sockets are Molded of General Purpose, or Mica Filled Phenolic. Other Materials Upon Application. Socket to Accept .017 Dia. Pins. Contacts may be Omitted to Accept Various Types of Integrated Circuit Patterns.

Std. Pkg. 50

No.	NET Per C
6267	\$40.00

UNIVERSAL TRANSISTOR SOCKET

Contacts are Phosphor Bronze, Cadmium Plated. Sockets are Molded of General Purpose Phenolic, or Mica Filled Phenolic. Other materials available upon request.

Std. Pkg. 100

Net per C
\$25.00

No. 6299

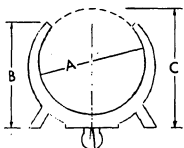
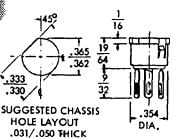


TRANSISTOR SOCKETS

Snap-in type transistor sockets for TO-5 and TO-18 cases. Phosphor bronze, cadmium plated contacts with a polysulfone body. Fits in "D" shape hole.

Std. Pkg. 100

No.	Case	NET Per C
6264	TO-18	\$15.00
6265	TO-5	15.00



COMPONENT CLIPS

Made of black self-extinguishing Nylon. Mounts into chassis or P.C. board. For panel thickness 1/4", panel hole size 3/32"; except #4081: panel hole size 1/8".

Std. Pkg. 100

Clip Width 1/4" except #4081 3/16".



No.	A	B	C	NET Per C
4081	3/32"	.265	.343	\$5.70
4082	1/4"	.343	.375	6.40
4084	3/8"	.437	.500	7.40
4086	1/2"	.546	.625	9.00
4088	5/8"	.685	.750	10.50
4090	3/4"	.800	.875	12.00
4091	.800	.781	.925	13.00
4092	1.000	1.000	1.125	16.00

USE OUR VAST NATIONAL DISTRIBUTION NETWORK for Off-The-Shelf Deliveries of your smaller hardware requirements.

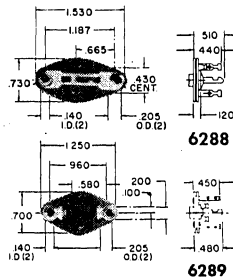


POWER TRANSISTOR SOCKET

Fully insulated power transistor socket, for use with diamond case, TO-3 style. Body of self-extinguishing phenolic, U.L. Listed. Phosphor bronze contacts, gold plated over silver. Mounting plate tapped for 6-32 screws. Integrally molded bosses on mounting holes eliminate need for separate washers.

Std. Pkg. 100

No. 6266
NET Per C
\$30.00

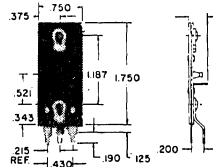


TRANSISTOR WAFER SOCKETS FOR TO-3 AND TO-66 CASE STYLES

Molded nylon top with molded boss washer construction and self-threading mounting bracket for #6 screw. Contacts and mounting plate are of cadmium plated brass.

Std. Pkg. 100

No.	FOR CASE	NET Per C
6288	TO-3	\$20.00
6289	TO-66	\$20.00



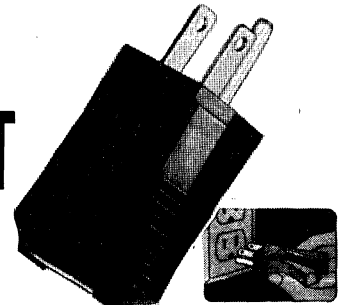
P.C. VERTICAL MOUNT SOCKET FOR TO-3 CASE STYLE

All connections are made through P.C. mounting tabs. Contacts and mounting plate of cadmium plated brass.

Std. Pkg. 100

No. 6290
NET Per C \$30.00

AMP* AC FAULT FINDER



ELECTRICAL CIRCUIT CONDITIONS

- Open Ground • Open Hot • Open Neutral • Correct
- Hot/Ground — Reversed • Hot/Neutral — Reversed

This revolutionary AC Fault Finder has indicator lights and a chart on both sides to describe the condition for each lighting arrangement. Plug in and illuminated signals indicate: reverse polarity, faulty wiring, missing grounds and/or correct wiring conditions.

FEATURES:

- Just plug in — simple & easy-to-use.
- No tools, meters, wires needed.
- Easy to read from any angle — labeled on both sides.
- Break resistant plastic.
- Designed for conventional 3 wire 120 Volt AC outlets
- Checks dual wire outlets with use of polarized adapter and ground wire.

No. 3030

Standard Pkg.—12

\$5.95 Net Each

*All international rights reserved by AMP Incorporated. Products covered by U.S. and foreign patents and/or patents pending.

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH**EQUIPMENT HANDLES**STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE**MATERIAL AND FINISH SPECIFICATIONS****MATERIALS:**

Brass: In accordance with Federal Spec. QQ-B-626, Composition 22, 1/2 Hard.

Aluminum: In accordance with Federal Spec. QQ-A-365, Composition A, Type 3.

Steel: Cold-Rolled, in accordance with QQ-S-633b, Grade FS-1010.

SEND US YOUR DRAWINGS FOR SPECIAL SIZE HANDLES

FINISHES:

Nickel Plate: Polished Nickel Plate, in accordance with Federal Spec. QQ-N-290, Class I, Type VI.

Black Oxide: In accordance with MIL-F-495A.

Satin Etch: Commercial finish.

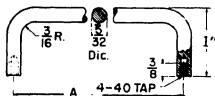
Black Anodize: In accordance with MIL-A-8625A.

Optical Black: Color in accordance with Fed. Std. 595, type 37038. Paint complies with Fed. Spec. TT-E-527.

PANEL HANDLES

Brass Panel Handles, finished as shown, with internal thread. Individually packaged.

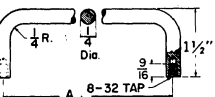
Std. Pkg. 10

5/32" O.D.

No.	(A)	Finish	NET Ea.
BRASS			
1632	1 1/4"	Nickel Plate	\$1.25
1633	1 1/4"	Black Oxide	1.25
1636	2"	Nickel Plate	1.40
1637	2"	Black Oxide	1.40
1640	3"	Nickel Plate	1.45
1641	3"	Black Oxide	1.45

ALUMINUM

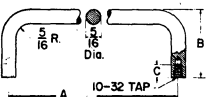
No.	(A)	Finish	NET Ea.
1634	1 1/4"	Satin	\$1.00
1635	1 1/4"	Blk. Anodize	1.15
1638	2"	Satin	1.20
1639	2"	Blk. Anodize	1.35
1642	3"	Satin	1.25
1643	3"	Blk. Anodize	1.40

1/4" O.D.

No.	(A)	Finish	NET Ea.
BRASS			
1616	2"	Nickel Plate	\$1.50
1617	2"	Black Oxide	1.50
1620	3"	Nickel Plate	1.55
1621	3"	Black Oxide	1.55
1624	4"	Nickel Plate	1.60
1625	4"	Black Oxide	1.60
1628	6"	Nickel Plate	1.80
1629	6"	Black Oxide	1.80

ALUMINUM

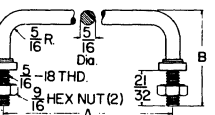
No.	(A)	Finish	NET Ea.
1618	2"	Satin	\$.80
1619	2"	Blk. Anodize	.85
1622	3"	Satin	.85
1623	3"	Blk. Anodize	.95
1626	4"	Satin	.90
1627	4"	Blk. Anodize	1.00
1630	6"	Satin	1.05
1631	6"	Blk. Anodize	1.20

5/16" O.D.

No.	(A)	(B)	(C)	NET Ea.
BRASS NICKEL PLATE				
2050	3"	1 1/8"	7/16"	\$1.60
2057	3"	1 1/2"	7/16"	1.75
2056	4 1/4"	1 1/2"	7/16"	1.85
2051	4 1/2"	1 1/2"	7/16"	2.00
2052	6 7/16"	1 3/4"	7/16"	2.50

BRASS BLACK OXIDE

No.	(A)	(B)	(C)	NET Ea.
1601	3"	1 1/8"	7/16"	\$1.60
1602	3"	1 1/2"	7/16"	1.75
1604	4 1/4"	1 1/2"	7/16"	1.85
1605	4 1/2"	1 1/2"	7/16"	2.00
1606	6 7/16"	1 3/4"	7/16"	2.50

5/16" O.D.**PANEL HANDLES**

Brass Panel Handles, finished as shown with male threaded stud. Supplied complete with matching ferrules, and brass, nickel plated hex nuts. Individually packaged. Std. Pkg. 10

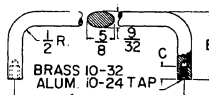
No.	(A)	(B)	NET Ea.
BRASS NICKEL PLATE			
1607	2"	2 1/8"	\$2.20
1609	3"	2 1/8"	2.25
1611	4"	2 1/8"	2.50
2053	4 1/4"	2 1/8"	2.55
1614	6"	2 11/16"	2.95

BRASS BLACK OXIDE

No.	(A)	(B)	NET Ea.
1608	2"	2 1/8"	\$2.20
1610	3"	2 1/8"	2.25
1612	4"	2 1/8"	2.50
1613	4 1/4"	2 1/8"	2.55
1615	6"	2 11/16"	2.95

OVAL PANEL HANDLES

Individually packaged. Std. Pkg. 10



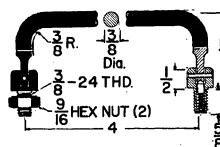
No.	Mtg. Ctrs. (A)	Height (B)	Tap Depth (C)	Finish	NET Ea.
BRASS					
1644	3"	1 1/2"	1/2"	Nickel Plate	\$ 3.00
1645	3"	1 1/2"	1/2"	Black Oxide	3.00
1647	4 1/4"	1 1/2"	1/2"	Nickel Plate	3.50
1648	4 1/4"	1 1/2"	1/2"	Black Oxide	3.50
1651	6 1/4"	1 1/2"	1/2"	Nickel Plate	3.65
1653	6 1/4"	1 1/2"	1/2"	Black Oxide	3.65
1655	9"	1 1/2"	1/2"	Nickel Plate	4.15
1657	9"	1 1/2"	1/2"	Black Oxide	4.15

ALUMINUM

No.	Mtg. Ctrs. (A)	Height (B)	Tap Depth (C)	Finish	NET Ea.
1646	3"	1 1/2"	1/2"	Black Anodize	1.80
1649	4 1/4"	1 1/2"	1/2"	Black Anodize	2.20
1654	6 1/4"	1 1/2"	1/2"	Black Anodize	2.95
1658	9"	1 1/2"	1/2"	Black Anodize	3.15

FOLDING HANDLES

Folding Brass panel handles, with spring-loaded detents which snap into upright or left-or-right folded position. Finished as shown. Supplied with brass, nickel plated hex nuts. Mounts in 3/4" panel holes. Individually packaged. Std. Pkg. 10

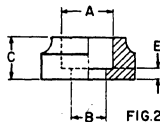
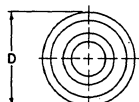
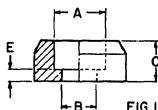


No.	Finish	NET Ea.
1662	Nickel Plate	\$7.00
1663	Black Oxide	7.00

U.S. PATENT NO. 3,082,473

FERRULES

Brass and Aluminum ferrules, finished as shown, to match handles listed above. Std. Pkg. 50



No.	Fig.	A	B	C	D	E	NET Per C
1664	1	3/8"	.109	1/8"	1/4"	3/4"	\$23.00
1668	1	1/4"	.203	3/16"	3/8"	1 1/4"	29.00
2055	1	3/8"	.219	1/4"	1/2"	1 1/4"	32.00
2054	2	3/8"	.196	3/16"	3/4"	1 1/2"	42.00

BRASS, BLACK OXIDE

No.	Fig.	A	B	C	D	E	NET Per C
1665	1	3/8"	.109	1/8"	1/4"	3/4"	23.00
1669	1	1/4"	.203	3/16"	3/8"	1 1/4"	29.00
1673	1	3/8"	.219	1/4"	1/2"	1 1/4"	32.00
1672	2	3/8"	.196	3/16"	3/4"	1 1/2"	42.00

ALUMINUM SATIN ETCH

No.	Fig.	A	B	C	D	E	NET Per C
1666	1	3/8"	.109	1/8"	1/4"	3/4"	23.00
1670	1	1/4"	.203	3/16"	3/8"	1 1/4"	25.00

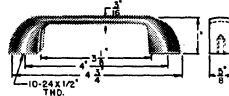
ALUMINUM, BLACK ANODIZED

No.	Fig.	A	B	C	D	E	NET Per C
1667	1	3/8"	.109	1/8"	1/4"	3/4"	23.00
1671	1	1/4"	.203	3/16"	3/8"	1 1/4"	25.00

OVAL HANDLE

Die Cast Zamac Handle. Brush chrome plated. Std. Pkg. 10

No.	NET Per C
2065	\$99.00

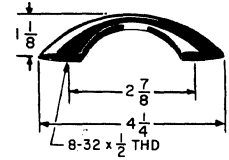
**BAKELITE HANDLE**

MATERIAL: Molded Phenolic, Red or Black.

RATING: 40 lbs maximum load.

DESCR.: Molded cabinet handle attaches with two 8-32 screws (not supplied) on 27/64" mounting centers.

Std. Pkg. 10



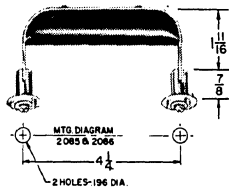
No.	Color	NET Per C
2281	Black	\$22.00
2882	Red	22.00

THESE HANDLES ARE STANDARD AND STOCKED IN DEPTH. We welcome your inquiry for special sizes, materials and plating.

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

EQUIPMENT HANDLES & ACCESS. SMITH

MOLDED GRIP HANDLES



HANDLE: Molded high impact Styrene, fungus resistant.

HDWRE.: Steel, nickel plated.

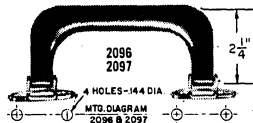
RATING: 75 lbs maximum load.

DESCR.: Rounded palm fitting design. Std. Pkg. 10

Attaches with 10-32 machine screws supplied. Maximum panel thickness 1/4".

No.	Color	NET Ea.
2085	Black	\$2.20
2086	Grey	2.20

MOLDED GRIP HANDLES



HANDLE: Molded high impact Styrene.

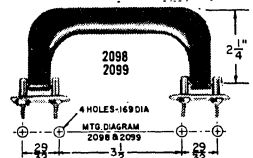
HDWRE.: Steel, nickel plated.

RATING: 60 lbs maximum load.

DESCR.: Designed for economy and rugged use. Folds flat to case. Std. Pkg. 10

Attaches with rivets or #6 screws (not supplied). Maximum panel thickness unlimited.

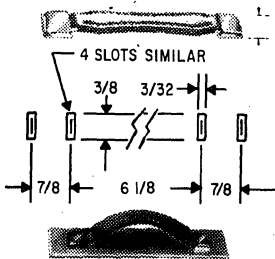
No.	Color	NET Ea.
2096	Black	\$.70
2097	Grey	.70



Attaches with integral 8-32 studs and nuts supplied. Maximum panel thickness 3/8".

2098	Black	\$1.60
------	-------	--------

SPRING-GLIDE HANDLE



HANDLE: Black genuine leather, contoured stitched.

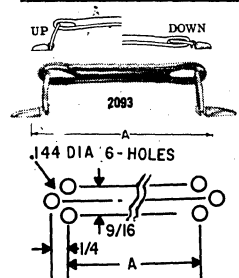
HDWRE.: Steel, chrome plate.

RATING: 120 lbs maximum load.

DESCR.: Strong spring-glide retract mechanism prevents handle rattle at vibration extremes, automatically lies flat against case when not in use. Attaches with fold tabs on cap against rear bearing washer plate. Spring and washer plate can be secured with optional screws. Maximum panel thickness 1/4". Std. Pkg. 10

No.	Color	NET Ea.
2089	Black	\$4.20

RETRACTO-LINK HANDLES



HANDLE: Black genuine leather, matching stitching.

HDWRE.: Steel, nickel plated.

RATING: 60 lbs maximum load.

DESCR.: Sliding link retracts inside handle to lie flat to panel when not in use. Shipped with all hardware assembled except decorative cover cap. Std. Pkg. 10

Attaches with fold tabs against rear bearing washer plate, which can be secured with optional #6 screws (not supplied). Maximum panel thickness 1/2".

No.	4 1/2"	5 3/4"	NET Ea.
2093			\$3.60
2094	5 1/2"	6 5/8"	3.60
2095	6 3/4"	7 7/8"	3.60

INSTRUMENT CASES AND COVERS

Ideal for small instruments and test equipment. The right size and the right mounting for your requirements. Molded of high quality, glass finish, thermosetting plastic. Threaded brass insert for cover mounting. BLACK ONLY. Std. Pkg. 5.

No.	H	W	D	Insert	NET Ea.
2377	4"	2 7/8"	1 1/8"	4-40	.72
2291	5"	4 1/4"	1 3/4"	6-32	1.25
2255	6 1/4"	3 3/4"	2"	6-32	1.00
2257	6 1/2"	5 1/2"	2 3/8"	4-40	2.00
2289	8 1/2"	7 1/8"	3 1/8"	6-32	2.40

PHENOLIC COVERS

No.	For No.	NET Ea.
2378	For No. 2377	.20
2292	For No. 2291	.30
2256	For No. 2255	.75
2260	For No. 2257	1.30
2390	For No. 2289	2.30

PANEL PLATE

No.	Brushed and lacquered Aluminum	NET Ea.
2379	For No. 2255	1.10

CAPTIVE SCREW & BUSHING LARGE HEAD

BODY: BRASS, nickel plated.

DESCR.: Supplied with panel bushing as shown. Used extensively for quick removal of panels from chassis. Non-removable from panel. Std. Pkg. 25

No.	Panel Bushing Length (L)	Panel Thickness	NET Per C
2365-A	5/8"	1/8"	\$125.00
2365-B	7/8"	3/16"	125.00
2365-C	1"	1/4"	125.00

CAPTIVE SCREW & BUSHING SMALL HEAD

BODY: BRASS, nickel plated.

DESCR.: Supplied with panel bushing as shown. Used extensively for quick removal of panels from chassis. Non-removable from panel. Std. Pkg. 25

No.	Panel Bushing Length (L)	Panel Thickness	NET Per C
2375-A	5/8"	1/8"	\$55.00
2375-B	7/8"	3/16"	55.00
2375-C	1"	1/4"	55.00

THUMB SCREW

BODY: BRASS, nickel plated.

DESCR.: Used extensively for quick removal of panels from chassis. Std. Pkg. 25

No.	Thread	NET Per C
2366	6-32	\$30.00
2367	8-32	30.00
2368	10-32	30.00

FAHNESTOCK CLIPS

Nickel plated, spring brass battery clips, in both single and double clip types, with single counting hole. Type 539 has additional solder lug hole for wire. Std. Pkg. 100

SINGLE CLIPS

No.	Width	Length	Mtg. Hole	NET Per C
539	3/4"	1 1/2"	#4	\$2.80
533	3/4"	1 1/2"	#6	2.80
534	3/8"	1"	#6	4.00

DOUBLE CLIPS

No.	Width	Length	Mtg. Hole	NET Per C
535	3/4"	1 1/2"	#6	16.00
536	3/8"	2 1/8"	#8	20.00

BATTERY CONNECTING STRIPS



1205	1217
1206	1218
1210	

1219	1234
------	------

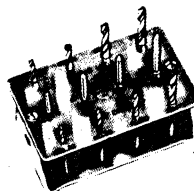
1296	1297
------	------

No.	Term. Spacing	Eveready	Burgess	Fits Batteries No.	Std. Pkg. 50
1205	1 1/2"	455, 467, 457, 468	XX30, XX45, K45, V451	VS055, VS016, VS082, VS125	\$35.00
1206	2 1/2"	490	N60	VS090	
1210	1 1/2"	437, 495, 477, 2356, 479	XX50, N60X, P45, C6X, D60	VS217, VS316, VS218, VS219	35.00
1217	1 1/4"	707	D5	VS315	\$35.00
1218	1 3/4"	274, 276	4D4, D6	VS306	35.00
1219	1 3/4"	243	223	VS324	35.00
1234	1 1/2"	E126, 415, 216, 416, 246	H126, U30, 2U6, UX45, 2N6	VS328, VS086, VS323, VS318, VS305	27.00

CONNECTOR SNAPS

No.	Term.	Std. Pkg. 100
1296	Female	226, 228
1297	Male	2709

DRILL & TAP KIT



Contains most popular size drills & taps for electronic bench duty. Includes 4-40, 6-32, 8-32, 10-32 taps with eight corresponding tap & body drills. Std. Pkg. 1

No.	Kit	NET Each
750	Stand Only	\$20.00
749		.75

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

Terminals shown below are "stock" items, available for speedy delivery. All brass, silver-plated, precision made. See next page for Suggested Resale Prices. For quantities over 15,000 request special prices. Inquiries are invited, for special types and sizes to particular requirements.

2000 HOLLOW LUG <table border="1"> <thead> <tr> <th>No.</th> <th>L</th> <th>T</th> </tr> </thead> <tbody> <tr><td>2000A</td><td>.075</td><td>1/16</td></tr> <tr><td>2000B</td><td>.105</td><td>1/8</td></tr> <tr><td>2000C</td><td>.135</td><td>1/4</td></tr> <tr><td>2000D</td><td>.165</td><td>3/8</td></tr> <tr><td>2000E</td><td>.195</td><td>1/2</td></tr> <tr><td>2000F</td><td>.230</td><td>5/8</td></tr> </tbody> </table> STAKING TOOL KIT No. 3860	No.	L	T	2000A	.075	1/16	2000B	.105	1/8	2000C	.135	1/4	2000D	.165	3/8	2000E	.195	1/2	2000F	.230	5/8	2001 SHORT TERMINAL LUG <table border="1"> <thead> <tr> <th>No.</th> <th>L</th> <th>T</th> </tr> </thead> <tbody> <tr><td>2001A</td><td>.075</td><td>1/16</td></tr> <tr><td>2001B</td><td>.105</td><td>1/8</td></tr> <tr><td>2001C</td><td>.135</td><td>1/4</td></tr> <tr><td>2001D</td><td>.165</td><td>3/8</td></tr> </tbody> </table> STAKING TOOL KIT No. 3860	No.	L	T	2001A	.075	1/16	2001B	.105	1/8	2001C	.135	1/4	2001D	.165	3/8	2002 DOUBLE END TERMINAL LUG <table border="1"> <thead> <tr> <th>No.</th> <th>L</th> <th>T</th> </tr> </thead> <tbody> <tr><td>2002A</td><td>.105</td><td>1/16</td></tr> <tr><td>2002B</td><td>.135</td><td>1/8</td></tr> <tr><td>2002C</td><td>.165</td><td>1/4</td></tr> <tr><td>2002D</td><td>.195</td><td>3/8</td></tr> <tr><td>2002E</td><td>.230</td><td>1/2</td></tr> </tbody> </table> STAKING TOOL KIT No. 3861	No.	L	T	2002A	.105	1/16	2002B	.135	1/8	2002C	.165	1/4	2002D	.195	3/8	2002E	.230	1/2	2003 DOUBLE END LUG, LONG <table border="1"> <thead> <tr> <th>No.</th> <th>L</th> <th>T</th> </tr> </thead> <tbody> <tr><td>2003A</td><td>.105</td><td>1/16</td></tr> <tr><td>2003B</td><td>.135</td><td>1/8</td></tr> <tr><td>2003C</td><td>.165</td><td>1/4</td></tr> <tr><td>2003D</td><td>.195</td><td>3/8</td></tr> <tr><td>2003E</td><td>.230</td><td>1/2</td></tr> </tbody> </table> STAKING TOOL KIT No. 3862	No.	L	T	2003A	.105	1/16	2003B	.135	1/8	2003C	.165	1/4	2003D	.195	3/8	2003E	.230	1/2	2004 SLOTTED TERMINAL LUG SHORT <table border="1"> <thead> <tr> <th>No.</th> <th>L</th> <th>T</th> </tr> </thead> <tbody> <tr><td>2004A</td><td>.075</td><td>1/16</td></tr> <tr><td>2004B</td><td>.105</td><td>1/8</td></tr> <tr><td>2004C</td><td>.135</td><td>1/4</td></tr> <tr><td>2004D</td><td>.165</td><td>3/8</td></tr> </tbody> </table> STAKING TOOL KIT No. 3863	No.	L	T	2004A	.075	1/16	2004B	.105	1/8	2004C	.135	1/4	2004D	.165	3/8	2005 HOLLOW KNURLED LUG <table border="1"> <thead> <tr> <th>No.</th> <th>L</th> <th>T</th> </tr> </thead> <tbody> <tr><td>2005A</td><td>.105</td><td>1/16</td></tr> <tr><td>2005B</td><td>.135</td><td>1/8</td></tr> <tr><td>2005C</td><td>.165</td><td>3/8</td></tr> </tbody> </table> STAKING TOOL KIT No. 3860	No.	L	T	2005A	.105	1/16	2005B	.135	1/8	2005C	.165	3/8	2006 SHORT TERMINAL LUG <table border="1"> <thead> <tr> <th>No.</th> <th>L</th> <th>T</th> </tr> </thead> <tbody> <tr><td>2006A</td><td>.075</td><td>1/16</td></tr> <tr><td>2006B</td><td>.105</td><td>1/8</td></tr> <tr><td>2006C</td><td>.135</td><td>1/4</td></tr> <tr><td>2006D</td><td>.165</td><td>3/8</td></tr> </tbody> </table> STAKING TOOL KIT No. 3864	No.	L	T	2006A	.075	1/16	2006B	.105	1/8	2006C	.135	1/4	2006D	.165	3/8
No.	L	T																																																																																																																						
2000A	.075	1/16																																																																																																																						
2000B	.105	1/8																																																																																																																						
2000C	.135	1/4																																																																																																																						
2000D	.165	3/8																																																																																																																						
2000E	.195	1/2																																																																																																																						
2000F	.230	5/8																																																																																																																						
No.	L	T																																																																																																																						
2001A	.075	1/16																																																																																																																						
2001B	.105	1/8																																																																																																																						
2001C	.135	1/4																																																																																																																						
2001D	.165	3/8																																																																																																																						
No.	L	T																																																																																																																						
2002A	.105	1/16																																																																																																																						
2002B	.135	1/8																																																																																																																						
2002C	.165	1/4																																																																																																																						
2002D	.195	3/8																																																																																																																						
2002E	.230	1/2																																																																																																																						
No.	L	T																																																																																																																						
2003A	.105	1/16																																																																																																																						
2003B	.135	1/8																																																																																																																						
2003C	.165	1/4																																																																																																																						
2003D	.195	3/8																																																																																																																						
2003E	.230	1/2																																																																																																																						
No.	L	T																																																																																																																						
2004A	.075	1/16																																																																																																																						
2004B	.105	1/8																																																																																																																						
2004C	.135	1/4																																																																																																																						
2004D	.165	3/8																																																																																																																						
No.	L	T																																																																																																																						
2005A	.105	1/16																																																																																																																						
2005B	.135	1/8																																																																																																																						
2005C	.165	3/8																																																																																																																						
No.	L	T																																																																																																																						
2006A	.075	1/16																																																																																																																						
2006B	.105	1/8																																																																																																																						
2006C	.135	1/4																																																																																																																						
2006D	.165	3/8																																																																																																																						
2007 SHORT DOUBLE END LUG <table border="1"> <thead> <tr> <th>No.</th> <th>L</th> <th>T</th> </tr> </thead> <tbody> <tr><td>2007A</td><td>.075</td><td>1/16</td></tr> <tr><td>2007B</td><td>.105</td><td>1/8</td></tr> <tr><td>2007C</td><td>.135</td><td>1/4</td></tr> <tr><td>2007D</td><td>.165</td><td>3/8</td></tr> </tbody> </table> STAKING TOOL KIT No. 3865	No.	L	T	2007A	.075	1/16	2007B	.105	1/8	2007C	.135	1/4	2007D	.165	3/8	2008 TERMINAL LUG <table border="1"> <thead> <tr> <th>No.</th> <th>L</th> <th>T</th> </tr> </thead> <tbody> <tr><td>2008A</td><td>.075</td><td>1/16</td></tr> <tr><td>2008B</td><td>.105</td><td>1/8</td></tr> <tr><td>2008C</td><td>.135</td><td>1/4</td></tr> <tr><td>2008D</td><td>.165</td><td>3/8</td></tr> <tr><td>2008E</td><td>.195</td><td>1/2</td></tr> <tr><td>2008F</td><td>.230</td><td>5/8</td></tr> <tr><td>2008G</td><td>.265</td><td>3/4</td></tr> </tbody> </table> STAKING TOOL KIT No. 3860	No.	L	T	2008A	.075	1/16	2008B	.105	1/8	2008C	.135	1/4	2008D	.165	3/8	2008E	.195	1/2	2008F	.230	5/8	2008G	.265	3/4	2009 TERMINAL LUG No. 2009 STAKING TOOL KIT Not Required	2010 SPLIT TERMINAL LUG <table border="1"> <thead> <tr> <th>No.</th> <th>L</th> <th>T</th> </tr> </thead> <tbody> <tr><td>2010A</td><td>.075</td><td>1/16</td></tr> <tr><td>2010B</td><td>.105</td><td>1/8</td></tr> <tr><td>2010C</td><td>.135</td><td>1/4</td></tr> <tr><td>2010D</td><td>.165</td><td>3/8</td></tr> </tbody> </table> STAKING TOOL KIT No. 3866	No.	L	T	2010A	.075	1/16	2010B	.105	1/8	2010C	.135	1/4	2010D	.165	3/8	2011 DOUBLE END TERMINAL LUG <table border="1"> <thead> <tr> <th>No.</th> <th>L</th> <th>T</th> </tr> </thead> <tbody> <tr><td>2011A</td><td>.105</td><td>1/16</td></tr></tbody></table>	No.	L	T	2011A	.105	1/16																																																								
No.	L	T																																																																																																																						
2007A	.075	1/16																																																																																																																						
2007B	.105	1/8																																																																																																																						
2007C	.135	1/4																																																																																																																						
2007D	.165	3/8																																																																																																																						
No.	L	T																																																																																																																						
2008A	.075	1/16																																																																																																																						
2008B	.105	1/8																																																																																																																						
2008C	.135	1/4																																																																																																																						
2008D	.165	3/8																																																																																																																						
2008E	.195	1/2																																																																																																																						
2008F	.230	5/8																																																																																																																						
2008G	.265	3/4																																																																																																																						
No.	L	T																																																																																																																						
2010A	.075	1/16																																																																																																																						
2010B	.105	1/8																																																																																																																						
2010C	.135	1/4																																																																																																																						
2010D	.165	3/8																																																																																																																						
No.	L	T																																																																																																																						
2011A	.105	1/16																																																																																																																						

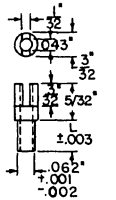
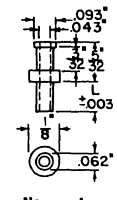
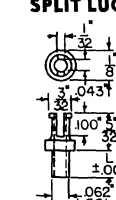
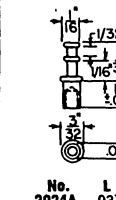
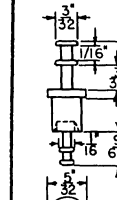
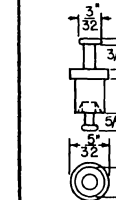
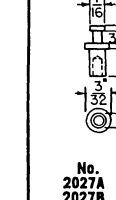
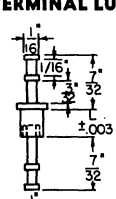
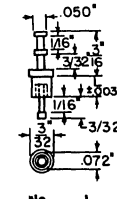
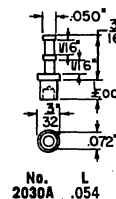
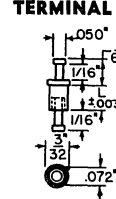
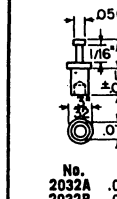
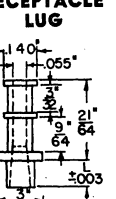
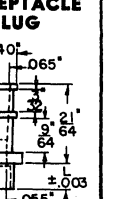
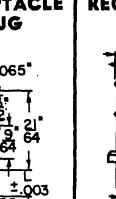
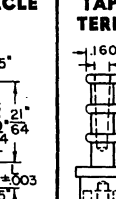
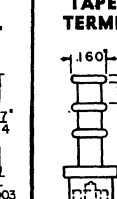
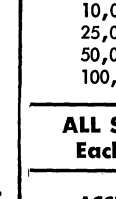
IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

SWAGE TURRET TERMINALS SMITH

Terminals shown below are "stock" items, available for speedy delivery. All brass, silver-plated, precision made. See below for Suggested Resale Prices. For quantities over 15,000 request special prices. Inquiries are invited, for special types and sizes to particular requirements.
L indicates Shank Length of Lug.
T indicates thickness of mounting boards.

Standard Package 100

2021 MINIATURE SPADE LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2021A</td><td>.037</td><td>1/4</td></tr><tr><td>2021B</td><td>.053</td><td>1/2</td></tr><tr><td>2021C</td><td>.084</td><td>1/4</td></tr><tr><td>2021D</td><td>.115</td><td>3/2</td></tr><tr><td>2021E</td><td>.147</td><td>3/8</td></tr></table> STAKING TOOL KIT No. 3867	No.	L	T	2021A	.037	1/4	2021B	.053	1/2	2021C	.084	1/4	2021D	.115	3/2	2021E	.147	3/8	2022 MINIATURE HOLLOW LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2022A</td><td>.037</td><td>1/4</td></tr><tr><td>2022B</td><td>.053</td><td>1/2</td></tr><tr><td>2022C</td><td>.084</td><td>1/4</td></tr><tr><td>2022D</td><td>.115</td><td>3/2</td></tr><tr><td>2022E</td><td>.147</td><td>1/8</td></tr></table> STAKING TOOL KIT No. 3864	No.	L	T	2022A	.037	1/4	2022B	.053	1/2	2022C	.084	1/4	2022D	.115	3/2	2022E	.147	1/8	2023 MINIATURE HOLLOW SPLIT LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2023A</td><td>.037</td><td>1/4</td></tr><tr><td>2023B</td><td>.053</td><td>3/2</td></tr><tr><td>2023C</td><td>.084</td><td>1/4</td></tr><tr><td>2023D</td><td>.115</td><td>3/2</td></tr><tr><td>2023E</td><td>.147</td><td>3/8</td></tr></table> STAKING TOOL KIT No. 3864	No.	L	T	2023A	.037	1/4	2023B	.053	3/2	2023C	.084	1/4	2023D	.115	3/2	2023E	.147	3/8	2024 MINIATURE DOUBLE TIE LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2024A</td><td>.037</td><td>1/4</td></tr><tr><td>2024B</td><td>.053</td><td>1/2</td></tr><tr><td>2024C</td><td>.084</td><td>1/4</td></tr><tr><td>2024D</td><td>.115</td><td>3/2</td></tr><tr><td>2024E</td><td>.147</td><td>3/8</td></tr></table> STAKING TOOL KIT No. 3868	No.	L	T	2024A	.037	1/4	2024B	.053	1/2	2024C	.084	1/4	2024D	.115	3/2	2024E	.147	3/8	2025 MINIATURE THROUGH LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2025A</td><td>.075</td><td>1/2</td></tr><tr><td>2025B</td><td>.105</td><td>1/4</td></tr><tr><td>2025C</td><td>.135</td><td>3/2</td></tr><tr><td>2025D</td><td>.165</td><td>1/8</td></tr></table> STAKING TOOL KIT No. 3869	No.	L	T	2025A	.075	1/2	2025B	.105	1/4	2025C	.135	3/2	2025D	.165	1/8	2026 MINIATURE THROUGH LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2026A</td><td>.075</td><td>1/2</td></tr><tr><td>2026B</td><td>.105</td><td>1/4</td></tr><tr><td>2026C</td><td>.135</td><td>3/2</td></tr><tr><td>2026D</td><td>.165</td><td>1/8</td></tr></table> STAKING TOOL KIT No. 3869	No.	L	T	2026A	.075	1/2	2026B	.105	1/4	2026C	.135	3/2	2026D	.165	1/8	2027 MINIATURE LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2027A</td><td>.037</td><td>1/4</td></tr><tr><td>2027B</td><td>.054</td><td>1/2</td></tr><tr><td>2027C</td><td>.084</td><td>1/4</td></tr><tr><td>2027D</td><td>.115</td><td>3/2</td></tr><tr><td>2027E</td><td>.147</td><td>1/8</td></tr></table> STAKING TOOL KIT No. 3868	No.	L	T	2027A	.037	1/4	2027B	.054	1/2	2027C	.084	1/4	2027D	.115	3/2	2027E	.147	1/8																																										
No.	L	T																																																																																																																																																																						
2021A	.037	1/4																																																																																																																																																																						
2021B	.053	1/2																																																																																																																																																																						
2021C	.084	1/4																																																																																																																																																																						
2021D	.115	3/2																																																																																																																																																																						
2021E	.147	3/8																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2022A	.037	1/4																																																																																																																																																																						
2022B	.053	1/2																																																																																																																																																																						
2022C	.084	1/4																																																																																																																																																																						
2022D	.115	3/2																																																																																																																																																																						
2022E	.147	1/8																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2023A	.037	1/4																																																																																																																																																																						
2023B	.053	3/2																																																																																																																																																																						
2023C	.084	1/4																																																																																																																																																																						
2023D	.115	3/2																																																																																																																																																																						
2023E	.147	3/8																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2024A	.037	1/4																																																																																																																																																																						
2024B	.053	1/2																																																																																																																																																																						
2024C	.084	1/4																																																																																																																																																																						
2024D	.115	3/2																																																																																																																																																																						
2024E	.147	3/8																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2025A	.075	1/2																																																																																																																																																																						
2025B	.105	1/4																																																																																																																																																																						
2025C	.135	3/2																																																																																																																																																																						
2025D	.165	1/8																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2026A	.075	1/2																																																																																																																																																																						
2026B	.105	1/4																																																																																																																																																																						
2026C	.135	3/2																																																																																																																																																																						
2026D	.165	1/8																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2027A	.037	1/4																																																																																																																																																																						
2027B	.054	1/2																																																																																																																																																																						
2027C	.084	1/4																																																																																																																																																																						
2027D	.115	3/2																																																																																																																																																																						
2027E	.147	1/8																																																																																																																																																																						
2028 FEED-THRU TERMINAL LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2028A</td><td>.054</td><td>1/2</td></tr><tr><td>2028B</td><td>.084</td><td>1/4</td></tr><tr><td>2028C</td><td>.115</td><td>3/2</td></tr><tr><td>2028D</td><td>.147</td><td>1/8</td></tr></table> STAKING TOOL KIT No. 3870	No.	L	T	2028A	.054	1/2	2028B	.084	1/4	2028C	.115	3/2	2028D	.147	1/8	2029 TERMINAL LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2029A</td><td>.054</td><td>1/2</td></tr><tr><td>2029B</td><td>.084</td><td>1/4</td></tr><tr><td>2029C</td><td>.115</td><td>3/2</td></tr><tr><td>2029D</td><td>.147</td><td>1/8</td></tr></table> STAKING TOOL KIT No. 3871	No.	L	T	2029A	.054	1/2	2029B	.084	1/4	2029C	.115	3/2	2029D	.147	1/8	2030 TERMINAL LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2030A</td><td>.054</td><td>1/2</td></tr><tr><td>2030B</td><td>.084</td><td>1/4</td></tr><tr><td>2030C</td><td>.115</td><td>3/2</td></tr><tr><td>2030D</td><td>.147</td><td>1/8</td></tr></table> STAKING TOOL KIT No. 3868	No.	L	T	2030A	.054	1/2	2030B	.084	1/4	2030C	.115	3/2	2030D	.147	1/8	2031 FEED TERMINAL LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2031A</td><td>.054</td><td>1/2</td></tr><tr><td>2031B</td><td>.084</td><td>1/4</td></tr><tr><td>2031C</td><td>.115</td><td>3/2</td></tr><tr><td>2031D</td><td>.147</td><td>1/8</td></tr></table> STAKING TOOL KIT No. 3871	No.	L	T	2031A	.054	1/2	2031B	.084	1/4	2031C	.115	3/2	2031D	.147	1/8	2032 TERMINAL LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2032A</td><td>.054</td><td>1/2</td></tr><tr><td>2032B</td><td>.084</td><td>1/4</td></tr><tr><td>2032C</td><td>.115</td><td>3/2</td></tr><tr><td>2032D</td><td>.147</td><td>1/8</td></tr></table> STAKING TOOL KIT No. 3868	No.	L	T	2032A	.054	1/2	2032B	.084	1/4	2032C	.115	3/2	2032D	.147	1/8	SUGGESTED RESALE PRICES & QUANTITY DISCOUNT SCHEDULE <table><tr><th>Cat. No.</th><th>NET Per C</th><th>Cat. No.</th><th>NET Per C</th></tr><tr><td>2000</td><td>\$ 6.10</td><td>2021</td><td>\$ 4.60</td></tr><tr><td>2001</td><td>6.00</td><td>2022</td><td>3.50</td></tr><tr><td>2002</td><td>14.60</td><td>2023</td><td>5.00</td></tr><tr><td>2003</td><td>14.90</td><td>2024</td><td>3.50</td></tr><tr><td>2004</td><td>8.70</td><td>2025</td><td>7.50</td></tr><tr><td>2005</td><td>6.80</td><td>2026</td><td>5.30</td></tr><tr><td>2006</td><td>3.60</td><td>2027</td><td>3.50</td></tr><tr><td>2007</td><td>5.00</td><td>2028</td><td>4.60</td></tr><tr><td>2008</td><td>6.00</td><td>2029</td><td>4.50</td></tr><tr><td>2009</td><td>9.10</td><td>2030</td><td>3.20</td></tr><tr><td>2010</td><td>9.20</td><td>2031</td><td>3.60</td></tr><tr><td>2011</td><td>10.00</td><td>2032</td><td>3.50</td></tr><tr><td>2012</td><td>6.60</td><td>2033</td><td>10.80</td></tr><tr><td>2013</td><td>3.20</td><td>2034</td><td>11.50</td></tr><tr><td>2014</td><td>4.50</td><td>2035</td><td>10.30</td></tr><tr><td>2015</td><td>13.50</td><td>2036</td><td>11.10</td></tr><tr><td>2016</td><td>6.60</td><td>2037</td><td>15.00</td></tr><tr><td>2017</td><td>8.00</td><td>2038</td><td>15.00</td></tr><tr><td>2018</td><td>6.70</td><td></td><td></td></tr><tr><td>2019</td><td>9.00</td><td></td><td></td></tr><tr><td>2020</td><td>4.80</td><td></td><td></td></tr></table>	Cat. No.	NET Per C	Cat. No.	NET Per C	2000	\$ 6.10	2021	\$ 4.60	2001	6.00	2022	3.50	2002	14.60	2023	5.00	2003	14.90	2024	3.50	2004	8.70	2025	7.50	2005	6.80	2026	5.30	2006	3.60	2027	3.50	2007	5.00	2028	4.60	2008	6.00	2029	4.50	2009	9.10	2030	3.20	2010	9.20	2031	3.60	2011	10.00	2032	3.50	2012	6.60	2033	10.80	2013	3.20	2034	11.50	2014	4.50	2035	10.30	2015	13.50	2036	11.10	2016	6.60	2037	15.00	2017	8.00	2038	15.00	2018	6.70			2019	9.00			2020	4.80		
No.	L	T																																																																																																																																																																						
2028A	.054	1/2																																																																																																																																																																						
2028B	.084	1/4																																																																																																																																																																						
2028C	.115	3/2																																																																																																																																																																						
2028D	.147	1/8																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2029A	.054	1/2																																																																																																																																																																						
2029B	.084	1/4																																																																																																																																																																						
2029C	.115	3/2																																																																																																																																																																						
2029D	.147	1/8																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2030A	.054	1/2																																																																																																																																																																						
2030B	.084	1/4																																																																																																																																																																						
2030C	.115	3/2																																																																																																																																																																						
2030D	.147	1/8																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2031A	.054	1/2																																																																																																																																																																						
2031B	.084	1/4																																																																																																																																																																						
2031C	.115	3/2																																																																																																																																																																						
2031D	.147	1/8																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2032A	.054	1/2																																																																																																																																																																						
2032B	.084	1/4																																																																																																																																																																						
2032C	.115	3/2																																																																																																																																																																						
2032D	.147	1/8																																																																																																																																																																						
Cat. No.	NET Per C	Cat. No.	NET Per C																																																																																																																																																																					
2000	\$ 6.10	2021	\$ 4.60																																																																																																																																																																					
2001	6.00	2022	3.50																																																																																																																																																																					
2002	14.60	2023	5.00																																																																																																																																																																					
2003	14.90	2024	3.50																																																																																																																																																																					
2004	8.70	2025	7.50																																																																																																																																																																					
2005	6.80	2026	5.30																																																																																																																																																																					
2006	3.60	2027	3.50																																																																																																																																																																					
2007	5.00	2028	4.60																																																																																																																																																																					
2008	6.00	2029	4.50																																																																																																																																																																					
2009	9.10	2030	3.20																																																																																																																																																																					
2010	9.20	2031	3.60																																																																																																																																																																					
2011	10.00	2032	3.50																																																																																																																																																																					
2012	6.60	2033	10.80																																																																																																																																																																					
2013	3.20	2034	11.50																																																																																																																																																																					
2014	4.50	2035	10.30																																																																																																																																																																					
2015	13.50	2036	11.10																																																																																																																																																																					
2016	6.60	2037	15.00																																																																																																																																																																					
2017	8.00	2038	15.00																																																																																																																																																																					
2018	6.70																																																																																																																																																																							
2019	9.00																																																																																																																																																																							
2020	4.80																																																																																																																																																																							
2033 RECEPTACLE LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2033A</td><td>.075</td><td>1/2</td></tr><tr><td>2033B</td><td>.105</td><td>1/4</td></tr><tr><td>2033C</td><td>.135</td><td>3/2</td></tr><tr><td>2033D</td><td>.165</td><td>1/8</td></tr><tr><td>2033E</td><td>.195</td><td>3/2</td></tr><tr><td>2033F</td><td>.230</td><td>1/4</td></tr></table> STAKING TOOL KIT No. 3860	No.	L	T	2033A	.075	1/2	2033B	.105	1/4	2033C	.135	3/2	2033D	.165	1/8	2033E	.195	3/2	2033F	.230	1/4	2034 RECEPTACLE LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2034A</td><td>.075</td><td>1/2</td></tr><tr><td>2034B</td><td>.105</td><td>1/4</td></tr><tr><td>2034C</td><td>.135</td><td>3/2</td></tr><tr><td>2034D</td><td>.165</td><td>1/8</td></tr><tr><td>2034E</td><td>.195</td><td>3/2</td></tr><tr><td>2034F</td><td>.230</td><td>1/4</td></tr></table> STAKING TOOL KIT No. 3860	No.	L	T	2034A	.075	1/2	2034B	.105	1/4	2034C	.135	3/2	2034D	.165	1/8	2034E	.195	3/2	2034F	.230	1/4	2035 RECEPTACLE LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2035A</td><td>.075</td><td>1/2</td></tr><tr><td>2035B</td><td>.105</td><td>1/4</td></tr><tr><td>2035C</td><td>.135</td><td>3/2</td></tr><tr><td>2035D</td><td>.165</td><td>1/8</td></tr><tr><td>2035E</td><td>.195</td><td>3/2</td></tr><tr><td>2035F</td><td>.230</td><td>1/4</td></tr></table> STAKING TOOL KIT No. 3863	No.	L	T	2035A	.075	1/2	2035B	.105	1/4	2035C	.135	3/2	2035D	.165	1/8	2035E	.195	3/2	2035F	.230	1/4	2036 RECEPTACLE LUG  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2036A</td><td>.075</td><td>1/2</td></tr><tr><td>2036B</td><td>.105</td><td>1/4</td></tr><tr><td>2036C</td><td>.135</td><td>3/2</td></tr><tr><td>2036D</td><td>.165</td><td>1/8</td></tr><tr><td>2036E</td><td>.195</td><td>3/2</td></tr><tr><td>2036F</td><td>.230</td><td>1/4</td></tr></table> STAKING TOOL KIT No. 3863	No.	L	T	2036A	.075	1/2	2036B	.105	1/4	2036C	.135	3/2	2036D	.165	1/8	2036E	.195	3/2	2036F	.230	1/4	2037 TAPERED TERMINAL  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2037A</td><td>.105</td><td>1/4</td></tr><tr><td>2037B</td><td>.135</td><td>3/2</td></tr><tr><td>2037C</td><td>.165</td><td>1/8</td></tr></table> STAKING TOOL KIT Not Available	No.	L	T	2037A	.105	1/4	2037B	.135	3/2	2037C	.165	1/8	2038 TAPERED TERMINAL  <table><tr><th>No.</th><th>L</th><th>T</th></tr><tr><td>2038A</td><td>.105</td><td>1/4</td></tr><tr><td>2038B</td><td>.135</td><td>3/2</td></tr><tr><td>2038C</td><td>.165</td><td>1/8</td></tr></table> STAKING TOOL KIT Not Available	No.	L	T	2038A	.105	1/4	2038B	.135	3/2	2038C	.165	1/8	QUANTITY DISCOUNT OFF NET <table><tr><td>100</td><td>-</td><td>999</td><td>Net</td></tr><tr><td>1,000</td><td>-</td><td>4,999</td><td>15%</td></tr><tr><td>5,000</td><td>-</td><td>9,999</td><td>25%</td></tr><tr><td>10,000</td><td>-</td><td>24,999</td><td>35%</td></tr><tr><td>25,000</td><td>-</td><td>49,999</td><td>40%</td></tr><tr><td>50,000</td><td>-</td><td>99,999</td><td>50%</td></tr><tr><td>100,000</td><td>-</td><td></td><td>On Request</td></tr></table> ALL STAKING TOOL KITS Each.....\$3.00 ACCESSORY TOOL HOLDERS  Anvil Bench Tool Holder, 1/4" anvils. Malleable iron base with bottom felt pad for bench use. No. 3877 Net Ea. \$4.20  Anvil tool holder for use with drill press, arbor, kick press, punch press or vise. No. 3878 Net Ea. \$1.50 WE INVITE YOUR INQUIRIES ON OTHER TYPES OF TURRET TERMINALS NOT SHOWN HERE	100	-	999	Net	1,000	-	4,999	15%	5,000	-	9,999	25%	10,000	-	24,999	35%	25,000	-	49,999	40%	50,000	-	99,999	50%	100,000	-		On Request																										
No.	L	T																																																																																																																																																																						
2033A	.075	1/2																																																																																																																																																																						
2033B	.105	1/4																																																																																																																																																																						
2033C	.135	3/2																																																																																																																																																																						
2033D	.165	1/8																																																																																																																																																																						
2033E	.195	3/2																																																																																																																																																																						
2033F	.230	1/4																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2034A	.075	1/2																																																																																																																																																																						
2034B	.105	1/4																																																																																																																																																																						
2034C	.135	3/2																																																																																																																																																																						
2034D	.165	1/8																																																																																																																																																																						
2034E	.195	3/2																																																																																																																																																																						
2034F	.230	1/4																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2035A	.075	1/2																																																																																																																																																																						
2035B	.105	1/4																																																																																																																																																																						
2035C	.135	3/2																																																																																																																																																																						
2035D	.165	1/8																																																																																																																																																																						
2035E	.195	3/2																																																																																																																																																																						
2035F	.230	1/4																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2036A	.075	1/2																																																																																																																																																																						
2036B	.105	1/4																																																																																																																																																																						
2036C	.135	3/2																																																																																																																																																																						
2036D	.165	1/8																																																																																																																																																																						
2036E	.195	3/2																																																																																																																																																																						
2036F	.230	1/4																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2037A	.105	1/4																																																																																																																																																																						
2037B	.135	3/2																																																																																																																																																																						
2037C	.165	1/8																																																																																																																																																																						
No.	L	T																																																																																																																																																																						
2038A	.105	1/4																																																																																																																																																																						
2038B	.135	3/2																																																																																																																																																																						
2038C	.165	1/8																																																																																																																																																																						
100	-	999	Net																																																																																																																																																																					
1,000	-	4,999	15%																																																																																																																																																																					
5,000	-	9,999	25%																																																																																																																																																																					
10,000	-	24,999	35%																																																																																																																																																																					
25,000	-	49,999	40%																																																																																																																																																																					
50,000	-	99,999	50%																																																																																																																																																																					
100,000	-		On Request																																																																																																																																																																					

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH BRASS SPACERS

ZINC PLATED

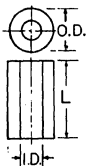
STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

ROUND

1/4" O.D.

Std. Pkg. 100

Length "L"	CLEARANCE HOLE			NET Per C
	#4(.115) No.	#6(.140) No.	#8(.171) No.	
.125	8700	8701	8702	\$ 5.70
.187	8703	8704	8705	6.20
.250	2340	2100	2105	7.00
.312	8706	8707	8708	7.90
.375	2341	2101	2106	8.40
.437	8709	8710	8711	\$ 9.20
.500	2342	2102	2107	9.40
.562	8712	8713	8714	10.70
.625	8715	8716	8717	11.20
.687	8718	8719	8720	14.00
.750	2343	2103	2108	\$14.50
.812	8721	8722	8723	15.00
.875	8724	8725	8726	16.30
.937	8727	8728	8729	16.80
1.000	2344	2104	2109	18.60



3/8" O.D.

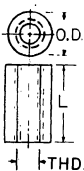
Length "L"	CLEARANCE HOLE			NET Per C
	#4(.115) No.	#6(.140) No.	#8(.171) No.	
.125	8730	8731	8732	\$10.20
.187	8733	8734	8735	11.90
.250	2345	2110	2115	12.50
.312	8736	8737	8738	13.40
.375	2346	2111	2116	15.90
.437	8739	8740	8741	\$16.90
.500	2347	2112	2117	17.30
.562	8742	8743	8744	21.80
.625	8745	8746	8747	20.70
.687	8748	8749	8750	23.30
.750	2348	2113	2118	\$20.60
.812	8751	8752	8753	24.10
.875	8754	8755	8756	27.40
.937	8757	8758	8759	28.20
1.000	2349	2114	2119	29.30

ROUND THREADED

1/4" O.D.

Std. Pkg. 100

Length "L"				NET Per C
	4-40 No.	6-32 No.	8-32 No.	
.125	8760	8761	8762	\$ 7.40
.187	8763	8764	8765	7.70
.250	2370	2120	2125	8.00
.312	8766	8767	8768	8.50
.375	2371	2121	2126	9.50
.437	8769	8770	8771	\$10.10
.500	2372	2122	2127	12.40
.562	8772	8773	8774	13.20
.625	8775	8776	8777	13.70
.687	8778	8779	8780	17.80
.750	2373	2123	2128	\$18.00
.812	8781	8782	8783	18.10
.875	8784	8785	8786	19.10
.937	8787	8788	8789	19.50
1.000	2374	2124	2129	21.00

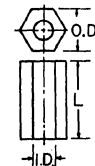


HEX

1/4" HEX

Std. Pkg. 100

Length "L"	CLEARANCE HOLE			NET Per C
	#4(.115) No.	#6(.140) No.	#8(.171) No.	
.125	8790	8791	8792	\$ 6.40
.187	8793	8794	8795	6.80
.250	2380	2300	2305	7.50
.312	8796	8797	8798	8.90
.375	2381	2301	2306	9.20
.437	8799	8800	8801	\$ 9.50
.500	2382	2302	2307	9.80
.562	8802	8803	8804	10.80
.625	8805	8806	8807	11.40
.687	8808	8809	8810	14.20
.750	2383	2303	2308	\$14.50
.812	8811	8812	8813	15.70
.875	8814	8815	8816	17.50
.937	8817	8818	8819	19.00
1.000	2384	2304	2309	20.00



3/8" HEX

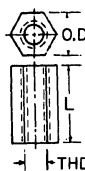
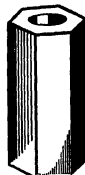
Length "L"	CLEARANCE HOLE			NET Per C
	#4(.115) No.	#6(.140) No.	#8(.171) No.	
.125	8850	8851	8852	\$10.60
.187	8853	8854	8855	11.90
.250	2385	2310	2315	12.80
.312	8856	8857	8858	14.80
.375	2386	2311	2316	16.20
.437	8859	8860	8861	\$19.80
.500	2387	2312	2317	20.50
.562	8862	8863	8864	21.50
.625	8865	8866	8867	23.70
.687	8868	8869	8870	24.10
.750	2388	2313	2318	\$25.10
.812	8871	8872	8873	26.40
.875	8874	8875	8876	29.50
.937	8877	8878	8879	29.90
1.000	2389	2314	2319	32.60

HEX THREADED

1/4" HEX

Std. Pkg. 100

Length "L"				NET Per C
	4-40 No.	6-32 No.	8-32 No.	
.125	8820	8821	8822	\$ 7.50
.187	8823	8824	8825	8.00
.250	2330	2320	2325	8.70
.312	8826	8827	8828	9.40
.375	2331	2321	2326	10.60
.437	8829	8830	8831	\$11.40
.500	2332	2322	2327	12.40
.562	8832	8833	8834	14.50
.625	8835	8836	8837	17.30
.687	8838	8839	8840	18.30
.750	2333	2323	2328	\$19.30
.812	8841	8842	8843	20.00
.875	8844	8845	8846	20.30
.937	8847	8848	8849	21.30
1.000	2334	2324	2329	22.80

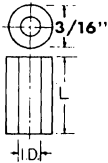


* On Threaded Spacers
over 1" the top is 3/8"
from each end and not
continuous through.

* On Threaded Spacers
over 1" the top is 3/8"
from each end and not
continuous through.

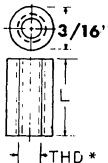
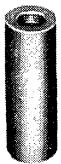
IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

3/16" O.D. BRASS SPACERS ZINC PLATED SMITH

3/16" O.D.

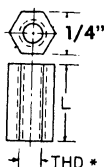
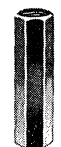
DIM. "L"	CLEARANCE HOLE		NET Per C
	#2(.093) No.	#4(.115) No.	
.125	9000	9015	\$ 5.70
.187	9001	9016	6.20
.250	9002	9017	7.00
.312	9003	9018	7.90
.375	9004	9019	8.40
.437	9005	9020	\$ 9.00
.500	9006	9021	9.40
.562	9007	9022	10.70
.625	9008	9023	11.20
.687	9009	9024	14.00
.750	9010	9025	\$14.50
.812	9011	9026	15.00
.875	9012	9027	16.30
.937	9013	9028	16.80
1.000	9014	9029	18.00

* On Threaded Spacers over 1/2", top is 3/8" from each end and not continuous through.



DIM. "L"	THREADED		NET Per C
	2-56 No.	4-40 No.	
.125	9030	9045	\$ 7.40
.187	9031	9046	7.70
.250	9032	9047	8.00
.312	9033	9048	8.50
.375	9034	9049	9.50
.437	9035	9050	\$10.10
.500	9036	9051	12.40
.562	9037	9052	13.20
.625	9038	9053	13.70
.687	9039	9054	17.80
.750	9040	9055	\$18.00
.812	9041	9056	18.10
.875	9042	9057	19.10
.937	9043	9058	19.50
1.000	9044	9059	21.00

* On Threaded Spacers over 1/2", top is 3/8" from each end and not continuous through.



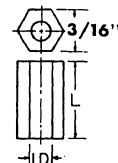
THREADED HEX STAINLESS STEEL SPACERS

MINIMUM Std. Pkg. 100

DIM. "L"			NET Per C
	4-40	6-32	
.125	9060	9080	\$29.00
.187	9061	9081	30.00
.250	9062	9082	31.00
.312	9063	9083	32.00
.375	9064	9084	33.00
.437	9065	9085	38.00
.500	9066	9086	43.00
.562	9067	9087	46.00
.625	9068	9088	49.00
.687	9069	9089	52.00
.750	9070	9090	54.00
.812	9071	9091	55.00
.875	9072	9092	56.00
.937	9073	9093	57.00
1.000	9074	9094	58.00

HEX

Std. Pkg. 100

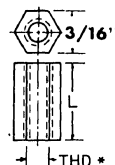
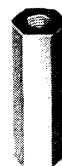
3/16" HEX

DIM. "L"	CLEARANCE HOLE		NET Per C
	#2(.093) No.	#4(.115) No.	
.125	9100	9115	\$ 6.40
.187	9101	9116	6.80
.250	9102	9117	7.50
.312	9103	9118	8.90
.375	9104	9119	9.20
.437	9105	9120	\$ 9.50
.500	9106	9121	9.80
.562	9107	9122	10.80
.625	9108	9123	11.40
.6875	9109	9124	14.20
.750	9110	9125	\$14.50
.812	9111	9126	15.70
.875	9112	9127	17.50
.937	9113	9128	19.00
1.000	9114	9129	20.00

HEX THREADED

Std. Pkg. 100

* On Threaded Spacers over 1/2", top is 3/8" from each end and not continuous through.

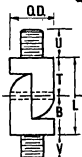
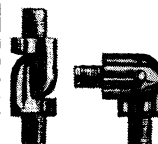
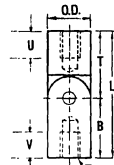
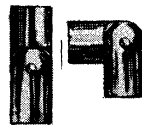


DIM. "L"	THREADED		NET Per C
	2-56 No.	4-40 No.	
.125	9130	9145	\$ 7.50
.187	9131	9146	8.00
.250	9132	9147	8.70
.312	9133	9148	9.40
.375	9134	9149	10.60
.437	9135	9150	\$11.40
.500	9136	9151	12.40
.562	9137	9152	14.50
.625	9138	9153	17.30
.687	9139	9154	18.30
.750	9140	9155	\$19.30
.812	9141	9156	20.00
.875	9142	9157	20.30
.937	9143	9158	21.30
1.000	9144	9159	22.80

SWIVEL STANDOFFS

MATERIALS: BRASS
FINISH: TIN PLATED
DESCR.: FOR PRINTED CIRCUIT BOARDS

STD. PKG. 25

**FEMALE INTERNAL THREAD**

NO.	O.D.	THD.	TOP (T)	DEP. (U)	BOT (B)	DEP. (V)	LGTH (L)	NET PER C
3021	3/16	4-40	.375	.172	.375	.172	3/4"	\$55.00
3022	3/16	4-40	.375	.172	.625	.250	1"	60.00
3023	1/4	6-32	.375	.172	.375	.172	3/4"	60.00
3024	1/4	6-32	.375	.172	.625	.250	1"	65.00
3025	1/4	8-32	.375	.172	.375	.172	3/4"	60.00
3026	1/4	8-32	.375	.172	.625	.250	1"	65.00

MALE INTERNAL THREAD

NO.	O.D.	THD.	TOP (T)	DEP. (U)	BOT (B)	DEP. (V)	LGTH (L)	NET PER C
3027	3/16	4-40	.250	.250	.250	.250	1/2"	\$55.00
3028	1/4	6-32	.250	.312	.250	.312	1/2"	60.00
3029	1/4	8-32	.250	.312	.250	.312	1/2"	60.00

NOTE: SPECIAL SIZES ON REQUEST.

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH**ALUMINUM SPACERS**STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE**ALUMINUM SPACERS**

Iridite 14-2 per MIL-C-5541

Std. Pkg. 100

ROUND**1/4" O.D.**

— CLEARANCE HOLE —

LENGTH "L"	No.	No.	No.	NET Per C
#4(.115)	#6(.140)	#8(.171)		
.125	8480	8500	8520	\$ 5.00
.187	9200	9207	9214	5.50
.250	8481	8501	8521	6.00
.312	9201	9208	9215	6.50
.375	8482	8502	8522	7.00
.437	9202	9209	9216	7.50
.500	8483	8503	8523	8.00
.562	9203	9210	9217	8.50
.625	8484	8504	8524	9.00
.687	9204	9211	9218	9.50
.750	8485	8505	8525	10.00
.812	9205	9212	9219	10.50
.875	8486	8506	8526	11.00
.937	9206	9213	9220	11.50
1.000	8487	8507	8527	12.00
1.250	8488	8508	8528	15.00
1.500	8489	8509	8529	16.00
1.750	8490	8510	8530	17.00
2.000	8491	8511	8531	18.00

5/16" O.D.

CLEAR

LENGTH "L"	No.	NET Per C
#10(.200)		
.125	8540	\$ 7.00
.187	9221	7.50
.250	8541	8.00
.312	9222	8.50
.375	8542	9.00
.437	9223	9.50
.500	8543	10.00
.562	9224	10.50
.625	8544	11.00
.687	9225	11.50
.750	8545	12.00
.812	9226	12.50
.875	8546	13.00
.937	9227	13.50
1.000	8547	14.00
1.250	8548	15.00
1.500	8549	27.00
1.750	8550	28.00
2.000	8551	29.00

ROUND THREADED**1/4" O.D.**

LENGTH "L"	4-40 No.	6-32 No.	8-32 No.	NET Per C	10-32 No.	NET Per C
.125	8320	8340	8360	\$ 6.00	8380	\$ 8.00
.187	9228	9235	9242	6.50	9249	8.50
.250	8321	8341	8361	7.00	8381	9.00
.312	9229	9236	9243	7.50	9250	9.50
.375	8322	8342	8362	8.00	8382	10.00
.437	9230	9237	9244	8.50	9251	10.50
.500	8323	8343	8363	9.00	8383	11.00
.562	9231	9238	9245	9.50	9252	11.50
.625	8324	8344	8364	10.00	8384	12.00
.687	9232	9239	9246	10.50	9253	12.50
.750	8325	8345	8365	11.00	8385	13.00
.812	9233	9240	9247	11.50	9254	13.50
.875	8326	8346	8366	12.00	8386	14.00
.937	9234	9241	9248	12.50	9255	14.50
1.000	8327	8347	8367	14.00	8387	15.00
1.250	8328	8348	8368	16.00	8388	16.00
1.500	8329	8349	8369	17.00	8389	18.00
1.750	8330	8350	8370	18.00	8390	20.00
2.000	8331	8351	8371	19.00	8391	22.00

HEX**1/4" O.D.**

— CLEARANCE HOLE —

LENGTH "L"	No.	No.	No.	NET Per C
#4(.115)	#6(.140)	#8(.171)		
.125	8560	8580	8600	\$ 6.00
.187	9256	9263	9270	6.50
.250	8561	8581	8601	7.00
.312	9257	9264	9271	7.50
.375	8562	8582	8602	8.00
.437	9258	9265	9272	8.50
.500	8563	8583	8603	9.00
.562	9259	9266	9273	9.50
.625	8564	8584	8604	10.00
.687	9260	9267	9274	10.50
.750	8565	8585	8605	11.00
.812	9261	9268	9275	11.50
.875	8566	8586	8606	12.00
.937	9262	9269	9276	12.50
1.000	8567	8587	8607	13.00

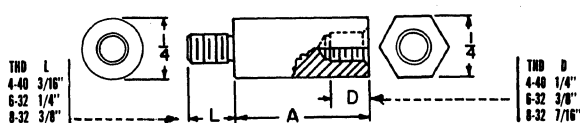
5/16" O.D.

CLEAR

LENGTH "L"	No.	NET Per C
#10(.200)		
.125	8620	\$ 9.00
.187	9277	9.50
.250	8621	10.00
.312	9278	10.50
.375	8622	11.00
.437	9279	11.50
.500	8623	12.00
.562	9280	12.50
.625	8624	13.00
.687	9281	13.50
.750	8625	14.00
.812	9282	14.50
.875	8626	15.00
.937	9283	15.50
1.000	8627	16.00

HEX THREADED**1/4" O.D.**

LENGTH "L"	4-40 No.	6-32 No.	8-32 No.	NET Per C	10-32 No.	NET Per C
.125	8400	8420	8440	\$ 7.00	8460	\$10.00
.187	9284	9291	9298	7.50	9305	10.50
.250	8401	8421	8441	8.00	8461	11.00
.312	9285	9292	9299	8.50	9306	11.50
.375	8402	8422	8442	9.00	8462	12.00
.437	9286	9293	9300	9.50	9307	12.50
.500	8403	8423	8443	10.00	8463	13.00
.562	9287	9294	9301	10.50	9308	13.50
.625	8404	8424	8444	11.00	8464	14.00
.687	9288	9295	9302	11.50	9309	14.50
.750	8405	8425	8445	12.00	8465	15.00
.812	9289	9296	9303	12.50	9310	15.50
.875	8406	8426	8446	13.00	8466	16.00
.937	9290	9297	9304	13.50	9311	16.50
1.000	8407	8427	8447	14.00	8467	17.00

MALE-FEMALE SPACERS**MALE-FEMALE THREADED SPACERS**

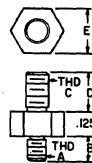
BRASS zinc plated

Std. Pkg. 100

ROUND					HEX				
4-40 THD. No.	6-32 THD. No.	8-32 THD. No.	"A" LGTH.	NET PER C	4-40 THD. No.	6-32 THD. No.	8-32 THD. No.	"A" LGTH.	NET PER C
8200	8232	8264	.250	\$22.80	8216	8248	8280	.250	\$22.80
8201	8233	8265	.375	23.20	8217	8249	8281	.375	23.20
8202	8234	8266	.500	23.70	8218	8250	8282	.500	23.70
8203	8235	8267	.625	24.20	8219	8251	8283	.625	24.20
8204	8236	8268	.750	24.70	8220	8252	8284	.750	24.70
8205	8237	8269	.875	25.20	8221	8253	8285	.875	25.20
8206	8238	8270	1.000	25.90	8222	8254	8286	1.000	25.90
8207	8239	8271	1.125	26.40	8223	8255	8287	1.125	26.40
8208	8240	8272	1.250	27.60	8224	8256	8288	1.250	27.60
8209	8241	8273	1.375	29.30	8225	8257	8289	1.375	29.30
8210	8242	8274	1.500	30.30	8226	8258	8290	1.500	30.30
8211	8243	8275	1.625	31.00	8227	8259	8291	1.625	31.00
8212	8244	8276	1.750	31.60	8228	8260	8292	1.750	31.60
8213	8245	8277	2.000	32.40	8229	8261	8293	2.000	32.40
8214	8246	8278	2.500	33.90	8230	8262	8294	2.500	33.90
8215	8247	8279	3.000	36.80	8231	8263	8295	3.000	36.80

MALE SPACER ADAPTERS

Dual-stud spacer adapters convert female threaded spacers to male-female or splice spacers together for added length. Brass, zinc plated hex body for wrench tightening. Adds 1/8" to length of spacer. Std. Pkg. 25



No.	THD. A	LGTH. B	THD. C	LGTH. D	THD. E	NET Per C
8300	4-40	3/16"	4-40	3/16"	1/4"	\$21.30
8301	4-40	3/16"	6-32	1/4"	1/4"	23.80
8302	6-32	1/4"	6-32	1/4"	1/4"	24.50
8303	6-32	1/4"	8-32	3/8"	1/4"	25.00
8304	8-32	3/8"	8-32	3/8"	1/4"	26.00
8305	8-32	3/8"	10-32	3/8"	1/4"	27.00
8306	8-32	3/8"	10-32	3/8"	5/16"	29.10
8307	10-32	3/8"	10-32	3/8"	5/16"	30.60

SPACERS SHOWN ARE STANDARD AND STOCKED IN DEPTH. We welcome your inquiry for special sizes, materials and plating.

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

INSULATED SPACERS

SMITH

FIBRE SPACERS

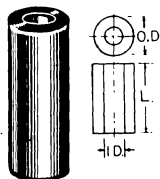
MATERIAL: FIBRE, per MIL-F-1148A, Grade CH.

These fibre bushings are ideal for use in raising sub panels, chassis, condensers, transformers, etc.

1/4" O.D.

— CLEARANCE HOLE — Std. Pkg. 100

Length "L"	#4(.115) No.	#6(.140) No.	#8(.171) No.	NET Per C
.125	8880	8881	8882	\$5.20
.187	8883	8884	8885	5.80
.250	2335	2130	2140	6.30
.312	8886	8887	8888	7.10
.375	2336	2131	2141	7.80
.437	8889	8890	8891	8.50
.500	2337	2132	2142	9.20
.562	8892	8893	8894	10.20
.625	8895	8896	8897	10.60
.687	8898	8899	8900	11.70
.750	2338	2133	2143	12.60
.812	8901	8902	8903	13.80
.875	8904	8905	8906	14.50
.937	8907	8908	8909	15.20
1.000	2339	2134	2144	15.50



PHENOLIC THREADED SPACERS

MATERIAL:

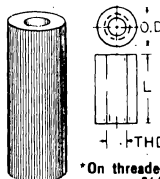
PBE Grade MIL-P-79A, Natural Color

Ideal for use in mounting chassis, components, etc. Good mechanical strength, resists abrasives and chemicals. Excellent dielectric and low moisture absorption.

1/4" O.D.

Std. Pkg. 100

Length "L"	THD. 4-40 No.	THD. 6-32 No.	THD. 8-32 No.	NET Per C
.250	8660	8661	8662	\$ 9.40
.312	8663	8664	8665	10.40
.375	8666	8667	8668	12.00
.437	8669	8670	8671	12.40
.500	8672	8673	8674	13.40
.562	8675	8676	8677	14.00
.625	8678	8679	8680	15.00
.687	8681	8682	8683	16.70
.750	8684	8685	8686	17.70
.812	8687	8688	8689	18.40
.875	8690	8691	8692	19.40
.937	8693	8694	8695	20.00
1.000	8696	8697	8698	21.00



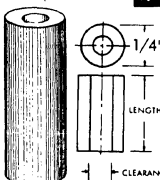
*On threaded spacers 3/4" and longer, tap is 3/8" from each end, and not continuous through.

1/4" O.D. ROUND PLASTIC SPACERS

Polyvinyl Dichloride (PVDC) 1/4" O.D. plastic spacers. Self-extinguishing and high temperature resistant. Available in gray. Std. Pkg. 100

CLEARANCE HOLE

Length	#4(.115) No.	#6(.140) No.	#8(.171) No.	NET Per C
1/4"	4154	4155	4156	\$3.20
3/8"	4157	4158	4159	3.35
1/2"	4160	4161	4162	3.50
5/8"	4163	4164	4165	3.75
3/4"	4166	4167	4168	4.20
1"	4169	4170	4177	4.35

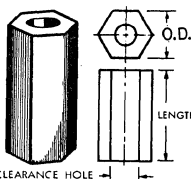


HEX PLASTIC SPACERS

Polyvinyl Dichloride (PVDC) Hex Spacers. Self-extinguishing and high temperature resistant. Designed for use with self-tapping screws of size indicated. Available in gray only. Std. Pkg. 100

SELF-TAPPING SCREW HOLE SIZE

Length	#4(.092) O.D. 3/16"	#6(.110) O.D. 1/4"	#8(.141) O.D. 3/8"	NET Per C
3/8"	4178	—	—	\$3.50
1/2"	4179	4180	—	4.00
5/8"	4181	4182	4183	4.20
3/4"	4184	4185	4186	4.35
7/8"	4187	4188	4189	5.00
1"	4190	4191	4192	5.50

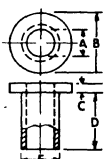


NYLON SPACER BUSHINGS

Natural Color. MIL-P-20693A.

Std. Pkg. 100

No.	I.D. (A)	B	C	D	E	NET Per C
2534	#4(.115)	.235	3/4"	1/4"	.147	\$2.30
2535	#6(.140)	.290	3/4"	1/4"	.170	2.40
2536	#8(.170)	.344	1/2"	3/8"	.205	2.50
2537	#10(.200)	.399	1/2"	3/8"	.260	2.70
2538	1/4"(.260)	.513	1/2"	3/8"	.312	3.00



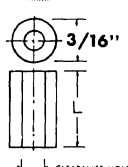
NYLON SPACERS

Molded Nylon, Type 66, Mil Spec. 20693A

Std. Pkg. 100

3/16" O.D.

DIM "L"	#2 (.091) No.	#4 (.115) No.	NET PER C
.125	9160	9180	3.30
.187	9161	9181	3.80
.250	9162	9182	4.30
.312	9163	9183	4.90
.375	9164	9184	5.50
.437	9165	9185	6.00
.500	9166	9186	6.50
.562	9167	9187	7.00
.625	9168	9188	7.50
.687	9169	9189	8.00
.750	9170	9190	8.50
.812	9171	9191	8.80
.875	9172	9192	9.30
.937	9173	9193	9.70
1.000	9174	9194	10.00



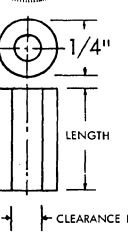
NYLON SPACERS

Non-conductive and molded of corrosion resistant Nylon. Useful for a wide variety of applications as well as for bushings, bearings, rollers and glides. Available in Natural finish, 1/4" O.D. in various clearance hole diameters.

1/4" O.D.

— CLEARANCE HOLE — Std. Pkg. 100

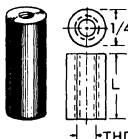
Length	#4(.115) No.	#6(.140) No.	#8(.171) No.	NET Per C
.125	4000	4001	4002	\$ 3.30
.187	4003	4004	4005	3.80
.250	4006	4007	4008	4.30
.312	4009	4010	4011	4.90
.375	4012	4013	4014	5.50
.437	4015	4016	4017	6.00
.500	4018	4019	4020	6.50
.562	4021	4022	4023	7.00
.625	4024	4025	4026	7.50
.687	4027	4028	4029	8.00
.750	4030	4031	4032	8.50
.812	4033	4034	4035	8.80
.875	4036	4037	4038	9.30
.937	4039	4040	4041	9.70
1.000	4042	4043	4044	10.00



1/4" O.D. NYLON THREADED SPACERS

Molded Nylon, Type 66, Mil Spec 20693A, 1/4" O.D. machine tapped. Std. Pkg. 100

LENGTH "L"	4/40 No.	6/32 No.	8/32 No.	NET per C
1/4"	4050	4051	4052	\$8.00
3/8"	4053	4054	4055	9.50
1/2"	4056	4057	4058	11.00
3/4"	4059	4060	4061	15.00
1"	4062	4063	4064	18.00

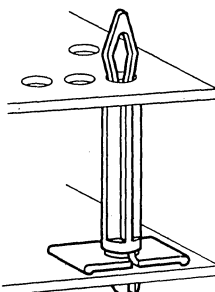


* On threaded spacers 3/4" and longer, tap is 3/8" from each end and not continuous through.

PRINTED CIRCUIT BOARD SUPPORTS

Made of Nylon and snaps into circuit board and chassis. Chassis hole .187 diameter, thickness from .034 to .080. P.C. board hole .156, 1/16" thick. Std. Pkg. 100

No.	Length	NET Per C
4093	3/16"	\$3.00
4094	1/4"	3.10
4095	3/8"	3.30
4096	1/2"	3.50
4097	5/8"	3.75
4098	3/4"	4.00
4099	7/8"	4.50



SELF-EXTINGUISHING PRINTED CIRCUIT BOARD SUPPORTS

Same as above except Made of natural flame retardant Nylon.

No.	Length	NET Per C
4293	3/16"	\$4.20
4294	1/4"	4.50
4295	3/8"	4.85
4296	1/2"	5.20
4297	5/8"	5.50
4298	3/4"	6.00
4299	7/8"	6.75

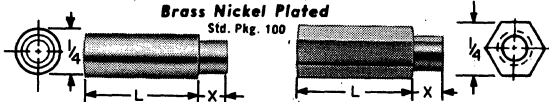
IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH SWAGE & CERAMIC STANDOFFS

THREADED SWAGE STANDOFFS

Brass Nickel Plated

Std. Pkg. 100

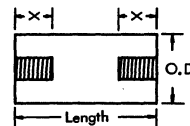
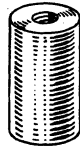


NOTE: FOR 1" STANDOFFS, TAP IS 1/4" FROM EACH END, AND NOT CONTINUOUS THRU. 8-32 TAPS ARE FULL LENGTH, BUT DO NOT CLEAR COUNTERBORE. C = Counter Bore S = Shoulder

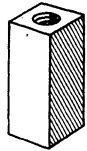
PANEL	DIM. "X"	DIM. "L"	ROUND	NET Per C	HEX	NET Per C		
2-56 THREAD			"S" DIA. — .138		"C" DIA. — .113			
3/64	.094	.125	4369	10.00	4269	10.40		
		.187	4370	10.40	4270	10.70		
		.250	4371	10.70	4271	11.00		
4-40 THREAD			"S" DIA. — .138		"C" DIA. — .113			
3/64	.094	.125	4354	10.00	4254	10.40		
		.187	4358	10.40	4258	10.70		
		.250	4362	10.40	4262	11.00		
1/16	.105	.125	4355	10.00	4255	10.40		
		.187	4359	10.40	4259	10.70		
3/32	.135	.125	4356	10.00	4256	10.40		
		.187	4360	10.40	4260	10.70		
1/8	.165	.125	4357	10.00	4257	10.40		
		.187	4361	10.40	4261	10.70		
4-40 THREAD			"S" DIA. — .187		"C" DIA. — .156			
1/16	.105	.250	4100	10.40	4200	11.00		
		.375	4103	12.00	4203	12.70		
		.500	4106	14.70	4206	15.40		
		.625	4109	15.40	4209	16.00		
		.750	4112	17.00	4212	17.70		
3/32	.135	1.000	4115	22.00	4215	22.70		
		.250	4101	10.40	4201	11.00		
		.375	4104	12.00	4204	12.70		
		.500	4107	14.70	4207	15.40		
		.625	4110	15.40	4210	16.00		
1/8	.165	.750	4113	17.00	4213	17.70		
		1.000	4116	22.00	4216	22.70		
		.250	4102	10.40	4202	11.00		
		.375	4105	12.00	4205	12.70		
		.500	4108	14.70	4208	15.40		
3/32	.135	.625	4111	15.40	4211	16.00		
		.750	4114	17.00	4214	17.70		
		1.000	4117	22.00	4217	22.70		
		6-32 THREAD			"S" DIA. — .138		"C" DIA. — .113	
		1/16	.105	.125	4363	10.00	4263	10.40
.187	4366			10.40	4266	10.70		
.250	4369			10.40	4269	10.70		
3/32	.135	.125	4364	10.00	4264	10.40		
		.187	4367	10.40	4267	10.70		
		.250	4370	10.40	4270	10.70		
1/8	.165	.125	4365	10.00	4265	10.40		
		.187	4368	10.40	4268	10.70		
		6-32 THREAD			"S" DIA. — .187		"C" DIA. — .156	
1/16	.105	.250	4118	10.40	4218	11.00		
		.375	4121	12.00	4221	12.70		
		.500	4124	14.70	4224	15.40		
		.625	4127	15.40	4227	16.00		
		.750	4130	17.00	4230	17.70		
3/32	.135	1.000	4133	22.00	4233	22.70		
		.250	4119	10.40	4219	11.00		
		.375	4122	12.00	4222	12.70		
		.500	4125	14.70	4225	15.40		
		.625	4128	15.40	4228	16.00		
1/8	.165	.750	4131	17.00	4231	17.70		
		1.000	4134	22.00	4234	22.70		
		.250	4120	10.40	4220	11.00		
		.375	4123	12.00	4223	12.70		
		.500	4126	14.70	4226	15.40		
3/32	.135	.625	4129	15.40	4229	16.00		
		.750	4132	17.00	4232	17.70		
		1.000	4135	22.00	4235	22.70		
		8-32 THREAD			"S" DIA. — .187		"C" DIA. — .156	
		1/16	.105	.250	4136	10.40	4236	11.00
.375	4139			12.00	4239	12.70		
.500	4142			14.70	4242	15.40		
.625	4145			15.40	4245	16.00		
.750	4148			17.00	4248	17.70		
3/32	.135	1.000	4151	22.00	4251	22.70		
		.250	4137	10.40	4237	11.00		
		.375	4140	12.00	4240	12.70		
		.500	4143	14.70	4243	15.40		
		.625	4146	15.40	4246	16.00		
1/8	.165	.750	4149	17.00	4249	17.70		
		1.000	4152	22.00	4252	22.70		
		.250	4138	10.40	4238	11.00		
		.375	4141	12.00	4241	12.70		
		.500	4144	14.70	4244	15.40		
3/32	.135	.625	4147	15.40	4247	16.00		
		.750	4150	17.00	4250	17.70		
		1.000	4153	22.00	4253	22.70		

CERAMIC STANDOFFS

MIL SPEC. GRADE L-5 MIL 1-10



Std. Pkg. 100



ROUND

3/8" Dia. 6/32 Thread

SQUARE

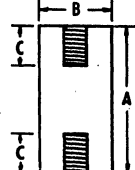
Std. Pkg. 50

No.	MIL Type	NET Per C	Length	X	No.	MIL Type	NET Per C
2600	NL523W01-004	24.00	.500	3/4"	3600	NL523W10-004	85.00
2601	NL523W01-005	25.00	.625	3/4"	3601	NL523W10-005	88.00
2602	NL523W01-006	26.00	.750	1"	3602	NL523W10-006	93.00
2603	NL523W01-008	28.00	1.000	3/4"	3603	NL523W10-008	99.00
2604	NL523W01-010	29.00	1.250	3/4"	3604	NL523W10-010	104.00
2605	NL523W01-012	32.00	1.500	3/4"	3605	NL523W10-012	112.00
2606	NL523W01-016	35.00	2.000	3/4"	3606	NL523W10-016	125.00
1/2" Dia. 8/32 Thread							
No.	MIL Type	NET Per C	Length	X	No.	MIL Type	NET Per C
2607	NL523W02-005	26.00	.625	3/4"	3608	NL523W11-006	96.00
2608	NL523W02-006	27.00	.750	1"	3609	NL523W11-008	104.00
2609	NL523W02-008	29.00	1.000	3/4"	3610	NL523W11-010	112.00
2610	NL523W02-010	32.00	1.250	3/4"	3611	NL523W11-012	120.00
2611	NL523W02-012	34.00	1.500	3/4"	3612	NL523W11-016	136.00
2612	NL523W02-016	38.00	2.000	3/4"	3613	NL523W11-020	152.00
2613	NL523W02-020	42.00	2.500	3/4"			
2614	NL523W02-024	46.00	3.000	3/4"			
3/4" Dia. 10/32 Thread							
No.	MIL Type	NET Per C	Length	X	No.	MIL Type	NET Per C
2615	NL523W03-008	55.00	1.000	3/4"	3615	NL523W12-008	147.00
2616	NL523W03-010	59.00	1.250	3/4"	3616	NL523W12-010	155.00
2617	NL523W03-012	67.00	1.500	3/4"	3617	NL523W12-012	163.00
2618	NL523W03-016	70.00	2.000	3/4"	3618	NL523W12-016	182.00
2619	NL523W03-020	78.00	2.500	3/4"	3619	NL523W12-020	200.00
2620	NL523W03-024	87.00	3.000	3/4"	3620	NL523W12-024	219.00
2621	NL523W03-032	95.00	4.000	3/4"	3621	NL523W12-032	246.00
1" Dia. 1/4 x 20 Thread							
No.	MIL Type	NET Per C	Length	X	No.	MIL Type	NET Per C
2622	NL523W04-010	78.00	1.250	3/4"	3623	NL523W13-012	190.00
2623	NL523W04-012	84.00	1.500	1/2"	3624	NL523W13-016	216.00
2624	NL523W04-016	96.00	2.000	3/4"	3625	NL523W13-020	243.00
2625	NL523W04-020	109.00	2.500	3/4"	3626	NL523W13-024	270.00
2626	NL523W04-024	118.00	3.000	3/4"	3627	NL523W13-032	326.00
2627	NL523W04-032	129.00	4.000	3/4"			
2628	NL523W04-040	140.00	5.000	3/4"			
2629	NL523W04-048	151.00	6.000	3/4"			

CERAMIC STANDOFFS, COMMERCIAL

Grade L5 Ceramic with outside glazed.

Std. Pkg. 100

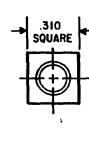
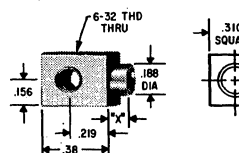


No.	A	B	C	THRU	Thd.	NET Per C
2640	1/4"	1/4"	3/4"	3/4"	6-32	21.00
2641	1/2"	1/4"	3/4"	3/4"	6-32	22.00
2642	3/4"	3/4"	3/4"	3/4"	6-32	23.00
2643	1/2"	3/4"	3/4"	3/4"	6-32	24.00
2644	1/2"	1/2"	1/4"	3/4"	6-32	25.00
2645	3/4"	1/2"	1/4"	3/4"	6-32	26.00
2646	1"	1/2"	3/4"	3/4"	6-32	28.00
2647	1 1/2"	1/2"	3/4"	3/4"	6-32	32.00
2648	2 1/2"	1/2"	3/4"	3/4"	6-32	55.00
2649	2 1/2"	3/4"	3/4"	3/4"	1/4-20	110.00
2650	4"	3/4"	3/4"	3/4"	1/4-20	128.00

CHASSIS FASTENERS

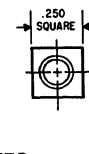
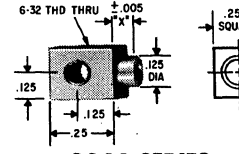
Designed to be swaged onto metal chassis for use as mounting surfaces for terminal boards, tie strips, etc. Brass, Cadmium Plated.

Std. Pkg. 100



2039 SERIES

No.	"X"	Board Thickness	NET Per C
2039B	.105	.062	\$30.00
2039C	.135	.094	30.00
2039D	.165	.125	30.00



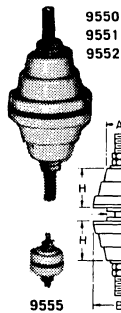
2040 SERIES

No.	"X"	Board Thickness	NET Per C
2040A	.075	.031	\$30.00
2040B	.105	.062	30.00
2040C	.135	.094	30.00
2040D	.165	.125	30.00

SPACERS SHOWN ARE STANDARD AND STOCKED IN DEPTH. We welcome your inquiry for special sizes, materials and plating.

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

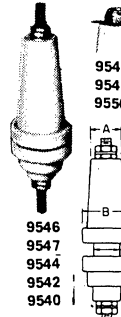
STEATITE & PORCELAIN INSULATORS **SMITH**



STEATITE INSULATED THRU-PANEL BUSHINGS

Consists of a pair of identical steatite insulators along with cushion washers and hardware. The 9555 assembly has interlocking insulators which are self-centering in mounting hole and may be used on very thin panels.

No.	Std.	Pkg.	H	B	D	A	Hdwre	Net Ea.
9555	50	1/4"	3/4"	15/32"	1/2"	6-32		.48
9550	25	1/2"	3/4"	15/32"	3/8"	6-32		.66
9551	10	13/16"	1 1/4"	27/32"	5/8"	10-32		1.05
9552	10	1 1/8"	1 3/4"	17/32"	7/8"	1/4"-20		1.50

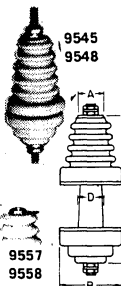


THRU-PANEL INSULATORS

Compression mounted by means of a stud throughout the entire length of the unit. Extrusion of insulator base extends thru mounting hole, increasing the breakdown rating. Units have flat mounting surfaces and are furnished with cushion washer. Types with jacks have terminal permitting connection above, as well as below, panel.

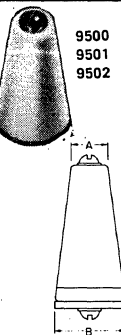
STEATITE

No.	Std.	Pkg.	H	B	D	E	A	Hdwre	Net Ea.
9544	50	5/8"	5/8"	5/16"	5/16"	3/8"	6-32		.54
9542	25	7/8"	3/4"	13/32"	3/8"	1/2"	10-32		.84
9540	25	1 1/4"	15/16"	7/16"	1/2"	19/32"	10-32		1.00
9543	10	No. 9542 with Std. Ban. Jack							1.03
9541	10	No. 9540 with Std. Ban. Jack							1.19



PORCELAIN

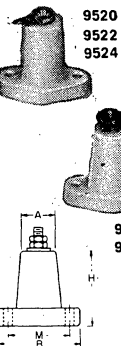
No.	Std.	Pkg.	H	B	D	E	A	Hdwre	Net Ea.
9545	25	13/8"	1 1/4"	1/2"	11/15"	5/8"	10-32		1.10
9548	10	2"	15/8"	11/16"	7/8"	3/4"	10-32		1.68
9546	10	2 3/4"	15/8"	11/16"	1"	15/16"	1/4"-20		2.15
9547	10	4 1/2"	2 1/8"	31/32"	1 1/2"	1 1/16"	1/4"-20		3.60
9557	10	No. 9545 with Std. Ban. Jack							1.30
9558	10	No. 9548 with Std. Ban. Jack							1.88
9556	10	No. 9546 with Giant Ban. Jk.							2.75



STEATITE CONE INSULATORS

Constructed of grade L-423 or better steatite, with threaded holes. Insulators are furnished complete with two nickel-plated machine screws, nickel-plated brass washers, and a cork cushion washer.

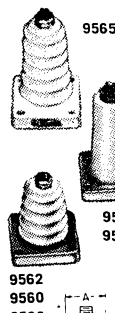
No.	Std.	Pkg.	H	B	A	Hdwre	Net Ea.
9500	50	2 1/32"	5/8"	7/16"	6-32		.40
9501	25	1 1/32"	3/4"	1/2"	8-32		.45
9502	25	17/16"	1"	1/2"	8-32		.84
9503	10	2 1/16"	1 1/8"	5/8"	10-32		1.40
9504	10	3 1/16"	1 1/2"	3/4"	10-32		4.00



STEATITE STAND-OFF INSULATORS

Two hole mounting permits substantial lateral loads. Hardware includes screw, flat washer, and two nuts.

No.	Std. Pkg.	H	B	M	A	Hdwre	Net Ea	
9524	50	5/8"	1"	11/16"	13/8"	6-32	.27	
9522	50	1"	15/32"	13/16"	15/32"	8-32	.42	
9520	25	1 1/16"	1 3/4"	15/16"	3/4"	10-32	.60	
9523	10	No. 9522 with Std. Ban. Jack						.62
9521	10	No. 9520 with Std. Ban. Jack						.80

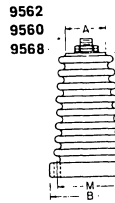


PORCELAIN STAND-OFF INSULATORS

Feature square mounting bases with four mounting holes. Porcelain is dense molded and glazed, except on mounting surfaces.

No.	Std.	Pkg.	H	B	M	A	Hdwre	Net Ea.
9562	10	2 3/4"	17/8"	13/8"	7/8"	1/4"-20		1.70
9560	10	4 1/2"	2 1/2"	17/8"	13/16"	1/4"-20		2.10

This group is supplied with drawn and etched aluminum bases.



PORCELAIN LEAD-IN BUSHINGS

Consisting of single porcelain insulators less all hardware and mounting flange except cushion washer.

No.	Std.	Pkg.	H	B	A	Net Ea.
9553	10	13/4"	2 1/2"	1 1/16"		.75
9554	10	4"	3 1/2"	1"		1.80



Stamped aluminum mounting flanges, for three mounting holes spaced 120 degrees apart.

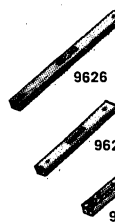
No.	Std.	Pkg.	For Bushing No.	Net Ea.
9590	10		9553	.75
9591	10		9554	1.80



PORCELAIN ANTENNA STRAIN INSULATORS

The 9651, 9652, and 9653 have heavy 1 1/2" diameter wet process porcelain insulator with specially sealed end bells of non-corrosive aluminum alloy. Porcelain is glazed to prevent moisture absorption. Numbers 9607 and 9612 are wet process, 1" diameter glazed porcelain. Number 9604 is dry process, glazed 5/8" square. The 9632 is a compression type strain insulator for aircraft or guy wire applications — made of dry process glazed porcelain.

No.	Std.	Pkg.	Breaking Strength	Length		Net Ea.
				Net	Overall	
9632	50		EGG	—	1 1/2"	.30
9604	25		400 lbs.	—	4"	.43
9607	25		800 lbs.	—	7"	2.20
9612	25		800 lbs.	—	12"	2.50
9651	1		5000 lbs.	8"	15 1/2"	20.00
9652	1		5000 lbs.	12"	19 1/2"	21.00
9653	1		5000 lbs.	20"	25 1/2"	ON REQUEST



PORCELAIN FEEDER INSULATORS

Conventional feeder spreaders for constructing high efficiency, open-wire antenna feeders and transmission lines. Insulators are made of high grade, low absorption porcelain silicone impregnated for moisture resistance. Insulators have 3/8" x 1/2" cross section. The 9622 has extra notches for 1 1/2" line spacing.

No.	Std.	Pkg.	Length	Net Ea.
9622	25		2"	.24
9624	25		4"	.48
9626	25		6"	.60

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH**KNOBS**STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE**INSTRUMENT KNOBS**

Style A Plain



Style B With Pointer



Style C With Skirt

Molded black bakelite instrument knobs with molded in brass insert for 1/4" shafts. Style B pointer knobs have white vinyl pointer. Style C skirt type have white indicator line. Style D same as style A except with protruding brass insert for mounting special dials and pointers.

Std. Pkg. 10

No.	Style	O.D.	Pointer Size	Height	NET Per C
2200	A	1 1/8"		5/8"	\$52.00
2201	A	1 3/8"		1 1/4"	53.00
2202	A	1 5/8"		1 3/4"	59.00
2203	A	2 3/8"		2 1/8"	80.00
2204	B	1 1/8"	3/4" pointer	1 1/4"	78.00
2205	B	1 3/8"	1 1/4" pointer	1 3/4"	79.00
2206	B	1 5/8"	1 3/4" pointer	2 1/4"	84.00
2207	B	2 3/8"	1 5/4" pointer	2 3/4"	108.00
2208	C	1 1/8"	1 1/2" Skirt	1 3/4"	106.00
2209	C	1 3/8"	1 3/4" Skirt	2 1/8"	114.00
2210	C	1 5/8"	2 1/4" Skirt	2 3/4"	123.00
2211	C	2 3/8"	3" Skirt	3 1/2"	155.00

FLUTED INSTRUMENT KNOBS

Molded Black bakelite, supplied with white filled line on crown and skirt. Supplied with 1/4" plain hole with set screw.

Std. Pkg. 10



2391



2891

No.	Skirt Dia.	Height	NET Per C
2391	3/4"	1/2"	\$38.00
2392	1 1/8"	5/8"	43.00
2393	1 1/4"	3/4"	48.00
2394	1 1/2"	7/8"	52.00
2395	2.000"	1 1/4"	67.00

With 1/8" plain hole and set screw

2396	3/4"	1/2"	40.00
------	------	------	-------

Same as above, except for spun Silver insert and lined skirt.

2891	3/4"	1/2"	57.00
2892	1 1/8"	5/8"	73.00
2893	1 1/4"	3/4"	61.00
2894	1 1/2"	7/8"	78.00
2895	2.000"	1 1/4"	97.00

With 1/8" plain hole and set screw

2896	3/4"	1/2"	61.00
------	------	------	-------

CONTROL KNOBS

Molded bakelite control knobs. Supplied with 1/4" molded hole; complete with set screw.

Std. Pkg. 50

No.	Style	O.D.	Height	Color	NET Per C
2240	A	3/4"	1 1/2"	Black	\$25.00
2242	B	1 1/4"	1 3/4"	Black	14.00
2244*	B	1"	1 1/2"	Black	20.00
2275†	B	1 1/4"	1 3/4"	Black	18.00
2246	C	1 1/4"	1 3/4"	Black	14.00

2273†	C	1 1/4"	1 3/4"	Black	18.00
2248*	D	1 1/4"	1 3/4"	Black	27.00
2250*	E	1 1/8"	3/4"	Black	22.00
2252*	F	1 1/4"	1 1/4"	Black	29.00
2258	G	7/8"	3/4"	Black	25.00

2265	H	2 3/8"	1 1/2"	Black	26.00
2267	J	1 3/8"	5/8"	Black	21.00
2283	L	7/8"	1/2"	Black	37.00

†Supplied with Brass Insert. *Recessed for locknut.

POINTER KNOBS

Molded bakelite pointer knobs, supplied with 1/4" plain hole or brass inset. Complete with set screw.

Std. Pkg. 50

No.	Style	Type Hole	Color	NET per C
2220	A	1/4" Plain	Black	\$15.00
2223	A	1/4" Brass Insert	Black	19.00
2226	B	1/4" Plain	Black	28.00
2228	B	1/4" Brass Insert	Black	41.00
2230	C	1/4" Plain	Black	22.00

DESIGNER SERIES INSTRUMENT KNOBS

Molded Black bakelite with lined spun Silver insert. Supplied with plain 1/4" hole and set screw.

Std. Pkg. 10



2885



2890

No.	Height	Diameter	Net Per C
2885	5/8"	3/4"	\$64.00
2886	1 1/8"	1.000"	62.00
2887	3/4"	1 3/8"	74.00
2888	1 1/4"	1 3/4"	81.00

Pointer type, white line on pointer.

2890 5/8" 1 1/4" 82.00

With 1/8" plain hole and set screw

2889 5/8" 1 1/2" 64.00

Same as above, lined crown, less the spun Silver insert.

2879 5/8" 3/4" 35.00

2880 1 1/8" 1.000" 38.00

2881 3/4" 1 3/8" 45.00

2882 1 1/4" 1 3/4" 48.00

With 1/8" plain hole and set screw

2883 5/8" 1 1/2" 35.00

Pointer type, white line on pointer.

2884 5/8" 1 1/4" 44.00

CONCENTRIC DESIGNER SERIES KNOBS

Molded Black outside knob with filled line 1/4 hole, inner molded Black knob with lined spun Silver lined insert, 1/8 hole.

Std. Pkg. 10



2898



2899

No.	Net Per C
2898	\$110.00

Same as above except less the spun Silver insert, outside knob with lined side, top inner knob with lined crown.

2899 82.00

CONCENTRIC FLUTED INSTRUMENT KNOB

Molded Black and Red bakelite dual concentric knob. Black outside knob with White filled line on skirt. Red inner knob with White filled line on skirt and crown. Supplied with set screws.



2397



2897

No.	Std. Pkg. 10	Net Per C
2397		\$80.00

Same as above except with lined spun Silver insert on Red inner knob.

2897 \$102.00

LEVER KNOBS

Molded bakelite lever knobs with 1/4" brass insert, complete with set screw.

Std. Pkg. 25



A



B



C



D

No.	Style	Length	Height	Color	NET per C
2232	A	1 1/8"	1 1/2"	Black	\$42.00
2234	B	1 1/4"	1 3/4"	Black	74.00
2236	C	2 1/4"	2"	Black	41.00
2238	D	2 1/4"	5/8"	Black	73.00

PUSH BUTTON KNOBS

Std. Pkg. 50



A

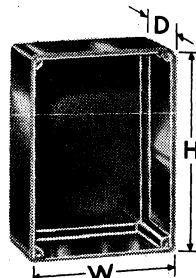


B

No.	Style	O.D.	Height	Color	NET Per C
2277	A	1 1/2"	3/4"	Black	\$ 10.70
2279	B	3/4"	3/8"	Black	4.50

INSTRUMENT CASES AND COVERS

Ideal for small instruments and test equipment. The right size and the right mounting for your requirements. Molded of high quality, glass finish, thermosetting plastic. Threaded brass insert for cover mounting. BLACK ONLY. Std. Pkg. 5.



No.	H	W	D	Insert	NET Ea.
2377	4"	2 7/8"	1 1/8"	4-40	.72
2291	5"	4 1/4"	1 3/4"	6-32	1.25
2255	6 1/4"	3 3/4"	2"	6-32	1.00
2257	6 1/4"	5 1/2"	2 1/8"	4-40	2.00
2289	8 1/2"	7 1/8"	3"	6-32	2.40

PHENOLIC COVERS

2378	For No. 2377	.20
2292	For No. 2291	.30
2256	For No. 2255	.75
2260	For No. 2257	1.30
2390	For No. 2289	2.30

PANEL PLATE

Brushed and Jaquered Aluminum

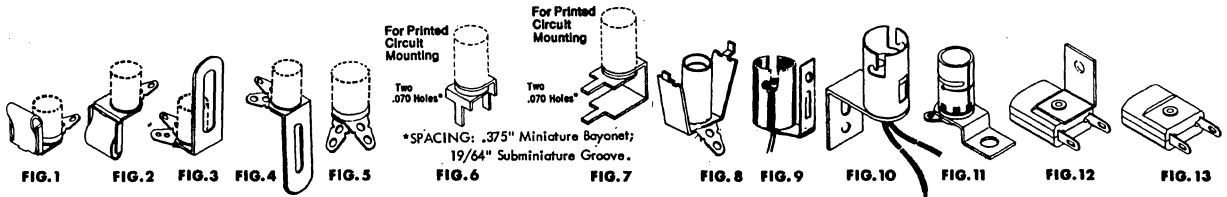
2379	For No. 2255	1.10
------	--------------	------

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH PILOT LIGHT SOCKETS & INDICATOR LIGHTS

PILOT LIGHT SOCKETS

Sockets are available for Mini Screw, Mini Bayonet, Candelabra Screw, Candelabra Bayonet (Single and Double Contact), Sub-Mini Groove, Wedge and Printed Circuit in Mini Bayonet and Sub-Mini groove. Brackets are made of .025-.032 corrosion resistant plated steel, shells of nickel plated brass and tinned brass solder lugs.



MINIATURE SCREW

No.	Fig. No.	Std. Pkg.	NET Per C
1922	1	100	\$33.00
1923	2	100	33.00
1928	3	100	33.00
1929	4	100	33.00
1934	5	100	33.00

MINIATURE BAYONET

No.	Fig. No.	Std. Pkg.	NET Per C
1924	1	100	\$33.00
1925	2	100	33.00
1930	3	100	33.00
1931	4	100	33.00
1935	5	100	33.00
1938	8	100	33.00
1900	6	25	65.00
1901	7	25	110.00

CANDELABRA SCREW

No.	Fig. No.	Std. Pkg.	NET Per C
1926	1	100	\$33.00
1927	2	100	33.00
1932	3	100	33.00
1933	4	100	33.00
1936	5	100	33.00

CANDELABRA BAYONET — SINGLE CONTACT

No.	Fig. No.	Std. Pkg.	NET Per C
1902	9	25	\$60.00
1903	10	25	60.00

CANDELABRA BAYONET — DOUBLE CONTACT

No.	Fig. No.	Std. Pkg.	NET Per C
1904	9	25	\$75.00
1905	10	25	75.00

SUB-MINIATURE GROOVE

No.	Fig. No.	Std. Pkg.	NET Per C
1906	6	25	\$120.00
1907	7	25	120.00
1908	11	25	75.00

WEDGE

No.	Fig. No.	Std. Pkg.	NET Per C
1909	13	25	\$50.00
1910	12	25	50.00

INDICATOR LIGHTS

Housings of White Nylon, lens of high impact plastic. Built-in resistors provide voltage ratings from 6.3V to 115V. Low voltage indicators use incandescent lamps, the 115V indicators use high brilliance Neon lamps. Lens colors available for incandescent indicators, Red, Green and Amber, for Neon indicators, Red, Clear and Amber. SPECIFY COLOR.

Self-mounting, snaps into a rectangular opening 1.28" x .391", panel thickness up to .090". Terminates with two 6" wire leads, 18 gauge, stripped 1/2". UL and CSA approved.

Std. Pkg. 10

No.	Voltage	NET Per C
1911	6.3 V	\$190.00
1912	28 V	190.00
1913	115 V	140.00

Self-mounting, snaps into a 1/2" round hole and requires no mounting hardware. Terminates with two 6" wire leads, 18 gauge, stripped 1/2". UL and CSA approved.

Std. Pkg. 10

No.	Voltage	NET Per C
1914	6.3 V	\$190.00
1915	28 V	190.00
1916	115 V	140.00

Designed to mount in a 3/4" round hole, retained by Speednut which is supplied. Terminates with two 6" wire leads, 18 gauge, stripped 1/2". UL and CSA approved.

Std. Pkg. 10

No.	Voltage	NET Per C
1917	6.3 V	\$190.00
1918	28 V	190.00
1919	115 V	140.00

PILOT LIGHT SHIELD

Prevents glare when used in radio receiver meters, etc. Ribbed bottom holds shield securely in place on bulb.

Std. Pkg. 100

No.	Type	NET Per C
1963	Brass Cad Plate	\$5.50
1968	Plain Brass	5.00
1969	Flared Brass Cad. Plate	6.00

SNAP-IN BULB CONNECTOR

Designed for use with the new Twin Pin Baseless Miniature Lamps (G.E. #10-25 volts, #12-6.3 volts, or #15-7.0 volts). Easily assembled to any unit for indicating purposes. Withstands excessive temperatures. Snaps into a .500 x .296 rectangular hole in panels .032 to .062 thick. Bezel — brass, cad. plated; contacts — brass; silver plated.

Std. Pkg. 25

No. 1504 NET per C \$25.00

Low cost switch and indicator combination. Self-mounting, snaps into a rectangular opening 1.281" x .395", panel thickness to .080". SPST switch rated at 6 Amps AC 125 V. Terminates with three quick disconnect .250" tabs. Available only for 115 V operation. UL and CSA approved.

Std. Pkg. 10

No.	Voltage	NET Per C
1920	115 V	\$270.00

Self-mounting, snaps into a rectangular opening 1.281" x .395", panel thickness .032" — .125". SPST switch rated at 10 Amps AC 125 V. Illuminated rocker, lights in the "on" position. Terminates with two quick-disconnect .250" male tabs. Available for 115 V only. UL and CSA approved.

Std. Pkg. 10

No.	Voltage	NET Per C
1921	115 V	\$270.00

ANGLES

A — Length of leg B — Length of leg C — Hole location H1 — Hole dia. H2 — Hole dia. T — Thickness W — Width

Std. Pkg. 100

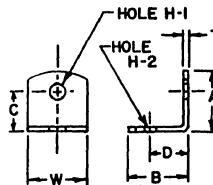
STEEL, Cadmium Plated

No.	A	B	C	D	W	T	H1	H2	Net Per C
1444	7/16	7/16	17/64	1/4	3/8	.032	9/16	#4	\$8.00
1445	1/2	1/2	11/32	23/64	3/8	.050	#8	#4	1.00
1446	49/64	27/64	39/64	15/64	5/16	.032	#6	#8	1.00
1447	19/64	1/4	61/64	23/64	5/16	.050	#8	#8	1.10
1476	11/16	11/16	1/2	1/2	3/4	.032	#6	#6	1.70

Note: No. 1476 has Hot Tin Dipped finish

BRASS, Nickel Plated

No.	A	B	C	D	W	T	H1	H2	Net Per C
1474	15/32	15/32	19/64	19/64	5/16	.025	#8	#	\$2.50
1475	21/32	21/32	3/4	3/4	3/4	.050	#8	#	5.00



"OFF-THE-SHELF"

SMITH Standard Products are stocked nationally on the shelves of every major Parts Distributor. That's ONE reason why Engineers and Purchasing Agents agree: "It's Sound Planning to SPECIFY SMITH!"

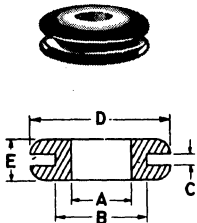
IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

GROMMETS-BUMPERS-BUSHINGS-WASHERS

SPECIFY SMITH

RUBBER GROMMETS

Std. Pkg. 100



No.	A	B	C	D	E	NET Per C
2185	1/8	3/16	1/16	5/16	3/16	\$2.40
2172	3/16	5/16	1/16	7/16	3/16	2.20
2170	1/4	3/8	1/16	5/8	1/4	2.50
2174	5/16	7/16	1/16	5/8	1/4	2.40
2175	3/8	1/2	1/16	21/32	1/4	2.50
2177	7/16	9/16	1/16	3/4	1/4	2.50
2186	1/2	3/4	1/16	1-1/16	5/16	5.30
2188	9/16	13/16	1/16	1-1/16	5/16	5.30
2187	5/8	7/8	1/16	1-1/8	5/16	5.40
2189	3/4	7/8	1/32	1	5/32	5.20

VINYL GROMMETS

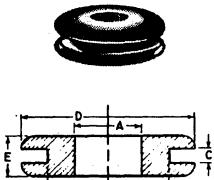
DESCR.: Exceptional aging qualities. High dielectric properties. Oil resistant. Durometer hardness 45 to 85.

No.	A	B	C	D	E	NET Per C
2145	1/8	1/4	1/16	11/32	3/16	\$1.20
2146	3/16	5/16	1/16	7/16	7/32	1.35
2147	1/4	3/8	1/16	9/16	1/4	1.70
2148	3/8	1/2	1/16	5/8	1/4	1.75
2149	1/2	5/8	1/16	13/16	9/32	2.80

RUBBER GROMMETS

Formerly listed by Radio Essentials, Inc., and American Radio Hardware Inc., (Their catalog numbers as below, minus first digit).

Std. Pkg. 100

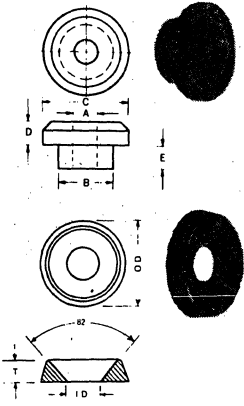


No.	A	B	C	D	E	NET Per C
91114	1/8	1/4	1/16	11/32	3/16	\$2.50
91118	3/16	5/16	1/16	7/16	7/32	2.50
91103	3/16	5/16	15/32	1/8	9/16	3.30
91122	1/4	11/32	1/32	1/2	5/32	3.10
91119	1/4	13/32	1/16	9/16	1/4	2.70
91102	9/32	13/32	5/32	5/8	3/8	3.50
91123	9/32	1/2	1/4	11/16	7/16	5.50
91117	5/16	7/16	1/8	19/32	3/8	3.50
91116	5/16	1/2	1/8	3/4	3/8	5.00
91106	5/16	1/2	3/16	5/8	1/2	7.20
91120	19/64	7/16	1/16	5/8	1/4	3.10
91107	3/8	7/16	3/32	5/8	5/16	5.00
91121	3/8	1/2	1/16	21/32	1/4	3.00
91100	3/8	1/2	9/64	13/16	13/32	8.00
91111	3/8	11/16	9/64	7/8-1"	13/32	9.00
91109	3/8	7/8	1/4	1-1/16	3/8	15.00
91124	7/16	9/16	1/16	3/4	1/4	3.50
91112	49/64	1-3/32	1/16	1-5/8	5/16	15.00

MOLDED NYLON WASHERS

Non conductive and corrosion resistant, ideal for insulation, cushioning or spacing protection. Meets Military Specification MIL-P-20693, Type 1. Available in Natural.

Std. Pkg. 100



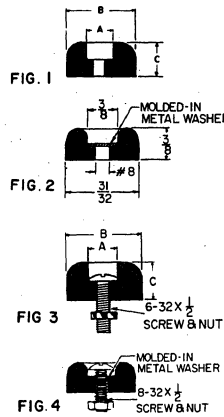
SHOULDER

No.	A	B	C	D	E	NET Per C
2681	.122	.187	.281	.040	.040	\$2.25
2682	.146	.218	.328	.040	.040	2.40
2683	.174	.250	.375	.060	.050	2.50
2684	.201	.281	.437	.050	.050	2.75
2685	.260	.375	.562	.060	.060	3.00
2686	.385	.500	.750	.060	.060	4.75

FINISHING

No.	O.D.	I.D.	Thickness	NET Per C
2687	.437	.143	.100	\$5.00
2688	.515	.171	.115	5.25
2689	.580	.191	.152	5.50
2690	.609	.225	.160	6.00
2691	.683	.251	.183	6.50

USE OUR VAST NATIONAL DISTRIBUTION NETWORK for Off-The-Shelf Deliveries of your smaller hardware requirements.



RECESS RUBBER BUMPERS

Std. Pkg. 100

No.	Fig.	A	B	C	NET Per C
2192	1	1/4"	1/2"	1/4"	\$1.80
2193	1	1/4"	5/8"	3/16"	3.00
2194	1	3/32"	3/4"	9/8"	3.50
2184	1	3/32"	5/8"	3/2"	3.50
2135	With molded-in metal washer				5.00

With Screw and Nut

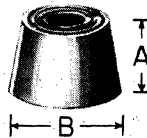
Supplied complete with 1/4" mounting screw and hex nut. For panels up to 1/4" thick. Specify longer screw for thicker panels. Std. Pkg. 100

No.	Fig.	A	B	C	Screw	NET Per C
2196	3	1/4"	1/2"	1/4"	6-32	\$7.00
2197	3	1/4"	5/8"	3/16"	6-32	8.00
2198	3	3/32"	3/4"	3/8"	6-32	9.00
2199	3	1/4"	5/8"	9/8"	6-32	9.00
2195	4	3/8"	3/32"	3/8"	8-32	10.00

VINYL CABINET BUMPERS

All molded cabinet bumpers with brass insert to absorb screw load. Molded of ethylene vinyl, color black.

Std. Pkg. 100



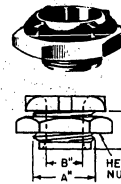
No.	Size Screw	A	B	NET Per C
2181	4	3/8"	3/4"	\$5.50
2182	6	7/8"	3/4"	6.50
2183	8	5/8"	1 1/8"	9.00

BAKELITE BUSHINGS

BODY: MOLDED Phenolic, black. U.L. approved. recommended for temperatures up to 300 degrees Fahrenheit.

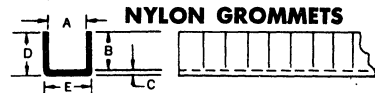
NUT: Steel, cadmium plated.

Std. Pkg. 50



No.	A	B	C	NET Per C
2136	1 1/2"	1 1/4"	1/4"	\$4.70
2137	1 1/2"	1 1/4"	3/4"	6.50
2138	2 1/2"	2 1/4"	3/4"	8.00
2139	2 1/2"	2 1/4"	1 1/2"	20.00

EXTRUDED "CATERPILLAR" NYLON GROMMETS



Shape your own grommets to fit any size or shape opening. Made of non-conductive Black Nylon, Type 6/6, fungus resistant to conform to Mil M 20693a, Type 1. Available in 25 ft. rolls for panel thickness .052 to .125

Std. Pkg. 1

No.	A	B	C	D	E	NET Ea.
2692	.052	.150	.040	.190	.125	\$10.00
2693	.085	.155	.045	.200	.162	11.50
2694	.125	.175	.045	.220	.206	12.00

BLIND HOLE MOUNTING ACCESSORIES

Molded of polyethylene and requires no mounting hardware or special tools, just snaps into hole. Color Gray, temperature rating 100-205°F.

Std. Pkg. 100

GROMMETS

max. panel thickness .095

No.	Mtg. Hole	Cable Dia.	Net Per C
8974	1/4"	1/8"	\$2.00
8976	3/8"	3/8"	2.25
8976	1/2"	3/8"	2.50
8977	3/4"	1/2"	3.50
8978	3/4"	5/8"	4.00

CABLE STRAPS

mounting hole 1/4", 3/8" wide for panel thickness 1/8"

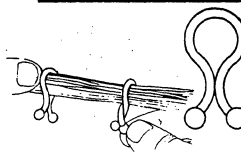
No.	Max. Cable Dia.	NET Per C
8971	1/4"	\$2.00
8972	3/8"	2.50
8973	5/8"	3.00

TWIST LOCK CABLE TIES

Time and cost saving white Nylon re-usable cable ties. Twists to lock wire into place, twists to unlock.

Std. Pkg. 100

No.	For Wire Dia.	NET Per C	NET per M
8982	.200-.300	\$2.10	\$18.00
8983	.400-.500	2.40	20.00
8984	.700-.800	2.90	24.00



IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

TERMINAL STRIPS

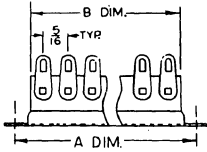
SMITH

TERMINAL STRIP ASSEMBLY

LUG: Steel, cadmium plated.
BASE: Steel, cadmium plated. Mounting holes for #6 screw.

STRIP: XP Phenolic

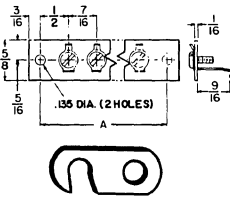
Std. Pkg. 100



No.	Terminals	Dimensions "A"	Dimensions "B"	NET Per C
3002	2	1.000	5/8"	\$10.50
3003	3	1.312	1 1/8"	13.00
3004	4	1.625	1 3/4"	15.50
3005	5	1.937	1 7/8"	17.00
3006	6	2.250	2 1/8"	18.50
3007	7	2.562	2 3/8"	19.50
3008	8	2.875	2 1/2"	22.00
3009	9	3.187	2 7/8"	24.00
3010	10	3.500	3 1/8"	26.50
3011	11	3.812	3 3/8"	27.50
3012	12	4.125	3 5/8"	30.00
3013	13	4.437	4 1/8"	32.00

SCREW TYPE TERMINAL BOARD

LUGS: BRASS, hot tinned, spaced 3/4" centers.
SCREW: Steel, cadmium plated 6-32 x 3/8".
STRIP: XP Phenolic 5/8" wide x .062 thick.

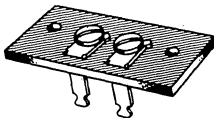


No.	Terminals	Mounting Center	Std. Pkg.	NET Per C
914	1	7/8"	50	\$12.00
872	2	1 1/4"	50	13.00
873	3	1 3/4"	50	19.00
874	4	2 1/4"	50	23.00
875	5	2 5/8"	25	28.00
876	6	3 1/4"	25	31.00
877	7	3 1/2"	25	38.00
928	8	3 3/4"	25	42.00
929	9	4 3/8"	25	46.00
930	10	4 3/4"	25	52.00
878		Shorting Link		2.50

HEAVY DUTY TERMINAL BOARD

LUG: BRASS, cadmium plated .042 thick spaced 1/2" centers. Terminals numbered.
STRIP: XP Phenolic 7/8" wide x 3/32" thick, numbered.

SCREW: Brass, nickel plated 8-32 x 3/4".



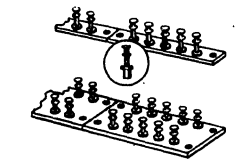
No.	Terminals	Mounting Center	Std. Pkg.	NET Per C
902	2	1 1/2"	25	\$28.00
903	3	2"	25	35.00
904	4	2 1/2"	25	42.00
905	5	3"	25	50.00
906	6	3 1/2"	25	56.00
907	7	4"	25	63.00
908	8	4 1/2"	25	72.00
909	9	5"	25	79.00
910	10	5 1/2"	25	87.00
911	11	6"	25	94.00
912	12	6 1/2"	25	102.00

SCORED TERMINAL BOARDS

SNAP-APART SEPARATION

SMITH Scored Boards are fabricated in PBE material per MIL-P-3115C, Temp. 250° F. Max., Type XXPP. Terminals are securely staked and are made of Brass per QQ-626 comp. 22, half-hard with hot-tinned dip solder finish, per MIL-F-14072 Type 221. Smith type 2008.

Std. Pkg. 10



Cat. No.	Dimensions A	Dimensions B	Terminals	Net Price Each
2810	1/2"	Single Row	25	\$2.25
2811	1 1/2"	1"	50	4.70
2812	2"	1 1/2"	50	4.90
2813	2 1/2"	2"	50	5.10
2814	3"	2 1/2"	50	5.25

"T" TYPE TERMINAL STRIPS

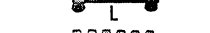
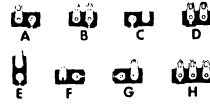
LUGS: STEEL, cadmium plated, spaced 3/8" centers.

STRIP: XP Phenolic 3/8" wide x .062 thick.

MOUNT: .140 I.D. for No. 6 screw. Std. Pkg. 100



No.	Lugs	NET Per C	No.	Lugs	NET Per C
815	1	\$ 4.10	818	4	\$11.50
816	2	6.20	819	5	15.00
817	3	8.60			



TIE DOWN TERMINAL STRIP STANDARD TYPE

LUG: STEEL cadmium plated, spaced 3/8" STRIP: XP Phenolic 3/8" wide x .062 thick.

MOUNT: .140 I.D. for No. 6 screw.

Std. Pkg. 100

III. No.	Per C	III. No.	Per C
A	861 \$ 2.40	Q	868 5.00
B	862 2.40	R	847 5.50
C	813 2.50	S	865 4.50
D	820 2.50	T	866 4.00
E	849 3.00	U	855 3.50
F	828 2.40	V	869 5.10
G	821 2.40	W	854 5.50
H	830 3.00	X	879 6.50
I	829 2.80	Y	859 6.00
J	864 3.00	Z	871 5.50
K	863 3.00	AA	860 6.00
L	846 3.50	BB	848 6.70
M	850 4.00	CC	900 6.50
N	857 4.00	DD	858 7.00
O	867 4.50	EE	870 7.20
P	853 4.50	FF	901 6.00

MINIATURE TYPE

LUG: STEEL cadmium plated, spaced 1/4" centers.

STRIP: XP Phenolic 3/8" wide x .062 thick.

MOUNT: .096 I.D. for No. 3 screw or 3/32 rivet.

Std. Pkg. 100

III. No.	Per C	III. No.	Per C
A	1061 \$ 2.40	Q	1068 5.80
B	1062 3.00	R	1071 5.80
C	1003 3.30	S	1065 5.20
D	1004 3.50	T	1066 6.50
E	1039 4.00	U	1084 7.00
F	1005 4.50	V	1069 6.20
G	1009 3.50	W	1076 9.00
H	1055 4.50	X	1158 9.50
I	1043 4.50	Y	1156 9.50
J	1064 3.60	Z	1157 9.50
K	1063 4.50	AA	1060 7.00
L	1059 4.50	BB	1078 7.50
M	1074 5.50	CC	1075 10.50
N	1072 5.50	DD	1096 10.20
O	1067 5.00	EE	1070 8.40
P	1073 5.20		

TERMINAL STRIPS UNIVERSAL LUGS

LUG: Steel, cadmium plated, spaced 3/8" STRIP: XP Phenolic 3/8" wide x .062 thick.

MOUNT: .140" I.D. for No. 6 screw.

DESCR.: QUICK CONNECT-DISCONNECT; TIE POINT SOLDER: WRAP AND SOLDER. Std. Pkg. 100

No.	Illust.	NET Per C	No.	Illust.	NET Per C
1085	A	\$ 5.60	1092	I	\$13.10
1086	B	6.30	1093	H	14.40
1087	C	5.60	1094	J	13.20
1088	D	8.10	1095	K	18.80
1089	E	8.80	1097	L	16.30
1090	F	10.60	1098	M	21.30
1091	G	13.10	1099	N	21.90



1576 Terminal Strip Connectors 8.00

BRACKET TERMINAL STRIPS

LUGS: STEEL cadmium plated, spaced 3/8" centers.

BRACKETS: Brass, cadmium plated.

STRIPS: XP Phenolic 3/8" wide x .062 thick.

MOUNT: .140 I.D. for No. 6 screw.

No.	Fig.	Lugs	NET Per C
1077	A	2	\$ 5.60
1079	C	3	8.80
1080	B	3	9
1081	B	4	
1082	B	5	1
1083	B	6	14.00

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH SOLDERLESS TERMINALS

COLOR CODE: RED: 22-18 AWG; BLUE: 16-14 AWG; YELLOW: 12-10 AWG

RING

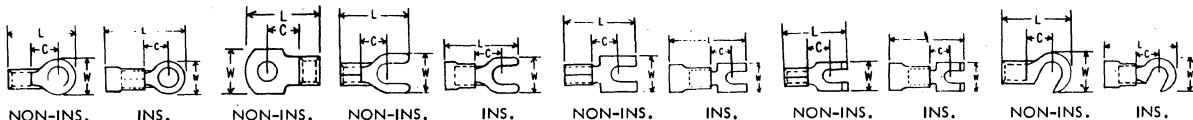
FLAG

SPADE

BLOCK SPADE

BLOCK SPADE FLANGED

HOOK



WIRE SIZE 12-10 AWG

UL APPROVED .040 Electrolytic Copper Tin Plated

Smith Cat.No.	Material	Stud Size	W	Dimensions C L	Net Per C
RING TERMINAL — NON-INSULATED					
4931	Butted Seam	8-10	3/8	9/32 47/64	\$3.10
4932	Butted Seam	12 1/4	39/64	7/16 31/32	3.50
4933	Butted Seam	5/16-3/8	39/64	7/16 31/32	3.50
4934	Brazed	8-10	39/64	7/16 47/64	\$5.30
4935	Brazed	12 1/4	39/64	7/16 31/32	6.10
4936	Brazed	5/16-3/8	39/64	7/16 31/32	6.10

RING TERMINAL — INSULATED

4937	Vinyl	8-10	3/8	9/32 1-1/64	6.10
4938	Vinyl	12 1/4	39/64	7/16 1-9/32	6.60
4939	Vinyl	5/16-3/8	39/64	7/16 1-9/32	6.60
4940	Nylon	8-10	3/8	9/32 1-1/64	7.70
4941	Nylon	12 1/4	39/64	7/16 1-9/32	8.80
4942	Nylon	5/16-3/8	39/64	7/16 1-9/32	8.80

FLAG TERMINAL — NON-INSULATED

4943	Butted Seam	8-10	3/8	9/32 11/16	3.50
------	-------------	------	-----	------------	------

SPADE TERMINAL — NON-INSULATED

4944	Butted Seam	8	3/8	9/32 47/64	\$3.10
4945	Butted Seam	10	3/8	9/32 47/64	3.10
4946	Brazed	8	3/8	9/32 47/64	5.30
4947	Brazed	10	3/8	9/32 47/64	5.30

SPADE TERMINAL — INSULATED

4948	Vinyl	8	3/8	9/32 1-1/64	6.10
4949	Vinyl	10	3/8	9/32 1-1/64	6.10
4950	Nylon	8	3/8	9/32 1-1/64	8.30
4951	Nylon	10	3/8	9/32 1-1/64	8.30

BLOCK SPADES — NON-INSULATED

4952	Butted Seam	8	5/16	9/32 47/64	\$3.10
4953	Butted Seam	10	5/16	9/32 47/64	3.10
4954	Brazed	8	5/16	9/32 47/64	5.30
4955	Brazed	10	5/16	9/32 47/64	5.30

BLOCK SPADE — INSULATED

4956	Nylon	8	5/16	9/32 1-1/64	6.10
4957	Vinyl	10	5/16	9/32 1-1/64	6.10
4958	Nylon	8	5/16	9/32 1-1/64	8.30
4959	Nylon	10	5/16	9/32 1-1/64	8.30

HOOK TERMINAL — NON-INSULATED

4960	Butted Seam	8	3/8	9/32 47/64	\$3.10
4961	Butted Seam	10	3/8	9/32 47/64	3.10
4962	Brazed	8	3/8	9/32 47/64	5.30
4963	Brazed	10	3/8	9/32 47/64	5.30

HOOK TERMINAL — INSULATED

4964	Vinyl	8	3/8	9/32 1-1/64	6.10
4965	Vinyl	10	3/8	9/32 1-1/64	6.10
4966	Nylon	8	3/8	9/32 1-1/64	8.30
4967	Nylon	10	3/8	9/32 1-1/64	8.30

WIRE SIZE 26-24 AWG

UL APPROVED .020 Electrolytic Copper Tin Plated

Smith Cat.No.	Material	Stud Size	W	Dimensions C L	Net Per C
MINIATURE RING TERMINAL — NON-INSULATED					
4968	Butted Seam	4	13/64	7/32 37/64	\$6.60
4969	Butted Seam	6	13/64	7/32 37/64	6.60
4970	Butted Seam	8	1/4	9/32 21/32	6.60
4971	Butted Seam	10	1/4	9/32 21/32	6.60

MINIATURE RING TERMINAL — INSULATED

4972	Nylon	4	13/64	7/32 39/64	7.70
4973	Nylon	6	13/64	7/32 39/64	7.70
4974	Nylon	8	1/4	9/32 11/16	7.70
4975	Nylon	10	1/4	9/32 11/16	7.70

MINIATURE SPADE TERMINAL — NON-INSULATED

4976	Butted Seam	4	13/64	7/32 37/64	6.60
4977	Butted Seam	6	1/4	9/32 11/16	6.60

MINIATURE SPADE TERMINAL — INSULATED

4978	Nylon	4	13/64	7/32 39/64	7.70
4979	Nylon	6	1/4	9/32 11/16	7.70

WIRE SIZE 16-14 AWG

UL APPROVED .030 Electrolytic Copper Tin Plated

Smith Cat.No.	Material	Stud Size	W	Dimensions C L	Net Per C
RING TERMINAL — NON-INSULATED					
4865	Butted Seam	4-6	1/4	7/32 19/32	\$2.20
4866	Butted Seam	8	21/64	1/4 11/16	2.20
4867	Butted Seam	10	21/64	1/4 11/16	2.20
4868	Butted Seam	12 1/4	15/32	13/32 57/64	2.60
4869	Brazed	4-6	1/4	7/32 19/32	3.50
4870	Brazed	8	21/64	1/4 11/16	3.50
4871	Brazed	10	21/64	1/4 11/16	3.50
4872	Brazed	12 1/4	15/32	13/32 57/64	4.40

RING TERMINAL — INSULATED

4873	Vinyl	4-6	1/4	7/32 25/32	4.40
4874	Vinyl	8	21/64	1/4 7/8	4.40
4875	Vinyl	10	21/64	1/4 7/8	4.40
4876	Vinyl	12 1/4	15/32	13/32 1-3/16	5.00
4877	Nylon	4-6	1/4	7/32 25/32	7.20
4878	Nylon	8	21/64	1/4 7/8	7.20
4879	Nylon	10	21/64	1/4 7/8	7.20
4880	Nylon	12 1/4	15/32	13/32 1-3/16	8.30

FLAG TERMINAL — NON-INSULATED

4881	Butted Seam	8-10	3/8	11/32 11/16	\$3.30
------	-------------	------	-----	-------------	--------

SPADE TERMINAL — NON-INSULATED

4882	Butted Seam	4-6	21/64	1/4 11/16	\$2.20
4883	Butted Seam	8	21/64	1/4 11/16	2.20
4884	Butted Seam	10	21/64	1/4 11/16	2.20
4885	Brazed	4-6	21/64	1/4 11/16	3.50
4886	Brazed	8	21/64	1/4 11/16	3.50
4887	Brazed	10	21/64	1/4 11/16	3.50

SPADE TERMINAL — INSULATED

4888	Vinyl	4-6	21/64	1/4 7/8	4.40
4889	Vinyl	8	21/64	1/4 7/8	4.40
4890	Vinyl	10	21/64	1/4 7/8	4.40
4891	Nylon	4-6	21/64	1/4 7/8	7.20
4892	Nylon	8	21/64	1/4 7/8	7.20
4893	Nylon	10	21/64	1/4 7/8	7.20

BLOCK SPADES — NON-INSULATED

4894	Butted Seam	4-6	19/64	1/4 21/32	\$2.20
4895	Butted Seam	8	19/64	1/4 21/32	2.20
4896	Butted Seam	10	19/64	1/4 21/32	2.20
4897	Brazed	4-6	19/64	1/4 21/32	3.50
4898	Brazed	8	19/64	1/4 21/32	3.50
4899	Brazed	10	19/64	1/4 21/32	3.50

BLOCK SPADES — INSULATED

4901	Vinyl	4-6	19/64	1/4 27/32	4.40
4902	Vinyl	8	19/64	1/4 27/32	4.40
4903	Vinyl	10	19/64	1/4 27/32	4.40
4904	Nylon	4-6	19/64	1/4 27/32	7.20
4905	Nylon	8	19/64	1/4 27/32	7.20
4906	Nylon	10	19/64	1/4 27/32	7.20

BLOCK SPADES FLANGED — NON-INSULATED

4907	Butted Seam	4-6	19/64	1/4 21/32	\$2.20
4908	Butted Seam	8	19/64	1/4 21/32	2.20
4909	Butted Seam	10	19/64	1/4 21/32	2.20
4910	Brazed	4-6	19/64	1/4 21/32	3.50
4911	Brazed	8	19/64	1/4 21/32	3.50
4912	Brazed	10	19/64	1/4 21/32	3.50

BLOCK SPADES FLANGED — INSULATED

4913	Vinyl	4-6	19/64	1/4 27/32	4.40
4914	Vinyl	8	19/64	1/4 27/32	4.40
4915	Vinyl	10	19/64	1/4 27/32	4.40
4916	Nylon	4-6	19/64	1/4 27/32	7.20
4917	Nylon	8	19/64	1/4 27/32	7.20
4918	Nylon	10	19/64	1/4 27/32	7.20

HOOK TERMINAL — NON-INSULATED

4919	Butted Seam	4-6	21/64	1/4 11/16	\$2.20
4920	Butted Seam	8	21/64	1/4 11/16	2.20
4921	Butted Seam	10	21/64	1/4 11/16	2.20
4922	Brazed	4-6	21/64	1/4 11/16	3.50
4923	Brazed	8	21/64	1/4 11/16	3.50
4924	Brazed	10	21/64	1/4 11/16	3.50

HOOK TERMINAL — INSULATED

4925	Vinyl	4-6	21/64	1/4 7/8	4.40
4926	Vinyl	8	21/64	1/4 7/8	4.40
4927	Vinyl	10	21/64	1/4 7/8	4.40
4928	Nylon	4-6	21/64	1/4 7/8	7.20
4929	Nylon	8	21/64	1/4 7/8	7.20
4930	Nylon	10	21/64	1/4 7/8	7.20

STANDARD PACKAGE: 100 OF A NUMBER

WIRE SIZE 22-18 AWG

UL APPROVED .020 Electrolytic Copper Tin Plated

Smith Cat.No.	Material	Stud Size	W	Dimensions C L	Net Per C
RING TERMINAL — NON-INSULATED					
4801	Butted Seam	4-6	1/4	7/32 19/32	\$2.20
4802	Butted Seam	8	21/64	1/4 11/16	2.20
4803	Butted Seam	10	21/64	1/4 11/16	2.20
4804	Brazed	4-6	1/4	7/32 19/32	3.50
4805	Brazed	8	21/64	1/4 11/16	3.50
4806	Brazed	10	21/64	1/4 11/16	3.50

RING TERMINAL — INSULATED

4809	Vinyl	4-6	1/4	7/32 25/32	4.40
4810	Vinyl	8	21/64	1/4 7/8	4.40
4811	Vinyl	10	21/64	1/4 7/8	4.40
4812	Nylon	4-6	1/4	7/32 25/32	7.20
4813	Nylon	8	21/64	1/4 7/8	7.20
4814	Nylon	10	21/64	1/4 7/8	7.20

FLAG TERMINAL — NON-INSULATED

4815	Butted Seam	8-10	3/8	11/32 21/32	3.50
------	-------------	------	-----	-------------	------

SPADE TERMINAL — NON-INSULATED

4816	Butted Seam	4-6	21/64	1/4 11/16	\$2.20
4817	Butted Seam	8	21/64	1/4 11/16	2.20
4818	Butted Seam	10	21/64	1/4 11/16	2.20
4819	Brazed	4-6	21/64	1/4 11/16	3.50
4820	Brazed	8	21/64	1/4 11/16	3.50
4821	Brazed	10	21/64	1/4 11/16	3.50

SPADE TERMINAL — INSULATED

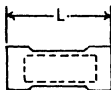
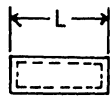
4822	Vinyl	4-6	21/64	1/4 7/8	4.40
4823	Vinyl	8	21/64	1/4 7/8	4.40
4824	Vinyl	10	21/64	1/4 7/8	4.40
4825	Nylon	4-6	21/64	1/4 7/8	7.20
4826	Nylon	8	21/64	1/4 7/8	7.20
4827	Nylon	10	21/64	1/4 7/8	7.20

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

SOLDERLESS TERMINALS

SMITH

BUTT CONNECTORS UL APPROVED

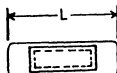


Smith Cat. No.	Material	Wire Size	Thick	L	Cost Per C
NON-INSULATED					
4986	Butted Seam	26-24	.016	5/8	\$7.20
4987	Butted Seam	22-18	.030	9/16	2.20
4988	Butted Seam	16-14	.030	9/16	2.20
4989	Butted Seam	12-10	.040	9/16	3.30

INSULATED

4990	Nylon	26-24	.016	7/8	\$10.50
4991	Nylon	22-18	.030	15/16	5.50
4992	Vinyl	16-14	.030	15/16	5.50
4993	Vinyl	12-10	.040	15/16	6.60

PARALLEL CONNECTORS



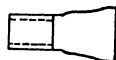
NON-INSULATED

4994	Butted Seam	22-18	.030	5/16	\$2.20
4995	Butted Seam	12-10	.030	5/16	2.20
4996	Butted Seam	12-10	.040	5/16	2.80

INSULATED

4997	Vinyl	22-18	.030	11/16	\$3.90
4998	Vinyl	16-14	.030	11/16	3.90
4999	Vinyl	12-10	.040	11/16	5.00

CONNECTORS



BUTT CONNECTORS — CLOSED END

Smith Cat. No.	Material	Wire Size	I.D.	O.D.	L	Cost Per C
5005	Nylon	22-14	1/4	13/32	45/64	\$3.90
5006	Nylon	18-10	3/8	15/32	3/4	5.00

TOOLS

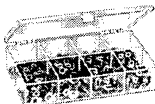


TOOL NO. 4980

Made of heavy gauge heat treated tool steel with insulated handles. Adjustable tension screw, cuts and crimps wire and all types of terminals 10-22 AWG, also 7 MM. Std. Pkg. 1

No.	Less Bolt Cutter	NET Ea.
4980		\$5.50
5050	With Bolt Cutter	6.10

KITS



TERMINAL KIT, UNINSULATED

Terminal Kit, Uninsulated, contains 200 popular assorted types, 18 styles.
Cat. No. 4981 With Tool NET \$11.00
Cat. No. 4984 Less Tool NET 5.50

TERMINAL KIT, VINYL INSULATED

Terminal Kit, Vinyl Insulated Types, contains 180 popular types, 18 styles.
Cat. No. 4982 With Tool NET 15.40
Cat. No. 4985 Less Tool NET 9.90

TERMINAL KIT, NYLON INSULATED

Terminal Kit, Nylon Insulated Types, contains 165 assorted types, 18 styles.
Cat. No. 4983 With Tool NET \$18.70
Cat. No. 5000 Less Tool NET 13.20

ALL KITS PACKED IN PLASTIC BOXES

*QUICK SLIDES — SELF MATING UL APPROVED



NON-INSULATED

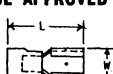
5015	Butted Seam	18-14	.187-.205	31/64	\$2.80
5016	Butted Seam	18-14	.250	41/64	2.80

INSULATED — PATENTED

5017	Vinyl	18-14	.187-.205	25/32	5.00
5018	Vinyl	18-14	.250	25/32	5.00

* U. S. PATENT

QUICK SLIDES — FEMALE — UL APPROVED



NON-INSULATED

Smith Cat. No.	Material	Wire Size	W	Thick	L	Cost Per C
5007	Butted Seam	18-14	.187	.018	31/64	\$2.20
5008	Butted Seam	18-14	.250	.030	41/64	2.20

INSULATED

5009	Vinyl	18-14	.187	.018	25/32	5.00
5010	Vinyl	18-14	.250	.032	55/64	5.00

QUICK SLIDES — MALE



NON-INSULATED

5011	Butted Seam	18-14	.187	.016	1/2	\$2.20
5012	Butted Seam	18-14	.250	.032	23/32	2.20

INSULATED

5013	Vinyl	18-14	.187	.016	25/32	5.00
5014	Vinyl	18-14	.250	.032	59/64	5.00

QUICK SLIDE RECEPTACLE INSULATED



DOUBLE MALE INLINE CONNECTION

5019	Vinyl	.157	.250W	\$8.30
------	-------	------	-------	--------



MULTI-STACKING QUICK SLIDE SELF-MATING

NON-INSULATED

Smith Cat. No.	Material	Wire Size	W	Thick	Length	Cost Per C
5077	Butted Seam	22-18	.250	.030	5/8"	\$4.40
5078	Butted Seam	16-14	.250	.030	5/8"	6.40

INSULATED

5079	Vinyl	22-18	.250	.030	7/8"	9.70
5080	Vinyl	16-14	.250	.030	7/8"	9.70

MULTI-STACKING QUICK SLIDE SELF-MATING

Smith Cat. No.	Material	Wire Size	W	Thick	Length	Cost Per C
5082	Open Barrel Solder	20-14	.250	.030	3/4"	6.40



QUICK SLIDE ADAPTER

Smith Cat. No.	Material	Wire Size	W	Thick	Length	Cost Per C
5081	—	—	.250	.030	3/4"	6.40



QUICK SLIDE MALE TABS

Smith Cat. No.	Material	Stud Size	W	Thick	Length	Cost Per C
5083	—	#6	.250	.030	13/16"	\$2.80
5084	—	#8	.250	.030	13/16"	2.80

*CROSS-LOCK DISCONNECT — SELF-MATING



NON-INSULATED

Smith Cat. No.	Material	Wire Size	W	Thick	Cost Per C
5001	Butted Seam	22-18	1/4	.030	\$3.90
5002	Butted Seam	16-14	1/4	.030	3.90

INSULATED

5003	Vinyl	22-18	1/4	.030	6.60
5004	Vinyl	16-14	1/4	.030	6.60

* U. S. PATENT

SNAP PLUGS —



NON-INSULATED

Smith Cat. No.	Material	Wire Size	W	Thick	Net Per C
5020	Butted Seam	16-14	.157	3/16	\$2.20
5021	Butted Seam	16-14	.176	3/16	2.20

INSULATED

5022	Vinyl	16-14	.157	3/16	.030 4.40
5023	Vinyl	16-14	.176	3/16	.030 4.40



SNAP PLUG RECEPTACLE INSULATED

5024	Vinyl	used with .157 plug	6.60
------	-------	---------------------	------

SMITH BARREL STYLES NON-INSULATED TERMINALS



BUTTED SEAM

- Electrolytic pure copper, tin plated.
- Open end for visual inspection of wire contact.
- Tight grip, multiple barrel serrations for full wire contact.

BRAZED — Same as above except silver brazed barrel.

INSULATED TERMINALS



VINYL INSULATED

- Electrolytic pure copper, tin plated.
- Vinyl insulation, butted seam.
- Flared for easy wire insertion.
- Color coded for proper wire selection.

NYLON INSULATED

- Electrolytic pure copper, tin plated.
- Flared for easy wire insertion.
- Nylon insulation.
- Butted seam with seamless brass sleeve attached.
- Color Coded.

MODERN FACILITIES

We invite you to utilize our modern manufacturing facilities and methods for your molding, screw-machine, stamping or sub-assemblies. We are equipped for both the long run and the short run. From raw material to finished part, SMITH detailed workmanship and production efficiency assure a quality product, speedily and economically made.

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH AMP SOLDERLESS TERMINALS

"PRE-INSULATED DIAMOND GRIP" (P.I.D.G.)



These terminals exceed all military specifications in regard to Tensile Strength, Corrosion Resistance, Vibration Resistance and Heat Cycling Tests. Color coded for wire size.

Std. Pkg. 100

RING TONGUE

Wire Size	No.	AMP No.	Stud Size	Tongue Width	Overall Length	Stud Clear.	NET Per C
22	1550	320882	4	3/16	2 1/2	3/32	\$13.00
	1551	31881	6	3/16	2 1/2	3/32	13.00
to	1552	31885	8	3/16	2 1/2	3/32	13.00
	1553	31887	10	3/16	2 1/2	3/32	13.00
16	1554	31894	1/4	1/32	1 1/8	2 1/4	15.00
14	1555	32441	4	1/4	1 1/8	1 1/4	\$13.00
	1556	32442	6	1/4	1 1/8	1 1/4	13.00
to	1557	31902	8	1/32	2 1/2	3/32	13.00
	1558	322238	10	3/16	2 1/2	3/32	13.00
18	1559	31906	1/4	1/32	1 1/8	2 1/4	15.00

SPADE TONGUE

22-16	1565	34541	6	1/4	3 1/4	1 3/4	\$13.00
	1566	32053	8	3/8	3 1/4	1 3/4	15.00
	1567	32054	10	3/8	3 1/4	1 3/4	13.00
14-16	1568	35559	6	1/4	4 7/8	1 3/4	\$13.00
	1569	321233	8	1/4	4 7/8	1 3/4	13.00
	1570	32060	10	3/8	5 1/4	3 1/8	15.00

HOOK TONGUE

22-16	1571	34313	6	3/32	4 7/8	1 3/4	\$13.00
	1572	32456	8	1/32	5 1/4	3/32	13.00
14-16	1573	320381	6	1/32	2 1/2	3/32	\$13.00
	1574	320306	8	1/32	2 1/2	3/32	15.00
	1575	35481	10	1/32	2 1/2	3/32	13.00

BUTT CONNECTOR

1548	320559	22-16	.125 I.D.	\$50.00
1549	320562	16-14	.150 I.D.	50.00

FLANGED SPADE

22-16	1560	32562	6	1 1/4	2 1/2	1 3/4	\$13.00
	1561	32498	8	2 1/4	1 1/4	1/4	13.00
14-16	1562	320861	6	1 3/4	2 1/2	1 3/4	13.00
	1563	320862	8	1 3/4	2 1/2	1 3/4	16.00
	1564	320863	10	1 3/4	2 1/2	1 3/4	16.00

"SOLISTRAND" TERMINALS

NON-INSULATED

The only terminal designed for use with solid, stranded or irregularly shaped wires, or combinations of wires. Corrosion resistant, high strength, electro-tinned; versatile — widely adaptable.

Std. Pkg. 100

RING TONGUE

Wire Size	No.	AMP No.	Stud Size	Tongue Width	Overall Length	Stud Clear.	NET Per C
22	2850	32989	4	3/32	1 1/2	3/32	\$ 6.00
	2851	34194	6	3/32	1 1/2	3/32	6.00
	2852	32990	8	3/32	1 1/4	1 3/4	7.00
to	2853	33214	10	3/16	1 1/4	3/32	7.00
	2854	33215	1/4	1/32	1 1/8	2 1/4	10.00
16	2855	33452	3/8	1/32	1 1/8	2 1/4	10.00
	2856	33453	3/8	1/32	1 1/8	1 1/2	10.00
16	2857	32991	4	1/4	3/8	1 1/4	\$ 7.00
	2858	34197	6	1/4	3/8	1 1/4	7.00
	2859	32992	8	3/16	1 1/2	1/4	7.00
to	2860	320093	10	3/16	1 1/2	1/4	7.00
	2861	33218	1/4	1/32	1 1/8	3/4	10.00
14	2862	33454	3/8	1/32	1 1/8	3/4	10.00
	2863	33455	3/8	1/32	1 1/8	1 1/2	10.00

SPADE TONGUE

22	2864	32897	6	1 1/2	5/8	1 3/4	6.00
to	2865	32898	8	1 1/2	5/8	1 3/4	6.00
16	2866	32899	10	1 1/2	5/8	1 3/4	6.00
16	2867	32903	6	1 1/2	5/8	1 3/4	6.00
to	2868	32904	8	1 1/2	5/8	1 3/4	6.00
14	2869	32905	10	1 1/2	5/8	1 3/4	6.00

BUTT CONNECTOR

2870	31818	22-16	.140 I.D.	3/4	8.00
2871	31819	16-14	.170 I.D.	3/4	8.00

"PLASTI-GRIP" (P.G.)

Insulated, strong, special plastic has high dielectric strength. Applied with single operation of press dies or hand tools. High tensile strength. High conductivity copper, electro-tinned. Color coded for wire size.

Std. Pkg. 100

RING TONGUE

Wire Size	No.	AMP No.	Stud Size	Tongue Width	Overall Length	Stud Clear.	NET Per C
22	2750	34141	4	3/32	2 1/2	3/32	\$10.50
	2751	34142	6	3/32	2 1/2	3/32	10.50
to	2752	34145	8	3/32	2 1/2	3/32	10.50
	2753	34146	10	3/32	2 1/2	3/32	10.50
16	2754	34150	1/4	1/32	1 1/8	2 1/4	12.00
	2755	34151	3/8	1/32	1 1/8	2 1/4	12.00
	2756	34152	3/8	1/32	1 1/8	2 1/4	12.00
16	2757	34157	4	1/4	1 1/8	3/32	10.50
	2758	34158	6	1/4	1 1/8	3/32	10.50
to	2759	34160	8	1/4	1 1/8	3/32	10.50
	2760	34161	10	1/4	1 1/8	3/32	10.50
14	2761	34162	1/4	1/32	1 1/8	2 1/4	12.00
	2762	34163	3/8	1/32	1 1/8	2 1/4	12.00
	2763	34164	3/8	1/32	1 1/8	2 1/4	12.00

SPADE TONGUE

22	2764	34153	6	1 1/2	4 1/4	1 3/4	10.50
to	2765	34155	8	3/8	3 1/4	1 3/4	10.50
16	2766	34156	10	3/8	3 1/4	1 3/4	10.50
16	2767	34165	6	3/8	4 1/4	1 3/4	10.50
to	2768	34166	8	3/8	4 1/4	1 3/4	10.50
14	2769	34167	10	3/8	4 1/4	1 3/4	10.50

HOOK TONGUE

20-16	2770	34501	6	3/32	4 1/4	3/4	10.50
	2771	321699	8	1/32	5 1/4	3/4	10.50
18-14	2772	320263	8	1/32	3 1/4	1 1/4	14.00

BUTT CONNECTOR

2773	34070	22-16	.140 I.D.	1	12.00
2774	34071	16-14	.170 I.D.	1 1/4	12.00

SOLDERLESS

TERMINAL ASSORTMENTS

A basic assortment of the most commonly used Ring Tongue and Spade Terminals for wire sizes 22 thru 14. Packed in a re-usable clear plastic compartmented box.

Std. Pkg. 1

No.	Approx. Quantity of Terminals	Style	NET
1526	200	"PLASTI-GRIP"	\$25.00
1527	300	"PLASTI-GRIP"	35.00
1528	200	"SOLISTRAND"	16.00
1529	300	"SOLISTRAND"	22.00
1577	200	"P.I.D.G."	30.00
1578	300	"P.I.D.G."	45.00

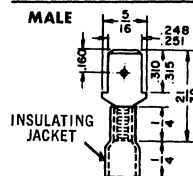
HAND CRIMPING TOOLS

Made of heavy gauge heat treated tool steel with insulated handles. Adjustable tension screw, cuts and crimps wire and all types of terminals 10-22 AWG, also 7 MM.

Std. Pkg. 1

No.	Less Bolt Cutter	With Bolt Cutter	NET Ea.
4980			\$5.50
5050			6.10

QUICK DISCONNECT TERMINALS



2742



2745

2794



2797

Terminals of pure electrolytic copper. Resists corrosion and insures shelf life. Beveled entry for easy wire threading and improved V-ridges for wire protection. Male tongue width .248/251, female entry .225 Min. Std Pkg. 100

Non-Insulated

Male	Female	Wire-Size	NET Per C
2742	2745	22-16	\$ 2.10
2743	2746	16-14	2.10
2744	2747	12-10	2.10
2794	2797	22-16	4.50
2795	2798	16-14	4.50
2796	2799	12-10	4.50

Std. Pkg. 1

No. 2748 Kit, 50 each, 12 types in plastic box

NET Ea.
\$19.80

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

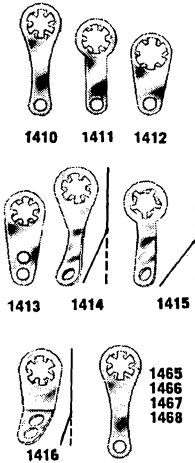
SOLDER LUGS & POWER OUTLETS

SMITH

LOCKING TERMINAL LUGS

Brass Hot Tinned

Std. Pkg. 1000



No.	Length	Thick	Hole	NET Per M
1410-4	7/8"	.018	#4	\$15.00
1410-6	7/8"	.018	#6	15.00
1410-8	7/8"	.018	#8	15.00
1410-10	5/4"	.018	#10	15.00
1410-14	1 1/2"	.018	1/2"	15.00
1411-4	4 1/2"	.020	#4	15.00
1411-6	4 1/2"	.020	#6	15.00
1411-8	4 1/2"	.020	#8	15.00
1412-4	5/8"	.018	#4	15.00
1412-6	5/8"	.018	#6	15.00
1412-8	5/8"	.018	#8	15.00
1413-4	2 3/4"	.018	#4	15.00
1413-6	2 3/4"	.018	#6	15.00
1413-8	2 3/4"	.018	#8	15.00
1414-4	1 3/4"	.018	#4	15.00
1414-6	1 3/4"	.018	#6	15.00
1414-8	1 3/4"	.018	#8	15.00
1414-10	5 3/4"	.018	#10	15.00
1415-4	4 1/2"	.018	#4	15.00
1415-6	4 1/2"	.018	#6	15.00
1415-8	4 1/2"	.018	#8	15.00
1416-4	1 1/2"	.020	#4	15.00
1416-6	1 1/2"	.020	#6	15.00
1416-8	1 1/2"	.020	#8	15.00
1465	4 1/2"	.020	#4	15.00
1466	4 1/2"	.020	#6	15.00
1467	7/8"	.020	#8	15.00
1468	1 3/4"	.020	1/4"	15.00

LOCKING TERMINAL LUG ASSORTMENT

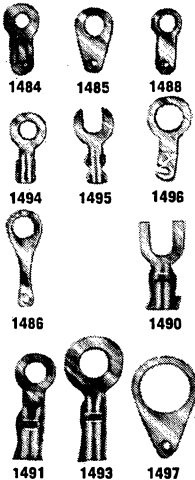
A complete assortment of the most widely used Locking Terminal Lug styles, with hole sizes from #4 thru #10. Packed in a re-usable clear plastic compartmented box. Std. Pkg. 1

No.	Approx. Quantity of Terminals	NET
1547	900	\$20.00

SOLDER LUGS

Hot Tinned

Std. Pkg. 1000



No.	Material	Length	Thick-ness	Hole	NET Per M
1484	Ph. Br.	5/8"	.020"	#6	\$12.00
1485-4	Ph. Br.	1 1/2"	.012"	#4	12.00
1485-6	Ph. Br.	1 1/2"	.012"	#6	12.00
1485-8	Ph. Br.	1 1/2"	.012"	#8	12.00
1485-10	Ph. Br.	1 1/2"	.012"	#10	12.00
1486-4	Ph. Br.	1 1/2"	.012"	#4	12.00
1486-6	Ph. Br.	1 1/2"	.012"	#6	12.00
1486-8	Ph. Br.	1 1/2"	.012"	#8	12.00
1486-10	Ph. Br.	1 1/2"	.012"	#10	12.00
1488-4	Ph. Br.	5/8"	.012"	#4	12.00
1488-6	Ph. Br.	5/8"	.012"	#6	12.00
1488-8	Ph. Br.	5/8"	.012"	#8	12.00
1490	Brass	3/4"	.020"	#10	15.00
1491	Copper	1 1/2"	.020"	#10	25.00
1493	Brass	1 1/8"	.027"	1/4"	30.00
1494-6	Brass	5/8"	.020"	#6	13.00
1494-8	Brass	5/8"	.020"	#8	13.00
1495	Brass	5/8"	.020"	#8	15.00
1496	Brass	3/4"	.020"	1/4"	15.00
1497	Brass	7/8"	.017"	3/8"	18.00

SOLDER LUG ASSORTMENT

A complete assortment of the most widely used Solder Lug styles, with hole sizes from #4 thru #10. Packed in a re-usable clear plastic compartmented box. Std. Pkg. 1

No.	Approx. Quantity of Terminals	NET
1546	1400	\$20.00

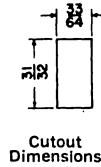
TERMINAL LUGS & SCREWS

Recommended for heavy duty terminal strips. Lugs are tapped with screw inserted. Brass hot tinned. Std. Pkg. 100

No.	Screw	NET Per C
1478	6-32	\$6.00
1479	8-32	8.00

CONVENIENCE OUTLETS

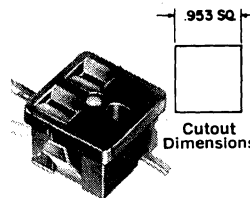
For small unit electrical appliances and Electronic devices.
UL Approved RADIOS — CLOCK RADIOS — CLOCKS —
T.V. SETS — LAMPS — TOASTERS, ETC.



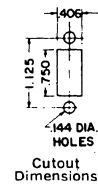
Cutout Dimensions



1283-1284-1285 Flat Flange

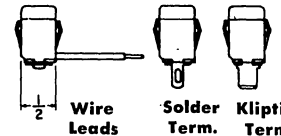


Cutout Dimensions



Cutout Dimensions

PUSH-IN SNAP-LOCK BRACKET TYPE



Carbon Steel spring clips lock unit securely in place when pushed into opening. UL Approved.

Rating: 15 Amps, 125 Volts AC or DC.
Leads: Plastic wire #14 gauge, 6" long.

No.	Terminals	Color	Std. Pkg. 50
1283-103	Wire Leads	Black	Net Per C \$30.00
1284-103	Solder	Black	38.00
1285-103	Kriptite	Black	38.00

THREE WIRE OUTLET (With grounding lead)

Carbon Steel spring clips lock unit securely in place when pushed into opening. UL Approved.

Rating: 15 Amps, 125 Volts AC or DC.
Leads: Two #14 gauge 6" long plastic wire and one #16 gauge green ground lead 6" long.

No.	Color	Std. Pkg. 50
1280-103	Black	Net Per C \$43.00
1280-101	White	45.00

BRACKET TYPE

Top or Bottom Mount

Flat steel bracket mounts with two #6 screws or equivalent size eyelets. Black Only.

Rating: 15 Amps, 125 Volts AC or DC.
Leads: No. 1279 has two leads, plastic wire #16 gauge, 8" long. UL Approved.

No.	Type	Terminals	Std. Pkg. 50
1299	Top or Bottom Mount	Solder	Net Per C \$18.00

"UNIVERSAL" FOREIGN ADAPTER PLUGS

Permits operation of American, British or Continental electric shavers, radios, record players and other small appliances from any electrical outlet, anywhere in the world, supplying the required voltage. All plugs are rated at 15 Amps/117V: 7 1/2 Amps/220 V. Std. Pkg. 25

No.	Male Plug	NET Per C
1991	Continental	\$ 51.00
1992	American	60.00
1993	Bayonet	60.00
1994	Screw	60.00
1995	Kit of 4 Adapters, 1 each of above	Std. Pkg. 6 240.00

Streamlined bakelite plug adapters. Adapts from American to Foreign type.

RATING: 125 VAC — 15 AMP
220 VAC — 7.5 AMP

No.	Female End	Male End	Std. Pkg. 25
852	American	Continental	NET per C \$50.00
856	American	British	55.00

THE SMITH ORGANIZATION

has been a major supplier of electronic components to the industry for 25 years. Today, with its modern plant facilities and capabilities we are in a position to convert your ideas and needs, whether they be one or a million, and deliver what you want, when you want it!

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

MOUNTING ACCESSORIES SMITH

BRASS THREADED RODS

Std. Pkg. 10

1-Ft. Length			2-Ft. Length		
No.	NET Ea.	Threaded	No.	NET Ea.	
1400-1	\$.90	6-32	1400-2	\$1.80	
1401-1	.90	8-32	1401-2	1.80	
1402-1	.90	10-32	1402-2	1.80	
1403-1	1.10	1/4-20	1403-2	2.20	

NYLON THREADED RODS

Std. Pkg. 10

1-Ft. Length			2-Ft. Length		
No.	NET Ea.	Threaded	No.	NET Ea.	
1420-1	\$1.20	6-32	1420-2	\$2.40	
1421-1	1.30	8-32	1421-2	2.60	
1422-1	1.50	10-32	1422-2	3.00	
1423-1	1.80	1/4-20	1423-2	3.60	

PLAIN RODS Brass, Acetate & Nylon

Std. Pkg. 10

1/4" DIA	Std. Pkg. 10	1/4" DIA	Net Ea.
No.	Net Ea.	Type	Length
1404	\$.70	Brass N.P.	6"
1405	1.40	Brass N.P.	12"
1406	.15	Acetate	6"
1407	.30	Acetate	12"
1408	.35	Nylon	6"
1409	.70	Nylon	12"

SHAFT WRENCHES

Specially designed offset, double-end wrenches for most hex sizes encountered in electronic construction. Made of heavy gauge, cadmium plated steel, clearly marked with size. No. 999 is especially useful for Toggle Switch and Volume Control mounting nuts.

Std. Pkg. 25

No.	For Nut Sizes	NET per C
998	5/16" - 3/4"	\$30.00
999	1/2" - 3/4"	30.00
997	Set of 2 above	60.00

FIBRE WASHER KIT

Each kit contains about 1,000 Flat and Shoulder Washers, packed in an 18-compartment plastic box, in the following approximate quantities of SMITH standard washers:

100 each #2151, 2161, 2153, 2160; 75 each #2150, 2162; 60 each #2155, 2163; 50 each #2156, 2164; 2154, 2165; 35 each #2159, 2167; 25 each #2158, 2168; 10 each #2157, 2169.

No.	NET Each
2173	Kit of 1,000 Washers \$20.00

MOLDED NYLON WASHERS

Non conductive and corrosion resistant, ideal for insulation, cushioning or spacing protection. Meets Military Specification MIL-P-20693, Type 1. Available in Natural.

Std. Pkg. 100

SHOULDER

No.	A	B	C	D	E	NET Per C
2681	.122	.187	.281	.040	.040	\$2.25
2682	.146	.218	.328	.040	.040	2.40
2683	.174	.250	.375	.060	.060	2.50
2684	.201	.281	.437	.050	.050	2.75
2685	.260	.375	.562	.060	.060	3.00
2686	.385	.500	.750	.060	.060	4.75

FINISHING

No.	O.D.	I.D.	Thickness	NET Per C
2687	.437	.143	.100	\$5.00
2688	.515	.171	.115	5.25
2689	.580	.191	.152	5.50
2690	.609	.225	.160	6.00
2691	.683	.251	.183	6.50

FIBRE WASHERS



SHOULDER WASHERS



FLAT WASHERS

MATERIAL: Commercial vulcanized fibre, black, per MIL-F-1148A, grade CH. TOLERANCES: "A" dim. (I.D.) — +.010 —.000. All other dimensions shown, ± 1/64". "E" dim. (shoulder dia.) — +.000 —.010.

SHOULDER WASHERS

Cat. No.	Screw Clear.	A (I.D.)	B (O.D.)	C (Thk)	D (Shldr Hgt)	E (Shldr Dia.)	NET Per C	NET Per M
2171	NO. 2	.093	.250	.055	.025	.154	\$1.40	\$11.00
2151	NO. 4	.115	.250	.062	.031	.187	1.40	11.00
2152	NO. 6	.141	.250	.093	.031	.187	1.40	11.00
2153	NO. 6	.141	.312	.093	.031	.187	1.50	12.00
2150	NO. 6	.141	.375	.093	.031	.240	1.50	12.00
2155	NO. 8	.167	.375	.093	.031	.246	1.50	12.00
2156	NO. 10	.194	.375	.093	.031	.308	1.60	13.00
2154	1/4"	.253	.500	.093	.031	.308	1.60	13.00
2159	17/64"	.265	.500	.093	.031	.365	2.10	17.00
2158	3/8"	.385	.625	.093	.031	.498	2.30	19.00
2157	3/8"	.378	.750	.093	.031	.498	2.70	22.00

FLAT WASHERS

Cat. No.	Screw Clear.	A (I.D.)	B (O.D.)	C (Thk)	NET Per C	NET Per M
2191	NO. 2	.093	.250	1/32"	\$.80	\$ 6.00
2161	NO. 4	.115	.250	1/16"	.90	7.00
2160	NO. 6	.141	.250	1/16"	.90	7.00
2162	NO. 6	.141	.375	1/16"	.90	7.00
2163	NO. 8	.169	.375	1/16"	1.00	8.00
2164	NO. 10	.196	.375	1/16"	1.00	8.00
2165	1/4"	.253	.500	1/16"	1.00	8.00
2166	1/4"	.253	.500	3/32"	1.80	14.00
2167	5/16"	.315	.500	1/16"	1.30	10.00
2168	3/8"	.385	.625	1/16"	1.30	10.00
2169	3/8"	.378	.750	1/16"	1.90	15.00

NYLON WASHERS



SHOULDER WASHERS



FLAT WASHERS

MATERIAL: Nylon (Zytel 101), natural, per MIL-P-20693A.

TOLERANCES: "A" dim. (I.D.) — +.010 —.000. All other dimensions shown, ± 1/64". "E" dim. (shoulder dia.) — +.000 —.010.

SHOULDER WASHERS

Cat. No.	Screw Clear.	A (I.D.)	B (O.D.)	C (Thk)	D (Shldr Hgt)	E (Shldr Dia.)	NET Per C	NET Per M
2651	NO. 2	.093	.250	.055	.025	.154	\$ 2.20	\$17.00
2661	NO. 4	.115	.250	.062	.031	.187	2.00	15.00
2662	NO. 6	.141	.250	.093	.031	.187	2.00	15.00
2663	NO. 6	.141	.312	.093	.031	.187	2.10	16.00
2660	NO. 6	.141	.375	.093	.031	.240	2.20	17.00
2665	NO. 8	.167	.375	.093	.031	.246	2.20	17.00
2666	NO. 10	.194	.375	.093	.031	.308	2.20	17.00
2664	1/4"	.253	.500	.093	.031	.308	3.30	25.00
2669	17/64"	.265	.500	.093	.031	.365	3.30	25.00
2668	3/8"	.385	.625	.093	.031	.498	3.30	25.00
2667	3/8"	.378	.750	.093	.031	.498	4.80	37.00

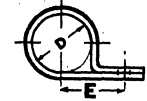
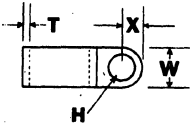
FLAT WASHERS

Cat. No.	Screw Clear.	A (I.D.)	B (O.D.)	C (Thk)	NET Per C	NET Per M
2652	NO. 2	.093	.250	1/32"	\$ 1.00	\$ 8.00
2671	NO. 4	.115	.250	1/16"	1.20	9.00
2614	NO. 4	.115	.281	3/64"	1.20	9.00
2670	NO. 6	.141	.250	1/16"	1.20	9.00
2615	NO. 6	.141	.312	3/64"	1.20	9.00
2672	NO. 6	.141	.375	1/16"	1.40	11.00
2673	NO. 8	.170	.375	1/16"	1.40	11.00
2516	NO. 8	.170	.375	1/16"	1.40	11.00
2674	NO. 10	.196	.375	1/16"	1.40	11.00
2517	NO. 10	.196	.437	1/16"	1.80	14.00
2675	1/4"	.253	.500	1/16"	2.10	16.00
2676	1/4"	.253	.500	3/32"	3.30	25.00
2518	1/4"	.253	.562	1/16"	2.20	17.00
2677	5/16"	.315	.500	1/16"	2.10	16.00
2678	3/8"	.385	.625	1/16"	2.50	19.00
2679	3/8"	.378	.750	1/16"	3.90	30.00

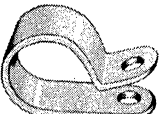
**MORE THAN TEN THOUSAND ITEMS
MANUFACTURED UNDER ONE ROOF**

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH NYLON CABLE ACCESSORIES



T=.060 X=3/32"
W=1/2" H=13/64"



T=.060 X=3/32"
W=1/2" H=13/64"



T=.050 X=3/32"
W=1/2" H=13/64"

T=.050 X=3/32"
W=3/8" H=13/64"



ALL-MOLDED CABLE CLAMPS POLYPROPYLENE

Marked for easy identification. Conforms to applicable Mil. Specs. Std. Pkg. 100

No.	Hole (D)	E	NET Per C
8910	1/8	.360	\$1.60
8911	3/16	.423	1.80
8912	1/4	.457	1.90
8913	5/16	.498	2.00
8914	3/8	.529	2.10
8915	7/16	.560	2.20
8916	1/2	.592	2.30
8917	5/8	.623	2.40
8918	3/4	.654	2.50
8919	7/8	.752	2.60
8920	1	.783	2.70
8921	3/4	.845	2.90
8922	1	.908	3.00

CELLULOSE

Made to meet MIL Std 242B (Ships), MS 3914 (Ord.) Std. Pkg. 100

No.	Hole (D)	E	NET Per C
8925	1/8	.360	\$2.10
8926	3/16	.423	2.20
8927	1/4	.457	2.30
8928	5/16	.498	2.40
8929	3/8	.529	2.50
8930	7/16	.560	2.60
8931	1/2	.592	2.70
8932	5/8	.623	2.90
8933	3/4	.654	3.00
8934	7/8	.752	3.30
8935	1	.783	3.50
8936	3/4	.845	3.70
8937	1	.908	3.90

NYLON
Marked for easy identification. Black. Made to meet these Military Specifications: Mil-Std-24E; MS-30914(Ord.) Mil-C-21565(NAS); Mil-P-17091-B; Mil-P-20693. Std. Pkg. 100

No.	Hole (D)	E	NET Per C
8940	1/8	.360	\$2.30
8941	3/16	.423	2.40
8942	1/4	.457	2.50
8943	5/16	.495	2.60
8944	3/8	.529	2.70
8945	7/16	.560	2.80
8946	1/2	.592	2.90
8947	5/8	.623	3.00
8948	3/4	.654	3.20
8949	7/8	.752	3.30
8950	1	.783	3.50
8951	3/4	.845	3.70
8952	1	.908	3.90

8955	1/8	.325	1.90
8956	3/16	.378	2.00
8957	1/4	.409	2.10
8958	5/16	.441	2.20
8959	3/8	.471	2.30
8960	7/16	.519	2.40
8961	1/2	.550	2.50

BEADED WIRE TIES WHITE NYLON

No. 8962 5" Long Std. Pkg. 100
NET Per C \$2.30

NYLON ADJUSTABLE CABLE TIE

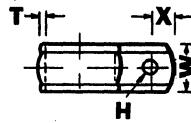
Efficiently and economically replaces lacing cord, tape and other fasteners in wrap-around applications. Adjustable from 1/8" to 1 3/8" diameter. Once applied it cannot slip. Made of Nylon.

No. 8963C NET Per C \$ 1.50
No. 8963M NET Per M \$13.00

TIGHTENING TOOL

Used with strapping for fast assembly. Std. Pkg. 1

No. 804 NET Ea. \$20.00



T=.060 - W 1/2"
X 3/16" - H .204



Hole (D)
1/8" to 1/2"
T .040
W 3/8"
X 1/2"
H .167

Hole (D)
3/16" to 1 1/4"
T .060
W 1/2"
X 3/4"
H .204

CABLE CLAMPS BUTYRATE

Made to meet MIL Std 242B (Ships), MS 3914 (Ord.) Withstands temperatures from -60 to +175 degrees F.

No.	Hole (D)	E	NET Per C
831	1/8	.360	\$ 2.34
832	3/16	.423	2.40
833	1/4	.457	2.58
834	5/16	.498	2.85
835	3/8	.529	3.00
836	7/16	.560	3.30
837	1/2	.592	3.60
838	5/8	.623	4.20
839	3/4	.654	4.50
840	7/8	.752	4.80
841	1	.783	5.10
842	3/4	.845	5.40
843	1	.908	5.70
844	3/4	.970	6.00
845	1 1/4	1.062	6.30

NYLON

MIL P17091A, Amend 2. Withstands temperatures from -60 to +250 degrees F. Black.

No.	Hole (D)	E	NET Per C
771	1/8	.310	\$ 3.60
772	3/16	.373	3.90
773	1/4	.407	4.20
774	5/16	.448	4.65
775	3/8	.479	4.80
776	7/16	.510	5.10
777	1/2	.542	5.40
778	5/8	.623	6.60
779	3/4	.654	7.20
780	7/8	.752	7.50
781	1	.783	8.10
782	3/4	.845	8.70
783	1	.908	10.20
784	3/4	1.002	12.00
785	1 1/4	1.062	13.80

NYLON LOCKING CLAMP

Wedge and ratchet design makes for positive holding and locking. Accommodates cables from 1/8" to 1 3/4". No knot tying, just slip clamp around cable, insert tongue and pull tight.

Std. Pkg. 100
No. 800 NET Per C \$9.00

NYLON MOUNTING TABS

For use with No. 800 locking clamp when pre-mounted assembly points are desired. Furnished with .203 mounting hole. Std. Pkg. 100

No. 801 NET Per C \$3.00

NYLON PERFORATED STRAPPING

For bundling of wire, cable and tubing. Time saver for harnessing. Use No. 803 ratchet buckle for fast assembly. Supplied on 50' rolls. Std. Pkg. 1

No. 802 NET Per Roll \$18.00

NYLON RATCHET BUCKLE

For No. 802 strapping. Quick and easier assembly with this ingenious item. Std. Pkg. 100

No. 803 For 1/2" Strapping NET Per C \$12.00

USE OUR VAST NATIONAL DISTRIBUTION NETWORK for Off-The-Shelf Deliveries of your smaller hardware requirements.

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

TEFLON* SPAGHETTI TUBING



COLOR CODE CHART

- 101 WHITE
- 102 RED
- 103 BLACK
- 104 GREEN
- 105 BLUE
- 106 ORANGE
- 107 YELLOW
- 108 BROWN
- 112 PURPLE
- 113 GREY
- 115 NATURAL

SPECIFY COLOR

If no color is specified, Natural Teflon (-115) will be supplied.)

Meets and exceeds MIL-1-22129B, AMS-3655 or 3654; CS252-63. Ideal for slip-on insulation, and provides greater reliability and resistance to high temperatures. Shrink-back is virtually eliminated. Individually packed in dust. SPECIFY COLOR.

STANDARD WALL

CAT. NO.	AWG WIRE SIZE	NOM. I.D.	NOM. WALL THK.	STD. PKG. FT.	NET EA.
7701-24	24	.022	.012	100	\$8.66
7701-22	22	.027	.012	100	9.57
7701-20	20	.034	.016	100	12.91
7701-19	19	.038	.016	100	14.04
7701-18	18	.042	.016	100	15.12
7701-17	17	.047	.016	100	16.46
7701-16	16	.053	.016	100	17.46
7701-15	15	.059	.016	100	18.36
7701-14	14	.066	.016	100	19.65
7701-13	13	.076	.016	100	21.81
7701-12	12	.085	.016	100	23.32
7701-11	11	.095	.016	100	25.92
7701-10	10	.106	.016	100	30.91
7701-09	9	.118	.020	100	46.32
7701-81	1/8"	.125	.020	100	52.80
7701-08	8	.133	.020	50	27.55
7701-07	7	.148	.020	50	28.20
7701-06	6	.166	.020	50	30.38
7701-05	5	.186	.020	50	33.24
7701-04	4	.208	.020	50	38.40
7701-03	3	.234	.020	50	41.16
7701-02	2	.263	.020	50	45.19
7701-01	1	.294	.020	50	50.40
7701-51	5/16"	.312	.020	50	57.60
7701-00	0	.330	.020	50	55.80

LIGHTWEIGHT

CAT. NO.	AWG WIRE SIZE	NOM. I.D.	NOM. WALL THK.	STD. PKG. FT.	NET EA.
7703-28	28	.015	.006	100	\$7.54
7703-26	26	.018	.006	100	6.00
7703-24	24	.022	.006	100	6.48
7703-22	22	.027	.006	100	7.44
7703-20	20	.034	.006	100	9.24
7703-19	19	.038	.006	100	9.72
7703-18	18	.042	.006	100	10.10
7703-17	17	.047	.006	100	11.52
7703-16	16	.053	.006	100	12.60
7703-15	15	.059	.006	100	12.96
7703-14	14	.066	.008	100	13.80
7703-13	13	.076	.008	100	15.60
7703-12	12	.085	.008	100	16.92
7703-11	11	.095	.008	100	18.36
7703-10	10	.106	.008	100	20.16
7703-09	9	.118	.008	50	14.83
7703-81	1/8"	.125	.008	50	15.60
7703-08	8	.133	.008	50	16.32
7703-07	7	.148	.008	50	20.64
7703-06	6	.166	.010	50	23.88
7703-05	5	.186	.010	50	26.04
7703-04	4	.208	.010	50	29.28
7703-03	3	.234	.010	50	31.68
7703-01	1/4"	.250	.010	50	33.60
7703-02	2	.263	.010	50	35.76
7703-01	1	.294	.010	50	40.08
7703-51	5/16"	.312	.012	50	43.20
7703-00	0	.330	.012	50	45.48

THINWALL

CAT. NO.	AWG WIRE SIZE	NOM. I.D.	NOM. WALL THK.	STD. PKG. FT.	NET EA.
7702-30	30	.012	.009	100	\$7.80
7702-28	28	.015	.009	100	6.84
7702-26	26	.018	.009	100	6.24
7702-24	24	.022	.010	100	6.84
7702-22	22	.027	.010	100	7.56
7702-20	20	.034	.012	100	9.36
7702-19	19	.038	.012	100	10.08
7702-18	18	.042	.012	100	10.80
7702-17	17	.047	.012	100	11.88
7702-16	16	.053	.012	100	12.96
7702-15	15	.059	.012	100	13.20
7702-14	14	.066	.012	100	14.16
7702-13	13	.076	.012	100	15.96
7702-12	12	.085	.012	100	17.04
7702-11	11	.095	.012	100	18.36
7702-10	10	.106	.012	100	20.40
7702-09	9	.118	.015	100	28.68
7702-81	1/8"	.125	.015	100	29.28
7702-08	8	.133	.015	50	16.66
7702-07	7	.148	.015	50	20.40
7702-06	6	.166	.015	50	26.04
7702-05	5	.186	.015	50	29.16
7702-04	4	.208	.015	50	31.68
7702-03	3	.234	.015	50	34.20
7702-01	1/4"	.250	.015	50	36.00
7702-02	2	.263	.015	50	38.88
7702-01	1	.294	.015	50	39.60
7702-51	5/16"	.312	.015	50	46.80
7702-00	0	.330	.015	50	48.00

*Registered Trademark, E.I. DuPont DeNemours & Co.

NYLON LACING CORD

MIL-T-713-D, Type P, Classes 3,2 and 1. Supplied in 1-lb. tubes. Std. Pkg. 1



No.	Class	Test	Ydge.	NET Ea.
734	1	70 lb.	600	\$13.00
735	2	48 lb.	800	13.00
736	3	32 lb.	1140	13.00
BLACK				
791	1	70	600	\$17.00
792	2	48	800	17.00
793	3	32	1140	17.00

NYLON LACING TAPE

BRAIDED - MGD FINISH

#18 size meets MIL-T-43435, size 3, finish B. Furnished in 500 yard spools.



No.	Size	Width	Thick.	Test	NET Each
766	18	.090	.0125	50 lbs.	\$15.00
767	21	.054	.008	20 lbs.	17.00
BLACK					
769	18	.090	.0125	50 lbs.	\$16.00
770	21	.054	.008	20 lbs.	18.00
COMMERCIAL TYPE					
Has all application of above but at a much lower cost. Supplied in 1-lb. tubes in natural color.					
No.	Width	Yardage	NET Ea.		
743	3/8"	620	\$12.00		

LINEN LACING CORD

MIL-T-713-D, Type N. Mildew-proofed. Supplied in 1-lb. tubes. Std. Pkg. 1



No.	Ply	Class	Ydge.	NET Ea.
727	4	—	850	\$12.00
730	6	3	600	12.00
739	8	2	470	12.00
733	9	—	400	12.00
742	12	1	300	12.00
BLACK				
794	4	—	850	\$12.00
795	6	3	600	12.00
796	8	2	470	12.00
797	9	—	400	12.00
798	12	1	300	12.00

DACRON LACING CORD

Conforms to the physical requirements of MIL-T-713-D. Greater tensile strength with minimal stretch than nylon. Fungus, acid and abrasion resistance.

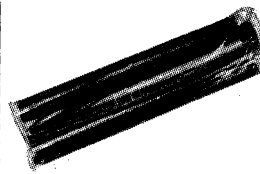
Supplied in 1 lb. tubes in natural color.



No.	Class	Test	Yardage	NET Ea.
722	1	78 lbs.	750	\$11.60
724	3	37 lbs.	1500	12.70

SHRINK TUBING ASSORTMENT

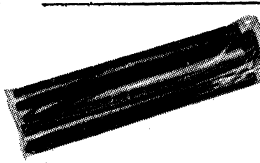
Laboratory or Work Shop assortment of Heat Shrink Polyolefin tubing meets Mil Spec 123053/5. Contains 6 different colors of all sizes from 1/8" thru 3/8" in 12" lengths, total of 36 feet.



Std. Pkg 5
Suggested Resale/Ea.
\$10.80

P.V.C. TUBING ASSORTMENT

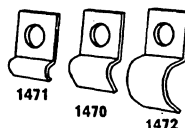
A 36 piece assortment of tubing consisting of 12" lengths, sizes #24 thru #2, 3 lengths of each size, a total of 12 sizes in assorted colors. Made of Military Grade 105° PVC, conforms to Mil-I-631D.



Std. Pkg. 6
NET Ea.
\$3.00

CABLE CLAMPS

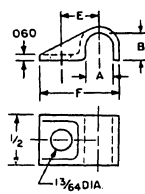
Steel Cadmium Plated with No. 8 Mtg. Hole.



No.	Length	Width	Cable	NET Per C
1471	5/8"	3/8"	1/4"	\$.90
1470	3/4"	3/8"	1/4"	.95
1472	1"	3/8"	1/2"	1.00

NYLON "HALF" CABLE CLAMPS

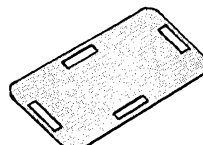
Made of solvent resistant Nylon, unaffected by most solvents, alkalies, dilute mineral acids and most organic acids. Available in Black and conforms to the following Military Specifications: MIL-P-17091A and Amendment 2, MIL-P-17091B / MIL-M-20693A Type 1, MIL-STD-242A (Ships) / MIL-STD-242B (Ships), MS-39014 (ORD)



No.	Wire Size	A	B	E	F	NET Per C
8964	1/8	.115	.115	.307	.675	\$5.50
8965	3/16	.172	.172	.336	.732	5.90
8966	1/4	.234	.234	.366	.793	6.50
8967	5/16	.297	.297	.400	.859	6.70
8968	3/8	.359	.359	.430	.920	7.00
8969	7/16	.422	.422	.460	.980	7.25
8970	1/2	.484	.484	.492	1.044	8.00

NYLON WIRE MARKER PLATES

Made of Nylon, attaches to wire harness with any type of wire tie or lacing cord. Write in identification. Available in three sizes. Reusable.



No.	Size	NET Per C
8979	3/4"x1 1/2"	9.00
8980	3/4"x1 3/4"	9.50
8981	3/4"x2"	10.00

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH

HARDWARE

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE



MACHINE SCREWS ROUND HEAD

STEEL, CADMIUM PLATED

Size	No.	NET per C	No.	NET per M
2-56 x 1/4"	1173C	\$1.29	1173M	\$11.90
2-56 x 1/2"	1174C	1.39	1174M	12.90
2-56 x 3/4"	1175C	1.47	1175M	13.70
3-48 x 3/4"	1176C	1.54	1176M	14.40
4-36 x 1/4"	1177C	1.39	1177M	12.90
4-36 x 3/8"	1178C	1.43	1178M	13.30
4-36 x 1/2"	1183C	1.48	1183M	13.80
4-36 x 5/8"	1184C	1.56	1184M	14.60
4-36 x 3/4"	1185C	1.59	1185M	14.90
4-40 x 1/4"	1350C	1.39	1350M	12.90
4-40 x 3/8"	1351C	1.43	1351M	13.30
4-40 x 1/2"	1352C	1.48	1352M	13.80
4-40 x 5/8"	1353C	1.56	1353M	14.60
4-40 x 3/4"	1354C	1.59	1354M	14.90
6-32 x 1/4"	1000C	1.23	1000M	11.30
6-32 x 3/8"	1001C	1.27	1001M	11.70
6-32 x 1/2"	1002C	1.32	1002M	12.20
6-32 x 5/8"	1355C	1.40	1355M	13.00
6-32 x 3/4"	1356C	1.48	1356M	13.80
6-32 x 1"	1357C	1.64	1357M	15.40
6-32 x 1 1/2"	1358C	3.42	1358M	33.20
8-32 x 1/4"	1006C	1.55	1006M	14.50
8-32 x 3/8"	1007C	1.45	1007M	13.50
8-32 x 1/2"	1008C	1.55	1008M	14.50
8-32 x 5/8"	1010C	1.67	1010M	15.70
8-32 x 3/4"	1359C	1.80	1359M	17.00
10-32 x 1/4"	1271C	3.04	1271M	29.40
10-32 x 1/2"	1360C	1.84	1360M	17.40
10-32 x 3/4"	1361C	2.14	1361M	20.40
10-32 x 1"	1362C	2.47	1362M	23.70

BRASS, NICKEL PLATED

Size	No.	NET per C	No.	NET per M
4-36 x 1/4"	1044C	\$2.72	1044M	\$26.20
4-36 x 3/8"	1045C	2.79	1045M	26.90
4-36 x 1/2"	1046C	3.38	1046M	32.80
4-40 x 1/4"	1047C	2.72	1047M	26.20
4-40 x 3/8"	1048C	2.79	1048M	26.90
4-40 x 1/2"	1049C	3.38	1049M	32.80
6-32 x 1/4"	1050C	3.38	1050M	32.80
6-32 x 3/8"	1051C	3.61	1051M	35.10
6-32 x 1/2"	1052C	4.05	1052M	39.50
8-32 x 1/4"	1056C	4.98	1056M	48.80
8-32 x 3/8"	1057C	5.27	1057M	51.70
8-32 x 1/2"	1058C	5.96	1058M	58.60



BINDING HEAD

STEEL, CADMIUM PLATED

Size	No.	NET per C	No.	NET per M
2-56 x 1/4"	1369C	\$1.29	1369M	\$11.90
2-56 x 1/2"	1370C	1.39	1370M	12.90
2-56 x 5/8"	1371C	1.43	1371M	13.30
3-48 x 1/4"	1272C	1.21	1272M	11.10
4-40 x 1/4"	1372C	1.39	1372M	12.90
4-40 x 1/2"	1373C	1.48	1373M	13.80
4-40 x 3/4"	1374C	1.60	1374M	15.00
6-32 x 1/8"	1273C	1.09	1273M	9.90
6-32 x 3/16"	1375C	1.40	1375M	13.00
6-32 x 1/4"	1425C	1.23	1425M	11.30
6-32 x 3/8"	1426C	1.27	1426M	11.70
6-32 x 1/2"	1427C	1.32	1427M	12.20
6-32 x 5/8"	1376C	1.40	1376M	13.00
6-32 x 3/4"	1377C	1.48	1377M	13.80
8-32 x 1/4"	1428C	1.55	1428M	14.50
8-32 x 5/16"	1378C	1.50	1378M	14.00
8-32 x 3/8"	1429C	1.45	1429M	13.50
8-32 x 1/2"	1430C	1.55	1430M	14.50
8-32 x 3/4"	1379C	1.80	1379M	17.00
10-32 x 1/2"	1380C	1.84	1380M	17.40
10-32 x 3/4"	1381C	2.14	1381M	20.40

OVAL HEAD RACK SCREWS

STEEL, NICKEL PLATED

Size	No.	NET per C	No.	NET per M
6-32 x 3/4"	1382C	\$1.55	1382M	\$14.50
8-32 x 3/4"	1383C	1.96	1383M	18.60
10-32 x 1/2"	1111C	2.53	1111M	24.30
10-32 x 3/4"	1112C	2.44	1112M	23.40



COUNTER SUNK WASHERS

BRASS, NICKEL PLATED

Size	No.	NET per C	No.	NET per M
#6	1115C	\$1.90	1115M	\$18.00
#8	1116C	1.95	1116M	18.50
#10	1117C	2.00	1117M	19.00



HEXAGON NUTS

BRASS NICKEL PLATED

Thrd Size	WD. A.F.	Thk-ness	No.	Net Per C	No.	Net Per M
2-56	3/16	1/16	1326C	\$1.04	1326M	\$ 9.40
3-48	3/16	1/16	1327C	1.04	1327M	9.40
4-36	1/4	3/32	1188C	1.33	1188M	12.30
4-40	1/4	3/32	1189C	1.33	1189M	12.30
6-32	1/4	3/32	1189C	1.33	1189M	12.30
6-32	5/16	7/64	1190C	1.87	1190M	17.70
8-32	1/4	3/32	1328C	1.33	1328M	12.30
8-32	5/16	7/64	1192C	1.79	1192M	16.90
10-32	5/16	7/64	1193C	1.85	1193M	17.50

VOLUME CONTROL—SWITCH AND POTENTIOMETER NUTS

HEX BRASS NICKEL PLATED

Thrd Size	WD. A.F.	Thk-ness	No.	Net Per C	No.	Net Per M
1/4-20	7/16	3/16	1329C	\$4.58	1329M	\$44.80
1/4-28	3/8	3/32	1243C	2.36	1243M	\$22.60
1/4-28	3/8	1/8	1244C	2.41	1244M	23.10
1/4-32	5/16	5/64	1245C	1.87	1245M	17.70
1/4-32	3/8	3/32	1187C	2.60	1187M	25.00
5/16-32	7/16	.101	1255C	3.71	1255M	36.10
3/8-32	1/2	3/32	1195C	2.33	1195M	22.30
*3/8-32	1/2	3/32	*1196C	3.26	*1196M	31.60
3/8-32	9/16	3/32	1258C	3.05	1258M	29.50
15/32-32	9/16	5/64	1196C	2.42	1196M	23.20
15/32-32	9/16	3/32	1260C	2.65	1260M	25.50

**STEEL, CADMIUM PLATED

RING NUTS, BRASS NICKEL PLATED

Thrd Size	Dia.	Thk-ness	No.	Net Per C	No.	Net Per M
3/8-32	1/2	3/32	1120C	\$ 5.10	1120M	\$50.00
15/32-32	5/8	1/16	1197C	3.10	1197M	30.00

DRESS NUT, BRASS NICKEL PLATED

15/32-32	5/8	3/32	1198C	10.10	1198M	100.00
----------	-----	------	-------	-------	-------	--------



HEXAGON NUTS

STEEL, CADMIUM PLATED

2-56	3/16	1/16	1363C	\$1.47	1363M	\$13.70
3-48	3/16	1/16	1364C	1.42	1364M	13.70
4-36	1/4	3/32	1398C	1.42	1398M	13.20
4-40	1/4	3/32	1365C	1.42	1365M	13.20
6-32	1/4	3/32	1179C	1.42	1179M	13.20
6-32	5/16	7/64	1180C	1.42	1180M	13.20
8-32	1/4	3/32	1366C	1.42	1366M	13.20
8-32	5/16	7/64	1181C	1.70	1181M	16.00
10-32	3/8	1/8	1367C	1.82	1367M	17.20
1/4-20	7/16	3/16	1368C	2.86	1368M	27.60
1/4-32	3/8	1/8	1186C	2.90	1186M	28.00



NYLON SCREWS

Natural Color, MIL-P-20693A Std. Pkg. 100

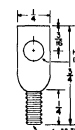
Size	No.	No.	No.	\$4.50
4-40 x 1/4"	2500	2520	2580	\$4.50
4-40 x 1/2"	2501	2521	2581	4.50
4-40 x 3/4"	2502	2522	2582	4.50
6-32 x 1/4"	2503	2523	2583	4.50
6-32 x 1/2"	2504	2524	2584	4.50
6-32 x 3/4"	2505	2525	2585	4.50
6-32 x 1"	2506	2526	2586	4.50
6-32 x 1 1/4"	2507	2527	2587	4.50
8-32 x 1/4"	2509	2529	2589	4.50
8-32 x 1/2"	2510	2530	2590	4.50
8-32 x 3/4"	2511	2531	2591	4.50
8-32 x 1"	2512	2532	2592	4.50



NYLON HEX NUTS

Natural Color, MIL-P-20693A Std. Pkg. 100

No.	Size	NET Per C
2594	4-40 x 1/4"	\$7.00
2595	6-32 x 5/16"	7.00
2596	8-32 x 11/32"	7.00
2597	10-32 x 3/8"	7.00



SPADE BOLTS

STEEL, CADMIUM PLATED

No.	NET Per C	No.	NET Per M
1500C	\$3.73	1500M	\$36.30



CAP NUTS

BRASS NICKEL PLATED

Thrd Size	Hex	Ht.	No.	Net Per C	No.	Net Per M
6-32	5/16	9/32	1300C	\$2.15	1300M	\$20.50
8-32	5/16	9/32	1301C	2.15	1301M	20.50
10-32	3/8	11/32	1302C	2.96	1302M	28.60
1/4-20	7/16	3/8	1303C	3.77	1303M	36.70
1/4-20	1/2	13/32	1304C	4.67	1304M	45.70
1/4-28	7/16	3/8	1305C	3.77	1305M	36.70
5/16-18	9/16	7/16	1306C	3.10	1306M	30.00
3/8-16	5/8	1/2	1307C	8.18	1307M	80.80
3/8-24	5/8	1/2	1308C	8.18	1308M	80.80



OPEN END CAP NUTS

Thrd Size	Hex	Ht.	No.	Net Per C	No.	Net Per M
8-32	5/16	1/4	1309C	1.73	1309M	16.30
1/4-20	7/16	21/64	1310C	3.21	1310M	31.10
1/4-20	1/2	3/8	1311C	4.47	1311M	43.70
5/16-18	9/16	3/8	1312C	5.66	1312M	55.60



KNURLED THUMB NUTS

BRASS NICKEL PLATED

Thrd Size	Dia.	Ht.	No.	Net Per C	No.	Net Per M
6-32	3/8	1/4	1313C	\$2.58	1313M	\$24.80
8-32	7/16	5/16	1314C	3.21	1314M	31.10
10-24	1/2	21/64	1315C	3.83	1315M	37.30
10-32	1/2	21/64	1316C	3.83	1316M	37.30
1/4-20	5/8	3/8	1317C	6.03	1317M	59.30



BATTERY NUTS

BRASS NICKEL PLATED

Thrd Size	Dia.	Ht.	No.	Net Per C	No.	Net Per M
6-32	11/32	13/64	1248C	\$1.87	1248M	\$17.70
8-32	11/32	13/64	1249C	1.84	1249M	17.40



ROUND LOCK NUTS

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

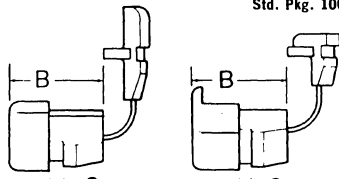
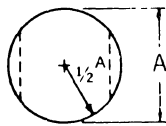
ACCESSORIES

SMITH



NYLON STRAIN RELIEFS

One-piece construction, absorbs pull and twist. Wire full anchored and insulated at chassis entrance. Available straight thru and right angle. Std. Pkg. 100



STRAIGHT THRU

RIGHT ANGLE

A = Chassis Hole. B = Length. C = Max. Chassis Thickness

STRAIGHT THRU

No.	Wire Type	Approx. Wire Size	A	B	C	NET Per C
937	AWM	1/8 - 3/16	.375"	.410"	.060"	\$ 4.00
938	SP-1, SPT-1	.12 x .22	.437"	.410"	.062"	4.00
939	SV, SVT, HPD	.250-.290	.500"	.438"	.100"	4.50
822	SPT-1, SPT-2, SP-2, HPN	.12 to .30	.500"	.406"	.062"	6.00
823	SJ, SJT, SJO	.365-.360	.625"	.580"	.062"	9.50

RIGHT ANGLE

824	SPT-1, SPT-2, SP-2, HPN	.12 to .30	.500"	.687"	.100"	8.50
825	SV, SVT, HPD	.250-.290	.500"	.687"	.100"	8.50
826	S, ST	.360-.430	.750"	1.085"	.125"	19.00



No. 940 Setting Pliers \$25.00 NET Each

FUSE MOUNTING BASES

Black bakelite, panel mount type. Will accommodate the 3 A G Auto type cartridge fuse. Std. Pkg. 50



No.	Type	NET per C
530	Single	\$22.00
531	Double	40.00

MOLDED "IN-LINE" FUSE HOLDER

For use in automobile radios, T.V., and other applications. Provides positive insulated connection. For use with 3 A G fuse, supplied with 18" wire loop, less fuse. Std. Pkg. 50



No.	NET Per C
1295	\$40.00

HEX AND SPLINE KEYS

Made of special alloy steel, tempered to avoid brittleness and impose maximum resistance to torsional strain. Ends ground for easy insertion. Std. Pkg. 100

HEX KEYS

No.	Screw	O.D.	NET Per C
340	No. 2	.034	\$ 8.60
341	No. 3, 4	.050	8.60
342	No. 5, 6	.062	8.60
343	No. 8	.078	8.60
344	No. 10	.093	9.90
345	1/4"	.125	9.90
346	5/16"	.156	9.90

SPLINE KEYS

No.	Screw	O.D.	NET Per C
370	No. 4	.058	\$ 8.60
371	No. 5	.068	8.60
372	No. 6	.075	8.60
373	No. 8	.093	8.60
374	No. 10	.109	9.90
375	1/4"	.143	9.90
376	5/16"	.182	9.90



HEX KEYS SPLINE KEYS

HEX AND SPLINE KEY KITS

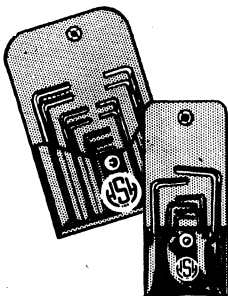
Attractive tearproof vinyl plastic kit with individual pockets for each of six keys in kit. Std. Pkg. 10

Kit of 6 hex keys for screws from No. 3 to 3/16".	NET per C
No. 355	\$66.00

Kit of 6 spline keys for screws from No. 5 to 3/16".	NET per C
No. 385	\$66.00

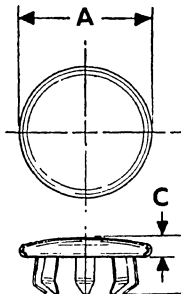
Combination Kit of 3 hex and 3 spline keys for No. 6-8-10 screws.	NET per C
No. 390	\$66.00

Kit of 7 hex keys for screws from No. 2 to 3/16" and 4 spline keys Nos. 4, 6, 8, and 10.	NET per C
No. 395	\$130.00



METAL HOLE PLUGS

Metal plugs for covering punched or drilled holes. Firm grip spring action prongs in steel, plated. Std. Pkg. 100

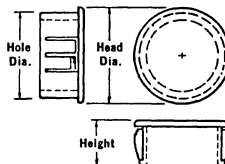


No.	Hole Dia.	A	B	C	Prongs	NET per C
650	1/4"	1/32"	1/4"	1/4"	6	\$2.75
651	3/8"	1/16"	3/8"	3/8"	6	2.75
652	1/2"	1/8"	1/2"	1/2"	6	2.75
653	5/8"	1/4"	5/8"	5/8"	8	3.00
654	3/4"	3/8"	3/4"	3/4"	8	4.00
655	7/8"	1/2"	7/8"	7/8"	12	4.00
608	1"	3/4"	1"	1"	12	4.50
612	1 1/4"	1"	1 1/4"	1 1/4"	12	8.00
656*	1"	1 1/2"	1 1/2"	1 1/2"	6	27.00
3084	1 1/8"	1 1/4"	1 1/4"	1 1/4"	12	10.00
3085	1 1/4"	1 1/2"	1 1/2"	1 1/2"	12	10.25
3086	1 3/8"	1 3/4"	1 3/4"	1 3/4"	12	10.50
3087	1 1/2"	1 3/4"	1 3/4"	1 3/4"	12	12.00

*Vent

NYLON HOLE PLUGS

Nylon hole plug, Type 66, Mil Spec. 20693A. Maximum panel thickness .062", (1/4 and 3/8); all others .125". All flat heads, except 1 1/4" dia. domed, head thickness 3/16". Std. Pkg. 100



No.	Hole Dia.	Head Dia.	Height	NET per C
3089	1/4"	3/16"	3/16"	\$4.00
3090	3/8"	3/8"	3/8"	4.25
3091	1/2"	1/2"	1/2"	4.50
3092	5/8"	5/8"	5/8"	4.75
3093	3/4"	3/4"	3/4"	5.75
3094	7/8"	7/8"	7/8"	7.50
3095	1.000	1 1/8"	1 1/8"	10.00
3096	1 1/8"	1 1/2"	1 1/2"	10.75
3097	1 1/4"	1 3/8"	1 3/8"	13.00
3098	1 3/8"	1 5/8"	1 5/8"	15.00
3099	1 1/2"	1 3/4"	1 3/4"	16.50
3083*	1"	1 1/4"	1 1/4"	12.00

*Vent

"CLEAPS"

(Connectors for Joining Severed Wires)

MATERIAL: Brass, cadmium plated.

WIRE SIZE: For wires, .010" to .050" (B&S Gauge 16 to 30).

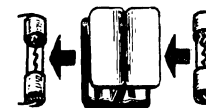
DESCR.: Used to splice cut leads of condensers, resistors, etc., in process of trouble-shooting. Insert wire in each tapered end and solder. Std. Pkg. 1000



No.	NET per M
1270	\$10.00

TV SNAP-ON FUSE HOLDER

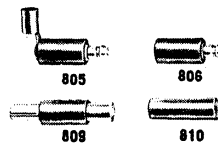
Snap fuse clip over burned out fuse. Insert new fuse without soldering. Std. Pkg. 50



No.	NET Per C
529	\$40.00

AUTO RADIO IGNITION SUPPRESSORS

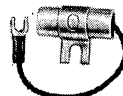
Std. Pkg. 50



No.	Type	NET per C
805	Snap-On Type Suppressor	\$55.00
806	Univ. Type with Double Thr.	50.00
809	Distributor Plug-in Type	60.00
810	Double Screw Type	35.00

GENERATOR CONDENSER

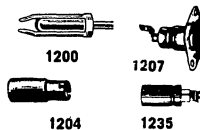
Eliminates radio interference caused by auto electrical system. Fits all cars - Proven quality - Guaranteed long life. Std. Pkg. 25



No.	Cap.	Type	NET per C
811	.5 Mfd.	General, Univ.	\$40.00
812	.25 Mfd.	Universal	42.00

MOTOROLA PLUGS & JACKS

Std. Pkg. 100



No.	Type	NET per C
1200	Motorola Type Plug	\$12.00
1207	Motorola Jack	65.00
1204	Lead-in Adapter	9.00
1235	Motorola Jack, without flange	10.00

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH CHASSIS PUNCHES / WIRE & CABLE

GREENLEE

RADIO CHASSIS PUNCHES

A complete line of chassis hole punches for swiftly cutting clean, accurately located holes in chassis and panels. An assortment of round, square, "D", and Keyed holes can be punched by inserting in drilled pilot hole, and turning with wrench. Finished hole is smooth, accurately sized without burrs. Round punches are provided with center-line markings for enlarging holes larger than pilot hole. Individually packed.

ROUND



ROUND HOLE PUNCHES

Std. Pkg. 1					
No.	Hole Size	NET Ea.	No.	Hole Size	NET Ea.
3801	1/8"	\$3.85	3814	1 1/4"	\$4.60
3802	3/16"	3.85	3815	1 3/8"	5.70
3803	1/4"	3.85	3816	1 1/2"	5.70
3804	5/16"	3.90	3817	1 3/4"	6.25
3805	3/8"	3.90	3818	1 7/8"	7.60
3806	7/16"	3.90	3819	2"	8.60
3807	1/2"	3.90	3820	2 1/8"	10.65
3808	5/8"	4.40	3821	2 1/4"	11.25
3809	3/4"	4.40	3822	2 3/8"	12.15
3810	7/8"	4.60	3823	2 1/2"	12.60
3811	1"	4.60	3824	2 7/8"	20.40
3812	1 1/8"	4.60	3825	3"	28.45
3813	1 1/4"	4.60	3826	3 1/4"	39.20

METER HOLE PUNCH

3836	2 3/8"	\$20.35
------	--------	---------

SQUARE PUNCHES

3827	1/4"	\$10.25	3830	3/4"	\$13.00
3828	3/8"	10.25	3831	1"	13.45
3829	1/2"	11.10			

"KEY" PUNCHES

3832	1 1/2"	\$9.65	3834	1 1/4"	\$11.45
3833	1 3/4"	10.40	3835	1 1/2"	13.45

"D" PUNCHES

3837	1/2"x1 1/2"	\$8.35	3838	3/4"x1 1/2"	\$8.85
------	-------------	--------	------	-------------	--------

STANDARD DRIVE SCREWS

No.	Use with Nos.	NET Ea.
3847	3804 to 3807	\$4.40
3848	3808 to 3817	.45
3849	3818 to 3819	.75
3850	3820 to 3824	.85

BALL BEARING DRIVE SCREWS

Reduces friction and effort when punching round holes 1/4" and larger. For use only with Round punches listed above.

No.	Use with Nos.	NET Ea.
3839	3804 to 3807	\$1.75
3840	3808 to 3817	1.85
3841	3818 to 3819	4.30
3842	3820 to 3824 and 3836	4.50

RELAY SOCKET PUNCH

No.	Hole Size	NET Ea.
3845	1.018 x .861	\$20.95
3846	1.250 x 1.375	31.90
3851	.990 x 1.140	23.20

CHASSIS PUNCH SET

A set of 7 of the most often used chassis punch sizes for electronic construction. Packed in a plastic platform box to keep punches sharp and rust-free. Contains the following sizes: 1/2", 3/8", 3/4", 1", 1 1/4", 1 1/2", 1 3/4".

No.	Description	Net ea.
3844	Set of 7 Punches	\$30.00

USE OUR VAST NATIONAL DISTRIBUTION NETWORK for Off-The-Shelf Deliveries of your smaller hardware requirements!

RUBBER COVERED TEST LEAD WIRE

Single conductor exceptionally flexible rubber covered wire for test lead applications. Conductor is tinned, soft annealed copper wire, stranded as shown. Available in Red and Black. Specify color.

Std. Pkg. 6

No.	AWG	Strand	Volt.	O.D.	Spool	NET ea.
7500	20	41/36	5,000	.120"	100'	\$9.00
7501	20	26/34	5,000	.125"	100'	9.20
7502	18	65/36	12,000	.150"	100'	17.00
7503	18	65/36	22,000	.245"	100'	20.40

PLASTIC COVERED TEST LEAD WIRE

Single conductor exceptionally flexible wire for modern test lead applications. Conductor is tinned, soft annealed copper wire, stranded as shown. Insulation is special flexible compound PVC, smooth finish, grease and oil resistant. Available in Red, Black, Yellow, Green, Blue, and White. Specify color.

Std. Pkg. 6

No.	AWG	Strand	Volt.	O.D.	Spool	NET ea.
7510	18	65/36	5,000	.140"	100'	\$18.00

PLASTIC-COVERED HOOK UP WIRE

Single conductor flexible stranded wire, soft annealed copper, stranded as shown. Insulation is UL rated PVC, smooth finish, available in Red, Black, Yellow, Green, Blue, White, and Brown. Specify color.

Std. Pkg. 6

No.	AWG	Strand	Volt.	O.D.	Spool	NET ea.
7561	18	16/30	1,000	.109"	100'	\$13.70
7562	16	26/30	1,000	.123"	100'	14.40
7563	14	41/30	1,000	.141"	100'	15.00

PORTABLE APPLIANCE CORD (Zip-Cord)

Two conductor, UL type SPT-1 Vinyl covered appliance cord. Available in White or Brown. Specify color.

Std. Pkg. 6

No.	AWG	Strand	Volt.	O.D.	Spool	NET ea.
7564	18	41/34	300	.110"	100'	\$13.70

SHIELDED AUDIO CABLE

Single conductor, stranded tinned copper wire, clear polyethylene insulation. Spiral or braided shield, as shown, tinned. Gray PVC jacket overall. *No. 7520 has 3/36 Phos. bronze wires for pull resistance.

Std. Pkg. 6

No.	AWG	Strand	Shield	Cap. mm/ft	O.D.	Spool	NET ea.
7520	26	*7/36	Spiral #36		.140"	100'	\$24.40
7521	22	19/34	Braid #34	25	.195"	100'	17.70

STEREO AUDIO CABLE

Two separate, shielded audio cables, molded side-by-side for stereo application. Color coded red stripe on one cable for channel identification. Each cable has stranded, tinned copper wire inner conductor color coded clear and red polyethylene insulation. Spiral shield, tinned. Gray PVC jacket overall. Can be separated in "zip-cord" fashion for termination.

Std. Pkg. 6

No.	AWG	Strand	Shield	Cap. mm/ft	O.D.	Spool	NET ea.
7540	20	10/30	Spiral #36	35	.110"	100'	\$31.70

CO-AXIAL CABLE

MIL-type coaxial cable. Stranded bare copper center conductor, polyethylene insulation. Copper braided shield, black PVC jacket overall.

Std. Pkg. 6

No.	RG-type	AWG	Braid	Cap. mm/ft	Spool	NET ea.
7530	RG-58C/U	#20 #21	Tinned	28.5	100'	\$30.40
7531	RG-11/U	#18	Bare	20.5	50'	41.80

MULTIPLE CONDUCTOR CABLE

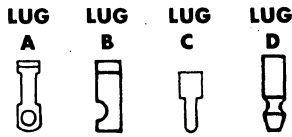
Two color-coded (Orange and Yellow) PVC insulated stranded wires. Jute filler, Gray PVC full-round .015 jacket.

Std. Pkg. 6

No.	AWG	Strand	Volt.	O.D.	Spool	NET ea.
7550	18	65/36	600	.210"	100'	\$25.40

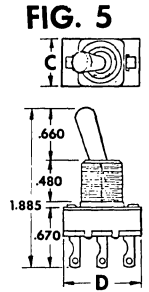
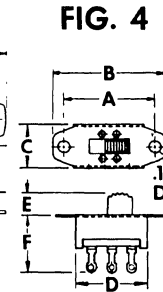
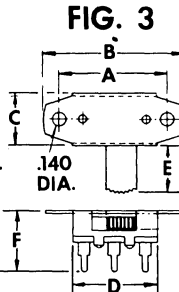
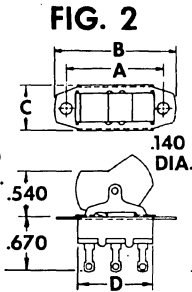
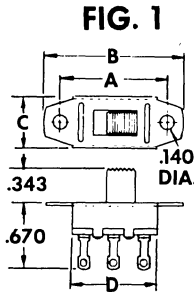
IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

CONTINENTAL-WIRE SLIDE SWITCHES **SMITH**



MATERIALS: Housings—Steel, cad. plated;
Insulators—Phenolic; Contacts—Silver
Plated Brass; Knobs & Toppers—Black
Phenolic (except = 8655—Natural Nylon)

RATINGS: Ratings: Based on 125 Volts:
Rating A—3.0 amps AC, 0.5 amps DC
Rating B—6.0 amps AC, 0.5 amps DC
Rating C—0.5 amp AC-DC



SLIDE SWITCHES - STANDARD



FIG. 1 - LUG A

DETENT

TYPE	RATING "A"				RATING "B"			
	A	B	C	D	NO.	NET per C	NO.	NET per C
SPST	1.12	1.40	0.54	0.88	515	\$17.00	1105	\$24.00
SPDT	1.12	1.40	0.54	0.88	516	18.00	1106	25.00
DPST	1.12	1.40	0.54	0.88	517	24.00	1107	32.00
DPDT	1.12	1.40	0.54	0.88	518	25.00	1108	33.00
DP3Pos	1.40	1.65	0.54	1.18	1054	35.00	8637	37.00

SPRING RETURN

3PDT	1.12	1.40	0.71	0.88	1109	55.00	8638	65.00
3P3Pos	1.40	1.65	0.78	1.18	8635	65.00	8639	75.00
4PDT	1.12	1.40	1.00	0.88	1104	75.00	8640	80.00
4P3Pos	1.40	1.65	1.00	1.18	8636	90.00	8641	100.00

ROCKER

FIG. 2 - LUG A RATING "A"



TYPE	DETENT				SPRING RETURN			
	A	B	C	D	NO.	NET per C	NO.	NET per C
SPST	1.12	1.40	0.54	0.88	8646	\$50.00	8651	60.00
SPDT	1.12	1.40	0.54	0.88	8647	55.00	8652	65.00
DPST	1.12	1.40	0.54	0.88	8648	60.00	--	--
DPDT	1.12	1.40	0.54	0.88	8649	62.00	--	--
3PDT	1.12	1.40	0.71	0.88	8650	90.00	--	--

SIDE ACTION

FIG. 3 - LUG A RATING "A"



TYPE	RATING "A"						NO.	NET per C
	A	B	C	D	E	F		
SPDT	1.12	1.40	0.54	0.88	0.51	.610	8653	30.00
DPDT	1.12	1.40	0.54	0.88	0.51	.610	8654	35.00

PRINTED CIRCUIT

FIG. 1 - LUG C RATING "A"



TYPE	RATING "A"				NO.	NET per C
	A	B	C	D		
SPDT	1.12	1.40	0.54	0.88	8613	20.00
DPDT	1.12	1.40	0.54	0.88	8614	30.00

PRINTED CIRCUIT - SIDE ACTION

FIG. 3 - LUG C RATING "C"



TYPE	RATING "C"						NO.	NET per C
	A	B	C	D	E	F		
DPDT	1.125	1.406	0.54	0.88	0.515	.610	8615	30.00

SUBMINIATURE SLIDE SWITCHES



FIG. 4 - LUG A or B RATING "C"

DETENT

TYPE	LUG	RATING "C"						NO.	NET per C
		A	B	C	D	E	F		
SPDT	B	0.56	0.76	0.31	0.38	0.19	0.261	8655	\$45.00
SPDT	A	0.81	1.00	0.40	0.63	0.20	0.550	1226	27.00
DPDT	A	0.81	1.00	0.40	0.63	0.20	0.550	1227	35.00
SP3Pos	A	1.00	1.19	0.40	0.80	0.20	0.550	1238	40.00
DP3Pos	A	1.00	1.19	0.40	0.80	0.20	0.550	1239	45.00

SPRING RETURN

SPDT	A	0.81	1.00	0.40	0.63	0.20	0.550	1236	40.00
------	---	------	------	------	------	------	-------	------	-------

PRINTED CIRCUIT

FIG. 4 - LUG C or D RATING "C"



TYPE	LUG	RATING "C"						NO.	NET per C
		A	B	C	D	E	F		
SPST	C	0.812	1.00	0.400	0.628	0.208	0.550	8632	30.00
DPDT	C	0.812	1.00	0.400	0.628	0.208	0.550	8633	36.00
DPDT	D	0.562	0.762	0.312	0.380	0.187	0.371	8634	65.00

PRINTED CIRCUIT - SIDE ACTION

FIG. 3 - LUG C RATING "C"



TYPE	RATING "C"						NO.	NET per C
	A	B	C	D	E	F		
SPDT	0.812	1.00	0.400	0.628	0.456	0.504	8616	45.00
DPDT	0.812	1.00	0.400	0.628	0.456	0.504	8617	50.00
DP3Pos	1.000	1.19	0.400	0.800	0.456	0.504	8618	65.00

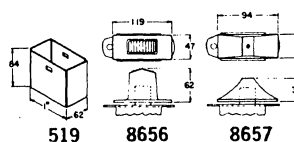
SLIDE TOGGLE SWITCHES

FIG. 5 - LUG A RATING "B"



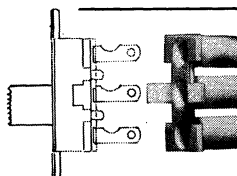
NO.	TYPE	RATING "B"		NET per C
		C	D	
1100	SPDT	0.544	0.88	\$ 95.00
1101	DPDT	0.544	0.88	100.00
1102	3PDT	0.714	0.88	130.00
1103	4PDT	1.000	0.88	150.00

SLIDE SWITCH ACCESSORIES



NO.	DESCRIPTION	NET PER C
519	NYLON SHIELD	\$15.00
8656	BLACK SLIDE TOPPER FOR STANDARD SWITCH	12.00
8657	BLACK SLIDE TOPPER FOR MINIATURE SWITCH	12.00

PLASTIC WIRE INSULATOR



For SPST and SPDT standard slide switches. Insulates lug and wire. Eliminates need of shrink-tubing insulation.

NO.	NET Per C
8699	\$7.00

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH CUTLER-HAMMER SWITCHES

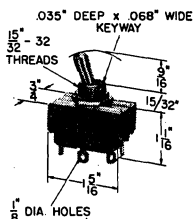


FIG. A

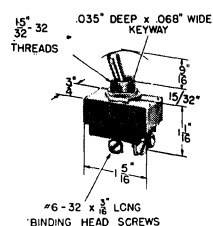


FIG. B

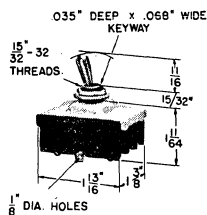


FIG. C

TOGGLE SWITCHES STANDARD DUTY

15 Amps. 125 Volts—10 Amps. 250 Volts
AC, UL Approved; 1/2" shank; slow-make and break; bakelite case. AC rated only for longer life and greater capacity. Std. Pkg. 10

BACK CONNECTED LUG TERMINALS

No.	C-H No.	Fig.	Type	NET Each
966	7501K13	A	SPST	\$1.25
967	7505K4	A	SPDT	1.40
968	7561K4	A	DPST	1.90
969	7565K5	A	DPDT	2.25
970	7611K2	C	TPST	3.70
971	7615K2	C	TPDT	4.55

BACK CONNECTED SCREW TERMINALS

No.	C-H No.	Fig.	Type	NET Each
972	7500K14	B	SPST	\$1.40
973	7504K4	B	SPDT	1.70
974	7560K5	B	DPST	2.25
975	7564K6	B	DPDT	2.70
976	7610K2	C	TPST	4.35
977	7614K2	C	TPDT	5.45

CENTER OFF STANDARD DUTY TOGGLE SWITCHES

BACK CONNECTED LUG TERMINALS

No.	C-H No.	Fig.	Type	NET Each
978	7503K13	A	SPDT	\$1.40
979	7563K4	A	DPDT	2.25
980	7613K2	C	TPDT	4.50

BACK CONNECTED SCREW TERMINALS

No.	C-H No.	Fig.	Type	NET Each
981	7502K13	B	SPDT	\$1.70
982	7562K4	B	DPDT	2.75
983	7612K2	C	TPDT	5.45

FOUR POLE SWITCHES

AC-DC GOVERNMENT APPROVED PER MIL-S-6745.
1/2" shank. Rated 10 amps, 115 volt AC—20 amps, 28 volts DC (Nominal rating per pole)
SEALED LEVER. Std. Pkg. 5

SOLDER LUGS

No.	C-H No.	"MS" No.	Type	Circuit†	NET Each
944	7661K6	—	4PST	A-D-R	\$ 7.25
945	7665K4	—	4PDT	A-D-A	8.70
924	7673K4	—	4PDT	C-B-C	11.00
3925	7675K4	—	4PDT	A-D-C	11.00

SCREW TERMINALS (Per MIL-S-3950)

No.	C-H No.	"MS" No.	Type	Circuit†	NET Each
946	7660K12	MS25068-*	4PST	A-D-B	\$ 7.55
947	7664K5	MS25068-23	4PDT	A-D-A	9.05
3926	7660K13	MS25068-24	4PST	A-B-D	7.55
3927	7666K6	MS25068-*	4PST	A-D-C	10.90
3928	7666K9	MS25068-28	4PST	D-B-C	10.90
3930	7670K6	MS25068-31	4PDT	A-B-C	11.75
3931	7672K5	MS25068-27	4PDT	C-B-C	11.75
3932	7674K5	MS25068-26	4PDT	A-D-C	11.75

†Circuit Code: A=On B=Off C=Momentary On
D=None E=Momentary Off

SHAFT WRENCHES

Specially designed offset, double-end wrenches for most hex sizes encountered in electronic construction. Made of heavy gauge, cadmium plated steel, clearly marked with size. No. 999 is especially useful for Toggle Switch and Volume Control mounting nuts. Std. Pkg. 25

No.	For Nut Sizes	NET per C
998	5/16" - 3/8"	\$30.00
999	1/2" - 9/16"	30.00
997	Set of 2 above	69.00



TOGGLE SWITCHES LIGHT DUTY

AC-DC, UL Approved; 1/2" shank; quick make—quick break; bakelite case. Unusually small size for electrical capacity. Std. Pkg. 10

BAT HANDLE 1 1/2" LONG

No.	C-H No.	Current Rating	Type	125 V.	250 V.	NET Each
950	8280K16	SPST	3 Amps.	3 Amps.		\$1.15
951	8381K8	SPST	6 Amps.	3 Amps.		1.35
952	8282K14	SPDT	3 Amps.	1 Amp.		1.50
953	8284K14	2 circ.	3 Amps.	1 Amp.		1.55
954	8360K7	DPST	3 Amps.	3 Amps.		2.10
955	8370K7	DPST	6 Amps.	3 Amps.		2.30
956	8363K7	DPDT	3 Amps.	3 Amps.		2.45
957	8373K7	DPDT	6 Amps.	3 Amps.		2.60

BAT HANDLE 1 1/8" LONG

1160	8280K38	SPST	3 Amps.	\$1.15
1164	8360K38	SPST	3 Amps.	2.10
1166	8363K38	DPDT	3 Amps.	2.45

SIDE CONN. SCREW TERMINALS SMALL BAT HANDLE 1 1/2" LONG

No.	C-H No.	Current Rating	Type	125 V.	250 V.	NET Each
958	8295K8	SPST	3 Amps.	3 Amps.		\$1.40
959	8396K8	SPST	6 Amps.	3 Amps.		1.60
960	8297K8	SPDT	3 Amps.	1 Amp.		2.05
961	8372K7	DPST	3 Amps.	3 Amps.		2.75
962	8365K7	DPDT	3 Amps.	3 Amps.		3.35
963	8375K7	DPDT	6 Amps.	3 Amps.		3.35

WIRE LEADS—SIX INCHES LONG SMALL BAT HANDLE 1 1/2" LONG

No.	C-H No.	Current Rating	Type	125 V.	250 V.	NET Each
964	8290K16	SPST	3 Amps.	3 Amps.		\$1.40
965	8391K8	SPST	6 Amps.	3 Amps.		1.60

TOGGLE SWITCHES HEAVY DUTY

AC-DC, UL Approved; 1/2" shank; quick make—quick break; bakelite case. Screw Terminals. Std. Pkg. 10

No.	C-H No.	Current Rating	Type	125 V.	250 V.	NET Each
984*	7321K3	SPST	16 A	8 A		\$2.00
985*	7320K3	DPST	16 A	8 A		2.35
986*	7361K5	SPST	15 A	10 A		4.25
987*	7360K8	DPST	15 A	10 A		4.05
988*	7402K4	DPST		20 A		5.50

*1 Hp—125/250V. +1 1/2 Hp—125/250V.
+1 1/2 Hp—125V, 2 Hp—250V.

PUSH BUTTON SWITCHES

Push to make—Push to break

AC-DC, UL Approved; 1/2" shank; bakelite case. Pushing the button once closes the contacts. Pushing it again opens the contacts. Rated at 6 Amps. 125 Volts—3 Amps. 250 Volts. Std. Pkg. 10

No.	C-H No.	Type	Terminals	NET Each
989	7206K4	SPST	Lug	\$1.75
990	7208K4	SPST	Screw	2.00
991	7207K4	SPST	Wire	2.00

PUSH BUTTON MOMENTARY SWITCHES

AC-DC, UL Approved, 1/2" shank; rated at 3/4 Amp, 125 volts—1/4 Amp, 250 volts. Std. Pkg. 10

No.	C-H No.	Type	Terminals	NET Each
992	8411K11	SP	Norm. Op. Lug	\$0.80
993	8411K12	SP	Norm. Op. Screw	.95
994	8411K8	SP	Norm. Cl. Lug	.60
995	8411K7	SP	Norm. Cl. Screw	.75

SMITH STOCKS SWITCHES

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

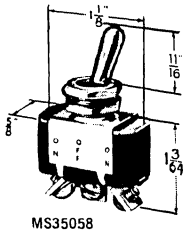
CUTLER-HAMMER SWITCHES

SMITH

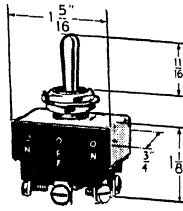
"MS" SERIES

Made to Spec. MIL-S-3950B

Supersedes all previous specifications. Made to meet MIL-S-3950B. Provided with sealed lever for protection against sand, dust and moisture.



MS35058



MS35059

SINGLE POLE

No.	C-H No.	"MS" No.	Type	Circuit†	NET Each
3900	8800K16	MS35058-21	SPST	A-B-A	\$3.10
3901	8801K22	MS35058-22	SPST	A-D-B	2.70
3902	8810K15	MS35058-23	SPST	A-D-A	3.10
3903	8801K23	MS35058-24	SPDT	A-B-D	2.70
3904	8813K18	MS35058-25	SPDT	A-E-D	4.40
3905	8804K13	MS35058-26	SPDT	A-D-C	3.40
3906	8812K14	MS35058-27	SPDT	C-B-C	3.40
3907	8811K18	MS35058-28	SPDT	D-B-C	3.00
3908	8813K17	MS35058-29	SPDT	A-D-E	3.00
3909	8811K17	MS35058-30	SPDT	B-D-C	3.00
3910	8809K16	MS35058-31	SPDT	A-B-C	3.40

DOUBLE POLE

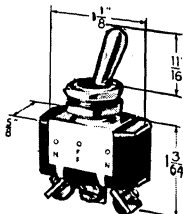
No.	C-H No.	"MS" No.	Type	Circuit†	NET Each
3911	8820K16	MS35059-21	DPDT	A-B-A	\$4.15
3912	8822K20	MS35059-22	DPST	A-D-B	3.70
3913	8824K14	MS35059-23	DPDT	A-D-A	4.15
3914	8822K21	MS35059-24	DPDT	A-B-D	3.80
3915	8828K12	MS35059-25	DPDT	A-E-D	5.40
3916	8830K13	MS35059-26	DPDT	A-D-C	5.15
3917	8834K5	MS35059-27	DPDT	C-B-C	5.15
3918	8826K14	MS35059-28	DPDT	D-B-C	4.90
3919	8828K13	MS35059-29	DPDT	A-D-E	5.40
3920	8826K15	MS35059-30	DPDT	B-D-C	4.90
3921	8832K6	MS35059-31	DPDT	A-B-C	5.40

†Circuit Code: A=On B=Off C=Momentary On
D=None E=Momentary Off

ST-40 SERIES

Nominal Rating Per Pole: 10 Amps, 115 V. AC.
20 Amps, 28 V. DC.

All ST-40 Series Switches are equipped with Sealed Lever.

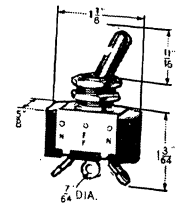


No.	C-H	IAN Type	Circuit	NET Each
1720	8801K13	ST40A SPST	On-Non-Off	\$2.70
1721	8813K12	ST40B SPST	On-None-Mom-Off	3.00
1722	8811K12	ST40C SPST	On-None-Mom-On	3.00
1723	8810K12	ST40D SPDT	On-None-On	3.10
1724	8800K13	ST40E SPDT	On-Off-On	3.10
1725	8804K12	ST40F SPDT	On-None-Mom-On	3.40
1726	8812K13	ST40G SPDT	Mom-On-Off-Mom-On	3.40
1727	8809K13	ST40H SPDT	On-Off-Mom-On	3.40

ST-42 SERIES

Nominal Rating Per Pole: 10 Amps, 115 V. AC.
20 Amps, 28 V. DC.

Std. Pkg. 10

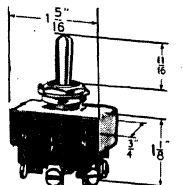


No.	C-H	ST Type	Circuit	NET Each
1730	8803K6	ST42A SPST	On-None-Off	\$2.45
1732	8817K5	ST42C SPST	On-None-Mom-On	2.70
1733	8816K5	ST42D SPDT	On-None-On	3.10
1734	8802K6	ST42E SPDT	On-Off-On	2.70
1735	8805K5	ST42F SPDT	On-None-Mom-On	3.10
1736	8818K5	ST42G SPDT	Mom-On-Off-Mom-On	2.95
1737	8815K6	ST42H SPDT	On-Off-Mom-On	2.95

ST-50 SERIES

Nominal Rating Per Pole: 10 Amps, 115 V. AC.
20 Amps, 28 V. DC.

Std. Pkg. 10



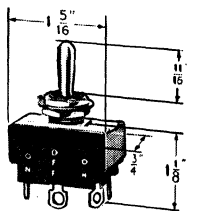
No.	C-H	ST Type	Circuit	NET Each
1740	8822K8	ST50K DPST*	On-None-Off	\$3.70
1742	8826K5	ST50M DPST	Off-None-Mom-On	4.75
1743	8824K8	ST50N DPDT*	On-None-On	4.15
1744	8820K10	ST50P DPDT*	On-Off-On	4.15
1745	8830K5	ST50R DPDT	On-None-Mom-On	5.15
1746	8834K4	ST50S DPDT*	Mom-On-Off-Mom-On	5.40
1747	8832K4	ST50T DPDT*	On-Off-Mom-On	5.15

*These switches are equipped with Sealed Lever.

ST-52 SERIES

Nominal Rating Per Pole: 10 Amps, 115 V. AC.
20 Amps, 28 V. DC.

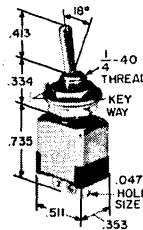
Std. Pkg. 10



No.	C-H	ST Type	Circuit	NET Each
1760	8823K5	ST52K DPST	On-None-Off	\$3.45
1762	8827K5	ST52M DPST	Off-None-Mom-On	4.25
1763	8825K5	ST52N DPDT	On-None-On	3.45
1764	8821K5	ST52P DPDT	On-Off-On	3.55
1765	8831K5	ST52R DPDT	On-None-Mom-On	4.45
1766	8835K3	ST52S DPDT	Mom-On-Off-Mom-On	4.45
1767	8833K3	ST52T DPDT	On-Off-Mom-On	4.45

MINIATURE COMMERCIAL SWITCHES

Designed for miniature applications, small in size, lightweight and requires a minimum of rear panel clearance. All phenolic parts resistive to soldering temperature, humidity and arc tracking. Mounts in a 3/4" clearance hole, solder terminal lugs with .047 dia. hole. Rated at 5 Amps 125V AC, 28V. DC except those with * 10 Amps 125V AC, 5 Amps 28V. DC. Optional color coded lever caps available to coordinate with equipment or to code circuit function. Supplied with mounting hardware, unassembled, less plastic lever cap. Std. Pkg. 10



No.	C-H No.	Circuit†	Type	NET Each
3100	SF1SBX191	A-B-A	SPDT	\$2.35
3101	SF1SCY191*	A-D-A	SPDT	2.00
3102	SF1SFX191	A-B-C	SPDT	2.35
3103	SF1SGX191	A-D-C	SPDT	2.35
3104	SF1SHX191	C-B-C	SPDT	2.10
3105	SF2SBX191	A-B-A	DPDT	3.10
3106	SF2SCY191*	A-D-A	DPDT	2.55
3107	SF2SFX191	A-B-C	DPDT	3.10
3108	SF2SGX191	A-D-C	DPDT	3.10
3109	SF2SHX191	C-B-C	DPDT	3.10
3110	SF3SBX191	A-B-A	3PDT	4.70
3111	SF3SCY191*	A-D-A	3PDT	4.40
3112	SF3SFX191	A-B-C	3PDT	4.70
3113	SF3SGX191	A-D-C	3PDT	4.70
3114	SF3SHX191	C-B-C	3PDT	4.70
3115	SF4SBX191*	A-B-A	4PDT	6.05
3116	SF4SCY191*	A-D-A	4PDT	5.00
3117	SF4SFX191	A-B-C	4PDT	6.05
3118	SF4SGX191	A-D-C	4PDT	6.05
3119	SF4SHX191	C-B-C	4PDT	6.05

†A-ON, B-OFF, C-Momentary ON, D-None

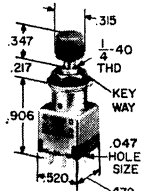
ACCESSORY PLASTIC LEVER DECORATOR CAPS

Available in white, red, black, blue, yellow, green. SPECIFY COLOR.

No.	C-H No.	NET Per C
3120	SW49AA	\$15.00

MINIATURE PUSH BUTTON SWITCHES

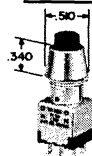
Designed for single hole mounting, quick make and break action. Solder lug terminals with .047 dia. hole. Molded phenolic parts resistive to soldering temperature, humidity and arc tracking. Rated at 5 Amps 125V AC, 28V DC. Color coded screw-on plastic available for coordination with equipment or circuit function. A decorative metal Bezel is also available and acts as shroud for the switch. Supplied unassembled, with mounting hardware less decorative button. Std. Pkg. 10



No.	C-H No.	Circuit	Type	NET Each
3126	SA21SDX1	MOM.	SPDT	\$2.36
3127	SA21SEX1	PUSH-ON-OFF	SPST	2.36
3128	SA22SDX1	MOM.	DPDT	3.24
3129	SA22SEX1	PUSH-ON-OFF	DPDT	3.24
3130	SA24SDX1	MOM.	4PDT	5.99
3131	SA24SEX1	PUSH-ON-OFF	4PDT	5.99

DECORATOR BEZEL AND SHROUD

Std. Pkg. 25



No.	C-H No.	NET per C
3138	SW2AA10	\$40.00

SCREW ON DECORATIVE PLASTIC BUTTON

Available in white, red, black, blue, yellow, green. SPECIFY COLOR.

Std. Pkg. 100

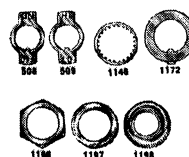
No.	C-H No.	NET per C
3132	SW53AA	\$15.00

SHAFT WRENCHES

Specially designed offset, double-end wrenches for most hex sizes encountered in electronic construction. Made of heavy gauge, cadmium plated steel, clearly marked with size. No. 999 is especially useful for Toggle Switch and Volume Control mounting nuts. Std. Pkg. 25



No.	For Nut Sizes	NET per C
998	7/16" - 3/8"	\$30.00
999	1/2" - 5/16"	30.00
997	Set of 2 above	60.00

SWITCH ACCESSORIES

No.	Description	Std. Pkg.	NET per C
508	ON-OFF name plate	100	\$ 7.00
509	HI-LO name plate	100	7.00
581	Snap-On Button (Red or Black)	50	35.00
1146	Narrow Rim Lockwasher	100	2.20
1170	Key - Remove off position	50	33.00
1171	Key - Remove both positions	50	33.00
1172	Locking Ring	50	3.20
1196	Hex Nut - Brass N.P.	100	2.40
1197	Ring Nut - Brass N.P.	100	3.10
1198	Dress Nut - Brass N.P.	100	10.10

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

KEYWAY
080 W. 046 D.
15/32
DIA.
32 THDS

21/32
15/32
29/32
21/32
9/32
1/32

Laminated type. $\frac{1}{32}$ -32 slotted sleeve, nickel finish. Supplied with hex nut and knurled nut. Solder terminals. SPST rated at 3 amps-250 volts AC-DC; all others rated at 1 amp-250 volts, 3 amps-125 volts AC-DC. Std. Pkg. 10

15 $\frac{1}{2}$ " long shaft

No.	Circuit	NET Each
510	SPST	\$1.55
511	SPDT	1.95
512	DPST	2.82
513	DPDT	3.23

$1\frac{5}{32}$ " long shaft

No.	Circuit	NET Each
500	SPST	\$1.55
502	SPDT	1.95
504	DPST	2.82
506	DPDT	3.23

MEETS MIL-S-3950B

Rated at 3 amps-250 volts, 6 amps-125 volts
AC-DC

No.	Circuit	NET Each
566	SPDT	\$3.00
567	DPDT	3.67

Laminated type. $\frac{1}{2}$ -.32 x $\frac{3}{8}$ " sleeve, nickel finish. Solder lugs. Supplied with hex nut and dress nut. SPST rated at 3 amps-250 volts AC-DC, all others rated at 1 amp-250 volts, 3 amps-125 volts AC-DC. Key removable in OFF position only on SPST and DPST—key removable in both positions on all others. **Std. Pkg. 10**

1½" Shaft

No.	Circuit	NET Each
570	SPST	\$2.09
573	DPDT	4.39

No.	Circuit	NET Each
1034	SPST	\$4.02
1035	SPDT	4.12
1037	DPST	5.10
1038	DPDT	5.12

Laminated type. $\frac{1}{32}$ x $\frac{1}{32}$ x $\frac{1}{16}$ " slotted sleeve, nickel finish. Supplied with hex nut and knurled nut. All switches accept snap on button. SPST rated at 3 amps-250 volts AC-DC. All others rated at 1 amp-250 volts, 3 amps-125 volts AC-DC. **SUPPLIED LESS BUTTON: ORDER BUTTON SEPARATELY.** (No. 581 listed on page 75.)

No.	Circuit	NET Each
552	SPST	\$3.08
556	SPDT	3.48
557	2 Circ.	3.56
564	DPST	4.18
559	DPDT	4.32

No.	Circuit	NET Each
555	SPST	\$3.08
558	DPST	4.18

Rated at 1 amp-125 volts AC

No.	Circuit	NET Each
582	SPST	\$1.70
580	2 Circ.	2.16

No.	Circuit	NET Each
579	SPST	\$1.70

Molded phenolic base. $\frac{1}{2}$ "-32 x $\frac{1}{2}$ " long slotted sleeve, nickel finish. Supplied with hex nut and knurled nut. Back connected silver plated solder contacts. SPDT rated at 1 amp-250 volts, 6 amps-125 volts AC-DC; all others rated at 3 amps-250 volts, 6 amps-125 volts AC-DC. Std. Pkg. 10

No.	Circuit	NET Each	No.	Circuit	NET Each
520	SPST	\$1.55	524	SPST (OFF)	\$2.45
521	SPDT	1.85	537	DPST (OFF)	2.91
522	DPST	2.30	525	DPDT	3.86
523	DPDT	2.62			

Bat lever. Molded phenolic base. $1\frac{1}{2}$ x $3\frac{1}{2}$ x $1\frac{1}{2}$ " long. Slotted sleeve, nickel finish. Supplied with hex nut and knurled nut. Back connected silver plated solder contacts. Rated at 1 amp.-250 volts; 3 amps.-125 volts. **Std. Pkg. 10**

No.	Circuit	NET Each
920	SPST	\$1.55
921	SPDT	1.85
923	DPST	2.30
924	DPDT	2.62

Molded phenolic base. $1\frac{1}{32}$ "-32 x $\frac{7}{16}$ " long
slotted sleeve, nickel finish, Screw terminals.
Supplied with two hex nuts. **Std. Pkg. 10**

RATINGS:		SPST	SPDT	2-Circ.	DPST*
Amps @	250 V ACDC	6	6	2	8
Amps @	125 V ACDC	12	12	6	16

*also 1 H.P. 125/250 V ACDC.

BAT LEVER

No.	Circuit	NET Each
597	SPST	\$2.34
598	SPDT	2.34
596	DPST	2.34

Molded phenolic base. $\frac{1}{32}$ x $\frac{1}{32}$ long slotted sleeve, nickel finish. Side connected silver plated solder contacts. Supplied with hex nut and knurled nut. SPST rated at 3 amps-250 volts; 6 amps-125 volts; all others rated at 1 amp-250 volts, 6 amps-125 volts. Std. Pkg. 10

No.	Circuit	NET Each
590	SPST	\$1.34
589	SPDT	1.65

No.	Circuit	NET Each
591	SPST	\$1.34
592	SPDT	1.65

3 POSITION POSITIVE CENTER OFF
Slotted sleeve 3/4-32, nickel finish. Screw terminals. Supplied with 2 hex nuts. Rated at 5 amps-250 volts, 10 amps-125 volts plus HP rating shown below.

Description	
3/4 HP	250 volts AC-DC
1/2 HP	115/230 volts AC, 3 phase
1/2 HP	115/230 volts AC, 2 phase

No.	Circuit	NET Each
574	DPDT	\$ 7.10
575	TPDT	10.90
576	4PDT	14.50

Molded Phenolic Base- $\frac{1}{32}$ x $\frac{1}{16}$ " slotted sleeve, Nickel Finish. Supplied with hex nut and knurled nut. Side connected silver plated solder contacts. Rated at 3 amps.-120 volts A.C. Supplied less button; order button separately.

No.	Contacts	Circuit	NET Ea.
925	Normally Closed (ON)	SPST	\$1.28
926	Normally Closed (ON)	2 Circ.	1.36
927	Normally Open (OFF)	SPST	1.28

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

ARROW, HART & HEGEMAN
& CUTLER-HAMMER

SWITCHES **SMITH**

SUB-MINIATURE TOGGLE SWITCHES

Offers the greatest switching flexibility and is available in both positive and momentary action. Gold plated silver stationary contacts to insure continuity on low energy circuits and Rhodium plated silver movable contacts to withstand mechanical wear. Molded diallyl phthalate and aluminum housing. Available in Commercial and Military types

Rating.

5A. 125V. AC	*AC: 75% Power Factor
5A. 29V. DC	DC: An Inductors
Max. Inrush: 25A.	Mechanical Life:
Minimum rating: 40	100,000 cycles
milliamps at 1.5 volts	

COMMERCIAL

Housing and mounting hardware gold anodized. Available only in stainless steel ball lever.

Smith No.	AH&H No.	Circuit*	Std. Pkg. 5	Net Each
4740	TC-3	SPDT A-B-A		\$5.50
4741	TE-3	SPDT C-B-A		5.80
4742	TG-3	SPDT C-B-C		5.80
4743	TM-3	SPDT C-D-A		5.80
4744	TS-1	SPST B-D-A		5.00
4745	TS-2	DPST B-D-A		6.20
4746	TS-3	SPDT A-D-A		5.50
4747	TC-6	DPDT A-B-A		9.00
4748	TE-6	DPDT C-B-C		9.00
4749	TG-6	DPDT C-B-C		9.00
4750	TM-6	DPDT C-D-A		9.00
4751	TS-6	DPDT A-D-A		7.20

*A-ON, B-OFF, C-Momentary ON, D-None

MILITARY

Meets Mil S-3950B, MS75028 and MS75029. Housing and hardware, clear anodized. Available only with aluminum bat lever.

Smith No.	AH&H No.	MS No.	Circuit*	Net Each
4760	TC-3-M	MS75028-21	SPDT A-B-A	\$5.80
4761	TE-3-M	MS75028-31	SPDT C-B-A	6.20
4762	TG-3-M	MS75028-27	SPDT C-B-C	6.20
4763	TM-3-M	MS75028-26	SPDT C-D-A	6.20
4764	TS-1-M	MS75028-22	SPST B-D-A	6.20
4765	TS-2-M	MS75029-22	DPST B-D-A	6.60
4766	TS-3-M	MS75028-23	SPDT A-D-A	5.80
4767	TC-6-M	MS75029-21	DPDT A-B-A	7.50
4768	TE-6-M	MS75029-31	DPDT C-B-A	9.50
4769	TG-6-M	MS75029-27	DPDT C-B-C	9.50
4770	TM-6-M	MS75029-26	DPDT C-D-A	9.50
4771	TS-6-M	MS75029-23	DPDT A-D-A	7.50

*A-ON, B-OFF, C-Momentary ON, D-None

SUB-MINIATURE MOMENTARY PUSH BUTTON SWITCHES

Smallest momentary switches available, combining maximum performance, dependability and durability with minimum weight and envelope. Gold plated leaf contacts, with molded diallyl phthalate body and anodized aluminum housing. Mounts with 1/2" diameter slotted sleeve, supplied with mounting hardware. Nylon push button caps are optional and are available in seven colors.

Rating: 2A. 29V. DV Resistive
1A. 115V. AC
Minimum Rating: 10 Micro-amps at 50 MV.
Weight: 2.5 Grams Single Pole
4.0 Grams Double Pole
Mechanical Life: Min. 1,000,000 Cycles.

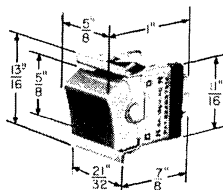
Smith No.	AH&H No.	Circuit	Net Each
4755	PM-3	SPDT NO/MC	\$5.00
4756	PM-6	DPDT NO/MC	6.20
4757	PM-7	3PST 3P/NO	5.80
4758	PM-8	3PST 3P/NC	8.40
4754		Button Only, Available in Red, Black, Green, Yellow, Blue, Brown, Natural	.19

Std. Pkg. 25

SWITCH ACCESSORIES

No.	Description	Std. Pkg.	NET per C
508	ON-OFF name plate	100	\$ 7.00
509	HI-LO name plate	100	7.00
581	Snap-On Button (Red or Black)	50	35.00
1146	Narrow Rim Lockwasher	100	2.20
1170	Key - Remove off position	50	33.00
1171	Key - Remove both positions	50	33.00
1172	Locking Ring	100	3.20
1196	Hex Nut - Brass N.P.	100	2.40
1197	Ring Nut - Brass N.P.	100	3.10
1198	Dress Nut - Brass N.P.	100	10.10

MINIATURE ILLUMINATED ROCKER SWITCHES



Designed to snap into a rectangular opening .729 x .662, panel thickness .040 to .125. Slow make and break, solder lug termination. Lamp circuit is independent with separate terminals for flexibility. Utilizes slide base bulb, readily replaceable from front panel, voltages from 6V to 220V. Rated at 5 Amps 125V AC, 28V DC. Translucent rocker available in colors. White, Red, Green, Amber, Gray, Black, Blue and Yellow — SPECIFY COLOR. Optional color-coded Nylon Bezel also available. Supplied less bulb and Bezel. Std. Pkg. 10

No.	C-H No.	Circuit†	NET Each
3139	SC2BX	A-B-A	\$4.58
3140	SC2CX	A-D-A	4.58
3141	SC2GX	C-D-A	4.71

†A-ON, B-OFF, C-Momentary ON, D-None

REPLACEMENT BULBS

Available for 6, 12, 18, 24, 28 or *110/220 Volts. SPECIFY VOLTAGE.

No.	C-H No.	NET Each
3142	SW8F	\$0.88

*Note: Neon lamp, use with 33K resistor for 110V, use 110K resistor for 220V.

DECORATOR PLASTIC BEZEL

Available in white, red, green, amber, gray, black, blue, yellow. SPECIFY COLOR. Std. Pkg. 100

No.	C-H No.	NET Per C
3148	SW2AA	\$30.00

MINIATURE PADDLE SWITCHES

Designed to snap into a rectangular opening .610 x .490, panel thickness .040 to .125. Slow make and break operation, solder lug terminals. Rated at 5 Amps 125V AC, 28V. DC. Paddle available in White, Gray, Black and Red. SPECIFY COLOR. Supplied less Bezel. Std. Pkg. 10

No.	C-H No.	Circuit†	Type	NET Each
3156	SC3BX18	A-B-A	SPDT	\$2.53
3157	SC3CX18	A-D-A	SPDT	2.31
3158	SC3FX18	A-B-C	SPDT	2.53
3159	SC3GX18	A-D-C	SPDT	2.53
3160	SC3HX18	C-B-C	SPDT	2.53
3161	SC4BX18	A-B-A	DPDT	3.21
3162	SC4CX18	A-D-A	DPDT	3.00
3163	SC4FX18	A-B-C	DPDT	3.21
3164	SC4GX18	A-D-C	DPDT	3.21
3165	SC4HX18	C-B-C	DPDT	3.21

†A-ON, B-OFF, C-Momentary ON, D-None

DECORATOR PLASTIC BEZELS

Available in white, red, gray, black. SPECIFY COLOR.

No.	C-H No.	NET Per C
3166	SW2AA	\$20.00

SHAFT WRENCHES

Specially designed offset, double-end wrenches for most hex sizes encountered in electronic construction. Made of heavy gauge, cadmium plated steel, clearly marked with size. No. 999 is especially useful for Toggle Switch and Volume Control mounting nuts.

No.	For Nut Sizes	NET per C
998	5/16" - 3/8"	\$30.00
999	1/2" - 9/16"	30.00
997	Set of 2 above	60.00



ALL SWITCHES ON PAGES 2-879 THRU 2-883 ARE STOCKED IN DEPTH AND ARE AVAILABLE THROUGH YOUR LOCAL INDUSTRIAL DISTRIBUTOR.

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH TEFLON* TERMINALS

* Du Pont's registered trademark

PLATING INFORMATION FOR ALL SMITH TEFLON TERMINALS LISTED IN THIS DIRECTORY

-P1 and -P12 are STANDARD PLATING.

For Platings listed below, other than Standard, add \$10.00 per M

Minimum Quantity 1000 Pieces.

For Platings other than listed below, please consult Factory.

Unless otherwise specified, these plating finishes will be supplied:
 TEST JACKS & PROBES: Plating -P1 (see below)
 STANDOFFS & FEED-THRU: Plating -P12 (see below)

PLATING DASH NO.	TYPE OF PLATING	THICKNESS OF PLATE	APPLICABLE SPECIFICATIONS if any
-P1 (STANDARD)	Copper strike Gold flash	0.0005 0.000020	QQ-S-365, Type III MIL-G-45204, Type II
-P2	Copper strike Silver plate	0.0003/0.0005	QQ-S-365, Type III
-P3	Copper strike Solder plate	0.0005 Min.	(M-259) MIL-F-14072 (M222, Type I)
-P4	Copper strike Gold flash	0.000010/0.000020	MIL-G-45204, Type II
-P5	Copper strike Silver plate Gold plate	0.0003 0.000050	QQ-S-365, Type III MIL-G-45204, Type II
-P6	Copper strike Gold plate	0.000050/0.000070	MIL-G-45204, C1.1, Type II
-P7	Copper strike Gold plate	0.000200/0.000250	MIL-G-45204, C1.3, Type II
-P8	Copper strike Gold plate	0.000100/0.000150	MIL-G-45204, C1.2, Type II
-P9	Copper strike Nickel plate Gold plate	0.000050/0.000070 0.000030/0.000050	QQ-N-290, Class I MIL-G-45204, Type II
-P10	Copper strike Gold plate	0.00030 Min.	MIL-G-45204, Type II
-P11	Copper Tin plate	0.0002 0.0002/0.0004	MIL-T-10727, Type I
-P12 (STANDARD)	Copper Bright acid tin "Tintilate"	0.000050 0.0003	MIL-T-10727, Type I
-P13	Hot tin dip	Approx. 0.0002	MIL-T-10727, Type II
-P17	Copper strike Nickel plate	0.0003/0.0005	QQ-N-290, C1.1, Type VI (KC)
-P18	Silver Gold	0.0005 0.000030	QQ-S-365, Type III

QUANTITY DISCOUNTS FOR ALL SMITH TEFLON TERMINALS LISTED IN THIS DIRECTORY

100 — 999	20% Off
1,000 — 4,999	35% Off
5,000 — 14,999	45% Off
15,000 — & up	On request

COLOR CODE SUFFIX - Add to Catalog Number as required

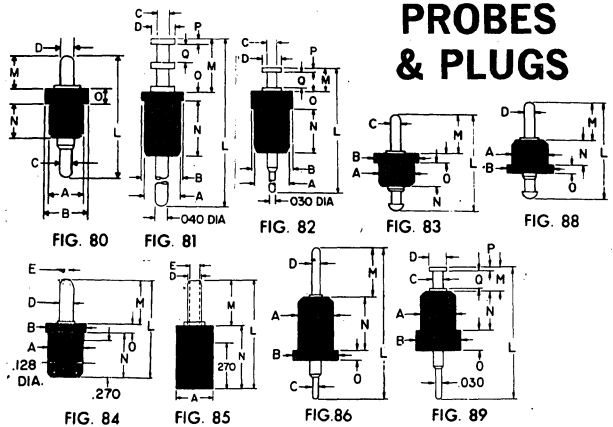
— 101 WHITE* 104 GREEN 107 YELLOW 112 PURPLE

— 102 RED — 105 BLUE — 108 BROWN 113 GREY

— 103 BLACK — 106 ORANGE

* White is natural "Teflon" per MIL-P-19468 and will be supplied if no color is specified.

PROBES & PLUGS



FOR RAPID SELECTION:
 terminals are listed (within figure groups) in ascending order of the MOST PERTINENT DIMENSION:
 C & D = PROBE DIAS. N = LGTH. OF MIN. DIA.
 M = LGTH. OF PIN O = LGTH. OF MAJ. DIA.
 A = MIN. DIA. L = OVERALL LGTH.
 B = MAJ. DIA.

FIG. SMITH DIMENSIONS RESALE

PLATING: Standard (-P4 Gold flash) unless otherwise specified.

No.	No.	A	B	C	D	E	L	M	N	O	P	Q	Per M
80	73-1028	.185	.218	.030	.040	—	1.870	.120	.250	.046	—	—	\$240.00
80	73-1018	.148	.172	.030	.050	—	1.937	.250	.165	.046	—	—	240.00
80	73-1003	.185	.218	.030	.050	—	1.937	.250	.140	.046	—	—	240.00
80	73-1001	.185	.218	.030	.050	—	906	.250	.287	.046	—	—	240.00
80	73-1000	.185	.218	.030	.050	—	1.531	.250	.287	.046	—	—	240.00
80	73-1002	.185	.218	.030	.050	—	2.083	.250	.287	.046	—	—	240.00
80	73-3006	.218	.250	.040	.050	—	1.531	.312	.375	.157	—	—	240.00
80	73-3006	.218	.250	.040	.050	—	1.531	.312	.375	.157	—	—	240.00

80	73-1006	.185	.218	.050	.081	—	739	.281	.287	.046	—	—	\$190.00
----	---------	------	------	------	------	---	-----	------	------	------	---	---	----------

81	73-1010	.185	.218	.060	.125	—	1.052	.281	.287	.046	.031	.093	230.00
----	---------	------	------	------	------	---	-------	------	------	------	------	------	--------

82	73-1009	.185	.218	.050	.093	—	2.000	.125	.150	.230	.020	.085	\$220.00
----	---------	------	------	------	------	---	-------	------	------	------	------	------	----------

82	73-1008	.185	.218	.050	.093	—	1.000	.125	.287	.093	.020	.085	200.00
----	---------	------	------	------	------	---	-------	------	------	------	------	------	--------

82	73-1007	.185	.218	.050	.093	—	2.005	.125	.287	.093	.020	.085	200.00
----	---------	------	------	------	------	---	-------	------	------	------	------	------	--------

83	73-1182	.148	.172	.040	—	—	415	.125	.100	.040	—	—	\$180.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	----------

83	73-1156	.148	.172	.040	—	—	478	.188	.100	.040	—	—	180.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	--------

83	73-1022	.171	.187	.040	—	—	687	.272	.212	.040	—	—	\$190.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	----------

83	73-1011	.185	.218	.050	—	—	562	.250	.135	.052	—	—	\$190.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	----------

83	73-1016	.185	.218	.050	—	—	562	.250	.141	.046	—	—	190.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	--------

83	73-1023	.185	.218	.050	—	—	906	.250	.287	.046	—	—	220.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	--------

83	73-1027	.185	.218	.062	—	—	612	.250	.141	.046	—	—	\$190.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	----------

83	73-1017	.185	.218	.081	—	—	562	.250	.141	.046	—	—	\$190.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	----------

83	73-1015	.185	.218	.081	—	—	739	.281	.287	.046	—	—	190.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	--------

83	73-1026	.185	.218	.090	—	—	648	.190	.287	.046	—	—	\$190.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	----------

PLATING: Standard (-P17) unless otherwise specified.

84	73-3010	.218	.250	—	.080	.062	.695	.270	.325	.050	—	—	\$210.00
----	---------	------	------	---	------	------	------	------	------	------	---	---	----------

85	73-3001	.218	—	—	.080	.062	.645	.270	.375	—	—	—	\$210.00
----	---------	------	---	---	------	------	------	------	------	---	---	---	----------

85	73-3016	.218	—	—	.080	.062	.875	.500	.375	—	—	—	220.00
----	---------	------	---	---	------	------	------	------	------	---	---	---	--------

85	73-3012	.218	—	—	.090	.062	.645	.270	.375	—	—	—	\$210.00
----	---------	------	---	---	------	------	------	------	------	---	---	---	----------

86	37-1028	.185	.218	.030	.040	—	1.870	.120	.250	.046	—	—	\$200.00
----	---------	------	------	------	------	---	-------	------	------	------	---	---	----------

86	37-1018	.148	.172	.030	.050	—	1.937	.250	.165	.046	—	—	200.00
----	---------	------	------	------	------	---	-------	------	------	------	---	---	--------

86	37-1003	.185	.218	.030	.050	—	1.937	.250	.141	.046	—	—	200.00
----	---------	------	------	------	------	---	-------	------	------	------	---	---	--------

86	37-1001	.185	.218	.030	.050	—	906	.250	.287	.046	—	—	220.00
----	---------	------	------	------	------	---	-----	------	------	------	---	---	--------

86	37-1000	.185	.218	.030	.050	—	1.531	.250	.287	.046	—	—	180.00
----	---------	------	------	------	------	---	-------	------	------	------	---	---	--------

86	37-1002	.185	.218	.030	.050	—	2.083	.250	.287	.046	—	—	240.00
----	---------	------	------	------	------	---	-------	------	------	------	---	---	--------

86	37-1006	.185	.218	.050	.081	—	739	.281	.287	.046	—	—	200.00
----	---------	------	------	------	------	---	-----	------	------	------	---	---	--------

88	37-1182	.148	.172	.040	—	—	415	.125	.100	.040	—	—	\$200.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	----------

88	37-1156	.148	.172	.040	—	—	478	.188	.100	.040	—	—	200.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	--------

88	37-1022	.171	.187	.040	—	—	687	.272	.212	.040	—	—	230.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	--------

88	37-1011	.185	.218	.050	—	—	562	.250	.135	.052	—	—	\$180.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	----------

88	37-1016	.185	.218	.050	—	—	562	.250	.141	.046	—	—	180.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	--------

88	37-1023	.185	.218	.050	—	—	906	.250	.287	.046	—	—	200.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	--------

88	37-1027	.185	.218	.062	—	—	612	.250	.141	.046	—	—	\$200.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	----------

88	37-1017	.185	.218	.081	—	—	562	.250	.141	.046	—	—	\$210.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	----------

88	37-1015	.185	.218	.081	—	—	739	.281	.287	.046	—	—	200.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	--------

88	37-1026	.185	.218	.090	—	—	648	.190	.287	.046	—	—	\$200.00
----	---------	------	------	------	---	---	-----	------	------	------	---	---	----------

89	37-1009	.185	.218	.050	.093	—	2.000	.125	.150	.230	.020	.085	\$220.00
----	---------	------	------	------	------	---	-------	------	------	------	------	------	----------

89	37-1008	.185	.218	.050	.093	—	1.000	.125	.287	.093	.020	.085	220.00
----	---------	------	------	------	------	---	-------	------	------	------	------	------	--------

89	37-1007	.185	.218	.050	.093	—	2.005	.125	.287	.093	.020	.085	220.00
----	---------	------	------	------	------	---	-------	------	------	------	------	------	--------

COLORS: Supplied in White (-101) unless otherwise specified.

Ten colors available.

See at right For **COLOR CODE, PLATING SUFFIXES** and

QUANTITY DISCOUNTS

IT'S SOUND PLANNING TO SPECIFY SMITH WHEN DESIGNING OR PURCHASING

SMITH TEFLON* TERMINALS

TEST JACKS

* Du Pont's registered trademark

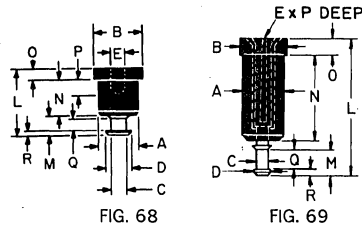


FIG. 68

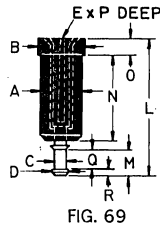


FIG. 69

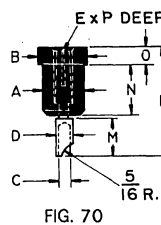


FIG. 70

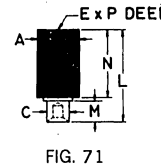


FIG. 71

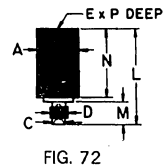


FIG. 72

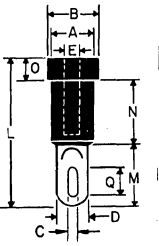


FIG. 76

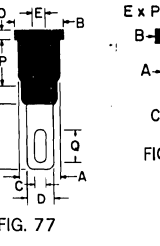


FIG. 77

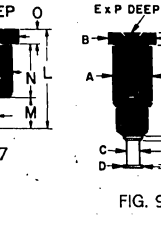


FIG. 97

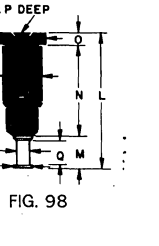


FIG. 98

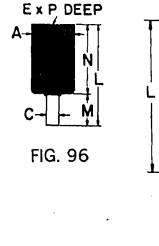


FIG. 96

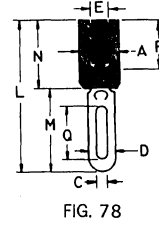


FIG. 78

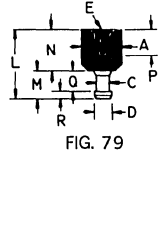


FIG. 79

FOR RAPID SELECTION:

terminals are listed (within figure groups) in ascending order of the MOST PERTINENT DIMENSION:

E = PROBE
P = PROBE DEPTH
A = MIN. DIA.
B = MAJ. DIA.
N = LGTH. OF MIN. DIA.

O = LGTH. OF MAJ. DIA.
M = LGTH. OF PIN
C = DIA. OF PIN
L = OVERALL LGTH.

PANEL BOARD MOUNT

FIG. No.	SMITH No.	A	B	C	D	E	L	M	N	O	P	Q	R	RESALE Per M
68	63-1033	.120	.150	.046	.080	.040	.203	.060	.113	.030	.078	.040	.010	\$240.00
68	63-1032	.148	.172	.046	.080	.040	.203	.060	.097	.046	.078	.040	.010	240.00
68	63-1029	.140	.172	.046	.080	.040	.253	.060	.143	.050	.125	.040	.010	240.00
68	63-1077	.140	.172	.046	.060	.040	.345	.120	.179	.046	.140	.077	.023	240.00
68	63-1010	.148	.172	.040	.060	.040	.345	.120	.179	.046	.140	.077	.023	240.00
68	63-1061*	.148	.172	.040	.060	.040	.345	.120	.179	.046	.140	.077	.023	450.00
68	63-1072	.120	.142	.040	.060	.040	.410	.120	.244	.046	.205	.060	.030	240.00
68	63-1012	.120	.142	.040	.060	.040	.449	.120	.283	.046	.245	.060	.030	240.00
68	63-1079	.185	.218	.054	.074	.050	.437	.120	.271	.046	.195	.053	.037	\$280.00
68	63-1004	.185	.218	.054	.074	.080	.437	.120	.271	.046	.195	.053	.037	\$260.00
68	63-1060*	.185	.218	.054	.074	.080	.437	.120	.271	.046	.195	.053	.037	450.00
68	63-1075	.185	.218	.054	.074	.080	.504	.187	.271	.046	.195	.104	.037	280.00
68	63-1006	.204	.250	.054	.074	.080	.437	.120	.271	.046	.195	.053	.037	280.00
68	63-1057	.185	.218	.054	.074	.080	.367	.120	.301	.046	.225	.047	.035	240.00
68	63-1005	.185	.218	.054	.074	.080	.640	.187	.400	.050	.287	.104	.037	270.00
68	63-1080	.185	.218	.080	.125	.080	.455	.105	.300	.050	.315	.065	.020	180.00
68	63-1054	.185	.218	.054	.074	.090	.340	.120	.174	.046	.140	.077	.023	\$250.00
68	63-1003	.185	.218	.054	.074	.090	.437	.120	.271	.046	.195	.053	.037	260.00
68	63-1007	.170	.218	.046	.078	.090	.375	.066	.269	.046	.250	.040	.010	280.00
68	63-1028	.200	.218	.054	.074	.093	.699	.187	.386	.125	.390	.116	.035	\$300.00
68	63-1013	.200	.218	.054	.074	.093	.761	.187	.386	.187	.455	.116	.035	320.00
68	63-1081	.200	.375	.054	.074	.093	.834	.187	.417	.230	.518	.116	.035	180.00
68	63-1011	.218	.250	.066	.098	.104	.400	.060	.294	.046	.250	.037	.010	\$300.00
69	63-1500	.148	.171	.040	.060	.040	.470	.100	.285	.065	.225	.070	.020	\$260.00
69	63-1504	.148	.171	.040	.060	.062	.470	.100	.285	.065	.225	.070	.020	260.00
70	63-1083	.148	.171	.046	.061	.040	.359	.140	.154	.065	.125	—	—	\$270.00
70	63-1093	.148	.188	.046	.061	.040	.359	.140	.154	.065	.125	—	—	270.00
70	63-1506	.148	.172	.046	.060	.040	.531	.147	.334	.050	.250	—	—	280.00
70	63-1505	.203	.245	.046	.060	.040	.531	.147	.334	.050	.250	—	—	300.00
70	63-1510	.185	.250	.080	.100	.080	.437	.156	.216	.065	.187	—	—	\$320.00
76	63-1001	.185	.218	.050	.115	.040	.687	.354	.287	.046	.250	.156	—	\$180.00
76	63-1016	.185	.218	.050	.115	.050	.624	.354	.224	.046	.200	.156	—	180.00
76	63-1037	.185	.218	.050	.115	.050	.687	.330	.146	.187	.200	.156	—	180.00
76	63-1014	.185	.218	.050	.115	.050	.687	.354	.281	.052	.250	.156	—	180.00
76	63-1000	.185	.218	.050	.115	.050	.687	.354	.287	.046	.250	.156	—	180.00
76	63-1017	.185	.218	.050	.115	.060	.718	.316	.356	.046	.315	.156	—	\$180.00
76	63-1015	.185	.218	.050	.115	.080	.687	.330	.146	.187	.187	.156	—	180.00
76	63-1002	.185	.218	.050	.115	.080	.687	.354	.287	.046	.250	.156	—	180.00
76	63-1085	.185	.218	—	.110	.080	.710	.354	.287	.070	.275	.156	.050	180.00
77	63-1052	.185	.218	.050	.115	.050	.620	.287	.287	.046	.250	.156	—	\$180.00
77	63-1063	.185	.218	.050	.115	.080	.704	.354	.304	.046	.280	.156	—	220.00
97	63-1095	.148	.18	.040	—	.040	.359	.140	.154	.065	.135	—	—	\$300.00
98	63-1151	.185	.218	.055	.070	.050	.890	.150	.275	.046	.350	.090	—	\$420.00

*Closed Entry Type

VERTICAL - FLOATING

FIG. No.	SMITH No.	A	B	C	D	E	L	M	N	O	P	Q	R	RESALE Per M
71	63-3018	.187	—	.066	—	.080	.376	.085	.281	—	.200	—	—	\$340.00
71	63-3019	.187	—	.066	—	.080	.376	.085	.281	—	.200	—	—	340.00
71	63-3020	.187	—	.062	—	.080	.381	.090	.281	—	.250	—	—	340.00
71	63-3008	.218	—	.112	—	.080	.381	.080	.281	—	.250	—	—	320.00
71	63-3007	.218	—	.112	—	.080	.441	.078	.343	—	.250	—	—	320.00
72	63-3017	.187	—	.048	.056	.080	.391	.100	.281	.250	.250	—	—	\$340.00
96	63-1073	.218	—	.050	—	.080	.585	.140	.430	—	.278	—	—	\$280.00
78	63-1086	.185	—	—	.105	.050	.641	.354	.287	—	.204	—	—	\$200.00
79	63-1034	.140	—	.046	.080	.025	.203	.060	.143	—	.075	.040	.010	\$280.00
79	63-1009	.120	—	.046	.080	.040	.203	.060	.140	—	.075	.040	.010	300.00
79	63-1008	.140	—	.046	.080	.040	.203	.060	.140	—	.075	.040	.010	300.00
79	63-1039	.187	—	.046	.078	.090	1.000	.060	.940	—	.825	.040	.010	400.00
79	63-1038	.218	—	.046	.078	.090	1.000	.060	.940	—	.825	.040	.010	400.00

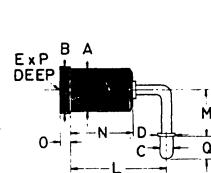


FIG. 73

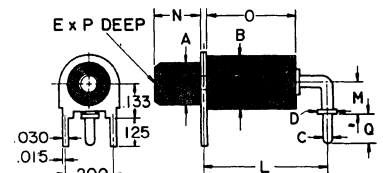


FIG. 74 & 75

RIGHT ANGLE - PRINTED CIRCUIT MOUNT

FIG. No.	SMITH No.	A	B	C	D	E	L	M	N	O	P	Q	R	RESALE Per M
73	63-1098	.218	.250	.040	—	.040	.300	.437	.154	.046	.190	—	—	\$320.00
73	63-1099	.218	.250	.040	—	.040	.500	.437	.154	.046	.190	—	—	320.00
73	63-3000	.218	.250	.050	.080	.080	.400	.250	.316	.046	.250	.125	—	500.00
74	63-3003	.187	.218	.050	.080	.080	.400	.140	.046	.300	.125	.250	—	\$500.00
74	63-3002	.187	.218	.050	.080	.080	.500	.140	.046	.420	.125	.250	—	500.00
74	63-3004	.187	.218	.040	.080	.080	.520	.140	.046	.340	.130	.250	—	500.00
74	63-3005	.187	.218	.035	.080	.080	.400	.140	.046	.300	.187	.250	—	500.00
75	63-3009	.187	.218	.050	.080	.080	.500	.140	.230	.425	.125	.500	—	\$500.00

COLORS: Supplied in White (-101) unless otherwise specified.

Ten colors available.

PLATING: Standard (P-1) unless otherwise specified.

For COLOR CODE, PLATING SUFFIXES and QUANTITY DISCOUNT SCHEDULES see SMITH PAGE 2.884 in this directory

IT'S SOUND PLANNING TO SPECIFY SMITH WHEN DESIGNING OR PURCHASING

TEFLON* TERMINALS SMITH

*Du Pont's registered trademark

FEED-THRU

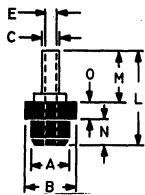


FIG. 48

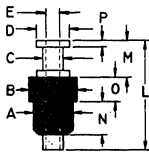


FIG. 49

FOR RAPID SELECTION:
 terminals are listed (within figure groups) in ascending order of the MOST PERTINENT DIMENSION:

N = MIN. DIA.
 N = LGTH. OF MIN. DIA.
 M = LGTH. OF PIN
 L = OVERALL LGTH.
 B = MAJ. DIA.
 O = LGTH. OF MAJ. DIA.
 C = DIA. OF PIN

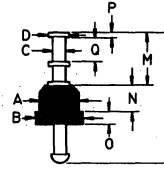


FIG. 42

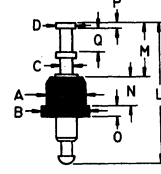


FIG. 43

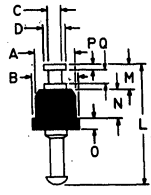


FIG. 44

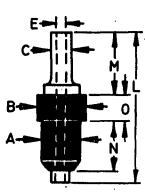


FIG. 50

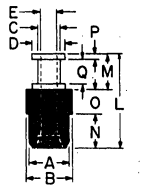


FIG. 52

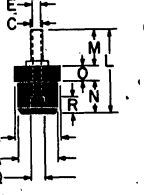


FIG. 54

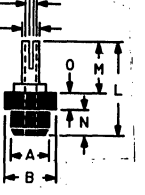


FIG. 51

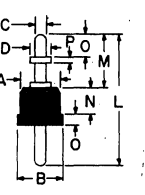


FIG. 46

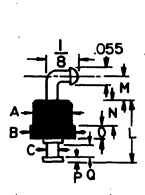


FIG. 47

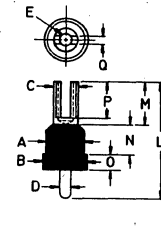


FIG. 64

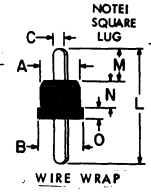


FIG. 101

SUB-MINIATURE TUBULAR

FIG. SMITH	DIMENSIONS													RESALE
No.	No.	A	B	C	D	E	L	M	N	O	P	Q	R	Per M
48	82-1134	.093	.125	.040	—	.030	.215	.125	.050	.040	—	—	—	\$150.00
48	82-1040	.093	.125	.040	—	.030	.225	.125	.060	.040	—	—	—	150.00
48	82-1135	.093	.125	.040	—	.030	.312	.207	.060	.040	—	—	—	150.00
48	82-1115	.093	.125	.040	—	.030	.317	.187	.090	.040	—	—	—	170.00
48	82-1116	.093	.125	.040	—	.030	.405	.275	.090	.040	—	—	—	150.00
48	82-1161	.093	.125	.043	—	.030	.252	.100	.110	.040	—	—	—	150.00
48	82-1037	.120	.130	.040	—	.030	.310	.207	.053	.050	—	—	—	\$150.00
48	82-1036	.125	.150	.040	—	.030	.225	.125	.060	.040	—	—	—	\$140.00
48	82-1151	.125	.150	.040	—	.030	.225	.126	.075	.025	—	—	—	140.00
48	82-1126	.125	.150	.040	—	.030	.247	.147	.075	.025	—	—	—	140.00
48	82-1124	.125	.150	.040	—	.030	.325	.125	.075	.125	—	—	—	140.00
48	82-1123	.148	.172	.040	—	.030	.245	.147	.053	.040	—	—	—	\$150.00
48	82-1035	.148	.172	.040	—	.030	.250	.147	.053	.050	—	—	—	150.00
48	82-1034	.148	.172	.040	—	.030	.310	.207	.053	.050	—	—	—	150.00
48	82-1127	.148	.172	.080	—	.052	.193	.105	.063	.025	—	—	—	150.00
48	82-1090	.148	.172	.085	—	.063	.332	.207	.075	.050	—	—	—	150.00
48	82-1038	.148	.172	.040	—	.030	.296	.136	.100	.060	—	—	—	150.00
48	82-1017	.148	.172	.085	—	.063	.367	.207	.110	.050	—	—	—	150.00
48	82-1091	.148	.172	.085	—	.070	.367	.207	.110	.050	—	—	—	150.00
48	82-1089	.148	.172	.085	—	.063	.413	.207	.156	.050	—	—	—	150.00
48	82-1039	.171	.218	.040	—	.030	.367	.207	.110	.050	—	—	—	\$160.00
48	82-1041	.171	.218	.085	—	.063	.367	.207	.110	.050	—	—	—	160.00
48	82-1024	.200	.240	.085	—	.063	.367	.207	.110	.050	—	—	—	\$180.00
49	82-1055	.148	.172	.040	—	.030	.296	.136	.100	.060	—	—	—	\$150.00
50	82-1146	.082	.093	.040	—	.030	.375	.172	.148	.040	—	—	—	\$160.00
52	82-1119	.093	.125	.040	.080	.030	.215	.125	.050	.040	.020	.093	—	\$150.00
52	82-1120	.125	.150	.060	.090	.030	.293	.133	.060	.040	.020	.093	—	\$140.00
52	82-1122	.125	.150	.060	.090	.030	.200	.090	.060	.050	.020	.093	—	140.00
52	82-1049	.125	.150	.060	.090	.030	.273	.133	.080	.060	.020	.093	—	140.00
52	82-1103	.125	.150	.060	.090	.030	.273	.133	.100	.040	.020	.093	—	140.00
52	82-1118	.125	.150	.060	.090	.030	.293	.133	.110	.050	.020	.093	—	140.00
52	82-1093	.148	.172	.060	.093	.040	.238	.133	.065	.040	.020	.093	—	\$160.00
52	82-1054	.148	.172	.060	.090	.030	.273	.133	.100	.040	.020	.093	—	160.00
52	82-1050	.148	.172	.060	.090	.030	.303	.133	.100	.040	.020	.093	—	160.00
52	82-1051	.148	.172	.060	.090	.030	.333	.133	.110	.050	.020	.093	—	160.00
52	82-1096	.148	.172	.060	.093	.030	.293	.133	.110	.050	.020	.093	—	160.00
52	82-1016	.148	.172	.082	.125	.063	.351	.133	.125	.090	.020	.093	—	160.00
52	82-1092	.148	.172	.060	.090	.030	.303	.133	.130	.040	.020	.093	—	160.00
52	82-1060	.148	.172	.060	.093	.042	.392	.162	.130	.100	.020	.130	—	160.00
52	82-1052	.171	.188	.082	.125	.062	.381	.133	.125	.093	.020	.093	—	\$160.00
54	82-1046	.148	.172	.040	—	.030	.282	.147	.075	.060	—	.070	.042	\$150.00
54	82-1085	.148	.172	.040	—	.030	.387	.207	.110	.050	—	.050	.050	150.00
54	82-1150	.148	.172	.072	—	.052	.606	.025	.220	.025	—	.062	.011	150.00
54	82-1088	.171	.218	.085	—	.063	.710	.500	.160	.040	—	.085	.050	\$160.00
54	82-1047	.171	.218	.085	—	.063	.417	.207	.160	.050	—	.085	.050	160.00
54	82-1044	.200	.240	.040	—	.030	.367	.207	.110	.050	—	.050	.057	\$160.00
54	82-1045	.218	.250	.060	—	.030	.287	.147	.100	.040	—	.050	.030	160.00
51	82-2015	.125	.150	.050	.030	.030	.160	.062	.073	.025	—	—	—	\$230.00

REVERSED SUB-MINIATURE TURRET

FIG. SMITH		DIMENSIONS													RESALE
No.	No.	A	B	C	D	E	L	M	N	O	P	Q	R	Per M	
42	28-1516	.093	.125	.040	.080	—	.500	.210	.100	.040	.020	.100	—	\$120.00	
42	28-1551	.116	.172	.040	.080	—	.500	.210	.100	.040	.020	.100	—	\$130.00	
42	28-1521	.125	.150	.040	.080	—	.500	.210	.060	.040	.020	.100	—	\$120.00	
42	28-1518	.148	.172	.040	.080	—	.500	.210	.060	.040	.020	.100	—	\$120.00	
42	28-1536	.148	.172	.040	.080	—	.685	.395	.065	.040	.020	.070	—	120.00	
42	28-1539	.148	.172	.040	.080	—	.438	.210	.083	.040	.020	.100	—	120.00	
42	28-1509	.148	.172	.040	.080	—	.438	.210	.100	.040	.020	.100	—	120.00	
42	28-1500	.148	.172	.040	.080	—	.500	.210	.100	.040	.020	.100	—	160.00	
42	28-1537	.148	.172	.040	.080	—	.550	.245	.125	.040	.020	.100	—	130.00	
42	28-1512	.148	.172	.040	.080	—	.609	.210	.125	.093	.020	.100	—	110.00	
42	28-1527	.148	.172	.040	.080	—	.609	.210	.158	.060	.020	.100	—	130.00	
42	28-1501	.148	.172	.040	.080	—	.500	.210	.165	.040	.020	.100	—	120.00	
42	28-1550	.148	.172	.040	.080	—	.531	.210	.165	.040	.020	.100	—	120.00	
42	28-1532	.148	.172	.040	.080	—	.609	.210	.165	.040	.020	.100	—	130.00	
42	28-1538	.148	.172	.040	.080	—	.812	.210	.165	.040	.020	.100	—	150.00	
42	28-1546	.152	.172	.047	.093	—	.437	.156	.088	.040	.020	.047	—	\$140.00	
42	28-1547	.152	.172	.047	.093	—	.437	.156	.100	.040	.020	.047	—	140.00	
42	28-1514	.152	.172	.047	.093	—	.500	.156	.150	.040	.020	.047	—	130.00	
42	28-1502	.179	.200	.040	.080	—	.500	.210	.100	.040	.020	.100	—	\$130.00	
42	28-1515	.185	.218	.040	.080	—	.438	.210	.100	.040	.020	.100	—	\$140.00	
42	28-1534	.185	.218	.040	.080	—	.609	.210	.125	.093	.020	.100	—	140.00	
43	28-1504	.148	.172	.040	.080	—	.531	.210	.100	.040	.020	.100	—	\$150.00	
43	28-1523	.148	.172	.040	.080	—	.531	.210	.100	.040	.020	.100	—	150.00	
43	28-1505	.148	.172	.040	.080	—	.531	.210	.125	.040	.020	.100	—	150.00	
43	28-1520	.175	.218	.040	.080	—	.531	.210	.100	.040	.020	.100	—	\$170.00	
43	28-1506	.185	.218	.040	.080	—	.531	.210	.100	.040	.020	.100	—	\$170.00	
43	28-1507	.185	.218	.040	.080	—	.531	.210	.125	.040	.020	.100	—	170.00	
44	28-1540	.093	.125	.040	.080	—	.350	.125	.100	.040	.020	.085	—	\$120.00	
44	28-1524	.125	.150	.040	.080	—	.350	.125	.060	.040	.020	.095	—	\$120.00	
44	28-1558	.148	.172	.040	.080	—	.380	.090	.100	.040	.020	.060	—	\$130.00	
44	28-1510	.148	.172	.040	.080	—	.443	.093	.100	.040	.020	.062	—	130.00	
44	28-1513	.148	.172	.040	.080	—	.350	.125	.100	.040	.020	.094	—	120.00	
44	28-1137	.148	.172	.040	.080	—	.450	.190	.100	.040	.020	.160	—	130.00	
44	28-1581	.148	.172	.040	.080	—	.520	.190	.100	.040	.020	.160	—	140.00	
44	28-1557	.148	.172	.040	.080	—	.640	.250	.125	.040	.020	.210	—	150.00	
44	28-1549	.148	.172	.040	.093	—	.781	.078	.125	.040	.015	.062	—	120.00	
44	28-1542	.148	.172	.040	.080	—	.493	.093	.170	.020	.020	.063	—	130.00	
44	28-1511	.148	.172	.040	.080	—	.493	.093	.180	.040	.020	.062	—	130.00	
44	28-1525	.172	.200	.048	.090	—	.500	.120	.125	.075	.020	.080	—	\$150.00	
44	28-1541	.172	.200	.080	.125	—	.500	.120	.125	.075	.020	.080	—	140.00	
44	28-1143	.263	.312	.050	.093	—	.781	.078	.100	.040	.015	—	—	\$180.00	
46	28-1545	.148	.172	.040	.080	—	.500	.210	.100	.040	.020	.120	—	\$160.00	
47	28-1598	.148	.172	.040	.080	—	.240	.109	.100	.040	.020	.062	—	\$180.00	
64	28-2050	.148	.172	.125	.040	.062	.495	.190	.125	.060	.040	.042	—	\$180.00	
101	28-1140	.171	.187	.050	—	—	1.060	.500	.187	.100	—	—	—	160.00	

TEFLON* TERMINALS SMITH

* Du Pont's registered trademark

FEED-THRU

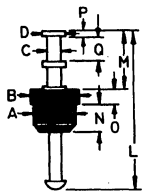


FIG. 37

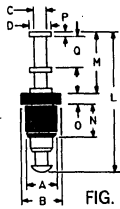


FIG. 38

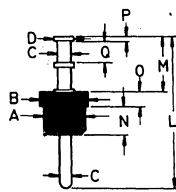


FIG. 39

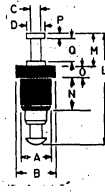


FIG. 40

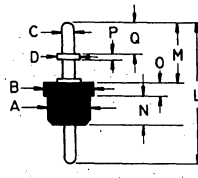


FIG. 41

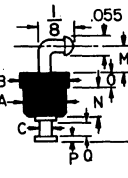


FIG. 45

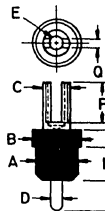


FIG. 87

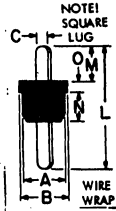


FIG. 100

FOR RAPID SELECTION:
terminals are listed (within figure groups) in ascending order of the MOST PERTINENT DIMENSION:

A = MIN. DIA.
B = MAJ. DIA.
N = LGTH. OF MIN. DIA.
O = LGTH. OF MAJ. DIA.

M = LGTH. OF PIN
C = DIA. OF PIN
L = OVERALL LGTH.

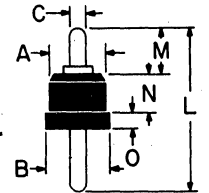


FIG. 36

SUB-MINIATURE TURRET

FIG. No.	SMITH No.	A	B	C	D	E	L	M	N	O	P	Q	R	RESALE Per M
37	82-1516	.093	.125	.040	.080	—	.500	.210	.100	.040	.020	.100	—	\$120.00
37	82-1551	.116	.172	.040	.080	—	.500	.210	.100	.040	.020	.100	—	\$130.00
37	82-1521	.125	.150	.040	.080	—	.500	.210	.060	.040	.020	.100	—	\$120.00
37	82-1518	.148	.172	.040	.080	—	.500	.210	.060	.040	.020	.100	—	\$120.00
37	82-1536	.148	.172	.040	.080	—	.685	.395	.065	.040	.020	.070	—	120.00
37	82-1539	.148	.172	.040	.080	—	.438	.210	.083	.040	.020	.100	—	120.00
37	82-1509	.148	.172	.040	.080	—	.438	.210	.100	.040	.020	.100	—	120.00
37	82-1500	.148	.172	.040	.080	—	.500	.210	.100	.040	.020	.100	—	120.00
37	82-1537	.148	.172	.040	.080	—	.550	.245	.125	.040	.020	.100	—	120.00
37	82-1512	.148	.172	.040	.080	—	.609	.210	.125	.093	.020	.100	—	130.00
37	82-1527	.148	.172	.040	.080	—	.609	.210	.158	.060	.020	.100	—	130.00
37	82-1501	.148	.172	.040	.080	—	.500	.210	.165	.040	.020	.100	—	120.00
37	82-1550	.148	.172	.040	.080	—	.531	.210	.165	.040	.020	.100	—	120.00
37	82-1532	.148	.172	.040	.080	—	.609	.210	.165	.040	.020	.100	—	130.00
37	82-1538	.148	.172	.040	.080	—	.812	.210	.165	.040	.020	.100	—	140.00
37	82-1546	.152	.172	.047	.093	—	.437	.156	.088	.040	.020	.047	—	\$140.00
37	82-1547	.152	.172	.047	.093	—	.437	.156	.100	.040	.020	.047	—	140.00
37	82-1514	.152	.172	.047	.093	—	.500	.156	.150	.040	.020	.047	—	140.00
37	82-1502	.179	.200	.040	.080	—	.500	.210	.100	.040	.020	.100	—	\$130.00
37	82-1515	.185	.218	.040	.080	—	.438	.210	.100	.040	.020	.100	—	\$130.00
37	82-1534	.185	.218	.040	.080	—	.609	.210	.125	.093	.020	.100	—	140.00
38	82-1504	.148	.172	.040	.080	—	.531	.210	.100	.040	.020	.100	—	\$150.00
38	82-1505	.148	.172	.040	.080	—	.531	.210	.125	.040	.020	.100	—	150.00
38	82-1520	.175	.218	.040	.080	—	.531	.210	.100	.040	.020	.100	—	\$160.00
38	82-1506	.185	.218	.040	.080	—	.531	.210	.100	.040	.020	.100	—	\$160.00
38	82-1507	.185	.218	.040	.080	—	.531	.210	.125	.040	.020	.100	—	160.00
39	82-1523	.148	.172	.040	.080	—	.531	.210	.100	.040	.020	.100	—	\$120.00
40	82-1540	.093	.125	.040	.080	—	.350	.125	.100	.040	.020	.085	—	\$120.00
40	82-1524	.125	.150	.040	.080	—	.350	.125	.060	.040	.020	.095	—	\$120.00
40	82-1558	.148	.172	.040	.080	—	.380	.090	.100	.040	.020	.060	—	\$120.00
40	82-1510	.148	.172	.040	.080	—	.443	.093	.100	.040	.020	.062	—	120.00
40	82-1513	.148	.172	.040	.080	—	.350	.125	.100	.040	.020	.094	—	120.00
40	82-1570	.148	.172	.040	.093	—	.385	.160	.100	.040	.020	.130	—	130.00
40	82-1137	.148	.172	.040	.080	—	.450	.190	.100	.040	.020	.160	—	120.00
40	82-1581	.148	.172	.040	.080	—	.520	.190	.100	.040	.020	.160	—	120.00
40	82-1557	.148	.172	.040	.080	—	.640	.250	.125	.040	.020	.210	—	130.00
40	82-1549	.148	.172	.040	.080	—	.500	.120	.130	.040	.020	.080	—	120.00
40	82-1542	.148	.172	.040	.080	—	.493	.093	.170	.020	.020	.063	—	130.00
40	82-1511	.148	.172	.040	.080	—	.493	.093	.180	.040	.020	.062	—	130.00
40	82-1525	.172	.200	.048	.090	—	.500	.120	.125	.075	.020	.080	—	\$150.00
40	82-1541	.172	.200	.080	.125	—	.500	.120	.125	.075	.020	.080	—	140.00
40	82-1143	.263	.312	.050	.093	—	.781	.078	.100	.040	.015	—	—	\$170.00
41	82-1545	.148	.172	.040	.080	—	.500	.210	.100	.040	.020	.120	—	\$150.00
45	82-1598	.148	.172	.040	.080	—	.350	.097	.100	.040	.020	.062	—	\$180.00
87	82-2050	.148	.172	.125	.040	.062	.495	.190	.125	.060	.140	.042	—	210.00
100	82-1140	.171	.187	.050	—	—	1.060	.500	.187	.100	—	—	—	160.00

REVERSED SUB-MINIATURE STRAIGHT PIN

FIG. SMITH		DIMENSIONS												RESALE
No.	No.	A	B	C	D	E	L	M	N	O	P	Q	R	Per M
36	28-1023	.093	.125	.040	—	—	.375	.147	.075	.040	—	—	—	\$120.00
36	28-1025	.093	.125	.040	—	—	.335	.125	.100	.040	—	—	—	120.00
36	28-1076	.093	.125	.040	—	—	.453	.156	.100	.040	—	—	—	140.00
36	28-1022	.093	.125	.040	—	—	.515	.210	.100	.040	—	—	—	140.00
36	28-1077	.093	.125	.040	—	—	.987	.687	.100	.040	—	—	—	150.00
36	28-1031	.125	.150	.040	—	—	.335	.125	.060	.040	—	—	—	120.00
36	28-1032	.125	.150	.040	—	—	.350	.187	.060	.040	—	—	—	120.00
36	28-1018	.125	.150	.040	—	—	.515	.210	.060	.040	—	—	—	\$140.00
36	28-1002	.148	.172	.040	—	—	.515	.210	.050	.050	—	—	—	\$140.00
36	28-1075	.148	.172	.040	—	—	.325	.075	.100	.040	—	—	—	130.00
36	28-1080	.148	.172	.040	—	—	.443	.093	.100	.040	—	—	—	130.00
36	28-1021	.148	.172	.040	—	—	.375	.125	.100	.040	—	—	—	130.00
36	28-1000	.148	.172	.040	—	—	.443	.210	.100	.040	—	—	—	120.00
36	28-1003	.148	.172	.040	—	—	.515	.210	.100	.040	—	—	—	140.00
36	28-1068	.148	.172	.040	—	—	.562	.210	.100	.040	—	—	—	140.00
36	28-1010	.148	.172	.040	—	—	.725	.210	.100	.040	—	—	—	150.00
36	28-1011	.148	.172	.040	—	—	1.000	.210	.100	.040	—	—	—	150.00
36	28-1084	.148	.172	.045	—	—	.585	.320	.100	.040	—	—	—	140.00
36	28-1033	.148	.172	.040	—	—	.890	.625	.100	.040	—	—	—	150.00
36	28-1069	.148	.172	.040	—	—	.431	.106	.110	.050	—	—	—	120.00
36	28-1001	.148	.172	.040	—	—	.410	.147	.110	.050	—	—	—	120.00
36	28-1004	.148	.172	.040	—	—	.535	.210	.110	.050	—	—	—	120.00
36	28-1007	.148	.172	.040	—	—	.535	.210	.120	.040	—	—	—	120.00
36	28-1028	.148	.172	.040	—	—	.407	.125	.132	.040	—	—	—	120.00
36	28-1086	.148	.172	.040	—	—	2.500	.175	.132	.040	—	—	—	130.00
36	28-1027	.148	.172	.040	—	—	.515	.210	.132	.040	—	—	—	120.00
36	28-1008	.148	.172	.040	—	—	.535	.210	.132	.040	—	—	—	130.00
36	28-1009	.148	.172	.040	—	—	.535	.210	.160	.040	—	—	—	130.00
36	28-1081	.148	.172	.040	—	—	.535	.210	.160	.040	—	—	—	131.00
36	28-1030	.148	.172	.040	—	—	.571	.210	.160	.040	—	—	—	130.00
36	28-1063	.148	.172	.040	—	—	.630	.210	.170	.040	—	—	—	150.00
36	28-1064	.148	.172	.040	—	—	.630	.210	.170	.040	—	—	—	150.00
36	28-1065	.148	.172	.040	—	—	.630	.210	.217	.040	—	—	—	150.00
36	28-1067	.148	.172	.040	—	—	.725	.210	.250	.040	—	—	—	150.00
36	28-1026	.157	.172	.040	—	—	.515	.210	.100	.040	—	—	—	\$120.00
36	28-1073	.169	.218	.049	—	—	.250	.125	.100	.040	—	—	—	\$210.00
36	28-1072	.169	.218	.049	—	—	.937	.125	.100	.040	—	—	—	210.00
36	28-1071	.169	.218	.049	—	—	1.875	.125	.100	.040	—	—	—	210.00
36	28-1013	.169	.219	.040	—	—	2.500	.460	.100	.040	—	—	—	230.00
36	28-1014	.169	.219	.040	—	—	2.500	.460	.100	.040	—	—	—	230.00
36	28-1082	.171	.218	.040	—	—	1.090	.680	.110	.050	—	—	—	\$170.00
36	28-1012	.171	.218	.040	—	—	2.000	.680	.110	.050	—	—	—	230.00
36	28-1015	.172	.195	.040	—	—	.515	.210	.100	.040	—	—	—	\$130.00
36	28-1070	.172	.195	.040	—	—	.560	.210	.100	.040	—	—	—	140.00
36	28-1005	.179	.200	.040	—	—	.515	.210	.100	.040	—	—	—	\$120.00
36	28-1006	.218	.250	.040	—	—	.515	.210	.100	.040	—	—	—	\$130.00

SMITH TEFLON* TERMINALS

* Du Pont's registered trademark

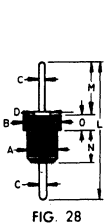


FIG. 28

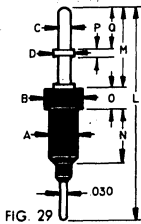


FIG. 29

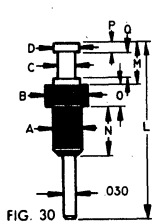


FIG. 30

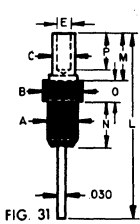


FIG. 31

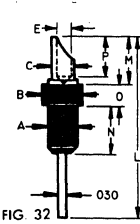


FIG. 32

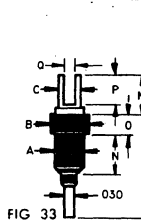


FIG. 33

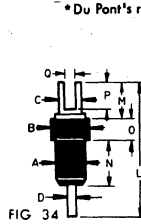


FIG. 34

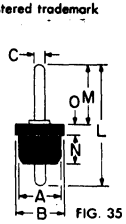


FIG. 35

FEED-THRU MICRO-MINIATURE

FIG. SMITH	DIMENSIONS												RESALE
No.	No.	A	B	C	D	E	L	M	N	O	P	Q	Per M
28	81-1019	.058	.093	.018	.062	—	.450	.200	.060	.020	—	—	\$290.00
28	81-1016	.075	.093	.030	.060	—	.550	.275	.100	.040	—	—	\$290.00
29	81-1515	.075	.093	.032	.060	—	1.500	.210	.100	.040	.020	.100	\$300.00
29	81-1514	.075	.093	.030	.060	—	1.500	.210	.125	.040	.020	.100	300.00
29	81-1513	.075	.093	.032	.060	—	1.500	.210	.125	.040	.020	.100	300.00
29	81-1516	.075	.093	.032	.060	—	1.700	.210	.125	.090	.020	.100	330.00
30	81-1506	.075	.093	.040	.060	—	.250	.090	.060	.030	.020	.050	\$290.00
30	81-1505	.075	.093	.040	.060	—	.510	.100	.100	.040	.020	.060	290.00
31	81-1007	.075	.093	.060	—	.040	.588	.125	.100	.040	.080	—	360.00
32	81-1009	.075	.093	.060	—	.040	.588	.120	.100	.040	.080	—	\$390.00
33	81-2002	.075	.093	.060	—	—	.471	.100	.090	.040	.080	.024	\$290.00
33	81-2000	.075	.093	.060	—	—	.510	.100	.090	.040	.080	.024	290.00
33	81-2001	.075	.093	.060	—	—	.635	.225	.090	.040	.075	.024	290.00
34	81-2005	.075	.093	.060	—	—	.320	.100	.100	.040	.080	.024	\$290.00
34	81-2003	.075	.093	.060	—	—	.510	.100	.100	.040	.080	.024	290.00
34	81-2004	.075	.093	.060	—	—	.525	.100	.100	.040	.080	.024	260.00
34	81-2016	.075	.093	.060	—	—	.320	.100	.125	.040	.080	.024	220.00
34	81-2017	.075	.093	.066	—	—	.320	.100	.125	.040	.080	.024	220.00

FEED-THRU

SUB-MINIATURE STRAIGHT PIN

FIG. SMITH	DIMENSIONS												RESALE
No.	No.	A	B	C	D	E	L	M	N	O	P	Q	Per M
35	82-1023	.093	.125	.040	—	—	.375	.147	.075	.040	—	—	\$120.00
35	82-1025	.093	.125	.040	—	—	.337	.125	.100	.040	—	—	120.00
35	82-1076	.093	.125	.040	—	—	.453	.156	.100	.040	—	—	140.00
35	82-1022	.093	.125	.040	—	—	.515	.210	.100	.040	—	—	140.00
35	82-1077	.093	.125	.040	—	—	.987	.687	.100	.040	—	—	150.00
35	82-1031	.125	.150	.040	—	—	.335	.125	.060	.040	—	—	\$120.00
35	82-1032	.125	.150	.040	—	—	.350	.187	.060	.040	—	—	120.00
35	82-1018	.125	.150	.040	—	—	.515	.210	.060	.040	—	—	140.00
35	82-1002	.148	.172	.040	—	—	.515	.210	.050	.050	—	—	\$140.00
35	82-1075	.148	.172	.040	—	—	.325	.075	.100	.040	—	—	210.00
35	82-1080	.148	.172	.040	—	—	.443	.093	.100	.040	—	—	130.00
35	82-1021	.148	.172	.040	—	—	.375	.125	.100	.040	—	—	130.00
35	82-1000	.148	.172	.040	—	—	.443	.210	.100	.040	—	—	120.00
35	82-1003	.148	.172	.040	—	—	.515	.210	.100	.040	—	—	140.00
35	82-1068	.148	.172	.040	—	—	.562	.210	.100	.040	—	—	140.00
35	82-1010	.148	.172	.040	—	—	.725	.210	.100	.040	—	—	150.00
35	82-1011	.148	.172	.040	—	—	1.000	.210	.100	.040	—	—	150.00
35	82-1084	.148	.172	.045	—	—	.585	.320	.100	.040	—	—	140.00
35	82-1033	.148	.172	.040	—	—	.890	.625	.100	.040	—	—	150.00
35	82-1069	.148	.172	.040	—	—	.431	.106	.110	.050	—	—	130.00
35	82-1001	.148	.172	.040	—	—	.410	.147	.110	.050	—	—	120.00
35	82-1004	.148	.172	.040	—	—	.535	.210	.110	.050	—	—	120.00
35	82-1007	.148	.172	.040	—	—	.535	.210	.120	.040	—	—	120.00
35	82-1028	.148	.172	.040	—	—	.407	.125	.132	.040	—	—	120.00
35	82-1027	.148	.172	.040	—	—	.515	.210	.132	.040	—	—	120.00
35	82-1008	.148	.172	.040	—	—	.535	.210	.132	.040	—	—	130.00
35	82-1086	.148	.172	.040	—	—	2.500	.750	.132	.040	—	—	220.00
35	82-1009	.148	.172	.040	—	—	.535	.210	.160	.040	—	—	130.00
35	82-1081	.148	.172	.040	—	—	.535	.210	.160	.040	—	—	130.00
35	82-1030	.148	.172	.040	—	—	.571	.210	.160	.040	—	—	130.00
35	82-1063	.148	.172	.040	—	—	.630	.210	.170	.040	—	—	150.00
35	82-1064	.148	.172	.040	—	—	.630	.210	.170	.040	—	—	150.00
35	82-1065	.148	.172	.040	—	—	.630	.210	.217	.040	—	—	150.00
35	82-1067	.148	.172	.040	—	—	.725	.210	.250	.040	—	—	150.00
35	82-1026	.157	.172	.040	—	—	.515	.210	.100	.040	—	—	\$120.00
35	82-1072	.169	.218	.049	—	—	.937	.125	.100	.040	—	—	\$210.00
35	82-1071	.169	.218	.049	—	—	1.187	.125	.100	.040	—	—	210.00
35	82-1073	.169	.218	.049	—	—	1.250	.125	.100	.040	—	—	210.00
35	82-1013	.169	.219	.040	—	—	1.500	.460	.100	.040	—	—	230.00
35	82-1014	.169	.219	.049	—	—	1.500	.460	.100	.040	—	—	230.00
35	82-1082	.171	.218	.040	—	—	1.090	.680	.110	.050	—	—	\$170.00
35	82-1012	.171	.218	.040	—	—	1.000	.680	.110	.050	—	—	230.00
35	82-1015	.172	.195	.040	—	—	.515	.210	.100	.040	—	—	\$130.00
35	82-1070	.172	.195	.040	—	—	.560	.210	.100	.040	—	—	140.00
35	82-1005	.179	.200	.040	—	—	.515	.210	.100	.040	—	—	\$120.00
35	82-1006	.218	.250	.040	—	—	.515	.210	.100	.040	—	—	130.00

COLORS: Supplied in White (-101) unless otherwise specified. Ten colors available. **PLATING:** Standard (P-12) unless otherwise specified.

For **COLOR CODE**, **PLATING SUFFIXES** and **QUANTITY DISCOUNT SCHEDULES** see SMITH PAGE 2.884 in this directory

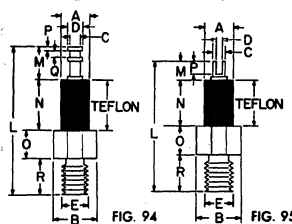
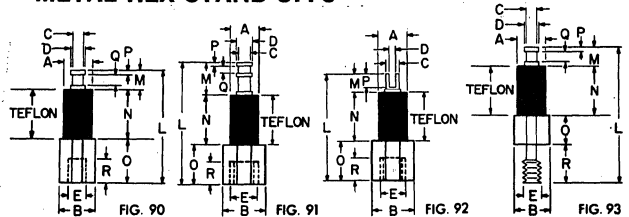
IT'S SOUND PLANNING TO SPECIFY SMITH WHEN DESIGNING OR PURCHASING

FOR RAPID SELECTION:

Terminals are listed (within figure groups) in ascending order of the MOST PERTINENT DIMENSION:

A = MIN. DIA.
B = MAJ. DIA.
N = LGTH. OF MIN. DIA.
O = LGTH. OF MAJ. DIA.
M = LGTH. OF PIN
C = DIA. OF PIN
L = OVERALL LGTH.

METAL HEX STAND-OFFS



FOR RAPID SELECTION:

Terminals are listed (within figure groups) in ascending order of the MOST PERTINENT DIMENSION:

R = LGTH. OF THD.
B = DIA. OF HEX
L = OVERALL LGTH.
O = LGTH. OF HEX
N = LGTH. OF TEFLON
A = DIA. OF TEFLON

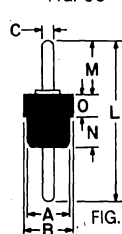
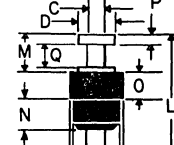
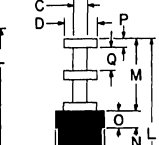
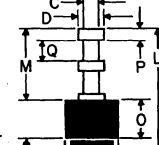
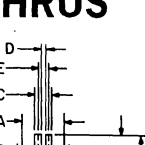
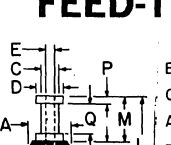
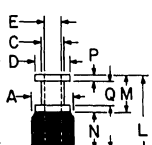
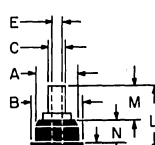
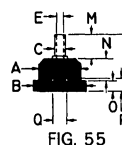
SUB-MINIATURE TURRET - BIFURCATED

FIG. SMITH		DIMENSIONS												RESALE
No.	No.	A	B	C	D	E	L	M	N	O	P	Q	R	Per M
90	52-1504	.125	.156	.045	.066	4-40	.484	.079	.303	.181	.018	.049	100	\$470.00
90	52-1503	.245	.250	.039	.140	4-40	.594	.180	.336	.258	.031	.120	156	530.00
90	52-1510	.245	.250	.039	.140	4-40	1.172	.180	.914	.258	.031	.120	156	620.00
90	52-1501	.245	.250	.069	.140	6-32	.594	.180	.336	.258	.031	.120	156	\$530.00
90	52-1511	.245	.250	.039	.140	6-32	1.172	.180	.914	.258	.031	.120	156	620.00
91	52-1500	.125	.156	.045	.066	4-40	.547	.148	.366	.181	.018	.031	100	\$470.00
91	52-1505	.245	.250	.069	.140	4-40	.719	.310	.461	.258	.025	.100	156	530.00
91	52-1507	.245	.250	.069	.140	4-40	1.297	.310	.750	.258	.025	.100	156	620.00
91	52-1502	.245	.250	.069	.140	6-32	.719	.310	.461	.258	.025	.100	156	\$470.00
91	52-1508	.245	.250	.069	.140	6-32	1.297	.310	.750	.258	.025	.100	156	620.00
92	52-2002	.125	.156	.066	.036	4-40	.484	.087	.303	.181	.067	—	100	\$470.00
92	52-2001	.245	.250	.140	.060	4-40	.594	.174	.236	.258	.101	—	156	470.00
92	52-2003	.245	.250	.140	.060	4-40	1.172	.174	.914	.258	.101	—	156	620.00
92	52-2000	.245	.250	.140	.060	6-32	.594	.174	.236	.258	.101	—	156	\$470.00
92	52-2004	.245	.250	.140	.060	6-32	1.172	.174	.914	.258	.101	—	156	620.00
93	53-1504	.125	.156	.045	.066	4-40	.672	.079	.294	.128	.018	.049	250	\$500.00
93	53-1503	.245	.250	.069	.140	4-40	.766	.180	.336	.180	.031	.120	250	530.00
93	53-1510	.245	.250	.069	.140	4-40	1.344	.180	.914	.180	.031	.120	250	630.00
93	53-1509	.125	.156	.045	.066	6-32	.672	.079	.294	.128	.018	.049	250	\$500.00
93	53-1501	.245	.250	.069	.140	6-32	.766	.180	.336	.180	.031	.120	250	530.00
93	53-1511	.245	.250	.069	.140	6-32	1.344	.180	.914	.180	.031	.120	250	630.00
94	53-1500	.125	.156	.045	.066	4-40	.750	.148	.372	.128	.018	.031	250	\$500.00
94	53-1505	.245	.250	.069	.140	4-40	.890	.310	.460	.180	.025	.100	250	530.00
94	53-1507	.245	.250	.069	.140	4-40	1.469	.310	.750	.180	.025	.100	250	630.00
94	53-1506	.125	.156	.045	.066	6-32	.750	.148	.372	.128	.018	.031	250	\$500.00
94	53-1502	.245	.250	.069	.140	6-32	.890	.310	.460	.180	.025	.100	250	530.00
94	53-1508	.245	.250	.069	.140	6-32	1.469	.310	.750	.180	.025	.100	250	630.00
95	53-2002	.125	.156	.066	.036	4-40	.672	.087	.294	.128	.067	—	250	\$500.00
95	53-2001	.245	.250	.140	.060	4-40	.766	.174	.336	.180	.101	—	250	530.00
95	53-2003	.245	.250	.140	.060	4-40	1.344	.174	.914	.180	.101	—	250	630.00
95	53-2005	.125	.156	.066	.036	6-32	.672	.087	.294	.128	.067	—	250	\$500.00
95	53-2000	.245	.250	.140	.060	6-32	.766	.174	.336	.180	.101	—	250	530.00
95	53-2004	.245	.250	.140	.060	6-32	1.344	.174	.914	.180	.101	—	250	630.00

TEFLON* TERMINALS SMITH

*Du Pont's registered trademark

FEED-THRU



FOR RAPID SELECTION:
terminals are listed (within figure groups) in ascending order of the MOST PERTINENT DIMENSION:

A = MIN. DIA.
B = MAJ. DIA.
N = LGTH. OF MIN. DIA.
O = LGTH. OF MAJ. DIA.
M = LGTH. OF PIN
C = DIA. OF PIN
L = OVERALL LGTH.

MINIATURE

FIG. SMITH	DIMENSIONS													RESALE
No.	No.	A	B	C	D	E	L	M	N	O	P	Q	R	Per M
59	83-1509	.148	.172	.040	.093	—	.836	.250	.165	.187	.020	.095	—	\$160.00
59	83-1510	.148	.172	.040	.093	—	.836	.250	.230	.125	.020	.095	—	160.00
59	83-1530	.148	.172	.040	.080	—	.812	.210	.287	.046	.020	.100	—	160.00
59	83-1544	.161	.187	.050	.093	—	.836	.250	.212	.187	.020	.093	—	\$180.00
59	83-1524	.171	.187	.050	.093	—	.836	.250	.150	.250	.020	.093	—	\$180.00
59	83-1511	.171	.187	.050	.093	—	.836	.250	.212	.187	.020	.095	—	180.00
59	83-1553	.171	.187	.050	.093	—	1.337	.281	.400	.375	.031	.093	—	240.00
59	83-1512	.204	.250	.040	.093	—	.836	.250	.212	.187	.020	.093	—	\$200.00
59	83-1513	.230	.250	.040	.093	—	.836	.250	.212	.187	.020	.093	—	\$200.00
59	83-1501	.234	.250	.040	.080	—	.500	.210	.100	.040	.020	.100	—	\$150.00
59	83-1500	.264	.312	.040	.080	—	.531	.210	.100	.040	.020	.100	—	\$150.00
60	83-1516	.171	.187	.062	.125	—	.828	.281	.200	.125	.031	.093	—	\$150.00
60	83-1515	.185	.218	.062	.125	—	.828	.281	.210	.094	.031	.093	—	\$180.00
60	83-1542	.185	.218	.062	.125	—	.828	.281	.212	.187	.031	.093	—	180.00
60	83-1570	.218	.250	.062	.125	—	.828	.281	.212	.050	.031	.093	—	\$190.00
60	83-1571	.218	.250	.062	.125	—	.828	.281	.310	.050	.031	.093	—	190.00
61	83-1540	.171	.187	.050	.093	—	.740	.125	.125	.187	.020	.093	—	\$160.00
61	83-1505	.171	.187	.050	.093	—	.740	.125	.150	.250	.031	.062	—	160.00
61	83-1502	.171	.187	.046	.093	—	.540	.133	.171	.063	.020	.093	—	120.00
61	83-1504	.171	.187	.050	.093	—	.740	.125	.212	.187	.031	.062	—	160.00
61	83-1521	.171	.187	.050	.125	—	1.115	.125	.212	.562	.031	.062	—	250.00
61	83-1506	.171	.187	.050	.093	—	.865	.125	.275	.250	.031	.062	—	240.00
61	83-1551	.171	.187	.050	.093	—	1.115	.125	.318	.365	.031	.062	—	240.00
61	83-1552	.171	.187	.050	.093	—	1.115	.125	.340	.375	.031	.062	—	240.00
61	83-1507	.171	.187	.050	.125	—	1.115	.125	.400	.375	.031	.062	—	230.00
61	83-1520	.171	.250	.050	.093	—	.740	.125	.212	.187	.031	.062	—	190.00
61	83-1522	.171	.250	.050	.125	—	1.365	.125	.525	.500	.031	.062	—	250.00
61	83-1523	.171	.250	.050	.125	—	1.965	.125	.825	.800	.031	.062	—	390.00
61	83-1503	.185	.215	.046	.093	—	.640	.133	.210	.093	.020	.093	—	\$150.00
61	83-1519	.185	.215	.046	.093	—	.718	.133	.288	.093	.020	.093	—	160.00
61	83-1508	.217	.250	.050	.125	—	1.365	.125	.525	.500	.031	.062	—	\$310.00
61	83-1514	.217	.250	.050	.125	—	1.965	.125	.825	.800	.031	.062	—	350.00
62	83-1002	.148	.172	.040	—	—	.619	.187	.105	.140	—	—	—	\$160.00
62	83-1000	.165	.187	.040	—	—	.675	.200	.150	.125	—	—	—	\$160.00
62	83-1001	.165	.187	.040	—	—	.710	.210	.150	.125	—	—	—	160.00
62	83-1003	.171	.187	.046	—	—	.540	.133	.171	.063	—	—	—	\$160.00
62	83-1004	.171	.187	.063	—	—	.740	.125	.212	.187	—	—	—	160.00
62	83-1005	.171	.187	.050	—	—	.865	.125	.275	.250	—	—	—	160.00
63	83-1531	.171	.312	.125	.188	—	.506	.099	.171	.063	.020	.048	—	180.00
63	83-1532	.171	.312	.046	.093	—	.540	.133	.171	.063	.020	.093	—	180.00
65	83-1525	.218	.250	.062	.125	—	1.187	.281	.375	.250	.031	.093	—	\$310.00
65	83-1526	.218	.250	.062	.125	—	1.687	.281	.625	.500	.031	.093	—	380.00
65	83-1527	.218	.250	.062	.125	—	2.287	.281	.925	.800	.031	.093	—	540.00
66	83-2050	.148	.172	.062	.125	—	.495	.190	.125	.060	.140	.042	—	\$200.00
66	83-2031	.171	.187	.078	.148	—	.593	.203	.150	.100	.156	.046	—	\$220.00
66	83-2001	.171	.187	.048	.148	—	.821	.203	.212	.187	.156	.046	—	220.00
66	83-2003	.171	.187	.078	.148	—	.947	.203	.275	.250	.156	.046	—	220.00
66	83-2002	.171	.187	.078	.148	—	.947	.203	.275	.250	.156	.046	—	240.00
66	83-2005	.171	.187	.078	.148	—	1.197	.203	.400	.375	.156	.046	—	260.00
66	83-2004	.171	.187	.078	.148	—	1.197	.203	.400	.375	.156	.046	—	260.00
66	83-2007	.171	.187	.078	.148	—	1.197	.203	.525	.250	.156	.046	—	260.00
66	83-2006	.171	.187	.078	.148	—	1.197	.203	.550	.225	.156	.046	—	260.00
66	83-2034	.218	.250	.086	.156	—	.828	.281	.310	.050	.200	—	—	\$240.00
67	83-2500	.171	.187	.050	—	—	4.36	.899	.281	.212	.187	—	—	\$230.00
67	83-2502	.171	.187	.050	—	—	4.36	1.024	.281	.212	.250	—	—	240.00
67	83-2504	.171	.187	.050	—	—	4.36	1.274	.281	.212	.375	—	—	240.00
67	83-2501	.171	.187	.050	—	—	4.40	.899	.281	.212	.187	—	—	230.00
67	83-2503	.171	.187	.050	—	—	4.40	1.024	.281	.212	.250	—	—	240.00
67	83-2505	.171	.187	.050	—	—	4.40	1.274	.281	.212	.375	—	—	250.00

FIG. 53

FIG. 59

FIG. 60

FIG. 61

FIG. 63

FIG. 65

FIG. 66

FIG. 67

REVERSED SUB-MINIATURE TUBULAR

FIG. SMITH		DIMENSIONS													RESALE
No.	No.	A	B	C	D	E	L	M	N	O	P	Q	R	Per M	
55	28-1046	.148	.172	.040	—	.030	.282	.147	.075	.060	—	.070	.042	\$150.00	
55	28-1085	.148	.172	.040	—	.030	.387	.207	.110	.050	—	.050	.050	150.00	
55	28-1150	.148	.172	.072	—	.052	.606	.025	.220	.025	—	.062	.011	150.00	
55	28-1088	.171	.218	.085	—	.063	.710	.500	.160	.040	—	.085	.050	\$160.00	
55	28-1047	.171	.218	.085	—	.063	.417	.207	.160	.050	—	.085	.050	160.00	
55	28-1044	.200	.240	.040	—	.030	.367	.207	.110	.050	—	.050	.057	\$160.00	
55	28-1045	.218	.250	.060	—	.030	.287	.147	.100	.040	—	.050	.030	\$160.00	
56	28-1134	.093	.125	.040	—	.030	.215	.125	.050	.040	—	—	—	\$150.00	
56	28-1040	.093	.125	.040	—	.030	.225	.125	.060	.040	—	—	—	150.00	
56	28-1135	.093	.125	.040	—	.030	.312	.207	.060	.040	—	—	—	150.00	
56	28-1115	.093	.125	.040	—	.030	.317	.187	.090	.040	—	—	—	150.00	
56	28-1116	.093	.125	.040	—	.030	.405	.275	.090	.040	—	—	—	150.00	
56	28-1161	.093	.125	.043	—	.030	.252	.100	.110	.040	—	—	—	150.00	
56	28-1037	.120	.130	.040	—	.030	.310	.207	.053	.050	—	—	—	\$150.00	
56	28-1036	.125	.150	.040	—	.030	.225	.125	.060	.040	—	—	—	\$140.00	
56	28-1151	.125	.150	.040	—	.030	.225	.126	.075	.025	—	—	—	140.00	
56	28-1126	.125	.150	.040	—	.030	.247	.147	.075	.025	—	—	—	140.00	
56	28-1124	.125	.150	.040	—	.030	.325	.125	.075	.125	—	—	—	140.00	
56	28-1123	.148	.172	.040	—	.030	.245	.147	.053	.045	—	—	—	\$150.00	
56	28-1035	.148	.172	.040	—	.030	.250	.147	.053	.050	—	—	—	150.00	
56	28-1034	.148	.172	.040	—	.030	.310	.207	.053	.050	—	—	—	150.00	
56	28-1127	.148	.172	.080	—	.052	.193	.105	.063	.025	—	—	—	150.00	
56	28-1090	.148	.172	.085	—	.063	.332	.207	.075	.050	—	—	—	150.00	
56	28-1038	.148	.172	.040	—	.030	.296	.136	.100	.060	—	—	—	150.00	
56	28-1017	.148	.172	.085	—	.063	.367	.207	.110	.050	—	—	—	150.00	
56	28-1091	.148	.172	.085	—	.070	.367	.207	.110	.050	—	—	—	150.00	
56	28-1089	.148	.172	.085	—	.063	.413	.207	.156	.050	—	—	—	150.00	
56	28-1039	.171	.218	.040	—	.030	.367	.207	.110	.050	—	—	—	\$160.00	
56	28-1041	.171	.218	.085	—	.063	.367	.207	.110	.050	—	—	—	160.00	
56	28-1024	.200	.240	.085	—	.063	.367	.207	.110	.050	—	—	—	\$180.00	
57	28-1119	.093	.125	.040	.080	.030	.215	.125	.050	.040	.020	.093	—	\$150.00	
57	28-1120	.125	.150	.060	.090	.030	.293	.133	.060	.040	.020	.093	—	\$140.00	
57	28-1122	.125	.150	.060	.090	.030	.200	.090	.060	.050	.020	.093	—	140.00	
57	28-1049	.125	.150	.060	.090	.030	.273	.133	.080	.060	.020	.093	—	140.00	
57	28-1103	.125	.150	.060	.090	.030	.273	.133	.100	.040	.020	.093	—	140.00	
57	28-1118	.125	.150	.060	.090	.030	.293	.133	.110	.050	.020	.093	—	140.00	
57	28-1093	.148	.172	.060	.093	.040	.238	.133	.065	.040	.020	.093	—	\$160.00	
57	28-1054	.148	.172	.060	.090	.030	.273	.133	.100	.040	.020	.093	—	160.00	
57	28-1096	.148	.172	.060	.093	.030	.293	.133	.110	.050	.020	.093	—	160.00	
57	28-1016	.148	.172	.082	.125	.063	.351	.133	.125	.093	.020	.093	—	160.00	
57	28-1092	.148	.172	.060	.090	.030	.303	.133	.130	.040	.020	.093	—	160.00	
57	28-1060	.148	.172	.060	.093	.042	.392	.162	.130	.100	.020	.130	—	160.00	
57	28-1052	.171	.188	.082	.125	.062	.381	.133	.125	.093	.020	.093	—	\$160.00	
57	28-1048	.263	.297	.060	.090	.030	.333	.133	.160	.040	.020	.093	—	\$200.00	
58	28-1050	.148	.172	.060	.090	.030	.303	.133	.100	.040	.020	.093	—	\$170.00	
58	28-1051	.148	.172	.060	.090	.030	.333	.133	.110	.050	.020	.093	—	171.00	
53	28-2015	.125	.150	.050	.030	.030	.160	.062	.073	.025	—	—	—	\$230.00	

SMITH TEFLON* TERMINALS

STAND-OFFS

* Du Pont's registered trademark

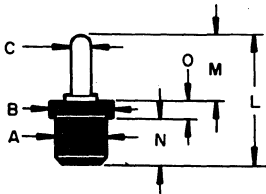


Fig. 1

FOR RAPID SELECTION:

terminals are listed (within figure groups) in ascending order of the MOST PERTINENT DIMENSION:

A = MIN. DIA.
B = MAJ. DIA.
N = LGTH. OF MIN. DIA.
O = LGTH. OF MAJ. DIA.
M = LGTH. OF PIN
C = DIA. OF PIN
L = OVERALL LGTH.

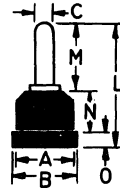


Fig. 2

SUB-MINIATURE STRAIGHT PIN

FIG. SMITH		DIMENSIONS												RESALE
No.	No.	A	B	C	D	E	L	M	N	O	P	Q	R	Per M
1	92-1025	.093	.125	.040	—	—	.262	.147	.075	.050	—	—	—	\$130.00
1	92-1055	.093	.125	.040	—	—	.299	.174	.085	.040	—	—	—	130.00
1	92-1053	.093	.125	.040	—	—	.213	.093	.089	.031	—	—	—	130.00
1	92-1066	.093	.125	.040	—	—	.250	.130	.089	.031	—	—	—	130.00
1	92-1034	.093	.125	.040	—	—	.350	.210	.100	.040	—	—	—	130.00
1	92-1089	.093	.125	.040	—	—	.572	.432	.100	.040	—	—	—	130.00
1	92-1095	.093	.125	.040	—	—	.587	.447	.100	.040	—	—	—	130.00
1	92-1089	.093	.125	.040	—	—	.672	.532	.100	.040	—	—	—	130.00
1	92-1090	.093	.125	.040	—	—	.737	.597	.100	.040	—	—	—	160.00
1	92-1094	.093	.125	.040	—	—	.755	.615	.100	.040	—	—	—	160.00
1	92-1091	.093	.125	.040	—	—	.770	.630	.100	.040	—	—	—	160.00
1	92-1098	.093	.125	.040	—	—	.797	.657	.100	.040	—	—	—	160.00
1	92-1086	.093	.125	.040	—	—	1.025	.885	.100	.040	—	—	—	200.00
1	92-1087	.093	.125	.040	—	—	1.125	.985	.100	.040	—	—	—	200.00
1	92-1003	.104	.125	.040	—	—	.250	.130	.098	.031	—	—	—	\$130.00
1	92-1035	.104	.125	.040	—	—	.250	.130	.089	.031	—	—	—	130.00
1	92-1067	.106	.125	.040	—	—	.250	.130	.089	.031	—	—	—	\$130.00
1	92-1070	.112	.172	.040	—	—	.350	.210	.120	.020	—	—	—	\$120.00
1	92-1061	.112	.172	.040	—	—	.350	.210	.120	.020	—	—	—	120.00
1	92-1971	.125	.150	.040	—	—	.310	.210	.060	.040	—	—	—	\$130.00
1	92-1022	.148	.172	.040	—	—	.247	.147	.050	.050	—	—	—	\$130.00
1	92-1020	.148	.172	.040	—	—	.310	.210	.050	.050	—	—	—	130.00
1	92-1052	.148	.172	.040	—	—	.210	.120	.060	.030	—	—	—	130.00
1	92-1054	.148	.172	.040	—	—	.350	.210	.062	.076	—	—	—	130.00
1	92-1008	.148	.172	.040	—	—	.350	.210	.062	.078	—	—	—	130.00
1	92-1015	.148	.172	.040	—	—	.250	.150	.070	.030	—	—	—	130.00
1	92-1037	.148	.172	.040	—	—	.260	.145	.075	.040	—	—	—	130.00
1	92-1038	.148	.172	.040	—	—	.230	.105	.075	.050	—	—	—	130.00
1	92-1012	.148	.172	.040	—	—	.335	.210	.075	.050	—	—	—	130.00
1	92-1006	.148	.172	.040	—	—	.345	.210	.075	.060	—	—	—	130.00
1	92-1062	.148	.172	.040	—	—	.330	.210	.100	.020	—	—	—	130.00
1	92-1017	.148	.172	.040	—	—	.250	.110	.100	.040	—	—	—	130.00
1	92-1016	.148	.172	.040	—	—	.265	.125	.100	.040	—	—	—	130.00
1	92-1018	.148	.172	.040	—	—	.285	.145	.100	.040	—	—	—	130.00
1	92-1000	.148	.172	.040	—	—	.350	.210	.100	.040	—	—	—	130.00
1	92-1050	.148	.172	.040	—	—	.460	.320	.100	.040	—	—	—	130.00
1	92-1011	.148	.172	.040	—	—	.594	.450	.100	.040	—	—	—	130.00
1	92-1019	.148	.172	.040	—	—	.750	.610	.100	.040	—	—	—	130.00
1	92-1085	.148	.172	.040	—	—	.797	.657	.100	.040	—	—	—	130.00
1	92-1021	.148	.172	.040	—	—	.305	.145	.110	.050	—	—	—	130.00
1	92-1001	.148	.172	.040	—	—	.370	.210	.110	.050	—	—	—	130.00
1	92-1069	.148	.172	.040	—	—	.350	.210	.120	.020	—	—	—	130.00
1	92-1007	.148	.172	.040	—	—	.370	.210	.120	.040	—	—	—	130.00
1	92-1060	.148	.172	.040	—	—	.350	.210	.125	.015	—	—	—	130.00
1	92-1051	.148	.172	.040	—	—	.280	.125	.125	.040	—	—	—	130.00
1	92-1036	.148	.172	.040	—	—	.365	.193	.132	.040	—	—	—	130.00
1	92-1068	.148	.172	.040	—	—	.382	.210	.132	.040	—	—	—	130.00
1	92-1072	.148	.172	.040	—	—	.390	.218	.132	.040	—	—	—	130.00
1	92-1073	.148	.172	.040	—	—	.750	.578	.132	.040	—	—	—	130.00
1	92-1009	.148	.172	.040	—	—	.406	.210	.156	.040	—	—	—	130.00
1	92-1010	.148	.172	.040	—	—	.500	.210	.250	.040	—	—	—	130.00
1	92-1063	.148	.172	.040	—	—	.500	.210	.250	.040	—	—	—	130.00
1	92-1003	.171	.195	.040	—	—	.350	.210	.100	.040	—	—	—	\$130.00
1	92-1004	.179	.200	.040	—	—	.350	.210	.100	.040	—	—	—	\$130.00
1	92-1005	.218	.250	.040	—	—	.350	.210	.100	.040	—	—	—	\$130.00

REVERSED SUB-MINIATURE STRAIGHT PIN

FIG. SMITH		DIMENSIONS												RESALE
No.	No.	A	B	C	D	E	L	M	N	O	P	Q	R	Per M
2	29-1025	.093	.125	.040	—	—	.262	.147	.075	.050	—	—	—	\$130.00
2	29-1055	.093	.125	.040	—	—	.299	.174	.085	.040	—	—	—	130.00
2	29-1053	.093	.125	.040	—	—	.213	.093	.089	.031	—	—	—	130.00
2	29-1066	.093	.125	.040	—	—	.250	.130	.089	.031	—	—	—	130.00
2	29-1034	.093	.125	.040	—	—	.350	.210	.100	.040	—	—	—	130.00
2	29-1089	.093	.125	.040	—	—	.572	.432	.100	.040	—	—	—	130.00
2	29-1095	.093	.125	.040	—	—	.587	.447	.100	.040	—	—	—	130.00
2	29-1088	.093	.125	.040	—	—	.672	.532	.100	.040	—	—	—	130.00
2	29-1090	.093	.125	.040	—	—	.737	.597	.100	.040	—	—	—	140.00
2	29-1094	.093	.125	.040	—	—	.755	.615	.100	.040	—	—	—	160.00
2	29-1091	.148	.172	.040	—	—	.795	.630	.100	.065	—	—	—	160.00
2	29-1098	.093	.125	.040	—	—	.797	.657	.100	.040	—	—	—	160.00
2	29-1086	.093	.125	.040	—	—	1.025	.885	.100	.040	—	—	—	200.00
2	29-1087	.093	.125	.040	—	—	1.125	.985	.100	.040	—	—	—	200.00
2	29-1003	.104	.125	.040	—	—	.250	.130	.089	.031	—	—	—	130.00
2	29-1035	.104	.125	.040	—	—	.250	.130	.089	.031	—	—	—	\$130.00
2	29-1067	.106	.125	.040	—	—	.250	.130	.089	.031	—	—	—	120.00
2	29-1070	.112	.172	.040	—	—	.350	.210	.120	.020	—	—	—	\$120.00
2	29-1061	.112	.172	.040	—	—	.350	.210	.125	.015	—	—	—	\$120.00
2	29-1071	.125	.150	.040	—	—	.310	.210	.060	.040	—	—	—	130.00
2	29-1022	.148	.172	.040	—	—	.247	.147	.050	.050	—	—	—	130.00
2	29-1020	.148	.172	.040	—	—	.310	.210	.050	.050	—	—	—	130.00
2	29-1052	.148	.172	.040	—	—	.210	.120	.060	.030	—	—	—	130.00
2	29-1008	.148	.172	.040	—	—	.350	.210	.062	.078	—	—	—	130.00
2	29-1054	.148	.172	.040	—	—	.350	.210	.062	.078	—	—	—	130.00
2	29-1015	.148	.172	.040	—	—	.250	.150	.070	.030	—	—	—	130.00
2	29-1037	.148	.172	.040	—	—	.260	.145	.075	.040	—	—	—	130.00
2	29-1038	.148	.172	.040	—	—	.230	.105	.075	.050	—	—	—	130.00
2	29-1012	.148	.172	.040	—	—	.335	.210	.075	.050	—	—	—	130.00
2	29-1006	.148	.172	.040	—	—	.345	.210	.075	.060	—	—	—	130.00
2	29-1062	.148	.172	.040	—	—	.330	.210	.100	.020	—	—	—	130.00
2	29-1017	.148	.172	.040	—	—	.250	.110	.100	.040	—	—	—	130.00
2	29-1016	.148	.172	.040	—	—	.265	.125	.100	.040	—	—	—	130.00
2	29-1018	.148	.172	.040	—	—	.285	.145	.100	.040	—	—	—	130.00
2	29-1000	.148	.172	.040	—	—	.350	.210	.100	.040	—	—	—	130.00
2	29-1050	.148	.172	.040	—	—	.460	.320	.100	.040	—	—	—	130.00
2	29-1011	.148	.172	.040	—	—	.594	.450	.100	.040	—	—	—	130.00
2	29-1019	.148	.172	.040	—	—	.750	.610	.100	.040	—	—	—	140.00
2	29-1085	.148	.172	.040	—	—	.797	.657	.100	.040	—	—	—	130.00
2	29-1021	.148	.172	.040	—	—	.305	.145	.110	.050	—	—	—	130.00
2	29-1001	.148	.172	.040	—	—	.370	.210	.110	.050	—	—	—	130.00
2	29-1069	.148	.172	.040	—	—	.350	.210	.120	.020	—	—	—	130.00
2	29-1007	.148	.172	.040	—	—	.370	.210	.120	.040	—	—	—	130.00
2	29-1060	.148	.172	.040	—	—	.350	.210	.125	.015	—	—	—	130.00
2	29-1051	.148	.172	.040	—	—	.280	.125	.125	.040	—	—	—	130.00
2	29-1036	.148	.172	.040	—	—	.365	.193	.132	.040	—	—	—	130.00
2	29-1068	.148	.172	.040	—	—	.382	.210	.132	.040	—	—	—	140.00
2	29-1072	.148	.172	.040	—	—	.390	.218	.132	.040	—	—	—	130.00
2	29-1073	.148	.172	.040	—	—	.750	.578	.132	.040	—	—	—	140.00
2	29-1009	.148	.172	.040	—	—	.406	.210	.156	.040	—	—	—	130.00
2	29-1010	.148	.172	.040	—	—	.500	.210	.250	.040	—	—	—	130.00
2	29-1063	.148	.172	.040	—	—	.330	.210	.074	.046	—	—	—	130.00
2	19-1003	.171	.195	.040	—	—	.350	.210	.100	.040	—	—	—	\$130.00
2	29-1004	.179	.200	.040	—	—	.350	.210	.100	.040	—	—	—	\$130.00
2	29-1005	.218	.250	.040	—	—	.350	.210	.100	.040	—	—	—	\$130.00

SMITH TEFLON* TERMINALS

STAND-OFFS

*Du Pont's registered trademark

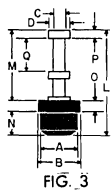


FIG. 3

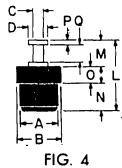


FIG. 4

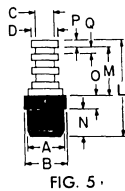


FIG. 5

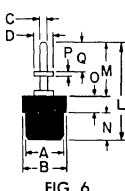


FIG. 6

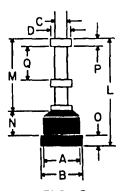


FIG. 9

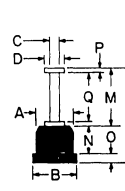


FIG. 10

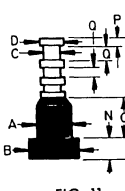


FIG. 11

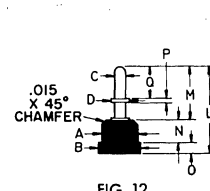


FIG. 12

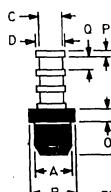


FIG. 7

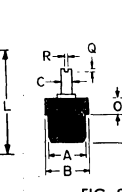


FIG. 8

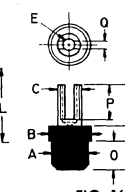


FIG. 16

FOR RAPID SELECTION:

terminals are listed (within figure groups) in ascending order of the MOST PERTINENT DIMENSION:

A = MIN. DIA.
B = MAJ. DIA.
N = LGTH. OF MIN. DIA.
O = LGTH. OF MAJ. DIA.

M = LGTH. OF PIN
C = DIA. OF PIN
L = OVERALL LGTH.

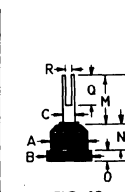


FIG. 13

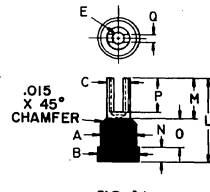


FIG. 14

SUB-MINIATURE TURRET - SINGLE - MULTIPLE BIFURCATED

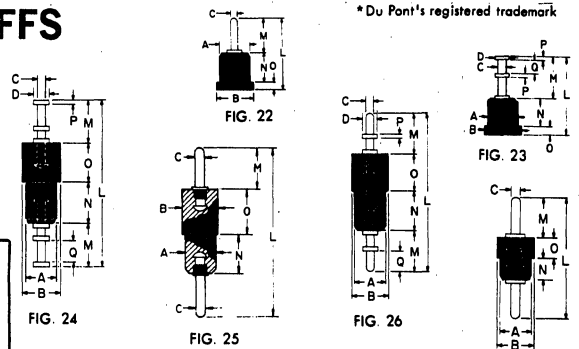
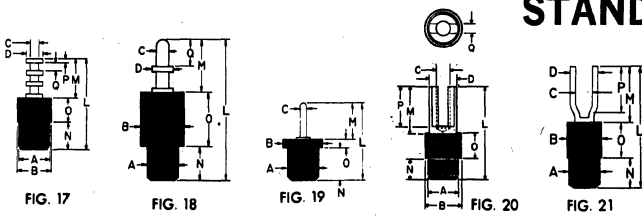
FIG. No.	SMITH No.	A	B	C	D	E	L	M	N	O	P	Q	R	RESALE Per M
3	92-1577	.093	.125	.040	.080	—	.280	.140	.100	.040	.030	.040	—	\$130.00
3	92-1500	.093	.125	.030	.060	—	.310	.170	.100	.040	.020	.060	—	120.00
3	92-1528	.093	.125	.040	.080	—	.350	.210	.100	.040	.020	.100	—	130.00
3	92-1587	.093	.125	.040	.080	—	.390	.210	.140	.040	.020	.100	—	130.00
3	92-1540	.130	.172	.040	.093	—	.480	.250	.190	.040	.020	.093	—	\$130.00
3	92-1519	.148	.172	.046	.090	—	.254	.154	.060	.040	.020	.046	—	\$120.00
3	92-1511	.148	.172	.046	.093	—	.296	.156	.100	.040	.020	.046	—	120.00
3	92-1500	.148	.172	.040	.080	—	.350	.210	.100	.040	.020	.100	—	120.00
3	92-1578	.148	.172	.040	.080	—	.390	.250	.100	.040	.020	.093	—	120.00
3	92-1573	.148	.172	.040	.080	—	.400	.210	.100	.090	.020	.093	—	120.00
3	92-1586	.148	.172	.045	.093	—	.443	.250	.100	.093	.020	.085	—	120.00
3	92-1542	.148	.172	.040	.080	—	.359	.210	.109	.040	.020	.100	—	120.00
3	92-1570	.148	.172	.046	.093	—	.319	.154	.125	.040	.020	.046	—	120.00
3	92-1501	.148	.172	.040	.080	—	.375	.210	.125	.040	.020	.100	—	120.00
3	92-1505	.148	.172	.040	.080	—	.428	.210	.125	.093	.020	.100	—	120.00
3	92-1504	.148	.172	.046	.093	—	.334	.154	.140	.040	.020	.046	—	120.00
3	92-1566	.148	.172	.040	.080	—	.406	.210	.156	.040	.020	.100	—	120.00
3	92-1524	.148	.172	.040	.080	—	.461	.210	.158	.093	.020	.100	—	120.00
3	92-1506	.148	.172	.040	.093	—	.455	.250	.160	.040	.020	.093	—	120.00
3	92-1567	.148	.172	.040	.093	—	.470	.250	.180	.040	.020	.093	—	120.00
3	92-1507	.148	.172	.040	.093	—	.500	.210	.250	.040	.020	.100	—	120.00
3	92-1512	.148	.172	.040	.080	—	.540	.250	.250	.040	.020	.093	—	120.00
3	92-1534	.152	.172	.047	.093	—	.335	.207	.088	.040	.020	.093	—	\$120.00
3	92-1532	.152	.172	.047	.093	—	.296	.156	.100	.040	.020	.047	—	120.00
3	92-1535	.152	.172	.047	.093	—	.347	.207	.100	.040	.020	.093	—	120.00
3	92-1531	.152	.172	.047	.093	—	.346	.156	.150	.040	.020	.047	—	120.00
3	92-1533	.152	.172	.047	.093	—	.361	.156	.165	.040	.020	.047	—	120.00
3	92-1513	.171	.187	.040	.080	—	.405	.210	.155	.040	.020	.100	—	\$130.00
3	92-1502	.179	.200	.040	.080	—	.350	.210	.100	.040	.020	.100	—	\$130.00
3	92-1508	.185	.218	.040	.080	—	.350	.210	.100	.040	.020	.100	—	\$130.00
3	92-1523	.185	.218	.040	.080	—	.460	.300	.120	.040	.020	.140	—	130.00
3	92-1503	.185	.218	.040	.080	—	.375	.210	.125	.040	.020	.100	—	130.00
3	92-1526	.204	.250	.040	.080	—	.350	.210	.100	.040	.020	.100	—	\$140.00
4	92-1579	.093	.125	.040	.080	—	.230	.090	.100	.040	.020	.060	—	\$130.00
4	92-1527	.148	.172	.040	.080	—	.262	.125	.087	.050	.020	.085	—	\$130.00
4	92-1525	.148	.172	.040	.080	—	.250	.110	.100	.040	.020	.080	—	130.00
4	92-1563	.148	.172	.046	.093	—	.296	.156	.100	.040	.020	.116	—	130.00
4	92-1562	.148	.172	.040	.080	—	.382	.227	.130	.025	.020	.187	—	130.00
4	92-1571	.148	.172	.045	.093	—	.468	.250	.168	.050	.020	.180	—	150.00
4	92-1521	.148	.172	.040	.080	—	.455	.227	.187	.040	.020	.187	—	130.00
4	92-1581	.150	.175	.045	.093	—	.468	.250	.168	.050	.020	.190	—	130.00
4	92-1520	.171	.200	.048	.090	—	.320	.120	.125	.075	.020	.080	—	\$150.00
5	92-1517	.148	.172	.070	.109	—	.362	.232	.080	.050	.029	.031	—	\$180.00
5	92-1514	.148	.172	.070	.109	—	.392	.232	.110	.050	.029	.031	—	180.00
6	92-1509	.148	.172	.040	.080	—	.328	.210	.075	.040	.020	.120	—	\$130.00
6	92-1545	.148	.172	.040	.080	—	.350	.210	.100	.040	.020	.120	—	130.00
6	92-1546	.148	.172	.040	.080	—	.415	.210	.165	.040	.020	.120	—	130.00
7	92-1516	.093	.125	.068	.078	—	.255	.150	.075	.030	.015	.031	—	\$160.00
7	92-1515	.093	.125	.068	.078	—	.344	.153	.140	.041	.015	.031	—	160.00
8	92-2008	.104	.125	.080	—	—	.350	.210	.100	.040	—	.180	.036	\$180.00
8	92-2000	.148	.172	.040	—	—	.265	.125	.100	.040	—	.010	.010	\$180.00
16	92-2010	.148	.172	.125	—	—	.062	.375	.190	.125	.060	.140	.030	\$180.00

REVERSED SUB-MINIATURE TURRET - SINGLE - MULTIPLE BIFURCATED

FIG. No.	SMITH No.	A	B	C	D	E	L	M	N	O	P	Q	R	RESALE Per M
9	29-1577	.093	.125	.040	.080	—	.280	.140	.100	.040	.020	.040	—	\$130.00
9	19-1500	.093	.125	.030	.060	—	.310	.170	.100	.040	.020	.060	—	120.00
9	29-1528	.093	.125	.040	.080	—	.350	.210	.100	.040	.020	.100	—	130.00
9	29-1587	.093	.125	.040	.080	—	.390	.210	.140	.040	.020	.100	—	130.00
9	29-1540	.130	.172	.040	.093	—	.480	.250	.190	.040	.020	.093	—	\$130.00
9	29-1519	.148	.172	.046	.093	—	.254	.154	.060	.040	.020	.046	—	\$120.00
9	29-1511	.148	.172	.046	.093	—	.296	.156	.100	.040	.020	.046	—	120.00
9	29-1500	.148	.172	.040	.080	—	.350	.210	.100	.040	.020	.100	—	120.00
9	29-1578	.148	.172	.040	.080	—	.390	.250	.100	.040	.020	.093	—	120.00
9	29-1573	.148	.172	.040	.080	—	.400	.210	.100	.090	.020	.093	—	120.00
9	29-1586	.148	.172	.045	.093	—	.443	.250	.100	.093	.020	.085	—	120.00
9	29-1542	.148	.172	.040	.080	—	.359	.210	.109	.040	.020	.100	—	120.00
9	29-1570	.148	.172	.046	.093	—	.319	.154	.125	.040	.020	.046	—	120.00
9	29-1501	.148	.172	.040	.080	—	.375	.210	.125	.040	.020	.100	—	120.00
9	29-1505	.148	.172	.040	.080	—	.428	.210	.125	.093	.020	.100	—	120.00
9	29-1504	.148	.172	.046	.093	—	.334	.154	.140	.040	.020	.046	—	120.00
9	29-1566	.148	.172	.040	.080	—	.406	.210	.156	.040	.020	.100	—	120.00
9	29-1524	.148	.172	.040	.080	—	.461	.210	.158	.093	.020	.100	—	120.00
9	29-1506	.148	.172	.040	.093	—	.455	.250	.160	.040	.020	.093	—	120.00
9	29-1567	.148	.172	.040	.093	—	.470	.250	.180	.040	.020	.093	—	120.00
9	29-1507	.148	.172	.040	.093	—	.500	.210	.250	.040	.020	.100	—	120.00
9	29-1512	.148	.172	.040	.080	—	.540	.250	.250	.040	.020	.093	—	120.00
9	29-1534	.152	.172	.047	.093	—	.335	.207	.088	.040	.020	.093	—	\$120.00
9	29-1532	.152	.172	.047	.093	—	.296	.156	.100	.040	.020	.047	—	120.00
9	29-1535	.152	.172	.047	.093	—	.347	.207	.100	.040	.020	.093	—	120.00
9	29-1531	.152	.172	.047	.093	—	.346	.156	.150	.040	.020	.047	—	120.00
9	29-1533	.152	.172	.047	.093	—	.361	.156	.165	.040	.020	.047	—	120.00
9	29-1513	.171	.187	.040	.080	—	.405	.210	.155	.040	.020	.100	—	\$130.00
9	29-1502	.179	.200	.040	.080	—	.350	.210	.100	.040	.020	.100	—	\$130.00

SMITH TEFLON* TERMINALS

STAND-OFFS



* Du Pont's registered trademark

FOR RAPID SELECTION:
terminals are listed (within figure groups) in ascending order of the MOST PERTINENT DIMENSION:

A = MIN. DIA.
B = MAJ. DIA.
C = LGTH. OF MIN. DIA.
N = LGTH. OF MAJ. DIA.
M = LGTH. OF PIN
C = DIA. OF PIN
L = OVERALL LGTH.

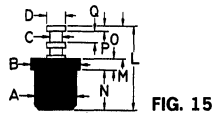


FIG. 15

MINIATURE TURRET

FIG. SMITH	No.	No.	A	B	C	D	E	L	M	N	O	P	Q	R	RESALE
															Per M
15	93-1515	.104	.125	.046	.090	—	.346	.156	.087	.103	.020	.046	—	—	\$140.00
15	93-1542	.104	.125	.046	.093	—	.346	.156	.087	.103	.020	.046	—	—	140.00
15	93-1549	.104	.125	.046	.093	—	.359	.156	.100	.103	.020	.046	—	—	140.00
15	93-1526	.127	.156	.046	.090	—	.531	.156	.156	.219	.020	.046	—	—	\$170.00
15	93-1527	.135	.187	.040	.093	—	.647	.250	.150	.250	.020	.093	—	—	\$140.00
15	93-1518	.148	.172	.040	.093	—	.482	.250	.110	.125	.020	.093	—	—	\$140.00
15	93-1525	.148	.172	.040	.093	—	.598	.250	.165	.187	.020	.093	—	—	140.00
15	93-1535	.165	.187	.046	.093	—	.656	.156	.100	.400	.020	.046	—	—	\$170.00
15	93-1563	.165	.187	.040	.093	—	.797	.250	.100	.400	.020	.093	—	—	170.00
15	93-1524	.165	.187	.046	.093	—	.468	.156	.125	.187	.020	.046	—	—	140.00
15	93-1500	.165	.187	.046	.093	—	.431	.156	.150	.125	.020	.046	—	—	140.00
15	93-1551	.165	.187	.040	.080	—	.485	.210	.150	.125	.020	.100	—	—	140.00
15	93-1502	.165	.187	.040	.093	—	.522	.250	.150	.125	.020	.093	—	—	140.00
15	93-1503	.165	.187	.046	.125	—	.556	.281	.150	.125	.031	.093	—	—	140.00
15	93-1519	.165	.187	.046	.125	—	.556	.281	.150	.125	.031	.093	—	—	140.00
15	93-1501	.165	.187	.046	.093	—	.493	.156	.150	.187	.020	.046	—	—	140.00
15	93-1504	.165	.187	.040	.093	—	.584	.250	.150	.187	.020	.093	—	—	140.00
15	93-1506	.165	.187	.046	.125	—	.616	.281	.150	.187	.031	.093	—	—	160.00
15	93-1505	.165	.187	.046	.093	—	.556	.156	.150	.250	.020	.046	—	—	140.00
15	93-1529	.165	.187	.040	.093	—	.647	.250	.150	.250	.020	.093	—	—	160.00
15	93-1530	.165	.187	.046	.125	—	.681	.281	.150	.250	.031	.093	—	—	160.00
15	93-1534	.165	.187	.046	.093	—	.706	.156	.150	.400	.020	.046	—	—	180.00
15	93-1533	.165	.187	.040	.093	—	.797	.250	.150	.400	.020	.093	—	—	180.00
15	93-1507	.165	.187	.046	.125	—	.831	.281	.150	.400	.031	.093	—	—	180.00
15	93-1528	.165	.187	.046	.125	—	.681	.281	.200	.200	.031	.093	—	—	160.00
15	93-1560	.165	.187	.046	.125	—	.831	.281	.200	.350	.031	.093	—	—	160.00
15	93-1561	.165	.187	.047	.125	—	.893	.343	.200	.350	.031	.125	—	—	180.00
15	93-1532	.165	.187	.046	.093	—	.706	.156	.300	.250	.020	.046	—	—	180.00
15	93-1579	.171	.187	.040	.093	—	.390	.250	.100	.040	.020	.093	—	—	\$140.00
15	93-1574	.171	.187	.040	.093	—	.525	.250	.125	.150	.020	.093	—	—	140.00
15	93-1510	.171	.187	.046	.093	—	.431	.156	.150	.125	.020	.046	—	—	140.00
15	93-1552	.171	.187	.046	.080	—	.485	.210	.150	.125	.020	.100	—	—	140.00
15	93-1580	.171	.187	.040	.093	—	.525	.250	.150	.125	.020	.093	—	—	140.00
15	93-1520	.171	.187	.046	.125	—	.556	.281	.150	.125	.031	.093	—	—	140.00
15	93-1521	.171	.187	.062	.125	—	.556	.281	.150	.125	.031	.093	—	—	140.00
15	93-1511	.171	.187	.046	.093	—	.493	.156	.150	.187	.020	.046	—	—	140.00
15	93-1516	.171	.187	.040	.093	—	.584	.250	.150	.187	.020	.093	—	—	140.00
15	93-1583	.171	.187	.046	.125	—	.619	.281	.150	.187	.031	.093	—	—	150.00
15	93-1512	.171	.187	.046	.093	—	.556	.156	.150	.250	.020	.046	—	—	150.00
15	93-1547	.171	.187	.040	.080	—	.610	.210	.150	.250	.020	.100	—	—	150.00
15	93-1581	.171	.187	.040	.093	—	.650	.250	.150	.250	.020	.093	—	—	150.00
15	93-1531	.171	.187	.046	.125	—	.681	.281	.150	.250	.031	.093	—	—	160.00
15	93-1513	.171	.187	.046	.125	—	.831	.281	.150	.400	.031	.093	—	—	160.00
15	93-1582	.171	.187	.040	.093	—	.800	.250	.150	.400	.020	.093	—	—	160.00
15	93-1557	.171	.187	.046	.093	—	.593	.156	.187	.250	.020	.046	—	—	160.00
15	93-1543	.171	.187	.062	.125	—	.621	.281	.215	.125	.031	.093	—	—	160.00
15	93-1559	.171	.187	.046	.093	—	.706	.156	.300	.250	.020	.046	—	—	160.00
15	93-1562	.171	.187	.046	.125	—	.831	.281	.300	.250	.031	.093	—	—	170.00
15	93-1578	.171	.218	.040	.080	—	.350	.210	.100	.040	.020	.100	—	—	140.00
15	93-1522	.171	.218	.040	.080	—	.485	.210	.150	.125	.020	.100	—	—	140.00
15	93-1536	.171	.250	.046	.125	—	.968	.281	.187	.500	.031	.093	—	—	240.00
15	93-1514	.171	.250	.046	.125	—	.1268	.281	.187	.800	.031	.093	—	—	280.00
15	93-1553	.185	.218	.046	.125	—	.546	.281	.140	.125	.031	.093	—	—	\$150.00
15	91-1003	.185	.218	.046	.093	—	.487	.154	.287	.046	.020	.046	—	—	130.00
15	91-1500	.185	.218	.046	.093	—	.583	.250	.287	.046	.020	.093	—	—	130.00
15	93-1558	.215	.250	.046	.125	—	.718	.281	.187	.250	.031	.093	—	—	\$200.00
15	93-1538	.215	.250	.046	.125	—	.843	.156	.187	.500	.020	.046	—	—	220.00
15	93-1537	.215	.250	.040	.093	—	.934	.250	.187	.500	.020	.093	—	—	220.00
15	93-1508	.215	.250	.046	.125	—	.968	.281	.187	.500	.031	.093	—	—	190.00
15	93-1540	.215	.250	.046	.093	—	.1143	.156	.187	.800	.020	.046	—	—	220.00
15	93-1539	.215	.250	.040	.093	—	.1234	.250	.187	.800	.020	.093	—	—	240.00
15	93-1509	.215	.250	.046	.125	—	.1268	.281	.187	.800	.031	.093	—	—	240.00
15	93-1576	.215	.250	.046	.125	—	.641	.281	.310	.050	.031	.093	—	—	170.00
15	93-1564	.215	.250	.046	.125	—	.968	.281	.317	.370	.031	.093	—	—	180.00
15	93-1571	.312	.375	.125	.187	—	.812	.500	.250	.062	.032	.200	—	—	\$300.00

MINIATURE SUB-MINIATURE

FIG. 27

FIG. SMITH		DIMENSIONS													RESALE
No.	No.	A	B	C	D	E	L	M	N	O	P	Q	R	Per M	
17	93-1554	.171	.187	.046	.093	—	.555	.218	.150	.187	.020	.046	—	\$200.00	
18	93-1575	.171	.250	.046	.125	—	.993	.281	.187	.500	.031	.140	—	\$250.00	
19	39-1000	.165	.187	.040	—	—	.485	.210	.150	.125	—	—	—	\$140.00	
19	93-1004	.165	.187	.040	—	—	.547	.210	.150	.187	—	—	—	140.00	
19	93-1006	.165	.187	.040	—	—	.718	.312	.218	.187	—	—	—	160.00	
19	93-1007	.180	.200	.062	—	—	.600	.300	.175	.125	—	—	—	\$160.00	
19	93-1001	.185	.218	.040	—	—	.543	.210	.287	.046	—	—	—	\$150.00	
19	93-1002	.185	.218	.040	—	—	1.133	.800	.333	.046	—	—	—	170.00	
20	93-2010	.165	.187	.078	.148	—	.603	.203	.150	.250	.156	.046	—	\$230.00	
20	93-2012	.171	.187	.078	.148	—	.703	.203	.100	.406	.156	.046	—	\$240.00	
20	93-2006	.171	.187	.046	.148	—	.478	.203	.150	.125	.156	.030	—	200.00	
20	93-2007	.171	.187	.046	.148	—	.478	.203	.150	.125	.161	.030	—	200.00	
20	93-2000	.171	.187	.078	.148	—	.478	.203	.150	.125	.156	.046	—	200.00	
20	93-2008	.171	.187	.046	.148	—	.540	.203	.150	.187	.161	.030	—	200.00	
20	93-2001	.171	.187	.078	.148	—	.540	.203	.150	.187	.156	.046	—	220.00	
20	93-2009	.171	.187	.046	.148	—	.603	.203	.150	.250	.156	.030	—	220.00	
20	93-2002	.171	.187	.078	.148	—	.603	.203	.150	.250	.156	.046	—	220.00	
20	93-2011	.171	.187	.046	.148	—	.753	.203	.150	.400	.161	.030	—	230.00	
20	93-2003	.171	.187	.078	.148	—	.753	.203	.150	.400	.156	.046	—	230.00	
20	93-2017	.171	.187	.046	.148	—	.555	.203	.165	.187	.161	.030	—	230.00	
20	93-2014	.171	.187	.078	.148	—	.890	.203	.187	.500	.156	.046	—	270.00	
20	93-2018	.171	.187	.078	.148	—	.602	.203	.212	.187	.156	.046	—	230.00	
20	93-2020	.171	.187	.078	.148	—	.620	.203	.230	.187	.156	.046	—	230.00	
20	93-2016	.171	.250	.078	.148	—	1.190	.203	.187	.800	.156	.046	—	340.00	
20	93-2013	.217	.250	.046	.148	—	.890	.203	.187	.500	.161	.030	—	\$300.00	
20	93-2004	.217	.250	.078	.148	—	.890	.203	.187	.500	.156	.046	—	300.00	
20	93-2015	.217	.250	.046	.148	—	1.190	.203	.187	.800	.161	.030	—	340.00	
20	93-2005	.217	.250	.078	.148	—	1.190	.203	.187	.800	.156	.046	—	340.00	
20	93-2021	.218	.250	.086	.156	—	.641	.281	.310	.050	.200	.055	—	\$220.00	
21	93-2019	.171	.187	.090	.150	—	.633	.296	.150	.187	.234	—	—	\$220.00	
22	19-1003	.165	.187	.040	—	—	.485	.210	.150	.125	—	—	—	\$140.00	
22	93-1004	.165	.187	.040	—	—	.547	.210	.150	.187	—	—	—	140.00	
22	93-1006	.165	.187	.040	—	—	.718	.312	.218	.187	—	—	—	160.00	
22	93-1007	.180	.200	.062	—	—	.600	.300	.175	.125	—	—	—	\$160.00	
22	93-1001	.185	.218	.040	—	—	.543	.210	.287	.046	—	—	—	150.00	
22	93-1002	.185	.218	.040	—	—	1.133	.800	.333	.046	—	—	—	170.00	
23	19-1003	.185	.218	.046	.093	—	.487	.154	.287	.046	.020	.046	—	\$160.00	
23	19-1500	.185	.218	.046	.093	—	.583	.250	.287	.046	.020	.093	—	150.00	
24	93-3500	.169	.205	.040	.080	—	.640	.210	.170	.050	.020	.100	—	\$210.00	
24	93-3509	.148	.187	.040	.080	—	.819	.210	.212	.187	.020	.100	—	\$230.00	
24	93-3500	.171	.187	.040	.080	—	.819	.210	.212	.187	.020	.100	—	\$210.00	
24	93-3505	.187	.218	.040	.080	—	.819	.210	.212	.187	.020	.100	—	\$230.00	
24	93-3501	.218	.250	.046	.125	—	1.187	.281	.375	.250	.031	.093	—	\$320.00	
24	93-3502	.218	.250	.046	.125	—	1.687	.281	.625	.500	.031	.093	—	290.00	
24	93-3503	.218	.250	.046	.125	—	1.287	.281	.925	.800	.031	.093	—	460.00	
25	93-3512	.148	.172	.040	—	—	.819	.210	.187	.212	—	—	—	\$230.00	
25	93-3511	.148	.187	.040	—	—	.819	.210	.187	.212	—	—	—	230.00	
25	93-3507	.171	.187	.040	—	—	.572	.110	.140	.212	—	—	—	\$230.00	
25	93-3508	.171	.187	.040	—	—	.696	.172	.140	.212	—	—	—	230.00	
25	93-3513	.171	.187	.040	—	—	.587	.125	.187	.150	—	—	—	230.00	
25	93-3504	.171	.187	.040	—	—	.819	.210	.187	.212	—	—	—	230.00	
26	93-3510	.171	.187	.040	.080	—	.819	.210	.212	.187	.020	.120	—	\$230.00	
27	92-3003	.148	.172	.040	—	—	.515	.155	.160	.040	—	—	—	\$220.00	
27	92-3001	.148	.172	.040	—	—	.560	.180	.160	.040	—	—	—	220.00	
27	92-3002	.148	.172	.040	—	—	.606	.155	.210	.080	—	—	—	170.00	
27	92-3000	.169	.205	.040	—	—	.640	.210	.170	.020	—	—	—	220.00	

CONTENTS INDEX/TEFLON* DATA **SMITH**

CONTENTS

ALPHABETICAL INDEX

A-B

Adapters, Foreign & American	2-871
Alligator Clips & Accessories	2-830,4
Angles	2-866
Auto Accessories	2-877
Battery Clips & Accessories	2-830
Battery Strips	2-855
Binding Posts	2-812,7
Bumpers	2-865

C-F

Cable Clips	2-874,5
Captive Hardware	2-855
Ceramic Standoffs	2-862,3
Chassis Fastener	2-862
Chassis Punches	2-878
Convenience Outlets	2-871
Fahnestock Clips	2-855
Fuse Mounts	2-877

G-H-I

Grommets	2-865
Giant Plugs & Jacks	2-817
Handles	2-854,5
Hardware	2-876
Heat Sinks	2-852
Hole Plugs	2-877
"Hookon" Probe	2-849
IC Sockets	2-853
Indicator Lights	2-866
Insulators, Porcelain & Steatite	2-862,3

J-K

JACKS, BANANA & PHONE TIP	
Insulated	2-822,3,4
Non-Insulated	2-825,6,7
Printed Circuit	2-825
Jack Strips	2-822
Jumpers	2-836,7
Knobs	2-864

L-M

Lacing Cord	2-875
LUGS & TERMINALS	
Solderless	2-868,9,70
Solder Type	2-871
Meter Cases	2-864
Mike Connectors	2-817

P

PATCH CORDS	
RF	2-837,8
Cross Patch	2-839
Banana Plug	2-839
Dual Banana Plug	2-840,1
Pilot Light Socket	2-866
PLUGS, BANANA & PHONE TIP	
Insulated	2-818-21
Non-Insulated	2-825,6,7
Plug-In Housings	2-821
Porcelain Standoffs	2-862,3

PRINTED CIRCUIT ACCESSORIES

Card Rack	2-849
Test Jacks	2-823
Boards	2-850
Terminals	2-850
Connectors	2-851
Accessories	2-851

R-S

R.F. Connectors & Adapters	2-848
Shaft Accessories	2-872,3
Shorting Links	2-815
Spacers	2-858-62
Strain Reliefs	2-877
Swage Standoffs	2-862
Switches	2-879-83

T

Telephone Plugs & Jacks	2-828,9
-------------------------------	---------

TEFLON TERMINALS

FEED-THRU (Standard)	
Micro-Miniature	2-888
Sub-Miniature Straight Pin	2-888
Turret	2-887
Tubular	2-886
Miniature Straight Pin	2-889
Turret, Bi-furcated, Threaded	2-889

FEED-THRU (Reversed)	
Sub-Miniature Straight Pin	2-887
Turret	2-886
Tubular	2-889

HEX METAL STAND-OFFS	
Sub-Miniature	2-888
PROBES & PLUGS	2-884

STAND-OFFS (Standard)	
Sub-Miniature Straight Pin	2-890
Turret, Bi-furcated	2-891
Miniature Straight Pin	2-892
Turret, Bi-furcated	2-892

STAND-OFFS (Reversed)	
Sub-Miniature Straight Pin	2-890
Turret, Bi-furcated	2-891

STAND-OFFS DOUBLE	
Sub-Miniature & Miniature	2-892

TEST JACKS	
Panel Mount	2-885
Floating	2-885
Printed Circuit	2-885

TRANSISTOR HOLDERS ???	
Terminal Strips & Boards	2-867
Test Adapters	2-843-7
Test Leads	2-834,5,6
Test Lead Accessories	2-842
Test Prods	2-832,3

TRANSISTOR	
Sockets	2-853
Mounting Hardware	2-852
Accessories	2-852
Tubing Teflon & Spaghetti	2-875
Turret Terminals	2-856,7

W

WASHERS	
Fibre, Nylon & Metal	2-873
Wire	2-878

TEFLON NUMERICAL INDEX*

EEM pages 2-884-2-893. Only last two digits of page numbers are shown below.

Series	Type	Page	Series	Type	Page
19-1003	Standoff, Reversed	90	73-1100	Probes & Plugs	84
19-1500	Standoff, Reversed	91	73-3000	Probes & Plugs	84
28-1000	Feedthru, Reversed	87, 89	81-1000	Feedthru	88
28-1100	Feedthru, Reversed	86, 89	81-1500	Feedthru	88
28-1500	Feedthru, Reversed	86	81-2000	Feedthru	88
28-2000	Feedthru, Reversed	86, 89	82-1000	Feedthru	86, 88
29-1000	Standoff, Reversed	90	82-1100	Feedthru	86, 87
29-1500	Standoff, Reversed	91	82-1500	Feedthru	87
29-2000	Standoff, Reversed	91	82-2000	Feedthru	86, 87
34-1000	Transistor Holder	90	83-1000	Feedthru	89
34-1100	Transistor Holder	90	83-1500	Feedthru	89
37-1000	Probes & Plugs	84	83-2000	Feedthru	89
37-1100	Probes & Plugs	84	83-2500	Feedthru	89
39-1000	Standoff, Reversed	91	91-1003	Standoff	92
43-1000	Transistor Holder	90	91-1500	Standoff	92
43-1100	Transistor Holder	90	92-1000	Standoff	90
52-1500	Hex Standoff	88	92-1500	Standoff	91
52-2000	Hex Standoff	88	92-2000	Standoff	91
53-1500	Hex Standoff	88	92-3000	Double Standoff	92
53-2000	Hex Standoff	88	92-3500	Double Standoff	92
63-1000	Test Jacks	85	93-1000	Standoff	92
63-1100	Test Jacks	85	93-1500	Standoff	92
63-1500	Test Jacks	85	93-2000	Standoff	92
63-3000	Test Jacks	85	93-3000	Double Standoff	92
73-1000	Probes & Plugs	84	93-3500	Double Standoff	92

*Complete Numerical Index will be found on page 2-894.

TECHNICAL DATA

Teflon insulated terminals have proven to have outstanding inherent quality characteristics, electrically, mechanically, chemically, and thermally made possible through the use of virgin Teflon resins. These terminals are manufactured to strict quality control standards based on MIL-spec requirements.

MATERIAL SPECIFICATIONS

TEFLON*

MIL-P-19468

● MECHANICAL PROPERTIES

TENSILE STRENGTH - 1500 - 2500 PSI
ELONGATION - 75 - 150%
MODULUS OF ELASTICITY - 55,000 PSI

● CHEMICAL PROPERTIES

Teflon is resistant to acids and alkalis of all concentration, solvents, fungus and rot.

TEMPERATURE RANGE - -100° C to +250° C.

WATER ABSORPTION - .01%

LUGS

BRASS - All lugs on Stand-offs, Feed-thrus, Probes, Plugs, unless otherwise specified are manufactured from Brass/QQB-626, Composition 22, 1/2 hard.

BERYLLIUM COPPER - Test Jacks are manufactured from Beryllium Copper per MIL-C-530 or MIL-C-533 and heat treated prior to plating.

● TOLERANCES

"A" (minor dia.) +.000, -.002

"E" (probe dia.) ± .001

All other dimensions ±.005

● ELECTRICAL PROPERTIES

DIELECTRIC STRENGTH - 400 to 450 volts/Mil.

DIELECTRIC CONSTANT - 2.0 to 2.2 (60 cycles to 10⁶ cycles.)

Capacitance and voltage measured with terminals installed in aluminum chassis .050 Thick. Insulator protrudes a minimum of .040 below panel.

SPECIAL REQUIREMENTS?

Use our Engineering and Production Facilities to design and develop new products or modify existing components to meet your specific needs. "Specials are Standard with SMITH!"

IT'S SOUND PLANNING TO "SPECIFY SMITH" WHEN DESIGNING OR PURCHASING

SMITH

NUMERICAL INDEX

STOCKED BY
LEADING
DISTRIBUTORS
NATIONWIDE

For RAPID LOCATION, Use CATALOG # to find EEM Page,
starting with 2•812 thru 2•894 (Use last 2 digits only)

No. Page	No. Page	No. Page	No. Page	No. Page	No. Page	No. Page	No. Page	No. Page	No. Page	No. Page	No. Page	No. Page	No. Page	No. Page
100	220 13	323 31	480 28	700	997 83	1259 12	1474 65	1691 44	2000	2350 63	3050 48	5021 42	8400	
100 25	221 23	324 19	481 thru 30	701 thru 30	998 83	1260 76	1475 65	1692 43	2351 thru 55	3051 thru 55	5022 69	8401 thru 59		
101 25	222 27	325 23	482 thru 20	702 thru 30	999 83	1270 77	1476 65	1693 43	2352 thru 54	3052 thru 54	5023 69	8402 thru 59		
102 25	224 14	326 30	483 thru 35	703 thru 35	1000	1271 76	1477 71	1694 43	2353 thru 56	3053 thru 56	5024 69	8403 thru 59		
103 25	225 28	327 15	484 thru 19	704 thru 35	1000 76	1272 76	1478 thru 71	1695 44	2354 thru 57	3054 thru 57	5025 42	8500		
104 26	226 28	328 23	485 thru 19	705 thru 35	1001 76	1273 76	1479 thru 71	1696 43	2355 thru 58	3055 thru 58	5026 42	8501 thru 59		
105 thru 25	227 27	329 31	486 thru 23	706 thru 35	1002 76	1274 12	1480 23	1697 45	2356 thru 61	3056 thru 61	5027 42	8502 thru 59		
106 thru 25	228 19	330 38	487 thru 23	707 thru 35	1003 67	1275 12	1481 23	1698 44	2357 thru 61	3057 thru 61	5028 42	8503 thru 59		
107 thru 16	229 13	331 30	488 thru 23	708 thru 35	1004 67	1276 12	1482 23	1699 44	2358 thru 61	3058 thru 61	5029 42	8600		
108 thru 16	230 13	332 30	489 thru 23	709 thru 35	1005 67	1277 12	1483 23	1700 47	2359 thru 61	3059 thru 61	5030 42	8601 thru 50		
109 thru 16	231 13	333 thru 30	500	710 thru 35	1006 76	1278 thru 71	1484 23	1701 47	2360 thru 61	3060 thru 61	5031 42	8602 thru 50		
110 thru 16	232 18	334 thru 30	500 thru 72	711 thru 35	1007 76	1279 thru 71	1485 23	1702 47	2361 thru 61	3061 thru 61	5032 42	8603 thru 50		
111 thru 16	233 18	335 thru 30	501 thru 72	712 thru 35	1008 76	1280 thru 71	1486 23	1703 47	2362 thru 61	3062 thru 61	5033 42	8604 thru 50		
112 thru 16	234 18	336 thru 30	502 thru 72	713 thru 35	1009 76	1281 thru 71	1487 23	1704 47	2363 thru 61	3063 thru 61	5034 42	8605 thru 50		
113 thru 16	235 19	337 thru 30	503 thru 72	714 thru 35	1010 76	1282 thru 71	1488 23	1705 47	2364 thru 61	3064 thru 61	5035 42	8606 thru 50		
114 thru 16	236 18	338 thru 30	504 thru 72	715 thru 35	1011 76	1283 thru 71	1489 23	1706 47	2365 thru 61	3065 thru 61	5036 42	8607 thru 50		
115 thru 16	237 19	339 thru 30	505 thru 72	716 thru 35	1012 76	1284 thru 71	1490 23	1707 47	2366 thru 61	3066 thru 61	5037 42	8608 thru 50		
116 thru 16	238 27	340 thru 30	506 thru 72	717 thru 35	1013 76	1285 thru 71	1491 23	1708 47	2367 thru 61	3067 thru 61	5038 42	8609 thru 50		
117 thru 16	239 27	341 thru 30	507 thru 72	718 thru 35	1014 76	1286 thru 71	1492 23	1709 47	2368 thru 61	3068 thru 61	5039 42	8700		
118 thru 16	240 22	342 thru 30	508 thru 72	719 thru 35	1015 76	1287 thru 71	1493 23	1710 47	2369 thru 61	3069 thru 61	5040 42	8701 thru 50		
119 thru 16	241 22	343 thru 30	509 thru 72	720 thru 35	1016 76	1288 thru 71	1494 23	1711 47	2370 thru 61	3070 thru 61	5041 42	8702 thru 50		
120 thru 16	242 18	344 thru 30	510 thru 72	721 thru 35	1017 76	1289 thru 71	1495 23	1712 47	2371 thru 61	3071 thru 61	5042 42	8703 thru 50		
121 thru 16	243 18	345 thru 30	511 thru 72	722 thru 35	1018 76	1290 thru 71	1496 23	1713 47	2372 thru 61	3072 thru 61	5043 42	8704 thru 50		
122 thru 16	244 20	346 thru 30	512 thru 72	723 thru 35	1019 76	1291 thru 71	1497 23	1714 47	2373 thru 61	3073 thru 61	5044 42	8705 thru 50		
123 thru 16	245 42	347 thru 30	513 thru 72	724 thru 35	1020 76	1292 thru 71	1498 23	1715 47	2374 thru 61	3074 thru 61	5045 42	8706 thru 50		
124 thru 16	246 42	348 thru 30	514 thru 72	725 thru 35	1021 76	1293 thru 71	1499 23	1716 47	2375 thru 61	3075 thru 61	5046 42	8707 thru 50		
125 thru 16	247 27	349 thru 30	515 thru 72	726 thru 35	1022 76	1294 thru 71	1500 76	1717 47	2376 thru 61	3076 thru 61	5047 42	8708 thru 50		
126 thru 16	248 42	350 thru 30	516 thru 72	727 thru 35	1023 76	1295 thru 71	1501 23	1718 47	2377 thru 61	3077 thru 61	5048 42	8709 thru 50		
127 thru 16	249 42	351 thru 30	517 thru 72	728 thru 35	1024 76	1296 thru 71	1502 23	1719 47	2378 thru 61	3078 thru 61	5049 42	8800		
128 thru 16	250 42	352 thru 30	518 thru 72	729 thru 35	1025 76	1297 thru 71	1503 23	1720 47	2379 thru 61	3079 thru 61	5050 42	8801 thru 50		
129 thru 16	251 42	353 thru 30	519 thru 72	730 thru 35	1026 76	1298 thru 71	1504 23	1721 47	2380 thru 61	3080 thru 61	5051 42	8802 thru 50		
130 thru 16	252 27	354 thru 30	520 thru 72	731 thru 35	1027 76	1299 thru 71	1505 23	1722 47	2381 thru 61	3081 thru 61	5052 42	8803 thru 50		
131 thru 16	253 18	355 thru 30	521 thru 72	732 thru 35	1028 76	1300 thru 71	1506 23	1723 47	2382 thru 61	3082 thru 61	5053 42	8804 thru 50		
132 thru 16	254 18	356 thru 30	522 thru 72	733 thru 35	1029 76	1301 thru 71	1507 23	1724 47	2383 thru 61	3083 thru 61	5054 42	8805 thru 50		
133 thru 16	255 18	357 thru 30	523 thru 72	734 thru 35	1030 76	1302 thru 71	1508 23	1725 47	2384 thru 61	3084 thru 61	5055 42	8806 thru 50		
134 thru 16	256 18	358 thru 30	524 thru 72	735 thru 35	1031 76	1303 thru 71	1509 23	1726 47	2385 thru 61	3085 thru 61	5056 42	8807 thru 50		
135 thru 16	257 12	359 thru 30	525 thru 72	736 thru 35	1032 76	1304 thru 71	1510 23	1727 47	2386 thru 61	3086 thru 61	5057 42	8808 thru 50		
136 thru 16	258 12	360 thru 30	526 thru 72	737 thru 35	1033 76	1305 thru 71	1511 23	1728 47	2387 thru 61	3087 thru 61	5058 42	8809 thru 50		
137 thru 16	259 13	361 thru 30	527 thru 72	738 thru 35	1034 76	1306 thru 71	1512 23	1729 47	2388 thru 61	3088 thru 61	5059 42	8900		
138 thru 16	260 13	362 thru 30	528 thru 72	739 thru 35	1035 76	1307 thru 71	1513 23	1730 47	2389 thru 61	3089 thru 61	5060 42	8901 thru 50		
139 thru 16	261 18	363 thru 30	529 thru 72	740 thru 35	1036 76	1308 thru 71	1514 23	1731 47	2390 thru 61	3090 thru 61	5061 42	8902 thru 50		
140 thru 16	262 18	364 thru 30	530 thru 72	741 thru 35	1037 76	1309 thru 71	1515 23	1732 47	2391 thru 61	3091 thru 61	5062 42	8903 thru 50		
141 thru 16	263 14	365 thru 30	531 thru 72	742 thru 35	1038 76	1310 thru 71	1516 23	1733 47	2392 thru 61	3092 thru 61	5063 42	8904 thru 50		
142 thru 16	264 13	366 thru 30	532 thru 72	743 thru 35	1039 76	1311 thru 71	1517 23	1734 47	2393 thru 61	3093 thru 61	5064 42	8905 thru 50		
143 thru 16	265 13	367 thru 30	533 thru 72	744 thru 35	1040 76	1312 thru 71	1518 23	1735 47	2394 thru 61	3094 thru 61	5065 42	8906 thru 50		
144 thru 16	266 13	368 thru 30	534 thru 72	745 thru 35	1041 76	1313 thru 71	1519 23	1736 47	2395 thru 61	3095 thru 61	5066 42	8907 thru 50		
145 thru 16	267 12	369 thru 30	535 thru 72	746 thru 35	1042 76	1314 thru 71	1520 23	1737 47	2396 thru 61	3096 thru 61	5067 42	8908 thru 50		
146 thru 16	268 12	370 thru 30	536 thru 72	747 thru 35	1043 76	1315 thru 71	1521 23	1738 47	2397 thru 61	3097 thru 61	5068 42	8909 thru 50		
147 thru 16	269 14	371 thru 30	537 thru 72	748 thru 35	1044 76	1316 thru 71	1522 23	1739 47	2398 thru 61	3098 thru 61	5069 42	8910 thru 50		
148 thru 16	270 19	372 thru 30	538 thru 72	749 thru 35	1045 76	1317 thru 71	1523 23	1740 47	2399 thru 61	3099 thru 61	5070 42	8911 thru 50		
149 thru 16	271 18	373 thru 30	539 thru 72	750 thru 35	1046 76	1318 thru 71	1524 23	1741 47	2400 thru 61	3100 thru 61	5071 42	8912 thru 50		
150 thru 16	272 27	374 thru 30	540 thru 72	751 thru 35	1047 76	1319 thru 71	1525 23	1742 47	2401 thru 61	3101 thru 61	5072 42	8913 thru 50		
151 thru 16	273 27	375 thru 30	541 thru 72	752 thru 35	1048 76	1320 thru 71	1526 23	1743 47	2402 thru 61	3102 thru 61	5073 42	8914 thru 50		
152 thru 16	274 27	376 thru 30	542 thru 72	753 thru 35	1049 76	1321 thru 71	1527 23	1744 47	2403 thru 61	3103 thru 61	5074 42	8915 thru 50		
153 thru 16	275 12	377 thru 30	543 thru 72	754 thru 35	1050 76	1322 thru 71	1528 23	1745 47	2404 thru 61	3104 thru 61	5075 42	8916 thru 50		
154 thru 16	276 12	378 thru 30	544 thru 72	755 thru 35	1051 76	1323 thru 71	1529 23	1746 47	2405 thru 61	3105 thru 61	5076 42	8917 thru 50		
155 thru 16	277 12	379 thru 30	545 thru 72	756 thru 35	1052 76	1324 thru 71	1530 23	1747 47	2406 thru 61	3106 thru 61	5077 42	8918 thru 50		
156 thru 16	278 27	380 thru 30	546 thru 72	757 thru 35	1053 76	1325 thru 71	1531 23	1748 47	2407 thru 61	3107 thru 61	5078 42	8919 thru 50		
157 thru 16	279 27	381 thru 30	547 thru 72	758 thru 35	1054 76	1326 thru 71	1532 23	1749 47	2408 thru 61	3108 thru 61	5079 42	8920 thru 50		
158 thru 16	280 13	382 thru 30	548 thru 72	759 thru 35	1055 76	1327 thru 71	1533 23	1750 47	2409 thru 61	3109 thru 61	5080 42	8921 thru 50		
159 thru 16	281 18	383 thru 30	549 thru 72	760 thru 35	1056 76	1328 thru 71	1534 23	1751 47	2410 thru 61	3110 thru 61	5081 42	8922 thru 50		
160 thru 16	282 22	384 thru 30	550 thru 72	761 thru 35	1057 76	1329 thru 71	1535 23	1752 47	2411 thru 61	3111 thru 61	5082 42	8923 thru 50		
161 thru 16	283 14	385 thru 30	551 thru 72	762 thru 35	1058 76	1330 thru 71	1536 23	1753 47	2412 thru 61	3112 thru 61	5083 42	8924 thru 50		
162 thru 16	284 14	386 thru 30	552 thru 72	763 thru 35	1059 76	1331 thru 71	1537 23	1754 47	2413 thru 61	3113 thru 61	5084 42	8925 thru 50		
163 thru 16	285 17	387 thru 30	553 thru 72	764 thru 35	1060 76	1332 thru 71	1538 23	1755 47	2414 thru 61	3114 thru 61	5085 42	8926 thru 50		
164 thru 16	286 17	388 thru 30	554 thru 72	765 thru 35	1061 76	1333 thru 71	1539 23	1756 47	2415 thru 61	3115 thru 61	5086 42	8927 thru 50		
165 thru 16	287 17	389 thru 30	555 thru 72	766 thru 35	1062 76	1334 thru 71	1540 23	1757 47	2416 thru 61	3116 thru 61	5087 42	8928 thru 50		
166 thru 16	288 27	390 thru 30	556 thru 72	767 thru 35	1063 76	1335 thru 71	1541 23	1758 47	2417 thru 61	3117 thru 61	5088 42	8929 thru 50		
167 thru 16	289 27	391 thru 30	557 thru 72	768 thru 35	1064 76	1336 thru 71	1542 23	1759 47	2418 thru 61	3118 thru 61	5089 42	8930 thru 50		
168 thru 16	290 13	392 thru 30	558 thru 72	769 thru 35	1065 76	1337 thru 71	1543 23	1760 47	2419 thru 61	3119 thru 61	5090 42	8931 thru 50		
169 thru 16	291 18	393 thru 30	559 thru 72	770 thru 35	1066 76	1338 thru 71	1544 23	1761 47	2420 thru 61	3120 thru 61	5091 42	8932 thru 50		
170 thru 16	292 18	394 thru 30	560 thru 72	771 thru 35	1067 76	1339 thru 71	1545 23	1762 47	2421 thru 61	3121 thru 61	5092 42	8933 thru 50		
171 thru 16	293 18	395 thru 30	561 thru 72	772 thru 35	1068 76	1340 thru 71	1546 23	1763 47	2422 thru 61	31				

TRIMM / INC.

A SELECTED LISTING FROM OVER 2500
TRIMM-MANUFACTURED COMPONENTS.

TELEPHONE PLUGS
Product Family 80

TELEPHONE JACKS & KEYS
Product Family 50

TERMINAL BLOCKS
Product Family 35

AUDIO PLUGS & JACKS
Product Family 40

PATCH & TEST CORDS
Product Family 30

COAX JACKS PLUGS & PATCH CORDS
Product Family 60

HEADSETS
Product Family 01-29

JACK PANELS
Product Family 70

Bulletins covering each product family represented by typical parts illustrated above are available upon your request. Also, for further engineering assistance, outline drawings of specific items can be supplied. In addition, our nationwide network of distributors of Trimm industrial electronic products are ready to assist you by supplying any of our standard cataloged items.

TRIMM INC.

400 W. Lake St.
Libertyville, Ill.
60048 USA
(312) 362 3700

TRW[®] CINCH CONNECTORS

PRODUCT INDEX

Description	EEM Page
PRINTED CIRCUIT CONNECTORS (CAT. NO. C-24)	
General Index	2•900
"Tykon" Miniature Edge Connectors (.050 Spacing)	2•901
"Mini-Tyke" Miniature Edge Connector (.100 Spacing)	2•901
PC Board Connectors with .100" Terminal Centers	2•902
Miniature 2-Piece Right Angle Connector (.050 Spacing)	2•903
Standard 2-Piece Right Angle Connector (.125 Spacing)	2•903
Miniature Wire Wrap Connectors (.125 Spacing)	2•903
Miniature Wire Wrap Edge Connectors for Punched Plates	2•905
Miniature Wire Wrap PC Connector Modules (.125 Spacing)	2•905
Standard Wire Wrap Connector Modules (.200 Spacing)	2•905
NAFI 40 and 80 Contact PC Modules	2•906
Standard Wire Wrap Edge Connectors (.156 Spacing)	2•907
Low Cost PC Edge Connectors (.156 Spacing)	2•907
"Twin-Con" Crimp-On Snap-In Edge Connectors (.156 Spacing)	2•908
Assembly Tools and Machines	2•908
Standard Solder Tab Edge Connectors (.156 Spacing)	2•909
PC Board Connectors (.156 Spacing)	2•910
Special Purpose PC Board Connectors (.156 Spacing)	2•910
Standard Dip Solder Edge Connectors (.156 Spacing)	2•911
Standard Wrap Post Edge Connectors (.156 Spacing)	2•912
Special Center Bridge Edge Connectors	2•912
Economy Line Connectors — Series 90 (.156 Centers)	2•913
Edge Connectors for $\frac{3}{32}$ " PC Boards (.156 Spacing)	2•914
Edge Connectors for $\frac{1}{8}$ " PC Boards (.156 Spacing)	2•914
DIP Solder Terminal PC Connectors (.156 Centers)	2•915
Environmental and Electrical Specifications	2•916

SUBMINIATURE CONNECTORS (CAT. NO. C-46)

General Description and Index	2•917
Burgon-D, Mark IV Connectors	2•918
Connectors with Crimp Snap-In Contacts in 2-Piece Insulators with Integral Retension System	
Royal D, Mark III Connectors	2•934
Connectors with Crimp Snap-In Contacts in Monoblock Insulators Utilizing Little Caesar Rear Release Contact Assembly	
Golden D, Mark I Connectors	2•929
Connectors with Monoblock Insulators for Critical Application Requirements	
Original D Connectors	2•927
D Connectors with 2-Piece Insulators	
General Ratings and Specifications (Royal D, Golden D, Original D)	2•926
Installation Instructions	2•936
Accessories	2•938
Dura-Con Series Connectors	2•940

RACK & PANEL CONNECTORS (CAT. NO. C-36)

General Features, Description and Index	2•943
Solderless Ribbon Connectors	
Cable to Cable Mounting	2•944

Description	EEM Page
RACK & PANEL CONNECTORS (Cont'd)	
Design Features	2•945
Performance Data	2•943
Systems for Terminating	2•946
Blue Ribbon Connectors	
Rack and Panel Mounting — Barrier Polarization Type	2•950
Rack and Panel Mounting — Pin Polarization Type	2•950
Performance Data	2•943
Cinch Ribbon Connectors	
Rack and Panel Mounting	2•947
Cable to Chassis Mounting	2•947
Cable to Cable Mounting	2•948
Rack and Panel Mounting (Special "High Barrier")	2•949
Cable to Cable Mounting (Special "High Barrier")	2•949
Polyethylene Dust Covers	2•949
Performance Data	2•943

BARRIER TERMINAL BLOCKS (CAT. NO. C-44)

General Description, Ratings and Index	2•951
140 Series — #5-40 Screw — $\frac{3}{8}$ " Terminal Centers	2•952
140 Series with Wrapost Terminals	2•952
141 Series — #6-32 Screw — $\frac{1}{8}$ " Terminal Centers	2•953
141 Series with Quick-Clamp Terminals	2•953
142 Series — #8-32 Screw — $\frac{5}{16}$ " Terminal Centers	2•954
142 Series with Quick-Clamp Terminals	2•954
142 Series with Special High Barriers	2•955
150 Series — #10-32 Screw — $\frac{1}{4}$ " Terminal Centers	2•955
151 Series — #12-32 Screw — $\frac{7}{8}$ " Terminal Centers	2•955
152 Series — $\frac{1}{4}$ -28 Screw — $1\frac{1}{8}$ " Terminal Centers	2•955
164 Series — #6-32 Screw — $\frac{3}{8}$ " Terminal Centers	2•956
171 Series — #2-56 Screw — $\frac{1}{4}$ " Terminal Centers	2•956
172 Series — #2-56 Screw — $\frac{1}{4}$ " Terminal Centers	2•956
173 Series — Sems Type B.H. Screws — $\frac{3}{8}$ " Centers	2•957
174 Series — Plain Type B.H. Screws — $\frac{3}{8}$ " Centers	2•957
240 Series — Solder Terminals — $\frac{3}{8}$ " Centers	2•957
241 Series — Solder Terminals — $\frac{7}{16}$ " Centers	2•957
242 Series — Solder Terminals — $\frac{9}{16}$ " Centers	2•957
250 Series — Solder Terminals — $1\frac{1}{8}$ " Centers	2•957
251 Series — Solder Terminals — $\frac{7}{8}$ " Centers	2•957
252 Series — Solder Terminals — $1\frac{1}{2}$ " Centers	2•957
341 Series — Solderless Tabs — $\frac{7}{16}$ " Centers	2•958
342 Series — Solderless Tabs — $\frac{9}{16}$ " Centers	2•958
540 Series — Closed Back — #5-40 Screw — $\frac{3}{8}$ " Centers	2•958
541 Series — Closed Back — #6-32 Screw — $\frac{7}{16}$ " Centers	2•959
542 Series — Closed Back — #8-32 Screw — $\frac{9}{16}$ " Centers	2•959
Fanning Strips	2•960
Optional Terminals, Jumpers and Clamps	2•961
SEMS Screw Terminals	2•961
Imprinting Information	2•961
Mounting Data	2•962
Terminal Strips and Binding Posts	2•964

TRW[®] CINCH CONNECTORS

PRODUCT INDEX (Cont'd)

Description	EEM Page
SOCKETS & ACCESSORIES (CAT. NO. C-2)	
General Features and Index	2•966
DIP Sockets	2•967
TO-5 Case IC Sockets	2•968
Transistor Sockets	2•968
Miniature Semiconductor Sockets	2•970
Nuvistor Triode Tube Sockets	2•970
Subminiature Tube Sockets	2•972
7 Pin Miniature Tube Sockets	2•974
9 Pin Noval Tube Sockets	2•978
8 Pin Octal Tube Sockets	2•981
Special Purpose Tube Sockets	2•983
Miscellaneous Sockets and Plugs	2•985
Capacitor Sockets	2•986
Laminated Sockets and Plugs	2•987
Phono Connectors and Sockets	2•988
Coaxial Plugs and Sockets	2•989
Disconnect Plugs	2•990

"JONES" PLUGS & SOCKETS (CAT. NO. C-1)

General Description and Index	2•991
300 Series	
with Standard Termination	2•992
Auxiliary Locking Arrangement	2•999
Polarizing and Mounting Data	2•1003
400 Series	
with Standard Termination	2•997
with Screw Terminals	2•999
Combination Cable Clamps and Handles	2•1000
Auxiliary Locks	2•999
Polarizing and Mounting Data	2•1004
2400 Series	
with Standard Termination	2•1000
with Solderless Terminals	2•1001
500 Series	
with Screw Terminals	2•1002
Polarizing and Mounting Data	2•1005
General Information (withdrawal, soldering, etc.)	2•1005
Laminated Plugs and Sockets	
1400 Series	2•1006
Other Laminated Types	2•1006
Special Purpose Plugs and Sockets	
Audio Connectors	2•1007
Plugs Mounted on Wall Plates	2•1007

INTEGRATED CIRCUIT LOGIC BOARDS (CAT. NO. C-198)

General Description and Index	2•1008
High Density DIP Packaging Panels	
60-HPG Series	2•1009
60-HUP Series	2•1011
60-HC Series	2•1012
60-HUC-1 Series	2•1013
Adaptor Plugs and Adaptors	2•1014
61 Position Edge Connectors	2•1014
22 Position Edge Connectors	2•1014
Plug Assemblies, Extractor Tools and Keys	2•1015
Socket/Terminals	2•1016

BACKPLANE CONNECTOR SYSTEMS 2•1017

PATCHMASTER — CIRCUIT CONCENTRATION BAY SYSTEM 2•1018

CYLINDRICAL CONNECTORS

Commercial Input/Output Connectors — 904 Series	2•1019
High Density Connectors — Astro-348	2•1021
High Efficiency Circular Connectors — "Omega" Series	2•1025
MMB Series	2•1029
Nu-Lock Connectors — 1200 Series	2•1031

WIRE, CABLE & CABLE ASSEMBLIES

TRW Holyoke Wire and Cable	2•2061
----------------------------	--------

PRINTED CIRCUIT BOARDS

TRW Cinch-Graphik	2•337
-------------------	-------

POTENTIOMETERS — TRW/IRC

Trimmer Potentiometers (Rectangular)	
Cermet	2•1682
Wirewound	2•1682
Trimmer Potentiometers (Square and Cube)	
Cermet	2•1683
Wirewound	2•1683
Circuitrim 100 — ¼" and ½" Single Turn Trimmers	2•1684
Precision Single Turn and Multiturn Potentiometers	2•1685
Precision Potentiometers — ⅞" to 3" Diameter	2•1686

TRW[®] CINCH CONNECTORS

FOR IMMEDIATE DELIVERY OF TRW/CINCH

EDGE CONNECTORS, RACK AND PANEL CONNECTORS, COMPONENT SOCKETS, BARRIER TERMINAL BLOCKS AND OTHER INTERCONNECTION DEVICES **CONTACT**

ALABAMA

Cramer/E. W. Huntsville (205) 539-5722
M. G. Electronics Birmingham (205) 328-4525

ALASKA

Intercoastal, Inc. □ Fairbanks
Yukon Radio Supply Corp. ▲□△ Fairbanks (907) 452-1011

ARIZONA

Cramer Electronics Inc. Phoenix (602) 267-7321
Inland Electronic Supply Tucson (602) 624-4402
Kierulff Electronics Phoenix (602) 273-7331
Marshall Industries Tempe (602) 968-6181
Sterling Electronics Phoenix (602) 258-4531
R. V. Weatherford Co. Phoenix (602) 272-7144

ARKANSAS

Carlton Bates Co. Fort Smith (501) 646-8201
Little Rock (501) 562-9100

CALIFORNIA

Jack C. Arbuckle Fresno (209) 264-6554
Channel Radio Supply Co. ▲△ Santa Barbara (805) 965-8551
Dunlap Electronics Hayward (415) 352-1933
Sacramento (916) 444-8070
Electronic Supply Riverside (714) 683-7300
Elmar Electronics Mt. View (415) 961-3611
Kierulff Electronics Los Angeles (213) 685-5511
Palo Alto (415) 968-6292
San Diego (714) 278-2112
Marshall Industries El Monte (213) 686-0141
Irvine (714) 556-6400
San Diego (714) 278-6350
Sunnyvale (408) 732-1100
Sterling Electronics Sun Valley (213) 767-5030
R. V. Weatherford Co. Anaheim (714) 633-9633
Glendale (213) 849-3451
Palo Alto (415) 493-5373
Pomona (714) 623-1261
San Diego (714) 278-7400
Yale Radio Electric Co. ▲□△ Hollywood (213) 465-3186
Zack Radio Supply Corp. ▲□△ San Francisco (415) 626-1444

COLORADO

Electronic Parts Co. Denver (303) 744-1992
Elmar Electronics Commerce City (303) 287-9611
Marshall Industries Arvada (303) 423-9670
Newark Electronics Denver (303) 757-3351
R. V. Weatherford Co. Englewood (303) 761-5432

CONNECTICUT

Bond Radio Electronics ▲□△ Waterbury (203) 753-1184
J. V. Electronics ▲□△ East Haven (203) 469-2321
Marshall Industries North Branford (203) 484-0488
Wilshire Electronics/Connecticut Hamden (203) 281-1166

FLORIDA

Cramer/E. W. Hollywood (305) 923-8181
Orlando (305) 894-1511
Electronic Equipment Co. ▲ Miami (305) 871-3500
Grice Electronics ▲□△ Pensacola (904) 433-4616
Hall-Mark Electronics Corp. Orlando (305) 855-4020
Ft. Lauderdale (305) 971-9280
Hammond Electronics Orlando (305) 849-6060
Lykes Electronics Tampa (813) 886-6621
Marshall Industries Palm Beach Gardens (305) 622-8490
Southeast Electronics ▲□△ Jacksonville (904) 356-3007

GEORGIA

Cramer/E. W. Atlanta Atlanta (404) 448-9050
Lykes Electronics Corp Atlanta (404) 355-2223
Specialty Distributing Atlanta (404) 873-2521

HAWAII

Honolulu Electronics ▲□△ Honolulu (808) 949-5564
Precision Radio Ltd. Honolulu (808) 537-5291

IDAHO

Schwendimans Wholesale Dist. ▲□△ Idaho Falls (208) 522-2492
United Electronic Wholesalers ▲□△ Twin Falls (208) 733-7324

ILLINOIS

Allied Electronics Elgin (312) 697-8200
Bell Electronics △ Skokie (312) 965-7500
Electronic Distributors □ Chicago (312) 283-4800
J & M Electronics Rockford (815) 963-6445
Klaus Radio, Inc. Champaign (217) 356-1896
La Salle (815) 223-7400
Peoria (309) 691-4840
Quincy (217) 223-7560
Lakeland Electronics, Inc. Elk Grove Village (312) 595-1000
Marshall Industries Des Plaines (312) 298-3700
Melvin Electronics ▲△ Villa Park (312) 279-5015

Newark Electronics △

Chicago (312) 638-4411
Ohm Electronics Inc. Palatine (312) 359-5500
Texas Instrument Supply Arlington Heights (312) 593-7660

INDIANA

Fort Wayne Electronics △ Fort Wayne (219) 423-3422
Hutch & Son Inc. ▲ Evansville (812) 425-7201
Graham Electronics △ Indianapolis (317) 634-8202
Ohio Valley Sound Service ▲□△ Evansville (812) 425-6173
Pioneer/Indiana Indianapolis (317) 849-7300
Ra-Dis-Co., Inc. ▲□ Indianapolis (317) 637-5571
Radio Distributing Co. △ South Bend (219) 287-2911

IOWA

DEECO, Inc. Cedar Rapids (319) 365-7551
Klaus Radio Davenport (319) 323-9761
Radio Trade Supply Co. Des Moines (515) 288-7237
Warren Radio Co. ▲□△ Davenport (319) 323-8051

KANSAS

Acme Radio, Inc. ▲□△ Topeka (913) 235-1363
Radio Supply Co. Wichita (316) 267-5216

KENTUCKY

P. I. Burks Co. Louisville (502) 583-2871

LOUISIANA

Lykes Electronics New Orleans (504) 486-7441
Industrial Electronic Supply Shreveport (318) 222-9459
Radio Parts, Inc. ▲□△ New Orleans (504) 581-5959
Ralph's of Lafayette △ Lafayette (318) 234-4507
Southern Radio Supply Co. New Orleans (504) 524-2343

MARYLAND

Arrow Electronics, Inc. Baltimore (202) 737-1700
Capitol Radio Wholesalers Rockville (301) 881-2270
Empire Electronic Supply Co. ▲□△ Bethesda (301) 656-3300
Kierulff Electronics Gaithersburg (301) 948-0250
Milgray/Washington Inc. Hyattsville (301) 864-1111
Pioneer/Washington Gaithersburg (301) 948-0710
Radio Elec. Service Co. ▲△ Baltimore (301) 823-0070
Stoddard Supply Co. ▲□△ Hagerstown (301) 733-3390

MASSACHUSETTS

T. F. Cushing Co. ▲□△ Springfield (413) 788-7341
Cramer Electronics Newton Centre (617) 969-7700
Gerber Radio Supply Co. Dedham (617) 329-2400
Greene Shaw Co. ▲□△ Newton (617) 969-8900
Industrial Components Corp. △ No. Wilbraham (413) 596-3854
Marshall Industries Newton Highland (617) 965-5115
A. W. Mayer Co., Inc. ▲ West Newton (617) 965-1111
R. M. Electronics, Inc. ▲△ Worcester (617) 756-8311
Sager Electrical Supply Boston (617) 542-2281
Sterling Electronics Watertown (617) 926-9720
Wilshire Electronics/New England Burlington (617) 272-8200

MICHIGAN

Fitzpatrick Electric ▲□△ Muskegon (616) 722-6621
Fulton Radio Supply ▲□△ Lansing (517) 489-6519
Newark Electronics Detroit (Oak Park) (313) 548-0250
Wyoming (616) 241-6681
N. W. R. Electronics Corp. ▲□△ Marquette (906) 228-9660
Pioneer/Michigan Livonia (313) 525-1800
R. S. Electronics Detroit (313) 491-1000
Shand Electronics Inc. Flint (313) 743-8940
Wedemeyer Electric Supply △ Ann Arbor (313) 665-8611

MINNESOTA

Gopher Electronics Co. St. Paul (612) 645-0241
Newark Electronics Minneapolis (612) 331-6350
Stark Electronics Minneapolis (612) 332-1325

MISSISSIPPI

Ellington Electronic Supply Jackson (601) 355-0561

MISSOURI

Burstein-Appleebe Co. Kansas City (816) 561-5460
Four State Radio & Supply Joplin (417) 624-0368
Interstate Industrial Elec. ▲□△ St. Louis (314) 481-6110
Olive Industrial Electronics St. Louis (314) 863-7800
Radiolab, Inc. Kansas City (816) 561-9935
Van Sickle Radio Electronics St. Louis (314) 621-5000

MONTANA

Electronic Supply Co. ▲□△ Billings (406) 252-2197

For Authorized IC Logic Board Distributors, Contact Your Local Sales Office.

Authorized distributor except for: ▲ D-Sub □ Edge △ Blue Ribbon

TRW[®] CINCH CONNECTORS

LOCAL DISTRIBUTORS (Cont'd)

NEBRASKA

Radio Equipment Co.
Omaha (402) 341-7700
Scott Electronic Supply
Lincoln (402) 434-8308

NEVADA

Dunlap Electronics
Reno (702) 329-1308
Metcalf Electronics ▲□
Las Vegas (702) 384-2151

NEW HAMPSHIRE

Evans Radio, Inc.
Concord (603) 224-9961

NEW JERSEY

Arrow Electronics
Saddlebrook (201) 797-5800
General Radio Supply Co.
Camden (609) 964-8560
Newark Electronics
Kenilworth (201) 272-8410
Radio Electric Service Co.
Pennsauken (609) 662-4000
State Elec. Parts Corp.
Hanover (201) 887-2550
Texas Instruments Supply
Clark (201) 382-6400
Valley Electronics Supply
Rahway (201) 381-5404
Wilshire Electronics/New Jersey
Clifton (201) 365-2600
Wilshire Electronics/Philadelphia
Cinnaminson (609) 786-8990

NEW MEXICO

Cramer/New Mexico
Albuquerque (505) 265-5767

NEW YORK

Arrow Electronics, Inc.
Farmingdale (516) 694-6800
Brady Supply Corporation ▲□
Elmira (607) 733-6591
Connecting Components Corp.
Commack (516) 543-8300
Cramer Electronics ▲□
Rochester (716) 275-0300
Harrison Electronics Corp. ▲□
Farmingdale (516) 293-7990
Harvey Electronics
Binghamton (607) 748-8211
Harvey Electronics ▲□
Woodbury (516) 921-8700
Higgins-Sheer Elec. Dist.
Poughkeepsie (914) 471-3510
Marshall Industries
Farmingdale (516) 293-4141
Peerless Radio Corporation ▲□
Lynbrook (516) 593-2121
Rampart Components, Inc.
Hauppauge (516) 273-1111
Ray Supply, Inc. ▲□
Glens Falls (518) 792-5848
Rochester Radio Supply
Rochester (716) 454-7800
Rome Electronics ▲□
Rome (315) 337-5400
Simcona Electronics Corp.
Rochester (716) 328-3230
Stack Industrial Electronics ▲□
Binghamton (607) 723-6326

Summit Distributors, Inc.

Buffalo (716) 884-3450
E. E. Taylor Co. ▲□
Albany (518) 489-5600
Westchester Electronics Inc. ▲
White Plains (914) 949-2400

NORTH CAROLINA

Cramer/E. W.
Winston Salem (919) 725-8711
Dixie Radio Supply
Charlotte (704) 377-5413
Hammond Elec. of Carolina
Greensboro (919) 275-6391
Southeastern Radio Supply
Raleigh (919) 828-2311

OHIO

Akron Electronics Supply
Akron (216) 762-8818
Electronics Marketing Corp.
Columbus (614) 299-4161
ESCO, Inc.
Dayton (513) 226-1133
Hughes Peters, Inc.
Cincinnati (513) 351-2000
Columbus (614) 294-5351
Marshall Industries
Dayton (513) 898-1105
Newark Electronics ▲□
Cincinnati (513) 874-5115
W. M. Pattison Supply Co.
Cleveland (216) 441-3000
Pioneer/Cleveland
Cleveland (216) 587-3600
Pioneer/Dayton
Dayton (513) 236-9900
REM Electronic Supply
Warren (216) 399-2777
Warren Radio Co.
Toledo (419) 248-3364

OKLAHOMA

Cummins Electronics Supply ▲□
Bartlesville (918) 336-4448
Hall-Mark Electronics Corp.
Tulsa (918) 835-8458
Oil Capitol Electronics
Tulsa (918) 836-2541
Radio, Inc.
Tulsa (918) 587-9123
Trice Wholesale Electronics
Oklahoma City (405) 524-4411

OREGON

Central Distribution ▲□
Portland (503) 234-0711
Double O Electronics, Inc. ▲□
Salem (503) 363-2371
Portland Radio Supply, Inc. ▲□
Portland (503) 228-8647
United Radio Supply
Portland (503) 233-7151
Vitus Electric Supply Co. ▲□
Eugene (503) 345-4377
Verl G. Walker Co. ▲□
Medford (503) 773-7557

PENNSYLVANIA

Almo Electronics Corp.
Philadelphia (215) 698-4000
B & R Electronics ▲□
St. Mary (814) 834-2814

The George Barbey Co.

Reading (215) 376-7451
Barno Radio Co. ▲□
McKeesport (412) 751-5966
Cameradio Electronics ▲
Pittsburgh (412) 288-2600
Herbach-Rademan, Inc. ▲□
Philadelphia (215) 426-1700
Kass Electronics Dist. ▲□
Drexel Hill (215) 449-2300
McCullough Electric Co. ▲□
Pittsburgh (412) 261-2420
Peak Electronics
Devon (215) 687-9822
A. A. Peters, Inc. ▲□
Allentown (215) 434-5237
Philadelphia Electronics ▲□
Philadelphia (215) 568-7400
Pursell Electronics ▲
Scranton (717) 346-2011
R. P. C. Electronics
Pittsburgh (412) 782-3770
Rosen Electronics Co. ▲□
York (717) 843-3875
Warren Radio, Inc.
Erie (814) 454-5285

RHODE ISLAND

Wm. Dandreta & Co.
Providence (401) 861-2800
W. H. Edwards Co., Inc.
Warwick (410) 781-8000

SOUTH CAROLINA

Dixie Radio Supply
Columbia (803) 253-5333
Greenville (803) 232-5357
Hammond Electronics
Greenville (803) 233-4121
Wholesale Radio Supply
Charleston (803) 747-9672

TENNESSEE

Bluff City Dist. Co.
Memphis (901) 725-9500
Bondurant Bros. Co. ▲
Knoxville (615) 577-0473
Electra Distributing Co.
Nashville (615) 329-3971
Industrial Electronics, Inc.
Knoxville (615) 573-7135
Radio Electric Supply ▲
Kingsport (615) 247-8111

TEXAS

Allied Electronics
Ft. Worth (817) 336-5401
All State Electronics, Inc.
Dallas (214) 358-4171
Electrotex ▲□
San Antonio (512) 735-9271
Hall-Mark Electronics Corp.
Dallas (214) 231-6111
Houston (713) 781-6100
Harrison Equip. Co., Inc. ▲
Houston (713) 224-9131
Marshall Industries
Dallas (214) 233-5200
Midland Specialty Co.
El Paso (915) 533-9555
Newark Electronics
Garland (214) 271-2511

R & R Electronics Supply

Abilene (915) 677-2974
Amarillo (806) 374-2866
Lubbock (806) 765-7727

Rio Radio Supply ▲□

McAllen (512) 682-5224

Sterling Electronics

Houston (713) 627-9800

Swieco, Inc.

Fort Worth (817) 335-6521

Texas Instruments Supply

Dallas (214) 238-2011

Wicks Radio Equipment Co. ▲□

Corpus Christi (512) 884-8285

UTAH

Cramer/Utah
Salt Lake City (801) 487-4131
Standard Supply Co.
Salt Lake City (801) 355-2971

VIRGINIA

Arlington Electronic
Wholesalers ▲□
Arlington (703) 524-2412
Meridan Electronic Equip. Co.
Richmond (804) 353-6648
Peoples Radio & TV Supply Co.
Roanoke (703) 342-8933
Priest Electronics, Inc.
Norfolk (804) 855-0141
Virginia Radio Supply
Charlottesville (804) 296-4184

WASHINGTON

Advanced Electronic, Inc. ▲□
Bellingham (206) 734-3400
Almac/Strom Electronics
Seattle (206) 763-2300
Inland Electronics Supply ▲□
Walla Walla (509) 529-2241
Interface Electronics Corp.
Seattle (206) 285-3500
Lay & Nord ▲□
Yakima (509) 453-5596
Liberty Electronics
Seattle (206) 763-8200
Marshall Industries
Bellevue (206) 883-1084
Northwest Electronics, Inc.
Spokane (509) 535-7652
R. V. Weatherford Co.
Seattle (206) 243-6340
Western Electronics Co. ▲□
Seattle (206) 284-0200
Wible Radio Supply Co. ▲□
Tacoma (206) 474-9471

WEST VIRGINIA

Electronic Supply, Inc. ▲□
Huntington (304) 523-6443

WISCONSIN

Electronic Expeditors, Inc.
Milwaukee (414) 228-8100
Marsh Electronics
West Allis (414) 545-6500
Parts Mart Corp. ▲
Milwaukee (414) 276-4160
Satterfield Electronics
Madison (608) 257-4801

For Authorized IC Logic Board Distributors, Contact Your Local Sales Office.

Authorized distributor except for: ▲ D-Sub □ Edge △ Blue Ribbon

TRW[®] CINCH CONNECTORS

CINCH PRINTED CIRCUIT CONNECTORS

The connectors in this catalog are representative of TRW Cinch Connectors' broad capability in the design and production of printed circuit connectors. All of the units described are standard types which can be provided to the user on relatively short delivery cycles. Many of these connectors are available for immediate delivery through the nationwide network of Cinch Distributors.

Cinch specializes in the design and production of printed circuit connectors designed to fit specific customer applications. These connectors can be modifications of the devices described in this catalog or can be of a completely different design based on a detailed evaluation of your requirements. In addition to individual connectors, Cinch can supply complete modular assemblies mounted on aluminum plates. This can be done in virtually any configuration the customer may need.

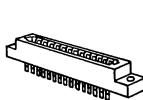
The ability of Cinch to provide high performance printed circuit connectors at surprisingly low prices is a result of special expertise in plating, plastic molding and connector assembly. Cinch has been a leader in the development of unique, proprietary selective plating techniques which permit deposition of gold or other precious metals only in the areas where they are required. The conventional barrel plating technique provides no control over the area of gold deposition. In order to obtain the necessary gold thickness at the contact area, the equivalent thickness must be plated over the entire contact area. Cinch can control the gold deposition to specific areas of the contact, thereby providing a device of high reliability that utilizes considerably less gold in the contact.

Cinch has special capabilities in plastic mold design and is recognized as a leader in molding equipment development. Manufacturers of molding equipment, of the type used in the connector industry, frequently come to Cinch for field evaluation and testing of their devices. Cinch engineers have made major contributions to the design of many plastic molding machines used today throughout the electronic industry. In addition, Cinch maintains its own mold design department known for its capability to develop molds that permit extremely high yields.

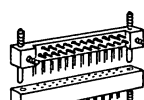
Our design engineering staff works closely with production engineering in the development of new connector designs. Techniques for automatic and semi-automatic assembly as well as special fixtures for hand assembly are planned in association with the product design. As a result, a high level of product uniformity and quality control as well as a low assembly cost is achieved.

BASIC TYPES

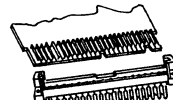
The most frequently used printed circuit connectors being manufactured today fall into three broad design categories: (1) the "edge" type in which the edge of the circuit board mates with a slotted connector; (2) a "two piece" type where one mating piece is permanently attached to the circuit board; and (3) a "hermaphroditic" connector which combines separately mounted contact banks and a card slot.



EDGE TYPE



TWO-PIECE



HERMAPHRODITIC TYPE

Cinch manufactures all three basic types; however, this catalog covers only the "edge" and "two-piece" types. Hermaphroditic connectors are described in the literature listed below.

CONTACT DESIGN & TERMINATIONS

Most of the connectors in this catalog utilize a patented bifurcated bellows contact design which has two spring-loaded contact surfaces instead of one. This provides a more reliable contact where vibration or PC board irregularities may be encountered. There are four basic termination designs available. (1) Tabs or cups for conventional soldering; (2) Dip solder tails for automatic or wave soldering; (3) .025" and .045" square tails or .030" x .060" wrappost tails for automatic and semi-automatic Wirewrap** equipment; and (4) Crimp-on pins which snap into receptacles molded into the connector. Not all types are provided for each connector, but non-standard types and modifications can be designed on special order.

SOLDER TABS
& CUPS

DIP SOLDER



WRAP POST



SQUARE TAIL

OTHER PRINTED CIRCUIT CONNECTORS

If the printed circuit connector to meet your requirements is not illustrated in this catalog, please call your nearest sales office listed on the back cover, or write or call TRW Cinch Connectors, 1501 Morse Ave., Elk Grove Village, Ill. 60007, (312) 439-8800.

* Interchangeable with Elco's products sold under the trademark VARICON. Manufactured under license agreement with Elco Corp.
** Trade Mark Gardner Denver.

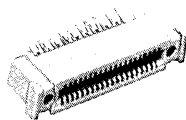
INDEX

Description	Page No.	Description	Page No.
"Tykon" Miniature Edge Connectors	3	"Twin-Con" Crimp-on Snap-in Edge Connectors	10
"Mini-Tyke" Miniature Edge Connector	3	Standard Solder Tab Edge Connectors	11
PC Board Connectors with terminals on .100 centers	4	PC Board Connectors with terminals on .156 centers	12
Miniature 2-Piece Right Angle Connector	5	Special Purpose 0.156" Center PC Board Connectors	12
Standard 2-Piece Right Angle Connector	5	Standard Dip Solder Edge Connectors	13
Miniature Wire Wrap Edge Connectors	5-6	Standard Wrap Post Edge Connectors	14
Miniature Wire Wrap Edge Connectors for Punched Plate Application	6-7	Special Center Bridge Edge Connectors	14
Miniature Wire Wrap Connector Modules	7	Economy Line Connectors — Series 90	15
Standard Wire Wrap Connector Modules	7	Special Size Edge Connectors for 3/32" PC Boards	16
NAFI 40 & 80 Contact PC Modules	8	Special Size Edge Connectors for 1/8" PC Boards	16
Standard Wire Wrap Edge Connectors	9	Dip Solder Term. PC Connectors — .156 Centers	17
Low Cost Edge Connector	9	Environmental and Electrical Specifications	18

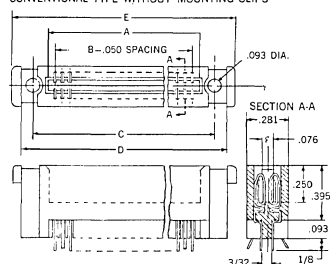
TRW[®] CINCH CONNECTORS

MINIATURE PC CONNECTORS

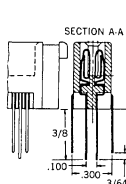
"TYKON" EDGE CONNECTORS/.050" SPACING-DOUBLE READOUT FOR $\frac{1}{16}$ " PRINTED CIRCUIT BOARDS



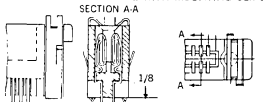
CONVENTIONAL TYPE WITHOUT MOUNTING CLIPS



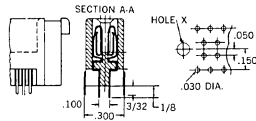
WRAP POST TAIL



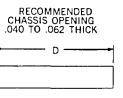
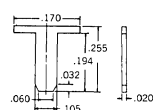
CONVENTIONAL TYPE WITH MOUNTING CLIPS



DIP SOLDER TYPE



POLARIZING KEY



FEATURES AND SPECIFICATIONS

SPECIAL FEATURES: High density (.050" centers) miniature edge connector with special ribbon-type contacts.

Potential applications include standard and thin film memory planes, diodes on insulating substrates and virtually any type of modular plug-in unit.

Available in wide range of sizes with variety of terminations and mounting styles.

SIZES: Available in 6, 10, 15, 20 and 25 contact position sizes with intermediate sizes available on special order.

TERMINATIONS: Available with conventional ribbon-type wiring tails; dip solder or wire wrap versions also available.

MOUNTING STYLES: Conventional wiring

tail types available with special mounting clips for snap-in removable semi-flush panel mounting or without clips and using plain .093" dia. holes for standard mounting.

INSULATOR MATERIAL: Green glass-filled diallyl phthalate, type SDG-F per MIL-M-14.

CONTACT MATERIAL & PLATING: Beryllium copper with 30 micro-inches gold finish.

MOUNTING CLIP MATERIAL & PLATING: Carbon steel with cadmium plate plus yellow chromate finish.

POLARIZING KEY MATERIALS: Made of cellulose acetate and must be ordered separately.

PERFORMANCE SPECIFICATIONS: See page 18.

ORDERING INFORMATION

DESCRIPTION	PART NUMBERS*		NO. OF POSITIONS	NO. OF CONTACTS
	CONVENTIONAL TYPE W/O CLIPS**	CONVENTIONAL TYPE W/CLIPS		
6-Position Connector	255-06-30-190	255-06-30-200	6	12
10-Position Connector	255-10-30-190	255-10-30-200	10	20
15-Position Connector	255-15-30-190	255-15-30-200	15	30
20-Position Connector	255-20-30-190	255-20-30-200	20	40
25-Position Connector	255-25-30-190	255-25-30-200	25	50
Polarizing Key	Part No. 456-99-99-190			

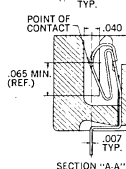
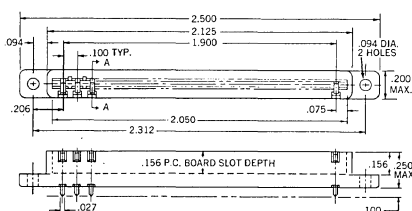
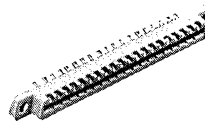
* To order DIP SOLDER or WIRE WRAP TYPES: Substitute "210" as final three figures of part number for dip solder types and "220" for wire wrap types (e.g. 255-06-30-210 or 255-06-30-220); both types available in all sizes shown above.

** These items available through Cinch Distributors.

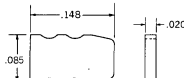
DIMENSIONAL DATA

SIZE (No. of Contact Positions)	DIMENSIONS				
	"A"	"B"	"C"	"D"	"E"
6	.350	.250	.550	.725	.850
10	.550	.450	.750	.925	1.050
15	.800	.700	1.000	1.175	1.300
20	1.050	.950	1.250	1.425	1.550
25	1.300	1.200	1.500	1.675	1.800

"MINI-TYKE" EDGE CONNECTOR/.100" SPACING-SINGLE READOUT FOR $\frac{1}{32}$ " PRINTED CIRCUIT BOARDS



POLARIZING KEY



FEATURES AND SPECIFICATIONS

SPECIAL FEATURES: Extremely low profile connector for compact packaging — overall $\frac{1}{4}$ " height of connector less than half that of standard PC connectors.

Preloaded contact construction provides uniformity of gap and assures adequate contact pressure. Ideally suited for a wide range of miniature PC board plug-in applications including airborne equipment, test equipment and digital components.

SIZE: Available in 20 contact position size only.

TERMINATION: Dip solder tails for inser-

tion and wave soldering in PC mother board.

MOUNTING STYLE: Plain .094" Dia. holes for standard mounting.

INSULATOR MATERIAL: Green glass-filled diallyl phthalate, type SDG-F per MIL-M-14.

CONTACT MATERIAL & PLATING: Beryllium copper with 50 micro-inches gold finish.

POLARIZING KEY MATERIAL: Made of nylon and must be ordered separately.

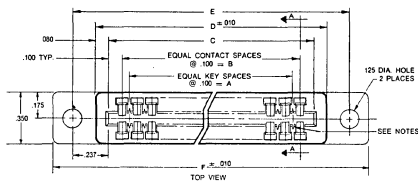
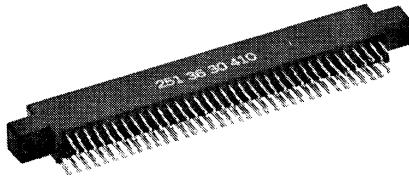
PERFORMANCE SPECIFICATIONS: See page 18 for environmental specifications. Consult factory for electrical data.

ORDERING INFORMATION

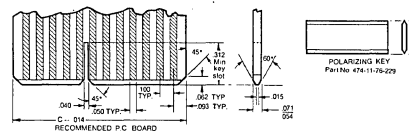
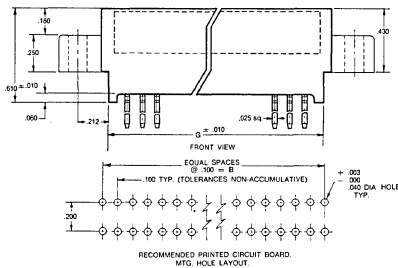
DESCRIPTION	PART NUMBER	NO. OF POSITIONS	NO. OF CONTACTS
Connector	259-20-30-233	20	20
Polarizing Key	457-01-25-008		

TRW[®] CINCH CONNECTORS

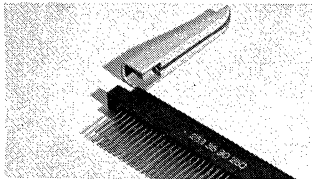
PC BOARD CONNECTORS WITH TERMINALS ON .100 CENTERS



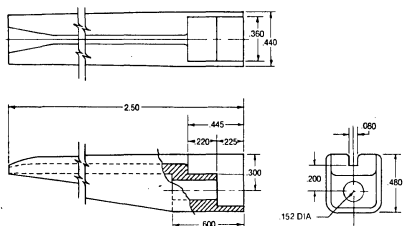
NOTE: POLARIZING KEY SLOTS LOCATED SYMMETRICALLY BETWEEN CONTACT POSITIONS.



CARD GUIDE POST NO. 474-11-90-259



Card Guides No. 474-11-90-259 can be ordered separately and can be assembled with any 251- or 253- connector with clearance mounting holes. Available through Cinch distributors; specify No. 50-GP-1.



FEATURES AND SPECIFICATIONS

CURRENT RATING: 3 amperes.

RATED VOLTAGE (Sea Level): 600 VDC.

INSULATION RESISTANCE: 5000 megohms min.

CONTACT RESISTANCE: 16 milliohms max.

TERMINAL STYLES: Dip Solder, Wire Wrap or Solder Tab.

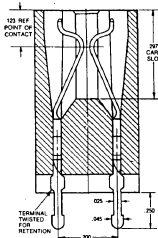
TOTAL INSERTION FORCE: A maximum of one lb. times the number of contact pairs when measured with a .070 in. thick steel blade in accordance with MIL-C-21097.

DIMENSIONAL DATA

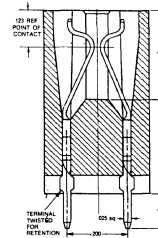
	PART NUMBER	NO. OF CONTACTS	DIMENSIONS						
			A	B	C	D	E	F	G
SOLDER TAB	*251-10-30-410	10/20	.800	.900	1.100	1.260	1.575	1.835	1.150
	†251-15-30-410	15/30	1.300	1.400	1.600	1.760	2.075	2.335	1.650
	*251-18-30-410	18/36	1.600	1.700	1.900	2.060	2.375	2.635	1.950
	*251-20-30-410	20/40	1.800	1.900	2.100	2.260	2.575	2.835	2.150
	†251-22-30-410	22/44	2.000	2.100	2.300	2.460	2.775	3.035	2.350
	*251-25-30-410	25/50	2.300	2.400	2.600	2.760	3.075	3.335	2.650
	†251-28-30-410	28/56	2.600	2.700	2.900	3.060	3.375	3.635	2.950
	*251-30-30-410	30/60	2.800	2.900	3.100	3.260	3.575	3.835	3.150
	†251-31-30-410	31/62	2.900	3.000	3.200	3.360	3.675	3.935	3.250
	*251-35-30-410	35/70	3.300	3.400	3.600	3.760	4.075	4.335	3.650
	†251-36-30-410	36/72	3.400	3.500	3.700	3.860	4.175	4.435	3.750
	*251-40-30-410	40/80	3.800	3.900	4.100	4.260	4.575	4.835	4.150
	†251-43-30-410	43/86	4.100	4.200	4.400	4.560	4.875	5.135	4.450
	*251-44-30-410	44/88	4.200	4.300	4.500	4.660	4.975	5.235	4.550
	†251-49-30-410	49/98	4.700	4.800	5.000	5.160	5.475	5.735	5.050
	†251-50-30-410	50/100	4.800	4.900	5.100	5.260	5.575	5.835	5.150
DIP SOLDER	*252-10-30-360	10/20	.800	.900	1.100	1.260	—	—	1.150
	†252-15-30-360	15/30	1.300	1.400	1.600	1.760	—	—	1.650
	*252-18-30-360	18/36	1.600	1.700	1.900	2.060	—	—	1.950
	*252-20-30-360	20/40	1.800	1.900	2.100	2.260	—	—	2.150
	†252-22-30-360	22/44	2.000	2.100	2.300	2.460	—	—	2.350
	*252-25-30-360	25/50	2.300	2.400	2.600	2.760	—	—	2.650
	†252-28-30-360	28/56	2.600	2.700	2.900	3.060	—	—	2.950
	*252-30-30-360	30/60	2.800	2.900	3.100	3.260	—	—	3.150
	†252-31-30-360	31/62	2.900	3.000	3.200	3.360	—	—	3.250
	*252-35-30-360	35/70	3.300	3.400	3.600	3.760	—	—	3.650
	†252-36-30-360	36/72	3.400	3.500	3.700	3.860	—	—	3.750
	*252-40-30-360	40/80	3.800	3.900	4.100	4.260	—	—	4.150
	†252-43-30-360	43/86	4.100	4.200	4.400	4.560	—	—	4.450
	*252-44-30-360	44/88	4.200	4.300	4.500	4.660	—	—	4.550
	†252-49-30-360	49/98	4.700	4.800	5.000	5.160	—	—	5.050
	†252-50-30-360	50/100	4.800	4.900	5.100	5.260	—	—	5.150
WIRE WRAP	*253-10-30-260	10/20	.800	.900	1.100	1.260	1.575	1.835	1.150
	†253-15-30-260	15/30	1.300	1.400	1.600	1.760	2.075	2.335	1.650
	*253-18-30-260	18/36	1.600	1.700	1.900	2.060	2.375	2.635	1.950
	*253-20-30-260	20/40	1.800	1.900	2.100	2.260	2.575	2.835	2.150
	†253-22-30-260	22/44	2.000	2.100	2.300	2.460	2.775	3.035	2.350
	*253-25-30-260	25/50	2.300	2.400	2.600	2.760	3.075	3.335	2.650
	†253-28-30-260	28/56	2.600	2.700	2.900	3.060	3.375	3.635	2.950
	*253-30-30-260	30/60	2.800	2.900	3.100	3.260	3.575	3.835	3.150
	†253-31-30-260	31/62	2.900	3.000	3.200	3.360	3.675	3.935	3.250
	*253-35-30-260	35/70	3.300	3.400	3.600	3.760	4.075	4.335	3.650
	†253-36-30-260	36/72	3.400	3.500	3.700	3.860	4.175	4.435	3.750
	*253-40-30-260	40/80	3.800	3.900	4.100	4.260	4.575	4.835	4.150
	†253-43-30-260	43/86	4.100	4.200	4.400	4.560	4.875	5.135	4.450
	*253-44-30-260	44/88	4.200	4.300	4.500	4.660	4.975	5.235	4.550
	†253-49-30-260	49/98	4.700	4.800	5.000	5.160	5.475	5.735	5.050
	†253-50-30-260	50/100	4.800	4.900	5.100	5.260	5.575	5.835	5.150

* To be made available at a later date. Contact factory.

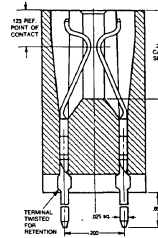
† Indicates items available through Cinch Distributors.



SOLDER TAB

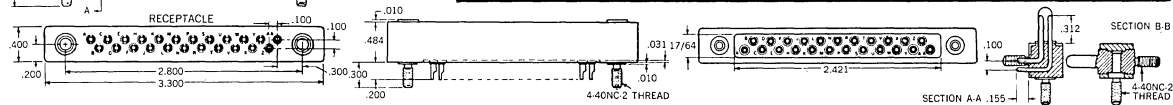
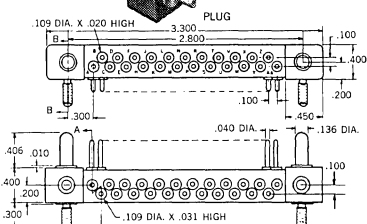
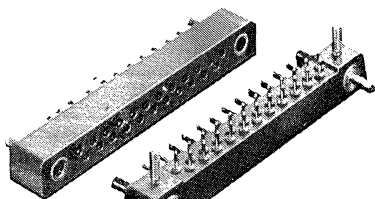


DIP SOLDER



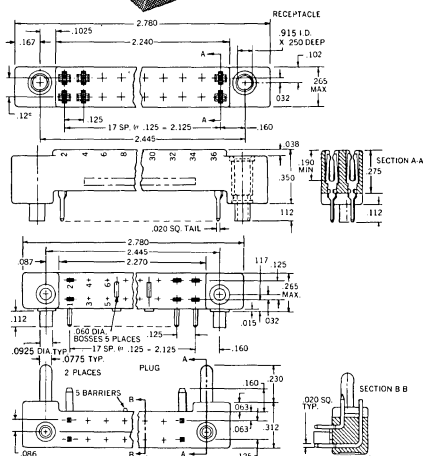
WIRE WRAP

RIGHT ANGLE PC CONNECTOR/.100" SPACING (STAGGERED) - TWO-PIECE PLUG & RECEPTACLE



ORDERING INFORMATION

DESCRIPTION	PART NUMBER	NO. OF POSITIONS	NO. OF CONTACTS
Plug	213-23-42-194	23	23
Receptacle	212-23-42-901	23	23



ORDERING INFORMATION

DESCRIPTION	PART NUMBER	NO. OF POSITIONS	NO. OF CONTACTS
Plug	213-36-90-101	18	36
Receptacle	211-36-92-106	18	36

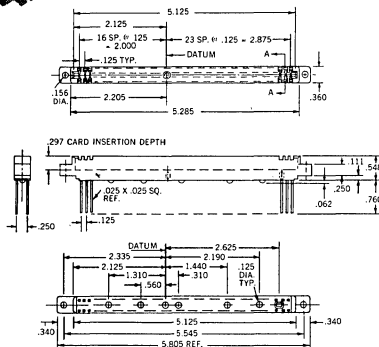
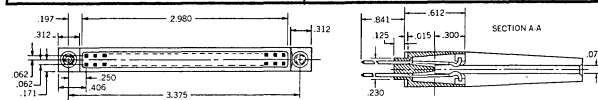
POLARIZING KEY MATERIAL: Made of glass epoxy laminate and must be ordered separately.

24-POSITION WIRE WRAP CONNECTORS (CONT.)



DESCRIPTION	PART NUMBER	NO. OF POSITIONS	NO. OF CONTACTS
Connector w/card guides	253-24-30-054	24	48
Connector w/short card guides	253-24-30-056	24	48
Connector wo/card guides	253-24-30-055	24	48
Polarizing key	456-07-35-003	—	—

PART NUMBER	A	B
253-24-30-054	1.812	.203
253-24-30-056	1.093	.287



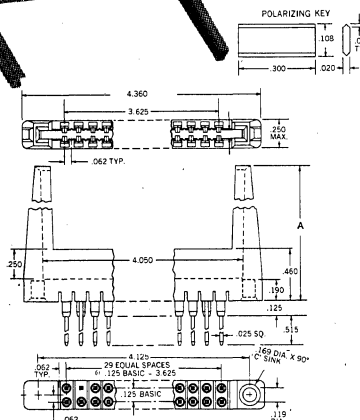
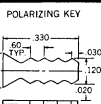
SPECIAL FEATURES: Special edge connector with .025" square tails for hand or machine wire wrap.

Ideally suited for variety of wire wrap interconnection applications on data processing, test and communications equipment.

SIZE: Available in 40-contact position size only.

TERMINATIONS: .025" square tails on

DESCRIPTION	PART NUMBER	NO. OF POSITIONS	NO. OF CONTACTS
Connector	253-40-30-003	40	80
Polarizing Key	456-07-35-003	—	—



SPECIAL FEATURES: Designed for extreme ruggedness — insulator is impervious to normal cleaning solvents.

Special oversize bosses on insulator permit press-fit retention to aluminum plate.

SIZE: Available in 30-position size only with card guides.

TERMINATION: .025" wire wrap square
tails on .125" centers.

MOUNTING STYLE: Connector insulator has special oversize bosses to press-fit into .080" thick plate with .072 $\pm$.001 dia. holes. (Bosses can be omitted at

ORDERING INFORMATION

DESCRIPTION	PART NO.	NO. OF POSITIONS	NO. OF CONTACTS	DIMENSION "A"
Connector w/Card Guides	253-30-80-024	30	60	2.000"
Connector w/Card Guides	253-30-80-025	30	60	.720"
Connector w/o Card Guide	253-30-80-026	30	60	—
Polarizing Key	474-11-76-229	—	—	—

.125" centers for wire wrapping.

MOUNTING STYLE: Plain holes for standard mounting.

INSULATOR MATERIAL: Green glass-filled diallyl phthalate, type SDG-F per MIL-M-14.

CONTACT MATERIAL & PLATING: Phosphor bronze with .100 micro-inches gold over 25 micro-inches nickel plate finish.

POLARIZING KEY MATERIAL: Made of glass epoxy laminate and must be ordered separately.

INSULATOR MATERIAL: Black glass-filled nylon.

CONTACT MATERIAL & PLATING: Phosphor bronze contacts with finish of 30 micro-inches gold.

NOTE: Contacts can also be selectively gold plated creating substantial reduction in overall connector costs. Contact factory for further details on Cinch selective plating process.

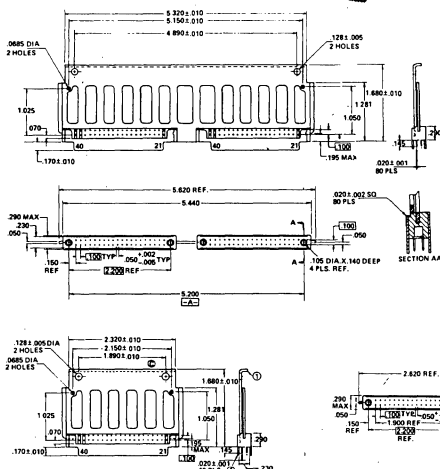
POLARIZING KEY MATERIAL: Made of Nylon and must be ordered separately.

PERFORMANCE SPECIFICATIONS: See page 18.

2.905

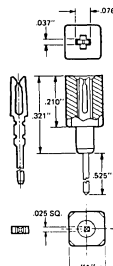
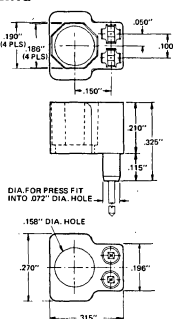
These assemblies function as headers for the support of a printed circuit board measuring approximately $2\frac{5}{16}$ ", or $5\frac{1}{16}$ " x $1\frac{1}{32}$ ". They provide for the assembly of

Contact Strip: Glass filled diallyl phthalate per MIL-M-14F, Type SDG.



Grid	Dim. "A"	Dim. "B"
.100" x .100"	.095"	.095"
.125" x .125"	.120"	.120"
.150" x .150"	.145"	.145"

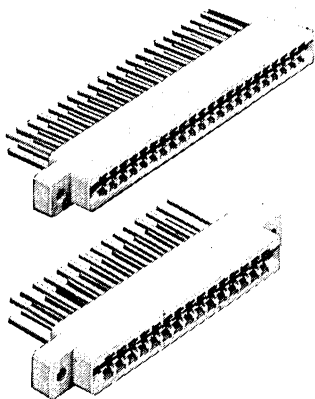
- Modular construction for wide latitude of configurations on .100" x .100" .125" x .125" and .150" x .150" grid.
- Meet stringent requirements for military airborne applications.
- Meet NAFI's standard packaging concept per WS-6157A.
- Nylon modules serve as both contact retention devices and as a dielectric.
- Available in colors for easy color coding and identification.



Contact Plating: 30 microinches gold per MIL-G-45204B over copper flash. Other finishes available on request.

Individual contact insertion and withdrawal with an .020 blade — 2-10 oz.
Individual contact retention — 8 lbs. min.

.045" SQUARE TAIL WIRE WRAP CONNECTORS/.156" SPACING - DOUBLE READOUT FOR 1/16" PRINTED CIRCUIT BOARDS



FEATURES AND SPECIFICATIONS

SPECIAL FEATURES: Combines contact reliability of a flexing bifurcated contact with stability of a rigid .045" square tail. Tail section contains inner core of copper with outer cover of flexible contact material formed into .045" square shape.

SIZES: Available in 15 and 22-position sizes.

TERMINATION: .045" square tails for automatic and/or semi-automatic wire wrapping.

MOUNTING STYLE: Plain .128" diameter holes for standard mounting.

INSULATOR MATERIAL: Green glass-filled diallyl phthalate, type SDG-F per MIL-M-14.

CONTACT MATERIAL & PLATING: Phosphor bronze contacts with 30 micro-inches gold finish.

POLARIZING KEY MATERIAL: Made of glass epoxy laminate and must be ordered separately.

PERFORMANCE SPECIFICATIONS: See page 18.

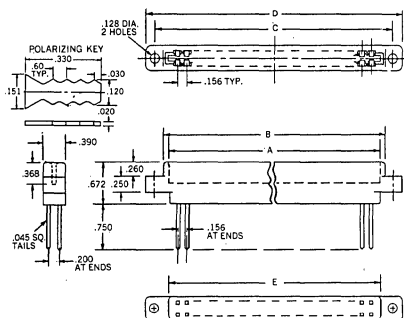
ORDERING INFORMATION

DESCRIPTION	PART NUMBER *	NO. OF POSITIONS	NO. OF CONTACTS
15-Position Connector	253-15-30-074	15	30
22-Position Connector	253-22-30-021	22	44
Polarizing Key	474-11-75-445	—	—

*Available through Cinch Distributors.

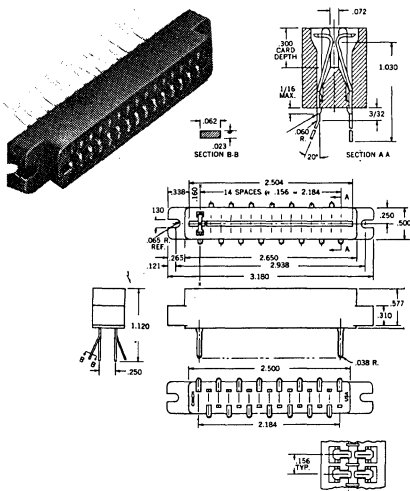
DIMENSIONAL DATA

SIZE (No. of Contact Positions)	DIMENSIONS				
	"A"	"B"	"C"	"D"	"E"
15	2.504	2.646	2.938	3.250	2.500
22	3.596	3.738	4.030	4.342	3.592



LOW COST PC CONNECTORS

**LOW COST EDGE CONNECTOR WITH CANTILEVER CONTACTS/
.156" SPACING - DOUBLE READOUT FOR 1/8" PRINTED CIRCUIT BOARDS**



FEATURES AND SPECIFICATIONS

SPECIAL FEATURES: Cantilever contact construction combines maximum contact pressure with minimum insertion force. Gap uniformity is achieved through pre-loading contacts against insulator stop. Selective gold plating permits concentration of gold at contact area only, at substantially reduced cost.

SIZE: Available in 15 positions, 30 contact size only.

TERMINATION: Special contact tails for slip-on clip or wire wrap application.

MOUNTING HOLE: Cutout area for standard mounting.

INSULATOR MATERIAL: High impact general purpose black phenolic.

CONTACT MATERIAL & PLATING: Phosphor bronze with selective plating of 100 micro-inches gold over 50 micro-inches of copper at contact area and tails tin-lead coated on 2 sides only.

PERFORMANCE SPECIFICATIONS: See page 18.

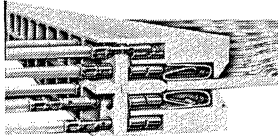
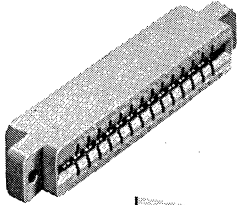
ORDERING INFORMATION

DESCRIPTION	PART NUMBER	NO. OF POSITIONS	NO. OF CONTACTS
Connector	253-15-90-240	15	30

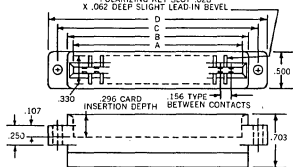
TRW[®] CINCH CONNECTORS

CRIMP TYPE PC CONNECTORS

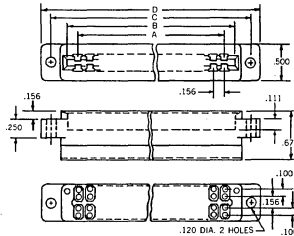
"TWIN-CON" EDGE CONNECTORS WITH CRIMP-ON SNAP-IN PINS/
.156" SPACING - DOUBLE READOUT FOR $\frac{1}{16}$ " PRINTED CIRCUIT BOARDS



8, 15 AND 22 POSITION CONNECTORS



43 POSITION CONNECTORS



FEATURES AND SPECIFICATIONS

1. Crimp-on removable wire pins provide widest range of wiring flexibility.
2. Probe-proof closed entry back plates protect wire leads and receptacles.
3. Wire pins "snap" into contact receptacles, held securely by detent action.
4. Twin-barrel contact receptacles permit 2 wires per contact, 4 wires per position.
5. Bifurcated contacts provide twin contact surfaces, assure positive contact.

SIZES: Available in 8, 15, 22 and 43 position sizes.

TERMINATION: Twin-barrel contact receptacles with crimp-on snap-in wire pins.

MOUNTING STYLE: Plain .128" dia. holes for standard mounting.

INSULATOR MATERIAL: Green glass-filled

diallyl phthalate, type GDI-30F per MIL-M-19833.

CONTACT AND PIN MATERIAL & PLATING: Contacts are made of beryllium copper and wire pins are brass, both with a finish of 30 micro-inches gold over 200 micro-inches silver.

INSULATED JUMPER MATERIAL & PLATING: Jumpers are brass with red or black insulated area dipped and aired with plastisol coating; same finish as pins and contacts.

POLARIZING KEY MATERIAL: Made of nylon and must be ordered separately (Part No. 456-01-25-788). Pins and connectors indicated below can be supplied with 50 micro-inch gold finish to meet MIL-C-21097B.

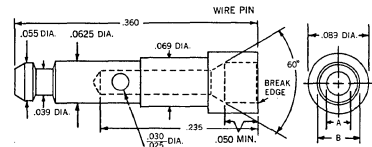
PERFORMANCE SPECIFICATIONS: See page 18.

ORDERING INFORMATION

DESCRIPTION	PART NUMBER	NO. OF POSITIONS	NO. OF CONTACTS
8-Position Connector	254-08-70-118	8	16
15-Position Connector	254-15-70-113	15	30
22-Position Connector	254-22-70-115	22	44
43-Position Connector	254-43-70-114	43	86
Polarizing Key	456-01-25-788	—	—

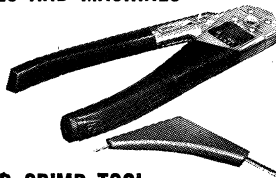
DIMENSIONAL DATA

No. of Positions	DIMENSIONS			
	"A"	"B"	"C"	"D"
8	1.412	1.572	1.844	2.094
15	2.504	2.668	2.938	3.188
22	3.596	3.760	4.030	4.280
43	6.552	6.802	7.302	7.600



Pin Part No.	Wire	"A" Dia. ±.002	"B" Dia. ±.002
462-94-11-130 (840)	No. 20	.046	.073
462-94-11-131 (840)	No. 22-24	.036	.063

TOOLS AND MACHINES



HAND CRIMP TOOL

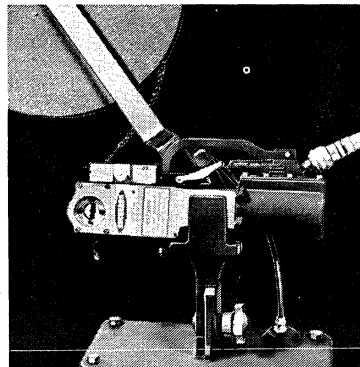
Part No. 599-11-11-108

Versatile, cycle-controlled Buchanan crimp tool. Positioners must be ordered separately. For #20 wire, order positioner No. 598-98-22-107. For #22-24 wire, order No. 598-98-22-108.

PIN INSERTION/REMOVAL TOOL

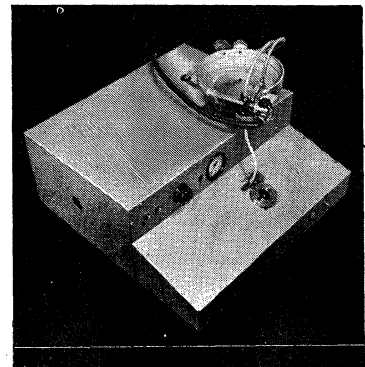
Part No. 599-11-11-102

Special metal hand tool with separate tips for inserting or removing wire pins from "Twin-Con" contact receptacles. Request Form ISM-51 for detailed operating instructions.



BENCH-MOUNTED SEMI-AUTOMATIC CRIMP MACHINE

Pneumatically operated, cycle-controlled tool with large capacity reel. Contacts fed to machine on strips. Order direct from Buchanan (their Catalog Nos. 11151 for machine base and 11566 for tool).



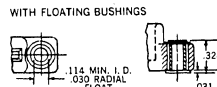
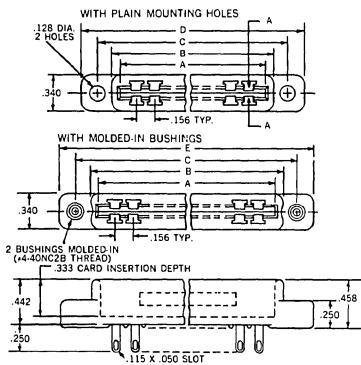
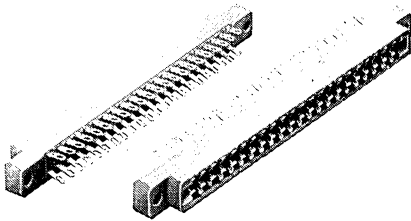
AUTOMATIC CRIMP MACHINE

Available only for extremely high production needs — contacts can be bulk fed into machine. Crimps over both wire and insulation at same time. Direct all inquiries to Factory.

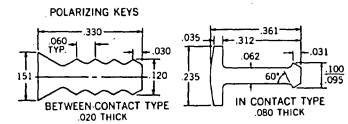
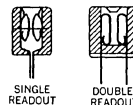
TRW[®] CINCH CONNECTORS

STANDARD PC CONNECTORS

STANDARD EDGE CONNECTORS WITH SOLDER TAB CONTACTS/
.156" SPACING - SINGLE OR DOUBLE READOUT FOR 1/16" PRINTED CIRCUIT BOARDS



SECTION A-A



FEATURES AND SPECIFICATIONS

SPECIAL FEATURES: Patented bifurcated bellows contacts Pat. No. 3274532 provide added contact reliability especially in applications where vibration and board irregularities are involved.

SIZES: Both single and double readout versions are available in 6, 10, 12, 15, 18, 20, 22 and 25-contact position sizes.

TERMINATION: Bifurcated contacts with conventional .115" x .050" slot solder tabs.

MOUNTING STYLES: Available with either .128" diameter holes for standard mounting molded-in bushings or floating bushings. .142" diameter plain holes also available on special order.

INSULATOR MATERIAL: Green glass-filled diallyl phthalate, type SDG-F per MIL-M-14.

CONTACT MATERIALS & PLATING: Contacts are available in either phosphor bronze or beryllium copper. Standard finish is 30 micro-inches gold. Beryllium copper contacts can also be supplied with special finish of 50 micro-inches gold to meet MIL-C-21097B.

POLARIZING KEY MATERIALS: Two types of polarizing keys are available, and must be ordered separately as follows: Part No. 456-07-35-003 (for between-contact polarization) is made of glass epoxy; Part No. 474-11-54-200 (for in-contact polarization) is made of diallyl phthalate.

PERFORMANCE SPECIFICATIONS: See page 18.

SINGLE READOUT

NO. OF CONTACT POSITIONS	TYPE I PART NO. (Plain Mtg. Holes .128" Dia.)	TYPE 1A PART NO. (Plain Mtg. Holes .142" Dia.)	TYPE 2 PART NO. (Molded-In Bushings)	TYPE 3 PART NO. (Floating Bushings)	CONTACT MATERIAL	DIMENSIONS					NO. OF CONTACT POSITIONS
						A	B	C	D	E	
6	250-06-30-170*	250-06-30-211	250-06-30-190	250-06-30-200	Phosphor Bronze	1.100	1.239	1.531	1.785	1.937	6
10	250-06-30-171†	250-06-30-210	250-06-30-191†	250-06-30-201†	Beryllium Copper	1.724	1.864	2.156	2.410	2.562	10
	250-10-30-170*	250-10-30-211	250-10-30-190	250-10-30-200	Phosphor Bronze						
12	250-10-30-171†	250-10-30-210	250-10-30-191†	250-10-30-201†	Beryllium Copper	2.036	2.177	2.469	2.723	2.875	12
	250-12-30-170*	250-12-30-211	250-12-30-190	250-12-30-200	Phosphor Bronze						
15	250-12-30-171†	250-12-30-210	250-12-30-191†	250-12-30-201†	Beryllium Copper	2.504	2.645	2.937	3.191	3.343	15
	250-15-30-170*	250-15-30-211	250-15-30-190	250-15-30-200	Phosphor Bronze						
18	250-15-30-171†	250-15-30-210	250-15-30-191†	250-15-30-201†	Beryllium Copper	2.972	3.114	3.406	3.660	3.812	18
	250-18-30-170*	250-18-30-211	250-18-30-190	250-18-30-200	Phosphor Bronze						
20	250-18-30-171†	250-18-30-210	250-18-30-191†	250-18-30-201†	Beryllium Copper	3.286	3.427	3.719	3.973	4.125	20
	250-20-30-170*	250-20-30-211	250-20-30-190	250-20-30-200	Phosphor Bronze						
22	250-20-30-171†	250-20-30-210	250-20-30-191†	250-20-30-201†	Beryllium Copper	3.596	3.739	4.031	4.285	4.437	22
	250-22-30-170*	250-22-30-211	250-22-30-190	250-22-30-200	Phosphor Bronze						
25	250-22-30-171†	250-22-30-210	250-22-30-191†	250-22-30-201†	Beryllium Copper	4.067	4.208	4.500	4.754	4.906	25
	250-25-30-170*	250-25-30-211	250-25-30-190	250-25-30-200	Phosphor Bronze						
	250-25-30-171†	250-25-30-210	250-25-30-191†	250-25-30-201†	Beryllium Copper						

DOUBLE READOUT

NO. OF CONTACT POSITIONS	TYPE I PART NO. (Plain Mtg. Holes .128" Dia.)	TYPE 1A PART NO. (Plain Mtg. Holes .142" Dia.)	TYPE 2 PART NO. (Molded-In Bushings)	TYPE 3 PART NO. (Floating Bushings)	CONTACT MATERIAL	DIMENSIONS					NO. OF CONTACT POSITIONS
						A	B	C	D	E	
6	251-06-30-160*	251-06-30-260	251-06-30-210	251-06-30-220	Phosphor Bronze	1.100	1.239	1.531	1.785	1.937	6
10	251-06-30-161†	251-06-30-261	251-06-30-211†	251-06-30-221†	Beryllium Copper	1.724	1.864	2.156	2.410	2.562	10
	251-10-30-160*	251-10-30-260	251-10-30-210	251-10-30-220	Phosphor Bronze						
12	251-10-30-161†	251-10-30-261	251-10-30-211†	251-10-30-221†	Beryllium Copper	2.036	2.177	2.469	2.723	2.875	12
	251-12-30-160*	251-12-30-260	251-12-30-210	251-12-30-220	Phosphor Bronze						
15	251-12-30-161†	251-12-30-261	251-12-30-211†	251-12-30-221†	Beryllium Copper	2.504	2.645	2.937	3.191	3.343	15
	251-15-30-160*	251-15-30-260	251-15-30-210	251-15-30-220	Phosphor Bronze						
18	251-15-30-161†	251-15-30-261	251-15-30-211†	251-15-30-221†	Beryllium Copper	2.972	3.114	3.406	3.660	3.812	18
	251-18-30-160*	251-18-30-260	251-18-30-210	251-18-30-220	Phosphor Bronze						
20	251-18-30-161†	251-18-30-261	251-18-30-211†	251-18-30-221†	Beryllium Copper	3.286	3.427	3.719	3.973	4.125	20
	251-20-30-160*	251-20-30-260	251-20-30-210	251-20-30-220	Phosphor Bronze						
22	251-20-30-161†	251-20-30-261	251-20-30-211†	251-20-30-221†	Beryllium Copper	3.596	3.739	4.031	4.285	4.437	22
	251-22-30-160*	251-22-30-260	251-22-30-210	251-22-30-220	Phosphor Bronze						
25	251-22-30-161†	251-22-30-261	251-22-30-211†	251-22-30-221†	Beryllium Copper	4.067	4.208	4.500	4.754	4.906	25
	251-25-30-160*	251-25-30-260	251-25-30-210	251-25-30-220	Phosphor Bronze						
	251-25-30-161†	251-25-30-261	251-25-30-211†	251-25-30-221†	Beryllium Copper						

* These items available through Cinch distributors.

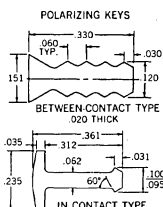
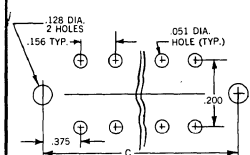
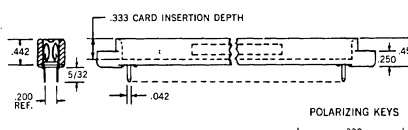
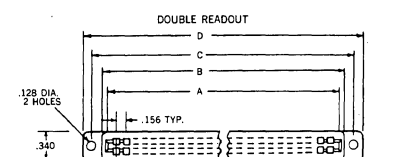
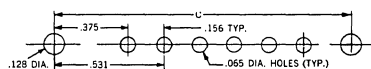
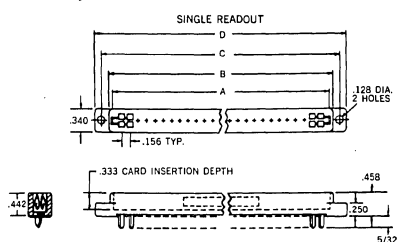
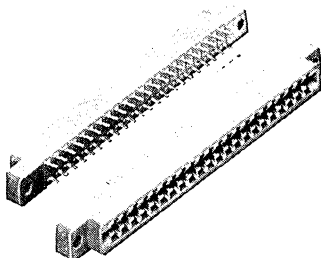
† Can be supplied to meet MIL-C-21097B.

TRW/CINCH CONNECTORS, AN ELECTRONIC COMPONENTS DIV. OF TRW INC. / 1501 MORSE AVE. / ELK GROVE VILLAGE, ILL. 60007

TRW[®] CINCH CONNECTORS

STANDARD DIP SOLDER PC CONNECTORS .156 CENTER SPACING

STANDARD EDGE CONNECTORS WITH DIP SOLDER CONTACTS/
.156" SPACING - SINGLE OR DOUBLE READOUT FOR $\frac{1}{16}$ " PRINTED CIRCUIT BOARDS



DIMENSIONAL DATA

SIZE (No. of Contact Positions)	DIMENSIONS			
	"A"	"B"	"C"	"D"
6	1.100	1.239	1.531	1.785
10	1.724	1.864	2.156	2.410
12	2.036	2.177	2.469	2.723
15	2.504	2.645	2.937	3.191
18	2.972	3.114	3.406	3.660
20	3.286	3.427	3.719	3.973
22	3.596	3.739	4.031	4.285
25	4.067	4.208	4.500	4.754

FEATURES AND SPECIFICATIONS

SPECIAL FEATURES. Patented bifurcated bellows contacts Pat. No. 374532 provide added contact reliability especially in applications where vibration and board irregularities are involved.

SIZES: Both single and double readout versions are available in 6, 10, 12, 15, 18, 20, 22 and 25-contact position sizes.

TERMINATIONS: Bifurcated contacts with tails designed for dip soldering $\frac{3}{32}$ " long. Other lengths available on special order.

MOUNTING STYLE: Plain .128" diameter holes for standard mounting.

INSULATOR MATERIAL: Green glass-filled diallyl phthalate, type SDG-F per MIL-M-14.

CONTACT MATERIALS & PLATING: Contacts are available in either phosphor

bronze or beryllium copper. Standard finish is 30 micro-inches gold. Connectors can also be supplied with a contact finish of 50 micro-inches gold to meet MIL-C-21097B.

POLARIZING KEY MATERIALS: Two types of polarizing keys are available, and must be ordered separately as follows: Part No. 456-07-35-003 (for between-contact polarization) is made of glass epoxy; Part No. 474-11-54-200 (for in-contact polarization) is made of diallyl phthalate.

PERFORMANCE SPECIFICATIONS: See page 18.

SINGLE READOUT

NO. OF CONTACT POSITIONS	PART NO. (Plain Mounting Holes)	CONTACT MATERIAL	DIMENSIONS				NO. OF CONTACT POSITIONS
			A	B	C	D	
6	252-06-30-240 252-06-30-241	Phosphor Bronze Beryllium Copper	1.100	1.239	1.531	1.785	6
10	252-10-30-240 252-10-30-241	Phosphor Bronze Beryllium Copper	1.724	1.864	2.156	2.410	10
12	252-12-30-240 252-12-30-241	Phosphor Bronze Beryllium Copper	2.036	2.177	2.469	2.723	12
15	252-15-30-240 252-15-30-241	Phosphor Bronze Beryllium Copper	2.504	2.645	2.937	3.191	15
18	252-18-30-240 252-18-30-241	Phosphor Bronze Beryllium Copper	2.972	3.114	3.406	3.660	18
20	252-20-30-240 252-20-30-241	Phosphor Bronze Beryllium Copper	3.286	3.427	3.719	3.973	20
22	252-22-30-240 252-22-30-241	Phosphor Bronze Beryllium Copper	3.596	3.739	4.031	4.285	22
25	252-25-30-240 252-25-30-241	Phosphor Bronze Beryllium Copper	4.067	4.208	4.500	4.754	25

DOUBLE READOUT

NO. OF CONTACT POSITIONS	PART NO. (Plain Mounting Holes)	CONTACT MATERIAL	DIMENSIONS				NO. OF CONTACT POSITIONS
			A	B	C	D	
6	252-06-30-160* 252-06-30-161†	Phosphor Bronze Beryllium Copper	1.100	1.239	1.531	1.785	6
10	252-10-30-160 252-10-30-161†	Phosphor Bronze Beryllium Copper	1.724	1.864	2.156	2.410	10
12	252-12-30-160* 252-12-30-161	Phosphor Bronze Beryllium Copper	2.036	2.177	2.469	2.723	12
15	252-15-30-160* 252-15-30-161†	Phosphor Bronze Beryllium Copper	2.504	2.645	2.937	3.191	15
18	252-18-30-160* 252-18-30-161†	Phosphor Bronze Beryllium Copper	2.972	3.114	3.406	3.660	18
20	252-20-30-160 252-20-30-161	Phosphor Bronze Beryllium Copper	3.286	3.427	3.719	3.973	20
22	252-22-30-160* 252-22-30-161†	Phosphor Bronze Beryllium Copper	3.596	3.739	4.031	4.285	22
25	252-25-30-160 252-25-30-161	Phosphor Bronze Beryllium Copper	4.067	4.208	4.500	4.754	25

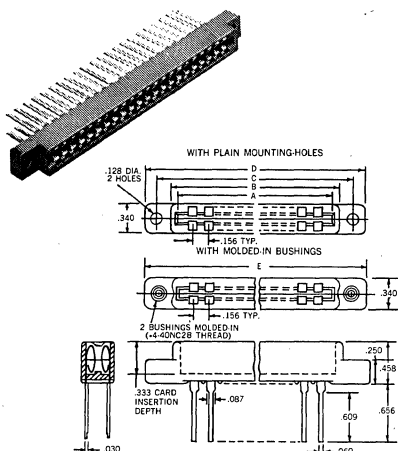
* These items available through Cinch distributors.

† Can be supplied to meet MIL-C-21097B.

TRW[®] CINCH CONNECTORS

STANDARD PC CONNECTORS .156 CENTER SPACING

STANDARD EDGE CONNECTORS WITH WIRE WRAP POST CONTACTS/
.156" SPACING - DOUBLE READOUT FOR $\frac{1}{16}$ " PRINTED CIRCUIT BOARDS



FEATURES AND SPECIFICATIONS

SPECIAL FEATURES: Available in wide range of sizes and mounting styles.

SIZES: Available in 6, 10, 12, 15, 18, 20 and 25 contact position sizes.

TERMINATION: Special wrap post contacts with .060" x .030" tails designed for wire wrapping.

MOUNTING STYLES: Available with plain .128" diameter holes for standard mounting, molded-in bushings or floating bushings.

INSULATOR MATERIAL: Green glass-filled

diallyl phthalate, type SDG-F per MIL-M-14.

CONTACT MATERIALS & PLATING: Contacts are available in either phosphor bronze or beryllium copper with 30 micro-inches gold finish.

POLARIZING KEY MATERIALS: Two types of polarizing keys are available and must be ordered separately as follows: Part No. 456-07-35-003 key (for between-contact polarization) is made of glass epoxy. Part No. 474-11-54-200 key (for in-contact polarization) is made of diallyl phthalate (see page 13).

PERFORMANCE SPECIFICATIONS: See page 18.



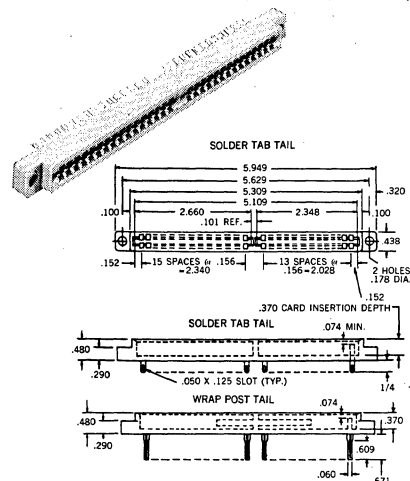
SPECIFICATIONS

NO. OF CONTACT POSITIONS	TYPE 1 PART NO. (Plain Mounting Holes)	TYPE 2 PART NO. (Molded-In Bushings)	TYPE 3 PART NO. (Floating Bushings)	CONTACT MATERIAL	DIMENSIONS				
					A	B	C	D	E
6	253-06-30-140*	253-06-30-180	253-06-30-170	Phosphor Bronze	1.100	1.239	1.531	1.785	1.937
	253-06-30-141	253-06-30-181	253-06-30-171	Beryllium Copper					
10	253-10-30-140*	253-10-30-180	253-10-30-170	Phosphor Bronze	1.724	1.864	2.156	2.410	2.562
	253-10-30-141	253-10-30-181	253-10-30-171	Beryllium Copper					
12	253-12-30-140*	253-12-30-180	253-12-30-170	Phosphor Bronze	2.036	2.177	2.469	2.723	2.875
	253-12-30-141	253-12-30-181	253-12-30-171	Beryllium Copper					
15	253-15-30-140*	253-15-30-180	253-15-30-170	Phosphor Bronze	2.504	2.645	2.937	3.191	3.343
	253-15-30-141	253-15-30-181	253-15-30-171	Beryllium Copper					
18	253-18-30-140*	253-18-30-180	253-18-30-170	Phosphor Bronze	2.972	3.114	3.406	3.660	3.812
	253-18-30-141	253-18-30-181	253-18-30-171	Beryllium Copper					
20	253-20-30-140	253-20-30-180	253-20-30-170	Phosphor Bronze	3.286	3.427	3.719	3.973	4.125
	253-20-30-141	253-20-30-181	253-20-30-171	Beryllium Copper					
22	253-22-30-140*	253-22-30-180	253-22-30-170	Phosphor Bronze	3.596	3.739	4.031	4.285	4.437
	253-22-30-141	253-22-30-181	253-22-30-171	Beryllium Copper					
25	253-25-30-140	253-25-30-180	253-25-30-170	Phosphor Bronze	4.067	4.208	4.500	4.754	4.906
	253-25-30-141	253-25-30-181	253-25-30-171	Beryllium Copper					

* These items available through Cinch distributors.

SPECIAL DESIGN PC CONNECTORS .156 CENTER SPACING

SPECIAL EDGE CONNECTORS WITH CENTER BRIDGE DESIGN/
.156" SPACING - DOUBLE READOUT FOR $\frac{1}{16}$ " PRINTED CIRCUIT BOARDS



FEATURES AND SPECIFICATIONS

SPECIAL FEATURES: Center bridge construction utilized in insulator to minimize warpage. Available with both solder tab and wrap post termination.

SIZE: Available in 30-position size only.

TERMINATIONS: Available with conventional solder tab tails or .060" x .030" wrap post contacts.

MOUNTING STYLE: Plain .178" diameter holes for standard mounting.

INSULATOR MATERIAL: Green glass-filled

diallyl phthalate, type SDG-F per MIL-M-14.

CONTACT MATERIALS & PLATING: Contacts are available in either phosphor bronze or beryllium copper with 30 micro-inches gold finish.

POLARIZING KEY MATERIALS: Available with "in-contact" polarization only; polarizing key is made of diallyl phthalate and must be ordered separately. (Part No. 474-11-54-200).

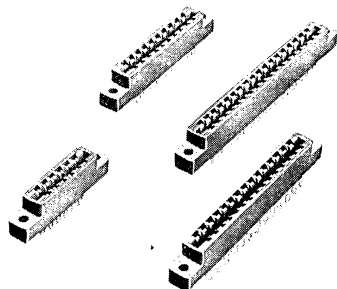
PERFORMANCE SPECIFICATIONS: See page 18.

ORDERING INFORMATION

DESCRIPTION	PART NO.	CONTACT MATERIAL	NO. OF POSITIONS	NO. OF CONTACTS
Connector w/Solder Tab Tails	251-30-30-232	Phosphor Bronze	30	60
Connector w/Wrap Post Tails	251-30-30-231	Beryllium Copper		
	253-30-30-212	Phosphor Bronze	30	60
	253-30-30-213	Beryllium Copper		

TRW[®] CINCH CONNECTORS

SERIES 90 ECONO-LINE LOW-COST P.C. EDGE CONNECTORS ON .156" CENTERS FOR 1/16" BOARDS — .333" DEEP CARD SLOT



Most of the performance features of TRW/Cinch Connectors standard printed circuit edge connectors are found in this low-cost version for commercial applications. Except for the reduced amount of gold-plating, the Series 90 Econo-Line connectors meet all the latest requirements of MIL-C-21097, Std. 202.

The Series 90 incorporates a newly developed high tensile brass, Alcoloy* 688, in its bifurcated bellow contacts. The contact area is selectively plated with 20 micro-

inches of gold over 30 microinches of nickel that provides a non-migrating base. A green, glass-filled thermoplastic polyester replaces the more expensive diallyl phthalate used in the standard connector line.

Econo-Line connectors are supplied in 6, 10, 12, 15, 18, 22 and 25 positions, with either single or double readout in either conventional solder eyelet or dip solder tails.

*T.M. Olin Corporation.

PERFORMANCE DATA

MECHANICAL

Contact Insertion Force: 16 oz. max. per contact position.

Individual Separation Force: 1 oz. min. Performed in accordance with Para. 4.6.6.1.2 of MIL-C-21097 using .054-in. thick blade.

Durability: 100 cycles with steel blade .070-in. thick. Contact resistance and individual contact separation force requirements met after test.

ELECTRICAL

Voltage Rating (AC RMS, adjacent terminals): 830V (sea level); 300V (3.4" Hg, 50,000 feet); 450V (1.3" Hg, 70,000 feet).

Test Voltage (AC RMS, adjacent terminals):

1870V (sea level); 675V (3.4" Hg, 50,000 feet); 450V (1.3" Hg, 70,000 feet).

Current Rating: 5 amperes.

(Based upon all contacts carrying specified current and a temperature rise of 30°C. above ambient.)

Contact Resistance (at rated current): .005 ohms.

Insulation Resistance: 5000 Megohms.

ENVIRONMENTAL SPECIFICATIONS

(Per MIL-C-21097 and MIL-STD-202, latest versions)

Shock: 3 blows at 50G, Method 202B.

Temperature Cycling: 5 continuous cycles per Method 107B.

Test Condition B: -65°C to +125°C.

Salt Spray: 48 hours per Method 101B, Condition B.

Vibration: Per Method 204A, Condition B for bifurcated contacts.

Humidity: Per Method 103B, Condition B.

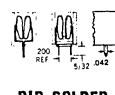
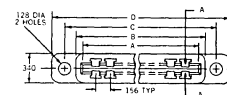
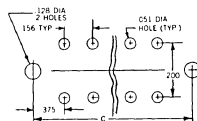
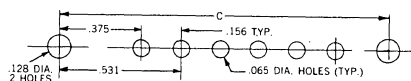
MATERIALS & FINISHES

Contacts: Alcoloy 688 high tensile brass.

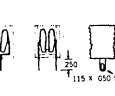
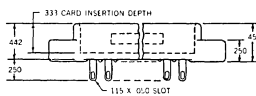
Plating: Contact surface selectively plated with 20 microinches gold over 30 microinches nickel overall; solder-coated terminals.

Insulator: 30% glass-filled green polyester, SEO-rated.

DIMENSIONS



DIP SOLDER



SOLDER TAB

DIP SOLDER TERMINALS, .156 SPACING BETWEEN ROWS

Contact Positions	SINGLE READOUT		DOUBLE READOUT	
	Part No.	Distributor Part No.	Part No.	Distributor Part No.
6	252-06-90-240	50-6EE-10	252-06-90-160	50-12EE-40
10	252-10-90-240	50-10EE-10	252-10-90-160	50-20EE-40
12	252-12-90-240	50-12EE-10	252-12-90-160	50-24EE-40
15	252-15-90-240	50-15EE-10	252-15-90-160	50-30EE-40
18	252-18-90-240	50-18EE-10	252-18-90-160	50-36EE-40
22	252-22-90-240	50-22EE-10	252-22-90-160	50-44EE-40
25	252-25-90-240	50-25EE-10	252-25-90-160	50-50EE-40

No. of Contact Pos.	DIMENSIONS			
	A	B	C	D
6	1.100	1.239	1.531	1.785
10	1.724	1.864	2.156	2.410
12	2.036	2.177	2.469	2.723
15	2.504	2.645	2.937	3.191
18	2.972	3.114	3.406	3.660
22	3.596	3.739	4.031	4.285

CONVENTIONAL SOLDER TERMINALS, .156 SPACING BETWEEN ROWS

Contact Positions	SINGLE READOUT		DOUBLE READOUT	
	Part No.	Distributor Part No.	Part No.	Distributor Part No.
6	250-06-90-170	50-6EE-20	251-06-90-160	50-12EE-30
10	250-10-90-170	50-10EE-20	251-10-90-160	50-20EE-30
12	250-12-90-170	50-12EE-20	251-12-90-160	50-24EE-30
15	250-15-90-170	50-15EE-20	251-15-90-160	50-30EE-30
18	250-18-90-170	50-18EE-20	251-18-90-160	50-36EE-30
22	250-22-90-170	50-22EE-20	251-22-90-160	50-44EE-30
25	250-25-90-170	50-25EE-20	251-25-90-160	50-50EE-30

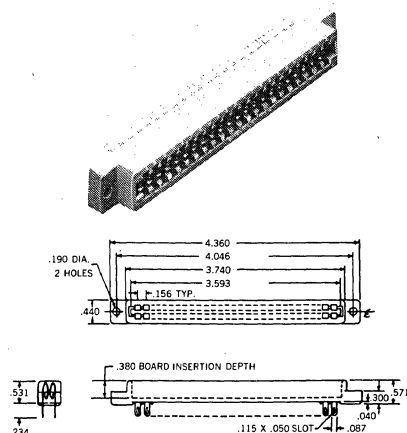
DIP SOLDER TAILS, DOUBLE READOUT, .140 SPACING BETWEEN ROWS

Contact Positions	DIMENSIONS	
	Part No.	Distributor Part No.
6	252-06-90-210	50-12EE-140
10	252-10-90-210	50-20EE-140
12	252-12-90-210	50-24EE-140
15	252-15-90-210	50-30EE-140
18	252-18-90-210	50-36EE-140
22	252-22-90-210	50-44EE-140
25	252-25-90-210	50-50EE-140

TRW[®] CINCH CONNECTORS

SPECIAL BOARD SIZE PC CONNECTORS .156 CENTER SPACING

SPECIAL EDGE CONNECTORS/.156" SPACING - DOUBLE READOUT FOR $\frac{3}{32}$ " PRINTED CIRCUIT BOARDS



FEATURES AND SPECIFICATIONS

SPECIAL FEATURES: Accommodates $\frac{3}{32}$ " thick printed circuit boards. Bifurcated contact construction provides added reliability.

SIZE: Available in 22-position size only.

TERMINATION: Conventional .234 solder tabs. Printed circuit tails $\frac{3}{32}$ " long available on special order. Consult factory.

MOUNTING STYLE: Plain .190" diameter holes for standard mounting.

INSULATOR MATERIAL: Green glass-filled diallyl phthalate, type SDG-F per MIL-M-14.

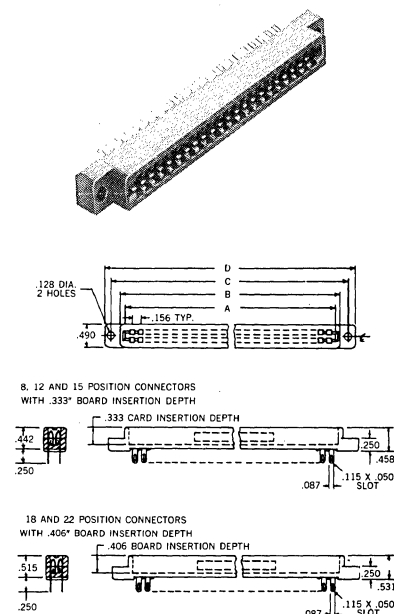
CONTACT MATERIALS & PLATING: Bifurcated contacts available in either phosphor bronze or beryllium copper with 30 micro-inches gold finish.

PERFORMANCE SPECIFICATIONS: See page 18.

ORDERING INFORMATION

DESCRIPTION	PART NO.	CONTACT MATERIAL	NO. OF POSITIONS	NO. OF CONTACTS
Connectors	251-22-30-341 251-22-30-340	Phosphor Bronze Beryllium Copper	22	44

SPECIAL EDGE CONNECTORS/.156" SPACING - DOUBLE READOUT FOR $\frac{1}{8}$ " PRINTED CIRCUIT BOARDS



FEATURES AND SPECIFICATIONS

SPECIAL FEATURES: Accommodates $\frac{1}{8}$ " thick printed circuit boards. Available in variety of sizes; all with patented bifurcated bellows contact construction. Pat. No. 3274532.

SIZES: Available in 8, 12, 15, 18 and 22-contact position sizes.

TERMINATION: Conventional $\frac{1}{4}$ " solder tabs. Printed circuit tails $\frac{3}{32}$ " long available on special order. Consult factory.

MOUNTING STYLE: Plain .128" diameter holes for standard mounting.

INSULATOR MATERIAL: Green glass-filled diallyl phthalate, type SDG-F per MIL-M-14.

NOTE: Two different height insulators are used—the 8, 12 and 15-position connector insulators permit .333" board insertion depth while the 18 and 22-position insulators permit .406" depth.

CONTACT MATERIAL & PLATING: Bifurcated contacts available in either phosphor bronze or beryllium copper with 30 micro-inches gold finish.

PERFORMANCE SPECIFICATIONS: See page 18.

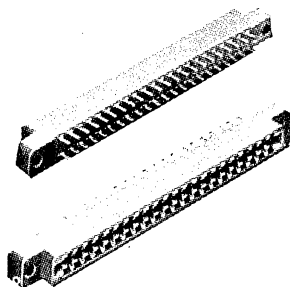
ORDERING INFORMATION

DESCRIPTION	PART NO.	CONTACT MATERIAL	BOARD INSERTION DEPTH	NO. OF POSITIONS	NO. OF CONTACTS
8-Position Connectors	251-08-30-121 251-08-30-120	Phosphor Bronze Beryllium Copper	.333	8	16
12-Position Connectors	251-12-30-121 251-12-30-120	Phosphor Bronze Beryllium Copper	.333	12	24
15-Position Connectors	251-15-30-121 251-15-30-120	Phosphor Bronze Beryllium Copper	.333	15	30
18-Position Connectors	251-18-30-350 251-18-30-351	Phosphor Bronze Beryllium Copper	.406	18	36
22-Position Connectors	251-22-30-350 251-22-30-351	Phosphor Bronze Beryllium Copper	.406	22	44

No. of Contact Positions	DIMENSIONS			
	"A"	"B"	"C"	"D"
8	1.341	1.537	1.740	1.943
12	1.965	2.164	2.419	2.700
15	2.433	2.637	2.948	3.265
18	2.973	3.114	3.406	3.660
22	3.598	3.739	4.031	4.285

TRW[®] CINCH CONNECTORS

DIP SOLDER TERMINAL PC CONNECTORS 0.140" SPACING BETWEEN ROWS 0.156" CONTACT CENTERS



- Patented bifurcated bellows contacts for added contact reliability.
- Ideal for applications involving vibration or board irregularities.
- 6, 10, 12, 15, 18, 22 and 25-contact sizes, double readout.

- Available with or without mounting ears.
- Accepts single or double $\frac{1}{16}$ " thick sided boards.
- 0.125" long dip solder terminations.

MATERIALS

Insulator Material: Green glass-filled diallyl phthalate, type SDG-F per MIL-M-14.

Contact Material: Contacts are available in phosphor bronze. Standard finish is 30 microinches gold.

Polarizing Key Materials: Two types of polarizing keys are available, and must be ordered separately as follows: Part No. 456-07-35-003 (for between contact polarization) is made of glass epoxy; Part No. 474-11-54-200 (for in-contact polarization) is made of diallyl phthalate.

ENVIRONMENTAL SPECIFICATIONS

Shock: 3 blows of 50G per MIL-STD-202C, Method 202B.

Temperature Cycling: 5 continuous cycles (-65°C to $+105^{\circ}\text{C}$) per MIL-STD-202C, Method 107B, Test Condition B.

Salt Spray: 48 hours per MIL-STD-202C, Method 101B, Condition B.

Vibration: Per MIL-STD-202C, Method 204A, Test Condition B.

Humidity: Per MIL-STD-202C, Method 103B, Condition B.

ELECTRICAL SPECIFICATIONS

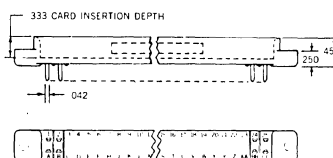
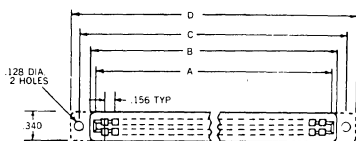
Test Voltage (AC RMS, adjacent terminals): 830V (sea level); 300V (3.4" Hg, 50,000 feet); 200V (1.3" Hg, 70,000 feet).

Current Rating: 5.0 amperes.

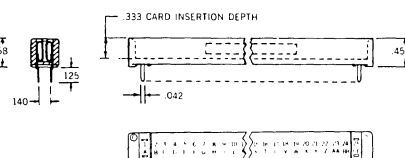
Contact Resistance at Rated Current: .005 ohms.

Insulation Resistance: 5000 megohms.

DIMENSIONS

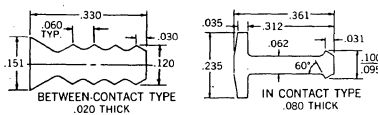


210 SERIES

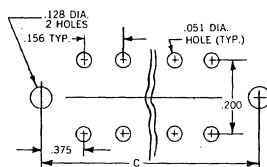


211 SERIES

POLARIZING KEYS



MOUNTING HOLE LAYOUT



WITH MOUNTING HOLES

Contact Positions	Contacts	Factory Part No.	Dimensions			
			A	B	C	D
6	12	252-06-30-210*	1.100	1.239	1.531	1.785
10	20	252-10-30-210*	1.724	1.864	2.156	2.410
12	24	252-12-30-210*	2.036	2.177	2.469	2.723
15	30	252-15-30-210*	2.504	2.645	2.937	3.191
18	36	252-18-30-210*	2.972	3.114	3.406	3.660
22	44	252-22-30-210*	3.596	3.739	4.031	4.285
25	50	252-25-30-210*	4.067	4.208	4.500	4.754

WITHOUT MOUNTING HOLES

6	12	252-06-30-211*	1.100	1.239		
10	20	252-10-30-211*	1.724	1.864		
12	24	252-12-30-211*	2.036	2.177		
15	30	252-15-30-211*	2.504	2.645		
18	36	252-18-30-211*	2.972	3.114		
22	44	252-22-30-211*	3.596	3.739		
25	50	252-25-30-211*	4.067	4.208		

*These items available through Cinch distributors.

TRW[®] CINCH CONNECTORS

ENVIRONMENTAL SPECIFICATIONS

PAGE REF.	CONNECTOR DESCRIPTION	MIL-SPEC REF.	SHOCK	TEMP. CYCLING	SALT SPRAY	VIBRATION	HUMIDITY	NOTES
3	"Tykon" Connectors	2	1	2	1	1		1
3	"Mini-Tyke Connectors	1, 2	1	5	1	2		
5	Right Angle Connectors .100" Staggered Spacing	2-3	2	1	1	2		2, 3
5	Right Angle Connector .125" Spacing	1, 2	1	1	1	1	1	3
5-6	24-position wire wrap connectors .125" Spacing	1, 2	1	1	1	1	1	
6	40-position wire wrap connectors .125" Spacing	1, 2	1	1	1	1	1	
6	30-position wire wrap connectors for Punch Plate	1, 2	1	1	1			4
7	36-position wire wrap connectors for Punch Plate	1, 2	1	1	1			4
9	.045" Square Tail Wire Wrap connectors with .156" Spacing	1, 2	1	3	1	3	1	3
10	"Twin-Con" Edge connectors	1, 2	1	4	1	4	1	5
11-14, 16	Standard Edge Connector	1, 2	1	1	1	1	1	

MIL-Spec REFERENCES: 1. MIL-C-21097, latest version

2. MIL-STD-202, latest version

3. MIL-C-8384

SHOCK: 1. 3 blows of 50G per MIL-STD-202C, METHOD 202B.

2. 10 blows of 50G per MIL-STD-202C, METHOD 202B.

TEMPERATURE CYCLING: 1.5 Continuous cycles (−65°C to 125°C) per MIL-STD-202C, Method 107B, Test Condition B (−65°C to 105°C for phosphor bronze contacts, where applicable).

2. Per MIL-STD-202C, Method 102A, Condition D (except high temperature 105°C).

3. 5 continuous cycles (−55°C to 105°C) per MIL-STD-202C, Method 102A, Test Condition D.

4. 5 continuous cycles (−55°C to 125°C).

5. 5 continuous cycles (−55°C to 85°C) per MIL-STD-202C, Method 107B, Test Condition A.

SALT SPRAY: 1. 48 hours per MIL-STD-202C, Method 101B, Condition B.

VIBRATION: 1. Per MIL-STD-202C, Method 204A, Test Condition B for bifurcated contacts, Method 201A for non-bifurcated contacts.

2. Per MIL-STD-202C, Method 204A, Test Condition A.

3. Per MIL-STD-202C, Method 204A, Test Condition D.

4. 5-3000 CPS at 30G exceeding MIL-STD-202C, Method 204D.

HUMIDITY: 1. Per MIL-STD-202C, Method 103B, Condition B, unless otherwise stated in NOTES.

NOTES: 1. Insertion Force, 5-32 lbs., depending on number of contacts.

2. Insertion Force, 18 lbs., max.

3. Mechanical Durability, 500 cycles.

4. Vibration capability dependent on backplane aluminum plate design and mounting. Consult factory for specific application.

5. Insertion Force 16-40 lbs., depending on number of contacts.

ELECTRICAL SPECIFICATIONS

PAGE REF.	CONNECTOR DESCRIPTION	VOLTAGE RATINGS (AC RMS) (ADJACENT TERMINALS)			CURRENT RATING (AMPS)	CONTACT RESISTANCE AT RATED CURRENT	INSULATION RESISTANCE (MEG Ω)
		SEA LEVEL	3.4 HG 50,000 FT.	1.3 HG 70,000 FT.			
3	"Tykon" Connectors	500	*	*	.5	.020 Avg.	5000
5	Right Angle Connectors .100" Spacing	2400	640	400	7.5	.004	100,000
5	Right Angle Connectors .125" Spacing	1800	675	450	5.0	.005	5000
5-6	24 and 40-position wire wrap connectors .125" Spacing	830	300	200	5.0	.005	1000
6-7	30 and 36-position wire wrap connectors for Punch Plate	1800	675	450	3.0	.016	5000
9	.045" Square tail wire wrap with .156" Spacing	830	300	200	5.0	.005	5000
10	"Twin con" Edge Connectors	500	—	—	5.0	.005	5000
11-14, 16	Standard Edge Connector	830	300	200	5.0	.005	5000

* Additional voltage ratings are: at sea level to ground, 1160 v rms, 1660 vdc; at 60,000 ft. to adjacent terminals, 165 v rms, 230 vdc; at 60,000 ft. to ground, 300 vrms, 400 vdc.

CONSULT FACTORY FOR ADDITIONAL INFORMATION

Dimensions in this book are nominal within accepted engineering standards. Consult factory for exact tolerances.

TRW[®] CINCH CONNECTORS

CINCH D-SUBMINIATURE CONNECTORS[†]

All Cinch D-Subminiature Connectors undergo final assembly and inspection in the ultra-modern, temperature controlled Cinch "clean room." In this room, contacts, insulators and shells are stored and assembled under tight quality control inspection. Ultrasonic cleaning capabilities are also available on request.

GENERAL DESCRIPTION

The Cinch D-Subminiature Connectors described in this catalog are designed for applications where space and weight are prime considerations. These high contact density connectors are especially well-suited for aircraft, missile and ground support installations. Although designed essentially for rack-and-panel installations, D series connectors may be adapted for cable attachment by means of accessory junction shells with integral clamps.

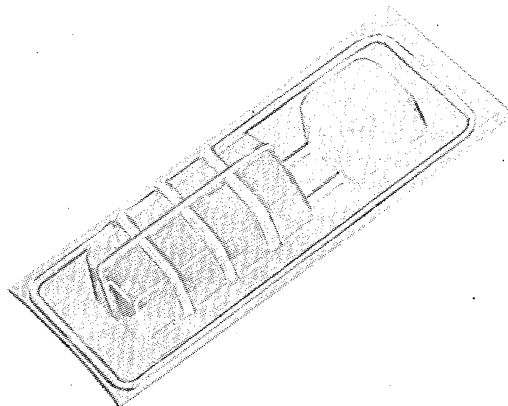
In addition to the original D series with solder pot contacts in a two piece insulator, Cinch now offers Golden D, Mark I Connectors with solder pot contacts in a monobloc insulator for improved moisture resistance; Royal D, Mark III connectors with crimp snap-in contacts in the Little Caesar assembly for high performance, high reliability applications, and the Burgun-D with insertable and removable stamped or machine contacts for commercial applications.

All D-Subminiature Connectors will inter-mate if insert arrangements correspond. Mark I and Mark III connectors are designed to meet or exceed the requirements of MIL-C-24308 Rev. A.

A wide range of insert arrangements is offered accommodating up to 50 contacts accepting standard AWG wire as indicated in the individual specifications. Combination layouts are available, with provisions for coaxial and/or high voltage contacts. Printed circuit and wire wrap terminations are also available. The versatility of the D series is further enhanced by the variety of insulating materials and finishes, as well as a complete line of accessories.

The D-Subminiature series is handled by leading electronic distributors throughout the country. Questions regarding modifications of these designs or any connector requirement should be addressed to your local Cinch representative and will receive his immediate attention.

CONNECTORS INDIVIDUALLY PACKED IN HEAT-SEALED CONTAINERS TO ASSURE EXTENDED SHELF-LIFE



To protect D-Subminiature Connectors from contamination and other corrosive elements in the air, Cinch individually packs each connector in heat-sealed polyvinyl-chloride containers (as shown). This assures every customer of an extended shelf life. A separate compartment is also provided in each container for the loose crimp-type contacts supplied with the Royal D Mark III Connectors. Connectors can also be packed in individual polyethylene bags if desired.

INDEX CONNECTORS

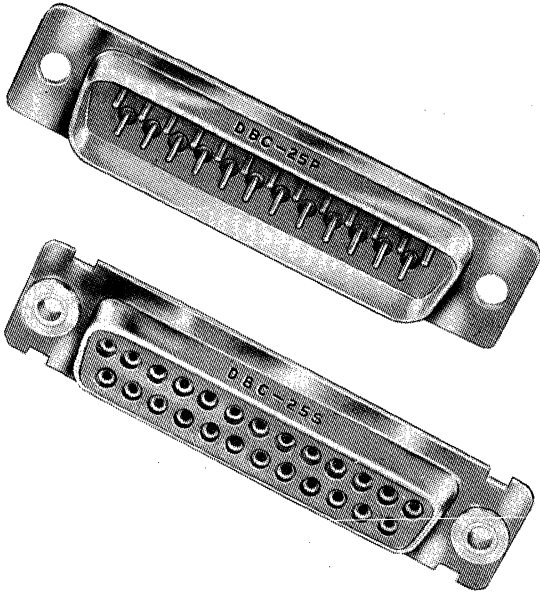
Type	Description	Common Name	Insulator Type	Contact Termination	Page
D ^{*C}	D connectors with crimp snap-in contacts in two-piece insulators, with integral retention system	Burgun D	Two-piece, Nylon	Crimp Snap-in Screw machine and stamped contacts	3-9
D ^{*MA}	D connectors with crimp snap-in contacts in monobloc insulators utilizing Little Caesar rear release contact assembly	Royal D, Mark III	Monobloc, diallyl phthalate	Crimp Snap-in	19-20
D ^{*M}	D connectors with monobloc insulators for more critical application requirements	Golden D, Mark I Golden D, Mark I Combination	Monobloc, diallyl phthalate Monobloc, diallyl phthalate	Solder Pot Solder Pot with coaxial and/or HV and/or power	14-18
D [*]	Original D connector with two-piece insulators	Original D	Two-piece, Nylon	Solder Pot	12-13
ACCESSORIES					23-24
GENERAL RATINGS AND SPECIFICATIONS					11
HOW TO ORDER AND STANDARD DIMENSIONS					10
INSTALLATION INSTRUCTIONS					21-22
DURA-CON MICRO MINIATURE STRIP AND RECTANGULAR CONNECTORS ON .050 CENTERS					26-28

[†]Manufactured under license agreement with ITT Cannon Electric Inc.

TRW/CINCH CONNECTORS, AN ELECTRONIC COMPONENTS DIV. OF TRW INC. / 1501 MORSE AVE. / ELK GROVE VILLAGE, ILL. 60007

TRW[®] CINCH CONNECTORS

BURGUN-D MARK IV CONNECTORS



The TRW/Cinch Burgun-D subminiature connector is designed for commercial applications where space, weight, and economy are important considerations.

It is especially suited to plug-in module, cable to panel and cable to cable installations, in computers and peripherals, test equipment, communications equipment and a wide range of other applications.

The Burgun-D (Mark IV) Series utilizes rear-release crimp snap-in contacts, that are readily inserted and removed by means of a simple, expendable insertion/extraction tool.

It offers these important features:

- Mates with existing original D and Mark I, Mark II and Mark III connectors.
- Operates at temperatures to 250°F (120°C).
- Size 20 contacts accommodate wire size #18 through #30 AWG stranded wire. (Screw machine only.)
- Closed-entry sockets automatically corrects misaligned pins.
- Rated at 5 amperes for #20 wire.
- Available in 9, 15, 25, 37, and 50 contact arrangements.
- Variety of contacts for hand and machine assembly and PC board insertion.

A COMPLETE LINE OF HARDWARE and accessories including junction shells, hoods, dust caps and lock assemblies is available and listed in TRW/Cinch Catalogs CD-12, and C-46.

FOR IMMEDIATE DELIVERY from stock, contact your TRW/Cinch D-subminiature industrial distributor.

CONDENSED DATA

STANDARD MATERIALS & FINISHES

Shell: Steel, yellow chromate over cadmium plate.

Insulator: Glass-filled burgundy nylon (per Fed. Spec. L-P-395B).

Contacts:

Machined — Copper alloy.

Stamped — Cadmium copper.

Contact Plating:

Selective Stamped — 30 microinches of gold (min.) over 50 microinches of nickel (min.) at contacting area, with gold flash overall.

Overall Stamped — 20 microinches of gold (min.) over 60 microinches of nickel (min.).

Machined — 30 microinches of gold over nickel.

Rivets and Washers: Stainless steel.
(float mounting)

MECHANICAL FEATURES

Coupling: Friction and lock accessories.

Polarization: Keystone-shaped shells.

Contact Type: Crimp snap-in.

ELECTRICAL DATA

Contact Termination: Crimp.

Wire Size:

Size 20 contacts — #20, #22, and #24 AWG stranded wire.

Size 20-18 contacts — one #18 or two #22 AWG stranded wires.

Current Rating: Size 20 contacts — 5 amps.

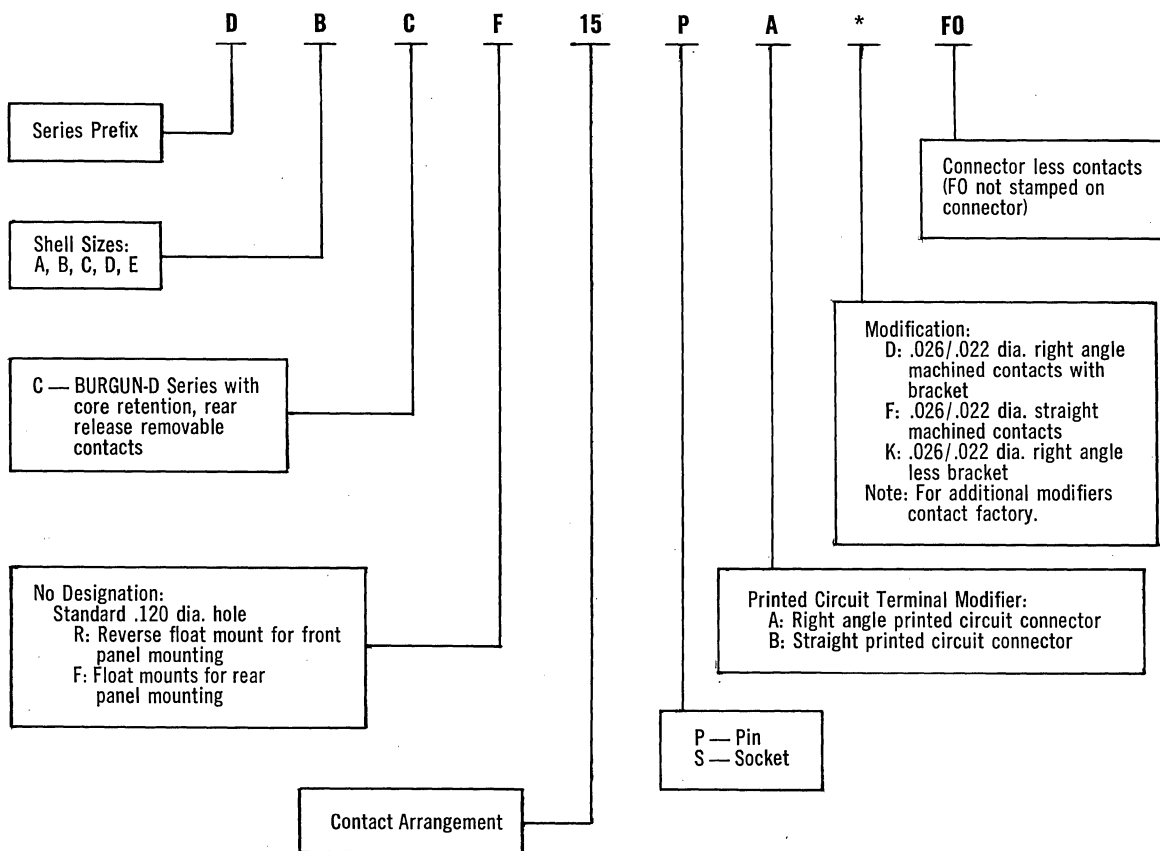
VOLTAGE RATING

	Sea Level	20,000 ft.	70,000 ft.	120,000 ft.
Average Flashover:	1500V AC	1000V AC	500V AC	255V AC
Test:	1000V AC	650V AC	325V AC	175V AC

Voltage Drop: Size 20 contacts — 2.67 millivolts max. per amp when tested in accordance with MIL-STD-202, Method 307.

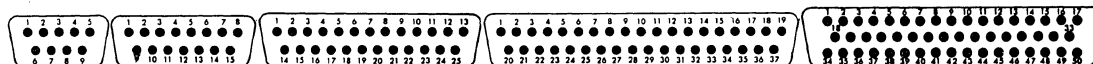
TRW[®] CINCH CONNECTORS

HOW TO ORDER BURGUN-D CONNECTORS



BASIC CONTACT ARRANGEMENTS

#20 CONTACTS ONLY



Shell Size	E	A	B	C	D
No. of Contacts	9	15	25	37	50
Contact Size	#20	#20	#20	#20	#20

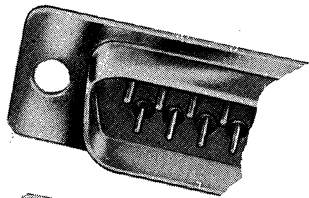
PART NUMBERS

CONNECTORS WITH STD. .120 MOUNTING HOLE

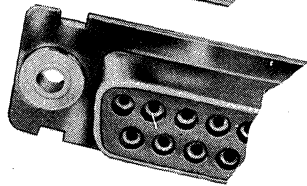
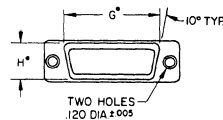
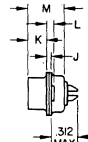
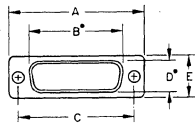
CONNECTORS WITH FLOAT MOUNTS

With Loose Machine Contacts		Less Contacts		With Loose Machine Contacts		Less Contacts	
Description Part No.	Factory Part No.	Description Part No.	Factory Part No.	Description Part No.	Factory Part No.	Description Part No.	Factory Part No.
DEC-9P	234-09-11-102	DEC-9PFO	234-09-11-100	DECF-9P	234-09-11-107	DECF-9PFO	234-09-11-106
DEC-9S	233-09-11-102	DEC-9SFO	233-09-11-100	DECF-9S	233-09-11-107	DECF-9SFO	233-09-11-106
DAC-15P	234-15-11-102	DAC-15PFO	234-15-11-100	DACF-15P	234-15-11-107	DACF-15PFO	234-15-11-106
DAC-15S	233-15-11-102	DAC-15SFO	233-15-11-100	DACF-15S	233-15-11-107	DACF-15SFO	233-15-11-106
DBC-25P	234-25-11-102	DBC-25PFO	234-25-11-100	DBCF-25P	234-25-11-107	DBCF-25PFO	234-25-11-106
DBC-25S	233-25-11-102	DBC-25SFO	233-25-11-100	DBCF-25S	233-25-11-107	DBCF-25SFO	233-25-11-106
DCC-37P	234-37-11-102	DCC-37PFO	234-37-11-100	DCCF-37P	234-37-11-107	DCCF-37PFO	234-37-11-106
DCC-37S	233-37-11-102	DCC-37SFO	233-37-11-100	DCCF-37S	233-37-11-107	DCCF-37SFO	233-37-11-106
DDC-50P	234-50-11-102	DDC-50PFO	234-50-11-100	DDCF-50P	234-50-11-107	DDCF-50PFO	234-50-11-106
DDC-50S	233-50-11-102	DDC-50SFO	233-50-11-100	DDCF-50S	233-50-11-107	DDCF-50SFO	233-50-11-106

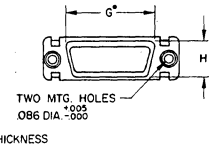
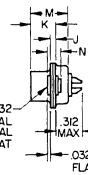
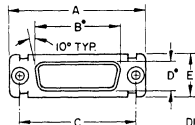
TRW[®] CINCH CONNECTORS



STANDARD SHELL



SHELL WITH FLOAT MOUNTS

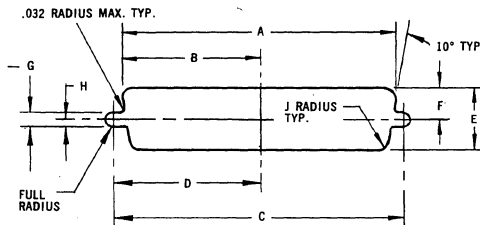


It is recommended that only one assembly, either pin or socket, be float mounted. For front panel mounting use reverse float mount.

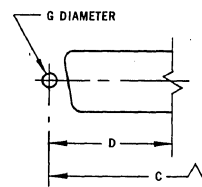
Description Part No.	A ±.015(0.38)	B* ±.010(0.25)	C ±.005(0.13)	D* ±.010(0.25)	E ±.015(0.38)	G* ±.010(0.25)
DEC-9P	1.213(30.81)	.697(17.70)	.984(24.99)	.360(9.14)	.494(12.55)	.759(19.28)
DEC-9S	1.213(30.81)	.640(16.26)	.984(24.99)	.308(7.82)	.494(12.55)	.759(19.28)
DAC-15P	1.541(39.14)	1.025(26.04)	1.312(33.32)	.360(9.14)	.494(12.55)	1.083(27.51)
DAC-15S	1.541(39.14)	.968(24.59)	1.312(33.32)	.308(7.82)	.494(12.55)	1.083(27.51)
DBC-25P	2.088(53.04)	1.583(40.21)	1.852(47.04)	.378(9.60)	.494(12.55)	1.625(41.27)
DBC-25S	2.088(53.04)	1.508(38.30)	1.852(47.04)	.308(7.82)	.494(12.55)	1.625(41.27)
DCC-37P	2.729(69.32)	2.231(56.67)	2.500(63.50)	.378(9.60)	.494(12.55)	2.272(57.71)
DCC-37S	2.729(69.32)	2.156(54.76)	2.500(63.50)	.308(7.82)	.494(12.55)	2.272(57.71)
DDC-50P	2.635(66.93)	2.127(54.03)	2.406(61.11)	.484(12.29)	.605(15.37)	2.178(55.32)
DDC-50S	2.635(66.93)	2.062(52.34)	2.406(61.11)	.420(10.67)	.605(15.37)	2.178(55.32)

Description Number	H* ±.010(0.25)	J ±.010(0.25)	K ±.010(0.25)	L ±.010(0.25)	M ±.010(0.25)	N ±.010(0.25)	X Max.
DEC-9P	.422(10.72)	.030(0.76)	.236(5.99)	.045(1.14)	.422(10.72)	.120(3.05)	.375(9.52)
DEC-9S	.422(10.72)	.030(0.76)	.243(6.17)	.045(1.14)	.429(10.92)	.120(3.05)	.375(9.52)
DAC-15P	.422(10.72)	.030(0.76)	.236(5.99)	.045(1.14)	.422(10.72)	.120(3.05)	.375(9.52)
DAC-15S	.422(10.72)	.030(0.76)	.243(6.17)	.045(1.14)	.429(10.92)	.120(3.05)	.375(9.52)
DBC-25P	.422(10.72)	.039(0.99)	.231(5.87)	.060(1.52)	.426(10.82)	.129(3.28)	.375(9.52)
DBC-25S	.422(10.72)	.030(0.76)	.243(6.17)	.045(1.14)	.429(10.92)	.120(3.05)	.375(9.52)
DCC-37P	.422(10.72)	.039(0.99)	.231(5.87)	.060(1.52)	.426(10.82)	.129(3.28)	.375(9.52)
DCC-37S	.422(10.72)	.030(0.76)	.243(6.17)	.045(1.14)	.429(10.92)	.120(3.05)	.375(9.52)
DDC-50P	.422(10.72)	.039(0.99)	.231(5.87)	.060(1.52)	.426(10.82)	.129(3.28)	.375(9.52)
DDC-50S	.534(13.56)	.030(0.76)	.243(6.17)	.045(1.14)	.429(10.92)	.120(3.05)	.375(9.52)

*Dimensions B, D, G, and H are measured as outside dimensions at the bottom of draw. For shell with float mounts, add letter F after C, e.g., DECF-9P. (Bracketed figures centimeters)



Standard Cutout

Optional Cutout
(For rear mounting)

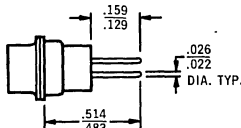
Plug	Mounting Method	A ±.005(0.13)	B ±.005(0.13)	C ±.005(0.13)	D ±.005(0.13)	E ±.005(0.13)	F ±.005(0.13)	G ±.002(0.05)	H ±.002(0.05)	J ±.005(0.13)
DA	Front Mtg.	1.202(30.53)	.601(15.26)	1.312(33.32)	.656(16.66)	.513(13.03)	.257(6.53)	.120(3.05)	.060(1.52)	.083(2.11)
DAC	Rear Mtg.	1.134(28.80)	.567(14.40)	1.312(33.32)	.656(16.66)	.449(11.40)	.225(5.72)	.120(3.05)	.060(1.52)	.132(3.35)
DAF	Front Mtg.	1.234(31.34)	.617(15.67)	1.312(33.32)	.656(16.66)	.545(13.84)	.273(6.93)	.088(2.24)	.044(1.12)	.083(2.11)
DACF	Rear Mtg.	1.166(29.62)	.583(14.81)	1.312(33.32)	.656(16.66)	.481(12.22)	.241(6.12)	.088(2.24)	.044(1.12)	.132(3.35)
DB	Front Mtg.	1.743(44.27)	.872(22.15)	1.852(38.61)	.926(23.52)	.513(13.03)	.257(6.53)	.120(3.05)	.060(1.52)	.083(2.11)
DBC	Rear Mtg.	1.674(42.52)	.837(21.26)	1.852(38.61)	.926(23.52)	.449(11.40)	.225(5.72)	.120(3.05)	.060(1.52)	.132(3.35)
DBF	Front Mtg.	1.775(45.08)	.888(22.26)	1.852(38.61)	.926(23.52)	.545(13.84)	.273(6.93)	.088(2.24)	.044(1.12)	.083(2.11)
DBCF	Rear Mtg.	1.706(43.33)	.853(21.67)	1.852(38.61)	.926(23.52)	.481(12.22)	.241(6.12)	.088(2.24)	.044(1.12)	.132(3.35)
DC	Front Mtg.	2.391(60.73)	1.196(30.38)	2.500(63.50)	1.250(38.10)	.513(13.03)	.257(6.53)	.120(3.05)	.060(1.52)	.083(2.11)
DCC	Rear Mtg.	2.326(59.08)	1.163(29.54)	2.500(63.50)	1.250(38.10)	.449(11.40)	.225(5.72)	.120(3.05)	.060(1.52)	.132(3.35)
DCF	Front Mtg.	2.423(61.54)	1.212(30.78)	2.500(63.50)	1.250(38.10)	.545(13.84)	.273(6.93)	.088(2.24)	.044(1.12)	.083(2.11)
DCCF	Rear Mtg.	2.354(59.79)	1.177(29.90)	2.500(63.50)	1.250(38.10)	.481(12.22)	.241(6.12)	.088(2.24)	.044(1.12)	.132(3.35)
DD	Front Mtg.	2.297(58.34)	1.149(29.18)	2.406(61.11)	1.203(30.56)	.623(15.82)	.312(7.92)	.120(3.05)	.060(1.52)	.083(2.11)
DDC	Rear Mtg.	2.218(56.34)	1.109(28.17)	2.406(61.11)	1.203(30.56)	.555(14.10)	.278(7.06)	.120(3.05)	.060(1.52)	.132(3.35)
DDF	Front Mtg.	2.329(59.16)	1.165(29.59)	2.406(61.11)	1.203(30.56)	.655(16.64)	.328(8.33)	.088(2.24)	.044(1.12)	.083(2.11)
DDCF	Rear Mtg.	2.250(57.15)	1.125(28.57)	2.406(61.11)	1.203(30.56)	.587(14.91)	.294(7.47)	.088(2.24)	.044(1.12)	.132(3.35)
DE	Front Mtg.	.874(22.20)	.437(11.10)	.984(24.99)	.492(12.50)	.513(13.03)	.257(6.53)	.120(3.05)	.060(1.52)	.083(2.11)
DEC	Rear Mtg.	.806(20.47)	.403(10.24)	.984(24.99)	.492(12.50)	.449(11.40)	.225(5.72)	.120(3.05)	.060(1.52)	.132(3.35)
DEF	Front Mtg.	.906(23.01)	.453(11.51)	.984(24.99)	.492(12.50)	.545(13.84)	.273(6.93)	.088(2.24)	.044(1.12)	.083(2.11)
DECF	Rear Mtg.	.838(21.29)	.419(10.41)	.984(24.99)	.492(12.50)	.481(12.22)	.241(6.12)	.088(2.24)	.044(1.12)	.132(3.35)

(Bracketed figures centimeters)

TRW[®] CINCH CONNECTORS

PRINTED CIRCUIT CONNECTORS

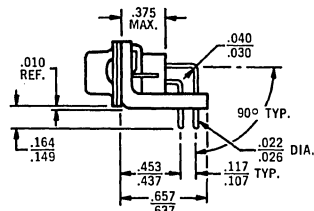
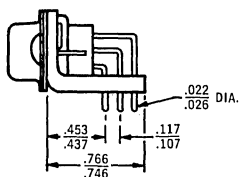
STRAIGHT PRINTED CIRCUIT CONTACT CONNECTORS



Supplied as complete assemblies with gold plated machined contacts.

Description Part No.	Part No.
DEC-9PBF	234-9-11-104
DEC-9SBF	233-9-11-104
DAC-15PBF	234-15-11-104
DAC-15SBF	233-15-11-104
DBC-25PBF	234-25-11-104
DBC-25SBF	233-25-11-104
DCC-37PBF	234-37-11-104
DCC-37SBF	233-37-11-104
DDC-50PBF	234-50-11-104
DDC-50SBF	233-50-11-104

RIGHT ANGLE CONNECTORS



With Assembled Contacts

With Molded Bracket		Less Bracket	
Description Part No.	Factory Part No.	Description Part No.	Factory Part No.
DEC-9SAD	233-09-11-101	DEC-9SAK	233-09-11-105
DEC-9PAD	234-09-11-101	DEC-9PAK	234-09-11-105
DAC-15SAD	233-15-11-101	DAC-15SAK	233-15-11-105
DAC-15PAD	234-15-11-101	DAC-15PAK	234-15-11-105
DBC-25SAD	233-25-11-101	DBC-25SAK	233-25-11-105
DBC-25PAD	234-25-11-101	DBC-25PAK	234-25-11-105
DCC-37SAD	233-37-11-101	DCC-37SAK	233-37-11-105
DCC-37PAD	234-37-11-101	DCC-37PAK	234-37-11-105
DDC-50SAD	233-50-11-101	DDC-50SAK	233-50-11-105
DDC-50PAD	234-50-11-101	DDC-50PAK	234-50-11-105

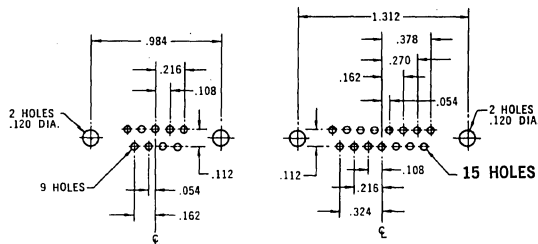
METRIC EQUIVALENTS FOR PC BOARD CONNECTOR LAYOUTS

Inches	MM's	Inches	MM's
.039	0.99	.435	11.09
.054	1.37	.489	12.42
.055	1.40	.544	13.82
.108	2.74	.598	15.19
.109	2.77	.652	16.56
.112	2.84	.707	17.96
.120	3.05	.761	19.33
.162	4.11	.815	20.70
.163	4.14	.870	22.10
.216	5.49	.924	23.47
.218	5.54	.978	24.84
.224	5.69	.984	24.99
.272	6.91	1.312	33.32
.324	8.23	1.852	47.04
.326	8.28	2.406	61.11
.381	9.68	2.500	63.50

LEAD HOLE SIZE

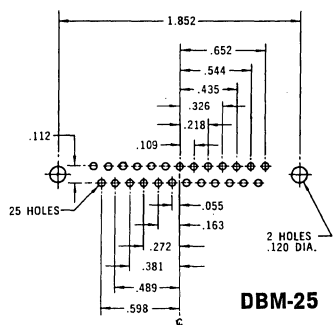
Terminal Dia.	Hole Dia.
.040	.055
.030	.045
.024	.039

BOARD LAYOUTS

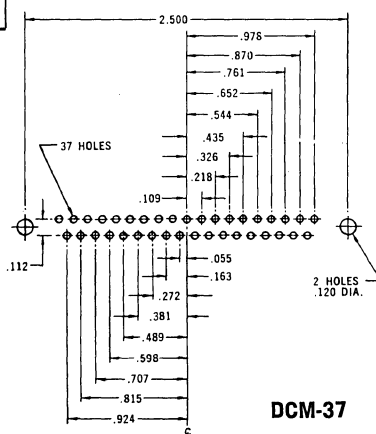


DEM-9

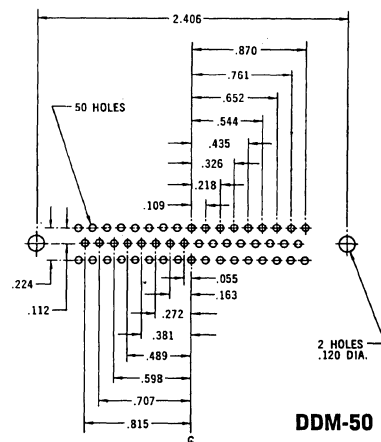
DAM-15



DBM-25



DCM-37



DDM-50

TRW[®] CINCH CONNECTORS

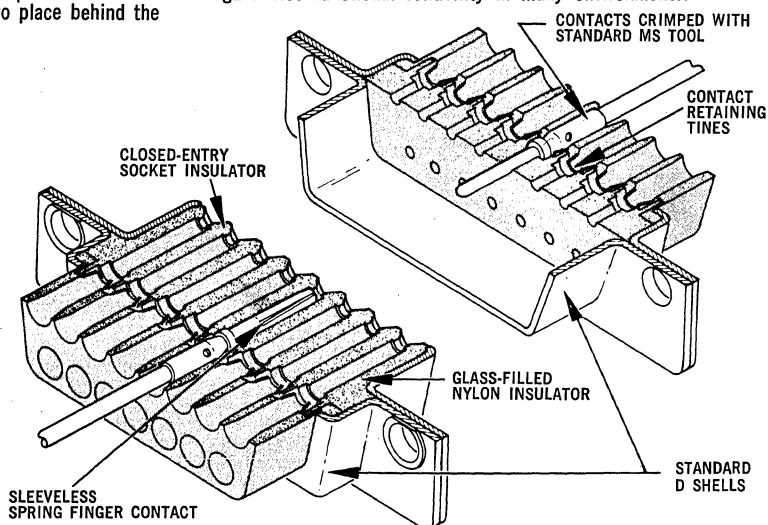
REAR RELEASE CONTACT RETENTION SYSTEM

The BURGUND connector features a rear insulator with integral, molded contact retaining tines. These plastic tines permit the insertion and extraction of contacts from the rear of the connector with a simple, expendable plastic insertion/extraction tool. During contact insertion, the retaining tines expand as the contact passes thru. These rugged tines snap into place behind the

contact shoulder when the contact is fully inserted. The tool is inserted to expand the tines, allowing easy extraction of the wired contact.

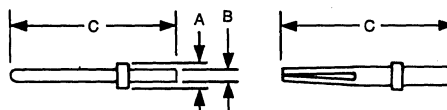
The retention system and the integral contact retaining tines guarantee functional reliability in many environments.

- Mates with existing D types.
- Operates in temperatures to +250°F.
- Crimp snap-in contacts.
- Highly reliable socket contacts.
- Insertion/extraction with expendable tool.
- Corrects misaligned contacts.



MACHINED CONTACTS

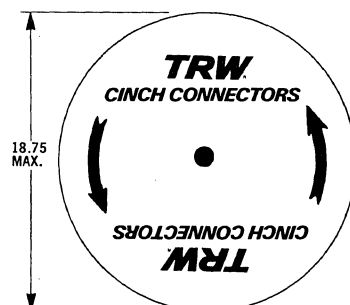
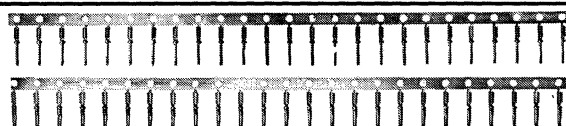
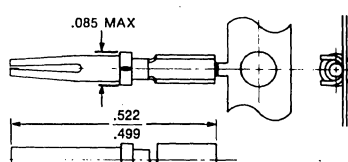
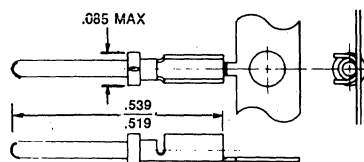
Machined contacts are supplied loose for use with hand crimp tools or in vibration hopper feeder crimp machines. A vibrator-fed, semi-automatic tool, 599-11-11-225 is available. These contacts are supplied in three wire cup sizes.



Description	Part No.	Cannon Reference	Wire Accommodation	±.002(.051)	±.002(.051)	C Max.
Pin 20	403-30-15-130-410	030-1952-000	#20, 22, 24	.067(1.70)	.042(1.07)	.537(13.64)
Pin 20-18	403-30-99-129-410	030-1954-000	#18 or 2-#22	.086(2.18)	.066(1.68)	.874(22.20)
Pin 20-26	403-30-99-126-410	030-1952-002	#26, 28, 30	.067(1.70)	.025(0.64)	.537(13.64)
Socket 20	414-30-14-227-410	030-1953-000	#20, 22, 24	.067(1.70)	.042(1.07)	.523(13.28)
Socket 20-18	414-30-99-236-410	030-1955-000	#18 or 2-#22	.086(2.18)	.062(1.68)	.852(21.64)
Socket 20-26	414-30-99-233-410	030-1953-002	#26, 28, 30	.067(1.70)	.025(0.64)	.523(13.28)

STAMPED CONTACTS

Stamped contacts are supplied loose for use with hand crimp tools, or on reels for use with the semiautomatic machines, selectively gold plated or with gold plate overall. These contacts will accommodate wire sizes #20 through #28 AWG by adjusting or changing the crimp die set. (For other wire sizes consult factory.)



LOOSE CONTACTS

Type	Plating	Part No.	Cannon Reference
Pin	Selective	402-30-11-135	030-1960-005
Pin	Overall	402-30-11-137	030-1960-001
Socket	Selective	412-30-14-355	030-1957-005
Socket	Overall	412-30-14-361	030-1957-001

RIGHT HAND FEED CONTACTS ON REELS

Type (RH)	Plating	Part No.	Cannon Reference
Pin	Selective	402-30-11-134	—
Pin	Overall	402-30-11-136	—
Socket	Selective	412-30-14-354	—
Socket	Overall	412-30-14-360	—

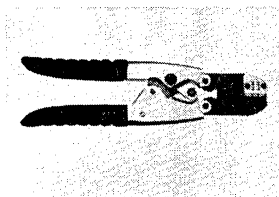
LEFT HAND FEED CONTACTS ON REELS

Type (LH)	Plating	Part No.	Cannon Reference
Pin	Selective	402-30-11-138	D110238-034
Pin	Overall	402-30-11-139	D110238-004
Socket	Selective	412-30-14-362	D110238-035
Socket	Overall	412-30-14-363	D110238-005

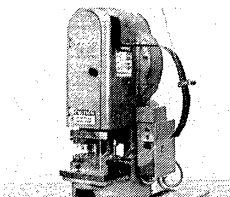
TRW[®] CINCH CONNECTORS

ASSEMBLY INSTRUCTIONS

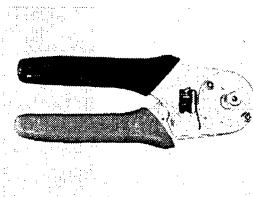
CRIMP & ASSEMBLY TOOLS



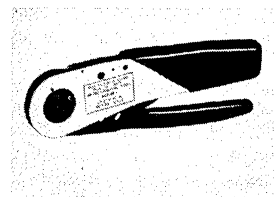
599-11-11-189



599-11-11-186



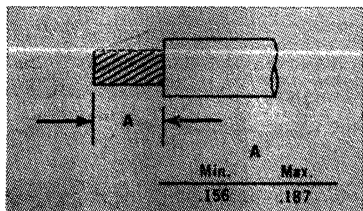
DAVO-320D



M22520/2-01

Contact	Wire Accom.	Hand Crimp Tool	Semi-Automatic Tool	Extraction	Insertion
20 (Machined)	24, 22, 20	M22520/1-01 with Locator TH185	599-11-11-225 (Vibra-feed) CBT-460	599-11-11-176 (Colored Tip)	599-11-11-176 (White Tip)
		M22520/2-01 with Locator L22520-HDL			
		Davo 320D			
20-18 (Machined)	1 #18 or 2 #22	M22520/1-01 with Locator TH185	None	599-11-11-176 (Colored Tip)	599-11-11-176 (White Tip)
20-26 (Machined)	30, 28, 26	M22520/2-01 with Locator L22520/HDL	599-11-11-225 (Vibra-feed) CBT-460	599-11-11-176 (Colored Tip)	599-11-11-176 (White Tip)
20 (Stamped)	22, 20	599-11-11-189	ABT-500 599-11-11-186	599-11-11-176 (Colored Tip)	599-11-11-176 (White Tip)
	28, 26, 24	599-11-11-189	ABT-500 599-11-11-186	599-11-11-176 (Colored Tip)	599-11-11-176 (White Tip)

ASSEMBLY



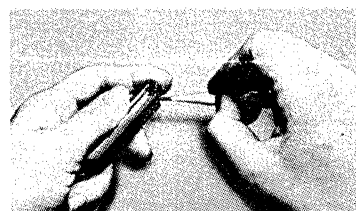
WIRE STRIPPING

1. Cut wires to length. Strip insulation per above illustration. Check for broken or frayed wires.



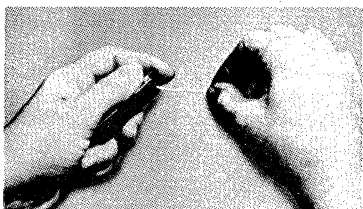
CONTACT CRIMPING

2. Insert contact and wire into proper crimp tool (and locator, if required). Crimp contact to wire. Inspect crimp.

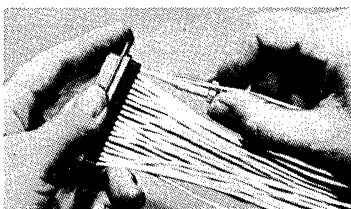


CONTACT INSERTION

3. Center wired contact in groove of insertion tool, with tool tip butting contact shoulder. Insert contact into cavity until a positive stop is felt. Inspect insertion.

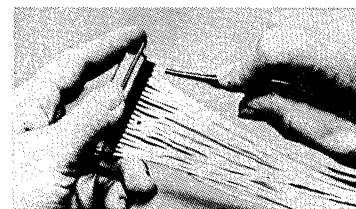


4. To be sure contact is locked securely, pull back lightly on wire. Repeat for balance of contacts, working row by row across the insulator.



CONTACT EXTRACTION

5. Place wire into extraction tool tip.

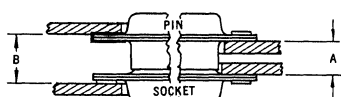


6. Insert tool tip into contact cavity and rotate slowly. When slot in tool aligns with contact crimp, push tool until tip bottoms against contact shoulder. Hold wire against tool with finger and remove tool and contact. Repeat for balance of contacts.

TRW[®] CINCH CONNECTORS

PANEL MOUNTING

PIN FRONT MOUNTING



PIN REAR MOUNTING

PIN REAR MOUNTING

PIN FRONT MOUNTING

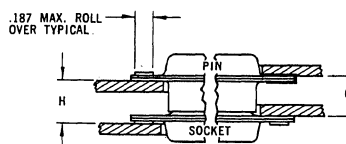
SOCKET
FRONT MOUNTINGSOCKET
REAR MOUNTING

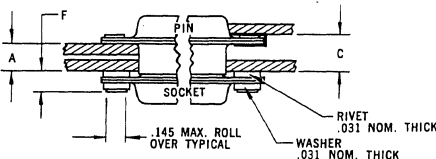
FIGURE 1A

SOCKET
FRONT MOUNTINGSOCKET
REAR MOUNTING

FIGURE 1B

PIN REAR MOUNTING

PIN FRONT MOUNTING



PIN REAR MOUNTING

PIN FRONT MOUNTING

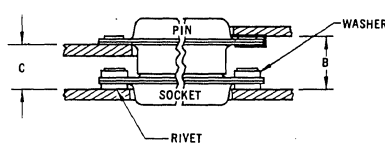
SOCKET
FLOAT MOUNTINGSOCKET
FLOAT MOUNTING

FIGURE 2

SOCKET REVERSE
FLOAT MOUNTINGSOCKET REVERSE
FLOAT MOUNTING

FIGURE 3

Fig. No.	COMBINATION OF MATED CONNECTORS			A +.030(0.76) -.000	B +.030(0.76) -.000	C +.030(0.76) -.000	E		F ±.010(0.25)	H +.030(0.76) -.000
	Size	Pin*	Socket				Pin ±.010(0.25)	SKT. ±.010(0.25)		
1	A, E	Std.	Std.	.250(6.35)	.340(8.64)	.295(7.49)	.045(1.14)	.045(1.14)	—	.295(7.49)
1	B, C, D	Std.	Std.	.238(6.04)	.343(8.71)	.298(7.57)	.060(1.52)	.045(1.14)	—	.283(7.19)
2	A, E	Std.	Float Mount	.218(5.53)	—	.263(6.68)	.045(1.14)	—	.120(3.05)	—
2	B, C, D	Std.	Float Mount	.206(5.23)	—	.266(6.76)	.060(1.52)	—	.120(3.05)	—
2	A, E	Float Mount	Std.	.218(5.54)	—	.263(6.68)	—	.045(1.14)	.120(3.05)	—
2	B, C, D	Float Mount	Std.	.206(5.23)	—	.251(6.38)	—	.045(1.14)	.130(3.30)	—
3	A, E	Std.	Rev. Float Mount	—	.358(9.09)	.313(7.95)	.045(1.14)	—	.120(3.05)	—
3	B, C, D	Std.	Rev. Float Mount	—	.361(9.17)	.301(7.65)	.060(1.52)	—	.120(3.05)	—
3	A, E	Rev. Float Mount	Std.	—	.358(9.09)	.313(7.95)	—	.045(1.14)	.120(3.05)	—
3	B, C, D	Rev. Float Mount	Std.	—	.355(9.02)	.310(7.87)	—	.045(1.14)	.130(3.30)	—

*NOTE: Standard pin assemblies contain .015" (0.38mm) thick front shells on E and A sizes; .024" (0.61mm) thick front shells on B, C, and D sizes. (Bracketed figures centimeters)

TRW/CINCH DIVISIONS DISTRICT SALES OFFICES & REPRESENTATIVES

ALABAMA
Huntsville, 35806
Huntsville-Madison Cty.
Jet Port

P.O. Box 6045
Phone: (205) 772-9656
TWX: 810-726-2190

ARIZONA
Scottsdale, 85251
2939 N. 67th Pl., Suite H
Phone: (602) 994-0441
TWX: 910-950-1181

CALIFORNIA
Cerritos, 90701
17150 Norwalk Blvd.
Suite 110
Phone: (213) 924-5711
TWX: 910-583-4802
Mountain View, 94040
2680 Bayshore Frontage Rd.
Phone: (415) 969-2252
TWX: 910-379-6482

COLORADO
Denver, 80221
Straube Associates
Mt. States, Inc.
7100 Broadway, Bldg. 10
Phone: (303) 426-0890
TWX: 910-938-0390

CONNECTICUT
Orange, 06477
Comtronics Associates
477 Boston Post Rd. #23
Box 779
Phone: (203) 795-3515

Rowayton, 06853
137 Rowayton Ave.
Phone: (203) 853-4466
TWX: 710-468-3058

FLORIDA
Orlando, 32809
6220 So. Orange Blossom Tr.
Suite 151, Bldg. 1
Phone: (305) 857-3650
TWX: 810-850-4113

Fort Lauderdale, 33319
6636 N.S. 57th St., Suite 101
Phone: (305) 721-1700
TWX: 510-956-9724

ILLINOIS
Rosemont, 60018
10400 W. Higgins Rd., Rm. 308
Phone: (312) 298-1340
TWX: 910-222-1796

INDIANA
Indianapolis, 46205
2511 E. 46th St. J-1
Phone: (317) 547-9411
TWX: 810-341-3301

MASSACHUSETTS
Reading, 01857
100 Main St.
Phone: (617) 944-3020
TWX: 710-393-6565

MICHIGAN
Southfield, 48075
21311 Civic Center Dr.
Phone: (313) 357-3700
TWX: 810-221-7096

MINNESOTA
Minneapolis, 55435
7400 Metro Blvd., Suite 360
Phone: (612) 835-5454
TWX: 910-576-2721

MISSOURI
St. Louis, 63105
8000 Bonhomme
Phone: (314) 727-7370
TWX: 910-216-2142

NEW JERSEY
Clifton, 07015
404 Clifton Ave.
Phone: (201) 546-0990

NEW MEXICO
Albuquerque, 87110
Straube Associates
Mt. States, Inc.
9910 Indian School Rd., N.E.
Suite 203
Phone: (505) 292-0295
TWX: 910-989-1169

NEW YORK
Rochester, 14623
130 Metro Park, Suite 10
Phone: (716) 461-3070
TWX: 510-253-1594

NORTH CAROLINA
Charlotte, 28210
One Woodlawn Green
Suite 236
Phone: (704) 376-6811
TWX: 810-621-0457

OHIO
Dayton, 45409
1250 W. Dorothy Lane
Phone: (513) 298-9862
TWX: 810-459-1631

PENNSYLVANIA
Spring House, 19477
Stephano Bldg.
Bethlehem Pike & Sheble Le.
Phone: (215) 542-9470
TWX: 510-661-1151

TEXAS
Dallas, 75247
13740 Midway Rd., Suite 501
Phone: (214) 387-3030
TWX: 910-860-5009
Houston, 77036
6420 Hilcroft, Suite 310
Phone: (713) 772-5541
TWX: 910-881-2698

UTAH
Salt Lake City, 84121
Straube Associates
Mt. States, Inc.
P.O. Box 9248
Phone: (801) 328-4513
TWX: 910-925-5607

WASHINGTON
Seattle, 98103
Don Smith Sales Office
711 N. Northlake Way
P.O. Box 1520
Phone: (206) 633-3160
TWX: 910-444-2005

INTERNATIONAL OFFICES

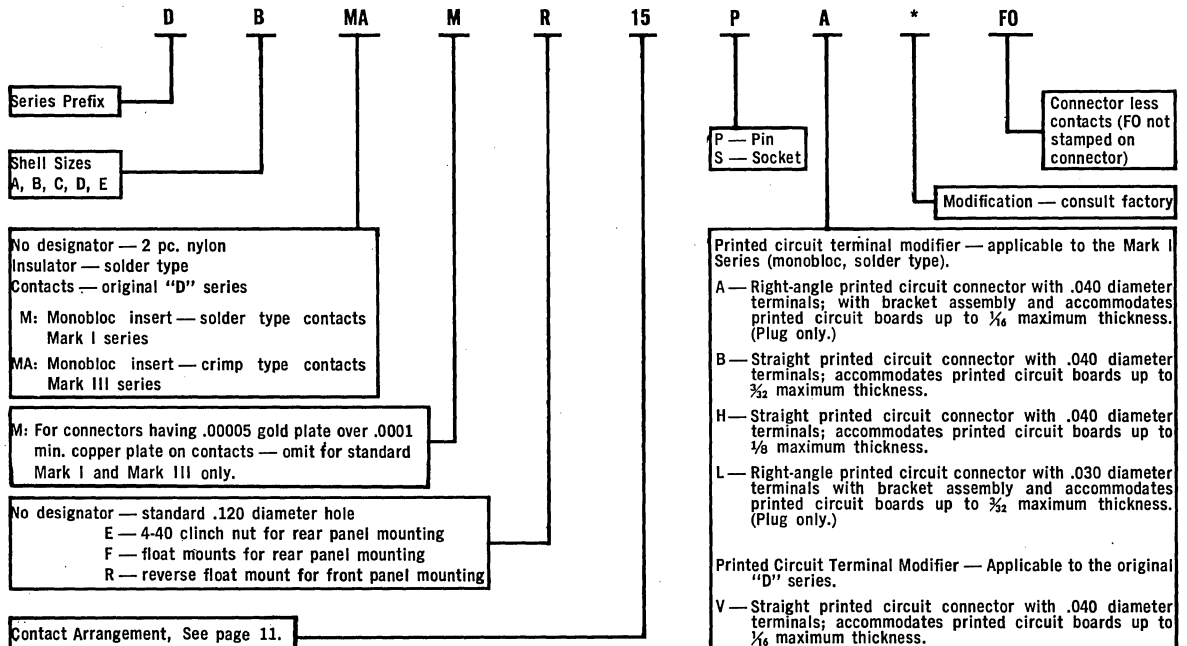
CANADA
Weber Electronics Inc.
1111 Finch Ave. West
Suite 104
Downsview, Ontario M3J 2E5
Phone: (416) 638-1322
TWX: 610-492-1337

FRANCE
REA
Radio Equipements Antares S.A.
9, Rue Ernest Cognacq
92 Levallois Perret
Phone: 737-5480, 270-01-70
TWX: 62630 F

PUERTO RICO
San Juan, 00936
Morris Saliss
G.P.O. Box 2307
Phone: (809) 764-1842
(809) 766-6248
TWX: 345-0328

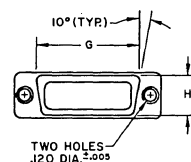
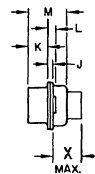
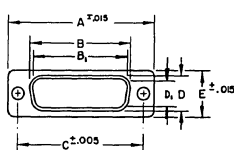
TRW[®] CINCH CONNECTORS

HOW TO ORDER — TYPES D*MA, D*M & D CONNECTORS

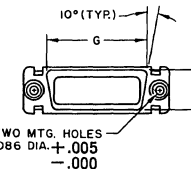
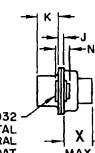
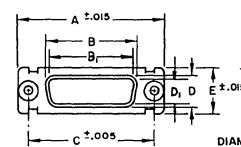


STANDARD DIMENSIONS

STANDARD SHELL



SHELL WITH FLOAT MOUNTS



	Dim. X
Original "D"	.312
Mark I	.390
Mark III	.375

Shell Size	Connector Type	A ±.015	B ±.005	B ₁ ±.005	C ±.005	D ±.005	D ₁ ±.005	E ±.015	G ±.010	H ±.010	J ±.010	K ±.005	L ±.010	M ±.010	N ±.010
E	9P	1.213		.666	.984		.329	.494	.759	.422	.030	.235	.045	.422	.120
	9S	1.213	.643		.984	.311		.494	.759	.422	.030	.243	.045	.429	.120
A	15P	1.541		.994	1.312		.329	.494	1.083	.422	.030	.235	.045	.422	.120
	15S	1.541	.971		1.312	.311		.494	1.083	.422	.030	.243	.045	.429	.120
B	25P	2.088		1.534	1.852		.329	.494	1.625	.422	.039	.230	.060	.426	.129
	25S	2.088	1.511		1.852	.311		.494	1.625	.422	.030	.243	.045	.429	.120
C	37P	2.729		2.182	2.500		.329	.494	2.272	.422	.039	.230	.060	.426	.129
	37S	2.729	2.159		2.500	.311		.494	2.272	.422	.030	.243	.045	.429	.120
D	50P	2.635		2.079	2.406		.436	.605	2.178	.534	.039	.230	.060	.426	.129
	50S	2.635	2.064		2.406	.423		.605	2.178	.534	.030	.243	.045	.429	.120

B and D dimensions are the outside dimensions (for socket side).

B₁ and D₁ dimensions are the inside dimensions (for pin side).

TRW[®] CINCH CONNECTORS

GENERAL RATINGS AND SPECIFICATIONS

VOLTAGE RATINGS

All voltage figures are AC (rms), 60 cps. measured at approximately 77°F., 50% RH.

Connectors with Basic Arrangements

AWG #20 wire contacts only

All voltages are measured from contact to contact, and contact to shell, in unmated condition.

Connector Type		Sea Level	Altitude (feet)		
			20,000	50,000	70,000
D*MA	Average Flashover	1500	1000	500	500
	Test	1000	650	325	325
D*M	Average Flashover	1700	1000	650	500
	Test	1250	750	475	375

Connectors with Combination Arrangements

AWG #20 wire contacts with coaxial, high power, and/or high voltage contacts

All voltages are for plugs and receptacles in both mated and unmated conditions.

Altitude (feet)		Sea Level		20,000		Sea Level		20,000	
Type or Contact		90°	Straight	90°	Straight	90°	Straight	90°	Straight
Center Conductor to Coaxial Shell	Average Flashover	1200	1500	900	1000	600	700	400	500
	Test	800	1000	600	650	400	475	275	325
High Power Contact and/or Coaxial Shell to Plug Shell	Average Flashover	1500	1500	1000	1000	500	500	500	500
	Test	1000	1000	650	650	325	325	325	325
Coaxial Shell to Nearest Standard Solder Pot Contact	Average Flashover	•	1500	•	1500	•	900	•	650
	Test	•	1000	•	1000	•	600	•	425
HV Contact to Nearest #20 Contact or to Shell	Average Flashover	3800	3800	2300	2300	500	900	650	650
	Test	2800	2800	1700	1700	675	675	475	475

• Not applicable due to variable rotation.

CURRENT RATINGS

Cinch vs. Military.

The Cinch rating for #20 contacts is 5 amps, which means 5 amps for all contacts simultaneously. MIL-W-5088 rates #20 contacts at 7.5 amps maximum. The explanation is as follows:

MIL-W-5088B, Paragraph 3-9-2-1-2 specifies:
"Table I current ratings for cables in bundles are based upon 15 or more cables carrying no more than 20% of the total carrying capacity of the bundle."

Table I specifies a current rating of 7.5 amps maximum for single wires in bundles of 15 or more wires. NOTE: Wires and contacts are both considered to be in the category of conductors.

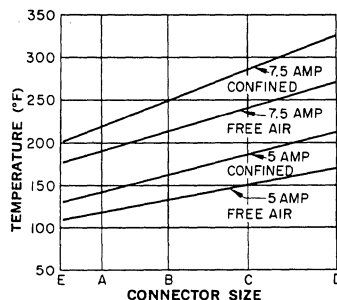
Explanation

If 15 wires (normally rated at 7.5 amps per wire maximum, or at a total bundle current of 112.5 amps) are not to carry more than 20% of the total 112.5 amps, the average current rating per wire is 20% of 112.5 amps (total bundle capacity) divided by 15 (number of wires).

Conclusion

The Military rating of #20 contacts or wires is 1.5 amps average (based on 15 wires per bundle or 15 contacts per connector) vs. a Cinch rating of 5 amps.

Average Maximum Temperature vs. Connector Size for various current ratings of mated pairs of D Subminiature Connectors.



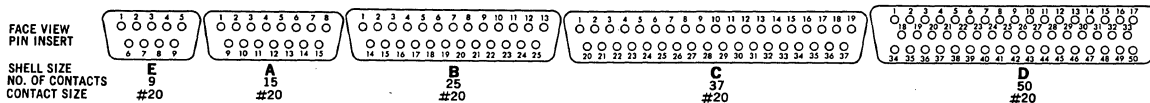
Notes:

- Free air condition. Connectors not shielded from ambient condition in any manner.
- Confined condition. Connectors placed in insulated box (1 x 2 x 3.5) during test, with no moving air.
- Average maximum temperature stabilization: 1 hour or less in all cases.
- All contacts in each mated pair tested were wired in series with specified current flowing.
- Ambient conditions 77°F. 50% rh.

MATERIAL AND PLATING SPECIFICATIONS

Material	Application	Per Specification
Beryllium Copper	Coax. Recept. Outer Body	QQ-C-530
Brass	Contact	QQ-B-626a, Composition 22, HH
Brass	Shell	QQ-B-613a, Composition 2, soft temper
Diallyl phthalate, glass fibre filled, (short)	Insulator	MIL-M-14F, Type SDGF
Diallyl phthalate, glass fibre filled, (long)	Insulator	MIL-P-19833, Type GDI-30F
Leaded copper	Contact	Anaconda Alloy 1870 or equivalent
Nylon	Insulator	MIL-P-17091B
Phosphor bronze	Contact	ASTM B139, Alloy BE per QQ-B-750
Stainless steel	Float rivet	per QQ-S-764B
Stainless steel	Float washer	No. 304, per QQ-S-766c
Steel	Shell	QQ-S-636
Teflon	Coaxial Insulator	—
Plating	Application	Per Specification
Cadmium plate	Shell	QQ-P-416a, Type II, Class 2
Copper	Contact	MIL-C-14550, Class I
Gold plate	Contact	MIL-G-45204, Type II, Class I
Silver plate	Contact	QQ-S-365a
Tin plate	Shell and contact	MIL-T-10727A

BASIC CONTACT ARRANGEMENTS (Applicable to all Series)



TRW[®] CINCH CONNECTORS

ORIGINAL D CONNECTORS

GENERAL INFORMATION

The Cinch Original D Plug utilizes a two-piece nylon insulator housed in a variety of five basic shell sizes: E, A, B, C, and D. These shell sizes contain 9, 15, 25, 37, and 50 #20 solder pot contacts respectively. Standard contact terminations accommodate up to #20 AWG stranded wire. Current rating is 5 amperes.*

The keystone shape of the shell assures proper polarization. Coupling is by means of friction; locking accessories are avail-

able. Also available are shells with float mounts. Connectors with #4-40 or #2-56 cinch nut mounts may be provided.

With standard nylon insulators, operating temperatures range from -65°F to +250°F (the limiting factor being the insulator material). When diallyl phthalate insulator is substituted, the operating temperature range is from -65°F to +275°F.

*Military rating of #20 contacts or wires is 1.5 amps average, and 7.5 amps maximum. See explanation on page 11.

MATERIALS AND FINISHES

Shells: Steel, cadmium plated with yellow chromate supplementary coating.
Pin Contacts: Brass, gold plated (.00003) over nickel plate (.000060 min.).
Socket Contacts: Phosphor bronze, gold plated (.00003) over nickel plate (.000060 min.).
Insulators: Nylon, two-piece.
Float Mounting
Rivets and Washers: Stainless steel.

For listing of applicable specifications see page 11.

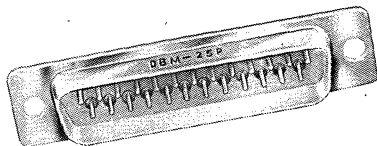
PERFORMANCE DATA

Voltage Rating: See tabulation on page 11.
Insulation Resistance: Greater than 5,000 megohms, determined in accordance with MIL-STD-202D, Method 302, Condition B.
Contact Resistance: 2.7 milliohms maximum @ 7.5 amps.
Individual Contact Separation Force: 1 to 8 ounces.
Moisture Resistance: Exceeds test requirements of MIL-STD-202D, Method 106.†
Vibration: Exceeds test requirements of MIL-STD-202D, Method 204, Condition B.†
Shock: Exceeds test requirements of MIL-STD-202D, Method 213, Condition G.†
Corrosion Resistance: Exceeds requirements of 48 hr. exposure to salt spray in accordance with MIL-STD-202D, Method 101C, Condition B.†

†As referenced in MIL-C-24308.

ORDERING INFORMATION

STANDARD MOUNT



Shell Size	Layout	Order No.*	Factory No.
E	9 Contact Plug Socket	DE-9P *	231-09-11-101
		DE-9S *	230-09-11-101
A	15 Contact Plug Socket	DA-15P *	231-15-11-101
		DA-15S *	230-15-11-101
B	25 Contact Plug Socket	DB-25P *	231-25-11-101
		DB-25S *	230-25-11-112
C	37 Contact Plug Socket	DC-37P *	231-37-11-101
		DC-37S *	230-37-11-101
D	50 Contact Plug Socket	DD-50P *	231-50-11-101
		DD-50S *	230-50-11-101

FLOAT MOUNT



Shell Size	Layout	Order No.*	Factory No.
E	9 Contact Plug Socket	DEF-9P *	231-09-11-306
		DEF-9S *	230-09-11-301
A	15 Contact Plug Socket	DAF-15P *	231-15-11-301
		DAF-15S *	230-15-11-301
B	25 Contact Plug Socket	DBF-25P *	231-25-11-301
		DBF-25S *	230-25-11-301
C	37 Contact Plug Socket	DCF-37P *	231-37-11-301
		DCF-37S *	230-37-11-301
D	50 Contact Plug Socket	DDF-50P *	231-50-11-304
		DDF-50S *	230-50-11-301

* These items available through Cinch distributors.

FOR DIMENSIONS SEE PAGE 10

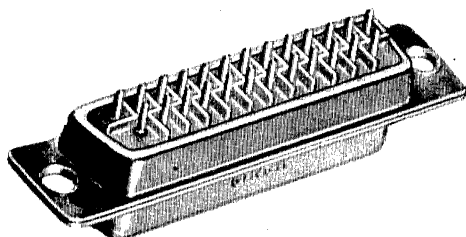
TRW/CINCH CONNECTORS, AN ELECTRONIC COMPONENTS DIV. OF TRW INC. / 1501 MORSE AVE. / ELK GROVE VILLAGE, ILL. 60007

TRW[®] CINCH CONNECTORS

ORIGINAL D CONNECTORS (Cont'd)

PRINTED CIRCUIT TERMINALS

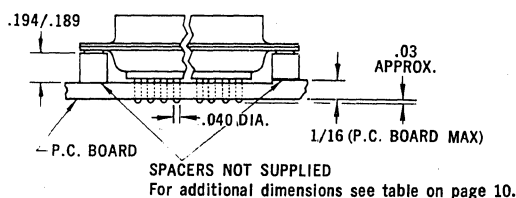
Straight terminals for printed circuit boards up to and including $\frac{1}{16}$ " maximum thickness. Terminals extend $\frac{3}{32}$ " beyond the rear of the insert. For greater board thicknesses consult factory.



ORDERING INFORMATION

Shell Size	Layout	Order No.*	Factory No.
E	9 Contact Plug Socket	DE-9PV *	231-09-12-112
		DE-9SV *	230-09-12-115
A	15 Contact Plug Socket	DA-15PV *	231-15-12-121
		DA-15SV *	230-15-12-131
B	25 Contact Plug Socket	DB-25PV *	231-25-12-116
		DB-25SV *	230-25-12-105
C	37 Contact Plug Socket	DC-37PV *	231-37-12-115
		DC-37SV *	230-37-12-114
D	50 Contact Plug Socket	DD-50PV *	231-50-12-114
		DD-50SV *	230-50-12-113

* These items available through Cinch distributors.

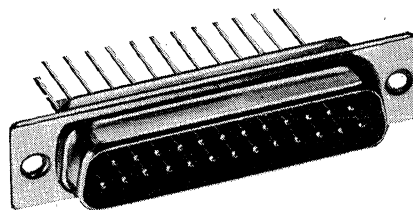


WIRE WRAP TERMINALS

RACK AND PANEL CONNECTORS WITH 0.025" SQUARE WIRE WRAP* TAILS

Cinch D-Subminiature Connectors are designed for applications where space and weight considerations are prime considerations. These high contact density connectors are especially well-suited for aircraft, missile and ground support installations. They are designed to meet or exceed most of the requirements of MIL-C-24308.

These wire-wrap versions are available in 9, 15, 25, 37 and 50 contact sizes in both plug and socket types. Two tail lengths are available: $\frac{3}{8}$ " long to accommodate two wires, and $\frac{3}{4}$ " long to accommodate three wires. Socket contacts and plug pins are copper alloy gold plated over silver. Insulators are two-piece nylon, and the outer shells are yellow chromate finished, cadmium-plated steel.



These D-Subminiature Connectors will intermate with any other D-Subminiature Connector of the same insert configuration. Mating connectors with standard termination may be adapted for cable attachment by means of accessory junction shells with integral clamps.

IMMEDIATE DELIVERY FROM CINCH DISTRIBUTORS can be provided on the $\frac{3}{8}$ " long termination types.

ORDERING INFORMATION

Layout	Shell Size	$\frac{3}{8}$ " TAIL LENGTH**		$\frac{3}{4}$ " TAIL LENGTH	
		Order No.	Factory No.	Order No.	Factory No.
9 Contact Plug Socket	E	DE-9P-F179	231-09-13-133	DE-9P-F179C	231-09-13-134
		DE-9S-F179	230-09-13-132	DE-9S-F179C	230-09-13-133
15 Contact Plug Socket	A	DA-15P-F179	231-15-13-152	DA-15P-F179C	231-15-13-153
		DA-15S-F179	230-15-13-142	DA-15S-F179C	230-15-13-143
25 Contact Plug Socket	B	DB-25P-F179	231-25-13-157	DB-25P-F179C	231-25-13-161
		DB-25S-F179	230-25-13-149	DB-25S-F179C	230-25-13-150
37 Contact Plug Socket	C	DC-37P-F179	231-37-13-141	DC-37P-F179C	231-37-13-142
		DC-37S-F179	230-37-13-131	DC-37S-F179C	230-37-13-132
50 Contact Plug Socket	D	DD-50P-F179	231-50-13-136	DD-50P-F179C	231-50-13-137
		DD-50S-F179	230-50-13-124	DD-50S-F179C	230-50-13-125

*Trademark Gardner-Denver Corp.

**All $\frac{3}{8}$ " Tail length D-Subminiature Connectors are available for immediate delivery from local Authorized Cinch Distributors.

FOR DIMENSIONS SEE PAGE 10

TRW[®] CINCH CONNECTORS

GOLDEN D MARK I CONNECTORS

GENERAL INFORMATION

Cinch D*M Connectors feature solder pot contacts in a monobloc insulator for improved temperature characteristics and increased moisture resistance. Two insulator types are available: (a) combination layouts with coaxial and/or high voltage contacts plus standard AWG wire contacts, and (b) layouts with standard AWG wire contacts only. The five amp* solder pot contacts accommodate wire sizes up to #20 AWG stranded wire. Socket contacts are of the closed entry type. Operating temperatures range from -65°F to +300°F.

Combination layouts are supplied with unfilled coaxial and/or HV contact cavities. Coaxial and HV contacts must be ordered separately, and may be used interchangeably in any of the layouts listed. HV contacts accommodate wire sizes up to #20. In both, coaxial and HV contacts, the center contacts have solder type termination. Braid, on coaxial contacts, may be soldered or crimped to the outer conductor. Both of the above contacts are snap-in, removable type.

*Military rating of #20 contacts or wires is 1.5 amps average, and 7.5 amps maximum. See explanation on page 11.

Standard coaxial and HV plugs contain female center contacts; receptacles contain male center contacts. Special reversed versions are available. Pin connector assemblies accommodate coaxial and HV plugs only; socket assemblies accommodate receptacles. Connector assemblies and contact inserts are matched and color coded to ease assembly. Pins and plugs are coded red, sockets and receptacles are coded blue. No insertion tool is required. Coaxial and HV inserts may be removed with Cinch Tool CET-C6B.

Five basic shell sizes are available. Polarization is by means of the keystone cornered shell. Coupling is by friction; locking accessories are available. Shells with float mounts are also available.

Printed circuit plugs are listed on page 8 with other popular modifications. For additional modifications and special plugs, consult factory. Accessories such as junction shells are shown on pages 23 and 24.

MATERIALS AND FINISHES

Shells: Steel, cadmium plated with yellow chromate supplementary coating.

Insulators: Diallyl phthalate, glass fibre filled, med. green color, monobloc construction.

#20 Contacts

(Standard): Pins and sockets: brass, gold plated (.00003) over silver plate (.0001).

Coaxial Contacts (Standard):

Outer Contact — Plug: Brass, gold plated (.00003) over silver plate (.0001). Receptacle: Beryllium copper, gold plated (.00003) over silver plate (.0001).

Center Female Contact — Phosphor bronze, gold plated (.00003) over silver plate (.0001).

Center Male Contact — Brass, gold plated (.00003) over silver plate (.0001).

Insulator — Teflon.

High Voltage Contacts (Standard):

Socket Contact — Phosphor bronze, gold plated (.00003) over silver plate (.0002).

Pin Contact — Brass, gold plated (.00003) over silver plate (.0002).

Insulator — Nylon (temperature range: -65°F to +250°F).

For listing of applicable specifications see page 11.

PERFORMANCE DATA

VOLTAGE RATING:

- Insulation Resistance — Greater than 5000 megohms in accordance with MIL-C-24308 Ref. MIL-C-24308
- Contact Resistance — (#20 contacts) 2.67 milliohms max. exceeds requirements of Para 3.53 Ref. MIL-C-24308
- Contact Engagement Force — .7 to 12 oz. when tested with MS3197 test pin Ref. MIL-C-24308
- Contact Separation Force — .7 to 8 oz. when tested with MS3197 test pin Ref. MIL-C-24308
- Moisture Resistance — Exceeds test requirements of MIL-STD-202D, Method 106 Ref. MIL-C-24308
- Vibration — Exceeds test requirements of MIL-STD-202D, Method 204, Condition B Ref. MIL-C-24308
- Shock — Exceeds test requirements of MIL-STD-202D, Method 213, Condition G Ref. MIL-C-24308
- Corrosion Resistance — Exceeds requirements of 48-hour exposure to salt spray in accordance with MIL-STD-202D, Method 101C, Condition B Ref. MIL-C-24308
- High Potential Test Voltage — MIL-STD-202D, Method 301 Ref. MIL-C-24308
- Temperature Cycling — MIL-STD-202D, Method 102A, Condition D Ref. MIL-C-24308

See tabulation on page 11.

CROSS REFERENCE MIL-C-24308 MILITARY PART NO. VERSUS CINCH PART NO.

Mark I Solder Contact Connectors		
	Military Part No.	Cinch Part No.
Sockets	M24308/1-1	230-09-09-129
	M24308/1-2	230-15-09-129
	M24308/1-3	230-25-09-129
	M24308/1-4	230-37-09-129
	M24308/1-5	230-50-09-129
Plugs	M24308/3-1	231-09-09-129
	M24308/3-2	231-15-09-129
	M24308/3-3	231-25-09-129
	M24308/3-4	231-37-09-129
	M24308/3-5	231-50-09-129

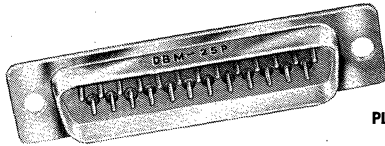
Mark I Solder Contact Connectors With Float Mount		
	Military Part No.	Cinch Part No.
Sockets	M24308/1-12	230-09-09-322
	M24308/1-13	230-15-09-322
	M24308/1-14	230-25-09-322
	M24308/1-15	230-37-09-322
	M24308/1-16	230-50-09-322
Plugs	M24308/3-12	231-09-09-322
	M24308/3-13	231-15-09-322
	M24308/3-14	231-25-09-322
	M24308/3-15	231-37-09-322
	M24308/3-16	231-50-09-322

Solder Contact Connectors (Non-Magnetic)		
	Military Part No.	Cinch Part No.
Sockets	M24308/5-1	230-09-09-513
	M24308/5-2	230-15-09-513
	M24308/5-3	230-25-09-513
	M24308/5-4	230-37-09-513
	M24308/5-5	230-50-09-513
Plugs	M24308/7-1	231-09-09-513
	M24308/7-2	231-15-09-513
	M24308/7-3	231-25-09-513
	M24308/7-4	231-37-09-513
	M24308/7-5	231-50-09-513

Solder Contact Connectors (Non-Magnetic) With Float Mount		
	Military Part No.	Cinch Part No.
Sockets	M24308/5-12	230-09-09-210
	M24308/5-13	230-15-09-210
	M24308/5-14	230-25-09-210
	M24308/5-15	230-37-09-210
	M24308/5-16	230-50-09-210
Plugs	M24308/7-12	231-09-09-210
	M24308/7-13	231-15-09-210
	M24308/7-14	231-25-09-210
	M24308/7-15	231-37-09-210
	M24308/7-16	231-50-09-210

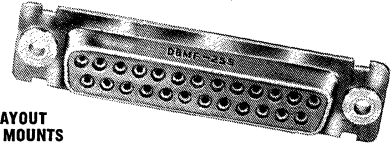
TRW[®] CINCH CONNECTORS

GOLDEN D MARK I CONNECTORS (Cont'd)



STANDARD MOUNT
FLOAT MOUNT

PLUG WITH BASIC LAYOUT
IN STANDARD SHELL



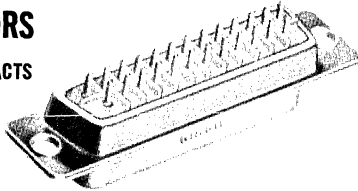
SOCKET WITH BASIC LAYOUT
IN SHELL WITH FLOAT MOUNTS

Shell Size	Layout	Standard Connectors		Commercial Equivalents of MIL-C-24308 Connectors	
		Order No.*	Factory No.	Order No.	Factory No.
E	9 Contact Plug Socket	DEM-9P* DEM-9S*	231-09-09-105 230-09-09-107	DEMM-9P DEMM-9S	231-09-09-120 230-09-09-120
A	15 Contact Plug Socket	DAM-15P* DAM-15S*	231-15-09-108 230-15-09-110	DAMM-15P DAMM-15S	231-15-09-127 230-15-09-123
B	25 Contact Plug Socket	DBM-25P* DBM-25S*	231-25-09-109 230-25-09-111	DBMM-25P DBMM-25S	231-25-09-124 230-25-09-121
C	37 Contact Plug Socket	DCM-37P* DCM-37S*	231-37-09-109 230-37-09-109	DCMM-37P DCMM-37S	231-37-09-131 230-37-09-119
D	50 Contact Plug Socket	DDM-50P* DDM-50S*	231-50-09-109 230-50-09-111	DDMM-50P DDMM-50S	231-50-09-132 230-50-09-131

Shell Size	Layout	Standard Connectors		Commercial Equivalents of MIL-C-24308 Connectors	
		Order No.*	Factory No.	Order No.	Factory No.
E	9 Contact Plug Socket	DEMF-9P* DEMF-9S*	231-09-09-301 230-09-09-301	DEMMF-9P DEMMF-9S	231-09-09-305 230-09-09-314
A	15 Contact Plug Socket	DAMF-15P* DAMF-15S*	231-15-09-301 230-15-09-302	DAMMF-15P DAMMF-15S	231-15-09-304 230-15-09-312
B	25 Contact Plug Socket	DBMF-25P* DBMF-25S*	231-25-09-301 230-25-09-301	DBMMF-25P DBMMF-25S	231-25-09-308 230-25-09-312
C	37 Contact Plug Socket	DCMF-37P* DCMF-37S*	231-37-09-301 230-37-09-302	DCMMF-37P DCMMF-37S	231-37-09-307 230-37-09-314
D	50 Contact Plug Socket	DDMF-50P* DDMF-50S*	231-50-09-301 230-50-09-301	DDMMF-50P DDMMF-50S	231-50-09-308 230-50-09-313

PC CONNECTORS

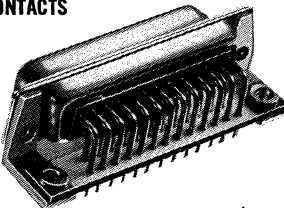
STRAIGHT PC CONTACTS



These compact, high contact density connectors are designed for direct, above board mounting to printed circuit boards up to 1/8" thick. They provide a highly reliable means for direct inline interconnection of printed circuitry with mother-board mounted sockets.

Shell Size	Layout	.040 Dia. 1/4" Board		.040 Dia. 1/8" Board	
		Order No.	Factory No.	Order No.	Factory No.
E	9 Contact Plug Socket	DEM-9PB DEM-9SB	231-09-09-117 230-09-09-127	DEM-9PH DEM-9SH	231-09-09-130 230-09-09-128
A	15 Contact Plug Socket	DAM-15PB DAM-15SB	231-15-09-124 230-15-09-118	DAM-15PH DAM-15SH	231-15-09-139 230-15-09-127
B	25 Contact Plug Socket	DBM-25PB DBM-25SB	231-25-09-127 230-25-09-122	DBM-25PH DBM-25SH	231-25-09-125 230-25-09-121
C	37 Contact Plug Socket	DCM-37PB DCM-37SB	231-37-09-118 230-37-09-114	DCM-37PH DCM-37SH	231-37-09-121 230-37-09-120
D	50 Contact Plug Socket	DDM-50PB DDM-50SB	231-50-09-133 230-50-09-119	DDM-50PH DDM-50SH	231-50-09-136 230-50-09-135

RIGHT ANGLE PC CONTACTS



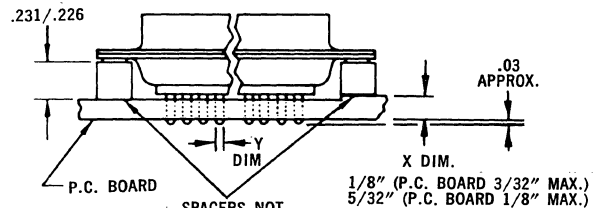
These right-angle plugs are available in 9, 15, 25, and 37 contact configurations. The standard units listed herein are supplied with 0.040" or 0.030" nominal diameter pins that extend 0.093" below the 90° bracket. Other pin diameters and lengths may be obtained on special order.

Design and construction of these connectors meets or exceeds many of the requirements of MIL-C-24308.

These right-angle D-Subminiature connectors will mate with any other D-Subminiature connector of the same insert configuration. Mating connectors may be adapted for cable attachment by means of accessory junction shells.

FOR DIMENSIONS SEE PAGE 10

* These items available through Cinch distributors.



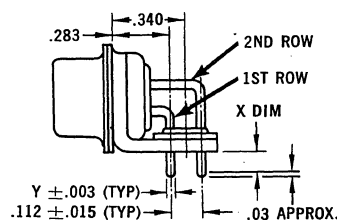
Dimensions subject to change

Part No. Printed Circuit Terminal Modifier	X	Y ±.003
B	1/2	.040
H	1/8	.040

For additional dimensions see table on page 10.

Shell Size	Layout	.040 Dia. 1/4" Board		.030 Dia. 1/4" Board	
		Order No.*	Factory No.	Order No.	Factory No.
E	9 Contact Plug	DEM-9PA*	231-09-09-124	DEM-9PL	231-09-09-118
A	15 Contact Plug	DAM-15PA*	231-15-09-115	DAM-15PL	231-15-09-125
B	25 Contact Plug	DBM-25PA*	231-25-09-116	DBM-25PL	231-25-09-139
C	37 Contact Plug	DCM-37PA*	231-37-09-130	DCM-37PL	231-37-09-127

For additional dimensions see table on page 10.



Part No. Printed Circuit Terminal Modifier	X	Y ±.003 Typ.
A	1/4	.040
L	3/8	.030

TRW[®] CINCH CONNECTORS

GOLDEN D MARK I CONNECTORS (Cont'd)



PLUG WITH
COMBINATION
LAYOUT IN
STANDARD SHELL

MARK 1 — COMBINATION PLUG & SOCKET LAYOUTS STANDARD SHELL — STANDARD FINISH ON CONTACTS

Shell Size	Order No.*	Factory No.
E	*DEM-5W1P	236-05-00-101
	*DEM-5W1S	235-05-00-101
A	*DAM-3W3P	236-03-00-101
	*DAM-3W3S	235-03-00-101
	*DAM-7W2P	236-07-00-101
	*DAM-7W2S	235-07-00-101
	*DAM-11W1P	236-11-00-102
	*DAM-11W1S	235-11-00-101
B	*DBM-9W4P	236-09-00-101
	*DBM-9W4S	235-09-00-101
	*DBM-13W3P	236-13-00-01
	*DBM-13W3S	235-13-00-101
	*DBM-17W2P	236-17-00-101
	*DBM-17W2S	235-17-00-101
	*DBM-21W1P	236-21-00-101
	*DBM-21W1S	235-21-00-101
C	DCM-8W8P	236-08-00-101
	DCM-8W8S	235-08-00-101
	*DCM-13W6P	236-13-00-102
	*DCM-13W6S	235-13-00-102
	DCM-17W5P	236-17-00-102
	DCM-17W5S	235-17-00-102
	DCM-21W4P	236-21-00-107
	DCM-21W4S	235-21-00-105
	DCM-25W3P	236-25-00-101
	DCM-25W3S	235-25-00-101
D	DDM-24W7P	236-24-00-101
	DDM-24W7S	235-24-00-101
	DDM-36W4P	236-36-00-101
	DDM-36W4S	235-36-00-101

MARK 1 — COMBINATION PLUG & SOCKET LAYOUTS STANDARD SHELL — MILITARY FINISH ON CONTACTS

Shell Size	Order No.	Factory No.
E	DEMM-5W1P	236-05-00-102
	DEMM-5W1S	235-05-00-105
A	DAMM-3W3P	236-03-00-102
	DAMM-3W3S	235-03-00-102
	DAMM-7W2P	236-07-00-104
	DAMM-7W2S	235-07-00-102
	DAMM-11W1P	236-11-00-106
	DAMM-11W1S	235-11-00-103
B	DBMM-9W4P	236-09-00-104
	DBMM-9W4S	235-09-00-106
	DBMM-13W3P	236-13-00-105
	DBMM-13W3S	235-13-00-103
	DBMM-17W2P	236-17-00-110
	DBMM-17W2S	235-17-00-107
	DBMM-21W1P	236-21-00-103
	DBMM-21W1S	235-21-00-103
C	DCMM-8W8P	236-08-00-103
	DCMM-8W8S	235-08-00-103
	DCMM-13W6P	236-13-00-108
	DCMM-13W6S	235-13-00-109
	DCMM-17W5P	236-17-00-116
	DCMM-17W5S	235-17-00-112
	DCMM-21W4P	236-21-00-102
	DCMM-21W4S	235-21-00-102
	DCMM-25W3P	236-25-00-106
	DCMM-25W3S	235-25-00-105
D	DDMM-24W7P	236-24-00-106
	DDMM-24W7S	235-24-00-107
	DDMM-36W4P	236-36-00-103
	DDMM-36W4S	235-36-00-102

SOCKET WITH
COMBINATION
LAYOUT IN
SHELL WITH FLOAT MOUNTS



MARK 1 — COMBINATION PLUG & SOCKET LAYOUTS SHELL WITH FLOAT MOUNTS — STANDARD FINISH ON CONTACTS

Shell Size	Order No.*	Factory No.
E	DEMF-5W1P	236-05-00-301
	DEMF-5W1S	235-05-00-301
A	DAMF-3W3P	236-03-00-301
	*DAMF-3W3S	235-03-00-301
	DAMF-7W2P	236-07-00-301
	DAMF-7W2S	235-07-00-301
	*DAMF-11W1P	236-11-00-301
	*DAMF-11W1S	235-11-00-301
B	*DBMF-9W4P	236-09-00-301
	*DBMF-9W4S	235-09-00-301
	DBMF-13W3P	236-13-00-301
	DBMF-13W3S	235-13-00-301
	*DBMF-17W2P	236-17-00-301
	*DBMF-17W2S	235-17-00-302
	DBMF-21W1P	236-21-00-301
	DBMF-21W1S	235-21-00-301
C	DCMF-8W8P	236-08-00-301
	DCMF-8W8S	235-08-00-301
	DCMF-13W6P	236-13-00-302
	DCMF-13W6S	235-13-00-302
	DCMF-17W5P	236-17-00-302
	DCMF-17W5S	235-17-00-307
	DCMF-21W4P	236-21-00-303
	DCMF-21W4S	235-21-00-305
	DCMF-25W3P	236-25-00-301
	DCMF-25W3S	235-25-00-301
D	DDMF-24W7P	236-24-00-301
	DDMF-24W7S	235-24-00-302
	DDMF-36W4P	236-36-00-301
	DDMF-36W4S	235-36-00-302

MARK 1 — COMBINATION PLUG & SOCKET LAYOUTS SHELL WITH FLOAT MOUNTS — MILITARY FINISH ON CONTACTS

Shell Size	Order No.	Factory No.
E	DEMMF-5W1P	236-05-00-302
	DEMMF-5W1S	235-05-00-304
A	DAMMF-3W3P	236-03-00-302
	DAMMF-3W3S	235-03-00-305
	DAMMF-7W2P	236-07-00-302
	DAMMF-7W2S	235-07-00-305
	DAMMF-11W1P	236-11-00-302
	DAMMF-11W1S	235-11-00-307
B	DBMMF-9W4P	236-09-00-302
	DBMMF-9W4S	235-09-00-306
	DBMMF-13W3P	236-13-00-303
	DBMMF-13W3S	235-13-00-307
	DBMMF-17W2P	236-17-00-303
	DBMMF-17W2S	235-17-00-314
	DBMMF-21W1P	236-21-00-302
	DBMMF-21W1S	235-21-00-304
C	DCMMF-8W8P	236-08-00-302
	DCMMF-8W8S	235-08-00-302
	DCMMF-13W6P	236-13-00-304
	DCMMF-13W6S	235-13-00-309
	DCMMF-17W5P	236-17-00-304
	DCMMF-17W5S	235-17-00-317
	DCMMF-21W4P	236-21-00-302
	DCMMF-21W4S	235-21-00-306
	DCMMF-25W3P	236-25-00-302
	DCMMF-25W3S	235-25-00-305
D	DDMMF-24W7P	236-24-00-302
	DDMMF-24W7S	235-24-00-304
	DDMMF-36W4P	236-36-00-302
	DDMMF-36W4S	235-36-00-304

FOR DIMENSIONS SEE PAGE 10

* These items available through Cinch distributors.

TRW/CINCH CONNECTORS, AN ELECTRONIC COMPONENTS DIV. OF TRW INC. / 1501 MORSE AVE. / ELK GROVE VILLAGE, ILL. 60007

TRW[®] CINCH CONNECTORS

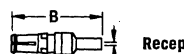
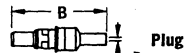
GOLDEN D MARK I CONNECTORS (Cont'd)

REMOVABLE COAXIAL, HIGH VOLTAGE, AND HIGH POWER CONTACTS

All coaxial and high voltage contacts have solder center contact. For coax, high voltage, and power contact material, see page 14.

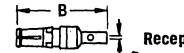
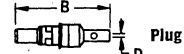
COAXIAL CONTACT TERMINATIONS For D*M coaxial crimp tools, consult factory.

STRAIGHT CRIMP BRAID CONTACTS



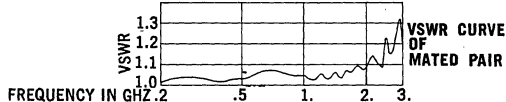
	Part Number				Dimensions			RG Cable No.	
	Standard Finish		Military Finish **		Max.	Ref.	D	Old	New
	Order No.	Factory No.	Order No.	Factory No.					
Plug	DM53740	167-0133-000	DM53740-17	167-0251-000	.739	.929	.040	196/U	178B/U
Plug	DM53740-1	167-0126-000	DM53740-15	167-0007-000	.739	.929	.067	187/U	179B/U
Plug	DM53740-3	167-0130-000	DM53740-16	167-0057-000	.847	1.037	.110	188/U	316B/U
Plug	DM53740-5	167-0088-000	DM53740-18	167-0252-000	.847	1.037	.125	195/U	180B/U
Receptacle	DM53742	167-0124-000	DM53742-18	167-0253-000	.739	.929	.040	188/U	58B/U
Receptacle	DM53742-1	167-0118-000	DM53742-16	167-0006-000	.739	.929	.067	196/U	178B/U
Receptacle	DM53742-3	167-0122-000	DM53742-17	167-0041-000	.847	1.037	.110	187/U	316B/U
Receptacle	DM53742-5	167-0086-000	DM53742-19	167-0254-000	.847	1.037	.125	195/U	180B/U

STRAIGHT SOLDER BRAID CONTACTS



Plug	DM53740-5008*	167-0189-000	DM53740-5015	167-0113-000	.739	.929	.040	196/U	178B/U
Plug	DM53740-5001*	167-0153-000	DM53740-5099	167-0010-000	.739	.929	.067	187/U	179B/U
Plug	DM53740-5002*	167-0132-000	DM53740-5104	167-0237-000	.847	1.037	.110	188/U	316B/U
Plug	DM53740-5005	167-0150-000	DM53740-5101	167-0207-000	.847	1.037	.125	195/U	180B/U
Receptacle	DM53742-5006*	167-0190-000	DM53742-5092	167-0138-000	.739	.929	.040	188/U	58B/U
Receptacle	DM53742-5001*	167-0169-000	DM53742-5089	167-0012-000	.739	.929	.067	196/U	178B/U
Receptacle	DM53742-5002*	167-0168-000	DM53742-5091	167-0139-000	.847	1.037	.110	187/U	316B/U
Receptacle	DM53742-5004*	167-0172-000	DM53742-5086	167-0137-000	.847	1.037	.125	195/U	180B/U
Receptacle (Short)	DM53740-5000*	167-0129-000	DM53740-5100	167-0011-000	.670	.860	.040	196/U	178B/U
Receptacle (Short)	DM53742-5000*	167-0121-000	DM53742-5085	167-0023-000	.670	.860	.040	196/U	178B/U

50 OHM MATCHED IMPEDANCE COAX CONTACTS

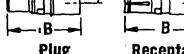
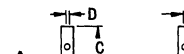


Description	Part No.
Straight Plug 50 Ohm	167-02-46-000
Straight Receptacle 50 Ohm	167-02-45-000

To be used with UT-85 coax cable

RIGHT ANGLE SOLDER BRAID CONTACTS

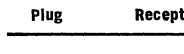
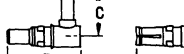
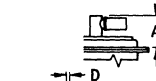
Cinch can also supply 50 ohm matched impedance coax contacts to be used with UT-85 coax cable.



	Part Number				Dimensions				RG Cable No.	
	Standard Finish		Military Finish **		Max.	Ref.	C	D	Old	New
	Order No.	Factory No.	Order No.	Factory No.						
Plug	DM53741-5000*	167-0187-000	DM53741-5059	167-0020-000	.530	.734	.492	.040	196/U	178B/U
Plug	DM53741-5001*	167-0128-000	DM53741-5062	167-0074-000	.530	.734	.492	.067	187/U	179B/U
Plug	DM53741-5003	167-0151-000	DM53741-5063	167-0159-000	.530	.734	.601	.110	188/U	316B/U
Plug	DM53741-5004	167-0173-000	DM53741-5060	167-0255-000	.530	.734	.601	.125	195/U	180B/U
Receptacle	DM53743-5000*	167-0119-000	DM53743-5073	167-0013-000	.530	.734	.492	.040	196/U	178B/U
Receptacle	DM53743-5001*	167-0120-000	DM53743-5076	167-0101-000	.530	.734	.492	.067	187/U	316B/U
Receptacle	DM53743-5003	167-0171-000	DM53743-5077	167-0158-000	.530	.734	.601	.110	195/U	180B/U
Receptacle	DM53743-5004	167-0170-000	DM53743-5074	167-0106-000	.530	.734	.601	.125	196/U	178B/U

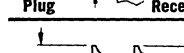
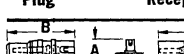
** MIL-C-24308 Finish: .00005 minimum gold plate over .0001 minimum copper plate.

RIGHT ANGLE CRIMP BRAID CONTACTS



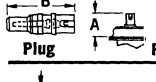
Plug	DM53741	167-0176-000	DM53741-12	167-0256-000	.530	.734	.492	.040	196/U	178B/U
Plug	DM53741-1	167-0152-000	DM53741-11	167-0162-000	.530	.734	.492	.067	187/U	179B/U
Plug	DM53741-3	167-0160-000	DM53741-10	167-0072-000	.530	.734	.601	.110	188/U	316B/U
Plug	DM53741-4	167-0149-000	DM53741-13	167-0257-000	.530	.734	.601	.125	195/U	180B/U
Receptacle	DM53743-2	167-0174-000	DM53743-18	167-0258-000	.530	.734	.492	.040	196/U	178B/U
Receptacle	DM53743-3	167-0166-000	DM53743-16	167-0161-000	.530	.734	.492	.067	187/U	316B/U
Receptacle	DM53743-5	167-0165-000	DM53743-17	167-0055-000	.530	.734	.601	.110	195/U	180B/U
Receptacle	DM53743-6	167-0164-000	DM53743-19	167-0259-000	.530	.734	.601	.125	196/U	178B/U

STRAIGHT HIGH VOLTAGE CONTACTS



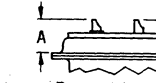
	Part Number				Dimensions		
	Standard Finish		Military Finish **		A	R	Wire Size
	Order No.	Factory No.	Order No.	Factory No.	Max.	Ref.	
Plug	DM51157	167-0002-000	DM51157-8	167-0263-000	.539	.734	#20
Receptacle	DM51155	167-0111-000	DM51155-7	167-0221-000	.539	.734	#20

RIGHT ANGLE HIGH VOLTAGE CONTACTS



Plug	DM51157-5000	167-0260-000	DM51157-5005	167-0261-000	.491	.697	#20
Receptacle	DM51155-5000	167-0089-000	DM51155-5004	167-0262-000	.491	.697	#20

HIGH POWER SOLDER TYPE CONTACTS



HIGH POWER SOLDER TYPE CONTACTS								
	Part Number				Dimensions		Cur. Rating (amps)	Wire Size
	Standard Finish		Military Finish **		A	B		
	Order No.	Factory No.	Order No.	Factory No.	Max.	Ref.		
Plug	DM53745-1	167-0144-000	DM53745-28	167-0219-000	.666	.866	40	#8
Plug	DM53745-7	167-0042-000	DM53745-27	167-0167-000	.666	.866	20	#21
Plug	DM53745-8	167-0115-000	DM53745-25	167-0187-000	.666	.866	10	#16
Receptacle	DM53744-1	167-0145-000	DM53744-21	167-0220-000	.666	.856	40	#8
Receptacle	DM53744-6	167-0043-000	DM53744-25	167-0215-000	.666	.856	20	#21
Receptacle	DM53744-7	167-0087-000	DM53744-24	167-0188-000	.666	.856	10	#16

** MIL-C-24308 Finish: .00005 minimum gold plate over .0001 minimum copper plate.

* These items available through Cinch distributors.

TRW/CINCH CONNECTORS, AN ELECTRONIC COMPONENTS DIV. OF TRW INC. / 1501 MORSE AVE. / ELK GROVE VILLAGE, ILL. 60007

TRW[®] CINCH CONNECTORS

GOLDEN D MARK I CONNECTORS (Cont'd)

COMBINATION ARRANGEMENTS #20 CONTACTS WITH COAX, POWER AND/OR HIGH VOLTAGE CONTACTS

Coax and/or high voltage contacts must be ordered separately. See page 10 for ordering numbers.

Shell Size — E	A	A	A	B*	B	B	B
Arrangement — 5W1	3W3	7W2	11W1	5W5	9W4	13W3	17W2
No. of Contacts — 4	0	5	10	0	5	10	15
Contact Size — #20	—	#20	#20	—	#20	#20	#20
Coax or HV Cavities — 1	3	2	1	5	4	3	2

Shell Size — B	C	C	C	C*
Arrangement — 21W1	8W8	13W6	17W5	21W4
No. of Contacts — 20	0	7	23	17
Contact Size — #20	—	#20	#20	#20
Coax or HV Cavities — 1	8	6	5	4

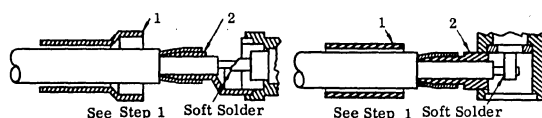
Shell Size — C	D	D	D*
Arrangement — 25W3	24W7	43W2	30WS7
No. of Contacts — 22	17	41	23
Contact Size — #20	#20	#20	#20
Coax or HV Cavities — 3	7	2	7 shielded contacts

Consult factory for D*MA Series combination arrangements.

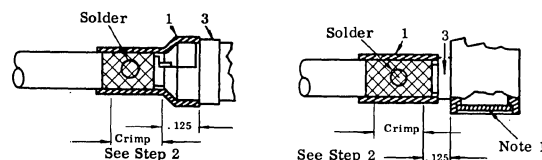
* These items not tooled.

COAXIAL CABLE INSTALLATION INSTRUCTIONS

STRAIGHT COAXIAL 90° COAXIAL



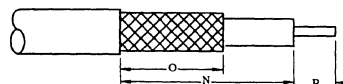
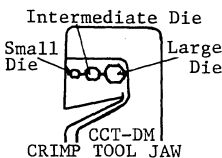
STEP 1. Slide outer ring (1) over cable jacket. Trim cable. Insert cable dielectric and center conductor into inside diameter of inner sleeve (2) solder center conductor to coaxial center contact.



STEP 2. Slide outer ring (1) forward until flush with coaxial shell, (3) confining braid between outer ring and inner sleeve. For solder type coaxials, soft solder outer ring to assembly through cross-drilled solder hole. For crimp type coaxials, crimp with tool indicated being sure to crimp in area defined.

NOTES

- Soft solder or stake access cap into shell after cable assembly on 90° type coaxials.
- Crimp tool description — Cannon CCT-DM (to crimp outer sleeve only).
 - Use small die.
 - Use intermediate die.
 - Use large die.
- Pin assemblies will accommodate high voltage and coaxial plugs only. Socket assemblies will accommodate high voltage and coaxial receptacles only.



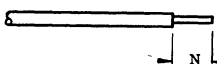
TRIM COAXIAL CABLE TO THESE DIMENSIONS FOR INSTALLATION TO D*MA COAXIAL CONTACTS

RECOMMENDED COAXIAL CABLE DIMENSIONS

Nomenclature	N	O	P	Tool No. Note 2
DM-53740	3/16	1/4	5/64	A
-1	3/16	1/4	5/64	B
-3	3/8	5/16	5/64	C
-5	3/8	5/16	5/64	C
DM-53741	3/8	15/64	1/16	A
-1	3/8	15/64	1/16	B
-3	27/64	5/16	3/32	C
-4	27/64	5/16	3/32	C
DM-53742	3/16	1/4	5/64	A
-1	3/16	1/4	5/64	B
-3	3/8	5/16	5/64	C
-5	3/8	5/16	5/64	C
DM-53743-2	3/8	15/64	1/16	A
-3	3/8	15/64	1/16	B
-5	27/64	5/16	3/32	C
-6	27/64	5/16	3/32	C
DM-53740-5000	3/16	1/4	5/64	None
-5001	3/16	1/4	5/64	None
-5002	3/8	5/16	5/64	None
-5005	3/8	5/16	5/64	None
-5008	3/16	1/4	5/64	None
DM-53741-5000	3/8	15/64	1/16	None
-5001	3/8	15/64	1/16	None
-5003	27/64	5/16	3/32	None
-5004	27/64	5/16	3/32	None
DM-53742-5000	3/16	1/4	5/64	None
-5001	3/16	1/4	5/64	None
-5002	3/8	5/16	5/64	None
-5004	3/8	5/16	5/64	None
-5006	3/16	1/4	5/64	None
DM-53743-5000	3/8	15/64	1/16	None
-5001	3/8	15/64	1/16	None
-5003	27/64	5/16	3/32	None
-5004	27/64	5/16	3/32	None

All tolerances $\pm .010$ inch.

RECOMMENDED AWG WIRE DIMENSIONS



TRIM AWG WIRE TO THIS DIMENSION FOR INSTALLATION TO #20 CONTACTS

All tolerances $\pm .010$ inch.

Nomenclature	N	Tool No. Note 2
DM-53744	.119	None
-5000	.119	None
DM-53745	.119	None
-5000	.119	None
Solder Type #20 Contact	.119	None

TRW[®] CINCH CONNECTORS

ROYAL D MARK III CONNECTORS

GENERAL INFORMATION

The D*MA connector is a D-Subminiature Connector that utilizes the "Little Caesar" rear release contact assembly. This contact assembly allows rear insertion, release and extraction of crimp snap-in contacts. The simplified contact design with no undercuts offers greater bend resistance and a hard, closed entry socket insulator insures positive contact alignment. Crimp terminations accommodate #20, #22 and #24 AWG stranded wire and are rated for 5 amps.* ROYAL D-connectors are intermate-

able and interchangeable with all other D-Subminiature Connectors having compatible contact arrangement.

Polarization is by keystone shape of shell; coupling is by friction. Accessories are shown on pages 23 and 24. An extraction tool is supplied with ROYAL D-connectors. Extra contacts may be ordered for replacement purposes. See page 20 for ordering information.

MATERIALS, FINISHES AND TYPES

- Shell:** Steel, cadmium plated with yellow chromate supplementary coating.
- Insulator:** Diallyl phthalate, glass fibre filled, per MIL-P-19833, Type GDI-30F, royal purple color, monobloc construction.
- Contacts:** Pin—lead copper, gold plate over silver plate. Socket—copper alloy, gold plate over silver plate with stainless steel sleeves.
- Current Rating:** (#20 Contacts) 5 amps.*
- Contact Termination:** Crimp, accommodating #20, #22 or #24 AWG stranded wire. The 20-18 contacts accommodate one #18 or two #22 AWG stranded wires.
- Contact Type:** Snap-in, removable, crimp, with rear release assembly. Contacts not interchangeable with other D Series.
- Socket Type:** Closed entry.
- Float Mounting**
- Rivets & Washers:** Stainless steel.

For listing of applicable specifications, see page 11.

*Military rating of #20 contacts or wires is 1.5 amps average, and 7.5 amps maximum. See explanation on page 11.

PERFORMANCE DATA

VOLTAGE RATING:

- Insulation Resistance** — Greater than 5000 megohms in accordance with MIL-STD-202D, Method 302, Condition B
Ref. MIL-C-24308
- Contact Resistance** — (#20 contacts) 20 milliohms max. in accordance with Para 3.5.8
Exceeds Req'ts of MIL-C-24308
- Contact Engagement Force** — .7 to 12 oz. when tested with MS3197 test pin
Ref. MIL-C-24308
- Contact Separation Force** — .7 to 8 oz. when tested with MS3197 test pin
Ref. MIL-C-24308
- Moisture Resistance** — Exceeds test requirements of MIL-STD-202D, Method 106
Ref. MIL-C-24308
- Vibration** — Meets test requirements of MIL-STD-202D, Method 204, Condition B
Ref. MIL-C-24308
- Shock** — Meets test requirements of MIL-STD-202D, Method 213, Condition G
Ref. MIL-C-24308
- Corrosion Resistance** — Exceeds requirements of 48-hour exposure to salt spray in accordance with MIL-STD-202D, Method 101A, Condition B
Ref. MIL-C-24308
- High Potential Test Voltage** — MIL-STD-202D, Method 301
Ref. MIL-C-24308
- Temperature Cycling** — MIL-STD-202D, Method 102A, Condition B
Ref. MIL-C-24308

See tabulation on page 11.

Military Part No.	Cinch Part No.
*M24308/10-1 Socket	415-30-99-130
*M24308/11-1 Pin	403-30-99-106

* These items available through Cinch distributors.

Mark III Crimp Removable Contact Connectors

	Military Part No. With Contacts	Cinch Part No. Complete	Military Part No. Less Contacts	Cinch Part No. Less Contacts	Marked
Sockets	M24308/2-1	230-01-09-102	M24308/2-281	230-01-09-109	M24308/2-1
	M24308/2-2	230-01-15-102	M24308/2-282	230-01-15-109	M24308/2-2
	M24308/2-3	230-01-25-102	M24308/2-283	230-01-25-109	M24308/2-3
	M24308/2-4	230-01-37-102	M24308/2-284	230-01-37-109	M24308/2-4
	M24308/2-5	230-01-50-102	M24308/2-285	230-01-50-109	M24308/2-5
Plugs	M24308/4-1	231-01-09-102	M24308/4-259	231-01-09-109	M24308/4-1
	M24308/4-2	231-01-15-102	M24308/4-260	231-01-15-109	M24308/4-2
	M24308/4-3	231-01-25-102	M24308/4-261	231-01-25-109	M24308/4-3
	M24308/4-4	231-01-37-102	M24308/4-262	231-01-37-109	M24308/4-4
	M24308/4-5	231-01-50-102	M24308/4-263	231-01-50-109	M24308/4-5

Mark III Crimp Removable Contact Connectors With Float Mount

	Military Part No. With Contacts	Cinch Part No. Complete	Military Part No. Less Contacts	Cinch Part No. Less Contacts	Marked
Sockets	M24308/2-23	230-01-09-307	M24308/2-292	230-01-09-308	M24308/2-23
	M24308/2-24	230-01-15-307	M24308/2-293	230-01-15-308	M24308/2-24
	M24308/2-25	230-01-25-307	M24308/2-294	230-01-25-308	M24308/2-25
	M24308/2-26	230-01-37-307	M24308/2-295	230-01-37-308	M24308/2-26
	M24308/2-27	230-01-50-307	M24308/2-296	230-01-50-308	M24308/2-27
Plugs	M24308/4-302	231-01-09-307	M24308/4-324	231-01-09-308	M24308/4-302
	M24308/4-303	231-01-15-307	M24308/4-325	231-01-15-308	M24308/4-303
	M24308/4-304	231-01-25-307	M24308/4-326	231-01-25-308	M24308/4-304
	M24308/4-305	231-01-37-307	M24308/4-327	231-01-37-308	M24308/4-305
	M24308/4-306	231-01-50-307	M24308/4-328	231-01-50-308	M24308/4-306

Mark III Crimp Removable Contact Connectors (Non-Magnetic)

	Military Part No. With Contacts	Cinch Part No. Complete	Military Part No. Less Contacts	Cinch Part No. Less Contacts	Marked
Sockets	M24308/6-1	230-01-09-500	M24308/6-281	230-01-09-504	M24308/6-1
	M24308/6-2	230-01-15-500	M24308/6-282	230-01-15-504	M24308/6-2
	M24308/6-3	230-01-25-500	M24308/6-283	230-01-25-504	M24308/6-3
	M24308/6-4	230-01-37-500	M24308/6-284	230-01-37-504	M24308/6-4
	M24308/6-5	230-01-50-500	M24308/6-285	230-01-50-504	M24308/6-5
Plugs	M24308/8-1	231-01-09-500	M24308/8-259	231-01-09-504	M24308/8-1
	M24308/8-2	231-01-15-500	M24308/8-260	231-01-15-504	M24308/8-2
	M24308/8-3	231-01-25-500	M24308/8-261	231-01-25-504	M24308/8-3
	M24308/8-4	231-01-37-500	M24308/8-262	231-01-37-504	M24308/8-4
	M24308/8-5	231-01-50-500	M24308/8-263	231-01-50-504	M24308/8-5

Mark III Crimp Removable Contact Connectors (Non-Magnetic) With Float Mount

	Military Part No. With Contacts	Cinch Part No. Complete	Military Part No. Less Contacts	Cinch Part No. Less Contacts	Marked
Sockets	M24308/6-259	230-01-09-200	M24308/6-324	230-01-09-201	M24308/6-259
	M24308/6-260	230-01-15-200	M24308/6-325	230-01-15-201	M24308/6-260
	M24308/6-261	230-01-25-200	M24308/6-326	230-01-25-201	M24308/6-261
	M24308/6-262	230-01-37-200	M24308/6-327	230-01-37-201	M24308/6-262
	M24308/6-263	230-01-50-200	M24308/6-328	230-01-50-201	M24308/6-263
Plugs	M24308/8-302	231-01-09-200	M24308/8-324	231-01-09-201	M24308/8-302
	M24308/8-303	231-01-15-200	M24308/8-325	231-01-15-201	M24308/8-303
	M24308/8-304	231-01-25-200	M24308/8-326	231-01-25-201	M24308/8-304
	M24308/8-305	231-01-37-200	M24308/8-327	231-01-37-201	M24308/8-305
	M24308/8-306	231-01-50-200	M24308/8-328	231-01-50-201	M24308/8-306

TRW[®] CINCH CONNECTORS

ROYAL D MARK III CONNECTORS (CONT'D)

ORDERING INFORMATION

STANDARD SHELL



Shell Size	Layout	Order No.*	Factory No.	Order No.	Factory No.
E	9 Contact Plug Socket	DEMA-9P*	231-01-09-100	DEMAM-9P	231-01-09-103
		DEMA-9S*	230-01-09-100	DEMAM-9S	230-01-09-101
A	15 Contact Plug Socket	DAMA-15P*	231-01-15-100	DAMAM-15P	231-01-15-103
		DAMA-15S*	230-01-15-100	DAMAM-15S	230-01-15-101
B	25 Contact Plug Socket	DBMA-25P*	231-01-25-100	DBMAM-25P	231-01-25-108
		DBMA-25S*	230-01-25-100	DBMAM-25S	230-01-25-101
C	37 Contact Plug Socket	DCMA-37P*	231-01-37-100	DCMAM-37P	231-01-37-103
		DCMA-37S*	230-01-37-100	DCMAM-37S	230-01-37-101
D	50 Contact Plug Socket	DDMA-50P*	231-01-50-100	DDMAM-50P	231-01-50-103
		DDMA-50S*	230-01-50-100	DDMAM-50S	230-01-50-105

SHELL WITH FLOAT MOUNTS



Shell Size	Layout	Order No.*	Factory No.	Order No.	Factory No.
E	9 Contact Plug Socket	DEMAF-9P*	231-01-09-300	DEMAMF-9P	231-01-09-301**
		DEMAF-9S*	230-01-09-300	DEMAMF-9S	230-01-09-305
A	15 Contact Plug Socket	DAMAF-15P*	231-01-15-300	DAMAMF-15P	231-01-15-301**
		DAMAF-15S*	230-01-15-300	DAMAMF-15S	230-01-15-305
B	25 Contact Plug Socket	DBMAF-25P*	231-01-25-300	DBMAMF-25P	231-01-25-301**
		DBMAF-25S*	230-01-25-300	DBMAMF-25S	230-01-25-304
C	37 Contact Plug Socket	DCMAF-37P*	231-01-37-300	DCMAMF-37P	231-01-37-302
		DCMAF-37S*	230-01-37-300	DCMAMF-37S	230-01-37-305
D	50 Contact Plug Socket	DDMAF-50P*	231-01-50-300	DDMAMF-50P	231-01-50-302
		DDMAF-50S*	230-01-50-300	DDMAMF-50S	230-01-50-304

FOR DIMENSIONS SEE PAGE 10

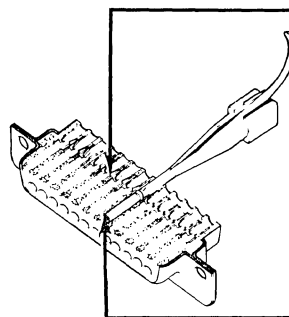
**A156 Parts.

"LITTLE CAESAR" REAR RELEASE CONTACT ASSEMBLY

The "Little Caesar" rear release contact assembly permits contacts to be inserted by hand and to be released and extracted from the rear of the connector with a simple, expendable plastic tool.

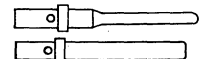
The contact is inserted from the rear of the connector thru a cylindrical clip in the insulator until the indented tines of the clip snap securely behind the contact shoulder. The contact is released as the plastic tool is inserted into the rear of the connector, expanding the tines beyond the contact shoulder and permitting contact extraction. The simplified contact design improves bend resistance through a single holding shoulder with no undercuts.

The "Little Caesar" contact assembly was selected by the National Aerospace Standards Committee for use in a major industry connector specification for vital programs demanding great operational reliability.



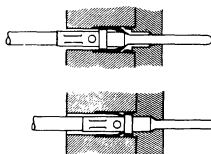
Contact retaining clip.

Hard dielectric, closed-entry socket inserts realigns bent or misaligned pin contacts.



Simple stronger contact without undercuts for greater bend resistance.

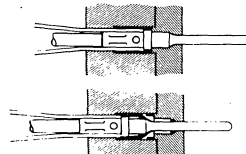
CONTACT INSERTION



Contact partially inserted.

Tines snap behind contact shoulder when contact is fully inserted.

CONTACT EXTRACTION



Insert extraction tool to fully bottomed condition.

Tines expanded beyond contact shoulder.

Remove contact by pulling on wire.

Contact partially removed.

ORDERING INFORMATION FOR ADDITIONAL CONTACTS

All D*MA connectors are supplied with the proper number of crimp type contacts. Additional contacts may be ordered for replacement purposes as indicated.

Contact Size	Contact Part Numbers			
	Pin		Socket	
	Order No.	Factory No.	Order No.	Factory No.
20 Standard Finish	330-5291-000*	403-30-99-214	031-1007-000*	415-30-99-119
20-18 Standard Finish	330-5291-001	403-30-99-215	031-1007-001	415-30-99-118
20 Military Finish	M24308/11-1*	403-30-99-106	M24308/10-1*	415-30-99-130

* These items available through Cinch distributors.

TRW/CINCH CONNECTORS, AN ELECTRONIC COMPONENTS DIV. OF TRW INC. / 1501 MORSE AVE. / ELK GROVE VILLAGE, ILL. 60007

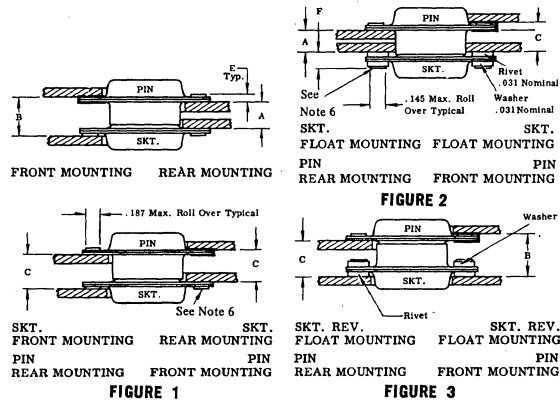
TRW[®] CINCH CONNECTORS

INSTALLATION INSTRUCTIONS

RECOMMENDED PANEL MOUNTING CONFIGURATIONS

NOTES

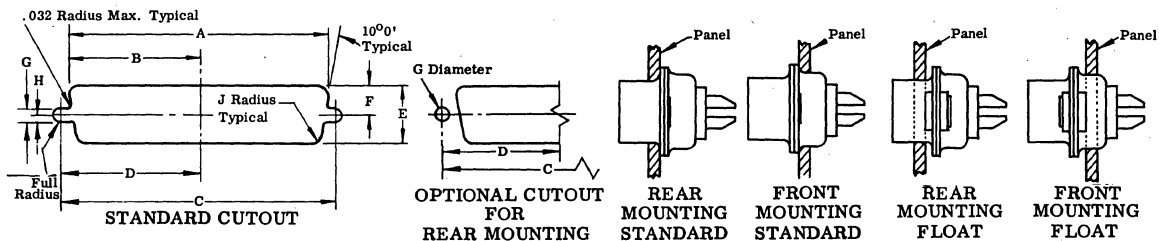
1. A, B, and C minimum dimensions between panels represent a recommended limit to be approached in the design of the plug mounting means. The construction of this plug series permits normal operation when disengaged .030 above the minimum, indicated under any combination of mounting conditions.
2. On plugs with float hardware dimensions, apply as shown whether hardware is on socket (as illustrated) or pin side. Standard float mount plugs have sockets.
3. It is recommended that only one assembly, either pin or socket, be float mounted.
4. Float mount assemblies consist of .030 thick washers. Earlier versions (previous to September 1, 1961) contained .025 thick washers.
5. Standard pin assemblies contain .015 thick front shells on E and A sizes; .024 thick front shells on B, C and D sizes.
6. Standard plugs accommodate a number 4-screw. Float mounted plugs accommodate a #2 screw.



RECOMMENDED PANEL MOUNTING DIMENSIONS

Combination of Mated Plugs			Dimensions					
See Fig. No.	Pin Description	Socket	A Min.	B See Note 1 Min.	C Min.	Pin $\pm .010$	Skt. $\pm .010$	F $\pm .010$
1	.015 Front Shell	Std.	.250	.343	.298	.045	.045	—
1	.024 Front Shell	Std.	.238	.345	.298	.060	.045	—
2	.015 Front Shell	Float Mount	.221	—	.269	.045	—	.120
2	.024 Front Shell	Float Mount	.209	—	.269	.060	—	.120
2	.015 Front Shell Float Mount	Std.	.221	—	.268	—	.045	.120
2	.024 Front Shell Float Mount	Std.	.209	—	.256	—	.045	.130
3	.015 Front Shell	Rev. Float Mount	—	.360	.314	.045	—	.120
3	.024 Front Shell	Rev. Float Mount	—	.362	.302	.060	—	.120
3	.015 Front Shell Rev. Float Mount	Std.	—	.360	.314	—	.045	.120
3	.024 Front Shell Rev. Float Mount	Std.	—	.357	.302	—	.045	.130

RECOMMENDED PANEL CUTOUT CONFIGURATIONS



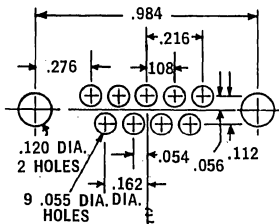
RECOMMENDED PANEL CUTOUT DIMENSIONS

Connectors	Mounting Method	A $\pm .005$	B $\pm .005$	C $\pm .005$	D $\pm .005$	E $\pm .005$	F $\pm .005$	G $\pm .002$	H $\pm .002$	J $\pm .005$
DA, DAM	Front Mounting	1.202	.601	1.312	.656	.513	.257	.120	.060	.083
DAMA	Rear Mounting	1.134	.567	1.312	.656	.449	.225	.120	.060	.132
DAF, DAMF	Front Mounting	1.234	.617	1.312	.656	.545	.273	.088	.044	.083
DAMA	Rear Mounting	1.166	.583	1.312	.656	.481	.241	.088	.044	.132
DB, DBM	Front Mounting	1.743	.872	1.852	.926	.513	.257	.120	.060	.083
DBMA	Rear Mounting	1.674	.837	1.852	.926	.449	.225	.120	.060	.132
DBF, DBMF	Front Mounting	1.775	.888	1.852	.926	.545	.273	.088	.044	.083
DBMAF	Rear Mounting	1.706	.853	1.852	.926	.481	.241	.088	.044	.132
DC, DCM	Front Mounting	2.391	1.196	2.500	1.250	.513	.257	.120	.060	.083
DCMA	Rear Mounting	2.326	1.163	2.500	1.250	.449	.225	.120	.060	.132
DCF, DCMF	Front Mounting	2.423	1.212	2.500	1.250	.545	.273	.088	.044	.083
DCMAF	Rear Mounting	2.354	1.177	2.500	1.250	.481	.241	.088	.044	.132
DD, DDM	Front Mounting	2.297	1.149	2.406	1.203	.623	.312	.120	.060	.083
DDMA	Rear Mounting	2.218	1.109	2.406	1.203	.555	.278	.120	.060	.132
DDF, DDMF	Front Mounting	2.329	1.165	2.406	1.203	.655	.328	.088	.044	.083
DDMAF	Rear Mounting	2.250	1.125	2.406	1.203	.587	.294	.088	.044	.132
DE, DEM	Front Mounting	.874	.437	.984	.492	.513	.257	.120	.060	.083
DEMA	Rear Mounting	.806	.403	.984	.492	.449	.225	.120	.060	.132
DEF, DEMF	Front Mounting	.906	.453	.984	.492	.545	.273	.088	.044	.083
DEMAF	Rear Mounting	.838	.419	.984	.492	.481	.241	.088	.044	.132

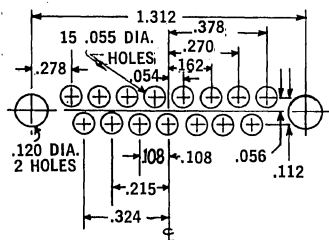
TRW[®] CINCH CONNECTORS

INSTALLATION INSTRUCTIONS (Cont'd)

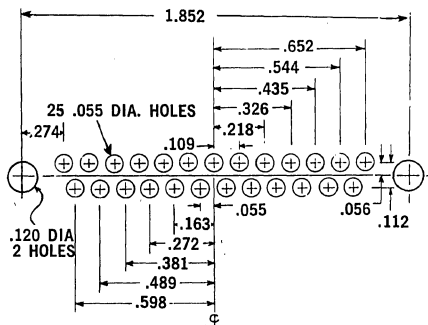
RECOMMENDED PRINTED CIRCUIT BOARD LAYOUTS



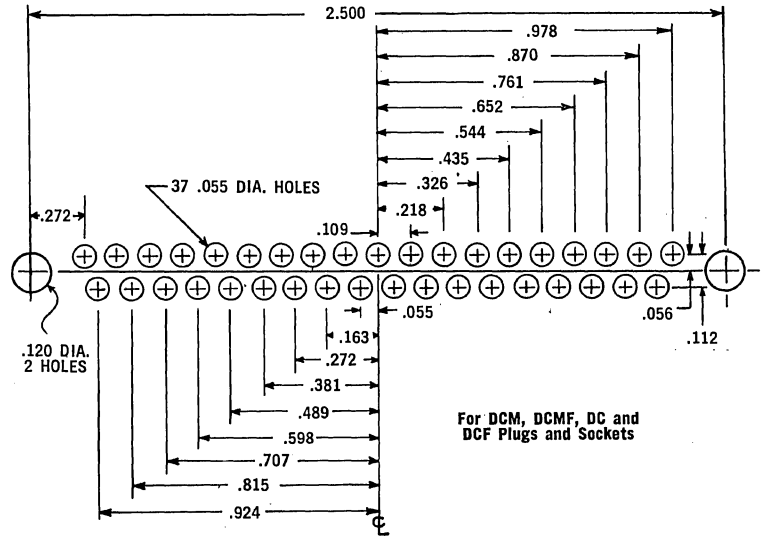
For DEM, DEMF, DE and DEF Plugs and Sockets



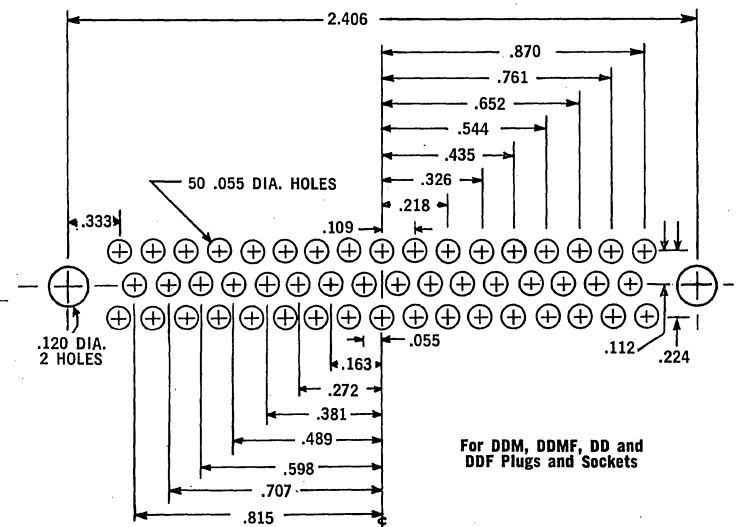
For DAM, DAMF, DA and DAF Plugs and Sockets



For DBM, DBMF, DB and DBF Plugs and Sockets

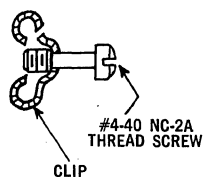


For DCM, DCMF, DC and DCF Plugs and Sockets

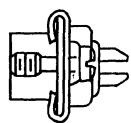


For DBM, DBMF, DD and DDF Plugs and Sockets

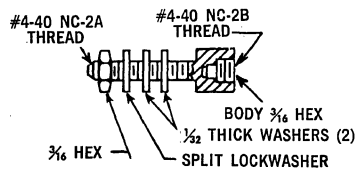
SCREW LOCK INSTALLATION INSTRUCTIONS



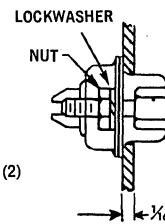
MALE



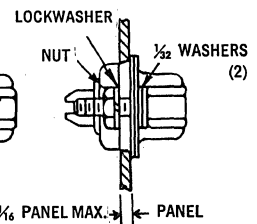
CABLE CONNECTOR



FEMALE



REAR MOUNTING

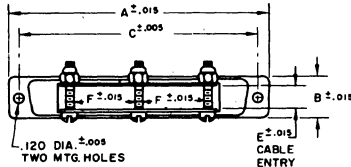


FRONT MOUNTING

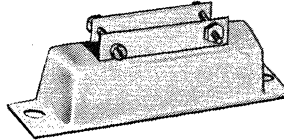
TRW[®] CINCH CONNECTORS

ACCESSORIES JUNCTION SHELLS

19678 STRAIGHT CLAMP



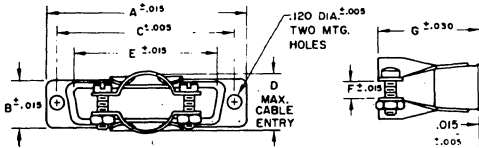
For use with D*, D*M and D*MA only



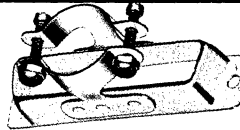
Material: Low carbon steel.
Finish: Cadmium plate, yellow chromate.
Corrosion Resistance: Passes 48 hour exposure to salt spray in accordance with MIL-STD-202D, Method 101C, Condition B. All tolerances are $\pm .010$ unless noted otherwise.

Order No.* by Shell Size	Factory No.	No. of Cable Locking Screws Required	A	B	C	E	F	G
DA-19678-1*	239-13-22-004	2	1.531	.500	1.312	.296	.312	.640
DB-19678-2*	239-13-22-003	2	2.078	.500	1.852	.296	.796	.640
DC-19678-3*	239-13-22-002	3	2.718	.500	2.500	.296	.687	.640
DD-19678-4*	239-13-22-001	3	2.625	.609	2.406	.390	.687	.703

ROUND CLAMP



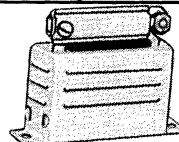
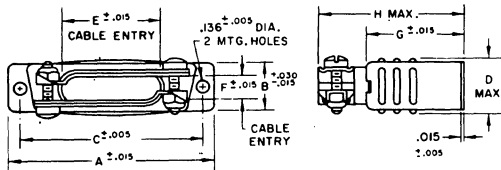
For use with D*, D*M and D*MA only



Material: Low carbon steel.
Finish: Cadmium plate, yellow chromate.
Corrosion Resistance: Passes 48 hour exposure to salt spray in accordance with MIL-STD-202D, Method 101C, Condition B.

Order No.* by Shell Size	Factory No.	A	B	C	D	E	F	G
DA-20961	239-14-22-017	1.531	.500	1.312	.406	.984	.125	1.031
DB-20962	239-14-22-018	2.078	.500	1.852	.593	1.515	.187	1.062
DC-20963	239-14-22-019	2.718	.500	2.500	.718	2.171	.250	1.062
DD-20964	239-14-22-020	2.625	.609	2.406	.812	2.093	.312	1.062

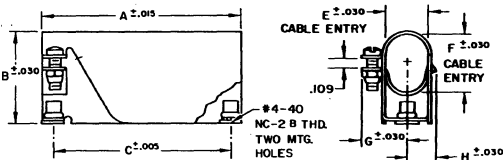
DEEP, STRAIGHT CLAMP



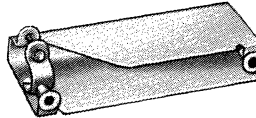
Material: Low carbon steel.
Finish: Cadmium plate, yellow chromate.
Corrosion Resistance: Passes 48 hour exposure to salt spray in accordance with MIL-STD-202D, Method 101C, Condition B.

Order No.* by Shell Size	Factory No.	A	B	C	D	E	F	G	H
DE-24657*	239-14-23-030	1.203	.484	.984	.578	.375	.375	.750	1.219
DA-24658*	239-14-22-068	1.531	.484	1.312	.578	.713	.312	.750	1.250
DB-24659*	239-14-22-066	2.078	.484	1.852	.578	1.000	.312	1.000	1.531
DC-24660*	239-14-22-067	2.718	.484	2.500	.578	1.375	.312	1.000	1.531
DD-24661*	239-14-22-049	2.625	.593	2.406	.687	1.406	.406	1.125	1.656

19977 RIGHT ANGLE CLAMP



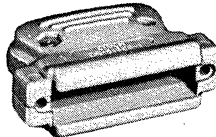
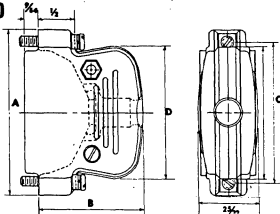
For use with D*, D*M and D*MA only



Material: Low carbon steel.
Finish: Cadmium plate, yellow chromate.
Corrosion Resistance: Passes 48 hour exposure to salt spray in accordance with MIL-STD-202D, Method 101C, Condition B.

Order No.* by Shell Size	Factory No.	A	B	C	E	F	G	H
DE-19977-5*	239-14-22-021	1.203	.718	.984	.437	.437	.468	.281
DA-19977-1*	239-14-22-013	1.531	.718	1.312	.437	.437	.468	.281
DB-19977-2*	239-14-22-014	2.078	.968	1.852	.437	.625	.468	.281
DC-19977-3*	239-14-22-015	2.718	1.187	2.500	.437	.812	.468	.281
DD-19977-4*	239-14-22-016	2.625	1.250	2.406	.562	.906	.531	.343

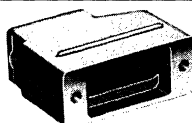
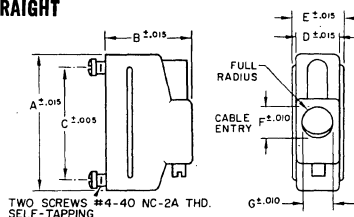
ALL MOLDED HOOD



Material: Grey Melamine.
Finish: None.
Corrosion Resistance: Hardware passes 48 hour exposure to salt spray in accordance with MIL-STD-202D, Method 101C, Condition B.

Order No.* by Shell Size	Factory No.	A	B	C	D
DA-51225-1*	239-13-99-069	1 3/4	1 1/4	1.312	1 1/2
DB-51226-1*	239-13-99-070	2 3/4	1 1/2	1.852	1 3/4

PLASTIC STRAIGHT



Material: Nylon.
Finish: None.
Corrosion Resistance: Hardware passes 48 hour exposure to salt spray in accordance with MIL-STD-202D, Method 101C, Condition B.

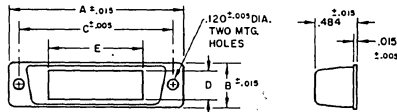
Order No.* by Shell Size	Factory No.	A	B	C	D	E	F	G
DE-51218-1*	239-13-99-101	1.218	1.000	.984	.500	.562	.281	.281
DA-51210-1*	239-13-99-124	1.546	1.000	1.312	.500	.562	.360	.360
DB-51212-1*	239-13-99-135	2.093	1.250	1.852	.500	.562	.493	.360

* These items available through Cinch distributors.

TRW® CINCH CONNECTORS

ACCESSORIES (Cont'd)

POTTING SHELLS

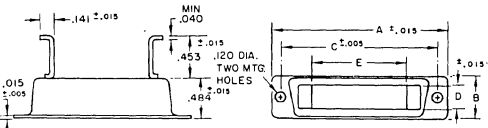


For use with D*, D*M and D*MA only

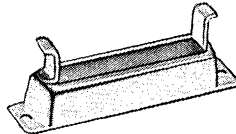


Material: Low carbon steel.
Finish: Cadmium plate, yellow chromate.
Corrosion Resistance: Passes 48 hour exposure to salt spray in accordance with MIL-STD-202D, Method 101C, Condition B.
 All tolerances are $\pm .010$ unless noted otherwise.

Order No. by Shell Size	Factory No.	A	B	C	D	E
DA-19678-10	239-14-22-009	1.531	.500	1.312	.300	.588
DB-19678-11	239-14-22-010	2.078	.500	1.852	.300	1.125
DC-19678-12	239-14-22-011	2.718	.500	2.500	.300	1.750
DD-19678-13	239-14-22-012	2.625	.609	2.406	.390	1.750



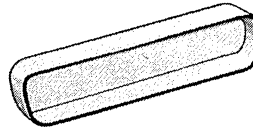
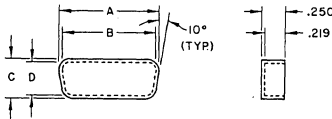
For use with D*, D*M and D*MA only



Material: Low carbon steel.
Finish: Cadmium plate, yellow chromate.
Corrosion Resistance: Passes 48 hour exposure to salt spray in accordance with MIL-STD-202D, Method 101C, Condition B.

Order No.	Factory No.	A	B	C	D	E
DA-19678-14	239-19-22-074	1.531	.500	1.312	.300	.588
DB-19678-15	239-19-22-075	2.078	.500	1.852	.300	1.125
DC-19678-16	239-19-22-076	2.718	.500	2.500	.300	1.750
DD-19678-17	239-19-22-077	2.625	.609	2.406	.390	1.750

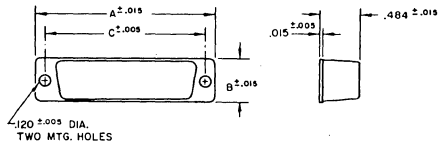
DUST CAPS



Material: Polypropylene (clear).
Finish: None.

Order No. by Shell Size	For Use with	Factory No.	A	B	C	D
DE-59-20	DE-9S	474-11-92-303	.694	.627	.362	.295
DE-60-20	DE-9P	474-11-92-304	.749	.682	.412	.345
DA-59-20	DA-15S	474-11-92-305	1.022	.955	.362	.295
DA-60-20	DA-15P	474-11-92-306	1.077	1.010	.412	.345
DB-59-20	DB-25S	474-11-92-301	1.562	1.495	.362	.295
DB-60-20	DB-25P	474-11-92-302	1.635	1.568	.430	.363
DC-59-20	DC-37S	474-11-92-307	2.210	2.143	.362	.295
DC-60-20	DC-37P	474-11-92-308	2.283	2.216	.430	.363
DD-59-20	DD-50S	474-11-92-309	2.116	2.049	.474	.407
DD-60-20	DD-50P	474-11-92-310	2.179	2.112	.536	.469

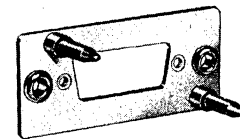
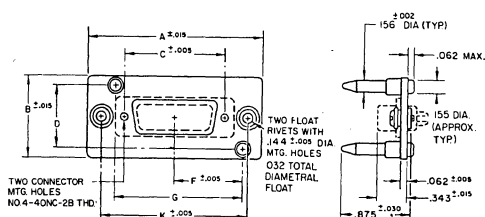
SWITCHING SHELLS



Material: Low carbon steel.
Finish: Cadmium plate, yellow chromate.
Corrosion Resistance: Passes 48 hour exposure to salt spray in accordance with MIL-STD-202D, Method 101C, Condition B.

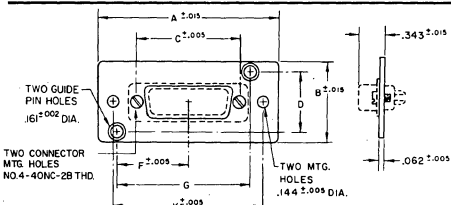
Order No. by Shell Size	Factory No.	A	B	C
DA-19678-6	239-14-22-005	1.531	.500	1.312
DB-19678-7	239-14-22-006	2.078	.500	1.852
DC-19678-8	239-14-22-007	2.718	.500	2.500
DD-19678-9	239-14-22-008	2.625	.609	2.406

GUIDE PIN PLATES



Material: Plates and float hardware are cold rolled steel; guidepins are stainless steel.
Finish: Cadmium plate, yellow chromate.
Corrosion Resistance: Passes 48 hour exposure to salt spray in accordance with MIL-STD-202A, Method 101A, Condition B.

Order No. by Shell Size	Factory No.	A	B	C	D	F	G	K
DA-22213	442-36-22-703	2.281	1.000	1.312	.750	.898	1.663	1.906
DB-22255	442-36-22-701	2.820	1.000	1.852	.750	1.168	2.203	2.446
DC-22070	442-36-22-702	3.468	1.000	2.500	.750	1.492	2.851	3.094
DD-21962	442-36-22-706	3.375	1.125	2.406	.874	1.437	2.749	3.000



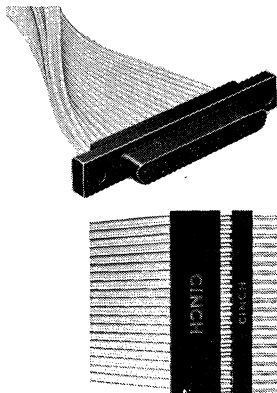
Material: Cold rolled steel.
Finish: Cadmium plate, yellow chromate.
Corrosion Resistance: Passes 48 hour exposure to salt spray in accordance with MIL-STD-202A, Method 101A, Condition B.

Order No.	Factory No.	A	B	C	D	F	G	K
DA-22214	442-36-22-503	2.281	1.000	1.312	.750	.898	1.663	1.906
DB-22254	442-36-22-502	2.820	1.000	1.852	.750	1.168	2.203	2.446
DC-22071	442-36-22-501	3.468	1.000	2.500	.750	1.492	2.851	3.094
DD-21961	442-36-22-500	3.375	1.125	2.406	.874	1.437	2.749	3.000

FOR ACCESSORIES OTHER THAN THOSE SHOWN, CONSULT FACTORY

TRW[®] CINCH CONNECTORS

DURA-CON[®] SERIES MICROMINIATURE CONNECTORS ON .050" CENTERS



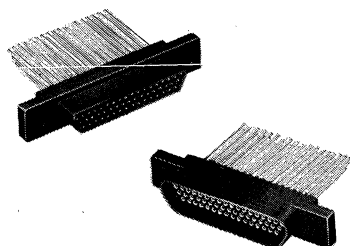
- High contact density with up to 266 contacts per square inch.
- Lightweight.
- Rugged, reliable contacts.
- Shock and vibration resistant.

The Cinch Dura-Con Series of Microminiature Strip and Rectangular connectors are ideally suited for space and weight reduction in miniaturized airborne electronics and for shorter signal paths in electronic data processing equipment. Both Cinch Dura-Con Series have rugged, high-performance contacts capable of providing shock and vibration proof continuity from dry circuit to three amperes current.

This is accomplished by making the pin the spring member. The Cinch Dura-Con is

made from a precision miniature spring cable with a welded tip. The expanded cable provides seven spring members peripherally around the pin so that no matter what radial forces are applied, contact is maintained with the mating socket wall. Furthermore, this flexible spring pin can be bent many times without evidencing any metal fatigue. By protecting this pin in a recessed tolerance cavity, reliable mating is assured. Hence, despite its small size, the Cinch Dura-Con provides superior performance.

DURA-CON D RECTANGULAR MICROMINIATURE CONNECTORS



PERFORMANCE DATA

ELECTRICAL

Current Rating: 3 amperes.

Contact Resistance: Nominal 4 milliohms, maximum 8 milliohms

Dielectric Withstanding Voltage:

Sea Level: 900V RMS 60 Hz.

70,000 Ft.: 300V RMS 60 Hz.

Insulation Resistance: 5,000 megohms minimum.

MECHANICAL

Contact Engaging Force: 6 oz. per contact maximum.

Contact Separation Force: 1/2 oz. per contact minimum.

ENVIRONMENTAL

Temperature: -65°F to 300°F.

Vibration and Shock: No discontinuity detected (equipment sensitivity 6 nanoseconds) during 10 to 2,000 cps at .06" double amplitude or 50 g. 20 shocks 500 g.

Durability: Contact resistance still within specification after 500 cycles mating and unmating.

Salt Spray: No damage — Contact resistance still within specification after mated sample exposed 48 hours per MIL-STD-202B, Method 101A, Condition B.

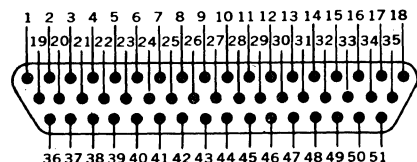
DURA-CON D RECTANGULAR CONNECTORS

This series of microminiature rectangular connectors is available in contact layouts with 9, 15, 21, 25, 37, and 51 positions. In addition to the 1/2" long #24 AWG solid copper leads and 18" long #26 AWG stranded Type E insulated wire terminations, this connector series can be supplied with custom terminations.

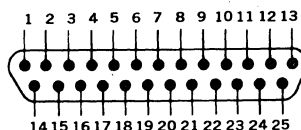
Contacts: 24 gage copper alloy, gold plated.

Insulator: Glass-filled polyester SE-O.

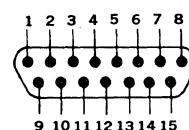
CONTACT ARRANGEMENTS (FACE VIEW OF PIN INSERT)



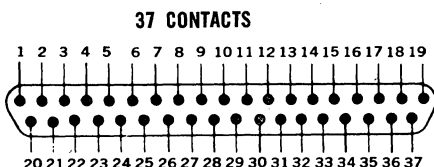
51 CONTACTS



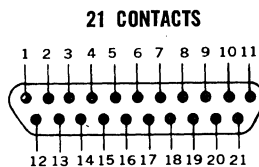
25 CONTACTS



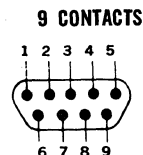
15 CONTACTS



37 CONTACTS



21 CONTACTS



9 CONTACTS

*Trade Name TRW Inc.

TRW[®] CINCH CONNECTORS

DURA-CON D RECTANGULAR MICROMINIATURE CONNECTORS

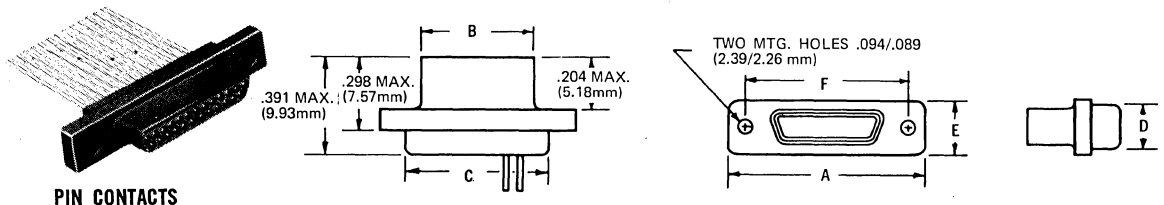
Termination: #24 AWG Solid Copper Leads, 1/2" long

No. of Contacts	P — Pin S — Socket	Distributor Part No.	Factory Part No.
9	P	DCDA-9P4C4-00.5	280-51-09-001
	S	DCDA-9S4C4-00.5	280-52-09-001
15	P	DCDA-15P4C4-00.5	280-51-15-001
	S	DCDA-15S4C4-00.5	280-52-15-001
21	P	DCDA-21P4C4-00.5	280-51-21-001
	S	DCDA-21S4C4-00.5	280-52-21-001
25	P	DCDA-25P4C4-00.5	280-51-25-001
	S	DCDA-25S4C4-00.5	280-52-25-001
37	P	DCDA-37P4C4-00.5	280-51-37-001
	S	DCDA-37S4C4-00.5	280-52-37-001
51	P	DCDA-51P4C4-00.5	280-51-51-001
	S	DCDA-51S4C4-00.5	280-52-51-001

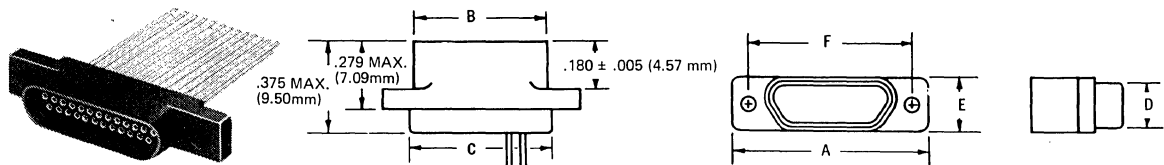
Termination: 18" #26 AWG Stranded, Type E, Yellow Insulation

No. of Contacts	P — Pin S — Socket	Distributor Part No.	Factory Part No.
9	P	DCDA-9P6E2-18.0	280-53-09-001
	S	DCDA-9S6E2-18.0	280-54-09-001
15	P	DCDA-15P6E2-18.0	280-53-15-001
	S	DCDA-15S6E2-18.0	280-54-15-001
21	P	DCDA-21P6E2-18.0	280-53-21-001
	S	DCDA-21S6E2-18.0	280-54-21-001
25	P	DCDA-25P6E2-18.0	280-53-25-001
	S	DCDA-25S6E2-18.0	280-54-25-001
37	P	DCDA-37P6E2-18.0	280-53-37-001
	S	DCDA-37S6E2-18.0	280-54-37-001
51	P	DCDA-51P6E2-18.0	280-53-51-001
	S	DCDA-51S6E2-18.0	280-54-51-001

DIMENSIONS



PIN CONTACTS

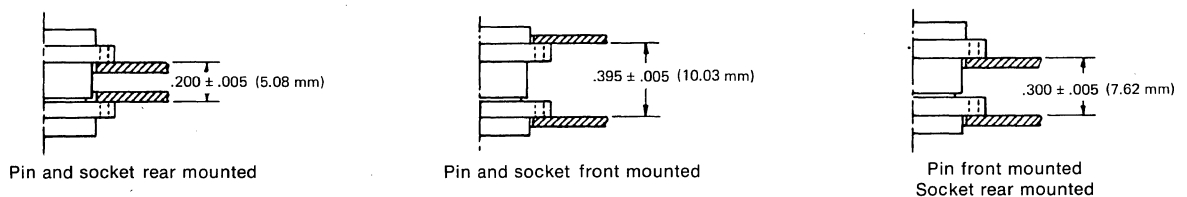


SOCKET CONTACTS

Part No.	A Max.	B Max.	C Max.	D Max.	E Max.	F Max.
DCDA-9P	.785(19.93)	.2905(7.38)	.403(10.23)	.170(4.32)	.215(5.46)	.565(14.35)
DCDA-9S	.785(19.93)	.3760(9.55)	.403(10.23)	.170(4.32)	.215(5.46)	.565(14.35)
DCDA-15P	.935(23.74)	.4405(11.21)	.553(14.04)	.170(4.32)	.215(5.46)	.715(18.16)
DCDA-15S	.935(23.74)	.5260(13.36)	.553(14.04)	.170(4.32)	.215(5.46)	.715(18.16)
DCDA-21P	1.085(27.38)	.5905(14.91)	.703(17.73)	.170(4.32)	.205(5.26)	.865(21.97)
DCDA-21S	1.085(27.38)	.5905(15.14)	.703(17.73)	.170(4.32)	.205(5.26)	.865(21.97)
DCDA-25P	1.185(30.09)	.6905(17.54)	.803(20.39)	.170(4.32)	.215(5.46)	.965(24.51)
DCDA-25S	1.185(30.09)	.7760(19.71)	.803(20.39)	.170(4.32)	.215(5.46)	.965(24.51)
DCDA-37P	1.485(37.71)	.9905(25.16)	1.103(28.01)	.170(4.32)	.215(5.46)	1.270(32.25)
DCDA-37S	1.485(37.71)	1.0760(27.33)	1.103(28.01)	.170(4.32)	.215(5.46)	1.270(32.25)
DCDA-51P	1.435(36.44)	.9405(23.89)	1.053(26.74)	.213(5.41)	.258(6.55)	1.215(30.86)
DCDA-51S	1.435(36.44)	1.0260(26.06)	1.053(26.74)	.213(5.41)	.258(6.55)	1.215(30.86)

NOTE: P — Pin, S — Socket. (Bracketed figures millimeters)

PANEL MOUNTING DIMENSIONS



TRW[®] CINCH CONNECTORS

DURA-CON D RECTANGULAR MICROMINIATURE CONNECTORS (Cont'd)

PANEL CUTOUT DIMENSIONS

FIGURE 1 — FRONT MOUNTING

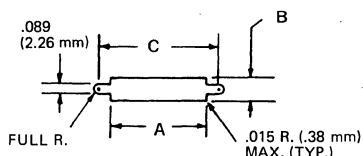
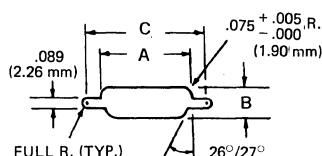


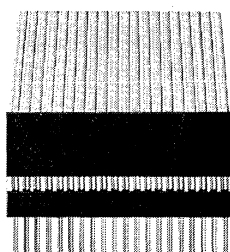
FIGURE 2 — REAR MOUNTING



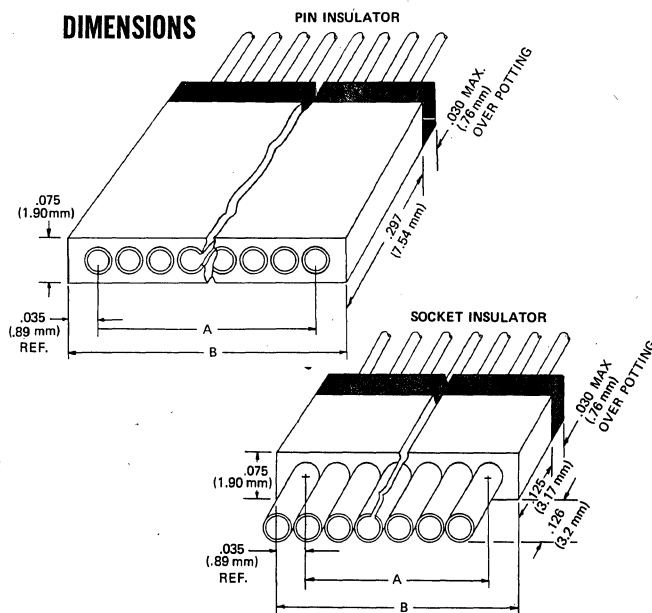
Size	Fig.	A +.004(.102) -.000(.000)	B +.004(.102) -.000(.000)	C +.005(.127) -.000(.000)
DCDA-9	1	.408(10.36)	.172(4.37)	.570(14.49)
DCDA-9	2	.381(9.68)	.216(5.49)	.570(14.49)
DCDA-15	1	.558(14.17)	.172(4.37)	.720(18.29)
DCDA-15	2	.531(13.49)	.216(5.49)	.720(18.29)
DCDA-21	1	.706(17.93)	.172(4.37)	.870(22.10)
DCDA-21	2	.673(17.09)	.216(5.49)	.870(22.10)
DCDA-25	1	.808(20.52)	.172(4.37)	.970(24.64)
DCDA-25	2	.731(18.56)	.216(5.49)	.970(24.64)
DCDA-37	1	1.108(28.14)	.172(4.37)	1.270(32.26)
DCDA-37	2	1.081(27.46)	.216(5.49)	1.270(32.26)
DCDA-51	1	1.058(26.87)	.215(5.46)	1.220(30.99)
DCDA-51	2	1.031(26.19)	.259(6.58)	1.220(30.99)

(Bracketed figures millimeters)

MICROMINIATURE STRIP CONNECTORS



DIMENSIONS



DURA-CON STRIP CONNECTORS

For maximum flexibility of application, Cinch Dura-Con contacts are available in strips on .050" centers. By cutting, adding, or stacking, a variety of contact arrangements can be achieved. These versatile connector strips are available with up to 120 contact positions on special order. Moreover, guide pins that engage prior to the contact in the mating cycle, can be provided to assist in mating and polarization.

Contacts: 24 gage copper alloy, gold plated.

Insulator: Glass-filled polyester SE-O.



DURA-CON STRIP CONNECTORS

Termination: #24 AWG Solid Copper Leads, 1/2" Long

No. of Contacts	P — Pin S — Socket	Distributor Part No.	Factory Part No.
5	P	CSA1-5P4C4-00.5	280-10-05-001
	S	CSA1-5S4C4-00.5	280-20-05-001
10	P	CSA1-10P4C4-00.5	280-10-10-001
	S	CSA1-10S4C4-00.5	280-20-10-001
15	P	CSA1-15P4C4-00.5	280-10-15-001
	S	CSA1-15S4C4-00.5	280-20-15-001
20	P	CSA1-20P4C4-00.5	280-10-20-001
	S	CSA1-20S4C4-00.5	280-20-20-001

NOTE: P — Pin, S — Socket.

Part No.	A	B Max.
CSA1-5P/5S	.200(5.080)	.270(6.858)
CSA1-10P/10S	.450(11.420)	.520(13.198)
CSA1-15P/15S	.700(17.780)	.770(19.558)
CSA1-20P/20S	.950(24.130)	1.020(25.908)

(Bracketed figures millimeters)

Termination: 18" #26 AWG Stranded, Type E, Yellow Insulation

No. of Contacts	P — Pin S — Socket	Distributor Part No.	Factory Part No.
5	P	CSA1-5P6E2-18.0	280-30-05-001
	S	CSA1-5S6E2-18.0	280-40-05-001
10	P	CSA1-10P6E2-18.0	280-30-10-001
	S	CSA1-10S6E2-18.0	280-40-10-001
15	P	CSA1-15P6E2-18.0	280-30-15-001
	S	CSA1-15S6E2-18.0	280-40-15-001
20	P	CSA1-20P6E2-18.0	280-30-20-001
	S	CSA1-20S6E2-18.0	280-40-20-001

TRW[®] CINCH CONNECTORS

GENERAL FEATURES AND DESCRIPTION

CINCH SOLDERLESS RIBBON CONNECTORS

Now the popular Cinch Ribbon Connector is available with solderless terminations. This new Series of connectors is compatible in every way with 150,000,000 Cinch Ribbon Connectors now in use throughout the communications industry. The new Solderless Cinch Ribbon Connector Series can be assembled with automatic, semi-automatic or field assembly tools. They provide gas tight connections for both 24 and 26 gauge solid wire with speeds that far exceed conventional soldering techniques.

The newly designed Solderless Cinch Ribbon incorporates a built-in strain relief to prevent any inadvertent removal of wires. All existing Cinch Ribbon hardware is available on the new connectors.

BLUE RIBBON* CONNECTORS

Cinch's Blue Ribbon Connectors are ideal for a wide variety of applications. The smooth, easy insertion and extraction action and the self-wiping, self-cleaning features of both mating contact members give Blue Ribbon Connectors added reliability. The ribbon contact principal itself eliminates the possibility of bent contacts. Rack and panel plugs and receptacles are available with barrier-type polarization in four sizes: 8, 16, 24, and 32 contacts. Special 16-contact rack and panel plug and receptacle are also available with pin-type polarization.

CINCH RIBBON CONNECTORS

The extremely small Cinch Ribbon Connectors were designed to allow utilization of the unique "ribbon" contact features in miniaturization programs, particularly in airborne electronics and computer projects, for increased reliability. Available in as many as 50 contacts, it is possible to route a great many circuits through one or more small connectors at a great savings of space and weight. Mounting types include rack and panel, cable-to-chassis and cable-to-cable, each in 14, 24, 36, and 50-contact sizes. In addition, a special 50-contact "high barrier" plug and receptacle is also available for rack and panel or cable-to-cable mounting.

*Registered Trademark of Bunker-Ramo Corporation.

BLUE RIBBON CONNECTOR PERFORMANCE DATA

ELECTRICAL

Voltage Ratings:

- a) At Sea Level 800 Volts D.C.
- b) At 70,000 Feet 300 Volts D.C.

Contact Current

Rating: 5 Amperes

Contact Resistance: .003 Ohms Max.

Insulation Resistance

(As Received): 100,000 Megohms Min.

CINCH RIBBON & SOLDERLESS RIBBON CONNECTOR PERFORMANCE DATA

ELECTRICAL

Voltage Ratings:

- | | Volts |
|-------------------|-----------------------|
| a) At Sea Level | 500 A.C. RMS 700 D.C. |
| b) At 70,000 Feet | 125 A.C. RMS 200 D.C. |

Contact Current

Rating: 5 Amperes

Contact Resistance: .003 Ohms Average

Insulation Resistance

(As Received): 5000 Megohms Min.

INDEX

SOLDERLESS RIBBON CONNECTORS

	Page
For Cable to Cable Mounting	3
Design Features	4
Performance Data	Above
Systems for Terminating	5

BLUE RIBBON CONNECTORS

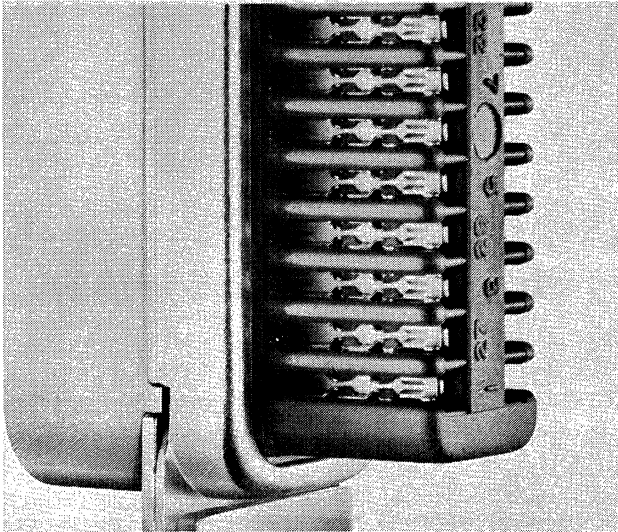
For Rack and Panel Mounting — Barrier Polarization Type.....	9
For Rack and Panel Mounting — Pin Polarization Type.....	9
Performance Data.....	Above

CINCH RIBBON CONNECTORS

For Rack and Panel Mounting.....	6
For Cable-to-Chassis Mounting.....	6-7
For Cable-to-Cable Mounting.....	7
For Rack and Panel Mounting — Special "High Barrier"	8
For Cable-to-Cable Mounting — Special "High Barrier"	8
Polyethylene Dust Covers	8
Performance Data.....	Above

TRW[®] CINCH CONNECTORS

CINCH SOLDERLESS RIBBON CONNECTORS

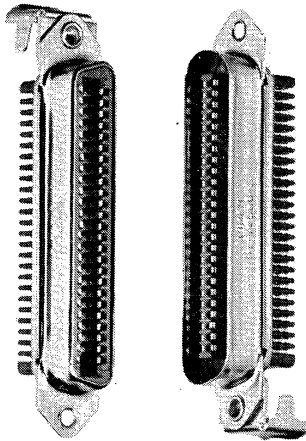


The Solderless Cinch Ribbon Connector has all the quality features of the solder type Cinch Ribbon Connectors, are intermateable and utilize all the same hardware.

The solderless Cinch Ribbon Series can be terminated with automatic, semi-automatic or field hand tools. Each contact provides four gas-tight connections for both 24 and 26 gauge solid wire. Termination speeds far exceed soldering techniques.

This newly designed connector incorporates a built-in strain relief in each contact to prevent any inadvertent removal of the wires; however, contacts can be reused without physical damage or electrical degradation.

CABLE-TO-CABLE PLUG & RECEPTACLE



Miniaturized rack and panel connectors utilizing "ribbon" contact feature. Smooth, easy insertion/extraction action plus the double-sided, self-cleaning, flexing action of both mating contact members provide added reliability. Shell-type polarization and float-mounted receptacle assure proper alignment. Insulator material is diallyl phthalate, Type MDG per MIL-M-14F. Plug and receptacle contacts are of cadmium bronze, ASTM-B-105, with a finish of .00002 gold per MIL-G-45204 Type II over copper flash. Shells are brass, ASTM-B-36 Alloy 6, with a finish of .0002 to .0004 zinc. No stripping of wires required for perfect connections, when terminated with Cinch Auto-Clinch, Clinch or Mini-Clinch tools.

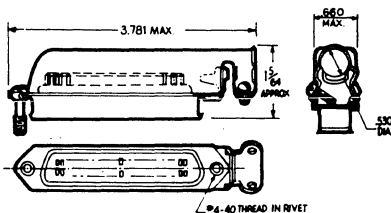
CONNECTORS WITH DEEP HOOD

No. of Contacts	PLUGS TRW/Cinch Part No.	RECEPTACLE TRW/Cinch Part No.
50	222-33-50-091	222-43-50-069

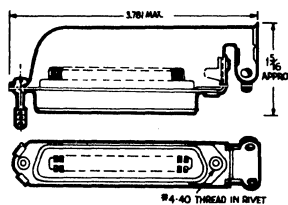
CONNECTORS WITH SHALLOW HOODS

No. of Contacts	PLUGS TRW/Cinch Part No.	RECEPTACLE TRW/Cinch Part No.
50	222-33-50-092	222-43-50-070

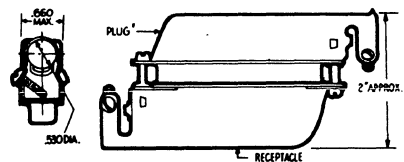
DIMENSIONAL DATA



PLUG



RECEPTACLE



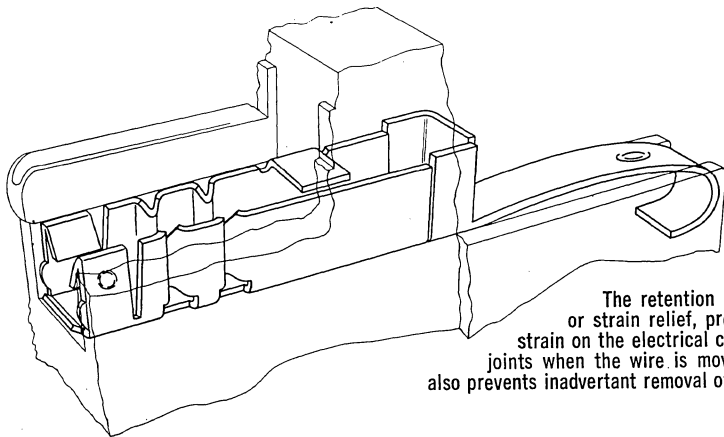
MATING PLUG & RECEPTACLE

TRW[®] CINCH CONNECTORS

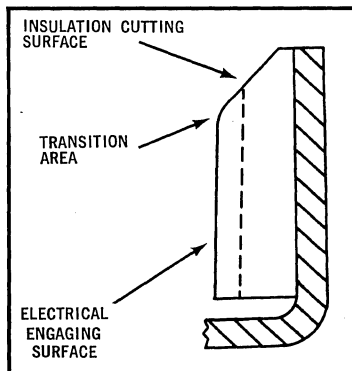
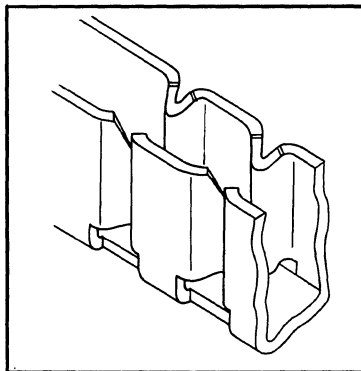
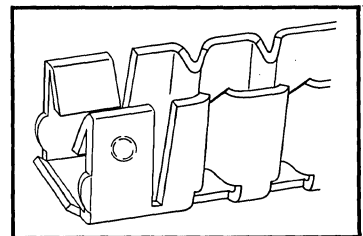
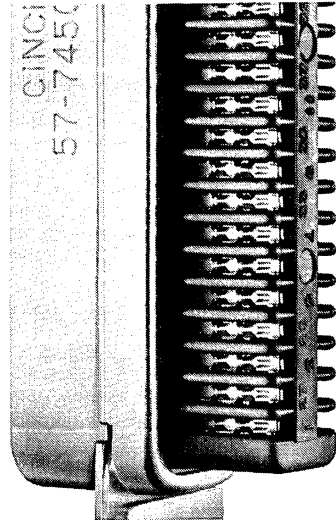
CINCH SOLDERLESS RIBBON CONNECTORS

FEATURES

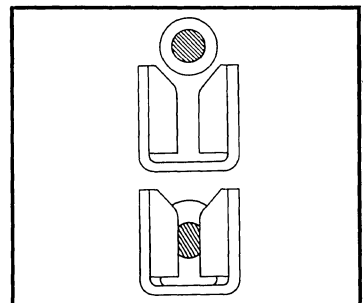
- Identical mating to standard solder type connector.
- Same contact material.
- Same mating and mounting dimensions.
- Will handle 24 and 26 gauge solid wire.
- Built-in wire restraint.
- 4 points of contact provide redundancy.
- Exactly same mounting and auxiliary hardware.
- Rapid field wiring.
- Totally interchangeable with existing Cinch Ribbon Connectors and hardware.



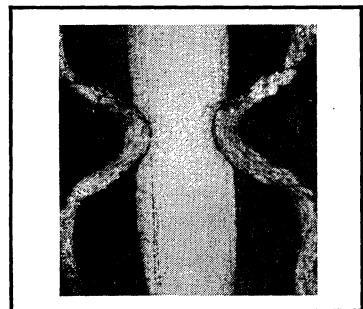
The retention device or strain relief, prevents strain on the electrical contact joints when the wire is moved. It also prevents inadvertant removal of wire.



The shape of the wire terminating end of the contact is arranged with four indents. These indents are so constructed and shaped as to peel the insulation off the wire at these points. The step-by-step progression is as follows. As the wire enters, the insulation is peeled off by the ramp shape of the contact indents. This leads into a coined, relatively sharp area. As the wire, after the insulation is removed, progresses into the remaining contact pocket, the transition area permits the conductor to be deformed and held between each set of the two opposing indented sections. The result is four gas tight connections on each conductor.



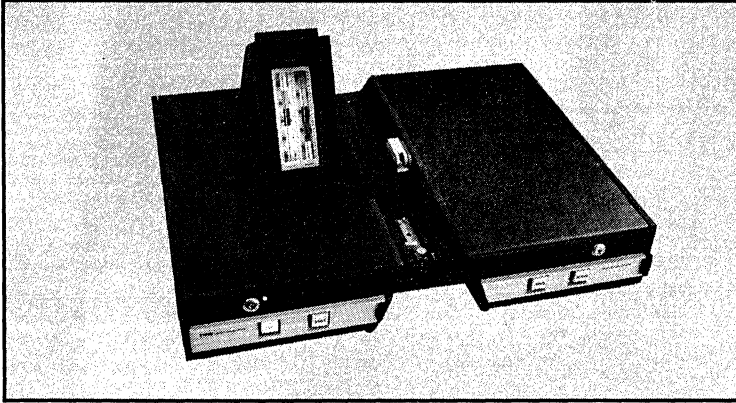
Insulation, both standard PVC and irradiated PVC is pierced sufficiently to facilitate electrical connection.



Photomicrographic of 24 gauge longitudinal cross section of prime electrical contact area.

TRW[®] CINCH CONNECTORS

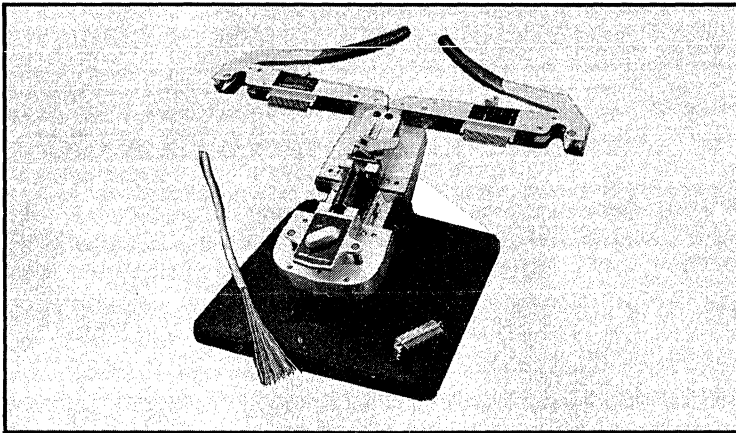
SYSTEMS FOR TERMINATING THE CINCH SOLDERLESS RIBBON CONNECTOR



AUTO-CLINCH

PART NO. 599-11-11-310

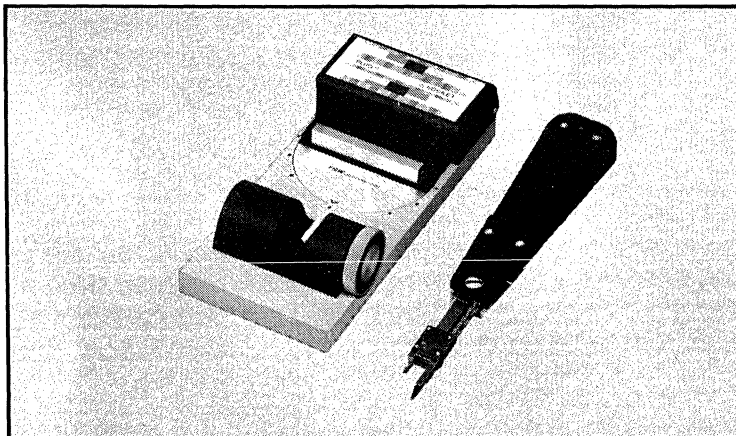
Auto-Clinch for rapid factory wiring. Completely terminates a 50-contact connector in less than 2 minutes. Has provision for omission of wires, inspection check during wiring, correction of errors and changing of wiring codes.



CLINCH

PART NO. 599-11-11-312

Clinch terminates a 50-contact connector in less than 4 minutes. Designed for field assembly and low production applications, it is readily portable and requires no set-up time.



MINI-CLINCH

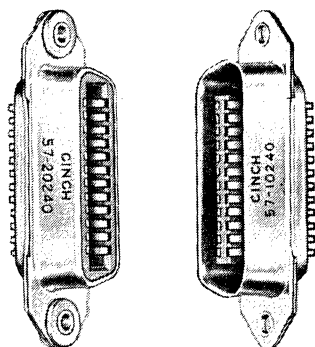
PART NO. 599-11-11-309

Mini-Clinch is a lightweight belt-mounted unit that enables a serviceman in the field to terminate a 50-contact connector in less than 5 minutes. It can be used with 90° or 180° connectors. Wires are automatically cut as they are inserted into the terminals.

TRW[®] CINCH CONNECTORS

CINCH RIBBON CONNECTORS

RACK AND PANEL PLUGS & RECEPTACLES



57-20240 RECEPTACLE

57-10240 PLUG

Miniaturized rack and panel connectors utilizing "ribbon" contact feature. Smooth, easy insertion/extraction action plus the double-sided, self-cleaning, flexing action of both mating contact members provide added reliability. Shell-type polarization and float-mounted receptacle assure proper alignment. Insulator material is diallyl phthalate, type MDG per MIL-M-14F. Plug and receptacle contacts are of cadmium bronze, ASTM-B-105, with a finish of .00002 gold per MIL-G-45204 type II over copper flash. Shells are brass, ASTM-B-36 Alloy 6, with a finish of .0002 to .0004 zinc. Pretinning wires before soldering is recommended. 14, 24, 36 and 50-contact sizes are available.

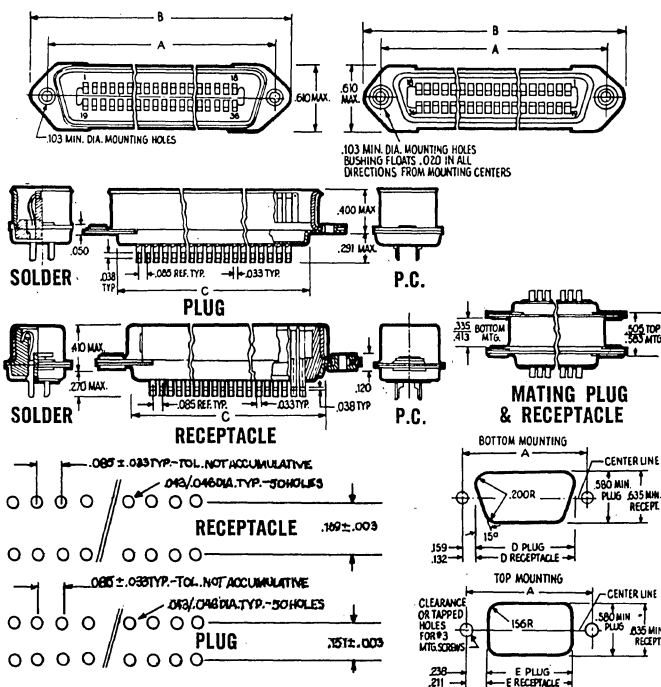
PART NUMBER ORDERING INFORMATION

No. of Contacts	SOLDER		P.C.	
	Plug Part No.*	Receptacle Part No.*	Plug Part No.*	Receptacle Part No.*
14	57-10140	57-20140	57-10140-4	57-20140-8
24	57-10240	57-20240	57-10240-3	57-20240-8
36	57-10360	57-20360	57-10360-13	57-20360-9
50	57-10500	57-20500	57-10500-27	57-20500-31

*Part numbers shown in Listing have finish of clear chromate. If finish of yellow chromate is desired, add ".1" to appropriate part number(s) in listing to indicate same. (Examples: 57-10140-1 or 57-20140-1.)

Ⓢ Indicates items normally available through Cinch distributors.

DIMENSIONAL DATA

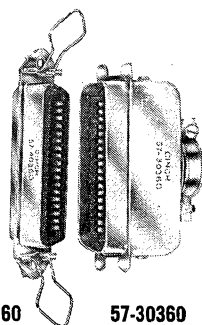


MOUNTING LAYOUTS

P.C.	SOLDER	TYPE	DIMENSIONS†				
			A	B	C	D Min.	E Min.
57-10140-4	57-10140	Plug	1.417	1.750	.910	1.098	.940
57-20140-8	57-20140	Receptacle	1.417	1.750	.910	1.153	.995
57-10240-3	57-10240	Plug	1.842	2.175	1.335	1.523	1.365
57-20240-8	57-20240	Receptacle	1.842	2.175	1.335	1.578	1.420
57-10360-13	57-10360	Plug	2.352	2.685	1.845	2.033	1.875
57-20360-9	57-20360	Receptacle	2.352	2.685	1.845	2.088	1.930
57-10500-27	57-10500	Plug	2.947	3.270	2.440	2.628	2.472
57-20500-31	57-20500	Receptacle	2.947	3.270	2.440	2.683	2.525

†NOTE: All dimensions are reference.

CABLE TO CHASSIS PLUGS & RECEPTACLES

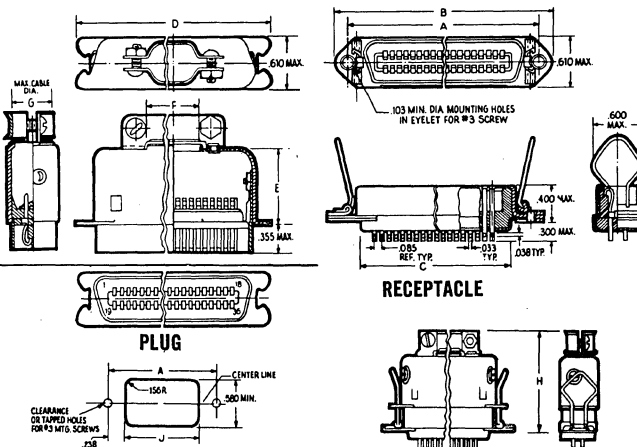


57-40360

57-30360

Miniaturized connectors with same basic features as those shown on above except plug is equipped with hood and cable clamp while receptacle has sturdy spring-type latches which are guided and held by cut-outs in plug hood flanges. Insulator body is molded of diallyl phthalate, type MDG per MIL-M-14F. Plug and

DIMENSIONAL DATA



MOUNTING LAYOUT

MATING PLUG & RECEPTACLE

TRW[®] CINCH CONNECTORS

CINCH RIBBON CONNECTORS (Cont'd)

CABLE TO CHASSIS PLUGS & RECEPTACLES (Cont'd)

receptacle contacts are cadmium bronze, ASTM-B-105 with a finish of .00002 gold per MIL-G-45204 type II over copper flash. Shells are brass, ASTM-B-36 Alloy 6, with a finish of .0002 to .0004 zinc. Pretinning wires before soldering is recommended. 14, 24, 36 and 50-contact sizes are available.

PART NUMBER ORDERING INFORMATION

No. of Contacts	Plug Part No.* (with hood) [Ⓢ]	Receptacle Part No.* (with latches) [Ⓢ]
14	57-30140	57-40140
24	57-30240	57-40240
36	57-30360	57-40360
50	57-30500	57-40500

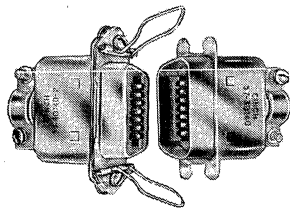
*Part numbers shown in listing have finish of clear chromate. If finish of yellow chromate is desired, add "-1" to appropriate part number(s) in listing to indicate same. (Example: 57-30140-1 or 57-40140-1.)

[Ⓢ] Indicates items normally available through Cinch distributors.

Dimensions†	Type	A	B	C	D	E	F	G	H	J min.
57-30140	Plug	—	—	—	1.495	.843	.306	.422	1.668	—
57-40140	Receptacle	1.417	1.750	.910	—	—	—	—	—	.940
57-30240	Plug	—	—	—	1.920	.825	.473	.473	1.668	—
57-40240	Receptacle	1.842	2.175	1.335	—	—	—	—	—	1.365
57-30360	Plug	—	—	—	2.431	.905	.640	.473	1.730	—
57-40360	Receptacle	2.352	2.685	1.845	—	—	—	—	—	1.875
57-30500	Plug	—	—	—	3.025	.995	.766	.473	1.825	—
57-40500	Receptacle	2.947	3.270	2.440	—	—	—	—	—	2.472

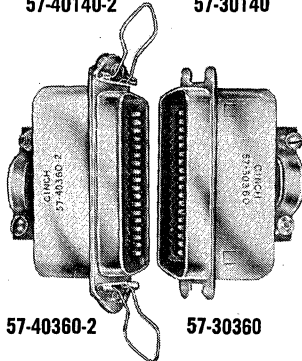
†NOTE: All dimensions are reference.

CABLE-TO-CABLE PLUGS & RECEPTACLES



57-40140-2

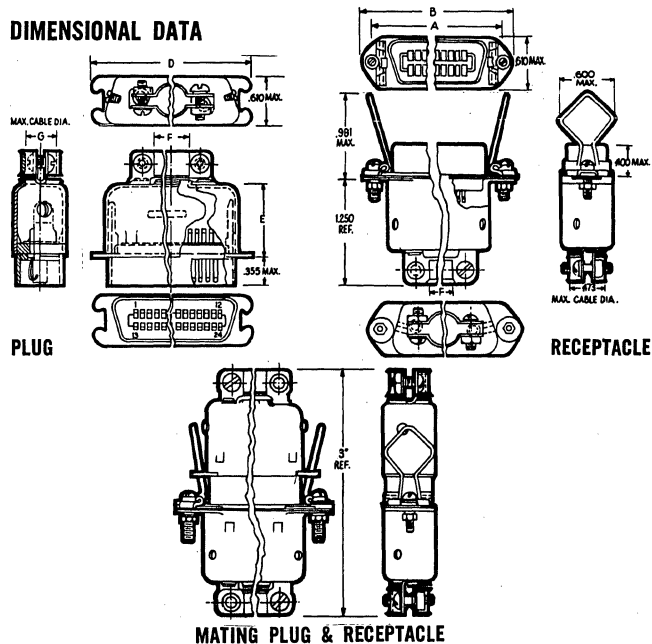
57-30140



57-40360-2

57-30360

DIMENSIONAL DATA



PLUG

RECEPTACLE

MATING PLUG & RECEPTACLE

Same miniaturized connectors as shown on two previous pages except both plug and receptacle are equipped with hood and cable clamp for cable-to-cable application. Receptacle also has spring-type latches which are held by cutouts in plug hood flanges. Insulator material is diallyl phthalate, type MDG per MIL-M-14F. Plug and receptacle contacts are cadmium bronze, ASTM-B-105 with a finish of .00002 gold per MIL-G-45204 type II over copper flash. Shells are brass, ASTM-B-36 Alloy 6, with a finish of .0002 to .0004 zinc. Pretinning wires before soldering is recommended. 14, 24, 36 and 50-contact sizes are available.

PART NUMBER ORDERING INFORMATION

No. of Contacts	Plug Part No.* (with hood) [Ⓢ]	Receptacle Part No.* (with hood and latches) [Ⓢ]
14	57-30140	57-40140-†
24	57-30240	57-40240-†
36	57-30360	57-40360-†
50	57-30500	57-40500-†

[Ⓢ] Indicates items normally available through Cinch distributors.

Dimensions†	Type	A	B	D	E	F	G
57-30140	Plug	—	—	1.495	.843	.306	.422
57-40140-2	Receptacle	1.417	1.750	—	—	.306	.422
57-30240	Plug	—	—	1.920	.825	.473	.473
57-40240-3	Receptacle	1.842	2.175	—	—	.473	.473
57-30360	Plug	—	—	2.431	.905	.640	.473
57-40360-2	Receptacle	2.352	2.685	—	—	.640	.473
57-30500	Plug	—	—	3.025	.995	.766	.473
57-40500-2	Receptacle	2.947	3.270	—	—	.766	.473

*Part numbers shown in listing have clear chromate finish. If finish of yellow chromate is desired, add "-1" to appropriate plug part number(s) in listing. (Example: 57-30240-1) and "-6" to appropriate receptacle part number(s). (Example: 57-40240-6.)

NOTES:

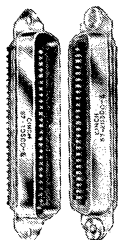
†These cable-to-cable receptacles are available for large volume requirements only; consult factory for details.

‡All dimensions are reference.

TRW[®] CINCH CONNECTORS

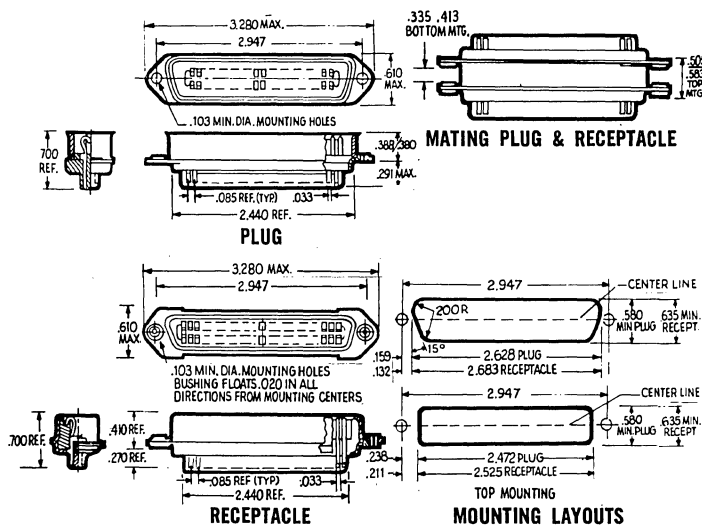
CINCH RIBBON CONNECTORS (Cont'd)

SPECIAL "HIGH-BARRIER" RACK AND PANEL PLUG & RECEPTACLE



Available in 50-contact size only. Same as 50-contact rack and panel connector shown on page 5, except for a special "high barrier" (additional insulator material) interposed between opposite rows of contacts. Insulator body is molded of diallyl phthalate, type MDG per MIL-M-14F. Plug and receptacle contacts are of cadmium bronze, ASTM-B-105, with a finish of .00003 gold per MIL-G-45204 type II over gold flash per MIL-G-45204 type I over .00005 copper per MIL-C-14550. Shells are brass, ASTM-B-36 Alloy 6, with a finish of .0002 to .0004 zinc. Polyethylene dust covers also available as shown below.

DIMENSIONAL DATA

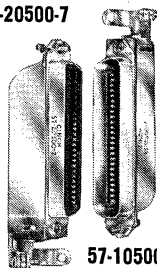


PART NUMBER ORDERING INFORMATION

No. of Contacts	Plug Part No. (C _D)	Receptacle Part No. (C _D)
50	57-10500-6	57-20500-6

SPECIAL "HIGH-BARRIER" CABLE-TO-CABLE PLUG & RECEPTACLE

57-20500-7



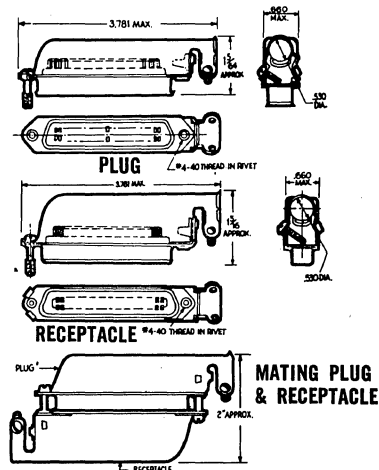
57-10500-7

Same as 50-contact rack and panel connector shown above except for special hood and hardware for cable-to-cable applications. Plug and receptacle have same special "high barrier" of insulator material interposed between opposite rows of contacts. Insulator body is molded of diallyl phthalate, type MDG per MIL-M-14F. Plug and receptacle contacts are of cadmium bronze, ASTM-B-105 with a finish of .00003 gold per MIL-G-45204 type II over gold flash per MIL-G-45204 type I over .00005 copper per MIL-C-14550. Shells are brass, ASTM-B-36 Alloy 6, with a finish of .0002 to .0004 zinc. Polyethylene dust covers are also available as described below.

PART NUMBER ORDERING INFORMATION

No. of Contacts	Plug Part No. (C _D)	Receptacle Part No. (C _D)
50	57-10500-7	57-20500-7

DIMENSIONAL DATA



POLYETHYLENE DUST COVERS



PART NUMBER ORDERING INFORMATION

Plug Cover Part No.	Color and Type	Receptacle Cover Part No.	Color and Type
57-1008	Blue — Fits Inside Shell	57-1022	Red — Fits Outside Shell

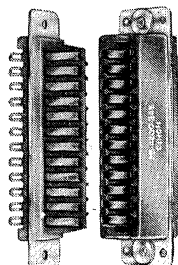
The 50-contact Cinch Ribbon connectors can be supplied with optional polyethylene dust covers. Two types of covers are available: one for the plugs and one for the receptacles. The plug cover is blue and fits inside the shell. The receptacle cover is red and fits outside the shell. The covers can be used only with these 50-contact size connectors.

(C_D) Indicates items normally available through Cinch distributors.

TRW[®] CINCH CONNECTORS

BLUE RIBBON CONNECTORS

RACK AND PANEL PLUGS & RECEPTACLES — BARRIER POLARIZATION TYPE



26-4100-24P 26-4200-24S

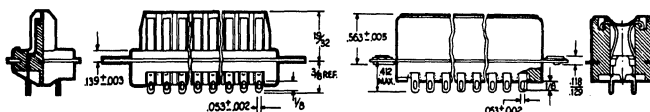
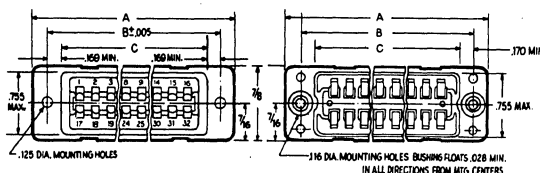
The interlocking design of these mating plug and receptacle bodies provides positive polarization equal to any other type. This barrier-type polarization makes visual alignment unnecessary since it is not dependent on contact arrangement. The float-mounted receptacle allows for possible misalignment with the mating plug. Insulator material is diallyl phthalate, type MDG per MIL-M-14F. Plug contacts are of copper, ASTM-B-152, type ETP, with a finish of .00002 gold per MIL-G-45204 type II over copper flash. Receptacle contacts are of phosphor bronze, ASTM-B-103, MIL-B-892, Grade A, with the same finish as on the plug contacts. The mounting plate, of corrosion resistant, passivated stainless steel, provides a sturdy mounting.

PART NUMBER ORDERING INFORMATION

No. of Contacts	Plug Part No. (C)	Receptacle Part No. (C)
8	26-4100-8P	26-4200-8S
16	26-4100-16P	26-4200-16S
24	26-4100-24P	26-4200-24S
32	26-4100-32P	26-4200-32S

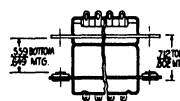
(C) Indicates items normally available through Cinch distributors.

DIMENSIONAL DATA

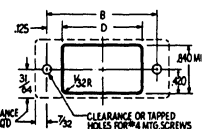


PLUG

RECEPTACLE



MATING PLUG & RECEPTACLE

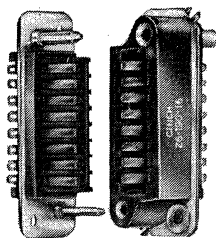


MOUNTING LAYOUT

DIMENSIONS*	A	B	C	D (Min.)
26-4100-8P or 26-4200-8S	1 $\frac{3}{32}$	1.375	1 $\frac{1}{32}$	1.120
26-4100-16P or 26-4200-16S	2 $\frac{1}{32}$	2.125	1 $\frac{25}{32}$	1.868
26-4100-24P or 26-4200-24S	3 $\frac{1}{32}$	2.875	2 $\frac{1}{32}$	2.620
26-4100-32P or 26-4200-32S	3 $\frac{3}{32}$	3.625	3 $\frac{1}{32}$	3.370

*Tolerances: Fractions $\pm \frac{1}{64}$
Decimals $\pm .005$

RACK AND PANEL PLUG & RECEPTACLE — PIN POLARIZATION TYPE



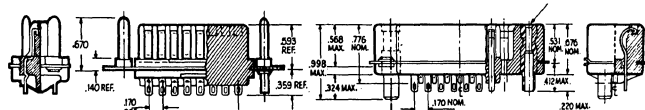
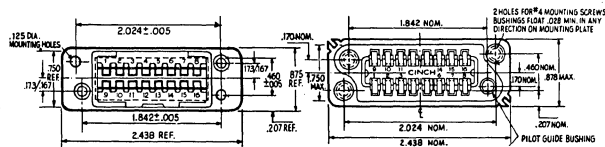
26-159-16 26-190-16

Combining pin-type polarization with unique spring contact construction, this plug and receptacle assure positive contact even under the most severe conditions of vibration. Receptacles are float-mounted to allow possible misalignment in mating with the plug. Insulator material is diallyl phthalate, type MDG per MIL-M-14F. Plug contacts are of copper, ASTM-B-152, type ETP, with a finish of .00002 gold per MIL-G-45204 type II over copper flash. Receptacle contacts are of phosphor bronze, ASTM-B-103, MIL-B-892, Grade A, with the same finish. Plug guide pins and receptacle guide pin bushings are aluminum. The mounting plate is corrosion resistant, passivated stainless steel. The only size available at the present time is 16-contact.

PART NUMBER ORDERING INFORMATION

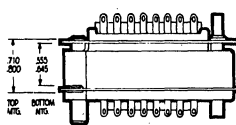
No. of Contacts	Plug Part No.	Receptacle Part No.
16	26-159-16	26-190-16

DIMENSIONAL DATA

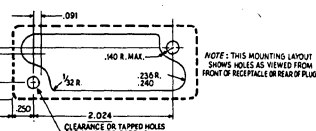


PLUG

RECEPTACLE



MATING PLUG & RECEPTACLE



MOUNTING LAYOUT

TRW[®] CINCH CONNECTORS

GENERAL DESCRIPTION AND SPECIFICATIONS

The "Jones" Barrier Terminal Block is designed to offer increased insurance against failure of electrical/electronic circuitry. By interposing barriers between each adjacent terminal position, not only are much higher voltage ratings obtained, but an additional safeguard is created against frayed wire faults.

The various barrier block series shown in this catalog make it possible to select the combination of mechanical and electrical characteristics which best meet the exact requirements of the application. Over-sizing and under-rating are minimized, resulting in considerable cost savings. Also, the selection of optional terminals and fanning strips available permits the equipment designer to choose the method of termination most suitable for his environmental specifications and manufacturing requirements.

The standard barrier block insulator body is made of general purpose black phenolic. However, a large number of optional insulator materials are available upon request, including mica, diallyl phthalate, melamine and alkyd. Barrier block eyelets and binder head screws are made of brass nickel-plated. Optional

terminals, such as the "W," "3/4W" and "Y" are brass, hot solder finish. Fibre or XP phenolic marker strips are available on nearly all barrier blocks as indicated on each page. Fanning strips are all laminated XP black phenolic with cadmium-plated brass terminals.

Electrical ratings for all barrier block series are shown below. Otherwise, all the necessary ordering information for each series is shown complete on its own page. This includes specifications, dimensional data and a convenient part number listing. Refer to the index on this page to locate each individual series and its appropriate page number.

Many of the "Jones" barrier terminal blocks and accessories shown throughout this catalog are also available locally through authorized Cinch Distributors usually at a savings in delivery time and freight costs. For your convenience, those items normally carried in local stock by Cinch Distributors are indicated on each appropriate page of the catalog by the symbol $\odot$.

ELECTRICAL RATINGS FOR BARRIER BLOCKS

Series	Max. Volts rms without Marker Strip	Max. Volts rms with Marker Strip	Max. Current in Amps	Max. Watts per Terminal
140	1,100	2,000	15	3,750
141	1,100	2,400	20	5,000
142	1,600	2,600	30	7,500
150	1,700	2,600	50	12,500
151	1,800	3,400	70	17,500
152	2,100	3,800	90	54,000
164	1,100	2,000	15	3,750
171	1,000	*	†	‡
172	1,000	2,000	‡	1,250
173	1,000	*	†	‡
174	1,000	*	†	‡
240	1,100	2,000	15	3,750
241	1,100	2,400	20	5,000
242	1,600	2,600	30	7,500
250	1,700	2,600	50	12,500
251	1,800	3,400	70	17,500
252	2,100	3,800	90	54,000

Series	Max. Volts rms without Marker Strip	Max. Volts rms with Marker Strip	Max. Current in Amps	Max. Watts per Terminal
341	1,100	1,600	20	5,000
342	1,600	2,500	30	7,500
540†	2,300	2,300	15	3,750
541†	2,800	2,800	20	5,000
542†	4,000	4,000	30	7,500

*No marker strip available.

†Bottoms are closed; marker strip does not affect voltage rating.

‡The current rating of the 171, 173 and 174 Series is governed by the size of the wire being used. The ratings shown below would be typical when used with the following wire sizes:

Series	Wire	Rating
171	2 solid #18 wires	6 amps.
173	2 solid #16 wires	10 amps.
174	2 solid #16 wires	10 amps.

INDEX

BARRIER TERMINAL BLOCKS AND MARKER STRIPS

Special Features	Screw Size	Terminal Centers	Page
140 Series	#5-40	3/8"	3
140 Series (With Wapost Terminals)	#5-40	3/8"	3
141 Series	#6-32	1/8"	4
141 Series (With Quick-Clamp Terminals)	#6-32	1/8"	4
142 Series	#8-32	1/8"	5
142 Series (With Quick-Clamp Terminals)	#8-32	1/8"	5
142 Series (With Special High Barriers)	#8-32	1/8"	6
150 Series	#10-32	1/4"	6
151 Series	#12-32	7/8"	6
152 Series	#1/4-28	1 1/8"	6
164 Series	#6-32	3/8"	7
171 Series (Single Row)	#2-56	1/4"	7
172 Series (Double Row)	#2-56	1/4"	7
173 Series (Sems Type B.H. Screws)	#4-40	3/8"	8
174 Series (Plain Type B.H. Screws)	#4-40	3/8"	8
240 Series (With Solder Terminals)	—	3/8"	8
241 Series (With Solder Terminals)	—	1/8"	8
242 Series (With Solder Terminals)	—	1/8"	8
250 Series (With Solder Terminals)	—	1/4"	8
251 Series (With Solder Terminals)	—	7/8"	8
252 Series (With Solder Terminals)	—	1 1/8"	8
341 Series (With Solderless Tabs)	—	1/8"	9

Special Features	Screw Size	Terminal Centers	Page
342 Series (With Solderless Tabs)	—	1/8"	9
540 Series (Closed Back & Wider Barriers)	#5-40	3/8"	9
541 Series (Closed Back & Wider Barriers)	#6-32	1/8"	10
542 Series (Closed Back & Wider Barriers)	#8-32	1/8"	10
Fanning Strips for Connecting to Barrier Terminal Blocks			11
Optional Terminals, Jumpers & Cable Clamps			12
Marker Strip Imprinting Information			12
Dimensional Details			13, 14
Terminal Strips & Binding Posts			15, 16

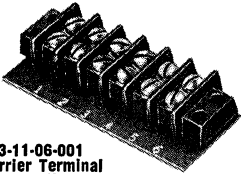
FOR CROSS-REFERENCE BETWEEN NEW AND OLD PART NUMBERS

Request Cinch Form C-44A from your local Cinch Representative or write us direct. This form provides a convenient cross-reference between the new Cinch part numbers shown in this catalog and the old "Jones" part numbers used previously.

TRW[®] CINCH CONNECTORS

140 SERIES

BARRIER TERMINAL BLOCKS AND MARKER STRIPS



353-11-06-001
Barrier Terminal
Block with
353-11-06-011
Marker Strip (Imprinted)

Available in 1 to 25 terminal sizes with standard, "W", "3/4W" and "Y" type terminals. Has 5-40 binder head screws. Accommodates up to #14 solid wire. Terminal centers are 3/8". Creepage distance from terminal to terminal and terminal to ground is 1/4". Materials and finishes designated below. Electrical ratings are shown on the inside front cover.

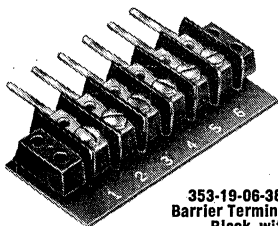
Marker strips are available to mount beneath barrier block and afford additional insulation for metal mounting surface. "Single" marker strips that extend out on only one side are shown in listing below; "double" marker strips extending out on both sides are also available. Marker strips can be imprinted with terminal designations as described on page 12.

140 SERIES PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	STANDARD TERMINAL 5-40 x 3/8" B.H. Screws	"W" TYPE TERMINAL 5-40 x 1/4" B.H. Screws	"3/4W" TYPE TERMINAL 5-40 x 1/4" B.H. Screws	MARKER STRIPS* FOR STANDARD, "W" and "3/4W" TYPE TERMINALS	"Y" TYPE TERMINAL 5-40 x 1/4" B.H. Screws	MARKER STRIPS* FOR "Y" TYPE TERMINAL
1	353-11-01-001	353-16-01-001	353-17-01-001	363-11-01-010	353-18-01-001	363-12-01-010
2	353-11-02-001	353-16-02-001	353-17-02-001	363-11-02-010	353-18-02-001	363-12-02-010
3	353-11-03-001	353-16-03-001	353-17-03-001	363-11-03-010	353-18-03-001	363-12-03-010
4	353-11-04-001	353-16-04-001	353-17-04-001	363-11-04-010	353-18-04-001	363-12-04-010
5	353-11-05-001	353-16-05-001	353-17-05-001	363-11-05-010	353-18-05-001	363-12-05-010
6	353-11-06-001	353-16-06-001	353-17-06-001	363-11-06-010	353-18-06-001	363-12-06-010
7	353-11-07-001	353-16-07-001	353-17-07-001	363-11-07-010	353-18-07-001	363-12-07-010
8	353-11-08-001	353-16-08-001	353-17-08-001	363-11-08-010	353-18-08-001	363-12-08-010
9	353-11-09-001	353-16-09-001	353-17-09-001	363-11-09-010	353-18-09-001	363-12-09-010
10	353-11-10-001	353-16-10-001	353-17-10-001	363-11-10-010	353-18-10-001	363-12-10-010
11	353-11-11-001	353-16-11-001	353-17-11-001	363-11-11-010	353-18-11-001	363-12-11-010
12	353-11-12-001	353-16-12-001	353-17-12-001	363-11-12-010	353-18-12-001	363-12-12-010
13	353-11-13-001	353-16-13-001	353-17-13-001	363-11-13-010	353-18-13-001	363-12-13-010
14	353-11-14-001	353-16-14-001	353-17-14-001	363-11-14-010	353-18-14-001	363-12-14-010
15	353-11-15-001	353-16-15-001	353-17-15-001	363-11-15-010	353-18-15-001	363-12-15-010
16	353-11-16-001	353-16-16-001	353-17-16-001	363-11-16-010	353-18-16-001	363-12-16-010
17	353-11-17-001	353-16-17-001	353-17-17-001	363-11-17-010	353-18-17-001	363-12-17-010
18	353-11-18-001	353-16-18-001	353-17-18-001	363-11-18-010	353-18-18-001	363-12-18-010
19	353-11-19-001	353-16-19-001	353-17-19-001	363-11-19-010	353-18-19-001	363-12-19-010
20	353-11-20-001	353-16-20-001	353-17-20-001	363-11-20-010	353-18-20-001	363-12-20-010
21	353-11-21-001	353-16-21-001	353-17-21-001	363-11-21-010	353-18-21-001	363-12-21-010
22	353-11-22-001	353-16-22-001	353-17-22-001	363-11-22-010	353-18-22-001	363-12-22-010
23	353-11-23-001	353-16-23-001	353-17-23-001	363-11-23-010	353-18-23-001	363-12-23-010
24	353-11-24-001	353-16-24-001	353-17-24-001	363-11-24-010	353-18-24-001	363-12-24-010
25	353-11-25-001	353-16-25-001	353-17-25-001	363-11-25-010	353-18-25-001	363-12-25-010

*Available with SEMS Screws through Cinch Distributors. See Page 12.

WITH WRAPOST TERMINALS



353-19-06-383
Barrier Terminal
Block with
353-11-06-011
Marker Strip (Imprinted)

"Jones" Barrier Blocks with wrapost terminals on one side permit faster connections—four times faster than standard screw terminals. There are three terminal angles presently available—parallel to, at a 45° angle to, and perpendicular to the mounting surface. Choose the angle that best suits your application.

Available in 1 to 25-terminal sizes with each of the terminal angles. Has 5-40 binder head screw opposite terminal. Terminal centers are 3/8". Creepage distance is 1/4". Materials and finishes designated below. Electrical ratings are shown on the inside front cover.

Standard 140 Series marker strips are available to mount beneath the barrier block and insulate against the metal mounting surface. "Single" or "double" marker strips are available. Marker strips can be imprinted with terminal designations as shown on page 12.

140 SERIES (WRAPOST) PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	PARALLEL (180°) STYLE 5-40 x 3/8" B.H. Screws	45° STYLE 5-40 x 3/8" B.H. Screws	PERPENDICULAR (90°) STYLE 5-40 x 3/8" B.H. Screws	MARKER STRIPS* FOR ALL STYLES
1	353-19-01-383	353-19-01-385	353-19-01-386	363-11-01-010
2	353-19-02-383	353-19-02-385	353-19-02-386	363-11-02-010
3	353-19-03-383	353-19-03-385	353-19-03-386	363-11-03-010
4	353-19-04-383	353-19-04-385	353-19-04-386	363-11-04-010
5	353-19-05-383	353-19-05-385	353-19-05-386	363-11-05-010
6	353-19-06-383	353-19-06-385	353-19-06-386	363-11-06-010
7	353-19-07-383	353-19-07-385	353-19-07-386	363-11-07-010
8	353-19-08-383	353-19-08-385	353-19-08-386	363-11-08-010
9	353-19-09-383	353-19-09-385	353-19-09-386	363-11-09-010
10	353-19-10-383	353-19-10-385	353-19-10-386	363-11-10-010
11	353-19-11-383	353-19-11-385	353-19-11-386	363-11-11-010
12	353-19-12-383	353-19-12-385	353-19-12-386	363-11-12-010
13	353-19-13-383	353-19-13-385	353-19-13-386	363-11-13-010
14	353-19-14-383	353-19-14-385	353-19-14-386	363-11-14-010
15	353-19-15-383	353-19-15-385	353-19-15-386	363-11-15-010
16	353-19-16-383	353-19-16-385	353-19-16-386	363-11-16-010
17	353-19-17-383	353-19-17-385	353-19-17-386	363-11-17-010
18	353-19-18-383	353-19-18-385	353-19-18-386	363-11-18-010
19	353-19-19-383	353-19-19-385	353-19-19-386	363-11-19-010
20	353-19-20-383	353-19-20-385	353-19-20-386	363-11-20-010
21	353-19-21-383	353-19-21-385	353-19-21-386	363-11-21-010
22	353-19-22-383	353-19-22-385	353-19-22-386	363-11-22-010
23	353-19-23-383	353-19-23-385	353-19-23-386	363-11-23-010
24	353-19-24-383	353-19-24-385	353-19-24-386	363-11-24-010
25	353-19-25-383	353-19-25-385	353-19-25-386	363-11-25-010

INSULATOR MATERIAL: General Purpose Black Phenolic; Other Materials Available.

EYELET AND SCREW MATERIAL AND FINISH: Brass, Nickel-Plated. No Eyelet on Wrapost.

"W", "3/4W" and "Y" TERMINAL MATERIAL AND FINISH: Brass, Hot Solder Dipped. Wrapost Terminal Electro Tin Plate.

MARKER STRIP MATERIAL: 1/2" Black Fibre; Also Available in 1/2" XP Phenolic.

* Marker strip part numbers shown are "single sided" not imprinted type that extend out on only one side; equivalent "double" type strips extending out on both sides also available. To order change second field to 14.

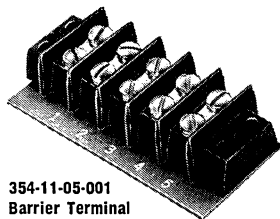
To order imprinted marker strips change fourth field from 010 to 011.

Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

141 SERIES

BARRIER TERMINAL BLOCKS AND MARKER STRIPS



354-11-05-001
Barrier Terminal
Block with
364-11-05-011
Marker Strip (Imprinted)

Available in 1 to 20-terminal sizes with standard, "W," "3/4W" and "Y" type terminals. Has 6-32 binder head screws. Accommodates up to #12 solid wire. Terminal centers are 3/8". Creepage distance from terminal to terminal is 3/8" and terminal to ground is 3/8". Materials and finishes described below. Electrical ratings shown on inside front cover. Marker strips are available to mount beneath barrier block and provide insulation for metal mounting surface. "Single" or "double" marker strips are available. Marker strips can be imprinted with terminal designations as described on page 12.

141 SERIES PART NUMBER ORDERING INFORMATION

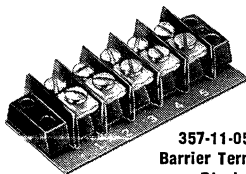
NO. OF TERMI- NALS	STANDARD TERMINAL 6-32 x 1/4 B.H. Screws	"W" TYPE TERMINAL 6-32 x 3/8 B.H. Screws	"3/4W" TYPE TERMINAL 6-32 x 3/8 B.H. Screws	MARKER STRIPS* FOR STANDARD "W" and "3/4W" TERMINALS	"Y" TYPE TERMINAL 6-32 x 3/8 B.H. Screws	MARKER STRIPS* FOR "Y" TYPE TERMINAL
1	354-11-01-001	354-16-01-001	354-17-01-001	364-11-01-010	354-18-01-001	364-12-01-010
2	†354-11-02-001	354-16-02-001	354-17-02-001	364-11-02-010	354-18-02-001	364-12-02-010
3	†354-11-03-001	354-16-03-001	354-17-03-001	364-11-03-010	354-18-03-001	364-12-03-010
4	†354-11-04-001	354-16-04-001	354-17-04-001	364-11-04-010	354-18-04-001	364-12-04-010
5	†354-11-05-001	354-16-05-001	354-17-05-001	364-11-05-010	354-18-05-001	364-12-05-010
6	†354-11-06-001	354-16-06-001	354-17-06-001	364-11-06-010	354-18-06-001	364-12-06-010
7	†354-11-07-001	354-16-07-001	354-17-07-001	364-11-07-010	354-18-07-001	364-12-07-010
8	†354-11-08-001	354-16-08-001	354-17-08-001	364-11-08-010	354-18-08-001	364-12-08-010
9	†354-11-09-001	354-16-09-001	354-17-09-001	364-11-09-010	354-18-09-001	364-12-09-010
10	†354-11-10-001	354-16-10-001	354-17-10-001	364-11-10-010	354-18-10-001	364-12-10-010
11	†354-11-11-001	354-16-11-001	354-17-11-001	364-11-11-010	354-18-11-001	364-12-11-010
12	†354-11-12-001	354-16-12-001	354-17-12-001	364-11-12-010	354-18-12-001	364-12-12-010
13	†354-11-13-001	354-16-13-001	354-17-13-001	364-11-13-010	354-18-13-001	364-12-13-010
14	†354-11-14-001	354-16-14-001	354-17-14-001	364-11-14-010	354-18-14-001	364-12-14-010
15	†354-11-15-001	354-16-15-001	354-17-15-001	364-11-15-010	354-18-15-001	364-12-15-010
16	†354-11-16-001	354-16-16-001	354-17-16-001	364-11-16-010	354-18-16-001	364-12-16-010
17	†354-11-17-001	354-16-17-001	354-17-17-001	364-11-17-010	354-18-17-001	364-12-17-010
18	†354-11-18-001	354-16-18-001	354-17-18-001	364-11-18-010	354-18-18-001	364-12-18-010
19	†354-11-19-001	354-16-19-001	354-17-19-001	364-11-19-010	354-18-19-001	364-12-19-010
20	†354-11-20-001	354-16-20-001	354-17-20-001	364-11-20-010	354-18-20-001	364-12-20-010

†Available with SEMS Screws through Cinch Distributors. See Page 12.

141 SERIES (QUICK-CLAMP) PART NUMBER ORDERING INFORMATION

NO. OF TERMI- NALS	STANDARD TERMINAL (One Side Only) 6-32 x 3/8 B.H. Screws	STANDARD TERMINAL (Both Sides) 6-32 x 3/8 B.H. Screws	"3/4W" TYPE TERMINAL 6-32 x 3/8 B.H. Screws	MARKER STRIPS* FOR STANDARD "3/4W" TYPE TERMINAL	"Y" TYPE TERMINAL 6-32 x 3/8 B.H. Screws	MARKER STRIPS* FOR "Y" TYPE TERMINAL
1	357-11-01-001	357-12-01-001	357-13-01-001	364-11-01-010	357-14-01-001	364-12-01-010
2	357-11-02-001	357-12-02-001	357-13-02-001	364-11-02-010	357-14-02-001	364-12-02-010
3	357-11-03-001	357-12-03-001	357-13-03-001	364-11-03-010	357-14-03-001	364-12-03-010
4	357-11-04-001	357-12-04-001	357-13-04-001	364-11-04-010	357-14-04-001	364-12-04-010
5	357-11-05-001	357-12-05-001	357-13-05-001	364-11-05-010	357-14-05-001	364-12-05-010
6	357-11-06-001	357-12-06-001	357-13-06-001	364-11-06-010	357-14-06-001	364-12-06-010
7	357-11-07-001	357-12-07-001	357-13-07-001	364-11-07-010	357-14-07-001	364-12-07-010
8	357-11-08-001	357-12-08-001	357-13-08-001	364-11-08-010	357-14-08-001	364-12-08-010
9	357-11-09-001	357-12-09-001	357-13-09-001	364-11-09-010	357-14-09-001	364-12-09-010
10	357-11-10-001	357-12-10-001	357-13-10-001	364-11-10-010	357-14-10-001	364-12-10-010
11	357-11-11-001	357-12-11-001	357-13-11-001	364-11-11-010	357-14-11-001	364-12-11-010
12	357-11-12-001	357-12-12-001	357-13-12-001	364-11-12-010	357-14-12-001	364-12-12-010
13	357-11-13-001	357-12-13-001	357-13-13-001	364-11-13-010	357-14-13-001	364-12-13-010
14	357-11-14-001	357-12-14-001	357-13-14-001	364-11-14-010	357-14-14-001	364-12-14-010
15	357-11-15-001	357-12-15-001	357-13-15-001	364-11-15-010	357-14-15-001	364-12-15-010
16	357-11-16-001	357-12-16-001	357-13-16-001	364-11-16-010	357-14-16-001	364-12-16-010
17	357-11-17-001	357-12-17-001	357-13-17-001	364-11-17-010	357-14-17-001	364-12-17-010
18	357-11-18-001	357-12-18-001	357-13-18-001	364-11-18-010	357-14-18-001	364-12-18-010
19	357-11-19-001	357-12-19-001	357-13-19-001	364-11-19-010	357-14-19-001	364-12-19-010
20	357-11-20-001	357-12-20-001	357-13-20-001	364-11-20-010	357-14-20-001	364-12-20-010

WITH QUICK-CLAMP* TERMINALS



357-11-05-001
Barrier Terminal
Block with
364-11-05-011
Marker Strip (Imprinted)

141 Series Barrier Blocks with Quick-Clamp Terminals permit efficient rapid assembly without costly wire terminals and without bending conductors around screws. Just insert the conductors and tighten screws to make positive contact.

Available in 1 to 20-terminal sizes for one side only, both sides, with "3/4W" connection on one side and with "Y" connection through the panel. Uses 6-32 binder head screws. Terminal centers are 3/8". See page 12 for more complete description on the terminal itself and wire gauges accommodated. Materials and finishes described below. Electrical ratings are shown on the inside front cover.

141 Series marker strips are available to mount beneath the barrier block and provide insulation from the metal mounting surface. "Single" or "double" marker strips are available. Terminal designations can be imprinted on marker strips as shown on page 12.

* Patent Pending

INSULATOR MATERIAL: General Purpose Black Phenolic; Other Materials Available.

EYELET and SCREW MATERIAL and FINISH: Brass, Nickel-Plated.

"W," "3/4W" and "Y" TERMINAL MATERIAL and FINISH: Brass, Hot Solder Dipped.

QUICK-CLAMP TERMINAL MATERIAL and FINISH: Brass, Electro-Tinned.

MARKER STRIP MATERIAL: 1/2" Black Fibre; Also available in 1/2" XP Phenolic.

* Marker strip part numbers shown are "single sided" not imprinted type that extend out on only one side; equivalent "double" type strips extending out on both sides also available. To order change second field to 14.

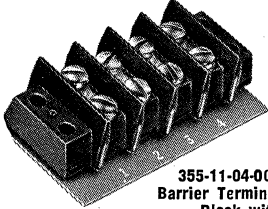
To order imprinted marker strips change fourth field from 010 to 011.

Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

142 SERIES

BARRIER TERMINAL BLOCKS AND MARKER STRIPS

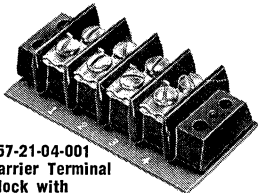


355-11-04-001
Barrier Terminal
Block with
365-11-04-011
Marker Strip (Imprinted)

Available in 1 to 17-terminal sizes with standard, "W," "3/4W" and "Y" type terminals. Has 8-32 binder head screws. Accommodates up to #10 solid wire. Terminal centers are 3/16". Creepage distance from terminal to terminal is 3/16" and terminal to ground is 3/8". Materials and finishes described below. Electrical ratings shown on inside front cover.

Marker strips are available to mount beneath barrier block and provide insulation for metal mounting surface. "Single" or "double" marker strips are available. Terminal designations can be imprinted on marker strips as described on page 12.

WITH QUICK-CLAMP* TERMINALS



357-21-04-001
Barrier Terminal
Block with
365-11-04-011
Marker Strip (Imprinted)

142 Series Barrier Blocks with Quick-Clamp Terminals permit fast, efficient assembly without costly wire terminals and without bending conductors around screws. Insert the conductors, tighten the screws and positive contact is made.

Available in 1 to 17-terminal sizes for one side only, both sides, with "3/4W" connection on one side and with "Y" connection through the panel. 8-32 binder head screws are used. 3/16" terminal centers. Refer to page 12 for more complete description on the terminal itself and wire gauges accommodated. Materials and finishes described below. Electrical ratings are shown on the inside front cover.

142 Series marker strips are available to mount beneath the barrier block and afford insulation from the metal mounting surface. "Single" or "double" marker strips are available. Marker strips can be imprinted with terminal designations as shown on page 12.

*Patent Pending

142 SERIES PART NUMBER ORDERING INFORMATION

						
NO. OF TERMINALS	STANDARD TERMINAL 8-32 x 3/8 B.H. Screws	"W" TYPE TERMINAL 8-32 x 3/8 B.H. Screws	"3/4W" TYPE TERMINAL 8-32 x 3/8 B.H. Screws	MARKER STRIPS* FOR STANDARD, "W" and "3/4W" TYPE TERMINALS	"Y" TYPE TERMINAL 8-32 x 3/8 B.H. Screws	MARKER STRIPS* FOR "Y" TYPE TERMINAL
1	355-11-01-001	355-16-01-001	355-17-01-001	365-11-01-010	355-18-01-001	365-12-01-010
2	†355-11-02-001	355-16-02-001	355-17-02-001	365-11-02-010	355-18-02-001	365-12-02-010
3	†355-11-03-001	355-16-03-001	355-17-03-001	365-11-03-010	355-18-03-001	365-12-03-010
4	†355-11-04-001	355-16-04-001	355-17-04-001	365-11-04-010	355-18-04-001	365-12-04-010
5	†355-11-05-001	355-16-05-001	355-17-05-001	365-11-05-010	355-18-05-001	365-12-05-010
6	†355-11-06-001	355-16-06-001	355-17-06-001	365-11-06-010	355-18-06-001	365-12-06-010
7	†355-11-07-001	355-16-07-001	355-17-07-001	365-11-07-010	355-18-07-001	365-12-07-010
8	†355-11-08-001	355-16-08-001	355-17-08-001	365-11-08-010	355-18-08-001	365-12-08-010
9	†355-11-09-001	355-16-09-001	355-17-09-001	365-11-09-010	355-18-09-001	365-12-09-010
10	†355-11-10-001	355-16-10-001	355-17-10-001	365-11-10-010	355-18-10-001	365-12-10-010
11	†355-11-11-001	355-16-11-001	355-17-11-001	365-11-11-010	355-18-11-001	365-12-11-010
12	†355-11-12-001	355-16-12-001	355-17-12-001	365-11-12-010	355-18-12-001	365-12-12-010
13	†355-11-13-001	355-16-13-001	355-17-13-001	365-11-13-010	355-18-13-001	365-12-13-010
14	†355-11-14-001	355-16-14-001	355-17-14-001	365-11-14-010	355-18-14-001	365-12-14-010
15	†355-11-15-001	355-16-15-001	355-17-15-001	365-11-15-010	355-18-15-001	365-12-15-010
16	†355-11-16-001	355-16-16-001	355-17-16-001	365-11-16-010	355-18-16-001	365-12-16-010
17	†355-11-17-001	355-16-17-001	355-17-17-001	365-11-17-010	355-18-17-001	365-12-17-010

†Available with SEMS Screws through Cinch Distributors. See Page 12.

142 SERIES (QUICK-CLAMP) PART NUMBER ORDERING INFORMATION

						
NO. OF TERMINALS	STANDARD TERMINAL (One Side Only) 8-32 x 3/8 B.H. Screws	STANDARD TERMINAL (Both Sides) 8-32 x 3/8 B.H. Screws	"3/4W" TYPE TERMINAL 8-32 x 3/8 B.H. Screws	MARKER STRIPS* FOR STANDARD, "W" and "3/4W" TYPE TERMINALS	"Y" TYPE TERMINAL 8-32 x 3/8 B.H. Screws	MARKER STRIPS* FOR "Y" TYPE TERMINAL
1	357-21-01-001	357-22-01-001	357-23-01-001	365-11-01-010	357-24-01-001	365-12-01-010
2	357-21-02-001	357-22-02-001	357-23-02-001	365-11-02-010	357-24-02-001	365-12-02-010
3	357-21-03-001	357-22-03-001	357-23-03-001	365-11-03-010	357-24-03-001	365-12-03-010
4	357-21-04-001	357-22-04-001	357-23-04-001	365-11-04-010	357-24-04-001	365-12-04-010
5	357-21-05-001	357-22-05-001	357-23-05-001	365-11-05-010	357-24-05-001	365-12-05-010
6	357-21-06-001	357-22-06-001	357-23-06-001	365-11-06-010	357-24-06-001	365-12-06-010
7	357-21-07-001	357-22-07-001	357-23-07-001	365-11-07-010	357-24-07-001	365-12-07-010
8	357-21-08-001	357-22-08-001	357-23-08-001	365-11-08-010	357-24-08-001	365-12-08-010
9	357-21-09-001	357-22-09-001	357-23-09-001	365-11-09-010	357-24-09-001	365-12-09-010
10	357-21-10-001	357-22-10-001	357-23-10-001	365-11-10-010	357-24-10-001	365-12-10-010
11	357-21-11-001	357-22-11-001	357-23-11-001	365-11-11-010	357-24-11-001	365-12-11-010
12	357-21-12-001	357-22-12-001	357-23-12-001	365-11-12-010	357-24-12-001	365-12-12-010
13	357-21-13-001	357-22-13-001	357-23-13-001	365-11-13-010	357-24-13-001	365-12-13-010
14	357-21-14-001	357-22-14-001	357-23-14-001	365-11-14-010	357-24-14-001	365-12-14-010
15	357-21-15-001	357-22-15-001	357-23-15-001	365-11-15-010	357-24-15-001	365-12-15-010
16	357-21-16-001	357-22-16-001	357-23-16-001	365-11-16-010	357-24-16-001	365-12-16-010
17	357-21-17-001	357-22-17-001	357-23-17-001	365-11-17-010	357-24-17-001	365-12-17-010

INSULATOR MATERIAL: General Purpose Black Phenolic; Other Materials Available.

EYELET and SCREW MATERIAL and FINISH: Brass, Nickel-Plated.

"W," "3/4W" and "Y" TERMINAL MATERIAL and FINISH: Brass, Hot Solder Dipped.

QUICK-CLAMP TERMINAL MATERIAL and FINISH: Brass, Electro-Tinned.

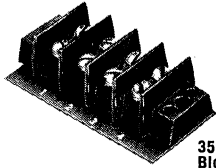
MARKER STRIP MATERIAL: 1/2" Black Fibre; Also Available in 1/2" XP Phenolic.

* Marker strip part numbers shown are "single sided" not imprinted type that extend out on only one side; equivalent "double" type strips extending out on both sides also available. To order change second field to 14. To order imprinted marker strips change fourth field from 010 to 011.

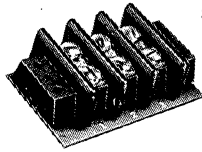
Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

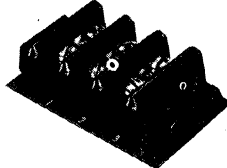
142/150/151/152 SERIES



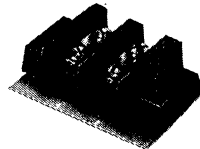
355-11-04-222 Barrier Terminal Block with 365-11-04-011 Marker Strip (Imprinted)



356-11-03-001 Barrier Terminal Block with 366-11-03-011 Marker Strip (Imprinted)



356-21-03-001 Barrier Terminal Block with 366-21-03-011 Marker Strip (Imprinted)



356-31-02-001 Barrier Terminal Block with 366-31-02-011 Marker Strip (Imprinted)

142 SERIES

SPECIAL HIGH BARRIER TERMINAL BLOCKS AND MARKER STRIPS

The 142 Series is also available, in 1 to 4-terminal sizes only, with special $\frac{3}{4}$ " high barriers to meet requirements for certain 220 volt specifications. Terminal centers still $\frac{1}{4}$ ". Creepage distance becomes $\frac{3}{4}$ ". "Single" or "double" marker strips available for use with each size barrier block and can be imprinted with terminal designations as shown on page 12.

SPECIAL 142 SERIES PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	STD. TERM. ONLY (As Shown) 8-32 x $\frac{3}{16}$ B.H. Screws	MARKER STRIPS [Ⓢ]
1	355-11-01-223	365-11-01-010
2	355-11-02-224	365-11-02-010
3	355-11-03-225	365-11-03-010
4	355-11-04-222	365-11-04-010

150 SERIES

BARRIER TERMINAL BLOCKS AND MARKER STRIPS

Available in 1 to 10-terminal sizes with standard, "W," $\frac{3}{4}$ "W" and "Y" type terminals. Uses 10-32 binder screws. Accommodates up to #10 wire or 50 amp solder lug for #6 stranded wire. Terminal centers are $\frac{1}{4}$ ". Creepage distance from terminal to terminal is $\frac{5}{8}$ "; from terminal to ground is $\frac{3}{4}$ ". Materials and finishes described below. Electrical ratings are shown on the inside front cover.

Marker strips are available to mount beneath barrier block and provide insulation for metal mounting surface. "Single" or "double" marker strips are available. Terminal designations can be imprinted on marker strips as shown on page 12.

150 SERIES PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	STANDARD TERMINAL 10-32 x $\frac{3}{16}$ B.H. Screws	"W" TYPE TERMINAL 10-32 x $\frac{3}{16}$ B.H. Screws	" $\frac{3}{4}$ "W" TYPE TERMINAL 10-32 x $\frac{3}{16}$ B.H. Screws	MARKER STRIPS* FOR STANDARD "W" and " $\frac{3}{4}$ "W" TYPE TERMINALS	"Y" TYPE TERMINAL 10-32 x $\frac{3}{16}$ B.H. Screws	MARKER STRIPS* FOR "Y" TYPE TERMINAL
1	356-11-01-001	356-16-01-001	356-17-01-001	366-11-01-010	356-18-01-001	366-12-01-010
2	356-11-02-001	356-16-02-001	356-17-02-001	366-11-02-010	356-18-02-001	366-12-02-010
3	356-11-03-001	356-16-03-001	356-17-03-001	366-11-03-010	356-18-03-001	366-12-03-010
4	356-11-04-001	356-16-04-001	356-17-04-001	366-11-04-010	356-18-04-001	366-12-04-010
5	356-11-05-001	356-16-05-001	356-17-05-001	366-11-05-010	356-18-05-001	366-12-05-010
6	356-11-06-001	356-16-06-001	356-17-06-001	366-11-06-010	356-18-06-001	366-12-06-010
7	356-11-07-001	356-16-07-001	356-17-07-001	366-11-07-010	356-18-07-001	366-12-07-010
8	356-11-08-001	356-16-08-001	356-17-08-001	366-11-08-010	356-18-08-001	366-12-08-010
9	356-11-09-001	356-16-09-001	356-17-09-001	366-11-09-010	356-18-09-001	366-12-09-010
10	356-11-10-001	356-16-10-001	356-17-10-001	366-11-10-010	356-18-10-001	366-12-10-010

151 SERIES

BARRIER TERMINAL BLOCKS AND MARKER STRIPS

Available in 1 to 8-terminal sizes with standard, "W" and " $\frac{3}{4}$ "W" type terminals. Has 12-32 binder head screws. Accommodates up to #8 wire or 70 amp solder lug for #4 stranded wire. Creepage distance is $\frac{3}{4}$ " from terminal to terminal and $\frac{1}{2}$ " from terminal to ground. $\frac{7}{8}$ " terminal centers. Materials and finishes described below. Electrical ratings are shown on the inside front cover.

Marker strips to mount beneath barrier block and provide insulation for metal mounting surface are available. "Single" or "double" marker strips are available. Marker strips can be imprinted with terminal designations as described on page 12.

151 SERIES PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	STANDARD TERMINAL 12-32 x $\frac{3}{16}$ B.H. Screws	"W" TYPE TERMINAL 12-32 x $\frac{3}{16}$ B.H. Screws	" $\frac{3}{4}$ "W" TYPE TERMINAL 12-32 x $\frac{3}{16}$ B.H. Screws	MARKER STRIPS* FOR ALL 151 SERIES TERMINALS
1	356-21-01-001	356-26-01-001	356-27-01-001	366-21-01-010
2	356-21-02-001	356-26-02-001	356-27-02-001	366-21-02-010
3	356-21-03-001	356-26-03-001	356-27-03-001	366-21-03-010
4	356-21-04-001	356-26-04-001	356-27-04-001	366-21-04-010
5	356-21-05-001	356-26-05-001	356-27-05-001	366-21-05-010
6	356-21-06-001	356-26-06-001	356-27-06-001	366-21-06-010
7	356-21-07-001	356-26-07-001	356-27-07-001	366-21-07-010
8	356-21-08-001	356-26-08-001	356-27-08-001	366-21-08-010

152 SERIES PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	STANDARD TERMINAL $\frac{1}{4}$ "-28 x $\frac{1}{2}$ B.H. Screws	"W" TYPE TERMINAL $\frac{1}{4}$ "-28 x $\frac{1}{2}$ B.H. Screws	" $\frac{3}{4}$ "W" TYPE TERMINAL $\frac{1}{4}$ "-28 x $\frac{1}{2}$ B.H. Screws	MARKER STRIPS* FOR ALL 152 SERIES TERMINALS
1	356-31-01-001	356-36-01-001	356-37-01-001	366-31-01-010
2	356-31-02-001	356-36-02-001	356-37-02-001	366-31-02-010
3	356-31-03-001	356-36-03-001	356-37-03-001	366-31-03-010
4	356-31-04-001	356-36-04-001	356-37-04-001	366-31-04-010
5	356-31-05-001	356-36-05-001	356-37-05-001	366-31-05-010
6	356-31-06-001	356-36-06-001	356-37-06-001	366-31-06-010

INSULATOR MATERIAL: General Purpose Black Phenolic; Other Materials Available.

TERMINAL and SCREW MATERIAL and FINISH: Brass, Nickel-Plated.

"W," $\frac{3}{4}$ "W" and "Y" TERMINAL MATERIAL and FINISH: Brass, Hot Solder Dipped.

MARKER STRIP MATERIAL: $\frac{1}{2}$ " Black Fibre; Also Available in $\frac{1}{2}$ " XP Phenolic.

* Marker strip part numbers shown are "single sided" not imprinted type that extend out on only one side; equivalent "double" type strips extending out on both sides also available. To order change second field to 14.

To order imprinted marker strips change fourth field from 010 to 011.

Ⓢ Indicates items normally available through Cinch Distributors.

152 SERIES

BARRIER TERMINAL BLOCKS AND MARKER STRIPS

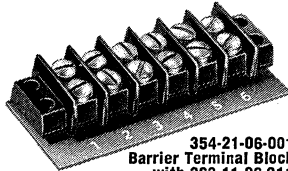
Available in 1 to 6-terminal sizes with standard, "W" and " $\frac{3}{4}$ "W" type terminals. Uses $\frac{1}{4}$ "-28 binder head screws. Accommodates up to #6 wire or 90 amp solder lug for #2 stranded wire. Creepage distance from terminal to terminal is $\frac{1}{4}$ ", from terminal to ground $\frac{5}{8}$ ". Terminal centers are $\frac{1}{4}$ ". Materials and finishes described below. Electrical ratings are shown on the inside front cover.

Marker strips are available to mount beneath barrier block and afford insulation for metal mounting surface. "Single" or "double" marker strips are also available. Terminal designations can be imprinted on marker strips as described on page 12.

TRW[®] CINCH CONNECTORS

164 SERIES

BARRIER TERMINAL BLOCKS AND MARKER STRIPS



354-21-06-001
Barrier Terminal Block
with 363-11-06-011
Marker Strip (Imprinted)

Similar to the 140 Series except equipped with 6-32 screws. Available in 1 to 21-terminal sizes with standard, "W," "3/4W" and "Y" type terminals. Accommodates up to #14 solid wire. Terminal centers are 3/8". Creepage distance from terminal to terminal and terminal to ground is 1/4". Materials and finishes described below. Electrical ratings shown on inside front cover.

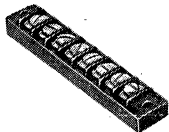
Marker strips are available to mount beneath barrier block and provide insulation for metal mounting surface. "Single" or "double" marker strips are available. Terminal designations can be imprinted on marker strips as described on page 12.

164 SERIES PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	STANDARD TERMINAL 6-32 x 1/4 B.H. Screws	"W" TYPE TERMINAL 6-32 x 1/4 B.H. Screws	"3/4W" TYPE TERMINAL 6-32 x 1/4 B.H. Screws	MARKER STRIPS* FOR STANDARD, "W" and "3/4W" TYPE TERMINALS	"Y" TYPE TERMINAL 6-32 x 1/4 B.H. Screws	MARKER STRIPS* FOR "Y" TYPE TERMINAL
1	354-21-01-001	354-26-01-001	354-27-01-001	363-11-01-010	354-28-01-001	363-12-01-010
2	354-21-02-001	354-26-02-001	354-27-02-001	363-11-02-010	354-28-02-001	363-12-02-010
3	354-21-03-001	354-26-03-001	354-27-03-001	363-11-03-010	354-28-03-001	363-12-03-010
4	354-21-04-001	354-26-04-001	354-27-04-001	363-11-04-010	354-28-04-001	363-12-04-010
5	354-21-05-001	354-26-05-001	354-27-05-001	363-11-05-010	354-28-05-001	363-12-05-010
6	354-21-06-001	354-26-06-001	354-27-06-001	363-11-06-010	354-28-06-001	363-12-06-010
7	354-21-07-001	354-26-07-001	354-27-07-001	363-11-07-010	354-28-07-001	363-12-07-010
8	354-21-08-001	354-26-08-001	354-27-08-001	363-11-08-010	354-28-08-001	363-12-08-010
9	354-21-09-001	354-26-09-001	354-27-09-001	363-11-09-010	354-28-09-001	363-12-09-010
10	354-21-10-001	354-26-10-001	354-27-10-001	363-11-10-010	354-28-10-001	363-12-10-010
11	354-21-11-001	354-26-11-001	354-27-11-001	363-11-11-010	354-28-11-001	363-12-11-010
12	354-21-12-001	354-26-12-001	354-27-12-001	363-11-12-010	354-28-12-001	363-12-12-010
13	354-21-13-001	354-26-13-001	354-27-13-001	363-11-13-010	354-28-13-001	363-12-13-010
14	354-21-14-001	354-26-14-001	354-27-14-001	363-11-14-010	354-28-14-001	363-12-14-010
15	354-21-15-001	354-26-15-001	354-27-15-001	363-11-15-010	354-28-15-001	363-12-15-010
16	354-21-16-001	354-26-16-001	354-27-16-001	363-11-16-010	354-28-16-001	363-12-16-010
17	354-21-17-001	354-26-17-001	354-27-17-001	363-11-17-010	354-28-17-001	363-12-17-010
18	354-21-18-001	354-26-18-001	354-27-18-001	363-11-18-010	354-28-18-001	363-12-18-010
19	354-21-19-001	354-26-19-001	354-27-19-001	363-11-19-010	354-28-19-001	363-12-19-010
20	354-21-20-001	354-26-20-001	354-27-20-001	363-11-20-010	354-28-20-001	363-12-20-010
21	354-21-21-001	354-26-21-001	354-27-21-001	363-11-21-010	354-28-21-001	363-12-21-010

171 SERIES

BARRIER TERMINAL BLOCKS



351-11-08-001 Barrier
Terminal Block

A miniature barrier terminal block with single screw terminals. Available in 1 to 8 terminal sizes with standard type terminal only. Has 2-56 x 3/16" binder head screws. Terminal centers are 1/4". Insulator material is general purpose black phenolic. Eyelets and screws are brass with nickel-plated finish. Marker strips are not available for use with the 171 Series.

171 SERIES PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	PART NUMBER	NO. OF TERMINALS	PART NUMBER
1	351-11-01-001	5	351-11-05-001
2	351-11-02-001	6	351-11-06-001
3	351-11-03-001	7	351-11-07-001
4	351-11-04-001	8	351-11-08-001

172 SERIES

BARRIER TERMINAL BLOCKS



351-21-08-001 Barrier
Terminal Block

Miniature barrier terminal block with double screw terminals. Available in 1 to 14-terminal sizes with standard, "W," "3/4W" and "Y" type terminals. 2-56 binder head screws. 1/4" terminal centers. Insulator molded of general purpose black phenolic. Eyelets and screws are nickel-plated brass. "W," "3/4W" and "Y" terminals are made of brass, hot solder dipped. Marker strips are available; write for details.

172 SERIES PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	STANDARD TERMINAL 2-56 x 3/16 B.H. Screws	"W" TYPE TERMINAL 2-56 x 1/4 B.H. Screws	"3/4W" TYPE TERMINAL 2-56 x 1/4 B.H. Screws	"Y" TYPE TERMINAL 2-56 x 3/16 B.H. Screws
1	351-21-01-001	351-26-01-001	351-27-01-001	351-28-01-001
2	351-21-02-001	351-26-02-001	351-27-02-001	351-28-02-001
3	351-21-03-001	351-26-03-001	351-27-03-001	351-28-03-001
4	351-21-04-001	351-26-04-001	351-27-04-001	351-28-04-001
5	351-21-05-001	351-26-05-001	351-27-05-001	351-28-05-001
6	351-21-06-001	351-26-06-001	351-27-06-001	351-28-06-001
7	351-21-07-001	351-26-07-001	351-27-07-001	351-28-07-001
8	351-21-08-001	351-26-08-001	351-27-08-001	351-28-08-001
9	351-21-09-001	351-26-09-001	351-27-09-001	351-28-09-001
10	351-21-10-001	351-26-10-001	351-27-10-001	351-28-10-001
11	351-21-11-001	351-26-11-001	351-27-11-001	351-28-11-001
12	351-21-12-001	351-26-12-001	351-27-12-001	351-28-12-001
13	351-21-13-001	351-26-13-001	351-27-13-001	351-28-13-001
14	351-21-14-001	351-26-14-001	351-27-14-001	351-28-14-001

INSULATOR MATERIAL: General Purpose Black Phenolic; Other Materials Available.

EYELET AND SCREW MATERIAL AND FINISH: Brass, Nickel-Plated.

"W," "3/4W" and "Y" TERMINAL MATERIAL AND FINISH: Brass, Hot Solder Dipped.

MARKER STRIP MATERIAL: 1/2" Black Fibre; Also available in 1/2" XP Phenolic.

* Marker strip part numbers shown are "single sided" not imprinted type that extend out on only one side; equivalent "double" type strips extending out on both sides also available. To order change second field to 14.

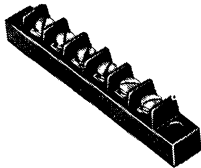
To order imprinted marker strips change fourth field from 010 to 011.

Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

173/174 SERIES

BARRIER TERMINAL BLOCKS



352-11-06-001
Barrier Terminal Block

173 SERIES

Single-screw terminal barrier blocks available in 2 to 10-terminal sizes. Has 4-40 x 3/4" Sems type binder head screws. Terminal centers are 3/8". Insulator is general purpose black phenolic. Eyelets and screws are nickel-plated brass.

174 SERIES

Same as 173 Series except the screws are 4-40 x 1/4" plain binder head type. 2 to 10-terminal sizes. 3/8" terminal centers. Same insulator material. Same eyelet and screw material and finish.

PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	173 SERIES 4-40 x 3/4" Sems Type B.H. Screws	174 SERIES 4-40 x 1/4" Plain Type B.H. Screws
1	352-15-01-001	352-11-01-001
2	352-15-02-001	352-11-02-001
3	352-15-03-001	352-11-03-001
4	352-15-04-001	352-11-04-001
5	352-15-05-001	352-11-05-001
6	352-15-06-001	352-11-06-001
7	352-15-07-001	352-11-07-001
8	352-15-08-001	352-11-08-001
9	352-15-09-001	352-11-09-001
10	352-15-10-001	352-11-10-001

240/241/242 SERIES

BARRIER TERMINAL BLOCKS AND MARKER STRIPS



359-14-06-001
240 Series
Barrier Terminal Block with
363-11-06-011 Marker Strip
(Imprinted)

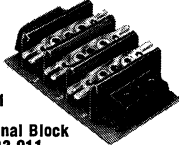
Similar to the 140, 141 and 142 Series except that solder terminals are used instead of screw terminals. These solder terminals are designed to accommodate one or more wires, which can be brought through slot into hole, simplifying soldering. Terminal sizes available are: 1-25 for the 240 Series, 1-20 for the 241 and 1-17 for the 242. Terminal centers are shown in the dimensional drawings. Materials and finishes are described below. Electrical ratings are shown on the inside front cover. Marker strips that mount beneath barrier block and afford insulation from metal mounting surfaces are available in either "single" or "double" type. See page 12 for information on imprinting terminal designations in these marker strips.

PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	240 SERIES BARRIER BLOCKS With Solder Terminals	240 SERIES MARKER STRIPS* Ⓢ	241 SERIES BARRIER BLOCKS With Solder Terminals	241 SERIES MARKER STRIPS* Ⓢ	242 SERIES BARRIER BLOCKS With Solder Terminals	242 SERIES MARKER STRIPS* Ⓢ
1	359-14-01-001	363-11-01-010	359-24-01-001	364-11-01-010	359-34-01-001	365-11-01-010
2	359-14-02-001	363-11-02-010	359-24-02-001	364-11-02-010	359-34-02-001	365-11-02-010
3	359-14-03-001	363-11-03-010	359-24-03-001	364-11-03-010	359-34-03-001	365-11-03-010
4	359-14-04-001	363-11-04-010	359-24-04-001	364-11-04-010	359-34-04-001	365-11-04-010
5	359-14-05-001	363-11-05-010	359-24-05-001	364-11-05-010	359-34-05-001	365-11-05-010
6	359-14-06-001	363-11-06-010	359-24-06-001	364-11-06-010	359-34-06-001	365-11-06-010
7	359-14-07-001	363-11-07-010	359-24-07-001	364-11-07-010	359-34-07-001	365-11-07-010
8	359-14-08-001	363-11-08-010	359-24-08-001	364-11-08-010	359-34-08-001	365-11-08-010
9	359-14-09-001	363-11-09-010	359-24-09-001	364-11-09-010	359-34-09-001	365-11-09-010
10	359-14-10-001	363-11-10-010	359-24-10-001	364-11-10-010	359-34-10-001	365-11-10-010
11	359-14-11-001	363-11-11-010	359-24-11-001	364-11-11-010	359-34-11-001	365-11-11-010
12	359-14-12-001	363-11-12-010	359-24-12-001	364-11-12-010	359-34-12-001	365-11-12-010
13	359-14-13-001	363-11-13-010	359-24-13-001	364-11-13-010	359-34-13-001	365-11-13-010
14	359-14-14-001	363-11-14-010	359-24-14-001	364-11-14-010	359-34-14-001	365-11-14-010
15	359-14-15-001	363-11-15-010	359-24-15-001	364-11-15-010	359-34-15-001	365-11-15-010
16	359-14-16-001	363-11-16-010	359-24-16-001	364-11-16-010	359-34-16-001	365-11-16-010
17	359-14-17-001	363-11-17-010	359-24-17-001	364-11-17-010	359-34-17-001	365-11-17-010
18	359-14-18-001	363-11-18-010	359-24-18-001	364-11-18-010		
19	359-14-19-001	363-11-19-010	359-24-19-001	364-11-19-010		
20	359-14-20-001	363-11-20-010	359-24-20-001	364-11-20-010		
21	359-14-21-001	363-11-21-010				
22	359-14-22-001	363-11-22-010				
23	359-14-23-001	363-11-23-010				
24	359-14-24-001	363-11-24-010				
25	359-14-25-001	363-11-25-010				

250/251/252 SERIES

BARRIER TERMINAL BLOCKS AND MARKER STRIPS



359-44-03-001
250 Series
Barrier Terminal Block
with 366-11-03-011
Marker Strip (Imprinted)

Similar to the 150, 151 and 152 Series except for use of solder terminals instead of screw terminals. Solder terminals accommodate one or more wires that can be brought through slot into hole, simplifying solder operation. Terminal sizes available include: 1-10 for the 250 Series, 1-8 for the 251 and 1-6 for the 252. Refer to dimensional drawings for terminal centers. Materials and finishes are described below. Electrical ratings are shown on inside front cover. "Single" or "double" marker strips are available to mount beneath barrier block and provide insulation from metal mounting surface. Terminal designations can be imprinted on marker strips as described on page 12.

PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	250 SERIES BARRIER BLOCKS With Solder Terminals	250 SERIES MARKER STRIPS* Ⓢ	251 SERIES BARRIER BLOCKS With Solder Terminals	251 SERIES MARKER STRIPS* Ⓢ	252 SERIES BARRIER BLOCKS With Solder Terminals	252 SERIES MARKER STRIPS* Ⓢ
1	359-44-01-001	366-11-01-010	359-54-01-001	366-21-01-001	359-64-01-001	366-31-01-010
2	359-44-02-001	366-11-02-010	359-54-02-001	366-21-02-010	359-64-02-001	366-31-02-010
3	359-44-03-001	366-11-03-010	359-54-03-001	366-21-03-010	359-64-03-001	366-31-03-010
4	359-44-04-001	366-11-04-010	359-54-04-001	366-21-04-010	359-64-04-001	366-31-04-010
5	359-44-05-001	366-11-05-010	359-54-05-001	366-21-05-010	359-64-05-001	366-31-05-010
6	359-44-06-001	366-11-06-010	359-54-06-001	366-21-06-010	359-64-06-001	366-31-06-010
7	359-44-07-001	366-11-07-010	359-54-07-001	366-21-07-010		
8	359-44-08-001	366-11-08-010	359-54-08-001	366-21-08-010		
9	359-44-09-001	366-11-09-010				
10	359-44-10-001	366-11-10-010				

INSULATOR MATERIAL: General Purpose Black Phenolic; Other Materials Available.

TERMINAL MATERIAL AND FINISH: Brass, Hot Solder Dipped.

MARKER STRIP MATERIAL: 1/2" Black Fibre; Also Available in 1/2" XP Phenolic.

* Marker strip part numbers shown are "single sided" not imprinted type that extend out on only one side; equivalent "double" type strips extending out on both sides also available. To order change second field to 14.

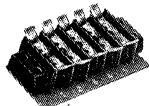
To order imprinted marker strips change fourth field from 010 to 011.

Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

341/342 SERIES

BARRIER TERMINAL BLOCKS AND MARKER STRIPS



354-32-05-001 341 Series Barrier Terminal Block with 364-11-05-011 Marker Strip (Imprinted)

Similar to 141 and 142 Series except equipped with solderless-type terminals to accommodate either AMP tab receptacles or Ark-Les quick connects. (Contact manufacturer for exact part number.) Terminal sizes available are 1-20 for the 341 Series and 1-17 for the 342. A variety of terminal types are available for each series as shown. Refer to dimensional drawings for terminal centers. Materials and finishes are described below. Electrical ratings are shown on inside front cover.

"Single" or "double" type marker strips can be supplied to mount beneath barrier block and afford insulation from metal mounting surfaces. Terminal designations can be imprinted on marker strips as described on page 12.

9 different types of terminals can be supplied with any of the 341 or 342 Series barrier blocks. Identify these types by changing the second field of the part number to match the 341 or 342 series number opposite the desired terminal drawing below. For example, to order a 5-terminal 341 Series with both terminals at right angles (Type C), signify part no. 354-33-05-001. In addition, there are 4 more terminal types as shown which can be ordered in combination with the 9 regular terminal types. To order any of these 4 "combination" types, write direct to the factory for more further information, enclosing detailed drawings where possible.

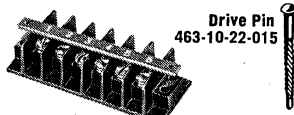
PART NUMBER ORDERING INFORMATION

Insert in 2nd Field	Terminal Drawing	Terminal Type
341 Series	342 Series	
31	21	A
32	22	B
33	23	C
34	24	D
35	25	E
36	26	F
37	27	G
38	28	H
39	29	J
Combination Types		

NO. OF TERMINALS	341 SERIES BARRIER BLOCKS† With Solderless Terminals	341 SERIES MARKER STRIPS* (C)	342 SERIES BARRIER BLOCKS† With Solderless Terminals	342 SERIES MARKER STRIPS* (C)
1	354-31-01-001	364-11-01-010	355-21-01-001	365-11-01-010
2	354-31-02-001	364-11-02-010	355-21-02-001	365-11-02-010
3	354-31-03-001	364-11-03-010	355-21-03-001	365-11-03-010
4	354-31-04-001	364-11-04-010	355-21-04-001	365-11-04-010
5	354-31-05-001	364-11-05-010	355-21-05-001	365-11-05-010
6	354-31-06-001	364-11-06-010	355-21-06-001	365-11-06-010
7	354-31-07-001	364-11-07-010	355-21-07-001	365-11-07-010
8	354-31-08-001	364-11-08-010	355-21-08-001	365-11-08-010
9	354-31-09-001	364-11-09-010	355-21-09-001	365-11-09-010
10	354-31-10-001	364-11-10-010	355-21-10-001	365-11-10-010
11	354-31-11-001	364-11-11-010	355-21-11-001	365-11-11-010
12	354-31-12-001	364-11-12-010	355-21-12-001	365-11-12-010
13	354-31-13-001	364-11-13-010	355-21-13-001	365-11-13-010
14	354-31-14-001	364-11-14-010	355-21-14-001	365-11-14-010
15	354-31-15-001	364-11-15-010	355-21-15-001	365-11-15-010
16	354-31-16-001	364-11-16-010	355-21-16-001	365-11-16-010
17	354-31-17-001	364-11-17-010	355-21-17-001	365-11-17-010
18	354-31-18-001	364-11-18-010		
19	354-31-19-001	364-11-19-010		
20	354-31-20-001	364-11-20-010		

540 SERIES

BARRIER TERMINAL BLOCKS AND MARKER STRIPS



353-21-06-001 Barrier Terminal Block with 363-21-06-071 Marker Strip (Imprinted)

353-21-06-001 Barrier Terminal Block with 363-21-06-020 "Cover"

Available in 1 to 31 terminal sizes with standard, "W," "3/4W" and "Y" type terminals. Particularly recommended when electrical and mechanical performance requirements are especially critical. Same terminal centers (3/4") as 140 Series. Also uses same 5-40 binder head screws. Otherwise, has higher and wider barriers. Extra material between barriers at the base strengthens construction and maintains same 1/2" creepage distance between terminal to terminal and terminal to ground. Terminal designations can be imprinted on this base. Materials and finishes are described below. Electrical ratings are shown on inside front cover.

Bottoms are closed so that insulating strips are not required. However, knockouts are molded into the base so that "Y" terminals can be accommodated if desired. A top-mounted marker strip, 1/4" wide is available and can be imprinted with 1/4" numbers or a "double" marker strip can be used as a "cover" with one end position slotted to facilitate swinging the cover clear for quick inspection. Character designations can be imprinted on one or both sides of the cover if desired as described on page 12.

540 SERIES PART NUMBER ORDERING INFORMATION

NO. OF TERMINALS	STANDARD TERMINAL (C) 5-40 x 1/4 B.H. Screws	"W" TYPE TERMINAL 5-40 x 1/4 B.H. Screws	"3/4W" TYPE TERMINAL 5-40 x 1/4 B.H. Screws	"Y" TYPE TERMINAL 5-40 x 1/4 B.H. Screws	540 SERIES TOP-MOUNTED MARKER STRIPS (C)	540 SERIES COVERS† (DOUBLE MARKER STRIPS)
1	353-21-01-001	353-26-01-001	353-27-01-001	353-28-01-001	363-21-01-070	363-31-01-020
2	353-21-02-001	353-26-02-001	353-27-02-001	353-28-02-001	363-21-02-070	363-31-02-020
3	353-21-03-001	353-26-03-001	353-27-03-001	353-28-03-001	363-21-03-070	363-31-03-020
4	353-21-04-001	353-26-04-001	353-27-04-001	353-28-04-001	363-21-04-070	363-31-04-020
5	353-21-05-001	353-26-05-001	353-27-05-001	353-28-05-001	363-21-05-070	363-31-05-020
6	353-21-06-001	353-26-06-001	353-27-06-001	353-28-06-001	363-21-06-070	363-31-06-020
7	353-21-07-001	353-26-07-001	353-27-07-001	353-28-07-001	363-21-07-070	363-31-07-020
8	353-21-08-001	353-26-08-001	353-27-08-001	353-28-08-001	363-21-08-070	363-31-08-020
9	353-21-09-001	353-26-09-001	353-27-09-001	353-28-09-001	363-21-09-070	363-31-09-020
10	353-21-10-001	353-26-10-001	353-27-10-001	353-28-10-001	363-21-10-070	363-31-10-020
11	353-21-11-001	353-26-11-001	353-27-11-001	353-28-11-001	363-21-11-070	363-31-11-020
12	353-21-12-001	353-26-12-001	353-27-12-001	353-28-12-001	363-21-12-070	363-31-12-020
13	353-21-13-001	353-26-13-001	353-27-13-001	353-28-13-001	363-21-13-070	363-31-13-020
14	353-21-14-001	353-26-14-001	353-27-14-001	353-28-14-001	363-21-14-070	363-31-14-020
15	353-21-15-001	353-26-15-001	353-27-15-001	353-28-15-001	363-21-15-070	363-31-15-020
16	353-21-16-001	353-26-16-001	353-27-16-001	353-28-16-001	363-21-16-070	363-31-16-020
17	353-21-17-001	353-26-17-001	353-27-17-001	353-28-17-001	363-21-17-070	363-31-17-020
18	353-21-18-001	353-26-18-001	353-27-18-001	353-28-18-001	363-21-18-070	363-31-18-020
19	353-21-19-001	353-26-19-001	353-27-19-001	353-28-19-001	363-21-19-070	363-31-19-020
20	353-21-20-001	353-26-20-001	353-27-20-001	353-28-20-001	363-21-20-070	363-31-20-020
21	353-21-21-001	353-26-21-001	353-27-21-001	353-28-21-001	363-21-21-070	363-31-21-020
22	353-21-22-001	353-26-22-001	353-27-22-001	353-28-22-001	363-21-22-070	363-31-22-020
23	353-21-23-001	353-26-23-001	353-27-23-001	353-28-23-001	363-21-23-070	363-31-23-020
24	353-21-24-001	353-26-24-001	353-27-24-001	353-28-24-001	363-21-24-070	363-31-24-020
25	353-21-25-001	353-26-25-001	353-27-25-001	353-28-25-001	363-21-25-070	363-31-25-020
26	353-21-26-001	353-26-26-001	353-27-26-001	353-28-26-001	363-21-26-070	363-31-26-020
27	353-21-27-001	353-26-27-001	353-27-27-001	353-28-27-001	363-21-27-070	363-31-27-020
28	353-21-28-001	353-26-28-001	353-27-28-001	353-28-28-001	363-21-28-070	363-31-28-020
29	353-21-29-001	353-26-29-001	353-27-29-001	353-28-29-001	363-21-29-070	363-31-29-020
30	353-21-30-001	353-26-30-001	353-27-30-001	353-28-30-001	363-21-30-070	363-31-30-020
31	353-21-31-001	353-26-31-001	353-27-31-001	353-28-31-001	363-21-31-070	363-31-31-020

INSULATOR MATERIAL: General Purpose Black Phenolic; Other Materials Available.

TERMINAL AND SCREW MATERIAL AND FINISH: Brass, Nickel-Plated.

"W," "3/4W" and "Y" TERMINAL MATERIAL AND FINISH: Brass, Hot Solder Dipped.

* Marker strip part numbers shown are "single sided" not imprinted type that extend out on only one side; equivalent "double" type strips extending out on both sides also available. To order change second field to 14.

To order imprinted marker strips change fourth field from 010 to 011.

† See information on "341 and 342 Series Terminals" on how to signify desired terminal type by changing second field part numbers above. "31" and "21" are given as examples.

341 and 342 SERIES TERMINAL MATERIAL AND FINISH: Brass, Cadmium-Plated.

341 and 342 SERIES MARKER STRIP MATERIAL: 1/2" Black Fibre; Also Available in 1/2" XP Phenolic.

‡ 1/4" spacers should be used with the 540 Series cover available on special request.

§ TOP-MOUNTED MARKER STRIP MATERIAL: 1/4" XP Phenolic.

¶ COVER (DOUBLE MARKER STRIP) MATERIAL: 1/2" XP Phenolic.

(C) Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

541 SERIES BARRIER TERMINAL BLOCKS AND ACCESSORIES



354-61-05-001 Barrier Terminal Block with 364-61-05-071 Marker Strip (Imprinted)

Available in 1 to 30 terminal sizes with standard, "W", "3/4W" and "Y" type terminals. Ideal for higher voltage requirements. Same terminal centers (3/4") as 141 Series. 6-32 binder head screws. Has higher and wider barriers with extra material between barriers at the base. Creepage distance is 3/8" between terminal to terminal and terminal to ground. Terminal designations can be imprinted on base. Materials and finishes are described below. Electrical ratings are shown on inside front cover.

Insulating strips are not required because of closed bottoms on barrier block. However, "Y" terminals can still be accommodated if desired through use of knockouts molded into base. Top-mounted 1/4" wide marker strip is available and can be imprinted with 3/8" numbers or a "double" marker strip can be used as a "cover" with one end position slotted to facilitate swinging clear. Cover can be imprinted with character designations on one or both sides as described on page 12.

541 SERIES PART NUMBER ORDERING INFORMATION

NO. OF TERMI- NALS	STANDARD TERMINAL 6-32 x 1/4" [ⓐ] B.H. Screws	"W" TYPE TERMINAL 6-32 x 3/8" B.H. Screws	"3/4W" TYPE TERMINAL 6-32 x 3/8" B.H. Screws	"Y" TYPE TERMINAL 6-32 x 3/8" B.H. Screws	541 SERIES TOP-MOUNTED MARKER STRIPS [ⓐ]	541 SERIES COVER† (DOUBLE MARKER STRIPS)
1	354-61-01-001	354-66-01-001	354-67-01-001	354-68-01-001	364-61-01-070	364-71-01-020
2	354-61-02-001	354-66-02-001	354-67-02-001	354-68-02-001	364-61-02-070	364-71-02-020
3	354-61-03-001	354-66-03-001	354-67-03-001	354-68-03-001	364-61-03-070	364-71-03-020
4	354-61-04-001	354-66-04-001	354-67-04-001	354-68-04-001	364-61-04-070	364-71-04-020
5	354-61-05-001	354-66-05-001	354-67-05-001	354-68-05-001	364-61-05-070	364-71-05-020
6	354-61-06-001	354-66-06-001	354-67-06-001	354-68-06-001	364-61-06-070	364-71-06-020
7	354-61-07-001	354-66-07-001	354-67-07-001	354-68-07-001	364-61-07-070	364-71-07-020
8	354-61-08-001	354-66-08-001	354-67-08-001	354-68-08-001	364-61-08-070	364-71-08-020
9	354-61-09-001	354-66-09-001	354-67-09-001	354-68-09-001	364-61-09-070	364-71-09-020
10	354-61-10-001	354-66-10-001	354-67-10-001	354-68-10-001	364-61-10-070	364-71-10-020
11	354-61-11-001	354-66-11-001	354-67-11-001	354-68-11-001	364-61-11-070	364-71-11-020
12	354-61-12-001	354-66-12-001	354-67-12-001	354-68-12-001	364-61-12-070	364-71-12-020
13	354-61-13-001	354-66-13-001	354-67-13-001	354-68-13-001	364-61-13-070	364-71-13-020
14	354-61-14-001	354-66-14-001	354-67-14-001	354-68-14-001	364-61-14-070	364-71-14-020
15	354-61-15-001	354-66-15-001	354-67-15-001	354-68-15-001	364-61-15-070	364-71-15-020
16	354-61-16-001	354-66-16-001	354-67-16-001	354-68-16-001	364-61-16-070	364-71-16-020
17	354-61-17-001	354-66-17-001	354-67-17-001	354-68-17-001	364-61-17-070	364-71-17-020
18	354-61-18-001	354-66-18-001	354-67-18-001	354-68-18-001	364-61-18-070	364-71-18-020
19	354-61-19-001	354-66-19-001	354-67-19-001	354-68-19-001	364-61-19-070	364-71-19-020
20	354-61-20-001	354-66-20-001	354-67-20-001	354-68-20-001	364-61-20-070	364-71-20-020
21	354-61-21-001	354-66-21-001	354-67-21-001	354-68-21-001	364-61-21-070	364-71-21-020
22	354-61-22-001	354-66-22-001	354-67-22-001	354-68-22-001	364-61-22-070	364-71-22-020
23	354-61-23-001	354-66-23-001	354-67-23-001	354-68-23-001	364-61-23-070	364-71-23-020
24	354-61-24-001	354-66-24-001	354-67-24-001	354-68-24-001	364-61-24-070	364-71-24-020
25	354-61-25-001	354-66-25-001	354-67-25-001	354-68-25-001	364-61-25-070	364-71-25-020
26	354-61-26-001	354-66-26-001	354-67-26-001	354-68-26-001	364-61-26-070	364-71-26-020
27	354-61-27-001	354-66-27-001	354-67-27-001	354-68-27-001	364-61-27-070	364-71-27-020
28	354-61-28-001	354-66-28-001	354-67-28-001	354-68-28-001	364-61-28-070	364-71-28-020
29	354-61-29-001	354-66-29-001	354-67-29-001	354-68-29-001	364-61-29-070	364-71-29-020
30	354-61-30-001	354-66-30-001	354-67-30-001	354-68-30-001	364-61-30-070	364-71-30-020

542 SERIES PART NUMBER ORDERING INFORMATION

NO. OF TERMI- NALS	STANDARD TERMINAL 8-32 x 3/8" [ⓐ] B.H. Screws	"W" TYPE TERMINAL 8-32 x 3/8" B.H. Screws	"3/4W" TYPE TERMINAL 8-32 x 3/8" B.H. Screws	"Y" TYPE TERMINAL 8-32 x 3/8" B.H. Screws	542 SERIES [ⓐ] TOP-MOUNTED MARKER STRIPS	542 SERIES COVER† (DOUBLE MARKER STRIPS)
1	355-31-01-001	355-36-01-001	355-37-01-001	355-38-01-001	365-31-01-070	365-41-01-020
2	355-31-02-001	355-36-02-001	355-37-02-001	355-38-02-001	365-31-02-070	365-41-02-020
3	355-31-03-001	355-36-03-001	355-37-03-001	355-38-03-001	365-31-03-070	365-41-03-020
4	355-31-04-001	355-36-04-001	355-37-04-001	355-38-04-001	365-31-04-070	365-41-04-020
5	355-31-05-001	355-36-05-001	355-37-05-001	355-38-05-001	365-31-05-070	365-41-05-020
6	355-31-06-001	355-36-06-001	355-37-06-001	355-38-06-001	365-31-06-070	365-41-06-020
7	355-31-07-001	355-36-07-001	355-37-07-001	355-38-07-001	365-31-07-070	365-41-07-020
8	355-31-08-001	355-36-08-001	355-37-08-001	355-38-08-001	365-31-08-070	365-41-08-020
9	355-31-09-001	355-36-09-001	355-37-09-001	355-38-09-001	365-31-09-070	365-41-09-020
10	355-31-10-001	355-36-10-001	355-37-10-001	355-38-10-001	365-31-10-070	365-41-10-020
11	355-31-11-001	355-36-11-001	355-37-11-001	355-38-11-001	365-31-11-070	365-41-11-020
12	355-31-12-001	355-36-12-001	355-37-12-001	355-38-12-001	365-31-12-070	365-41-12-020
13	355-31-13-001	355-36-13-001	355-37-13-001	355-38-13-001	365-31-13-070	365-41-13-020
14	355-31-14-001	355-36-14-001	355-37-14-001	355-38-14-001	365-31-14-070	365-41-14-020
15	355-31-15-001	355-36-15-001	355-37-15-001	355-38-15-001	365-31-15-070	365-41-15-020
16	355-31-16-001	355-36-16-001	355-37-16-001	355-38-16-001	365-31-16-070	365-41-16-020
17	355-31-17-001	355-36-17-001	355-37-17-001	355-38-17-001	365-31-17-070	365-41-17-020
18	355-31-18-001	355-36-18-001	355-37-18-001	355-38-18-001	365-31-18-070	365-41-18-020
19	355-31-19-001	355-36-19-001	355-37-19-001	355-38-19-001	365-31-19-070	365-41-19-020
20	355-31-20-001	355-36-20-001	355-37-20-001	355-38-20-001	365-31-20-070	365-41-20-020
21	355-31-21-001	355-36-21-001	355-37-21-001	355-38-21-001	365-31-21-070	365-41-21-020
22	355-31-22-001	355-36-22-001	355-37-22-001	355-38-22-001	365-31-22-070	365-41-22-020
23	355-31-23-001	355-36-23-001	355-37-23-001	355-38-23-001	365-31-23-070	365-41-23-020
24	355-31-24-001	355-36-24-001	355-37-24-001	355-38-24-001	365-31-24-070	365-41-24-020
25	355-31-25-001	355-36-25-001	355-37-25-001	355-38-25-001	365-31-25-070	365-41-25-020
26	355-31-26-001	355-36-26-001	355-37-26-001	355-38-26-001	365-31-26-070	365-41-26-020

542 SERIES BARRIER TERMINAL BLOCKS AND ACCESSORIES



Available in 1-26 terminal sizes with standard, "W", "3/4W" and "Y" type terminals. Higher and wider barriers increase voltage ratings. Same 3/4" terminal centers as 142 Series. Also uses 8-32 x 3/8" binder head screws. Extra material between barriers at base adds strength and maintains same 3/4" creepage distance between terminal to terminal and terminal to ground. Terminal designations can be imprinted on base. Materials and finishes described below. Electrical ratings shown on inside front cover.

Bottoms are closed, eliminating need for insulating strips. Knockouts are molded into base to accommodate "Y" terminals if desired. Top mounted 1/4" wide marker strip is available and can be imprinted with 3/8" numbers or a "double" marker strip can be used as a "cover" with one end position slotted to facilitate swinging clear for fast inspection. Character designations can be imprinted on one or both side of the cover if desired.

INSULATOR MATERIAL: General Purpose Black Phenolic; Other Materials Available.

TERMINAL AND SCREW MATERIAL AND FINISH: Brass, Nickel-Plated.

"W", "3/4W" and "Y" TERMINAL MATERIAL AND FINISH: Brass, Hot Solder Dipped.

† 3/8" spacers should be used with the 541 Series cover available on special request.

‡ 3/8" spacers should be used with the 542 Series cover available on special request.

TOP-MOUNTED MARKER STRIP MATERIAL: 1/2" XP Phenolic.

COVER (DOUBLE MARKER STRIP) MATERIAL: 1/2" XP Phenolic.

ⓐ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

FANNING STRIPS

FOR CONNECTING TO BARRIER TERMINAL BLOCKS



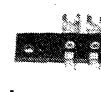
161 Series Fanning Strip with Cable Clamp and
141 Series Barrier Terminal Block

Fanning strips serve as a convenient means for rapidly making and removing connections from barrier terminal blocks. They facilitate cable or harness wiring and minimize the possibility of subsequent wiring errors. Both straight and angle type fanning strips are available. Terminals are made of .032" brass, cadmium-plated. The $\frac{3}{8}$ " thick, $\frac{1}{2}$ " wide XP black phenolic mounts are furnished with a hole, in either the right or left side, for securing the cable with lacing twine. For larger sizes, use of a cable clamp as shown on page 12 is recommended.

STRAIGHT TYPE FANNING STRIP PART NUMBER ORDERING INFORMATION

NO. OF TERMI- NALS	160 SERIES  327-11-02-001		160B SERIES  327-22-02-001		161 SERIES  327-31-02-001		162 SERIES  327-42-02-001	
	Fits 140 Series Barrier Blocks $\frac{3}{8}$ " Terminal Centers		Fits 140 Series Barrier Blocks $\frac{3}{8}$ " Terminal Centers		Fits 141 Series Barrier Blocks $\frac{3}{8}$ " Terminal Centers		Fits 142 Series Barrier Blocks $\frac{3}{8}$ " Terminal Centers	
	C.C. Hole on Left	C.C. Hole on Right	C.C. Hole on Left	C.C. Hole on Right	C.C. Hole on Left	C.C. Hole on Right	C.C. Hole on Left	C.C. Hole on Right
2	327-11-02-001	327-12-02-001	327-21-02-001	327-22-02-001	327-31-02-001	327-32-02-001	327-41-02-001	327-42-02-001
3	327-11-03-001	327-12-03-001	327-21-03-001	327-22-03-001	327-31-03-001	327-32-03-001	327-41-03-001	327-42-03-001
4	327-11-04-001	327-12-04-001	327-21-04-001	327-22-04-001	327-31-04-001	327-32-04-001	327-41-04-001	327-42-04-001
5	327-11-05-001	327-12-05-001	327-21-05-001	327-22-05-001	327-31-05-001	327-32-05-001	327-41-05-001	327-42-05-001
6	327-11-06-001	327-12-06-001	327-21-06-001	327-22-06-001	327-31-06-001	327-32-06-001	327-41-06-001	327-42-06-001
7	327-11-07-001	327-12-07-001	327-21-07-001	327-22-07-001	327-31-07-001	327-32-07-001	327-41-07-001	327-42-07-001
8	327-11-08-001	327-12-08-001	327-21-08-001	327-22-08-001	327-31-08-001	327-32-08-001	327-41-08-001	327-42-08-001
9	327-11-09-001	327-12-09-001	327-21-09-001	327-22-09-001	327-31-09-001	327-32-09-001	327-41-09-001	327-42-09-001
10	327-11-10-001	327-12-10-001	327-21-10-001	327-22-10-001	327-31-10-001	327-32-10-001	327-41-10-001	327-42-10-001
11	327-11-11-001	327-12-11-001	327-21-11-001	327-22-11-001	327-31-11-001	327-32-11-001	327-41-11-001	327-42-11-001
12	327-11-12-001	327-12-12-001	327-21-12-001	327-22-12-001	327-31-12-001	327-32-12-001	327-41-12-001	327-42-12-001
13	327-11-13-001	327-12-13-001	327-21-13-001	327-22-13-001	327-31-13-001	327-32-13-001	327-41-13-001	327-42-13-001
14	327-11-14-001	327-12-14-001	327-21-14-001	327-22-14-001	327-31-14-001	327-32-14-001	327-41-14-001	327-42-14-001
15	327-11-15-001	327-12-15-001	327-21-15-001	327-22-15-001	327-31-15-001	327-32-15-001	327-41-15-001	327-42-15-001
16	327-11-16-001	327-12-16-001	327-21-16-001	327-22-16-001	327-31-16-001	327-32-16-001	327-41-16-001	327-42-16-001
17	327-11-17-001	327-12-17-001	327-21-17-001	327-22-17-001	327-31-17-001	327-32-17-001	327-41-17-001	327-42-17-001
18	327-11-18-001	327-12-18-001	327-21-18-001	327-22-18-001	327-31-18-001	327-32-18-001		
19	327-11-19-001	327-12-19-001	327-21-19-001	327-22-19-001	327-31-19-001	327-32-19-001		
20	327-11-20-001	327-12-20-001	327-21-20-001	327-22-20-001	327-31-20-001	327-32-20-001		
21	327-11-21-001	327-12-21-001	327-21-21-001	327-22-21-001				

ANGLE TYPE FANNING STRIP PART NUMBER ORDERING INFORMATION

NO. OF TERMI- NALS	160A SERIES  327-14-02-001		160BA SERIES  327-23-02-001		161A SERIES  327-34-02-001		162A SERIES  327-43-02-001	
	Fits 140 Series Barrier Blocks $\frac{3}{8}$ " Terminal Centers		Fits 140 Series Barrier Blocks $\frac{3}{8}$ " Terminal Centers		Fits 141 Series Barrier Blocks $\frac{3}{8}$ " Terminal Centers		Fits 142 Series Barrier Blocks $\frac{3}{8}$ " Terminal Centers	
	C.C. Hole on Left	C.C. Hole on Right	C.C. Hole on Left	C.C. Hole on Right	C.C. Hole on Left	C.C. Hole on Right	C.C. Hole on Left	C.C. Hole on Right
2	327-13-02-001	327-14-02-001	327-23-02-001	327-24-02-001	327-33-02-001	327-34-02-001	327-43-02-001	327-44-02-001
3	327-13-03-001	327-14-03-001	327-23-03-001	327-24-03-001	327-33-03-001	327-34-03-001	327-43-03-001	327-44-03-001
4	327-13-04-001	327-14-04-001	327-23-04-001	327-24-04-001	327-33-04-001	327-34-04-001	327-43-04-001	327-44-04-001
5	327-13-05-001	327-14-05-001	327-23-05-001	327-24-05-001	327-33-05-001	327-34-05-001	327-43-05-001	327-44-05-001
6	327-13-06-001	327-14-06-001	327-23-06-001	327-24-06-001	327-33-06-001	327-34-06-001	327-43-06-001	327-44-06-001
7	327-13-07-001	327-14-07-001	327-23-07-001	327-24-07-001	327-33-07-001	327-34-07-001	327-43-07-001	327-44-07-001
8	327-13-08-001	327-14-08-001	327-23-08-001	327-24-08-001	327-33-08-001	327-34-08-001	327-43-08-001	327-44-08-001
9	327-13-09-001	327-14-09-001	327-23-09-001	327-24-09-001	327-33-09-001	327-34-09-001	327-43-09-001	327-44-09-001
10	327-13-10-001	327-14-10-001	327-23-10-001	327-24-10-001	327-33-10-001	327-34-10-001	327-43-10-001	327-44-10-001
11	327-13-11-001	327-14-11-001	327-23-11-001	327-24-11-001	327-33-11-001	327-34-11-001	327-43-11-001	327-44-11-001
12	327-13-12-001	327-14-12-001	327-23-12-001	327-24-12-001	327-33-12-001	327-34-12-001	327-43-12-001	327-44-12-001
13	327-13-13-001	327-14-13-001	327-23-13-001	327-24-13-001	327-33-13-001	327-34-13-001	327-43-13-001	327-44-13-001
14	327-13-14-001	327-14-14-001	327-23-14-001	327-24-14-001	327-33-14-001	327-34-14-001	327-43-14-001	327-44-14-001
15	327-13-15-001	327-14-15-001	327-23-15-001	327-24-15-001	327-33-15-001	327-34-15-001	327-43-15-001	327-44-15-001
16	327-13-16-001	327-14-16-001	327-23-16-001	327-24-16-001	327-33-16-001	327-34-16-001	327-43-16-001	327-44-16-001
17	327-13-17-001	327-14-17-001	327-23-17-001	327-24-17-001	327-33-17-001	327-34-17-001	327-43-17-001	327-44-17-001
18	327-13-18-001	327-14-18-001	327-23-18-001	327-24-18-001	327-33-18-001	327-34-18-001		
19	327-13-19-001	327-14-19-001	327-23-19-001	327-24-19-001	327-33-19-001	327-34-19-001		
20	327-13-20-001	327-14-20-001	327-23-20-001	327-24-20-001	327-33-20-001	327-34-20-001		
21	327-13-21-001	327-14-21-001	327-23-21-001	327-24-21-001				

Ⓢ Indicates items normally available through Cinch Distributors.

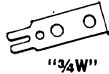
TRW[®] CINCH CONNECTORS

OPTIONAL TERMINALS, JUMPERS AND CABLE CLAMPS

SOLDER TERMINALS



"W"



"3/4W"



"Y"

"W," "3/4W" and "Y" terminals are available optionally as separate terminals for use with 140, 141 and 142 Series barrier blocks as indicated below. Also specify hot solder dipped finish when ordering.

SOLDER TERMINALS PART NUMBER ORDERING INFORMATION

FOR:	"W" TYPE (G)	"3/4W" TYPE (G)	"Y" TYPE (G)
140 Series	495-11-11-017	495-11-11-019	495-12-11-016
141 Series	495-11-11-020	495-11-11-022	495-12-11-012
142 Series	495-11-11-023	495-11-11-025	495-12-11-011

QUICK-CLAMP* TERMINALS



Simplifies engaging of wires to barrier blocks. Wire is inserted into flared opening and screw is tightened. Screws are nickel-plated brass, binder head type. Terminals are electro-tinned brass. Set includes two mating clamps and one screw. For use with 141 and 142 Series barrier blocks as shown below.

* Patent Pending

QUICK-CLAMP* TERMINALS PART NUMBER ORDERING INFORMATION

FOR:	PART NO.	WIRE GAUGES	SCREW SIZE
141 Series	422-14-11-143	14 thru 22	6-32 x 3/8"
142 Series	422-14-11-144	8 thru 16	8-32 x 3/8"

SEMS SCREW TERMINALS



The Sems screw termination, with integral lockwasher, permits rapid, permanent attachment of solid or stranded wire leads or spade lug terminations to the barrier terminal block. The lockwasher teeth cut into the termination material, assuring excellent electrical contact and the ability to withstand substantial strain and vibration.

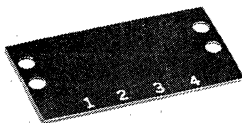
The Sems screws are nickel plated brass and the lockwasher is nickel plated phosphor bronze.

When ordering by ten digit manufacturing part number, change second digit from 11 to 12. (Example: 355-12-02-001)

When ordering by distributor part number, add letter (E). (Example: 2-140-E)

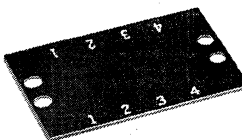
IMPRINTING INFORMATION ON MARKER STRIPS

"SINGLE" MARKER STRIPS



All "single" marker strips, extending out on only one side, as shown in this catalog, can be supplied at extra cost with terminal designations as desired, imprinted directly on the strips. Either 3/32" or 1/8" high letters, number, words or symbols can be imprinted in white. If no preference is given, the size best suited for the particular order will be used. Each imprinting order necessitates a set-up charge in addition to regular imprinting charges based on the number of characters and panels. Please make sure all imprinting instructions are clear and concise.

"DOUBLE" MARKER STRIPS



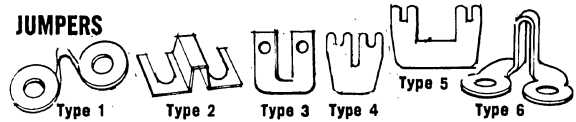
"Double" marker strips, extending out on both sides, can also have terminal designations imprinted at extra cost on one or two sides, if desired. Either 3/32" or 1/8" high letters, numbers, words or symbols can be imprinted in white and if no preference is given, the best suited size for the particular order will be used. When used as a "cover" for the 540, 541 or 542 Series, "double" marker strips can also be imprinted on either side, as specified. Regular imprinting and set-up charges apply. Please indicate whether the marker strip is being used as "double" or "cover."

SPECIAL TOP-MOUNTED MARKER STRIPS



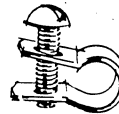
Special marker strips used on top of 540, 541 and 542 Series barrier blocks can be imprinted with terminal designations at extra cost. Either 1/8" letters, numbers, words or symbols can be imprinted in white. Each imprinting order requires both set-up and regular imprinting charges. Please make sure all necessary instructions are included.

JUMPERS



Used for making permanent connections between adjacent barrier block terminals, except for type 5, which connects two alternate terminals bridging the intermediate terminal. Six types for use with 140, 141, 142, 540, 541 and 542 Series barrier blocks as shown. All jumpers are brass with nickel-plated satin finish.

CABLE CLAMPS



For use with "Jones" Fanning Strips shown on page 20. Recommended for securing the cable where at least several conductors are to be terminated with fanning strips. As indicated, six different inner diameter sizes are available.

Clamps and 6-32 x 1/2" round head screws are brass, nickel-plated. For convenience cable clamps are supplied unassembled.

PART NUMBER ORDERING INFORMATION

JUMPERS

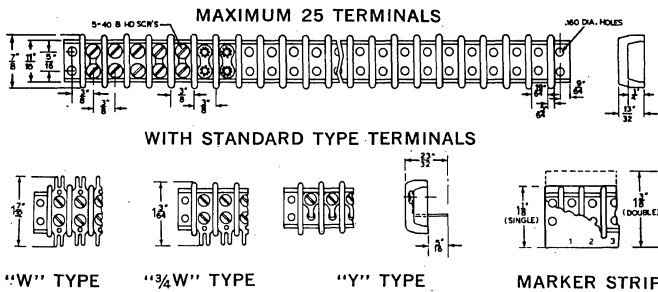
FOR:	PART NO. (G)	TYPE	INNER DIA.	PART NO. (G)
141 Series	422-13-11-026	1	1/4"	422-04-11-109
142 Series	422-13-11-025	1	3/8"	422-04-11-110
140 Series	422-13-11-013	2	1/2"	422-04-11-111
141 Series	422-13-11-012	3	5/8"	422-04-11-112
142, 542 Series	422-13-11-028	4	3/4"	422-04-11-113
142, 542 Series	422-13-11-027	5	7/8"	422-04-11-114
540 Series	422-13-11-029	6		
541 Series	422-13-11-030	6		
542 Series	422-13-11-031	6		

CABLE CLAMPS

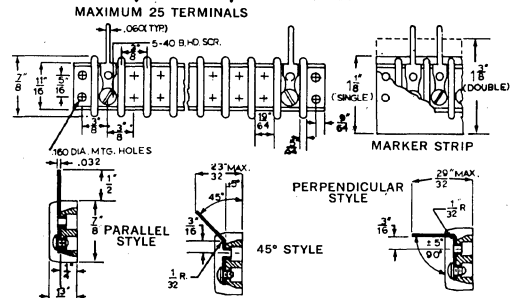
TRW[®] CINCH CONNECTORS

MOUNTING DATA

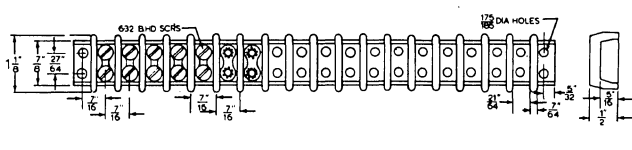
140 SERIES DIMENSIONS



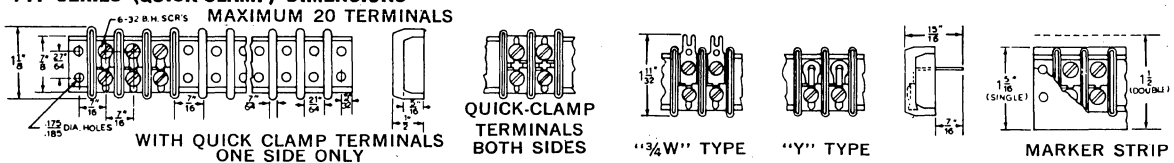
140 SERIES (WRAPOST) TERMINALS



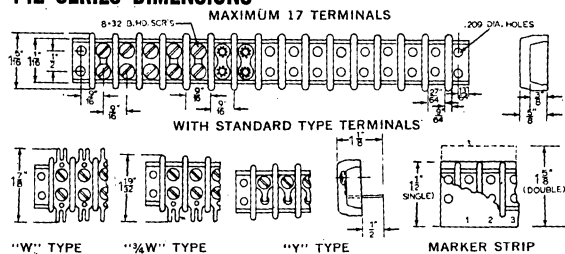
141 SERIES DIMENSIONS



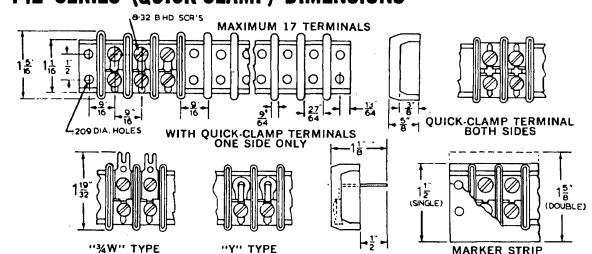
141 SERIES (QUICK-CLAMP) DIMENSIONS



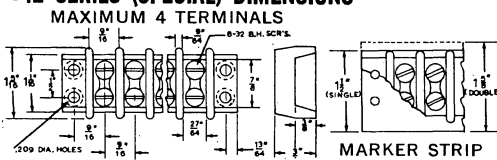
142 SERIES DIMENSIONS



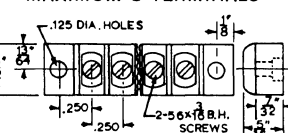
142 SERIES (QUICK-CLAMP) DIMENSIONS



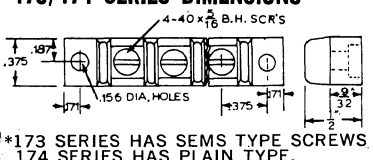
142 SERIES (SPECIAL) DIMENSIONS



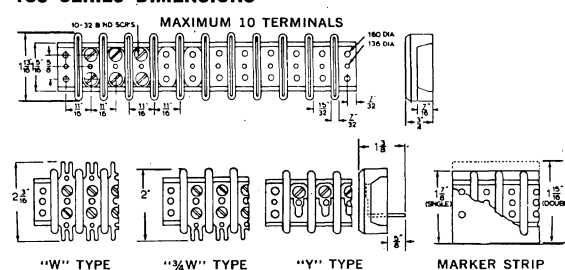
171 SERIES DIMENSIONS



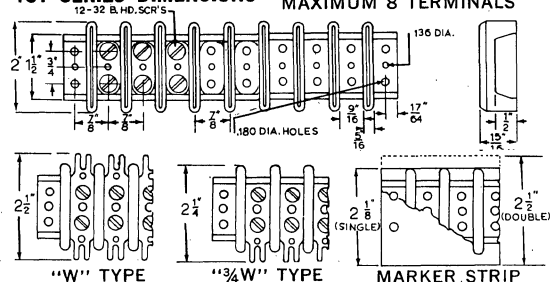
173/174 SERIES DIMENSIONS



150 SERIES DIMENSIONS



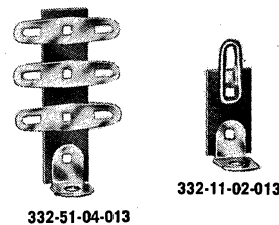
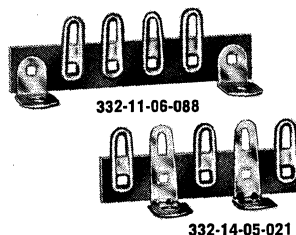
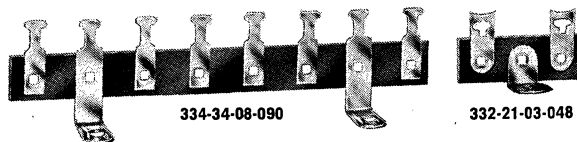
151 SERIES DIMENSIONS



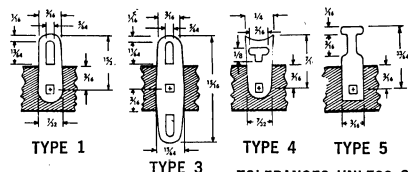
[illegible]

TRW[®] CINCH CONNECTORS

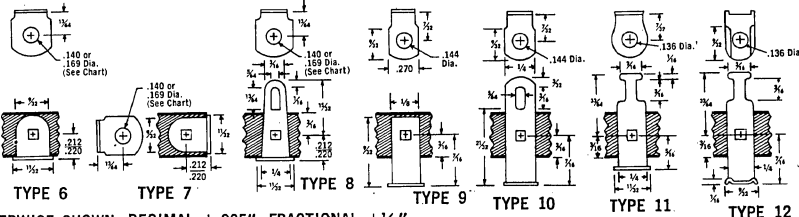
LUG-TYPE TERMINAL STRIPS — 332 SERIES



SOLDERING LUGS



MOUNTING LUGS



TOLERANCES UNLESS OTHERWISE SHOWN: DECIMAL $\pm .005"$, FRACTIONAL $\pm \frac{1}{64}"$

TWO-LUG TERMINAL STRIP PART NUMBERS

Part No.	Lug Types Used In Positions:		Spacing Between Lugs	Terminal Strip Length	Mtg. Hole Dia.
	1	2			
332-11-02-001	1	6	$\frac{3}{8}"$	$\frac{3}{4}"$	.140"
332-11-02-024	6	1	$\frac{3}{8}"$	$\frac{3}{4}"$	.140"
332-14-02-001	1	8	$\frac{3}{8}"$	$\frac{3}{4}"$	.140"
332-14-02-005	8	1	$\frac{3}{8}"$	$\frac{3}{4}"$	.140"
332-11-02-013	2	7	$\frac{3}{8}"$	$\frac{3}{4}"$	.140"
332-51-02-003	3	7	$\frac{3}{8}"$	$\frac{3}{4}"$	.140"

THREE-LUG TERMINAL STRIP PART NUMBERS

Part No.	Lug Types Used In Positions:			Spacing Between Lugs	Terminal Strip Length	Mtg. Hole Dia.
	1	2	3			
332-11-03-044	6	1	1	$\frac{3}{8}"$	$1\frac{1}{8}"$	.140"
332-11-03-028	1	6	1	$\frac{3}{8}"$	$1\frac{1}{8}"$	.140"
332-11-03-051	1	1	6	$\frac{3}{8}"$	$1\frac{1}{8}"$	.140"
332-14-03-013	8	1	1	$\frac{3}{8}"$	$1\frac{1}{8}"$	.140"
332-14-03-010	1	8	1	$\frac{3}{8}"$	$1\frac{1}{8}"$	.140"
332-14-03-017	1	1	8	$\frac{3}{8}"$	$1\frac{1}{8}"$	.140"
332-13-03-001*	1	9	1	$\frac{3}{8}"$	$1\frac{1}{8}"$	.144"
332-15-03-009*	1	10	1	$\frac{3}{8}"$	$1\frac{1}{8}"$	.144"
332-51-03-007*	3	3	7	$\frac{3}{8}"$	$1\frac{1}{8}"$	.140"
332-21-03-048*	4	6	4	$\frac{3}{8}"$	$1\frac{1}{8}"$	.140"
332-34-03-013*	5	11	5	$\frac{3}{8}"$	$1\frac{1}{8}"$	.136"
332-31-03-102*	5	6	5	$\frac{3}{8}"$	$1\frac{1}{8}"$	.140"

FOUR-LUG TERMINAL STRIP PART NUMBERS

Part No.	Lug Types Used In Positions:				Spacing Between Lugs	Terminal Strip Length	Mtg. Hole Dia.
	1	2	3	4			
332-11-04-082*	6	1	1	1	$\frac{3}{8}"$	$1\frac{1}{2}"$	.140"
332-11-04-068	1	6	1	1	$\frac{3}{8}"$	$1\frac{1}{2}"$	.140"
332-11-04-060	1	1	6	1	$\frac{3}{8}"$	$1\frac{1}{2}"$	.140"
332-11-04-074*	1	1	1	6	$\frac{3}{8}"$	$1\frac{1}{2}"$	.140"
332-14-04-037*	8	1	1	1	$\frac{3}{8}"$	$1\frac{1}{2}"$	.140"
332-14-04-022	1	8	1	1	$\frac{3}{8}"$	$1\frac{1}{2}"$	.140"
332-14-04-061	1	1	8	1	$\frac{3}{8}"$	$1\frac{1}{2}"$	.140"
332-14-04-026*	1	1	1	8	$\frac{3}{8}"$	$1\frac{1}{2}"$	.140"
332-51-04-013*	3	3	3	7	$\frac{3}{8}"$	$1\frac{1}{2}"$	.140"
334-34-04-099*	5	12	5	5	$1\frac{1}{2}"$	$1\frac{7}{8}"$	.133"

FIVE-LUG TERMINAL STRIP PART NUMBERS

Part No.	Lug Types Used In Positions:					Spacing Between Lugs	Terminal Strip Length	Mtg. Hole Dia.	Mtg. Centers
	1	2	3	4	5				
332-11-05-120*	1	6	1	1	1	$\frac{3}{8}"$	$1\frac{7}{8}"$	.140"	—
332-11-05-092	1	1	6	1	1	$\frac{3}{8}"$	$1\frac{7}{8}"$	.140"	—
332-11-05-096*	1	1	1	6	1	$\frac{3}{8}"$	$1\frac{7}{8}"$	.140"	—
332-11-05-055	1	6	1	6	1	$\frac{3}{8}"$	$1\frac{7}{8}"$	.140"	$\frac{3}{4}"$
332-14-05-089*	1	8	1	1	1	$\frac{3}{8}"$	$1\frac{7}{8}"$	.140"	—
332-14-05-034	1	1	8	1	1	$\frac{3}{8}"$	$1\frac{7}{8}"$	.140"	—
332-14-05-112*	1	1	1	8	1	$\frac{3}{8}"$	$1\frac{7}{8}"$	.140"	—
332-14-05-021	1	8	1	8	1	$\frac{3}{8}"$	$1\frac{7}{8}"$	.140"	$\frac{3}{4}"$
332-13-05-018*	1	1	9	1	1	$\frac{3}{8}"$	$1\frac{7}{8}"$	.144"	—
332-15-05-010*	1	1	10	1	1	$\frac{3}{8}"$	$1\frac{7}{8}"$	.144"	—
332-21-05-066*	4	4	6	4	4	$\frac{3}{8}"$	$1\frac{7}{8}"$	.140"	—
332-34-05-060*	5	5	11	5	5	$\frac{3}{8}"$	$1\frac{7}{8}"$	.136"	—
334-34-05-088*	5	5	12	5	5	$1\frac{1}{2}"$	$2\frac{3}{8}"$	.133"	—

Two-lug to nine-lug strips made of $\frac{1}{16}"$ thick by $\frac{3}{8}"$ wide polyester UL approved 94V0 with cadmium plated steel lugs securely eye-letted in position. Brass lugs also available on request. $\frac{3}{8}"$ or $\frac{1}{2}"$ terminal centers. The chart above illustrates (with dimensions) the various soldering and mounting lug types available. These type numbers are shown in the part number listings below to designate the exact lug used in each position on the strip, in sequence from left to right.

SIX-LUG TERMINAL STRIP PART NUMBERS

Part No.	Lug Types Used In Positions:						Spacing Between Lugs	Terminal Strip Length	Mtg. Hole Dia.	Mtg. Centers
	1	2	3	4	5	6				
332-11-06-088	6	1	1	1	1	6	$\frac{3}{8}"$	$2\frac{1}{4}"$	.140"	$1\frac{7}{8}"$
332-14-06-032	8	1	1	1	1	8	$\frac{3}{8}"$	$2\frac{1}{4}"$	.140"	$1\frac{7}{8}"$
334-34-06-091*	5	5	12	5	5	5	$\frac{1}{2}"$	$2\frac{7}{8}"$	.136"	—
332-34-06-294*	5	5	5	12	5	5	$\frac{3}{8}"$	$2\frac{1}{4}"$	.136"	—

SEVEN-LUG TERMINAL STRIP PART NUMBERS

Part No.	Lug Types Used In Positions:							Spacing Between Lugs	Terminal Strip Length	Mtg. Hole Dia.	Mtg. Centers
	1	2	3	4	5	6	7				
332-11-07-231*	1	1	1	6	1	1	1	$\frac{3}{8}"$	$2\frac{5}{8}"$	.140"	—
332-11-07-106	6	1	1	1	1	1	6	$\frac{3}{8}"$	$2\frac{5}{8}"$	.140"	$2\frac{1}{4}"$
332-11-07-108	1	6	1	1	1	6	1	$\frac{3}{8}"$	$2\frac{5}{8}"$	.140"	$1\frac{1}{2}"$
332-14-07-039	8	1	1	1	1	1	8	$\frac{3}{8}"$	$2\frac{5}{8}"$	.140"	$2\frac{1}{4}"$
332-14-07-041	1	8	1	1	1	1	8	$\frac{3}{8}"$	$2\frac{5}{8}"$	.140"	$1\frac{1}{2}"$
332-34-07-226*	5	5	5	12	5	5	5	$\frac{3}{8}"$	$2\frac{5}{8}"$	.136"	—
334-34-07-098*	12	5	5	5	5	5	12	$\frac{1}{2}"$	$3\frac{3}{8}"$	.136"	$3"$

EIGHT LUG TERMINAL STRIP PART NUMBERS

Part No.	Lug Types Used In Positions:								Spacing Between Lugs	Terminal Strip Length	Mtg. Hole Dia.	Mtg. Centers
	1	2	3	4	5	6	7	8				
332-11-08-110	1	6	1	1	1	1	6	1	$\frac{3}{8}"$	$3"$	.140"	$1\frac{7}{8}"$
332-11-08-111	6	1	1	1	1	1	1	6	$\frac{3}{8}"$	$3"$	.140"	$2\frac{5}{8}"$
332-14-08-042	1	8	1	1	1	1	1	8	$\frac{3}{8}"$	$3"$	.140"	$1\frac{7}{8}"$
332-14-08-045	8	1	1	1	1	1	1	8	$\frac{3}{8}"$	$3"$	.140"	$2\frac{5}{8}"$
334-34-08-090*	5	12	5	5	5	5	12	5	$\frac{1}{2}"$	$3\frac{7}{8}"$	.136"	$2\frac{1}{2}"$

NINE-LUG TERMINAL PART NUMBERS

Part No.	Lug Types Used In Positions:									Spacing Between Lugs	Terminal Strip Length	Mtg. Hole Dia.	Mtg. Centers
	1	2	3	4	5	6	7	8	9				
332-34-09-297	12	5	5	5	5	5	12	5	5	$\frac{3}{8}"$	$3\frac{3}{8}"$	.136"	$2\frac{5}{8}"$

*Available for large volume requirements only; consult factory for details.

†Also available with $\frac{1}{2}"$ spacing between lugs.

‡Also available with .169" diameter mounting holes.

Ⓢ indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

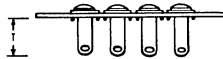
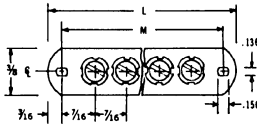
MINIATURE TERMINAL STRIPS — 321 SERIES



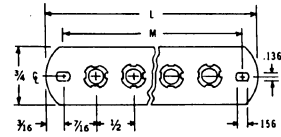
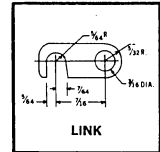
321-31-05-024



321-11-05-003



Screw type binding posts available with $\frac{7}{16}$ ", $\frac{15}{32}$ ", $\frac{1}{2}$ ", $\frac{21}{32}$ ", or $\frac{3}{4}$ " terminal centers in sizes as shown below. Insulation is polyester UL approved 94V0, $\frac{1}{16}$ " thick for 1 to 6 terminal sizes, $\frac{3}{32}$ " thick for all others. Screws are No. 6-32 x $\frac{3}{16}$ " cadmium plated steel, binder head. Terminals are .032" brass, cadmium plated. The link shown as Part No. 422-13-22-003 is .032" cold rolled steel and can be swung to either right or left. Screw and terminal assembly can be ordered separately as shown.



$\frac{1}{16}$ " TERMINAL CENTERS

Part No. (C)	No. of Lugs	Dim. L	Dim. M	Dim. T
321-11-01-003	1	1 $\frac{1}{4}$ "	.875"	$\frac{1}{2}$ "
321-11-02-013	2	1 $\frac{11}{16}$ "	1.3125"	$\frac{1}{2}$ "
321-11-03-011	3	2 $\frac{1}{8}$ "	1.750"	$\frac{1}{2}$ "
321-11-04-005	4	2 $\frac{1}{4}$ "	2.1875"	$\frac{1}{2}$ "
321-11-05-003	5	3"	2.625"	$\frac{1}{2}$ "
321-11-06-001	6	3 $\frac{1}{4}$ "	3.0625"	$\frac{1}{2}$ "
321-11-07-001	7	3 $\frac{7}{8}$ "	3.500"	$\frac{15}{32}$ "
321-11-08-001	8	4 $\frac{1}{8}$ "	3.9375"	$\frac{15}{32}$ "
321-11-09-001*	9	4 $\frac{3}{4}$ "	4.375"	$\frac{15}{32}$ "
321-11-10-001	10	5 $\frac{1}{8}$ "	4.8125"	$\frac{15}{32}$ "

$\frac{1}{2}$ " TERMINAL CENTERS

Part No.	No. of Lugs	Dim. L	Dim. M
321-31-02-052	2	1 $\frac{3}{4}$ "	1.375"
321-31-03-033*	3	2 $\frac{1}{4}$ "	1.875"
321-31-04-023*	4	2 $\frac{3}{4}$ "	2.375"
321-31-05-024*	5	3 $\frac{1}{4}$ "	2.875"

*Available for large volume requirements only; consult factory for details.

(C) Indicates items normally available through Cinch Distributors.

$\frac{3}{4}$ " Terminal Centers

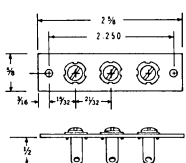
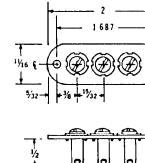
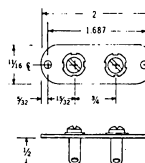
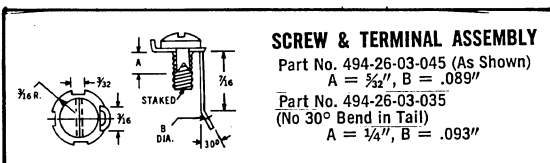
321-51-02-002

$\frac{1}{2}$ " Terminal Centers

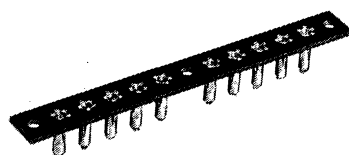
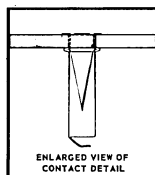
321-51-03-004

$\frac{21}{32}$ " Terminal Centers

321-51-03-003*

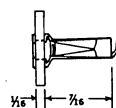
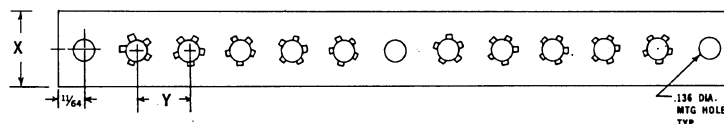


WIRE-GRIP TERMINAL STRIPS — 336 SERIES



Cinch wire-grip* terminal strips provide the ideal quick, low cost termination for radio . . . TV . . . phonograph chassis assembly. Patented solder well construction holds wires securely to facilitate multiple-dipping or individual soldering. Strips available in lengths up to 26 positions including mounting holes. Insulator material $\frac{1}{2}$ " wide by $\frac{1}{16}$ " thick is available in laminated phenolic, Stradoclad 102, or UTS 1478, or GPO-2. Terminal material is brass, available in either cadmium or electroless-tin finish. .136" diameter holes available in any position for use with eyelets or screws.

TYPICAL ASSEMBLY DIMENSIONS



When X is	Y is
$\frac{1}{2}$ "	.343
$\frac{3}{8}$ "	.300

HOW TO ORDER

SPECIFY

- No. of Terminals.
- List Terminals (T) and Mounting Holes (MH) by Position.
- Choose insulator material . . .
 - Laminated Phenolic (Stradoclad 102)
 - Laminated Phenolic (UTS, 1478)
 - (GPO-2)
- Terminal Finish . . . Electroless Tin Plate.

*Manufactured under license agreement with Malco Manufacturing Company.

EXAMPLE: (as for typical assembly shown above)

- 10 Terminals.
- Pos. 1-MH, Pos. 2-T, Pos. 3-T
Pos. 4-T, Pos. 5-T, Pos. 6-T
Pos. 7-MH, Pos. 8-T, Pos. 9-T
Pos. 10-T, Pos. 11-T, Pos. 12-T
Pos. 13-MH
- UTS 1478 Laminated Phenolic.
- Plated Electro Tin.

TRW[®] CINCH CONNECTORS

FLAME PROOF REQUIREMENTS For those who must consider the new requirements for flammability, all materials used in the parts listed in this catalog are considered self-extinguishing, and will, in general meet the UL requirements of Group II. Please consult factory for availability of parts meeting SE-1 or SE-0 as many are available on order.

INDEX

DIP SOCKETS

	Page
Deep Throat with .017 x .033 Tails .170 long	3
Shallow Throat with .017 x .033 Tails .110 long	3
Shallow Throat with .017 x .017 Tails .010 Long	3
Low Profile with .025 x .025 Tails .687 Long	3

TO-5 CASE IC SOCKETS

Standard TO-5 Case IC Sockets	4
Low Profile 3-Pin TO-5 Case IC Sockets	4

TRANSISTOR SOCKETS

Press-in Transistor Sockets	4
Universal Transistor Sockets	5
Power Transistor Sockets	5
General Purpose Transistor Sockets	5

MINIATURE SEMICONDUCTOR SOCKETS

TO-5 and TO-18 Case Devices	6
-----------------------------------	---

NUVISTOR TRIODE TUBE SOCKETS

Mechanical Crimp Mounting Type	6
Conventional Mounting Type	7
Heat Dissipating Type	7
Stand-off P.C. Type	7

SUBMINIATURE TUBE SOCKETS

Subminiature Military Stand-off Sockets	8
3, 5 & 7 Contact In-Line Sockets	8
7 Contact In-Line Socket with Long Tails	8
S-5 Subminiature Tube Sockets	9
Ring Mount T-3 Sockets	9
Double Diode Sockets	9
In-Line Military Sockets	9
T-3 Military Sockets	9

7-PIN MINIATURE TUBE SOCKETS

Miniature Tube Sockets with Mounting Saddles	10
Miniature Shield Base Sockets	10
Miniature Shield Base Stand-off Sockets	10
Military Contract P.C. Sockets	11
Miniature Socket Strap Nuts	11
J-Slot Type Shield Bases	12
J-Slot Type Tube Shields	12
Miniature Stand-off Sockets	12
Miniature Stand-off Sockets with Special Tabs..	13
Miniature Stand-off Sockets with "V" Shaped Tails	13
Miniature Stand-off Sockets with Snap-in Tails..	13

9-PIN NOVAL TUBE SOCKETS

Molded Noval Sockets with Mounting Saddles....	14
Noval Shield Base Sockets	14
J-Slot Type Shield Bases	14
J-Slot Tube Shields	14
Noval Stand-off Sockets	15
Noval Stand-off Sockets with Special Tabs	15
Noval Stand-off Sockets with Snap-in Tails	15
Noval Socket Strap Nuts	16

9-PIN NOVAL TUBE SOCKETS (CONT'D)

Noval Shield Base Stand-off Sockets	16
Right Angle Noval Shield Base Stand-off Sockets	16
Noval Stand-off Sockets with P.C. Tails	16

8-PIN OCTAL TUBE SOCKETS

Molded Octal Sockets with Mounting Saddles....	17
All-Molded Octal Sockets	17
Ring Mount Molded Octal Sockets	18
Crimped Retainer Ring	18
Adaptor Plate	18
Special Commercial Molded Octal Sockets with Mounting Saddle	18

SPECIAL PURPOSE TUBE SOCKETS

2-Pin Cetron Tube Socket	19
7-Pin Vidicon Tube Socket	19
9-Pin Molded Novar Tube Socket with Mounting Saddle	19
12-Pin Compactron Stand-off Socket	19
12-Pin Compactron All-Molded Tube Socket	19
11-Pin Magnal Tube Socket	20
14-Pin Standard Diheptal Tube Socket	20
14-Pin Thin Diheptal Tube Socket	20
12-Pin Duodecal Tube Socket	20
20-Pin Photo-Multiplier Tube Socket	21
3-5 Pin Connector Plugs, Sockets & Shell	21

MISCELLANEOUS SOCKETS & PLUGS

8 & 11 Pin Connector Plugs & Sockets	21
8 & 11 Pin Connector Shells	22

CAPACITOR SOCKETS

1" FP Type Capacitor Sockets	22
1 $\frac{3}{8}$ " FP Type Capacitor Sockets	22
Two Prong on .486" Centers	22
Two Prong on $\frac{3}{16}$ " Centers	22
Two Prong on $\frac{1}{2}$ " Centers	22
Four Prong on $\frac{3}{16}$ " Centers	22

LAMINATED SOCKETS & PLUGS

Laminated Sockets & Plugs	23
---------------------------------	----

PHONO CONNECTORS & SOCKETS

Phono Connectors & Sockets	24-25
----------------------------------	-------

COAXIAL PLUGS & SOCKETS

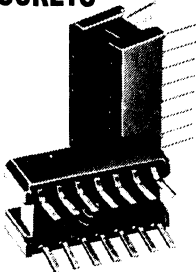
Coaxial Plugs & Sockets	25
-------------------------------	----

DISCONNECT PLUGS

125-Volt A.C. Connector	26
Standard Disconnect Plug	26

TRW[®] CINCH CONNECTORS

DIP SOCKETS

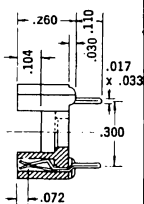


These dual-inline package sockets are designed for testing, prototype or production applications. They offer excellent resistance to corrosive atmospheres and to extremes of temperature and humidity. The unique bowed contact provides high contact forces, yet permits easy insertion and removal of the DIP.

The sockets will accept any standard 14, 16 or 24-lead DIP with round or flat centers. The socket leads are on the same centers as the DIP leads so the sockets can be used with PC boards designed for direct insertion of the DIP.

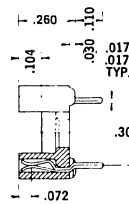
Cinch DIP sockets are available with diallyl phthalate, GP black phenolic or glass nylon insulation. Contacts on PC and solder tail versions are beryllium copper, and on wirewound versions are phosphor bronze. Contact plating is gold or electro-tin plate.

DIP SOCKET WITH .017 x .033 TAILS .110 LONG



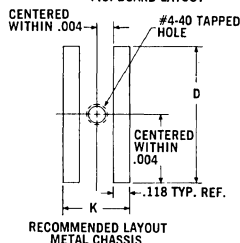
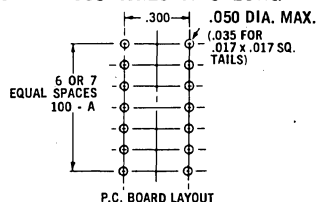
Part No.	Contacts	Insulator	Contacts
133-51-92-072	14	Diallyl Phthalate	Gold Plated
133-51-92-071	14	Diallyl Phthalate	Electro-Tin
133-51-02-073	14	GP Black Phenolic	Electro-Tin
133-51-02-074	14	GP Black Phenolic	Gold Plated
133-51-92-077	16	Diallyl Phthalate	Gold Plated
133-51-92-076	16	Diallyl Phthalate	Electro-Tin
133-51-02-078	16	GP Black Phenolic	Gold Plated
133-51-02-075	16	GP Black Phenolic	Electro-Tin
133-59-92-079	24	Diallyl Phthalate	Electro-Tin
133-59-92-080	24	Diallyl Phthalate	Gold Plated
133-59-02-081	24	GP Black Phenolic	Electro-Tin
133-59-02-082	24	GP Black Phenolic	Gold Plated

DIP SOCKETS WITH .017 x .017 SQ. TAILS .110 LONG



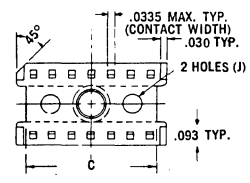
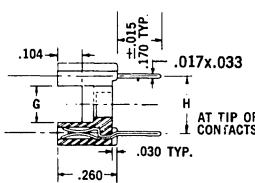
Part No.	Contacts	Insulator	Contacts
133-59-92-060	14	Diallyl Phthalate	Gold Plated
133-59-92-068	14	Diallyl Phthalate	Electro-Tin
133-59-02-059	14	GP Black Phenolic	Electro-Tin
133-59-02-069	14	GP Black Phenolic	Gold Plated
133-59-92-061	16	Diallyl Phthalate	Gold Plated
133-59-92-067	16	Diallyl Phthalate	Electro-Tin
133-59-02-068	16	GP Black Phenolic	Gold Plated
133-59-02-062	16	GP Black Phenolic	Electro-Tin
133-59-92-070	24	Diallyl Phthalate	Electro-Tin
133-59-92-064	24	Diallyl Phthalate	Gold Plated
133-59-02-063	24	GP Black Phenolic	Electro-Tin
133-59-02-069	24	GP Black Phenolic	Gold Plated

DIP SOCKET WITH .017 x .033 TAILS .170 LONG

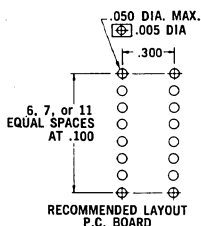


Part No.	Contacts	Insulator	Contacts
133-51-02-005	14	Diallyl Phthalate	Gold Plated
133-51-92-001	14	Diallyl Phthalate	Electro-Tin
133-51-02-003	14	GP Black Phenolic	Electro-Tin
133-51-02-004	14	GP Black Phenolic	Gold Plated
133-51-92-008	16	Diallyl Phthalate	Gold Plated
133-51-92-002	16	Diallyl Phthalate	Electro-Tin
133-51-02-007	16	GP Black Phenolic	Gold Plated
133-51-02-006	16	GP Black Phenolic	Electro-Tin
133-59-92-009	24	Diallyl Phthalate	Electro-Tin
133-59-92-010	24	Diallyl Phthalate	Gold Plated
133-59-02-011	24	GP Black Phenolic	Electro-Tin
133-59-02-012	24	GP Black Phenolic	Gold Plated

No. of Contacts	A	B	C	D	E	F	G	H ± .015	J	K
14	.600	.770	.690	.796	.300	.424	.187	.300	.093	.446
16	.700	.870	.790	.896	.300	.424	.187	.300	.093	.446
24	1.100	1.270	1.190	1.296	.600	.724	.488	.600	.125	.746

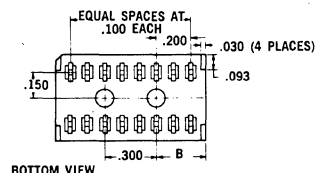
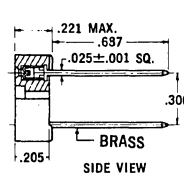
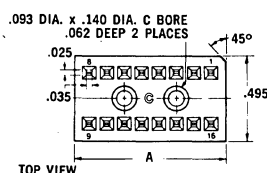


LOW PROFILE DIP SOCKETS WITH .025 x .025 W.W. TAILS .687 LONG



Part No.	Contacts	Insulator	Contacts
133-59-91-055	14	Black Glass Nylon	Electro-Tin
133-59-91-056	14	White Glass Nylon	Electro-Tin
133-59-91-051	14	Black Glass Nylon	Gold Plated
133-59-91-052	14	White Glass Nylon	Gold Plated
133-59-91-058	16	Black Glass Nylon	Electro-Tin
133-59-91-057	16	White Glass Nylon	Electro-Tin
133-59-91-054	16	Black Glass Nylon	Gold Plated
133-59-91-053	16	White Glass Nylon	Gold Plated

DIM.	14 Pin	16 Pin
A	.770	.870
B	.235	.285



† These items available through Cinch Distributors.

TOP VIEW

45°

.200 DIA. PIN CIRCLE

.376

SIDE VIEW

.015 ±

.296

1/4

BOTTOM VIEW

.243 DIA.

.050 DIA. 6 HOLES

45° TYP.

CHASSIS LAYOUT

.243 DIA.

.050 DIA. 8 HOLES

45° TYP.

8 LEAD VERSION

.230 DIA. PIN CIRCLE

36°

36°

.375 DIA.

.218 R.1

.031

.296

.015 ±

.171 ± .015

.031 R.

10 LEAD VERSION

.273 DIA.

.050 DIA. 10 HOLES

36° TYP.

.031 ± .002

Part No.	No. of Leads
133-96-92-060	6
133-98-92-061	8
133-99-92-054	10

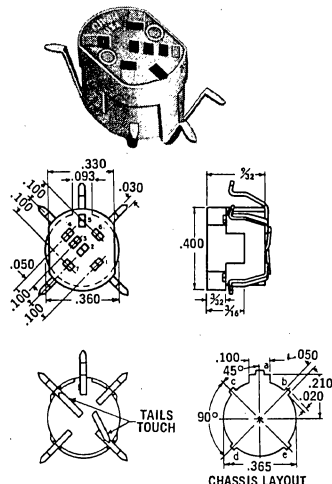
Part No.	Color
133-23-92-041	Black
133-23-92-039	Natural
133-23-92-040	Green

Part No.	No. of Contacts	Insulator Material	Contact Material
131-73-02-062	3	Black	Beryllium Copper

TRW[®] CINCH CONNECTORS

TRANSISTOR SOCKETS (CONT.)

UNIVERSAL TRANSISTOR SOCKETS TYPE T-7

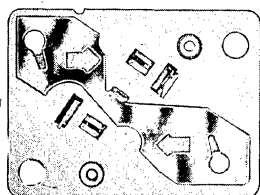


For use with ten transistor bases and five base styles illustrated. Insulator bodies are all mica-filled low loss phenolic (MFE). Contacts are beryllium copper, gold-plated. For use with $\frac{1}{16}$ " thick printed circuit board. Table lists the chassis cutout tabs required for the various base types.

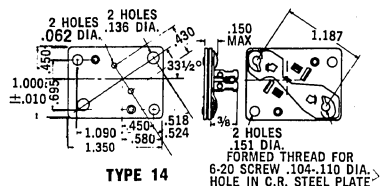
Part No.	Transistor Base Styles	Chassis Cutout Tabs Used	Contact Positions Used
†133-27-12-011	All	a, b, c, d, e	All
†133-24-12-012*	A & C	c, d, e	1, 3, 4, 7
133-25-12-013*	B & C	b, c, d, e	1, 2, 3, 4, 7
†133-23-12-014*	C	c, d, e	1, 4, 7
†133-25-12-015	D	a, b, c, d, e	1, 4, 5, 6, 7
†133-23-12-016*	E	b, d, e	1, 6, 7
†133-24-12-017	A & C	c, d, e	1, 3, 4, 7

*In positions where contacts are not required, cavity for contacts is also omitted except in position 5.

POWER TRANSISTOR SOCKETS



TYPE 14



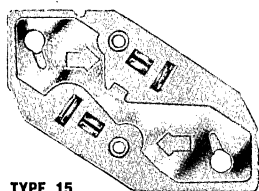
TYPE 14

Type 14 and 15 power transistor sockets with laminated top and bottom plates are used under the most severe vibration conditions because of high initial withdrawal force. Transistor can be grounded to collector plate and at the same time be completely insulated from the chassis. Type 14 and 15 top and bottom plates are made of Valox 310. Collector plates are cadmium-plated steel and contacts are made of cadmium-plated brass. Type 16 power transistor socket with molded insulator body is designed for mobile communication receivers. Type 16 socket has an insulating body of general purpose black phenolic (also available in mica and diallyl) and contacts are phosphor bronze, cadmium plated.

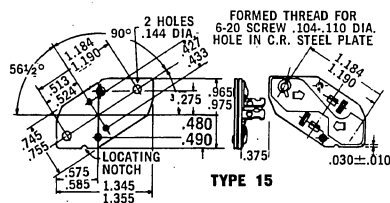
Part No.	Type	Insulator Material	Contact Material	Contact Finish	Collector Plate Material & Finish
†133-32-10-013	14	XP Natural*	Brass	Cadmium	Cadmium-Plated Steel
133-32-10-021	15	XP Natural*	Brass	Cadmium	Cadmium-Plated Steel
†133-12-02-016	16	Black†	Phosphor Bronze	Cadmium	—

*Wax impregnated.

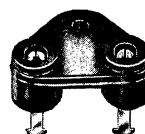
†Also available in mica and diallyl.



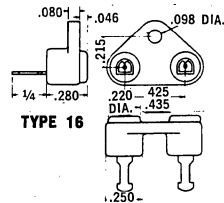
TYPE 15



TYPE 15

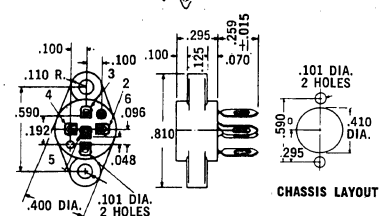


TYPE 16



TYPE 16

GENERAL PURPOSE TRANSISTOR SOCKETS TYPE 13



CHASSIS LAYOUT

Multi-purpose all-molded sockets designed to the triangular base layout (.2" x .1" JETEC-30 contact centers) as well as the 3-contact in-line layout (.048" x .192" contact centers). Insulator material is either general purpose black phenolic or mica-filled low loss phenolic (Type MFE per MIL-M-14). Contacts are made of phosphor bronze, cadmium plated. Sockets may be used with E3-14, E3-15, E3-25, E3-32, E3-43, E3-44 and E3-51 EIA base designations.

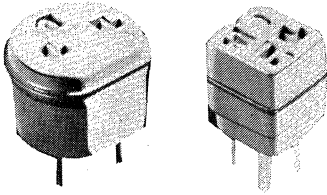
Part No.	Type	Insulator Material	Contact Material	Contact Finish	Contact Positions Used
†133-14-01-011	13	Black	Phosphor Bronze	Cadmium	1, 2, 3, 5
133-14-11-014	13	Mica	Phosphor Bronze	Cadmium	1, 2, 3, 5
133-13-01-012	13	Black	Phosphor Bronze	Cadmium	1, 2, 3
133-13-11-025	13	Mica	Phosphor Bronze	Cadmium	1, 2, 3

†These items available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

MINIATURE SEMICONDUCTOR SOCKETS

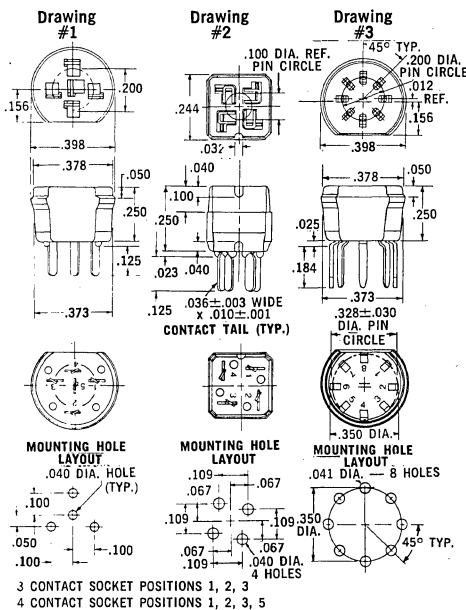
TO-5 AND TO-18 CASE DEVICES



This group of semiconductor sockets, for printed circuit board insertion, covers the standard configurations in most common use today.

Their low profile (.250") makes them especially applicable in high density applications. All units are made of MFE, mica-filled phenolic, and the six position TO-5 socket, is also available in FEP fluoro-carbon resin.

These Cinch sockets have low contact resistance, low capacitance and insulation resistance of over 1000 megohms. They are rated at 1.0 amperes and 750 volts A.C.



SPECIFICATIONS

Maximum Voltage: 750 VAC
Maximum Current: 1.0 amperes
Max. Capacitance: 1.3 pf
(1.0 pf for FEP)

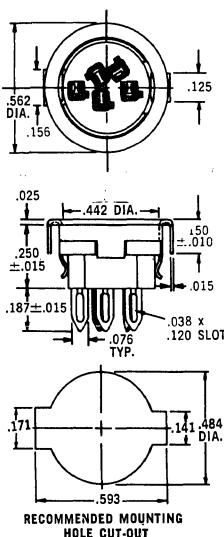
Insulation Test: 1685 VAC
Insulation Resistance: 1000 megohm, minimum
Contact Resistance: 0.05 ohms

Socket Size	No. of Contacts	Terminal Mounting	Contact Material	Insulator Material**	Part No.	Contact Plating*	Dim. Drawing
TO-5	3	PC Board	Phos. Bronze	MFE	‡133-23-11-024	(1)	#1
TO-5	4	PC Board	Phos. Bronze	MFE	‡133-24-11-026	(1)	#1
TO-5	6	PC Board or Chassis	Ber. Copper	MFE	‡133-96-12-062	(2)	#3
TO-5	6	PC Board or Chassis	Ber. Copper	FEP	‡133-96-92-067	(2)	#3
TO-5	8	PC Board or Chassis	Ber. Copper	MFE	‡133-98-12-062	(2)	#3
TO-18	3	PC Board	Phos. Bronze	MFE	‡133-23-11-034	(2)	#2
TO-18	4	PC Board	Phos. Bronze	MFE	‡133-24-11-035	(2)	#2

*CONTACT PLATING: (1) Chromate over .0003" cadmium
(2) .0003" tin over .0001" copper

**INSULATOR MATERIAL: MFE — Mica filled phenolic
FEP — Fluorocarbon resin

NUVISTOR TRIODE TUBE SOCKETS



MECHANICAL CRIMP MOUNTING TYPE

This type socket is fastened to the chassis by two tabs, which are an integral part of the metal saddle retaining the insulator body. These tabs are rolled against the underneath side of the chassis. Insulator material is mica-filled low loss phenolic (Type MFE), glass-filled diallyl phthalate (Type SDG-F per MIL-M-14). Contacts are made of brass, phosphor bronze or beryllium copper with finishes as shown below. Saddles are made of cold rolled steel or brass, with finishes as shown below.

Part No.	Insulator Material*	Contact Material	Contact Finish	Saddle Material	Saddle Finish
‡133-65-10-001	Mica	Brass	.0001 Cadmium	C.R. Steel	Copper Flash plus .0001 Cadmium
133-65-11-011	Mica	Phosphor Bronze	.0001 Silver†	C.R. Steel	Copper Flash plus .0001 Cadmium
133-65-12-012	Mica	Beryllium Copper	.0001 Silver†	C.R. Steel	Copper Flash plus .0001 Cadmium
133-65-92-025	Diallyl	Beryllium Copper	.0005 Gold	C.R. Steel	Copper Flash plus .0001 Cadmium

*Also available in general purpose black phenolic.

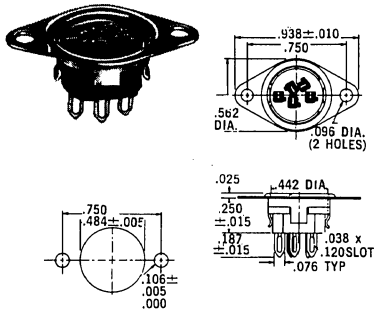
†Contact tails hot solder coated.

‡ These items available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

NUVISTOR TRIODE TUBE SOCKETS (CONT'D)

CONVENTIONAL MOUNTING TYPE

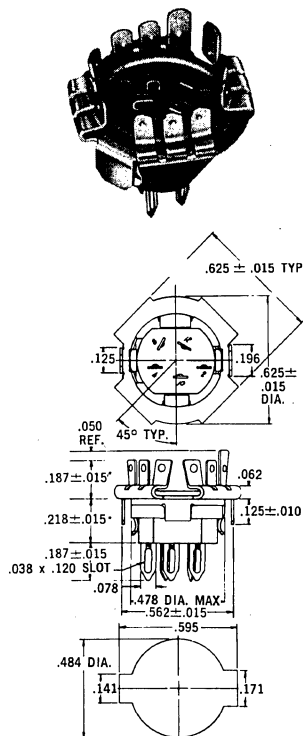


This tube socket is fastened to the chassis in the conventional manner, using screws, eyelets, rivets for self-tapping screws. Any #2 screw or $\frac{3}{32}$ " diameter rivet with a head diameter up to .190" may be used. Insulator material is mica-filled low loss phenolic (Type MFE). Contacts are made of cadmium-plated brass or silver-plated beryllium copper. Mounting saddle is either steel with copper flash plus cadmium plate finish or brass with cadmium plate plus yellow chromate finish.

Part No.	Insulator Material*	Contact Material	Contact Finish	Saddle Material	Saddle Finish
‡133-65-10-003	Mica	Brass	.0001 Cadmium	Steel	Copper Flash plus .0001 Cadmium

*Also available in general purpose black phenolic or glass-filled diallyl phthalate, Type SDG-F per MIL-M-14.

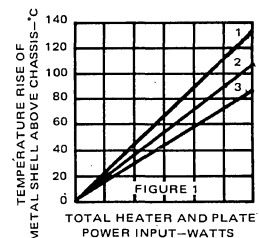
HEAT DISSIPATING TYPE



This socket with the fingered-style base, provides an excellent heat dissipator for VHF and industrial type Nuvistor tubes. As shown in the graph below, this socket is extremely effective in holding down the temperature rise of the tube metal shell relative to the chassis temperature. The socket adds 12 metal-shell-contact points to the heat paths provided by the base pins and indexing lugs which conduct tube-generated heat to the chassis. RF measurements through 1200 Mc made on the RCA-8058 double-ended Nuvistor triode in this socket show that the socket has the same effect as that obtained when the tube is soldered to the socket flange. Socket insulator material is mica-filled low loss phenolic (Type MFE). Contacts are made of brass, cadmium-plated. Saddle material is cold rolled steel, hot solder coated.

COMPARISON OF COOLING EFFECTIVENESS OF VARIOUS TYPES OF NUVISTOR SOCKETS

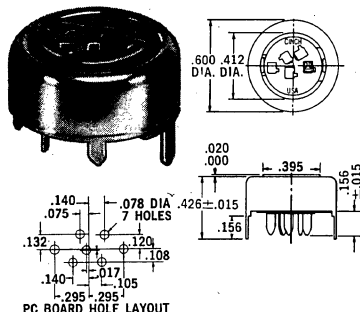
Temperature-rise curves for the RCA-7586 Nuvistor operating in (1) Cinch socket 133-65-10-009 mounted on printed-circuit board, (2) general-purpose socket crimp-mounted on aluminum chassis, and (3) Cinch socket 133-65-10-041 crimp-mounted on aluminum chassis.



Part No.	Insulator Material*	Contact Material	Contact Finish	Saddle Material	Saddle Finish
‡133-65-10-041	Mica	Brass	.0001 Cadmium	C.R. Steel	Hot Solder Coated

*Also available in general purpose black phenolic or glass-filled diallyl phthalate, Type SDG-F per MIL-M-14.

STAND-OFF P.C. TYPE



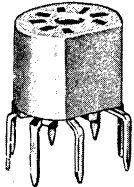
This tube socket is a stand-off type for printed circuitry containing five contacts and two grounding terminals on the saddle. The tube socket is mounted to the printed circuit board by inserting the assembly into a pre-punched hole layout as shown. The socket is then soldered into the circuitry.

Part No.	Insulator Material*	Contact Material	Contact Finish	Saddle Material	Saddle Finish
‡133-65-10-009	Mica	Brass	.0001 Cadmium	C.R. Steel	Copper Flash plus .0001 Cadmium

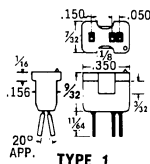
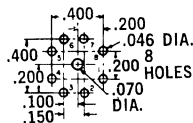
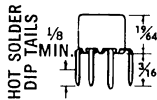
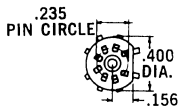
*Also available in general purpose black phenolic or glass-filled diallyl phthalate, Type SDG-F per MIL-M-14.

‡ These items available through Cinch Distributors.

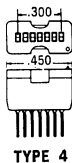
SUBMINIATURE MILITARY STAND-OFF SOCKETS TYPE S-1, S-3



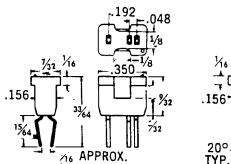
TYPE S-1



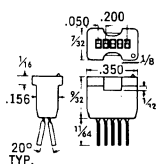
TYPE 1



TYPE 4



TYPE 2



TYPE 3

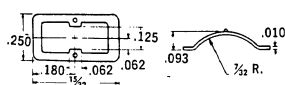
The Type S-3 socket is a seven-contact in-line subminiature right angle socket for horizontal tube position. A nickel-plated brass mounting bracket provides additional support when mounted to the printed circuit board.

Part No.	Type	No. of Contacts	Insulator Materials	Contact Material
131-78-12-024	S-1	8	Mica	Beryllium Copper
131-78-92-025	S-1	8	Diallyl Phthalate	Beryllium Copper

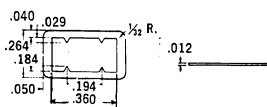
Part No.	Type	No. of Contacts	Insulator Material	Contact Material	Contact Finish
131-13-02-061	1	3	Black	Beryllium Copper	Silver
131-13-02-054	2	3	Black	Beryllium Copper	Cadmium
131-15-12-011	3	5	Mica†	Beryllium Copper	Silver
131-15-12-013	3	5	Mica	Beryllium Copper	Silver*
131-17-12-038	4	7	Mica†	Beryllium Copper	Silver
131-17-12-039	4	7	Mica	Beryllium Copper	Silver*

*Contact tails hot solder coated.

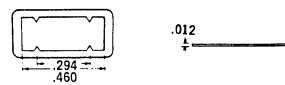
No. 441-00-11-082 ring is for use with Type 1, 2 and 3 sockets. No. 441-00-11-084 is for use with Type 4 and 5 sockets. Sharp teeth bite into side of insulator when ring is pressed on. Both rings are made of brass.



PART NO. 441-00-23-094

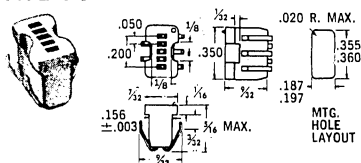


PART NO. 441-00-11-082



PART NO. 441-00-11-084

TYPE S-5



Part No.	No. of Contacts	Insulator Material	Contact Material
131-75-12-045	5	Mica	Beryllium Copper

Part No.	Type	Insulator Material	Contact Finish	Contact Finish	Center Shield Material	Center Shield Finish
132-18-12-011	6	Mica	Beryllium Copper	Silver	Brass	Cadmium
132-18-12-017	6	Mica	Beryllium Copper	Silver*	Brass	Cadmium

MOUNTING HOLE LAYOUT

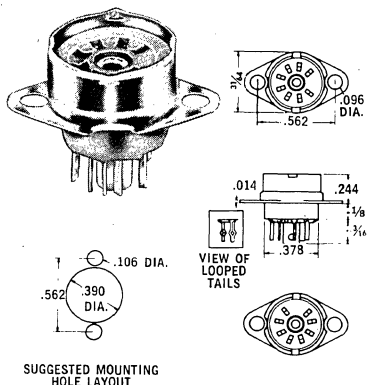
.055 DIA.
3 HOLES
200 ± .200

TYPE 17

Part No.	Type	Insulator Material	Contact Material	Contact Finish
203-91-03-029	17	Black	Brass	Electro-Tinned over Copper Flash

Part No.	Insulator Material	Contact Material	Contact Finish	Tail Type	Military Standard
131-27-92-011	Diallyl	Beryllium Copper	Silver*	Twisted	MS-35408-1
131-17-92-032	Diallyl	Beryllium Copper	Silver*	Twisted	—
131-17-92-034	Diallyl	Beryllium Copper	Silver	Looped	—

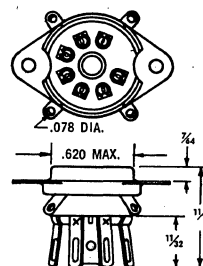
T-3 TYPE MILITARY SOCKETS



Part No.	Insulator Material	Contact Material	Contact Finish	Tail Type	Center Shield	Military Standard
132-28-92-022	Diallyl	Beryllium Copper	Silver*	Twisted	Yes	MS-35407-1
132-28-12-023	Mica	Beryllium Copper	Silver*	Twisted	Yes	MS-35407-2
132-28-92-019	Diallyl	Beryllium Copper	Silver*	Looped	No	—
132-28-92-023	Diallyl	Beryllium Copper	Silver*	Looped	No	—
132-28-92-025	Diallyl	Beryllium Copper	Silver*	Twisted	Yes	—
132-28-12-026	Mica	Beryllium Copper	Silver*	Twisted	Yes	—

2.973

MOLDED MINIATURE SOCKETS WITH MOUNTING SADDLES



TYPE 2 Bottom Mount

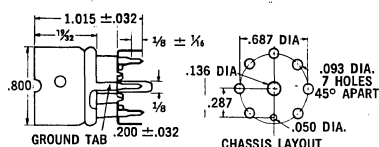
TYPE 3
Bottom Mount
With Ground Lugs

Part No.	Mtg. Hole Dia.	Part No.	Mtg. Hole Dia.	Type	Insulator Material	Contact Material	Center Shield O.D.
111-12-00-026	.098	111-12-00-037	.125	1	Black	Brass	3/16"
111-12-00-027	.098	111-12-10-038	.125	1	Mica	Brass	3/16"
111-12-20-035	.098	111-12-20-039	.125	1	Ceramic	Brass	3/16"
111-12-00-028	.098	111-12-00-034	.125	1	Black	Brass	—
111-12-10-029	.098	111-12-10-032	.125	1	Mica	Brass	—
111-12-20-036	.098	111-12-20-040	.125	1	Ceramic	Brass	—
111-11-00-011	.098	111-11-00-016	.125	2	Black	Brass	3/16"
111-11-10-012	.098	111-11-10-017	.125	2	Mica	Brass	3/16"
111-11-20-020	.098	111-11-20-024	.125	2	Ceramic	Brass	3/16"
111-11-00-013	.098	111-11-00-022	.125	2	Black	Brass	—
111-11-10-019	.098	111-11-10-023	.125	2	Mica	Brass	—
111-11-20-021	.098	111-11-20-025	.125	2	Ceramic	Brass	—
111-11-11-048	.098	111-11-11-041	.125	2	Mica	Phosphor Bronze	3/16"
—	—	111-11-12-014	.125	2	Mica	Beryllium Copper	3/16"
111-25-00-012	.098	—	—	3	Black*	Brass	3/16"

Technical drawing of the rear view of the connector. It shows a circular base with eight pins arranged in two rows of four. Dimensions include a total width of 1 1/8 inches, a pin pitch of .0875 inches, a central hole diameter of .125 DIA., and a mounting flange diameter of 5/8 inch. A side view shows a maximum length of 1 3/8 inches.

Part No.	Mtg. Hole Dia.	Insulator Material	Contact Material	Center Shield O.D.
‡111-31-00-012	.125	Black	Brass	3/8"
‡111-31-10-011	.125	Mica	Brass	3/8"
‡111-31-20-102	.125	Ceramic	Brass	3/8"

These miniature sockets have an attached bayonet type shield base. Bases have ground tab where specified in listings below. May also be obtained with heli-coil insert for use with No. 4-40 NC-2 screw. Sockets listed are for use in $\frac{1}{16}$ " thick printed circuit board, but others may also be obtained for use in $\frac{3}{32}$ " and $\frac{1}{8}$ " boards. Insulator bodies are mica-filled low loss phenolic (MFE). Contacts are phosphor bronze with copper flash and electrolytic tin. Center shield is copper flash and electrolytic tin brass and shield base and ground tab are nickel-plated brass.

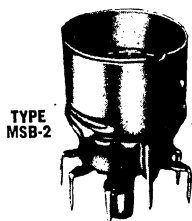


Part No.	Insulator Material	Contact Material	Center Shield	Ground Tab
111-51-11-084	Mica	Phosphor Bronze	Yes	Yes
111-51-11-085	Mica	Phosphor Bronze	No	No
111-51-11-086	Mica	Phosphor Bronze	No	Yes

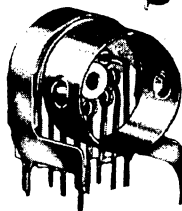
TRW[®] CINCH CONNECTORS

7-PIN MINIATURE TUBE SOCKETS (CONT'D)

MILITARY CONTRACT PC SOCKETS



TYPE MSB-2



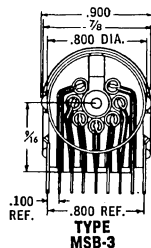
TYPE MSB-3

Two types of miniature shield base sockets designed for military use to meet rigid MIL specifications. Both types drop through clearance holes arranged on a .1" x .1" grid layout. The Type MSB-2 socket has a mica-filled low loss phenolic (MFE) insulator body. Contacts are phosphor bronze, silver-plated with hot solder dipped tails. Center shield is brass, hot solder dipped, and shield base is brass, nickel-plated. Hot solder dipped ground tab is an integral part of the base. The Type MSB-3 socket, for right angle tube position, also has a mica-filled low loss phenolic (MFE) insulator body. Contacts are made of beryllium copper, silver-plated with hot solder dipped tails. Shield base is brass, copper flash and electrolytic tin.

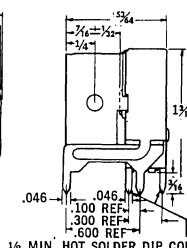
IMPORTANT

All of the sockets shown on this panel can only be purchased with a Government contract number. No exceptions can be made.

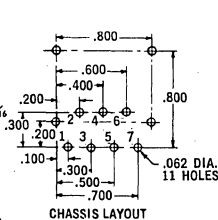
Part No.	Type	Insulator Material	Contact Material	Center Shield
111-54-11-101	MSB-2	Mica	Phosphor Bronze	Yes
111-54-12-149	MSB-3	Mica	Beryllium Copper	No



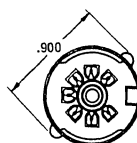
TYPE MSB-3



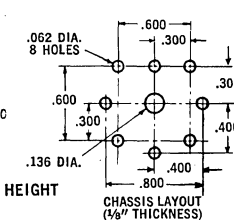
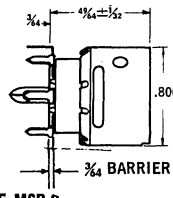
1/8 MIN. HOT SOLDER DIP CONTACT TAILS.



CHASSIS LAYOUT

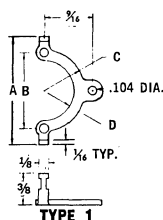
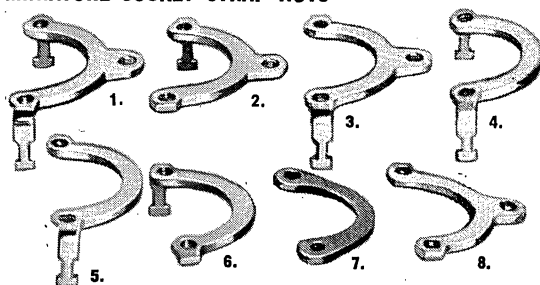


TYPE MSB-2



CHASSIS LAYOUT (1/8" THICKNESS)

MINIATURE SOCKET STRAP NUTS



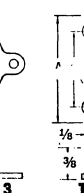
TYPE 1



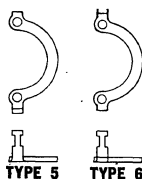
TYPE 2



TYPE 3



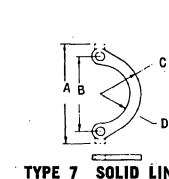
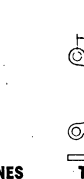
TYPE 4



TYPE 5

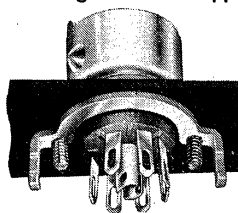


TYPE 6

TYPE 7 SOLID LINES
TYPE 7A DOTTED LINES

TYPE 8

A Cinch development for ease and simplicity in mounting miniature sockets. One strap nut takes the place of two conventional type nuts. Generally used in assembling shield base sockets. 8 types are available, with hot tin dipped ground lugs attached for convenience in wiring. All are made of 1/8" brass. Three finishes are available with each type: .0005 cadmium-plated, .0005 cadmium-plated plus yellow chromate or .0003 electro-tin. Desired finish must be specified. Strap nuts with .104 diameter rivet hole can be used for mounting or for fastening to aluminum chassis. All mounting holes are tapped to accept No. 4-40 screws.

TYPICAL STRAP NUT ASSEMBLY
WITH SHIELD BASE SOCKET

Part. No.*	Type	Dim. A	Dim. B	Dim. C	Dim. D
422-05-11-113	1	1 1/4	.875	1 1/2	1 1/2
422-05-11-133	2	1 1/4	.875	1 1/2	1 1/2
422-05-11-143	3	1 1/4	.875	1 1/2	1 1/2
422-05-11-103	4	1 1/4	.875	1 1/2	1 1/2
422-05-11-083	5	1 1/4	.875	1 1/2	1 1/2
422-05-11-093	6	1 1/4	.875	1 1/2	1 1/2
422-05-11-153	7	—	.875	1 1/2	1 1/2
422-05-11-148	8	—	.875	1 1/2	1 1/2

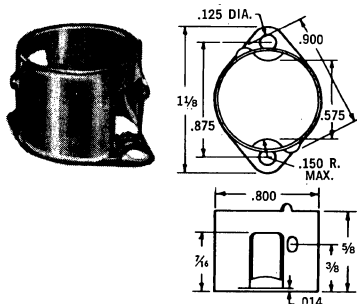
* Specify finish.

† These items available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

7-PIN MINIATURE TUBE SOCKETS (CONT'D)

J-SLOT TYPE SHIELD BASES

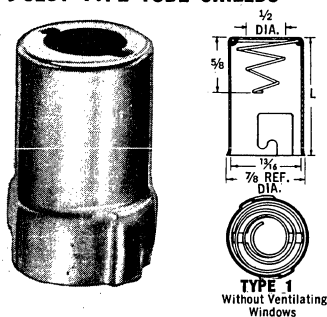


Durable shield bases of cadmium-plated steel or nickel-plated brass, designed for use with J-slot type miniature shields. $\frac{7}{8}$ " mounting centers.

Part No.*	Mtg. Hole Dia.	Material
‡441-43-22-018	.125	Steel
‡441-43-11-028	.125	Brass

*Specify finish.

J-SLOT TYPE TUBE SHIELDS

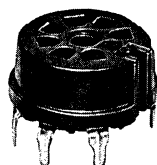


Durable tube shields with J-slot feature, designed to fit securely with Cinch miniature shield base type sockets or J-slot type shield bases. Available with or without ventilating windows. Three sizes of shields are available in either steel or brass. Each shield is complete with stainless steel pressure spring.

Part No.	Shield Material	Part No.	Shield Material	Type	Dim. L
‡150-11-13-011	Steel	150-11-10-018	Brass	1	1 3/8"
‡150-11-23-012	Steel	150-11-20-019	Brass	1	1 3/4"
‡150-11-33-013	Steel	150-11-30-020	Brass	1	2 1/4"

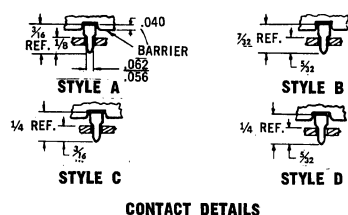
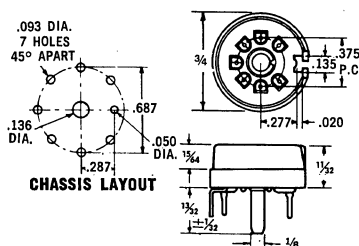
Available with either cadmium-plated or heat resistant flat black enamel finish.

MINIATURE STAND-OFF SOCKETS TYPE M-1



Miniature stand-off sockets that rest on the shoulder of the contact tail and provide an air gap for cooling, thus eliminating the possibility of a moisture trap. Sockets are designed with contacts for $\frac{1}{16}$ ", $\frac{3}{32}$ " and $\frac{1}{8}$ " thick printed circuit boards. These sockets are represented by Styles A, B and C respectively. Style D sockets are also for $\frac{1}{16}$ " thick boards, but they provide a greater air gap than the Style A socket.

The insulating body is available in either general purpose black phenolic or mica-filled low loss phenolic (MFE). Contacts are made of either brass or phosphor bronze and given a copper flash and electrolytic tin unless otherwise specified. Some of the phosphor bronze contacts are silver plated with tails hot solder dipped, as designated. Where provided, the center shield is brass with hot solder finish.



CONTACT DETAILS

Part No.	Style	Insulator Material	O.D. Ctr. Shield	Contact Material
‡111-51-00-011	A	Black	—	Brass
111-51-00-012	A	Black	1/8	Brass
111-51-10-060	A	Mica	—	Brass
111-51-11-013	A	Mica	1/8	Brass
111-51-01-062	A	Black	—	Phos. Bronze
111-51-11-061	A	Mica	—	Phos. Bronze
111-51-11-059	A	Mica	1/8	Phos. Bronze*
111-51-11-014	B	Mica	—	Phos. Bronze*
111-51-00-066	C	Black	—	Brass
111-51-11-065	C	Mica	—	Phos. Bronze
111-51-11-063	C	Mica	—	Phos. Bronze*
111-51-00-113	D	Black	—	Brass
111-51-00-114	D	Black	1/8	Brass

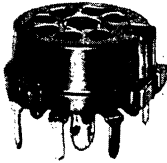
*Silver plated with tails hot solder dipped.

‡These items available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

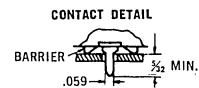
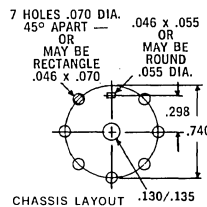
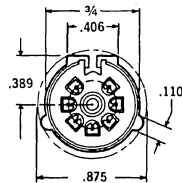
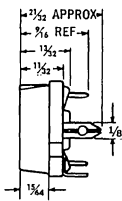
7-PIN MINIATURE TUBE SOCKETS (CONT'D)

MINIATURE STAND-OFF SOCKET With Special Tabs and Center Shield

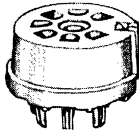


This socket is similar to those shown below except that special tabs have been added to prevent tube shield from contacting the printed circuit chassis. Center shield provides mechanical retention of the socket in the chassis. Insulating body is general purpose black phenolic. Contacts and center shield are brass with copper flash and electrolytic tin.

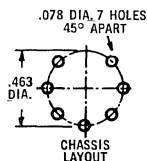
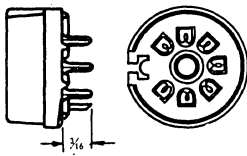
Part No.	Insulator Material	O.D. Ctr. Shield	Contact Material
#111-51-00-105	Black	1/8	Brass



MINIATURE SOCKET With "V" Shaped Contact Tails



Miniature socket with small pin circle for contact tails. The "V" shape of the contact tail aids in dip soldering. Insulating body is mica-filled low loss phenolic (MFE). Contacts are beryllium copper with copper flash and electrolytic tin.



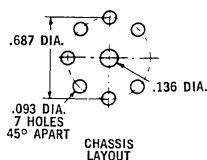
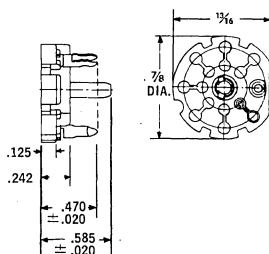
Part No.	Insulator Material	Contact Material
111-51-12-115	Mica	Beryllium Copper

MINIATURE STAND-OFF SOCKETS With Snap-in Contact Tails



These miniature sockets have special contact tails that can be snapped into the chassis holes, providing mechanical retention prior to dip soldering in 1/16" pc board. Outer circle of holes in the top of body permits sockets to be stacked vertically for automatic assembly.

Insulator bodies are available in either general purpose black phenolic, mica-filled low loss phenolic (MFE) or Alkyd 422 material. Contacts are brass with copper flash and hot tin dipped. Where provided, the center shield is brass, copper flash and electrolytic tin.



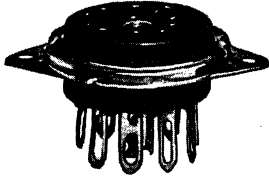
Part No.	Insulator Material	Contact Material	Center Shield
#111-52-00-019	Black	Brass	No
#111-52-10-020	Mica	Brass	No
111-52-90-021	Alkyd 422	Brass	No
#111-52-00-022	Black	Brass	Yes
#111-52-10-023	Mica	Brass	Yes

‡ These items available through Cinch Distributors.

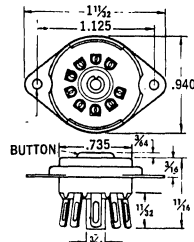
TRW[®] CINCH CONNECTORS

9-PIN NOVAL TUBE SOCKETS

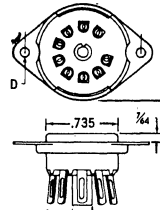
MOLDED NOVAL SOCKETS WITH MOUNTING SADDLES



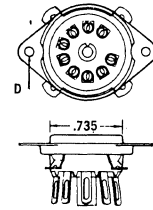
For all standard 9-pin noval tubes. Available in top-mount with or without button guide, bottom mount, bottom mount with ground lugs or bottom mount with integral eyelets. Molded of high dielectric black phenolic, mica-filled low loss phenolic or ceramic material (top mount only) with cadmium-plated brass contacts and hot-solder-coated center shield. Designed for mounting through chassis in $\frac{3}{4}$ " diameter hole, copper flash and electrolytic tin steel saddle with $1\frac{1}{8}$ " mounting centers and .098 or .125 diameter mounting holes.



TYPE 1
Top Mount Without Button
TYPE 1A
Top Mount With Button



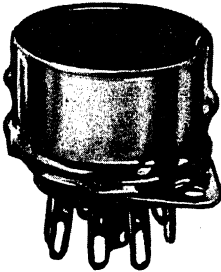
TYPE 2
Bottom Mount



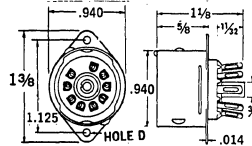
TYPE 3
Bottom Mount With Ground Lugs

Part No.	Mtg. Hole Dia. (D)	Part No.	Mtg. Hole Dia.	Type	Insulator Material	Contact Material	Center Shield O.D.
‡121-12-00-017	.098	121-12-00-023	.125	1	Black	Brass	$\frac{3}{16}$ "
‡121-12-10-018	.098	121-12-10-022	.125	1	Mica	Brass	$\frac{3}{16}$ "
121-14-20-094	.098	121-14-20-095	.125	1A	Ceramic	Brass	$\frac{3}{16}$ "
‡121-11-00-016	.098	121-11-00-021	.125	2	Black	Brass	$\frac{3}{16}$ "
121-11-00-029	.098	121-11-00-027	.125	2	Black	Brass	—
‡121-11-10-015	.098	121-11-10-020	.125	2	Mica	Brass	$\frac{3}{16}$ "
121-11-10-019	.098	121-11-10-026	.125	2	Mica	Brass	—
121-25-00-013	.098	121-25-00-015	.125	3	Black	Brass	$\frac{3}{16}$ "
121-25-10-014	.098	121-25-10-016	.125	3	Mica	Brass	$\frac{3}{16}$ "

NOVAL SHIELD BASE SOCKETS



Molded from high dielectric black phenolic, mica-filled low loss phenolic or ceramic material. One piece cadmium-plated steel shield base and saddle on $1\frac{1}{8}$ " centers. Cadmium-plated brass contacts and copper flash and electrolytic tin center shield. Mounts through top of chassis in $\frac{3}{4}$ " diameter hole. Use Cinch J-Slot type shields with these sockets.

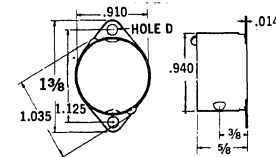


Part No.	Mtg. Hole Dia. (D)	Part No.	Mtg. Hole Dia. (D)	Insulator Material	Contact Material
‡121-31-00-015	.098	121-31-00-014	.125	Black	Brass
‡121-31-10-012	.098	121-31-10-011	.125	Mica	Brass
‡121-31-20-018	.098	121-31-20-019	.125	Ceramic	Brass

J-SLOT SHIELD BASES

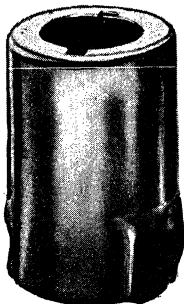


Durable cadmium-plated steel or nickel-plated brass shield bases designed for use with J-slot shields. $1\frac{1}{8}$ " mounting centers. May be used with any 9-pin saddle type socket shown.

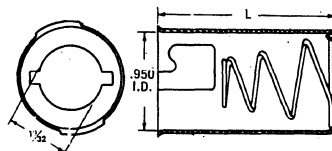


Part No.	Mtg. Hole Dia. (D)	Part No.	Mtg. Hole Dia. (D)	Material
441-41-22-213	.098	‡441-43-22-212	.125	Steel
441-41-11-216	.098	441-43-11-215	.125	Brass

J-SLOT TUBE SHIELDS



Made from durable cadmium-plated steel. Complete with tube pressure spring. J-slot feature designed to fit securely with Cinch noval shield base sockets and shield base.



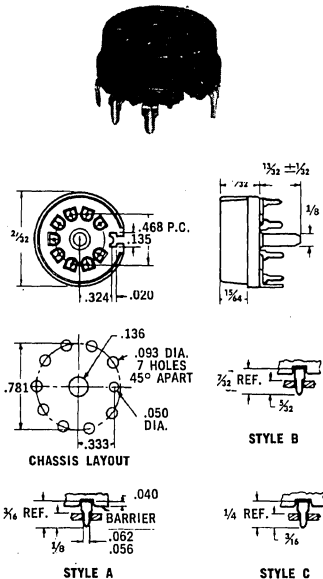
Part No.	Dim. L	Material
‡151-11-13-011	$1\frac{1}{2}$ "	Steel
‡151-11-23-012	$1\frac{1}{4}$ "	Steel
‡151-11-33-013	$2\frac{3}{8}$ "	Steel

‡ These items available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

9-PIN NOVAL TUBE SOCKETS (CONT'D)

NOVAL STAND-OFF SOCKETS



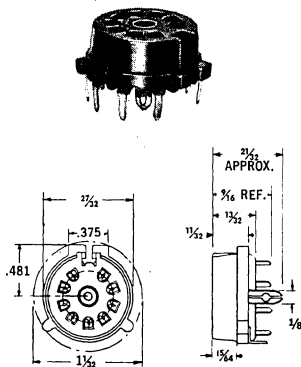
Similar to miniature sockets shown on page 13 except noval size. Socket eliminates possibility of moisture trap by resting on shoulder of contact tail, thereby providing an air gap for cooling. Socket Styles A, B and C are designed with contacts for $\frac{1}{16}$ ", $\frac{3}{32}$ " and $\frac{1}{8}$ " thick printed circuit boards, respectively.

Insulating bodies available in either general purpose black phenolic or mica-filled low loss phenolic (MFE). Contacts are either brass or phosphor bronze with copper flash and electrolytic tin, except that some of the phosphor bronze contacts are silver plated with tails hot solder dipped, as indicated. Center shield, where provided, is brass with copper flash and electrolytic tin.

Part No.	Style	Insulator Material	Shield O.D. Shield	Contact Material
‡121-51-00-040	A	Black	—	Brass
121-51-00-041	A	Black	$\frac{1}{8}$	Brass
121-51-10-044	A	Mica	—	Brass
121-51-10-042	A	Mica	$\frac{1}{8}$	Brass
121-51-01-053	A	Black	—	Phos. Bronze
121-51-11-051	A	Mica	—	Phos. Bronze
121-51-11-050	A	Mica	$\frac{1}{8}$	Phos. Bronze*
121-51-00-046	B	Black	—	Brass
121-51-00-045	B	Black	$\frac{1}{8}$	Brass
121-51-10-047	B	Mica	$\frac{1}{8}$	Brass
121-51-11-049	B	Mica	—	Phos. Bronze*
121-51-11-055	C	Mica	—	Phos. Bronze
121-51-11-052	C	Mica	—	Phos. Bronze*

*Silver plated with tails hot solder dipped.

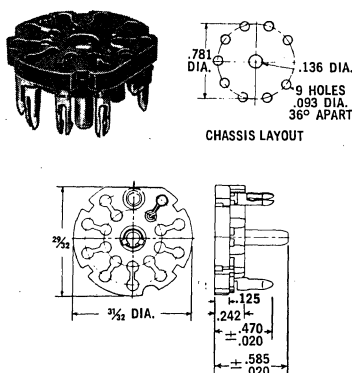
NOVAL STAND-OFF SOCKET With Special Tabs and Center Shield



Similar to miniature socket shown on page 12. Special tabs prevent tube shields from contacting printed circuit chassis. Mechanical retention of the socket in chassis is provided by special center shield. Insulating body is general purpose black phenolic. Center shield and contact material is brass with copper flash and electrolytic tin.

Part No.	Insulator Material	O.D. Ctr. Shield	Contact Material
‡121-51-00-011	Black	$\frac{1}{8}$	Brass

NOVAL STAND-OFF SOCKETS With Snap-in Contact Tails



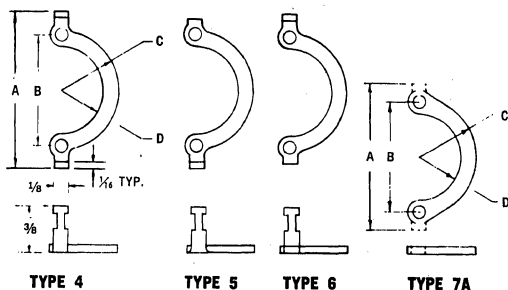
Similar to miniature sockets shown on page 12, except for noval size. Same special snap-in contact tails. Outer circle holes in top of insulator facilitates vertical stacking for automatic assembly.

Insulator bodies available in general purpose black phenolic, mica-filled low loss phenolic or Alkyd 422 material. Contacts are brass copper flash and electrolytic tin finish. Where provided, center shield is brass, copper flash and electrolytic tin.

Part No.	Insulator Materials	Contact Material	Center Shield
‡121-52-00-106	Black	Brass	No
‡121-52-10-107	Mica	Brass	No
121-52-90-111	Alkyd 422	Brass	No
‡121-52-00-108	Black	Brass	Yes
‡121-52-10-109	Mica	Brass	Yes

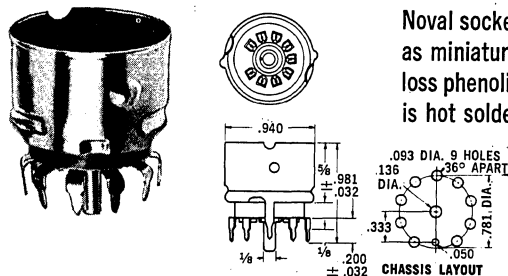
‡ These items available through Cinch Distributors.

NOVAL SOCKET STRAP NUTS



Noval Part No.*	Type	Dim. A	Dim. B	Dim. C	Dim. D
422-05-11-169	4	1 $\frac{1}{16}$	1.125	1 $\frac{1}{32}$	1 $\frac{1}{32}$
422-05-11-179	5	1 $\frac{3}{32}$	1.125	1 $\frac{1}{32}$	1 $\frac{1}{32}$
422-05-11-189	6	1 $\frac{1}{32}$	1.125	1 $\frac{1}{32}$	1 $\frac{1}{32}$
422-05-11-159	7A	1 $\frac{1}{16}$	1.125	1 $\frac{1}{16}$	1 $\frac{1}{16}$

NOVAL SHIELD BASE STAND-OFF SOCKETS



Part No.	Insulator Material	Contact Material	Center Shield	Ground Tab
#121-51-11-077	Mica	Phosphor Bronze	Yes	Yes
121-51-11-078	Mica	Phosphor Bronze	No	No
121-51-11-079	Mica	Phosphor Bronze	No	Yes

HOT TIN DIP CONTACT TERMINALS $\frac{1}{8}$ " MIN.

.046 ± .002

1 $\frac{3}{4}$ "

5% REF.

1.000 REF.

1.035 ± .010

.940 DIA.

.468

1.000

.800

.600

.400

.300

.200

.100

.003

.800

.700

.600

.500

.400

.300

**13 HOLES
.062 DIA.**

CHASSIS LAYOUT

Part No.	Insulator Material	Contact Material
121-54-12-137	Mica	Beryllium Copper

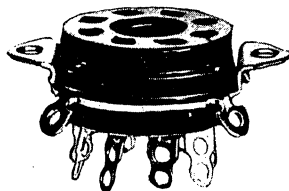
Part No.	Insulator Material	Contact Material
121-51-00-076	Black	Brass

eem/1975

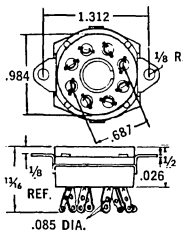
TRW[®] CINCH CONNECTORS

8-PIN OCTAL TUBE SOCKETS

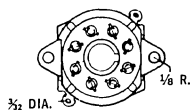
MOLDED OCTAL SOCKETS With Mounting Saddle, 1 $\frac{1}{16}$ " Mounting Centers



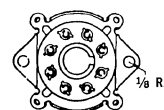
Sub-panel mounting molded sockets for 1" chassis hole. Molded from high dielectric black phenolic or mica-filled low loss phenolic. Contacts are cadmium-plated brass or silver-plated phosphor bronze. Sturdy steel hot-solder-coated press-on type saddle, available with or without integral ground lugs. On saddles having two ground lugs, the lugs are adjacent to the No. 2 and 6 positions. On saddles having four ground lugs, they are adjacent to the No. 2, 4, 6 and 8 positions.



TYPE 1
Press-on Saddle
Without Ground Lugs



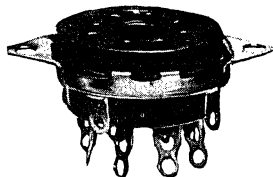
TYPE 2
Press-on Saddle
With 2 Ground Lugs



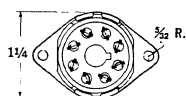
TYPE 3
Press-on Saddle
With 4 Ground Lugs

Part No.	Type	Mtg. Hole Dia.	Insulator Material	Contact Material
101-11-00-011	1	.140	Black	Brass
101-11-10-018	1	.140	Mica	Brass
101-11-11-013	1	.140	Mica	Phosphor Bronze
101-12-00-067	2	.140	Black	Brass
101-12-10-069	2	.140	Mica	Brass
101-12-11-068	2	.140	Mica	Phosphor Bronze
‡101-12-00-039	3	.136	Black	Brass
‡101-12-10-044	3	.136	Mica	Brass
101-12-11-051	3	.136	Mica	Phosphor Bronze
101-12-00-052	3	.156	Black	Brass
101-12-10-053	3	.156	Mica	Brass
101-12-11-054	3	.156	Mica	Phosphor Bronze

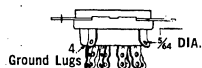
MOLDED OCTAL SOCKETS With Mounting Saddle, 1 $\frac{1}{2}$ " Mounting Centers



Sub-panel mounting molded octal sockets for 1 $\frac{1}{8}$ " chassis hole. Same specifications as 1 $\frac{1}{16}$ " type described above. Press-on type metal saddles are made with or without integral ground lugs.

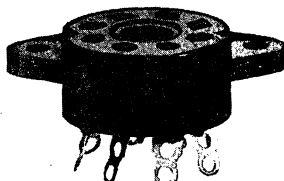


TYPE 5
Clinch-on
Saddle
With 4
Ground Lugs

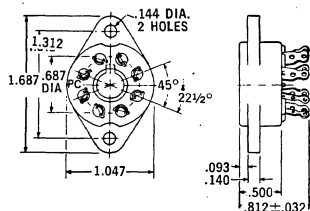


Part No.	Type	Mtg. Hole Dia.	Insulator Material	Contact Material
‡101-24-00-065	5	.143	Black	Brass
‡101-24-10-067	5	.143	Mica	Brass
101-24-11-057	5	.143	Mica	Phosphor Bronze

ALL-MOLDED OCTAL SOCKETS



Cinch's all-molded octal socket offers a complete one-piece construction for higher voltage applications. The saddle and body are a single casting, molded of high dielectric black phenolic or mica-filled low loss phenolic. Contacts are of brass, cadmium-plated. Mounting hole centers are 1 $\frac{1}{16}$ ". This socket can also be supplied with keyway rotated 90°.



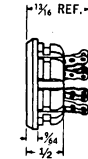
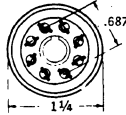
Part No.	Mtg. Hole Dia.	Insulator Material	Contact Material
‡101-06-00-199	.144	Black	Brass
‡101-06-10-200	.144	Mica	Brass

‡ These items available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

8-PIN OCTAL TUBE SOCKETS (CONT'D)

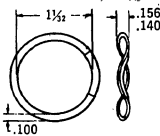
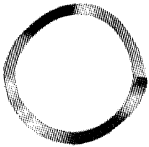
RING MOUNT MOLDED OCTAL SOCKETS



Used extensively on test equipment, public address amplifiers and on other apparatus where sockets are exposed. Mounts in 1 1/4" chassis hole. Molded keyways in side engage key in chassis hole, preventing socket from turning. Molded of high dielectric black phenolic or mica-filled low loss phenolic. Contacts are brass, cadmium-plated or phosphor bronze, silver-plated.

Part No.	Chassis Thickness	Insulator Material	Contact Material
101-03-00-033	1/8"	Black Mica	Brass
101-03-10-059	1/8"	Mica	Brass

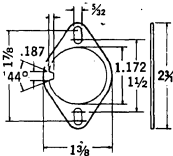
CRIMPED RETAINER RING



Formed of .020 spring steel, is used with ring mount sockets. Securely anchors sockets in place without requiring screws or rivets. Ring finishes available are cadmium-plated, nickel-plated and cadmium-plated plus yellow chromate. Specify finish.

‡(Part No. 441-00-23-072)

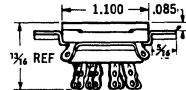
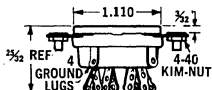
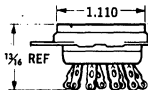
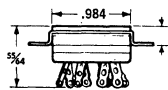
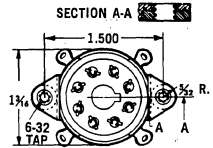
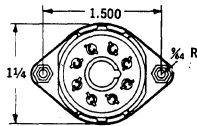
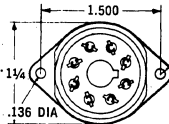
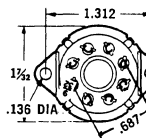
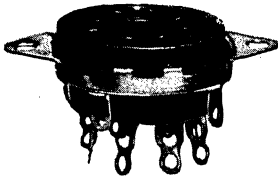
ADAPTOR PLATE



Is for use when the hole in chassis is too large to use crimped retainer ring alone. In such cases, this adaptor plate is anchored to the chassis and the ring clamps the appropriate ring-mount socket to the plate. Made of 1/8" cold rolled steel with cadmium-plated or cadmium-plated plus yellow chromate finish. Specify finish.

‡(Part No. 441-37-22-001)

SPECIAL COMMERCIAL MOLDED OCTAL SOCKETS WITH MOUNTING SADDLE



TYPE 7
1 1/2" Mounting Centers
Press-on Saddle
Top Mount

TYPE 9
1 1/2" Mounting Centers
Cinch-on Saddle
Top Mount

TYPE 10
1 1/2" Mounting Centers
Cinch-on Saddle
With "Kim" Nuts

TYPE 11
1 1/2" Mounting Centers
Cinch-on Saddle
With "Pem" Nuts

Several variations of molded saddle octal sockets are also available for special commercial needs. Type 3 in the table below refers to material variations of these types shown in the previous standard molded saddle sections. Types 7 and 9 are designed for top mounting in chassis. Type 8 is the equivalent of octal socket Type 5, with 1 1/2" mounting centers instead of 1 1/4". Type 10 provides "Kim" nuts for simplification of assembly and to prevent screws from loosening due to vibration. Type 11 shows a socket with "Pem" nuts attached to simplify assembly by eliminating conventional type nuts.

Part No.	Type	Mtg. Hole Dia.	Insulator Material	Contact Material	Saddle Material	See Note
101-12-12-055	3*	.156	Mica	Beryllium Copper	Steel	1, 2, 3, 4
101-12-11-056	3*	.156	Mica	Phosphor Bronze	Steel	1, 2, 3, 4
101-11-90-101	7	.136	Brown	Brass	Steel	—
101-11-10-099	7	.136	Mica	Brass	Steel	—
101-23-10-146	9	.136	Mica	Brass	Steel	5
101-24-11-183	10	4-40 Tap	Mica	Phosphor Bronze	Steel	1, 3
101-24-12-223	11	6-32 Tap	Mica	Beryllium Copper	Brass	1, 2, 3, 4

NOTES

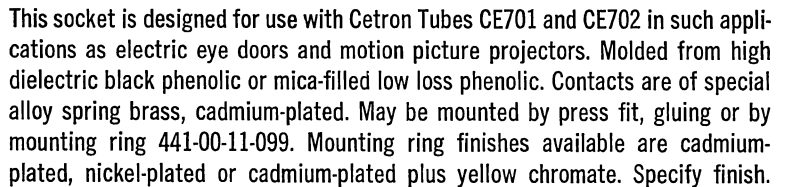
1. Contacts silver plated.
2. Contact tails tin dipped.
3. Saddle tin dipped.

4. Plated to withstand 50 hour salt spray test.
5. Insulator wax impregnated.

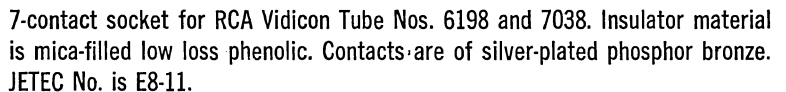
*See page 17 for dimensions.

‡ These items available through Cinch Distributors.

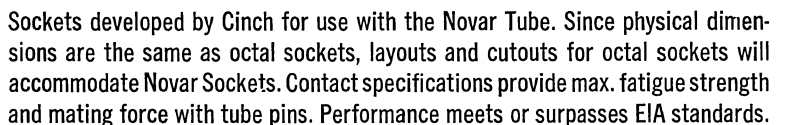
CETRON TUBE SOCKETS (2-PIN)



VIDICON TUBE SOCKET (7-PIN)

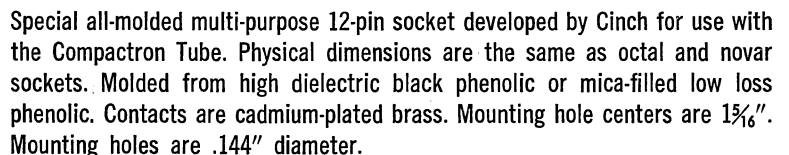


MOLDED NOVAR SOCKETS WITH MOUNTING SADDLE (9-PIN)



Novar sockets with mounting saddles are available bottom mount only. Molded from high dielectric black phenolic or mica-filled low loss phenolic. Cadmium-plated brass contacts. Cadmium-plated steel saddle. 1½" mounting centers. Mounting holes are .136" diameter.

COMPACTRON TUBE SOCKETS (12-PIN)

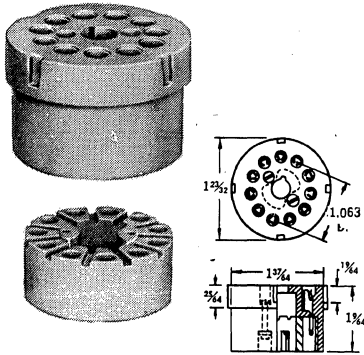


TRW/CINCH CONNECTORS, AN ELECTRONIC COMPONENTS DIV. OF TRW INC. / 1501 MORSE AVE. / ELK GROVE VILLAGE, ILL. 60007

TRW[®] CINCH CONNECTORS

SPECIAL PURPOSE TUBE SOCKETS (CONT'D)

MAGNAL TUBE SOCKETS (11-PIN)

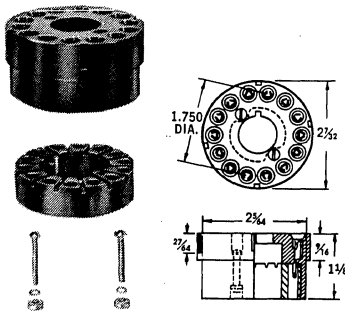


For use with 5BP1 and 2AP1 type cathode ray tubes. Molded from high dielectric black phenolic or mica-filled low loss phenolic. Full floating cadmium-plated phosphor bronze contacts ensure easy insertion of tube and provide excellent electrical connections. Navy type has silver-plated phosphor bronze contacts. Two-piece insulator consists of outer casting with required number of contacts assembled and inner casting assembled in position but not fastened. Supplied with two screws, two nuts and two lock washers for assembly. Also available with cadmium-plated or zinc-plated steel mounting ring 441-30-22-012. Specify mounting ring finish.

Part No.	Insulator Material	Contact Material	Navy Type No.
143-14-01-017	Black	Phosphor Bronze	—
143-14-11-016	Mica	Phosphor Bronze	—
†143-13-11-011	Mica	Phosphor Bronze†	CMG49707

†Silver plated finish.

DIHEPTAL TUBE SOCKETS (14-PIN) STANDARD DIHEPTAL SOCKETS

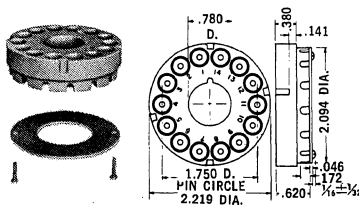


Possess same features as Cinch Magnal Sockets shown above. Molded of high dielectric black phenolic or mica-filled low loss phenolic with full-floating cadmium-plated phosphor bronze contacts. Silver-plated phosphor bronze contacts also available in mica material. Two-piece insulator construction. Supplied with two screws, two nuts and two lock washers unassembled. Available with cadmium-plated, nickel-plated or zinc-plated steel mounting ring 441-30-22-038. Specify mounting ring finish.

Part No.	Type	Insulator Material	Contact Material	Navy Type No.
†143-42-01-014	Standard	Black	Phosphor Bronze	—
†143-42-11-016	Standard	Mica	Phosphor Bronze	—
143-42-11-011	Standard	Mica	Phosphor Bronze†	CMG49920

†Silver plated finish.

THIN DIHEPTAL SOCKET (14-PIN)

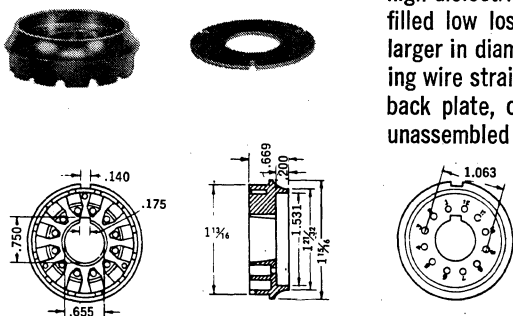


Thinner version of standard diheptal for tighter space requirements. Molded from mica-filled low loss phenolic with silver-plated beryllium copper contacts. Consists of one-piece socket base, back plate, contacts and two drive screws, all supplied unassembled.

Part No.	Type	Insulator Material	Contact Material	Navy Type No.
143-44-12-028	Thin	Mica	Beryllium Copper†	—

†Silver plated finish.

DUODECAL TUBE SOCKETS (12-PIN)



For use with 10BP4, 2BP1, 5TP4 type tubes and RCA 6199 tube. Molded from high dielectric black phenolic with cadmium plated brass contacts or from mica-filled low loss phenolic with silver-plated beryllium copper contacts. Slightly larger in diameter than tube base and only slightly longer than tube pin, featuring wire strain relief as an integral part of the contact. Consists of socket base, back plate, contacts and three slotted-head self-tapping screws, all supplied unassembled for wiring to suit individual specifications.

Part No.	Insulator Material	Contact Material	Navy Type No.
†143-24-00-011	Black	Brass	—
†143-24-12-013	Mica	Beryllium Copper	CMG492005

†These items available through Cinch Distributors.

An exploded view diagram showing three components of a cylindrical container. At the top is a lid with a wide rim featuring four vertical slots. Below it is the main body of the container, which has a textured surface and two vertical slots on its side. At the bottom is a circular base plate with two small holes. To the left of the base plate is a small screw, and to the right is another small component, possibly a pin or washer.

.312 I.D. OF OPENING EXTRUDED .032 HIGH

.373

.218

.080

.625

.062

.002

.627 I.D.

.715 I.D.

8 PIN PLUG

11 PIN PLUG

SOCKET

Technical drawing of an 8-pin plug. The top view shows a circular plug with an outer diameter of 1.043, a central hole diameter of .687, and a distance of .915 from the center to the edge of the pin holes. The side view shows a plug with a total length of 1.36, a pin diameter of .093, and a pin length of 3/16. The plug has 8 pins in total, with a diameter of 3/16 and a length of 3/16. The plug is labeled "8 PIN PLUG" and "DIA. .093".

1.175
 .750 DIA.
 .035
 1.158
 1.043
 22°
 11 PIN PLUG

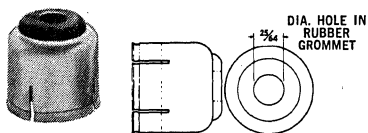
11 PIN SOCKET

2.985

TRW[®] CINCH CONNECTORS

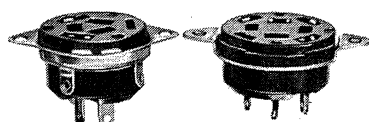
MISCELLANEOUS SOCKETS AND PLUGS

8-11 PIN CONNECTOR SHELLS



Shells are available to snap on to 8- and 11-pin connector plugs and sockets grooved for a $\frac{1}{16}$ " chassis thickness. Shell has a $\frac{3}{64}$ " diameter hole in a rubber grommet in the top. There is a screwdriver slot at the bottom of each shell to facilitate removal when necessary. All shells are made of cadmium-plated steel with an insulating liner. Part No. 209-23-23-205.

CAPACITOR SOCKETS



1" FP TYPE

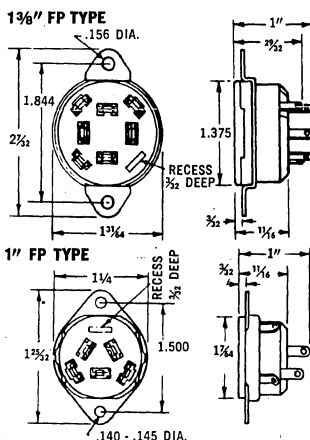
1 3/8" FP TYPE

1" FP TYPE CAPACITOR SOCKET

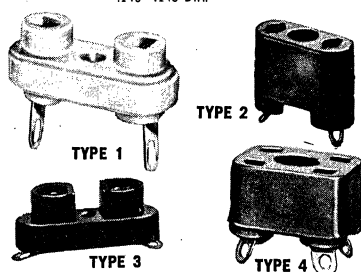
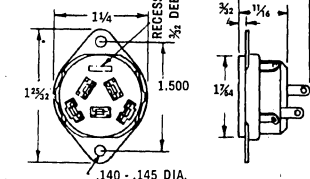
Molded of high dielectric black phenolic. Steel saddle, with 4 ground lugs, is hot-solder-coated. $\frac{1}{2}$ " mounting centers. Contacts are phosphor bronze, cadmium-plated. Has 3 recessed center contacts for extended prongs of capacitor and two outer contacts flush with surface for short prongs of capacitor.

1 3/8" FP TYPE CAPACITOR SOCKET

Molded of high dielectric black phenolic. Sturdy cadmium-plated steel saddle has $1\frac{7}{32}$ " mounting centers. Contacts are phosphor bronze, cadmium-plated. Has four recessed center contacts for extended prongs of capacitor and three outer contacts flush with surface for short prongs of capacitor.



1" FP TYPE



TYPE 1

TYPE 2

TYPE 3

TYPE 4

TYPE 1—2-PRONG .486" CENTERS

Made of ceramic material. Silver-plated beryllium copper contacts with hot tinned tails, mounted on .486" centers. $\frac{1}{8}$ " mounting hole. Tails extend straight down. For all .050 pin crystals with HC-6/U holders.

TYPE 2—2-PRONG $\frac{3}{4}$ " CENTERS

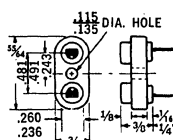
Molded of high dielectric black phenolic or mica-filled low loss phenolic. Silver-plated beryllium copper contacts. .120" diameter recessed mounting hole. For use with crystals having .093 pins on .486" centers.

TYPE 3—2-PRONG $\frac{1}{2}$ " CENTERS

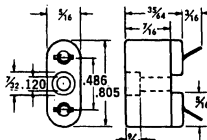
Molded of high dielectric black phenolic or mica-filled low loss phenolic. Silver-plated phosphor bronze contacts. No. 4-40 tap mounting hole. For crystals having .125 pins on .500 centers.

TYPE 4—4-PRONG

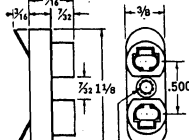
Molded of mica-filled low loss phenolic. Silver-plated beryllium copper contacts on $\frac{3}{4}$ " centers. .150" diameter mounting hole recessed $\frac{3}{64}$ " from surface in $\frac{3}{64}$ " diameter hole. Designed for use with two crystals having .093 pins on .486" centers.



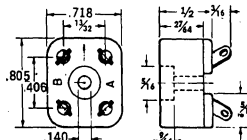
TYPE 1



TYPE 2



TYPE 3



TYPE 4

Part No.	Type	No. of Prongs	Centers	Insulator Material	Contact Material
‡203-73-02-015	1	2	.486"	Ceramic	Beryllium Copper
‡203-71-02-031	2	2	.486"	Black	Beryllium Copper
‡203-72-02-030	2	2	.486"	Mica	Beryllium Copper
203-72-02-021	3	2	.500"	Black	Phosphor Bronze
203-72-02-022	3	2	.500"	Mica	Phosphor Bronze
‡203-72-04-037	4	4	.486"	Mica	Beryllium Copper

‡ These items available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

LAMINATED CONNECTOR SOCKETS AND PLUGS

Part No.	Ref. Dwg.
202-31-02-068	1
202-31-02-002	1A
202-31-02-010	2
202-31-02-128	2A
202-41-02-074	3
202-41-02-075	3A
202-41-02-155	4
202-41-02-154	4A
201-31-02-001	5
201-41-02-288	6

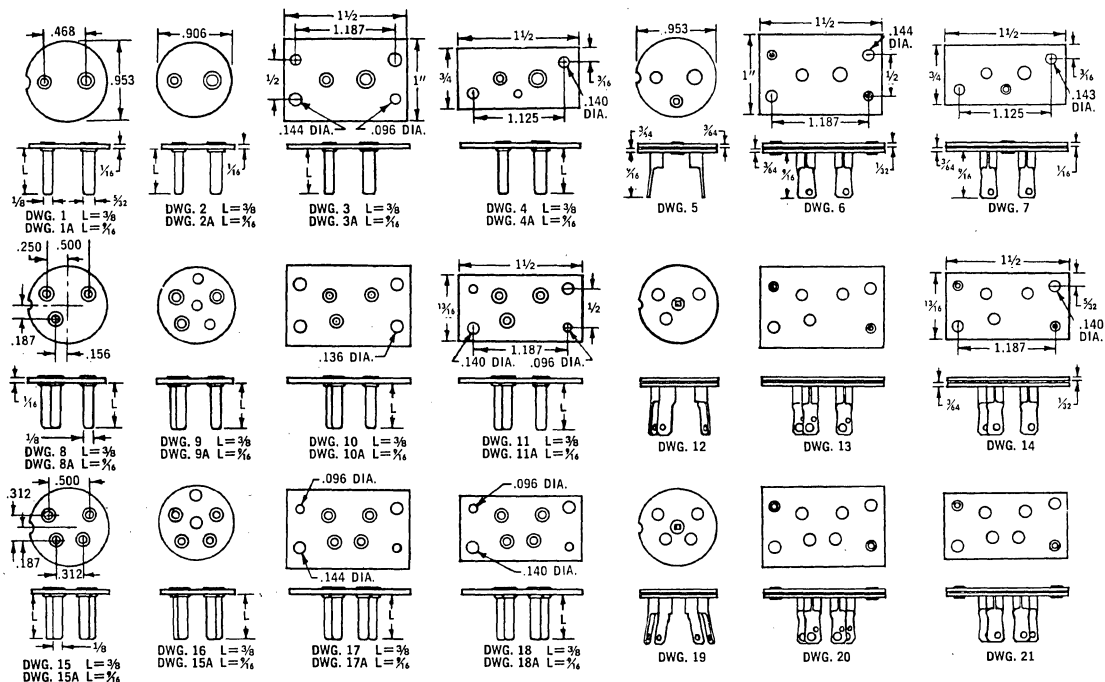
Part No.	Ref. Dwg.
201-41-02-106	7
202-31-03-070	8
202-31-03-003	8A
202-31-03-011	9
202-31-03-133	9A
202-41-03-152	10
202-41-03-153	10A
202-41-03-146	11
202-41-03-145	11A
201-31-03-002	12

Part No.	Ref. Dwg.
201-41-03-024	13
201-41-03-278	14
202-31-04-179	15
202-31-04-005	15A
202-31-04-017	16
202-31-04-032	16A
202-41-04-108	17
202-41-04-109	17A
202-41-04-144	18
202-41-04-143	18A

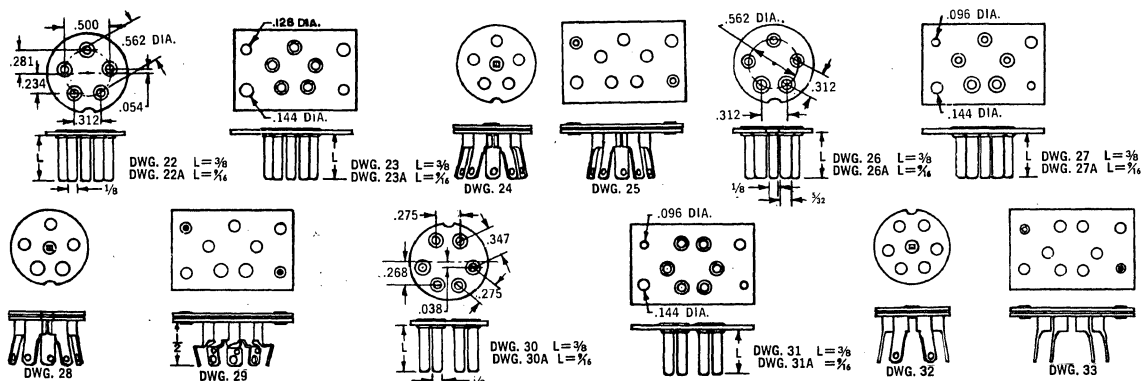
Part No.	Ref. Dwg.
202-31-05-208	26
201-31-04-003	19
201-41-04-027	20
201-41-04-280	21
202-31-05-018	22
202-31-05-006	22A
202-41-05-141	23
202-41-05-139	23A
201-31-05-004	24
201-41-05-281	25

Part No.	Ref. Dwg.
202-31-05-212	26A
202-41-05-066	27
202-41-05-065	27A
201-31-05-062	28
201-41-05-074	29
202-31-06-066	30
202-31-06-007	30A
202-41-06-136	31
202-41-06-135	31A
201-31-06-005	32
201-41-06-243	33

The following groups of Cinch sockets and plugs are made of NEMA grade XP laminated phenolic material with plug type pins of nickel plated brass and socket contacts of Cinch brass alloy, solder coated.



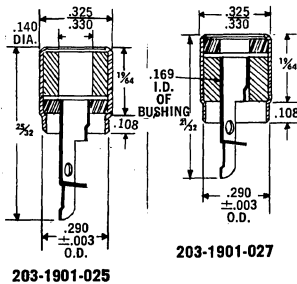
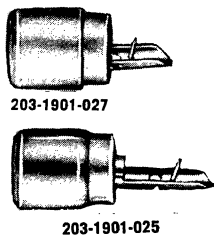
In the group below, the general dimensions of Part No. 202-41-05-141 group conform to those of Part No. 202-41-02-074 group in the top panel. Similarly, those of the 201-31-05-004 group and the 201-41-05-281 group correspond to the F-20 and 4068 groups respectively.



TRW[®] CINCH CONNECTORS

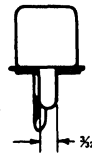
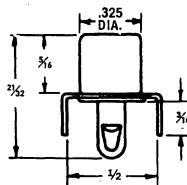
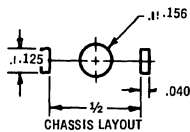
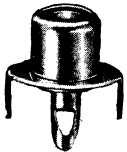
PHONO CONNECTORS AND SOCKETS

PHONO SOCKET



Mates with either crimp or solder-type phono plug. Special internal bushing holds contact lengths. SHELL: Cold-rolled steel, cadmium-plated. CONTACT: Cadmium-plated brass. INSULATOR ASSEMBLY: Insulated washer with bushing.

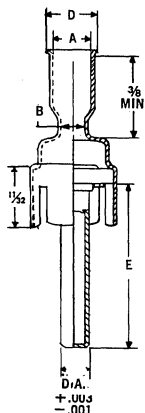
PHONO CONNECTOR PC SOCKETS



Phono connector socket for printed circuit use. Can be used as a two-contact connector or for ground in phono applications. Insulator is general purpose black phenolic. Brass mounting bracket, brass contact and steel shell are cadmium-plated. Two styles available, one as shown and one with no wire hole in contact tail.

Part No.	Insulator Material	Contact Material	Wire Hole
203-11-01-016	Black	Brass	Yes
203-11-01-015	Black	Brass	No

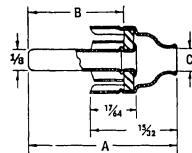
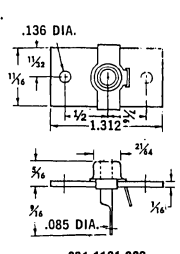
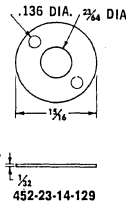
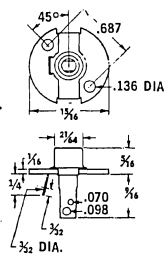
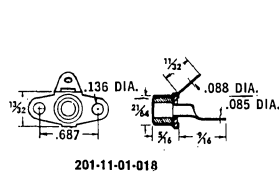
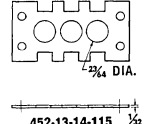
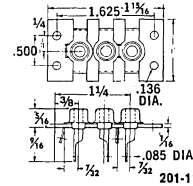
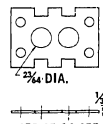
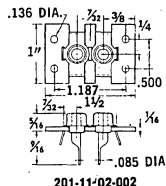
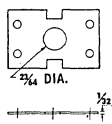
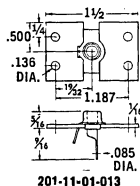
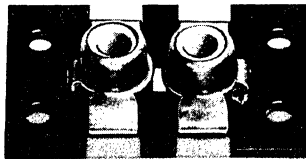
PHONO PLUGS AND SOCKETS



Cinch's low cost crimp-type phono plugs provide the ideal phono connector for your TV — stereo — hi-fi chassis needs. Sturdy, reliable construction assures electrical continuity. Automatic crimping capability helps cut assembly costs to barest minimum. Different types available for use with .090, .125 or .135 diameter wire. SHELL: Cold-rolled steel, cadmium-plated. PIN ASSEMBLY: Nickel-plated brass pin with insulated washer.

Part No.	DIMENSIONS IN INCHES			
	A +.010 -.005	B	D ± .010	E (Pin Length)
202-19-01-093	.125	.090	.188	3/16
202-19-01-092	.156	.125	.219	3/16
202-19-01-091	.175	.135	.233	3/16
202-19-01-111	.225	.180	.275	—

Part No. 201-11-01-018 is a small, compact unit especially designed for use in places where economy of space is essential.

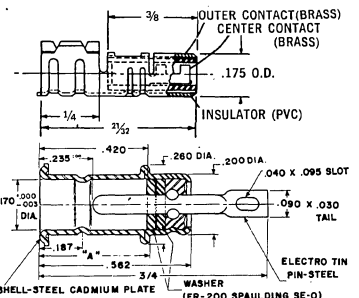
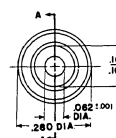
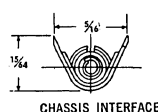


Part No.	A	B	C
‡202-15-01-011	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{3}{8}$
‡202-15-01-015	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{3}{8}$
202-15-01-026	$\frac{5}{8}$	$\frac{3}{8}$	$\frac{3}{8}$
202-15-01-013	$\frac{1}{16}$	$\frac{1}{16}$	$\frac{1}{64}$
202-15-01-016	$\frac{1}{16}$	$\frac{3}{16}$	$\frac{1}{64}$
202-15-01-022	$\frac{5}{8}$	$\frac{3}{8}$	$\frac{1}{64}$

Insulators No. 452-12-17-171, 452-12-14-189 and 452-13-14-115 are made of $\frac{1}{32}$ " NEMA grade XP laminated phenolic material. Insulation in female connectors is ceramic. Mounting hole center distance of both single and double connectors is 1.187".

‡These items available through Cinch Distributors.

Plug: Polyvinyl chloride
Contacts: Pre-tinned brass
Shell and Sleeve:
Steel, copper flashed
and cadmium plated

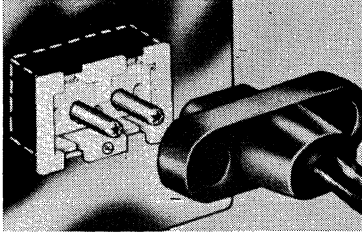


Standard parts are available with mounting sleeve dimensions as indicated in the chart.

TRW[®] CINCH CONNECTORS

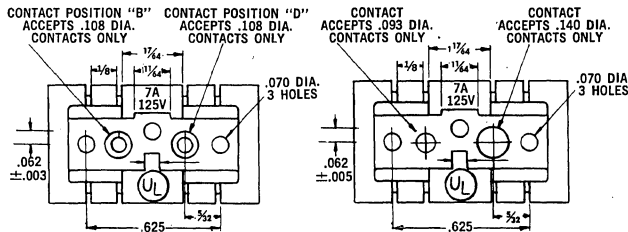
DISCONNECT PLUGS

125 VOLT A.C. CONNECTOR

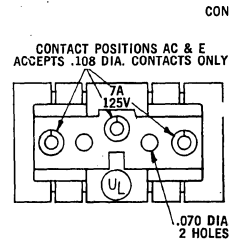


A low cost Cinch 125 volt AC connector provides the ideal disconnect plug for radio . . . TV . . . phonographs and appliance chassis needs. The snap-in locking feature eliminates the need for riveting or eyeletting. Sturdy construction insures continuous, dependable performance. Insulator material is Black Lexan. Solid brass pins are cadmium plated. These parts are UL and CSA approved.

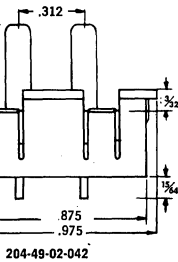
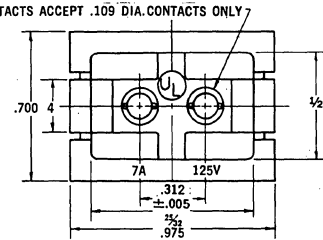
TWO-CONTACT CONNECTOR



THREE-CONTACT CONNECTOR



TWO-CONTACT CONNECTOR



TRW[®] CINCH CONNECTORS

GENERAL DESCRIPTION

For more than a generation, "Jones" plugs and sockets have been a "by-word" of the electrical/electronic industry. Even today, the quality, reliability, convenience and basic excellence of the "Jones" design continues to meet the requirements of such exacting fields as communications and automatic vending equipment.

Within this catalog are listed each of the four basic lines of "Jones" plugs and sockets: 300, 400, 500, 2400 Series. The 300 Series, designed for light duty, has plug prongs $\frac{3}{32}$ " wide by $\frac{3}{64}$ " thick. The 400 Series, designed for medium work, has plug prongs $\frac{1}{4}$ " wide by $\frac{1}{16}$ " thick. The 500 Series, for heavy duty work, has plug prongs $\frac{5}{16}$ " wide by $\frac{3}{32}$ " thick. The 2400 Series, with the same characteristics as the 400 Series, carries a higher voltage rating.

In addition to the basic lines, also included are the 1400 Series and several other low-cost laminated plugs and sockets designed for simultaneous quick disconnect usage. Other units shown are

special purpose plugs and sockets mounted in wall plates for terminating TV antennas or general industrial applications and a special line of audio connectors for high frequency connections.

For those individuals desiring a cross-reference between the "Jones" part numbers shown throughout this catalog and the new Cinch 10-digit factory part numbers, a separate form is available for this purpose. This free cross-reference guide, known as form C-1A, can be obtained by writing us direct or contacting your local Cinch representative.

Many of the "Jones" plugs and sockets shown throughout this catalog are also available locally through **authorized Cinch Distributors** usually at a savings in delivery time and freight costs. For your convenience those items normally carried in local stock by Cinch Distributors are indicated on each appropriate page of the catalog by the symbol. Ⓢ

ELECTRICAL RATINGS

	Rated Voltage* (V. RMS)	Current Capacity (Amps)	Max. Wattage on any Contact
300 SERIES		(Listed below)	
400 SERIES	1,100	15	3,750
2400 SERIES	1,700	10	2,500
500 SERIES	3,000	25	5,000
1400 SERIES	1,700	10	2,500

AUDIO CONNECTORS

101 SERIES	800	10	2,500
201 SERIES	1,300	10	2,500
202 SERIES	730	7.5	1,875

*Rated Voltage is $\frac{1}{3}$ Voltage Breakdown.

300 SERIES

All connector ratings are based on a continuously mated condition. "Rated Voltage" is $\frac{1}{3}$ of Voltage Breakdown.

Rated Voltage730 Volts rms.
Contact Resistance0.16 Ohms max.
Rated Current(See at right)

Under most normal operating conditions where not all contacts are carrying substantially full rated current, maximum current per contact is rated at 10 amperes. The "Jones" 300 Series plugs and sockets are recognized under the Component Program of Underwriters' Laboratories, Inc. In accordance with UL Standard #498, the Underwriters' Laboratories ratings are derived from the condition whereby all contacts are carrying "rated" current simultaneously. The resultant ratings are as follows:

Rated Current

(2-12 contacts)7.5 amperes
(15-33 contacts)4.5 amperes

Rated Wattage

(2-12 contacts)1875 watts
(15-33 contacts)1125 watts

INDEX

300 SERIES	Page
With Standard Termination	3-7
Auxiliary Locking Arrangement	10
Polarizing and Mounting Data	14-16
400 SERIES	
With Standard Termination	8-9
(Note Regarding Loose Contacts)	9
With Screw Terminals	10-11
Combination Cable Clamps and Handles	10-11
Auxiliary Locks	10-11
Polarization and Mounting Data	14-16
2400 SERIES	
With Standard Termination	12
With Solderless Terminals	13

500 SERIES	Page
With Screw Terminals (Standard)	13
Mounting Data/Polarization Data	14-16

GENERAL INFORMATION PERTAINING TO

300/400/2400/500 SERIES	17
-------------------------------	----

LAMINATED PLUGS AND SOCKETS

1400 Series	17
Other Laminated Types	17

SPECIAL PURPOSE PLUGS AND SOCKETS

Audio Connectors	17
Plugs Mounted on Wall Plates	18

FOR CROSS-REFERENCE BETWEEN "JONES" AND CINCH PART NUMBERS:

Request Cinch Form C-1A from your local Cinch Representative or write us direct. This form provides a convenient cross-reference between the "Jones" part numbers used in this catalog and the new Cinch 10-digit factory part numbers.

TRW[®] CINCH CONNECTORS

300 SERIES WITH STANDARD TERMINATION

The "Jones" 300 Series plugs and sockets, designed for light and medium duty applications, are small in size with good separation between contacts. This series is available in sizes from 2 to 33 contacts, arranged for either cap or panel mounting. All plugs and sockets are polarized so that plugs of one size cannot fit with sockets of another size. 24 to 33-contact plugs with standard termination also have a special polarizing pin to facilitate faster positioning of the mating plug and socket.

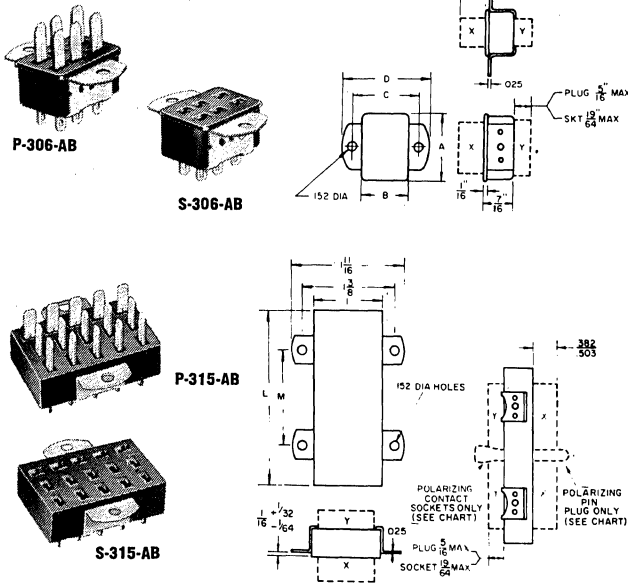
The insulating material is general purpose black phenolic. Phosphor bronze "knife-switch" type socket contacts engage both sides of flat brass plug contacts, providing double contact area. All contacts are cadmium-plated. Plug prongs are $\frac{3}{32}$ " wide and

$\frac{3}{4}$ " thick. All solder lugs provided with size .093" x .062" wiring hole. Formed metal caps have black wrinkle finish with insulating liners. Other finishes and material available. Consult factory. The 300 Series plugs and sockets feature MONOBLOCK (one-piece) construction. MONOBLOCK eliminates internal moisture traps. Furthermore, MONOBLOCK's new patented* snap-in socket contacts permit external prewiring, as well as removal and replacement of individual contacts if necessary. Contacts are "locked-in" to withstand wiring stress.

Note: All 2-contact plugs and sockets are round; all other sizes are rectangular.

*U.S. Pat. Nos. 2688123 & 2980881

TYPE AB WITH ANGLE BRACKET

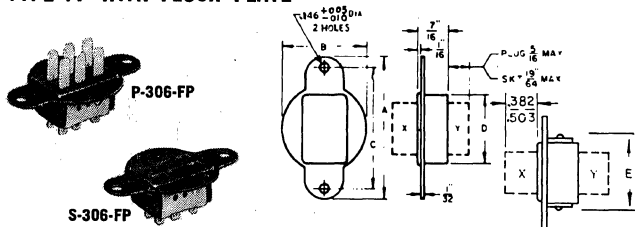


No. of Contacts	Part No.*	Dimensions in Inches Tolerance: $\pm \frac{1}{64}$ " or $\pm .005$ "			
		A	B	C	D
2	P-302-AB S-302-AB	$\frac{1}{2}$ Dia.	—	$\frac{3}{32}$	$\frac{1}{32}$
3	P-303-AB S-303-AB	1	$\frac{3}{16}$	$\frac{3}{4}$	$\frac{1}{16}$
4	P-304-AB S-304-AB	$\frac{3}{4}$	$\frac{1}{16}$	1	$\frac{1}{16}$
6	P-306-AB S-306-AB	1	$\frac{1}{16}$	1	$\frac{1}{16}$
8	P-308-AB S-308-AB	$1\frac{1}{4}$	$\frac{1}{16}$	1	$\frac{1}{16}$
10	P-310-AB S-310-AB	$1\frac{1}{2}$	$\frac{1}{16}$	1	$\frac{1}{16}$
12	P-312-AB S-312-AB	$1\frac{1}{4}$	$\frac{1}{16}$	$1\frac{1}{4}$	$\frac{1}{16}$

No. of Contacts	Part No.*	Dimensions Tol.: $\pm \frac{1}{64}$ " or $\pm .005$ "		Polarizing Contact Pin	Polarizing In Cont. or Pin Position
		L	M		
15	P-315-AB S-315-AB	$1\frac{1}{8}$	See Note	No	—
18	P-318-AB S-318-AB	$1\frac{1}{8}$	$1\frac{1}{4}$	No	—
21	P-321-AB S-321-AB	$2\frac{1}{4}$	$\frac{1}{8}$	No	—
24	P-324-AB S-324-AB	$2\frac{3}{4}$	$1\frac{1}{4}$	Yes	14
27	P-327-AB S-327-AB	$2\frac{7}{8}$	$1\frac{3}{4}$	Yes	14
30	P-330-AB S-330-AB	$3\frac{3}{8}$	$1\frac{7}{8}$	Yes	14
33	P-333-AB S-333-AB	$3\frac{1}{2}$	$2\frac{3}{8}$	Yes	17

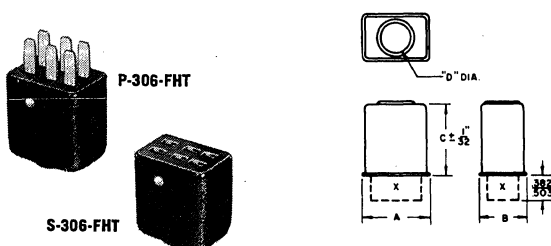
Note: P-315-AB and S-315-AB require only two mounting brackets, mounted at center on longer sides.
18-33 contact sizes require four mounting brackets.

TYPE FP WITH FLUSH PLATE



No. of Contacts	Part No.*	Tolerance: $\pm \frac{1}{64}$ " or $\pm .005$ "				
		A	B	C	D	E (Max.)
2	P-302-FP S-302-FP	$2\frac{1}{16}$	$1\frac{1}{4}$	$1\frac{3}{4}$	—	$\frac{3}{32}$
3	P-303-FP S-303-FP	$2\frac{1}{16}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$\frac{1}{16}$	$\frac{1}{2}$
4	P-304-FP S-304-FP	$2\frac{1}{16}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$\frac{1}{16}$	$\frac{3}{4}$
6	P-306-FP S-306-FP	$2\frac{1}{16}$	$1\frac{1}{4}$	$1\frac{3}{4}$	$\frac{1}{16}$	$\frac{3}{4}$
8	P-308-FP S-308-FP	$2\frac{1}{16}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$\frac{1}{16}$	$\frac{3}{4}$
10	P-310-FP S-310-FP	$2\frac{1}{16}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$\frac{1}{16}$	$\frac{3}{4}$
12	P-312-FP S-312-FP	$2\frac{1}{16}$	$1\frac{3}{4}$	$2\frac{1}{4}$	$\frac{1}{16}$	1

TYPE FHT WITH FLARED HOLE IN TOP



No. of Contacts	Part No.*	Tolerance: $\pm \frac{1}{64}$ " or $\pm .005$ "			
		A	B	C	D
2	P-302-FHT S-302-FHT	$\frac{1}{2}$ Dia.	—	$\frac{1}{64}$	$\frac{3}{8}$
3	P-303-FHT S-303-FHT	1	$\frac{3}{16}$	$\frac{1}{64}$	$\frac{3}{8}$
4	P-304-FHT S-304-FHT	$\frac{3}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{8}$
6	P-306-FHT S-306-FHT	1	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{8}$
8	P-308-FHT S-308-FHT	$1\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{2}$
10	P-310-FHT S-310-FHT	$1\frac{1}{2}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{2}$
12	P-312-FHT S-312-FHT	$1\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{8}$

*P-Indicates Plug S-Indicates Socket.

X dimension is applicable to plugs only, with allowance made for pin float.

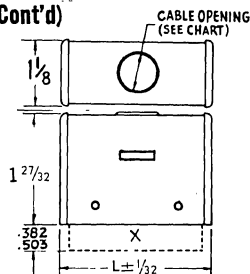
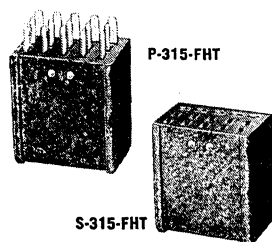
Y is the dimension for contact tail extension.

Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

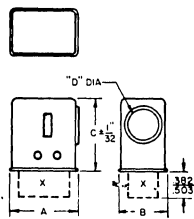
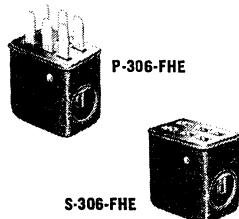
300 SERIES WITH STANDARD TERMINATION (cont'd)

TYPE FHT WITH FLARED HOLE IN TOP (Cont'd)

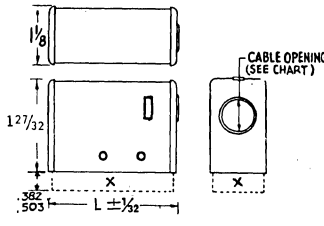
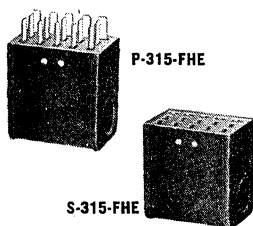


No. of Contacts	Part No.*	Dimensions In Inches L Cable Opening ± 1/32	Dimensions In Inches Cable Opening	Polarizing Contact Pin	Polarizing In Cont. or Pin Position
15	P-315-FHT S-315-FHT	1 1/8	3/8	No	—
18	P-318-FHT S-318-FHT	2	3/8	No	—
21	P-321-FHT S-321-FHT	2 3/8	5/8	No	—
24	P-324-FHT S-324-FHT	2 5/8	5/8	Yes	14
27	P-327-FHT S-327-FHT	2 11/8	5/8	Yes	14
30	P-330-FHT S-330-FHT	3 1/4	3/4	Yes	14
33	P-333-FHT S-333-FHT	3 3/8	3/4	Yes	17

TYPE FHE WITH FLARED HOLE IN END

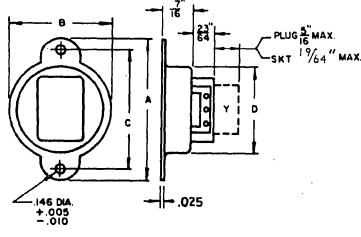
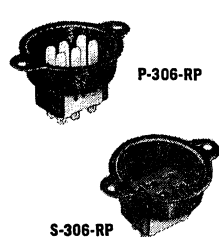


No. of Contacts	Part No.*	Dimensions In Inches Tolerance: ± 1/64" or ± .005"	A	B	C	D
2	P-302-FHE S-302-FHE	2 1/2 Dia.	—	1/4	1/4	3/8
3	P-303-FHE S-303-FHE	1	3/8	1/4	1/4	1/2
4	P-304-FHE S-304-FHE	3/4	1/2	1/4	1/4	1/2
6	P-306-FHE S-306-FHE	1	1/2	1/4	1/4	1/2
8	P-308-FHE S-308-FHE	1 1/4	1/2	1/4	1/4	1/2
10	P-310-FHE S-310-FHE	1 1/2	1/2	1/4	1/4	1/2
12	P-312-FHE S-312-FHE	1 3/4	1/2	1/4	1/4	1/2



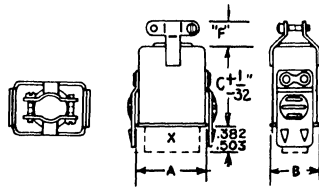
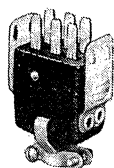
No. of Contacts	Part No.*	Dimensions In Inches L Cable Opening ± 1/32	Dimensions In Inches Cable Opening	Polarizing Contact Pin	Polarizing In Cont. or Pin Position
15	P-315-FHE S-315-FHE	1 1/8	3/8	No	—
18	P-318-FHE S-318-FHE	2	3/8	No	—
21	P-321-FHE S-321-FHE	2 3/8	5/8	No	—
24	P-324-FHE S-324-FHE	2 5/8	5/8	Yes	14
27	P-327-FHE S-327-FHE	2 11/8	5/8	Yes	14
30	P-330-FHE S-330-FHE	3 1/4	3/4	Yes	14
33	P-333-FHE S-333-FHE	3 3/8	3/4	Yes	17

TYPE RP WITH RECESSED PLATE



No. of Contacts	Part No.*	Dimensions In Inches Tolerance: ± 1/64" or ± .005"	A	B	C	D (Max.)
2	P-302-RP S-302-RP	2 1/2	1 1/2	1 3/4	1.350	
3	P-303-RP S-303-RP	2 1/2	1 1/2	1 3/4	1.350	
4	P-304-RP S-304-RP	2 1/2	1 1/2	1 3/4	1.350	
6	P-306-RP S-306-RP	2 1/2	1 1/2	1 3/4	1.350	
8	P-308-RP S-308-RP	2 1/2	2	2 1/4	1.850	
10	P-310-RP S-310-RP	2 1/2	2	2 1/4	1.850	
12	P-312-RP S-312-RP	2 1/2	2	2 1/4	1.850	

TYPE CCT-L WITH CABLE CLAMP IN TOP OF CAP AND WITH LOCKS



No. of Contacts	Part No.*	Dimensions In Inches Tolerance: ± 1/64" or ± .005"	A	B	C	F	Cable Opening
2	P-302-CCT-L	2 1/2 Dia.	—	1/4	1/4	2 3/4	3/8
3	P-303-CCT-L	1	3/8	1/4	1/4	2 3/4	3/8
4	P-304-CCT-L	3/4	1/2	1/4	1/4	2 3/4	3/8
6	P-306-CCT-L	1	1/2	1/4	1/4	2 3/4	3/8
8	P-308-CCT-L	1 1/4	1/2	1/4	1/4	2 3/4	1/2
10	P-310-CCT-L	1 1/2	1/2	1/4	1/4	2 3/4	1/2
12	P-312-CCT-L	1 3/4	1/2	1/4	1/4	2 3/4	1/2

*P-Indicates Plug S-Indicates Socket

X dimension is applicable to plugs only, with allowance made for pin float.

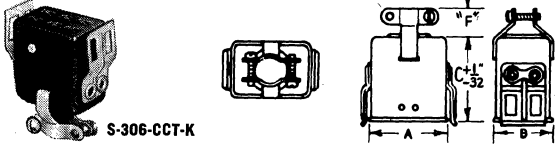
Y is the dimension for contact tail extension.

Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

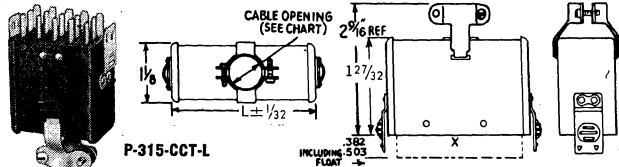
300 SERIES WITH STANDARD TERMINATION (cont'd)

TYPE CCT-K WITH CABLE CLAMP IN TOP OF CAP & WITH KEEPERS



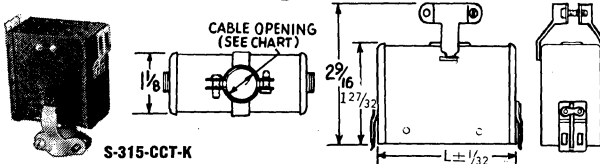
No. of Contacts	Part No.*	Dimensions In Inches Tolerance: $\pm \frac{1}{64}$ " or $\pm .005$ "				Cable Opening
		A	B	C	F	
2	S-302-CCT-K	$\frac{1}{32}$ Dia.	—	$\frac{1}{64}$	$\frac{3}{64}$	$\frac{3}{8}$
3	S-303-CCT-K	1	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{64}$	$\frac{3}{8}$
4	S-304-CCT-K	$\frac{3}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{64}$	$\frac{3}{8}$
6	S-306-CCT-K	1	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{64}$	$\frac{3}{8}$
8	S-308-CCT-K	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{64}$	$\frac{1}{2}$
10	S-310-CCT-K	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{64}$	$\frac{1}{2}$
12	S-312-CCT-K	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{64}$	$\frac{1}{2}$

TYPE CCT-L WITH CABLE CLAMP IN TOP OF CAP & WITH LOCKS



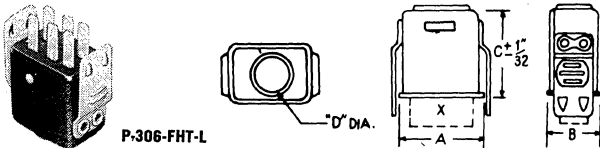
No. of Contacts	Part No.*	Dimensions In Inches Tolerance: $\pm \frac{1}{64}$ "		Polarizing Contact Pin	Polarizing In Cont. Pin Pos.
		L	Cable Opening		
15	P-315-CCT-L	$\frac{1}{16}$	$\frac{1}{8}$	No	—
18	P-318-CCT-L	2	$\frac{1}{8}$	No	—
21	P-321-CCT-L	$\frac{2}{8}$	$\frac{5}{8}$	No	—
24	P-324-CCT-L	$\frac{2}{8}$	$\frac{5}{8}$	Yes	14
27	P-327-CCT-L	$\frac{2}{8}$	$\frac{5}{8}$	Yes	14
30	P-330-CCT-L	$\frac{3}{4}$	$\frac{3}{4}$	Yes	14
33	P-333-CCT-L	$\frac{3}{4}$	$\frac{3}{4}$	Yes	17

TYPE CCT-K WITH CABLE CLAMP IN TOP OF CAP & WITH KEEPERS



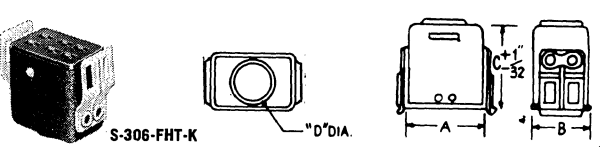
No. of Contacts	Part No.*	Dimensions In Inches Tolerance: $\pm \frac{1}{64}$ "		Polarizing Contact Pin	Polarizing In Cont. Pin Pos.
		L	Cable Opening		
15	S-315-CCT-K	$\frac{1}{16}$	$\frac{1}{8}$	No	—
18	S-318-CCT-K	2	$\frac{1}{8}$	No	—
21	S-321-CCT-K	$\frac{2}{8}$	$\frac{5}{8}$	No	—
24	S-324-CCT-K	$\frac{2}{8}$	$\frac{5}{8}$	Yes	14
27	S-327-CCT-K	$\frac{2}{8}$	$\frac{5}{8}$	Yes	14
30	S-330-CCT-K	$\frac{3}{4}$	$\frac{3}{4}$	Yes	14
33	S-333-CCT-K	$\frac{3}{4}$	$\frac{3}{4}$	Yes	17

TYPE FHT-L WITH FLARED HOLE IN CAP AND WITH LOCKS



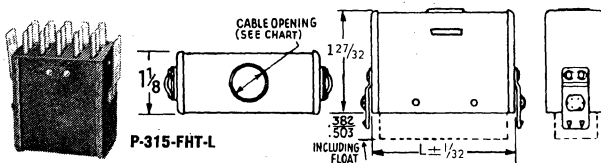
No. of Contacts	Part No.*	Dimensions In Inches Tolerance: $\pm \frac{1}{64}$ " or $\pm .005$ "			
		A	B	C	D
2	P-302-FHT-L	$\frac{1}{32}$ Dia.	—	$\frac{1}{64}$	$\frac{3}{8}$
3	P-303-FHT-L	1	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{8}$
4	P-304-FHT-L	$\frac{3}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{8}$
6	P-306-FHT-L	1	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{8}$
8	P-308-FHT-L	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{2}$
10	P-310-FHT-L	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{2}$
12	P-312-FHT-L	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{2}$

TYPE FHT-K WITH FLARED HOLE IN CAP AND WITH KEEPERS



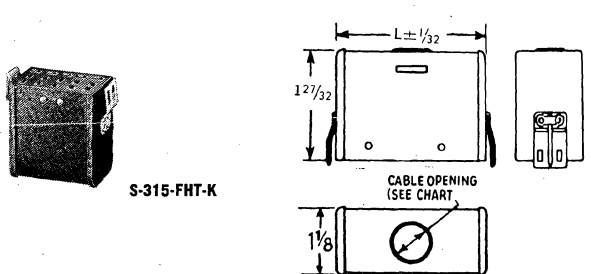
No. of Contacts	Part No.*	Dimensions In Inches Tolerance: $\pm \frac{1}{64}$ " or $\pm .005$ "			
		A	B	C	D
2	S-302-FHT-K	$\frac{1}{32}$ Dia.	—	$\frac{1}{64}$	$\frac{3}{8}$
3	S-303-FHT-K	1	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{8}$
4	S-304-FHT-K	$\frac{3}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{8}$
6	S-306-FHT-K	1	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{3}{8}$
8	S-308-FHT-K	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{2}$
10	S-310-FHT-K	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{2}$
12	S-312-FHT-K	$\frac{1}{4}$	$\frac{1}{16}$	$\frac{1}{64}$	$\frac{1}{2}$

TYPE FHT-L WITH FLARED HOLE IN CAP AND WITH LOCKS



No. of Contacts	Part No.*	Dimensions In Inches Tolerance: $\pm \frac{1}{64}$ "		Polarizing Contact Pin	Polarizing In Cont. Pin Pos.
		L	Cable Opening		
15	P-315-FHT-L	$\frac{1}{16}$	$\frac{1}{8}$	No	—
18	P-318-FHT-L	2	$\frac{1}{8}$	No	—
21	P-321-FHT-L	$\frac{2}{8}$	$\frac{5}{8}$	No	—
24	P-324-FHT-L	$\frac{2}{8}$	$\frac{5}{8}$	Yes	14
27	P-327-FHT-L	$\frac{2}{8}$	$\frac{5}{8}$	Yes	14
30	P-330-FHT-L	$\frac{3}{4}$	$\frac{3}{4}$	Yes	14
33	P-333-FHT-L	$\frac{3}{4}$	$\frac{3}{4}$	Yes	17

TYPE FHT-K WITH FLARED HOLE IN CAP AND WITH KEEPERS



No. of Contacts	Part No.*	Dimensions In Inches Tolerance: $\pm \frac{1}{64}$ "		Polarizing Contact Pin	Polarizing In Cont. Pin Pos.
		L	Cable Opening		
15	S-315-FHT-K	$\frac{1}{16}$	$\frac{1}{8}$	No	—
18	S-318-FHT-K	2	$\frac{1}{8}$	No	—
21	S-321-FHT-K	$\frac{2}{8}$	$\frac{5}{8}$	No	—
24	S-324-FHT-K	$\frac{2}{8}$	$\frac{5}{8}$	Yes	14
27	S-327-FHT-K	$\frac{2}{8}$	$\frac{5}{8}$	Yes	14
30	S-330-FHT-K	$\frac{3}{4}$	$\frac{3}{4}$	Yes	14
33	S-333-FHT-K	$\frac{3}{4}$	$\frac{3}{4}$	Yes	17

*P-Indicates Plug S-Indicates Socket

‡Keepers and locks are centered on each side, not on each end as shown.

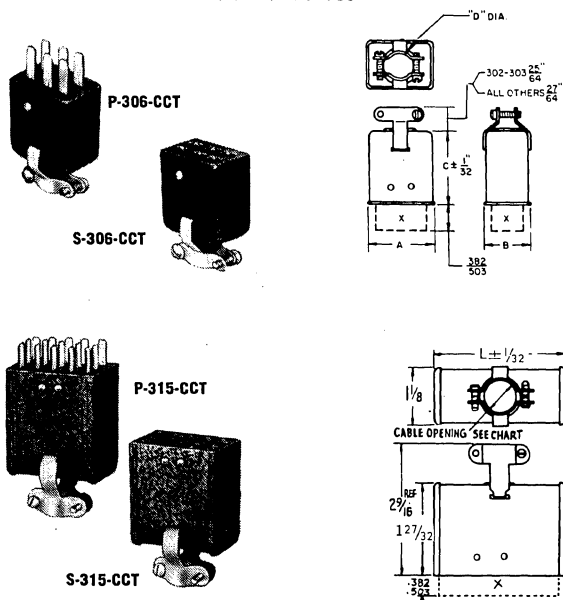
X dimension is applicable to plugs only, with allowance made for pin float.

Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

300 SERIES WITH STANDARD TERMINATION (cont'd)

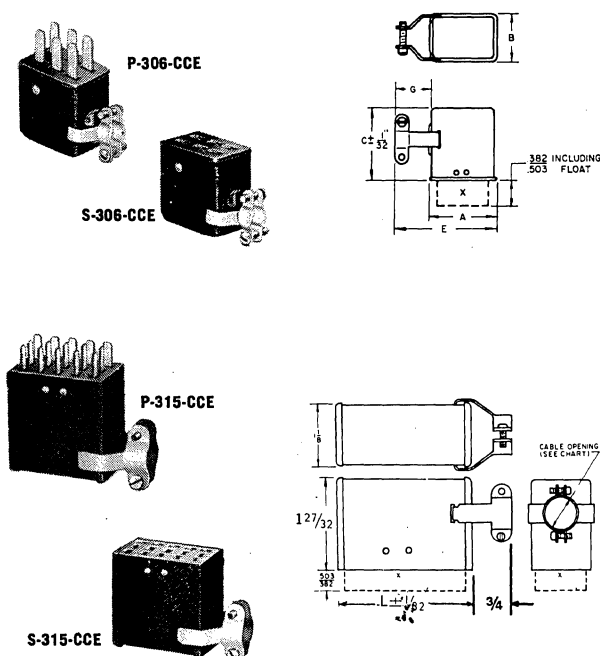
TYPE CCT WITH CABLE CLAMP IN TOP



No. of Contacts	Part No.*	Dimensions In Inches Tolerance: $\pm \frac{1}{64}$ " or $\pm .005$ "			
		A	B	C	D
2	P-302-CCT S-302-CCT	$\frac{1}{32}$ Dia.	—	$\frac{5}{64}$	$\frac{3}{8}$
3	P-303-CCT S-303-CCT	1	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{3}{8}$
4	P-304-CCT S-304-CCT	$\frac{3}{4}$	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{3}{8}$
6	P-306-CCT S-306-CCT	1	$\frac{1}{16}$	$1\frac{1}{64}$	$\frac{3}{8}$
8	P-308-CCT S-308-CCT	$1\frac{1}{4}$	$\frac{1}{16}$	$1\frac{1}{64}$	$\frac{1}{2}$
10	P-310-CCT S-310-CCT	$1\frac{1}{2}$	$\frac{1}{16}$	$1\frac{1}{64}$	$\frac{1}{2}$
12	P-312-CCT S-312-CCT	$1\frac{1}{4}$	$\frac{1}{16}$	$1\frac{1}{64}$	$\frac{3}{8}$

No. of Contacts	Part No.*	Dimensions In Inches L Cable Opening		Polarizing Contact Pin	Polarizing In Cont. Pin Pos.
		$\pm \frac{1}{32}$			
15	P-315-CCT S-315-CCT	$1\frac{1}{16}$	$\frac{3}{8}$	No	—
18	P-318-CCT S-318-CCT	2	$\frac{3}{8}$	No	—
21	P-321-CCT S-321-CCT	$2\frac{3}{8}$	$\frac{5}{8}$	No	—
24	P-324-CCT S-324-CCT	$2\frac{5}{8}$	$\frac{5}{8}$	Yes	14
27	P-327-CCT S-327-CCT	$2\frac{1}{16}$	$\frac{5}{8}$	Yes	14
30	P-330-CCT S-330-CCT	$3\frac{1}{4}$	$\frac{3}{4}$	Yes	14
33	P-333-CCT S-333-CCT	$3\frac{3}{8}$	$\frac{3}{4}$	Yes	17

TYPE CCE WITH CABLE CLAMP IN END



No. of Contacts	Part No.*	Dimensions In Inches $\pm \frac{1}{64}$ " or $\pm .005$ "			
		A	B	C	G
2	P-302-CCE S-302-CCE	$\frac{1}{32}$ Dia.	—	$\frac{5}{64}$	$\frac{3}{8}$
3	P-303-CCE S-303-CCE	1	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{1}{4}$
4	P-304-CCE S-304-CCE	$\frac{3}{4}$	$\frac{1}{16}$	$\frac{5}{64}$	$\frac{3}{8}$
6	P-306-CCE S-306-CCE	1	$\frac{1}{16}$	$1\frac{1}{64}$	$\frac{3}{8}$
8	P-308-CCE S-308-CCE	$1\frac{1}{4}$	$\frac{1}{16}$	$1\frac{1}{64}$	$\frac{1}{2}$
10	P-310-CCE S-310-CCE	$1\frac{1}{2}$	$\frac{1}{16}$	$1\frac{1}{64}$	$\frac{1}{2}$
12	P-312-CCE S-312-CCE	$1\frac{1}{4}$	$\frac{1}{16}$	$1\frac{1}{64}$	$\frac{3}{8}$

No. of Contacts	Part No.*	$\textcircled{C_9}$	Dimensions In Inches L Cable $\pm \frac{1}{32}$ Opening		Polarizing Contact Pin	Polarizing In Cont. Pin Pos.
15	P-315-CCE S-315-CCE		1 $\frac{1}{16}$	$\frac{3}{16}$	No	—
18	P-318-CCE S-318-CCE		2	$\frac{3}{16}$	No	—
21	P-321-CCE S-321-CCE		2 $\frac{3}{16}$	$\frac{5}{8}$	No	—
24	P-324-CCE S-324-CCE		2 $\frac{5}{8}$	$\frac{5}{8}$	Yes	14
27	P-327-CCE S-327-CCE		2 $\frac{1}{16}$	$\frac{5}{8}$	Yes	14
30	P-330-CCE S-330-CCE		3 $\frac{1}{4}$	$\frac{3}{4}$	Yes	14
33	P-333-CCE S-333-CCE		3 $\frac{3}{8}$	$\frac{3}{4}$	Yes	17

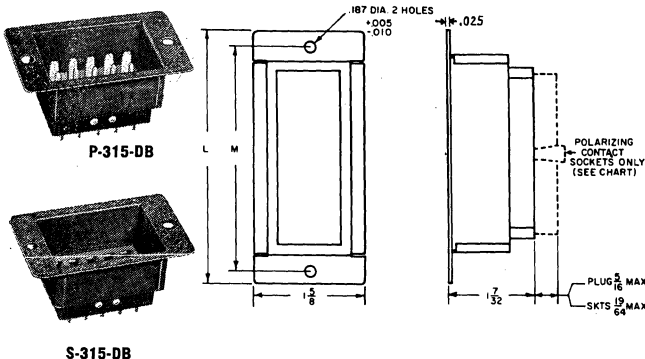
*See pg. 10 cable clamp for CCE caps.

*P-Indicates Plug S-Indicates Socket

X dimension is applicable to plugs only, with allowance made for pin float.

Ⓢ Indicates items normally available through Cinch Distributors.

TYPE EB WITH END BRACKETS



No. of Contacts	Part No.* ($\odot$)	Dimensions in Inches		Polarizing Contact Pins	Polarizing in Cont. Pin Pos.
		$\pm \frac{1}{16}$ L	$\pm \frac{1}{32}$ M		
15	P-315-DB S-315-DB	$2\frac{1}{16}$	$2\frac{3}{8}$	No	—
18	P-318-DB S-318-DB	$3\frac{1}{8}$	$2\frac{1}{16}$	No	—
21	P-321-DB S-321-DB	$3\frac{3}{8}$	3	No	—
24	P-324-DB S-324-DB	$3\frac{3}{8}$	$3\frac{3}{8}$	Yes	14
27	P-327-DB S-327-DB	$4\frac{1}{8}$	$3\frac{5}{8}$	Yes	14
30	P-330-DB S-330-DB	$4\frac{3}{8}$	$3\frac{1}{4}$	Yes	14
33	P-333-DB S-333-DB	$4\frac{1}{4}$	$4\frac{1}{4}$	Yes	17

Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

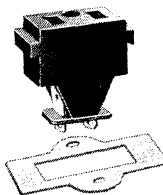
400 SERIES WITH STANDARD TERMINATION

The "400" Series plugs and sockets from the famous "Jones" line of quality components are rated for duty beyond the range of the 300 Series. Maximum rating is 1200 volts r.m.s. at 15 amperes.

400 Series plugs and sockets are available in sizes of 2, 4, 6, 8, 10 and 12 contacts, each size being polarized and suitable for either cap or panel mounting. "Knife-switch" type socket contacts are made of cadmium-plated phosphor bronze. These contacts engage both sides of the flat plug contacts, providing double the contact area.

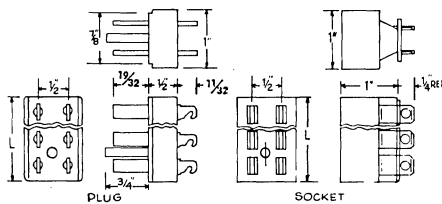
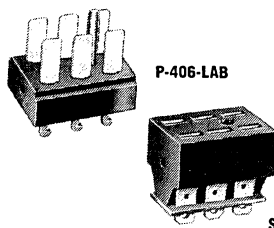
Plug prongs are made of cadmium-plated brass $\frac{1}{4}$ " wide by $\frac{1}{16}$ " thick. Caps are finished in black wrinkle and equipped with insulating lining. Other finishes and material available. Consult factory.

Should a connector be required which is rated for higher voltages, the "Jones" 2400 Series plugs and sockets are similar to the 400 Series except that the 2400 Series has a higher voltage rating.



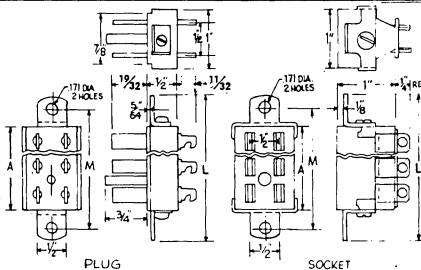
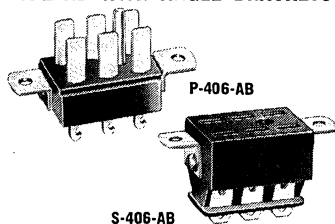
Note: The 2-contact angle bracket (AB) type socket will not accept the standard angle bracket as shown in the S-406-AB illustration below. Instead, a special bracket is supplied for mounting to a panel or chassis. The illustration at the left shows the S-402-AB socket with the special bracket.

TYPE LAB LESS ANGLE BRACKETS



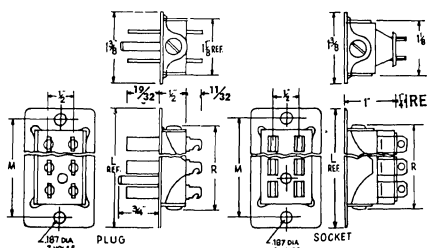
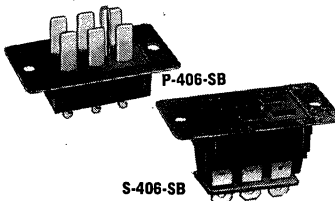
No. of Contacts	Part No.*	Dimensions In Inches $\pm \frac{1}{64}$ "
2	P-402-LAB S-402-LAB	$\frac{3}{16}$
4	P-404-LAB S-404-LAB	1
6	P-406-LAB S-406-LAB	$1\frac{1}{16}$
8	P-408-LAB S-408-LAB	$1\frac{7}{8}$
10	P-410-LAB S-410-LAB	$2\frac{3}{16}$
12	P-412-LAB S-412-LAB	$2\frac{3}{4}$

TYPE AB WITH ANGLE BRACKETS



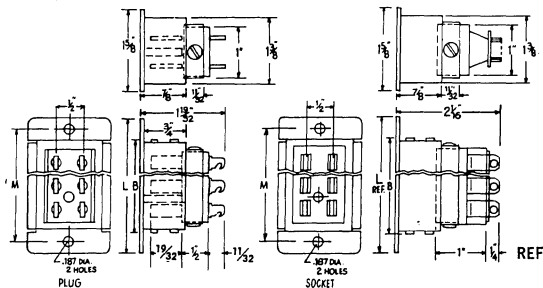
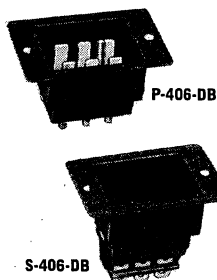
No. of Contacts	Part No.*	Dimensions In Inches $\pm \frac{1}{64}$ "
2	P-402-AB S-402-AB	$\frac{3}{16}$ A $1\frac{1}{16}$ M $1\frac{1}{32}$ L
4	P-404-AB S-404-AB	1 A $1\frac{1}{16}$ M $2\frac{1}{32}$ L
6	P-406-AB S-406-AB	$1\frac{1}{16}$ A $2\frac{1}{16}$ M $2\frac{1}{32}$ L
8	P-408-AB S-408-AB	$1\frac{7}{8}$ A $2\frac{1}{2}$ M $2\frac{3}{32}$ L
10	P-410-AB S-410-AB	$2\frac{3}{16}$ A $2\frac{1}{16}$ M $3\frac{1}{32}$ L
12	P-412-AB S-412-AB	$2\frac{3}{4}$ A $3\frac{3}{8}$ M $3\frac{3}{32}$ L

TYPE SB WITH SHALLOW BRACKET FOR FLUSH MOUNTING



No. of Contacts	Part No.*	Dimensions In Inches $\pm \frac{1}{64}$ "
2	P-402-SB S-402-SB	$1\frac{1}{2}$ L $1\frac{1}{16}$ M $\frac{3}{4}$ R(Max.)
4	P-404-SB S-404-SB	$1\frac{1}{16}$ L $1\frac{1}{2}$ M $1\frac{1}{16}$ R
6	P-406-SB S-406-SB	$2\frac{3}{8}$ L $1\frac{1}{16}$ M $1\frac{1}{4}$ R
8	P-408-SB S-408-SB	$2\frac{1}{16}$ L $2\frac{3}{8}$ M $2\frac{1}{4}$ R
10	P-410-SB S-410-SB	$3\frac{1}{4}$ L $2\frac{1}{16}$ M $2\frac{3}{4}$ R
12	P-412-SB S-412-SB	$3\frac{1}{16}$ L $3\frac{1}{4}$ M $2\frac{3}{4}$ R

TYPE DB WITH DEEP BRACKET FOR RECESSED MOUNTING



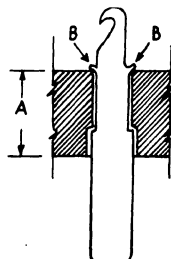
No. of Contacts	Part No.*	Dimensions In Inches $\pm \frac{1}{64}$ "
2	P-402-DB S-402-DB	$\frac{5}{16}$ B $1\frac{1}{4}$ L $1\frac{1}{16}$ M
4	P-404-DB S-404-DB	$1\frac{3}{16}$ B $2\frac{3}{16}$ L $1\frac{3}{8}$ M
6	P-406-DB S-406-DB	$1\frac{1}{4}$ B $2\frac{5}{8}$ L $2\frac{3}{16}$ M
8	P-408-DB S-408-DB	$2\frac{1}{16}$ B $3\frac{1}{16}$ L $2\frac{5}{8}$ M
10	P-410-DB S-410-DB	$2\frac{3}{4}$ B $3\frac{1}{2}$ L $3\frac{1}{16}$ M
12	P-412-DB S-412-DB	$3\frac{3}{4}$ B $3\frac{1}{16}$ L $3\frac{1}{2}$ M

*P-Indicates Plug S-Indicates Socket

Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

400 SERIES WITH STANDARD TERMINATION (cont'd)



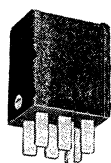
NOTE REGARDING LOOSE CONTACTS ON 400 SERIES PLUGS

This illustration shows the method of staking 400 Series plug contacts in the phenolic body. Manufacturing tolerances permit a slight variation in the "A" dimension during the molding process. Thus, in some instances the fit between the contact and the body at points "B" may not be perfectly snug. When this condition occurs, the contact appears to be "loose" in the connector body. However, the security of the contact is

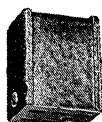
in no way jeopardized and the performance of the connector is not impaired.

It is recommended that personnel responsible for inspection and installation of the connectors be informed of this condition to avoid unnecessary delays and correspondence arising from a mistaken conclusion that the connectors are faulty. In case of doubt, however, it is advisable to check with the local Cinch representative or contact the factory before any action is taken.

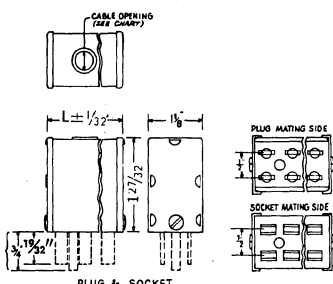
TYPE FHT WITH FLARED HOLE IN TOP



P-406-FHT



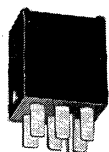
S-406-FHT



PLUG & SOCKET

No. of Contacts	Part No.*	Dimensions In Inches	
		L ± 1/32"	Cable Opening ± 1/64"
2	P-402-FHT S-402-FHT	5/8	3/8
4	P-404-FHT S-404-FHT	1 1/8	3/8
6	P-406-FHT S-406-FHT	1 1/2	3/8
8	P-408-FHT S-408-FHT	1 13/16	3/8
10	P-410-FHT S-410-FHT	2 3/8	3/8
12	P-412-FHT S-412-FHT	2 13/16	5/8

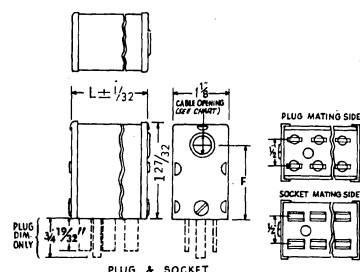
TYPE FHE WITH FLARED HOLE IN END



P-406-FHE



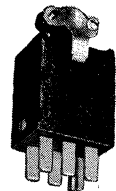
S-406-FHE



PLUG & SOCKET

No. of Contacts	Part No.*	Dimensions In Inches		
		F	L ± 1/32"	Cable Opening ± 1/64"
2	P-402-FHE S-402-FHE	1 3/8	5/8	3/8
4	P-404-FHE S-404-FHE	1 3/8	1 1/8	3/8
6	P-406-FHE S-406-FHE	1 3/8	1 1/2	3/8
8	P-408-FHE S-408-FHE	1 11/32	1 13/16	3/8
10	P-410-FHE S-410-FHE	1 11/32	2 3/8	3/8
12	P-412-FHE S-412-FHE	1 3/8	2 13/16	5/8

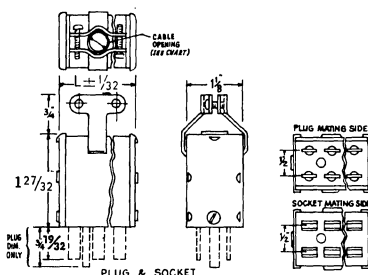
TYPE CCT WITH CABLE CLAMP IN TOP



P-406-CCT



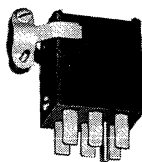
S-406-CCT



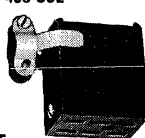
PLUG & SOCKET

No. of Contacts	Part No.*	Dimensions In Inches	
		L ± 1/32"	Cable Opening ± 1/64"
2	P-402-CCT S-402-CCT	5/8	3/8
4	P-404-CCT S-404-CCT	1 1/8	3/8
6	P-406-CCT S-406-CCT	1 1/2	3/8
8	P-408-CCT S-408-CCT	1 13/16	3/8
10	P-410-CCT S-410-CCT	2 3/8	3/8
12	P-412-CCT S-412-CCT	2 13/16	5/8

TYPE CCE WITH CABLE CLAMP IN END

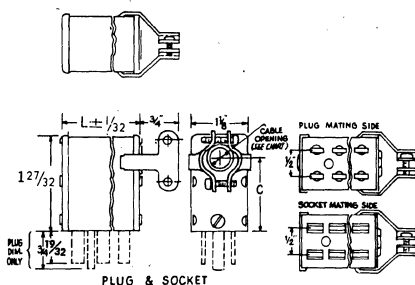


P-406-CCE



S-406-CCE

"See p. 9 cable clamp for CCE Caps"



PLUG & SOCKET

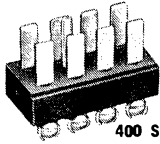
No. of Contacts	Part No.*	Dimensions In Inches		
		L ± 1/32"	C	Cable Opening ± 1/64"
2	P-402-CCE S-402-CCE	5/8	1 3/8	3/8
4	P-404-CCE S-404-CCE	1 1/8	1 3/8	3/8
6	P-406-CCE S-406-CCE	1 1/2	1 3/8	3/8
8	P-408-CCE S-408-CCE	1 13/16	1 11/32	3/8
10	P-410-CCE S-410-CCE	2 3/8	1 11/32	3/8
12	P-412-CCE S-412-CCE	2 13/16	1 3/8	5/8

*P-Indicates Plug S-Indicates Socket

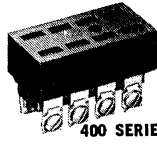
Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

400 SERIES—WITH SCREW TERMINALS



400 SERIES PLUG



400 SERIES SOCKET

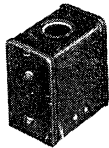
400 SERIES PLUGS AND SOCKETS WITH SCREW TERMINALS

In addition to the solder-type terminals, the 400 Series is also available with screw terminals as listed below. The plug and socket bodies are of slightly different construction from those used with the standard solder-type. This is necessary in order to accommodate the screw terminals. However, the overall dimensions for installation purposes are compatible with the standard type. (To order see top pg. 11.)

No. of Contacts	Type LAB (Less Angle Brackets) Part No.*	Type AB (With Angle Brackets) Part No.*	Type SB (With Shallow Bracket) Part No.*	Type DB (With Deep Bracket) Part No.*	Type FHT (With Flared Hole in Top) Part No.*	Type FHE (With Flared Hole in End) Part No.*	Type CCT (With Cable Clamp in Top) Part No.*	Type CCE (With Cable Clamp in End) Part No.*
2	P-402-LAB-ST SS-402-LAB-ST	P-402-AB-ST SS-402-AB-ST	P-402-SB-ST SS-402-SB-ST	P-402-DB-ST SS-402-DB-ST	P-402-FHT-ST SS-402-FHT-ST	P-402-FHE-ST SS-402-FHE-ST	P-402-CCT-ST SS-402-CCT-ST	P-402-CCE-ST SS-402-CCE-ST
4	P-404-LAB-ST SS-404-LAB-ST	P-404-AB-ST SS-404-AB-ST	P-404-SB-ST SS-404-SB-ST	P-404-DB-ST SS-404-DB-ST	P-404-FHT-ST SS-404-FHT-ST	P-404-FHE-ST SS-404-FHE-ST	P-404-CCT-ST SS-404-CCT-ST	P-404-CCE-ST SS-404-CCE-ST
6	P-406-LAB-ST SS-406-LAB-ST	P-406-AB-ST SS-406-AB-ST	P-406-SB-ST SS-406-SB-ST	P-406-DB-ST SS-406-DB-ST	P-406-FHT-ST SS-406-FHT-ST	P-406-FHE-ST SS-406-FHE-ST	P-406-CCT-ST SS-406-CCT-ST	P-406-CCE-ST SS-406-CCE-ST
8	P-408-LAB-ST SS-408-LAB-ST	P-408-AB-ST SS-408-AB-ST	P-408-SB-ST SS-408-SB-ST	P-408-DB-ST SS-408-DB-ST	P-408-FHT-ST SS-408-FHT-ST	P-408-FHE-ST SS-408-FHE-ST	P-408-CCT-ST SS-408-CCT-ST	P-408-CCE-ST SS-408-CCE-ST
10	P-410-LAB-ST SS-410-LAB-ST	P-410-AB-ST SS-410-AB-ST	P-410-SB-ST SS-410-SB-ST	P-410-DB-ST SS-410-DB-ST	P-410-FHT-ST SS-410-FHT-ST	P-410-FHE-ST SS-410-FHE-ST	P-410-CCT-ST SS-410-CCT-ST	P-410-CCE-ST SS-410-CCE-ST
12	P-412-LAB-ST SS-412-LAB-ST	P-412-AB-ST SS-412-AB-ST	P-412-SB-ST SS-412-SB-ST	P-412-DB-ST SS-412-DB-ST	P-412-FHT-ST SS-412-FHT-ST	P-412-FHE-ST SS-412-FHE-ST	P-412-CCT-ST SS-412-CCT-ST	P-412-CCE-ST SS-412-CCE-ST

*P-Indicates Plug SS-Indicates Sockets

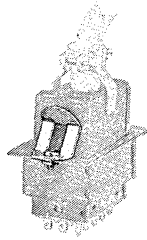
AUXILIARY LOCKING ARRANGEMENTS



Capped Connector Member
Showing Extrusion for
Engaged Auxiliary Lock



Auxiliary Lock 63A
Factory No.
422-12-14-012



Complete Auxiliary
Locking Assembly

AUXILIARY LOCK 63A — FACTORY NO. 422-1214012

Where connectors are subject to shock or vibration, the Auxiliary Locking Arrangement (No. 63A) is recommended. It can be used with the 300 Series end bracket (EB), shallow bracket (SB) or deep bracket (DB) types. It consists of a set of spring locks secured by the mounted bolts which engage extrusions on the cap creating a secure, shakeproof mating condition.

The No. 63A locks must be ordered separately, one pair for each plug and socket. The part numbers for the plugs and sockets with the special extrusions on the caps are found in the table below. Note that there are two types of caps, one with extrusions placed for end bracket or shallow bracket mates (S-type) and the other for deep bracket mates (D-type).

IMPORTANT: As indicated below, the caps with the S-type mates are the only ones which can be used with FHE and CCE plugs and sockets.

PLUGS AND SOCKETS WITH D-TYPE EXTRUSIONS

For Deep Bracket (DB) Mates

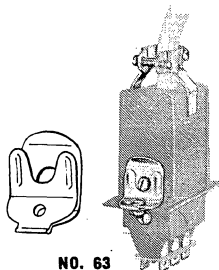
No. of Contacts	Type FHT (With Flared Hole in Top) Part No.*	Type CCT (With Cable Clamp in Top) Part No.*
15	P-315-FHT-63A-DB S-315-FHT-63A-DB	P-315-CCT-63A-DB S-315-CCT-63A-DB
18	P-318-FHT-63A-DB S-318-FHT-63A-DB	P-318-CCT-63A-DB S-318-CCT-63A-DB
21	P-321-FHT-63A-DB S-321-FHT-63A-DB	P-321-CCT-63A-DB S-321-CCT-63A-DB
24	P-324-FHT-63A-DB S-324-FHT-63A-DB	P-324-CCT-63A-DB S-324-CCT-63A-DB
27	P-327-FHT-63A-DB S-327-FHT-63A-DB	P-327-CCT-63A-DB S-327-CCT-63A-DB
30	P-330-FHT-63A-DB S-330-FHT-63A-DB	P-330-CCT-63A-DB S-330-CCT-63A-DB
33	P-333-FHT-63A-DB S-333-FHT-63A-DB	P-333-CCT-63A-DB S-333-CCT-63A-DB

*P-Indicates Plug S-Indicates Socket

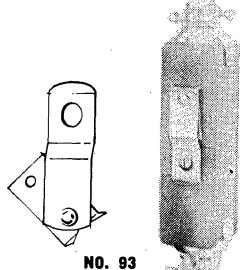
PLUGS AND SOCKETS WITH S-TYPE EXTRUSIONS

For Shallow Bracket (SB) and End Bracket (EB) Mates

No. of Contacts	Type FHT (With Flared Hole in Top) Part No.*	Type CCT (With Cable Clamp in Top) Part No.*	Type CCE (With Cable Clamp in End) Part No.*
15	P-315-FHT-63A-SB S-315-FHT-63A-SB	P-315-CCT-63A-SB S-315-CCT-63A-SB	P-315-CCE-63A-SB S-315-CCE-63A-SB
18	P-318-FHT-63A-SB S-318-FHT-63A-SB	P-318-CCT-63A-SB S-318-CCT-63A-SB	P-318-CCE-63A-SB S-318-CCE-63A-SB
21	P-321-FHT-63A-SB S-321-FHT-63A-SB	P-321-CCT-63A-SB S-321-CCT-63A-SB	P-321-CCE-63A-SB S-321-CCE-63A-SB
24	P-324-FHT-63A-SB S-324-FHT-63A-SB	P-324-CCT-63A-SB S-324-CCT-63A-SB	P-324-CCE-63A-SB S-324-CCE-63A-SB
27	P-327-FHT-63A-SB S-327-FHT-63A-SB	P-327-CCT-63A-SB S-327-CCT-63A-SB	P-327-CCE-63A-SB S-327-CCE-63A-SB
30	P-330-FHT-63A-SB S-330-FHT-63A-SB	P-330-CCT-63A-SB S-330-CCT-63A-SB	P-330-CCE-63A-SB S-330-CCE-63A-SB
33	P-333-FHT-63A-SB S-333-FHT-63A-SB	P-333-CCT-63A-SB S-333-CCT-63A-SB	P-333-CCE-63A-SB S-333-CCE-63A-SB



NO. 63



NO. 93

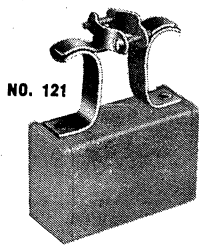
AUXILIARY LOCK NO. 63 — FACTORY NO. 422-12-14-011

Spring Lock For Use With 400 Series Panel-Mounted Plugs and Sockets: Can be used with Type AB or SB. Proper operation requires that the mounted plug or socket body be flush with the top of the panel. The standard binder head screws furnished for fastening the mating connector body to a cap must be replaced by filister head screws.

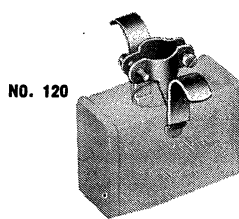
AUXILIARY LOCK NO. 93 — FACTORY NO. 319-01-99-003

Extension-Cable Lock For Use With 400 Series: Can be used with any 400 Series unmounted (cap-type) plug or socket when both mating units are attached to cables. The lock is attached to the plug cap with the screw which holds the cap to the connector body. The binder head screws in the socket cap must be replaced with filister head screws and the opening in the lock snaps over the filister head screws, completing the lock.

TRW[®] CINCH CONNECTORS



NO. 121



NO. 120

No. S-2408-CCE
with #21851

COMBINATION CABLE CLAMPS AND HANDLES

These units provide relief from strain on connector wiring and also facilitate connector separation in close quarters. Can be used for both plugs and sockets. Cap is not included.

No. 120 fits all Type CCT plugs and sockets of the 400 and 2400 Series and 15-33 contact plugs and sockets of the 300 Series.

No. 121 fits the following Type FHT plugs and sockets of the 300, 400 and 2400 Series: 300 Series — 24, 27, 30 and 33 contact; 400 Series — 10 and 12 contact; 2400 Series — 10 and 12 contact.

CABLE CLAMP FOR CCE CAPS — When Used with Deep Bracket

When ordering CCE caps for 315-333, 402-412, 2402-2412 Series plugs or sockets that are to be mated with DB plugs or sockets specify cable clamp No. 21851. (For example, P-2408-CCE with No. 21851.) There is no difference in price. Standard cable clamps normally furnished with all CCE will mate with SB plugs and sockets only.

2400 SERIES WITH STANDARD TERMINATION



Cross-section of 2400 Series socket showing four-surfaced contact with plug prong.



Solder-connecting side of plug body showing recessed pockets with barriers around contacts. Plug contacts are also in recessed pockets on opposite side.



Solder-connecting side of socket body showing recessed pockets with barriers around contacts. Socket contacts are also in recessed pockets on opposite side.

The "Jones" 2400 Series plugs and sockets are designed for excellent electrical and mechanical performance. Ratings for the 2400 Series voltage (for which the 2400 Series carries a 50% higher rating). Note the electrical rating chart on the inside front cover.

An entirely new type of socket contact designed is utilized in the 2400 Series as shown in the above illustration. Four individual flexing surfaces

make contact over practically their entire length. Note in the illustration how they exert maximum pressure at every point. Also note the unique method of anchoring terminals in the block — they cannot be moved up or down.

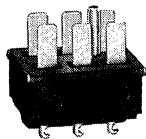
The contact-to-contact and contact-to-ground distance has been considerably increased by mounting the contacts into recessed pockets with a phenolic barrier surrounding and extending above. This method is used on both the top and bottom side of both plugs and sockets, greatly increasing the leakage path.

All units of the 2400 Series are interchangeable with corresponding units of the 400 Series. The same 2, 4, 6, 8, 10 and 12-contact plug and socket sizes are available, each size being polarized and suitable for either cap or panel mounting.

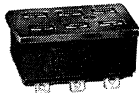
Plug and socket bodies are molded of general purpose black phenolic. Socket prongs are of heavy brass $\frac{1}{4}$ " x $\frac{1}{8}$ ", cadmium-plated. The formed metal caps have a black wrinkle finish with insulating liners.

A shoulder extends around the mating side of the 2400 Series plug and socket presenting a finished appearance when mounted in bracket or cap. Because of this shoulder, when angle brackets are used, they must first be removed from the plug or socket. The unit is then inserted into the chassis with the brackets replaced underneath the panel.

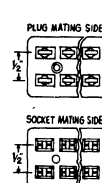
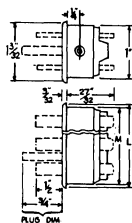
TYPE LAB (LESS ANGLE BRACKETS)



P-2406-LAB

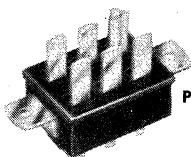


S-2406-LAB



No. of Contacts	Part No.*	Dim. In Inches $\pm \frac{1}{64}$ "		
		L	M	A
2	P-2402-LAB S-2402-LAB	$\frac{3}{32}$	$\frac{3}{16}$	$\frac{3}{16}$
4	P-2404-LAB S-2404-LAB	$1\frac{1}{32}$	1	1
6	P-2406-LAB S-2406-LAB	$1\frac{1}{16}$	$1\frac{1}{8}$	$1\frac{1}{8}$
8	P-2408-LAB S-2408-LAB	$1\frac{3}{16}$	$1\frac{3}{8}$	$1\frac{3}{8}$
10	P-2410-LAB S-2410-LAB	$2\frac{1}{32}$	$2\frac{1}{8}$	$2\frac{1}{8}$
12	P-2412-LAB S-2412-LAB	$2\frac{3}{16}$	$2\frac{3}{8}$	$2\frac{3}{8}$

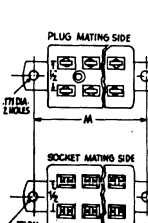
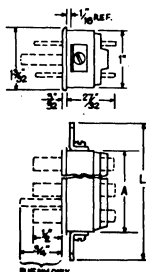
TYPE AB (WITH ANGLE BRACKETS)



P-2406-AB



S-2406-AB



No. of Contacts	Part No.*	Dim. In Inches $\pm \frac{1}{64}$ "		
		L	M	A
2	P-2402-AB S-2402-AB	$1\frac{1}{32}$	$1\frac{1}{8}$	$\frac{3}{16}$
4	P-2404-AB S-2404-AB	$2\frac{1}{32}$	$1\frac{3}{8}$	1
6	P-2406-AB S-2406-AB	$2\frac{1}{16}$	$2\frac{1}{8}$	$1\frac{3}{8}$
8	P-2408-AB S-2408-AB	$2\frac{3}{16}$	$2\frac{1}{2}$	$1\frac{3}{4}$
10	P-2410-AB S-2410-AB	$3\frac{1}{32}$	$2\frac{1}{4}$	$2\frac{1}{8}$
12	P-2412-AB S-2412-AB	$3\frac{3}{16}$	$3\frac{1}{8}$	$2\frac{3}{8}$

*P-Indicates Plug S-Indicates Socket
 Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

2400 SERIES WITH STANDARD TERMINATION (cont'd)

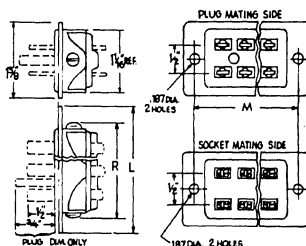
TYPE SB (WITH SHALLOW BRACKET FOR FLUSH MOUNTING)



P-2406-SB



S-2406-SB

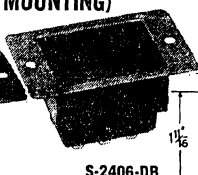


No. of Contacts	Part No.*	Dim. In Inches		
		R ± 1/16"	L ± 1/16"	M ± 1/16"
2	P-2402-SB S-2402-SB	1 1/8	1 1/2	1 1/8
4	P-2404-SB S-2404-SB	1 1/8	1 1/8	1 1/2
6	P-2406-SB S-2406-SB	1 1/8	2 3/8	1 1/8
8	P-2408-SB S-2408-SB	2 1/8	2 1/8	2 3/8
10	P-2410-SB S-2410-SB	2 1/8	3 1/4	2 1/8
12	P-2412-SB S-2412-SB	3	3 1/8	3 1/4

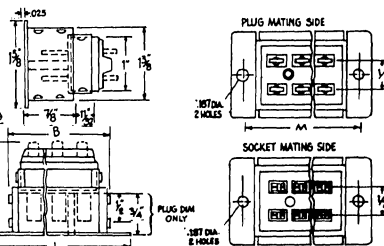
TYPE DB (WITH DEEP BRACKET FOR RECESSED MOUNTING)



P-2406-DB



S-2406-DB



No. of Contacts	Part No.*	Dim. In Inches		
		B ± 1/16"	L ± 1/16"	M ± 1/16"
2	P-2402-DB S-2402-DB	1 1/8	1 3/4	1 1/8
4	P-2404-DB S-2404-DB	1 3/8	2 1/8	1 3/4
6	P-2406-DB S-2406-DB	1 1/8	2 5/8	2 1/8
8	P-2408-DB S-2408-DB	2 1/4	3 1/8	2 5/8
10	P-2410-DB S-2410-DB	2 1/8	3 1/2	3 1/8
12	P-2412-DB S-2412-DB	3 1/8	3 1/8	3 1/2

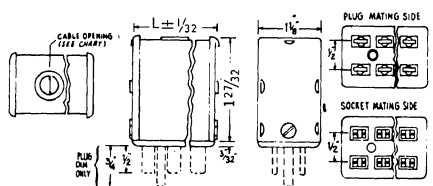
TYPE FHT (WITH FLARED HOLE IN TOP)



P-2406-FHT

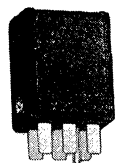


S-2406-FHT



No. of Contacts	Part No.*	Dim. In Inches	
		Cable Opening	L ± 1/16"
2	P-2402-FHT S-2402-FHT	3/8	5/8
4	P-2404-FHT S-2404-FHT	3/8	1 1/8
6	P-2406-FHT S-2406-FHT	3/8	1 1/2
8	P-2408-FHT S-2408-FHT	3/8	1 1/8
10	P-2410-FHT S-2410-FHT	3/8	2 3/8
12	P-2412-FHT S-2412-FHT	5/8	2 1/8

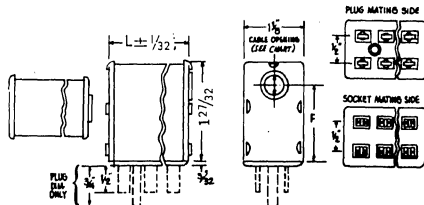
TYPE FHE (WITH FLARED HOLE IN END)



P-2406-FHE



S-2406-FHE



No. of Contacts	Part No.*	Dim. In Inches		
		Cable Opening	L ± 1/16"	F ± 1/16"
2	P-2402-FHE S-2402-FHE	3/8	5/8	1 3/8
4	P-2404-FHE S-2404-FHE	3/8	1 1/8	1 3/8
6	P-2406-FHE S-2406-FHE	3/8	1 1/2	1 3/8
8	P-2408-FHE S-2408-FHE	3/8	1 1/8	1 1/2
10	P-2410-FHE S-2410-FHE	3/8	2 3/8	1 1/2
12	P-2412-FHE S-2412-FHE	5/8	2 1/8	1 3/8

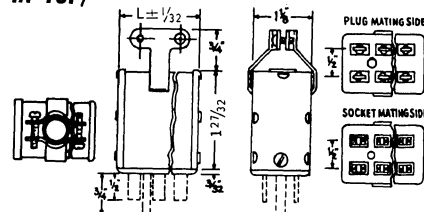
TYPE CCT (WITH CABLE CLAMP IN TOP)



P-2406-CCT



S-2406-CCT



No. of Contacts	Part No.*	Dim. In Inches	
		L ± 1/16"	Cable Opening
2	P-2402-CCT S-2402-CCT	5/8	3/8
4	P-2404-CCT S-2404-CCT	1 1/8	3/8
6	P-2406-CCT S-2406-CCT	1 1/2	3/8
8	P-2408-CCT S-2408-CCT	1 1/8	3/8
10	P-2410-CCT S-2410-CCT	2 3/8	3/8
12	P-2412-CCT S-2412-CCT	2 1/8	5/8

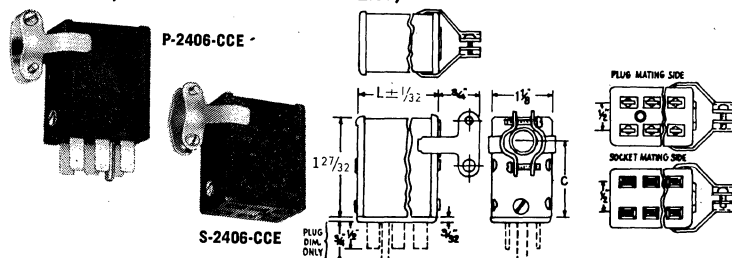
Ⓢ Indicates items normally available through Cinch Distributors.

*P-Indicates Plug S-Indicates Socket

TRW[®] CINCH CONNECTORS

2400 SERIES WITH STANDARD TERMINATION (cont'd)

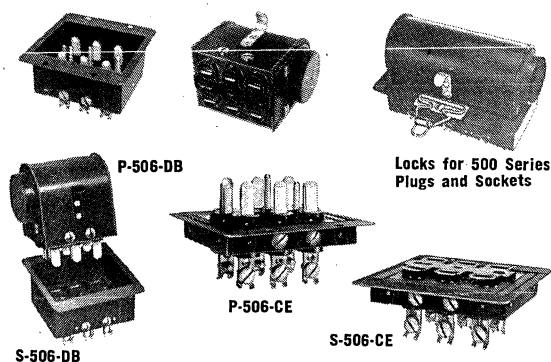
TYPE CCE (WITH CABLE CLAMP IN END)



No. of Contacts	Part. No.*	Dim. in Inches		
		L ± 1/32"	C ± 1/32"	Cable Opening
2	P-2402-CCE S-2402-CCE	5/8	1 3/8	3/8
4	P-2404-CCE S-2404-CCE	1 1/8	1 3/8	3/8
6	P-2406-CCE S-2406-CCE	1 1/2	1 3/8	3/8
8	P-2408-CCE S-2408-CCE	1 3/4	1 1/2	3/8
10	P-2410-CCE S-2410-CCE	2 3/8	1 1/2	3/8
12	P-2412-CCE S-2412-CCE	2 3/4	1 3/8	5/8

Ⓢ Indicates items normally available through Cinch Distributors
*P-Indicates Plug S-Indicates Socket

500 SERIES — WITH STANDARD SCREW TERMINALS / MOUNTING DATA



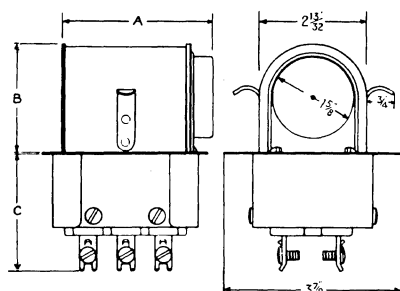
No. 500-L Lock fits any deep bracket and cap combination. It holds securely, but can be released instantly. The lock is fastened by the same screw or rivet that holds the deep bracket to the panel. Two locks are required. Cannot be used on shallow brackets.

The "Jones" 500 Series plugs and sockets are designed for use in extremely heavy-duty applications. Ratings are somewhat dependent on the parameters of the associated circuitry, but maximum voltage is nominally 3000 volts and maximum current is nominally 25 amperes per contact. Wattage per contact should not exceed 5000 watts.

500 Series plugs and sockets are available in sizes of 2, 4, 6, 8, 10 and 12 contacts, each size being polarized so as to prevent accidental mismatching with any other size. The units have been designed to allow maximum accessibility under plug caps for making terminal connections and also subsequent inspection. Plug and socket blocks will accept all appropriately-sized caps and brackets interchangeably.

Male contacts are brass and female contacts are phosphor bronze, cadmium-plated. Metal parts of caps and brackets are steel and made rustproof by parkerizing. All caps are insulated with canvas bakelite. Plug prong cross section is 3/16" by 3/32".

IMPORTANT: When used with high voltages present, it is recommended that a deep bracket type (DB) be used as one plug or socket and that its mate has a cap. Shallow brackets (Type SB) are for use only in connecting to mates of the same type.



For Type DB connectors, dimension B is 2 1/4" and Dimension C is 2 5/8" reference on the socket and 2 3/4" reference on the plug. For Type SB connectors, dimension C is 1 3/4", cap height is 2 3/4".

No. of Contacts	Type DB (With Deep Bracket for Recess Mounting) Type DB Part No.*	Type CE (With Cap) Type CE Part No.*	Type SB (With Shallow Bracket for Flush Mounting) Type SB Part No.*	Dimen. "A"
2	P-502-DB S-502-DB	P-502-CE S-502-CE	P-502-SB S-502-SB	1 1/8"
4	P-504-DB S-504-DB	P-504-CE S-504-CE	P-504-SB S-504-SB	2 1/2"
6	P-506-DB S-506-DB	P-506-CE S-506-CE	P-506-SB S-506-SB	3 3/8"
8	P-508-DB S-508-DB	P-508-CE S-508-CE	P-508-SB S-508-SB	4 1/8"
10	P-510-DB S-510-DB	P-510-CE S-510-CE	P-510-SB S-510-SB	4 3/8"
12	P-512-DB S-512-DB	P-512-CE S-512-CE	P-512-SB S-512-SB	5 3/4"

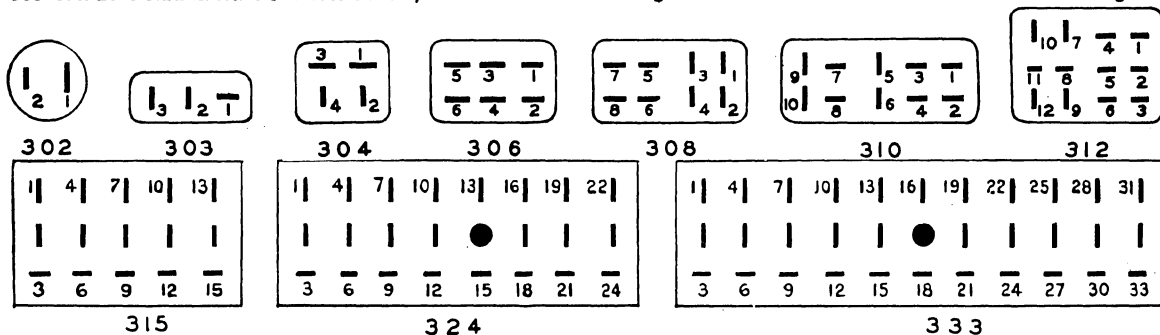
*P-Indicates Plug S-Indicates Socket

Ⓢ Indicates items normally available through Cinch Distributors.

TRW[®] CINCH CONNECTORS

MOUNTING DATA

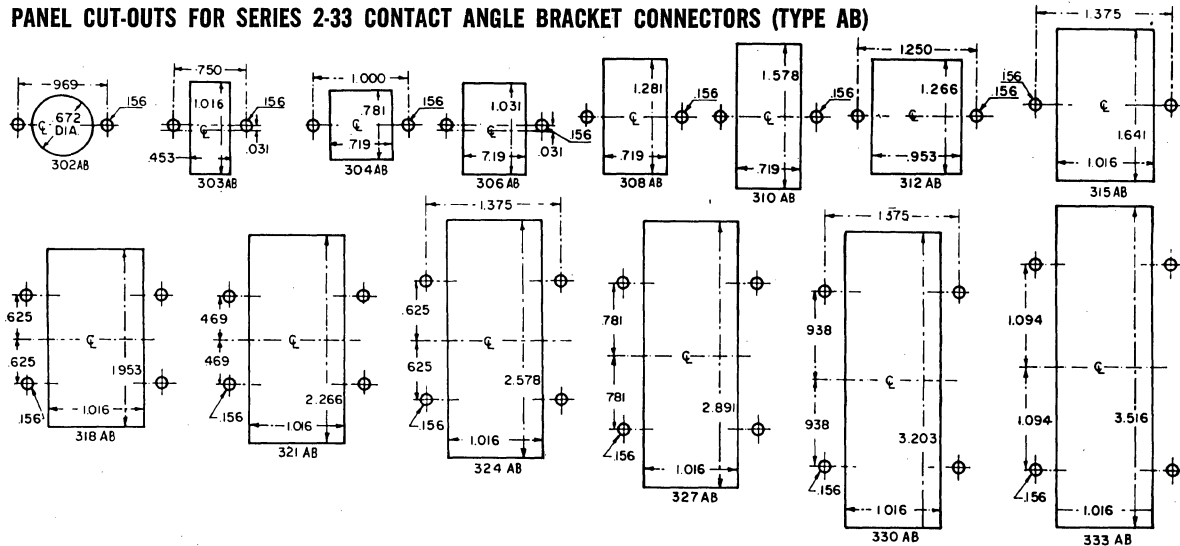
300 SERIES POLARIZING POSITION DATA / Polarization and Numbering of Contacts on Socket Units When Viewed from Wiring Side



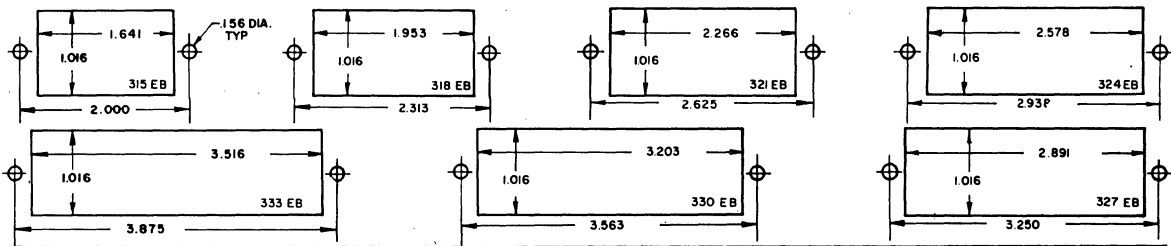
TRW[®] CINCH CONNECTORS

MOUNTING DATA

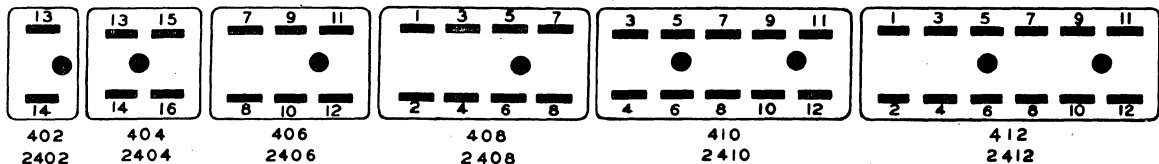
PANEL CUT-OUTS FOR SERIES 2-33 CONTACT ANGLE BRACKET CONNECTORS (TYPE AB)



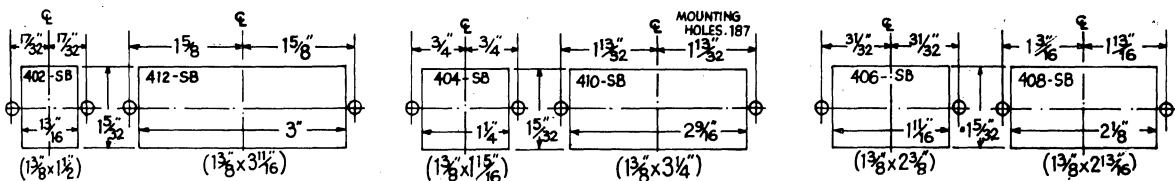
MOUNTING DIMENSIONS FOR 300 SERIES 15-33 CONTACT END BRACKET CONNECTORS (TYPE EB)



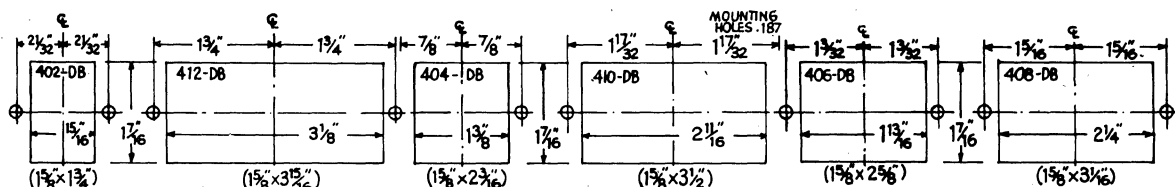
400 AND 2400 SERIES POLARIZATION DATA (VIEWED FROM WIRING SIDE OF SOCKET)



400 AND 2400 SB (SHALLOW BRACKET) MOUNTING DIMENSIONS



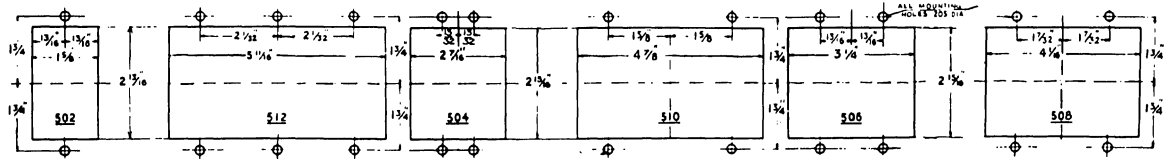
400 AND 2400 DB (DEEP BRACKET) MOUNTING DIMENSIONS



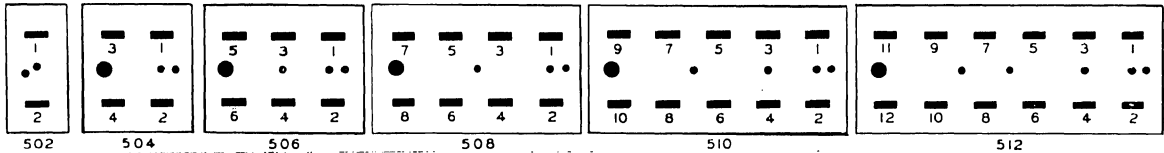
TRW[®] CINCH CONNECTORS

MOUNTING DATA

MOUNTING SPECIFICATIONS FOR DEEP OR SHALLOW BRACKETS



500 SERIES POLARIZATION DATA (VIEWED FROM WIRING SIDE OF SOCKET)

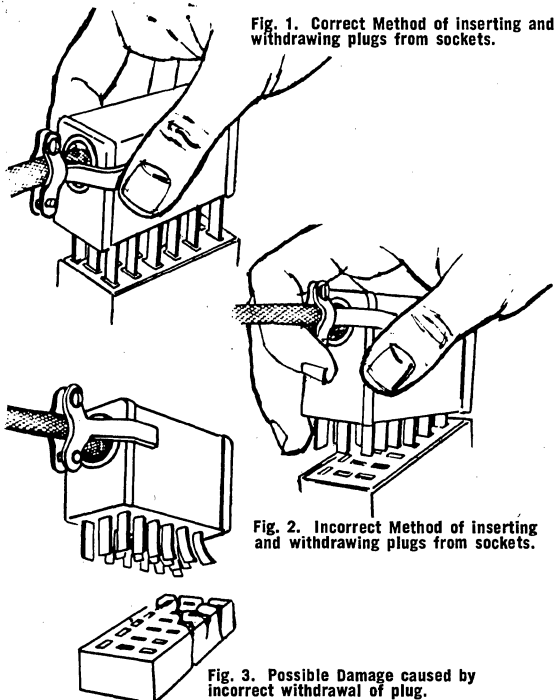


The contacts of the 500 Series are numbered from 1 up. Two sizes of polarizing pins are used as illustrated above.

PROPER WITHDRAWAL OF PLUG FROM SOCKET

As indicated in the descriptions of the 300, 400, 2400 and 500 Series plugs and sockets, the insulator bodies are made of general purpose black phenolic. This choice is based on the excellent electrical insulating properties of the material, rather than on its mechanical characteristics. Despite Cinch's achievement in designing as rugged a construction as other parameters will allow, some care is required in the mating and disconnecting of the plugs and sockets in order to avoid damage to the insulator bodies and contacts.

Figure 1 shows the correct method of inserting and withdrawing plugs from sockets—only by direct pull straight out at right angles to the mounting surface. Pulling alternately at one end of the connector and then the other as shown in Figure 2 is incorrect. Figure 3 shows the possible damage that may occur if one end of the plug is extracted before the other. When contacts are bent and insulator bodies cracked in this manner, the connector must be completely replaced in order to assure reliable operation.



RECOMMENDATIONS ON SOLDERING TERMINAL WIRES

Although "Jones" plugs and sockets are designed to minimize the effects of wiring stress on the contacts, especially those with the new monoblock design, it is desirable to observe good wiring and soldering practices when attaching wires to the contacts. The wires should be of sufficient length and properly stripped so that they can be soldered to the terminals without placing undue stress on the contacts. Figure 4 shows a properly terminated wiring harness.

When soldering with leads that are too short or attempting to twist the wires into a compact assembly as illustrated in Figure 5, contacts may become distorted as shown in Figure 6. In extreme cases, socket contacts may be dislocated to the extent that insertion of the plug prong is impossible.

Good soldering technique is always a necessity to assure reliability. Despite plating of plug and socket contact tails to facilitate proper solder joints, oxidizing of unwrapped contacts and exposure to contaminated air may cause the contacts to become difficult to solder. The contacts may be easily cleaned with sandpaper or a small brush and then will be ready for proper soldering.

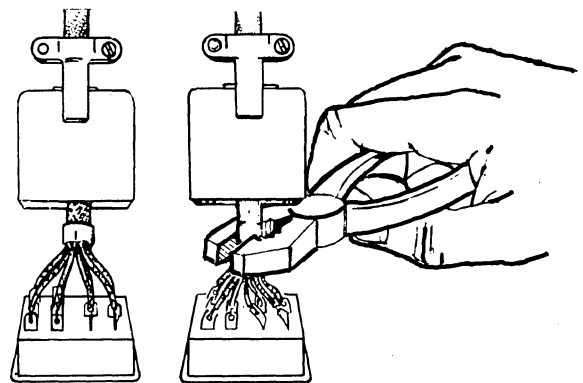


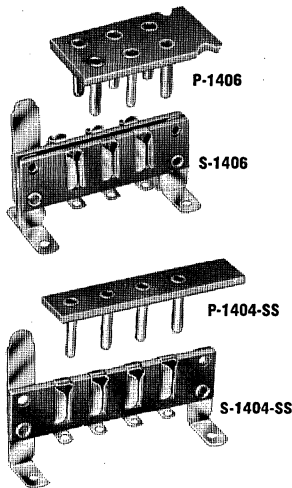
Fig. 4. Proper termination of wiring harness. Fig. 5. Incorrect practice caused by allowing insufficient wire length and stripping.



Fig. 6. Possible result of twisting improperly terminated wires.

TRW[®] CINCH CONNECTORS

1400 SERIES LAMINATED PLUGS AND SOCKETS



TWO-SIDE 1400 SERIES

Designed for use where a quick disconnect point is needed simultaneously for various circuits at low cost. Due to exposed metal parts, 1400 Series plugs and sockets are recommended for use when the complete unit is within a housing. All of the advantages of multiple-circuit connectors are offered including polarization to prevent incorrect connections.

Insulation is XP phenolic. Contacts are made of spring-tempered cadmium-plated brass. Socket mounting brackets are made of steel. In addition to the units indicated, others with more contacts are available on special order. However, with 20 or more contacts it is recommended that two or more plugs be used since a single long plug is not mechanically strong. However, the mating socket can feasibly be manufactured as a single assembly.

SINGLE-SIDE 1400 SERIES

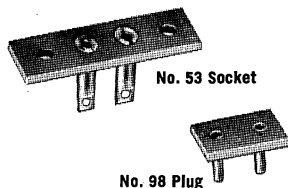
The 1400 Series is also available with single-side plugs and sockets. Contacts are arranged in a single row, so that these units are actually half the size of the standard two-side plug or socket. Otherwise, all features are the same.

No. of Contacts	Plug Part No.	Socket Part No.	Socket Mounting Centers
2	P-1402	S-1402	1 1/8"
3	P-1403	S-1403	1 3/8"
4	P-1404	S-1404	1 5/8"
5	P-1405	S-1405	1 3/4"
6	P-1406	S-1406	1 7/8"
7	P-1407	S-1407	2 1/4"
8	P-1408	S-1408	2 1/4"
9	P-1409	S-1409	2 1/4"
10	P-1410	S-1410	2 1/4"
11	P-1411	S-1411	3 1/8"
12	P-1412	S-1412	3 1/8"
13	P-1413	S-1413	3 1/8"
14	P-1414	S-1414	3 1/8"
15	P-1415	S-1415	4"
16	P-1416	S-1416	4"

Mounting Hole Size — 3/4"

No. of Contacts	Plug Part No.	Socket Part No.
2	P-1402-SS	S-1402-SS
3	P-1403-SS	S-1403-SS
4	P-1404-SS	S-1404-SS
5	P-1405-SS	S-1405-SS
6	P-1406-SS	S-1406-SS
7	P-1407-SS	S-1407-SS
8	P-1408-SS	S-1408-SS
9	P-1409-SS	S-1409-SS
10	P-1410-SS	S-1410-SS
11	P-1411-SS	S-1411-SS
12	P-1412-SS	S-1412-SS

OTHER LAMINATED PLUGS AND SOCKETS



No. 98 Plug • No. 53 Socket. Terminals mounted on 3/8" centers. 3/32" diameter plug prongs. Insulation is XP phenolic, 1/2" wide, 3/32" thick. Socket mounting holes 3/8" from center of end terminals. Mounting hole size .144. Plug has no mounting holes.

No. 99 Plug • No. 42 Socket. Terminals mounted on 1/2" centers. 1/8" diameter plug prongs. Insulation: XP phenolic, 1/2" wide, 3/32" thick. Socket mounting holes 1/2" from center of end terminals. Mounting hole size .144. No mounting holes on plug.

No. 100 Plug • No. 43 Socket. Terminals mounted on 5/8" centers. 3/32" diameter plug prongs. XP phenolic insulation, 5/8" wide, 3/32" thick. Socket mounting holes 5/8" from center of end terminals. Mounting hole size .144. Plug does not have mounting holes.

No. of Contacts	No. 98 Plug Part No.	No. 53 Socket Part No.
2	2-98	2-53
3	3-98	3-53
4	4-98	4-53
5	5-98	5-53
6	6-98	6-53
7	7-98	7-53
8	8-98	8-53
9	9-98	9-53

No. of Contacts	No. 99 Plug Part No.	No. 42 Socket Part No.
2	2-99	2-42
3	3-99	3-42
4	4-99	4-42
5	5-99	5-42
6	6-99	6-42
7	7-99	7-42
8	8-99	8-42
9	9-99	9-42

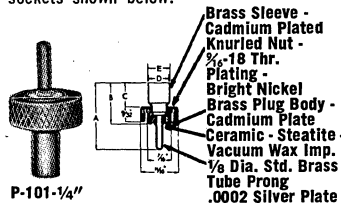
No. of Contacts	No. 100 Plug Part No.	No. 43 Socket Part No.
2	2-100	2-43
3	3-100	3-43
4	4-100	4-43
5	5-100	5-43
6	6-100	6-43
7	7-100	7-43
8	8-100	8-43
9	9-100	9-43

SPECIAL PURPOSE AUDIO CONNECTORS

These audio connectors have been designed for use in those applications where reliability under extreme environmental conditions is an absolute necessity. They have been designed to provide low-loss connections over a range of frequencies even beyond the audio spectrum.

SERIES 101 PLUGS

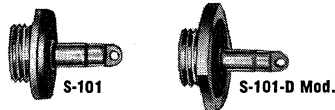
The "Jones" 101 Series audio connectors are designed to provide low-loss connections, even at high frequencies. The 1/4" and .290 have a one piece body and ferrule, which is cadmium-plated. All metal parts are brass. The plugs fit all of the No. 101 Series sockets shown below.



Part No. (C)	Dimensions In Inches				
	A	B	C	D	E
P-101-1/4"	1 1/4	3/4	7/16	1/4	3/2
P-101-.290	1 1/4	3/4	7/16	.290	.319

SERIES 101 SOCKETS

The No. 101 Series sockets are furnished in three types as shown below. Base is of brass, bright nickel finish. Brass contact is silver-plated. Insulation is of low-loss natural color XXX phenolic. The S-101-D is similar to the S-101 except that the phenolic is recessed in the base. S-101-D Mod. is the same as S-101-D except that two sides of the base are milled as shown.



Part No. (C)	Mounting Centers	Drill Size For Mounting Holes
S-101	1 1/8"	41
S-101-D	1 1/8"	30
S-101-D Mod.	1 1/8"	30

SERIES 202 PLUGS

The 202 Series plugs and sockets have two polarized contacts. Metal parts are of brass with bright nickel finish. Insulation is of molded phenolic. Phosphor bronze "knife-switch" type socket contacts engage both sides of flat brass plug contacts, doubling contact area. Formed fibre linings in caps. Knurled nut has 3/4"-27 thread.

SERIES 202 PLUGS



P-202-CCT **S-202-B** **S-202-CCT-THR**
Socket Mounting Holes. No. 30 drill size on 1/4" centers.

S-202-CCT-THR when used with the P-202-CCT makes an ideal microphone connector.

Part No. (C)	Type	Part No. (C)	Type
P-202-CCT (as shown above)	Plug with Cable Clamps	S-202-B (as shown above)	Socket with Mounting Base
S-202-CCT	Socket with Cable Clamps	P-202-B	Plug with Mounting Base
P-202-FHT	Plug without Cable Clamps	S-202-CCT-THR (as shown above)	Socket with Cable Clamps and threaded body. For attaching to a P-202-CCT
S-202-FHT	Socket without Cable Clamps		

*P-Indicates Plug S-Indicates Socket
(C) Indicates items normally available through Cinch Distributors.

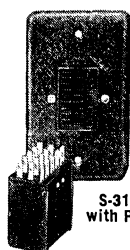
TRW[®] CINCH CONNECTORS

SPECIAL PURPOSE PLUGS AND SOCKETS MOUNTED ON WALL PLATES

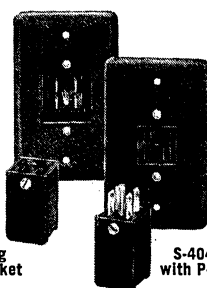
The plugs and sockets shown on these pages are based on the designs of the 300, 400 and 2400 Series plugs and sockets described on pages 3-13 of this catalog. They are mounted on wall plates as illustrated below and are intended to mate with appropriate plugs and sockets of the same series.

These plugs and sockets are normally used in general industrial applications where conventional chassis-mounted units are not practical. Those described below are used primarily for patching communications devices such as television antennas and rotators.

The wall plates shown below are made of heavy steel and are designed to fit a standard outlet box. They are finished in black wrinkle to match the mating plugs and sockets. When a 400 or 2400 Series plug is to be mounted on the wall plate, a deep bracket is used so that the plug prongs will be recessed, giving them necessary protection. However, if it should be desired that the plug contacts extend above the plate, delete the DB from the plug part number below and the angle bracket type of plate-mounted plug will be furnished.

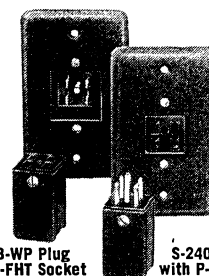


S-315-WP Socket
with P-315-FHT Plug



P-404-DB-WP Plug
with S-404-FHT Socket

S-404-WP Socket
with P-404-FHT Plug



P-2404-DB-WP Plug
with S-2404-FHT Socket

S-2404-WP Socket
with P-2404-FHT Plug

300 SERIES		400 SERIES				2400 SERIES			
WITH ANGLE BRACKET SOCKET MOUNTED ON WALL PLATE		WITH DEEP BRACKET PLUG MOUNTED ON WALL PLATE		WITH ANGLE BRACKET SOCKET MOUNTED ON WALL PLATE		WITH DEEP BRACKET PLUG MOUNTED ON WALL PLATE		WITH ANGLE BRACKET SOCKET MOUNTED ON WALL PLATE	
No. of Contacts	Part No.	No. of Contacts	Part No.	No. of Contacts	Part No.	No. of Contacts	Part No.	No. of Contacts	Part No.
6	S-306-WP								
8	S-308-WP	2	P-402-DB-WP	2	S-402-WP	2	P-2402-DB-WP	2	S-2402-WP
10	S-310-WP								
12	S-312-WP	4	P-404-DB-WP	4	S-404-WP	4	P-2404-DB-WP	4	S-2404-WP
15	S-315-WP								
18	S-318-WP	6	P-406-DB-WP	6	S-406-WP	6	P-2406-DB-WP	6	S-2406-WP
21	S-321-WP								
24	S-324-WP	8	P-408-DB-WP	8	S-408-WP	8	P-2408-DB-WP	8	S-2408-WP
27	S-327-WP								

SPECIAL PURPOSE WALL PLATES FOR TERMINATING TV ANTENNAS

302 SERIES CHROME-PLATED WALL PLATES

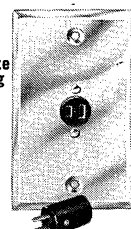
The 302 Series wall plates are available as shown with various combinations of 2-contact, 4-contact and 8-contact sockets mounted in the heavy chrome-plated steel plates. The plates fit a standard outlet box and provide a convenient junction between the antenna lead-in and a TV or FM set, or even a low-power transmitter. Mounting screws are furnished.

- Ⓢ S-302-WPC provides a connection for antenna lead-in only.
- Ⓢ S-302-4-WPC provides connections for antenna lead-in and up to a 4-contact rotor control system.
- Ⓢ S-302-8-WPC is similar and will accommodate an 8-contact rotor control system.
- Ⓢ S-302-2-8-WPC (not shown) is similar to the S-302-8-WPC except that it has two 2-contact sockets instead of one.

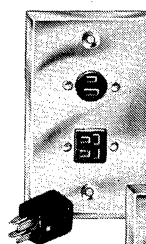
The plugs shown in the illustrations are suggested mates for the rotor sockets.

Ⓢ Indicates items normally available through Cinch Distributors.

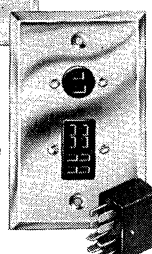
S-302-WPC Wall Plate
with P-302-FHT Plug



S-302-4-WPC Wall Plate
with P-304-FHT Plug



S-302-8-WPC Wall Plate
with P-308-FHT Plug



TRW[®] CINCH CONNECTORS

INTEGRATED CIRCUIT LOGIC BOARDS

Integrated circuit logic boards are designed to provide flexibility in breadboarding — by enabling the circuit designer to make rapid changes in either components or interconnect wiring at little or no expense — and in special purpose circuit layout for custom applications.

This flexibility is accomplished through the use of a specially designed, high reliability socket terminal that can accept directly the leads of standard dual-in-line IC packages and discrete components. These sockets are arrayed on one side of the epoxy glass boards to accommodate 14, 16, 24, 36, or 40-pin DIP packages, depending upon the series selected.

The reverse side of the board contains precision machined .025"

square terminals suitable for wire wrapping.* The boards themselves are designed for the layout of either mother, or daughter, board applications, and contain a ground plane on one side, and a power plane on the other, with discrete terminals connected to each plane.

A wide variety of board configurations and sizes are available to accommodate every need. To complement the line, various accessory hardware — such as input-output connectors, discrete component adaptors, and special purpose pins — are offered to provide the designer everything he needs to make the job of circuit layout easier.

FEATURES

- Wire wrapping pins available in two tail lengths: .370 and .510.
- Sockets accept rectangular DIP leads varying from as small as .009 x .016 to as large as .013 x .020.
- Sockets accept round pins ranging from .018 diameter to .023 diameter.
- Pins individually replaceable.
- Two board thicknesses: .062 and .125.
- Available with plated through holes.

MECHANICAL & ELECTRICAL CHARACTERISTICS

Terminal to Board Retention: 8 lbs. minimum, (no movement of pin relative to board when 2.5 in.-oz. of torque applied).

Maximum Insertion Force with Nominal Size Pin: 16 oz.

MATERIALS

Wire Wrap Terminals: Brass per QQ-B-626.

Contacts: Beryllium copper per QQ-C-530.

PC Boards: FR-4 Epoxy Glass with 2 oz. copper.

Finishes:

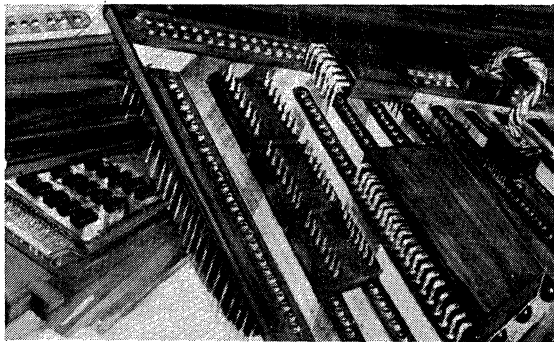
- Terminals:** .0002 tin plate per MIL-T-10727, or .00003 gold over .00005 nickel.
- Contacts:** .00003 gold over .00005 nickel.
- PC Boards:** Reflowed Solder and .00005 gold over .00005 nickel where applicable.

Minimum Withdrawal Force with Nominal Size Pin: 2 oz.

Current Rating: 5 amps.

Contact Resistance: 10 Milliohms maximum.

CUSTOM BOARDS



TRW/Cinch Connectors Division possesses extensive facilities to handle custom board requirements. Our complete manufacturing facilities, including drilling, etching, assembly, pin straightening, etc., enable us to provide customized IC logic boards made to individual customer specifications. Turn around time is minimized through flexible scheduling and total in-house manufacturing capability.

Although the standard logic boards described in this catalog are 1/8" glass epoxy, 1/16" thick boards are also available, as well as our line of standard 1/16" PC board edge connectors.

To obtain a prompt proposal based on your specific requirements, submit a sketch and supporting details to New Products Manager, TRW/Cinch Connectors, An Electronic Components Division of TRW Inc., 1501 Morse Avenue, Elk Grove Village, Illinois 60007.

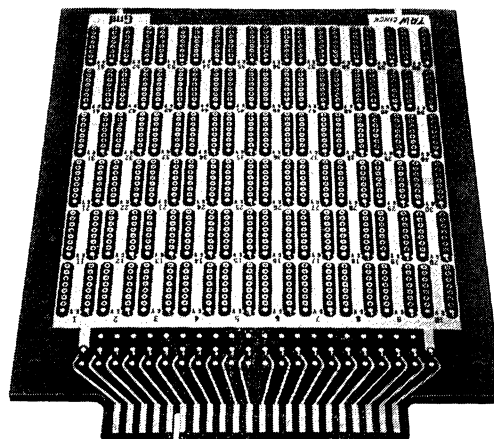
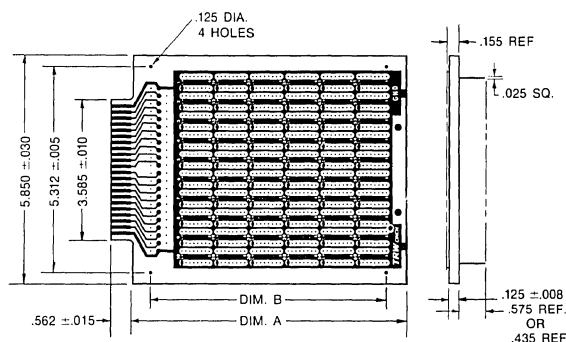
INDEX

Description	Page
Adaptor (Card Guide)	7
Adaptor Plugs (14 & 16 Pin)	7
Connectors, Edge (22 & 61 Position)	7
DIP Logic Boards, High Density	
60-HC (60 patterns)	5
60-HC4, 60-HC6 (60 & 30 Patterns)	2
60-HMC (Combination 14 & 16 Pin Patterns)	5
60-HPG (30 to 180 Patterns)	3
60-HP4, 60-HP6 (60 & 30 Patterns)	2
Double-Ended Plug Assemblies	8
Dummy Pin Socket/Terminal	9
Edge Connectors (22 & 61 Position)	7
Ejector Keys	8
Extractor Tool	8

Description	Page
Logic Boards	
60-HC (High Density DIP)	5
60-HC4, 60-HC6 (High Density DIP)	2
60-HMC (Combination 14 & 16 Pin High Density DIP)	5
60-HPG (High Density DIP)	3
60-HP4, 60-HP6 (High Density DIP)	2
60-HUC (Universal IC)	6
60-HUP (Universal IC)	4
Plug Assemblies (14 & 16 Pin)	8
Plug Assemblies (Unassembled)	8
Slotted Pin Socket/Terminals	9
Socket/Terminal Replacement Kit	9
Socket/Terminals	9
Universal IC Logic Boards	
60-HUC (20 Rows of 50 Contacts)	6
60-HUP (9 to 54 rows of 50 contacts)	4

TRW[®] CINCH CONNECTORS

HIGH DENSITY DIP PACKAGING PANELS 60-HC4 & 60-HC6 SERIES



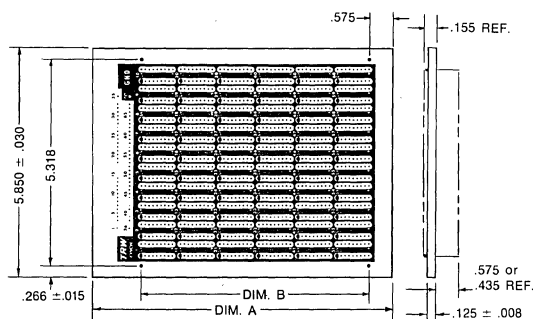
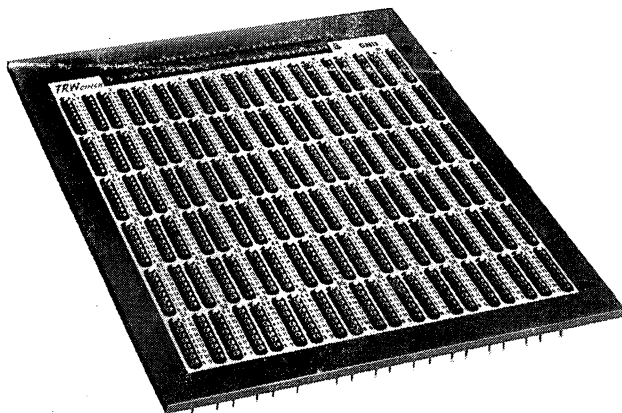
Edge connector take off accepts Cinch 22 position double readout edge connector. (See Page 2•1014)

Contacts are gold plated all over and supplied for 3 level wrap.

Distributor Part No.	Factory Part No.	Pins Per Pattern	Gnd. and Power Pins	No. of Patterns For Board	A ±.030	B ±.005
60-HC4-60	299-08-00-018	14	V & G Dummies*	60	6.938	6.000
60-HC4-30	299-08-00-019	14	V & G Dummies*	30	4.238	3.300
60-HC6-60	299-08-00-020	16	V & G Dummies*	60	7.538	6.600
60-HC6-30	299-08-00-021	16	V & G Dummies*	30	4.538	3.600

*2 additional wire wrap pins for wire strapping to pins on different packages.

60-HP4 & 60-HP6 SERIES



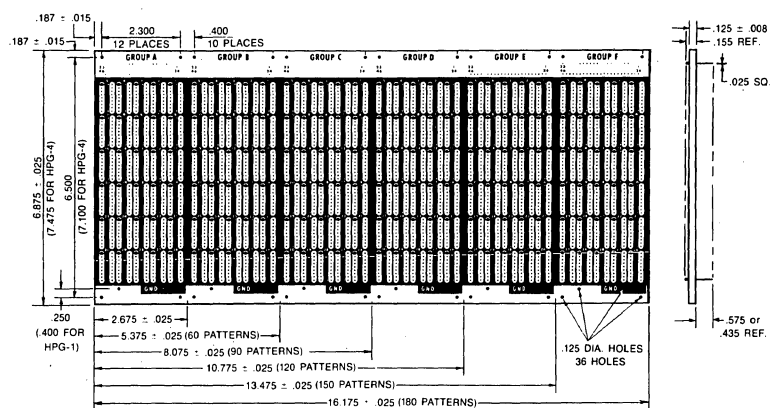
Contacts are gold plated all over and supplied for 3 level wrap.

Distributor Part No.	Factory Part No.	Pins Per Pattern	Gnd. and Power Pins	No. of Patterns For Board	A ±.030	B ±.005
60-HP4-60	299-08-00-014	14	V & G Dummies*	60	7.000	5.200
60-HP4-30	299-08-00-015	14	V & G Dummies*	30	4.300	2.500
60-HP6-60	299-08-00-016	16	V & G Dummies*	60	7.600	5.800
60-HP6-30	299-08-00-017	16	V & G Dummies*	30	4.600	2.800

*2 additional wire wrap pins for wire strapping to pins on different packages.

60-HPG SERIES

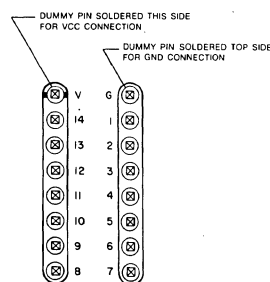
-



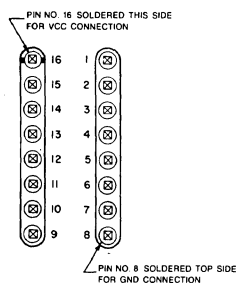
Distributor Part No.	Factory Part No.	No. of Patterns For Board	Pins Per Pattern	Gnd. and Power Pins
60-HPG1-30	299-08-00-022	30	14	7 + 14
60-HPG1-60	299-08-00-023	60		
60-HPG1-90	299-08-00-024	90		
60-HPG1-120	299-08-00-025	120		
60-HPG1-150	299-08-00-026	150		
60-HPG1-180	299-08-00-027	180		
60-HPG2-30	299-08-00-028	30	14	V & G Dummies*
60-HPG2-60	299-08-00-029	60		
60-HPG2-90	299-08-00-030	90		
60-HPG2-120	299-08-00-031	120		
60-HPG2-150	299-08-00-032	150		
60-HPG2-180	299-08-00-033	180		
60-HPG3-30	299-08-00-034	30	16	8 + 16
60-HPG3-60	299-08-00-035	60		
60-HPG3-90	299-08-00-036	90		
60-HPG3-120	299-08-00-037	120		
60-HPG3-150	299-08-00-038	150		
60-HPG3-180	299-08-00-039	180		
60-HPG4-30	299-08-00-040	30	16	V & G Dummies*
60-HPG4-60	299-08-00-041	60		
60-HPG4-90	299-08-00-042	90		
60-HPG4-120	299-08-00-043	120		
60-HPG4-150	299-08-00-044	150		
60-HPG4-180	299-08-00-045	180		

PIN NO. 14 SOLDERED THIS SIDE FOR VCC CONNECTION

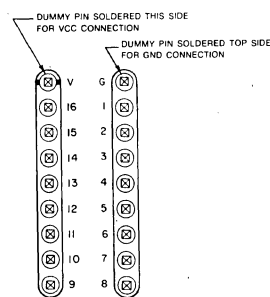
14	1
13	2
12	3
11	4
10	5
9	6
8	7

60-HPG1

60-HPG2



60-HPG3



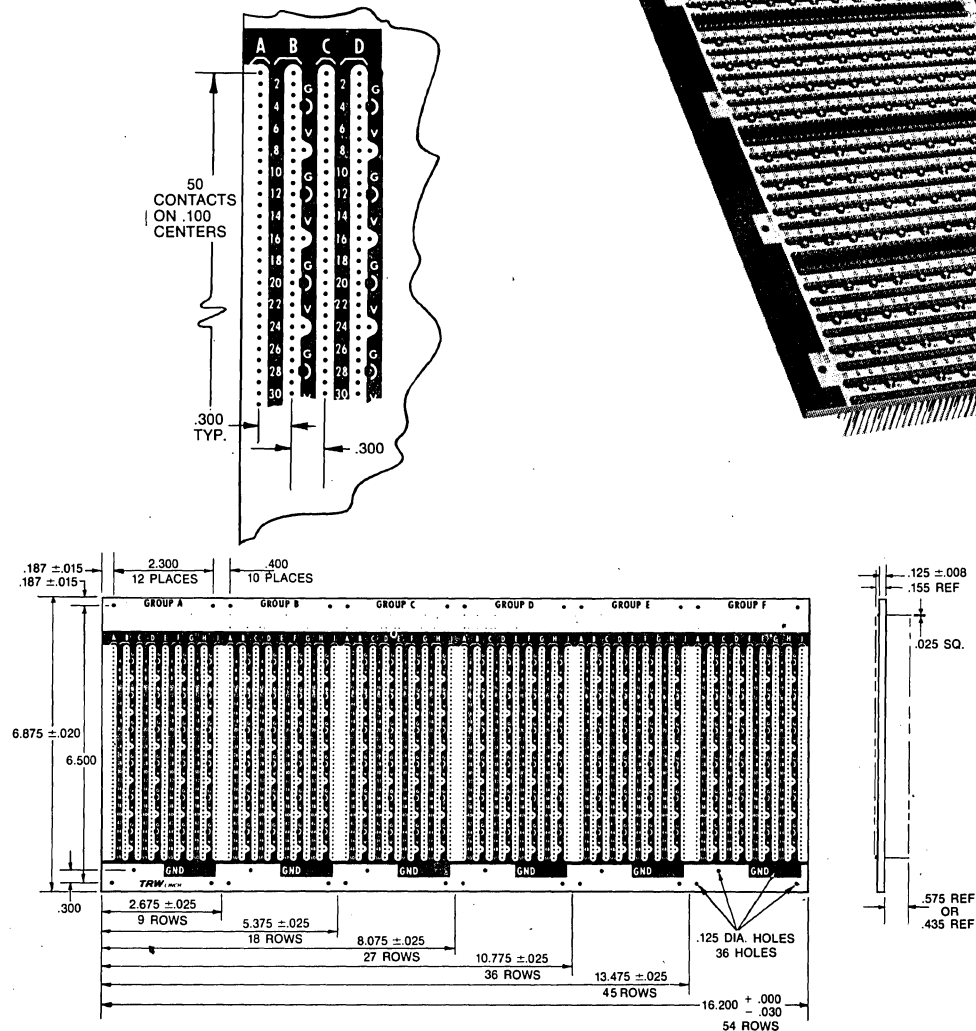
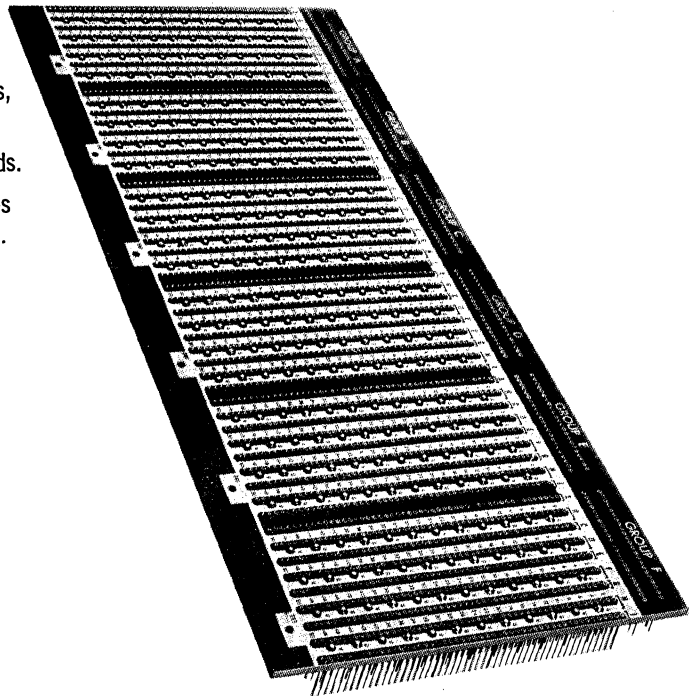
60-HPG4

TRW[®] CINCH CONNECTORS

UNIVERSAL IC PACKAGING PANEL

60-HUP SERIES

- Panels available in 9-row multiples from 9 to 54 rows, 50 contacts per row.
- Panels adaptable to DIP IC's containing 14 to 40 leads.
- Double-sided board contains power and ground planes connected to additional pins outside of contact rows.



Finished panel widths are for the specified number of contact rows.

Distributor Part No.	Factory Part No.	No. of Rows	Panel Width ±.025
60-HUP-9	299-08-00-002	9	2.675
60-HUP-18	299-08-00-003	18	5.375
60-HUP-27	299-08-00-004	27	8.075
60-HUP-36	299-08-00-005	36	10.775
60-HUP-45	299-08-00-006	45	13.475
60-HUP-54	299-08-00-007	54	16.200 +.000 -.030

Additional wire wrap terminals are connected to ground and power planes outside of contact rows.

TRW[®] CINCH CONNECTORS

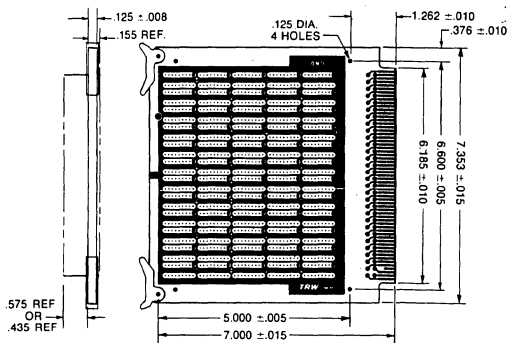
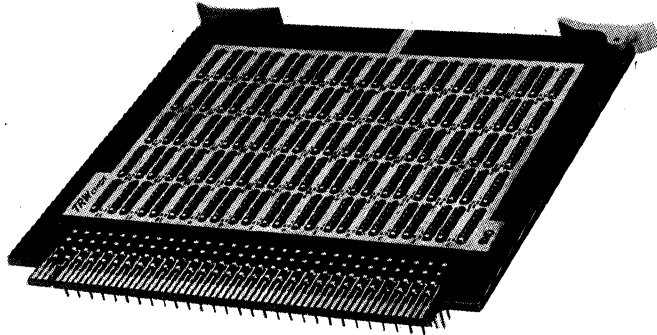
HIGH DENSITY DIP PACKAGING PANEL WITH CONNECTOR TAKE-OFF

60-HC SERIES — 60 PATTERNS

Edge connector takeoff accepts Cinch 61 position, double readout edge connectors. (See Page 2-1014)

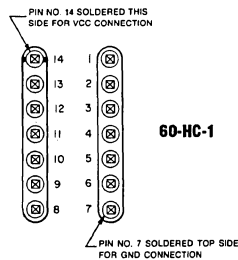
Ground and power planes connected to contacts or dummy pins at each pattern.

Contacts are gold plated all over and supplied for 3 level wrap.

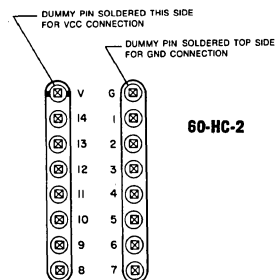


Distributor Part No.	Factory Part No.	Pins Per Pattern	Gnd. and Power Pins
60-HC-1	299-08-00-008	14	7 + 14
60-HC-2	299-08-00-009	14	V & G Dummies*
60-HC-3	299-08-00-010	16	8 + 16
60-HC-4	299-08-00-011	16	V & G Dummies*

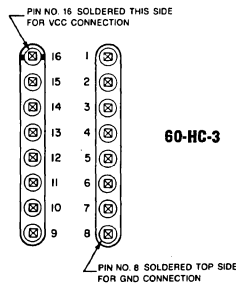
*2 additional wire wrap pins for wire strapping to pins on different packages.



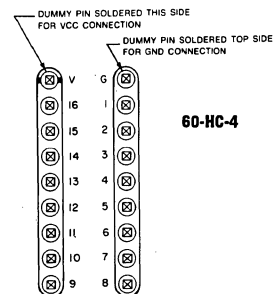
60-HC-1



60-HC-2



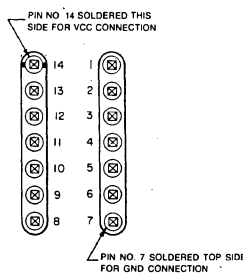
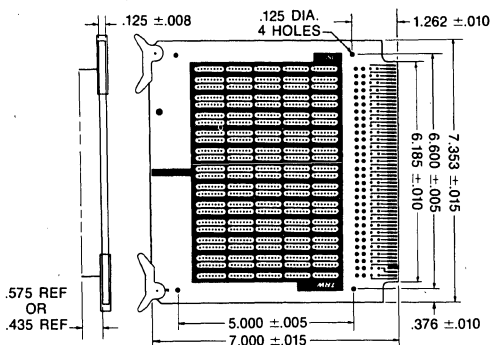
60-HC-3



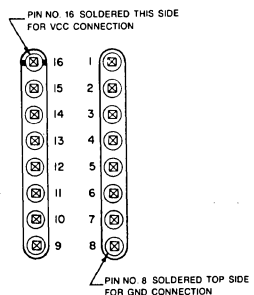
60-HC-4

60-HMC-1 — 60 PATTERNS

COMBINATION 14 & 16 PIN PATTERNS — FACTORY PART NO. 299-08-00-013



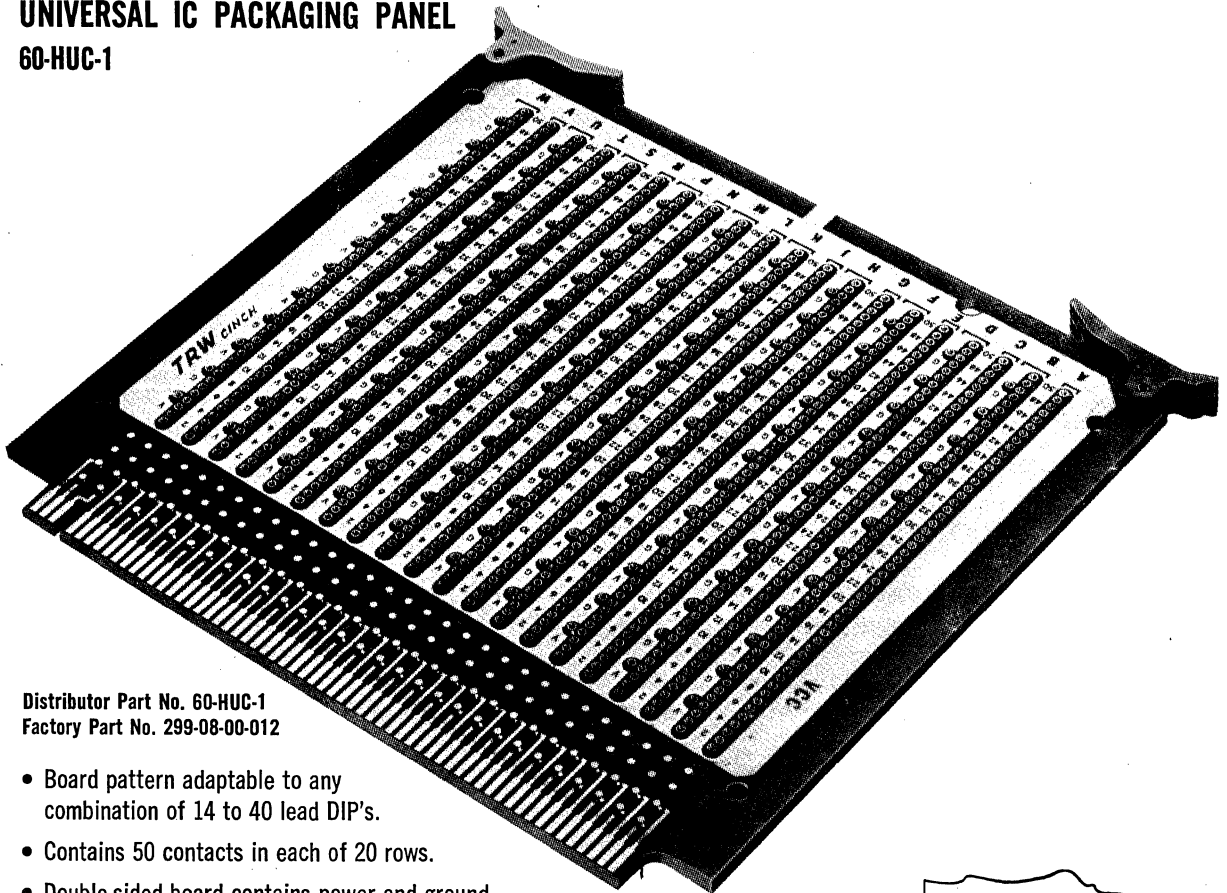
PATTERNS 1-48
(FIRST FOUR ROWS)



PATTERNS 49-60
(FIFTH ROW)

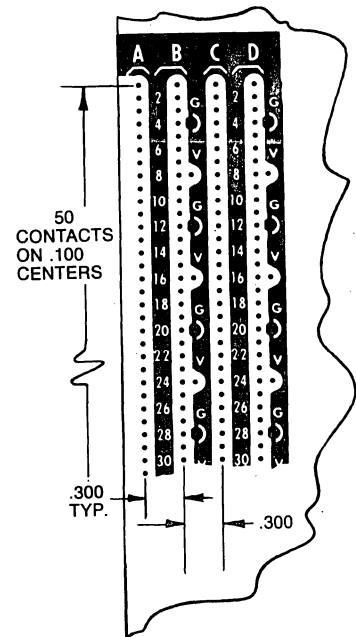
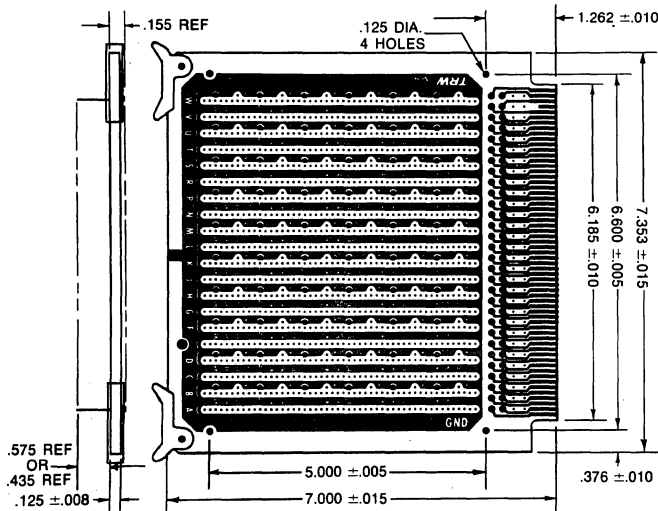
TRW[®] CINCH CONNECTORS

UNIVERSAL IC PACKAGING PANEL 60-HUC-1



Distributor Part No. 60-HUC-1
Factory Part No. 299-08-00-012

- Board pattern adaptable to any combination of 14 to 40 lead DIP's.
- Contains 50 contacts in each of 20 rows.
- Double-sided board contains power and ground planes connected to additional pins outside of contact rows.
- Contacts are gold plated all over and supplied for 3 level wrap.

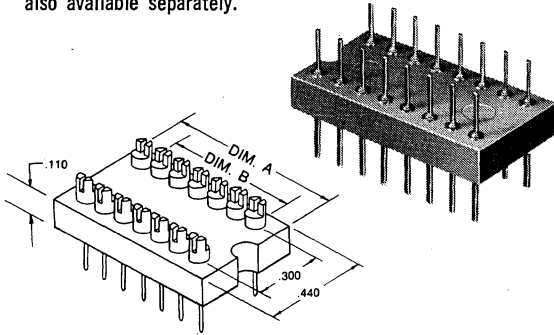


Additional wire wrap terminals are connected to ground and power planes outside of contact rows.

TRW[®] CINCH CONNECTORS

ADAPTOR PLUGS

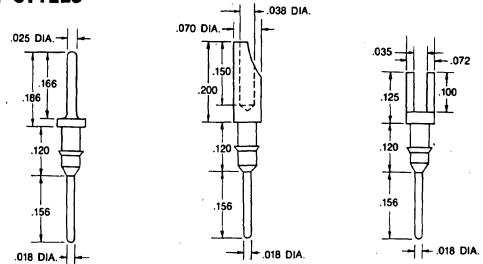
- Designed for interposing discrete components and as a base for modular construction and special plug assemblies.
- Terminals plug directly into 14- and 16-pin patterns on 60-HPG, 60-HP, 60-HC, and 60-HMC panels, or universal patterns on other panels.
- Round, solder pocket, and slotted pin styles available. Pins also available separately.



Materials: Base — Glass-filled nylon, 1/8".
Pin — Brass, gold over nickel plated.

Distributor Part No.	Factory Part No.	No. of Pins	Dimensions		Pin Style
			A +.005 -.010	B ±.005	
AP-14-A	299-11-00-017	14	.740	.600	Round
AP-16-A	299-11-00-018	16	.840	.700	Round
AP-14-B	299-11-00-019	14	.740	.600	Solder Pocket
AP-16-B	299-11-00-020	16	.840	.700	Solder Pocket
AP-14-C	299-11-00-021	14	.740	.600	Slotted Pin
AP-16-C	299-11-00-022	16	.840	.700	Slotted Pin

PIN STYLES



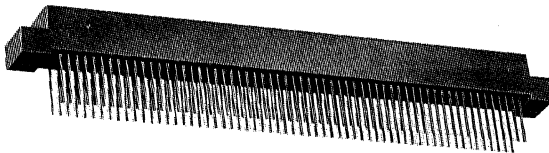
ROUND
Distributor Part No. 60-PA
Factory Part No. 462-14-11-038

SOLDER POCKET
Distributor Part No. 60-PB
Factory Part No. 462-14-11-039

SLOTTED
Distributor Part No. 60-PC
Factory Part No. 462-14-11-040

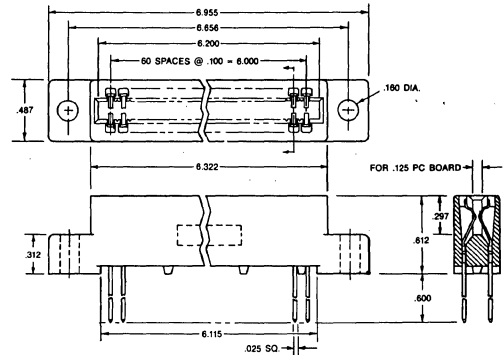
61 POSITION EDGE CONNECTORS

Distributor Part No. 50-122W-60
Factory Part No. 253-61-00-001



Materials:

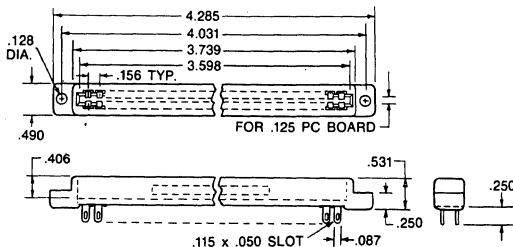
Contact — Phosphor Bronze per QQ-P-330 gold plated MIL-G-45204, over nickel plate.
Insulator — Glass Reinforced Polyester.



22 POSITION EDGE CONNECTORS

Distributor Part No. 50-44A-60
Factory Part No. 251-22-30-351

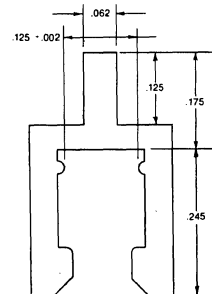
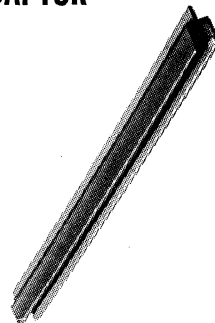
Designed for minimum printed circuit card wear, low insertion force, and bifurcated contacts that permit two flexing surfaces for positive contact.



Materials:

Insulation — Glass-filled diallyl phthalate, Type SDG-F per MIL-M-14.
Contacts — Phosphor bronze with minimum of 30 microinches thickness gold plate.

ADAPTOR



Distributor Part No. A-60
Factory Part No. 474-11-77-430

Available for use with 60-HC, 60-HC4 and 60-HC6 Series Boards, as well as Board Nos. 60-HUC-1 and 60-HMC-1.

TRW[®] CINCH CONNECTORS

PLUG ASSEMBLIES

Designed for input-output connections, interfacing, and testing terminals on the same plane as the IC patterns.

PLUG ASSEMBLIES (CRIMP CONTACT)

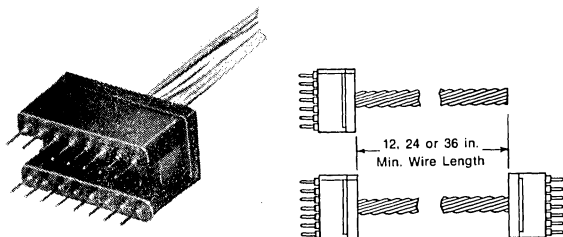
Distributor Part No.*	Factory Part No.**	No. of Pins	Pin Dia.	Wire Length***
PA-1412-T	299-11-00-001	14	.018	12"
PA-1424-T	299-11-00-003	14	.018	24"
PA-1436-T	299-11-00-005	14	.018	36"
PA-1612-T	299-11-00-007	16	.018	12"
PA-1624-T	299-11-00-009	16	.018	24"
PA-1636-T	299-11-00-011	16	.018	36"

ALL ABOVE TOP ENTRY

*For double-ended plug assemblies replace -T suffix with -DE. Example: PA-1412-DE.

**For double-ended plug assemblies, add "1" to final digit: Example: 14 pins, 12" — 299-11-00-002.

***Standard lengths are 12, 24, and 36". Other lengths available, upon request.

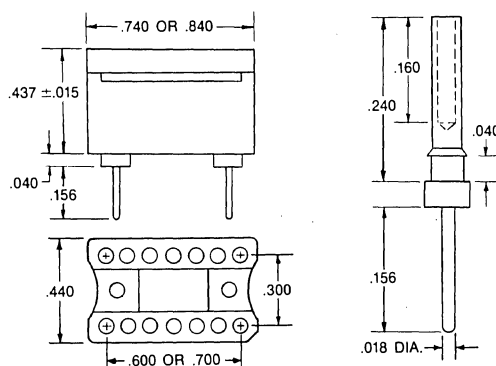


Available with top wire entry, terminated as a single or double ended assembly. Strain relief cover.

PLUG ONLY (UNASSEMBLED)

Distributor Part No.	Factory Part No.	Pin Termination	Pin Dia.
P-14-S	299-11-00-013	Solder Pocket	.018
P-14-C	299-11-00-015	Crimp*	.018
P-16-S	299-11-00-014	Solder Pocket	.018
P-16-C	299-11-00-016	Crimp*	.018

*Use Buchanan Tool No. 612118 and Locator No. 613427.



MATERIALS

Insulator: Glass-filled nylon.

Pins: Brass, gold over nickel plated.

Screws: Steel, nickel plated.

Wire: #26 AWG stranded copper, Type B per MIL-W-16878.

FEATURES

1. Wire in single ended plug is color coded per MIL-STD-681.
2. Wire in double ended plug is all black.

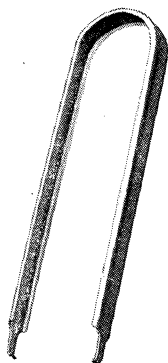
EXTRACTOR TOOL

Distributor Part No. RT-60

Factory Part No. 599-11-11-184

Designed to speed handling of IC's and to minimize damage to leads. Permits easy removal of IC's from top of board, especially in high density packaging conditions.

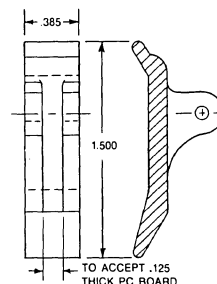
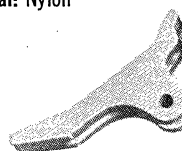
Tool available separately.



EJECTOR KEYS

For use on plug-in type boards.

Material: Nylon



Distributor Part No.	Factory Part No.	Color	Board Thickness
EK-8W	474-11-77-428	White	1/8"
EK-8R	474-11-77-429	Red	1/8"

TRW[®] CINCH CONNECTORS

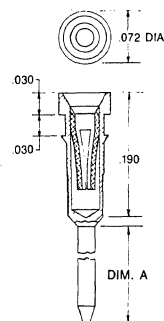
SOCKET/TERMINALS

Four standard pins and terminals are available to meet individual requirements. Modifications are simplified since no staking or special assembly tool is required. All pins and terminals are self-locking into insulated board by simply pressing into recommended mounting hole (.055 ±.001 dia.).

SOCKET/TERMINALS (AVAILABLE SEPARATELY)

Recommended Mtg. Hole: .055 ±.001 Dia. (Pressed into place without special tools.)

Distributor Part No.	Factory Part No.	Dimension "A"	Plating
60-S3	318-01-99-502	.510 (3 level)	Gold Contact and Sleeve
60-S3T	318-01-99-503	.510 (3 level)	Gold Contact, Tin Sleeve
60-S2	318-01-99-504	.370 (2 level)	Gold Contact and Sleeve
60-S2T	318-01-99-485	.370 (2 level)	Gold Contact, Tin Sleeve

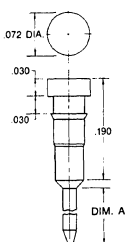


DUMMY PIN (NO CONTACT)

Distributor Part No.	Factory Part No.	Dimension "A"
60-PD1	462-14-11-043	.510
60-PD2	462-14-11-035	.370

(Brass, Gold over Nickel Plated)

Recommended Mtg. Hole #54 drill (.055 dia. ref.) .062 min. board thickness.

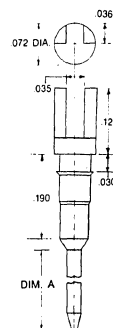


SLOTTED PIN

Distributor Part No.	Factory Part No.	Dimension "A"
60-PC1	462-14-11-041	.510
60-PC2	462-14-11-042	.370

(Brass, Gold over Nickel Plated)

Recommended Mtg. Hole #54 drill (.055 dia. ref.) .062 min. board thickness.

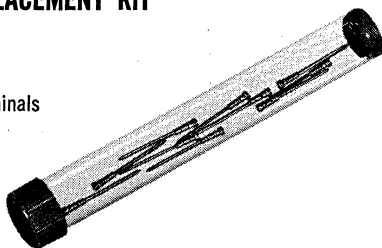


SOCKET/TERMINAL REPLACEMENT KIT

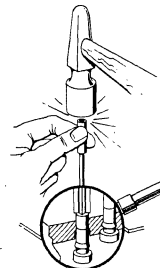
Distributor Part No. RK-60

Factory Part No. 318-01-99-505

Contains 20 60-S3 Socket/Terminals



To remove damaged Socket/Terminals, tap out from back side.



ALL IC LOGIC BOARDS LISTED ARE AVAILABLE FROM AUTHORIZED CINCH DISTRIBUTORS

TRW/CINCH AUTHORIZED IC LOGIC BOARD DISTRIBUTORS

ARIZONA

Marshall Industries
Phoenix (602) 968-6181
Sterling Electronics
Phoenix (602) 258-4531

CALIFORNIA

Marshall Industries
El Monte (213) 686-0141
Marshall Industries
Irvine (714) 556-6400
Marshall Industries
San Diego (714) 278-6350
Marshall Industries
Sunnyvale (408) 732-1100
Sterling Electronics
San Carlos (415) 592-2353
Sterling Electronics
San Diego (714) 565-2441
Sterling Electronics
Sun Valley (213) 767-5030

COLORADO

Marshall Industries
Arvada (303) 423-9670

CONNECTICUT

Marshall Industries
North Branford (203) 484-0488
Wilshire Electronics/Connecticut
Hamden (203) 281-1166

FLORIDA

Marshall Industries
Palm Beach Gardens (305) 622-8490

ILLINOIS

Marshall Industries
Des Plaines (312) 298-3700

INDIANA

Pioneer/Indiana
Indianapolis (317) 849-7300

LOUISIANA

Sterling Electronics
Metairie (504) 887-7610

MARYLAND

Pioneer/Washington
Rockville (301) 948-0710

MASSACHUSETTS

Marshall Industries
Newton Highland (617) 965-5115

MASSACHUSETTS (Cont'd)

Sterling Electronics
Watertown (617) 926-9720
Wilshire Electronics/New England
Burlington (617) 272-8200

MICHIGAN

Pioneer/Michigan
Livonia (313) 525-1800

NEW JERSEY

Resco
Pennsauken (609) 662-4000
Sterling Electronics
Perth Amboy (201) 442-8000
Wilshire Electronics/New Jersey
Clifton (201) 365-2600

NEW MEXICO

Sterling Electronics
Albuquerque (505) 345-6601

NEW YORK

Marshall Industries
Farmingdale, L.I. (516) 293-4141
Rampart Components, Inc.
Hauppauge (516) 273-1111

OHIO

Marshall Industries
Dayton (513) 898-1105
Pioneer/Cleveland
Cleveland (216) 587-3600
Pioneer/Dayton
Dayton (513) 236-9900

TEXAS

Marshall Industries
Dallas (214) 233-5200
Sterling Electronics
Dallas (214) 357-9131
Sterling Electronics
Houston (713) 627-9800

VIRGINIA

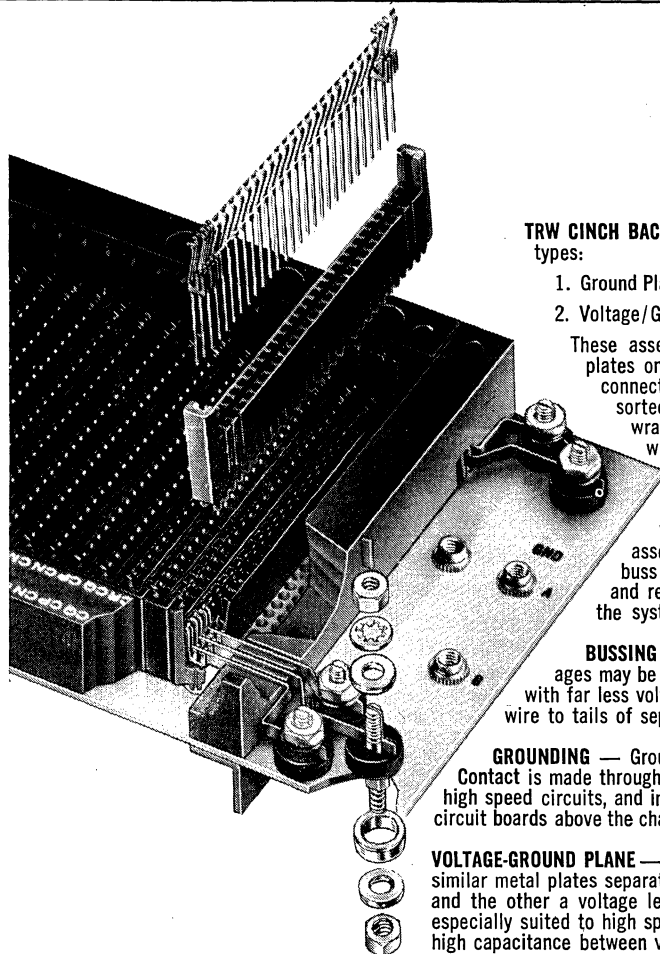
Sterling/Meridian Electronics
Richmond (804) 353-6648

WASHINGTON

Marshall Industries
Bellevue (206) 883-1084
Sterling Electronics
Seattle (206) 762-9100

TRW[®] CINCH CONNECTORS

CREATIVE TECHNOLOGY IN BACK PLANE CONNECTOR SYSTEMS



TRW CINCH BACK PLANE CONNECTOR SYSTEMS are available in two general types:

1. Ground Plane Systems
2. Voltage/Ground Plane Systems

These assemblies consist, basically, of precision punched aluminum plates on which are mounted a series of printed circuit board edge connectors, solid copper buss bars, phenolic support bars, and assorted hardware. Contacts with square tails for automatic wire wrapping are assembled into rows of edge connector insulators with tails extending through the punched plate(s) for proper positioning.

VOLTAGE BUSS CONTACT — Specially designed Cinch voltage buss contacts are an integral part of each connector assembly. No soldering or welding is required in bussing. Both, buss bars and individual bussing contacts are easy to remove and replace. If necessary, without disturbing the remainder of the system.

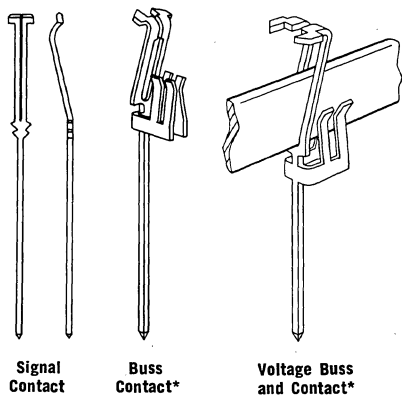
BUSSING — With connectors mounted side by side, all common voltages may be easily bussed together. Solid copper buss bars carry circuits with far less voltage variation than is possible by the technique of wrapping wire to tails of separate contacts.

GROUNDING — Grounding is made directly to the aluminum ground plate. Contact is made through the ground bushing. The short distance to ground enhances high speed circuits, and improves shielding between wiring below chassis and plug-in circuit boards above the chassis.

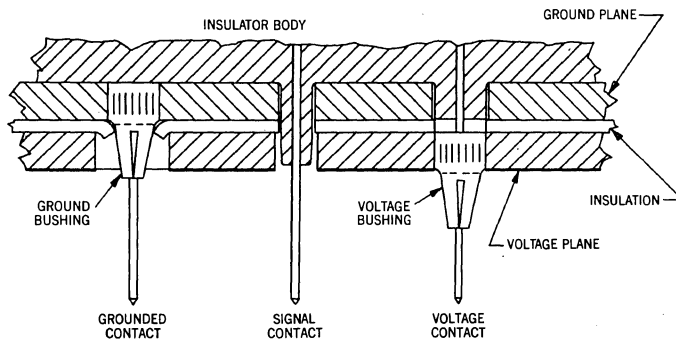
VOLTAGE-GROUND PLANE — Structurally, the voltage-ground plane is a sandwich of two similar metal plates separated by a layer of insulation. One plate serves as the ground, and the other a voltage level. This system provides superior circuit stability, and is especially suited to high speed signal applications. It also provides low impedance and high capacitance between voltage and ground planes.

PHYSICAL CHARACTERISTICS

TYPICAL CONTACTS



TYPICAL PLATE ASSEMBLY



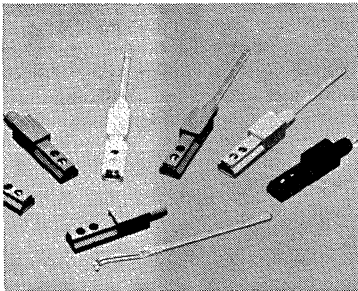
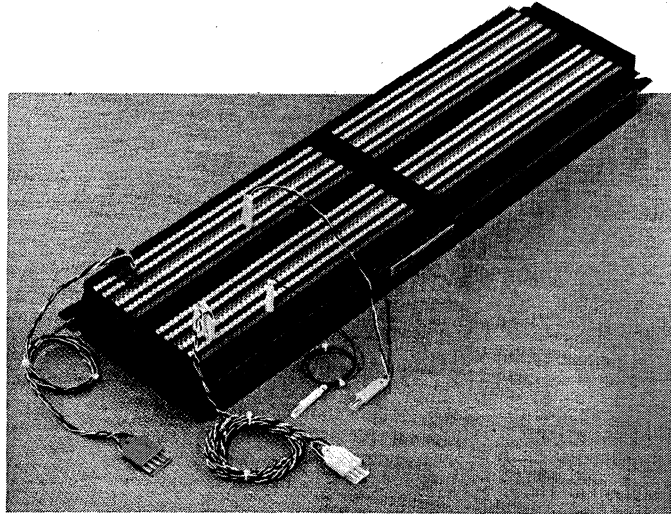
*Patented Cinch Mfg. Co. a Div. of TRW Inc.

TRW[®] CINCH CONNECTORS

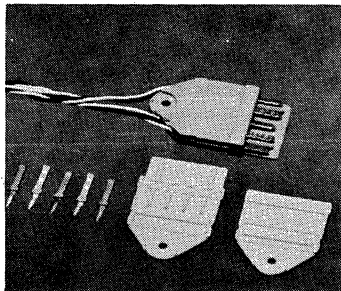
PATCHMASTER CIRCUIT CONCENTRATION BAY SYSTEM

PATCHMASTER CCB—The heart of the new TRW Cinch Patchmaster system is a unique back panel and patch cord plugs. One side of the back panel is available for wire wrapping while the other side of the panel serves the same function as the solder side of the terminal block, but instead of soldering, interconnection is simply a matter of plugging in the patch cord.

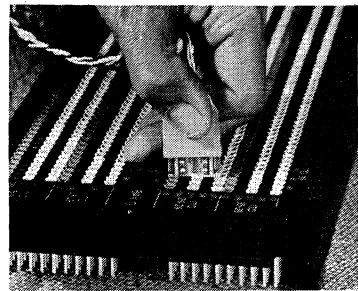
The Cinch Patchmaster CCB Unit was originally designed to meet the stringent requirements of the telephone industry and to provide a product that offered the utmost in reliability with features that would make installation, service, usability and maintenance as simple and positive as possible. Patchmaster has a great many features that make it ideal for programming or interconnecting systems that require maximum flexibility.



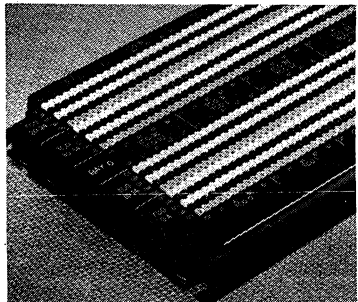
MODULES — The back panel consists of individual modules, press fitted into a 0.125-in. (3.18mm) thick anodized aluminum plate having formed sides. The module insulator material is a glass filled polyester in a variety of colors. The module contact is fabricated of phosphor bronze or copper nickel alloy and gold plated.



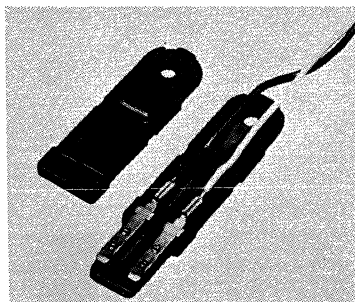
PATCH CORDS — The patch cord plugs consist of male pins assembled into a two piece insulator design with 24 or 26 gage wires either soldered or crimped to the pins. After the pins are assembled, the two insulator halves are ultrasonically bonded together. The plug insulator is polycarbonate and is available in a variety of colors. The plug pins are brass, gold plated.



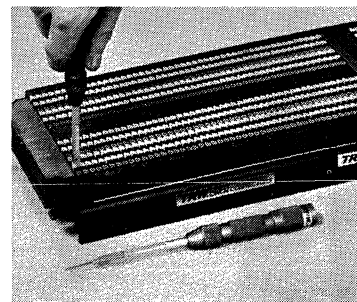
POLARIZATION — If the back panel and patch cord are designed without polarization, the patch cord plug could be assembled into the panel backwards, possibly causing serious circuit damages. The positive polarization of the Cinch Patchmaster plug assures correct insertion of the plug into the back panel.



RAISED MARKING — Those who install and service the CCB installation must be able to easily identify each circuit. In the Cinch Patchmaster system, all markings are on raised strips, putting circuit identification at the same level as the plug-in portion of the connector.



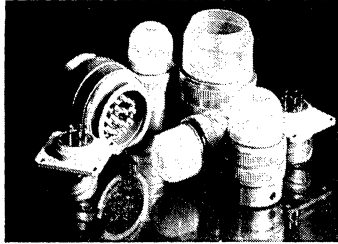
STRAIN RELIEF — Although a tool is provided to remove patch plugs from the back panel, on occasion it may become necessary to pull a plug out by the wires. If so, the plug has a built in strain relief that removes all strain from the interconnection of the wire to the pin.



REPAIRABILITY — The complete module can be replaced if a contact is damaged. Easily operated tools are available for convenient repair and replacement of modules.

TRW[®] CINCH CONNECTORS

CINCH NULINE 904 SERIES COMMERCIAL INPUT/OUTPUT CONNECTORS



FEATURES

Meets or exceeds appropriate MIL-C-5015 requirements for:

- Moisture resistance (when potted).
- Insulation resistance.
- Environmental resistance.
- Temperature cycling.

Additional features of the 904 Series:

- Lightweight.
- Visual engagement ring.
- Positive locking.
- Hooded female contacts.
- Three pin coupling.
- Stainless steel pins and bayonet slots.

PERFORMANCE CHARACTERISTICS

Durability: Connectors do not show any damage detrimental to the operation of the connector after 100 mating-unmating cycles at a rate of 300 cycles per hour.

Corrosion Resistance: After salt-spray testing per MIL-STD-202, Method 101C, Test Condition B connectors show no exposure of base metal which will affect performance.

Dielectric Withstanding Voltage: Connectors show no evidence of breakdown or flash over between adjacent contacts and from contacts to outer shell when subjected to the conditions specified in table below. (Tests performed per Method 3001 of MIL-STD-1344.)

	Condition*	Test V RMS	Recommended Working Voltage	
			DC	AC
Sea Level	Unsealed	1500	700	500
	Sealed	2000	700	500
70,000 Ft.	Unsealed	375	175	125
	Sealed	1500	700	500

* (Unsealed) Refers to connectors with no provisions made for sealing front or rear areas.

(Sealed) Refers to connectors that are potted or pressurized in mounting, having front and rear areas sealed.

Insulation Resistance: Minimum insulation resistance of 5000 megohms between adjacent contacts and from contacts to outer shell when tested in accordance with MIL-STD-202, Method 302, Test Condition B.

Vibration: There are no circuit discontinuities longer than one microsecond when subjected to vibration testing in accordance with MIL-STD-1344, Method 2005, Test Condition III.

Physical Shock: Connectors are not damaged when subjected to 1500 G's for 0.5 milliseconds in each of three mutually perpendicular planes per MIL-STD-202, Method 213A, Test Condition F.

Temperature Cycling: Mated connectors perform satisfactorily after being subjected to temperature cycling from -55°C to +85°C per MIL-STD-202, Method 102A, Test Condition D.

Humidity: Connectors remain completely functional after being subjected to humidity testing per MIL-STD-202, Method 103B, Test Condition A.

Contact Resistance: Contact resistance through each mated contact pair doesn't exceed the requirements specified in the following table when tested in accordance with MIL-STD-1344, Method 3004.

Contact Mating End Size	Wire Size	Test Current (Amp)	Millivolt Drop (Max.)	
			Initial	After Corrosion
#20	20	7.5	55	65
	22	5.0	45	55
	24	3.0	45	55
#16	16	13.0	50	60
	18	10.0	45	55
	20	7.5	45	55

MATERIALS & FINISHES

Contacts: Copper Base Alloy Gold Plated per MIL-G-45204, Type II, Grade C, Class O over Nickel Underplate.

Shells: Aluminum Alloy 6262 per QQ-A-225/10 Gray Anodized per MIL-A-8625.

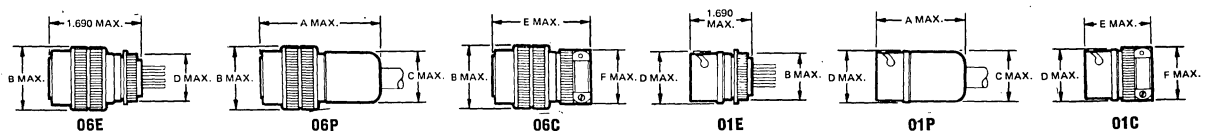
Inserts: Diallyl Phthalate per MIL-M-14F, Type MDG.

Face Seals: Neoprene Rubber per MIL-R-3065.

Bayonet Pins: Stainless Steel Type 303 Passivated.

Component Parts: Anodized Aluminum conforming to QQ-A-225 or Passivated Stainless Steel in accordance with QQ-S-764.

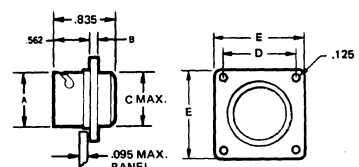
DIMENSIONS



Connector Size	A		B		C		D		E		F	
	Inches	Centimeters	Inches	Centimeters	Inches	Centimeters	Inches	Centimeters	Inches	Centimeters	Inches	Centimeters
12	1.687	4.284	.957	2.430	.795	2.019	.895	2.273	1.870	4.749	.817	2.075
14	1.687	4.284	1.082	2.748	.920	2.336	1.000	2.540	1.870	4.749	.967	2.456
18	1.687	4.284	1.375	3.492	1.170	2.971	1.250	3.175	1.870	4.749	1.185	3.009
20	1.734	4.404	1.500	3.810	1.223	3.106	1.375	3.492	1.970	5.003	1.312	3.332
22	1.734	4.404	1.625	4.127	1.352	3.434	1.468	3.728	1.970	5.003	1.440	3.657

MOUNTING DIMENSIONS (For Square Flange Connectors)

Connector Size	A		B		C		D		E	
	Inches	Centimeters	Inches	Centimeters	Inches	Centimeters	Inches	Centimeters	Inches	Centimeters
12	.662	1.681	.062	0.157	.690	1.752	.812	2.062	1.031	2.618
14	.781	1.983	.062	0.157	.812	2.062	.906	2.301	1.125	2.857
18	1.032	2.621	.093	0.236	1.062	2.697	1.062	2.697	1.312	3.332
20	1.156	2.936	.093	0.236	1.187	3.014	1.156	2.936	1.437	3.649
22	1.281	3.253	.093	0.236	1.281	3.253	1.250	3.175	1.562	3.967



TRW[®] CINCH CONNECTORS

904 SERIES (Cont'd)

HOW TO ORDER

To get the 904 Series Connector you want, put together the part number as per the example in the following chart. The available

combinations of shell styles and construction classes are shown below along with available inserts.

CN0904 06 E 12-7 P W

SERIES DESIGNATION
CN0904

SHELL STYLE

01 Cable Mounting Receptacle
02 4-Hole Mount Panel Receptacle
06 Cable Plug-Straight

CONSTRUCTION

E Environmentally sealed (Unitized grommet)
P Environmentally sealed (Disposable Polyethylene Potting Form Furnished)
C Mechanical Clamp (Sealed only when potted)

ALTERNATE INSERT POSITIONS

TYPE OF CONTACT
P-Pin
S-Socket

INSERTS AVAILABLE (Front face of pin insert shown)

SIZE 12 INSERTS
12-60 3 #16 contacts
12-7 7 #20 contacts

SIZE 14 INSERTS
14-63 5 #16 contacts
14-12 12 #20 contacts

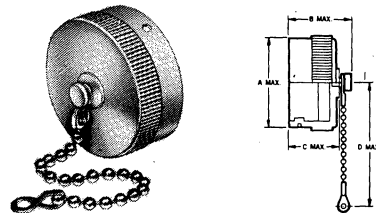
SIZE 18 INSERTS
18-64 14 #16 contacts
18-24 24 #20 contacts

SIZE 20 INSERT
20-37 37 #20 contacts

SIZE 22 INSERT
22-48 48 #20 contacts

CAP & CHAIN ASSEMBLIES

Cap and chain assemblies for 904 Series Receptacles are water-proof and include a sealing gasket. They provide protection against live circuits and contamination when receptacles are unmated.



Connector Size	Part No.	A		B		C		D	
		Inches	Centimeters	Inches	Centimeters	Inches	Centimeters	Inches	Centimeters
12	CN0904-1200	.804	2.042	.774	1.965	.603	1.531	3.5	8.890
14	CN0904-1400	.938	2.382	.750	1.905	.594	1.508	3.5	8.890
18	CN0904-1800	1.172	2.976	.774	1.965	.603	1.531	3.5	8.890
20	CN0904-2000	1.296	3.291	.774	1.965	.603	1.531	4.0	10.160
22	CN0904-2200	1.421	3.609	.774	1.965	.603	1.531	4.0	10.160

TRW[®] CINCH CONNECTORS

CINCH-NULINE ASTRO/348[®] MIL-C-81511 HIGH DENSITY CONNECTORS

DESIGN FEATURES

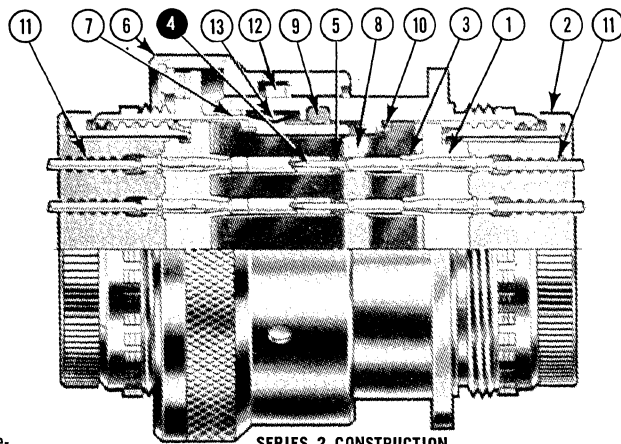
1. Molded One-Piece Contact Retention Disc.
2. Captivated Rear-Locking Nut (Metal to Metal Bottoming).
3. Individual Contact Risers.
4. Anti-Scoop Recessed Pin Contacts (in receptacle).
5. Closed Entry Socket Insert and Contacts.
6. Captivated Triple Bayonet Coupling System.
7. 5 Key Shell Polarization. (Series 2, Size 8 has 2 keys.)
8. Interfacial Mating Seal.
9. Dynamic "O" Ring Peripheral Shell Ring.
10. Monoblock Construction — Inserts Bonded to Shells.
11. Self-Sealing Rear Grommets.
12. Visual Mating Indicator.
13. Shell to Shell Grounding Fingers.

Astro/348 has been designed to eliminate the costly space-wasters in removable contacts. Problem-causing metal retention clips for each contact are gone. Instead, a single one-piece molded dielectric retention system locks Poke-Home contacts in place. Designed as a high density subminiature, Astro/348 is the best high density miniature and standard connector ever made. It packs more contacts of every size into standard shells than any other design. MIL-C-81511* has established the standard connector family for the next decade.

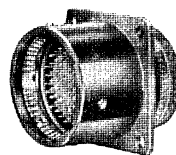
The single-piece retention disc gives other excellent advantages in addition to density. Dielectric wall thicknesses in the subminiature #23-22 contact arrangements are equal to standard miniatures. With greater density, #20's, #16's and #12's provide dielectric separation comparable to standard miniature and power connectors.

*MIL-C-81511 is a Military Specification for Connectors, Electric, Circular, High Density, Quick Disconnect, Environment Resistant.

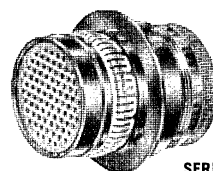
**Astro/348 and Poke-Home are Trade Marks of the Bunker-Ramo Corp.



SERIES 2 CONSTRUCTION



SERIES 2



SERIES 1

GROUNDING FINGERS

Shell-to-shell grounding is established by beryllium spring fingers permanently fixed to the Series 2 receptacle shell and permanently fixed to the Series 1 plug shell. These spring fingers, spaced at a minimum of 6 per inch (except at key-ways in Series 2 construction), make contact at least .090" before pin-socket electrical engagement occurs during mating and maintain contact at least .090" after pin-socket disengagement during unmating.

SHELL CONSTRUCTIONS SERIES 2



Plug
348-46EXX-XX



Single Hole Mtg.
Receptacle
348-43EXX-XX



Square Flange
Receptacle
348-40EXX-XX



Cable Receptacle
348-41EXX-XX



Hermetic Seal—
Solder Flange
Receptacle
348-25HXX-XXP



Hermetic Seal—
Receptacle
Single Hole Mtg.
348-23HXX-XXP

SHELL CONSTRUCTIONS SERIES 1



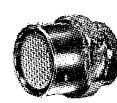
Plug 348-36EXX-XX



Square Flange Receptacle
348-30EXX-XX

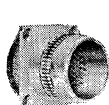


Single Hole Mtg. Receptacle
348-33EXX-XX

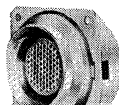


Cable Receptacle
348-31EXX-XX

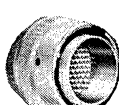
SHELL CONSTRUCTIONS SERIES 1



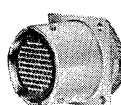
348 Series Type Rack and Panel Connector



348 Series High Temperature Connector (200°C)



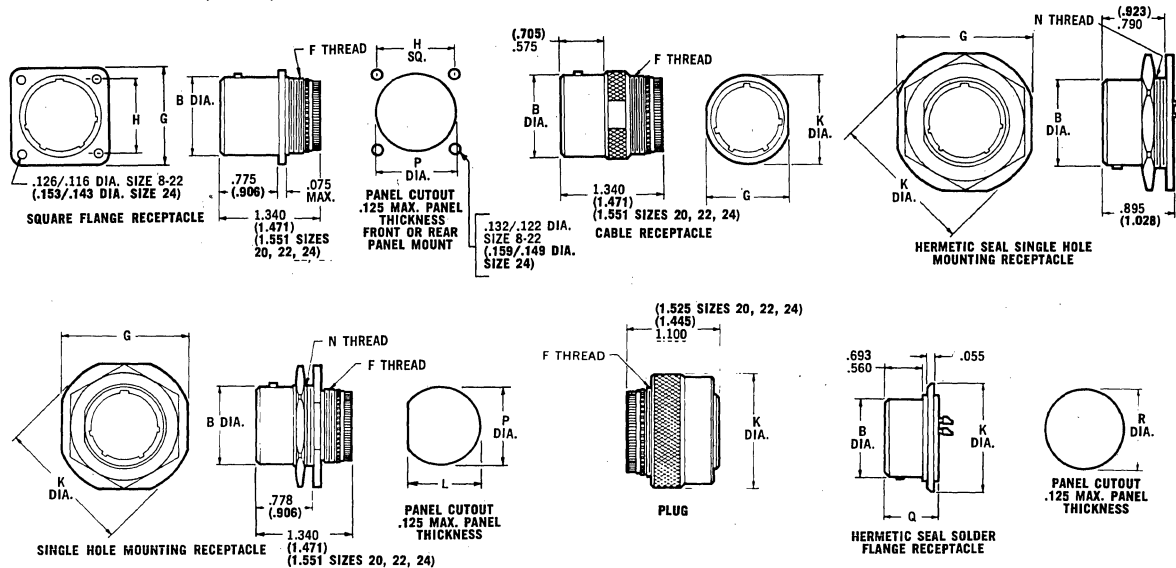
348 Series Fluid Resistant Connector (175°C)



TRW[®] CINCH CONNECTORS

CINCH-NULINE ASTRO/348 HIGH DENSITY CONNECTORS (Cont'd)

SHELL DIMENSIONS (inches) All Dimensions Are Shown As MAX.



Bold face in parentheses indicates Series 1-Long 100% No-Scoop Design.

DIMENSIONS

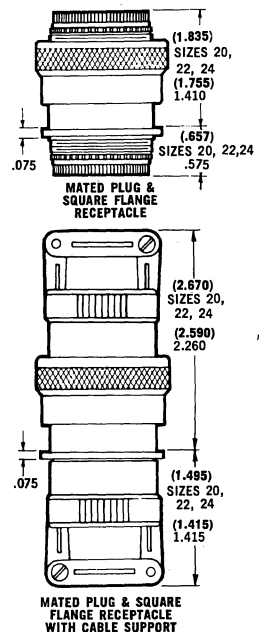
	SHELL SIZE						
	8- Standard Series 2	8- Long Series 1	10- Standard Series 2	10- Long Series 1	14- Standard Series 2	14- Long Series 1	16- Standard Series 2
B Dia. Max.	.553	.553	.678	.678	.928	.928	1.054
F Thread	1/2-28	1/2-28	5/8-28	5/8-28	7/8-28	7/8-28	1-28
G Max. Sq. Flange Recept.	.820	.820	.945	.945	1.133	1.133	1.258
G Max. Cable Recept. Flats	.565	.565	.690	.690	.940	.940	1.066
G Max. Single Hole Mtg. Recept. & Herm. Seal "D" Hole Recept.	.989	.989	1.114	1.114	1.401	1.401	1.526
H ±.005	.594	.594	.719	.719	.906	.906	.969
K Dia. Max. Cable Recept.	.780	.780	.900	.900	1.150	1.150	1.280
K Dia. Max. Single Hole Mtg. Recept. & Herm. Seal Single Hole	1.072	1.072	1.197	1.197	1.510	1.510	1.635
K Dia. Max. Plug	.850	.850	.975	.975	1.225	1.225	1.350
K Dia. Max. Herm. Seal Solder Flange Recept.	.945	.945	1.070	1.070	1.320	1.320	1.446
L ±.005	.605	.605	.730	.730	.980	.980	1.105
N Thread	5/8-20	5/8-20	3/4-20	3/4-20	1-20	1-20	1 1/8-20
P Dia. ±.005	.635	.635	.760	.760	1.010	1.010	1.135
Q Max.	.710	.843	.710	.843	.710	.843	.710
R Dia. ±.005	.661	.661	.786	.786	1.036	1.036	1.162

	SHELL SIZE					
	16- Long Series 1	18- Standard Series 2	18- Long Series 1	20- Long Series 1	22- Long Series 1	24- Long Series 1
B Dia. Max.	1.054	1.178	1.178	1.303	1.428	1.553
F Thread	1-28	1 1/8-28	1 1/8-28	1 1/4-28	1 3/8-28	1 1/2-28
G Max. Sq. Flange Recept.	1.258	1.351	1.351	1.475	1.570	1.711
G Max. Cable Recept. Flats	1.066	1.190	1.190	1.315	1.440	1.565
G Max. Single Hole Mtg. Recept. & Herm. Seal "D" Hole Recept.	1.526	1.651	1.651	1.776	1.901	2.026
H ±.005	.989	1.062	1.062	1.156	1.250	1.375
K Dia. Max. Cable Recept.	1.280	1.400	1.400	1.525	1.650	1.775
K Dia. Max. Single Hole Mtg. Recept. & Herm. Seal Single Hole	1.635	1.745	1.745	1.870	1.995	2.120
K Dia. Max. Plug	1.350	1.475	1.475	1.624	1.749	1.874
K Dia. Max. Herm. Seal Solder Flange Recept.	1.446	1.570	1.570	1.816	1.941	2.066
L ±.005	1.105	1.230	1.230	1.355	1.480	1.605
N Thread	1 1/8-20	1 1/4-20	1 1/4-20	1 3/8-20	1 1/2-20	1 5/8-20
P Dia. ±.005	1.135	1.260	1.260	1.385	1.510	1.635
Q Max.	.843	.740	.873	.903	.903	.903
R Dia. ±.005	1.162	1.286	1.286	1.411	1.536	1.661

N.A. — Hermetics available only in Standard Sizes 8 through 18, Long Size 24.

Screened area indicates Series 1-Long 100% No-Scoop Design.

MATED CONNECTORS DIMENSIONS (inches)

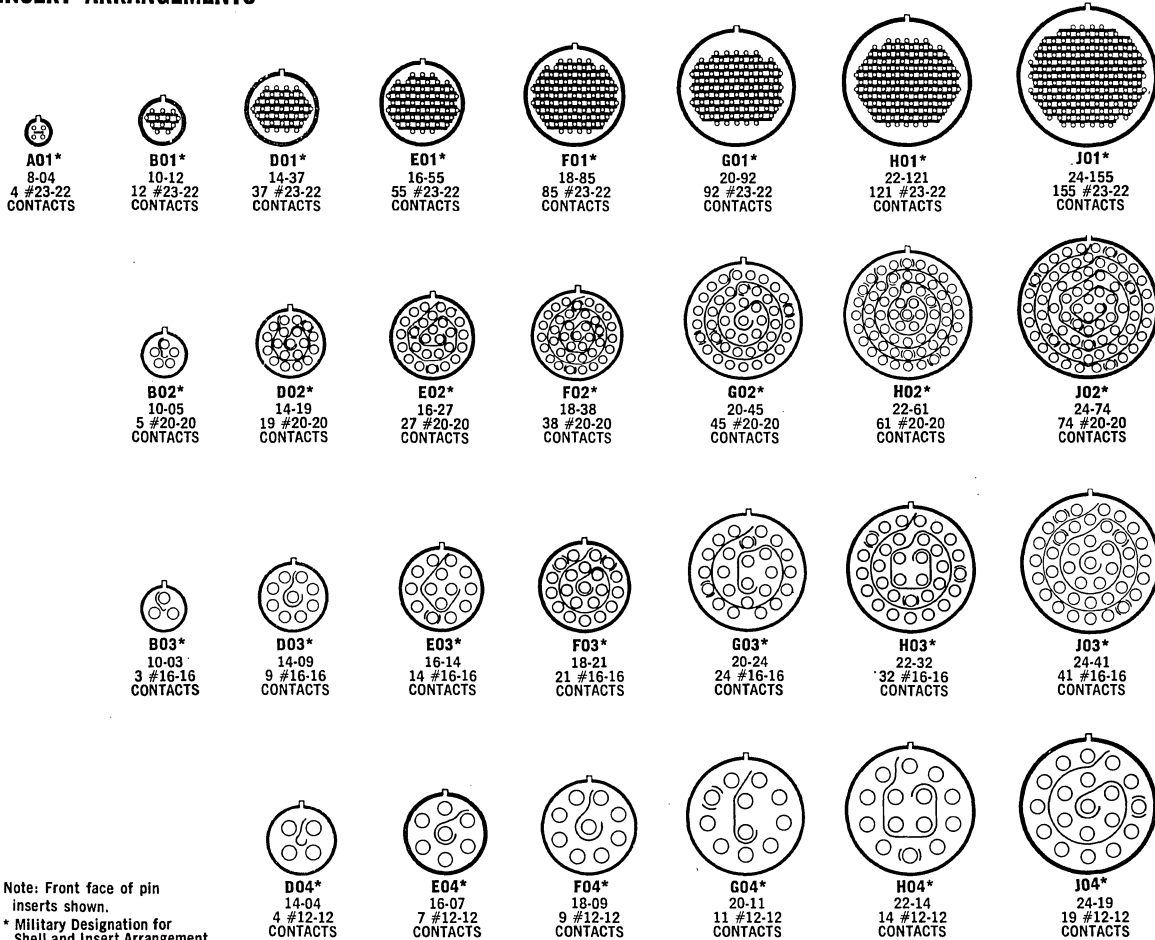


Bold face in parentheses indicates Series 1-Long 100% No-Scoop Design.

TRW[®] CINCH CONNECTORS

CINCH-NULINE ASTRO/348 HIGH DENSITY CONNECTORS (Cont'd)

INSERT ARRANGEMENTS



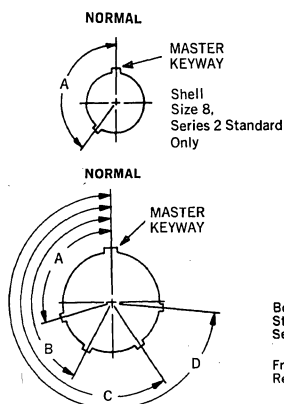
STANDARD — SERIES 2

Key and Keyway Arrangement	Angular Location (All Dimensions In Degrees)								
	Shell Size 8	Shell Sizes 10, 14				Shell Sizes 16, 18			
	A	A	B	C	D	A	B	C	D
1	128	105	140	215	265	105	140	215	265
2	190	102	132	248	320	18	149	192	259
3	205	80	118	230	312	92	152	222	342
4	220	35	140	205	275	84	152	204	334
5	235	64	155	235	304	24	135	199	240
6	250	35	115	220	270	98	152	268	338

LONG — SERIES 1

Key and Keyway Arrangement	Angular Location (All Dimensions In Degrees)										
	Shell Size 8				Shell Sizes 10, 14				Shell Sizes 16, 18, 20, 22, 24		
	A	B	C	D	A	B	C	D	A	B	C
1	105	140	215	265	95	141	208	236	80	142	196
2	102	132	248	320	113	156	182	292	135	170	200
3	80	118	230	312	90	145	195	252	49	169	200
4	35	140	205	275	53	156	220	255	66	140	200
5	64	155	234	304	119	146	176	298	62	145	180
6	91	131	197	240	51	141	184	242	79	153	197

ALTERNATE SHELL POSITIONS

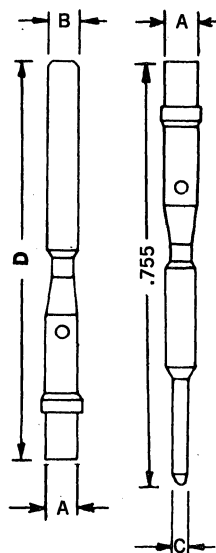


TRW[®] CINCH CONNECTORS

CINCH-NULINE ASTRO/348 HIGH DENSITY CONNECTORS (Cont'd)

CONTACTS

DIMENSIONS



Size	A. Max.		B Max.		C Max.		D Ref.		Current Rating
	Series 2	Series 1	Series 2	Series 1	Series 2	Series 1	Series 2	Series 1	
23-22	.050	.050	.051	.051	.028	.028	.718	1.048	5.0 Amps
23-28	.050	.050	.051	.051	.028	.028	.718	1.048	1.5 Amps
20-20	.078	.078	.078	.078	.041	.041	.718	1.048	7.5 Amps
16-16	.103	.103	.113	.113	.063	.063	.718	1.048	13.0 Amps
12-12	.158	.158	.161	.161	.095	.095	.718	1.048	23.0 Amps

Screened area indicates Series 1 (100% No-Scoop) Design.

TABLE OF POWER CONTACTS

Contact Size	Wire Size Accommodations	Cinch-Nuline Part No.		MS Part No.	
		Socket	Pin	Socket	Pin
23-22	Series 2 #22, #24, #26	348-100-2201S-02	348-100-2202P-02	MS90460A23-22	MS90461A23-22
23-28		348-100-5047S-02	348-100-5047P-02	MS90460A23-28	MS90461A23-28
20-20		348-100-2000S-02	348-100-2000P-02	MS90460A20-20	MS90461A20-20
16-16		348-100-1600S-02	348-100-1600P-02	MS90460A16-16	MS90461A16-16
12-12	Series 1 #12, #14	348-100-1200S-02	348-100-1200P-02	MS90460A12-12	MS90461A12-12
23-22		348-100-2203S-02	348-100-2202P-02	MS3343A23-22	MS90461A23-22
23-28		348-100-5048S-02	348-100-5047P-02	MS3343A23-28	MS90461A23-28
20-20		348-100-2003S-02	348-100-2000P-02	MS3343A20-20	MS90461A20-20
16-16	Series 1 #16, #18, #20	348-100-1603S-02	348-100-1600P-02	MS3343A16-16	MS90461A16-16
12-12		348-100-1203S-02	348-100-1200P-02	MS3343A12-12	MS90461A12-12

FOR CONTACT FINISHES:

"A" 150°C. MS rating, use Cinch-Nuline P/N with .02 (see table).

"B" 200°C. MS rating, use Cinch-Nuline P/N with .03.

EXAMPLE: MS90460B23-22 is equivalent to 348-100-2201S-03.

Screened area indicates Series 1 (100% No-Scoop) Design.

TABLE OF THERMOCOUPLE CONTACTS

Contact Size	Material	Wire Size	Cinch-Nuline Part No.	
			Socket	Pin
20-20	Series 2	#20, #22, #24	348-100-5014S	348-100-5014P
	Series 1		348-100-5019S	348-100-5014P
	Series 2		348-100-5015S	348-100-5015P
	Series 1		348-100-5020S	348-100-5015P
	Series 2		348-100-5016S	348-100-5016P
	Series 1		348-100-5021S	348-100-5016P
	Series 2		348-100-5017S	348-100-5017P
	Series 1		348-100-5022S	348-100-5017P
	Series 2		348-100-5018S	348-100-5018P
	Series 1		348-100-5023S	348-100-5018P

Screened area indicates Series 1 (100% No-Scoop) Design.

HOW TO ORDER

To get the specific Astro/348 Connector you want, put together the part number as per the following example:

348 - 3 0 E 18 - 85 P 1 (200)

Series Designation	348	Omit if no cable clamp is desired. (200) — Connector with cable clamp. (201) — Connector less contacts. (207) — Connector with Fluorosilicone rubber seals and insert. Connector Types 3 & 4 only.
Connector Type 150°C Oper. Temp. 3-Series 1 Connector 4-Series 2 Connector	3	
200°C Oper. Temp. 5-Series 1 Connector 6-Series 2 Connector	0	
High Fluid Resistance 7-Series 1 Connector 8-Series 2 Connector 175°C Oper. Temp.	E	
0-Sq. Flange Recept. 1-Cable Receptacle 3-Single Hole Mtg. Recept. 5-Solder Flange Recept. (Hermetic only) 6—Straight Plug	18	
Class E—Environmental H—Hermetic (Solder cap contacts) P—Potting seal	-	
Shell Size 08 10 14 16 18 20* 22* 24* *Available only in Series 1-Long	85	
Alternate Shell Positions 1 Normal, 2, 3, 4, 5, 6 As per table on Page 2-1023	P	
Contact Style P-Pin S-Socket	1	
Insert Arrangement 03 04 05 07 09 11 12 14 19 21 24 27 32 37 38 41 45 55 61 74 85 92 121 (01)* 155 (01)*	(200)	

MIL-STD PART NO. FORMAT FOR REV. "C" CONNECTORS

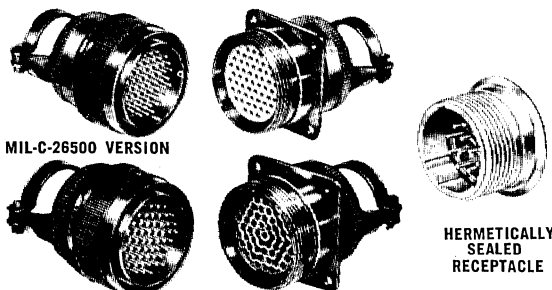
Note: Under Rev. "C" of MIL-C-81511, the part numbering system has been revised to a 15 digit system to be in conformance with Defense Standardization Manual 4120-3-M.
The connector part number is put together as per the following example:

M81511 / 01 E F 01 P 1

Specification No.	M81511	Alternate Shell Positions 1, 2, 3, 4, 5, 6 As per table on Page 2-1023
Shell Style Series 2 Connectors /01 Sq. Flange Recept. /02 Solder Flange Recept., Hermetic /03 Single Hole Mtg. Recept. /04 Single Hole Mtg. Recept., Hermetic /05 Cable Receptacle /06 Straight Plug /28 Single Hole Mtg. Recept., Bulkhead Feed thru Contacts, Hermetic /31 Square Flange Recept., Potting Seal /32 Single Hole Mtg. Recept., Potting Seal /33 Cable Recept., Potting Seal /34 Straight Plug, Potting Seal	/ 01	Contact P-Pin, S-Socket, C-Feed thru Cont.
Series 1 Connectors /21 Square Flange Recept. /22 Solder Flange Recept., Hermetic /23 Single Hole Mtg. Recept. /24 Single Hole Mtg. Recept., Hermetic /25 Cable Receptacle /26 Straight Plug /27 Single Hole Mtg. Recept., Bulkhead Feed thru Contacts, Hermetic /35 Square Flange Recept., Potting Seal /36 Single Hole Mtg. Recept., Potting Seal /37 Cable Recept., Potting Seal /38 Straight Plug, Potting Seal	E F 01	Insert Arrangement Code numbers coordinated with insert arrangements Page 2-1023. Example: F01 is 18-85 insert.
	P 1	Shell Size 8 10 14 16 18 20 22 24 A B D E F G H J
		Class E-Grommet Seal Connectors (150°C Oper. Temp.) F-Grommet Seal Connectors (175°C Oper. Temp.) A-Grommet Seal Connectors (200°C Oper. Temp.) H-Hermetic Seal Connectors (150°C Oper. Temp.) C-Hermetic Seal Connectors (175°C Oper. Temp.) B-Hermetic Seal Connectors (200°C Oper. Temp.) P-Potting Seal Connectors (150°C Oper. Temp.) T-Potting Seal Connectors (175°C Oper. Temp.) C-Potting Seal Connectors (200°C Oper. Temp.)

TRW[®] CINCH CONNECTORS

CINCH-NULINE "OMEGA" SERIES — HIGH EFFICIENCY CIRCULAR CONNECTORS



MIL-C-26500 VERSION

HERMETICALLY
SEALED
RECEPTACLE

MIL-C-38300 VERSION OR "GOLDEN OMEGA"

MORE CONTACTS IN LESS SPACE

When it becomes necessary to provide connections for a large number of circuits in a limited amount of space, a CINCH-NULINE "Omega" Series High Environmental Circular Connector is your best choice. CINCH-NULINE offers a wide selection of these miniature connectors that meet and exceed the requirements of MIL-C-26500 and MIL-C-38300. They are available in a variety of constructions, including those which can be potted or are hermetically sealed. Most connectors feature MIL-C-26636 Crim-Lok contacts. Many others are available also with coaxial, shielded or thermocouple contacts.

SIGNIFICANT ADVANCE IN STATE-OF-THE-ART

On the ground or in space, wherever there is a requirement for superior environmental protection, high reliability and minimum weight and bulk, CINCH-NULINE "Omega" Series Connectors are the answer. To produce this series requires the satisfaction of many exacting requirements on reliability, logistics and present and anticipated environmental conditions. To meet these requirements, it was necessary to develop advanced design concepts, formulate materials for specific connector usage and work out new production techniques. The resulting connectors exceed the stringent requirements of MIL-C-26500 (USAF) and MIL-C-38300 (USAF) for performance and reliability.

THE "GOLDEN OMEGA" — CLOSED ENTRY & FRONT SERVICING

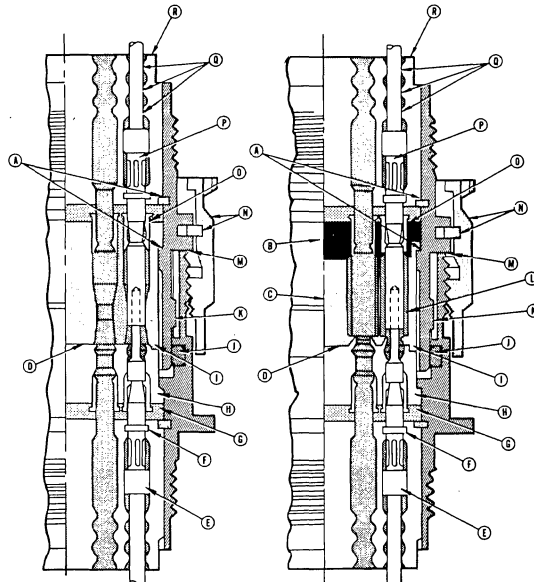
"Golden Omega" Connectors are identical to the other connectors in the "Omega" Series, except the socket inserts have a hard face of glass-filled epoxy. They are the first connectors to combine the positive reliability of closed entry with the speed and convenience of front servicing. In addition, the MIL-C-26636 contacts are tamper proof. Wrong-size contacts or oversize test prods cannot be inserted in the hard dielectric contact entry-ways on the socket inserts.

COMPLETE ENVIRONMENTAL SEALING

CINCH-NULINE "Omega" Series Connectors are fully sealed against extreme environmental conditions. Silicone rubber dielectric provides resilience and unsurpassed resistance to tear, compression set, fluids and high temperatures.

When the connectors are mated, insert faces compress to form a resilient dielectric seal around each individual contact. A continuous barrier on the periphery of the socket insert mates with a recess around the pin insert to form an additional compression seal. A dynamic "O" ring seal between mated shells constitutes still another barrier to dirt and moisture, and protects the integrity of the face seals. Together with monoblock construction, this puts void-free, continuous dielectric around each contact through the entire connector length.

Monoblock construction, with bonded interfaces between the dielectric components (insert, anti-deflection disc, and grommet) eliminates air voids and protects connectors from degrading moisture and altitude conditions. A pressurizing seal around each contact at the major O.D. prevents the passage of air or moisture through the contact hole, and triple sealing riser design at each wire hole in the grommet seals each individual wire.



MIL-C-26500 VERSION

MIL-C-38300/Golden Omega

- | | |
|--|--|
| A. Positive Location Captivated Insert (Mechanical Interlock) | I. Insert Rim Seal |
| B. Resilient Rear Insert (Only on MIL-C-38300 Version) | J. Dynamic "O" Ring Shell Seal |
| C. Closed Entry Hard Dielectric Front Insert (Only on MIL-C-38300 Version) | K. Five Key Shell Polarization |
| D. Insert Static Face Seal | L. Releasing Sleeve |
| E. Pin Contact, MIL-C-26636 | M. Metal to Metal Shoulder |
| F. Contact Pressurizing Seal | N. Bayonet or Threaded Coupling, Permanent Captivation |
| G. Anti-Deflection Disc | O. Contact Retention Clip |
| H. Resilient Pin Insert | P. Socket Contact, MIL-C-26636 |
| | Q. Wire Sealing Risers |
| | R. Grommet |

WIDE VARIETY OF CONFIGURATIONS

Detailed information on configurations available, shell sizes, dimensions and data on how to order are given on the following pages.

GO/NO-GO RELIABILITY

When a "Golden Omega" connector is mated, you can be sure there is proper contact. The socket contacts are closely surrounded by hard dielectric with a chamfered entry to guide in the pins accurately. However, if the pins are bent, the hard dielectric presents a closed entry and prevents mating.

LIGHTWEIGHT & HIGH CONTACT DENSITY

Connector shells are impact-extruded aluminum forgings with a high strength-to-weight ratio. The insert arrangement is designed for the maximum number of contacts within the area available.

CRIM-LOK CONTACTS

Crim-Lok contacts (front release, rear insertable) provide for easy servicing of connector circuits without disassembling the connector from its mounting, or disturbing adjacent contacts. MIL-C-26636 contacts are crimped quickly, consistently, and reliably with either hand or power tools. They have high electrical conductivity, present a smooth configuration, and completely protect electrical contact pressure-members from environmental and handling damage. The contacts come in sizes 20, 16, 12, and shielded coaxial, with rhodium-over-silver plating. (Other platings such as gold are available; write factory for details.)

TRW[®] CINCH CONNECTORS

CINCH-NULINE "OMEGA" SERIES — HIGH EFFICIENCY CIRCULAR CONNECTORS (Cont'd) ALTERNATE SHELL POSITIONS



THREADED
PLUG



THREADED SQUARE
FLANGE RECEPTACLE



THREADED SINGLE HOLE
MOUNTING RECEPTACLE



BAYONET
PLUG



BAYONET SQUARE
FLANGE RECEPTACLE



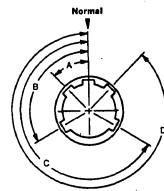
BAYONET SINGLE HOLE
MOUNTING RECEPTACLE

FOR CONNECTORS SIZE 10

(All Dimensions In Degrees)					
Position	A	B	C	D	
Normal	105	140	215	265	
6	102	132	248	320	
7	80	118	230	312	
8	35	140	205	275	
9	64	155	234	304	
10	25	115	220	270	

FOR CONNECTORS SIZE 12, 14, 16, 18, 20, 22, 24

(All Dimensions In Degrees)					
Position	A	B	C	D	
Normal	105	140	215	265	
6	18	149	192	259	
7	92	152	222	342	
8	84	152	204	334	
9	24	135	199	240	
10	98	152	268	338	



FRONT FACE OF RECEPTACLE
SHOWN

Note: Alternate positions 6 thru 10 incorporate special shell polarizing key and keyways. All inserts remain in normal position.

INSERTS AVAILABLE — (Showing front face of socket insert)

SHELL SIZE 10 — MS-24260



5 #20
5 CONTACTS*



2 #20
2 CONTACTS**



12 #20
12 CONTACTS*



3 #16
3 #2
3 CONTACTS*

SHELL SIZE 14 — MS-24260



15 #20
15 CONTACTS*



9 #20
3 #16
12 CONTACTS**



7 #16
7 CONTACTS*



4 #12
4 #2
4 CONTACTS*



2 #16
1 #2
3 #2
3 CONTACTS

SHELL SIZE 16 — MS-24261

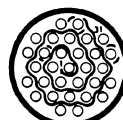


24 #20
24 CONTACTS*



10 #16
10 #2
10 CONTACTS**

SHELL SIZE 18 — MS-24262



31 #20
31 CONTACTS*



14 #16
14 #2
14 CONTACTS*



10 #16
1 #2
11 #2
11 CONTACTS

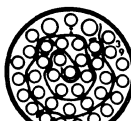


8 #12
8 #2
8 CONTACTS

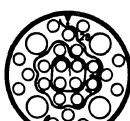
SHELL SIZE 20



41 #20
41 CONTACTS**



37 #20
2 #16
39 CONTACTS**



24 #20
4 #12
28 CONTACTS**

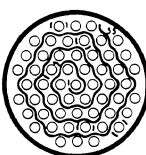


19 #20
6 #12
25 CONTACTS**

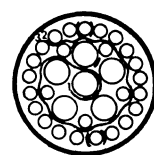


16 #16
16 #2
16 CONTACTS**

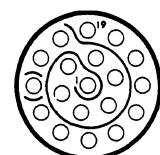
SHELL SIZE 22 — MS-24263



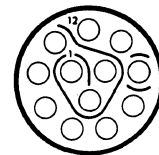
55 #20
55 CONTACTS*



26 #20
6 #12
32 CONTACTS**

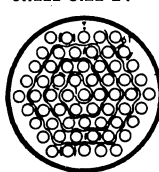


19 #16
19 #2
19 CONTACTS*



12 #12
12 #2
12 CONTACTS

SHELL SIZE 24



61 #20
61 CONTACTS**

SPECIFICATIONS

Contact Size	Rated Amps	for AWG Wire Size	Insulation Max.	O.D. Min.
20	7.5	24-22-20	.090	.040
16	20.	18-16	.130	.064
12	35.	14-12	.170	.106
#2 Shielded	7.5	Shielded Cable Size 20 per MIL-C-7078, Type II		

*Available with hard-dielectric face socket inserts for "Golden Omega" (MIL-C-38300) connectors. Pin inserts for MIL-C-38300 connectors have a resilient face and, except for marking, are identical to MIL-C-26500 pin inserts.

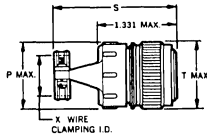
**Not included in MS24260 at time of printing.

TRW[®] CINCH CONNECTORS

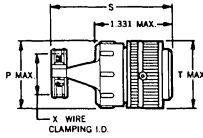
CINCH-NULINE "OMEGA" SERIES — HIGH EFFICIENCY CIRCULAR CONNECTORS (Cont'd)

DIMENSIONS

PLUGS



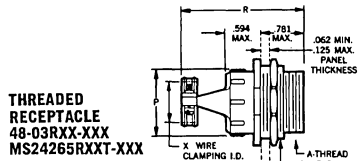
THREADED PLUG
48-06RXX-XXX
MS24266RXX-XXX



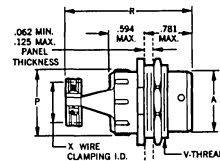
BAYONET PLUG
48-16RXX-XXX
MS24266RXXB-XXX

Shell Size	P Max. Thread & Bayonet	T Max.		X ±.015	S
		Thread	Bayonet		
10	.914	.836	.906	.270	1.832
12	1.026	1.025	1.078	.400	1.832
14	1.090	1.125	1.141	.460	2.067
16	1.250	1.250	1.265	.610	2.067
18	1.358	1.375	1.375	.690	2.067
22	1.604	1.625	1.625	.940	2.067

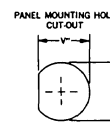
SINGLE HOLE MOUNTING RECEPTACLES



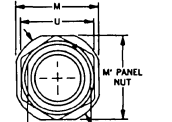
THREADED RECEPTACLE
48-03RXX-XXX
MS24265RXXT-XXX



BAYONET RECEPTACLE
48-13RXX-XXX
MS24265RXXB-XXX



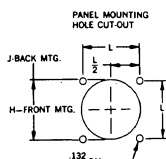
PANEL CUTOUT
BOTH THREADED & BAYONET RECEPTACLES



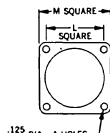
FLANGE AND NUT
BOTH THREADED & BAYONET RECEPTACLES

Shell Size	A Th'd	DIMENSIONS (Inches)											
		A +.000 -.003	M Max.	M' Max.	P Max.	U Max.	V Th'd	V' ±.003	V'' ±.005	X ±.015	Y Max.	Z ±.005	R Max.
10	1 1/16-24	.659	1.109	1.075	.914	.953	3/4-20	.718	.730	.270	1.192	.760	1.890
12	7/8-20	.829	1.296	1.292	1.026	1.140	1 1/8-20	.905	.917	.400	1.380	.947	1.890
14	1 1/16-20	.898	1.396	1.396	1.090	1.205	1-20	.968	.980	.460	1.505	1.010	2.125
16	1 1/8-18	1.025	1.521	1.521	1.250	1.329	1 1/8-20	1.093	1.105	.610	1.630	1.135	2.125
18	1 3/8-18	1.131	1.646	1.646	1.358	1.455	1 3/4-20	1.217	1.225	.690	1.740	1.260	2.125
22	1 7/8-18	1.381	1.959	1.959	1.604	1.705	1 1/2-20	1.467	1.475	.940	2.040	1.510	2.125

SQUARE FLANGE RECEPTACLES

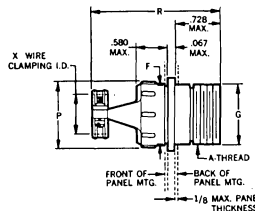


PANEL CUTOUT

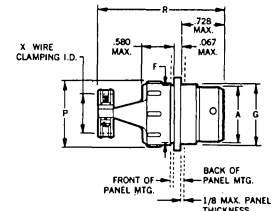


FLANGE

BOTH THREADED & BAYONET RECEPTACLES



THREADED RECEPTACLE
48-00RXX-XXX
MS24264RXXT-XXX



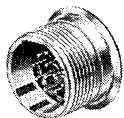
BAYONET RECEPTACLE
48-10RXX-XXX
MS24264RXXB-XXX

Shell Size	A Th'd	DIMENSIONS (Inches)									
		A +.000 -.003	F Max.	G Max.	H Min.	J Min.	L ±.005	M ±.005	P Max.	X ±.015	R Max.
10	1 1/16-24	.659	.562	.696	.572	.748	.719	.937	.914	.270	1.890
12	7/8-20	.829	.750	.875	.760	.913	.812	1.031	1.026	.400	1.890
14	1 1/16-20	.898	.812	.935	.822	.980	.906	1.125	1.090	.460	2.125
16	1 1/8-18	1.025	.938	1.062	.948	1.107	.969	1.250	1.250	.610	2.125
18	1 3/8-18	1.131	1.062	1.187	1.072	1.209	1.062	1.343	1.358	.690	2.125
22	1 7/8-18	1.381	1.312	1.437	1.322	1.452	1.250	1.562	1.604	.940	2.125

SOLDER FLANGE HERMETIC RECEPTACLES



BAYONET



THREADED



FLANGE
Both Threaded &
Bayonet Receptacles



PANEL CUTOUT
Both Threaded &
Bayonet Receptacles

48-15HXX-XXP
MS27034HXX-XXP

48-05HXX-XXP
MS27034HXX-XXP

Shell Size	DIMENSIONS (Inches)				
	+ .004 -.000	A Th'd	B Max.	D Max.	+ .010 -.000 E
10	.659	1 1/16-24	.855	.557	.567
12	.829	7/8-20	1.050	.745	.755
14	.898	1 1/16-20	1.105	.807	.817
16	1.025	1 1/8-18	1.225	.933	.942
18	1.131	1 3/8-18	1.355	1.057	1.067
22	1.381	1 7/8-18	1.605	1.307	1.317

Write factory for information on Sizes 20 and 24.

TRW[®] CINCH CONNECTORS

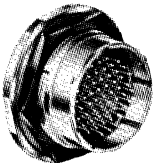
CINCH-NULINE "OMEGA" SERIES — HIGH EFFICIENCY CIRCULAR CONNECTORS (Cont'd)

HERMETIC RECEPTACLES

SINGLE HOLE MOUNTING HERMETIC RECEPTACLES



THREADED



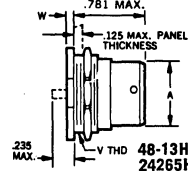
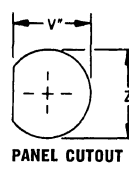
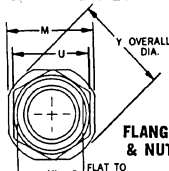
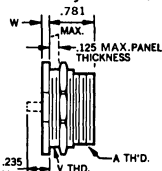
BAYONET

48-03HX-XXX

MS24265HXXT-XXX

Shell Size	DIMENSIONS (Inches)									
	A +.004 -.000	A Th'd	Y Max.	M Max.	U Max.	V Th'd	V' ±.003	V'' ±.005	W Max.	Z ±.005
10	.659	1/16-24	1.190	1.107	.953	3/4-20	.718	.730	.135	.760
12	.829	7/16-20	1.380	1.294	1.140	1/2-20	.905	.917	.135	.947
14	.898	1/2-20	1.505	1.394	1.205	1-20	.968	.980	.135	1.010
16	1.025	1/2-18	1.630	1.519	1.329	1 1/2-20	1.093	1.105	.135	1.135
18	1.131	1 1/8-18	1.740	1.644	1.455	1 1/4-20	1.217	1.225	.135	1.260
22	1.381	1 1/4-18	2.040	1.957	1.705	1 1/2-20	1.467	1.475	.135	1.510

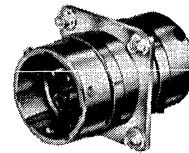
Write factory for information on Sizes 20 and 24.



BOTH THREADED & BAYONET RECEPTACLES

48-7005 HERMETICALLY SEALED RECEPTACLE

- Hermetically sealed, feed-through connector.
- Has two #16 pin contacts, one shielded socket contact.
- Has bayonet coupling, mates with 48-16R14-3S or 48-16R14-2/1S.
- Offers all features of MIL-C-26500B(USAF) including continuous operation at 200°C; metal-to-metal bottoming of mated shells; interfacial insert seal, insert rim seal, and dynamic O ring between shells; visual full engagement indicators for mating; and five polarizing keys in alternate positions to prevent mismating.



HOW TO ORDER

To get the specific "Omega" Series Connector you want, put together the part number as per the following typical example. (Remember, of course, that only the inserts shown on Page 2-1026 are available.)

48 - 0 6 R 22 - 55 P 6 - (102)

Series Designation
48—

Coupling Type
0-Threaded
1-Bayonet

Shell Style
0-Square Flange Receptacle
3-Single Hole Mounting Receptacle†
5-Solder Flange Mounting Receptacle†
6-Straight Plug

Environmental Class
R-Meets MIL-C-26500(USAF)
C-Meets MIL-C-38300(USAF)*
H-Hermetically Sealed†

Shell Size
10 12 14 16 18 20 22 24

See Table of available inserts on Page 2-1026

Number of Contacts
2 3 4 5 7 8 11 12
14 15 19 24 31 55 61

Contact Style
P-Pin, S-Socket

Deviations

- (100)—Connector for Potting
- (102)—Connector Less Cable Support
- (105)—Connector Less Contacts
- (106)—Connector Less Contacts & Less Cable Support
- (107)—Shell Assembly — Less Insert Assembly
- (108)—Hermetic Receptacle with Solder Cup Contact
- (113)—Gold Iridite Finish on Shell & Grommet Nut & Less Cable Support
- (114)—Gold Iridite Finish on Shell & Grommet Nut & Less Cable Support & Contacts
- (117)—Hermetic with Solder Flowed on Mounting Flange Surface (48-15HXX-XX and 05HXX-XX)
- (118)—(108) & (117) Combined
- (145)—MIL-C-38300 Contact Style "P" Only

Alternate Shell Positions as per Table on Page 2-1026 (Omit for normal position)

MIL. STANDARD PART NUMBERS

You can use MS as well as CINCH-NULINE part numbers in ordering "Omega" Series Connectors. The MS part numbers for MIL-C-26500 Connectors are worked out on the basis shown in the table below. Whether you order by the MS or the "Omega" Series Number, all qualified connectors are shipped with the MS marking. The part numbers for MIL-C-38300 Connectors start off with the identification M38300/ and take the form M38300/XXXX-XX. To determine the specific M numbers, refer to military specifications MIL-C-38300.

MS24266 R 22 T 55 P 6 X

MS Shell Drawing
MS24264—Sq. Flange Recept.
MS24265—Single Hole Mtg. Receptacle†
MS24266—Straight Plug
MS27034—Solder Flange Mtg. Receptacle (Hermetic only)

Environmental Class
R-Meets MIL-C-26500 (USAF)
H-Hermetically Sealed†

Shell Size
10 12 14 16 18 22

Coupling Type
T-Threaded, B-Bayonet

Cable Support
X-Less Cable Support (Omit if cable support is desired)

Alternate Shell Positions as per Table on Page 2-1026 (Omit for normal position)

Contact Style
P-Pin, S-Socket

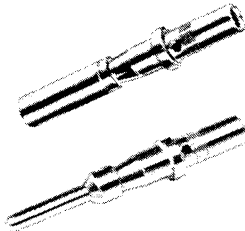
Number of Contacts
3 4 5 7 8 11 12 14 15 19 24 31 55

†Hermetics are available in receptacle Shell Style "X3" (MS24265) and "X5" (MS27034).

*MIL-C-38300 Connectors are furnished without cable clamp. If a cable support is desired, it must be ordered separately.

TRW[®] CINCH CONNECTORS

CINCH-NULINE "OMEGA" SERIES CRIM-LOK CONTACTS & SEALING PLUGS



MIL-C-26636 CONTACTS

When you order "Omega" Series Connectors with contacts, the contact package contains an extra 10% spares (or at least 3 extra contacts). The package also includes 15% as many sealing plugs as contacts (or at least 5 sealing plugs).

To order contacts and sealing plugs separately use the part numbers in the table at right. (The contacts, of course, are MIL-C-26636 contacts.) Contacts may also be ordered in reels for use with automatic crimping tools.

CONTACT DATA

Contact Size	Max. Current Rating	Wire Size	CINCH-NULINE Part No.		MS Part No.	
			Pin	Socket	Pin	Socket
No. 20	7.5 Amps	24-22-20 AWG	48-1595-02	48-100-2000S-02	MS24254-20P	MS24255-20S
No. 16	22 Amps	18-16 AWG	48-1825-02	48-100-1600S-02	MS24254-16P	MS24255-16S
No. 12	41 Amps	14-12 AWG	48-1827-02	48-1215-02	MS24254-12P	MS24255-12S
No. 1* (Shielded)	3 Amps	RG179/U, 179A/U, 187/U, 188/U, 161/U	48-1226-50	48-1227-50	—	—
No. 2** (Shielded)	7.5 Amps	RG195/U	48-2187-50	48-2188-50	—	—
No. 2** (Shielded)	7.5 Amps	—	48-2187-02	48-2188-02	MS27184	MS21785

*Cables RG178/U, RG178A/U, and RG196/U can be accommodated with modification to shielded contacts.

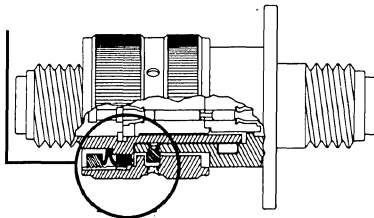
**AWG 18, 20, and 22 shielded wire per MIL-C-7078 Type II or MIL-C-27500 (USAF) can be accommodated with modification to shielded contacts.

***MS numbers represent similar type contacts, pending qualification of CINCH-NULINE part numbers.

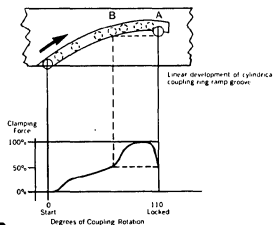
GROMMET SEALING PLUGS

Color Code	Size	CINCH-NULINE Part No.	MS Part No.	Color Code	Size	CINCH-NULINE Part No.	MS Part No.
Yellow	12	48-2221-12	MS27187-2	Red	20	48-2221-20	MS27186-1
Blue	16	48-2221-16	MS27187-1	White	#2 Shielded	48-1458	MS25251-8

CINCH-NULINE MMB SERIES



The detent locking function is contained in this area and isolated from the mechanism which locks the connectors together.
Patent Numbers: 3,805,379, 3,750,087



CONTACTS

When you order connectors with contacts, the contact package contains enough contacts to complete the insert arrangement and have 2 spares left. The package also includes enough sealing plugs for at least 15% of the contacts in the insert, in any case a minimum of 3 sealing plugs. To provide proper sealing, insert unwired contacts and sealing plugs in all unused holes. (Use a #12 contact for a #1 shielded hole.) To order contacts and sealing plugs separately use the part numbers in the table at right. Contacts may also be ordered in reels for use with automatic crimping tools.

GROMMET SEALING PLUGS

Color Code	Size	TRW/Cinch Part No.	MS Part No.
Yellow	12 & #1 Shielded	C48-2221-12	MS27187-2
Blue	16	C48-2221-16	MS27187-1
Red	20	C48-2221-20	MS27186-1
White	#2 Shielded	C48-1458-01	—

- The convenience of bayonet coupling.
- The rigidity of screw type coupling

Severe vibration, such as that which occasionally occurs in airborne equipment, can cause a high rate of early failure in connectors. This is especially true of the bayonet type of coupling connectors. To overcome this problem, aircraft manufacturers put out a call for connector manufacturers to design a more vibration-proof model, within definite limits.

Realizing that a new type of connector could cost more per unit than the failure-prone type, the aircraft companies stipulated that the increased costs should be justified by reduced maintenance cost and lower air traffic revenue losses caused by excessive downtime. Also, to prevent a complete re-engineering of the present connection systems used in airplanes, the new design would have to:

1. Mate with the standard MIL-C-26500 and MIL-C-83723 bayonet receptacle presently used on the aircraft.
2. Use standard contacts.
3. Use standard crimping, insertion and removal tools.
4. Withstand vibration and shock equivalent to the capability of thread-coupled connectors locked up metal-to-metal.

To meet the challenging conditions imposed by the aircraft manufacturers, TRW/Cinch Nuline engineers decided to approach the development of a new design based on an analysis of the failure-modes of the present connector system.

Critical analysis of the connector needing improvement revealed that a vibration envelope induced forces on the connector that resulted in a wear producing relative motion between the plug and its mating receptacle.

Further analysis of the connector design disclosed that the "relative motion" was due to the unloading effect on the clamping force when the bayonet dropped into its detent in the coupling ring ramp.

Contact Size	Wire Size AWG	Max. Current Rating Amps	TRW/Cinch Part No.		MS Part No.		Crimping Tool	Bushing (Positioner)	Crimp Jaw Setting Dia. (Insp.)	Insertion Tool	Removal Tool
			Pin	Socket	Pin	Socket					
No. 20	24	3.0			MS24254-20P	MS24255-20S	294-126	Included		294-88	294-89
	22	5.0					294-186	294-1266	.031-.041	294-1266	(MS24256A20)
	20	7.5					294-243	Turret Hd.		294-243	(MS24256R16)
							294-293	Turret Hd.	.031-.041	294-213	
No. 16	18	16			MS24254-16P	MS24255-16S	294-126	Included		294-96	294-97
	16	22					294-243	Turret Hd.	(MS24256A16)	(MS24256R16)	
							294-293	Turret Hd.	.041-.053		
							294-358	Automatic	.041-.053		
No. 12	14	32			MS24254-12P	MS24255-12S	294-86	294-903	.0625	294-72	294-73
	12	41					294-243	Included	(MS24256A12)	(MS24256R12)	
							294-293	Turret Hd.			
							294-358	Automatic	.062-.072		
No. 1* (Shielded)	**	3	C48-1226-02	C48-1227-02			294-289	294-1631		294-72†	294-73†
	****	1	C48-1226-54	C48-1227-54						(MS24256A12)	(MS24256R12)
	****	1	C48-1226-55	C48-1227-55							
	***	7.5	C48-2187-02	C48-2188-02			294-358	294-1015		294-128†	294-127†

*Replaces No. 12 power contact.

**Accommodates Cables RG174/U, RG179/U, RG179A/U, RG187/Y, RG188/U, and RG161/U as well as shielded wire.

Can also accommodate Cable MIL-C-27500-22 K1N6 (Extruded) or 22 AWG per MIL-C-7078 Type II.

***Accommodates Cable MIL-C-27500-22 K1N6; 20 K1N6, 18 K1N6 (Extruded) or 22, 20, 18 AWG, per MIL-C-7078 Type II.

****For use with RG195/U, RG180/U, RG180A/U, and RG180B/U.

*****Accommodates Cables RG178/U, RG178A/U, RG178B/U, and RG196/U.

†These tools are applicable to all #1 or #2 shielded contacts, respectively, not just contacts listed here.

TRW[®] CINCH CONNECTORS

CINCH-NULINE MMB SERIES (Cont'd)

INSERTS

SHELL SIZE 8 — MS27561



2 #20 CONTACTS
INSERT 8-2



3 #20 CONTACTS
INSERT 8-3



2 #20 CONTACTS
INSERT 10-2



2 #16 CONTACTS
INSERT 10-20



5 #20 CONTACTS
INSERT 10-5



3 #16 CONTACTS
INSERT 12-3



12 #20 CONTACTS
INSERT 12-12

SHELL SIZE 14 — MS24260



2 #16 CONTACTS
1 #2 SHIELDED CONTACT
INSERT 14-3



4 #12 CONTACTS
INSERT 14-4



7 #16 CONTACTS
INSERT 14-7



9 #20 CONTACTS
3 #16 CONTACTS
INSERT 14-12



15 #20 CONTACTS
INSERT 14-15



10 #16 CONTACTS
INSERT 16-10



24 #20 CONTACTS
INSERT 16-24

SHELL SIZE 18 — MS24262



8 #12 CONTACTS
INSERT 18-8



10 #16 CONTACTS
1 #2 SHIELDED CONTACT
INSERT 18-11



14 #16 CONTACTS
INSERT 18-14



31 #20 CONTACTS
INSERT 18-31

SHELL SIZE 20 — MS27561



16 #16 CONTACTS
INSERT 20-16



19 #20 CONTACTS
6 #12 CONTACTS
INSERT 20-25



24 #20 CONTACTS
4 #12 CONTACTS
INSERT 20-28



37 #20 CONTACTS
2 #16 CONTACTS
INSERT 20-39



41 #20 CONTACTS
INSERT 20-41

SHELL SIZE 22 — MS24263



12 #12 CONTACTS
INSERT 22-12



19 #16 CONTACTS
INSERT 22-19



26 #20 CONTACTS
6 #12 CONTACTS
INSERT 22-32



55 #20 CONTACTS
INSERT 22-55

SHELL SIZE 24 — MS27561



23 #20 CONTACTS
20 #16 CONTACTS
INSERT 24-43



2 #12 CONTACTS
INSERT 24-57



61 #20 CONTACTS
INSERT 24-61

TABLE I

Shell and Insert	Shell Size	Contacts	Drawing
08-02	8	2 #20	MS27561
08-03	8	3 #20	MS27561
10-02	10	2 #20	MS24260
10-05	10	5 #20	MS24260
10-20	10	2 #16	MS24260
12-03	12	3 #16	MS24260
12-12	12	12 #20	MS24260
14-03	14	2 #16	MS24260
1 #2 Coax			
14-04	14	4 #12	MS24260
14-07	14	7 #16	MS24260
14-12	14	9 #20	MS24260
3 #16			
14-15	14	15 #20	MS24260
16-10	16	10 #16	MS24261
16-24	16	24 #20	MS24261
18-08	18	8 #12	MS24262
18-11	18	10 #16	MS24262
1 #2 Coax			
18-14	18	14 #16	MS24262
18-31	18	31 #20	MS24262
20-16	20	16 #16	MS27561
20-25	20	19 #20	MS27561
6 #12			
20-28	20	24 #20	MS27561
4 #12			
20-39	20	37 #20	MS27561
2 #16			
20-41	20	41 #20	MS27561
22-12	22	12 #12	MS24263
22-19	22	19 #16	MS24263
22-32	22	26 #20	MS24263
6 #12			
22-55	22	55 #20	MS24263
24-43	24	23 #20	MS27561
20 #16			
24-57	24	55 #20	MS27561
2 #12			
24-61	24	61 #20	MS27561

TABLE II

Shell Size	A + .000 - .005	B Min.	C Max.	D + .003	E + .000 - .003	J (3 Full Threads Min.)	K Min.	M + .005 - .000	R Min.	S Max.	V + .003
8	.424	.352	.312	.084	.234	7/16-28 UNEF-2A	.079	.539	.632	.766	.042
10	.526	.428	.388	.084	.285	9/16-24 UNEF-2A	.094	.662	.760	.906	.052
12	.696	.598	.558	.084	.370	3/4-20 UNEF-2A	.094	.832	.930	1.078	.052
14	.765	.667	.627	.084	.405	13/16-20 UNEF-2A	.094	.901	.999	1.141	.052
16	.892	.794	.754	.115	.468	15/16-20 UNEF-2A	.094	1.028	1.126	1.266	.052
18	.998	.900	.860	.115	.521	1 1/16-18 UNEF-2A	.094	1.134	1.232	1.375	.052
20	1.123	1.025	.985	.115	.583	1 3/16-18 UNEF-2A	.094	1.261	1.357	1.510	.052
22	1.248	1.150	1.110	.115	.646	1 5/16-18 UNEF-2A	.094	1.384	1.482	1.625	.052
24	1.373	1.275	1.235	.115	.708	1 7/16-18 UNEF-2A	.094	1.511	1.607	1.760	.052

TABLE III — ALTERNATE SHELL KEY POSITIONS

Shell	Position	A°	B°	C°	D°
8 and 10	Normal	105	140	215	265
	6	102	132	248	320
	7	80	118	230	312
	8	35	140	205	275
	9	64	155	234	304
10	10	25	115	220	270
12	Normal	105	140	215	265
14	6	18	149	192	259
16	7	92	152	222	342
18	8	84	152	204	334
20	9	24	135	199	240
22	10	98	152	268	338

TABLE IV

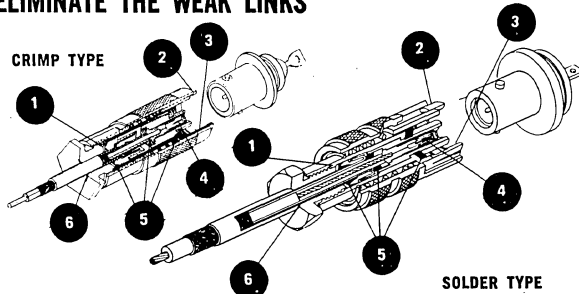
TRW/CINCH NULINE PART NO. CODE (EXAMPLE)

Basic Part No.	C0909A	10	05	P	8	XXX
Shell Size (See Table I)						
Insert Arrangement (See Table I)						
P-Pin Insert, S-Socket Insert						
NOTES: 1. The C0909A-XX-XXXX-XXX complies with the requirements of TRW/Cinch Nuline PS-C0909 product specification. 2. The last three digits of the part number in Table IV are optional and denote deviations to the Standard Connector.						
Deviation -102 Less Cable Support -105 Less Contacts -106 Less Contacts and Less Cable Support -998 Nickel Plate per MIL-C-26074 Class 3 Grade A, .001 Min.						
Alternate Shell Key Position (See Table III)						

TRW[®] CINCH CONNECTORS

CINCH-NULINE NU-LOK 1200 SERIES CONNECTORS

HOW NU-LOK 1200 SERIES CRIMP & SOLDER TYPE ELECTRICAL CONNECTORS ELIMINATE THE WEAK LINKS



1 Solid, single-piece shell assures continuity of shielding circuit and eliminates intermittents. Crown contacts provide many independent points of contact.

2 Exclusive Nu-Lok bayonet locking mechanism assures positive locking of mating connectors.

3 Solid, one-piece, metal cable clamp distributes clamping stress uniformly over large area. Tightening back end nut causes beveled edge of cable clamp to cut through chevron seal, providing metal-to-metal locking of shielding to shell.

4 Closed entry socket contact prevents spreading and weakening times due to insertion of oversized objects. Constructed of heat treated beryllium copper for ruggedness and gold plated to provide maximum electrical conductivity.

5 Maximum environmental protection provided by three moisture seals applied on non-distorted dielectrics. Nu-Lok exclusive locking mechanism assures rigid coupling of connectors and maintains front end gasket uniformly compressed at all times to exclude moisture.

6 Large radius eliminates sharp edge on back end nut, allowing maximum flexing of cable without rupturing insulation or conductors.

FAILURE-PROOF DESIGN & CONSTRUCTION

Cinch-Nuline 1200 Series Nu-Lok Connectors are miniature environment-resistant coaxial connectors designed to fully meet all requirements of Military Specification MIL-C-25516. They are available in either solder pot or crimp contact designs to accommodate conductor sizes 18 AWG or smaller, either coaxial or unshielded single conductor types. The crimp version also provides crimp termination for the cable braid.

All 1200 Series Cable Connectors are of environment-resistant construction. Bulkhead-mounted connectors are offered in conventional pressure sealed construction or true hermetic seal design with fused glass to metal seals. Hermetically sealed units are individually tested to ensure leakage of less than 1×10^{-5} cc/second of Helium at a pressure differential of one atmosphere. All units are designed for greatest ease of installation and maintenance with commonly available tools.

Center contacts of the 1200 Series Connectors are of "captive contact" design to provide electrical continuity that is completely independent of cable stability. Each center contact, both pin and socket types, is double-plated with gold over nickel. Socket contacts are chamfered to facilitate entrance of the mating contact and to minimize the possibility of contact damage during insertion or separation.

1200 Series Nu-Lok Connectors are highly corrosion-resistant. Both metallic and non-metallic connector components are resistant to hydrocarbon fuels and lubricants and sea water.

PERFORMANCE CHARACTERISTICS

ELECTRICAL

TEST	PERFORMANCE
1 Insulation Resistance (Ambient)	The insulation resistance between center contact and outer contact exceeds 5000 megohms. Between outer contact and shell, the resistance exceeds 1000 megohms.
2 Dielectric Withstanding Voltage (Sea Level)	Connectors will withstand 1500 V RMS without evidence of breakdown or leakage in excess of 0.3 ma, either mated or unmated.
3 Dielectric Withstanding Voltage (Altitude)	Mated connectors withstand 750V RMS without evidence of breakdown or leakage in excess of 0.3 ma. Unmated connectors withstand 125V RMS without breakdown or leakage in excess of 0.3 ma.
4 Contact Resistance	Center contacts in hermetic connectors do not exceed 0.4 mv at 10 ma. Other types do not exceed 0.2 mv. When tested at 7.5 amps the center contacts do not exceed 12.0 mv. Resistance for outer contacts is $\frac{1}{4}$ or less than above values.
5 Shield Clamp Resistance	The junction resistance for connectors assembled on typical 200°C cable is 10 milliohms max.
6 Impedance	Basic connector plugs and receptacles exhibit an impedance of 50 ± 2 ohms.
7 Voltage Standing Wave Ratio	The VSWR of basic plugs and receptacles does not exceed 1.15:1 at frequencies up to 1 GHz.

PHYSICAL

TEST	PERFORMANCE
1 Contact Engaging & Separating Forces	The force required to engage and separate the steel test pin is within the minimum limit of 2 ozs. and the maximum limit of 12 oz.
2 Resistance to Test Probe Damage	Engagement and Separation forces for socket contact remains within the limits following the application of the weighted probe. In addition the socket will reject an oversize (0.044) pin.
3 Contact Retention	Axial displacement does not exceed 0.010" under a 10 lb. retention load.
4 Connector Endurance	There are no detrimental effects on physical or electrical performance as a result of endurance cycling.
5 Cable Retention Force	Connectors maintain electrical continuity under a 30 lb. retention load. There are no detrimental effects on physical or electrical performance as a result of the retention load. For connector assemblies using cable with a tensile strength of 33 lbs. or less, the retention load is 90% of the cable strength.

PHYSICAL (Cont'd)

TEST	PERFORMANCE
6 Side Load	Mated cabled and mounted jacks withstand a side load of 30 lbs. without detrimental effects to physical or electrical performance. Uncabled adaptors withstand 25 lbs.
7 Hermetic Seal	The leak rate of hermetic sealed connectors does not exceed 1×10^{-5} cc/second of helium.
8 Altitude Humidity (Leak Integrity)	Hermetic sealed connectors show no evidence of fluid leakage as a result of, or during 10 cycles of pressure cycling at room temperature and -54°C. The 5 lb. tensile load causes no leakage of fluid.
9 Shock	The connectors maintain electrical and leak integrity as well as remain fully operational following the test. Circuit continuity remains intact with no interruptions greater than 10 microsec.
10 Vibration	The connectors maintain electrical and seal integrity as well as remain fully operational following the test. Circuit continuity remains intact with no interruptions greater than 10 microsec.
11 Sulphide Immersion	Visual examinations indicate no detrimental effects to the plating on functional surfaces.

ENVIRONMENTAL

TEST	PERFORMANCE
1 Thermal Shock	The connectors maintain electrical and leak integrity as well as remain fully operational following the thermal shock.
2 High Temperature	The insulation resistance values remain above 1000 megohms for center contact to outer contact measurements. Outer insulators for triaxial connectors remain above 400 megohms. Contact resistance values remain below 23 millivolts at 7.5 amps and 0.8 millivolts at 10 milliamps.
3 Fluid Immersion	The connectors maintain electrical integrity and remain operational following the fluid immersion. There is no detrimental change in connector piece parts as a result of immersion in the specified fluids.
4 Altitude Humidity (Electrical Integrity)	The insulation resistance remains above 200 megohms through 10 altitude humidity cycles.
5 Ozone	The ozone exposure cause no detrimental effects to the connector.
6 Corrosion Resistance	Connectors and contacts maintain electrical integrity and remain operational following the salt spray exposure. No detrimental exposure of base metal is experienced.

TI's GOLDEN RULE: NO GOLD ADDERS.

A lot of manufacturers give you a little something extra when they sell you gold sockets.

It's called a gold adder. And it can cost you a lot of extra money.

Not so with TI.

TI has a policy of no gold adder. So when you order low profile solder tail sockets from us, the price we quote is the price you pay.

No matter what the cost of gold.

That's what you **don't** get from TI.

Here's what you **do** get.

- 100 microinch wrought gold contact surfaces for maximum reliability, serviceability, and longevity.
- Universal mounting and packaging.
- Stand-off tabs on the base for solder flush.
- Redundant contact points for low contact resistance, high reliability, and repetitive insertion.
- An anti-wicking wafer for better wave soldering.
- And a price that even competes with many tin-plated sockets.

We have a whole family of gold, low profile DIP sockets to choose from—all the way from 8 pins to 40 pins.

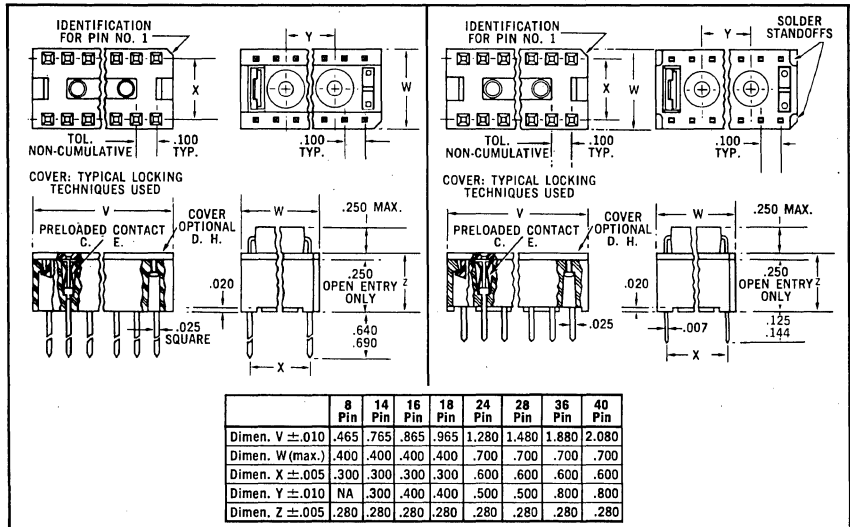
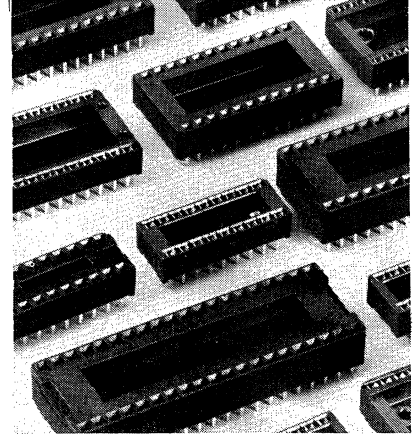
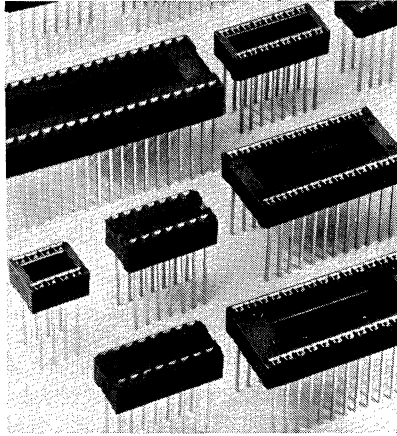
But if gold is a little rich for your needs, we offer an identical family of sockets with a tough 200-400 microinch plating of tin.

For literature, write Texas Instruments, Mail Station 10-5, Attleboro, Mass. 02703. For the name of your nearest distributor, or for information on our custom connectors, call Connector Systems Marketing, (617) 222-2800, Ext. 268 or 7216.



TEXAS INSTRUMENTS
INCORPORATED

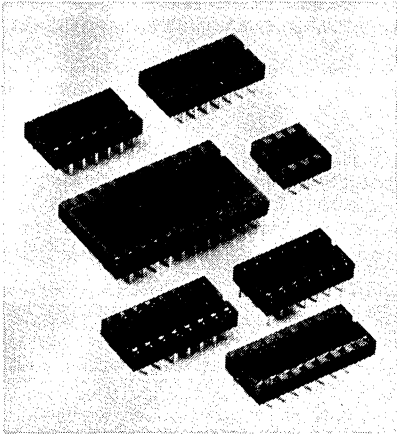
STANDARD DIP SOCKETS



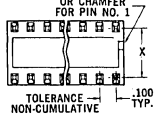
WIRE WRAP				
PART NUMBER				
SCHEDULE				
Contact Finish	Pins	Open Entry	Closed Entry	
Series C-81 200-400 microinch min. tin per MIL-T-10727	8	C81-08-54	C81-08-04	
	14	C81-14-54	C81-14-04	
	16	C81-16-54	C81-16-04	
	18	C81-18-54	C81-18-04	
	24	C81-24-54	C81-24-04	
	28	C81-28-54	C81-28-04	
	36	—	C81-36-04	
Series C-91 50 microinch min. gold inlay	8	C91-08-50	C91-08-00	
	14	C91-14-50	C91-14-00	
	16	C91-16-50	C91-16-00	
	18	C91-18-50	C91-18-00	
	24	C91-24-50	C91-24-00	
	28	C91-28-50	C91-28-00	
	36	—	C91-36-00	
	40	—	C91-40-00	

SOLDER TAIL				
PART NUMBER				
SCHEDULE				
Contact Finish	Pins	Open Entry	Closed Entry	
Series C-82 200-400 microinch min. tin per MIL-T-10727	8	C82-08-54	C82-08-04	
	14	C82-14-54	C82-14-04	
	16	C82-16-54	C82-16-04	
	18	C82-18-54	C82-18-04	
	24	C82-24-54	C82-24-04	
	28	C82-28-54	C82-28-04	
	36	—	C82-36-04	
Series C-92 100 microinch min. gold inlay	8	C92-08-50	C92-08-00	
	14	C92-14-50	C92-14-00	
	16	C92-16-50	C92-16-00	
	18	C92-18-50	C92-18-00	
	24	C92-24-50	C92-24-00	
	28	C92-28-50	C92-28-00	
	36	—	C92-36-00	
	40	—	C92-40-00	

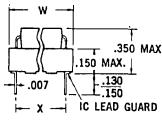
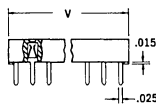
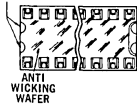
LOW PROFILE DIP SOCKETS



IDENTIFICATION NOTCH
OR CHAMFER
FOR PIN NO. 1



SOLDER STANDOFF



Pin	Dimensions		
	X ± .005	V ± .015	W (max.)
8 Pin	.300	.400	.400
14 Pin	.300	.700	.400
16 Pin	.300	.800	.400
18 Pin	.300	.900	.400
22 Pin	.400	1.100	.500
24 Pin	.600	1.200	.700
28 Pin	.600	1.400	.700
40 Pin	.600	2.000	.700

PART NUMBER SCHEDULE

BLACK BODY
(with anti-wicking wafer)

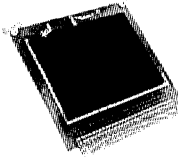
Pins	Part Number
GOLD ALLOY	
8	C93-08-02
14	C93-14-02
16	C93-16-02
18	C93-18-02
22	C93-22-02
24	C93-24-02
28	C93-28-02
40	C93-40-02

TIN PLATE

8	C83-08-02
14	C83-14-02
16	C83-16-02
18	C83-18-02
22	C83-22-02
24	C83-24-02
28	C83-28-02
40	C83-40-02

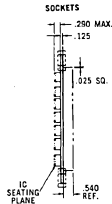
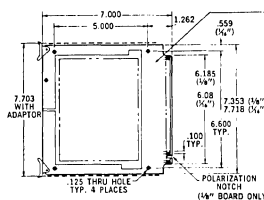
SOCKET CARDS

STANDARD SOCKET SERIES D02



- 14-16 pin socket pattern—60 position
- Standard ground and power pin commitment
- Mates with dual 60 position edge connector

LAYOUT FOR ALL CARDS

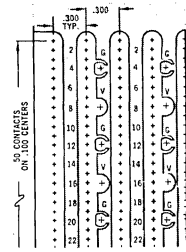


P/C BOARD MATERIAL
1/16 AND 1/8 THICK GLASS
EPOXY, 2 OZ. COPPER
CIRCUITRY BOTH SIDES, TIN
PLATED.

NOTE: Dimensions shown are approximate. Detail information and tolerances available on request (indicate series and group number).

UNIVERSAL PATTERN LAYOUT

Double sided board with power and ground planes connected to additional wire wrap terminations outside of contact row



STANDARD SOCKET SERIES D02

CARD PART NO SCHEDULE (SOCKETS)

Group No.	Board Thickness	Cards with C-81 Sockets	Cards with C-91 Sockets
GROUP I 14 PIN PIN 14—VCC PIN 7—GRD	1/16"	D022-11-0	D022-13-0
	1/8"	D021-11-0	D021-13-0
GROUP II 14 PIN PIN V—VCC PIN G—GRD	1/16"	D022-31-0	D022-33-0
	1/8"	D021-31-0	D021-33-0
GROUP III 16 PIN PIN 16—VCC PIN 8—GRD	1/16"	D022-21-0	D022-23-0
	1/8"	D021-21-0	D021-23-0
GROUP IV 16 PIN PIN V—VCC PIN G—GRD	1/16"	D022-41-0	D022-43-0
	1/8"	D021-41-0	D021-43-0

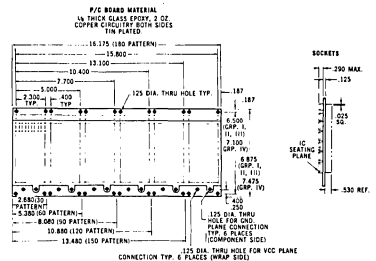
SOCKET PANELS

STANDARD SOCKET SERIES D4



- 180 position panel or multiples of 30 position with 14 or 16 position socket pattern
- Optional 52 pin or three 14 pin sockets in 1/0 area

LAYOUT FOR STANDARD PANELS



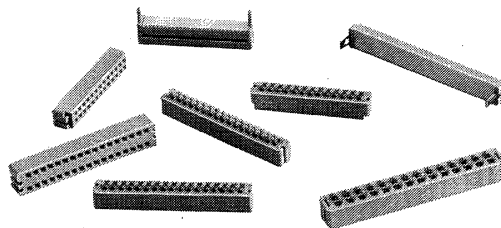
NOTE: Dimensions shown are approximate. Detail information and tolerances available on request (indicate series and group number).

STANDARD SOCKET SERIES D4

PANEL PART NO. SCHEDULE

Group No.	I/O Option	Sockets per Panel	Panel with C-81 Sockets	Panel with C-91 Sockets
GROUP I 14 PIN PIN 14—VCC PIN 7—GRD	SOCKETS	30 60 90 120 150 180	D411-21-1 D411-21-2 D411-21-3 D411-21-4 D411-21-5 D411-21-6	D411-23-1 D411-23-2 D411-23-3 D411-23-4 D411-23-5 D411-23-6
	FEED-THRU PINS	30 60 90 120 150 180	D411-41-1 D411-41-2 D411-41-3 D411-41-4 D411-41-5 D411-41-6	D411-43-1 D411-43-2 D411-43-3 D411-43-4 D411-43-5 D411-43-6
GROUP II 14 PIN PIN V—VCC PIN G—GRD	SOCKETS	30 60 90 120 150 180	D434-21-1 D434-21-2 D434-21-3 D434-21-4 D434-21-5 D434-21-6	D434-23-1 D434-23-2 D434-23-3 D434-23-4 D434-23-5 D434-23-6
	FEED-THRU PINS	30 60 90 120 150 180	D434-41-1 D434-41-2 D434-41-3 D434-41-4 D434-41-5 D434-41-6	D434-43-1 D434-43-2 D434-43-3 D434-43-4 D434-43-5 D434-43-6
GROUP III 16 PIN PIN 16—VCC PIN 8—GRD	SOCKETS	30 60 90 120 150 180	D423-21-1 D423-21-2 D423-21-3 D423-21-4 D423-21-5 D423-21-6	D423-23-1 D423-23-2 D423-23-3 D423-23-4 D423-23-5 D423-23-6
	FEED-THRU PINS	30 60 90 120 150 180	D423-41-1 D423-41-2 D423-41-3 D423-41-4 D423-41-5 D423-41-6	D423-43-1 D423-43-2 D423-43-3 D423-43-4 D423-43-5 D423-43-6
GROUP IV 16 PIN PIN V—VCC PIN G—GRD	SOCKETS	30 60 90 120 150 180	D444-21-1 D444-21-2 D444-21-3 D444-21-4 D444-21-5 D444-21-6	D444-23-1 D444-23-2 D444-23-3 D444-23-4 D444-23-5 D444-23-6
	FEED-THRU PINS	30 60 90 120 150 180	D444-41-1 D444-41-2 D444-41-3 D444-41-4 D444-41-5 D444-41-6	D444-43-1 D444-43-2 D444-43-3 D444-43-4 D444-43-5 D444-43-6

Scotchflex[®] BRAND SOCKET CONNECTORS



INTRODUCTION

SCOTCHFLEX brand socket connectors are available in a variety of sizes and center spacings to fit standard, commercially available wrap panels and custom configurations. Socket connectors may be used in conjunction with SCOTCHFLEX headers, where quick disconnect/reconnect capability

is required. Optional strain relief clips are available for all SCOTCHFLEX socket connectors, should design needs require them.

As you will note, all U.S. dimensions are followed with the respective corresponding metric dimensions, which are in parentheses.

TYPICAL PROPERTIES OF Scotchflex[®] BRAND SOCKET CONNECTORS

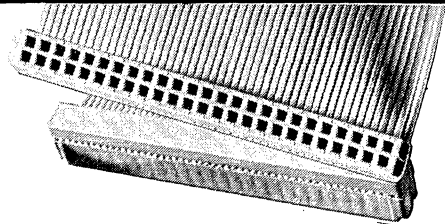
PHYSICAL PROPERTIES						
GRID SPACING	<u>.100" x .100"</u> (2.54 mm x 2.54 mm)		<u>.100" x .200"</u> (2.54 mm x 5.08 mm)	<u>.100" x .300"</u> (2.54 mm x 7.62 mm)	<u>.125" x .250"</u> (3.18 mm x 6.36 mm)	<u>.150" x .150"</u> (3.81 mm x 3.81 mm)
3M PART NUMBER(S)	3473-_____ 3421-_____ 3399-_____ 3414-_____ 3417-_____ 3425-_____		3471-0000 3471-0001	3407-0000 3327-0000	3450-0000 3450-0001	3441-0000
INSULATION MATERIAL	Glass Reinforced Polyester; U.L. Flame Retardant Rating 94V-O					
COLOR	GRAY			3407 — GRAY 3327 — RED	GRAY	
CONTACT MATERIAL	Beryllium Copper					
CONTACT PLATING	0.000030" (.762 μm) Gold Per Mil-G-45204 Type II over 0.000050" (1.27 μm) Nickel				0.000050" (1.27 μm) Gold Per Mil-G- 45204 Type II over 0.000050" (1.27 μm) Nickel	0.000030" (.762 μm) Gold Per Mil-G- 45204 Type II over 0.000050" (1.27 μm) Nickel
MARKING	Raised Figures; 3M and Part Identification Numbers, Contact Position Numbers, Orientation Triangle			Raised Figures; 3M and Part Identification Numbers, Contact Position Numbers	Raised Figures; 3M and Part Identification Numbers, Contact Position Numbers, Orientation Triangle	
WIRE ACCOMMODATION	26 Solid, 28 AWG Solid or Stranded, 30 AWG Solid				24 AWG Solid or Stranded 26 AWG Stranded	
CONTACT INSERTION FORCE	.5 lb. (2.2N) per Contact				.2 lb. (.9N) per Contact	.16 lb. (.71N) per Contact
CONTACT WITH- DRAWAL FORCE	.5 lb. (2.2N) per Contact				.1 lb. (.4N) per Contact	.11 lb. (.49N) Contact
ELECTRICAL PROPERTIES						
CURRENT RATING	1 AMP					
INSULATION RESISTANCE	> 5 x 10 ⁶ Ohms					
DIELECTRIC WITHSTAND- ING VOLTAGE	> 500 Volts at Sea Level					
ENVIRONMENTAL PROPERTIES						
TEMPERATURE RATING	-67°F to +221°F (-55°C to +105°C)					

DIMENSIONS	
U.S.	Inches
Metric	(mm)

While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the particular connector be requested. These sheets contain full dimensional details and are available from the Scotchflex sales representative in your area.

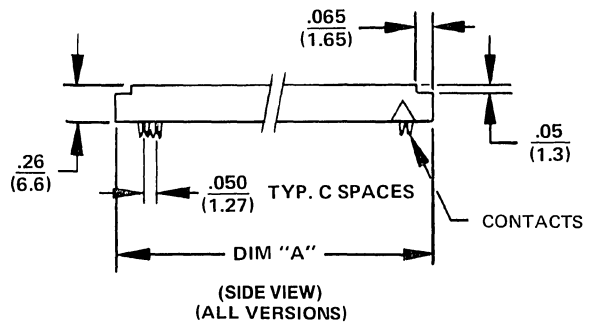
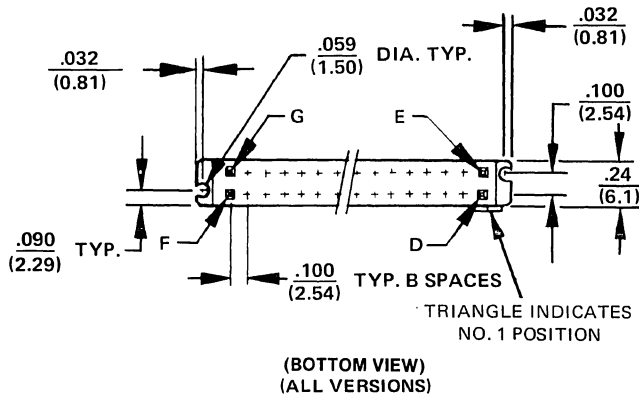
Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®] BRAND SOCKET CONNECTORS .100" (2.54mm) X .100" (2.54mm) GRID SPACING

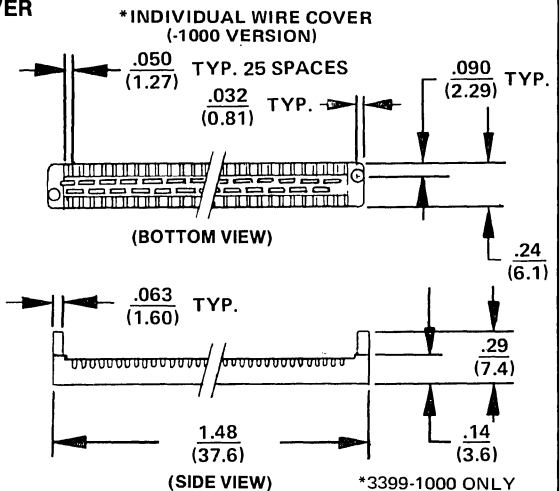
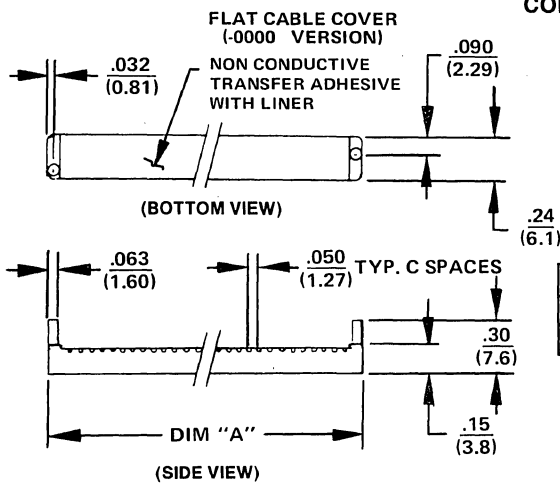


WITH FLAT CABLE COVER AND INDIVIDUAL WIRE COVER

CONNECTOR BODY



CONNECTOR COVER



DIMENSIONS	
U.S.	Inches
Metric	(mm)

Scotchflex[®] BRAND SOCKET CONNECTORS ON .100 x .100 (2.54 x 2.54) GRID SPACING

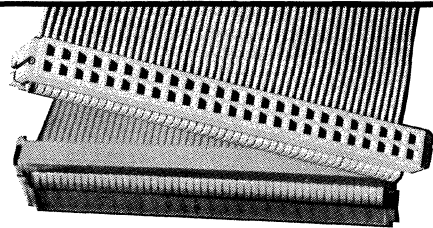
CONTACT QUANTITY	CONNECTOR PART NUMBER	DIMENSIONS			CONTACT NUMBER SEQUENCE			
		A	B	C	D	E	F	G
10	3473-0000	.68 (17.3)	4	9	1	2	9	10
20	3421-0000	1.18 (30.0)	9	19	1	2	19	20
26	3399-0000 3399-1000	1.48 (37.6)	12	25	1	14	13	26
34	3414-0000	1.88 (47.8)	16	33	1	18	17	34
40	3417-0000	2.18 (55.4)	19	39	1	2	39	40
50	3425-0000	2.68 (68.1)	24	49	1	2	49	50

When ordering SCOTCHFLEX brand socket connectors, be sure to order by using complete 8-digit part number (i.e., 3399-0000).

While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the particular connector be requested. These sheets contain full dimensional details and are available from the Scotchflex sales representative in your area.

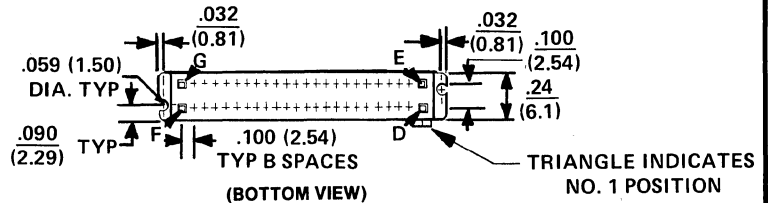
Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®] BRAND SOCKET CONNECTORS .100" (2.54mm) X .100" (2.54mm) GRID SPACING



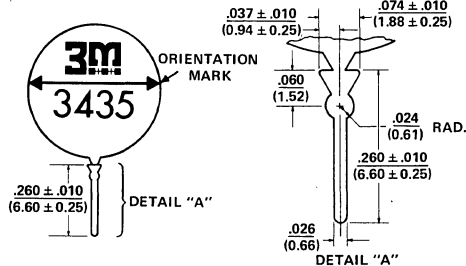
WITH INTEGRAL STRAIN RELIEF COVER

CONNECTOR BODY



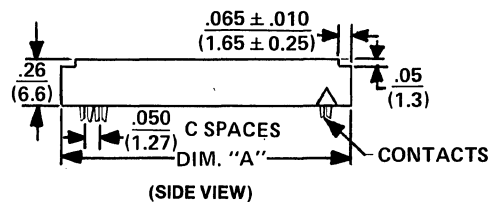
POLARIZING KEY FOR SCOTCHFLEX SOCKET CONNECTORS

3M PART NO. 3435-0000
USED WITH 3M PART NOS: 3327, 3399, 3407, 3414
3417, 3421, 3424, 3425, 3471

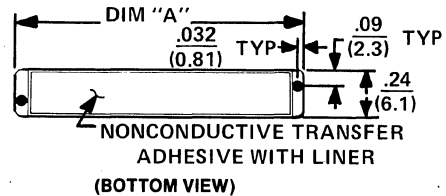


NOTES:

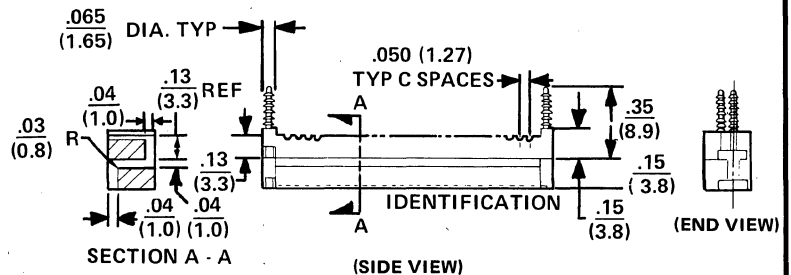
- 1 MATERIAL - POLYCARBONATE (.032 [0.81] THK.)
- 2 COLOR - GRAY
- 3 MARKING - RAISED FIGURES



STRAIN RELIEF CONNECTOR COVER



DIMENSIONS	
U.S.	Inches
Metric	(mm)



Scotchflex[®] BRAND STRAIN RELIEF SOCKET CONNECTORS ON .100 x .100 (2.54 x 2.54) GRID SPACING

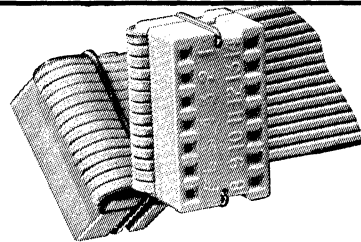
CONTACT QUANTITY	CONNECTOR PART NUMBER	DIMENSIONS			CONTACT NUMBER SEQUENCE			
		A	B	C	D	E	F	G
10	3473-3000	.68 (17.3)	4	9	1	2	9	10
20	3421-3000	1.18 (30.0)	9	19	1	2	19	20
26	3399-3000	1.48 (37.6)	12	25	1	14	13	26
34	3414-3000	1.88 (47.8)	16	33	1	18	17	34
40	3417-3000	2.18 (55.4)	19	39	1	2	39	40
50	3425-3000	2.68 (68.1)	24	49	1	2	49	50

When ordering SCOTCHFLEX brand socket connectors, be sure to order by using complete 8-digit part number (i.e., 3399-3000).

While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the particular connector be requested. These sheets contain full dimensional details and are available from the Scotchflex sales representative in your area.

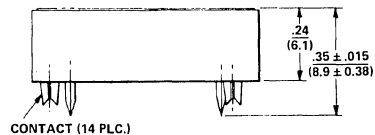
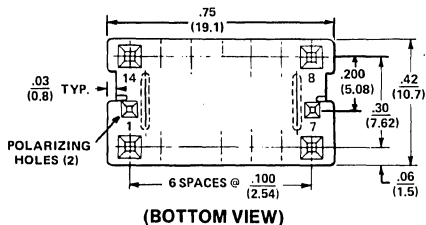
Electronic Products Division **3M**
COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®] BRAND SOCKET CONNECTORS .100" (2.54mm) X .300" (7.62mm) GRID SPACING

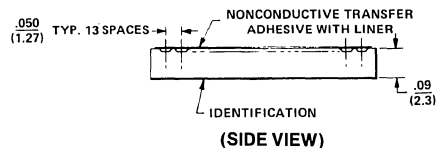
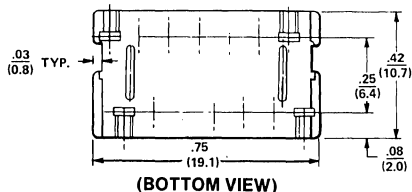


3M PART NO. 3407-0000

CONNECTOR BODY

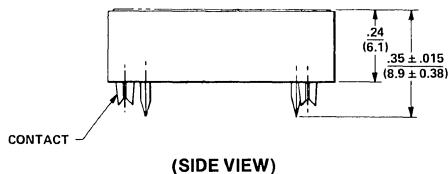
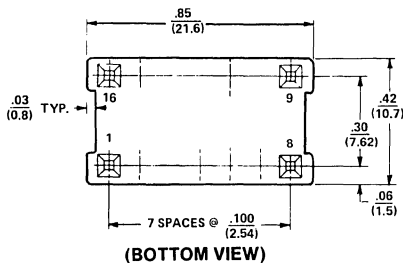


CONNECTOR COVER

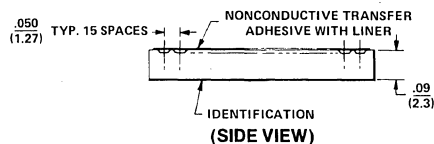
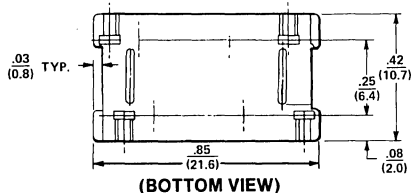


3M PART NO. 3327-0000

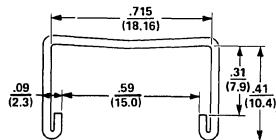
CONNECTOR BODY



CONNECTOR COVER



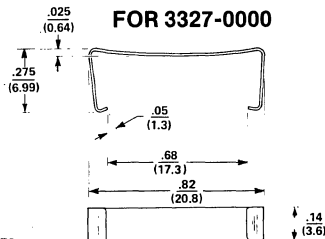
STRAIN RELIEF CLIP 3M PART NO. 3448-3 FOR 3407-0000



NOTES:
MATERIAL - STEEL MUSIC WIRE, 13 GA. [.031 (.79) DIA.]
PLATING - NICKEL

DIMENSIONS	
U.S.	Inches
Metric	(mm)

STRAIN RELIEF CLIP 3M PART NO. 3448-8 FOR 3327-0000



NOTES:
1 - MATERIAL: STEEL 30 GA. [.010 (0.25) THK] 3 - COLOR - RED
2 - FINISH: EPOXY COATING, .01 (.3) NOMINAL

When ordering SCOTCHFLEX brand socket connectors, be sure to order by using complete 8-digit part number (i.e., 3407-0000).

While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the particular connector be requested. These sheets contain full dimensional details and are available from the Scotchflex sales representative in your area.

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®]

BRAND

HEADERS



REFERENCE CHART

CON- TACT QTY.	GRID SPACING	3M PART NUMBER						MATING SCOTCHFLEX SOCKET CONNECTOR
		SOLDER TAIL				WRAP TAIL		
		RIGHT ANGLE PIN		STRAIGHT PIN		RIGHT ANGLE PIN	STRAIGHT PIN	
		FOR P.C. BOARD THICKNESS						
		.062 (1.57)		.094 -.125 (2.39-3.18)				
10	.100 x .100 (2.54 x 2.54)	3491-1002	3491-1003	3491-2002*	3491-2003*	3491-3005*	3491-4005*	3473-0000, 3473-3000
20	.100 x .100 (2.54 x 2.54)	3428-1002 3492-1002*	3428-1003 3492-1003*	3428-2002 3492-2002*	3428-2003 3492-2003*	3428-3005 3492-3005*	3428-4005 3492-4005*	3421-0000, 3421-3000
24	.125 x .250 (3.18 x 6.36)	3466-1002*		3466-2002*				3450-0000, 3450-0001
26	.100 x .100 (2.54 x 2.54)	3429-1002 3493-1002*	3429-1003 3493-1003*	3429-2002 3493-2002*	3429-2003 3493-2003*	3429-3005 3493-3005*	3429-4005 3493-4005*	3399-0000, 3399-1000 3399-3000
28	.150 x .150 (3.81 x 3.81)	3467-1002*	3467-1003*	3467-2002*	3467-2003*			3441-0000
34	.100 x .100 (2.54 x 2.54)	3431-1002 3494-1002*	3431-1003 3494-1003*	3431-2002 3494-2002*	3431-2003 3494-2003*	3431-3005 3494-3005*	3431-4005 3494-4005*	3414-0000, 3414-3000
40	.100 x .100 (2.54 x 2.54)	3432-1002 3495-1002*	3432-1003 3495-1003*	3432-2002 3495-2002*	3432-2003 3495-2003*	3432-3005 3495-3005*	3432-4005 3495-4005*	3417-0000, 3417-3000
50	.100 x .100 (2.54 x 2.54)	3433-1002 3496-1002*	3433-1003 3496-1003*	3433-2002 3496-2002*	3433-2003 3496-2003*	3433-3005 3496-3005*	3433-4005 3496-4005*	3425-0000, 3425-3000

* Available Mid-1975.

Note: 3466-1001 and 3466-2001, 24 position solder tail headers are available when using .032"-.047" (0.81 mm-1.19 mm) printed circuit boards.

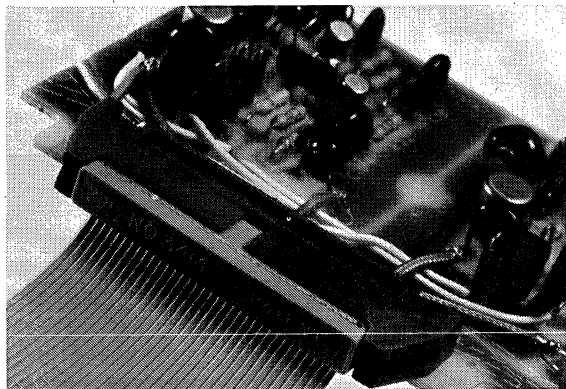
TYPICAL PROPERTIES	
PHYSICAL	
Body Material	Glass reinforced poly-ester; UL flammability rating 94V-0
Color	Gray
Contact Metal	Phosphor bronze
Contact Plating	0.000030" (.762 µm) min. Gold per Mil-G-45204 Type II over 0.000050" (1.27 µm) Nickel
Marking	Raised figures; 3M and part identification number and orientation triangle
ELECTRICAL	
Current Rating	1 AMP
Dielectric Withstand Voltage	>500 Volts at Sea Level
Insulation Resistance	>5 x 10 ⁶ Ohms
ENVIRONMENTAL	
Temp Range	-67°F to +221°F (-55°C to +105°C)

DIMENSIONS	
U.S.	Inches
Metric	(mm)

Where additional header to board mounting is required, use the following screws with indicated header types.

P.C. Board Thickness	Right Angle Contact	Straight Contact
.032 - .062 (0.81 - 1.57)	2-56 x 3/8"	3M Part No. 3458 (4-40 x 1/4" Type F)
.063 - .125 (1.60 - 3.18)	2-56 x 1/2"	3M Part No. 3472 (4-40 x 5/16" Type F)

When ordering 3M Brand Headers, use complete 8 digit part - suffix number (i.e., 3428-1002).

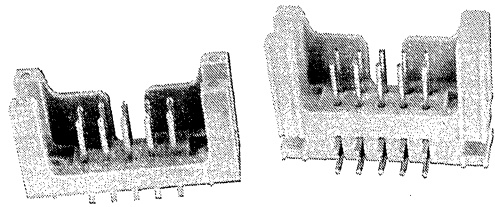


Contact your 3M Scotchflex sales representative, or the authorized 3M Scotchflex distributor in your area for pricing, availability, and design assistance.

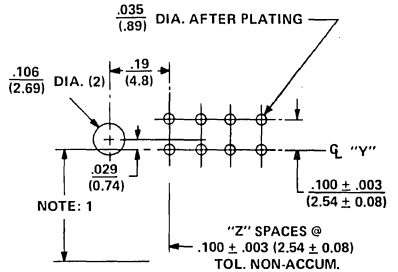
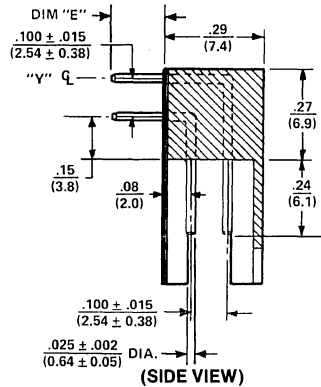
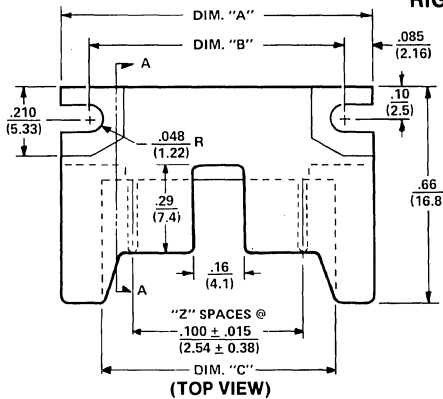
Electronic Products Division 3M COMPANY

3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®] BRAND SOLDER TAIL HEADERS .100" (2.54mm) x .100" (2.54mm)



RIGHT ANGLE PIN CONFIGURATION*



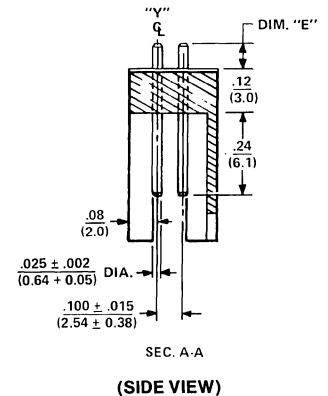
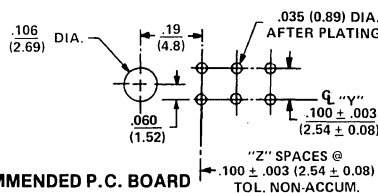
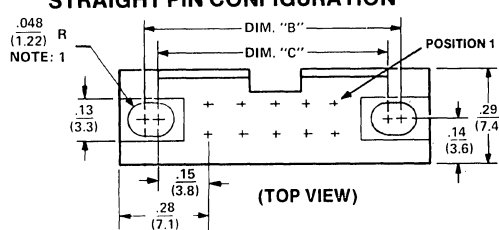
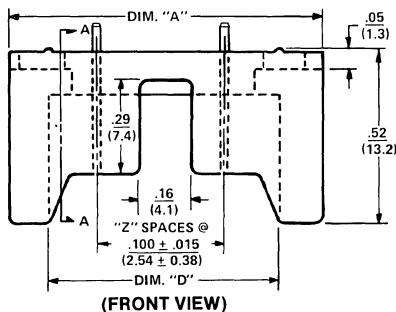
RECOMMENDED P.C. BOARD HOLE PATTERN

NOTE:
1. .41 (10.4) MAX. DIM. TO
EDGE OF P.C.B. FOR
DAISY CHAIN

When ordering 3M Brand Headers, use complete 8 digit part - suffix number (i.e., 3491-1002).

Contact Qty.	3M Part Number	Suffix Number for Board Thickness		DIM "A"	DIM "B"	DIM "C"	DIM "E" ±0.10 (±0.25) for Suffix Number:		DIM "Z"
		.062 (1.57)	.094-.125 (2.39-3.18)				-1002	-1003	
10	3491-	-1002	-1003	.95 (24.1)	.78 (19.8)	.71 (18.0)	.092 (2.34)	.155 (3.94)	4
20	3492-			1.45 (36.8)	1.28 (32.5)	1.21 (30.7)			9
26	3493-			1.75 (44.5)	1.58 (40.1)	1.51 (38.4)			12
34	3494-			2.15 (54.6)	1.98 (50.3)	1.91 (48.5)			16
40	3495-			2.45 (62.2)	2.28 (57.9)	2.21 (56.1)			19
50	3496-			2.95 (74.9)	2.78 (70.6)	2.71 (68.8)			24

STRAIGHT PIN CONFIGURATION*



DIMENSIONS	
U.S.	Inches
Metric	(mm)

NOTE:
1. ACCEPTS NO. 256 HEX HD
OR NO. 1-72 RD HD SCREW

RECOMMENDED P.C. BOARD HOLE PATTERN

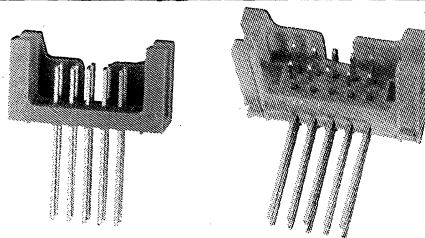
When ordering 3M Brand Headers, use complete 8 digit part - suffix number (i.e., 3491-2002).

Contact Qty.	3M Part Number	Suffix Number for Board Thickness		DIM "A"	DIM "B"	DIM "C"	DIM "D"	DIM "E" ±0.10 (±0.25) for Suffix Number:		DIM "Z"
		.062 (1.57)	.094-.125 (2.39-3.18)					-2002	-2003	
10	3491-	-2002	-2003	.95 (24.1)	.78 (19.8)	.70 (17.8)	.71 (18.0)	.092 (2.34)	.155 (3.94)	4
20	3492-			1.45 (36.8)	1.28 (32.5)	1.20 (30.5)	1.21 (30.7)			9
26	3493-			1.75 (44.5)	1.58 (40.1)	1.50 (38.1)	1.51 (38.4)			12
34	3494-			2.15 (54.6)	1.98 (50.3)	1.90 (48.3)	1.91 (48.5)			16
40	3495-			2.45 (62.2)	2.28 (57.9)	2.20 (55.9)	2.21 (56.1)			19
50	3496-			2.95 (74.9)	2.78 (70.6)	2.70 (68.6)	2.71 (68.8)			24

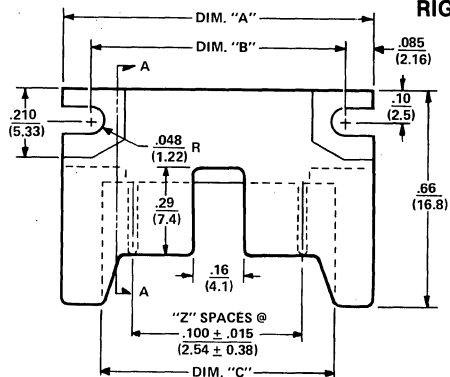
*Headers 3491- through 3496- will be available by Mid-1975. Contact your 3M Scotchflex sales representative or the Scotchflex distributor in your area for design assistance and availability.

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

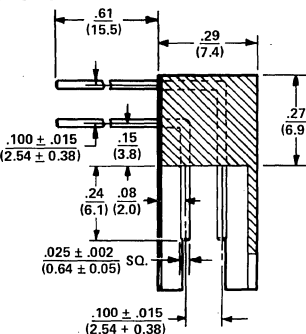
Scotchflex® BRAND WRAP TAIL HEADERS .100" (2.54mm) x .100" (2.54mm)



RIGHT ANGLE PIN CONFIGURATION*

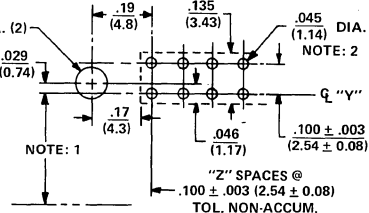


(TOP VIEW)



SEC. A-A

(SIDE VIEW)



RECOMMENDED P.C. BOARD HOLE PATTERN

NOTE:

1. DIM. .41 (10.4) MAX. TO EDGE OF BOARD FOR DAISY CHAIN
2. ALTERNATE - SLOT (DOTTED LINES)

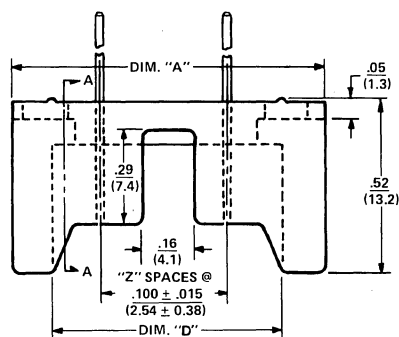
DIMENSIONS	
U.S.	Inches
Metric	(mm)

When ordering 3M Brand Headers, use complete 8 digit part - suffix number (i.e., 3491-4005).

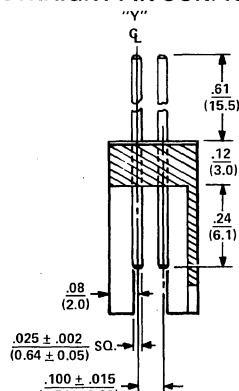
Contact Qty.	3M Part Number	DIM "A"	DIM "B"	DIM "C"	"Z"
10	3491-3005	.95 (24.1)	.78 (19.8)	.71 (18.0)	4
20	3492-3005	1.45 (36.8)	1.28 (32.5)	1.21 (30.7)	9
26	3493-3005	1.75 (44.5)	1.58 (40.1)	1.51 (38.4)	12
34	3494-3005	2.15 (54.6)	1.98 (50.3)	1.91 (48.5)	16
40	3495-3005	2.45 (62.2)	2.28 (57.9)	2.21 (56.1)	19
50	3496-3005	2.95 (74.9)	2.78 (70.6)	2.71 (68.8)	24

While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the particular connector be requested. These sheets contain full dimensional details and are available from the Scotchflex sales representative in your area.

STRAIGHT PIN CONFIGURATION*

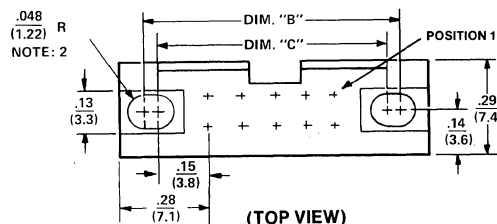


(FRONT VIEW)

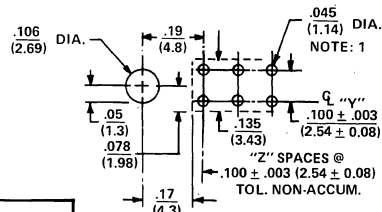


SEC. A-A

(SIDE VIEW)



(TOP VIEW)



RECOMMENDED P.C. BOARD HOLE PATTERN

NOTE:

1. ALTERNATE - SLOT (DOTTED LINES)
2. ACCEPTS NO. 2-56 HEX HD SCREW OR NO. 1-72 RD HD SCREW

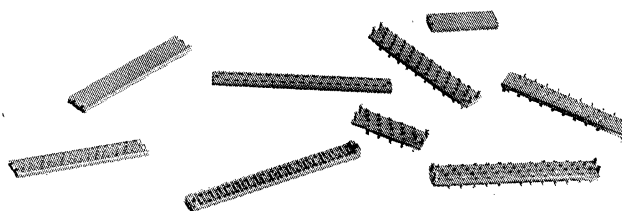
When ordering 3M Brand Headers, use complete 8 digit part - suffix number (i.e., 3491-3005).

Contact Qty.	3M Part Number	DIM "A"	DIM "B"	DIM "C"	DIM "D"	"Z"
10	3491-4005	.95 (24.1)	.78 (19.8)	.70 (17.8)	.71 (18.0)	4
20	3492-4005	1.45 (36.8)	1.28 (32.5)	1.20 (30.5)	1.21 (30.7)	9
26	3493-4005	1.75 (44.5)	1.58 (40.1)	1.50 (38.1)	1.51 (38.4)	12
34	3494-4005	2.15 (54.6)	1.98 (50.3)	1.90 (48.3)	1.91 (48.5)	16
40	3495-4005	2.45 (62.2)	2.28 (57.9)	2.20 (55.9)	2.21 (56.1)	19
50	3496-4005	2.95 (74.9)	2.78 (70.6)	2.70 (68.6)	2.71 (68.8)	24

*Headers 3491- through 3496- will be available by Mid-1975. Contact your 3M Scotchflex sales representative or the Scotchflex distributor in your area for design assistance and availability.

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®] BRAND P.C.B. CONNECTORS



INTRODUCTION

Flat cable may be terminated at the circuit card by hand or flow solderable SCOTCHFLEX connectors. The contacts which are positioned in the connector body are soldered to the board as a unit. The flat cable terminates in the connector to the "U" form end of the con-

tacts. As with other SCOTCHFLEX connectors, no stripping or soldering of conductors is required. SCOTCHFLEX P.C.B. Connectors come in a variety of configurations to mate with SCOTCHFLEX flat cable.

TYPICAL PROPERTIES OF Scotchflex[®] BRAND P.C.B. CONNECTORS

PHYSICAL PROPERTIES			
3M PART NUMBER	3474-____T 3402-____T 3422-____T 3418-____T 3434-____T 3426-____T	3470-0000T	3378-____T 3468-0000T
INSULATION MATERIAL	GLASS FILLED POLYESTER; U.L. FLAME RETARDANT RATING 94V-0		
COLOR	GRAY		
CONTACT MATERIAL	BERYLLIUM COPPER		
CONTACT PLATING	TIN ALLOY		
MARKING	RAISED FIGURES, 3M PART & IDENTIFICATION NUMBER		
WIRE ACCOMMODATION	26 AWG SOLID, 28 AWG SOLID & STRANDED 30 AWG SOLID	24 AWG SOLID & STRANDED	24 AWG SOLID & STRANDED
CABLE ACCEPTANCE	.050" (1.27 mm) CONDUCTOR CENTERS	.0625" (1.59 mm) CONDUCTOR CENTERS	.075" (1.90 mm) CONDUCTOR CENTERS
ELECTRICAL PROPERTIES			
CURRENT RATING	1 AMP		
INSULATION RESISTANCE	> 5 X 10 ⁶ OHMS		
DIELECTRIC WITHSTANDING VOLTAGE	>500 VOLTS AT SEA LEVEL		
ENVIRONMENTAL PROPERTIES			
TEMPERATURE RATING	-67°F TO +221°F (-55°C TO +105°C)		

REFERENCE CHART FOR P.C.B. CONNECTORS

NO. OF CONTACTS	3M PART NUMBER	FOR PC BOARD THICKNESS	FOR ASSEMBLY BEFORE SOLDERING USE LOCATOR PLATE PART NUMBER	FOR ASSEMBLY AFTER SOLDERING USE LOCATOR PLATE PART NUMBER	MATES WITH 3M FLAT CABLE
10	3474-0000T	.062 (1.57)	3443-15	3443-8	3350/10, 3365/10, 3306/10
	3474-0001T	.094 -.125 (2.39-3.18)			
20	3422-0000T	.062 (1.57)	3443-16	3443-8	3350/20, 3365/20, 3306/20, 3369/20, 3476/20
	3422-0001T	.094 -.125 (2.39-3.18)			
24	*3470-0000T	.062 (1.57)	3443-34	3443-8	3451/24
26	3434-0000T	.062 (1.57)	3443-15	3443-8	3350/26, 3365/26, 3306/26, 3469/26, 3476/26
	3434-0001T	.094 -.125 (2.39-3.18)			
28	*3468-0000T	.062 (1.57)	3443-33	3443-8	3405/28
34	3402-0000T	.062 (1.57)	3443-15	3443-8	3350/34, 3365/34, 3306/34, 3469/34, 3476/34
	3402-0001T	.094 -.125 (2.39-3.18)			
36	3378-0000T	.062 (1.57)	3443-19	3443-8	3405/36
	**3378-1000T	.062 (1.57)			Individual Insulated Wire
40	3418-0000T	.062 (1.57)	3443-16	3443-8	3350/40, 3365/40, 3306/40, 3380/40, 3469/40, 3476/40
	3418-0001T	.094 -.125 (2.39-3.18)			
50	3426-0000T	.062 (1.57)	3443-15	3443-8	3350/50, 3365/50, 3306/50, 3380/50, 3469/50, 3476/50
	3426-0001T	.094 -.125 (2.39-3.18)			

DIMENSIONS	
U.S.	Inches
Metric	(mm)

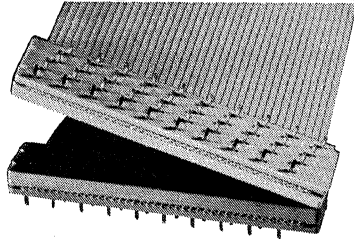
* Available Mid-1975

** 3378-1000 denotes individual wire cover.

NOTE: All connectors listed use the 3442-1 standard platen, except the 3378-____T connector, which utilizes the 3442-2 platen.

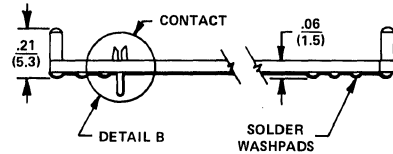
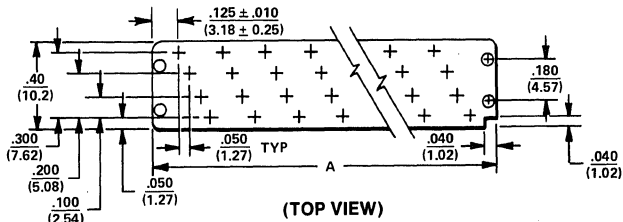
While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the particular connector be requested. These sheets contain full dimensional details and are available from the Scotchflex sales representative in your area.

Scotchflex[®] P.C.B. CONNECTORS

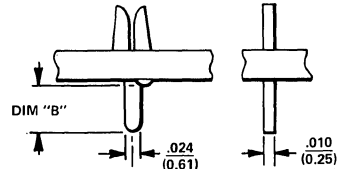


3M PART NOS. 3422-____ T & 3418-____ T

CONNECTOR BODY

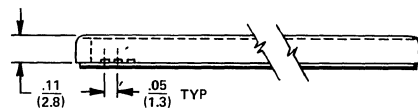
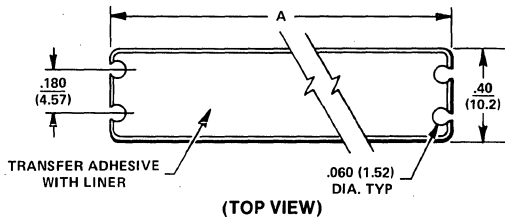


(SIDE VIEW)



DETAIL B

CONNECTOR COVER



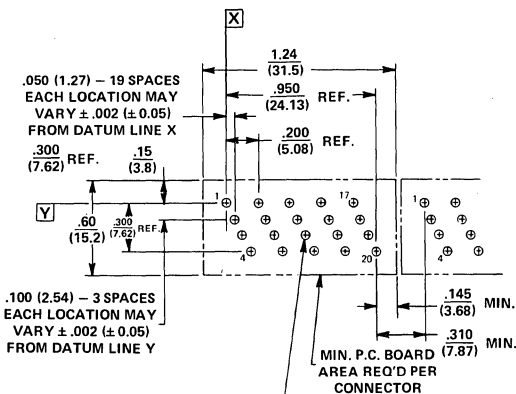
DIMENSIONS

U.S. Inches

Metric (mm)

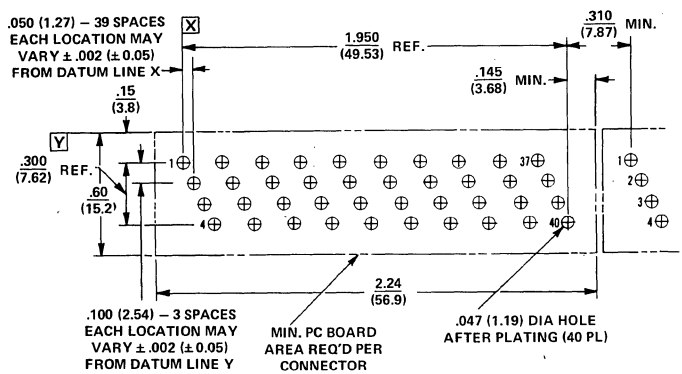
RECOMMENDED PCB HOLE PATTERNS

3M PART NO. 3422-____ T



NOTE: HOLE PATTERN IS SHOWN FOR THE MOUNTING SIDE OF THE P.C. BOARD

3M PART NO. 3418-____ T



NOTE: HOLE PATTERN IS SHOWN FOR THE MOUNTING SIDE OF THE P.C. BOARD

Scotchflex[®] BRAND PCB CONNECTORS

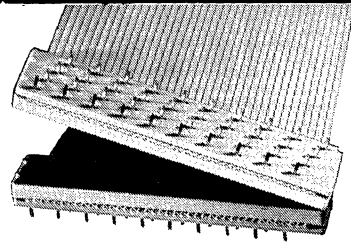
CONTACT QUANTITY	CONNECTOR PART NUMBER	DIMENSIONS	
		A	B
20	3422-0000T	1.20 (30.5)	.100 ± .010 (2.54 ± .025)
	3422-0001T		.156 ± .010 (3.96 ± .025)
40	3418-0000T	2.20 (55.9)	.100 ± .010 (2.54 ± .025)
	3418-0001T		.156 ± .010 (3.96 ± .025)

Each Scotchflex connector is identified by an eight-digit part no. When ordering be sure to include the complete part number. (i.e., 3422-0000T).

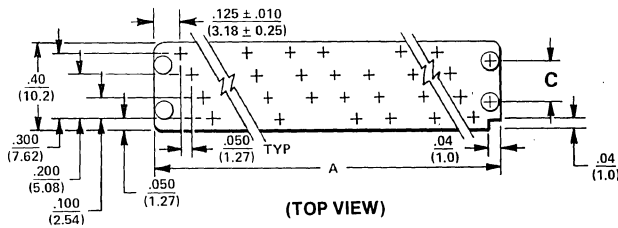
While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the particular connector be requested. These sheets contain full dimensional details and are available from the Scotchflex sales representative in your area.

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

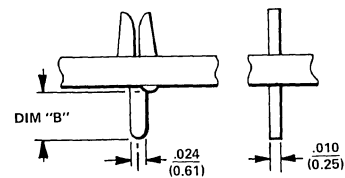
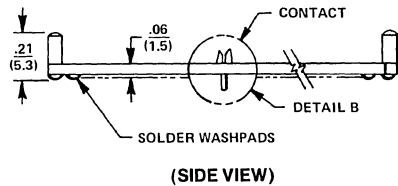
Scotchflex[®] P.C.B. CONNECTORS



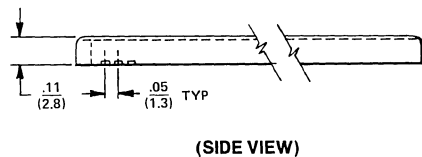
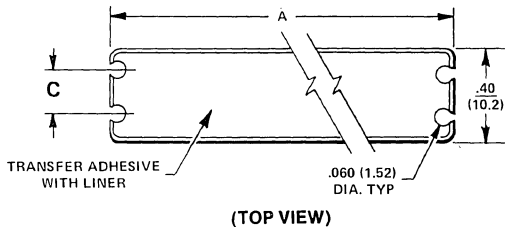
3M PART NOS. 3474-____ T, 3434-____ T, 3402-____ T, & 3426-____ T
CONNECTOR BODY



DIMENSIONS	
U.S.	Inches
Metric	(mm)



CONNECTOR COVER



Scotchflex[®] BRAND P.C.B. CONNECTORS

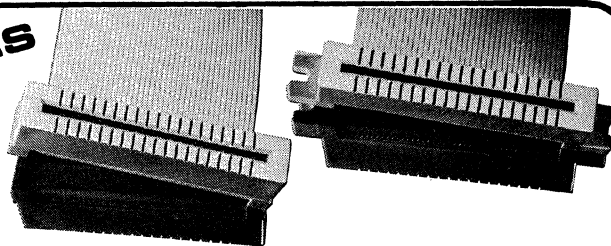
CONTACT QUANTITY	CONNECTOR PART NUMBER	DIMENSIONS		
		A	B	C
10	3474-0000T	.70 (17.8)	.100 ± .010 (2.54 ± .025)	.200 (5.08)
	3474-0001T		.156 ± .010 (3.96 ± .025)	
26	3434-0000T	1.50 (38.1)	.100 ± .010 (2.54 ± .025)	.181 (4.60)
	3434-0001T		.156 ± .010 (3.96 ± .025)	
34	3402-0000T	1.90 (48.3)	.100 ± .010 (2.54 ± .025)	.181 (4.60)
	3402-0001T		.156 ± .010 (3.96 ± .025)	
50	3426-0000T	2.70 (68.6)	.100 ± .010 (2.54 ± .025)	.181 (4.60)
	3426-0001T		.156 ± .010 (3.96 ± .025)	

Each Scotchflex connector is identified by an eight-digit part no. When ordering be sure to include the complete part number. (i.e., 3474-0000T).

While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the specific connector be requested. These sheets contain full dimensional details and are available from the Scotchflex sales representative in your area.

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®] BRAND CARD-EDGE CONNECTORS



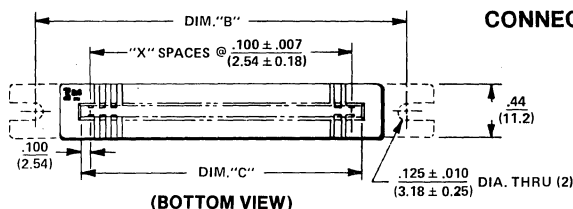
INTRODUCTION

Dual readout SCOTCHFLEX Card-Edge Connectors are available with or without mounting ears.

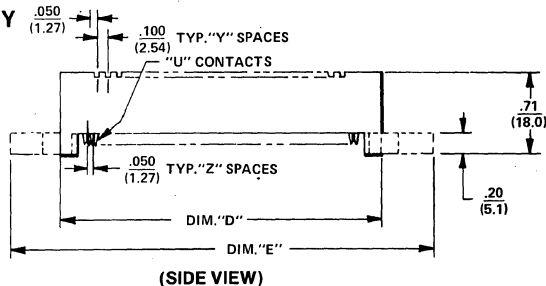
Both versions have bifurcated, gold-plated beryllium copper contacts insuring dependable electrical interface through repeated insertions and withdrawals. In-

sulation piercing "U" contacts are on .100" (2.54 mm) spacings, designed to accept SCOTCHFLEX round conductor cables on .050" (1.27 mm) centers. As with other SCOTCHFLEX connectors, 3M's card-edge connector line features labor cost savings, since up to 50 terminations can be made in a single step.

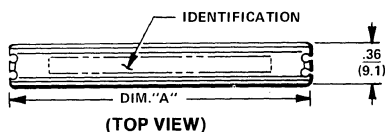
3M PART NOS. 3461- THROUGH 3464-



CONNECTOR BODY

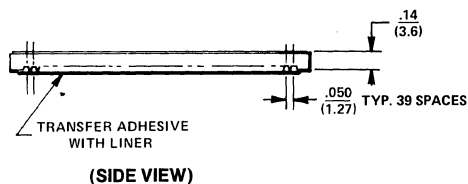


CONNECTOR COVER



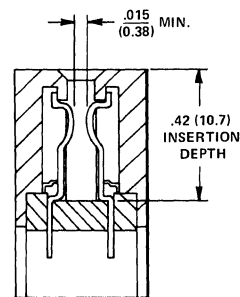
TYPICAL PROPERTIES FOR ALL CARD-EDGE CONNECTORS

PHYSICAL	
Insulation Material	Glass filled thermoplastic
Contact Material	Beryllium Copper
Contact Plating	0.000050" (1.27 um) Min. Gold per MIL-G-45204 Type II over 0.000100" (2.54 um) Min. Nickel
Color	Gray
Contact Spacing	.100" (2.54 mm) accepts Scotchflex Cables on .050" (1.27 mm) Centers. Mates with P.C. Board Pads on .100" (2.54 mm) Centers.
ELECTRICAL	
Current Rating	1 AMP
Dielectric withstanding Voltage	>500 V.D.C. (Sea Level)
Insulation Resistance	>5 x 10 ⁶ Ohms
ENVIRONMENTAL	
Temperature Range	-67°F to +221°F (-55°C to 105°C)



DIMENSIONS	
U.S.	Inches
Metric	(mm)

3M Suffix Number	Mounting Style
-0000	With mounting ears
-0001	Without mounting ears



NOTE: While the above data was correct at the time of this publication, it is recommended that for specification purposes a current Spec Data Sheet on the specific connector be requested from the 3M SCOTCHFLEX representative in your area.

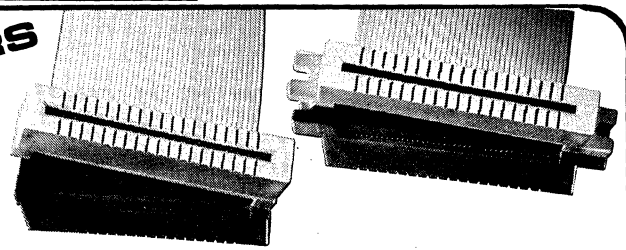
When ordering 3M Brand Card-Edge Connectors, use complete 8 digit part - suffix number (i.e., 3461-0000).

Contact Qty.	3M Part Number	Dim "A"	Dim "B"	Dim "C"	Dim "D"	Dim "E"	"X"	"Y"	"Z"
20	3461-0000 3461-0001	1.24 (31.5)	1.80 (45.7)	1.104 (28.04)	1.50 (38.1)	2.00 (50.8)	9	8	19
26	3462-0000 3462-0001	1.54 (39.1)	2.10 (53.3)	1.404 (35.66)	1.80 (45.7)	2.30 (58.4)	12	11	25
34	3463-0000 3463-0001	1.94 (49.3)	2.50 (63.5)	1.804 (45.82)	2.20 (55.9)	2.70 (68.6)	16	15	33
40	3464-0000 3464-0001	2.24 (56.9)	2.80 (71.1)	2.104 (53.44)	2.50 (63.5)	3.00 (76.2)	19	18	39

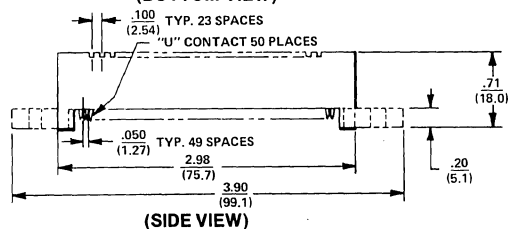
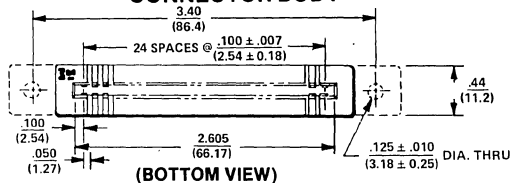
Refer to page 35 for recommended P.C. Board configuration.

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

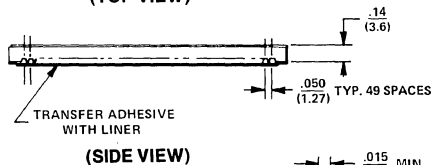
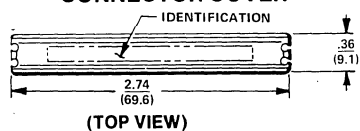
Scotchflex® CARD-EDGE CONNECTORS



3M PART NUMBER 3415- CONNECTOR BODY

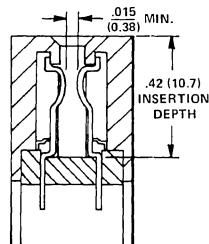


CONNECTOR COVER

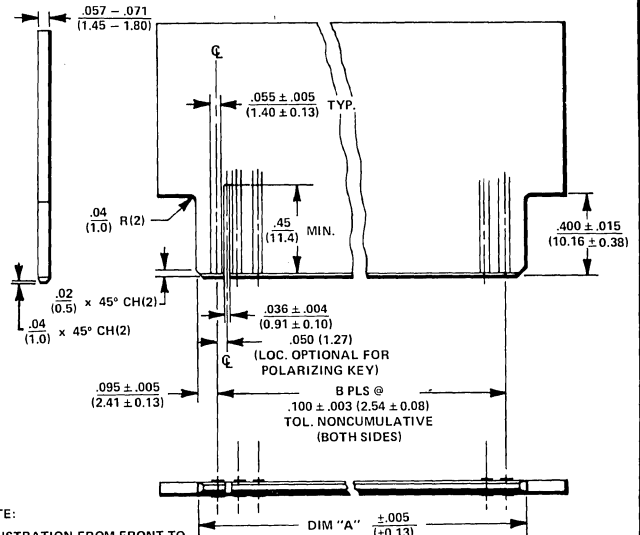


3M Suffix Number	Mounting Style
-0000	With mounting ears
-0001	Without mounting ears

NOTE: When ordering 3M Brand Card-Edge connectors, use complete 8 digit part - suffix number (i.e., 3415-0000).



RECOMMENDED P.C. BOARD CONFIGURATION



NOTE:
REGISTRATION FROM FRONT TO
BACK
 $\pm .005$
(± 0.13)

DIMENSIONS	
U.S.	Inches
Metric	(mm)

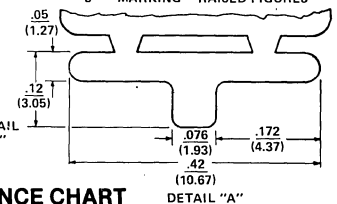
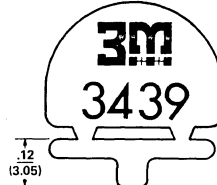
Contact Qty.	3M Part Number	Dim "A"	B
20	3461-_____	1.095 (27.81)	9
26	3462-_____	1.395 (35.43)	12
34	3463-_____	1.795 (45.59)	16
40	3464-_____	2.095 (53.21)	19
50	3415-_____	2.595 (65.91)	24

3M PART NO. 3439-0000 POLARIZING KEY

NOTES:

USED WITH 3M PART NOS: 3415, 3461, 3462, 3463, 3464

- MATERIAL - POLYCARBONATE (.027 [0.69] THK.)
- COLOR - GRAY
- MARKING - RAISED FIGURES



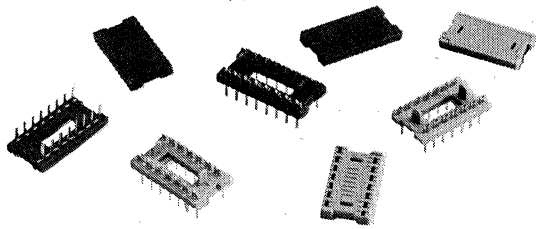
Scotchflex® BRAND CARD-EDGE CONNECTOR REFERENCE CHART

Contact Qty.	Grid Spacing	3M Part Number	Locator Plate Number	Platen Number	Mating Scotchflex Cable
20	.100" (2.54)	3461-0000 3461-0001	3443-11	3442-4	3350/20, 3365/20, 3306/20, 3469/20, 3476/20
26		3462-0000 3462-0001		3442-7	3350/26, 3365/26, 3306/26, 3469/26, 3476/26
34		3463-0000 3463-0001		3442-3	3350/34, 3365/34, 3306/34, 3469/34, 3476/34
40		3464-0000 3464-0001		3442-8	3350/40, 3365/40, 3306/40, 3380/40, 3469/40, 3476/40
50		3415-0000 3415-0001		3442-1	3350/50, 3365/50, 3306/50, 3380/50, 3469/50, 3476/50

NOTE: While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the specific connector be requested. These sheets contain full dimensional details and are available on request from the SCOTCHFLEX representative in your area.

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®] BRAND D.I.P. CONNECTORS



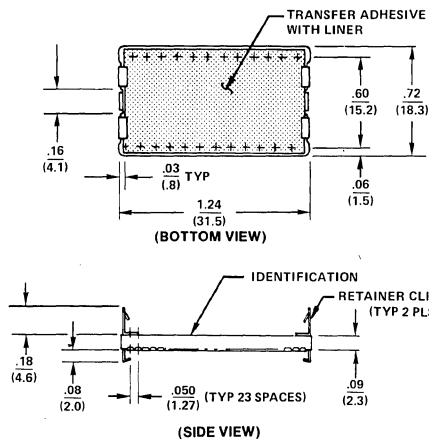
INTRODUCTION

Solderless connections with 14, 16 and 24 pin dual in-line plugs, which mate with standard I.C. sockets and high density D.I.P. panels, are now possible using Scotchflex Brand connectors. Offering interboard bus-ing capabilities, Scotchflex Brand D.I.P. connectors are designed to conserve space on the P.C. board. Fast, economical terminations using either flat cable or discrete wires make Scotchflex D.I.P. connectors an ideal choice.

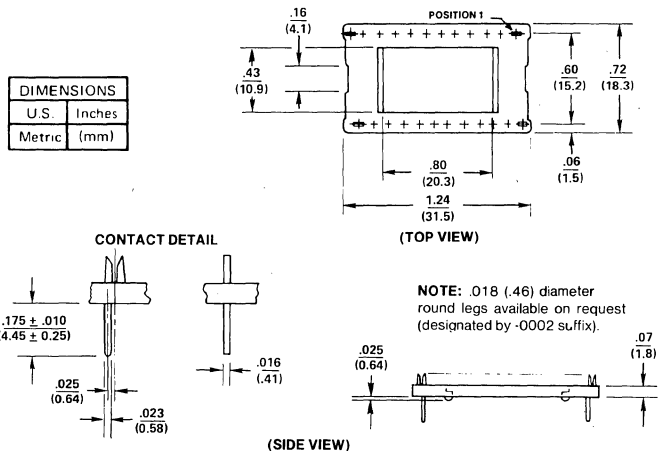
TYPICAL PROPERTIES OF Scotchflex BRAND D.I.P. CONNECTORS

PHYSICAL PROPERTIES			
GRID SPACING	100" X 300" (2.54 mm X 7.62 mm)	100" X 300" (2.54 mm X 7.62 mm)	100" X 600" (2.54 mm X 15.24 mm)
3M PART NO.	3406- ----	3416- ----	3460- ----
INSULATION MATERIAL	GLASS REINFORCED POLYESTER; U.L. FLAMMABILITY RATING, 94V-0		
COLOR	GRAY	RED	GRAY
CONTACT MATERIAL	BERYLLIUM COPPER		
CONTACT PLATING	0.000030" (.762 μm) MIN. GOLD PER MIL-G-45204 TYPE II OVER 0.000050" (1.27 μm) NICKEL		
MARKING	RAISED FIGURES; 3M PART & IDENTIFICATION NUMBER, CONTACT POSITION NUMBER		
ELECTRICAL PROPERTIES			
CURRENT RATING	1 AMP		
INSULATION RESISTANCE	>5 X 10 ⁶ OHMS		
DIELECTRIC WITHSTANDING VOLTAGE	>500 VOLTS AT SEA LEVEL		
ENVIRONMENTAL PROPERTIES			
TEMPERATURE RATING	-67°F TO +221°F (-55°C TO +105°C)		

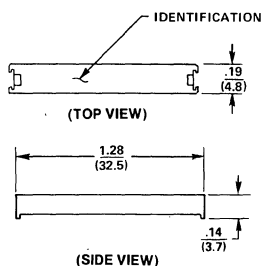
3M PART NO. 3460- CONNECTOR COVER



CONNECTOR BODY



STRAIN RELIEF CLIP FOR 3460-____ CONNECTOR (SHIPPED WITH CONNECTOR)



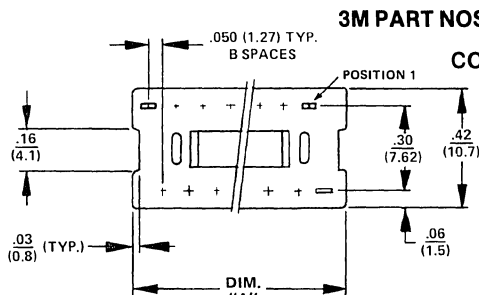
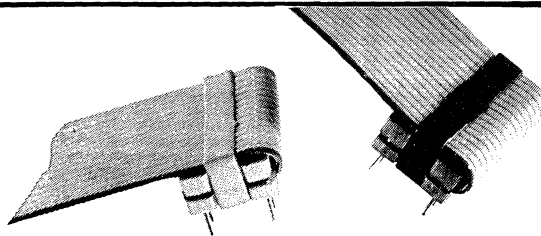
Scotchflex BRAND D.I.P. CONNECTOR REFERENCE CHART

Contact Qty.	Grid Spacing	3M Part No.	Connector Description	Strain Relief Clip Part No.	Platen Part No.	Locator Plate Part No.	Mates with 3M Flat Cable
14	.100 x .300 (2.54 x 7.62)	3406-0000	Rectangular leg with flat cable cover	3448-7	3442-1	3443-12	3350 X X X X
		3406-0002	Round leg with flat cable cover				X X X X
		3406-1000	Rectangular leg with individual wire cover				28 AWG & 26 AWG Stranded & Solid Individual Insulated Wire
16	.100 x .300 (2.54 x 7.62)	3416-0000	Rectangular leg with flat cable cover	3448-8	3442-1	3443-13	X X X X
		3416-0002	Round leg with flat cable cover				X X X X
		3416-1000	Rectangular leg with individual wire cover				28 AWG & 26 AWG Stranded & Solid Individual Insulated Wire
24	.100 x .600 (2.54 x 15.24)	3460-0000	Rectangular leg with flat cable cover	(Shipped with Connector)	3442-6	3443-10	X X X
		3460-0002	Round leg with flat cable cover				X X X

Each SCOTCHFLEX connector is identified by an eight digit part number. When ordering, be sure to include the complete number. (i.e., 3460-0000). NOTE: While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the specific connector be requested. These sheets contain full dimensional details and are available on request from the SCOTCHFLEX representative in your area.

Electronic Products Division **3M COMPANY**
3M CENTER • SAINT PAUL, MINNESOTA 55101

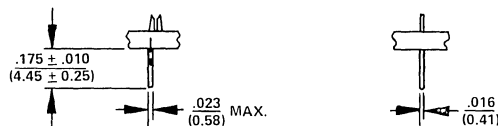
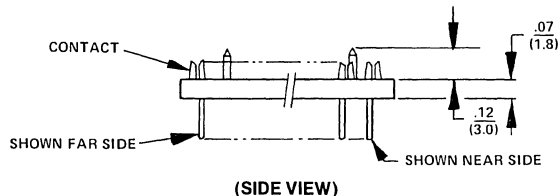
Scotchflex[®] D.I.P. CONNECTORS .100" (2.54mm) x .300" (7.62mm) GRID SPACING



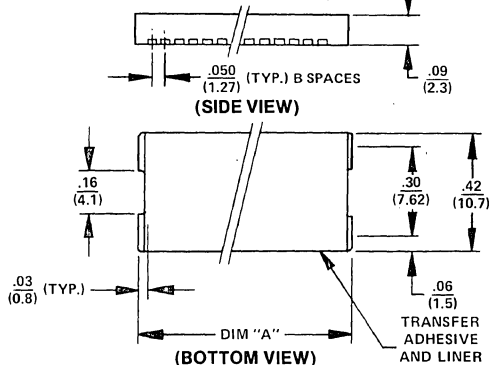
(TOP VIEW)

DIMENSION TABLE

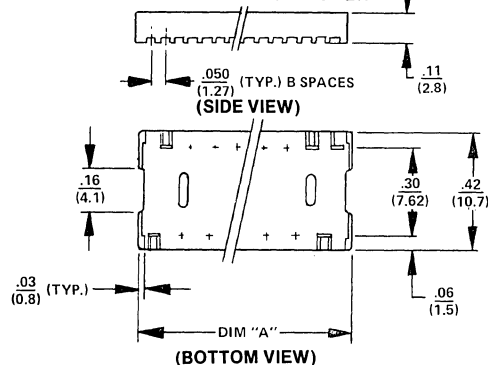
Contact Quantity	3M Part Number	DIM "A"	DIM "B"
14	3406	.75 (19.1)	13
16	3416	.85 (21.6)	15



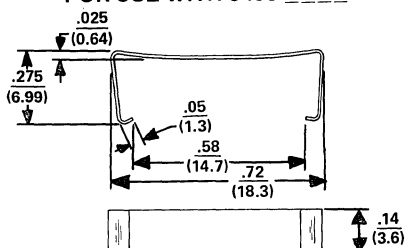
NOTE: .018 (.46) diameter round contact legs available on request (designated by -0002 suffix).

CONNECTOR COVER**3M PART NOS. 3406-0000 & 3416-0000****FLAT CABLE COVER**

(BOTTOM VIEW)

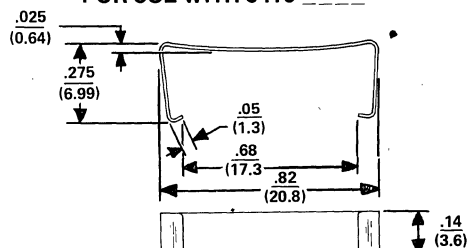
3M PART NOS. 3406-1000 & 3416-1000**INDIVIDUAL WIRE COVER**

(BOTTOM VIEW)

**3448-7 STRAIN RELIEF CLIP
FOR USE WITH 3406-_____****NOTES:**

- 1 - MATERIAL: STEEL 30 GA. [.010 (2.54) THK.]
- 2 - FINISH: EPOXY COATING .01 (.13) NOMINAL
- 3 - COLOR: GRAY

DIMENSIONS	
U.S.	Inches
Metric	(mm)

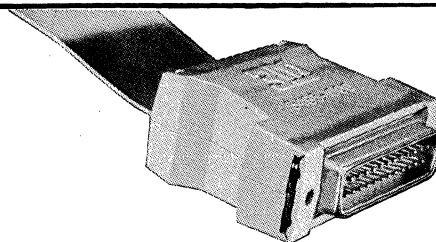
**3448-8 STRAIN RELIEF CLIP
FOR USE WITH 3416-_____****NOTES:**

- 1 - MATERIAL: STEEL 30 GA. [.010/(0.25) THK.]
- 2 - FINISH: EPOXY COATING .01 (.13) NOMINAL
- 3 - COLOR - RED

Each SCOTCHFLEX connector is identified by an eight digit part number. When ordering, be sure to include the complete number i.e., 3416-0000. **NOTE:** While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the specific connector be requested. These sheets contain full dimensional details and are available on request from the SCOTCHFLEX representative in your area.

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®] BRAND DELTA CONNECTOR SYSTEM



INTRODUCTION

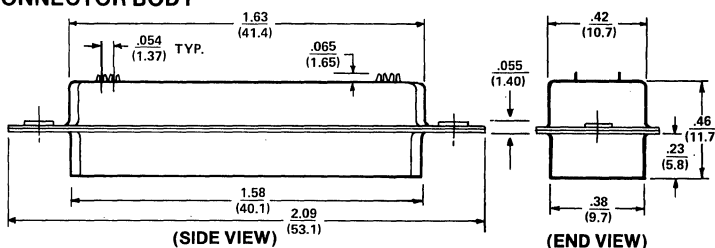
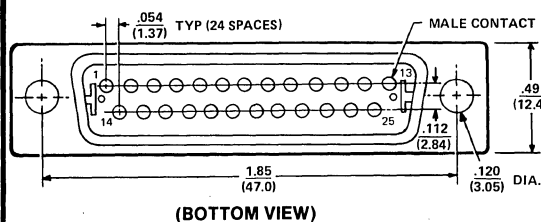
The revolutionary SCOTCHFLEX Delta Connector System is similar in configuration and compatible with other "D" subminiature connectors existing in the industry. It offers the first connector of its kind where it is not necessary to strip, solder, crimp and individually position discrete wires into the connector body. This connector offers simultaneous insulation stripping and terminating using the proven "U" contact principle of connecting a unique SCOTCHFLEX flat cable or individual insulated conductors to the connector. A SCOTCHFLEX brand cable, made especially for the SCOTCHFLEX Delta Connector System, with conductors alternating from .050" (1.27 mm) to .054" (1.37 mm) every 9.5" (24.13 cm) is specifically designed to provide instant interfacing of equipment based on two standard center spacings. Maximum versatility is achieved, for it is possible to connect a SCOTCHFLEX Delta Connector to other existing lines of SCOTCHFLEX connectors (i.e., Socket, P.C.B., D.I.P. and Card-Edge). Customer requirements for implementing the SCOTCHFLEX Delta Connector System are met through the complete line of accessory components.

TYPICAL PROPERTIES OF THE SCOTCHFLEX DELTA CONNECTOR 3M PART NOS. 3482-1000 & 3483-1000

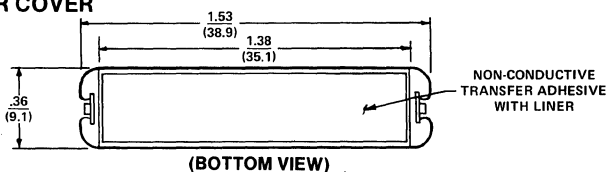
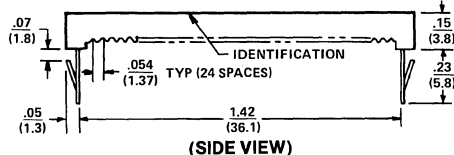
No. of Contacts	3M Part No.	Description
25	3482-1000	pin version
25	3483-1000	socket version

PHYSICAL
Contact housing—Glass reinforced polyester; U.L. Flammability rating 94V-O, encased in chromate plated steel shell
Color—Gray
Contact material—Beryllium copper
Contact plating—.000050" (1.27 μm) gold per MIL-G-45204 over .000050" (1.27 μm) electroless nickel
Marking—Raised figures; 3M and part identification numbers, contact position numbers
Wire accommodation—26 AWG solid
ELECTRICAL
Current rating—1 AMP
Insulation resistance— 5×10^6 ohms minimum
Dielectric strength—>500 volts (sea level)
ENVIRONMENTAL
Temperature rating—-67°F to +221°F (-55°C to +105°C)

3M PART NO. 3482-1000 CONNECTOR BODY

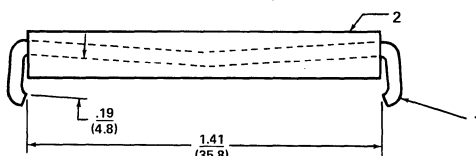


CONNECTOR COVER



3M PART NO. 3448-6 STRAIN RELIEF CLIP

DIMENSIONS	
U.S.	Inches
Metric	(mm)



NOTES:

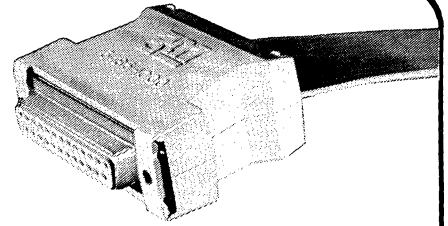
- MATERIAL: STEEL MUSIC WIRE, 19 GA. [.043/(1.09) DIA.]
PLATING: NICKEL
- MATERIAL: EXTRUDED POLYVINYL CHLORIDE
COLOR: GRAY

NOTE: Each SCOTCHFLEX connector is identified by an eight digit part number. When ordering, be sure to include the complete number. (i.e., 3482-1000).

NOTE: While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the specific connector be requested. These sheets contain full dimensional details and are available on request from the SCOTCHFLEX representative in your area.

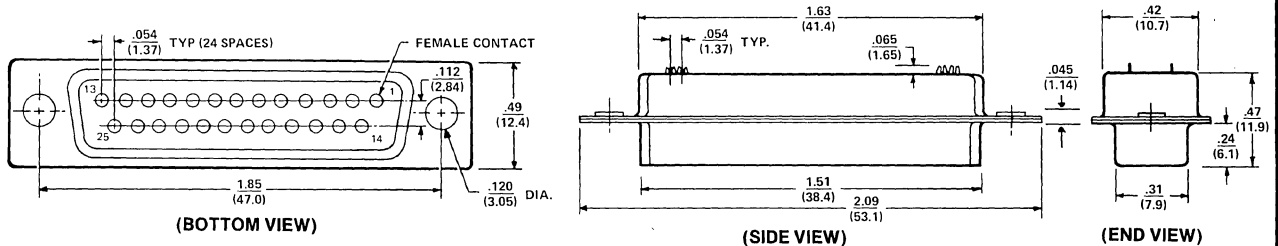
Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®] BRAND DELTA CONNECTOR SYSTEM

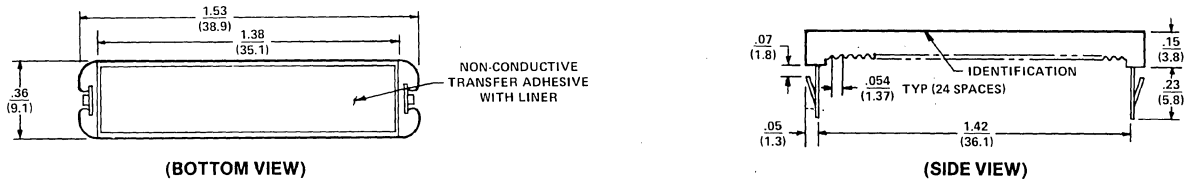


3M PART NO. 3483-1000

CONNECTOR BODY

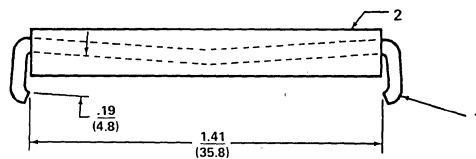


CONNECTOR COVER



3M PART NUMBER 3448-6 STRAIN RELIEF CLIP

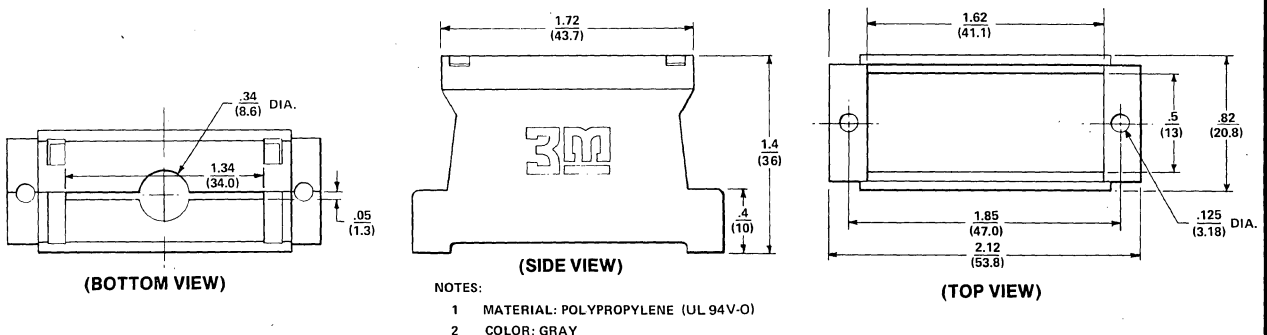
DIMENSIONS	
U.S.	Inches
Metric	(mm)



NOTES:

- 1 MATERIAL - STEEL MUSIC WIRE, 19 GA. [.043/(1.09) DIA.] PLATING - NICKEL
- 2 MATERIAL - EXTRUDED POLYVINYL CHLORIDE COLOR - GRAY

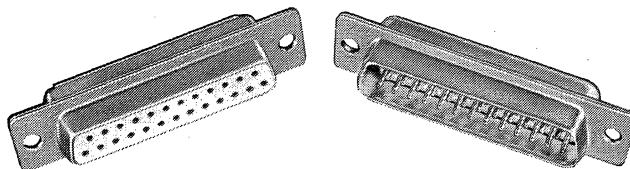
3M PART NUMBER 3485-1000 JUNCTION SHELL



NOTE: While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the specific connector be requested. These sheets contain full dimensional details and are available on request from the SCOTCHFLEX representative in your area.

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®] BRAND DELTA CONNECTOR SYSTEM



3M PART NO. 3349/25 ROUND CONDUCTOR FLAT CABLE

TYPICAL PROPERTIES OF Scotchflex[®] DELTA CONNECTORS

No of Conductors	3M Part No.
25	3349/25
PHYSICAL	
Insulator material—Polyvinyl chloride, U.L. style no. 2651, flammability rating of FR-1.	
Color—Gray	
Conductors—26 AWG solid	
Markings—Red line indicating .050 inch (1.27 mm) center to center conductor area.	
Raised lines running across cable indicating transition area from .050 inch (1.27 mm) to .054 inch (1.37 mm) center. Termination is made outside these lines.	
ELECTRICAL	
Ground Signal Ground (GSG) Configuration	
Impedance—94 ohms (nominal)	
Capacitance—14.6 pF/ft. (47.9 pF/m)	
Inductance—.16 µH/ft. (.52 µH/m)	
Propagation Delay—1.46 ns/ft. (4.79 ns/m)	
Insulation Resistance— 10^{10} ohms/10 ft. (3 m)	
Voltage Rating—300 volts RMS	
Ground Signal (GS) Configuration	
Impedance—137 ohms (nominal)	
Capacitance—8.0 pF/ft. (26.2 pF/m)	
Inductance—.25 µH/ft. (.41 µH/m)	
Propagation Delay—1.42 ns/ft. (4.66 ns/m)	
Insulation Resistance— 10^{10} ohms/10 ft. (3 m)	
Voltage Rating—300 volts RMS	
ENVIRONMENTAL	
Temperature Rating—-4°F to +221°F (-20°C to +105°C)	

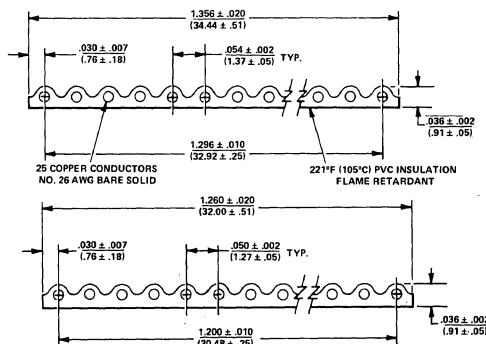
SCOTCHFLEX 3349/25 FLAT CABLE



.050" (1.27 mm)	NO ASSEMBLY ZONE	.054" (1.37 mm)	NO ASSEMBLY ZONE	.050" (1.27 mm)
SPACING 7.85 ± .10 (177.8 ± 2.5)	1.45 ± .10 (36.8 ± 2.5)	SPACING 7.85 ± 2.5 (177.8 ± 2.5)	1.45 ± .10 (36.8 ± 2.5)	SPACING 7.85 ± .10 (177.8 ± 2.5)

NOTES:

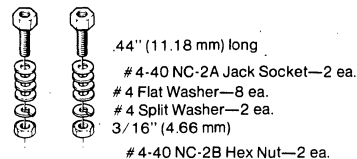
1. Pattern repeats itself every 18.62 ± .25 (473.0 ± 6.4)
2. Cable marking is red stripe down .050 (1.27) spacing, for a lineal length of 7.50 ± .25 (189.5 ± 6.4)



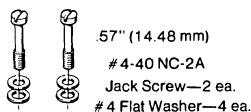
DIMENSIONS	
U.S.	Inches
Metric	(mm)

SYSTEM ACCESSORIES ASSEMBLY KITS

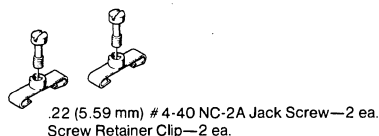
3M PART 3341-1 JACK SOCKET ASSEMBLY



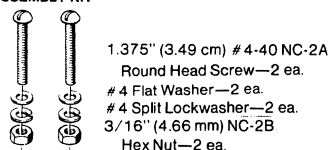
3M PART NO. 3342-2 JACK SCREW ASSEMBLY (LONG)



3M PART NO. 3342-1 JACK SCREW ASSEMBLY (SHORT)



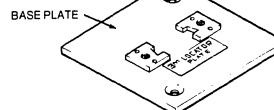
3M PART NO. 3343-1 ASSEMBLY KIT



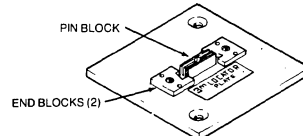
LOCATOR PLATES

FOR ASSEMBLY OF THE SCOTCHFLEX BRAND DELTA CONNECTORS, PART NOS. 3482-1000 AND 3483-1000

3M PART NO. 3443-30 FOR ASSEMBLY OF THE 3483-1000 SOCKET CONNECTOR



3M PART NO. 3443-39 FOR ASSEMBLY OF THE 3482-1000 PIN CONNECTOR

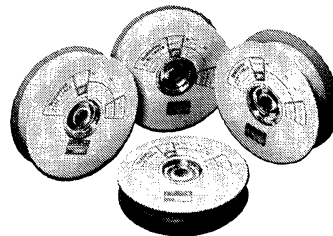


SCOTCHFLEX brand cable is identified by a six digit part - suffix number. When ordering, be sure to include the complete number.

NOTE: While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the specific cable be requested. These sheets contain full dimensional details and are available on request from the SCOTCHFLEX representative in your area.

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

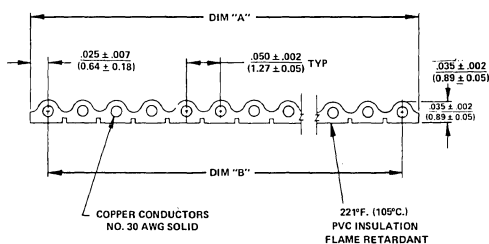
Scotchflex[®] BRAND FLAT CABLES



ROUND CONDUCTOR FLAT CABLE

The 3M Company supplies 6 standard round conductor flat cables. They come in wire sizes #30 AWG Solid, #28 AWG Stranded, #26 AWG Solid and #24 Stranded with up to 50 conductor widths. Depending on the particular cable, there are three center spacings to choose from—.050", .0625" and .075". Being zippable, breakouts can be made when more than one connector is required on an end. With this wide selection, 3M has the right cable to meet your needs.

3M PART NO. 3350/ .050 (1.27) CENTER SPACING

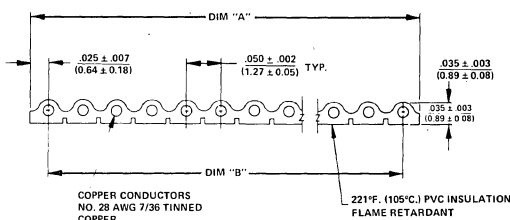


Number of Conductors	3M Part No.	DIM "A"	DIM "B"
10	3350/10	.500 ± .010 (12.70 ± 0.25)	.450 ± .007 (11.43 ± 0.18)
14	3350/14	.700 ± .010 (17.78 ± 0.25)	.650 ± .007 (16.51 ± 0.18)
16	3350/16	.800 ± .015 (20.32 ± 0.38)	.750 ± .011 (19.05 ± 0.28)
20	3350/20	1.000 ± .015 (25.40 ± 0.38)	.950 ± .011 (24.13 ± 0.28)
24	3350/24	1.200 ± .015 (30.48 ± 0.38)	1.150 ± .011 (29.21 ± 0.28)
26	3350/26	1.300 ± .015 (33.02 ± 0.38)	1.250 ± .011 (31.75 ± 0.28)
34	3350/34	1.700 ± .020 (43.18 ± 0.51)	1.650 ± .011 (41.91 ± 0.28)
40	3350/40	2.000 ± .020 (50.80 ± 0.51)	1.950 ± .015 (49.53 ± 0.38)
50	3350/50	2.500 ± .020 (63.50 ± 0.51)	2.450 ± .015 (62.23 ± 0.38)

NOTE:
1 RED MARKING ON ONE EDGE OF CABLE

U.L. STYLE NO. 2651

3M PART NO. 3365/ .050 (1.27) CENTER SPACING



Number of Conductors	3M Part No.	DIM "A"	DIM "B"
10	3365/10	.500 ± .010 (12.70 ± 0.25)	.450 ± .007 (11.43 ± 0.18)
14	3365/14	.700 ± .010 (17.78 ± 0.25)	.650 ± .007 (16.51 ± 0.18)
16	3365/16	.800 ± .015 (20.32 ± 0.38)	.750 ± .011 (19.05 ± 0.28)
20	3365/20	1.000 ± .015 (25.40 ± 0.38)	.950 ± .011 (24.13 ± 0.28)
24	3365/24	1.200 ± .015 (30.48 ± 0.38)	1.150 ± .011 (29.21 ± 0.28)
26	3365/26	1.300 ± .015 (33.02 ± 0.38)	1.250 ± .011 (31.75 ± 0.28)
34	3365/34	1.700 ± .020 (43.18 ± 0.38)	1.650 ± .011 (41.91 ± 0.28)
40	3365/40	2.000 ± .020 (50.80 ± 0.51)	1.950 ± .015 (49.53 ± 0.38)
50	3365/50	2.500 ± .020 (63.50 ± 0.51)	2.450 ± .015 (62.23 ± 0.38)

NOTE:
1 RED MARKING ON ONE EDGE OF CABLE

U.L. STYLE NO. 2651

When ordering SCOTCHFLEX Brand cable be sure to order by complete 6 digit part - suffix number (i.e., 3365/50).

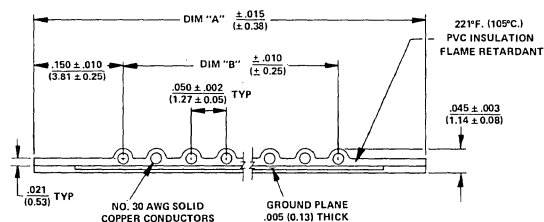
FLAT CABLES WITH GROUND PLANE

In applications where it is especially critical to control or lower cross-talk or inductive coupling, 3M Company offers a #30 AWG solid and #28 AWG stranded flat cable with a copper mesh ground plane embedded in the insulation parallel with the conductors. In addition, a #28 AWG stranded flat cable comes with a drain wire in contact with the ground plane. All these cables have a .050" wire center spacing and are designed to mate with SCOTCHFLEX connectors.

3M PART NO. 3380/ FLAT CABLE WITH GROUND PLANE .050 (1.27) CENTER SPACING

NOTE:

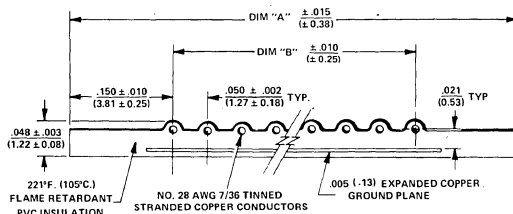
1 GREEN LINE ON INSULATION, U.L. STYLE NO. 2682 ABOVE ONE EDGE CONDUCTOR



3M PART NO. 3469/ FLAT CABLE WITH GROUND PLANE .050 (1.27) CENTER SPACING

NOTE:

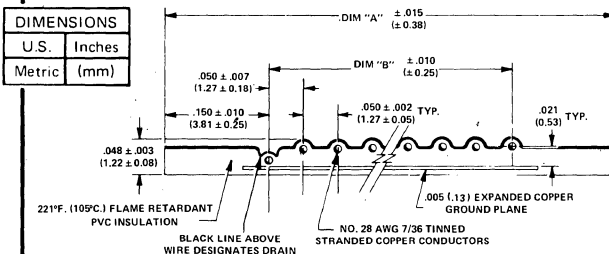
1 RED LINE ON INSULATION U.L. STYLE NO. 2682 ABOVE ONE EDGE CONDUCTOR



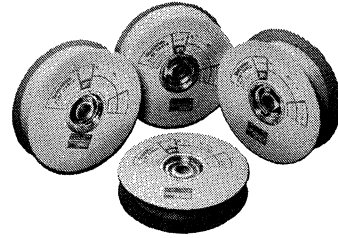
3M PART NO. 3476/ FLAT CABLE WITH GROUND PLANE AND DRAIN WIRE .050 (1.27) CENTER SPACING

NOTE:

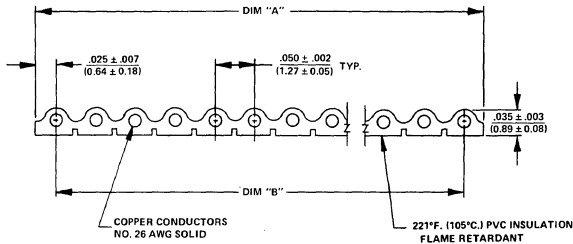
1 BLACK LINE ON INSULATION U.L. STYLE NO. 2682 ABOVE DRAIN WIRE



Scotchflex[®] BRAND FLAT CABLES



3M PART NO. 3306/____ .050 (1.27) CENTER SPACING



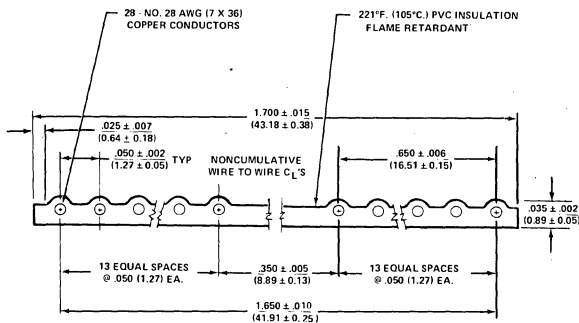
Number of Conductors	3M Part No.	DIM "A"	DIM "B"
10	3306/10	.500 ± .010 (12.70 ± 0.25)	.450 ± .007 (11.43 ± 0.18)
14	3306/14	.700 ± .010 (17.78 ± 0.25)	.650 ± .007 (16.51 ± 0.18)
16	3306/16	.800 ± .015 (20.32 ± 0.38)	.750 ± .011 (19.05 ± 0.28)
20	3306/20	1.000 ± .015 (25.40 ± 0.38)	.950 ± .011 (24.13 ± 0.28)
24	3306/24	1.200 ± .015 (30.48 ± 0.38)	1.150 ± .011 (29.21 ± 0.28)
26	3306/26	1.300 ± .015 (33.02 ± 0.38)	1.250 ± .011 (31.75 ± 0.28)
34	3306/34	1.700 ± .020 (43.18 ± 0.38)	1.650 ± .011 (41.91 ± 0.28)
40	3306/40	2.000 ± .020 (50.80 ± 0.51)	1.950 ± .015 (49.53 ± 0.38)
50	3306/50	2.500 ± 0.20 (63.50 ± 0.51)	2.450 ± .015 (62.23 ± 0.38)

NOTE:

1 RED MARKING ON ONE EDGE OF CABLE

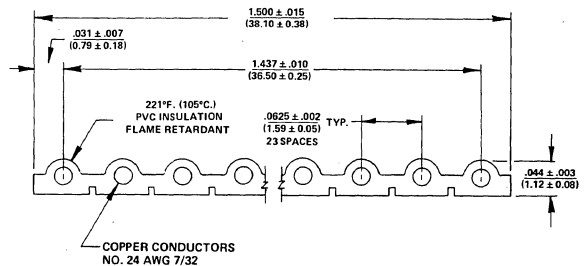
U.L. STYLE NO. 2651

3M PART NO. 3401/28 .050 (1.27) CENTER SPACING 28 CONDUCTORS



U.L. STYLE NO. 2651

3M PART NO. 3451/24 .0625 (1.59) CENTER SPACING 24 CONDUCTORS



NOTE:

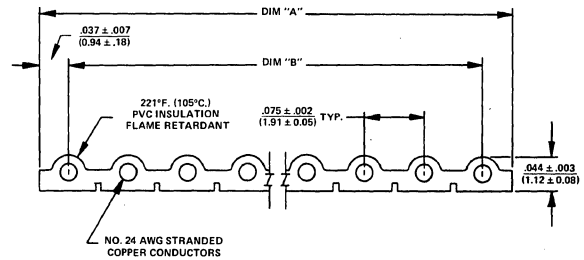
1 RED MARKING ON ONE EDGE OF CABLE

U.L. STYLE 2651

DIMENSIONS

U.S.	Inches
Metric	(mm)

3M PART NO. 3405/____ .075 (1.91) CENTER SPACING



Number of Conductors	3M Part No.	DIM "A"	DIM "B"
28	3405/28	2.100 ± .015 (53.34 ± 0.38)	2.025 ± .011 (51.4 ± 0.28)
36	3405/36	2.700 ± .020 (68.58 ± 0.51)	2.625 ± .015 (66.68 ± 0.38)

NOTE:

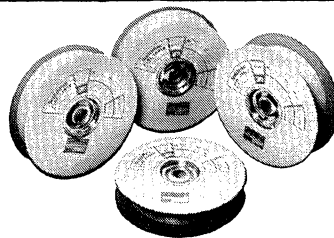
1 RED MARKING ON ONE EDGE OF CABLE

U.L. STYLE NO. 2651

When ordering SCOTCHFLEX Brand cable be sure to order by complete 6 digit part - suffix number (i.e., 3365/50).

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®] BRAND FLAT CABLES

TYPICAL PROPERTIES OF **Scotchflex[®]** BRAND FLAT CABLES

3M Part Number	3350/___	3365/___	3401/28	3306/___	3451/24	3405/28 3405/36	3380/___	3469/___	3476/___
Insulation Material	Polyvinyl Chloride (PVC) U.L. Rated FR-1						Polyvinyl Chloride (PVC) U.L. Rated FR-1		
Color	Gray						Gray		
Edge Marking	Red		None		Red		Green	Red	Black
Center Spacing	.050" (1.27 mm)				.0625" (1.59 mm)	.075" (1.91 mm)	.050" (1.27 mm)		
Conductor	Solid Copper	Stranded Copper		Solid Copper	Stranded Copper		Solid Copper	Stranded Copper	
Conductor Size	30 AWG	28 AWG (7x36)		26 AWG	24 AWG (7x32)		30 AWG	28 AWG (7x36)	
Conductor Quantity	10 14 16 20 24 26 34 40 50	10 14 16 20 24 26 34 40 50	28	10 14 16 20 24 26 34 40 50	24	28 36	40 46 50	14 16 20 26 34 40 50	20 26 34 40 50
Impedance	125 ohms	105 ohms		95 ohms	85 ohms	100 ohms	75 ohms	65 ohms	
Capacitance	12 pF/ft. (39 pF/m)	15 pF/ft. (49 pF/m)		14 pF/ft. (46 pF/m)	16 pF/ft. (52 pF/m)	13 pF/ft. (43 pF/m)	24.0 pF/ft. (78.7 pF/m)	29.0 pF/ft. (95.1 pF/m)	
Inductance	0.23 µH/ft. (0.75 µH/m)	0.20 µH/ft. (0.66 µH/m)		0.16 µH/ft. (0.52 µH/m)	0.17 µH/ft. (0.56 µH/m)	0.17 µH/ft. (0.56 µH/m)	0.20 µH/ft. (0.66 µH/m)	0.14 µH/ft. (0.46 µH/m)	
Propagation Delay	1.42 ns/ft. (4.66 ns/m)	1.40 ns/ft. (4.59 ns/m)		1.42 ns/ft. (4.66 ns/m)	1.29 ns/ft. (4.23 ns/m)	1.33 ns/ft. (4.36 ns/m)	1.68 ns/ft. (5.51 ns/m)	1.65 ns/ft. (5.41 ns/m)	
Insulation Resistance	>10 ¹⁰ ohms/ 10 Ft. (3 m)						>10 ⁹ ohms/ 10 Ft. (3 m)		
Voltage Rating	300 VRMS						300 VRMS		
Temperature Rating	-4°F to +221°F (-20°C to +105°C)						-4°F to +221°F (-20°C to +105°C)		
U.L. Style Number	2651						2682		

FLAT CABLE AND MATING CONNECTOR GUIDE

3M Part No.	Conductor Qty.	Socket	P.C.B.	Card-Edge	D.I.P.
3350/10	10	3473	3474	—	—
3350/14	14	3407	—	—	3406
3350/16	16	3327	—	—	3416
3350/20	20	3421	3422	3461	3460
3350/24	24	—	—	—	—
3350/26	26	3399	3434	3462	—
3350/34	34	3471, 3414	3402	3463	—
3350/40	40	3417	3418	3464	—
3350/50	50	3425	3426	3415	—
3365/10	10	3473	3474	—	—
3365/14	14	3407	—	—	3406
3365/16	16	3327	—	—	3416
3365/20	20	3421	3422	3461	—
3365/24	24	—	—	—	3460
3365/26	26	3399	3434	3462	—
3365/34	34	3471, 3414	3402	3463	—
3365/40	40	3417	3418	3464	—
3365/50	50	3425	3426	3415	—
3306/10	10	3473	3474	—	—
3306/14	14	3407	—	—	3406
3306/16	16	3327	—	—	3416
3306/20	20	3421	3422	3461	—
3306/24	24	—	—	—	3460
3306/26	26	3399	3434	3462	—
3306/34	34	3471, 3414	3402	3463	—
3306/40	40	3417	3418	3464	—
3306/50	50	3425	3426	3415	—

3M Part No.	Conductor Qty.	Socket	P.C.B.	Card-Edge	D.I.P.
3401/28	28	3471-0001	—	—	—
3451/24	24	3450	3470	—	—
3405/28	28	3441	3468	—	—
3405/36	36	—	3378	—	—
3469/14	14	3407	—	—	3406
3469/16	16	3427	—	—	3416
3469/20	20	3421	3422	3461	—
3469/26	26	3399	3434	3462	—
3469/34	34	3471, 3414	3402	3463	—
3469/40	40	3417	3418	3464	—
3469/50	50	3425	3426	3415	—
3380/40	40	3417	3418	3464	—
3380/50	50	3425	3426	3415	—
3476/20	20	3421	3422	3461	—
3476/26	26	3399	3434	3462	—
3476/34	34	3471, 3414	3402	3463	—
3476/40	40	3417	3418	3464	—
3476/50	50	3425	3426	3415	—

TEST METHODS

Impedance, capacitance, and inductance are measured GROUND — SIGNAL — GROUND on round conductor flat cables.

Ground Plane cables are measured CONDUCTOR to GROUND PLANE.

CAPACITANCE & INDUCTANCE

Direct reading reactance meter to measure small reactances at a frequency between 125 KHz and 140 KHz. With cable in copper guard tube and a guard voltage applied to copper tube and two adjacent wires.

IMPEDANCE

TDR. Far end of cable open circuit. Sample length 10 feet (3 m).

PROPAGATION DELAY

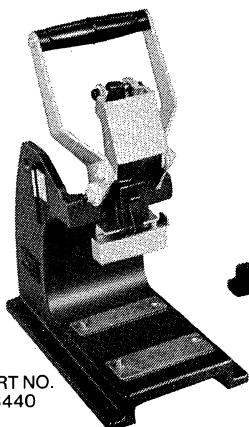
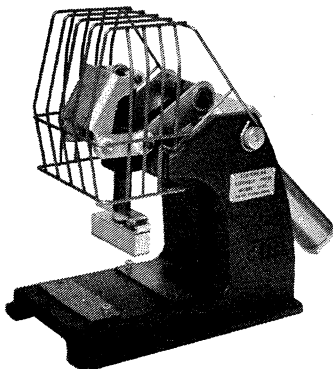
TDR. Sample length 10 feet (3 m). Far end short circuit.

CROSSTALK — Minimum sample length 10'(3 m). 6 ns rise time; 1 MHz repetition rate, 2 to 5 volts pulse amplitude, 10 ns pulse width, sample terminated in Z₀.

For test values on crosstalk, or full description of test methods, consult your local 3M SCOTCHFLEX representative or the SCOTCHFLEX distributor in your area.

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101

Scotchflex[®] BRAND ACCESSORIES

PART NO.
3440PART NO.
3445

REPLACEMENT PARTS KIT

3M PART NO. 3455

2 small nylon bushings	2 10-32 machine screws
2 small nylon washers	2 10-32 nuts
2 large nylon bushings	2 1/4 x 20 nuts
2 large nylon washers	

DIMENSIONS

U.S.	Inches
Metric	(mm)

3M SUPPLIES EVERYTHING NEEDED TO IMPLEMENT THE Scotchflex[®] SYSTEM

The SCOTCHFLEX assembly press is a parallel action device designed specifically for use with SCOTCHFLEX connectors. The proper amount of force is applied to connector components to pierce cable insulation and insure a tight interference fit between connector body and cover. Over center handle action reduces operator fatigue. Positive-stop design insures proper assembly pressure with each connection.

Both hand and pneumatically operated presses are available. These presses are die cast for strength and rigidity, and may be bench mounted, or easily moved from position to position. Special fixtures may also be used with the press to meet the requirements of unique SCOTCHFLEX applications.

With these assembly presses come an assortment of hex wrenches, a pressure platen, 3M Part No. 3442-1, and a shut height gauge block, 3M Part No. 3436-1, for making adjustment settings to insure proper termination of 3M cables and connectors.

SPECIFICATIONS

Part No.	3440	3445
Height	7 1/2 ins. (19.05 cm)	10 ins. (25.4 cm)
Width	5 1/4 ins. (13.34 cm)	5 1/4 ins. (13.34 cm)
Depth	9 1/2 ins. (24.13 cm)	9 1/2 ins. (24.13 cm)
Weight	7 lbs. (30.8 N)	8 lbs. (35.2 N)
Line Pressure Required	65-125 lbs./sq. in.	

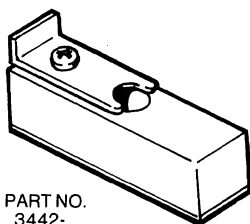
Model 3445 does not include air filtration, air pressure regulation, or actuation control equipment.

Connector locator plates are not included with press.

PLATENS

PLATEN GUIDE

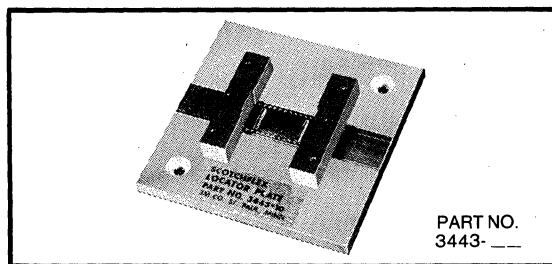
3M Part No.	Description
3442-1	(Standard platen shipped with all assembly presses.) For assembly of all SCOTCHFLEX Connectors, except 3378, 3460, 3461, 3462, 3463, and 3464.
3442-2	For assembly of 3378 P.C.B. Connector.
3442-3	For assembly of 3463 Card-Edge Connector.
3442-4	For assembly of 3461 Card-Edge Connector.
3442-6	For assembly of 3460 D.I.P. Connector.
3442-7	For assembly of 3462 Card-Edge Connector.
3442-8	For assembly of 3464 Card-Edge Connector.

PART NO.
3442-1

LOCATOR PLATE GUIDE

3M Part Number	For Assembly of:
SOCKET CONNECTORS	
3443-1	3399-0000, 3399-1000
3443-2	3407-0000, 3407-1000
3443-3	3414-0000
3443-4	3417-0000
3443-5	3421-0000
3443-6	3471-0000, 3471-0001
3443-7	3425-0000
3443-9	3473-3000, 3421-3000, 3399-3000, 3414-3000, 3417-3000, 3425-3000
3443-20	3441-0000
3443-21	3450-0000
3443-22	3450-0001
3443-23	3473-0000
3443-31	3327-0000
*3443-36	3473-0000, 3421-0000, 3399-0000, 3414-0000, 3417-0000, 3425-0000
P.C.B. CONNECTORS	
3443-8	For assembly after soldering of all versions of: 3474, 3422, 3434, 3402, 3378, 3418, 3426, 3468, and 3470.
3443-15	For assembly before soldering of all versions of: 3474, 3402, 3434, and 3426.
3443-16	For assembly before soldering of all versions of: 3418 and 3422.
3443-19	For assembly before soldering of all versions of: 3378.
*3443-33	For assembly before soldering of 3468.
*3443-34	For assembly before soldering of 3470.

LOCATOR PLATE

PART NO.
3443-10

An assortment of locator plates are available from 3M Company for making the proper connection of SCOTCHFLEX cables to connectors.

D.I.P. CONNECTORS

3443-10	All versions of 3460.
3443-12	All versions of 3406.
3443-13	All versions of 3416.

CARD-EDGE CONNECTORS

3443-11	All versions of: 3461, 3462, 3463, 3464, and 3415.
---------	--

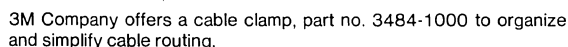
DISCRETE COMPONENT CONNECTOR

3443-35	3447-0000
---------	-----------

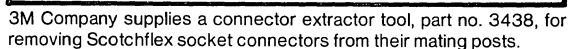
*Available Mid-1975

While the above data was correct at the time of publication, it is recommended that for specification purposes a current Spec Data Sheet on the particular connector be requested. These sheets contain full dimensional details and are available from the Scotchflex sales representative in your area.

CABLE CLAMP



EXTRACTOR TOOL

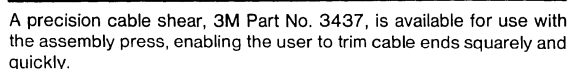


HEADER MOUNTING SCREWS

Where additional header to board mounting is required, use the following screws with the indicated header types.

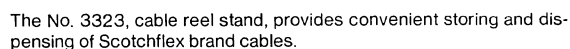
P.C. Board Thickness	Right Angle Contact	Straight Contact
.062" (.57 mm)	2-56 x 3/8"	3M Part No. 3458 (4-40 x 1/4" Type F)
.063" - .125" (1.67 mm - 3.18 mm)	2-56 x 1/2"	3M Part No. 3472 (4-40 x 5/16" Type F)

CABLE SHEAR



A replaceable cutting board, 3M Part No. 3457, and replacement cutting blades, 3M Part No. 3449, are available for order if needed.

CABLE REEL STAND



CABLE REEL STAND SPECIFICATIONS

HEIGHT	9" (22.9 cm)
WIDTH	15" (38.1 cm)
DEPTH	5" (12.7 cm)
WEIGHT	10 lbs. 10 oz. (46.75N)
MATERIAL	Cast Aluminum
FINISH	Black Enamel
SHAFT	Steel, 1" (2.54 cm) dia.
MAXIMUM CABLE WIDTH	3½" (8.89 cm) per side of pedestal
MAXIMUM REEL DIAMETER	14" (35.6 cm)
MOUNTING CENTERS	4.5" (11.4 cm) x 10" (25.4 cm)

Electronic Products Division **3M** COMPANY
3M CENTER • SAINT PAUL, MINNESOTA 55101



Solderless Connectors

UNCONDITIONALLY GUARANTEED

for quick, positive terminations or connections of wire ... solid or stranded

Vaco Terminals and Connectors are produced from the finest materials to give you unequalled accuracy at the lowest possible cost. Ample use of materials means that the current carrying capacity of the devices exceeds that of the wire size they are designed to accept. Uniform, positive connections are made every time with no special skill required.

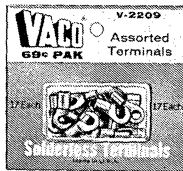
Your choice of insulated or non-insulated styles.

Pure electrolytic copper is carefully annealed to assure perfect crimp and permanent grip.

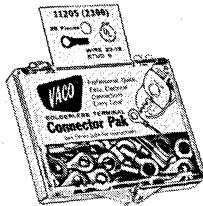
Pure tin plating provides excellent corrosion resistance and electrical conductivity.

PACKAGED 4 CONVENIENT WAYS

The Vaco "V" Pak is a self closing bubble pak card for the small quantity user. Available in 26 popular sizes and two assortment paks. Standard package 5.



The Vaco "D" Pak holds larger quantity in plastic box for on-the-job use. Standard package 5 per shelf carton.



The Vaco "C Pak" features Mod-Pak packaging. Contains 100 Terminals in individual plastic bags to the box ... 5 boxes (500 pieces) to master carton.



The Vaco "MB" Pak features Mod-Pak packaging for the largest user. Contains 10 Mod-Paks of 100 Terminals each to the carton.

10000 SERIES

Non-Insulated, Single Grip

Stock No.	Wire Size	Stud Size	Hole Dia.	Length	Width
-----------	-----------	-----------	-----------	--------	-------

Ring Tongue



11204	22-18	4	7/64	19/32	15/64
11205	22-18	5-6	9/64	19/64	15/64
11206	22-18	5-6	9/64	21/32	19/64
11208	22-18	8	11/64	43/64	21/64
11210	22-18	10	13/64	43/64	21/64
11214	22-18	12-1/4	17/64	59/64	15/32
11238	22-18	3/8	25/64	1-1/16	17/32
11304	16-14	4	7/64	9/16	1/4
11305	16-14	5-6	9/64	9/16	1/4
11306	16-14	5-6	9/64	43/64	21/64
11308	16-14	8	11/64	23/32	21/64
11310	16-14	10	13/64	23/32	21/64
11314	16-14	12-1/4	17/64	59/64	15/32
11338	16-14	3/8	25/64	1-1/16	35/64
11406	12-10	5-6	9/64	23/32	25/64
11408	12-10	8	11/64	23/32	25/64
11410	12-10	10	13/64	23/32	25/64
11414	12-10	12-1/4	17/64	63/64	17/32
11438	12-10	3/8	25/64	1-1/32	39/64

Spade Tongue



13204	22-18	4	7/64	17/32	19/64
13206	22-18	5-6	9/64	5/8	19/64
13208	22-18	8	11/64	23/32	13/32
13210	22-18	10	13/64	23/32	13/32
13306	16-14	4-6	9/64	5/8	19/64
13308	16-14	8	11/64	23/32	13/32
13310	16-14	10	13/64	23/32	13/32
13406	12-10	4-6	9/64	11/16	23/64
13408	12-10	8	11/64	11/16	23/64
13410	12-10	10	13/64	23/32	13/32

Spade Tongue With Flange



14206	22-18	4-6	9/64	11/16	19/64
-------	-------	-----	------	-------	-------

Hook Tongue



15408	12-10	8	11/64	43/64	23/64
15410	12-10	10	13/64	23/32	13/32
15206	22-18	4-6	9/64	43/64	23/64
15208	22-18	8	11/64	43/64	23/64
15210	22-18	10	13/64	43/64	23/64
15306	16-14	4-6	9/64	19/32	5/16
15308	16-14	8	11/64	21/32	23/64
15310	16-14	10	13/64	45/64	13/32

Flag Tongue



16210	22-18	8-10	13/64	41/64	3/8
16310	16-14	8-10	13/64	5/8	3/8
16410	12-10	8-10	13/64	3/4	3/8

Butt Connectors



17202	22-18	—	—	5/8	9/64
17302	16-14	—	—	5/8	5/32
17402	12-10	—	—	11/16	7/32

Parallel Connectors



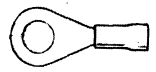
17203	22-14	—	—	21/64	9/64
17405	18-10	—	—	21/64	7/32

60000 SERIES

Bellmouth Insulated

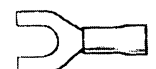
Stock No.	Wire Size	Stud Size	Hole Dia.	Length	Width
-----------	-----------	-----------	-----------	--------	-------

Ring Tongue



61204	22-18	4	7/64	51/64	15/64
61205	22-18	5-6	9/64	51/64	15/64
61206	22-18	5-6	9/64	55/64	19/64
61208	22-18	8	11/64	7/8	21/64
61210	22-18	10	13/64	7/8	21/64
61214	22-18	12-1/4	17/64	1-1/8	15/32
61238	22-18	3/8	25/64	1-17/64	17/32
61304	16-14	4	7/64	51/64	1/4
61305	16-14	5-6	9/64	51/64	1/4
61306	16-14	5-6	9/64	29/32	21/64
61308	16-14	8	11/64	61/64	21/64
61310	16-14	10	13/64	61/64	21/64
61314	16-14	12-1/4	17/64	1-5/32	15/32
61338	16-14	3/8	25/64	1-19/64	35/64
61406	12-10	4-6	9/64	1-1/32	25/64
61408	12-10	8	11/64	1-1/32	25/64
61410	12-10	10	13/64	1-1/32	25/64
61414	12-10	12-1/4	17/64	1-19/64	17/32
61438	12-10	3/8	25/64	1-13/32	39/64

Spade Tongue



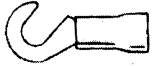
63204	22-18	4	7/64	47/64	19/64
63206	22-18	5-6	9/64	53/64	19/64
63208	22-18	8	11/64	59/64	13/32
63210	22-18	10	13/64	59/64	13/32
63306	16-14	4-6	9/64	55/64	19/64
63308	16-14	8	11/64	61/64	13/32
63310	16-14	10	13/64	61/64	13/32
63406	12-10	4-6	9/64	1	23/64
63408	12-10	8	11/64	1	23/64
63410	12-10	10	13/64	1-1/32	13/32

Spade Tongue With Flange



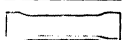
64206	22-18	4-6	9/64	57/64	19/64
-------	-------	-----	------	-------	-------

Hook Tongue



65206	22-18	4-6	9/64	7/8	23/64
65208	22-18	8	11/64	7/8	23/64
65210	22-18	10	13/64	7/8	23/64
65306	16-14	4-6	9/64	53/64	5/16
65308	16-14	8	11/64	57/64	23/64
65310	16-14	10	13/64	15/16	13/32

Butt Connectors



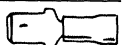
67202	22-18	—	—	1-1/16	—
67302	16-14	—	—	1-1/16	—
67402	12-10	—	—	1-1/16	—

Pigtail Connectors



67203	22-14	—	—	3/4	21/64
67405	18-10	—	—	53/64	15/32

Quick Connects Male Tab

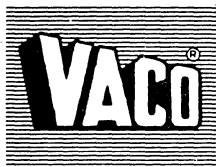


68202	22-18	—	—	29/32	5/16
68301	18-14	—	—	63/64	1/4
68401	12-10	—	—	29/32	5/16

Female Tab



68203	22-18	—	—	1-1/4	9/32
68302	18-14	—	—	63/64	1/4
68403	12-10	—	—	1-1/4	9/32



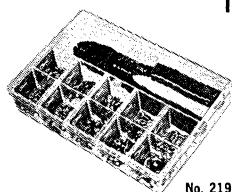
Solderless Connector Kits & Crimping Tools

Illustrations Actual Size

Metal Tab 18201 Wire 22-18	Butt Connector 17202* Wire 22-18	Butt Connector 17302* Wire 16-14	Butt Connector 17402* Wire 12-10	Adapter (Snap to Male) 18001	Adapter (Male to Female) 18002	Adapter (Screw to Tab) 18006 Stud 4-6
Adapter (Snap to Female) 18007	Adapter (Screw to Tab) 18010 Stud 8-10	Female Tab 18204 Wire 22-18	Male Tab 18301* Wire 16-14	Female Tab 18302* Wire 16-14	Angle Male Tab 18303 Wire 16-14	Angle Female Tab 18304 Wire 16-14
Snap Terminal 19301 Wire 16-14	Snap Terminal 19303 Wire 16-14	Snap Stop Lite Conn. 19305	Snap Connector 19302	See facing page for complete selection of Vaco solderless terminals in 4 convenient package types.		

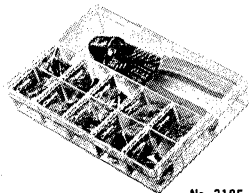
*Available in Insulated Style Also

TERMINAL KITS



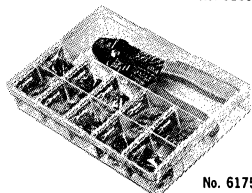
No. 2195-63

No. 2195-63 Service Kit. Kit contains 10 different types of popular electrical, radio and TV single-grip terminals and No. 1963 crimping tool. Terminals included are: 11205, 11206, 11210, 11305, 11306, 11310, 14206, 13306, 13310, 15208.



No. 3185-63

No. 3185-63 Service Kit. Especially designed for the appliance, automotive and electrical equipment service man. Contains varied assortment of popular quick connect terminals and adapters plus No. 1963 crimping tool. Terminals included are: 18301, 18302, 18303, 18304, 18001, 18002, 18008, 18007, 19301, 19302.



No. 6175-63

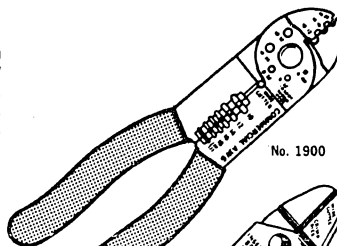
No. 6175-63 Service Kit. Kit contains 10 different types of popular insulated single-grip terminals for electrical, radio and TV plus No. 1963 crimping tool. Terminals included are: 51205, 51206, 51210, 51305, 53206, 53306, 53310, 51306, 51310, 54206.



No. 5000-63 Non-Insulated "Cash Register" Assortment. Heavy steel box contains 20 compartmented sections each with supply of 50 single-grip, non-insulated terminals (1000 in all). Complete with identification card in cover for easy selection of any terminal. Size: 13-1/4"x9-1/4"x2".

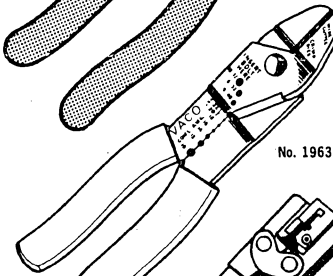
No. 4900-63 Insulated "Cash Register" Assortment. Same as No. 5000-63 except assortment contains 500 insulated, single-grip terminals in 20 different types and sizes. Plastic insulation is color-coded for size. Size: 13-1/4"x9-1/4"x2".

ATTACHING TOOLS



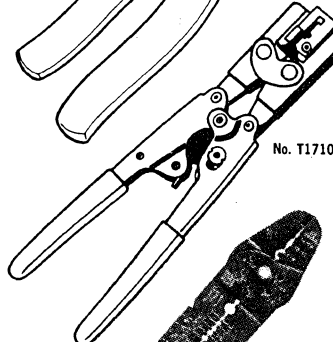
No. 1900

No. 1900 Tool. Features specially designed crimping dies for use on non-insulated type terminals ... forms cold weld between wire and terminal barrel. Cuts wire, strips wire and crimps terminals 22 to 10 gauge AWG. Plastic comfort grip handles.



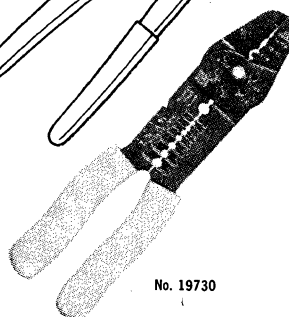
No. 1963

No. 1963 Tool. Patented, all purpose wiring tool cuts wire, strips wire, crimps insulated and non-insulated terminals and slices 6 sizes of bolts (4-40, 5-40, 6-32, 8-32, 10-32, and 10-24). Special features include end positioned wire cutter for reaching into hard-to-get-at places, and new bolt slicing principle that permits less hand pressure for slicing bolts with no burrs to file. Plastic comfort grip handles.



No. T1710

No. T1710 Tool. One tool ... one die ... crimps all styles of insulated and non-insulated terminals in wire range from 22-10 gauge AWG. Built-in ratchet with safety release assures uniform crimps every time, and compound lever action from narrow span handles puts "ease in the squeeze." Terminals are quickly positioned for double crimps by special terminal locator. Plastic comfort grip handles.



No. 19730

No. 19730 Wire Plier. Unique, highly versatile wiring tool will crimp 7mm ignition terminals and 6 and 8 gauge non-insulated terminals, as well as 10 to 22 AWG insulated and non-insulated terminals. Other features include a wire cutter, stripping dies and bolt cutting dies. Large, comfortable plastic cushion grip handles.

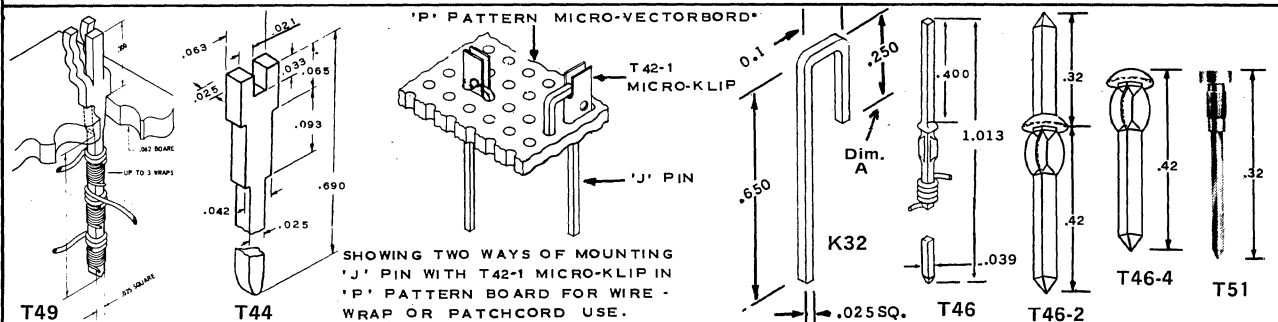


Vector

WIRE WRAPPABLE TERMINALS – TOOLS

WIRE WRAPPABLE TERMINALS AND PINS

Vector "wrap-post" terminals are stamped from high grade phosphor bronze (for hardness) and have sharp corners (maximum radius .003") for "gas-tight" connections when properly wrapped with Vector P160-4 Power Wrapper or other wrapping equipment. Like many other Vector terminals, wrap-post terminals may be installed with inexpensive hand tools. As a result of their unique board holding design, when properly installed, terminals hold tightly to meet all production requirements. Wrap-post terminals may be installed wherever required without high cost machines. They are ideal for building sub-assembly production boards for later incorporation in larger assemblies. Most models fit 0.042" dia. circuit board holes ("P" Pattern Micro-Vectorbord®) and those with knurled or "stepped" shank designs may be used in plated-through holes. Different tail lengths accommodate single to multi-level wraps.



T49 TRIFURCATED KLIP-WRAP

Unique three-fingered clip on upper end makes this a time-saving terminal for production or experimental uses. The spring clip holds leads from 0.018" to 0.025", 0.032" or 0.040" until soldered. Hand Insertion Tool P156 is adequate for installing a few at a time, but Spring Impact Tool P158 and D-8 Die Point are recommended for larger quantity installation due to the speed and ease of use.

T44 MINIWRAP

Low profile upper end has .021" wide by .055" deep slot for laying in small wires. Ideal for miniaturized assemblies which are to be wire wrapped.

K32 "J" PIN

Lowest cost wrappable terminal. May be used alone in circuit board hole by inserting into two adjacent 0.028" to 0.042" dia. holes and bending shorter leg over for retention. Hooked end can also be embedded in encapsulated assemblies and wraps made on protruding tail. Illustration also shows terminal being used to provide wire wrappable extension tail to T42-1, a solderable Micro-Klip terminal.

T46 MINIWRAP - 0.028" SQ.

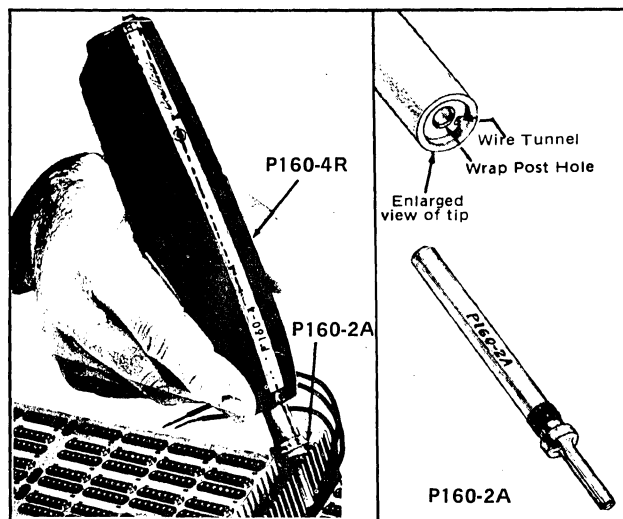
Sturdy double ended terminal fits 0.042" dia. holes. Has flanged mid-section.

STAR SERIES T46-2,-3,-4 - 0.025" SQ.

This 0.025" sq. double ended terminal stands rigid in 0.042" holes without wobble due to four protrusions on the terminal corners in the terminal midsection. It is ideal for printed circuit applications because the seating flange creates a natural solder fillet bonding point.

T51 SERIES

Lowest profile rounded head is low enough to fit beneath installed DIP packages. Head diameter is .072" and may be used as a solder point for wave or "tack" soldering.



WIRE WRAPPING TOOLS

The Vector P160-2A Tool for wrapping wire is the ideal, low-cost manual tool for making solderless wrapped connections. The hardened bit insures long life. The effective radius of .070" permits working on terminals spaced 0.1" apart. The tool will wrap 0.025-0.028" sq. Wrap-Posts (standard Vector terminals), and its 0.56" minimum post hole depth permits multi-level wrap capability. Wire sizes range from 26 ga. through 30 ga., with 28 ga. (0.0129" dia.) preferred. Tool may be used for wrapping bare wire point to point, or for continuous strapping using bare wire fed through the back end of the tool.

P160-1A Dual-Way Unwrap Tool slips over terminal and is turned to unwrap wire which was wrapped either right or left. Use with P160-4L for powered unwrapping of wires wrapped clockwise, and with P160-4R for unwrapping wires wrapped counter-clockwise.

The convenience of a power tool is supplied by the P160-4R (Right Hand) Rechargeable Electro-Tool. This lightweight unit (9 oz.) accepts the P160-2A Manual Wrapping Tool (see above) in its chuck. The sturdy, shock-resistant, high torque P160-4R is shaped in a straight configuration, convenient for working on horizontal as well as vertical panels. Just a touch of the switch on its side with the index finger provides 6 to 8 gas-tight wraps. May be used remotely without cord for many hours without recharging--or may be used with cord to extend its working time.

P160-2A Manual Wrapping Tool

P160-4R Power Wrapper, 110V to 2.9 VDC recharging unit, wall hanger, 6' plug-in cord. Order P160-4L (for left hand).

P160-1A Manual Unwrapping Tool

2323A-28-3 28 ga. bare tinned copper wrapping wire, 50' roll

2323A-28-4 28 ga. tinned copper wrapping wire, Kynar insulated, 50' roll

2323A-32-4 Belsol Solder-Through insulated wrapping wire, 32 ga., 50' "

ORDERING INFORMATION

Supplied in Pkg. 100 or 1000

Part No./Plating	Tail Lgth.	Hand Insertion	P158 Tool	Install in
Tin	Gold	Below 1/16" Bd.	Tool	w/ Die Point: Hole Dia.
T49	T49A	.560	P156	D-8 .042
T49-1	T49A-1	.388	P156	D-8 .042
T44	T44-1	.500	A13	.042

Part No.	Dimension "A"	Insertion Tool	For Stacking--	Install in
K32	.250"	Not	P158 Tool Plus:	Hole Dia.
K32-2	.170"	Required	D-14 Die; A-14 Anvil	.028" min.
K32-3	.140"		D-14 Die; A-14 Anvil	.028" min.

Part No./Plating	Tail Lgth.	Hgt. Above	Lgth. Below
Tin	Gold	O/A Lgth.	Board
T46	T46-1	1.013	.400 .950
T46-2	T46-2A	.74	.32 .358
T46-3	T46-3A	1.02	.42 .538
T46-4	T46-4A	.42	.030 .358

For T46-1: Order P158 Tool w/ D7-1 Die Pt. or P133A Hand Tool
For T46-2,-3: Order P158 Tool w/ D7 Die Pt. (for T46-4: D10 Die Pt.) or P133B Hand Tool

Part No.	Material	For Hole Dia.	O/A Lgth.	Hgt. Above Board	Lgth. Below 1/16" Board
T51	Phosphor Bronze	0.042"	.35	.03	.258


Vector

SOLDERABLE TERMINALS – TOOLS

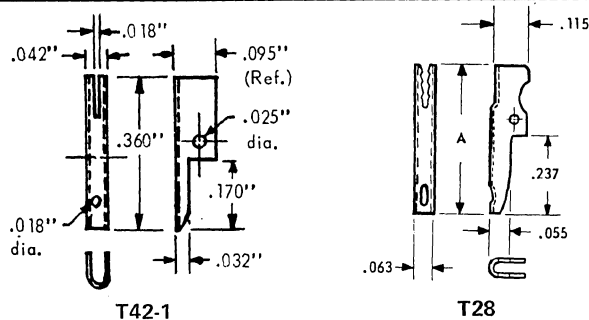
SOLDERABLE TERMINALS AND PINS

Stamped Push-In Terminals -- Hold **WITHOUT** Staking Faster to Install -- Inexpensive -- Hold Component Leads Until Soldered

Vector Push-In Terminals for All the Most Popular Hole Sizes -- 0.042", 0.062", 0.093"

Suitable for PC Board Production, Prototyping and Experimenting

No Expensive Installation Machines Required -- Just Inexpensive Hand Tools

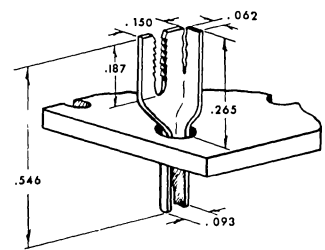


T42-1

T28



T28-1



T9.4

T42-1 MINIATURIZED COMPACT PUSH-IN

Fits 0.042" dia. holes such as in "P" and "Q" Pattern Micro-Vectorbord® and can be mounted on 0.1 in. centers side-to-side. Tintillate plated. Main slot holds three to four 0.025" dia. 22 ga. wires, two 0.032" dia. 20 ga. wires, or five 0.016" dia. 26 ga. wires. Cross holes in upper part accommodates 0.025" wire (22 ga.). Small hole in bottom tab accepts 0.018" transistor size wires. Ideal for IC work because leads can be laid in slots or pass through terminal vertically. By addition of soldered K32 "J" pin series terminal, converts to wire wrappable type (see illustration, on Vector wrappable terminal page).

T28 SERIES

Compact push-in fits 0.062" dia. holes in printed circuit boards and Vectorbord® Patterns B,F,G and H. Deep springy main slot holds leads in serrated teeth until soldered; additional cross hole is useful for busing; and tab end is furnished with slot or hole as indicated. 20 ga. 0.032" dia. wires may be run down center of terminal. Staking is not required, but may be done by flattening the tab end with a pair of flats, or flaring the tab end and subsequently cutting across the "U" with a pair of diagonal pliers. Tintillate or silver plated. All models in phosphor bronze material.

Installation of T28:

P91 Insertion Tool has terminal holding hole and 1/4" metal shaft for hand use or mounting in arbor or drill press. P91A has wooden handle on 1/4" metal shaft with terminal holding hole in end. "Pusher" tool may be readily made by using 1/2w or 1 watt resistor with wire on one side cut to about 9/16" for guiding terminal down into hole and pushing in.

T9.4 AND T9.6 SERIES

Push-in type fits 0.093" dia. holes in printed circuit boards or Vectorbord® "A" and "AA" Patterns. Serrated teeth (on all except T9.4A type) holds leads 0.032" to 0.040" in slots until soldered. Sturdy construction holds larger components readily. Wires of up to 0.040" may be passed down through center slot. Staking is not required, but may be done by flaring the "U" shaped end with round nose pliers and subsequently cutting across the flare with diagonal cutting pliers. Supplied with tintillate plating for easy soldering. T9.6 type is beryllium copper and has more "spring" action in slots and shank.

Installation of T9.4 and T9.6 Types:

P122B Insertion Tool holds terminal in end and has wooden handle. Long nose pliers may also be used.

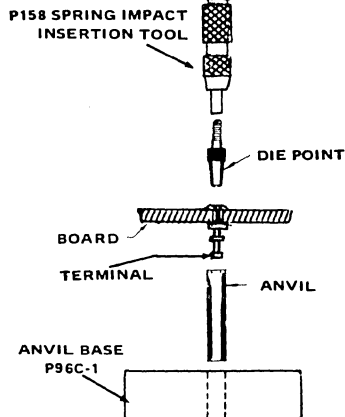
ORDERING INFORMATION

Supplied in Pkg. 100 or 1000

Part No.	Material	For Hole Dia.	O/A Lgth.	Hght.Above Board	Lgth.Below 1/16"Bd.
T42-1	Beryll. Copper brite tin plated	0.042"	.360"	.190"	.107"

Part No.	Plating	Tab End Style	For Hole Dia.	O/A Lgth.	Ht.Above Board	Lgth.Below 1/16"Bd.
T28	Tintillate	Hole	0.062"	.437"	.200"	.175"
T28S	Silver	Hole	0.062"	.437"	.200"	.175"
T28-1	Tin	No Hole	0.062"	.325"	.200"	.063"
T28S-1	Silver	No Hole	0.062"	.325"	.200"	.063"

Part No.	Material	Main Slot Style	For Hole Dia.	O/A Lgth.	Ht.Above Board	Lgth.Below 1/16"Bd.
T9.4	.016" Half Hard Brass	Serrated	0.093"	.562"	.203"	.296"
T9.4A		Smooth	0.093"	.562"	.203"	.296"
T9.6	.016" Beryllium Copper	Serrated	0.093"	.605"	.324"	.218"



SPRING IMPACT TOOL P158 AND ACCESSORIES

The P158 spring loaded installing tool delivers an adjustable striking force of 18 to 34 lbs. to a terminal anvil or installing die screwed into the end. It is ideal for production terminal and wrap-post installation because of the uniform striking pressure resulting in well-seated terminals. The tool may be adapted to any drill or arbor press accepting a 1/2" shank furnished on the P158-1 Adapter. Anvils and dies are available for use with nearly all Vector terminals and many screw machine terminals.

Part No.	Description
P158	Spring Impact Insertion Tool
P96C-2	Holder to adapt die point to arbor or drill press, or to adapt die point to anvil base
P96C-1	Anvil Base
P158-1	Holder to adapt P158 for arbor or drill press

ALIGNMENT BLOCK MB45-20-062

This alignment block is 5/8" high by 3/4" long by 2 1/4" wide and has holes on 0.1" centers. The block is used to insure perpendicularity of wrap-post tails during their installation in circuit boards. Additionally, it provides support during installation of wrap-post or other high-insertion-force terminals.



Vector

D.I.P. SOCKETS – PINS – CONTACTS

K24 - K41 SERIES

KNURLED SHANK PINS

New diamond knurled shank phosphor bronze pins for 0.042" dia. circuit board holes seat firmly and are "rockless." Recommended for use in epoxy or polyester glass boards only. P158 Impact Tool with D7-2 Die Point is recommended, but Hand Insertion Tool P133A may be used.

Supplied in Pkg. 50 or 1000

Part No.	Tintill. Nick/Gold	O/A Lgth.	Dimensions			
			A	B	C	D
K24C	K24A	.650	.255	.375	.075	.080
K41C	K41A	.753	.255	.478	.075	.080

PHOSPHOR BRONZE PINS TO FIT 0.040" DIA. HOLES

Supplied in Pkg. 100 or 1000

Part No.	Tintill. Nick/Gold	O/A Lgth.	Dimensions				Hand Push-In Tool	P158 Tool + Die Point:
			A	B	C	D		
K26C	K26A	3/8"	.160	.195	.080	.080	P133A	D7-2
K27C	K27A	3/8"	.160	.195	.050	.050	P131A	---
K30C	K30A	.550"	.225	.225	.305	.085	P133A	D7-2
K31C	K31A	3/8"	.160	.195	.075	.060	P133A	D7-2
K36C	K36A	.705"	.293	.400	.040	.050	P131A	---
K37C	K37A	.415"	.255	.140	.042	.050	P131A	---
K38C	K38A	.700"	.080	.600	.085	.062	P133A	D7-2

K31 SERIES

R30, R31, R32 SOCKET PINS

R23A, R24A CUP RECEPTACLES

T45-4 KLIP-STRIP

SOCKET CONTACTS FOR INTEGRATED CIRCUITS

SOCKET PINS

High quality beryllium copper gold plated four-fingered contacts are housed inside gold plated brass screw machine terminals with solderable or 0.025" sq. wire wrappable tails for installing wherever required in 1/16" thick circuit boards. Models R30 and R31 have lower profile than low profile DIP sockets and press fit into 0.055" dia. holes. Model R32 fits 0.042" dia. holes in "P" Pattern Micro-Vectorbord® or DIP Plugboards.

		Dimensions					Supplied in Pkg.:
Part No.	Tail Type	A	B	C	D	E	
R30	Solder	.250	.100	.072	.030	---	25, 100, or 1000
R31	WW	.703	.500	.072	.030	---	25, 100, or 1000
R32	WW	.745	.500	.072	.155	.075	25, 100, or 1000

P158 Impact Insert. Tool w/D10 Die Point inserts R30, R31; **w/D9 Die Point** inserts R32. **P158-1 Holder** adapts Tool to drill or arbor press.

SOCKET PINS FOR TRANSISTORS

Low cost gold plated beryllium copper socket pin accepts round wires, such as L.E.D.s and transistor leads, 0.014" to 0.017". Pins press-fit in 0.1" centers in 0.042" dia. holes in "P" Pattern Micro-Vectorbord®, DIP Plugboards, or drilled circuit boards. Extremely low profile (extends 0.015" above 1/16" thick circuit board) pins are 0.230" long and may be wave or hand soldered into circuits. R41 Socket Pin Pkg. 50, 1000

DIP SOCKETS

Vector DIP sockets have high quality beryllium copper or phosphor bronze gold plated contacts in glass filled nylon castings. Tapered lead entry on all models facilitates DIP insertion and castings are "keyed" for proper orientation. All models will fit "P" Pattern Micro-Vectorbord® or DIP Plugboards. Contact tails are 0.025" sq. for wrapping or solder tab type as indicated. Solder tab models have barrier to prevent solder wicking up inside contact.

No. Contacts	Wire Wrap Tail Type		Solder Tab Tail Type (Regular Hght.)		Solder Tab Tail Type (Low Prof.)	
	Pkg. 5, 25	Pkg. 3, 15	Pkg. 5, 10	Pkg. 3, 15	Pkg. 5, 10	Pkg. 3, 15
14	16	24	14	16	24	14
Casting Lgth.	.762	.862	1.280	.762	.862	1.280
Casting Wdth.	.400	.400	.700	.400	.400	.700
Casting Hght.	.280	.280	.280	.280	.280	.150
Spacing Betw. Contact Rows	.300	.300	.50	.300	.300	.50
Tail Style	WW	WW	WW	WW	WW	WW
Lgth. Below Casting	.684	.684	.690	.145	.145	.150
Casting	max.	max.	max.	max.	max.	max.

P150 DIP Extractor Tool and **P157 DIP Inserting Tool** for 14- and 16-pin units - prevent bent leads; **P157** guides DIPs into sockets. (Not Illustr.)

KLIP-STRIPS

For leads 0.055" to 0.032" max. diameter. Handy low resistance solderless contacts are ideal for use as test points, or for plugging in devices such as operational amplifiers with random spaced leads or for DIP or transistor leads. Clips are furnished with or without press-in mounting pins for push-in or adhesive mounting on circuit boards. Only 0.095" wide by 0.382" long, Klip-Strips have 4 top entry holes into a multiple tandem clip. Klip-Strips have insulated brass shells and beryllium copper contacts with fused tin lead plating.

T45-4	Klip-Strip w/two .040" mtg. pins spaced 0.2"	Pkg. 16 or 100
T45A-4	Klip-Strip without mounting pins	Pkg. 16 or 100

CUP RECEPTACLES FOR 0.040" DIA. PINS

Vector Cup Receptacles accept 0.040" dia. Inboard Pins. High reliability press formed phosphor bronze contacts are positioned in brass shells with contact tabs emerging through a slot in one end. May be mounted anywhere on 1/16" or 3/32" panels in 0.140" dia. holes with staking tools listed below. Cup spacing should not be less than 0.2". A special staking anvil for the 0.2" spacing is listed giving greater clearance between the edges than the standard anvil. Staking and holding tools have 1/2" dia. shank for arbor or drill press use. P95 provides uniform "roll"; P95A provides oblong "roll" for 0.2" spacing.

SPECIFICATIONS.

Cup: Half hard brass, bright tin plate per MIL-T-10727.

Contacts: Phosphor bronze, nickel plate per QQ-N-45204, Type II.

Part No.	Description	Dim. A	Circular Roll	Oblong Roll
R23A	Cup Receptacle for .062" thick board.	.095	P95	P95A
R24A	Cup Receptacle for .093" thick board.	.127	P95	P95A

P95B Cup Holder - Use for both stakers.

SLIP-ON CONTACTS FOR 0.025" SQ. POSTS

Use for solderless connection to 0.025" sq. posts on Vector Wrap-Post terminals or I.C. sockets. Loose contacts are tin plated and supplied without insulation. "Daisy chain" type are gold plated, insulated, and connected to No. 26 vinyl insulated wire 5" apart.

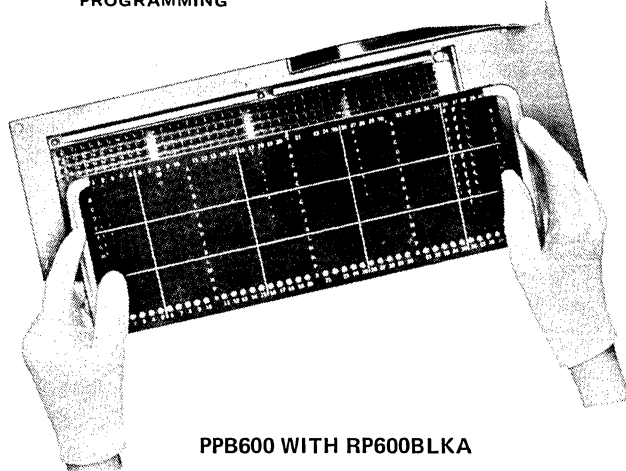
T120	Slip-on single contacts, solder type, tin plated.	Pkg. 50
T120-1	Slip-on contacts, "Daisy Chain" spaced 5", No. 26 insul. wire, nickel & gold plate. Blue insulation.	Reel 50 or Reel 250



Vector

PATCHBOARD PROGRAMMING SYSTEMS

For: **RELIABILITY — TEST AND CONTROL SYSTEMS**
LONG LIFE, LOW NOISE CONNECTIONS
204, 300, 450, 600, 1200 CONTACT SYSTEMS
ANALOG AND DIGITAL COMPUTER
PROGRAMMING



PPB600 WITH RP600BLKA

PREPROGRAMMING PATCHBOARDS

Functionally, Vector preprogramming patchboard systems work as a multi-contact switch which makes up to 1200 connections at the throw of a lever. These connections can be made in any combination due to the program panel. Contacts on the back of the receptacle frame are connected by soldering or wire wrapping to the functions being controlled or tested. Interconnection arrangements are set up on the removable program panel with patchcords which make contact with the receptacle frame contacts when the program panel is put into the frame and engaged by depressing the hand lever. Test programs may be pre-arranged in extra program panels, thus speeding up test running by eliminating costly reprogramming time between tests.

SPECIFICATIONS.

Receptacle Frame Contacts: Heat treated beryllium copper, nickel plus tin or gold plating, staked in epoxy laminate. Wire wrappable types (W) have wrap tails; solder contact models have 2 holes in tabs for wire attachment.

Frame: Welded steel with hardened steel cam engagement mechanism, grey painted finish.

Removable Program Panels: Black paper based phenolic or epoxy paper to special order.

Rack Adapter Plate: 19" wide with holes for rack mounting, 1/8" thk. steel, painted light grey, with cutout for receptacle frame.

Operational: Maximum operating voltage 1500 V.D.C. or 1000 V.A.C. Leakage Resistance Between Adjacent Contacts: In excess of 5000 megohms.

Continuous Current Rating: Max. 5.0 amps, AC/DC.

Capacitance Between Any Two Contacts: 2.5 mmfd. max.

Total Resistance At Contact: Less than .01 ohms from nickel plated contact to nickel plated plug; less than .003 ohms from gold flashed contact to gold flashed plug.

MATING PROGRAM PANELS†

No. of Contacts	RECEPTACLE FRAME NO.			OVERALL DIMENSION		
	Tin-Plated Contacts	Gold-Plated Contacts	Gold-Plated WW Contacts	Wdth.	Hght.	Dpth.*
204	PPB204	PPB204G	PPB204AG	10-3/8"	6"	2-5/8"
300	PPB300	PPB300G	PPB300AG	10-3/8"	6"	2-5/8"
450	PPB450	PPB450G	PPB450AG	16"	6"	2-5/8"
600	PPB600	PPB600G	PPB600AG	16"	6"	2-5/8"
1200	PPB1200	PPB1200G	PPB1200AG	17"	10 3/4"	2-5/8"

† Custom silk screened panels available to order. Write factory for layout sheets.

Blank for User Marks.	w/Standard Alpha-Numeric Markings	Holes		Rack Adapter Mounting Plate	Cover for Mating Program Panel	Cover Hght. Above Panel
		No.	Vert.			
RP204	RP204BLKA	17	12	AP19-70-300	PC300-1	2.5"
RP300	RP300BLKA	20	15	AP19-70-300	PC300-1	2.5"
RP450	RP450BLKA	30	15	AP19-70-600	PC600-1	2.5"
RP600	RP600BLKA	40	15	AP19-70-600	PC600-1	2.5"
RP1200	RP1200BLKA	40	30	AP19-123-1200	PC1200-1	2.5"

* Front Face Panel to tab contact ends at back. Handle in engaged position extends 2 1/2" above panel; during disengagement when program panels being removed, lever end extends 4" above receptacle frame panel.

FIXED PANEL PATCHBOARDS

These low-cost, high reliability patch panels are ideal for test or control panels in all types of equipment where connection ease and flexibility is desirable. All models have heat treated "wrap-around" beryllium copper nickel plated gold flashed contacts mounted in aluminum framed phenolic panels on 0.265" centers. Tabs at rear of patchboard have two holes for soldered connections. Interconnection between the patch panel contacts is readily made with various types of patchcords having 0.090" dia. prongs which plug into contacts located behind holes in front insulating panels. For programming and wiring ease, front and back panels have standard printed alpha-numeric legend. Custom marked (or colored) panels are available to order. Unmarked bottom sides of front panels may be marked by user if removed from aluminum frame and reassembled after marking. The 10, 20, 50, and 100 contact units are of equal width so units may be "stacked" to achieve larger number of contacts. Sturdy, attractive anodized frames on all units provide finished appearance, and have brackets for panel mounting. Custom units in special sizes, with or without brackets, are available to order. Contact factory.

No. of Contacts			Part No.	Dimensions		No. of Brackets
Total	Wide	Vertical		A	B	
10	10	1	PB110-2	2.985	.600	2
20	10	2	PB210-2	2.985	.865	2
50	10	5	PB510-2	2.985	1.660	4
50	10	5	PB510-4*	2.985	1.660	4
100	10	10	PB1010-2	2.985	2.985	4
100	10	10	PB1010-4*	2.985	2.985	4
200	20	10	PB1020-2	5.635	2.985	4
300	20	15	PB1520-2	5.635	4.310	4

*Front Panel unprinted; all others have standard legend.

PATCHCORDS

Patchcords are No. 20 gage vinyl insulated stranded wire in color coded lengths with vinyl shrouded 0.091" dia. brass nickel plated plug tips. Special cord lengths may be made by user by ordering K2001-2 prongs and T7.39 eyelets to which he connects own wire and prong insulation.

SPECIFICATIONS.

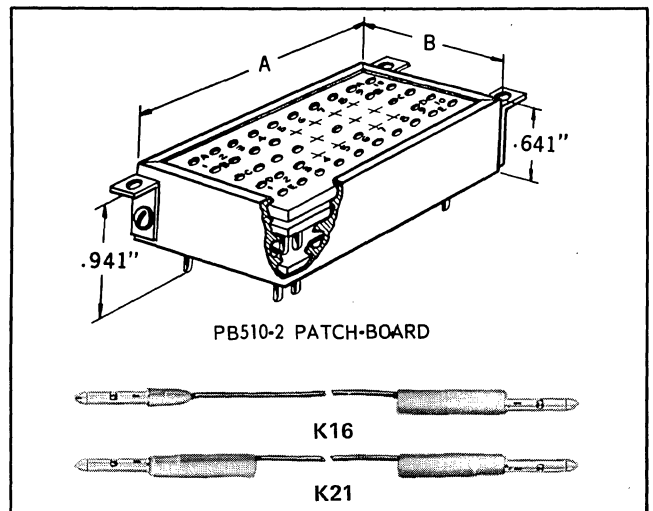
Maximum Current: 5 amps.

Contact Resistance: Less than .001 ohms.

Capacitance Between Adjacent Contacts: Less than 1.0 pf.

Resistance Between Adjacent Contacts: More than 10,000 megohms.

Maximum Operating Voltage: More than 1500 V.D.C. or 1000 V.A.C.



PB510-2 PATCH-BOARD

K16

K21

BALL DETENT TYPE PATCHCORDS

Overall Length (min.)	Wire Insul. Color	Single Conductor Plug Plating		3-Prong Common Plug Plating	
		Nickel	Nkl./Gold Flash	Nickel	Nkl./Gold Flash
6"	Black	K3.06	KG3.06		
9"	Yellow	K3.09	KG3.09	K4.09	KG4.09
15"	Blue	K3.15	KG3.15	K4.15	KG4.15
24"	Green	K3.24	KG3.24	K4.24	KG4.24
Jumper	Gray	K3.02	KG3.02		

PIGGY-BACK TYPE PATCHCORDS

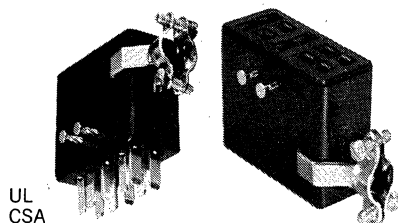
Overall Length	Wire Insul. Color	Single Plug & Piggy-Back Recept. Ea. End		Single Conductor, Prong & Recept. Both Ends		3-Prong Common, Prong & Recept. at Other Ends	
		Ea. End	Ea. End	Nickel	Nkl./Gold	Nickel	Nkl./Gold
6"	Black	K2.06	K9.06	K16.06	KG16.06	K21.06	KG21.06
9"	Yellow	K2.09	K9.09	K16.09	KG16.09	K21.09	KG21.09
15"	Blue	K2.15	K9.15	K16.15	KG16.15	K21.15	KG21.15



BEAU® PLUG & SOCKET CONNECTORS

3300 SERIES

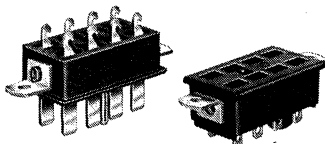
10 amp., 250 volts
2-33 contacts



UL
CSA

5400 SERIES

15 amps, 250 volts
4-16 contacts

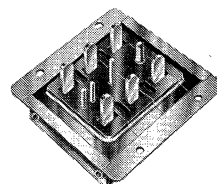


UL
CSA

Also, 4400 Series—for mounting
from back of panel.

5500 SERIES

50 amps, 250 volts
2-16 contacts



Shallow-bracket mounting

SEVEN EXCLUSIVE INNOVATIONS

Standard Beau connectors offer special innovations not available from other manufacturers—like the seven described here—only from Beau. And Beau's prices offer you a big advantage.

1. PRE-GROUNDING—see next page.

2. THERMOPLASTIC BACKSHELLS.

(Metal also.) Resilient thermoplastic backshells provide greater dielectric strength and greater safety. They're also non-rusting and acid resistant. UL; CSA.



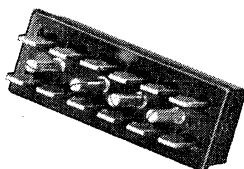
3. WAVE SOLDERABLE CONTACT TAILS.

Special tail design (S_6) allows for mounting directly to PC boards and flexible circuits—and gives you the economy of automatic wave soldering. 3300 series. UL; CSA.



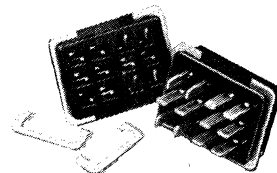
4. 16 CONTACTS IN THE SPACE OF 12.

Our 15 amp connectors can have up to 16 contacts—4 more than other 15 amp makes. That's 33% more contacts in the same amount of space. UL; CSA.



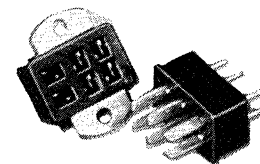
5. PANEL MOUNTED IN ONE-FOURTH THE TIME.

C-clip mounting of Beau connectors cuts panel mounting time by 3/4ths. No drilling. No screws. Just slide on C-clips and it's secure. 3300, 5400 Series. UL; CSA.



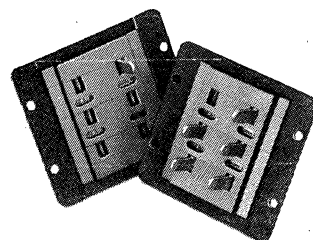
6. SELF-POLARIZING 6-CONTACT CONNECTOR.

With contacts set in opposing directions, even a heavy hand can't mismatch our 6-contact 10 amp plugs and sockets. UL; CSA.



7. HERMAPHRODITIC SELF-POLARIZING.

With male and female contacts in both halves, or with conventional polarization. Can gang in building block fashion. 50 amp.



PANEL MOUNTING HARDWARE

AB = Angle Bracket
ABR = Angle Bracket Reversed
LAB = Less Angle Bracket
ABT = Angle Bracket Tapped
DB = Deep Bracket
EB = End Bracket

EBR = End Bracket Reversed
EBT = End Bracket Tapped
FP = Flat Plate
SB = Shallow Bracket
SCC = Snap "C" Clip
RP = Recessed Plate

CABLE MOUNTING HARDWARE

BBS = Blank Back Shell
CCE = Cable Clamp End
CCE-L = Cable Clamp End, Latch
CCE-K = Cable Clamp End, Keeper
CCT = Cable Clamp Top
CCT-L = Cable Clamp Top, Latch
CCT-K = Cable Clamp Top, Keeper

FHE = Flared Hole End
FHE-L = Flared Hole End, Latch
FHE-K = Flared Hole End, Keeper
FHT = Flared Hole Top
FHT-L = Flared Hole Top, Latch
FHT-K = Flared Hole Top, Keeper

CONTACT TAILS

3300 SERIES

5400 SERIES

5500



P or S
Solder
eye



P₁ or S₁
Quick
Connect
.110 tab



P₄
Wire-
Wrap



S₆
Printed
Circuit



P
Solder
hook



P₁
Quick
Connect,
.205 tab



P₂
Quick
Connect,
.187 tab



P₃
Solder
eye



S₁
Quick
Connect/
Sold. eye



S₃
Large
Solder
Eye



Binding
head
screw



Beau Products Division
Vernitron Electrical Components

P.O. Box 10, Laconia, N.H. 03246 Tel. (603) 524-5101 TWX 710-364-1843
See your local representative listed in EEM Yellow Pages
Also available in Canada, England and Europe.



BEAU® PRE-GROUNDING CONNECTORS

3300 SERIES: 10 amps per contact

5400 SERIES: 15 amps per contact

PRE-GROUNDING FOR GREATER SAFETY

Beau gives you the greater safety of U.L. recognized pre-grounding plug and socket connectors. The extra long grounding contact engages before any other active contacts are mated. Available for chassis and cable mounting.

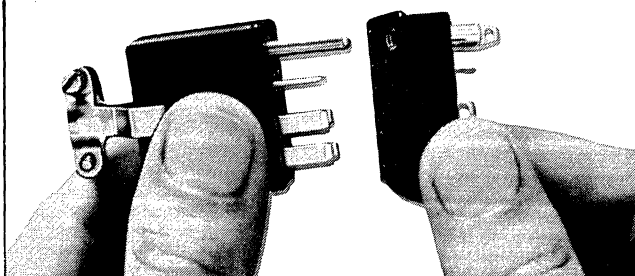
LOWEST INSTALLED COST

Only Beau offers the longer pre-grounding contact. Thus, you will never have to cut any contacts to a shorter length to achieve a safer connection. No more costly, time-consuming hand cutting operations.

CONTACT POSITION

In the 3300 Series, the grounding contact takes the place of a regular contact. Connector sizes 3324 through 3333 are already of the pre-grounding type, and there is no need to specify the grounding contact.

In the 5400 Series, the grounding contact is an additional contact position rather than taking the place of a standard contact.



SPECIFICATIONS

For other specifications and data, see previous page.

Rating: 3300 Series, 10 amps per contact at 250 v,
5400 Series, 15 amps per contact at 250 v

Grounding contact rating: 30 amps at rated voltages.

No. of contacts: 3300 Series, 3 to 33 (incl. grounding contact),
5400 Series, 5 to 13 (incl. grounding contact)

Grounding contact: Extra long, heavy-duty plated brass.

Grounding contact tail: 5400 Series, mounted on an elevated creep path barrier that puts required distance between ground and active contacts.

U.L. recognized.

CSA certified.



BEAU® HIGH-BARRIER RESILIENT TERMINAL STRIPS

72000 SERIES:

SINGLE ROW; 3/8" CENTERS

20 AMPS, 600 VOLTS

FEED THRU AND CLOSED BACK

BEND BARRIERS WITHOUT BREAKING

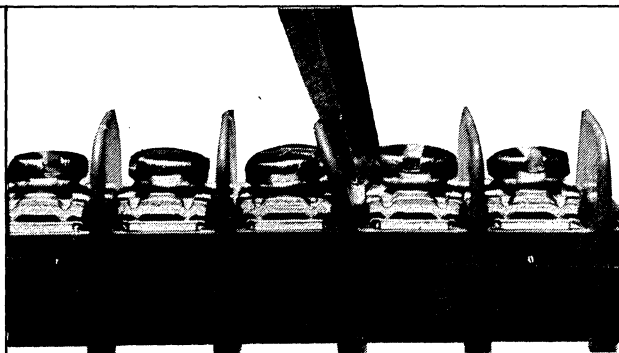
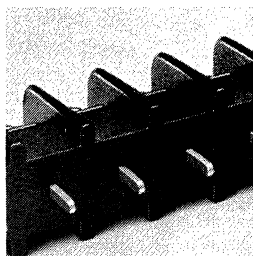
Beau's flexible barrier strips reduce breakage dramatically because they are made of highly resilient glass-filled thermoplastic materials. Impact strength is many times greater than phenolics. Production line and in-field damage (and time-consuming re-wiring) are virtually eliminated.

PROTECTS SOLDER JOINTS FROM DAMAGE

Exclusive from Beau—terminals are ultrasonically welded to the base. This eliminates solder joint damage from torquing screws, or from strain in dressing down wire bundles. Also, pull-out strength is double the other makes.

CONTACT TAILS ENCLOSED

Cavities are eliminated around dip solder contact tails. This allows mounting directly on PC board without affecting circuit isolation. It eliminates entrapment of foreign matter, reduces solder wicking.



SPECIFICATIONS

Size: 5/8" w x 21/32" h

No. of terminals: 1 to 26

Terminal styles (bottom):

Printed circuit
Printed circuit/wire wrap
combination (with long
extended tail)

Quick connect tab (insulated feed
thru)
Solder turret (insulated feed thru)
Closed back

Terminal styles (screw side):

#6-32 x 1/4" binding head
screw
Wire clamp plate, self rising

Quick connect tab (1 to 6
terminations)
Solder terminal, single or double



Beau Products Division
Vernitron Electrical Components

P.O. Box 10, Laconia, N.H. 03246 Tel. (603) 524-5101 TWX 710-364-1843

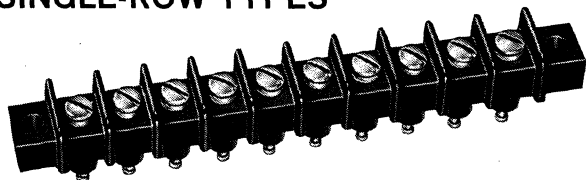
See your local representative listed in EEM Yellow Pages

Also available in Canada, England and Europe



BEAU® BARRIER TERMINAL STRIPS

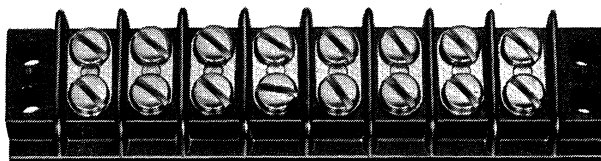
SINGLE-ROW TYPES



Available in 15 and 20 amp models, both have high-impact glass-filled phenolic bases with excellent breakage resistance. They can be furnished with or without mounting ends. Nickel-plated brass screws. Cadmium or tin plated terminals. Imprinting available.

RATING, AMPS	SERIES NO.	BACK TYPES	NO. CIRCUITS	WIDTH	HEIGHT	TERMINAL SCREWS
15	12000	Open & Closed	1-31	35/64"	7/16"	5-40x3/16"
20	13000	Open & Closed	1-26	47/64"	35/64"	6-32x1/4"

DOUBLE-ROW TYPES



Available in 10, 15, 20 and 30 amp models, they can be molded in general-purpose phenolic, glass-filled phenolic, or highly resilient glass-filled thermoplastic materials. Nickel-plated brass terminals and screws. Marker/insulation strips and covers available for added safety (in vulcanized fiber or phenolic). Choice of printing styles.

RATING, AMPS	SERIES	BACK TYPE	NO. CIRCUITS	WIDTH	HEIGHT	TERMINAL SCREWS
10	10,000	Open	1-20	5/8"	5/16"	2-56x3/16"
15	14,000	Open	1-30	7/8"	13/32"	5-40x1/4"
	15,000	Closed	1-31	7/8"	27/64"	5-40x1/4"
	16,000	Open	1-30	7/8"	13/32"	6-32x1/4"
	17,000	Closed	1-31	7/8"	27/64"	6-32x1/4"
20	18,000	Open	1-30	1-1/8"	1/2"	6-32x1/4"
	19,000	Closed	1-30	1-1/8"	35/64"	6-32x1/4"
30	21,000	Open	1-25	1-5/16"	5/8"	8-32x5/16"
	22,000	Closed	1-26	1-5/16"	21/32"	8-32x5/16"

TERMINALS (bottom)

12000 SERIES

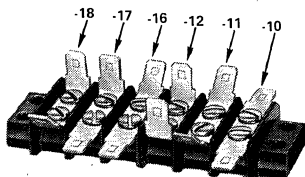
Closed back
PC
Turret

13000 SERIES

Screw
Closed back
Turret, insul.
PC, insul.
Taper pin/turret
PC
Turret

QUICK CONNECT TERMINALS

Beau Quick Connect terminals cut assembly time and costs; improve connections; eliminate cold solder joints. In 1- and 2-sided types for single- and double-row strips. Cadmium-plated brass.



TERMINALS

Single-sided solder
Two-sided solder
Feed-thru solder

PC
Wire-wrap
Quick connect
(details at left)

OTHER HARDWARE

Straddle plate
Jumper plate, over-the-barrier type
Jumper plate, edge-on type



BEAU® PC EDGEBOARD CONNECTORS

FOR .062" BOARDS

SOLDER DIP AND SOLDER EYE

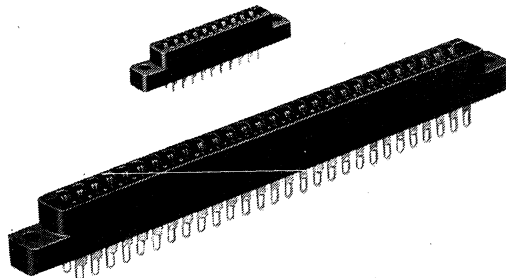
DUAL READ-OUT

SERIES 8500: 600 vac; .125" contact centers

SERIES 8600: 750 vac; .156" contact centers

Beau Edgeboard Connectors are designed for heavy usage in commercial applications where economy is an important factor. They're designed for low, stable contact resistance (up to 50% lower than others), minimum wear of mating surfaces and excellent mechanical abuse withstanding qualities. Problems from vibration and board irregularities are minimized.

Unique bow design has improved spring characteristics, reduced fatigue. A modified ribbon contact has cantilever action and maximum wiping action.



Beau Products Division
Vernitron Electrical Components

P.O. Box 10, Laconia, N.H. 03246 Tel. (603) 524-5101 TWX 710-364-1843
See your local representative listed in EEM Yellow Pages
Also available in Canada, England and Europe.

VICTOREEN METALIZED CERAMICS

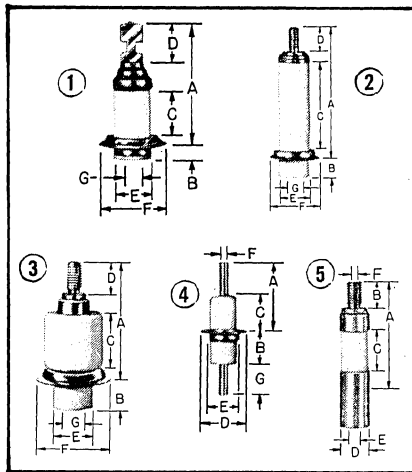
ALITE TERMINALS • BUSHINGS • SEALS • SPECIAL ASSEMBLIES

ALITE CERAMIC-TO-METAL SEALS

The key to the performance of ALITE ceramic-to-metal seals, lies in careful attention to these three basic factors:

- Soundness of the Design
- Quality of the Ceramic

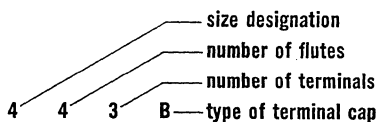
- Integrity of the Bond



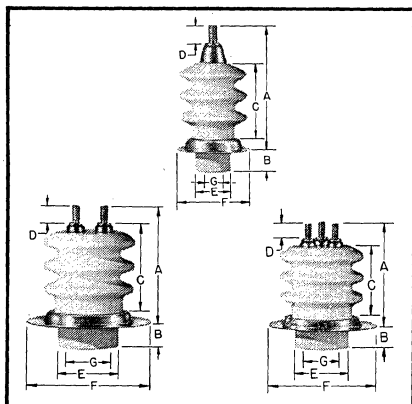
ALITE HIGH VOLTAGE TERMINAL BUSHINGS

- Reliable Electrical Characteristics
- Excellent Dielectric Strength
- High Surface Resistivity
- Vacuum-tight, Mass Spectrometer Tested
- Superior Mechanical Strength
- High Temperature Resistance
- Resistance to Thermal Shock

STANDARD PART NUMBERS for fluted terminals indicate certain physical features of each terminal. For example, Part No. 4-4-3B indicates the following:



NOTE: Voltage ratings are average, measured at 40% RH at sea level. Voltages are 60 cycles RMS.



TUBULAR TYPE BUSHINGS

Fig.	Part No.	(Dimensions In Inches)						
		A	B	C	D	E	F	G
1	B-27-1	3/4	3/2	7/2	3/2	1/4	1/2	.105
	B-27-2	3/4	3/2	7/2	3/2	1/4	1/2	.105
	B-27-6	7/8	7/2	7/2	3/2	1/4	1/2	.105
2	B-38-1	1 1/2	1 1/2	3 1/2	3/8	3/8	1 1/8	3/16
	B-38-3	1 1/2	1 1/2	1/2	3/8	3/8	1 1/8	3/16
	B-38-6	1 1/2	1 1/2	5/8	3/8	3/8	1 1/8	3/16
	B-50-2	1 1/2	1 1/2	3/2	3/8	1/2	1 1/8	1/4
	B-50-5	1 1/2	3/2	3 1/2	3/8	1/2	1 1/8	1/4
	B-50-9	1 1/2	3/2	4 1/2	3/8	1/2	1 1/8	1/4
	B-50-10	1 1/2	1 1/2	7/8	3/8	1/2	1 1/8	1/4
	B-50-14	2 1/2	1 1/2	1 3/4	3/8	1/2	1 1/8	1/4
	B-50-15	2 1/2	1 1/2	2 3/4	3/8	1/2	1 1/8	1/4
	B-75-1	1 1/2	1 1/2	1	3/4	3/4	1 1/8	3/8
	B-75-5	2 1/2	1 1/2	2	3/4	3/4	1 1/8	3/8
	B-75-9	4 3/4	1	3 3/8	3/4	3/4	1 1/8	3/8
	B-100-1	2 3/4	3/2	1 3/2	3/8	1	1 1/2	1/2
	B-100-5	5 3/8	1	4 1/4	3/8	1	1 1/2	1/2

STANDARD TYPE BUSHINGS

Part No.	(Dimensions In Inches)						
	A	B	C	D	E	F	G
A-50-1	$\frac{7}{32}$	$\frac{3}{32}$	$\frac{1}{4}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{8}$
A-50-2	$\frac{11}{32}$	$\frac{1}{4}$	$\frac{7}{16}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{8}$
A-50-3	$\frac{13}{32}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{4}$	$\frac{1}{2}$	$\frac{1}{8}$
A-75-1	$\frac{13}{32}$	$\frac{3}{16}$	$\frac{7}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{13}{16}$	$\frac{1}{4}$
A-75-2	$\frac{11}{32}$	$\frac{3}{16}$	$\frac{1}{2}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{13}{16}$	$\frac{1}{4}$
A-75-3	$\frac{11}{32}$	$\frac{3}{16}$	$\frac{15}{16}$	$\frac{3}{8}$	$\frac{1}{2}$	$\frac{13}{16}$	$\frac{1}{4}$
A-100-1	$\frac{13}{32}$	$\frac{3}{16}$	$\frac{7}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{11}{8}$	$\frac{1}{2}$
A-100-2	$\frac{11}{32}$	$\frac{1}{2}$	$\frac{11}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{11}{8}$	$\frac{1}{2}$
A-100-3	$\frac{13}{32}$	$\frac{3}{16}$	$\frac{15}{16}$	$\frac{1}{2}$	$\frac{3}{4}$	$\frac{11}{8}$	$\frac{1}{2}$

FEED-THROUGH TERMINALS

4	Part No.	(Dimensions In Inches)						
		A	B	C	D	E	F	G
	D-187	3/8	1/8	3/16	5/16	3/16	.045	3/16
	D-250	1/2	1/4	3/16	3/8	1/4	.060	1/4
	D-312	3/4	1/4	1/2	1/2	3/4	.060	5/8

Metal Parts: Grade A Nickel.

CABLE END SEALS

Part No.	(Dimensions In Inches)						Thread Size	
	A	B	C	D	E	F		
5	C-250	1 $\frac{1}{8}$	1 $\frac{3}{32}$	$\frac{3}{4}$	.250	$\frac{1}{8}$	.082	8-32
	C-320	1 $\frac{1}{8}$	1 $\frac{15}{32}$	$\frac{3}{4}$	.320	$\frac{5}{32}$	.117	10-32
	C-375	1 $\frac{3}{8}$	1 $\frac{1}{2}$	$\frac{1}{2}$	.375	$\frac{3}{16}$	.117	10-32
	C-435	1 $\frac{5}{8}$	1 $\frac{1}{2}$	$\frac{1}{2}$	.435	$\frac{1}{2}$	.150	$\frac{1}{4}$ -28
	C-450	1 $\frac{5}{8}$	1 $\frac{1}{2}$	$\frac{1}{2}$	.450	$\frac{1}{2}$	.150	$\frac{1}{4}$ -28
	C-500	1 $\frac{5}{8}$	1 $\frac{1}{2}$	$\frac{1}{2}$	.500	$\frac{1}{4}$	.150	$\frac{1}{4}$ -28
	C-625	1 $\frac{5}{8}$	1 $\frac{1}{2}$	$\frac{1}{2}$	.625	$\frac{3}{16}$	.150	$\frac{1}{4}$ -28

Cap and Tube: Grade A Nickel.

HIGH VOLTAGE TERMINAL BUSHINGS — SINGLE TERMINAL

Series	Part No.	No. of Flutes	(Dimension In Inches)							Flash Voltage KV	Weight Approx Net
			A	B	C	D	E	F	G		
100	1-2-1C	2	2	1/4	7/8	7/16	3/4	1 1/8	1/2	12.0	2 oz.
100	1-3-1C	3	2 3/8	1/4	1 1/4	3/16	3/4	1 1/8	1/2	16.0	3 oz.
200	2-2-1C	2	2 3/8	1/2	1 3/4	3/16	7/8	1 3/4	5/8	17.0	4 oz.
200	2-3-1C	3	2 7/8	1/2	2 1/4	3/16	7/8	1 3/4	5/8	21.0	5 oz.
200	2-4-1C	4	3 3/8	1/2	2 1/2	3/16	7/8	1 3/4	5/8	25.0	6 oz.
200	2-5-1C	5	3 7/8	1/2	2 3/4	3/16	7/8	1 3/4	5/8	29.0	7 oz.
300	3-3-1D	3	3 1/2	1/2	1 3/4	3/8	1 3/8	2 3/4	1	24.0	7 oz.
300	3-4-1D	4	3 7/8	1/2	2 1/4	3/8	1 3/8	2 3/4	1	28.5	9 oz.
300	3-5-1D	5	4 1/2	1/2	2 3/4	3/8	1 3/8	2 3/4	1	33.0	11 oz.
400	4-3-1D	3	3 1/2	1/2	1 3/4	5/8	2	3 1/2	1 1/8	26.5	13 oz.
400	4-6-1D	6	4 3/8	1	3 1/4	5/8	2	3 1/2	1 1/8	39.0	1 lb. 6 oz.
400	4-8-1D	8	5 1/8	1 1/4	4 1/4	5/8	2	3 1/2	1 1/8	48.0	1 lb. 12 oz.

HIGH VOLTAGE TERMINAL BUSHINGS — TWO TERMINALS

Series	Part No.	No. of Flutes	A	B	C	D	E	F	G	Flash Voltage KV	Weight Approx Net
300	3-2-2A	2	2 1/2	1/2	1 1/4	3/8	1 3/8	2 3/4	1	20.0	6 oz.
300	3-5-2A	5	3 1/2	1/2	2 3/4	3/8	1 3/8	2 3/4	1	33.0	11 oz.
400	4-6-2B	6	4 3/8	1	3 1/4	5/8	2	3 1/2	1 1/8	39.0	1 lb. 6 oz.
400	4-8-2B	8	5 1/8	1 1/4	4 1/4	5/8	2	3 1/2	1 1/8	48.0	1 lb. 12 oz.

HIGH VOLTAGE TERMINAL BUSHINGS — THREE TERMINALS

Series	Part No.	No. of Flutes	A	B	C	D	E	F	G	Flash Voltage KV	Weight Approx Net
300	3-2-3A	2	2 1/2	1/2	1 1/4	3/8	1 3/8	2 3/4	1	20.0	6 oz.
300	3-5-3A	5	3 1/2	1/2	2 3/4	3/8	1 3/8	2 3/4	1	33.0	11 oz.
400	4-8-3B	8	5 1/8	1 1/4	4 1/4	5/8	2	3 1/2	1 1/8	48.0	1 lb. 12 oz.

FOR ADDITIONAL INFORMATION REQUEST BULLETIN 5593-2-71
SPECIALS QUOTED UPON REQUEST



SHELLER-GLOBE CORPORATION

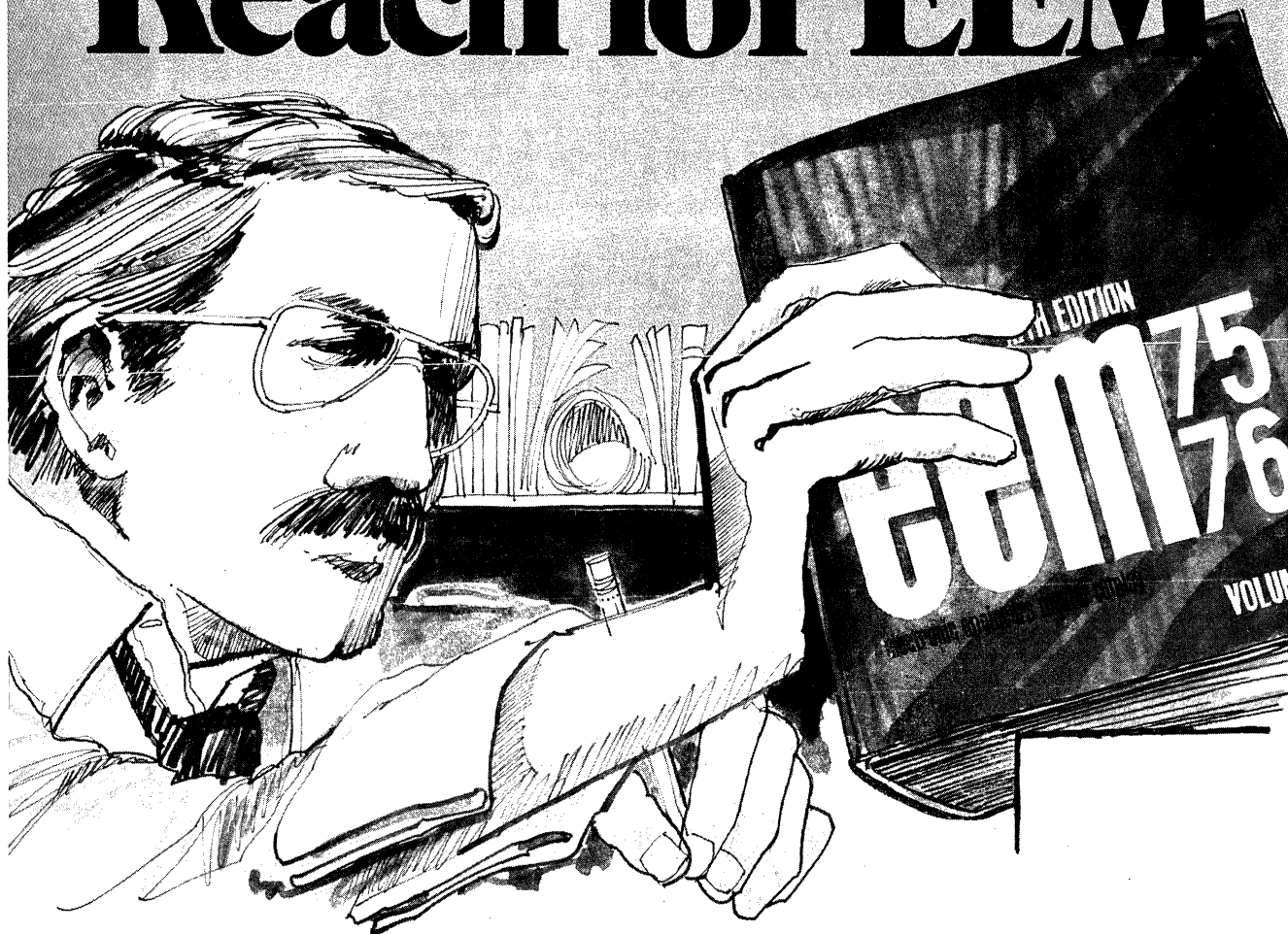
10101 WOODLAND AVENUE • CLEVELAND, OHIO 44104

VICTOREEN INSTRUMENT DIV.

VICTOREEN

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



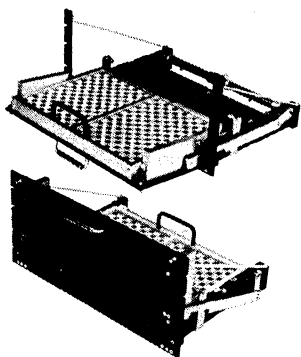
**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



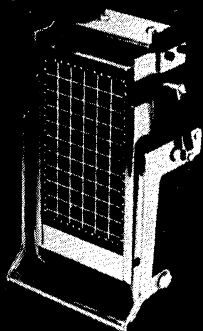
electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

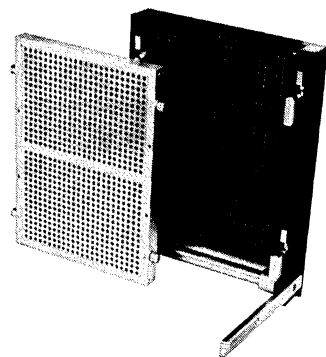
Patchboard Programming Systems and Accessories



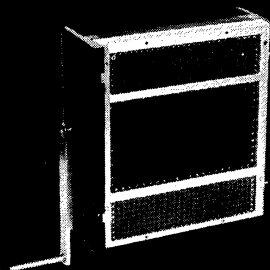
Drawer Type Systems—a roll cam designed for horizontal mounting to save up to 50% in panel areas. Also provides R.F. shielding. Five standard sizes range from 480 to 1870 contacts. All fit 19" wide racks.



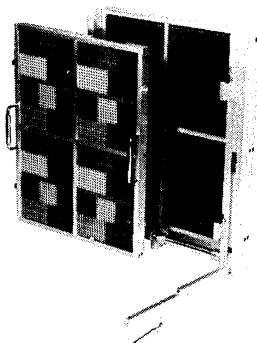
Lever Lock Systems—are most utilized by large computer manufacturers. A lever provides the necessary force to simultaneously mate up to 680 patchcord tips and paddle contacts. A smaller model offers 252.



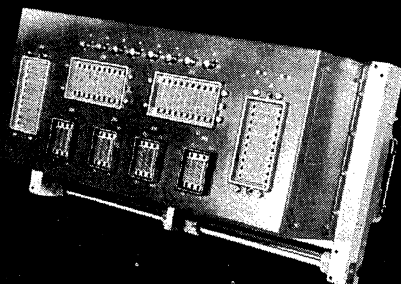
Shielded Systems—Each paddle contact is isolated with medal shielding. Crosstalk reduction is 92 db at 1000 cycles, 100 volts peak to peak. There are six models ranging from 360 to 4200 contacts.



True Thru-Shielded Systems—offer individual shielding, matched impedance, VSWR of 1.01 from 100 MHz to 500 MHz. These advanced programming systems can be manufactured to virtually any specifications.

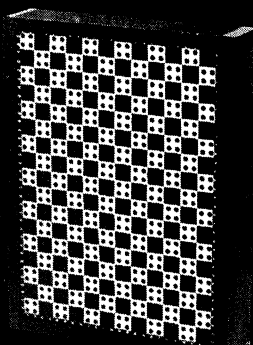


Roll Cam Systems—offer greatest capability and reliability, large number of contacts (24 sizes from 48 to 5120 contacts). Camming action engages full patchboard gently and accurately.



Pre-Wired Systems—can be standard panel boards wired to special quick connectors to eliminate hours of wiring and permit instantaneous re-circuiting. The 2560-contact roll cam system shown terminates in only 13 connectors.

Plating—Nickel or Gold
Board Material—Phenolic or Diallyl Phthalate
Contact Diameters—.093 and .053
Connections—Solder, wire wrap or Locktite
Finish—clear polish or black anodized
Silk Screen—Alpha/ numeric grid or special designs
Patchcords—Manual or fixed; single tip to nine-prong tip; squids; splits; shunts.
All unconditionally guaranteed.
Tools—a variety of 27 tools for crimping, extraction, insertion, and paddle contact.
Send for complete 40-page catalog today.



Fixed Systems—26 standard models ranging from 30 contact points to 7,188 combine reliability and economy to meet a wide variety of programming needs primarily in industrial controls and communications.

We have salesmen in 42 U.S. Cities. Please refer to the proper section in this catalog for the one nearest you, or contact our factory in Waynesboro, Va.

Besides our 75 standard models of programming systems, some of which are described on this page, VPC also produces a wide variety of custom products.

We invite your inquiries and will appreciate your business.

VIRGINIA PANEL CORPORATION
 1400 NEW HOPE ROAD



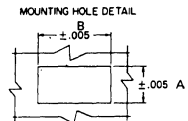
WAYNESBORO, VIRGINIA 22980
 (703) 942-8376



CONNECTORS, TERMINALS, SOCKETS

4633 WEST 53rd STREET / CHICAGO, ILLINOIS 60632 / (312) 585-1212

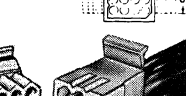
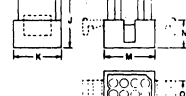
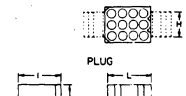
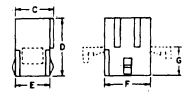
waldom/molex

STANDARD .093"
CONNECTORS
(.198" GRID PATTERN)MINIATURE .062"
CONNECTORS
(.145" GRID PATTERN)

MINIATURE .062" CONNECTORS DATA

No. of Cir.		1		3		4		5		6		8		9		12		15		24		36	
		1625-1		1625-3		1625-4		1625-5		1625-6		1649-8		1625-9		1625-12		1625-15		1625-24		1772-36	
		R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P
A	B	N/A	N/A	.265	.318	N/A	N/A	.265	N/A	.552	N/A	.330	N/A	.552	.615	.563	.614	.563	.614	.715	.765	.707	.825
		N/A	N/A	.650	.754	N/A	N/A	.940	N/A	.505	N/A	1.715	N/A	.650	.752	.795	.903	.934	1.042	1.079	1.182	1.677	1.795
C	D	.203 Dia.		.203		.203		.203		.484		.310		.531		.531		.531		.640		.859	
E	F	.781		.781		.781		.781		.781		.781		.781		.781		.781		.750		.781	
G	H	N/A		.203		.203		.203		.484		.220		.484		.484		.484		.500		.687	
I	J	N/A		.484		.625		.781		.343		1.500		.484		.625		.765		.920		1.515	
K	L	N/A		.390		.390		.390		.390		.390		.390		.390		.390		.375		.390	
M	N	N/A		.187		N/A		.187		.375		.312		.375		.375		.375		.500		.562	
O	P	.203 Dia.		.203		.203		.203		.484		.225		.531		.531		.531		.640		1.015	
Q	R	.750		.750		.750		.750		.750		.750		.750		.750		.750		.750		.750	
S	T	.296 Dia.		.281		.296		.296		.578		.312		.578		.578		.593		.750		.812	
U	V	N/A		.484		.625		.781		.343		1.500		.484		.625		.781		.930		1.640	
W	X	N/A		.578		.734		.875		.453		1.593		.578		.718		.859		1.031		1.640	
Y	Z	N/A		.375		.375		N/A		.375		N/A		.375		.375		.375		.375		.375	
AA	AB	N/A		.187		N/A		N/A		N/A		N/A		.375		.375		.350		.500		.625	

RECEPTACLE



STANDARD .093" CONNECTORS DATA

No. of Cir.		1		2		3		4		5		6		9		12		15	
		1619		1545		1396		1490		1653		1261		1292		1360		1375	
		R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P	R	P
A	B	N/A	N/A	.705	.800	.840	.933	.038	1.131	N/A	N/A	.718	.750	.828	.937	1.050	1.155	1.240	1.342
		N/A	N/A	.312	.375	.312	.375	.312	.375	N/A	N/A	.600	.695	.725	.725	.655	.760	.655	.760
C	D	.234 Dia.		.250		.234		.236		.234		.632		.625		.640		.632	
E	F	1.000		1.000		1.031		1.000		1.000		1.031		1.031		1.031		1.031	
F	G	N/A		.250		.234		.236		.234		.632		.625		.640		.632	
		N/A		.531		.671		.875		1.062		.437		.671		.870		1.067	
		N/A		.437		.437		.437		.437		.437		.437		.437		.437	
H	I	N/A		.250		.234		.236		N/A		.562		.562		.562		.562	
J	K	.241 Dia.		.250		.234		.250		.250		.634		.634		.634		.632	
		.968		.968		.968		.968		.968		.968		.968		.968		.968	
		.358 Dia.		.352		.338		.338		.343		.640		.734		.734		.734	
L	M	N/A		.531		.671		.859		1.062		.531		.765		.975		1.169	
N	O	N/A		.640		.773		.968		1.171		.531		.765		.975		1.169	
		N/A		.421		.421		.421		.421		.421		N/A		.421		.421	
		N/A		.250		.234		.250		N/A		.562		.562		.562		.562	

Dimensions subject to nominal variation. N/A — Not Applicable.

ORDER DATA

WALDOM/MOLEX MINIATURE NYLON CONNECTOR HOUSINGS .062" PIN DIA. — 250 VOLTS PER CIRCUIT

HOUSINGS ARE SUPPLIED LESS
TERMINALS — TO ORDER TERMINALS
REFER TO PAGE

PLUG OR RECEPTACLE				PLUG CONFIGURATION ONLY							RECEPTACLE CONFIGURATION ONLY						
No. of Cirs.	Amps Per Cir.	Std. Pack- age	En. P/N New No. Shown ()	Mounting Ears		Per Pkg.	Per C			Eng. P/N New No. Shown ()	With Holding Tabs	With Mtg. Ears and Holding Tabs	Per Pkg.	Per C			
				With	Without		100-499	500-999	1000-2499					100-499	500-999	1000-2499	
1	5	10	1625-1	—	P (03-06-2011)	1.00	6.90	4.75	3.70	1625-1	R (03-06-1011)	—	.85	5.95	4.10	3.15	
3	5	10	1625-3	P (03-06-2031)	P1 (03-06-2032)	1.70	11.60	8.60	6.15	1625-3	R1 (03-06-1032)	R (03-06-1031)	1.95	13.00	9.65	7.05	
4	5	10	1625-4	P (03-06-2041)	P1 (03-06-2042)	3.85	25.80	19.20	13.35	1625-4	R1 (03-06-1042)	R (03-06-1041)	3.80	25.50	18.90	13.10	
5	5	5	1625-5	P (03-06-2054)	P1 (03-06-2055)	1.25	17.15	12.70	9.20	1625-5	—	R (03-06-1055)	1.65	22.15	16.15	11.80	
6	5	5	1625-6	P (03-06-2062)	P1 (03-06-2061)	1.20	16.45	11.95	9.00	1625-6	—	R (03-06-1061)	1.40	19.15	13.50	10.40	
8	5	5	1649-8	—	P (03-06-2081)	1.00	14.05	9.75	7.55	1649-8	—	R (03-06-1081)	1.25	17.25	12.00	9.30	
9	5	5	1625-9	P (03-06-2091)	P1 (03-06-2092)	1.30	17.75	12.70	9.65	1625-9	R1 (03-06-1092)	R (03-06-1091)	1.50	20.30	14.40	11.05	
12	5	5	1625-12	P (03-06-2121)	P1 (03-06-2122)	1.35	18.50	13.70	10.10	1625-12	R1 (03-06-1122)	R (03-06-1121)	1.55	21.20	15.45	11.60	
15	5	5	1625-15	P (03-06-2151)	P1 (03-06-2152)	2.20	30.00	21.00	16.25	1625-15	R1 (03-06-1152)	R (03-06-1151)	2.55	34.25	23.85	18.50	
24	4	5	1625-24	P (03-06-2241)	P1 (03-06-2242)	3.30	44.60	31.00	24.00	1625-24	R1 (03-06-1242)	R (03-06-1241)	3.45	46.80	32.50	25.20	
36	4	5	1772-36	P (03-06-2361)	P1 (03-06-2362)	3.75	50.40	34.95	27.05	1772-36	—	R1 (03-06-1361) R1 (03-06-1362)†	3.90	52.65	36.50	28.20	

WALDOM/MOLEX STANDARD NYLON CONNECTOR HOUSINGS .093" PIN DIA. — 250 VOLTS PER CIRCUIT

1	12	10	1619P	—	P (03-09-2011)	1.00	6.75	4.65	3.60	1619R	R (03-09-1011)	—	.85	5.85	4.05	3.10
2	12	10	1545P	P (03-09-2021)	P1 (03-09-2022)	1.95	13.30	9.85	6.80	1545R	R1 (03-09-1022)	R (03-09-1021)	2.00	13.40	9.95	6.90
3	12	10	1396P	P (03-09-2031)	P1 (03-09-2032)	1.70	11.50	7.95	6.15	1396R	R1 (03-09-1032)	R (03-09-1031)	1.70	11.60	8.05	6.25
4	9	10	1490P	P (03-09-2041)	P1 (03-09-2042)	2.40	16.05	11.10	8.60	1490R	R1 (03-09-1042)	R (03-09-1041)	2.45	16.40	11.35	8.75
5	9	5	1653P	—	P1 (03-09-2052)	1.40	18.85	13.15	10.25	1653R	R (03-09-1052)	—	1.75	23.85	17.10	12.90
6	9	5	1261P	P (03-09-2061)	P1 (03-09-2062)	1.55	20.75	13.75	10.50	1261R	R2 (03-09-1063)	R (03-09-1061)	1.60	21.75	14.40	10.90
9	9	5	1292P	P (03-09-2091)	P1 (03-09-2092)	1.65	22.20	15.40	11.90	1292R	R3 (03-09-1094)	R2 (03-09-1093)†	1.70	23.10	15.60	12.05
12	7.5	5	1360P	P1 (03-09-2122)	P (03-09-2121)	1.65	22.55	15.70	12.15	1360R	—	R (03-09-1121)	1.85	25.20	17.50	13.60
15	7.5	5	1375P	P2 (03-09-2152)	*P (03-09-2151)	2.60	34.50	24.10	18.60	1375R	—	R (03-09-1152)†	2.95	39.40	27.30	21.05
												R (03-09-1151)				

* With Pull Tabs only.

† Without Mounting Ears and Holding Tabs

STRAIN RELIEF (2 PCS. REQUIRED PER PLUG OR RECEPTACLE)

Eng. P/N	New P/N	Used With	"A" I.D.	Std. Pkg.	Per Pkg.	100-499 Per C	500-Up Per C
SD-1815	15-04-0201	15 Cir. .062"	.230"	10	3.50	28.40	21.15
SD-1864-415	15-04-0202	36 Cir. .062"	.500"	10	3.75	25.15	18.90

Maximum Panel Thickness For Mounting Ears:
.062" Series..... .060" (1.5mm)
.093" Series..... .093" (2.4mm)

Engineering Part Nos. are to be used as a Reference No. only. Order by proper 8 digit Part No. shown.

Manufactured by Molex Products Co. These items are made available from leading electronic distributors through Waldom Electronics Inc.

FOR LARGER QUANTITY PRICES, CONTACT WALDOM ELECTRONICS

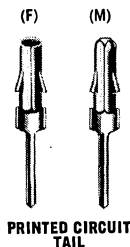
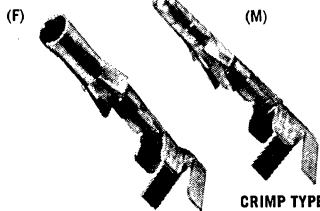


CONNECTORS, TERMINALS, SOCKETS

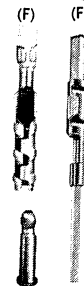
4633 WEST 53rd STREET / CHICAGO, ILLINOIS 60632 / (312) 585-1212



CRIMP & P.C. TERMINALS

PRINTED CIRCUIT
TAIL

CRIMP TYPE



CLASP CON

Part	Body Dia.		Staking Dia. B	Overall Length C	Contact Length D	Staking Length E	Bead Dia. F	Bead Terminal Part #
	A Outside	A-1 Inside						
Female Bead-type terminal (mates with 1560 and 1854 Miniature .062 Male Terminal).	.093	.060	.083	.365	.210	.125	.110	M93-102
Male Bead-type terminal (mates with 1561 and 1855 Miniature .062 Female Terminal).	3 varieties	.062	.062	.435	.280	.125	.090	R62-3
		.062	.062	.555	.400	.125	.090	R62-4
		.062	.062	.455	.280	.145	.100	R62-5
Female Bead-type terminal (mates with 1190, 1380 & 1434 Standard .093 Male Terminal).	.118	.089	.093	.420	.234	.14	.150	M118-95A
Male Bead Pin-type terminal (mates with 1189, 1381 & 1433 Standard .093 Female Terminal).	2 varieties	.093	.093	.592	.437	.109	.125	R93-12
		.093	.093	.592	.437	.169	.125	R93-31

Eng. No.	New P/N	Type	Mating Dia.	Style	Wire Range	Per Pkg. †	1000-3999*	4000-11,999*	12,000-27,999 *	Prototype Hand Tool	Manual Prod. Tool
1189	02-09-1103	F	.093	Crimp	18-14	4.20	26.60	19.50	15.30	HT-1919	HTR-1031-C
1190	02-09-2103	M	.093	Crimp	18-14	4.20	26.60	19.50	15.30	HT-1919	HTR-1031-C
1381	02-09-1118	F	.093	Crimp	24-18	4.20	26.60	19.50	15.30	HT-1919	HTR-1031-C
1380	02-09-2118	M	.093	Crimp	24-18	4.20	26.60	19.50	15.30	HT-1919	HTR-1031-C
1433	02-09-1143	F	.093	Crimp	30-22	4.20	26.60	19.50	15.30	HT-1921	HTR-2262
1434	02-09-2143	M	.093	Crimp	30-22	4.20	26.60	19.50	15.30	HT-1921	HTR-2262

Eng. No.	New P/N	Type	Mating Dia.	Style	Wire Range	Per Pkg. †	1000-4999*	5000-9999*	10,000-24,999 *	Prototype Hand Tool	Manual Prod. Tool
1377	02-09-1133	F	.093	P. C. Tail	—	3.25	22.50	17.35	13.90	—	—
1376	02-09-2133	M	.093	P. C. Tail	—	3.25	22.50	17.35	13.90	—	—

Eng. No.	New P/N	Type	Mating Dia.	Style	Wire Range	Per Pkg. †	4000-7999*	8,000-27999*	—	Prototype Hand Tool	Manual Prod. Tool
1881-2	02-08-1102	F	.093	Crimp	28-16	4.60	26.40	21.10	—	HT-1919	HTR-1031-C

Eng. No.	New P/N	Type	Mating Dia.	Style	Wire Range	Per Pkg. †	1000-2999*	3000-5999*	6000-11,999*	12,000-24,999 *	Prototype Hand Tool	Manual Prod. Tool
1561	02-06-1103	F	.062	Crimp	22-18	4.65	40.25	31.80	19.20	13.20	HT-1921	HTR-2262
1560	02-06-2103	M	.062	Crimp	22-18	4.65	40.25	31.80	19.20	13.20	HT-1921	HTR-2262
1855	02-06-1132	F	.062	Crimp	30-22	4.65	40.25	31.80	19.20	13.20	HT-1921	HTR-2262
1854	02-06-2132	M	.062	Crimp	30-22	4.65	40.25	31.80	19.20	13.20	HT-1921	HTR-2262

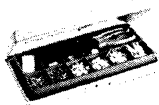
Eng. No.	New P/N	Type	Mating Dia.	Style	Wire Range	Per Pkg. †	4000-7999*	8,000-2499*	—	Prototype Hand Tool	Manual Prod. Tool
1929	02-05-1105	F	.062	Crimp	22-18	4.00	24.80	18.45	—	HT-1921	HTR-2262

Eng. No.	New P/N	Type	Mating Dia.	Style	Wire Range	Per Pkg. †	1000-4999*	5000-9999*	10,000 Up*	Prototype Hand Tool	Manual Prod. Tool
M-93-102	M-93-102	F	.093	Bead Chain	—	1.80	11.15	7.75	6.95	—	—
R-93-12	R-93-12	M	.093	Bead Chain	—	1.80	11.00	7.70	6.30	—	—
R-93-31	R-93-31	M	.093	Bead Chain	—	1.80	11.40	7.90	6.45	—	—
M-118-95A	M-118-95A	F	.093	Bead Chain	—	1.85	11.80	8.20	6.70	—	—
R-62-3	R-62-3	M	.062	Bead Chain	—	1.80	11.50	8.10	6.65	—	—
R-62-4	R-62-4	M	.062	Bead Chain	—	1.85	11.90	8.45	6.65	—	—
R-62-5	R-62-5	M	.062	Bead Chain	—	1.80	11.50	8.10	6.95	—	—

F — Female. M — Male. * Per M. † Standard pkg. — 100 pcs.

Engineering Part Nos. are to be used as a Reference No. only. Order by proper 8 digit Part No. shown.

DESIGNER KITS



The MINIATURE SERIES No. WM-72 (using .062" pin terminals) Designer Kit contains parts to assemble male and female connector housing from SINGLE-CIRCUIT to 36-CIRCUIT COMPLETE CONNECTORS. (Total of 56 Connectors.) Includes crimping tool and pin terminal ejector tool. WM-72 KIT EACH \$34.95

Manufactured by Molex Products Co. These items are made available from leading electronic distributors through Waldom Electronics Inc.

A must for every creative designer, repairman and experimenter...as modern as today's circuitry. Eliminates need of searching for proper connectors or tools — everything is under one lid. This polarized Nylon Connector Designers Kit comes with all circuit capacities, complete with Male and Female housings, terminals, and crimp tool. Separated in individual compartments, each connector element is numbered and described, enabling you to re-order when running low.

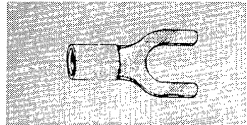
This light-weight, unbreakable kit closes with a snap-lock to avoid spills and mix-ups. Each kit contains a prototype hand crimping tool, specially balanced and weighted for ease of operation. Machined from hardened-steel, this tool provides excellent, uniform crimps every time. It also cuts and strips wire. Each kit also contains a special terminal ejector tool, and detailed crimping instructions permanently affixed and mar-proof.

WALDOM/MOLEX also produces a Designer Kit in the STANDARD SERIES No. WM-50 (using .093" pin terminals). Similarly, it has all the elements and tools necessary to make up standard connectors in all sizes. (Single circuit to 15 circuits in the standard series.) Total of 45 complete connectors. WM-50 KIT EACH \$29.95

FOR LARGER QUANTITY PRICES, CONTACT WALDOM ELECTRONICS

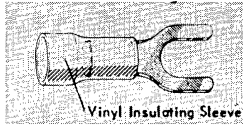


SOLDERLESS TERMINALS AND CONNECTORS



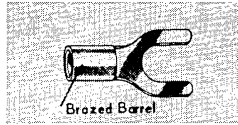
S TYPE (1000 SERIES)

Basic non-insulated electro-tin plated copper terminal. One-piece construction for maximum strength and conductivity.



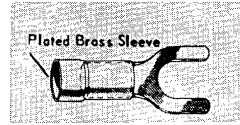
T TYPE (2000 SERIES)

All advanced features of S TYPE plus permanently attached rigid vinyl plastic insulating sleeve for increased vibration resistance. Temperature range from -40°F to 220°F continuous duty to 220°F intermittent duty.



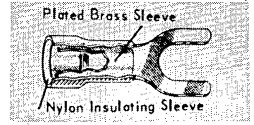
B TYPE (3000 SERIES)

Advantageous features of S TYPE plus the higher tensile strength afforded by BRAZED BARREL construction.



D TYPE (4000 SERIES)

Particularly suitable where high vibration is a factor. S TYPE construction plus seamless annealed electro-tin plated brass sleeve.



N TYPE (5000 SERIES)

All D TYPE features, tin plated brass sleeve plus permanently attached overlapping nylon insulating sleeve. Temperature range -40°F to 250°F continuous duty — to 350°F intermittent duty.

Insulated terminals color coded: 26-24 Yellow, 22-18 Red, 16-14 Blue, 12-10 Yellow UL & CSA LISTED

Material: Annealed electrolytic copper, electro-tin finish. Modern one-piece design for maximum strength and conductivity. With strength gusset, open end rapid inspection, beveled edge to facilitate wire insertion. Circumferential serrations for maximum contact area and grip. Full 1/4 inch barrel length, wide crimping area, easy location.

Wire ranges 26-24, .020 stock. 22-18, .032 stock. 16-14, .030 stock. 12-10, .050 stock. 12-10, .040 stock. No. 8, and No. 6, .050 stock. No. 4, .075 stock. Terminals in 22-18 and 16-14 wire range are available with 3/32" barrel by adding "S" to front of part desired.

RING TONGUE TERMINALS

(1/8" Barrel) 26-24 / AWG WIRE RANGE / BARREL I.D. — .035 x .020" THICK / INSULATION COLOR — YELLOW

BASIC TERMINAL DIMENSIONS			NON-INSULATED BUTTED SEAM		VINYL INSULATED		NON-INSULATED BRAZED SEAM		NON-INSULATED WITH INSULATION GRIP		NYLON INSULATED WITH INSULATION GRIP	
Stud Size S	Width W	Clearance C	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L
0	3/64	3/64	S-1925	5/16	—	—	—	—	D-4925	3/16	N-5925	15/32
1-2	3/64	3/64	S-1926	5/16	—	—	—	—	D-4926	3/16	N-5926	15/32
3-4	1/64	3/32	S-1929	29/64	—	—	—	—	D-4929	3/16	N-5929	39/64
5-6	1/64	3/32	S-1930	29/64	—	—	—	—	D-4930	3/16	N-5930	39/64
8	1/4	3/32	S-1932	17/32	—	—	—	—	D-4932	21/32	N-5932	11/16
10	1/4	3/32	S-1933	17/32	—	—	—	—	D-4933	21/32	N-5933	11/16

STANDARD BARREL (1/4" Barrel) 22-18 / AWG WIRE RANGE / BARREL I.D. — .075 x .030" THICK / INSULATION COLOR — RED

1-2	1/4	3/32	S-1099	19/32	T-2099	25/32	B-3099	19/32	D-4099	47/64	N-5099	25/32	A
3-4	1/4	3/32	S-1047	19/32	T-2047	25/32	B-3047	19/32	D-4047	47/64	N-5047	25/32	A
	2/64	1/4	S-1096	11/16	T-2096	7/8	B-3096	11/16	D-4096	53/64	N-5096	7/8	A
5-6	1/4	3/32	S-1001	19/32	T-2001	25/32	B-3001	19/32	D-4001	47/64	N-5001	25/32	A
	1/4	3/32	S-1700	11/16	T-2700	57/64	B-3700	11/16	D-4700	27/32	N-5700	57/64	A
	2/64	1/4	S-1002	11/16	T-2002	7/8	B-3002	11/16	D-4002	53/64	N-5002	7/8	A
	3/16	3/32	S-1103	47/64	T-2103	57/64	B-3103	47/64	D-4103	7/8	N-5103	57/64	A
8	1/4	3/32	S-1097	19/32	T-2097	25/32	B-3097	19/32	D-4097	47/64	N-5097	25/32	A
	2/64	1/4	S-1021	11/16	T-2021	7/8	B-3021	11/16	D-4021	53/64	N-5021	7/8	A
	3/16	3/32	S-1701	47/64	T-2701	57/64	B-3701	47/64	D-4701	7/8	N-5701	57/64	A
10	2/64	1/4	S-1098	11/16	T-2098	7/8	B-3098	11/16	D-4098	53/64	N-5098	7/8	A
	3/16	3/32	S-1003	47/64	T-2003	57/64	B-3003	47/64	D-4003	7/8	N-5003	57/64	A
1/4	15/32	13/32	S-1004	57/64	T-2004	13/64	B-3004	57/64	D-4004	1	N-5004	13/64	B
	9/16	13/32	S-1801	57/64	T-2801	13/32	B-3801	57/64	D-4801	13/64	N-5801	13/32	B
5/16	15/32	13/32	S-1005	57/64	T-2005	13/64	B-3005	57/64	D-4005	1	N-5005	13/64	B
	9/16	13/32	S-1802	13/16	T-2802	13/32	B-3802	13/16	D-4802	13/64	N-5802	13/32	B
3/8	9/16	13/32	S-1143	13/16	T-2143	13/32	B-3143	13/16	D-4143	13/64	N-5143	13/32	B

STANDARD BARREL (1/4" Barrel) 16-14 / AWG WIRE RANGE / BARREL I.D. — .095 x .030" THICK / INSULATION COLOR — BLUE

1-2	1/4	3/32	S-1102	19/32	T-2102	25/32	B-3102	19/32	D-4102	47/64	N-5102	25/32	A
3-4	1/4	3/32	S-1048	19/32	T-2048	25/32	B-3048	19/32	D-4048	47/64	N-5048	25/32	A
	2/64	1/4	S-1823	11/16	T-2823	7/8	B-3823	11/16	D-4823	53/64	N-5823	7/8	A
5-6	1/4	3/32	S-1006	19/32	T-2006	25/32	B-3006	19/32	D-4006	47/64	N-5006	25/32	A
	2/64	1/4	S-1007	11/16	T-2007	7/8	B-3007	11/16	D-4007	53/64	N-5007	7/8	A
	3/16	3/32	S-1092	47/64	T-2092	57/64	B-3092	47/64	D-4092	7/8	N-5092	57/64	A
8	1/4	3/32	S-1824	19/32	T-2824	25/32	B-3824	19/32	D-4824	47/64	N-5824	25/32	A
	2/64	1/4	S-1024	11/16	T-2024	7/8	B-3024	11/16	D-4024	53/64	N-5024	7/8	A
	3/16	3/32	S-1093	47/64	T-2093	57/64	B-3093	47/64	D-4093	7/8	N-5093	57/64	A
10	2/64	1/4	S-1008	11/16	T-2008	7/8	B-3008	11/16	D-4008	53/64	N-5008	7/8	A
	3/16	3/32	S-1094	47/64	T-2094	57/64	B-3094	47/64	D-4094	7/8	N-5094	57/64	A
1/4	15/32	13/32	S-1009	57/64	T-2009	13/64	B-3009	57/64	D-4009	1	N-5009	13/64	B
	9/16	13/32	S-1826	13/16	T-2826	13/32	B-3826	13/16	D-4826	13/64	N-5826	13/32	B
5/16	15/32	13/32	S-1041	57/64	T-2041	13/64	B-3041	57/64	D-4041	1	N-5041	13/64	B
	9/16	13/32	S-1827	13/16	T-2827	13/32	B-3827	13/16	D-4827	13/64	N-5827	13/32	B
3/8	9/16	13/32	S-1147	13/16	T-2147	13/32	B-3147	13/16	D-4147	13/64	N-5147	13/32	B

STANDARD BARREL (1/4" Barrel) 12-10 / AWG WIRE RANGE / BARREL I.D. — .138 x .040" THICK / INSULATION COLOR — YELLOW

3-4	1/4	3/32	S-1148	47/64	T-2148	13/64	B-3148	47/64	D-4148	31/32	N-5148	13/64	B
5-6	1/4	3/32	S-1149	47/64	T-2149	13/64	B-3149	47/64	D-4149	31/32	N-5149	13/64	B
	3/8	3/32	S-1049	47/64	T-2049	13/64	B-3049	47/64	D-4049	31/32	N-5049	13/64	B
8	1/4	3/32	S-1150	47/64	T-2150	13/64	B-3150	47/64	D-4150	31/32	N-5150	13/64	B
	3/8	3/32	S-1050	47/64	T-2050	13/64	B-3050	47/64	D-4050	31/32	N-5050	13/64	B
10	3/8	3/32	S-1011	47/64	T-2011	13/64	B-3011	47/64	D-4011	31/32	N-5011	13/64	B
1/4	15/32	7/16	S-1100	61/64	T-2100	11/32	B-3100	61/64	D-4100	13/64	N-5100	11/32	C
	3/64	7/16	S-1012	31/32	T-2012	11/32	B-3012	31/32	D-4012	11/64	N-5012	11/32	C
5/16	15/32	7/16	S-1101	61/64	T-2101	11/32	B-3101	61/64	D-4101	13/64	N-5101	11/32	C
	3/64	7/16	S-1042	31/32	T-2042	11/32	B-3042	31/32	D-4042	11/64	N-5042	11/32	C
3/8	15/32	7/16	S-1013	61/64	T-2013	11/32	B-3013	61/64	D-4013	13/64	N-5013	11/32	C
	3/64	7/16	S-1153	31/32	T-2153	11/32	B-3153	31/32	D-4153	11/64	N-5153	11/32	C
7/16	3/4	3/64	S-1154	11/64	T-2154	11/32	B-3154	11/64	D-4154	12/64	N-5154	11/32	N
1/2	3/4	3/64	S-1155	11/64	T-2155	11/32	B-3155	11/64	D-4155	12/64	N-5155	11/32	N

FOR LARGER QUANTITY PRICES, CONTACT WALDOM ELECTRONICS

"REFER TO PAGE 2-1074 FOR PRICES"



BLOCK SPADE—FLANGED BLOCK SPADE TERMINALS

STANDARD BARREL (1/4" BARREL)

22-18/AWG WIRE RANGE/BARREL I.D. — .075 x .030" THICK/
INSULATION COLOR — RED

BASIC TERMINAL DIMENSIONS			NON-INSULATED BUTTED SEAM		VINYL INSULATED		NON-INSULATED BRAZED SEAM		NON-INSULATED WITH INSULATION GRIP		NYLON INSULATED WITH INSULATION GRIP		
Stud Size S	Width W	Clearance C	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	PRICE CODE
4-6	1/4 1 5/16	1/4	S-1118 S-1014	2 1/2 2 1/2	T-2118 T-2014	2 1/2 2 1/2	B-3118 B-3014	2 1/2 2 1/2	D-4118 D-4014	2 1/2 2 1/2	N-5118 N-5014	2 1/2 2 1/2	A A
8	1 5/16	1/4	S-1030	2 1/2	T-2030	2 1/2	B-3030	2 1/2	D-4030	2 1/2	N-5030	2 1/2	A
10	1 5/16	1/4	S-1032	2 1/2	T-2032	2 1/2	B-3032	2 1/2	D-4032	2 1/2	N-5032	2 1/2	A

STANDARD BARREL (1/4" BARREL)

16-14/AWG WIRE RANGE/BARREL I.D. — .095 x .030" THICK/
INSULATION COLOR — BLUE

4-6	1/4 1 5/16	1/4	S-1123 S-1015	2 1/2 2 1/2	T-2123 T-2015	2 1/2 2 1/2	B-3123 B-3015	2 1/2 2 1/2	D-4123 D-4015	2 1/2 2 1/2	N-5123 N-5015	2 1/2 2 1/2	A A
8	1 5/16	1/4	S-1033	2 1/2	T-2033	2 1/2	B-3033	2 1/2	D-4033	2 1/2	N-5033	2 1/2	A
10	1 5/16	1/4	S-1702	2 1/2	T-2702	2 1/2	B-3702	2 1/2	D-4702	2 1/2	N-5702	2 1/2	A

STANDARD BARREL (1/4" BARREL)

12-10/AWG WIRE RANGE/BARREL I.D. — .138 x .040" THICK/
INSULATION COLOR — YELLOW

4-6	5/16	3/32	S-1706	4 7/16	T-2706	1 1/4	B-3706	4 7/16	D-4706	3 1/2	N-5706	1 1/4	B
8	5/16	3/32	S-1707	4 7/16	T-2707	1 1/4	B-3707	4 7/16	D-4707	3 1/2	N-5707	1 1/4	B
10	5/16	3/32	S-1708	4 7/16	T-2708	1 1/4	B-3708	4 7/16	D-4708	3 1/2	N-5708	1 1/4	B

FLANGED BLOCK SPADE TERMINALS

STANDARD BARREL (1/4" BARREL)

22-18/AWG WIRE RANGE/BARREL I.D. — .075 x .030" THICK/
INSULATION COLOR — RED

BASIC TERMINAL DIMENSIONS			NON-INSULATED BUTTED SEAM		VINYL INSULATED		NON-INSULATED BRAZED SEAM		NON-INSULATED WITH INSULATION GRIP		NYLON INSULATED WITH INSULATION GRIP		
Stud Size S	Width W	Clearance C	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	PRICE CODE
4-6	1/4 1 5/16	1/4	S-1717 S-1080	2 1/2 2 1/2	T-2717 T-2080	2 1/2 2 1/2	B-3717 B-3080	2 1/2 2 1/2	D-4717 D-4080	2 1/2 2 1/2	N-5717 N-5080	2 1/2 2 1/2	A A
8	1 5/16	1/4	S-1081	2 1/2	T-2081	2 1/2	B-3081	2 1/2	D-4081	2 1/2	N-5081	2 1/2	A
10	1 5/16	1/4	S-1082	2 1/2	T-2082	2 1/2	B-3082	2 1/2	D-4082	2 1/2	N-5082	2 1/2	A

STANDARD BARREL (1/4" BARREL)

16-14/AWG WIRE RANGE/BARREL I.D. — .095 x .030" THICK/
INSULATION COLOR — BLUE

4-6	1/4 1 5/16	1/4	S-1718 S-1083	2 1/2 2 1/2	T-2718 T-2083	2 1/2 2 1/2	B-3718 B-3083	2 1/2 2 1/2	D-4718 D-4083	2 1/2 2 1/2	N-5718 N-5083	2 1/2 2 1/2	A A
8	1 5/16	1/4	S-1084	2 1/2	T-2084	2 1/2	B-3084	2 1/2	D-4084	2 1/2	N-5084	2 1/2	A
10	1 5/16	1/4	S-1085	2 1/2	T-2085	2 1/2	B-3085	2 1/2	D-4085	2 1/2	N-5085	2 1/2	A

STANDARD BARREL (1/4" BARREL)

12-10/AWG WIRE RANGE/BARREL I.D. — .138 x .040" THICK/
INSULATION COLOR — YELLOW

4-6	5/16	3/32	S-1722	4 7/16	T-2722	1 1/4	B-3722	4 7/16	D-4722	3 1/2	N-5722	1 1/4	B
8	5/16	3/32	S-1723	4 7/16	T-2723	1 1/4	B-3723	4 7/16	D-4723	3 1/2	N-5723	1 1/4	B
10	5/16	3/32	S-1724	4 7/16	T-2724	1 1/4	B-3724	4 7/16	D-4724	3 1/2	N-5724	1 1/4	B

Short Barrel (3/32" Barrel) terminals available for all above terminals except 12-10 wire range. To order, add prefix letter "S" to complete part number shown above.

FOR LARGER QUANTITY PRICES, CONTACT WALDOM ELECTRONICS

"REFER TO PAGE 2-1074 FOR PRICES"

waldom

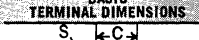


4633 WEST 53rd STREET / CHICAGO, ILLINOIS 60632 / (312) 585-1212

ROUND SPADE — ROUND FLANGED SPADE TERMINALS

(1/4" BARREL)

26-24 /AWG WIRE RANGE/BARREL I.D. — .035 x .020" THICK/
INSULATION COLOR — YELLOW

BASIC TERMINAL DIMENSIONS			NON-INSULATED BUTTED SEAM		VINYL INSULATED		NON-INSULATED BRAZED SEAM		NON-INSULATED WITH INSULATION GRIP		NYLON INSULATED WITH INSULATION GRIP		
													
Stud Size S	Width W	Clearance C	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	PRICE CODE
0	3/64	3/64	S-1938	5/16	—	—	—	—	D-4938	7/16	N-5938	7/32	A
3-4	1/64	1/32	S-1934	23/64	—	—	—	—	D-4934	3/64	N-5934	23/64	A
5-6	1/4	1/2	S-1940	13/32	—	—	—	—	D-4940	23/32	N-5940	7/16	A

STANDARD BARREL (1/4" BARREL)

22-18/AWG WIRE RANGE/BARREL I.D. — .075 x .030" THICK/
INSULATION COLOR — RED

4-6	3/64 2/64	1/4 1/32	S-1029 S-1501	1/16 2/32	T-2029 T-2501	7/8 1/16	B-3029 B-3501	1/16 2/32	D-4029 D-4501	3/64 2/64	N-5029 N-5501	7/8 1/16	A A
8	2/64 2/64	1/4 1/32	S-1031 S-1806	1/16 2/32	T-2031 T-2806	7/8 1/16	B-3031 B-3806	1/16 2/32	D-4031 D-4806	3/64 2/64	N-5031 N-5806	7/8 1/16	A A
10	2/64 2/64	1/4 1/32	S-1709 S-1505	1/16 2/32	T-2709 T-2505	7/8 1/16	B-3709 B-3505	1/16 2/32	D-4709 D-4505	3/64 2/64	N-5709 N-5505	7/8 1/16	A A

STANDARD BARREL (1/4" BARREL)

16-14/AWG WIRE RANGE/BARREL I.D. — .095 x .030" THICK/
INSULATION COLOR — BLUE

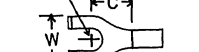
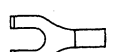
4-6	2/64 2/64	1/4 1/32	S-1529 S-1051	1/16 2/32	T-2529 T-2051	7/8 1/16	B-3529 B-3051	1/16 2/32	D-4529 D-4051	3/64 2/64	N-5529 N-5051	7/8 1/16	A A
8	2/64 2/64	1/4 1/32	S-1831 S-1052	1/16 2/32	T-2831 T-2052	7/8 1/16	B-3831 B-3052	1/16 2/32	D-4831 D-4052	3/64 2/64	N-5831 N-5052	7/8 1/16	A A
10	2/64 2/64	1/4 1/32	S-1016 S-1533	1/16 2/32	T-2016 T-2533	7/8 1/16	B-3016 B-3533	1/16 2/32	D-4016 D-4533	3/64 2/64	N-5016 N-5533	7/8 1/16	A A

STANDARD BARREL (1/4" BARREL)

12-10/AWG WIRE RANGE/BARREL I.D. — .138 x .040" THICK/
INSULATION COLOR — YELLOW

4-6	3/8	1/2	S-1053	1/4	T-2053	1 1/4	B-3053	1/4	D-4053	1/2	N-5053	1 1/4	B
8	3/8	1/2	S-1054	1/4	T-2054	1 1/4	B-3054	1/4	D-5054	1/2	N-5054	1 1/4	B
10	3/8	1/2	S-1017	1/4	T-2017	1 1/4	B-3017	1/4	D-4017	1/2	N-5017	1 1/4	B

22-18/AWG WIRE RANGE/BARREL I.D. — .075 x .030" THICK/
INSULATION COLOR — REDROUND FLANGED SPADE TERMINALS
STANDARD BARREL (1/4" BARREL)

BASIC TERMINAL DIMENSIONS			NON-INSULATED BUTTED SEAM		VINYL INSULATED		NON-INSULATED BRAZED SEAM		NON-INSULATED WITH INSULATION GRIP		NYLON INSULATED WITH INSULATION GRIP		
													
Stud Size S	Width W	Clearance C	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	PRICE CODE
4-6	2 ³ / ₆₄	1 ¹ / ₃₂	S-1510 S-1809	1 ¹ / ₁₆ 2 ³ / ₃₂	T-2510 T-2809	7 ⁸ / ₁₆	B-3510 B-3809	1 ¹ / ₁₆ 2 ³ / ₃₂	D-4510 D-4809	5 ⁶ / ₆₄	N-5510 N-5809	7 ⁸ / ₁₆	A A
8	2 ³ / ₆₄	1 ¹ / ₃₂	S-1811 S-1812	1 ¹ / ₁₆ 2 ³ / ₃₂	T-2811 T-2812	7 ⁸ / ₁₆	B-3811 B-3812	1 ¹ / ₁₆ 2 ³ / ₃₂	D-4811 D-4812	5 ⁶ / ₆₄ 2 ³ / ₆₄	N-5811 N-5812	7 ⁸ / ₁₆	A A
10	2 ³ / ₆₄	1 ¹ / ₃₂	S-1715 S-1582	1 ¹ / ₁₆ 2 ³ / ₃₂	T-2715 T-2582	7 ⁸ / ₁₆	B-3715 B-3582	1 ¹ / ₁₆ 2 ³ / ₃₂	D-4715 D-4582	5 ⁶ / ₆₄ 2 ³ / ₆₄	N-5715 N-5582	7 ⁸ / ₁₆	A A

STANDARD BARREL (1/4" BARREL)

16-14/AWG WIRE RANGE/BARREL I.D. — .095 x .030" THICK/
INSULATION COLOR — BLUE

4-6	2/64 2/64	1/4 1/32	S-1538 S-1834	1/16 2/32	T-2538 T-2834	7/8 1/16	B-3538 B-3834	1/16 2/32	D-4538 D-4834	3/64 2/64	N-5538 N-5834	7/8 1/16	A A
8	2/64 2/64	1/4 1/32	S-1836 S-1837	1/16 2/32	T-2836 T-2837	7/8 1/16	B-3836 B-3837	1/16 2/32	D-4836 D-4837	3/64 2/64	N-5836 N-5837	7/8 1/16	A A
10	2/64 2/64	1/4 1/32	S-1716 S-1585	1/16 2/32	T-2716 T-2585	7/8 1/16	B-3716 B-3585	1/16 2/32	D-4716 D-4585	3/64 2/64	N-5716 N-5585	7/8 1/16	A A

STANDARD BARREL (1/4" BARREL)

12-10/AWG WIRE RANGE/BARREL I.D. — .138 x .040" THICK/
INSULATION COLOR — YELLOW

4-6	3/8	1/2	S-1086	1/4	T-2086	1 1/4	B-3086	1/4	D-4086	1/2	N-5086	1 1/4	B
8	3/8	1/2	S-1087	1/4	T-2087	1 1/4	B-3087	1/4	D-4087	1/2	N-5087	1 1/4	B
10	3/8	1/2	S-1088	1/4	T-2088	1 1/4	B-3088	1/4	D-4088	1/2	N-5088	1 1/4	B

Short Barrel (1/2" Barrel) terminals available for all above terminals except 12-10 wire range. To order, add prefix letter "S" to complete part number shown above.

FOR LARGER QUANTITY PRICES, CONTACT WALDOM ELECTRONICS

"REFER TO PAGE 2-1074 FOR PRICES"



QUICK-DISCONNECT TERMINALS & BUTT-PARALLEL CONNECTORS

FEMALE PUSH-ON TYPE



BASIC TERMINAL DIMENSIONS			NON-INSULATED BUTTED SEAM		VINYL INSULATED		NON-INSULATED WITH INSULATION GRIP		NYLON INSULATED WITH INSULATION GRIP		PRICE CODE
Wire Range	Tab Width W	Tab Thickness T	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	
26-20	.110-.125	.016	S-1725	$\frac{3}{4}$	—		D-4725	$\frac{3}{4}$	N-5725	$\frac{1}{4}$	D
	.110-.125	.030-.032	S-1726	$\frac{3}{4}$			D-4726	$\frac{3}{4}$	N-5726	$\frac{1}{4}$	D
22-18	.250	.030-.032	S-1727	$\frac{1}{4}$	—		—		—		D
18-14	.110-.125	.016	SS-1186	$\frac{3}{4}$	ST-2186	$\frac{5}{4}$	SD-4186	$\frac{3}{4}$	SN-5186	$\frac{5}{4}$	D
	.110-.125	.030-.032	SS-1728	$\frac{3}{4}$	ST-2728	$\frac{5}{4}$	SD-4728	$\frac{3}{4}$	SN-5728	$\frac{5}{4}$	D
	.187-.205	.016	SS-1187	$\frac{3}{4}$	ST-2187	$\frac{25}{32}$	SD-4187	$\frac{7}{16}$	SN-5187	$\frac{25}{32}$	D
	.250	.030-.032	SS-1090	$\frac{1}{4}$	ST-2090	$\frac{3}{4}$	SD-4090	$\frac{13}{16}$	SN-5090	$\frac{5}{4}$	AK
12-8	.250	.030-.032	S-1729	$\frac{1}{4}$	T-2729	$\frac{1}{4}$	D-4729	$\frac{25}{32}$	N-5729	$\frac{1}{4}$	F
	.375	.050	S-1730	$\frac{3}{4}$	T-2730	$\frac{13}{16}$	D-4730	$\frac{13}{16}$	N-5730	$\frac{13}{16}$	C

MALE PUSH-ON TYPE



18-14	.187	.016	S-1190	$\frac{1}{2}$	T-2190	$\frac{25}{32}$	D-4190	$\frac{1}{4}$	N-5190	$\frac{25}{32}$	D
18-14	.250	.030-.032	S-1089	$\frac{25}{32}$	T-2089	$\frac{5}{4}$	D-4089	$\frac{7}{8}$	N-5089	$\frac{5}{4}$	D
16-12	.250	.030-.032	SS-1188	$\frac{1}{4}$	ST-2188	$\frac{25}{32}$	SD-4188	$\frac{5}{4}$	SN-5188	$\frac{27}{32}$	P
12-8	.250	.030-.032	S-1731	$\frac{1}{4}$	T-2731	$\frac{13}{32}$	D-4731	$\frac{13}{16}$	N-5731	$\frac{13}{32}$	P

MALE-FEMALE QUICK SLIDES — SELF-MATING



26-20	.110-.125		S-1732	$\frac{3}{4}$	—		D-4732	$\frac{3}{4}$	N-5732	$\frac{1}{4}$	D
18-14	.110-.125	SELF-MATING PARTS	S-1733	$\frac{3}{4}$	T-2733	$\frac{5}{4}$	D-4733	$\frac{3}{4}$	N-5733	$\frac{5}{4}$	D
	.187-.205		S-1734	$\frac{3}{4}$	T-2734	$\frac{25}{32}$	D-4734	$\frac{7}{16}$	N-5734	$\frac{25}{32}$	D
	.250		S-1735	$\frac{1}{4}$	T-2735	$\frac{5}{4}$	D-4735	$\frac{13}{16}$	N-5735	$\frac{5}{4}$	D
12-8	.250		S-1736	$\frac{1}{4}$	T-2736	$\frac{1}{4}$	D-4736	$\frac{25}{32}$	N-5736	$\frac{1}{4}$	P
	.375		S-1737	$\frac{3}{4}$	T-2737	$\frac{13}{16}$	D-4737	$\frac{13}{16}$	N-5737	$\frac{13}{16}$	R

SELF-MATING DISCONNECTING TERMINALS



22-18	.250	.030	S-1738	$\frac{1}{4}$	T-2738	$\frac{5}{4}$	D-4738	$\frac{7}{8}$	N-5738	$\frac{5}{4}$	C
16-14	.250	.030	S-1739	$\frac{1}{4}$	T-2739	$\frac{5}{4}$	D-4739	$\frac{7}{8}$	N-5739	$\frac{5}{4}$	C

SNAP PLUGS



16-14	$\frac{3}{16}$	.157	S-1055	$\frac{15}{32}$	T-2055	$\frac{25}{32}$	D-4055	$\frac{5}{4}$	N-5055	$\frac{27}{32}$	A
16-14	$\frac{3}{16}$	.176	S-1056	$\frac{15}{32}$	T-2056	$\frac{25}{32}$	D-4056	$\frac{5}{4}$	N-5056	$\frac{27}{32}$	A
12-10	$\frac{3}{16}$	.157	S-1740	$\frac{15}{32}$	T-2740	$\frac{1}{4}$	D-4740	$\frac{25}{32}$	N-5740	$\frac{1}{4}$	B

BUTT CONNECTORS



BASIC TERMINAL DIMENSIONS			NON-INSULATED BUTTED SEAM		VINYL INSULATED		NON-INSULATED SEAMLESS		NYLON INSULATED WITH INSULATION GRIP		PRICE CODE
Wire Range	Stock	Barrel I.D.	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	Catalog Number	Length L	
26-22	.020	.035	S-1950	—	—		—		N-5950	$\frac{7}{8}$	P
22-18	.030	.075	S-1019	$\frac{3}{4}$					N-5019	1	D
16-14	.030	.095	S-1020	$\frac{3}{4}$	T-2020	1	B-3020	$\frac{21}{32}$	N-5020	1	D
12-10	.040	.138	S-1046	$\frac{3}{4}$	T-2046	$\frac{11}{16}$	B-3046	$\frac{13}{16}$	N-5046	$\frac{11}{16}$	F
8	.050	.185	—	—	T-2263	$\frac{11}{16}$	B-3263	$\frac{13}{16}$	—	—	AC
5-6	.050	.255	—	—	T-2264	$\frac{11}{16}$	B-3264	$\frac{13}{16}$	—	—	AA
3-4	.075	.285	—	—	T-2265	$\frac{21}{16}$	B-3265	$\frac{11}{8}$	—	—	AA

PARALLEL CONNECTORS

22-18	.020	.075	S-1105	$\frac{3}{16}$	T-2105	$\frac{11}{16}$	B-3105	$\frac{5}{16}$	N-5105	$\frac{11}{16}$	A
16-14	.030	.095	S-1063	$\frac{25}{32}$	T-2063	$\frac{11}{16}$	B-3063	$\frac{21}{32}$	N-5063	$\frac{11}{16}$	G
12-10	.040	.138	S-1064	$\frac{25}{32}$	T-2064	$\frac{11}{16}$	B-3064	$\frac{21}{32}$	N-5064	$\frac{11}{16}$	H
8	.050	.185	—	—	T-2260	$\frac{15}{16}$	B-3260	$\frac{13}{16}$	—	—	AB
4-6	.050	.255	—	—	T-2261	$\frac{13}{16}$	B-3261	$\frac{25}{32}$	—	—	AC

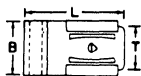
FOR LARGER QUANTITY PRICES, CONTACT WALDOM ELECTRONICS

"REFER TO PAGE 2-1074 FOR PRICES"

QUICK-DISCONNECT TERMINALS

FEMALE FLAGS | waldom

18-14 WIRE RANGE—KRIMPITITE*

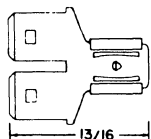


Part No.	Tab T	Barrel Length B	Length L	Pkg. of 100	Bulk	
					1000-4999, or more, per M	5000 or more, per M
S-1189	.187x.020	15/64	29/64	3.75	26.55	20.90
S-1091-A	.250x.032	15/64	29/64	4.15	29.35	22.90

16-12 WIRE RANGE—KRIMPITITE*

S-1091-B	.250x.020	5/16	19/32	4.15	29.35	22.90
----------	-----------	------	-------	------	-------	-------

DOUBLE MALE TAB ADAPTER



For converting one .250 x .032 Male Tab to two Male Tabs. .032 Stock.

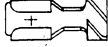
Part No.	Pkg. of 100	NET PRICES	
		1000-4999, or more, per M	5000 or more, per M
A-1428	6.10	48.45	36.35

ECONOMICAL INSULATION-GRIP QUICK DISCONNECTS

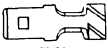
MATERIAL: BRASS, ELECTRO-TIN PLATED



CP-801



CP-802



CP-803

Part No.	Wire Range	Description	Pkg. of 100	NET PRICES	
				1000-4999, per M	5000 or more, per M
CP-801	20-16	1/4" Female	4.75	37.50	32.65
CP-802	16-12	1/4" Female	4.75	37.50	32.65
CP-803	20-16	1/4" Male	4.75	37.50	32.65

1/4" MALE TABS

MATERIAL: .031 BRASS, CADMIUM PLATED



S-1432T

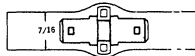


S-1431T

Part No.	Height	Mtg. Hole	Pkg. of 100	NET PRICES	
				1000-4999, per M	5000 or more, per M
S-1431T	7/16	.156	2.20	17.35	16.95
S-1432T	29/64	.144	4.75	37.50	32.65

INSULATED TAB RECEPTACLE

For connecting two .250 Female Disconnects.



TR1427

Part No.	NET PRICES		
	Pkg. of 100	1000-4999, or more, per M	5000 or more, per M
TR-1427	11.65	83.75	65.25



PR-1426

Part No.	NET PRICES		
	Pkg. of 100	1000-4999, or more, per M	5000 or more, per M
PR-1426	11.65	83.75	65.25

INSULATED SNAP PLUG RECEPTACLE. An insulated connector for use with S-1005, T-2055, T-2055X, D-4055 & N-5055. One snap plug is inserted in either end of the receptacle. Tubular Shell is high impact transparent Styrene.

SNAP PLUG TO TAB ADAPTERS



DOUBLE MALE A-1429



DOUBLE FEMALE A-1430

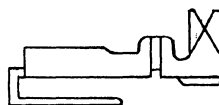
For adapting .157 Plug Receptacle to .250 Female Disconnect. .032 Stock.

For adapting .157 Plug to .250 x .032 Tab.

Part No.	Pkg. of 100	NET PRICES	
		1000-4999, per M	5000 or more, per M
A-1429	6.05	45.85	35.80
A-1430	8.60	61.50	57.10

PIGGY BACK TERMINAL

MATERIAL: BRASS (UNPLATED)



Part No.	Wire Range	NET PRICES		
		Pkg. of 100	Pkg. of 1000 1-4	5 or more
PB-1431	20-12	8.60	61.50	57.10

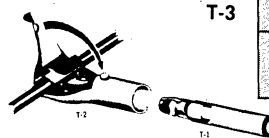
T-TAB TERMINAL

For attaching trailer lights to Towing Vehicle's Lighting System without cutting wires. The T-2 receptacle consists of a brass insulation piercing terminal with a slipover, fold-over insulating sleeve. (Use ordinary pliers to crimp piercing portion of terminal to wire.) The T-1 snap plug, with nylon insulating sleeve, allows easy, quick disconnecting of trailer wire. Wire range 16-14. Use CT-4050 crimping tool.

PART NO. (Male) T-1

PART NO. (Female) T-2

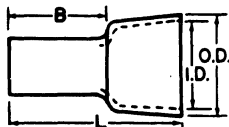
PART NO. (Complete Set) T-3



Part No.	Pkg. of 25	NET PRICES		
		Pkg. of 100	1000-4999, per M	5000 or more, per M
T-3	7.10	22.95	182.45	153.05
T-2	3.90	12.50	100.05	83.60
T-1	3.25	10.50	82.40	69.45

NYLON INSULATED CLOSED END CONNECTORS

Connectors are annealed, tin-plated, seamless brass for 22-14 wire range, and annealed tin-plated copper for 16-10 wire range. Insulation is natural-color translucent DuPont Nylon. Underwriters' Laboratories approved. UL temperature rating of 105°C maximum. 600 Volts maximum in building wire and 1,000 Volts inside a sign or fixture.



Wire Range	Part Number	Outside Diameter O.D.	Overall Length L	Barrel Length B	Inside Diameter I.D.	Circular Mil Area	Pkg. of 100	BULK	
								1000-4999, per M	5000 or more, per M
22-14	CE-2214	5/16	39/64	11/32	1/4	600-5,180	5.40	39.80	31.15
16-10	CE-1610	7/16	23/32	3/8	3/8	2,400-13,000	7.85	57.90	45.25

T-2000 SERIES VINYL INSULATED

PRICE CODE	PER Pkg. of 100	100-999	1,000-9,999	10,000-99,999	100,000-999,999
A	\$ 6.05	\$44.70	\$35.05	\$35.05	\$35.05
B	7.85	57.90	45.25	45.25	45.25
C	9.65	71.10	55.55	55.55	55.55
D	11.45	84.30	65.85	65.85	65.85
E	13.25	97.50	76.15	76.15	76.15
F	15.05	110.70	86.45	86.45	86.45
G	16.85	123.90	96.75	96.75	96.75
H	18.65	137.10	107.05	107.05	107.05
I	20.45	150.30	117.35	117.35	117.35
J	22.25	163.50	127.65	127.65	127.65
K	24.05	176.70	137.95	137.95	137.95
L	25.85	189.90	148.25	148.25	148.25
M	27.65	203.10	158.55	158.55	158.55
N	29.45	216.30	168.85	168.85	168.85
O	31.25	229.50	179.15	179.15	179.15
P	33.05	242.70	189.45	189.45	189.45
Q	34.85	255.90	199.75	199.75	199.75
R	36.65	269.10	210.05	210.05	210.05
S	38.45	282.30	220.35	220.35	220.35
T	40.25	295.50	230.65	230.65	230.65
U	42.05	308.70	240.95	240.95	240.95
V	43.85	321.90	251.25	251.25	251.25
W	45.65	335.10	261.55	261.55	261.55
X	47.45	348.30	271.85	271.85	271.85
Y	49.25	361.50	282.15	282.15	282.15
Z	51.05	374.70	292.45	292.45	292.45
AA	52.85	387.90	302.75	302.75	302.75
AB	54.65	401.10	313.05	313.05	313.05
AC	56.45	414.30	323.35	323.35	323.35
AD	58.25	427.50	333.65	333.65	333.65
AE	60.05	440.70	343.95	343.95	343.95
AF	61.85	453.90	354.25	354.25	354.25
AG	63.65	467.10	364.55	364.55	364.55

B-3000 SERIES NON-INSULATED BRAZED BARREL				
PRICE CODE	PER Pkg. of 100	100-999	1,000-9,999	10,000-99,999
A	\$ 4.30	\$38.35	\$29.20	\$29.20
B	5.10	45.45	34.85	34.85
C	5.90	52.55	40.45	40.45
D	6.70	59.65	46.05	46.05
E	7.50	66.75	51.65	51.65
F	8.30	73.85	57.25	57.25
G	9.10	80.95	62.85	62.85
H	9.90	88.05	68.45	68.45
I	10.70	95.15	74.05	74.05
J	11.50	102.25	79.65	79.65
K	12.30	109.35	85.25	85.25
L	13.10	116.45	90.85	90.85
M	13.90	123.55	96.45	96.45
N	14.70	130.65	102.05	102.05
O	15.50	137.75	107.65	107.65
P	16.30	144.85	113.25	113.25
Q	17.10	151.95	118.85	118.85
R	17.90	159.05	124.45	124.45
S	18.70	166.15	130.05	130.05
T	19.50	173.25	135.65	135.65
U	20.30	180.35	141.25	141.25
V	21.10	187.45	146.85	146.85
W	21.90	194.55	152.45	152.45
X	22.70	201.65	158.05	158.05
Y	23.50	208.75	163.65	163.65
Z	24.30	215.85	169.25	169.25
AA	25.10	222.95	174.85	174.85
AB	25.90	230.05	180.45	180.45
AC	26.70	237.15	186.05	186.05
AD	27.50	244.25	191.65	191.65

D-4000 SERIES NON-INSULATED WITH COPPER SLEEVE				
PRICE CODE	PER Pkg. of 100	100-999	1,000-9,999	10,000-99,999
A	\$ 6.20	\$48.15	\$37.45	\$37.45
B	7.40	57.45	44.75	44.75
C	8.60	66.75	52.05	52.05
D	9.80	76.05	59.35	59.35
E	11.00	85.35	66.65	66.65
F	12.20	94.65	73.95	73.95
G	13.40	103.95	81.25	81.25
H	14.60	113.25	88.55	88.55
I	15.80	122.55	95.85	95.85
J	17.00	131.85	103.15	103.15
K	18.20	141.15	110.45	110.45
L	19.40	150.45	117.75	117.75
M	20.60	159.75	125.05	125.05
N	21.80	169.05	132.35	132.35
O	23.00	178.35	139.65	139.65
P	24.20	187.65	146.95	146.95
Q	25.40	196.95	154.25	154.25
R	26.60	206.25	161.55	161.55
S	27.80	215.55	168.85	168.85
T	29.00	224.85	176.15	176.15
U	30.20	234.15	183.45	183.45
V	31.40	243.45	190.75	190.75
W	32.60	252.75	198.05	198.05
X	33.80	262.05	205.35	205.35
Y	35.00	271.35	212.65	212.65
Z	36.20	280.65	219.95	219.95
AA	37.40	289.95	227.25	227.25
AB	38.60	299.25	234.55	234.55
AC	39.80	308.55	241.85	241.85
AD	41.00	317.85	249.15	249.15

N5000 SERIES NYLON INSULATED WITH COPPER SLEEVE				
PRICE CODE	PER PKG. A-25 B-25	100- 999 Per C	1,000- 9,999 Per M	5,000- 9,999 Per M
A	\$ 9.40	\$75.90	\$57.00	\$57.00
B	11.70	93.60	70.30	70.30
C	13.20	103.75	77.85	77.85
D	9.40	75.90	57.00	57.00
E	10.90	87.90	70.00	70.00
F	A- 8.60	27.35	205.10	183.60
G	A-11.20	33.40	250.50	230.65
H	A-13.75	44.00	330.00	297.75
I		15.40	123.30	82.50
J		9.85	79.60	71.80
K		14.90	116.60	89.00
L		16.15	129.40	97.00
M		18.45	147.30	119.40

Buckeye

KNOBS

**IMPERIAL
SERIES**

**DESIGNER
SERIES**

**STANDARD
SERIES**

**PRESTIGE
SERIES**

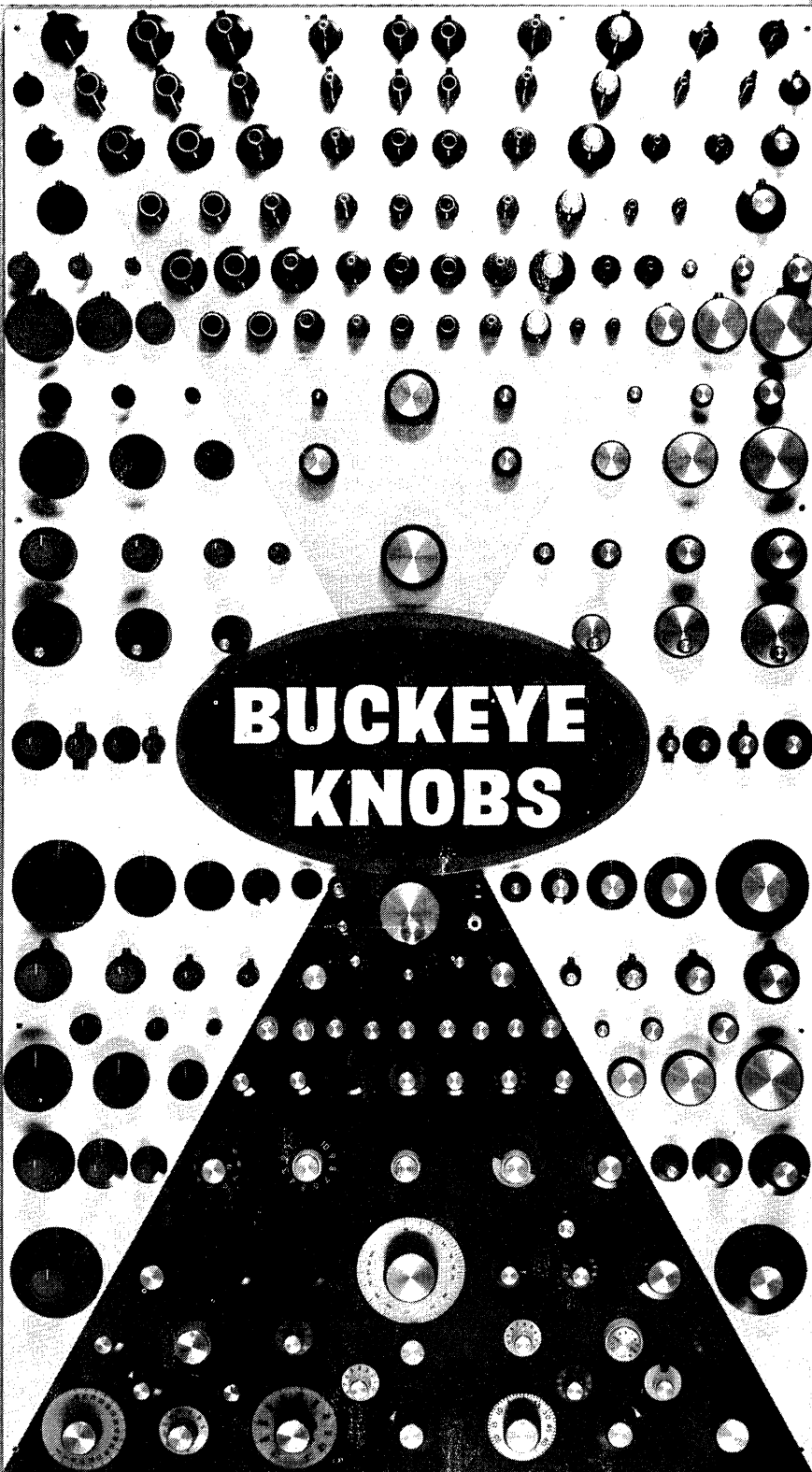
**STANDARD
AND CUSTOM
MODIFICATIONS**

**SILK
SCREENING**

**HOT
STAMPING**

Buckeye Stamping also
manufactures:

Cabinets, Cases, Bord-pak
Racks, retractable self-locking
Bails, and modular Card
Guides shown on pages 1•46,
1•47 section 1400

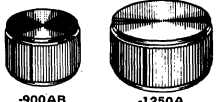
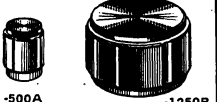
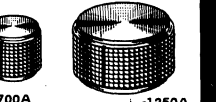


the **BUCKEYE** stamping co.

555 MARION ROAD / COLUMBUS, OHIO 43207 / TELEPHONE (614) 445-8433

"Quality Products Since 1902"

ALCO KNOB

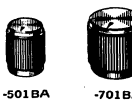
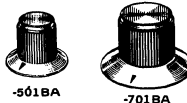
												
	KN STRAIGHT KNURL WITH OR WITHOUT HAIRLINE INDICATOR			K FLUTED, WITH OR WITHOUT HAIRLINE AND SPINNER			KD DIAMOND KNURL WITH HAIRLINE INDICATOR			KG HORIZONTAL KNURL WITH HAIRLINE INDICATOR		
BASIC DIAMETER	Model - Shaft Size	Finish	Unit Price	Model - Shaft Size	Finish	Unit Price	Model - Shaft Size	Finish	Unit Price	Model - Shaft Size	Finish	Unit Price
1/2"	KN-500A-1/8	Natural	1.05	K-500A-1/8	Natural	.90	KD-500A-1/8	Natural	1.05	KG-500A-1/8	Natural	.90
	KN-500A-1/4	Natural	1.05	K-500A-1/4	Natural	.90	KD-500A-1/4	Natural	1.05	KG-500A-1/4	Natural	.90
	KN-500B-1/8	Black	1.05	K-500B-1/8	Black	.90	KD-500B-1/8	Black	1.05	KG-500B-1/8	Black	.90
	KN-500B-1/4	Black	1.05	K-500B-1/4	Black	.90	KD-500B-1/4	Black	1.05	KG-500B-1/4	Black	.90
	KN-500AB-1/8	Nat'l/Blk.	1.30	K-500G-1/8	Gold	.90	KD-500G-1/8	Gold	1.05			
	KN-500AB-1/4	Nat'l/Blk.	1.30	K-500G-1/4	Gold	.90	KD-500G-1/4	Gold	1.05			
	KN-500BA-1/8	Blk./Nat'l	1.30									
	KN-500BA-1/4	Blk./Nat'l	1.30									
3/4"	KN-700A-1/4	Natural	1.10	K-700A-1/4	Natural	1.00	KD-700A-1/4	Natural	1.10	KG-700A-1/4	Natural	1.00
	KN-700B-1/4	Black	1.10	K-700B-1/4	Black	1.00	KD-700B-1/4	Black	1.10	KG-700B-1/4	Black	1.00
	KN-700AB-1/4	Nat'l/Blk.	1.40	K-700G-1/4	Gold	1.00	KD-700G-1/4	Gold	1.10			
	KN-700BA-1/4	Blk./Nat'l	1.40									
15/16"	KN-900A-1/4	Natural	1.30	K-900A-1/4	Natural	1.15	KD-900A-1/4	Natural	1.30	KG-900A-1/4	Natural	1.15
	KN-900B-1/4	Black	1.30	K-900B-1/4	Black	1.15	KD-900B-1/4	Black	1.30	KG-900B-1/4	Black	1.15
	KN-900AB-1/4	Nat'l/Blk.	1.60	K-900G-1/4	Gold	1.15	KD-900G-1/4	Gold	1.30			
	KN-900BA-1/4	Blk./Nat'l	1.60									
1-1/4"	KN-1250A-1/4	Natural	1.85	K-1250A-1/4	Natural	1.60	KD-1250A-1/4	Natural	1.75	KG-1250A-1/4	Natural	1.50
	KN-1250B-1/4	Black	1.85	K-1250B-1/4	Black	1.60	KD-1250B-1/4	Black	1.75	KG-1250B-1/4	Black	1.50
	KN-1250AB-1/4	Nat'l/Blk.	2.10	K-1250G-1/4	Gold	1.60	KD-1250G-1/4	Gold	1.75			
	KN-1250BA-1/4	Blk./Nat'l	2.10	K-1251A-1/4	Natural	1.55						
	KN-1251A-1/4	Natural	1.80	K-1251B-1/4	Black	1.55						
	KN-1251B-1/4	Black	1.80	K-1251G-1/4	Gold	1.55						
				K-1251AS-1/4	Natural	2.20						
				K-1251BS-1/4	Black	2.20						

MACHINED ANODIZED

All ALCO aluminum knobs are precision machined from special alloys. Anodized in natural, black or gold, depending on model selected. Five basic diameters from 1/2" to 1-3/4". Choice of styles from a variety of plain, knurled, fluted or grooved designs.

All standard series offer a choice of sizes, and the most popular styles have matching concentric, skirted, and spinner options. 1/8" and 1/4" shaft hole diameters are indicated by type number suffix. Allen head cup point stainless steel set screws are standard.

ALCO, YOUR PRIME KNOB SUPPLIER

	 -500B -500A			 -500A -500B-10			 -501BA -701BA			 -501BA -701BA		
	KB STRAIGHT KNURL WITH TOP LINE INDICATOR			KBS STRAIGHT KNURL WITH TOP LINE INDICATOR OR NUMERALS AND SKIRT			KN STRAIGHT KNURL WITH TOP ARROWHEAD INDICATOR			KNS STRAIGHT KNURL WITH SKIRT AND TOP ARROWHEAD INDICATOR		
BASIC DIAMETER	Model - Shaft Size	Finish	Unit Price	Model - Shaft Size	Finish	Unit Price	Model - Shaft Size	Finish	Unit Price	Model - Shaft Size	Finish	Unit Price
1/2"	KB-500A-1/8	Natural	1.15	KBS-500A-1/8	Natural	1.50	KN-501BA-1/8	Blk./Nat'l	1.30	KNS-501BA-1/8	Blk./Nat'l	1.55
	KB-500A-1/4	Natural	1.15	KBS-500A-1/4	Natural	1.50	KN-501BA-1/4	Blk./Nat'l	1.30	KNS-501BA-1/4	Blk./Nat'l	1.55
	KB-500B-1/8	Black	1.15	KBS-500B-1/8	Black	1.50						
	KB-500B-1/4	Black	1.15	KBS-500B-1/4	Black	1.50						
3/4"				KBS-500A-10-1/8	Natural	1.75						
				KBS-500A-10-1/4	Natural	1.75						
				KBS-500B-10-1/8	Black	1.75						
				KBS-500B-10-1/4	Black	1.75						
							KN-701BA-1/8	Blk./Nat'l	1.35	KNS-701BA-1/8	Blk./Nat'l	1.70
							KN-701BA-1/4	Blk./Nat'l	1.35	KNS-701BA-1/4	Blk./Nat'l	1.70

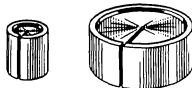
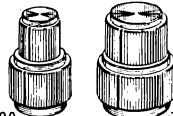
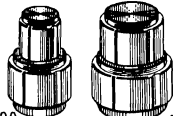
ALCO

ELECTRONIC PRODUCTS, INC.
1551E OSGOOD ST., NO. ANDOVER, MASS. 01845 U.S.A.

TEL: (617) 685-4371
TWX: 710 342-0552

A SUBSIDIARY OF
AUGAT INC.

ALCO KNOB

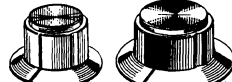
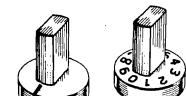
												
	-700A -900BA			-500A -1250A			-5700A -7900A			-5700A -7900A		
KPN STRAIGHT KNURL WITH POINTER AND LINE INDICATOR KHF SMOOTH BODY WITH TOP AND SIDE SAWCUT INDICATOR KN STRAIGHT KNURL CONCENTRIC WITH HAIRLINE INDICATORS K CONCENTRIC, FLUTED DESIGN WITH INDICATOR LINE												
BASIC DIAMETER	Model - Shaft Size	Finish	Unit Price	Model - Shaft Size	Finish	Unit Price	Model - Shaft Size	Finish	Unit Price	Model - Shaft Size	Finish	Unit Price
1/2"	KPN-500A-1/8	Natural	2.60	KHF-500A-1/4	Natural	.85						
	KPN-500A-1/4	Natural	2.60	KHF-500G-1/4	Gold	.85						
	KPN-500B-1/8	Black	2.60									
	KPN-500B-1/4	Black	2.60									
	KPN-500AB-1/8	Nat'l/Blk.	2.95									
	KPN-500AB-1/4	Nat'l/Blk.	2.95									
3/4"	KPN-500BA-1/8	Blk./Nat'l	2.95									
	KPN-500BA-1/4	Blk./Nat'l	2.95									
	KPN-700A-1/4	Natural	2.75	KHF-700A-1/4	Natural	.95						
	KPN-700B-1/4	Black	2.75	KHF-700G-1/4	Gold	.95						
15/16"	KPN-700AB-1/4	Nat'l/Blk.	3.10									
	KPN-700BA-1/4	Blk./Nat'l	3.10									
	KPN-900A-1/4	Natural	3.45	KHF-900A-1/4	Natural	1.05						
	KPN-900B-1/4	Black	3.45	KHF-900G-1/4	Gold	1.05						
1-1/4"	KPN-900AB-1/4	Nat'l/Blk.	3.70									
	KPN-900BA-1/4	Blk./Nat'l	3.70									
				KHF-1250A-1/4	Natural	1.45						
				KHF-1250G-1/4	Gold	1.45						
1/2" 3/4"							KN-5700A	Natural	2.30	K-5700A	Natural	2.05
							KN-5700B	Black	2.30	K-5700B	Black	2.05
3/4" 15/16"							KN-7900A	Natural	2.55	K-7900A	Natural	2.40
							KN-7900B	Black	2.55	K-7900B	Black	2.40

ALUMINUM KNOBS

Special and modified versions of all Alco machined aluminum knobs are available on special order. The unsurpassed appearance and high quality of these knobs provide enhanced visual impact for any control panel and assure greater customer acceptance.

Normally, orders are filled promptly from our inventory or from our large group of stocking distributors throughout the U.S.A., Canada and Europe. Use complete model numbers when requesting quotations or ordering. For detailed information ask for catalog K 974.

CUSTOM DESIGN SERVICE PROVIDED

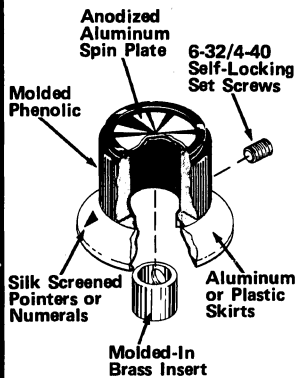
												
	-500A -700A			-700A -900B			-500A -500A-10			-500A -500B		
	KS FLUTED DESIGN WITH ALUMINUM SKIRT AND INDICATOR LINE			KSP FLUTED DESIGN WITH CLEAR ACRYLIC SKIRT AND INDICATOR LINE			KC CONTROL KNOB WITH FLATTED BODY AND SKIRT			KCVS "ADJUSTABLE STOP" CONTROL KNOB WITH SKIRT		
BASIC DIAMETER	Model - Shaft Size	Finish	Unit Price	Model - Shaft Size	Finish	Unit Price	Model - Shaft Size	Finish	Unit Price	Model - Shaft Size	Finish	Unit Price
1/2"	KS-500A-1/8	Natural	1.25				KC-500A-1/8	Natural	1.65	KCVS-500A-1/8	Natural	2.05
	KS-500A-1/4	Natural	1.25				KC-500B-1/8	Black	1.65	KCVS-500B-1/8	Black	2.05
	KS-500B-1/8	Black	1.25				KC-500A-10-1/8	Natural	1.90			
	KS-500B-1/4	Black	1.25				KC-500B-10-1/8	Black	1.90			
3/4"	KS-700A-1/4	Natural	1.50	KSP-700A-1/4	Natural	1.35						
	KS-700B-1/4	Black	1.50	KSP-700B-1/4	Black	1.35						
15/16"	KS-900A-1/4	Natural	1.75	KSP-900A-1/4	Natural	1.55						
	KS-900B-1/4	Black	1.75	KSP-900B-1/4	Black	1.55						
KNOB DISCOUNT SCHEDULE												
1-99 List 100-249 less 10% 250-499 less 15% 500-999 less 20%												

ALCO ^(P)
ELECTRONIC PRODUCTS, INC.
1551E OSGOOD ST., NO. ANDOVER, MASS. 01845 U.S.A.

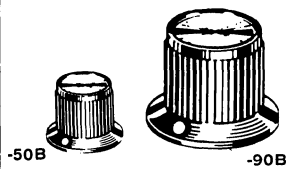
TEL: (617) 685-4371
TWX: 710 342-0552

A SUBSIDIARY OF
AUGAT INC.

ALCOKNOB

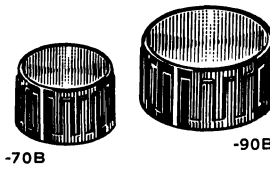


All Alco phenolic knobs have molded-in brass inserts, aluminum spin plates, and cup point Allen head set screws.



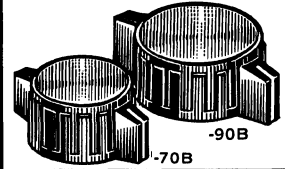
PK STRAIGHT KNURL, PHENOLIC SKIRT & DOT INDICATOR

Model - Shaft Size	Max. Dia.	Unit Price
PK-50B-1/8	.748	.35
PK-50B-1/4	.748	.35
PK-70B-1/4	.984	.40
PK-90B-1/4	1.245	.45



PKG RIBBED, BLACK OR RED WITH INDICATOR LINE

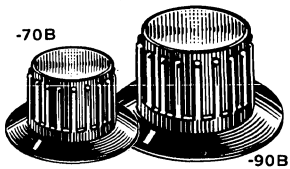
Model - Shaft Size	Max. Dia.	Unit Price
PKG-40B-1/8	.437	.55
PKG-40R-1/8	.437	.60
PKG-50B-1/8 - 1/4	.551	.60
PKG-50R-1/8 - 1/4	.551	.65
PKG-60B-1/8 - 1/4	.673	.60
PKG-60R-1/8 - 1/4	.673	.65
PKG-70B-1/8 - 1/4	.740	.65
PKG-70R-1/8 - 1/4	.740	.70
PKG-90B-1/8 - 1/4	.858	.70
PKG-90R-1/8 - 1/4	.858	.75
PKG-100B-1/4	1.055	.80
PKG-125B-1/4	1.248	1.05



PKGP RIBBED WITH BAR POINTERS AND INDICATOR LINE

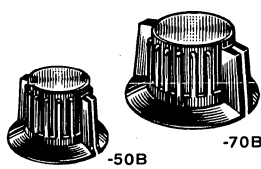
Model - Shaft Size	Max. Dia.	Unit Price
PKGP-70B-1/4	.996	.75
PKGP-90B-1/4	1.295	.80
PKGP-100B-1/4	1.642	.90

(Diameter is bar length.)



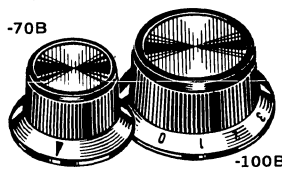
PKA RIBBED, PHENOLIC SKIRT AND INDICATOR LINE

Model - Shaft Size	Max. Dia.	Unit Price
PKA-50B-1/8	.795	.55
PKA-50B-1/4	.795	.55
PKA-70B-1/4	.984	.65
PKA-90B-1/4	1.370	.80



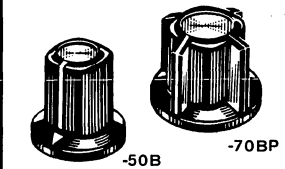
PKAP RIBBED, PHENOLIC SKIRT, POINTER & INDICATOR LINE

Model - Shaft Size	Max. Dia.	Unit Price
PKAP-50B-1/8	.795	.65
PKAP-50B-1/4	.795	.65
PKAP-70B-1/4	.980	.75
PKAP-90B-1/4	1.365	.90



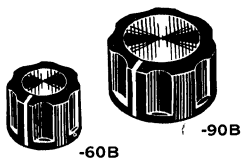
PKD STRAIGHT KNURL, ALUM. SKIRT/ARROW OR 0-10 NUMERALS

Model - Shaft Size	Max. Dia.	Unit Price
PKD-60B-1/8	.790	.50
PKD-60B-1/4	.790	.50
PKD-70B-1/4	1.030	.55
PKD-100B-1/4	1.290	.60
PKD-60B-10-1/8	.790	.55
PKD-60B-10-1/4	.790	.55
PKD-70B-10-1/4	1.030	.60
PKD-100B-10-1/4	1.290	.65



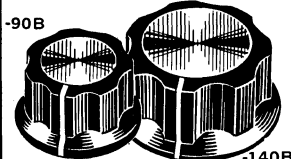
PKF SMOOTH OR RIBBED QUADRATURE WITH INDICATOR LINE

Model - Shaft Size	Max. Dia.	Unit Price
PKF-50B-1/8	.688	.55
PKF-50B-1/4	.688	.55
PKF-70B-1/4	.830	.60
PKF-70BP-1/4	.830	.70



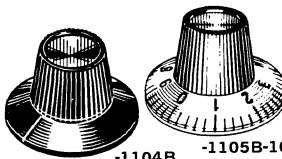
PKE FLUTED DESIGN WITH INDICATOR LINE

Model - Shaft Size	Max. Dia.	Unit Price
PKE-60B-1/8	.626	.60
PKE-60B-1/4	.626	.60
PKE-60R-1/8	.626	.65
PKE-90B-1/4	.890	.70



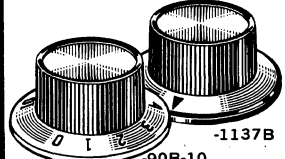
PKES FLUTED DESIGN WITH SKIRT AND INDICATOR LINE

Model - Shaft Size	Max. Dia.	Unit Price
PKES-60B-1/8	.750	.60
PKES-60B-1/4	.750	.65
PKES-70B-1/4	.855	.65
PKES-90B-1/4	1.012	.70
PKES-120B-1/4	1.296	.85
PKES-140B-1/4	1.496	1.20
PKES-150B-1/4	1.768	1.35



PKS STRAIGHT KNURL, ALUM./PHEN. SKIRT HAIRLINE/NUM.

Model - Shaft Size	Max. Dia.	Unit Price
PKS-1104B-1/4	1.120	.50
PKS-1103B-10-1/4	1.120	.55
PKS-1106B-1/4	1.160	.55
PKS-1105B-10-1/4	1.160	.60



PKS STRAIGHT KNURL, ALUMINUM SKIRT ARROW OR NUM.

Model - Shaft Size	Max. Dia.	Unit Price
PKS-90B-1/4	1.425	.60
PKS-90B-10-1/4	1.425	.65
PKS-1137B-1/4	1.390	.65
PKS-1137B-10-1/4	1.390	.70

KNOB DISCOUNT SCHEDULE: 1-99, list; 100-249, less 10%; 250-499, less 15%; 500-999 less 20%. Higher quantity prices quoted upon request.

ALCO ELECTRONIC PRODUCTS, INC.
1551 E OSGOOD ST., NO. ANDOVER, MASS. 01845 U.S.A.

TEL (617) 685-4371
TWX 710 342 0552

A SUBSIDIARY OF
AUGAT INC.

DATAK • dry transfer marking kits

MARK

- **CONTROL PANELS**
- **METERS & DIALS**
- **CIRCUIT BOARDS**
- **DRAWINGS & ART**
- **CHASSIS PARTS**
- **PILOT LIGHTS**

A ballpoint pen will transfer these amazing words, letters, numbers or symbols to any clean surface! JUST RUB AND IT'S MARKED. Reproduction quality printing is clean and sharp with no background film or haze. Heat resistant adhesive is safe for diazo copies. Makes your prototypes look like production units. Coat panels with DATAKOAT for permanency.

The complete DATAK catalog lists many other kits including organic chemical symbols, schematic and logic symbols, drafting alphabets, printed circuit patterns and tapes. Also ask for the complete LETRASET catalog listing thousands of alphabet sheets.

titles for electronic equipment

BIAS BIAS BLANKING BINARY
RAL BLANK BINARY BLANKING
◀ING BLEND BLEND BLOCKING
◀ BLOCKING BLOWER BLOWER
N BLOWN BLOWN BOOSTER BNC

This popular set for professionals has well over 2000 titles plus letters and numbers. 24 sheets cover audio, aircraft, controls, communications, computers, microwaves and other specialties. Coat transferred titles with DATAKOAT for permanency.

9581 Black Titles (24 sh.)	\$5.95	9611 White Letters (12 sh.)	\$3.00
9591 White Titles (24 sh.)	5.95	9621 Blk. Numbers (12 sh.)	3.00
9601 Black Letters (12 sh.)	3.00	9631 Wht. Numbers (12 sh.)	3.00

terminal & chassis marking kit

Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q Q
K K K K L L L L L CR CR CR CR CR
I 182 183 184 185 186 187 188 189
I 192 193 194 195 196 197 198 199

Mark chassis, terminals, circuit boards and components with this handy set. Includes all standard component ID letters and consecutive number sheets from 1 to 209. Contains 24 3"x5" sheets.

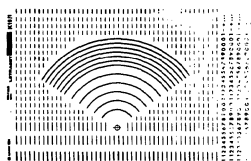
966 Black set	\$5.95	967 White set	\$5.95
-----------------------	--------	-----------------------	--------

DATAMARK titles and alphabets

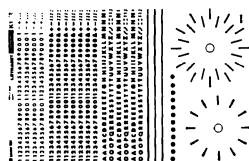
These economical sets offer DATAK quality in 12 specialized assortments of titles, symbols, alphabets and numerals. Each set of 6 sheets (3"x5") covers one electronic specialty. Sets use the same typeface and size as "Titles for Electronic Equipment" so they make handy refills. Coat transferred titles with DATAKOAT for permanency.

K58B Black (K58W — White) Audio, TV, Hi-Fi	\$1.50
K59B Black (K59W — White) Amateur Radio & CB	1.50
K60B Black (K60W — White) Experimenter, Home & Intercom	1.50
K61B Black (K61W — White) Test Equipment, Industry	1.50
K62 Marks & Switch Patterns (Black & White)	1.50
K63 1/8" Letters & Numbers (Black, White & Gold)	1.50
K64 1/4" Letters & Numbers (Black, White & Gold)	1.50
K65 1/2" Letters & Numbers (Black, White & Gold)	1.50

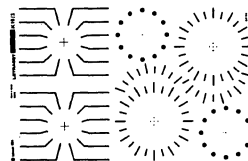
meter & dial marking kit



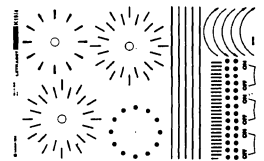
K19/1 BLK
K19/5 RED
K19/1* WHT



K19/2 BLK
K19/6 RED
K19/9 WHT



K19/3 BLK
K19/7 WHT
K19/12 RED



K19/4 BLK
K19/8, 10 WHT
K19/11 RED

Use directly on control panels and meter dial plates or as 1:1 master art. Tap switch marks are set for standard 15° and 30° detents but can be transferred at any angle for special situations. The complete set has meter arcs and

968 Meter & Dial Kit \$5.95

graduations in black and red (white available as a refill)*. Other patterns, letters and numbers supplied in black, white and red. Protect finished panels with DATAKOAT SPRAY. Do not coat dialplates.

K19/# (color) Refill of 4 Identical Sheets \$4.58

DATAKOAT protective coating

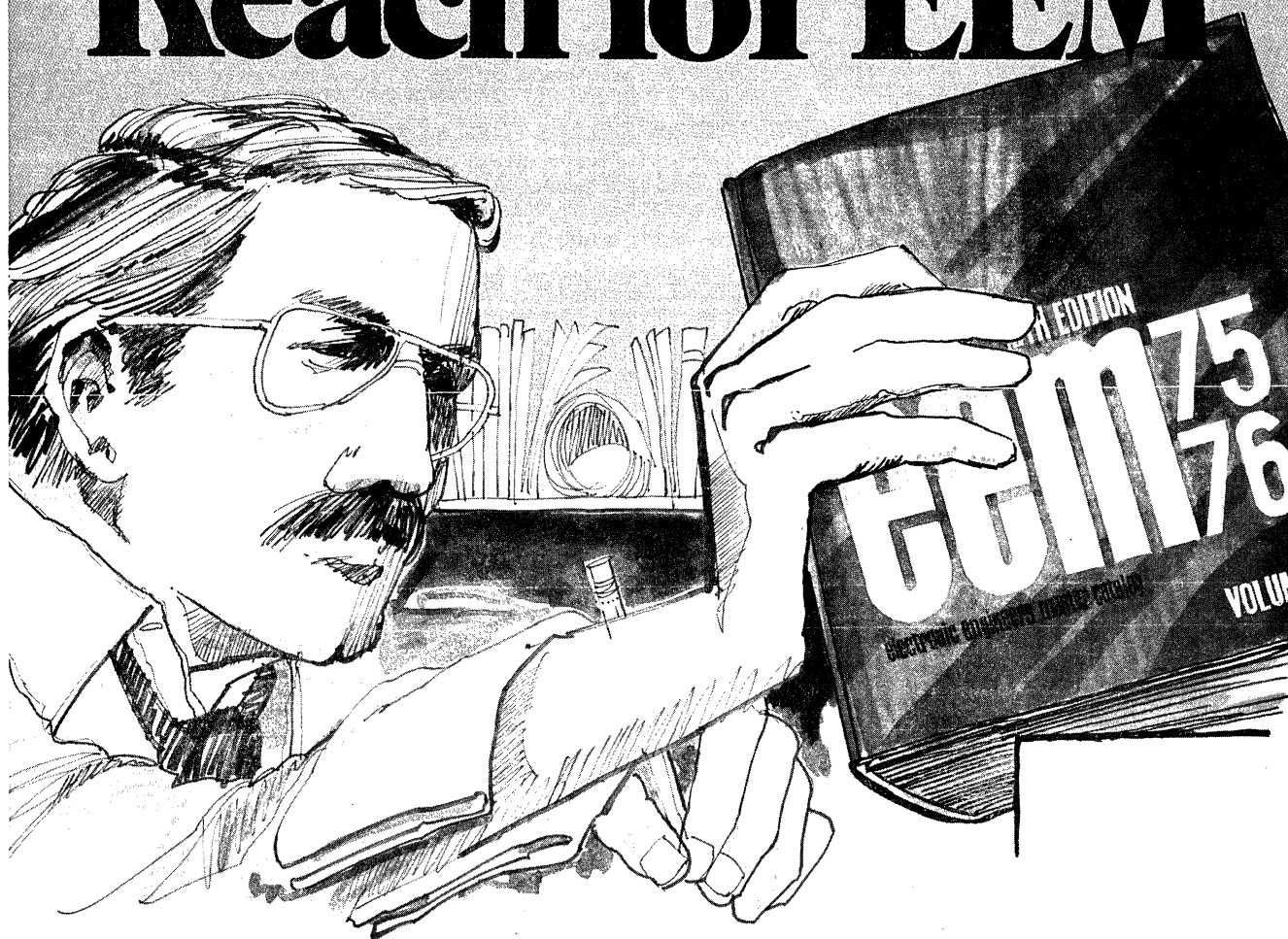
High solids water-clear coating encapsulates transfers under a tough plastic film. Will not attack most plastics, lacquers or cured enamels.

04176 Brushcoat & Thinner Kit (1 oz. ea.)	\$1.25
04177 Gloss Spray (16 fl. oz.)	3.25
04178 Matte Spray (16 fl. oz.)	3.25

the DATAK corporation • 65 71st Street • Guttenberg, N.J. 07093

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM

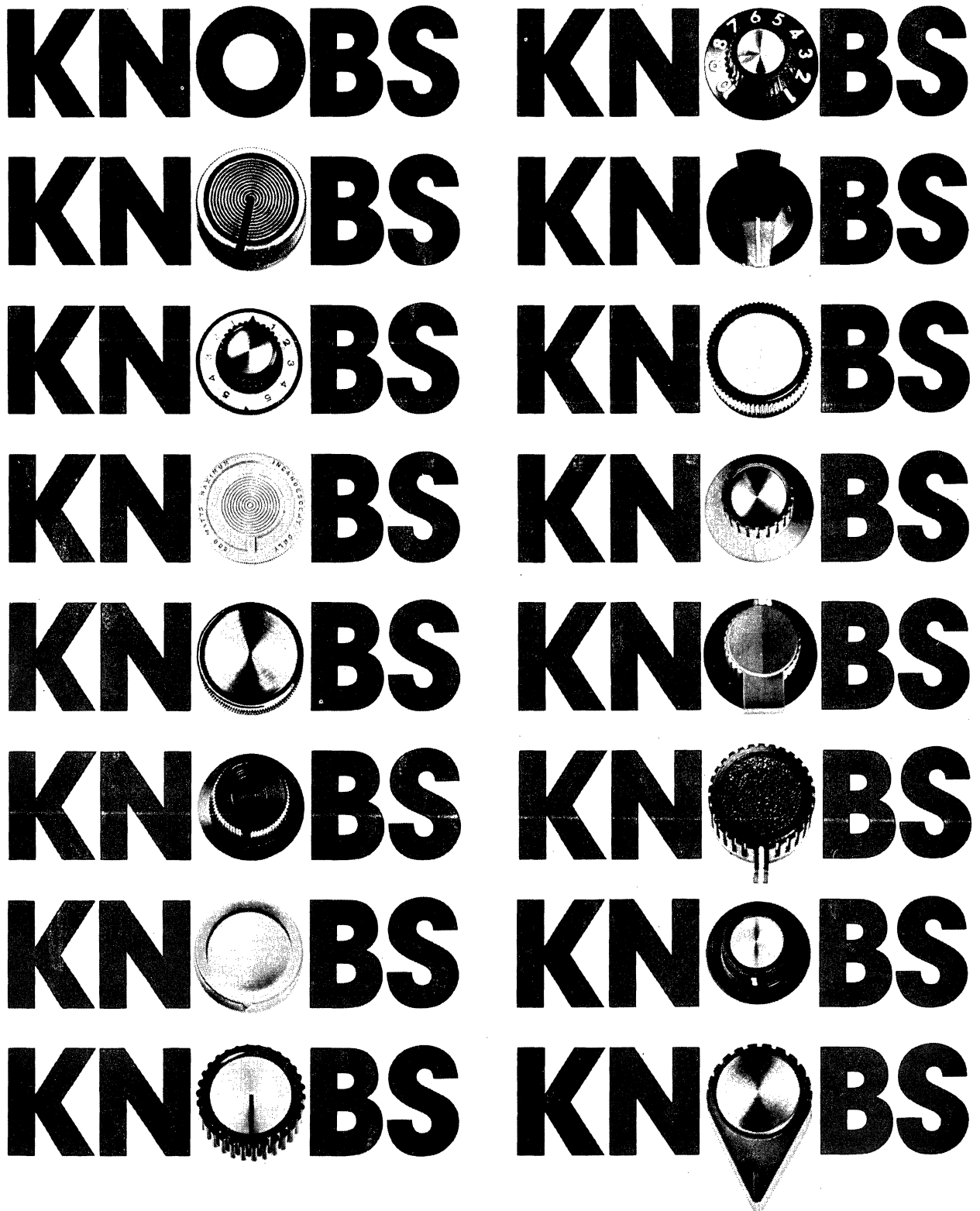


**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700



From Stock—Write for catalogs—largest line of stock sizes and shapes including special instrument and Mil. spec knobs
Custom—Send Prints—for fast quote—"Family Mold" process assures lower cost

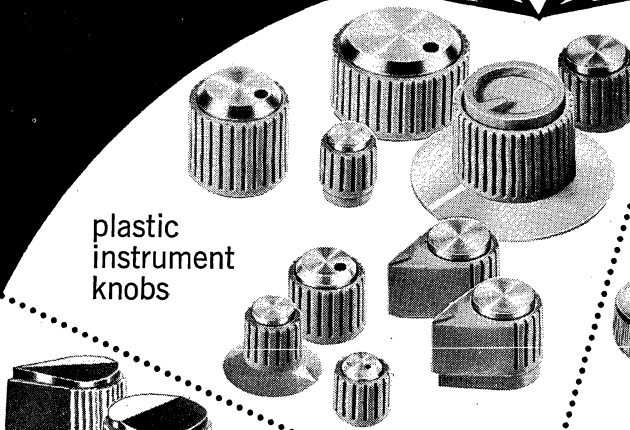


Electronic Hardware Corp.
A Division of Hi-Tech Industries, Inc.
180-08 Liberty Ave., Jamaica, N.Y. 11433
Telephone: 212-291-2710

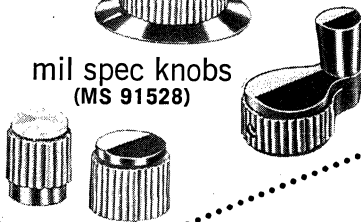
ELECTRONIC HARDWARE CORPORATION

KNOBS

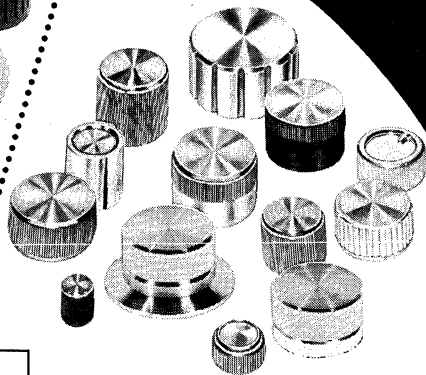
plastic
instrument
knobs



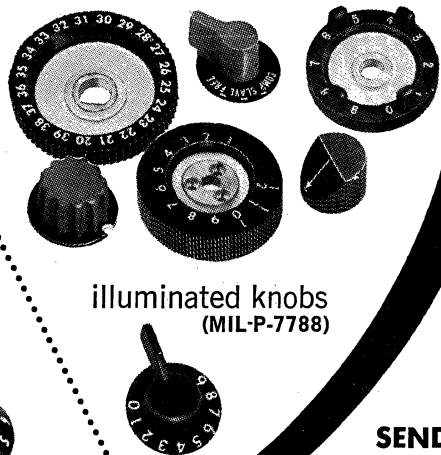
mil spec knobs
(MS 91528)



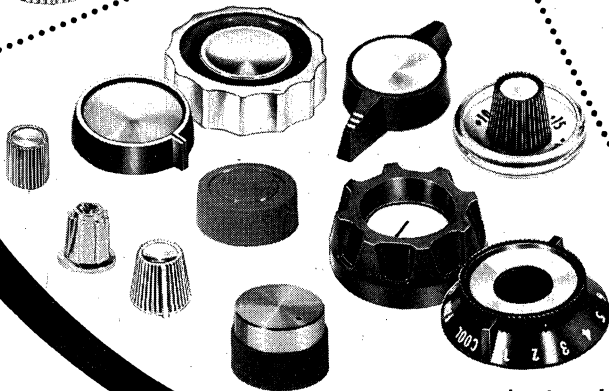
metal knobs



illuminated knobs
(MIL-P-7788)



consumer electronics
knobs



SEND
FOR
CATALOGS



Electronic Hardware Corp.

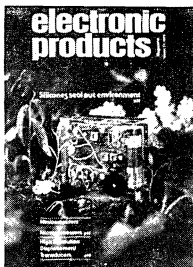
A Division of Hi-Tech Industries, Inc.
180-08 Liberty Ave., Jamaica, N.Y. 11433
Telephone: 212-291-2710



OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

***Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530***



electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.

INTERLOK

ONE OF THE PURDY GROUP OF COMPANIES

Knobs and Accessories

770 AIRPORT BLVD. • BURLINGAME, CA 94010
(415) 348-5625 • TWX 910-374-2353 • TELEX 34-9373

INTERLOK offers two basic knob styles; with or without wings, and with or without line markings. The diameters include 10-mm, 14.5-mm, 21-mm, 28-mm and 36-mm. You have a choice of three cap styles, nine different colors, nine standard variations in figure dials and the ability to order special dials. The standard collets will fit 1/8" shafts on the 10-mm, 14.5-mm and 21-mm knobs, and 1/4" shafts on the 14.5-mm, 21-mm, 28-mm and 36-mm knobs.

Versatility, design and engineering pace-setting standards are only the beginning of our knob story. Throw away those Allen wrenches, and don't scratch any more front panels. Our knobs mount easily and securely without damage to the knob or to your products.

A large selection of standard figure dials, plain and skirted pointers, stators, and other indicators add to the flexibility of the system and eliminate the need for obtaining any part from another source. Depending on the knob size, dial division ranges from 30° to 60°.

Because of the unique collet used on all INTERLOK knobs, the 10-mm and 14.5-mm, the 14.5-mm and 21-mm, and the 21-mm and 28-mm knobs can be combined to form concentric knobs.

INTERLOK also has binding posts available in two sizes, 10-mm and 14.5-mm, and six different colors including the new international standard for ground terminals, green with yellow stripes.

Contact INTERLOK for a complete catalog and begin putting together your own custom knobs.

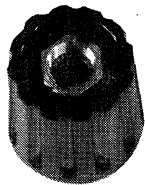


Fig. A

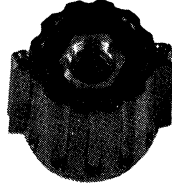


Fig. B

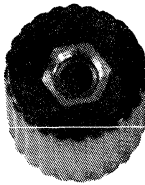


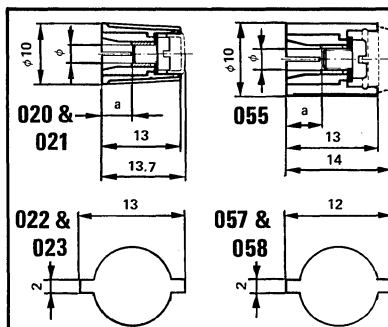
Fig. C



Fig. D

10 mm

Part Number	Fig.	Shaft Size	Color
020-2210	A	1/8"	Lt Gy
020-2220	A	1/8"	Blk
020-2230	A	1/8"	Red
021-2210	A	1/8"	Lt Gy w/line
021-2220	A	1/8"	Blk w/line
021-2230	A	1/8"	Red w/line
022-2210	B	1/8"	Lt Gy
022-2220	B	1/8"	Blk
022-2230	B	1/8"	Red
023-2210	B	1/8"	Lt Gy w/line
023-2220	B	1/8"	Blk w/line
023-2230	B	1/8"	Red w/line
055-2220	C	1/8"	Blk
055-2231	C	1/8"	Dk Red
057-2220	D	1/8"	Blk
057-2231	D	1/8"	Dk Red
058-2220	D	1/8"	Blk w/line
058-2231	D	1/8"	Dk Red w/line



CAPS, FLAT
(USE ON
055-058 ONLY)

Part Number	Color
040-2110	Lt Gy
040-2113	Wht
040-2120	Blk
040-2131	Dk Red
040-2141	Blu Gy

CAPS, RIDGED
(USE ON 055-058 ONLY)

Part Number	Color
040-2210	Lt Gy
040-2213	Wht
040-2220	Blk
040-2231	Dk Red
040-2241	Blu Gy

POINTERS

Part Number	Color
041-2110	Lt Gy
041-2120	Blk
041-2130	Red
041-2131	Dk Red
041-2141	Blu Gy

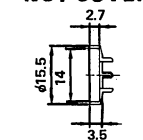
STATORS

Part Number	Color
043-2110	Gy w/Blk line
043-2220	Blk w/Wht indicator

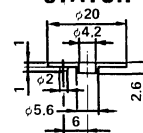
NUT COVERS

Part Number	Color
044-2010	Lt Gy
044-2013	Wht
044-2020	Blk
044-2030	Red
044-2031	Dk Red
044-2041	Blu Gy
044-2110	Lt Gy w/line
044-2113	Wht w/line
044-2120	Blk w/line
044-2130	Red w/line
044-2131	Dk Red w/line
044-2141	Blu Gy w/line

NUT COVER



STATOR



POINTER

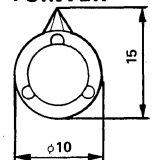
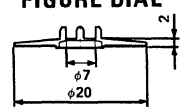


FIGURE DIAL



Dimensions are in millimeters

FIGURE DIALS

Part Number	Color	Marking	Size
042-2000	Clear	-	20 mm
042-2100	Clear	0 - 11	20 mm
042-2200	Clear	1 - 12	20 mm
042-2300	Clear	0 - 9	20 mm
042-2400	Clear	1 - 10	20 mm
042-2500	Clear	0 - 5	20 mm
042-2600	Clear	1 - 6	20 mm
042-2800	Clear	-	20 mm
042-2910	Lt Gy	Pointer	20 mm
042-2913	Wht	Pointer	20 mm
042-2920	Blk	Pointer	20 mm
042-2930	Red	Pointer	20 mm
042-2931	Dk Red	Pointer	20 mm
042-2941	Blu Gy	Pointer	20 mm

CAPS
(USE ON
020-023 ONLY)

Part Number	Color
040-1010	Lt Gy
040-1020	Blk
040-1030	Red
040-1040	Blu
040-1050	Yel
040-1060	Grn

The Collet Knob

INTERLOK

ONE OF THE PURDY GROUP OF COMPANIES

Knobs and Accessories

770 AIRPORT BLVD. • BURLINGAME, CA 94010
(415) 348-5625 • TWX 910-374-2353 • TELEX 34-9373

Part Number	Fig.	Shaft Size	Color
020-3210	A	1/8"	Lt Gy
020-3220	A	1/8"	Blk
020-3230	A	1/8"	Red
020-3510	A	1/4"	Lt Gy
020-3520	A	1/4"	Blk
020-3530	A	1/4"	Red
021-3210	A	1/8"	Lt Gy w/line
021-3220	A	1/8"	Blk w/line
021-3230	A	1/8"	Red w/line
021-3510	A	1/4"	Lt Gy w/line
021-3520	A	1/4"	Blk w/line
021-3530	A	1/4"	Red w/line
022-3210	B	1/8"	Lt Gy
022-3220	B	1/8"	Blk
022-3230	B	1/8"	Red
022-3510	B	1/4"	Lt Gy
022-3520	B	1/4"	Blk
022-3530	B	1/4"	Red
023-3210	B	1/8"	Lt Gy w/line
023-3220	B	1/8"	Blk w/line
023-3230	B	1/8"	Red w/line
023-3510	B	1/4"	Lt Gy w/line
023-3520	B	1/4"	Blk w/line
023-3530	B	1/4"	Red w/line
055-3220	C	1/8"	Blk
055-3231	C	1/8"	Dk Red
055-3520	C	1/4"	Blk
055-3531	C	1/4"	Dk Red
057-3220	D	1/8"	Blk
057-3231	D	1/8"	Dk Red
057-3520	D	1/4"	Blk
057-3531	D	1/4"	Dk Red
058-3220	D	1/8"	Blk w/line
058-3231	D	1/8"	Dk Red w/line
058-3520	D	1/4"	Blk w/line
058-3531	D	1/4"	Dk Red w/line

14.5 mm

CAPS
(USE ON
020-023 ONLY)

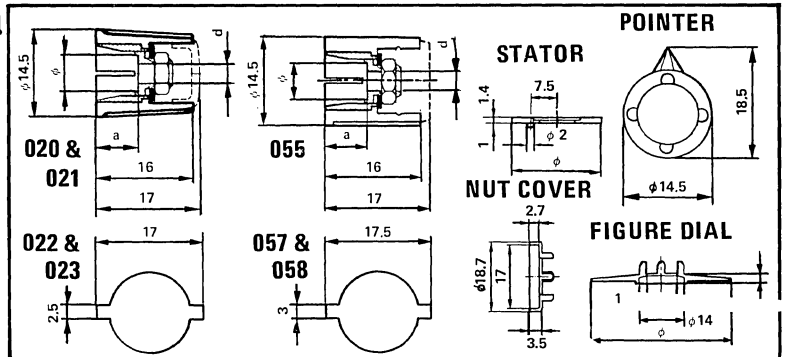
Part Number	Color
040-3010	Lt Gy
040-3020	Blk
040-3030	Red
040-3040	Blu
040-3050	Yel
040-3060	Grn

CAPS, FLAT
(USE ON
055-058 ONLY)

Part Number	Color
040-3110	Lt Gy
040-3113	Wht
040-3120	Blk
040-3131	Dk Red
040-3141	Blu Gy

CAPS, RIDGED
(USE ON
055-058 ONLY)

Part Number	Color
040-3210	Lt Gy
040-3213	Wht
040-3220	Blk
040-3231	Dk Red
040-3241	Blu Gy



Dimensions are in millimeters

POINTERS

Part Number	Color
041-3110	Lt Gy
041-3120	Blk
041-3130	Red
041-3131	Dk Red
041-3141	Blu Gy

NUT COVERS

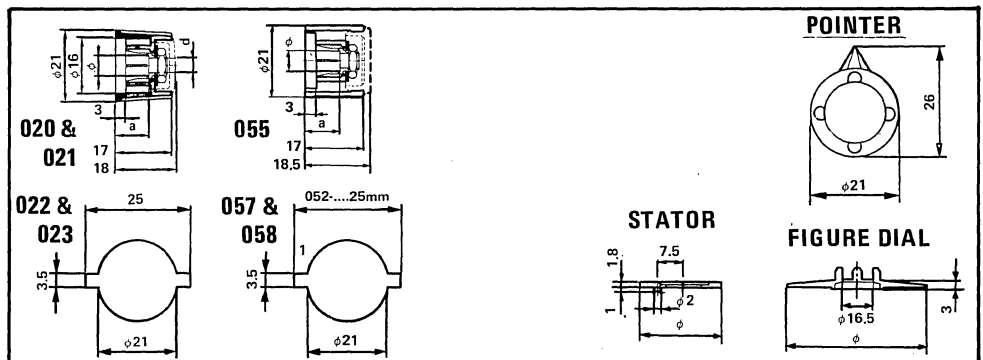
Part Number	Color
044-3010	Lt Gy
044-3013	Wht
044-3020	Blk
044-3030	Red
044-3031	Dk Red
044-3041	Blu Gy
044-3110	Lt Gy w/line
044-3113	Wht w/line
044-3120	Blk w/line
044-3130	Red w/line
044-3131	Dk Red w/line
044-3141	Blu Gy w/line
044-3210	Lt Gy w/line
044-3220	Blk w/line
044-3230	Red w/line

FIGURE DIALS

Part Number	Color	Marking	Size
042-3000	Clear	—	26 mm
042-3010	Clear	—	44 mm
042-3100	Clear	0 - 11	26 mm
042-3200	Clear	1 - 12	26 mm
042-3300	Clear	0 - 9	26 mm
042-3400	Clear	1 - 10	26 mm
042-3500	Clear	0 - 5	26 mm
042-3600	Clear	1 - 6	26 mm
042-3800	Clear	—	26 mm
042-3910	Lt Gy	Pointer	26 mm
042-3913	Wht	Pointer	26 mm
042-3920	Blk	Pointer	26 mm
042-3930	Red	Pointer	26 mm
042-3931	Dk Red	Pointer	26 mm
042-3941	Blu Gy	Pointer	26 mm

21 mm

Part Number	Fig.	Shaft Size	Color
020-4210	A	1/8"	Lt Gy
020-4220	A	1/8"	Blk
020-4230	A	1/8"	Red
020-4510	A	1/4"	Lt Gy
020-4520	A	1/4"	Blk
020-4530	A	1/4"	Red
021-4210	A	1/8"	Lt Gy w/line
021-4220	A	1/8"	Blk w/line
021-4230	A	1/8"	Red w/line
021-4510	A	1/4"	Lt Gy w/line
021-4520	A	1/4"	Blk w/line
021-4530	A	1/4"	Red w/line
022-4510	B	1/4"	Lt Gy
022-4520	B	1/4"	Blk
022-4530	B	1/4"	Red
023-4510	B	1/4"	Lt Gy w/line
023-4520	B	1/4"	Blk w/line
023-4530	B	1/4"	Red w/line
055-4220	C	1/8"	Blk
055-4231	C	1/8"	Dk Red
055-4520	C	1/4"	Blk
055-4531	C	1/4"	Dk Red
057-4520	D	1/4"	Blk
057-4531	D	1/4"	Dk Red
058-4520	D	1/4"	Blk w/line
058-4531	D	1/4"	Dk Red w/line



Dimensions are in millimeters

CAPS, FLAT
(USE ON 055-058 ONLY)

Part Number	Color
040-4110	Lt Gy
040-4113	Wht
040-4120	Blk
040-4131	Dk Red
040-4141	Blu Gy

CAPS, RIDGED
(USE ON 055-058 ONLY)

Part Number	Color
040-4210	Lt Gy
040-4213	Wht
040-4220	Blk
040-4231	Dk Red
040-4241	Blu Gy

POINTERS

Part Number	Color
041-4110	Lt Gy
041-4120	Blk
041-4130	Red
041-4131	Dk Red
041-4141	Blu Gy

STATORS

Part Number	Color
043-4110	Gy w/Blk line
043-4220	Blk w/Wht indicator

CAPS (USE ON 020-023 ONLY)

Part Number	Color
040-4010	Lt Gy
040-4020	Blk
040-4030	Red
040-4040	Blu
040-4050	Yel
040-4060	Grn

FIGURE DIALS

Part Number	Color	Marking	Size
042-4000	Clear	—	36 mm
042-4010	Clear	—	44 mm
042-4020	Clear	—	53 mm
042-4030	Clear	—	63 mm
042-4100	Clear	0 - 11	36 mm
042-4200	Clear	1 - 12	36 mm
042-4700	Clear	1 - 13	36 mm
042-4800	Clear	—	36 mm
042-4910	Lt Gy	Pointer	36 mm
042-4913	Wht	Pointer	36 mm
042-4920	Blk	Pointer	36 mm
042-4930	Red	Pointer	36 mm
042-4931	Dk Red	Pointer	36 mm
042-4941	Blu Gy	Pointer	36 mm

The Collet Knob

INTERLOK

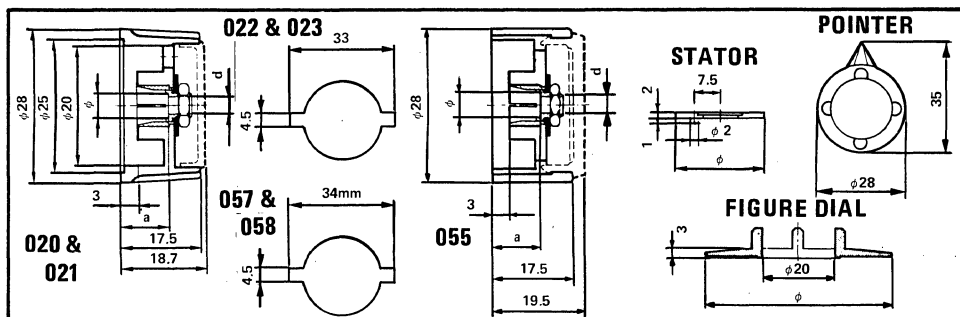
ONE OF THE PURDY GROUP OF COMPANIES

Knobs and Accessories

770 AIRPORT BLVD. • BURLINGAME, CA 94010
(415) 348-5625 • TWX 910-374-2353 • TELEX 34-9373

28 mm

Part Number	Fig.	Shaft Size	Color
020-5510	A	1/4"	Lt Gy
020-5520	A	1/4"	Blk
020-5530	A	1/4"	Red
021-5510	A	1/4"	Lt Gy w/line
021-5520	A	1/4"	Blk w/line
021-5530	A	1/4"	Red w/line
022-5510	B	1/4"	Lt Gy
022-5520	B	1/4"	Blk
022-5530	B	1/4"	Red
023-5510	B	1/4"	Lt Gy w/line
023-5520	B	1/4"	Blk w/line
023-5530	B	1/4"	Red w/line
055-5520	C	1/4"	Blk
055-5531	C	1/4"	Dk Red
057-5520	D	1/4"	Blk
057-5531	D	1/4"	Dk Red
058-5520	D	1/4"	Blk w/line
058-5531	D	1/4"	Dk Red w/line



Dimensions are in millimeters

POINTERS

Part Number	Color
041-5110	Lt Gy
041-5120	Blk
041-5130	Red
041-5131	Dk Red
041-5141	Blu Gy

FIGURE DIALS

Part Number	Color	Marking	Size
042-5000	Clear	—	44 mm
042-5020	Clear	—	53 mm
042-5030	Clear	—	63 mm
042-5100	Clear	0 - 11	44 mm
042-5200	Clear	1 - 12	44 mm
042-5700	Clear	1 - 13	44 mm
042-5800	Clear	—	44 mm
042-5910	Lt Gy	Pointer	44 mm
042-5913	Wht	Pointer	44 mm
042-5920	Blk	Pointer	44 mm
042-5930	Red	Pointer	44 mm
042-5931	Dk Red	Pointer	44 mm
042-5941	Blu Gy	Pointer	44 mm

CAPS (USE ON 020-023 ONLY)

Part Number	Color
040-5010	Lt Gy
040-5020	Blk
040-5030	Red
040-5040	Blu
040-5050	Yel
040-5060	Grn

CAPS, FLAT (USE ON 055-058 ONLY)

Part Number	Color
040-5110	Lt Gy
040-5113	Wht
040-5120	Blk
040-5131	Dk Red
040-5141	Blu Gy

CAPS, RIDGED (USE ON 055-058 ONLY)

Part Number	Color
040-5210	Lt Gy
040-5213	Wht
040-5220	Blk
040-5231	Dk Red
040-5241	Blu Gy

STATORS

Part Number	Color
043-5110	Gy w/Blk line
043-5220	Blk w/Wht indicator

36 mm

Part Number	Fig.	Shaft Size	Color
020-6510	A	1/4"	Lt Gy
020-6520	A	1/4"	Blk
020-6530	A	1/4"	Red
021-6510	A	1/4"	Lt Gy w/line
021-6520	A	1/4"	Blk w/line
021-6530	A	1/4"	Red w/line
055-6520	B	1/4"	Blk
055-6531	B	1/4"	Dk Red

CAPS (USE ON 020,021 ONLY)

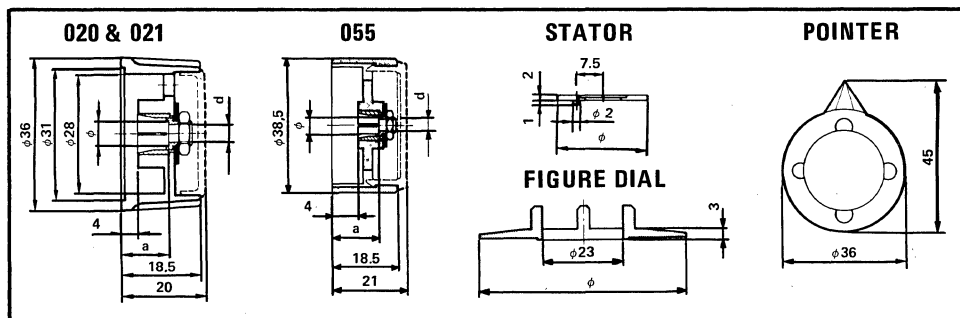
Part Number	Color
040-6010	Lt Gy
040-6020	Blk
040-6030	Red
040-6040	Blu
040-6050	Yel
040-6060	Grn

CAPS, FLAT (USE ON 055 ONLY)

Part Number	Color
040-6110	Lt Gy
040-6113	Wht
040-6120	Blk
040-6131	Dk Red
040-6141	Blu Gy

CAPS, RIDGED (USE ON 055 ONLY)

Part Number	Color
040-6110	Lt Gy
040-6113	Wht
040-6120	Blk
040-6131	Dk Red
040-6141	Blu Gy



Dimensions are in millimeters

POINTERS

Part Number	Color
041-6110	Lt Gy
041-6120	Blk
041-6130	Red
041-6131	Dk Red
041-6141	Blu Gy

FIGURE DIALS

Part Number	Color	Marking	Size
042-6000	Clear	—	53 mm
042-6030	Clear	—	63 mm
042-6100	Clear	0 - 11	53 mm
042-6200	Clear	1 - 12	53 mm
042-6700	Clear	1 - 13	53 mm
042-6800	Clear	—	53 mm
042-6910	Lt Gy	Pointer	53 mm
042-6913	Wht	Pointer	53 mm
042-6920	Blk	Pointer	53 mm
042-6930	Red	Pointer	53 mm
042-6931	Dk Red	Pointer	53 mm
042-6941	Blu Gy	Pointer	53 mm

STATORS

Part Number	Color
043-6110	Gy w/Blk line
043-6220	Blk w/Wht indicator

Knob Designer Kits

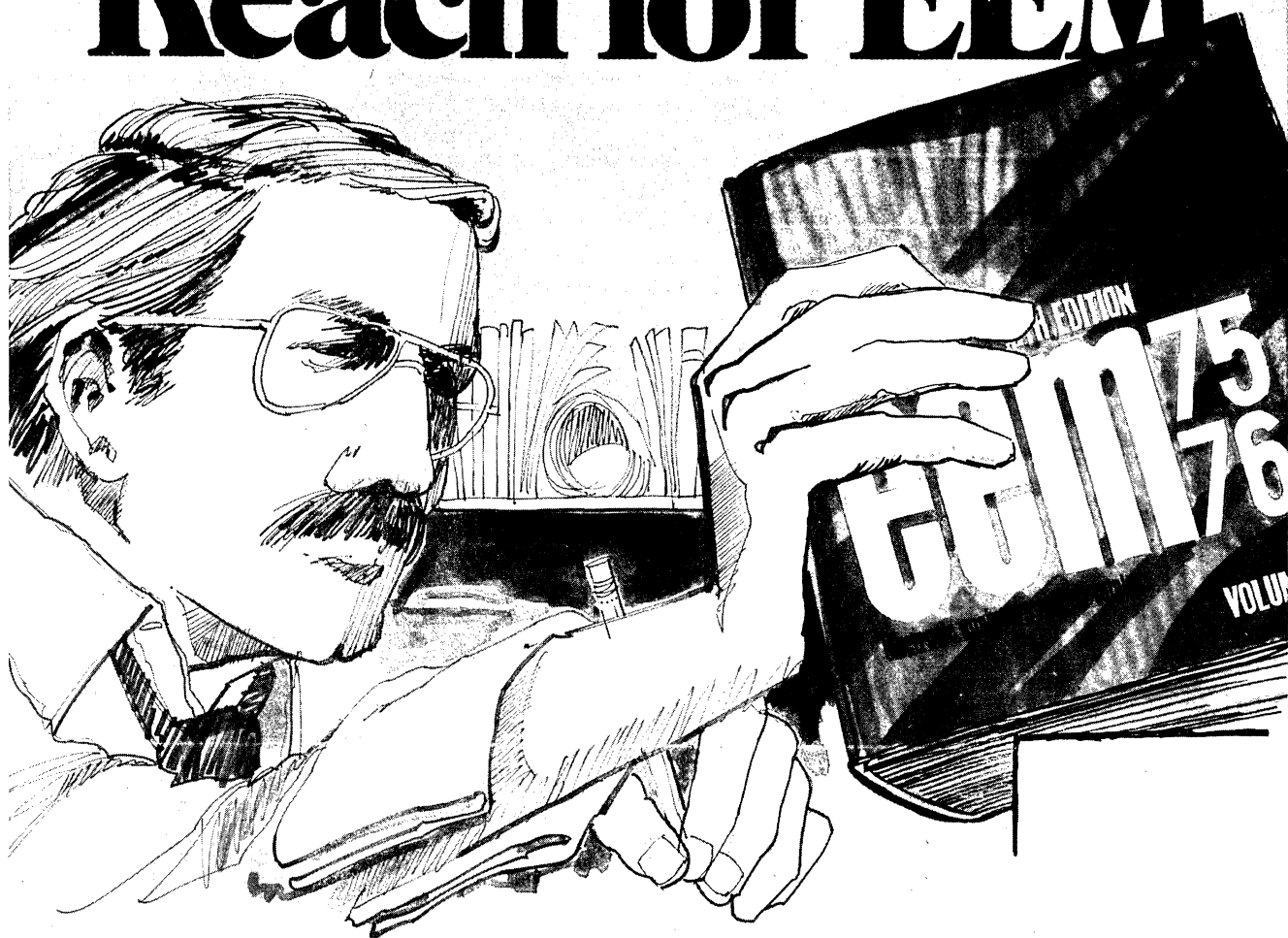
INTERLOK has a great idea for the packaging designer. We have a series of five designer kits that give you a complete idea of the many applications for each of our knob sizes. Each kit contains one of every item relating to that size knob.

Description	Part Number
10 mm Knob Designer Kit	070-1000
14.5 mm Knob Designer Kit	070-1450
21 mm Knob Designer Kit	070-2100
28 mm Knob Designer Kit	070-2800
36 mm Knob Designer Kit	070-3600

The Collet Knob

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700



JAN HARDWARE

MANUFACTURING COMPANY INC.

QUALITY
RELIABILITY
ECONOMY

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

RATIO DRIVES FOR FINE INSTRUMENT AND MACHINE CONTROLS

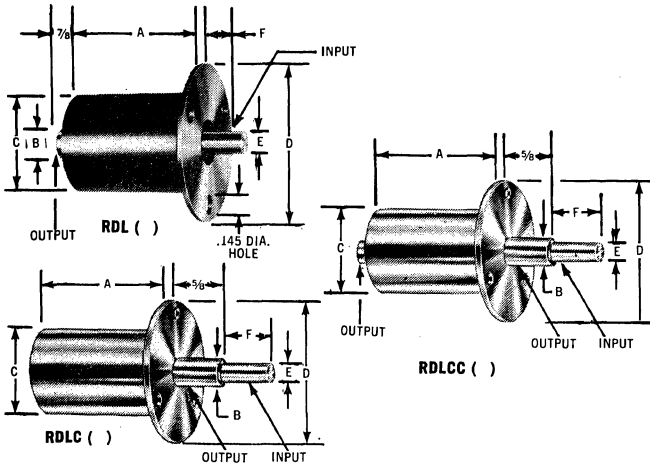
BALL BEARING TYPES — Compact, Durable, Exceptionally Smooth Action

These unique ratio drives employ precision ball bearings. Used for rotary control of components in instruments, they provide unexcelled smooth motion. Ruggedly built, permanently sealed and lubricated, JAN Ratio Drives accommodate applications where miniaturization is essential.

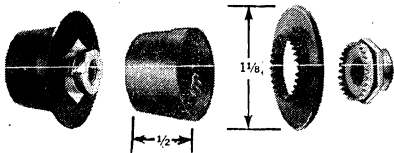
Input and output shafts of these units operate in the SAME DIRECTION. Type "RDL" provides "in-line" input-output shafts. Type "RDLC" is supplied with concentric shafts whereby the output envelops the input shaft. An added feature of Type "RDLC" is the output shaft in the rear.

Cat. No.	Ratio	A	O.D. B	I.D.	C	D	Input Shaft E	F	Bolt-Mtg. Dia.
RDL-1	2.6:1	1	3/8	1/4	1 1/8	1 1/8	1/4	3/4	1 1/2
RDL-2	7.0:1	1 1/2	3/8	1/4	1 1/8	1 1/8	1/4	3/4	1 1/2
RDL-3	17.0:1	1 1/2	3/8	1/4	1 1/8	1 1/8	1/4	3/4	1 1/2
RDLC-1	2.6:1	1	3/8	1/4	1 1/8	1 1/8	1/4	1 1/2	1 1/2
RDLC-2	7.0:1	1 1/2	3/8	1/4	1 1/8	1 1/8	1/4	1 1/2	1 1/2
RDLC-3	17.0:1	1 1/2	3/8	1/4	1 1/8	1 1/8	1/4	1 1/2	1 1/2
RDLC-1	2.6:1	1 1/2	3/8	1/4	1 1/8	1 1/8	1/4	1 1/2	1 1/2
RDLC-3	17.0:1	1 1/2	3/8	1/4	1 1/8	1 1/8	1/4	1 1/2	1 1/2

All Ratios are $\pm 10\%$.



KNOB RATIO DRIVE

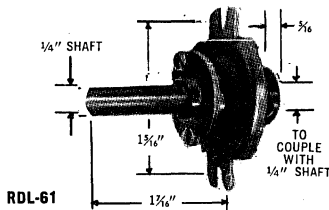


9 to 1 ratio (to dial skirt).
1:1 to potentiometer.

Cat. No. KRD-11 (Plain Gripping Surface) Cat. No. KRD-12 (Knurled Gripping Surface)

Exploded view shows engineered miniature gear system, to permit precise, fine tuning of controls. As shown, 9 to 1 ratio (to dial skirt). 1:1 to potentiometer. Other ratios designed to specifications. Brass gears; black anodized aluminum knob and dial. Available with knurled or non-knurled outside knob. Available for 1/8" shafts. 1/4" on special order.

Now! Corrosion Resistant! IN-LINE RATIO DRIVE — 6.3:1

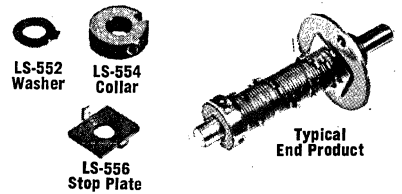


Variations Available to Customers Specifications

For smooth rotary control of components requiring Vernier adjustments. Suitable for use where panel space is at a premium. Durable, ruggedized ball bearing mechanism.

LIMIT STOP COMPONENTS

Designers can now consider the limit stop as a component to design with, such as potentiometers, capacitors, or other standard units. The simplicity of adjustment and the large number of available turns enables the stop range to be set with extreme precision. Conveniently located dual locking screws maintain settings under all conditions of shock and vibration.

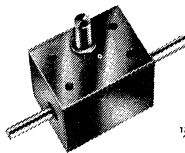


Available for 1/4" and 3/8" Shafts
Specify — (3) for 3/8"
— (4) for 1/4"

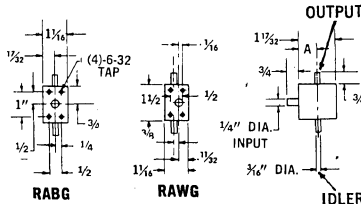
RIGHT ANGLE RATIO DRIVES — Versatile, Miniaturized, Right Angle Rotary Controls

Featuring dual output stainless steel shafts at right angles to input, these engineered drives provide ideal type instrument control. Available with matched bevel worm gears covering a wide range of ratios.

JAN's Right Angle Drives are especially useful for handling spring or gravity-loaded components since the output shaft automatically locks in any desired position yet remains free for smooth adjustment by the input shaft. Assembled in dust-proof housings, the gears are permanently pinned in place on stainless-steel shafts mounted in oilite bearings and held under constant pressure.



RAWG ()
RABG ()

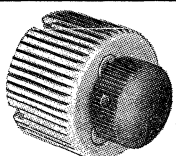


BEVEL GEAR RIGHT ANGLE DRIVES

Cat. No.	Ratio	"A"
RABG-1	1:1	7/8
RABG-2	2:1	7/8
RABG-3	3:1	7/8

WORM GEAR RIGHT ANGLE DRIVES

Cat. No.	Ratio	"A"
RAWG-1	5:1	3/4
RAWG-2	10:1	3/4
RAWG-22	12:1	3/4
RAWG-3	20:1	3/4



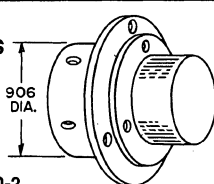
MACROVERNIER CONTROL KNOBS

K-1320-1

Macroposition—
1" Dia. Knob; Ratio 1:1

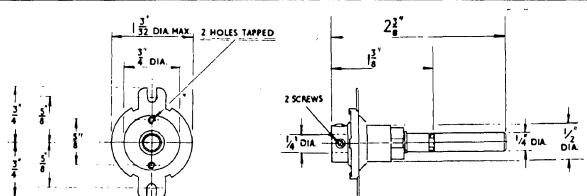
Vernier Position—
5/8" Dia. Knob; Ratio 10:1

Vernier ratios from 6:1 up to 18:1 available on special order.
Torque capacity factory adjusted in increments up to 6 lb.-in.



K-1320-2

Flange mounts to front panel. Provisions for Dial mounting. Vernier ratios from 6:1 to 18:1 available on special order.



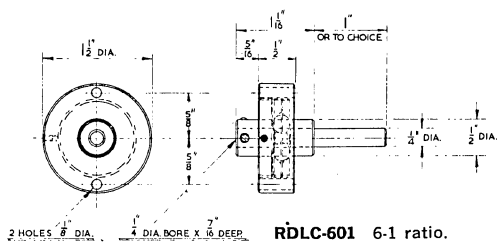
DUAL RATIO DRIVE

RDLC-D 366

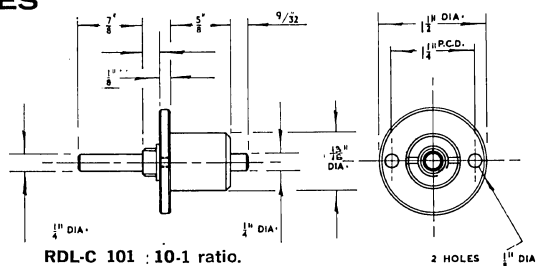
Reverse Vernier Action with 36:1 ratio and Fast Drive of 6:1 ratio.

PANEL COMPONENTS (EXCLUDING LIGHTING & DISPLAYS)

RATIO DRIVES



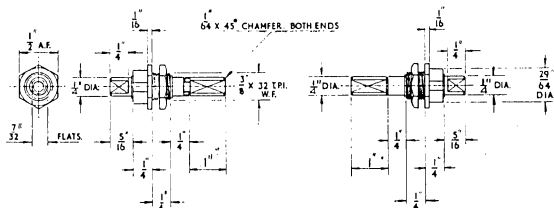
RDL-C 101 6-1 ratio.



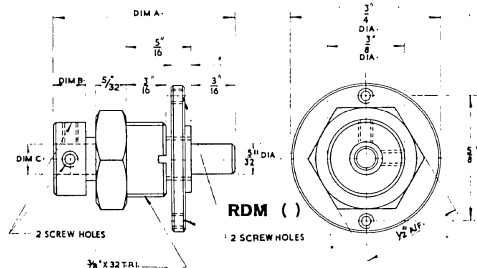
RDL-C 101 10:1 ratio.

DIRECT DRIVE, REVERSE VERNIER RDS - R 51

CONTINUOUS DRIVE RDS 51

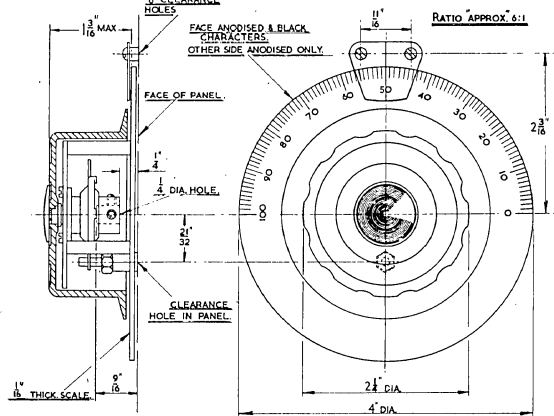


OTHER LENGTHS AVAILABLE

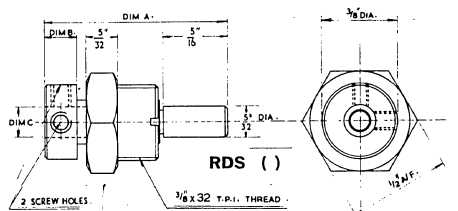


RDM ()

BALL DRIVE DIAL



DAD 600 6-1 ratio.



RDS ()

PART NO.	PART NO.	DIM A	DIM B	DIM C
RDS 101-1	RDM 101-1	29/32"	5/32"	5/32"
RDS 101-2	RDM 101-2	15/16"	13/64"	15/64"
RDS 101-3	RDM 101-3	15/16"	13/64"	1/4"

URNS COUNTING DIALS WITH BRAKE

Turns-counting Dials for Accurate Multi Turn Settings.

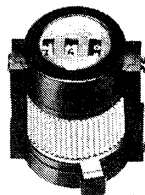
These devices are continuous and Bi-directional and can be used with Potentiometers or other Multi-Turn devices having 1; 10; 15; or 20 turns.

Other dials and knobs can be supplied to special requirements.

P/N	No. of Turns	Reading Accuracy	O.D.	Knob Height	Shaft Dia.
CT-19	10/15	.02	.827	.787/.906	1/8 or 1/4
CT-25	10	.01	.875	.866	1/8 or 1/4
CT-22	10	.01	*1.102	1.385	1/8 or 1/4
CT-23	10	.002	1.070	1.240	1/8 or 1/4
CT-26	10	.002	1.204	1.240	1/8 or 1/4
BT-11	1	.01	.827	.866	1/8 or 1/4
CT-22A	10	.01	*1.023	1.141	1/8 or 1/4
CT-46	10/20	.01	1.791	.906/1.000	1/4 only

NEW!

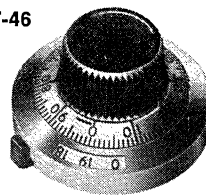
CT-22



CT-23



CT-46



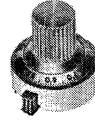
CT-26



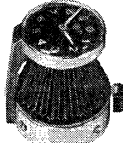
CT-25



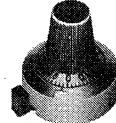
BT-11



CT-22A



CT-19



JAN HARDWARE
MANUFACTURING COMPANY INC.

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

QUALITY
RELIABILITY
ECONOMY

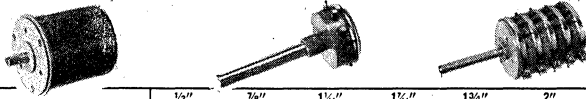
POTENTIOMETERS / PRECISION WIRE WOUND

- LINEAR AND NON-LINEAR • SINGLE AND MULTI-TURN • PENDULUM OPERATED
- SECTORS AND GYRO PICKOFFS • SWITCHES

Reliable, competitively priced wire-wound potentiometers for commercial, industrial and military electronic equipment manufacturers.

- **EXCELLENT LINEARITY:**
0.03% available in single turn 5" diameter unit.
- **LONG LIFE:**
Over two million revolutions with base metal windings.
- **WIDE TEMPERATURE RANGE:**
Available for operation from -55°C to +125°C.
- **MAXIMUM STORAGE LIFE:**
Platinum alloy winding also insures low noise level.
- **RELIABILITY:**
Welded taps for better mechanical and electrical connections.
- **HIGH RESOLUTION:**
Wire as fine as 0.0003" diameter can be used.

- **CUSTOM DESIGNS:**
Fast prototype delivery on special linear or non-linear units.
- **PRECISION CONSTRUCTION:**
Anodized aluminum housings and polished steel shafts.
- **ACCURATE FUNCTIONS:**
Welded taps to a single turn of wire eliminates shorted sections of winding at intermediate taps.
- **RUGGEDNESS:**
Meets all applicable MIL Specs.
- **LOW NOISE:**
Maintained over long life and extreme environments by unique wiper designs compatible with winding configurations.

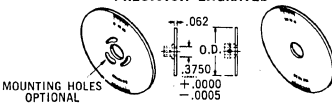


DIAMETER	1/2"	3/4"	1 1/4"	1 1/2"	1 3/4"	2"	3"
SERIES	05	09	11	15	18	20	30
ELECTRICAL							
Standard Resistance Range, Ohms	100 to 100K	100 to 100K	200 to 110K	200 to 120K	200 to 155K	200 to 180K	200 to 230K
Standard Resistance Tolerance %	5%	3%	5%	3%	5%	2%	5%
Standard Linearity %	0.5	0.5	0.5	0.5	0.3	0.3	0.3
Best Linearity %	0.2	0.2	0.15	0.12	0.1	0.1	0.05
Power Rating, Watts at 40°	1.2	1.2	2.0	3.0	3.5	4.0	6.0
Noise Max. in Ohms	100	100	100	100	100	100	100
Temp. Coefficient of Wire PPM/°C	±20	±20	±20	±20	±20	±20	±20
Electrical Rotation (Nominal)	352°	354°	354°	354°	356°	356°	358°
MECHANICAL							
Mechanical Rotation	AS REQUIRED						
Weight, Oz., Single Section	0.5	0.6	0.8	1.7	2.5	3.5	6.0
Each Additional Section	0.2	0.3	0.5	1.0	1.3	1.5	1.8
Torque, Max. Starting, Oz., In., B.B., Single Section	0.1	0.1	0.3	0.4	0.7	0.8	1.1
Each Additional Section	0.1	0.1	0.2	0.4	0.5	0.6	0.6
Torque, Max. Running, Oz., In., Single Section	0.1	0.1	0.15	0.2	0.5	0.6	0.6
Each Additional Section	0.1	0.1	0.15	0.2	0.5	0.6	0.6
Taps, Maximum	4	9	12	17	20	24	27
Tap Tolerance	AS REQUIRED ±1 TURN OF WIRE						
Ganged Section, Maximum	3	6	6	8	8	9	9
Life Expectancy, Shaft Revolutions	2 x 10 ⁴	2 x 10 ⁴	2 x 10 ⁴	2 x 10 ⁴	2 x 10 ⁴	2 x 10 ⁴	2 x 10 ⁴
Shaft Runout, Max. T.I.R., In.	.001	.001	.001	.001	.001	.001	.001
Shaft Radial Play Max. T.I.R., In.	.001	.001	.001	.001	.001	.001	.001

PRECISION DISC DIALS

Clockwise and Counter Clockwise

PRECISION ENGRAVED



Material: Aluminum 24ST Black Anodized

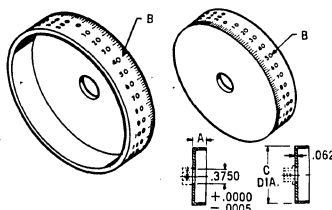
Cat. No.	Range	D. +.000 D. -.003	Steps in Degrees	Graduations
DA-01	0-360	1.500	2°	BLANK
DA-02	0-100		3°-36'	180
DA-03	0-60		6°	100
DA-04	0-50		7°-12'	60
DA-05	0-25		14°-24'	50
DA-06	0-10		36°	25
DA-07	0-10		36°	10
DA-08	0-360	2.000	2°	BLANK
DA-09	0-120		3°-36'	180
DA-10	0-60		6°	120
DA-11	0-50		7°-12'	72
DA-12	0-25		14°-24'	60
DA-13	0-10		36°	50
DA-14	0-10		36°	25
DA-15	0-10		36°	10
DA-16	0-10		36°	10
DA-17	0-360	3.000	1°	BLANK
DA-18*	0-360		2°	360
DA-19*	0-200		1°-48'	180
DA-20	0-180		2°	200
DA-21	0-180		3°	180
DA-22*	0-120		3°-36'	120
DA-23*	0-100		3°-36'	100
DA-24	0-72	4.000	5°	72
DA-25	0-50		7°-12'	50
DA-26	0-10		36°	10
DA-27	0-360		1°	BLANK
DA-28*	0-360		2°	360
DA-29*	0-200		1°-48'	180
DA-30	0-180		2°	200
DA-31	0-180		3°	180
DA-32	0-100		3°-36'	100
DA-33	0-72		5°	72
DA-34	0-10		36°	10

*Available counter clockwise. To order, use prefix DC in place of DA.

PRECISION DRUM DIALS

Clockwise and Counter Clockwise

PRECISION ENGRAVED

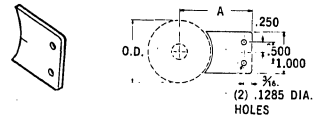


Material: Aluminum 24ST Black Anodized

Cat. No.	A	B	C	Range	Steps in Degrees
DB-1	3/8	100	.990	BLANK	0-100
DB-2		180		0-360	3°-36'
DB-3		180		0-360	2°
DB-4				BLANK	0-60
DB-5	3/8	60	1.490	0-60	6°
DB-6		100		0-100	3°-36'
DB-7		180		0-360	2°
DB-8				BLANK	0-50
DB-9		50		0-50	7°-12'
DB-10	3/8	25	1.990	0-25	14°-24'
DB-11		10		0-10	36°
DB-12		180		0-180	2°
DB-13		180		0-360	2°
DB-14				BLANK	0-200
DB-15	1/2	200	2.490	0-200	1°-48'
DB-16		180		0-180	2°
DB-17*		360		0-360	2°
DB-18*		180		0-360	1°
DB-19		100		0-100	3°-36'
DB-20				BLANK	0-180
DB-21		180		0-180	2°
DB-22	1/2	100	2.990	0-100	3°-36'
DB-23		10		0-10	36°
DB-24*		360		0-360	1°
DB-25*		180		0-360	2°

*Available counter clockwise. To order, use prefix DD in place of DB.

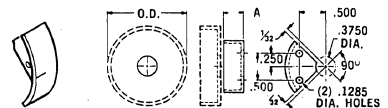
PRECISION DISC DIAL INDEX



Material: Aluminum 24ST Black Anodized
Note: Use with "DA" and "DC" Type Disc Dials

Cat. No.	A	O.D. of Dial
DG-1	1.760	1.500
DG-2	2.010	2.000
DG-3	2.510	3.000
DG-4	3.010	4.000

PRECISION DRUM DIAL INDEX

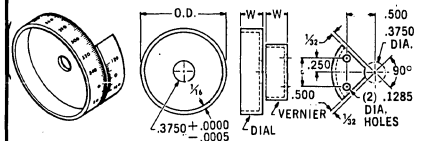


Material: Aluminum 24ST Black Anodized
Note: Use with "DB" and "DD" Type Drum Dials

Cat. No.	A	O.D. of Drum
DF-1	.375	1.490
DF-2	.375	1.990
DF-3	.500	2.490
DF-4	.500	2.990

VERNIER AND DRUM DIAL SETS

PRECISION ENGRAVED



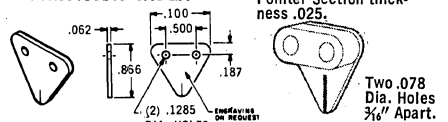
Material: Aluminum 24ST Black Anodized
Note: Special Sets Available on Request

For Additional Information See Technical Section

Cat. No.	D. +.005 D. -.005	W	Dial Graduations	Dial Range	Vernier Reading
DJ-1	1.490	.375	360° in 2° Steps	0°-360°	12'
DJ-2	1.990	.375	360° in 2° Steps	0°-360°	12'
DJ-3	2.490	.500	360° in 1° Steps		6'
DJ-4	2.990	.500	360° in 1° Steps		6'

No. 1341 POINTER, DIAL
3/8" W. x 3/8" H. x 1/8" D.
Pointer section thickness .025.

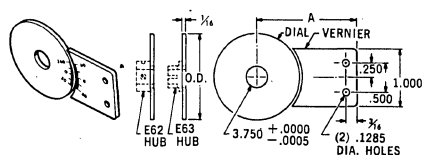
PRECISION INDEX



Cat. No.	Material
DE-1	Clear Plexiglass
DE-2	Aluminum 24ST Black Anodized

VERNIER AND DISC DIAL SETS

PRECISION ENGRAVED



Material: Aluminum 24ST Black Anodized
Note: Special Sets Available on Request

For Additional Information See Technical Section

Cat. No.	D. +.000 D. -.005	A	Dial Graduations	Dial Range	Vernier Reading
DH-1	1.500	1.760	360° in 2° Steps	0°-360°	12'
DH-2	2.000	2.010	360° in 2° Steps	0°-360°	12'
DH-3	3.000	2.510	360° in 1° Steps		6'
DH-4	4.000	3.010	360° in 1° Steps		6'

We invite your inquiries for special dials and drums. Also available from stock — precision ground shafts.



JAN HARDWARE
MANUFACTURING COMPANY INC.

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

QUALITY
RELIABILITY
ECONOMY



JAN HARDWARE

MANUFACTURING COMPANY INC.

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

QUALITY
RELIABILITY
ECONOMY

HI-VOLTAGE INSULATED COUPLINGS

U.S. PATENT NO. 2,681,387
MEETS MILITARY SPECIFICATIONS — TEMPERATURE - HUMIDITY - SHOCK - VIBRATION - FUNGUS

HI-VOLTAGE INSULATED COUPLINGS

15 KV Breakdown — 10 inch pounds torque
Series No. AK-5079 and No. AK-5164

Engineered with stainless steel shaft and precision, screwdriver tip molded-integrally with Diallyl Phthalate Material in accordance with Military Specifications. Completely shock, vibration and fungus proof, they operate with ease over an ambient temperature range of -75°C to +175°C. Supplied complete with nickel plated mounting hardware.

Stainless steel screwdriver tip fits all standard slotted shafts (potentiometer, etc.) without need for further machining. Ideally suited to adjust high voltage controls thus protecting operating personnel against danger. They are also used to reduce ground capacitance on other types of sensitive instrument controls.

For Commercial Instrument Applications . . .
These couplings are available in general purpose Black Bakelite.

Cat. No. 6164-(X or B)-(-) For Standard Type
Cat. No. 6079-(X or B)-(-) with Locking Type Bushing.
Dimensions are identical with 5000 Series, in chart below.

STANDARD TYPE

Cat. No.	Dimensions in Inches			
	"A"	"B"	Shaft	"C"
AK-5164-X-1	3/8	3/16	Slotted	5/16
AK-5164-B-1	3/8	3/16	Slotted	5/16
AK-5164-X-2	3/8	3/16	Slotted	5/16
AK-5164-B-2	3/8	3/16	Slotted	5/16
AK-5164-X-3	3/8	3/16	No Slot	1 1/16
AK-5164-B-3	3/8	3/16	No Slot	1 1/16
AK-5164-X-4	3/8	3/16	No Slot	1 1/16
AK-5164-B-4	3/8	3/16	No Slot	1 1/16
AK-5164-X-5	3/8	3/16	Slotted	Minus 1/16
AK-5164-B-5	3/8	3/16	Slotted	Minus 1/16

WITH LOCKING TYPE BUSHING

AK-5079-X-1	3/8	3/16	Slotted	1/8
AK-5079-B-1	3/8	3/16	Slotted	1/8
AK-5079-X-2	3/8	3/16	Slotted	5/32
AK-5079-B-2	3/8	3/16	Slotted	5/32

Note: (3/16") to be used with 1/8" long shaft.
(1/16") to be used with 1/4" long shaft.

HI-VOLTAGE INSULATED COUPLINGS FOR 1/8" SHAFTS
White Cycalac material. Voltage ratings: 6000 VDC.
Hubs — Brass, Nickel Plated; Shafts — St. Steel.
*Insert letter "S" or "N" followed by first two numbers of decimal equivalent, for fractional length of shaft beyond bushing.

"S" = with slot. "N" = no slot.

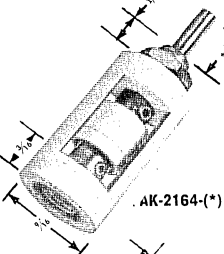
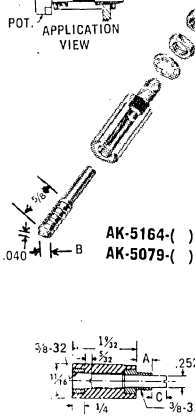
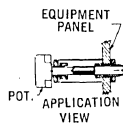
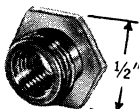
Typical Part Number: AK-2164-N31 =
3/8" long shaft beyond bushing (standard), no slot.
If length is 1" use "X".

Typical Part Number: AK-2164-SX =
1" long shaft beyond bushing, slotted.
If length exceeds 1", use "X" and decimal equivalent for balance of number.

Typical Part Number: AK-2164-NX31 =
1 1/8" long shaft beyond bushing, no slot.

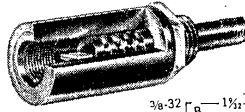
REDUCER INSERT BUSHING Cat. No. AK771

Used as an adapter with high voltage insulated couplings to accommodate miniature (1/8" shaft) potentiometers. External thread 3/8x32. Internal thread 1/4x32.

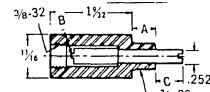


AP-1540

COMMERCIAL INSULATED COUPLINGS



AK-4160



30 KV Breakdown
10 inch pounds torque

STANDARD TYPE

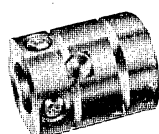
Cat. No.	Dimensions in Inches		
	"A"	"B"	Shaft "C"
AK-4160-X-1	3/8	3/16	Slotted 1/8
AK-4160-B-1	3/8	3/16	Slotted 1/8
AK-4160-X-2	3/8	3/16	No Slot 1/2
AK-4160-B-2	3/8	3/16	No Slot 1/2

Series No. AK-4160
For TV and Industrial Applications

These handy couplings, capable of withstanding 30 KV, are made of high grade Bakelite throughout except for the stainless steel screwdriver tip molded within the drive shaft. Mounting hardware supplied.

AUTOLINEAR (INSULATED) SHAFT COUPLINGS

2.5-5 KV Breakdown Universal, Miniature, Self-aligning



Typical Part No.'s

AP-1530-34
AP-1538-22

Voltage Rating

AP-1530, 2500 V
AP-1538, 5000 V

Part No.	Dimensions in Inches			
	Dia. Hole	"A"	"B"	"C"
AP-1530-2	1/8	1/2	1 1/4	5/8 ± 1/32
AP-1530-3	3/16	1/2	1 1/4	5/8 ± 1/32
AP-1530-4	1/4	1/2	1 1/4	5/8 ± 1/32
AP-1538-2	3/8	1/2	2 1/4	1 1/4 ± 1/32
AP-1538-3	3/8	1/2	2 1/4	1 1/4 ± 1/32
AP-1538-4	1/2	1/2	2 1/4	1 1/4 ± 1/32

Cat. No. AP-1530 and AP-1538

A unique series of shaft couplers that accommodate either similar or dissimilar 1/8", 3/16" or 1/4" shafts. Permits offset misalignment to 1/16" and 5° angle. Operates free of backlash. Self-extinguishing low water absorption characteristic plastic insulator between precision cast aluminum hubs. Each hub has 2 set screws for firm attachment. Aldolite finish.

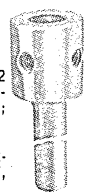
1/4" SHAFT COUPLING EXTENDER

Cat. No. AP-1010

Nickel plated brass with 2 set screws for firm attachment to shaft. 1/2" O.D.; 1 1/4" overall length.

Cat. No. AP-1321

Same as above, except extends 1/4" shaft to 1/8", overall length 2 1/2".



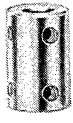
SHAFT COUPLING

Cat. No. AP-15150

A rugged, nickel plated brass coupling for joining two 1/4" shafts. Supplied with 4 set screws for firm attachment to shafts.

Cat. No. AP-15151

Same as above, 2 set screws.

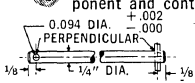
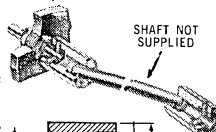


OFFSET-SHAFT (INSULATED) COUPLINGS

10 KV Breakdown 1 ± 30° Offset Cat. No. AP-15299

Highly versatile, durable, insulated couplings made with single-unit, molded Nylon-to-metal insert construction. Application requires two couplings — permits smooth control for two parallel shafts offset from each other up to 30° at separations greater than 3". Secured to component and control shafts by 2 set screws.

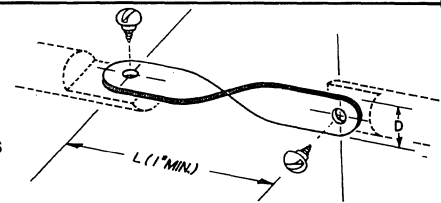
Note: Coupling is accomplished with a 1/4" shaft of any length (not furnished). Coupling shaft keyed to coupler by steel drive pins supplied.



Cat. No. AP-1367 UNITWIST JAN UNIVERSAL (shoulder screws supplied)

Specify:

1. Torque Requirement
2. Shaft Diameters (D) in increments of 1/16
3. Distance "L" in increments of 1/16"



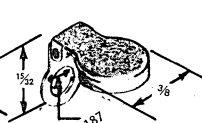
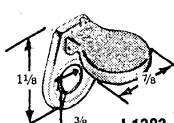
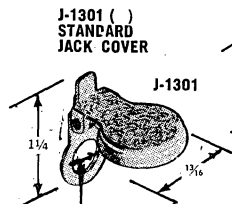
JACK COVERS (TRIMMER COVERS)

These sturdy Jack Covers fit jack or panel bushings and are used to keep out dust and moisture as well as to prevent inadvertent disturbance of control settings. Outer surfaces are finished in standard colors of baked enamel.

To Order Colors Specify:

(-1) Black Wrinkle; (-2) Smooth Gray; (-3) Smooth Olive; (-4) Smooth Black. Other colors on request.

Example: Jack cover, color black wrinkle, order as J-1301 (-1)



J-1303 (-)
WATERPROOF
JACK COVER
Gasket & Nut

J-1305 (-)
SUB-MINI
JACK COVER



JAN HARDWARE

MANUFACTURING COMPANY INC.

QUALITY
RELIABILITY
ECONOMY

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

RELAY SOCKETS with Fixed or Removable Contacts!

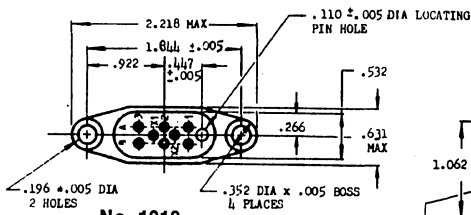
Jan's relay sockets are specifically designed for use with plug-in relays ... in electronic circuit applications which demand quick and easy assembly and maintenance.

Available with dip-solder pin terminals for printed circuit assembly, or solder cup and turret terminals for direct wiring. For applications requiring removable contacts, solderless wire crimp terminations are available for #16, 20, 22, or 24 AWG wire sizes.

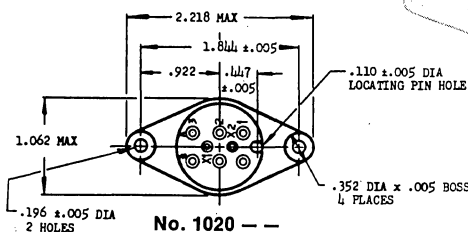
A variety of mounting styles are offered including ... tapped

inserts with studs for top chassis mounting; thru hole; or tapped inserts with removable standoffs and screws for mounting on either side of chassis or panel. Unexpected disconnect because of vibration is eliminated by fastening the relay to the socket. Polarization dots and/or index holes (optional) aid in plugging in relay correctly. Socket contact material is spring tempered phosphor bronze gold plate over silver plate. Body material is Diallyl Phthalate, fiberglass filled per MIL-M-19833.

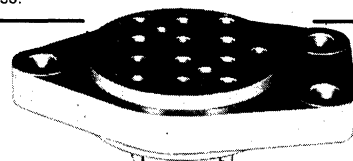
1000 SERIES



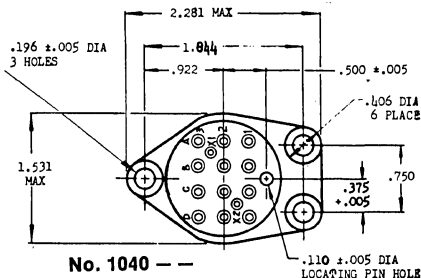
No. 1010 --



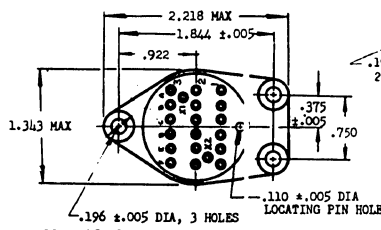
No. 1020 --



No. 1030 --



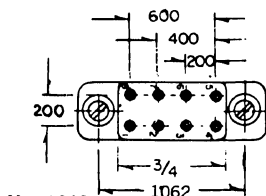
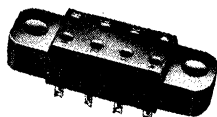
No. 1040 --



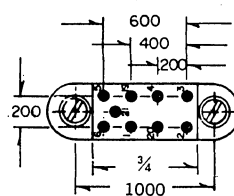
No. 1050 --

MS No.	JAN Part No.	MS No.	JAN Part No.
MS25322	No. 1010	MS25456	No. 1060
MS25324	No. 1020	MS25458	No. 1070
MS25326	No. 1030	MS25460	No. 1080
MS25328	No. 1040	MS25462	No. 1090
MS25330	No. 1050	MS25464	No. 1100

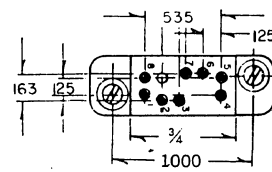
2000 SERIES



No. 2010 --

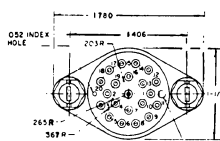
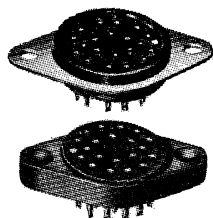


No. 2020 --

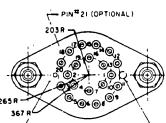


No. 2030 --

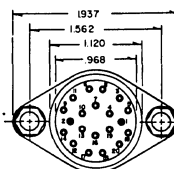
3000 SERIES



No. 3010 --



No. 3020 --



No. 3030 --

JAN Part No.			Relay Type
No. 3010	No. 3020	No. 3030	6PDT
No. 3011	No. 3021	No. 3031	6PDTL
No. 3012	No. 3022	No. 3032	4PDT
No. 3013	No. 3023	No. 3033	4PDTL
No. 3014	No. 3024	No. 3034	3PDT
No. 3015	No. 3025	No. 3035	3PDTL

Numbering System

3000

A = Closed Entry	1 = Solder Cup
B = Slotted	2 = Eyelet
	3 = Turret
	4 = Dip Solder
	5 = Taper

JOLTA SHOCK TEST MACHINES

For Reproducible Impact-Shock Test Pulses

Four Models Engineered to Reproduce the Entire Spectrum of All Significant Impact Shock Waves

Designed for laboratory and production testing of light to medium weight components as well as complete instrumentation. Produced to meet practically all requirements of common Mil. Spec. qualification tests. Each JOLTA is electronically calibrated to certify compliance with test specifications.

JOLTA Bench Model No. 1001 — Produced to meet JAN-S-44 and Mil-Std. 202 (202A). Standard model range 30-120G. Accessory plate springs available for test pulses to 500 G.

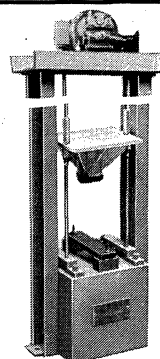
JOLTA Bench Model No. M-500 — Produced to meet Mil-T-12679A (Sig. C) and Mil-T-19500A. Standard model range — 200 to 1000 G at 1.0 millsecs. Alternate anvils and pad kits available to order.

JOLTA Floor Model Nos. F-3003-C1, C2, C3 — De-

signed for high impact shock testing for small and moderate-sized components. Precision-machined magnesium casting utilized for higher shock amplitudes. Typical tests with these units 50 to 5000 G at .2 to 11.0 millsecs. For high impact testing, accessory springs and twin anvil combinations yield impulses of 0.2 millsecs to 5000 G.

SPECIFICATIONS — JOLTA SHOCK TESTERS

Model No.	Carriage Volume	Test Weight	"G" Ranges
1001	4"x4"x5"	0-12 lbs.	25-500
M-500	3" cube	0-2.0 lbs.	100-1000
F-3003-C-1	5" cube	0-12 lbs.	50-1500
F-3003-C-2	5" cube	0-4.0 lbs.	350-5000



For Production Testing, Can Be Automated for Continuous Operation

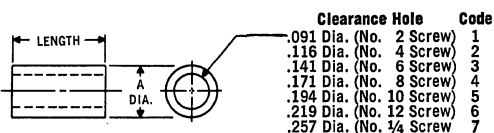
FEATURES

- Economical
- Simple to Operate
- Rugged
- Uniformly Accurate

Note: New design allows for quick changeovers of accessories.

STANDOFFS

SPACER-THRU HOLE



Length	A=1/8	A=3/16	A=1/4	Length	A=3/8	A=1/2
1/8	SP 021	SP 031		1/8	SP 0311	SP 0411
1/8	SP 022	SP 032	SP 042	3/8	SP 0312	SP 0412
1/8	SP 023	SP 033	SP 043	1/4	SP 0314	SP 0414
1/4	SP 024	SP 034	SP 044	1/2	SP 0315	SP 0415
1/4	SP 025	SP 035	SP 045	1	SP 0316	SP 0416
3/8	SP 026	SP 036	SP 046	1 1/8		SP 0418
1/2	SP 027	SP 037	SP 047	1 1/4		SP 0420
1/2	SP 028	SP 038	SP 048	1 3/8		SP 0422
3/4	SP 029	SP 039	SP 049	1 1/2		SP 0424
3/4	SP 030	SP 040				

EXAMPLE (TO ORDER) Pt. No. SP 035-2-B = 3/8 Dia. x 3/8 Lg. Spacer-Brass w/.116 Clearance Hole for #4 Screw.

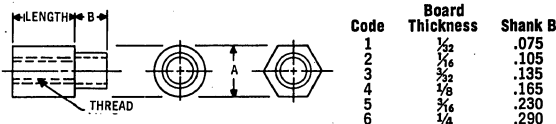
Length	A=1/8	A=3/16	A=1/4	Length	A=3/8	A=1/2
1/8	SP 025	SP 062	SP 082	7/8	SP 0514	SP 0614
1/8	SP 053	SP 063	SP 083	1 1/8	SP 0515	SP 0615
1/4	SP 054	SP 064	SP 084	1 1/4	SP 0516	SP 0616
1/4	SP 055	SP 065	SP 085	1 3/8	SP 0518	SP 0618
3/8	SP 056	SP 066	SP 086	1 1/2	SP 0520	SP 0620
3/8	SP 057	SP 067	SP 087	1 3/4	SP 0522	SP 0622
1/2	SP 058	SP 068	SP 088	1 7/8	SP 0524	SP 0624
1/2	SP 059	SP 069	SP 089	2	SP 0626	SP 0826
3/4	SP 0510	SP 0610	SP 0810	2 1/4	SP 0628	SP 0828
3/4	SP 0511	SP 0611	SP 0811	2 1/2	SP 0630	SP 0830
3/4	SP 0512	SP 0612	SP 0812	2 3/4	SP 0632	SP 0832

EXAMPLE (TO ORDER) Pt. No. SP 064-3-P = 3/8 Dia. x 3/4 Lg. Spacer-Phenolic w/.141 Clearance Hole for #6 Screw.

MATERIALS B = Brass A = Aluminum SS = Stainless Steel PH = Phenolic

STANDOFF — RIVET

— HEX AND ROUND



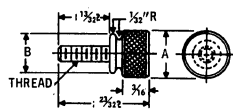
Length	A=1/8 Dia. 0-80 Thread	A=1/4 Dia. 2-56 Thread	A=3/8 Dia. 4-40 Thread	A=1/2 Dia. 6-32 Thread
1/8	RR 202 RH 202	RR 4022 RH 4022	RR 5024 RH 5024	RR 6026 RH 6026
1/8	RR 203 RH 203	RR 4032 RH 4032	RR 5034 RH 5034	RR 6036 RH 6036
1/4	RR 204 RH 204	RR 4042 RH 4042	RR 5044 RH 5044	RR 6046 RH 6046
1/4	RR 205 RH 205	RR 4052 RH 4052	RR 5054 RH 5054	RR 6056 RH 6056
3/8	RR 206 RH 206	RR 4062 RH 4062	RR 5064 RH 5064	RR 6066 RH 6066
1/2	RR 207 RH 207	RR 4072 RH 4072	RR 5074 RH 5074	RR 6076 RH 6076
1/2	RR 208 RH 208	RR 4082 RH 4082	RR 5084 RH 5084	RR 6086 RH 6086
3/4	RR 209 RH 209	RR 4092 RH 4092	RR 5094 RH 5094	RR 6096 RH 6096
3/4	RR 210 RH 210	RR 4102 RH 4102	RR 5104 RH 5104	RR 6106 RH 6106
1	RR 211 RH 211	RR 4112 RH 4112	RR 5114 RH 5114	RR 6116 RH 6116
1 1/8	RR 212 RH 212	RR 4122 RH 4122	RR 5124 RH 5124	RR 6126 RH 6126
1 1/4	RR 214 RH 214	RR 4142 RH 4142	RR 5144 RH 5144	RR 6146 RH 6146
1 1/2	RR 216 RH 216	RR 4162 RH 4162	RR 5164 RH 5164	RR 6166 RH 6166

EXAMPLE (TO ORDER) Pt. No. RR 4052-2-B = 1/4 Dia. x 3/8 Lg. Round, Rivet Standoff-Brass w/2-56 Thread Shank = .105 for 1/8 Board.

MATERIALS B = Brass A = Aluminum SS = Stainless Steel PH = Phenolic

SPECIAL SIZES AND MATERIALS MANUFACTURED TO ORDER

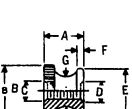
THUMB SCREW



EXAMPLE (TO ORDER)

Pt. No. TS 6058-9 = 8-32 x 1 1/2 Lg. Thread, Thumb Screw- Brass.

THUMB NUT KNURLED



Thread	A	B Dia.	C Dia.	D Dia.	E Dia.	F	G	R Rad.	Part No.
4-36	3/4	3/8	1/8	.147	3/16	3/16	3/32	3/4	KN 436
4-40	3/4	3/8	1/8	.147	3/16	3/16	3/32	3/4	KN 440
6-32	3/4	3/8	1/8	.169	3/16	3/16	3/32	3/4	KN 632
6-32	3/4	3/8	1/8	.169	3/16	3/16	3/32	3/4	KN 6321
8-32	3/4	3/8	1/8	.169	3/16	3/16	3/32	3/4	KN 832
10-24	3/4	1/2	1/4	.194	3/16	3/16	3/32	.070	KN 124
10-32	3/4	1/2	1/4	.194	3/16	3/16	3/32	.070	KN 132
12-24	3/4	1/2	1/4	.224	3/16	3/16	3/32	.070	KN 224
1/4-20	3/8	3/8	1/4	.254	3/16	3/16	3/32	3/4	KN 420

QUALITY
RELIABILITY
ECONOMY

JAN HARDWARE

MANUFACTURING COMPANY INC.

47-27 36TH STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

STANDOFF — THREADED ENDS



Length	A=1/8 Dia. 0-80 Thread	A=1/4 Dia. 4-40 Thread	A=3/8 Dia. 6-32 Thread	A=1/2 Dia. 8-32 Thread
1/8	DR 217 DH 217	DR 4174 DH 4174	DR 4176 DH 4176	DR 4178 DH 4178
1/8	DR 218 DH 218	DR 4184 DH 4184	DR 4186 DH 4186	DR 4188 DH 4188
1/8	DR 219 DH 219	DR 4194 DH 4194	DR 4196 DH 4196	DR 4198 DH 4198
1/4	DR 220 DH 220	DR 4204 DH 4204	DR 4206 DH 4206	DR 4208 DH 4208
1/4	DR 221 DH 221	DR 4214 DH 4214	DR 4216 DH 4216	DR 4218 DH 4218
1/4	DR 222 DH 222	DR 4224 DH 4224	DR 4226 DH 4226	DR 4228 DH 4228
1/4	DR 223 DH 223	DR 4234 DH 4234	DR 4236 DH 4236	DR 4238 DH 4238
1/2	DR 224 DH 224	DR 4244 DH 4244	DR 4246 DH 4246	DR 4248 DH 4248
3/8		DR 4324 DH 4324	DR 4326 DH 4326	DR 4328 DH 4328
1/2		DR 4344 DH 4344	DR 4346 DH 4346	DR 4348 DH 4348
3/4		DR 4444 DH 4444	DR 4446 DH 4446	DR 4448 DH 4448
1		DR 4484 DH 4484	DR 4486 DH 4486	DR 4488 DH 4488

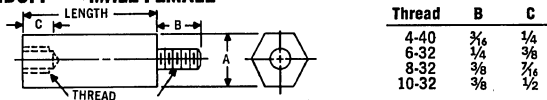
EXAMPLE (TO ORDER) Pt. No. DR 219-B = 1/8 Dia. x 1 1/8 Lg. Hex Standoff-Tapped Both Ends Brass w/0-80 x 3/8 Hole.

Lgth.	A=3/8 Dia. 6-32 Thread	A=3/8 Dia. 6-32 Thread	A=3/8 Dia. 8-32 Thread	A=1/2 Dia. 8-32 Thread
1/8	DR 5176 DH 5176	DR 6176 DH 6176	DR 6178 DH 6178	DR 8178 DH 8178
1/8	DR 5186 DH 5186	DR 6186 DH 6186	DR 6188 DH 6188	DR 8188 DH 8188
1/8	DR 5196 DH 5196	DR 6196 DH 6196	DR 6198 DH 6198	DR 8198 DH 8198
1/4	DR 5206 DH 5206	DR 6206 DH 6206	DR 6208 DH 6208	DR 8208 DH 8208
1/4	DR 5216 DH 5216	DR 6216 DH 6216	DR 6218 DH 6218	DR 8218 DH 8218
1/4	DR 5226 DH 5226	DR 6226 DH 6226	DR 6228 DH 6228	DR 8228 DH 8228
1/4	DR 5236 DH 5236	DR 6236 DH 6236	DR 6238 DH 6238	DR 8238 DH 8238
1/4	DR 5246 DH 5246	DR 6246 DH 6246	DR 6248 DH 6248	DR 8248 DH 8248
1/4	DR 5256 DH 5256	DR 6256 DH 6256	DR 6258 DH 6258	DR 8258 DH 8258
2	DR 5326 DH 5326	DR 6326 DH 6326	DR 6328 DH 6328	DR 8328 DH 8328
2 1/4	DR 5366 DH 5366	DR 6366 DH 6366	DR 6368 DH 6368	DR 8368 DH 8368
2 1/2	DR 5406 DH 5406	DR 6406 DH 6406	DR 6408 DH 6408	DR 8408 DH 8408
3	DR 5486 DH 5486	DR 6486 DH 6486	DR 6488 DH 6488	DR 8488 DH 8488
3 1/2	DR 5566 DH 5566	DR 6566 DH 6566	DR 6568 DH 6568	DR 8568 DH 8568
4	DR 5646 DH 5646	DR 6646 DH 6646	DR 6648 DH 6648	DR 8648 DH 8648

EXAMPLE (TO ORDER) Pt. No. DR 6186-A = 3/8 Dia. x 1 1/8 Lg. Round Standoff-Aluminum-Tapped Both Ends w/6-32 x 3/8 Thread.

MATERIALS B = Brass A = Aluminum SS = Stainless Steel PH = Phenolic

STANDOFF — MALE-FEMALE



Lgth.	A=1/4 AC. Fits.	A=3/8 AC. Fits.	A=1/2 AC. Fits.	A=3/4 AC. Fits.
1/4	MF 4044 MF 4046	MF 4048 MF 4048	MF 4044 MF 4046	MF 6044 MF 6046
3/8	MF 4064 MF 4066	MF 4068 MF 4068	MF 4064 MF 4066	MF 6064 MF 6066
1/2	MF 4084 MF 4086	MF 4088 MF 4088	MF 4084 MF 4086	MF 6084 MF 6086
3/4	MF 4104 MF 4106	MF 4108 MF 4108	MF 4104 MF 4106	MF 6104 MF 6106
1	MF 4124 MF 4126	MF 4128 MF 4128	MF 4124 MF 4126	MF 6124 MF 6126
1 1/8	MF 4144 MF 4146	MF 4148 MF 4148	MF 4144 MF 4146	MF 6144 MF 6146
1 1/4	MF 4164 MF 4166	MF 4168 MF 4168	MF 4164 MF 4166	MF 6164 MF 6166
1 1/2	MF 4184 MF 4186	MF 4188 MF 4188	MF 4184 MF 4186	MF 6184 MF 6186
1 3/4	MF 4204 MF 4206	MF 4208 MF 4208	MF 4204 MF 4206	MF 6204 MF 6206
2	MF 4224 MF 4226	MF 4228 MF 4228	MF 4224 MF 4226	MF 6224 MF 6226
2 1/4	MF 4244 MF 4246	MF 4248 MF 4248	MF 4244 MF 4246	MF 6244 MF 6246
2 1/2	MF 4264 MF 4266	MF 4268 MF 4268	MF 4264 MF 4266	MF 6264 MF 6266
2 3/4	MF 4284 MF 4286	MF 4288 MF 4288	MF 4284 MF 4286	MF 6284 MF 6286
3	MF 4304 MF 4306	MF 4308 MF 4308	MF 4304 MF 4306	MF 6304 MF 6306
3 1/4	MF 4324 MF 4326	MF 4328 MF 4328	MF 4324 MF 4326	MF 6324 MF 6326
3 1/2	MF 4344 MF 4346	MF 4348 MF 4348	MF 4344 MF 4346	MF 6344 MF 6346
3 3/4	MF 4364 MF 4366	MF 4368 MF 4368	MF 4364 MF 4366	MF 6364 MF 6366
4	MF 4384 MF 4386	MF 4388 MF 4388	MF 4384 MF 4386	MF 6384 MF 6386

EXAMPLE (TO ORDER) Pt. No. MF 4146-B = 1/4 AC. Fits. Standoff-Brass 6-32 Male-Female Threads.

MATERIALS B = Brass A = Aluminum SS = Stainless Steel

MATERIALS MANUFACTURED TO ORDER

THREADED ROD

— 1/4-20 THREAD — 2" EACH END



Lgth.	Lgth.	Lgth.	Lgth.	Lgth.	Lgth.	Lgth.
4 1/2	TR 1445 7	TR 1470 9 1/2	TR 1495 12	TR 14120 14 1/2	TR 14145 17 1/2	TR 14175 20
5	TR 1450 7 1/2	TR 1475 10	TR 14100 12 1/2	TR 14125 15	TR 14150 18	TR 14180 21
5 1/2	TR 1455 8	TR 1480 10 1/2	TR 14105 13	TR 14130 15 1/2	TR 14155 18 1/2	TR 14185 21 1/2
6	TR 1460 8 1/2	TR 1485 11	TR 14110 13 1/2	TR 14135 16	TR 14160 19	TR 14190 22
6 1/2	TR 1465 9	TR 1490 11 1/2	TR 14115 14	TR 14140 16 1/2	TR 14165 19 1/2	TR 14200 22 1/2

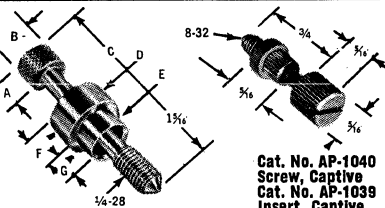
MATERIALS B = Brass A = Aluminum SS = Stainless Steel

CAPTIVE SCREW

AND NUT ASSEMBLY

Cat. No. AP-711-(1)
Cat. No. AP-711-(2)

Consists of slotted, knurled thumb screws made of corrosion resistant steel bar, and nickel-plated (on brass) panel inserts.

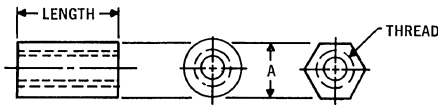


Lgth.	A	B	C	D	E	F	G	Cat. No.
1	1/4	3/8	1 1/8	3/8	1 1/2	3/8	3/8	AP-1197
2	1/4	3/8	1 1/8	3/8	1 1/2	3/8	3/8	AP-1197

1 1/4" slotted knurled head (3/8" O.D.)
1 1/4" overall length; 8-32 thread.

STANDOFFS (cont'd)

STANDOFF — THREADED — HEX & ROUND



MATERIALS B = Brass A = Aluminum SS = Stainless Steel PH = Phenolic
SPECIAL SIZES AND MATERIALS/MANUFACTURED TO ORDER

Lgth.	A = 1/8 Dia. 0-80 Thread		A = 3/16 Dia. 2-56 Thread		A = 1/4 Dia. 4-40 Thread	
	Round	Hex	Round	Hex	Round	Hex
1/8	SR 201	SH 201	SR 3012	SH 3012	SR 3014	SH 3014
1/8	SR 202	SH 202	SR 3022	SH 3022	SR 3024	SH 3024
1/8	SR 203	SH 203	SR 3032	SH 3032	SR 3034	SH 3034
1/8	SR 204	SH 204	SR 3042	SH 3042	SR 3044	SH 3044
1/8	SR 205	SH 205	SR 3052	SH 3052	SR 3054	SH 3054
1/8	SR 206	SH 206	SR 3062	SH 3062	SR 3064	SH 3064
1/8	SR 207	SH 207	SR 3072	SH 3072	SR 3074	SH 3074
1/8	SR 208	SH 208	SR 3082	SH 3082	SR 3084	SH 3084
1/8	SR 209	SH 209	SR 3092	SH 3092	SR 3094	SH 3094
1/8	SR 210	SH 210	SR 3102	SH 3102	SR 3104	SH 3104
1/8	SR 212	SH 212	SR 3122	SH 3122	SR 3124	SH 3124
1			SR 3162	SH 3162	SR 3164	SH 3164

EXAMPLE (TO ORDER) Pt. No. SR 3032-A = 3/16 Dia. x 3/8 Lg. Round Standoff-Aluminum w/2-56 Threaded Hole.

Lgth.	4-40 Thread		6-32 Thread		A = 1/4 Dia. 8-32 Thread		10-32 Thread	
	Round	Hex	Round	Hex	Round	Hex	Round	Hex
1/8	SR 4024	SH 4024	SR 4026	SH 4026	SR 4028	SH 4028	SR 40210	SH 40210
1/8	SR 4034	SH 4034	SR 4036	SH 4036	SR 4038	SH 4038	SR 40310	SH 40310
1/8	SR 4044	SH 4044	SR 4046	SH 4046	SR 4048	SH 4048	SR 40410	SH 40410
1/8	SR 4054	SH 4054	SR 4056	SH 4056	SR 4058	SH 4058	SR 40510	SH 40510
1/8	SR 4064	SH 4064	SR 4066	SH 4066	SR 4068	SH 4068	SR 40610	SH 40610
1/8	SR 4074	SH 4074	SR 4076	SH 4076	SR 4078	SH 4078	SR 40710	SH 40710
1/8	SR 4084	SH 4084	SR 4086	SH 4086	SR 4088	SH 4088	SR 40810	SH 40810
1/8	SR 4094	SH 4094	SR 4096	SH 4096	SR 4098	SH 4098	SR 40910	SH 40910
1/8	SR 4104	SH 4104	SR 4106	SH 4106	SR 4108	SH 4108	SR 41010	SH 41010
1/8	SR 4124	SH 4124	SR 4126	SH 4126	SR 4128	SH 4128	SR 41210	SH 41210
1/8	SR 4144	SH 4144	SR 4146	SH 4146	SR 4148	SH 4148	SR 41410	SH 41410
1	SR 4164	SH 4164	SR 4166	SH 4166	SR 4168	SH 4168	SR 41610	SH 41610

EXAMPLE (TO ORDER) Pt. No. SH 4086-B = 1/4 Dia. x 1/2 Lg. Hex Standoff-Brass w/6-32 Threaded Hole.

Lgth.	4-40 Thread		6-32 Thread		8-32 Thread		10-32 Thread	
	Round	Hex	Round	Hex	Round	Hex	Round	Hex
1/8	SR 5024	SH 5024	SR 5026	SH 5026	SR 5028	SH 5028	SR 50210	SH 50210
1/8	SR 5034	SH 5034	SR 5036	SH 5036	SR 5038	SH 5038	SR 50310	SH 50310
1/8	SR 5044	SH 5044	SR 5046	SH 5046	SR 5048	SH 5048	SR 50410	SH 50410
1/8	SR 5054	SH 5054	SR 5056	SH 5056	SR 5058	SH 5058	SR 50510	SH 50510
1/8	SR 5064	SH 5064	SR 5066	SH 5066	SR 5068	SH 5068	SR 50610	SH 50610
1/8	SR 5074	SH 5074	SR 5076	SH 5076	SR 5078	SH 5078	SR 50710	SH 50710
1/8	SR 5084	SH 5084	SR 5086	SH 5086	SR 5088	SH 5088	SR 50810	SH 50810
1/8	SR 5094	SH 5094	SR 5096	SH 5096	SR 5098	SH 5098	SR 50910	SH 50910
1/8	SR 5104	SH 5104	SR 5106	SH 5106	SR 5108	SH 5108	SR 51010	SH 51010
1/8	SR 5124	SH 5124	SR 5126	SH 5126	SR 5128	SH 5128	SR 51210	SH 51210
1/8	SR 5144	SH 5144	SR 5146	SH 5146	SR 5148	SH 5148	SR 51410	SH 51410
1	SR 5164	SH 5164	SR 5166	SH 5166	SR 5168	SH 5168	SR 51610	SH 51610

EXAMPLE (TO ORDER) Pt. No. SR 5146-PH = 3/8 Dia. x 7/8 Lg. Round Standoff-Phenolic w/6-32 Threaded Hole.

Lgth.	6-32 Thread		8-32 Thread		10-32 Thread	
	Round	Hex	Round	Hex	Round	Hex
1/8	SR 6026	SH 6026	SR 6028	SH 6028	SR 60210	SH 60210
1/8	SR 6036	SH 6036	SR 6038	SH 6038	SR 60310	SH 60310
1/8	SR 6046	SH 6046	SR 6048	SH 6048	SR 60410	SH 60410
1/8	SR 6056	SH 6056	SR 6058	SH 6058	SR 60510	SH 60510
1/8	SR 6066	SH 6066	SR 6068	SH 6068	SR 60610	SH 60610
1/8	SR 6076	SH 6076	SR 6078	SH 6078	SR 60710	SH 60710
1/8	SR 6086	SH 6086	SR 6088	SH 6088	SR 60810	SH 60810
1/8	SR 6096	SH 6096	SR 6098	SH 6098	SR 60910	SH 60910
1/8	SR 6106	SH 6106	SR 6108	SH 6108	SR 61010	SH 61010
1/8	SR 6126	SH 6126	SR 6128	SH 6128	SR 61210	SH 61210
1/8	SR 6146	SH 6146	SR 6148	SH 6148	SR 61410	SH 61410
1	SR 6166	SH 6166	SR 6168	SH 6168	SR 61610	SH 61610

EXAMPLE (TO ORDER) Pt. No. SH 6068-B = 3/8 Dia. x 3/8 Lg. Hex Standoff-Brass w/8-32 Threaded Hole.

Lgth.	8-32 Thread		10-32 Thread		A = 1/2 Dia. 12-24 Thread		1/4-20 Thread	
	Round	Hex	Round	Hex	Round	Hex	Round	Hex
1/8	SR 8028	SH 8028	SR 80210	SH 80210	SR 80212	SH 80212	SR 80214	SH 80214
1/8	SR 8038	SH 8038	SR 80310	SH 80310	SR 80312	SH 80312	SR 80314	SH 80314
1/8	SR 8048	SH 8048	SR 80410	SH 80410	SR 80412	SH 80412	SR 80414	SH 80414
1/8	SR 8058	SH 8058	SR 80510	SH 80510	SR 80512	SH 80512	SR 80514	SH 80514
1/8	SR 8068	SH 8068	SR 80610	SH 80610	SR 80612	SH 80612	SR 80614	SH 80614
1/8	SR 8078	SH 8078	SR 80710	SH 80710	SR 80712	SH 80712	SR 80714	SH 80714
1/8	SR 8088	SH 8088	SR 80810	SH 80810	SR 80812	SH 80812	SR 80814	SH 80814
1/8	SR 8098	SH 8098	SR 80910	SH 80910	SR 80912	SH 80912	SR 80914	SH 80914
1/8	SR 8108	SH 8108	SR 81010	SH 81010	SR 81012	SH 81012	SR 81014	SH 81014
1/8	SR 8128	SH 8128	SR 81210	SH 81210	SR 81212	SH 81212	SR 81214	SH 81214
1/8	SR 8148	SH 8148	SR 81410	SH 81410	SR 81412	SH 81412	SR 81414	SH 81414
1	SR 8168	SH 8168	SR 81610	SH 81610	SR 81612	SH 81612	SR 81614	SH 81614

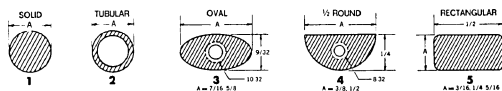
EXAMPLE (TO ORDER) Pt. No. SR 80910-A = 1/2 Dia. x 3/8 Lg. Round Standoff-Aluminum w/10-32 Threaded Hole.

EQUIPMENT HANDLES

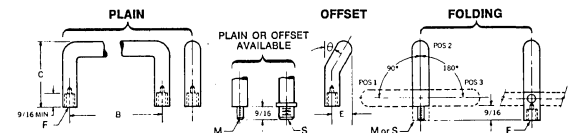
MATERIAL
A — ALUMINUM
B — BRASS
S — COLD ROLLED STEEL
SS — STAINLESS STEEL

FINISH
A — BLACK ANODIZE
B — OPTICAL BLACK
C — CLEAR ANODIZE
E — SATIN ETCH
N — NICKEL PLATE
X — BLACK OXIDE
P — PASSIVATE
O — NO FINISH

SHAPE



TYPE



HOW TO SPECIFY

TYPE OF HANDLE

*TYPE	PREFIX	DESCRIPTION
PLAIN	NONE	
OFFSET	φ, E	
FOLDING	A, B, C	
		A = FREE 180° B = 2 POS., DETENT, 90° C = 3 POS., DETENT, 90°

A DIA.	3/16	1/4	5/16	3/8	7/16	1/2
M, F	4-40	8-32	10-32	10-32	10-32	10-32
S	10-32	1/4-28	3/8-24	3/8-24	3/8-24	3/8-24

RECOMMENDED CARRYING LOAD (lbs.) BASED ON HUMAN ENGINEERING FACTORS

A DIA.	1/4	3/8	1/2	5/8	3/4
JAN STD. (lbs.)	10-15	15-20	20-30	30-40	40-50
MIL STD. 1472 (lbs. max.)	15	—	20	—	40

NOTE: For special designs, identify differences from standard in () after Part No.
Example: 3008 H0A 1 F 10 C09 B08 A (F = 6-32 x 3/4" deep).

TYPE* (PREFIX)
H (HANDLE)
MATERIAL
SHAPE
THREAD M, F, or S
A DIA. OR WIDTH
B DIMENSION
C DIMENSION
FINISH

DIMENSION:

θ Specify in Degrees
A, E Specify in 1/16 increments
C, B Specify with Letter + Fraction in 1/16 increments

LETTER VALUE:

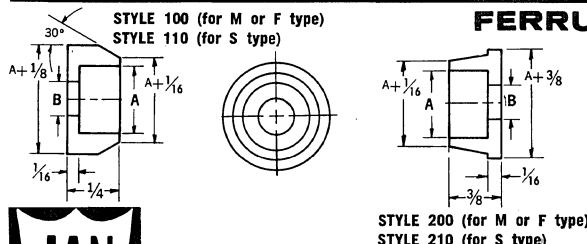
A thru Z = 1 thru 26. When Specifying dimension in 1/16 increments, use numerator of fraction for Part No. See Examples.

TYPICAL PART NUMBER

H 0B 1 M 04 D03 A02 X ...
3008 H 0A 1 F 10 C09 B08 A ...
A H SS 2 S 08 D00 A08 P ...

Plain Handle Brass, Shape 1, Male Thd., A = 1/4 O.D., B = 4 3/8, C = 1 1/8, Black Oxide Finish.
30° Offset, E = 1/2, Aluminum, Shape 1, Female Thd., A = 3/8 O.D., B = 3 3/8, C = 2 1/2, Blk. Anodized.
Folding Handle, 180°, Free, Stainless Steel, Shape 2, A = 1/2 Dia., B = 4", C = 1 1/2, Passivate, 3/8-24 thd.

FERRULES



DESIGNATION
MATERIAL
STYLE
A DIA.
B DIA.
FINISH

NOTES: "A" dimension is specified in 1/16 increments using numerator of fraction for part No.
"B" Dia. is clearance hole. For thd., see table.
For material and finish, see above. See examples.

HF 0B 100 05 10 X	Ferrule Brass, Style 100, A = 5/8 Dia. B = clearance for 10-32, Black Oxide
HF 0A 200 08 10 A	Ferrule Aluminum, Style 200, A = 1/2 Dia. B = clearance for 10-32, Black Anodized.

Thd. Size	4-40	6-32	8-32	10-32	1/4-24	3/8-24
B	04	06	08	10	25	38



JAN HARDWARE

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

SHIELDS

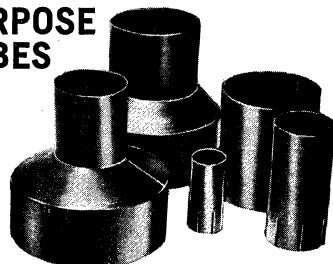
JAN's Magnetic Shields are made of MU-Metal or equal and are hydrogen annealed by a special process to assure optimum orientation of the molecular structure of the alloy for best magnetic shielding. JAN's Magnetic Shields prevent distortion and intensify modulation of the electron beam due to stray magnetic fields. In addition, the use of these shields protect personnel against the dangers of accidental tube breakage. Mounting holes are tapped for No. 6-32 screws as shown. These shields are designed to fit JAN's standard bezels as listed below. See following page for specifications on JAN's Bezel Assemblies.

Shield Cat. No.	For Use With C.R.T. No.	Matching JAN Bezel	
S-2001 S-2001-1	902 2AP 2BP	CP-1110P2 CP-1120P2	
S-3001 adaptable for edge-lighting graticule using S-3010 with Bezel CP-1428*	3RP 3RPA	CP-1328-P1 CP-1427-1 CP-1429-1 CP-1328-P2 CP-1427-2 CP-1429-2 CP-3430-1 CP-3430-2	
S-3003 S-3003-1	3KP 908A 3AP	CP-1328-P1 CP-1427-1 CP-1429-1	Same type as S-3001, except A = 10 1/8 B = 2
S-3004 — 12 (less anode hole) — 22 (with anode hole) adaptable for edge-lighting graticule using S-3012 with Bezel CP-1428*	3BP 3JP 3ACP	Same as S-3003 Same as S-3005	Same type as S-3001, except A = 8 5/8 B = 2 3/8
S-3005 adaptable for edge-lighting graticule using S-3008 with Bezel CP-1428*	3WP	CP-1328-P2 CP-1427-2 CP-1429-2	Same type as S-3001, except A = 10 5/8 B = 1 7/8
S-5001	5UP	CP-1465 CP-13584-1 CP-13549-1 CP-13595-1 CP-19495-1 CP-446-11 CP-446-22	
S-5002 adaptable for Edge-lighting	5BP 5CP 5ABP 5ADP	Same as S-5001 5ABP 5ADP	
S-5003	5UP	CP-1465 CP-13584-1 CP-13549-1 CP-13595-1 CP-19495-1	
S-5005 adaptable for edge-lighting	5AQP 5ABP 5ADP	CP-1465-2 CP-13549-2 CP-13584-2 CP-13595-2 CP-19495-2 CP-446-11 CP-446-22	
S-5017 adaptable for edge-lighting	5ABP 5ADP	CP-1465-2 CP-19636-2	
S-5027	5BTP	CP-19495-2	
S-7001	7GP 7JP 7VP	CP-7330 CP-7445 CP-7331 CP-7550 CP-7420	
S-7006	7AEP	CP-7330 CP-7445 CP-7331 CP-7550 CP-7420	

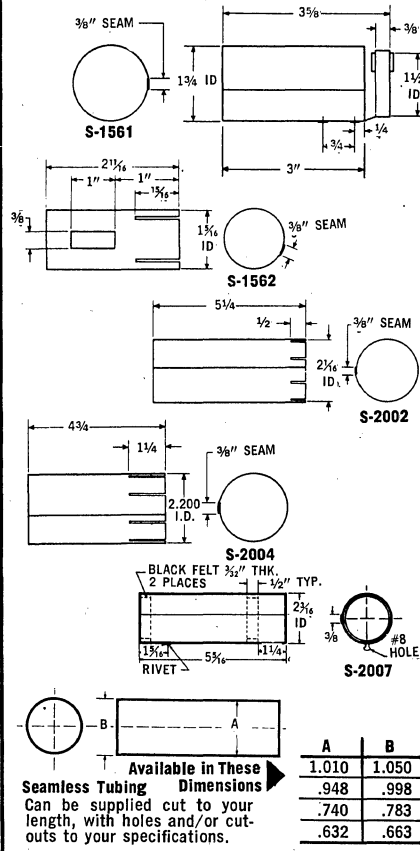
All Shields are Fabricated with Overlapped and Spot Welded Construction.
*See mounting hole arrangement illustrated with S-3001 edge-lit dimension drawing.

When ordering, be sure to specify CRT type number. Anode openings provided, where required. Shielding for EMC, RFI, and EMI now available, as bezels, shields, cushions, gaskets . . . in strip, sheet, formed, and molded.

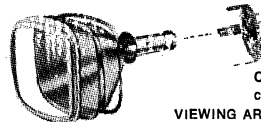
MAGNETIC SHIELDS FOR PHOTO-MULTIPLIER AND SPECIAL PURPOSE TUBES



Shield Tube	Shield Tube	Shield Tube
S-1091 ICP1	S-1562 IP21	S-2005 6372
929	IP22	S-2007 7850
930	IP28	
S-1181 5581	S-1563 1EP1	S-2008 6217
5653	S-2002 6810	S-3015 1197
IP39	7264	6363
IP40		
S-1500 6291	S-2003 6903	S-5013 1112
S-1561 6199	5819	S-5018 1198
7102	6292	6364
931	S-2004 6342	
S-1562 6323	6571	S-7009 1238
6328	6655	1287



We will design and manufacture SPECIAL Shields and Bezels, to customers specifications. Complete facilities for prototype work.



CRT Alignment Board contained within neck.
VIEWING AREA
1 1/8" high x 1 1/2" wide



JAN HARDWARE
MANUFACTURING COMPANY INC.

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

QUALITY
RELIABILITY
ECONOMY

PANEL COMPONENTS (EXCLUDING LIGHTING & DISPLAYS)

BEZELS

JAN's Bezels enhance the appearance of the instruments on which they are used. These units are functionally designed to provide OPTIMUM UTILIZATION OF THE C.R.T. SCREEN as well as safety against tube breakage and danger to operating personnel.

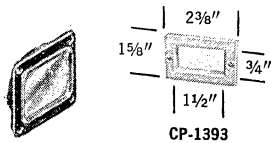
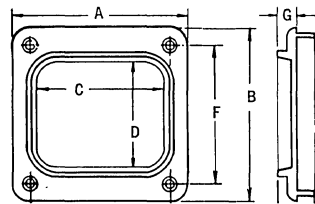
JAN Bezel Assemblies are supplied with a bezel, calibrated graticule, (where applicable) light filter and C.R.T. cushion. Bezels are finished in a smooth dull black non-reflecting surface. These units fit JAN Mu-Metal Shields.

Edge-lit Bezels** (E.L.B.A.)

These Bezels are designed to provide edge lighting of the engraved scale-calibrated graticule by means of pilot lights.

Camera Mount Bezel

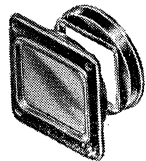
These units provide an integral cast mounting flange that fits all standard 3", 5" and 7" C.R.T. cameras.



CP-1393

CP-1110P2
(with 4 mounting holes)

CP-1120P2
(same as above, but with 2 mounting holes, in diagonal corners)

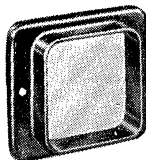


CP-1220-P

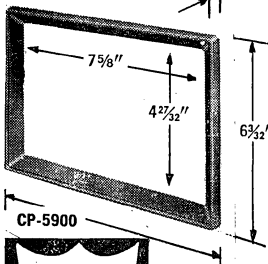
CP-1328-P-()

CP-1428-()

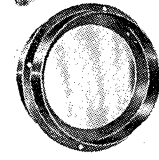
CP-1427 Same as CP-1428, except for mounting holes



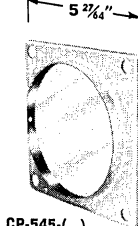
CP-1533-P



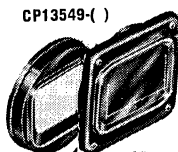
CP-5900



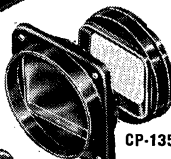
CP-1465



CP-545-()



CP-13549-()

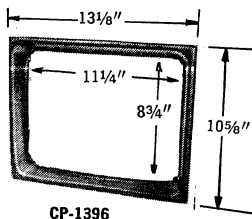


CP-13584-()

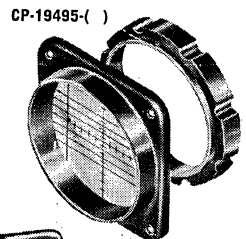


CP-7330

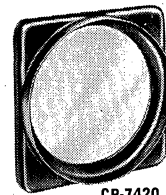
CP-13595-()



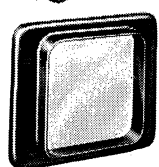
CP-1396



CP-19495-()



CP-7420



CP-7550

DISTINCTIVE FEATURES

- Engineered for 2", 3", 4", 5", 7", 8", 10" C.R.T.
- Maximum display area
- Precision engraved, scale-calibrated graticules; standard or to customer's specifications
- Materials and finish to "Mil Spec"
- Heavy buna-S shock cushion

- Models for edge-lighting
- Phosphor-matched light filters
- Non-reflecting matte surfaces
- Rugged camera mounts
- Models for curved and flat-faced C.R.T.

Cat. No.	C.R.T. Face	Material	Type	Dimensions in Inches										Visible Area (Cushion)	
				Panel Opening	A Over-all Width	B Over-all Ht.	C Visible Area (Bezel) Width	D Visible Area (Bezel) Ht.	E Mtg. Holes Width	F Mtg. Holes Ht.	G-Thickness (Face Only)	H-Thickness (Incl. Flange)	Ht.	Width	
BEZELS FOR 2" C.R.T.															
CP-1110-P-2	Flat	Plastic*	Standard	2 $\frac{3}{16}$	2 $\frac{5}{8}$	2 $\frac{5}{8}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	2	2	$\frac{5}{16}$	$\frac{7}{16}$	1 $\frac{3}{4}$	1 $\frac{3}{4}$	
BEZELS FOR 3" C.R.T.															
CP-1220-P‡	Curved or Flat	Plastic*	Camera Mount	—	4 $\frac{7}{8}$	3 $\frac{1}{4}$	2 $\frac{3}{4}$	2 $\frac{1}{4}$	4	2 $\frac{1}{2}$	$\frac{5}{8}$	1 $\frac{1}{8}$	—		
CP-1328-P-1	Curved Flat	Plastic*	Standard	3 $\frac{3}{64}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	2 $\frac{5}{8}$	2 $\frac{1}{8}$	3	3	$\frac{3}{8}$	4 $\frac{5}{64}$	2 $\frac{1}{2}$	2 $\frac{1}{8}$	
CP-1427-1	Curved Flat	Aluminum	Camera Mount	3 $\frac{1}{64}$	4	4	2 $\frac{3}{4}$ Dia.		3	3	$\frac{7}{16}$	2 $\frac{7}{32}$	2 $\frac{25}{32}$ Dia.		
CP-1428-1**	Curved Flat	Aluminum	Camera Mount	3 $\frac{1}{64}$	4	4	2 $\frac{3}{4}$ Dia.		3	3	$\frac{7}{16}$	2 $\frac{7}{32}$	2 $\frac{25}{32}$ Dia.		
CP-1428-2**	Curved Flat	Aluminum	E.L.B.A.**	3 $\frac{1}{64}$	4	4	2 $\frac{3}{4}$ Dia.		3	3	$\frac{7}{16}$	2 $\frac{7}{32}$	2 $\frac{25}{32}$ Dia.		
CP-1429-1	Curved Flat	Aluminum	Camera Mount	3 $\frac{1}{64}$	4	4	2 $\frac{3}{4}$ Dia.		3	3	$\frac{7}{16}$	2 $\frac{7}{32}$	2 $\frac{25}{32}$ Dia.		
CP-1429-2	Curved Flat	Aluminum	Camera Mount	3 $\frac{1}{64}$	4	4	2 $\frac{3}{4}$ Dia.		3	3	$\frac{7}{16}$	2 $\frac{7}{32}$	2 $\frac{25}{32}$ Dia.		
CP-3430-1	Curved Flat	Steel	Standard	—	4 $\frac{1}{8}$ Dia.		3 $\frac{3}{8}$ Dia.		3 $\frac{3}{4}$	3 $\frac{3}{4}$	1 $\frac{1}{4}$ $\frac{1}{4}$	1 $\frac{1}{4}$ $\frac{1}{4}$	2 $\frac{25}{32}$ Dia.		
CP-3430-2	Curved Flat	Steel	Standard	—	4 $\frac{1}{8}$ Dia.		3 $\frac{3}{8}$ Dia.		3 $\frac{3}{4}$	3 $\frac{3}{4}$	1 $\frac{1}{4}$ $\frac{1}{4}$	1 $\frac{1}{4}$ $\frac{1}{4}$	2 $\frac{25}{32}$ Dia.		
BEZELS FOR 4" C.R.T.															
CP-1533-P‡	—	Plastic*	Camera Mount	3 $\frac{1}{32}$	4 $\frac{3}{64}$	3 $\frac{1}{64}$	3	3	4	—	1 $\frac{3}{32}$	1 $\frac{3}{32}$	No Cushion		
BEZELS FOR 5" C.R.T.															
CP-13549-1	Curved Flat	Aluminum	Standard	6.0	6 $\frac{1}{4}$	6 $\frac{1}{4}$	4 $\frac{7}{8}$	3 $\frac{3}{4}$	4 $\frac{1}{16}$	4 $\frac{1}{16}$	1 $\frac{1}{2}$	1 $\frac{3}{32}$	4 $\frac{1}{4}$	3 $\frac{3}{16}$	
CP-13549-2	Curved Flat	Aluminum	Standard	6.0	6 $\frac{1}{4}$	6 $\frac{1}{4}$	4 $\frac{7}{8}$	3 $\frac{3}{4}$	4 $\frac{1}{16}$	4 $\frac{1}{16}$	1 $\frac{1}{2}$	1 $\frac{3}{32}$	4 $\frac{1}{4}$	3 $\frac{3}{16}$	
CP-13584-1	Curved Flat	Aluminum	Camera Mount	6.0	6 $\frac{1}{4}$	6 $\frac{1}{4}$	4 $\frac{7}{8}$	3 $\frac{3}{4}$	4 $\frac{1}{16}$	4 $\frac{1}{16}$	1 $\frac{1}{2}$	1 $\frac{3}{32}$	4 $\frac{1}{4}$	3 $\frac{3}{16}$	
CP-13584-2	Curved Flat	Aluminum	Camera Mount	6.0	6 $\frac{1}{4}$	6 $\frac{1}{4}$	4 $\frac{7}{8}$	3 $\frac{3}{4}$	4 $\frac{1}{16}$	4 $\frac{1}{16}$	1 $\frac{1}{2}$	1 $\frac{3}{32}$	4 $\frac{1}{4}$	3 $\frac{3}{16}$	
CP-13595-1**	Curved Flat	Aluminum	Standard	5 $\frac{1}{16}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	4 $\frac{7}{8}$	3 $\frac{3}{4}$	4 $\frac{1}{16}$	4 $\frac{1}{16}$	1 $\frac{1}{2}$	—	4 $\frac{3}{4}$ Dia.		
CP-13595-2**	Curved Flat	Aluminum	E.L.B.A.**	5 $\frac{1}{16}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	4 $\frac{7}{8}$	3 $\frac{3}{4}$	4 $\frac{1}{16}$	4 $\frac{1}{16}$	1 $\frac{1}{2}$	—	4 $\frac{3}{4}$ Dia.		
CP-1465	Curved or Flat	Steel	Camera Mount	5 $\frac{1}{8}$ 5 $\frac{1}{32}$	6 $\frac{3}{8}$ Dia.		5 $\frac{3}{4}$ Dia.		6	6	7 $\frac{1}{8}$	7 $\frac{1}{8}$	No Cushion 4 $\frac{1}{2}$ Dia.		
CP-1465-2	Curved or Flat	Steel	Camera Mount	5 $\frac{1}{8}$ 5 $\frac{1}{32}$	6 $\frac{3}{8}$ Dia.		5 $\frac{3}{4}$ Dia.		6	6	7 $\frac{1}{8}$	7 $\frac{1}{8}$	No Cushion 4 $\frac{1}{2}$ Dia.		
CP-19495-1**	Curved Flat	Aluminum	Camera Mount	5 $\frac{1}{8}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	5 $\frac{1}{4}$ Dia.		4 $\frac{1}{16}$	4 $\frac{1}{16}$	1 $\frac{1}{2}$	—	4 $\frac{3}{4}$ Dia.		
CP-19495-2**	Curved Flat	Aluminum	E.L.B.A.**	5 $\frac{1}{8}$	6 $\frac{1}{4}$	6 $\frac{1}{4}$	5 $\frac{1}{4}$ Dia.		4 $\frac{1}{16}$	4 $\frac{1}{16}$	1 $\frac{1}{2}$	—	4 $\frac{3}{4}$ Dia.		
CP-19636-2**	Flat	Aluminum	Camera Mount	5 $\frac{5}{8}$	5 $\frac{7}{8}$	5 $\frac{7}{8}$	4 $\frac{1}{2}$ Dia.	3	4 $\frac{7}{8}$	4 $\frac{7}{8}$	1 $\frac{1}{4}$	—	4 $\frac{1}{2}$ Dia.		
CP-446-11	Flat	Steel	Camera Mount	—	6 $\frac{1}{8}$ Dia.		5 $\frac{1}{8}$ Dia.		6 $\frac{3}{32}$ 6 $\frac{1}{8}$	6 $\frac{3}{32}$ 6 $\frac{1}{8}$	1	1 $\frac{1}{4}$ 1 $\frac{1}{16}$	4 $\frac{1}{2}$ Dia.		
CP-446-22	Flat	Steel	Camera Mount	—	6 $\frac{1}{8}$ Dia.		5 $\frac{1}{8}$ Dia.		6 $\frac{3}{32}$ 6 $\frac{1}{8}$	6 $\frac{3}{32}$ 6 $\frac{1}{8}$	1	1 $\frac{1}{4}$ 1 $\frac{1}{16}$	4 $\frac{1}{2}$ Dia.		
CP-545	Curved or Flat	Aluminum	Camera Mount	5	5 $\frac{27}{32}$	5 $\frac{27}{32}$	4 $\frac{25}{32}$ Dia.		5	5	2 $\frac{5}{32}$	—	—		
BEZELS FOR 7" C.R.T.															
CP-7330-1	Curved Flat	Aluminum	Standard	7 $\frac{1}{32}$	7 $\frac{1}{16}$	7 $\frac{1}{16}$	6 $\frac{3}{8}$ Dia.		6 $\frac{3}{8}$	6 $\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	6 $\frac{3}{8}$ Dia.		
CP-7331-2**	Curved Flat	Aluminum	E.L.B.A.**	7 $\frac{1}{32}$	7 $\frac{1}{16}$	7 $\frac{1}{16}$	6 $\frac{3}{8}$ Dia.		6 $\frac{3}{8}$	6 $\frac{3}{8}$	$\frac{3}{4}$	$\frac{3}{4}$	6 $\frac{3}{8}$ Dia.		
CP-7375-1**	Curved Flat	Aluminum	Camera Mount	7 $\frac{1}{32}$	8	8	4 $\frac{1}{2}$	4 $\frac{1}{2}$	6 $\frac{3}{8}$	6 $\frac{3}{8}$	1 $\frac{1}{2}$	2 $\frac{29}{32}$	1 $\frac{1}{2}$	4 $\frac{1}{2}$	
CP-7375-2**	Curved Flat	Aluminum	E.L.B.A.**	7 $\frac{1}{32}$	8	8	4 $\frac{1}{2}$	4 $\frac{1}{2}$	6 $\frac{3}{8}$	6 $\frac{3}{8}$	1 $\frac{1}{2}$	2 $\frac{29}{32}$	1 $\frac{1}{2}$	4 $\frac{1}{2}$	
CP-7420-1**	Curved or Flat	Aluminum	Camera Mount	7 $\frac{1}{32}$	7 $\frac{1}{16}$	7 $\frac{1}{16}$	6 $\frac{1}{16}$ Dia.		6 $\frac{3}{8}$	6 $\frac{3}{8}$	$\frac{3}{4}$	1 $\frac{3}{8}$	6 $\frac{3}{8}$ Dia.		
CP-7420-2**	Curved or Flat	Aluminum	Camera Mount	7 $\frac{1}{32}$	7 $\frac{1}{16}$	7 $\frac{1}{16}$	6 $\frac{1}{16}$ Dia.		6 $\frac{3}{8}$	6 $\frac{3}{8}$	$\frac{3}{4}$	1 $\frac{3}{8}$	6 $\frac{3}{8}$ Dia.		
CP-7550	Curved or Flat	Aluminum	Camera Mount	4 $\frac{25}{32}$	7 $\frac{3}{8}$	6 $\frac{1}{4}$	4 $\frac{3}{4}$	4 $\frac{3}{4}$	6 $\frac{1}{4}$	5 $\frac{1}{8}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$	No Cushion		
BEZEL FOR 10" C.R.T.															
CP-10860	Curved or Flat	Aluminum	Standard	11 $\frac{1}{32}$	12 $\frac{1}{4}$ Dia.		8 $\frac{1}{8}$	6 $\frac{1}{4}$	11 $\frac{1}{2}$ B.O.		$\frac{1}{16}$	$\frac{1}{16}$	No Cushion		

*All Plastic Bezels are furnished in shock resistant plastic, per MIL-P-3414. **Edge Lit Bezel Assemblies. ‡Rectangular C.R.T.



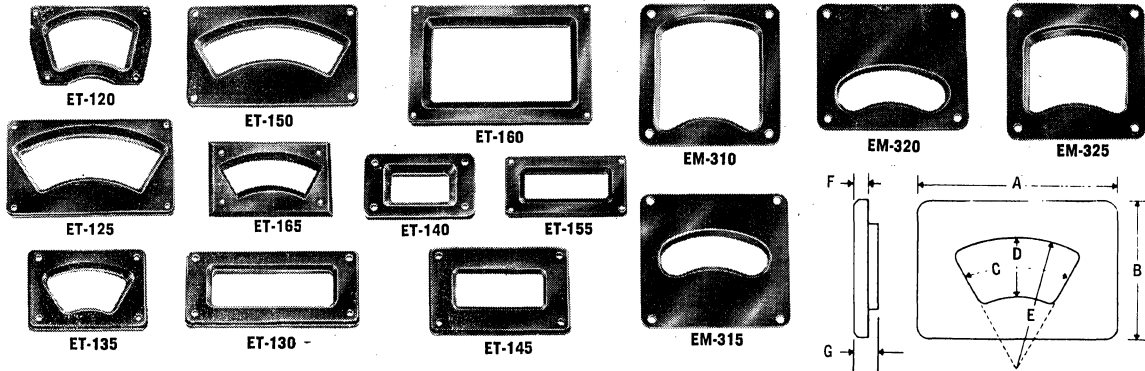
JAN HARDWARE

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

QUALITY
RELIABILITY
ECONOMY

ESCUTCHEON PLATES

FOR ELEGANT FRAMING OF PANEL OPENINGS



SPECIFICATIONS — JAN ESCUTCHEONS

Escutcheon Cat. No.	A Overall Width	B Overall Height	C Window Width	D Window Height	E Effective Outer Dial Radius	F Face Only	G Incl. Flange	Panel Opening Width	Panel Opening Height	Mounting Holes Width	Mounting Holes Height	Type of Dial	Material
ET-128*	2 1/2	1 3/4	1 3/4	1	1 1/2	3/4	3/4	2 1/2	1 3/4	2 1/2 top	1 3/4	Circular	Injection Molded Tenite II, Black Matte Finish
ET-125*	3 3/8	2 1/4	2 3/8	1	3 1/4	3/4	3/4	3 1/2	1 1/2	3 1/2 bottom	1 3/4		
ET-135*	2 3/4	1 7/8	1 3/4	7/8	1 7/8	3/4	3/4	2 1/4	1 3/4	2 1/4	1 3/4		
ET-150*	3 3/8	2 3/4	2 3/8	3/4	3 1/4	3/4	3/4	3 1/2	1 3/4	3 1/2	1 3/4		
ET-165*	2 5/8	1 5/8	1 3/4	3/4	2 3/4	3/4	3/4	2 1/4	1 1/2	2 1/4	1 3/4		
ET-130*	4	1 1/4	2 3/4	1 3/4	—	3/4	1/4	2 3/4	1 1/2	3 1/2	1 3/4	Flexible Tape, Digital Counter, Cylinder or Drum	Injection Molded Tenite II, Black Matte Finish
ET-140*	2 1/2	1 1/2	1 1/4	5/8	—	1/8	3/4	1 1/2	1 3/4	2	1		
ET-145*	3 1/4	2 1/4	1 3/4	3/4	—	3/4	3/4	2 1/2	1 3/4	2 1/4	1 3/4		
ET-155*	2 1/2	1 3/4	1 1/4	1/2	—	3/4	3/4	2 1/2	1 3/4	2 1/4	1 3/4		
ET-160*	3 3/8	2 1/2	2 1/4	1 3/8	—	1/8	3/4	3	2 1/2	3 3/8	2 1/4		
EM-310	3	3	2 1/4	1 1/4	2 1/4	1/2	1/4	3 1/4	2 1/2	2 1/2	2 1/2	Helical Circular	Soft Aluminum with Black Matte Enamel Finish
EM-315	3 1/4	3	2 1/4	5/8	2 1/4	1/2	1/8	2 3/4	1 3/4	2 1/2	2 1/2	Helical Circular	Soft Aluminum with Black Matte Enamel Finish
EM-320	3 1/4	2 3/4	2 1/4	5/8	2 1/4	1/2	1/8	2 3/4	1 3/4	2 1/2	2 1/2	Helical Circular	Soft Aluminum with Black Matte Enamel Finish
EM-325	3	3	2 1/4	1 1/2	2 3/4	1/2	1/4	2 1/2	1 3/4	2 1/2	2 1/2	Helical Circular	Soft Aluminum with Black Matte Enamel Finish

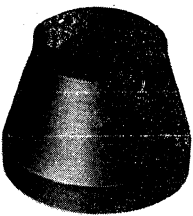
*To Order Specify: (1) frame only; (2) frame with clear window; (3) frame with clear window scribed with a center line.

JAN's molded, black, shock-resistant plastic escutcheons are available in an exceptionally wide variety of different types and sizes. They provide a pleasing window to frame dial plates mounted behind the panel.

Plastic escutcheons are available in the following ways: frame only; frame with clear windows; frame with clear window scribed with a center line.

For especially large working areas, stamped aluminum escutcheons, finished in dull black are available to meet the needs for space economy. Withstands temp. shock -65°C to +80°C. NON INFLAMMABLE.

VIEWING HOODS



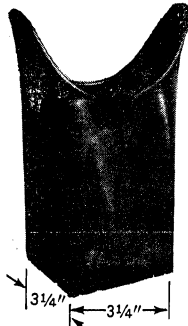
Cat. No. H-689-1
(5 5/8" I.D.)

Black neoprene rubber, contour-molded, fits the shape of face. Keeps out ambient light when viewing scope.

Used with following Jan Bezels: 19636; 19495; 13584; 1465.

No. H-689-2 (4 7/8" I.D.)

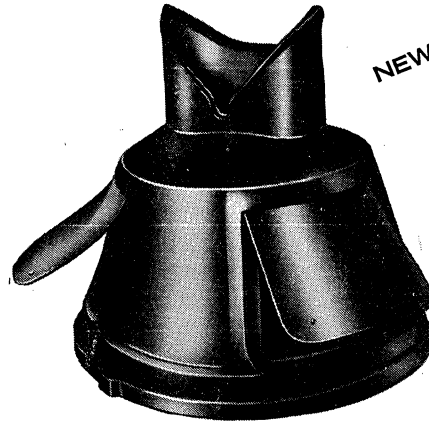
Used with JAN Bezel #545



Cat. No. H-1008
TO FIT RECTANGULAR
BEZELS

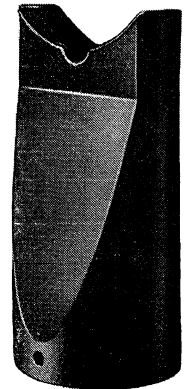
Black, contour molded neoprene rubber. Keeps ambient light out, when viewing scope. Fits shape of face. Can be adapted for smaller I.D.'s.

Can be used with JAN Bezel CP-1328P. Can be adapted for #1533-P



Cat. No. H-1063

Black, contour molded neoprene rubber. Keeps ambient light out, when viewing scope. Fits shape of face. Flanges provided for hand access to PPI settings.



Cat. No. H-1361

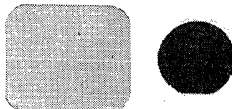
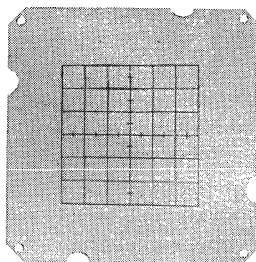
Black neoprene rubber, contour-molded, fits the shape of face. Keeps out ambient light when viewing scope.

Cat. No. H-465 AND/OR ADAPTER

Can be used as viewing hood, on 2 3/4" dia. bezels. (#1427; 1428; 1429). Also serves as adapter to permit use of face-fitting neoprene rubber viewing hoods (see above). All aluminum. Has dull black enamel finish.

GRATICULES — FILTERS — CUSHIONS —

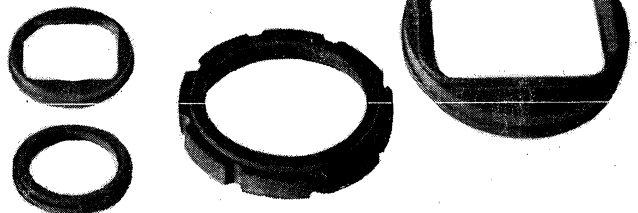
Assorted Sizes and Shapes



New! Non-reflective filter material.

Matte 1 side. Grey or Blue.

Other colors on special order.



JAN HARDWARE
MANUFACTURING COMPANY INC.

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

QUALITY
RELIABILITY
ECONOMY

KNOB

TRANSILLUMINATED POINTER KNOBS



Precision molded of JAN's transparent plastic material, to NAS specs, with dull finish. Transilluminated pointers permit easy reading under subdued lighting conditions. For use on instrument panels, switchboards electrical and electronic apparatus.

Cat. No. LM USED ON LUNAR MODULES!

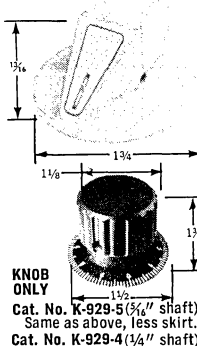
Precision aluminum casting. Adaptable for back lighting. With slip clutch features similar to K1375.

Cat. No. K-936-5

Black phenolic molded knob, with beveled aluminum skirt, black with white contrasting markings. Accurately centered brass insert, for $\frac{3}{16}$ " shafts.

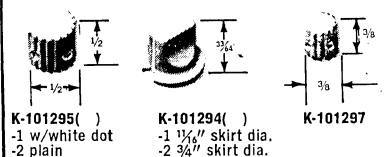
Cat. No. K-936-4 ($\frac{1}{4}$ " shaft)

Variations on shaft sizes and markings available in production quantities.



MINIATURE KNOBS

PLASTIC



K-101295()
-1 w/white dot
-2 plain
For $\frac{1}{8}$ " shaft.
Can also be supplied with $\frac{1}{8}$ " round shafts.

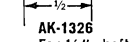
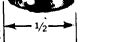
K-101294()
-1 $\frac{1}{4}$ " skirt dia.
-2 $\frac{3}{4}$ " skirt dia.

K-101297

METAL

BK-1080

$\frac{1}{8}$ " flatted shaft



TUNING KNOB

Cat. No. K-243

For $\frac{3}{16}$ " shaft. Die cast aluminum. Made to Fed. Spec. QQ-A-591 and MIL-F-14072. Use no-mar clamp Cat. No. 937-8 for mounting (not supplied).

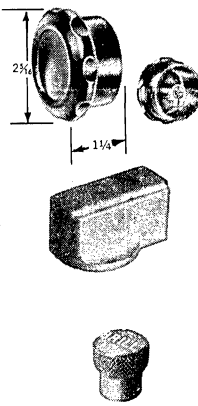
BAR KNOB

Cat. No. K-783

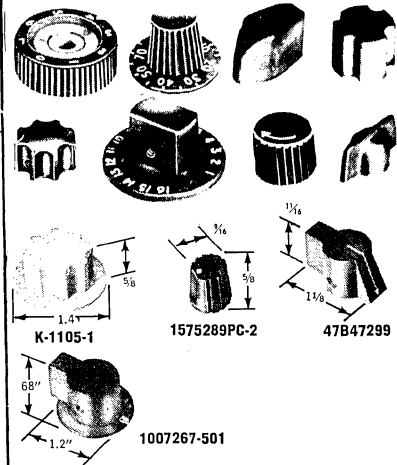
Phenolic molded knob, with metal insert. Set screw at back, for shaft attachment. Finished to specifications.

K1329

Knurled edge for easy turning. Twin set screws. $\frac{23}{64}$ " high x $\frac{5}{16}$ " dia. Available with & w/o marking.



STANDARD PLASTIC KNOBS



Knobs to satisfy almost any design or demand. Can be produced in any color or finish, either illuminated or non-illuminated. Knobs shown are only part of our stock. Let us quote on your specifications. Knobs back lighted on special request, only. Special marking by engraving or screening, available to your specifications.

POINTER KNOB

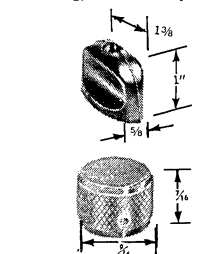
Cat. No. K-706

Molded thermosetting phenolic. Type CF6 per MIL-P-14. Designed for square shaft, providing positive action.

KNOB

Cat. No. K-897

Machined knurled edge for easy turning. Has set screw for firm attachment to $\frac{1}{4}$ " shafts. Height $\frac{3}{16}$ " x $\frac{1}{4}$ " dia.



NEW!

MOLDED PLASTIC KNOBS WITH METAL INSERTS



JAN HARDWARE

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

QUALITY
RELIABILITY
ECONOMY

PANEL COMPONENTS (EXCLUDING LIGHTING & DISPLAYS)



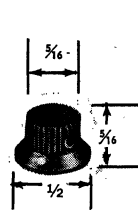
K1336
Aluminum locking knob.
1 1/2" high, 1/2" knurled O.D.
For 8-32 threaded shaft.



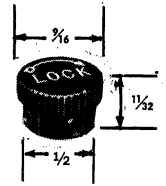
K1328
For 1/4" shaft.
Precision cast aluminum.
1 1/4" high X 1 1/4" dia.
Twin set screws.



K1330 For 1/8" shaft. Aluminum.
Can be used for printed circuit
boards. Gives both finger and
screwdriver adjustment. 1/2" high
x 5/8" diameter. One set screw.



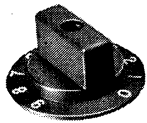
BK-1080
1/8" flattened shaft.



AK-1326
For 1/4" shaft.

KNOBS TO MILITARY SPECIFICATIONS

One of the largest assortment of Military Knobs in the country



SMD500502



SMD500501



K1124 For 1/8" shaft. 3/8" high x 1 1/4" diameter.
One set screw.
Aluminum die-cast.



No. K-1005
Available with or
without skirt.



No. K-1020
1 1/4" high x 3/4" base dia.
For 1/4" shaft.
Other shaft diameters on request.



No. K-1021
1 1/4" high
x 1" base dia.

MACHINED KNOBS



K-1006-(2)
3/4" high x 3/8" dia.



K-1007-(2)
3/4" high
x 3/4" O.D.

CAST ALUMINUM KNOBS

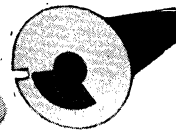
Available in black. Other colors on request.
Specify shaft hole size required.



No. K-1022
Full Round Skirt
1/4" hole x
1 1/2" high
x 1 1/2" base dia.



No. K-1023
Flat Back Round
Skirt 1/4" hole x
1 1/2" high x 1 1/2" base dia.
(3/32" to flat back)



No. K-1024
With Cam Shape
Cut-out 1/4" hole
x 1 1/2" high
x 1 1/2" base dia.



SCB-41848
5/8" High x 1 1/4" Dia.



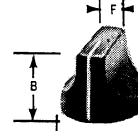
K1126 For 1/4" Double D shaft. 1 1/2" high x 3/4" diameter.
Mounts from top of knob. Aluminum die-cast.



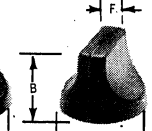
K1127 For 1/8" shaft. 1 1/2" high x 3/4" diameter.
Two set screws.
Aluminum die-cast.

SIGNAL CORPS DIE CAST KNOBS

ZINC ALLOY



No. K-242-1
& K-242-2



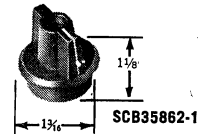
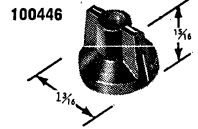
No. K-242-3

Cat. No.	B *	E	F	Marking
K-242-1	3/4"	1 1/4"	3/8"	White
K-242-2	7/8"	1 1/8"	3/8"	White
K-242-3	3/4"	1 1/4"	3/8"	None

ALUMINUM



No. K-984
Dimensions as per 242-3
No markings.
Aluminum.
.257 tear drop shaft hole.



MS SIGNAL CORPS DIE-CAST ALUMINUM AND ZINC ALLOY CONTROL KNOBS

Manufactured in Accordance with Applicable Military Specifications

SMB 134094



SMB 134884



SMB 134171

SMC 414401



SMB 144319



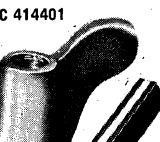
SMC 503203



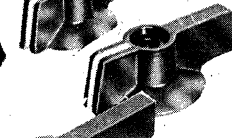
K 680-(3)



MS 91524-(1)

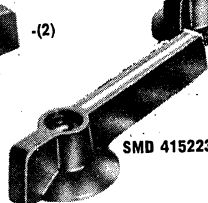


MS 91525-(1)



-(3) -(4) Longer

SMB 91018

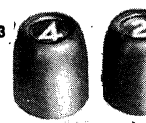


SMD 415223

SMC 414393



SMC 414399



SMC 414680-1 thru 10

(Many sizes available. Lengths from 1 1/4" to 2 1/4")

PARTIAL LIST OF GOVERNMENT KNOBS MANUFACTURED BY JAN

SMC 100446	SMB 134957	SMB 182273	SCB 35863	SMD 415223	NAS 539 1B	SMB 601422	SCB 72585
SCB 104717	SMB 143975	SMB 249242-3	SMB 393998	BUORD 416956PT2	NAS 539 1C	SCB 60158	SCB 72687
SMC 108874	SMB 144318	MS 25165	SCB 40771	SCB 41848	SMB 540595-2	SCB 60744	NAVORD 814528
SMC 108875	SMB 144319	SCD 2593-5	SCB 40859	SMB 422875	SMB 541048	USAF 61D40474	SCB 82716
SMC 108876	SMB 144358	SMB 283419	SCB 40860	SMB 424034	SMB 541119	SCC 614661	SMB 902574-1
SMC 108951	SMB 144517	SMB 314747	SMB 414393	SMC 447052	SMB 541127	SCB 63251	SMC 91018
SMC 108952	SMB 149064	SMB 320816	SMC 414399	SMC 447226	SMB 541150	SMB 633276	MS 91522
SMB 120139	SMB 16505	SMC 328271	SMC 414401	SMC 447307	SMB 552131-1	SCC 65018	MS 91523
SMD 131010	SCB 16532	SMB 336784	SMC 414680-1	SMB 456374	SMB 552258	SMB 65018-1	MS 91525-1
SMB 134093	SMB 16552	SMC 344847	thru -10	SMC 500407	SMB 558544-1	SCC 65411	thru -4
SMB 134094	SMB 180200A2	SMC 345389	SMD 415160	SMC 500501	SMB 601249	SCB 65673	91528
SMB 134171	SMB 180288A2	SCB 35862	SMC 415161	SMC 502491	SMC 60125	SCB 65884	MC 91528
SMB 134884	SMB 180465A1						SMC 97250

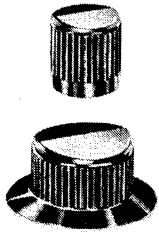


JAN HARDWARE
MANUFACTURING COMPANY INC.

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

QUALITY
RELIABILITY
ECONOMY

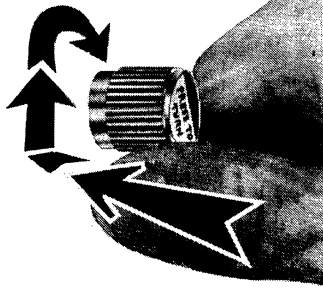
SAFETY KNOBS



"PRESS-TO-TURN" KNOBS FOR LOW TORQUE APPLICATIONS

Knobs spin freely . . . and Must Be Pressed-In while making changes. Developed specifically to prevent inadvertent changing of settings. For basic dimensions, see our "Deluxe Instrument Knobs" (9, 12, 17 and 22 body dia. series). When ordering, be sure to substitute prefix "T" for 9 Series and "Q" for 17 Series, as per typical part numbers.

TIC4GA = .90 Dia./Press-to-Turn/Round/Dial/1/4"/Glossy/Black



SLIP-CLUTCH KNOB with Spinners

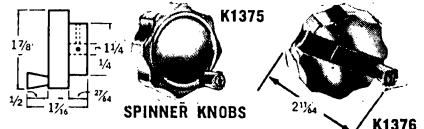
Cat. Nos. K-1375 & K-1376 (For 1/4" Shafts)

For driving devices such as variable capacitors, inductors, potentiometers, etc., the "slip-clutch" automatically disengages and slips when the pre-determined torque has been exceeded. Knobs are fluted, and are equipped with either fixed or retractable spinner for fast turning. Backlash-free units safeguard delicate and costly instruments against careless or inadvertent cranking beyond their normal stops.

*Normally set for 3-6" lbs. Can be modified for other requirements.

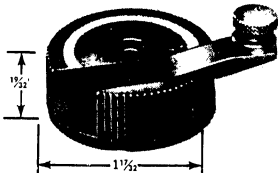
Model No. K-1376 is identical with No. K-1375 but has the additional feature of a retractable spinner. Spring loading provides positive, toggle-type action to lock spinner in either open or closed position. Model No. K-1376 is designed for use where economy of space is essential.

Cat. Nos. K-1275 & 1276 (For 1/4" shafts) In appearance, these knobs are identical with No. K-1375 and No. K-1376 but without JAN's Slip-Clutch mechanism. Made with single-unit, molded Bakelite-to-metal-insert construction, with two set screws for firm attachment to shafts.



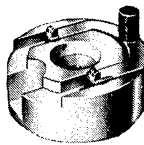
With Fixed or Retractable Spinners Standard: Glossy finish. (Matte finish avail. on special order)

Cat. No. MS-91522-1
CRANK KNOB
Retractable
Spinner



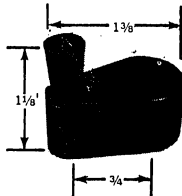
Aluminum Olive Drab. For 1/4" shaft. Other colors and shaft diameters on request. 2 5/8" minimum clearance required with handle in open position.

NEW!



Cat. No. K1622
Retractable Spinner CRANK KNOB
Modified version to replace MS91522. Incorporates brake mechanism to lock control in position.

Cat. No. K-1125
SPINNER KNOB
For Limited Space
Applications



For 1/4" shaft. Other shaft diameters on request.

NEW!



Cat. No. K1358
MINIATURE SPINNER KNOB
Nylon. 1/2" High x 3/4" Wide. Spinner section diameter 3/8". Accepts 1/8" shaft or smaller.



Cat. No. K-1356
RADIAL LOCK —
Single-turn indicator dial
with Radial Lock

Cat. No. K1357
CLUTCH KNOBS



Straight knurl aluminum knob. Twin set screws. For 1/4" shaft. Other sizes available. 1 3/8" dia. skirt, tapers to 1" dia. at top. Height, 1" Std. Torque 1 to 3 in/lbs. Available from 1/2 in/oz. to 48 in/oz.

BAR-KNOB
Cat. No. K-1325
Precision cast aluminum for 1/4" shafts. Furnished with twin 8-32 set screws for shaft attachment. Provides a 1.0" integrally cast lever arm for heavy-load switching. Finished to specifications.



K1327 For 1/4" shaft. Twin set screws. 1" high x 1 1/8" body diameter. 1 3/8" overall width.



K1337 Shaft hole .260. Twin set screws. 1 1/8" long x 3/8" high x 1/2" body diameter.



K1342 Knob switch. For 1/4" D flatted shaft. 1 1/2" long x 1/4" high. 1" body dia., 3/8" bar dia.



51A30C82
Aluminum cast bar knob for high torque applications.



K1387 For 1/2" shaft hole. Twin set screws. 1/4" high x 3/4" diameter. Aluminum die-cast.



K1389 For 1/4" shaft. Twin set screws. 3/4" high x 1 1/8" diameter. Aluminum die-cast.



K1390 For 3/8" shaft. Two set screws. 1 1/4" high x 3/8" diameter. Aluminum die-cast.



K1391 For 1/8" shaft. Twin set screws. 3/4" high x 5/8" diameter. Aluminum die-cast, with white-filled line.



K1392 For 3/8" shaft. Two set screws. 3/4" high x 1 1/8" diameter. (Bar is 1 1/4" long). Aluminum die-cast.



K1394 For 1/8" shaft. Two set screws. 7/8" high x 1/2" diameter. Aluminum die-cast.



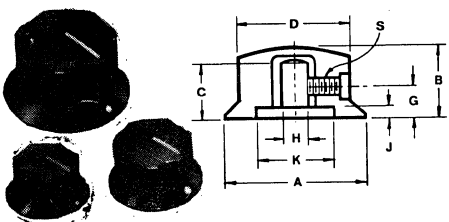
INSTRUMENT KNOBS

DIMENSIONS

PART NO.	A	B	C	D	G	H	J	K	S
6 1 C	3/4	1/16	3/8	5/8	7/32	1/4	1/16	1/16	6-32
8 1 C	1	1/32	1/2	1 1/8	7/32	1/4	3/32	1/16	8-32
10 1 C	1 1/4	3/32	1/2	1	7/32	1/4	3/32	1/16	8-32
13 1 C	1 1/2	3/4	1/2	1 1/4	1/32	1/4	3/32	3/32	8-32
16 1 C	2	7/8	3/32	1 5/8	1/32	1/4	3/32	1/16	8-32

TYPICAL PART NUMBERS

81C4GB = 1 1/8" Dia./Round/Skirt w/indicator marker/1/4" Shaft Hole Dia./Glossy/Red
101C4MA = 1" Dia./Round/Skirt w/indicator marker/1/4" Shaft Hole Dia./Matte/Black
101C04MA = 1" Dia./Round/Skirt w/indicator marker/1/4" Shaft Hole Dia. without metal insert/Matte/Black
Available with Metal Tops



Body Dia.
6 = 5/8"
8 = 1 1/8"
10 = 1"
13 = 1 1/4"
16 = 1 5/8"

Body Style
1 = Round

Skirt
C = Skirt w/ Indicator Marker

Shaft Hole Dia.
2 = 1/8"
4 = 1/4"
(Standard—
with metal insert.
"0" preceding number
means without metal insert)

Finish
G = Glossy
(Standard)
M = Matte

Color
A = Black
Other
Colors on
Special
Order

(Other shaft holes to order)



JAN HARDWARE
MANUFACTURING COMPANY INC.

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

QUALITY
RELIABILITY
ECONOMY

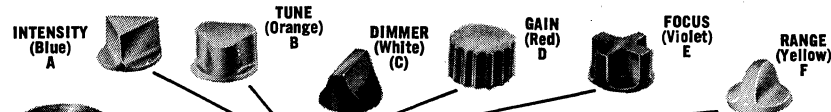
PANEL COMPONENTS (EXCLUDING LIGHTING & DISPLAYS)

DELUXE INSTRUMENT KNOBS MEETS PERFORMANCE OF MIL-STD-242D (SHIPS) & MS 91528D

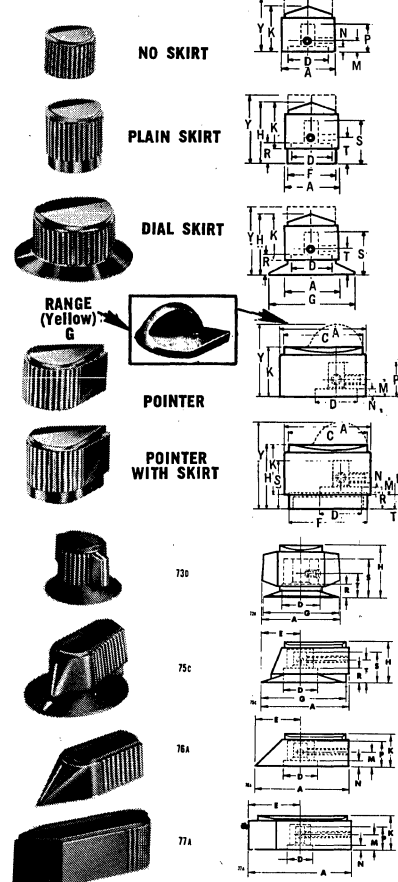
Molded of polycarbonate, these knobs will withstand the extreme environmental conditions of MIL-E-16400. QPL #3926 — T.R. #J101

TACTILE SHAPE CONTROL CAPS

Expressly made for both visual and tactile function identification. Each Tactile Knob is produced in the standard recognizable color identified with its configuration. Available in other colors on special order. See column below for applicable tactile shape.

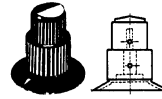


M SUPER DELUXE
Aluminum
Anodized Top (Number as below)



Dual Knobs for Concentric Controls APPROVED FOR USE MIL-STD-242D & MS-91528C

Molded of polycarbonate plastic, these "piggy-back" knobs are used with dual concentric potentiometers and in other similar applications. Meet performance of military specs above. See diagrams below for dimensions of each knob.



PART NO.		DIMENSIONS											
		A	D	F	G	H	K	M	N	P	R	S	T
51	A	.505	.435				.509	.158	.026	.408			
71	A	.708	.486				.626	.187	.026	.406			.915
91	A	.911	.645				.798	.255	.114	.521			1.171
121	A	1.255	.974				.703	.260	.115	.458			1.220
171	A	1.755	1.465				.854	.255	.114	.521			
221	A	2.255	1.870				.885	.255	.114	.521			
51	B	.505	.435	.450		.660	.509				.181	.563	.324
71	B	.708	.486	.670		.805	.626				.188	.568	.340
91	B	.911	.654	.826		1.027	.798				.323	.730	1.399
121	B	1.255	.974	1.155		.870	.703				.262	.605	1.399
171	B	1.755	1.465	1.666		1.088	.854				.338	.740	.489
221	B	2.255	1.870	2.153		1.114	.885				.333	.740	.489
51	C	.505	.435			.885	.660	.509			.181	.563	.324
71	C	.708	.486			1.135	.805	.626			.183	.568	.340
91	C	.911	.645			1.510	1.027	.798			.323	.730	1.399
121	C	1.255	.974			1.822	.870	.703			.262	.605	1.399
171	C	1.755	1.465			2.453	1.088	.854			.333	.740	.489
221	C	2.255	1.870			3.005	1.114	.885			.333	.740	.489

POINTER KNOBS

PART NO.		A	D	E	F	H	K	M	N	P	R	S	T
52	A	7.50	.406	.510			.505	.158	.026	.402			
72	A	1.038	.486	.690			.619	.187	.026	.406			.918
92	A	1.344	.645	.895			.796	.255	.114	.555			1.171
52	B	.750	.406	.510	.669	.655	.505			.402	.177	.563	.324
72	B	1.038	.486	.690	.940	.791	.619			.406	.193	.573	.364
92	B	1.344	.645	.895	1.251	1.051	.796			.555	.328	.796	1.400

PART NO.		A	D	F	G	H	K	M	N	P	R	S	T
73	A	1.150	.486				.610	.187	.026	.406			
73	B	1.150	.486	.680		.782					.183	.568	.364
73	D	1.150	.486		1.135	.782					.183	.568	.364

PART NO.		A	D	E	G	H	K	M	N	P	R	S	T
75	A	1.515	.515	.575			.645	.250	.110	.445			
75	C	1.720	.515	.780	1.520	.815					.266	.590	.435
76	A	1.855	.595	.900			.645	.250	.110	.445			
77	A	2.552	.562	1.290			.869	.348	.177	.739			

CRANK KNOBS

PART NO.		A	D	F	H	J	L	R	S	T	Y
12	4	1.250	0.685	1.185	.850	1.350	1.275	.250	.605	.427	1.475
17	4	1.750	0.685	1.690	1.070	1.758	1.735	.320	.740	.489	1.940
22	4	2.250	0.685	2.185	1.095	1.782	1.970	.320	.740	.489	1.970



TYPICAL PART NUMBERS

- 91C4GA = 90 Dia./Round/Dial/1/4"/Glossy/Black.
- T1C4GA = 90 Dia./Press-to-Turn/Round/Dial/1/4"/Glossy/Black.
- A71B4MA = Triangle Top Blue/.72/Round/Plain/1/4"/Matte/Black.
- 124B4MA = 1.25 dia./Crank (Spinner)/Plain/1/4"/Matte/Black.
- B71B4MA = Standard Top Red/.72/Round/Plain/1/4"/Matte/Black.
- **071B4MA = No Top, Shaft hole drilled thru/.72/Round/Plain/1/4"/Matte/Black.

** — Specify if .127, .190, .250 hole is required for dual mounting.
NOTE: *T — Preceded by color code (BT — would mean Standard RED top).

- 1 — TOP
(Color of Tactile)
O = NO TOP —
Shaft Hole Drilled Thru
A = (INTENSITY - Blue)
B = (TUNE - Orange)
C = (DIMMER - White)
D = (GAIN - Red)
E = (FOCUS - Violet)
F = (RANGE - Yellow)
M = ALUM ANODIZED TOP
H = (MARKER - Green)
J = (BEARING - Grey)
- 2 — BODY DIA.
5 = .51
7 = .71
9 = .90
I = .90 Press-to-Turn*
12 = 1.25
L = 1.25 Press-to-Turn*
17 = 1.75
Q = 1.75 Press-to-Turn*
22 = 2.25
V = 2.25 Press-to-Turn*
- 3 — BODY STYLE
1 = ROUND
2 = POINTER
3 = BAR, ROUND
4 = SPINNER
5 = BAR, SHORT
6 = BAR, LONG
7 = BAR—HIGH TORQUE
- 4 — SKIRT
A = NONE
B = PLAIN
C = DIAL W/POINTER
D = DIAL W/O POINTER
H = Slot
- 5 — SHAFT HOLE DIA.
2 = .128
3 = .190
4 = .253
5 = .312
6 = .375
7 = .268
"D" FLAT SHAFT HOLES
B = .107 (1/8")
D = .222 (3/4")
- 6 — FINISH
M = MATTE
G = GLOSSY
- 7 — COLOR
A = BLACK
B = RED
C = GREY
D = GREEN
E = YELLOW
F = PURPLE
G = BLUE
H = WHITE
J = ORANGE
- 8 — MARKING
/WD = WHITE DOT
/FD = FLUORESCENT DOT
/PD = PHOSPHORESCENT DOT
/FA = FLUORESCENT ARROW
/PA = PHOSPHORESCENT ARROW
For no marking, leave blank

▲ To order slip-clutch mechanism, prefix part no. with letter 'S' and add torque requirement in brackets. e.g. S 124B4MA (2 lbs.-in. ±0.5).

FOR SPECIAL KNOBS — GIVE FULL DESCRIPTION OR SKETCH WITH ORDER.
QUALITY RELIABILITY ECONOMY



JAN HARDWARE
MANUFACTURING COMPANY INC.

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800



JAN HARDWARE MANUFACTURING COMPANY, INC.

47-27 36th STREET • LONG ISLAND CITY, NEW YORK 11101 • TEL: (212) 361-0800

JANSET® KNOBS

QUALITY
RELIABILITY
ECONOMY

"PUSH-TO-SET" OR "PUSH-TO-TURN"

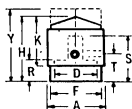
JANSET® Knobs are precision engineered and are completely integral with its mechanism totally enclosed within the knob body configuration. They protect control settings against accidental change due to shock or vibration. Only when they are depressed can the setting be altered. The knob provides infinite resolution with zero backlash such that registration to indicators (illuminated arrow, dot, cutouts etc.) is maintained throughout a full excursion. To use for existing or new designs JANSET® KNOBS REQUIRE NO MODIFICATION TO PANEL DESIGN.

Available from 1/2" to 2 1/4" diameters with ring or dial skirts; with or without indicator markings. Fits all 1/4" or 3/8" panel bushings and 1/8" thru 1/4" shafts.

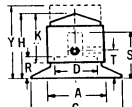
FOR TACTILE SHAPE CONTROL CAPS,
SEE INFORMATION ON PRECEDING PAGE.



PLAIN SKIRT



DIAL SKIRT

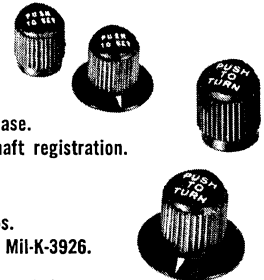


PREFIX

PS = PUSH-TO-SET
PT = PUSH-TO-TURN
PN = NO MARKING

Distinctive Features

- Knob locks automatically upon release.
- Infinite resolution with absolute shaft registration.
- Guards critical settings.
- Completely integral assembly.
- Installation same as standard knobs.
- Configuration meets MS-91528 and Mil-K-3926.



PUSH-TO-SET or PUSH-TO-TURN DIMENSIONS

PART NO.	A	D	F	G	H	K	R	S	T	Y
5 1 B	.505	.435	.450		.660	.509	.181	.563	.375	
7 1 B	.708	.486	.670		.805	.626	.188	.587	.406	1.100
9 1 B	.911	.654	.826		1.027	.798	.323	.812	.603	1.399
12 1 B	1.255	.974	1.155		.870	.703	.262	.605	.603	1.399
17 1 B	1.755	1.465	1.666		1.088	.854	.338	.740	.603	
22 1 B	2.255	1.870	2.153		1.114	.885	.333	.740	.603	
5 1 C	.505	.435		.885	.660	.509	.181	.587	.400	
7 1 C	.708	.486		1.135	.805	.626	.183	.602	.431	1.100
9 1 C	.911	.645		1.510	1.027	.798	.323	.730	.603	1.399
12 1 C	1.255	.974		1.822	.870	.703	.262	.605	.603	1.399
17 1 C	1.755	1.465		2.453	1.088	.854	.333	.740	.603	
22 1 C	2.255	1.870		3.005	1.114	.885	.333	.740	.603	

INCREMENTAL KNOBS DIMENSIONS

PART NO.	A	D	F	G	H	K	R	S	T	Y
EE 1 B	.505	.435	.450		.660	.509	.181	.563	.375	
GG 1 B	.708	.486	.670		.805	.626	.188	.587	.406	1.100
II 1 B	.911	.654	.826		1.027	.798	.323	.812	.603	1.399
LL 1 B	1.255	.974	1.155		.870	.703	.262	.605	.603	1.399
QQ 1 B	1.755	1.465	1.666		1.088	.854	.338	.740	.603	
VV 1 B	2.255	1.870	2.153		1.114	.885	.333	.740	.603	
EE 1 C	.505	.435		.885	.660	.509	.181	.587	.400	
GG 1 C	.708	.486		1.135	.805	.626	.183	.602	.431	1.100
II 1 C	.911	.645		1.510	1.027	.798	.323	.730	.603	1.399
LL 1 C	1.255	.974		1.822	.870	.703	.262	.605	.603	1.399
QQ 1 C	1.755	1.465		2.453	1.088	.854	.333	.740	.603	
VV 1 C	2.255	1.870		3.005	1.114	.885	.333	.740	.603	

1 — CAP

(Color of Tactile)
O = NO TOP —
Shaft Hole Drilled Thru
A = (INTENSITY - Blue)
B = (TUNE - Orange)
C = (DIMMER - White)
D = (GAIN - Red)
E = (FOCUS - Violet)
F = (RANGE - Yellow)
M = ALUM ANODIZED TOP
T = STANDARD TOP (prefix not required) Use letter 'T' only when color of standard shape top is different than body color. Precede T by color code from Column 7 (BT — would mean standard shape RED top).

2 — BODY DIA.

EE = .51
GG = .71
II = .90
LL = 1.25
QQ = 1.75
VV = 2.25

3 — BODY STYLE

1 = ROUND
2 = POINTER

4 — SKIRT

B = PLAIN
C = DIAL W/POINTER
D = DIAL W/O POINTER
H = Slot

5 — SHAFT HOLE DIA

2 = .128
3 = .190
4 = .253
5 = .312
6 = .375
7 = .268
"D" FLAT SHAFT HOLES
B = .107 (1/4")
D = .222 (1/4")

6 — FINISH

M = MATTE
G = GLOSSY

8 — MARKING

/WD = WHITE DOT
/FD = FLUORESCENT DOT
/PD = PHOSPHORESCENT DOT
/FA = FLUORESCENT ARROW
/PA = PHOSPHORESCENT ARROW
For no marking, leave blank

7 — COLOR

A = BLACK
B = RED
C = GREY
D = GREEN
E = YELLOW
F = PURPLE
G = BLUE
H = WHITE
J = ORANGE

9 — NO. OF INCREMENTAL POSITIONS.

SPECIFY 1 THRU 32.

11 — TOTAL ANGULAR ROTATION IN DEGREES AND MINUTES

SPECIFY 0° to 360°

10 — INCREMENT ANGLES

E = Equal Angles
N = Unequal Angles*
*Supply table of angular increments in degrees and minutes. See Table.

*SAMPLE OF TYPICAL TABLE (to be supplied)

Position	Increment Angle	Total Angle
1	0	0
2	5	5
3	4	9
4	25	34
5	266	300

TYPICAL PART NUMBERS

PS91C4GA = Marking Push-To-Set/.90 Dia./Round/Dial 1/4"/Glossy/Black.
PTB771B4MA = Marking Push-To-Turn/Standard Top Red/.72/Round/Plain/1/4"/Matte/Black.
11B4MA/WD [17E 180°] = Std. Top/.90 Dia./Round/Plain/.253 Dia. Shaft Hole/Matte/Black/White Dot/17 Incremental Positions/Equally Spaced, in 180° Rotation.
MLL1C4GB [5N 300°] = Alum. Anodized Top/1.25 Dia./Round/Dial with Pointer/.253 Dia. Shaft Hole/Glossy/Red/5 Incremental Positions/ Unequally Spaced, in 300° Rotation (See Table).

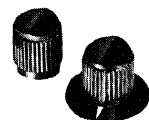
FOR SPECIAL KNOBS —
GIVE FULL DESCRIPTION
OR SKETCH WITH ORDER.

INCREMENTAL KNOBS

Easily provide precise setting to pre-determined positions. Equipment can now be tuned repeatedly with finite exactness to as many as 32 or as few as a single specific position. Lock positively at exact point required with zero backlash. Once positioned, no further tuning or other adjustment is needed. They guard against shock or vibration and provide a uniquely smooth action, yet permit easy setting to pre-determined, incremental positions by touch, sight or sound. Essentially, their purpose may be compared to a series of multi-position stops.

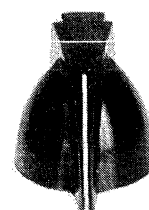
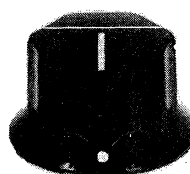
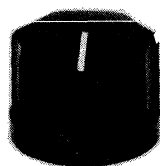
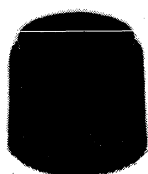
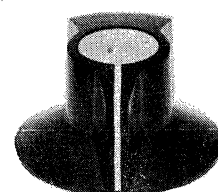
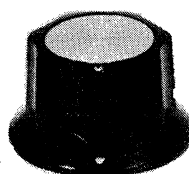
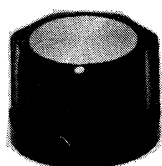
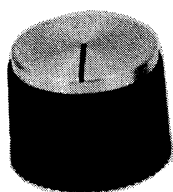
JANSET Incremental Knobs are totally integral and incorporate all functions within the knob body itself. Achieve major economies in space, weight and cost. Equally suited to existing or new designs since they require no modification to the panel. Installation is the same as any standard knob.

Available in a wide variety of styles, sizes and shapes, and are made to fit 1/8" to 1/4" diameter shafts. Configuration meets MS-91528 and MIL-K-3926.



- Knob locks automatically at exact point, with zero backlash.

High Quality Thermoset Instrument Knobs



Snob Knob Series

Instrument Series

Skirted Series

Pointer Series

For information on our complete line of thermoset knobs, contact our representative in your area.

Adams McGregor, Inc.

Wallingford, Conn. (203) 269-5816
Lincoln, R.I. (401) 726-1300
Scituate, Mass. (617) 545-2213

Marsey Sales

Rochester, N.Y. (716) 442-9700

Carter-McCormick & Pierce

Pittsburgh, Pa. (412) 824-3760
Cleveland, Ohio (216) 333-5650
Dayton, Ohio (513) 278-5873
Worthington, Ohio (614) 888-4466
Farmington, Mich. (313) 477-7700

R. Klipp Associates

Libertyville, Ill. (312) 362-4676

KSW Associates

Kansas City, Mo. (816) 358-5240

Gordon Peck Co.

Garland, Tex. (214) 341-8311
Houston, Texas (713) 664-1435

Dale G. Weber Co.

Portland, Oregon (503) 234-7671

W. S. Harmon Co.

Los Angeles, Cal. (213) 937-1460

Frank Tylinski Co.

Great Neck, L.I., N.Y. (516) 466-9070

Skor, Inc.

St. Paul, Minn. (612) 645-6461

Lake Engineering Ltd.

Scarborough, Ont., Canada (416) 757-3253
Montreal, Quebec, Canada (514) 739-5795
Quebec, Canada (514) 747-2411

KURZ-KASCH

711 Hunter Ave.
Wilmington, Ohio 45177
(513) 382-0966



CONTROL KNOBS

STANDARD SERIES



Raytheon Standard Series Control Knobs feature top quality and lend distinctive customer appeal to your products. All knobs have a common motif, resulting in uniform appearance regardless of function. Standard Series includes hundreds of knobs in many functional shapes, sizes and colors meeting MIL-K-3926 and MS91528. All are molded from high-impact polycarbonate with corrosion-resistant aluminum inserts for maximum strength.

400 SERIES



To complement or contrast with the color and design of your products. The 400 Series Knobs are made of durable, high-impact acrylonitrile-butadiene-styrene (ABS) with a lusterless finish. All contain metal bushings and two set screws.

DESIGNER SERIES



Give your product a fine, custom appearance with these Designer Series Knobs. Contrasting with the black bases, the aluminum caps, protected by baked-on epoxy coating, give a sunburst effect which is modern, aesthetically pleasing and implies quality. Knob bases are molded of high quality polycarbonate. Set screws, inserts same as for Standard Series. Colors or other modifications available on special order.

PANELRAMA SERIES



These knobs, molded of durable, high-impact acrylonitrile-butadiene-styrene (ABS), have a black matte finish capped with an epoxy-coated aluminum disk. All contain circular shaft metal inserts with two 6-32 UNC-3A set screws.

REGENCY SERIES



Regency Series Control Knobs offer the combination of fine quality and a custom appearance at a **modest cost**, with the choice of spun aluminum cupped caps (RS Series) or flat inlaid discs (RSF Series), protected by an epoxy coating. These knobs are particularly suited for use in industrial and instrumentation applications.

PUSH TO ENGAGE



Designed for applications in which control settings must be maintained under conditions of shock and vibration. The setting can not be changed accidentally, since the knob must be depressed before movement. Zero backlash allows the operator infinite resolution of setting, yet prevents control shaft from rotating when released. Design is identical to Raytheon's standard line of control knobs, allowing uniformity of panel design when used in conjunction with other types.

FOR SPECIFICATIONS SEE PAGE 2-1110

ORDERING INFORMATION

Catalog numbers published here are for stocked items. For other variations, contact factory. The derivation of the catalog numbers for each series is shown below. This does not imply that all combinations are available. Mirror finish is specified on most Standard and Designer Series Catalog num-

bers listed. Where matte (dull) finish is specified the suffix G is added. Note 400 and Panelrama Series have a matte finish.

Raytheon knobs are available through franchised distributor. See listing of representatives for location of your nearest distributor.

Sample knobs are available for your evaluation, write Raytheon Distributor—Products Operation, Fourth Ave., Burlington, Mass. 01803, Dept. RKE.

STANDARD AND DESIGNER SERIES AND REGENCY SERIES

Series	Color	Bar Knob	Style	Type	Approx. Diameter	Shaft Hole Size	Finish
DS—Designer	None—Black Knob G—Gray Knob R—Red Knob	B—Bar knob None—Other Styles	BL—Backlighted Skirt CB—Concentric Base LK—Knob Lock Pointer Knob NP—No Pointer Mark WD—White Dot WL—White Line Regency Styles BD—Blackdot BL—½ Black Line	1. Plain round 2. Skirted round 3. Dial Skirted Round 4. Unskirted Pointer 5. Skirted Pointer 6. Crank 7. Plain Bar Pointer 8. Dial Skirted Bar Pointer	50 = ½" 70 = ¾" 90 = 1" 125 = 1¼" 175 = 1½" 225 = 2¼"	1 = .127" 2 = .252" 3 = .190" 4 = .267" 5 = .377"	None—Mirror Finish G—Matte Finish

400 AND PANELRAMA SERIES

Style	Approx. Dia. and Series Panelrama	Shaft hole size	Color
D—Round/Dial Skirt P—Pointer PD—Pointer/Dial Skirt R—Round	PS6—5/8" PS7—3/4" PS12—1-1/4" 400 Series 407—3/4" 409—7/8" 412—1-1/4"	1—1/8" 2—1/4"	K1—Black K3—Beige K7—Blue-Gray K1R—See note

Note: Panelrama available only in K1R black with aluminum cap

RAYTHEON COMPANY • DISTRIBUTOR PRODUCTS OPERATION
Fourth Avenue, Burlington, Massachusetts 01803 Tel.: (617) 272-6400 TWX: 710-332-7641

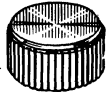


CONTROL KNOBS/STANDARD AND DESIGNER SERIES

ROUND



Standard



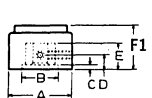
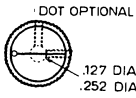
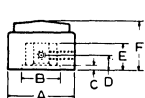
Designer

SELECTION GUIDE

Knob Dia. (Appx.)	Shaft Dia.	Knob Height (Appx.)	Dimension Dwg. Ref.	Stocked Catalog Numbers			
				Standard		Designer	
				Black Plain	White Dot	Black Plain	Black Dot
1/2"	1/8"	1/2"	Series 50	50-1-1	50-1WD-1	—	—
3/4"	1/8"	5/8"	Series 70	70-1-1	70-1WD-1	DS70-1-1	DS70-1BD-1
3/4"	3/16"	5/8"	Series 70	70-1-3	—	DS70-1-3	DS70-1BD-3
3/4"	1/4"	5/8"	Series 70	70-1-2	70-1WD-2	DS70-1-2	DS70-1BD-2
1"	1/8"	3/4"	Series 90	90-1-1G	90-1WD-1G	DS90-1-1	DS90-1BD-1G
1"	3/16"	3/4"	Series 90	90-1-3	—	DS90-1-3	DS90-1BD-3
1"	1/4"	3/4"	Series 90	90-1-2	90-1WD-2	DS90-1-2	DS90-1BD-2
1-1/4"	1/4"	5/8"	Series 125	125-1-2	125-1WD-2G	DS125-1-2	—
1-3/4"	1/4"	7/8"	Series 175	175-1-2	—	—	—
2-1/4"	1/4"	7/8"	Series 225	225-1-2	—	—	—

Standard

Designer



Series	A +.030 -.010	B min.	C min.	D max.	E min.	F ±.030	F1 ±.030
50	.500	.435	.026	.158	.405	.510	—
70	.700	.485	.026	.187	.405	.610	.590
90	.900	.640	.114	.260	.520	.790	.735
125	1.250	.750	.114	.260	.455	.700	.620
175	1.750	.750	.114	.260	.520	.850	—
225	2.250	.750	.114	.260	.520	.875	—

ROUND/RING SKIRT



Standard



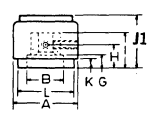
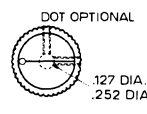
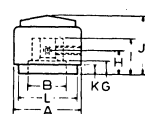
Designer

SELECTION GUIDE

Knob Dia. (Appx.)	Shaft Dia.	Knob Height (Appx.)	Dimension Dwg. Ref.	Stocked Catalog Numbers			
				Standard		Designer	
				Black Plain	White Dot	Black Plain	Black Dot
1/2"	1/8"	5/8"	Series 50	50-2-1	50-2WD-1	—	—
3/4"	1/8"	3/4"	Series 70	70-2-1	70-2WD-1	DS70-2-1	DS70-2BD-1
3/4"	1/4"	3/4"	Series 70	70-2-2	70-2WD-2	DS70-2-2	DS70-2BD-2
1"	1/8"	1"	Series 90	90-2-1G	—	—	—
1"	1/4"	1"	Series 90	90-2-2	90-2WD-2	DS90-2-2	DS90-2BD-2
1-1/4"	1/4"	3/4"-7/8"	Series 125	125-2-2	—	DS125-2-2	—
1-3/4"	1/4"	1"	Series 175	175-2-2	—	—	—
2-1/4"	1/4"	1"	Series 225	225-2-2	—	—	—

Standard

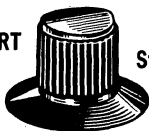
Designer



Series	A +.030 -.010	B min.	H max.	I min.	J ±.030	J1 ±.030	K max.	L max.
50	.500	.435	.325	.560	.655	—	.175	.460
70	.700	.485	.369	.568	.782	.780	.187	.680
90	.900	.640	.484	.730	1.010	.980	.235	.845
125	1.250	.750	.427	.605	.850	.785	.175	1.185
175	1.750	.750	.489	.740	1.070	—	.240	1.690
225	2.250	.750	.489	.740	1.095	—	.240	2.185

Note: Two set screws are provided.

ROUND/ DIAL SKIRT



Standard



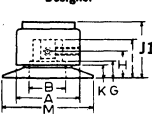
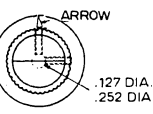
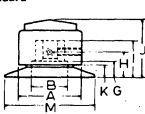
Designer

SELECTION GUIDE

Knob Dia. (Appx.)	Dial Skirt Dia. (Appx.)	Shaft Dia.	Knob Hght. (Appx.)	Dimension Dwg. Ref.	Stocked Catalog Numbers		
					Standard		Designer
					Black	Black Matte Back Lighted Arrow	Black
1/2"	1"	1/8"	5/8"	Series 50	50-3-1	50-3BL-1G	—
3/4"	1-1/8"	1/8"	3/4"	Series 70	70-3-1	—	DS70-3-1
3/4"	1-1/8"	1/4"	3/4"	Series 70	70-3-2	70-3BL-2G	DS70-3-2
1"	1-1/2"	1/8"	1"	Series 90	90-3-1G	—	—
1"	1-1/2"	1/4"	1"	Series 90	90-3-2	90-3BL-2G	DS90-3-2
1-1/4"	1-7/8"	1/4"	3/4"-7/8"	Series 125	125-3-2	125-3BL-2G	DS125-3-2
1-3/4"	2-1/2"	1/4"	1"	Series 175	175-3-2	175-3BL-2G	—
2-1/4"	3"	1/4"	1"	Series 225	225-3-2	—	—

Standard

Designer



Series	A +.030 -.010	B min.	G min.	H max.	I min.	J ±.030	J1 ±.030	K max.*	M max.
50	.500	.435	.177	.325	.560	.655	—	.175	.900
70	.700	.485	.188	.369	.568	.782	.780	.187	1.150
90	.900	.640	.320	.484	.730	1.010	.980	.235	1.525
125	1.250	.750	.250	.427	.605	.850	.785	.175	1.837
175	1.750	.750	.320	.489	.740	1.070	—	.240	2.468
225	2.250	.750	.320	.489	.740	1.095	—	.240	3.020

POINTER



Standard



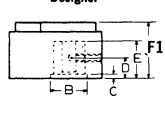
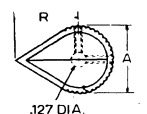
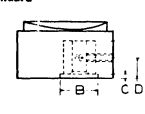
Designer

SELECTION GUIDE

Knob Dia. (Appx.)	Pointer Radius (Appx.)	Shaft Dia.	Knob Hght. (Appx.)	Dimension Dwg. Ref.	Stocked Catalog Numbers	
					Standard	Designer
					Black	Black
1/2"	1/2"	1/8"	1/2"	Series 50	50-4-1	—
3/4"	5/8"	1/8"	5/8"	Series 70	70-4-1	—
3/4"	5/8"	1/4"	5/8"	Series 70	70-4-2	DS70-4-2
1"	7/8"	1/8"	1"	Series 90	90-4-1G	—
1"	7/8"	1/4"	1"	Series 90	90-4-2	DS90-4-2

Standard

Designer



Series	A +.030 -.010	B min.	C min.	D max.	E min.	F ±.030	F1 ±.030	R +.025 -.005
50	.500	.435	.026	.158	.405	.510	—	.490
70	.700	.485	.026	.187	.405	.610	.590	.680
90	.900	.640	.114	.260	.520	.790	.735	.885

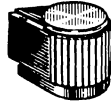
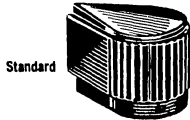
RAYTHEON COMPANY • DISTRIBUTOR PRODUCTS OPERATION

Fourth Avenue, Burlington, Massachusetts 01803 Tel.: (617) 272-6400 TWX: 710-332-7641

RAYTHEON

CONTROL KNOBS/STANDARD & DESIGNER SERIES

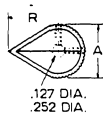
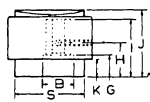
POINTER/RING SKIRT



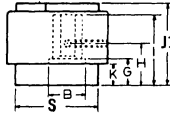
SELECTION GUIDE

Knob Dia. (Appx.)	Pointer Radius (Appx.)	Shaft Dia.	Knob Hght. (Appx.)	Dimension Dwg. Ref.	Stocked Catalog Numbers	
					Standard Black	Designer Black
1/2"	1/2"	1/8"	1/2"	Series 50	50-5-1	—
3/4"	5/8"	1/8"	5/8"	Series 70	70-5-1	DS70-5-1
3/4"	5/8"	1/4"	5/8"	Series 70	70-5-2	—
1"	7/8"	1/8"	1"	Series 90	—	—
1"	7/8"	1/4"	1"	Series 90	90-5-2	DS90-5-2

Standard



Designer



Series	A +.030 -.010	B min.	G min.	H max.	I min.	J ±.030	J1 ±.030	K max.	R +.025 -.005	S max.
50	.500	.435	.177	.325	.560	.655	—	.175	.490	.690
70	.700	.485	.188	.369	.568	.782	.765	.187	.680	1.000
90	.900	.640	.320	.484	.730	1.010	.970	.235	.885	1.345

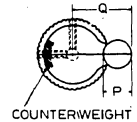
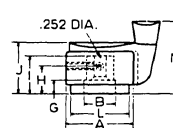
Note: Two set screws are provided.

CRANK



Knob Dia. (Appx.)	Crank Radius (Appx.)	Shaft Dia.	Crank Hght. (Appx.)	Dimension Dwg. Ref.	Stocked Catalog Numbers	
					Standard Black	Designer Black
1-1/4"	1-1/8"	1/4"	1-3/8"	Series 125	125-6-2	DS125-6-2
1-3/4"	1-1/2"	1/4"	1-3/4"	Series 175	175-6-2	DS175-6-2G
2-1/4"	1-3/4"	1/4"	1-3/4"	Series 225	225-6-2	—

Standard and Designer



Aluminum handle (Designer Series)

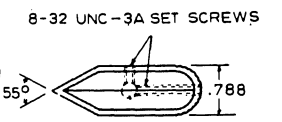
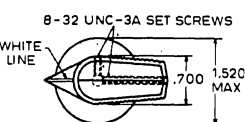
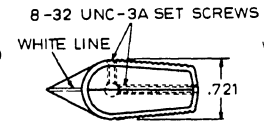
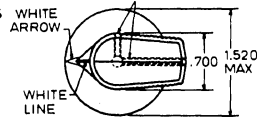
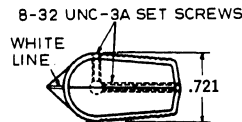
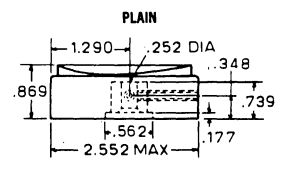
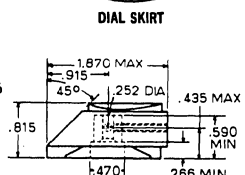
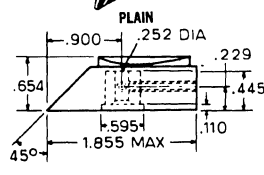
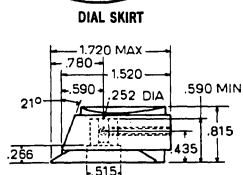
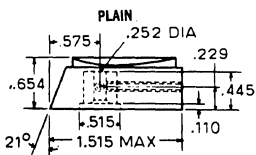
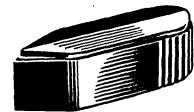
Series	A +.030 -.010	B min.	H max.	I min.	J ±.030	L max.	N ±.050	P ±.025	Q max.
125	1.250	.750	.427	.605	.850	1.185	1.350	.580	1.133
175	1.750	.750	.489	.740	1.070	1.690	1.758	.780	1.527
225	2.250	.750	.489	.740	1.095	2.185	1.782	.780	1.777

BAR POINTERS/STANDARD SERIES

1-1/2" BAR—70 SERIES

1-7/8" BAR—90 SERIES

2-1/2" BAR—125 SERIES



Bar Lgh. (Appx.)	Shaft Dia.	Bar Wdth. (Appx.)	Style	Stocked Catalog Numbers			
				Plain		Dial Skirt	
				Black	With White Line	Black	With White Line
					*Gray		Gray
1-1/2"	1/4"	3/4"	Series 70	—	70-7WL-2	70-8WL-2	G70-8WL-2
1-7/8"	1/4"	3/4"	Series 90	—	90-7WL-2	90-8WL-2	*G90-8WL-2G
2-1/2"	1/4"	3/4"	Series 125	125-7-2	—	—	—

*Matte Finish

RAYTHEON COMPANY • DISTRIBUTOR PRODUCTS OPERATION

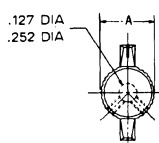
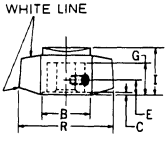
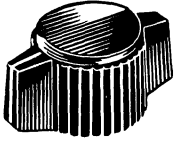
Fourth Avenue, Burlington, Massachusetts 01803 Tel.: (617) 272-6400 TWX: 710-332-7641

RAYTHEON

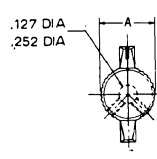
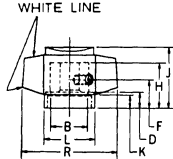
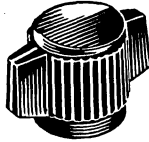
CONTROL KNOBS/STANDARD & DESIGNER SERIES

BAR KNOBS—STANDARD SERIES

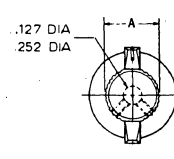
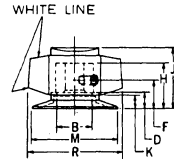
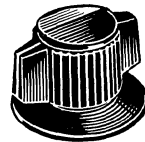
ROUND



RING SKIRT



DIAL SKIRT



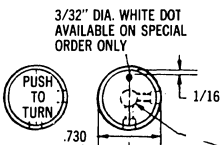
A	+.030 -.010	.700	H min.	.568
B	min.	.485	I ±.030	.610
C	min.	.026	J ±.030	.782
D	min.	.188	K max.	.187
E	max.	.187	L max.	.680
F	max.	.369	M max.	1.150
G	min.	.405	R ±.025	1.150

SELECTION GUIDE

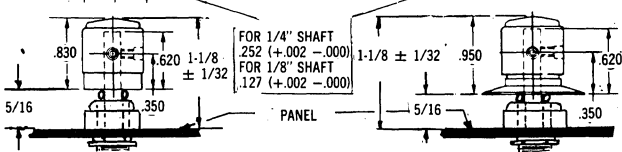
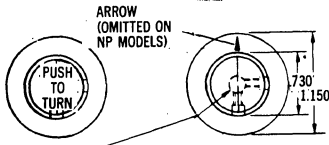
Knob Dia. (Appx.)	Bar Lgth. (Appx.)	Shaft Dia.	Knob Hght. (Appx.)	Stocked Catalog Numbers		
				Black with White Line		
				Round	Ring Skirt	Dial Skirt
3/4"	1-1/8"	1/8"	3/4"	—	—	70B-3-1
3/4"	1-1/8"	1/4"	3/4"	—	70B-2-2	70B-3-2
3/4"	1-1/8"	1/4"	5/8"	70B-1-2	—	—

PUSH TO ENGAGE DEVICES—STANDARD SERIES

ROUND—RING SKIRT



ROUND—DIAL SKIRT



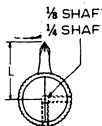
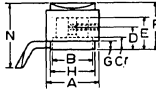
SELECTION GUIDE

Push to Engage Devices			Stocked Catalog Numbers			
Knob Dia. (Appx.)	Shaft Dia.	Series No.	Round-Ring Skirt		Round-Dial Skirt	
			Gray*	Black*	Gray with Arrow*	Black with Arrow*
3/4"	1/8"	70	PTEG70-2-1	PTE70-2-1	—	PTE70-3-1
3/4"	1/4"	70	PTEG70-2-2	PTE70-2-2	PTEG70-3-2	PTE70-3-2

*Numbers shown are for mirror finish. Add suffix G for matte (dull) finish.

KNOB LOCKS—STANDARD SERIES

POINTER



KNOB LOCK POINTER DIMENSIONS

Series	A	B	C	D	E	F	G	H	I	J	K	L	N
70	.700	.560	.188	.369	.568	.782	.187	.680	.812	1.154			
90	.905	.640	.320	.437	.680	.958	.235	.845	.968	1.310			
125	1.250	1.000	.250	.442	.605	.862	.175	1.185	1.125	1.215			

SELECTION GUIDE KNOB LOCK POINTER

Knob Dia. (Appx.)	Shaft Dia.	Dimension Dwg. Series	Stocked Catalog No.	
			Knob Lock	Pointer
3/4"	1/4"	70	50-1LK-2	Black
1"	1/4"	90	90-1LK-2	Black
1-1/4"	1/4"	125	125-1LK-2	Black

KNOB LOCK DIMENSIONS

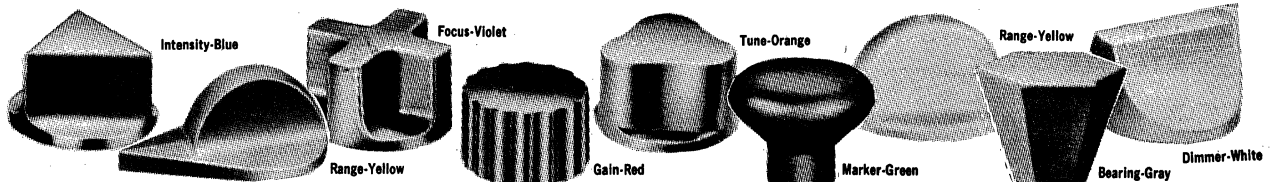
Series	A	B
70	1	.721
90	1-5/16	.928
125	1-5/8	1.269

SELECTION GUIDE KNOB LOCKS

Knob Dia. (Appx.)	Thread	Dimension Series No.	Stocked Catalog Numbers	
			Black Standard	Splash Proof
3/4"	3/8-32	70	KL701	KL703
3/4"	1/4-32	70	KL702	—
1"	3/8-32	90	KL901	KL902
1-1/4"	3/8-32	125	KL1251	KL1252

TACTILE KNOBS

These tactile-shaped and colored tops may be combined with all knob styles except bar pointer.



RAYTHEON COMPANY • DISTRIBUTOR PRODUCTS OPERATION

Fourth Avenue, Burlington, Massachusetts 01803 Tel.: (617) 272-6400 TWX: 710-332-7641

RAYTHEON

CONTROL KNOBS/STANDARD & DESIGNER SERIES

CONCENTRIC KNOBS

ROUND—ROUND

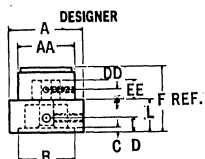
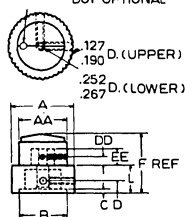


Standard



Designer

STANDARD DOT OPTIONAL



ROUND—RING SKIRT

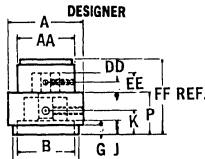
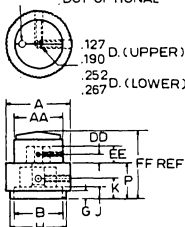


Standard



Designer

STANDARD DOT OPTIONAL



ROUND—DIAL SKIRT

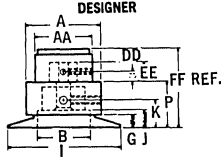
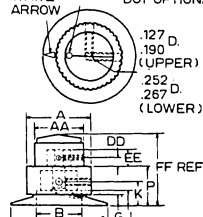


Standard

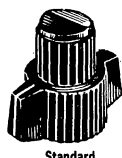


Designer

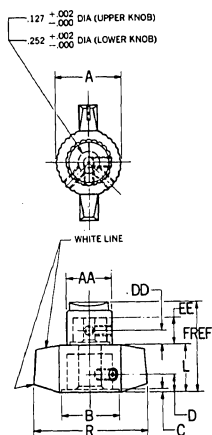
STANDARD DOT OPTIONAL WHITE ARROW



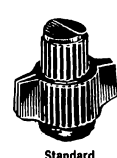
ROUND—ROUND BAR



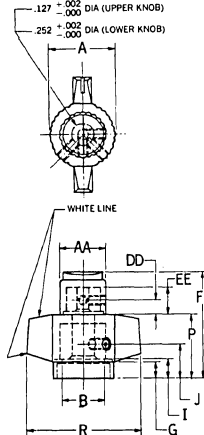
Standard



ROUND—RING SKIRT BAR



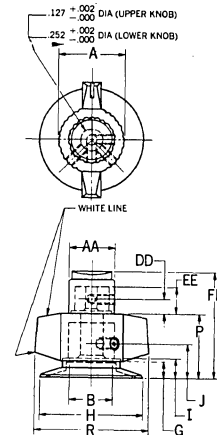
Standard



ROUND—DIAL SKIRT BAR



Standard



DIMENSIONS FOR ALL CONCENTRICS

Standard and Designer Series	A +.030 -.010	AA +.030 -.010	B min.	C min.	D max.	DD max.	EE min.	F ref.	FF ref.	G max.	H max.	I max.	J max.	K max.	L ±.015	P ±.025	R ±.025
50/70	.700	.500	.485	.026	.187	.158	.405	1.065	1.255	.187	.680	1.150	.188	.369	.510	.690	1.150
70/90	.900	.700	.640	.114	.260	.187	.405	1.310	1.550	.235	.845	1.525	.320	.484	.655	.885	—
90/125	1.250	.900	.750	.114	.260	.260	.520	1.365	1.545	.175	1.185	1.837	.250	.427	.530	.700	—

SELECTION GUIDE ROUND TYPES ONLY

Knob Dia's. Upper/Lower (Approx.)	Shaft Dia's. Upper/Lower	Knob Color Upper/Lower	Style Series	Stocked Catalog Numbers		
				Concentric Styles		
				Round—Round Upper/Lower	Round—Ring Skirt Upper/Lower	Round Dial Skirt Upper/Lower

STANDARD SERIES ROUND TYPES ONLY

1/2"/3/4"	1/8"/1/4"	Black/Black	50/70	—	—	50-1-1/70-3CB-2
1/2"/3/4"	1/8"/1/4"	Black White Dot/Black	50/70	—	—	50-1WD-1/70-3CB-2
3/4"/1"	1/8"/1/4"	Black/Black	70/90	70-1-1/90-1CB-2	70-1-1/90-2CB-2	70-1-1/90-3CB-2
3/4"/1"	1/8"/1/4"	Black White Dot/Black	70/90	70-1WD-1/90-1CB-2	70-1WD-1/90-2CB-2	70-1WD-1/90-3CB-2
3/4"/1"	3/16"/.267	Black/Black	70/90	70-1-3/90-1CB-4	—	70-1-3/90-3CB-4
1"/1.25"	3/16"/1/4"	Black/Black	90/125	—	—	90-1-3/125-3CB-2

DESIGNER SERIES ROUND TYPES ONLY

3/4"/1"	1/8"/1/4"	Alum./Black	70/90	DS70-1-1/90-1CB-2	DS70-1-1/90-2CB-2	DS70-1-1/90-3CB-2
3/4"/1"	1/8"/1/4"	Alum. Black Dot/Black	70/90	DS70-1BD-1/90-1CB-2	DS70-1BD-1/90-2CB-2	DS70-1BD-1/90-3CB-2
3/4"/1"	3/16"/.267	Alum./Black	70/90	DS70-1-3/90-1CB-4	—	DS70-1-3/90-3CB-4
3/4"/1"	3/16"/.267	Alum. Black Dot/Black	70/90	—	—	—
1"/1.25"	1/8"/1/4"	Alum. Black Dot/Black	90/125	—	—	DS90-1BD-1/125-3CB-2
1"/1.25"	3/16"/1/4"	Alum./Black	90/125	—	—	DS90-1-3/125-3CB-2

STANDARD SERIES BAR TYPES ONLY

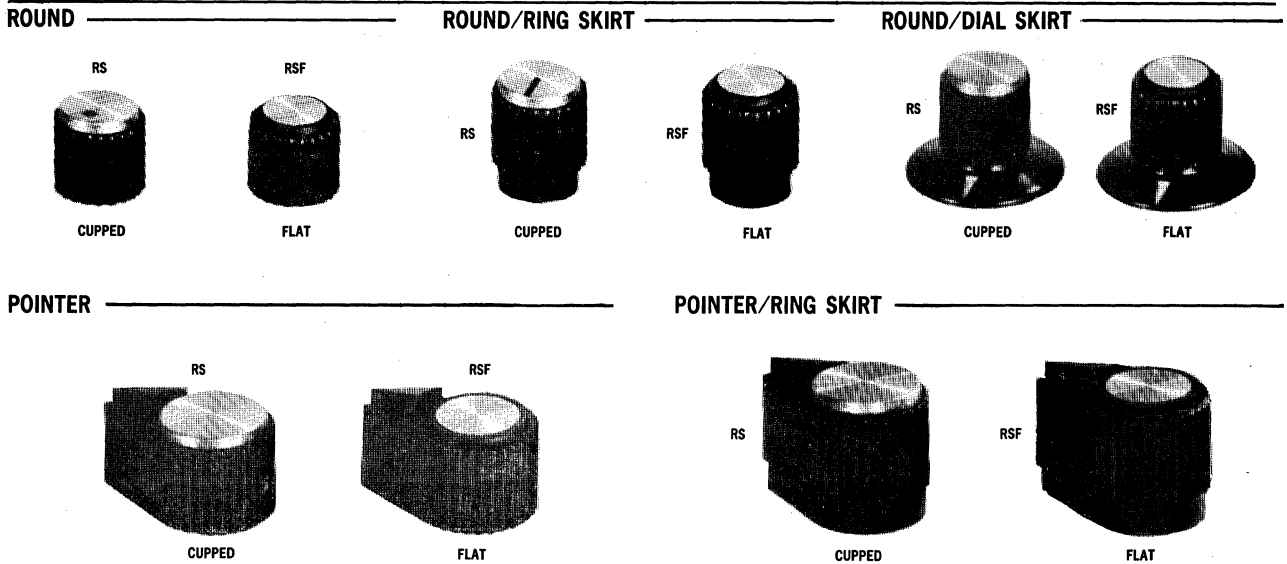
1/2"/3/4"	1/8"/1/4"	Black/Black White Line	50/70	50-1-1/70B-1CB-2	50-1-1/70B-2CB-2	50-1-1/70B-3CB-2
-----------	-----------	------------------------	-------	------------------	------------------	------------------

RAYTHEON COMPANY • DISTRIBUTOR PRODUCTS OPERATION

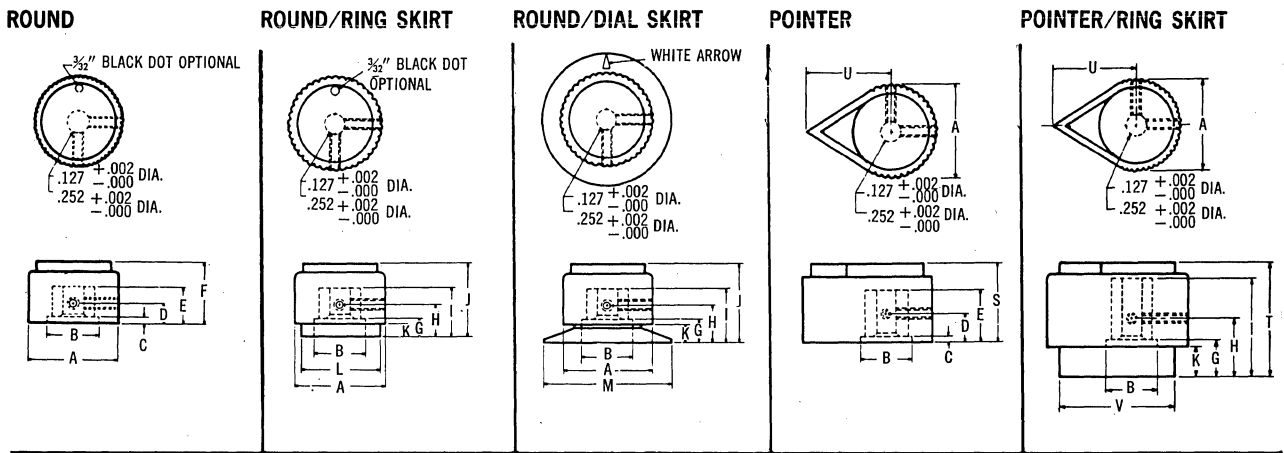
Fourth Avenue, Burlington, Massachusetts 01803 Tel.: (617) 272-6400 TWX: 710-332-7641

RAYTHEON

CONTROL KNOBS/REGENCY SERIES



DIMENSIONS REGENCY SERIES



SPECIFICATIONS FOR ALL SERIES

STANDARD SERIES

- A. Material and performance per MIL-K-3926
- B. Dimensions per MS91528
- C. Colors per FED-STD-595. Black No. 37038 (matte); 17038 (mirror). Gray No. 36231 (matte); 16231 (Mirror).
- D. Moisture Resistance: 10 days, method 106 of MIL-STD-202.
- E. Salt Spray: 48 hours, method 101, Cond. B of MIL-STD-202.
- F. Temperature: -65° to $+125^{\circ}\text{C}$.
- G. Torque: 15 pound inches with 4-40 set screws, maximum diameter $\frac{3}{4}$ " 30 lb. inches with 8-32 set screw and larger diameters.
- H. Set Screws: Corrosion treated steel with hex heads, cup points. Fluted socket and stainless steel types available.
- J. Flammability: self extinguishing.

DESIGNER SERIES

- Moisture Resistance: 10 days
- Temperature: -65°C to $+125^{\circ}\text{C}$
- Torque: 15 pound inches with 4-40 set screws, maximum diameter $\frac{3}{4}$ ", 30 lb. inches with 8-32 set screw and larger diameters.
- Set Screws: Corrosion treated steel with hex heads, cup points. Fluted socket and stainless steel types available.

REGENCY SERIES

- Molded parts in accordance with MIL-K-3926.
- Color per FED-STD-595.
- Black number 37038 (MATTE), 10738 (MIRROR).
- Flammability: self extinguishing.
- Set screws: per FFS200, corrosion-treated steel with hex heads and cup points.

NOTES:

- (c) Some sizes available from stock in gray or red. Other colors on special order
- (d) Reducing bushings available to reduce $\frac{1}{4}$ " shaft to $\frac{1}{8}$ " or $\frac{3}{16}$ " (RB-100= $\frac{1}{8}$ " (RB-200= $\frac{3}{16}$ ")

Designer Series

- (a) Two set screws are provided:
4-40 UNC-3A on all 70 series and $\frac{1}{8}$ " shaft models
8-32 UNC-3A on all others

400 and Panelrama Series

- (a) Two set screws are provided:
4-40 UNC-3A on all $\frac{1}{8}$ " shaft models
6-32 UNC-3A on all others

Regency Series

- (a) Two set screws are provided:
4-40 UNC-3A on all $\frac{1}{8}$ " shaft models
8-32 UNC-3A on $\frac{1}{4}$ " shaft models.



CONTROL KNOBS/REGENCY SERIES

DIMENSIONS

Series	A +.030 -.010	B min.	C min.	D max.	E min.	F ±.030	G min.	H max.	I min.	J ±.030	K max.	L max.	M ±.050	S ±.030	T ±.030	U +.025 -.005	V max.
RS/RSF50	.500	.300	.026	.158	.405	.470	.177	.325	.560	.625	.175	.460	.900	—	—	—	—
RS/RSF70	.700	.485	.026	.187	.405	.590	.188	.369	.568	.780	.187	.680	1.150	.590	.765	.680	1.000
RS/RSF90	.900	.640	.114	.260	.520	.735	.320	.484	.730	.980	.235	.845	1.525	.735	.970	.885	1.345
RS/RSF125	1.250	.750	.114	.260	.455	.620	.250	.427	.605	.785	.175	1.185	1.837	—	—	—	—

*RS70, RS90, RSF70 and RSF90 series knobs available with 0.127 hole for 1/8" shafts at slight additional cost.

Note: Two set screws are provided:

4-40 UNC-3A on all 50 & 70 Series and 1/8" shaft models

8-32 UNC-3A on all others

SELECTION GUIDE

STOCKED CATALOG NO.

Style	Finish		Knob Dia. (Inches Approx.)	*Shaft Dia. (Inches)	Knob Height (Inches Approx.)	Dial Skirt Dia. (Inches Approx.)	Pointer Radius (Inches Approx.)	Dimension Drawing Reference	Cupped RS Series			Flat RSF Series		
	Matte	Mirror							Plain	Black Dot	Black 1/2 Line	Plain	Black Dot	Black 1/2 Line
Round	—	X	1/2	1/8	1/2	—	—	50	—	—	—	RSF50-1-1	RSF50-1BD-1	RSF50-1BL-1
	X	—	1/2	1/8	1/2	—	—	50	—	—	—	RSF50-1-1G	RSF50-1BD-1G	RSF50-1BL-1G
	—	X	3/4	1/4	5/8	—	—	70	RS70-1-2	RS70-1BD-2	—	—	RSF70-1BD-2	RSF70-1BL-2
	X	—	3/4	1/4	5/8	—	—	70	RS70-1-2G	RS70-1BD-2G	—	—	RSF70-1BD-2G	RSF70-1BL-2G
	—	X	1	1/4	3/4	—	—	90	—	—	—	RSF90-1-2	RSF90-1BD-2	RSF90-1BL-2
	X	—	1	1/4	3/4	—	—	90	—	RS90-1BD-2G	—	RSF90-1-2G	RSF90-1BD-2G	RSF90-1BL-2G
	—	X	1-1/4	1/4	5/8	—	—	125	RS125-1-2	—	—	RSF-125-1-2	RSF125-1BD-2	—
	X	—	1-1/4	1/4	5/8	—	—	125	—	—	—	—	RSF125-1BD-2G	RSF125-1BL-2G
Round with Ring Skirt	—	X	1/2	1/8	5/8	—	—	50	—	RS50-2BD-1	—	RSF50-2-1	RSF50-2BD-1	RSF125-2BL-1
	X	—	1/2	1/8	5/8	—	—	50	RS50-2-1G	—	RS50-2BL-1G	—	RSF50-2BD-1G	RSF50-2BL-1G
	—	X	3/4	1/4	3/4	—	—	70	RS70-2-2	RS70-2BD-2	—	RSF70-2-2	RSF70-2BD-2	RSF70-2BL-2
	X	—	3/4	1/4	3/4	—	—	70	RS70-2-2G	RS70-2BD-2G	RS70-2BL-2G	RSF70-2-2G	RSF70-2BD-2G	RSF70-2BL-2G
	—	X	1	1/4	1	—	—	90	RS90-2-2	—	—	RSF90-2-2	RSF90-2BD-2	RSF90-2BL-2
	X	—	1	1/4	1	—	—	90	—	—	—	RSF90-2-2G	RSF90-2BD-2G	RSF90-2BL-2G
	—	X	1-1/4	1/4	3/4	—	—	125	—	—	—	—	RSF125-2BD-2	—
	X	—	1-1/4	1/4	3/4	—	—	125	—	—	—	—	RSF125-2BD-2G	RSF125-2BL-2G
Round with Dial Skirt	—	X	1/2	1/8	5/8	1	—	50	RS50-3-1	—	—	RSF-50-3-1	—	—
	X	—	1/2	1/8	5/8	1	—	50	RS50-3-1G	—	—	RSF-50-3-1	—	—
	—	X	3/4	1/4	3/4	1-1/8	—	70	RS70-3-2	—	—	—	—	—
	X	—	3/4	1/4	3/4	1-1/8	—	70	RS70-3-2G	—	—	—	—	—
	—	X	1	1/4	1	1-1/2	—	90	RS90-3-2	—	—	RSF-90-3-2	—	—
	X	—	1	1/4	1	1-1/2	—	90	RS90-3-2G	—	—	RSF-90-3-2G	—	—
Pointer	—	X	3/4	1/4	1/2	—	5/8	70	RS70-4-2	—	—	RSF-70-4-2	—	—
	X	—	3/4	1/4	1/2	—	5/8	70	RS70-4-2G	—	—	RSF-70-4-2G	—	—
	—	X	1	1/4	3/4	—	7/8	90	—	—	—	RS-90-4-2	—	—
	X	—	1	1/4	3/4	—	7/8	90	RS90-4-2G	—	—	RSF-90-4-2G	—	—
Pointer with Ring Skirt	—	X	3/4	1/4	3/4	—	5/8	70	RS70-5-2	—	—	RSF-70-5-2	—	—
	X	—	3/4	1/4	3/4	—	5/8	70	RS70-5-2G	—	—	RSF-70-5-2G	—	—
	—	X	1	1/4	1	—	7/8	90	RS90-5-2	—	—	RSF-90-5-2	—	—
	X	—	1	1/4	1	—	7/8	90	RS90-5-2G	—	—	RSF-90-5-2G	—	—

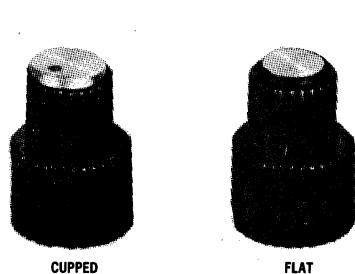
RAYTHEON COMPANY • DISTRIBUTOR PRODUCTS OPERATION

Fourth Avenue, Burlington, Massachusetts 01803 Tel.: (617) 272-6400 TWX: 710-332-7641



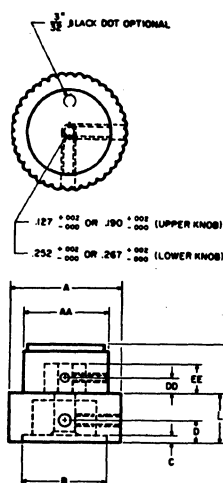
CONTROL KNOBS/CONCENTRIC STYLES

ROUND—ROUND

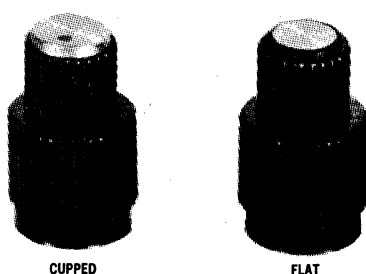


CUPPED

FLAT

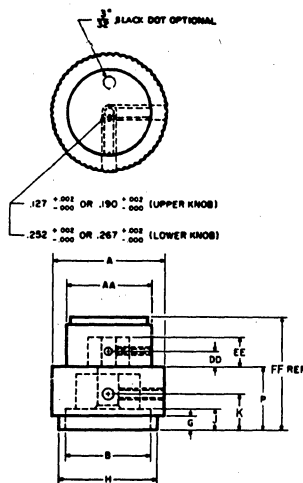


ROUND—RING SKIRT

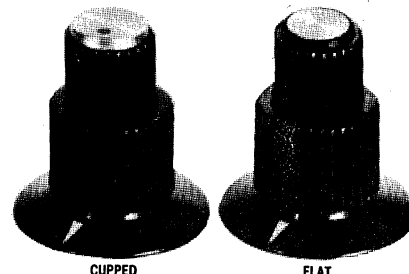


CUPPED

FLAT

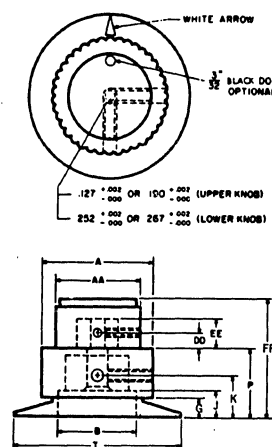


ROUND—DIAL SKIRT



CUPPED

FLAT



EXPLANATION OF CATALOG DESIGNATIONS FOR CONCENTRIC KNOBS

Concentric knobs bear a dual designation, those at the left of the slash mark describe the upper round knob (1) the series, (2) the diameter, (3) the cap marking if any. The designations to the right of the slash mark describe for the lower concentric knob (1) the diameter, (2) the type, (3) the through shaft hole size and (4) the finish of both upper and lower knobs.

Note: Two set screws are provided:
4-40 UNC-3A on all 1/8" shaft models
8-32 UNC-3A on 1/4" shaft models

DIMENSIONS

Series	A +.030 -.010	AA +.030 -.010	B min.	C min.	D max.	DD max.	EE min.	F ref.	FF ref.	G max.	H max.	I min.	J max.	K max.	L ±.015	P ±.025
RS/RSF50/70	.700	.500	.485	.026	.187	.158	.405	.980	1.309	.187	.680	1.150	.188	.369	.510	.690
RS/RSF70/90	.900	.700	.640	.114	.260	.187	.405	1.310	1.550	.235	.845	1.525	.320	.484	.655	.885
RS/RSF90/125	1.250	.900	.750	.114	.260	.260	.520	1.365	1.545	.175	1.185	1.837	.250	.427	.530	.700

Style	Finish Upper and Lower		Knob Dia. (Inches Approx.)		Overall Height (Inches Approx.)	Shaft Dia. (Inches)		Dial Skirt (Inches Approx.) Lower Only	Dimension Drawing Reference	STOCKED CATALOG NUMBERS					
										Cupped RS Series Upper Knob			Flat RSF Series Upper Knob		
	Matte	Mirror	Upper	Lower		Upper	Lower			Plain	Black Dot	Black 1/2 Line	Plain	Black Dot	Black 1/2 Line
Round Round	—	X	1/2	3/4	1	1/8	1/4	—	50/70	RS50/70-1-2	—	—	RSF50/70-1-2	—	—
	X	—	1/2	3/4	1	1/8	1/4	—	50/70	RS50/70-1-2G	RS50BD/70-1-2G	RS50BL/70-1-2G	RSF50BD/70-1-2G	RSF50BL/70-1-2G	RSF50BL/70-1-2G
	—	X	3/4	1	1-3/8	1/8	1/4	—	70/90	RS70/90-1-2	RS70BD/90-1-2	RS70BL/90-1-2	RSF70/90-1-2	RSF70BD/90-1-2	RSF70BL/90-1-2
	X	—	3/4	1	1-3/8	1/8	1—	—	70/90	RS70/90-1-2G	RS70BD/90-1-2G	RS70BL/90-1-2G	RSF70-90-1-2G	RSF70BD/90-1-2G	RSF70BL/90-1-2G
	—	X	1	1-1/4	1-3/8	1/8	1/4	—	90/125	RS90/125-1-2	RS90BD/125-1-2	RS90BL/125-1-2	RSF90/125-1-2	RSF90BD/125-1-2	RSF90BL/125-1-2
Round Ring Skirt	X	—	1	1-1/4	1-3/8	1/8	1/4	—	90/125	RS90/125-1-2G	RS90BD/125-1-2G	RS90BL/125-1-2G	RSF90/125-1-2G	RSF90BD/125-1-2G	RSF90BL/125-1-2G
	—	X	1/2	3/4	1-1/4	1/8	1/4	—	50/70	RS50/70-2-2	—	RS50BL/70-2-2	RSF50/70-2-2	RSF50BD/70-2-2	RSF50BL/70-2-2
	X	—	1/2	3/4	1-1/4	1/8	1/4	—	50/70	RS50/70-2-2G	RS50BD/70-2-2G	RS50BL/70-2-2G	RSF50/70-2-2G	RSF40BD/70-2-2G	RSF50BL/70-2-2G
	—	X	3/4	1	1-1/2	1/8	1/4	—	70/90	RS70/90-2-2	RS70BD/90-2-2	RS70BL/90-2-2	RSF70/90-2-2	RSF70BD/90-2-2	RSF70BL/90-2-2
	X	—	3/4	1	1-1/2	1/8	1/4	—	70/90	RS70/90-2-2G	RS70BD/90-2-2G	RS70BL/90-2-2G	RSF70/90-2-2G	RSF70BD/90-2-2G	RSF70BL/90-2-2G
Round Dial Skirt	—	X	1	1-1/4	1-1/2	1/8	1/4	—	90/125	RS90/125-2-2	RS90BD/125-2-2	RS90BL/125-2-2	RSF90/125-2-2	RSF90BD/125-2-2	RSF90BL/125-2-2
	X	—	1	1-1/4	1-1/2	1/8	1/4	—	90/125	RS90/125-2-2G	RS90BD/125-2-2G	RS90BL/125-2-2G	RSF90/125-2-2G	RSF90BD/125-2-2G	RSF90BL/125-2-2G
	—	X	1/2	3/4	1-3/8	1/8	1/4	1-1/8	50/70	—	—	—	RSF50/70-3-2	RSF50BD/70-3-2	RSF50BL/70-3-2
	X	—	1/2	3/4	1-3/8	1/8	1/4	1-1/8	50/70	RS50/70-3-2G	RS50BD/70-3-2G	RS50BL/70-3-2G	RSF50/70-3-2G	RSF50BD/70-3-2G	RSF50BL/70-3-2G
	—	X	3/4	1	1-1/2	1/8	1/4	1-1/2	70/90	RS70/90-3-2	RS70BD/90-3-2	RS70BL/90-3-2	RSF70/90-3-2	RSF70BD/90-3-2	RSF70BL/90-3-2

RAYTHEON COMPANY • DISTRIBUTOR PRODUCTS OPERATION

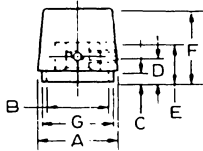
Fourth Avenue, Burlington, Massachusetts 01803 Tel.: (617) 272-6400 TWX: 710-332-7641

RAYTHEON**CONTROL KNOBS/400 & PANELRAMA SERIES****ROUND**

400 SERIES



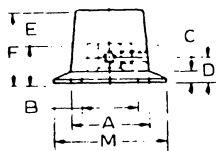
PANELRAMA

**ROUND/DIAL SKIRT**

400 SERIES



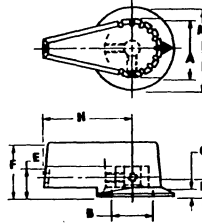
PANELRAMA

**POINTER/DIAL SKIRT**

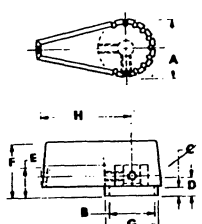
400 SERIES



PANELRAMA

**POINTER**

400 SERIES

**DIMENSIONS 400 SERIES AND PANELRAMA**

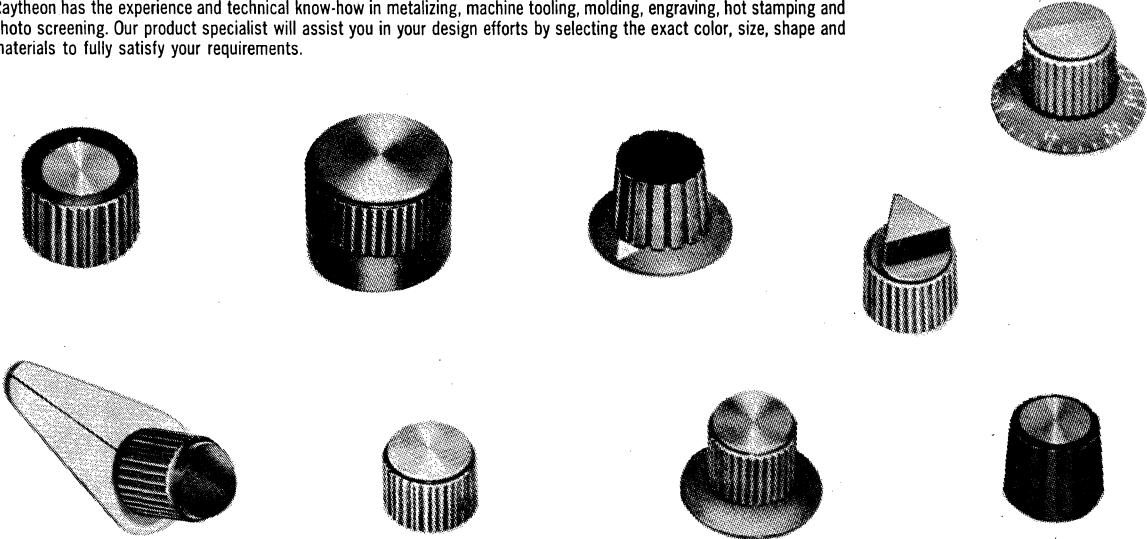
Series No.		A	B	C	D	E	F	G	H	J	K	M
400 Series	Panel Rama	$\begin{matrix} +.025 \\ -.005 \end{matrix}$	min.	min.	max.	min.	$\pm .030$	max.	max.	max.	max.	max.
—	PS6	.625	.458	.120	.290	.625	.813	.558	.910	—	—	.925
407	PS7	.720	.520	.120	.290	.625	.813	.640	1.120	—	—	1.050
409	—	.875	.660	.120	.290	.625	.813	.800	1.375	1.540	.500	1.270
412	PS12	1.250	1.041	.120	.290	.625	.813	1.170	2.000	1.540	.500	1.710

SELECTION GUIDE 400 SERIES AND PANELRAMA

Knob Dia. Panel End (Appx.)	Shaft Size	Knob Hght. (Appx.)	Dial Skirt Dia. (Appx.)	Pointer Radius (Appx.)	Dimension Series Ref.	STOCKED CATALOG NUMBERS															
						Round			Round/Dial Skirt						Pointer/Dial Skirt				Pointer		
						400 Series			Panelrama		400 Series			Panelrama		400 Series		Panelrama		400 Series	
						Black	Beige	Blue Gray	Black	Black	Beige	Blue Gray	Black	Black	Beige	Black	Black	Beige	Black	Black	Beige
5/8"	1/4"	13/16"	1"	—	PS6	—	—	—	—	—	—	—	PS6D2K1R	—	—	—	—	—	—		
3/4"	1/8"	13/16"	1"	—	407	407R1K1	—	—	—	407D1K1	—	—	—	—	—	—	—	—	—		
3/4"	1/4"	13/16"	1-1/16"	1-1/8"	PS7/407	407R2K1	407R2K3	407R1K7	PS7R2K1R	407D2K1	407D2K3	407D2K7	PS7D2K1R	407PD2K1	407PD2K3	PS7PD2K1R	407P2K1	—	—		
7/8"	1/4"	13/16"	1-1/4"	1-3/8"	409	409R2K1	409R2K3	—	—	409D2K1	409D2K3	—	—	409PD2K1	409PD2K3	—	409P2K1	—	—		
1-1/4"	1/4"	13/16"	1-11/16"	2"	PS12/412	412R2K1	412R2K3	—	—	412D2K1	412D2K3	—	PS12DK1R	412PD2K1	—	—	412P2K1	412P2K3	—		

CUSTOM CONTROL KNOBS

Increase the sales appeal of your equipment by coordinating its front panel design. Control Knobs don't have to be just functional "add-on" accessories; you can design your knobs to enhance the appearance of panels and instruments. Raytheon has the experience and technical know-how in metalizing, machine tooling, molding, engraving, hot stamping and photo screening. Our product specialist will assist you in your design efforts by selecting the exact color, size, shape and materials to fully satisfy your requirements.

**RAYTHEON COMPANY • DISTRIBUTOR PRODUCTS OPERATION**

Fourth Avenue, Burlington, Massachusetts 01803 Tel.: (617) 272-6400 TWX: 710-332-7641

PANEL COMPONENTS (EXCLUDING LIGHTING & DISPLAYS)

Product Selection Guide



1139 BAKER STREET, COSTA MESA, CALIF. 92626
(714) 549-3041 TWX: 910/595-1507

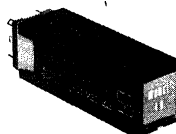
**SERIES
1M
PUSHBUTTON
SWITCH
MATRIX
SYSTEM**



**SERIES
1MR
PUSHBUTTON
SWITCH
MATRIX
SYSTEM**



**SERIES
40
PUSHBUTTON
SWITCH
INDICATOR**



**SERIES
40R
PUSHBUTTON
SWITCH
INDICATOR**



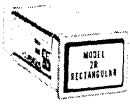
**SERIES
2/S
PUSHBUTTON
SWITCH
INDICATOR**



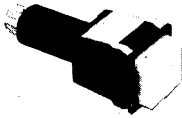
PUSHBUTTON SHAPE					
Round	—	—	—	—	—
Square	X	—	X	—	X
Rectangular	—	X	—	X	—
MOUNTING					
Matrix	X	X	—	—	—
Clamping Bezel	—	—	X	X	X
Snap-in	—	—	—	—	—
Bushing	—	—	—	—	—
DISPLAY SCREEN					
Visible Message	X	X	X	X	X
Concealed Message	X	X	X	X	X
Full Display	X	X	X	X	X
Split Horz./Vertical	X	X	X	X	X
Split 3-way	X	X	X	X	X
Split 4-way	X	X	X	X	X
MECHANICAL ACTION					
Alternate	X	X	X	X	X
Momentary	X	X	X	X	X
Magnetic Held Momentary	X	—	X	—	—
Mechanical Latchdown	X	—	X	—	—
Indicator Light Only	X	X	X	X	X
CIRCUIT					
6PDT	—	—	—	—	—
4PDT	X	X	X	X	X
2PDT	X	X	X	X	X
SPDT	—	—	—	—	—
2 Circuit	—	—	—	—	—
Illuminated	X	X	X	X	X
Unlighted	—	—	—	—	—
ELECTRICAL					
Contact Load	28 VDC/115 VAC	28 VDC/115 VAC	28 VDC/115 VAC	28 VDC/115 VAC	28 VDC/115 VAC
Resistive	2 amps	2 amps	2 amps	2 amps	5 amps
Lamp	.75 amps	.75 amps	.75 amps	.75 amps	.75 amps
DIMENSIONS					
Depth Behind Panel Front	2.81/3.31	2.81/3.31	2.65-3.11	2.65	2.65
Mounting Centers	.775	.775 x 1.025	.805/.875	1.125 x .875	.875

PANEL COMPONENTS (EXCLUDING LIGHTING & DISPLAYS)

**SERIES
2/R
PUSHBUTTON
SWITCH
INDICATOR**



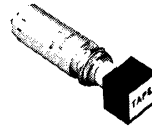
**SERIES
C1
PUSHBUTTON
SWITCH
INDICATOR**



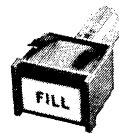
**SERIES
C3
PUSHBUTTON
SWITCH**



**SERIES
C6
PUSHBUTTON
SWITCH
INDICATOR**



**SERIES
C6P
PUSHBUTTON
SWITCH
INDICATOR**



**SERIES
30
PUSHBUTTON
SWITCH**



**SERIES
60/70
PUSHBUTTON
SWITCH
INDICATOR**



For more information on variable transformers and variable isolation transformers, see our pages in the Transformers section, pages 2•1808, 2•1809.

— — X	— X —	X — —	X X X	X X X	X — —	X X X
— X — —	— — X —	— — — X	— — — X	— — X —	— — — X	— — — X
X X X X X X	X — X — — —	— — — — — —	X — X — — —	X — X — — —	— — — — — —	X — X — — — —
X X — — X	X X — — X	X X — — —	X X — — X	X X — — X	X X — — —	X X — — X
— X X — — X —	— — X X — X —	— — X X X — X	— — X X X X —	— — X X — X —	X — X X X X —	X — X X X X —
28 VDC/115 VAC 5 amps .75 amps	28 VDC/115 VAC 2 amps 1 amp	28 VDC/115 VAC 3 amps 1 amp	28 VDC/115 VAC 3 amps 1 amp	28 VDC/115 VAC 3 amps 1 amp	28 VDC/115 VAC 3 amps 1 amp	28 VDC/115 VAC 3 amps 60 - 1 amp 70 - .75 amp
2.65 1.125 x .875	2.28 1.00	1.13 .625/.880	1.40 .635-1.125	2.39 .865-1.35	1.16/1.25 .880/1.00	1.30/1.41 .630/.990

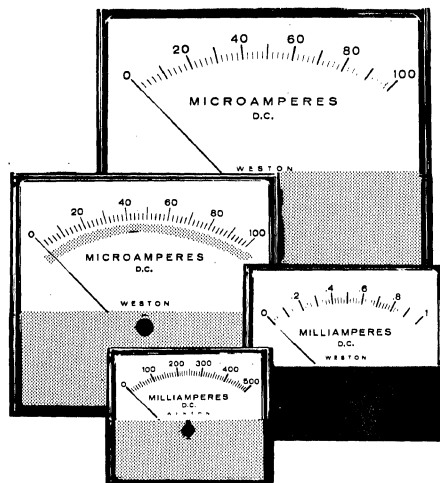
WESTON®

2000 Series Panel Meters

Specifications

Size	Model	Function & Mechanism	Accuracy (% Full Scale)	Scale Length	Pointer	Type***
2 1/4"	2021 2022	DC-CORMAG® AC RECT.-CORMAG®	2% 3%*	2.13" 2.13"	Knife-Edge Knife-Edge	Plain Plain
3 1/4"	2031 2032	DC-CORMAG® AC RECT.-CORMAG®	2%** 3%*	2.7" 2.7"	Knife-Edge Knife-Edge	Plain Plain
4 1/4"	2041 2042	DC-CORMAG® AC RECT.-CORMAG®	2%** 3%*	3.7" 3.7"	Knife-Edge Knife-Edge	Plain Plain
5 1/4"	2051 2052	DC-CORMAG® AC RECT.-CORMAG®	2%** 3%*	4.5" 4.5"	Knife-Edge Knife-Edge	Plain Plain

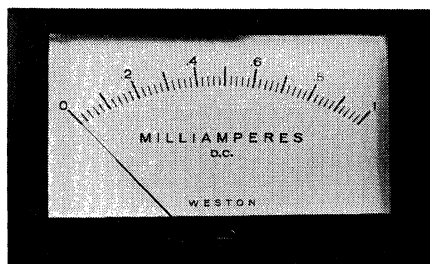
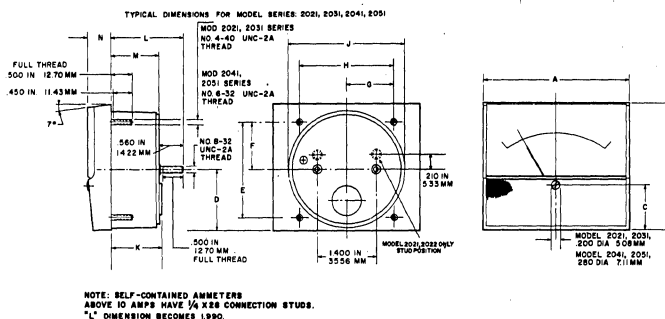
*On Sinewave, 25-20,000 Hz for current meters, 25-1500 Hz voltmeters.
**Available with increased accuracy and tracking on special order.
***Minor scale available on special order.
(Higher frequency available on special order.)



Dimensions

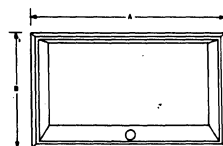
Model	A	B	C	D	E	F	G	H	J	K	L	M	N
2021	2.810	2.400 in.	.985 in.	1.160 in.	1.880 in.	.940 in.	.940 in.	1.880 in.	2.200 in.	1.220 in.	1.725 in.	1.140 in.	.560 in.
2022	71.37 mm	60.96 mm	25.02 mm	29.46 mm	47.75 mm	23.88 mm	23.88 mm	47.75 mm	55.88 mm	30.99 mm	43.82 mm	28.96 mm	14.22 mm
2031	3.500 in.	2.980 in.	1.060 in.	1.440 in.	2.250 in.	1.125 in.	1.125 in.	2.250 in.	2.750 in.	1.200 in.	1.725 in.	1.140 in.	.560 in.
2032	88.90 mm	75.69 mm	26.92 mm	36.58 mm	57.15 mm	28.58 mm	28.58 mm	57.15 mm	69.85 mm	30.48 mm	43.82 mm	28.96 mm	14.22 mm
2041	4.530 in.	4.050 in.	1.480 in.	1.780 in.	3.560 in.	2.020 in.	2.000 in.	4.000 in.	2.750 in.	1.200 in.	1.725 in.	1.140 in.	.600 in.
2042	115.06 mm	102.87 mm	37.59 mm	45.21 mm	90.42 mm	51.31 mm	50.80 mm	101.60 mm	69.85 mm	30.48 mm	43.82 mm	28.96 mm	15.24 mm
2051	5.630 in.	4.490 in.	1.460 in.	1.590 in.	3.000 in.	2.150 in.	2.625 in.	5.250 in.	2.750 in.	1.200 in.	1.725 in.	1.140 in.	.600 in.
2052	143.00 mm	114.45 mm	37.08 mm	40.39 mm	76.20 mm	54.61 mm	66.68 mm	133.35 mm	69.85 mm	30.48 mm	43.82 mm	28.96 mm	15.24 mm

See diagram for dimensions

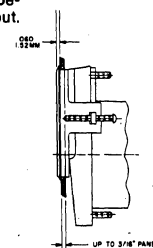


RECESS (Bezel mounting)

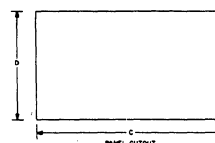
Only the scale is visible since meter is mounted behind the panel . . . half bezel fits into panel cutout.



Note: Half bezel mounting easily adaptable to external illumination.



Model	A	B	C	D	Catalog. No.
2021/22/24	3.120 in. 79.25 mm	1.720 in. 43.69 mm	3.000 in. 76.20 mm	1-19/32 (1.609) in. 40.87 mm	020090271495
2031/32/34	3.860 in. 98.04 mm	2.265 in. 57.54 mm	3-23/32 (3.718) in. 94.43 mm	2-5/32 (2.156) in. 54.74 mm	020090271922
2041/42/44	4.960 in. 125.98 mm	2.900 in. 73.66 mm	4-13/16 (4.812) in. 122.22 mm	2-3/4 (2.750) in. 69.85 mm	020090271923
2051/52	6.060 in. 153.92 mm	3.300 in. 83.82 mm	5-7/8 (5.875) in. 149.22 mm	3-5/32 (3.156) in. 80.16 mm	020090271924

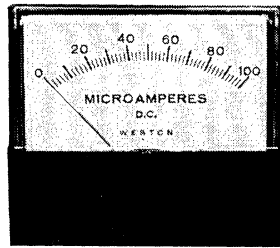
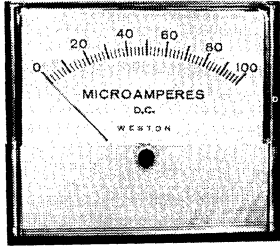


WESTON INSTRUMENTS, INC. 614 FRELINGHUYSEN AVENUE, NEWARK, N. J. 07114

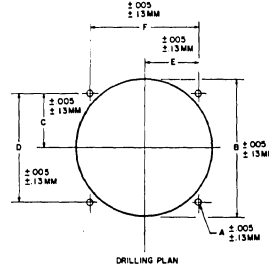
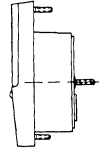
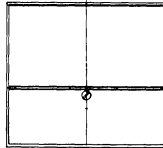
WESTON 2000 Series Panel Meters

CONVENTIONAL

Use same dimensions, whether you choose a meter with taut band or pivot and jewel movement.



Model	A	B	C	D	E	F
2021	.125 in. 3.17 mm	2.200 in. 55.88 mm	.940 in. 23.88 mm	1.880 in. 47.75 mm	.940 in. 23.88 mm	1.880 in. 47.75 mm
2031	.125 in. 3.17 mm	2.820 in. 71.63 mm	1.125 in. 28.57 mm	2.250 in. 57.15 mm	1.125 in. 28.57 mm	2.250 in. 57.15 mm
2041	.166 in. 4.21 mm	2.820 in. 71.63 mm	2.020 in. 51.31 mm	3.562 in. 90.47 mm	2.000 in. 50.80 mm	4.000 in. 101.60 mm
2051	.166 in. 4.21 mm	2.820 in. 71.63 mm	2.150 in. 54.61 mm	3.000 in. 76.20 mm	2.625 in. 66.67 mm	5.250 in. 133.35 mm



DC MICROAMMETERS

2½" MODEL 2021

Range	Scale Div.	Pivot & Jewel Resistance (Ohms)	Catalog No. †	Taut Band Resistance (Ohms)	Catalog No. †
50	50	2500	5841050*	950	5842050*
100	50	2300	5841100*	845	5842100*
200	40	850	5841200*	275	5842200*
500	50	230	5841500	60	5842500*
50-0-50	40	2300	8888001*	845	8888004*
100-0-100	40	850	8888002	275	8888005*
500-0-500	50	85	8888003	16.5	8888006

3½" MODEL 2031

Range	Scale Div.	Pivot & Jewel Resistance (Ohms)	Catalog No. †	Taut Band Resistance (Ohms)	Catalog No. †
50	50	2500	5841050*	950	5842050*
100	50	2300	5841100*	845	5842100*
200	40	850	5841200*	275	5842200*
500	50	230	5841500	60	5842500*
50-0-50	40	2300	8888001*	845	8888004*
100-0-100	40	850	8888002	275	8888005*
500-0-500	50	85	8888003	16.5	8888006

4½" MODEL 2041

Range	Scale Div.	Pivot & Jewel Resistance (Ohms)	Catalog No. †	Taut Band Resistance (Ohms)	Catalog No. †
50	50	2500	5841050*	950	5842050*
100	50	2300	5841100*	845	5842100*
200	40	850	5841200*	275	5842200*
500	50	230	5841500	60	5842500*
50-0-50	40	2300	8888001*	845	8888004*
100-0-100	40	850	8888002	275	8888005*
500-0-500	50	85	8888003	16.5	8888006

5½" MODEL 2051

Range	Scale Div.	Pivot & Jewel Resistance (Ohms)	Catalog No. †	Taut Band Resistance (Ohms)	Catalog No. †
50	50	2500	5841050*	950	5842050*
100	50	2300	5841100*	845	5842100*
200	40	850	5841200*	275	5842200*
500	50	230	5841500	60	5842500*
50-0-50	40	2300	8888001*	845	8888004*
100-0-100	40	850	8888002	275	8888005*
500-0-500	50	85	8888003	16.5	8888006

DC MILLIAMMETERS

2½" MODEL 2021

Range	Scale Div.	Pivot & Jewel Res. Ohms ±20%	Catalog No. †	Taut Band Res. Ohms ±20%	Catalog No. †
1	50	85	4841001*	16.5	4842001*
2	40	16	4841002	8.2	4842002
5	50	9	4841005	4.7	4842005
10	50	2.2	4841010*	2.2	4842010
20	40	1.6	4841020	2.0	4842020
50	50	2.0	4841050*	2.0	4842050*
100	50	1.0	4841100*	1.0	4842100
200	40	0.5	4841200*	0.5	4842200
300	60	0.33	4841300*	0.33	4842300
500	50	0.2	4841500	0.2	4842500

3½" MODEL 2031

Range	Scale Div.	Pivot & Jewel Res. Ohms ±20%	Catalog No. †	Taut Band Res. Ohms ±20%	Catalog No. †
1	50	85	4841001*	16.5	4842001*
2	40	16	4841002	8.2	4842002
5	50	9	4841005	4.7	4842005
10	50	2.2	4841010*	2.2	4842010
20	40	1.6	4841020	2.0	4842020
50	50	2.0	4841050*	2.0	4842050*
100	50	1.0	4841100*	1.0	4842100
200	40	0.5	4841200	0.5	4842200
300	60	0.33	4841300	0.33	4842300
500	50	0.2	4841500*	0.2	4842500

4½" MODEL 2041

Range	Scale Div.	Pivot & Jewel Res. Ohms ±20%	Catalog No. †	Taut Band Res. Ohms ±20%	Catalog No. †
1	50	85	4841001*	16.5	4842001*
2	40	16	4841002	8.2	4842002
5	50	9	4841005	4.7	4842005
10	50	2.2	4841010	2.2	4842010
20	40	1.6	4841020	2.0	4842020
50	50	2.0	4841050*	2.0	4842050*
100	50	1.0	4841100	1.0	4842100
200	40	0.5	4841200	0.5	4842200
300	60	0.33	4841300*	0.33	4842300
500	50	0.2	4841500	0.2	4842500

5½" MODEL 2051

Range	Scale Div.	Pivot & Jewel Res. Ohms ±20%	Catalog No. †	Taut Band Res. Ohms ±20%	Catalog No. †
1	50	85	4841001*	16.5	4842001*
2	40	16	4841002	8.2	4842002
5	50	9	4841005	4.7	4842005
10	50	2.2	4841010	2.2	4842010
20	40	1.6	4841020	2.0	4842020
50	50	2.0	4841050	2.0	4842050*
100	50	1.0	4841100	1.0	4842100
200	40	0.5	4841200	0.5	4842200
300	60	0.33	4841300	0.33	4842300
500	50	0.2	4841500	0.2	4842500

* Stock item.

† When ordering meters, model number must precede catalog number.

Δ When ordering meter with optional black painted front change second digit of catalog number "8" to "7."

WESTON INSTRUMENTS, INC. 614 FRELINGHUYSEN AVENUE, NEWARK, N. J. 07114

WESTON 2000 Series Panel Meters

DC AMMETERS

2½" MODEL 2021

Range	Scale Div.	Pivot & Jewel	Catalog No. †	Taut Band	Catalog No. †
1	50	Approx. 50MV Drop	2841001*	Approx. 50MV Drop	2842001
2	40		2841002		2842002
5	50		2841005*		2842005
10	50		2841010		2842010
20	40		2841020		2842020
25	50		2841025*		2842025
30	60		2841030		2842030
50	50		2841050*		2842050

3½" MODEL 2031

Range	Scale Div.	Pivot & Jewel	Catalog No. †	Taut Band	Catalog No. †
1	50	Approx. 50MV Drop	2841001*	Approx. 50MV Drop	2842001*
2	40		2841002		2842002
5	50		2841005*		2842005
10	50		2841010*		2842010
20	40		2841020		2842020
25	50		2841025		2842025
30	60		2841030		2842030
50	50		2841050*		2842050

4½" MODEL 2041

Range	Scale Div.	Pivot & Jewel	Catalog No. †	Taut Band	Catalog No. †
1	50	Approx. 50MV Drop	2841001*	Approx. 50MV Drop	2842001
2	40		2841002*		2842002
5	50		2841005*		2842005
10	50		2841010		2842010
20	40		2841020		2842020
25	50		2841025*		2842025
30	60		2841030		2842030
50	50		2841050*		2842050

5½" MODEL 2051

Range	Scale Div.	Pivot & Jewel	Catalog No. †	Taut Band	Catalog No. †
1	50	Approx. 50MV Drop	2841001*	Approx. 50MV Drop	2842001
2	40		2841002		2842002
5	50		2841005*		2842005
10	50		2841010*		2842010

DC VOLTMETERS

2½" MODEL 2021

Range	Scale Div.	OHMS PER VOLT			
		Pivot & Jewel	Catalog No. †	Taut Band	Catalog No. †
2	40	1000	1841002	1000	1842002
5	50		1841005*		1842005
10	50		1841010*		1842010
15	30		1841015		1842015
25	50		1841025		1842025
30	60		1841030		1842030
50	50		1841050*		1842050
100	50		1841100		1842100
150	30		1841150*		1842150
200	40		1841200*		1842200
300	60	↓	1841300*	↓	1842300
500	50		1841500		1842500

3½" MODEL 2031

Range	Scale Div.	OHMS PER VOLT			
		Pivot & Jewel	Catalog No. †	Taut Band	Catalog No. †
2	40	1000	1841002	1000	1842002
5	50		1841005		1842005
10	50		1841010*		1842010
15	75		1841015		1842015
25	50		1841025*		1842025
30	60		1841030		1842030
50	50		1841050*		1842050
100	50		1841100		1842100
150	75		1841150*		1842150
200	40		1841200		1842200
300	60	↓	1841300*	↓	1842300
500	50		1841500		1842500

4½" MODEL 2041

Range	Scale Div.	OHMS PER VOLT			
		Pivot & Jewel	Catalog No. †	Taut Band	Catalog No. †
2	40	1000	1841002	1000	1842002
5	50		1841005		1842005
10	50		1841010*		1842010
15	75		1841015		1842015
25	50		1841025		1842025
30	60		1841030		1842030
50	50		1841050*		1842050
100	50		1841100		1842100
150	75		1841150*		1842150
200	40		1841200		1842200
300	60	↓	1841300*	↓	1842300
500	50		1841500		1842500

5½" MODEL 2051

Range	Scale Div.	OHMS PER VOLT			
		Pivot & Jewel	Catalog No. †	Taut Band	Catalog No. †
2	40	1000	1841002	1000	1842002
5	50		1841005		1842005
10	50		1841010		1842010
15	75		1841015		1842015
25	50		1841025		1842025
30	60		1841030		1842030
50	50		1841050		1842050
100	50		1841100		1842100
150	75		1841150		1842150
200	40		1841200		1842200
300	60	↓	1841300	↓	1842300
500	50		1841500		1842500

AC VOLTMETERS, RECTIFIER TYPE

2½" MODEL 2022

Range	Scale Div.	OHMS PER VOLT			
		Pivot & Jewel	Catalog No. †	Taut Band	Catalog No. †
15	30	1000	1841015	1000	1842015
30	60		1841030		1842030
75	75		1841075		1842075
150	75		1841150		1842150
300	60		1841300		1842300

3½" MODEL 2032

Range	Scale Div.	OHMS PER VOLT			
		Pivot & Jewel	Catalog No. †	Taut Band	Catalog No. †
15	30	1000	1841015	1000	1842015
30	60		1841030		1842030
75	75		1841075		1842075
150	75		1841150*		1842150
300	60		1841300		1842300

4½" MODEL 2042

Range	Scale Div.	OHMS PER VOLT			
		Pivot & Jewel	Catalog No. †	Taut Band	Catalog No. †
15	30	1000	1841015	1000	1842015
30	60		1841030		1842030
75	75		1841075		1842075
150	75		1841150		1842150
300	60		1841300		1842300

5½" MODEL 2052

Range	Scale Div.	OHMS PER VOLT			
		Pivot & Jewel	Catalog No. †	Taut Band	Catalog No. †
15	75	1000	1841015	1000	1842015
30	60		1841030		1842030
75	75		1841075		1842075
150	75		1841150		1842150
300	60		1841300		1842300

* Stock item.

† When ordering meters, model number must precede catalog number.

Δ When ordering meter with optional black painted front change second digit of catalog number "8" to "7."

WESTON INSTRUMENTS, INC. 614 FRELINGHUYSEN AVENUE, NEWARK, N. J. 07114

WESTON 2000 Series Panel Meters

AC MICROAMMETERS, RECTIFIER TYPE

2½" MODEL 2022

Range	Scale Div.	Pivot & Jewel Resistance Ohms (Approx.)	Catalog No. †	Taut Band Resistance Ohms (Approx.)	Catalog No. †
100	50	5500	5841100	5500	5842100
200	40	2600	5841200	2400	5842200
500	50	1000	5841500	1000	5842500

3½" MODEL 2032

Range	Scale Div.	Pivot & Jewel Resistance Ohms (Approx.)	Catalog No. †	Taut Band Resistance Ohms (Approx.)	Catalog No. †
100	50	5500	5841100	5500	5842100
200	40	2600	5841200	2400	5842200
500	50	1000	5841500	1000	5842500

4½" MODEL 2042

Range	Scale Div.	Pivot & Jewel Resistance Ohms (Approx.)	Catalog No. †	Taut Band Resistance Ohms (Approx.)	Catalog No. †
100	50	5500	5841100	5500	5842100
200	40	2600	5841200	2400	5842200
500	50	1000	5841500	1000	5842500

5½" MODEL 2052

Range	Scale Div.	Pivot & Jewel Resistance Ohms (Approx.)	Catalog No. †	Taut Band Resistance Ohms (Approx.)	Catalog No. †
100	50	5500	5841100	5500	5842100
200	40	2600	5841200	2400	5842200
500	50	1000	5841500	1000	5842500

AC MILLIAMMETERS, RECTIFIER TYPE

2½" MODEL 2022

Range	Scale Div.	Pivot & Jewel Resistance Ohms (Approx.)	Catalog No. †	Taut Band Resistance Ohms (Approx.)	Catalog No. †
1	50	530	4841001	500	4842001
2	40	280	4841002	270	4842002
5	50	115	4841005	115	4842005

3½" MODEL 2032

Range	Scale Div.	Pivot & Jewel Resistance Ohms (Approx.)	Catalog No. †	Taut Band Resistance Ohms (Approx.)	Catalog No. †
1	50	530	4841001	500	4842001
2	40	280	4841002	270	4842002
5	50	115	4841005	115	4842005

4½" MODEL 2042

Range	Scale Div.	Pivot & Jewel Resistance Ohms (Approx.)	Catalog No. †	Taut Band Resistance Ohms (Approx.)	Catalog No. †
1	50	530	4841001	500	4842001
2	40	280	4841002	270	4842002
5	50	115	4841005	115	4842005

5½" MODEL 2052

Range	Scale Div.	Pivot & Jewel Resistance Ohms (Approx.)	Catalog No. †	Taut Band Resistance Ohms (Approx.)	Catalog No. †
1	50	530	4841001	500	4842001
2	40	280	4841002	270	4842002
5	50	115	4841005	115	4842005

* Stock Item.

† When ordering meters, model number must precede catalog number.

Δ When ordering meter with optional black painted front change second digit of catalog number "8" to "7."

AC IRON VANE

AC VOLTMETERS Iron Vane (Pivot & Jewel Only) Frequency: 25-125 Hz^Δ

Range	2½" MODEL 2024 Scale Div.	Nominal Resistance	3½" MODEL 2034 Scale Div.	Nominal Resistance	4½" MODEL 2044 Scale Div.	Nominal Resistance	CATALOG NO.
7.5	75	37.5	75	37.5	75	37.5	1841975
10	50	66.5	50	66.5	50	66.5	1841010***
15	75	150	75	150	75	150	1841015***
25	50	500	50	500	50	500	1841025
30	60	600	60	600	60	600	1841030
50	50	1665	50	1665	50	1665	1841050*
100	50	6700	50	6700	50	6700	1841100
150	75	15,000	75	15,000	75	15,000	1841150*
300	60	60,000	60	60,000	60	60,000	1841300*
500	50	100,000	50	100,000	50	100,000	1841500**

Δ Can be adjusted for 400 (± 10%) Hz

NOTE: Power Consumption: 150 Volt Range at 115 Volts, 1.15 Watts; at 60 Hz, 1.15 Volt-Ampere

AC AMMETERS Iron Vane (Pivot & Jewel Only) Frequency: 25-500 Hz

Range	2½" MODEL 2024 Scale Div.	Nominal Resistance	3½" MODEL 2034 Scale Div.	Nominal Resistance	4½" MODEL 2044 Scale Div.	Nominal Resistance	CATALOG NO.
1	50	25	50	25	50	25	2841001*
2	40	06	40	062	40	062	2841002
3	60	025	60	025	60	025	2841003
5	50	016	50	016	50	016	2841005*
10	50	0045	50	0045	50	0045	2841010*
15	75	0015	75	0025	75	0025	2841015
20	40	0011	40	0011	40	0011	2841020*
25	50	0011	50	0011	50	0011	2841025**
30	60	00056	60	00056	60	00056	2841030*
50	50	00027	50	00027	50	00027	2841050*

NOTE: Power Consumption: 5 Ampere Range at 5 Amperes, 0.45 Watts; 0.45 Watts; at 60 Hz, 0.45 Volt-Ampere

AC MILLIAMMETERS Iron Vane (Pivot & Jewel Only) Frequency: 25-500 Hz

Range	2½" MODEL 2024 Scale Div.	Nominal Resistance	3½" MODEL 2034 Scale Div.	Nominal Resistance	4½" MODEL 2044 Scale Div.	Nominal Resistance	CATALOG NO.
10	20	2550	50	2550	50	2550	4841010
50	25	100	50	100	50	100	4841050*
100	20	25	50	25	50	25	4841100*
200	40	6.3	40	6.33	40	6.33	4841200
250	25	6.3	50	4.0	50	4.0	4841250
500	25	1.0	50	1.0	50	1.0	4841500*

* Denotes Stock Item

** Model 2044 In Stock Only

*** Models 2034, 2044 In Stock Only

2000 SERIES VU METERS

Model	Catalog No.	Scale Type
2022	3841001*	Type 30 A scale
	3841002	Type 30 B scale
2032	3841001*	Type 30 A scale
	3841002	Type 30 B scale

* Stock item.

† When ordering meters, model number must precede catalog number.

Δ When ordering meter with optional black painted front change second digit of catalog number "8" to "7."

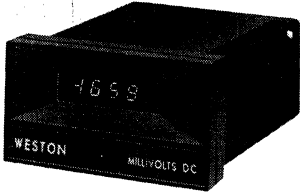
External Illumination Kits Available

Weston VU Meters are available with Type A or Type B scales. The Type A scale stresses the level in VU units for monitoring wire lines. The Type B scale emphasizes percent use of transmitter output and is the standard for broadcast service. The VU meter is designed to read zero VU, or 100%, with 1.228 volts AC applied to the meter and a 3600 ohm series resistor. This represents 4dB above 1 MW in 600 ohms.

WESTON INSTRUMENTS, INC. 614 FRELINGHUYSEN AVENUE, NEWARK, N. J. 07114

WESTON® Digital Panel Meters

MODEL 1220 (BIPOLAR)



Also available for AC operation as Model 1221

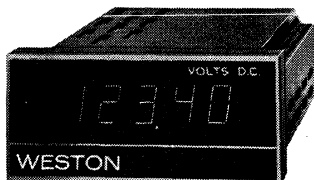
Features

- All digital logic circuitry contained on a single MOS LSI plug-in chip—added reliability
- LED plug-in readout—added reliability
- Instant accuracy—requires no warm-up time
- Requires only 4 sq. in. space
- Complete instrument uses approximately 3/4 watt power—conservatively rated to operate in 60°C ambient—added reliability
- Fixed or remote programmed decimal points
- Range change easily accomplished—simplifying stocking requirements
- Input vs readout "slope" changes easily accomplished
- Ruggedized—engineered to meet Military shock and vibration specs.—exceeds requirements of ACA C39.1 specifications for analog panel meters
- Model 1220 weighs less than 4 oz.

SPECIFICATIONS

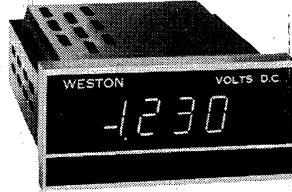
Full Scale Ranges	
Volts:	Input Impedance:
0—100 millivolts	>100 megohms
0—1 volt	>100 megohms
0—10 volts	5 megohms
0—100 volts	5 megohms
0—1000 volts	5 megohms
Current:	Input Impedance:
0—10 microamps	10 K ohms
0—100 microamps	1 K ohms
0—1 milliamp	100 ohms
0—10 milliamps	10 ohms
0—100 milliamps	1 ohm
Accuracy:	±0.1% of reading ±1 digit @ 25°C ±10°C
Overrange:	100% (reads 1999) except on 1000V range (Stated accuracy applies to full overrange.)
Readout:	3 1/2 digits, 7 segment LED
Out-of-Range Indication:	Flashing "1" in most significant digit with blanking of the remaining digits
Operating Temperature Range:	0-60°C (32-140°F)
Temperature Coefficient:	±0.01% F.S. ±1 digit (±0.005% reading/°C)
Common Mode Rejection:	Battery operation: > 120 dB Line operation: 80 dB
Normal Mode Rejection:	30 dB at 60 Hz
Sampling Rate:	> 3 per second
Response Time:	< 1.5 seconds
Power Requirements:	Model 1220: +5.5 volts DC ±10% (75 watts) Model 1221: 117 volts ±10% or 234 volts ±10% 50 to 400 Hz
Storage Temperature:	-40°C to 70°C
Weight:	Approximately 4 oz.

NOTE: Input PC board connectors are not supplied with the DPM. They may be ordered as an accessory under part No. 9790-0273883.



Model 1234

MODEL 1230



Available in 2 1/2 Digit as Model 1232

Features

- Dual Slope Integration* A/D Converter
- Automatic bipolar operation
- Automatic zeroing
- Reliable TTL Logic and C-MOS analog gates
- 100% overrange (except 1 KV range)
- 2 nA maximum input bias current
- 7.5 conversions per second
- 0.55" Sperry displays
- 80 dB CMRR
- 25 dB NMRR (10 dB on 1 volt range)
- Signal and control terminals:
 - Hold • Print Command • Outrange
 - Polarity

SPECIFICATIONS

Full Scale Ranges:	
Volts:	Input Impedance:
0—100 millivolts	>100 megohms
0—1 volt	>1000 megohms
0—10 volts	5 megohms
0—100 volts	5 megohms
0—1000 volts	5 megohms
Current:	
0—10 microamps	10K
0—100 microamps	1K
0—1 milliamp	100 ohms
0—10 milliamps	10 ohms
0—100 milliamps	1 ohm
Accuracy:	1230: ±0.1% of reading ±1 digit 1232: ±0.5% of reading ±1 digit
Overrange:	100% except on 1000V range. Stated accuracy applies to full overrange.
Readout:	7 Segment, Sperry Display
Out-of-Range Indication:	"1" in most significant digit with blanking of the remaining digits.
Operating Temperature Range:	0-50°C, (32-122°F)
Temperature coefficient:	±100 PPM/°C
Common Mode Rejection:	80 dB with 1000 ohm/ unbalance at 60 Hz
Storage Temperature:	-40°C to +70°C
Sampling Rate:	7.5 per second
Response Time:	< 1.0 seconds
Power:	117 volts ±10%, 50 Hz to 60 Hz, 4.7 watts. Can be changed to 230 volts ±10% in field.
Weight:	Approximately 13 oz.

Connector supplied as an accessory under P/N 9790-0267253

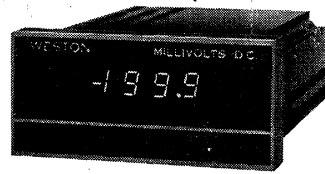
Features

- Dual Slope Integration* A/D Converter
- Automatic bipolar operation
- Reliable TTL Logic
- 3 nA maximum input bias current
- 7.5 conversions per second
- 0.55" Sperry displays
- 80 dB CMRR
- 40 dB NMRR
- Signal and control terminals:
 - Hold • Print Command • Outrange
 - Polarity

SPECIFICATIONS

Accuracy:	
Short-term	±0.01% rdg. ±0.025% f.s.
Long-term	±0.03% rdg. ±0.02% f.s.
Linearity Error:	-(0.01% rdg. + 0.015% f.s.)
Input Bias Current:	3 nanoamperes
A.C. Rejection (NMRR)	40 dB minimum at 60 Hz (standard filter)
Common Mode Rejection	80 dB minimum, 60 Hz and 1000 ohm unbalance
Reading Rate	7.5 per second (15 sec or 30 sec optional)

MODEL 1295 (BI-POLAR)



Limited Bi-Polar version Model 1296;
2 1/2 Digit version Model 1297

Features

- Dual slope integration for long term stability
- All digital logic on a single 24-pin LSI MOS chip.
- 100% overrange (except 1000V range)
- Non-Blinking Display
- Automatic bi-polar operation
- Excellent noise rejection characteristics
- Plug-in readouts
- 7 segment LED's
- Can be mounted entirely from front of panel
- Takes only 7 sq. in. of panel space
- "Of reading" accuracy
- Physically interchangeable with Weston's present 1230 series

SPECIFICATIONS

Full Scale Ranges:	
Volts:	Input Impedance:
0—100 millivolts	>100 megohms
0—1 volt	>1000 megohms
0—10 volts	5 megohms
0—100 volts	5 megohms
0—1000 volts	5 megohms
Current:	
0—10 microamps	10K
0—100 microamps	1K
0—1 milliamp	100 ohms
0—10 milliamps	10 ohms
0—100 milliamps	1 ohm
Accuracy:	±0.1% of reading, ±1 digit
Overrange:	100% (reads 1999) except on 1000V range. Stated accuracy applies to full overrange
Readout:	7 Segment LED's
Out-of-Range Indication:	Flashing "1" in most significant digit with blanking of the remaining digits
Operating Temperature Range:	0-60°C, (32-140°F)
Temperature coefficient:	±0.01% F.S. (±1 digit) ±0.005% rdg./°C
Common Mode Rejection:	100 dB with 1000 ohm unbalance at 60 Hz
Normal Mode Rejection:	30 dB at 60 Hz
Sampling Rate:	> 3 per second
Response Time:	< 1.5 seconds
Power:	117 volts ±10%, 50 Hz to 400 Hz 3 watts. Can be changed to 230 volts ±10% in field.
Weight:	Approximately 13 oz.

NOTE: Input P. C. Board Connectors are not supplied with the DPM. They may be ordered as an accessory - P/N 9790-0267432

Step Input Response	2 seconds max. for full scale step
A/D Conversion Method	Dual Slope Integration*
Display Type	0.55" seven-segment gas plasma (±19999)
Operating Temperature	0° to 50°C
Storage Temperature	-40° to +70°C
Temp. Coefficient	-(50 ppm rdg. + 0.3 digit) /°C
Outrange Indication	Display blanked except MSD "1" and polarity
Control Outputs:	
Hold	Logic "0" retains most recent data
Convert (option)	1 µSec TTL pulse causes conversion within 10mSec
Status Outputs:	
Print Command	Logic "0" signifies valid output data
Polarity	Logic "1" signifies positive input signal
Overrange	Logic "1" signifies signal beyond 19999 counts
BCD Output (option)	1-2-4-8 parallel, TTL (DTL 2 u.i.)
Decimal Selection	External, by grounding appropriate terminal
Power Input	117 v. ± 10%, 50/60 Hz, 6 watts (available for 100, 220, or 240 volt line)
Size	Approx. 1.75" x 4.0" x 4.25" (see drawing)
Weight	Approx 2 pounds (0.9 kg)

WESTON INSTRUMENTS, INC. 614 FRELINGHUYSEN AVENUE, NEWARK, N. J. 07114

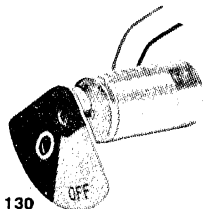
ELECTROMAGNETIC INDICATORS

ALLARD INSTRUMENT DIV.

OF AFI

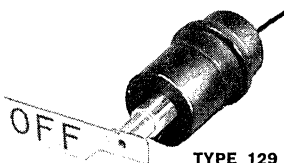
Designed for compact instrument and control panels, Allard miniature electromagnetic indicators provide positive visual signaling, are not subject to burnout, assure high readability in strong incident light. One-piece balanced rotor for dependable performance under

shock and vibration. Models for momentary or latching operation, from DC or rectified AC. All models can be supplied to meet particular requirements for operating voltage, type of display and mounting, to commercial or MIL specifications.



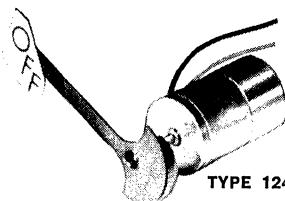
TYPE 130

Tiny indicator, totally enclosed structure. Rotation up to 60°. CW or CCW. For use with plug-on flags. Operates in any position. Case size: $\frac{1}{16}$ " O.D. x $\frac{3}{32}$ " L.



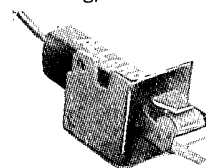
TYPE 129

Short, powerful semaphore indicator for CW or CCW rotation using demountable flag arms. Rotational angles to 60°. Works in any position. $\frac{1}{16}$ " diam. x $\frac{3}{4}$ " long.



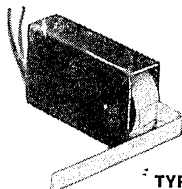
TYPE 124

Miniaturized semaphore indicator with rotation up to 60°. Available with CW or CCW rotation. For use with plug-on flags. Operates in any position. Case size: $\frac{3}{8}$ " O.D. x .575" long.



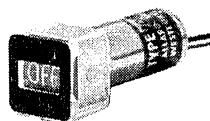
TYPE 219

Relatively inexpensive version of our highly successful instrument and panel mount indicator. Can display legends on the drum face or rotate a flag arm CW or CCW. 2 or 3 position momentary or 2 position latching operation. Indicator drum is .300" wide x .300" diam. Total length is 1 $\frac{1}{8}$ ".



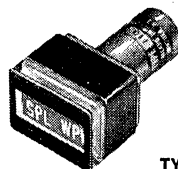
TYPE 109

2 or 3 position slim indicator for narrow locations. Can supply power to rotate a flag arm up to 60° or can display a legend directly on rotor face. CW or CCW for two position operation. .270" x .562" x 1".



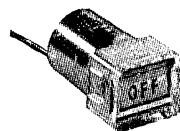
TYPE 108

Small indicator for 2- or 3-position momentary or 2-position latching (memory) indication. Prism-cut plastic lens in head can focus external light on indicator face. Colors or legends as required. 1 $\frac{1}{8}$ " long, $\frac{3}{8}$ " dia., $\frac{1}{16}$ " square head.



TYPE 110

Extended face indicator, permits display of complete words or multiple symbols. For 2- or 3-position momentary, or 2-position latching indication. Plastic capped for dust and moisture protection. Length 1 $\frac{3}{4}$ ", head 1" by $\frac{3}{4}$ ".



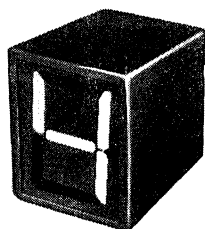
TYPE 120

Tiny broad faced indicator available with 2- or 3-position momentary or 2-position latching indication. Shows colors or legends. Head is $\frac{3}{8}$ " wide by $\frac{1}{16}$ " high. Body $\frac{1}{2}$ " dia. Overall length $\frac{1}{16}$ ".

Types	130	129	124	219	109	108	110	120
D.C. VOLTAGES	To 28	To 40	To 40	To 40	To 40	To 90	To 50	To 40
OPERATING POWER (WATTS)	0.8	0.9	1.0	0.9	1.0	1.0	0.5	0.5
NO. OF CONNECTIONS	2	2	2	2, 3, 4	2, 3, 4	2, 3	2, 3, 4	2, 3
WEIGHT (GRAMS)	10	10.5	5	15	9.	10.6	35	9.5

ELECTROMECHANICAL READOUTS

All units illustrated are made under one or more of the following patents:
Re 2,494,313/3,096,594
3,273,270/3,553,619



TYPE 202

A wide variety of other sizes available in single and multi-unit packages.

Compact digital indicating modules for instrument, data presentation and other display systems. Seven electromechanical indicating segments can be operated in any desired combination by low power DC signals. Momentary or latching types. Windings available from 1 to 30 V, 1 $\frac{1}{16}$ " h. x 1 $\frac{1}{16}$ " w. x 2 $\frac{1}{4}$ " d. Digit size 1 $\frac{1}{2}$ " h. x 1" w. Other digit sizes up to 4" and custom units, with as many lines as necessary, also available. Operating time less than 0.03 sec. Units also supplied with packaged encoders and decoders.

**High Visibility!
Inherent Memory!**

Complete readout display operating as remote repeater of cash register readings. Contains readouts, encoding matrices, pulsing and cycling circuitry and its own power supply. Use of latching (memory) type readouts makes average power consumption negligible. Packaged for all-weather, outdoor use. Uses 4 Type 218 readouts, 4" high.



TYPE 1218
Other sizes available

For literature or quotations on electromechanical instruments and controls, call or write -
ALLARD INSTRUMENT DIV. OF AFI

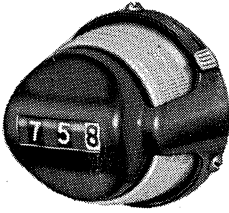
770 MAIN STREET, WESTBURY, L. I., N. Y. 11590

(516) 334-8742

MICRODIAL® COUNTING DIALS

BUNKER
RAMO

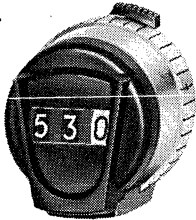
AMPHENOL

**1300 Series, Digital**

Gives you fast, accurate indication of shaft position up to 1,000 turns. All models (3-digit 10-turn, 4-digit, 100-turn, and 5-digit 1,000-turn) mount directly on shaft to be controlled, eliminating backlash. Speed: up to 6,000 counts per minute.

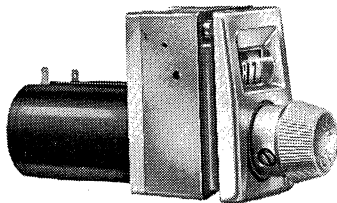
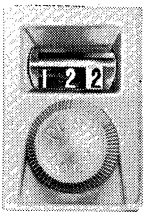
Large, contrasting numerals readable even from angular view because convex windows reduce glare, reflections. Rugged, dust-sealed construction includes Cyclocac* counter wheels, Nylatron* GS gear assemblies, knurled aluminum control knobs. Brake optional. Special readouts are also optional. All models conform to military requirements.

*Reg. TM Borg-Warner Corp.

**1330 Series, Digital**

You get straight-on or angular readout with this illuminated turns-counting Microdial. One-piece lens/window magnifies numerals 1.5x. In exactly 10 turns, unit counts from 000 through 999. Fingertip brake locks settings in place.

This Microdial is sealed against dust yet its snap-on cap makes lamp replacement easy. Standard finishes for color coding: dark or light gray, red, white, and black; other colors and special read outs available on request.

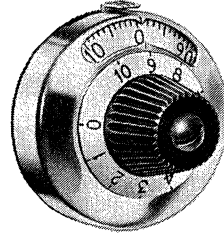
**3100 Series, Digital**

Remarkably accurate (1000:1 indexing accuracy) miniature 3100 Series dial almost makes a standard circular dial look gigantic by comparison. This Microdial measures only $1\frac{1}{8} \times 1\frac{1}{2}$ inches and protrudes only $\frac{25}{32}$ " from a panel.

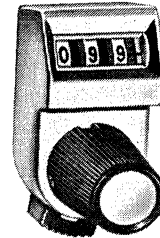
Digits (with illumination optional) are magnified by a convex lens in recessed window. Three-digit, ten-turn dial rotates continuously clockwise or counter clockwise with push-pull fingertip brake to lock settings. This 3100 miniature Microdial will mount on panels from $\frac{1}{16}$ " through $\frac{3}{16}$ " thick.

Standard color: natural brushed aluminum finish.

Amphenol's Dial-Pot assembly saves you time and money... eliminates costly mounting and phasing. If you now buy pots and dials separately, but for the same application, Amphenol can prephase and pre-assemble the 3100 dial to any potentiometer at no extra cost. You simply mount the assembly from rear of panel and wire into your circuit.

**1320 Series, Concentric**

The 1320 series is a $1\frac{1}{4}$ inch diameter 10 turn concentric scale dial with extra large numerals and a wide variety of color combinations including gloss and dull black, satin chrome, and bright chrome. Incorporating Amphenol's exclusive continuous inner dial movement, the 1320 is offered with or without brake. This dial is a rugged, long lasting, highly accurate unit which will meet your most demanding requirements.

**DFD Series, Digital**

- 250 PPM Reading Accuracy.
- High-Density Packaging — Up to 72 Per Sq. Foot!

The DFD is a precision mechanism that provides a direct manual drive for a panel-mounted ten-turn potentiometer and an associated 3-digit readout that registers the drive-shaft rotation in turns, to three significant figures, a vernier wheel providing four graduations intermediate between adjacent digits on the least significant digit counter wheel permits interpolating to 250 parts per million, or less — fully compatible with the resolution and linearity of the average ten-turn precision potentiometer.

The entire assembly is less than one inch wide and less than two inches high, making it feasible to mount up to 72 controls per square foot of panel space, yet the digital display is comfortably readable at all times. It is not hidden by the operator's hand during adjustment and is equipped with a magnifying window that significantly enlarges the numerals and vernier scale for easy viewing from all positions.

Special Options

Amphenol, with the broadest and most versatile concentric scale and digital dial lines in the industry, offers you more than standard units. An example is the 1300 and 1330 series digitals which can be modified to give you such special features as index lines, internal illumination and special readouts. Contact your Amphenol area representative for full details on these and other optional features available to solve your design problems.

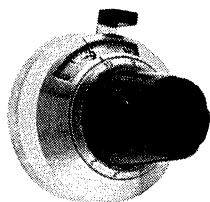
Microdial® — Trademark Reg. U.S. Patent Office.

MICRODIAL® COUNTING DIALS

BUNKER
RAMO

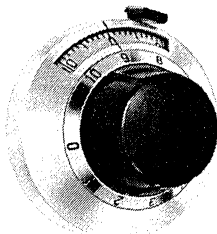
AMPHENOL

Specify AMPHENOL Concentric and Digital Dials for precise potentiometer control



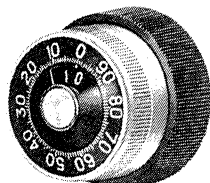
1370 Series, Concentric

Only $\frac{7}{8}$ " diameter ($1\frac{1}{2}$ " with finger brake), this 10-turn Microdial® projects $\frac{29}{32}$ " from panel. Don't let the small size of this dial fool you. It has the same silent gear action of the conventional size Amphenol dials. It indicates angular position of potentiometers and multiturn devices of 10 turns and less with 1000:1 indexing accuracy. Inner dial counts turns, outer dial counts hundredths. Locks rigidly onto shaft to eliminate backlash. Epicyclic internal gearing assures readout accuracy. Finger-tip lever offers positive brake action without disturbing critical settings.



1350 Series, Concentric

The 1350, $1\frac{13}{16}$ " diameter, indicates angular position of potentiometers and multiturn devices of ten turns and less with 1000:1 indexing accuracy. Inner dial counts turns, outer dial counts off hundredths. Locks rigidly onto shaft to prevent backlash. Internal gearing is epicyclic type so you always know exact reading. Fingertip brake holds shaft position until reset.



3000 Series, Concentric

Only 1-inch diameter ($1\frac{15}{32}$ " with finger brake), this 10-turn Microdial projects $\frac{15}{16}$ " from your panel. Without brake, array of these units can be mounted on $\frac{1}{4}$ " centers. And the digits are as large and as easy to read as some dials twice the size.

Clear plastic dial face is sealed and angled to prevent reflections. You can color-key dial functions by choosing from 5 standard brake knob colors and different combinations of numeral and background colors.

Don't let the small size of this Microdial fool you. It has the same silent gear action of the conventional size Amphenol Microdials.

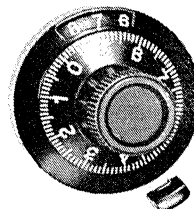


1380 Series

FEATURES . . .

- Precision digital dial designed for precision potentiometers up to ten turns — yet exceptionally low cost.
- Zinc die cast housing and rear cover for demanding applications.
- Indexing accuracy is 1 part in 1,000.
- Modern styling and small size.
- Easy mounting . . . A single set screw mounts dial to potentiometer shaft.

Amphenol's new 1380 Series miniature digital dial is available in a black finish model 1381 or a fine black-grey hammer finish model 1385. The 1380 accepts a $\frac{1}{4}$ " shaft diameter and modification for a $\frac{1}{8}$ " shaft diameter is available as a special option. Fingertip brake assures maintenance of critical dial settings. And the 1380 offers you ultra-modern styling to compliment any panel layout.



DFA Series, Concentric

- 1 Part in 1000 Reading Accuracy.
- Up to 99 Dials Per Square Foot of Panel Space!
- Satin Chrome on Black Finish.

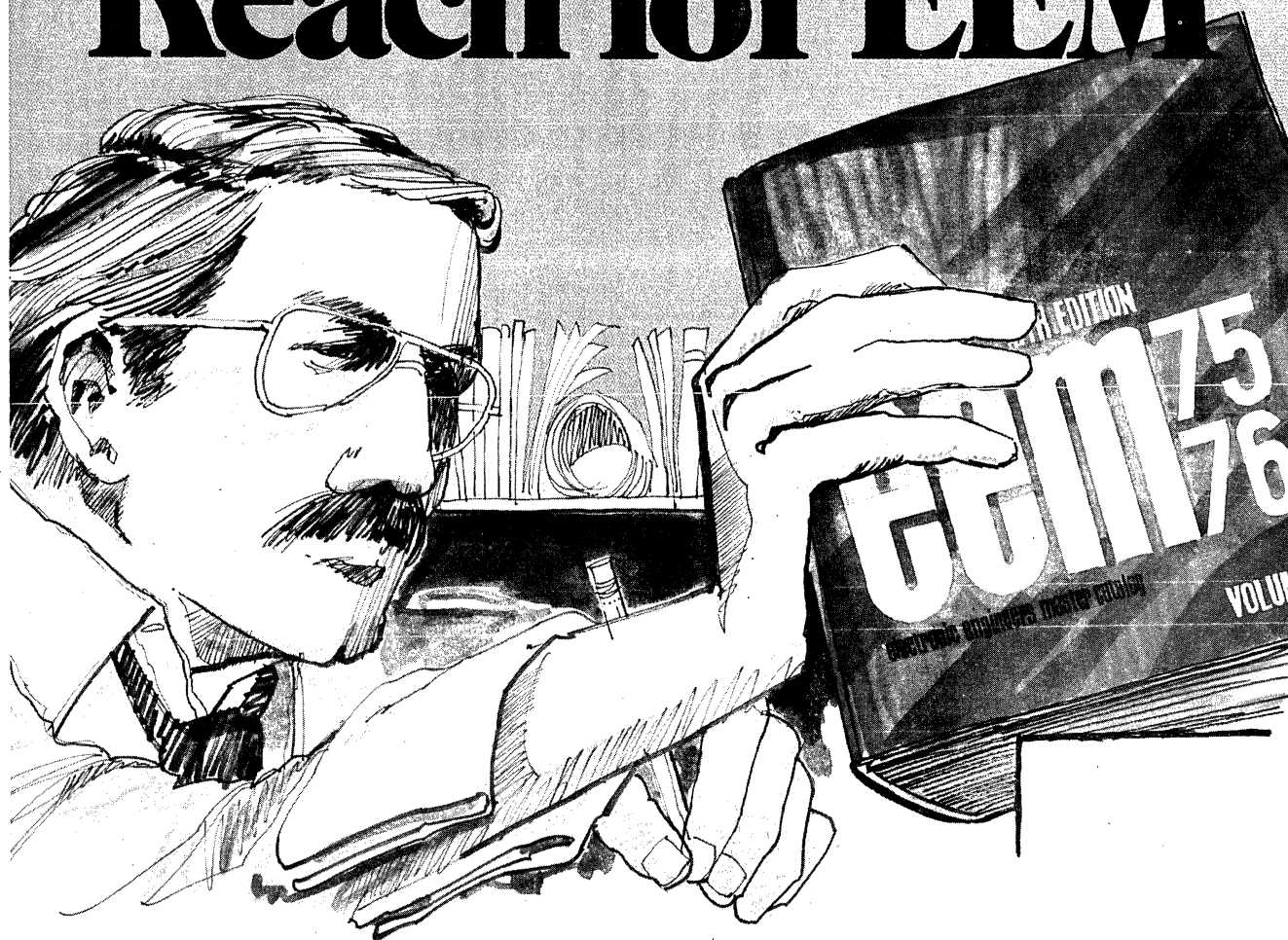
The DFA is an excellent answer to the need for a precision setting and indicating device for use with multi-turn potentiometers, particularly in control-console and computer applications, where the multiplicity of control elements is a significant factor in the total investment, and panel space is often at a premium.

The dial control knob couples directly to the potentiometer shaft, hence there is no backlash in the control of the actual resistance setting. A single numeral in the window above the knob indicates the number of completed turns of the shaft, and the graduated dial integral with the knob indicates in tenths and hundredths the percent of partial turn of the shaft enabling an accuracy in setting of one part per 1000.

Two standard models are available in this control series: The Model DFA-N with satin chrome finish and Model DFA-NB with white numbers on black finish. They feature constant torque that allows easy adjustment, yet maintain settings under conditions of extreme vibration. Both models include a flip-lock lever that applies 25 inch-ounces of torque against accidental displacement, in the locked position, yet allows high-speed rotation and setting when unlocked. The units are only 1.06 inches wide, with a body height of 1.25 inches (1.63 inches including lock lever) enabling grouping of miniature ten-turn potentiometers in control banks of up to 99 elements per square foot of panel space.

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

ARCOLECTRIC SWITCH CORPORATION

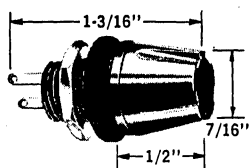
P. O. Box 348 / North Hollywood, California 91603 / Phone (213) 985-3130 / TELEX 65-1349

REFER TO OTHER EEM PAGE FOR ARCOLECTRIC SWITCH PRODUCTS

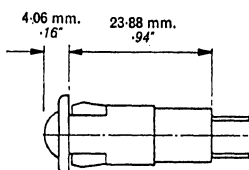
For further details on these and other items, request our catalog.

Lamp Holders for Replaceable Lamps Polycarbonate Lens Red/Amber/Green/Blue/Clear**SL60/L111**

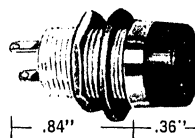
Lens Colors: Trans/Red/
Green/Amber/Blue/Clear
Replaceable Midget Screw
Base Lamp T1-3/4 can be
supplied 6V, 12V, 24V
Mtg hole dia .375"
Solder Terminals

**SL61/B**

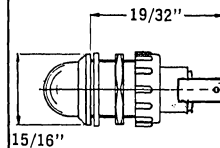
Lens Colors: Trans/Red/
Green/Amber/Blue/Clear
Replaceable Midget Screw
Base Lamp T1-3/4 can be
supplied 6V, 12V, 24V
Mtg hole dia .375"
Solder Terminals

**SL62**

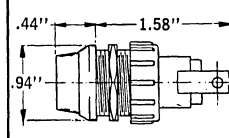
Lens Colors: Red/Green/
Amber/Blue/Clear
Replaceable Midget Flange
Base Lamp T1-3/4 can be
supplied 6V, 14V, 28V
Chrome bezel is "live" but
insulated from panel
.50" dia mtg hole

**SL93/C**

Chrome Bezel and Bushing
Can be supplied with replace-
able T3-1/4 lamps, 6, 14, 28V
.750" dia mtg hole
.250" Tab Terminals
7/16" max panel acceptance
Colors: Transparent/Red/
Green/Blue/Amber/Clear

**SL392/C**

All-Nylon, insulated; chrome
bezel.
Can be supplied with replace-
able T3-1/4 lamps, 6, 14, 28V
.375" dia mtg hole
.250 Tab Terminals
.250" max panel acceptance

**Neon 125V and Low Voltage Versions**

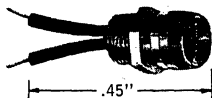
Add to Part Number Voltage required. Ex. SL267/B/125V, SL267/B/28V

Colors Red/Amber/Clear and Green on some types

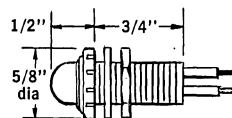
Standard terminals are .250 tabs or 6-inch leads

**SL40 SL41
SL42**

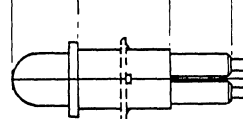
SL40 12/14V .04A
10K hours life
SL41/WL 125V Neon
10K hours life
SL42 LED Min Volt 1.6
Min Curr .02A

**SL78**

For 125V operation; built-in
resistor;
Red/Amber/Green
All-insulated; nylon barrel;
8" leads; .375" dia mtg hole
21/32" max panel acceptance

**SL168/C**

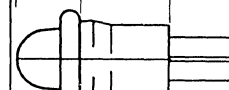
11-94 mm. 16-76 mm. 11-18 mm.
.47" .66" .44"



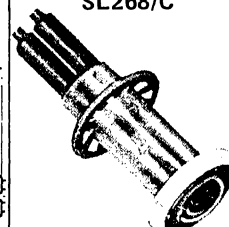
.375 dia Mtg. Hole

SL190

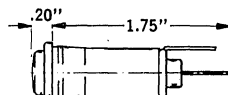
27-7 mm. 11-18 mm.
1-09" .44"
16-76 mm.
.66"



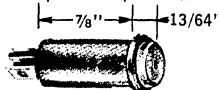
.53 dia Mtg. Hole

SL268/C.375 dia Mtg. Hole
.97 Body

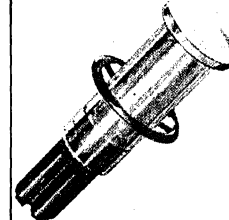
SL66N 125V Neon Red/Amb/Gr
SL67/C 6, 12 or 24V Replace-
able Lamp Red/Amb/Blue/Gr
SL67/N/WL 125V Neon 8" wire
leads; chrome bezel
Red/Amb/Gr
All snap into .50" dia hole
Max panel thickness .045"
SL66N and SL67/C have
.250" Tab Terminals
Wedge Bulbs:
BA7 6V 0.6W
BA7 12V 2.0W

**SL80**.50 dia Mtg. Hole
.59 Body**SL180/K**

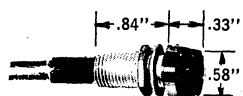
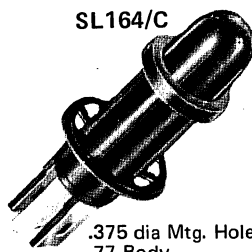
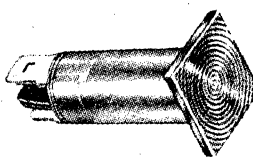
For 125V Operation;
built in resistor
Supplied with push-on
lock washer
Red/Amber
.250 tab terminals
Chrome bezel
Max panel acceptance 3/4"



.50" dia Mtg. Hole

SL265.375 dia Mtg. Hole
.97 Body**SL430**Snap-In Mtg.
1.11 x .452**SL77**

For 125V operation; built-in
resistor
Red/Amber/Green
Nylon barrel; chrome bezel;
8" leads; .375" dia mtg hole
11/16" max panel acceptance

**SL164/C**.375 dia Mtg. Hole
.77 Body**SL186**.50 dia Mtg. Hole
1.19 Body**SL267/B**

For 125V operation;
built in resistor
Snap-in fit;
.375 dia mtg. hole;
8" wire leads
Red/Amber/Green
Chrome bezel
Max panel acceptance .045"



.50" dia Mtg. Hole

COMPLETE
DETAILS
FORWARDED
ON
REQUEST

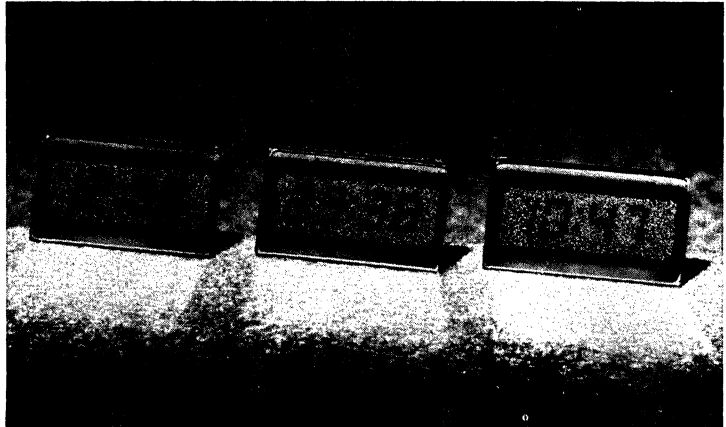
ALL ITEMS SUBJECT TO DESIGN CHANGE WITHOUT NOTICE

Beckman®

LIQUID CRYSTAL DISPLAYS

Beckman Series 701, 702 and 703 Liquid Crystal Displays (LCD's) are field effect displays specifically designed for electronic digital watch module applications. Series 701 and 703 provide standardized mechanical configurations and electrical specifications for 12 hour (3-1/2 digit) applications and Series 702 provides a 24 hour display capability. Significant features include:

- 1.0 μ W typical average power consumption.
- 3 volt and 6 volt standard models in all series.
- CMOS compatible drive characteristics.
- Transmissive designs for back lighting and reflective designs for ambient lighting in all series.
- Excellent readability in high ambient lighting conditions.
- High stability, moisture insensitive liquid crystal materials.



Series 701, 702 and 703

PERFORMANCE SPECIFICATIONS

Parameters Unless otherwise specified $T_A = +25^\circ\text{C}$ and test voltages are 32 Hz square wave, $3.0 \pm 0.1 V_{\text{rms}}$ or $7.0 \pm 0.1 V_{\text{rms}}$	Series 701/702/703						
	R3 & T3			R6 & T6			Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	
Operating Voltage	2.8	3.0	3.2	6.0	7.0	8.0	V_{rms}
DC drive component allowable			25			25	mV
Operating frequency range (Note 1)	25		100	25		100	Hz
Dynamic current (all segments ON)		300	600		250	450	nA
Capacitance (all segments ON)		325	650		225	400	pF
DC resistance (all segments ON)	100	300		100	400		$M\Omega$
Visual threshold 10% ON	0.5			1.0			V_{rms}
Visual threshold 90% ON			2.7			5.7	V_{rms}
Response Time (Note 2)							
Segment ON ($T_A = +25^\circ\text{C}$)		250	500		250	500	ms
Segment OFF ($T_A = +25^\circ\text{C}$)		400	600		400	600	ms
Segment ON ($T_A = 0^\circ\text{C}$)		1500	2000		1500	2000	ms
Segment OFF ($T_A = 0^\circ\text{C}$)		2000	3000		2000	3000	ms
Colon (1/2 sec. ON, 1/2 sec. OFF, $T_A = +10^\circ\text{C}$)	visible "blink"			visible "blink"			
Contrast ratio	20:1			20:1			
Operating temperature range (Note 3)	0		+50	0		+50	$^\circ\text{C}$
Storage temperature range (Note 3)	-20		+60	-20		+60	$^\circ\text{C}$

Note 1: The limits shown avoid flicker below 25 Hz and increased power consumption above 100Hz.

Note 2: Time is measured from initial change of state of drive voltage to 90% change in visual state.

Note 3: Extended storage at high temperatures listed may cause polarizer degradation.

CUSTOM CAPABILITY

Variations of standard designs are readily available on a custom basis for any application where low power displays are required (hand held on portable test instruments, calculators, etc.), including:

- Special font styles
- Different background reflectors or polarizers
- Special configurations and sizes
- Other display thicknesses
- Other threshold voltage materials
- Different terminal assignments

Beckman INSTRUMENTS, INC.

HELIPOT DIVISION 2500 Harbor Boulevard, Fullerton, California 92634
(714) 871-4848 • TWX No. 910-592-1260

Beckman

LIQUID CRYSTAL DISPLAYS



Series 705

Beckman Series 705 Liquid Crystal Displays (LCDs) are field effect displays specifically designed for electronic digital watch module applications. Series 705 LCDs provide a continuous 3-1/2 digit display of hours and minutes and also continuously display either seconds or the date as shown above. The word DATE or SEC and the appropriate corresponding digits are typically selected by a pushbutton which will alternately switch the display from one continuous presentation mode to the other. Features include:

- 1.0 μ W typical average power consumption.
- 3 volt and 6 volt standard models.
- CMOS compatible drive characteristics.
- Transmissive designs for back lighting and reflective designs for ambient lighting.
- Excellent readability in high ambient lighting conditions.
- High stability, moisture insensitive liquid crystal materials.

PERFORMANCE SPECIFICATIONS

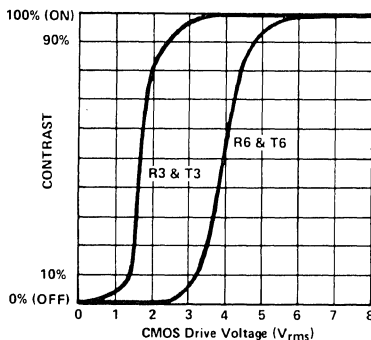
Parameters Unless otherwise specified $T_A = +25^\circ\text{C}$ and test voltages are 32 Hz square wave, 3.0 ± 0.1 V _{rms} or 7.0 ± 0.1 V _{rms}	Series 705						
	R3 & T3			R6 & T6			Units
	Min.	Typ.	Max.	Min.	Typ.	Max.	
Operating Voltage	2.8	3.0	3.2	6.0	7.0	8.0	V _{rms}
DC drive component allowable			25			25	mV
Operating frequency range (Note 1)	25		100	25		100	Hz
Dynamic current (all segments ON)		325	700		300	600	nA
Capacitance (all segments ON)		400	800		300	600	pF
DC resistance (all segments ON)	100	300		100	300		M Ω
Visual threshold 10% ON	0.5			1.0			V _{rms}
Visual threshold 90% ON			2.7			5.7	V _{rms}
Response Time (Note 2)							
Segment ON ($T_A = +25^\circ\text{C}$)		250	500		250	500	ms
Segment OFF ($T_A = +25^\circ\text{C}$)		400	600		400	600	ms
Segment ON ($T_A = 0^\circ\text{C}$)		1500	2000		1500	2000	ms
Segment OFF ($T_A = 0^\circ\text{C}$)		2000	3000		2000	3000	ms
Colon (1/2 sec. ON, 1/2 sec. OFF, $T_A = +10^\circ\text{C}$)	visible "blink"			visible "blink"			
Contrast ratio	20:1			20:1			
Operating temperature range (Note 3)	0		+50	0		+50	$^\circ\text{C}$
Storage temperature range (Note 3)	-20		+60	-20		+60	$^\circ\text{C}$

Note 1: The limits shown avoid flicker below 25 Hz and increased power consumption above 100Hz.

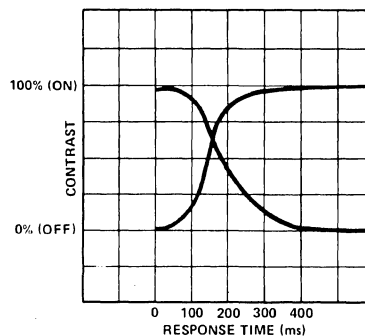
Note 2: Time is measured from initial change of state of drive voltage to 90% change in visual state.

Note 3: Extended storage at high temperatures listed may cause polarizer degradation.

TYPICAL CONTRAST CURVES @ 25°C



TYPICAL RESPONSE TIME @ 25°C



MODEL NUMBER EXPLANATION

Example: 701-R-3

Series designation — 701 — R — 3

R=Reflective type

T=Transmissive type

3 = 3 volt model

6 = 6 volt model

Beckman

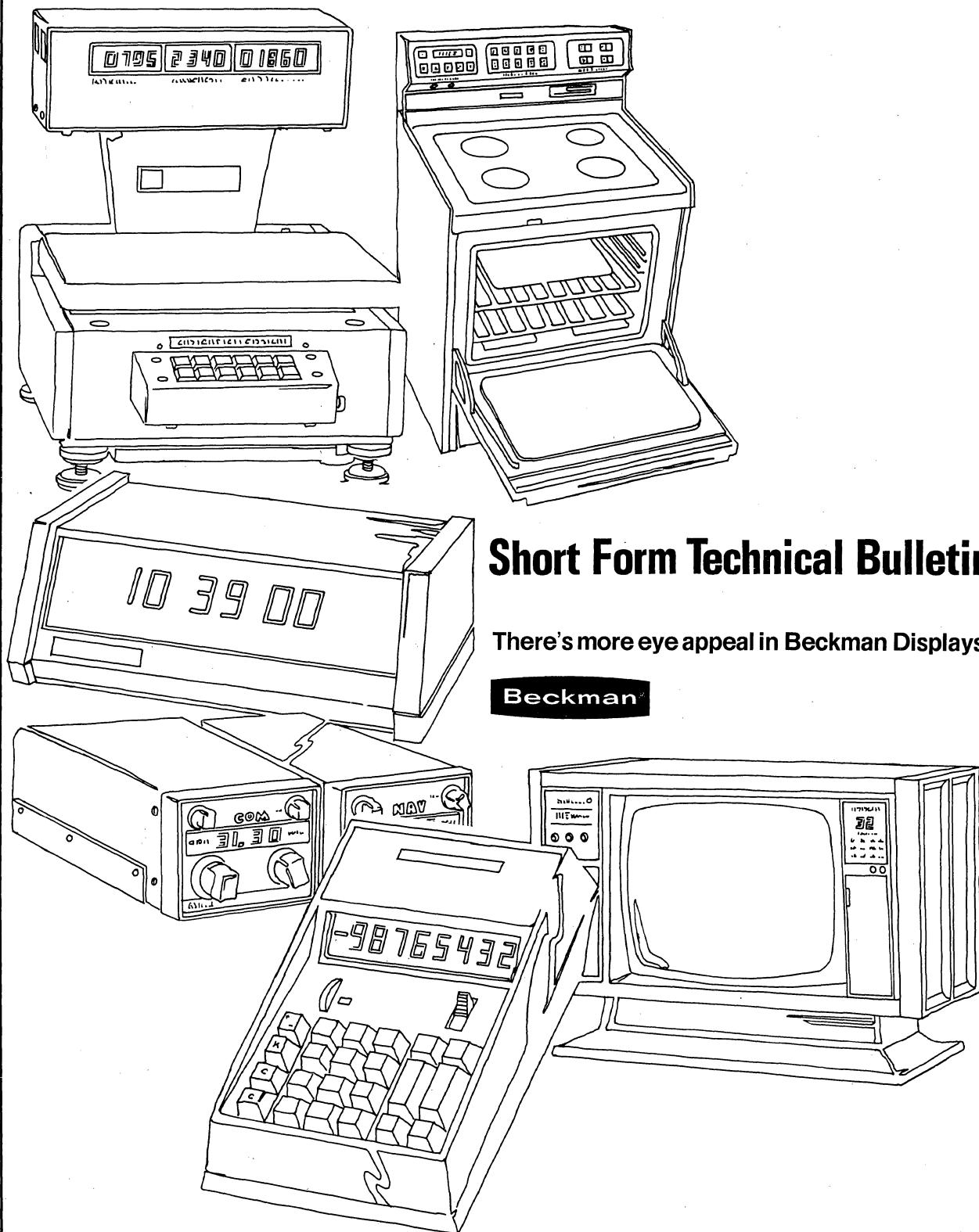
INSTRUMENTS, INC.

HELIPOT DIVISION

2500 Harbor Boulevard, Fullerton, California 92634
(714) 871-4848 • TWX No. 910-592-1260

Beckman[®]

Displays and Accessories



Short Form Technical Bulletin

There's more eye appeal in Beckman Displays!

Beckman[®]

Beckman

INSTRUMENTS, INC.

INFORMATION DISPLAYS OPERATIONS 350 North Hayden Rd. P. O. Box 3579
Scottsdale, Arizona 85257 Phone (602) 947-8371

Beckman®

Display Features

Beckman continues to significantly advance display designs and application technology with the introduction of new and improved devices. Beckman has consolidated their position as a display manufacturer and is established as a leader in the field of planar gas-discharge display technology. Beckman's position in the marketplace is the result of providing devices which represent some of the most *readable* and *reliable* displays available today. Furthermore, their characteristics of low power consumption, low cost and versatility make them ideally suited for virtually any application.

Application and Use

Applications in which Beckman displays can be used are virtually unlimited. Any system or unit that requires a displayed information readout, will be enhanced by the use of Beckman displays. These devices are being used in a wide range of commercial and consumer products, as well as industrial and military applications. Manufacturers are finding that Beckman displays are a cost-effective means by which to improve sales, since they provide the end product with improved readability, reliability and overall appearance.

Readability

Beckman displays produce a brilliant, easily read orange neon glow. This color, which is well within the visual sensitivity spectrum of the human eye, makes the reading of a Beckman display a much less eye fatiguing action than other types or colors of displays presently available in today's marketplace. By comparison, the reading of red monochromatic colored displays can cause eye strain since this color is outside the optimum visual spectrum. Each display is illuminated against a stark black background, thus making it fully readable in any high ambient light condition, including direct sunlight. In addition, that flat planar design allows 130 degree viewing.

Power

Beckman displays use less power than most other display technologies available today. In contrast, a typical 0.27 inch light emitting diode (LED) display requires approximately 0.680 watts per digit, while a Beckman 0.33 inch display requires an average of only 0.200 watts per digit — less than half. Similar comparisons may be made with other gas discharge devices as well. This low power consumption is another good reason for specifying Beckman displays, especially when available power is limited or battery operation is required.

Versatility

Beckman displays are available in four convenient character heights — 0.33, 0.50, 0.55 and 1.0 inches. The small 0.33 inch characters are easily legible to 20 feet while the larger half-inch characters are legible to 40 feet and beyond. Beckman displays with the 0.33 and 0.55 character height are available in 1½-, 2-, 2½- and 3-digit envelopes that can be horizontally stacked in any configuration while maintaining uniform character spacing.

As a further endorsement of Beckman versatility, the 0.55 inch character displays are available in module form for the user who does not wish to design a complete display interface. The modules can be mounted in any digit combination and all module configurations are equipped with complete electronics.

Cost

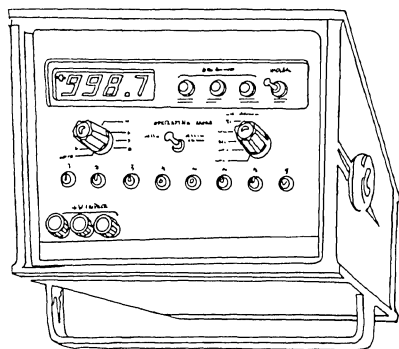
Beckman displays are priced to make them attractive for any application from desk calculators and test instruments to process controls and consumer products. The prices of Beckman displays are a reality now and not a prediction for sometime in the future.

Reliability

All Beckman displays have a 10-year service life. Construction is rugged and compact to ensure total environmental and mechanical reliability in the most demanding application. Beckman's quality control procedures ensure that all shipments are fully tested and that each device meets all published specifications, thus eliminating the bulk of infant mortality in the working design.

Accessories

Beckman offers a full line of related accessories, providing the design engineer with convenience of application and ease of implementation. These accessories include monolithic TTL/DTL compatible decode/drivers, connectors, a 16-position multiplex board, voltage converters, and pin straighteners.

**Beckman**

INSTRUMENTS, INC.

INFORMATION DISPLAYS OPERATIONS 350 North Hayden Rd. P. O. Box 3579
Scottsdale, Arizona 85257 Phone (602) 947-8371

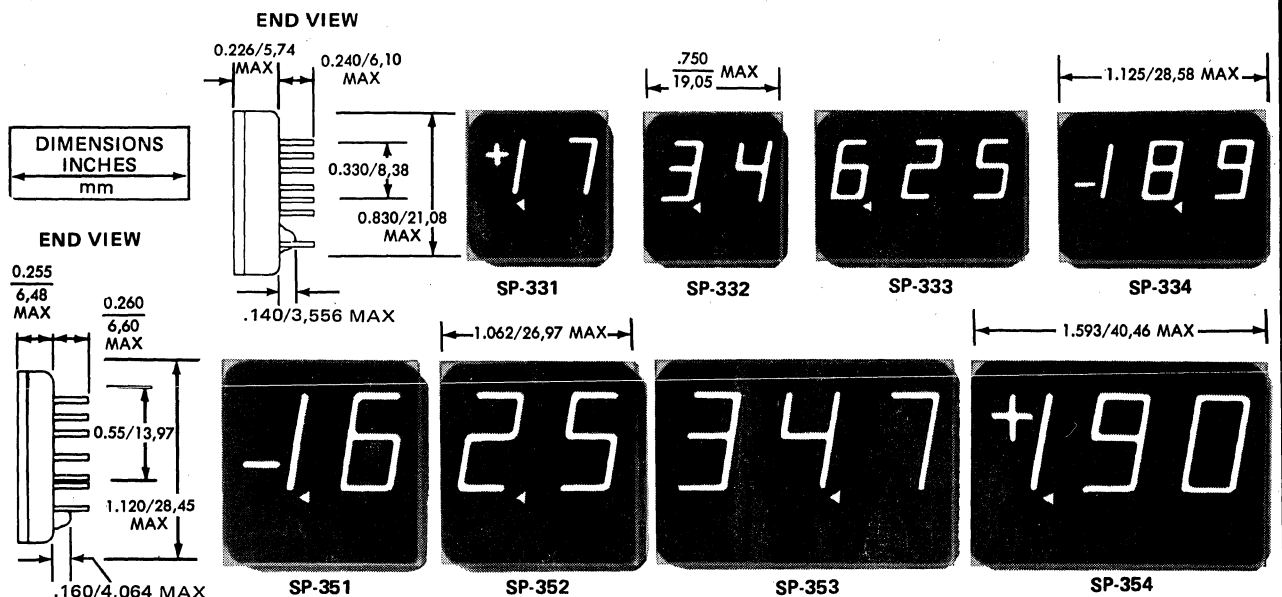
Beckman®

SP-300 Series Displays

SPECIFICATIONS	SP-330 SERIES			SP-350 SERIES		
DC Characteristics	Minimum	Typical	Maximum	Minimum	Typical	Maximum
Display Supply Voltage ⁽¹⁾	160 Vdc	180 Vdc	Note 2	160 Vdc	180 Vdc	Note 2
Anode-to-Anode Differential Voltage ⁽²⁾	—	—	14 Vdc	—	—	14 Vdc
Anode-to-Cathode Voltage Drop (Typical Current)	—	135 Vdc	—	—	135 Vdc	—
Cathode Current — Typical Segment (Seg. "b") ⁽⁴⁾	70 μ A	180 μ A	250 μ A	130 μ A	330 μ A	420 μ A
Cathode Current — Decimal Point ⁽⁴⁾	65 μ A	135 μ A	190 μ A	65 μ A	135 μ A	190 μ A
Cathode Current — Plus Sign	110 μ A	290 μ A	400 μ A	260 μ A	585 μ A	820 μ A
Cathode Current — Minus Sign	50 μ A	135 μ A	185 μ A	120 μ A	270 μ A	380 μ A
Cathode Current — Keep Alive	10 μ A	50 μ A	—	10 μ A	50 μ A	—
Power Dissipation per digit (With all segments lighted and assuming typical segment current)	—	175 mW	—	—	325 mW	—
Operating Temperature	0°C	—	70°C	0°C	—	70°C
Storage Temperature	-55°C	—	125°C	-55°C	—	125°C
Multiplex Characteristics	Minimum	Typical	Maximum	Minimum	Typical	Maximum
Anode On Time ⁽⁵⁾	80 μ sec	200 μ sec	—	80 μ sec	200 μ sec	—
Interdigit Blanking Time ^{(4) (10)}	40 μ sec	55 μ sec	—	40 μ sec	55 μ sec	—
Refresh Period	—	—	Note 7	—	—	Note 7
*Display Supply Voltage ⁽¹⁾	160 Vdc	180 Vdc	Note 2	160 Vdc	180 Vdc	Note 2
Anode Voltage Swing ⁽¹⁾	30 Vdc	45 Vdc	90 Vdc	30 Vdc	45 Vdc	90 Vdc
Cathode Voltage Swing ⁽¹⁾	30 Vdc ⁽⁹⁾	50 Vdc	120 Vdc	30 Vdc ⁽⁹⁾	50 Vdc	120 Vdc
Cathode Bias Voltage ("On" Anode to "Off" Cathode Voltage) ⁽⁹⁾	90 Vdc	115 Vdc	120 Vdc	90 Vdc	115 Vdc	120 Vdc

FEATURES	SP-330 SERIES	SP-350 SERIES
Character Height	0.330 inch/8,38 mm	0.550 inch/13,97 mm
Color	Orange (Neon Glow)	Orange (Neon Glow)
Brightness	210 foot lamberts at typical current	210 foot lamberts at typical current
Viewing Angle	130 degrees	130 degrees
Viewing Distance	20 feet/6,10 meters	40 feet/12,20 meters
Life Expectancy	>10 years	>10 years

The SP-330 and SP-350 Series Displays are designed for interfacing with MOS/LSI and are recommended for use in all dc or multiplexed applications, with or without suppressed (blanked) zeros. The displays can be quickly, easily read even in direct sunlight. Continuous, "no gap" characters make the displays most attractive to users. A keep-alive cathode provides an internal ion source that reduces reionization time to less than 30 microseconds, allows zero suppression, and improves the operation of the display in dark environments and at low temperatures. Units are horizontally stackable in any combination with uniform centerline spacing.



Beckman

INSTRUMENTS, INC.

INFORMATION DISPLAYS OPERATIONS 350 North Hayden Rd. P. O. Box 3579
Scottsdale, Arizona 85257 Phone (602) 947-8371

Beckman®**SP-101 Display****DC CHARACTERISTICS**

	MIN	TYP	MAX
Display Supply Voltage ⁽¹⁾	160 Vdc	180 Vdc	Note 2
Anode-to-Cathode Voltage Drop (segment b = 700 μ a)		135 Vdc	
Cathode Current — Per Segment ^(3,4)	350 μ a	700 μ a	1000 μ a
Cathode Current — Decimal Point	100 μ a	200 μ a	300 μ a
Cathode Current — Comma (decimal point included)	200 μ a	400 μ a	600 μ a
Cathode Current — Each Colon Segment ⁽⁵⁾	50 μ a	100 μ a	150 μ a
Cathode Current — Keep-Alive	15 μ a	75 μ a	—
Power Dissipation (With All Segments Lighted @ 700 μ a Typical) ⁽⁴⁾		725 mW	
Operating Temperature	0°C		70°C
Storage Temperature	-55°C		125°C

MULTIPLEX CHARACTERISTICS

	MIN	TYP	MAX
Anode On Time ^(6,7)	80 μ sec	400 μ sec	—
Refresh Period			Note 6
Display Supply Voltage	160 Vdc	180 Vdc	Note 2
Anode Voltage Swing	30 Vdc	45 Vdc	90 Vdc
Cathode Voltage Swing	30 Vdc ⁽⁸⁾	50 Vdc	120 Vdc
Cathode Bias Voltage ("ON" Anode to "OFF" Cathode Voltage) ⁽⁹⁾	90 Vdc	110 Vdc	120 Vdc

NOTES

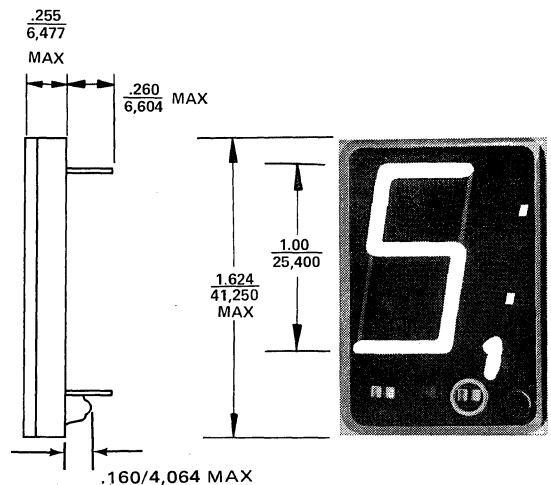
- The minimum recommended supply voltage required to ionize the display is 160 volts DC. After the display has ionized, the voltage drop is approximately 135 volts. Typical cathode current of 700 μ a is assumed.
- Display supply voltage (including ripple) should not exceed 200 Vdc when display is used with DD-700 or DD-702 decoder/driver. Higher display supply voltages are acceptable when the drive device breakdown exceeds 80 volts DC.
- All segment currents are ratioed to b segment.

a, d, f, and g Current Ratio	1.00
c Current Ratio	1.25
e Current Ratio	1.20
- The lowest current for even glow on the largest segment is 350 μ a. Currents up to 1.5 times the typical current may be used, however, life expectancy may be reduced by operation at excessively higher currents. For multiplexed (time shared) operation segment currents may be increased to 2.8 mA with 0.25 or smaller duty cycle.
- To ensure uniform operation of the two colon cathodes, it is recommended that each cathode have its own current limiting device (resistor or current sink). The current listed is the current required for each colon segment.
- Keep-alive is recommended in all multiplexed applications. Three (3) milliseconds is maximum refresh period without keep-alive. Ten (10) milliseconds is typical with keep-alive.
- No anode or cathode blanking is required for the display to perform properly, however, some blanking may be advantageous to eliminate time overlap of signals due to circuit characters.
- Under specific conditions, Cathode Voltage Swings of as low as 30 volts are acceptable.
- The combination of Cathode Bias Voltage and Cathode Voltage Swing must be within recommended display supply voltage.

The SP-101 is a planar, neon gas discharge display similar to the Beckman SP-300 series alphanumeric product family. It is intended to fill the need for display readability at distances greater than 40 feet/12 meters.

The SP-101 is recommended for either DC or multiplexed applications, with or without suppressed zeroes. The display can be quickly and easily read even in direct sunlight. Continuous, "no gap" characters make the display most attractive to users.

A keep-alive cathode provides an internal ion source that reduces reionization time to less than 30 micro-seconds. This enhances dynamic response and improves multiplex, low temperature and dark ambient performance. The units may be evenly or randomly spaced to build any display field desired.

**Beckman**

INSTRUMENTS, INC.

INFORMATION DISPLAYS OPERATIONS 350 North Hayden Rd. P. O. Box 3579
 Scottsdale, Arizona 85257 Phone (602) 947-8371

Beckman

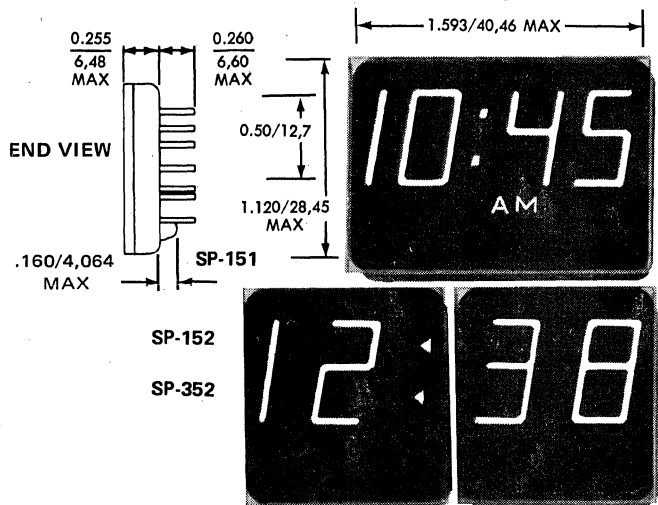
SP-100 Clock Displays

SPECIFICATIONS		SP-151			SP-152/SP-352		
DC Characteristics		Minimum	Typical	Maximum	Minimum	Typical	Maximum
Display Supply Voltage ⁽¹⁾		160 Vdc	180 Vdc	Note 2	160 Vdc	180 Vdc	Note 2
Anode-to-Anode Differential Voltage ⁽¹⁾		—	—	14 Vdc	—	—	14 Vdc
Anode-to-Cathode Voltage Drop (Typical Current)		—	135 Vdc	—	—	135 Vdc	—
Cathode Current — Typical Segment (Seg. "b") ⁽⁴⁾		125 μ A	300 μ A	385 μ A	130 μ A	330 μ A	420 μ A
Cathode Current — Decimal Point ⁽⁴⁾		65 μ A	135 μ A	190 μ A	65 μ A	135 μ A	190 μ A
Cathode Current — Colon (both colons tied together) ⁽⁴⁾		90 μ A	225 μ A	315 μ A	130 μ A	270 μ A	380 μ A
Cathode Current — A ⁽⁴⁾		100 μ A	245 μ A	340 μ A	—	—	—
Cathode Current — P ⁽⁴⁾		85 μ A	205 μ A	285 μ A	—	—	—
Cathode Current — M ⁽⁴⁾		140 μ A	330 μ A	460 μ A	—	—	—
Cathode Current — Keep Alive		10 μ A	50 μ A	—	10 μ A	50 μ A	—
Power Dissipation — (One digit With All Segments Lighted, 330 μ A typical) ⁽⁴⁾		—	300 mW	—	—	325 mW	—
Operating Temperature		0°C	—	70°C	0°C	—	70°C
Storage Temperature		-55°C	—	125°C	-55°C	—	125°C
Multiplex Characteristics		Minimum	Typical	Maximum	Minimum	Typical	Maximum
Anode On Time (typical clock circuit) ⁽⁵⁾		80 μ sec	400 μ sec	—	80 μ sec	400 μ sec	—
Interdigit Blanking Time (segment = 825 μ A @ 180 V) ^{(4) (10)}		50 μ sec	100 μ sec	—	40 μ sec	80 μ sec	—
Refresh Period		—	—	Note 7	—	—	Note 7
Display Supply Voltage		160 Vdc	180 Vdc	Note 2	160 Vdc	180 Vdc	Note 2
Anode Voltage Swing		30 Vdc	45 Vdc	90 Vdc	30 Vdc	45 Vdc	90 Vdc
Cathode Voltage Swing ⁽⁸⁾		30 Vdc ⁽⁹⁾	50 Vdc	120 Vdc	30 Vdc ⁽⁹⁾	50 Vdc	120 Vdc
Cathode Bias Voltage ("On" Anode to "Off" Cathode Voltage) ⁽⁸⁾		90 Vdc	115 Vdc	120 Vdc	90 Vdc	115 Vdc	120 Vdc
FEATURES		SP-151			SP-152		
Character Height		0.50 inch/12,7 mm			0.55 inch/13,97 mm		
Color		Orange (Neon Glow)			Orange (Neon Glow)		
Brightness		200 foot lamberts at typical current			200 foot lamberts at typical current		
Viewing Angle		130 degrees			130 degrees		
Viewing Distance		40 feet/ 12,20 meters			40 feet/ 12,20 meters		
Life Expectancy		>10 years			>10 years		

NOTES: (Apply to both SP-100 & SP-300 Series)

- The minimum recommended voltage required to ionize the display is 160 Volts dc. After ionization, the voltage drop across the display is approximately 135 Volts. Typical cathode current of 180 μ A is assumed for the SP-330 Series, 300 μ A for the SP-151 Series and 330 μ A for the SP-350 Series.
- Display supply voltage (including ripple) should not exceed 200 Vdc when display is used with DD-700 or DD-702 Decoder/Driver. Higher display supply voltages are acceptable when devices having a higher breakdown voltage are used. Current must be limited as specified.
- Lighted cathodes on all digits with independent current limiting. For bussed cathodes (multiplexed operation), 90 Volts is permissible.
- The lowest current for an even glow on segment b (reference segment) is 125 μ A for the SP-151, 130 μ A for the SP-152, 70 μ A for the SP-330 Series, and 130 μ A for the SP-350 Series. Currents up to 1.5 times the typical current may be used, however, life expectancy may be reduced by dc operation above the maximum current limit. For multiplexed operation, segment currents may be increased to 4 times typical dc rating, assuming a 0.25 or smaller duty cycle.
- Anode On Time assumes typical keep-alive current and typical anode supply voltage.
- Specified blanking time assumes 520 μ A typical segment current for the SP-330 Series and 990 μ A typical segment current for the SP-350 Series with 180 Vdc supply voltage. Blanking requirements are strongly dependent upon the mode of multiplex operation and upon the segment current used.
- Three milliseconds is the maximum refresh period without keep-alive. Using keep-alive can extend the acceptable refresh period to 10 milliseconds.
- The total display voltage (considering cathode bias and cathode swing) must be within the recommended display supply voltage.
- Under specific conditions, Cathode Voltage Swings of as low as 30 Volts are acceptable.
- The colons, AM and PM must have same blanking as any other cathode, and are only enabled during their respective digit times.

Beckman Clock Displays are designed for interfacing with MOS/LSI clock chips. They are recommended for use in all dc or multiplexed applications. The displays can be quickly, easily read even in direct sunlight. Continuous, "no gap" characters make the displays most attractive to users. A keep-alive cathode provides an internal ion source that reduces reionization time to less than 30 microseconds, allows zero suppression and improves operation of displays in dark environments and at low temperatures.



Beckman INSTRUMENTS, INC.

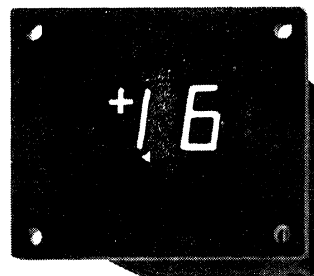
INFORMATION DISPLAYS OPERATIONS 350 North Hayden Rd. P. O. Box 3579
Scottsdale, Arizona 85257 Phone (602) 947-8371

Beckman®

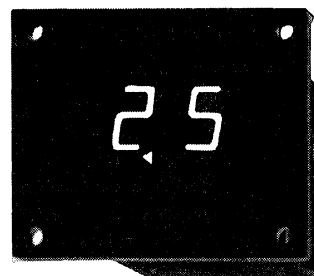
SM-800 Series Display Modules

Type	Description		Electronics	Input
	Digit Positions	Digits		
SM-851	2	1-1/2	decoder, latch	BCD
SM-852	2	2	decoder, latch	BCD
SM-853	3	3	decoder, latch	BCD
SM-854	3	2-1/2	decoder, latch	BCD
SM-855	2	1-1/2	decoder, latch, counter	serial count
SM-856	2	2	decoder, latch, counter	serial count
SM-857	3	3	decoder, latch, counter	serial count
SM-858	3	2-1/2	decoder, latch, counter	serial count

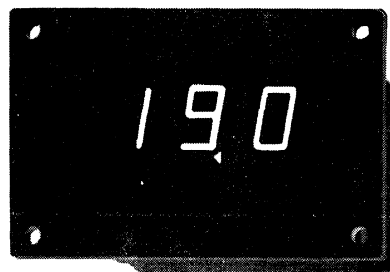
SM-851



SM-852



SM-853

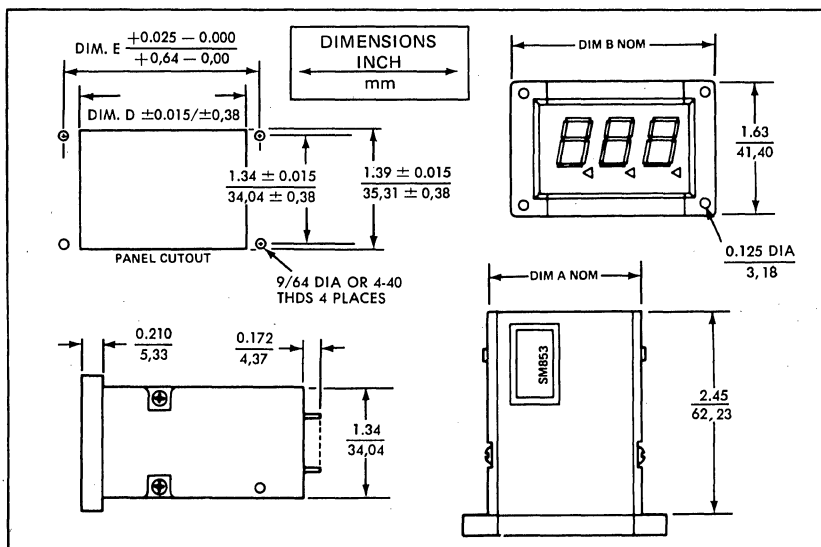
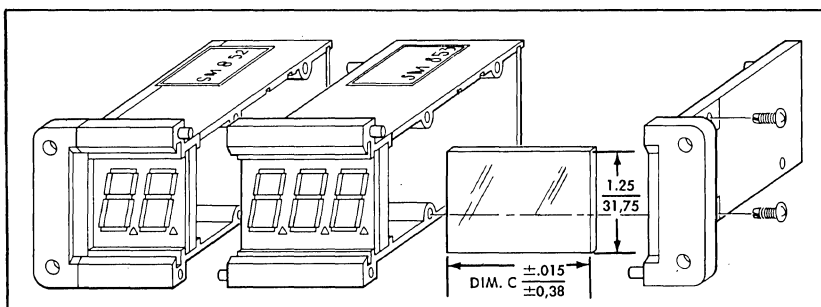


MECHANICAL SPECIFICATIONS, INCH/MM

No. Digits	Body Width Dim A Nom	Bezel Width Dim B Nom	Filter Size 1.25/31,8x Dim C ± 0.015/±,38	Panel Cutout Dim D	Hole Spacing Dim E +0.25/0,64 -0.000/0,00
2	1.30/33,0	1.98/50,3	1.51/38,4	1.42/36,1	1.68/42,7
3	1.83/46,5	2.51/63,8	2.04/51,8	1.94/49,3	2.21/56,1
4	2.40/61,0	3.08/78,2	2.62/66,5	2.52/64,0	2.78/70,6
5	2.93/74,4	3.61/91,7	3.15/80,0	3.05/77,5	3.31/84,1
6*	3.46/87,9	4.14/105,2	3.68/93,5	3.58/90,9	3.84/97,5
7	4.03/102,4	4.71/119,6	4.26/108,2	4.16/105,7	4.41/112,0
8**	4.56/115,8	5.24/133,1	4.79/121,7	4.69/119,1	4.94/125,5

*Assumes two each three digit displays

**Assumes two each three digit displays and one each two digit displays



The SM-800 Series modules provide the user with a modularly expandable display, complete electronics, and ready-to-mount convenience. The series is available in 1½-, 2-, 2½-, and 3-digit configurations that can be mounted individually or as multi-digit displays. These expanded displays are achieved by horizontally stacking two or more modules together. The maximum number of digits thus attainable is theoretically unlimited since each module contains its own drive and decode electronics. The SM-855, SM-856, SM-857 and SM-858 modules are supplied with counters in addition to the decoder/drivers and the latch provided in the SM-851, SM-852, SM-853 and SM-854.

The physical design of the package allows for easy mounting of the module(s). The ease of assembly and expansion make Beckman's SM-800 Series an ideal unit for inclusion in low and medium volume display products. Character height is 0.55 inch/13,970mm for all modules.

Beckman

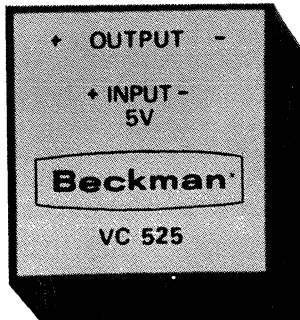
INSTRUMENTS, INC.

INFORMATION DISPLAYS OPERATIONS 350 North Hayden Rd. P. O. Box 3579
Scottsdale, Arizona 85257 Phone (602) 947-8371

Beckman®

Display Accessories

Beckman offers a full line of related accessories, providing the design engineer with convenience of application and ease of implementation. These accessories include:



VC-525 VOLTAGE CONVERTERS

For the display user who prefers to buy rather than build a power supply, Beckman offers economically priced dc/dc voltage converters designed specifically to operate with the Beckman Displays. These reliable voltage converters are of compact modular construction that provides an adjustable output: 170 to 210 Volts dc. 180 Volts is recommended for most dc and multiplexed applications. Unit operates from 5 Volt dc TTL/DTL logic supply.

Significant product features include:

- Adjustable output from 170 to 210 Vdc.
- Operates from 5 Volt dc TTL/DTL logic supply (Vcc).
- Compact modular construction
- Rugged, reliable design

Electrical Characteristics	170-Volt Output	210-Volt Output
Input Voltage	5 Vdc ($\pm 5\%$)	5 Vdc ($\pm 5\%$)
Output Voltage Regulation	+25V-10V	$\pm 20V$
Input Current (5 Vdc)	1.25A max	1.25A max
Load Current	0-15 mA	4-15 mA
Input/Output Isolation	600 Vdc	600 Vdc

SPECIAL CONFIGURATIONS

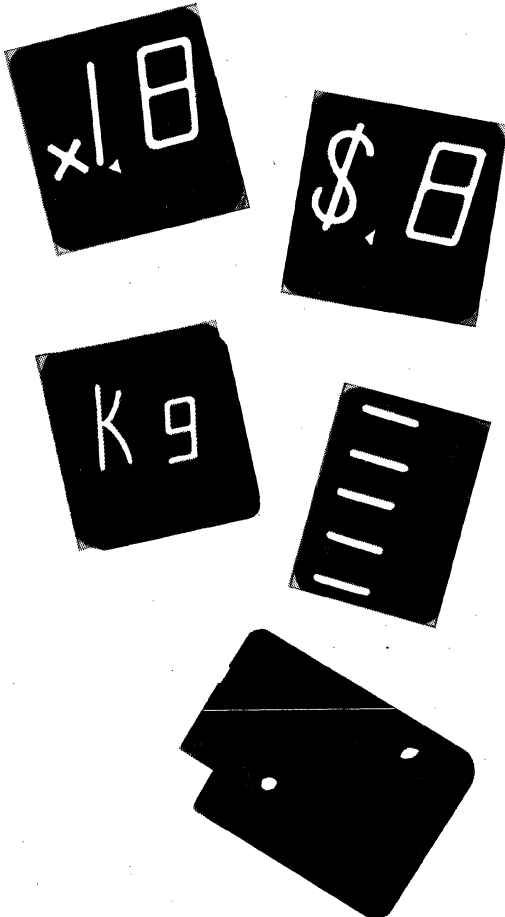
Beckman has the capability to design and produce displays for unique applications. Alpha readouts such as OHMS, VOLTS, AMPS, MPH, GPM and others can be combined with NUMERIC digits for special displays. You are invited to discuss your custom requirements with the local Beckman sales office.

CS-151 CONNECTORS

These Beckman connectors simplify the mounting of the SP-151. Units are attached with two mounting screws, or soldered directly to a circuit board.

CS-300 CONNECTORS

Designed for use with the SP-300 Series. Units help simplify assembly; they may be attached with screws or soldered directly to a circuit board.

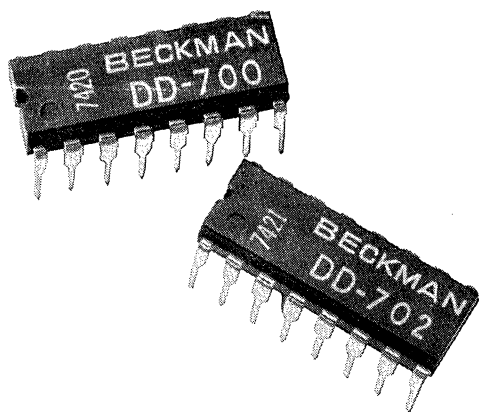
**Beckman**

INSTRUMENTS, INC.

INFORMATION DISPLAYS OPERATIONS 350 North Hayden Rd. P. O. Box 3579
Scottsdale, Arizona 85257 Phone (602) 947-8371

Beckman®

Display Products



DD-700 DECODER/DRIVER WITH CURRENT REGULATED OUTPUTS

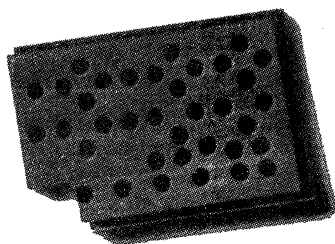
This monolithic integrated circuit accepts TTL/DTL 8-4-2-1 binary coded decimal (BCD) information to direct drive the seven-segment Beckman Display. A blanking input feature on the DD-700 provides unconditional blanking of all outputs while a ripple blanking feature allows suppression of unwanted leading and trailing zeros. The DD-700 has seven regulated, current programmable outputs capable of between 0.18 to 1.5 mA each. Regulation ensures constant brightness display operation under a changing supply voltage situation.

DD-702 BUFFER/DRIVER WITH CURRENT REGULATED OUTPUTS

This device interfaces MOS integrated circuits directly to Beckman SP-100 and SP-300 Series displays. Using the DD-702, calculator and clock chips with seven-segment outputs as well as all types of counter/latch/decoder circuits can be used to direct drive these neon gas discharge displays. The units have a current programmable output of 0.18 to 1.5 mA. Regulation ensures constant brightness display operation under a changing supply voltage situation.

The units feature:

- Output current programmable
- Direct drive for display segments
- BCD input for 7-segment output (DD-700)
- Six inputs decoded to seven outputs (DD-702)
- Output current ratioed for uniform brightness
- Ripple blanking for suppression of unwanted leading or trailing zeros (DD-700)
- Blanking input for unconditional blanking
- Saturated switch operation (external current limited)
- Current regulated outputs
- Hexidecimal decoding (DD-700)



PIN STRAIGHTENERS

Inexpensive pin straighteners are available for each display series. They are useful in realigning pins misaligned through handling, assuring ease of assembly.

SB-300 SUBASSEMBLIES

Beckman SP-300 Series Information Displays are available mounted on circuit boards. These circuit boards can be supplied in configurations of from 8 to 16 digits.

Subassemblies are available with either a lead frame or with the edge board connector. Both of these packages allow the user to mount the display conveniently to a panel cutout and connect them directly into the electronic circuitry by means of standard off-the-shelf connectors. The lead frame configuration can also be connected to the electronic circuitry by flow soldering.

Beckman

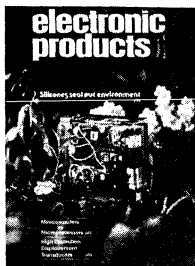
INSTRUMENTS, INC.

INFORMATION DISPLAYS OPERATIONS 350 North Hayden Rd. P. O. Box 3579
Scottsdale, Arizona 85257 Phone (602) 947-8371

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

**Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530**



electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.

BLOC-LITE

DIVISION LVC INDUSTRIES INC.

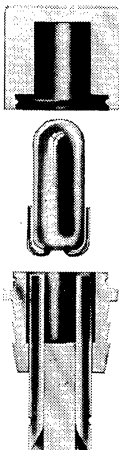
135-25 37th AVENUE

FLUSHING, NEW YORK 11354

TEL: (212) 438-8777

MINI-BRITE "simplicity" in subminiature indicator lights

HOUSING GUIDES LAMP
LEADS TO CONTACTS



Housing is keyed so that wire leads of lamp will only be accepted by the electrical contacts.



MINI-BRITE
75001
Panel Mount



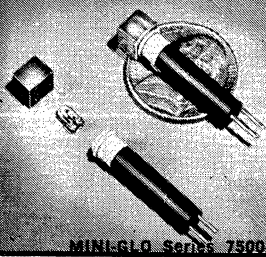
MINI-BRITE
75002
Panel/Printed
Circuit Mount



MINI-BRITE
75003
Printed Circuit
Mount

MINI-BRITE subminiature indicators have been engineered and are manufactured with the idea of achieving the ultimate in simplicity, standardization, reliability and cost reduction...this has been accomplished by the design of a unique housing and contact arrangement centered on the use of standard, wire terminal lamps...which provides light intensity comparable to units five times their size.
Conforms to MS90308. U. S. Patent #3,559,153

- **FRONT RELAMPABLE**
just remove the snap on cap
 - **STANDARD LAMPS**
any T-1 lamp, wire lead type
 - **EASY INSTALLATION**
press housing into hole
 - **WIRING OPTIONS**
combination solder/female terminal
 - **MOUNTING OPTIONS**
panel mounted, panel/printed circuit
 - **HIGH DENSITY PACKAGING**
mount on .250 centers.
 - **CODED CAPS**
available in a variety of colors
- Write for Bulletin 1470



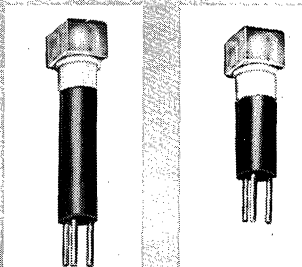
MINI-GLO Series 75004

MINI-GLO subminiature Neon Indicator lights

This series of subminiature indicators provided neon bright intensity with the application of 115 VAC power. The complete indicator consists of a MINI-BRITE housing, a standard wire terminal neon lamp type USASI A1K, and a snap-on cap. The housing further incorporates an integral resistor for varying life expectancies. Except for the increased length of the housing, these indicators are compatible and have all of the features of the MINI-BRITE series.

Write for Bulletin No. 1470G

STANDARD OR SPECIAL
CONFIGURATIONS



MINI-TRANS Series 75006 (NPN)
75007 (PNP)

MINI-TRANS subminiature Transistorized indicator lights

The MINI-TRANS series incorporates a silicon planar transistor, either NPN or PNP, which will turn on the indicator and provide an extremely bright indication from signal levels as low as 0.30 mA. In addition to standard circuits, specially designed physical and electrical configurations can be furnished to customer specifications. Units can be supplied with a built-in resistor of any standard value. This unique transistorized design capability is ideally suited when extremely low level signals are used for front panel indications, assuring long life and maximum brightness. A wide range of standard incandescent lamps are available to meet your requirements. Except for the increased length of the housing, these indicators are compatible and have all the features of the MINI-BRITE series.

Write for Bulletin No. 1470T

ANNUNCIATORS • LIGHT MATRICES
• DISPLAY PANELS • EDGE-LIGHTED
PANELS • SPECIAL INDICATORS •
ALPHA/NUMERIC READOUTS.

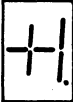
BLOC-LITE can offer specialized lighted products in a wide range of capabilities. Physical and electrical designed configurations based on customer specifications can be proposed and submitted at surprisingly low cost. Our staff will be happy to extend any engineering assistance needed to optimize your application. Please contact the factory direct, or our nearest field engineering representative.

SEE OUR CO-ORD MATRIX BOARDS • SECTION 5100

DIALIGHT LED

203 Harrison Place, Brooklyn, N.Y. 11237

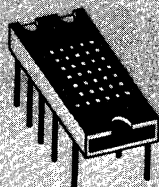
Dialight offers you one-stop shopping in LED readout displays. Choose from readout with character height of .270", .300" or .625". Each display is available with or without decoder/driver or in assemblies ready for instant mounting.

Part No.	Display	Type	Character Height	Operating Temperature
745-0004		Overflow Display with Polarity and Decimal	0.270 in.	0 – 70° C
745-0005		5x7 Alphanumeric	0.300 in.	0 – 70° C
745-0006		Seven Segment	0.270 in.	0 – 70° C
745-0007		Hexadecimal (Latch Decoder/Driver)	0.270 in.	0 – 70° C
745-0008		Seven Segment (Latch Decoder/Driver)	0.270 in.	0 – 70° C
745-0009		Seven-Segment (Counter, Latch Decoder/Driver)	0.270 in.	0 – 70° C
730-0004 730-1004		Seven Segment	0.625 in.	0 – 70° C
730-0005 730-1005		Overflow Display with Polarity and Decimal	0.625 in.	0 – 70° C

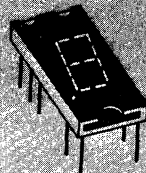
* If peak is the peak current allowed for the stated Pulse width (Pw) and Duty Cycle.



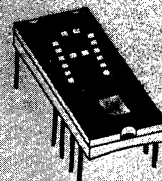
745-0004



745-0005



745-0006



745-0007

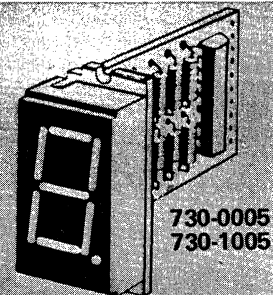
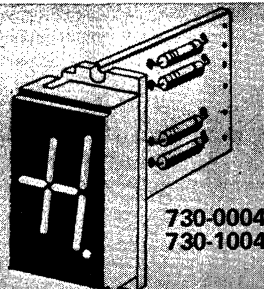
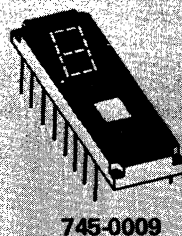
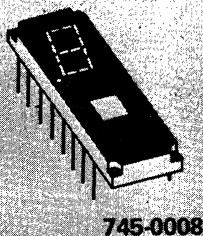
READOUT DISPLAYS



The table summarizes the salient points of all Dialight displays. Included is peak current information, at stated pulse widths and duty cycles, for multiplexing applications.

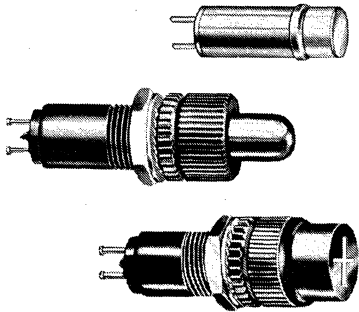
For detailed data, request Readout Product Selector Guide.

Segment		Decimal	I_F max	Multiplexing Data		
$V_F @ I_F$		$V_F @ I_F$		I_F peak	@ Pw	@Duty* Cycle
3.4V 20mA		1.65V 20mA	30mA	200mA	15msec	10%
1.65V 10mA		1.65V 10mA	20mA	100mA	.25msec	20%
3.4V 20mA		1.65V 20mA	30mA	200mA	15 msec	10%
				→ N.A.		
				→ N.A.		
				→ N.A.		
2.2V 16mA		2.2V 16mA	25mA	200mA	10 μ sec	10%
1.8V 27mA		1.8V 27mA	50mA	200mA	10 μ sec	10%
2.2V 30mA		2.2V 15mA	25mA	200mA	10 μ sec	10%
1.8V 25mA		1.8V 25mA	50mA	200mA	10 μ sec	10%



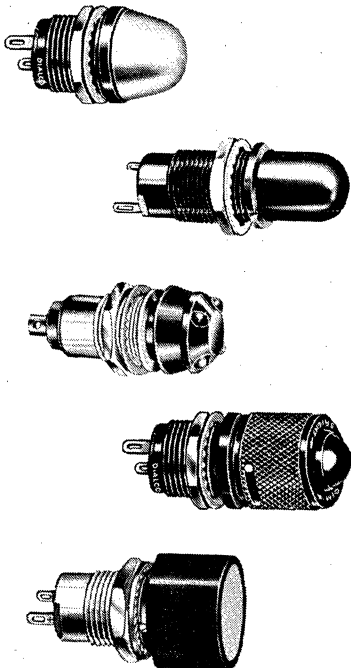
1,500,000 VISUAL INDICATORS

INDICATOR LIGHTS, ILLUMINATED SWITCHES, READOUT DISPLAYS



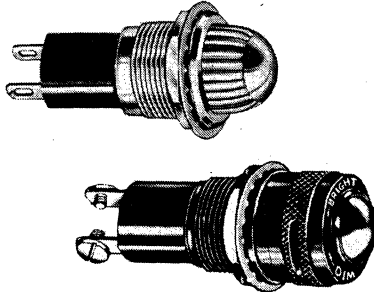
ULTRA-MINIATURE INDICATORS

Meet requirements of MIL-L-3661B. Incandescent, neon and LED. Mount in $\frac{3}{16}$ " clearance hole. Ask for Catalog UM1200.



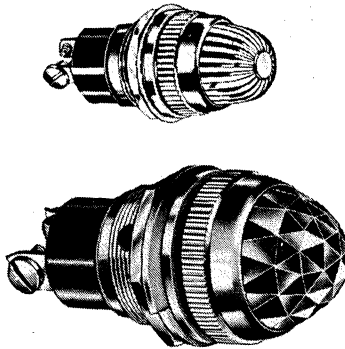
SUB-MINIATURE INDICATORS

Incandescent and neon. Mount in $\frac{1}{32}$ " to $\frac{1}{16}$ " clearance holes. Meet or exceed environmental requirements of MIL-L-6723 and MIL-L-3661B. Ask for Catalogs L-157, L-158, L-178.



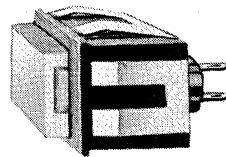
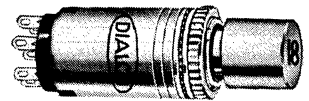
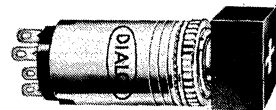
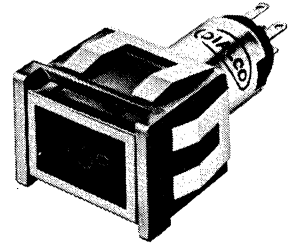
MINIATURE AND LARGE INDICATORS

Incandescent and neon. Miniature units mount in $\frac{3}{16}$ " or $\frac{1}{8}$ " clearance holes, large units in 1" or $1\frac{1}{8}$ " hole. Wide choice of cap shapes and colors, also caps with mechanical dimming feature. Ask for Catalog L-161.



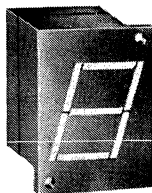
OIL-TIGHT INDICATORS

Incandescent and neon. Mount in $\frac{1}{16}$ ", 1" or $1\frac{1}{8}$ " clearance holes. For heavy duty. Ask for Catalog L-200.



LIGHTED SWITCHES AND MATCHING INDICATORS

Low-profile snap-in switches and standard mounting switches. Momentary non-snap, snap or alternate switch actions. Ratings up to 5 A. Cap sizes include $\frac{1}{2}$ " $\frac{5}{8}$ " and $\frac{3}{4}$ " round or square; $\frac{3}{4}$ " x 1" rectangle. Ask for Catalog L-210.



SINGLE-PLANE READOUTS

Incandescent and neon—5 to 170 volts. $\frac{3}{4}$ " or 1" characters. Display 10 numbers and 10 letters. Compatible caption models.



Send for FREE Indicator Light Product Selector Guide Catalog SG730.

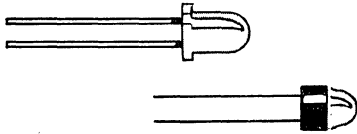
DIALIGHT

A NORTH AMERICAN PHILIPS COMPANY

203 HARRISON PLACE, BROOKLYN, N. Y. 11237 • AREA CODE (212) 497-7600

TO CHOOSE FROM **DIALCO®**

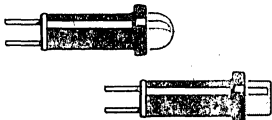
... AND INDUSTRY'S BROADEST LINE OF LED DISPLAY DEVICES



DIODE-LITE™ LIGHT SOURCES

RED • GREEN • YELLOW

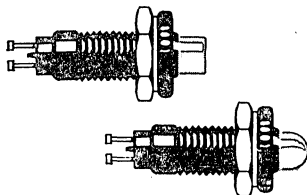
Diffusing particles in plastic encapsulant provide large, soft light source for panel light, status indicator and A/N display applications.



INDICATOR LIGHT CARTRIDGES

RED • GREEN • YELLOW

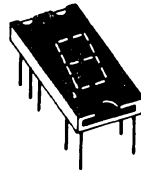
IC-compatible ultra-miniature cartridges with DIODE-LITE light source are interchangeable with incandescent types using DC power source.



INDICATOR LIGHT ASSEMBLIES

RED • GREEN • YELLOW

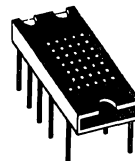
Cartridge with DIODE-LITE in housing with mounting hardware ready for installation. Interchangeable with DIALCO ultra-miniature incandescent types.



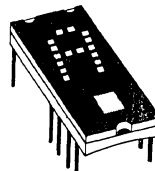
.270" CHARACTER



PLUS-MINUS ONE, .270" CHARACTER



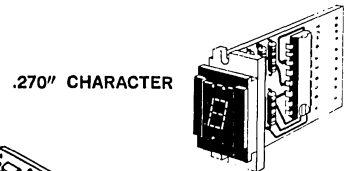
ALPHA-NUMERIC .300" CHARACTER



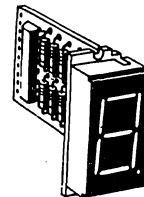
.270" HEXADECIMAL

READOUT MODULES

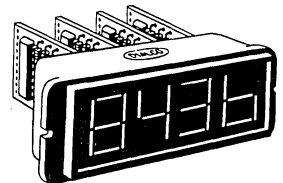
Character heights from .270" to .625". Dot, dot matrix and segmented formats for both numeric and full alpha-numeric displays. Wide angle (140°) viewing. IC compatible.



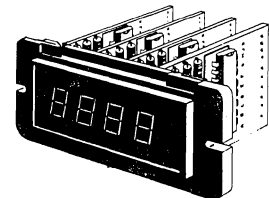
.270" CHARACTER



.625" CHARACTER



.625" CHARACTER



.270" or .300" CHARACTERS

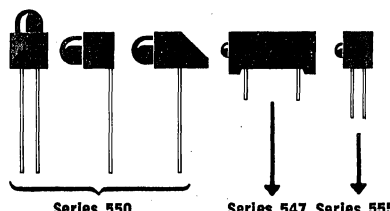
READOUT PACKAGES AND ASSEMBLIES

Single-digit packages in character heights from .270" to .625" include decoder/driver and resistors mounted on PC board. Bezel assemblies ready for panel mounting available with up to 10 display packages.

ASK FOR LED PRODUCT SELECTOR GUIDE

LED LOGIC-STATE FAULT INDICATORS

RED • GREEN • YELLOW



Series 550

Series 547 Series 555

550 series indicators, with/without built-in series resistors. For use as electronic circuit fault finders, as indicators or in binary data displays.

547 series indicators, with built-in series resistor, permit dense packaging — 10 units to the inch. Pin spacing is compatible with DIP sockets.

555 series indicators have built-in series resistor, are IC compatible, and can be p-c board mounted 10 units to the inch.

DIALIGHT

A NORTH AMERICAN PHILIPS COMPANY

203 HARRISON PLACE, BROOKLYN, N. Y. 11237 • AREA CODE (212) 497-7600

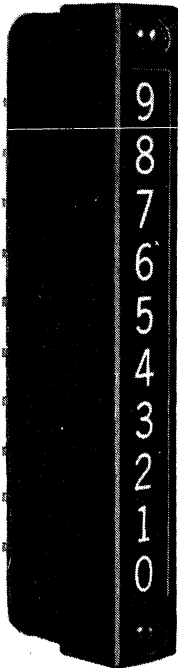
d²

display devices

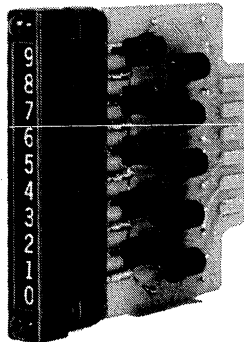
DIGISTRIP front relampable DIGITAL DISPLAYS

For a wide range of console and instrument display applications. Can be mounted horizontally or vertically, directly on p.c. boards, or ganged for high-density readout.

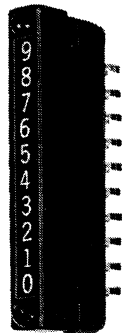
All Digistrip models are available with standard 0-9 legend, or with custom read-out information.



Digistrip II
3" legend area.



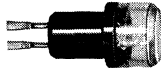
Digistrip I with high-gain
transistor drivers on integral
printed circuit board.



Digistrip I
1 1/2" legend area.

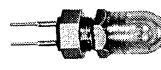
MINIATURE T-1 INDICATOR LIGHTS

Designed to provide the brightest light in the least space.
Available off-the-shelf, or designed to your application.



QUICK-LENS

Front-relampable miniature indicator light with built in light reflector for maximum brightness, even in high ambient light.



MINI-LENS

Frontrelampable, micro-miniature indicator light, featuring minimum panel spacing. Can be RFI shielded. Threaded body can mount directly to panel.



FLUSH-LENS

For panel mounting without protrusion. Available with RFI shield. Unit is relampable from rear of panel. No solder connections required.

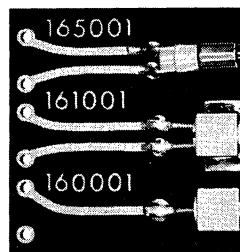


TRANS-LENS

Each front relampable, with high-gain transistor driver on compact, integral p.c. board. Minimum depth behind panel. Both available in "bare board" configuration for customer to install own components. Trans-Lens is transistor-driven version of Quick-Lens; TDML is transistor-driven version of Mini-Lens.



TDML



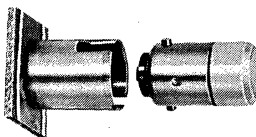
PCB LIGHT

P.C. BOARD INDICATORS

SINGLE-SIDED BOARDS

DOUBLE-SIDED BOARDS

TEST
LENS



ADAPTER LENS AND SOCKET

Midget T-1 1/4 flanged base lamp adaptor used with T-3/4 printed circuit mounted socket. Furnished with or without integral color filter.

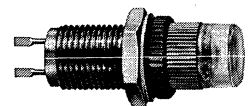
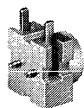


T-1 UNBASED



T-1 3/4 BI-PIN

Basic sockets for custom designed lamp holders or p.c. board mounting used as lighting chassis for back lighted display.
Also available in side mounting.



TWIST-LENS

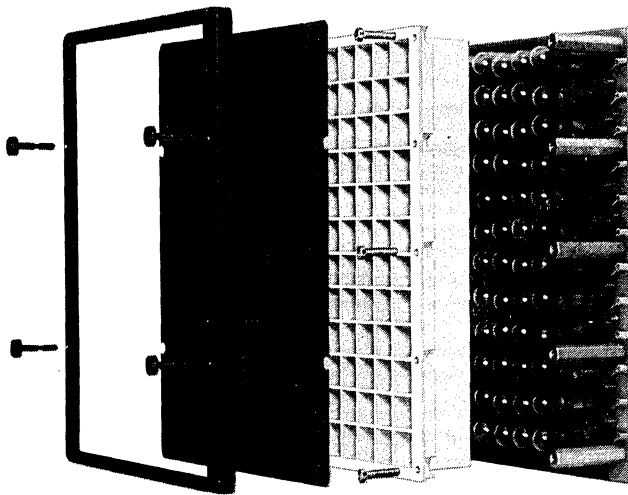
Quick-change lens, available in clear or colors. Waterproof and RFI shielded units available. Uses T-1 3/4 Bi-Pin base lamp for high brightness.

d²

display devices, inc

mailing address: p. o. box 667 encinitas, california 92024
plant location: second and E streets (714) 753-0113

All illustrations are actual size



panels and laminates

d²

BACK LIGHTED PANELS

Exploded view shows a typical backlit panel application with printed circuit board lighting chassis containing lamps and sockets, light baffle (eggcrate) to divide message areas, and legend screen with front bezel. Application shown is relampable from front of panel. Rear relamping is also available.



POLYESTER DEAD FRONT LAMINATES

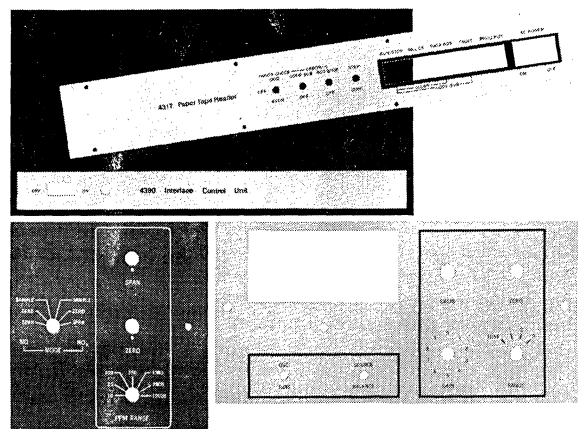
Used in conjunction with backlit panels, or provided separately, are DF991 legend screen laminates. Except for permanently visible graphics that may be desired all nomenclature is invisible until

backlit. Standard background is black, but colored dead front laminates are also available. .010" and double .010" thickness are used.



POLYCARBONATE AND ACRYLIC LAMINATES

Offered in dead front as noted above for polyester laminates. Thickness ranges from .020" to .250". Used for LED devices as well as incandescent lamps. All laminates are provided with or without pressure sensitive adhesive backing, depending upon application. All laminates feature color matching to FED STD 595, Pantone, or customer supplied color chips.



NON-ILLUMINATED LAMINATES

Supplied on .010" adhesive backed polyester film non-illuminated laminates are used to replace conventional painting and printing of metal panels. Screen printing of graphics is sub-surface to protect markings from being scratched off. Holes for switches, knobs, etc. are steel rule die cut. Background color is matched to customer requirements.

*Write for detailed
specification sheets*

d²

display devices, inc

mailing address: p. o. box 667 encinitas, california 92024
plant location: second and E streets (714) 753-0113



WHICH ONE?

A mini-guide to small-lamp selection*

Design Factors	Incandescent Lamps	
	Sub-Miniature	Miniature
Typical applications	Function indication (switches, indicators, etc.) illumination (front & back panel, edge lighting floodlight, backlight, etc.).	
Space requirements (bulb size.).	1/8" to 1/4" dia.	1/4" — 9/16" dia.
Current range	0.014 to 0.35 A	0.022 to 1.0 A
Voltage range	1.35 to 60 v	1.25 to 55 v
AC or DC operation	Both ⁽²⁾	Both ⁽²⁾
Light output range	0.003 to 0.65 mscp	0.04 to 8 mscp
Light source viewing angle	Full 180°	Full 180°
Light color	White, and all colors	White, and all colors
Infrared component	High	High
Environmental Temp. Range	—40 to 175°C	—40 to 175°C
Shock & Vibration resistance ⁽⁵⁾	Depends on lamp application	Depends on lamp application
Life ⁽⁵⁾	Up to 60,000 hr.	Up to 20,000 hr.
Approx. price range per lamp (in quantity to OEM mfg.)	10¢ to 53¢ ⁽⁶⁾	5¢ to 77¢ ⁽⁶⁾
Special features	High ambient light levels will not wash out lamp light source. Flexibility to fit many applications. Produces white light.	
Notes:	(1) Lamps up to 9/16-in. in diameter. (2) DC may affect lamp life. (3) Directional light source (4) Molded plastic lens limits high and low temperature use.	

For helpful service contact one of these offices. If your city isn't listed, look under General Electric Lamp Division in your phone book.

ALBANY, N. Y. . . . 783-6188
 ATLANTA, GA. . . . 875-0921
 BALTIMORE, MD. . . . 242-5700
 BOSTON, MASS. . . . 332-6200
 BUFFALO, N. Y. . . . 874-5180
 CHARLOTTE, N. C. . . . 376-6585
 CHICAGO, ILL. . . . 332-4712
 CINCINNATI, OHIO . . . 745-5730

CLEVELAND, OHIO . . .
 Commercial & Industrial . . . 266-4256
 Consumer Products . . . 266-4264
 DALLAS, TEXAS . . . 358-5321
 DENVER, COLO. . . . 388-4611
 DETROIT, MICH. . . . 883-0200
 HOUSTON, TEXAS . . . 623-6250
 HYATTSVILLE, MD. . . 864-6105

INDIANAPOLIS, IND. . . 547-5511
 KANSAS CITY, MO. . . 471-0123
 LOS ANGELES, CAL. . . 723-2541
 MEMPHIS, TENN. . . . 948-2646
 MIAMI, FLA. . . . 693-3811
 MILWAUKEE, WIS. . . . 462-3860
 MINNEAPOLIS, MINN. . 331-4050
 NEWARK, N. J. . . . 376-9000

NEW HAVEN, CONN. . . 932-2274
 NEW ORLEANS, LA. . . 835-6421
 NEW YORK, N. Y. . . . 750-2180
 . . . 750-3028
 NEW YORK, N. Y. . . . 896-6000
 OAKLAND, CALIF. . . . 569-3422
 PHILADELPHIA, PA. . . 688-5900

There was a time when you could easily select the small lamp you needed from a limited number of incandescent types. But times change. Today, small-lamp selection requires a complex, precise sorting process through an almost endless array of styles, types, and sizes. The incandescents have broadened and subdivided into miniature and sub-miniature classes. And, to complicate things, there are neon-glow lamps in a range of colors, and light-emitting diodes have made the scene.

What used to be a relatively simple matter has become an all-important design consideration — which lamp is the right lamp? Right in terms of function? light output? available space? power requirements? life expectancy? color? environment? and **cost**?

How to be RIGHT

Being "right" in lamp selection first requires a system-

atic matching of design and function requirements to available types. This process will identify the most likely lamp candidates.

Second, being "right" requires a detailed analysis of the candidates along with a thorough evaluation of the various lamp design tradeoffs to zero in on the lamp for your specific application.

How to get help

Your local G-E sales specialist will be glad to assist you in all phases of the lamp selection process. But, to help you in the all-important first stage of systematically matching design and function requirements to available lamp types, we've prepared this "mini-guide" to small-lamp selection. For further help, contact one of the GE sales offices listed below. Or write General Electric, Miniature Lamp Products Department 3382E, Nela Park, Cleveland, Ohio 44112.

Neon-Glow Lamps	Light Emitting Diodes (visible)
Function indication (switches, indicators). Illumination (panel, edge lighting. Circuit component voltage regulation.	Function indication.
1/4" to 9/16" dia.	1/16" to 1/4" dia.
2.6 mA or less	5 to 25 mA
110 to 220 v	2.5 to 3.1 v
Both ⁽²⁾	Both
0.003 to 0.018 mscp	0.004 cp ⁽³⁾
Full 180°	Narrow ⁽³⁾
Red, amber, green, blue	Red, amber, green
No	Low
-40 to 95°C	Note ⁽⁴⁾
Excellent in most environments	Excellent in most environments
100,000 hr. with proper resistor selection	100,000 hr.
4-1/2¢ to 90¢	7¢ to 35¢
Variable light output with series resistor selection. Compatible with some semi-conductors. Low cost. Low power consumption. Excellent shock and vibration resistance.	Long life. Excellent shock and vibration resistance. Low operating voltage & power consumption.

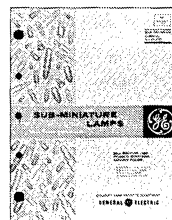
(5) Service life depends on use and environment.

(6) Lamp price depends on base and filament configuration. Special purpose lamps, such as lens end, can cost up to \$1.21.

*Lamps up to 9/16" in diameter

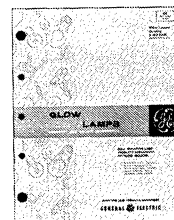
PITTSBURGH, PA. . . . 471-9050
 PORTLAND, ORE. . . . 221-5120
 RICHMOND, VA. . . . 355-3289
 SALT LAKE CITY, UTAH . . . 487-2276
 SEATTLE, WASH. . . . 763-2870
 ST. LOUIS, MO. . . . 429-6930
 TAMPA, FLA. 988-7351

You can find a GE miniature lamp for practically every need... in one of these 4 free catalogs.



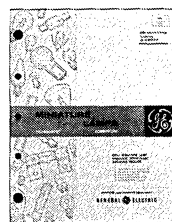
Sub-Miniature Lamps: 24 pages. Data covers over 210 sub-miniature lamps. Diameters 1/4" and smaller. Average rated voltage 1.3 to 60. Candlepower range from .006 to 15. Lamp life up to 60,000 hours.

Sub-Miniature Lamps (3-6252R1)



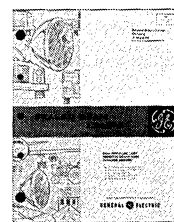
Glow Lamps: 8 pages. Data covers 83 Neon Glow Indicator and Circuit Component lamps. Diameters ranging from 1/4" to 1 1/4". Wire terminal lengths 1/2", 3/8", 3/4" and 1 1/8".

Glow Lamps (3-6254R)



Miniature Lamps: 40 pages. Data covers over 500 miniature lamps ranging up to 20,000 hours average rated life. With a design voltage range of from 1.2 to 55, and candlepower range from .02 to 250. Diameter range from 1 1/2" to 2 1/8".

Miniature Lamps (3-6253R1)



Sealed Beam Lamps: 16 pages. Data covers over 180 Sealed Beam lamps, ranging from 4 1/2" to 8" in diameter with a design voltage range of from 4.0 to 115, and initial candlepower of from 150 to 600,000.

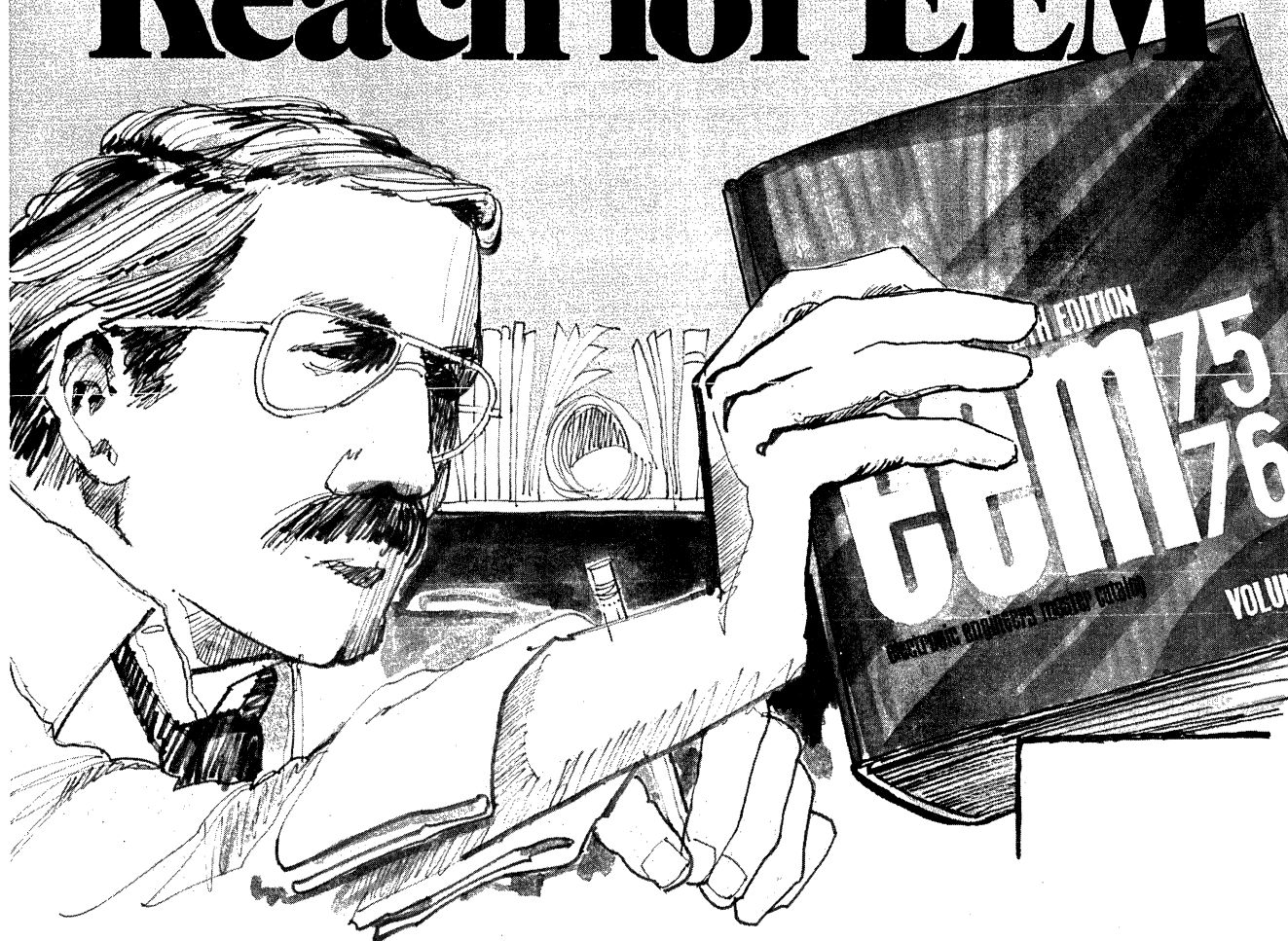
Sealed Beam Lamps (3-6251R1)

Get complete and up-to-date electrical and physical specifications from the four General Electric catalogs shown above. To order your new ones, contact one of the sales offices listed or write General Electric, Miniature Lamp Products Department, 3382E, Nela Park, Cleveland, Ohio 44112.

GENERAL  ELECTRIC

There is more catalog data
available to you at your fingertips
than ever before...when you

Reach for EEM



With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

GTE SYLVANIA

miniature lamps, sockets & lenses

1. Meet stringent optical system requirements with all-glass, wedge-base halogen lamps featuring precisely located filaments, nearly constant light output over rated life. Other applications: detection systems, photocell activators, medical/dental instruments, aircraft instruments.

2. Reduce inventory with interchangeable cartridge lamps, sockets and lenses. For fast, easy field replacement, choose from a complete voltage range of 7 pilot and 15 indicator cartridge lamps, 10 transparent or translucent color lenses; and standard bi-pin bases that fit all Sylvania assemblies.

3. Fill special application needs with high-candlepower annunciator lamps. Ratings from 6 to 120V, with built-in aluminum reflectors to intensify candlepower, pyrex colored lens caps for unique lighting and signaling effects. Choice of bases: candelabra screws, miniature bayonets, PC-card compatible bi-pins.

4. Simplify multiple mounting with strip sockets that clip to panel, can be cut to any length. Up to 12 sockets on $\frac{1}{2}$ " or $\frac{3}{4}$ " centers. Common or separate socket connections, choice of three optional snap-on color caps for the twin light.

5. Get total assembly backup without compromise for all pilot

and indicator miniature lamps. Full hardware range includes pilot housing with five interchangeable screw-on lens types, round or rectangular single sockets, twin-light indicator assemblies, even three types of color caps.

For technical information and applications data compiled especially for the engineer, write or call for the 54-page Engineering Design Handbook and Catalog, No. 201.



SYLVANIA MINIATURE LIGHTING PRODUCTS INC.

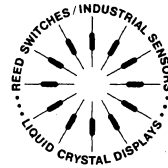
West Main Street, Hillsboro, N. H. 03244 • (603) 464-5533
TWX 710-366-0387

GTE SYLVANIA

HAMLIN INC.

628 LAKE STREET • LAKE MILLS, WISCONSIN 53551

PHONE: SALES 414/648-2361 • TWX 910-260-3740

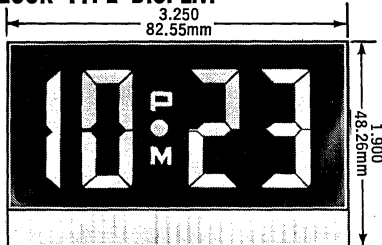


LIQUID CRYSTAL DISPLAYS

Hamlin has "standard" LCD's to fill most digital readout requirements in watches, clocks, calculators, meters or instruments. Displays can be "custom" made to nearly any design. All feature very low power requirements, excellent contrast

ratio and long life. Condensed descriptions and specifications are listed below. For further information on these, or if you have special requirements, please consult your local Hamlin representative or distributor.

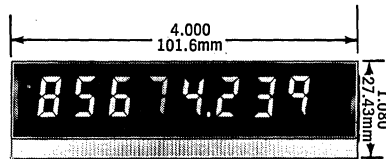
MODEL 3401 3½ DIGIT CLOCK TYPE DISPLAY



**Dynamic Scattering,
Reflective or Transmissive**

Operating Voltage: 15-20 Vac, 15-120Hz. **Power Consumption:** 3.75 mW nominal (all segments energized with 15 volts). **Turn On (Rise) Time:** 150 milliseconds typical. **Turn Off (Decay) Time:** 100 milliseconds typical. **Contrast ratio:** 20:1 typical. **Character Height:** 1.12" (2.80 mm). **Terminal Width:** .050" (5.250mm). **Terminal Spacing:** .100" (2.50 mm) C to C. **Operating Temperature:** 5°C to 55°C. **Storage Temperature:** -20°C to 70°C. **Drawing No.:** D10-3401. **Base Price:** \$24.00 reflective, \$22.50 transmissive.

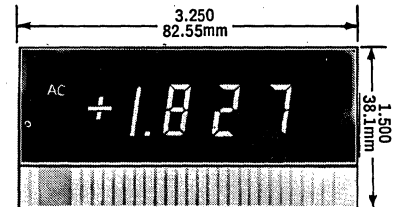
MODEL 3501 8 DIGIT CALCULATOR TYPE DISPLAY



**Dynamic Scattering,
Reflective or Transmissive**

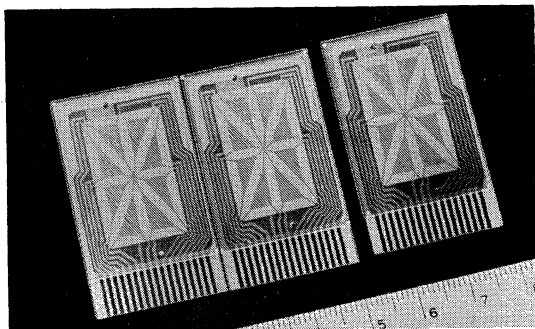
Operating Voltage: 15-20 Vac, 15-120 Hz. **Power Consumption:** 1.50 mW nominal (all segments energized with 15 volts). **Turn On (Rise) Time:** 150 milliseconds typical. **Turn Off (Decay) Time:** 100 milliseconds typical. **Contrast ratio:** 20:1 typical. **Character Height:** .470" (11.750 mm). **Terminal Width:** .025" (.625 mm). **Terminal Spacing:** .050" (1.250 mm). **Operating Temperature:** 5°C to 55°C. **Storage Temperature:** -20°C to 70°C. **Drawing No.:** D10-3501. **Base Price:** \$22.50 reflective, \$21.50 transmissive.

MODEL 3601 3½ DIGIT INSTRUMENT TYPE DISPLAY



**Dynamic Scattering,
Reflective or Transmissive**

Operating Voltage: 15-20 Vac, 15-120 Hz. **Power Consumption:** 2.25 mW nominal (all segments energized with 15 volts). **Turn On (Rise) Time:** 150 milliseconds typical. **Turn Off (Decay) Time:** 100 milliseconds typical. **Contrast Ratio:** 20:1 typical. **Character Height:** .600" (15.0 mm). **Terminal Width:** .050". **Terminal Spacing:** .075" (1.875 mm) C to C. **Operating Temperature:** 5°C to 55°C. **Storage Temperature:** -20°C to 70°C. **Drawing No.:** D10-3601. **Base Price:** \$21.50 reflective, \$21.00 transmissive.



NEW! Alphanumeric Liquid Crystal Displays — 1" High

These 16 segment, dynamic scattering displays can be mounted side by side to form any legend. They are ideal for prototype work or where quantities desired might not meet factory minimum orders. Stocked at authorized distributors for immediate delivery.

Models — 3305-2 Reflective, silver — 3305-3 Transmissive, yellow segments, black background. **Operating Voltage:** 10-30 Vac, 16-150 Hz. **Power Consumption:** 2.25 mW. **Turn On (Rise) Time:** 150 milliseconds typical. **Turn Off (Decay) Time:** 50 milliseconds typical. **Contrast Rates:** Reflective 20:1; Transmissive 15:1. **Operating Temperature:** 5°C to 55°C. **Storage Temperature:** -20°C to 70°C. **Terminal Spacing:** .050" (1.25 mm) (centerline to centerline) **Terminal Width:** .025" (.625 mm). **Character Height:** 1.00" (25. mm). **Character Width:** 0.6" (15. mm). **Base Price:** \$14.95 each.

MODEL 3302 3½ DIGIT WATCH TYPE (MEN'S) DISPLAY

Dynamic Scattering, Reflective Silver or Gold

Operating Voltage: 10-30 Vac, 16-150 Hz. **Power Consumption:** 30 μ W maximum (all segments energized at 15 Volts). **Operating Temperature:** 5°C to 55°C. **Storage Temperature:** -20°C to 70°. **Turn On (Rise) Time:** 100 milliseconds typical. **Turn Off (Decay) Time:** 150 milliseconds typical. **Contrast Ratio:** 20:1. **Character Height:** .200" (5.0 mm). **Character Width:** .100" (2.50 mm). **Terminal Width:** .043" (1.075 mm). **Segment Width:** .020" (.500 mm). **Terminal Spacing:** .085" (2.125 mm) C to C. **Character Slope:** 5½°. **Base Price:** \$25.00.

MODEL 3304 3½ DIGIT WATCH TYPE (MEN'S) DISPLAY

Field Effect

Operating Voltage: 5-20 Vac, 25-32 Hz. **Power Consumption:** 21 μ W maximum (all segments energized with 7 volts). **Operating Temperature:** 0-50°C. **Storage Temperature:** -20°C to 55°C. **Turn On (Rise) Time:** 150 milliseconds typical. **Turn Off (Decay) Time:** 300 milliseconds typical. **Contrast Ratio:** 20:1. **Character Height:** .200" (5.0 mm). **Character Width:** .122" (3.050 mm). **Terminal Width:** .039" (.975 mm). **Terminal Spacing:** .070" (1.750 mm) C to C. **Character Slope** 5°. **Base Price:** \$25.00.

HAMLIN INC

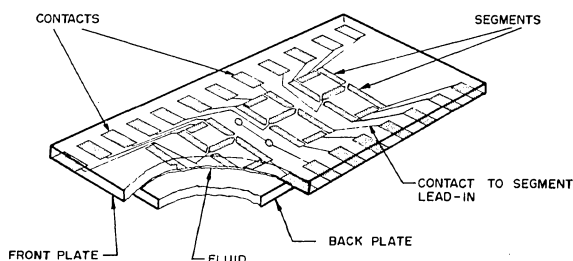
628 LAKE STREET • LAKE MILLS, WISCONSIN 53551
PHONE: SALES 414/648-2361 • TWX 910-260-3740



THE CASE FOR LIQUID CRYSTAL DISPLAYS DYNAMIC SCATTERING OR FIELD EFFECT

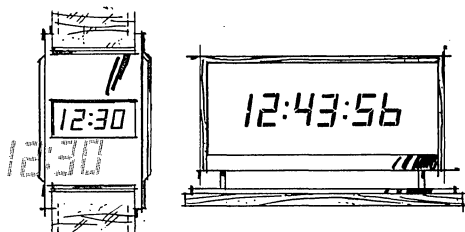
Liquid Crystal Displays; light emitting diodes; incandescent and fluorescent displays and "Nixie" tubes are becoming solidly established in circuit design as the trend to digital readout continues. The design engineer faces an unusually formidable task in determining the type of display most suitable and practical for his product. We make liquid crystal displays — dynamic scattering AND field effect.

The Display of the Future? Our displays are as sandwiches of two glass plates, spaced typically about .0005" apart with a nematic liquid crystal solution between them and hermetically sealed at the perimeters.



How They Work. When the liquid is not electrically excited, its long cigar-shaped molecules are parallel to one another in a position perpendicular to the plates. The liquid appears transparent. When an electric current is applied, ion activity of the molecules leads to turbulence causing the liquid to scatter incident light. Depending on the type of nematic liquid used, either a dynamic scattering or field effect display results.

Dynamic Scattering. We use a nematic liquid crystal solution in our dynamic scattering displays. This nematic liquid crystal is conductive, have negative dielectric anisotropy, and is oriented in either a homeotropic or homogeneous alignment. In either case the liquid is clear in the absence of an electric field. When an electric field is induced, the molecules scatter, giving the visual effect of a frosted piece of glass.



Field Effect. These displays also utilize a nematic liquid crystal but with a different molecular orientation. The molecules are arranged in a helical stack, like a spiral staircase. The liquid is also sandwiched between two polarizers which are at right angles with each other. When current is applied the molecules rotate 90° so that they become perpendicular to the front polarizer. Light that passes through them is not rotated and therefore is absorbed by the rear polarizer. The result is a dark image on a light background. The image also can be reversed — light on dark.

Producing an Image — digital or other — simply requires a conductive surface the shape of the desired image on the front glass plate. Current flowing from the conductive image through the liquid crystal to the common ground back plate causes the liquid to change from clear to a frosted appearance in the current-carrying areas.

The images almost always are in the form of seven segments formed on the front glass with transparent oxide and each with its own electrical lead. Energizing the proper segments produces the desired numerals. Leads connect the segments to external contacts on the sandwich (display).

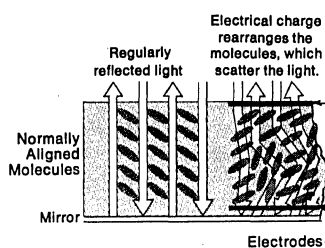
Consider the Advantages. Liquid crystal displays have a number of distinct advantages. Simplicity is the reason for several of these. The elements are few and passive — very little can go wrong with an LCD and this means reliability and long life.

Simplicity means low cost too — lower than that of most similar displays. Packaging costs are low because LCD's can be driven directly by MOS and C/MOS circuits. Very narrow character widths are possible and still provide a good viewing angle — 60 degrees in many cases.

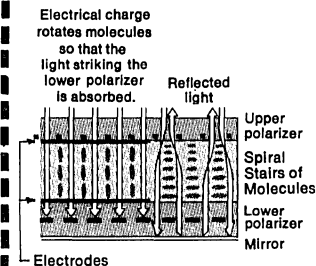
Low power consumption makes LCD's a logical choice where power limitations rule other displays out. They do not generate light as do other displays so use no power for that purpose. Watch type field effect LCD's use only 3 μ W for example with all segments energized at 7 Volts.

LCD's offer the greatest flexibility of any display type. Several standard displays, dynamic scattering or field effect, are immediately available from Hamlin's stock. Special displays with virtually any type of image can be produced with surprisingly low preparation or "tooling" cost. Because of the LCD's simplicity, lead time on specials is only a matter of weeks.

DYNAMIC SCATTERING

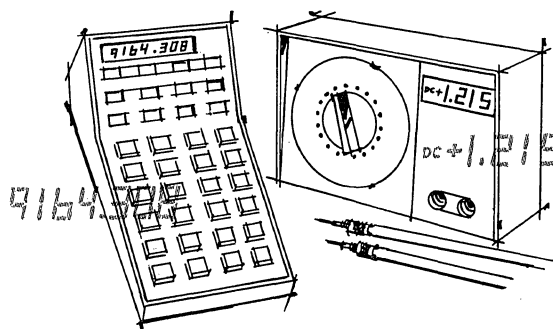


FIELD EFFECT



A Few Limitations. LCD's have limitations too. Operating temperature range is one. Liquid crystals slow down and may even cease to function at temperatures below 0°C. Above 50-60°C, crystals go into solution and will not function properly. But extremes do not damage LCD's. Once the temperature returns to normal, operation is automatically resumed.

LCD's are somewhat difficult to read under low ambient light conditions. (Side or back lighting can remedy this.) Visibility under medium to high ambient light conditions is excellent.



Conclusion. In the majority of display applications, MOS and C/MOS compatibility, reliability, flexibility and low power requirements are important considerations. No other display can match the liquid crystal display on these jobs. They could be the display of the future.

And that's the case for the LCD. For specifications, and application data, write Hamlin, Inc., Lake Mills, Wisconsin 53551, (414) 648-2361, for name of nearest representative.

Red, Yellow and Green Seven Segment LED Displays



Device	Description	Package	Application
	5082-7650 .43" High Efficiency Red, Common Anode, LHDP	14 Pin Epoxy, .3" DIP .75"H x .5"W x .25"D	General Purpose Market • Test Equipment • Digital Clocks • Clock Radios • TV Channel Indicators • Business Machines • Digital Instruments • Automobiles
	5082-7660 .43" Yellow, Common Anode, LHDP		
	5082-7670 .43" Green, Common Anode, LHDP		
	5082-7750 .43" Red, Common Anode, LHDP	14 Pin Epoxy, .3" DIP .75"H x .5"W x .25"D	For further information ask for Application Note 941 on 7-Segment Displays or AN 964 on Contrast Enhancement
	5082-7751 .43" Red, Common Anode, RHDP		
	5082-7752 .43" Red, Common Anode, Polarity & Overflow Indicator		
	5082-7760 .43" Red, Common Cathode, RHDP	14 Pin Epoxy, .3" DIP .75"H x .5"W x .25"D	
	5082-7730 .3" Red, Common Anode, LHDP	14 Pin Epoxy, .3" DIP .75"H x .4"W x .18"D	
	5082-7731 .3" Red, Common Anode, RHDP		
	5082-7732 .3" Red, Common Anode, Polarity & Overflow Indicator		
	5082-7740 .3" Red, Common Cathode, RHDP	10 Pin Epoxy, .3" DIP .75"H x .4"W x .18"D	
	5082-7402 .11" Red, 3 Digits Right, ^[1] Centered Decimal Point	12 Pin Epoxy, .3" DIP	Small Display Market • Portable/Battery Power Instruments • Portable Calculators For further information ask for Application Note 937 on Monolithic LED Displays
	5082-7403 .11" Red, 3 Digits Left, ^[1] Centered Decimal Point		
	5082-7404 .11" Red, 4 Digits, Centered Decimal Point		
	5082-7405 .11" Red, 5 Digits, Centered Decimal Point	14 Pin Epoxy, .3" DIP	
	5082-7412 .11" Red, 3 Digits Right, ^[1] RHDP	12 Pin Epoxy, .3" DIP	
	5082-7413 .11" Red, 3 Digits Left, ^[1] RHDP		
	5082-7414 .11" Red, 4 Digit, RHDP		
	5082-7415 .11" Red, 5 Digit, RHDP	14 Pin Epoxy, .3" DIP	
	5082-7432 .11" Red, 2 Digits Right, ^[2] RHDP	12 Pin Epoxy, .3" DIP	
	5082-7433 .11" Red, 3 Digits, RHDP		

NOTES: 1. Three Digit Displays are mounted in four-digit packages with digits placed to the left or right.
2. Two Digit Displays are mounted in three-digit packages with digits placed to the right.



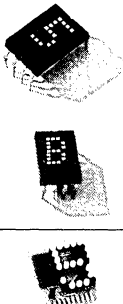
HPA DIVISION • 640 Page Mill Road, Palo Alto, California 94304, Telephone 415 493-1212, TWX 910 373-1751/1247

Red, Yellow and Green Seven Segment LED Displays (Continued)

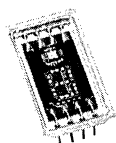


Device	Description	Package	Application
	5082-7440 .105" Red, 8 Digits, Mounted on P.C. Board	17 Term. P.C. Bd., 2,000" W., Edge Card Connector	Small Display Market • Portable/Battery Power Instruments • Portable Calculators For further information ask for Application Note 937 on Monolithic LED Displays
	5082-7448 .105" Red, 8 Digits, Mounted on P.C. Board	17 Term. P.C. Bd., 2,375" W., Edge Card Connector	
	5082-7441 .105" Red, 9 Digits, Mounted on P.C. Board	17 Term. P.C. Bd., 2,000" W., Edge Card Connector	
	5082-7449 .105" Red, 9 Digits, Mounted on P.C. Board	17 Term. P.C. Bd., 2,375" W., Edge Card Connector	

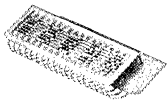
Commercial Integrated LED Displays

Device	Description	Package	Application
	5082-7300 .29" 4 x 7 Single Digit Numeric, RHDP, Built-In Decoder/Driver/Memory	8 Pin Epoxy, .6" DIP .55"H x .4"W x .11"D	General Purpose Market • Test Equipment • Business Machines • Medical • Computer Peripherals • Avionics For further information ask for Application Note 934 on LED Display Installation Techniques
	5082-7302 .29" 4 x 7 Single Digit Numeric, LHDP, Built-In Decoder/Driver/Memory		
	5082-7340 .29" 4 x 7 Single Digit Hexadecimal, Built-In Decoder/Driver/Memory		
	5082-7304 .29" Overrange Character Plus/Minus Sign	8 Pin Epoxy, .6" DIP .55"H x .4"W x .11"D	
	5082-7500 1.5" 5 x 7 Single Digit LHDP, Built-In Decoder/Driver	P.C. Board 10 Pin Edge Card Connector (.156" Centers)	General Purpose Market • Test Equipment • Medical Equipment • Industrial Controls

Hermetically Sealed Integrated LED Displays

Device	Description	Package	Application
	5082-7010 .27" 5 x 7 Single Digit Numeric, LHDP, Built-In Decoder/Driver	8 Pin Hermetic .100" Pin Centers	• Ground, Airborne, Shipboard Equipment • Fire Control Systems • Medical Instruments • Space Flight Systems
	5082-7011 .27" Plus/Minus Sign		
	5082-7001 .27" 5 x 7 Three Digit Numeric, LHDP, Built-In Decoder/Driver	24 Pin Hermetic .100" Pin Centers	

Alphanumeric LED Displays

Device	Description	Package	Application
	5082-7100 .29" 5x7 Three Digit Alphanumeric	22 Pin Hermetic .6" DIP	General Purpose Market • Business Machines • Calculators • Solid State CRT • High Reliability Applications For further information ask for Application Note 931 on Alphanumeric Displays
	5082-7101 .29" 5x7 Four Digit Alphanumeric	28 Pin Hermetic .6" DIP	
	5082-7102 .29" 5x7 Five Digit Alphanumeric	36 Pin Hermetic .6" DIP	



HPA DIVISION • 640 Page Mill Road, Palo Alto, California 94304, Telephone 415 493-1212, TWX 910 373-1751/1247

Red, Yellow and Green LED Lamps

Device		Description				Typical Luminous Intensity	Θ½ [1]	Typical Forward Voltage	
Photo	Part No. 5082-	Color	Emitting Material	Lens	Package				
	4650	High Eff. Red (635nm) [2]	GaAsP on GaP	Red Diffused	T-1½; Plastic; Long, General Purpose Leads [3]	2.0mcd @ 10mA	90°	2.2 Volts @ 10 mA	
	4655			Red Non-Diffused		4.0mcd @ 10mA			
	4657					12.0mcd @ 10mA	35°		
	4658					24.0mcd @ 10mA			
	4684	High Eff. Red (635nm) [2]	GaAsP on GaP	Red Diffused	T-1; Plastic; Long Leads [4]	2.5mcd @ 10mA	80°	2.2 Volts @ 10mA	
	4550	Yellow (583nm) [2]	GaAsP on GaP	Yellow Diffused	T-1½; Plastic; Long, General Purpose Leads [3]	1.8mcd @ 10mA	90°	2.2 Volts @ 10mA	
	4555			Yellow Non-Diffused		3.0mcd @ 10mA			
	4557					9.0mcd @ 10mA	35°		
	4558					16.0mcd @ 10mA			
	4584	Yellow (583nm) [2]	GaAsP on GaP	Yellow Diffused	T-1; Plastic; Long Leads [4]	2.5mcd @ 10mA	60°	2.2 Volts @ 10mA	
	4950	Green (565nm) [2]	GaP	Green Diffused	T-1½; Plastic; Long, General Purpose Leads [3]	1.8mcd @ 20mA	90°	2.4 Volts @ 20mA	
	4955			Green Non-Diffused		3.0mcd @ 20mA			
	4957					9.0mcd @ 20mA	30°		
	4958					16.0mcd @ 20mA			
	4984	Green (565nm) [2]	GaP	Green Diffused	T-1; Plastic; Long Leads [4]	2.0mcd @ 20mA	70°	2.4 Volts @ 20mA	
 4403/4440	4403	Red (655nm) [2,5]	GaAsP on GaAs	Red Diffused	T-1½; Plastic; Short Leads [3]	1.2mcd @ 20mA	75°	1.6 Volts @ 20mA	
	4415				T-1½; Plastic; Short, Bent Leads [4]				
	 4415/4444				4440	T-1½; Plastic; Short Leads [3]			0.7mcd @ 20mA
					4444	T-1½; Plastic; Short, Bent Leads [4]			
	4480	Red (655nm) [2,5]	GaAsP on GaAs	Red Diffused	T-1; Plastic; Long Leads [4]	0.8mcd @ 20mA	120°	1.6 Volts @ 20 mA	
	4483			Clear Diffused			80°		
	4486			Clear Non-Diffused					
 4850/4855	4850	Red (655nm) [2,5]	GaAsP on GaAs	Red Diffused	T-1½; Plastic; Long, Wire Wrappable Leads [3]	0.8mcd @ 20mA	95°	1.6 Volts @ 20 mA	
	4855				T-1; Plastic; Long Leads [4]	1.4mcd @ 20mA			
	 4484/4494					4484	0.8mcd @ 20mA		120°
						4494	1.4mcd @ 20mA		
	4487	Red (655nm) [2,5]	GaAsP on GaAs	Clear Non-Diffused	T-1 (Low Dome); Plastic; Long Leads [4]	0.8mcd @ 20mA	120°	1.6 Volts @ 20mA	
	4488					Guaranteed Minimum: 0.3mcd @ 20mA			

NOTES: 1. Total Angle Between Half Luminous Intensity Points.
2. Peak Wavelength.
3. Panel Mountable. Ask for Data Sheet 5082-4707.
4. PC Board Mountable.
5. Ask for AN 945 on Photometry of Red LED Lamps.

Red, Yellow and Green LED Lamps (Cont'd.)

COMPONENTS

Device		Description				Typical Luminous Intensity	$\Theta_{1/2}$ [1]	Typical Forward Voltage
Photo	Part No. 5082-	Color	Emitting Material	Lens	Package			
	4880	Red (655nm) [2,6]	GaAsP on GaAs	Red Diffused	T-1 1/4; Plastic; Long, Wire Wrappable Leads [3]	0.8mcd @ 20mA	58°	1.6 Volts @ 20mA
	4883			Clear Non-Diffused			50°	
	4886			Clear Diffused			65°	
	4881			Red Diffused		1.3mcd @ 20mA	58°	
	4884			Clear Non-Diffused			50°	
	4887			Clear Diffused			65°	
	4882			Red Diffused		1.8mcd @ 20mA	58°	
	4885			Clear Non-Diffused			50°	
	4888			Clear Diffused			65°	

Integrated LED Lamps

Device		Description				Typical Luminous Intensity	$\Theta_{1/2}$ [1]	Typical Forward Current
Photo	Part No. 5082-	Color	Integration	Lens	Package			
	4732	Red (655nm) [2,6]	Voltage Sensing IC integrated with GaAsP LED chip	Red Diffused	T-1; Plastic; Long Leads [4]	0.7mcd @ 2.75V	95°	13mA @ 2.75V
	4860	Red (655nm) [2,6]	Resistor chip integrated with GaAsP LED chip	Red Diffused	T-1 1/4; Plastic; Long Leads [3]	0.8mcd @ 5.0V	58°	16mA @ 5.0V
	4468			Clear Diffused	T-1; Plastic; Long Leads [4]		70°	

Hermetically Sealed LED Lamps

Device		Description			Minimum Luminous Intensity	$\Theta_{1/2}$ [1]	Typical Forward Voltage
Photo	Part No.	Color	Lens	Package			
	1N5765 JAN 1N5765 [5] JAN TX 1N5765 [5]	Red (655nm) [2,6]	Red Diffused	Hermetic/TO-46; Long Leads [4]	0.5mcd @ 20mA	70°	1.6 Volts @ 20mA
	5082-4420	Red (655nm) [2,6]	Red Diffused	Hermetic/TO-46; Long Leads [4]	0.5mcd @ 20mA	70°	1.6 Volts @ 20mA

NOTES: 1. Total Angle Between Half Luminous Intensity Points.
 2. Peak Wavelength.
 3. Panel Mountable. Ask for Data Sheet 5082-4707.
 4. PC Board Mountable.
 5. Military Approved and qualified for High Reliability Applications.
 6. Ask for AN 945 on Photometry of Red LED Lamps.

ILLUMINATED PRODUCTS INC. (formerly MARCO-OAK)

A Subsidiary of OAK Industries Inc.

INDICATORS

The sub-miniature indicators shown here and other sizes and styles shown on the following page are examples of those most frequently used by panel designers. A complete catalog of IPI indicators and switches is available on request.

The QT series below owe their wide popularity to low

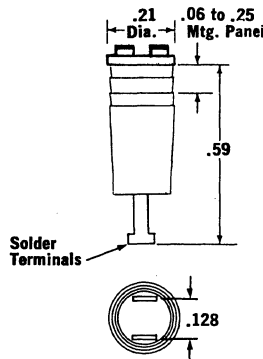
cost, dependability, and the patented "slide base" lamp that is self-orienting when replaced. Caps are available in a variety of translucent or transparent colors and domed or flat top shapes. The LED and neon models feature a micro-grooved dome cap for optimum visibility.

sub-miniature "little QT"

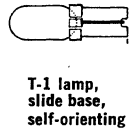
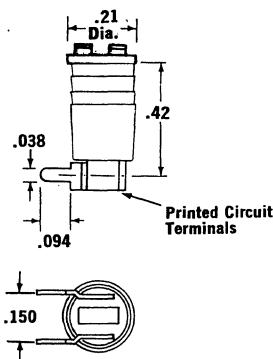


99-33080 SERIES 99-33081 SERIES

BASE ASSEMBLY 99-33080



BASE ASSEMBLY 99-33081

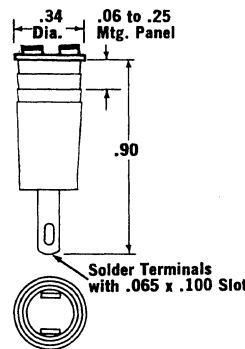


miniature "big QT"

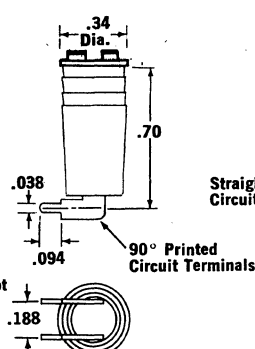


14-33880 SERIES 14-33881 SERIES 14-33882 SERIES

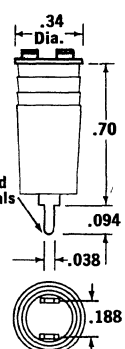
BASE ASSEMBLY 14-33880



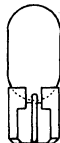
BASE ASSEMBLY 14-33881



BASE ASSEMBLY 14-33882



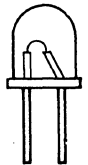
T-1 3/4 lamp,
slide base,
self-orienting



Neon version (22-35380 Series)
uses standard T-2 neon lamp
(series resistor not included).
Used only with solder terminal
base assembly.



L.E.D. version
(QT/D300, 14-35380
Series) incorporated any
L.E.D. conforming to
outline, diam. is .235,
height, .390. Solder
terminal base only.

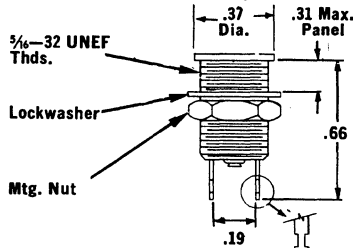


sub-miniature



99-33180 SERIES

BASE ASSEMBLY 99-33180



The standard and watertight versions of this indicator are identical except for the addition of rubber washers to the base and lens caps for the latter.

sub-miniature, watertight



95-33180 SERIES

ILLUMINATED PRODUCTS INC. (formerly MARCO-OAK)

A Subsidiary of OAK Industries Inc.

INDICATORS, typical

miniature



14-35180 SERIES

miniature



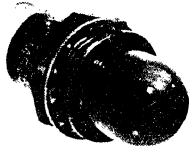
14-30380 SERIES

miniature



14-30080 SERIES

miniature



**11-33480 SERIES
(MS25256)**

miniature, press-to-test



03-90980 SERIES

**miniature, watertight
and oiltight**



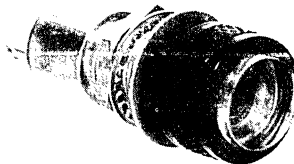
15-35183 SERIES

**miniature, watertight,
press-to-test**



05-90881 SERIES

**miniature, E. M. I.
suppressed
press-to-test**



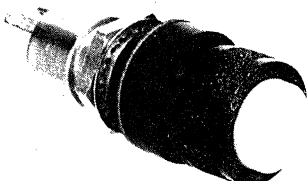
08-83281 SERIES

**miniature, E. M. I.
suppressed**



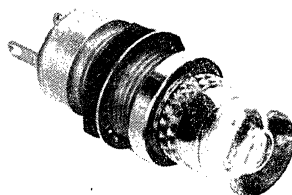
18-36880 SERIES

**miniature, E. M. I.
suppressed, watertight
press-to-test**



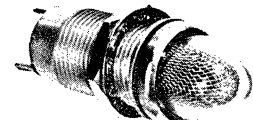
08-83283 SERIES

miniature, neon



33-30880 SERIES

**miniature, neon,
E.M.I. suppressed**



38-36480 SERIES

ILLUMINATED PRODUCTS INC. (formerly MARCO-OAK)

A Subsidiary of OAK Industries Inc.

207 S. Helena St., P.O. Box 4011, Anaheim, CA 92803

Tel: (714) 535-6037 TWX 910-591-1185

For Switches, see ILLUMINATED
PRODUCTS SWITCH SECTION, EEM Pages 1•2062-1•2065

ILLUMINATED PRODUCTS INC. (formerly LAMPS INC.)

A Subsidiary of OAK Industries Inc.

SUBMINIATURE AND MICROMINIATURE LAMPS

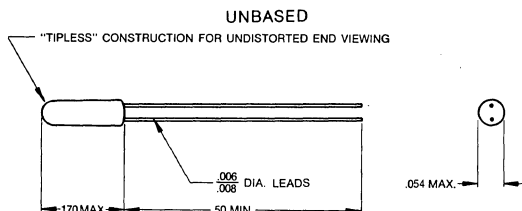
The incandescent lamps described in these 3 pages constitute only a small part of the broad line of high quality light sources available from Illuminated Products Inc. Those

shown in bold face type are the more frequently specified types. A complete Lamp Catalog is available on request. Contact factory for special lamp assemblies.

T-3/8 LAMP

Design		MSCP (Note 1)	Life (hrs.)	Part Numbers	
Volts	Amps (±10%)			IPI	Industry*
1.5	0.015	0.002	10,000	LA173	7090
1.5	0.051	0.020	1,000	LA155	—
3.0	0.029	0.030	5,000	LA156	7093

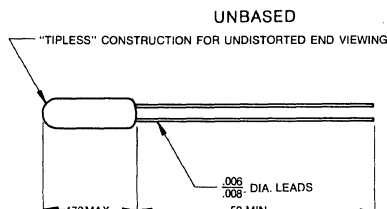
*Ref. American National Standards Institute



T-1/2 LAMP

Design		MSCP (Note 1)	Life (hrs.)	Part Numbers	
Volts	Amps (±10%)			IPI	Industry*
1.5	0.015	0.002	10,000	LA174	7094
1.5	0.051	0.020	5,000	LA175	—
2.5	0.045	0.050	1,000	LA186	—
3.0	0.029	0.030	5,000	LA176	7096
5.0	0.020	0.034	5,000	LA157	7097

*Ref. American National Standards Institute



T-3/4 LAMP

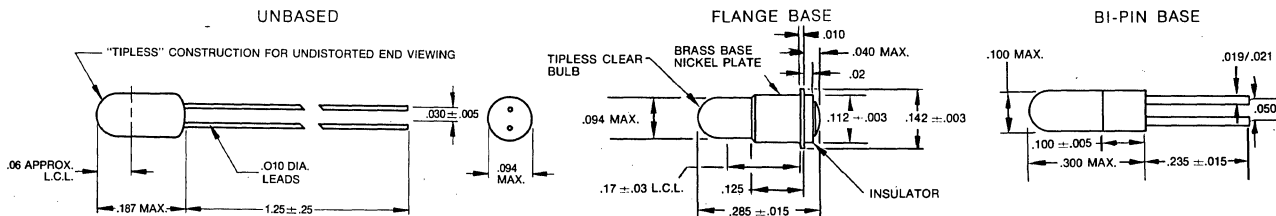
Design		MSCP (Note 1)	Life (hrs.)	Part Numbers					
Volts	Amps (±10%)			Unbased		Flange		Bi-Pin	
				IPI	Industry*	IPI	Industry*	IPI	Industry*
1.5	0.010†	0.002	10,000	LA1	7100	LA282	3810	LA283	7810
1.5	0.015	0.003	5,000	LA3	—	LA285	—	LA286	—
1.5	0.060	0.015	50,000	LA201	—	LA289	—	LA290	—
2.0	0.040	0.020	10,000	LA739	—	LA733	—	LA734	—
5.0	0.020	0.020	50,000	LA213	—	LA292	—	LA293	—
5.0	0.020	0.034	10,000	LA189	2	LA262	7122	LA455	7112
5.0	0.024	0.043	1,000	LA224	—	LA296	—	LA297	—
5.0	0.025	0.030	5,000 ∅	LA803	—	LA819	—	LA804	—
5.0	0.060	0.030	100,000	LA30**	6803	LA239	8587	LA299	7113
5.0	0.060	0.050	100,000	LA9**	6833	LA240	8913	LA456	7114
5.0	0.075	0.090	25,000	LA12**	7133	LA241	8828	LA303	7116
5.0	0.080	0.150	6,000	LA34	8666	LA305	8383	LA457	7117
5.0	0.115	0.150	40,000	LA17**	7153	LA242	8270	LA405	7118
5.0	0.115	0.200	5,000	LA18	7102	LA310	7123	LA458	7119

* Ref. American National Standards Institute

** MS-90452 (AS)

† ±0.0015 amp.

Ø Rated for D.C. operation

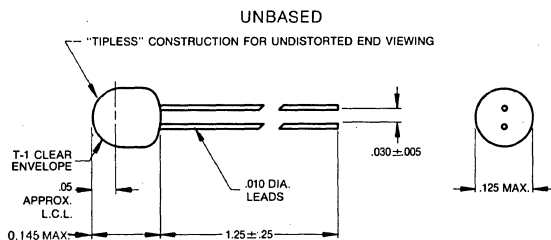


T-1 LAMP — REDUCED LENGTH — 0.145" MOL

Design		MSCP (Note 1)	Life (hrs.)	Part Numbers	
Volts	Amps (±10%)			IPI	Industry*
5.0	0.060	0.03	100,000	LA57**	6802
5.0	0.060	0.05	100,000	LA58**	6832
5.0	0.060	0.15	6,500	LA697	6152
5.0	0.075	0.09	25,000	LA59**	7132
5.0	0.080	0.15	5,000	LA700	6212
5.0	0.115	0.15	40,000	LA33**	7152
5.0	0.115	0.20	5,000	LA60	7212
5.0	0.125	0.25	5,000	LA701	8175

*Ref. American National Standards Institute

**MS-90451



ILLUMINATED PRODUCTS INC. (formerly LAMPS INC.)

A Subsidiary of OAK Industries Inc.

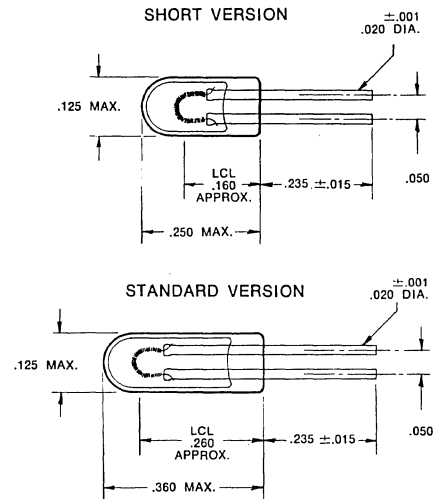
T-1 INTEGRAL BI-PIN LAMP

Design			IPI Part Numbers		
Volts	Amps (±10%)	MSCP (Note 1)	Life (hrs.)	Standard	Short
5.0	.020	.020	50,000	LA871	LA773
5.0	.020	.034	10,000	LA872	LA774
5.0	.060	.050	100,000	LA869	LA775
5.0	.115	.150	40,000	LA870	LA824

Features:

- Easy installation and removal
- Standard size fully interchangeable with conventional bi-pin lamp
- Short version unique for small-space applications
- Available with integral lens for increased light intensity from end of lamp (consult factory)

Tested in an integrating sphere traceable to National Bureau of Standards, after minimum burn-in period of 16 hours at 5V.



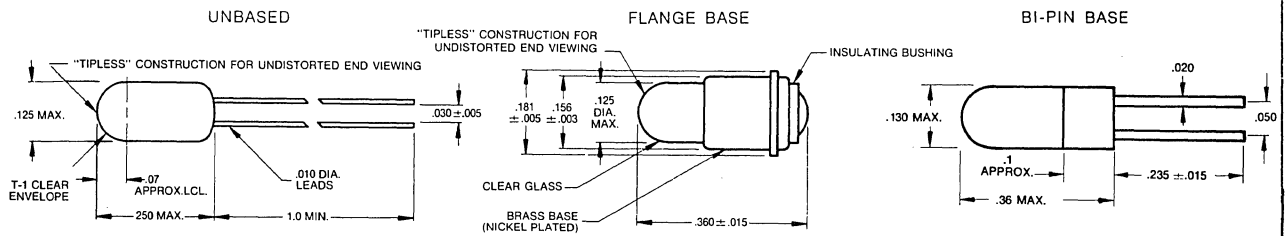
T-1 LAMP UNSUPPORTED (Also available in 1.5 through 3 volts.)

Design				Part Numbers					
Volts	Amps (±10%)	MSCP (Note 1)	Life (hrs.)	Unbased		Flange		Bi-Pin	
				IPI	Industry*	IPI	Industry*	IPI	Industry*
5.0	0.020	0.020	50,000	LA472	—	LA473	—	LA693	—
5.0	0.020	0.034	10,000	LA210	6022	LA263	8022	LA340	7022
5.0	0.025	0.030	5,000	LA821	—	LA822	—	LA823	—
5.0	0.060	0.030	100,000	LA32**	680	LA29***	682	LA343	7680
5.0	0.060	0.050	100,000	LA11**	683	LA25***	685	LA344	7683
5.0	0.060	0.150	6,500	LA246	—	LA247	—	LA346	—
5.0	0.075	0.090	25,000	LA14**	713	LA26***	714	LA347	7714
5.0	0.115	0.150	40,000	LA16**	715	LA27***	718	LA349	7715
5.0	0.115	0.200	5,000	LA20	7213	LA28	7237	LA356	7267
5.0	0.115	0.250	5,000	LA244	—	LA245	—	LA355	—

* Ref. American National Standards Institute

**MS-24367

***MS-24515



T-1 LAMP SUPPORTED

Design					Part Numbers					
Volts	Amps (±10%)	MSCP (Note 1)	Life (hrs.)	Number of Supports	Unbased		Flange		Bi-Pin	
					IPI	Industry*	IPI	Industry*	IPI	Industry*
3.0	0.008	0.001	10,000	1	LA80	7204	LA87	7228	LA330	—
5.0	0.030	0.030	16,000	1	LA139	7210	LA160	7234	LA341	7263
10.0	0.027	0.100	10,000	1	LA74	7218	LA85	7240	LA362	8095
12.0	0.030	0.100	25,000	1	LA209	—	LA243	—	LA382	—
12.0	0.060	0.150	16,000	1	LA66	7219	LA71	32	LA384	8097
14.0	0.040	0.150	16,000	1	LA248	—	LA256	—	LA388	—
14.0	0.065	0.150	16,000	1	LA367	8111	LA368	8112	LA369	8098
18.0	0.026	0.150	10,000	2	LA75	7220	LA86	7241	LA389	8099
28.0	0.024	0.150	16,000	2	LA62	6838	LA64**	6839	LA393	7839
28.0	0.024	0.200	16,000	2	LA267	—	LA390	—	LA391	—

* Ref. American National Standards Institute

**MS-3338

Note 1: MSCP tolerances usually available are: ±50%, ±25% and ±15%.

ILLUMINATED PRODUCTS INC. (formerly LAMPS INC.)

A Subsidiary of OAK Industries Inc.

T-1 3/4 LAMP

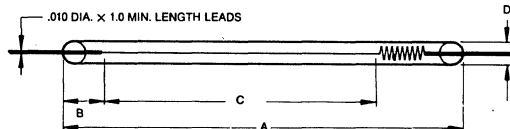
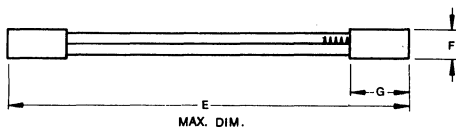
Design				Part Numbers							
Volts	Amps (±10%)	MSCP (Note 1)	Life (hrs.)	Unbased		Flange		Groove		Bi-Pin	
				IPI	Industry*	IPI	Industry*	IPI	Industry*	IPI	Industry*
2.5	0.200	0.220	500	LA715	1783	LA716**	368	LA717	8699	LA719	7968
3.0	0.015	0.002	20,000	LA582	2158	LA586	375	LA590	390	LA594	7375
6.0	0.040	0.040	10,000	LA598	1730	LA602	345	LA606	8705	LA610	7345
6.0	0.200	0.340 @ 5V	1,000	LA421	1784	LA328**	328	LA422	337	LA442	7328
6.3	0.075	0.230	1,000	LA811	1739	LA812	377	LA813	8708	LA814	7377
6.3	0.200	0.400	50,000	LA662	2181	LA666	381	LA670	379	LA674	7381
10.0	0.014	0.006	50,000	LA678	1869	LA682	344	LA686	709	LA688	7344
12.0	0.040	0.100	10,000	LA815	2174	LA816	394	LA817	7354	LA818	7371
14.0	0.080	0.500	1,500	LA703	1705	LA704**	330	LA705	336	LA706	7330
18.0	0.040	0.150	10,000	LA707	2102	LA708	370	LA709	346	LA710	7370
28.0	0.040	0.300	25,000	LA711	2187	LA712***	387	LA713	388	LA714	7387
28.0	0.040	0.340	7,000	LA480	1764	LA327**	327	LA432	334	LA447	7327

* Ref. American National Standards Institute **MS-25237 ***MS-18209

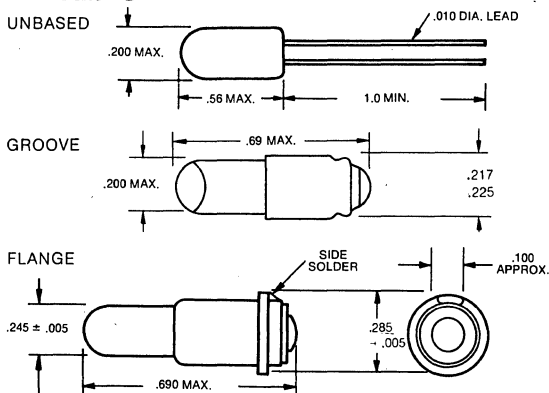
LINE FILAMENT LAMP

Design				Dimensions								Part Numbers	
Volts	Amps (±10%)	Filam. Temp. (°K)	Life (hrs.)	A	B	C	Min. Hot Length	D	Max. E	F	G	IPI	Industry*
3.0	0.400	1910	25,000	2.00	20	1.45	1.00	.160	2.20	.190	.32	LA218	—
3.7	0.120	2380	1,000	1.30	12	.82	.62	.094	1.40	.125	.25	LA219	—
5.0	0.480	2100	20,000	2.25	20	1.75	1.50	.160	2.40	.190	.32	LA468	—
6.0	0.110	1980	25,000	2.00	12	1.60	1.40	.094	2.10	.125	.25	LA563	—
6.0	0.120	2160	5,000	1.70	12	1.25	1.00	.094	1.80	.125	.25	LA105	7104
12.0	0.140	1910	25,000	4.44	12	3.93	3.70	.094	4.56	.125	.25	LA288	—
14.0	0.500	2240	5,000	4.50	20	3.80	3.80	.160	4.70	.190	.32	LA211	—
18.0	0.120	1990	25,000	4.50	12	3.95	3.50	.094	4.60	.125	.25	LA97	7107
20.0	0.120	1990	25,000	5.00	12	4.45	4.00	.094	5.10	.125	.25	LA108	7106
30.0	0.335	2100	20,000	10.40	20	9.50	9.00	.160	10.60	.190	.32	LA40	—
36.0	0.120	1990	25,000	8.80	12	7.95	7.50	.094	8.90	.125	.25	LA98	7108
48.0	0.200	2130	5,000	12.90	15	11.95	11.50	.125	13.10	.160	.25	LA100	7224

* Ref. American National Standards Institute



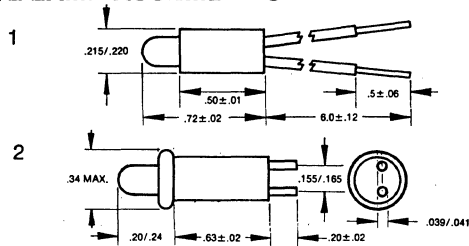
TL LAMPS



Design			Part Numbers					
Volts	Amps (±10%)	Life (hrs.)	Unbased		Groove		Flange	
			IPI	Ind.*	IPI	Ind.*	IPI	Ind.*
2.5	0.350	10,000	LA729	2140	LA253	253	LA732	252
2.5	0.350	10,000	LA731	2136	LA253-X	253-X	—	—
2.5	0.350	10,000	LA730	2124	LA253-1	261	—	—

* Ref. American National Standards Institute

TL LAMP ASSEMBLIES



Design		Life (hrs.)	Spot Intensity**	Part Numbers IPI	Fig. No.
Volts	Amps (±10%)				
2	0.180	12,000	220	LA474***	1
2.5	0.200	1,000	500	LA474	1
2.5	0.350	10,000	800	LA476	1
2.5	0.350	10,000	1,000†	LA477	1
2.5	0.350	10,000	800	LA478	2
5	0.180	10,000	500	LA475***	1
6	0.200	1,000	1,000	LA475	1

**Foot-Candles

***Derated

Note: Min. spot dia. is .12 measured at .6 in. from tip of lamp.
†0.06" Min. Dia. Spot

NUMERIC READOUTS

"LINKS BETWEEN MAN AND MACHINE"

INFO-LITE CORPORATION

46-10 104th STREET • CORONA, N. Y. 11368

See our Programming and Switching Products in Vol. 2, Section 5100.

— FEATURING —

- Ready to mount into panel cutout
- Servicing from front without tools
- Supplied in attractive assemblies with bezel
- Includes anti-glare "Black-Out" panel & color filter
- Snap-in logic boards available with memory option
- All wear parts (lamps and logic) socket mounted
- Plus minus signs, colons, decimal, message modules optional

212 / 476-1287



Series 68030

.7" Characters — Viewing to 20 Ft.



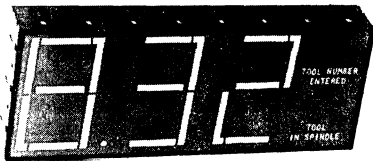
Series 68031

1.0" Characters — Viewing to 30 Ft.



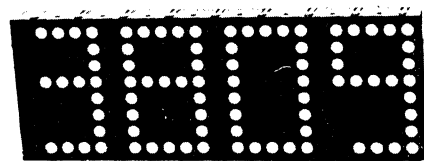
Series 68032

2.0" Characters — Viewing to 60 Ft.



Series 68033

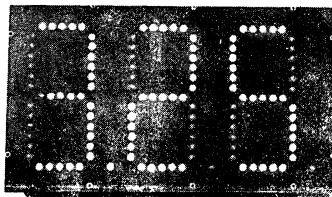
2.7" Characters — Viewing to 80 Ft.



FOR
OUTDOOR
VIEWING

Series OD68032/33

2.1"/2.9" Characters — Viewing to 60/80 Ft.

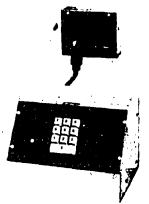


**Series
68036 &
OD68036**

Indoor/Outdoor — Viewing to 150 Ft.

SPECIAL SYSTEMS

We have supplied various hardware designed to meet special customer needs, including keyboard entry displays, up/down counters, hi-threshold interfaces, pre-determining counters, display/control systems and special enclosures. Call us to discuss your requirements.



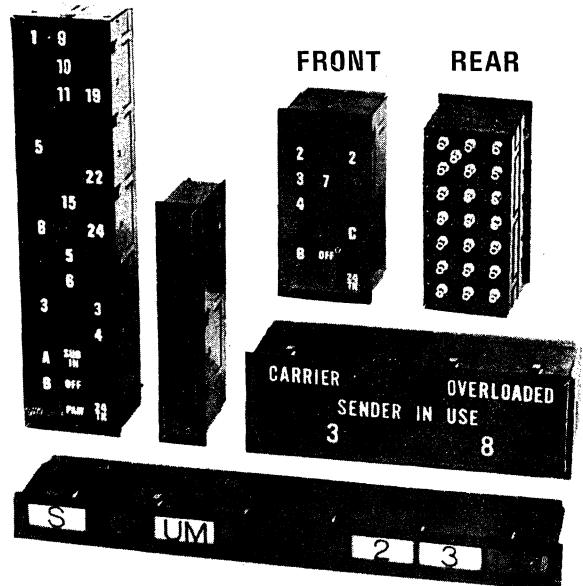
LIGHTED INDICATORS STATUS DISPLAYS

BACK-LIGHTED/DEAD FRONT PANELS ANNUNCIATORS

SERIES 68011, 68012, 68013 AND 68014

Any group of messages/symbols can be displayed in any combination of colors • Front panel graphics are back lighted using Std. MFB T 1 1/4" lamps • Basic message module sizes: 3/8" Sq, 3/8" x 3/4", 3/8" x 1-1/8", 3/8" x 1-1/2" or multiples of these • Units are supplied in an attractive package with bezel and "Black-Out" front panel, ready to snap into rectangular panel cutout • Common ground reduces installation time • Servicing can be done from the front • Lamp drivers and special logic available.

74000 SERIES BACKLIGHTED/DEAD FRONT PANEL ASSEMBLIES are available to meet a wide variety of medium to large size display applications. These are supplied to meet customer specifications.

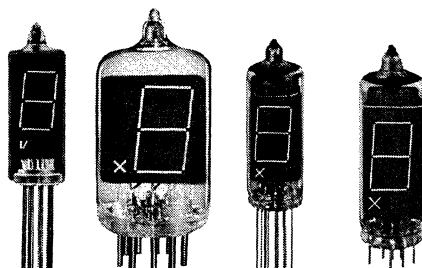


The world's broadest line of

Industrial Electronic Engineers, Inc. • 7740 Lemona Avenue,

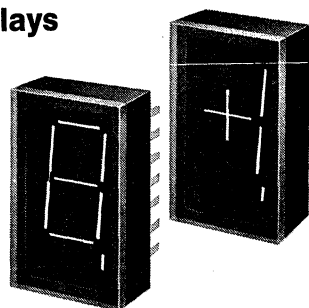
IEE - APOLLO — Incandescent Tube Digital Displays

- Choice of .4", .5", or .6" high, 7 segment digital characters (plus selected alphanumerics, ± 1 , and decimal point options)
- Adjustable brightness: 1,500 through 85,000 F/L against black ceramic base for sharp contrast in high ambient lighting
- Variable, low power, AC/DC operation: 3.5 to 12.0V; 10 to 30 MA per segment
- Wide, single plane viewing angle (140°); unobstructed display
- Color filter option
- Rugged construction; 100,000 hour life expectancy
- Standard BCD logic, IC Driver/Decoder, commercial socket compatible



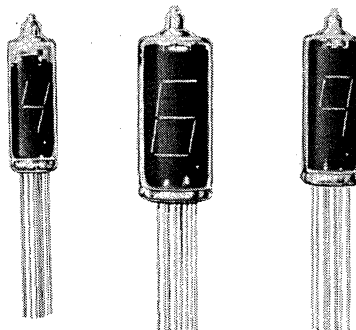
IEE - AURORA — Incandescent Flatpack Digital Displays

- Choice of .472" or .614" high, 7 segment characters
- 4,500 F/L of "morning dawn" brightness
- Low power - 15 MA per segment at 5 VDC
- Sharp contrast and excellent, 120° angular readability in high ambient lighting
- Convenient, slim profile; standard DIP package design
- 100,000 hours average life expectancy



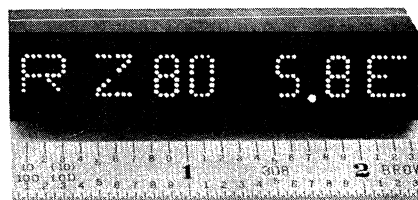
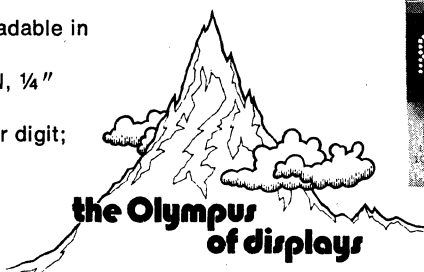
IEE - LUNA — Neon Tube Digital Displays

- Choice of 3/8", 1/2", or 5/8" high, 7 segment characters
- Sharp, high-contrast display with wide angle (120°) viewing
- Low power, cool operation - .5 MA at 190 VDC Max
- Bright, amber, single plane, stable and unobstructed characters
- Rugged, 100,000 hour life construction
- Minimal cost per digit
- Wide temperature range



IEE - HELIOS — High Intensity Fiberoptic Displays

- Specially designed for aircraft use; readable in direct sunlight @ 40,000' altitude
- 7 segment numeric or 16 segment A/N, 1/4" high characters
- Hi-density packaging: .1 in³ & .1 oz per digit; .2 in³ & .15 oz per A/N character
- Variable brightness for night vision
- 20mA per segment @ 5 VDC
- Meets MIL-E-5400, Class 2



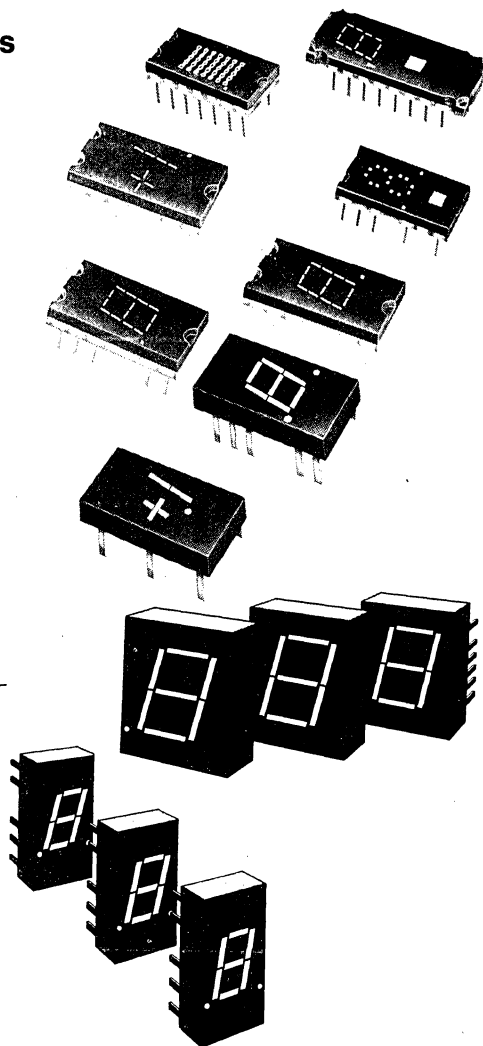
displays — digital readouts

Van Nuys, California 91405 • Telephone: (213) 787-0311 • TWX 910-495-1707

IEE — HERCULES — Light Emitting Diode Displays

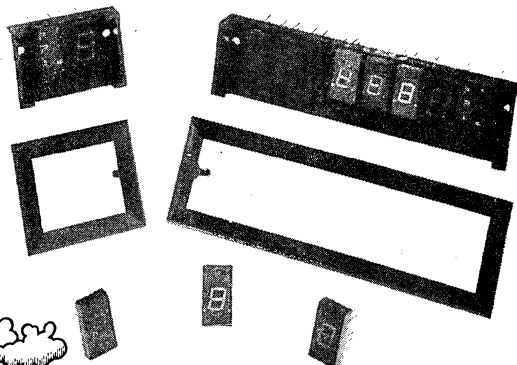
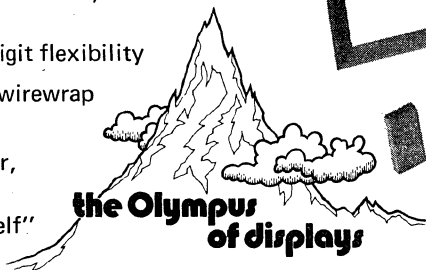
- Slim profile; single plane; standard 14/16 pin, .3" C/C DIP-packaged (except Series 1714)
- Character format versatile; choice of red, yellow or green colors
- Self-contained LSI chip, logic options (BCD, hexadecimal, pulse count accumulation)
- Numeric, hexadecimal or alphanumeric formats available; seven segment or 5x7 dot matrix characters
- Bright, transparent-plastic encapsulated characters, easily readable over wide angles
- Durably designed for minimum power & low cost per digit
- Choice of .27", .3", .43" or .6" high characters
- Install as integral unit with IEE•ATLAS Display Mounting Hardware

HERCULES SERIES #	DESCRIPTION	CHARACTER HEIGHT	COLOR
1701	0-9, Left D. P.	.270"	Red
1702	0-9, Right D. P.	.270"	Red
1703	+,-,1, Right D. P.	.270"	Red
1704	5x7 Dot A/N; Left D. P.	.300"	Red
1705	0-9, w/ Counter, Latch, D/D/ IC; Left D. P.	.270"	Red
1706	0-9, w/Latch, D/D IC; Left D. P.	.270"	Red
1707	Hexadecimal; D/D IC; Left & Right D. P.	.270"	Red
1710	+,-,1, Left D. P.	.300"	Red
1711	0-9, Left & Right D. P.	.300"	Red
1712R	0-9, Left D. P.	.300"	Red
1712Y	0-9, Left D. P.	.300"	Yellow
1712G	0-9, Left D. P.	.300"	Green
1713R	0-9, Left D. P.	.430"	Red
1713Y	0-9, Left D. P.	.430"	Yellow
1713G	0-9, Left D. P.	.430"	Green
1714R	0-9, Left D. P.	.635"	Red
1714Y	0-9, Left D. P.	.635"	Yellow
1714G	0-9, Left D. P.	.635"	Green



IEE — ATLAS — Universal Display Mounting Hardware

- Accommodates all standard 14/16 pin, DIP-packaged LED and planar displays
- NEW, "WIDE-EYE" bezel with 1" window accommodates character heights up to .500"
- Provides automatically self-aligning, unitized, "SLIP-IN" installation
- Offers optional two through eight digit flexibility
- Simplifies interconnection through wirewrap termination
- Facilitates wide-angle, optional color, polarized viewing
- Forever puts an end to "do-it-yourself" installation problems

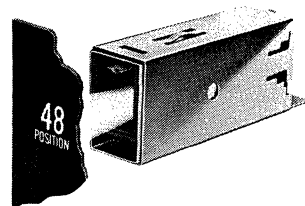
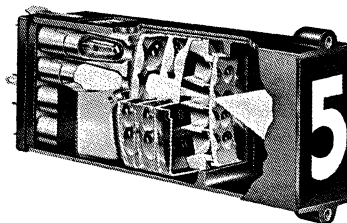


The world's broadest line of

Industrial Electronic Engineers, Inc. • 7740 Lemona Avenue,

IEE - TITAN — Projection Readout Displays

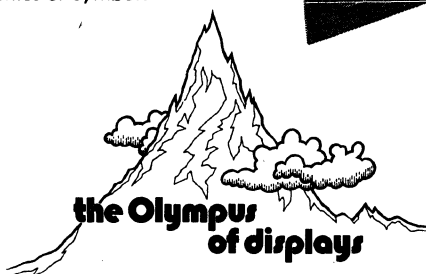
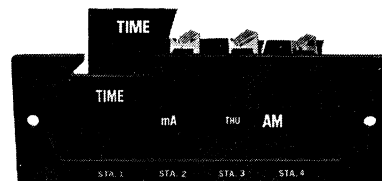
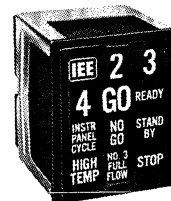
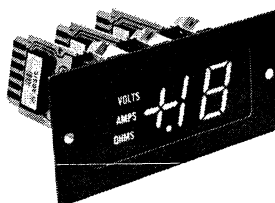
- World's most extensively used message displays
- Completely versatile - displays any image, color, message, type style reproducible on film with variable brilliance
- Bright, easily, legible, single plane, 160° wide angle viewing
- Displays from 12 to 48 messages per module
- Easily combined into multi-module, integral assemblies for added information capacity
- 14 different models: message type font heights from .076" to 1.39"; individual character heights from 3/8" to 3-3/8"; MIL-R-39027 models available
- Ultra-reliable, non-mechanical, passive operation; easy unitized installation; long life, low power, subminiature incandescent lamps
- Integral Driver/Decoders optional



SERIES	10	80	120	160	220	340	345	360	400	405	865	880	1002	1100
NUMBER OF MESSAGES	12	12	12	12	12	11	11	12	12	12	24	12	48	12
CHARACTER HEIGHT	.94"	3.375"	.59"	1.56"	.59"	.375"	.375"	2"	.5"	.5"	.5"	.5"	.45"	.59"
VIEWING DISTANCE	20'	70'	12'	30'	12'	8'	8'	40'	10'	10'	10'	10'	8'	12'
CHARACTER BRIGHTNESS	75F/L	45F/L	100F/L	45F/L	100F/L	30F/L	30F/L	40F/L	30F/L	30F/L	30F/L	30F/L	12F/L	100F/L
MIL-R-39027					X				X					

IEE - IRIS — Transilluminated Status Indicators & Annunciators

- BIG, BOLD, BRIGHT display with easy-to-read, single plane viewing
- Choice of 1/2", 3/4", or 2" high, 7-bar digital or 9-bar hexadecimal characters
- Up to twelve discrete messages per module; five optional, standard screen colors
- Unlimited message versatility - any graphics or symbols reproducible on film
- Long life, low power, subminiature incandescent lamps
- Simple, plug-in installation
- Low cost per message with optimum versatility
- Integral Driver/Decoders optional

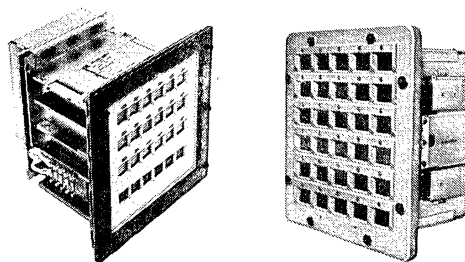


message displays & systems

Van Nuys, California 91405 • Telephone: (213) 787-0311 • TWX 910-495-1707

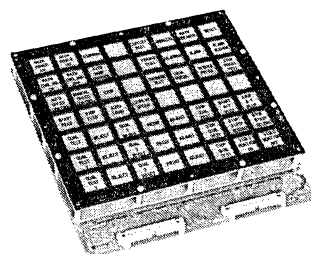
IEE - SYSTEMS

- Adaptable to all applications and environments
- Airborne, space, shipboard, subsurface, field and command center, military applications
- Process control, petrochemical, hydroelectric, paper, textile, aluminum, and manufacturing industrial usages
- Point-of-Sale, communications, telephonic switching accounting, computer, public health, educational, transportation, public services, governmental, medical & hotel facilities, and service industry commercial installations
- Multi-functional capabilities: information display; status indication; switching; automatic control; operator cueing and decision assistance; POS customer data



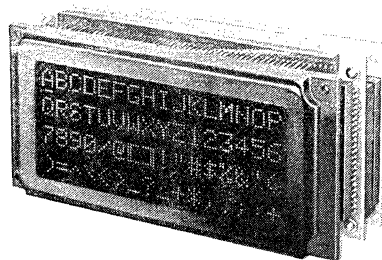
IEE - MIDAS — Illuminated Transparent Switches & Keyboard Arrays

- Environmentally sealed, transparent mylar membranes
- Extremely lightweight, "wafer-thin", profile - front & rear of panel
- Long life: 1,000,000 cycle life-rated
- No mechanical linkage, springs or buttons
- Quiet, positive, fingertip pressure (4-9 oz.), single pole/single throw, momentary contact switching
- Lowest cost per switch for high density switch requirements
- Optional matrix design (customized or standard), such as 1x8, 3x4, 2x3, 5x6, 7x8, 10x10, etc.
- Displays any graphic data reproducible on film; optional color



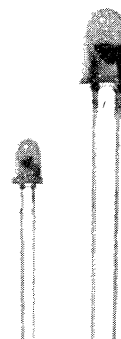
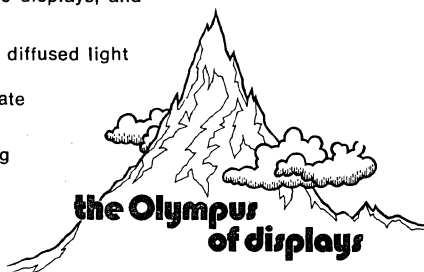
IEE - ARGUS — Dot Matrix Message Panel

- Choice of 4-line, 64-character or 8-line, 128 & 256-character soft copy panel displays
- 5x7 dot matrix; .3" character height; .9mm individual dot diameter
- Soft green characters for easy viewing
- USASCII/EBCDIC code compatible; complete repertoire of A/N's and symbols
- Flat plate display panel for overall slim profile
- Low operating voltage
- 100 us clock rate



IEE - HERCULES/ELECTRA — Solid State Indicators

- Ideally suited for visual indicators, large displays, and built-in diagnostics
- Choice of red, yellow, amber, or green, diffused light
- High brightness, with low cost, solid state reliability
- Socket, PC board or 1/8" panel mounting
- TTL/DTL circuit compatible
- Choice of T-1 or T-1 1/4 sizes



The world's broadest line of

Industrial Electronic Engineers, Inc. • 7740 Lemona Avenue,

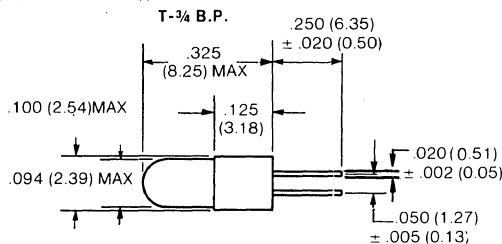
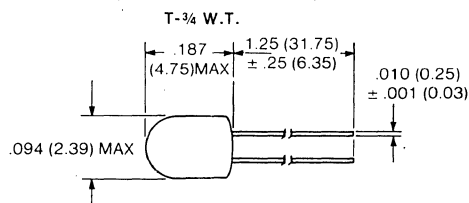
IEE - ELECTRA - Subminiature Incandescent Lamps

T-3/4 LAMPS

LINE NO.	DESIGN		MSCP (±25%)	LIFE HOURS	FILAMENT SHAPE	-LAMP NUMBERS-	
	VOLTS	AMPS				WIRE TERMINAL	BI-PIN BASE
1	1.5	.015	.01 NOM	5,000	C-2R	7101	7811
2	5.0	.020	.02	50,000	C-2R	DU51	DB51
3	5.0	.021	.034	10,000	C-2R	2	7112
4	5.0	.060	.03	100,000	C-2R	6803	7113
5	5.0	.060	.05	100,000	C-2R	6833	7114
6	5.0	.060	.15	3,000	C-2R	6153	7115
7	5.0	.075	.09	25,000	C-2R	7133	7116
8	5.0	.115	.15	40,000	C-2R	7153	7118
9	5.0	.115	.20	5,000	C-2R	7102	7119

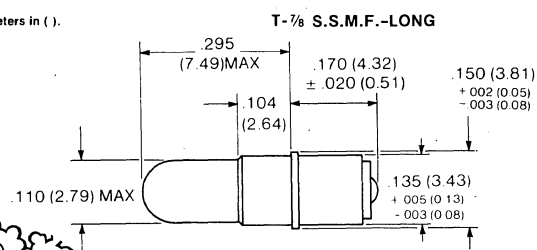
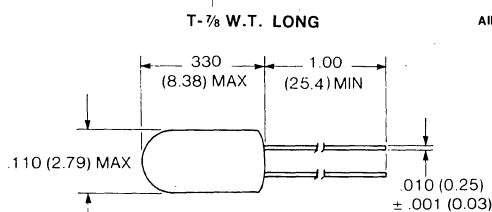
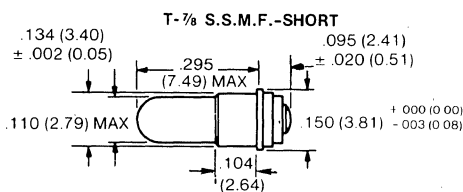
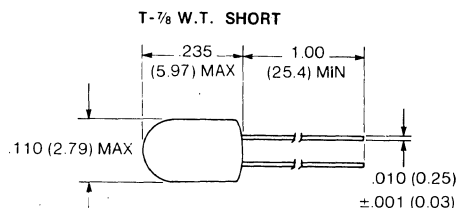
APPLICABLE MILITARY LAMP DRAWINGS
MS 90452AS 15% (6803, 6833, 7133, 7153)

All dimensions are in inches and millimeters in ().



T-7/8 LAMPS

LINE NO.	DESIGN		MSCP (±25%)	LIFE HOURS	FILAMENT SHAPE	LAMP NUMBERS			
	VOLTS	AMPS				WIRE TERMINAL SHORT	WIRE TERMINAL LONG	SPECIAL SUB-MIDGET FLANGE SHORT	SPECIAL SUB-MIDGET FLANGE LONG
10	5.0	.040	.12	1,000	C-2R	AU8	CU8	A8	C8
11	5.0	.060	.12	12,000	CC-6	AU12	CU12	A12	C12
12	5.0	.072	.12	40,000	C-2R	AU36	CU58	36	C58
13	5.0	.115	.15	40,000	C-2R	3	CU1	1	C1
14	12.0	.060	.14	16,000	C-2V	AU5	CU5	A5	C5
15	14.0	.040	.14	16,000	C-2V	AU3	CU3	A3	C3



APPLICABLE MILITARY LAMP SPECIFICATION
MIL-L-6363

IEE manufactures lamps not listed above. Consult factory for your requirements

**the Olympus
of displays**

(Specifications subject to change without notice)

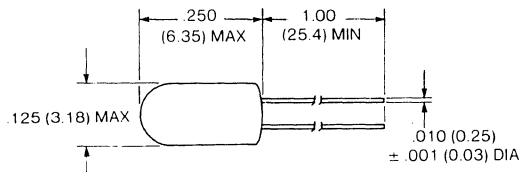
displays - Lamps & Indicators

Van Nuys, California 91405 • Telephone: (213) 787-0311 • TWX 910-495-1707

T-1 LAMPS

LINE NO.	DESIGN		MSCP (±25%)	LIFE HOURS	FILAMENT SHAPE	LAMP NUMBERS		
	VOLTS	AMPS				WIRE TERMINAL	SUB- MIDGET FLANGE	BI-PIN BASE
1	1.5	.015	.01 NOM	5,000	C-2R	7201	7226	7254
2	3.0	.012	.001 NOM	16,000	C-2R	2128	679	7259
3	3.0	.015	.02 NOM	5,000	C-2R	7205	7229	3229
4	3.0	.060	.03	100,000	C-2R	7207	7231	7260
5	3.0	.120	.15	16,000	C-2R	7208	7232	7261
6	5.0	.020	.02	50,000	C-2R	EU1	E1	EB1
7	5.0	.021	.034	10,000	C-2R	6022	8022	7022
8	5.0	.030	.03	75,000	C-2R	7210	7234	7263
9	5.0	.060	.03	100,000	C-2R	680	682	7680
10	5.0	.060	.05	100,000	C-2R	683	685	7683
11	5.0	.060	.15	5,000	C-2R	6150	6180	7265
12	5.0	.075	.09	25,000	C-2R	713	714	7714
13	5.0	.115	.15	40,000	C-2R	715	718	7715
14	5.0	.115	.20	5,000	C-2R	7213	7236	7267
15	10.0	.027	.10	10,000	C-2F	7218	7240	8095
16	12.0	.030	.10	25,000	C-2V	EU2	E2	EB2
17	12.0	.060	.15	16,000	C-2F	7219	32	8097
18	14.0	.040	.14	16,000	C-2V	23	22	EB3
19	14.0	.065	.15	16,000	C-2F	8111	8112	8098
20	18.0	.026	.15	16,000	C-2F	7220	7241	8099
21	24.0	.020	.08	15,000	CC-2F	EU4	E4	EB4
22	28.0	.024	.15	16,000	CC-2F	6838	6839	7839

T-1 W.T.



APPLICABLE MILITARY LAMP SPECIFICATION
MIL-L-6363

APPLICABLE MILITARY LAMP DRAWINGS

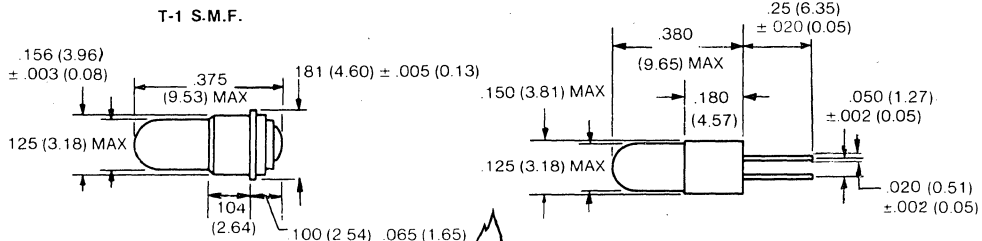
MS 3338AS 25% (6839)

MS 24367AS 15% and AS25% (680, 683, 713, 715)

MS 24515AS15% and AS25% (682, 685, 714, 718)

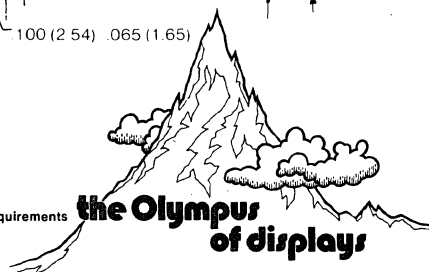
All dimensions are in inches and millimeters in ().

T-1 B.P.



T-1 S.M.F.

IEE manufactures lamps not listed above. Consult factory for your requirements



(Specifications subject to change without notice)

The world's broadest line of

Industrial Electronic Engineers, Inc. • 7740 Lemona Avenue,

T-1 LAMPS (Short Envelope)

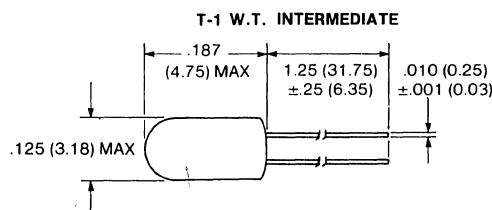
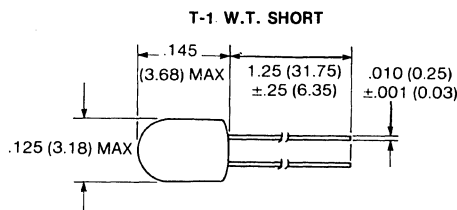
LINE NO.	DESIGN VOLTS	AMPS	MSCP (±25%)	LIFE HOURS	FILAMENT SHAPE	WIRE TERMINAL	
						SHORT	INTERMEDIATE
1	5.0	.060	.03	100,000	C-2R	6802	6801
2	5.0	.060	.05	100,000	C-2R	6832	6831
3	5.0	.060	.15	5,000	C-2R	6152	6151
4	5.0	.075	.09	25,000	C-2F	7132	7131
5	5.0	.115	.15	40,000	C-2R	7152	7151
6	5.0	.115	.20	5,000	C-2R	7212	3211

APPLICABLE MILITARY LAMP SPECIFICATION
MIL-L-6363

All dimensions are in inches and millimeters in ().

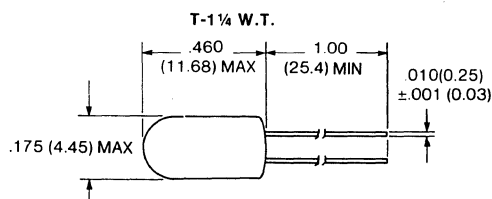
APPLICABLE MILITARY LAMP DRAWINGS

MS 90451AS15% (6802, 6832, 7132, 7152)



T-1 1/4 LAMPS

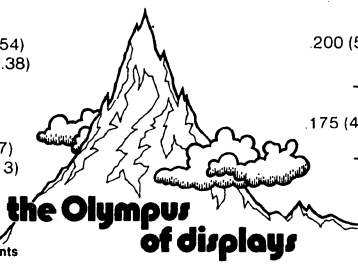
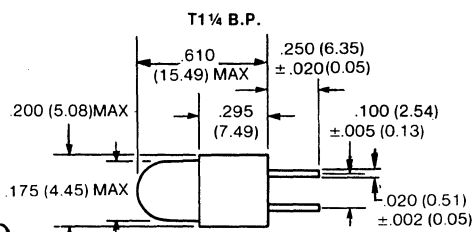
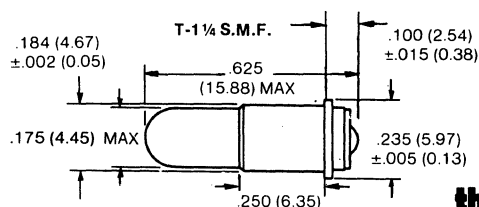
LINE NO.	DESIGN VOLTS	AMPS	MSCP (NOMINAL)	LIFE HOURS	FILAMENT SHAPE	WIRE TERMINAL	SPECIAL MIDGET FLANGE	BI-PIN BASE
7	5.0	.060	.03	100,000	C-2R	580	3582	7580
8	5.0	.060	.05	100,000	C-2R	583	3585	7583
9	5.0	.115	.15	40,000	C-2R	515	3518	7515
10	6.0	.040	.03	1,000	C-2V	8661	8660	7660
11	6.0	.060	.13	3,000	C-2R	2114	8541	7309
12	6.0	.200	.63	1,000	C-2R	634	8628	7628
13	6.3	.200	.55	5,000	C-2R	8610	8551	7310
14	14.0	.080	.30	25,000	C-2F	8605	F3	FB3
15	14.0	.080	.50	1,000	C-2F	8640	8646	7646
16	24.0	.040	.17	15,000	C-2F	FU1	F1	FB1
17	28.0	.040	.30	25,000	C-2F	FU2	F2	FB2
18	28.0	.040	.32	1,000	C-2F	8627	8632	7632



APPLICABLE MILITARY LAMP SPECIFICATION
MIL-L6363

APPLICABLE MILITARY LAMP DRAWINGS
MS 28135AS25% (8627)

All dimensions are in inches and millimeters in ().



IEE manufactures lamps not listed above. Consult factory for your requirements

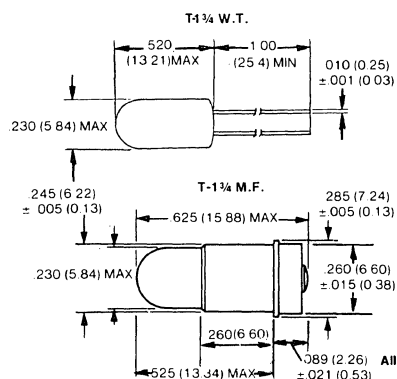
(Specifications subject to change without notice)

displays - Lamps & Indicators

Van Nuys, California 91405 • Telephone: (213) 787-0311 • TWX 910-495-1707

T-1 $\frac{3}{4}$ LAMPS

LINE NO.	DESIGN VOLTS	AMPS	MSCP (NOMINAL)	LIFE HOURS	FILAMENT SHAPE	WIRE TERMINAL	LAMP NUMBERS			
							MIDGET FLANGE	MIDGET GROOVE	MIDGET SCREW	BI-PIN BASE
1	1.35	.060	.01	500	C-2R	1728	331	698	8669	7931
2	2.5	.200	.22	500	C-2R	1783	368	8699	1769	7968
3	2.7	.060	.04	6,000	C-2R	1738	338	8704	8693	7838
4	3.0	.015	.003-.006	10,000	C-6	2158	375	390	7313	7375
5	5.0	.020	.02	50,000	C-2R	HU51	H51	HG51	HS51	HB51
6	5.0	.040	.03	25,000	C-2R	HU540	H540	HG540	HS540	HB540
7	5.0	.060	.03	100,000	C-2R	8805	7332	7346	7316	7360
8	5.0	.060	.05	100,000	C-2R	2200	7333	7347	7318	7361
9	5.0	.060	.15	5,000	C-2R	3151	3150	3152	3153	3149
10	5.0	.115	.15	40,000	C-2R	2203	7335	7348	7319	7362
11	6.0	.040	.03	10,000	C-2V	1730	345	8705	342	7945
12	6.0	.200	.60	3,000	C-2R	1784	328	337	1768	7328
13	6.3	.040	.03	50,000	C-2R	2180	380	7351	7320	7380
14	6.3	.075	.22	500	C-2R	1739	377	8708	1775	7377
15	6.3	.200	.42	50,000	C-2R	2181	381	379	378	7381
16	6.3	.200	.57	5,000	C-2R	2112	349	398	7323	7349
17	10.0	.014	.004	5,000	C-2F	1869	344	709	8691	7344
18	10.0	.040	.08	3,000	C-2V	2107	367	397	389	7367
19	12.0	.040	.12	10,000	C-2F	2174	394	7354	7326	7371
20	14.0	.080	.30	50,000	C-2V	2182	382	386	8362	7382
21	14.0	.080	.52	2,500	C-2V	1705	330	336	373	7330
22	14.0	.100	.50	10,000	C-2F	2162	8918	393	8162	7373
23	18.0	.040	.15	10,000	C-2F	2102	370	346	8536	7370
24	28.0	.040	.20	50,000	C-2F	2185	385	7355	8384	7374
25	28.0	.040	.30	25,000	C-2F	2187	387	388	399	7387
26	28.0	.040	.34	5,000	C-2F	1764	327	334	335	7327
27	28.0	.060	.34	25,000	C-2F	1764LSV	376	334LSV	335LSV	7876



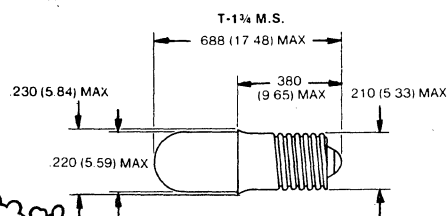
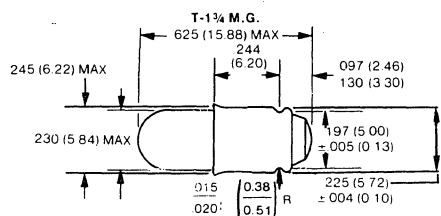
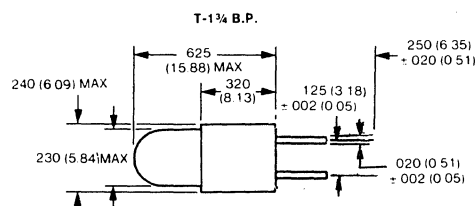
APPLICABLE MILITARY LAMP SPECIFICATION
MIL-L-6363

APPLICABLE MILITARY LAMP DRAWINGS

MS 15612 (335, 342, 1768, 1769)

MS 18209AS25% (387)

MS 25237AS (327, 328, 330, 338, 368)



**the Olympus
of displays**

IEE manufactures lamps not listed above. Consult factory for your requirements

(Specifications subject to change without notice)

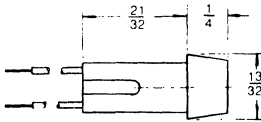
IDI Pilot and Indicator Lights—

Glo-Dot



SERIES 2990D

One-piece lens-body 6, 12 and 28 volt incandescent pilot lights.



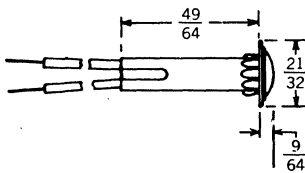
Lens Color	6V	12V	28V
Red	2990D1-6V	2990D1-12V	2990D1-28V
Amber	2990D3-6V	2990D3-12V	2990D3-28V
White	2990D4-6V	2990D4-12V	2990D4-28V
Green	2990D5-6V	2990D5-12V	2990D5-28V
Blue	2990D6-6V	2990D6-12V	2990D6-28V
Yellow	2990D7-6V	2990D7-12V	2990D7-28V

Mounting hole— $\frac{5}{16}$ " diameter.



SERIES 2990P

One-piece lens-body 6, 12, and 28 volt incandescent pilot lights with plug bezel and low profile lens.



Lens Color	6V	12V	28V
Red	2990P1-6V	2990P1-12V	2990P1-28V
Amber	2990P3-6V	2990P3-12V	2990P3-28V
White	2990P4-6V	2990P4-12V	2990P4-28V
Green	2990P5-6V	2990P5-12V	2990P5-28V
Blue	2990P6-6V	2990P6-12V	2990P6-28V
Yellow	2990P7-6V	2990P7-12V	2990P7-28V

Mounting hole— $\frac{1}{2}$ " diameter in $\frac{1}{32}$ to $\frac{3}{32}$ " thick panels.

Current ratings for 2990D and 2990P series: 6V—.200A, 12V—.100A, 28V—.040A.

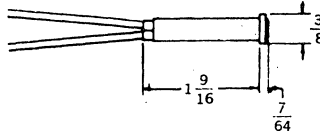
GLO-DOT MINIATURE NEON PILOT LIGHT WITH WIRE LEADS



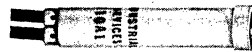
SERIES 2120A

Lens Color	120 VAC
Red	2120A1
Amber	2120A3
White	2120A4

Mounting hole— $\frac{5}{16}$ " diameter



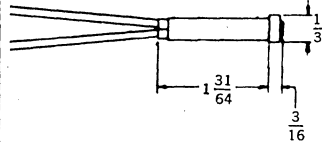
GLO-DOT MINIATURE NEON PILOT LIGHT WITH WIRE LEADS



SERIES 2110A 2112A

Lens Color	120 VAC
Red	2110A1
Clear	2110A2
Amber	2110A3
White	2110A4
Green	2112A5

Mounting hole— $\frac{5}{16}$ " diameter



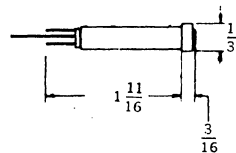
GLO-DOT MINIATURE NEON PILOT LIGHT WITH .187 TERMINALS**



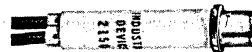
SERIES 2110QA 2112QA

Lens Color	120 VAC
Red	2110QA1
Clear	2110QA2
Amber	2110QA3
White	2110QA4
Green	2112QA5

Mounting hole: $\frac{5}{16}$ " diameter

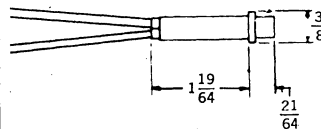


GLO-DOT MINIATURE NEON PILOT LIGHT WITH WIRE LEADS



SERIES 2150A 2152A

Lens Color	120 VAC
Red	2150A1
Amber	2150A3
White	2150A4
Green	2152A5



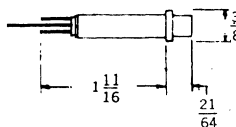
Mounting Hole— $\frac{5}{16}$ " diameter. Voltage—105-125 VAC.

GLO-DOT MINIATURE NEON PILOT LIGHT WITH .187 TERMINALS**



SERIES 2150QA 2152QA

Lens Color	120 VAC
Red	2150QA1
Amber	2150QA3
White	2150QA4
Green	2152QA5



Mounting hole— $\frac{5}{16}$ " diameter. Voltage—105-125 VAC.

**All terminal models tinned for soldering convenience.

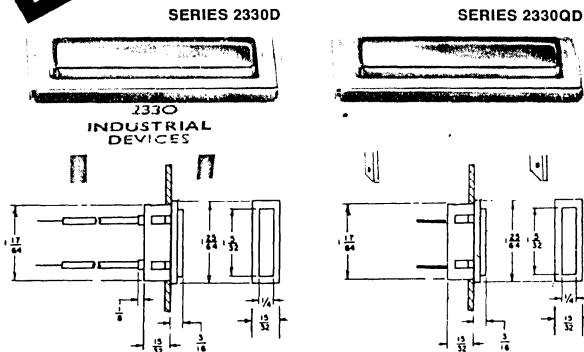
Wire lead models have $4\frac{1}{2}$ " leads stripped $\frac{1}{2}$ "



INDUSTRIAL DEVICES, INC.

The Bright Spot for Your Product

Line-O-Lite



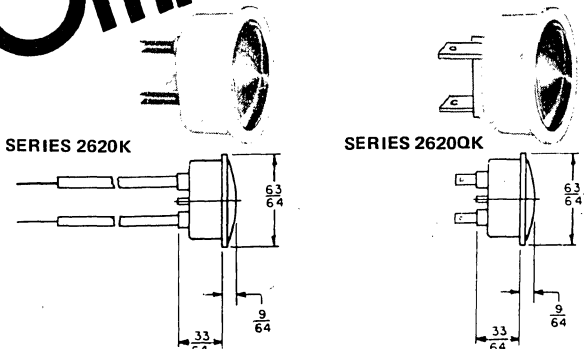
Will snap-fit into panels .055-.070" thick without speednut, and into other thicknesses with speednut. Mounting hole— $1\frac{1}{32}'' \times \frac{39}{400}''$. Voltage—105-125 VAC.

SERIES 2330D, 2330QD

Lens Color	NEON — 120 VAC	
	With wire leads	With .250 terminals**
Red	2330D1	2330QD1
Amber	2330D3	2330QD3
White	2330D4	2330QD4
Green	2330D5	2330QD5

**All terminal models tinned for soldering convenience.

Omni-Glow



Versatile general purpose neon pilot lights. Mounting hole— $\frac{7}{8}''$ diameter. Voltage—105-125 VAC

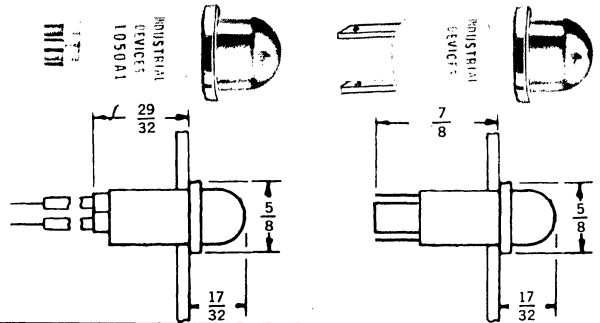
SERIES 2620K, 2620QK

Lens Color	NEON — 120 VAC	
	With wire leads	With .250 terminals**
Red	2620K1	2620QK1
Amber	2620K3	2620QK3
White	2620K4	2620QK4
Green	2620K5	2620QK5

**All terminal models tinned for soldering convenience.

Wire lead models have $4\frac{1}{2}''$ leads stripped $\frac{1}{2}''$

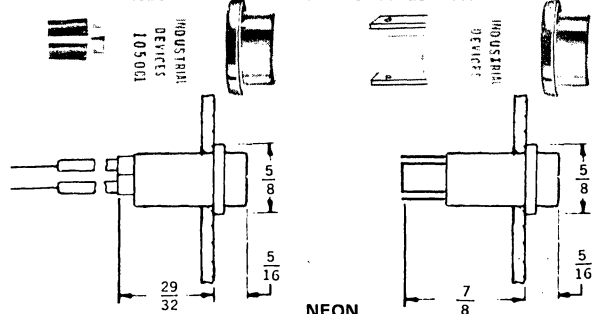
SERIES 1050A 1051A 1052A SERIES 1050QA 1051QA 1052QA



Lens Color	Incandescent			Neon		
	6 Volt	12 Volt	28 Volt	120 VAC	250 VAC	With .187 terminals**
Red	1090A1-6V	1090A1-12V	1090A1-28V	1050A1	1051A1	1050QA1
Clear	1090A2-6V	1090A2-12V	1090A2-28V	1050A2	1051A2	1050QA2
Amber	1090A3-6V	1090A3-12V	1090A3-28V	1050A3	1051A3	1050QA3
White	1090A4-6V	1090A4-12V	1090A4-28V	1050A4	1051A4	1050QA4
Green	1090A5-6V	1090A5-12V	1090A5-28V	1052A5	1053A5	1052QA5
Blue	1090A6-6V	1090A6-12V	1090A6-28V	1052A6		1053QA5

*Mounting hole— $\frac{1}{2}$ inch diameter

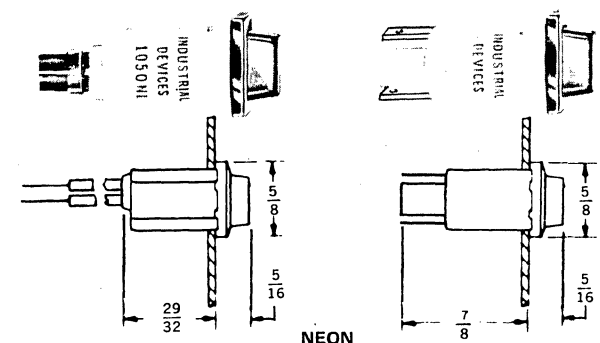
SERIES 1050C 1052C SERIES 1050QC 1052QC



Lens Color	With wire leads	With .187 terminals**
	120 VAC	120VAC
Red	1050C1	1050QC1
Amber	1050C3	1050QC3
White	1050C4	1050QC4
Green	1052C5	1052QC5

*Mounting hole— $\frac{1}{2}$ inch diameter

SERIES 1050N 1052N (Square Lens) SERIES 1050QN 1052QN (Square Lens)



Lens Color	With wire leads	With .187 terminals**
	120 VAC	120 VAC
Red	1050N1	1050QN1
Amber	1050N3	1050QN3
White	1050N4	1050QN4
Green	1052N5	1052QN5

Versatile general purpose neon and incandescent pilot lights.

Mounting hole— $\frac{1}{2}$ inch diameter

**All terminal models tinned for soldering convenience.

Wire lead models have $4\frac{1}{2}''$ leads stripped $\frac{1}{2}''$

Edgewater, New Jersey 07020 Phone: (201) 224-4700



IDI Pilot and Indicator Lights

Red, Green or Amber Light Emitting Diodes

Light on your budget, heavy on performance

All models incorporate gallium phosphide light-emitting diodes—the brighter, more efficient LED

SOLID STATE GLO-DOT 2190U Series HEMISPHERICAL LENS—RED, AMBER OR GREEN

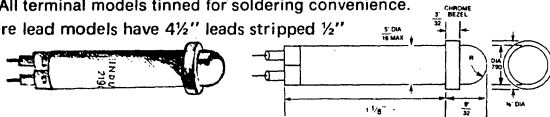
Approx. 100,000 hour life. Low voltage, low power drain—ideal for solid state and battery operations. Built-in current-limiting resistor and rectifier diode permit unit use in AC and DC applications, and protect against damage from incorrect polarity connection. Highly reliable, shock and vibration resistant. Requires $\frac{5}{16}$ " diameter hole for mounting (speednut supplied).

Lens Color	WITH WIRE LEADS		
	6 Volt	12 Volt	28 Volt
Red	2190U1-6V	2190U1-12V	2190U1-28V
Amber	2190U3-6V	2190U3-12V	2190U3-28V
Green	2190U5-6V	2190U5-12V	2190U5-28V

Lens Color	With .187 tinned terminals**		
	6 Volt	12 Volt	28 Volt
Red	2190QU1-6V	2190QU1-12V	2190QU1-28V
Amber	2190QU3-6V	2190QU3-12V	2190QU3-28V
Green	2190QU5-6V	2190QU5-12V	2190QU5-28V

**All terminal models tinned for soldering convenience.

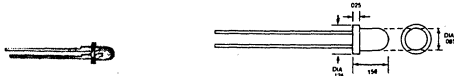
Wire lead models have $\frac{4}{32}$ " leads stripped $\frac{1}{2}$ "



SOLID STATE SUBMINIATURE LED 4302 M SERIES—RED, GREEN OR AMBER

For circuit applications where space is limited. Wiring and installation instructions are furnished with each unit.

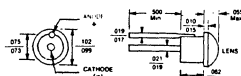
Lens Color	Stock Models Available	VOLTAGE RATING From 3V up depending on resistor you use.
Red	4302M1	
Amber	4302M3	
Green	4302M5	



SOLID STATE MICRO-MINIATURE LED 4301T SERIES—RED, GREEN OR AMBER

For circuit applications where space is limited. Wiring and installation instructions are furnished with each unit.

Lens Color	Stock Models Available	VOLTAGE RATING From 3V up depending on resistor you use.
Red	4301T1	
Amber	4301T3	
Green	4301T5	



SOLID STATE GLO-DOT 2190L SERIES FLAT TOP LENS—RED, AMBER OR GREEN

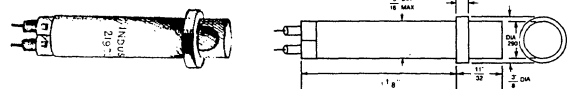
Approx. 100,000 hour life. Low voltage, low power drain—ideal for solid state and battery operations. Built-in current limiting resistor and rectifier diode permit unit use in AC and DC applications, and protect against possible damage from incorrect polarity connection. Highly reliable, shock and vibration resistant. Requires $\frac{5}{16}$ " diameter hole for mounting (speednut supplied).

Lens Color	With wire leads		
	6 Volt	12 Volt	28 Volt
Red	2190L1-6V	2190L1-12V	2190L1-28V
Amber	2190L3-6V	2190L3-12V	2190L3-28V
Green	2190L5-6V	2190L5-12V	2190L5-28V

Lens Color	With .187 tinned terminals**		
	6 Volt	12 Volt	28 Volt
Red	2190QL1-6V	2190QL1-12V	2190QL1-28V
Amber	2190QL3-6V	2190QL3-12V	2190QL3-28V
Green	2190QL5-6V	2190QL5-12V	2190QL5-28V

**All terminal models tinned for soldering convenience.

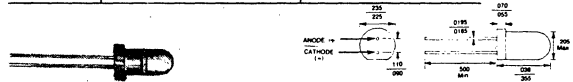
Wire lead models have $\frac{4}{32}$ " leads stripped $\frac{1}{2}$ "



SOLID STATE 4300H HIGH DOME LED SERIES—RED, GREEN OR AMBER

Each unit is packaged with one black panel mounting clip. Wiring and installation instructions are furnished with each unit. Mount in $\frac{1}{16}$ " diameter hole.

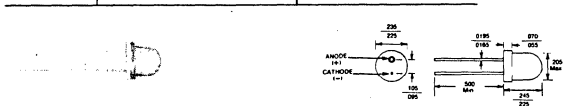
Lens Color	Stock Models Available	VOLTAGE RATING From 3V up depending on resistor you use.
Red	4300H1	
Amber	4300H3	
Green	4300H5	



SOLID STATE 4300S STANDARD DOME LED SERIES—RED, GREEN OR AMBER

Each unit is packaged with one black panel mounting clip. Wiring and installation instructions are furnished with each unit. Mount in $\frac{1}{16}$ " diameter hole.

Lens Color	Stock Models Available	VOLTAGE RATING From 3V up depending on resistor you use.
Red	4300S1	
Amber	4300S3	
Green	4300S5	



Note: Resistance values are recommended to limit current to approximately .015A for Red LEDs, and approximately .04A for Green and Amber LEDs.

New! Green Glow Pilot Lights

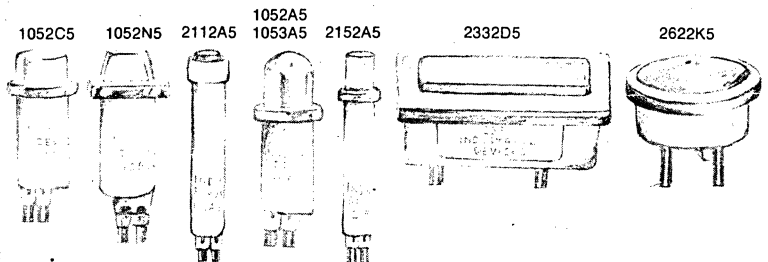
For the first time a green "neon" is available! The broad-spectrum bright green color gives you greater design flexibility, especially when emphasizing such functions as safe/unsafe and on/off. A special phosphor coating inside the bulb, which converts the emission from the internal ionized gas to green light, makes the green "neon" glow possible.

Lens Color	120 VAC	
	With wire leads	With .187 terminals† and .250 terminals††
Green	1052A5	1052QA5†
Green	1052C5	1052QC5†
Green	1052N5	1052QN5†
Green	2112A5	2112QA5†
Green	2152A5	2152QA5†
Green	2332D5	2332QD5††
Green	2622K5	2622QK5††

Lens Color	250 VAC	
	With wire leads	With .187 terminals† and .250 terminals††
Green	1053A5	1053QA5†

All terminal models tinned for soldering convenience.

Wire lead models have $\frac{4}{32}$ " leads stripped $\frac{1}{2}$ "



INDUSTRIAL DEVICES, INC.

The Bright Spot for Your Product

Mini-Slide

- FULL RANGE OF COLORS
- EASY TO INSTALL
- SECURELY SEATED — WILL NOT VIBRATE LOOSE
- ECONOMICAL — LONG-LIVED
- EASY RELAMPING FROM FRONT OF PANEL
- U.L. RECOGNIZED CSA APPROVED (120V MODELS)

Pilot Light Assemblies

MODEL 2800 SERIES for use with "Pilot" Lamps

MINI-SLIDE Series 2800 pilot light assemblies are bright, highly visible, beautiful pilot lights styled with either solid black or stainless steel bezels.

The units feature round, light-diffusing, screw-in lenses. They come in a variety of colors and utilize "pilot" lamps in a full range of voltages from 6 to 120 volts. The lenses are molded polycarbonate, and the screw-in design permits easy relamping from the front of the panel. Mini-Slide Series 2800 is UL listed and CSA approved for 120 volt service.

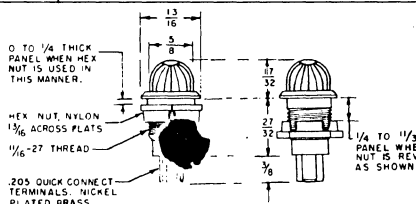
There are 2 sockets. Model 2800 (all plastic-black bezel) and Model 2801 (mirror-finish stainless steel bezel). Leads can be attached by soldering or with quick-connect receptacles for .205 x .020 tab.

MOUNTING

The heat-resistant phenolic socket is held to panel by means of a unique nylon torque-limiting nut (U.S. Patent 3352194). This nut eliminates any possibility of stripping threads or over-tightening, and is self-locking. Series 2800 Pilot Light Assemblies mount in an 11/16" diameter hole.



Socket #	Description
2800	All Plastic Black Bezel
2801	Mirror-finish Stainless Steel Bezel



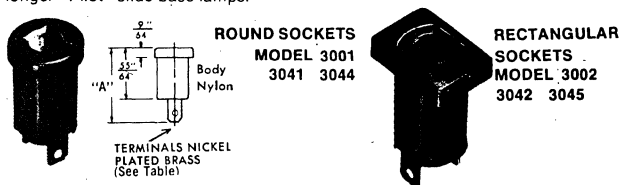
Lens Color	Red	Clear	Amber	White	Green	Blue	Yellow
Assembly lens code	A1	A2	A3	A4	A5	A6	A7
Lens Part Number (if ordered separately)	2811	2812	2813	2814	2815	2816	2817

Ordering Information. The complete assembly model consists of the socket number plus lens code and lamp voltage and designation. (See table). For example Model 2801A1-120PSB indicates an assembly consisting of socket with stainless bezel, (2801), red lens (A1) and 120V lamp.

Individual Sockets

Available in round or rectangular styles to suit your design requirements. MINI-SLIDE mounts in 1/2" diameter holes—which may be punched with flats to prevent rotation. Model 3002 series socket can be turned to establish 1/2" or 3/4" mounting centers.

Models 3001 and 3002 series sockets are molded from black nylon and accept "Indicator" lamps—Model 3061 socket is molded black phenolic and accepts the longer "Pilot" slide base lamps.



Round Sockets	Rectangular Sockets	Terminal Size	Dim "A"
Model No.	Model No.		
3001	3002	.205 x .020	19/64"
3041	3042	.187 x .020	19/64"
3044	3045	.060 Wide	63/64"
		No Hole	

Mounting

All MINI-SLIDE 3000 Series single sockets (3001, 3002, 3061) mount in either a 1/2" round hole or a standard "D" shaped hole. Push-on speednuts are automatically supplied with MINI-SLIDE sockets. Normally, #461 will be supplied with single sockets and 3/4" center strips—#1264 supplied with 1/2" center strips. When

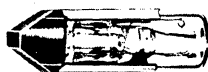
single sockets are mounted on closer than 3/4" centers, the #1264 speednut should be used and will be supplied if specified.

MODEL 3061



SHORT SLIDE BASE LAMPS

A complete line of rugged, long-life miniature incandescent slide base lamps is available, covering a wide range of voltages up to 120 volts and ratings up to three watts. Lamps are available in two lengths, the shorter "Indicator" lamps and the longer "Pilot" lamps.



"INDICATOR" LAMPS



"PILOT" LAMPS

Although relamping can be accomplished readily without special tools, where many lamps must be replaced a lamp-puller is helpful. The most effective such tool is simply a piece of soft vinyl sleeving of appropriate size. Order as stock No. 1937.

"INDICATOR" LAMPS

LAMP NUMBER	DESIGN VOLTS	DESIGN AMPS	MIN. LAB LIFE (HRS.)	WATTAGE AT DESIGN VOLTS	AVERAGE END FOOT CANDLES
4ESB	4	.035-.045	5,000	2	200
5ESB	5	.035-.045	5,000	2	225
6ESB	6	.035-.045	5,000	2	250
10ASB	10	.009-.011	15,000	1	-
10CSB	10	.015-.020	5,000	2	100
10ESB	10	.035-.045	10,000	4	450
12ESB	12	.035-.045	5,000	4	650
16CSB	16	.015-.020	5,000	3	150
16ESB	16	.035-.045	5,000	6	900
18ESB	18	.035-.045	5,000	7	1000
24CSB	24	.015-.020	5,000	4	200
24ESB	24	.035-.045	5,000	10	1100
28ESB	28	.035-.045	5,000	1.1	1285
48ESB	48	.035-.045	5,000	1.9	2000

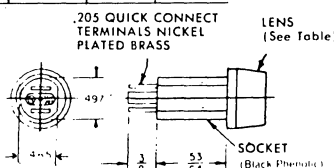
*Cherry Red Glow

"PILOT" LAMPS

LAMP NUMBER	DESIGN VOLTS	DESIGN AMPS	MIN. LAB LIFE (HRS.)	WATTAGE AT DESIGN VOLTS	AVERAGE END FOOT CANDLES
6PSB	6	.140	5,000	8	800
12PSB	12	.170	5,000	20	2400
24PSB	24	.073	5,000	1.7	2200
28PSB	28	.040	5,000	1.1	1900
48PSB	48	.053	5,000	2.5	1500
60PSB	60	.050	5,000	3.0	2400
120PSB	120	.025	5,000	3.0	1600

MODEL 3060 SERIES

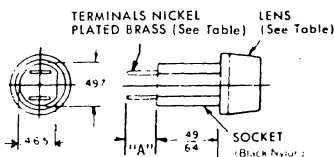
For use with "Pilot" Lamps
MINI-SLIDE Model 3060 assemblies accept slide base "Pilot" lamps. Socket molded of black phenolic is UL listed and CSA approved for 120 volt service and takes both round and square lenses. Lenses snap on or off for easy frontpanel relamping.



MODEL 3040 SERIES

For use with "Indicator" Lamps
MINI-SLIDE Model 3040 sockets are molded from black nylon. Designed to accept short slide base "Indicator" lamps. Otherwise identical to Model 3060.

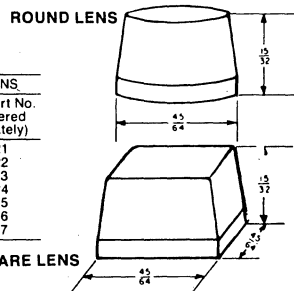
Model No.	Terminal Size	Dim "A"
3040	.205 x .020	9/32"
3043	.187 x .020	9/32"
3046	.060 Wide	1/8"
	No Hole	



Pilot Light Lenses

for 3060-3040 Series
MINI-SLIDE individual pilot light lenses are available in 3 shapes—round, square, and angle. Lenses are molded polycarbonate and either round or square lens will fit both 3040 and 3060 sockets. Angle lens will fit model 3060 with "Indicator" lamp only. Each lens is available in 7 bright colors (see table). Round and square lenses may be supplied hot-stamped with legends as desired. All lenses are keyed to socket for correct orientation.

Lens Color	ROUND LENS		SQUARE LENS	
	Lens Code	Lens Part No. (if ordered separately)	Lens Code	Lens Part No. (if ordered separately)
Red	C1	3111	D1	3121
Clear	C2	3112	D2	3122
Amber	C3	3113	D3	3123
White	C4	3114	D4	3124
Green	C5	3115	D5	3125
Blue	C6	3116	D6	3126
Yellow	C7	3117	D7	3127



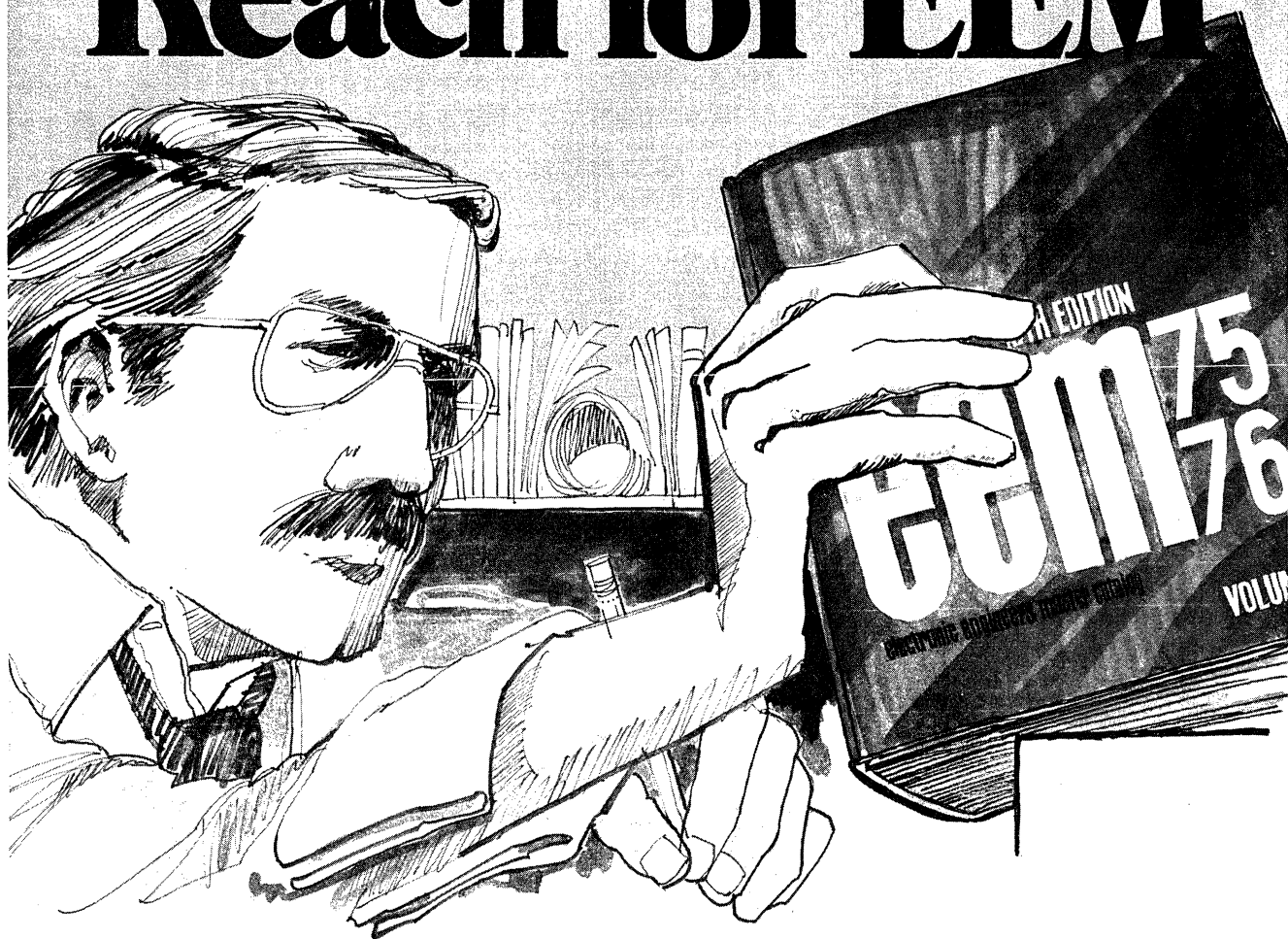
Ordering Information The complete assembly model consists of the socket number plus lens code (as derived from the lens table) and lamp voltage designation. For example: Model 3060D1-120PSB indicates an assembly consisting of socket, square red lens and 120v lamp. Model 3040C5-28ESB consists of a socket and a round green lens with 28ESB lamp.



Edgewater, New Jersey 07020 Phone: (201) 224-4700

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**

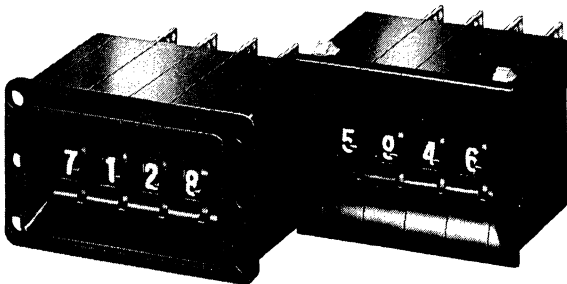


electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

WHEN THE ORDINARY WON'T DO!

Thumbwheel Switches • Miniature Lamps • Glow Lamps • LEDs • Indicator Lights



HARDWARE?

WHO NEEDS IT!

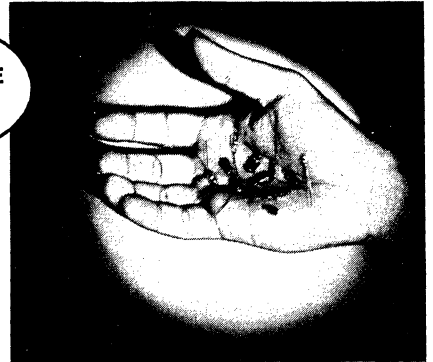
Not with Inter-Market's new "no hardware" Series SM subminiature thumbwheel switches. You put them together with built-in snap studs ... which eliminates hardware, saves assembly time and simplifies bank changes ... to reduce costs.

Even their size is frugal ... a mere 8mm. wide with 5mm. high characters. Front or rear mounting models ... 10, 11 and 16 position wheels ... decimal or BCD boards ... single or double pole.

Fully U.S. made ... with plus features like removable stop pins, PCB pin terminations and plastic dust windows. So go ahead ... cut costs, fight inflation. Be a hero.

Request Bulletin TS-75

MINIATURE LAMPS



OUR HELPING HAND

If the prosaic nature of miniature lamps leaves you a little cold, maybe you'll warm up to our price and delivery.

Not being one of the "big" little lamp people—at least not yet—means Inter-Market has to do some attractive things on pricing and shipping to compete.

We aren't running this ad to ask to be your second source, but we'll accept this for openers. So if you're being kicked around by one of the "bigs," let's talk. You're important to us and we respond accordingly.

Complete lines of ImLec miniature and subminiature filament lamps, neon glow lamps, Green Glow lamps and accessories. Lamps only or packaged assemblies.

Request Bulletin ML-74

UNIQUE, NEW

green glow

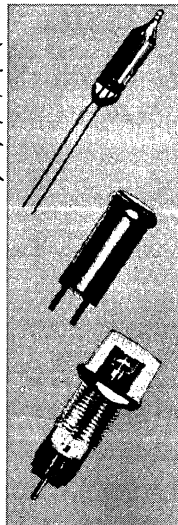
LAMPS & INDICATOR LIGHTS

Give your product
a new look
without expensive
retooling or redesign

New high brightness lamps provide a pleasing, "easy on the eye" green glow ... instead of conventional orange-red. Distinctive when used alone, greater contrast when used with ordinary neon glow lamps.

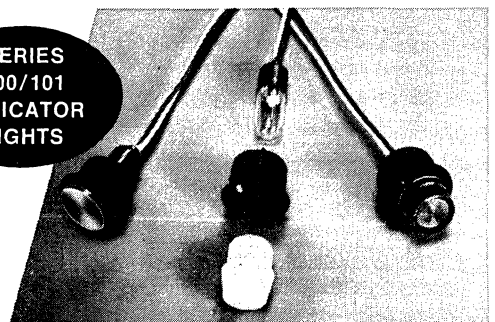
No expensive filtering, retooling or product modification required. Simply substitute for what you are now using. Inter-Market's green glow feature is available in lamps alone or in five models of packaged lamps, including both indicator lights and cartridges.

Request Bulletin GG-72



PHONE
OR
WRITE
FOR
FULL LINE
BROCHURE

SERIES 100/101 INDICATOR LIGHTS



VERY PURPOSEFUL PARTS FOR MODULAR VERSATILITY

Somebody has finally seen the light on indicator lights. It's Inter-Market with their Series 100/101 comprised of three very purposeful parts.

A rubber bushing snaps into a 3/8" dia. cutout—and stays there without any nut or retainer clip. Then "marry" your light source and lens cap and "divorce" them later, if you change your mind as sometimes happens.

As your light source, choose a 6, 14 or 28 V. filament, neon, Green Glow or LED lamp assembly—now or later. Select blue, red, yellow, green, white or clear lenses in flush or top hat style. In addition to this modular design versatility, your production manager will appreciate the latitude in assembly and your customer the ease of lamp replacement.

Request Bulletin IL-75



PHONE OR WRITE FOR DETAILS

INTER-MARKET, INCORPORATED

1946 LEHIGH AVE. • GLENVIEW, ILLINOIS 60025 • (312) 729-5330 • TWX: 910-651-1997

litronix

- **Lamps**

First with LED lamp incorporating IC current regulator.

- **Displays**

First with super large 0.6 inch display.

- **Opto-Isolators**

First with quad opto-isolator.

- **Calculator Circuits**

First with low cost automatic shut-off calculator circuit.

- **Watch Circuits**

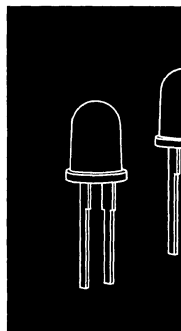
First with low cost alphanumeric Day/Date electronic watch circuit.

**No wonder
we're No. 1!**

LAMPS

litronix

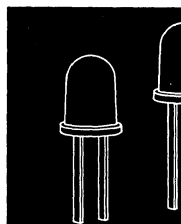
Panel Indicator Lamps



- High reliability
- TTL Compatible
- Low power consumption
- Economical molded plastic package
- Can be panel mounted
- Standard T-1 $\frac{3}{4}$ package

Part Number	Features	Typical Light Output @ 20 mA
RL-2000	High brightness	3.5
RL-4403	Wide angle	1.2
RL-4415	Right angle leads	0.8
RL-4850	Low cost	0.8
RL-5054 -1	High on axis intensity	2
RL-5054 -2	High on axis intensity	3
RL-5054 -5	High on axis intensity	0.4
*RL-20	High on axis intensity	1.2
*RL-21	High diffusion	0.8
OL-30	Orange	1.2
GL-4850	Green	1

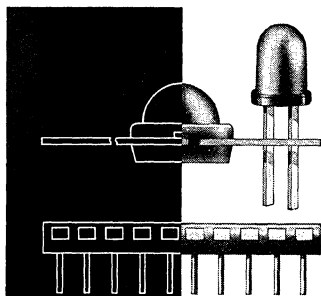
General Purpose Lamps



- TTL Compatible
- Economical molded plastic package
- Low power consumption
- High reliability
- Can be panel mounted
- Standard T-1 package

*RL-209	Wide angle	0.8
RL-4484	Low cost	0.8
*RL-T1	Flangeless	0.8
OL-31	Orange	0.8
GL-4484	Green	1

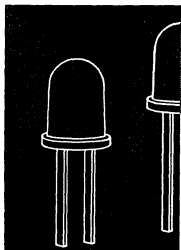
Status Indicator Lamps



- Axial leaded lamps
- Design for maximum strength at minimum linear spacing
- 8 Diode array for bar graphs

*RL-50	Water clear	0.8
RL-54	Low cost	0.8
RL-55	High intensity	3
RL-55-5	Low cost	2
GL-56	Green	1
*RL-2	Wide angle	1.5 @ 50 mA
ARL-18	8-diode array	0.2

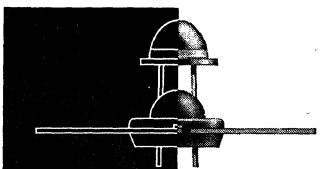
Functional Lamps



- Constant intensity over wide voltage range
- Can be panel mounted
- Incorporates silicon current source IC
- Voltage indicator illuminates at pre-set voltage

RLC-200 (T-1 $\frac{3}{4}$)	20 mA Constant current	1.2 mcd @ 6v
RLC-201 (T-1 $\frac{3}{4}$)	10 mA Constant current	0.7 mcd @ 6v
RLC-210 (T-1)	10 mA Constant current	0.6 mcd @ 6v
RLC-400 (T-1)	Voltage indicator	2 mcd @ 3v
RLC-410 (T-1)	Voltage indicator	2 mcd @ 3.5v

Infrared Lamps



- Spectrally matched to silicon sensors
- High reliability
- Useful as optical source in Card Readers, Encoders, Photochoppers and high speed optoelectronic data links.

IRL-40	Header	1.5 mW @ 100 mA
IRL-60	Axial lead	550 μ W @ 50 mA

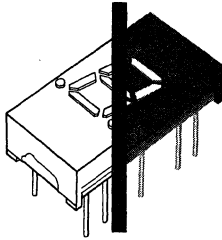
Mounting clips available all T-1 $\frac{3}{4}$

*Available in red diffused, red clear, white diffused and water clear.

DISPLAYS

litronix

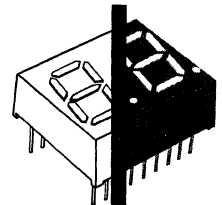
Single Digit Numeric Displays



Soft light stroke, mitred corner, .3 inch high displays for use in portable or non-portable industrial instrumentation and consumer application such as clocks and table top calculators.

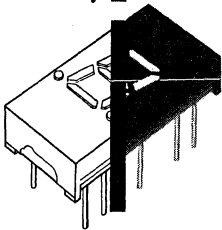
707 7-segment display with left hand decimal
707R 7-segment display with right hand decimal
701 Overflow, polarity indicator

702 7-segment display with left hand decimal
704 Overflow, polarity indicator



Two-digit modules, soft light stroke, mitred corner, .5 inch high displays for use in DVM, and instrumentation requiring maximum readability in smallest package.

721 Overflow, polarity indicator
727 7-segment display with right hand decimal
722 Overflow, polarity indicator
728 7-segment display with right hand decimal



Largest LED digit available, soft light stroke, mitred corner, .6 inch high display for use in clocks and industrial systems.

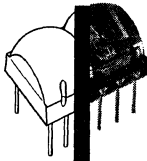
746 Overflow, polarity indicator
747 7-segment display with left hand decimal
749 Overflow, polarity indicator
750 7-segment display with left hand decimal

Polarity	Character Height	Light Output	Forward Voltage (Typical)
Common Anode	0.30"	0.7mcd @10mA	1.7V $I_F=20mA$
Common Cathode			

Common Anode	0.50"	2.8mcd $I_F=20mA$	1.65V $I_F=20mA$
Common Cathode			

Common Anode	.630"	5.0 mcd $I_F=20mA$	3.4V $I_F=20mA$
Common Cathode			

Magnified Numeric Displays



DL-44M Dual, 7-segment with right hand decimal

Bubble magnified, .110-.190 inch high efficiency, multiple digit, monolithic display for application requiring maximum brightness at lowest currents, in a small package. Applications include stop watches, thermometers, and electronic scales.

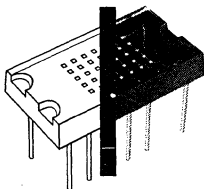


DL-34M Quad, 7-segment with right hand decimal

Common Cathode	.19"	0.1mcd $I_F(AVG)=1.5mA$ Pulsed	1.7V $I_F=5mA$
----------------	------	--------------------------------------	-------------------

Common Cathode	.110"	0.3mcd $I_F(AVG)=1.0mA$ Pulsed	1.7V
----------------	-------	--------------------------------------	------

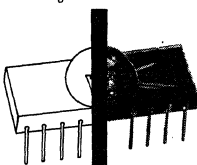
Alpha-Numeric Displays



Hybrid, 5 x 7 matrix, .32 inch display for display of alphanumeric information in standard ASCII code.

DL-57 5 x 7 dot matrix with left hand decimal

	.32"	0.6 mcd 300ft-L $I_F=10mA$	1.7V $I_F=10mA$
--	------	----------------------------------	--------------------



Monolithic, bubble magnified, high efficiency, 16-segment starburst alphanumeric display.

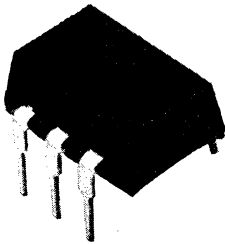
DL-16 16-segment with left hand decimal

Common Cathode	.157"	0.8mcd segment $I_F=10mA$	1.7V $I_F=5mA$
----------------	-------	------------------------------	-------------------

OPTO-ISOLATORS

litronix

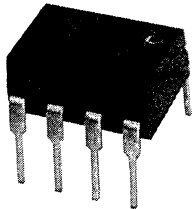
Single Channel



Complete selection of photo transistor and photo darlington isolators

	Current Transfer Ratio Min.	Ratio Typ.	Isolation Breakdown Voltage	BV_{CEO} DET. (MAX.)	I_{CEO} (Typ.)
IL-1	0.2	0.35	2500	30V	5nA
IL-5	no max.	0.70	2500		
IL-12	0.02	0.10	1000		
IL-15	0.06	0.14	1500		
IL-16	no max.	0.14	1500		
IL-74	max 0.3 .125	0.35	1500		
	Isolation Voltage	Collector Current			
ILCA2-30	2500V	125mA		30V	1nA
ILCA2-55	2500V	125mA		55V	1nA
ILA-30	1500V	100mA		30V	10nA
ILA-55	1500V	100mA		55V	10nA

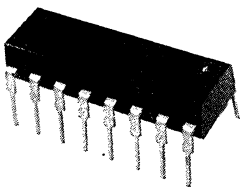
Dual Channel



2 totally independent isolators in a single package

	Current Transfer Ratio Min.	Ratio Typ.	Isolation Breakdown Voltage	BV_{CEO} DET. (MAX.)	I_{CEO} (Typ.)
ILCT-6	0.20	0.50	1500	30V	1nA
ILD-74	0.125	0.35			5nA

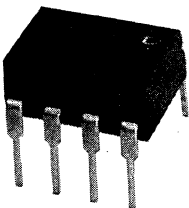
Quad Channel



4 low cost, totally independent general purpose isolators in a single package

	Current Transfer Ratio Min.	Ratio Typ.	Isolation Breakdown Voltage	BV_{CEO} DET. (MAX.)	I_{CEO} (Typ.)
ILQ-74	0.125	0.35	1500	30V	5nA

High Speed



High speed three state output, built-in Schmitt trigger to avoid oscillation.

			Propagation Delay	
			t_{pd} (1)	t_{pd} (0)
IL-100	1000	1500	65	65
IL-101	1000	1500	100	100

LED DISPLAY DIE

litronix

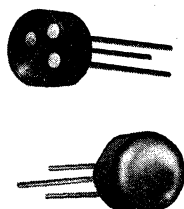


High brightness GaAsP monolithic LED displays designed for use in digital electronic watches.



	Character Height	Die Size	Description
RW-13	13 x 13 mils	15 x 15 mils	Decimal point
RW-26	40 mils	40 x 45 mils	7-segment + decimal point
RW-62	102 mils	78 x 107 mils	9-segment alphanumeric
RW-64	100 mils	95 x 105 mils	16-segment alphanumeric
RW-68	59 mils	48 x 64 mils	7-segment + decimal point
RW-74	102 mils	30 x 107 mils	2-segment
RW-50	71 mils	59 x 78 mils	7-segment
RW-72	71 mils	59 x 78 mils	9-segment alphanumeric

PHOTOTRANSISTORS

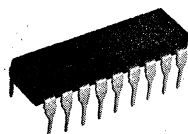


Low dark current, high responsivity phototransistors for use in electronic watches, card readers and high speed optoelectronic data links. Available packaged or in die form.

	I_{CEO} Collector Dark Current (Typ.)	Responsivity (Min.)		Photo Current (Min.)	
		Tungsten	GaAs	$V_{CE}=5V$ $H=5mW/cm^2$	
				Tungsten	GaAs
LPT-100				0.2mA $V_{CE}=5V$	
LPT-100A				1.0mA $V_{CE}=5V$	
LPT-100B				1.3mA $V_{CE}=5V$	
LPT-110	0.25nA $V_{CE}=10V$	0.6uA mW/cm^2 $V_{CE}=10V$	1.8uA mW/cm^2 $V_{CE}=10V$	0.2mA $V_{CE}=5V$	0.6mA
LPT-110A				0.6mA $V_{CE}=5V$	
LPT-100B				0.8mA $V_{CE}=5V$	
LPC-13 (Die)	10nA	0.6	1.8	0.2	0.6
LPC-30 (Die)	20nA	5	15	1.8	5
Darlington					

SILICON PRODUCTS

Calculators



LBC-1081



LMC-2302

LMC-2302 MOS/IC 8-digit full accumulating memory, full floating decimal point, automatic constant, percent and square root.

LMC-2304 MOS/IC 8-digit scratch pad memory, full floating decimal point, automatic constant, percent, square, square root and reciprocal.

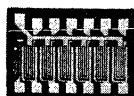
Both calculators have automatic shut-off.

LBC-1081 Bipolar IC including the digit decoder/drivers and necessary circuitry for the automatic shut-off feature of the 2300 series calculator MOS.

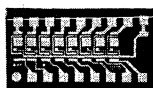
A full line of low cost 8 and 9-digit LED calculator displays is available.

LBC-1050 Bipolar IC is an 8-driver active low open collector array designed for use as the digit driver interface between MOS circuitry and LED displays.

Electronic Digital Watches



LBC-1060



LBC-1070



LMC-6120



LMC-6130

The LMC-6120 is a versatile multiplexed LED watch CMOS integrated circuit chip capable of displaying on demand seconds, minutes and hours.

The LMC-6130 is a versatile multiplexed LED watch CMOS integrated circuit chip capable of displaying on demand seconds, minutes, hours, day and date.

The LBC-1060 is a monolithic NPN transistor array designed for use as an LED/CMOS digit driver interface in electronic watch systems.

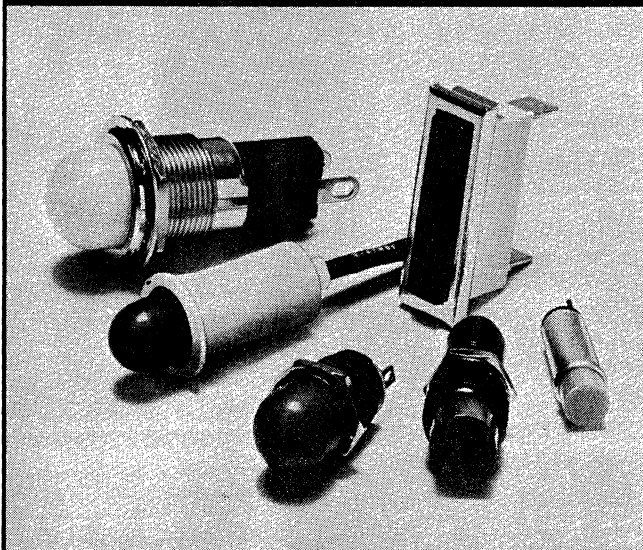
The LBC-1070 is a monolithic NPN transistor array designed for use as an LED/CMOS segment driver interface in electronic watch systems.

A full line of 4-digit LED electronic watch displays is available.

2-1179

LITTELITES

INDICATOR LIGHTS...



- **Broad line** ... Littellites include Cartridge Lamps and Lampholders, Subminiature Lampholders, Miniature Lampholders, and Snap-Mount Plastic Lites ... we offer a wider selection among these four product groups than any other single manufacturer.
- **UL/CSA** ... All Littellites are UL Recognized or Listed and CSA Certified. New tools and molds assure you of the finest quality lights on the market today.
- **Fast turn-around** on large volume orders.
- **Off-the-shelf** availability from a nationwide network of Littellites distributors.
- **Special requirements?** Just give us a call (312) 824-1188.

CARTRIDGE

LAMPS/LAMPHOLDERS

SEND FOR CATALOG LL-C574

UL RECOGNIZED
CSA CERTIFIED
MEET MIL-L-3661
REQUIREMENTS



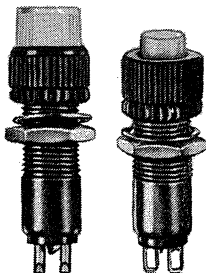
Cartridge Lamps

Incandescent, neon, or solid state. Solid state units supplied with green, red, yellow, or amber LEDs. All cartridge lamps offer a wide choice of lens styles and colors. Mate with cartridge lampholders shown below.



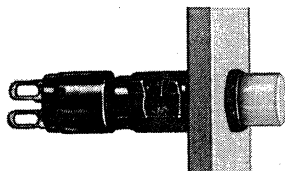
Cartridge Lampholders

Designed for rear mounting into 3/8" clearance hole. Turret pin, solder lug, or solder cup terminals. Available with flat for "D" hole mounting. Supplied separately or as complete assembly, which includes lens cap (smooth or fluted) or lens collar (.284" or .230" wide).



Clips and Sockets

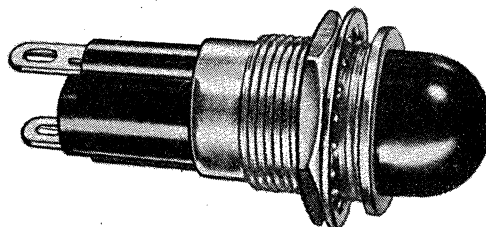
Provides inexpensive means of mounting cartridge lamps directly to the panel. Solder lug or solder cup terminals. Clip secures cartridge lamp in 9/32" mounting hole.



MINIATURE

LAMPHOLDERS

SEND FOR CATALOG LL-M574



- For front mounting into 11/16" clearance hole.
- Accommodate T3-1/4 or T2 bayonet based incandescent lamps and T3-1/4 bayonet based neon lamps.
- Screw or solder lug terminals
- Drip proof and "D" hole mounting available.
- Neon lampholders feature built-in resistor.
- Six basic lens styles available in wide choice of colors.
- **UL Listed, CSA Certified** (Solder Lug Terminals)
UL Recognized, CSA Certified (Screw Type Terminals)

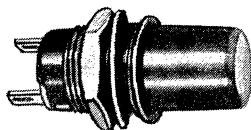
...FROM LITTELFUSE

LITTELFUSE

SUBMINIATURE LAMPHOLDERS

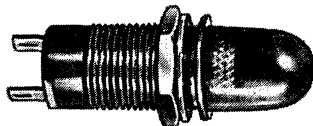
SEND FOR CATALOG LL-S574

Subminiature lampholders accommodate T1-3/4 incandescent or T2 neon midget flanged base lamps. All lampholders allow easy installation and replacement of the lamp and lens from the panel front. **UL Recognized. CSA Certified.**



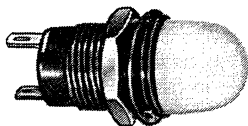
920 Series

For front mounting into 15/32" clearance hole. Accept a T1-3/4 incandescent midget flanged base lamp (1.35-28V). Choice of four different lens styles. Meet requirements of MIL-L-3661.



921 Series

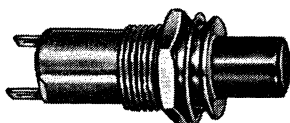
Front mounting into 15/32" clearance hole. Accommodate replaceable T2 neon midget flanged base lamps (C7A—105-125V AC-DC or C9A—110-125VAC). Built-in resistor limits lamp current. Meet requirements of MIL-L-3661.



922 Series

Three different mounting configurations: **922 Series**—front mount—15/32" clearance hole; **923 Series**—front mount—17/32" clearance hole; **924 Series**—front or rear mount—15/32" clearance hole.

Accept a T1-3/4 incandescent midget flanged base lamp (1.35-28V). Choice of four lens styles.



925, 926, 927 Series

Three different mounting configurations: **925 & 926 Series**—rear mount—3/8" hole; **927 Series**—front mount—15/32" hole.

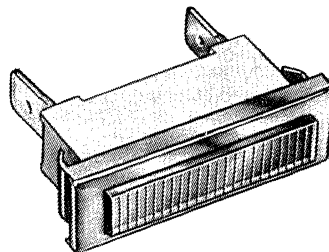
Accommodate either T1-3/4 incandescent or T2 neon midget flanged base lamps. Three different lens styles in smooth face or fresnel. Lampholders and lenses can be furnished with gaskets for drip proof applications.

SNAP-MOUNT PLASTIC LITES

SEND FOR CATALOG LL-P574

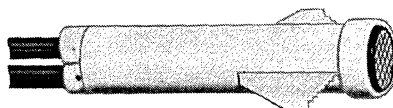
Designed to snap into mounting hole without the use of auxiliary hardware. The 970 and 980 Series feature a pair of flex arms which ensure positive retention and protection against shock and vibration. **UL Listed. CSA Certified:** All units with wire leads.

UL Recognized. CSA Certified: Units with Q.C. Terminals.



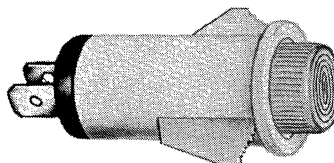
960 Series

Snap-mount into 1.281" x .395" mounting hole. Available with neon (125-250V) or incandescent (6-28V) lamps. Can be supplied with 6" wire leads, 1/4" or 3/16" Q.C. terminals. Choice of fluted or smooth face lens.



970 Series

Snap-mount into .312/.318" diameter hole. Available with neon (125-250V), incandescent (6-28V) or solid state (1.8-28V) lamps. Solid state units supplied with red, yellow, amber, or green LEDs. Terminations include 6" wire leads or .125" Q.C. terminals. Choice of eight lens styles.



980 Series

Snap-mount into .500/.510" diameter hole. Available with neon (125-250V) or incandescent (6-28V) lamps. 6" wire leads or .187" Q.C. terminals. Fresnel lenses in six different styles.

LITTELFUSE
SUBSIDIARY OF TRACOR

800 EAST N.W. HWY. • DES PLAINES, ILL. 60016
(312) 824-1188

LAMP HOLDERS

The special you want is probably a standard in the Leecraft line. The lamp holders and mounting brackets shown are only part of the vast selection available.



No. 16-08

MIDGET SCREW

16-00 Series Solder Term.
16-200 Series Wire Leads



No. 25-35

MIDGET GROOVED

25-200 Series Wire Leads
25-00 Series Soldering Terminals
Used in instrumentation, meters, edp/automation, photoelectric controls. For use with lens end lamp Nos. 253, 253X, 261 and other styles.



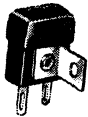
No. 52-07

SUB-MINIATURE WEDGE BASE

For T1 1/4 Lamps
5200 Series
Also available with wire leads (Series 52-200)

WEDGE BASE

No. 23-24



23-00 Series

23-00 Series—
Molded hous-
ing, terminals

No. 23-223



23-200 Series

23-200 Series—
Molded hous-
ing, wire leads

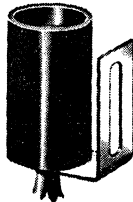
No. 24-07A



24-00 Series

24-00 Series—
Wafer type,
terminals

3-00 Series



No. 3.05

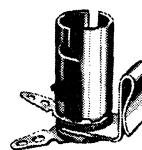
2-00 Series



No. 2-15

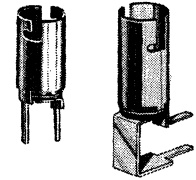
MINIATURE BAYONET

7-00 Series



No. 7-01

7-00 Series P.C. Mount

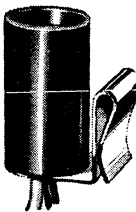


No. 7-35

No. 7-35XP11A

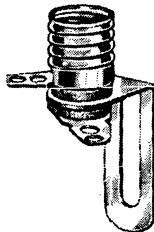
CANDELABRA SCREW

4-00 Series



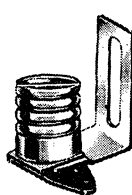
No. 4-45

6-00 Series



No. 6-06

18-00 Series

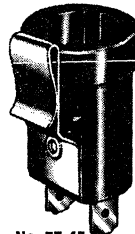


No. 18-79

CANDELABRA BAYONET

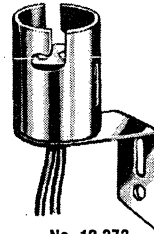
Double Contact

57-00 Series



No. 57-45

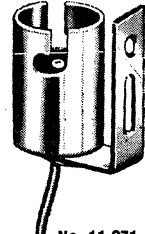
12-200 Series



No. 12-272

Single Contact

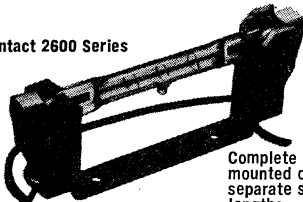
11-200 Series



No. 11-271

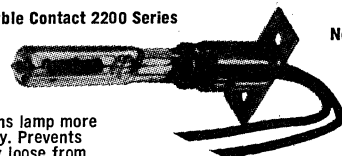
LAMP HOLDERS FOR SINGLE-ENDED & DOUBLE-ENDED QUARTZ LAMPS

Recessed
Single Contact 2600 Series



Complete assembly. Two holders mounted on common bracket, or separate sockets. Brackets in all lengths.

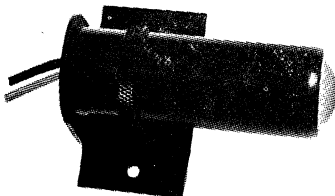
Double Contact 2200 Series



No. 22-225

Positions lamp more securely. Prevents shaking loose from vibration.

PHOTOELECTRIC CONTROLS



Full range of sizes for all applications including Counting, Conveyor Control, Inspection and Skew.
Series LRT and LRR



Responds to presence or absence of opaque or translucent materials from a fraction of an inch up to 25 feet. Special designs are available for specific requirements. Contact our applications engineers for details. Light sources may be incandescent or long life, narrow beam L-E-D's.

Series PT41 and PR 41

SSF FLASHER UNIT

SOLID STATE FLASHER PAK

Warning Lights, control for EXIT signs.
Series SSF



Flashing rate as specified Standard 6V-12V-24V, D.C. Standard wire termination. May be modified for specific applications.

LEE CRAFT

WRITE FOR PRODUCT LIGHTING GUIDE • PROTOTYPE SAMPLES AVAILABLE

MANUFACTURING CO., INC., 21-16 44th Road, Long Island City, N.Y. 11101, (212) 392-8800/TWX: 7105822897

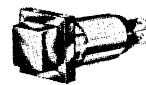
INDICATOR LIGHTS AND LIGHTED SWITCHES

SNAPLITE INDICATOR LIGHTS

Long-life, high brightness lamps. Built-in resistors with neon lamps to suit circuit voltage. Snap fit in $\frac{1}{2}$ " hole with no additional hardware. Wide variety of lens and housing colors. Tab or solder terminals or wire leads. Also available with chrome rings.



Flat Cylindrical Lens
32-2111 $\frac{3}{8}$ " high



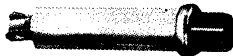
Square Lens
32R-2911T $\frac{3}{8}$ " high



4100 Series
(with neon
less resistor,
or incandescent)



3600 Series
(with built-in resistor
in 3 flange dimensions)
No. 36EN-2111



45 Series
(Tab
Terminals)
No. 45RN-
2111T3

All Tineons may
be ordered with
aluminum bezel

TINEON INDICATOR LIGHTS

Long-life, high brightness lamps. Press fit into $\frac{3}{8}$ " hole. Plastic Lens and Nylon housing in colors (white, standard). Speednut furnished. Legends, Built-in resistor. Insulated leads. Neon types rated 110-250V. Also available with incandescent lamp.



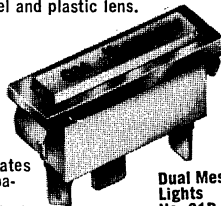
3900 Series
(one piece lens and housing for
snap fit into .033/.078 panels)
No. 39-0381

RECTANGULAR INDICATOR LIGHTS

Long-life, high brightness, neon. Snap fit into panels securely without additional hardware. Choice of lens colors. Complete range of voltages. Series 3100 has chrome bezel and plastic lens.

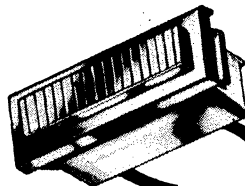


Dual Bezel
No. 31ML2 For $1\frac{1}{2}$ " x $1\frac{1}{8}$ " hole

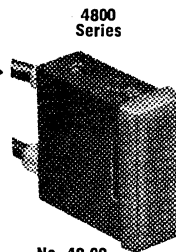


Barrier separates
light into separate
message
areas. Individual
or simultaneous
operation.

Dual Message
Lights
No. 31D
For $1\frac{1}{2}$ " x
 $1\frac{1}{2}$ " hole



No. 31-2111

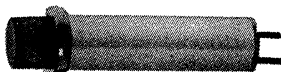


48-T SERIES

No. 48-3T

Snap Fit
for .325 x .860
mounting hole.
Panel Range .031 to .100

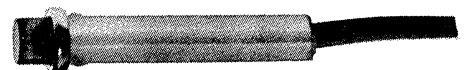
100,000 HOUR SOLID STATE L-E-D INDICATORS



Series L46R
.040 pins for PC and socket mounting.
Friction fit in $\frac{3}{8}$ " hole (.312)

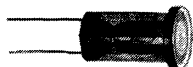


Series L45R
Friction fit mounting
in $\frac{3}{8}$ " hole (.312)



Series L39UR
Wire leads. Snap fit for $\frac{3}{8}$ " hole (.312)
Also available with tabs.

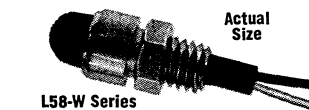
SUBMINIATURE L-E-D SERIES L28



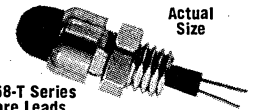
For limited space. Mounts in $\frac{3}{8}$ " hole. Clear Butyrate housing. Leads coded for polarity. Flush lens, red or green. $\frac{1}{4}$ " dia. Front panel projection .040". Rear panel projection $\frac{3}{8}$ " max.

SOLID STATE L-E-D SERIES L58

Using high brightness L-E-D's, micro size. Unaffected by shock and vibration. Wide viewing angle. Red, green, yellow.



L58-W Series
Insulated Wire Leads



L58-T Series
Bare Leads

Also available with square bezel

MIDGET SCREW INDICATORS



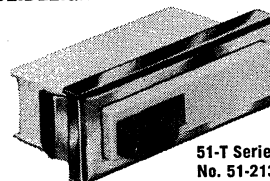
49D Series
Dome Lens



49F Series
Flat Cylindrical
Lens

Flat or dome shape lens of translucent plastic in yellow, red, amber, green and white. Incandescent lamp easily inserted into front panel. Fits $\frac{1}{4}$ " dia. hole. $\frac{1}{4}$ " (max.) panel thickness. $\frac{3}{8}$ " (min.) centers. Alphanumeric hot stamping. 6-7V, 12-14V, 24-28V. Spring tempered phosphorous bronze center maintains positive contact with lamp.

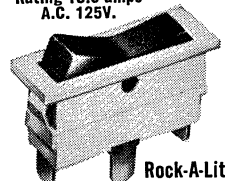
SLIDELIGHT™



51-T Series
No. 51-2135T

Pilot indicator light. Slide-switch. Ultra-compact. Snap fit in .395 x 1.281 hole. Choice of colors and lights. Wide voltage range. Message stamped. Leads or terminals. Rating: 125V, 6 amps.

Series 7100T
Rating 15.0 amps
A.C. 125V.



Rock-A-Lite

Ultra-compact. Snap Fit in 1.281" x .395". High-brightness, neon or incandescent. .250" brass tab terminals. Size: $1\frac{1}{2}$ " x $1\frac{1}{8}$ " x $1\frac{1}{16}$ ".

LEE CRAFT

WRITE FOR INDICATOR LIGHT GUIDE LG 1-70 • PROTOTYPE SAMPLES AVAILABLE

MANUFACTURING CO., INC., 21-16 44th Road, Long Island City, N.Y. 11101, (212) 392-8800/TWX: 7105822897

X-Y PLASMA DISPLAY UNITS

Clear, stable, accurate and compact alphanumeric displays.
The units are consisted of dot matrix panels with drivers and some logic circuits.

●PXU0601

The unit provides a single row of 32 character positions. Each character is displayed on an NEC PX0606A-32, a 5 x 7 dot matrix plasma display panel. Positive logic 6-bit code employed for modified ASCII display.



PXU0601

Specifications

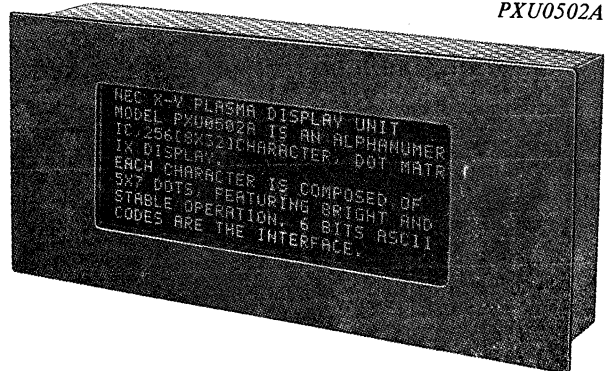
Character					Dot	
Dot Matrix	Digits	Height	Width	Separation	Size	Pitch
5 x 7	32 x 1-line	5.5mm	3.7mm	2 columns	0.5mm [□]	0.8mm

General Characteristics

Brightness	Viewing angle	Contrast ratio	Color	Scan rate	Operating temperature	Storage temperature
12fL	≥120°	≥30/1	Neon orange	≥60Hz	-10° ~ 50°C	-20° ~ 70°C

●PXU0502A

The unit provides 256-character capability (32 digits x 8 lines). Each character is displayed on an NEC PX0705-32, a 5 x 7 dot matrix plasma display panel. Positive logic 6-bit code employed for modified ASCII display.



PXU0502A

Specifications

Character					Dot	
Dot matrix	Digits	Height	Width	Separation	Size	Pitch
5 x 7	32 x 8-line	6.7mm	4.7mm	2 columns, 3 rows	0.7mm [□]	1.0mm

General Characteristics

Brightness	Viewing angle	Contrast ratio	Color	Scan rate	Memory access time	Operating temperature	Storage temperature
15fL	≥120°	≥30/1	Neon orange	≥60Hz	2.2μsec	-10° ~ 50°C	-20° ~ 70°C

NEC America, Inc.

Head Office

277 Park Ave., New York, N.Y. 10017
Tel: 212-758-1666
Cable Address: NIPPELECO NEW YORK
Telex Address: NECA UR 234936

Los Angeles Office

4940 West 147th Street
Hawthorne, California 90045
Tel: 213-776-5923/4
Telex Address: NIPPON ELEC LA 673569

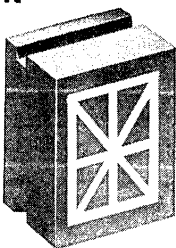
NEC
Nippon Electric Co. Ltd.

ALPHANUMERIC & NUMERIC DISPLAYS & LAMPS

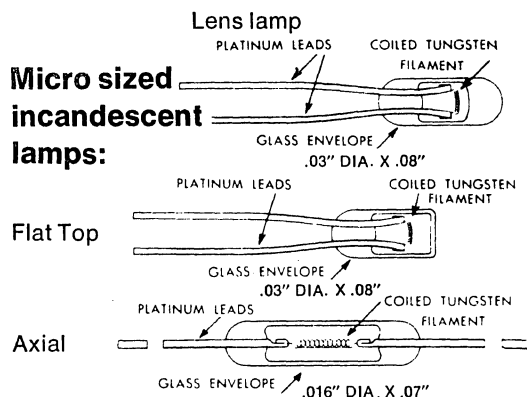
- Directly viewed incandescent
- Visible in high ambient light
- Plus-minus, N.S.E.W., Colon, Decimal point all available
- Character heights: 3/16" to 5/8"
- IC Compatible
- Custom designs

"O" Series/16 segment alphanumeric:

1/4" & 5/16" character height, 3, 4, 5 Volt, 8 ma. to 17 ma., .465"H x .375"W x .312"D; AC, DC or multiplex operation.

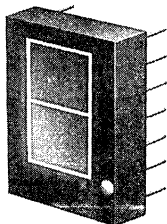


Micro sized incandescent lamps:



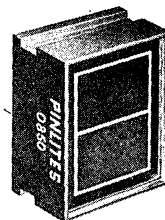
600 & 800 Series DIP-LITE® digital displays

5/16" (600) 1/2" (800) char. ht., 3, 4, 5V, 8 ma.-18 ma., AC, DC or multiplex operation; DIP Pak mount, built-in decimal or colon (right or left), direct LED replacement



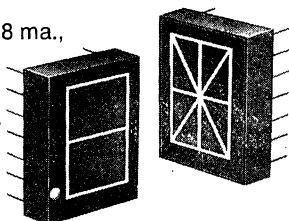
"O" Series digital readout:

3/16" - 1/2" char. ht., 1.5V-5V, 8 ma.-18 ma., AC, DC or multiplex operation, I.C. decoder/driver compatible, plug-in construction.



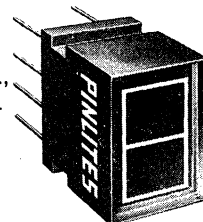
1050 Series numeric and alphanumeric readouts:

5/8" char. ht., 5V, 18 ma., plug-in — 14 pin (numeric) or 24 pin alphanumeric.



"Mini-Dip" numeric display:

5/8" char. ht., 3, 4, 5V, 8-18 ma., AC, DC, or multiplex operation, PC board mounting, 8 pin DIP package.



SEND FOR COMPLETE INFORMATION

REFAC Electronics Corp.

1275 BLOOMFIELD AVENUE - FAIRFIELD, NEW JERSEY 07006
TELEPHONE 201/575-8820 — TWX 710-734-4348

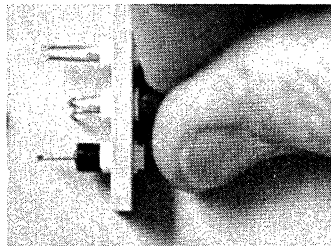
MAILING ADDRESS: P.O. BOX 453, CALDWELL, NEW JERSEY 07006



A REFAC Company

Manufacturer's of Pinlites Displays and Lamps

PRESENTING... Industry's most complete line of T1 indicator lamps and LED's



Shelly sells more T1 indicators than anyone — Brite-Eye incandescents, Trans-Eyes with built in amplifier, LED's plus low cost, completely assembled indicators. For good reasons. Shelly offers more cap styles, more colors and more time saving features.

Just Snap Them Into Panel

Shelly indicators are the easiest to use, requiring no added hardware. Just insert the indicator into a 0.191" (#11) hole and press into position. What a snap! Shelly Brite-Eye and Trans-Eye incandescents are also relampable from the front. Just remove the snap-on cap, remove the lamp, insert a new one and replace the cap. It takes just seconds.

Ideal for confined applications

Shelly's unique microminiature "Easy Lamp" housings are ideal for high density packaging applications. Incandescents and LED's mount on 0.225" centers and weigh in at less than 1/2 gram. They combine high illumination with clean design. Just right for contemporary panel styling. Indicators have the same physical dimensions, which simplifies mixing or matching.

Wide Variety Of Colors, Cap Styles and Features

Brite-Eyes & Trans-Eyes come in 7 cap styles and colors. LED-Eyes are available with Ball End or Digi-Cap in red, green, yellow and orange. LED-EYE configurations include a current regulated LED for constant light intensity from 4.5V to 11V and a voltage sensing LED.

BRITE-EYES can be easily ordered using this chart

LAMP				
Voltage	Amps	MSCP	Life	P/N
5	.020	.03	10,000	A03
5	.060	.05	100,000	A05
5	.060	.15	6,500	A02
5	.115	.15	40,000	A04
12	.030	.10	25,000	A06
18	.026	.15	10,000	A01
28	.024	.15	16,000	A07

Other lamp voltages available on special order.

Completely Assembled Low Cost Indicators

Shelly Associates offers completely assembled, low cost indicator lamps in both Brite-Eye (LCI) and Trans-Eye (LCT) configurations. The indicators are available in 4 colors - red (R), green (G), yellow (Y) and white (W) - with a ball cap, a black base and a 5 volt, 60ma lamp. The LCT uses an NPN transistor. Three current limiting resistors - 1.7K, 2.2K and 3.9K are available.

Prices

Quantity	Brite-Eye LCI-R,G,Y,W	Trans-Eye LCT-R,G,Y,W
1-24	\$ 0.78	\$ 2.75
25-49	0.75	2.64
50-99	0.72	2.51
100-499	0.69	2.38
500-999	0.66	2.25
1000-4999	0.62	2.12
5000 up	0.59	1.99



Basic Series	Mounting Style		Housing Accessories		Housing Color		Lamp	Cap Color							Cap Style							Cap Type	
Brite-Eye	Panel	Circuit Board	Heat Barrier	Standard	Black	White	See Table Above	Red	Green	Amber	Clear (transparent only)	Blue	White (translucent only)	Yellow (translucent only)	Ball End	Cylindrical	Digicap	Lens End	Macrodone	Square	Tubular	Transparent	Translucent
BE	P	C	H	-	B	W	See Table Above	R	G	A	C	B	W	Y	B	C	D	L	M	S	T	P	L
EXAMPLE PART #BEP-WA02GSL																							

PHONE OR WRITE FOR COMPLETE SPECIFICATION SHEETS, ORDERING INFORMATION AND PRICES

shelly associates

A Subsidiary of Datatron, Inc.

Dedicated to your future

INDICATORS • MULTI MESSAGE DISPLAYS • FIBER OPTICS • ANNUNCIATORS

1562 Reynolds Ave., Santa Ana, California 92707 • (714) 549-3414

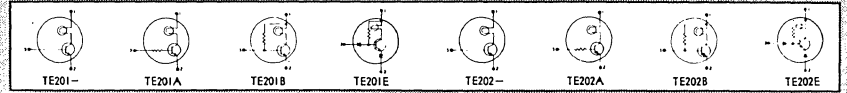
Mailing Address: P.O. Box 11427, Santa Ana, California 92711

TWX 910-595-1589

This chart's for ordering TRANS-EYES



TRANS-EYE — Base type/circuit configuration



TE201 & TE202 — Transistor driven lamp — requires ex. base limiting resistor.
TE201A & TE202A — Internal base current limiting resistor. Requires 1.6mA max. base drive. Any value resistor can be specified.
TE201B & TE202B — Internal pull-up resistor. Requires a —1.6mA sink. Use with open collector transistor.
TE201E — Compatible with most TTL, DTL and current sinking logic families.
TE202E — Compatible with positive inverted logic.

Basic Series		Trans Type		Circuit Configuration			Lamp	Cap Color							Cap Style							Cap Type	Base * Resistor	
Trans-Eye		NPN	PNP	See Schematic Diagram Above			See Brite-Eye Table	Red	Green	Amber	Clear (transparent only)	Blue	White (translucent only)	Yellow (translucent only)								Transparent	Translucent	Choose One Resistor Shown Below
TE	201 202	—	A B E	See Brite-Eye Table			R G A C B W Y	B C D L M S T P	L	1.7K, 2.2K or 3.9K														

It's easy to order LED-EYES using this chart

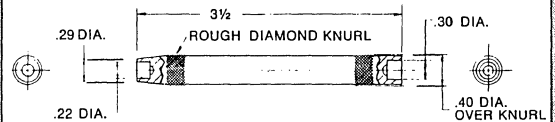


LED Specifications

Suggested Voltage & Current: Red: 2.4V @ 10 ma. Others: 2.4V @ 40 ma.	Vf (typ)	Luminous Intensity in MCD @ 10 ma.	
		Minimum	Typical
Red	2.0	0.5	1.5
Green	2.0	0.5	1.5
Yellow	2.0	0.5	1.5
Orange	2.0	0.5	1.5
Regulating	4.5 - 11	0.1	0.6
Voltage Sensing	on @ 3.0 off @ 2.0	—	0

INSTALLATION TOOL

Although not required, this handy tool simplifies indicator installation in high density applications and makes cap removal much easier.

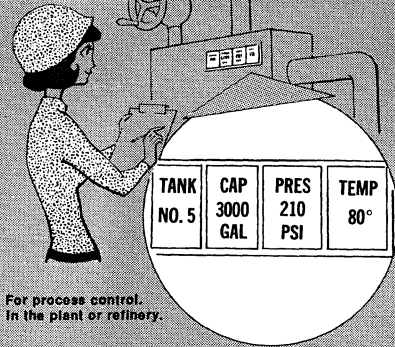


BASIC SERIES		MOUNTING STYLE		HOUSING COLOR		LIGHT SOURCE COLOR				LIGHT SOURCE TYPE			CAP COLOR					CAP STYLE	
LED-EYE	PANEL	CIRCUIT BOARD	BLACK	WHITE	RED	GREEN	YELLOW	ORANGE	STANDARD LED	REGULATING	VOLTAGE SENSING	RED	GREEN	YELLOW	ORANGE	CLEAR	BALL END	DIGI-CAP	
LE	P	C	B	W	R	G	Y	O	—	R	V	R	G	Y	O	C	B	D'	

Shelly Multi-Message Modules and Displays

Some Important Advantages

- Industry's largest high-contrast image with single plane 160° viewing insures easy readability and increases operator efficiency.
- True random access provides fast selection of desired message.
- Complete messages are projected eliminating the possibility of erroneous readings.
- Rugged multi-module assemblies last longer and require less maintenance.
- Optional integral driver/decoder saves interface design time at customer level.
- Multi-message modules cost far less than other types of information displays.
- Commercial, industrial and military packaging. Choose the type that best fits your particular requirement.
- Small size minimizes panel space requirements.
- Wide selection of voltage and current combinations for the ultimate in flexibility.

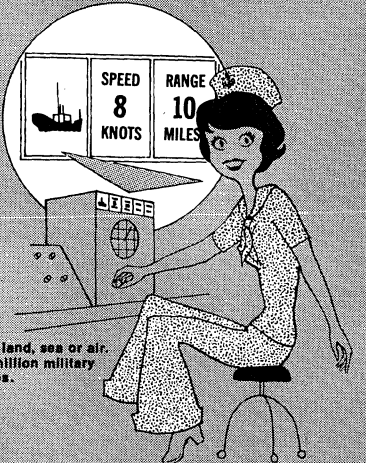
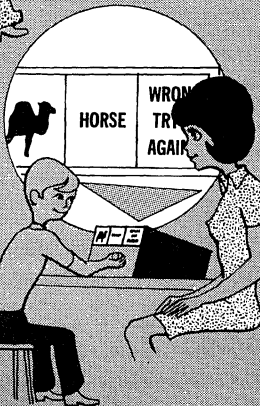


For process control. In the plant or refinery.

A myriad of medical applications abound.

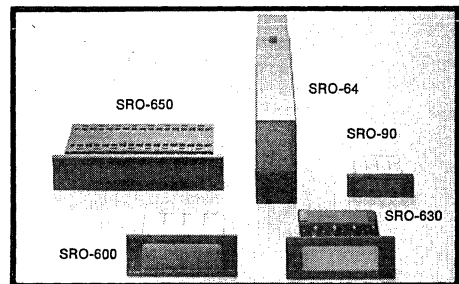


Education. Such as the teaching machine.



On land, sea or air. A million military uses.

The SRO-90 and 600 series of 12 message displays



SRO-90 Series — Industry's Smallest Multi-Message Module

The SRO-90 is industry's smallest multi-message display, providing a viewing area of 0.435" by 0.34". Up to 12 messages can be projected on the single plane screen. Lamp voltages are 5v and 28v and housing is modular. Either snap-on or screw-on bezels are available. A plug-in drive module with TTL logic, with or without memory, can convert an 8-4-2-1 binary input code into the visual decimal display.

SRO-92 is a dual unit which can display two messages simultaneously on a viewing screen that can be split either vertically or horizontally, offering a total of 24 different messages.



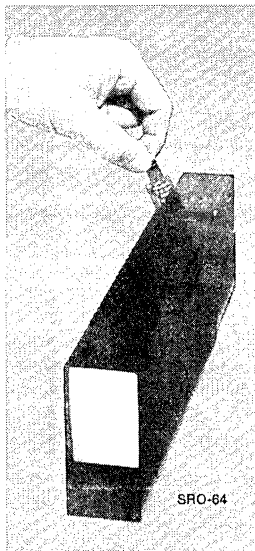
SRO-600 — For Commercial, Industrial & Military Applications

The SRO-600 is a 12 message module with a 0.7" by 0.59" display. The unit is modular with a screw-on bezel and offers switching capability. Lamp voltages are 5v to 28v. A plug-in drive module (TTL logic) with or without memory is available to convert an 8-4-2-1 binary input code into the visual decimal display.

SRO-630 is an economical, self-contained module. Display is 0.7" by 0.59" with a 12 message capacity. The unit can be provided with mounting brackets for panel mounting or can be provided in a projector component configuration for mounting directly to a PC board or to meet your own design requirement.

SRO 650 is a low cost commercial version of the SRO-600. Maximum viewing area is 0.62" by 0.59". Lightweight, with one piece construction, the SRO-650 is similar in performance to the SRO-600.

The SRO-64:
up to 64 messages on
a tiny, snap-in, snap-out
"Slip-Chip"

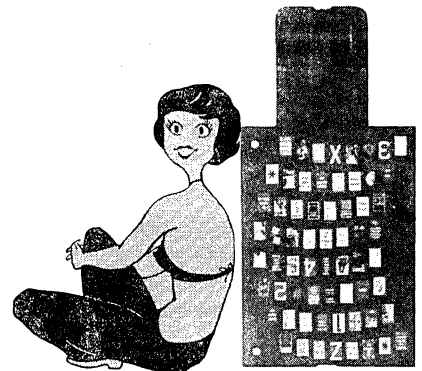
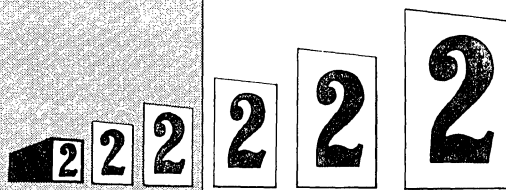


SRO-64

The Shelly SRO-64 is the first Multi-Message Display offering "Slip-Chip" readouts—64 message "slip-chips" that snap in and out for easy field replacement.

The SRO-64 operates like a miniature slide projector, but uses only one multi-message slide and one projector lamp. Individual images can be created from anything photographable — black & white or in color. Random selection in response to a 6 bit* input code positions the desired image which is projected onto a high contrast screen. The image is retained without signal power and can be changed in only 70 milliseconds. Placement of the screen with relation to distance from the projector allows for image size areas from 0.7" to 2" high. Drivers and driver timers for low level and IC inputs are available.

*A subset of ASCII is standard. EBCDIC or virtually any 6-bit code optional.



A Quick-Look at Shelly's Line of Multi-Message Displays

Model Number	Number of Messages	Size of Display	Lamp Voltage	Housing	Driver Modules	Bezels	Switching Capability
SRO-64	up to 64	up to 2"	3.5V to 24V	Self-contained. Mounting cases for 2 to 20 readouts available.	Drivers & driver-timers for low level & IC inputs	Snap-on or screw-on types. RFI and drip-proof	No
SRO-90	12	0.435" high 0.340" high	5V-28V	Modular	Decode 8-4-2-1 BCD to visual decimal display	Snap-on or screw-on types. RFI and drip-proof	Yes
SRO-92	2 x 12 (dual unit)	0.435" high 0.340" high	5V-28V	Modular	Decode 8-4-2-1 BCD to visual decimal display	Snap-on or screw-on types. RFI and drip-proof	Yes
SRO-600	12	0.7" high 0.59" wide	5V-28V	Modular	Decode 8-4-2-1 BCD to visual decimal display	Screw-on type	Yes
SRO-630	12	0.7" high 0.59" wide	5V-28V	Self-contained	12 line input only	Screw-on type	No
SRO-650	12	0.62" high 0.59" wide	5V-28V	Modular	Decode 8-4-2-1 BCD to visual decimal display	Snap-on type	No

PHONE OR WRITE FOR COMPLETE SPECIFICATION SHEETS, ORDERING INFORMATION AND PRICES

shelly associates

A Subsidiary of Datatron, Inc.

Dedicated to your future

INDICATORS • MULTI MESSAGE DISPLAYS • FIBER OPTICS • ANNUNCIATORS

1562 Reynolds Ave., Santa Ana, California 92707 • (714) 549-3414

Mailing Address: P.O. Box 11427, Santa Ana, California 92711

TWX 910-595-1589



THE SLOAN COMPANY

7704 SAN FERNANDO ROAD BOX 367

SERIES

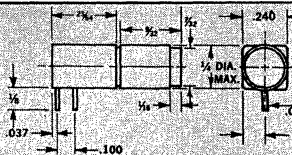
DRAWINGS

LENS STYLE

101



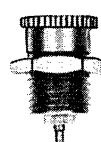
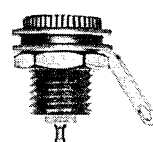
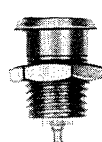
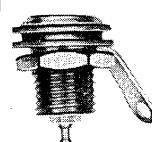
LENS BAYONET TYPE
LENS STYLES AVAIL. — DS, DSC, Q, QB



SUN VALLEY, CALIFORNIA 91353

PHONE: (213) 875-1123

TWX: 910-498-2250

LENS STYLE		LENS COLOR	LAMP TYPE	HOW TO ORDER
QB  Matte black anodized bezel. Allows 180° visibility. Blends with dark colored panels; contrasts with light colored panels. BI-COLOR has the added feature, white when unlighted and colored when lighted.	D  Skirted lens covers metal parts for neat panel appearance. Large lighted surface assures positive indication. BI-COLOR has the added feature, white when unlighted and colored when lighted.	TRANSPARENT RL — Red *BL — Blue *GL — Green AL — Amber CL — Clear TRANSLUCENT RLUC — Red WLUC — White BLUC — Blue GLUC — Green ALUC — Amber	T-1 INCANDESCENT OR T-1 BASED LED	EXAMPLE: 101 RL ↓ ↓ Model No. Lens Color DSC T-1 Based Lamp ↓ ↓ Lens Style Lamp Type
MB  Offers the same features as Type M. Black metal trim. Both accommodate T-1¾ based lamp or T-2 based neon lamp (NE2J or AH types).	M  Large lens for maximum visibility from all angles. Engineered to offer the most uniform light distribution. Full 180° visibility.	TRANSPARENT RL — Red *BL — Blue *GL — Green AL — Amber CL — Clear TRANSLUCENT RLUC — Red WLUC — White BLUC — Blue GLUC — Green ALUC — Amber	T-1¾ OR T-2 INCANDESCENT OR T-1¾ BASED LED	EXAMPLE: 864 RL ↓ ↓ Model No. Lens Color DSC T-1¾ Based Lamp ↓ ↓ Lens Style Lamp Type
BODY TYPES		GENERAL PURPOSE LENS MATERIAL (Translucent except M lens) R — Red W — White B — Blue G — Green A — Amber *C — Clear LEXAN LENS MATERIAL (Transparent) (Translucent) RL — Red RLUC — Red BL — Blue WLUC — White GL — Green BLUC — Blue AL — Amber GLUC — Green CL — Clear ALUC — Amber	T-1 INCANDESCENT OR T-1 BASED LED	EXAMPLE: 102SI AL ↓ ↓ Body Type Lens Color DSC T-1 BASED LAMP ↓ ↓ Lens Style Lamp Type
SK  Presents small knurled flange in front of the panel or in front of the shoulder washer on the SKI model.	SKI  Presents small knurled flange in front of the panel or in front of the shoulder washer.	GENERAL PURPOSE (Translucent) R — Red W — White B — Blue G — Green A — Amber LEXAN LENS MATERIAL (Transparent) (Translucent) RL — Red RLUC — Red BL — Blue WLUC — White GL — Green BLUC — Blue AL — Amber GLUC — Green CL — Clear ALUC — Amber	T-1¾ INCANDESCENT OR T-1¾ BASED LED	EXAMPLE: 855SI G 5 ↓ ↓ ↓ Body Type Lens Color Color Coding D BI-COLOR BASED LAMP ↓ ↓ Lens Style Lamp Type
SR  Presents a small flange in front of the panel or in front of the shoulder washer on the SRI model.	SRI  Presents a small flange in front of the panel or in front of the shoulder washer.	M and MB LENS TRANSPARENT EXCEPT FOR WHITE R — Red *G — Green W — White A — Amber *B — Blue C — Clear ALL LENSES EXCEPT M AND MB TRANSPARENT RL — Red *BL — Blue *GL — Green AL — Amber CL — Clear TRANSLUCENT RLUC — Red WLUC — White *BLUC — Blue *GLUC — Green ALUC — Amber *Not recommended for use with neon lamps	T1¾ AND T2 INCANDESCENT OR T-1¾ BASED LED	EXAMPLE: 856 RLUC ↓ ↓ MODEL NO. LENS COLOR T-1¾ or T-2 BASED LAMP ↓ LAMP TYPE



THE SLOAN COMPANY

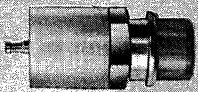
7704 SAN FERNANDO ROAD BOX 367

SERIES

DRAWINGS

LENS STYLE

107



REAR RELAMPABLE
LENS STYLES AVAILABLE — STD, DS, DSC,
Q, QB
BODY STYLES — SI, S



DS



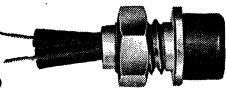
Matte black anodized bezel prevents sidelight emission. Blends with dark colored panels; contrasts with light colored panels. BI-COLOR has the added feature, white when unlighted and colored when lighted.

Q

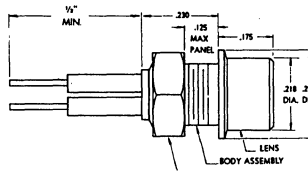


Aluminum anodized bezel (matte silver appearing) allows 180° visibility. Blends with light colored panels; contrasts with dark colored panels. BI-COLOR has the added feature, white when unlighted and colored when lighted.

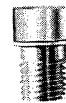
105



FIXED
LENS STYLES AVAILABLE —
STD DS DSC Q QB



DSC

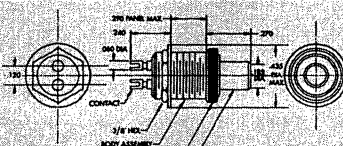


Aluminum anodized bezel (matte silver appearing) prevents sidelight emission. Blends with light colored panels; contrasts with dark colored panels. BI-COLOR has the added feature, white when unlighted and colored when lighted.

106



FIXED



QB



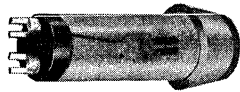
Matte black anodized bezel. Allows 180° visibility. Blends with dark colored panels; contrasts with light colored panels. BI-COLOR has the added feature, white when unlighted and colored when lighted.

STD

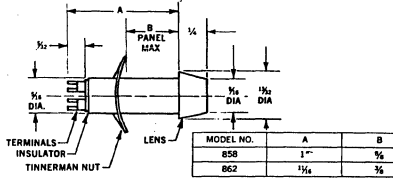


Flat, slightly projected lens gives 180° visibility.

858
862



FIXED



BODY STYLES

S



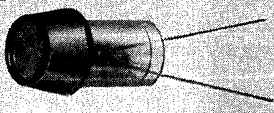
Presents bright metal Hex extending in front of the panel or in front of the shoulder washer on the SI model.

SI

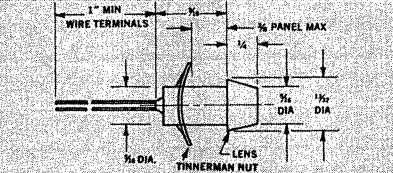


Presents bright metal Hex extending in front of the panel or in front of the shoulder washer.

859



FIXED



FIXED LED

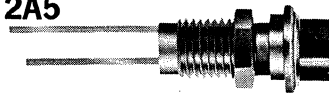
WE RECOMMEND A TRANSPARENT LENSED LENS TO BE USED FOR APPLICATIONS REQUIRING A BASED LED. IF TRANSLUCENT LENS IS DESIRED WE RECOMMEND NO LENSING IN THE LENS.

SERIES

LENS COLOR

- Red Transparent, Red Translucent, White Translucent, Clear Transparent, Green Transparent, Amber Transparent
- Forward Voltage: $5.0 \pm .3V$ for TTL Logic or Other Low Voltages as Needed
- Resistor Built-In for Voltage Needed (Over 2 Volts)
- Dome or Flat Lens
- Choice of Wire-Wrap* — Solder or Connector Terminals
- Soldering Conditions: 230°C for 5 Seconds Maximum

2L5
2G5
2A5



LENS STYLE



DOMES



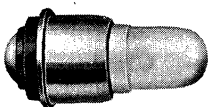
FLAT

T-1 BASED LED

The versatile T-1 Based LED is available in Red diffused, Green diffused and Amber diffused.

It features: **For Red ONLY:** (operating current of 12mA) (absolute max. current 40mA) (2.1V Typical to 3.0V max.)
For Green & Amber ONLY: (operating current of 25mA) (absolute max. current 40mA) (2.4V Typical to 3.6V max.)

Light output is 2.0 millicandelas Typical for all colors at operating current.

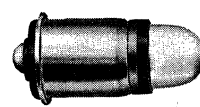


T-1-3/4 BASED LED

The versatile T-1-3/4 Based LED is available in Red diffused, Green diffused and Amber diffused.

It features: **For Red ONLY:** (operating current of 10mA) (absolute max. current 30mA) (1.9V Typical to 2.4V max.)
For Green and Amber ONLY: (operating current of 10mA) (absolute max. current 40mA) (1.9V Typical to 2.4V max.)

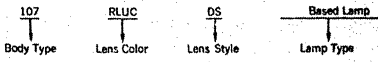
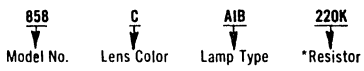
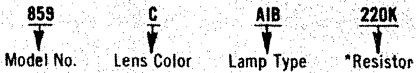
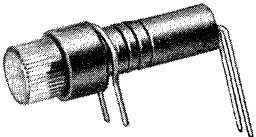
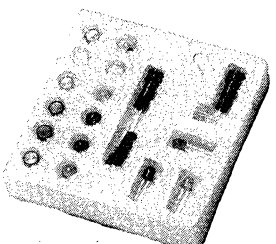
Light output is 1.5 millicandelas Typical for all colors at operating current. Higher voltages are available with built-in resistor within the maximum current limit.



SUN VALLEY, CALIFORNIA 91353

PHONE: (213) 875-1123

TWX: 910-498-2250

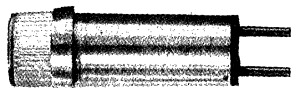
LENS COLOR		LAMP TYPE	HOW TO ORDER
General Purpose Lens Materials (Translucent) R — Red W — White B — Blue G — Green A — Amber	Lexan Lens Materials (Transparent) RL — Red BL — Blue GL — Green AL — Amber CL — Clear	T-1 BASED LAMP INCANDESCENT OR T-1 BASED LED	EXAMPLE 
General Purpose Lens Materials (Translucent) R — Red W — White B — Blue G — Green A — Amber	Lexan Lens Materials (Transparent) RL — Red BL — Blue GL — Green AL — Amber CL — Clear	T-1 UNBASED LAMP MIL SPEC OR COMM.	105S - R - MIL. or COMM. ↙ ↗ ↖ Model No. Lens Color Mil. Spec. or Commercial Bulbs
R — Red W — White *B — Blue *Not recommended for use with neon lamps.	*G — Green A — Amber	T-1 UNBASED LAMP MIL SPEC OR COMM.	106S - R - MIL. or COMM. ↙ ↗ ↖ Model No. Lens Color Mil. Spec. or Commercial Bulbs
R — Red W — White *B — Blue *Not recommended for use with neon lamps.	*G — Green A — Amber C — Clear	T-1, T-1¾ OR T-2 UNBASED INCANDESCENT OR NEON LAMP	
R — Red W — White *B — Blue *Not recommended for use with neon lamps.	*G — Green A — Amber C — Clear	T-1, T-1¾ OR T-2 UNBASED INCANDESCENT OR NEON LAMP	
LED RELAMPABLE INDICATOR LIGHTS		LED INDICATOR DESIGN KIT 175	
 The P175 relampable LED indicator is virtually a modular lamp system for designers. The economical nylon-bodied unit features snap-in mounting in a quarter-inch hole on 3/8-inch centers, or PC board mounting—vertical or horizontal. Snap-on domed or flat lenses allow quick replacement of bright, Sloan furnished LED's, or those of any other manufacturer. The P175 is available in 2 to 28 volt units, and can be ordered with pull down resistor if needed.		 The Sloan LED Indicator Design Kit 175 provides all of the component parts necessary to build an LED Indicator for either panel or printed circuit mounting. Varied snap-on lens styles and colors make this concept even more versatile.	
PART NUMBER SEQUENCE		KIT CONTENTS	
Model No. P	Body Style 175	LED Color R	Lens Color RTP
Lens Style F	Voltage Current 5/15	For unit with resistor see Graph. Fig. II Example: 5/15 *Omit callout for unit w/o resistor	
P — Panel Mount P/C — Printed Circuit Mount**	Model # D — D Hole R — Round Hole	R — Red G — Green A — Amber	RTP — Red Transparent RTL — Red Translucent GTP — Green Transparent ATP — Amber Transparent CTP — Clear Transparent WTL — White Translucent
*Unit w/o Resistor rated at: Red — (Typical) — 2.15 volts at 10 mA. Green/Amber — (Typical) — 2.6 volts at 40 mA.		12 — Lenses 2 — Bodies for Panel Mount 1 — Body for PC Mount 3 — LED's; Red, Green & Amber 1 — Mounting Clip 1 — Instruction Sheet	
**Printed circuit version available with D configuration body style only.			

New Product Bulletin

THE SLOAN CO.



Sloan Cartridge Indicators



**SOLID STATE
CL SERIES**



**INCANDESCENT
CI SERIES**



**NEON
CN SERIES**

Sloan Cartridge units are designed to provide low cost, front panel light indication with a variety of light sources and multi-optional mounting features.

Extremely rugged in construction, Sloan Cartridge units consist of an aluminum body incorporating Solid State, Incandescent or Neon light sources. Termination is by .040 diam. stainless steel pins.

Lens styles are flat or domed in transparent or translucent material. All lenses incorporate Fresnel rings for maximum distribution of light output. A wide variety of lens colors make the Sloan Cartridge line even more versatile.

Series CL is designated for the Solid State version, Series CI for Incandescent and Series CN for Neon. All panel mount through .290 diameter holes and are non-relampable. Solid State and Neon versions can be supplied with or without built-in resistors.

- BENEFITS:**
- Easy replacement in the field without soldering.
 - Interchangeability of light sources after installation with no effect on appearance.
 - Interchangeable with most cartridge units on the market.
 - Fast delivery from distributor or factory stock.

MATERIAL: CASE — Aluminum clear anodized LENS — Butyrate for Neon and LED PINS — Stainless Steel
 — Aluminum black anodized — Lexan for Incandescent .040 ±.002 Diam.
 — HiDielectric internal insulation — All with Fresnel Rings

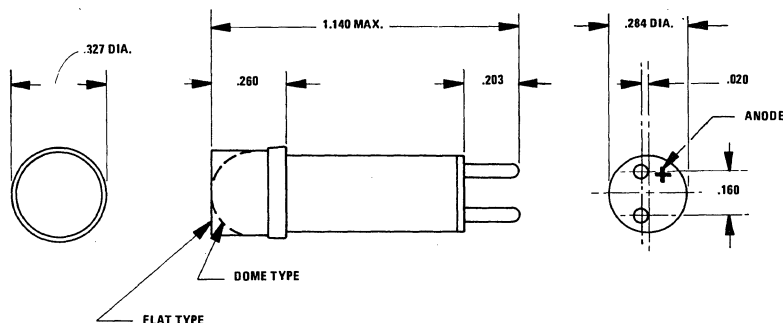
Electrical Specifications

LED	INCANDESCENT				NEON							
The following specifications pertain to Red, Green and Amber LED's.	Voltage Amps MSCP Life				WITH RESISTOR							
	1762/1764	28	.04	.34	1000 hrs.							
W/RESISTOR: (Standard Values)	1784	6	.20	.60	1000 hrs.							
	2182	14	.08	.30	50,000 hrs.							
5 volt — 40mA Max. 6 volt — 35mA Max. 10 volt — 25mA Max. 14 volt — 20mA Max. 28 volt — 9mA Max.	1869	10	.0126-.0154	.004	Indefinite							
	2101	18	.04	.15	10,000 hrs.							
Other voltage/current combinations available upon request.	1730	6.0	.04	.04	1,000 hrs.							
	2180	6.3	.04	.03	50,000 hrs.							
W/O RESISTOR:	1739	6.3	.075	.23	1,000 hrs.							
	2107	10.0	.04	.08	3,000 hrs.							
2.4 volt — 50 mA Max. 1.9 volt @ 10 mA (typical)						WITHOUT RESISTOR						
						Lamp	Volts AC DC	Starting Voltage AC DC	Milli-Amps	Watts	Hours Life	Resistor
						A1B	115 115	65 90	0.3	1/25	25,000	220K
						*A1C	115 150	95 135	1.2	1/7	25,000	47K
						A1B	115 115	65 90	0.3	1/25	25,000	
						*A1C	115 150	95 135	1.2	1/7	25,000	

*High Brightness

Note 1: Resistors other than shown are available.

Note 2: Life figures are for AC. Life at DC is approximately 1/2 life at AC.



How to Order Information

LED CARTRIDGE ORDERING INFORMATION

EXAMPLE: CL-R-B-RTP-F-2.4/50

Series	LED Color	Body Type	Lens Color	Lens Style	Voltage/Current
CL	R-Red G-Green A-Amber	B-Black S-Silver	RTP - Red Transparent GTP - Green Transparent ATP - Amber Transparent CTP - Clear Transparent WTL - White Translucent	F-Flat D-Domed	5/40 Max. 6/35 Max. 10/25 Max. 14/20 Max. 28/9 Max. Omit this callout for 2.4V - No Resistor

INCANDESCENT CARTRIDGE ORDERING INFORMATION

EXAMPLE: CI-B-RL-F-1762

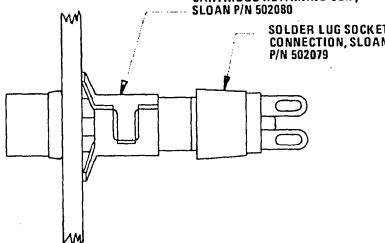
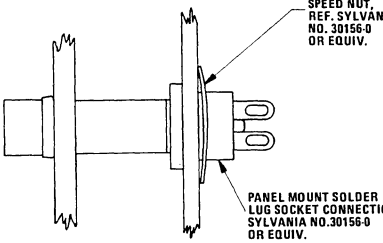
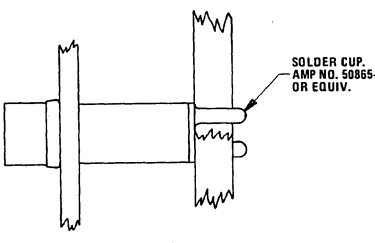
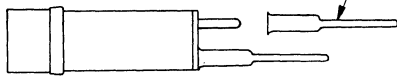
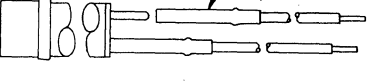
Series	Body Type	Lens Color	Lens Style	Lamp
CI	B-Black S-Silver	RL - Red Transparent BL - Blue Transparent GL - Green Transparent AL - Amber Transparent CL - Clear Transparent RLUC - Red Translucent BLUC - Blue Translucent GLUC - Green Translucent ALUC - Amber Translucent WLUC - White Translucent	F-Flat D-Domed	1762 1764 1784 2182 1869 2101 1730 2180 1739 2107

NEON CARTRIDGE ORDERING INFORMATION

EXAMPLE: CN-B-RTL-F-A1B-22K

Series	Body Type	Lens Color	Lens Style	Lamp	Resistor
CN	B-Black S-Silver	RTL - Red Translucent RTP - Red Transparent ATL - Amber Translucent ATP - Amber Transparent WTL - White Translucent CTP - Clear Transparent	F-Flat D-Domed	A1B A1B A1C A1C	220K 47K

Mounting Options

 CARTRIDGE RETAINING CLIP, SLOAN P/N 502080 SOLDER LUG SOCKET CONNECTION, SLOAN P/N 502079	 SPEED NUT, REF. SYLVANIA NO. 30156-0 OR EQUIV. PANEL MOUNT SOLDER LUG SOCKET CONNECTION, SYLVANIA NO. 30156-0 OR EQUIV.	 SOLDER CUP, AMP NO. 50865-6 OR EQUIV.
 WIRE WRAP POST, AMP NO. 52120 OR EQUIV.	 LEAD WIRE TERMINAL CONNECTION, AMP NO. 205090-1 OR EQUIV.	Mounting hardware shown can be provided as optional accessories - Sloan Part No. 502080 and Part No. 502079 can be purchased directly from Sloan. Other additional mounting accessories can be purchased from the manufacturers referenced or their equivalents.

Approximate pricing for reference only:

Cartridge with Red LED - No Resistor	- 2000 pcs. \$.87 Each
Cartridge with Green or Amber LED - No Resistor	- 2000 pcs. \$.95 Each
Cartridge with Incandescent Bulb	- 2000 pcs. \$.90 Each
Cartridge with Neon - No Resistor	- 2000 pcs. \$.72 Each

THE SLOAN COMPANY, P.O. Box 367, 7704 San Fernando Rd., Sun Valley, CA 91352

Phone: (213) 875-1123 TWX: (910) 498-2250

P175 SERIES

HOW TO ORDER

EXAMPLE: LENS ONLY

F — Flat



D — Dome



P175-RTPD

COLORS AVAILABLE

RTP

Red Transparent

RTL

Red Translucent

GTP

Green Transparent

ATP

Amber Transparent

CTP

Clear Transparent

WTL

White Translucent

BODY ONLY



P175D BODY

BODY AND LENS ONLY



P175D-00-RTPD

BODY AND LED AND LENS ONLY



P175D-R-RTPD

BODY-LED-LENS-RESISTOR ASSEMBLY



P175D-R-RTPD-5/15

The P175 relampable LED indicator is virtually a modular lamp system for designers. The economical nylon-bodied unit features snap-in mounting in a quarter-inch hole on $\frac{3}{8}$ inch centers, or PC board mounting — vertical or horizontal. Snap-on domed or flat lenses allow quick replacement of bright, Sloan furnished LED's, or those of **any other manufacturer**. The P175 is available in 2 to 28 volt units, and can be ordered with pull down resistor if needed.

At last . . . you can specify exactly and **only** what you need for an LED indicator.

PART NUMBER SEQUENCE

Model No.	Body Style	LED Color	Lens Color	Lens Style	Voltage Current
P 175	D	R	RTP	F	5/15
P — Panel Mount P/C — Printed Circuit Mount**	D — D Hole R — Round Hole	R — Red G — Green A — Amber	RTP — Red Transparent RTL — Red Translucent GTP — Green Transparent ATP — Amber Transparent CTP — Clear Transparent WTL — White Translucent	F — Flat D — Domed	For unit with resistor see Graph, Fig. II Example: 5/15 *Omit callout for unit w/o resistor

*Unit w/o Resistor rated at:
Red — (Typical) — 2.15 volts at 10 mA.
Green/Amber — (Typical) — 2.6 volts at 40 mA.

**Printed circuit version available with D configuration body style only.

MATERIALS:

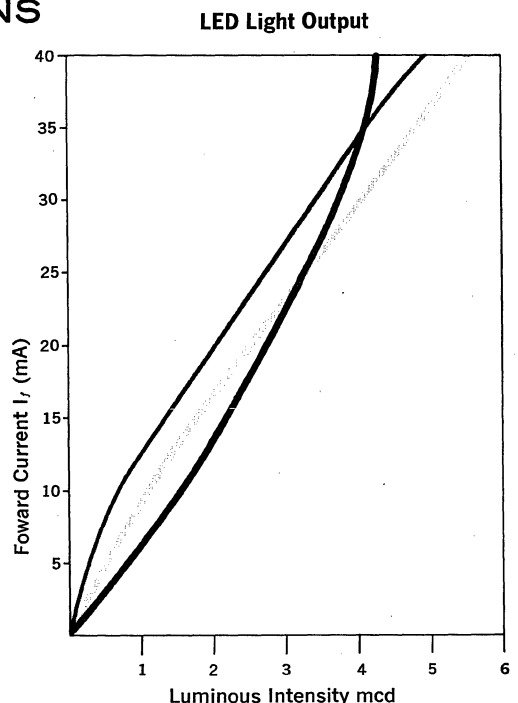
Terminal	Phosphor Bronze Spring Temper Gold Plate per Mil-6-45204, Type I, Class II
Body	Black Nylon per Mil-M-20693A, Type I
Lens	Cellulose Acetate Butyrate per LP-349C
P/C Mtg. Clip	Phosphor Bronze per QQ-B-750, Composition A, - Spring Temper Tin Plate per Mil-T-10727A, Type II.

LED SPECIFICATIONS

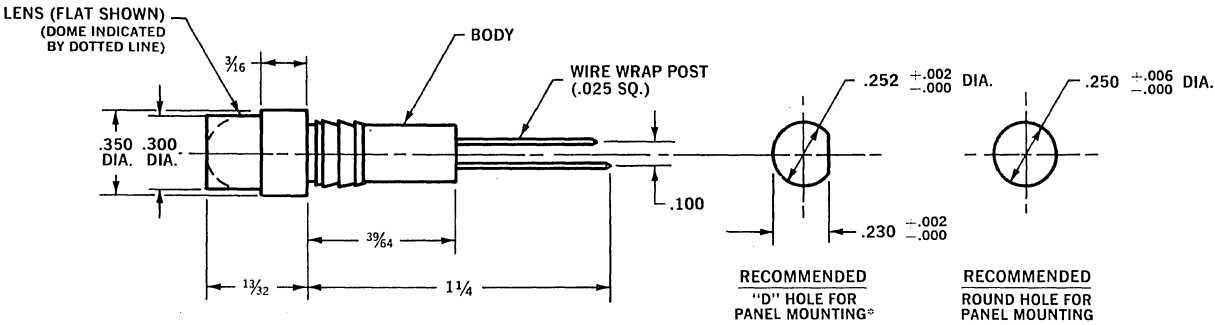
Red
2.15 Forward Voltage (Typical)
at 10 mA.

Green/Amber
2.6 Forward Voltage (Typical)
at 40 mA.

See chart for Special Voltage
and current requirements
which require built-in resistor.



DISPLAYS & READOUTS (INCLUDING LAMPS & LIGHTS)



*Note: We recommend "D" hole be punched from backside of panel.

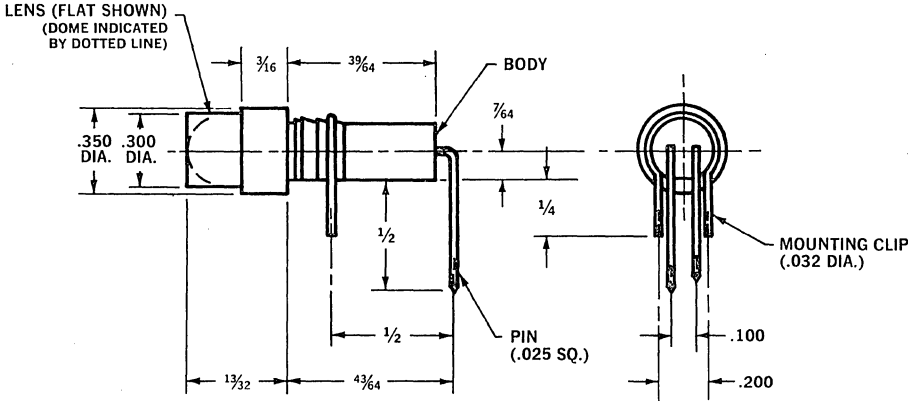


Figure I

CURRENT/VOLTAGE AVAILABLE WITH BUILT-IN RESISTORS

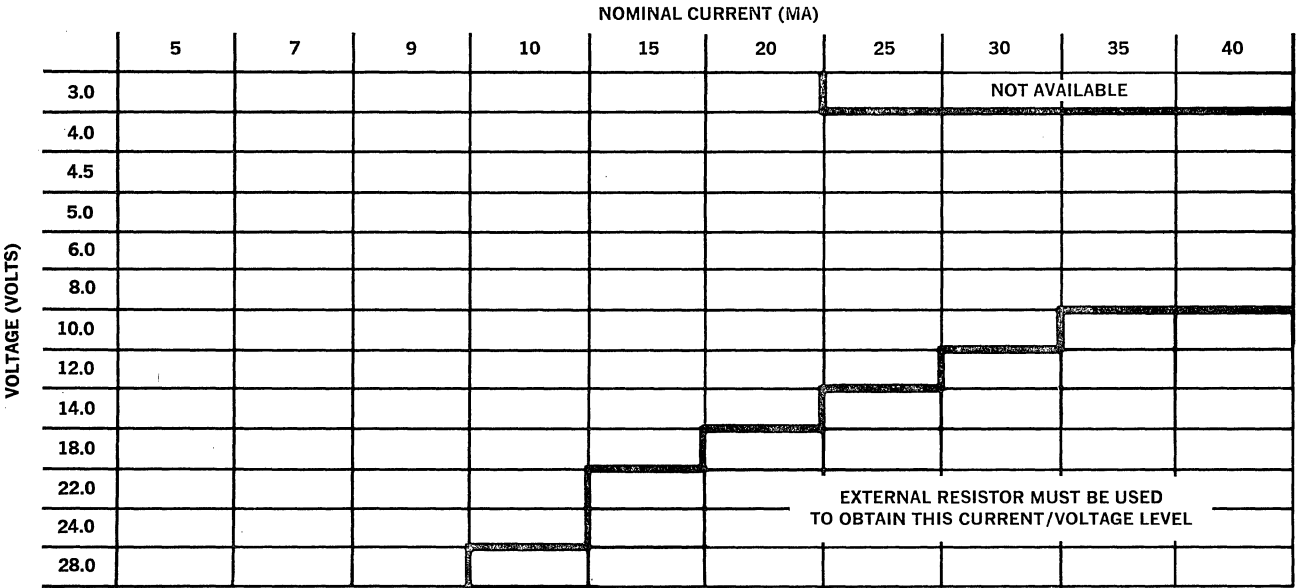
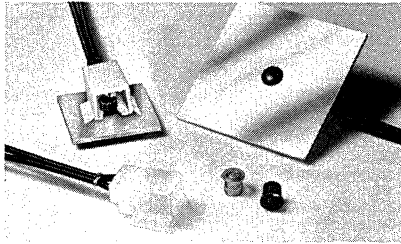


Figure II

SoLiCo PILOT AND INDICATOR LIGHTS



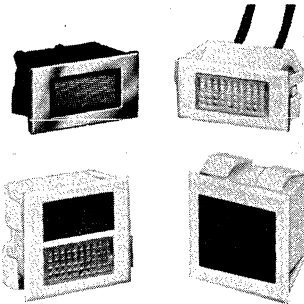
1K14 SERIES

Rear mounts in panel not more than .085" thick. Mounting hole .310" — .320"

LAMP: High brightness neon is standard with complete range of attached resistors available. Miniature incandescent in T-1¾ size available in range of 1.3 volt thru 28 volt.

COLORS: Lens colors are available in complete spectrum both in transparent and translucent material.

Recognized under the component program of U/L and CSA approved.

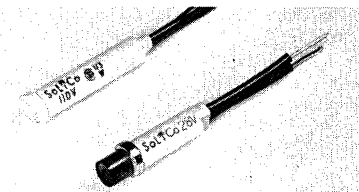


"L" SERIES

Molded from DuPont Zytel 101. Standard colors are black or white, custom colors available upon request.

Optional: When ordering metal bezel, stainless steel is standard. Consult factory for other finishes.

Recognized under the component program of U/L and CSA approved.



3L SERIES (with built-in resistor)

3S SERIES (resistor in lead)

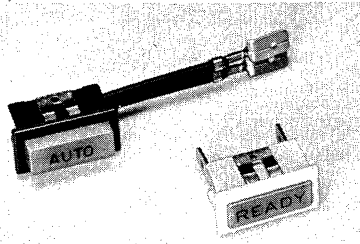
These compact lights snapfit in a 5/16" hole. No additional hardware is necessary. Extended portion is .350 diameter by .110 inch high, while body length below shoulder is 1.420" long on 3L and .940" long on 3S.

Recognized under the component program of U/L and CSA approved. High brightness neon lamps with appropriate resistors to assure long life while achieving desired brightness. Complete range of incandescent lamps also available.

LENS: F4 and F5* lens is offered in a variety of colors and available in nylon or lexan. Decorative bezel with various finishes upon request. Chrome is standard.

BODY COLORS: White is standard although body can be molded in any color.

LEADS: Same as 5S.



"M" SERIES

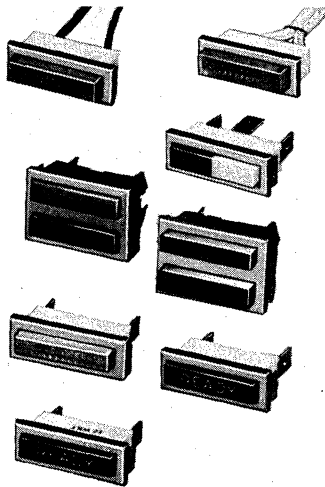
These compact units snap securely without additional hardware into .940 by .440 inch opening. Material thickness .031" — .093".

LENS: M Series with "H" lens features a .855 by .315 inch lens face — .170" high offering excellent raised lighting characteristics with a choice of colors. (Imprinting available).

M Series with "F" lens affords a full .860 by .315 inch lighting face ideal for hot stamping legends, even two lines if desired.

BODY COLORS: white or black available.

LEADS: Black plastic 105°C leads 6" long ends stripped ½" and tinned are standard. Any desired length and colored leads can be readily supplied. In addition, these leads can be provided with a variety of terminations — ring, female flag, etc. M series can be supplied with .250" or .187" male spades.



"R" SERIES

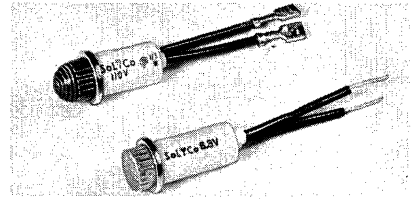
These rectangular lights snap in securely (without additional hardware) into 1.312 or 1.280 by .375 inch opening. Material thickness range .030/.080 inch. 2R requires 1.280" by .812 inch mounting hole.

Recognized under the component program of U/L and CSA approved. High brightness neon lamps with appropriate built-in resistors to assure long life while achieving desired brightness. Complete range of incandescent lamps also available.

LENS: Ideal for vertical or horizontal hot stamp legends. These 1.150 by .250 inch lenses are offered in a variety of colors (nylon or lexan). Split lens variations also available (2R and 4R Series).

BEZEL: Decorative bezel in various finishes available (black, bright brass, etc.) Chrome plate is standard.

LEADS: Same as M SERIES.



5S AND 5L SERIES

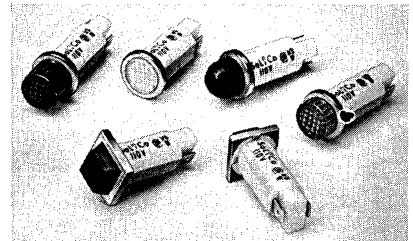
These stylish round body lights with chrome plated bezel mount into ½" hole and are secured by snapfit feature. The overall body length below the bezel is .900" on the 5S and 1.120" on the 5L.

Recognized under the component program of U/L and CSA approved. High brightness neon lamps with appropriate resistors to assure long life while achieving desired brightness. Complete range of incandescent lamps also available.

LENS: A choice of lens styles and colors available. Nylon or Lexan is standard.

BEZEL: Decorative bezels in various finishes available (chrome plated is standard).

LEADS: Black plastic 105°C leads 6" long, ends stripped ½" and tinned are standard. Any desired length and color leads can be readily supplied. In addition, these leads can be provided with a variety of terminals, ring, female quick connect, male spade, etc.



5T SERIES

HOUSING: Zytel 101, White is standard. However, Black, Red and other colors are available. Fits in ½" mounting hole (snap fit).

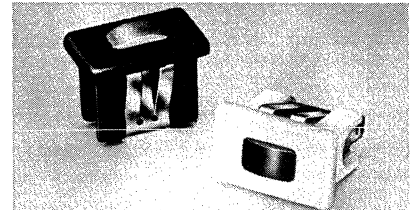
RATING: Same as 5S — 5L SERIES

LAMP: High brightness neon is standard with complete range of attached resistors available. Miniature incandescent in T-1¾ size available in range of 1.3 volt thru 28 volt.

LENS: Various styles with internal facets for maximum light refraction. Available in Lexan and Nylon.

COLORS: Lens colors are available in complete spectrum both in transparent and translucent material.

BEZEL: Optional, available in chrome or other finishes. Square or round depending on lens style.



S222 SERIES

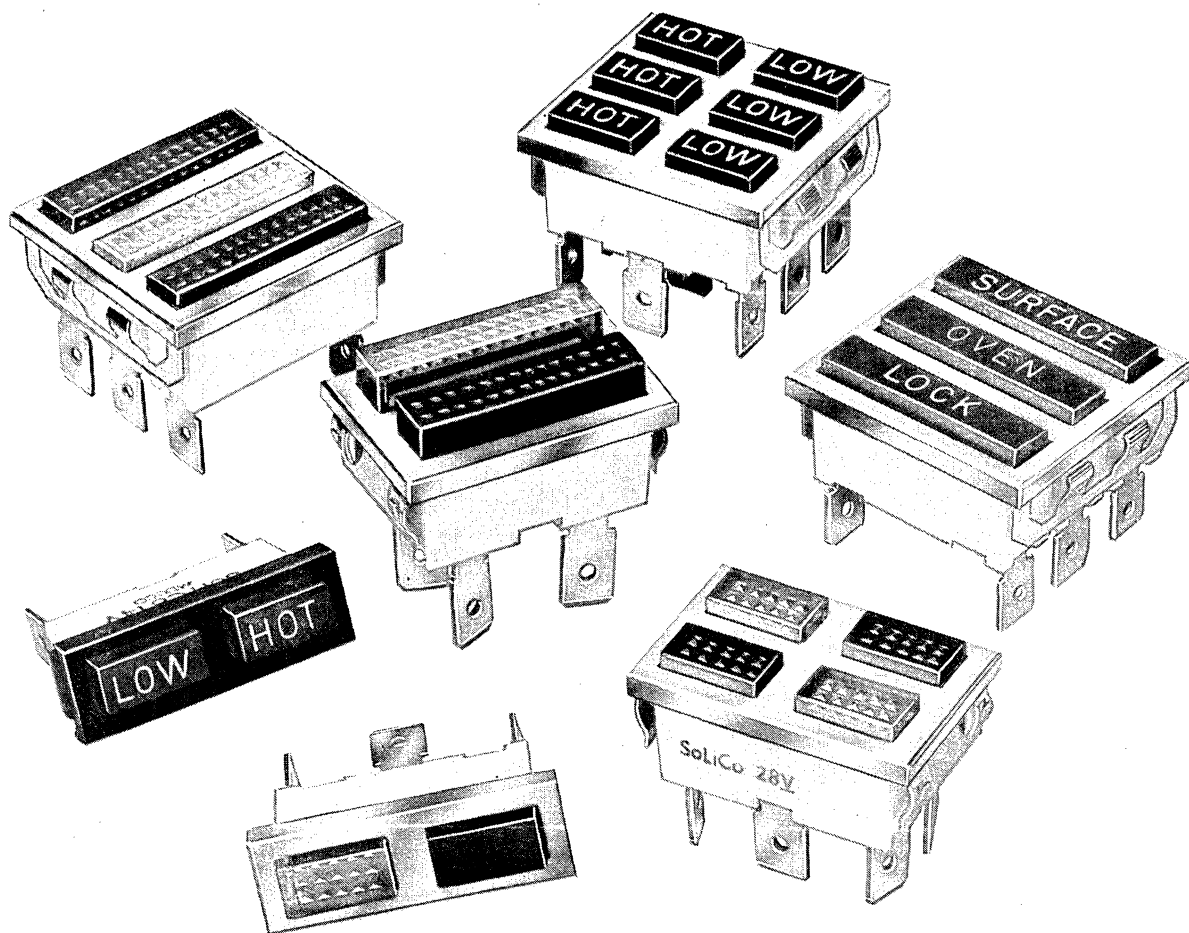
These lights snap securely without additional hardware into a rectangular opening 1.200 by .640 inch. Material thickness .045 to .065 inch.

LENS: Choice of colors available (nylon and acrylic). Red, white, amber, clear.

LEADS: S222 Series provided with screw terminals, S222-A with wire leads. S222-B provided with .250 male spade terminals.

SORENSEN LIGHTED CONTROLS, INC. 530 Oakwood Avenue, West Hartford, Ct. 06110

SoLiCo *PILOT AND INDICATOR LIGHTS*



multiple indication

SoLiCo now offers a complete range of multiple-function indicator lights. All models snap-mount securely without additional hardware into standard panel openings. Up to six separate lenses may be ordered in any combination of available lens colors; clear, red, amber, white, blue and green. Legend imprinting is available. Chrome plated bezels are standard with decorative black or brass bezels optional. 6" black plastic leads are supplied. Solder lugs and male spades quick connect or female flag terminations may be specified.

SORENSEN LIGHTED CONTROLS, INC.

530 Oakwood Avenue, West Hartford, Ct. 06110 Tel. 203/236-3267

Signalex electromagnetic displays

Inherent memory.

Large size.

Long lasting.

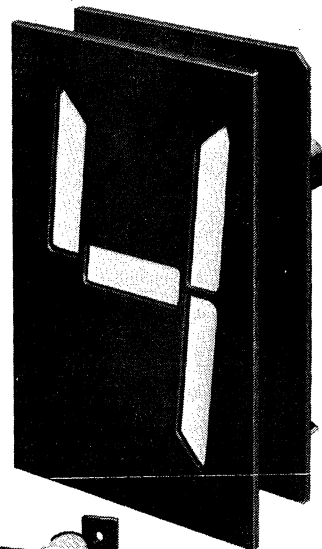
Legible in bright light.

Signalex signalling devices are the simple solutions to problem display requirements. Driven electromagnetically, they are virtually maintenance-free, last almost indefinitely. And the big, bold, light-reflecting characters (up to 6" high and larger) can be seen under most environmental conditions . . . even bright sunlight, or in the dark, when illuminated.

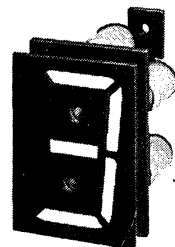
SIGNALEX READOUTS. Type 400L, shown, is 5" x 3-1/4" x 1-13/16" with a character size of 4" H x 2-1/4" W. It can operate at up to 8 display cycles per second. Type 150L has a character size of 1-1/2" H x 9/10" W. Maximum operating speed is 15 cycles/second.

Specifications

	TYPE 400L	TYPE 150L
Character Size	4" H x 2-1/4" W	1-1/2" H x 9/10" W
Panel Size	5" H x 3-1/4" W	1-13/16" H x 1-5/16" W
No. Segments	7	7
No. Coils	7	7
No. Connections	3/coil (Plug-in PC Board available)	3/coil (Plug-in PC Board available)
Mode of Operation	Bi-stable (D.C. pulse activated)	Bi-stable (D.C. pulse activated)
Pulse Length Required	50 ms — display or reset	30 ms — display or reset
Power Required during Pulse	0.93 watt/segment	0.33 watt/segment
Voltage available	6 or 12 VDC (or to specs)	6 or 12 VDC (or to specs)
Max. Operating Speed	8 cycles/sec.	15 cycles/sec.
Segment Colors	Per customer's specs (matte white std)	Per customer's specs (matte white std)

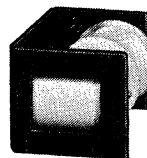


Type 400L

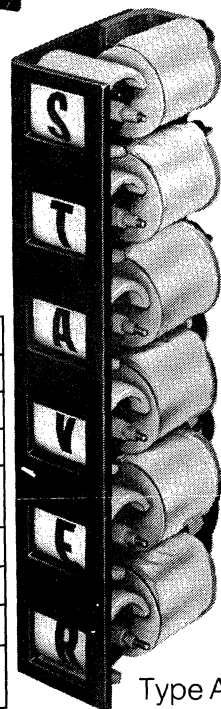


Type 150L

SIGNALEX STRIP INDICATOR. Type A1-1 is a single window model. Strips may be ordered with as many windows as required. Each window has two alternating display faces. The signal, letter or number at each display position snaps into view with an electric pulse and remains until a pulse activates alternate circuit. Type A1-6, shown, is a six-window strip.



Type A1-1



Type A1-6

Specifications

Window Size	3/8" H x 1/2" W
Window to Window Spacing	3/4"
No. Displays per Window	2
No. Connections	3/window
Mode of Operation	Bi-stable (D.C. pulse activated)
Pulse Length Required	30 ms either display
Power Required during Pulse	1.1 watts
Voltage Available	6 or 12 VDC (or to specs)
Display Colors	Per customer's specs (black and white std)

Note:

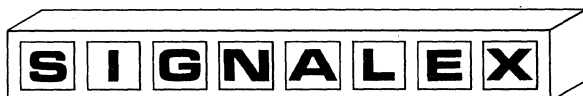
In addition to standard models, economical Signalex display devices can be designed to customers' specifications. For more information, write The Staver Company, Inc., Signalex Division, 41-51 N. Saxon Ave., Bay Shore, N.Y. 11706.

The

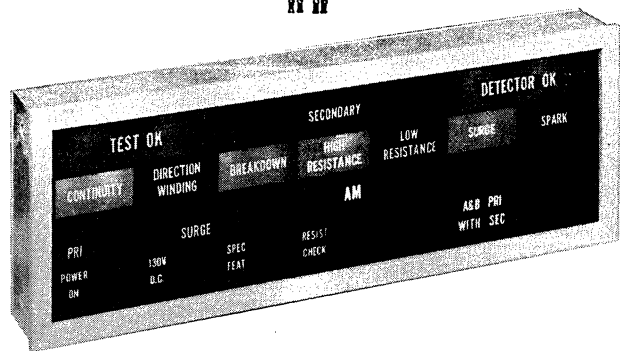
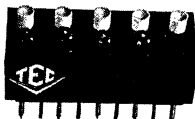
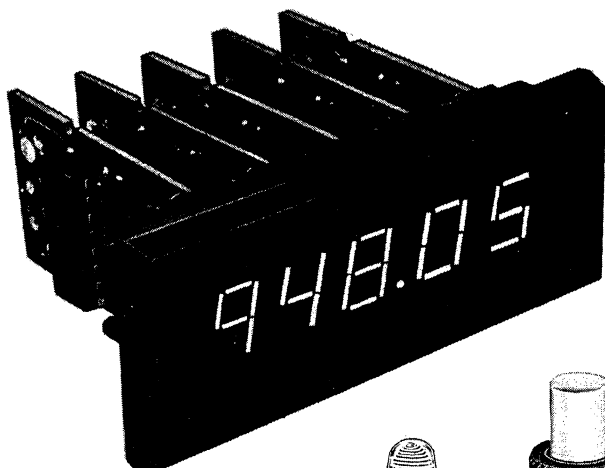


Company, Inc.

41-51 N. Saxon Ave., Bay Shore, N.Y. 11706 (516) 666-8000



TEC-LITE™ YOUR SYMBOL FOR THE HIGHEST QUALITY INFORMATION DISPLAY/CONTROL DEVICES



READOUTS:

Full alphanumeric, low-cost hexadecimal, incandescents, and LED's in red, orange, yellow and green. Sizes from 0.27" to 1 foot. Solid state modules come ready to install and operate. Include decoder/driver and all circuitry needed to hook up to your system.

SWITCHES:

Rotary, PCB-mounted, bounce free, DIP models. Miniature and subminiature versions. Choose from a variety of switch options, lens colors and terminal types.

SWITCH/INDICATORS:

Conventional, subminiature, miniature, DIP and transistorized models. Available with various switch options, lens colors, and LED, incandescent or neon lamps.

INDICATORS:

LED, incandescent and neon. Miniature, sub-miniature, DIP, PCB-mounted and transistorized models. A size and style to meet most any requirement, with numerous lens colors, terminal types and mounting options.

DISPLAY SYSTEMS:

TEC's line of display systems, display modules, and annunciator systems, provide a low-cost approach to information display and control. TEC also manufactures a complete line of low-cost CRT terminals called DATA-SCREEN® terminals. See last page of TEC section for more details.

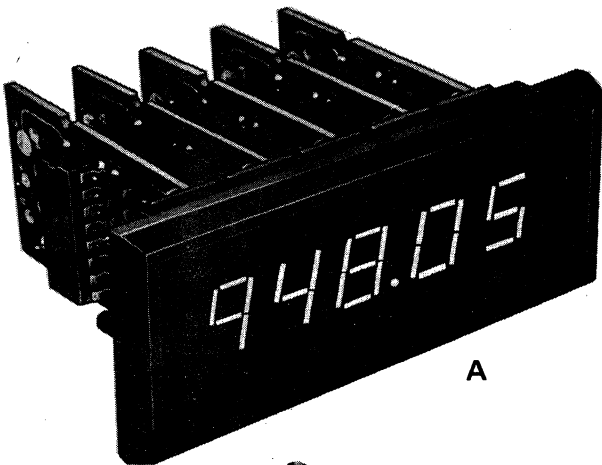
OVER 200 STANDARD INDICATING DEVICES! Add a wide variety of options—such as RFI/EMI shielding, numerous lens styles and voltage levels—and the number of catalogued items runs over 1,000,000! Also, over 50% of the products we sell are specials—devices made to our customers' specific designs. TEC has over 8,000 electrical and mechanical designs on file, so let us help you with your special requirements. And for a demonstration of TEC-LITE Indicating Devices in your own plant, just contact your nearest TEC-REP.

TEC offers you a complete man-machine interface line of highly reliable, economically priced devices for every information display and control need: computers and peripherals, industrial controls, communications, test equipment, aircraft and missiles, navigation, guidance/control systems and consumer products—TEC serves all, with over 17 years of proven performance. The following pages contain a sampling of TEC-LITE Indicating Devices. For detailed information on our complete product line, ask for 96-page catalog No. 2027.



TEC-LITE™

DIGITAL READOUTS



A

- Bright, sharply defined characters are easily read over wide viewing angle from 10 feet to over 60 feet
- IC-compatible devices are controlled by DTL or TTL signal levels for high brightness with low power and current requirements
- All units have solid state circuitry for long life and dependability and accept BCD inputs
- Optional bezels provide handsome panel appearance, mount quickly and easily, and include red, neutral or amber polarizing filters

Choose from a wide variety of standard configurations and display types, as well as custom-designed modules. All have supply voltage of 5 VDC $\pm 5\%$. Some typical applications are calculators, digital clocks, counters, time/event indicators, test instrumentation, digital voltmeters and display terminals.

The SSR Series (A) is available with LED's (green, red and yellow in two models) in heights from 0.27" to 0.60" and incandescent displays in heights of 0.30" and 0.625". All models in this series have 7-segment decoder/driver and include nondriven decimal point, overflow module, memory option, lamp-test feature and provision for automatic blanking of leading and/or trailing edge zeros in a multidigit assembly.

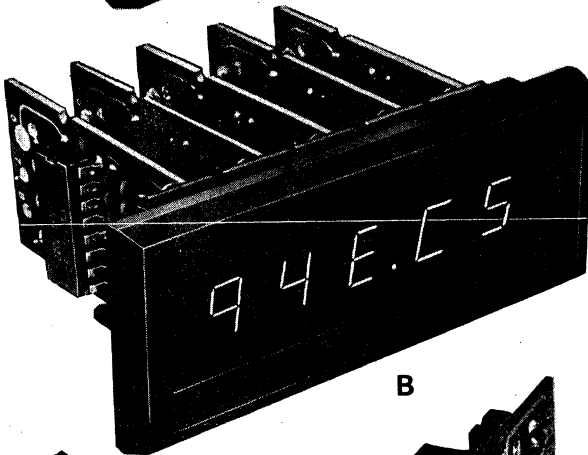
Hexadecimal readout (B) has the same features as above, but with 0-9 and A-F character sequence, built-in memory, 0.27" or 0.30" high red LED display, and no lamp-test feature.

The MDA Series (C) consists of single-digit and hexadecimal LED displays in heights from 0.27" to 0.60". This series is available with decoder/driver, latch and counter, overflow module (D), and red, orange, green and yellow LED's in two models.

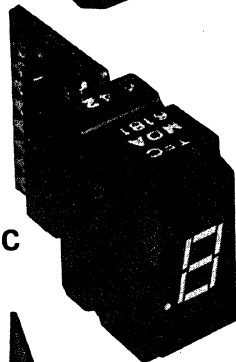
The R-100X Series (E) has the same features as the SSR Series above, but uses discrete LED's instead of a 7-segment display. Standard character heights are 1", 2" and 3", and we can build these modules up to 1 foot high.

Full alphanumeric readouts (F and G) are equipped with ROM, drivers and clock and display 64 ASCII characters. Available in two models: 35-diode, single-plane red LED array 0.35" high (F) and 35-diode, discrete red, green or yellow LED array 1" high (G).

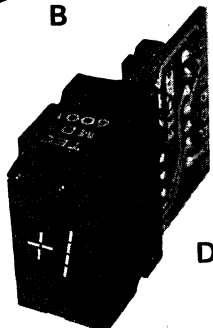
TEC also manufactures transistorized neon digital readouts and other incandescents; see catalog No. 2027 for details.



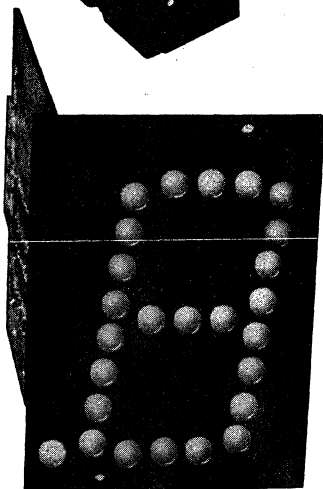
B



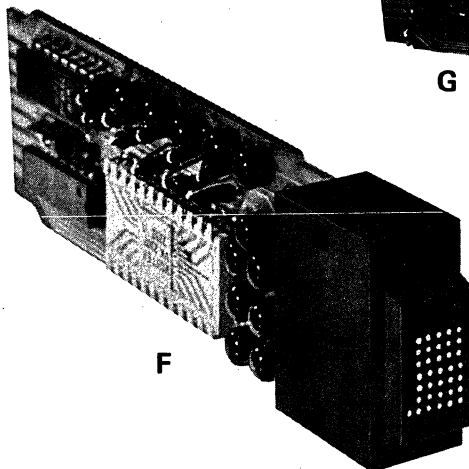
C



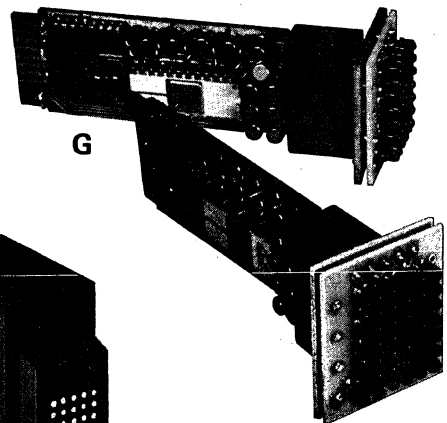
D



E



F



G



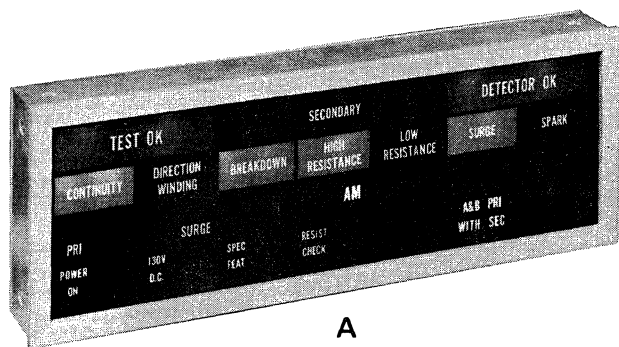
TEC—LITE indicators are available with the same terminal options and voltage ranges as shown at left, and many have replaceable lamps. All devices have either an anodized aluminum or rugged plastic body; irridite finish is available with many models for RFI/EMI shielding. Engraved legends and waterproof models are also available at slight extra cost. Units on this page are shown approximately actual size (except for rectangular switch/indicator, shown 50% actual size).

TEC. Incorporated 9800 N. ORACLE ROAD • TUCSON, AZ USA 85704 • (602) 297-1111 • TWX 910-952-1377

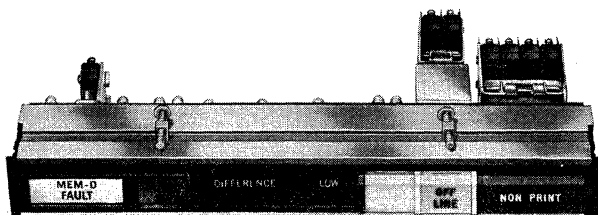


TEC-LITE™

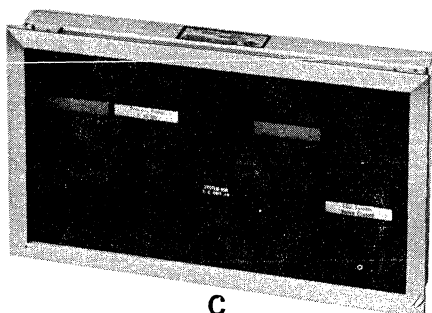
DISPLAY SYSTEMS



A



B



C

A. DATA-PANEL® DISPLAY SYSTEMS. These integrated display cost less per point than individual indicators and cut installation by 50% or more. Messages displayed in single viewing plane, and optimum use of IC's lowers cost and increases reliability. Permanently visible legends, symbols and grid lines can be provided. Unit functions as a total input/output system and is modular designed to grow with your needs. . . may be installed in consoles, racks or walls. Just a few applications are: data processing, communications, materials handling and dispatch. For complete information, ask for brochure No. 1024.

B. DATA-LINETM DISPLAY MODULES. Combines switches, indicators and message displays in an in-line modular package that complements basic DATA-PANEL Display System design. . . an information display device for computers, industrial control, peripheral equipment, etc. Modular in-line design permits intermixing of message display, incandescent and neon functions. Displays may be arranged in any sequence on .7" centers in a frame available in lengths to 4 feet. Frame forms front bezel and provides panel mounting hardware; lamps are replaceable from front or rear of panel. Full details are contained in brochure No. 599.

C. DATA-MONITORTM ANNUNCIATORS. Feature for feature, the best annunciator buy on the market—1/3 the cost and 1/9 the space of conventional models. Only 6-3/4" high by 11-3/4" wide. . . holds up to 10 cards and 100 legends. . . comes ready to install and operate. Five different systems are available—ranging from simple lighted indication of off-normal points to supervised model with audible and flashing alarms. Memory logic in four of these systems insures operator awareness of intermittent alarm. These four systems also have a built-in ring-back capability. Brochure No. 1019 has complete details.

TEC-LITETM, DATA-PANEL®, DATA-LINETM, DATA-MONITORTM, DATA-SCREEN® and MINI-TECTM TEC, Incorporated

DATA-SCREEN® TERMINALS

These versatile CRT terminals provide low-cost communications between man and computer—fast, efficient, operator-oriented terminals for data communications networks. Three basic interfaces—high speed parallel, block mode and conversational TTY—plus a full complement of application-proved features and options are provided in 14 different models.

Series 400 terminals were introduced in 1970, and several thousand units are now in service throughout the world. The 400 Series comprises 11 different models offering parallel, serial, polling and TTY compatible and replaceable interfaces.

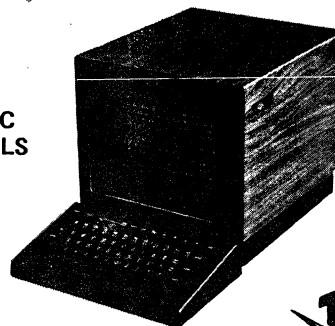
MINI-TECTM terminals incorporate design concepts that have resulted in a highly versatile, yet compact, low-cost model. Like the 400 Series, these terminals interface with most minicomputers and provide high-speed data communication capabilities.

A low-cost TTY replaceable terminal is also available. Brochure No. 3003 contains information on the complete line of DATA-SCREEN® terminals.



SERIES 400
TERMINALS

MINI-TEC
TERMINALS



TEC, Incorporated 9800 N. ORACLE ROAD • TUCSON, AZ USA 85704 • (602) 297-1111 • TWX 910-952-1377



TEKELEC, INC.



2623 Saddle Avenue, Oxnard, California 93030
Tel: (805) 485-5445 TWX: 910-336-1280

DIGITAL MULTIMETERS

There's a low-cost, high performance Tekelec Digital Multimeter to meet virtually every lab, bench and production application. Each model has exceptional accuracy, resolution and sensitivity. Exceptional stability and reliability are provided by Tekelec's exclusive Poly-Tek™ conversion system which uses special custom integrated IC's in both the analog and digital circuits.

An outstanding feature of all Tekelec digital multimeters is their big, bright "Field Effect" liquid crystal display that reduces eye fatigue and reading errors. A recently added sensational feature, available as a no-cost option on all Tekelec digital multimeters, is our new Transflective Liquid Crystal Display which can be easily read in bright sunlight or in complete darkness.

Ask your Tekelec representative or contact the factory direct for detailed brochures covering every model.

TA 357 MULTEX

AN ENTIRELY NEW CONCEPT IN LOW COST, HIGH PERFORMANCE DIGITAL MULTIMETERS

Tekelec presents the TA 357 MULTEX, an entirely new concept in low-cost digital multimeters. With its low, low cost and extreme versatility and an easily portable 9½" x 5¼" x 2½" package weighing only 1¾ pounds, the MULTEX will prove to be as valuable to you as a pocket calculator. The MULTEX is a rugged, portable digital multimeter, providing all the measuring power you'll ever need and assures you of laboratory accuracy no matter where you use it.

Accuracy of the MULTEX is outstanding. As an example, the basic accuracy on the two lowest DC voltage ranges is: $\pm 1\%$ ± 1 digit. And with extra-high sensitivity on every function — 100 microvolts on both the DC

and AC voltage functions, the MULTEX will always meet your exacting measurement needs.

Protection against over-voltage is built into every function. All 8 DC and AC voltage ranges are protected against overvoltages up to 848 Volts peak to peak, and the current ranges are doubly protected by both current limiting circuits and fuses. And on all of the resistance ranges, the MULTEX will take a full 220 VAC without damage of any kind.

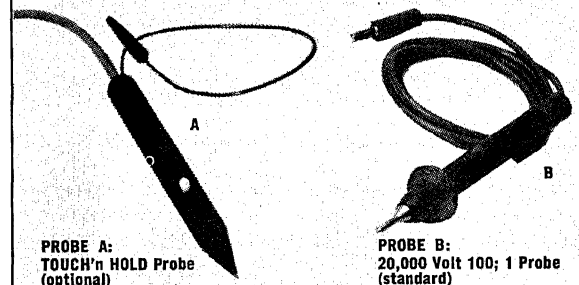
As an added standard feature, a unique test switch on the MULTEX causes the AC line voltage to be displayed without poking probes into the line socket.



- 7 Functions
- 27 Ranges
- Extra Long Life Field Effect Liquid Crystal Display with .4" High Numerals
- 10⁻¹² MHO Sensitivity (10¹² OHMS!)
- 10 pA Sensitivity
- AC Line Measurement Switch
- 20,000 Volts Measurement Capability, Safety Probe At No Extra Charge
- .05% F.S. $\pm 1\%$ R Basic Accuracy
- Automatic Decimal & Function Display



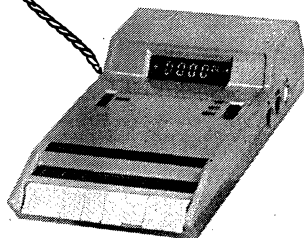
ACCESSORIES FOR TEKELEC MULTIMETERS



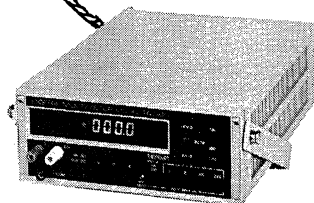
PROBE A:
TOUCH'n HOLD Probe
(optional)

PROBE B:
20,000 Volt 100; 1 Probe
(standard)

Now you can keep both eyes on your circuits with Tekelec's "TOUCH'n HOLD" probe. Just push the button of the probe and your Tekelec multimeter will take — and hold your reading for you.



- Nicad Battery Pack & Charger Standard
- 25 Ranges
- 5 Functions
- 3½ Digits
- Sensitivity:
100 μ V AC & DC, .1 Ω , 100 nA
- .4" Extra Long Life Field Effect Liquid Crystal Display
- Illuminated Function Indicators
- LSI Circuits
- Pushbutton Operation



- 25 Ranges
- 5 Functions
- 3½ Digits
- Sensitivity:
100 μ V AC & DC, .1 Ω , 100 nA
- Dual Reading Rate
- Pushbutton Operation
- Illuminated Function Indicators
- .4" Extra Long Life Field Effect Liquid Crystal Display

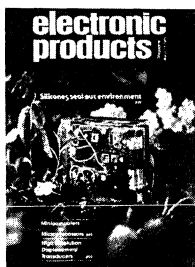


- 4½ Digits
- 25 Ranges
- 5 Functions
- Sensitivity: 10 μ V AC & DC, .01 Ω , 10 nA
- Extra Long Life Field Effect Liquid Crystal Display
- Pushbutton Operation
- Automatic Polarity & Decimal Placement
- Isolated BCD Output & Battery Operation Optional
- Dual Reading Rate
- LSI Circuits

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

***Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530***



electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.



for

VERNITECH

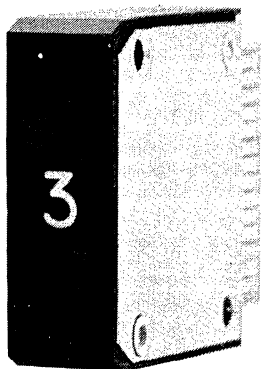
DIVISION OF VERNITRON CORPORATION

ELECTRO-MAGNETIC READOUTS*Problems with VISIBILITY?**Problems with LIFE?**Problems with**POWER SHUTDOWN?***Call VERNITECH****(516) 586-5100 for selection from the widest available range of RELIABLE electro-magnetic readouts**

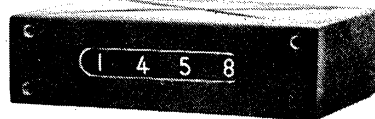
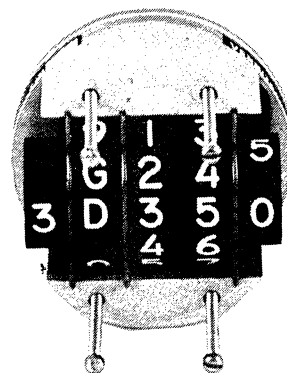
The tiny module that converts digital inputs to an electro-magnetic readout. In addition to standard models listed, Vernitech will manufacture to your specifications.

Part No.	Volts D.C.	No. of Char.	Size of Char.	Pulse Mode	No. of Leads or Term.
06VEA-0022	10	11	.156 x .156	1-1-1-1	12 L
06VBA-0048	10	10	.156 x .156	1-2-1-2	6 T
06VBD-1105 3 Position Flag	10	3	.187 x .187	Return to Flag with Power off	3 T
12VBB-1002	6	10	.281 x .250	Polarity Reversal	6 P/C
12VAC-0015	6	11	.250 x .156	1-1-1-1	12 P/C

Write or phone today for detailed bulletin and stock list.



VERNIDEX
STANDARD
1/2 x 1 1/2 x 1 1/2

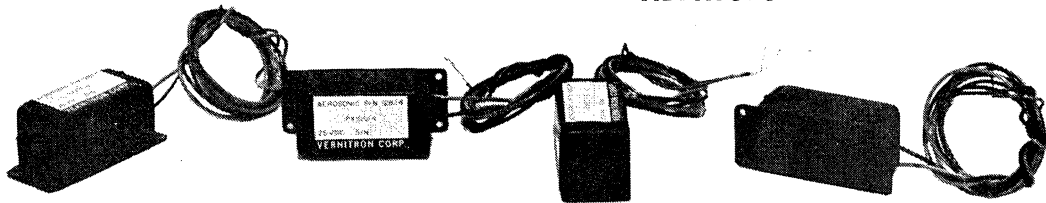


VERNIDEX
MINIATURE

Vernitech has fully qualified hermetically sealed units to military specs with regard to:

Altitude	Shock	Fungus	Radio Interference
Temperature	Salt Spray	Explosion	Life
Vibration	Sand/Dust	Acceleration	Fogging

ALL MODELS AVAILABLE WITH FULL LOGIC SELF-CONTAINED—ACCEPTS BCD INPUT

VIBRATORS

The VERNIBRATOR is an electro-mechanical vibrating device originally designed to eliminate stiction from instruments such as altimeters, etc. The Vernitech vibrator produces exceptionally High-G forces over 10,000 hours of failure and maintenance-free operation, while consistently attaining reliable low-voltage operation.

Consult the factory for either standard or custom-made designs.

Part No.	Input Voltage	Input Current	Peak G's	Size (Inches)	Weight
PX 10014	28 VDC	50 ma	.75 - 2.0	1.6 x .67 x .65	28 grams
PX 10018	13-15 VDC	25 ma max. @ 13V	.75 - 2.0	1.6 x .67 x .65	28 grams
PX 10021	21-28 VDC	25 ma @ 21V 30 ma @ 28V	.75 - 2.0	1.0 x .725 x .65	24 grams
PX 10036	14-28 VDC	30 ma max.	.25	.75 x .725 x .65	22 grams

AVAILABLE WITH AND WITHOUT MOUNTING PLATES

**VERNITECH**

DIVISION OF VERNITRON CORPORATION

300 Marcus Boulevard, Deer Park, New York 11729 / (516) 586-5100, TWX: 510-227-6079

TUNG-SOL® SUBMINIATURE LAMPS

All base and bulb types for read-out and indicator applications

SPECIFICATIONS: T-1³/₄ LAMPS

ELECTRICAL CHARACTERISTICS					PHYSICAL CHARACTERISTICS					
Lamp No.	Design Volts	Design Current	Nominal Light Output	Average Rated Life	Midget Base Style	Max. Bulb Diam.	MOL	Filament Type	LCL	Application
331	1.35	.06	.02 CP	500	Flange	.230	.625	S-2	.375	Indicator ⁽⁴⁾
440	1.5	.05	.012 CP	Indef.	Flange	.230	.625	C-2R	.375	Indicator
1769	2.5	.20	.20 CP	500	Screw	.230	.718	C-2R	.500	Indicator
1767	2.5	.20	.20 CP	500	Screw	.230	.625	C-2R	.500	Indicator ⁽⁴⁾
*364	2.5	.40	.28 CP	5000	Flange	.230	.625	C-2R	.375	Indicator
4 ⁽¹⁾	2.5	.40	800 ft.-cd ⁽⁵⁾	Indef.	Groove	.240	.813	C-2R		Read-out
4S ⁽¹⁾	2.5	.40	1250 ft.-cd ⁽⁶⁾	Indef.	Groove	.240	.813	C-2R		Read-out
1748 ⁽¹⁾ (2)	2.5	.40	800 ft.-cd ⁽⁵⁾	Indef.	3/4" Leads	.240	.718	C-2R		Read-out
1748S ⁽¹⁾ (2)	2.5	.40	1250 ft.-cd ⁽⁶⁾	Indef.	3/4" Leads	.240	.718	C-2R		Read-out
*2169 ⁽²⁾	2.5	.35	.21 CP	10,000	5/8" Leads	.230	.520	C-2R		Indicator
1738 ⁽²⁾	2.7	.06	.04 CP	6000	3/4" Leads	.230	.520	C-2R		Indicator
338	2.7	.06	.04 CP	6000	Flange	.230	.625	C-2R	.375	Indicator
342	6	.04	.03 CP	10,000	Screw	.230	.718	C-2V	.500	Indicator
345	6	.04	.03 CP	10,000	Flange	.230	.625	C-2V	.375	Indicator ⁽⁴⁾
328	6	.20	.60 CP	1000	Flange	.230	.625	C-2R	.375	Indicator ⁽⁴⁾
337	6	.20	.60 CP	1000	Groove	.230	.625	C-2R	.375	Indicator
1768	6	.20	.60 CP	1000	Screw	.230	.625	C-2R	.500	Indicator ⁽⁴⁾
1730 ⁽²⁾	6	.04	.03 CP	10,000	1" Leads	.230	.520	C-2V		Indicator
.2134 ⁽²⁾	6	.04	.03 CP	10,000	1 1/4" Leads	.230	.520	C-2V		Indicator
1784 ⁽²⁾	6	.20	.60 CP	1000	5/8" Leads	.230	.520	C-2R		Indicator
*380	6.3	.040	.02 CP	50,000	Flange	.230	.625	C-2V	.375	Indicator
1739 ⁽²⁾	6.3	.075	.25 CP	1000	5/8" Leads	.230	.520	C-2R		Indicator
1775	6.3	.075	.25 CP	1000	Screw	.230	.625	C-2R	.500	Indicator ⁽⁴⁾
350	6.3	.15	.45 CP	3000	Flange	.230	.625	C-2R	.375	Indicator ⁽⁴⁾
349	6.3	.20	.50 CP	5000	Flange	.230	.625	C-2R	.375	Indicator
*379	6.3	.20	.40 CP	20,000	Groove	.230	.625	C-2F	.375	Indicator
*381	6.3	.20	.40 CP	20,000	Flange	.230	.625	C-2F	.375	Indicator
2112 ⁽²⁾	6.3	.20	.50 CP	5000	5/8" Leads	.230	.520	C-2R		Indicator
*2181 ⁽²⁾	6.3	.20	.40 CP	20,000	5/8" Leads	.230	.520	C-2F		Indicator
344	10	.014	.002 CP	5000+	Flange	.230	.625	C-2F	.375	Indicator ⁽⁴⁾
367	10	.04	.10 CP	Indef.	Flange	.230	.625	C-2V	.375	Indicator
374	10	.014	.006 CP	5000	Flange	.230	.625	C-2F	.375	Indicator
1869 ⁽²⁾	10	.014	.002 CP	5000+	5/8" Leads	.230	.520	C-2F		Indicator
1917 ⁽²⁾	10	.014	.006 CP	5000	5/8" Leads	.230	.520	C-2F		Indicator
2107 ⁽²⁾	10	.04	.10 CP	Indef.	5/8" Leads	.230	.520	C-2V		Indicator
*2207	10	.04	.10 CP	20,000	Groove	.230	.625	C-2V	.375	Indicator
384	11	.025	.05 CP	2000	Flange	.230	.625	C-2F	.375	Indicator
1916 ⁽²⁾	12	.019	.012 CP	Indef.	5/8" Leads	.230	.520	C-2V		Indicator
*336	14	.08	.50 CP	750	Groove	.230	.625	C-2F	.375	Indicator
*373	14	.08	.50 CP	750	Screw	.230	.718	C-2F	.500	Indicator
382	14	.08	.30 CP	50,000	Flange	.230	.625	C-2F	.375	Indicator
386	14	.08	.30 CP	50,000	Groove	.230	.625	C-2F	.375	Indicator
330	14	.08	.50 CP	750	Flange	.230	.625	C-2F	.375	Indicator ⁽⁴⁾
1705 ⁽²⁾	14	.08	.50 CP	750	1" Leads	.230	.520	C-2F		Indicator
2182 ⁽²⁾	14	.08	.30 CP	50,000	5/8" Leads	.230	.520	C-2F		Indicator
346	18	.04	.25 CP	1000	Groove	.230	.625	C-2F	.375	Indicator
*370	18	.04	.25 CP	1000	Flange	.230	.625	C-2F	.375	Indicator
*457	22	.04	.30 CP	2000	Groove	.230	.625	C-2F	.375	Indicator
327	28	.04	.34 CP	1000	Flange	.230	.625	C-2F	.375	Indicator ⁽⁴⁾
327X	28	.046	.34 CP	2500	Flange	.230	.625	C-2F	.375	Indicator ⁽⁴⁾
334	28	.04	.34 CP	1000	Groove	.230	.625	C-2F	.375	Indicator ⁽⁴⁾
335	28	.04	.34 CP	1000	Screw	.230	.718	C-2F	.500	Indicator
340 ⁽³⁾	28	.04	.34 CP	1000	Flange	.230	.625	C-2F	.375	Indicator ⁽⁴⁾
*369	28	.04	.34 CP	1000	Screw	.230	.593	C-2F	.500	Indicator
1762 ⁽²⁾	28	.04	.34 CP	1000	5/8" Leads	.230	.520	C-2F		Indicator ⁽⁴⁾
387	28	.04	.30 CP	25,000	Flange	.230	.625	C-2F	.375	Indicator
*388	28	.04	.30 CP	25,000	Groove	.230	.625	C-2F	.375	Indicator
2187 ⁽²⁾	28	.04	.30 CP	25,000	5/8" Leads	.230	.520	C-2F		Indicator
1764 ⁽²⁾	28	.04	.34 CP	1000	1" Leads	.230	.520	C-2F		Indicator
1860 ⁽²⁾	28	.04	.34 CP	1000	1" Tinned Leads	.230	.520	C-2F		Indicator
1762X ⁽²⁾	28	.046	.34 CP	2500	5/8" Leads	.230	.520	C-2F		Indicator
37	14	.09	.5 CP	1500	Wedge	.240	.800	C-2F	.400	Indicator
73	14	.08	.3 CP	15,000	Wedge	.240	.800	C-2F	.400	Indicator
74	14	.10	.7 CP	500	Wedge	.240	.800	C-2F	.400	Indicator
85	28	.04	.3 CP	10,000	Wedge	.240	.800	C-2F	.400	Indicator
86	6.3	.20	.4 CP	20,000	Wedge	.240	.800	C-2F	.400	Indicator

These lamps are normally supplied in clear glass. Colored bulbs will be made on special order. Unless otherwise specified, all lamps have metal bases.

*Made to order only

SPECIFICATIONS: T-3/4 LAMPS

Lamp No.	Design Volts	Design Current	Nominal Light Output	Average Rated Life	Midget Base Style	Max. Bulb Diam.	MOL	Filament Type	LCL	Application
30	4.5 DC	.0215	.0175	5000.	1-3/16" Tinned leads	.102	.230	C-2R		Digital

Reference Notes Indef.—Life over 5000 hours. (1) Lens end. (2) Wire leads. (3) High temperature solder. (4) Application in aircraft service. (5) Through 3/16" min. dia. window at 1/4" from lamp tip. (6) Through 1/4" min. dia. window at 1/4" from lamp tip.

Wire Lamp Types Not Shown—Type F. 2264—2129—2176—2183—2119—2201—2265 and 2002.

WAGNER ELECTRIC CORPORATION/Tung-Sol Division

630 W. Mt. Pleasant Avenue, Livingston, N.J. 07039 / TWX: 710-994-4865 Phone: (201) 992-1100; (212) 732-5426

Trademark "TUNG-SOL" Reg. U. S. Pat. Off. and Marcas Registradas

TUNG-SOL® MOLDED BASE LAMPS AND BASELESS CARTRIDGE LAMPS

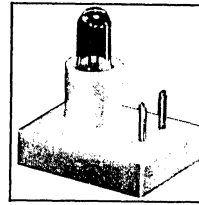
BASELESS CARTRIDGE LAMPS



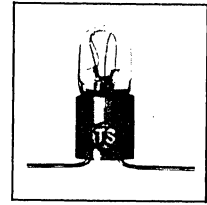
ELECTRICAL CHARACTERISTICS

Lamp Type	Design Volts	Design Amps	Design C.P.	Life Hours
561	12.8	.97	12	1000 @ 12.8V
562	13.5	.74	6	2000 @ 14V
563	13.5	.52	4	1000 @ 14V
564	14.0	.44	2	2000† @ 14V
566	14.0	.36	1.0	2000† @ 14V
567	12.8	.78	9	1000 @ 12.8V

These lamps may be mounted on a variety of simplified terminals. AMP Inc., Harrisburg, Pa., makes several types.



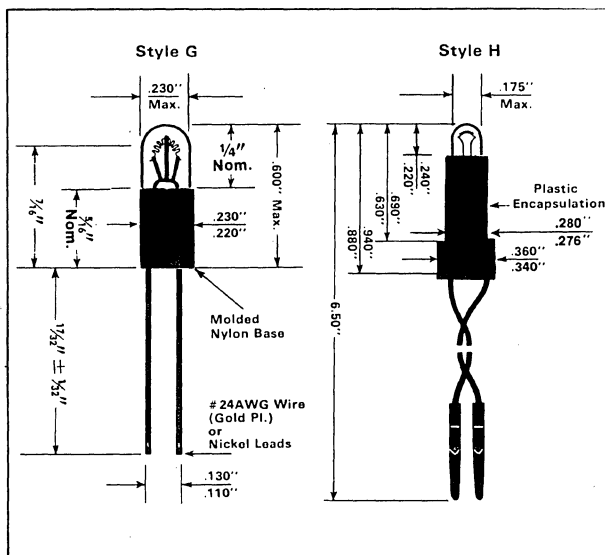
Plug-in module activates photo-electric sensor in high speed check sorter.



Molded base permits bending lead wires at acute angles.

The molded base lamp provides important advantages that simplify production and contribute added reliability to the end product. The molded base is permanently bonded to the bulb. It replaces the previously cemented-on metal base. The former receptacle that had to be wired into the circuit is completely eliminated. The molded base lamp is self-mounting. In fact, the Tu-Pin lamp can be applied with automated equipment.

The molded base technique makes it possible to provide a wide variety of lamp packages—built-in key ways, plug-in types, unusual positioning of the leads and multi-purpose configurations.



Strip-mounted, grain-size, 21-mil lamps snap into molded plastic holder to form a condition monitor for computer circuit boards. Lamp sockets are numbered to correspond to individual circuits. Space for test probe contacts is provided. Units can be operated in either normally "on" or "off" condition and can be wired to a door switch or test push button.

TUNG-SOL®

TUNG-SOL DIVISION

Wagner Electric Corporation

630 W. Mt. Pleasant Avenue, Livingston, N. J. 07039

TWX: 710-994-4865 Phone: (201) 992-1100; (212) 732-5426

Trademark "TUNG-SOL" Reg. U.S. Pat. Off. and Marcas Registradas

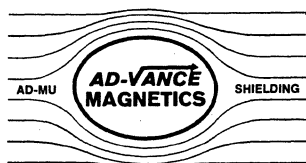
ELECTRICAL CHARACTERISTICS						PHYSICAL CHARACTERISTICS				
Lamp No.	Style	Design Volts	Design Current	Nominal Light Output	Average Rated Life	Midget Base Style	Max. Bulb Diam.	MOL	Filament Type	Indicator Base Color
2301	G	1.35	.06	.02	500	Tu-Pin Molded	.230	.600	S-2	White
2302	G	2.5	.20	.20	500	Tu-Pin Molded	.230	.600	C-2R	Brown
2303	G	2.7	.06	.04	500	Tu-Pin Molded	.230	.600	C-2R	Lt. Grn.
2304	G	3.0	.30	.34	1500	Tu-Pin Molded	.230	.600	C-2R	Black
2305	G	6.0	.04	.03	10,000	Tu-Pin Molded	.230	.600	C-2V	Aluminum
2306	G	6.0	.20	.60	1000	Tu-Pin Molded	.230	.600	C-2R	Orange
2307	G	6.3	.20	.50	5000	Tu-Pin Molded	.230	.600	C-2R	Dk. Blue
*2319	G	6.3	.20	.40	50,000	Tu-Pin Molded	.230	.600	C-2F	Lt. Brown
2308	G	10.0	.014	.006	5000 †	Tu-Pin Molded	.230	.600	C-2F	Pink
2309	G	10.0	.04	.10	5000 †	Tu-Pin Molded	.230	.600	C-2V	Lt. Blue
2310	G	14.0	.08	.50	750	Tu-Pin Molded	.230	.600	C-2F	Yellow
*2339	G	24.0	.05	.50	1000	Tu-Pin Molded	.230	.600	C-2F	Black
2311	G	18.0	.04	.25	1000	Tu-Pin Molded	.230	.600	C-2F	Dk. Grn.
*2318	G	24.0	.080	.50	20,000	Tu-Pin Molded	.230	.600	C-2F	Lt. Blue
2312	G	28.0	.04	.34	1000	Tu-Pin Molded	.230	.600	C-2F	Red
*2329	G	28.0	.046	.34	2500	Tu-Pin Molded	.230	.600	C-2F	Gray
2334	G	6.3	.075	.25	1000	Tu-Pin Molded	.230	.600	C-2R	Red
EN1748 †	H	2.5	.400	800 ft.-cd ⁽⁵⁾	Indef.	Encapsulated	.175	.940	C-2R	Gray
EN1748S †	H	2.5	.400	1250 ft.-cd ⁽⁶⁾	Indef.	Encapsulated	.175	.940	C-2R	Red

†Various lead lengths are available

*Made to order only

WAGNER ELECTRIC CORPORATION/Tung-Sol Division

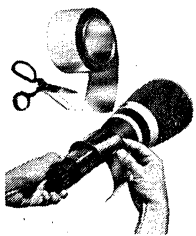
630 W. Mt. Pleasant Avenue, Livingston, N.J. 07039 / TWX: 710-994-4865 Phone: (201) 992-1100; (212) 732-5426



MAGNETIC SHIELD COSTS REDUCED

Ad-Vance Magnetics, Inc. already owns tooling for just about every type of magnetic shield used during the past 20 years. Such existing tooling could cut your shielding costs substantially. Or, our Magnetic Shielding Specialists will design and fabricate an AD-MU shield to your precise performance requirements.

AD-MU FOILS PROVIDE ECONOMICAL SHIELDING



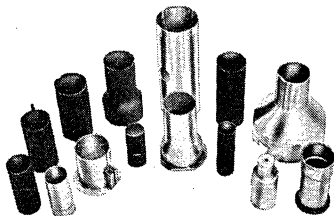
1. Cut and contour in minutes to exact desired shape.
2. Can eliminate costs of designing and manufacturing pre-fabricated shields in many instances.
3. Excellent for hard-to-get-at places.
4. Ideal for experimental applications to quickly determine exact amount of shielding required.
5. Useful in many production applications. Permit placing magnetically reacting components closer, compacting assemblies.

Heat treated; ready for instant use. Delivery from stock.

Widths: 4", 15".

Thicknesses: For AD-MU-78, .002" (4" width only), .004", .006", .010". For AD-MU-00, .004" only.

AD-MU-78 OR 80 HIGH PERMEABILITY SHIELDS FIT 312 TYPES OF PHOTOMULTIPLIER TUBES



For your special application or specific magnetic environment, our engineers can either modify a stock shield or custom design a shield to your exact requirement.

AD-MU SHEET STOCK — DELIVERY FROM STOCK

Order Low (AD-MU-00), Medium (AD-MU-48), and/or High (AD-MU-80) Permeability Stock as Required.

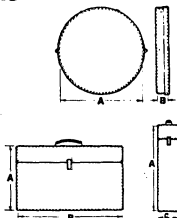
For the convenience of those preferring to design and manufacture magnetic shields in-house. Easy to work: bend, stamp, draw, finish, etc. on ordinary sheet metal working equipment. SHIELDS MUST BE HEAT TREATED before finishing by plating, MIL spec painting, etc.

Sheet dimensions: 30" x 120".

Thicknesses: .014", .020", .025", .031", .040", .050" and .062".

STURDY AD-MU TAPE DATA PROTECTORS

1. Assure fidelity by keeping vital recorded data on magnetic tapes free from distortions caused by unforeseen external magnetic fields.
2. Minimize erasure accidents during safekeeping or transport.
3. Deter the covert saboteur or vandal.
4. Invaluable insurance against possible expensive or irreplaceable losses.

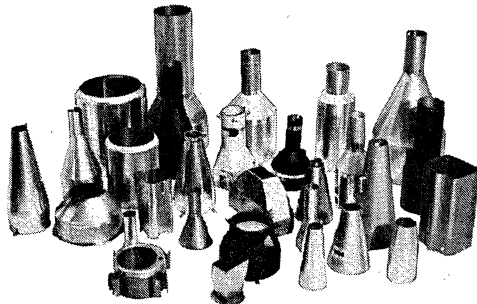


AD-MU CRT SHIELDS

Eliminate the reactive effects of external magnetic fields on the electron beam. Contact our Engineering Department for help in designing and manufacturing the best shield for your application.

Ad-Vance Magnetics, the Old Firm with the New Name, is the industry's largest, oldest and most experienced firm specializing in magnetic shielding. Our shielding is everywhere: off-planet in spacecraft and satellites, and planet-wide in exacting industrial, military, laboratory and consumer applications.

AD-MU CUSTOM FABRICATED SHIELDS FOR COMPONENTS AND SYSTEMS



From the simplest component to the most complex system, Ad-Vance Magnetics can design and make the shields you need . . . for magnetic isolation test chambers, for low field research, magnetic shielding components required in systems (such as CRTs), transformers, motors, tachometers, reed relays and computers, dewars for cryogenic or geophysical research, video cameras, scan converters, etc.

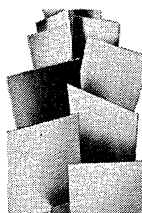
COMPLETE FACILITIES IN 2 LARGE MODERN PLANTS

Up-to-date equipment for all types of metal forming, heliarc and spot welding, processing control of heat treating and finishing . . . complete in-house tool room . . . in-house quality control . . . experienced engineering and design services unequalled in the industry.

PHYSICAL CHARACTERISTICS OF AD-MU ALLOYS

(FORMING QUALITY — NOT ANNEALED)

	AD-MU-80	AD-MU-78	AD-MU-48	AD-MU-00
density (grams/cm ³)	8.74	8.21	8.20	7.80
coefficient of expansion per degree C (20°/100°)	12.30 x 10 ⁻⁶	12.42 x 10 ⁻⁶	9.38 x 10 ⁻⁶	13.10 x 10 ⁻⁶
tensile strength (lbs/in ² x 10 ³)	99.0	85.0	73.0	45.0
yield point (lbs/in ² x 10 ³)	35.0	32.5	29.5	28.0
hardness (rockwell B)	65/80	65/75	65/75	20/40
modulus of elasticity (lbs/in ² x 10 ⁶)	32.0	30.0	24.0	29.5
melting point degrees C	1450	1470	1425	1525
shear point (x 10 ³ psi)	—	42.75	—	35.00
elongation (% in 2" section)	32	35	33	—



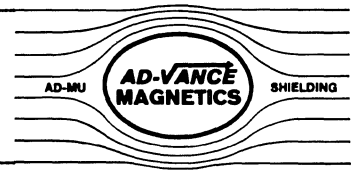
AD-MU ALLOYS PROTECT PERMANENTLY

- Will not saturate when properly used
- No excessive loss of permeability from shock
- Relatively stable permeability characteristics after final anneal, avoiding the expense and inconvenience of regularly repeated annealings
- Minimum retentivity for any alloy of a given permeability.

Ad-Vance engineers are magnetic shielding specialists. Contact our Engineering Department for help with your current magnetic shielding problems. Request Ad-Vance's complete 16-page catalog featuring advanced shielding techniques and components.

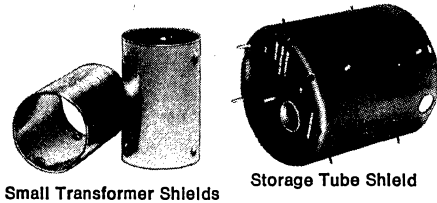


MAGNETIC SHIELDS—ANY SIZE OR SHAPE



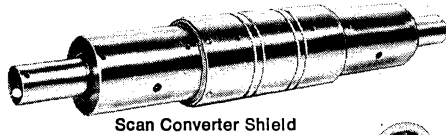
From Ad-Vance Magnetics, Inc., The Problem Solving Magnetic Shielding Specialists

Pictured are typical examples of magnetic shielding problems solved by Ad-Vance Magnetics. Tell us your problem. Be assured our Engineering Department will design the optimum magnetic shield to your exact requirement.

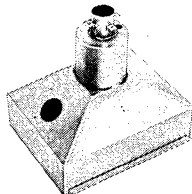


Small Transformer Shields

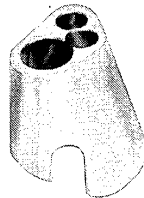
Storage Tube Shield



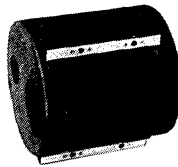
Scan Converter Shield



Specialized CRT Shield



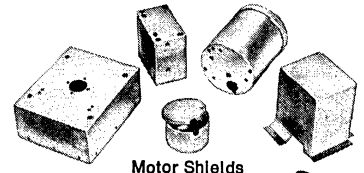
Hydroformed CRT Shield



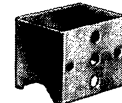
Radar Display Tube Shield



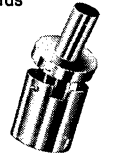
CRT Shield



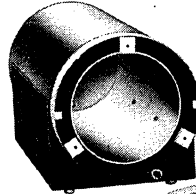
Motor Shields



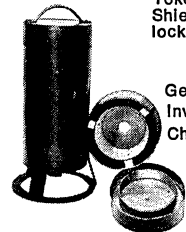
Small Transformer Shield



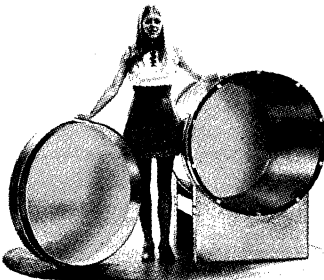
CRT Deflection Yoke & Neck Shield ("L" locking)



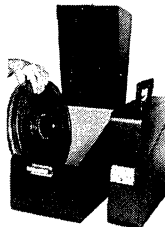
Magnetic Isolation Chamber



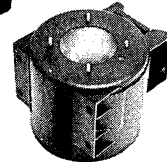
Geo-Magnetic Investigation Chamber



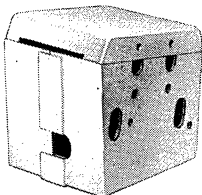
Movable Multi-Layer Controlled Magnetic Environment Chamber



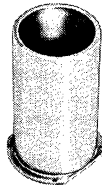
Presidential Model Tape Data Protector



Hydroformed Storage Tube Shield



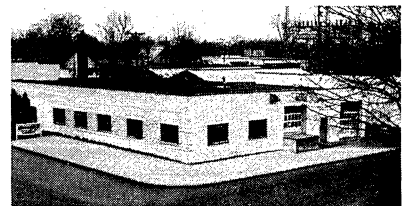
Video Recorder Head Assembly Shield



Special 5-Layer PM Shield



Foolproof Snaptwist Fastener Lock



Our 2 factories only manufacture magnetic shields. Complete in-house facilities.

Typical DC Magnetic Properties For AD-MU Shielding Alloys

	MATERIAL	INITIAL PERMEABILITY at 40 gauss	PERMEABILITY at 100-200 gauss	MAXIMUM PERMEABILITY	SATURATION INDUCTION gauss	COERCIVE FORCE oersteds
High Permeability	AD-MU-80	35,000	45,000	350,000	8,200	0.015
	AD-MU-78	20,000	30,000	300,000	7,500	0.015
Med. Permeability	AD-MU-48	11,000	27,000	100,000	15,200	0.03
Low Permeability	AD-MU-00	300	500	3,000	22,000	1.0

Let our Problem-Solving Engineering Department help solve your shielding problem.

Our 3rd Decade of Magnetic Shielding Leadership

AD-VANCE MAGNETICS, INC., 226 SEVENTH STREET / ROCHESTER, IND. 46975 / (219) 223-3158 / TWX 810-290-0294

SPECIFY "ARNOLD"

FOR YOUR PERMANENT MAGNET

Arnold permanent magnets are available in all types of Alnico material, in sizes ranging from large castings weighing over 80 pounds to very small sintered parts weighing less than one gram.

Alnico 5 can usually be depended upon to deliver the greatest energy product to the magnetic circuit per weight of magnet material. It is therefore generally the first choice for a magnetic material except where special physical considerations are paramount. Modified or premium grades are also available, such as Arkomax 800, a crystal-oriented material used where size and weight must be reduced without loss of energy.

Special assemblies such as rotors, traveling wave tube magnets, magnetron magnets, etc. may be supplied in an aluminum jacket to facilitate mounting and supply an added protection to the magnet.

Large magnet assemblies may be supplied for focusing mass spectrometer and other measuring applications where a high degree of stability and uniformity of field is required.

Many sizes and types of Alnico magnets are carried in stock for immediate delivery.

ALNICO 8 Available from Arnold in production quantities, Alnico 8 possesses the highest coercive force of all Alnico grades, as well as a high energy product and a relatively low temperature coefficient. It is especially suited for traveling wave tube periodic focusing applications. Gap flux densities greater than 1000 gauss are attainable in tubular-type straight field focusing magnets. Alnico 8 is also recommended for applications which involve strong demagnetizing fields, or where space considerations dictate the use of a short magnet.

ARNOX 5 Arnox 5 is a ceramic permanent magnet material composed of highly oriented barium ferrite. It has many times the energy product of Arnox 3 and is comparable in many applications to Alnico 5. Because of its high coercive force, its use is recommended in applications where a short magnetic length is desirable or where extremely high demagnetizing forces are encountered.

ARNOX 7 is a magnet material which was developed primarily for D.C. motors. It combines high energy with very high resistance to demagnetization over a wide range of temperatures.

ARNOX 8 is a premium quality ferrite magnet with the highest magnetic energy of all Arnox magnet grades. It is used where great magnetic efficiency and space-saving are desired. In addition to the higher flux density available from this magnetic material, it also provides a very high resistance to demagnetization.

SILECTRON C, E, O AND DISTRIBUTED GAP CORES Precision-rolled Silectron strip in 1, 2, 4 and 12 mil thicknesses. They are supplied in a wide variety of shapes, and in sizes from a fraction of an ounce to several hundred pounds. In addition to standard transformer applications, they may also be supplied for special applications such as saturable reactors, instrument transformers and pulse transformers.

Distributed Gap Cores reduce watt loss by 30%, exciting current by 70% and cost by 10% over conventional 12 mil C cores of the same size and weight. Made of the best commercial grades of .012" grain-oriented silicon steel, cores are available in 36 basic sizes for power transformer and reactor applications.

Over 1,000 stock cores are listed in the Arnold Silectron catalog. A wide selection of preferred sizes are stocked for immediate shipment.

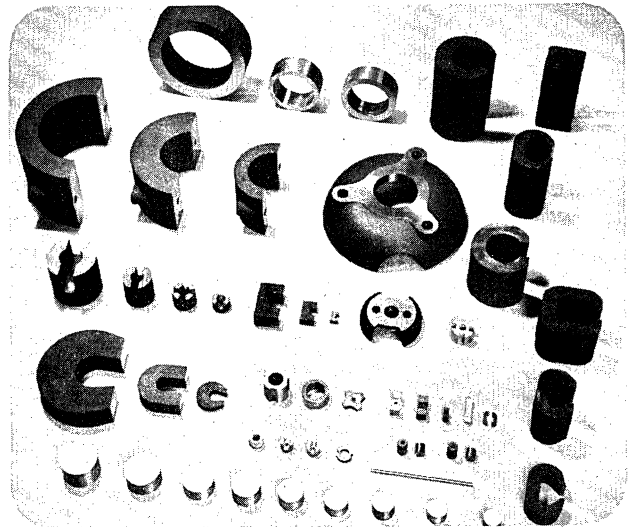
TAPE WOUND CORES OF HIGH PERMEABILITY MATERIALS Arnold tape wound cores are available made of Deltamax, 4-79 Mo-Permalloy, Supermalloy, Mumetal, 4750 Electrical Metal, Silectron, or the new rectangular-loop material, Supermendur. All except Supermendur cores are available in standard tape thicknesses of 1/2, 1, 2, 4 or 12-mils.

Toroidal cores are made in 30 standard sizes with protective nylon or aluminum cases. Special sizes produced to individual requirements. Wide selection of Deltamax, Square Permalloy and Supermalloy type 6T cores (aluminum cased, oil filled, hermetically sealed and epoxy coated) carried in stock for immediate shipment.

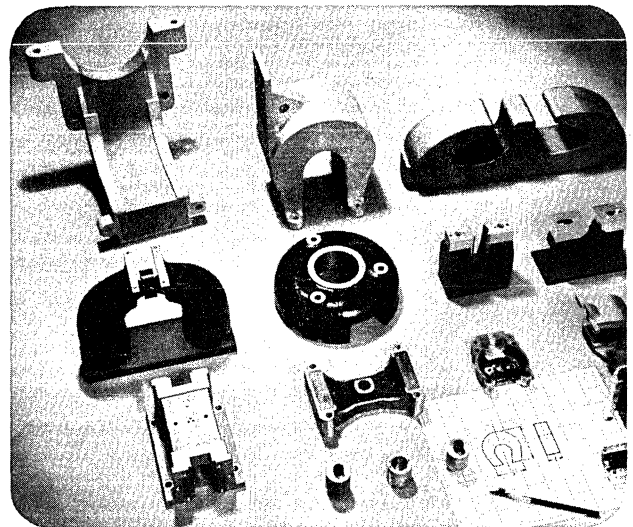
BOBBIN CORES Arnold bobbin cores are available in a wide range of sizes, tape thicknesses, widths and number of wraps to suit the ultimate use of the core in electronic computer assemblies. Magnetic materials usually employed are Deltamax and Square Permalloy in standard thicknesses of 1, 1/2, 1/4 and 1/8 mil. Bobbins are supplied in ceramic or stainless steel.

MO-PERMALLOY POWDER CORES Available in a wide range of sizes, from .140" OD to 5.218" OD. They are given various types of enamel and varnish finishes, some of which permit winding with heavy Formex insulated wire without supplementary insulation over the core.

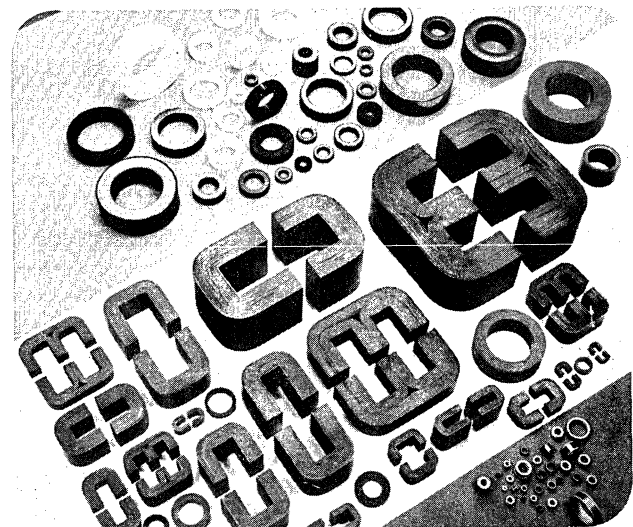
These powder cores are supplied in standard permeabilities of 14, 26, 60 and 125 Mu; high-permeability cores of 147, 160, 173, 205, 250, 300 and 350 Mu are also available in all sizes. They provide constant permeability over a wide range of flux density, and in many cases may be furnished stabilized to provide essentially constant permeability over a specific temperature range. Preferred sizes carried in warehouse stock for immediate shipment.



Typical group of Arnold permanent magnets, both cast and sintered types.

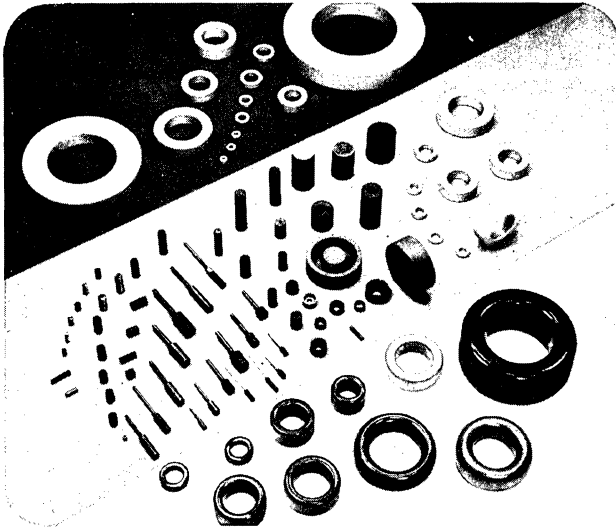


Typical group of permanent magnet assemblies.

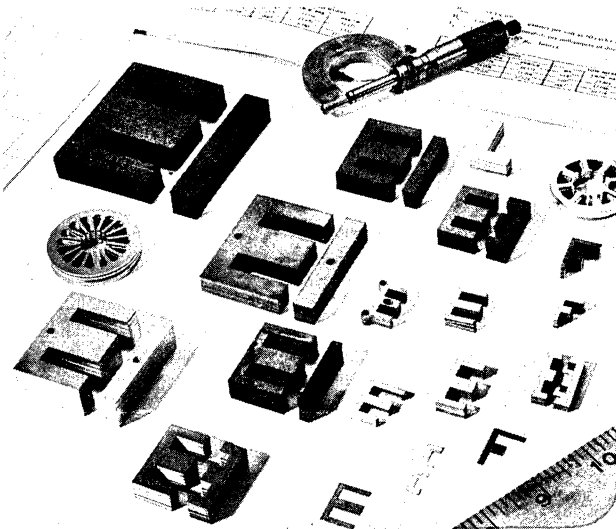


Top to bottom: Tape wound cores, Silectron C, E and O cores, and bobbin cores.

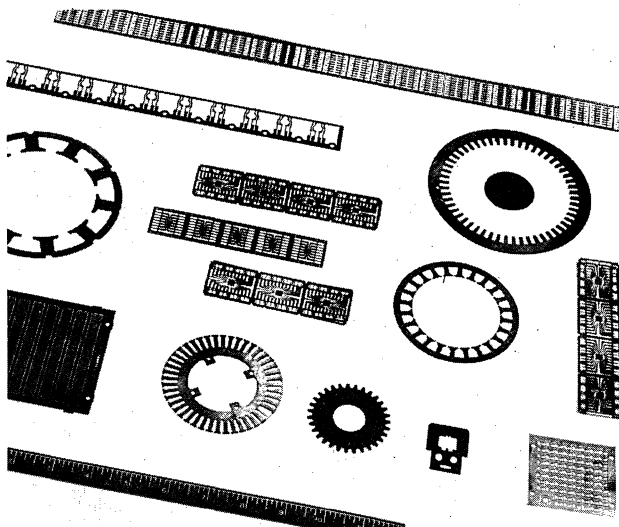
AND OTHER MAGNETIC MATERIAL REQUIREMENTS . . .



Powder cores.



Laminations of silicon and nickel-iron.



Chemically etched parts.

IRON POWDER CORES A wide selection of cores is available from simple cylinders to special cores of complicated design. The line includes all standard types of threaded cores, cup, sleeve, slug and cylindrical insert cores as well as a series of iron powder toroids conforming to the standard sizes adopted by the Metal Powder Industries.

SOFT FERRITE CORES Arnold Soft Ferrite cores are available in a wide range of shapes and permeabilities. Threaded cores, slugs, toroids, beads, E, & U-shapes and pot cores are produced in many sizes from standard tooling. Permeabilities range from 40 to 200 for nickel zinc ferrite and 400 to 3000 for manganese zinc ferrite. Higher permeability materials are currently under development.

MSS IRON POWDER CORES MSS powder cores have a very high electrical resistivity combined with a lower magnetostrictive noise than any other commercial iron powder even when cores are operated at saturation flux densities. They are moderately priced and are available in a wide range of sizes.

LAMINATIONS AND FORMED PARTS Arnold produces a wide selection of silicon-steel, nickel-iron and cobalt-iron laminations for motors and transformers. Thin-gauge laminations (1, 2 and 4-mil thicknesses) of high-permeability materials are specialties. A complete line of transformer cans and hardware is available, including Mil-T specification. Many sizes and types of magnetic shields are available or can be fabricated to your exact requirements from Mumetal and other shielding materials. Shielding materials are also available in bulk form, without annealing.

PHOTO-CHEMICAL FABRICATION This technique provides a wide variety of stress-free, burr-free parts. It also provides economical fabrication where expensive tooling is not justified. A wide range of materials is available for applications such as lead frames, recording head laminations, and other applications.

PRECISION FOIL AND STRIP PRODUCTS Thin and Ultra-thin metals and alloys are custom processed in one of the newest and most modern rolling facilities in the world. Materials such as Aluminum, Brass, Copper, Magnetic Alloys, Stainless Steels and others are produced to individual requirements of gage, width, hardness, flatness, grain size, edge and surface condition.

VICALLOY Vicalloy is a carbon-free permanent magnet alloy containing about 10% vanadium, 50% cobalt and the balance iron.

Vicalloy may be fabricated in the form of castings, hot rolled bars and forgings, or cold rolled strip, wire and tubing. After suitable heat treatment, the material is quite readily machinable. Vicalloy is available on special order in bar, strip and thin tape for recording purposes.

2V PERMENDUR A ferromagnetic alloy of cobalt, vanadium and iron that possesses high flux density saturation properties. Its magnetostrictive properties are useful in many transducer applications.

A NEW CUSTOMER SERVICE

Ogallala Electronics, the newest Arnold division, offers a new service designed to meet special requirements for alnico and ceramic permanent magnet and ferrite customers. If you want fast delivery on prototype or production quantities, call today for complete information or costs estimates. Ogallala Electronics can offer you

Close tolerance grinding and shaping
All shapes and sizes
Large inventory of stock parts for immediate delivery
Engineering assistance
Competitive prices
Stringent quality control

Call Howard Harrington, Ogallala Electronics, (308) 284-4093, or write to 601 West First St., P.O. Box 59, Ogallala, Nebraska 69153.

ARNOLD

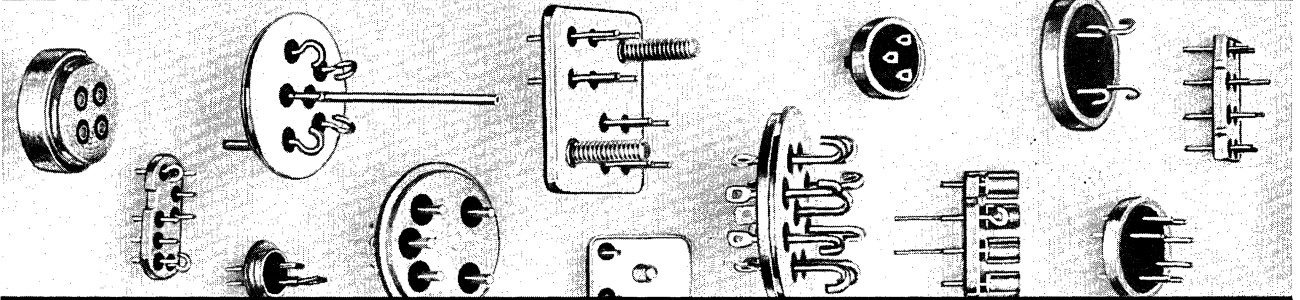
MEMBER COMPANY OF ALLEGHENY LUDLUM INDUSTRIES

THE ARNOLD ENGINEERING COMPANY, Main Office: MARENGO, ILL.
BRANCH OFFICES and REPRESENTATIVES in PRINCIPAL CITIES

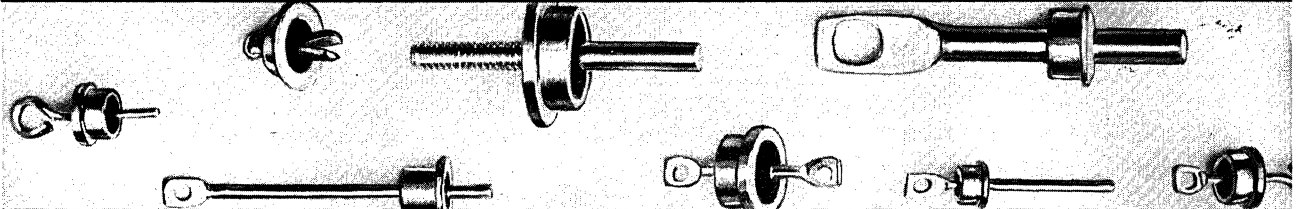
WRITE FOR COMPLETE TECHNICAL DATA

Glass-to-metal PRECISION HERMETIC SEALS

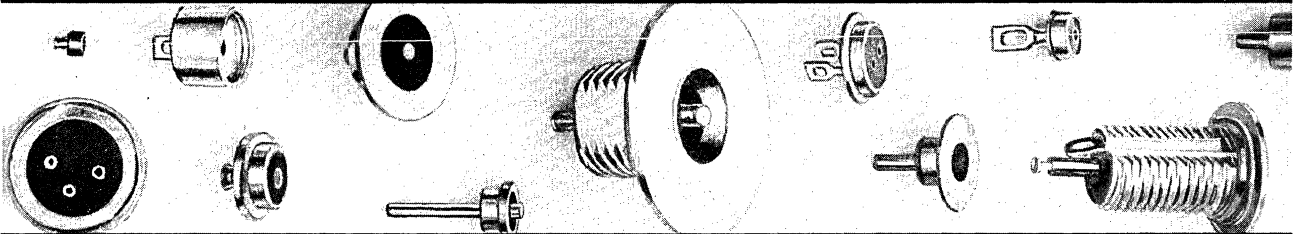
HEADERS



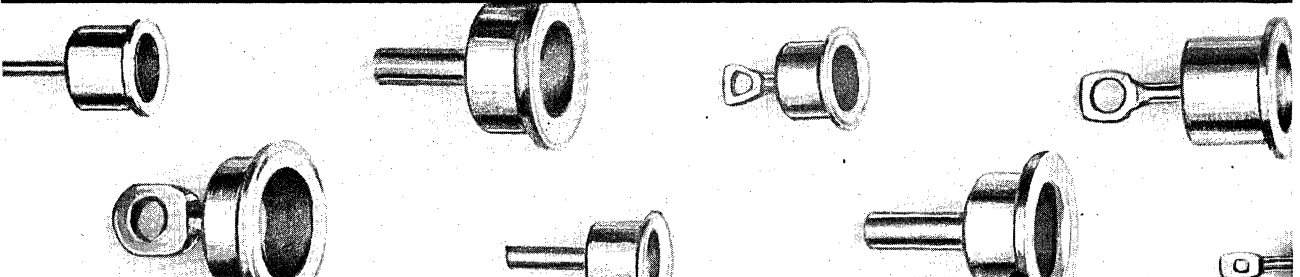
TERMINAL SEALS



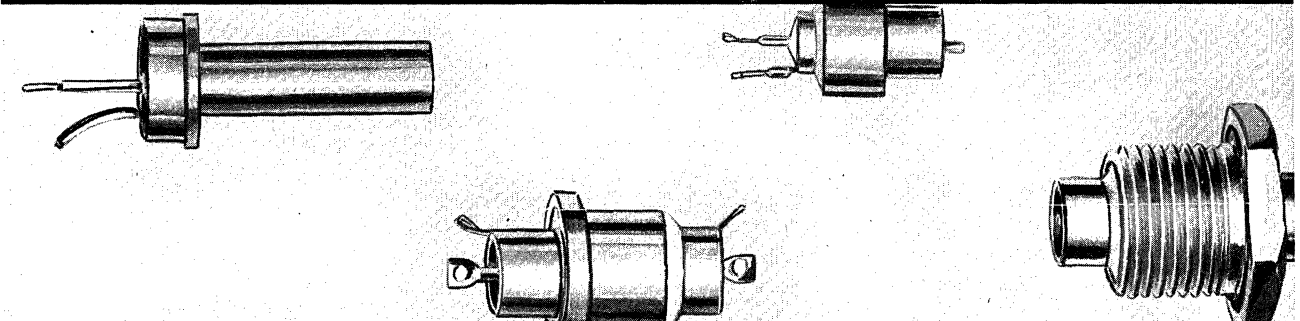
END SEALS and CAPACITOR SEALS



DIODE CASES



DOUBLE SEALS



Custom designing to your individual requirements is our special skill. For information call your representative or write direct to Microwave Devices Division, The Bendix Corporation, Hurricane Road, Franklin, Indiana 46131. Phone (317) 736-6136.





FAIR-RITE PRODUCTS CORP.

FERRITE

SAMPLES-QUOTES-PRODUCTION...

FAST

CONTACT THE FAIR-RITE REP NEAREST YOU:

BERGFORD & ASSOCIATES
OLYMPIA, WA
206-943-6664

R. S. PETTIGREW & COMPANY
WEST HARTFORD, CT
203-233-8533
or at
WEST NEWTON, MA
617-969-5770

ELECTRONIC SALES, INC.
DENVER, CO
303-771-8300

FRANK J. CAMPISANO & COMPANY
CINCINNATI, OH
513-662-1616

A. B. KREGER COMPANY
ROANOKE, VA
703-989-4738

MICROMETALS, INC.
CITY OF INDUSTRY, CA
213-968-4718

**MEANWHILE,
BACK AT FAIR-RITE...**



YOUR MAN IS:
BRUCE TOLEN
WALLKILL, NEW YORK 12589
914-895-2055
TWX 510-249-4819 FR WALK

STASCO
DALLAS, TX
214-239-5054

BARRETT ASSOCIATES
MAITLAND, FL
305-678-0172



JAKE WETZEL
PALESTINE, ILLINOIS 62451
618-586-2556
TWX 510-525-1712 FR PAL

An innovator in ferrite cores since 1953, FAIR-RITE® offers you: A wide range of ferrite materials and core shapes to cover most current applications — from the smallest inductor cores through deflection yokes • Reliable delivery schedules • Sensible year-to-year pricing • A willingness to stretch the state of the art. For FAIR-RITE, call your nearest Rep, or Bruce, or Jake. They know ferrites and will give you the best.

MAGNETIC PROPERTIES OF TYPICAL FAIR-RITE MATERIALS

Material	65	61	64	33	43	34	77	72	73	75
(μ_i) Initial Permeability	100	125	250	800	950	1200	1800	2000	2500	5000
(μ_M) Maximum Permeability	370	450	375	1380	3000	2500	4500 6000 @ 100°C	3500	4000	8000
(B_s) Saturation Flux Density @ 13 oersteds (gauss)	2150	2350	2200	2500	2750	3400	4600	3500	4000	3900
(T_c) Curie Temperature	300°C	300°C	210°C	150°C	130°C	120°C	200°C	150°C	160°C	160°C
(H_c) Coercive Force (oersteds)	2.35	1.60	1.40	0.30	0.30	0.25	0.22	0.18	0.16	0.18
Typical Applications	Microwave Attenuators, Wide Band Transformers	Antennas, Coilforms, Shielding Sleeves	Coil Forms, Shield Beads, Antennas	Coil Forms, Threaded Cores, Cup Cores	Shield Beads, High Frequency Transformers	Bobbins, Shield Beads	Inverters, Power & Pin Cushion Transformers	Inductors, Transformers	Shield Beads, Wide Band Transformers	Wide Band Transformers, Inductors



FAIR-RITE PRODUCTS CORP.

WALLKILL, NEW YORK 12589 • 914-895-2055 & PALESTINE, ILL. 62451 • 618-586-2556

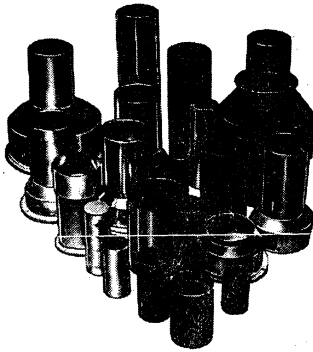
Export inquiries to Claude Forter at Wallkill, N.Y.

MEXICAN MANUFACTURING AFFILIATE: NUMEX, S.A. APDO 16-010 MEXICO 16, D.F. MEXICO.

Magnetic Shielding by Eagle

A brand new source with a 20-year background in magnetic shield design and production. Now ready to help you with personal service, modern equipment and the latest techniques.

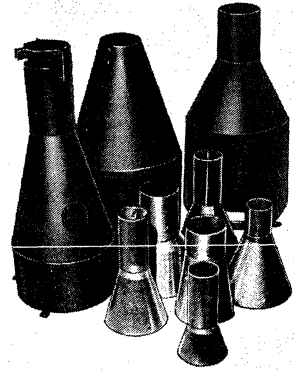
Custom Shields • Standard Shields • Sheet • Foil • Design Engineering • Fabrication • Heat Treating • Testing • Finishing



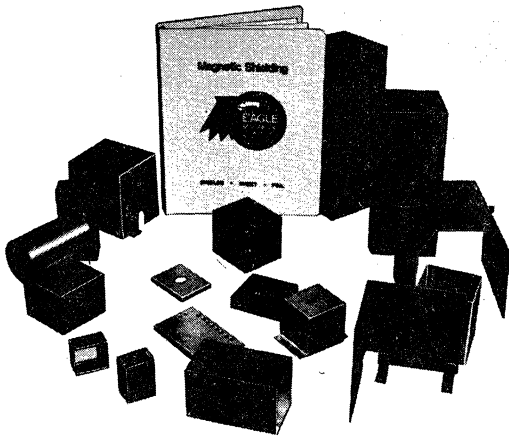
PHOTOMULTIPLIER
TUBE SHIELDS



CATHODE RAY TUBE
SHIELDS



SHIELDS FOR
MEDICAL INSTRUMENTS



TRANSFORMER SHIELDS

Sheet and Foil for Every Need

Eagle "AAA" High permeability against low level fields

Eagle "A" Low permeability against high level fields

SHEET

For forming, bending, drawing

Eagle "AAA"

Dimensions: 30" x 120"

Thickness: .014, .020, .025, .030, .040, .050 and .062

Eagle "A"

Dimensions: 36" x 96"

Thickness: .014, .020, .025, .030, .050 and .062

FOIL

Plain or with adhesive backing

Eagle "AAA"

Width: To 15"

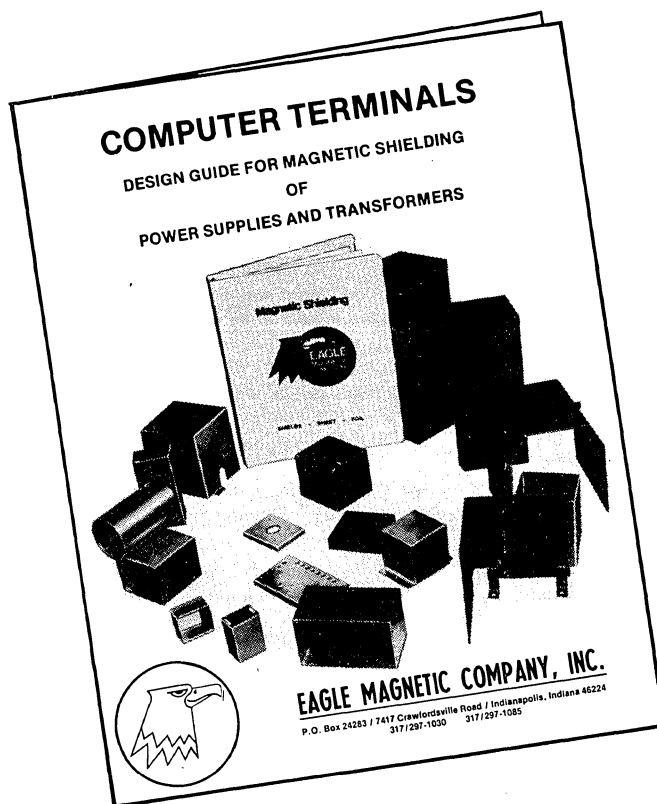
Thickness: .004, .006 and .010



Write for catalog and selection guide

P.O. BOX 24283
INDIANAPOLIS, INDIANA 46224
PHONE (317) 297-1030

Write for this design guide on magnetic shielding



CONTENTS

Why magnetic shielding is needed • When to plan for it • Basic design considerations — mechanical and electrical • Permeability • Heat treating • Grounding • Electrical attenuation • The eight factors that determine electrical attenuation • Engineering check list • How to engineer a typical shield • The four equations needed • Shielding properties of Eagle sheet and foil

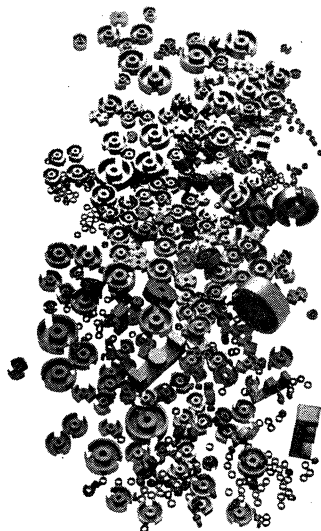


*For your free copy, write or phone
John Coddington or Bob Jackson*

EAGLE MAGNETIC COMPANY, INC.
P. O. Box 24283 • Indianapolis, Indiana 46224
Telephone 317/297-1030 or 317/297-1085



FERROXCUBE LINEAR-FERRITE MAGNETIC CORES



CHOOSE the exact shape, size, and performance combination you require in a magnetic core from among the thousand-odd in-stock, Ferroxcube Catalog-Standard ferrite designs. Then get the cores, in the quantity you need, direct from your local Ferroxcube Stocking Center. There are six of them, across the country — (see bottom of page). As the largest single source of ferrite products, and the largest volume supplier, we maintain a continuously available stock of cores that runs high up into the millions. What's more, we offer the broadest, most complete line in the industry:

... Six different ferrites ... Six different shapes ... Graduated sizes in every shape ... Ungapped, fixed-gap, and adjustable-gap types ... Operating ranges from power frequencies to $>200\text{MHz}$.

STANDARD FERRITES

Of the scores of ferrite compositions developed in our laboratories, six distinctive types are represented in our Catalog Standard cores. Each is precision-formulated; its properties are deliberately determined, are tightly controllable, and consistently reproducible, from core to core, and lot to lot. Each is the core material of choice in a range of applications; at times it is the only means by which a set of design objectives may be met. The primary characteristics of these premium ferrites are listed below, in Table I. Their availability in standard core shapes are indicated in Table II, and their initial permeability curves, as influenced by frequency and temperature, are plotted in the adjacent graphs for comparison. Characteristics and availability of the standard cores are detailed on the following three pages.

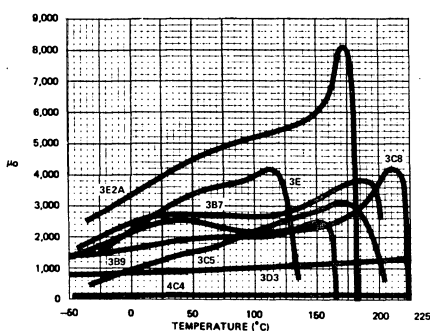
TABLE I. STANDARD-FERRITE CHARACTERISTICS
Parameters shown are typical values, based upon measurements of a 1" toroid.

	3B7 FERRITE	3B9 FERRITE	3C8 FERRITE	3D3 FERRITE	3E2A FERRITE	4C4 FERRITE
(μ_0) Initial Permeability ($\pm 20\%$) at 25°C	2300	1800	2700	750	5000	125
(B_s) Saturation Flux Density at 25°C (Gauss) $H = 2$ Oersteds	3800	3200	$25^\circ\text{C} \geq 4400$ $100^\circ\text{C} \geq 3300$ ($H = 3$ Oersteds)	3800 ($H = 5$ Oersteds)	3600	3000
(TF) Temperature Factor (min.) (max.) (Temp. Range)	-0.6×10^{-6} $+0.6 \times 10^{-6}$ $+20^\circ\text{C}$ to $+70^\circ\text{C}$	$+0.9 \times 10^{-6}$ $+1.9 \times 10^{-6}$ -30°C to $+70^\circ\text{C}$		1×10^{-6} 3×10^{-6} 30°C to $+70^\circ\text{C}$	$\pm 2 \times 10^{-6}$ $+20^\circ\text{C}$ to $+70^\circ\text{C}$	$\pm 6 \times 10^{-6}$ 0 $+5^\circ\text{C}$ to $+55^\circ\text{C}$
Recommended Frequency Range	Power frequencies to 300kHz	Power frequencies to 300kHz	Power frequencies to 300kHz	To 2.5MHz	Power frequencies to 300kHz	1MHz to 20MHz
Curie Temperature	$\geq 170^\circ\text{C}$	$\geq 145^\circ\text{C}$	$\geq 200^\circ\text{C}$	$\geq 150^\circ\text{C}$	$\geq 170^\circ\text{C}$	$\geq 300^\circ\text{C}$
Summary of Other Properties	Essentially zero T.C. Higher Q than 3B9. Higher permeability, permitting larger A_L values.	Linear, controlled T.C. over a wide temperature range, to compensate polystyrene capacitors.	High saturation. Low core loss material for power applications.	Linear, controlled T.C. over a wide temperature range, to compensate polystyrene capacitors.		Negative linear, controlled T.C. to compensate silver mica capacitors.

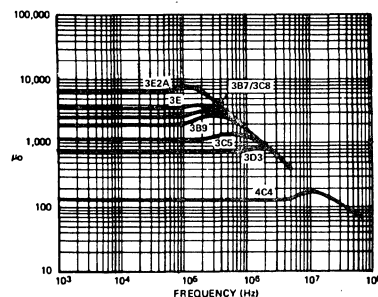
TABLE II. FERRITE AVAILABILITY IN STANDARD CORES

FERRITE	POT CORES (see page 2)	SQUARE CORES (see page 3)	E CORES (see page 3)	U CORES (see page 3)	TOROIDS (see page 4)
3B7	X	X			X
3B9	X	X			
3C5				X	
3C8	X		X	X	X
3D3	X	X			X
3E	X				X
3E2A	X		X	X	X
4C4	X				X

INITIAL PERMEABILITY (μ_0) vs. TEMPERATURE



INITIAL PERMEABILITY (μ_0) vs. FREQUENCY

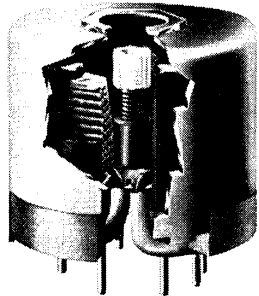


FERROXCUBE CORPORATION, SAUGERTIES, N.Y. 12477
914-246-2811

Distributed through North American Philips Electronic Components Corporation with warehouses in Boston, 617-899-7100; New York, 516-2300, Saugerties, 914-246-5861; Philadelphia, 215-836-1616; Chicago, 312-593-8220; San Diego, 714-453-5440



FERROXCUBE FERRITE POT CORES FOR PRECISION DESIGN AND PREMIUM PERFORMANCE IN TRANSFORMERS AND INDUCTORS ALL ACROSS THE ELECTROMAGNETIC SPECTRUM



Ferroxcube Ferrite Pot Core designs represent one of the most significant advances in ferromagnetic technology in the past two decades. They offer an almost classic combination of closely controlled characteristics that enables the circuit designer to achieve near-ideal performance, and to accomplish objectives that are impracticable by any other technique.

Inductors and transformers wound on ferrite pot cores, operating in the range from power frequencies on up to tens of megahertz, are superior to conventional magnetic-core components in so many ways that they should automatically be considered first in undertaking any magnetic design — small-signal transformers, pulse and broadband transformers, power transformers from mid-audio to the RF region, filters, and tuned circuits of every description. Because of the tight control maintained in the core's properties, and in its dimensions, the designer can count on high Q, high stability, and minimum volume. He can work to tight tolerances in his winding specifications, with the assurance of achieving target performance, with little or no trimming or adjustment.

Pot core construction lends itself admirably to automated production procedures in winding, assembly, mounting, interwiring, and PC board insertion — a fact which appreciably enhances the fundamental design efficiency, and the economy inherent in mass-production core and hardware prices.

STANDARD POT CORES



Figure 1. Pot Core Halves

Ferroxcube pot cores are manufactured in half-core sections as illustrated in Figure 1, in eleven standard sizes (from .282" to 2.657" O.D.), in six different ferrites (3B7, 3B9, 3C8, 3D3, 4C4, and 3E). They are available in three core-gap forms, as shown in Figure 2 in cross-section. Ungapped core halves (PL00's) are available in all materials. In the fixed-gap version, (PA's) the height of the center post in one core half is reduced

by machining to selected dimensions, providing various air-gap lengths, with corresponding variations in effective permeability (μ_e) and in inductance index (A_L). Adjustable-gap versions (CA's) are identical to the fixed-gap cores, but are furnished with a pre-inserted threaded nut, and an inductance adjustor pin that provides a 10-turn adjustment range of approximately 13% in the effective permeability of the core. The availability of the various combinations are indicated by x's, in Table IV, and their essential dimensional and mechanical characteristics are shown in Table III.

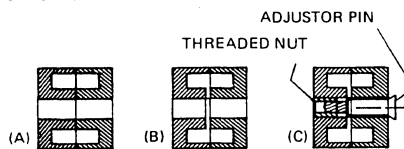


Figure 2. Internal Configurations of Ungapped (A), Fixed-Gap (B), and Adjustable-Gap (C) Pot Cores.

TABLE III. DIMENSIONAL AND MECHANICAL CHARACTERISTICS

POT CORE SERIES	O.D. (in.)	HGHT. (in.)	STANDARD BOBBIN	
			WINDING AREA (in ²)	MEAN LENGTH OF TURN (in.)
743	.282	.276	.0056	.47
905	.366	.212	.0053	.749
1107	.445	.264	.0083	.905
1408	.559	.334	.015	1.14
1811	.726	.428	.029	1.46
2213	.858	.538	.046	1.74
2616	1.024	.640	.063	2.08
3019	1.201	.754	.091	2.44
3622	1.418	.886	.116	2.92
4229	1.697	1.162	.217	3.39
6656	2.657	2.204	.620	5.118

Standard Delrin or Nylon bobbins are available for each of the 11 core sizes. For the more popular sizes, 2-section and 3-section bobbins are also obtainable, as well as printed circuit bobbins equipped with integral terminal pins. Standard hardware sets are available to provide surface mounting, PC board mounting, or panel mounting. (See page 4.)

NUMBERING SYSTEM FOR CORE IDENTIFICATION

All pot cores in the standardized sizes are identified by a part number that indicates many of the essential characteristics and the composition, of the core. The following is an example:

1811P	A100	3D3
Series	Inductance Index	Ferrite Material
(and size)	(Preadjustment)	

1811P This Series number also indicates the core size in millimeters — in this case, 18 mm diameter, 11 mm assembled height.

A100 This indicates a preadjusted and/or adjustable pot core set, and the number following the letter "A" is the inductance Index (A_L) of the core set in millihenries per 1000 turns. (The preadjusted core set is termed a PA, and the adjustable set as a CA.) The A_L value of adjustable core sets is the value before insertion of the adjustor pin. (An adjustor pin always increases the effective inductance.) Cores with no A_L value indicated are ungapped and are termed P-LOO cores.

3D3 Designates the Ferrite material used in the core.

TABLE IV. MATERIAL AND GAP AVAILABILITY

POT CORE SERIES	FERRITE MATERIALS																	
	3B7			3B9			3C8			3D3			4C4			3E		
	PL00	PA	CA	PL00	PA	CA	PL00	PA	CA	PL00	PA	CA	PL00	PA	CA	PL00	PA	CA
905	X	X	X	X	X	X				X	X	X	X	X	X			
1107	X	X	X	X	X	X				X	X	X	X	X	X			
1408	X	X	X	X	X	X	X			X	X	X	X	X	X			
1811	X	X	X	X	X	X	X			X	X	X	X	X	X			
2213	X	X	X	X	X	X	X			X	X	X	X	X	X			
2616	X	X	X	X	X	X	X			X	X	X	X	X	X			
3019	X	X	X	X	X	X	X											
3622	X	X	X	X	X	X	X											
4229	X	X	X				X											
743																		
6656																		X

NOTES:

(1) The nine Pot Core Series from 905 through 4229 are standardized sizes in accordance with the International E.I.C. specifications. Series 743, and 6656 are special (non-standardized) sizes, but are standard items of manufacture with Ferroxcube Corporation.

(2) The designations PL00, PA, and CA designate ungapped, fixed gap, and adjustable-gap core, respectively (see numbering system).



FERROXCUBE CORPORATION, SAUGERTIES, N. Y. 12477
914-246-2811

Distributed through North American Philips Electronic Components Corporation with warehouses in Boston, 617-899-7100; New York, 516-2300; Saugerties, 914-246-5861; Philadelphia, 215-836-1616; Chicago, 312-593-8220; San Diego, 714-453-5440

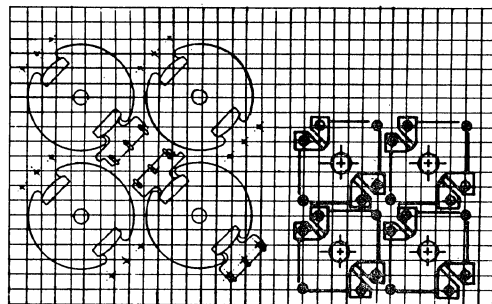
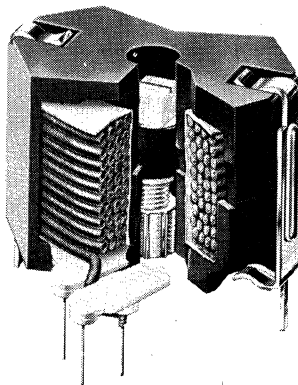


FERROXCUBE FERRITE SQUARE CORES

- Almost 40% higher packing density than equivalent pot cores
- Three ferrite compositions to choose from
- Ungapped, fixed-gap, and adjustable-gap forms

The RM6 square core system uses a specially designed printed circuit bobbin and is held together and mounted by two simple hardware clips. This unique core set allows for almost 40% higher packing density of core sets on a PC board, compared with conventional round pot cores. It is available in ungapped, fixed-gap and adjustable gap versions (see diagram on preceding page). Figure 3 compares the area occupied by the RM6 square core, and its pot core equivalent in performance (Series 1811).

A similar saving is achieved by the RM8 square core over the equivalent (Series 2213) pot core. Both models are available in 3B7, 3B9, and 3D3 ferrite, with a range of gap lengths available in each material. Single or dual-section bobbins, with 4 or 6 terminal pins are available for the RM6. 4, 8, or 12 pin single section bobbins are available for RM8 for direct PC board mounting.



Minimum Space Requirements for 18-mm Pot Core and RM6 Square Core.

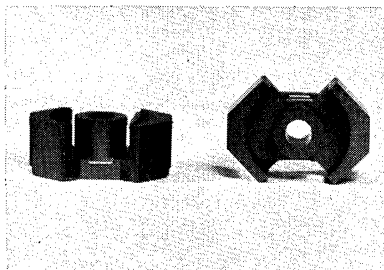
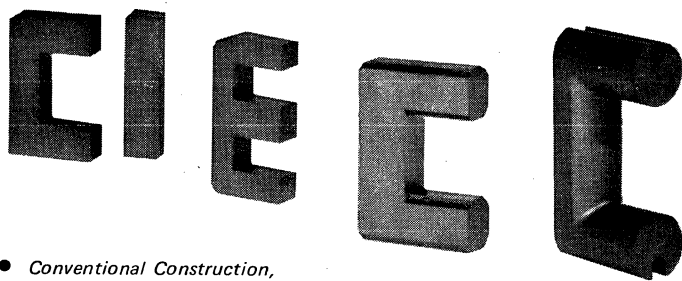


TABLE V. STANDARD SQUARE CORE CHARACTERISTICS

CORE SERIES	CORE MAT'L	OVERALL DIMENSIONS (in.)	STANDARD BOBBIN	
			WINDING AREA (in ²)	MEAN LENGTH OF TURN (in.)
RM6	3B7	0.6" SQ., 0.488" HIGH	.059	1.181
	3B9			
	3D3			
RM8	3B7	0.8" SQ., 0.646" HIGH	.053	1.62
	3B9			
	3D3			

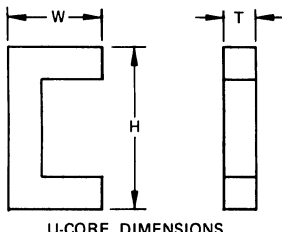
FERROXCUBE FERRITE E, U, AND I CORES for Power, Audio, HF Inductor and Transformer Design



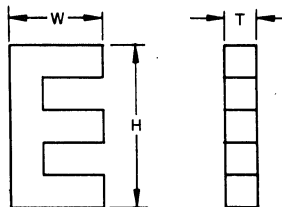
- Conventional Construction, With Exceptional Performance
- E-E, E-I, U-U, and U-I Configurations
- Three Ferrite Compositions, Liberal Range of Sizes

Ferroxcube Standard E, U, and I cores offer the convenience of employing conventional transformer and inductor winding techniques, the advantage of drastic reductions in eddy-current and hysteresis losses, as well as the uniquely precise control of magnetic, electrical, and dimensional properties afforded by ferrite materials.

The cores are all usable in E-E (or U-U) configuration. For certain models, a corresponding I core is available, offering an optional E-I (or U-I) configuration, as well. Standard bobbins, designed for installation on the center leg in E-E configurations, are obtainable.



U-CORE DIMENSIONS



E-CORE DIMENSIONS

TABLE VI. SUMMARY OF E, U, I CORE CHARACTERISTICS

CORE PART NO.	CORE MAT'L	CONFIG.	INDUCTANCE INDEX A _L (mH/1000 turns)	DIMENSIONS (inches)		
				Width (W)	Height (H)	Thickness (T)
1F4 (1B4)	3C5	U-U	≥6300 (25°C) ≥9000 (100°C)	2.99	3.66	1.18
		U-I	≥8600 (25°C) ≥12,300 (100°C)			
1F5 (1B5)	3C5	U-U	≥5500 (25°C) ≥7850 (100°C)	2.25	4.00	1.00
		U-I	≥6900 (25°C) ≥9850 (100°C)			
1F10	3C8	U-U	3800	1.06	2.625	.562
1F19	3C5	U-U	≥2125 (25°C) ≥3050 (100°C)	1.16	2.477	.545
1F30	3C8	U-U	2300	.875	1.32	.370
1F31	3C8	U-U	2700	.812	1.645	.470
376U250 (376B250)	3E2A	U-U	2320	.625	1.00	.250
		U-I	2500			
9F520	3C8	E-E	5700	.625	1.975	.520
		E-E	5000			
206F440 (206B440)	3C8	E-I	6100	.415	1.117	.440
		E-E	7100			
	3E2A	E-I	8650			
		E-E	2500			
782E272 (782B272)	3C8	E-I	3400	.587	1.181	.272
		E-E	3280			
	3E2A	E-I	4450			
		E-E	5900			
783E608	3C8	E-E	5900	.823	1.653	.608
	3E2A	E-E	8000			
812E250	3C8	E-E	2340	.375	1.00	.250
	3E2A	E-E	3500			
813E187	3E2A	E-E	2300	.312	.750	.187
813E343	3E2A	E-E	4250	.312	.750	.343
814E250	3E2A	E-E	2600	.219	.500	.250



FERROXCUBE CORPORATION, SAUGERTIES, N.Y. 12477
914-246-2811

Distributed through North American Philips Electronic Components Corporation with warehouses in Boston, 617-899-7100; New York, 516-2300; Saugerties, 914-246-5861; Philadelphia, 215-836-1616; Chicago, 312-593-8220; San Diego, 714-453-5440



FERROXCUBE FERRITE TOROIDAL CORES

for Low-Level Pulse and Broadband Transformer Design

TABLE VII. TOROID CHARACTERISTICS

CORE PART NUMBER	CORE MAT'L TYPE	INDUCTANCE ¹ INDEX AL (mH, 1000 turns) ±20%	INITIAL PERM. μ_0 (REF.)	O.D.	I.D.	WIDTH	MAGNETIC PATH LENGTH l_e (in.) (CM)	EFFECTIVE CORE AREA A_e (in. ²) (CM ²)
*135CT050	4C4 3D3 3B7 3E2A	20 110 375 660	125 675 2250 4000	.135	.070	.050	.3125 .790	.0016 .0108
*891CT050	4C4 3D3 3B7 3E2A	18 97 360 576	125 675 2500 4000	.155	.088	.050	.373 .945	.00167 .0108
*213CT050	4C4 3D3 3B7 3E2A	24 140 475 850	125 725 2500 4470	.190	.090	.050	.422 1.07	.00249 .0161
*1041CT060	4C4 3D3 3B7 3E2A	.25 144 495 890	125 725 2500 4495	.230	.120	.060	.532 1.35	.0033 .0213
*266CT125	4C4 3D3 3B7 3E2A	55 330 1100 2135	125 750 2500 4830	.375	.187	.125	.852 2.16	.0118 .076
768T188	3D3 3E2A 3C8	415 2750 1475	750 5000 2700	.500	.281	.188	1.19 3.03	.0206 .133
846T250	3E2A 3C8	3055 1650	5000 2700	.870	.540	.250	2.18 5.52	.0418 .270
K300502	3E	1688	2700	1.142	.748	.295	2.95 7.50	.0578 .373
K300500	3E	2422	2700	1.417	.905	.394	3.63 9.20	.100 .647
K300501	3E	3639	2700	1.417	.905	.591	3.63 9.20	.147 .977
528T500	3C8	4700	2700	1.530	.770	.500	3.40 8.63	.187 1.21
400T750	3C8	4800	2700	2.040	1.270	.750	5.00 12.7	.281 1.81
144T500	3C8	4350	2700	2.90	1.53	.500	6.7 17.1	.342 2.21

*Core is available uncoated, or polymer coated (EXCEPT: Cores of 3E3 ferrite are available only as coated toroids.) Part number shown is for coated core. To specify uncoated core when ordering, omit letter C from part number.

**Polymer coating, when specified, increases O.D. and Width, and decreases I.D., by .001" ±0003".

***Available only as coated toroid. All 3E3 toroids will meet the A_L value specifications over the temperature range from 10°C to 60°C.

ACCESSORIES AND TECHNICAL LITERATURE

BOBBINS

Ferroxcube Standard Pot Cores may be wound and mounted in a variety of configurations, as shown at right. Standard Lexan, Delrin, or Nylon Bobbins are available for all models, some with 2 and 3 winding sections. PC bobbins, equipped with integral terminal pins for direct PC board mounting, are available for the more popular core sizes, as are hardware sets for mounting core assemblies on PC boards, panels, or chassis surfaces. Availability of these items in the various core Series are summarized in Table VIII below.

TABLE VIII. POT CORE BOBBINS AND HARDWARE

Pot Core Series	Standard Bobbins No. of Sections	PC Bobbin	Container Type Assembly For PC Mounting	Surface Tab Mount	Surface Rivet Mount
743	x				
905	x				
1107	x x	x	x		
1408	x x	x x	x	x	
1811	x x	x x	x	x	x
2213	x x	x x	x	x	x
2616	x x	x x	x		x
3019	x x	x	x		
3622	x x	x	x		
4229	x x		x		
8656	x				

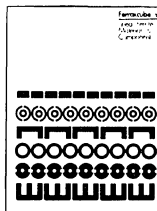
FERROXCUBE SHIELDING BEADS AND CHOKES

A convenient, simple, inexpensive means for obtaining effective RF decoupling, shielding, and parasitic suppression (without sacrificing DC or low-frequency power), for pennies per circuit. May be used in conjunction with small ceramic capacitors in damping circuits to provide additional rejection at the self-resonant frequency of the capacitor. Double-hole beads for twin-lead circuits, wideband 1½-turn or 2½-turn chokes, offer even better performance for a given space allotment. Five sizes, choice of four ferrite materials — ask for samples!

FERROXCUBE LINEAR FERRITE MASTER CATALOG

NEW

A 176-page catalog of the complete Ferroxcube line of Standard Linear-Ferrite Components, with complete magnetic, electrical and mechanical specifications, and performance data.



FERROXCUBE LINEAR FERRITE MAGNETIC DESIGN MANUAL

Your complete, definitive guide to fast, effective, precision design of magnetic components in the ferrite domain—transformers or inductors, power or low-level linear types. Step-by-step procedures, analyses, and examples.

POWER CORE APPLICATION NOTES

Power supply design factors, cores for switched mode power supply transformers, RFI suppression. Specifications and performance data.



FERROXCUBE CORPORATION, SAUGERTIES, N. Y. 12477
914-246-2811

Distributed through North American Philips Electronic Components Corporation with warehouses in Boston, 617-899-7100; New York, 516-2300; Saugerties, 914-246-5861; Philadelphia, 215-836-1616; Chicago, 312-593-8220; San Diego, 714-453-5440

SERIES EC
POWER E CORES



**NEW FROM
SAUGERTIES, N. Y.!**

The Power E

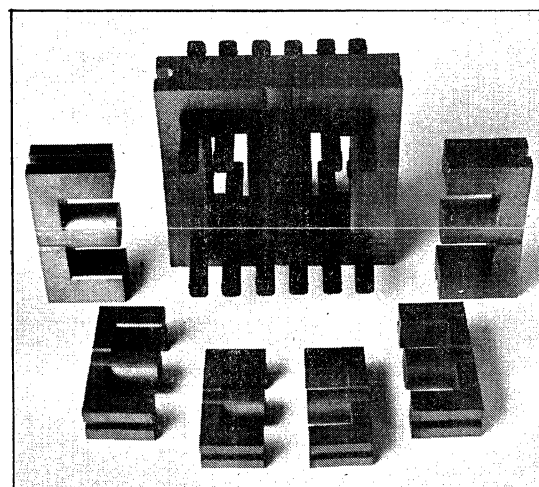
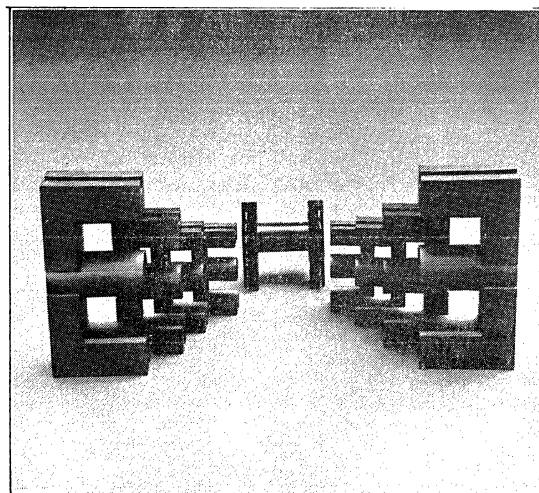
Ferroxcube's new line of EC-cores, designed specifically for switch-mode power supplies, inverters and converters, make transformer and filter design and fabrication easy. Representing a compromise between pot cores and the old-style square-legged U and I cores; they provide benefits not obtainable with either of these core configurations.

Ideally, any transformer operating at high flux densities and high frequencies should be completely screened to minimize external fields and radiation. Although this screening requirement is met by the pot core design, the slots place severe restrictions on the diameter of conductors that can be brought out. At the other extreme, the U and I core combination offers ease in winding and terminations but produces a high external field, particularly if an air gap is necessary.

These considerations have led to the adoption for the Series EC-cores of the round center-leg E-core design. This is virtually a pot core with the two sides removed and has the advantages of both the pot core and the U and I core, its external field being a compromise between the two. Because it has a circular cross-section for the center leg, the turn length is minimized, an important consideration in reducing copper losses. Further, the winding is more compact, since bowing is eliminated, reducing leakage inductance.

The new line of ferrite cores has been designed for use in switched-mode power supplies, inverters and converters. The core design has been optimized for operation in push-pull circuits, generally considered to be worst case, at frequencies up to 50 kHz. At present, the line comprises four sizes: Types EC-35, EC-42, EC-54 and EC-72 covering transformer throughput power to 1 Kw.

An added plus for the new core line is standardization and the resultant availability of associated accessories. A line of complementary bobbins is available for the EC-core series. In addition the cores are slotted to accept studding, thereby facilitating assembly and mounting and avoiding the need for special clips and attachments.





SERIES EC POWER E CORES

1 This core type is:

- manufactured in the following material
—3C8
- available with following optional accessories: single section standard bobbins for all sizes; printed circuit bobbin for EC-35.

2 Electrical parameters are expressed in the MKS System.

3 All terms and symbols used are defined in the Glossary at the rear of the Ferroxcube catalog.

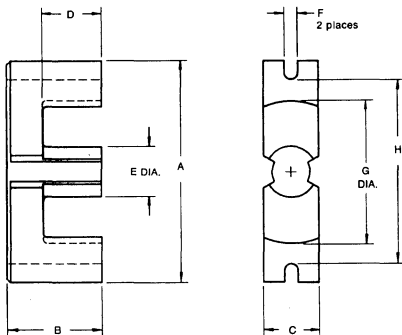
4 Characteristics of the ferrite material used are described in the Materials section at the front of the catalog.

ELECTRICAL CHARACTERISTICS

	EC-35	EC-42	EC-54	EC-72	UNITS
MIN. A_L at 3200 GAUSS & 100°C	1500	1875	2375	2700	mH/1000T
MAX. LOSSES 25 kHz 1600 GAUSS & 100°C	.85	1.35	2.35	5.0	watts

MECHANICAL CHARACTERISTICS AND DIMENSIONS

CORE DIMENSIONS



MECHANICAL CHARACTERISTICS

	EC-35	EC-42	EC-54	EC-72	UNITS
MAGNETIC PATH LENGTH l_e	77.4	89.3	105	144	mm
CORE CONSTANT $\sum \frac{l_e}{A_e}$	.92	.74	.58	.51	mm ⁻¹
EFFECTIVE CORE AREA A_e	84.3	121	180	279	mm ²
EFFECTIVE CORE VOLUME V_e	6530	10,800	18,800	40,100	mm ³
WEIGHT	1.26	1.82	3.88	8.80	oz.
	36	52	111	253	grams

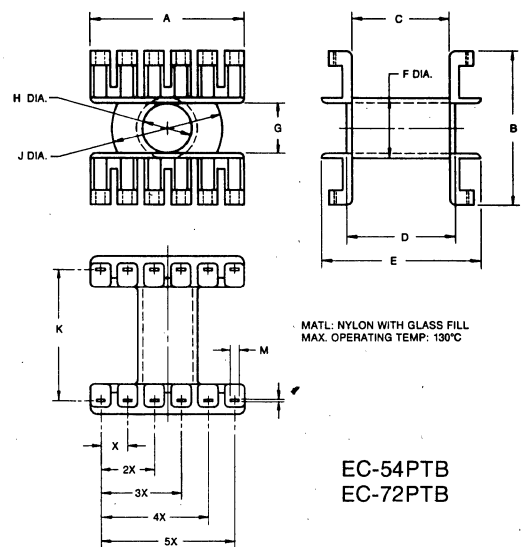
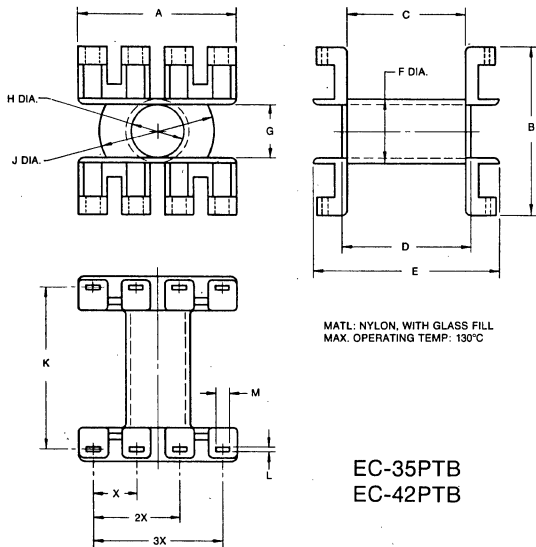
All Dimensions are in inches

Size Designation	A	B	C	D	E DIA.	F	G DIA.	H
EC-35	1.346	.681	.374	.482	.374	.108	.895	1.102
EC-42	1.598	.748	.457	.547	.457	.148	1.065	1.343
EC-54	2.055	.953	.528	.626	.528	.148	1.299	1.732
EC-72	2.756	1.359	.646	.895	.646	.187	1.752	2.347

SERIES EC POWER E CORES



STANDARD BOBBINS

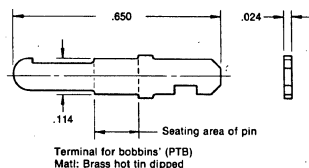


All Dimensions are in inches

TYPE	A	B	C	D	E	F	G	H	J	K	L	M	X	T*
EC-35PTB	1.125	1.284	.847	.925	1.340	.480	.394	.394	.853	1.200	.024	.102	.300	16
EC-42PTB	1.125	1.465	.965	1.052	1.512	.563	.476	.476	1.010	1.300	.024	.102	.300	16

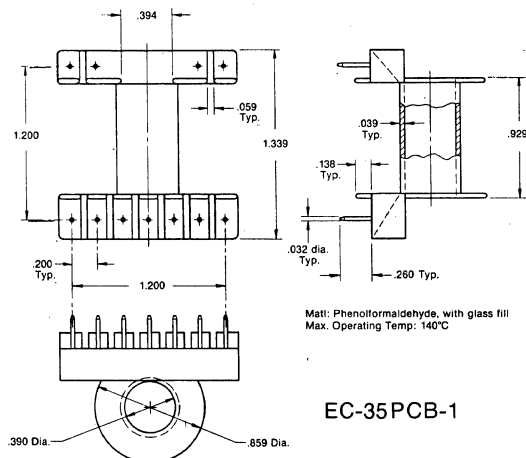
* Number of terminals (991 930 00) that can be installed in bobbin.

TYPE	A	B	C	D	E	F	G	H	J	K	L	M	X	T*
EC-54PTB	1.725	1.690	1.114	1.203	1.746	.638	.550	.550	1.238	1.500	.024	.102	.300	24
EC-72PTB	2.224	2.214	1.632	1.738	2.275	.768	.675	.675	1.676	2.000	.024	.102	.400	24



991 930 00

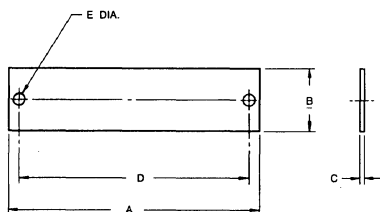
PRINTED CIRCUIT BOBBIN





SERIES EC POWER E CORES

MOUNTING DATA



Recommended Screw Size

EC-35	 #2	 1 $\frac{5}{8}$ "
EC-42	 #4	 1 $\frac{3}{4}$ "
EC-54	 #6	 2 $\frac{1}{4}$ "
EC-72	 #8	 3"

MOUNTING PLATE DIMENSIONS (Mounting Plate is not supplied by Ferroxcube)

SIZE DESIGNATION	A	B	C	D	E DIA.
EC-35	1.411 $\pm$.006	.375 $\pm$.008	.032 $\pm$.002	1.252 $\pm$.004	.125 $\pm$.004
EC-42	1.647 $\pm$.006	.438 $\pm$.008	.040 $\pm$.002	1.481 $\pm$.004	.144 $\pm$.004
EC-54	2.111 $\pm$.008	.500 $\pm$.008	.040 $\pm$.002	1.902 $\pm$.004	.144 $\pm$.004
EC-72	2.827 $\pm$.008	.625 $\pm$.008	.040 $\pm$.002	2.571 $\pm$.004	.171 $\pm$.004

All Dimensions are in inches

For fast delivery of the ferrites you require, or assistance with their application, contact the nearest Ferroxcube Distributor listed below.

Northeast

N.A.P.E.C.C., 1393 Main Street,
Waltham, Mass. 02154
617•899-7103

Elna Ferrite Labs.
P.O. Box 395
Woodstock, New York 12498
914•246-5861

Kahgan Sales Corporation
556 Peninsula Blvd.
Hempstead, L.I., New York 11550
516•538-2300

Mid Atlantic

Eastern Components, Inc.
1407 Bethlehem Pike
Flourtown, Pa. 19031
215•836-1616-1619

Mid West

N.A.P.E.C.C.
175 Scott Street
Elk Grove Village, Ill. 60007
312•593-8220

West

N.A.P.E.C.C.
11568 Sorrento Valley Road
San Diego, Calif. 92121
714•453-5440

Canada

Philips Electron Devices, Ltd
116 Vanderhoof Avenue
Toronto, Ontario, Canada
416•425-5161

Specifications subject to change without notice.



FERROXCUBE
A NORTH AMERICAN PHILIPS COMPANY

CORPORATION, SAUGERTIES, N. Y. 12477

914•246-2811

[illegible]

97-505
90° configuration available



97-500
*Patented

stick-on — a New Concept
in Instant RFI/EMI Shielding

High-performance beryllium copper finger contact strips... each with its own self-adhesive backing... provide an extremely tight, instant bond. To install, simply peel off the protective paper backing... place strip into position... and press down firmly. Seals instantly to shield against RFI/EMI interference in all types of metal cabinets and electronic enclosures. The adhesive strengthens as it cures with age. Moreover, the

The adhesive strengthens as it cures with age. Moreover, the

97-500

97-538

97-555

97-560



**electronic
gaskets**

97-440

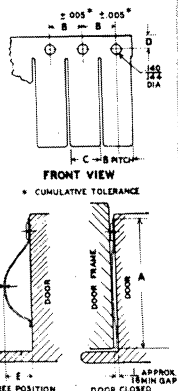
97-438

For pricing, please advise catalog number, total footage and surface finish required.

Write for Free Catalog Today!

INSTRUMENT SPECIALTIES COMPANY, INC.

276 Bergen Boulevard, Little Falls, N.J. 07424
Phone: 201-256-3500 TWX: 710-988-5732



CAT. NO.	A	B	C	D	E	T
97 - 438	1.32	3/8	.335	5/32	1/4	.005
97 - 440	1.90	1/2	.460	3/16	13/32	.007

97-436*

97-435*

***Patented**

97-445 *

MECHANICAL COMPONENTS (BEARINGS, CORES, MAGNETS, ETC.)

Typical Performance Capabilities*

*An independent testing laboratory has indicated the following performance:

Frequency	Field	Shielding Effectiveness (Fully Deflected)	
		97-520 at .045" Gap	97-520 at .090" Gap
14 kHz	Magnetic	63dB	38dB
200 kHz		81	57
1 MHz		>92	>92
1 MHz	Electric	>126	>126
18 MHz		>120	>120
400 MHz	Plane Wave	118	111
1 GHz		78	100
10 GHz		92	82

tions that require high shielding effectiveness despite frequent opening and closing of the cabinet.

Series 97-520 when tested per Military Standard MIL-STD-285 for electromagnetic shielding, showed superior performance under increased compression. It is supplied in standard 16" lengths, and in a variety of surface finishes.

*Patented

Approx. Pressure Required in Pounds/Linear Foot

Deflected to .090" height	97-520
.060" height	26 lbs./ft.
	37 lbs./ft.

Standard finishes available

Add proper suffix to catalog number

-A	-Bright (stock)	-G	-Gold
-SnPb	-Tin Lead	-S	-Silver
-CdC	-Cadmium Plate plus Chromate		

Other finishes available on special order.

Typical Performance Capabilities

Frequency	Field	Shielding Effectiveness	
		At 1/16" Gap 97-500	At 1/8" Gap 97-500
60 Hz	Magnetic	12dB	-
400 Hz		14	-
14 kHz		46	38dB
200 kHz	Electric	70	63
1 MHz		≥90	≥90
1 MHz		≥120dB	≥120dB
18 MHz	Plane Wave	≥145	≥145
400 MHz		117	109
1 GHz		104	100
10 GHz		≥108	100

Approx. Pressure Required in Pounds/Linear Foot

At 1/16" Gap: 36 lb/ft

At 1/8" Gap: 16 lb/ft

geometry of the strip design, continually compressed, further assists in strengthening the bond. Soldering or mechanical fastenings are completely eliminated. Shielding effectiveness of 97-500 has been proved greater than 46 dB at 14 kHz magnetic and 108 dB at 10 GHz plane wave.

STICKY FINGERS are unaffected in temperature ranges from -65 F. to 225 F. The adhesive meets salt spray, shock and humidity cycle tests, and complies with MIL-D-8634, MIL-N-25076 and MIL-P-19834A.

Furnished in approximately 24" lengths, cut to the center of nearest slot.



Twist Series

Self-adhesive beryllium copper contact strips with scientific twist design offer narrower-than-ever electronic gaskets for general shielding applications where space is at a premium.

Series 97-555 single edge contact strip measures only 3/8" wide, yet shielding effectiveness is 71 dB at 14 kHz magnetic and 102 dB at 10 GHz plane wave. Ideal for all types of panels or electronic enclosures.

Series 97-560 strips for cabinets with panel-divider bars. Unique double edge design, 1/2" wide, permits panels to be easily removed and replaced without damage to the installed strip.

Typical Performance Capabilities

Frequency	Field	Shielding Effectiveness (Fully Deflected)	
		97-555	97-560
14 kHz	Magnetic	71dB	≥75dB
200 kHz		96	≥97
1 MHz	Electric	≥120	≥120
18 MHz		≥120	≥120
400 MHz	Plane Wave	≥115	≥115
1 GHz		≥106	≥106
10 GHz		102	≥126

Approx. Pressure Required in Pounds/Linear Foot

	97-555	97-560
Deflected to .030" height	30 lbs./ft.	48 lbs./ft.
.015" height	67 lbs./ft.	72 lbs./ft.

Balanced Finger Strips offer 90° corners and quick spring clip fastening.

When contact strips are required for rectangular openings or structural joints, they can be quickly and easily installed in field or factory.

Matching 90° corners provide a perfect fit and spring clips hold the strips firmly in place. (No special tools or soldering required.) Result: More simplified design and construction of cabinets and enclosures.

These strips feature a mechanically balanced design to provide high dynamic range, long endurance life and multiple lines of contact under relatively light pressure. Attenuation of more than 100 dB at 200 kHz, 400 MHz and 10 GHz has been measured for a single, rectangular enclosure using Series 97-436 gaskets.

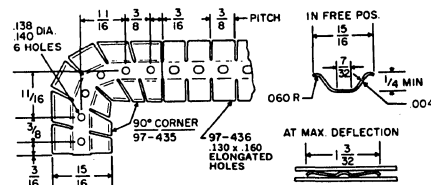
Spring Clip Fastener

Designed for use with Series 97-436 and Series 97-435 finger strips. Permits full strip compression, yet is easily installed without special tools. Fastener also permits temporary lifting of gaskets for cleaning of contact surfaces.

Advise Catalog number, total footage, and surface finish for pricing.

cat. no.	max. length*	finish*
97-436-A	35 ft.	Bright
97-436-S	25 ft.	Silver Plated .0002" ± .0001
97-436-G	25 ft.	Gold Plated .000050" min.

*Specified lengths and other finishes to order



prefabricated 90° corners	cat. no.	finish*
(advise number of corners needed.)	97-435-A	Bright
	97-435-S	Silver Plated .0002" ± .0001
	97-435-G	Gold Plated .000050" min.
spring clip fastener	cat. no.	finish*
packaged in lots of 100, 200, 500, or 1000 (advise total quantity needed.)	97-445-A	Bright
	97-445-S	Silver Plated .0002" ± .0001
	97-445-G	Gold Plated .000050" min.



finger contact strips

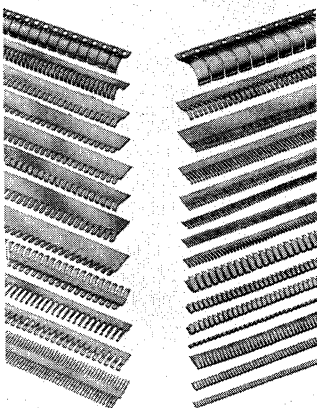
of MICRO-PROCESSED beryllium copper, alloy 25

for grounding and shielding in high-frequency equipment . . . for forming large-diameter contact rings

A wide variety of beryllium copper finger contact strips provides engineers and designers with flexibility in the solution of grounding and shielding problems. Various lengths, widths, contours and hole locations are possible for many of the standard catalog items shown here.

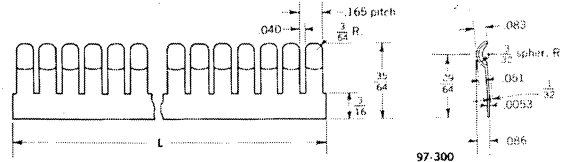
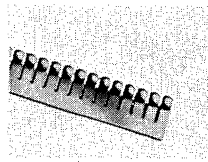
Engineering Design Kit Available

An Engineering Design Kit is available to permit the engineer the utmost latitude in his search for the exact strip configuration to effectively meet his needs. Each assortment contains at least 34 items listed on Pages 10 through 13. Includes data sheet on elastic performance of finger strips.



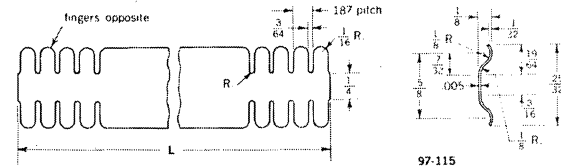
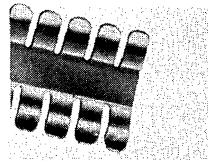
Order assortment by Number 97-272.

figure A



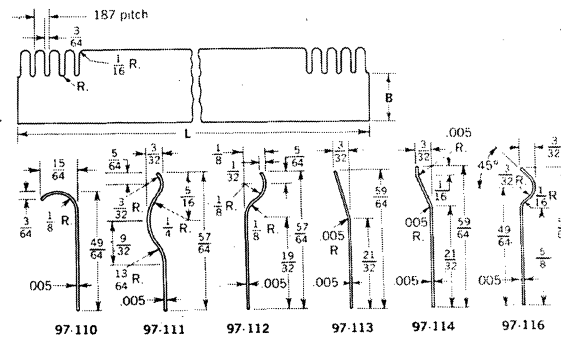
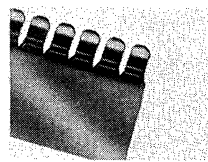
CONTIPS available

figure B



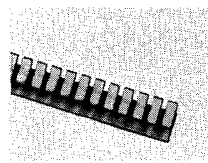
CONTIPS available

figure C



CONTIPS available on 97-111, 97-112, 97-114 and 97-116 only

figure D



not available with CONTIPS

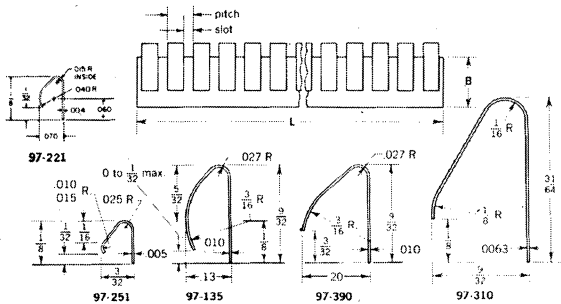
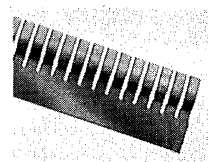
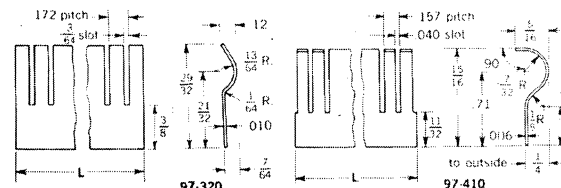


figure E



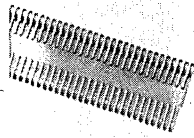
CONTIPS available



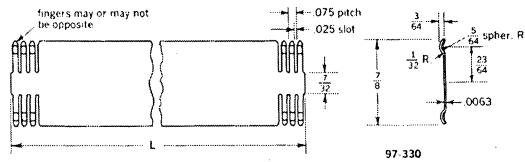
precision springs of beryllium copper



figure F



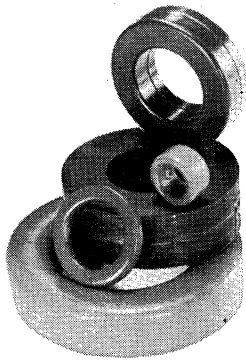
CONTIPS available



The INTER-TECHNICAL Group, Inc.

UNITED STATES AGENCY OF THE TELCON METALS GROUP OF COMPANIES

P. O. BOX 23
IRVINGTON, N. Y. 10533
TEL: 914-591-8822
TWX: 710-564-0802



HIGH PERMEABILITY FOIL — SURFACE PREPARED FOR CHEMICAL ETCHING

TELCON METALS LTD.

is one of the largest manufacturers of nickel-iron and cobalt alloys for magnetic applications. Their fully integrated facilities provide raw materials and fabricated components covering the whole range of commonly used soft magnetic materials.

HIGH PERMEABILITY TOROIDS — are available in all materials listed in the accompanying table in standard tape thickness.

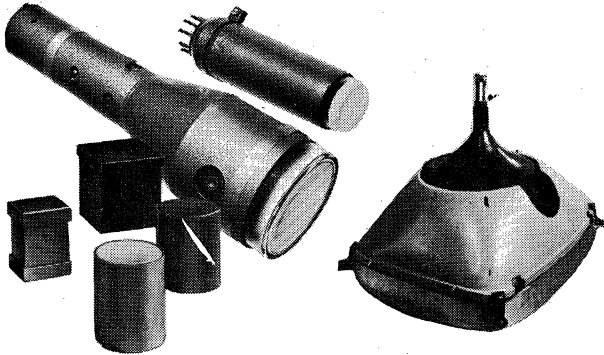
PHOTO-ETCH — high permeability alloys for recording and playback head laminations are available.

SEE OUR AD ON Page 1-2356

TELCON HIGH PERMEABILITY SOFT MAGNETIC ALLOYS AND FABRICATED TOROIDS

80% NICKEL	50% NICKEL	OTHER ALLOYS	ULTRATHIN FOIL
Round TELCON 79 TELCON 60 TELCON 100	Round RADIOMETAL 50 SUPER RADIOMETAL HYRHO RADIOMETAL	SATMUMETAL PERMENDUR 49 PERMENDUR 24 SUPERMENDUR VICALLOY RADIOMETAL 36 Magnetic Compensating Alloy REMENDUR	As thin as 0.000125" in a wide range of materials including many of those listed and others including Beryllium copper.
Square ORTHO TELCON 79	Square HCR ALLOY		

MAGNETIC SHIELDS UP TO 30" DIAMETER FOR CATHODE RAY TUBES & TRANSFORMERS by Telcon Metals Ltd.



MELTING, ROLLING, FABRICATING, ANNEALING FROM START TO FINISH IN ONE FACILITY

Telcon Metals, Ltd., has its own in-plant facilities to handle every phase of the magnetic shield manufacturing process from start to finish. This means 100% Telcon supervision all the way — from the melting and rolling of the raw material to the fabrication and annealing of the magnetic shield. Telcon's total production method is based on a century of experience in the manufacture of alloys. All these factors are your assurance that you get a sensibly priced, high quality product.

A NEW CONCEPT IN MAGNETIC SHIELD CONSTRUCTION

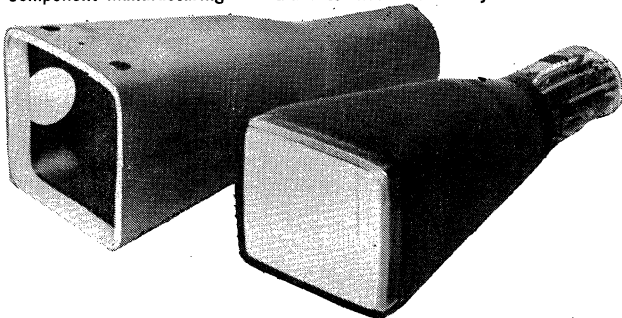
Specially developed for quantity production of high efficiency complex shields, new TELFORM construction utilizes precision drawn segments to drastically reduce welded seams. The result is extra close fitting shields with improved shielding characteristics. This new technique is applicable for CRT tubes up to approximately 20" long. No premium charge even though dimensions, finish and appearance are far more uniform throughout batches than conventionally fabricated shields. Rapid delivery after initial tooling. Available in 80%, 50% and 36% nickel-iron alloys.

Extremely Competitive Prices on Custom Shields.

Send for Illustrated Catalog and Ask for a Quotation.

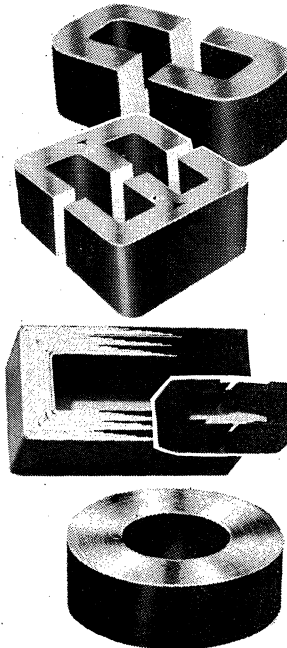
OTHER TELCON PRODUCTS

- Thermostatic Bimetals
- High Permeability Strip, Rod & Wire for Component Manufacturing
- Glass to Metal Seal Alloys



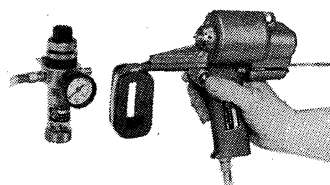
Substantial savings can be offered when shields and "Brimar" CRT's are purchased as assemblies. Also see CRT's described in EEM Page 1-2356

E, C AND TOROIDAL TAPE WOUND CORES BY TELMAG



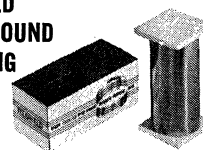
- Grain oriented Silicon Steel Cores.
- Made to EIA Spec. RS217 and trade specifications by our British associate TELCON MAGNETIC CORES LTD. ... one of the largest manufacturers of grain oriented silicon steel components.
- Available in all American standard or special sizes to American core numbers. Popular types available from New York warehouse for immediate delivery.
- Sold at prices that help you solve your constantly rising cost level problem.
- Produced by one of the largest manufacturing facilities in the world.
- Now, also available, LL distributed gap cores for small transformers where temperature and/or gap VA may be problems. Can replace 4 to 6 mil cut cores, 6 mil laminations, and sometimes Ni-Fe laminations.
- Toroidal cores available in 2, 4, 6 and 12/13 mil tape thickness. Cores can be supplied impregnated or edge bonded for improved rigidity. Also available gapped or cut.

"C" CORE COMPRESSED AIR BANDING TOOL by TELMAG



Manufacturing rejects caused by variations in banding of "C" transformer cores can now be eliminated. The new "C" core Compressed Air Banding Tool provides consistent banding stresses in assembly-line operation. By making cores useful which were formerly rejected, the tool soon pays for itself.

TELSHIELD WRAP-AROUND SHIELDING FOIL



Shield components efficiently, simply, from unwanted signals with easy-to-use Telsield. Available in 0.001 in.-0.010 in. thickness tape, in widths of 1/2 in.-6 in. Special handy packs for laboratory and R & D use.

THERMOSTATIC BIMETALS BY TELCON METALS, LTD.

We offer a complete selection of Telcon thermostatic bimetal for various temperature ranges and environments. Their varied mechanical properties, hardnesses, thermal activities, and thermal and electrical conductivities make it easy for the user to select the right one for his particular requirements. Available in thicknesses from .004" to .125" and widths as small as 1/16" in coils and flat lengths.

Full Coverage



ITT Thermotech Surrounds You with Service And Quality

At ITT Thermotech you can expect complete company involvement with your custom molded plastic job from start to finish. Each department is staffed with individuals who, in total, account for many years of experience in precision plastic molding. These people cover your job completely through estimating, mold design, raw material selection and control, manufacturing, quality control, to on-time delivery.

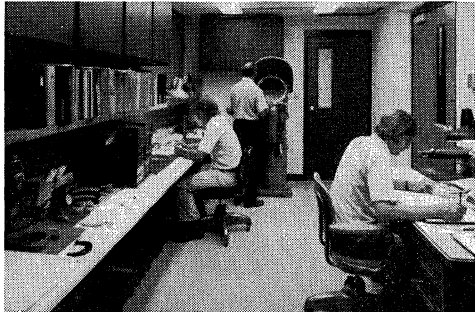
In addition to its ability to mold high tolerance, intricate parts, ITT Thermotech is capable of offering an Engineering service. And, even though we don't literally serve your order on a silver platter, we place a high degree of emphasis on giving you the excellent service you expect from ITT Thermotech.

Call us for an estimate. And find out what we mean by "full coverage".

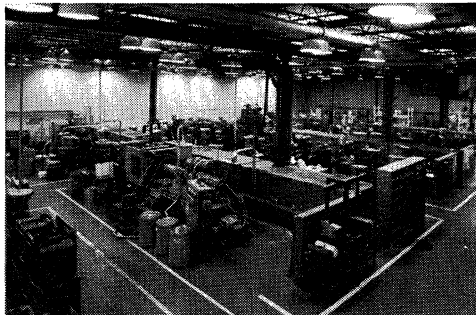
ITT THERMOTECH

1202 South Fifth St., Hopkins, Minnesota 55343, 612-938-7671 • 3200 Tyrone Blvd., St. Petersburg, Florida 33710, 813-347-2191

People make the big difference at **ITT THERMOTECH**



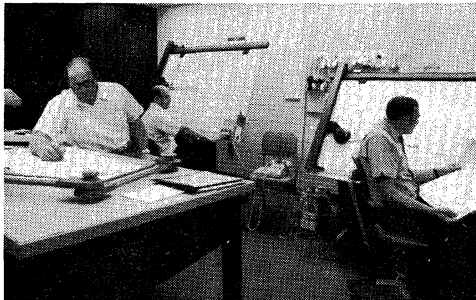
QUALITY CONTROL—Constant attention and adherence to strict quality control assures consistent part characteristics from run to re-run, press to press and within each lot.



MANUFACTURING—Over 200 injection, compression and transfer presses, from one ounce to 25 ounces and as large as 450 tons, offer a wide latitude for short and long runs.



COMPUTER FACILITIES—In-plant computer facilities are used for work order analysis, raw material control and production scheduling to insure fast, on time delivery of orders.



MOLD DESIGN—Skilled mold designers translate customer specifications into mold designs that meet customer's exact part cost, tolerances and quality requirements.

ITT THERMOTECH—The Full Service

Molder—For a quarter of a century ITT Thermotech has served the nation's industrial and military markets with high quality custom and stock precision moldings. Employing close to 500 employees, Thermotech offers customers complete molding facilities for thermoplastic, thermoset and fluorocarbons plus secondary operations.

All tool room, manufacturing and inspection facilities have been approved by government agencies.

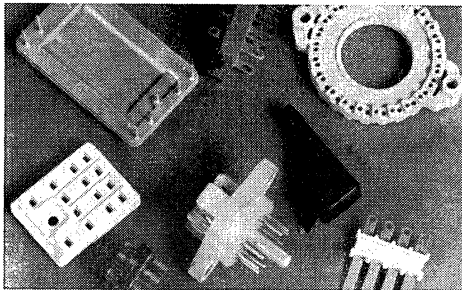
ITT Thermotech now encompasses these former subsidiaries and divisions:

- Booker Wallestad
- Thermotech Plastics
- Florida Division
- Wilcox Products
- Thermotech Coil Forms and Components

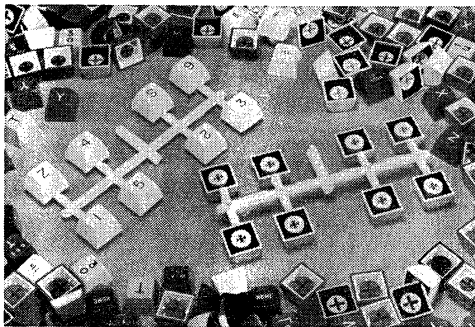
Other secondary services available:

- Silk Screening
- Hot Stamping
- Secondary Finishing
- Heat Sealing
- Sonic Welding
- Mold Maintenance

Precision makes the big difference at **ITT THERMOTECH**

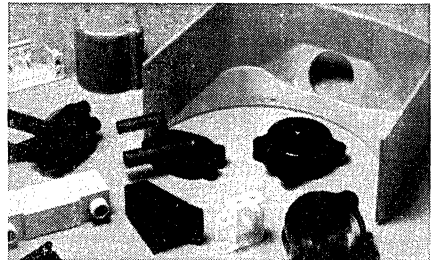


INSERTS—Highly automated equipment in both primary and secondary operations produce low-cost, precision parts with inserts for electrical/electronic components.

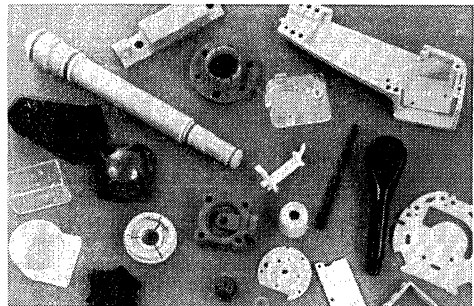


TWO COLOR KEYTOPS—An extensive library of stock and custom designed legends are available to meet all but the most unusual of alphanumeric and conventional control keytop needs.

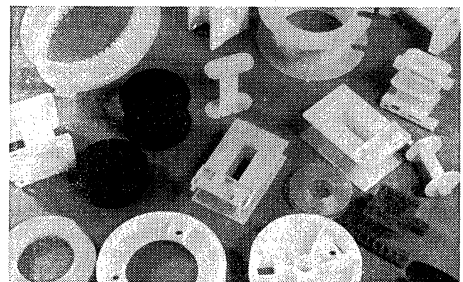
COILS AND BOBBINS—Years of experience bring superior technical know-how to the design and manufacture of simple or intricate shapes and sizes, thin or heavy walled coil forms and bobbins.



CASES AND HOUSING—Miniature or large cases and housings of thermoset, thermoplastic or fluorocarbons materials with a wide variety of characteristics and configurations are available in both short and long runs.



INTRICATE PARTS—Intricate configurations and shapes in a wide variety of plastics are commonplace challenges to design and production personnel.

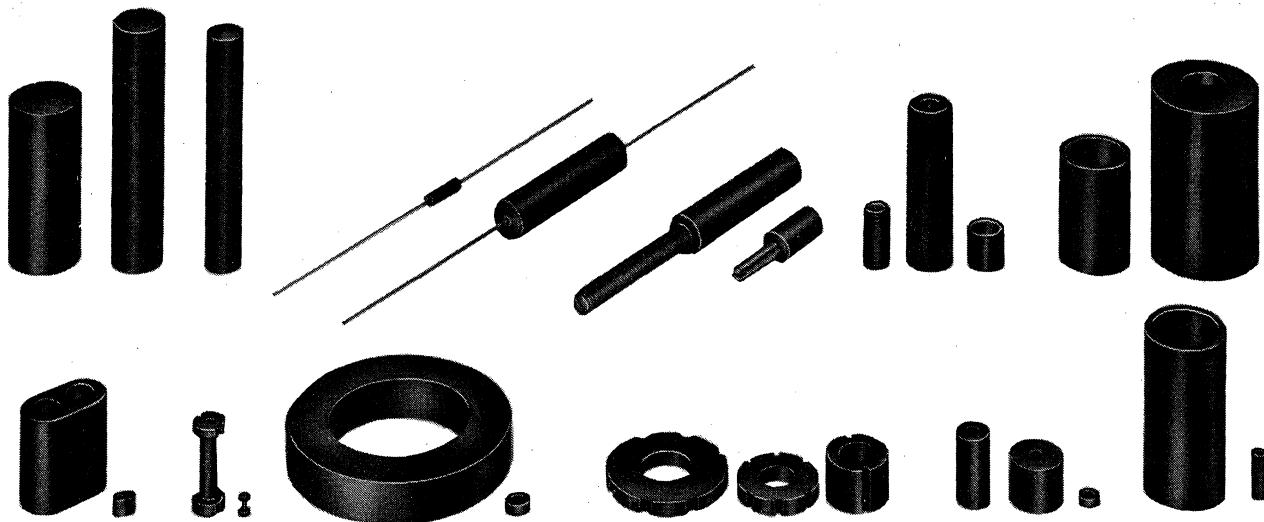


ITT THERMOTECH

1202 South Fifth Street / Hopkins, Minnesota 55343 / (612) 938-7671

Florida Division: 3200 Tyrone Blvd., / St. Petersburg, Fla. 33710 / (813) 347-2191

KRYSTINEL FERRITE CORES



Krystinel Corporation manufactures a complete line of soft ferrite materials. These ferrites are custom made within technological limits to meet desired electrical and mechanical specifications.

Krystinel Corporation maintains a large inventory of ferrites in standard sizes and shapes as detailed in its catalog. In addition, Krystinel will tailor-make ferrites to your electrical and mechanical specifications. Copies of our catalog, as well as samples and information, may be obtained by contacting Krystinel Corporation.

SLUGS: .035 to .500" diameter by .062 to 2" long.

COIL FORMS: .055 to .260" diameter x .187 to 1.250" long.

INSERT TUNING CORES: .157 to .370" diameter x .375 to 1.25" long.

THREADED CORES: .129 to .303" diameter x .187 to 1.500". Threads: 6-32, 8-32, 10-32, 1/4-28, 5/16-28. Metric: 4 x 0.5, 4.5 x 0.75, 6.3 x 1.0mm.

CUP CORES: .100 to .715" diameter x .485 to 1.000" long.

BALUN CORES: Various shapes: binocular, flat, chip, and round with 2 to 6 holes. All in many sizes.

BOBBINS: .060 to .375" major diameter x .100 to .750" long.

TOROIDS: .080 to 1.350" diameter x .025 to .500" height. (see next page)

WASHERS: .475 to .715" diameter x .067 to .125" long.

SHIELD BEADS: .050 to .500" diameter x .062 to .500" long. (see next page)

SLEEVES: .098 to .725" OD x .150 to 1.125" long.

KRYSTINEL

KRYSTINEL CORPORATION

FOX ISLAND ROAD / PORT CHESTER, NEW YORK 10573
(914) 937-5252 / TWX 710-569-1604

KRYSTINEL

FERRITE CORES

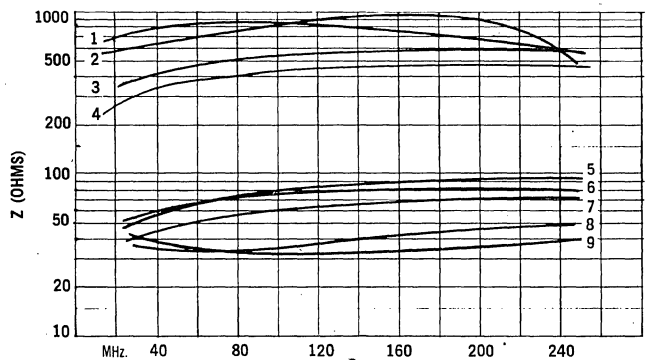
TOROIDAL CORE SELECTION CHART

A = CORE PART NUMBER, B = CORE MATERIAL TYPE, C = INDUCTANCE A_L (mH/1000 turns) $\pm 20\%$, D = INITIAL PERM. μ_i (REF.), E = O.D., F = I.D., G = HEIGHT, H = MAGNETIC PATH LENGTH I. (cm), I = EFFECTIVE CORE AREA (cm²).

A	B	C	D	E	F	G	H	I
L11-2V20-1F	K505	1.4	15	.100	.070	.050	.678	.0048
L10-2V20-1F	K502	4.0	40	.100	.070	.050	.678	.0048
L01-2V20-1F	K401-1	10.0	120	.100	.070	.050	.678	.0048
L31-2V20-1F	K810	62.0	700	.100	.070	.050	.678	.0048
L27-2V20-1F	K915	152.0	1500	.100	.070	.050	.678	.0048
L38-2V20-1F	K940	390.0	4400	.100	.070	.050	.678	.0048
L35-2V20-1F	K960	530.0	6000	.100	.070	.050	.678	.0048
L11-3Y20-1F	K505	2.7	15	.138	.070	.050	.829	.0109
L10-3Y20-1F	K502	7.5	40	.138	.070	.050	.829	.0109
L01-3Y20-1F	K401-1	19.0	120	.138	.070	.050	.829	.0109
L31-3Y20-1F	K810	116.0	700	.138	.070	.050	.829	.0109
L27-3Y20-1F	K915	280.0	1500	.138	.070	.050	.829	.0109
L31-3Y20-1F	K940	730.0	4400	.138	.070	.050	.829	.0109
L35-3Y20-1F	K960	990.0	6000	.138	.070	.050	.829	.0109
L11-4F2H-1F	K505	2.3	15	.155	.087	.050	.965	.0108
L10-4F2H-1F	K502	6.4	40	.155	.087	.050	.965	.0108
L01-4F2H-1F	K401-1	16.0	120	.155	.087	.050	.965	.0108
L31-4F2H-1F	K810	99.0	700	.155	.087	.050	.965	.0108
L27-4F2H-1F	K915	240.0	1500	.155	.087	.050	.965	.0108
L38-4F2H-1F	K940	620.0	4400	.155	.087	.050	.965	.0108
L35-4F2H-1F	K960	854.0	6000	.155	.087	.050	.965	.0108
L11-5F2K-1F	K505	2.9	15	.190	.090	.050	1.116	.0161
L10-5F2K-1F	K502	8.0	40	.190	.090	.050	1.116	.0161
L01-5F2K-1F	K401-1	21.0	120	.190	.090	.050	1.116	.0161
L31-5F2K-1F	K810	127.0	700	.190	.090	.050	1.116	.0161
L27-5F2K-1F	K915	272.0	1500	.190	.090	.050	1.116	.0161
L38-5F2K-1F	K940	798.0	4400	.190	.090	.050	1.116	.0161
L35-5F2K-1F	K960	1088.0	6000	.190	.090	.050	1.116	.0161
L11-6K3F-1Q	K505	3.0	15	.230	.120	.060	1.396	.0213
L10-6K3F-1Q	K502	8.6	40	.230	.120	.060	1.396	.0213
L01-6K3F-1Q	K401-1	22.0	120	.230	.120	.060	1.396	.0213
L31-6K3F-1Q	K810	134.0	700	.230	.120	.060	1.396	.0213
L27-6K3F-1Q	K915	287.0	1500	.230	.120	.060	1.396	.0213
L38-6K3F-1Q	K940	843.0	4400	.230	.120	.060	1.396	.0213
L35-6K3F-1Q	K960	1150.0	6000	.230	.120	.060	1.396	.0213
L11-AQ5C-3K	K505	6.8	15	.375	.187	.125	2.240	.076
L10-AQ5C-3K	K502	19.0	40	.375	.187	.125	2.240	.076
L01-AQ5C-3K	K401-1	46.0	120	.375	.187	.125	2.240	.076
L31-AQ5C-3K	K810	297.0	700	.375	.187	.125	2.240	.076
L27-AQ5C-3K	K915	595.0	1500	.375	.187	.125	2.240	.076
L38-AQ5C-3K	K940	1570.0	4400	.375	.187	.125	2.240	.076

SHIELD BEADS (Partial Listing)

Dimensions (Inches)			Material	K-430	K-405	K-810	K-480	K-925
HT.	O.D.	I.D.	Prefix	E49	E03	E31	E41	E46
			Base No.	A (nh/N ²) $\pm 20\%$				
.050	.138	.051	1F3Y-1G0	70	95	180	218	642
.128	.138	.051	3N3Y-1G0	181	244	460	561	1650
.128	.138	.062	3N3Y-1S0	137	185	350	425	1250
.125	.163	.062	3K4N-1S0	168	226	429	521	1530
.250	.163	.062	754N-1S0	337	453	858	1024	3060
.125	.190	.090	3K5F-2K0	130	175	331	400	1180
.250	.190	.090	755F-2K0	260	351	664	800	2370
.250	.200	.062	755Q-1S0	406	546	1034	1250	3690



1: WC41-B96R-25, 1 turn. 2: WC49-B96R-25, 1 turn. 3: WC41-B96R-15, 1 turn. 4: WC49-B96R-15, 1 turn. 5: E03-755Q-1S0, 1 turn. 6: E41-755Q-1S0, 1 turn. 7: E49-755Q-1S0, 1 turn. 8: E46-755Q-1S0, 1 turn. 9: E31-755Q-1S0, 1 turn.

WOUND CHOKE (6 HOLE BEAD)

Part Number	Dimensions			No. of Turns	No. of Windings	Impedance @ Freq.	
	L	O.D.	Lead			Min. Ω	MHz
WC41-B96R-15	.394	.236	1.562	1½	1	300	120
WC49-B96R-15	.394	.236	1.562	1½	1	400	240
WC41-B96R-25	.394	.236	1.562	2½	1	600	50
WC49-B96R-25	.394	.236	1.562	2½	1	700	180

KRYSTINEL FERRITE MAGNETIC CHARACTERISTICS

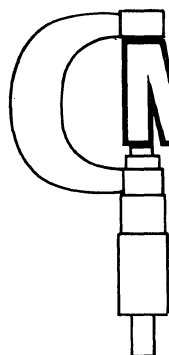
Characteristic	Unit	Symbol	K-505	K-502	K-401-1	K-430	K-405	K-204	K-810	K-480	K-820	K-915	K-925	K-940	K-960
Initial Permeability		μ_i	15	40	120	275	370	375	700	850	1500	1500	2500	4400	6000
Maximum Permeability		μ Max.	40	100	300	1500	1200	700	1900	2500	2600	2500	4100	6300	7500
Coercive Force	Oersted	Hc	23	5.0	2.5	0.5	0.6	0.8	0.3	0.35	0.3	0.4	0.17	0.11	0.10
Saturation Flux Density (@ H Oersted)	Gauss	Bsat (H)	2200 (20)	2000 (20)	2800 (20)	2100 (8)	3100 (15)	2700 (10)	3200 (5)	2800 (4)	4200 (6)	4750 (7)	4500 (4)	4000 (2.5)	3900 (2)
Residual Flux Density	Gauss	Br	1350	700	1600	1200	2100	1100	1200	1400	1600	1750	950	920	750
Curie Temperature	°C	Tc	500	450	400	150	325	200	175	140	180	220	200	150	150
Volume Resistivity	Ohm-Cm	ρ	2x10 ⁴	1x10 ⁶	1x10 ⁷	1x10 ⁸	1x10 ⁸	3x10 ⁹	4x10 ¹⁰	5x10 ¹⁰	5x10 ¹⁰	1x10 ¹²	5x10 ¹²	2x10 ¹³	2x10 ¹³
Temperature Change of Initial Permeability (0°C to 60°C)	%	$\frac{\Delta L \times 100}{L @ 25^\circ C}$	±5	±5	±6	±12	±20	±8	±8	±10	±10	±10	±15	±15	±25
Loss Factor X10 ⁻⁶		Tan. δ	325	60	20	20	30	12.5	27.0	25.0	6.0	4.0	3.0	10.0	9.0
@ Frequency	MHz	μ_i	100	10	1	.1	.1	.1	.1	.1	.1	.1	.1	.1	.1

KRYSTINEL

KRYSTINEL CORPORATION

FOX ISLAND ROAD / PORT CHESTER, NEW YORK 10573

(914) 937-5252 / TWX 710-569-1604



MICRITE

21531 STRATHERN STREET
CANOGA PARK, CA. 91304
TEL. (213) 348-1610



QUALITY IS OUR MOST IMPORTANT PRODUCT DEEP DRAWN ENCLOSURES AND RELATED COMPONENTS

GENERAL INFORMATION

QUALITY CONTROL PROGRAM — In order to maintain our consistently high level of quality and precision workmanship, our quality control procedures have been designed to comply with the inspection standards of Military Specification MIL-Q-9858 or at your request, a more rigid sampling plan.

TOLERANCES — Standard tolerances are $\pm .010$ unless otherwise specified.

PLATING/FINISHING — All plating processes

with the exception of Hot Tin Dip are available.

HEAT TREATING — Standard heat treating at Micrite is Fast and Slow Cycle Hydrogen Annealing.

TOOLING CAPABILITIES — At Micrite a complete tool and die facility is at your disposal. Our standard line of enclosures is increasing every day. If you have a requirement not listed in our catalog, please feel free to contact us. If it can be made, we can make it for you.

MICRITE REPRESENTATIVES

BURKE SALES

911 Broadway
Kansas City, Missouri 64105
Tel. (816) 842-5511

DORTON ENTERPRISES

363 East Virginia Avenue
Phoenix, Arizona 85011
Tel. (602) 263-0414

KING & ASSOCIATES

2966 Scott Boulevard
Santa Clara, California 95050
Tel. (408) 240-1022

CENTRAL STATES ASSOCIATES

306 Busse Highway
Parkridge, Illinois 60068
Tel. (312) 692-2101

JALCO ASSOCIATES

P.O. Box 97
Woburn, Massachusetts 01801
Tel. (617) 227-1515

STANGENBERG & ASSOCIATES

9531 Slater Avenue No. 5
Fountain Valley, California 92208
Tel. (714) 968-5049

QUALITY IS OUR MOST IMPORTANT PRODUCT

DEEP DRAWN ENCLOSURES AND RELATED COMPONENTS

MC SERIES

MATERIAL THICKNESS CODE / A .018 ST .020 AL .020 BR .020 MU / B .024 ST .025 AL .025 BR .025 MU / C .029 ST .032 AL .032 BR .031 MU

MC Series	A Diam.	B Max. Depth	C Material Code	D Radius	Cover
MC-037	.375	1.500	A	1/32	IS
MC-056	.562	1.875	.012/A	1/16	IS
MC-062	.625	1.625	.012*	1/16	IS
MC-065	.656	3.250	.010/B	1/16	IS
MC-075	.750	2.750	.010/A	1/16	IS
MC-081	.812	1.500	A	1/16	IS
MC-084	.844	1.750	A	3/64	IS
MC-087	.875	1.875	A	1/16	IS
MC-093	.930	1.625	A	1/16	IS
MC-095	.950	1.625	A	1/16	IS
MC-097	.975	1.750	B	3/64	IS
MC-098	.985	1.625	B	3/64	IS
MC-100	1.000	1.625	A	3/64	IS
MC-100A	1.000	2.625	.012*	1/16	IS
MC-104	1.047	1.625	A	3/64	IS
MC-106	1.062	2.625	A	1/16	IS
MC-110	1.100	1.625	A	3/64	IS
MC-112	1.125	1.625	A	3/64	IS
MC-117	1.172	1.875	A	3/32	IS
MC-118	1.188	2.250	A	3/64	IS
MC-125	1.250	2.250	A	1/8	IS
MC-125A	1.250	3.000	C	3/32	IS
MC-130	1.297	1.750	A	3/32	IS
MC-131	1.312	3.000	A	1/16	IS

* Special Gauge

MC Series	A Diam.	B Max. Depth	C Material Code	D Radius	Cover
MC-132	1.320	2.000	A	3/32	IS
MC-137	1.375	2.000	A	3/32	IS
MC-140	1.406	1.500	.040*	3/32	IS
MC-143	1.438	2.500	B	3/32	IS
MC-145	1.453	1.875	A	3/32	IS
MC-146	1.469	2.500	B	3/32	IS
MC-150	1.500	2.500	B	3/32	IS
MC-156	1.562	2.500	A	3/64	IS
MC-160	1.600	2.750	B	3/32	IS
MC-162	1.625	2.750	B	3/32	IS
MC-168	1.687	2.500	C	1/8	IS
MC-170	1.700	2.500	B	1/8	IS
MC-171	1.715	1.295	.040*	3/32	IS
MC-175	1.750	2.750	B	3/32	IS
MC-182	1.820	3.250	B	3/32	IS
MC-200	2.000	3.500	B	3/32	IS
MC-206	2.062	3.500	B	3/32	IS
MC-211	2.109	2.125	B	3/32	IS
MC-212	2.125	3.000	A/B	1/8	IS
MC-215	2.155	2.062	B	1/8	IS
MC-220	2.203	2.125	B	1/16	IS
MC-237	2.375	2.750	B	1/8	IS
MC-295	2.950	3.125	C	5/32	IS

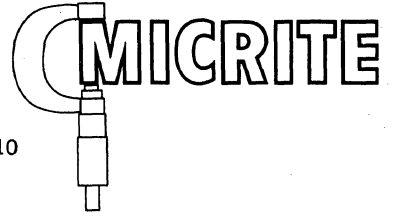
MR SERIES

MATERIAL THICKNESS CODE / A .018 ST .020 AL .020 BR .020 MU / B .024 ST .025 AL .025 BR .025 MU / C .029 ST .032 AL .032 BR .031 MU

MR Series	A Width	B Length	C Max. Depth	D Material Code	E Radius	Cover
MR-019-080	.19	.80	.750	.010*	.030	
MR-020-040	.203	.400	.520	.010*	.030	
MR-022-136	.218	1.359	.500	.013*	3/64	
MR-022-151	.218	1.515	.750	.010*	1/32	
MR-031-100	.312	1.000	.310	A	1/16	
MR-037-077	.375	.765	.379	.010*	.020	
MR-039-079	.390	.796	.400	.010*	1/32	
MR-040-080	.390	.790	.430	.010*	.030	
MR-045-082	.450	.820	1.250	A	3/32	IS
MR-047-073	.468	.734	.750	.010*	3/64	IS
MR-050-100	.500	1.000	1.375	A	3/64	IS
MR-050-100A	.500	1.000	1.000	A	3/32	IS
MR-050-103	.500	1.031	1.625	A	3/64	IS
MR-050-106	.500	1.062	1.300	A	3/64	IS
MR-051-101	.516	1.016	.880	A	3/64	IS
MR-051-157	.516	1.578	.477	.010*	1/16	IS
MR-053-157	.531	1.578	.500	.012*	1/16	IS
MR-055-125	.546	1.246	1.110	A	3/64	IS
MR-056-068	.562	.688	.250	A	3/64	IS
MR-059-098	.594	.984	1.125	A	3/16	IS
MR-059-100	.594	1.000	1.125	A	1/8	IS
MR-059-148	.593	1.484	.875	A	3/32	IS
MR-061-099	.614	.989	1.010	A	3/64	IS
MR-061-114	.614	1.146	1.350	A	3/64	IS
MR-062-308	.625	3.078	.500	A	3/32	IS
MR-068-126	.688	1.266	.500	A	3/32	IS
MR-071-150	.719	1.500	.475	A	3/64	IS
MR-074-131	.734	1.312	.160	C*	1/16	
MR-075-093	.750	.938	1.750	A	3/32	IS
MR-075-150	.750	1.500	.625	A	1/32	IS
MR-075-160	.750	1.594	1.375	B	1/16	IS
MR-075-218	.750	2.188	.780	A	3/32	IS
MR-075-269	.755	2.692	.580	A	3/64	IS
MR-076-089	.766	.891	.625	A	1/16	IS
MR-077-203	.766	2.031	.500	A	3/64	IS
MR-078-109	.781	1.094	2.125	A	3/32	IS
MR-078-156	.781	1.562	.656	A	3/64	IS
MR-079-175	.797	1.750	1.250	.015*	5/64	IS
MR-080-237	.797	2.375	.560	A	3/32	IS
MR-082-093	.817	.927	1.110	A	3/64	IS
MR-084-103	.844	1.031	.600	C	1/8	IS
MR-085-100	.844	1.000	1.500	A	1/16	IS

* Special Gauge

MR Series	A Width	B Length	C Max. Depth	D Material Code	E Radius	Cover
MR-085-159	.844	1.594	1.500	B	5/64	IS
MR-086-149	.859	1.484	.750	A	3/32	IS
MR-087-106	.875	1.062	2.000	A	11/64	IS
MR-088-128	.875	1.281	1.625	A	7/64	IS
MR-088-280	.875	2.800	.875	A	3/64	IS
MR-094-112	.938	1.125	1.000	A/B	3/32	IS
MR-094-118	.938	1.188	2.000	B	3/32	IS
MR-094-143	.938	1.438	2.250	A	3/32	IS
MR-094-194	.938	1.938	1.375	B	3/64	IS
MR-095-132	.953	1.328	2.250	A	5/64	IS
MR-095-135	.953	1.359	2.250	B	3/64	IS
MR-097-106	.969	1.062	2.000	A	1/16	IS
MR-097-123	.969	1.234	2.812	B	3/64	IS
MR-098-107	.984	1.078	2.500	A	3/64	IS
MR-098-236	.984	2.359	.750	A	3/32	IS
MR-098-278	.984	2.781	.700	B	3/32	IS
MR-099-109	.984	1.094	1.625	A	3/32	IS
MR-099-123	.984	1.234	2.812	B	1/16	IS
MR-099-124	.984	1.234	.463	A	1/32	IS
MR-099-140	.984	1.406	1.000	A	1/32	IS
MR-099-164	.984	1.641	.600	A	1/32	IS
MR-100-150	1.000	1.500	.937	A	1/8	IS
MR-100-159	1.000	1.594	.475	A	1/16	IS
MR-100-161	1.000	1.609	2.625	B	1/8	IS
MR-100-205	1.000	2.050	.703	A	3/32	IS
MR-100-206	1.000	2.062	.705	A	3/32	IS
MR-100-238	1.000	2.375	.937	A	1/8	IS
MR-103-109	1.031	1.094	.413	A	1/8	IS
MR-103-118	1.031	1.188	.812	B	1/8	IS
MR-104-141	1.047	1.406	.745	C	1/8	IS
MR-105-137	1.047	1.375	2.250	B	1/8	IS
MR-105-147	1.047	1.469	1.000	A	3/64	IS
MR-105-177	1.047	1.775	1.250	A	1/16	IS
MR-105-305	1.052	3.052	.580	A	3/64	IS
MR-106-125	1.062	1.250	2.500	A	11/64	IS
MR-106-157	1.062	1.578	.500	.012*	1/16	
MR-109-143	1.094	1.438	2.250	A	3/64	IS
MR-110-123	1.109	1.234	.445	A	1/16	IS
MR-118-144	1.188	1.438	1.106	A	1/8	IS
MR-118-168	1.188	1.688	2.500	B	3/32	IS
MR-125-150	1.250	1.500	2.500	A	3/32	IS
MR-125-175	1.250	1.750	1.350	A	3/64	IS



21531 STRATHERN STREET / CANOGA PARK, CA. 91304 / TEL. (213) 348-1610

MR SERIES

MATERIAL THICKNESS CODE / A .018 ST .020 AL .020 BR .020 MU / B .024 ST .025 AL .025 BR .025 MU / C .029 ST .032 AL .032 BR .031 MU

MR Series	A Width	B Length	B Max. Depth	D Material Code	E Radius	Cover
MR-125-194	1.250	1.953	1.000	B	$\frac{5}{64}$	IS
MR-125-318	1.250	3.188	.575	A	$\frac{1}{16}$	IS
MR-126-237	1.266	2.375	.610	A	$\frac{1}{16}$	IS
MR-135-156	1.350	1.560	2.750	B	$\frac{7}{64}$	IS/OUT
MR-135-156A	1.350	1.560	2.000	B	$\frac{1}{2}$	IS/OUT
MR-139-150	1.391	1.500	2.000	A	$\frac{3}{8}$	IS
MR-143-167	1.438	1.672	1.250	A	$\frac{1}{8}$	IS
MR-143-175	1.438	1.750	3.000	A	$\frac{3}{32}$	IS
MR-148-211	1.438	2.109	.510	B	$\frac{3}{32}$	IS
MR-150-200	1.500	2.000	1.000	B	$\frac{1}{16}$	IS
MR-150-250	1.500	2.500	.940	.040	$\frac{1}{8}$	IS
MR-150-367	1.500	3.672	1.450	B	$\frac{3}{16}$	IS
MR-156-187	1.562	1.875	1.187	C	$\frac{3}{16}$	IS
MR-159-184	1.594	1.844	1.187	A	$\frac{1}{8}$	IS
MR-161-354	1.609	3.547	.680	B	$\frac{5}{64}$	IS
MR-162-175	1.625	1.750	1.125	A	$\frac{1}{8}$	IS
MR-162-201	1.625	2.016	2.875	A	.350	IS

MR Series	A Width	B Length	B Max. Depth	D Material Code	E Radius	Cover
MR-175-200	1.750	2.000	2.500	B	$\frac{1}{4}$	IS/OUT
MR-175-375	1.750	3.750	2.500	B	$\frac{1}{8}$	IS
MR-178-586	1.781	5.859	3.700	C	$\frac{1}{8}$	IS
MR-179-787	1.797	7.875	1.093	C	$\frac{1}{16}$	IS
MR-184-200	1.844	2.000	2.875	A	$\frac{3}{8}$	IS
MR-187-690	1.875	6.906	1.250	C	$\frac{3}{16}$	IS
MR-187-699	1.875	6.984	1.250	C	$\frac{1}{4}$	IS
MR-195-460	1.953	4.609	.520	.040	$\frac{1}{32}$	IS
MR-200-350	2.000	3.500	1.500	.050*	$\frac{1}{8}$	IS/OUT
MR-204-360	2.047	3.609	1.000	B	$\frac{1}{8}$	IS
MR-210-243	2.109	2.438	3.000	B	$\frac{1}{8}$	IS
MR-218-250	2.188	2.500	.812	C	$\frac{3}{32}$	IS
MR-250-397	2.500	3.969	1.125	B	$\frac{1}{8}$	IS
MR-253-413	2.531	4.125	1.000	B	$\frac{1}{8}$	IS
MR-258-418	2.578	4.188	1.000	B	$\frac{1}{8}$	IS
MR-312-338	3.125	3.375	1.000	B	$\frac{1}{8}$	IS
MR-393-462	3.938	4.625	.562	B	$\frac{1}{8}$	IS

*Special Gauge

MS SERIES

MATERIAL THICKNESS CODE / A .018 ST .020 AL .020 BR .020 MU / B .024 ST .025 AL .025 BR .025 MU / C .029 ST .032 AL .032 BR .031 MU

MS Series	A Square Dimen.	B Max. Depth	C Material Code	D Radius	Cover
MS-053	.531	1.000	A	$\frac{1}{32}$	IS
MS-073	.734	1.125	A	$\frac{3}{32}$	IS
MS-075	.750	1.125	A	$\frac{3}{4}$	IS
MS-079	.797	1.250	A	$\frac{3}{64}$	IS
MS-087	.875	2.125	A	$\frac{3}{32}$	IS
MS-095	.953	1.750	A	$\frac{3}{64}$	IS
MS-096	.968	1.750	A	$\frac{3}{32}$	IS
MS-100	1.000	2.125	A	$\frac{3}{32}$	IS
MS-100A	1.000	2.500	A	$\frac{1}{16}$	IS
MS-100B	1.000	1.250	A	$\frac{3}{64}$	IS
MS-103	1.031	.500	A	$\frac{3}{64}$	IS
MS-118	1.188	2.250	A	$\frac{3}{4}$	IS

MS Series	A Square Dimen.	B Max. Depth	C Material Code	D Radius	Cover
MS-121	1.219	1.500	A	$\frac{13}{32}$	IS
MS-125	1.216	1.350	A	$\frac{7}{64}$	IS
MS-126	1.266	.938	A	$\frac{1}{8}$	IS
MS-128	1.281	2.125	A	$\frac{1}{8}$	IS
MS-131	1.312	3.000	A	$\frac{1}{8}$	IS
MS-143	1.438	2.750	B	$\frac{7}{64}$	IS
MS-143A	1.438	2.000	A	$\frac{3}{64}$	IS
MS-150	1.500	2.750	B	$\frac{1}{8}$	IS
MS-160	1.600	2.438	B	$\frac{1}{8}$	IS
MS-175	1.750	3.000	B	$\frac{1}{8}$	IS
MS-200	2.000	1.125	B	$\frac{1}{8}$	IS
MS-301	3.016	.750	B	$\frac{3}{32}$	IS

STANDARD MODIFICATIONS**TERMINAL KNOCKOUTS**

WELD SCREW

4-40 WELD SCREWS
A Dim. = .25, .31 & .38
B Dim. = .03
C Dim. = .22
D Dim. = .010

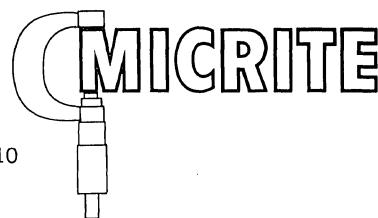
6-32 WELD SCREWS
A Dim. = .25, .31, .38 & .50
B Dim. = .03
C Dim. = .25
D Dim. = .010

COVER STOPS

SOLDER SCREW

4-40 SOLDER SCREWS
A Dim. = .25, .31 & .38
B Dim. = .030
C Dim. = .22

6-32 SOLDER SCREWS
A Dim. = .25, .31, .38 & .50
B Dim. = .03
C Dim. = .25



21531 STRATHERN STREET / CANOGA PARK, CA. 91304 / TEL. (213) 348-1610

HOW TO ORDER

ORDERING ENCLOSURES

In order to assure that you receive the correct part and to avoid delay in deliveries caused by misunderstanding, the steps outlined below should be followed when placing an order for Micrite parts:

1. Specify the correct Series Number for the part you want to order. The Series Number is the number in the first column on each catalog page describing Micrite Enclosure Series.

2. To the Series Number add the number representing Maximum Depth of the part. Maximum Depth is found in column 3 for MS and MC Series parts and in column 4 for MR Series parts.

Note: All parts listed are of maximum depth. With your exact specification, Micrite will machine trim them to the desired depth.

3. Finally, at the end of the part number obtained thus far, specify the type of material from which the part is to be manufactured by adding a material code as follows:

ST — Cold Rolled Steel

AL — Aluminum

BR — Brass

MU — Mu-Metal

The thickness at which a part may be made from each of these materials may be determined by consulting the Material Code chart at the top of each page.

Note: Most parts listed in this catalog also may be manufactured from Nickel Silver, Cupro Nickel, Copper and Stainless Steel. However, actual use is dependent upon the part requested. For additional information please contact Micrite directly or your nearest Micrite Representative.

4. When you have completed a Micrite Part Number, the number should appear as follows:

MC-075-1000 ST Micrite Circular—.750" dia. x 1.000" depth of Cold Rolled Steel

MS-162-1750 BR Micrite Square—1.625" sq. x 1.750" depth of Brass

MR-210-243-0875 AL Micrite Rectangular—2.109" wide x 2.438" long x .875" depth of Aluminum

ORDERING MATING COVERS

To order a mating cover for use with any enclosure listed in this catalog use the following procedure:

1. Specify the Series Number of the corresponding part (from column 1 in the listing).

2. To the Series Number add the code **IS** (for Inside Cover) or **OS** (for Outside Cover) as required.

CUSTOM MODIFICATIONS & SERVICES

In addition to its line of standard configurations, Micrite also offers its customers the capability for providing certain custom services and modifications to standard parts. Among those services and modifications available are the following:

Holes . . . all forms of pierced holes, including potting, extruded, evacuation, keyhole, diamond, square, oval, rectangular and plain hole.

Sealing Discs

Engraved Stamping

Tabs

Flanges

Brackets

Soft Soldering

Spotwelding (resistant welding)

Silver Soldering

Brazing

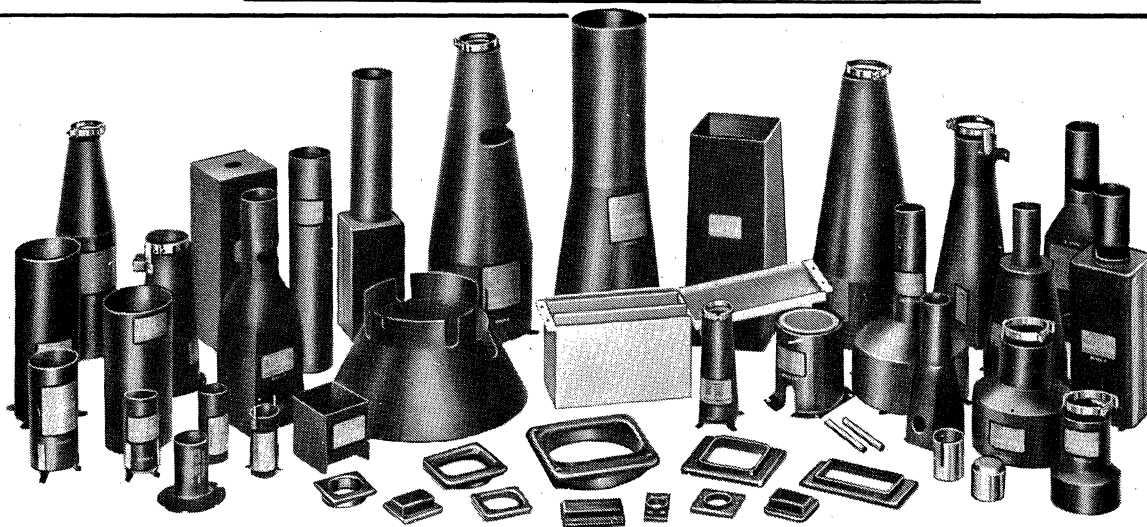
Terminals

Inserts

Ground Pins

Nuts, etc.

For further information and/or engineering assistance relating to your specific modification requirements, please contact your nearest Micrite Representative or the Main Plant.



Standard Shields for FAIRCHILD/DUMONT, RCA, AMPEREX AND PHILIPS TUBES Available From Stock

MAGNETIC SHIELDS FOR MULTIPLIER PHOTOTUBES

The James Millen Manufacturing Company of Malden, Mass., with over 35 years of experience, presents magnetic shields designed to meet today's requirements covering storage tubes, multiplier tubes, and cathode ray tubes as well as many special applications requiring magnetic shielding. The shields that are listed below we try to keep

in stock. More than 50% of our shield production is either modified or completely special. These shields are manufactured of high permeability material having a permeability of 80,000 or higher with a field of 40 gauss in the shield. We therefore can list a guaranteed field reduction on all of our shields.

TUBE TYPES				Millen Shield	Face Diameter Inside Inches	Neck Inside Diameter Inches	Length Inches	Tube Base Clamp	Side Opening Inches	Minimum D.C. Field Reduction in Gun Area	
RCA	Philips	Dumont	Other							2.5 Gauss	1.0 Gauss
1P21 1P22 1P28	—	6467	—	80801-A	1 1/4	1 1/4	2 3/4	None	None	690	655
931-A	—	—	—	80801-B	1.5	1.5	3 1/2	None	1/2 x 1 1/2	330	312
7360	—	—	—	80801-B	1.5	1.5	3 1/2	None	1/2 x 1 1/2	330	312
—	52AVP	—	—	80801-D-3	1 1/4	1 1/4	2 3/4	Bayonet	None	1030	950
6328	—	—	—	80801-F	1 1/4	1 1/4	4 1/2	None	None	1050	1010
6472	—	—	—	80801-G	1 1/4	1 1/4	2 1/4	None	3/8 x 1 1/2	250	200
7043	—	—	—	80801-H	1 1/4	1 1/4	2 1/4	None	3/8 x 1 1/2	275	220
7117	—	—	—	80801-J	1 1/2	1 1/2	2 3/4	None	3/8 x 1	275	220
7200	—	—	—	80801-K	1 1/2	1 1/2	2 1/4	None	1/2 x 1 1/2	200	175
7764	152AVP	7860	—	80801-L	1 1/4	1 1/4	5 1/2	None	1/2 x 1 1/2	960	910
7767 8644 8645	—	—	—	80801-M	3/4	3/4	2 1/2	None	None	1050	1000
4460 4516	—	—	—	80801-N	.800	.800	3.25	None	None	1030	950
4515	—	—	—	80801-P	.800	.800	3.00	None	None	1030	950
2020 4463 5819	—	6292	—	80801-Q	1.26	1.26	5	None	None	750	700
6217 6342-A	—	—	—	80802-B	2 1/4	2 1/4	4	Spring Clips	None	715	680
6655-A 6914 or 6914A	—	—	—	80802-B	2 1/4	2 1/4	4	Spring Clips	None	715	680
4438 4439	150AVP or UP	—	—	80802-B	2 1/4	2 1/4	4	Spring Clips	None	715	680
4440 4517 6199	150CUP 50AVP	—	—	80802-C	1 1/4	1 1/4	3 1/2	Spring Clips	None	850	810
7102 7151	—	6291	—	80802-C	1 1/4	1 1/4	3 1/2	Spring Clips	None	850	810
6810-A 6903 7264	—	—	EMI 9558	80802-E	2 3/4	2 3/4	5 1/2	Spring Clips	None	850	810
7265 7850	—	—	CBS 7817	80802-E	2 3/4	2 3/4	5 1/2	Spring Clips	None	850	810
6372	—	—	—	80802-F	3 1/4	3 1/4	7 1/2	None	3 x 4 1/4	365	350
—	51UVP	—	—	80802-H	1 1/4	1 1/4	3 1/2	Spring Clips	None	850	810
—	51AVP	—	—	80802-H	1 1/4	1 1/4	3 1/2	Spring Clips	None	850	810
4523	53AVP & UVP	—	Raytheon 1414	80802-86	2 1/4	2 1/4	10	None	1 1/4 Dia.	650	620
—	153AVP	—	XP1010	80802-J	2 3/4	2 3/4	3 1/2	Spring Clips	None	650	620
8053 4459 7746	55AVP	—	—	80802-K	2 3/4	2 3/4	3 1/2	Spring Clips	None	650	620
—	56AVP & UVP	—	—	80802-L	2 3/4	2 3/4	4 1/2	Spring Clips	None	850	810
4526 7038 7029	—	—	—	80802-L	2 3/4	2 3/4	4 1/2	Spring Clips	None	850	810
7326 8575	—	—	—	80802-M	1 1/4	1 1/4	2 1/4	None	None	850	810
4441 4441-A 4461	—	—	—	80802-N	2 3/4	2 3/4	4 1/2	Spring Clips	None	850	810
4464 4525 8054	—	1197 6363	EMI 9578 CBS	80802-P	1 1/4	1 1/4	2 3/4	Spring Clips	None	850	810
6499	—	—	XP1030 7818	80803-J	3 1/2	2 1/2	4 1/2	2.25" Dia.	None	610	580
6866	58AVP	—	—	80803-J	3 1/2	2 1/2	4 1/2	2.25" Dia.	None	510	580
4465 8055 4525	—	6364	CBS 7819	80803-L	3 1/4	3 1/4	12 1/4	Socket	Contact	700	665
8053 8054	—	—	—	80805-210	5 1/2	5 1/2	8 1/4	None	None	1050	1010
7046	—	—	—	80805-N	5 1/2	3 1/4	14	None	2-1 1/4" Dia.	610	580
7315 C73783	—	—	—	80805-M	5 1/2	2 1/2	6 1/2	2.25" Dia.	None	550	510
4522	54AVP	—	—	80805-M	5 1/2	2 1/2	6 1/2	2.25" Dia.	None	550	520
—	—	—	—	80805-P	6 1/2	3 1/2	9 1/4	None	Hole for Leads	550	520
—	—	—	—	80805-R	5 1/2	2 3/4	11 3/4	2.25	4-1 Dia.	620	590
—	—	—	—	80805-S	5 3/4	2 3/4	7 1/2	2.25	None	850	810
—	—	—	—	80805-Y	6 1/2	6 1/2	11	None	1 1/2 Dia.	850	810

JAMES MILLEN

Experience in design and application
WE MAKE SHIELDS TO YOUR SPECIFICATIONS

MANUFACTURING COMPANY, INC.

Main Office and Factory

150 EXCHANGE ST., MALDEN, MASS. 02148, U.S.A.

TEL. (617) 324-4108



MILLEN MAGNETIC SHIELDS FOR CATHODE RAY TUBES

TUBE TYPES	MILLEN SHIELD	FACE DIAMETER INSIDE INCHES	NECK INSIDE DIAMETER INCHES	LENGTH INCHES	TUBE BASE CLAMP	ANODE HOLE	CONTACT CUTOFF	MINIMUM D.C. FIELD REDUCTION IN GUN AREA 2.5 Gauss 1.0 Gauss		USE WITH MILLEN BEZEL #	SHIELD BEZEL ASSEMBLY	FIG. NO.
1CP-	80801-A	1.38	1.38	2.75	NONE	0	0	335	290	80071	80091-A	1
1DP-	80801-R	.89	.89	2.50	NONE	0	0	335	290	80071-R	80091-R	
1EP-	80801-C	1.34	1.48	3.25	NONE	0	0	415	340	80071-B	80091-C	2
2AP-	80802-D	2.19	1.56	5.25	1.37	0	0	425	400	80072	80092-D	3
2AP-	80042-A	2.19	1.56	5.25	1.37	0	0	110	100	80072	NONE	3
2BP-	80802-A	2.19	1.56	5.25	1.47	0	0	425	400	80072-B	80092-A	3
2BP-	80042	2.19	1.56	5.25	1.47	0	0	110	100	80072-B	NONE	3
3AP-	80803-B	3.45	2.00	9.44	1.64	0	0	500	450	80073	80093-B	4
3AP-	80053	3.45	2.00	9.44	1.64	0	0	100	90	80073	NONE	4
3ABP-	80803-K	3.45	3.45	8.75	NONE	2	0	405	375	80073-C	80093-K-1	5
3ACP-	80803-E	3.45	2.37	7.94	2.25	1	0	500	450	80073-C	80093-E-1	6
3ADP-	80803-H	3.45	2.50	8.44	1.50	1	1	425	400	80073-C	80093-H	7
3AHP-	80803-MB	3.06x1.62	1.69	8.00	NONE	0	0	425	400	80173-B	80093-MB	8
3AQP-	80803-D	3.45	1.75	7.62	1.50	0	0	425	400	80073	80093-D	4
3ASP-	80803-MA	3.06x1.62	1.69	7.50	NONE	1	0	550	500	80173-B	80093-MA	8
3AYP-	80803-M	3.06x1.62	1.69	7.50	NONE	0	0	550	500	80173-B	80093-M	8
3BP-	80803-C	3.45	2.37	7.94	2.25	0	0	425	400	80073-C	80093-C-1	6
3BP-	80043	3.45	2.37	7.94	2.25	0	0	100	90	80073	NONE	6
3BP-	80067	3.25	2.50	7.25	2.25	1	0	525	480	Shield & Bezel	NONE	9
3BCP-	80803-LA	3.44	3.44	14.50	NONE	2	0	550	500	80073-C	NONE	
3BDP-	80803-M	3.06x1.62	1.69	7.50	NONE	0	0	550	500	80173-B	80093-M-2	8
3BGP-	80803-MA	3.06x1.62	1.69	7.50	NONE	1	0	550	500	80173-B	80093-MA-2	8
3BFP-	80803-R	3.45	1.25	12.13	1.50	1	0	500	435	80073-C	80093-R-1	14
3DP-	80067	3.25	2.50	7.25	2.25	1	0	525	480	Shield & Bezel	NONE	9
3DP-	80803-C	3.45	2.37	7.94	2.25	0	0	425	400	80073	80093-C	6
3FP-	80803-E	3.45	2.37	7.94	2.25	1	0	500	450	80073	80093-E	6
3GP-	80803-A	3.45	2.00	9.44	1.69	0	0	500	450	80073	80093-A	4
3JP-	80803-E	3.45	2.37	7.94	2.25	1	0	500	450	80073-C	80093-E-1	6
3KP-	80803-B	3.45	2.00	9.44	1.64	0	0	500	450	80073	80093-B	4
3MP-	80803-F	3.45	1.75	6.44	1.50	0	0	425	400	80073	80093-F	8
3RP-	80803-D	3.45	1.75	7.62	1.50	0	0	425	400	80073	80093-D	4
3SP-	80803-M	3.06x1.62	1.69	7.50	NONE	0	0	550	500	80173-B	NONE	8
3WP-	80803-G	3.45	1.75	9.44	1.50	0	0	550	500	80073-C	80093-G-1	4
3XP-	80803-M	3.06x1.62	1.69	7.50	NONE	0	0	550	500	80173-B	80093-M	8
3YP-	80803-MC	3.06x1.62	1.69	5.75	NONE	0	0	550	500	80173-B	80093-MC	8
S.C. 3042	80805-A	6.12	1.87	15.50	1.69	0	0	550	500	80075-M	80095-A-2	10
S.C. 3093	80805-K	6.12	2.50	15.75	2.25	0	1	425	400	80075-C	80095-K	7
S.C. 3377	80803-S	3.6x3.6	2.00	12.13	NONE	1	1	550	500	80174-A	NONE	11
S.C. 3511	80803-S	3.6x3.6	2.00	12.13	NONE	1	1	550	500	80174-A	NONE	11
S.C. 3561	80805-U	4.37x6.37	4.37	18.25	NONE	1	0	550	500	NONE	NONE	12
S.C. 4348	80803-MA	3.06x1.62	1.69	7.50	NONE	1	0	550	500	80173-B	NONE	8

Fig. 1

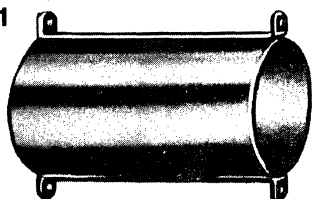


Fig. 2

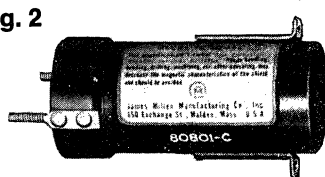


Fig. 3

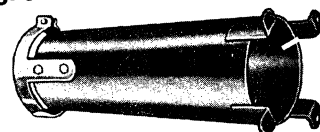


Fig. 4

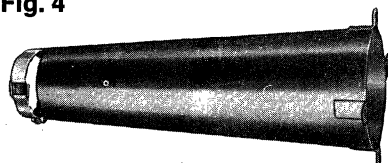


Fig. 5

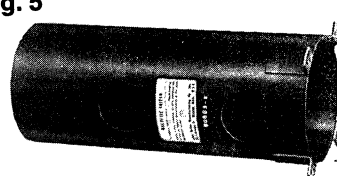
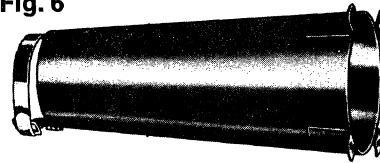


Fig. 6



MILLEN MAGNETIC SHIELDS FOR CATHODE RAY TUBES

TUBE TYPES	MILLEN SHIELD	FACE DIAMETER INSIDE INCHES	NECK INSIDE DIAMETER INCHES	LENGTH INCHES	TUBE BASE CLAMP	ANODE HOLE	CONTACT CUTOFF	MINIMUM D.C. FIELD REDUCTION IN GUN AREA		USE WITH MILLEN BEZEL #	SHIELD BEZEL ASSEMBLY	FIG. NO.
S.C. 4510	80085-G	5.44	1.75	10.75	1.50	1	0	600	540	80075-E	NONE	17
4KP-	80804-A	3.6x3.6	1.56	9.69	1.47	0	0	550	500	NONE	NONE	13
4MP-	80803-U	3.6x3.6	2.00	12.13	NONE	1	1	550	500	80174-A	80093-U	15
5ABP-	80035	6.25	2.38	14.88	2.25	1	0	100	90	80075-B or C	NONE	16
5ABP-	80085-H	5.44	2.38	14.94	2.25	1	0	600	540	80075-J or 80075-M	80095-H4 80095-H5	17
5ABP-	80805-H	6.12	2.50	15.00	2.25	1	0	600	540	80075-B or 80075-C	80095-H 80095-H2	16
5ABP-	80805-HZ	6.12	2.50	14.75	2.25	1	0	600	540	80075-B or 80075-C	80095-HZ 80095-HZ2	16
5ADP-	80035	6.25	2.38	14.88	2.25	1	0	100	90	80075-B or C	NONE	16
5ADP-	80085-H	5.44	2.38	14.94	2.25	1	0	600	540	80075-J or 80075-M	80095-H4 80095-H5	17
5ADP-	80805-H	6.12	2.50	15.00	2.25	1	0	600	540	80075-B or 80075-C	80095-H 80095-H2	16
5ADP-	80805-HZ	6.12	2.50	14.75	2.25	1	0	600	540	80075-B or 80075-C	80095-HZ 80095-HZ2	16
5AFP-	80805-D	5.50	4.50	16.00	NONE	2	2	500	460	80075-B or 80075-C	80095-D 80095-D2	18
5AGP-	80805-J	6.12	2.50	16.38	2.25	1	1	550	500	80075-B or 80075-C	80095-J 80095-J1	19
5AGP-	80805-JZ	6.12	2.50	15.50	2.25	1	1	550	500	80075-B or 80075-C	80095-JZ 80095-JZ1	19
5AHP-	80805-W	5.13	2.38	7.25	1.50	1	2	500	450	80075 or D	NONE	
5AMP-	80085-E	5.44	2.38	16.00	2.25	1	1	550	500	80075-J or 80075-M	80095-E 80095-E2	17
5AMP-	80805-K	6.12	2.50	15.75	2.25	0	1	550	500	80075-B or 80075-C	80095-K 80095-K2	7
5AMP-	80805-KZ	6.12	2.50	15.63	2.25	0	1	550	500	80075-B or 80075-C	80095-KZ 80095-KZ2	7
5AQP-	80035	6.25	2.38	14.88	2.25	1	0	100	90	80075-B or C	NONE	16
5AQP-	80085-H	5.44	2.38	14.94	2.25	1	0	600	540	80075-J or 80075-M	80095-H4 80095-H5	17
5AQP-	80805-H	6.12	2.50	15.00	2.25	1	0	600	540	80075-B or 80075-C	80095-H 80095-H2	16
5AQP-	80805-HZ	6.12	2.50	14.75	2.25	1	0	600	540	80075-B or 80075-C	80095-HZ 80095-HZ2	16
5ARP-	80805-X	5.50	5.50	13.25	NONE	0	0	350	330	80075-B or C	NONE	
5ATP-	80085-E	5.44	2.38	16.00	2.25	1	1	550	500	80075-J or 80075-M	80095-E 80095-E2	17
5ATP-	80805-K	6.12	2.50	15.75	2.25	0	1	550	500	80075-B or 80075-C	80095-K 80095-K2	7
5ATP-	80805-KZ	6.12	2.50	15.63	2.25	0	1	550	500	80075-B or 80075-C	80095-KZ 80095-KZ2	7
5AUP-	80805-Y	6.12	6.12	11.00	NONE	1	0	350	330	80075-B or C	NONE	5
5AWP-	80805-C	5.56	2.69	15.00	NONE	2	1	600	540	80075-B or 80075-C	80095-C 80095-C2	20

Fig. 7

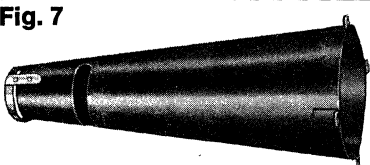


Fig. 8

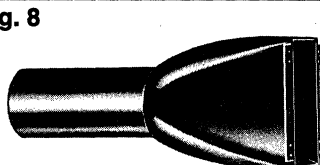


Fig. 9

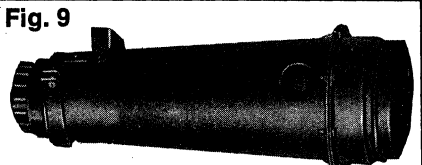


Fig. 10

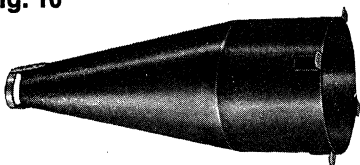


Fig. 11



Fig. 12



MILLEN MAGNETIC SHIELDS FOR CATHODE RAY TUBES

TUBE TYPES	MILLEN SHIELD	FACE DIAMETER INSIDE INCHES	NECK INSIDE DIAMETER INCHES	LENGTH INCHES	TUBE BASE CLAMP	ANODE HOLE	CONTACT CUTOFF	MINIMUM D.C. FIELD REDUCTION IN GUN AREA		USE WITH MILLEN BEZEL #	SHIELD BEZEL ASSEMBLY	FIG. NO.
5AXP-	80805-Y	6.12	6.12	11.00	NONE	1	0	350	330	80075-B or C	NONE	5
5BP-	80805-AZ	6.12	1.87	14.78	1.69	0	0	550	500	80075 or 80075-D	80095-AZ 80095-AZ1	10
5BP-	80045-Z	6.12	1.87	14.78	1.69	0	0	100	90	80075	NONE	10
5BDP-	80805-C	5.56	2.69	15.00	NONE	2	1	600	540	80075-B or 80075-C	80095-C 80095-C2	20
5BFP-	80805-Y	6.12	6.12	11.00	NONE	1	0	350	330	80075-B or C	NONE	5
5BGP-	80085-A	5.44	2.38	16.00	2.25	1	1	600	540	80075-J or M	80095-A4	17
5BGP-	80805-V	6.12	2.50	16.38	2.25	1	1	600	540	80075-B or 80075-C	80095-V 80095-V2	19
5BHP-	80085-A	5.44	2.38	16.00	2.25	1	1	600	540	80075-B or C	80095-A4	17
5BHP-	80805-V	6.12	2.50	16.38	2.25	1	1	600	540	80075-B or C	80095-B5	19
5BNP-	80805-Y	6.12	6.12	11.00	NONE	1	0	350	330	80075 or A	NONE	5
5BTP-	80805-33	5.63	2.63	105.00	NONE	1	0	110	320	80075-B or C	NONE	
5BTP-	80805-33-B	5.63	2.63	10.50	NONE	1	0	550	500	80075-B or C	NONE	
5BTP-	80085-G	5.44	1.75	10.75	1.50	1	0	600	540	80075-J or M	80095-G4	17
5CP-	80055	6.12	2.50	15.50	2.25	1	0	100	90	80075-J or M	NONE	16
5CP-	80055-Z	6.12	2.50	15.16	2.25	1	0	100	90	80075	NONE	16
5CP-	80805-B	6.12	2.50	15.50	2.25	1	0	600	540	80075 or 80075-A	80095-B 80095-B2	16
5CP-	80805-BZ	6.12	2.50	14.66	2.25	1	0	600	540	80075 or 80075-A	80095-BZ 80095-BZ2	16
5CP-	80085-H	5.44	2.38	14.94	2.25	1	0	600	540	80075-J or 80075-M	80095-H4 80095-H5	17
5CAP-	80085-A	5.44	2.38	16.00	2.25	1	1	600	540	80075-J or M	80095-A4	17
5CBP-	80085-B	5.44	2.38	18.25	2.25	1	1	600	540	80075-J or M	80095-B5	17
5CEP-	80805-Y	6.12	6.12	11.00	NONE	1	0	350	330	80075-B or C	NONE	5
5CKP-	80805-Y	6.12	6.12	11.00	NONE	1	0	350	330	80075-B or C	NONE	5
5DEP-	80805-F	6.12	1.87	13.44	1.50	0	0	600	540	80075	NONE	10
5DEP-	80805-FZ	6.12	1.87	13.63	1.50	0	0	600	540	80075	NONE	10
5DWP-	80085-C	5.44	2.38	18.50	2.25	1	1	600	540	80075-J or 80075-M	80095-C4 80095-C5	17
5FP-	80805-Y	6.12	6.12	11.00	NONE	1	0	350	330	80075-B or C	NONE	5
5GP-	80045	6.12	1.87	15.50	1.69	0	0	100	90	80075	NONE	10
5GP-	80805-A	6.12	1.87	15.50	1.69	0	0	550	500	80075 or 80075-A	80095-A 80095-A2	10
5GP-	80805-AZ	6.12	1.87	14.78	1.69	0	0	550	500	80075 or 80075-A	80095-AZ 80095-AZ2	10
5HP-	80045	6.12	1.87	15.50	1.69	0	0	100	90	80075	NONE	10
5HP-	80045-Z	6.12	1.87	14.78	1.69	0	0	100	90	80075	NONE	10
5HP-	80805-A	6.12	1.87	15.50	1.69	0	0	550	500	80075 or 80075-A	80095-A 80095-A2	10
5HP-	80805-AZ	6.12	1.87	14.78	1.69	0	0	550	500	80075 or 80075-A	80095-AZ 80095-AZ2	10

Fig. 13

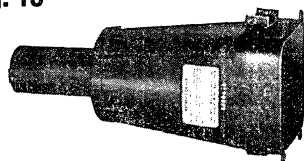


Fig. 14



Fig. 15



Fig. 16

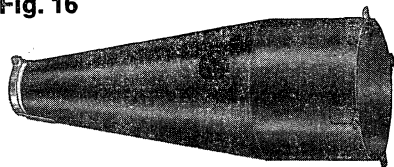


Fig. 17

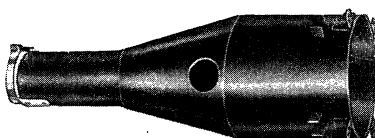
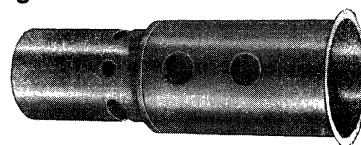


Fig. 18



MILLEN MAGNETIC SHIELDS FOR CATHODE RAY TUBES

TUBE TYPES	MILLEN SHIELD	FACE DIAMETER INSIDE INCHES	NECK INSIDE DIAMETER INCHES	LENGTH INCHES	TUBE BASE CLAMP	ANODE HOLE	CONTACT CUTOFF	MINIMUM D.C. FIELD REDUCTION IN GUN AREA		USE WITH MILLEN BEZEL #	SHIELD BEZEL ASSEMBLY	FIG. NO.
5JP-	80805-G	6.12	1.87	14.25	1.69	1	4	600	540	80075 or 80075-A	80095-G 80095-G2	21
5LP-	80805-E	6.12	1.87	14.56	1.62	1	0	600	540	80075 or 80075-A	80095-E 80095-E2	22
5M24X-	80805-Y	6.12	6.12	11.00	NONE	1	0	600	540	80075 or A	NONE	5
5MP-	80035	6.12	2.38	14.88	2.25	1	0	100	90	80075 or A	NONE	10
5MP-	80805-F	6.12	1.87	13.44	1.50	0	0	600	540	80075 or 80075-A	80095-F 80095-F1	10
5MP-	80805-FZ	6.12	1.87	13.12	1.50	0	0	600	540	80075 or 80075-A	80095-FZ 80095-FZ1	10
5NP-	80045	6.12	1.87	15.50	1.69	0	0	100	90	80075	NONE	10
5NP-	80045Z	6.12	1.87	14.78	1.69	0	0	100	90	80075	NONE	10
5NP-	80805-A	6.12	1.87	15.50	1.69	0	0	550	500	80075 or 80075-A	80095-A 80095-A2	10
5NP-	80805-AZ	6.12	1.87	14.78	1.69	0	0	550	500	80075 or 80075-A	80095-AZ 80095-AZ2	10
5RP-	80805-C	5.50	2.69	15.00	NONE	2	1	600	540	80075-B or 80075-C	80095-C 80095-C2	20
5SP-	80805-D	5.50	4.50	16.00	NONE	3	2	500	450	80075-B or 80075-C	80095-D 80095-D2	18
5UP-	80085-D	5.44	2.00	13.00	1.50	0	0	600	540	80075-J or 80075-M	80095-D4 80095-D5	17
5UP-	80805-F	6.12	1.87	13.44	1.50	0	0	600	540	80075 or 80075-A	80095-F 80095-F1	10
5UP-	80805-FZ	6.12	1.87	13.12	1.50	0	0	600	540	80075 or 80075-A	80095-FZ 80095-FZ1	10
5WP-	80805-Y	6.12	6.12	11.00	NONE	1	0	350	330	80075-B or C	NONE	5
5XP-	80805-C	5.50	2.69	15.00	NONE	2	1	600	540	80075-B or 80075-C	80095-C 80095-C2	20
5YP-	80805-J	6.12	2.50	16.38	2.25	1	1	550	500	80075-B or 80075-C	80095-J 80095-J-1	19
5YP-	80805-JZ	6.12	2.50	15.50	2.25	1	1	550	500	80075-B or 80075-C	80095-JZ 80095-JZ1	19
5ZP-	80805-Y	6.12	6.12	11.00	NONE	1	0	350	330	80075-C or B	NONE	
7ABP-	80807-C	7.50	4.12	12.00	NONE	1	0	600	540	80077-M	NONE	23
7ACP-	80807-G	4.5x6.5	4.50	16.00	NONE	1	0	440	385	BEZEL	80177-D	23
7AEP-	80807-B	7.50	3.00	13.50	NONE	1	0	600	540	80077-M	NONE	23
7AQP & 7AUP	80807-D	7.5 DIA.	3.00	8.00	NONE	1	0	580	520	80077-M	NONE	23
7BP-	80807-C	7.50	4.12	12.00	NONE	1	0	600	540	80077-M	NONE	23
7E10P-	80807-A	7.50	3.00	12.81	NONE	0	0	600	540	80077-M	NONE	23
7GP-	80807-A	7.50	3.00	12.81	NONE	0	0	600	540	80077-M	NONE	23
7JP-	80807-A	7.50	3.00	12.81	NONE	0	0	600	540	80077-M	NONE	23
7MP-	80807-C	7.50	4.12	12.00	NONE	1	0	600	540	80077-M	NONE	23
7SP-	80807-C	7.50	4.12	12.00	NONE	1	0	600	540	80077-M	NONE	23
7TP-	80807-C	7.50	4.12	12.00	NONE	1	0	600	540	80077-M	NONE	23
7VP-	80807-A	7.50	3.00	12.81	NONE	0	0	600	540	80077-M	NONE	23
	80815-A	14.75	6.25	9.75	NONE	0	0	450	390	NONE	NONE	24

Fig. 19

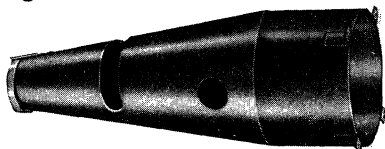


Fig. 20

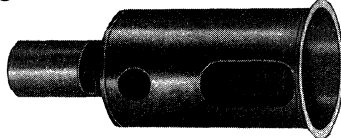


Fig. 21

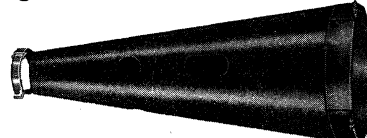


Fig. 22

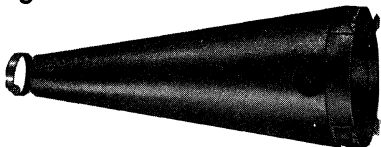


Fig. 23

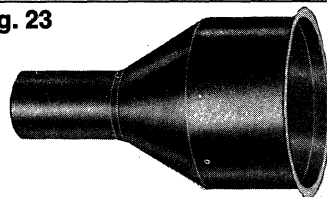
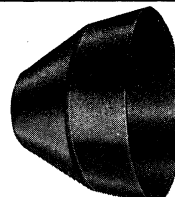
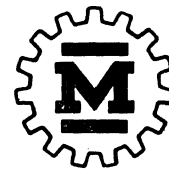


Fig. 24



MILLEN COUPLINGS



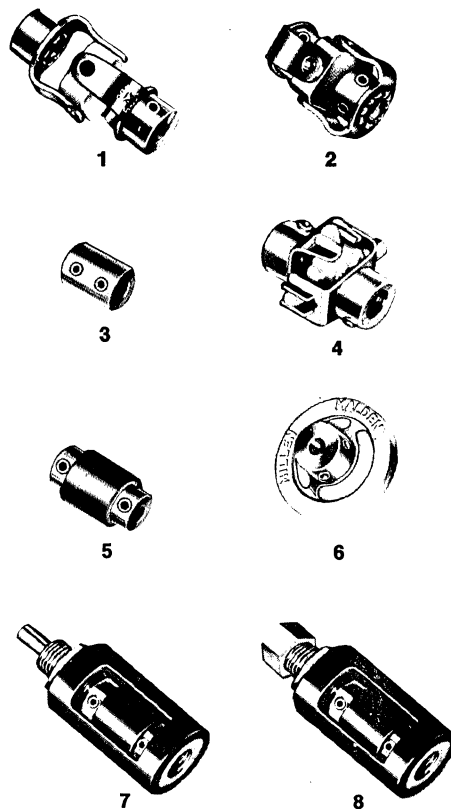
"Designed for Application"®

Miniature and Standard Size

The No. 39000 series of standard size and No. M000 series of miniature Millen "Designed for Application" flexible coupling units include, in addition to improved versions of the conventional types, also such exclusive original designs as the No. 39006 "slide-action" coupling (in ceramic and phenolic insulation or non-insulated for high torque).

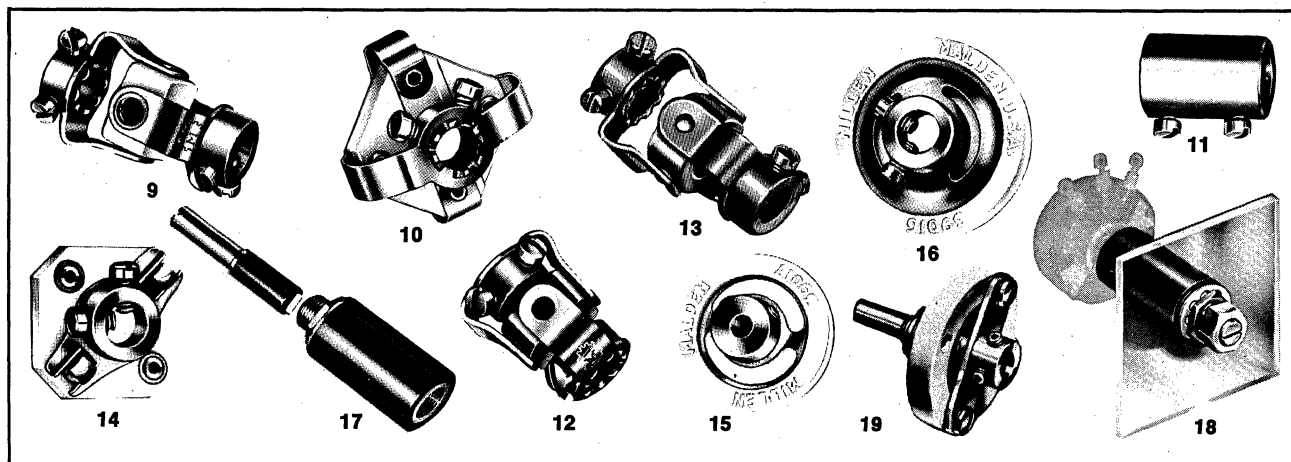
The No. 39016 incorporates features which have long been desired in a flexible coupling **NO Back Lash** — **Higher Flexibility** — **High Breakdown Voltage** — **Smaller Diameter** — etc. The couplings illustrated and tabulated here are standard production type units. Dimensioned drawings of each are contained in the Millen "Industrial Electronics Master Data Book".

The couplings described here are indicative of the types manufactured by the James Millen Mfg. Co., Inc. Many customers require special revisions of the standard designs or entirely special couplings. Hubs to fit 3/32", 1/8", 3/16", 1/4", and 3/8" shafts are available for most couplings where the design permits the use of special hubs. The James Millen Mfg. Co., Inc. often supplies special couplings to customer specifications and is pleased to quote on the design and manufacture of special couplings or revisions of standard couplings.



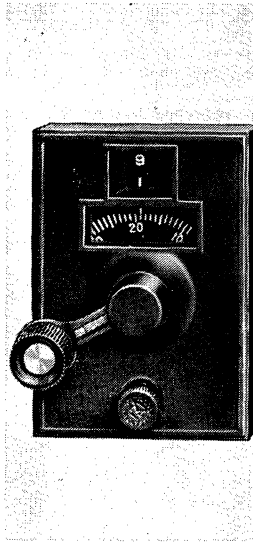
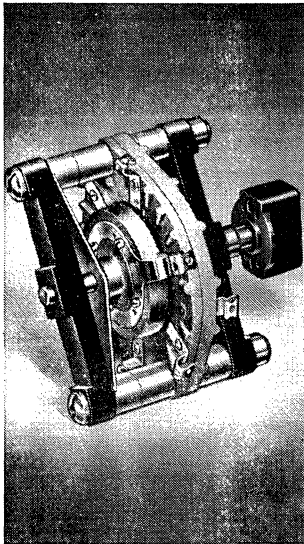
MINIATURE COUPLINGS

Catalog Number	Body Material	Maximum O.D.-In.	Hub to Hub Shaft Size	Length Inches	Voltage Rating Peak Volts	Separable	Maximum Torque In.-Oz.	Misalignment Angular	Parallel	FIG. NO.
M001	Ceramic	9/16	1/8 to 1/8	1 1/16	2500	No	75	45°	0	1
M001-C	Ceramic	9/16	1/8 to 1/8	3/4	2500	No	75	18°	0	2
M003	Brass	9/32	1/8 to 1/8	3/8	Non-Insulated	No	Solid	0	0	3
M004	Brass	9/16	1/8 to 1/8	3/4	Non-Insulated	No	75	18°	0	2
M005	Brass	9/16	1/8 to 1/8	1 1/16	Non-Insulated	No	75	45°	0	1
M005-B	Brass	9/16	1/8 to 1/8	1 1/16	Non-Insulated	No	96	45°	0	1
M006	Ceramic	11/16	1/8 to 1/8	15/16	2500	Yes	30	12°	1/16"	4
M008	Cyclac	11/32	1/8 to 1/8	39/64	6000	No	—	0	0	5
M017	Cyclac	15/16	1/8 to 1/8	17/32	4400	No	110	10°	0	6
M017-A	Cyclac	15/16	1/8 to 3/32	17/32	4400	No	—	10°	0	6
M017-B	Cyclac	15/16	1/8 to 3/16	17/32	4400	No	—	10°	0	6
M017-C	Phosphor Bronze	7/8	1/8 to 1/8	17/32	Non-Insulated	No	—	10°	0	
M017-D	Phosphor Bronze	7/8	1/8 to 3/32	17/32	Non-Insulated	No	—	10°	0	
M017-E	Phosphor Bronze	7/8	1/8 to 3/16	17/32	Non-Insulated	No	—	10°	0	
M023	Cyclac	9/16	1/8 to 1/8	1 9/32	6000	Yes	—	0	0	7
M024	Cyclac	9/16	1/8 to 1/8	1 17/32	6000	Yes	—	0	0	8



MILLEN STANDARD COUPLINGS

Catalog Number	Body Material	Maximum O.D.-In.	Hub to Hub I.D.	Length Inches	Voltage Rating Peak Volts	Separable	Maximum Torque In.-Oz.	Misalignment Angular	Parallel	FIG. NO.
39001	Ceramic	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$1 \frac{5}{16}$	4000	No	110	45°	0	9
39001-C	Ceramic	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{15}{16}$	4000	No	110	18°	0	12
39001-D	Ceramic	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{8}$	$1 \frac{5}{16}$	4000	No	110	45°	0	9
39001-E	Ceramic	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{3}{8}$	$1 \frac{5}{16}$	4000	No	110	45°	0	9
39001-F	Ceramic	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{8}$	$\frac{15}{16}$	4000	No		18°	0	12
39002	Ceramic	$1 \frac{1}{4}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{13}{16}$	3000	No	48	18°	0	10
39002-A	Ceramic	$1 \frac{1}{4}$	$\frac{1}{4}$ to $\frac{1}{8}$	$\frac{13}{16}$	3000	No	48	18°	0	10
39002-B	Ceramic	$1 \frac{1}{4}$	$\frac{1}{4}$ to $\frac{3}{16}$	$\frac{13}{16}$	3000	No	48	18°	0	10
39003	Brass	$\frac{3}{4}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{3}{4}$	Non-insulated	No	Solid	0	0	11
39003-K	Stainless	$\frac{1}{2}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{3}{4}$	Non-insulated	No	Solid	0	0	
39004	Brass	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{15}{16}$	Non-insulated	No	110	18°	0	12
39004-B	Brass	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{15}{16}$	Non-insulated	No	128	18°	0	12
39004-C	Brass	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{3}{16}$	$\frac{15}{16}$	Non-insulated	No	110	18°	0	12
39005	Brass	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$1 \frac{5}{16}$	Non-insulated	No	110	45°	0	13
39005-B	Brass	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$1 \frac{5}{16}$	Non-insulated	No	128	45°	0	13
39005-C	Brass	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{3}{16}$	$1 \frac{5}{16}$	Non-insulated	No	110	45°	0	13
39005-D	Brass	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{8}$	$1 \frac{5}{16}$	Non-insulated	No	110	45°	0	13
39005-E	Brass	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{3}{8}$	$1 \frac{5}{16}$	Non-insulated	No	110	45°	0	13
39006	Ceramic	$\frac{11}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{11}{16}$ to $\frac{7}{8}$	2000	Yes	140	13°	$\frac{1}{16}$	14
39006-A	Ceramic	$\frac{11}{16}$	$\frac{1}{4}$ to $\frac{1}{8}$	$\frac{11}{16}$ to $\frac{7}{8}$	2000	Yes	140	13°	$\frac{1}{16}$	14
39006-B	Aluminum	$\frac{11}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{11}{16}$ to $\frac{7}{8}$	Non-insulated	Yes	140	13°	$\frac{1}{16}$	14
39006-C	Ceramic	$\frac{11}{16}$	$\frac{1}{4}$ to $\frac{3}{16}$	$\frac{11}{16}$ to $\frac{7}{8}$	2000	Yes	140	13°	$\frac{1}{16}$	14
39006-E	Ceramic	$\frac{11}{16}$	$\frac{1}{4}$ to $\frac{3}{8}$	$\frac{11}{16}$ to $\frac{7}{8}$	2000	Yes	140	13°	$\frac{1}{16}$	14
39007	Phenolic	$\frac{11}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{11}{16}$ to $\frac{7}{8}$	2000	Yes	140	13°	$\frac{1}{16}$	14
39008	Ceramic	$1 \frac{1}{4}$	$\frac{1}{4}$ to $\frac{1}{4}$	$1 \frac{1}{8}$	3500	No	48	15°	0	
39009	Ceramic	$1 \frac{5}{8}$	$\frac{1}{4}$ to $\frac{1}{4}$	$1 \frac{1}{8}$	7000	No	190	3°	0	
39009-A	Ceramic	2	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{45}{64}$	6200	No	250	0	0	
39011	Ceramic	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$4 \frac{1}{8}$	10000	No	110	90°	0	
39011-B	Ceramic	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$4 \frac{1}{8}$	10000	No	220	90°	0	
39012	Ceramic	$1 \frac{1}{4}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{11}{16}$ to $\frac{7}{8}$	2000	Yes	320	13°	$\frac{1}{16}$	
39013	Nylon	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$1 \frac{5}{16}$	1700	No	96	45°	0	9
39013-B	Nylon	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$1 \frac{5}{16}$	1700	No	128	45°	0	9
39013-C	Nylon	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{15}{16}$	1700	No	96	18°	0	12
39013-D	Nylon	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{15}{16}$	1700	No	190	18°	0	12
39016	Cyclac	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{9}{16}$	4400	No	160	10°	0	16
39016-A	Cyclac	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{3}{16}$	$\frac{9}{16}$	4400	No	160	10°	0	16
39016-D	Phosphor Bronze	$\frac{11}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{17}{32}$	Non-insulated	No	130	10°	0	
39016-E	Cyclac	$\frac{13}{16}$	$\frac{1}{4}$ to $\frac{1}{8}$	$\frac{9}{16}$	4400	No	160	10°	0	16
39017	Cyclac	$\frac{15}{16}$	$\frac{3}{16}$ to $\frac{3}{16}$	$\frac{17}{32}$	4400	No	80	8°	0	15
39017-A	Cyclac	$\frac{15}{16}$	$\frac{3}{16}$ to $\frac{1}{8}$	$\frac{17}{32}$	4400	No	80	8°	0	15
39017-D	Phosphor Bronze	$\frac{7}{8}$	$\frac{3}{16}$ to $\frac{3}{16}$	$\frac{17}{32}$	Non-insulated	No	80	8°	0	
39023	Phenolic	$\frac{11}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$1 \frac{9}{32}$	5500	No	224	0	0	17
39024	Phenolic	$\frac{11}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$1 \frac{9}{32}$	5500	No	224	0	0	18
39027	Aluminum	$1 \frac{1}{4}$	$\frac{1}{4}$ to $\frac{1}{4}$	$\frac{11}{16}$ to $\frac{7}{8}$	Non-insulated	Yes	320	13°	$\frac{1}{16}$	14
39031	Phenolic	$\frac{15}{16}$	$\frac{1}{4}$ to $\frac{1}{4}$	$2 \frac{1}{8}$		No	Solid	0	0	
39032-B	Ceramic	$1 \frac{5}{8}$	$\frac{1}{4}$ to $\frac{1}{4}$ shaft		9000	No	190	0	0	19

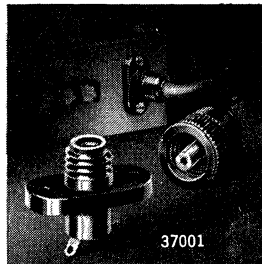
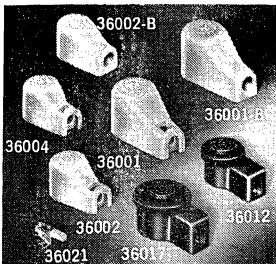


MILLEN NO. 10031 COUNTER DIAL

The No. 10031 Dial is a rugged turns counting dial. It has a 0-99 turn digital readout plus a vernier scale calibrated 0-100. The design includes a built-in dial lock. The output coupling is a hub for 1/4" diameter shaft. The crank handle drives any multi-turn device directly. This new small size dial is designed to drive vacuum variable capacitors, rotary tunable inductors, multi-turn potentiometers, permeability tuned inductors and other multi-turn devices. Height: 4 1/8". Width: 2 3/8". Depth: 1 3/32" behind panel. Bezel and gear case are black molded glass-filled Noryl. Ratio: 1:1. Scales: Black with white numerals.

51000 HIGH VOLTAGE R-F SWITCH

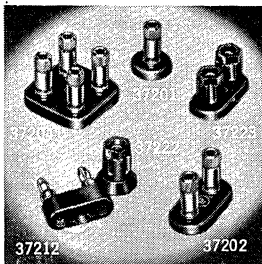
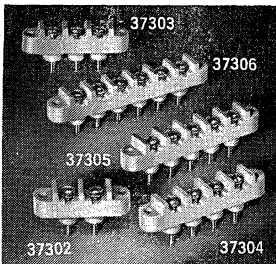
51001: Single Wafer. 1 pole, 2 to 6 positions. 13 KV. D.C. flash-over. 20 Amperes.
51001D: Single Wafer. 2 poles, 2 or 3 positions. 9 KV. D.C. flash-over. 20 Amperes.
51002: Double Wafer. 2 poles, 2 to 6 positions. 13 KV. D.C. flash-over. 20 Amperes.
51002D: Double Wafer. 4 poles, 2 or 3 positions. 9 KV. D.C. flash-over. 20 Amperes.



CERAMIC PLATE OR GRID CAPS—Soldering lugs and contact one-piece. Lug ears annealed and solder dipped to facilitate "mechanical plus soldered" connection of cable.
 No. 36001—3/16" No. 36002—3/8" No. 36004—1/4"

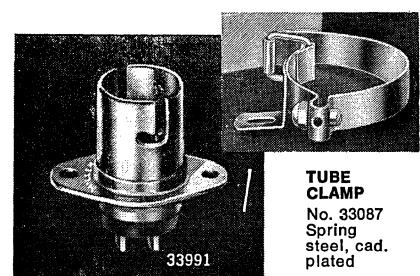
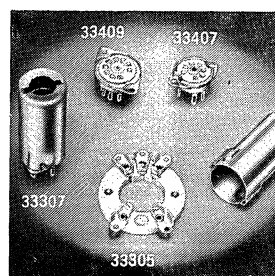
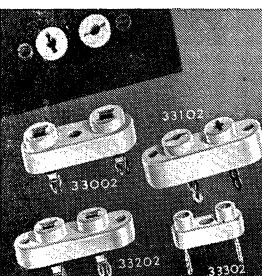
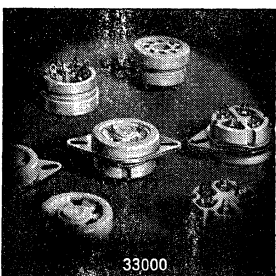
SAFETY TERMINAL—Combination high voltage terminal and thru-bushing. Tapered contact pin fits firmly into conical socket providing large area, low resistance connection. Pin is swivel mounted in cap to prevent twisting of lead wire.
 No. 37001, Black or Red No. 37501, Low loss

STEATITE TERMINAL STRIPS—Terminal and lug are one piece. Lugs are turret type and are free floating so as not to strain L522 ceramic on wide temperature variations. Easy to mount with series of round holes. 1400 volt and 3500 volt series.



POSTS, PLATES, AND PLUGS—The No. 37200 series, including both insulated and non-insulated binding posts with associated plates and plugs, provide various combinations to meet most requirements. The posts have captive heads and keyed mounting. The No. 37291 on No. 37223 are standard in black or red with other colors on special order. No. 37201, No. 37202, and No. 37204 are available in black, red, or low loss. The No. 37202 is also available in steatite.

No.	Description	No.	Description
37201	Single plates, pr.	37204	Double dual plates, pr.
37291	Single plates (tapered), pr.	37212	Dual plug
37202	Dual plates, pr.	37222	Non-insulated binding post
		37223	Insulated binding post



TUBE CLAMP
 No. 33087
 Spring steel, cad. plated

MILLEN TUBE SOCKETS DESIGNED FOR APPLICATION

Long Flashover path to chassis permits use with transmitting tubes, 866 rectifiers, etc. Long leakage path between contacts. Sockets may be mounted either with or without metal flange. Mounts in standard size chassis hole. All types have barrier between contacts and chassis. All but octal and crystal sockets also have barriers between individual contacts in addition.

Voltage regulator dual contact bayonet socket, 33991 black phenolic insulation and 33992 with low loss mica filled phenolic insulation.

No.	Description	No.	Description
33002	Crystal Socket 3/4" x .125"	33004	4 Pin Tube Socket
33102	Crystal Socket .487" x .095"	33005	5 Pin Tube Socket
33202	Crystal Socket 1/2" x .125"		
33302	Crystal Socket .487" x .050"	33008	8 Pin Tube Socket
33407	Miniature Socket only, ceramic	33991	Socket for 991
33409	Noval Socket only, ceramic	33992	Socket for 991
33307	Miniature Socket, Shield, ceramic	33207	829 Socket
33309	Noval Socket, Shield, ceramic	33305	Acorn Socket

JAMES MILLEN

MANUFACTURING COMPANY, INC.
 Main Office and Factory
 150 EXCHANGE ST., MALDEN, MASS. 02148, U.S.A.
 TEL. (617) 324-4108



MILLEN DRIVES, SHAFT LOCKS AND BEARINGS

Stock Millen "Designed for Application" drives, shaft locks and bearings are illustrated and described on this page. Dimensioned drawings of each are contained in The Millen "Industrial Electronics Master Data Book". The parts described here are indicative of the types of drives, shaft locks and bearings manufactured by The James Millen Mfg. Co., Inc. Many customers require special revisions of the standard design or entirely special parts. The James Millen Mfg. Co., Inc. is pleased to quote on the design and manufacture of special parts.

Drives

RIGHT ANGLE DRIVES

- No. A012** — Miniature right angle drive for $\frac{1}{8}$ " shafts. Single hole mounting. One to one ratio. $15/32" \times \frac{3}{4}" \times \frac{7}{8}"$.
No. 10012 — Standard size right angle drive for $\frac{1}{4}$ " shafts. Provisions for many methods of mounting. 1:1
No. 10012-T — Thru-sleeve right angle drive. Stainless steel sleeve to take $\frac{1}{4}$ " diameter shaft. One to one.

WORM DRIVE UNITS

- Cast aluminum frame may be panel or base mounted. Spring loaded split gears to minimize backlash. $\frac{3}{4}" \times 2\frac{1}{2}" \times 3"$.
No. 10000-A — 16:1 anti-backlash worm drive.
No. 10000-B — 48:1 anti-backlash worm drive.
No. 10000-C — 12:1 anti-backlash worm drive.
No. 10000-D — 36:1 anti-backlash worm drive.

GEAR DRIVE

- No. 10000-12** — Spring loaded split gears to minimize backlash. 2 to 1 ratio spur gears. $1\frac{1}{2}" \times 1\frac{1}{8}" \times 1\frac{3}{16}"$.

FRICTION DRIVE

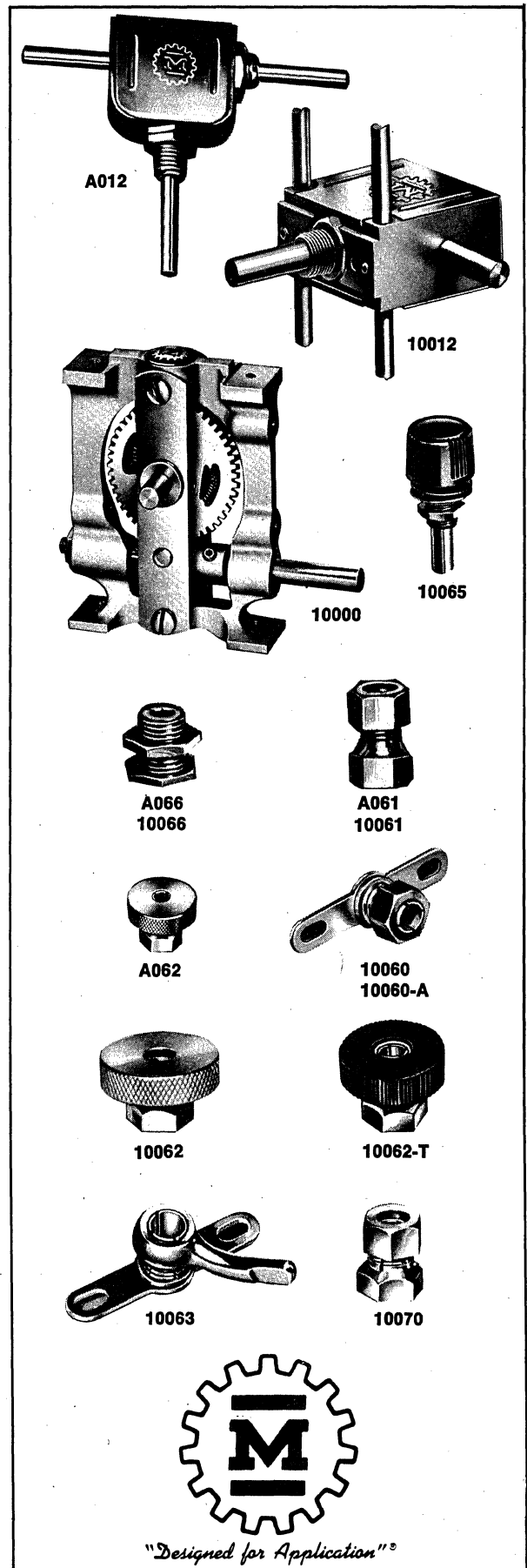
- No. 10065** — Friction drive for .025" to .032" thick disc dials. Complete with $13/16"$ diameter black phenolic knob.

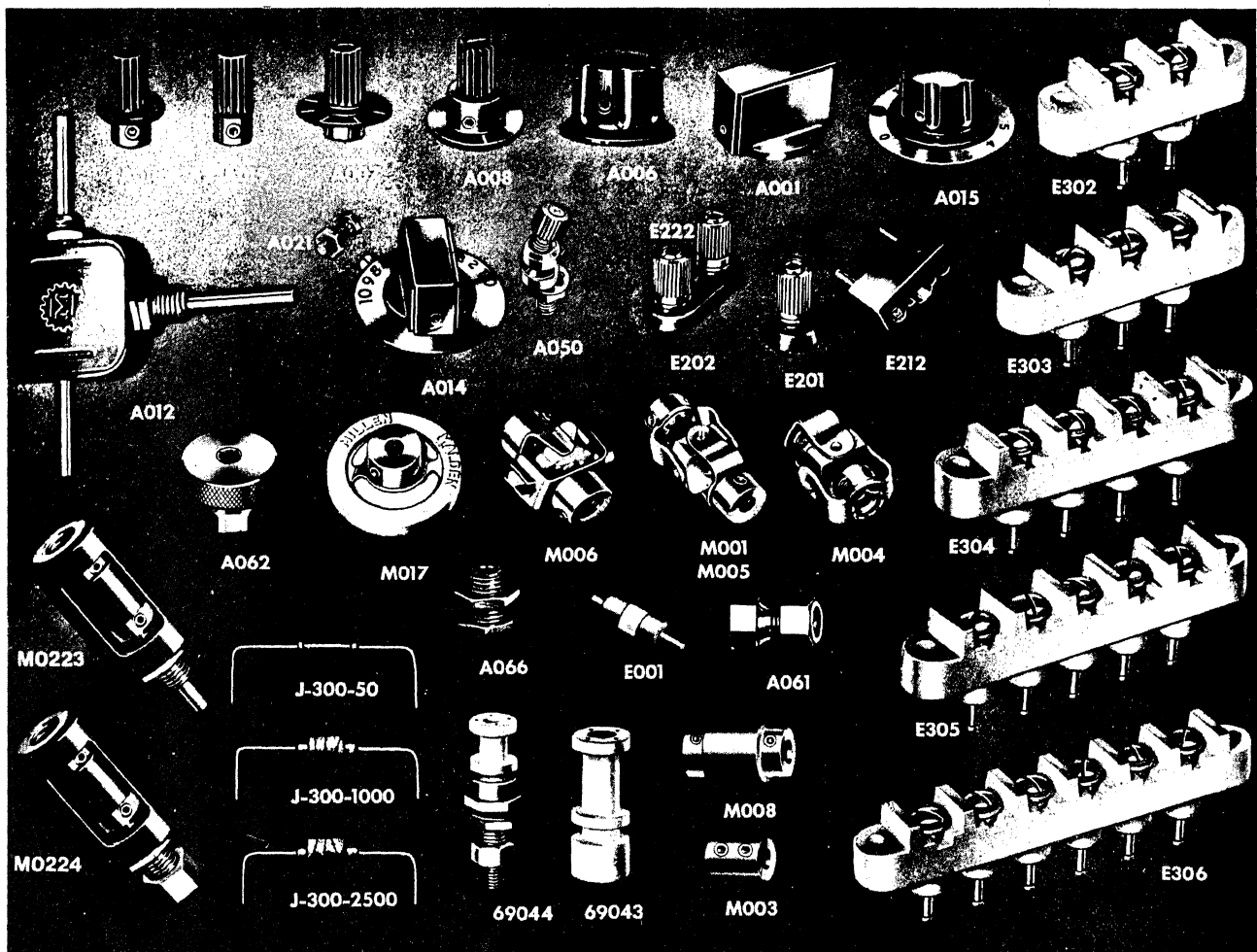
Shaft Locks

- No. A061** — Miniature shaft lock for $\frac{1}{8}"$ diameter shaft. $\frac{1}{4}$ -32 bushing. Nickel plated brass. Body $11/32"$ hex.
No. A062 — Miniature shaft lock with knurled locking nut for thumb operation. For $\frac{1}{8}"$ diameter shaft.
No. 10060 — Original standard size shaft lock for $\frac{1}{4}"$ diameter shaft. $\frac{3}{8}$ "-32 bushing with $7/16"$ hex nut.
No. 10060-A — Shaft lock for $\frac{3}{8}"$ diameter shaft. $9/16"$ -32 bushing with $\frac{5}{8}"$ hex nut. Nickel plated brass.
No. 10061 — Standard size shaft lock for instant conversion of "plain" $\frac{1}{4}"$ diameter shaft to "locking type".
No. 10062 — Thumb screw shaft lock for $\frac{1}{4}"$ diameter shaft. $\frac{3}{8}$ "-32 bushing. Nickel plated brass.
No. 10062T — Standard shaft lock with molded phenolic thumb operated locking nut. $\frac{3}{8}$ "-32 bushing with 1" nut.
No. 10063 — Lever operated shaft lock for $\frac{1}{4}"$ diameter shaft. $\frac{3}{8}$ "-32 bushing. Nickel plated brass.
No. 10064 — Shaft lock with dome locking nut. For $\frac{1}{4}"$ diameter shaft. $\frac{3}{8}$ "-32 bushing. Nickel plated brass.
No. 10064-C — Dome locking nut for use on slotted $\frac{3}{8}$ "-32 bushings. Nickel plated brass. Also black oxide finish.

BEARINGS

- No. A066** — Miniature shaft bearing for $\frac{1}{8}"$ diameter shaft. Nickel plated brass. Fits $17/64"$ diameter hole.
No. 10066 — Standard size shaft bearing for $\frac{1}{4}"$ diameter shaft. Nickel plated brass. Fits $\frac{1}{2}"$ diameter hole.





MILLEN MINIATURIZED COMPONENTS

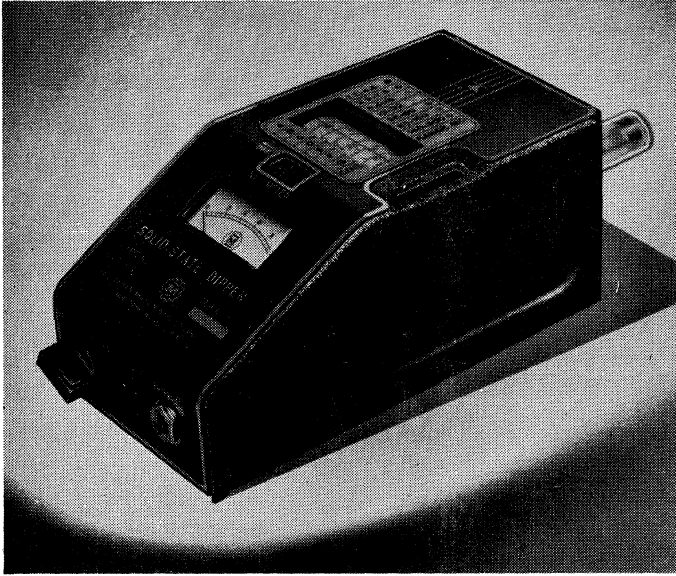
DESIGNED for APPLICATION miniaturized components developed for use in our own equipment such as the 90901 Oscilloscope, are available for separate sale. Many of these parts are similar, in most details except size, to their equivalents in our standard component parts group. In certain devices where complete miniaturization is not paramount, a combination of standard and miniature components may possibly be used to advantage. For convenience, we have also listed on this page the extremely small sized coil forms from our standard catalog.

Code	Description
A001	Bar knob for $\frac{1}{8}$ " shaft. $\frac{1}{2}$ " high by $\frac{3}{4}$ " long.
A006	Fluted black plastic knob with brass insert for $\frac{1}{8}$ " shaft. $\frac{1}{2}$ " high by $\frac{3}{4}$ " diameter.
A007	$\frac{1}{4}$ " black plastic dial knob with brass insert for $\frac{1}{8}$ " shaft. $\frac{5}{8}$ " diameter dial. $\frac{1}{16}$ " high.
A008	$\frac{1}{4}$ " black plastic knob. Same as no. A007 except for style.
A012	Right angle drive for $\frac{1}{8}$ " shafts. Single hole mounting.
A014	1" bar dial for $\frac{1}{8}$ " shaft. $\frac{1}{2}$ " high. 180° or 280° dials for clockwise or counter-clockwise rotation.
A015	1" fluted knob dial for $\frac{1}{8}$ " shaft. $\frac{1}{2}$ " high. Same dial plates as no. A014.
A017	$\frac{1}{8}$ " diameter fluted black plastic knob for $\frac{1}{8}$ " shaft.
A018	Knob, same as no. A007 except with $\frac{1}{16}$ " diameter flange.
A019	Knob, same as no. A007, but without dial.
A021	Miniature metal index for miniature dials.
A050	Miniature dial lock.
A061	Shaft lock for $\frac{1}{8}$ " diameter shaft. $\frac{1}{4}$ "-32 bushing. Nickel plated brass.
A062	Shaft lock with knurled locking nut.
A066	Shaft bearing for $\frac{1}{8}$ " diameter shafts. Nickel plated brass. Fits $\frac{1}{16}$ " diameter hole.

Code	Description
E001	Steatite ceramic standoff or tie-point. Integral mounting eyelet. 0.205" overall diameter.
E201	Black or red plastic binding post plates for No. E222.
E202	Black or red plastic plates for two binding posts spaced $\frac{1}{2}$ ".
E212	Black or red plastic plug for two binding posts spaced $\frac{1}{2}$ ".
E222	Metal binding post with jack top.
E302A	to E306A Steatite ceramic terminal strips. $\frac{1}{16}$ " wide. Terminals spaced $\frac{3}{8}$ " on centers. Screw type or solder type thru-terminals.
J300-3.3 to J300-2500	Complete line of miniature inductances 3.3 to 2500 microhenries. $\frac{3}{8}$ " long. Diameter 0.115" to 0.313".
M001	Insulated universal joint style flexible coupling for $\frac{1}{8}$ " dia. shafts.
M003	Solid coupling for $\frac{1}{8}$ " dia. shafts. Nickel plated brass.
M004	Universal joint style flexible coupling for $\frac{1}{8}$ " diameter shafts. Inverted hubs for short length. Not insulated.
M005	Universal joint style flexible coupling for $\frac{1}{8}$ " diameter shafts. External hub. Not insulated.
M006	Universal joint style flexible coupling for $\frac{1}{8}$ " diameter shafts. Spring finger. Steatite ceramic insulation.
M008	Plastic insulated coupling with nickel plated brass inserts for $\frac{1}{8}$ " diameter shafts.
M017	Plastic insulated flexible coupling for $\frac{1}{8}$ " diameter shafts. $\frac{7}{32}$ " long by $\frac{1}{16}$ " diameter. Bronze yoke.
M023	Insulated shaft extension for $\frac{1}{4}$ "-32 bushing and $\frac{1}{8}$ " shaft. For mounting sub-miniature potentiometer.
M024	Locking insulated shaft extension similar to no. M023.
69043	Steatite ceramic coil form. Adjustable core. Winding space $\frac{1}{4}$ " diameter by $\frac{13}{32}$ " long. Mounting 4-40 hole.
69044	Steatite ceramic coil form. Adjustable core. Winding space 0.187" dia. by $\frac{1}{16}$ " long. No. 10-32 mounting.

"Designed for Performance"®

SOLID-STATE DIPPER



The Millen No. 90652 Solid-State Dipper is a dip oscillator with performance comparable to that of the best vacuum-tube grid dip meters available, but with the universal advantage of battery power which eliminates the power cord and provides a portability which is not restricted by the requirement for a-c power.

The No. 90652 Solid-State Dipper is supplied in a convenient polypropylene carrying case with a complete set of coils and a 9-volt alkaline battery to provide instant operation.

The operating features of the No. 90652 Solid-State Dipper include (1) a sensitive oscillator-dipper for checking resonant frequencies of non-energized resonant circuits, and (2) an absorption-type wavemeter with the oscillator circuit arranged to act as a Q-Multiplier Amplifier, providing both a sharp tuning response and great sensitivity. Frequency range: 1.7 to 300 MHz/z.

Size of Dipper — $7\frac{1}{4}$ "L x $3\frac{1}{2}$ "W x $3\frac{3}{16}$ "H

Weight of Dipper — $2\frac{1}{2}$ Pounds with battery

Size of Carrying Case With Dipper and Coils — $11\frac{3}{8}$ "L x $5\frac{1}{8}$ "W x 4"H

Shipping Weight — 7 Pounds

Tube GRID DIP METER



The Millen 90651-A Tube Grip Dip Meter is a calibrated stable RF oscillator unit with a transistorized electronic voltmeter to indicate the amplitude of the output. The frequency determining coil is plugged into the unit so that it may be used as a probe.

It features a transistor d.c. amplifier, and taut band meter.

The No. 90651-A is supplied complete in a convenient polypropylene carrying case which keeps the coil/probes with the Grid Dip Meter and protects both.

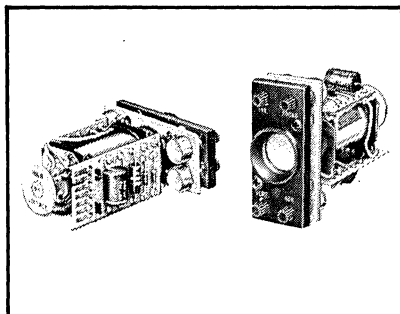
Five additional coils are available for extending the range to 165 KC.

The No. 90651-A has a transistor d.c. amplifier to increase sensitivity. It provides full scale meter reading at all frequencies from 1.7 to 300 mHz. It has a modern, taut band meter to eliminate any possibility of the meter ever becoming "sticky." These additions are made while still maintaining all of the features which have made the Millen No. 90651 Grip Dip Meter so thoroughly reliable it has become the standard of the industry. It uses the same stable oscillator without spurious dips, it has a transformer-type power supply, it has seven coils protected by form fitting molded covers, etc.

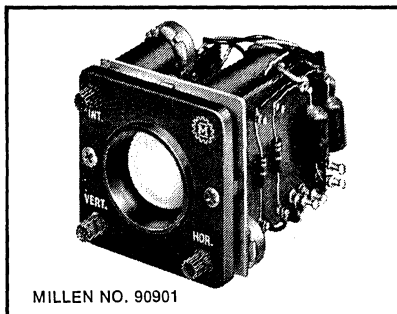
JAMES MILLEN MANUFACTURING COMPANY, INC.
Main Office and Factory
150 EXCHANGE ST., MALDEN, MASS. 02148, U.S.A.
TEL. (617) 324-4108



SCOPE MODULES TO BUILD INTO EQUIPMENT

**3/4 Inch Round Tube/Flat Face**

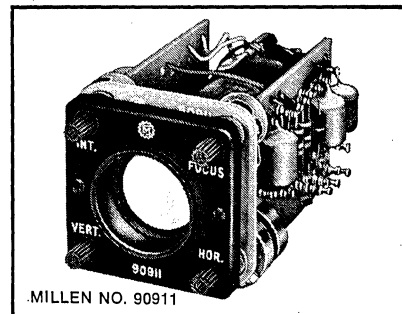
The Millen No. 90975 is an ultra-small, economical 'Scope with a flat face shielded 1DP1 C.R.T. that requires little power. Mounts on your panel and has a plug on rear for all input connections. Height: 2 3/4 inches overall. Depth: 3 1/2 inches behind panel. Width: 1 1/4 inches overall. Weight: 5 1/2 ounces, including tube. Uses Millen No. 90202 Module Plug-in High Voltage Power Supply. Sensitivity: Vert. 158, Hor. 184 v. per cm. defl.



MILLEN NO. 90901

One Inch Round Tube

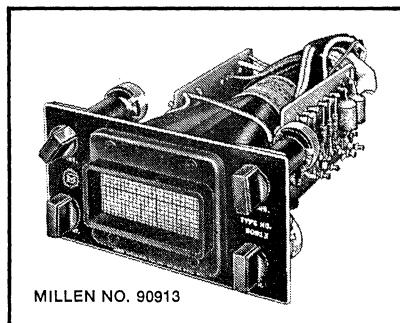
The Millen No. 90901 is the most economical of the module oscilloscopes. It uses a type 1CP31 one inch diameter cathode ray tube with fixed focus. Requires little power. Mounts on your panel. Height: 2 3/4 inches overall. Depth: 4 1/2 inches behind panel. Width: 2 1/2 inches overall. Weight: 10 ounces. Uses Millen No. 90202 Module Plug-in High Voltage Power Supply. Sensitivity: Vertical: 48, Horizontal: 71 v. p-p per cm. defl.



MILLEN NO. 90911

1 1/4 Inch Round Tube/Flat Face

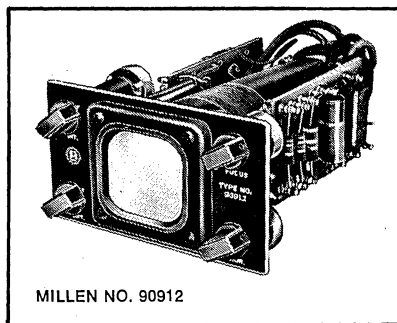
The Millen No. 90911 is a small module oscilloscope using the American-made type 1EP1 1 1/4 inch diameter cathode ray tube. The No. 90911 has balanced deflection, focus control and provisions for blanking or intensity modulation. Requires little power. Mounts on your panel. Height: 2 1/2 inches overall. Depth: 4 1/2 inches behind panel. Width: 3 1/2 inches overall. Weight: 12 ounces. Uses No. 90202 Plug-in High Voltage Power Supply.



MILLEN NO. 90913

3 x 1 1/2 Inch Rectangular Tube

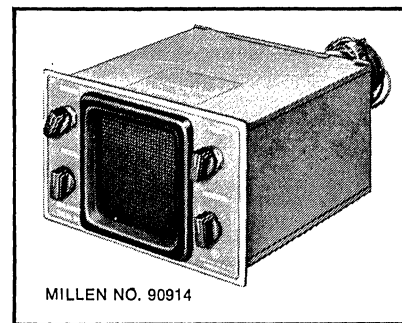
The Millen No. 90913 is a small module oscilloscope providing the larger rectangular display of a three inch tube, but requiring only the panel space used by a two inch tube. The No. 90913 has balanced deflection and has provisions for intensity modulation or blanking. Requires little power. Mounts on your panel. Height: 3 inches. Depth: 9 1/2 inches behind panel. Width: 6 inches. Weight: 1 1/2 pounds. Uses No. 90202 Power Supply.



MILLEN NO. 90912

Two Inch Round Tube

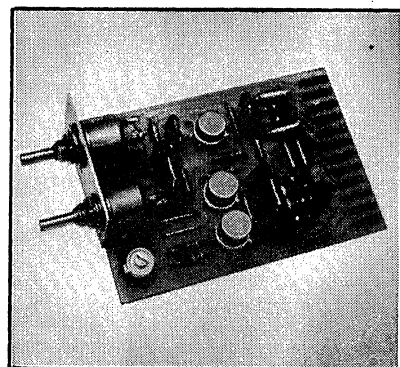
The Millen No. 90912 is a panel mounting module oscilloscope intended to be built into the customer's equipment. It is complete with bezel and panel, control of intensity, focus, vertical centering and horizontal centering. It requires only 3 x 5 inches of panel space but provides a 1 3/4 x 1 1/2 inch display. Requires little power. Mounts on your panel. Height: 3 inches. Depth: 7 1/4 in. behind panel. Width: 5 in. Weight: 1 3/4 pounds.



MILLEN NO. 90914

3 1/2 Inch Square Tube

The Millen No. 90914 is a panel mounting module oscilloscope intended for monitoring applications. This oscilloscope indicator is complete with front panel, bezel and front panel controls consisting of Intensity, Focus, Vertical Centering and Horizontal Centering. The No. 90914 uses a 4KP-square face cathode ray tube. Requires little power. Mounts on your panel. Height: 3 1/2 in. Depth: 11 1/4 in. Width: 6 1/2 in.

90928 Deflection Amplifier

MILLEN NO. 90928

Solid State Direct Coupled**Frequency Response:**

DC to 500 kHz for 15 v. peak to peak output (-3 db). (Balanced).
DC to 100 kHz for 250 v. peak to peak output (balanced).

Gain: Voltage: 650 Power: 55 db

Sensitivity: 23 millivolts input peak to peak produces 15 volts peak to peak swing.

Input Impedance: 100 k ω carbon potentiometer.

Output Impedance: 47 k ω collector load resistors.

Positioning: DC positioning control provided.

At least ± 150 volts plate-to-plate positioning voltage available.

Input: Single-ended.

Output: Push-pull balanced or single-ended (unbalanced).

Power Requirements:

+300 volts unreg. 7 ma.
+15 volts reg. 12.5 ma.
-15 volts reg. 5 ma.

Dimensions:

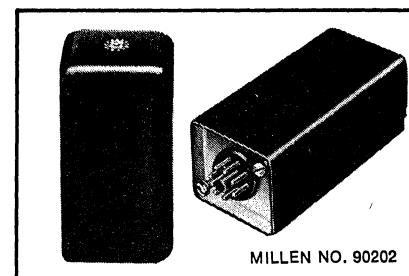
With control potentiometers mounted on bracket 2" w x 3 1/16" lg. x 1 1/16" deep.

With potentiometers removed

(for remote mounting) 2" x 3" x 5/8".

12 contacts, 0.156 centers, to fit circuit board receptacle (Such as Cinch 50-12A-20).

Weight: 1.7 oz.



MILLEN NO. 90202

Module Power Supplies

The Millen No. 90202 Plug-in High Voltage Module for use with the Millen Module Oscilloscopes supplies both high voltage and heater power. Input: 105-125 volts, 60 Hz. Output: 750 volts d.c. at 3 ma. to 1140 volts d.c. at 1 ma. and 6.3 volts a.c. at 0.6 ampere. Physical Data: 1 7/8" x 2 1/8" x 4 3/8". The Millan No. 90202-C is similar to No. 90202 except recommended for continuous duty and for 50 Hz. applications.

JAMES MILLEN

MANUFACTURING COMPANY, INC.

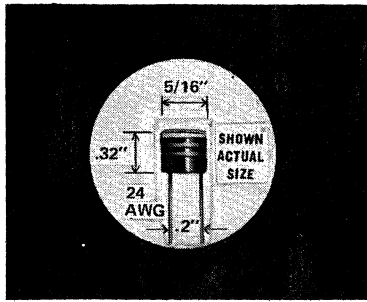
Main Office and Factory

150 EXCHANGE ST., MALDEN, MASS. 02148, U.S.A.

TEL. (617) 324-4108



MINIATURE J302 SERIES ENCAPSULATED FOR PRINTED CIRCUITS

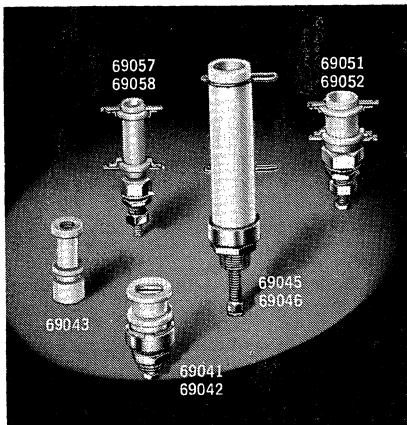


Catalog Number	Inductance Microhenries	Min. Q	Self Resonant Freq.
J302-3.3	3.3 ± 10%	20	43 MHz
J302-3.9	3.9 ± 10%	20	39
J302-4.7	4.7 ± 10%	25	35
J302-5.6	5.6 ± 10%	25	32
J302-6.8	6.8 ± 10%	25	29.0
J302-8.2	8.2 ± 10%	25	26.0
J302-10	10 ± 10%	25	23.0
J302-12	12 ± 10%	25	21.0
J302-15	15 ± 10%	25	18.5
J302-18	18 ± 10%	25	16.5
J302-22	22 ± 5%	30	15
J302-24	24 ± 5%	30	14
J302-25	25 ± 5%	30	14
J302-27	27 ± 5%	30	13
J302-30	30 ± 5%	30	12
J302-33	33 ± 5%	30	12 MHz

Catalog Number	Inductance Microhenries	Min. Q	Self Resonant Freq.
J302-36	36 ± 5%	30	11 MHz
J302-39	39 ± 5%	30	11
J302-43	43 ± 5%	30	10
J302-47	47 ± 5%	30	9.7
J302-50	50 ± 5%	25	9.4
J302-56	56 ± 5%	30	8.8
J302-62	62 ± 5%	30	8.3
J302-68	68 ± 5%	30	7.9
J302-75	75 ± 5%	30	7.5
J302-82	82 ± 5%	30	7.2
J302-91	91 ± 5%	30	6.8
J302-100	100 ± 5%	35	6.5
J302-120	120 ± 5%	35	5.8
J302-130	130 ± 5%	40	5.5
J302-150	150 ± 5%	40	5.2
J302-180	180 ± 5%	45	4.7
J302-200	200 ± 5%	45	4.3
J302-220	220 ± 5%	50	4.1
J302-240	240 ± 5%	50	3.9
J302-250	250 ± 5%	50	3.8
J302-270	270 ± 5%	50	3.7
J302-300	300 ± 5%	55	3.5
J302-330	330 ± 5%	55	3.3
J302-360	360 ± 5%	55	3.1
J302-390	390 ± 5%	55	3.0
J302-430	430 ± 5%	60	2.8
J302-470	470 ± 5%	45	2.7
J302-500	500 ± 5%	60	2.6
J302-510	510 ± 5%	60	2.6
J302-560	560 ± 5%	60	2.4 MHz

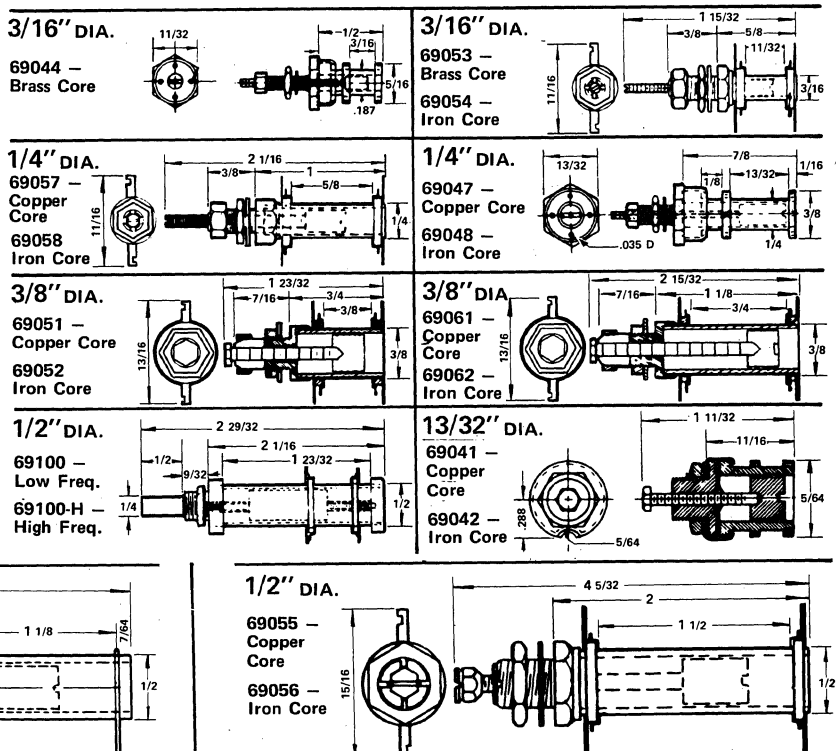
Catalog Number	Inductance Microhenries	Min. Q	Self Resonant Freq.
J302-620	620 ± 5%	60	2.3 MHz
J302-680	680 ± 5%	60	2.2
J302-750	750 ± 5%	60	2.1
J302-820	820 ± 5%	60	2.0
J302-910	910 ± 5%	60	1.9
J302-1000	1000 ± 5%	60	1.8
J302-1200	1200 ± 5%	60	1.6
J302-1300	1300 ± 5%	60	1.5
J302-1500	1500 ± 5%	60	1.4
J302-1800	1800 ± 5%	55	1.3
J302-2000	2000 ± 5%	55	1.2
J302-2200	2200 ± 5%	55	1.1
J302-2400	2400 ± 5%	55	1.1
J302-2500	2500 ± 5%	55	1.1
J302-2700	2700 ± 5%	50	1.0 MHz
J302-3000	3000 ± 5%	50	960 KHz
J302-3300	3300 ± 5%	50	920
J302-3600	3600 ± 5%	50	880
J302-3900	3900 ± 5%	45	840
J302-4300	4300 ± 5%	45	800
J302-4700	4700 ± 5%	45	760
J302-5000	5000 ± 5%	40	740
J302-5100	5100 ± 5%	40	730
J302-5600	5600 ± 5%	40	700
J302-6200	6200 ± 5%	40	650
J302-6800	6800 ± 5%	40	620
J302-7500	7500 ± 5%	40	600
J302-8200	8200 ± 5%	40	560
J302-9100	9100 ± 5%	35	530
J302-10,000	10,000 ± 5%	35	500

MILLEN 69000 SERIES PERMEABILITY TUNED CERAMIC FORMS



SPECIAL CORE
MATERIALS AVAILABLE
ON ORDER

TEL. (617) 324-4108

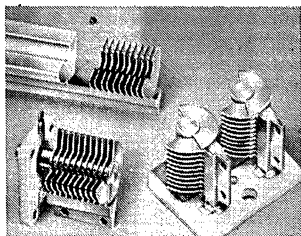


JAMES MILLEN

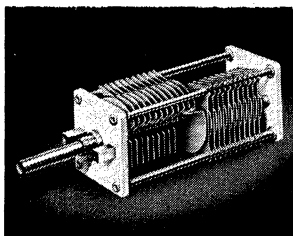
MANUFACTURING COMPANY, INC.
Main Office and Factory
150 EXCHANGE ST., MALDEN, MASS. 02148, U.S.A.
TEL. (617) 324-4108



MILLEN CAPACITORS—STANDARD AND "SPECIAL" ORDER TYPES

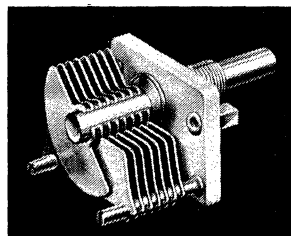


No. 25000 miniature, precision, high Q variable air dielectric capacitors with high reliability are machined from solid bars of extruded brass. Knob or screwdriver adjust from the front. Single hole mount, mount with two screws, or with tabs. 0.010" air gap. 350V. 21 plate 25035 is 4.0 to 35.8pf. 0.750" x 0.562" x 23/32"L.



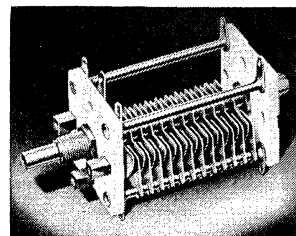
No. 28000 Straight line capacity or **No. 29000** straight line frequency. Double ceramic end plates 1 1/4" x 1 1/4". Double bearing. Single or double section. Balanced or inline rotor. Air gap 0.022"-850V. peak, 0.040"-1350V. peak, 0.066"-2250V. peak.

28227MKW 16-227pf. 1350V. 4 1/4"L.
29025KM 3.9-23.3pf. 850V. 1 1/4"L.



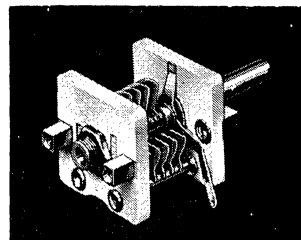
No. 22000 Ceramic end plate 1 1/4" x 1 1/4". Single bearing or double bearing. Air gap 0.020"-800V. peak or 0.060"-2000V. peak.

22006 2.8-7.5 pf. 800V. 1 1/4"L.
22200MK 11-207pf. 800V. 2 3/4"L.
22910 4.1-12.5pf. 2000V. 1 1/4"L.
22950MK 8.5-57.0pf. 2000V. 3"L.

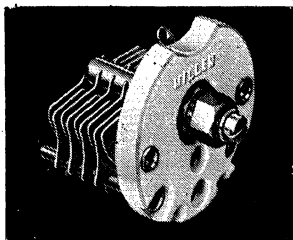


No. 23000 Ceramic end plate 1 1/4" x 1 1/4". Single bearing or double bearing. Single or dual section. Balanced or inline rotor. Air gap: 0.020"-800V. peak or 0.060"-2000V. peak.

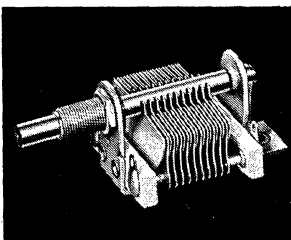
23907MKY 3.5-7pf. 2000V. 1 1/4"L.
23140MK 10-146.5pf. 800V. 2 1/4"L.



No. 21000 series is a smaller version of the popular Millen 23000 series variable air capacitors. Single and dual sections are precision-built for smooth rotation. All plates (rotor and stator) are soldered to supporting members to insure permanent bonding and elimination of microphonics. Non-chatter brass bearings; brass plates are plated.

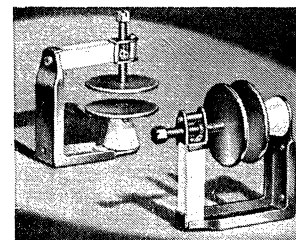


No. 17000 series is a single section tuning capacitor with a ceramic front plate. Soldered brass plates are cadmium plated, and uniformly spaced. Straight line capacity. Air gap 0.022" 850V. peak. Wide air gap capacitors may be supplied. Specify type number followed by the designation of W or Y. Gap: W—1350V. peak, Y—2250V. peak.



No. 19000 Ceramic insulators. Cross-section 1 1/4" x 1 1/4". Double bearing. Air gap 0.022"-850V. peak, 0.040"-1350 V. peak or 0.066"-2250V. peak. Single section. Tapped mounting brackets.

19335 14.7-339pf. 850V. 2 3/4"L.
19950 11.6-60pf. 2250V. 2 1/4"L.

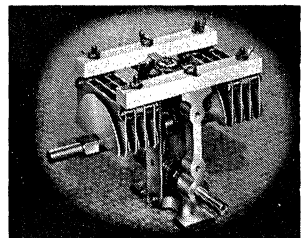


No. 15000 NEUTRALIZING CAPACITORS. Parallel discs or concentric cylinders.

15011 Disc. 3.5pf. at 0.4" gap to 18pf. at 0.04" gap.

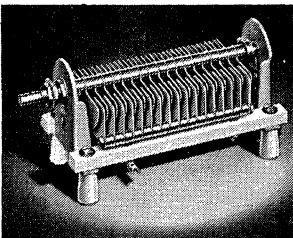
15005 Cylindrical Capacitor—3.5pf. to 16.2pf—4000V. peak.

15006 Cylindrical Capacitor—3.2pf. to 9.7pf—6000V. peak.



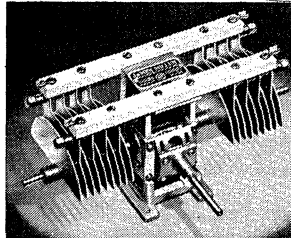
No. 11000 TRANSMITTING CAPACITORS. 16/1 or 48/1 ratio center gear drive. Ceramic insulation. Air gap 0.077"—3000V. peak or 0.176"—6000 V. peak. Aluminum plates 0.040" thick. Dual section.

11035 5.3-34pf. 3000V. 5 1/4"L.
11090 10-93pf 3000V. 7 1/4"L.

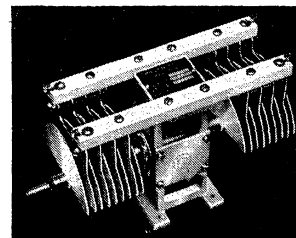


No. 12000 TRANSMITTING CAPACITORS. Rigid, heavy channeled aluminum end plates. Ceramic insulation. Single or dual section. Air gap 0.077"—3000V. peak or 0.176"—6000 V. peak. Aluminum plates 0.040" thick.

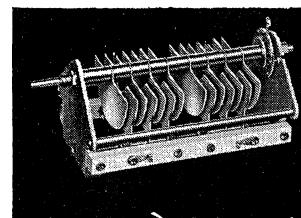
12935 9.7-28pf. 6000V. 4"L.
12515 16-150pf. 3000V. 5 1/4"L.



No. 04000 BALANCED TRANSMITTING CAPACITORS. 1/1 right angle center gear drive. Adjustable drive angle for sloping panel. Sturdy cast aluminum frame. Ceramic insulation. Air gap 0.077"—3000V. peak, 0.171"—6000V. peak or 0.265"—9000V. peak. Polished plates.



No. 14000 series transmitting capacitors have center-fed rotors for better high frequency current distribution, and ceramic insulation. "Designed for Application" terminals are in convenient places. End drive or right angle drive. Heavy gauge aluminum plates. Heavy cast aluminum mounting frame is employed. Rotor plate diameter is 3 1/2".



No. 16000 TRANSMITTING CAPACITORS. Ceramic insulation. Air gap 0.077"—3000V. peak, 0.171"—6000V. peak or 0.265"—9000V. peak. Polished aluminum plates 0.050" thick. Single or dual section.

16550 13-52pf. 6000V. 3 3/4"L.
16559 11-65pf. 9000V. 6 1/4"L.
16530 45-297pf. 6000V. 12 1/2"L.
16512 40-128pf. 9000V. 11 1/2"L.

Special Capacitors "Designed For Application"

At James Millen Mfg. Co., Inc. "special" capacitor designs and developments are the commonplace. Orders for unusual "special" capacitors are a specialty with us where we have the vast amount of standard parts and pieces of capacitor hardware to accomplish an infinite variety of specialized capacitors from the basic unit up to a completely new design. Whether it is a "special" capacitor to fit into a one inch cube or a capacitor a foot long, or custom units with low voltages required in solid state circuits to 9000 volt applications, James Millen Manufacturing Co., Inc. can design and produce it. Regardless of the size, voltage, or capacity, and whether it is an inline drive, right angle drive, gear box driven, or motor driven our facilities can manufacture a special capacitor to meet your specifications. Balanced

low-torque constructions are also available to meet all the needs of the Armed Services and highly specialized research programs.

Since James Millen Manufacturing Co., Inc. manufactures and designs a wide range of shaft hardware (knobs, drives, couplings, locks, and gears) we can incorporate these into "special" capacitor designs to meet practically any equipment need, as well as its commercial or MIL specifications. The capacitor experience of James Millen Manufacturing Co., Inc. is based upon years of custom manufacturing for companies such as RCA, Foxboro Company and others. This experience plus the available tooling will give you an unusual advantage in obtaining "special" capacitors with speedy delivery, exacting quality and custom design at a sensible price.

JAMES MILLEN

MANUFACTURING COMPANY, INC.

Main Office and Factory

150 EXCHANGE ST., MALDEN, MASS. 02148, U.S.A.

TEL. (617) 324-4108



SGL ELECTRONICS

MAGNETIC COMPONENTS

MAGNETIC LAMINATIONS

Available without tooling charge in a wide variety of EI, EE, F, DU, IU, L shapes in 6 and 14 mil. thickness, non-oriented and oriented, 80% and 50% nickel alloys. Also available in 4, 6, and selected 14 mil. grain oriented silicon steel alloys.

Special shapes are tooled in SGL's own Die Shop with either steel dies for economical short runs, or in carbide for maximum die life. Typical specialties are stamped rings, spacers, shields, in thickness down to 2 mil. with thickness tolerances as close as 50 micro-inches.

TAPE WOUND AND RING CORES

Promptly produced in gapless toroidal form — in sizes from less than $\frac{3}{8}$ " O.D. and $\frac{1}{8}$ " tape width, weighing from a gram to thousands of grams.

A wide selection of available alloys cover applications from tiny pulse and sensing transformers to massive cores for mag-amp controlled power supplies and inverters.

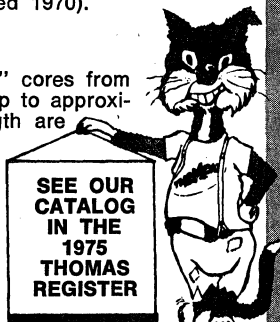
Aluminum cased cores, "EE" coated, have been used successfully in magnetic amplifiers at temperatures as high as 200°C. and have survived the shock of missile launching and in flight centrifugal and centripetal forces as high as 200 G.

SPECIFICATIONS

1. Custom annealing facilities in dry hydrogen and other atmospheres.
2. Custom stamping of flat metal parts on high speed presses.
3. High permeability foil material for magnetic shielding.
4. Permendur — For applications requiring higher saturation levels than either "O" or "S" alloys with other loop characteristics similar to "O" alloy.
5. Complete magnetic component testing, matching, grading facilities per IEEE Standard No. 106 and ASTM A346-64 (reapproved 1970).

"C" CORES

A wide range of 4 mil. "C" cores from the smallest requirements up to approximately $4\frac{1}{2}$ " in overall length are available. SGL "C" cores are produced by new manufacturing techniques with special emphasis on maintaining precise dimensional and electrical uniformity, to assure easier assembly and lower power losses.



SGL ELECTRONICS

A division of SGL INDUSTRIES, INC.

West Coast Warehouse
MAGNETIC MATERIALS
716 W. LaHabra Blvd.
LaHabra, Calif. 90631
TWX: 910-586-1642
(213) 694-2063

Factory, Engineering
Offices and
East Coast Warehouse
300 HARVARD AVE.
WESTVILLE, N.J. 08093
TWX: 710-944-0758
REPRESENTATIVES THROUGHOUT U.S. & CAN.

SGL HOMALITE

TRANSPARENT PLASTIC MATERIALS

- NON-GLARE CRT SCREENS
- LED FILTERS
- OPTICAL WEDGES
- INSTRUMENT WINDOWS
- FRONT PANEL DISPLAYS

SGL Homalite manufactures high performance, optically clear and colored thermosetting plastic materials to customer specifications.

Four basic grades are available with or without the non-glare surface in assorted standard sheet sizes, or can be in-house fabricated to meet your exacting requirements.

These grades provide a combination of unique features not found in ordinary transparent plastic:

ABRASION RESISTANCE:

H-911 has the best abrasion resistance. When measured by the modified Tabor Method, H-911 exceeds Acrylic 30 to 40 times. Resistance to scratching by high-speed particles is especially good.

CHEMICAL RESISTANCE:

H-911 and H-100 are immune to the effects of virtually all solvents, including acetone and benzene, and to most chemicals other than highly oxidizing acids. H-911 and H-100 resist checking and crazing when exposed to nitric or HF fumes.

HEAT RESISTANCE:

H-101 meets UL requirements as a self-extinguishing material, and can operate in environments when the temperature is at 250°F. continuous.

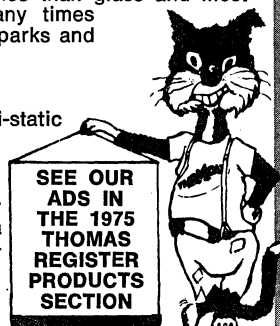
RESISTANCE TO PITTING:

H-911, H-100 and H-101 have more resistance to pitting by small, hot particles than glass and most other plastics, and is many times more resistant to welding sparks and hot molten spatter.

ANTI-STATIC:

H-141, is permanently anti-static throughout the material. Slightly softer than acrylic.

Call or write us today. Our unique materials can add a new dimension to your requirements.



SGL HOMALITE

A division of SGL INDUSTRIES, INC.

11 BROOKSIDE DRIVE
WILMINGTON, DELAWARE 19804
(302) 652-3686

Netic & Co-Netic

e.m.i. shield stock...

A complete stock of Netic (high saturation) and Co-Netic (high permeability) shielding alloys is available in both foil and sheet form. Our engineering department will gladly assist in the development of shield designs to meet your prototype or production-run needs.

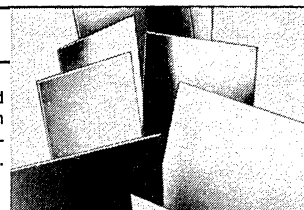
MAGNETIC SHIELD DIVISION



Perfection Mica Company
740 Thomas Drive
Bensenville, Illinois 60106
(312) 766-7800 TWX (910) 256-4815

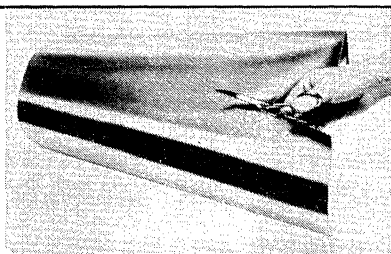
sheet stock: (standard size — 30" x 120")

STD. THK. (Inch)	NETIC S3-6 ALLOY SHEET	CO-NETIC AA STRESS ANNEALED	CO-NETIC AA PERFECTION ANNEALED
.014 .020 .025 .031 .040 .050 .062	High saturation capability. Stock shipped same day as ordered. .040 NETIC not stocked.	High permeability characteristics. Stress annealed for ease of fabrication. Must be final annealed for maximum attenuation characteristics.	High permeability characteristics. Perfection annealed material has been fully hydrogen annealed for optimum magnetic properties. No further annealing after fabrication is necessary if severe forming is avoided.



foil stock: (standard rolls — 50 and 100 ft. lengths)

STD. THK. (Inch)	NETIC PERFECTION ANNEALED WIDTH (Inch)	CO-NETIC PERFECTION ANNEALED WIDTH (Inch)	NOTES:
.002 .004 .004 .006 .006 .010 .010	— 4 15 — — — —	4 4 15 4 15 4 15	Standard foil shipped same day as ordered. Adhesive backed foil shipped within 1 week of order. Both Co-Netic AA and Netic foils can be slit to any desired width (including adhesive backed stock). Allow 1-2 weeks for delivery. All foil is Perfection annealed for maximum attenuation characteristics.



physical & magnetic data:

	CO-NETIC AA PERFECTION ANNEALED	CO-NETIC AA STRESS ANNEALED	NETIC S3-6
Specific Gravity	8.5	8.5	7.86
Coefficient of expansion per °C x 10 ⁻⁶	11.9	12.6	12.1
Tensile strength in PSI x 10 ³	64	89.6	65
Yield strength PSI x 10 ³	18	38	38
Hardness, Rockwell B	50±5	70±5	45±5
Modulus of Elasticity PSI x 10 ⁶	25	30	29
Elongation in 2 inches, percent	27	35	30
Melting point (°F)	2680	2680	2760
Thermal conductivity (cal/sec/cm ² /cm/°C) at 20°C	.138	.138	.118

	CO-NETIC AA PERFECTION ANNEALED	CO-NETIC AA STRESS ANNEALED	NETIC S3-6
Electrical Resistivity ohms/cir mil foot	337	337	60
Microhm centimeters	56	56	10
Thickness tolerance	±10%	±10%	±10%
Saturation Induction (Gauss)	7500	7500	22000
Initial Permeability	20000	15000	300
Permeability at 200 gauss	80000	60000	500
Maximum Permeability	450000	300000	3000
Induction at μmax.	3000	2800	8000
Coercive force, H _c , oersteds	.01-.03	.04-.06	1.0

photomultiplier tube shields...

Precision shields shipped from stock
for 90% of photomultiplier tubes.



MAGNETIC SHIELD DIVISION



Perfection Mica Company
740 Thomas Drive
Bensenville, Illinois 60106
(312) 766-7800 TWX (910) 256-4815

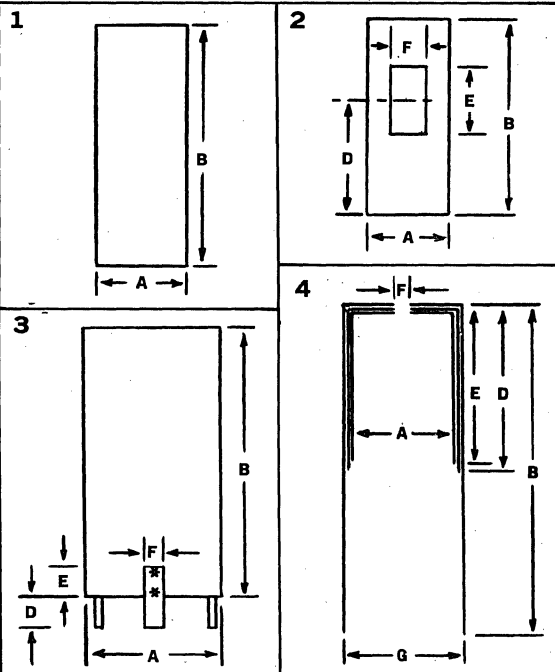
Co-Netic shields are not significantly affected by shock or vibration. They have minimal retentivity and do not require periodic re-annealing. When grounded, they effectively shield from electrostatic as well as magnetic fields over a wide range of intensity.

Shields can be custom engineered to your specifications and desired quantities.

Co-Netic shields improve the overall amplification characteristics of photomultiplier tubes by significantly reducing magnetic interference, especially in the low electron velocity region between the photocathode and first dynode.

SHIELDED DIMENSIONS

Part No.	Drawing	A	B	C	D	E	F	G	Notes
06P25	1	5/8	2 1/2						a
07P13V1	2	3/4	1 3/8		1 3/8	1/2	1/4		a
10P25	1	1	2 1/2						a
10P40	1	1	4						a
11P42X18	5	1 1/8	4 1/4	1 7/8	2 1/8	1 1/8	1/4		d
12P31V1	2	1 1/4	3 1/8		1 1/8	1 1/8	5/8		a
12P35	1	1 1/4	3 1/2						a
12P45	1	1 1/4	4 1/2						a
13P23V1	2	1 3/8	2 3/8		1 1/4	1 1/8	5/8		a
13P28V1	2	1 3/8	2 1/8		1 1/8	1 1/8	5/8		a
13P32V1	2	1 3/8	3 1/4		1 1/8	1 1/8	5/8		a
13P52V1	2	1 3/8	5 1/4		3 1/8	1 1/8	5/8		a
15P27	1	1 1/2	2 3/4						a
15P40	1	1 1/2	4						a
15P50	1	1 1/2	5						a
17P30	1	1 3/4	3						a
17P33V1	2	1 3/4	3 3/8		2 1/8	7/8	3/4		a
17P45	1	1 3/4	4 1/2						b
17P53V1	4	1 3/4	5 3/8		2 3/4	2 3/8	1/4	2 1/8	c
20P50	1	2	5						c
21P45V1	3	2 3/8	4 1/2		1/2	1/2	1/4		
21P55V1	3	2 3/8	5 1/2		1/2	1/2	1/4		
22P40	1	2 1/4	4						
22P50	1	2 1/4	5						
22P60	1	2 1/4	6						
22P70	1	2 1/4	7						
23P55X32	6	2 3/8	5 3/8		3 3/8	1 1/8		1 1/2	
23P61X37	6	2 3/8	6 1/8	3 3/4	1/4	3 3/4		2 1/8	
23P68X57	6	2 3/8	6 7/8	5 3/4	3	17/8		2	
23P101X57	6	2 3/8	10 1/8	5 3/4	1/2	2 3/4		6 7/8	
25P40	1	2 1/2	4						
25P50	1	2 1/2	5						
25P60	1	2 1/2	6						
25P70	1	2 1/2	7						
27P73V1	2	2 3/4	7 3/8		3 3/8	4 3/8	3		a
30P67X57	6	3	6 3/4	5 3/4	3 1/4	1 1/2		2	
32P80	1	3 1/4	8						
32P100X55	6	3 1/4	10	5 1/2	3 1/2	1		5 1/2	
35P70	1	3 1/2	7						



NOTES:

Unless otherwise noted:

Dimensions — All ID

Material — .040" Thick Co-Netic AA

Finish — Black baked enamel; texture outside, flat inside.

a — Upper end closed.

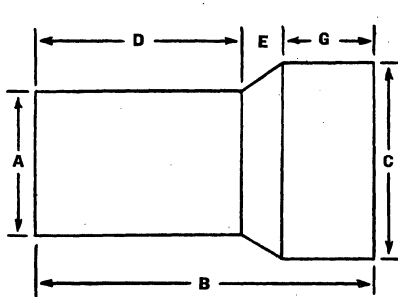
b — Dimensions D & E are measured from the outside of the outer shell. Dimension G is the maximum OD. Material — Three layers, separable; outer .049 Netic S3-6, two inner .031 Co-Netic AA

Finish — Netic S3-6, black oxide; Co-Netic AA, none.

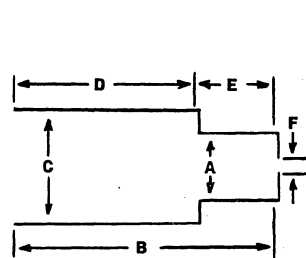
c — Has three tabs, spaced 120° apart, to grip the metal collar of the PM tube.

d — Material — .031" Co-Netic AA.

6



5

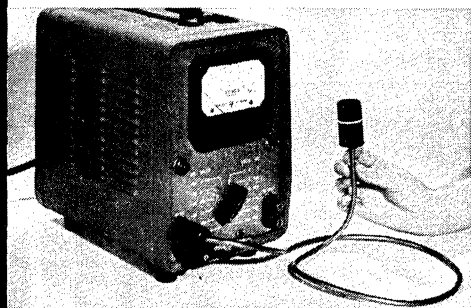


complete shielding accessories & mica

MAGNETIC SHIELD DIVISION



Perfection Mica Company
740 Thomas Drive
Bensenville, Illinois 60106
(312) 766-7800 TWX (910) 256-4815

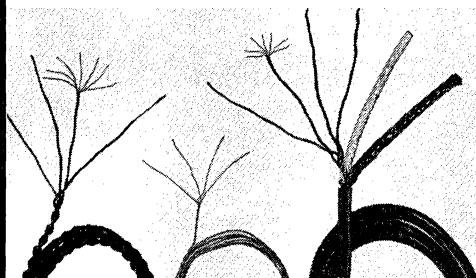
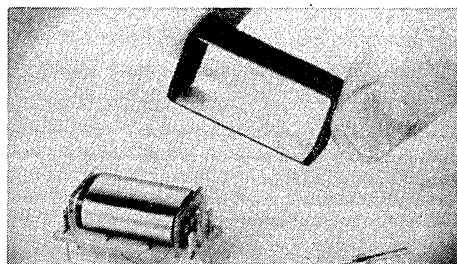


LAB KITS & PROBES

Perfection Mica's recently introduced e.m.i. shielding lab kit contains Netic and Co-Netic shielding material, double-side adhesive tape for shield construction and an LK-101 A.C. magnetic pick-up probe (output 20 millivolts/gauss @ 60Hz) . . . all for only \$99.50. Higher sensitivity probes of 60 millivolts/gauss are available on individual order.

COMPONENT SHIELDS

Perfection Mica stocks many standard shield enclosures for relays, reed switches, transformers, CRT's, small motor assemblies, etc. High attenuation shields can also be quickly fabricated for special component or sub-assembly configurations. Call Perfection Mica for a fast estimate on any of your shielding needs.

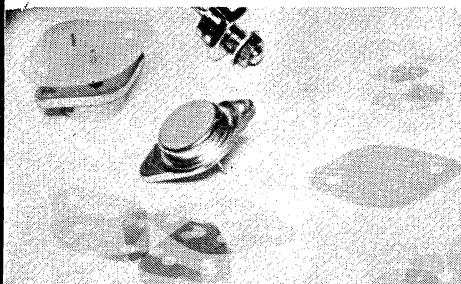
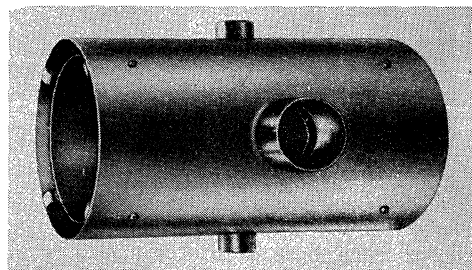


INTER-8 WEAVE CABLE

The special twisted configuration of individual wire leads within Inter-8 Weave Cable provides lower pick-up or radiation between interconnections. Typical performance improvement is -20 db for radiation and -12 db for pick-up. Plain or Co-Netic shielded cables are available in wire size 24 AWG in lengths up to 500 feet.

ZERO GAUSS CHAMBERS

Zero gauss chambers provide the ultimate in magnetic shielding. Perfection Mica's general-purpose zero gauss chamber (ZG-102), offers a significant reduction in both static and time varying fields normally found in laboratory and research environments. A Helmholtz coil system can be incorporated so that known fields can be generated for calibration purposes. Three concentrically spaced Co-Netic chambers with closed ends and two removable covers with openings for cable egress are provided.



MICA INSULATORS

All types of mica available. Supplied in clear, natural, and built-up sheet stock in thicknesses ranging from .001" to .062". Save tooling expense on many varieties of fabricated parts including semi-conductor insulators in .001" to .003" thickness with .002" hole tolerances. Excellent heat dissipation and high dielectric strength improves breakdown protection and efficiency of semi-conductors.



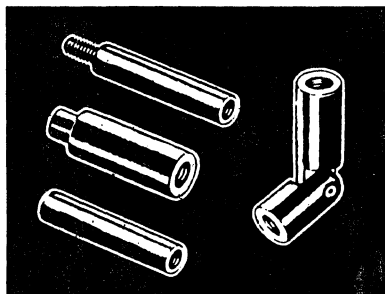
AMATOM ELECTRONIC HARDWARE

a Division of MITE Corporation
446 Blake Street • New Haven • Conn. 06515 • (203) 397-3311
Telex: 96-3419



Manufacturer of Standard Hardware for the Electric and Electronic Industries

Largest Stock of "OFF THE SHELF" Items Available Anywhere



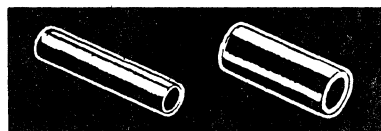
STANDOFFS

POST TYPE: Brass, Aluminum, Stainless Steel, Nylon, Phenolic, Tenite. 1/8 through 5/8 round, hex, square. Lengths: 1/8 through 10". Various thread sizes.

SWAGE TYPE: Brass, Aluminum, Stainless Steel. 1/8 through 3/8 round or hex. Lengths: 1/8 through 2". Various shank diameters and threads

MALE-FEMALE: Brass, Aluminum, Stainless Steel, Nylon. 3/16 through 3/8 round or hex. Lengths: 1/4 through 6". Various thread sizes.

HINGED: Brass, Aluminum, Stainless Steel. 3/16 through 3/8 round. Lengths: 3/4 through 2". Internal threads, external threads, swage type. Available with legs of equal length from hinge point or with unequal leg lengths.



SPACERS

Brass, Aluminum, Stainless Steel, Nylon, Phenolic, Tenite. 1/8 through 1/2 OD; various ID. Lengths: up to 2" depending on diameters.



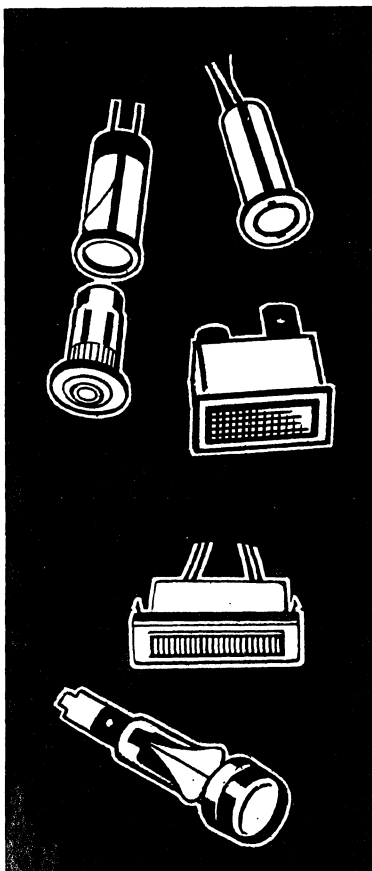
BUMPERS

Available types: machine screw, wood screw, knurled drive, recess and adhesive backed.



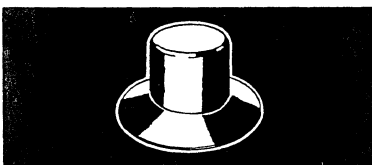
GROMMETS

Available in AN-MS and standard commercial line. 11/32 through 1-5/8 OD, 1/8 through 7/8 ID.



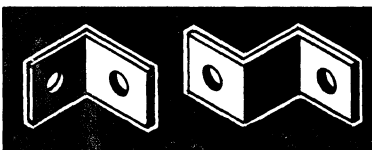
PANEL LIGHTS

Neon, fluorescent, incandescent from 6 to 380 volts. 10 colors in various shapes, sizes and terminations. Series available with interchangeable lamps.



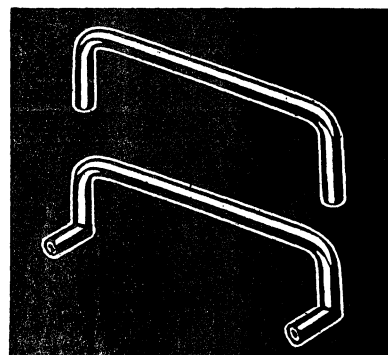
KNOBS

Machined aluminum—round, round skirted, pointer and push to turn. Variety of finishes.



BRACKETS

"L" and "Z" brackets available with various combinations of holes—tapped or untapped.



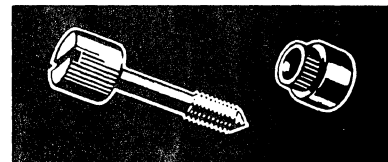
HANDLES

29 different styles available from standard round bow handles to 2 and 3 position folding handles. Rectangular, oval, extruded, tape insert, slanted, zinc die cast, circuit board, offset etc. External or internal threads. 1/8 through 3/8 round, 7/16 x 9/32 through 5/8 x 3/8 oval. Many combinations of heights and centers. Numerous finishes available.



FERRULES

5 different styles available for 1/8 to 1/2 diameter handles in brass, aluminum and stainless steel.



CAPTIVE PANEL HARDWARE

SCREWS: Brass and Stainless Steel. 7 types available with head diameters 1/8 through 3/4. Lengths: 1/4 through 2". Threads: 4-40 through 5/16-18.

RETAINERS: Brass and Stainless Steel. 7 types available, diameters 1/4 through 7/8. Threads: 4-40 through 5/16-18.



INSULATING WASHERS

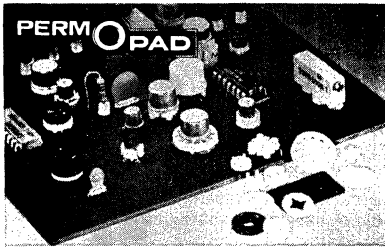
Fibre, Nylon, Phenolic, Teflon, Tenite etc.

Flat washers: .125 to 1.250 OD, .055-.563 ID, .016 to .135 thickness.

Shoulder washers: .140 to 1.500 OD, .046 to .765 ID, .019 to .187 overall thickness. Various shoulder thicknesses.

Full Line Catalog Available on Request

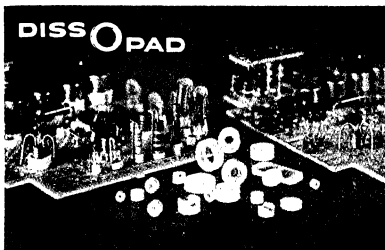
circuit & packaging problem solvers.



PERMANENT COMPONENT SPACERS

- PROTECT, INSULATE, SUPPORT COMPONENTS
- DURABLE NYLON PER MIL-M-20693
- HUNDREDS OF STANDARD STYLES
- LOW COST, IN-DEPTH STOCK

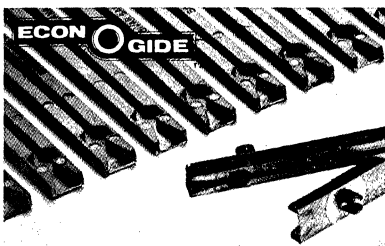
Reduce labor costs and repairs; ideal for transistors, capacitors, DIP packages.



WASH-AWAY COMPONENT SPACERS

DISS-O-PADS® provide accurate, uniform component spacing above PCB surface. Substantially reduces rejects and rework.

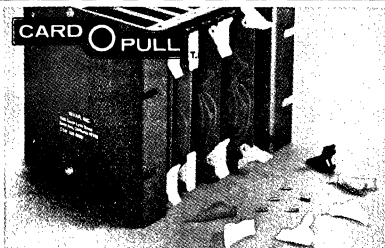
- WASH AWAY IN WARM OR HOT RUNNING WATER WITHOUT RESIDUE
- OVER 400 STANDARD STYLES
- IN-DEPTH STOCK; IMMEDIATE SHIPMENT



SNAP-IN CARD GUIDES

- 24 STANDARD LENGTHS FROM STOCK
- REINFORCED NYLON MOLDED
- SNAP-IN CONVENIENCE; MAXIMUM RETENTION

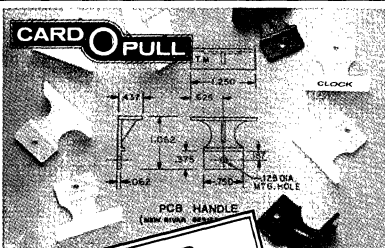
Snap-in convenience into card cages, sheet metal; unlimited spacing options to meet exacting needs.



PCB CARD EJECTORS

Safe, easy lever action for extraction and insertion of 1/16" and 3/32" PCB's.

- 6 STANDARD STYLES, 2 LOCKING VERSIONS
- MOLDED NYLON PER MIL-M-20693
- 12 COLORS, MARKING AVAILABLE
- STOCKED IN DEPTH



PCB CARD HANDLES

- LARGE, EASY PULL STYLE REQUIRES MINIMUM BOARD SPACE
- COLORS, MARKING AVAILABLE
- IN-DEPTH STOCK

PCB's can be easily removed or inserted and identified. Low cost, easy installation.

Hundreds of applications have provided a complete selection of standard BIVAR Component Spacers, Card Guides and PCB Card Ejectors to assist design, manufacturing and packaging engineers to improve efficiency and product appeal.

Reduced rework and rejections are assured with use of these Permanent or Temporary Spacers; and printed circuit boards are easily packaged and handled with BIVAR's Econ-O-Gide™ Snap-In Card Guides and CARD-O-PULL™ Ejectors and Handles. Although several standard models will answer most applications, special requirements are invited.

- IMPROVE PRODUCT AND PACKAGING EFFICIENCY, APPEAL
- OVER 600 STANDARD ITEMS TO CHOOSE FROM
- REDUCED REWORK, REJECTIONS: FASTER ASSEMBLY
- LOW-COST AND IN-DEPTH STOCK FOR IMMEDIATE SHIPMENT: DISTRIBUTOR AVAILABILITY

engineering / buyer's design and product catalogs free on request.

A complete, 24 page designer's catalog listing sizes, styles and pricing is available on request. Send for latest product/design bulletins and technical information on all BIVAR Packaging Products. Complete data will be sent immediately.



DISTRIBUTOR STOCKED!

BIVAR PRODUCTS ARE AVAILABLE FROM ELECTRONIC & ELECTRICAL DISTRIBUTORS THROUGH

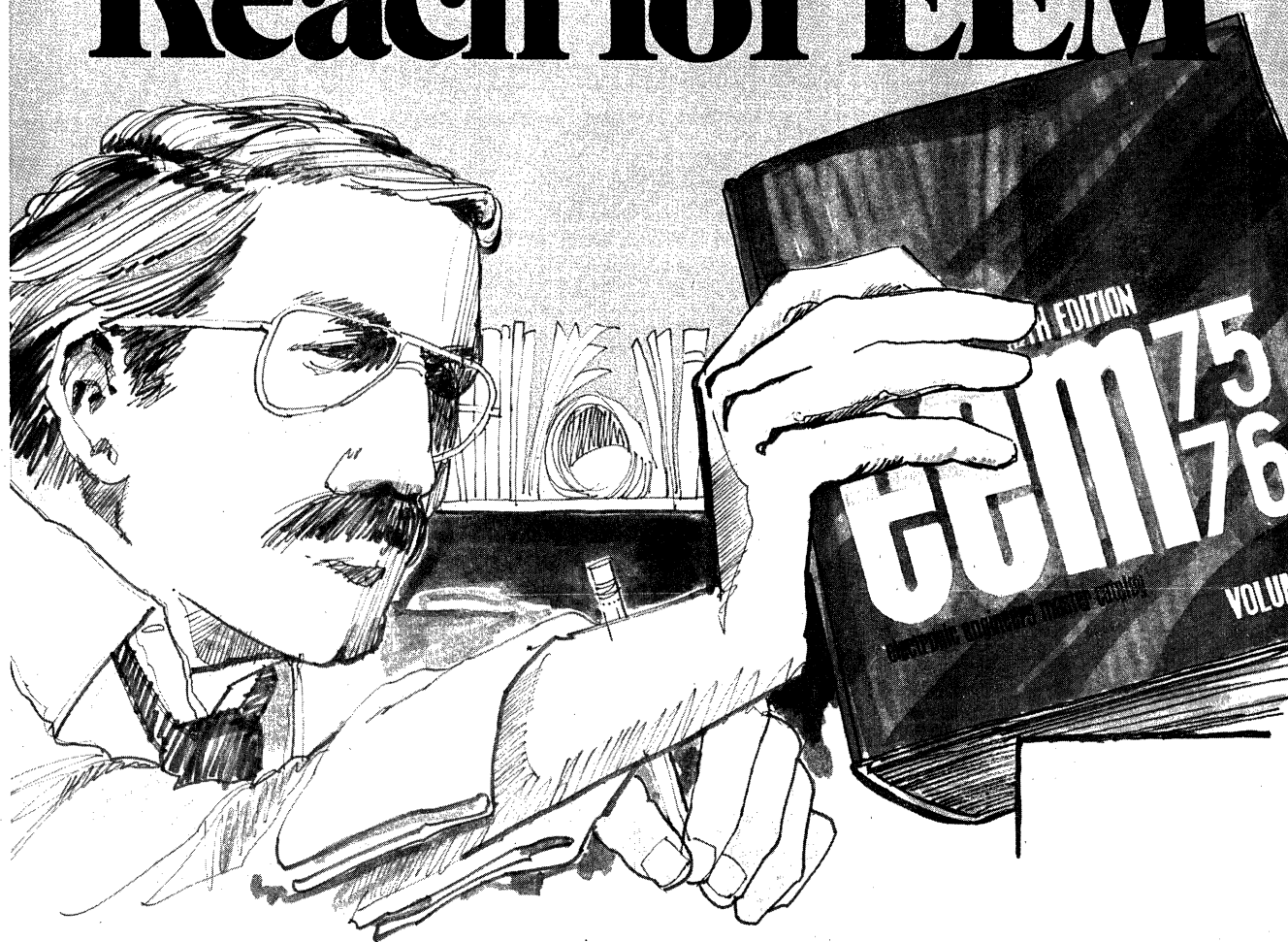
waldom
ELECTRONICS, INC.

4625 WEST 53rd ST.
CHICAGO, ILLINOIS 60632
(312) 585-1212
TELEX: 25-4604

BIVAR, INC. • 1617 E. EDINGER AVE., SANTA ANA, CALIFORNIA 92705 • (714) 547-5832

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

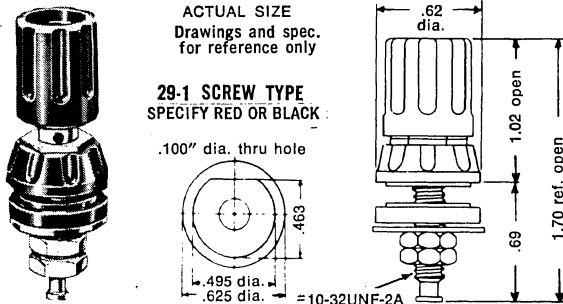


TERMINATION HARDWARE SERIES 2, 22, 29

BINDING POSTS

RATING:

RATING AT 120 VDC: 15 amps continuously with a max temperature use of 20°C.

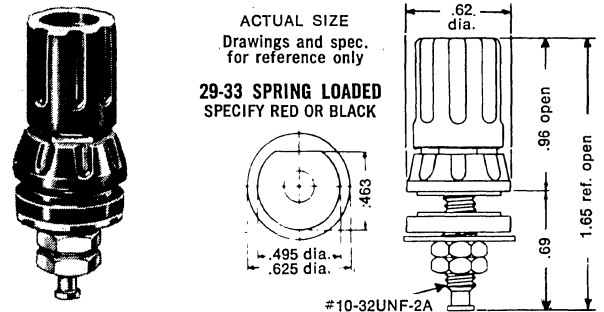


For 1/2" dia. mounting hole. For use in existing equipment or where wider spacing is desirable.

PRICE: Approx. \$.055 ea. 100 lots

INSULATION RESISTANCE: Between stud and mounting panel — 200,000 megohms.

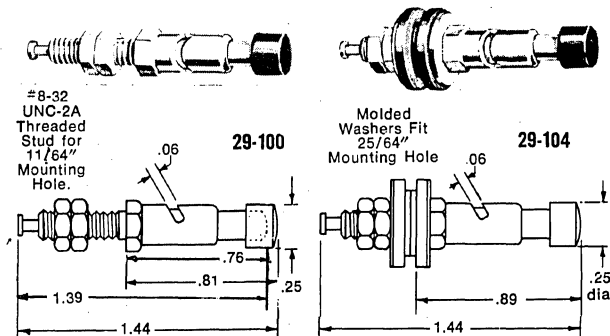
VOLTAGE BREAKDOWN: Between studs and mounting panel, 3000 VAC.



For 1/2" mounting hole. Spring loaded head gives 24 oz. of contact force.

PRICE: Approx. \$.055 ea. 100 lots

PUSH POSTS



New plunger type binding post for positive connections. To operate, button is depressed, lead is placed in slot, and button is released. Spring pressure assures firm positive contact. Extends only 7/8" above mounting board.

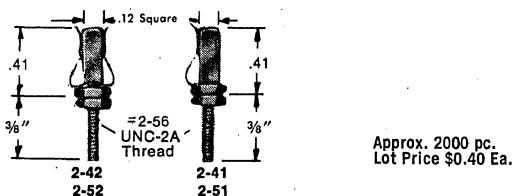
RATING AT 120 VDC: 20 amps continuously with a max. temperature use of 20°C.

ORDERING INFORMATION AND PRICES:

Part Number	Button or Cap Color	Approx. 100 pc. Lot Price
Push Posts Without Insulating Washers		
29-100R	Red Button Cap	\$0.50 Ea.
29-100B	Black Button Cap	.50 Ea.
Push Posts With Insulating Washers		
29-104R	Red Button Cap	\$0.70 Ea.
29-104B	Black Button Cap	.70 Ea.

Designed for panel mounting on test equipment to allow rapid connections without manual opening and closing of jaws. Hex nut under clip allows for tension adjustment of individual clip.

TEST CLIPS



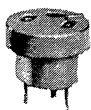
MINIATURE TEST CLIPS

Pat. No. 3,116,101

For simplified, rapid testing of "pig-tail" components.

Part Number	Finish	Approx. 2000 pc. Lot Price
2-41	Nickel Plate	\$0.40 Ea.
2-51	Gold	.60 Ea.
2-42	Nickel Plate	.45 Ea.
2-52	Gold	.60 Ea.

TRANSISTOR SOCKET



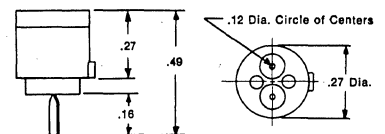
22-16-3



Hole and terminal at pos. 3 omitted

Part Number	Transistor Outlines	Dia. Pin Ctrs.	Max. Oper. Temp. (°F)	Less Factor @ 1 Meg.	Mounting	Approx. 500 pc. Lot Price
22-16-3	T0-5, 9, 11, 16, 26, 29, 31 & 39	.200	265	.06	Tru-Arc Ring "D" Hole	\$0.40 Ea.

BI-PIN LAMP SOCKET



22-3 accepts lamp size T-1 1/4 and T-1 3/4. Leads should be trimmed to .215" length for proper fit.

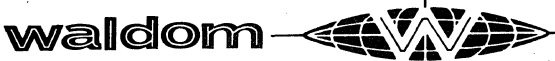
Part Number	Pin Diameter	Approx. 500 pc. Lot Price
22-3	.020	\$0.50 Ea.

Terminals are silver plated, beryllium copper with gold plate.



Available locally through your Grayhill distributor

GRAYHILL, INC. • 569 Hillgrove Avenue • LaGrange, Illinois 60525 • (312) 354-1040 • TWX 910-683-1850



HARDWARE AND FASTENING DEVICES

PACKAGED HARDWARE

Screw Size	Pkg. of 100		Bag of 1000	
	Part No.	Per Pkg.	Part No.	Per Bag

ROUND HEAD STEEL MACHINE SCREWS Nickel Plated

2-56 x 1/4"	F-579-C	1.75	F-579-M	11.10	9.60
2-56 x 1/4"	F-461-C	1.50	F-461-M	9.30	8.00
2-56 x 1/2"	F-462-C	1.70	F-462-M	10.70	9.25
2-56 x 3/4"	F-463-C	1.75	F-463-M	11.30	9.70
3-48 x 3/4"	F-464-C	2.00	F-464-M	13.40	11.55
4-36 x 1/4"	F-465-C	1.85	F-465-M	12.10	10.45
4-36 x 3/8"	F-466-C	1.75	F-466-M	11.45	9.85
4-36 x 1/2"	F-467-C	1.85	F-467-M	12.05	10.40
4-36 x 3/4"	F-580-C	1.90	F-580-M	12.45	10.75
4-36 x 3/4"	F-468-C	2.00	F-468-M	13.30	11.45
4-40 x 1/4"	F-469-C	1.85	F-469-M	11.95	10.30
4-40 x 3/8"	F-581-C	1.65	F-581-M	10.45	9.00
4-40 x 1/2"	F-470-C	1.90	F-470-M	12.45	10.75
4-40 x 3/4"	F-582-C	1.80	F-582-M	11.60	10.00
4-40 x 3/4"	F-471-C	1.95	F-471-M	12.80	11.00
6-32 x 1/4"	F-472-C	1.60	F-472-M	9.80	8.45
6-32 x 3/8"	F-583-C	1.70	F-583-M	10.95	9.45
6-32 x 1/2"	F-473-C	1.60	F-473-M	10.15	8.70
6-32 x 3/4"	F-584-C	1.80	F-584-M	11.60	10.00
6-32 x 1"	F-475-C	2.10	F-475-M	14.10	12.15
6-32 x 1 1/4"	F-476-C	2.25	F-476-M	15.25	13.15
6-32 x 2"	F-477-C	3.70	F-477-M	27.55	23.75
8-32 x 1/4"	F-478-C	1.80	F-478-M	11.45	9.85
8-32 x 3/8"	F-479-C	1.70	F-479-M	10.95	9.45
8-32 x 1/2"	F-480-C	1.85	F-480-M	11.95	10.30
8-32 x 3/4"	F-585-C	2.20	F-585-M	14.95	12.85
8-32 x 3/4"	F-481-C	2.05	F-481-M	13.60	11.70
8-32 x 1"	F-482-C	2.30	F-482-M	15.95	13.75
8-32 x 1 1/4"	F-483-C	2.80	F-483-M	19.75	17.00
10-32 x 1/2"	F-484-C	2.05	F-484-M	13.50	11.65
10-32 x 3/4"	F-586-C	2.60	F-586-M	18.45	15.85
10-32 x 3/4"	F-485-C	2.40	F-485-M	16.75	14.45
10-32 x 1"	F-486-C	2.95	F-486-M	21.10	18.15
10-32 x 1 1/2"	F-487-C	3.45	F-487-M	25.25	21.75

BINDER HEAD STEEL MACHINE SCREWS Nickel Plated

2-56 x 1/8"	F-591-C	1.90	F-591-M	12.45	10.75
2-56 x 1/4"	F-592-C	1.95	F-592-M	12.95	11.15
2-56 x 1/2"	F-593-C	2.10	F-593-M	14.10	12.15
2-56 x 3/8"	F-594-C	2.15	F-594-M	14.45	12.45
4-40 x 1/4"	F-020-C	1.75	F-020-M	11.40	9.80
4-40 x 1/2"	F-021-C	2.05	F-021-M	13.50	11.65
4-40 x 3/4"	F-022-C	2.15	F-022-M	14.70	12.65
6-32 x 3/4"	F-502-C	2.05	F-502-M	13.60	11.75
6-32 x 1/4"	F-503-C	1.55	F-503-M	9.45	8.15
6-32 x 3/8"	F-504-C	1.65	F-504-M	10.45	9.00
6-32 x 1/2"	F-014-C	1.60	F-014-M	9.75	8.40
6-32 x 3/4"	F-621-C	1.80	F-621-M	11.45	9.85
6-32 x 3/4"	F-015-C	1.90	F-015-M	12.40	10.65
8-32 x 1/4"	F-023-C	1.75	F-023-M	11.25	9.70
8-32 x 3/4"	F-505-C	1.75	F-505-M	11.30	9.70
8-32 x 3/4"	F-024-C	1.70	F-024-M	10.60	9.15
8-32 x 1/2"	F-025-C	2.00	F-025-M	13.45	11.60
8-32 x 3/4"	F-026-C	1.90	F-026-M	12.50	10.75
10-32 x 1/2"	F-577-C	2.45	F-577-M	16.95	14.60
10-32 x 3/4"	F-578-C	2.90	F-578-M	20.80	17.90

FLAT HEAD STEEL MACHINE SCREWS Nickel Plated

4-40 x 1/4"	F-622-C	1.80	F-622-M	11.60	10.00
4-40 x 3/8"	F-623-C	1.80	F-623-M	11.80	10.15
4-40 x 1/2"	F-624-C	1.90	F-624-M	12.30	10.60
6-32 x 1/4"	F-625-C	1.60	F-625-M	9.95	8.60
6-32 x 3/8"	F-626-C	1.70	F-626-M	10.60	9.15
6-32 x 1/2"	F-627-C	1.80	F-627-M	11.60	10.00
6-32 x 3/4"	F-628-C	1.85	F-628-M	12.10	10.45
8-32 x 3/8"	F-629-C	2.00	F-629-M	13.10	11.30
8-32 x 1/2"	F-630-C	2.10	F-630-M	13.95	12.00
8-32 x 3/4"	F-631-C	2.25	F-631-M	15.45	13.30
10-32 x 1/2"	F-632-C	2.05	F-632-M	13.10	11.30

OVAL HEAD STEEL MACHINE SCREWS Nickel Plated

6-32 x 1/2"	F-506-C	1.80	F-506-M	11.80	10.15
6-32 x 3/4"	F-507-C	1.90	F-507-M	12.45	10.75
8-32 x 3/4"	F-508-C	2.15	F-508-M	14.60	12.60
10-32 x 1/2"	F-509-C	2.35	F-509-M	16.10	13.85
10-32 x 3/4"	F-510-C	2.05	F-510-M	13.55	11.65

Screw Size	Pkg. of 100		Bag of 1000	
	Part No.	Per Pkg.	Part No.	Per Bag

HEX STEEL NUTS Nickel Plated

Thrd. Width Thk.					
2-56 x 3/4 x 1/4"	F-554-C	1.80	F-554-M	11.60	10.00
3-48 x 3/4 x 1/4"	F-555-C	1.90	F-555-M	12.45	10.75
4x36 x 1/4 x 3/4"	F-556-C	2.00	F-556-M	13.30	11.45
4-40 x 1/4 x 3/4"	F-557-C	2.10	F-557-M	14.10	12.15
6-32 x 1/4 x 3/4"	F-559-C	2.20	F-559-M	14.95	12.85
6-32 x 3/4 x 3/4"	F-560-C	2.30	F-560-M	15.75	13.60
8-32 x 1/4 x 3/4"	F-561-C	2.20	F-561-M	14.95	12.85
8-32 x 3/4 x 3/4"	F-562-C	2.30	F-562-M	15.75	13.60
10x32 x 3/8 x 1/8"	F-563-C	2.40	F-563-M	16.60	14.30
12-24 x 3/4 x 3/4"	F-619-C	3.40	F-619-M	25.05	21.60
1/4-20 x 3/4 x 3/4"	F-564-C	3.70	F-564-M	27.50	23.70

VOLUME CONTROL & TOGGLE SWITCH MOUNTING NUTS Nickel Plated

(For Volume Control)					
3/8-32 x 1/2 x 3/32"	F-565-C	5.60	F-565-M	43.15	37.20
(For Toggle Switch)					
1/2-32 x 3/4 x 3/4"	F-566-C	3.70	F-566-M	27.40	23.60
.475-32 x 1/2 x 3/4"	F-567-C	5.20	F-567-M	39.85	34.30

HEX WASHER HEAD SHEET METAL SCREWS (Type A) Steel-Indented Slotted Head Nickel Plated

6 x 1/4"	F-056-C	2.20	F-056-M	15.10	13.00
6 x 3/8"	F-057-C	2.10	F-057-M	14.05	12.10
6 x 1/2"	F-058-C	2.10	F-058-M	14.05	12.10
6 x 5/8"	F-059-C	2.25	F-059-M	15.35	13.25
6 x 3/4"	F-054-C	2.30	F-054-M	15.60	13.45
8 x 1/4"	F-051-C	2.30	F-051-M	15.75	13.60
8 x 3/8"	F-052-C	2.30	F-052-M	15.95	13.75
8 x 1/2"	F-053-C	2.45	F-053-M	17.10	14.75
8 x 3/4"	F-055-C	2.45	F-055-M	17.20	14.80
8 x 3/4"	F-059-C	2.35	F-059-M	16.10	13.85

SLOTTED HEX HEAD SHEET METAL SCREWS (Type A) — Nickel Plated

4 x 3/8"	F-016-C	1.85	F-016-M	11.85	10.20
4 x 1/2"	F-523-C	1.90	F-523-M	12.40	10.65
6 x 1/4"	F-524-C	1.95	F-524-M	12.80	11.00
6 x 3/8"	F-525-C	1.95	F-525-M	12.95	11.15
6 x 1/2"	F-526-C	2.10	F-526-M	14.30	12.30
6 x 5/8"	F-595-C	2.20	F-595-M	14.75	12.75
6 x 3/4"	F-527-C	2.30	F-527-M	15.95	13.75
8 x 1/4"	F-528-C	1.90	F-528-M	12.30	10.60
8 x 3/8"	F-529-C	1.90	F-529-M	12.45	10.75
8 x 1/2"	F-530-C	2.05	F-530-M	13.80	11.85
8 x 3/4"	F-017-C	2.20	F-017-M	15.15	13.05
8 x 1"	F-531-C	2.60	F-531-M	18.25	15.75
10 x 3/8"	F-532-C	2.55	F-532-M	18.05	15.55
10 x 1/2"	F-533-C	2.50	F-533-M	17.35	14.95
10 x 3/4"	F-534-C	2.85	F-534-M	20.40	17.60

PAN HEAD SHEET METAL SCREWS (Type A) — Nickel Plated

4 x 1/2"	F-596-C	1.70	F-596-M	10.90	9.40
6 x 1/4"	F-033-C	1.60	F-033-M	9.95	8.60
6 x 3/8"	F-597-C	1.70	F-597-M	10.70	9.25
6 x 1/2"	F-034-C	1.60	F-034-M	10.05	8.65
6 x 3/4"	F-035-C	1.95	F-035-M	12.95	11.15
8 x 1/4"	F-036-C	1.90	F-036-M	12.30	10.60
8 x 3/8"	F-598-C	1.90	F-598-M	12.45	10.75
8 x 1/2"	F-037-C	1.95	F-037-M	12.80	11.00
8 x 1"	F-038-C	2.50	F-038-M	17.45	15.00

Screw Size	Pkg. of 100		Bag of 1000	
	Part No.	Per Pkg.	Part No.	Per Bag

ROUND HEAD STEEL WOOD SCREWS Nickel Plated

4 x 1 1/2"	F-514-C	2.15	F-514-M	14.45	12.45
4 x 3/4"	F-515-C	2.25	F-515-M	15.45	13.30
6 x 3/4"	F-516-C	2.25	F-516-M	15.45	13.30
6 x 1"	F-517-C	2.60	F-517-M	18.45	15.90
8 x 3/4"	F-518-C	2.35	F-518-M	16.25	14.00
8 x 1"	F-047-C	2.85	F-047-M	20.40	17.60
8 x 1 1/4"	F-519-C	2.90	F-519-M	20.40	18.00
10 x 1 1/2"	F-520-C	3.70	F-520-M	27.40	23.60
12 x 1 1/2"	F-521-C	4.90	F-521-M	37.20	32.05
14 x 1 3/4"	F-522-C	6.45	F-522-M	50.30	43.35

FLAT HEAD STEEL WOOD SCREWS Nickel Plated

8 x 1 1/2"	F-027-C	2.10	F-027-M	14.30	12.30
8 x 1"	F-048-C	2.90	F-048-M	20.75	17.90
8 x 1 1/4"	F-032-C	2.95	F-032-M	21.10	18.15
10 x 1 1/2"	F-044-C	3.20	F-044-M	23.05	19.90

FLAT STEEL WASHERS Nickel Plated

Screw Size	I.D. In.	O.D. In.	Thk. In.	Part No.	Per Pkg.	Part No.	1-4 Per Bag	5-9 Per Bag
2	.092	3/32	.018	MW-400-C	.75	MW-400-M	2.80	2.45
4	.125	1/8	.025	MW-401-C	.65	MW-401-M	2.15	1.85
6	.150	3/16	.032	MW-402-C	.75	MW-402-M	2.95	2.55
8	.170	1/4	.032	MW-403-C	.75	MW-403-M	2.80	2.45
10	.204	1/2	.032	MW-404-C	.75	MW-404-M	2.95	2.55
1/4	.281	5/8	.050	MW-408-C	1.60	MW-408-M	9.80	8.45
3/8	.392	3/4	.050	MW-410-C	1.40	MW-410-M	8.15	7.00

FLAT BRASS WASHERS Nickel Plated

2	.092	3/32	.018	MW-400B-C	2.75	MW-400B-M	19.40	16.75
4	.125	1/8	.025	MW-401B-C	2.40	MW-401B-M	16.45	14.15
6	.150	3/16	.032	MW-402B-C	2.00	MW-402B-M	13.20	11.40
8	.170	1/4	.032	MW-403B-C	2.10	MW-403B-M	13.95	12.00
10	.204	1/2	.032	MW-404B-C	2.35	MW-404B-M	16.10	13.85

FLAT FIBER WASHERS

4	.120	1/4
---	------	-----

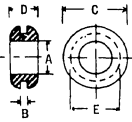
HARDWARE AND FASTENING DEVICES



PACKAGED HARDWARE



- VINYL GROMMETS**
- Exceptional Aging Qualities*
 - High Dielectric Properties
 - Oil Resistant
 - Durometer Hardness 45 1045
 - Cost Less Than Rubber
 - Will Not Stain Most Surfaces
 - * ???



					Pkg. of 100					Bag of 1000				
A	B	C	D	E	Part No.	Per Pkg.	Part No.	1-4 Per Bag	5-9 Per Bag	Part No.	1-4 Per Bag	5-9 Per Bag	Part No.	1-4 Per Bag
1/8	1/8	1/8	1/8	1/8	G-401-C	2.00	G-401-M	13.10	11.30	G-401-C	13.10	11.30	G-401-M	13.10
1/4	1/4	1/4	1/4	1/4	G-402-C	2.25	G-402-M	15.20	13.10	G-402-C	15.20	13.10	G-402-M	15.20
3/8	3/8	3/8	3/8	3/8	G-403-C	2.50	G-403-M	17.45	15.00	G-403-C	17.45	15.00	G-403-M	17.45
1/2	1/2	1/2	1/2	1/2	G-404-C	2.80	G-404-M	19.75	17.00	G-404-C	19.75	17.00	G-404-M	19.75
5/8	5/8	5/8	5/8	5/8	G-405-C	2.75	G-405-M	19.60	16.85	G-405-C	19.60	16.85	G-405-M	19.60
1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	G-406-C*	4.80	G-406-M	33.05	28.45	G-406-C*	33.05	28.45	G-406-M	33.05
1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	G-407-C*	7.20	G-407-M	46.40	40.00	G-407-C*	46.40	40.00	G-407-M	46.40

*(50)

These grommets were tested by Underwriters Laboratories in a circulating air oven at 212°F for seven days with no visible change.

RUBBER GROMMETS

					Pkg. of 100					Bag of 1000				
A	B	C	D	E	Part No.	Per Pkg.	Part No.	1-4 Per Bag	5-9 Per Bag	Part No.	1-4 Per Bag	5-9 Per Bag	Part No.	1-4 Per Bag
1/8	1/8	1/8	1/8	1/8	G-300-C	2.50	G-300-M	17.60	15.15	G-300-C	17.60	15.15	G-300-M	17.60
1/4	1/4	1/4	1/4	1/4	G-301-C	3.25	G-301-M	23.55	20.30	G-301-C	23.55	20.30	G-301-M	23.55
3/8	3/8	3/8	3/8	3/8	G-302-C	3.50	G-302-M	27.25	23.10	G-302-C	27.25	23.10	G-302-M	27.25
1/2	1/2	1/2	1/2	1/2	G-303-C	3.05	G-303-M	21.90	18.90	G-303-C	21.90	18.90	G-303-M	21.90
5/8	5/8	5/8	5/8	5/8	G-307-C*	5.60	G-307-M	40.00	34.45	G-307-C*	40.00	34.45	G-307-M	40.00
1 1/8	1 1/8	1 1/8	1 1/8	1 1/8	G-309-C	3.30	G-309-M	24.25	20.90	G-309-C	24.25	20.90	G-309-M	24.25
1 1/2	1 1/2	1 1/2	1 1/2	1 1/2	G-311-C*	10.20	G-311-M	71.60	61.65	G-311-C*	71.60	61.65	G-311-M	71.60

*(50) ** (25)

RUBBER BUMPERS

Recess Screw Type

For mounting on all types of Electronic Equipment. Prevents vibration and protects surfaces under equipment from being marred.



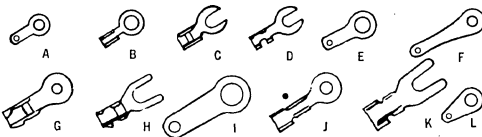
					Pkg. of 100					Bag of 1000				
A	B	C	D	E	Part No.	Per Pkg.	Part No.	1-4 Per Bag	5-9 Per Bag	Part No.	1-4 Per Bag	5-9 Per Bag	Part No.	1-4 Per Bag
1/2	1/4	1/2	1/4	1/8	B-321-C	3.65	B-321-M	27.10	23.35	B-321-C	27.10	23.35	B-321-M	27.10
3/4	1/4	3/4	1/4	1/8	B-322-C*	8.10	B-322-M	53.95	46.50	B-322-C*	53.95	46.50	B-322-M	53.95
1 1/4	3/8	1 1/4	1/4	1/8	B-323-C*	8.20	B-323-M	54.60	47.05	B-323-C*	54.60	47.05	B-323-M	54.60
1 3/4	3/8	1 3/4	1/4	1/8	B-324-C*	8.50	B-324-M	57.25	49.35	B-324-C*	57.25	49.35	B-324-M	57.25

*(25)

Button Type

					Pkg. of 100					Bag of 1000				
A	B	C	D	E	Part No.	Per Pkg.	Part No.	1-4 Per Bag	5-9 Per Bag	Part No.	1-4 Per Bag	5-9 Per Bag	Part No.	1-4 Per Bag
3/8	3/8	3/8	3/8	.040	B-361-C	5.00	B-361-M	38.20	32.90	B-361-C	38.20	32.90	B-361-M	38.20
1/2	1/2	1/2	1/2	.040	B-362-C	4.70	B-362-M	35.85	30.90	B-362-C	35.85	30.90	B-362-M	35.85
5/8	5/8	5/8	5/8	.040	B-363-C	8.80	B-363-M	59.70	51.40	B-363-C	59.70	51.40	B-363-M	59.70

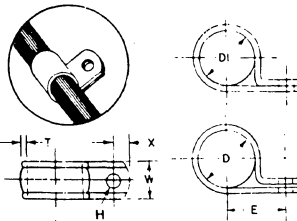
SOLDER TERMINAL AND SPADE LUGS



Supplied with hot-tin dipping in brass (B), or copper (C) as specified in Material (Mtl.) column.

					Pkg. of 100					Bag of 1000				
Fig.	Mtl. Thickness	Hole Size	Length In.		Part No.	Per Pkg.	Part No.	1-4 Per Bag	5-9 Per Bag	Part No.	1-4 Per Bag	5-9 Per Bag	Part No.	1-4 Per Bag
A	.015C	#2	2 1/4		T-251-M	1.60	T-251-M	9.80	8.45	T-251-M	9.80	8.45	T-251-M	9.80
A	.020B	#6	1 1/2		T-151-C	1.60	T-151-M	10.10	8.70	T-151-M	10.10	8.70	T-151-M	10.10
A	.020B	#8	1 1/4		T-152-C	2.35	T-152-M	16.40	14.15	T-152-M	16.40	14.15	T-152-M	16.40
A	.020B	#10	1 1/4		T-153-C	2.40	T-153-M	16.45	14.20	T-153-M	16.45	14.20	T-153-M	16.45
B	.020C	#4	1 1/2		T-226-C	1.85	T-226-M	12.20	10.50	T-226-M	12.20	10.50	T-226-M	12.20
B	.032C	#6	2 1/2		T-156-C	1.90	T-156-M	12.65	10.90	T-156-M	12.65	10.90	T-156-M	12.65
B	.020B	#8	2 1/2		T-227-C	3.25	T-227-M	23.55	20.30	T-227-M	23.55	20.30	T-227-M	23.55
B	.020B	#10	2 1/2		T-228-C	3.00	T-228-M	21.75	18.75	T-228-M	21.75	18.75	T-228-M	21.75
C	.020B	#8	2 1/2		T-157-C	2.35	T-157-M	16.10	13.85	T-157-M	16.10	13.85	T-157-M	16.10
C	.020B	#6	2 1/2		T-158-C	2.20	T-158-M	14.80	12.75	T-158-M	14.80	12.75	T-158-M	14.80
D	.020B	#8	2 1/2		T-159-C	2.35	T-159-M	16.35	14.05	T-159-M	16.35	14.05	T-159-M	16.35
D	.020B	#10	2 1/2		T-225-C	2.60	T-225-M	19.90	17.15	T-225-M	19.90	17.15	T-225-M	19.90
E	.015B	#8	1 1/4		T-162-C	2.60	T-162-M	18.25	15.75	T-162-M	18.25	15.75	T-162-M	18.25
E	.025B	#6	1 1/4		T-163-C	2.40	T-163-M	16.55	14.25	T-163-M	16.55	14.25	T-163-M	16.55
F	.025B	#8	1 1/4		T-164-C	2.40	T-164-M	16.45	14.15	T-164-M	16.45	14.15	T-164-M	16.45
G	.020C	#6	1 1/4		T-166-C	4.55	T-166-M	34.35	29.65	T-166-M	34.35	29.65	T-166-M	34.35
G	.020C	#8	1 1/4		T-167-C	4.55	T-167-M	34.35	29.65	T-167-M	34.35	29.65	T-167-M	34.35
G	.020C	#10	1 1/4		T-168-C	4.55	T-168-M	34.45	29.65	T-168-M	34.45	29.65	T-168-M	34.45
H	.020B	#8	1 1/4		T-170-C	2.95	T-170-M	21.10	18.15	T-170-M	21.10	18.15	T-170-M	21.10
I	.020B	#10	1 1/4		T-173-C	Disc.	T-173-M	Disc.		T-173-M	Disc.		T-173-M	Disc.
J	.032B	#8	1 1/4		T-187-C	5.00	T-187-M	38.25	32.95	T-187-M	38.25	32.95	T-187-M	38.25
K	.032B	#10	1 1/4		T-188-C	5.45	T-188-M	42.05	36.25	T-188-M	42.05	36.25	T-188-M	42.05
J	.032B	#8	1 1/4		T-193-C	6.15	T-193-M	47.80	41.20	T-193-M	47.80	41.20	T-193-M	47.80
L	.020B	#6	1 1/4		T-154-C	1.70	T-154-M	10.90	9.40	T-154-M	10.90	9.40	T-154-M	10.90
L	.015C	#8	1 1/2		T-224-C	2.55	T-224-M	17.80	15.35	T-224-M	17.80	15.35	T-224-M	17.80

CABLE CLAMPS



NYLON CABLE CLAMPS

					BLUE LINE					BULK PACK				
					Pkg. of 100 or as shown ()					Pkg. of 1000				
D	D ₁	E	Part No.	Per Pkg.	Part No.	Per Pkg.	Part No.	1-4 Per Bag	5 or more Per Bag	Part No.	1-4 Per Bag	5 or more Per Bag	Part No.	1-4 Per Bag
1/8"	.125	.310	CCN-31-C	3.05	CCN-31-M	22.10	CCN-31-M	22.10	19.00	CCN-31-M	22.10	19.00	CCN-31-M	22.10
3/16"	.188	.373	CCN-32-C	3.20	CCN-32-M	23.30	CCN-32-M	23.30	20.10	CCN-32-M	23.30	20.10	CCN-32-M	23.30
1/4"	.250	.407	CCN-33-C	3.30	CCN-33-M	24.25	CCN-33-M	24.25	20.90	CCN-33-M	24.25	20.90	CCN-33-M	24.25
5/16"	.313	.448	CCN-34-C	3.80	CCN-34-M	24.75	CCN-34-M	24.75	21.30	CCN-34-M	24.75	21.30	CCN-34-M	24.75
3/8"	.375	.479	CCN-35-C (50)	3.85	CCN-35-M	25.30	CCN-35-M	25.30	21.80	CCN-35-M	25.30	21.80	CCN-35-M	25.30
1/2"	.438	.510	CCN-36-C (50)	3.95	CCN-36-M	26.15	CCN-36-M	26.15	22.50	CCN-36-M	26.15	22.50	CCN-36-M	26.15
5/8"	.500	.542	CCN-37-C (50)	4.00	CCN-37-M	26.75	CCN-37-M	26.75	23.00	CCN-37-M	26.75	23.00	CCN-37-M	26.75
3/4"	.563	.623	CCN-38-C (25)	4.85	CCN-38-M	27.15	CCN-38-M	27.15	23.40	CCN-38-M	27.15	23.40	CCN-38-M	27.15
7/8"	.625	.638	CCN-39-C (25)	5.00	CCN-39-M	28.15	CCN-39-M	28.15	24.25	CCN-39-M	28.15	24.25	CCN-39-M	28.15
1"	.688	.752	CCN-40-C (20)	6.85	CCN-40-M	40.25	CCN-40-M	40.25	34.70	CCN-40-M	40.25	34.70	CCN-40-M	40.25
1 1/8"	.750	.783	CCN-41-C (20)	6.90	CCN-41-M	40.50	CCN-41-M	40.50	34.90	CCN-41-M	40.50	34.90	CCN-41-M	40.50
1 1/4"	.813	.845	CCN-42-C (20)	7.25	CCN-42-M	43.60	CCN-42-M	43.60	37.55	CCN-42-M	43.60	37.55	CCN-42-M	43.60
1 1/2"	.875	.908	CCN-43-C (15)	10.05	CCN-43-M	61.25	CCN-43-M	61.25	52.75	CCN-43-M	61.25	52.75	CCN-43-M	61.25

Width: Up to CCN-37, 3/8". All others are 1/2". 3/8" width have .167 mounting hole, 1/2" width have 1/4" mounting hole. 3/8" width are .040" thickness, 1/2" width are .060" thickness.

BUTYRATE CABLE CLAMPS

			BLUE LINE		BULK PACK		
			Pkg. of 100 or as shown ()		Pkg. of 1000		
D	D ₁	E	Part No.	Per Pkg.	Part No.	1-4 Per Bag	5 or More Per Bag
1/8"	.115	.310	CCB-1-C	3.90	CCB-1-M	29.20	25.15
3/8"	.172	.373	CCB-2-C	3.95	CCB-2-M	29.40	25.30
1/4"	.234	.407	CCB-3-C	4.40	CCB-3-M	29.70	25.60
5/8"	.294	.488	CCB-4-C (50)	4.45	CCB-4-M	32.40	27.90
3/16"	.359	.479	CCB-5-C (50)	4.45	CCB-5-M	32.40	27.90
7/8"	.422	.510	CCB-6-C (40)	4.95	CCB-6-M	32.75	28.25
1 1/2"	.484	.542	CCB-7-C (40)	4.65	CCB-7-M	30.20	26.05
9/8"	.547	.623	CCB-8-C (30)	5.40	CCB-8-M	33.60	28.95
5/8"	.609	.654	CCB-9-C (25)	5.80	CCB-9-M	34.85	30.00
1 3/8"	.672	.752	CCB-10-C (20)	6.50	CCB-10-M	37.20	32.05
1 1/4"	.734	.783	CCB-11-C (15)	6.85	CCB-11-M	40.40	34.55
7/8"	.859	.845	CCB-12-C (20)	7.25	CCB-12-M	43.50	37.45
1"	.934	.908	CCB-13-C (15)	8.15	CCB-13-M	45.30	39.05
1 1/2"	1.102	.970	CCB-14-C (15)	9.00	CCB-14-M	52.60	45.05
1 3/4"	1.227	1.062	CCB-15-C (10)	11.15	CCB-15-M	59.25	51.35

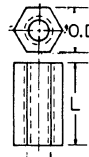
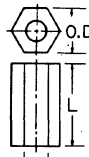
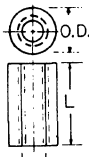
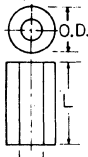
HARDWARE (NON-CURRENT CARRYING)



4633 WEST 53rd STREET / CHICAGO, ILLINOIS 60632 / (312) 585-1212



waldom space-it's



ROUND UNTHREADED I.D.

ROUND UNTHREADED I.D.

THD.*

HEX THREADED I.D.

HEX THREADED I.D.

ROUND BRASS SPACERS CADMIUM PLATED - Std. Pkg. 100

Length "L"	1/4" OD — UNTHREADED					1/4" OD — THREADED				3/8" OD — UNTHREADED			
	Clearance Hole (ID)				4-40 P/N	Thread Size (ID)			Per C	Clearance Hole (ID)			Per C
	#4 (.115) P/N	#6 (.140) P/N	#8 (.171) P/N	Per C		6-32 P/N	8-32 P/N	#4 (.115) P/N		#6 (.140) P/N	#8 (.171) P/N		
.125	60001	60016	60031	5.60	60046	60061	60076	7.25	60091	60106	60121	10.00	
.1875	60002	60017	60032	6.05	60047	60062	60077	7.50	60092	60107	60122	11.65	
.250	60003	60018	60033	6.85	60048	60063	60078	7.80	60093	60108	60123	12.25	
.3125	60004	60019	60034	7.75	60049	60064	60079	8.30	60094	60109	60124	13.10	
.375	60005	60020	60035	8.25	60050	60065	60080	9.30	60095	60110	60125	15.55	
.4375	60006	60021	60036	9.00	60051	60066	60081	9.75	60096	60111	60126	16.55	
.500	60007	60022	60037	9.20	60052	60067	60082	12.10	60097	60112	60127	16.90	
.5625	60008	60023	60038	10.50	60053	60068	60083	12.90	60098	60113	60128	21.35	
.625	60009	60024	60039	11.00	60054	60069	60084	13.40	60099	60114	60129	20.30	
.6875	60010	60025	60040	13.75	60055	60070	60085	17.40	60100	60115	60130	22.85	
.750	60011	60026	60041	14.20	60056	60071	60086	17.65	60101	60116	60131	20.20	
.8125	60012	60027	60042	14.70	60057	60072	60087	17.80	60102	60117	60132	23.60	
.875	60013	60028	60043	16.00	60058	60073	60088	18.70	60103	60118	60133	26.80	
.9375	60014	60029	60044	16.50	60059	60074	60089	19.25	60104	60119	60134	27.60	
1.000	60015	60030	60045	18.25	60060	60075	60090	20.50	60105	60120	60135	28.70	

HEX BRASS SPACERS CADMIUM PLATED - Std.Pkg.100

Length "L"	1/4" HEX — UNTHREADED					1/4" HEX THREADED				3/8" HEX — UNTHREADED			
	Clearance Hole (ID)				4-40 P/N	Thread Size (ID)			Per C	Clearance Hole (ID)			
	#4 (.115) P/N	#6 (.140) P/N	#8 (.171) P/N	Per C		6-32 P/N	8-32 P/N	Per C		#4 (.115) P/N	#6 (.140) P/N	#8 (.171) P/N	Per C
.125	60136	60151	60166	6.25	60181	60196	60211	7.35	60226	60241	60256	10.20	
.1875	60137	60152	60167	6.65	60182	60197	60212	7.85	60227	60242	60257	11.65	
.250	60138	60153	60168	7.35	60183	60198	60213	8.50	60228	60243	60258	12.65	
.3125	60139	60154	60169	8.70	60184	60199	60214	9.20	60229	60244	60259	14.50	
.375	60140	60155	60170	9.00	60185	60200	60215	10.35	60230	60245	60260	15.85	
.4375	60141	60156	60171	9.30	60186	60201	60216	11.15	60231	60246	60261	19.40	
.500	60142	60157	60172	9.60	60187	60202	60217	12.15	60232	60247	60262	20.00	
.5625	60143	60158	60173	10.55	60188	60203	60218	14.20	60233	60248	60263	21.00	
.625	60144	60159	60174	11.15	60189	60204	60219	17.00	60234	60249	60264	23.20	
.6875	60145	60160	60175	13.90	60190	60205	60220	17.90	60235	60250	60265	23.60	
.750	60146	60161	60176	14.20	60191	60206	60221	18.90	60236	60251	60266	24.60	
.8125	60147	60162	60177	15.35	60192	60207	60222	19.60	60237	60252	60267	25.80	
.875	60148	60163	60178	17.15	60193	60208	60223	19.90	60238	60253	60268	29.00	
.9375	60149	60164	60179	18.60	60194	60209	60224	20.85	60239	60254	60269	29.40	
1.000	60150	60165	60180	19.60	60195	60210	60225	22.50	60240	60255	60270	32.00	

ROUND FIBRE SPACERS

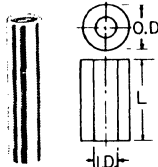
ROUND NYLON SPACERS

ROUND PHENOLIC THREADED SPACERS

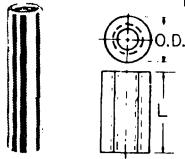
Length "L"	1/4" OD — UNTHREADED					1/4" OD — UNTHREADED				1/4" OD — THREADED			
	Clearance Hole (ID)				4-40 P/N	Clearance Hole (ID)			Per C	Thread Size (ID)			
	#4 (.115) P/N	#6 (.140) P/N	#8 (.171) P/N	Per C		#4 (.115) P/N	#6 (.140) P/N	#8 (.171) P/N		6-32 P/N	8-32 P/N	Per C	Per C
.125	60271	60286	60301	5.10	60316	60331	60346	3.25	—	—	—	—	—
.1875	60272	60287	60302	5.65	60317	60332	60347	3.70	—	—	—	—	—
.250	60273	60288	60303	6.15	60318	60333	60348	4.20	60361	60374	60387	9.20	—
.3125	60274	60289	60304	6.95	60319	60334	60349	4.80	60362	60375	60388	10.20	—
.375	60275	60290	60305	7.65	60320	60335	60350	5.40	60363	60376	60389	11.65	—
.4375	60276	60291	60306	8.35	60321	60336	60351	5.85	60364	60377	60390	12.15	—
.500	60277	60292	60307	9.00	60322	60337	60352	6.35	60365	60378	60391	13.10	—
.5625	60278	60293	60308	10.00	60323	60338	60353	6.85	60366	60379	60392	13.70	—
.625	60279	60294	60309	10.40	60324	60339	60354	7.35	60367	60380	60393	14.70	—
.6875	60280	60295	60310	11.45	60325	60340	60355	7.85	60368	60381	60394	16.35	—
.750	60281	60296	60311	12.35	60326	60341	60356	8.20	60369	60382	60395	17.35	—
.8125	60282	60297	60312	13.50	60327	60342	60357	8.60	60370	60383	60396	18.00	—
.875	60283	60298	60313	14.20	60328	60343	60358	9.10	60371	60384	60397	19.00	—
.9375	60284	60299	60314	14.90	60329	60344	60359	9.50	60372	60385	60398	19.60	—
1.000	60285	60300	60315	15.20	60330	60345	60360	9.80	60373	60386	60399	20.60	—

waldom

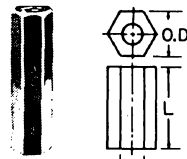
4633 WEST 53rd STREET / CHICAGO, ILLINOIS 60632 / (312) 585-1212

**space-it's**

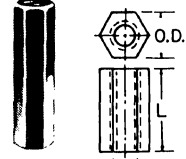
ROUND THREADED



ROUND THREADED - THD*



HEX UNTHREADED - I.D.



HEX UNTHREADED - THD*

ROUND ALUMINUM SPACERS - Irridite 14-2 per MIL-C-5541 - Std. Pkg. 100

Length "L"	1/4" OD — UNTHREADED				3/8" OD		1/2" OD — THREADED				5/8" OD	
	Clearance Hole (ID)				Clearance Hole (ID)		Thread Size (ID)				Thread Size (ID)	
	#4 (.115) P/N	#6 (.140) P/N	#8 (.171) P/N	Per C	#10 (.200) P/N	Per C	4-40 P/N	6-32 P/N	8-32 P/N	Per C	10-32 P/N	Per C
.125	60400	60418	60436	4.90	60454	6.85	60472	60488	60504	5.90	60520	7.85
.250	60401	60419	60437	5.90	60455	7.85	60473	60489	60505	6.85	60521	8.80
.375	60402	60420	60438	6.85	60456	8.80	60474	60490	60506	7.85	60522	9.80
.500	60403	60421	60439	7.85	60457	9.80	60475	60491	60507	8.80	60523	10.80
.625	60404	60422	60440	8.80	60458	10.75	60476	60492	60508	9.80	60524	11.75
.750	60405	60423	60441	9.80	60459	11.75	60477	60493	60509	10.80	60525	12.75
.875	60406	60424	60442	10.75	60460	12.75	60478	60494	60510	11.75	60526	13.70
1.000	60407	60425	60443	11.75	60461	13.70	60479	60495	60511	13.70	60527	14.70
1.250	60408	60426	60444	12.75	60462	14.70	60480	60496	60512	15.65	60528	15.65
1.500	60409	60427	60445	23.50	60463	26.45	60481	60497	60513	17.65	60529	17.65
1.750	60410	60428	60446	24.50	60464	27.45	60482	60498	60514	19.60	60530	19.60
2.000	60411	60429	60447	25.50	60465	28.40	60483	60499	60515	21.55	60531	21.55
2.50	60412	60430	60448	26.45	60466	29.40	60484	60500	60516	23.50	60532	23.50
3.00	60413	60431	60449	27.45	60467	30.40	60485	60501	60517	25.50	60533	25.50
3.50	60414	60432	60450	31.35	60468	31.35	60486	60502	60518	27.45	60534	27.45
4.00	60415	60433	60451	36.25	60469	32.35	60487	60503	60519	35.30	60535	29.40
5.00	60416	60434	60452	37.25	60470	33.30	—	—	—	—	—	—
6.00	60417	60435	60453	47.00	60471	34.30	—	—	—	—	—	—

HEX ALUMINUM SPACERS - Irridite 14-2 per MIL-C-5541 - Std. Pkg. 100

Length "L"	1/4" HEX — UNTHREADED				3/8" HEX		1/2" HEX THREADED				5/8" HEX	
	Clearance Hole (ID)				Clearance Hole (ID)		Thread Size (ID)				Thread Size (ID)	
	#4 (.115) P/N	#6 (.140) P/N	#8 (.171) P/N	Per C	#10 (.200) P/N	Per C	4-40 P/N	6-32 P/N	8-32 P/N	Per C	10-32 P/N	Per C
.125	60536	60548	60560	5.90	60572	8.80	60584	60600	60616	6.85	60632	9.80
.250	60537	60549	60561	6.85	60573	9.80	60585	60601	60617	7.85	60633	10.80
.375	60538	60550	60562	7.85	60574	10.80	60586	60602	60618	8.80	60634	11.75
.500	60539	60551	60563	8.80	60575	11.75	60587	60603	60619	9.80	60635	12.75
.625	60540	60552	60564	9.80	60576	12.75	60588	60604	60620	10.80	60636	13.70
.750	60541	60553	60565	10.80	60577	13.70	60589	60605	60621	11.75	60637	14.70
.875	60542	60554	60566	11.75	60578	14.70	60590	60606	60622	12.75	60638	15.70
1.000	60543	60555	60567	12.75	60579	15.70	60591	60607	60623	13.70	60639	16.65
1.250	60544	60556	60568	23.50	60580	26.45	60592	60608	60624	15.70	60640	18.60
1.500	60545	60557	60569	24.50	60581	27.45	60593	60609	60625	17.65	60641	20.60
1.750	60546	60558	60570	25.50	60582	82.40	60594	60610	60626	19.60	60642	22.55
2.000	60547	60559	60571	26.45	60583	29.40	60595	60611	60627	21.55	60643	24.50
2.50	—	—	—	—	—	—	60596	60612	60628	23.50	60644	26.45
3.00	—	—	—	—	—	—	60597	60613	60629	25.50	60645	28.40
3.50	—	—	—	—	—	—	60598	60614	60630	27.45	60646	30.40
4.00	—	—	—	—	—	—	60599	60615	60631	34.30	60647	32.35

THREADED SWAGE STANDOFFS - Brass Nickel Plated**ROUND****ROUND THREADED****HEX THREADED**

		Length		4-40 P/N	6-32 P/N	8-32 P/N	Per C	4-40 P/N	6-32 P/N	8-32 P/N	Per C
		A	X								
		1/4	.105	60648	60666	60684	10.20	60702	60720	60738	10.80
		1/4	.135	60649	60667	60685	10.20	60703	60721	60739	10.80
		1/4	.165	60650	60668	60686	10.20	60704	60722	60740	10.80
		3/8	.105	60651	60669	60687	11.75	60705	60723	60741	12.40
		3/8	.135	60652	60670	60688	11.75	60706	60724	60742	12.40
		3/8	.165	60653	60671	60689	11.75	60707	60725	60743	12.40
		1/2	.105	60654	60672	60690	14.40	60708	60726	60744	15.10
		1/2	.135	60655	60673	60691	14.30	60709	60727	60745	15.10
		1/2	.165	60656	60674	60692	14.30	60710	60728	60746	15.10
		5/8	.105	60657	60675	60693	15.10	60711	60729	60747	15.70
		5/8	.135	60658	60676	60694	15.10	60712	60730	60748	15.70
		5/8	.165	60659	60677	60695	15.10	60713	60731	60749	15.70
		3/4	.105	60660	60678	60696	16.65	60714	60732	60750	17.35
		3/4	.135	60661	60679	60697	16.65	60715	60733	60751	17.35
		3/4	.165	60662	60680	60698	16.65	60716	60734	60752	17.35
		1"	.105	60663	60681	60699	21.60	60717	60735	60753	22.25
		1"	.135	60664	60682	60700	21.60	60718	60736	60754	22.25
		1"	.165	60665	60683	60701	21.60	60719	60737	60755	22.25

DISSOPADS™

- IMPROVE RELIABILITY
- REDUCE PRODUCTION COSTS
- NYLON PER MIL-M-20693

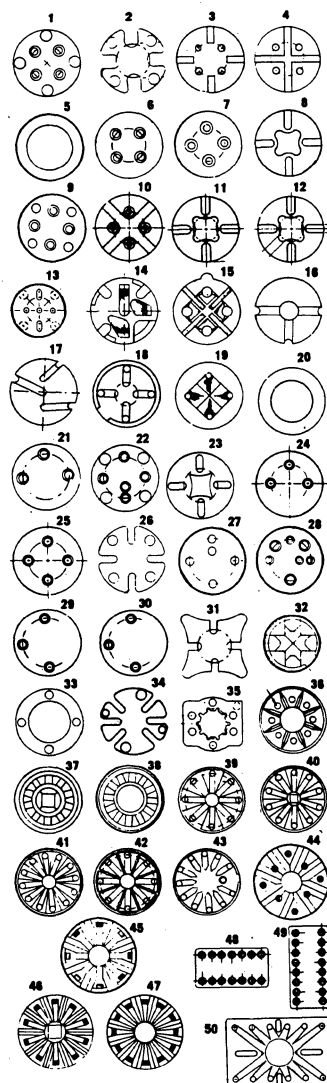
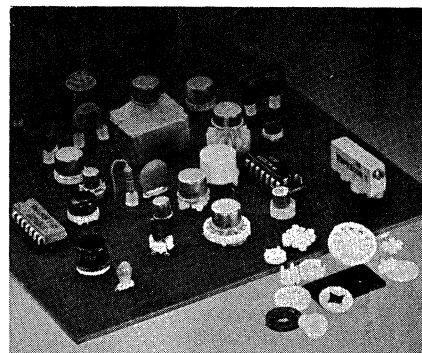
HARDWARE (NON-CURRENT CARRYING)

PERMANENT



FOR... PROTECTING, LOCATING, FIXTURING, SPACING, MOUNTING & REINFORCING... TRANSISTORS, INTEGRATED CIRCUITS & OTHER PRINTED CIRCUIT COMPONENTS.

PERMANENT MOUNTING SPACERS give protective support, shock mounting, added insulation, greater heat dissipation, cleanliness and improve neatness. PERM-O-PADS are molded from Nylon per MIL-M-20693 and are available from stock in a multitude of configurations. There are many unique designs to choose from in these economical mounts.



Part No.	Fig.	O.D.	Thickness	Spacing of Leads		100-499 Per C	500-999 Per C	1000-4,999 Per M	5,000-9,999 Per M	10,000 up Per M
				Entry	Exit					
100-095	1	.200	.095	.100	.100	\$4.35	\$3.35	\$23.75	\$21.25	\$17.00
101-096	2	.200	.096	.100	.100	4.35	3.35	23.75	21.25	17.00
102-125	3	.250	.125	.100	.100	4.35	3.35	23.75	21.25	17.00
111-125	4	.250	.125	.100	.100	4.35	3.35	23.75	21.25	17.00
103-080	5	.225	.080	.100	.100	4.35	3.35	23.75	21.25	17.00
104-060	6	.200	.060	.100	.100	4.35	3.35	23.75	21.25	17.00
105-021	7	.250	.021	.100	.100	4.35	3.35	23.75	21.25	17.00
106-045	8	.270	.045	.100	.100	4.35	3.35	23.75	21.25	17.00
107-180	9	.200	.180	.100	.100	4.35	3.35	23.75	21.25	17.00
108-021	10	.225	.021	.100	.100	4.35	3.35	23.75	21.25	17.00
109-045	11	.200	.045	.100	.100	4.35	3.35	23.75	21.25	17.00
110-030	12	.200	.030	.100	.100	4.35	3.35	23.75	21.25	17.00
112-040	13	.230	.040	.100	.100	4.35	3.35	23.75	21.25	17.00

200-170	14	.225	.170	.100	.200	\$4.70	\$3.65	\$26.50	\$22.50	\$18.25
201-150	15	.210	.150	.100	.200	4.70	3.65	26.50	22.50	18.25
202-150	16	.250	.150	.100	.200	4.70	3.65	26.50	22.50	18.25
203-150	17	.250	.150	.100	.200	4.70	3.65	26.50	22.50	18.25
204-125	18	.270	.125	.100	.200	4.70	3.65	26.50	22.50	18.25
205-085	19	.225	.085	.100	.150	4.70	3.65	26.50	22.50	18.25

500-080	20	.365	.080	.200	.200	\$4.70	\$3.65	\$26.50	\$22.50	\$18.25
501-075	21	.345	.075	.200	.200	4.70	3.65	26.50	22.50	18.25
502-120	22	.345	.120	.200	.200	4.70	3.65	26.50	22.50	18.25
503-075	23	.345	.075	.200	.200	4.70	3.65	26.50	22.50	18.25
504-038	24	.345	.038	.200	.200	4.70	3.65	26.50	22.50	18.25
511-038	25	.345	.038	.200	.200	4.70	3.65	26.50	22.50	18.25
505-120	26	.350	.120	.200	.200	4.70	3.65	26.50	22.50	18.25
506-038	27	.350	.038	.200	.200	4.70	3.65	26.50	22.50	18.25
507-100	28	.340	.100	.200	.200	4.70	3.65	26.50	22.50	18.25
508-075	29	.285	.075	.200	.200	4.70	3.65	26.50	22.50	18.25
510-110	30	.281	.110	.200	.200	4.70	3.65	26.50	22.50	18.25
509-060	31	.312	.060	.200	.200	4.70	3.65	26.50	22.50	18.25
512-115	32	.230	.115	.200	.200	4.70	3.65	26.50	22.50	18.25

Part No.	Fig.	No. of Leads	O.D.	Thickness	Spacing of Leads		100-499 Per C	500-999 Per C	1000-4,999 Per M	5,000-9,999 Per M	10,000 up Per M
					Entry	Exit					
600-080	33	—	.365	.080	.200/.230	.200/.230	\$4.70	\$3.65	\$26.50	\$22.50	\$18.25
601-120	34	6	.350	.120	.200/.230	.200/.230	5.00	3.85	27.00	24.00	19.25
608-090	35	10	.390	.090	.200/.230	.200/.230	5.50	4.25	30.00	27.00	21.50
605-085	36	8	.370	.085	.200/.230	.200/.230	5.50	4.25	30.00	27.00	21.50
606-075	37	10	.370	.075	.200/.230	.200/.230	5.50	4.25	30.00	27.00	21.50
607-075	38	12	.370	.075	.200/.230	.200/.230	5.50	4.25	30.00	27.00	21.50

700-130	39	8	.500	.130	.200/.230	.400	\$8.40	\$6.70	\$46.80	\$41.75	\$33.45
701-130	40	10	.500	.130	.200/.230	.400	8.40	6.70	46.80	41.75	33.45
702-130	41	12	.500	.130	.200/.230	.400	8.40	6.70	46.80	41.75	33.45
707-120	42	8	.450	.120	.200/.230	.400	8.40	6.70	46.80	41.75	33.45
708-275	43	12	.500	.275	.200/.230	.400	8.40	6.70	46.80	41.75	33.45
703-250	44	8	.500	.250	.200/.230	.400	9.05	7.25	50.75	45.30	36.25
704-250	45	8	.500	.250	.200/.230	.400	9.05	7.25	50.75	45.30	36.25
705-250	46	10	.500	.250	.200/.230	.400	9.05	7.25	50.75	45.30	36.25
706-250	47	12	.500	.250	.200/.230	.400	9.05	7.25	50.75	45.30	36.25

Width											
814-060	48	14	.450	.060	.100	.100	\$8.40	\$6.70	\$46.80	\$41.75	\$33.45
814-080	48	14	.450	.080	.100	.100	8.40	6.70	46.80	41.75	33.45
814-100	48	14	.450	.100	.100	.100	8.40	6.70	46.80	41.75	33.45
816-060	49	16	.450	.060	.100	.100	8.40	6.70	46.80	41.75	33.45
816-080	49	16	.450	.080	.100	.100	8.40	6.70	46.80	41.75	33.45
816-100	49	16	.450	.100	.100	.100	8.40	6.70	46.80	41.75	33.45
808-187	50	8	.385	.187	.200/.230	DIP	9.05	7.25	50.75	45.30	36.25
810-187	50	10	.385	.187	.200/.230	DIP	9.05	7.25	50.75	45.30	36.25
812-187	50	12	.385	.187	.200/.230	DIP	9.05	7.25	50.75	45.30	36.25

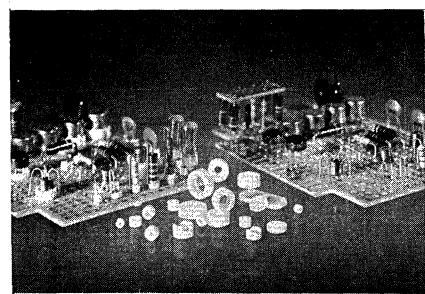
WASH-AWAY



- EVEN, ACCURATE POSITIONING
- REDUCE REJECTS & REWORK
- REDUCE LABOR COSTS
- STANDARD SHAPES TO FIT ALMOST ANY COMPONENT

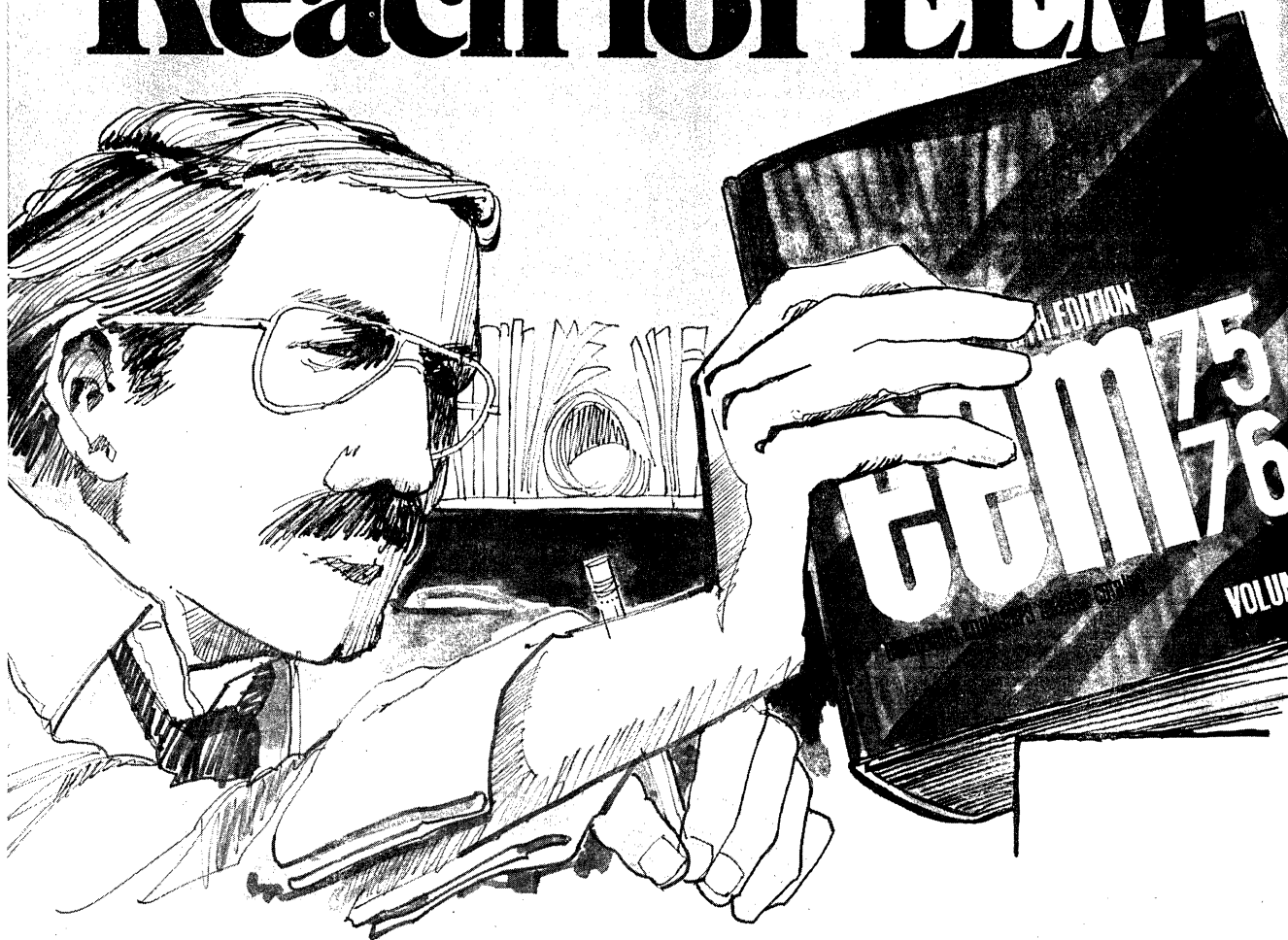
SIMPLE AND EASY TO USE... WASH AWAY IN WARM OR HOT RUNNING WATER... NO RESIDUE.

WASH AWAY SPACERS provide accurate, uniform component spacing above PCB surfaces, protect components throughout the soldering cycle, then **WASH AWAY** completely in **WARM** or **HOT RUNNING WATER**, without a trace of residue. Over 400 sizes are available from stock. Low cost, versatile DISS-O-PADS substantially reduce rejects, inspection and rework costs.



**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

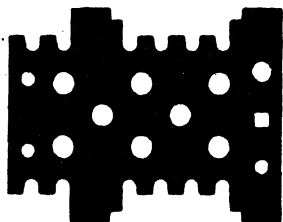
FOR EVERYTHING IN

NATURAL & SYNTHETIC MICA

40 YEARS OF KNOW HOW.

Precision-punched parts and specialties made from natural and synthetic micas, plastics, and other insulating materials suggested for use as insulating components in the following partial list of products.

IndoMica Type MS



A new insulating product, which closely approximates the electrical, mechanical, chemical and thermal properties of Natural Mica.

IndoMica, Type MS, consists of natural high heat resistant mica platelets BONDED WITH BORON BASE

SILICONE RESIN for high temperature applications. It is available in 10" x 36" sheets in thicknesses of 0.015" to 0.060" and in 20" x 36" sheets in thicknesses of 0.015" to 0.032" or precision punched to your specifications.

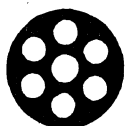
It offers: Inorganic, odorless, smokeless insulation; high mechanical strength and durability; regular thickness and sheet sizes, easy to punch to specific requirements; high temperature resistance and stability; chemical inertness and resistance; excellent dielectric properties.

Recommended for use as a self-supporting carrier of heating coils in appliances and industrial apparatus, as mechanical and thermal washers and gaskets, as a substrate, or insulating board for mounting components and similar applications.

Outstanding properties include:

Specific Gravity: 1.9.
AIEE Thermal Classification: Class C.
Maximum Continuous Use Temperature: 1200°F. Maximum Intermittent Use Temperature: 1400°F. Dielectric Strength per ASTM-D115: For .015" Sheet 1012V/mil. Dielectric Strength per ASTM-D115. For .030" Sheet 830V/mil. Surface Resistivity per ASTM-D257: 10^{15} megohm. Dielectric Constant per ASTM-D150: 2.95. Dissipation Factor per ASTM-D150: 0.33. Volume Resistivity per ASTM-D257: 10^{14} megohm-cm. Arc Resistance per ASTM-D495: 198 sec. Water Absorption, Weight Gain After 24 Hours Immersion: 0.91%. Coefficient of Linear Expansion: 9×10^{-6} per °C. Tensile Strength: 30,000 psi. Compressive Strength: 36,000 psi. Flexural Modulus: 15×10^4 psi.

IndoMica 21



Just as IndoMica Type MS, this new series 21 consists of natural high heat resistant mica platelets bonded with boron base silicone resin.

IndoMica series 21 is available in sheet sizes of approximately 22" x 40" in standard thicknesses of .004, .006, .008, .010, .012, .014 inches in the following three types:

IndoMica 21 - Soft

This material is similar to IndoMica Type MS but with a softer surface. It is not recommended for continuous applications above 500°F.

IndoMica 21 - Regular

This material has same properties as

IndoMica Type MS and its only difference are thinner thicknesses of the sheets.

IndoMica 21 - Hard

Material similar to IndoMica Type MS but with a substantially harder surface, higher mechanical strength and lower water absorption.

In addition to the standard thicknesses indicated above, IndoMica series 21 may be manufactured to other thicknesses on special orders.

IndoMica GR



This new version of IndoMica consists of mica paper reinforced by fibre glass. The extreme flexibility and mechanical strength of IndoMica series GR makes it an excellent material for application as a wrap around coil subject to high temperatures. This Class C material is presently available in sheet sizes of approximately 22" x 38"

in two standard types:

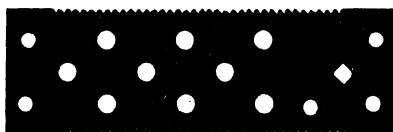
IndoMica GR - 1

is fibre glass reinforced on one side only and has a total thickness of approximately 0.005".

IndoMica GR - 2

is fibre glass reinforced on both sides and has a total thickness of approximately 0.006".

Natural Mica



Unsurpassed for its insulating properties for electrical and electronic applications, mica components manufactured by our Industrial Mica Division have been a standard for forty years.

Vacuum tube and capacitor manufacturers are just a few of the many customers who have taken advantage of coated natural mica spacers to reduce manufacturing

shrinkage due to delamination.

In addition, coating mica offers superior degassing properties and better dielectric parameters.

Industrial Mica offers an improved corrugated natural mica which enables the user to form thick mica sheets into curved patterns. This unique material overcomes the rigid properties that are inherent in natural mica and minimizes breakage during fabrication.

INDUSTRIAL MICA

A DIVISION OF COLUMBIA TECHNICAL CORPORATION

223 South Van Brunt St., Englewood, N. J. 07631 Telephone (201) 568-7200

HumiSeal

Protective coatings for electronics. See our General Chart of Properties in Section 1600 (Volume 2) of EEM.
HumiSeal Division, Columbia Technical Corporation, Woodside, N. Y. 11377 (212) 932-0800.

FOR EVERYTHING IN

NATURAL & SYNTHETIC MICA TRANSISTOR MOUNTINGS

40 YEARS OF KNOW HOW.

Precision-punched parts and specialties made from natural and synthetic micas, plastics, and other insulating materials suggested, for use as insulating components in the following partial list of products.

Possessing exceptional thermal and electrical properties, which afford highly effective protection against electrical losses, free from pressure-induced distortion, achieve rapid heat dissipation and are extremely lightweight. Outstanding chemical inertness and an absence of degassing characteristics make them particularly well suited for varied vacuum and spacer applications.

Major specifications include:

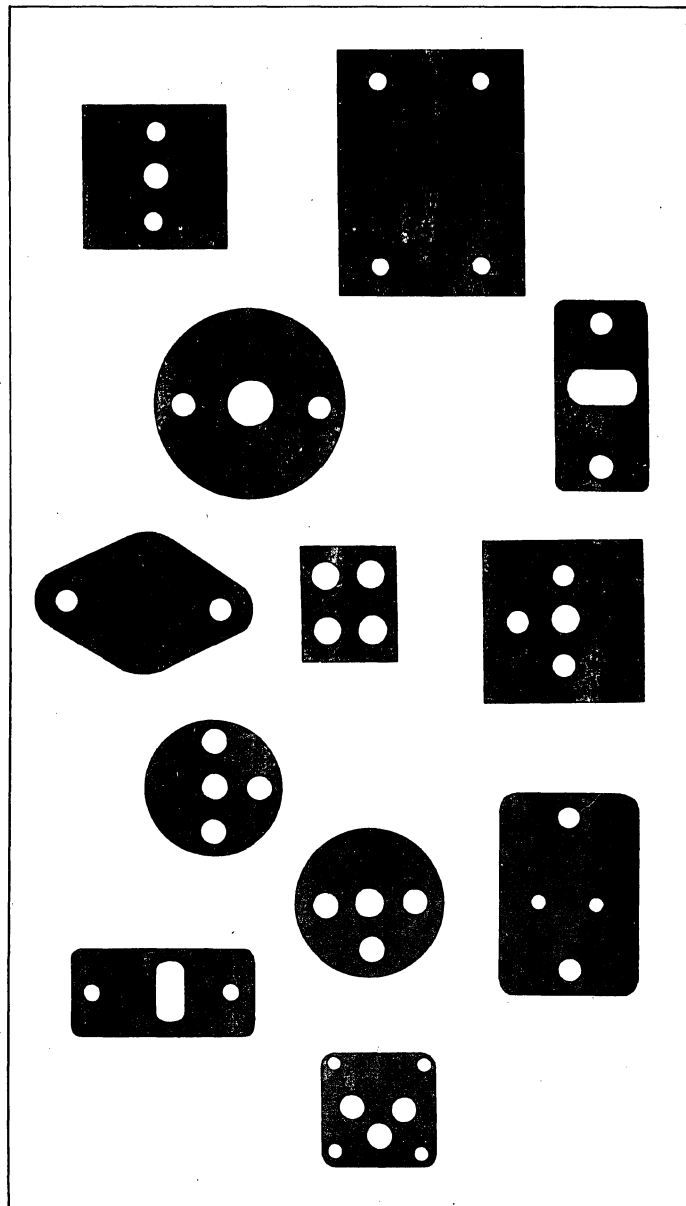
Specific heat	— 0.207
Volume resistivity	— 10^{15} ohm-cm/cm ³
Dielectric strength	— 3000 volts/mil
Dielectric constant	— 6
Maximum operating temperature	— 1400°F

Mica Pads and Spacers are available in both standard and custom produced items. When ordered from stock, units can be supplied at prices as low as \$5.00 per thousand.

Quality control is the keynote of our production facilities. We employ the use of the latest inspection equipment which includes 14" and 30" optical comparators, templates, electric taper pin gauges, electronic thickness gauges, etc. Our punch presses were built to punch precision parts. Dies, whether the blanking type, compound or pressure for flawless edges, are the best in the world.

We fabricate tons of precoated Mica (magnesium oxide and aluminum oxide coating). We hand cut, machine and punch, not only Mica, but Inorganic Micamat and Isomica as well as other insulation materials such as mylar and teflon.

We offer you decades of experience with a history of quality which allows us to look ahead for additional advancement for the mineral — Mica.



INDUSTRIAL MICA

A DIVISION OF COLUMBIA TECHNICAL CORPORATION

223 South Van Brunt St., Englewood, N. J. 07631 Telephone (201) 568-7200

HumiSeal

Protective coatings for electronics. See our General Chart of Properties in Section 1600 (Volume 2) of EEM.
HumiSeal Division, Columbia Technical Corporation, Woodside, N. Y. 11377 (212) 932-0800.

HUMISEAL COATINGS

GENERAL CHART

Listed in this General Chart of Properties are ten of the most frequently used HumiSeal Protective Coatings and their principal properties. These have been tabulated in order to facilitate comparison of their characteristics and selection of the most suitable type for a specific application. In addition to these HumiSeal types we manufacture a variety of coatings for special purposes, including high temperature applications. Should none of the coatings listed in this chart fulfill your requirements, we suggest that you contact us for recommendations.

HumiSeal Type ¹	PROPERTIES OF LIQUID HumiSeal										THERMAL PROPERTIES		
	Specific Weight (lbs. per gallon) ²	Solids Content (% by weight) ³	Viscosity, with catalyst when applicable (centipoises) ⁴	Flash Point (°F) ⁵	Drying Time for Handling ⁶	Recommended Curing Conditions	Time Required to Reach Optimum Properties	Pot Life, at Room Temperature	Shelf Life, at Room Temperature	Coverage per gallon (in sq. ft.) After One Dip	Continuous Use Temperature Range (°F)	Thermal Shock Test ⁷	Solderability ⁸
1B12	7.3	20	30	40	10 min.	24 hrs. at room temp. or 30 min. at 170°F	24 hrs.	1 year	1 year	550	-75°F to +280°F	Passes	Good
1B15	7.6	35	470	30	10 min.	24 hrs. at room temp. or 30 min. at 170°F	24 hrs.	1 year	1 year	450	-75°F to +270°F	Passes	Good
1B31	7.6	35	160	30	10 min.	24 hrs. at room temp. or 30 min. at 170°F	24 hrs.	6 mos.	6 mos.	450	-75°F to +270°F	Passes	Good
1A20	8.5	50	120	60	60 min.	24 hrs. at room temp.	1 week	6 mos.	6 mos.	375	-70°F to +250°F	Passes	Excellent
1A27	8.0	50	5000	100	15 min.	24 hrs. at room temp.	1 week	1 year	1 year	450	-90°F to +250°F	Passes	Excellent
1A33	7.7	44	160	30	15 min.	24 hrs. at room temp.	1 week	6 mos.	6 mos.	300	-90°F to +250°F	Passes	Excellent
2A72	7.8	36	<20	70	60 min.	24 hrs. at room temp. or 2 hrs at 170°F	1 week	4 hrs.	6 mos.	650	-70°F to +250°F	Passes	Excellent
2B13	7.5	42	50	40	30 min.	90 min. at 200°F	1 week	24 hrs.	1 year	480	-70°F to +270°F	Passes	Poor
2A51	9.2	100	6000	non flammable	2 hrs.	24 hrs. at room temp. or 2 hrs. at 200°F	1 week	6 hrs.	6 mos.	200	-70°F to +250°F	Passes	Poor
2A53	7.8	54	300	70	30 min.	2 hrs. at 200°F	1 week	24 hrs.	6 mos.	400	-70°F to +250°F	Passes	Poor

**HumiSeal TYPES LISTED IN BOLD PRINT
COMPLY WITH THE REQUIREMENTS
OF MIL-I-46058C**

All technical data in this bulletin are based on test results using the stated standards and are believed to be correct. However, since the end use of HumiSeal materials (and the manner of storing and handling them) is beyond our control, we make no warranty — expressed or implied — as to the fitness of use, results to be obtained from or effects of use with respect to these materials. Their use shall be solely by the judgment of and at the risk of the end-user notwithstanding any statement contained in this bulletin.

1. The first digit in the type number specifies whether the product is a one-, or a two-component system.
2. Fed-Std 141a, Method 4184.
3. Fed-Std 141a, Method 4044.
4. Fed-Std 141a, Method 4287.
5. Fed-Std 141a, Method 4291.
6. Fed-Std 141a, Method 4061.
7. Mil-I-46058C.
8. Visual evaluation for ease of soldering with an 85 watt iron through a 2 mil film.
9. Fluorescent dye may be added if required.
10. Fed-Std 141a, Method 2121.
11. Fed-Std 406, Method 7031, Procedure A.
12. Fed-Std 141a, Method 6303.
13. ASTM-D150-65T, at 1 MHz and 25°C.
14. Mil-I-46058C Insulation resistance during 10th cycle, at 65°C and 98% RH.

FOR ELECTRONICS OF PROPERTIES

HumiSeal Protective Coatings are available in one-quart or one-gallon cans, five-gallon pails, or fifty-five gallon drums. HumiSeal types 1B15 and 1A27 are also available in 16-ounce aerosol containers. All HumiSeal types listed in this chart may be applied by dip, brush or spray. Literature on recommended techniques for the proper application of coatings and preparation of the substrate is available upon request.

PROPERTIES OF CURED HumiSeal COATING

PHYSICAL PROPERTIES							ELECTRICAL PROPERTIES					CHEMICAL PROPERTIES			HumiSeal Type ¹
Color ⁹	Specific Gravity	Average Build After One Dip (mils) ¹⁰	Water Absorption (%) ¹¹	Flexibility ⁷	Adhesion ¹²	Mar Resistance ¹²	Dielectric Constant ¹³	Dissipation Factor ¹³	Dielectric Strength (volts) ⁷	Insulation Resistance (teraohms) ⁷	Moisture Resistance (gigaohms) ¹⁴	Main Constituent	Fungus Resistance ⁷	Resistance to Solvents	
Water Clear	1.05	0.5	.18	Very Good	Ex-cellent	Very Good	2.8	.010	6000	250	30	Acrylic	Ex-cellent	Very Good	1B12
Water Clear	1.05	2	.20	Fair	Ex-cellent	Fair	2.3	.010	8000	350	40	Acrylic	Ex-cellent	Fair	1B15
Water Clear	1.06	2	.20	Ex-cellent	Ex-cellent	Very Good	2.5	.010	7500	800	60	Acrylic	Ex-cellent	Good	1B31
Light Straw	1.05	2	.30	Ex-cellent	Very Good	Ex-cellent	3.5	.028	8000	300	48	Poly-urethane	Ex-cellent	Ex-cellent	1A20
Green Tinge	1.05	5	.31	Ex-cellent	Ex-cellent	Fair	3.6	.020	7500	200	12	Poly-urethane	Fair	Good	1A27
Yellow Tinge	1.05	2	.31	Ex-cellent	Ex-cellent	Fair	3.6	.030	7500	200	16	Poly-urethane	Ex-cellent	Good	1A33
Yellow Tinge	1.09	0.5	.30	Ex-cellent	Ex-cellent	Good	3.6	.024	3500	300	56	Poly-urethane	Ex-cellent	Ex-cellent	2A72
Yellow Tinge	1.06	2	.20	Ex-cellent	Ex-cellent	Ex-cellent	3.0	.030	8000	300	33	Epoxy	Ex-cellent	Ex-cellent	2B13
Yellow Tinge	1.10	15	.31	Fair	Good	Good	3.0	.030	6000	400	6	Epoxy	Ex-cellent	Good	2A51
Yellow Tinge	0.95	1	.30	Ex-cellent	Ex-cellent	Ex-cellent	3.0	.030	8000	200	28	Epoxy	Ex-cellent	Ex-cellent	2A53

HUMISEAL DIVISION

COLUMBIA TECHNICAL CORPORATION

WOODSIDE, NEW YORK 11377

(212) 932-0800

PLEASE ASK FOR DEPT. 77

MARKEL
 SINCE 1922

Insulating Tubings and Sleeveings— High Temperature Wire and Cable

ELECTRICAL INSULATING SLEEVEINGS

HYGRADE®

HYGRADE SR-398 Silicone Rubber Coated Fiberglass Sleeveing is a Class H material made of closely-woven glass braid, coated with highly abrasion-resistant silicone rubber.

HYGRADE SV-862 Silicone Varnish Impregnated Fiberglass Sleeveing is a flexible Class H insulation with unusual resistance to temperature extremes and weathering.

HYGRADE VF Flexible Fiberglass Sleeveing is a tough, Class B insulation of plastic-covered fiberglass with excellent electrical resistance, flexibility, and heat stability. (UL FR-1)

HYGRADE Polytube 463 Class F Flexible Fiberglass Sleeveing is an acrylic-coated material especially compatible with the wire enamels used in motors and transformers.

HYGRADE Thermoflex 1200 Class C Flexible Fiberglass Sleeveing is made of 100% tightly braided fiberglass. For use at continuous temperatures as high as 1200°C. (UL FR-1)

HYGRADE Thermoflex 500 Class C Flexible Fiberglass Sleeveing is made of tightly braided and pigmented fiberglass. For continuous operating temperatures to 500°C. (UL FR-1)

ELECTRICAL GRADE PLASTIC TUBINGS

FLEXITE®

FLEXITE TEFLON TFE Extruded Tubing offers unequalled quality, performance and scope in electrical insulation over the widest and most stable temperature range of any flexible insulation (below -70°C to +250°C). Its unique performance characteristics are superb electrical properties, unmatched chemical resistance, zero moisture absorption, non-corrosive to all metals, completely inert to fungi, and excellent anti-stick properties—having the lowest coefficient of friction of any solid material. With nearly infinite life under normal operating conditions, Teflon TFE is the ultimate space age insulating material.

FLEXITE TEFLON FEP Extruded Tubing is a fluorocarbon material that combines long-term reliability (matched only by TFE) with chemical inertness, flexibility, superb electrical characteristics and a useful continuous operating temperature range of -70°C to +200°C.

FLEXITE SR-200 Silicone Rubber Extruded Tubing is made of an extremely elastic compound, and is excellent for high voltage applications at Class H temperatures.

FLEXITE HT-105C Extruded Vinyl Tubing is UL recognized for continuous use at 105°C. It is a strong, very flexible tubing for many applications. (UL FR-1)

FLEXITE E Extruded Vinyl Tubing is an extremely flexible tubing designed primarily for low temperature applications (to -68°C), as in aeronautical instrumentation.

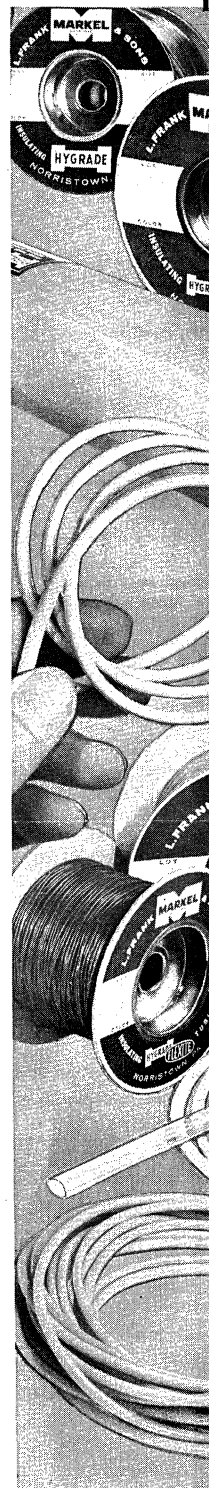
FLEXITE Shrinkdown HT105 is a flexible material made in expanded sizes to shrink 50% with 110°C heating; has outstanding electrical and mechanical properties. (UL FR-1)

FLEXITE Shrinkdown LM-145 is a very flexible modified polyolefin tubing that will shrink 50% with 120°C heating and conform closely to the object it covers. It is suitable for use at temperatures to 135°C; has excellent mechanical strength and abrasion resistance.

FLEXITE Shrinkdown PO-135 is a thermally-stable Class B (130°C) crosslinked material extruded from specially-formulated polymers. Supplied in expanded sizes, PO-135 may easily be assembled over components, connectors, cables, or other irregular shapes. When exposed to heat (150°C), it shrinks 50% in diameter, forming a tough, smooth insulating covering with excellent chemical, electrical and oil resistant properties.

FLEXITE Shrinkdown HM-140 is a heat shrinkable semi-rigid polyolefin tubing with exceptional mechanical strength and electrical properties. It has outstanding chemical resistance and may be operated continuously at temperatures from -55°C to +175°C. (UL FR-1)

FLEXITE Shrinkdown HA-150 is a heat shrinkable polyvinylidene fluoride tubing with an operating temperature range of -55°C to +175°C. It is a very tough material with high resistance to abrasion and cut through suitable for strain relief applications. (UL FR-1)



Ask for data sheets on these HYGRADE and FLEXITE products

Insulating Tubings and Sleeveings— High Temperature Wire and Cable

MARKEL

SINCE 1922

FLEXITE Shrinkdown TE-250 is a heat shrinkable Class H tubing with the unique properties of Teflon, plus the ability to shrink at 330°C to make a form-fitting cover over shapes.

FLEXITE SPIRAL-CUT CABLE WRAP is an expandable plastic wrap for harnessing, insulating, and the abrasion protection of wires, tubing lines, cables, or bundles in diameters up to four inches. Quick and easy to apply, the cable wrap provides openings through which leads can be broken out at any point, yet creates a firm, homogeneous harness assembly which can be channeled, bent or flexed without danger of cut through. Manufactured in five different materials to meet a wide variety of requirements over a temperature range from -100°C to +250°C.

FLEXTECH® FLUID AND MECHANICAL GRADE PLASTIC TUBINGS

FLEXTECH AR-400 Abrasion-Resistant Tubing is extruded from a Markel patented composition of reinforced Teflon and exhibits abrasion resistance many times greater than conventional Teflon tubings. It also offers good antistick properties, chemical inertness, high and low temperature stability, and meets the electrical requirements of MIL-I-22129C. Ideal for an extremely wide range of mechanical and viscous fluid transfer uses.

FLEXTECH AR-420 Abrasion-Resistant Tubing is extruded from a Markel-formulated reinforced Teflon. With chemical properties similar to AR-400, cut-through and abrasion resistance second only to AR-400, AR-420 also offers excellent flexibility and meets the requirements of MIL-I-22129C. Ideal for fluidic controls and transfer of fluids in difficult environments.

FLEXTECH TEFLON FEP is a fluorocarbon tubing suitable for continuous 200°C use in applications requiring the chemical inertness, durability, and other desirable properties of TFE but without the extreme high temperature requirements. It has nearly zero moisture absorbency, good antistick properties and semi-transparency ideal for fluid transfer.

FLEXTECH FN NYLON Tubings (FN-1000, standard wall and FN-2000, heavy wall) are extruded from polyamides specially compounded to provide flexibility, heat stability and ultraviolet resistance. They have low moisture absorption (1.5%), excellent mechanical strength, and are superior in corrosion resistance, flexibility and fatigue life. Both FN types are self-extinguishing and are available in non-toxic formulations for food and beverage and other uses at operating temperatures from -70°C to +70°C.

FLEXTECH HP NYLON Tubings (HP-1000, 1600 psi and HP-2500, 2800 psi Burst Strength) are extruded from a polyamide designed specifically for the conveyance of air, gases and liquids under high pressures. They are odorless, tasteless, non-corrosive, fungus-resistant and self-extinguishing. HP tubings have exceptional mechanical strength, are non-toxic, easy to clean and highly recommended for food processing or other heavy duty applications. Temperature ratings for HP-1000: -44°C to +93°C; for HP-2500: -85°C to +105°C.

FLEXTECH LP-80 POLYETHYLENE is a specially compounded tubing designed for the conveyance of air, gases and liquids under low pressure conditions. A strong flexible material with a useful working temperature range of -70°C to +80°C, it is odorless, tasteless, non-toxic, non-corrosive and fungus-resistant. Easily installed using standard fittings.

FLEXTECH U-585 POLYURETHANE is one of the most versatile of materials, combining long life with high working-pressure ratings, superb resistance to fuels and solvents, excellent flexibility, high resistance to abrasion, and low moisture absorption. U-585 preserves its rubber-like pliability and resistance to kinking over a temperature range of -70°C to +105°C, making it suitable for cryogenic use where clamped or pinched to control fluid flow.

FLEXTECH RETRACTABLE NYLON AIR HOSE is a seamless-extruded, abrasion-resistant, long life nylon hose that is helically coiled for spring-like action. It extends easily with minimum resistance and automatically retracts to its original coil configuration upon release. This self-storing feature keeps hose off the floor and out of the way, eliminating the need for expensive reel devices. It never becomes twisted or tangled, has long life, is lightweight and flexible, making it easy to use with any type of air-powered tool. Retractable air hose will not absorb oil and can be used to feed lubricant in air stream.

Ask for data sheets on these FLEXTECH products



1 SOURCE for EXCELLENCE in Insulating Tubings and Sleeveings • High Temperature Wire and Cable

L. FRANK MARKEL & SONS, INC.

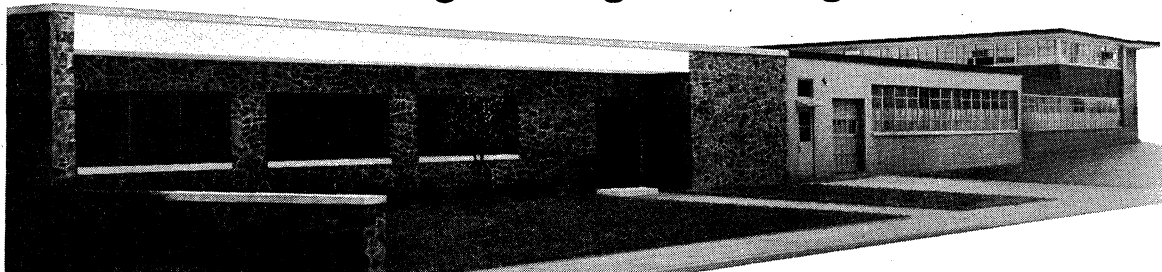
NORRISTOWN, PENNSYLVANIA 19404

Telephone: 215-272-8960 • TWX: 510-660-0190

reliable products delivered on time

VARFLEX

the complete line
of electrical insulating sleeving and tubing



Whatever your problem, heat, cold, flexibility miniaturization, high insulating or dielectric strength—Varflex can supply the required reliability and delivery. Our rapidly expanding plant is fully equipped to supply sleeving for any combination of characteristics you may

need. In addition to maintaining large stock for off-the-shelf delivery, Varflex has the productive capacity to provide prompt delivery (often 48 hours) on special orders. As insulation specialists, we are ready to work with you on unusual specifications or applications.

Here is a brief description of Varflex products

VARGLAS SILICONE RUBBER SLEEVING. The ultimate in flexibility, yet dielectric protection to 8000 volts. Class H-A-1 certified to meet Government Specification MIL-I-3190/6 (formerly MIL-I-18057A) Class H-B-1 (4000 volts) available, also. Continuous exposure from -70° to 400°F. does not affect coating or Fibreglas braid. Class H-C-1 (2500 volts), Class H-C-2 (1500 volts) and Class H-C-3 also available.

VARGLAS SILICONE RESIN SLEEVING. Class H-A-1 is recommended for applications requiring extremes of heat endurance and high dielectric strength (7000 volts). Class H-B-1 is identical except for dielectric guarantee (4000 volts). Good abrasion resistance. Class H-A-1 meets the requirements of MIL-I-3190/5. Four other standard grades available where 7000 volt test not important.

SILFLEX SLEEVING. A light coating of Silicone resin on Fibreglas braid. Extremely flexible within a temperature range from minus 85°F. to 500°F.

VARGLAS SILICONE LEAD WIRE. Made from solid or stranded wire covered with one or more walls of Fibreglas braid and impregnated with Silicone. Built to your specifications.

VARGLAS SILICONE TYING CORDS. Continuous filament Fibreglas cords impregnated with Silicone resin, 1/4" to 1/2" diameter. Specify Type 46 for dry cure, Type 48 for tacky cure.

VARGLAS S1600 SLEEVING. Newest development in Fibreglas yarn. Will retain "life" at temperatures up to 1600°F. (400 degrees higher than E glass).

VARGLAS POLYURETHANE CLASS F SLEEVING. Made with Polyurethane resins on Fibreglas braid. Offers better than Class B heat resistance (up to 155°C continuously). Available in F-A-1, F-B-1 and F-C-1 grades.

VARGLAS ACRYLIC CLASS F SLEEVING. Highly resistant to acids, organic solvents, oils and water and exhibits fair resistance to alkalis. It is compatible with polyester, acrylic, epoxy, phenolic and formvar wire enamels. Designed to perform for long periods in the 155°C range without loss of any electrical or physical properties. Available in five grades. Class F-A-1 (7000 volts) meets the requirements of MIL-I-3190/3.

VARFIL SLEEVING. Fibreglas braids impregnated with polyester resin. Four grades available in coils as well as 36" lengths in most sizes. In a class by itself because of its toughness, flexibility, high temperature resistance and ability to withstand bending and twisting without dielectric loss. Compatible with varnish. Over 1000 hours at 125°C., with intermittent operation at 150°C.

VARFLO SLEEVING. Class B insulation. Good flexibility, solvent, oil and moisture resistance. The A grade passes 90° Navy bend test after 2000 hours at 300°F. with 3500 volt end point. Varflo has good shelf life and will not lose dielectric strength when subjected to severe twisting. Classes B-A-1, B-B-1 and B-C-1 are available. Flame and fungus resistant if specified. B-A-1 approved under MIL-I-3190/2 (formerly MIL-I-21557B).

VARGLAS VARNISHED SLEEVINGS. Flexible continuous coatings of flame resistant oleoresinous varnish built up over fine Fibreglas braids in several carefully controlled operations. Operate at temperatures up to 130°C continuously. Available in five grades.

VARGLAS LECTON SLEEVING. Specifically designed for hermetic motors. Non-contamination of Freon and other refrigerants in Class B motors. B-A-1, B-B-1, and B-C-1 grades.

VARGLAS NON-FRAY SLEEVINGS. Type H: The normalizing treatment given the Fibreglas braid removes the organic impurities and tends to hold the individual filaments to-

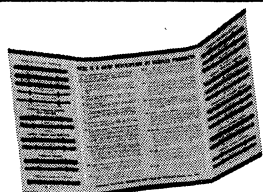
gether. The lack of any bonding agent means it may be subjected to temperatures as high as 1200°F. Recommended for applications where dielectric requirements are not of prime importance. Resists fungus and is non-corrosive. Type HP: Similar to Type H, but dyed various colors for coding purposes. Ideal as secondary insulation where primary covering might disintegrate due to high temperature or continual flexing. Colors may fade at 300°F. Type HO: A very light treatment of resin added after the braid has been normalized — just enough to hold the sleeving round for accurate cutting. Will distend to cover soldered joints or terminals. Available in eight colors. Colors fade at 300°F., but sleeving unaffected up to 1200°F. Best of the three from a non-fray standpoint.

VARGLAS LITEWALL SLEEVINGS. Wall thickness of Type A is .008" and of Type B, .006". These extremely flexible, finer braids are supplied untreated, heat treated and/or dyed. Produced in fractional sizes. Because of the construction, one size can be used to cover several different wire sizes. Specify Type HA or HB if heat treated braids preferred.

SYNTHOLVAR EXTRUDED TUBING. Made from vinyl polymers. High dielectric and tensile strength. Will not support combustion nor absorb moisture. Smooth surface, thin wall and flexibility all make for ease in assembling operations. Type SHH recognized by U/L for 105°C applications. Type LT will function at temperatures down to -50°C. Specify fungus resistant tubing where needed. Special formulations for high and low temperature environment. Made to meet applicable Government Specifications MIL-I-631 and MIL-I-7444.

RAYON SLEEVING. These sleeveings are varnish impregnated. NEMA grades A-A-1, A-B-1, A-C-1, A-C-2 and A-C-3 readily available.

NYLON UNTREATED SLEEVING. This product has outstanding abrasion resistance and is the ultimate in flexibility. It is intended for use over insulated wire and cable, not as primary insulation.



FREE

Write for our folder containing 25 test samples.

VARFLEX CORPORATION

514 W. Court Street

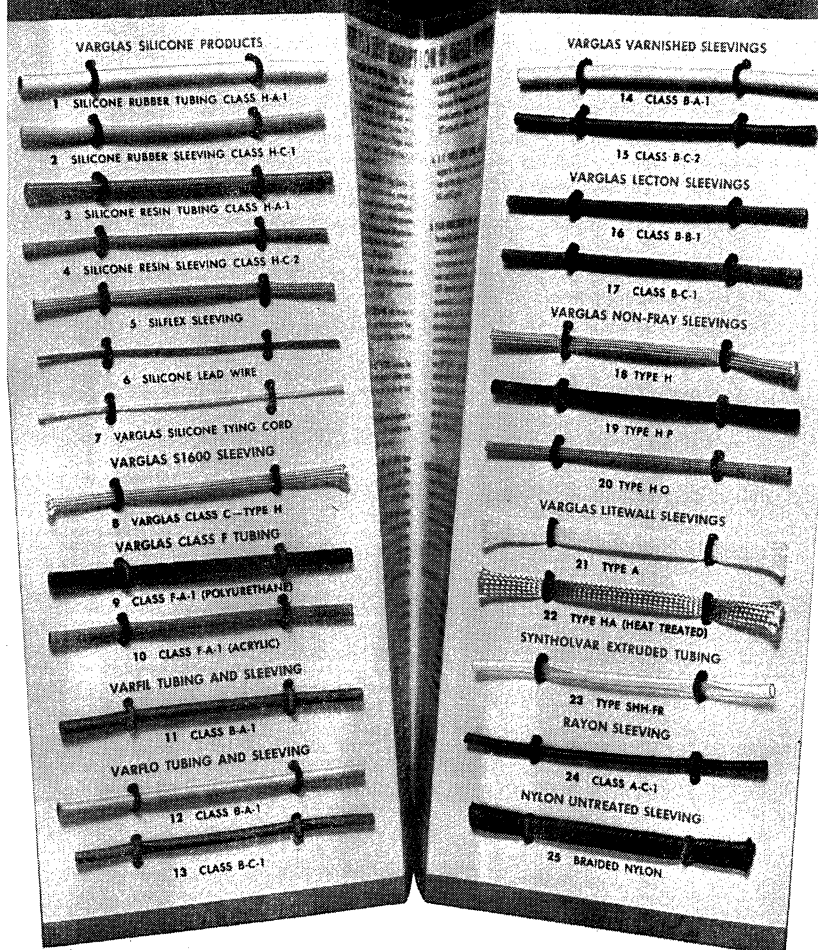
Rome, N. Y.

Varflex products meet or exceed applicable government specifications including: MIL-I-18057A, MIL-I-3190C, MIL-I-7444B, MIL-I-631D, MIL-I-21557



send for this free sample folder

Contains 25 different
test samples of high-dielectric
INSULATING SLEEVING



Get yours now from your Varflex distributor:

Electrical Specialty Co.

Arizona—Phoenix 85034	602-275-5736
202 So. 29th Street	
California—Anaheim 92806	714-630-7050
2900 E. Blue Star Street	
California—Los Angeles 90040	213-724-9600
7244 Condor Street	
California—San Diego 92101	714-239-1345
345 6th Avenue	
California—So. San Francisco 94080	415-589-9611
213 E. Harris Avenue	
Colorado—Denver 80207	303-321-0226
399 Holly Street	
Oregon—Portland 97210	503-227-3601
2360 N.W. Quimby Street	
Utah—Salt Lake City 84104	801-487-9805
1505 South 700 West	
Washington—Seattle 98134	206-682-3434
3667 First Avenue South	

Hisco

Arkansas—Little Rock 72209	501-568-3105
6621 Geyer Springs Road	
Texas—Garland 75042	214-272-5411
3710 Marquis Drive	
Texas—Houston 77003	713-228-6662
1815 Dallas Avenue	

Prehler Electrical Insulation Co.

Georgia—Chamblee 30005	404-451-4266
6030 Peachtree Road	
Illinois—Chicago 60639	312-384-6100
2300 N. Kilbourn Avenue	
Minnesota—St. Paul (Eagan) 55121	612-452-2470
3130 Lexington Avenue So.	
Ohio—Cleveland 44130	216-267-2650
12200 Brookpark Road	
Pennsylvania—Philadelphia 19120	215-725-5913
5698 Rising Sun Avenue	

E & H Electric Supply Company

Kentucky—Louisville 40203	502-587-0991
804 South Fifth Street	

Frederick H. Hart Co.

Massachusetts—Nahant 01908	617-581-0381
115 Pond Street	

Edward P. Gund Company

Missouri—University City 63130	314-862-1650
6403-15 Maple Avenue	

William T. Elliott

New York—Liverpool 13088	315-652-3690
16 Forester Road	

W.R. Murphy Company

New York—Carle Place 11514	516-333-6122
P.O. Box 177	

John P. Kennedy, Martin Electric Company

Pennsylvania—Ardmore 19003	215-649-6332
118 Valley Road	

Earl B. Beach Company

Pennsylvania—Pittsburgh 15221	412-242-0400
P.O. Box 8623	

Electric Insulation & Fibre Co. Ltd.

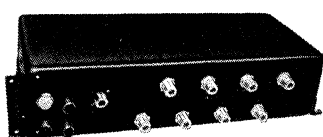
Canada, Mississauga, Ontario L4X 2C3	416-624-0700
3240 Wharton Way	

...or write direct to Varflex.

varflex CORPORATION

514 W. Court St. Rome, N. Y. 13440

RF Filters, Converters, Switches, Amplifiers, Multipliers, Signal Sources, Multicouplers



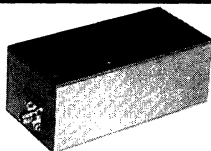
MULTICOUPLERS

Model HFM Series is designed to meet the needs of most systems.

General features:

- High isolation between outputs
- High dynamic range
- Low noise
- Modular construction
- Solid-state
- Octave bandwidth (if desired)

Model PM Series of passive multicouplers provides the ultimate performance in signal distribution.

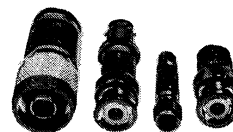


BROADBAND MULTIPLIERS (5-18,000 MHz)

These units utilize solid state devices. Using the frequency multiplier as the basic tool, lines of Signal Sources, Frequency Synthesizers and Multiplier Chains are now available.

General characteristics:

- Frequency Range: 5-18,000 MHz
- Bandwidths: up to 27%
- Power Output: up to 5 watts
- Efficiency: as high as 50%

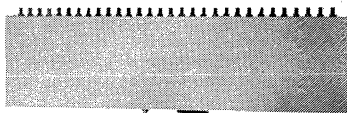


FIXED PAD ATTENUATORS & TERMINATIONS (DC-3 GHz) FOR TYPES BNC, TNC C, N & QSM CONNECTORS

Integrated line of fixed pad attenuators, terminations and impedance-matching transformers provides means for rapid and accurate division of DC to 3 GHz, and for the matching of different impedances with minimum loss over a broad frequency band. The unit cost is within the practical price range of the large and small equipment user, as well as the research and experimental user.

General characteristics:

- Frequency Range: DC-3 GHz
- VSWR: 1.25:1
- Attenuation Accuracy: ± 0.5 dB
- Impedances (nominal): 50, 75, 90 ohms
- Attenuation values: 1, 2, 3, 4, 6, 10, 12, 15, 20 dB (standard)



SWITCHES (10-1000 MHz)

A series of computer compatible solid state switches using PIN diodes in a broadband stripline matching structure. Can be directly addressed without interfacing. Units available with equal path lengths to all outputs, providing good phase coherence with phase and amplitude tracking on all ports. Switch matrix configurations are also available.

General Characteristics:

- Frequency Band: 10-1000 MHz
- Switch Configuration: 1x2 to 1x30
- Isolation: 70 dB min. (higher available)
- Insertion Loss: 1.0 dB max.
- VSWR: 1.2:1
- Operation Time: 1.0 μ sec.
- Primary Power: ± 4.5 V, 50ma per crosspoint
- Sizes: 2" to 16" L x 4" W x 1/2" H



CONVERTERS

State of the art converters available for military or commercial application throughout the frequency range. All units are constructed to meet mil applications.

TELEMETRY CONVERTERS

These units permit the ready adapting of existing UHF telemetry receiving equipment for use in the 1435 to 1540 and 2200 to 2300 MHz telemetry band with high conversion gain.

General characteristics:

- Long term stability: better than ± 1 PPM over temperature range
- Image rejection: >than 50 dB
- Noise figure: better than 5 dB for 100 mc bandwidth (2.2 to 2.3 GHz)

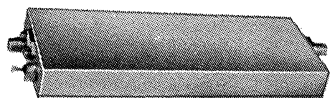


FILTERS (5-12,000 MHz)

Advanced network design techniques have developed filters operating in the frequency range up to 12,000 MHz. With electrical performance approximating theoretical expectations. In addition to Bandpass, Band Reject and Multiplex Filters, advanced network designs are available for antenna couplers, Diplexers, Interdigital Filters and many other types.

General characteristics:

- Frequency Range: 5-12,000 MHz
- Bandwidths: up to several octaves
- Insertion Loss: as low as 0.25 dB
- Power: up to 3.5 kW (cw)
- Band Reject Notches: as narrow as 1/4 % fo
- Band Reject Attenuation: as great as 75 dB



SOLID STATE RF AMPLIFIERS

(Power, low-noise, broadband, phase matched, linear and high dynamic range) Constructed to meet mil and missile applications.

General characteristics:

- Frequency Range: up to 4 GHz
- Bandwidths: up to multiple octaves
- Phase matching: to within 1° over an octave
- Noise figure: as low as 1.5 dB
- Gains: up to 120 dB
- Power output: >than 20 watts

For complete details, write or call

Applied Research

INCORPORATED

76 So. Bayles Ave.,
Port Washington, N. Y. 11050
(516) 883-5700



TUNABLE BAND REJECT FILTERS (5-2000 MHz)

Tunable multicontrol band reject filters provide high rejection of more than one and up to eight unwanted signals, or, extreme rejection of one. Low insertion loss and sharp skirt selectivity in the band reject region. Eight knobs and counter readout allow continuous tuning.

General Characteristics:

- Center Frequency: 5-2000 MHz
- Out-of-Band Insertion Loss: 0.5 dB
- Notch Bandwidth: narrow as 1/4 % fo
- Notch Depth: 20 dB/section
- VSWR (outside of notch region): 1.5:1
- Size: 24" x 2" x 8"
- Connectors: BNC



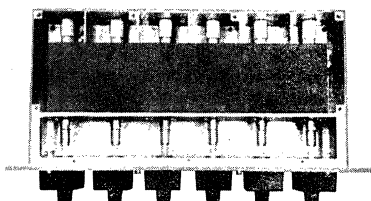
BAND REJECT FILTER (225 to 400 MHz)

Single knob control band reject filters reject unwanted signals, with extreme selectivity through L-band. Tune ranges of nearly an octave can be obtained. Units are tunable over the range 225 to 400 MHz. The bandwidth is >1 MHz at the 60 dB points. Total notch depth is 60 dB. Use of helical resonators provides for high rejection and low insertion loss in the passband of <1 dB. The phase linearity in the passband is achieved by utilizing quarterwave coaxial lines.

PERFORMANCE SPECIFICATIONS

Insertion Loss (out of notch region): 1 dB
Notch Range: 225 to 400 MHz
Typical Notch Specs: Frequency 225.2 MHz;
1 dB bandwidth 11.1 MHz;
Depth 68 dB

Impedance (I & O): 50 ohms
VSWR (I & O) (out of notch region): $<1.3:1$
Group Delay (out of notch region): <20 ns



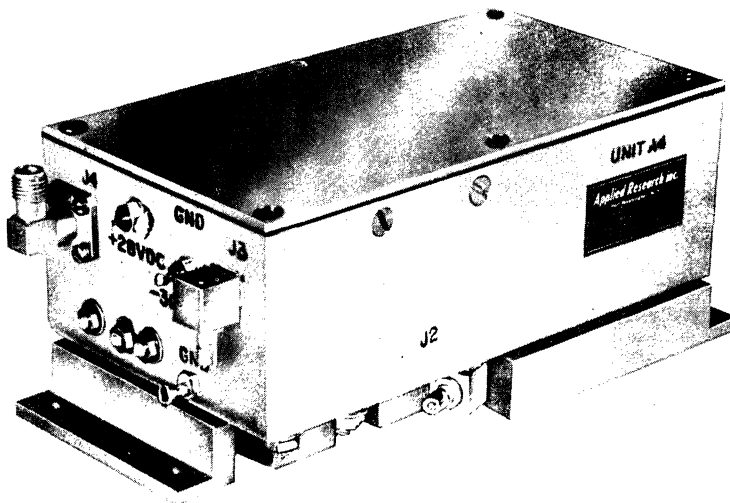
BAND REJECT FILTER (240 to 365 MHz)

Band reject filters operating from the HF range to K-band exhibit a wide bandpass frequency range without reentrances. Resonant elements are independently tuned or ganged to a single knob control. Operation is over frequency ranges greater than one octave, providing high rejection at one frequency or rejection by greater than 15 to 20 dB to as many as six separate and independent frequencies within the band.

Two or more notches can be aligned to adjacent frequencies to vary the depth and/or bandwidth of the band rejection curve. With all rejection notches tuned to a single frequency, the resultant response is such that an undesired signal approximately one percent away from a desired signal is attenuated by more than 70 to 80 dB while the desired signal is passed with only a 1 dB insertion loss.

PERFORMANCE SPECIFICATIONS

Insertion Loss (out of notch region):
 <1 dB 100 to 1000 MHz
Bandpass: DC to 1000 MHz
Notch Frequency: 240 to 365 MHz
Typical Rejection below Passband: 240 MHz/
23 dB; 325 MHz/19 dB; 365 MHz/17 dB
Impedance (I & O): 50 ohms
VSWR (I & O): $<1.35:1$



Frequency Generation thru Multiplication & Phase-Lock techniques VHF to Ku-Band (10 MHz to 1.5 GHz)

Applied Research offers many proven designs using both techniques. And we're capable of meeting your exact requirements, precisely.

Our Phase-lock loops, comprised of I.C. components, together with RF devices, yield outputs of up to 10 watts at microwave frequencies. And our multipliers are available as passive devices or in combination with amplifiers having multiplication factors of from 2 to 2000. In combination with varactor multiplier devices output in Ku-band can be obtained.

What's more, we can supply crystal oscillators or internal drivers to provide a self-contained source.

SOME PERFORMANCE SPECIFICATIONS

Phase-Lock Signal Source

Output: 494 MHz @ 10 watts
Stability: .005% from internal crystal oscillator

Phase-Lock Synthesizer

Input: 6 MHz & 200 MHz @ 10 dBm each
Output: 218, 224, 230, 236, 242, 248, 254, 260 MHz @ 10 dBm each
Spurious: 60 dBc min.

Ku-Band Multiplier

Input: 45.5 to 46.1 MHz @ 1 dBw; (other inputs available)
Output: 15.3 to 15.5 GHz @ 100 milliwatts
Spurious: 60 dBc min.

C-Band Multiplier

Input: 50.3 to 51.5 MHz @ 1 milliwatt; (other inputs available)
Output: 5030 to 5150 MHz @ 200 milliwatts
Spurious: 60 dBc min.

For complete details, write or call today.

Applied Research

INCORPORATED

76 So. Bayles Ave., Port Washington, N.Y. 11050, (516) 883-5700, TWX #510-223-0822.

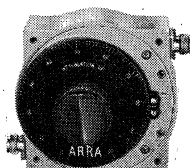
Low Pass Filters, High Power Varactor, Multipliers, Digital Attenuators

VARIABLE ATTENUATORS DC THRU 18000 MHz

Direct Reading

Low Ins. Loss • 1.5 Max. VSWR • 10 Watts Aver. Power

Freq. Range (GHz)	Atten. Range (dB)	Atten. vs. Freq. (±dB)	Form Type	Model No.
DC-0.3	50	2.0	0-760	7684-50*
DC-1.0	20	1.5	0-760	7684-20*
0.5-1.0	60	1.0	0-214	2952-60
0.5-1.0	100	1.5	0-214	2952-100
0.9-1.3	60	1.0	0-660	2-3952-60
0.9-1.3	100	1.5	0-660	2-3952-100
1.0-2.0	10	1.0	0-1014	3617-10F
1.0-2.0	60	1.0	0-660	3952-60X
1.0-2.0	100	1.5	0-660	3952-100X
1.4-2.4	80	1.25	0-660	3-4952-80
2.0-4.0	10	1.0	0-51	4674-10F
2.0-4.0	20	1.5	0-51	4674-20F
2.0-4.0	30	2.0	0-51	4674-30F
2.0-4.0	60	1.0	0-660	4952-60X
2.0-4.0	100	1.5	0-660	4952-100X
2.5-4.0	10	0.75	0-51	4674-10G
2.5-4.0	20	1.0	0-51	4674-20G
4.0-8.0	10	0.6	0-39	5684-10F
4.0-8.0	20	1.0	0-39	5684-20F
4.0-8.0**	60	1.0	0-660	5952-60X
4.0-8.0**	100	1.5	0-660	5952-100X
5.4-11.0	10	1.0	0-39-2	5-6684-10F
5.4-11.0	20	1.5	0-39-2	5-6684-20F
7.0-11.0	10	0.5	0-39-2	6684-10F
7.0-11.0	20	1.0	0-39-2	6684-20F
8.0-12.4	10	0.5	0-39-2	6684-10X
8.0-12.4	20	1.0	0-39-2	6684-20X
12.4-18.0	10	0.5	0-39-2	9684-10F
12.4-18.0	20	1.0	0-39-2	9684-20F
12.4-18.0	30	1.0	0-39-2	9684-30F


 Form 0-660: 5" Dia.
 Form 0-214: 6" Dia.

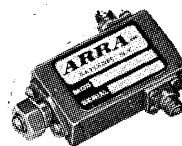
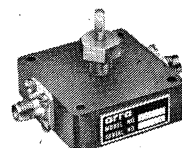
 Form 0-39 & 0-39-2: 3" Dia.
 Form 0-51: 5" Dia.

 *See catalog for VSWR, Ins. Loss and Power.
 **Only less than octave — consult factory.

Miniature

0.5 dB Max. Ins. Loss • 5 Watts Aver. 3 KW Peak • 2 Ounces

Freq. Range (GHz)	Atten. Range (dB)	Atten. vs. Freq. (±dB)	Max. VSWR	Form Type	Model No.
1.0-2.0	10		1.8	3651	3814-10
1.5-2.0	15		1.7	3651	3814-15
2.0-4.0	10		1.8	2191	4804-10
2.0-4.0	20		1.5	3651	4814-20
2.5-4.0	10		1.5	2191	4804-10X
3.0-4.0	10	1.5	1.5	3347	4603-10
4.0-8.0	10		1.5	2191	5804-10
4.0-8.0	20		1.5	2191	5804-20
4.0-8.0	30		1.5	3651	5814-30
4.0-8.0	10	1.5	1.5	3347	5603-10
6.0-11.0	10		1.5	2191	5-6804-10
6.0-11.0	20		1.5	2191	5-6804-20
6.0-11.0	30		1.5	2191	5-6804-30
6.0-11.0	40		1.5	3651	5-6814-40
8.0-18.0	10	1.5	1.5*	2191	9803-10
8.0-12.4	10		1.5*	2191	6804-10
8.0-12.4	20		1.5*	2191	6804-20
8.0-12.4	30		1.5*	2191	6804-30
8.0-12.4	40		1.5*	3651	6814-40
8.0-12.4	10	1.5	1.5	3347	6603-10
8.5-10.5	10	0.5	1.5	2191	6803-10A
8.5-10.5	20	0.5	1.5	2191	6803-20A
10.5-12.4	10	0.5	1.6	2191	6803-10B
10.5-12.4	20	0.5	1.6	2191	6803-20B
12.0-18.0	10		1.5	2191	9804-10X
12.0-18.0	20		1.5	2191	9804-20X
12.0-18.0	30		1.7	2191	9804-30X
12.0-18.0	40		1.7	2191	9804-40X
12.0-18.0	10	1.0	1.5	2191	9803-10A
12.0-18.0	15	1.0	1.7	2191	9803-15A


 Form 2191: 1 3/4 x 1 1/2"
 Form 3651: 2 x 1 1/4 x 1/2"


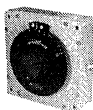
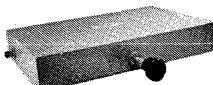
Form 3347: 1 1/2 x 1 1/2 x 1/2"

*1.7 VSWR above 11.0 GHz.

High Power 500W CW — 10KW PEAK

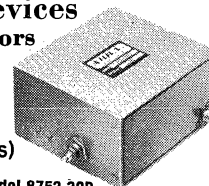
Low Ins. Loss • 1.5 Max. VSWR

Freq. Range (GHz)	Atten. Range (dB)	R. F. Power Watts (CW)	Model No.
0.5-1.0	10	500	2417-10
1.0-2.0	10	100	3617-10
1.0-2.0	20	500	3417-20
2.0-4.0	10	100	4617-10
2.0-4.0	20	500	4417-20
4.0-8.0	10	100	5417-10
4.0-8.0	20	500	5417-20
8.0-12.0	10	100	6417-10
8.0-12.0	20	500	6417-20
12.0-18.0	20	500	9417-20



Broadband Diode Devices Attenuators & Modulators

- Absorptive for all Values
- Each Model 200-18000 MHz
- Low Insertion Loss
- Integrated Linearized Driver (Attenuators)
- TTL Compatible Driver (Modulators)

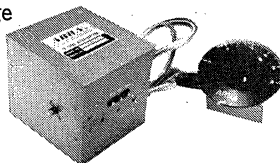


Model 8752-30B

Configuration	Attenuation (dB)	Switching Time	Model No.
Cont. Variable	35	50 μsec	8752-35D
Cont. Variable	65	50 μsec	8752-65D
On/Off	30	20 nsec	8752-30M
On/Off	65	20 nsec	8752-65M

Direct Reading Remote Control

200-18000 MHz Frequency Range
 Direct Reading Dial
 SMA Female R.F. Connectors
 Stop at Minimum and Maximum Loss Position
 Counter-Clockwise Rotation Increases Loss


 RF Section Control Section
 Model 8752-60MDR

Model No.	Freq. Range (GHz)	Min. Atten. Rge. (dB)	Max. Ins. Loss (dB)	Max. VSWR		Atten. vs Freq. (dB)
				0 dB	High Loss	
8752-30MDR	0.2-8.0	30	1.5	1.5	1.35	±1.0
	8.0-12.4	30	1.8	1.6	1.6	±1.0
	12.4-18.0	30	2.5	1.75	1.6	±1.0
8752-60MDR	0.2-8.0	60	2.5	1.5	1.5	±1.5
	8.0-12.4	60	3.0	2.0	1.6	±1.5
	12.4-18.0	60	5.0	2.3	1.8	±2.0

Motorized

Motor Head Characteristics

DC Voltage: 28V, 24V, 15V, 12V
 AC Voltage: 115V, 60 Hz
 Actuating Current: 200 ma max. (DC)
 250 ma max. (AC)

Speed: 1 1/2 RPM
 Size: 3.5" x 2.0" x 2.75"

Attenuator Characteristics

Identical to the specific variable attenuator model selected.

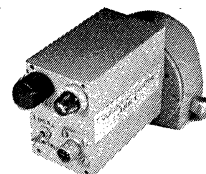
General Description

ARRA offers a rugged line of motor driven attenuators. Ideally suited for remote tuning applications. The ultimate in reliability and maintenance free operation.

The motors are integral gear head types. Units consist of an integrated motor gear head and single turn variable attenuator. All models feature fast stopping time and minimum backlash.

Available with an optional follower potentiometer output; local override switch mounted directly to the motor head.

Outline drawings furnished on request.



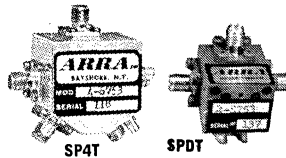


Coaxial • Waveguide • Solid State
microwave
 Components • Assemblies • Sub-Systems

Broadband Diode Switches

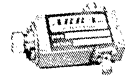
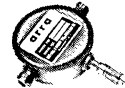
SPST & SPNT

- High Isolation
- Low Insertion Loss
- Integrated Drivers Available



Con-figuration	Freq. Range (MHz)	Switching Time (nsec)	Average Power (Watts)	Model Number	
				With Driver	Without Driver
SPST	100-18000	20	2	F8753-80D	F8753-80
SPST	200-18000	50	5	8753-80D	8753-80
SPST	500-18000	10	2	H8753-80D	H8753-80
SPDT	200-18000	500	2	2-8753D	2-8753
SP3T	200-18000	500	2	3-8753D	3-8753
SP4T	200-18000	500	2	4-8753D	4-8753
SP5T	200-18000	500	2	5-8753D	5-8753

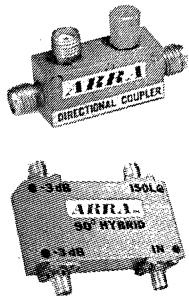
Mechanical Phase Shifters



10 WATTS AVER. POWER • 5 KW PEAK

Freq. Range (GHz)	Min. Phase Adjustment	Max. Insertion Loss (dB)	Max. VSWR	Form Factor	Model No.
1.0-2.0	90°	1.0	2.0	3332	3418-90
2.0-4.0	90°	1.0	1.5	3332	4418-90
2.0-4.0	180°	2.0	1.75	3332	4418-180
4.0-8.0	90°	1.0	1.5	3332	5418-90
4.0-8.0	180°	2.0	2.0	3332	5418-180
7.0-11.0	90°	1.0	1.5	3333	6428-90
7.0-11.0	180°	2.0	2.0	3333	6428-180
8.0-12.4	90°	1.0	1.5	3333	6428-90X
8.0-12.4	180°	2.0	2.0	3333	6428-180X
9.0-11.0	45° at 9 GHz 90° at 10 GHz	1.0	1.5	3382	6428-45X

Miniature Couplers • 90° & 180° Hybrids

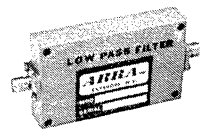
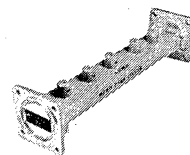
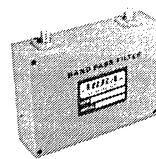


Freq. Range (GHz)	Model Number		
	90° Hybrid	180° Hybrid	Directional Coupler
0.5-1.0	2164-90	2164-180	2164-**
0.7-1.4			2-3164-**
0.925-1.225	2-3164-90	2-3164-180	
1.0-2.0	3164-90	3164-180	3164-**
2.0-4.2	4164-90	4164-180	4164-**
4.0-8.0	5164-90	5164-180	5164-**
7.0-11.0		6164-180	6164-**
7.0-12.4	6164-90		
8.0-12.4		6164-180	
8.0-16.0	6-9164-90		6-9164-**
12.0-18.0	9164-90		9164-**

**Value of coupling

Microwave Filters

STRIPLINE • WAVEGUIDE • COAX

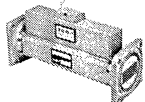


- 30-18,000 MHz (Narrow & Octave)
- High Power
- Miniature Size

- Band Pass
- Band Reject
- Low Pass
- 90 dB Rejection

WAVEGUIDE COMPONENTS & ASSEMBLIES

Broadband Diode Switches



Operate over the complete waveguide frequency band.

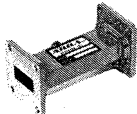
Frequency Bands: 2.60-18.0 GHz.
 Isolation: To 85 dB.
 Switching Speed: 10 nsec.

Continuously Variable Attenuators



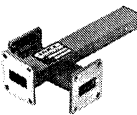
Frequency Bands: 3.95-18.0 GHz.
 Attenuation Range: 25 dB min.
 Max. VSWR: 1.15.
 Insertion Loss: 0.5 dB max.

Fixed Attenuators



Frequency Bands: 2.6-18.0 GHz.
 VSWR: 1.15.
 Attenuation: 3, 6, 10, 20 dB (other values on request).
 Attenuation Accuracy: ± 0.2 dB at calibrated frequency.

Cross Guide Couplers



Frequency Bands: 2.60-18.0 GHz.
 Coupling: 20, 30, 40 dB.
 Directivity: 15 dB min.
 Frequency Sensitivity: ± 1.3 dB.

High Power Dummy Loads



Frequency Bands: 2.6-18.0 GHz.
 Max. VSWR: 1.10 (typical 1.05).
 Material: Aluminum.
 Finish: High temperature black paint.



ARRA will fabricate your special waveguide assemblies in any material, finish, and in most waveguide sizes.

Items range from the simplest straight section and single bend to complex combinations of bends, reducers, twists, etc.

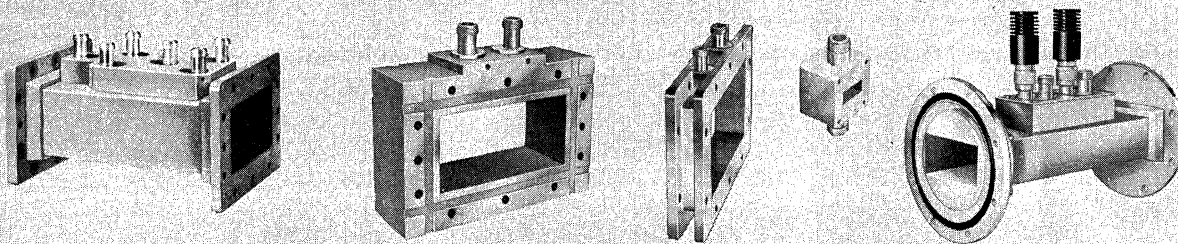
Stringent quality control and electrical test facilities enable ARRA to guarantee your mechanical and electrical specifications.

MICROWAVE DEVICES

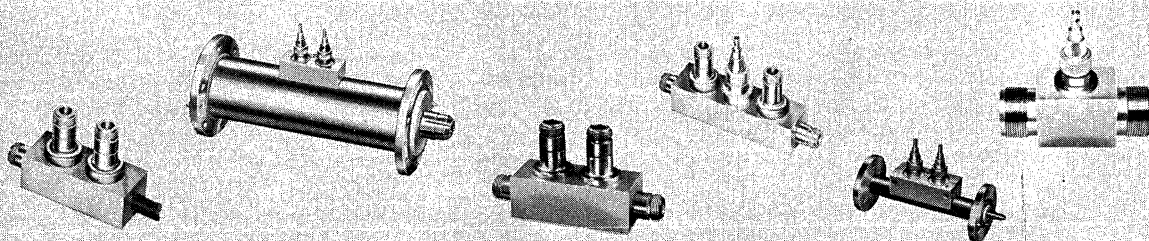
CIRCULATORS and ISOLATORS



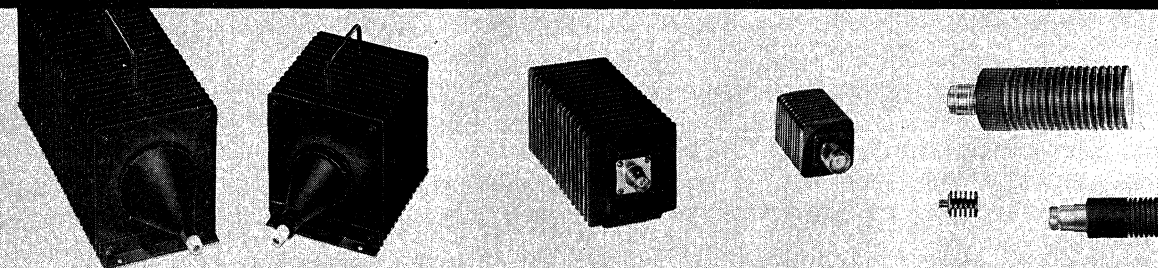
DIRECTIONAL COUPLERS—WAVEGUIDE



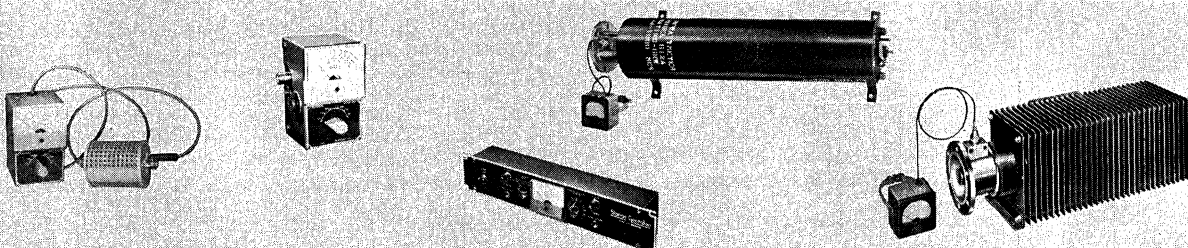
DIRECTIONAL COUPLERS—COAX



RESISTIVE TERMINATIONS



POWER METERS



We're equipped to modify or build to meet your specific requirements. For information call your representative or write to The Bendix Corporation, Microwave Devices Plant, Hurricane Road, Franklin, Indiana 46131. Phone (317) 736-6136.

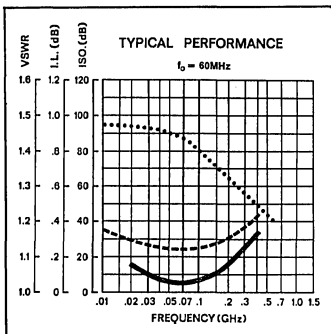




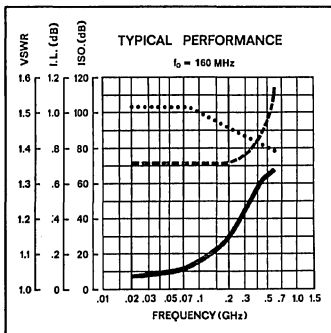
DAICO INDUSTRIES, INC.

MULTIPOLE DIODE SWITCHES

STANDARD



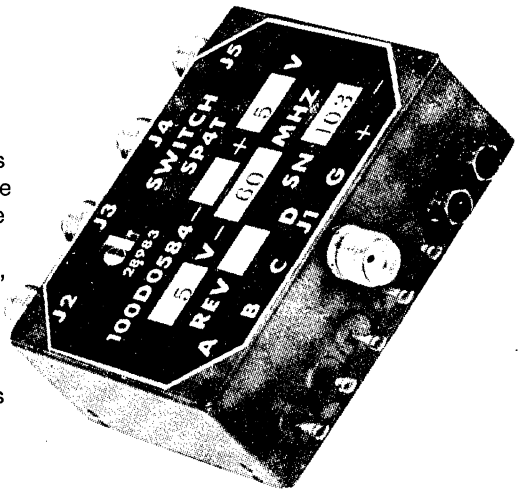
HIGH ISOLATION



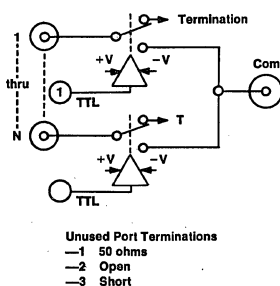
..... ISOLATION — VSWR --- INSERTION LOSS

Daico Industries standard line of multiposition diode switches provides the lowest switching transients and insertion loss consistent with speed and RF power. All the units listed below are compatible with TTL logic. The self-contained driver utilizes complex function IC's to improve reliability and reduce size. These units are designed to operate in the most hostile of military, land, sea and airborne environments.

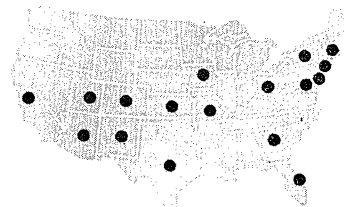
Special specification diode switches available from Daico include high-speed units for less than 25 nanosecond operation, RF units to 3 GHz, and high-power units to 1KW CW with up to 8KW peak load capabilities.



SOLID STATE +10 dbm, 5-800 MHz +30 dbm, 20-800 MHz							
SIZE MATRIX	SPST	SP2T	SP3T	SP4T	SP5T	SP6T	TRANSFER
STANDARD ISOLATION +10 dbm ±5 Volt	100D0581 1x1 1/2 x.68	100D0582 1x1 1/2 x.68	100D0583 1 1/2 x1 1/2 x.68	100D0584 2x1 1/2 x.68	100D0585 2 1/2 x1 1/2 x.68	100D0586 3x1 1/2 x.68	100C0587 2x1 1/2 x.94
STANDARD ISOLATION +30 dbm ±12 Volt	100D0591 1x1 1/2 x.68	100D0592 1 1/2 x1 1/2 x.68	100D0593 2x1 1/2 x.68	100D0594 2 1/2 x1 1/2 x.68	100D0595 3x1 1/2 x.68	100D0596 3x1 1/2 x.68	100D0597 2x1 1/2 x.94
HIGH ISOLATION +10 dbm ±5 Volt	100D0801 1 1/2 x1 1/2 x.68	100D0802 2x1 1/2 x.68	100D0803 2 1/2 x1 1/2 x.68	100D0804 2 1/2 x1 1/2 x.68	100D0805 3 1/2 x1 3/4 x.68	100D0806 3 1/2 x1 3/4 x.68	100D0807
HIGH ISOLATION +30 dbm ±12 Volt	100D0821 1 1/2 x1 1/2 x.68	100D0822 2x1 1/2 x.68	100D0823 2 1/2 x1 1/2 x.68	100D0824 2 1/2 x1 1/2 x.68	100D0825 3 1/2 x1 3/4 x.68	100D0826 3 1/2 x1 3/4 x.68	100D0827
STANDARD ISOLATION +30 dbm ±12 Volt BNC, TNC, N or C	100D0901 1x1 1/2 x1 1/4	100D0902 1 3/4 x1 3/4 x1 1/4	100D0903 3x1 3/4 x1 1/4	100D0904 4x1 3/4 x1 1/4	100D0905 5x1 3/4 x1 1/4	100D0906 5x1 3/4 x1 1/4	100D0907 1 3/4 x1 3/4 x1 1/4

TYPICAL SWITCH SCHEMATIC
MULTIPOLE

TTL control logic "1" introduced at terminal N will turn port ON. Where reverse logic is required ("ON" with 0 logic level) Part Number is suffixed with RL. Standard voltage of $\pm 5 \text{ VDC}$ is required for switches designed to handle +10 dbm. For $\pm 30 \text{ dbm}$ power levels a $\pm 12 \text{ VDC}$ is required. Other voltage levels can also be accommodated.

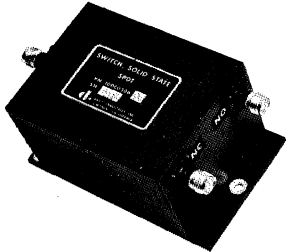


DAICO INDUSTRIES, INC.
2351 East Del Amo Blvd.
Compton, California 90220
Tel: (213) 631-1143
TWX 910-346-6741



RF SWITCH MATRICES • MODULATORS • PHASE SHIFTERS • ATTENUATORS

HIGH POWER
DIODE SWITCHES

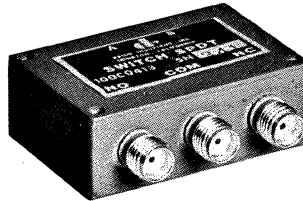


Daico Industries high-power diode switches have been successfully employed in numerous CW and pulse systems. CW power levels to 400 W are available in frequency ranges from 20-1100 MHz. Pulse power levels to 8 KW are available in frequency ranges of 50-1500 MHz.

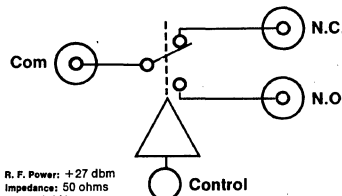
Representative designs (Can be adapted to other frequency ranges and power levels.)

P/N	Freq. MHz	Power Watts CW	Power Peak	Isolation db min.	Insertion Loss db max.
100C0557	30-250	250	1 KW	75	0.2
100C0657	50-200	200	1 KW	45	0.3
100C0638	100-1400	10	300	50	0.5
100C0495	950-1225	10	3.5 KW	28	1.0

HIGH SPEED,
LOW TRANSIENT
DIODE SWITCHES

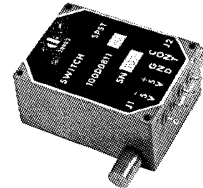


The SP2T High Speed Low Transient Diode Switch, Daico Industries Part Number 100D0812, is noted in the adjacent schematic. This unit has similar performance to the high speed modulator, 100D0811. The through channel is available for data immediately following the 30 nanosecond RF switching period. Other specifications:

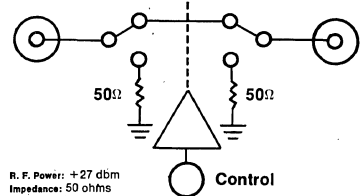


R. F. Power: +27 dbm
Impedance: 50 ohms
VSWR: 1.4/1 max.
Isolation: 40 db min. at 350 MHz, 60 db min. at 150 MHz
Insertion Loss: 3 db max.
Size: 1 1/2 x 2 x 1 inches

HIGH SPEED, LOW
TRANSIENT MODULATORS

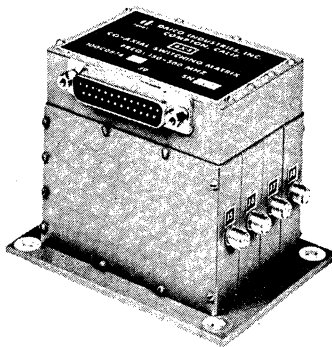


The Daico Industries Part Number 100D0811 is presented schematically with 50 ohm terminations for both ports when in the OFF condition. This unit is available in the frequency range from 60-400 MHz with 30% bandwidths. The TTL control and driver delay will consume approximately 20 nanoseconds with the RF switching and settling in less than 30 nanoseconds. The pass band transients do not exceed 10 MV peak. This SPST switch modulator is designed to preclude ringing thus allowing the full utilization of the data channel.



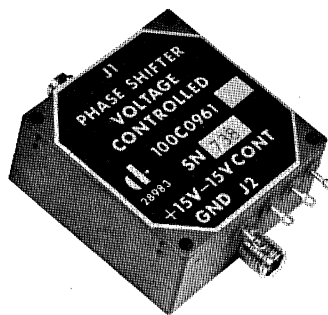
R. F. Power: +27 dbm
Impedance: 50 ohms
VSWR: 1.4/1 max.
Isolation: 40 db min. at 350 MHz, 60 db min. at 150 MHz
Insertion Loss: 3 db max.
Size: 1 1/2 x 2 x 1 inches

RF SWITCH MATRICES



Daico Industries M x N RF matrices are available with both relay and solid state cross point connections through 12 x 12 positions. The unique design concept assures maximum isolation and minimum VSWR through 500 MHz. Higher frequency matrices are offered with fewer poles. The unit pictured above, P/N 100D0874, describes a 4 x 4 solid state unit covering the 150-500 MHz frequency band. Remote control panels are available with electronic interlocks and indicators as companion equipment.

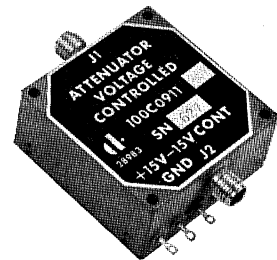
SOLID STATE
VOLTAGE CONTROLLED
PHASE SHIFTERS (ANALOG)



Daico Industries voltage controlled phase shifters are available in frequency ranges from 50-500 MHz. These units have a maximum RF power capability of +10 dbm with a 50 ohm impedance. Other specifications are listed below.

Frequency: Specify Center Frequency
Bandwidth: 20%
Insertion Loss: 3 db max.
Range: 360° continuous
Linearity: 10% max.
Scale Factor: 72°/volt
Power: ±15 volts
Slew Rate: 180°/millisec.
Size: 3 x 5 x 2
Connectors: SMA
Part Number: 100D0590

VOLTAGE CONTROLLED
ATTENUATORS (ANALOG)



Daico Industries voltage controlled attenuators are analog devices offered in two octave band widths from 10-500 MHz. These solid state units have a maximum RF power of +10 dbm with a 50 ohm nominal impedance. The following specifications and part numbers apply. Information on other custom designs will be forwarded on request.

Power: ±15 Volts at 25 ma. nom./section
Control: 0 to +5 Volts
Slew Rate: 2 x Range/millisec.
Linearity: ±5% of range
Connector: SMA

Part Number	Range (db)	Scale Factor db/volt	VSWR	Size Inches
100C0911	1-20	4	1.3/1	1 1/2 x 1 1/2 x .68
100C0912	2-40	8	1.4/1	1 1/2 x 1 1/2 x .68
100C0913	3-60	12	1.5/1	1 1/2 x 2 1/2 x .68
100C0914	4-80	16	1.5/1	1 1/2 x 3 x .68
100C0919	1-20 (dual)	4	1.3/1	1 1/2 x 2 x .68



DAICO INDUSTRIES, INC.

PHASE SHIFTERS • PROGRAMMABLE/STEP ATTENUATORS

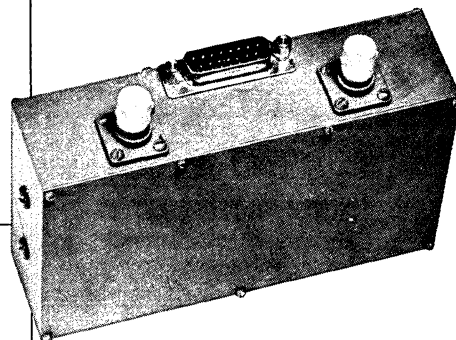
PHASE SHIFTERS

The IF series multi-bit phase shifters are also available with solid state or relay combining elements. The narrow band device uses various lengths of coaxial line to vary phase. The frequency of the solid state version covers 20-1000 MHz while those employing the relay combining elements are available in 20-500 MHz. Available with TTL compatibility. An LSB of 0.10 degrees can be readily provided.

	RELAY	SOLID STATE
Center Frequency Range	20-500 MHz	20-1000 MHz
R. F. Power	+30 dbm	+18 dbm
Impedance	50 ohms nom.	50 ohms nom.
VSWR	1.15/1 max.	1.2/1 max.
Insertion Loss	0.25 db/section	0.25 db/section
Control	Relay Coil Voltage	TTL
Power	(6, 12, 18 & 24 VDC)	±5VDC @ 30 ma/section
Phase Shift	MSB 180°, LSB 0.1°	MSB 180°, LSB 0.1°
Accuracy at Center Frequency	Standard ±0.2° ±1% of phase	Standard ±0.2° ±1% of phase

OPTIONS: Accuracy to ±0.1 degrees or ±0.3% of phase setting
Amplitude Stability: ±0.2 db

Sections	RELAY P/N	Size	Sections	SOLID STATE P/N	Size
4	100D0884	3x7x1.3	4	100D0894	3x7x1.3
5	100D0885	3x10x1.3	5	100D0895	3x10x1.3
6	100D0886	3x10x1.3	6	100D0896	3x10x1.3
7	100D0887	3x13x1.3	7	100D0897	3x13x1.3
8	100D0888	3x13x1.3	8	100D0898	3x13x1.3
9	100D0889	3x16x1.3	9	100D0899	3x16x1.3
10	100D0890	3x16x1.3	10	100D0890	3x16x1.3



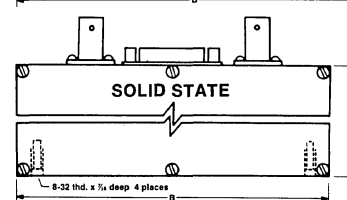
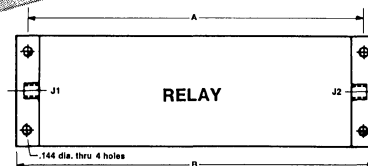
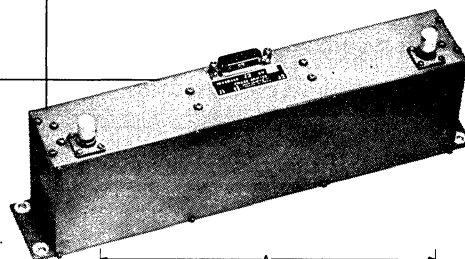
PROGRAMMABLE STEP ATTENUATORS

IF series programmable attenuators are available with both solid state and relay combining elements. The solid state series are offered from 5-1000 MHz, while those employing the relay combining elements are offered from DC-500 MHz.

	RELAY	SOLID STATE
Frequency Range	DC-200 MHz 200-450 MHz 300-500 MHz	10-500 MHz
Bandwidth	—	2 octaves
R. F. Power	0.25 watts CW max.	+10 dbm
Impedance	50 ohms nom.	—
VSWR	1.25/1 max.	1.2/1 max.
Insertion Loss	0.25 db/section max.	0.2 db/section nom.
Control	—	TTL (low logic thru)
Accuracy	±0.1 db or ±2% of setting	±0.1 db ±2% standard
Switching Speed	—	1 microsec. typical
Power	6, 12 or 24 VDC	± Volt D.C. (others available on request)
Intercept Point	—	+40 dbm typical
Attenuation/Section	—	0.1 db to 32 db
Options	Accuracy to ±0.03 db or 0.5% of setting Phase Stability: 0-23 db ±2° 24-47 db ±3° 48-95 db ±4°	—

Connectors Available: SMA, BNC, TNC

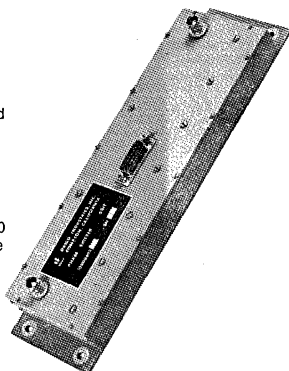
Pads	P/N	A	B	Sections	P/N	A	B
1	100D0808-1	1½	1x¾"	1	100D0588-1	1¼	3x1.35
2	100D0810-2	2	1½x¾"	2	100D0588-2	1¼	3x1.35
3	100D0810-3	2	1½x¾"	3	100D0589-3	1¼	4x1.35
4	100D0809-4	3	1½x¾"	4	100D0589-4	1¼	4x1.35
5	100D0809-5	3	1½x¾"	5	100C0422	1¼	5x1.35
6	100C0469-6	5	1¾x¾"	6	100D0576-6	3	5x1.35
7	100C0469-7	5	1¾x¾"	7	100D0576-7	3	5x1.35
8	100C0469-8	6	1¾x¾"	8	100D0576-8	3	5x1.35
				9	100D0598-9	3	10x1.35
				10	100D0598-10	3	10x1.35



HIGH SPEED PROGRAMMABLE PHASE SHIFTERS

High speed phase shifters in the range of frequencies of 200 MHz - 1200 MHz feature 35 nanosecond transition times with useful data within 50 nanoseconds of switching command. The phase shifter is compatible with computer controlled sampled data systems at rates up to 10MHz.

Typical of this type phase shifter is the 100D0693 which features 1.2 db insertion loss, 1.25/1 VSWR, and accuracies of ±2 degrees over a 360 degree phase shift range. The phase shifter is controlled by TTL logic in 6 steps of 180°, 90°, 45°, 22.5°, 11.25°, and 5.6° at 435 MHz.



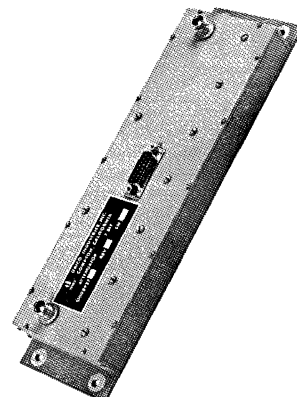
HIGH SPEED IF ATTENUATORS

Daico Industries high speed solid state programmable attenuators are available in frequency bands from 50-500 MHz with less than 35 nanoseconds switching speeds.

They are offered with MSB sections as high as 32 db and LSB sections as low as 0.2 db. Integral drivers are provided to operate from TTL or ECL levels.

Switching transients are less than 10 MV peak from 50 - 500 MHz. In-band transients are less than -50 dbm peak at 50 MHz and less than -80 db at 500 MHz.

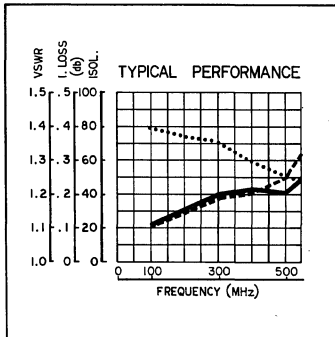
Attenuators in the band of 400 through 1200 MHz are available with similar specifications. Bandwidths of 25% around center frequencies in this range are provided at insertion losses on the order of 0.6 db/section, and VSWR of 1.5/1.



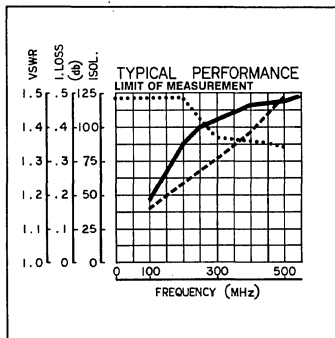


RF RELAYS, DC-500 MHz, 50 watts cw

STANDARD

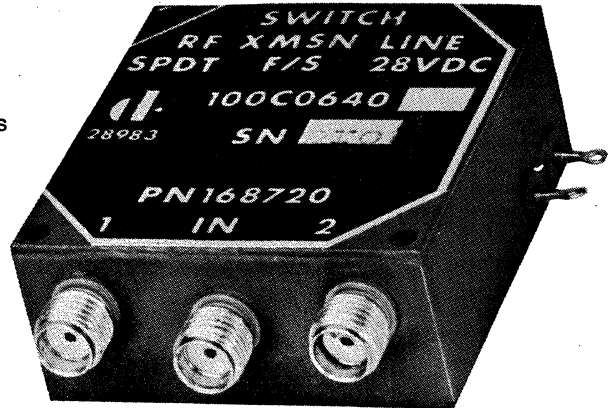


HIGH ISOLATION

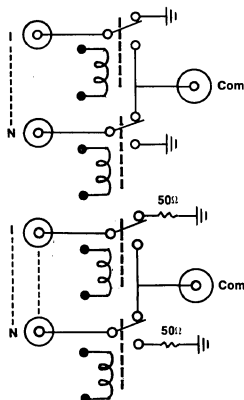


•••• ISOLATION — VSWR - - - - INSERTION LOSS

Daico Industries RF relays employ hermetically sealed switching elements which provide extreme resistance to the severe environments encountered in military aircraft and communications systems, including 20 g's vibration to 3 KHz, 80 g's shock and altitude in excess of 100,000 ft. A continual test and evaluation program assures switch performance in excess of 20 million operations. These units are operable at extremely low current levels and may be ordered with 6-, 12- or 24-volt coils. Units also available to 1.5 GHz with 50 ohm termination, reference SP2T P/N 100C0878.



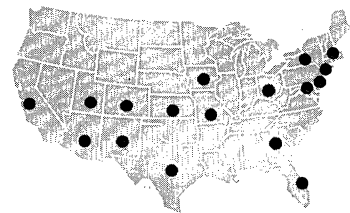
RF RELAYS DC-500 MHz 50 watts cw							
SIZE MATRIX	SPST	SP2T	SP3T	SP4T	SP5T	SP6T	TRANS.
STANDARD	100C0606 1x1 1/2 x.56	100C0073 1x1 1/2 x.56	100C0254 1 1/2 x1 1/2 x.62	100C0259 2x1 1/2 x.63	100C0604 2 1/2 x1 1/2 x.69	100C0605 3x1 1/2 x.69	100C0347 2x1 1/2 x.87
HIGH ISOLATION	100C0607 1x1 1/2 x.63	100C0109 1 1/2 x1 1/2 x.63	100C0630 1 1/2 x1 3/4 x1.5	100C0104 1 1/2 x1 3/4 x1.5			100C0608 1 1/4 x1 1/4 x1.3
50 OHM TERMINATION	100C0610 1x1 1/2 x.63	100C0611 1 1/2 x1 1/2 x.63	100C0612 2x1 1/2 x.63	100C0613 2 1/2 x1 1/2 x.63	100C0614 3x1 1/2 x.63	100C0615 3 1/2 x1 3/4 x.63	
HIGH ISOLATION & 50 OHM TERMINATION	100C0609 1x1 1/2 x.75	100C0350 1 1/2 x1 1/2 x.75	100C0285 2x1 1/2 x.75	100C0485 2 1/2 x1 1/2 x.75			



Switching Speed: 5 millisec. max.
R. F. Power: 50W CW, 500 W Peak
Drive Current: 24 mills nom. at 24 VDC. Other coils available include 6, 12, 18 VDC.

Units can be provided with Fail Safe (no power) to a through path.

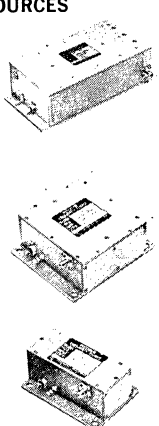
Can be operated directly from TTL with integrated circuit 75450 Dual Driver or equivalent.



DAICO INDUSTRIES, INC.
2351 East Del Amo Blvd.
Compton, California 90220
Tel: (213) 631-1143
TWX 910-346-6741

MICROWAVE FREQUENCY SOURCES

500 MHz to 18 GHz

	Frequency range GHz	Tuning range	Stability	Power output (minimum)	Line Voltage	Tuning	Dimensions (inches) approx. L W H	Model	Price Range 1—3
CRYSTAL CONTROLLED SOURCES 	.5-1.0 1.01-2.0 2.01-4.0 4.01-6.0	Crystal Oscillators	$\pm .00075\%$ over 0 to 50°C temperature range	5 mW	+ 28V dc	center freq. adjust.	3.8 x 3.4 x 2 3.8 x 3.4 x 2 3.8 x 3.4 x 2 3.8 x 3.4 x 2	EY-117-B EY-118-C EY-119-B EY-120-B	\$ 745.00 745.00 890.00 1045.00
	6.01-7.0 7.01-8.0 8.01-9.0 9.01-10	Fixed frequency					4.5 x 3.4 x 2 4.5 x 3.4 x 2 6.0 x 3.4 x 2 6.0 x 3.4 x 2	EY-121-B EY-122-B EY-123-B EY-123-C	1290.00 1645.00 1890.00 1995.00
	.5-1.0 1.01-2.0 2.01-4.0 4.01-6.0	Crystal Oscillators	$\pm .00075\%$ over 0 to 50°C temperature range	20 mW	+ 28V dc	center freq. adjust.	3.8 x 3.4 x 2 3.8 x 3.4 x 2 3.8 x 3.4 x 2 4.5 x 3.4 x 2	EY-103-1 EY-104-1A EY-105-2 EY-106-1	845.00 890.00 1290.00 1490.00
	6.01-7.0 7.01-8.0	Fixed frequency					6.0 x 3.4 x 2 6.0 x 3.4 x 2	EY-107-3 EY-108-1	1790.00 1990.00
	.5-10	Freq. std. Option	$\pm .0001\%$ (ovenized)	As above	+ 28V dc	As above	As above	EYHK-(above)	add 100.00
	.5-10	Freq. std. Option	$\pm 2 \times 10^{-8}$ (ovenized)	As above	+ 28V dc	As above	L (above) + 1.5"	EYH-(above)	add 550.00
	.5-10	$\pm .1\%$ VCXO Option	$\pm .007\%$ 0 to 50°C	As above	+ 28V dc	As above	L (above) + 3.0"	EN-(above)	add 400.00
	.5-8 .8-1.2 1.2-1.6	300 MHz 400 MHz 400 MHz	$\pm .05\%$ 0 to 50°C	10 mW	+ 24V dc	Mechanical (Screw driver adjust.)	7.0 x 1.3 x 1.3 5.0 x 1.3 x 1.3 3.0 x 1.0 x 1.4	EL-130 EL-131 EL-101	490.00 490.00 445.00
	1.6-2.1 2.1-2.6 2.6-3.2 2.1-3.6	500 MHz 500 MHz 600 MHz 1500 MHz					2.0 x 1.0 x 1.4	EL-102A EL-132 EL-103A EL-128	390.00 390.00 390.00 445.00
	6.4-8.1 8.2-12.3 12.4-18	Gunn Oscillator Fixed freq.	$\pm .2\%$ 0 to 50°C	10 mW	+ 15V dc	Center freq. adjust.	3.8 x 2.5 x 1.9 3.4 x 2.3 x 1.6 3.1 x 2.3 x 1.6	EL-154 EL-155 EL-156	690.00
HIGH "Q" CAVITY STABILIZED OSCILLATORS 	6.4-6.9 8.2-10 10-12 13-14	500 MHz 1800 MHz 2000 MHz 1000 MHz	$\pm .2\%$ 0 to 45°C	5 mW	+ 15V dc	Mechanical (Screw driver adjust.)	4.5 x 2.5 x 2.3	EL-126AF1 EL-126AF2 EL-126AF3 EL-126AF4	990.00
	6.4-14 Above ranges	Freq. ranges as above	$\pm .05\%$ (ovenized)	5 mW	+ 28V dc	Mechanical (Screw driver adjust.)	4.0 x 3.4 x 5.5	ELH-101A	1790.00
	.58-1.0 .80-1.5	420 MHz 700 MHz	$\pm .5\%$ 10 to 45°C	20 mW	- 24V dc	Electrical 0 to + 65V	2.8 x 2.8 x 1.5	EP-149D EP-149E	890.00 990.00
VOLTAGE TUNABLE OSCILLATORS 	6.4-8.1 8.2-12.3 12.4-18.0	.6% tuning range	$\pm .3\%$ 0 to 50°C	10 mW	+ 15V dc	Electrical + 4 to + 30V	3.8 x 2.9 x 1.9 3.4 x 2.3 x 1.6 3.1 x 2.3 x 1.6	EP-168 EP-169 EP-170	1039.00
	4.6-8.0 8.01-10	500 MHz 700 MHz	$\pm .05\%$ (ovenized)	40 mW	+ 28V dc	Electrical + 9 to + 60V	4.0 x 2.5 x 3.5	EPH-171 EPH-172	1480.00

HUNDREDS OF VARIETIES AVAILABLE—CALL US!

Greenray

840 West Church Road, Mechanicsburg, Pa. 17055



Industries, Inc.

Phone: (717) 766-0223 TWX: 510-650-4939

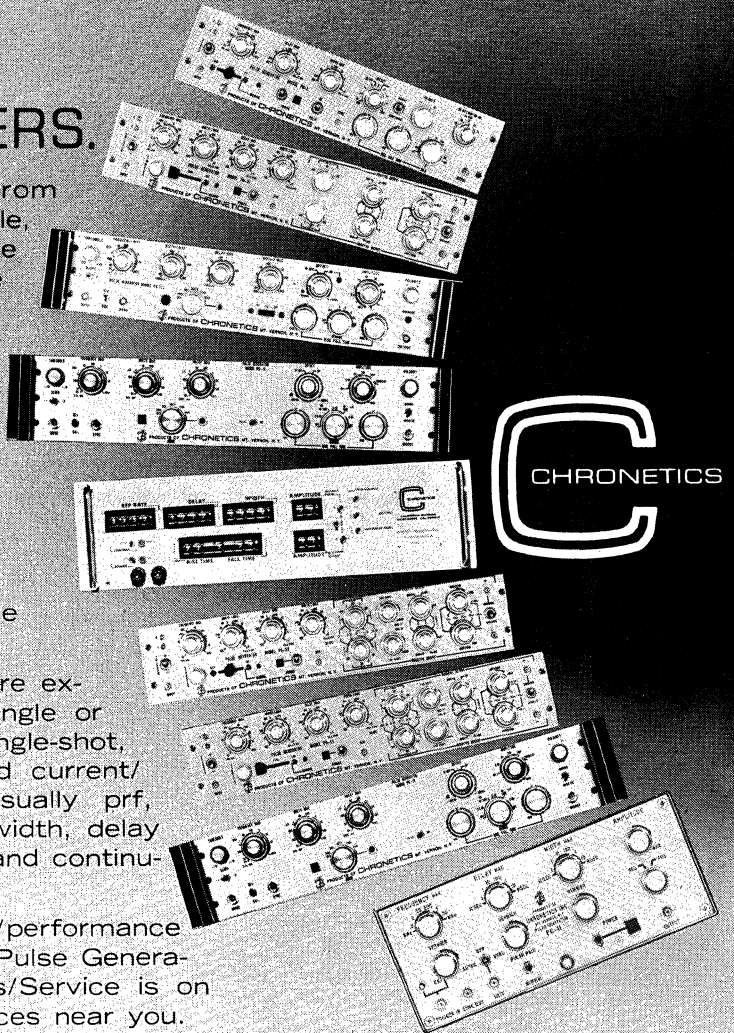
THE **PLUS** PULSERS.

Advanced Pulse Generators from CHRONETICS: The most versatile, sophisticated, high performance pulsers in the field. State of the art circuit design, meticulous construction for reliable quality. Performance and flexibility second to none. Thirteen standard models for virtually every need.

Repetition rates from 0.1 Hz to 100 MHz, output amplitudes from 0 to ± 100 volts or ± 2 A, rise/fall-times of less than 2 ns, wide dynamic ranges, high duty cycles, bipolar outputs, etc. are all available on standard instruments.

Chronetics' Pulse Generators are exceptionally flexible. All provide single or double pulses of either polarity, single-shot, pulse bursts. Bipolar outputs and current/voltage modes are available. Usually prf, amplitude, risetime and falltime, width, delay and DC-offset are independently and continuously variable.

"Total Pulse Control" and price/performance engineering make CHRONETICS' Pulse Generators the best buys in the field. Sales/Service is on a world-wide basis with field offices near you.



CHRONETICS Advanced Pulse Generators

MODEL	CLOCK PRF	AMPLITUDE ²	Z OUT	RISE/FALL TIME	PULSE DURATION	PULSE DELAY	DUTY CYCLE (MAX)	DC OFFSET
PG-10	0.1 Hz-50 MHz	5 mV-10V + or -	50 ohms or 1K, min.	< 5 ns	15 ns-1 sec	15 ns-1 sec	To 100%	± 2 V ± 40 mA
PG-11A	<10 Hz> 50 MHz	0-15V + or -	8 ohms	<5 ns	15 ns-10 ms	20 ns-10 ms	85%	
PG-12	0.1 Hz-50 MHz	100 mV-10V + or -	50 ohms	<5 ns-1 sec ⁴	10 ns-1 sec	15 ns-1 sec	To 100%	± 10 V
PG-13B	1 Hz-25 MHz	100 mV-100V + or -	50 ohms or 1K, min.	<10 ns-50 ms ⁴	10 ns-500 ms ⁵	15 ns-500 ms	10% @ 2A 50% @ 1A 100% @ < 0.5A	± 5 V ± 100 mA
PG-14	1 Hz-50 MHz	100 mV-20V + or -	50 ohms or 10K, min.	2 ns-50 ms ⁴	<5 ns-500 ms	10 ns-500 ms	To 100%	± 5 V ± 100 mA
PG-16	1 Hz-100 MHz	100 mV-20V + or -	50 ohms or 10K, min.	2 ns-50 ms ⁴	<5 ns-500 ms ⁵	10 ns-500 ms	To 100%	± 5 V ± 100 mA
PG-32A	0.1 Hz-10 MHz 20 MHz Max. ¹	20 mV-20V ³ + and - 2 Channels	50 ohms or 500 ohms	5 ns-1 sec ⁴	< 30 ns-1 sec ⁵	50 ns-1 sec	To 100%	To 10V To 400 mA
1012P ⁶	10 Hz-9.99 MHz 20 MHz Max. ¹	0-9.9V ² + or -	50 ohms	5 ns-9.9ms ⁴	40 ns-9.9 ms	25 ns-9.99 ms	85%	± 9.9 V

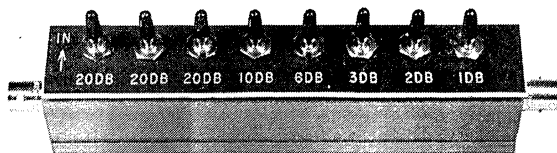
1 Effective PRF in double pulse mode
2 Max. Range into 50-ohm loads

3 Separate or combined (bipolar) channels;
same polarity on Special Order
4 Variable linearly - Separate control of Rise
and Fall Times

5 Independent control Pulse 1/Pulse 2
(double pulse mode)
6 Fully programmable

U.S.A.: 1 Lefevre Lane, New Rochelle, N. Y. 10801 (914) 636-5600 TWX 710-563-0640
Europe: 39 Rue Rothschild, Geneva, Switzerland (022) 31 81 80 TELEX 22266

HOPE ELECTRONICS

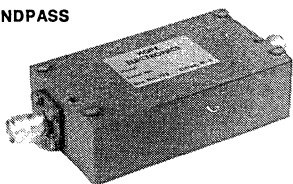


ATTENUATORS

Model	Attenuation Range	Attenuation Steps	Frequency Range	Impedance	Price 1 - 24
AT-42-50	0 to 42 db	1, 2, 3, 6, 10, 20	DC to 300 MHZ	50Ω	\$75.00
AT5-42-50	0 to 42 db	1, 2, 3, 6, 10, 20	DC to 500 MHZ	50Ω	\$85.00
AT10-32-50	0 to 32 db	1, 2, 3, 6, 10, 10	DC to 1000 MHZ	50Ω	\$90.00
AT5-3-50	0 to 3 db	.1, .2, .4, .5, .8, 1	DC to 500 MHZ	50Ω	\$75.00
AT-82-50	0 to 82 db	1, 2, 3, 6, 10, 20, 20, 20	DC to 300 MHZ	50Ω	\$89.00
AT5-82-50	0 to 82 db	1, 2, 3, 6, 10, 20, 20, 20	DC to 500 MHZ	50Ω	\$99.00
AT-42-75	0 to 42 db	1, 2, 3, 6, 10, 20	DC to 300 MHZ	75Ω	\$70.00
AT-3-75	0 to 3 db	.1, .2, .4, .5, .8, 1	DC to 300 MHZ	75Ω	\$70.00
AT-82-75	0 to 82 db	1, 2, 3, 6, 10, 20, 20	DC to 300 MHZ	75Ω	\$85.00
AT-42-600	0 to 42 db	1, 2, 3, 6, 10, 20	DC to 2 MHZ	600Ω	\$70.00
AT-82-600	0 to 82 db	1, 2, 3, 6, 10, 20, 20, 20	DC to 2 MHZ	600Ω	\$85.00
AT-3-600	0 to 3 db	.1, .2, .4, .5, .8, 1	DC to 2 MHZ	600Ω	\$70.00

FILTERS

MODEL FLP — LOWPASS
MODEL FHP — HIGHPASS
MODEL FBP — BANDPASS



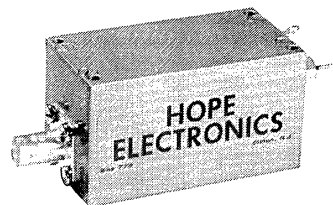
FROM \$55.00

Cutoff Frequency Range 10 HZ — 300 MHZ
3 db Bandwidth Range . . . 5% to 10% Model FBP Only
VSWR Less than 1.5:1
Nominal Impedance 50Ω, 75Ω, 600Ω, or 10 K

Send Us Your Filter Specification

Hope Electronics would welcome the opportunity to design and build a filter custom fit to your needs.

CRYSTAL OSCILLATORS



Model	Frequency Range	Power Output	Stability	From
EXO-10	70 KHZ to 300 MHZ	>10 mw	.005%	\$ 85.00
XO-10V	1 HZ to 1 MHZ	10V into 1K	.005%	\$ 99.00
XO-10	1 MHZ to 600 MHZ	>10 mw	.005%	\$110.00
XO-100	1 MHZ to 400 MHZ	>100 mw	.005%	\$195.00
ICXO-4	1 HZ to 1MHZ	4V into 50Ω	.005%	\$ 50.00



AMPLIFIERS

WIDE BAND — I F — PULSE



Model	Bandwidth	Gain	Flatness	VSWR	Noise Figure	Output Level	Price 1 - 24
PA200-20	1 to 200 MHZ	20 db	±.5 db	<1.5:1	<8 db	.5V	\$195.00
PA200-40	1 to 200 MHZ	40 db	±.5 db	<1.5:1	<8 db	.5V	\$295.00
A300-30	100 KHZ to 300 MHZ	30 db	±.75 db	<1.5:1	<12 db	.5V	\$275.00
A30-6-30E	27 to 33 MHZ	30 db		<1.3:1	<4 db	.1V	\$145.00
A60-10-25E	55 to 65 MHZ	25 db		<1.3:1	<4 db	.1V	\$145.00

HOPE ELECTRONICS BOX 773 CLIFTON, N. J. 07013 (201) 777-3522

SAVE TIME...

locating sources of supply, make better buying decisions with **MICROWAVES' PRODUCT DATA DIRECTORY**

Over 650 pages thick, loaded with time-saving information.

- 420 pages of data sheets, inserts from 96 microwave OEM manufacturers. Names of their presidents, marketing/sales managers, all sales offices. Also their complete rep list with addresses and phone numbers.

- Over 2,500 manufacturers listed with addresses and phone numbers.

- More than 250 pages of informative listings.

- 8 major product areas

Antennas

Materials and Processing Equipment

Passive Components

Semiconductors

Solid-State Components

Systems and Subsystems

Test Instruments

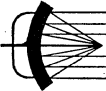
Tubes and Tube Amplifiers

- 195 product categories.

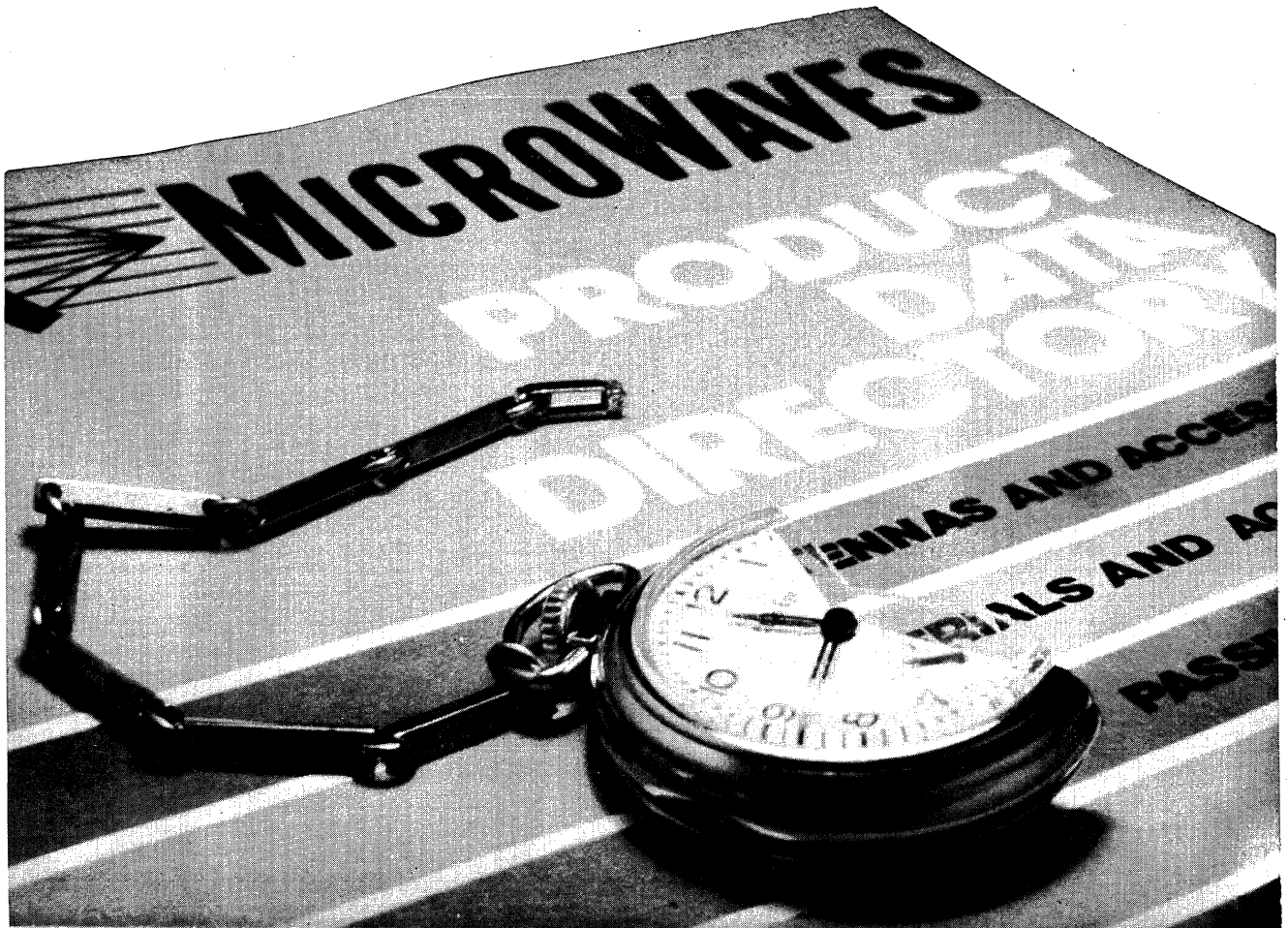
- Direct-response cards for immediate action.

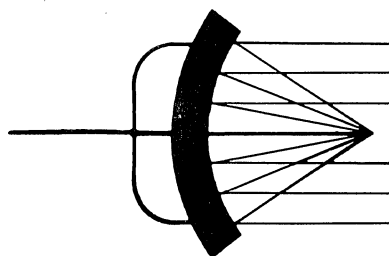
MicroWaves' Product Data Directory is the most current, up-to-date, comprehensive compilation of microwave product information available anywhere, at any price. **Use the directory often — let it work for you!** Price: \$10.00

(Check or money order)

 **MICROWAVES**

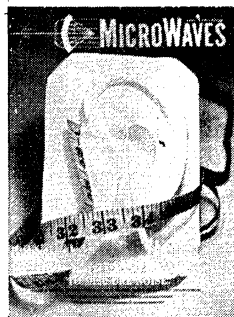
50 Essex Street, Rochelle Park, NJ 07662





MICROWAVES

The **NUMBER ONE**
Magazine for Microwave Engineers



DON'T MISS THESE IMPORTANT NEW ISSUES:

- Antennas & Phased Arrays
- Passive Components
- Electronic Countermeasures
- Amplifiers

SUBSCRIBE NOW!

SPECIAL BONUS: The first subscribers who send in cards, will receive 1976 *PRODUCT DATA DIRECTORIES*.

Send in your card. If you qualify, you'll receive a **FREE** MicroWaves subscription.

MICROWAVES FREE NEW SUBSCRIPTION APPLICATION

Please print all information requested below. Do not use periods, commas, etc. This application will become void if improperly filled out!

1st Initial	Last Name		Title	
Company Name		Please use full official company name		
Division/Department		Mail Stop		
Street Address/PO Box				
City		State/Country		Zip

I want to receive a free MicroWaves subscription

☐ YES
☐ NO

Signature _____

Date _____

1. ☐ Title (insert number)

- | | |
|---|-------------------------------------|
| 1. President, Vice President, General Manager | 6. Purchasing Agent, Buyer |
| 2. Chief Engineer, Director of Engineering | 7. Sales Manager, Marketing Manager |
| 3. Group Leader, Engineering Manager | 8. Professor |
| 4. Senior Engineer, Engineer | 9. Other (specify) _____ |
| 5. Scientist | |

2. ☐ Microwave job function (insert letter)

- | | | |
|------------------------------|----------------------------|-----------------------------|
| A. Administrative management | D. Development engineering | G. Applications engineering |
| B. Engineering management | E. Research | H. Purchasing |
| C. Design engineering | F. Production engineering | |

3. ☐ Plant

☐ Your own work

Primary microwave classification

Insert letter in EACH BOX even if the same

- | | |
|--|--|
| A. Communications Systems | A. Communications Systems |
| B. CATV and Broadcasting | B. CATV and Broadcasting |
| C. Radar Systems | C. Radar Systems |
| D. Telemetry and Data Systems | D. Telemetry and Data Systems |
| E. Electronic Countermeasures Systems | E. Electronic Countermeasures Systems |
| F. Navigation and Guidance Systems (incl. ATC, ILS) | F. Navigation and Guidance Systems (incl. ATC, ILS) |
| G. Weapons Control Systems | G. Weapons Control Systems |
| H. Industrial Systems and Equipment | H. Industrial Systems and Equipment |
| J. Laser Devices and Systems | J. Laser Devices and Systems |
| K. Components, active, (solid-state devices, tube, etc.) | K. Components, active, (solid-state devices, tube, etc.) |
| L. Components, passive, (attenuators, circulators, etc.) | L. Components, passive, (attenuators, circulators, etc.) |
| M. Components, other, (antennae, cables, etc.) | M. Components, other, (antennae, cables, etc.) |
| N. Test and Measurement | N. Test and Measurement |

Enclose page in envelope, send to Hayden Publishing Co., Inc., P.O. Box 13801, Philadelphia, PA 19101. Since the Post Office will no longer forward mail, be sure to affix correct postage.

DOUBLE-BALANCED MIXERS □ RF TRANSFORMERS

DIRECTIONAL COUPLERS □ FREQUENCY DOUBLERS

DOUBLE-BALANCED FET MIXERS □ LIMITERS

ELECTRONIC ATTENUATORS/SWITCHES

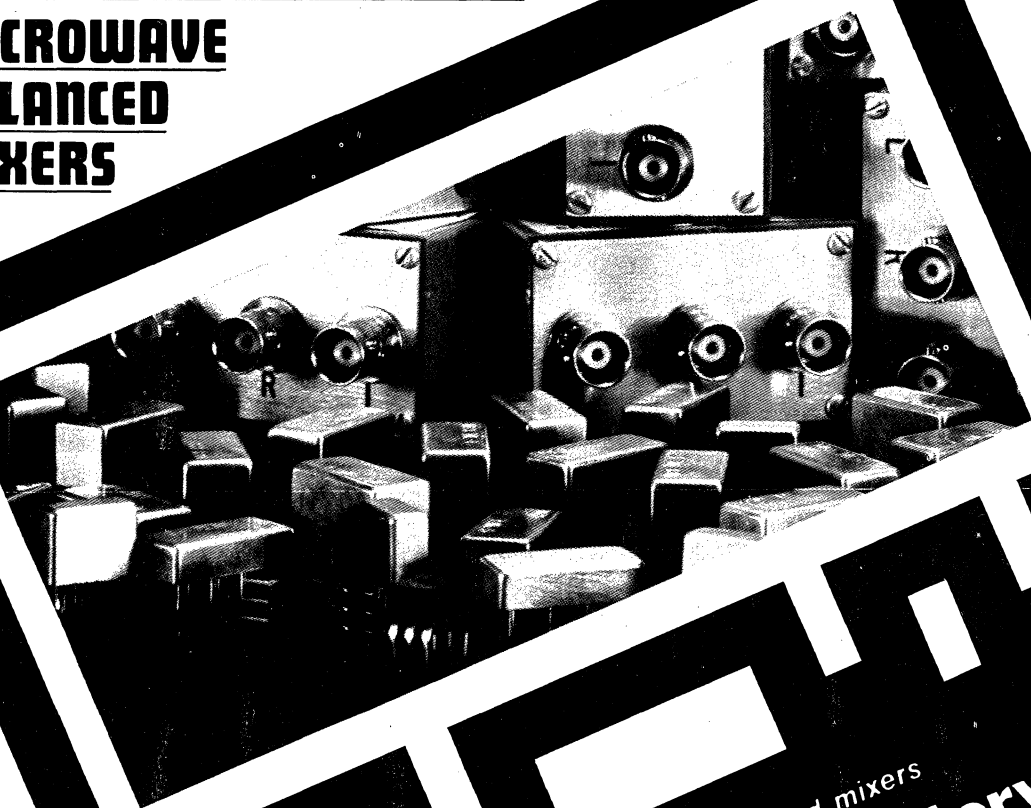
POWER SPLITTERS/COMBINERS

BROADBAND AMPLIFIERS

MICROWAVE

BALANCED

MIXERS



World's largest supplier of double balanced mixers

Mini-Circuits Laboratory

837-843 Utica Ave., Brooklyn, N.Y. 11203
(212) 342-2500 Int'l Telex 620156

A Division of Scientific Components Corp

Mini-Circuits Laboratory ^{MCL}

TABLE OF CONTENTS

DESIGNER'S SELECTION GUIDE.....p. 1292

DOUBLE-BALANCED MIXERS

STANDARD LEVEL +7 dBm

Printed Circuit Board Version

SRA SERIES p. 2•1301
 TAK SERIES p. 2•1307
 TSM SERIES p. 2•1310
 SAM SERIES p. 2•1312

Connector Version

ZAD SERIES p. 2•1315
 ZLW SERIES p. 2•1321

HIGH LEVEL +17 dBm

Printed Circuit Board Version

SRA-H SERIES p. 2•1330
 SAM-H SERIES p. 2•1332

Connector Version

ZAD-H SERIES p. 2•1334
 ZLW-H SERIES p. 2•1336

VERY HIGH LEVEL +23 dBm

Printed Circuit Board Version

RAY SERIES p. 2•1338

Connector Version

ZAY/ZMY SERIES p. 2•1340

MICROWAVE BALANCED MIXERS

STANDARD LEVEL +7 dBm

Connector Version

BALANCED
 ZMA SERIES p. 2•1342

STANDARD LEVEL +10 dBm

Connector Version

DOUBLE-BALANCED
 MA SERIES p. 2•1328

DOUBLE-BALANCED FET MIXERS

ZRC SERIES See Microwaves Product Data Directory

POWER SPLITTERS/COMBINERS

2-WAY 180°

Printed Circuit Board Version

PSCJ-2 SERIES p. 2•1364

Connector Version

ZSCJ-2 SERIES p. 2•1366

2-WAY 90°

Printed Circuit Board Version

PSCQ-2 SERIES

See Microwaves Product Data Directory

2-WAY 0°

Printed Circuit Board Version

PSC-2 SERIES p. 2•1357

MSC-2 SERIES p. 2•1360

Connector Version

ZSC-2/ZMSC-2 SERIES p. 2•1362

6-WAY 0°

Printed Circuit Board Version

PSC-6 SERIES

See Microwaves Product Data Directory

3-WAY 0°

Printed Circuit Board Version

PSC-3 SERIES p. 2•1368

Connector Version

ZSC-3/ZMSC-3 SERIES p. 2•1370

4-WAY 0°

Printed Circuit Board Version

PSC-4 SERIES p. 2•1372

Connector Version

ZSC-4/ZMSC-4 SERIES p. 2•1374

8-WAY 0°

Printed Circuit Board Version

PSC-8 SERIES

See Microwaves Product Data Directory

RF TRANSFORMERS

PLASTIC CASE

T SERIES p. 2•1386

METAL CASE

TMO SERIES p. 2•1387

ELECTRONIC ATTENUATORS/SWITCHES

Printed Circuit Board Version

PAS SERIES p. 2•1382

Connector Version

ZAS/ZMAS SERIES p. 2•1384

DIRECTIONAL COUPLERS

Printed Circuit Board Version

PDC SERIES p. 2•1344

Connector Version

ZDC/ZMDC SERIES p. 2•1351

FREQUENCY DOUBLERS

Printed Circuit Board Version

RK SERIES p. 2•1376

AK SERIES p. 2•1378

Connector Version

GK/MK SERIES p. 2•1380

BROADBAND AMPLIFIERS

Connector Version

ZHL SERIES See Microwaves Product Data Directory

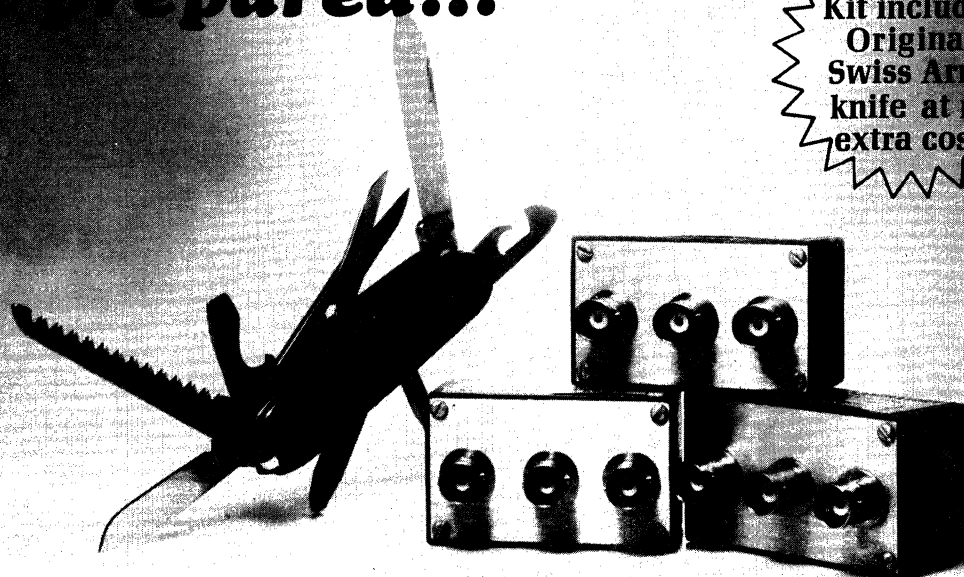
LIMITERS

Printed Circuit Board Version

PLS SERIES See Microwaves Product Data Directory

World's largest supplier of double balanced mixers
 Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

prepared...



Kit includes
Original
Swiss Army
knife at no
extra cost

for emergency needs...and design improvements

25 KHz - 1000 MHz

Double-Balanced Mixer Kit \$79.95

SAVE \$36.90 AND ALSO GET AN ORIGINAL SWISS ARMY KNIFE

Be prepared to . . .

- ... meet emergency customer needs
- ... outfit breadboards and prototypes overnight
- ... customize designs without delay
- ... retrofit and update designs
- ... modify and substitute for better performance or price
- ... and to cut, skin, slice, sever, snip, saw, screw, scribe, shape, scrape, strip, pick, pry, punch, trim with the Swiss Army knife included in kit.

There's an analogy between the popular Swiss Army knife and Mini-Circuits Laboratory's new double-balanced mixer kit (DBK-5). Both have been designed to serve their owner when the need arises . . . and both products should be on hand when the need arises.

Double-Balanced Mixer Kit (DBK-5) BE A PLANNER AND SAVE \$36.90

Order now and receive three Double-Balanced Mixers (1)ZAD-1, (1)ZAD-2, (1)ZAD-3 and one Swiss Army Knife for only \$79.95. (A \$116.85 Mixer value if purchased separately.)

MODEL	Frequency Range (MHz)	Conversion Loss (dB) Total Range	Isolation (dB)					
			Lower band edge to one decade higher		Mid range		Upper band edge to one octave lower	
			LO-RF	LO-IF	LO-RF	LO-IF	LO-RF	LO-IF
ZAD-1	LO-0.5-500 RF-0.5-500 IF-DC-500	6.5 typ. 8.5 max.	50 typ. 35 min.	45 typ. 30 min.	45 typ. 30 min.	40 typ. 25 min.	35 typ. 25 min.	30 typ. 20 min.
Price \$34.95 (1-3)								
ZAD-2	LO-1-1000 RF-1-1000 IF-0.5-500	6.5 typ. 8.5 max.	45 typ. 30 min.	45 typ. 30 min.	35 typ. 20 min.	35 typ. 20 min.	30 typ. 20 min.	30 typ. 20 min.
Price \$44.95 (1-3)								
ZAD-3	LO-0.025-200 RF-0.025-200 IF-DC-200	6.5 typ. 8.5 max.	60 typ. 50 min.	45 typ. 35 min.	45 typ. 35 min.	40 typ. 30 min.	35 typ. 25 min.	30 typ. 20 min.
Price \$36.95 (1-3)								

World's largest supplier of double balanced mixers

Mini-Circuits Laboratory

OUR NEW ADDRESS IS: 837-843 Utica Avenue,
Brooklyn, NY 11203 (212) 342-2500 Int'l Telex 620156

Foreign Sales Representatives: ☐ AUSTRALIA General Electronic Services, 99 Alexander Street, New South Wales, Australia 2065; ☐ ENGLAND Dale Electronics, Dale House, Wharf Road, Frimley Green, Camberley, Surrey; ☐ FRANCE S.C.I.E. - D.I.M.E.S., 31 Rue George - Sand, 91120 Palaiseau, France; ☐ GERMANY, AUSTRIA, SWITZERLAND Industrial Electronics GMBH, Klüberstrasse 14, 6000 Frankfurt/Main, Germany; ☐ ISRAEL Vectronics, Ltd., 69 Gordon Street, Tel-Aviv, Israel; ☐ JAPAN Densho Kaisha, Ltd., Eguchi Building, 8-1-1 Chome Hamamatsucho Minato-ku, Tokyo; ☐ EASTERN CANADA B. D. Hummel, 2224 Maynard Avenue, Utica, NY 13502 (315) 736-7821; NETHERLANDS Coimex, Veldweg 11, Hattem, Holland

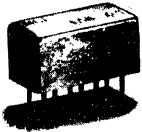
US Distributors: ☐ NORTHERN CALIFORNIA Cain-White & Co., Foothill Office Center, 105 Fremont Avenue, Los Altos, CA 94022 (415) 948-6533; ☐ SOUTHERN CALIFORNIA, ARIZONA Crown Electronics, 11440 Collins Street, No. Hollywood CA 91601 (213) 877-3550

Mini-Circuits Laboratory

DESIGNERS' SELECTION GUIDE

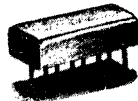
DOUBLE-BALANCED MIXERS

STANDARD LEVEL (+7dBmLO)



SRA SERIES

Low cost, miniature size. Frequency coverage from 500 Hz to 1250 MHz. Features 6 dB conversion loss, 40 dB isolation. Operates at -54°C to $+100^{\circ}\text{C}$. The SRA-1 double balanced mixer is industry standard and number one volume leader. Small quantity prices at \$9.95.



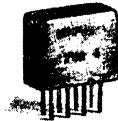
TAK SERIES

Low profile, miniature size, only 0.2 inches high. Frequency coverage 10 KHz to 1250 MHz. Features 6 dB conversion loss, 40 dB isolation. Operates -54°C to $+100^{\circ}\text{C}$. Small quantity prices start at \$19.95.



TSM SERIES

Frequency coverage from 100 KHz to 500 MHz. Low profile, micro-miniature size. Only 0.25 inches high, requires only 0.2 by 0.5 inches of PC board area. Smallest units available in industry. Features 6 dB conversion loss, 40 dB isolation, -54°C to $+100^{\circ}\text{C}$ operation. Small quantity prices start at \$16.95.



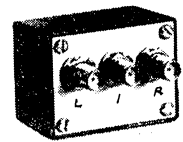
SAM SERIES

Frequency coverage from 100 KHz to 1500 MHz. Micro-miniature size, requires only 0.2 by 0.5 inches of PC board area. Features 6 dB conversion loss, 40 dB isolation. Operates at -54°C to $+100^{\circ}\text{C}$. Small quantity prices start at \$15.95.



ZAD SERIES

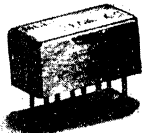
Cast aluminum case. 2.25 inches long. BNC connectors standard, TNC on request. Frequency coverage from 500 Hz to 1250 MHz. Conversion loss 6 dB, isolation 40 dB. Operates at -54°C to $+100^{\circ}\text{C}$. Small quantity prices start at \$24.95.



ZLW SERIES

Cast aluminum case, miniature size 1.5 inches long. SMA (3mm) connectors standard. Frequency coverage from 500 Hz to 1500 MHz. Conversion loss 6 dB, isolation 40 dB. Operates at -54°C to $+100^{\circ}\text{C}$. Small quantity prices start at \$34.95.

HIGH LEVEL (+17dBmLO)



SRA-H SERIES

Miniature size, provides frequency coverage from 50 KHz to 1000 MHz. Features 6 dB conversion loss, 40 dB isolation, temperature range -54°C to $+100^{\circ}\text{C}$. Offers increased dynamic range, 1 dB compression point at $+10$ dBm RF input. Small quantity prices start from \$15.95.



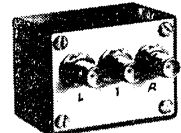
SAM-H SERIES

Micro-miniature size, requires same PC board area as a TO-5 transistor case. Premium high performance units. Frequency coverage from 100 KHz to 1000 MHz. Temperature range -54°C to $+100^{\circ}\text{C}$, constructed for tough military requirements. Small quantity prices start from \$19.95.



ZAD-H SERIES

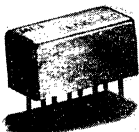
Cast aluminum case, BNC, or TNC connectors. Double shielded for tough EMI requirements. Frequency coverage from 50 KHz to 1000 MHz. Features 6 dB conversion loss, 40 dB isolation. Offers increased dynamic range, 1 dB compression point at $+10$ dBm RF input. Small quantity prices start from \$30.95.



ZLW-H SERIES

Cast aluminum case, miniature size, 1.5 inches long. SMA (3mm) connectors standard. Frequency coverage from 50 KHz to 1000 MHz. Features 6 dB conversion loss, 40 dB isolation. Offers increased dynamic range, 1 dB compression point at $+10$ dBm RF input. Small quantity prices start at \$40.95.

VERY HIGH LEVEL (+23dBmLO)



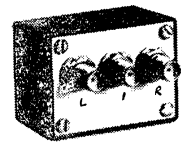
RAY SERIES

Miniature size, provides frequency coverage from 70 KHz to 1000 MHz. Features 6.5 dB conversion loss, 40 dB isolation, temperature range -54°C to $+100^{\circ}\text{C}$. Offers extra increased dynamic range, 1 dB compression point at $+15$ dBm RF input. Small quantity prices start from \$31.95 each.



ZAY SERIES

Cast aluminum case, BNC connectors standard, TNC on request. Double shielded for tough EMI requirements. Frequency coverage from 70 KHz to 1000 MHz. Features 6.5 dB conversion loss, 40 dB isolation. Offers extra increased dynamic range, 1 dB compression point at $+15$ dBm RF input. Small quantity prices start from \$41.95.



ZMY SERIES

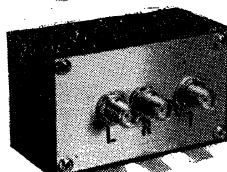
Cast aluminum case, miniature size 1.5 inches long. SMA (3mm) connectors standard. Frequency coverage from 70 KHz to 1000 MHz. Conversion loss 6 dB, isolation 40 dB. Operates at -54°C to $+100^{\circ}\text{C}$. Small quantity prices start at \$51.95.

MICROWAVE MIXERS



DOUBLE MA SERIES — BALANCED

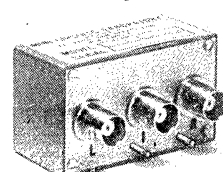
Cast aluminum case, SMA (3mm) connectors. Model MA-1 provides exceptionally broad frequency coverage 1 MHz to 2500 MHz. LO power $+10$ dBm, isolation greater than 40 dB, conversion loss 9.5 dB. Ruggedly constructed for tough military requirements. Single unit price only \$99.95.



ZMA SERIES — BALANCED

Cast aluminum case, 2.25 inches long. SMA (3mm) connectors standard. Frequency coverage from 1.0 to 3.0 GHz. Conversion loss 7 dB, isolation 30 dB. Operates at -54°C to $+100^{\circ}\text{C}$. Small quantity prices start at \$49.95.

DOUBLE-BALANCED FET MIXERS

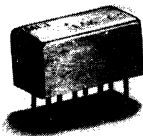


ZRC SERIES

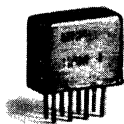
Cast aluminum case, 2.25 inches long. BNC connectors standard, TNC on request. Frequency range 1.0-200 MHz. Ultra-low distortion. Two-tone, third order intercept point $+30$ dBm. Conversion gain 0 dB. DC power $+15$ V, 45 mA. From \$79.95 in small quantities.

World's largest supplier of double balanced mixers

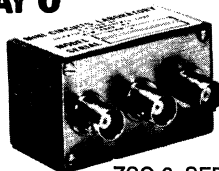
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

 Mini-Circuits Laboratory
DESIGNERS' SELECTION GUIDE**POWER SPLITTERS/COMBINERS****TWO-WAY 0°****PSC-2 SERIES**

Miniature size, provides frequency coverage from 2 KHz to 400 MHz. Low insertion loss .5 dB, high isolation 40 dB, amplitude unbalance typically .05 dB, phase unbalance typically less than 1 degree. Temperature range is from -54°C to +100°C. Economically priced from \$9.95 in small quantities.

**MSC-2 SERIES**

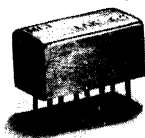
Micro-miniature size, requires same PC board area as a TO-5 transistor case. Model MSC-2-1 covers 0.1 to 450 MHz. Premium performance of low insertion loss .5 dB, high isolation 35 dB, amplitude unbalance less than .05 dB, phase unbalance less than 1 degree. Ruggedly constructed for military applications. Priced at \$16.95 each in small quantities.

**ZSC-2 SERIES**

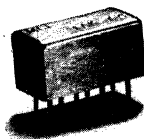
Cast aluminum case, BNC, or TNC connectors. Frequency coverage from 2 KHz to 400 MHz. Low insertion loss .5 dB, high isolation 40 dB, amplitude unbalance .05 dB, phase unbalance 1 degree. Temperature range -54°C to +100°C. Small quantity prices start from \$24.95 each.

**ZMSC-2 SERIES**

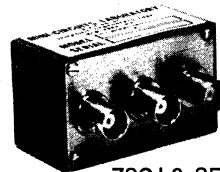
Cast aluminum case, miniature size 1.5 inches long. SMA (3mm) connectors standard. Frequency coverage from 2 KHz to 400 MHz. Low insertion loss .5 dB, high isolation 40 dB, amplitude unbalance .05 dB, phase unbalance 1 degree. Temperature range -54°C to +100°C. Small quantity prices start from \$34.95 each.

TWO-WAY 90°**PSCQ-2 SERIES**

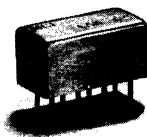
Miniature size. Frequency coverage from 25 MHz to 400 MHz. Low insertion loss .3 dB. Isolation 25 dB. Phase deviation from quadrature 1° typically. Temperature range -55°C to +100°C. From \$19.95 in small quantities.

**PSCJ-2 SERIES**

Miniature size. Frequency coverage from 1 MHz to 200 MHz. Low insertion loss .5 dB, high isolation 40 dB, amplitude unbalance .05 dB, phase unbalance 1 degree. Temperature range -54°C to +100°C. Small quantity prices start from \$19.95 each.

**ZSCJ-2 SERIES**

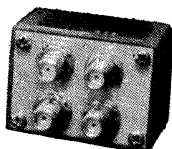
Cast aluminum case, BNC, or TNC connectors. Frequency coverage from 1 MHz to 200 MHz. Low insertion loss .5 dB, high isolation 40 dB, amplitude unbalance .05 dB, phase unbalance 1 degree. Temperature range -54°C to +100°C. Small quantity prices start from \$34.95 each.

THREE-WAY 0°**PSC-3 SERIES**

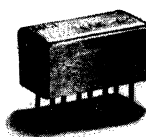
Miniature size. Frequency coverage 10 KHz to 200 MHz. Low insertion loss .4 dB, high isolation 40 dB, amplitude unbalance .05 dB, phase unbalance 1 degree. Temperature range -55°C to +100°C. Small quantity prices start at \$19.95.

**ZSC-3 SERIES**

Cast aluminum case, 2.25 inches long. BNC connectors standard. TNC on request. Frequency coverage 10 KHz to 200 MHz. Low insertion loss .4 dB, high isolation 40 dB, amplitude unbalance .05 dB, phase unbalance 1 degree. Temperature range -55°C to +100°C. Small quantity prices start at \$34.95.

**ZMSC-3 SERIES**

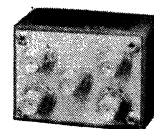
Cast aluminum case, miniature size 1.5 inches long. SMA (3mm) connectors standard. Frequency coverage 10 KHz to 200 MHz. Low insertion loss .4 dB, high isolation 40 dB, amplitude unbalance .05 dB, phase unbalance 1 degree. Temperature range -55°C to +100°C. Small quantity prices start at \$44.95.

**PSC-4 SERIES**

Miniature size. Frequency coverage 100 KHz to 250 MHz. Low insertion loss .5 dB, high isolation 30 dB, amplitude unbalance .05 dB, phase unbalance 1 degree. Temperature range -55°C to +100°C. Small quantity prices begin at \$23.95.

**ZSC-4 SERIES**

Cast aluminum case, 2.25 inches long. BNC connectors standard. TNC on request. Frequency coverage 2 KHz to 250 MHz. Low insertion loss .5 dB, high isolation 30 dB, amplitude unbalance .05 dB, phase unbalance 1 degree. Temperature range -55°C to +100°C. Small quantity prices begin at \$38.95.

**ZMSC-4 SERIES**

Cast aluminum case, miniature size 1.5 inches long. SMA (3mm) connectors standard. Frequency coverage 2 KHz to 250 MHz. Low insertion loss .5 dB, high isolation 30 dB, amplitude unbalance .05 dB, phase unbalance 1 degree. Temperature range -55°C to +100°C. Small quantity prices begin at \$48.95.

SIX-WAY 0°**PSC-6 SERIES**

Miniature size, .8 inches square. Frequency coverage from 1.0 to 175 MHz. Low insertion loss .7 dB. High isolation 30 dB. Amplitude unbalance .1 dB. Phase unbalance 3° typical. Temperature range -55°C to +100°C. From \$59.95 in small quantities.

EIGHT-WAY 0°**PSC-8 SERIES**

Miniature size, .8 inches square. Frequency coverage from 0.5 to 175 MHz. Low insertion loss .7 dB. High isolation 30 dB. Amplitude unbalance .1 dB. Phase unbalance 1° typical. Temperature range -55°C to +100°C. From \$59.95 in small quantities.

World's largest supplier of double balanced mixers

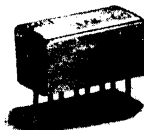
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

 Mini-Circuits Laboratory
DESIGNERS' SELECTION GUIDE**RF TRANSFORMERS****T SERIES**

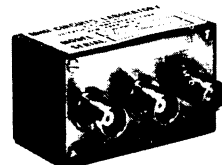
Micro-miniature, plastic case, wideband covering frequency range of .015 MHz to 800 MHz. Impedance levels from 12.5 ohms to 800 ohms. Low insertion loss less than 0.5 dB. Small quantity prices begin at only \$2.95! Kit available.

**TMO SERIES**

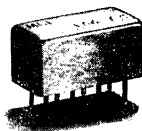
Micro-miniature, hermetically sealed metal case. Wideband, covering frequency range of .015 to 800 MHz. Impedance levels from 12.5 to 800 ohms. Low insertion loss less than 0.5 dB. Small quantity prices as low as \$4.95. Kit available.

ELECTRONIC ATTENUATORS/SWITCHES**PAS SERIES**

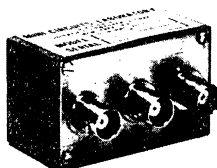
Miniature size. Broad frequency range 1-450 MHz. High on/off ratios, 50 dB. Low insertion loss, 1.5 dB. Ultra-low distortion, intercept point +45 dBm. Small quantity prices start from \$27.95.

**ZAS SERIES**

Cast aluminum case, 2.25 inches long. BNC connectors standard. TNC on request. Broad frequency range 1-450 MHz. High on/off ratios, 50 dB. Low insertion loss, 1.5 dB. Ultra-low distortion, intercept point +45 dBm. Small quantity prices start at \$42.95.

DIRECTIONAL COUPLERS**PDC SERIES**

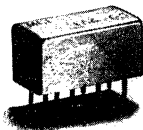
Miniature size. Broad frequency range 10 KHz to 1000 MHz. Wide selection of coupling. Low main line loss from 0.1 dB. High directivity to 35 dB. From \$9.95 in small quantities.

**ZDC SERIES**

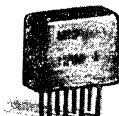
Cast aluminum case, 2.25 inches long. BNC connectors standard, TNC on request. Broad frequency range 10 KHz to 1000 MHz. Wide selection of coupling. Low main line loss from 0.1 dB. High directivity to 35 dB. From \$26.95 in small quantities.

**ZMDC SERIES**

Cast aluminum case, miniature size 1.5 inches long. SMA (3mm) connectors standard. Broad frequency range 10 KHz to 1000 MHz. Wide selection of coupling. Low main line loss from 0.1 dB. High directivity to 35 dB. From \$36.95 in small quantities.

FREQUENCY DOUBLERS**RK SERIES**

Miniature size. Wide band .05 to 1000 MHz. Exceptionally good spurious rejection. Low conversion loss, 12 dB. Temperature range from -55°C to +100°C. From \$14.95 in small quantities.

**AK SERIES**

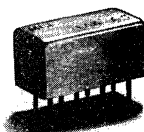
Micro-miniature size, PC board area only 0.1 sq. inches. Wide band 1-1000 MHz. Exceptionally good spurious rejection. Low conversion loss 13.5 dB. Temperature range from -55°C to +100°C. From \$19.95 in small quantities.

**GK SERIES**

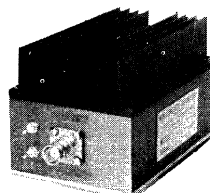
Cast aluminum case, 2.25 inches long. BNC connectors standard, TNC on request. Wide band .05-1000 MHz. Exceptionally good spurious rejection. Low conversion loss 12 dB. Temperature range -55°C to +100°C. From \$26.95 in small quantities.

**MK SERIES**

Miniature size, cast aluminum case, 1.5 inches long. SMA (3mm) connectors standard. Wide band .05-1000 MHz. Exceptionally good spurious rejection. Low conversion loss 12 dB. Temperature range -55°C to +100°C. From \$34.95 in small quantities.

LIMITERS**PLS SERIES**

Miniature size. Frequency coverage from .1 to 150 MHz. Input level +6 dBm to +20 dBm. Output level -1 dBm. Phase variation over range 2° typical. Temperature range -55°C to +100°C. From \$14.95 in small quantities.

BROADBAND AMPLIFIERS**ZHL SERIES**

High power linear amplifier. +38 dBm two-tone, third order intercept. Wide band, frequency range 2 to 500 MHz. Max. power output greater than 1 watt. Heat sink mounted on unit. Unit price \$199.00.

World's largest supplier of double balanced mixers

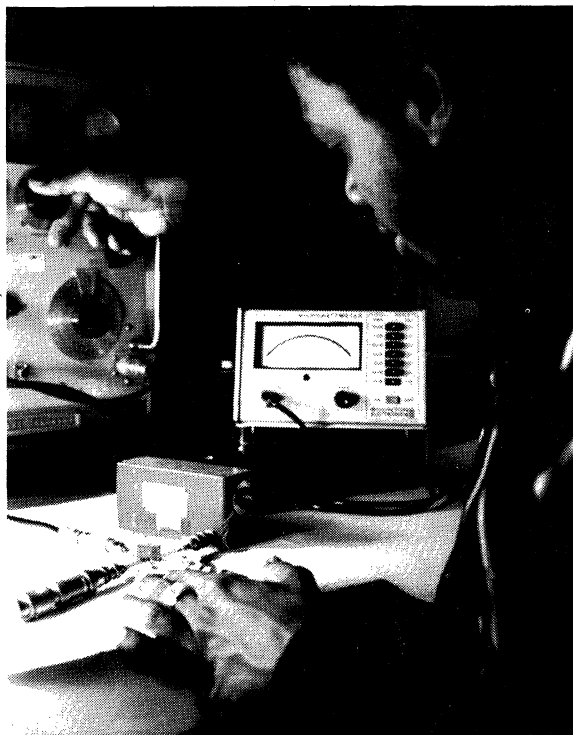
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Reliability Considerations

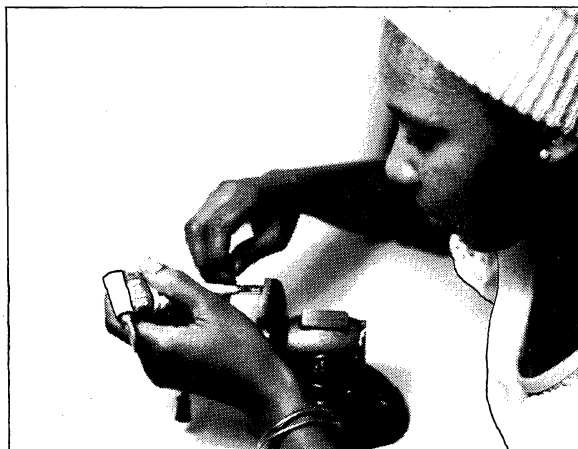
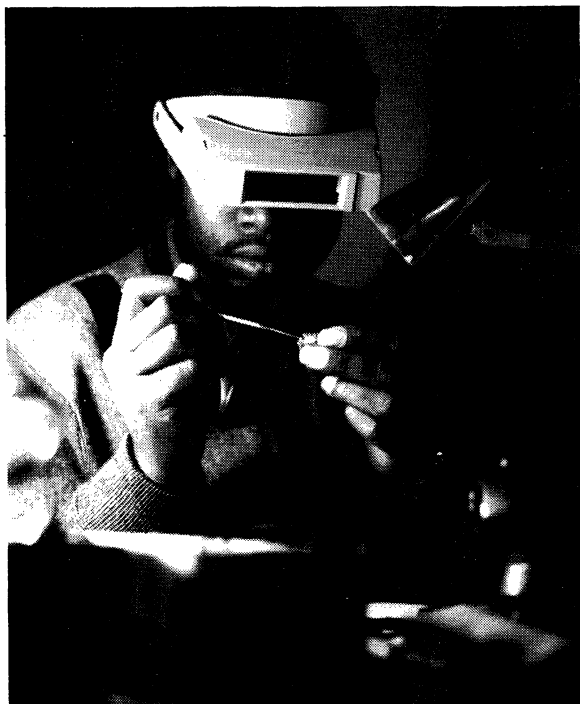
It is very important that the mixer should provide reliable service under adverse environmental conditions. The user should also expect satisfactory performance after years of operation. Since these two criteria are somewhat subjective the manufacturer should utilize procedures, techniques, and criterion which will enhance the reliability and quality of the finished product. After manufacturing tens of thousands of double balanced mixers Mini-Circuits Laboratory is confident that we are doing the "right thing".

At Mini-Circuits Laboratory reliability and quality control is one of the most important considerations in the manufacture of our products. Some of the procedures which are incorporated to ensure that every unit shipped has quality built in are as follows:

- A. 100% testing of each diode.
- B. 100% testing of each unit.
- C. 100% inspection of every solder connection.
- D. All transformers bonded to the header for protection against severe shock and vibration conditions.



No units are shipped without a thorough 100% test.



Matched diodes are carefully mounted to the header assembly for rugged protection against severe shock and vibration.

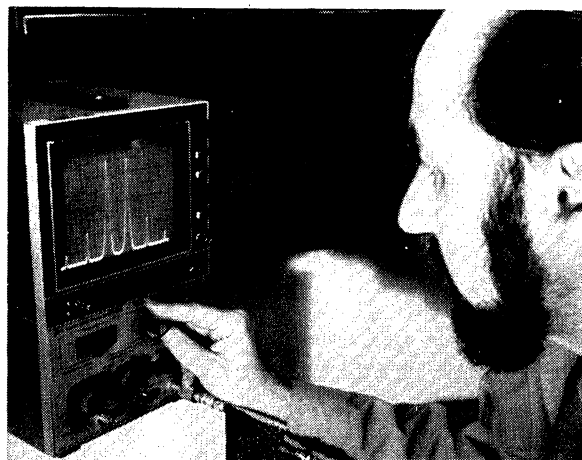
Every single solder connection is closely inspected to detect potential flaws.

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

- E. All diodes bonded to the header for protection against severe shock and vibration conditions.
- F. Diode power dissipation derated greater than 50%.
- G. All Components rated for greater than +125°C operation.
- H. All transformer leads double wrapped.
- I. Heavy coated wire insulation for Hi-Pot/altitude requirements.
- J. Completely encapsulated for protection against mechanical shock and vibration and temperature shock.
- K. Permanent case marking of model number, cannot be removed by cleaning agents or ultrasonic baths.
- L. Cupro-Nickel case for long lasting finish especially under salt atmosphere conditions.

As a consequence of these considerations Mini-Circuits Laboratory guarantees its products for one full year after shipment. In addition Mini-Circuits guarantees its units will meet the following environmental specifications.



Performance characteristics are checked to assure compliance with data-sheet specs.



Transformer leads are doubly wrapped to eliminate potential flaws.

Environmental Specifications

All MCL components are manufactured under exacting quality assurance and control standards. They will meet or exceed published specifications over the operating temperature range of -54° to $+100^{\circ}\text{C}$, and after being subjected to any or all of the following physical or environmental tests of MIL STD 202D which are applicable.

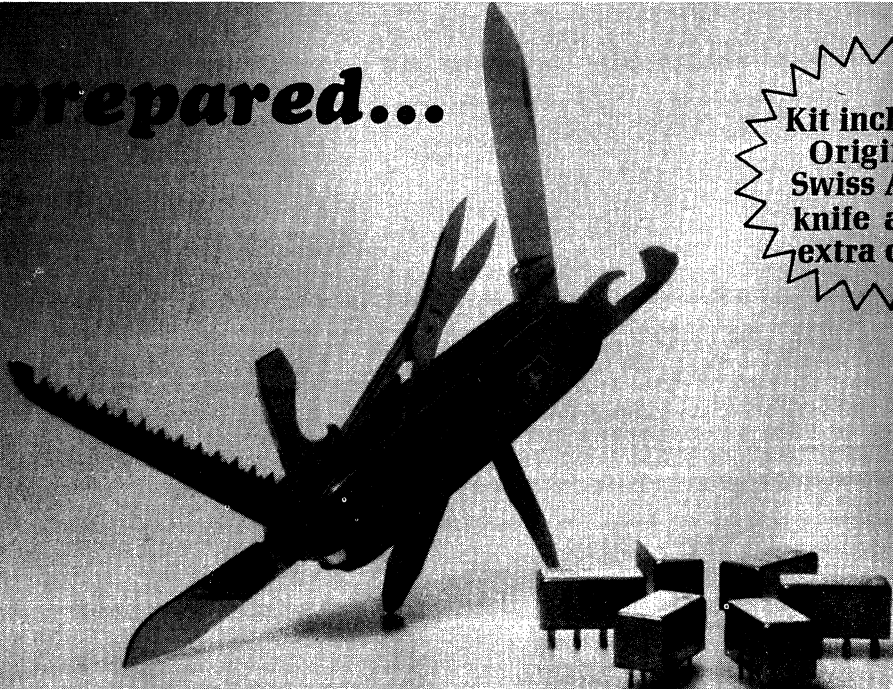
Temperature Cycling: -65° to $+125^{\circ}\text{C}$	102	C
Altitude: 656,000 feet	105	G
Humidity: 90% RH, 65°C	106	

Thermal Shock: -65°C to $+125^{\circ}\text{C}$	107	B
Seal: less than 10^{-5} Atm. cc/sec.	112	A
Drop: Random, 45 min.	203	
Vibration: 2 to 2,000 cps, 20g, 12 hrs.	204	D
Solder Heat 260°C , 10 sec.	210	B
Solderability: 95% coverage	208	
Terminal Tensile Strength: $4\frac{1}{2}$ lbs., 10 sec.	211	A
Terminal Fatigue: 2 lbs., 3 cycles	211	C
Mechanical Shock: 100g, 6ms	213	I
Solvent Resistance: Alcohol, Trichloroethane, Freon.	215	

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Be prepared...



Kit includes Original Swiss Army knife at no extra cost

for emergency needs...and design improvements

100 KHz - 400 MHz
Power splitter
Combiners Kit \$79.95

SAVE \$53.80 AND ALSO GET AN ORIGINAL SWISS ARMY KNIFE

Be prepared to . . .

- ... meet emergency customer needs
- ... outfit breadboards and prototypes overnight
- ... customize designs without delay
- ... retrofit and update designs
- ... modify and substitute for better performance or price
- ... and to cut, skin, slice, sever, snip, saw, screw, scribe, shape, scrape, strip, pick, pry, punch, trim with the Swiss Army knife included in kit.

There's an analogy between the popular Swiss Army knife and Mini-Circuits Laboratory's new Power Splitter/Combiner kit (PSK-1). Both have been designed to serve their owner when the need arises . . . and both products should be on hand when the need arises.

Power Splitter/Combiner Kit (PSK-1)
BE A PLANNER AND SAVE \$53.80
 Order now and receive Power Splitter/Combiners (2)PSC-2-1, (1)PSCJ-2-1, (1)PSC-3-1, (1)PSC-4-3 and one Swiss Army Knife for only \$79.95. (A \$133.75 Power Splitter value if purchased separately.)

Frequency Range (MHz)	Model PSC 2-1 1-400	Model PSC 3-1 1-200	Model PSC 4-3 .250-250	Model PSCJ 2-1 1-200
Nominal Phase Difference Between Output Ports	0°	0°	0°	180°
Isolation dB	Typ. Min.	Typ. Min.	Typ. Min.	Typ. Min.
Mid Range	25 20	40 30	40 30	40 30
Insertion Loss, dB	above 3 dB	above 4.8 dB	above 6 dB	above 3 dB
Mid Range	Typ. Max.	Typ. Max.	Typ. Max.	Typ. Max.
	.4 .75	.4 .7	.5 .75	.6 .8
Phase Unbalance degrees	Typ. Max.	Typ. Max.	Typ. Max.	Typ. Max.
Mid Range	1 3	2 4	2 4	2.0 4.0
Amplitude Unbalance, dB	Typ. Max.	Typ. Max.	Typ. Max.	Typ. Max.
Mid Range	.05 .2	.05 .2	.1 .25	.05 .2
VSWR	1.2 typical	1.1 typical	1.1 typical	1.2 typical
Matched Power Rating	1 watt max.	1 watt max.	1 watt max.	1 watt max.
Internal Load Dissipation	1/2 watt	1/2 watt	1/2 watt	1/2 watt
Price (Quantity)	\$19.95 (1-5)	\$29.95 (1-5)	\$33.95 (1-5)	\$29.95 (1-4)

Impedance, All Ports 50 ohms

World's largest supplier of double balanced mixers

Mini-Circuits Laboratory

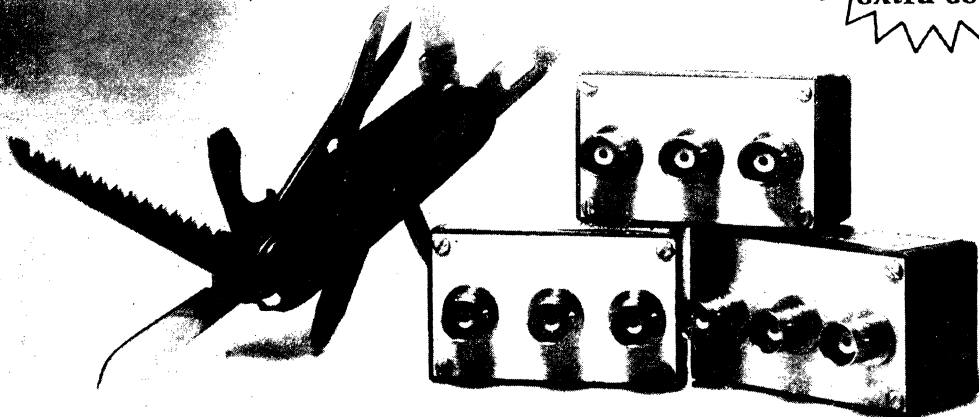
**OUR NEW ADDRESS IS: 837-843 Utica Avenue,
 Brooklyn, NY 11203 (212) 342-2500 Int'l Telex 620156**

Foreign Sales Representatives: ☐ AUSTRALIA General Electronic Services, 99 Alexander Street, New South Wales, Australia 2065; ☐ ENGLAND Dale Electronics, Dale House, Wharf Road, Frimley Green, Camberley Surrey; ☐ FRANCE S.C.I.E.-D.I.M.E.S., 31 Rue George - Sand, 91120 Palaiseau, France; ☐ GERMANY, AUSTRIA, SWITZERLAND Industrial Electronics GMBH, Klüberstrasse 14, 6000 Frankfurt/Main, Germany; ☐ ISRAEL Vectronics, Ltd., 69 Gordon Street, Tel-Aviv, Israel; ☐ JAPAN Denso Kaisha, Ltd., Eguchi Building, 8-1 Chome Hamamatsucho Minato-ku, Tokyo; ☐ EASTERN CANADA B. D. Hummel, 2224 Maynard Avenue, Utica, NY 13502 (315) 736-7821; ☐ NETHERLANDS Coimex, Veldweg 11, Hattem, Holland

US Distributors: ☐ NORTHERN CALIFORNIA Cain-White & Co., Foothill Office Center, 105 Fremont Avenue, Los Altos, CA 94022 (415) 948-6533; ☐ SOUTHERN CALIFORNIA, ARIZONA Crown Electronics, 11440 Collins Street, No. Hollywood CA 91601 (213) 877-3550

Be prepared...

Kit includes
Original
Swiss Army
knife at no
extra cost



for emergency needs...and design improvements

10 KHz - 1000 MHz

Directional Coupler Kit \$79.95

SAVE \$42.90 AND ALSO GET AN ORIGINAL SWISS ARMY KNIFE

Be prepared to . . .

- ... meet emergency customer needs
- ... outfit breadboards and prototypes overnight
- ... customize designs without delay
- ... retrofit and update designs
- ... modify and substitute for better performance or price
- ... and to cut, skin, slice, sever, snip, saw, screw, scribe, shape, scrape, strip, pick, pry, punch, trim with the Swiss Army knife included in kit.

There's an analogy between the popular Swiss Army knife and Mini-Circuits Laboratory's new Directional Coupler kit (DCK-1). Both have been designed to serve their owner when the need arises . . . and both products should be on hand when the need arises.

Directional Coupler Kit (DCK-1) BE A PLANNER AND SAVE \$42.90

Order now and receive three Directional Couplers (1)ZDC-10-1, (1)ZDC-15-6, (1)ZDC-10-2 and one Swiss Army Knife for only \$79.95. (A \$122.85 Directional Coupler value if purchased separately.)

	Model ZDC 10-1		Model ZDC 15-6		Model ZDC 10-2	
Frequency Range, MHz	0.5-500		.01-35		250-1000	
Coupling, dB (Input To Coupled Port)	11.5±0.5		15 dB±0.5 dB		10±0.5	
Coupling Flatness, dB	±0.6		±0.5 dB		±0.5	
VSWR	1.2:1 Typ.		1.15:1 Typ.		1.5:1 Typ.	
Impedance	50 ohms		50 ohms		50 ohms	
Directivity, dB	Typ. Min.		Typ. Min.		Typ. Min.	
Lower Band Edge To One Decade Higher	32 25		38 30		(250-400 MHz) 40 30	
Mid Range	32 25		35 25		(400-800 MHz) 30 20	
Upper Band Edge To One Octave Lower	22 15		28 20		(800-1000 MHz) 20 15	
Main Line Loss, dB (Includes Theoretical Power Split Loss)	Typ. Max.		Typ. Max.		Typ. Max.	
One Octave From Band Edge	.65 1.0		.2 .4		(250-600 MHz) 1.1 1.4	
Total Range	.85 1.2		.3 .6		(600-1000 MHz) 1.6 1.9	
Input Power						
Total Range (1)	3 Watts		4 Watts		5 Watts	
(1) Lower Band Edge To One Decade Higher	1.5 Watts		2 Watts		5 Watts	
Price (Quantity)	\$36.95 (1-3)		\$44.95 (1-3)		\$40.95 (1-3)	

World's largest supplier of double balanced mixers

Mini-Circuits Laboratory

OUR NEW ADDRESS IS: 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500 Int'l Telex 620156

Foreign Sales Representatives: ☐ AUSTRALIA General Electronic Services, 99 Alexander Street, New South Wales, Australia 2065; ☐ ENGLAND Dale Electronics, Dale House, Wharf Road, Frimley Green, Camberley Surrey; ☐ FRANCE S.C.I.E.-D.I.M.E.S., 31 Rue George - Sand, 91120 Palaiseau, France; ☐ GERMANY, AUSTRIA, SWITZERLAND Industrial Electronics GMBH, Klüberstrasse 14, 6000 Frankfurt/Main, Germany; ☐ ISRAEL Vectronics, Ltd., 69 Gordon Street, Tel-Aviv, Israel; ☐ JAPAN Denso Kaisha, Ltd., Eguchi Building, 8-1 Chome Hamamatsucho Minato-ku, Tokyo; ☐ EASTERN CANADA B. D. Hummel, 2224 Maynard Avenue, Utica, NY 13502 (315) 736-7821; ☐ NETHERLANDS Coimex, Veldweg 11, Hattem, Holland

US Distributors: ☐ NORTHERN CALIFORNIA Cain-White & Co., Foothill Office Center, 105 Fremont Avenue, Los Altos, CA 94022 (415) 948-6533; ☐ SOUTHERN CALIFORNIA, ARIZONA Crown Electronics, 11440 Collins Street, No. Hollywood CA 91601 (213) 877-3550

Be prepared...



Kit includes Original Swiss Army knife at no extra cost!

for emergency needs...and design improvements

3 KHz - 750 MHz

Double-Balanced Mixer Kit \$79.95

SAVE \$ 41.75 AND ALSO GET AN ORIGINAL SWISS ARMY KNIFE

Be prepared to . . .

- ... meet emergency customer needs
- ... outfit breadboards and prototypes overnight
- ... customize designs without delay
- ... retrofit and update designs
- ... modify and substitute for better performance or price
- ... and to cut, skin, slice, sever, snip, saw, screw, scribe, shape, scrape, strip, pick, pry, punch, trim with the Swiss Army knife included in kit.

There's an analogy between the popular Swiss Army knife and Mini-Circuits Laboratory's new double-balanced mixer kit (DBK-4). Both have been designed to serve their owner when the need arises . . . and both products should be on hand when the need arises.

Double-balanced mixer kit (DBK-4)

BE A PLANNER AND SAVE \$41.75.

Order now and receive six double-balanced mixers (2) SRA-1, (2) SRA-1W, (1) SRA-3, (1) SRA-6 and one Swiss Army knife for only \$79.95. (A \$121.70 mixer value if purchased separately.)

MODEL	Frequency Range (MHz)	Conversion Loss (dB) Total Range	Isolation (dB)					
			Lower band edge to one decade higher		Mid range		Upper band edge to one octave lower	
			LO-RF	LO-IF	LO-RF	LO-IF	LO-RF	LO-IF
SRA-1	LO-0.5-500	6.5 typ.	50 typ.	45 typ.	45 typ.	40 typ.	35 typ.	30 typ.
	RF-0.5-500	8.5 max.	35 min.	30 min.	30 min.	25 min.	25 min.	20 min.
	IF-DC-500		Price \$9.95-Quant. (1-49)					
SRA-1W	LO-1-750	6.5 typ.	50 typ.	45 typ.	45 typ.	40 typ.	35 typ.	30 typ.
	RF-1-750	8.5 max.	45 min.	30 min.	30 min.	25 min.	25 min.	20 min.
	IF-DC-750		Price \$24.95-Quant. (1-5)					
SRA-3	LO-0.025-200	6.5 typ.	60 typ.	45 typ.	45 typ.	40 typ.	35 typ.	30 typ.
	RF-0.025-200	8.5 max.	50 min.	35 min.	35 min.	30 min.	25 min.	20 min.
	IF-DC-200		Price \$21.95-Quant. (1-5)					
SRA-6	LO-0.003-100	6.5 typ.	60 typ.	45 typ.	45 typ.	40 typ.	35 typ.	30 typ.
	RF-0.003-100	8.5 max.	50 min.	45 min.	30 min.	25 min.	25 min.	20 min.
	IF-DC-100		Price \$29.95-Quant. (1-5)					

Mini-Circuits Laboratory

OUR NEW ADDRESS IS: 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500 Int'l Telex 620156

Foreign Sales Representatives: ☐ **AUSTRALIA** General Electronic Services, 99 Alexander Street, New South Wales, Australia 2065; ☐ **ENGLAND** Dale Electronics, Dale House, Wharf Road, Frimley Green, Camberley Surrey; ☐ **FRANCE** S.G.I.E.-D.I.M.E.S., 31 Rue George - Sand, 91120 Palaiseau, France; ☐ **GERMANY, AUSTRIA, SWITZERLAND** Industrial Electronics GmbH, Klüberstrasse 14, 6000 Frankfurt/Main, Germany; ☐ **ISRAEL** Vectronics, Ltd., 69 Gordon Street, Tel-Aviv, Israel; ☐ **JAPAN** Densho Kaisha, Ltd., Eguchi Building, 8-1-1 Chome Hamamatsucho Minato-ku, Tokyo; ☐ **EASTERN CANADA** B. D. Hummel, 2224 Maynard Avenue, Utica, NY 13502 (315) 736-7821; **NETHERLANDS** Coimex, Veldweg 11, Hattem, Holland

US Distributors: ☐ **NORTHERN CALIFORNIA** Cain-White & Co., Foothill Office Center, 105 Fremont Avenue, Los Altos, CA 94022 (415) 948-6533; ☐ **SOUTHERN CALIFORNIA, ARIZONA** Crown Electronics, 11440 Collins Street, No. Hollywood CA 91601 (213) 877-3550

INTRODUCTION TO SRA SERIES DOUBLE-BALANCED MIXERS

Standard Level (+7 dBm LO)

SRA Series

SRA-1	.5- 500 MHz	\$ 9.95 (1-49)
SRA-1-1	.1- 500 MHz	\$11.95 (6-49)
SRA-1W	1- 750 MHz	\$14.95 (6-49)
SRA-2	1-1000 MHz	\$24.95 (1-24)
SRA-4	5-1250 MHz	\$26.95 (1-24)
SRA-3	.025- 200 MHz	\$12.95 (6-49)
SRA-6	.003- 100 MHz	\$19.95 (5-24)
SRA-8	500 Hz- 10 MHz	\$24.95 (5-24)

FAST DELIVERY
From stock, one week max.



For connector version see ZAD series

FEATURES

MINIATURE SIZE, .128 CU. INCHES

BROAD FREQUENCY RANGE
500Hz - 1250MHz

HIGH ISOLATION 40 dB

LOW CONVERSION LOSS 6dB

HERMETICALLY SEALED METAL CASE

PC BOARD MOUNTING

LOW COST FROM \$9.95
IN SMALL QUANTITIES

DESCRIPTION

Having a volume of only .128 cu. inches, the SRA series covers a very broad frequency range from 500Hz to 1250MHz. Offered at the lowest prices available in the industry, these rugged units provide low conversion loss, 6 dB, high isolation 40 dB, and exceptional unit to unit matched performance.

Packaged within an RFI shielded metal enclosure and hermetically sealed header, these high performance units have their pins oriented on a 0.2 inch grid.

Ruggedness and durability are built into the SRA series. Only well matched hot-carrier diodes and ruggedly constructed transmission line transformers are used. Internally every component is bonded to the header and case with silicone rubber to provide super reliable protection against shock, vibration, and acceleration.

The model SRA-1 has become an industry standard throughout the world and is believed to be the number one volume leader. Used by all branches of the Department of Defense, NASA, FAA, and every major communications company, the SRA-1 has proven to be an industry work horse. Used in over 300 different military contracts, and over a period of years, enable sufficient history to establish the SRA-1 as one of the most reliable mixers obtainable, even when considering high priced models.

High reliability is associated with every SRA series mixer. Every production run is 100% tested and every unit must pass our rigid inspection and high quality standards. Naturally, our 1 year guarantee applies to these units.

APPLICATIONS

FREQUENCY MIXING

PULSE AND AMPLITUDE MODULATION

PHASE DETECTION

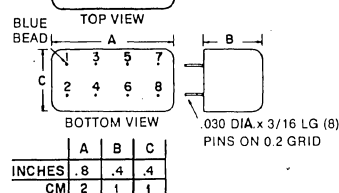
CURRENT CONTROLLED ATTENUATION

FAST SWITCHING

BI-PHASE MODULATION

LETTER M OVER PIN 2

Note: Numbers are for reference only, use blue bead or letter M for determining orientation.

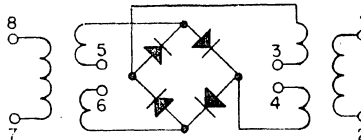


WEIGHT 5.2 grams .18 ounces

PIN CONNECTIONS

	SRA-1 SRA-1-1 SRA-1W [*] SRA-3	SRA-2 SRA-4	SRA-6 SRA-8
LO	8	8	8
RF	1	3,4	1
IF	3,4	1	3,4
Ground	2,5,6,7	2,5,6,7	2,5,6,7
Case Ground	2	2,5,6,7	—

NOTE: PINS 3 AND 4 MUST BE CONNECTED TOGETHER



ABSOLUTE MAXIMUM RATINGS

Total Input Power	500 mW
Total Input, Current Peak	40 mA
Operating & Storage Temperature	-55° C to +100° C
Pin Temperature (10 seconds)	510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DOUBLE-BALANCED MIXERS

Frequency Range, MHz	LO	MODEL SRA-1	
	RF	.5-500	
	IF	DC-500	
Conversion Loss, dB		Typical	Maximum
One Octave from Band Edge		5.5	7.5
Total Range		6.5	8.5
Signal, 1dB Compression Level	+1dBm		
Isolation, dB		Typical	Minimum
Lower Band Edge to One Decade Higher	LO-RF	50	35
	LO-IF	45	30
Mid Range	LO-RF	45	30
	LO-IF	40	25
Upper Band Edge to One Octave Lower	LO-RF	35	25
	LO-IF	30	20
Impedance, All Ports		50 ohms	
Phase Detection			
DC Offset		1mV typical	
DC Polarity		Negative	
Electronic Attenuation			
Minimum Attenuation (20mA)		3dB	

Standard Level
(+7 dBm LO)

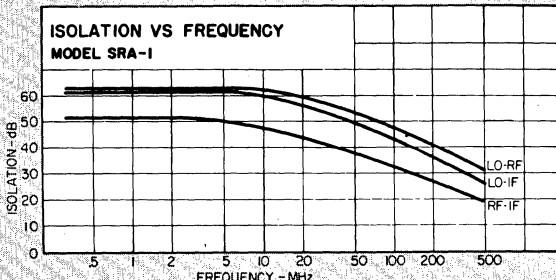
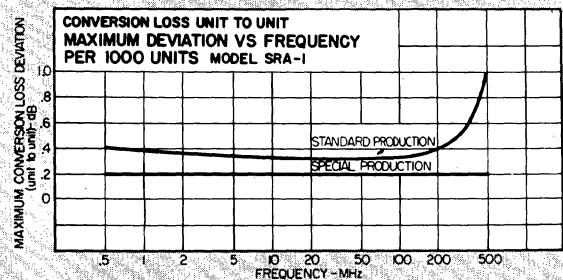
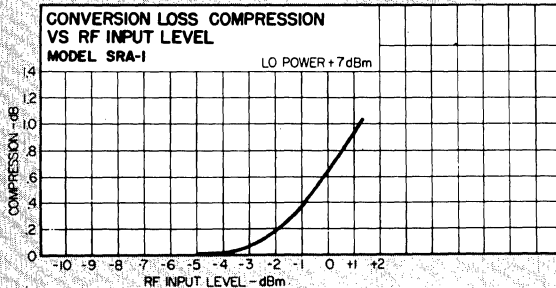
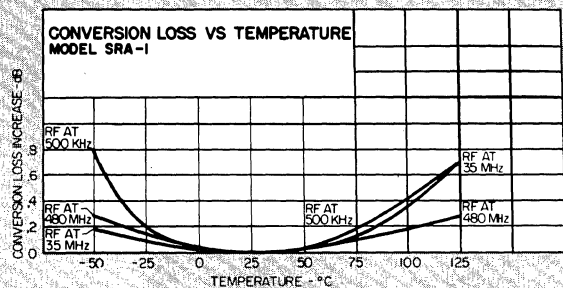
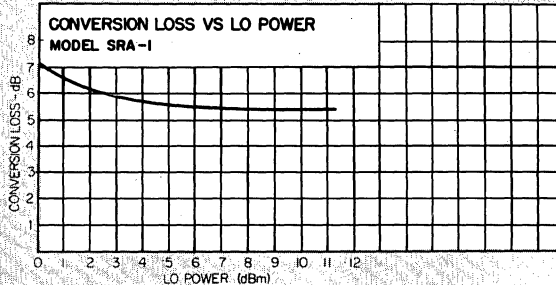
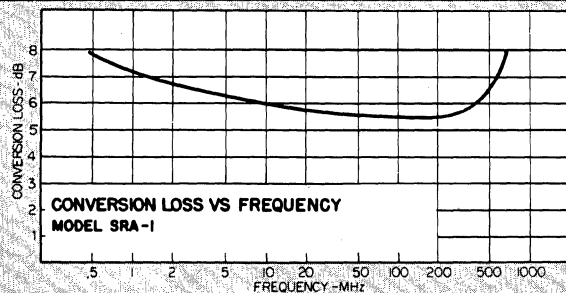
SRA Series

SRA-1 .5-500MHz \$9.95 (1-49)

FAST DELIVERY
From stock, one week max.



For connector version see ZAD series

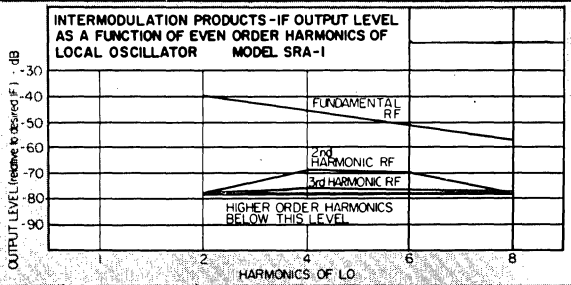
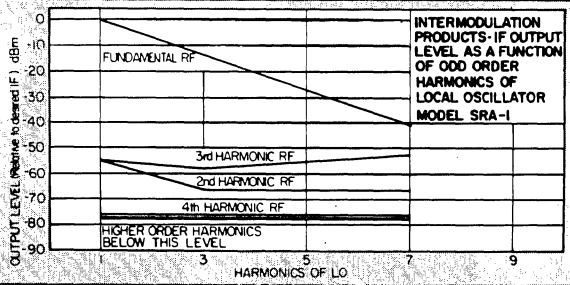
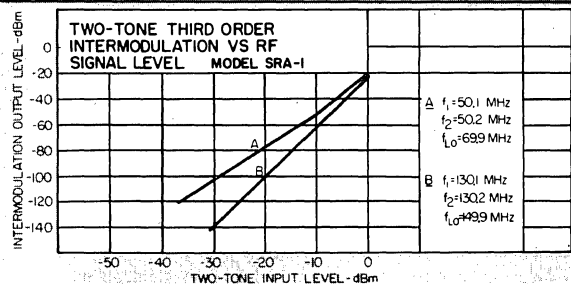
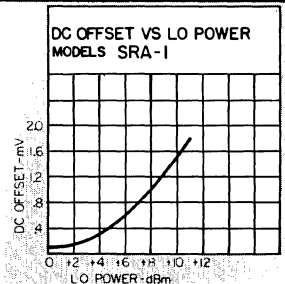
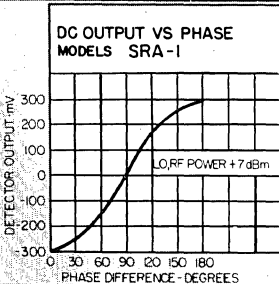
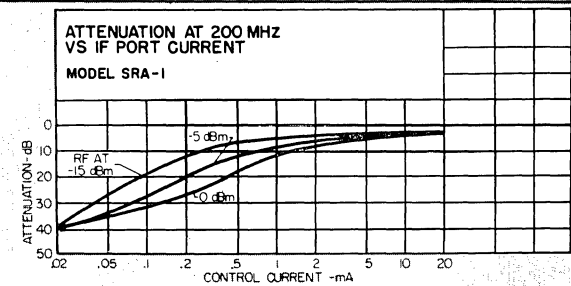
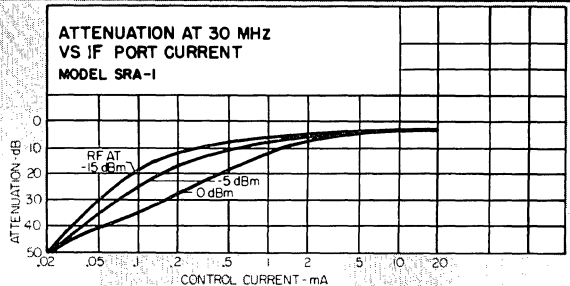
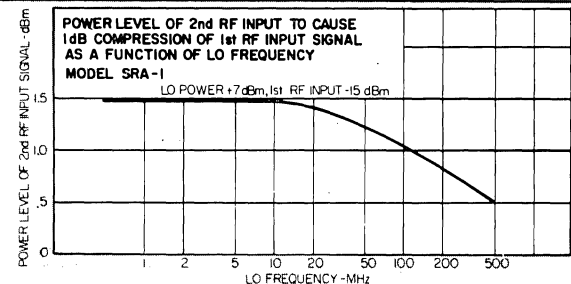
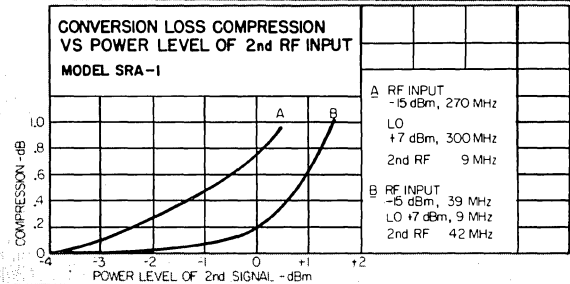
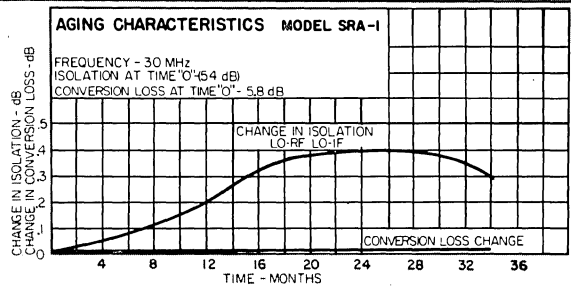
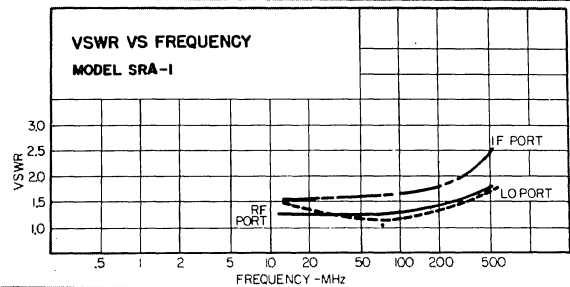
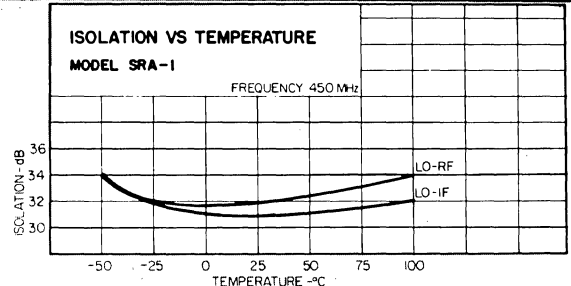
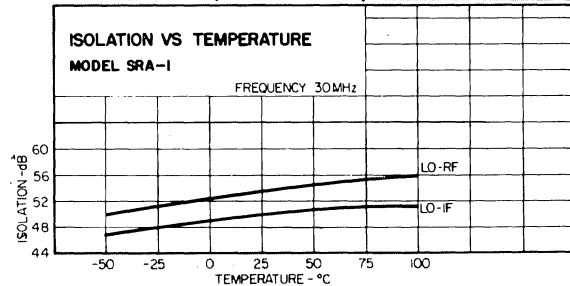


World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

See YELLOW SECTION for Local Sales Offices and Key Personnel

eem/1975



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

See YELLOW SECTION for Local Sales Offices and Key Personnel

DOUBLE-BALANCED MIXERS

Frequency Range, MHz	LO RF IF	MODEL SRA-1-I		MODEL SRA-1W	
		1-500	1-500	1-750	1-750
		DC-500	DC-500	DC-750	DC-750
Conversion Loss, dB		Typical	Maximum	Typical	Maximum
One Octave From Band Edge		5.5	7.5	5.5	7.5
Total Range		6.5	8.5	6.5	8.5
Signal, 1dB Compression Level		+1dBm		+1dBm	
Isolation, dB		Typical	Minimum	Typical	Minimum
Lower Band Edge to One Decade Higher	LO-RF	50	45	50	45
	LO-IF	45	30	45	30
Mid Range	LO-RF	45	30	45	30
	LO-IF	40	25	40	25
Upper Band Edge to One Octave Lower	LO-RF	35	25	35	25
	LO-IF	30	20	30	20
Impedance, All Ports		50 ohms		50 ohms	
Phase Detection					
DC Offset		1mV typical		1mV typical	
DC Polarity		Negative		Negative	
Electronic Attenuation					
Minimum Attenuation (20mA)		2.5 dB		3.5dB	

Standard Level
(+7 dBm LO)

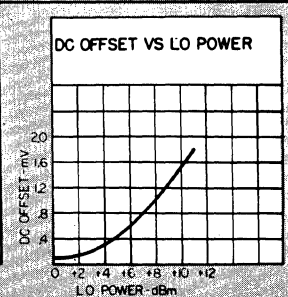
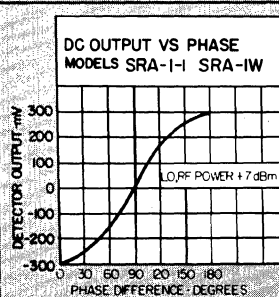
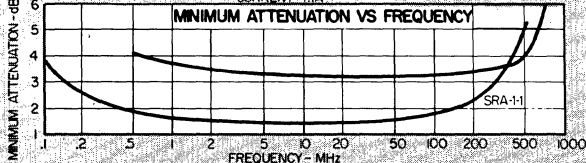
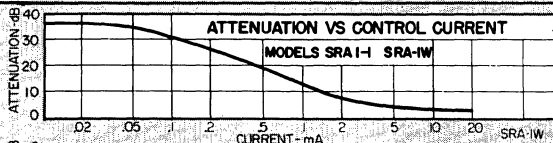
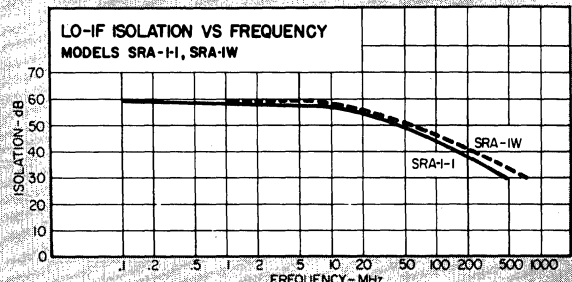
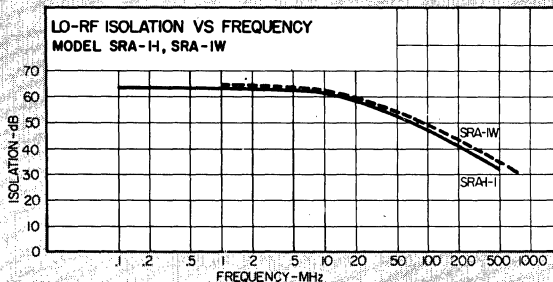
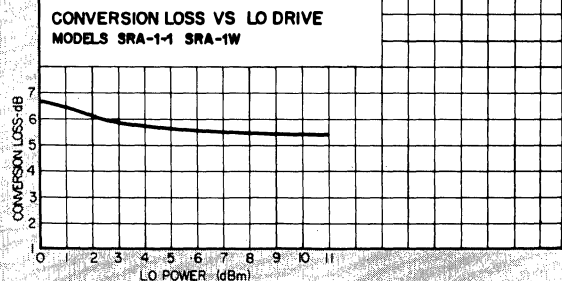
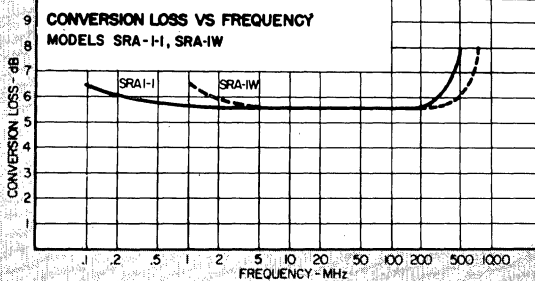
SRA Series

SRA-1-I 1-500MHz \$11.95 (6-49)
SRA-1W 1-750MHz \$14.95 (6-49)

FAST DELIVERY
From stock, one week max.



For connector version see ZAD series



DOUBLE-BALANCED MIXERS

Standard Level
(+7 dBm LO)

SRA Series

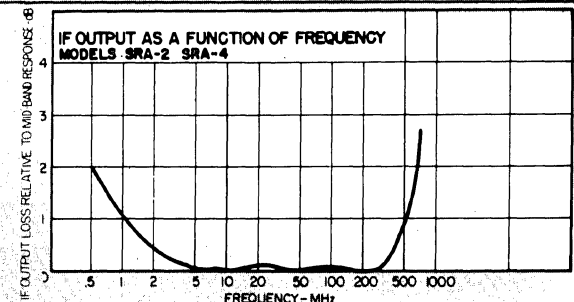
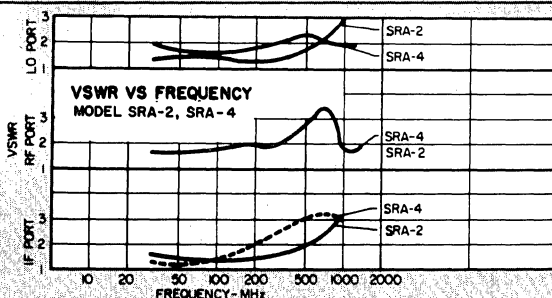
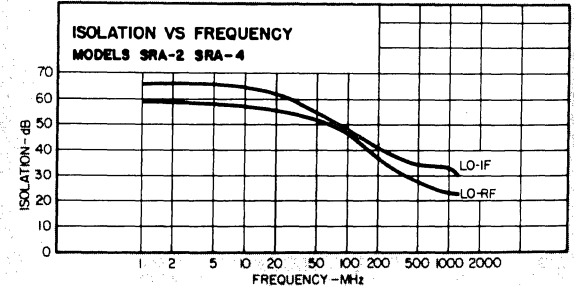
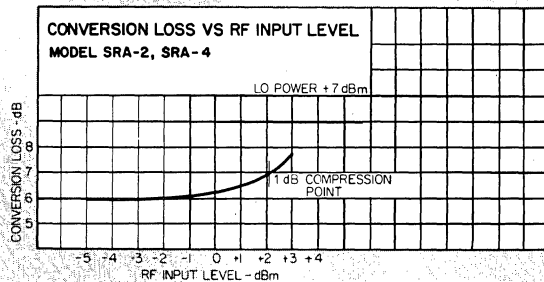
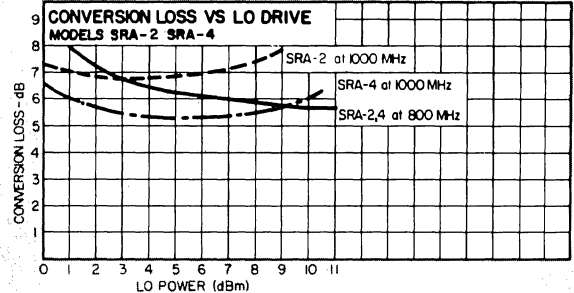
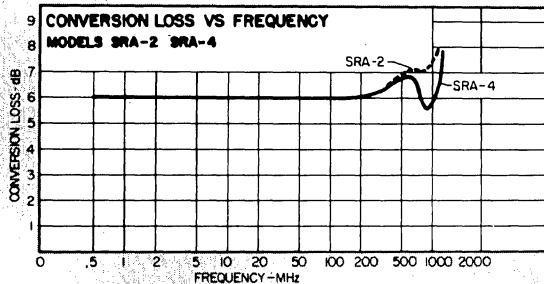
SRA-2 1-1000MHz \$24.95 (1-24)
SRA-4 5-1250-MHz \$26.95 (1-24)

Frequency Range, MHz	LO RF IF	MODEL SRA-2		MODEL SRA-4	
		1-1000		5-1250	
		1-1000		5-1250	
		.5-500		.5-500	
Conversion Loss, dB		Typical	Maximum	Typical	Maximum
One Octave From Band Edge		5.5	7.5	5.5	7.5
Total Range		6.5	8.5	6.5	8.5
Signal, 1dB Compression Level		+1dBm		+1dBm	
Isolation, dB		Typical	Minimum	Typical	Minimum
Lower Band Edge to One Decade Higher	LO-RF	45	30	50	40
	LO-IF	45	30	50	40
Mid Range	LO-RF	35	20	40	20
	LO-IF	35	20	40	20
Upper Band Edge to One Octave Lower	LO-RF	30	20	30	20
	LO-IF	30	20	30	20
Impedance, All Ports		50 ohms		50 ohms	

FAST DELIVERY
From stock, one week max.



For connector version see ZAD series



World's largest supplier of double balanced mixers

DOUBLE-BALANCED MIXERS

Standard Level
 (+7 dBm LO)

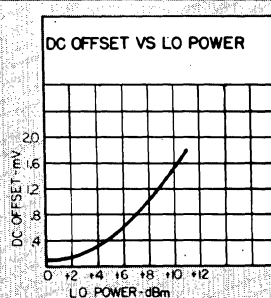
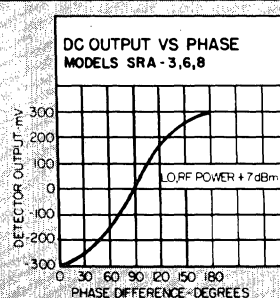
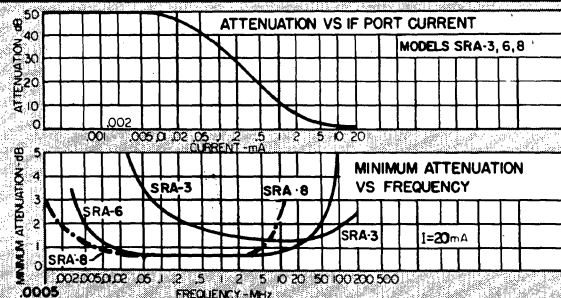
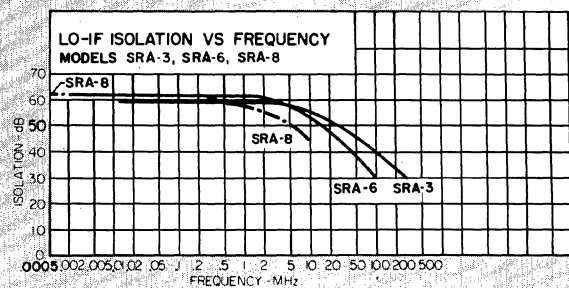
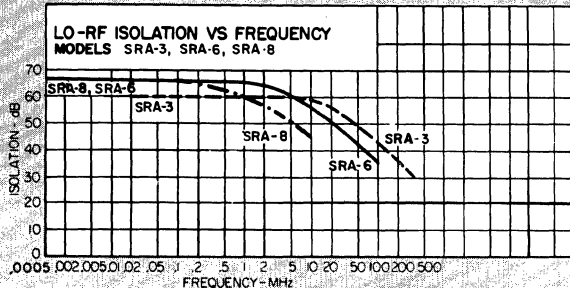
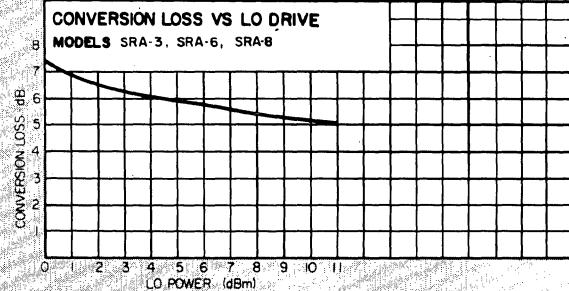
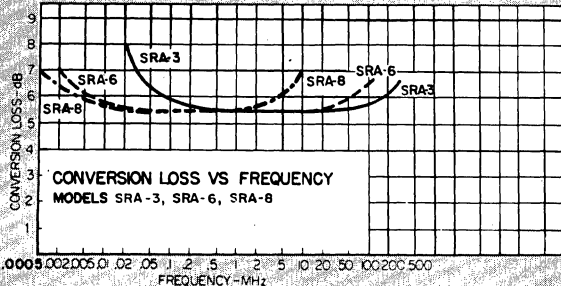
Frequency Range, MHz	LO RF IF	MODEL SRA-3		MODEL SRA-6		MODEL SRA-8	
		025-200	025-200	003-100	003-100	0005-10	0005-10
		DC-200	DC-200	DC-100	DC-100	DC-10	DC-10
Conversion Loss, dB		Typical Maximum		Typical Maximum		Typical Maximum	
One Octave From Band Edge		5.5	7.5	5.5	7.5	6.5	7.5
Total Range		6.5	8.5	6.5	8.5	7.0	8.5
Signal, 1dB Compression Level		+1dBm		+1dBm		+1dBm	
Isolation, dB		Typical Minimum		Typical Minimum		Typical Minimum	
Lower Band Edge to One Decade Higher	LO-RF	60	50	60	50	60	50
	LO-IF	45	35	60	45	60	50
Mid Range	LO-RF	45	35	45	30	50	40
	LO-IF	40	30	40	25	50	40
Upper Band Edge to One Octave Lower	LO-RF	35	25	35	25	45	35
	LO-IF	30	20	30	20	45	35
Impedance, All Ports		50 ohms		50 ohms		50 ohms	
Phase Detection							
DC Offset		1mV typical		1mV typical		1mV typical	
DC Polarity		Negative		Negative		Negative	
Electronic Attenuation							
Minimum Attenuation (20mA)		1.5dB		1.0dB		1.0dB	

SRA Series

SRA-3	025-200 MHz	\$12.95 (6-49)
SRA-6	003-100MHz	\$19.95 (5-24)
SRA-8	0005-10 MHz	\$24.95 (5-24)

FAST DELIVERY
 From stock, one week max.


For connector version see ZAD series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory^{MCL}

INTRODUCTION TO TAK SERIES LOW-PROFILE DOUBLE-BALANCED MIXERS

Standard Level

(+7 dBm LO)

TAK Series

TAK-5	.01- 250 MHz	\$19.95 (1-4)
TAK-6	.5- 600 MHz	\$19.95 (1-4)
TAK-7	2-1000 MHz	\$27.95 (1-4)
TAK-9	5-1250 MHz	\$29.95 (1-4)

FAST DELIVERY
From stock; one week max.



FEATURES

MINIATURE SIZE, .067 CU. INCHES

LOW PROFILE, .21 INCH HEIGHT

BROAD FREQUENCY RANGE
10KHz - 1250MHz

HIGH ISOLATION 40 dB

LOW CONVERSION LOSS 6 dB

HERMETICALLY SEALED METAL CASE

PC BOARD MOUNTING

LOW COST FROM \$24.95
IN SMALL QUANTITIES

DESCRIPTION

Only 0.2 inches high, the low profile TAK series of double balanced mixers cover a very broad frequency range from 10KHz to 1250MHz. Exhibiting a flat conversion loss, these low profile units are designed to operate with a 50 ohm impedance at all ports. Conversion loss is typically 5.5 dB and isolation is typically greater than 40 dB.

Packaged within an RFI shielded metal enclosure and hermetically sealed header, this low profile unit is only .064 cubic inches. Facilitating your design and production efforts, the TAK series has its 8 pins located on a 0.2 inch grid.

Ruggedness and durability are built-in features. Internal components include well matched hot-carrier diodes and extra wideband transmission line transformers. Hermetically sealed, supported with a silicone rubber for vibration and shock requirements, the TAK series operates from -55° C to +100° C under high humidity conditions.

High reliability is characteristic of the TAK series. Each unit carries with it a one year guarantee by Mini-Circuits.

APPLICATIONS

FREQUENCY MIXING

PULSE AND AMPLITUDE MODULATION

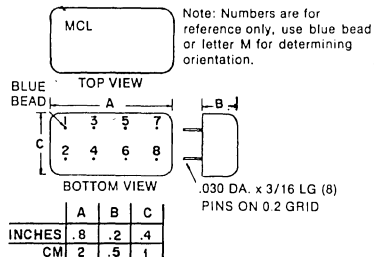
PHASE DETECTION

CURRENT CONTROLLED ATTENUATION

FAST SWITCHING

BI-PHASE MODULATION

LETTER M OVER PIN 2

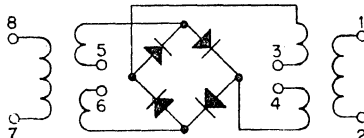


WEIGHT 3.7 grams .13 ounces

PIN CONNECTIONS

	TAK-5	TAK-6	TAK-7	TAK-9
LO	8	8	8	8
RF	1	1	3,4	3,4
IF	3,4	3,4	1	1
Ground	2,5,6,7	2,5,6,7	2,5,6,7	2,5,6,7
Case Ground	2	2	2,5,6,7	2,5,6,7

NOTE: PINS 3 AND 4 MUST BE CONNECTED TOGETHER



ABSOLUTE MAXIMUM RATINGS

Total Input Power	50mW
Total Input, Current Peak	40mA
Operating & Storage Temperature	-55° C to +100° C
Pin Temperature (10 seconds)	510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory, 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

LOW-PROFILE DOUBLE-BALANCED MIXERS

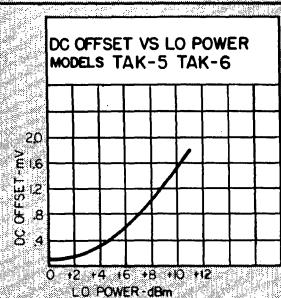
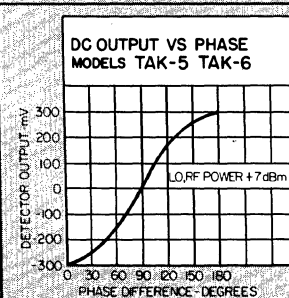
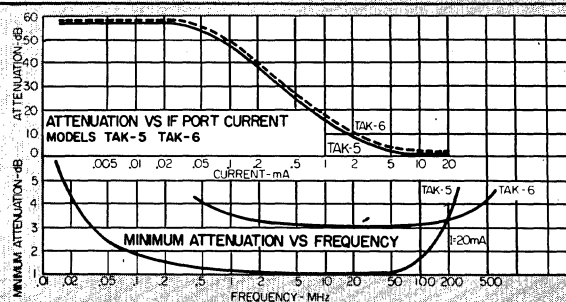
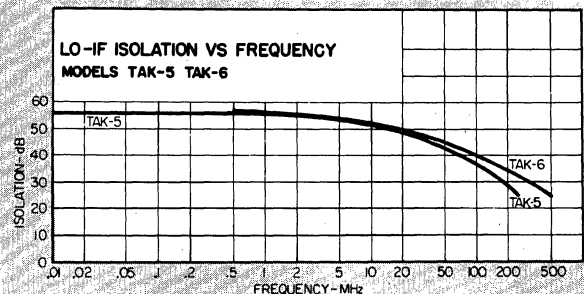
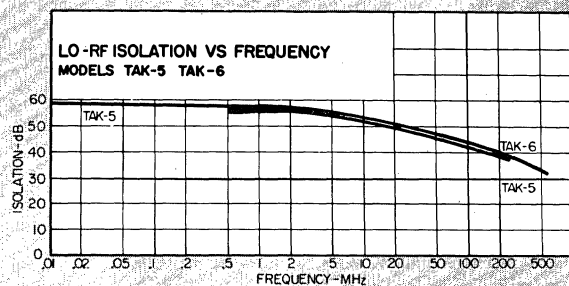
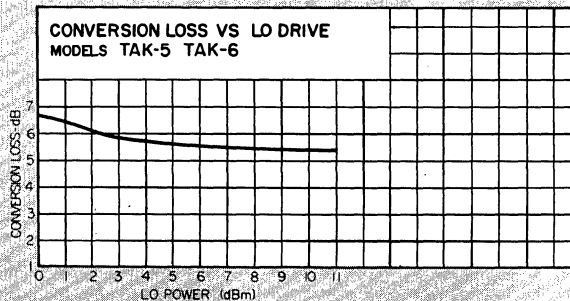
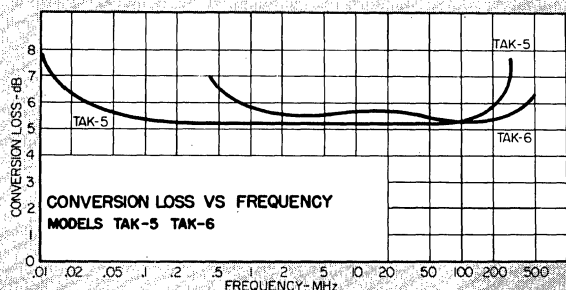
Frequency Range, MHz	MODEL TAK-5		MODEL TAK-6		
	LO	.01-250	0.5-600		
	RF	.01-250	0.5-600		
	IF	DC-250	DC-600		
Conversion Loss, dB	Typical		Maximum	Typical	Maximum
One Octave From Band Edge	5.5		7.0	5.5	7.0
Total Range	6.5		8.5	6.5	8.5
Signal, 1dB Compression Level	+1dB		+1dB		
Isolation, dB	Typical		Minimum	Typical	Minimum
Lower Band Edge to	LO-RF	60	50	60	50
One Decade Higher	LO-IF	55	45	55	45
Mid Range	LO-RF	50	40	50	30
	LO-IF	45	35	45	30
Upper Band Edge to	LO-RF	40	30	40	25
One Octave Lower	LO-IF	35	25	30	20
Impedance, All Ports	50 ohms		50 ohms		
Phase Detection	1mV typical		1mV typical		
DC Offset	Negative		Negative		
DC Polarity	Negative		Negative		
Electronic Attenuation	1.5dB		3.5dB		
Minimum Attenuation (20mA)	1.5dB		3.5dB		

Standard Level
(+7 dBm LO)

TAK Series

TAK-5	.01-250 MHz	\$19.95 (1-4)
TAK-6	.5-600 MHz	\$19.95 (1-4)

FAST DELIVERY
From stock, one week max.



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

See YELLOW SECTION for Local Sales Offices and Key Personnel

sem/1975

LOW-PROFILE DOUBLE-BALANCED MIXERS

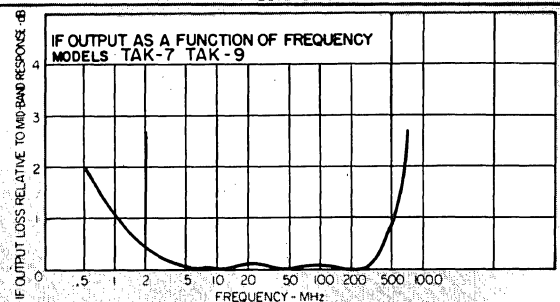
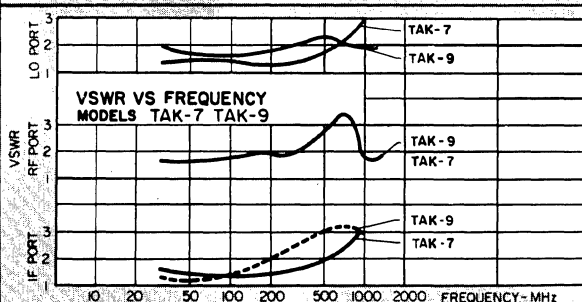
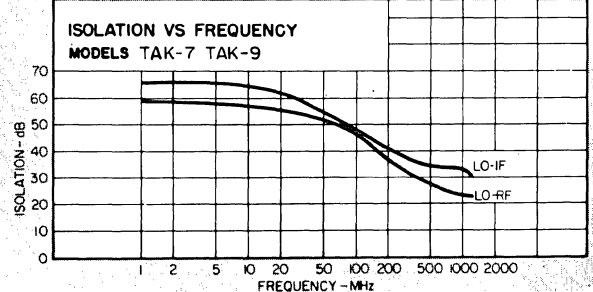
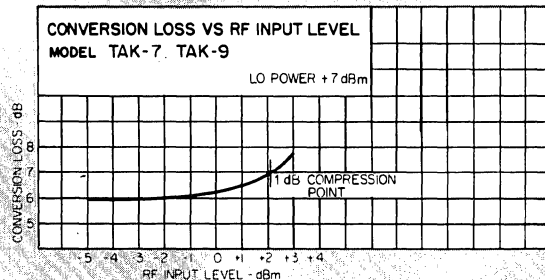
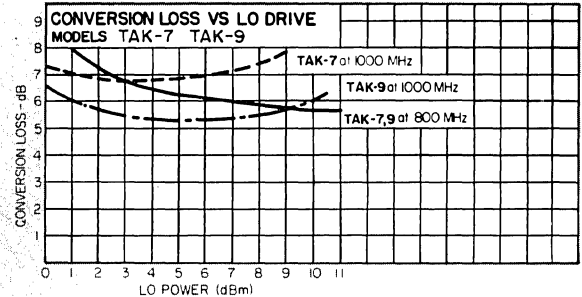
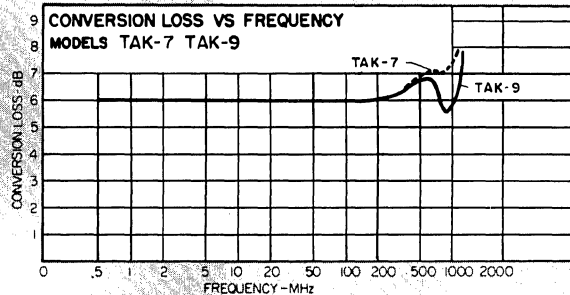
Standard Level
(+7 dBm LO)

TAK Series

TAK-7 2-1000MHz \$27.95 (1-4)
TAK-9 5-1250MHz \$29.95 (1-4)

Frequency Range, MHz	LO RF IF	MODEL TAK-7		MODEL TAK-9	
		2-1000	5-1250	5-1250	5-500
Conversion Loss, dB One Octave From Band Edge		Typical	Maximum	Typical	Maximum
		5.5	7.5	5.5	7.5
Total Range		6.5	8.5	6.5	8.5
Signal, 1dB Compression Level		+1dBm		+1dBm	
		Typical	Minimum	Typical	Minimum
Isolation, dB Lower Band Edge to One Decade Higher	LO-RF	45	30	50	40
	LO-IF	45	30	50	40
Mid Range	LO-RF	35	20	40	20
	LO-IF	35	20	40	20
Upper Band Edge to One Octave Lower	LO-RF	30	20	30	20
	LO-IF	30	20	30	20
Impedance, All Ports		50 ohms		50 ohms	

FAST DELIVERY
From stock, one week max.



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

INTRODUCTION TO TSM SERIES MINIATURE DOUBLE-BALANCED MIXERS

LOW-PROFILE

Standard Level

(+7 dBm LO)

TSM Series

TSM-1 1-500 MHz \$16.95 (5-24)
TSM-3 Q1-400 MHz \$18.95 (5-24)

FAST DELIVERY
From stock, one week max.



FEATURES

MICRO-MINIATURE SIZE, .025 CU. INCHES

LOW PROFILE, .025 INCH HEIGHT

PC BOARD AREA ONLY 0.1 SQ. INCHES

BROAD FREQUENCY RANGE
0.1 - 500MHz

HIGH ISOLATION 40 dB

LOW CONVERSION LOSS 5.5 dB

HERMETICALLY SEALED METAL CASE

PC BOARD MOUNTING

LOW COST FROM \$16.95
IN SMALL QUANTITIES

APPLICATIONS

FREQUENCY MIXING

PULSE AND AMPLITUDE MODULATION

PHASE DETECTION

CURRENT CONTROLLED ATTENUATION

FAST SWITCHING

BI-PHASE MODULATION

DESCRIPTION

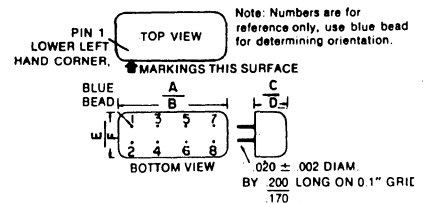
Representing a performance and price breakthrough in micro-miniature low profile double balanced mixers, the TSM series covers the frequency range 100KHz to 500MHz.

Although smaller than mixers presently available, the TSM series offers higher performance of extra wide bandwidth, low conversion loss, and high isolation. These tiny units offer isolation of greater than 55 dB and conversion loss of 5.5 dB! The TSM series performs with a 50 ohm impedance at all ports and has a operating and storage temperature range from -55° C to +100° C.

The TSM units require less PC area than a flat-pack or TO-5 can. For example, consider a 2x2 sq. in. PC board. You can mount 16 standard flat-packs (including room for lead bending), or 23 TO-5 cans (considering the space required for the tab), or 36 Mini-Circuits microminiature TSM's.

Packaged within an EMI shielded metal enclosure and hermetically sealed header (enclosure is 0.5 by 0.2 by 0.25 in.) the TSM series exhibits a typical noise figure of just 1/2 to 1dB greater than its conversion loss. Its pins are oriented on a 0.1 inch grid for printed circuit board mounting. Only well matched hot-carrier diodes and rugged transmission line transformers are used. Internally, silicone rubber is incorporated as an insulator against any wire shorts and to provide protection against shock, and vibration.

High reliability is characteristic of the TSM series. Each unit carries with it a one year warranty by MCL.



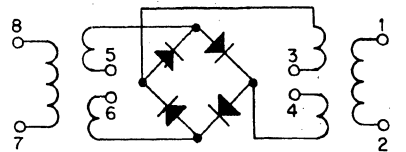
	A	B	C	D	E	F
INCHES	.500	.480	.255	.240	.230	.210
CM	1.27	1.22	.64	.60	.58	.53

WEIGHT 1.8 grams .07 ounces

PIN CONNECTIONS

	TSM-1	TSM-3
LO	8	8
RF	1	1
IF	3,4	3,4
Ground	2,5,6,7	2,5,6,7
Case ground	2	2

NOTE: PINS 3 AND 4 MUST BE CONNECTED TOGETHER



ABSOLUTE MAXIMUM RATINGS

Total Input Power	50mW
Total Input, Current Peak	40mA
Operating & Storage Temperature	-55° C to +100° C
Pin Temperature (10 seconds)	510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MINIATURE DOUBLE-BALANCED MIXERS

Frequency Range, MHz	LO RF IF	MODEL TSM-1		MODEL TSM-3	
		1-500	1-500	.1-400	.1-400
		DC-500	DC-500	DC-400	DC-400
Conversion Loss, dB		Typical Maximum		Typical Maximum	
One Octave From Band Edge		6.0	7.5	5.3	7.0
Total Range		6.5	8.5	6.5	8.0
Signal, 1dB Compression Level		+1dBm		+1dBm	
Isolation, dB		Typical Minimum		Typical Minimum	
Lower Band Edge to One Decade Higher	LO-RF	60	45	60	50
	LO-IF	55	45	55	45
Mid Range	LO-RF	45	35	50	35
	LO-IF	40	30	45	30
Upper Band Edge to One Octave Lower	LO-RF	35	25	35	25
	LO-IF	35	25	35	25
Impedance, All Ports		50 ohms		50 ohms	
Phase Detection		1mV typical		1mV typical	
DC Offset		Negative		Negative	
DC Polarity		Negative		Negative	
Electronic Attenuation		3.5dB		2.5dB	
Minimum Attenuation (20mA)		3.5dB		2.5dB	

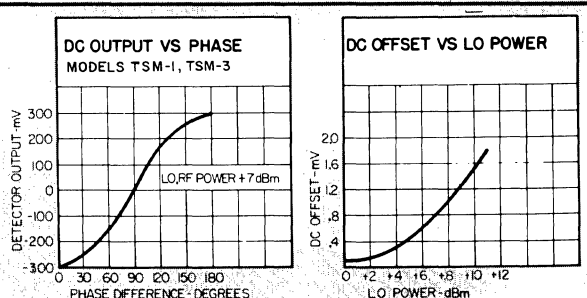
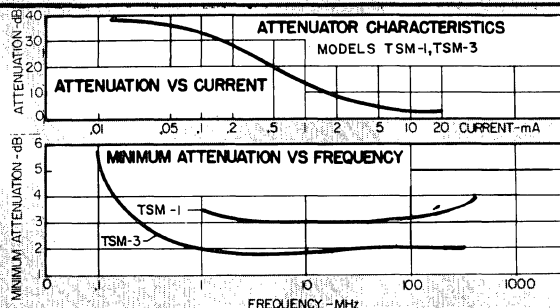
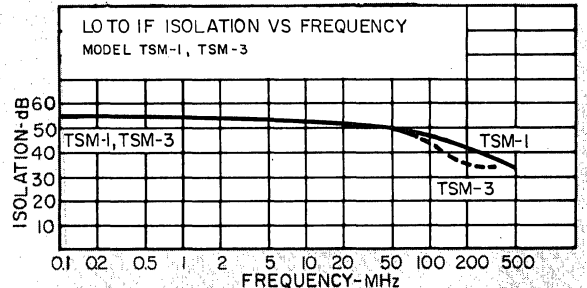
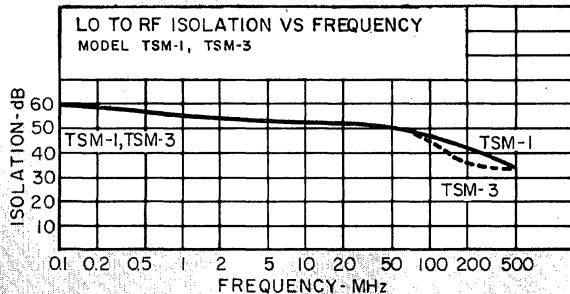
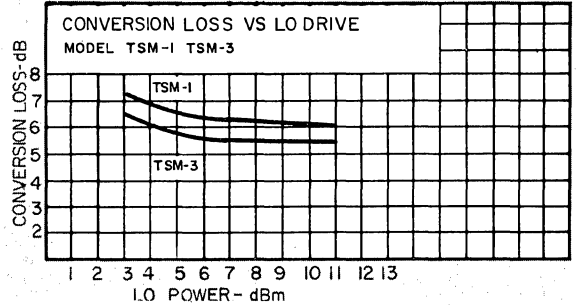
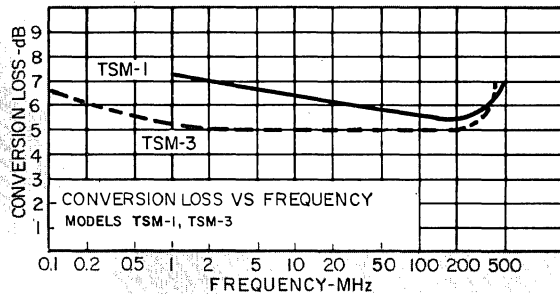
LOW-PROFILE

Standard Level (+7 dBm LO)

TSM Series

TSM-1 1-500 MHz \$16.95 (5-24)
TSM-3 0.1-400 MHz \$18.95 (5-24)

FAST DELIVERY
From stock, one week max.



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

INTRODUCTION TO SAM SERIES MINIATURE DOUBLE-BALANCED MIXERS

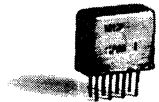
Standard Level

(+7 dBm LO)

SAM Series

SAM-1	1- 600 MHz	\$15.95 (6-24)
SAM-2	1-1000 MHz	\$29.95 (1-24)
SAM-3	1- 500 MHz	\$17.95 (5-24)
SAM-4	5-1250 MHz	\$39.95 (1-9)
SAM-5	5-1500 MHz	\$49.95 (1-9)

FAST DELIVERY
From stock, one week max.



FEATURES

MICRO-MINIATURE SIZE, .04 CU. INCHES

PC BOARD AREA ONLY 0.1 SQ. INCHES

BROAD FREQUENCY RANGE
0.1 - 1500MHz

HIGH ISOLATION 40 dB

LOW CONVERSION LOSS 5.5 dB

HERMETICALLY SEALED METAL CASE

PC BOARD MOUNTING

LOW COST FROM \$15.95
IN SMALL QUANTITIES

APPLICATIONS

FREQUENCY MIXING

PULSE AND AMPLITUDE MODULATION

PHASE DETECTION

CURRENT CONTROLLED ATTENUATION

FAST SWITCHING

BI-PHASE MODULATION

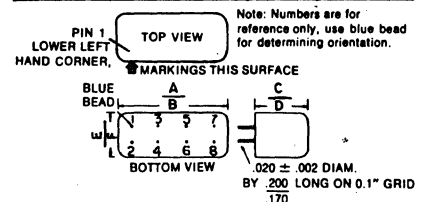
DESCRIPTION

Representing a performance and price breakthrough in micro-miniature double balanced mixers, the SAM series covers the frequency range 100KHz to 1500MHz. Although smaller than mixers presently available, the SAM series offers higher performance of extra wide bandwidth, low conversion loss, and high isolation. These tiny units offer isolation of greater than 55 dB and conversion loss of 5.5 dB. The SAM series performs with a 50 ohm impedance at all ports and has a operating and storage temperature range from -55° C to +100° C.

The SAM units require less PC area than a flat-pack or TO-5 can. For example, consider a 2x2 sq. in. PC board. You can mount 16 standard flat-packs (including room for lead bending), or 23 TO-5 cans (considering the space required for the tab), or 36 Mini-Circuits microminiature SAM's.

Packaged within an EMI shielded metal enclosure and hermetically sealed header (enclosure is 0.5 by 0.2 by 0.4 in.) the SAM series exhibits a typical noise figure of just 1/2 to 1dB greater than its conversion loss. Its pins are oriented on a 0.1 inch grid for printed circuit board mounting. Only well matched hot-carrier diodes and rugged transmission line transformers are used. Internally, silicone rubber is incorporated as an insulator against any wire shorts and to provide protection against shock, and vibration.

High reliability is characteristic of the SAM series. Each unit carries with it a one year warranty by MCL.



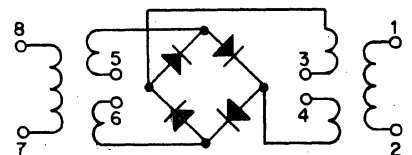
	A	B	C	D	E	F
INCHES	.500	.480	.405	.390	.230	.210
CM	1.27	1.22	1.03	.99	.58	.53

WEIGHT 1.9 grams .07 ounces

PIN CONNECTIONS

	SAM-1 * SAM-2 SAM-3	SAM-5 SAM-4
LO	8	8
RF	1	3,4
IF	3,4	1
Ground	2,5,6,7	2,5,6,7
Case ground	2	*2,5,6,7

NOTE: PINS 3 AND 4 MUST BE CONNECTED TOGETHER



ABSOLUTE MAXIMUM RATINGS

Total Input Power	50mW
Total Input, Current Peak	40mA
Operating & Storage Temperature	-55° C to +100° C
Pin Temperature - (10 seconds)	510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MINIATURE DOUBLE-BALANCED MIXERS

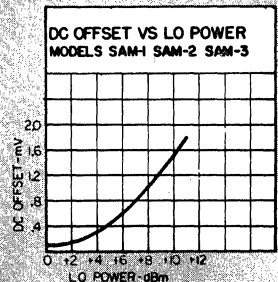
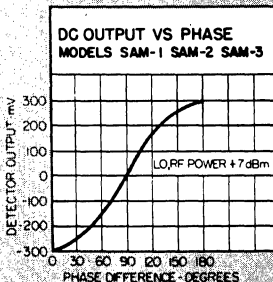
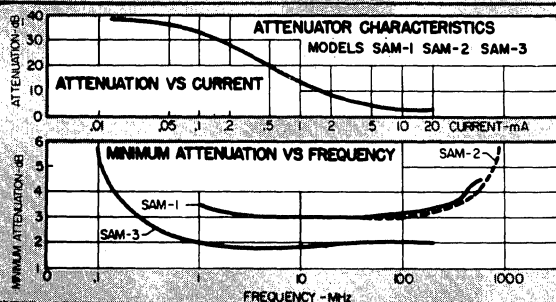
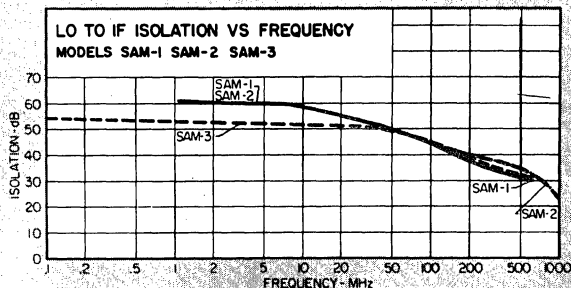
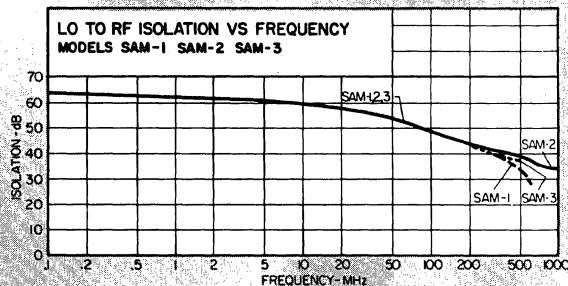
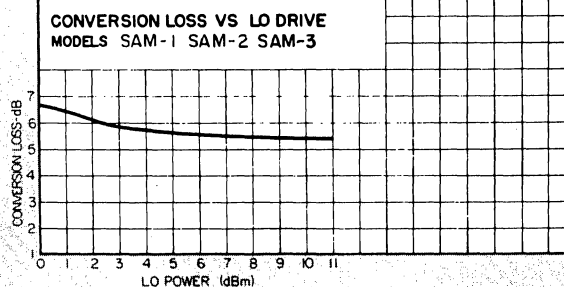
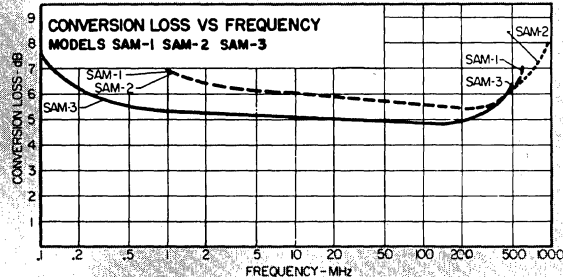
Frequency Range, MHz	LO RF IF	MODEL SAM-1		MODEL SAM-2		MODEL SAM-3	
		1-600	1-600	1-1000	1-1000	.1-500	.1-500
		DC-600	DC-600	DC-1000	DC-1000	DC-500	DC-500
Conversion Loss, dB One Octave From Band Edge		Typical	Maximum	Typical	Maximum	Typical	Maximum
		5.5	7.0	6	7.5	5.5	7.0
Total Range		6.5	8.5	7.0	9.5	6.5	8.5
Signal, 1dB Compression Level		+1dBm		+1dBm		+1dBm	
		Typical	Minimum	Typical	Minimum	Typical	Minimum
Isolation, dB Lower Band Edge to One Decade Higher	LO-RF	55	45	55	45	60	50
	LO-IF	50	40	50	40	50	40
Mid Range	LO-RF	45	30	40	25	50	35
	LO-IF	40	25	40	25	45	30
Upper Band Edge to One Octave Lower	LO-RF	35	20	35	20	35	30
	LO-IF	30	20	30	20	30	20
Impedance, All Ports		50 ohms		50 ohms		50 ohms	
Phase Detection DC Offset DC Polarity		1mV typical Negative		1mV typical Negative		1mV typical Negative	
Electronic Attenuation Minimum Attenuation (20mA)		3.5dB		3.5dB		2.5dB	

Standard Level
(+7 dBm LO)

SAM Series

SAM-1 1-600MHz \$15.95 (6-24)
SAM-2 1-1000MHz \$29.95 (1-24)
SAM-3 .1-500MHz \$17.95 (5-24)

FAST DELIVERY
From stock, one week max.



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500



MINIATURE DOUBLE-BALANCED MIXERS

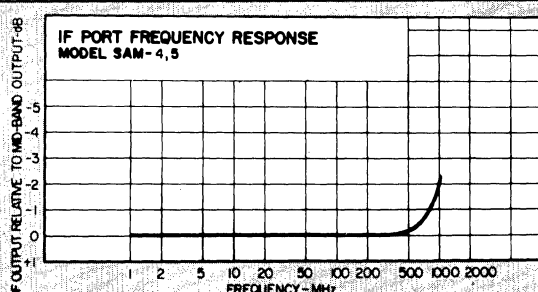
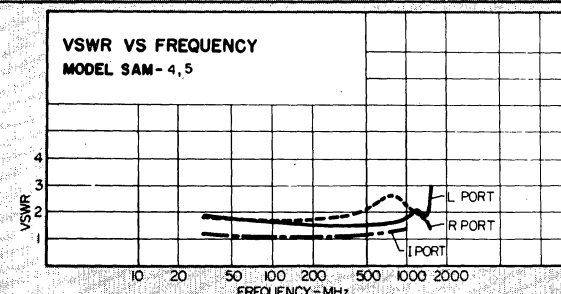
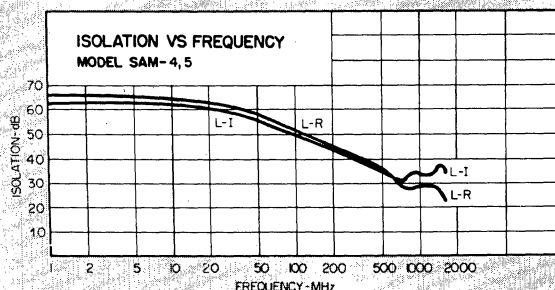
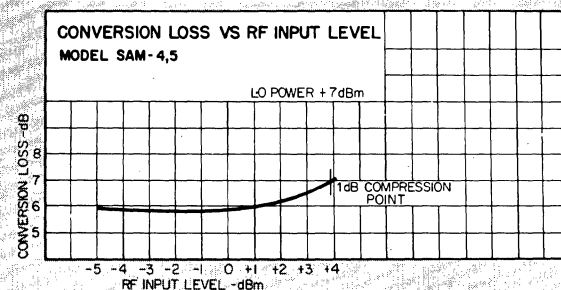
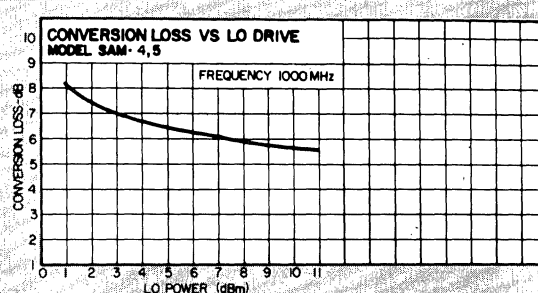
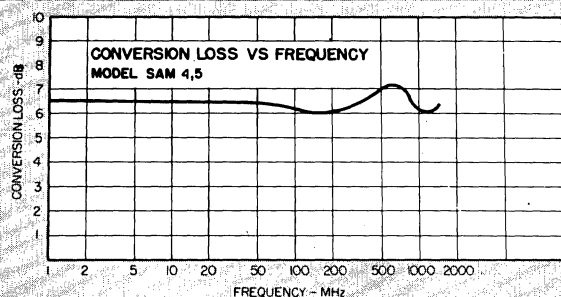
Standard Level
(+7 dBm LO)

SAM Series

SAM-4 5-1250MHz \$39.95 (1-9)
SAM-5 5-1500MHz \$49.95 (1-9)

Frequency Range, MHz	LO	MODEL SAM-4		MODEL SAM-5	
	RF	5-1250		5-1500	
	IF	5-1000		5-1000	
Conversion Loss, dB		Typical	Maximum	Typical	Maximum
One Octave From Band Edge		6.5	8.5	6.5	8.5
Total Range		6.5	8.5	6.5	8.5
Signal, 1dB Compression Level		+1dBm		+1dBm	
Isolation, dB		Typical	Minimum	Typical	Minimum
Lower Band Edge to One Decade Higher	LO-RF	55	40	55	40
	LO-IF	50	40	50	40
Mid Range	LO-RF	35	25	35	25
	LO-IF	35	25	35	25
Upper Band Edge to One Octave Lower	LO-RF	30	20	30	20
	LO-IF	30	20	30	20
Impedance, All Ports		50 ohms		50 ohms	

FAST DELIVERY
From stock, one week max.



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

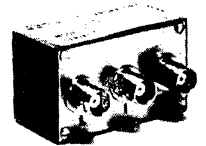
INTRODUCTION TO ZAD SERIES DOUBLE-BALANCED MIXERS

Standard Level (+7 dBm LO)

ZAD Series

ZAD-1	.5- 500 MHz
ZAD-1-1	.1- 500 MHz
ZAD-1W	1- 750 MHz
ZAD-2	1-1000 MHz
ZAD-4	5-1250 MHz
ZAD-3	.025- 200 MHz
ZAD-6	.003- 100 MHz
ZAD-8	.0005- 10 MHz

FAST DELIVERY
From stock, one week max.



For pin version see SRA series

FEATURES

BROAD FREQUENCY RANGE,
500Hz - 1250MHz

HIGH ISOLATION 40 dB

LOW CONVERSION LOSS 6 dB

DIE-CAST ALUMINUM CASE

DOUBLE SHIELDED FOR RFI PROTECTION

LOW COST FROM \$24.95
IN SMALL QUANTITIES

DESCRIPTION

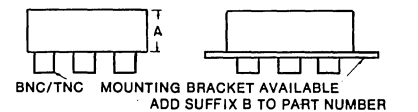
The ZAD series mixers are economically priced while covering the very broad frequency range from 500Hz to 1250MHz. They offer low conversion loss, 6 dB, high isolation 40 dB, and exceptional unit to unit matched performance.

Available with BNC, TNC, or SMA (3 mm) connectors the ZAD series is housed in a die cast aluminum case. These rugged units are double shielded to meet your tough RFI requirements. The case is finished with a blue baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.

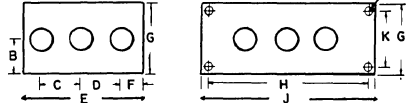
Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability.

Ruggedness and durability are built into the ZAD series. Only well matched hot-carrier diodes and ruggedly constructed transmission line transformers are used. Internally, every component is bonded with silicone rubber to provide protection against shock, vibration, and acceleration.

The exceptional low cost of the ZAD series is attributable to the breakthrough in production techniques achieved during the manufacture of the widely acclaimed Mini-Circuits SRA series of PC board mounting mixers. Utilizing this technology the ZAD series is offered at a remarkable price of 1/2 to 1/3 the cost of competitive units. The ZAD series provides performance, quality, and low cost.



BNC/TNC MOUNTING BRACKET AVAILABLE
ADD SUFFIX B TO PART NUMBER



	A	B	C	D	E	F	G	H	J	K
INCHES	1.15	.63	.750	.730	.225	.385	1.40	.295	.325	1.10
CM	2.9	1.6	1.9	1.85	5.7	9.77	3.55	.749	.825	2.8

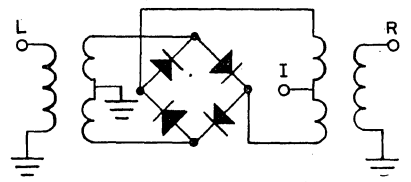
WEIGHT 74.0 grams 2.60 ounces

CONNECTORS

BNC standard
TNC on request
SMA (3mm) on request, add \$10 to unit cost.

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.



ABSOLUTE MAXIMUM RATINGS

Total Input Power	50mW
Total Input, Current Peak	40mA
Operating & Storage Temperature	-55° C to +100° C

APPLICATIONS

FREQUENCY MIXING

PULSE AND AMPLITUDE MODULATION

PHASE DETECTION

CURRENT CONTROLLED ATTENUATION

FAST SWITCHING

BI-PHASE MODULATION

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DOUBLE-BALANCED MIXERS

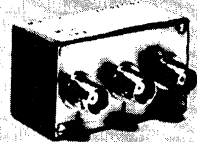
		MODEL ZAD-1	
Frequency Range, MHz	LO	.5-500	
	RF	.5-500	
	IF	DC-500	
Conversion Loss, dB		Typical	Maximum
One Octave From Band Edge		5.5	7.5
Total Range		6.5	8.5
Signal, 1dB Compression Level		+1dBm	
Isolation, dB		Typical	Minimum
Lower Band Edge to One Decade Higher	LO-RF	50	35
	LO-IF	45	30
Mid Range	LO-RF	45	30
	LO-IF	40	25
Upper Band Edge to One Octave Lower	LO-RF	35	25
	LO-IF	30	20
Impedance, All Ports		50 ohms	
Phase Detection			
DC Offset		1mV typical	
DC Polarity		Negative	
Electronic Attenuation			
Minimum Attenuation (20mA)		3dB	

Standard Level
(+7 dBm LO)

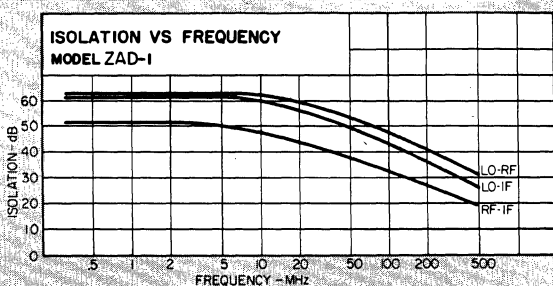
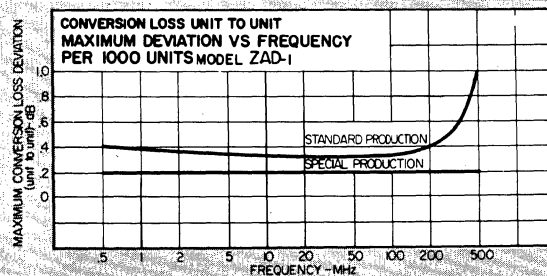
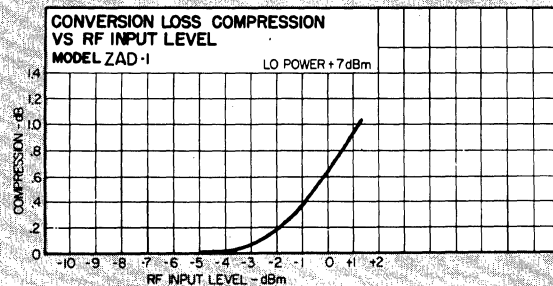
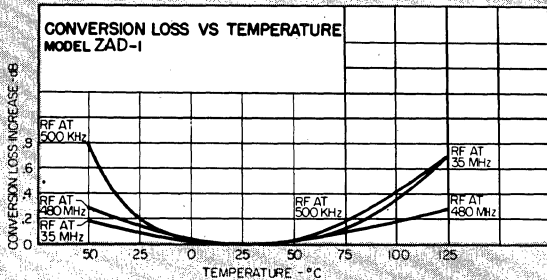
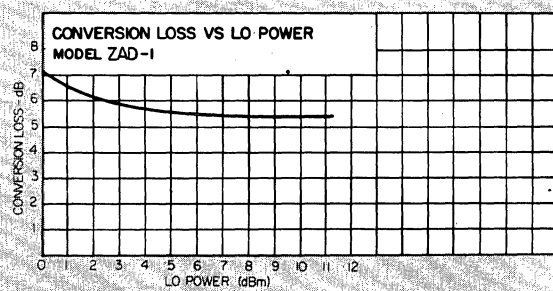
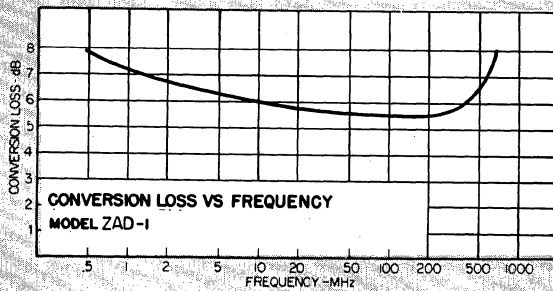
ZAD Series

ZAD-1 5-500MHz \$24.95 (4-24)

FAST DELIVERY
From stock, one week max.

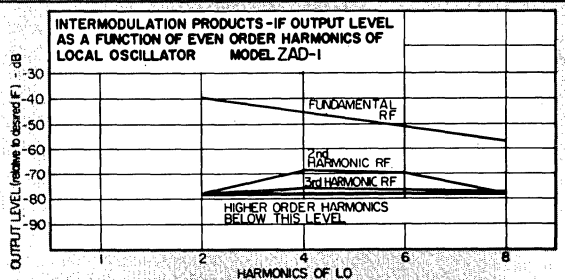
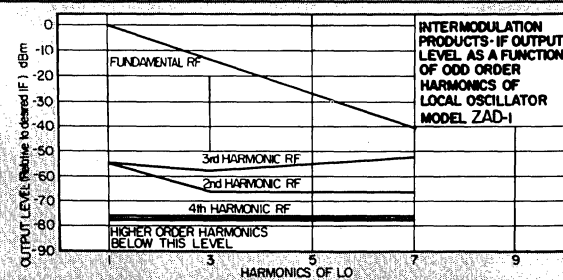
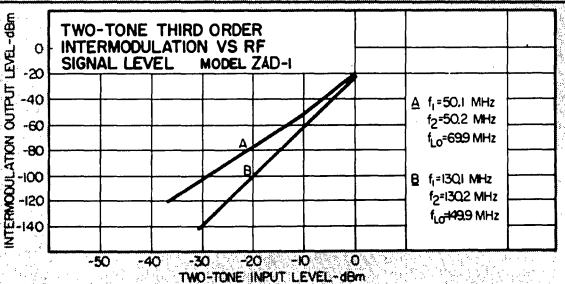
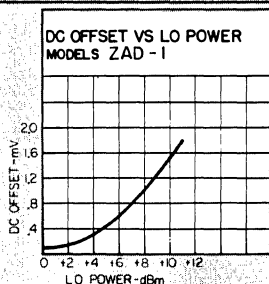
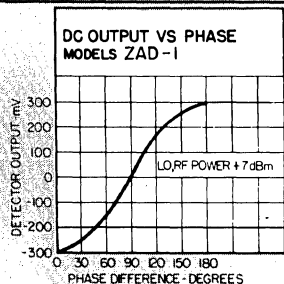
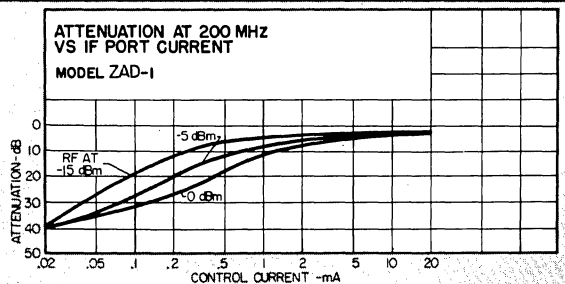
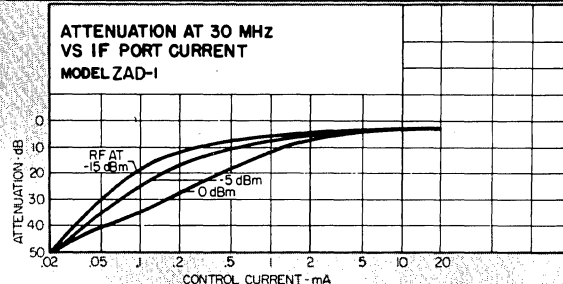
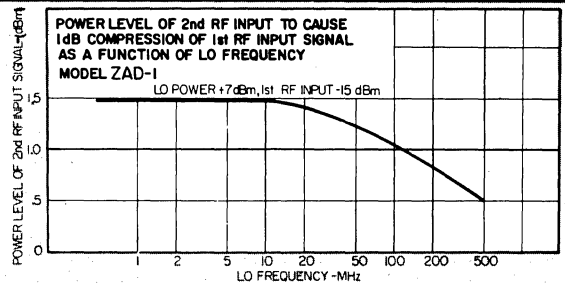
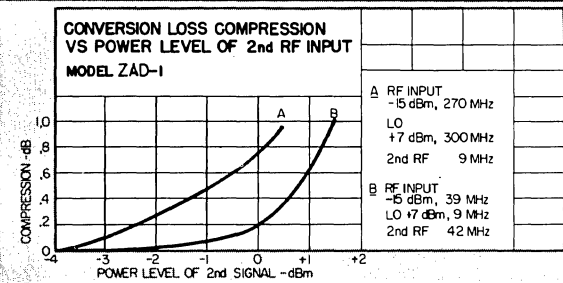
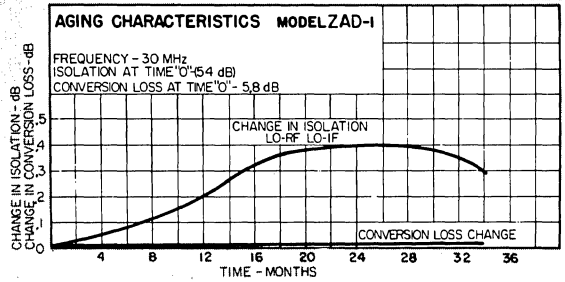
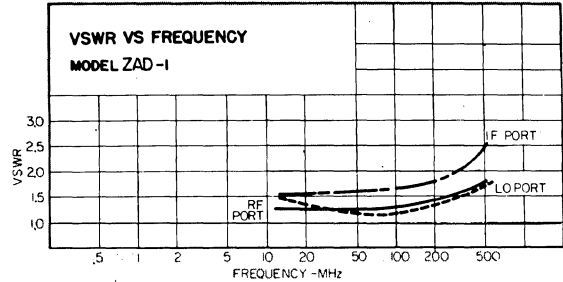
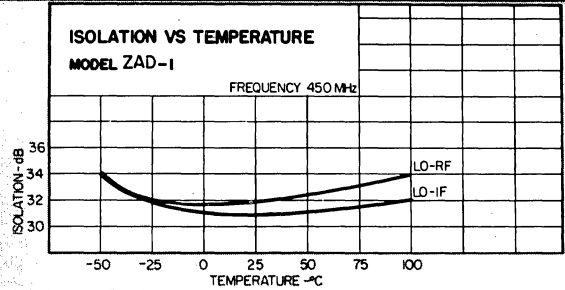
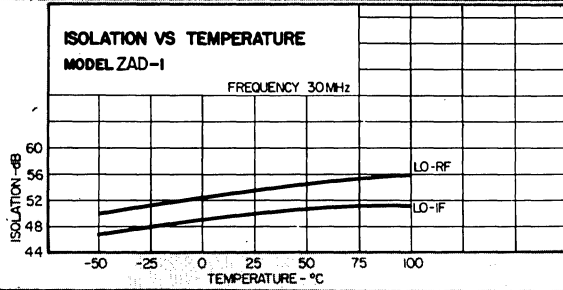


For pin version see SRA series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DOUBLE-BALANCED MIXERS

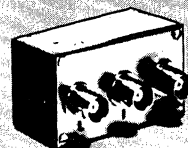
Frequency Range, MHz	LO RF IF	MODEL ZAD-1-I		MODEL ZAD-1W	
		1-500		1-750	
		1-500		1-750	
		DC-500		DC-750	
Conversion Loss, dB		Typical	Maximum	Typical	Maximum
One Octave From Band Edge		5.5	7.5	5.5	7.5
Total Range		6.5	8.5	6.5	8.5
Signal, 1dB Compression Level		+1dBm		+1dBm	
Isolation, dB		Typical	Minimum	Typical	Minimum
Lower Band Edge to One Decade Higher	LO-RF	50	45	50	45
	LO-IF	45	30	45	30
Mid Range	LO-RF	45	30	45	30
	LO-IF	40	25	40	25
Upper Band Edge to One Octave Lower	LO-RF	35	25	35	25
	LO-IF	30	20	30	20
Impedance, All Ports		50 ohms		50 ohms	
Phase Detection					
DC Offset		1mV typical		1mV typical	
DC Polarity		Negative		Negative	
Electronic Attenuation					
Minimum Attenuation (20mA)		2.5 dB		3.5dB	

Standard Level
(+7 dBm LO)

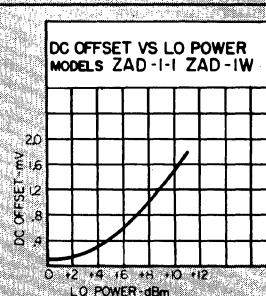
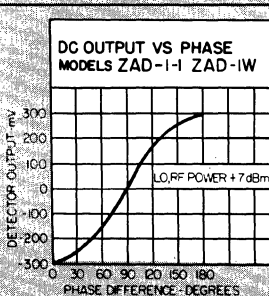
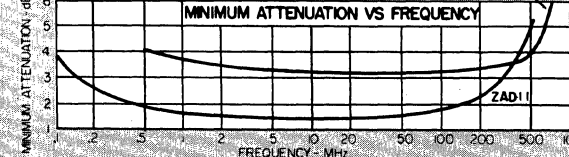
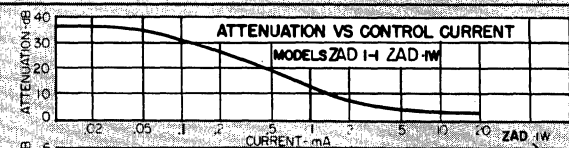
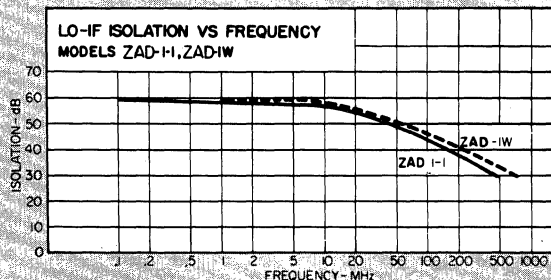
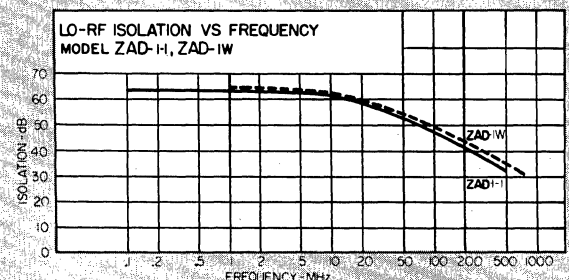
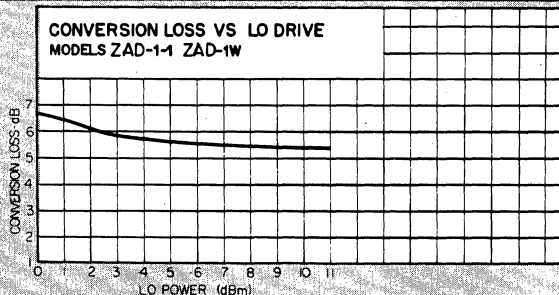
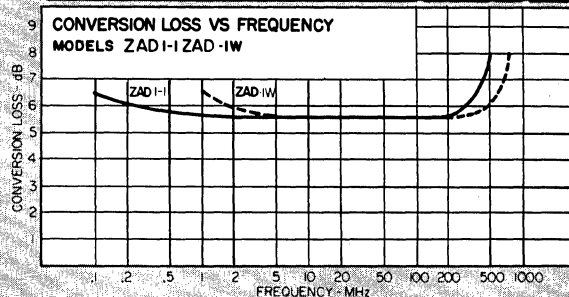
ZAD Series

ZAD-1-I	1-500MHz	\$26.95 (4-24)
ZAD-1-W	1-750MHz	\$29.95 (4-24)

FAST DELIVERY
From stock, one week max.



For pin version see SRA series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DOUBLE-BALANCED MIXERS

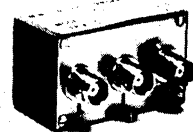
Standard Level
(+7 dBm LO)

ZAD Series

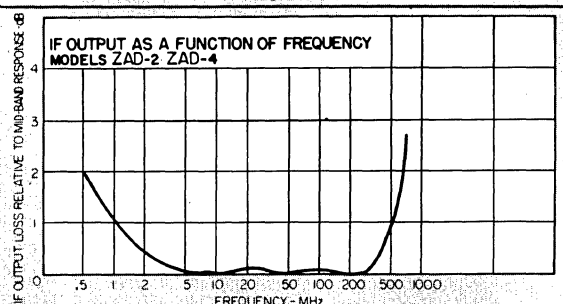
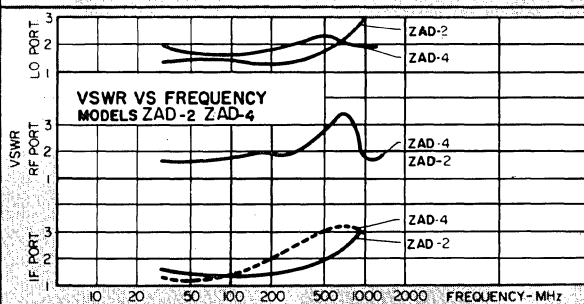
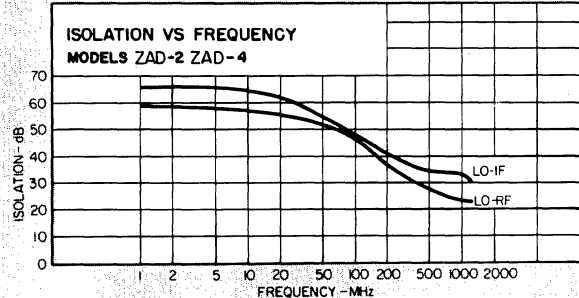
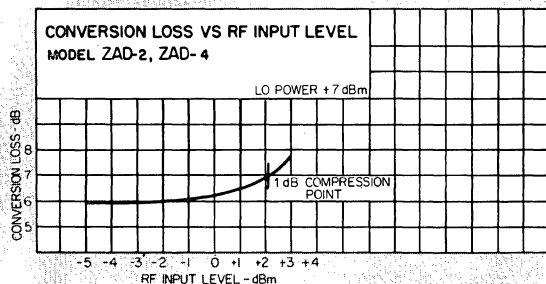
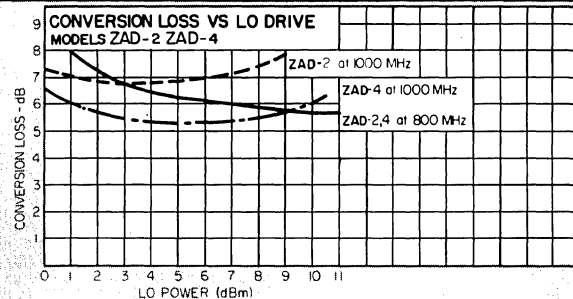
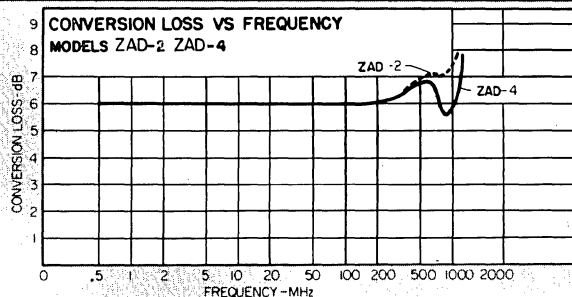
ZAD-2 1-1000MHz \$34.95 (4-24)
ZAD-4 5-1250MHz \$36.95 (4-24)

Frequency Range, MHz	LO RF IF	MODEL ZAD-2		MODEL ZAD-4	
		1-1000	1-1000	5-1250	5-1250
Conversion Loss, dB One Octave From Band Edge		Typical	Maximum	Typical	Maximum
		5.5	7.5	5.5	7.5
Total Range		6.5	8.5	6.5	8.5
Signal, 1dB Compression Level		+1dBm		+1dBm	
Isolation, dB Lower Band Edge to One Decade Higher	LO-RF LO-IF	Typical	Minimum	Typical	Minimum
		45	30	50	40
Mid Range	LO-RF LO-IF	35	20	40	20
		35	20	40	20
Upper Band Edge to One Decade Lower	LO-RF LO-IF	30	20	30	20
		30	20	30	20
Impedance, All Ports		50 ohms		50 ohms	

FAST DELIVERY
From stock, one week max.



For pin version see SRA series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DOUBLE-BALANCED MIXERS

Frequency Range, MHz	LO RF IF	MODEL ZAD-3		MODEL ZAD-6		MODEL ZAD-8	
		.025-200	.025-200	.003-100	.003-100	.0005-10	.0005-10
		DC-200	DC-200	DC-100	DC-100	DC-10	DC-10
Conversion Loss, dB		Typical Maximum		Typical Maximum		Typical Maximum	
One Octave From Band Edge		5.5	7.5	5.5	7.5	6.5	7.5
Total Range		6.5	8.5	6.5	8.5	7.0	8.5
Signal, 1dB Compression Level		+1dBm		+1dBm		+1dBm	
Isolation, dB		Typical Minimum		Typical Minimum		Typical Minimum	
Lower Band Edge to One Decade Higher	LO-RF	60	50	60	50	60	50
	LO-IF	45	35	60	45	60	50
Mid Range	LO-RF	45	35	45	30	50	40
	LO-IF	40	30	40	25	50	40
Upper Band Edge to One Octave Lower	LO-RF	35	25	35	25	45	35
	LO-IF	30	20	30	20	45	35
Impedance, All Ports		50 ohms		50 ohms		50 ohms	
Phase Detection		1mV typical		1mV typical		1mV typical	
DC Offset		Negative		Negative		Negative	
DC Polarity							
Electronic Attenuation		1.5dB		1.0dB		1.0dB	
Minimum Attenuation (20mA)							

Standard Level
(+7 dBm LO)

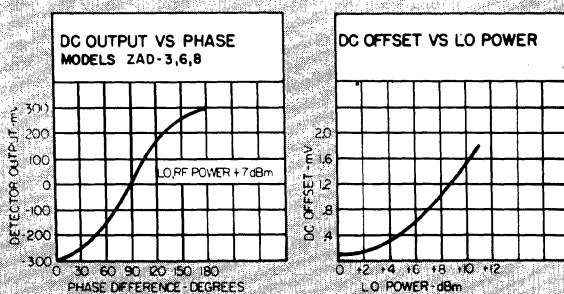
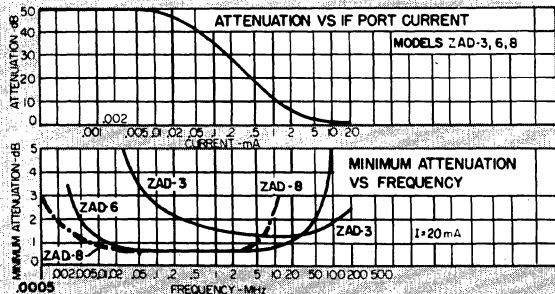
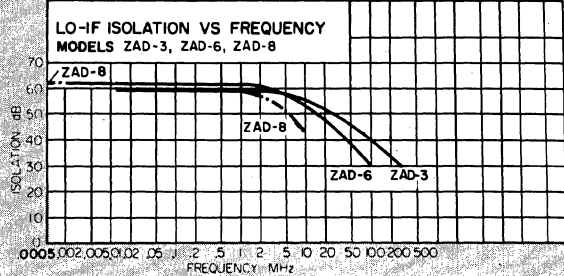
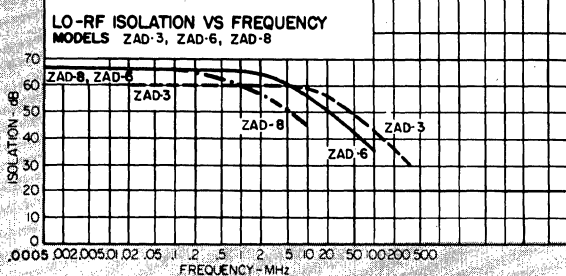
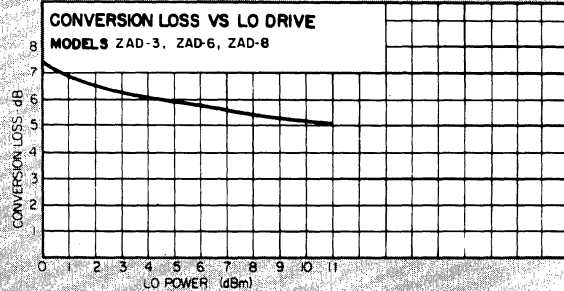
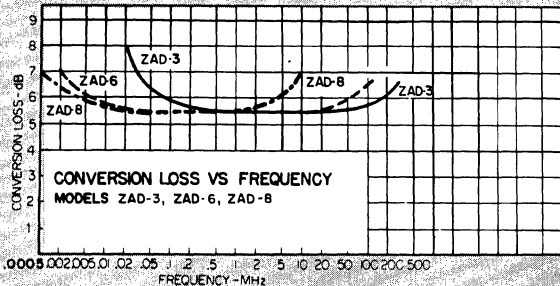
ZAD Series

ZAD-3	.025-200MHz	\$26.95 (4-24)
ZAD-6	.003-100MHz	\$34.95 (4-24)
ZAD-8	.0005-10 MHz	\$39.95 (4-24)

FAST DELIVERY
From stock, one week max



For pin version see SRA series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

 Mini-Circuits Laboratory

INTRODUCTION TO ZLW SERIES MINIATURE DOUBLE-BALANCED MIXERS

Standard Level (+7 dBm LO)

ZLW Series

ZLW-1	.5- 500 MHz	\$34.95 (4-24)
ZLW-1-1	.1- 500 MHz	\$36.95 (4-24)
ZLW-1W	1- 750 MHz	\$39.95 (4-24)
ZLW-2	1-1000 MHz	\$39.95 (1-24)
ZLW-3	.025- 200 MHz	\$36.95 (4-24)
ZLW-5	5-1500 MHz	\$74.95 (1-9)
ZLW-6	.003- 100 MHz	\$44.95 (4-24)
ZLW-8	.0005- 10 MHz	\$49.95 (4-24)

FAST DELIVERY
From stock; one week max.



For pin version see SRA series

FEATURES

BROAD FREQUENCY RANGE,
500Hz-1500 MHz

HIGH ISOLATION 40 dB

LOW CONVERSION LOSS 6 dB

DIE-CAST ALUMINUM CASE

DOUBLE SHIELDED FOR RFI PROTECTION

LOW COST FROM \$34.95
IN SMALL QUANTITIES

DESCRIPTION

The ZLW series mixers are economically priced while covering the very broad frequency range from 500Hz to 1500MHz. They offer low conversion loss, 6 dB, high isolation 40 dB, and exceptional unit to unit matched performance.

Available with SMA (3 mm) connectors the ZLW series is housed in a die cast aluminum case. These rugged units are double shielded to meet your tough RFI requirements. The case is finished with a blue baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability.

Ruggedness and durability are built into the ZLW series. Only well matched hot-carrier diodes and ruggedly constructed transmission line transformers are used. Internally, every component is bonded with silicone rubber to provide protection against shock, vibration, and acceleration.

The exceptional low cost of the ZLW series is attributable to the breakthrough in production techniques achieved during the manufacture of the widely acclaimed Mini-Circuits SRA series of PC board mounting mixers. Utilizing this technology the ZLW series is offered at a remarkable price of 1/2 to 1/3 the cost of competitive units. The ZLW series provides performance, quality, and low cost.

APPLICATIONS

FREQUENCY MIXING

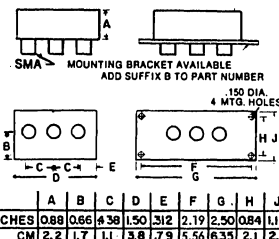
PULSE AND AMPLITUDE MODULATION

PHASE DETECTION

CURRENT CONTROLLED ATTENUATION

FAST SWITCHING

BI-PHASE MODULATION



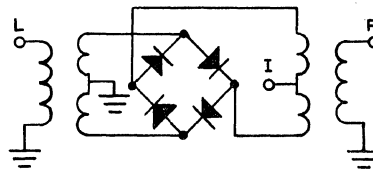
WEIGHT 34 grams 1.02 ounces

CONNECTORS

SMA (3mm) standard

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.



ABSOLUTE MAXIMUM RATINGS

Total Input Power	50mW
Total Input, Current Peak	40mA
Operating & Storage Temperature	-55° C to +100° C

World's largest supplier of double balanced mixers
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MINIATURE DOUBLE-BALANCED MIXERS

Frequency Range, MHz		MODEL ZLW-1	
LO		.5-500	
RF		.5-500	
IF		DC-500	
Conversion Loss, dB		Typical	Maximum
One Octave from Band Edge		5.5	7.5
Total Range		6.5	8.0
Signal, 1dB Compression Level		+1dBm	
Isolation, dB		Typical	Minimum
Lower Band Edge to One Decade Higher		LO-RF 50	35
		LO-IF 45	30
Mid Range		LO-RF 45	30
		LO-IF 40	25
Upper Band Edge to One Octave Lower		LO-RF 35	25
		LO-IF 30	20
Impedance, All Ports		50 ohms	
Phase Detection			
DC Offset		1mV typical	
DC Polarity		Negative	
Electronic Attenuation			
Minimum Attenuation (20mA)		3dB	

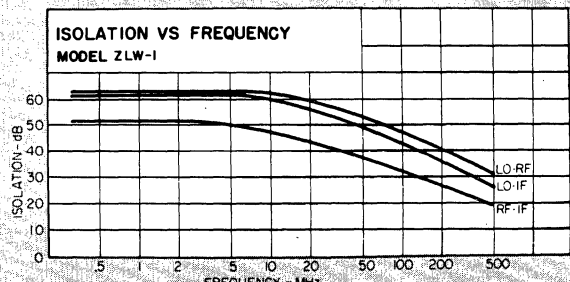
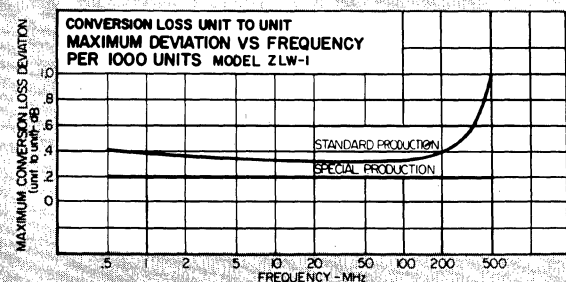
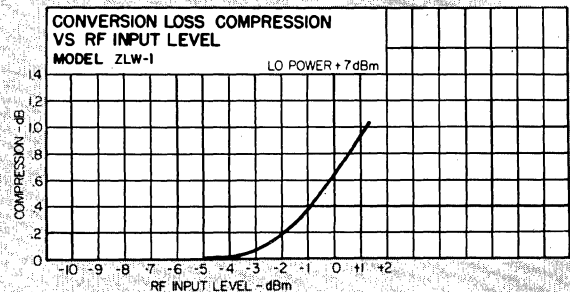
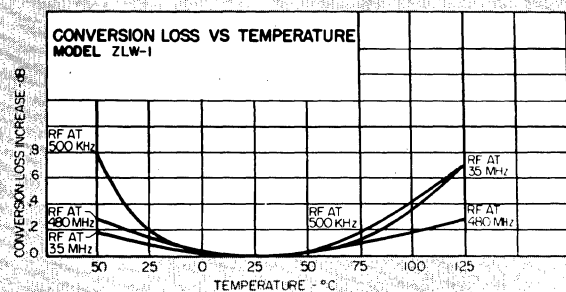
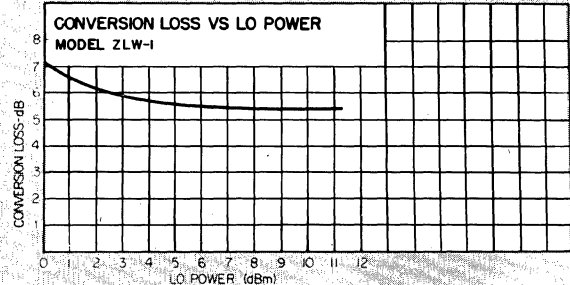
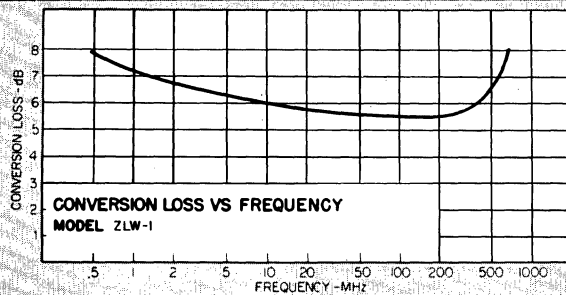
Standard Level
(+7 dBm LO)

ZLW Series
ZLW-1 .5-500MHz \$34.95(4-24)

FAST DELIVERY
From stock, one week max.



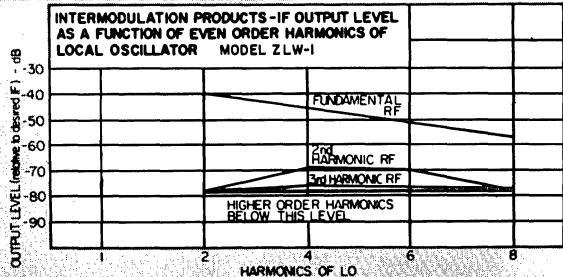
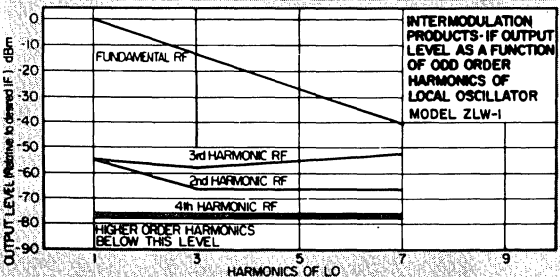
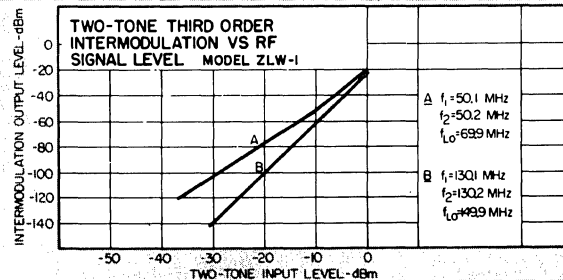
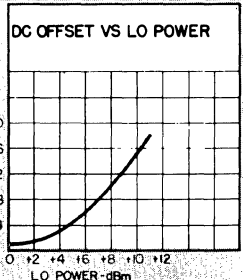
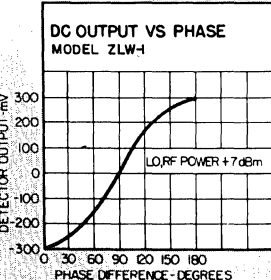
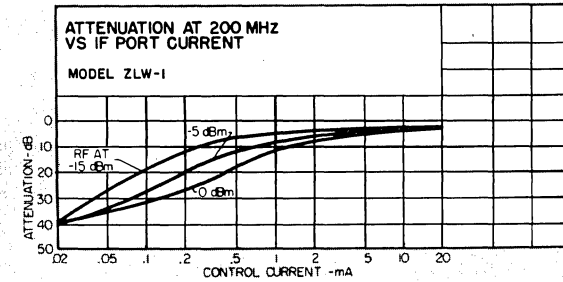
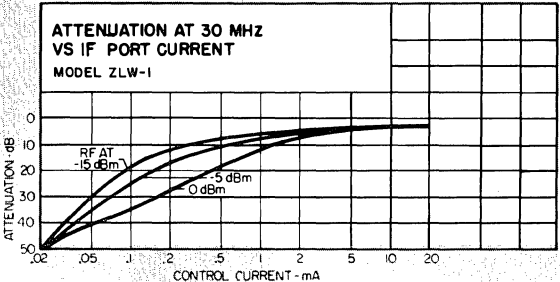
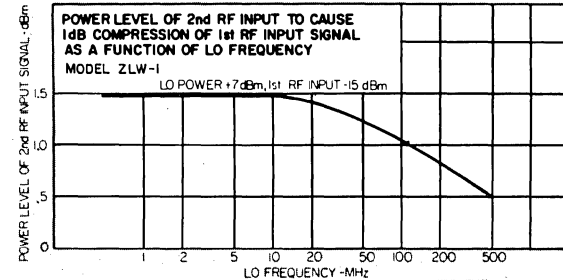
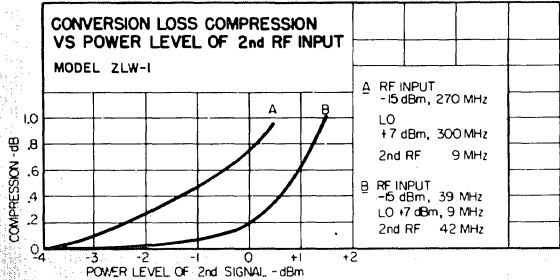
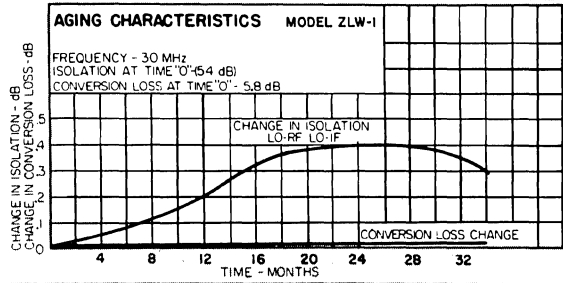
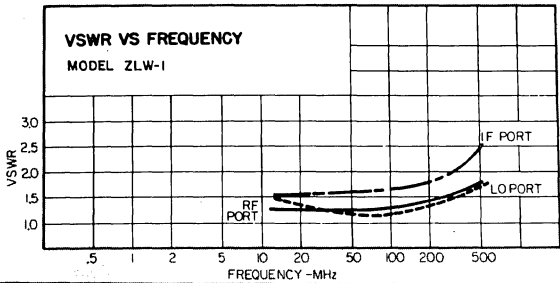
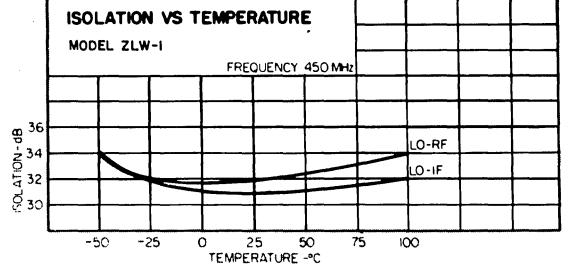
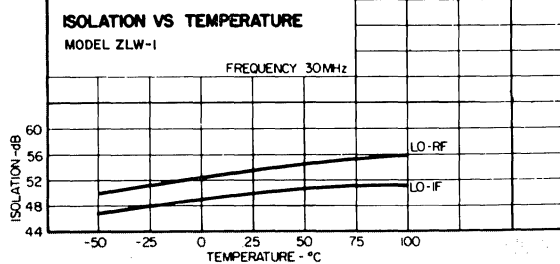
For pin version see SRA series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MINIATURE DOUBLE-BALANCED MIXERS

Frequency Range, MHz	LO RF IF	MODEL ZLW-I-I		MODEL ZLW-I-W	
		1-500 1-500 DC-500		1-750 1-750 DC-750	
Conversion Loss, dB One Octave From Band Edge		Typical	Maximum	Typical	Maximum
		5.5	7.5	5.5	7.5
Total Range		6.5	8.5	6.5	8.5
Signal, 1dB Compression Level		+1dBm		+1dBm	
Isolation, dB Lower Band Edge to One Decade Higher	LO-RF LO-IF	Typical	Minimum	Typical	Minimum
		50 45	45 30	50 45	45 30
Mid Range	LO-RF LO-IF	45 40	30 25	45 40	30 25
Upper Band Edge to One Octave Lower	LO-RF LO-IF	35 30	25 20	35 30	25 20
Impedance, All Ports		50 ohms		50 ohms	
Phase Detection DC Offset DC Polarity		1mV typical Negative		1mV typical Negative	
Electronic Attenuation Minimum Attenuation (20mA)		2dB		3.5dB	

Standard Level
(+7 dBm LO)

ZLW Series

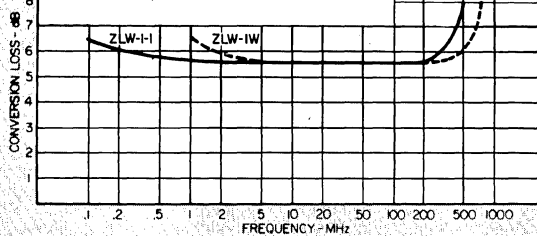
ZLW-I-I 1-500MHz \$36.95 (4-24)
ZLW-I-W 1-750MHz \$39.95 (4-24)

FAST DELIVERY
From stock, one week max.

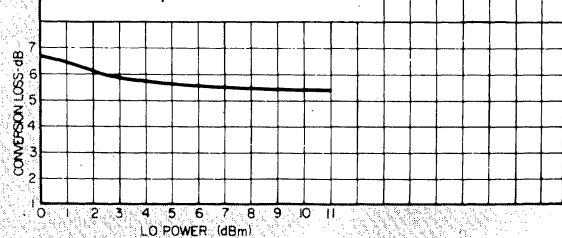


For pin version see SRA series

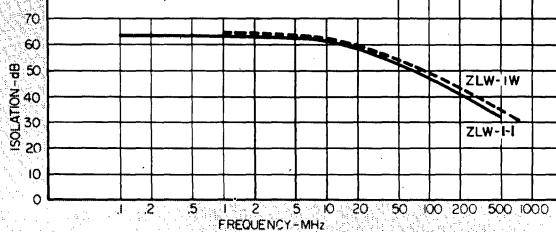
CONVERSION LOSS VS FREQUENCY
MODEL ZLW-I-I, ZLW-I-W



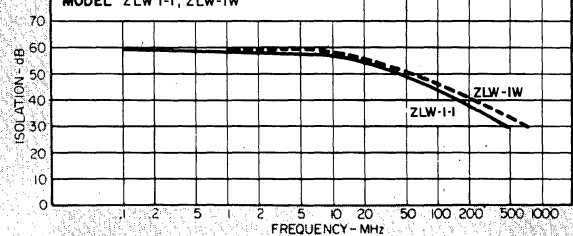
CONVERSION LOSS VS LO DRIVE
MODEL ZLW-I-I, ZLW-I-W



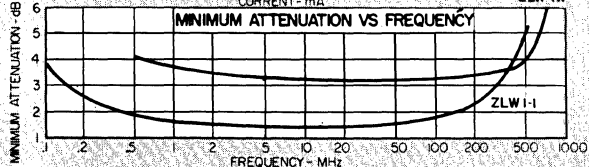
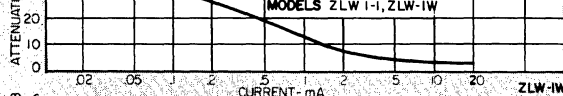
LO-RF ISOLATION VS FREQUENCY
MODEL ZLW-I-I, ZLW-I-W



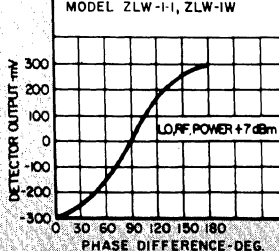
LO-IF ISOLATION VS FREQUENCY
MODEL ZLW-I-I, ZLW-I-W



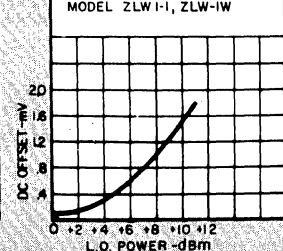
ATTENUATION VS CONTROL CURRENT
MODELS ZLW-I-I, ZLW-I-W



DC OUTPUT VS PHASE
MODEL ZLW-I-I, ZLW-I-W



DC OFFSET VS LO POWER
MODEL ZLW-I-I, ZLW-I-W



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

See YELLOW SECTION for Local Sales Offices and Key Personnel

eem/1975

MINIATURE DOUBLE-BALANCED MIXERS

Frequency Range, MHz	LO RF IF	MODEL ZLW-3		MODEL ZLW-6		MODEL ZLW-8	
		.025-200	.025-200	.003-100	.003-100	.0005-10	.0005-10
		DC-200	DC-200	DC-100	DC-100	DC-10	DC-10
Conversion Loss, dB		Typical	Maximum	Typical	Maximum	Typical	Maximum
One Octave From Band Edge		5.5	7.5	5.5	7.5	6.5	7.5
Total Range		6.5	8.5	6.5	8.5	7.0	8.5
Signal, 1dB Compression Level		+1dBm		+1dBm		+1dBm	
Isolation, dB		Typical	Minimum	Typical	Minimum	Typical	Minimum
Lower Band Edge to One Decade Higher	LO-RF	60	50	60	50	60	50
	LO-IF	45	35	60	45	60	50
Mid Range	LO-RF	45	35	45	30	50	40
	LO-IF	40	30	40	25	50	40
Upper Band Edge to One Octave Lower	LO-RF	35	25	35	25	45	35
	LO-IF	30	20	30	20	45	35
Impedance, All Ports		50 ohms		50 ohms		50 ohms	
Phase Detection							
DC Offset		1mV typical		1mV typical		1mV typical	
DC Polarity		Negative		Negative		Negative	
Electronic Attenuation							
Minimum Attenuation (20mA)		1.5dB		1.0dB		1.0dB	

Standard Level
(+7 dBm LO)

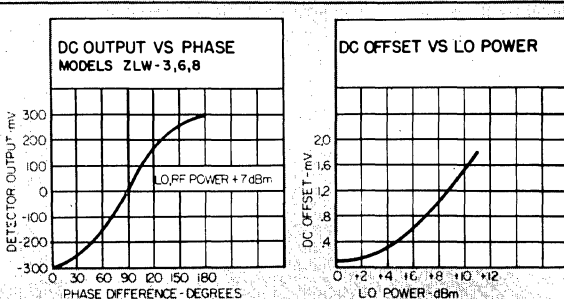
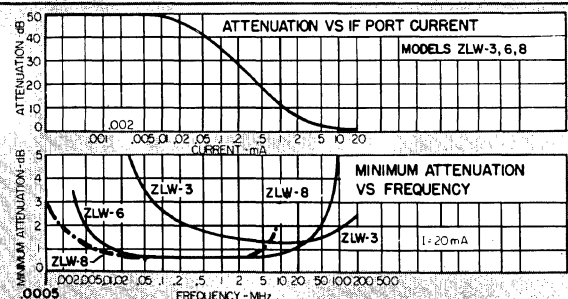
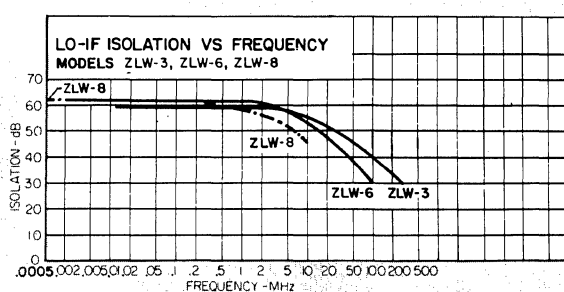
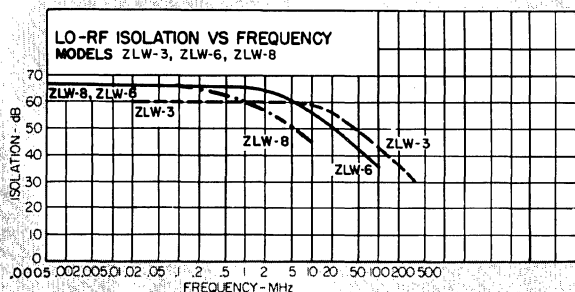
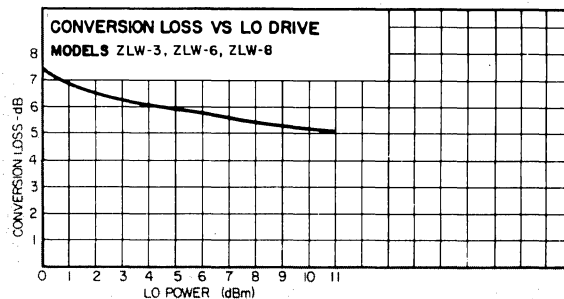
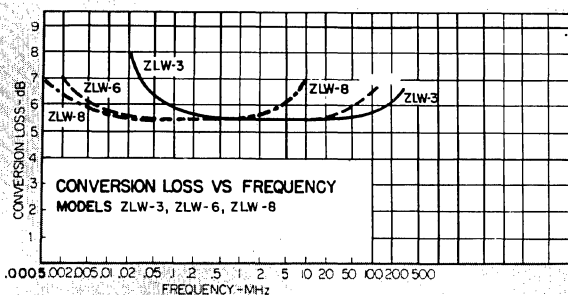
ZLW Series

ZLW-3	.025-200 MHz	\$36.95 (4-24)
ZLW-6	.003-100MHz	\$44.95 (4-24)
ZLW-8	.0005-10 MHz	\$49.95 (4-24)

FAST DELIVERY
From stock, one week max



For pin version see SRA series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MINIATURE DOUBLE-BALANCED MIXERS

Frequency Range, MHz	LO	MODEL ZLW-2	
	RF	1-1000	
	IF	1-1000	
	IF	DC-1000	
Conversion Loss, dB One Octave From Band Edge	Typical		Maximum
	6		7.5
	7.0		9.5
Total Range	7.0		9.5
Signal, 1dB Compression Level	+1dBm		
Isolation, dB Lower Band Edge to One Decade Higher	Typical		Minimum
	LO-RF	55	45
	LO-IF	50	40
	Mid Range	40	25
Upper Band Edge to One Octave Lower	LO-RF	35	20
	LO-IF	30	20
Impedance, All Ports	50 ohms		
Phase Detection			
DC Offset	1mV typical		
DC Polarity	Negative		
Electronic Attenuation			
Minimum Attenuation (20mA)	3.5dB		

Standard Level
(+7 dBm LO)

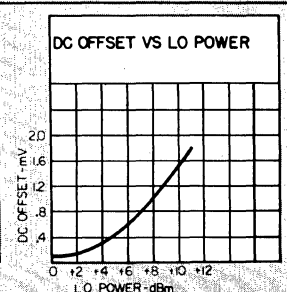
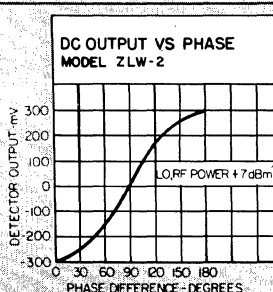
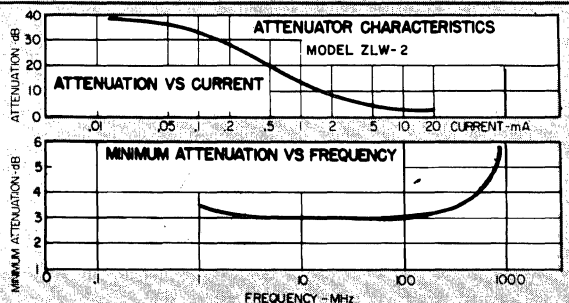
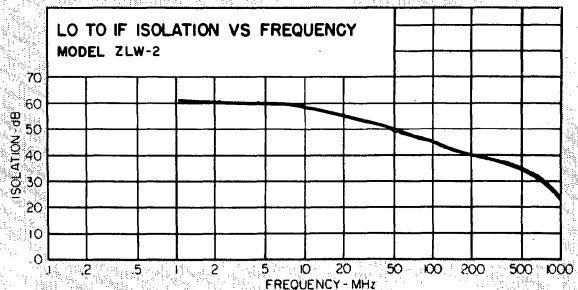
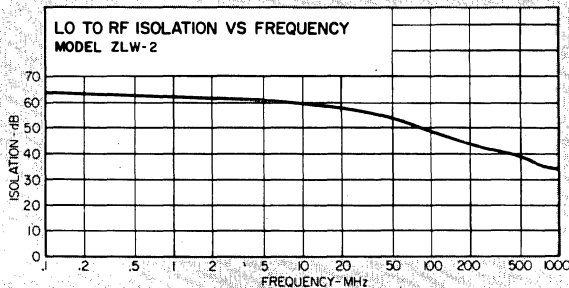
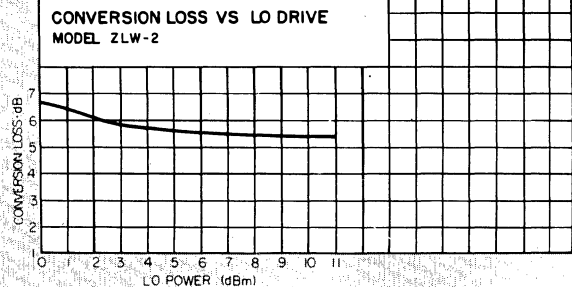
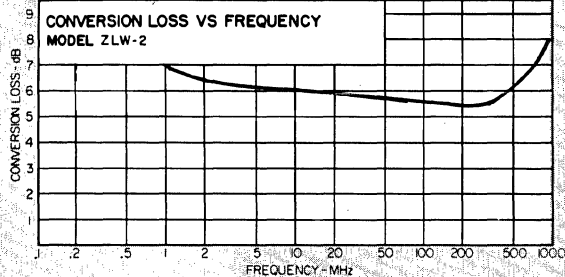
ZLW Series

ZLW-2 1-1000MHz \$39.95 (1-24)

FAST DELIVERY
From stock, one week max



For pin version see SAM series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MINIATURE DOUBLE-BALANCED MIXERS

Standard Level
(+7 dBm LO)

ZLW Series

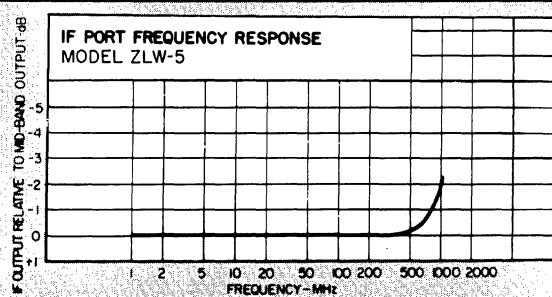
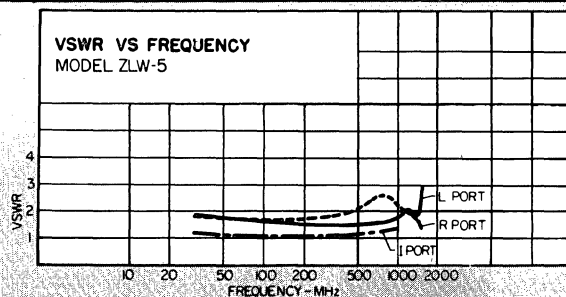
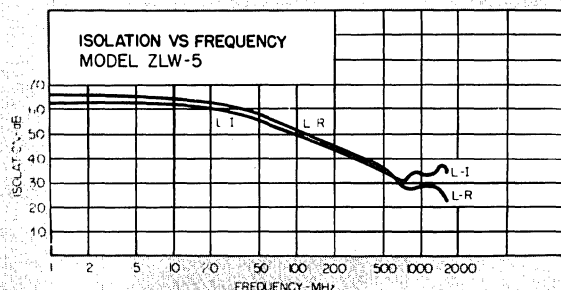
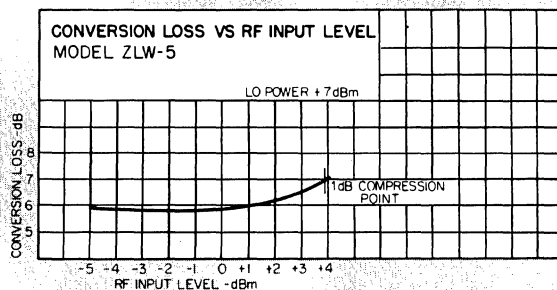
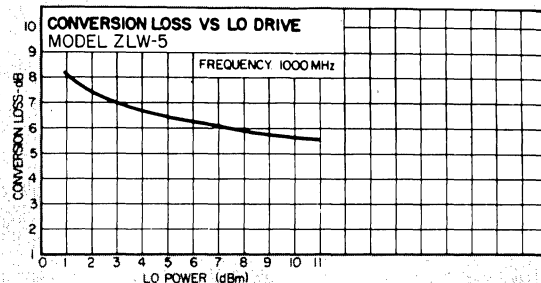
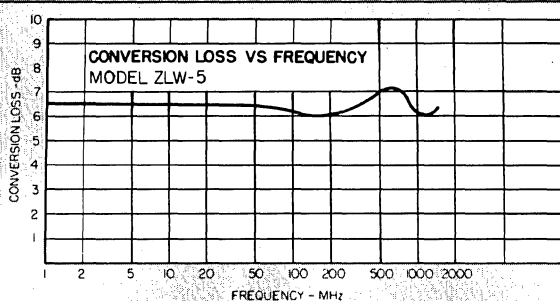
ZLW-5 5-1500MHz \$74.95 (1-9)

Frequency Range, MHz	LO	MODEL ZLW-5	
	RF	5-1500	
	IF	5-1000	
Conversion Loss, dB		Typical	Maximum
	One Octave From Band Edge	6.5	8.5
	Total Range	6.5	8.5
Signal, 1dB Compression Level		+1dBm	
Isolation, dB		Typical	Minimum
	Lower Band Edge to One Decade Higher	LO-RF 55 LO-IF 50	40 40
	Mid Range	LO-RF 35 LO-IF 35	25 25
Upper Band Edge to One Octave Lower	LO-RF	30	20
	LO-IF	30	20
Impedance, All Ports		50 ohms	

FAST DELIVERY
From stock, one week max.



For pin version see SAM series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory^{MCL}

INTRODUCTION TO MA SERIES DOUBLE-BALANCED MIXERS

Standard Level
(+10 dBm LO)

MA Series

MA-1 1-2500 MHz \$99.95 (1-9)

FAST DELIVERY
From stock, one week max.



FEATURES

ULTRA BROADBAND 1 - 2500MHz

HIGH ISOLATION 40 dB

LOW CONVERSION LOSS 9 dB

UNIQUE RUGGED CONSTRUCTION FOR
SEVERE MILITARY REQUIREMENTS

SMA 3mm CONNECTORS

LOW PRICED \$99.95
(1-9 QUANTITY)

APPLICATIONS

ECM

TELEMETRY

TEST INSTRUMENTATION

WIDE RANGE SIGNAL SOURCES

TEST RECEIVERS

LABORATORY PROTOTYPE ASSEMBLY

SWEEP GENERATORS

DESCRIPTION

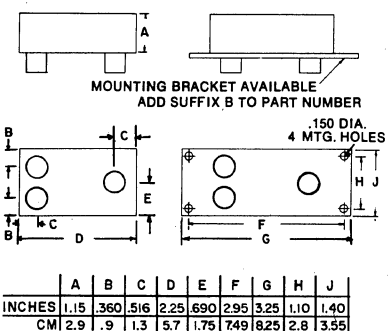
Representing a price/performance breakthrough in microwave double balanced mixers, a new 1 to 2500MHz mixer with 9.0dB conversion loss and isolation of 40dB can now be purchased for as low as \$99.95; even in small (1-9) quantities!

Housed in a die cast aluminum case, these rugged units are shielded to meet your tough EMI requirements. The case is finished with a blue baked enamel per Federal Standard 595# 25109 over phosphoric etch per MIL-C-15328A.

The MA-1 operates with a 50 ohm impedance at its ports and a local oscillator power level of +10dBm. Its operating and storage temperature range is from -55° to +100°C. Over the frequency range 1 to 30MHz the operating temperature is -20° to +100°C. Absolute ratings include total input power of 50mW, total peak input current of 40mA.

High reliability is characteristic of the MA-1. Each unit carries with it a one year warranty by MCL. Only well matched hot-carrier diodes and rugged coaxial transmission line transformers are used. Extra special care has been taken to enable these units to be used in environments of severe shock and vibration.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability. The exceptionally low cost of the MA-1 is attributable to the breakthrough in production techniques achieved by MCL during the manufacture of its high performance low price double balanced mixers. Utilizing this technology the high performance MA-1 is offered at a remarkable price of 1/3 to 1/4 of competitive units.



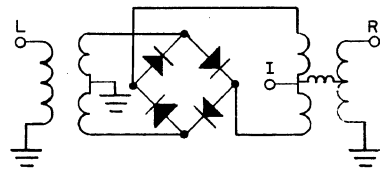
WEIGHT 74.0 grams 2.60 ounces

CONNECTORS*

SMA (3mm) standard

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.



ABSOLUTE MAXIMUM RATINGS

Total Input Power 50 mW

Total Input, Current Peak 40 mA

Operating & Storage Temperature -55°C to +100°C

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DOUBLE-BALANCED MIXERS

Standard Level
(+10dBm LO)

MA Series

MA-1 1-2500MHz \$99.95 (1-9)

SPECIFICATIONS

MODEL MA-1

Frequency Range, MHz	LO	1-2500
	RF	1-2500
	IF	1-1000

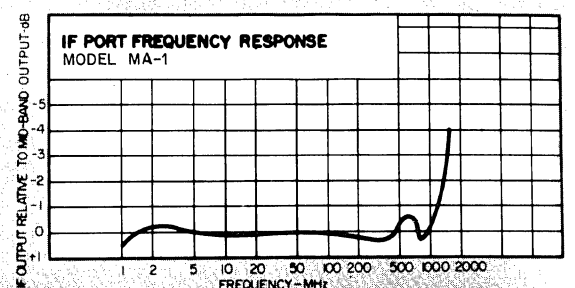
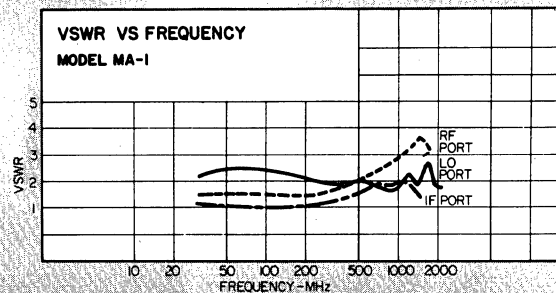
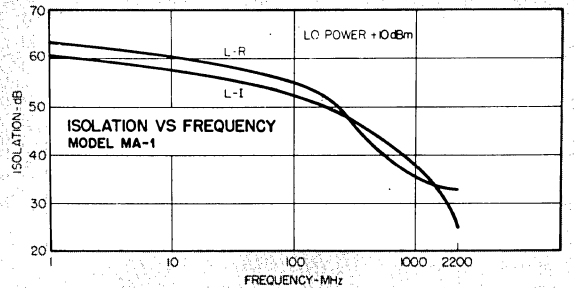
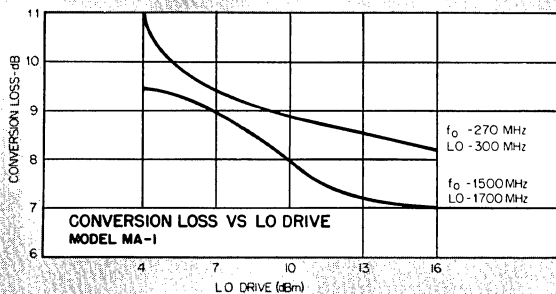
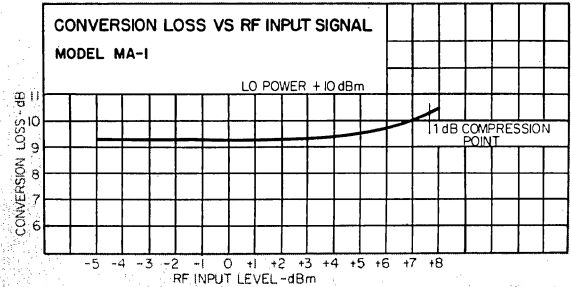
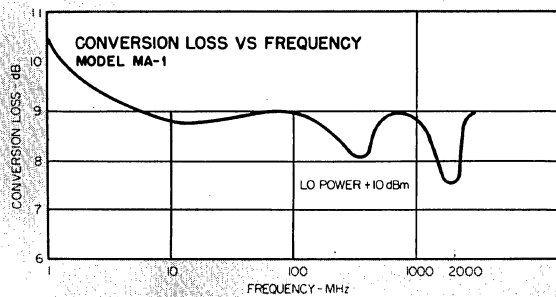
Conversion Loss, dB	Typical	Maximum
1-5MHz	9.5	11.0
5-1000MHz	9.0	10.5
1000-2500MHz	8.0	11.0

LO Power +10dBm

Signal, 1dB
Compression Level +7dBm

Isolation, dB	Typical	Minimum
Lower Band Edge to one Decade Higher	LO-RF 60	50
	LO-IF 55	45
Mid Range	LO-RF 40	30
	LO-IF 40	30
Upper Band Edge to One Octave Lower	LO-RF 35	25
	LO-IF 30	20

FAST DELIVERY
From stock, one week max.



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

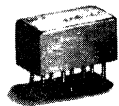
INTRODUCTION TO SRA-H SERIES DOUBLE-BALANCED MIXERS

High Level
(+17dBm LO)

SRA-H Series

SRA-1H	.5- 500 MHz	\$15.95 (5-24)
SRA-2H	2-1000 MHz	\$29.95 (5-24)
SRA-3H	.05- 200 MHz	\$17.95 (5-24)
SRA-1WH	1- 750 MHz	\$19.95 (5-24)

FAST DELIVERY
From stock, one week max.



For connector version see ZAD-H series

FEATURES

- MINIATURE SIZE, .128 CU. INCHES
- LINEAR OPERATION UP TO +10 dBm INPUT
- BROAD FREQUENCY RANGE
50KHz -1000MHz
- HIGH ISOLATION 40 dB
- LOW CONVERSION LOSS 6 dB
- HERMETICALLY SEALED METAL CASE
- PC BOARD MOUNTING
- LOW COST FROM \$15.95
IN SMALL QUANTITIES
- APPLICATIONS**
- FREQUENCY MIXING
- PULSE AND AMPLITUDE MODULATION
- PHASE DETECTION
- CURRENT CONTROLLED ATTENUATION
- FAST SWITCHING
- BI-PHASE MODULATION

DESCRIPTION

Having only 0.1 cu. inches, the high level SRA-H series covers a broad frequency range from 50KHz to 1000MHz. Designed to solve severe intermodulation distortion problems, the SRA-H series offers linear operation up to +10 dBm signal input at only 1 dB of compression. Reducing all higher order signal harmonic IMD, the SRA-H series provides a conversion loss of typically 6 dB and isolation of greater than 40 dB.

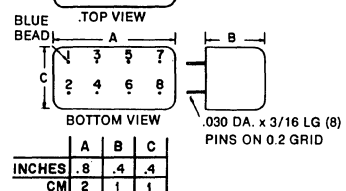
Packaged within an RFI shielded metal enclosure and hermetically sealed header, this tiny unit has its 8 pins located on a 0.2 inch grid.

Ruggedness and durability are built-in features. Internal components include well matched hot-carrier diodes and very broad band, low distortion transformers. Supported with silicone rubber, the SRA-H series withstands high shock, vibration, and acceleration environments.

Priced at 1/2 to 1/3 the cost of competitive units the SRA-H series incorporates the high reliability associated with every Mini-Circuits mixer. Our standard 1 year guarantee applies to these units.

LETTER M OVER PIN 2

Note: Numbers are for reference only, use blue bead or letter M for determining orientation.

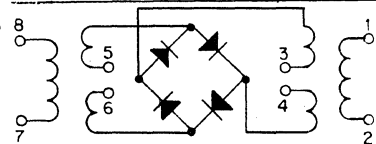


WEIGHT 5.2 grams .18 ounces

PIN CONNECTIONS

	SRA-1H SRA-3H	SRA-1WH SRA-2H
LO	8	8
RF	1	1
IF	3,4	3,4
Ground	2,5,6,7	2,5,6,7
Case Ground	2	2,5,6,7

NOTE: PINS 3 AND 4 MUST BE CONNECTED TOGETHER



ABSOLUTE MAXIMUM RATINGS

Total Input Power	500 mW
Total Input, Current Peak	40 mA
Operating & Storage Temperature	-55° C to +100° C
Pin Temperature (10 seconds)	510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MINIATURE DOUBLE-BALANCED MIXERS

Frequency Range, MHz	LO RF IF	SRA-1H		SRA-2H		SRA-1WH		SRA-3H	
		Typical	Max	Typical	Max	Typical	Max	Typical	Max
Conversion Loss, dB One Octave From Band Edge	.5-500	5.5	7.5	6.0	7.5	5.5	7.5	5.5	7.0
	5-500								
Total Range	DC-500	6.5	8.5	8.5	100	5.5	8.5	5.5	7.5
	DC-1000								
Signal, 1dB Compression Level	Typical	+10dBm		+10dBm		+10dBm		+10dBm	
	Max								
Isolation, dB Lower Band Edge to One Decade Higher	Typical	55	45	50	40	50	40	55	45
	Min	45	35	45	35	45	35	45	35
Mid Range	LO-RF	45	30	35	25	45	25	45	30
	LO-IF	40	30	30	20	40	25	40	30
Upper Band Edge to One Octave Lower	LO-RF	35	25	35	25	35	25	35	25
	LO-IF	30	20	25	20	30	20	30	20
Impedance, All Ports		50 ohms		50 ohms		50 ohms		50 ohms	
Phase Detection DC Offset		1.5mV typical		1.5mV typical		1.5mV typical		1.5mV typical	
DC Polarity		Negative		Negative		Negative		Negative	
Electronic Attenuation Minimum Attenuation (20mA)		3.5dB		5.0dB		3.5dB		2dB	

High Level
(+17dBm LO)

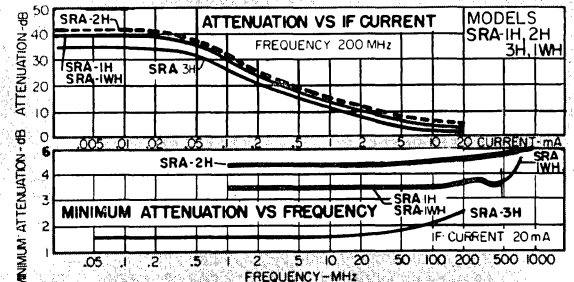
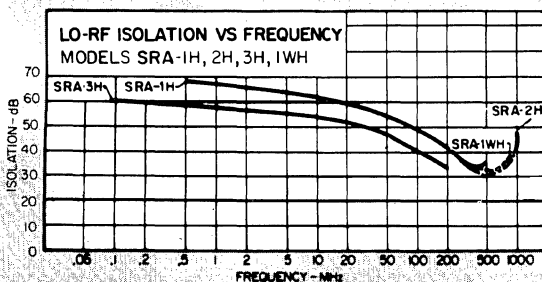
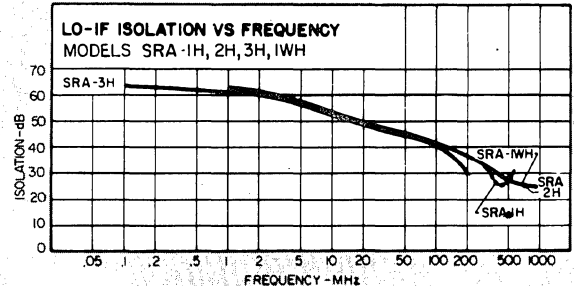
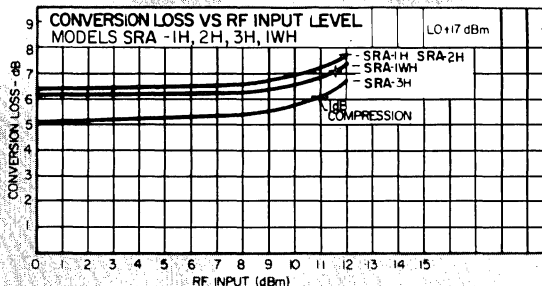
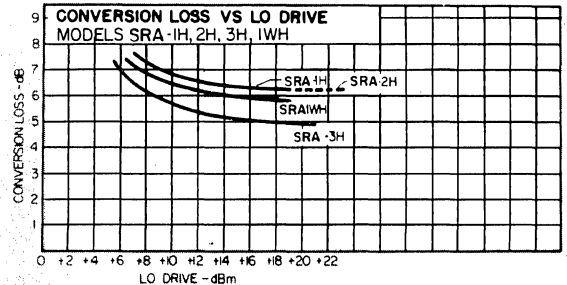
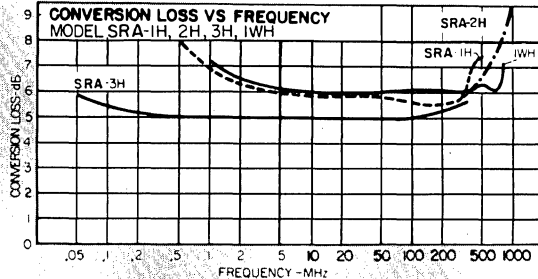
SRA-H Series

SRA-1H	.5-500MHz	\$15.95 (5-24)
SRA-2H	2-1000MHz	\$29.95 (5-24)
SRA-3H	.05-200MHz	\$17.95 (5-24)
SRA-1WH	1-750MHz	\$19.95 (5-24)

FAST DELIVERY
From stock, one week max.



For connector version see ZAD-H series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

INTRODUCTION TO SAM-H SERIES MINIATURE DOUBLE-BALANCED MIXERS

High Level
(+17dBm LO)

SAM-H Series

SAM-1H	1- 600 MHz	\$19.95 (5-24)
SAM-2H	5-1000 MHz	\$34.95 (1-24)
SAM-3H	.1- 500 MHz	\$19.95 (5-24)

FAST DELIVERY
From stock; one week max.



FEATURES

MICRO-MINIATURE SIZE, .04 CU. INCHES

PC BOARD AREA ONLY 0.1 SQ. INCHES

BROAD FREQUENCY RANGE
0.1 - 1000MHz

HIGH ISOLATION 40 dB

LOW CONVERSION LOSS 6.0 dB

HERMETICALLY SEALED METAL CASE

PC BOARD MOUNTING

LOW COST FROM \$19.95
IN SMALL QUANTITIES

APPLICATIONS

FREQUENCY MIXING

PULSE AND AMPLITUDE MODULATION

PHASE DETECTION

CURRENT CONTROLLED ATTENUATION

FAST SWITCHING

BI-PHASE MODULATION

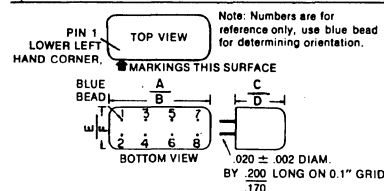
DESCRIPTION

Representing a performance and price breakthrough in micro-miniature double balanced mixers, the SAM-H series covers the frequency range 100KHz to 1000MHz. Although smaller than mixers presently available, the SAM-H series offers higher performance of extra wide bandwidth, low conversion loss, and high isolation. These tiny units offer isolation of greater than 55 dB and conversion loss of 6.0 dB. The SAM-H series performs with a 50 ohm impedance at all ports and has a operating and storage temperature range from -55°C to $+100^{\circ}\text{C}$.

The SAM-H units require less PC area than a flat-pack or TO-5 can. For example, consider a 2×2 sq. in. PC board. You can mount 16 standard flat-packs (including room for lead bending), or 23 TO-5 cans (considering the space required for the tab), or 36 Mini-Circuits microminiature SAM's.

Packaged within an EMI shielded metal enclosure and hermetically sealed header (enclosure is 0.5 by 0.2 by 0.4 in.) the SAM-H series exhibits a typical noise figure of just $1/2$ to 1dB greater than its conversion loss. Its pins are oriented on a 0.1 inch grid for printed circuit board mounting. Only well matched hot-carrier diodes and rugged transmission line transformers are used. Internally, silicone rubber is incorporated as an insulator against any wire shorts and to provide protection against shock, and vibration.

High reliability is characteristic of the SAM-H series. Each unit carries with it a one year warranty by MCL.



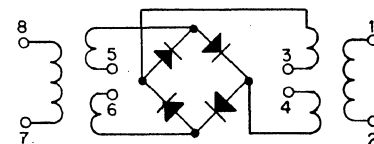
	A	B	C	D	E	F
INCHES	.500	.480	.405	.390	.230	.210
CM	1.27	1.22	1.03	.99	.58	.53

WEIGHT 1.9 grams .07 ounces

PIN CONNECTIONS

	SAM-1H SAM-3H	SAM-2H
LO	8	8
RF	1	1
IF	3,4	3,4
Ground	2,5,6,7	2,5,6,7
Case ground	2	2,5,6,7

NOTE: PINS 3 AND 4 MUST BE CONNECTED TOGETHER



ABSOLUTE MAXIMUM RATINGS

Total Input Power 100 mW

Total Input,
Current Peak 40mA

Operating & Storage
Temperature -55°C to $+100^{\circ}\text{C}$

Pin Temperature - (10 seconds) 510°F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MINIATURE DOUBLE-BALANCED MIXERS

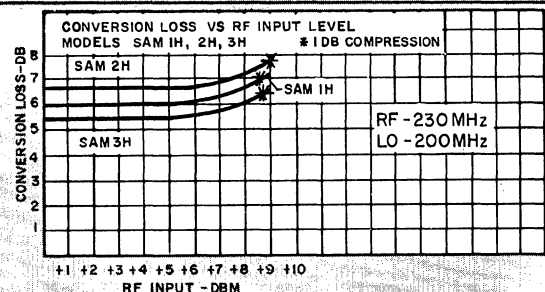
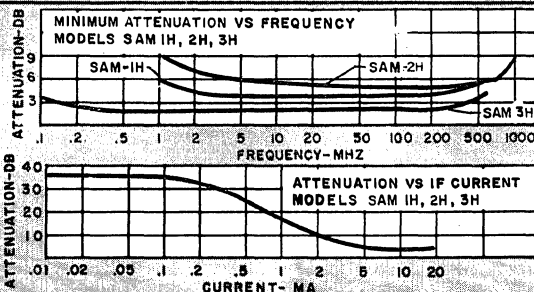
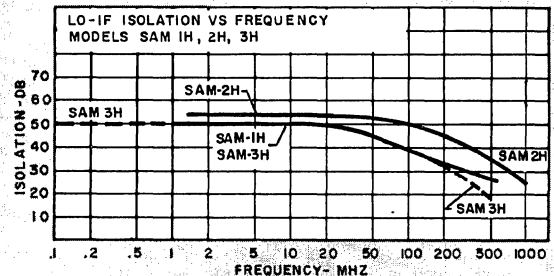
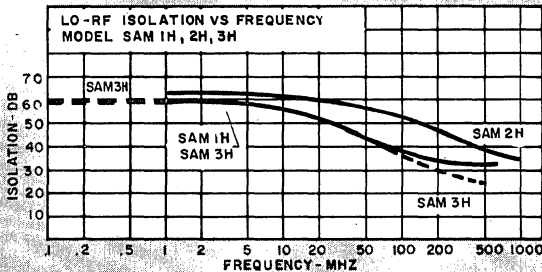
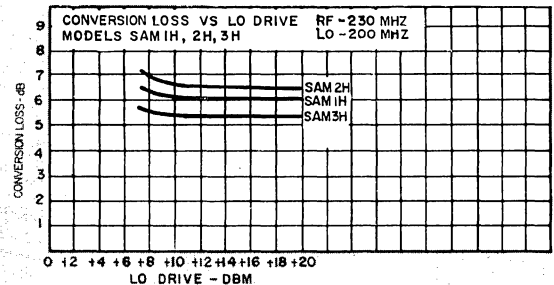
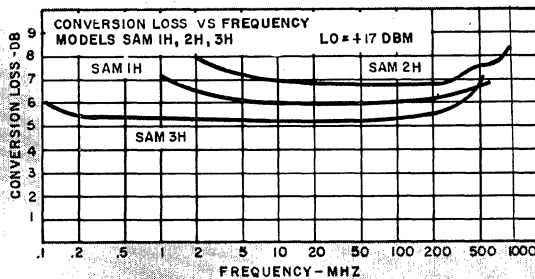
Frequency Range, MHz	LO RF IF	MODEL SAM-1H		MODEL SAM-2H		MODEL SAM-3H	
		1-600 1-600 DC-600		5-1000 5-1000 DC-1000		.1-500 .1-500 DC-500	
Conversion Loss, dB One Octave From Band Edge		Typical	Maximum	Typical	Maximum	Typical	Maximum
		6.0	7.5	6.7	8.0	5.5	7.0
Total Range		6.5	8.5	7.5	9.5	6.5	8.0
Signal, 1dB Compression Level		+7dBm		+7dBm		+7dBm	
Isolation, dB		Typical	Minimum	Typical	Minimum	Typical	Maximum
Lower Band Edge to One Decade Higher	LO-RF	55	45	55	45	55	45
	LO-IF	50	40	50	40	50	40
Mid Range	LO-RF	40	25	40	25	40	25
	LO-IF	35	25	35	20	35	20
Upper Band Edge to One Octave Lower	LO-RF	35	20	35	20	30	20
	LO-IF	30	20	25	15	20	15
Impedance, All Ports		50 ohms		50 ohms		50 ohms	
Phase Detection							
DC Offset		2mV typical		2mV typical		2mV typical	
DC Polarity		Negative		Negative		Negative	
Electronic Attenuation							
Minimum Attenuation (20mA)		3.5dB		5.0dB		2.5dB	

High Level
(+17dBm LO)

SAM-H Series

SAM-1H	1- 600 MHz	\$19.95 (5-24)
SAM-2H	5-1000 MHz	\$34.95 (1-24)
SAM-3H	.1- 500 MHz	\$19.95 (5-24)

FAST DELIVERY
From stock, one week max.



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory^{MCL}

INTRODUCTION TO ZAD-H SERIES DOUBLE-BALANCED MIXERS

High Level
(+17dBm LO)

ZAD-H Series

ZAD-1H	.5- 500 MHz	\$30.95 (4-24)
ZAD-2H	2-1000 MHz	\$44.95 (4-24)
ZAD-3H	.05- 200 MHz	\$32.95 (4-24)
ZAD-1WH	1- 750 MHz	\$34.95 (4-24)

FAST DELIVERY

From stock, one week max.



For pin version see SRA-H series

FEATURES

LINEAR OPERATION UP TO +10 dBm INPUT

BROAD FREQUENCY RANGE
50KHz - 1000MHz

HIGH ISOLATION 40 dB

LOW CONVERSION LOSS 6 dB

DIE-CAST ALUMINUM CASE

DOUBLE SHIELDED FOR RFI PROTECTION

LOW COST FROM \$30.95
IN SMALL QUANTITIES

APPLICATIONS

FREQUENCY MIXING

PULSE AND AMPLITUDE MODULATION

PHASE DETECTION

CURRENT CONTROLLED ATTENUATION

FAST SWITCHING

BI-PHASE MODULATION

DESCRIPTION

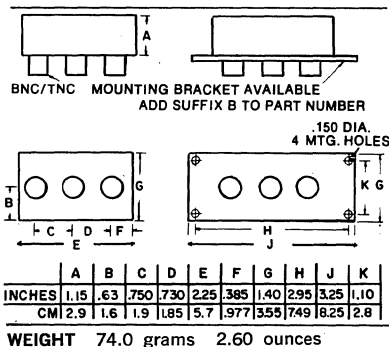
The ZAD-H series mixers cover a broad frequency range from 50KHz to 1000 MHz. Solving severe intermodulation distortion problems, the ZAD-H series offers linear operation up to +10 dBm signal input at only 1 dB of compression. Reducing all higher order signal harmonic IMD, the ZAD-H series provides a conversion loss of typically 6 dB and isolation of greater than 40 dB.

Available with BNC, or TNC coaxial connectors, the ZAD-H series is housed in a die cast aluminum case. These rugged units are double shielded to meet your tough RFI requirements. The case is finished with a blue baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability.

Ruggedness and durability are built into the ZAD-H series. Only well matched hot-carrier diodes and ruggedly constructed low distortion transformers are used. Internally, every component is bonded with silicone rubber to provide protection against shock, vibration, and acceleration.

Priced at 1/2 to 1/3 the cost of competitive units the ZAD-H series incorporates the high reliability associated with every Mini-Circuits unit. The ZAD-H series offers performance, quality, and low cost so that you can expect value with every purchase.

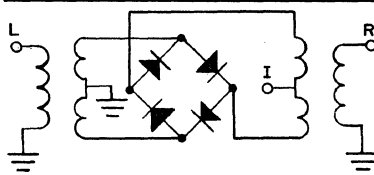


CONNECTORS

BNC standard
TNC on request

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.



ABSOLUTE MAXIMUM RATINGS

Total Input Power	500 mW
Total Input, Current Peak	40 mA
Operating & Storage Temperature	-55°C to +100°C

World's largest supplier of double balanced mixers
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MINIATURE DOUBLE-BALANCED MIXERS

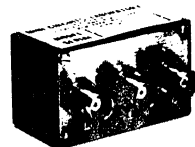
Frequency Range, MHz	LO RF IF	ZAD-1H		ZAD-2H		ZAD-1WH		ZAD-3H	
		.5-500		2-1000		1-750		.05-200	
		.5-500		2-1000		1-750		.05-200	
		DC-500		DC-1000		DC-750		DC-200	
Conversion Loss, dB		Typical	Max	Typical	Max	Typical	Max	Typical	Max
One Octave From Band Edge		5.5	7.5	6.0	7.5	5.5	7.5	5.5	7.0
Total Range		6.5	8.5	8.5	100	6.5	8.5	5.5	7.5
Signal, 1dB Compression Level		+10dBm		+10dBm		+10dBm		+10dBm	
Isolation, dB		Typical	Min	Typical	Min	Typical	Min	Typical	Min
Lower Band Edge to One Decade Higher	LO-RF	55	45	50	40	50	40	55	45
	LO-IF	45	35	45	35	45	35	45	35
Mid Range	LO-RF	45	30	35	25	45	25	45	30
	LO-IF	40	30	30	20	40	25	40	30
Upper Band Edge to One Octave Lower	LO-RF	35	25	35	25	35	25	35	25
	LO-IF	30	20	25	20	30	20	30	20
Impedance, All Ports		50 ohms		50 ohms		50 ohms		50 ohms	
Phase Detection									
DC Offset		1.5mV typical		1.5mV typical		1.5mV typical		1.5mV typica	
DC Polarity		Negative		Negative		Negative		Negative	
Electronic Attenuation									
Minimum Attenuation (20mA)		3.5dB		5.0dB		3.5dB		2dB	

High Level
(+17dBm LO)

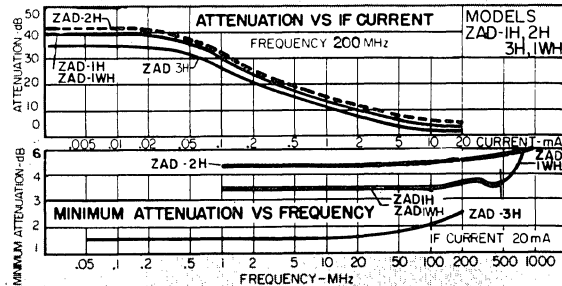
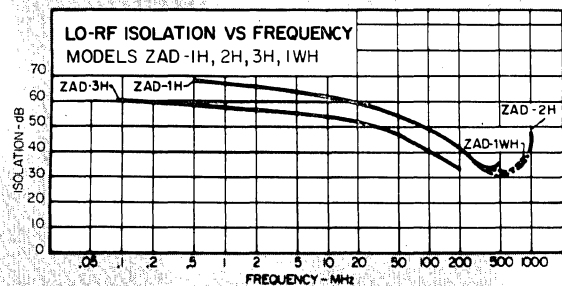
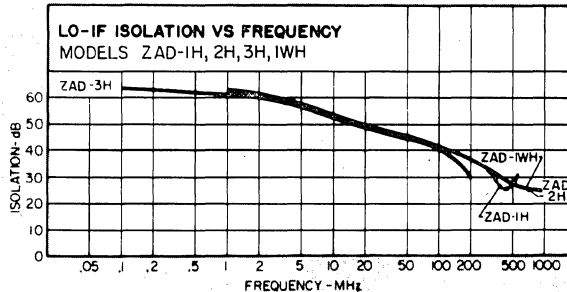
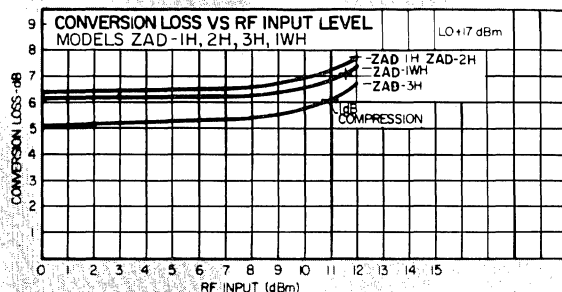
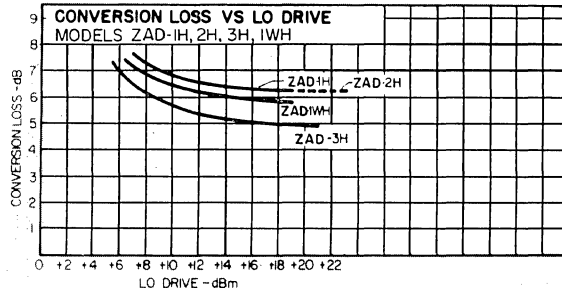
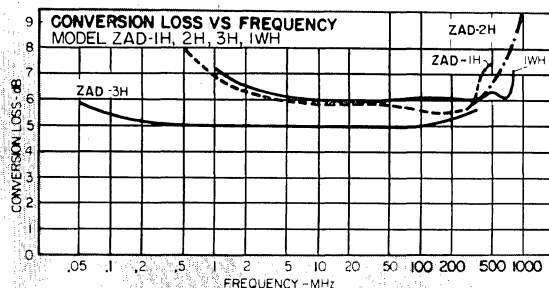
ZAD-H Series

ZAD-1H	.5- 500 MHz	\$30.95 (4-24)
ZAD-2H	2-1000 MHz	\$44.95 (4-24)
ZAD-3H	.05- 200 MHz	\$32.95 (4-24)
ZAD-1WH	1- 750 MHz	\$34.95 (4-24)

FAST DELIVERY
From stock, one week max.



For pin version see SRA-H series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

INTRODUCTION TO ZLW-H SERIES MINIATURE DOUBLE-BALANCED MIXERS

High Level
(+17dBm LO)

ZLW-H Series

ZLW-1H	.5- 500 MHz	\$40.95 (4-24)
ZLW-2H	2-1000 MHz	\$54.95 (4-24)
ZLW-3H	.05- 200 MHz	\$42.95 (4-24)
ZLW-1WH	1- 750 MHz	\$44.95 (4-24)

FAST DELIVERY
From stock: one week max.


For pin version see SRA-H series

FEATURES
LINEAR OPERATION UP TO +10 dBm INPUT
BROAD FREQUENCY RANGE
50KHz - 1000MHz

HIGH ISOLATION 40 dB

LOW CONVERSION LOSS 6 dB

DIE-CAST ALUMINUM CASE
DOUBLE SHIELDED FOR RFI PROTECTION
LOW COST FROM \$40.95
IN SMALL QUANTITIES

APPLICATIONS
FREQUENCY MIXING
PULSE AND AMPLITUDE MODULATION
PHASE DETECTION
CURRENT CONTROLLED ATTENUATION
FAST SWITCHING
BI-PHASE MODULATION
DESCRIPTION

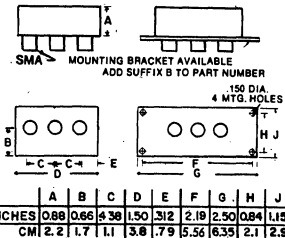
The ZLW-H series mixers cover a broad frequency range from 50KHz to 1000 MHz. Solving severe intermodulation distortion problems, the ZLW-H series offers linear operation up to +10 dBm signal input at only 1 dB of compression. Reducing all higher order signal harmonic IMD, the ZLW-H series provides a conversion loss of typically 6 dB and isolation of greater than 40 dB.

Available with SMA (3mm) connectors, the ZLW-H series is housed in a die cast aluminum case. These rugged units are double shielded to meet your tough RFI requirements. The case is finished with a blue baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability.

Ruggedness and durability are built into the ZLW-H series. Only well matched hot-carrier diodes and ruggedly constructed low distortion transformers are used. Internally, every component is bonded with silicone rubber to provide protection against shock, vibration, and acceleration.

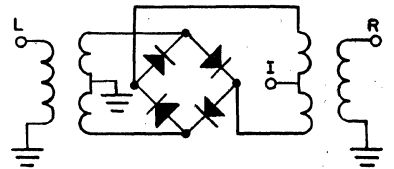
Priced at 1/2 to 1/3 the cost of competitive units the ZLW-H series incorporates the high reliability associated with every Mini-Circuits unit. The ZLW-H series offers performance, quality, and low cost so that you can expect value with every purchase.


WEIGHT 34.0 grams 1.02 ounces

CONNECTORS

SMA (3mm) standard

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.

ABSOLUTE MAXIMUM RATINGS
Total Input Power 500 mW

Total Input, Current Peak 40 mA

Operating & Storage Temperature -55°C to +100°C

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MINIATURE DOUBLE-BALANCED MIXERS

Frequency Range, MHz	ZLW-1H			ZLW-2H		ZLW-1WH		ZLW-3H	
	LO	.5-500		2-1000		1-750		.05-200	
	RF	.5-500		2-1000		1-750		.05-200	
	IF	DC-500		DC-1000		DC-750		DC-200	
Conversion Loss, dB		Typical	Max	Typical	Max	Typical	Max	Typical	Max
One Octave From Band Edge		5.5	7.5	6.0	7.5	5.5	7.5	5.5	7.0
Total Range		6.5	8.5	8.5	100	6.5	8.5	5.5	7.5
Signal, 1dB Compression Level		+10dBm		+10dBm		+10dBm		+10dBm	
Isolation, dB		Typical	Min	Typical	Min	Typical	Min	Typical	Min
Lower Band Edge to One Decade Higher	LO-RF	55	45	50	40	50	40	55	45
	LO-IF	45	35	45	35	45	35	45	35
Mid Range	LO-RF	45	30	35	25	45	25	45	30
	LO-IF	40	30	30	20	40	25	40	30
Upper Band Edge to One Octave Lower	LO-RF	35	25	35	25	35	25	35	25
	LO-IF	30	20	25	20	30	20	30	20
Impedance, All Ports		50 ohms		50 ohms		50 ohms		50 ohms	
Phase Detection									
DC Offset		1.5mV typical		1.5mV typical		1.5mV typical		1.5mV typical	
DC Polarity		Negative		Negative		Negative		Negative	
Electronic Attenuation									
Minimum Attenuation (20mA)		3.5dB		5.0dB		3.5dB		2dB	

High Level
(+17dBm LO)

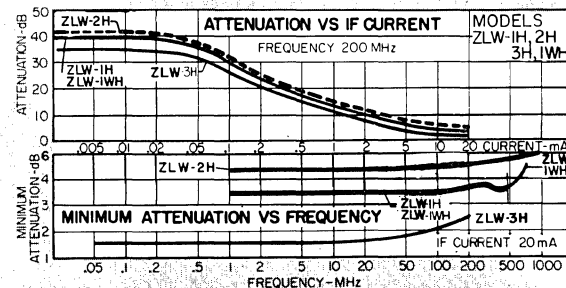
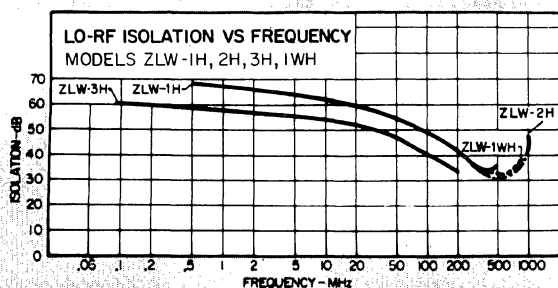
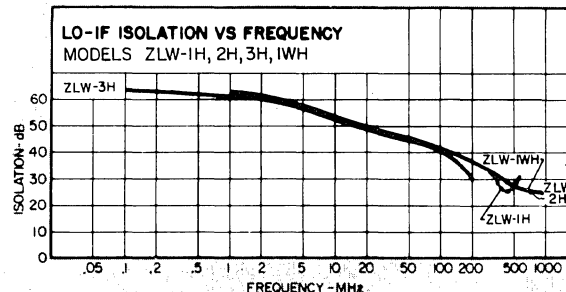
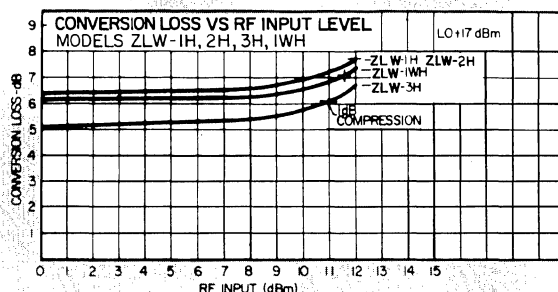
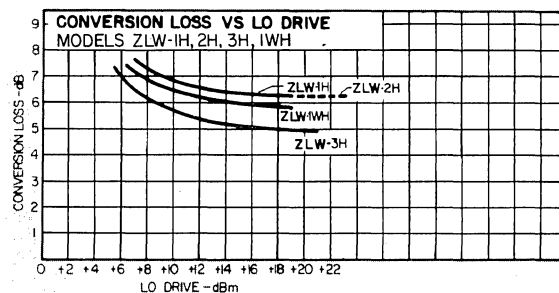
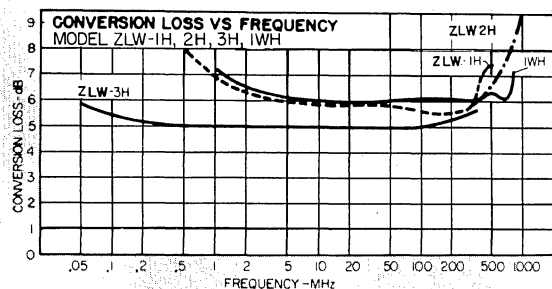
ZLW-H Series

ZLW-1H	.5- 500 MHz	\$40.95 (4-24)
ZLW-2H	2-1000 MHz	\$54.95 (4-24)
ZLW-3H	.05- 200 MHz	\$42.95 (4-24)
ZLW-1WH	1- 750 MHz	\$44.95 (4-24)

FAST DELIVERY
From stock, one week max.



For pin version see SRA-H series



World's largest supplier of double balanced mixers
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory^{MCL}

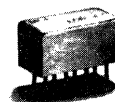
INTRODUCTION TO RAY SERIES DOUBLE-BALANCED MIXERS

Very High Level
(+23 dBm LO)

RAY Series

RAY-1	5- 500 MHz	\$31.95 (4-9)
RAY-2	10-1000 MHz	\$51.95 (4-9)
RAY-3	.07- 200 MHz	\$31.95 (4-9)

FAST DELIVERY
From stock, one week max.



For connector version see ZAY series

FEATURES

MINIATURE SIZE, .128 CUBIC INCHES

LINEAR OPERATION UP TO +15 dBm INPUT

BROAD FREQUENCY RANGE
70KHz - 1000MHz

HIGH ISOLATION 40 dB

LOW CONVERSION LOSS 6 dB

HERMETICALLY SEALED METAL CASE

PC BOARD MOUNTING

LOW COST FROM \$31.95
IN SMALL QUANTITIES

APPLICATIONS

FREQUENCY MIXING

PULSE AND AMPLITUDE MODULATION

PHASE DETECTION

CURRENT CONTROLLED ATTENUATION

FAST SWITCHING

BI-PHASE MODULATION

DESCRIPTION

Housed in a volume of only 0.1 cu. inches and requiring a PC board area of only .32 sq. inches makes the RAY series the smallest packaged mixers for very high level operation. The RAY series covers a broad frequency range from 70 KHz to 1000 MHz.

Designed to solve very severe intermodulation distortion problems, the RAY series offers linear operation up to +15 dBm signal input at only 1 dB of compression. Reducing all higher order IMD, the RAY series provides a conversion loss of typically 6 dB and isolation of greater than 40 dB.

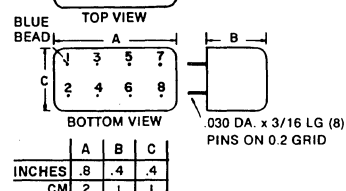
Packaged within an RFI shielded metal enclosure and hermetically sealed header, this tiny unit has its 8 pins located on a 0.2 inch grid.

Ruggedness and durability are built-in features. Internal components include well matched hot-carrier diodes and very broad band, low distortion transformers. Supported with silicone rubber, the RAY series withstands high shock, vibration, and acceleration environments.

Costing 1/3 to 1/4 the price of competitive units, the RAY series offers the high reliability associated with every Mini-Circuits mixer. Our standard 1 year guarantee applies to these units.

LETTER M OVER PIN 2

Note: Numbers are for reference only, use blue bead or letter M for determining orientation.

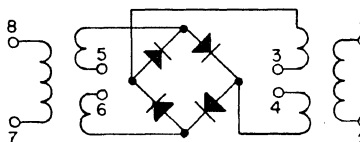


WEIGHT 5.2 grams .18 ounces

PIN CONNECTIONS

	RAY-1	RAY-3	RAY-2
LO	8	8	8
RF	1	1	1
IF	3,4	3,4	3,4
Ground	2,5,6,7	2,5,6,7	2,5,6,7
Case Ground	2	2	2,5,6,7

NOTE: PINS 3 AND 4 MUST BE CONNECTED TOGETHER



ABSOLUTE MAXIMUM RATINGS

Total Input Power	1 w
Total Input, Current Peak	40 mA
Operating & Storage Temperature	-55° C to +100° C
Pin Temperature (10 seconds)	510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DOUBLE-BALANCED MIXERS

Very High Level
(+23 dBm LO)

RAY Series

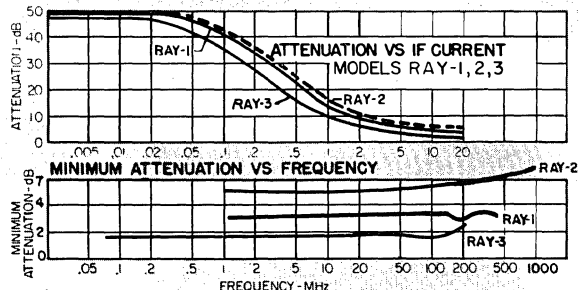
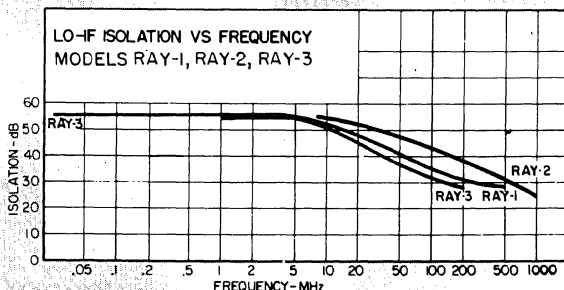
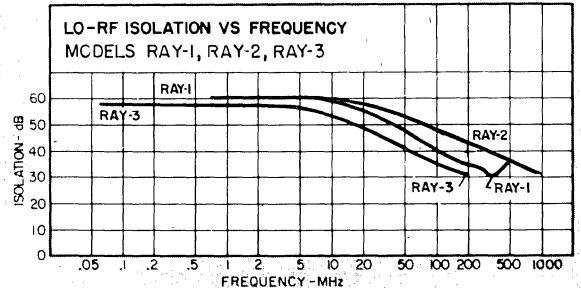
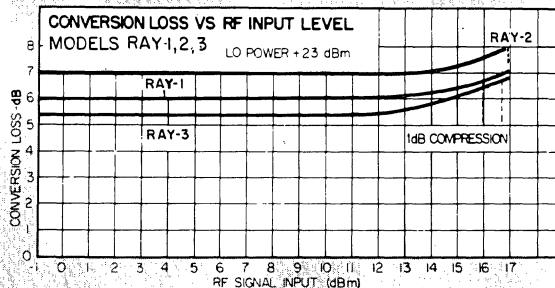
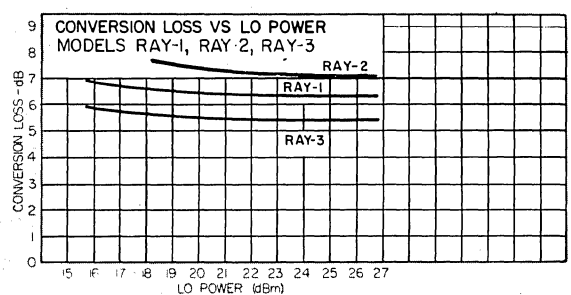
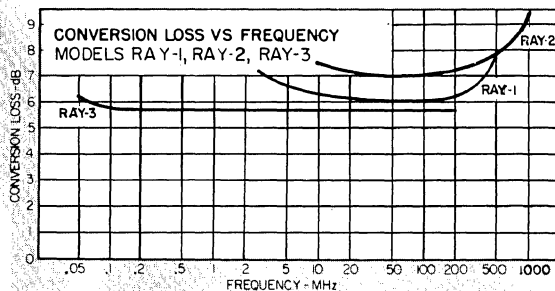
RAY-1 5- 500 MHz \$31.95 (4-9)
RAY-2 10-1000 MHz \$51.95 (4-9)
RAY-3 .07- 200 MHz \$31.95 (4-9)

Frequency Range, MHz	LO RF IF	MODEL RAY-1		MODEL RAY-2		MODEL RAY-3	
		5-500	5-500	10-1000	10-1000	0.07-200	0.07-200
		DC-500		DC-1000		DC-200	
Conversion Loss, dB One Octave From Band Edge		Typical	Maximum	Typical	Maximum	Typical	Maximum
		6.0	7.5	7.0	8.5	6.0	7.5
Total Range		7.5	8.5	8.5	10	6.5	8.0
Signal, 1dB Compression Level		+15dBm typical		+15dBm typical		+15dBm typical	
Isolation, dB Lower Band Edge to One Decade Higher		Typical	Minimum	Typical	Minimum	Typical	Minimum
		55	45	50	35	55	45
Mid Range	LO-RF	40	30	40	30	40	30
	LO-IF	40	30	35	25	40	30
Upper Band Edge to One Octave Lower	LO-RF	30	25	35	25	30	25
	LO-IF	30	20	25	20	30	20
Impedance, All Ports		50 ohms		50 ohms		50 ohms	
Phase Detection DC Offset DC Polarity		2mV typical Negative		2mV typical Negative		2mV typical Negative	
Electronic Attenuation Minimum Attenuation (20mA)		3.5dB		6 dB		2dB	

FAST DELIVERY
From stock, one week max.



For connector version see ZAY series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

INTRODUCTION TO ZAY ZMY SERIES DOUBLE-BALANCED MIXERS

FEATURES

LINEAR OPERATION UP TO +15 dBm INPUT

BROAD FREQUENCY RANGE
70KHz-1000 MHz

HIGH ISOLATION 40 dB

LOW CONVERSION LOSS 6 dB

DIE-CAST ALUMINUM CASE

DOUBLE SHIELDED FOR
RFI PROTECTION

LOW COST FROM \$41.95
IN SMALL QUANTITIES

APPLICATIONS

FREQUENCY MIXING

PULSE AND AMPLITUDE
MODULATION

PHASE DETECTION

CURRENT CONTROLLED
ATTENUATION

FAST SWITCHING

BI-PHASE MODULATION

DESCRIPTION

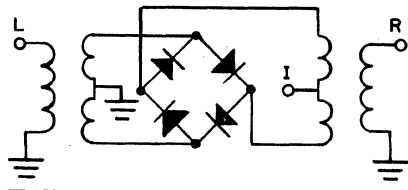
The ZAY/ZMY series of mixers cover a broad frequency range from 70 KHz to 1000MHz. Solving very severe inter-modulation distortion problems, the ZAY/ZMY series offers linear operation up to +15 dBm signal input at only 1 dB of compression. Reducing all higher order IMD, the ZAY/ZMY series provides a conversion loss of typically 6 dB and isolation of greater than 40 dB.

Available with BNC, TNC, or SMA (3mm) connectors, the ZAY/ZMY series is housed in a die cast aluminum case. These rugged units are double shielded to meet your tough RFI requirements. The case is finished with a blue baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability.

Ruggedness and durability are built into the ZAY/ZMY series. Only well matched hot-carrier diodes and ruggedly constructed low distortion transformers are used. Internally, every component is bonded with silicone rubber to provide protection against shock, vibration, and acceleration.

Priced at 1/3 to 1/4 the cost of competitive units the ZAY/ZMY series incorporates the high reliability associated with every Mini-Circuits unit. The ZAY/ZMY series offers performance, quality, and low cost so that you can expect value with every purchase.



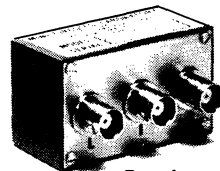
ABSOLUTE MAXIMUM RATINGS

Total Input Power	1w
Total Input, Current Peak	40 mA
Operating & Storage Temperature	-55° C to +100° C

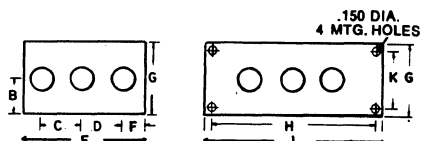
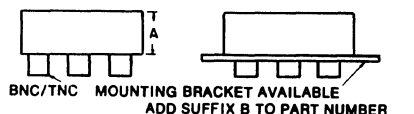
Very High Level
(+23 dBm LO)

ZAY Series (Standard Size)

ZAY-1	5- 500 MHz	\$41.95 (4-9)
ZAY-2	10-1000 MHz	\$61.95 (4-9)
ZAY-3	.07- 200 MHz	\$41.95 (4-9)



For pin version see RAY series



	A	B	C	D	E	F	G	H	J	K
INCHES	1.15	.63	.750	.730	.225	.395	1.40	.295	3.25	1.10
CM	2.9	1.6	1.9	1.85	5.7	9.77	3.55	7.49	8.25	2.8

WEIGHT 74.0 grams 2.60 ounces

CONNECTORS

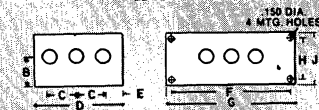
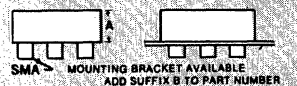
BNC	standard
TNC	on request

ZMY Series (Miniature Size)

ZMY-1	5-500MHz	\$51.95(4-9)
ZMY-2	10-1000MHz	\$71.95(4-9)
ZMY-3	.07-200MHz	\$51.95(4-9)



For pin version see RAY series



	A	B	C	D	E	F	G	H	J
INCHES	0.88	0.66	0.38	1.50	.312	2.19	2.50	0.84	1.18
CM	2.2	1.7	1.1	3.8	.79	5.56	6.35	2.1	2.9

WEIGHT 34.0 grams 1.02 ounces

CONNECTORS

SMA (3mm) standard

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DOUBLE-BALANCED MIXERS

Frequency Range, MHz	LO RF IF	MODEL ZAY-1/ZMY-1		MODEL ZAY-2/ZMY-2		MODEL ZAY-3/ZMY-3	
		5-500 5-500 DC-500		10-1000 10-1000 DC-1000		0.07-200 0.07-200 DC-200	
Conversion Loss, dB		Typical	Maximum	Typical	Maximum	Typical	Maximum
One Octave From Band Edge		6.0	7.5	7.0	8.5	6.0	7.5
Total Range		7.5	8.5	8.5	10	6.5	8.0
Signal, 1dB Compression Level		+15dBm typical		+15dBm typical		+15dBm typical	
Isolation, dB		Typical	Minimum	Typical	Minimum	Typical	Minimum
Lower Band Edge to One Decade Higher	LO-RF	55	45	50	35	55	45
	LO-IF	55	45	50	35	55	45
Mid Range	LO-RF	40	30	40	30	40	30
	LO-IF	40	30	35	25	40	30
Upper Band Edge to One Octave Lower	LO-RF	30	25	35	25	30	25
	LO-IF	30	20	25	20	30	20
Impedance, All Ports		50 ohms		50 ohms		50 ohms	
Phase Detection							
DC Offset		2mV typical		2mV typical		2mV typical	
DC Polarity		Negative		Negative		Negative	
Electronic Attenuation							
Minimum Attenuation (20mA)		3.5dB		6 dB		2dB	

Very High Level
(+23 dBm LO)

ZAY Series

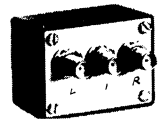
ZAY-1 5- 500 MHz \$41.95 (4-9)
ZAY-2 10-1000 MHz \$61.95 (4-9)
ZAY-3 .07- 200 MHz \$41.95 (4-9)



For pin version see RAY series

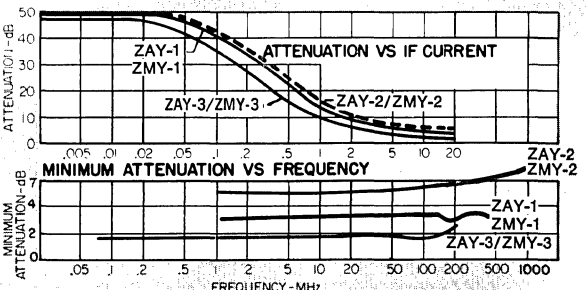
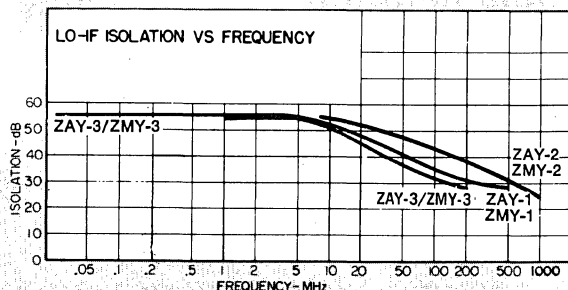
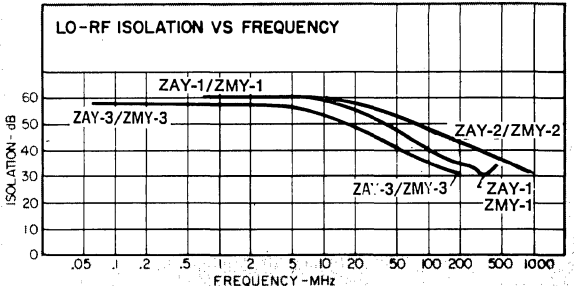
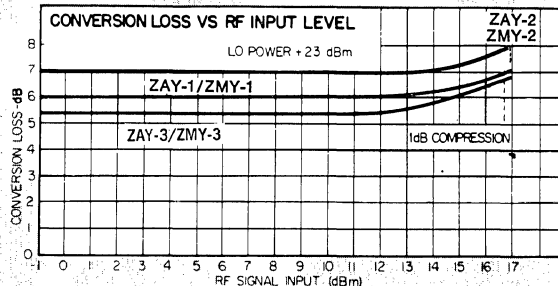
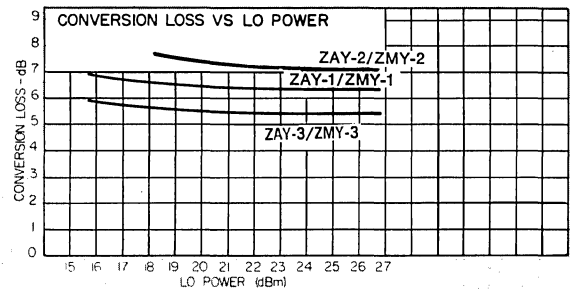
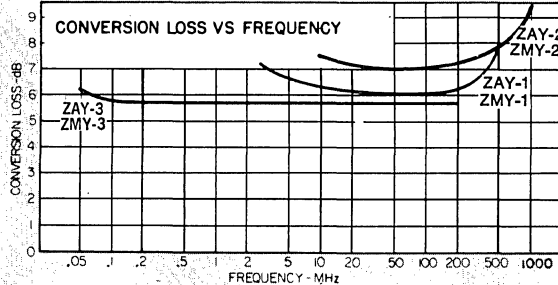
ZMY Series

ZMY-1 5-500MHz \$51.95 (4-9)
ZMY-2 10-1000MHz \$71.95 (4-9)
ZMY-3 .07-200MHz \$51.95 (4-9)



For pin version see RAY series

-FAST DELIVERY
From stock, one week max.



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

INTRODUCTION TO ZMA SERIES MICROWAVE BALANCED MIXERS

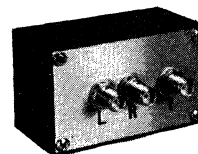
Standard Level
(+7 dBm LO)

ZMA Series

ZMA-2 1.0-2.5 GHz \$49.95 (1-9)

ZMA-3 1.4-3.0 GHz \$54.95 (1-9)

FAST DELIVERY
From stock, one week max.

**FEATURES**

BROADBAND 1.0-3.0 GHz

HIGH ISOLATION 30 dB

LOW CONVERSION LOSS 7dB

IF RESPONSE TO DC

SMA 3mm CONNECTORS

DELIVERY ONE WEEK

LOW PRICED \$49.95
(1-9 QUANTITY)**DESCRIPTION**

The ZMA series mixers are very economically priced while covering the broad frequency range from 1000MHz to 3000 MHz. They offer low conversion loss, 7 dB, and high LO-IF isolation 50 dB, over most of its frequency range.

Available with SMA (3 mm) connectors the ZMA series is housed in a die cast aluminum case. These rugged units are shielded to meet your tough RFI requirements. The case is finished with a blue baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability.

Ruggedness and durability are built into the ZMA series. Only well matched hot-carrier diodes and ruggedly constructed transmission line transformers are used. Internally, every component is bonded with silicone rubber to provide protection against shock, vibration, and acceleration.

The exceptional low cost of the ZMA series is attributable to the breakthrough in production techniques achieved during the manufacture of the widely acclaimed Mini-Circuits SRA series of PC board mounting mixers. Utilizing this technology the ZMA series is offered at a remarkable price of 1/2 to 1/3 the cost of competitive units. The ZMA series provides performance, quality, and low cost.

APPLICATIONS

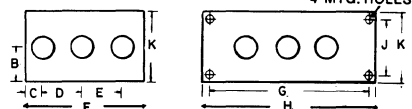
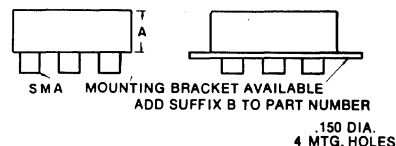
FREQUENCY MIXING

PULSE AND AMPLITUDE MODULATION

PHASE DETECTION

CURRENT CONTROLLED ATTENUATION

FAST SWITCHING



	A	B	C	D	E	F	G	H	J	K
INCHES	1.15	.690	.688	.437	.562	.225	.295	.325	1.10	1.40
CM	2.9	1.75	1.7	1.1	1.4	5.7	7.49	8.25	2.79	3.55

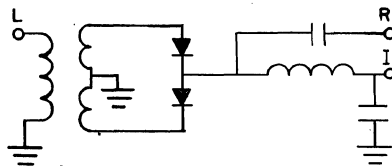
WEIGHT 74.0 grams 2.60 ounces

CONNECTORS

SMA (3mm) standard

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.

**ABSOLUTE MAXIMUM RATINGS**

Total Input Power 50mW

Total Input, Current Peak 40 mA

Operating & Storage Temperature
-55° C to +100° C

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MICROWAVE BALANCED MIXERS

Frequency Range, GHz	Model ZMA-2	
	LO	RF
	1-2.5	1-2.5
	IF	DC-0.15
Conversion Loss, dB	Typ.	Max.
	7.0	8.5
1.4-2 GHz	8.0	9.0
1.0-2.5 GHz		
Isolation, dB	Typ.	Min.
	25	20
1.0-1.5 GHz	50	35
	LO-RF	
	LO-IF	
1.5-2.0 GHz	22	17
	40	30
	LO-RF	
	LO-IF	
2.0-2.5 GHz	20	15
	35	25
	LO-RF	
	LO-IF	
Signal 1 dB compression	+2 dBm typ.	
Total input power	50 mW	
Total input, current peak	40 mA	
Operating and Storage Temperature	-55°C to +100°C	

Frequency Range, GHz	Model ZMA-3	
	LO	RF
	1.4-3.0	1.4-3.0
	IF	DC-0.5
Conversion Loss, dB	Typ.	Max.
	6.5	8.0
1.6-2.5 GHz	7.0	9.0
1.4-3.0 GHz		
Isolation, dB	Typ.	Min.
	25	20
1.4-2.0 GHz	50	35
	LO-RF	
	LO-IF	
2.0-2.5 GHz	28	18
	50	30
	LO-RF	
	LO-IF	
2.5-3.0 GHz	23	15
	50	30
	LO-RF	
	LO-IF	
Signal 1 dB compression	+3 dBm typ.	
Total input power	50 mW	
Total input, current peak	40 mA	
Operating and Storage Temperature	-55°C to +100°C	

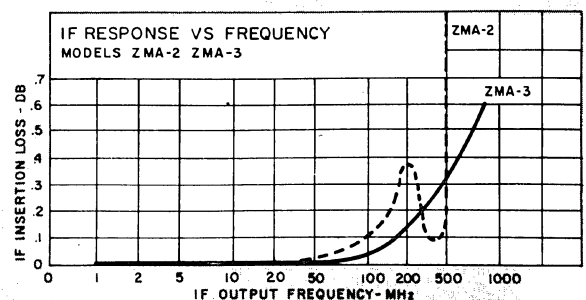
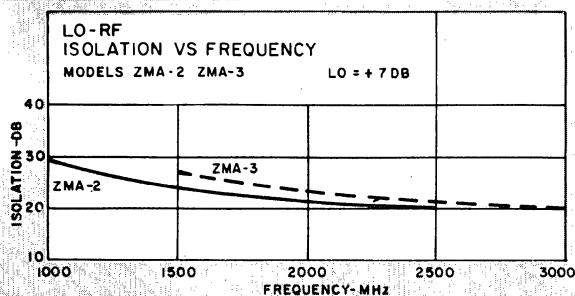
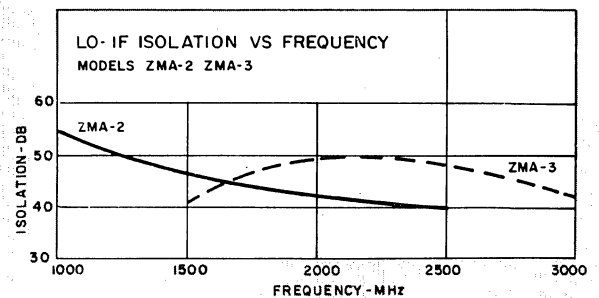
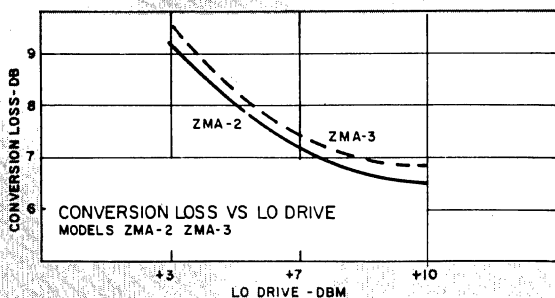
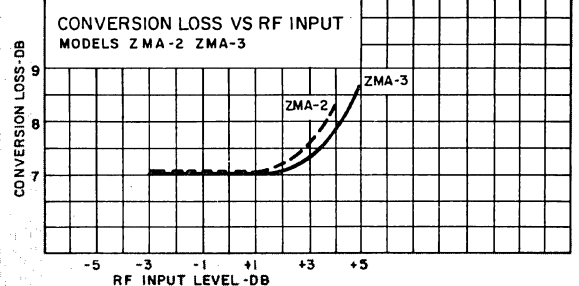
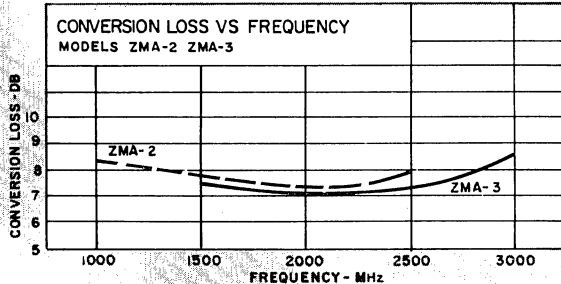
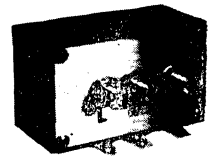
Standard Level
(+7 dBm LO)

ZMA Series

ZMA-2 1.0-2.5 GHz \$49.95 (1-9)

ZMA-3 1.4-3.0 GHz \$54.95 (1-9)

FAST DELIVERY
From stock, one week max.



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

INTRODUCTION TO PDC SERIES DIRECTIONAL COUPLERS

FEATURES

BROAD FREQUENCY RANGE,
10 KHz-1000 MHz

WIDE SELECTION OF COUPLING

LOW MAIN LINE LOSS FROM 0.1 dB

HIGH DIRECTIVITY TO 35 dB

HERMETICALLY SEALED METAL CASE

PC BOARD MOUNTING

LOW COST FROM \$9.95
IN SMALL QUANTITIES

APPLICATIONS

MEASURE INCIDENT AND REFLECTED
POWER TO DETERMINE VSWR

SIGNAL SAMPLING

S PARAMETER MEASUREMENT

SIGNAL INJECTION

SIGNAL GENERATOR/OSCILLATOR LEVELING

POWER FLOW MONITORING

DESCRIPTION

The PDC series directional couplers are economically priced while covering the frequency range from 10 kHz to 1000 MHz. They offer main-line loss as low as 0.1 dB and high directivity of up to 35 dB. A wide selection of coupling ratios are available and exceptional unit to unit matched performance is standard.

Having a volume of only 0.128 cu. inches, the PDC series is offered at the lowest prices available in the industry.

Packaged within an rfi shielded metal enclosure and hermetically-sealed header, these high performance units have their pins oriented on a 0.2 inch grid. Ruggedness and durability are built into the PDC series. Only well matched and ruggedly constructed transmission line transformers are used. Internally every component is bonded to the header and case with silicone rubber to provide super reliable protection against shock vibration and acceleration.

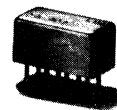
The PDC series uses the same construction technology as our SRA double-balanced mixer. This unit has become an industry standard throughout the world and is believed to be the number one volume leader. Used by all branches of the Department of Defense, NASA, FAA and every major communications company, the SRA has proven to be an industry work horse. Used in over 250 different military contracts, and over a period of years, enable sufficient history to establish SRA as one of the most reliable mixers obtainable, even when considering high priced models. The PDC series is expected to provide the same kind of results.

High reliability is associated with every PDC series directional coupler. Every production run is 100% tested and every unit must pass our rigid inspection and high quality standards. Naturally, our one year guarantee applies to these units.

PDC Series

PDC-10-1	0.5- 500 MHz	\$11.95 (5-49)
PDC-10-2	250-1000 MHz	\$24.95 (5-49)
PDC-15-6	0.01- 35 MHz	\$19.95 (5-49)
PDC-20-3	0.2- 250 MHz	\$11.95 (5-49)
PDC-20-1	25- 400 MHz	\$19.95 (5-49)
PDC-10-1B	1- 400 MHz	\$ 9.95 (6-49)
PDC-20-1B	0.5- 200 MHz	\$14.95 (5-49)

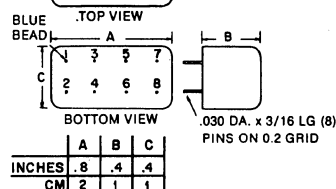
FAST DELIVERY
From stock; one week max.



For connector version see ZDC series

LETTER M OVER PIN 2

Note: Numbers are for reference only, use blue bead or letter M for determining orientation.

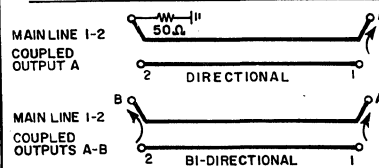


WEIGHT 5.2 grams .18 ounces

PIN CONNECTIONS

	PDC 10-1 10-2, 15-6 20-1, 20-3	PDC 10-1B 20-1B
MAIN LINE 2	4	4
MAIN LINE 1	1	1
COUPLE A	3	3
COUPLE B	—	6
GROUND	2,5,7,8	2,5,7,8

Model with Suffix B denotes external 50 ohm load required



ABSOLUTE MAXIMUM RATINGS

Operating & Storage —55° C to +100° C

Temperature

Pin Temperature (10 seconds) 510° F

World's largest supplier of double balanced mixers
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DIRECTIONAL COUPLERS

11.5 dB

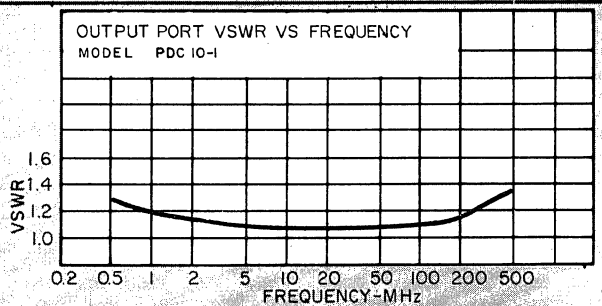
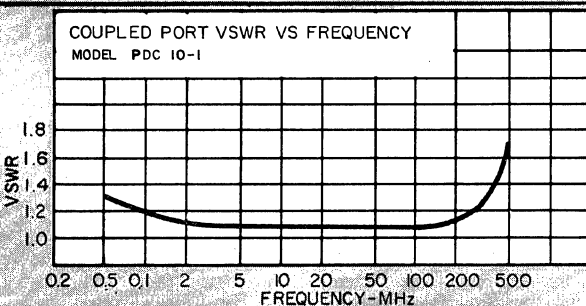
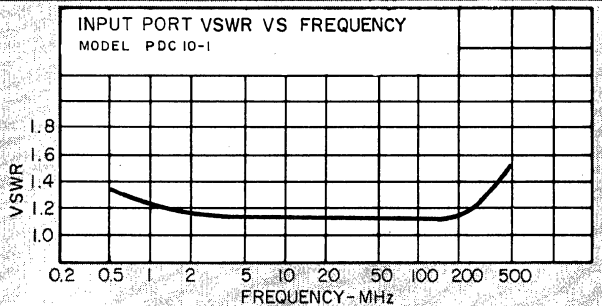
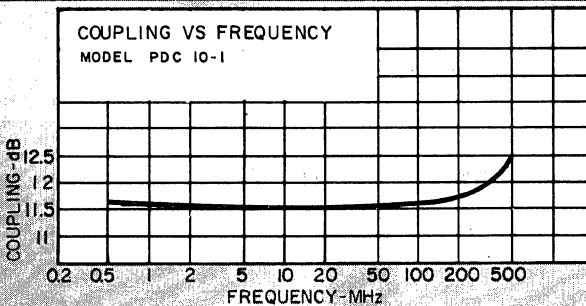
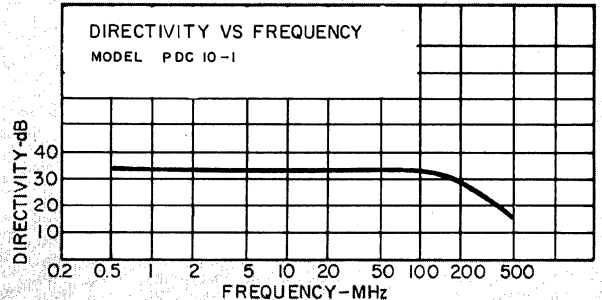
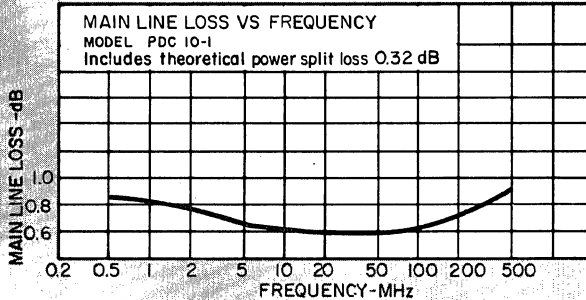
Frequency Range, MHz	MODEL PDC 10-1 0.5-500	
Coupling, dB (Input To Coupled Port)	11.5±0.5	
Coupling Flatness, dB	±0.6	
VSWR	1.2:1 Typ.	
Impedance	50 ohms	
Directivity, dB	Typical	Minimum
Lower Band Edge To One Decade Higher	32	25
Mid Range	32	25
Upper Band Edge To One Octave Lower	22	15
Main Line Loss, dB (Includes Theoretical 0.32 dB Power Split Loss)	Typical	Maximum
One Octave From Band Edge	.65	1.0
Total Range	.85	1.2
Input Power		
Total Range (1)	3 Watts	
(1) Lower Band Edge To One Decade Higher	1.5 Watts	

PDC 10-1 Series

PDC 10-1 0.5-500 MHz \$11.95 (5-49)

FAST DELIVERY
From stock, one week max

For connector version see ZDC 10-1 series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DIRECTIONAL COUPLERS

10 dB

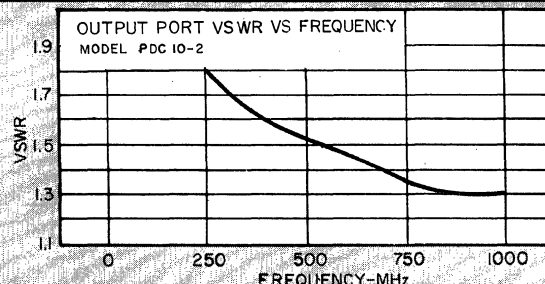
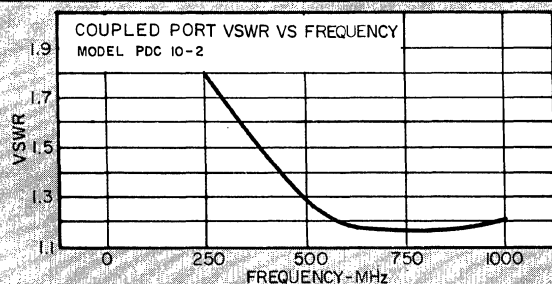
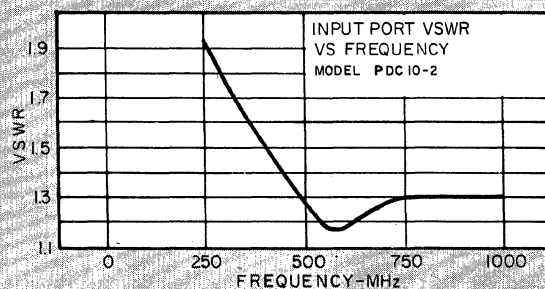
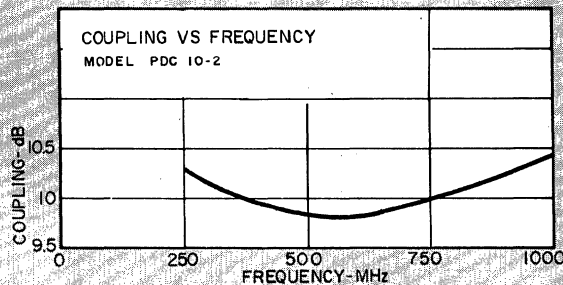
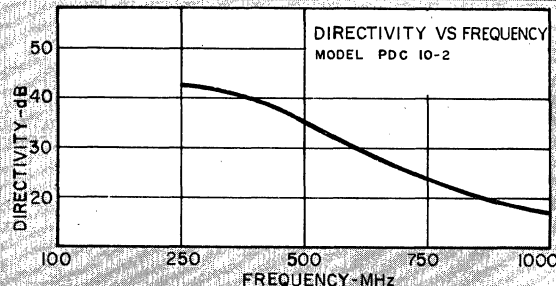
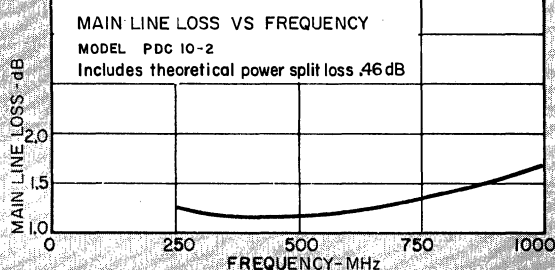
Frequency Range, MHz	MODEL PDC 10-2 250-1000	
Coupling, dB (Input To Coupled Port)	10±0.5	
Coupling Flatness, dB	±0.5	
VSWR	1.5:1 Typ.	
Impedance	50 ohms	
Directivity, dB	Typical	Minimum
250-400 MHz	40	30
400-800 MHz	30	20
800-1000 MHz	20	15
Main Line Loss, dB (Includes Theoretical 46 dB Power Split Loss)	Typical	Maximum
250-600 MHz	1.1	1.4
600-1000 MHz	1.6	1.9
Input Power	5 Watts	

PDC 10-2 Series

PDC 10-2 250-1000 MHz \$24.95 (5-49)

FAST DELIVERY
 From stock, one week max


For connector version see ZDC10-1 series



World's largest supplier of double balanced mixers
 Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DIRECTIONAL COUPLERS

15 dB

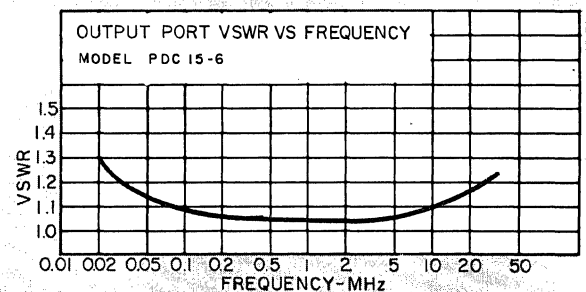
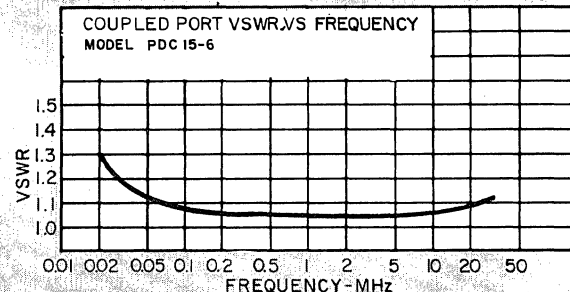
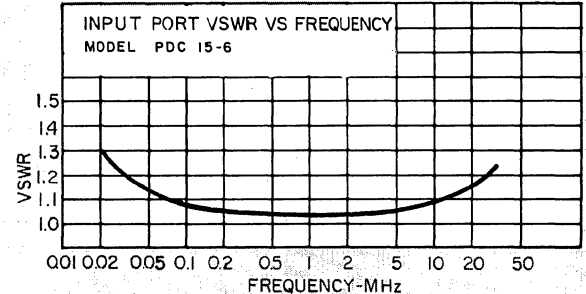
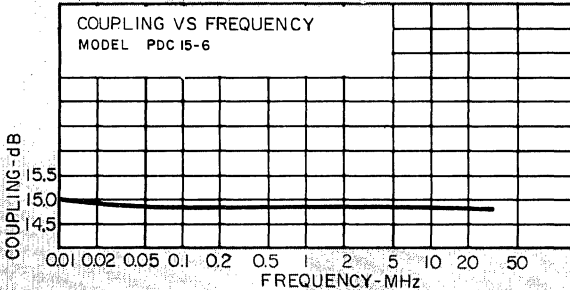
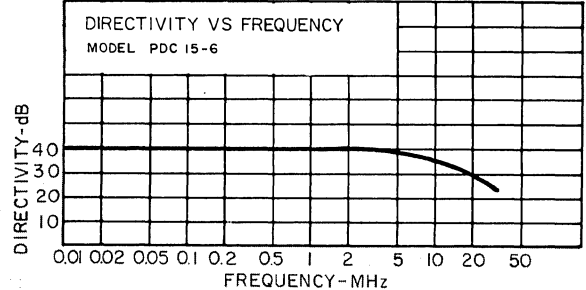
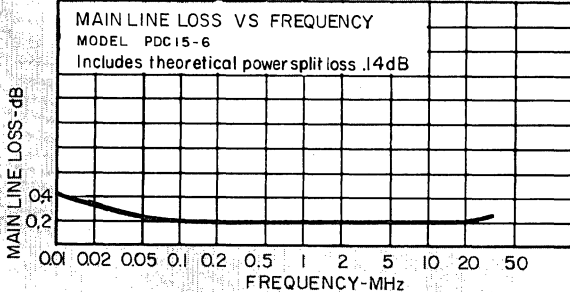
PDC 15-6 Series

PDC 15-6 0.01-35 MHz \$19.95 (5-49)

FAST DELIVERY
 From stock, one week max


For connector version see ZDC15-6 series

Frequency Range, MHz	MODEL PDC 15-6 .01-35	
Coupling, dB (Input To Coupled Port)	15 dB $\pm$ 0.5 dB	
Coupling Flatness, dB	$\pm$ 0.5 dB	
VSWR	1.15:1 Typ.	
Impedance	50 ohms	
Directivity, dB	Typical	Minimum
Lower Band Edge To One Decade Higher	38	30
Mid Range	35	25
Upper Band Edge To One Octave Lower	28	20
Main Line Loss, dB (Includes Theoretical .14 dB Power Split Loss)	Typical	Maximum
One Octave From Band Edge	.2	.4
Total Range	.3	.6
Input Power		
Total Range (1)	4 Watts	
(1) Lower Band Edge To One Decade Higher	2 Watts	



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DIRECTIONAL COUPLERS

19.5 dB

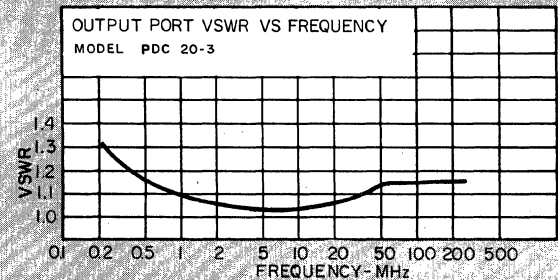
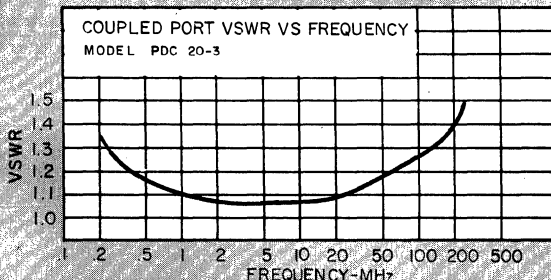
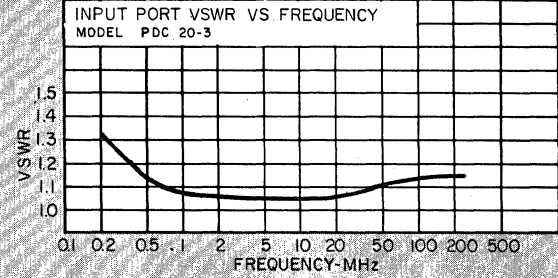
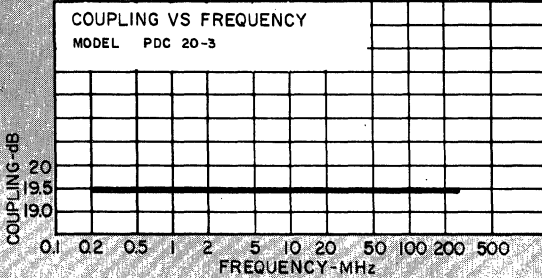
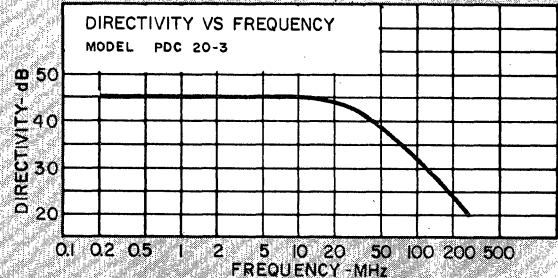
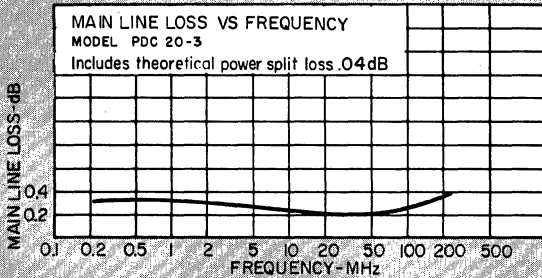
Frequency Range, MHz	MODEL PDC 20-3 0.2-250	
Coupling, dB (Input To Coupled Port)	19.5 ± 0.5	
Coupling Flatness, dB	± 0.5	
VSWR	1.2:1 Typ.	
Impedance	50 ohms	
Directivity, dB	Typical	Minimum
Lower Band Edge To One Decade Higher	36	30
Mid Range	33	25
Upper Band Edge To One Octave Lower	25	20
Main Line Loss, dB (Includes Theoretical 0.4 dB Power Split)	Typical	Maximum
One Octave From Band Edge	0.25	0.5
Total Range	0.35	0.6
Input Power		
Total Range (1)	4 watts	
(1) Lower Band Edge To One Decade Higher	1.5 watts	

PDC 20-3 Series
PDC 20-3 0.2-250 MHz \$11.95 (5-49)

FAST DELIVERY
From stock, one week max



For connector version see ZDC20-3 series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DIRECTIONAL COUPLERS

21 dB

Frequency Range, MHz	MODEL PDC 20-1 25-400	
Coupling, dB (Input To Coupled Port)	21 ± 0.5	
Coupling Flatness, dB	± 0.5	
VSWR	1.25:1 Typ.	
Impedance	50 ohms	
Directivity, dB	Typical	Minimum
25-150 MHz	25	20
150-300 MHz	35	25
300-400 MHz	25	20
Main Line Loss, dB (Includes Theoretical .04 dB Power Split)	Typical	Maximum
25-50 MHz	0.2	0.5
50-300 MHz	0.1	0.2
300-400 MHz	0.15	0.3

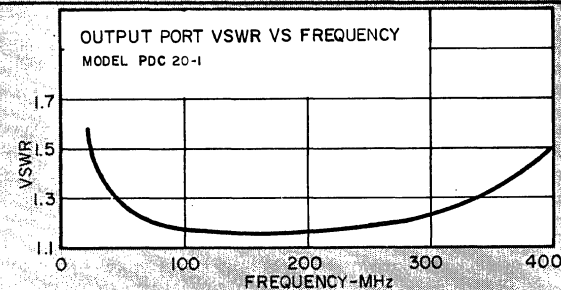
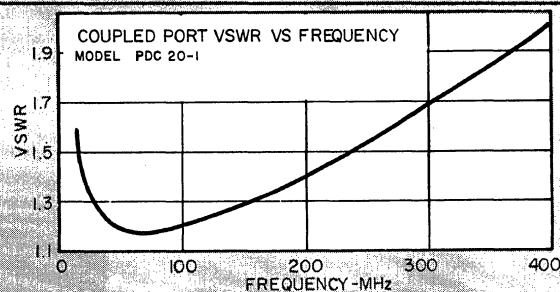
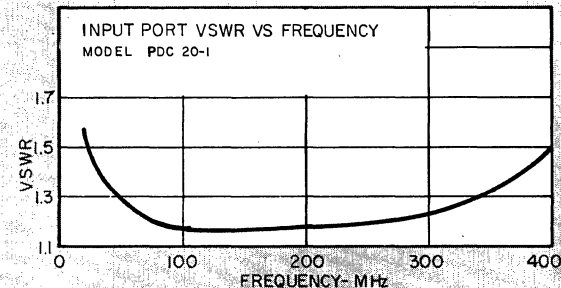
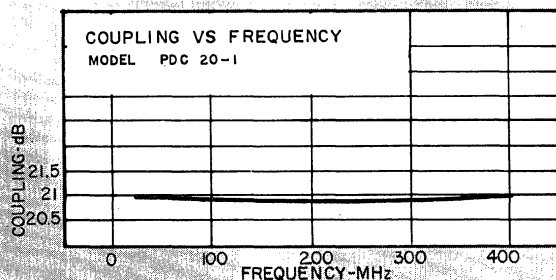
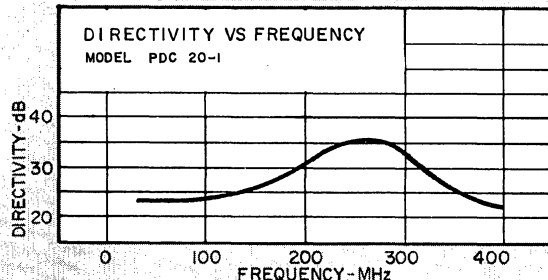
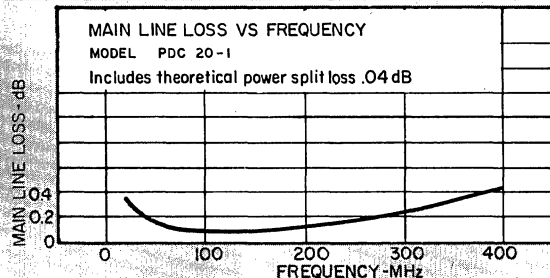
Input Power	
Total Range (1)	5 watts
(1) Lower Band Edge To One Octave Higher	3 watts

PDC 20-1 Series

PDC 20-1 25-400 MHz \$19.95 (5-49)

-FAST DELIVERY
 From stock, one week max.


For connector version see ZDC201 series



World's largest supplier of double balanced mixers

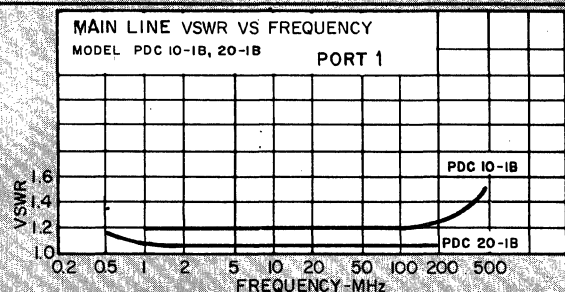
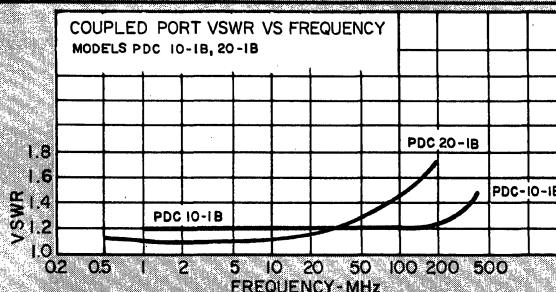
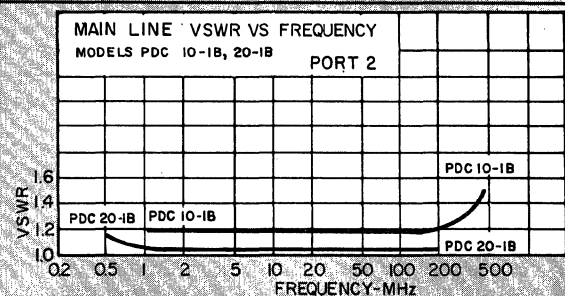
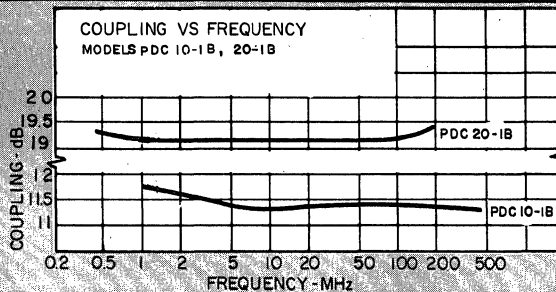
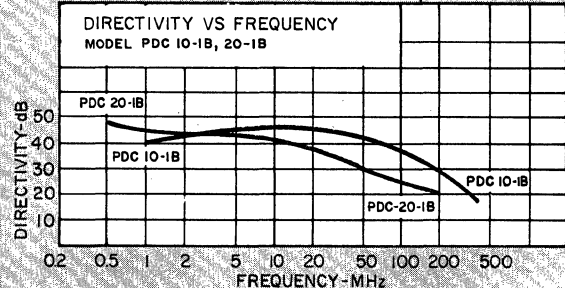
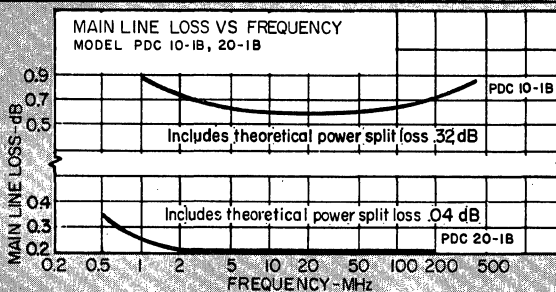
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

 Mini-Circuits Laboratory
BI-DIRECTIONAL COUPLERS**11.5 dB/19.2 dB**

	MODEL PDC 10-1B		MODEL PDC 20-1B	
Frequency Range, MHz	1-400 MHz		0.5-200	
Coupling, dB (Input To Coupled Port)	11.5±0.5		19.2±0.5	
Coupling Flatness, dB	±0.5 dB		±0.5	
VSWR	1.2:1 Typ.		1.1:1 Typ.	
Impedance	50 ohms		50 ohms	
Directivity, dB	Typical	Minimum	Typical	Minimum
Lower Band Edge To One Decade Higher	42	30	40	30
Mid Range	35	24	35	20
Upper Band Edge To One Octave Lower	22	15	22	15
Main Line Loss, dB	(Includes Theoretical 32 dB Power Split Loss)		(Includes Theoretical 0.4 dB Power Split)	
	Typical	Maximum	Typical	Maximum
One Octave From Band Edge	0.7	0.9	0.3	0.5
Total Range	0.9	1.2	0.4	0.6
Input Power	4 Watts		4 watts	
Total Range (1)	2 Watts			
(1) Lower Band Edge To One Decade Higher				

**PDC 10-1B Series
PDC 20-1B Series**

PDC 10-1B 1-400 MHz \$ 9.95 (6-49)
 PDC 20-1B 0.5-200 MHz \$14.95 (5-49)

FAST DELIVERY
From stock, one week max

World's largest supplier of double balanced mixers
 Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

INTRODUCTION TO ZDC ZMDC SERIES DIRECTIONAL COUPLERS

FEATURES

BROAD FREQUENCY RANGE,
10 kHz - 1000 MHz

WIDE SELECTION OF COUPLING

LOW MAIN LINE LOSS FROM 0.1 dB

HIGH DIRECTIVITY TO 35 dB

DIE-CAST ALUMINUM CASE

LOW COST FROM \$26.95
IN SMALL QUANTITIES

APPLICATIONS

MEASURE INCIDENT AND
REFLECTED POWER TO
DETERMINE VSWR

SIGNAL SAMPLING

S PARAMETER MEASUREMENT

SIGNAL INJECTION

SIGNAL GENERATOR/OSCILLATOR
LEVELING

POWER FLOW MONITORING

DESCRIPTION

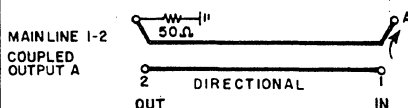
The ZDC/ZMDC series directional couplers are economically priced while covering the frequency range from 10 kHz to 1000 MHz. They offer main-line loss as low as 0.1 dB and high directivity of up to 35 dB. A wide selection of coupling ratios are available and exceptional unit to unit matched performance is standard.

Available with BNC, TNC, or SMA connectors, the ZDC/ZMDC series is housed in a die-cast aluminum case. The case is finished with a blue-baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.

Every unit 100% tested and inspected under strict MCL quality-control standards to insure superior electrical performance and reliability.

Ruggedness and durability are built into the ZDC/ZMDC series. Only well matched and ruggedly constructed transmission line transformers are used. Internally, every component is bonded with silicone rubber to provide protection against shock, vibration and acceleration.

The exceptional low cost of the ZDC/ZMDC series is attributable to the breakthrough in production techniques achieved during the manufacture of the widely acclaimed Mini-Circuits SRA series of PC board mounting mixers. Utilizing this technology, the ZDC/ZMDC series is offered at a remarkable price of 1/3 to 1/5 the cost of competitive units. The ZDC/ZMDC series provides performance, quality and low cost.



ABSOLUTE MAXIMUM RATINGS

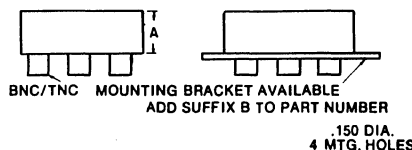
Operating & Storage
Temperature -55° C to +100° C

ZDC Series (Standard Size)

ZDC-10-1	0.5-500 MHz	(4-24)	\$26.95
ZDC-10-2	250-1000 MHz	(4-24)	\$34.95
ZDC-15-6	0.01-35 MHz	(4-24)	\$34.95
ZDC-20-1	25-400 MHz	(4-24)	\$34.95
ZDC-20-3	0.2-250 MHz	(4-24)	\$26.95



For pin version see PDC series



	A	B	C	D	E	F	G	H	J	K
INCHES	1.15	.63	.750	.730	.225	.385	1.40	.295	.325	1.10
CM	2.9	1.6	1.9	1.85	5.7	.977	3.55	.749	.825	2.8

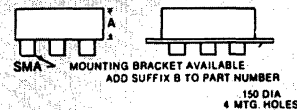
CONNECTORS

BNC standard
TNC on request

WEIGHT 74.0 grams 2.60 ounces

ZMDC Series (Miniature Size)

ZMDC-10-1	0.5-500 MHz	(4-24)	\$36.95
ZMDC-10-2	250-1000 MHz	(4-24)	\$44.95
ZMDC-15-6	0.01-35 MHz	(4-24)	\$44.95
ZMDC-20-1	25-400 MHz	(4-24)	\$44.95
ZMDC-20-3	0.2-250 MHz	(4-24)	\$36.95



	A	B	C	D	E	F	G	H	J
INCHES	0.88	0.66	4.38	1.50	.312	2.19	2.50	0.84	1.15
CM	2.2	1.7	11	3.8	7.9	5.56	6.35	2.1	2.9

WEIGHT 34.0 grams 1.02 ounces

CONNECTORS SMA (3mm) standard

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

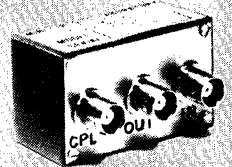
DIRECTIONAL COUPLERS

Frequency Range, MHz	MODEL ZDC 10-1/ZMDC 10-1 0.5-500	
Coupling, dB (Input To Coupled Port)	11.5±0.5	
Coupling Flatness, dB	±0.6	
VSWR	1.2:1 Typ.	
Impedance	50 ohms	
Directivity, dB	Typical	Minimum
Lower Band Edge To One Decade Higher	32	25
Mid Range	32	25
Upper Band Edge To One Octave Lower	22	15
Main Line Loss, dB (Includes Theoretical 0.32 dB Power Split Loss)	Typical	Maximum
One Octave From Band Edge	.65	1.0
Total Range	.85	1.2
Input Power		
Total Range (1)	3 Watts	
(1) Lower Band Edge To One Decade Higher	1.5 Watts	

11.5 dB

ZDC 10-1 Series

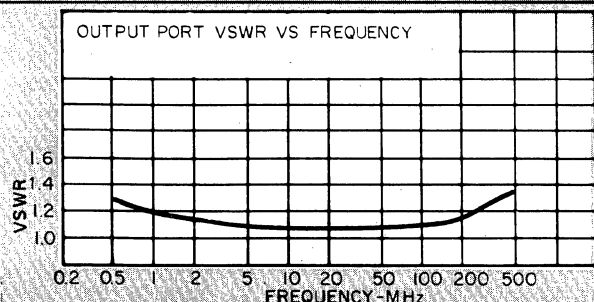
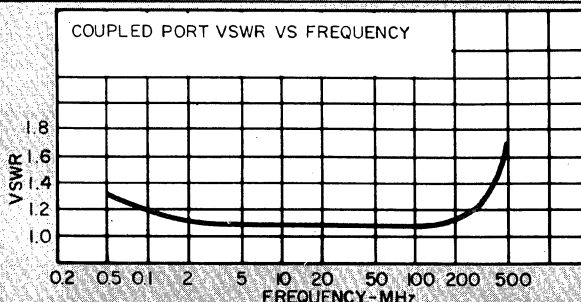
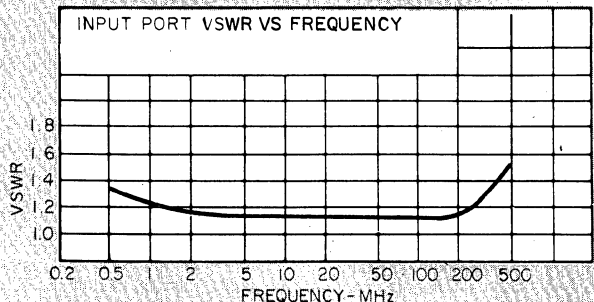
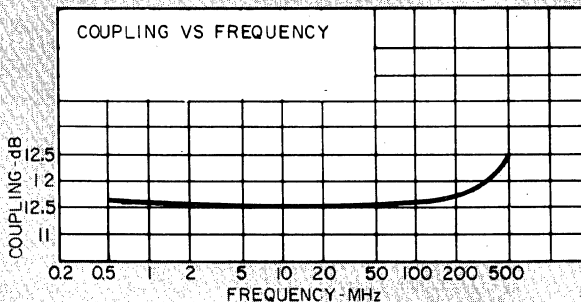
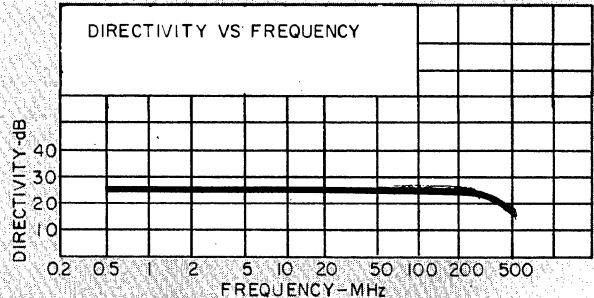
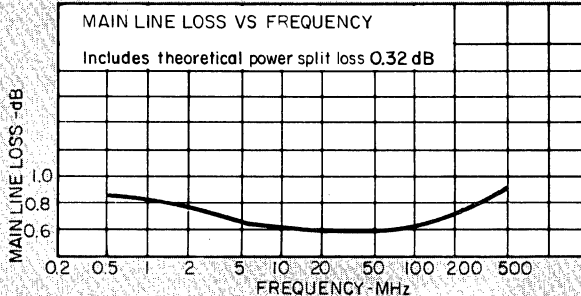
ZDC 10-1 0.5-500 MHz \$26.95 (4-24)



For pin version see PDC10-1 series

ZMDC 10-1 Series

ZMDC 10-1 0.5-500 MHz \$36.95 (4-24)


FAST DELIVERY
 From stock, one week max


World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

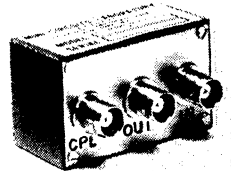
Mini-Circuits Laboratory

DIRECTIONAL COUPLERS

MODEL ZDC 10-2/ZMDC 10-2	
Frequency Range, MHz	250-1000
Coupling, dB (Input To Coupled Port)	10±0.5
Coupling Flatness, dB	±0.5
VSWR	1.5:1 Typ.
Impedance	50 ohms
Directivity, dB	Typical Minimum
250-400 MHz	40 30
400-800 MHz	30 20
800-1000 MHz	20 15
Main Line Loss, dB (Includes Theoretical .46dB Power Split Loss)	Typical Maximum
250-600 MHz	1.1 1.4
600-1000 MHz	1.6 1.9
Input Power	5 Watts

10 dB**ZDC 10-2 Series**

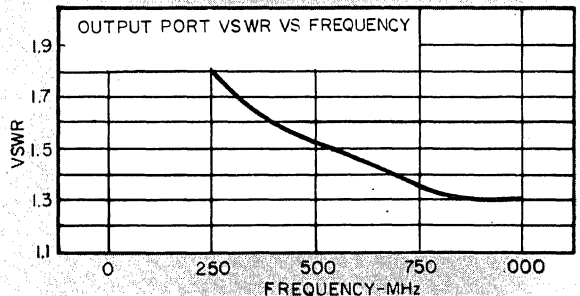
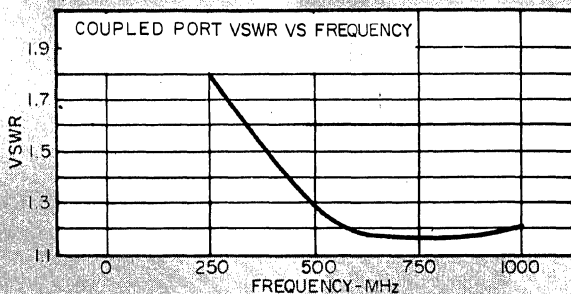
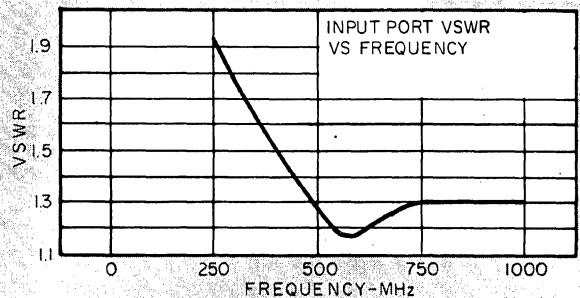
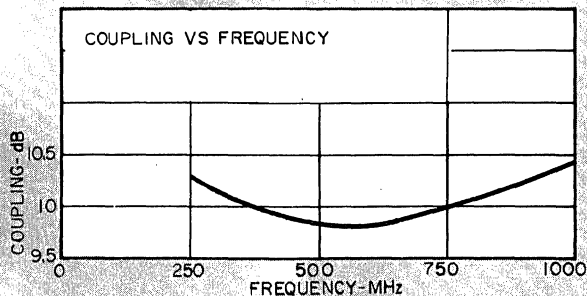
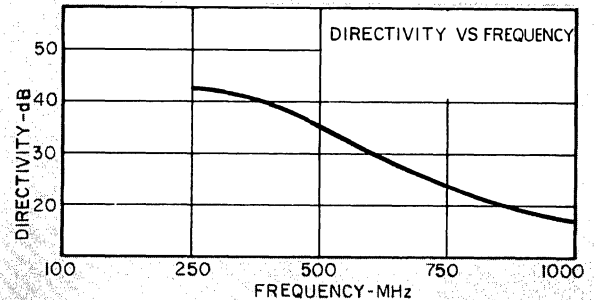
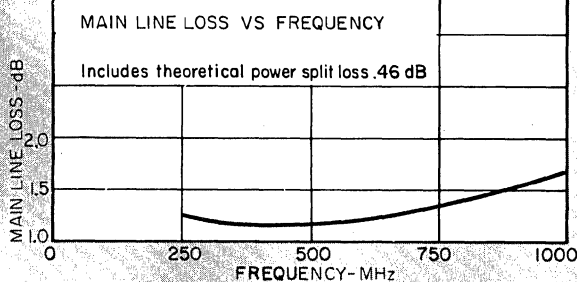
ZDC 10-2 250-1000 MHz \$34.95 (4-24)



For pin version see PDC10-1 series

ZMDC 10-2 Series

ZMDC 10-2 250-1000 MHz \$44.95 (4-24)

**FAST DELIVERY**
From stock, one week max

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

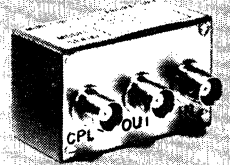
DIRECTIONAL COUPLERS

Frequency Range, MHz	MODEL ZDC 15-6/ZMDC 15-6 .01-35	
Coupling, dB (Input To Coupled Port)	15 dB $\pm$ 0.5 dB	
Coupling Flatness, dB	$\pm$ 0.5 dB	
VSWR	1.15:1 Typ.	
Impedance	50 ohms	
Directivity, dB	Typical	Minimum
Lower Band Edge To One Decade Higher	38	30
Mid Range	35	25
Upper Band Edge To One Octave Lower	28	20
Main Line Loss, dB (Includes Theoretical .14 dB Power Split Loss)	Typical	Maximum
One Octave From Band Edge	.2	.4
Total Range	.3	.6
Input Power		
Total Range (1)	4 Watts	
(1) Lower Band Edge To One Decade Higher	2 Watts	

15 dB

ZDC 15-6 Series

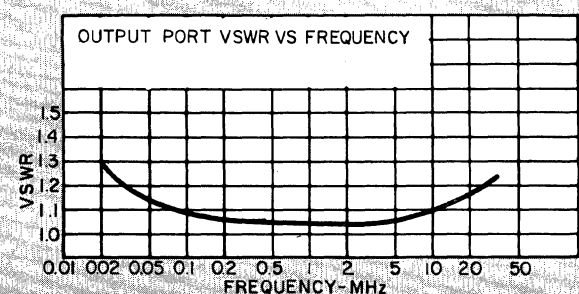
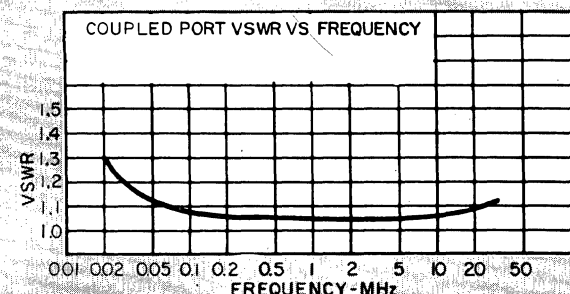
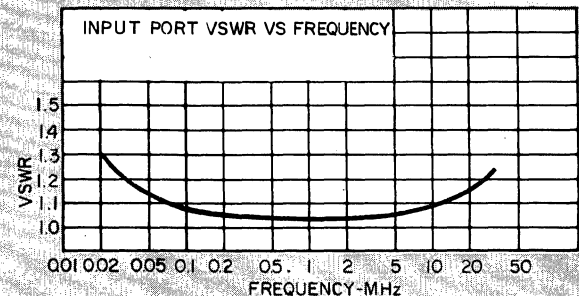
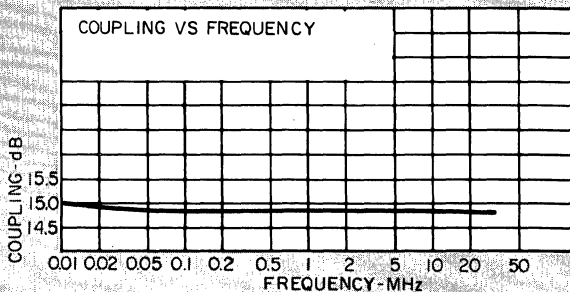
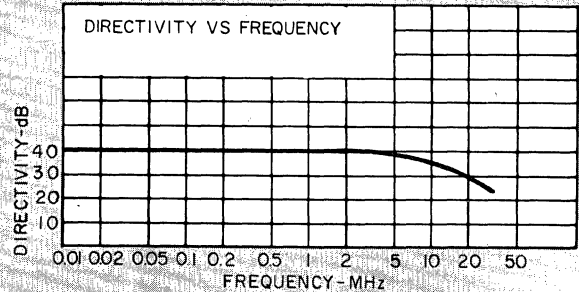
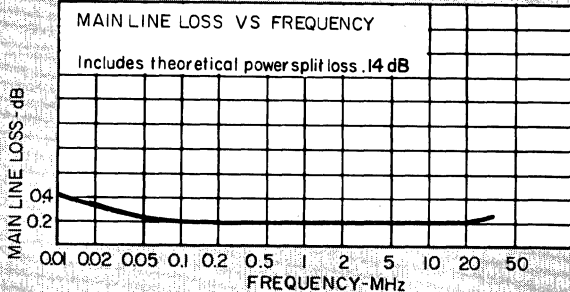
ZDC 15-6 0.01-35 MHz \$34.95 (4-24)



For pin version see PDC15-6series

ZMDC 15-6 Series

ZMDC 15-6 0.01-35 MHz \$44.95 (4-24)


FAST DELIVERY
 From stock, one week max


World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

DIRECTIONAL COUPLERS

Frequency Range, MHz

MODEL ZDC 20-1/ZMDC 20-1

25-400

Coupling, dB (Input To Coupled Port)

21 ± 0.5

Coupling Flatness, dB

± 0.5

VSWR

1.25:1 Typ.

Impedance

50 ohms

Directivity, dB

Typical Minimum

25-150 MHz

25 20

150-300 MHz

35 25

300-400 MHz

25 20

Main Line Loss, dB
(Includes Theoretical
.04 db Power Split)

Typical Maximum

25-50 MHz

0.2 0.5

50-300 MHz

0.1 0.2

300-400 MHz

0.15 0.3

Input Power

Total Range (1)

5 watts

(1) Lower Band Edge
To One Octave Higher

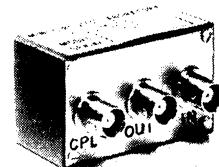
3 watts

21 dB

ZDC 20-1 Series

ZDC 20-1

25-400 MHz \$34.95 (4-24)

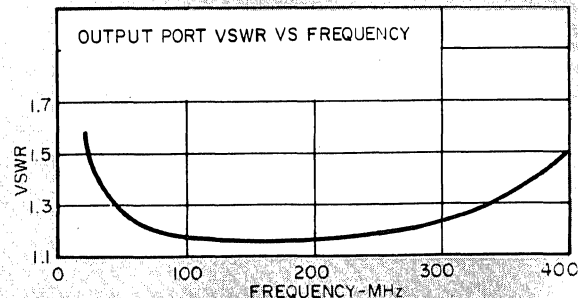
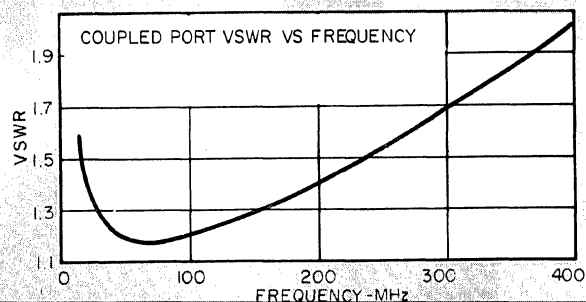
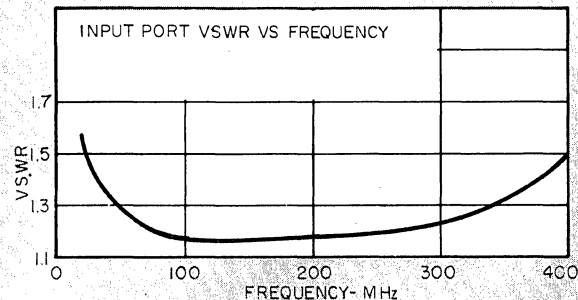
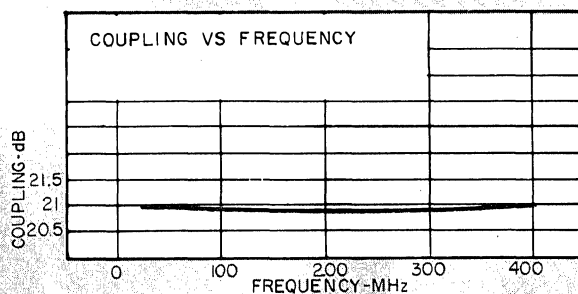
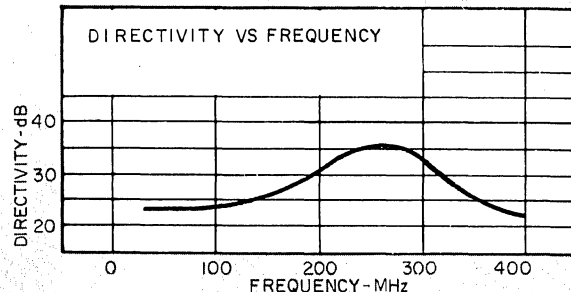
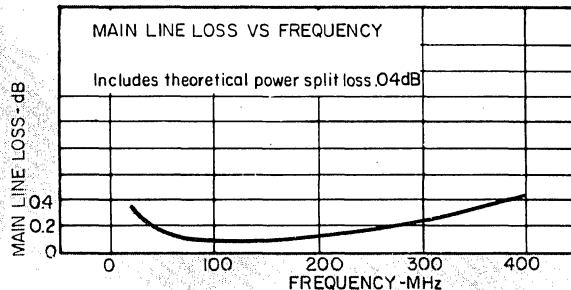


For pin version see PDC20-1 series

ZMDC 20-1 Series

ZMDC 20-1

25-400 MHz \$44.95 (4-24)

**FAST DELIVERY**
From stock, one week max

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

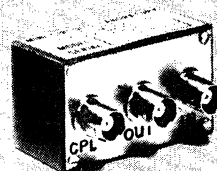
DIRECTIONAL COUPLERS

Frequency Range, MHz	MODEL ZDC 20-3/ZMDC 20-3 0.2-250	
Coupling, dB (Input To Coupled Port)	19.5±0.5	
Coupling Flatness, dB	±0.5	
VSWR	1.2:1 Typ.	
Impedance	50 ohms	
Directivity, dB	Typical	Minimum
Lower Band Edge To One Decade Higher	36	30
Mid Range	33	25
Upper Band Edge To One Octave Lower	25	20
Main Line Loss, dB (Includes Theoretical .04 dB Power Split)	Typical	Maximum
One Octave From Band Edge	0.25	0.5
Total Range	0.35	0.6
Input Power		
Total Range (1)	4 watts	
(1) Lower Band Edge To One Decade Higher	1.5 watts	

19.5 dB

ZDC 20-3 Series

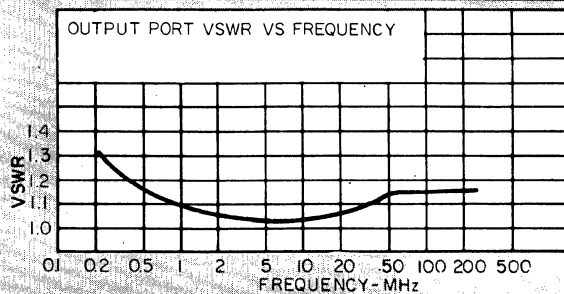
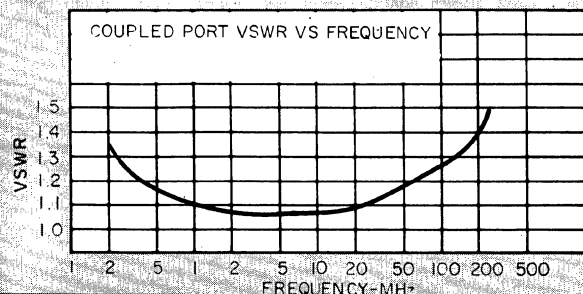
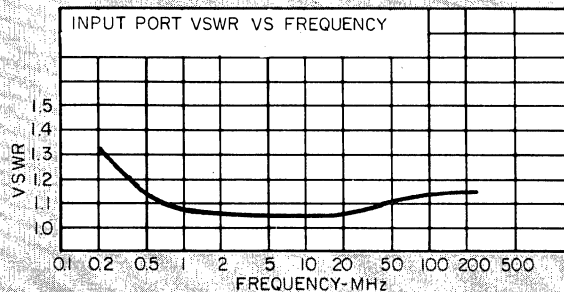
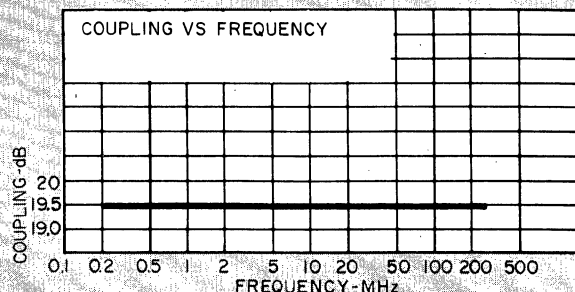
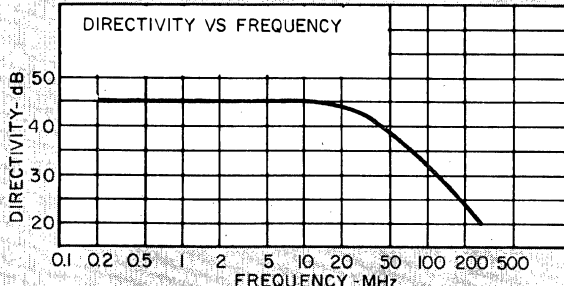
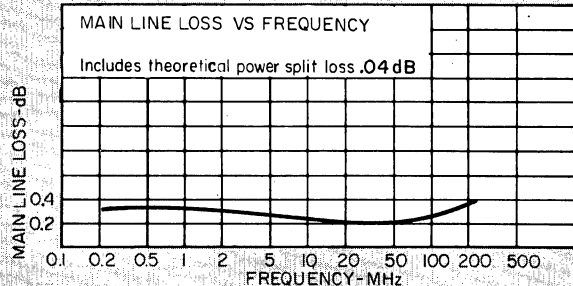
ZDC 20-3 0.2-250 MHz \$26.95 (4-24)



For pin version see PDC20-3 series

ZMDC 20-3 Series

ZMDC 20-3 0.2-250 MHz \$36.95 (4-24)


FAST DELIVERY
 From stock, one week max


World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory^{MCL}

INTRODUCTION TO PSC-2 SERIES POWER SPLITTER-COMBINERS

Two-Way (In Phase 0°)

PSC-2 Series

PSC-2-1	100 KHz-400 MHz	\$ 9.95 (6-49)
PSC-2-2	2 KHz- 60 MHz	\$19.95 (6-49)
PSC-2-1-75	250 KHz-300 MHz	\$11.95 (6-49)

FAST DELIVERY
From stock, one week max.



For connector version see ZSC-2 series

FEATURES

- MINIATURE SIZE, .128 CU. INCHES
- EXTRA WIDE BAND, 2KHz - 400MHz
- EXCEPTIONALLY GOOD BALANCE
- LOW INSERTION LOSS
- HIGH ISOLATION
- RFI SHIELDED
- HERMETICALLY SEALED METAL CASE
- LOW COST FROM \$9.95
IN SMALL QUANTITIES

APPLICATIONS

- ADD OR SUBTRACT SIGNALS VECTORIALLY
- OBTAIN MULTI IN-PHASE OUTPUT SIGNALS
PROPORTIONAL TO THE LEVEL OF A
COMMON INPUT SIGNAL
- SPLIT AN INPUT SIGNAL INTO
MULTI-OUTPUTS
- COMBINE SIGNALS FROM
DIFFERENT SOURCES TO OBTAIN
A SINGLE PORT OUTPUT
- PROVIDE CAPABILITY TO OBTAIN
RF LOGIC ARRANGEMENTS

DESCRIPTION

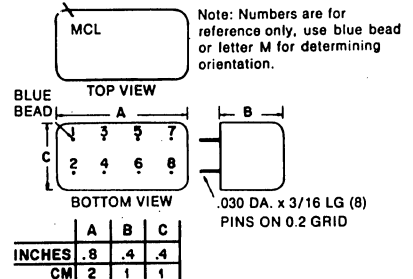
The model PSC-2 2-way power splitter/combiner is a high performance broad band hybrid junction. Internally, terminations and transformers are provided to ensure a well matched 50 ohm impedance at all ports. Signals fed into the input S port are equally divided, in phase, to the two output (1 and 2) ports. Similarly, signals fed into ports 1 and 2 are vectorially summed at the output S port.

The PSC-2 features exceptionally good amplitude and phase balance between the signals at the 2 output ports. Typically, over most of the frequency range, the phase balance is within 1 degree and the amplitude balance is within .05 dB.

The PSC-2 is ruggedly constructed to provide reliable service under severe environmental conditions. Internally, every component is bonded to the header for added strength to protect against shock and vibration. This hermetically sealed unit performs well under high relative humidity conditions and over temperature extremes from -55°C to +100°C.

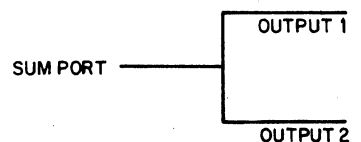
Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability. The exceptionally low cost of the PSC-2 is attributable to the breakthrough in production techniques achieved by MCL during the manufacture of its high performance low price double balanced mixers. Utilizing this technology, the high performance PSC-2 is offered at a remarkable price of 1/2 to 1/3 of competitive units.

LETTER M OVER PIN 2



WEIGHT 5.2 grams .18 ounces

PIN CONNECTIONS	PSC-2-1	PSC-2-2
SUM PORT	1	5
OUTPUT 1	5	6
OUTPUT 2	6	2,3,4,7,8
GROUND		



ABSOLUTE MAXIMUM RATINGS

Operating and Storage Temperature	-55° C to +100° C
Pin Temperature (10 seconds)	510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

POWER SPLITTER-COMBINERS

Two-Way
(In Phase 0°)

PSC-2 Series

PSC-2-1 100KHz-400MHz \$9.95 (6-49)
PSC-2-2 2KHz-60MHz \$19.95 (6-49)

FAST DELIVERY
From stock, one week max.



For connector version see ZSC-2 series

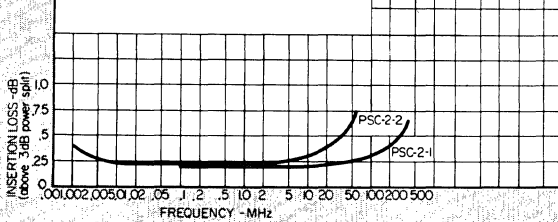
SPECIFICATIONS MODEL PSC-2-1

Frequency Range (MHz)	.1-400MHz
Nominal Phase Difference Between Output Ports	0°
Impedance, All Ports	50 ohms
Isolation Between Output 1 and 2, dB	Typical Minimum
2-40MHz	40 30
4-400MHz	25 20
1-4MHz	20 15
Insertion Loss, dB (above 3dB split)	Typical Maximum
1-100MHz	.2 .5
100-200MHz	.4 .75
200-400MHz	.6 1.0
Phase Unbalance, degrees	Typical Maximum
0.1-100MHz	.5 2
100-200MHz	1 3
200-400MHz	2 4
Amplitude Unbalance, dB	Typical Maximum
1-100MHz	.05 .15
100-200MHz	.05 .2
200-400MHz	.1 .3
VSWR	1.2 typical
Matched Power Rating	1 watt maximum
Internal Load Dissipation	1/2 watt

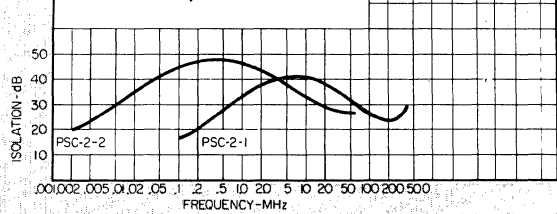
SPECIFICATIONS MODEL PSC-2-2

Frequency Range (MHz)	2KHz-60MHz
Nominal Phase Difference Between Output Ports	0°
Impedance, All Ports	50 ohms
Isolation Between Output 1 & 2, dB	Typical Minimum
15KHz-6MHz	40 30
2KHz-60MHz	27 20
Insertion Loss, dB (above 3dB split)	Typical Maximum
10KHz-3MHz	.2 .4
2KHz-20MHz	.3 .6
20MHz-60MHz	.6 1.0
Phase Unbalance, degrees	Typical Maximum
10KHz-3MHz	.5 2
2KHz-20MHz	1 3
20MHz-60MHz	2 4
Amplitude Unbalance, dB	Typical Maximum
2KHz-20MHz	.05 .15
20MHz-60MHz	.1 .3
VSWR	1.2 typical
Matched Power Rating	1 watt maximum
Internal Load Dissipation	1/2 watt

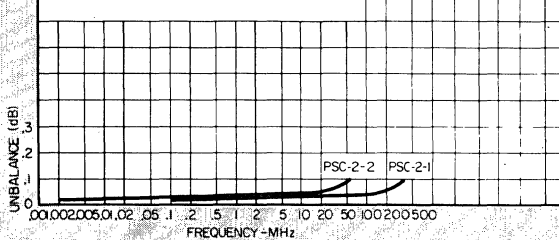
INSERTION LOSS VS FREQUENCY
MODEL PSC-2-1 PSC-2-2



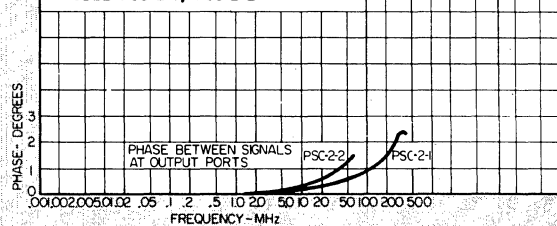
ISOLATION VS FREQUENCY
MODELS PSC-2-1, PSC-2-2



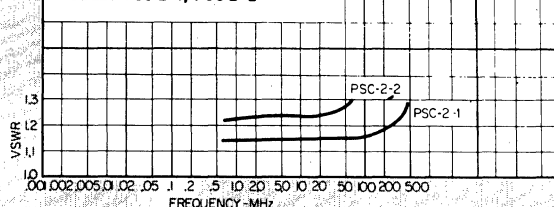
AMPLITUDE UNBALANCE VS FREQUENCY
MODELS PSC-2-1 PSC-2-2



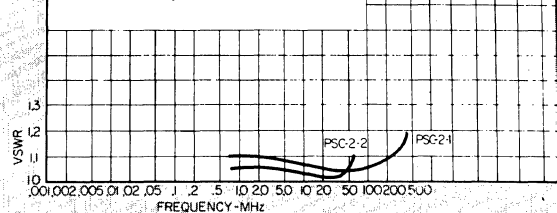
PHASE VS FREQUENCY
MODEL PSC-2-1, PSC-2-2



SUM PORT VSWR VS FREQUENCY
MODELS PSC-2-1, PSC-2-2



OUTPUT PORT VSWR VS FREQUENCY
MODELS PSC-2-1, PSC-2-2



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

POWER SPLITTER-COMBINERS

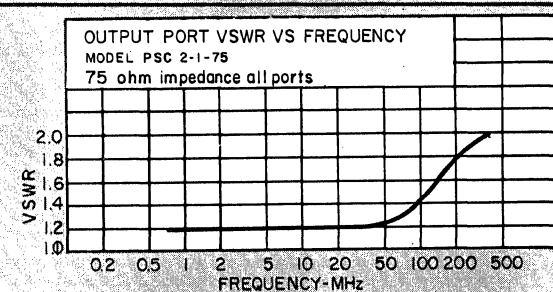
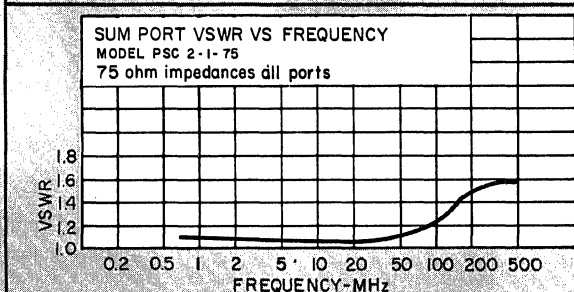
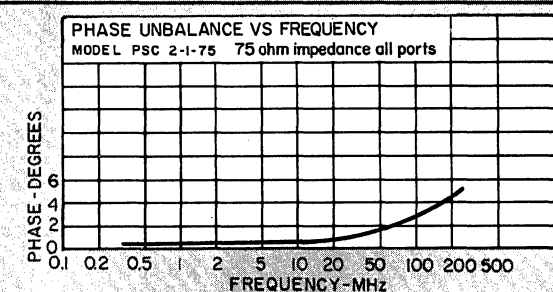
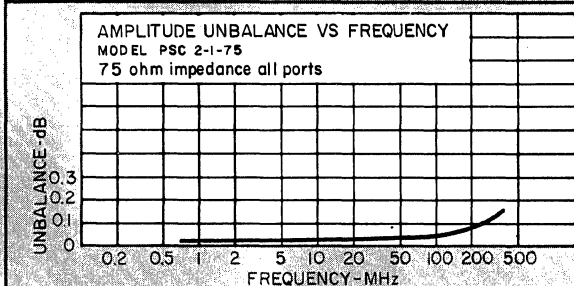
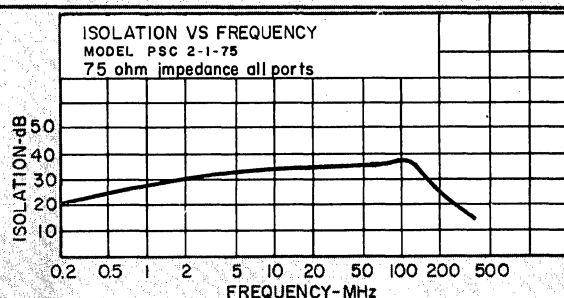
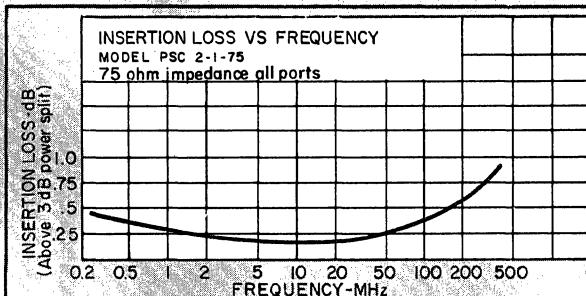
Two-Way
(In Phase 0°)

PSC-2 Series

PSC-2-1-75 250 KHz-300 MHz \$11.95 (6-49)

MODEL PSC 2-1-75			
Frequency Range (MHz)	0.25-300 MHz		
Nominal Phase Difference Between Output Ports	0°		
Impedance, All Ports	75 ohms		
Isolation Between Output 1 and 2, dB	Typical	Minimum	
10-50 MHz	40	30	
2-150 MHz	25	20	
0.25-300 MHz	20	15	
Insertion Loss, dB (above 3dB split)	Typical	Maximum	
1-50 MHz	.2	.5	
0.25-100 MHz	.4	.75	
100-300 MHz	.6	1.0	
Phase Unbalance, degrees	Typical	Maximum	
0.25-50 MHz	.5	2	
50-150 MHz	1	3	
150-300 MHz	2	5	
Amplitude Unbalance, dB	Typical	Maximum	
1-50 MHz	.05	.15	
50-150 MHz	.05	.2	
150-300 MHz	.1	.3	
VSWR	1.2 typical		
Matched Power Rating	1 watt maximum		
Internal Load Dissipation	1/8 watt		

FAST DELIVERY
From stock, one week max.



Mini-Circuits Laboratory^{MCL}

INTRODUCTION TO MSC-2 SERIES POWER SPLITTER-COMBINERS

Micro-Miniature Two-Way (In Phase 0°) MSC-2 Series

MSC-2-1 .1-450 MHz \$16.95 (6-24)

FAST DELIVERY
From stock, one week max.


FEATURES

MICRO-MINIATURE SIZE, .04 CU. INCHES

PC BOARD AREA ONLY 0.1 SQ. INCHES

WIDE BAND, 100KHz - 450MHz

EXCEPTIONALLY GOOD BALANCE

LOW INSERTION LOSS

HIGH ISOLATION

RFI SHIELDED

HERMETICALLY SEALED METAL CASE.

LOW COST FROM \$16.95
IN SMALL QUANTITIES

APPLICATIONS

ADD OR SUBTRACT SIGNALS VECTORIALLY

OBTAIN MULTI IN-PHASE OUTPUT SIGNALS
PROPORTIONAL TO THE LEVEL OF A
COMMON INPUT SIGNALSPLIT AN INPUT SIGNAL INTO
MULTI-OUTPUTSCOMBINE SIGNALS FROM
DIFFERENT SOURCES TO OBTAIN
A SINGLE PORT OUTPUTPROVIDE CAPABILITY TO OBTAIN
RF LOGIC ARRANGEMENTS

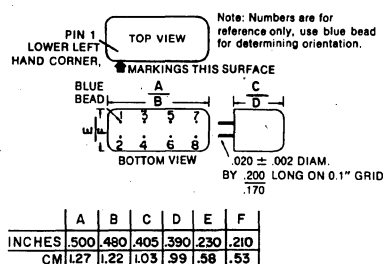
DESCRIPTION

The model MSC-2 2-way power splitter/combiner is a high performance broad band hybrid junction. Internally, terminations and transformers are provided to ensure a well matched 50 ohm impedance at all ports. Signals fed into the input S port are equally divided, in phase, to the two output (1 and 2) ports. Similarly, signals fed into ports 1 and 2 are vectorially summed at the output S port.

The MSC-2 features exceptionally good amplitude and phase balance between the signals at the 2 output ports. Typically, over most of the frequency range, the phase balance is within 1 degree and the amplitude balance is within .05 dB.

The MSC-2 is ruggedly constructed to provide reliable service under severe environmental conditions. Internally, every component is bonded to the header for added strength to protect against shock and vibration. This hermetically sealed unit performs well under high relative humidity conditions and over temperature extremes from -55° C to +100° C.

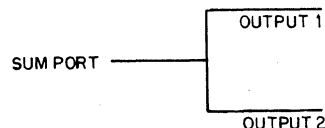
Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability. The exceptionally low cost of the MSC-2 is attributable to the breakthrough in production techniques achieved by MCL during the manufacture of its high performance low price double balanced mixers. Utilizing this technology, the high performance MSC-2 is offered at a remarkable price of 1/2 to 1/3 of competitive units.



WEIGHT 1.9 grams .07 ounces

PIN CONNECTIONS

	MSC-2-1
SUM PORT	1
OUTPUT 1	5
OUTPUT 2	6
GROUND	2,3,4,7,8



ABSOLUTE MAXIMUM RATINGS

Operating and Storage Temperature	-55° C to +100° C
Pin Temperature (10 seconds)	510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

POWER SPLITTER-COMBINERS

SPECIFICATIONS MODEL MSC-2-1

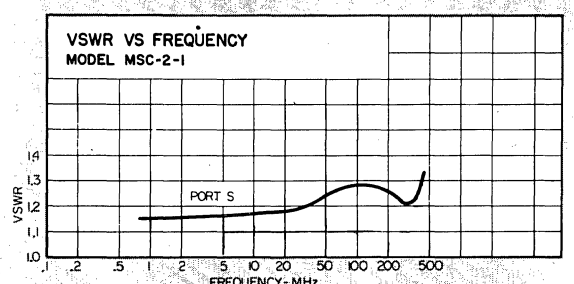
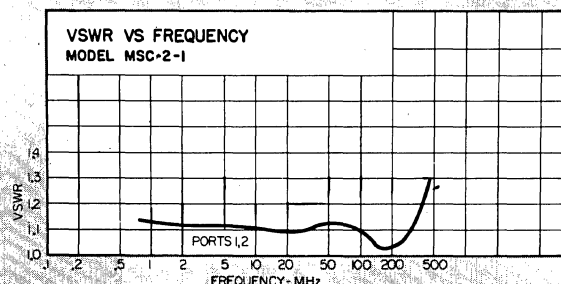
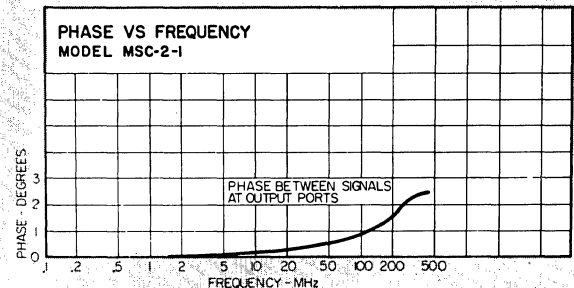
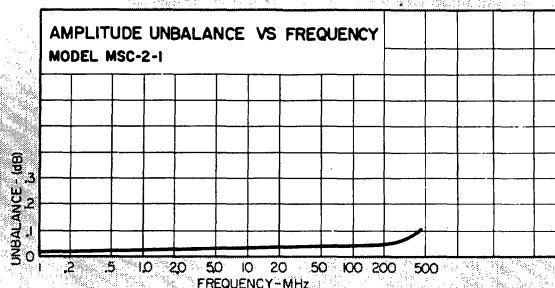
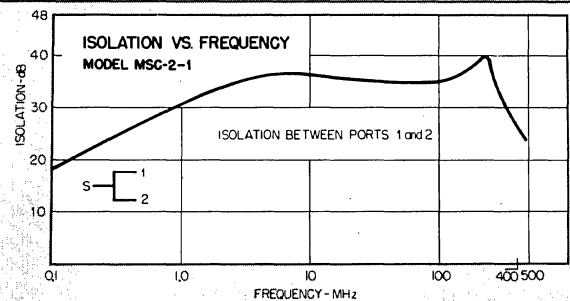
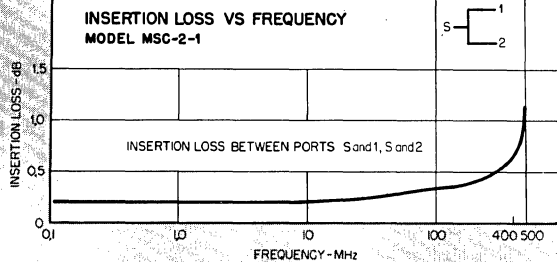
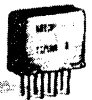
Frequency Range (MHz)	0.1-450MHz	
Nominal Phase Difference Between Output Ports	0°	
Impedance, All Ports	50 ohms	
Isolation, dB, Between Output 1 and 2	Typical	Minimum
2-250MHz	35	30
0.4-450MHz	30	20
0.1-0.4MHz	20	15
Insertion Loss, dB (above 3dB split)	Typical	Maximum
20-100MHz	.3	.5
100-250MHz	.4	.75
200-450MHz	.6	1.0
Phase Unbalance, degrees	Typical	Maximum
0.1-100MHz	.5	2
100-200MHz	1	3
200-400MHz	2	4
Amplitude Unbalance, dB	Typical	Maximum
.1-100MHz	.05	.15
100-200MHz	.05	.2
200-450MHz	.1	.3
VSWR	1.2 typical	
Matched Power Rating	1 watt maximum	
Internal Load Dissipation	1/8 watt	

Micro-Miniature Two-Way

(In Phase 0°)

MSC-2 Series

MSC-2-1 .1-450 MHz \$16.95 (6-24)

FAST DELIVERY
 From stock, one week max.


World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

INTRODUCTION TO ZSC-2 ZMSC-2 SERIES POWER SPLITTER-COMBINERS

FEATURES

BROAD FREQUENCY RANGE
2 kHz - 400 MHz

EXCEPTIONALLY GOOD BALANCE

LOW INSERTION LOSS

HIGH ISOLATION

DIE-CAST ALUMINUM CASE

LOW COST FROM \$24.95
IN SMALL QUANTITIES

APPLICATIONS

ADD OR SUBTRACT SIGNALS
VECTORIALLY

OBTAIN MULTI IN-PHASE OUTPUT
SIGNALS PROPORTIONAL TO THE
LEVEL OF A COMMON INPUT SIGNAL

SPLIT AN INPUT SIGNAL INTO
MULTI-OUTPUTS

COMBINE SIGNALS FROM
DIFFERENT SOURCES TO OBTAIN
A SINGLE PORT OUTPUT

PROVIDE CAPABILITY TO OBTAIN
RF LOGIC ARRANGEMENTS

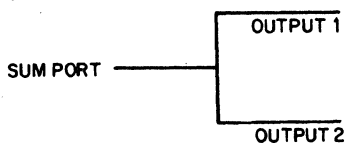
DESCRIPTION

The model ZSC-2/ZMSC-2 2-way power splitter/combiner is a high performance broad band hybrid junction. Internally, terminations and transformers are provided to ensure a well matched 50 ohm impedance at all ports. Signals fed into the input S port are equally divided, in phase, to the two output (1 and 2) ports. Similarly, signals fed into ports 1 and 2 are vectorially summed at the output S port.

The ZSC-2/ZMSC-2 features exceptionally good amplitude and phase balance between the signals at the 2 output ports. Typically, over most of the frequency range, the phase balance is within 1 degree and the amplitude balance is within .05 dB.

Housed in a die cast aluminum case, these rugged units are double shielded to meet your tough EMI requirements. The case is finished with a blue baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability. The exceptionally low cost of the ZSC-2/ZMSC-2 is attributable to the breakthrough in production techniques achieved by MCL during the manufacture of its high performance low price double balanced mixers. Utilizing this technology, the high performance ZSC-2/ZMSC-2 is offered at a remarkable price of 1/2 to 1/3 of competitive units.



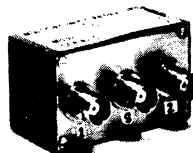
ABSOLUTE MAXIMUM RATINGS

Operating and Storage Temperature —55° C to +100° C

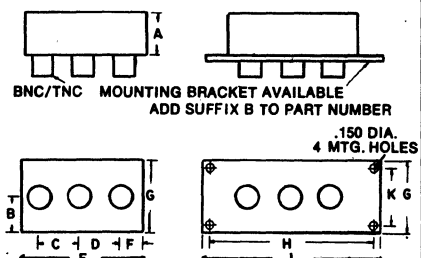
Two-Way
(In Phase 0°)

ZSC-2 Series (Standard Size)

ZSC-2-1 100KHz-400MHz (4-24) \$24.95
ZSC-2-2 2KHz-60MHz (4-24) \$34.95



For pin version see PSC-2 series



	A	B	C	D	E	F	G	H	J	K
INCHES	1.15	.63	.750	.730	.225	.385	1.40	.295	3.25	1.10
CM	2.9	1.6	1.9	1.85	5.7	9.77	3.55	7.49	8.25	2.8

WEIGHT 74.0 grams 2.60 ounces

CONNECTORS

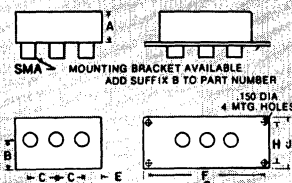
BNC standard
TNC on request

ZMSC-2 Series (Miniature Size)

ZMSC-2-1 100KHz-400MHz (4-24) \$34.95
ZMSC-2-2 2KHz-60MHz (4-24) \$44.95



For pin version see PSC-2 series



	A	B	C	D	E	F	G	H	J
INCHES	0.88	0.66	0.38	1.50	.312	2.19	2.50	0.84	1.15
CM	2.2	1.7	1.1	3.8	.79	5.56	6.35	2.1	2.9

WEIGHT 34.0 grams 1.02 ounces

CONNECTORS SMA (3mm) standard

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

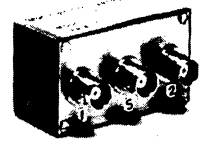
POWER SPLITTER-COMBINERS

Two-Way
(In Phase 0°)

ZSC-2 Series

ZSC-2-1 100KHz-400MHz \$24.95 (4-24)

ZSC-2-2 2KHz-60MHz \$34.95 (4-24)

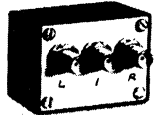


For pin version see PSC-2 series

ZMSC-2 Series

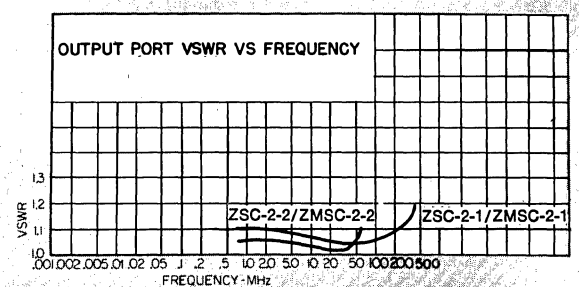
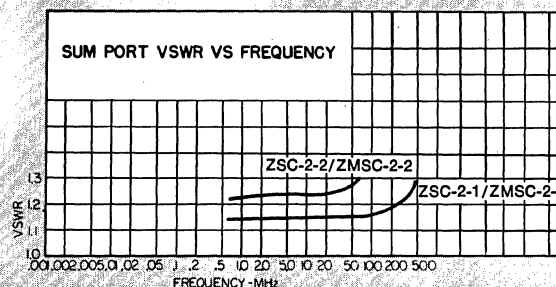
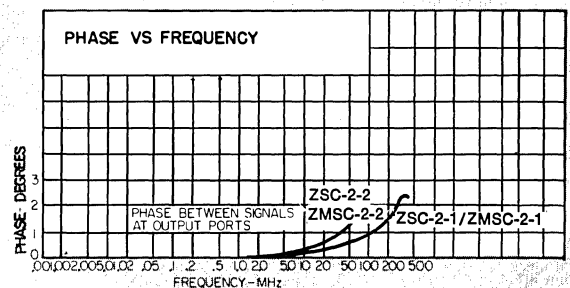
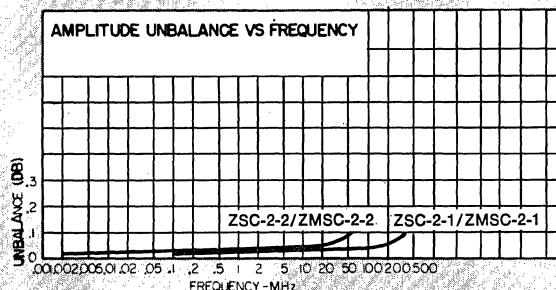
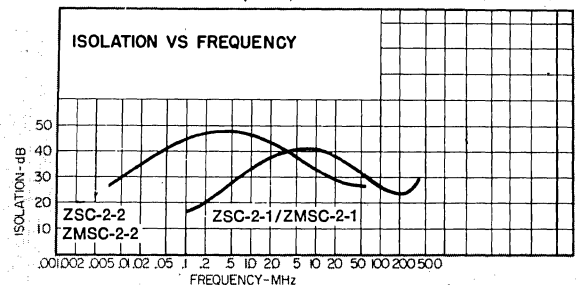
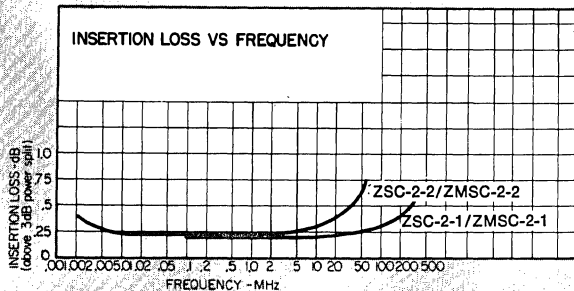
ZMSC-2-1 100KHz-400MHz \$34.95 (4-24)

ZMSC-2-2 2KHz-60MHz \$44.95 (4-24)

**FAST DELIVERY**
From stock, one week max.

SPECIFICATIONS	MODEL
Frequency Range (MHz)	ZSC-2-1/ZMSC-2-1 .1-400MHz
Nominal Phase Difference Between Output Ports	0°
Impedance, All Ports	50 ohms
Isolation Between Output 1 and 2, dB	Typical Minimum
2-40MHz	40 30
.4-400MHz	25 20
.1-4MHz	20 15
Insertion Loss, dB (above 3dB split)	Typical Maximum
.1-100MHz	.2 .5
100-200MHz	.4 .75
200-400MHz	.6 1.0
Phase Unbalance, degrees	Typical Maximum
0.1-100MHz	.5 2
100-200MHz	1 3
200-400MHz	2 4
Amplitude Unbalance, dB	Typical Maximum
.1-100MHz	.05 .15
100-200MHz	.05 .2
200-400MHz	.1 .3
VSWR	1.2 typical
Matched Power Rating	1 watt maximum
Internal Load Dissipation	¼ watt

SPECIFICATIONS	MODEL
Frequency Range (MHz)	ZSC-2-2/ZMSC-2-2 2KHz-60MHz
Nominal Phase Difference Between Output Ports	0°
Impedance, All Ports	50 ohms
Isolation Between Output 1 & 2, dB	Typical Minimum
15KHz-6MHz	40 30
4KHz-60MHz	27 20
Insertion Loss, dB (above 3dB split)	Typical Maximum
10KHz-3MHz	.2 .4
2KHz-20MHz	.3 .6
20MHz-60MHz	.6 1.0
Phase Unbalance, degrees	Typical Maximum
10KHz-3MHz	.5 2
2KHz-20MHz	1 3
20MHz-60MHz	2 4
Amplitude Unbalance, dB	Typical Maximum
2KHz-20MHz	.05 .15
20MHz-60MHz	.1 .3
VSWR	1.2 typical
Matched Power Rating	1 watt maximum
Internal Load Dissipation	¼ watt



World's largest supplier of double balanced mixers
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

INTRODUCTION TO PSC J-2 SERIES POWER SPLITTER-COMBINERS

Two-Way
(OUT OF PHASE 180°)

PSC J-2 Series

PSCJ-2-1 1-200 MHz \$19.95 (5-49)

FAST DELIVERY
From stock; one week max.



For connector version see ZSCJ-2 series

FEATURES

MINIATURE SIZE, .128 CU. INCHES

WIDE BAND, 1-200 MHz

EXCEPTIONALLY GOOD BALANCE

LOW INSERTION LOSS

HIGH ISOLATION

RFI SHIELDED

HERMETICALLY SEALED METAL CASE

LOW COST FROM \$19.95
IN SMALL QUANTITIES

APPLICATIONS

ADD OR SUBTRACT SIGNALS VECTORIALLY

OBTAIN MULTI 180° OUTPUT SIGNALS
PROPORTIONAL TO THE LEVEL OF A
COMMON INPUT SIGNAL

SPLIT AN INPUT SIGNAL INTO
MULTI-OUTPUTS

COMBINE SIGNALS FROM
DIFFERENT SOURCES TO OBTAIN
A SINGLE PORT OUTPUT

PROVIDE CAPABILITY TO OBTAIN
RF LOGIC ARRANGEMENTS

DESCRIPTION

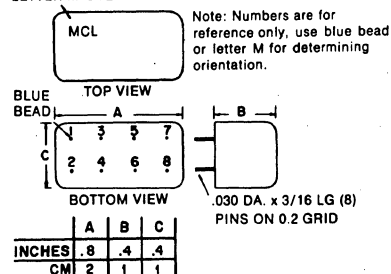
The model PSCJ-2 2-way power splitter/combiner is a high performance broad band hybrid junction. Internally, terminations and transformers are provided to ensure a well matched 50 ohm impedance at all ports. Signals fed into the input S port are equally divided, 180° out of phase to the two output (1 and 2) ports. Similarly, signals fed into ports 1 and 2 are vectorially summed at the output S port.

The PSCJ-2 features exceptionally good amplitude and 180° phase between the signals at the 2 output ports. Typically, over most of the frequency range, the phase balance is within 1 degree and the amplitude balance is within .05 dB.

The PSCJ-2 is ruggedly constructed to provide reliable service under severe environmental conditions. Internally, every component is bonded to the header for added strength to protect against shock and vibration. This hermetically sealed unit performs well under high relative humidity conditions and over temperature extremes from -55° C to +100° C.

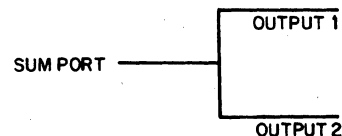
Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability. The exceptionally low cost of the PSCJ-2 is attributable to the breakthrough in production techniques achieved by MCL during the manufacture of its high performance low price double balanced mixers. Utilizing this technology, the high performance PSCJ-2 is offered at a remarkable price of 1/3 to 1/5 of competitive units.

LETTER M OVER PIN 2



WEIGHT 5.2 grams .18 ounces

PIN CONNECTIONS	PSCJ-2-1
SUM PORT	1
OUTPUT 1	5
OUTPUT 2	6
GROUND	2,3,4,7,8



ABSOLUTE MAXIMUM RATINGS

Operating and Storage Temperature	-55° C to +100° C
Pin Temperature (10 seconds)	510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

 **Mini-Circuits Laboratory**

POWER SPLITTER-COMBINERS

Two-Way

(OUT OF PHASE 180°)

PSCJ-2 Series

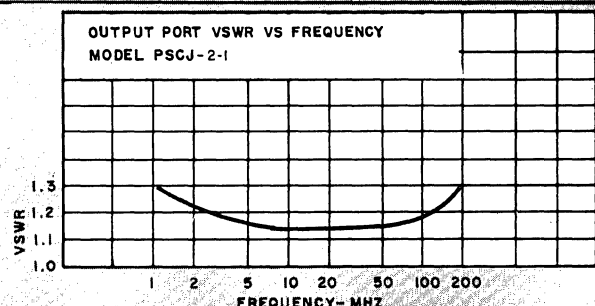
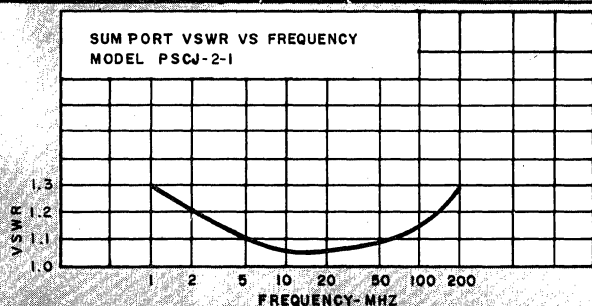
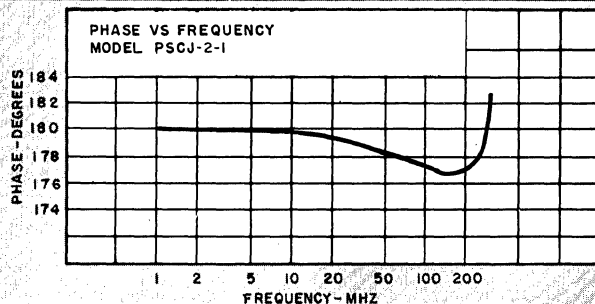
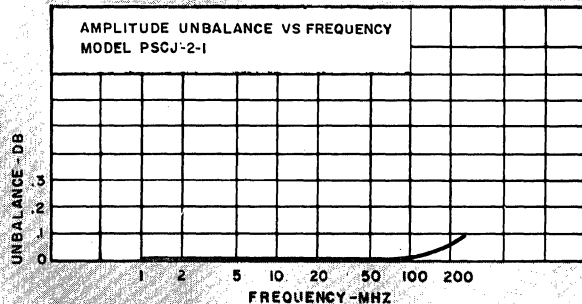
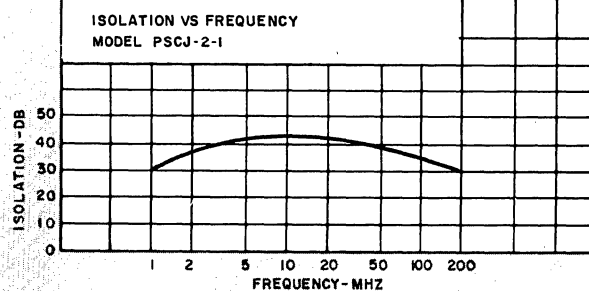
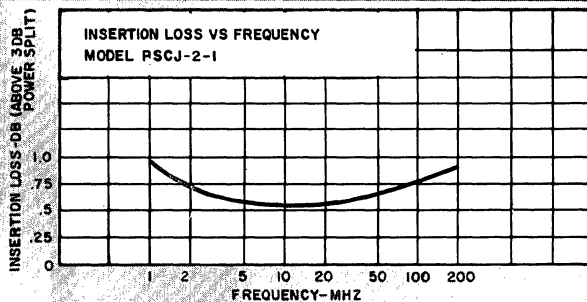
PSCJ-2-I 1-200MHz \$19.95 (5-49)

SPECIFICATIONS
MODEL PSCJ-2-I

Frequency Range (MHz)	1-200MHz	
Nominal Phase Difference Between Output Ports	180°	
Impedance, All Ports	50 ohms	
Isolation Between Output 1 and 2, dB	Typical	Minimum
1-5 MHz	35	25
5-50 MHz	40	30
50-200 MHz	35	25
Insertion Loss, dB (above 3dB split)	Typical	Maximum
1-5 MHz	0.75	1.0
5-50 MHz	0.6	0.8
50-200 MHz	0.75	1.0
Phase Deviation from 180°	Typical	Maximum
1-50 MHz	1.0	2.5
50-200 MHz	2.0	4.0
Amplitude Unbalance, dB	Typical	Maximum
1-100MHz	.05	.15
100-200MHz	.05	.2
VSWR	1.2 typical	
Matched Power Rating	1 watt maximum	
Internal Load Dissipation	1/8 watt	

FAST DELIVERY
 From stock, one week max.


For connector version see ZSCJ-2 series



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

INTRODUCTION TO ZSCJ-2 ZMSCJ-2 SERIES POWER SPLITTER-COMBINERS

FEATURES

BROAD FREQUENCY RANGE
1-200 MHz

EXCEPTIONALLY GOOD BALANCE

LOW INSERTION LOSS

HIGH ISOLATION

DIE-CAST ALUMINUM CASE

LOW COST FROM \$34.95
IN SMALL QUANTITIES

APPLICATIONS

ADD OR SUBTRACT SIGNALS
VECTORIALLY

OBTAIN MULTI 180° OUTPUT
SIGNALS PROPORTIONAL TO THE
LEVEL OF A COMMON INPUT SIGNAL

SPLIT AN INPUT SIGNAL INTO
MULTI-OUTPUTS

COMBINE SIGNALS FROM
DIFFERENT SOURCES TO OBTAIN
A SINGLE PORT OUTPUT

PROVIDE CAPABILITY TO OBTAIN
RF LOGIC ARRANGEMENTS

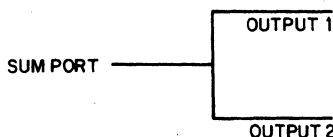
DESCRIPTION

The model ZSCJ-2/ZMSCJ-2 2-way power splitter/combiner is a high performance broad band hybrid junction. Internally, terminations and transformers are provided to ensure a well matched 50 ohm impedance at all ports. Signals fed into the input S port are equally divided, 180° out of phase to the two output (1 and 2) ports. Similarly, signals fed into ports 1 and 2 are vectorially summed at the output S port.

The ZSCJ-2/ZMSCJ-2 features exceptionally good amplitude and 180° phase between the signals at the 2 output ports. Typically, over most of the frequency range, the phase balance is within 1 degree and the amplitude balance is within .05 dB.

The ZSCJ-2/ZMSCJ-2 is ruggedly constructed to provide reliable service under severe environmental conditions. Internally, every component is bonded to the header for added strength to protect against shock and vibration. This hermetically sealed unit performs well under high relative humidity conditions and over temperature extremes from -55°C to +100°C.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability. The exceptionally low cost of the ZSCJ-2/ZMSCJ-2 is attributable to the breakthrough in production techniques achieved by MCL during the manufacture of its high performance low price double balanced mixers. Utilizing this technology, the high performance ZSCJ-2/ZMSCJ-2 is offered at a remarkable price of 1/3 to 1/5 of competitive units.



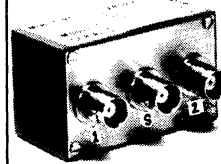
ABSOLUTE MAXIMUM RATINGS

Operating and Storage Temperature -55° C to +100° C

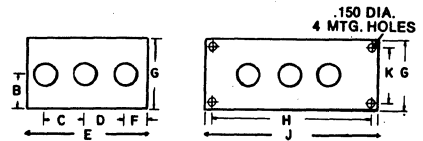
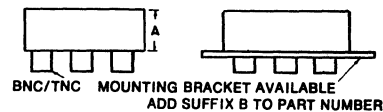
Two-Way (Out of Phase 180°)

ZSCJ-2 Series (Standard Size)

ZSCJ 2-1 1-200 MHz \$34.95 (5-49)



For pin version see PSCJ-2 series



	A	B	C	D	E	F	G	H	J	K
INCHES	1.15	.63	.750	.730	.225	.385	1.40	.295	.325	1.10
CM	2.9	1.6	1.9	1.85	5.7	9.77	35.5	7.49	8.25	2.8

WEIGHT 74.0 grams 2.60 ounces

CONNECTORS

BNC standard

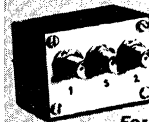
TNC on request

SMA (3mm) see miniature IC style

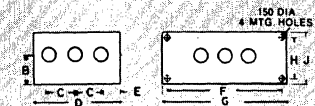
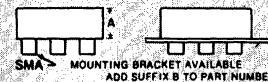
Two-Way Out of Phase 180° (Miniature Size)

Series ZMSCJ-2

ZMSCJ-2-1 1-200 MHz \$44.95 (5-49)



For pin version see PSCJ-2 series



	A	B	C	D	E	F	G	H	J
INCHES	0.88	0.66	0.36	1.50	3.12	2.19	2.50	0.84	1.15
CM	2.2	1.7	1.1	3.8	7.9	5.56	6.35	2.1	2.9

WEIGHT 34.0 grams 1.02 ounces

CONNECTORS

SMA (3mm) standard

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory ^{MCL}

POWER SPLITTER-COMBINERS

SPECIFICATIONS

MODEL ZSCJ-2-1/ZMSCJ-2-1

Frequency Range (MHz) 1-200MHz

Nominal Phase Difference
Between Output Ports 180°

Impedance, All Ports 50 ohms

Isolation Between Output 1 and 2, dB	Typical	Minimum
1-5 MHz	35	25
5-50 MHz	40	30
50-200 MHz	35	25

Insertion Loss, dB (above 3dB split)	Typical	Maximum
1-5 MHz	0.75	1.0
5-50 MHz	0.6	0.8
50-200 MHz	0.75	1.0

Phase Deviation from 180°	Typical	Maximum
1-50 MHz	1.0	2.5
50-200 MHz	2.0	4.0

Amplitude Unbalance, dB	Typical	Maximum
1-100 MHz	.05	.15
100-200 MHz	.05	.2

VSWR 1.2 typical

Matched Power Rating 1 watt maximum

Internal Load Dissipation 1/8 watt

Two-Way

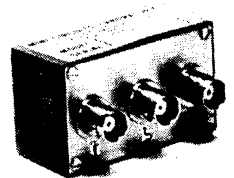
(Out of Phase 180°)

ZSCJ-2 Series

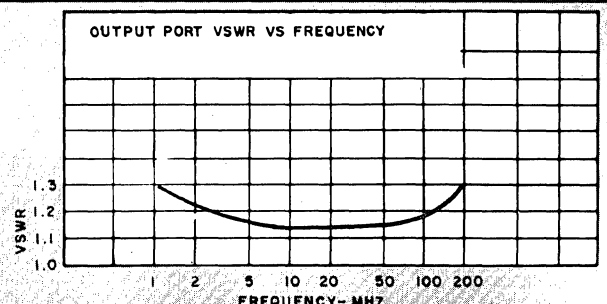
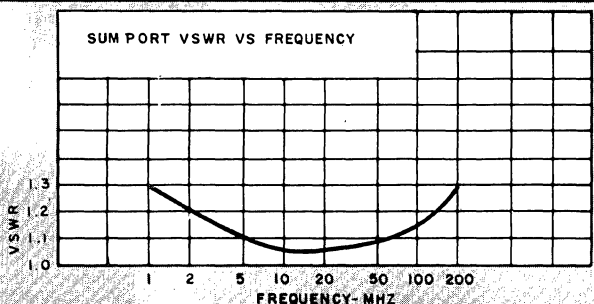
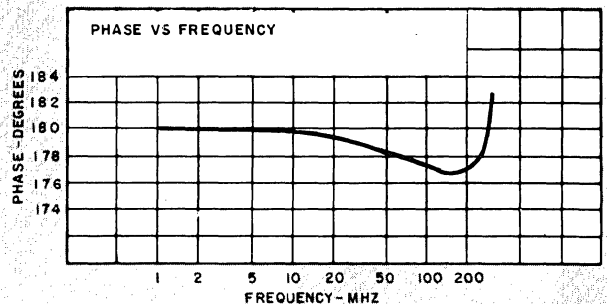
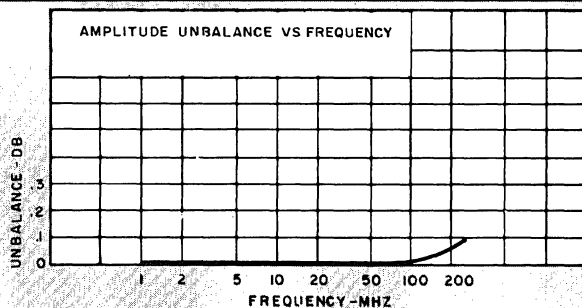
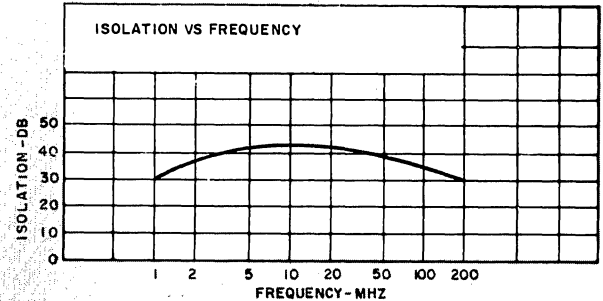
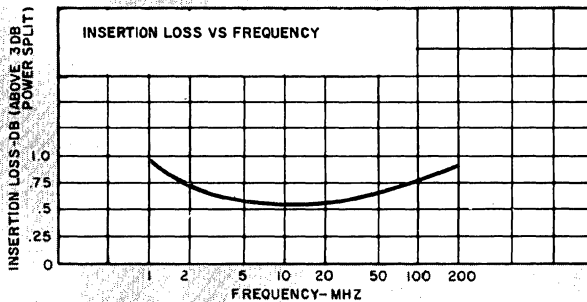
ZSCJ-2-1 1-200 MHz \$34.95 (5-49)

ZMSCJ-2 Series

ZMSCJ-2-1 1-200 MHz \$44.95 (5-49)



For pin version version see PSCJ-2 series

FAST DELIVERY
From stock, one week max.

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MCL Mini-Circuits Laboratory

INTRODUCTION TO PSC-3 SERIES POWER SPLITTER-COMBINERS

Three-Way (In Phase 0°)

PSC-3 Series

PSC-3-1	1-200 MHz	\$19.95 (6-49)
PSC-3-2	.01- 30 MHz	\$29.95 (6-49)

FAST DELIVERY
From stock, one week max.



For connector version see ZSC-3 series

FEATURES

- MINIATURE SIZE, .128 CU. INCHES
- WIDE BAND, 10KHz - 200MHz
- EXCEPTIONALLY GOOD BALANCE
- LOW INSERTION LOSS
- HIGH ISOLATION
- RFI SHIELDED
- HERMETICALLY SEALED METAL CASE
- LOW COST FROM \$19.95
IN SMALL QUANTITIES

APPLICATIONS

- ADD OR SUBTRACT SIGNALS VECTORIALLY
- OBTAIN MULTI IN-PHASE OUTPUT SIGNALS
PROPORTIONAL TO THE LEVEL OF A
COMMON INPUT SIGNAL
- SPLIT AN INPUT SIGNAL INTO
MULTI-OUTPUTS
- COMBINE SIGNALS FROM
DIFFERENT SOURCES TO OBTAIN
A SINGLE PORT OUTPUT
- PROVIDE CAPABILITY TO OBTAIN
RF LOGIC ARRANGEMENTS

DESCRIPTION

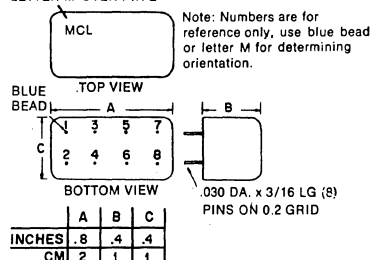
The PSC-3 series 3-way power splitter/combiner is a high performance broad-band hybrid junction. Internally, terminations and transformers are provided to ensure a well matched 50 ohm impedance at all ports. Signals fed into the input S port are equally divided, in phase, to the three output (1, 2, and 3) ports. Similarly, signals fed into ports 1, 2 and 3 are vectorially summed at the output S port.

The PSC-3 series features exceptionally good amplitude and phase balance between the signals at the 3 output ports. Typically, over most of the frequency range, the phase balance is within 1 degree and the amplitude balance is within .05 dB.

The PSC-3 series is ruggedly constructed to provide reliable service under severe environmental conditions. Internally, every component is bonded to the header for added strength to protect against shock and vibration. This hermetically sealed unit performs well under high relative humidity conditions and over temperature extremes from -55° C to +100° C.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability. The exceptionally low cost of the PSC-3 series is attributable to the breakthrough in production techniques achieved by MCL during the manufacture of its high performance low price double balanced mixer. Utilizing this technology, the high performance PSC-3 series is offered at a remarkable price of 1/2 to 1/3 the cost of competitive units.

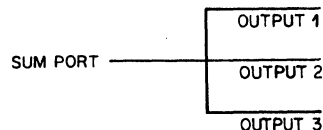
LETTER M OVER PIN 2



WEIGHT 5.2 grams .18 ounces

PIN CONNECTIONS

	PSC-3-1	PSC-3-2
SUM PORT	6	6
OUTPUT 1	1	1
OUTPUT 2	2	2
OUTPUT 3	5	5
GROUND	3,4,7,8	3,4,7,8



ABSOLUTE MAXIMUM RATINGS

Operating and Storage Temperature	-55° C to +100° C
Pin Temperature (10 seconds)	510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

POWER SPLITTER-COMBINERS

Three-Way
(In Phase 0°)

PSC-3 Series

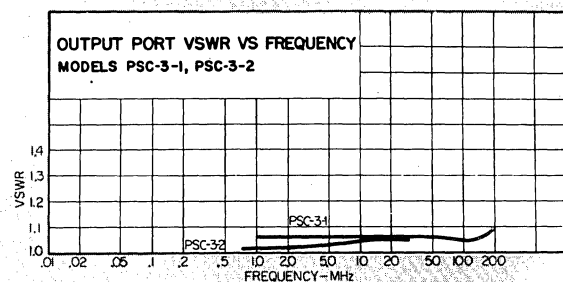
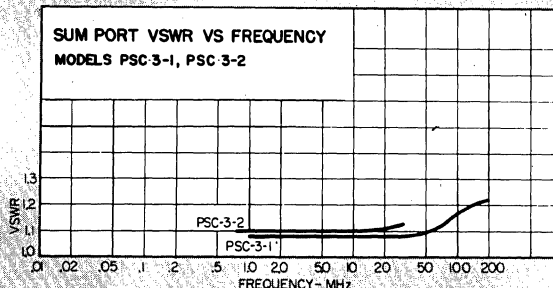
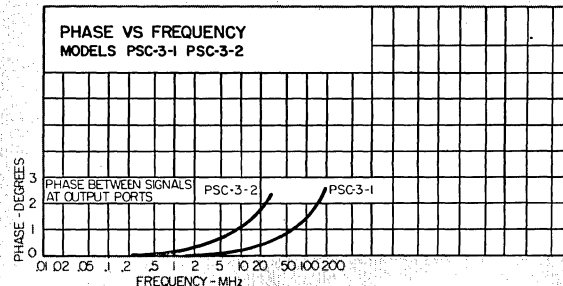
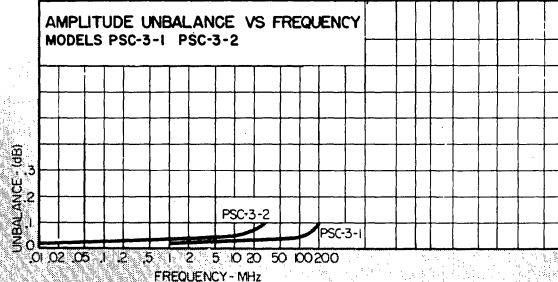
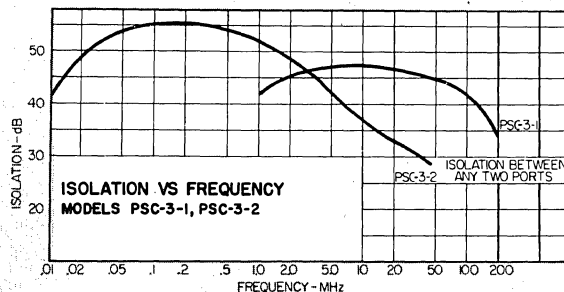
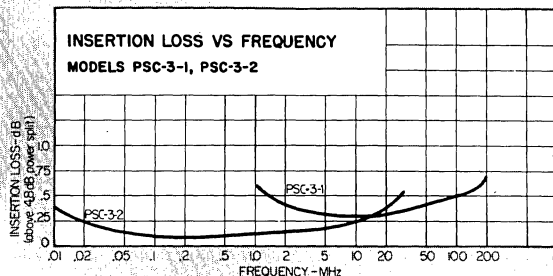
PSC-3-1	1-200 MHz	\$19.95 (6-49)
PSC-3-2	.01- 30 MHz	\$29.95 (6-49)

FAST DELIVERY
From stock, one week max.


For connector version see ZSC-3 series

SPECIFICATIONS		MODEL PSC-3-1	
Frequency Range (MHz)		1-200	
Nominal Phase Difference Between Output Ports		0°	
Impedance, All Ports		50 ohms	
Isolation (dB) Between Outputs 1, 2, and 3		Typical	Minimum
1-50 MHz		45	35
50-200 MHz		40	30
Insertion Loss, dB (above 4.8dB split)		Typical	Maximum
3-30 MHz		.3	.5
1.5-100 MHz		.4	.7
1-200 MHz		.6	.85
Phase Unbalance, degrees		Typical	Maximum
1-100 MHz		1	2
100-200 MHz		2	4
Amplitude Unbalance, dB		Typical	Maximum
1-10 MHz		.05	.15
10-100 MHz		.05	.2
100-200 MHz		.1	.3
VSWR		1.1 typical	
Matched Power Rating		1 watt maximum	
Internal Load Dissipation		3/8 watt	

SPECIFICATIONS		MODEL PSC-3-2	
Frequency Range (MHz)		.01-30	
Nominal Phase Difference Between Output Ports		0°	
Impedance, All Ports		50 ohms	
Isolation (dB) Between Outputs 1, 2, and 3		Typical	Minimum
.01-5 MHz		45	35
5-30 MHz		40	30
Insertion Loss, dB (above 4.8dB split)		Typical	Maximum
.05-5 MHz		.15	.3
.01-15 MHz		.25	.45
15-30 MHz		.45	.75
Phase Unbalance, degrees		Typical	Maximum
.01-10 MHz		1	2
10-30 MHz		2	4
Amplitude Unbalance, dB		Typical	Maximum
1-100 MHz		.05	.2
1-200 MHz		.1	.3
VSWR		1.1 typical	
Matched Power Rating		1 watt maximum	
Internal Load Dissipation		3/8 watt	



World's largest supplier of double balanced mixers

Mini Circuits Laboratory, 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory^{MCL}

INTRODUCTION TO ZSC-3 ZMSC-3 SERIES POWER SPLITTER-COMBINERS

FEATURES

BROAD FREQUENCY RANGE
10 KHz - 200 MHz

EXCEPTIONALLY GOOD BALANCE

LOW INSERTION LOSS

HIGH ISOLATION

DIE-CAST ALUMINUM CASE

LOW COST FROM \$34.95
IN SMALL QUANTITIES

APPLICATIONS

ADD OR SUBTRACT SIGNALS
VECTORIALLY

OBTAIN MULTI IN-PHASE OUTPUT
SIGNALS PROPORTIONAL TO THE
LEVEL OF A COMMON INPUT SIGNAL

SPLIT AN INPUT SIGNAL INTO
MULTI-OUTPUTS

COMBINE SIGNALS FROM
DIFFERENT SOURCES TO OBTAIN
A SINGLE PORT OUTPUT

PROVIDE CAPABILITY TO OBTAIN
RF LOGIC ARRANGEMENTS

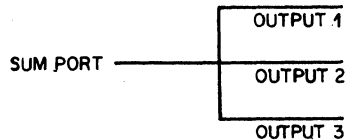
DESCRIPTION

The ZSC-3/ZMSC-3 series 3-way power splitter/combiner is a high performance broad band hybrid junction. Internally, terminations and transformers are provided to ensure a well matched 50 ohm impedance at all ports. Signals fed into the input S port are equally divided, in phase, to the three output (1, 2, and 3) ports. Similarly signals fed into ports 1, 2, and 3 are vectorially summed at the output S port.

The ZSC-3/ZMSC-3 series features exceptionally good amplitude and phase balance between the signals at the 3 output ports. Typically over most of the frequency range, the phase balance is within 1 degree and the amplitude balance is within 0.5 dB.

Ruggedness and durability are built into the ZSC-3/ZMSC-3 series. Internally every component is bonded with silicone rubber to provide protection against shock, vibration, and acceleration. Available with BNC, TNC, or SMA (3mm) connectors, the ZSC-3/ZMSC-3 series is housed in a die cast aluminum case. The case finish is a blue baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability. The exceptionally low cost of the ZSC-3/ZMSC-3 series is attributable to the breakthrough in production techniques achieved by MCL during the manufacture of its high performance low price double balanced mixers. Utilizing this technology, the high performance ZSC-3/ZMSC-3 series is offered at a remarkable price of 1/2 to 1/3 the cost of competitive units.



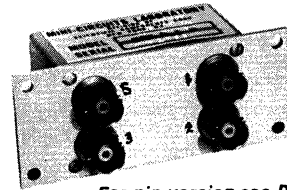
ABSOLUTE MAXIMUM RATINGS

Operating and Storage Temperature -55° C to +100° C

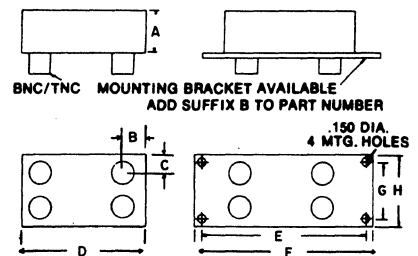
Three-Way (In Phase 0°)

ZSC-3 Series (Standard Size)

ZSC-3-1 1-200 MHz \$34.95 (4-24)
ZSC-3-2 .01- 30 MHz \$44.95 (4-24)



For pin version see PSC-3 series



	A	B	C	D	E	F	G	H
INCHES	1.15	.781	.346	2.25	2.95	3.25	1.10	1.40
CM	2.9	1.98	.878	5.7	7.5	8.3	2.79	3.55

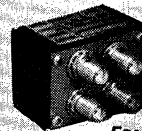
WEIGHT 81.0 grams 2.90 ounces

CONNECTORS

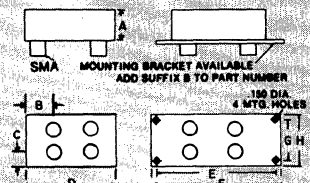
BNC standard
TNC on request
SMA (3mm) see miniature style

ZMSC-3 Series (Miniature Size)

ZMSC3-1 1-200 MHz \$44.95 (4-24)
ZMSC3-2 .01- 30 MHz \$54.95 (4-24)



For pin version see PSC-3 series



	A	B	C	D	E	F	G	H
INCHES	0.88	0.5	.315	1.50	2.19	2.50	0.84	1.15
CM	2.2	1.3	.8	3.8	5.56	6.35	2.1	2.9

WEIGHT 40.5 grams 1.4 ounces

CONNECTORS SMA (3mm) standard

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.

World's largest supplier of double balanced mixers

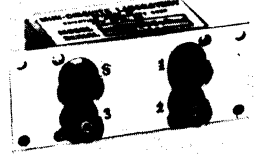
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

POWER SPLITTER-COMBINERS

Three-Way
(In Phase 0°)

ZSC-3 Series

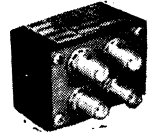
ZSC-3-1 1-200 MHz \$34.95 (4-24)
ZSC-3-2 .01-30 MHz \$44.95 (4-24)



For pin version see PSC-3 series

ZMSC-3 Series

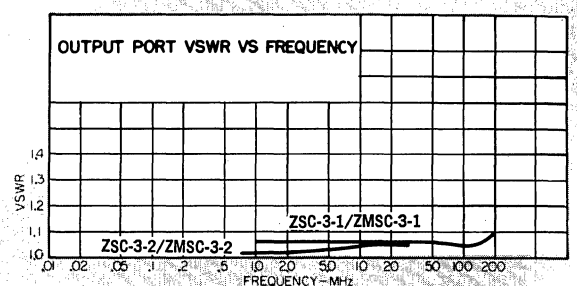
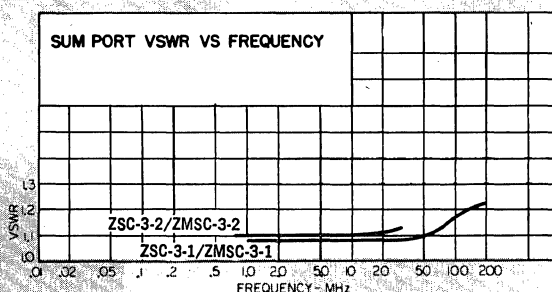
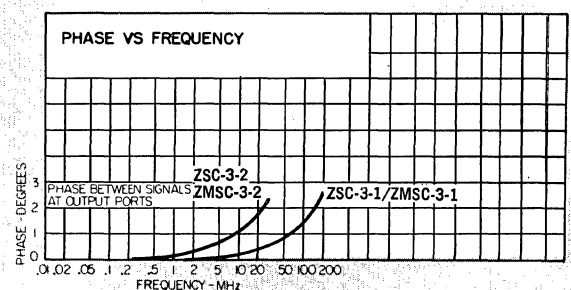
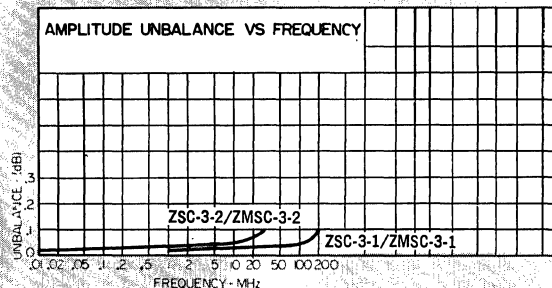
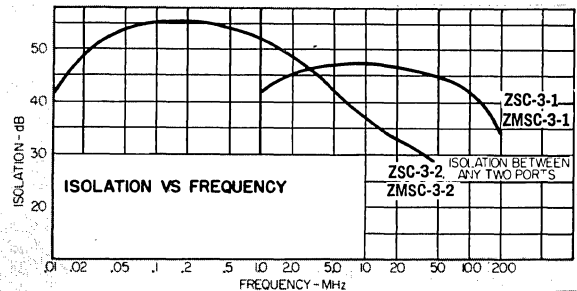
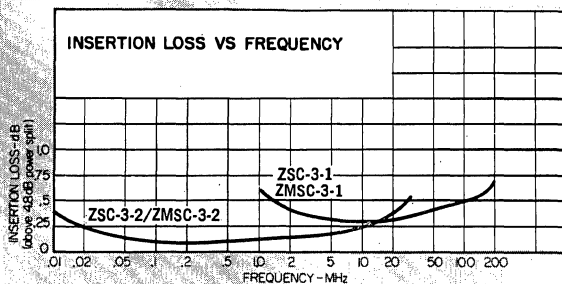
ZMSC-3-1 1-200MHz \$44.95 (4-24)
ZMSC-3-2 .01-30 MHz \$54.95 (4-24)



For pin version see PSC-3 series

SPECIFICATIONS		MODEL	
		ZSC-3-1/ZMSC-3-1	
Frequency Range (MHz)		1-200	
Nominal Phase Difference Between Output Ports		0°	
Impedance, All Ports		50 ohms	
Isolation (dB) Between Outputs 1, 2, and 3		Typical	Minimum
1-50 MHz		45	35
50-200 MHz		40	30
Insertion Loss, dB (above 4.8dB split)		Typical	Maximum
3-30 MHz		.3	.5
1.5-100 MHz		.4	.7
1-200 MHz		.6	.85
Phase Unbalance, degrees		Typical	Maximum
1-100 MHz		1	2
100-200 MHz		2	4
Amplitude Unbalance, dB		Typical	Maximum
1-10 MHz		.05	.15
10-100 MHz		.05	.2
100-200 MHz		.1	.3
VSWR		1.1 typical	
Matched Power Rating		1 watt maximum	
Internal Load Dissipation		3/8 watt	

SPECIFICATIONS		MODEL	
		ZSC-3-2/ZMSC-3-2	
Frequency Range (MHz)		.01-30	
Nominal Phase Difference Between Output Ports		0°	
Impedance, All Ports		50 ohms	
Isolation (dB) Between Outputs 1, 2, and 3		Typical	Minimum
.01-5 MHz		45	35
5-30 MHz		40	30
Insertion Loss, dB (above 4.8dB split)		Typical	Maximum
.05-5 MHz		.15	.3
.01-15 MHz		.25	.45
15-30 MHz		.45	.75
Phase Unbalance, degrees		Typical	Maximum
.01-10 MHz		1	2
10-30 MHz		2	4
Amplitude Unbalance, dB		Typical	Maximum
1-100 MHz		.05	.2
1-200 MHz		.1	.3
VSWR		1.1 typical	
Matched Power Rating		1 watt maximum	
Internal Load Dissipation		3/8 watt	

FAST DELIVERY
From stock, one week max


World's largest supplier of double balanced mixers
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

INTRODUCTION TO PSC-4 SERIES POWER SPLITTER-COMBINERS

Four-Way

(In Phase 0°)

PSC-4 Series

PSC-4-1 100 KHz-200 MHz \$26.95 (6-49)

PSC-4-3 250 KHz-250 MHz \$23.95 (6-49)

FAST DELIVERY
 From stock, one week max.


For connector version see ZSC-4 series

FEATURES

MINIATURE SIZE, .128 CU. INCHES

WIDE BAND, 100KHz - 250MHz

EXCEPTIONALLY GOOD BALANCE

LOW INSERTION LOSS

HIGH ISOLATION

RFI SHIELDED

HERMETICALLY SEALED METAL CASE

LOW COST FROM \$23.95
IN SMALL QUANTITIES

APPLICATIONS

ADD OR SUBTRACT SIGNALS VECTORIALLY

OBTAIN MULTI IN-PHASE OUTPUT SIGNALS
PROPORTIONAL TO THE LEVEL OF A
COMMON INPUT SIGNAL.SPLIT AN INPUT SIGNAL INTO
MULTI-OUTPUTSCOMBINE SIGNALS FROM
DIFFERENT SOURCES TO OBTAIN
A SINGLE PORT OUTPUTPROVIDE CAPABILITY TO OBTAIN
RF LOGIC ARRANGEMENTS

DESCRIPTION

The model PSC-4 4-way power divider/combiner is a high performance broad band hybrid junction. Internally, terminations and transformers are provided to ensure a well matched 50 ohm impedance at all ports. Signals fed into the input S port are equally divided, in power, to the four output (1, 2, 3, and 4) ports. Similarly, signals fed into ports 1, 2, 3 and 4 are vectorially summed at the output S port.

The PSC-4 features exceptionally good amplitude and phase balance between the signals at the 4 output ports. Typically, over most of the frequency range, the phase balance is within 1 degree and the amplitude balance is within .05 dB.

The PSC-4 is ruggedly constructed to provide reliable service under severe environmental conditions. Internally, every component is bonded to the header for added strength to protect against shock and vibration. This hermetically sealed unit performs well under high relative humidity conditions and over temperature extremes from -55°C to +100°C.

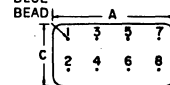
Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability. The exceptionally low cost of the PSC-4 is attributable to the breakthrough in production techniques achieved by MCL during the manufacture of its high performance low price double balanced mixers. Utilizing this technology, the high performance PSC-4 is offered at a remarkable price of 1/2 to 1/3 of competitive units.

LETTER M OVER PIN 2



Note: Numbers are for
reference only, use blue bead
or letter M for determining
orientation.

TOP VIEW



BOTTOM VIEW

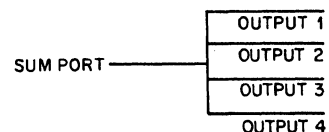
	A	B	C
INCHES	.8	.4	.4
CM	2	1	1

.030 DIA. x 3/16 LG (8)
PINS ON 0.2 GRID

WEIGHT 5.2 grams .18 ounces

PIN CONNECTIONS

	PSC-4-1	PSC-4-3
SUM PORT	4	4
OUTPUT 1	7	7
OUTPUT 2	8	8
OUTPUT 3	1	1
OUTPUT 4	2	2
GROUND	3,5,6	3,5,6



ABSOLUTE MAXIMUM RATINGS

Operating and Storage
Temperature -55° C to +100° C
Pin Temperature
(10 seconds) 510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

POWER SPLITTER-COMBINERS

Four-Way
(In Phase 0°)

PSC-4 Series

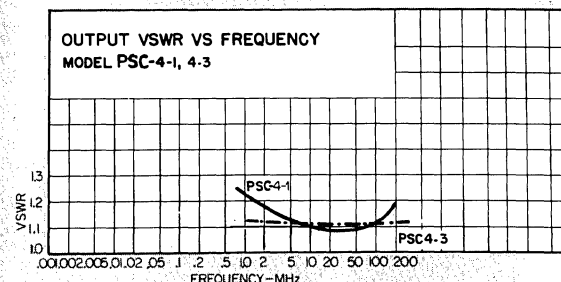
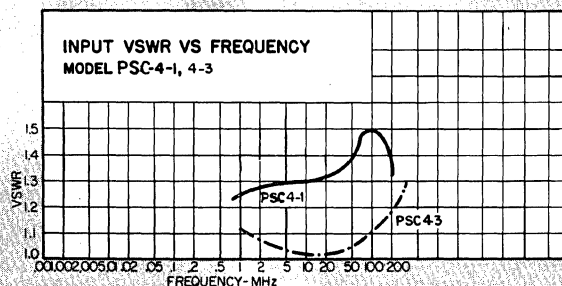
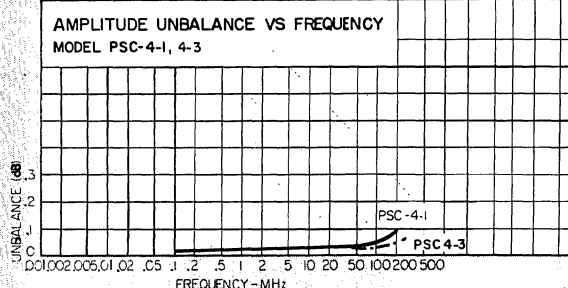
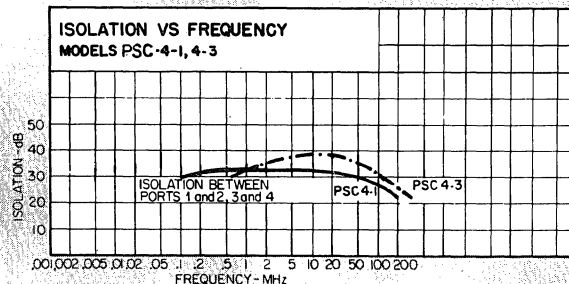
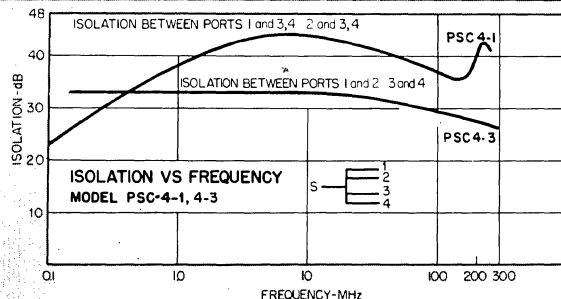
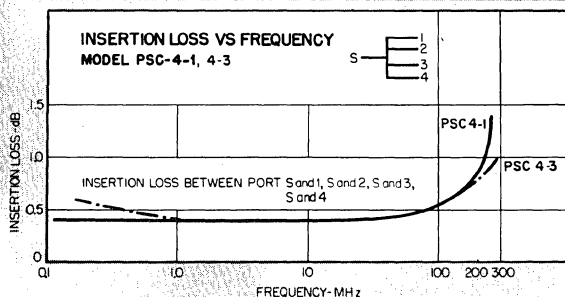
PSC-4-1 100 KHz-200 MHz \$26.95 (6-49)
PSC-4-3 250 KHz-250 MHz \$23.95 (6-49)

FAST DELIVERY
From stock, one week max


For connector version see ZSC-4 series

SPECIFICATIONS	MODEL PSC-4-1
Frequency Range (MHz)	0.1-200
Nominal Phase Difference Between Output Ports	0°
Impedance, All ports	50 ohms
Isolation, dB, Ports 1-3,4 2-3,4	Typical Minimum
.1-10 MHz	35 20
10-100 MHz	40 30
100-200 MHz	40 30
Isolation, dB, Ports 1-2 3-4	Typical Minimum
.1-10 MHz	33 25
10-100 MHz	30 20
100-200 MHz	27 20
Insertion Loss, dB, (above 6dB split)	Typical Maximum
.1-10 MHz	.4 .6
10-100 MHz	.5 .75
100-200 MHz	.7 1.0
Insertion Loss, Unbalance, dB	Typical Maximum
.1-100 MHz	.05 .15
100-200 MHz	.1 .25
VSWR	1.2 typical
Matched Power Rating	1 watt maximum
Internal Load Dissipation	3/4 watt

SPECIFICATIONS	MODEL PSC 4-3
Frequency Range (MHz)	.250-250
Nominal Phase Difference Between Output Ports	0°
Impedance, All ports	50 ohms
Isolation, dB, Ports 1-3,4 2-3,4	Typical Minimum
.25-10 MHz	35 20
10-100 MHz	40 30
100-250MHz	40 20
Isolation, dB, Ports 1-2 3-4	Typical Minimum
.25-10 MHz	33 20
10-100 MHz	30 20
100-250 MHz	27 20
Insertion Loss, dB, (above 6dB split)	Typical Maximum
.25-10 MHz	.4 .7
10-100 MHz	.5 .75
100-250MHz	.7 1.2
Insertion Loss, Unbalance, dB	Typical Maximum
.25-10 MHz	.05 .15
100-250 MHz	.1 .25
VSWR	1.1 typical
Matched Power Rating	1 watt maximum
Internal Load Dissipation	3/4 watt



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

INTRODUCTION TO ZSC-4 ZMSC-4 SERIES POWER SPLITTER-COMBINERS

Four-Way
(In Phase 0°)

FEATURES

BROAD FREQUENCY RANGE
2 KHz - 250 MHz

EXCEPTIONALLY GOOD BALANCE

LOW INSERTION LOSS

HIGH ISOLATION

DIE-CAST ALUMINUM CASE

LOW COST FROM \$38.95
IN SMALL QUANTITIES

APPLICATIONS

ADD OR SUBTRACT SIGNALS
VECTORIALLY

OBTAIN MULTI IN-PHASE OUTPUT
SIGNALS PROPORTIONAL TO THE
LEVEL OF A COMMON INPUT SIGNAL

SPLIT AN INPUT SIGNAL INTO
MULTI-OUTPUTS

COMBINE SIGNALS FROM
DIFFERENT SOURCES TO OBTAIN
A SINGLE PORT OUTPUT

PROVIDE CAPABILITY TO OBTAIN
RF LOGIC ARRANGEMENTS

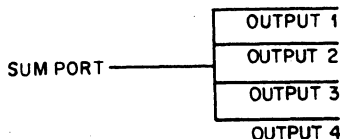
DESCRIPTION

The model ZSC-4/ZMSC-4 4-way power splitter/combiner is a high performance broad band hybrid junction. Internally, terminations and transformers are provided to ensure well matched 50 ohm impedance at all ports. Signals fed into the input S port are equally divided, in phase, to the four output (1, 2, 3 and 4) ports. Similarly, signals fed into ports 1, 2, 3 and 4 are vectorially summed at the S port.

The ZSC-4/ZMSC-4 features exceptionally good amplitude and phase balance between the signals at the 4 output ports. Typically, over most of the frequency range, the phase balance is within 1 degree and the amplitude balance is within .05 dB.

Housed in a die cast aluminum case, these rugged units are double shielded to meet your tough EMI requirements. The case is finished with a blue baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability. The exceptionally low cost of the ZSC-4/ZMSC-4 is attributable to the breakthrough in production techniques achieved by MCL during the manufacture of its high performance low price double balanced mixers. Utilizing this technology, the high performance ZSC-4/ZMSC-4 is offered at a remarkable price of 1/2 to 1/3 of competitive units.

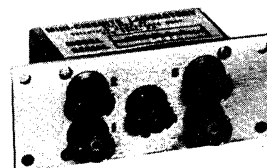


ABSOLUTE MAXIMUM RATINGS

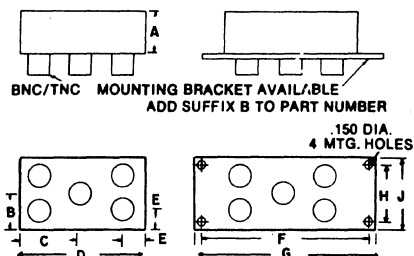
Operating and Storage Temperature -55° C to +100° C

ZSC-4 Series (Standard Size)

ZSC-4-1 100KHz-200MHz (4-24) \$41.95
ZSC-4-2 2KHz-20MHz (4-24) \$64.95
ZSC-4-3 250KHz-250MHz (4-24) \$38.95



For pin version see PSC-4 series



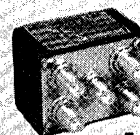
WEIGHT 85.0 grams 3.00 ounces

CONNECTORS

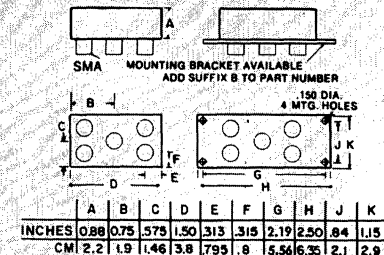
BNC standard
TNC on request

ZMSC-4 Series (Miniature Size)

ZMSC-4-1 100KHz-200MHz (4-24) \$51.95
ZMSC-4-2 2KHz-20MHz (4-24) \$74.95
ZMSC-4-3 250KHz-250MHz (4-24) \$48.95



For pin version see PSC-4 series



WEIGHT 40.5 grams 1.4 ounces

CONNECTORS SMA (3mm) standard

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.

World's largest supplier of double balanced mixers

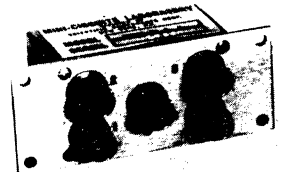
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

POWER SPLITTER-COMBINERS

Four-Way
(In Phase 0°)

ZSC-4 Series

ZSC-4-1 100KHz-200MHz (4-24) \$41.95
 ZSC-4-2 2KHz-20MHz (4-24) \$64.95
 ZSC-4-3 250KHz-250MHz (4-24) \$38.95


For pin version see PSC-4series
ZMSC-4 Series

ZMSC-4-1 100KHz-200MHz (4-24) \$51.95
 ZMSC-4-2 2KHz-20MHz (4-24) \$74.95
 ZMSC-4-3 250KHz-250MHz (4-24) \$48.95


For pin version see PSC-4series
FAST DELIVERY
From stock, one week max.
ZSC-4-1/ZMSC-4-1
Frequency Range 1-200MHz

Nominal Phase Difference
Between Output Ports 0°

Impedance, All Ports 50 ohms

Isolation, dB,
Ports 1-3, 4 2-3, 4 Typ Min
 .1-10MHz 35 20
 10-100MHz 40 30
 100-200MHz 40 30

Isolation, dB,
Ports 1-2 3-4 Typ Min
 .1-10MHz 33 25
 10-100MHz 30 20
 100-200MHz 27 20

Insertion Loss,
(above 6dB split) Typ Max
 .1-10MHz .4 .6
 10-100MHz .5 .75
 100-200MHz .7 1.0

Insertion Loss,
Unbalance, dB Typ Max
 .1-100MHz .05 .15
 100-200MHz .1 .25

VSWR 1.2 typical

Matched Power
Rating 1 Watt Max

Internal Load
Dissipation ¾ Watt

ZSC-4-2/ZMSC-4-2
Frequency Range 2KHz-20MHz

Nominal Phase Difference
Between Output Ports 0°

Impedance, All Ports 50 ohms

Isolation, dB
Ports 1-3, 4 2-3, 4 Typ Min
 40KHz-4MHz 45 35
 10KHz-20MHz 40 30
 2KHz-10KHz 30 20

Isolation, dB
Ports 1-2, 3-4 Typ Min
 2KHz-20MHz 33 25

Insertion Loss, dB
(above 6dB split) Typ Max
 5KHz-1.0MHz .3 .5
 2KHz-10MHz .45 .75
 10MHz-20MHz .7 1.0

Insertion Loss,
Unbalance, dB Typ Max
 2KHz-10MHz .05 .15
 10MHz-20MHz .1 .25

VSWR 1.2 dB typical

Matched Power
Rating 1 watt maximum

Internal Load
Dissipation ¾ Watt

ZSC-4-3/ZMSC-4-3
Frequency Range .250 - 250 MHz

Nominal Phase Difference
Between Output Ports 0°

Impedance, All ports 50 ohms

Isolation, dB,
Ports 1-3, 4 2-3, 4 Typ Min
 .25-10 MHz 35 20
 10-100 MHz 40 30
 100-250MHz 40 20

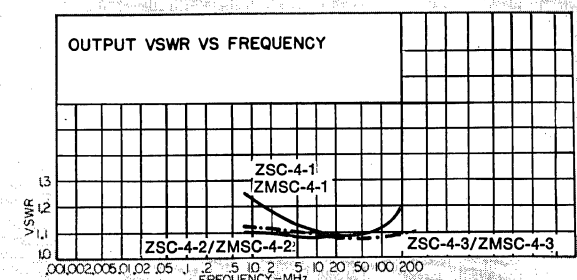
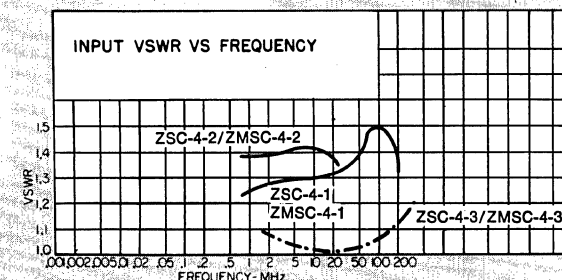
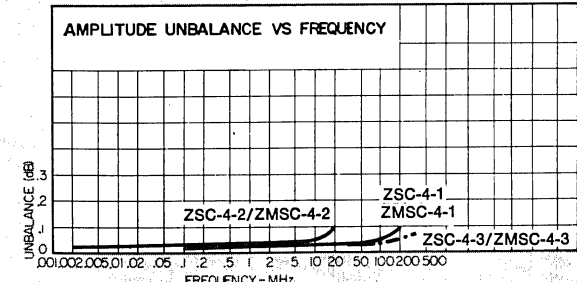
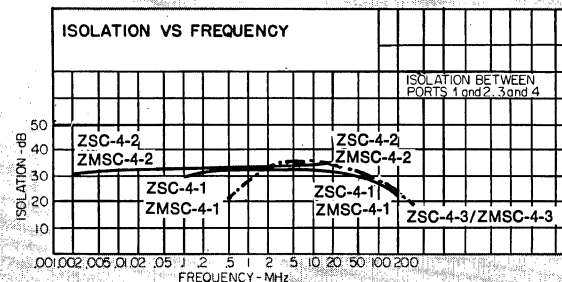
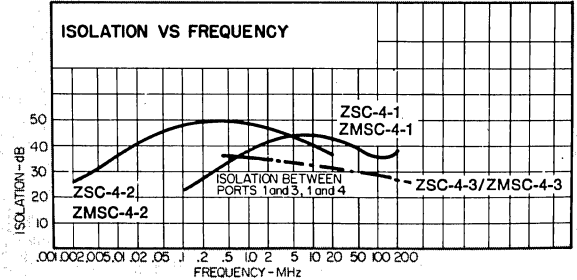
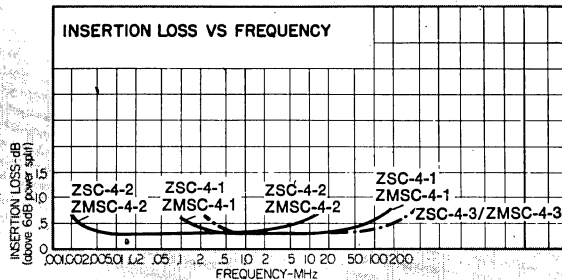
Isolation, dB,
Ports 1-2 3-4 Typ Min
 .25-10 MHz 33 20
 10-100 MHz 30 20
 100-250 MHz 27 20

Insertion Loss, dB,
(above 6dB split) Typ Max
 .25-10 MHz .4 .7
 10-100 MHz .5 .75
 100-250MHz .7 1.2

Insertion Loss,
Unbalance, dB Typ Max
 .25-10 MHz .05 .15
 100-250 MHz .1 .25

VSWR 1.1 typical

Matched Power Rating 1 watt max

Internal Load Dissipation ¾ watt

World's largest supplier of double balanced mixers
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory^{MCL}

INTRODUCTION TO RK SERIES FREQUENCY DOUBLERS

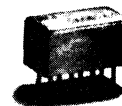
Broadband (9 Octaves)

RK Series

RK-2 1-1000 MHz (5-24) \$ 15.95

RK-3 .05-300 MHz (5-24) \$ 14.95

FAST DELIVERY
From stock; one week max.



For connector version see GK series

FEATURES

MINIATURE SIZE, .128 CU. INCHES

WIDE BAND, 0.5 MHz - 1000 MHz

EXCEPTIONALLY GOOD
SPURIOUS REJECTION

LOW CONVERSION LOSS, 12 dB

RFI SHIELDED

HERMETICALLY SEALED METAL CASE

LOW COST FROM \$14.95
IN SMALL QUANTITIES

APPLICATIONS

WIDEBAND FREQUENCY MULTIPLIER
CHAINS

LOW SPURIOUS FREQUENCY
MULTIPLIER CHAINS

FM, PM MODULATION CHAINS

DOUBLE FREQUENCY RANGE OF
SIGNAL GENERATORS

DESCRIPTION

Having a volume of only .128 cu. inches, the RK series covers a very broad frequency range from 50KHz to 1000MHz. Offered at the lowest prices available in the industry, these rugged units provide low conversion loss, 12.5 dB, high spurious rejection 40 dB, and exceptional unit to unit matched performance.

The RK series offers a new degree of freedom in designing frequency multiplier chains. It's many octave band width, and excellent rejection of fundamental and third harmonics enable a significant reduction in filter requirements. In addition, it operates with 50 ohm impedances at its input and output ports and is not very sensitive to input power. It performs well from 0 dBm to +15 dBm input.

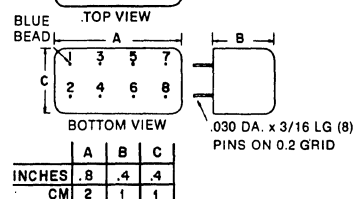
Packaged within an RFI shielded metal enclosure and hermetically sealed header, these high performance units have their pins oriented on a 0.2 inch grid.

Ruggedness and durability are built into the RK series. Only well matched hot-carrier diodes and ruggedly constructed transmission line transformers are used. Internally every component is bonded to the header and case with silicone rubber to provide super reliable protection against shock, vibration, and acceleration.

High reliability is associated with every RK unit. Every production run is 100% tested and every unit must pass our rigid inspection and high quality standards. Naturally, our 1 year guarantee applies to these units.

LETTER M OVER PIN 2

Note: Numbers are for reference only, use blue bead or letter M for determining orientation.



WEIGHT 5.2 grams .18 ounces

PIN CONNECTIONS

	RK-2
	RK-3
INPUT (Connect all pins together)	1, 3, 4
OUTPUT	8
GROUND	2, 5, 6, 7

ABSOLUTE MAXIMUM RATINGS

Total Input Power 100 mW

Operating & Storage

Temperature -55° C to +100° C
Pin Temperature (10 seconds) 510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

FREQUENCY DOUBLERS

Broadband
(9 Octaves)

RK Series

RK-2 1-1000 MHz (5-24) \$15.95
RK-3 .05-300 MHz (5-24) \$14.95

MODEL RK-2

Frequency Range, MHz

Input 1 — 500
Output 2 — 1000

RF Input Power

Nominal +7dBm
Full Range +1dBm — +15dBm

Conversion Loss, dB	Typical	Maximum
1 — 100 MHz	13dB	15dB
100 — 300 MHz	13.5dB	15.5dB
300 — 500 MHz	14.0dB	16.5dB

Spurious Harmonic Output, dB
(Relative to F_1)

	F_1 Typ.	F_1 Max.	F_2 Typ.	F_2 Max.	F_3 Typ.	F_3 Max.
2 — 200 MHz	-40	-30	-50	-40	-16	-12
200 — 600 MHz	-25	-20	-40	-30	-16	-12
600 — 1000 MHz	-20	-15	-30	-25	-16	-16

Impedance, All Ports 50 ohms

MODEL RK-3

Frequency Range, MHz

Input 0.05 — 150
Output 0.1 — 300

RF Input Power

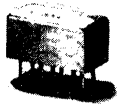
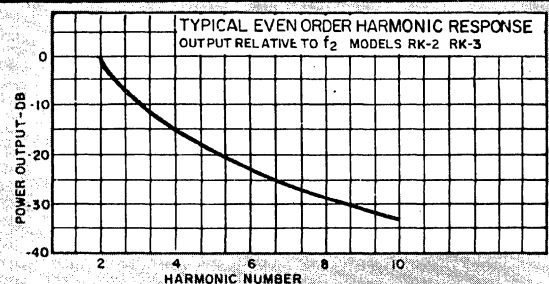
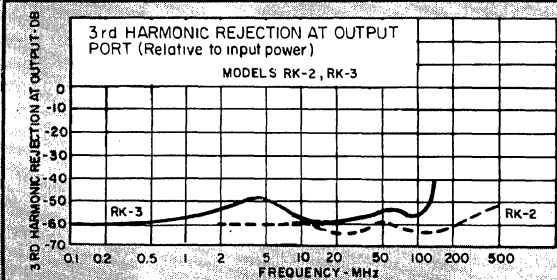
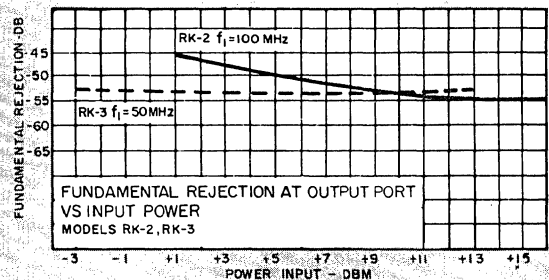
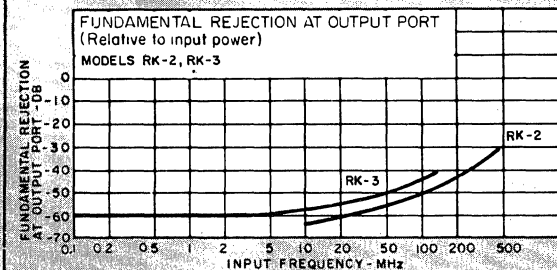
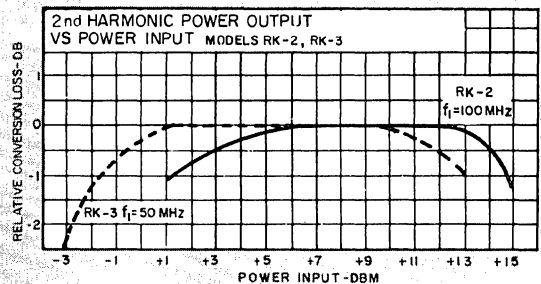
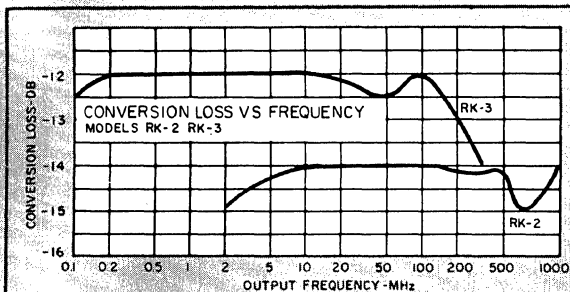
Nominal +7dBm
Full Range 0dBm to +13dBm

Conversion Loss, dB	Typical	Maximum
0.05 — 50 MHz	11dB	13dB
50 — 150 MHz	11.5dB	15dB

Spurious Harmonic Output, dB
(Relative to F_1)

	F_1 Typ.	F_1 Max.	F_2 Typ.	F_2 Max.	F_3 Typ.	F_3 Max.
0.1 — 100 MHz	-40	-30	-45	-30	-16	-12
100 — 300 MHz	-35	-20	-40	-20	-16	-12

Impedance, All Ports 50 ohms

FAST DELIVERY
From stock, one week maxFor connector version
see GK series

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory^{MCL}

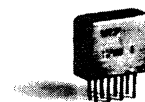
INTRODUCTION TO AK SERIES MINIATURE FREQUENCY DOUBLERS

Broadband
(9 Octaves)

AK Series

AK-2 1-1000 MHz (5-24) \$19.95

FAST DELIVERY
From stock, one week max.



For connector version see MK series

FEATURES

MICRO-MINIATURE SIZE, .04 CU. INCHES

PC BOARD AREA ONLY 0.1 SQ. INCHES

WIDE BAND, 1-1000MHz

EXCEPTIONALLY GOOD SPURIOUS REJECTION

LOW CONVERSION LOSS 13.5 dB

RFI SHIELDED

HERMETICALLY SEALED METAL CASE

PC BOARD MOUNTING

LOW COST FROM \$19.95
IN SMALL QUANTITIES

APPLICATIONS

WIDEBAND FREQUENCY MULTIPLIER
CHAINS

LOW SPURIOUS FREQUENCY
MULTIPLIER CHAINS

FM, PM MODULATION CHAINS

DOUBLE FREQUENCY RANGE OF
SIGNAL GENERATORS

DESCRIPTION

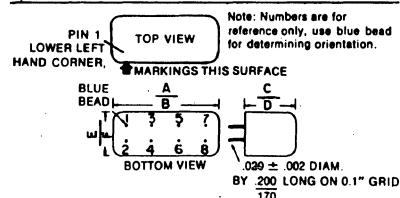
Representing a performance and price breakthrough in micro-miniature frequency doublers the AK series covers the frequency range 1 to 1000MHz.

The AK series offers high performance of extra wide bandwidth, low conversion loss, and high spurious rejection. These tiny units offer fundamental rejection of greater than 25 dB and conversion loss of 12.5 dB! The AK series performs with a 50 ohm impedance at all ports and has a operating and storage temperature range from -55° C to +100° C.

The AK units require less PC area than a flat-pack or TO-5 can. For example, consider a 2x2 sq. in. PC board. You can mount 16 standard flat-packs (including room for lead bending), or 23 TO-5 cans (considering the space required for the tab), or 36 Mini-Circuits microminiature AK's

The AK units are packaged within an EMI shielded metal enclosure and hermetically sealed header (enclosure is 0.5 by 0.2 by 0.4 in.) Its pins are oriented on a 0.1 inch grid for printed circuit board mounting. Only well matched hot-carrier diodes and rugged transmission line transformers are used. Internally, silicone rubber is incorporated as an insulator against any wire shorts and to provide protection against shock, and vibration.

High reliability is characteristic of the AK series. Each unit carries with it a one year warranty by MCL.



	A	B	C	D	E	F
INCHES	.500	.480	.405	.390	.230	.210
CM	1.27	1.22	1.03	.99	.58	.53

WEIGHT 1.9 grams .07 ounces

PIN CONNECTIONS	AK-2
INPUT (Connect all pins together)	1, 3, 4
OUTPUT	8
GROUND	2, 5, 6, 7

ABSOLUTE MAXIMUM RATINGS

Total Input Power	100 mW
Operating and Storage Temperature	-55° C to +100° C
Pin Temperature (10 seconds)	510° F

World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MINIATURE FREQUENCY DOUBLERS

Broadband
(9 Octaves)

AK Series

AK-2 1-1000 MHz (5-24) \$19.95

MODEL AK-2
Frequency Range, MHz

Input 1 — 500
Output 2 — 1000

RF Input Power

Nominal +7dBm
Full Range +1dBm — +15dBm

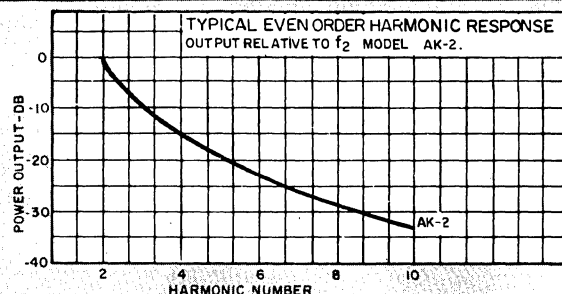
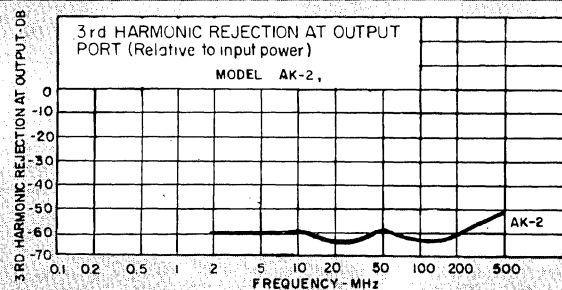
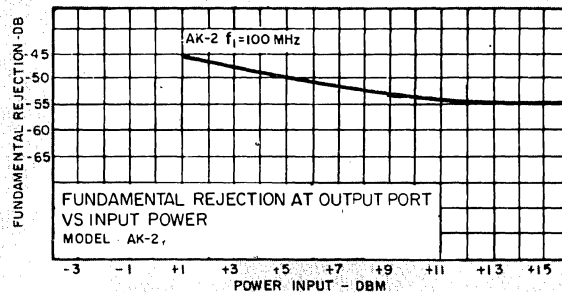
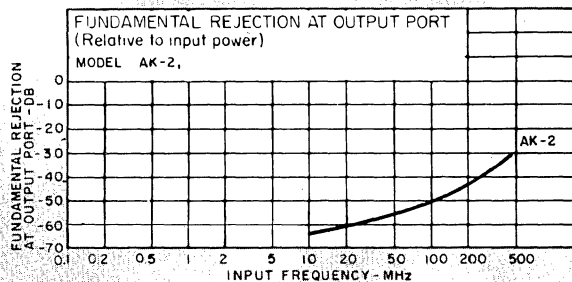
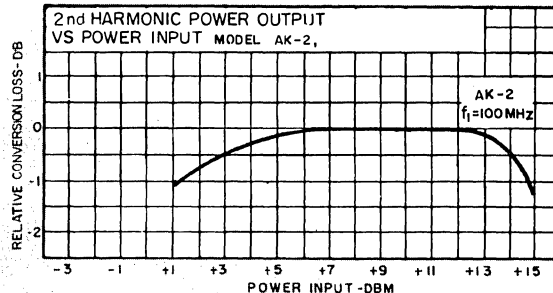
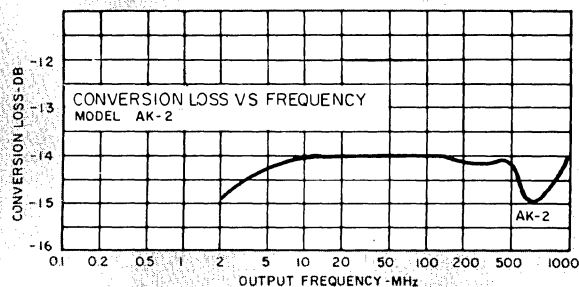
Conversion Loss, dB	Typical	Maximum
1 — 100 MHz	13dB	15dB
100 — 300 MHz	13.5dB	15.5dB
300 — 500 MHz	14.0dB	16.5dB

Spurious Harmonic Output, dB
(Relative to F_1)

	F_1 Typ. Max.	F_2 Typ. Max.	F_3 Typ. Max.
2 — 200 MHz	-40 -30	-50 -40	-16 -12
200 - 600 MHz	-25 -20	-40 -30	-16 -12
600 - 1000 MHz	-20 -15	-30 -25	-16

Impedance, All Ports 50 ohms

FAST DELIVERY
From stock, one week max

For connector version
see MK series


World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory^{MCL}

INTRODUCTION TO GK MK SERIES FREQUENCY DOUBLERS

FEATURES

WIDE BAND, .05MHz - 1000MHz

EXCEPTIONALLY GOOD SPURIOUS
REJECTION

LOW CONVERSION LOSS 12dB

DIE-CAST ALUMINUM CASE

DOUBLE SHIELDED FOR RFI
PROTECTION

LOW COST FROM \$34.95
IN SMALL QUANTITIES

APPLICATIONS

WIDEBAND FREQUENCY MULTIPLIER
CHAINS

LOW SPURIOUS FREQUENCY
MULTIPLIER CHAINS

FM, PM MODULATION CHAINS

DOUBLE FREQUENCY RANGE OF
SIGNAL GENERATORS

DESCRIPTION

The GK/MK series frequency doublers are economically priced while covering the very broad frequency range from 50KHz to 1000MHz. They offer low conversion loss, 12.5dB, high spurious rejection 40 dB, and exceptional unit to unit matched performance.

Available with BNC, TNC, or SMA (3mm) connectors the GK/MK series is housed in a die cast aluminum case. These rugged units are double shielded to meet your tough RFI requirements. The case is finished with a blue baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability.

Ruggedness and durability are built into the GK/MK series. Only well matched hot-carrier diodes and ruggedly constructed transmission line transformers are used. Internally, every component is bonded with silicone rubber to provide protection against shock, vibration, and acceleration.

The GK/MK series offers a new degree of freedom in designing frequency multiplier chains. Its many octave band width, and excellent rejection of fundamental and third harmonics enable a significant reduction in filter requirements. In addition, it operates with 50 ohm impedances at its input and output ports and is not very sensitive to input power. It performs well from 0dBm to +15dBm input.

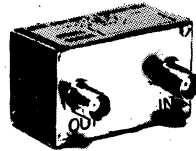
ABSOLUTE MAXIMUM RATINGS

Total Input Power	100 mW
Operating and Storage Temperature	-55° C to +100° C

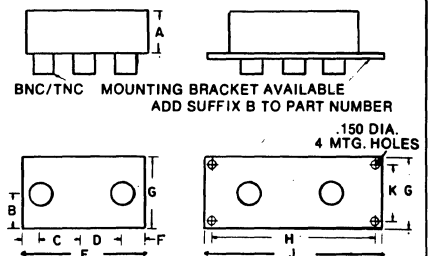
Broadband (9 Octaves)

GK Series (Standard Size)

GK-2	1-1000 MHz	\$29.95 (1-4)
GK-3	.05-300 MHz	\$27.95 (1-4)



For pin version see RK series



	A	B	C	D	E	F	G	H	J	K
INCHES	1.15	.63	.750	.730	.225	.385	1.40	.295	.325	1.10
CM	2.9	1.6	1.9	1.85	5.7	9.77	3.55	7.49	8.25	2.8

WEIGHT 74.0 grams 2.60 ounces

CONNECTORS

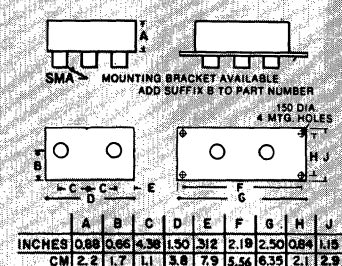
BNC	standard
TNC	on request

MK Series (Miniature Size)

MK-2	1-1000 MHz	\$39.95 (1-4)
MK-3	.05- 300 MHz	\$34.95 (1-4)



For pin version see AK series



WEIGHT 34.0 grams 1.02 ounces

CONNECTORS SMA (3mm) standard

MOUNTING BRACKET

On request, add \$1.50 to unit cost.
See dimensions above.

World's largest supplier of double balanced mixers
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

MINIATURE FREQUENCY DOUBLERS

MODEL GK-2/MK-2**Frequency Range, MHz**

Input 1 — 500
Output 2 — 1000

RF Input Power

Nominal +7dBm
Full Range +1dBm — +15dBm

Conversion Loss, dB	Typical	Maximum
1 — 100 MHz	13dB	15dB
100 — 300 MHz	13.5dB	15.5dB
300 — 500 MHz	14.0dB	16.5dB

Spurious Harmonic Output, dB
 (Relative to F_2)

	F_1 Typ. Max.	F_2 Typ. Max.	F_3 Typ. Max.
2 — 200 MHz	-40 -30	-50 -40	-16 -12
200 — 600 MHz	-25 -20	-40 -30	-16 -12
600 — 1000 MHz	-20 -15	-30 -25	-16

Impedance, All Ports 50 ohms

MODEL GK-3/MK-3**Frequency Range, MHz**

Input 0.05 — 150
Output 0.1 — 300

RF Input Power

Nominal +7dBm
Full Range 0dBm to +13dBm

Conversion Loss, dB	Typical	Maximum
0.05 — 50 MHz	11dB	13dB
50 — 150 MHz	11.5dB	15dB

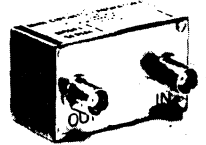
Spurious Harmonic Output, dB
 (Relative to F_2)

	F_1 Typ. Max.	F_2 Typ. Max.	F_3 Typ. Max.
0.1 — 100 MHz	-40 -30	-45 -30	-16 -12
100 — 300 MHz	-35 -20	-40 -20	-16 -12

Impedance, All Ports 50 ohms

Broadband
 (9 Octaves)
GK Series

GK-2 1-1000 MHz \$29.95 (1-4)
GK-3 .05-300 MHz \$27.95 (1-4)

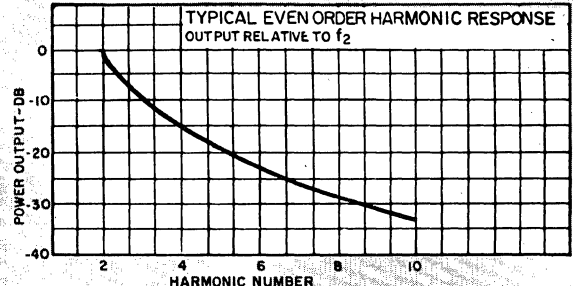
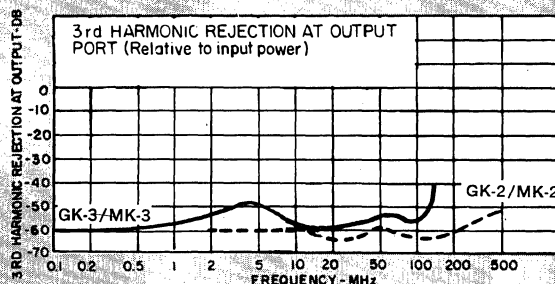
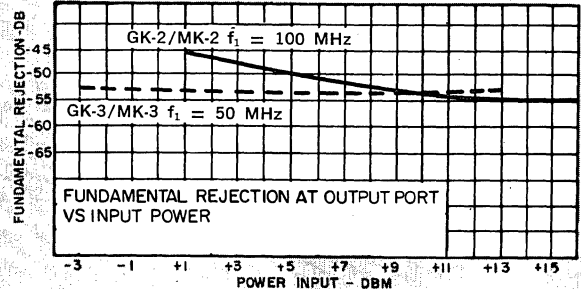
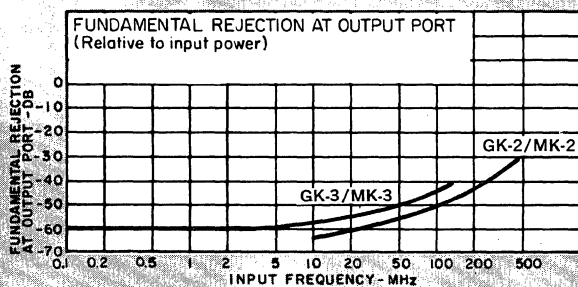
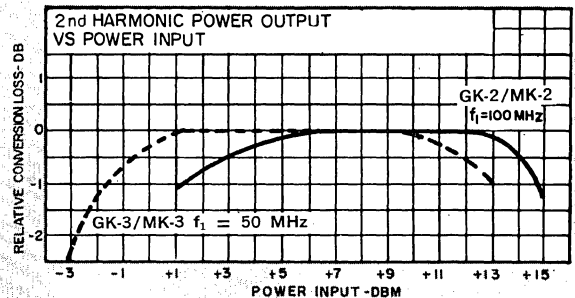
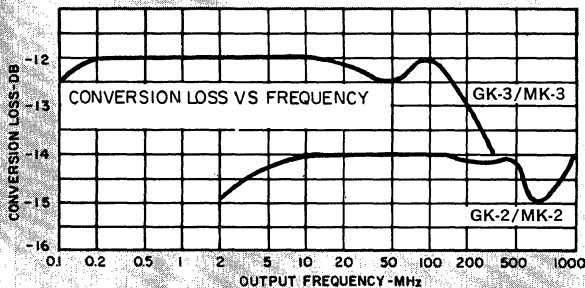
**MK Series**

MK-2 1-1000 MHz \$39.95 (1-4)
MK-3 .05-300 MHz \$34.95 (1-4)



For pin version see RK/AK series

-FAST DELIVERY
From stock, one week max



Mini-Circuits Laboratory ^{MCL}

INTRODUCTION TO PAS SERIES ELECTRONIC ATTENUATOR/SWITCH

PAS Series

PAS-1 5-450 MHz \$27.95 (5-24)
PAS-3 1-200 MHz \$28.95 (5-24)

FAST DELIVERY
From stock; one week max.



For connector version see ZAS series

FEATURES

MINIATURE SIZE, .128 CU. INCHES

BROAD FREQUENCY RANGE
1 - 450 MHz

HIGH ON/OFF RATIOS, 50 dB

LOW INSERTION LOSS, 1.5 dB

ULTRA-LOW DISTORTION, INTERCEPT
POINT +45 dBm

HERMETICALLY SEALED METAL CASE

PC BOARD MOUNTING

LOW COST FROM \$27.95
IN SMALL QUANTITIES

APPLICATIONS

ELECTRONIC SWITCHING

CURRENT CONTROLLED ATTENUATION

BI-PHASE MODULATION

POWER LEVELING

DESCRIPTION

The PAS series of electronic attenuators enable attenuation control of AF signals with a maximum of only 20 mA of control current. Due to the specific properties of the PAS attenuators, for a single frequency input all harmonics even and odd order, are virtually eliminated at the output. As a consequence, the PAS intercept point is greater than +45 dBm.

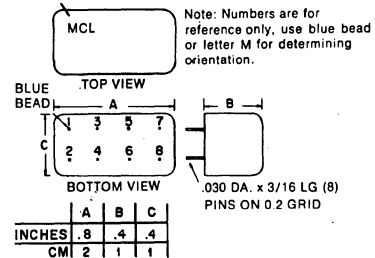
Having a volume of only .128 cu. inches, the PAS series covers a very broad frequency range from 1-450 MHz. Offered at the lowest prices available in the industry, these rugged units provide low insertion loss, 1.5 dB, high isolation 50 dB, and exceptional unit to unit matched performance.

Packaged within an RFI shielded metal enclosure and hermetically sealed header, these high performance units have their pins oriented on a 0.2 inch grid.

Ruggedness and durability are built into the PAS series. Only well matched diodes and ruggedly constructed transmission line transformers are used. Internally every component is bonded to the header and case with silicone rubber to provide super reliable protection against shock, vibration, and acceleration.

High reliability is associated with every PAS series attenuators. Every production run is 100% tested and every unit must pass our rigid inspection and high quality standards. Naturally, our 1 year guarantee applies to these units.

LETTER M OVER PIN 2

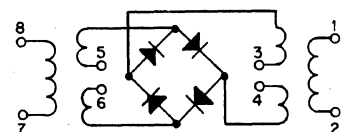


WEIGHT 5.2 grams .18 ounces

PIN CONNECTIONS

	PAS-1
	PAS-3
Output	8
Input	1
Control	3,4
Ground	2,5,6,7
Case Ground	2

NOTE: PINS 3 AND 4 MUST BE CONNECTED TOGETHER



ABSOLUTE MAXIMUM RATINGS

Total Input Power	1 W
Total Input, Current Peak	40 mA
Operating & Storage Temperature	-55° C to +100° C
Pin Temperature (10 seconds)	510° F

ELECTRONIC ATTENUATOR/SWITCH

Frequency Range, MHz	OUTPUT INPUT CONTROL	MODEL PAS-1		MODEL PAS-3	
		5-450		1-200	
		5-450		1-200	
		DC-0.05		DC-0.05	
Insertion Loss, dB		Typical	Maximum	Typical	Maximum
One Octave From Band Edge		3.5	4.0	1.4	2.0
Total Range		3.5	4.7	1.6	2.5
Signal, 1dB Compression Level		Greater than 1 Watt			
Isolation, dB		Typical	Minimum	Typical	Minimum
Lower Band Edge to One Decade Higher	IN-OUT	65	50	65	50
	IN-CON.	35	25	35	25
Mid Range	IN-OUT	45	35	50	40
	IN-CON.	25	15	20	15
Upper Band Edge to One Octave Lower	IN-OUT	35	25	50	40
	IN-CON.	20	10	15	10
Impedance, All Ports		50 ohms		50 ohms	

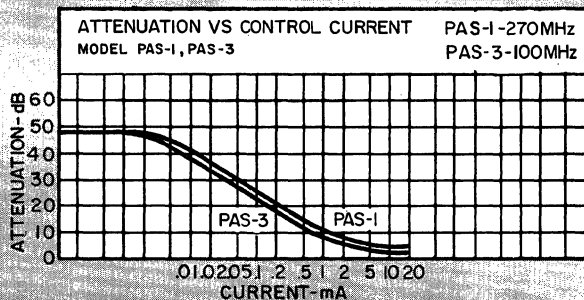
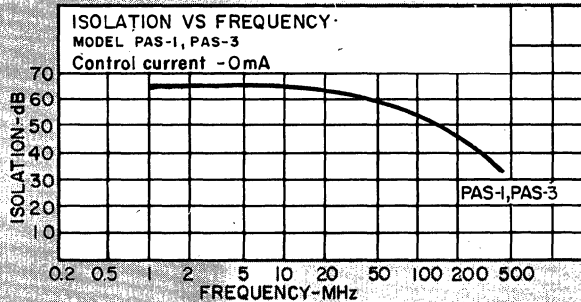
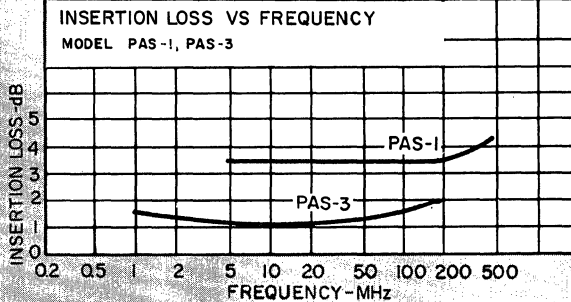
PAS Series

PAS-1	5-450 MHz	\$27.95 (5-24)
PAS-3	1-200 MHz	\$28.95 (5-24)

FAST DELIVERY
From stock, one week max.

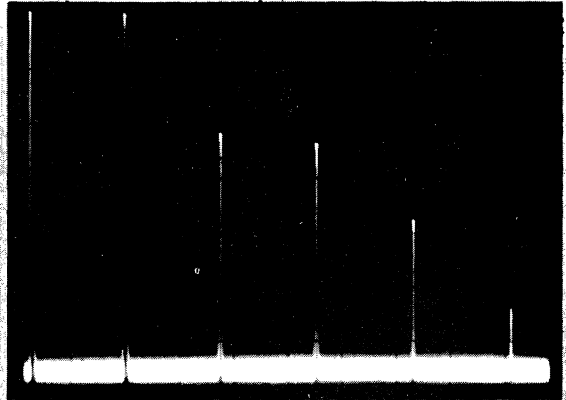


For connector version see ZAS series

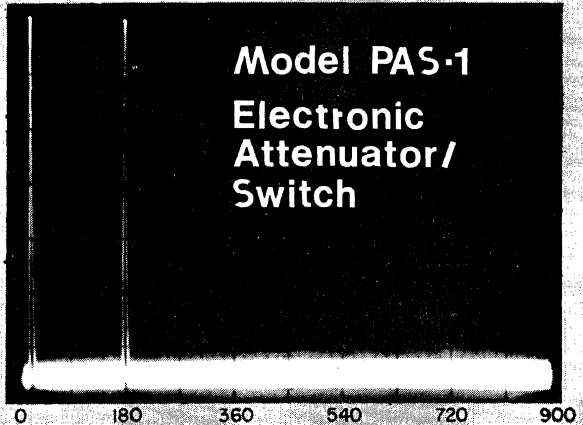


TYPICAL HARMONIC SPECTRUM COMPARING ATTENUATORS-CONTROL CURRENT SET FOR 10dB ATTEN.

SIGNAL FREQUENCY - 180 MHz VERTICAL SCALE - 10 dB per cm
HORIZONTAL SCALE - 100 MHz per cm SIGNAL POWER - 0 dBm



Model PAS-1 Electronic Attenuator/ Switch



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

INTRODUCTION TO ZAS ZMAS SERIES ELECTRONIC ATTENUATOR/SWITCH

FEATURES

- BROAD FREQUENCY RANGE
1 - 450 MHz
1 - 1000 MHz
- HIGH ON/OFF RATIOS, 50 dB
- LOW INSERTION LOSS, 1.5 dB
- ULTRA-LOW DISTORTION,
INTERCEPT POINT +45 dBm
- DIE-CAST ALUMINUM CASE
- DOUBLE SHIELDED FOR
RFI PROTECTION
- LOW COST FROM \$42.95
IN SMALL QUANTITIES

APPLICATIONS

- ELECTRONIC SWITCHING
- CURRENT CONTROLLED
ATTENUATION
- BI-PHASE MODULATION
- POWER LEVELING

DESCRIPTION

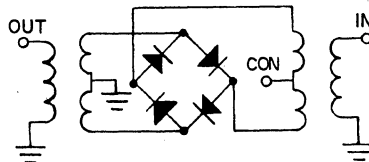
The ZAS/ZMAS series of electronic attenuators enable attenuation control of RF signals with a maximum of only 20 mA of control current. Due to the specific properties of the ZAS/ZMAS attenuators, for a single frequency input all harmonics even and odd order, are virtually eliminated at the output. As a consequence, the ZAS/ZMAS intercept point is greater than +45 dBm.

The ZAS/ZMAS series mixers are economically priced while covering the very broad frequency range from 1 - 450 MHz. They offer low insertion loss, 1.5 dB, high isolation 50 dB, and exceptional unit to unit matched performance.

Available with BNC, TNC, or SMA (3 mm) connectors the ZAS/ZMAS series is housed in a die cast aluminum case. These rugged units are double shielded to meet your tough RFI requirements. The case is finished with a blue baked enamel per Federal Standard 595 #25109 over phosphoric etch per MIL-C-15328A.

Every unit is 100% tested and inspected under strict MCL quality control standards to ensure superior electrical performance and reliability.

Ruggedness and durability are built into the ZAS/ZMAS series. Only well matched diodes and ruggedly constructed transmission line transformers are used. Internally, every component is bonded with silicone rubber to provide protection against shock, vibration and acceleration.

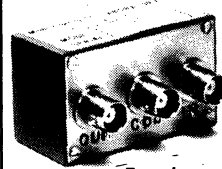


ABSOLUTE MAXIMUM RATINGS

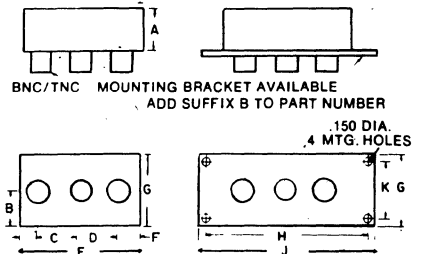
Total Input Power	1 W
Total Input, Current Peak	40mA
Operating & Storage Temperature	-55° C to +100° C

ZAS Series (Standard Size)

ZAS-1	5-450 MHz	\$42.95	(4-24)
ZAS-3	1-200 MHz	\$43.95	(4-24)



For pin version see PAS series



	A	B	C	D	E	F	G	H	J	K
INCHES	1.15	.63	.750	.730	.225	.385	1.40	.295	.325	1.10
CM	2.9	1.6	1.9	1.85	5.7	.977	3.55	.749	.825	2.8

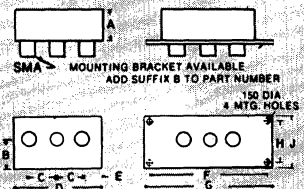
WEIGHT 74.0 grams 2.60 ounces

CONNECTORS

BNC	standard
TNC	on request

ZMAS Series (Miniature Size)

ZMAS-1	5-450 MHz	\$52.95	(4-24)
ZMAS-3	1-200 MHz	\$53.95	(4-24)



	A	B	C	D	E	F	G	H	J
INCHES	0.88	0.66	0.43	0.30	0.12	0.19	0.50	0.84	1.15
CM	2.2	1.7	1.1	0.8	3.0	4.8	12.7	21.3	2.9

WEIGHT 5.2 grams .18 ounces

CONNECTORS SMA (3mm) standard

MOUNTING BRACKET

On request, add \$1.50 to unit cost. See dimensions above.

World's largest supplier of double balanced mixers

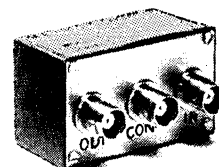
Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

ELECTRONIC ATTENUATOR/SWITCH

Frequency Range, MHz	OUTPUT INPUT CONTROL	MODEL ZAS-1/ZMAS-1		MODEL ZAS-3/ZMAS-3	
		5-450		1-200	
		5-450		1-200	
		DC-0.05		DC-0.05	
Insertion Loss, dB		Typical		Typical	
One Octave From Band Edge		3.5	4.0	1.4	2.0
Total Range		3.5	4.7	1.6	2.5
Signal, 1dB Compression Level		Greater than 1 Watt			
Isolation, dB		Typical		Typical	
Lower Band Edge to One Decade Higher		65	50	65	50
		35	25	35	25
Mid Range		45	35	50	40
		25	15	20	15
Upper Band Edge to One Octave Lower		35	25	50	40
		20	10	15	10
Impedance, All Ports		50 ohms		50 ohms	

ZAS Series

ZAS-1	5-450 MHz	\$42.95	(4-24)
ZAS-3	1-200 MHz	\$43.95	(4-24)



For pin version see PAS series

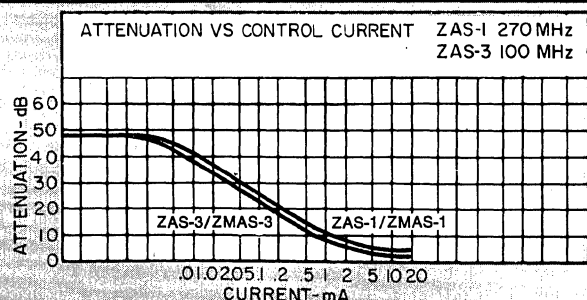
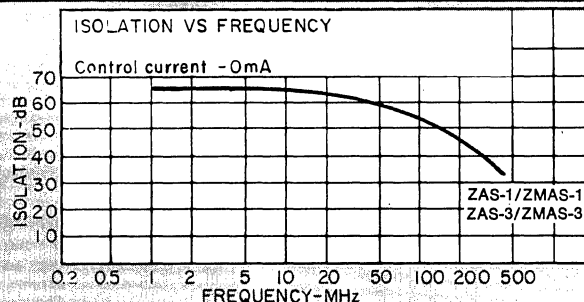
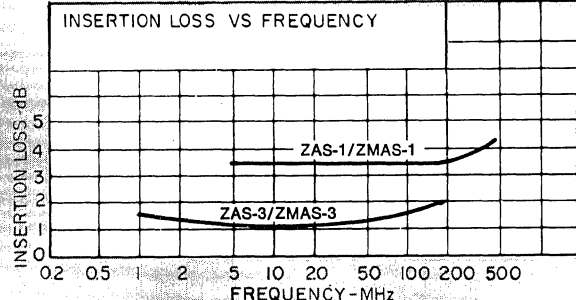
ZMAS Series

ZMAS-1	5-450 MHz	\$52.95	(4-24)
ZMAS-3	1-200 MHz	\$53.95	(4-24)

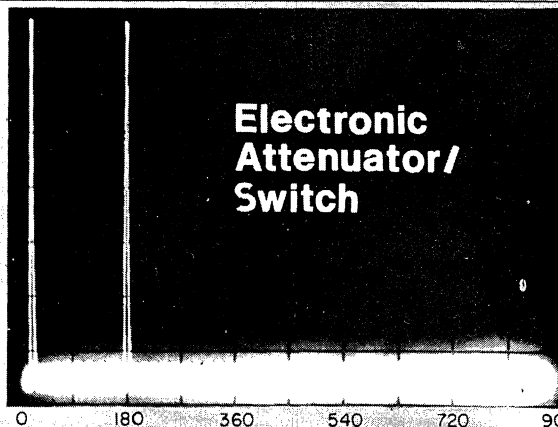
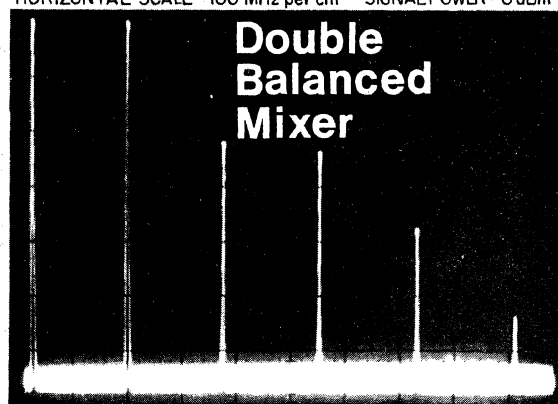


FAST DELIVERY

From stock, one week max.



TYPICAL HARMONIC SPECTRUM COMPARING ATTENUATORS - CONTROL CURRENT SET FOR 10dB ATTEN.
SIGNAL FREQUENCY - 180 MHz VERTICAL SCALE - 10 dB per cm
HORIZONTAL SCALE - 100 MHz per cm SIGNAL POWER - 0 dBm



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

RF TRANSFORMERS PLASTIC CASE

DESCRIPTION

Mini-Circuits' T-series of micro-miniature wideband RF transformers cover the frequency range from .015 to 600 MHz. They operate with impedance levels from 12.5 ohms to 800 ohms, and provide very low insertion loss, typically less than 0.5dB.

Model	T1-1	T2-1	T4-1	T9-1	T16-1
Impedance Ratio	1	2	4	9	16
Primary Impedance, ohms	50	50	50	50	50
Maximum Insertion Loss, dB					
1 dB	2-50 MHz	.05-200 MHz	2-100 MHz	2-40 MHz	5-20 MHz
2 dB	.35-200 MHz	.02-400 MHz	35-300 MHz	3-150 MHz	7-80 MHz
3 dB	.15-400 MHz	.015-600 MHz	2-350 MHz	15-200 MHz	3-120 MHz
Maximum Amplitude Unbalance, T4-1					
1 dB			5-100MHz		
5 dB			5-300MHz		
Maximum Phase Unbalance, T4-1					
1°			5-100MHz		
5°			5-300MHz		

MAXIMUM RATINGS FOR T-SERIES

Operating and Storage Temperature -54°C to +100°C
Pin Temperature (10 Sec) 500°F Input Power 1/4 watt

WEIGHT .04 grams .01 ounces

PRICE (10-49) T1-1 \$2.95 T2-1 \$3.45 T4-1 \$2.95 T9-1 \$2.95 T16-1 \$3.45

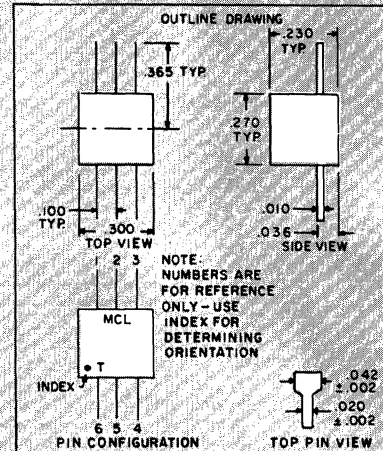
DELIVERY From Stock, One week maximum

T-SERIES

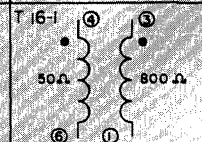
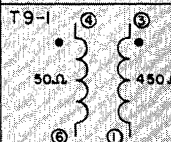
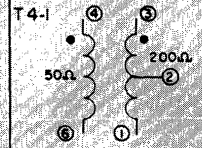
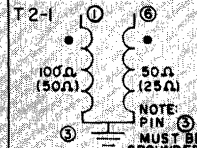
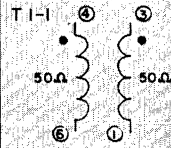
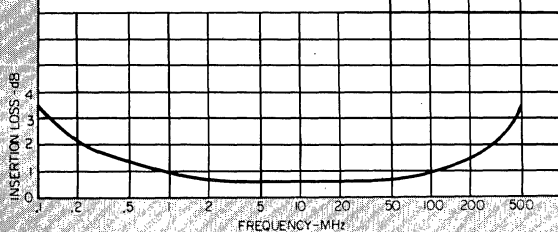
MODEL T1-1 15-400 MHz
MODEL T2-1 .015-600 MHz
MODEL T4-1 2-350 MHz
MODEL T9-1 15-200 MHz
MODEL T16-1 3-120 MHz

DESIGNERS KIT AVAILABLE

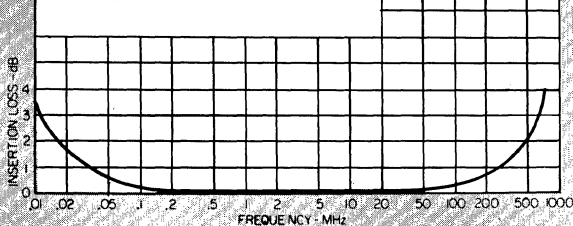
2 TRANSFORMERS OF EACH TYPE
T1-1, T2-1, T4-1, T9-1, T16-1 **\$32.00**



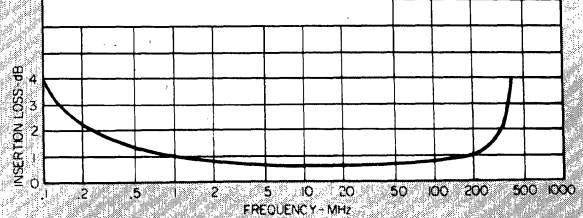
INSERTION LOSS VS FREQUENCY
MODEL T1-1



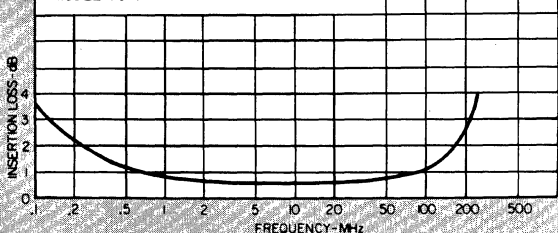
INSERTION LOSS VS FREQUENCY
MODEL T2-1



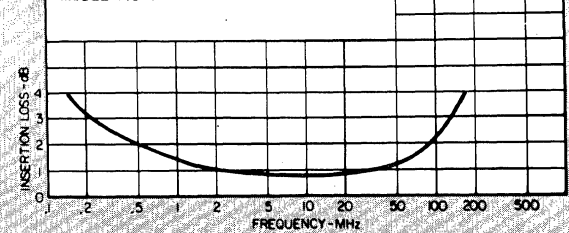
INSERTION LOSS VS FREQUENCY
MODEL T4-1



INSERTION LOSS VS FREQUENCY
MODEL T9-1



INSERTION LOSS VS FREQUENCY
MODEL T16-1



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

Mini-Circuits Laboratory

RF TRANSFORMERS

METAL CASE

Mini-Circuits' **TM** series of micro-miniature wideband RF transformers cover the frequency range from .015 to 600 MHz. They operate with impedance levels from 12.5 ohms to 800 ohms, and provide very low insertion loss, typically less than 0.5dB. The TMO series is packaged in a hermetically sealed metal case and is especially useful when rugged environments are encountered.

TMO SERIES

MODEL	TMO 1-1	.15-400 MHz
MODEL	TMO 2-1	.015-600 MHz
MODEL	TMO 4-1	.2-350 MHz
MODEL	TMO 9-1	.15-200 MHz
MODEL	TMO16-1	.3-120 MHz

Model	TMO 1-1	TMO 2-1	TMO 4-1	TMO 9-1	TMO 16-1
Impedance Ratio	1	2	4	9	16
Primary Impedance, ohms	50	50	50	50	50
Maximum Insertion Loss, dB					
1 dB	2-50 MHz	.05-200 MHz	2-100 MHz	2-40 MHz	5-20 MHz
2 dB	.35-200 MHz	.02-400 MHz	.35-300 MHz	.3-150 MHz	.7-80 MHz
3 dB	.15-400 MHz	.015-600 MHz	.2-350 MHz	.15-200 MHz	.3-120 MHz
Maximum Amplitude Unbalance, 1°	—	—	5-100MHz	—	—
5°	—	—	.5-300MHz	—	—
Maximum Phase Unbalance, 1°	—	—	5-100MHz	—	—
5°	—	—	.5-300MHz	—	—
PRICE (10-49)	\$4.95	\$5.45	\$4.95	\$4.95	\$5.45

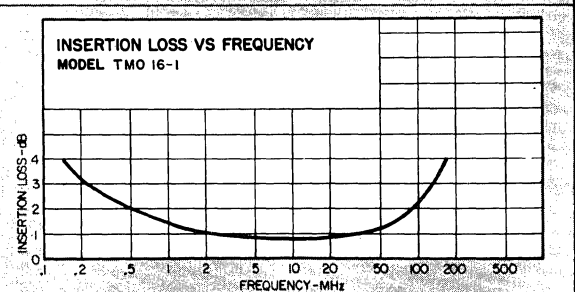
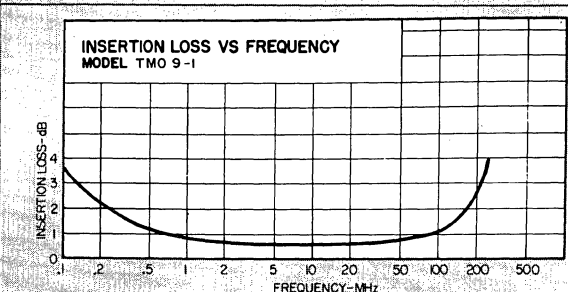
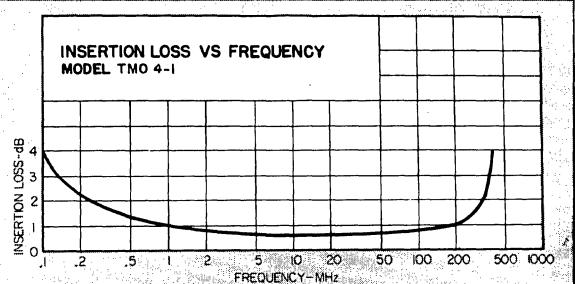
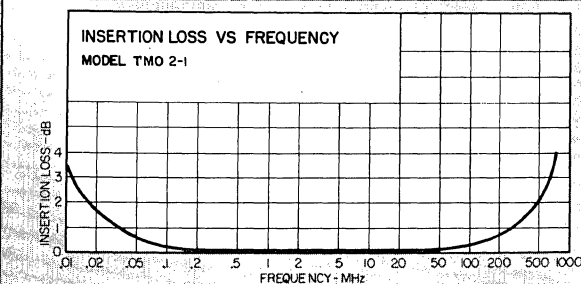
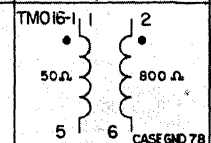
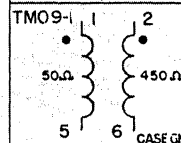
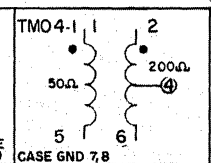
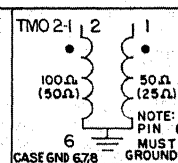
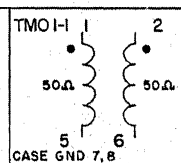
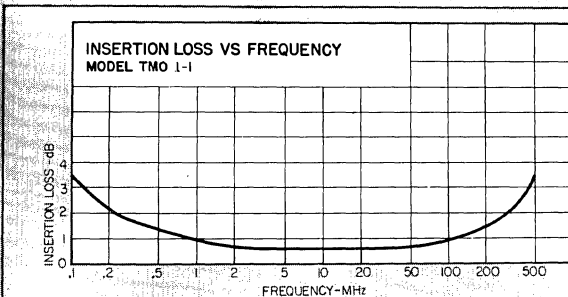
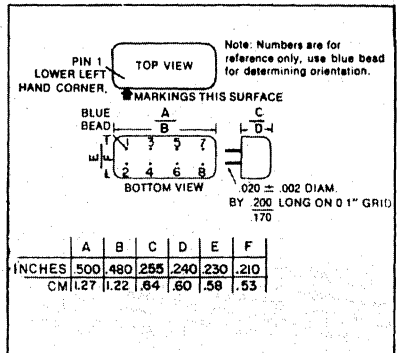
MAXIMUM RATINGS FOR TMO-SERIES

Operating and Storage Temperature -54°C to +100°C
Pin Temperature (10 Sec) 500°F Input Power 1/4 watt

WEIGHT 1.8 grams .07 ounces

DELIVERY From Stock, One week maximum

DESIGNERS KIT AVAILABLE
2 TRANSFORMERS OF EACH TYPE:
TMO 1-1, TMO 2-1, TMO 4-1
TMO 9-1, TMO 16-1 **\$49.50**



World's largest supplier of double balanced mixers

Mini Circuits Laboratory 837-843 Utica Avenue, Brooklyn, NY 11203 (212) 342-2500

WIDEBAND POWER DIVIDERS & HYBRID TRANSFORMERS


North Hills

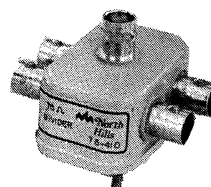
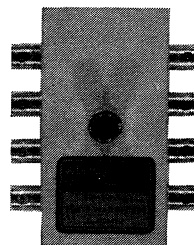
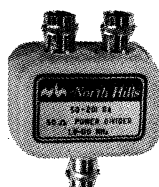
POWER DIVIDERS

0.2-110 and 30-225 MHz
2, 4, and 8-way
50 and 75 ohms

Series 01 and 10 Power Dividers are designed for low power applications in the 0.2 to 110 and 30 to 225 MHz frequency ranges.

Hybrid Junction Techniques are employed to assure superior isolation and minimal insertion loss. VSWR is optimized at all ports.

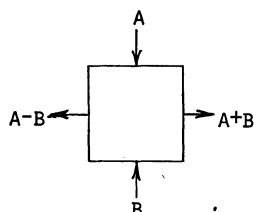
50 and 75 ohm impedances are standard. Other impedances available on special order.



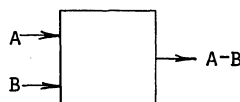
Model	2-WAY				4-WAY				8-WAY			
	50-201RA	75-201RA	50-210RA	75-210RA	50-401RB	75-401RB	50-410RB	75-410RB	50-801SA	75-801SA	50-810SA	75-810SA
Impedance (Ω)	50	75	50	75	50	75	50	75	50	75	50	75
Frequency Range (MHz)	0.2 - 110		30 - 225		0.2 - 110		30 - 225		0.2 - 110		30 - 225	
Insertion Loss (dB)	0.25		1.0		0.5		1.0		1.0		1.5	
Isolation (dB min)	30		30		30		30		30		30	
Amplitude Balance ($\pm$ dB)	0.5		0.5		0.5		0.5		1.0		0.5	
Phase Balance ($\pm$ °)	0.5		2.0		1.0		2.0		0.5		2.0	
Input VSWR	1.1		1.25		1.1		1.25		1.1		1.25	
Input Power (watts)	5		3		5		3		5		3	
Case Style	RA		RA		RB		RB		SA		SA	
Weight (gm)	50		50		65		65		160		160	

HYBRID TRANSFORMERS

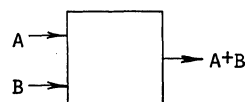
SUM & DIFFERENCE
(4-port)



DIFFERENCE DIVIDER
(3-port)



SUMMING JUNCTION
(3-port)

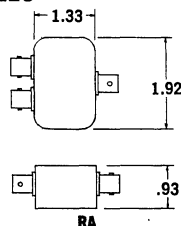


Port Impedance Type	50 Ω 50-212RE	75 Ω 75-212RE
Frequency Range	0.2 - 110 MHz	
Insertion Loss	1 dB max	
Isolation	30 dB min	
Amplitude Balance	$\pm$ 3 dB	
Phase Balance	1° max	
VSWR	1.20 max	
Power	0.5 watt max	

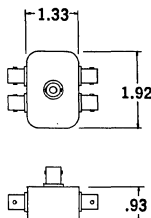
Port Impedance Type	50 Ω 50-221RA	75 Ω 75-221RA
Frequency Range	.2 - 110 MHz	
Insertion Loss	1 dB max	
Isolation	30 dB min	
Null	40 dB min	
VSWR	1.20 max	
Power	0.5 watt max	

Port Impedance Type	50 Ω 50-231RA	75 Ω 75-231RA
Frequency Range	.2 - 110 MHz	
Insertion Loss	.5 dB max	
Isolation	30 dB min	
Amplitude Balance	$\pm$ 0.5 dB	
Phase Balance	$\pm$.5°	
VSWR	1.20 max	
Power	0.5 watt max	

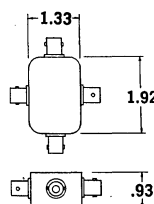
CASE STYLES



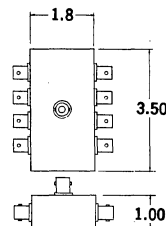
RA



RB



RE



SA

BNC Connectors are standard. Other connectors available on special order. Stud mounting standard.

Different case styles, including printed circuit types with solder terminals, available on special order.

SPECIAL UNITS

In addition to our standard lines, North Hills custom designs to specific requirements. Examples of these include:

- Active unity - or high-gain power splitters, adders and combiners.
- High power dividers.
- Power dividers for video applications with response down to 1 kHz.
- Non-standard impedances.

North Hills Electronics, INC.

GLEN COVE, N.Y. 11542 • 516-671-5700

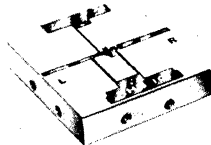
See Section 5600 for North Hills Wideband Transformers.

RHG

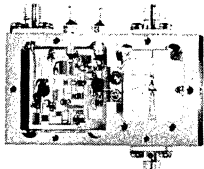
for newest designs & widest selections

MIC MIXERS & MIXER PREAMPS:

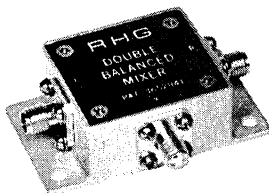
DOUBLE BALANCED • 1-18 GHz Coverage
• IF's to 8 GHz • Starved LO operation •
Noise Figures to 3.0 dB • Image Rejection
• Drop-in mixers



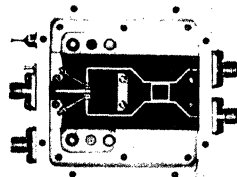
"Drop-In" Mixers
Supplied without housing
for Microstrip assemblies



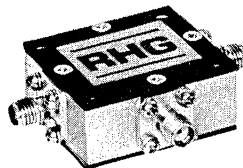
"Double Balanced" Mixer-Preamps
Over 150 standard
RF/IF combinations
L thru K band



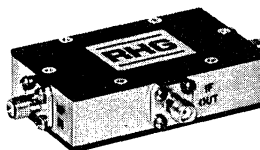
Multi-Octave "Starved LO" Mixers
2-18 GHz RF
-10 dBm LO
Usable 1 to 26 GHz



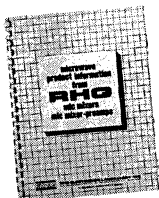
"QUIET" (ultra low noise) Mixers
Noise figure to 3.0 dB
20 dB Image rejection
L thru X Band



"QUAD-LINE" (extended IF) Mixers
2-18 GHz RF
0.5-8 GHz IF
+20 dBm intercept



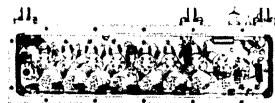
"Double-balanced" Mixers
1-18 GHz coverage
Isolation 20 dB



Comprehensive technical information, data sheets and application notes on MIC mixers and mixer preamps is contained in a special RHG catalog. Ask for a copy.

IF AMPLIFIERS:

LIN-LOG-LIMITING • Hybrid IC and discrete
• Preamps from 10 MHz to 2 GHz • Linear
amps with AGC and Video • Log amps to
1 GHz & octave BWs • Video amps —DC to
40 MHz • Constant phase limiters • Limiter-
discriminators



Log IF Amplifiers — Discrete Component
10-200 MHz Center Frequency
3-100 MHz Bandwidths
60-90 dB dynamic range



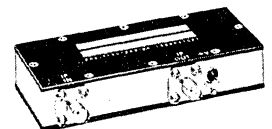
Linear IF Amplifiers — Discrete Component
10-160 MHz Center Frequency
2-40 MHz Bandwidths
IF & Video Outputs



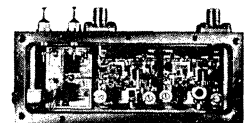
Hybrid IC Log IF Amplifiers
10-1000 MHz Center Frequency
2-200 MHz Bandwidths
50-80 dB dynamic range



Hybrid IC IF Preamplifiers
10 to 300 MHz Center Frequency
2 to 300 MHz Bandwidths
Noise figure to 1.1 dB



Hybrid IC Limiting IF Amplifiers
10-160 MHz Center Frequency
±1 dB out for >70 dB in
low phase shift



Hybrid IC Linear IF Amplifiers
10-160 MHz Center Frequency
2-40 MHz Bandwidths
IF & Video Outputs



Detailed product information on preamplifiers, log, linear and limiting amplifiers, limiter — discriminators is available in a special IF Amplifier Catalog. Call or write for a copy.



RHG ELECTRONICS LABORATORY • INC

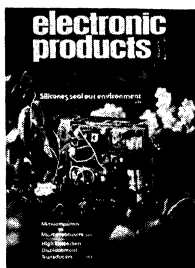
161 E. INDUSTRY COURT ■ DEER PARK, NEW YORK 11729 ■ (516) 242-1100 ■ TWX 510-227-6083

for RELIABILITY, INNOVATION and SERVICE

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



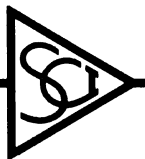
Sign up Now . . .

***Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530***



electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.



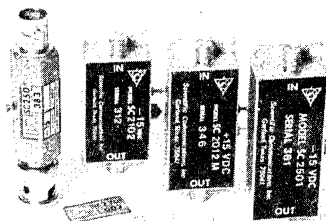
COMPONENTS & SUBSYSTEMS

TRANSISTOR AMPLIFIERS

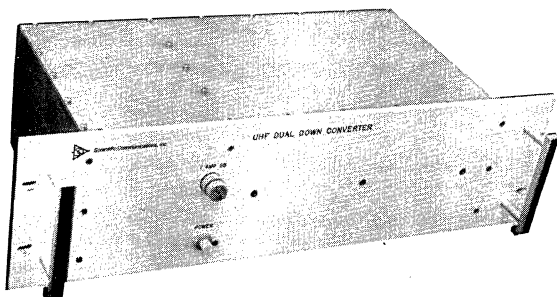
SCI components group produces several series of low-noise, cost effective solid state amplifiers from 0.5 MHz to 4 GHz. Available in a variety of mechanical packages, SCI transistor amplifiers are designed to deliver state-of-the-art performance with high reliability under adverse operating conditions.

CUSTOM AMPLIFIERS

SCI components group invites requests to modify standard series amplifiers or to design new amplifiers to meet special requirements. Our broad experience in all areas of amplifier design and fabrication enable SCI to perform these services with short turn around time at a modest increase in cost over our standard products.



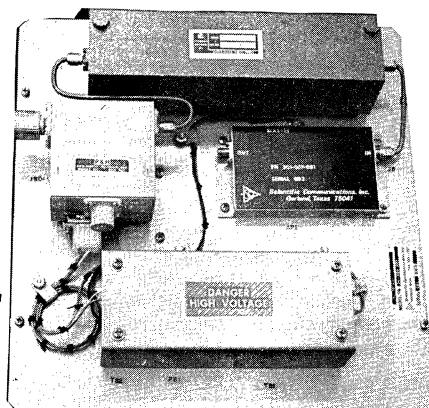
DOWN CONVERTERS



OTHER COMPONENTS/SUBSYSTEMS

SCI also manufactures other products from PIN attenuators and log amplifiers thru downconverters and complete radar front ends.

RADAR FRONT ENDS



Scientific Communications, Inc.

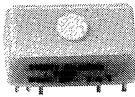
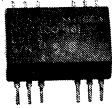
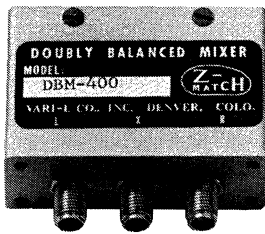
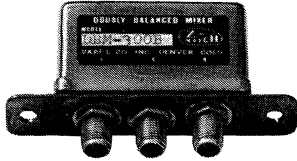
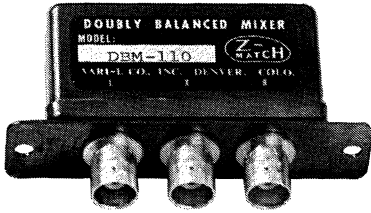
PARAMETRIC AMPLIFIERS • TRANSISTOR AMPLIFIERS • SURVEILLANCE RECEIVERS • MANAGEMENT CONTROL COMPUTERS

3425 KINGSLEY ROAD, GARLAND, TEXAS, 75041

(214) 271-3685 TWX 910-860-5172

Z-MATCH

DOUBLY BALANCED MIXERS



THE DOUBLY BALANCED MIXERS

Low Noise Figure**Flat Conversion Efficiency****Low Intermodulation Products****Wide Bandwidth****High Isolation****Low Insertion Noise**

Mixing two signals to produce a sum and a difference frequency requires a square-law device, and a diode has long been used for this purpose. Because it departs from true square-law behavior over much of its range, it produces products other than those desired, and it also feeds energy through from one port to another. The balanced mixer was developed to overcome these shortcomings, and its advantages are so numerous that it has become a standard component in most high-performance receivers. It is also valuable in the design of such high-reliability items as aircraft navigational equipment, microwave links, spectrum analyzers, etc. It would be out of the question to meet modern military equipment specifications, particularly as regards oscillator radiation from the antenna and intermodulation distortion, without the doubly balanced mixer. These advantages would also be desirable in equipment such as television receivers, CATV distribution circuits, and amateur communications receivers, but high cost has been a deterrent to using balanced mixers in such service. In recent months Vari-L Co., Inc. has been making strides toward a marked cost reduction in the device, and we invite inquiries from set designers who might like advance information.

NEW HIGH LEVEL DOUBLY BALANCED MIXERS

Recently balanced mixers have been developed containing networks which greatly improve their ability to handle, linearly, high RF signal levels. These designs have lower harmonic spurious outputs as well as improved odd order intermodulation production. Other characteristics parallel the low level types except that higher local oscillator drive levels are recommended.

APPLICATIONS: MODULATOR

Because one port is coupled to DC, the doubly balanced mixer may be used as a pulse modulator with unlimited pulse duration. RF input is made to port L, modulation to port X, and the output from port R. Total current should not exceed 50 ma. The modulator has a 35 dB on/off ratio at f_{max} (greater at the lower frequencies) and a turn-on/turn-off time of less than one nanosecond. As an AM modulator, with the X port used for the modulation-signal input, the mixer has excellent carrier rejection at high frequencies. The carrier may be reinserted after the modulator, or will feed through the mixer in controlled amounts if a DC bias (suitably isolated from the modulation source) is introduced into the X port.

CURRENT-CONTROLLED ATTENUATOR

By the use of a DC bias as described above, the mixer can function as a current/voltage controlled attenuator. With zero current into the X port the attenuation of an RF signal of frequency up to the specified f_{max} will be at least 35 dB, reducing to approximately 3 dB when the bias current is increased to 10 ma. Response time is less than one nanosecond. The signal is introduced to the R port and the output taken from the L port.

PHASE DETECTOR

Because the X port is DC coupled, it is possible to extract a DC voltage as a function of the phase difference between two signals. Minimal 1/f noise is introduced, because of the inherent low-noise quality of the diodes, and their superior balance makes a DC adjustment of the phase detector unnecessary. The DC output is approximately 0 VDC when the L and R port signal phase relationship is $\phi = 90^\circ$, and approximately ± 4 VDC for $\phi = 0$ or 180° phase conditions.

CONSTRUCTION

Z-match mixers are packaged in several case styles allowing the design engineer maximum layout flexibility. Most types are encapsulated to withstand severe environments and handling. High-rel screened diodes are employed throughout, as well as approved design tested materials. Write factory sales for appropriate bulletin.

Figures 8 and 9 are performance curves which are useful in selecting a mixer for a given application.

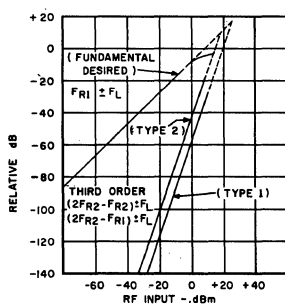


FIGURE 8
TYPICAL THIRD ORDER
INTERMODULATION PERFORMANCE

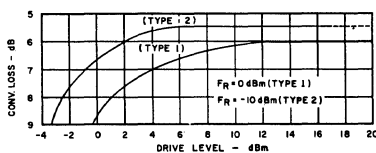


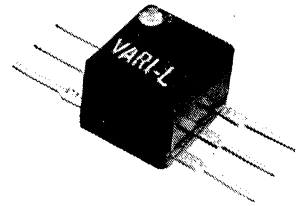
FIGURE 9
GENERAL PURPOSE DESIGN CURVE

DOUBLY BALANCED MIXERS (CONT.)

Z-MATCH

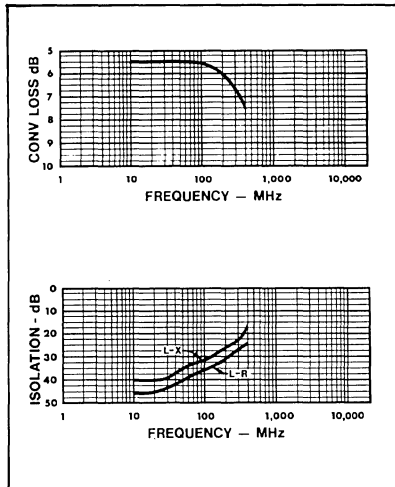
(1) OVERALL FREQ. RANGES (MHz)	(2) FREQ. BANDS (MHz)	(3) CON- VERSION LOSS SSBNF (dB, MAX.)	(4) ISOLATION (dB, MIN.)			PRICE
			LO-RF	LO-IF	RF-IF	
R&L: .4-400	.4-25	6.5	35	30	25	\$18.00
X: DC-400	25-200	7	25	20	20	
X: DC-400	200-400	8.5	20	20	15	

DBM-140

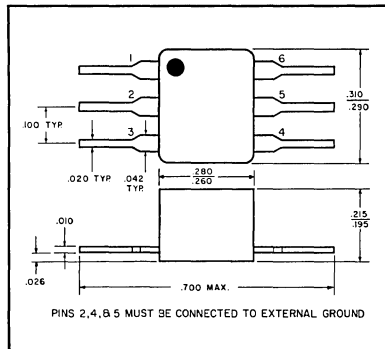
ULTRA MINIATURE
DOUBLY BALANCED MIXER

- .4-400 MHz
- ULTRA MINIATURE
- 6dB TYPICAL CONVERSION LOSS

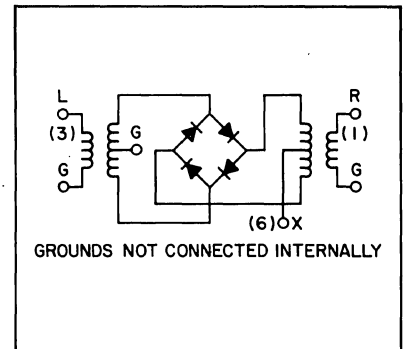
- RUGGED-ENCAPSULATED
- CONVENIENT P.C. BOARD MOUNTING



TYPICAL PERFORMANCE



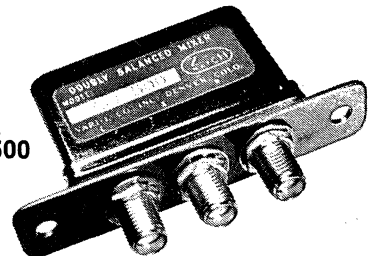
PACKAGE



SCHEMATIC

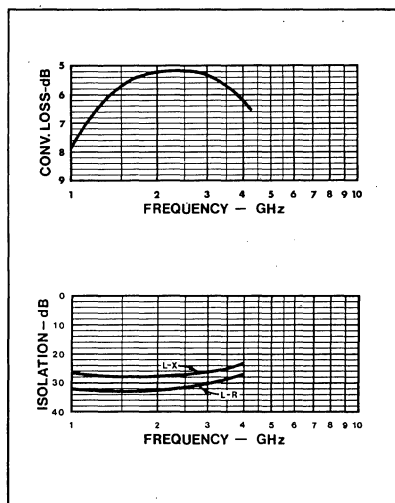
(1) OVERALL FREQ. RANGES (MHz)	(2) FREQ. BANDS (MHz)	(3) CON- VERSION LOSS SSBNF (dB, MAX.)	(4) ISOLATION (dB, MIN.)			PRICE
			LO-RF	LO-IF	RF-IF	
R&L: 1700-4200	2000-4000	6.5	25	25		\$125.00
X: DC-1200	1700-4200	8.0	20	20		

DBM-500

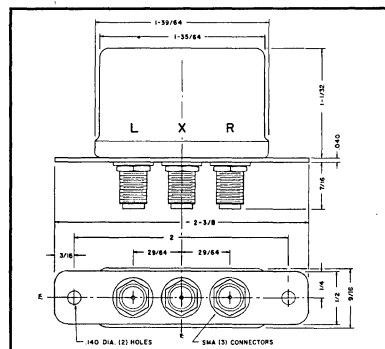


MICROWAVE DOUBLY BALANCED MIXER

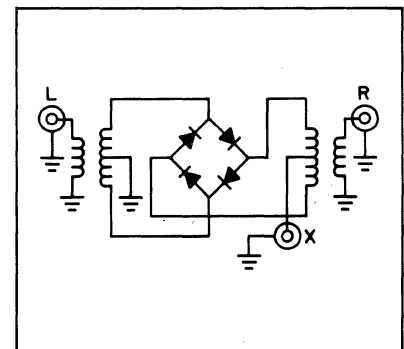
- 1.7-4.2 GHz
- 6dB TYPICAL CONVERSION LOSS
- SMA CONNECTOR PACKAGE



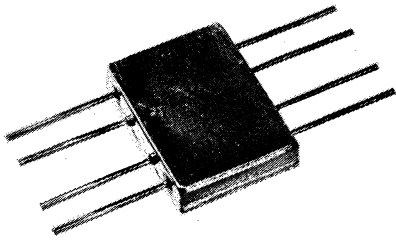
TYPICAL PERFORMANCE



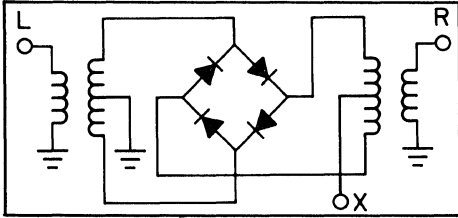
PACKAGE



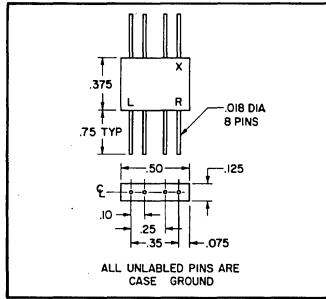
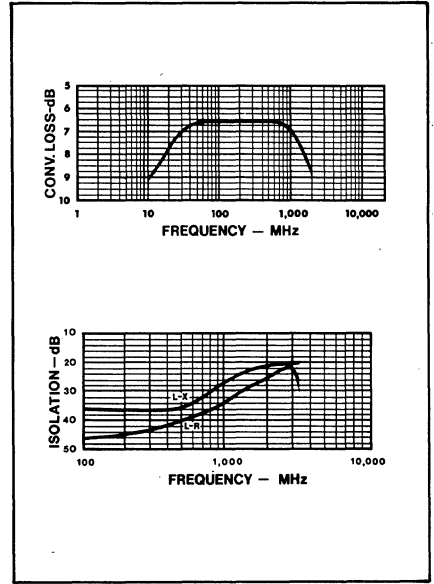
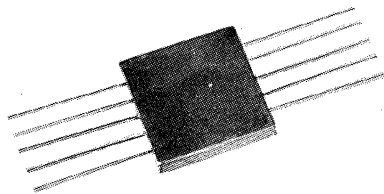
SCHEMATIC

Z-MATCH**DOUBLY BALANCED MIXERS (CONT.)****DBM-183****SUBMINIATURE
FLATPACK DOUBLY
BALANCED MIXER**

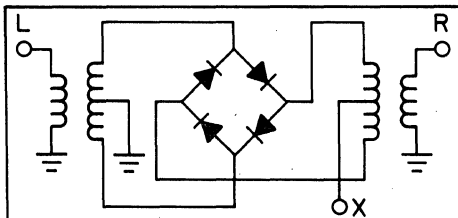
- 20-3500 MHz
- .125" HIGH
- 7 dB TYPICAL CONVERSION LOSS
- +17 dBm 3rd ORDER INTERCEPT POINT
- RUGGED-ENCAPSULATED

**SCHEMATIC**

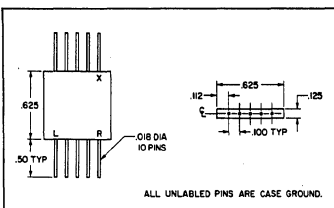
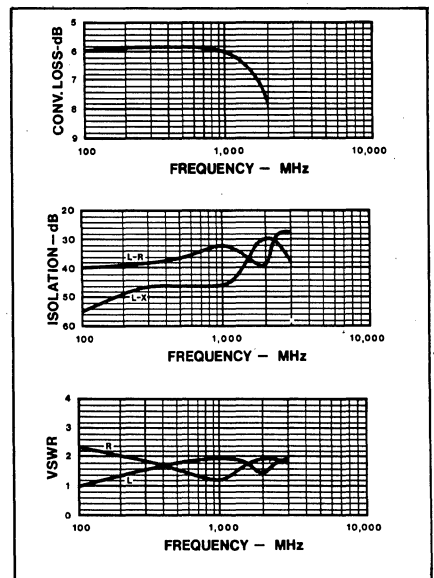
Conversion Loss: 9.0 dB Max.
($20 \leq f_r \leq 2100$ MHz)
Third Order Intercept Point:
+17 dBm typical
(+10 dBm LO, -10 dBm RF)
Port Impedance: 50 ohms Nom.
LO Power Range: +7 to +20 dBm
(Specs. guaranteed with +10 dBm)
Total Power Input, Max: +26 dBm @ 25°C
Operating Temperature Range:
-55 to +100°C

**PACKAGE****TYPICAL PERFORMANCE****DBM-184****SUBMINIATURE
FLATPACK DOUBLY
BALANCED MIXER**

- 2-3000 MHz
- .125" HIGH
- 6.5 dB TYPICAL CONVERSION LOSS
- +20 dBm 3rd ORDER INTERCEPT POINT
- RUGGED-ENCAPSULATED

**SCHEMATIC**

Conversion Loss:
7.0 dB Maximum, 20-1000MHz
8.0 dB Maximum, 5-2000 MHz
(R Port Frequencies)
Third Order Input Intercept Point:
+20 dBm Minimum
Conditions: 1000 MHz RF Two
Tone Level -5 dBm, LO Level
+13 dBm, IF Frequency 5 MHz
LO Power: +10 dBm Minimum
+13 dBm Nominal
+20 dBm Maximum
Operating Temperature Range:
-55°C to +85°C
Package:
5/8" square 10 lead flatpack
0.135" Maximum height

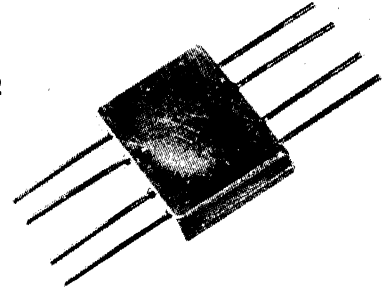
**PACKAGE****TYPICAL PERFORMANCE**

DOUBLY BALANCED MIXERS (CONT.)

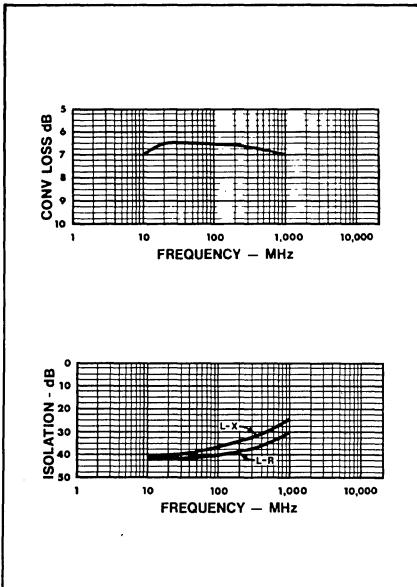
Z-MATCH

OVERALL FREQ. RANGES (MHz)	FREQ. BANDS	CON- VERSION LOSS SSBNF (dB, MAX.)	ISOLATION (dB, MIN.)			PRICE
			LO-RF	LO-IF	RF-IF	
L-10-1000	10-200	7.5	30	25	25	\$25.00
R-10-1000	200-500	7.5	30	25	20	
DC-1000	500-1000	8.0	25	20	15	

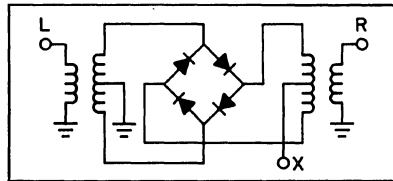
DBM-142

SUBMINIATURE
FLATPACK DOUBLY
BALANCED MIXER

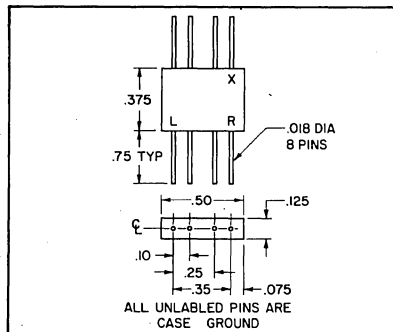
- 10-1000 MHz
- .125" HIGH
- 6.5 dB TYPICAL CONVERSION LOSS
- RUGGED-ENCAPSULATED



TYPICAL PERFORMANCE



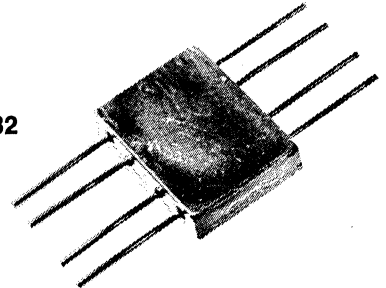
SCHEMATIC



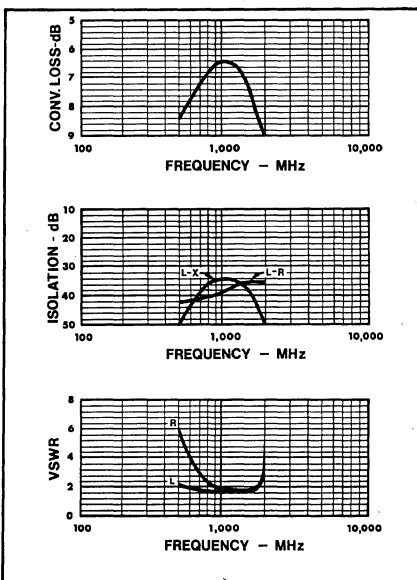
PACKAGE

OVERALL FREQ. RANGES (MHz)	FREQ. BANDS (MHz)	CON- VERSION LOSS SSBNF (dB, MAX.)	ISOLATION (dB, MIN.)			PRICE
			LO-RF	LO-IF	RF-IF	
R&L: 600-2000	600-2000	9.5	25	20	15	\$50.00
X: DC-200	950-1300	7.0	25	20	15	

DBM-182

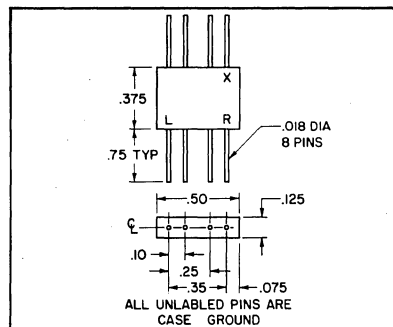
SUBMINIATURE
FLATPACK DOUBLY
BALANCED MIXER

- SUBMINIATURE FLATPACK
- .125" HIGH
- 600-2000 MHz
- 6.0 dB TYPICAL CONVERSION LOSS IN TACAN BAND
- LOW COST
- RUGGED-ENCAPSULATED

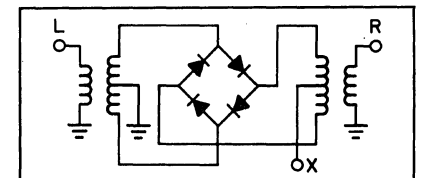


TYPICAL PERFORMANCE

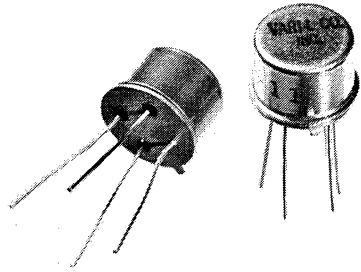
PORT IMPEDANCE: 50
OHMS — NOMINAL
MAXIMUM INPUT POWER:
+20 dBm
OPERATING TEMPERATURE
RANGE: -55° TO +100°C
PACKAGE: 1/2 x 3/8 x 1/8
FLATPACK
(1) TEST CONDITIONS:
LO POWER +7 dBm
RF POWER -10 dBm



PACKAGE

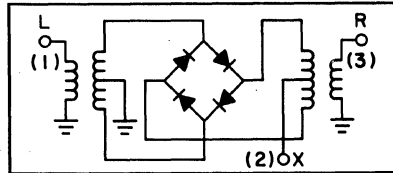
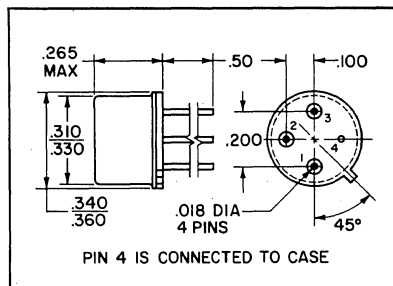
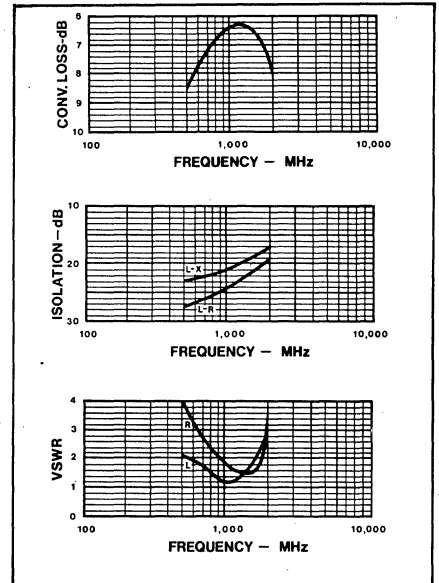
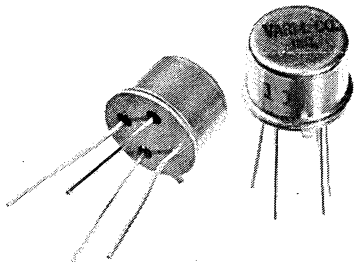


SCHEMATIC

Z-MATCH**DOUBLY BALANCED MIXERS (CONT.)****DBM-185****SUBMINIATURE TO-5 DOUBLY BALANCED MIXER**

- 600-2000 MHz
- TYPICAL 7 dB CONVERSION LOSS
- CONVENIENT PC BOARD MOUNTING
- RUGGED-ENCAPSULATED

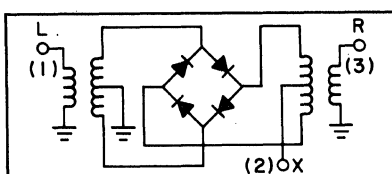
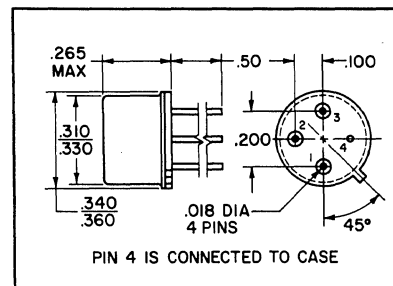
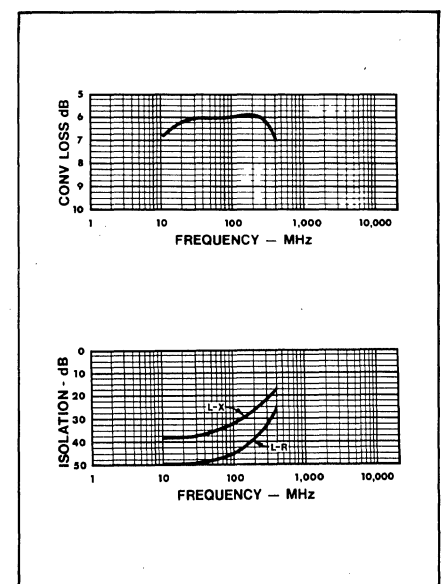
OVERALL FREQ. RANGES (MHz)	FREQ. BANDS (MHz)	CONVERSION LOSS SSBNF (dB, MAX.)	ISOLATION (dB, MIN.)			PRICE
			LO-RF	LO-IF	RF-IF	
R&L: 600-2000 X: DC-400	600-1000 600-2000	8.5 9.5	20 15	15 15	—	\$65.00

**SCHEMATIC****PACKAGE****TYPICAL PERFORMANCE****DBM-141****SUBMINIATURE TO-5 DOUBLY BALANCED MIXER**

- .4-400 MHz
- 6 dB TYPICAL CONVERSION LOSS
- CONVENIENT PC BOARD MOUNTING
- RUGGED-ENCAPSULATED

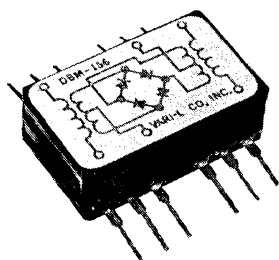
OVERALL FREQ. RANGES (MHz)	FREQ. BANDS (MHz)	CONVERSION LOSS SSBNF (dB, MAX.)	ISOLATION (dB, MIN.)			PRICE
			LO-RF	LO-IF	RF-IF	
R .4-400 L .4-400 X DC-400	.4-100 100-200 200-400	6.5 6.5 7.0	35 30 20	25 20 15	20 15 15	\$55.00

PORT IMPEDANCES: 50 OHMS — NOMINAL
 TOTAL POWER INPUT (MAX.): 50 mW
 OPERATING TEMPERATURE: -55° TO +100°C
 "X" PORT DC CURRENT (MAX.): 50 mA
 LO INPUT REQUIRED: +7 dBm NOMINAL

**SCHEMATIC****PACKAGE****TYPICAL PERFORMANCE**

**Z-
MATCH**

DOUBLY BALANCED MIXERS (CONT.)

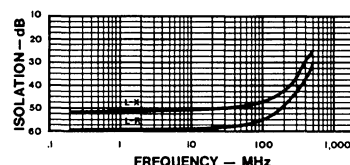
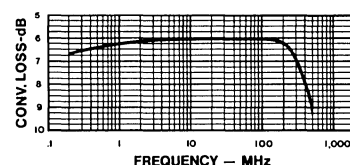
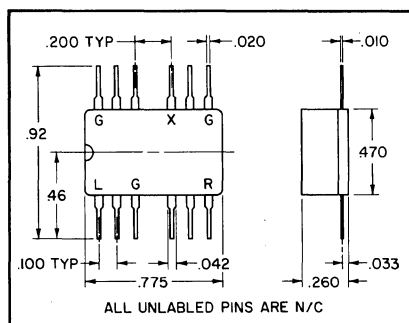
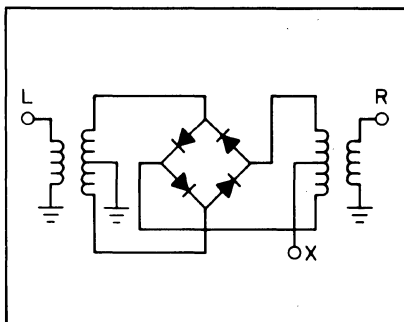
**DBM-166**

OVERALL FREQ. RANGES (MHz)	FREQ. BANDS (MHz)	CON- VERSION LOSS SSBNF (dB, MAX.)	ISOLATION (dB, MIN.)			PRICE
			LO-RF	LO-IF	RF-IF	
R .2-500	1-100	6.5	30	25	20	\$15.00
L .2-500	100-300	7.5	25	20	20	
X DC-500	.2-500	9.5	25	15	10	

LOW COST WIDE BAND DOUBLY BALANCED MIXER

- .2-500 MHz
- LOW COST
- HIGH PERFORMANCE/
RELIABILITY
- REFLOW SOLDER OR
PRINTED CIRCUIT
INSTALLATION

Port Impedances: 50 Ω Nominal
 Total Power Input: 50 mW Max.
 Operating Temperature: -55 to +85°C
 X Port Current: 50mA Max.
 RF Level for 1dB Conversion com-
 pression: +2dBm (Lo = +7 dBm)
 Unit prices: 1-24 (\$15.00), 25-49
 (\$8.75), 50-99 (\$8.00)

**TYPICAL PERFORMANCE****PACKAGE****SCHEMATIC**

DOUBLY BALANCED MIXER SPECIFICATIONS

MODEL () DENOTES TYPE*	OVERALL FREQUENCY RANGES (MHz)	FREQUENCY BANDS (MHz)	CONV. LOSS SSBNF (dB, Max.)	ISOLATION (dB, MIN.)			PACKAGE STYLE (See Page 2-1399)	Sche- matics Fig.	PRICE 1-9	SPECIAL NOTES
				LO-RF	LO-IF	RF-IF				
DBM-152 (2)	R&L: 002-15 X: DC-15	.002-1 1-15	5.5 5.5	50 50	40 40	25 20	EA	11B	\$35.00	Fully Encapsulated High Rel. Plastic Type
DBM-162 (2)	R&L: 002-15 X: DC-15	.002-1 1-15	6.0 6.0	45 45	35 35	25 20	EA	11B	\$35.00	Lower Spec. Equal of DBM-152
DBM-153 (2)	R&L: .01-50 X: DC-50	.01-1 1-35 35-50	8.5 5.0 5.5	40 40 40	35 35 30	25 25 20	EA	11B	\$30.00	Fully Encapsulated High Rel. Plastic Type
DBM-163 (2)	R&L: .01-50 X: DC-50	.01-1 1-35 35-50	8.5 5.5 6.0	35 35 35	30 30 25	25 20 20	EA	11B	\$25.00	Lower Spec. Equal of DBM-153
DBM-151 (2)	R&L: .05-200 X: DC-200	1-100 .05-200	6.5 7.5	40 35	35 30	25 20	EA	11B	\$30.00	Fully Encapsulated High Rel. Plastic Type
DBM-161 (2)	R&L: .05-200 X: DC-200	1-100 .05-200	6.5 8.0	35 30	30 25	20 20	EA	11B	\$25.00	Lower Spec. Equal of DBM-151
DBM-150 (2)	R&L: 5-500 X: DC-500	10-100 5-250 5-500	6.5 7.5 8.5	40 35 30	35 30 25	25 20 20	EA	11B	\$30.00	Fully Encapsulated High Rel. Plastic Type
DBM-160 (2)	R&L: 5-500 X: DC-500	10-100 5-250 5-500	6.5 7.5 9.0	35 30 30	30 25 20	25 20 15	EA	11B	\$25.00	Lower Spec. Equal of DBM-150

PORT IDENTIFICATION: L: LO PORT; R: RF PORT; X: IF PORT. All measurements made in a 50 ohm system with LO power of +7 dBm (5 mW). MAX. input power (total): 50 mW. Rated conv. loss and LO-RF figures maintained over a range from -55 to +100°C. Notes for models DBM-400 and DBM-400A: 1. Conversion loss figures apply to RF and/or LO frequencies in the ranges shown and an IF output frequency of 1.0 GHz (750 MHz for DBM-400A) or lower. The X port response

extends to 1.5 GHz (1.0 GHz for DBM-400A) with approx. 1 dB increase in conversion loss. 2. (DBM-400 only) for UP conversion with IF frequencies above 1.5 GHz, interchange R and X ports. (R port is now IF output.) Apply the lower frequencies (below 1.5 GHz) to the X port.

* Type (1) High Level — Low Intermodulation Production
 Type (2) Medium Level — Medium Intermodulation Production

DOUBLY BALANCED MIXERS (CONT.)



DOUBLY BALANCED MIXER SPECIFICATIONS (Continued)

MODEL () DENOTES TYPE*	OVERALL FREQUENCY RANGES (MHz)	FREQUENCY BANDS (MHz)	CONV. LOSS SSBNF (db, Max.)	ISOLATION (dB, MIN.)			PACKAGE STYLE (See Outline)	Sche- matics Fig.	PRICE 1-9	SPECIAL NOTES
				LO-RF	LO-IF	RF-IF				
DBM-166	R: 2-500 L: 2-500 X: DC-500	1-100 100-300 2-500	6.5 7.5 9.5	30 25 25	25 20 15	20 20 11	See Page 2-1397		\$ 15.00	New Model, See Page 2-1397 for Details
DBM-140	R&L: 4-400 X: DC-400	4-25 25-200 200-400	6.5 7.0 8.5	35 25 20	30 20 20	25 20 15	See Page 2-1393		\$ 18.00	New Model, See Page 2-1393 for Details
DBM-141	R: 4-400 L: 4-400 X: DC-400	4-100 100-200 200-400	6.5 6.5 7.0	35 30 20	25 20 15	20 15 15	See Page 2-1396		\$ 55.00	New Model, See Page 2-1396 for Details
DBM-142	L: 10-1000 R: 10-1000 DC-1000	10-200 200-500 500-1000	7.5 7.5 8.0	30 30 25	25 30 20	25 20 15	See Page 2-1395		\$ 25.00	New Model, See Page 2-1395 for Details
DBM-170 (2)	R&L: 2-700 X: DC-700	1-100 1-250 5-500 2-700	6.5 7.0 7.5 8.0	50 40 35 30	35 30 25 25	30 25 20 20	SPA "H" .200	11C	\$ 60.00	High Isolation Very Wide Band Shielded
DBM-171 (2)	R&L: 2-600 X: DC-600	1-100 1-250 5-500 2-600	6.5 7.0 7.5 8.0	45 35 30 30	35 30 25 25	20 25 20 20	SPA .200	11C	\$ 45.00	Best General Purpose Shielded PC Type
DBM-172 (2)	R&L: 2-500 X: DC-500	1-100 1-250 5-400 2-500	6.5 7.0 7.5 8.5	40 35 30 30	35 30 25 25	30 25 20 20	SPA .200	11C	\$ 40.00	Lower Spec. Equal of DBM-171
DBM-175 (2)	R&L: 2-600 X: DC-600	1-100 1-250 5-500 2-600	6.5 7.0 7.5 8.0	45 35 30 30	35 30 25 25	30 25 20 20	SPA .250	11C	\$ 70.00	Very High Rel., Encapsulated NASA Approved
DBM-182	R&L: 600-2000 X: DC-200	600-2000 950-1300	9.5 7.0	25 25	20 20	15 15	See Page 2-1395		\$ 50.00	New Model, See Page 2-1395 for Details
DBM-183	R: 20-2500MHz L: 20-3500MHz X: DC-2500MHz		9.0	20	20	20	See Page 2-1394		\$165.00	New Model, See Page 2-1394 for Details
DBM-184	R: 5-2000MHz L: 5-3000MHz X: 2-2000MHz		8.0	20	20	20	See Page 2-1394		\$165.00	New Model, See Page 2-1394 for Details
DBM-185	R&L: 600-2000 X: DC-400	600-1000 600-2000	8.5 9.5	20 15	15 15		See Page 2-1396		\$ 65.00	New Model, See Page 2-1396 for Details
DBM-100B (2)	R&L: 2-600 X: DC-600	5-100 5-250 2-500 2-600	6.5 7.0 8.0 8.5	45 40 30 30	35 30 25 25	25 20 20 20	CA	11A	\$ 45.00	Low VSWR, Highest Performance Mixer of its Type
DBM-100E (1)	R&L: 5-500 X: DC-500	5-30 30-100 100-500	7.0 7.5 9.0	60 55 35	45 40 30	30 25 25	CA	11A	\$ 85.00	Very High Level, Low Intermodulation Type
DBM-110 (2)	R&L: 5-600 X: DC-600	10-100 10-250 10-500 5-600	7.0 7.5 8.0 8.5	40 30 30 30	35 30 25 25	25 20 20 20	CA	11A	\$ 38.00	High Performance Low Cost
DBM-111 (2)	R&L: .05-200 X: DC-200	1-100 .05-200	6.5 7.5	40 35	35 30	25 20	CA	11A	\$ 38.00	Low Frequency Companion to the DBM-110
DBM-200 (2)	R&L: 5-1000 X: DC-500	10-100 10-250 250-500 5-1000	6.5 7.0 8.0 9.5	40 35 35 30	40 35 30 25	30 25 25 20	CA	11A	\$ 65.00	High Level, Low VSWR Ultra-high Performance up to 1GHz
DBM-300B (2)	R&L: 300-1500 X: DC-500	300-1000 1000-1500	8.0 7.0	35 30	30 25	25 10	CC	11A	\$125.00	High Performance, Optimized for Tacan
DBM-300A (2)	R&L: 300-2000 X: DC-750	300-1000 1000-2000	8.0 9.5	35 30	30 20	25 10	CC	11A	\$175.00	High Performance Optimized for L-Band
DBM-400 (2)	R&L: 10-3000 X: 10-1500	30-500 50-1800 10-2800	7.0 8.5 9.0	40 35 30	40 30 20	20 20 20	CB	11A	\$275.00	Best High Level Full Spectrum Miniature Mixer Available
DBM-400A (2)	R: 100-3000 L: 10-3000 X: DC-1000	2800-3000 See Note 1	9.5	25	20	20	CB	11A	\$295.00	DC Coupled Equal of the DBM-400
DBM-500	R&L: 1700-4200 X: DC-1200	2000-4000 1700-4200	6.5 8.0	25 20	25 20		See Page 2-1393		\$125.00	New Model, See Page 2-1393 for Details

GENERAL SPECIFICATIONS

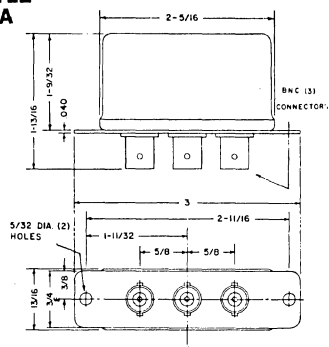
TYPE	MAXIMUM TOTAL INPUT POWER	"X" PORT DC CURRENT (MAX.)	RF LEVEL FOR 1dB CONVERSION COMPRESSION	NOMINAL LEVEL - LO
(1)	200 mW	100 mA	+8 dBm	+17 dBm
(2)	50 mW	50 mA	+2 dBm	+ 7 dBm

TYPES NOT RECOMMENDED FOR NEW DESIGNS

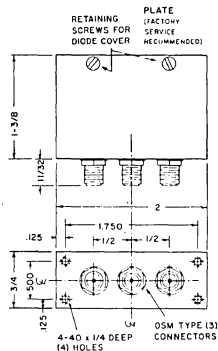
OLD MODEL #	NEAREST EQUIVALENT
DBM-154	DBM-140
DBM-155	DBM-140
DBM-157	DBM-183 DBM-184
DBM-159	DBM-183 DBM-184
DBM-174	DBM-172

OLD MODEL #	NEAREST EQUIVALENT
DBM-181	DBM-182 DBM-183 DBM-184
DBM-600	DBM-400 DBM-500
DBM-156	DBM-142
DBM-158	DBM-182

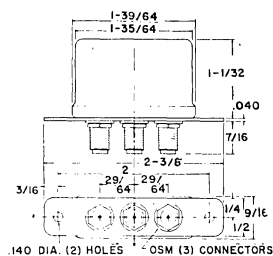
**STYLE
CA**



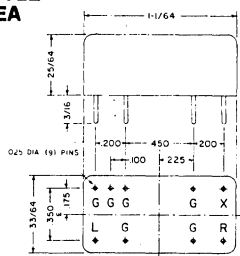
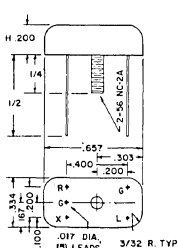
**STYLE
CB**



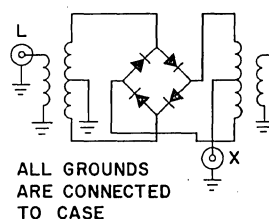
**STYLE
CC**



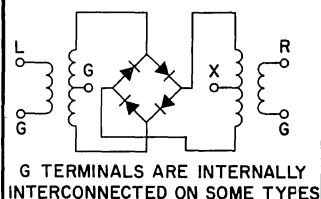
**STYLE
EA**

**STYLE
SPA**

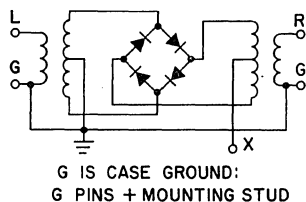
11A



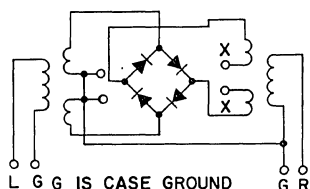
11B



11C



11D



11E

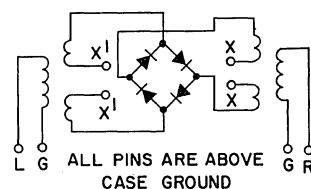
**FIGURE 12**

FIGURE 12
TYPICAL MID-BAND HARMONIC INTERMODULATION PRODUCT ATTENUATION

level is as shown in Figure 9, Page 2-1392. This table should be treated as design guide only; values given are normally within 10% of actual performance for models listed for service below 1 GHz and within 20% for models designed to operate above 1 GHz.

Z-MATCH

ALTERNATE MIXER STYLES

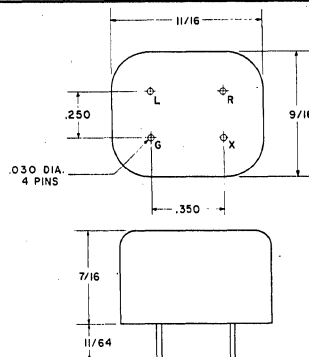
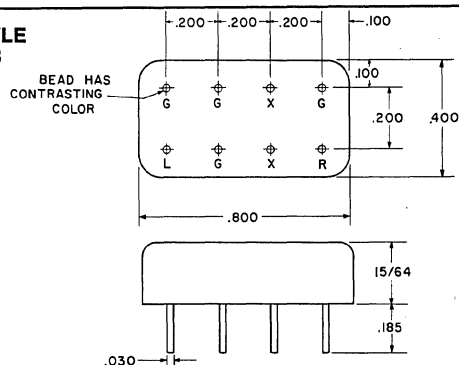
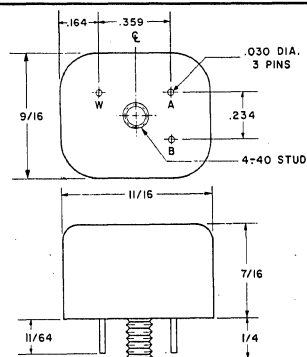
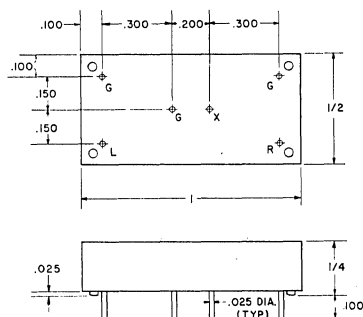
The mixers shown in the table below were designed at customer request to replace existing packages. This list of exact replacements gives specifications for units which are com-

pletely tooled in our shop and are available on a 2-3 week basis on special order. All are Type 2 units.

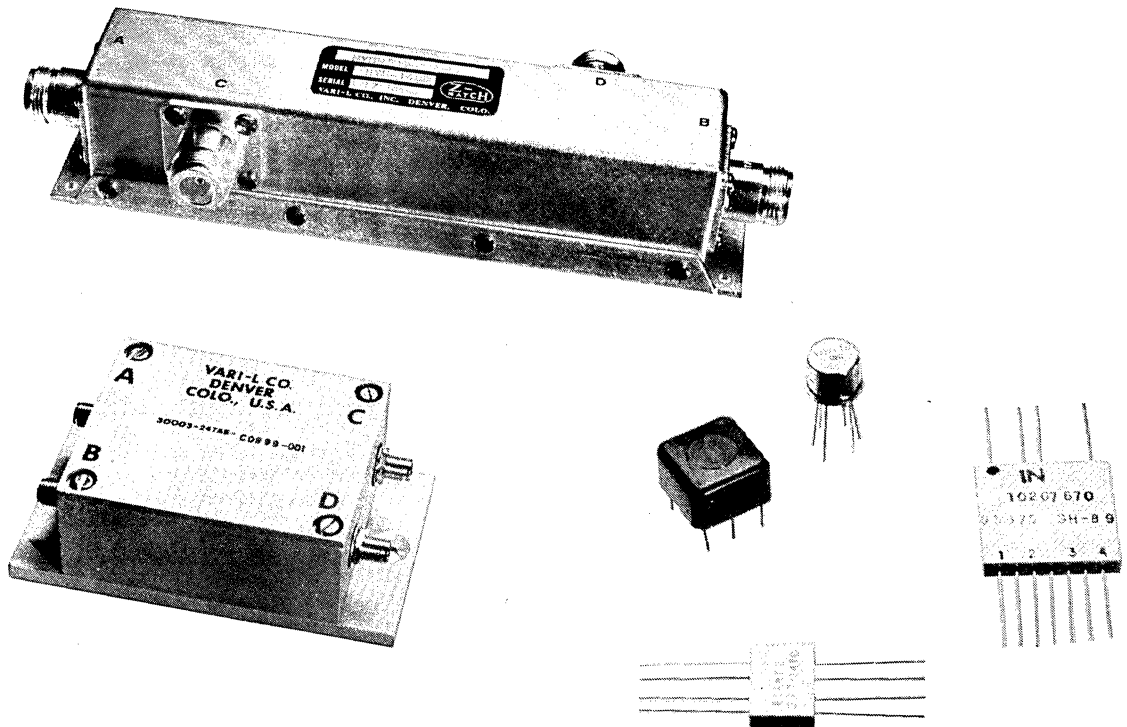
ALTERNATE PACKAGED MIXER SPECIFICATIONS

MODEL	OVERALL FREQUENCY RANGES (MHz)	FREQUENCY BANDS (MHz)	CONV. LOSS SSBNF (dB, MAX.)	ISOLATION (dB, MIN.)			PACKAGE STYLE (See Outline)	SCHEMATIC DIAGRAM	PRICE 1 - 9
				LO-RF	LO-IF	RF-IF			
DBM-151A	R&L: .05-200 X: DC-200	1-100 .05-200	6.5 7.5	40 35	35 30	25 20	ED	11B	\$25.00
DBM-151B	R&L: .05-200 X: DC-200	.05-30 30-200	6.5 8.0	45 35	35 25	30 20	SPB	11E	\$35.00
DBM-150A	R&L: 5-500 X: DC-500	10-100 5-250 5-500	6.5 7.5 8.5	40 35 30	35 30 25	25 20 20	ED	11B	*
DBM-150B	R&L: 5-500 X: DC-500	10-100 100-200 5-500	7.0 8.0 9.0	45 35 30	40 25 25	20 20 20	SPB	11D	*
DBM-172A	R&L: .2-500 X: DC-500	1-100 1-250 .5-400 .2-500	6.5 7.0 7.5 8.5	40 35 30 30	35 30 25 25	30 25 20 20	SPC	11C	*
DBM-172B	R&L: .2-500 X: DC-500	1-100 1-250 .5-400 .2-500	6.5 7.0 7.5 8.5	40 35 30 30	35 30 25 25	30 25 20 20	SPD	11C	*

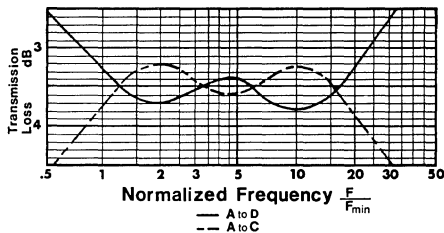
*Contact Factory for Current Prices.



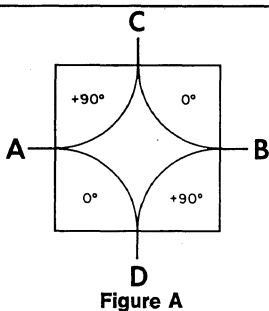
WIDE BAND HYBRID POWER COMBINERS/DIVIDERS

Z-MATCH


ULTRA WIDEBAND 90° HYBRIDS



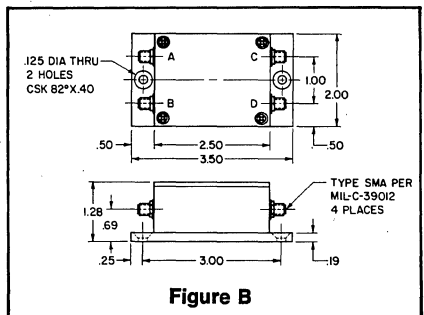
- 20:1 FREQUENCY RANGE
- EXCELLENT PHASE AND AMPLITUDE BALANCE
- SMA CONNECTOR PACKAGE



QH series devices are four port quadrature hybrids capable of supplying equal amplitude, isolated quadrature outputs (90°) of an input signal.

A signal applied to any port couples equally (3dB) to the two adjacent ports. The opposite port remains isolated.

Conversely, the QH series hybrid can be used to obtain the vector sum of the quadrature components of two signals.



UNIT	FREQUENCY RANGE	MINIMUM ISOLATION dB	MAXIMUM INSERTION LOSS (dB)	DEVIATION FROM QUADRATURE	AMPLITUDE BALANCE (dB)	VSWR	PACKAGE	SCHEMATIC	PRICE
QH-1	10-200KHz	20	1.0	±3°	1.5 dB	1.5	FIG. B	FIG. A	\$295.00
QH-2	.1-2.0MHz	20	1.0	±3°	1.5 dB	1.5	FIG. B	FIG. A	\$275.00
QH-3	2-40MHz	20	1.0	±3°	1.2 dB	1.5	FIG. B	FIG. A	\$275.00

VARI-L CO., INC. • 3883 MONACO PARKWAY • DENVER, COLORADO 80207 • (303) 321-1511 • TWX 910-931-0590

**Z-
MATCH**

WIDE BAND HYBRID POWER COMBINERS/DIVIDERS (CONT.)

180° HYBRIDS

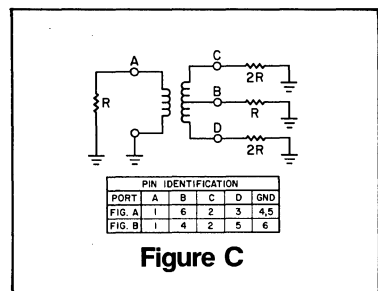
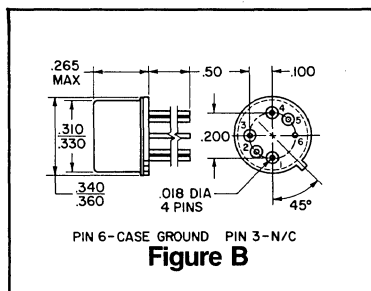
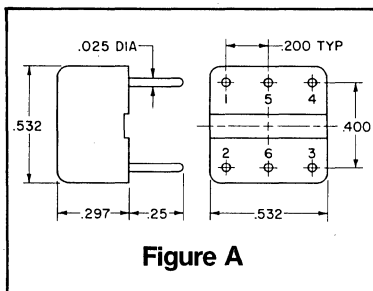
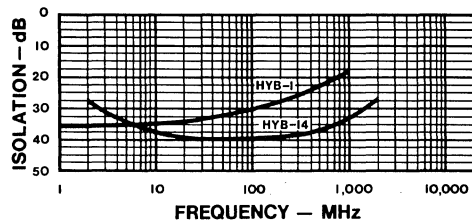
In all 180° hybrid designs ports A and B are mutually isolated and ports C and D are mutually isolated.

As a power combiner, two signals fed into port C and D yield their vector sum at port B and their vector difference at port A.

A signal fed into port B divides into two equal amplitude, equal phase, isolated output signals at port C and D. A signal fed into port A divides into equal amplitude, 180°

out of phase, isolated signals at port C and D.

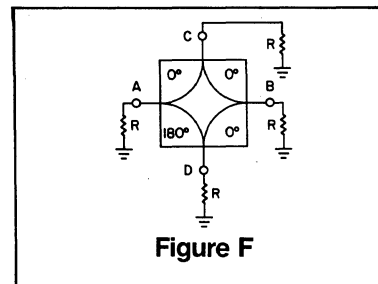
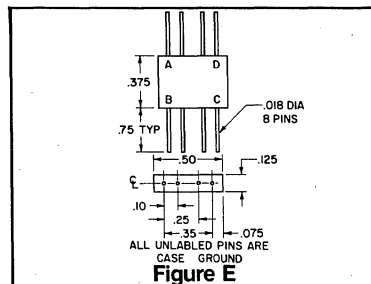
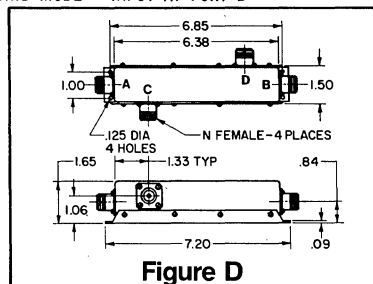
Vari-L hybrid models include both impedance transforming and non-impedance transforming designs. In the impedance transforming designs ports A and B are 50 ohm impedance and port C and D are 100 ohm impedance. (See Figure A.) In non-impedance transforming designs all four ports are 50 ohm impedance.



IMPEDANCE TRANSFORMING HYBRIDS

MODEL	FREQUENCY RANGE MHz	MINIMUM ISOLATION (dB) PORTS A to B	*MAXIMUM INSERTION LOSS (dB)	*PHASE BALANCE	*AMPLITUDE BALANCE (dB)	PACKAGE	SCHEMATIC	PRICE
HYB-1	1-500	20	1.0	2°	0.5	FIG. A	FIG. C	\$24.50
HYB-2	.500-300	20	1.0	2°	0.5	FIG. A	FIG. C	\$20.80
HYB-3	.250-200	20	1.0	2°	0.5	FIG. A	FIG. C	\$20.80
HYB-7	.020-100	20	1.0	2°	0.5	FIG. A	FIG. C	\$22.50
HYB-11	.250-200	20	1.0	2°	0.5	FIG. B	FIG. C	\$20.80

*HYBRID MODE — INPUT AT PORT B



NON-IMPEDANCE TRANSFORMING HYBRIDS

MODEL	FREQUENCY RANGE MHz	MINIMUM ISOLATION (dB)	MAXIMUM INSERTION LOSS	PHASE BALANCE	AMPLITUDE BALANCE (dB)	VSWR	SCHEMATIC	PACKAGE	PRICE
HYB-14	2-2000	25	2.5	5.0°	0.85	2.5	FIG. F	FIG. D	\$350.00
	25-500	35	0.8	1.5°	0.25	1.5			
	500-1000	30	1.3	2.5°	0.25	1.5			
HYB-16	1-200	25	1.0	3°	0.5	1.5	FIG. F	FIG. E	\$37.00
	5-50	30	1.0	2°	0.3	1.3			

WIDE BAND HYBRID POWER COMBINERS/DIVIDERS (CONT.)

Z-MATCH

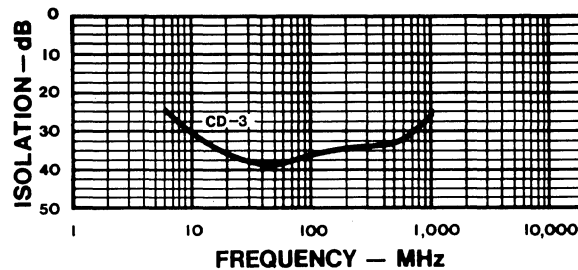
IN-PHASE HYBRIDS

A two-way in-phase hybrid power combiner/divider is a 180° hybrid power combiner/divider with the difference port (A) internally terminated.

As a two-way power divider, a signal fed into the input port yields two in-phase output signals 3dB down from the input power.

As a two-way power combiner, signals applied to the output ports yield a vector sum at the input port.

Multi-way binary power combiners/dividers are realized by cascading combinations of the basic two-way device. The power division ratio of the multi-way combiner/divider is $1/n$.



TYPICAL ISOLATION CD-3

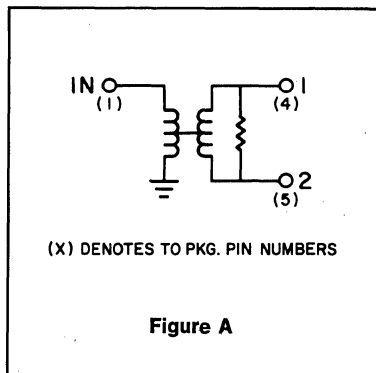


Figure A

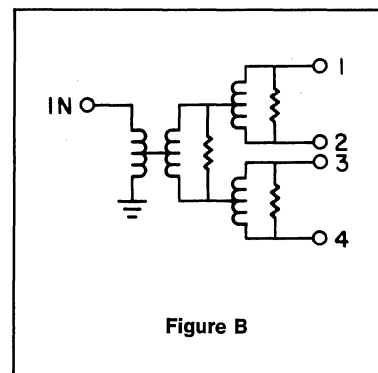


Figure B

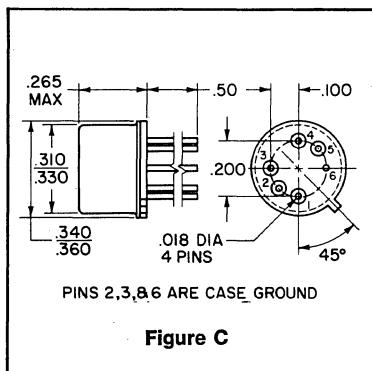


Figure C

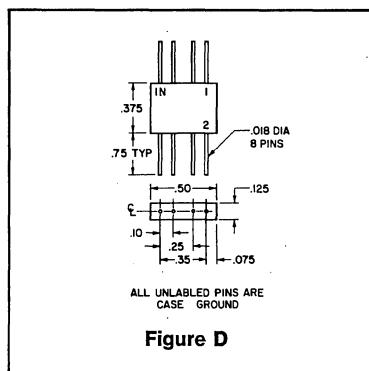


Figure D

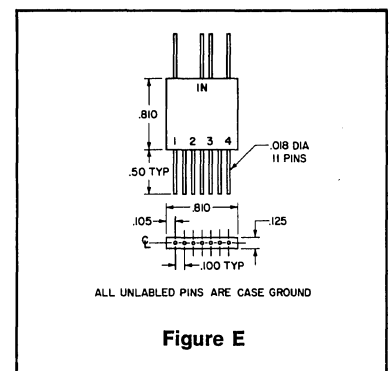
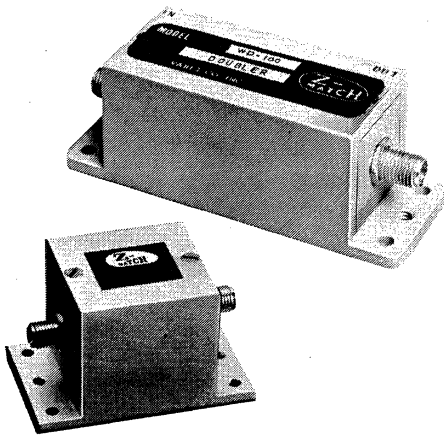


Figure E

MODEL	FREQUENCY RANGE MHz	MINIMUM ISOLATION (dB)	MAXIMUM INSERTION LOSS (dB)	AMPLITUDE BALANCE (dB)	PHASE BALANCE	VSWR	SCHEMATIC	PACKAGE	PRICE
CD-1	1-100	30	0.5	0.1	1.0°	1.3	FIG. A	FIG. C	\$24.50
CD-2	1-200	30	0.5	0.1	7.0°	1.4	FIG. A	FIG. D	\$34.00
CD-3	25-500	30	0.5	0.1	1.0°	1.3	FIG. A	FIG. D	\$34.00
	10-25	25	0.5	0.1	1.0°	1.5	FIG. A	FIG. D	\$34.00
CD-4	1-200	25	1.0	0.4	3°	1.4	FIG. B	FIG. E	\$80.00
	2-200	30	0.5	0.2	2.0°	1.3	FIG. B	FIG. E	\$80.00



WIDE BAND FREQUENCY DOUBLERS



Models WD-100, 101 and 102 were developed as components of laboratory equipment to double the frequency of high-level sweep generators, thus extending their range of usefulness. Since the output of the doubler is of relatively high level, the signal obtained is comparable to that of an expensive BWO unit, and a set-up can be made with existing equipment and appreciable savings are effected. The units, being quite small and compact, are often used as part of the local oscillator source for receivers, so they are recommended both as components of larger equipment and as laboratory test devices. The doublers are housed in extruded aluminum cases and are fitted with 3.6 mm. input and output connectors and have 50 ohm input and output impedances. The circuit employs a custom-designed Z-Match input transformer and carefully matched Schottky barrier diodes. The output circuit (Model WD-100 only) is isolated for DC by a special chip capacitor. The circuit elements and supporting structure are encapsulated in high-temperature polyurethane foam. Full electrical specifications are listed in the table below. Operating temperature range is -55 to $+100^{\circ}\text{C}$. Contact factory sales for appropriate bulletin.

DOUBLER SPECIFICATIONS

MODEL	FREQUENCY RANGE INPUT/OUTPUT	IMPEDANCE INPUT/OUTPUT	INPUT POWER NORMAL OPERATION	CONVERSION LOSS	FUNDAMENTAL +3rd HARM. SUPPRESSION	OUTPUT LEVEL VARIATION OVER THE BAND	SCHEM. FIG.	PRICE 1 - 9
WD-101	.5-500 MHz 1-1000 MHz	50 ohms 50	+5 to +20 dBm	13 dB max.	40 dB min.	± 1.5 dB	15A	\$ 90.00
WD-100	.3-2 GHz .6-4 GHz	50 ohms 50	+5 to +20 dBm	13.5 dB max.	35 dB min.	± 1.5 dB	15A	\$225.00
WD-102A	0.02 to 4.5 GHz 0.04 to 9.0 GHz	50 ohms 50	+10 to +20 dBm	14 dB max.	30 dB min.	± 1.5 dB	15B	\$350.00

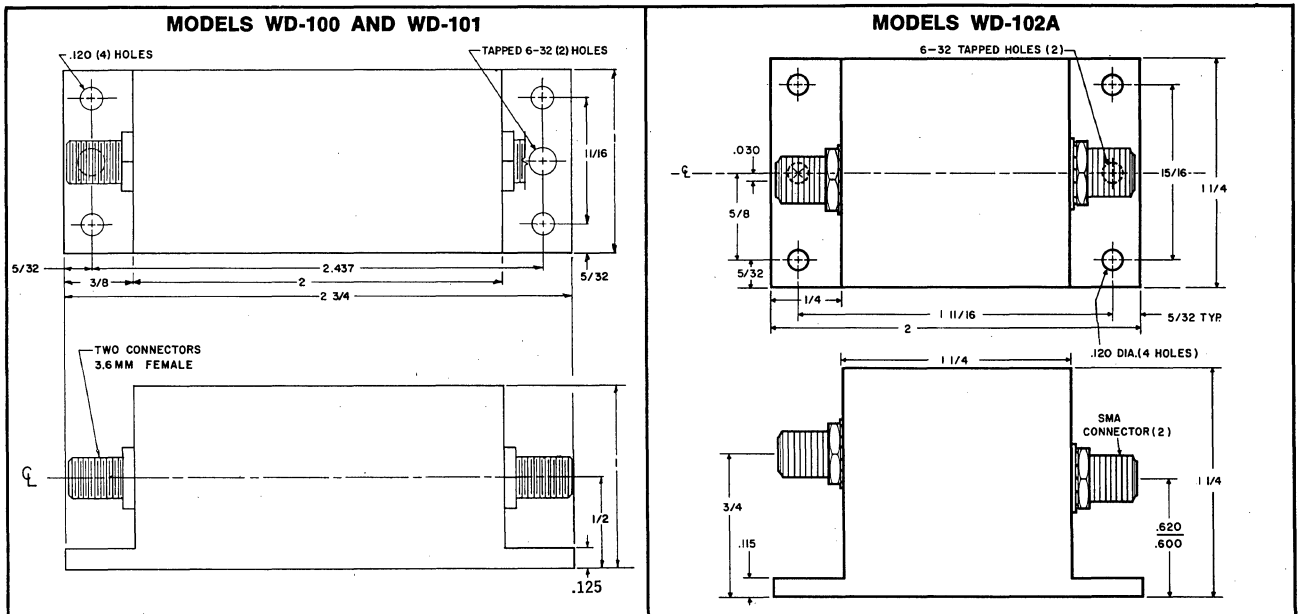


FIGURE 14 DOUBLER OUTLINE DRAWINGS

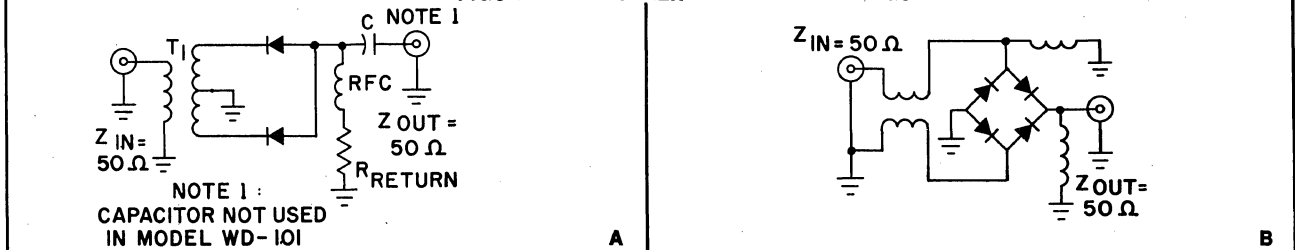
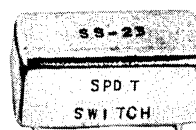
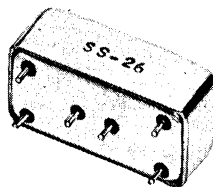
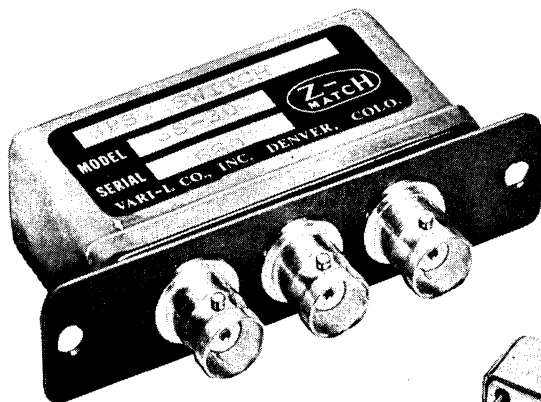


FIGURE 15 DOUBLER SCHEMATICS

R.F. SWITCHES



HIGH ISOLATION R.F. SWITCHES



- **LESS THAN TWO NANO SECONDS SWITCHING SPEED**
- **HIGH LEVEL SIGNAL HANDLING**
- **LARGE ON TO OFF POWER RATIOS**

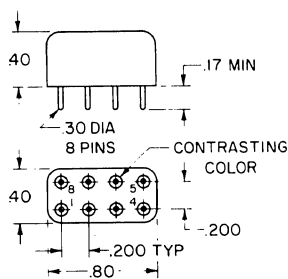


Figure A

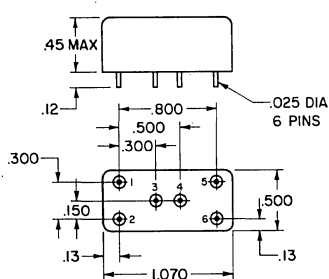


Figure B

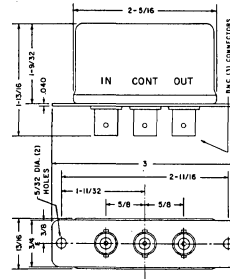
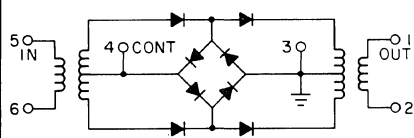


Figure C



PIN 3 IS CASE GROUND FIG. B.
2,3,8,6 ARE CASE GROUND FIG. A.

Figure D

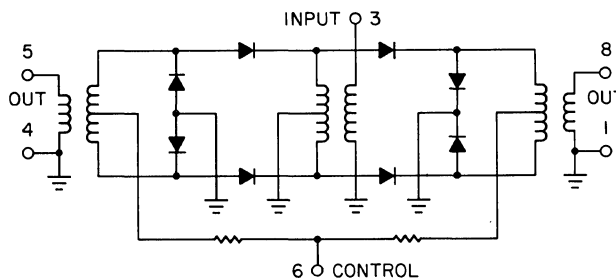


Figure E

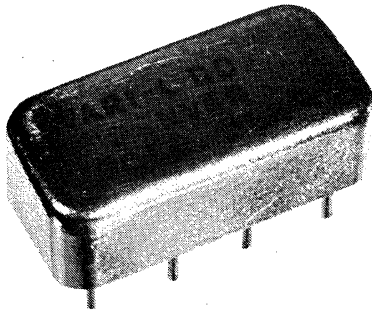
CURRENT	STATE
+I AT 6	3 TO 5
-I AT 6	3 TO 8

MODEL	TYPE	FREQ. RANGE MHz	ON-OFF RATIO db MIN.	INSERTION LOSS dB MAX.	RF POWER HANDLING	ON-OFF CURRENT TYPICAL	SWITCHING SIGNAL ISOLATION TYPICAL (1)	PACKAGE	PRICE 1 - 9
SS-23	SPST	5-50 50-200 .5-500	80 50 30	2.5 2.5 4.5	+ 10 dBm	±20 MA	30 dB (2)	Fig. B	\$ 60.00
SS-26	SPDT	1-20 200-100 100-400	50 40 30	2 2 3	+ 10 dBm	±40 MA	25 dB	Fig. A	\$110.00
SS-30	SPST	.5-100 100-500	80 60	5 6.5	+ 10 dBm	±20 MA	30 dB (2)	Fig. C	\$135.00
SS-50	SPST	1-30 30-100 100-200	63 53 47	2 2 2.5	+ 6 dBm	±20 MA	35 dB	Fig. B	\$120.00

(1) Fundamental feedthrough component at the output when a sine wave producing ± 20 mA is used to switch the unit.

(2) Typically low repetition rate switching will produce very little feedthrough. For example, switching noise power at the output is -100 dBm maximum per 100 MHz of bandwidth when driven with a 3 KHz square wave, $T_r = T_f = .5$ μ sec producing ± 20 mA control current.

PIN DIODE VARIABLE ATTENUATOR



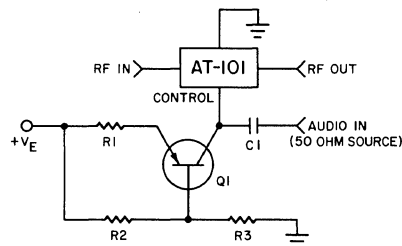
Model AT-101

DESIGNED FOR AM MODULATOR APPLICATION, BROADBAND PERFORMANCE, ULTRA LINEAR, LOW DISTORTION PERFORMANCE

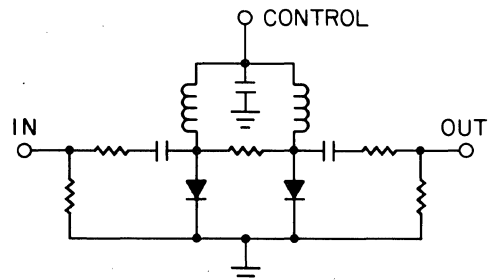
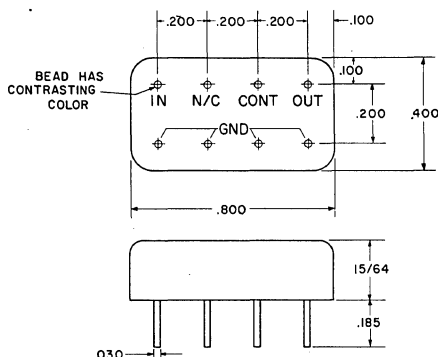
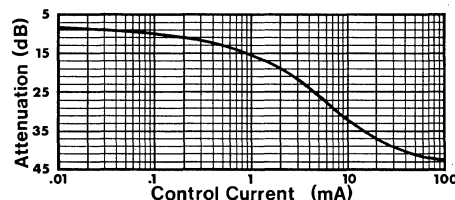
- 2-500 MHz RF PORT BANDWIDTH
- DC-250 MHz MODULATION PORT BANDWIDTH
- +35 dBm 3rd ORDER INTERCEPT POINT INDEPENDENT OF ATTENUATION SETTING
- CONSTANT PERCENTAGE AM MODULATION POSSIBLE OVER -55°C TO 85°C WITH SIMPLE COMPENSATION CIRCUIT

1dB Bandwidth RF Ports: 2-400 MHz
 3dB Bandwidth Modulation Port: DC-100KHz
 Maximum Attenuation, 0 Bias: 8.5 dB (100 MHz)
 Minimum Attenuation, 25 mA Bias: 30 dB (100 MHz)
Modulation Distortion:
 10% Maximum Distortion at 60% AM Modulation
 2% Maximum Distortion at 30% AM Modulation
 3rd Order IM Ratio 100 MHz +3 dBm tones:
 70 dB, Minimum
 75 dB, Typical
 Maximum DC Input Current: 100 mA
 Maximum RF Input Power: +10 dBm

SUGGESTED TEMPERATURE COMPENSATED MODULATOR CIRCUIT



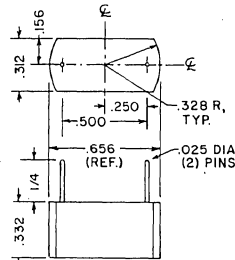
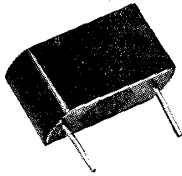
C1—DC BLOCK
 R1—294 OHM, 1%, LOW TCR, METAL FILM
 R2 & R3—SELECT FOR PROPER MODULATION BIAS CURRENT. RESISTORS SHOULD HAVE LOW TCR.
 Q1—2N3906 OR EQUIVALENT.
 V_E —+5 TO +30 VOLTS, (TEMPERATURE STABLE)



Z-MATCH

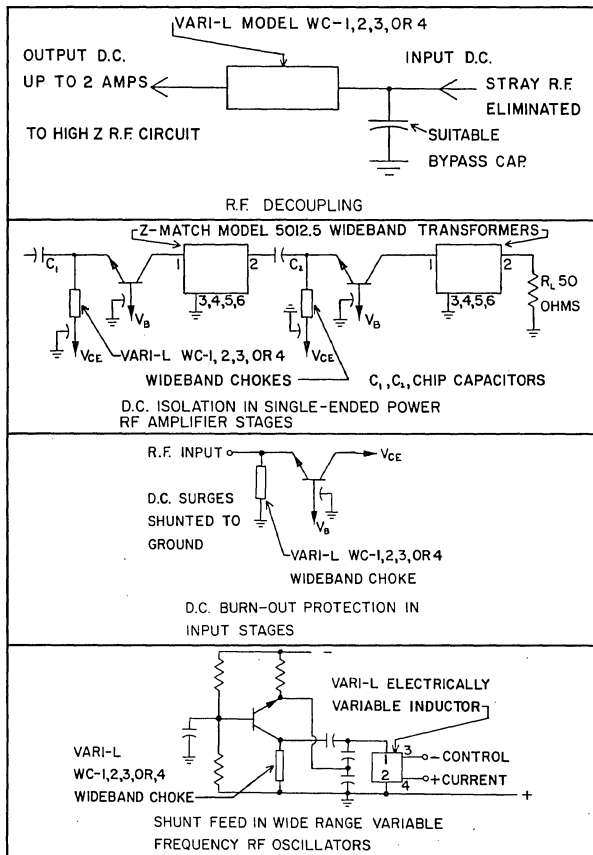
CHOKES & PHASE DETECTORS

WIDEBAND R.F. CHOKES

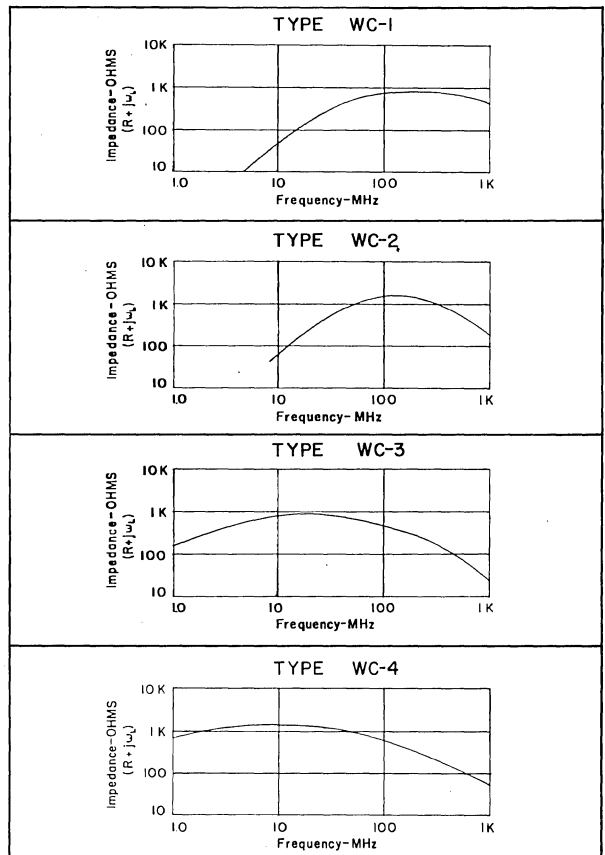


OUTLINE DRAWING

- LOW LOSS & VIRTUALLY NON-RESONANT
- CONSTANT IMPEDANCE OVER A WIDE RANGE OF FREQUENCIES
- DC RESISTANCE OF LESS THAN .1 OHMS
- WILL HANDLE UP TO TWO AMPS OF CURRENT
- 1-9 PRICE: \$10.50 EACH ALL MODELS (WC-1, WC-2, WC-3, WC-4)

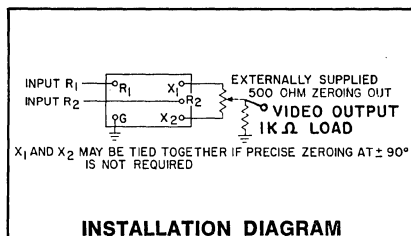


TYPICAL APPLICATIONS

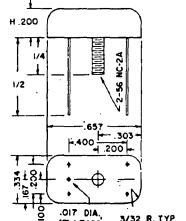


IMPEDANCE CHARACTERISTICS

HIGH LEVEL PHASE DETECTORS



- HIGH SENSITIVITY
- ADJUSTABLE DC BALANCE
- LINEAR OUTPUT CHARACTERISTIC
- PD-100, SPA PACKAGE
- PD-101, BNC CONNECTORS

OUTLINE
PD-100

MODEL	INPUT FREQUENCY RANGE	VIDEO BW OUTPUT PORT	ϕ SENSITIVITY @ +10 dBm INPUTS	TYPICAL OPERATION RF INPUTS +10 dBm		PRICE 1-9
				RELATIVE ϕ	DC OUT	
PD-100 and PD-101	R_1 , DC-500 MHz R_2 , .5-500 MHz	DC-1.5 MHz	10 MV/Degree	$\phi = 0^\circ$ $\phi = 90^\circ$ $\phi = 180^\circ$	+1 Volt 0 Volts -1 Volt	\$70.00



Bradford, Pa. (814) 362-5536

SPECIFICATIONS

Carbon Film Resistors

METAL OXIDE

Type Designation Power Rating @ 70°C Max. Continuous Working Voltage Operating Temperature Range Derating to 0 at Resistance Range @ $\pm 5\%$ $\pm 2\%$	CF $\frac{1}{8}$ 0.125 watts 250V -25°C to +125°C +125°C 2.2 Ω — 220K Ω NA	CF $\frac{1}{4}$ 0.25 watts 250V -55°C to +155°C +155°C 2.2 Ω — 2.2M Ω 10 Ω — 1M Ω	CF $\frac{1}{2}$ 0.5 watts 350V -55°C to +155°C +155°C 2.2 Ω — 5.1M Ω 10 Ω — 1M Ω	MO-1 1.0 watts 350V -55°C to +235°C +235°C 10 Ω — 100K Ω NA
Mechanical Body Length — Max. Body Diameter — Max. Lead Diameter — Nom. Lead Length — Min.	in./mm 0.177/4.50 0.071/1.80 0.020/0.50 1.060/27.00	in./mm 0.275/6.98 0.100/2.54 0.024/0.61 1.125/28.57	in./mm 0.375/9.53 0.125/3.17 0.024/0.61 1.125/28.57	in./mm 0.488/12.50 0.177/4.50 0.032/0.80 1.496/38.0
Voltage Coefficient — Max. Insulation Resistance — Min. Dry Wet Dielectric Withstanding Voltage — Min. Atmospheric Barometric Current Noise — Max. Nominal Resistance (Ohms) $\leq 1K$ 1.1K — 10K Ω 11K Ω — 100K Ω $\geq 101K\Omega$	-100ppm/V 10,000M Ω 1,000M Ω 500V rms 350V rms dB// $\mu V/V$ -20/0.100 -20/0.100 -8/0.400 -2/0.800	-100ppm/V 10,000M Ω 1,000M Ω 500V rms 350V rms dB// $\mu V/V$ -20/0.100 -15/0.180 -12/0.225 -10/0.260	-50ppm/V 10,000M Ω 1,000M Ω 700V rms 450V rms dB// $\mu V/V$ -20dB/0.100 -15dB/0.180 -10dB/0.260 -6dB/0.500	100ppm/V 10,000M Ω 1,000M Ω 1000V rms 500V rms dB// $\mu V/V$ -15db/0.3 -15db/0.3 -15db/0.3 -15db/0.3
PERFORMANCE CHARACTERISTICS	CF $\frac{1}{8}$ Max. ΔR From 25°C	CF $\frac{1}{4}$ Max. ΔR From 25°C	CF $\frac{1}{2}$ Max. ΔR From 25°C	MO-1 Max. ΔR From 25°C
Temperature Coefficient of Resistance Nominal Resistance (ohms) $\leq 1K$ 1.1K — 10K 11K — 100K 110K — 1.0M Ω $\geq 1.1M\Omega$	@-25°C @+125°C ppm/°C ppm/°C -350 -350 -350 -350 -400 -400 -700 -700 NA NA	@-55°C @+105°C ppm/°C ppm/°C -350 -300 -350 -350 -450 -450 -1000 -1000 -1300 -1300	@-55°C @+105°C ppm/°C ppm/°C -350 -300 -350 -350 -450 -450 -700 -700 -1300 -1300	@ -55°C ± 200 ± 200 ± 200 ± 200 ± 200 ± 200 NA NA NA NA
Thermal Shock Short Time Overload Dielectric Strength	$\pm(1.0\% + 0.05\Omega)$ $\pm(0.5\% + 0.05\Omega)$ $\pm(0.5\% + 0.05\Omega)$	$\pm(0.5\% + 0.05\Omega)$ $\pm(0.3\% + 0.05\Omega)$ $\pm(0.5\% + 0.05\Omega)$	$\pm(0.5\% + 0.05\Omega)$ $\pm(0.5\% + 0.05\Omega)$ $\pm(0.5\% + 0.05\Omega)$	$\pm(1.0\% + 0.05\Omega)$ $\pm(0.5\% + 0.05\Omega)$ $\pm(0.5\% + 0.05\Omega)$
Moisture Resistance $\leq 1.0M\Omega$ $\geq 1.0M\Omega$ Terminal Strength	$\pm 2.0\%$ NA $\pm(0.5\% + 0.05\Omega)$	$\pm 2.0\%$ $\pm 3.0\%$ $\pm(0.5\% + 0.05\Omega)$	$\pm 2.5\%$ NA $\pm(0.5\% + 0.05\Omega)$	$\pm 1.5\%$ NA $\pm(0.5\% + 0.05\Omega)$
Load Life $\leq 100K\Omega$ $\geq 100K\Omega$	$\pm 2\%$ $\pm 3\%$	$\pm 2\%$ $\pm 3\%$	$\pm 2\%$ $\pm 3\%$	$\pm 5\%$ NA
Resistance to Solder Heat Shock and High Frequency Oper. Low Temperature Operation	$\pm(1.0\% + 0.05\Omega)$ $\pm(0.3\% + 0.05\Omega)$ $\pm(0.5\% + 0.05\Omega)$	$\pm(0.5\% + 0.05\Omega)$ $\pm(0.3\% + 0.05\Omega)$ $\pm(0.5\% + 0.05\Omega)$	$\pm(0.5\% + 0.05\Omega)$ $\pm(0.3\% + 0.05\Omega)$ $\pm(0.5\% + 0.05\Omega)$	$\pm(0.5\% + 0.05\Omega)$ $\pm(0.5\% + 0.05\Omega)$ $\pm(0.5\% + 0.05\Omega)$
Frequency Characteristics Nominal Resistance (ohms) $\leq 100K$ $\geq 101K$	% Rdc Min. @44MHz @200MHz 80% 60% 50%	% Rdc Min. @44MHz @200MHz 80% 60% 50%	% Rdc Min. @44MHz @200MHz 80% 60% 50%	

For additional resistor information write or contact Aircoco Electronics, P.O. Box 547, Bradford, Pa. 16701.
Phone (814) 362-5536, TWX 510-695-5921.



Bradford, Pa. (814) 362-5536

RELIABLE FIXED COMPOSITION RESISTORS

Airco Electronics offers a complete line of 1/4, 1/2, 1 and 2 watt fixed composition resistors that meet or exceed all requirements of Military Specification MIL-R-11 and EIA Standard RS-172. Resistors to Established Reliability Specification MIL-R-39008 available in styles RCR 07, RCR 20 and RCR 32. Hi-Rel resistors for Military Space applications available.

Integration of the resistor core and insulating shell during molding provides tight reliable resistor lead anchorage. 100% pure tin lead coating maintains superior soldering characteristics even after extended storage. An industrial grade 1/2 w. resistor available in standard resistance values and tolerances. Our composition resistors are available for all applications.

Military Specification MIL-R-39008
Military Specification MIL-R-11
Industrial Applications

Airco Type SRR
Airco Type SR
Airco Type SC

Airco Type	Mil Type	Power Rating Watts	Resistance Range	Dimensions (Inches)			
				Body (Max.)		Leads (Nom.)	
				Dia.	Length	Dia.	Length
SR 1/4	RC 07	1/4	10 ohm to 1.0 megohm ¹	.090	.250	.025	1.405
SRR 1/4	RCR 07 ²	1/4	10 ohm to 1.0 megohm	.090	.250	.025	1.405
SR 1/2	RC 20	1/2	2.7 ohm to 22 megohm	.138	.375	.032	1.405
SRR 1/2	RCR 20 ²	1/2	10 ohm to 22 megohm	.138	.375	.032	1.405
SR 1	RC 32	1	2.7 ohm to 22 megohm	.225	.562	.040	1.430
SRR 1	RCR 32 ³	1	4.7 ohm to 5.6 megohm	.225	.562	.040	1.430
SR 2	RC 42	2	10 ohm to 22 megohm	.312	.688	.045	1.430

¹ Available to 5.6 megohms for non-military use. ² S failure level. ³ R failure level.

NEW

METAL FILM RESISTORS

Airco Type	Rated Power @ 70°C	Max. Cont. Working Voltage	Max. Overload Voltage	R.T.C.		Resistance Range		Tolerance
				CHAR. K	CHAR. L	CHAR. K	CHAR. L	
MF-55	0.250W	250V	500V	±100ppm/°C	±200ppm/°C	10Ω to 100KΩ	.47Ω to 240KΩ	D 0.5%
MF-60	0.500W	350V	700V			10Ω to 301KΩ	.47Ω to 510KΩ	F 1.0% G 2.0%

METAL OXIDE RESISTORS

Airco Type	Wattage @ 70°C	Max. Cont. Working Voltage	Max. Overload Voltage	Max. Pulse Voltage	R.T.C.	Resistance Range E-24 (5%)
MO-1	1	350	600	750	±200ppm/°C	10Ω-100KΩ
MO-2	2	500	600	750	±200ppm/°C	10Ω-100KΩ
MO-3	3	500	800	1500	±200ppm/°C	10Ω-150KΩ

For additional information write or contact Airco Electronics, P.O. Box 547, Bradford, Pa. 16701. Phone (814) 362-5536, TWX 510-695-5921.

THIN FILM

- Custom Designed Precision Resistor Networks
 - Packaged Networks
 - Leadless Chip Networks
 - Beam Lead Networks
 - Matched Sets
- Low TCR Precision Resistors — Miniature Radial Lead Style
- Miniature Precision Thin Film Chip Resistors
- Beam Lead Thin Film Chip Resistors

THICK FILM

- High Stability Ultra Low Ohm Chip Resistors
- General Purpose Chip Resistors
- Miniature High Megohm Chip Resistors
- Unique High Voltage Divider Networks

RESISTIVE DEVICES

For additional resistive device information write or contact:

AIRCO ELECTRONICS
Special Components Operations
47th and Packard Road
Niagara Falls, N.Y. 14302
Phone: (716) 285-6971
TWX: 710-524-1653

Allen-Bradley Trimming Potentiometers

**TYPE E:**

Cermet, single turn, 0.5W at 70°C, 10 ohms to 2 megs, $\pm 10\%$, pin terminals, linear taper.

**TYPE S:**

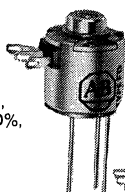
Cermet, single turn, 0.5W at 85°C, 50 ohms to 1 meg, $\pm 10\%$, pin terminals, linear taper.

**TYPE Z:**

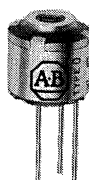
Cermet, single turn, 0.5W at 70°C, 50 ohms to 1 meg, $\pm 10\%$ and $\pm 20\%$, pin terminals, linear taper.

**TYPE RT:**

Cermet, 20 turns, 0.75W at 70°C, 10 ohms to 2.0 megs, $\pm 10\%$, pin terminals, linear taper, .250" or .340" high types.

**TYPE N:**

Hot-molded composition, 25 turns, 0.33W at 50°C, 100 ohms to 2.5 megs, $\pm 10\%$ and $\pm 20\%$, pin terminals, linear taper.

**TYPE R:**

Hot-molded composition, 25 turns, 0.25W at 70°C, 100 ohms to 2.5 megs, $\pm 10\%$ and $\pm 20\%$, pin or solder lug terminals, linear taper.

**TYPE F:**

Hot-molded composition, single turn, 0.25W at 70°C, 100 ohms to 5 megs, $\pm 10\%$ and $\pm 20\%$, pin or solder lug terminals, 5 standard tapers.

TYPE FD:

Dual version of Type F; front section: solder lug only, rear: pin or lug. Well suited for Bridged-T or L-pad attenuator applications.

TYPE BT:

An all plastic version of the Type FD for excellent performance at high frequencies. Two types available for top or side adjustments. Also well suited for Bridged-T or L-pad attenuator applications.

TYPE O:

Hot-molded composition, single turn, 0.4W at 70°C, 100 ohms to 5 megs, $\pm 10\%$ and $\pm 20\%$, pin or solder lug terminals, 5 standard tapers.

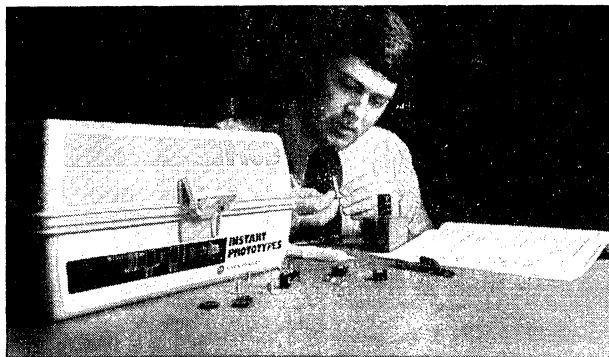
TYPE Y:

Hot-molded composition, single turn, 0.25W at 50°C, 100 ohms to 5 megs, $\pm 10\%$ and $\pm 20\%$, pin terminals, 5 standard tapers.

SPECIFICATIONS

Type	Publication Number	Resistance Element and Adjustment Turns	Resistance Range and Tolerance	Power Rating	Voltage Rating (RMS or DC)	Operating Temperature Range	Terminal Types	Case Dimensions in inches, (millimeters)	Enclosure
E	5219	Cermet Single Turn	10 Ohms to 2 Megohms $\pm 10\%$	0.5 Watt @ 70°C	300V	-55°C to +125°C	Pin	0.385 (9,78) Square by 0.197 (5,00) Thick	Immersion Sealed
S	5208		50 Ohms to 1 Megohm $\pm 10\%$	0.5 Watt @ 85°C		-65°C to +150°C		0.375 (9,52) Diameter by 0.375 (9,52)	
Z	5211		50 Ohms to 1 Megohm $\pm 10\%$, $\pm 20\%$	0.5 Watt @ 70°C		-55°C to +125°C		0.250 (6,35) cube	
RT	5237	Cermet 20 Turn	10 Ohms to 2 Megohms $\pm 10\%$	0.75 Watt @ 70°C		-65°C to +125°C		L 0.750 (19,05) H 0.250 (6,35) or H 0.340 (8,64) W 0.190 (4,83)	
N	5206	Composition 25 Turn	100 Ohms to 2.5 Megohms $\pm 10\%$, $\pm 20\%$	0.33 Watt @ 50°C		-55°C to +100°C		L 1.250 (31,75) H 0.359 (9,13) W 0.250 (6,35)	
R	5205			0.25 Watt @ 70°C		-55°C to +125°C				Pin or Solder Lug
F	5234	Composition Single Turn	100 Ohms to 5 Megohms $\pm 10\%$, $\pm 20\%$	0.25 Watt @ 70°C	350V	-55°C to +120°C	Pin or Solder Lug	0.500 (12,70) Diameter by 0.531 (13,49)	Dust and Splash Resistant
FD	5231						Front: Lug Rear: Lug or Pin	0.500 (12,70) Diameter by 0.688 (17,46)	
BT	5236			Contact Factory		350V	Side Adjust: Front: 3 Lugs Rear: 3 Pins Top Adjust: Front: 2 Pins Rear: 2 Pins	0.500 (12,70) Diameter by 0.535 (13,59)	
O	5235			0.4 Watt @ 70°C	Pin or Solder Lug		0.500 (12,70) Diameter by 0.531 (13,49)	Immersion Sealed	
Y	5209			0.25 Watt @ 50°C	Pin		0.500 (12,70) Diameter by 0.359 (9,13)	Dust and Splash Resistant	

Allen-Bradley Variable Resistors

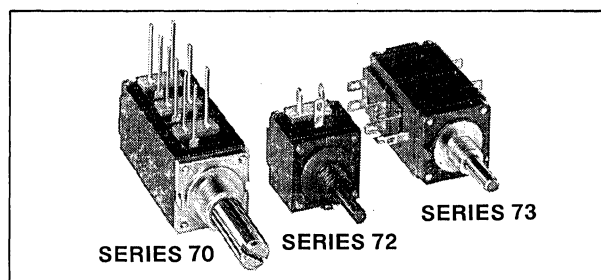


MOD POT Instant Prototypes (MPIP) puts a wide range of MOD POT components at your fingertips. MPIP available from your A-B distributor. Then get your production quantities of MOD POT fast from A-B distributors, assembled to exacting factory standards.

SERIES 70 MOD POT®: Unique modular design offers virtually unlimited configurations: single, double, triple or quadruple. Options include: PC or solder lug terminals, variety of switches, vernier drive, concentric shafts, composition or cermet resistance elements. 50 ohms to 10 megs, $\pm 10\%$ and $\pm 20\%$ (composition); 100 ohms to 1 meg, $\pm 10\%$ (cermet). 1.0W at 70°C (composition); 2.0W at 70°C (cermet).

SERIES 72 MOD POT®: Similar to Series 70 except the case, bushing and shaft are non-metallic for electrical isolation. Available in single or dual combinations only. Power rating is 0.5W at 70°C.

SERIES 73 MOD POT®: Another version of Series 70 for applications that require single or dual section controls.



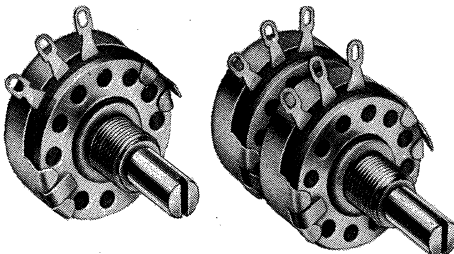
SPECIFICATIONS

Type	Publication Number	Resistance Element	Resistance Range and Tolerance	Power Rating	Voltage Rating (RMS or DC)	Operating Temperature Range	Number of Sections Available	Case Dimensions in inches, (millimeters)	Enclosure
70	5217	Cermet	100 Ohms to 1 Megohm ±10%	2.0 Watts @ 70°C	350V	−55°C to +150°C	1, 2, 3 or 4	0.594 (15,08) Deep by 0.625 (15,88) Square (Single Section)	Dust and Splash Resistant
		Composition	50 Ohms to 10 Megohms ±10%, ±20%	1.0 Watt @ 70°C		−55°C to +120°C			
72	5224	Composition	50 Ohms to 10 Megohms ±10%, ±20%	0.5 Watt @ 70°C		−55°C to +100°C	1 or 2		
73	5225	Cermet	100 Ohms to 1 Megohm ±10%	Contact Factory	Contact Factory				
			50 Ohms to 10 Megohms ±10%, ±20%						
J(RV4)	5200	Composition	50 Ohms to 5 Megohms ±10%, ±20%	2.25 Watts @ 70°C	500V	−55°C to +120°C	1, 2 or 3	0.625 (15,88) Deep by 1.156 (29,36) Diameter (Single Section)	
EJ	5230			2.25 Watts @ 70°C			1 or 2		
K	5222			3.0 Watts @ 70°C			1, 2 or 3		
G(RV6)	5201		100 Ohms to 5 Megohms ±10%, ±20%	0.5 Watt @ 70°C	350V	−55°C to +120°C	1	0.469 (11,91) Deep by 0.500 (12,70) Diameter (Without Switch)	Immersion Sealed
GD	5213					2			
L	5233			0.8 Watt @ 70°C		−55°C to +150°C	1		
W	5212			0.5 Watt @ 70°C		−55°C to +120°C			
WR	5220			0.5 Watt @ 70°C		−65°C to +175°C			
CQ	5214	Cermet	100 Ohms to 5 Megohms ±10%	0.5 Watt @ 125°C	300V	−65°C to +150°C		0.438 (11,11) Deep by 0.375 (9,52) Diameter	Immersion Sealed
SP	5216		50 Ohms to 1 Megohm ±10% (5% available)	1.0 Watt @ 70°C					

RESISTORS, FIXED

TYPE J (RV4):

Standard of the industry for for quality. Hot-molded composition, 50 ohm to 5 megs, $\pm 10\%$ and $\pm 20\%$ (special values to 1000 megs available), 2.25W at 70°C, single, dual, triple sections available, variety of switch types for single or dual sections.



TYPE EJ:

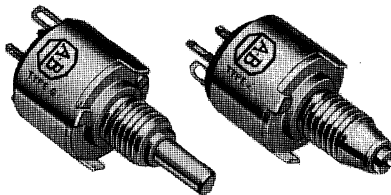
Extra long life version of the Type J with rotational life exceeding one million rotations, single or dual configurations.

TYPE K:

A 3.0W (at 70°C) version of the popular Type J. -55°C to +150°C.

TYPE G (RV6):

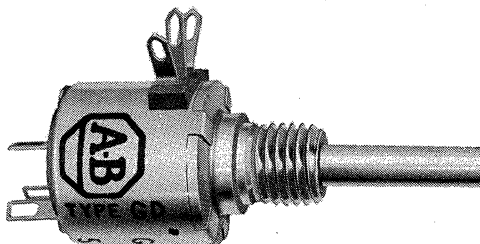
Hot-molded composition, 100 ohms to 5 megs, $\pm 10\%$ and $\pm 20\%$, 0.5W at 70°C, single section available with or without SPST switch.



TYPE L:

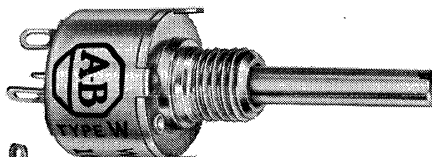
Hot-molded composition, 100 ohms to 5 megs, $\pm 10\%$ and $\pm 20\%$, 0.8W at 70°C, single section.

TYPE GD:
Dual section version of Type G. The smallest dual available.



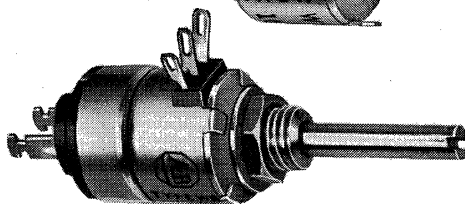
TYPE W:

Hot-molded composition, 100 ohms to 5 megs, $\pm 10\%$ and $\pm 20\%$, 0.5W at 70°C, single section.



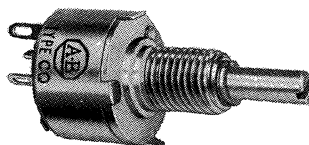
TYPE WR:

Radial-lead version of Type W. Available with switch with contacts that close at start of clockwise rotation (TYPE WRS) or with switch with contacts that close at start of counter-clockwise rotation (TYPE WRH).



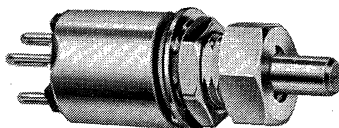
TYPE CQ:

Cermet, 100 ohms to 5 megs, $\pm 10\%$, 0.5W at 125°C, single section.



TYPE SP:

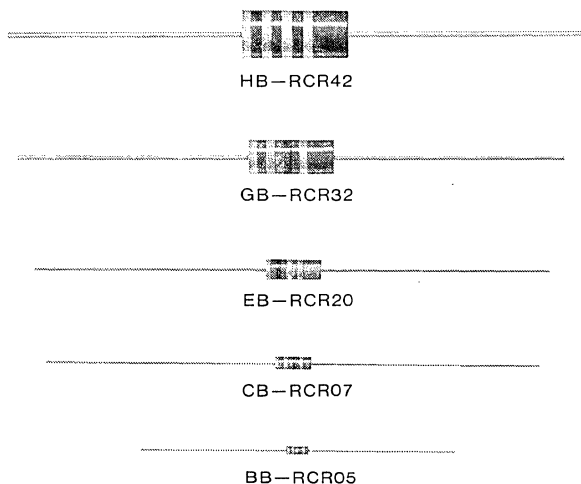
Cermet, 50 ohms to 1 meg, $\pm 10\%$, 1.0W at 70°C, single section. Only $\frac{3}{16}$ " diameter.



Standard options for all types include a variety of shafts, bushings, shaft endings, shaft lengths, and hardware.

Types FD, GD, J and the multi-section MOD POT with composition tracks are well suited for attenuator applications.

Allen-Bradley Hot-Molded Fixed Resistors



Allen-Bradley hot-molded composition resistors are high-quality units intended for general purpose use in the electronics industry.

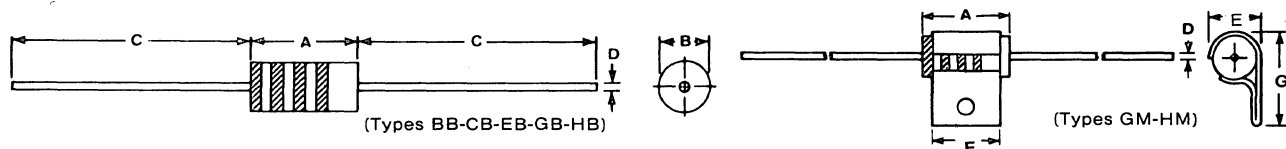
Allen-Bradley Style RCR resistors not only meet all requirements of MIL-R-39008 but also exceed the S level (best level) of Established Reliability of 0.001% failure rate per 1000 hours. And only Allen-Bradley resistors are available in S level reliability in all five wattage sizes over the entire resistance range. The S reliability level is indicated by a yellow 5th color band on the resistor body.

Metal-clad hot-molded resistors (Types GM and HM) are fitted with metal clamps which surround the major portion of the resistor. The metal clamps provide rigid mounting and efficient heat transfer from the resistors to the metal chassis or panels on which they are mounted.

For more information request Publication EC21.

SPECIFICATIONS

Type	Power at 70°C	Resistance Range	Tolerance	Voltage Rating (RMS)	Maximum Ambient Temperature	Dimensions in Inches (millimeters)						
						A	B	C	D	E	F	G
BB	½ watt	2.7 Ohms to 100 Megohms	±5, 10, 20%	150V	+130°C	0.145	0.062	1.000	0.015			
RCR05		2.7 Ohms to 22 Megohms	±5, 10%			(3,68)	(1,59)	(25,40)	(0,38)			
CB	¼ watt	2.7 Ohms to 100 Megohms	±5, 10, 20%	250V	+150°C	0.250	0.090	1.500	0.025			
RCR07		2.7 Ohms to 22 Megohms	±5, 10%			(6,35)	(2,29)	(38,10)	(0,64)			
EB	½ watt	1.0 Ohms to 100 Megohms	±5, 10, 20%	350V		0.375	0.140	1.500	0.033			
RCR20		2.7 Ohms to 22 Megohms	±5, 10%			(9,52)	(3,56)	(38,10)	(0,84)			
GB	1 watt	2.7 Ohms to 100 Megohms	±5, 10, 20%	500V		0.562	0.225	1.500	0.041			
RCR32		2.7 Ohms to 22 Megohms	±5, 10%			(14,29)	(5,72)	(38,10)	(1,04)			
HB	2 watts	10 Ohms to 100 Megohms	±5, 10, 20%	750V		0.688	0.312	1.500	0.045			
RCR42		10 Ohms to 22 Megohms	±5, 10%	500V		(17,46)	(7,94)	(38,10)	(1,14)			
GM	3 watts	2.7 Ohms to 22 Megohms	±5% ±10%	500V		0.562 (14,29)	0.225 (5,72)	1.500 (38,10)	0.041 (1,04)	0.305 (7,75)	0.438 (11,11)	0.656 (16,67)
HM	4 watts	10 Ohms to 22 Megohms		750V		0.688 (17,46)	0.312 (7,94)	1.500 (38,10)	0.045 (1,14)	0.391 (9,92)	0.562 (14,29)	0.766 (19,45)



Allen-Bradley Cermet Film Fixed Resistors



This one resistor can shrink your inventory costs

Capless design provides a reliable termination that does away with problems associated with end cap construction.

Leads are designed for both soldering and welding to give you freedom of choice about attachment, and long term storage capability.

Cores are high purity alumina with outstanding physical and thermal properties to reduce the incidence of fractures.

Coating is specially formulated to maintain outstanding insulation properties throughout environmental exposures.

Markings are clear, crisp and precise; dual resistance marking for easy identification, and durable to withstand production handling.

For more information request Publication EC33.

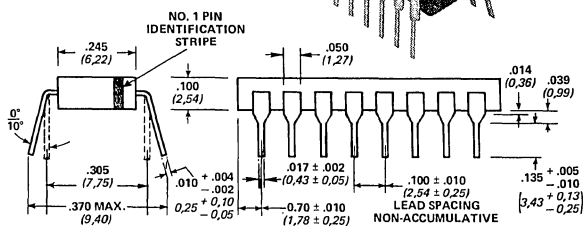
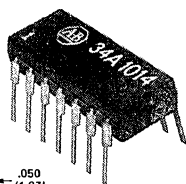
Resistance range	10 Ohms to 10 Megohms
Power rating	$\frac{1}{8}$ watt @ 125°C $\frac{1}{4}$ watt @ 70°C $\frac{1}{2}$ watt @ 70°C (250V Max.)
TCR	100 PPM
Tolerance	1%
Availability	Off the shelf
Approved	RN55D
Size	.250 L. x .090 D.



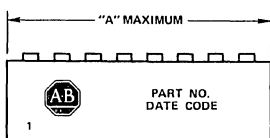
ALLEN-BRADLEY—THE LEADER IN TOTAL NETWORK CAPABILITY

CERMET DIP RESISTOR NETWORKS

NEW CERAMIC I-DIP PACKAGE



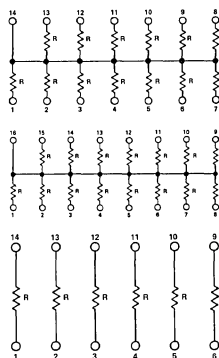
"A" Maximum		Number of Leads
Decimal	Metric	
.740	18,80	14
.840	21,34	16



STANDARD • PULL-UP • PULL-DOWN • TERMINATION • NETWORKS

APPLICATIONS:

- Pull-up array for unused TTL gates
- Parallel high speed circuitry
- Wired OR configurations
- Pull-down applications
- TTL-MOS interfacing
- Digital pulse squaring



APPLICATIONS:

- Transmission line termination
- Power gate pull-up
- Current limiting
- Logic level translation

STANDARD RESISTANCE VALUES—SERIES 314A, 314B, 316A, 316B

R (OHMS)						
22	75	270	910	3300	10K	47K
24	82	300	1000	3600	11K	68K
27	91	330	1100	3900	12K	100K
30	100	360	1200	4300	13K	
33	110	390	1300	4700	15K	
36	120	430	1500	5100	16K	
39	130	470	1600	5600	18K	
43	150	510	1800	6000	20K	
47	160	560	2000	6200	22K	
51	180	620	2200	6800	24K	
56	200	680	2400	7500	27K	
62	220	750	2700	8200	30K	
68	240	820	3000	9100	33K	

PRICES

Quantity	314A	316A	314B	316B
1—24	\$1.20	\$1.25	\$1.15	\$1.20
25—99	\$1.10	\$1.13	\$1.07	\$1.10

Prices and specifications subject to change without notice.

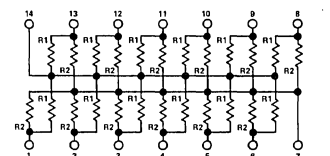
HOW TO ORDER

Example: Require Series 314A with resistance value=1000Ω.
Order part #314A102.

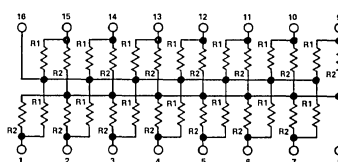
STANDARD • PARALLEL • TERMINATION • NETWORKS

APPLICATIONS:

Series 314E and 316E networks are used in digital IC logic circuits and are especially suited for ECL and TTL applications. For ECL applications the network's circuit configuration serves a dual purpose. The R2 resistors are pull-down resistors and are normally tied to the most negative supply voltage. The R1 resistors, in parallel with the R2 resistors, provide the characteristic impedance for proper transmission line matching. In TTL logic the networks are used in pulse squaring applications.



SERIES 314E



SERIES 316E

PRICES

Quantity	314E	316E
1—24	\$2.15	\$2.30
25—99	\$2.00	\$2.14

Prices and specifications subject to change without notice.

HOW TO ORDER

Example: Require series 316E with characteristic impedance=50Ω.
Order part #316E810131.

STANDARD RESISTANCE VALUES—SERIES 314E AND 316E

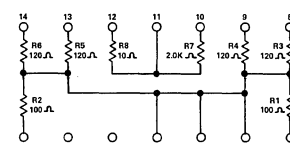
R1/R2	(Characteristic Z ₀ Impedance)
81/130	50
120/200	75
90/660	80
130/210	80
160/260	100
220/330	132
330/680	222
180/390	123

STANDARD • SENSE AMP • INTERFACE • NETWORKS

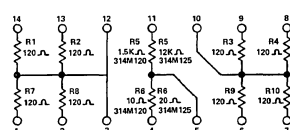
APPLICATIONS:

- Designed for use with 7520 series core memory sense amplifiers.
- Series 314M110 combines a threshold setting divider with balanced sense line termination and far end termination of two sense lines.
- Series 314M120 and 314M125 combine threshold setting dividers with four sense line termination. Following resistor values provide different threshold setting:

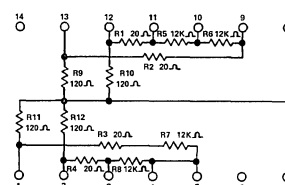
Resistor	314M120	314M125
R5	1.5KΩ	12KΩ
R6	10Ω	20Ω



314M110



314M120 or 314M125



314M130

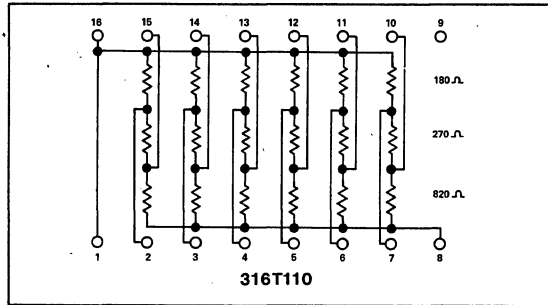
APPLICATIONS:

- Series 314M130 designed for use with μA711 dual voltage comparator in core memory sense amplifier applications.
- Combines four threshold dividers with balanced termination of two lines.

STANDARD TTL TO ECL TRANSLATOR NETWORK

APPLICATIONS:

- Series 316T110 provides TTL to ECL translation.
- Contains six TTL to ECL translators.



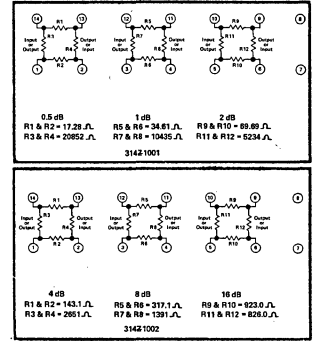
STANDARD NETWORK SPECIFICATIONS

Standard Network	Resistor Tolerance	Temperature Coefficient of Resistance (ppm/°C)	Power Dissipation Rating (Up to 70°C Ambient)	Operating Temperature Range	Resistance Ratios
314A	±2%	±100	125 mw/resistor 1.6 watt/package	-55°C to +125°C	-----
314B			250 mw/resistor 1.6 watt/package		
316A			125 mw/resistor 1.8 watt/package		
316B			250 mw/resistor 1.8 watt/package		
314E	±2%	±100	125 mw/resistor 1.6 watt/package	-55°C to +125°C	-----
316E			125 mw/resistor 1.8 watt/package		
314M110	±2% ±5% (R8 only)	±200	500 mw/resistor (R1 & R2) 100 mw/resistor (R3 through R8)	0°C to +70°C	R3/R4 ±1.5% R5/R6 ±1.5% R7/R8 ±2%
314M120	±2% ±5% (R6 only)		100 mw/resistor	0°C to +70°C	$\left. \begin{matrix} R1/R2 \\ R3/R4 \\ R5/R6 \\ R7/R8 \\ R9/R10 \end{matrix} \right\} \pm 1.5\%$
314M125					
314M130	±2%	±200	100 mw/resistor	0°C to +70°C	-----
316T110	±2%	±200	125 mw/resistor	0°C to +70°C	-----

STANDARD "O" PAD (BALANCED π) ATTENUATORS

APPLICATIONS:

These networks are used primarily in the communications industry where a fixed voltage attenuation is required with impedance matching. Voltage attenuation in steps of 0.5 dB from 0.5 dB to 31.5 dB can be obtained from the Series 314Z networks by the use of one "O" pad, or by placing two or more in series. For example, 20 dB is obtained by placing the 4 dB and 16 dB sections in series.



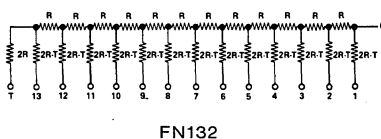
SPECIFICATIONS:

Characteristic Impedance	600 ohms
Attenuation Tolerance (dB)	±1%
Attenuation Change Due to Temperature	±1% Additional
Resistor Tolerance	±1%
Temperature Coefficient of Resistance	±200 ppm/°C
Power Dissipation Rating at 40°C	150 mw per Attenuator
Frequency Response	Flat to 1 MHz
Operating Temperature	0°C to +70°C

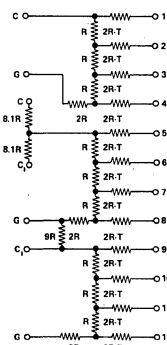
PRECISION THIN FILM RESISTOR NETWORKS, LADDERS AND ARRAYS

R/2R BINARY CODE LADDER NETWORKS

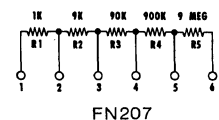
Ladder networks with fewer bits using the basic schematic of the FN132 are FN114, FN123, FN125, FN131, and FN160.



1-2-4-8 BCD CODE LADDER NETWORKS



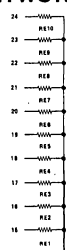
VOLTAGE DIVIDER NETWORK (Decade Attenuator)



APPLICATIONS:

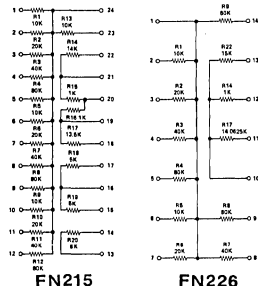
- All ladders—A/D and D/A conversion
- FN207—Input attenuation and range selection in digital instrumentation; particularly in digital voltmeters and multimeters.

CURRENT SUMMING NETWORKS



FN111 & FN112

PRECISION RESISTOR ARRAYS



FN215

FN226

APPLICATIONS:

- A/D and D/A conversion.
- FN111—10 bit binary operation.
- FN112—3 place BCD operation (0 to 399).
- FN215—12 bit conversion—designed for use with Fairchild μ A9650 IC.
- FN226**
- FN227**

*Both designed for use with Fairchild μ A722 IC.

**Both designed for use with Intersil ICL 8018, 8019, 8020 IC's. FN226 gives 8 bit conversion. FN226 plus FN227 gives 12 bit conversion.

R/2R BINARY CODE LADDER NETWORKS

Part Number	FN114 (1)	FN123 (1)	FN125 (2)	FN131	FN132	FN160
Number of Bits	12	10	10	10	13	10
Ladder Resistance Value (R)	R=200K T ₁₋₂ =500 Ω T ₃₋₁₂ =550 Ω	R=50K T ₁₋₂ =500 Ω T ₃₋₁₀ =550 Ω	R=50K T ₁₋₂ =200 Ω T ₃₋₁₀ =550 Ω	R=10K T=0	R=5K T=0	R=5K T=0
Ladder Resistance Tolerance	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$
Network Full Scale Accuracy	$\pm \frac{1}{2}$ LSB	$\pm \frac{1}{2}$ LSB	$\pm \frac{1}{2}$ LSB	$\pm \frac{1}{2}$ LSB	$\pm \frac{1}{2}$ LSB	$\pm \frac{1}{2}$ LSB
Operating Temperature Range	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C
Storage Temperature Range	-65°C to +175°C	-65°C to +175°C	-65°C to +175°C	-65°C to +175°C	-65°C to +175°C	-65°C to +175°C
Operating Voltage Range	$\pm 100V$ Maximum	$\pm 70V$ Maximum	$\pm 70V$ Maximum	$\pm 30V$ Maximum	$\pm 20V$ Maximum	$\pm 20V$ Maximum

(1) May be used with Fairchild 3750/3751 IC.

(2) May be used with Fairchild 3750 IC.

1-2-4-8 BCD CODE LADDER NETWORKS

Part Number	FN128 (1)	FN129 (1)	FN130
Number of Bits	12	12	12
Ladder Resistance Value (R)	R=50K T ₁₋₂ =500 Ω T ₃₋₁₂ =500 Ω	R=100K T ₁₋₂ =500 Ω T ₃₋₁₂ =550 Ω	R=10K T=0
Ladder Resistance Tolerance	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$
Network Full Scale Accuracy	$\pm \frac{1}{2}$ LSB	$\pm \frac{1}{2}$ LSB	$\pm \frac{1}{2}$ LSB
Operating Temperature Range	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C
Storage Temperature Range	-65°C to +175°C	-65°C to +175°C	-65°C to +175°C
Operating Voltage Range	$\pm 100V$ Maximum	$\pm 140V$ Maximum	$\pm 20V$ Maximum

(1) May be used with Fairchild 3750/3751 IC.

VOLTAGE DIVIDER NETWORK FN207

Resistance Tolerance on Total Resistance (R_T) at +25°C:
 $R_T = R_1 + R_2 + R_3 + R_4 + R_5 = 10$ Megohms $\pm 0.05\%$.

Ratio Tolerance at +25°C and from 0 to 1000 volts:

$$\frac{R_1 + R_2 + R_3 + R_4}{R_T} = \frac{1 \text{ Megohm}}{10 \text{ Megohms}} = 0.1 \pm 0.03\%$$

$$\frac{R_1 + R_2 + R_3}{R_T} = \frac{100 \text{ K ohms}}{10 \text{ Megohms}} = 0.01 \pm 0.03\%$$

$$\frac{R_1 + R_2}{R_T} = \frac{10 \text{ K ohms}}{10 \text{ Megohms}} = 0.001 \pm 0.03\%$$

$$\frac{R_1}{R_T} = \frac{1 \text{ K ohm}}{10 \text{ Megohms}} = 0.0001 \pm 0.03\%$$

Temperature Coefficient of Resistance..... ± 25 ppm/°C
 TCR Tracking..... ± 5 ppm/°C
 Operating Voltage (between pins 1 & 6)..... 1000 volts max.
 Operating Temperature..... 0°C to +70°C
 Storage Temperature..... -65°C to +175°C

CURRENT SUMMING NETWORKS

Part Number	Resistor Number (Re)	FN111				FN112			
		Nominal Resistance (K ohm)	Nominal Ratio (Re/Rei)	Max. Ratio Tolerance % At 25°C	Max. Ratio Temp. Coeff. (PPM/°C)	Nominal Resistance (K ohm)	Nominal Ratio (Re/Rei)	Max. Ratio Tolerance % At 25°C	Max. Ratio Temp. Coeff. (PPM/°C)
15	RE1	2.547	1.000	$\pm 10\%$ Absolute	± 5.0	2.547	1.000	$\pm 10\%$ Absolute	± 20
16	RE2	5.094	2.000	± 0.02	± 5.0	5.094	2.000	± 0.02	± 5.0
17	RE3	10.245	4.022	± 0.05	± 10	6.379	2.5045	± 0.02	± 5.0
18	RE4	20.60	8.088	± 0.10	± 20	12.83	5.036	± 0.05	± 10
19	RE5	41.43	16.265	± 0.20	± 20	25.80	10.13	± 0.10	± 20
20	RE6	81.93	32.17	± 0.20	± 50	51.03	20.03	± 0.20	± 50
21	RE7	163.4	64.16	± 0.50	± 100	63.36	24.88	± 0.50	± 100
22	RE8	325.7	127.9	± 1.0	± 200	126.3	49.57	± 1.0	± 200
23	RE9	644.9	253.2	± 2.0	± 500	250.1	98.17	± 1.0	± 200
24	RE10	1275.0	500.8	± 2.0	± 500	495.0	194.3	± 2.0	± 500

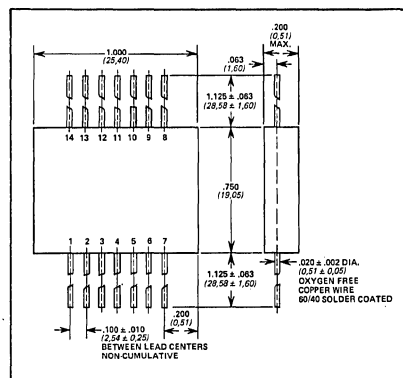
PRECISION RESISTOR ARRAYS

Part Number	FN215	FN226	FN227
Tolerance—Resistance matching or ratio	R2/R1 = $\pm 0.005\%$ R3/R1 = $\pm 0.01\%$ R4/R1 = $\pm 0.02\%$ R5/R1 = $\pm 1.0\%$ R6/R5 = $\pm 0.05\%$ R7/R5 = $\pm 0.1\%$ R8/R5 = $\pm 0.02\%$ R9/R1 = $\pm 1.0\%$ R10/R9 = $\pm 0.5\%$ R11/R9 = $\pm 1.0\%$ R12/R9 = $\pm 2.0\%$ R13/R1 = $\pm 0.2\%$	R2/R1 = $\pm 0.0122\%$ R3/R1 = $\pm 0.0244\%$ R4/R1 = $\pm 0.0488\%$ R5/R1 = $\pm 0.096\%$ R6/R1 = $\pm 0.195\%$ R7/R1 = $\pm 0.391\%$ R8/R1 = $\pm 0.781\%$ R9/R1 = $\pm 0.1\%$ R17/R14 = $\pm 0.1\%$ R22/R14 = $\pm 0.5\%$	R11/R10 = $\pm 1.0\%$ R12/R10 = $\pm 1.0\%$ R13/R10 = $\pm 1.0\%$ R16/R15 = $\pm 1.0\%$ R19/R18 = $\pm 0.1\%$ R21/R20 = $\pm 0.1\%$
Tolerance—Absolute	R14/R17 = $\pm 0.5\%$ R15/R16 = $\pm 1.0\%$ R18/R19 = $\pm 0.1\%$ R20 = $\pm 1.0\%$	R1 = $\pm 0.1\%$ R14 = $\pm 1.0\%$	R10 = $\pm 0.5\%$ R15 = $\pm 1.0\%$ R18 = $\pm 0.5\%$ R20 = $\pm 0.5\%$
Temperature coefficient of resistance	± 25 PPM/°C	± 25 PPM/°C	± 25 PPM/°C
Temperature coefficient of resistance tracking	± 5 PPM/°C	± 5 PPM/°C	± 5 PPM/°C
Power rating each resistor up to +125°C	50MW	50MW	50MW
Operating temperature range	-55°C to +125°C	0°C to +70°C	0°C to +70°C
Storage temperature range	-65°C to +175°C	-65°C to +175°C	-65°C to +175°C

PACKAGE

Modified flat pack (Diallyl phthalate epoxy material).

(Dip, chip, and conformal coated package styles also available upon request.)



CUSTOM RESISTOR NETWORKS

For more information on custom resistor network capabilities ask for these publications:

Cermet resistor networks—A-B Publication 5850

Thin film resistor networks—A-B Publication 5800

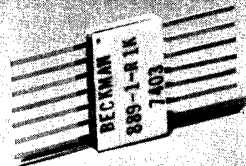
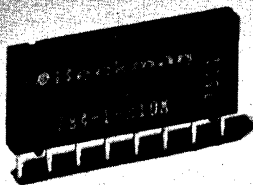
In addition to the standard cermet and precision thin film resistor networks listed on these pages, custom networks can be designed to meet a specific need.



ALLEN-BRADLEY
 Electronics Division
 Milwaukee, Wisconsin 53204

Beckman[®]

Save time, space and money with . . .

THICK FILM RESISTOR NETWORKS

Beckman RESNET[™] Dual-In-Line and Single-In-Line Resistor Networks consist of various thick film resistor configurations packaged in standard 14- and 16-pin DIPs and 8-pin SIPs that offer:

- Significant reduction of "on the board" costs.
- Space savings over individual resistors.
- Total compatibility with automatic insertion equipment.

Specifications (DIP or SIP)

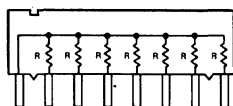
Resistance Tolerance (+25°C) 22Ω to 99Ω ± 2%
100Ω to 100K ± 2% max.

Power Rating (+25 C still air):

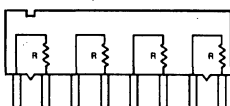
Model	Resistor Rating	Package Rating
764-1	0.175W	1.5W
764-3	0.2W	1.5W
784-1	0.3W	2.0W
784-3	0.5W	2.0W
898-1, 899-1	0.150W	1.5W
898-3, 899-3	0.250W	1.5W
898-5	0.250W	2.2W
899-5	0.250W	2.0W

Operating Temperature Range -55°C to +125°C

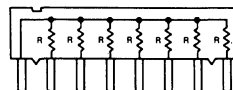
7 RESISTORS
8-pin SIP . . . 784-1-R



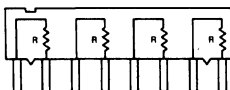
4 RESISTORS
8-pin SIP . . . 784-3-R



7 RESISTORS
8-pin Low Profile SIP
764-1-R



4 RESISTORS
8-pin Low Profile SIP
764-3-R



Stock Resistance Values Available (in Ohms)

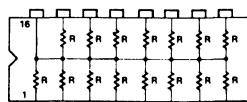
Stock Resources Values Available (in units)							
784-1-R (R)				784-3-R (R)			
764-1-R (R)				764-3-R (R)			
100	150	330	680	1.5K	3.3K	6.8K	15K
120	220	470	1K	2.2K	4.7K	10K	22K

PRICES — SIP RESISTOR NETWORKS

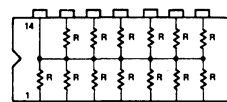
Quantity	784-1	784-3	764-1	764-3
1-99	\$.65	\$.60	\$.65	\$.60

STANDARD RESNET[™] DIPs

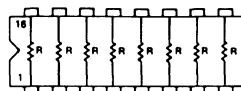
15 RESISTORS
16-Pin DIP . . . 898-1-R



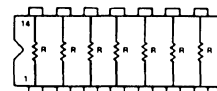
13 RESISTORS
14-Pin DIP . . . 899-1-R



8 RESISTORS
16-Pin DIP . . . 898-3-R



7 RESISTORS
14-Pin DIP . . . 899-3-R



Stock Resistance Values Available

Standard Values Available							
898-1-R							
898-3-R							
62†	110	330	1.0K	2.2K	6.0K	15.0K	47.0K
68	150	470	1.5K	3.3K	6.8K	22.0K	68.0K
100	220	680	2.0K††	4.7K	10.0K	33.0K	100.0K

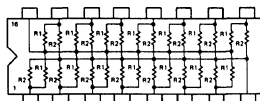
†62Ω is not standard in 898-1.

††2.0K is not standard in 898-3.

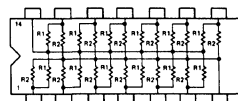
899-1-R

899-3-R												
22	39	68	120	220	390	680	1.2K	2.2K	3.9K	6.2K	11K	20K
24	43	75	130	240	430	750	1.3K	2.4K	4.3K	6.8K	12K	22K
27	47	82	150	270	470	820	1.5K	2.7K	4.7K	7.5K	13K	33K
30	51	91	160	300	510	910	1.6K	3.0K	5.1K	8.2K	15K	47K
33	56	100	180	330	560	1.0K	1.8K	3.3K	5.6K	9.1K	16K	68K
36	62	110	200	360	620	1.1K	2.0K	3.6K	6.0K	10K	18K	100K

28 RESISTORS
16-Pin DIP . . . 898-5-R 220/330*



24 RESISTORS
14-Pin DIP . . . 899-5-R 220/330*
14-Pin DIP . . . 899-5-R 220/270*



*Stock Resistance Values (Ω's). Other resistance values available as factory order.

PRICES — DIP RESISTOR NETWORKS

Quantity	898-1	899-1	898-3	899-3	898-5	899-5
1-99	\$1.25	\$1.20	\$1.20	\$1.15	\$2.30	\$2.15

Prices and specifications subject to change without notice.

How to Order: List DIP or SIP model number, add dash and resistance value. Example: 1500 ohm, 14-pin network with 13 resistors (Series 899-1), order 899-1-R1.5K.

Beckman

INSTRUMENTS, INC.

HELIPOT DIVISION

2500 Harbor Boulevard, Fullerton, California 92634

(714) 871-4848 • TWX No. 910-592-1260

Beckman**THICK FILM RESISTOR NETWORKS****STANDARD ECL TERMINATORS**

Beckman ECL Terminators are specifically designed for, and compatible with, the following Emitter Coupled Logic families:

- Motorola MECL 10,000 Series
- Signetics 10,000 Series ECL
- Fairchild 9500 Series ECL
- Texas Instruments Series SN10000 ECL
- National Semiconductor 10,000 Series ECL

Each terminator network utilizes thick film resistor materials with layouts specifically designed for low inductive characteristics and the high speed requirements of ECL systems. Where possible, the terminator networks include .01 μ F decoupling capacitors. Each capacitor occupies the entire top surface of the ceramic substrate and consists of 2 metal plates and a single layer dielectric selected specifically for high capacitance at high frequency.

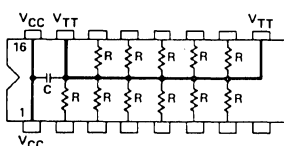


FIGURE 1 SERIES 898-41
-2.0 VOLT TERMINATORS

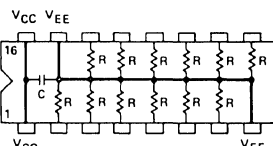
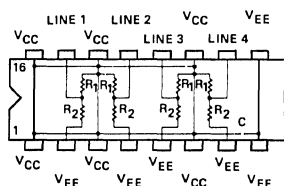


FIGURE 2 SERIES 898-42
-5.2 VOLT TERMINATORS





TRIMPOT PRODUCTS DIVISION

THICK-FILM NETWORKS

Bourns Resistor Networks are a product of many years of experience in the high volume production thick-film products. Bourns designs have been thoroughly tested to meet uncompromising standards as to product life and environmental performance. A proprietary thick-film resistor ink system imparts outstanding stability and temperature coefficient characteristics over the entire range of standard resistance values.

PERFORMANCE CHARACTERISTICS

Resistance Range: 33Ω to $470K\Omega$ Standard 10Ω to 1 Meg Ω SpecialResistance Tolerance: $\pm 2\%$ Standard, to $\pm 5\%$ Special

Power Ratings (@25°C)

MODELS	4114R-001	4114R-002	4116R-001	4116R-002	4406/08/10 R-001	4406/08/10 R-002
Total Pkg.	2.0W	2.0W	2.25W	2.25W	1.5/2./2.5W	1.5/2./2.5W
Single Resistor	0.25W	.125W	0.25W	0.125W	0.3W	0.5W

4114/16R-003	4116C-008	4410R-003	4116C-004	4116C-005	4116C-006	4116C-007	4114R-009
2./2.25W	1.0W	2.0W	1.5W	1.5W	1.5W	2.25W	1.5W
.125W	.125W	0.25W	.125W	.125W	.125W	0.25W	.125W

Capacitor Tolerance: $\pm 20\%$

Capacitor Dissipation Factor: 3% Max.

Capacitor Voltage Rating: 25V Max.

Short Time Overload (2.5 x Rated Voltage, 5 sec): $\pm 0.25\%$ Max. ΔR Resistance Temperature Coefficient (-55°C to $\pm 125^\circ\text{C}$):250 PPM/ $^\circ\text{C}$ STD, ± 100 PPM/ $^\circ\text{C}$ Special

MECHANICAL CHARACTERISTICS

Body Material: DIP Package — Molded Epoxy

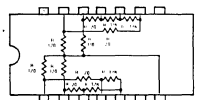
SIP Package — Epoxy Coated

Lead Material: Tin Plated Copper Alloy

PHYSICAL CHARACTERISTICS

Meets or exceeds MIL-R-83401A, and MIL-STD-202E

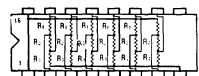
Call Bourns when you have applications which require non-standard or unequal resistor values, special schematics, capacitors, or special performance specifications. We maintain a special facility for quick turn-around requirements on prototype units.



MODEL 4114C-009

14 PIN DUAL-IN-LINE PACKAGE

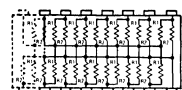
711 DUAL COMPARATOR TERMINATOR



MODEL 4116R-008

16 PIN DUAL-IN-LINE PACKAGE

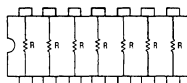
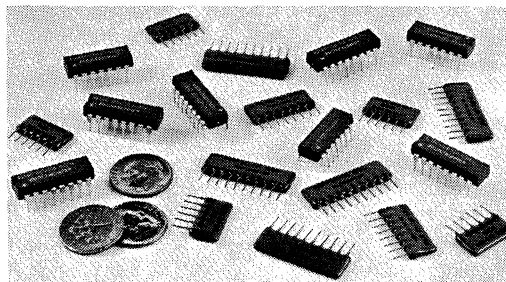
TTL TO ECL TRANSLATOR



MODEL 4114/4116R-003

14/16 PIN DUAL-IN-LINE PACKAGE

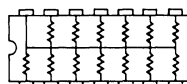
LINE TERMINATOR



MODEL 4114R-001

14 PIN DUAL-IN-LINE PACKAGE

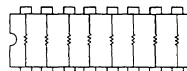
7 ISOLATED RESISTORS



MODEL 4114R-002

14 PIN DUAL-IN-LINE PACKAGE

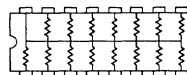
13 RESISTORS, PIN 14 COMMON



MODEL 4116R-001

16 PIN DUAL-IN-LINE PACKAGE

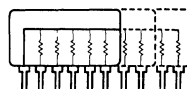
8 ISOLATED RESISTORS



MODEL 4116R-002

16 PIN DUAL-IN-LINE PACKAGE

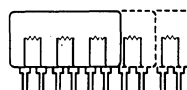
15 RESISTORS, PIN 16 COMMON



MODELS 4406/4408/4410R-001

6, 8, 10 PIN SINGLE-IN-LINE PACKAGE

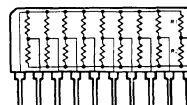
5, 7 OR 9 RESISTORS, PIN 1 COMMON



MODELS 4406/4408/4410R-002

6, 8 OR 10 PIN SINGLE-IN-LINE PACKAGE

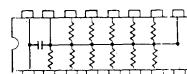
3, 4 OR 5 ISOLATED RESISTORS



MODEL 4410R-003

10 PIN SINGLE-IN-LINE PACKAGE

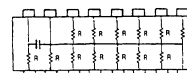
16 RESISTOR LINE TERMINATOR



MODEL 4116C-004

16 PIN DUAL-IN-LINE PACKAGE

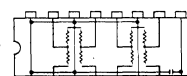
-2.0 VOLT ECL TERMINATOR



MODEL 4116C-005

16 PIN DUAL-IN-LINE PACKAGE

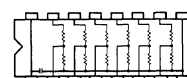
-5.2V ECL PULL DOWN RESISTORS



MODEL 4116C-006

16 PIN DUAL-IN-LINE PACKAGE

ECL THEVENIN EQUIVALENT TERMINATOR



MODEL 4116C-007

16 PIN DUAL-IN-LINE PACKAGE

SERIES LINE TERMINATOR

For quantity pricing, contact your Bourns representative or distributor. . . . or contact the factory direct.



CTS MICROELECTRONICS, INC.

SUBSIDIARY OF CTS CORPORATION, ELKHART, INDIANA

TOTAL CAPABILITY IN HYBRID CIRCUITRY

RESISTORS

- Over 15 years production experience in cermet circuitry
- Prototype and production facilities offer fast turn around per your requirements

RESISTOR NETWORKS
RESISTOR CAPACITOR NETWORKS
RESISTOR TRIMMER NETWORKS

SOLID CERMET PELLET AND CHIP RESISTORS

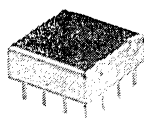


CERADOT RESISTOR

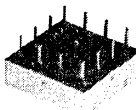


150 SERIES

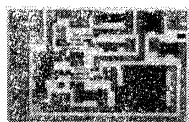
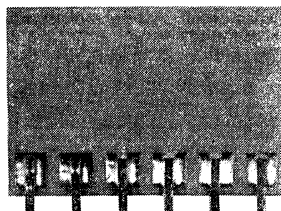
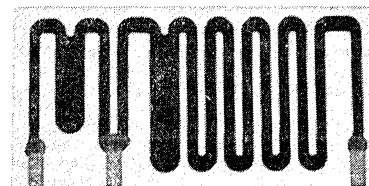
STANDARD RESISTOR NETWORKS



780 SERIES



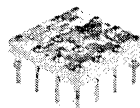
CUSTOM RESISTOR NETWORKS

RESISTOR
CONDUCTORHIGH POWER
MODULEHIGH VOLTAGE
MODULES

RESISTOR CAPACITOR NETWORKS

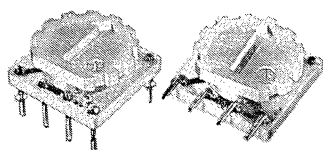


DIP COATING

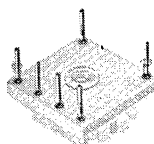


780 SERIES

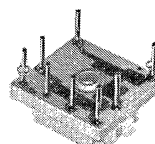
RESISTOR/TRIMMER COMBINATIONS



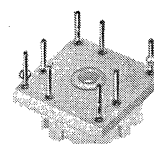
380



382



383



384

For active hybrid circuits, see page 1•888 in EEM

For Resistor/network applications, contact your CTS Representative (listed under CTS in the yellow pages) or contact: CTS MICROELECTRONICS, INC., P. O. Box 1278, Dept. E, Lafayette, Indiana 47902, or call and ask for Charles Sparks at (317) 463-2565 • TWX 810-342-1882



CTS OF BERNE, INC.

SUBSIDIARY OF CTS CORPORATION, ELKHART, INDIANA
WORLD LEADER IN CERMET RESISTOR TECHNOLOGY

DUAL-IN-LINE CERMET RESISTOR NETWORKS

CERMET RESISTOR NETWORKS (Available with capacitor chips and/or active devices*)

CTS Series 760 Dual-In-Line cermet resistor networks are available in 8, 14, 16, and 18 lead styles. CTS now offers you a choice of four popular space-saver packages. All are designed to simplify automatic insertion along with IC's and other DIP products for reduced costs. Easy to hand mount,

too. Available without cover coat, so you can trim for circuit balance in your own plant. Choose from standard circuits available off-the-shelf for immediate delivery or custom designed to your specifications.

FEATURES:

- Low height profile
- .100" lead spacing
- High overload capabilities
- 8, 14, 16 & 18 pin constructions
- Compatible with automatic insertion equipment
- 2 watt power capabilities
- Reduced insertion time
- Available with capacitors and/or active devices*

ELECTRICAL AND MECHANICAL SPECIFICATIONS:

Description: 8, 14, 16, and 18 pin dual-in-line modules on .100" lead centers.

Standard Resistance Range: 22Ω through 1 MegΩ.

Special Resistance Range: Below 22Ω and above 1 MegΩ.

Resistance Matching (2 like resistors):

50Ω to 30KΩ — 0.5%
30KΩ to 250KΩ — 1%
250KΩ to 3 MegΩ — 2.5%

Ratio Matching:

50Ω to 30KΩ — ±1%
30KΩ to 250KΩ — ±2%
250KΩ to 3 MegΩ — ±5%

Wattage Rating @ 70°C per module: 8 pin - .75 watt; 14 pin - 1.5 watts; 16 pin - 1.75 watts; 18 pin - 2.0 watts.

Standard Temperature Coefficient: ±300 ppm/°C.

Special Temperature Coefficient: to ±100 ppm/°C.

Temperature Coefficient Tracking: Available to 50 ppm/°C.

Standard Resistance Tolerance: ±5%.

Special Resistance Tolerance: ±1% or ½Ω (whichever is greater).

Substrate Material: Alumina.

Resistor Material: Cermet - thick film.

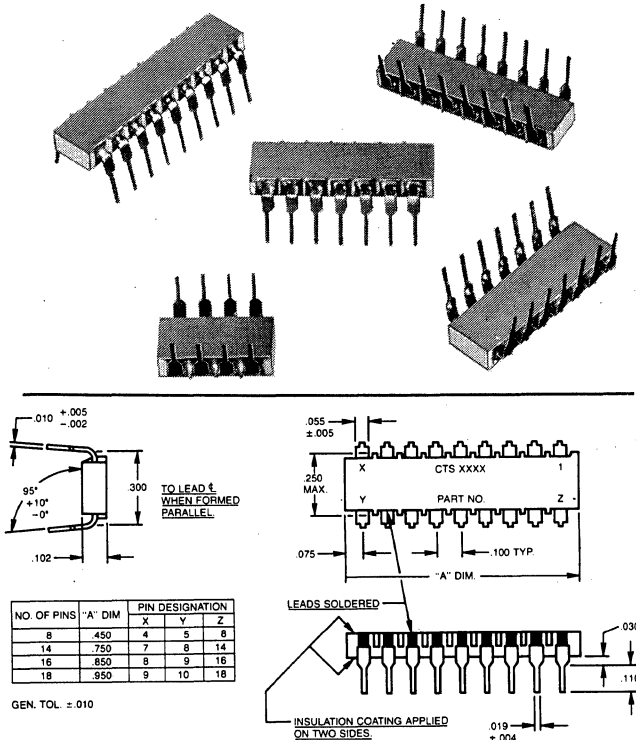
Insulation Coating: Organic - epoxy phenolic.

Lead Material: Solder coated copper.

Solder: 63/37 Tin/Lead. 246°C (475°F) for 9 sec. Max. reflow operation.

Lead Strength: 5# pull.

* Active devices added by CTS Microelectronics, Inc., Lafayette, Indiana.



Environmental Performance Characteristics

Test	Allowable Resistance Change CTS Max Δ R CTS Avg. Δ R	
Load Life: 1,000 hrs., 0.1 watt per resistor at 70°C	±0.50%	±0.20%
Moisture Resistance: 0.1 rated wattage at 70°C, 90-98% humidity, 1,000 hrs.	±0.50%	±0.20%
Insulation Resistance: Measured wet after moisture resistance test, 200 VDC	Greater than 1000 megohms	
Low Temperature Exposure: -63°C, 4 hrs.	±0.25%	±0.10%
Thermal Shock: 5 cycles, -63°C to +125°C, no load	±0.25%	±0.10%
Short Time Overload: 2.5 times rated voltage, 5 sec.	±0.25%	±0.05%
Terminal Strength: 5 lb. tensile & compression, 30 sec.	±0.25%	±0.03%
Effect of Soldering: 63/37 solder, 246°C, 2 sec.	±0.25%	±0.05%

ORDERING INFORMATION: Place orders using the following address: CTS OF BERNE, INC., 406E Parr Road, Berne, Indiana 46711 • Call and ask for John Henry at (219) 589-3111 • TWX 810-323-1580



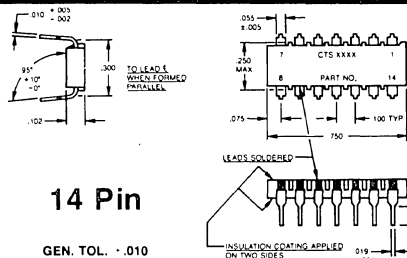
CTS OF BERNE, INC.

SUBSIDIARY OF CTS CORPORATION, ELKHART, INDIANA
WORLD LEADER IN CERMET RESISTOR TECHNOLOGY

760 SERIES 14/16 LEAD DUAL-IN-LINE CERMET RESISTOR NETWORKS

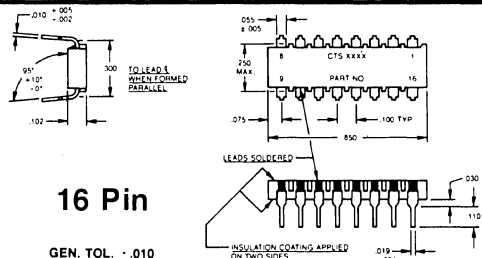
DIP RESISTOR NETWORKS

	CTS Series	Description	Element Type	Resistance Range & Tol.	Power Rating (Watts)	Standard TC	TC Tracking	Prices		
								1-99	100-499	500-999
	760-3	14 Pin Module on .100" x .300" DIP Centers	Cermet	22Ω-220KΩ*±2%	1.5 @ 70°C per module	±300 ppm/°C	50 ppm/°C	\$1.25	\$.99	\$.74
	760-1							1.45	1.12	.91
	760-5							2.50	2.00	1.75
	760-19							2.20	1.78	1.55
	761-3	16 Pin Module on .100" x .300" DIP Centers	Cermet	68Ω-470KΩ*±2%	1.75 @ 70°C per module	±300 ppm/°C	50 ppm/°C	\$1.31	\$1.04	\$.81
	761-1							1.52	1.18	1.02
	761-5							2.60	2.10	1.85
	761-45							2.40	1.90	1.50



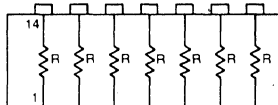
FEATURES:

- Low cost automatic insertion and handling
- High overload capabilities
- Low height profile
- Package compatibility, with monolithic packages
- .100" lead spacing

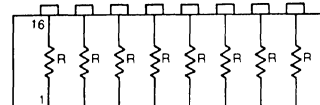


STANDARD "OFF THE SHELF" PART NUMBERS

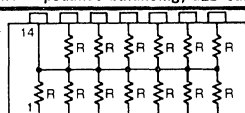
Resistance Value, Tolerance	14 Pin 7 Resistor	14 Pin 13 Resistor
22Ω ±2%	760-3-R22Ω	—
39Ω ±2%	760-3-R39Ω	—
68Ω ±2%	760-3-R68Ω	760-1-R68Ω
75Ω ±2%	—	760-1-R75Ω
100Ω ±2%	760-3-R100Ω	760-1-R100Ω
110Ω ±2%	760-3-R110Ω	—
150Ω ±2%	760-3-R150Ω	760-1-R150Ω
220Ω ±2%	760-3-R220Ω	760-1-R220Ω
330Ω ±2%	760-3-R330Ω	760-1-R330Ω
390Ω ±2%	—	760-1-R390Ω
470Ω ±2%	760-3-R470Ω	760-1-R470Ω
500Ω ±2%	760-3-R500Ω	760-1-R500Ω
680Ω ±2%	760-3-R680Ω	760-1-R680Ω
1KΩ ±2%	760-3-R1KΩ	760-1-R1KΩ
1.5KΩ ±2%	760-3-R1.5KΩ	760-1-R1.5KΩ
1.8KΩ ±2%	760-3-R1.8KΩ	—
2KΩ ±2%	—	760-1-R2KΩ
2.2KΩ ±2%	760-3-R2.2KΩ	760-1-R2.2KΩ
2.4KΩ ±2%	—	760-1-R2.4KΩ
3KΩ ±2%	—	760-1-R3KΩ
3.3KΩ ±2%	760-3-R3.3KΩ	760-1-R3.3KΩ
4.7KΩ ±2%	760-3-R4.7KΩ	760-1-R4.7KΩ
5KΩ ±2%	—	760-1-R5KΩ
5.6KΩ ±2%	—	760-1-R5.6KΩ
6KΩ ±2%	760-3-R6KΩ	760-1-R6KΩ
6.8KΩ ±2%	760-3-R6.8KΩ	760-1-R6.8KΩ
7.5KΩ ±2%	—	760-1-R7.5KΩ
9.1KΩ ±2%	—	760-1-R9.1KΩ
10KΩ ±2%	760-3-R10KΩ	760-1-R10KΩ
12KΩ ±2%	—	760-1-R12KΩ
15KΩ ±2%	760-3-R15KΩ	760-1-R15KΩ
22KΩ ±2%	760-3-R22KΩ	760-1-R22KΩ
33KΩ ±2%	760-3-R33KΩ	760-1-R33KΩ
47KΩ ±2%	760-3-R47KΩ	760-1-R47KΩ
68KΩ ±2%	760-3-R68KΩ	760-1-R68KΩ
75KΩ ±2%	760-3-R75KΩ	—
100KΩ ±2%	760-3-R100KΩ	760-1-R100KΩ
150KΩ ±2%	760-3-R150KΩ	760-1-R150KΩ
180KΩ ±2%	—	760-1-R180KΩ
220KΩ ±2%	760-3-R220KΩ	760-1-R220KΩ
Resistance Value, Tolerance	16 Pin 8 Resistor	16 Pin 15 Resistor
68Ω ±2%	761-3-R68Ω	761-1-R68Ω
87.5Ω ±2%	761-3-R87.5Ω	—
100Ω ±2%	761-3-R100Ω	761-1-R100Ω
110Ω ±2%	761-3-R110Ω	—
150Ω ±2%	761-3-R150Ω	761-1-R150Ω
220Ω ±2%	761-3-R220Ω	761-1-R220Ω
330Ω ±2%	761-3-R330Ω	761-1-R330Ω
470Ω ±2%	761-3-R470Ω	761-1-R470Ω
500Ω ±2%	—	761-1-R500Ω
680Ω ±2%	761-3-R680Ω	761-1-R680Ω
1KΩ ±2%	761-3-R1KΩ	761-1-R1KΩ
1.5KΩ ±2%	761-3-R1.5KΩ	761-1-R1.5KΩ
2KΩ ±2%	761-3-R2KΩ	761-1-R2KΩ
2.2KΩ ±2%	761-3-R2.2KΩ	761-1-R2.2KΩ
3.3KΩ ±2%	761-3-R3.3KΩ	761-1-R3.3KΩ
4.7KΩ ±2%	761-3-R4.7KΩ	761-1-R4.7KΩ
5KΩ ±2%	—	761-1-R5KΩ
6KΩ ±2%	—	761-1-R6KΩ
6.8KΩ ±2%	761-3-R6.8KΩ	761-1-R6.8KΩ
10KΩ ±2%	761-3-R10KΩ	761-1-R10KΩ
15KΩ ±2%	761-3-R15KΩ	761-1-R15KΩ
22KΩ ±2%	761-3-R22KΩ	761-1-R22KΩ
33KΩ ±2%	761-3-R33KΩ	761-1-R33KΩ
47KΩ ±2%	761-3-R47KΩ	761-1-R47KΩ
50KΩ ±2%	761-3-R50KΩ	761-1-R50KΩ
68KΩ ±2%	761-3-R68KΩ	761-1-R68KΩ
100KΩ ±2%	761-3-R100KΩ	761-1-R100KΩ
150KΩ ±2%	761-3-R150KΩ	761-1-R150KΩ
220KΩ ±2%	761-3-R220KΩ	761-1-R220KΩ
470KΩ ±2%	761-3-R470KΩ	—



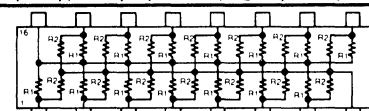
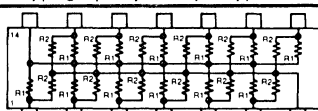
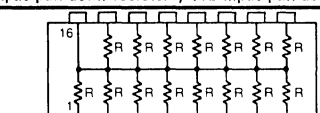
APPLICATIONS: "Wired OR" pull-up; Power driver pull-up; Power gate pull-up; Line termination; Long-line impedance balancing; LED current limiting; ECL output pull-down resistors; TTL input pull-down.



APPLICATIONS: MOS/ROM pull-up/pull-down; Open collector pull-up; "Wired OR" pull-up; Power driver pull-up; High speed parallel pull-up; TTL unused gate pull-up; TTL input pull-down; Digital pulse squaring.



APPLICATIONS: MOS/ROM pull-up/pull-down; Open collector pull-up; "Wired OR" pull-up; Power driver pull-up; High speed parallel pull-up; TTL unused gate pull-up; TTL input pull-down; Digital pulse squaring.

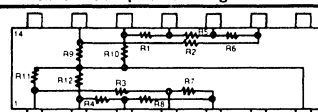


Resistance Values R1/R2	Part Numbers
220Ω/270Ω	760-5-R220/270 761-5-R220/270
220Ω/330Ω	760-5-R220/330 761-5-R220/330
1.5K/3.3K	760-5-R1.5/3.3K 761-5-R1.5K/3.3K

Other combinations available upon request

Pulse Squaring TTL Terminators

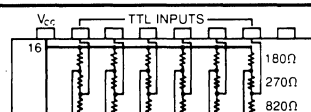
CTS 760-5 networks consist of two resistor pairs of the above value combinations. The resistors are connected together in series with a common line for power and a common line for ground. The junction of each pair is brought out to a separate terminal.



Interface Network

CTS 760-19 resistor network provides compatible interfacing with the μ A711 dual differential voltage comparator for core memory sense amplifier applications.

Resistance Values: R1 - R4 = 20KΩ ±0.5%
R5 - R8 = 12KΩ ±2%
R9 - R12 = 120KΩ ±2%



TTL to ECL Translator

CTS Series 761-45 network consists of 18 resistors internally divided into six identical three resistor sections for direct translation from TTL to ECL language.

*NOTE: Additional resistance values are constantly being added. Please contact your local CTS Industrial Distributor to check availability of values not shown above.

ORDERING INFORMATION: Place orders using the following address: CTS OF BERNE, INC., 406E Parr Road, Berne, Indiana 46711 • Call and ask for John Henry at (219) 589-3111 • TWX 810-323-1580



CTS OF BERNE, INC.

SUBSIDIARY OF CTS CORPORATION, ELKHART, INDIANA

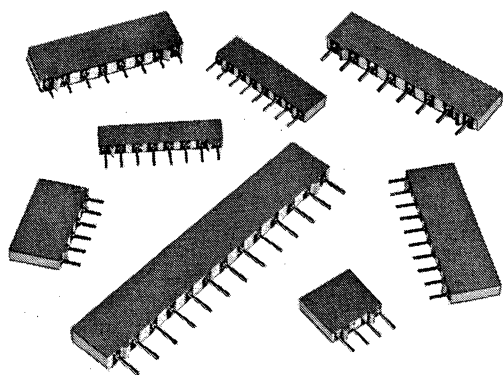
WORLD LEADER IN CERMET RESISTOR TECHNOLOGY

SINGLE-IN-LINE CERMET RESISTOR NETWORKS

CERMET RESISTOR NETWORKS (Available with capacitor chips and/or active devices*)

CTS... Leader in the field of **Low Profile** space-saving Cermet Resistor Modules. Readily recognizable because of the familiar CTS Blue.

As is well illustrated, these modules have been specifically designed to save space.



750 Series

So if you want to reduce the size of your design or add more complex circuitry without increasing size, CTS rates top consideration.

Most appealing is the fact that "The Little Blue Brick" is an extensive "Off The Shelf" item with CTS.

FEATURES:

- Compact edge mount modules
- Ultra high stability and reliability
- Automatic insertion capabilities
- Reduced insertion time
- Fewer items to inventory
- Space savings over individual resistors
- Available with capacitors and/or active devices*
- Available with .100", .125" and .150" lead centers

ELECTRICAL AND MECHANICAL SPECIFICATIONS:

Description: Cermet thick film single-in-line resistor networks.

Standard Resistance Range: 33Ω through 1 MegΩ.

Special Resistance Range: Below 33Ω and above 1 MegΩ.

Resistance Matching (2 like resistors):

50Ω to 30KΩ — 0.5%
30KΩ to 250KΩ — 1%
250KΩ to 3 MegΩ — 2.5%

Ratio Matching:

50Ω to 30KΩ — ±1%
30KΩ to 250KΩ — ±2%
250KΩ to 3 MegΩ — ±5%

Standard Temperature Coefficient: ±250 ppm/°C.

Special Temperature Coefficient: ±100 ppm/°C.

Temperature Coefficient Tracking: Available to 50 ppm/°C.

Standard Resistance Tolerance: ±5%.

Special Resistance Tolerance: to ±0.5% or 1/2Ω (whichever is greater).

Substrate Material: Alumina.

Resistor Material: Cermet - thick film.

Insulation Coating: Organic - epoxy phenolic.

Lead Material: Solder coated copper.

Solder: 63/37 Tin/Lead, 277°C (530°F) for 8 sec. Max. Reflow operation.

Lead Strength: 5# pull.

Wattage Rating @ 70°C (see chart below).

Environmental Performance Characteristics

For units less than .340" high, refer to page 8 for performance characteristics. Test	Allowable Resistance Change CTS Max Δ R CTS Avg. Δ R	
Load Life: 1,000 hrs., 0.1 watt per resistor at 70°C	±0.40%	±0.20%
Moisture Resistance: 0.1 rated wattage at 70°C, 90-98% humidity, 1,000 hrs.	±0.50%	±0.20%
Insulation Resistance: Measured wet after moisture resistance test, 200 VDC	Greater than 1000 megohms	
Low Temperature Exposure: -63°C, 4 hrs.	±0.10%	±0.04%
Thermal Shock: 5 cycles, -63°C to +125°C, no load	±0.10%	±0.03%
Short Time Overload: 2.5 times rated voltage, 5 sec.	±0.25%	±0.05%
Terminal Strength: 5 lb. tensile & compression, 30 sec.	±0.10%	±0.03%
Effect of Soldering: 63/37 solder, 246°C, 2 sec.	±0.10%	±0.05%

Lead Centers	Ht. of Module (Max.)	Number of Pins											
		2	4	5	6	7	8	9	10	11	12	13	
.100	(.187)	.25	—	—	—	.7	.8	—	—	—	—	—	
.100	(.250)	—	—	—	.9	—	1.1	—	1.5	—	—	—	
.100	(.350)	—	.7	—	1.0	—	1.3	—	2.0	2.3	—	—	
.125	(.187)	—	—	.6	—	—	1.0	—	—	—	—	—	
.125	(.350)	.5	1.0	—	1.5	—	2.0	—	2.5	—	3.0	—	
.150	(.340)	—	1.3	1.7	2.0	2.3	2.6	3.0	3.3	3.6	4.0	4.3	

* Active devices added by CTS Microelectronics, Inc., Lafayette, Indiana.

ORDERING INFORMATION: Place orders using the following address: CTS OF BERNE, INC., 406E Parr Road, Berne, Indiana 46711 • Call and ask for John Henry at (219) 589-3111 • TWX 810-323-1580

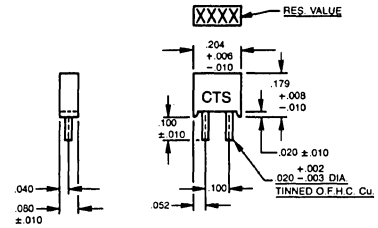
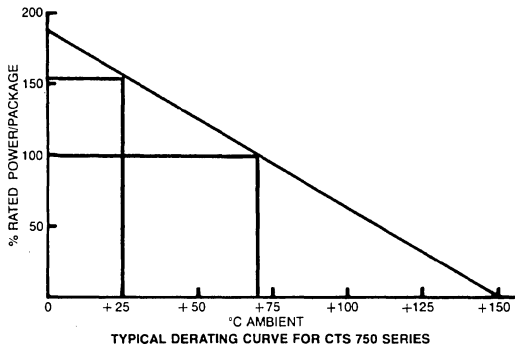


CTS OF BERNE, INC.

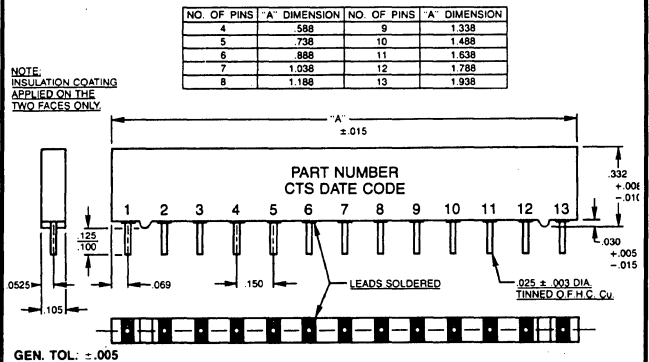
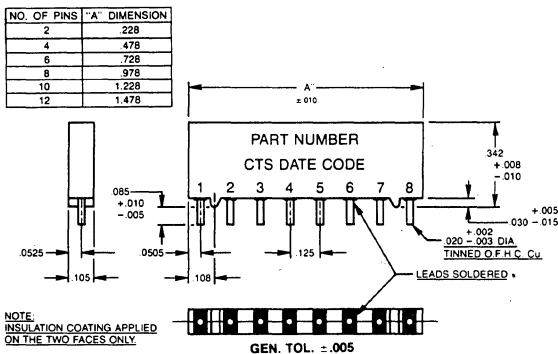
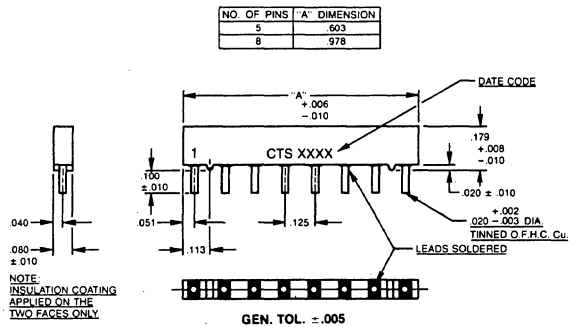
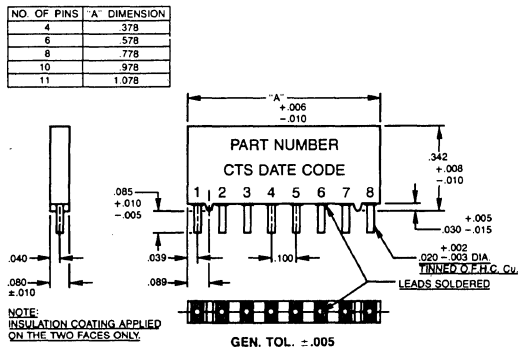
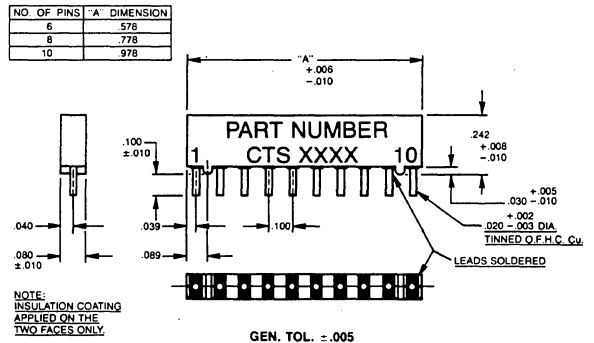
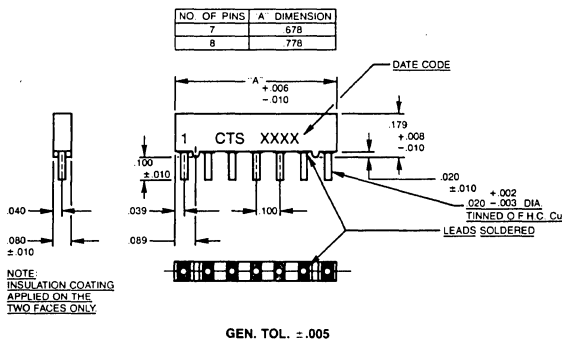
SUBSIDIARY OF CTS CORPORATION, ELKHART, INDIANA

WORLD LEADER IN CERMET RESISTOR TECHNOLOGY

SINGLE-IN-LINE CERMET RESISTOR NETWORKS



GEN. TOL. ± .005



ORDERING INFORMATION: Place orders using the following address: CTS OF BERNE, INC., 406E Parr Road, Berne, Indiana 46711 • Call and ask for John Henry at (219) 589-3111 • TWX 810-323-1580

RESISTORS, FIXED



CTS OF BERNE, INC.

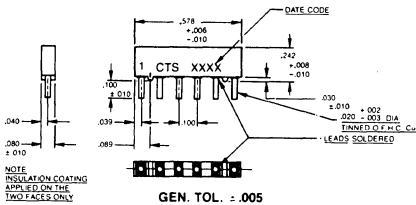
SUBSIDIARY OF CTS CORPORATION, ELKHART, INDIANA
WORLD LEADER IN CERMET RESISTOR TECHNOLOGY

SIP RESISTOR

750 SERIES SINGLE-IN-LINE CERMET RESISTOR NETWORKS

	CTS Series	Description	Element Type	Resistance Range & Tol.	Power Rating (Watts)	Standard TC	TC Tracking	Prices		
								1-99	100-499	500-999
	750-63	6 and 8 Pin Single In-Line Module on .100" Lead Centers	Cermet	33Ω-470KΩ* ±2%	6 Pin-.9 watt 8 Pin-1.1 watt @ 70°C per module	±250 ppm/°C	50 ppm/°C	\$.80	\$.62	\$.38
	750-61							.85	.65	.40
	750-83							.90	.68	.41
	750-81							.95	.75	.45

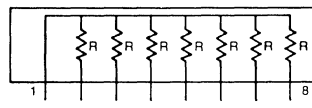
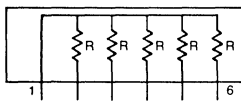
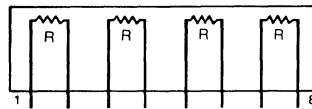
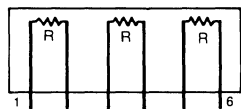
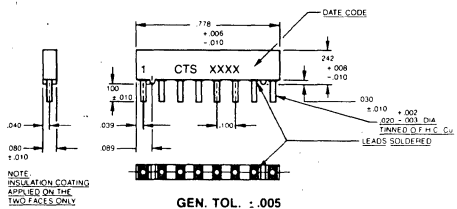
6 Pin



FEATURES:

- Low-Profile construction
- .100" lead spacing
- High reliability
- Alumina substrate
- Low cost automatic insertion and handling

8 Pin



STANDARD "OFF THE SHELF" PART NUMBERS

Resistance Value, Tolerance	6 Pin, 3 Resistor	6 Pin, 5 Resistor	8 Pin, 4 Resistor	8 Pin, 7 Resistor
33Ω ±2%	750-63-R33Ω	750-61-R33Ω	750-83-R33Ω	750-81-R33Ω
68Ω ±2%	750-63-R68Ω	—	750-83-R68Ω	—
100Ω ±2%	750-63-R100Ω	750-61-R100Ω	750-83-R100Ω	750-81-R100Ω
150Ω ±2%	750-63-R150Ω	750-61-R150Ω	750-83-R150Ω	750-81-R150Ω
180Ω ±2%	—	—	—	750-81-R180Ω
220Ω ±2%	750-63-R220Ω	750-61-R220Ω	750-83-R220Ω	750-81-R220Ω
330Ω ±2%	750-63-R330Ω	750-61-R330Ω	750-83-R330Ω	750-81-R330Ω
470Ω ±2%	750-63-R470Ω	750-61-R470Ω	750-83-R470Ω	750-81-R470Ω
500Ω ±2%	—	750-61-R500Ω	—	750-81-R500Ω
680Ω ±2%	750-63-R680Ω	750-61-R680Ω	750-83-R680Ω	750-81-R680Ω
1KΩ ±2%	750-63-R1KΩ	750-61-R1KΩ	750-83-R1KΩ	750-81-R1KΩ
1.5KΩ ±2%	750-63-R1.5KΩ	750-61-R1.5KΩ	750-83-R1.5KΩ	750-81-R1.5KΩ
2KΩ ±2%	750-63-R2KΩ	750-61-R2KΩ	750-83-R2KΩ	750-81-R2KΩ
2.2KΩ ±2%	750-63-R2.2KΩ	750-61-R2.2KΩ	750-83-R2.2KΩ	750-81-R2.2KΩ
3.3KΩ ±2%	750-63-R3.3KΩ	750-61-R3.3KΩ	750-83-R3.3KΩ	750-81-R3.3KΩ
4.7KΩ ±2%	750-63-R4.7KΩ	750-61-R4.7KΩ	750-83-R4.7KΩ	750-81-R4.7KΩ
6.8KΩ ±2%	750-63-R6.8KΩ	750-61-R6.8KΩ	750-83-R6.8KΩ	750-81-R6.8KΩ
10KΩ ±2%	750-63-R10KΩ	750-61-R10KΩ	750-83-R10KΩ	750-81-R10KΩ
15KΩ ±2%	750-63-R15KΩ	750-61-R15KΩ	750-83-R15KΩ	750-81-R15KΩ
22KΩ ±2%	750-63-R22KΩ	750-61-R22KΩ	750-83-R22KΩ	750-81-R22KΩ
33KΩ ±2%	750-63-R33KΩ	750-61-R33KΩ	750-83-R33KΩ	750-81-R33KΩ
47KΩ ±2%	750-63-R47KΩ	750-61-R47KΩ	750-83-R47KΩ	750-81-R47KΩ
68KΩ ±2%	750-63-R68KΩ	750-61-R68KΩ	750-83-R68KΩ	750-81-R68KΩ
100KΩ ±2%	750-63-R100KΩ	750-61-R100KΩ	750-83-R100KΩ	750-81-R100KΩ
150KΩ ±2%	750-63-R150KΩ	750-61-R150KΩ	750-83-R150KΩ	750-81-R150KΩ
220KΩ ±2%	750-63-R220KΩ	750-61-R220KΩ	750-83-R220KΩ	750-81-R220KΩ
470KΩ ±2%	750-63-R470KΩ	750-61-R470KΩ	750-83-R470KΩ	750-81-R470KΩ

*NOTE: Additional resistance values are constantly being added. Please contact your local CTS Industrial Distributor to check availability of values not shown above.

ORDERING INFORMATION: Place orders using the following address: CTS OF BERNE, INC., 406E Parr Road, Berne, Indiana 46711 • Call and ask for John Henry at (219) 589-3111 • TWX 810-323-1580



SERIES "200" WIRE WOUND RESISTORS

Quality Products Since 1953

24/48 HRS. SPECIAL HANDLING SERVICE

RESISTANCE RANGE (Ω): .01 to 10M
Accuracy (25°C): 1% to 25 ppm/°C
Stability: 30 ppm or better
Matching: To 5 ppm

TEMPERATURE COEFFICIENT:

Standard: 5 ppm/°C
To Order: 1-6000 ppm/°C
Matching: To ½ ppm/°C

EXTERNAL TEMPERATURE: -55°C thru 125°C

IMPREGNATION: Epoxy seal

TYPICAL OEM PRICES IN \$

10 Ω -10K Ω — 1/10W-1W — CAW TERMINALS

	1%	.1%	.05%	.01%	.0025%
1 each	\$2.50	\$3.10	\$3.50	\$6.00	\$12.00
10-25	1.30	1.80	2.00	3.30	5.50
100-249	.95	1.25	1.40	2.40	3.90
1000-2499	.80	.95	1.00	1.70	3.10

Over 10K add \$.30/100K

TABLE 1

WATTS vs. DIMENSIONS

Watts (125°C)	Body Style*	Size (Inches)	
		Dia. (D)	Length (L)
5	219-20	.875	4 13/16
3	220	.875	2 13/16
2	219	.875	2 3/16
1 1/4	218	.687	1 3/4
1	221	.875	1 1/16
	217	.520	1 1/32
3/4	216	.687	2 3/32
	215	.532	3/16
1/2	294	.375	1
	293	.375	3/4
1/4	276	.260	3/4
	287	.312	1 1/32
1/8	275	.260	1 1/32
	263	.187	2 1/32
1/10	261	.187	1 1/32
1/15	251	.135	3/16

TABLE 2

TERMINAL STYLES

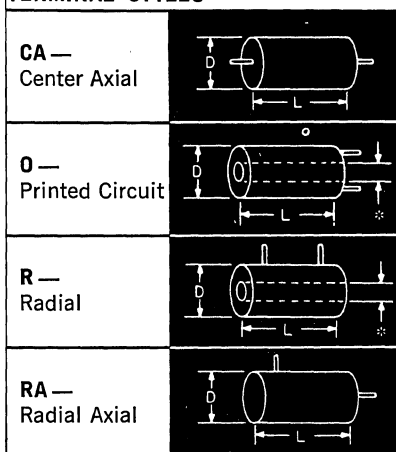


TABLE 3

TERMINAL TYPES

"L" — Lugs (tinned copper .016" thick x 3/32" wide x 5/16" long, measured from resistor axis).	
"T" — Flexible Leads (#20 x 2" long, insulated, stranded, tinned copper wire).	
"W" — Solid Leads (#22 or #20 x 1.5" long, tinned copper wire).	

MODEL DESIGNATION

Table #1
BODY
STYLE

Table #2
TERMINAL
STYLE

Table #3
TERMINAL
TYPE

EXAMPLE: 215 CAW designates 1/2 watt resistor provided with center-axial wire lead terminals.

For further information on "200" Resistors, request Engineering Bulletin #C-72 or call Alyce Powers.

OTHER RESISTOR PRODUCTS

MINIATURE POWER RESISTORS

Axial lead, silicone coated
.01-250 K Range
.4%-0.5% Tolerance
20 ppm/°C max. Temperature Coefficient

TRIMMER RESISTORS

(.01% resolution)

CURRENT SHUNTS RESISTOR NETWORKS

4 Terminal Resistors

EPOXY-CAST POTTING CUPS, CASES, HEADERS & BOBBINS

New manufacturing process for 1 — 10M quantity at competitive prices.
Any wanted Case or Header size — 24 hours delivery — No tool charges.

CUSTOMER DESIGN OPTIONS

DIMENSIONS: Any size specified by you

- Rectangular Cups: Width, length and height, 1/8" to 20"
- Round Cups: OD and height, 1/8" to 6"

MATERIAL: G10 Epoxy or XP Phenolic

WALL THICKNESS: .015", .020", .031", .046", .062", .093", .125"

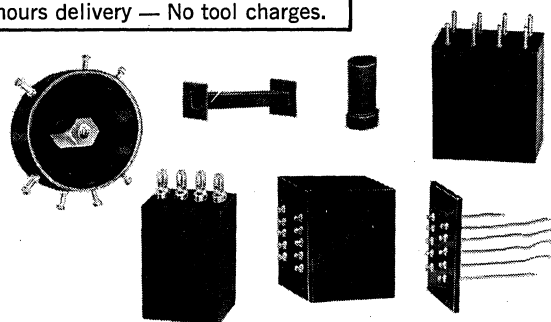
DIMENSIONAL TOLERANCE: $\pm .015"$, $\pm .010"$, $\pm .005"$

FINISH: Regular or fine (seams are concealed)

COLOR: Black or natural

SECONDARY OPERATIONS: Holes, slots, terminals, inserts

DELIVERY: 3 weeks regular. 24 hours — 1 week — at premium



For further information on Cases, request Engineering Bulletin #E-97 or call Alyce Powers.

CONSOLIDATED RESISTANCE COMPANY OF AMERICA, INC.

CONSOLIDATED RESISTANCE BUILDING

222 LAKE AVENUE • YONKERS, NEW YORK 10701 • TELEPHONE (914) YONkers 3-5900

CADDOCK

HIGH PERFORMANCE FILM RESISTORS

High Performance Power Film Resistors

Micronox* Resistance Films Provide Higher Power Ratings and Higher Operating Temperatures

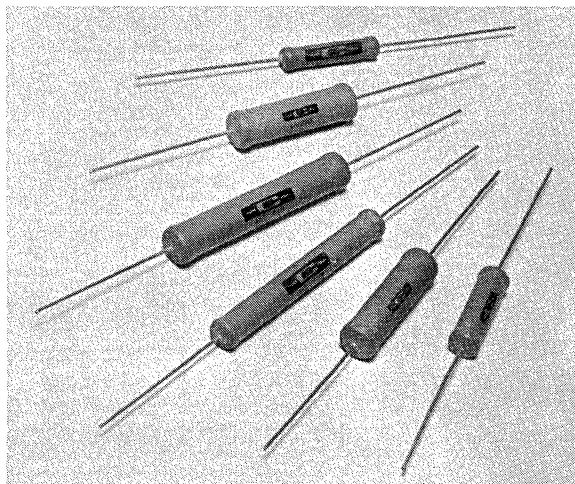
In the 12 years since Caddock Electronics first introduced Micronox* resistance films, the resistors produced with this advanced material have been providing electronic engineers with this long-sought combination of high performance advantages:

- Higher power ratings.
- Higher operating temperatures.
- Improved temperature characteristics.
- Exceptional stability.

The unique structure of Micronox* resistance films makes them relatively insensitive to high ambient temperatures and thermal shock. By firing these complex oxide films onto solid ceramic substrates, Caddock resistors achieve the higher stability that permits higher power densities and higher internal operating temperatures.

As a result, many types of Caddock resistors are rated for continuous operation at +275°C!

And Micronox* resistance films also provide a greatly extended resistance range that increases 'critical' resistance values up to 10 times higher than other types of power resistors.



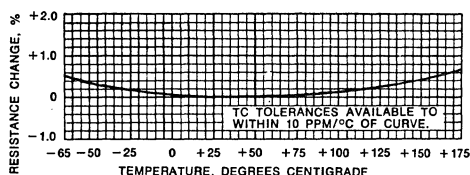
This higher performance has provided a means for immediately up-grading the specifications of many existing electronic circuits and systems, and has been instrumental in reducing the size, complexity and cost of newly developed electronic equipment.

Improved Temperature Characteristics, too

The curved temperature coefficient of Micronox* resistance films provides two important advantages:

First, because the shape of the curve is carefully controlled, the 'flat' section—that portion of the curve on each side of the point where the temperature coefficient is 'zero'—can be selected to provide minimum temperature effects over a wide range of temperature.

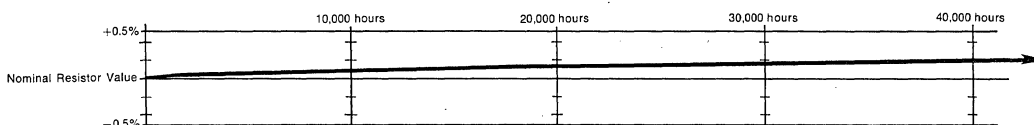
Second, because Micronox* resistance films are very stable, the "TC" of sets of resistors can be carefully matched for accurate temperature 'tracking.' On special order, this ratio 'tracking' can be held as close at 2 PPM/°C!



These temperature characteristics are a great advantage in all types of divider and reference circuits where precise resistance ratios are the primary source of equipment accuracy. Many precision instruments and scientific measurement systems now make use of matched sets of Caddock resistors to improve their overall performance specifications.

Outstanding Long-Term Stability

Annual load-life stability tests conducted on various types of Caddock resistors have demonstrated typical stability within 0.1% per 1000 hours and extended life stability of 0.01% per 1000 hours.



And in an extended load-life stability test that has now been running continuously for over 5 years—past the 50,000 hour mark—Caddock Type MP Power Film Resistors have achieved extended life stability better than 0.02% per 1000 hours!

This exceptional stability in combination with the other performance advantages of these advanced resistors is the reason why Caddock High Performance Film Resistors are the first choice in today's most demanding applications.

High Performance Power Film Resistors

CADDOCK

HIGH PERFORMANCE FILM RESISTORS

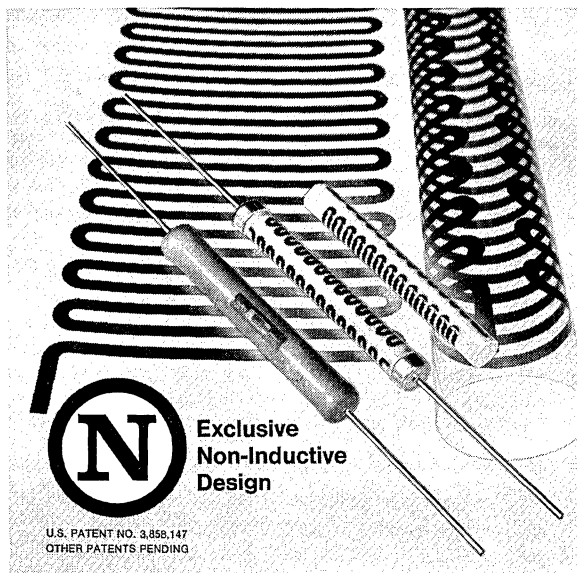
Non-Inductive Performance

When the lowest levels of inductance are required, Caddock High Performance Film Resistors can be specified with our Exclusive Non-Inductive Design. This special serpentine pattern provides for neighboring lines to carry currents in opposite directions, thereby achieving maximum cancellation of flux fields over the entire length of the resistor.

The result is a truly non-inductive resistor that is about as inductive as a straight piece of wire the length of the resistor or in the basic Micronox* resistance film, settling times and minimum distortion in all types of high frequency circuits.

And because this unique, patented design can be included without any changes in either the shape or size of the resistor or in the basic Micronox* resistance film, there's no derating of any performance advantages when you specify Caddock's Exclusive Non-Inductive Design!

In high power applications, for example, the Type MS Power Film Resistor with non-inductive performance can increase both the maximum resistance range and the maximum voltage ratings up to 10 times! Similar improvements available in other types of Caddock resistors can reduce both the size and the number of resistors required to meet circuit requirements and still maintain the superior stability and reliability that are an integral part of every Caddock High Performance Film Resistor.



*Micronox is a registered trademark of Caddock Electronics, Inc.

Index to Caddock High Performance Film Resistors in EEM:

Here is an index to the many types of High Performance Film Resistors now available from Caddock Electronics:

Type MS and MR — Precision Power Film Resistors.....	see pages 2•1430 & 2•1431
Type ML and MM — Precision Film Resistors.....	see page 2•1432
Type MK — Non-Inductive Film Resistor in a Rectangular Case	see page 2•1433
Type MG and MH — Precision High-Voltage Resistors.....	see pages 2•1434 & 2•1435
Including Model MH 7•11 Shielded Resistor	
Type MV — Low-R Power Film Resistors.....	see page 2•1436
Type MP — Chassis Mounted Power Film Resistors.....	see page 2•1437
Type MC — Precision Chip Resistors.....	see pages 2•1438 & 2•1439
Custom Resistive Networks.....	see page 2•1440
Precision Resistor Networks in SIP and DIP Packages	see page 2•1441
Multi-Megohm Resistors	see page 2•1442

Caddock also provides complete test results on the Annual Reliability and Qualification Tests that are conducted to verify performance to applicable government specifications. These reports are described in more detail on page 2•1443 and are available on request.

For complete information and technical assistance in the selection of any type of Caddock High Performance Film Resistors, please write or call to our main office in Riverside, California. We can often provide resistors for evaluation in 10 days or less, and production quantities of any model and type of resistors are always delivered on schedule.

CADDOCK

ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507

PHONE: (714) 683-5361 • TWX: 910-332-6108

CADDOCK

HIGH PERFORMANCE FILM RESISTORS

Type MS & MR Power Film Resistors

Here are the power film resistors that overcome the design limitations of wire-wound resistors! Caddock Power Film Resistors provide power ratings to 12.5 watts at 6000 volts in a single axial lead resistor. By extending both the resistance range and maximum voltage ratings, Type MS Power Film Resistors simplify circuit design and reduce equipment complexity and cost.

All These Features in One Resistor

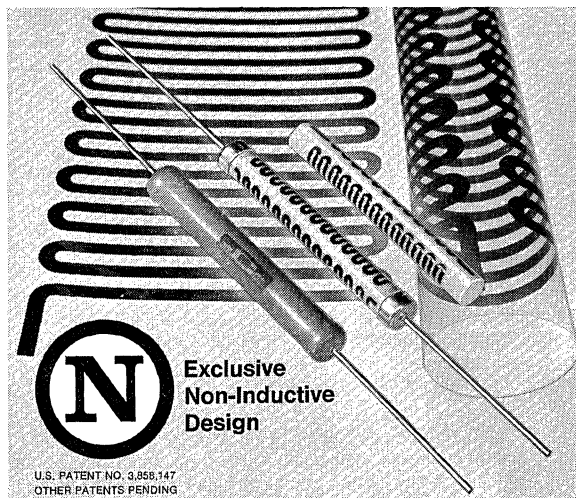
- Full power and voltage ratings, without derating —
— for non-inductive performance
— for high resistance values that extend the critical resistance value up to 10 times.
- Higher voltage ratings without the limitations of minimum wire size and spacing.
- Excellent long-term stability.
Tests demonstrate typical stability of 0.05% per 1000 hours over extended life.

MICRONOX Resistance Films

Type MS performance begins with Micronox resistance films, the basic element in every Caddock resistor. Produced exclusively by Caddock Electronics, these proven complex oxide films have been used reliably for 12 years in Caddock's precision power resistor products.

Micronox resistance films are fired directly onto a ceramic core, in air, at 1400°F. These resistance films have demonstrated outstanding stability when exposed to a high ambient temperature, thermal shock and high power densities.

This totally new approach to precision power resistors opens new design possibilities because of the wider resistance range, precise temperature characteristics, and higher temperature and power handling capability.



There's no derating of performance when you specify Caddock's Exclusive Non-Inductive Design.

When non-inductive performance is specified, we produce these power film resistors with a serpentine resistive pattern that provides for neighboring lines to carry currents in opposite directions, thereby achieving maximum cancellation of flux fields over the entire length of the resistor.

The result is a truly non-inductive resistor that is about as inductive as a straight piece of wire the length of the resistor body. This efficient design means faster settling times and minimum distortion in all types of high frequency circuits.

Type MS Power Film Resistors are produced under carefully controlled manufacturing and test procedures.

Manufacturing Control

Type MS Resistors are produced under strict manufacturing controls with processes which include power conditioning, overvoltage conditioning and maximum temperature conditioning.

Quality Control

Type MS Resistors receive quality surveillance which reaches from incoming raw materials to your packaged resistors in the shipping area. And our QC system has been approved for conformance to the requirements of NASA NPC200-3 and MIL-I-45208 in many recent surveys.

Reliability Verification

Type MS Resistors are included in the Caddock Reliability Testing Program. Conformance to specification parameters including Extended Life, Shock, Vibration and Humidity are verified on a periodic basis. Data from MS resistors can be compared by similarity to other Caddock resistor types, since Type ML, MM, MS, MP, MG, MH and MK represent an identical combination of materials — aluminum oxide substrate, Micronox resistance film and silicone insulating coating.

*Micronox is a registered trademark of Caddock Electronics, Inc.

Type MS & MR Power Film Resistors

CADDOCK

HIGH PERFORMANCE FILM RESISTORS

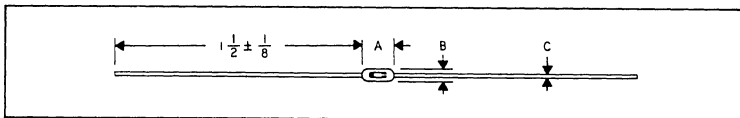
Type MS High Performance Power Film Resistors have a proven performance history in industrial, computer, military and space applications. This unique line now includes higher power ratings—up to 15 watts—and resistance values to 30 Megohms.

These exceptional resistors also provide outstanding extended life stability. In annual reliability tests where 2000 hour load-life stability data has been established, Type MS Power Film Resistors have demonstrated typical stability well within 0.1% per 1000 hours and extended life stability of 0.05% per 1000 hours.

Temperature coefficients are also low, with the standard TC of 50 PPM/°C available in all models of the Type MS Power Film Resistor. They can also be supplied on special order in matched resistor sets that provide ratio tracking with varying temperature to within 2 PPM/°C.

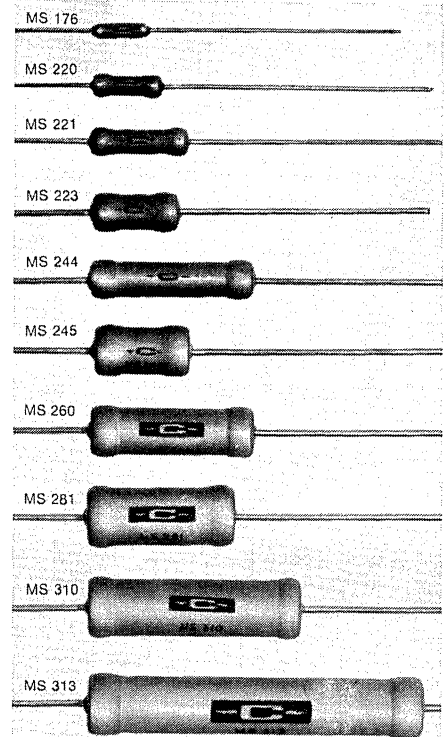
All of the Type MS Power Film Resistors are constructed with Micronox* resistance films bonded to a high strength solid ceramic core. Nickel alloy end caps and gold plated dumet axial leads complete the assembly. Encapsulation is provided by a silicone conformal coating.

Non-inductive construction is available in most models. Specify by adding "N" suffix to Model Number.



Model No.	Wattage	Max. Voltage	Oper. Temp. (Max.)	Dielect. Str'gth	TC ppm/°C	Resistance		Dimensions			Encapsulation	Leadwire
						Min.	Max.	A	B	C		
MR 129	.25	200	275°C	500	150	10Ω	500 K	.188 ±.020	.070 ±.015	.020 ±.002	Silicone Conformal	Nickel
MR 154	.40	300	275°C	750	150	10Ω	1 Meg	.250 ±.020	.094 ±.015	.025 ±.002	Silicone Conformal	Nickel
MR 178	.60	500	275°C	750	150	20Ω	3 Meg	.313 ±.020	.094 ±.015	.025 ±.002	Silicone Conformal	Nickel
MS 126	.25	200	275°C	500	50	10Ω	1 Meg	.188 ±.020	.070 ±.015	.020 ±.002	Silicone Conformal	Gold Plated Dumet
MS 150	.5	—	275°C	500	50	10Ω	2 K	.188 ±.020	.070 ±.015	.020 ±.002	Silicone Conformal	Gold Plated Dumet
MS 151	.5	300	275°C	750	50	10Ω	2 Meg	.250 ±.020	.094 ±.015	.025 ±.002	Silicone Conformal	Gold Plated Dumet
MS 175	.75	—	275°C	750	50	10Ω	2 K	.250 ±.020	.094 ±.015	.025 ±.002	Silicone Conformal	Gold Plated Dumet
MS 176	.75	500	275°C	750	50	20Ω	5 Meg	.313 ±.020	.094 ±.015	.025 ±.002	Silicone Conformal	Gold Plated Dumet
MS 210	1.0	—	275°C	750	50	20Ω	3 K	.313 ±.020	.094 ±.015	.025 ±.002	Silicone Conformal	Gold Plated Dumet
MS 220	2.0	1000	275°C	800	50	20Ω	10 Meg	.400 ±.060	.140 ±.030	.025 ±.002	Silicone Conformal	Gold Plated Dumet
MS 221	3.0	1000	275°C	800	50	30Ω	10 Meg	.575 ±.050	.165 ±.030	.030 ±.002	Silicone Conformal	Gold Plated Dumet
MS 223	3.0	800	275°C	1000	50	10Ω	4 Meg	.480 ±.060	.230 ±.030	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MS 244	4.0	2000	275°C	1000	50	30Ω	15 Meg	.950 ±.060	.230 ±.030	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MS 245	4.0	800	275°C	1000	50	10Ω	6 Meg	.570 ±.060	.300 ±.030	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MS 260	6.0	2000	275°C	1000	50	20Ω	15 Meg	.970 ±.060	.300 ±.030	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MS 281	8.0	2000	275°C	1000	50	10Ω	8 Meg	.910 ±.060	.350 ±.040	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MS 310	10.0	4500	275°C	1000	50	30Ω	20 Meg	1.25 ±.070	.350 ±.040	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MS 313	12.5	6000	275°C	1000	50	50Ω	30 Meg	2.00 ±.080	.350 ±.040	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MS 315	15.0	—	275°C	1000	50	50Ω	1 Meg	2.00 ±.080	.350 ±.040	.040 ±.002	Silicone Conformal	Gold Plated Dumet

*Temperature Coefficient: Referenced to 25°C, ΔR taken at -15°C and +105°C



SPECIFICATIONS

Resistance Tolerance: ±1% (tolerances to .1% on special order).

Insulation Resistance: 100 megohms, minimum.

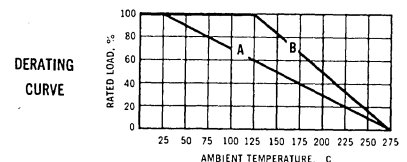
Overload: 5 times rated power for 5 seconds, R shift .5% max., or .5 ohms max., whichever is greater.

Overvoltage: 1.5 times max. voltage for 5 seconds, R shift .5% max., or .5 ohms max., whichever is greater.

Thermal Shock: MIL-STD-202, method 107, cond. C, R shift .5% max., or .5 ohms max., whichever is greater.

Moisture Resistance: MIL-STD-202, method 106, R shift .5% max., or .5 ohms max., whichever is greater.

Loadlife: 1000 hours at rated power, R shift .5% max., or .5 ohms max., whichever is greater.



A—all MS models except MS126, MS151, MS176
B—all MR models, and MS126, MS151, MS176

CADDOCK

ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507

PHONE: (714) 683-5361 • TWX: 910-332-6108

CADDOCK

HIGH PERFORMANCE FILM RESISTORS

Type ML & MM Precision Film Resistors

Type ML and MM resistors have a proven performance history in industrial, computer, military and space applications. With power ratings up to 3 watts and resistance values to 15 megohms, these outstanding resistors are ideal for applications requiring tolerances as close as 0.1% and extended life stability of 0.1% per 1000 hours.

The Type MM Precision Film Resistors provide a maximum operating temperature range of +275°C and both the Type ML and the Type MM have temperature coefficients of only 50 PPM/°C over the range from -15°C to +105°C.



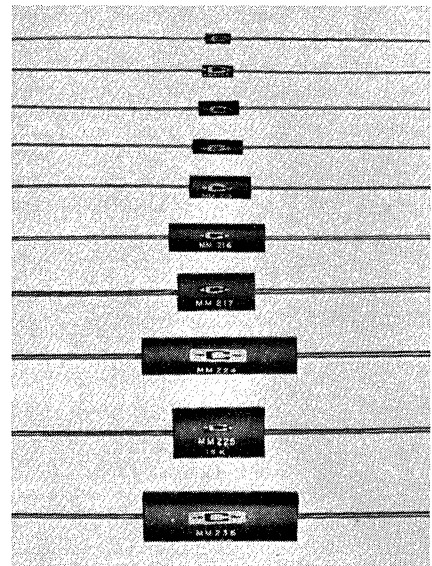
Construction includes Micronox* resistance films fired onto a high strength solid ceramic core. End cap construction and a molded case completes the resistor assembly and provides increased resistance to abrasion and solvents.

Caddock's Exclusive Non-Inductive Performance can also be specified for any of these resistors by adding the "N" suffix to the model number.

Model No.	Wattage	Max. Voltage	Oper. Temp. (Max.)	Dielect. Str'gth	TC ppm/°C	Resistance		Dimensions				Encapsulation	Leadwire
						Min.	Max.	A	B	C	D		
ML 103	.06	—	175°C	300	50	10Ω	250 K	.110 ±.005	.045 ±.005	.016 ±.001	1.00 ±.12	Transfer Molded Type	Gold Plated Dumet
ML 104	.08	200	175°C	400	50	50Ω	300 K	.160 ±.010	.065 ±.010	.016 ±.002	1.50 ±.12	Transfer Molded Type	Gold Plated Dumet
ML 114	.15	200	175°C	500	50	50Ω	500 K	.188 ±.020	.070 ±.015	.020 ±.002	1.50 ±.12	Transfer Molded Type	Gold Plated Dumet
ML 124	.25	300	175°C	750	50	50Ω	600 K	.250 ±.020	.094 ±.006	.025 ±.002	1.50 ±.12	Transfer Molded Type	Gold Plated Dumet
ML 131	.4	500	175°C	750	50	50Ω	1 Meg	.313 ±.020	.094 ±.006	.025 ±.002	1.50 ±.12	Transfer Molded Type	Gold Plated Dumet
ML 181	.6	600	175°C	750	50	50Ω	5 Meg	.400 ±.020	.150 ±.010	.025 ±.002	1.50 ±.12	Transfer Molded Type	Gold Plated Dumet
ML 212	1.0	1000	175°C	1000	50	30Ω	10 Meg	.625 ±.030	.190 ±.020	.030 ±.002	1.50 ±.12	Transfer Molded Type	Gold Plated Dumet
ML 213	1.0	800	175°C	1500	50	10Ω	4 Meg	.500 ±.030	.250 ±.020	.040 ±.002	1.50 ±.12	Transfer Molded Type	Gold Plated Dumet
ML 218	1.25	2000	175°C	1500	50	30Ω	15 Meg	1.00 ±.030	.250 ±.020	.040 ±.002	1.50 ±.12	Transfer Molded Type	Gold Plated Dumet
ML 219	1.25	800	175°C	2000	50	10Ω	6 Meg	.600 ±.030	.330 ±.020	.040 ±.002	1.50 ±.12	Transfer Molded Type	Gold Plated Dumet
ML 226	2.0	2000	175°C	2000	50	20Ω	15 Meg	1.00 ±.030	.330 ±.020	.040 ±.002	1.50 ±.12	Transfer Molded Type	Gold Plated Dumet
MM 112	.12	200	275°C	400	50	10Ω	500 K	.160 ±.010	.065 ±.010	.016 ±.002	1.50 ±.12	Black Molded Type	Gold Plated Dumet
MM 125	.25	200	275°C	500	50	10Ω	1 Meg	.188 ±.020	.070 ±.015	.020 ±.002	1.50 ±.12	Black Molded Type	Gold Plated Dumet
MM 152	.4	300	275°C	750	50	10Ω	2 Meg	.250 ±.020	.094 ±.006	.025 ±.002	1.50 ±.12	Black Molded Type	Gold Plated Dumet
MM 177	.6	500	275°C	750	50	20Ω	5 Meg	.313 ±.020	.094 ±.006	.025 ±.002	1.50 ±.12	Black Molded Type	Gold Plated Dumet
MM 215	1.0	800	275°C	1000	50	10Ω	10 Meg	.400 ±.020	.150 ±.010	.025 ±.002	1.50 ±.12	Black Molded Type	Gold Plated Dumet
MM 216	1.5	1000	275°C	1000	50	30Ω	10 Meg	.625 ±.030	.190 ±.020	.030 ±.002	1.50 ±.12	Black Molded Type	Gold Plated Dumet
MM 217	1.5	800	275°C	1500	50	10Ω	4 Meg	.500 ±.030	.250 ±.020	.040 ±.002	1.50 ±.12	Black Molded Type	Gold Plated Dumet
MM 224	2.0	2000	275°C	1500	50	30Ω	15 Meg	1.00 ±.030	.250 ±.020	.040 ±.002	1.50 ±.12	Black Molded Type	Gold Plated Dumet
MM 225	2.0	800	275°C	2000	50	10Ω	6 Meg	.600 ±.030	.330 ±.020	.040 ±.002	1.50 ±.12	Black Molded Type	Gold Plated Dumet
MM 236	3.0	2000	275°C	2000	50	20Ω	15 Meg	1.00 ±.030	.330 ±.020	.040 ±.002	1.50 ±.12	Black Molded Type	Gold Plated Dumet

*Temperature Coefficient: Referenced to 25°C, ΔR taken at -15°C and +105°C

*Micronox is a registered trademark of Caddock Electronics, Inc.



SPECIFICATIONS

Resistance Tolerance: ±1% (tolerances to .1% on special order).

Insulation Resistance: 100 megohms, minimum.

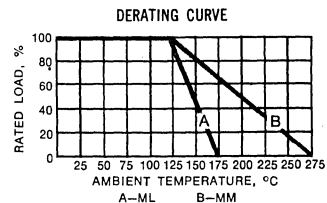
Overload: 5 times rated power for 5 seconds, R shift .5% max., or .5 ohms max., whichever is greater.

Overvoltage: 1.5 times max. voltage for .5 seconds, R shift .5% max., or .5 ohms max., whichever is greater.

Thermal Shock: MIL-STD-202, method 107, cond. B, R shift .2% max., or .5 ohms max., whichever is greater.

Moisture Resistance: MIL-STD-202, method 106, R shift .5% max., or .5 ohms max., whichever is greater.

Loadlife: 1000 hours at rated power, R shift .5% max., or .5 ohms, whichever is greater.



CADDOCK

ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507

PHONE: (714) 683-5361 • TWX: 910-332-6108

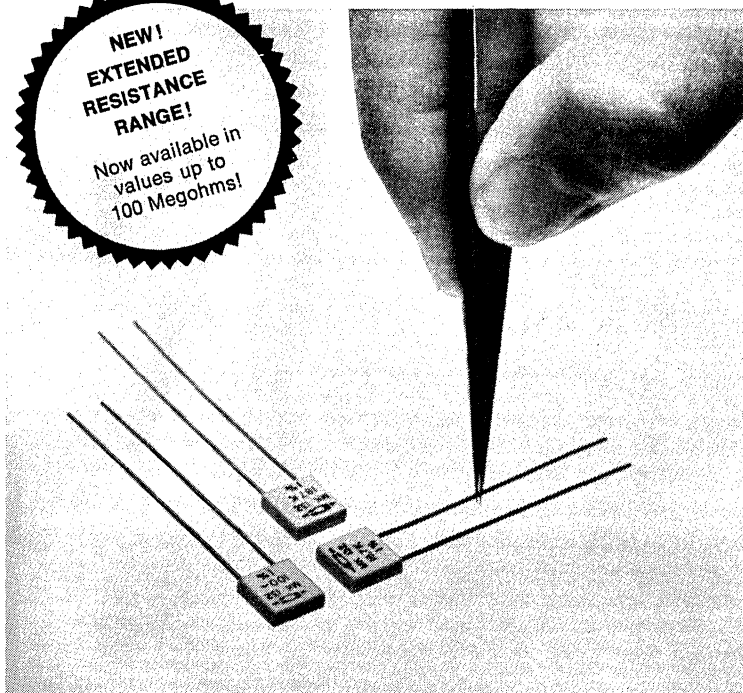
Low Cost Non-Inductive Precision Film Resistor in Rectangular Case

CADDOCK

HIGH PERFORMANCE FILM RESISTORS

**NEW!
EXTENDED
RESISTANCE
RANGE!**

Now available in
values up to
100 Megohms!



Developed as a low cost precision resistor for high density packaging in large volume printed circuit applications, Type MK Precision Film Resistors are now available in values as high as 100 Megohms!

Constructed with Caddock Micronox* resistance films fired onto a solid ceramic substrate, the Type MK Precision Film Resistors combine all of these outstanding advantages:

- Power Rating .75 watts at 125°C.
- Resistance Tolerance $\pm 1\%$ standard, to $\pm 0.1\%$ on special order.
- Operating Temperature -55°C to $+175^\circ\text{C}$.
- Temperature Coefficient 50 PPM/ $^\circ\text{C}$ to 10 Megohms, 80 PPM/ $^\circ\text{C}$ to 100 Megohms, referenced to 25°C with the ΔR taken at -15°C and $+105^\circ\text{C}$.
- Extended Life Stability Better than 0.05% per 1000 hours.

plus Caddock's Non-Inductive Performance for greater pulse fidelity and wider bandwidths in high frequency circuits!

The case of the Type MK resistors is a standard CK06 rectangular package that is only 0.3 inches square and 0.1 inches thick! The radial leads have a standard spacing of .2 inches and the resistor can be handled by automated assembly equipment.

Because the temperature coefficients of all values of Type MK Precision Film Resistors can be matched for 'tracking' within 40 PPM/ $^\circ\text{C}$, these resistors are finding wide application in compact instrumentation and scientific equipment where resistor precision and stability is vital to the ultimate accuracy of the measurement system.

The construction includes a transfer molded case that meets all requirements of extreme environmental specifications.

*Micronox is a registered trademark of Caddock Electronics, Inc.

SPECIFICATIONS

Resistance Range: 10 ohms to 100 meg
Tolerance: $\pm 1\%$ (Tolerances to $\pm 0.1\%$ on special order)

Wattage: .75 Watt @ 125°C (Derated to 0 @ 175°C)

Max. Working Voltage: 400 Volts

Operating Temperature: -55°C to 175°C

Temperature Coefficient: 50 PPM/ $^\circ\text{C}$ to 10 Megohms, 80 PPM/ $^\circ\text{C}$ to 100 Megohms, referenced to 25°C with the ΔR taken at -15°C and $+105^\circ\text{C}$.

Encapsulation: Transfer Molded

Leadwire Material: Tinned copper

1000 Hour Load Life: R Shift .4% Max. or .2 Ω

Moisture Resistance: R Shift .5% Max. or .2 Ω

Low. Temp. Operation: R Shift .05% Max. or .2 Ω

Temperature Cycling: R Shift .2% Max. or .2 Ω

Short Time Overload: R Shift .15% Max. or .2 Ω

Low Temp. Storage 4 Hour @ -40°C : R Shift .05% Max. or .2 Ω

Soldering: R Shift .03% Max. or .2 Ω

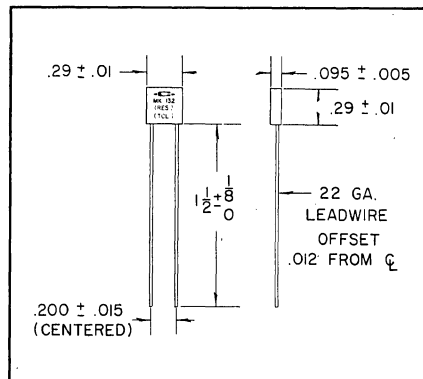
Insulation Resistance: $> 10^{12}$ ohms

Shock: R Shift .05% Max. or .2 Ω

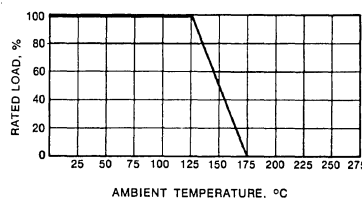
Vibration: R Shift .05% Max. or .2 Ω

Lead Pull 5 lbs.: R Shift .04% Max. or .2 Ω

Marking: Caddock Logo, Model Number, Resistance Value, Tolerance



DERATING CURVE



CADDOCK

ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507

PHONE: (714) 683-5361 • TWX: 910-332-6108

CADDOCK

HIGH PERFORMANCE FILM RESISTORS

Type MG & MH Precision High-Voltage Resistors

Type MG and MH resistors have been proven in years of use in critical applications such as airborne computer, manned space flight, geophysical instruments, medical electronics, etc., where long term reliability in extreme environment is of utmost importance. This line now includes a wide range of sizes with extended resistance range to lower values and higher values.

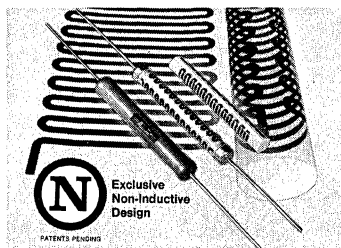
Matched resistor sets are available to your ratio requirements, with ratio TC as close as 2 ppm/°C. These divider sets are widely used in such applications as the control voltage feedback for precision high voltage supplies.

Special High-Voltage and High-Voltage Pulse Applications

All power ratings and maximum working voltage ratings are for continuous duty. Ratings are based on pre-stress voltage levels applied as part of the manufacturing process and provide for stable resistor performance, even with

momentary overloads applied. These resistors, with non-inductive construction, can be factory-conditioned to withstand up to 60% higher maximum working voltage, provided power ratings are not exceeded. (For this higher rating specify -15, example: MG750N-15. Overload and overvoltage ratings do not apply to -15 resistors).

Originally, MG and MH resistors were available only in megohm values, however, in lower resistance values they have found wide use in pulse and current limiting applications where high voltage levels are involved. Pulse levels of several times rated working voltage have been applied as factory pre-stress for special applications. Caddock has facilities to prove many pulse application parameters, and we invite you to submit your specific design problem. Non-inductive construction is especially valuable in pulse applications to minimize problems of localized resistor degradation due to reflected wave and other unusual phenomena associated with instantaneous current situations.



Non-inductive construction available in most models. Specify with N suffix on Model No.

SPECIFICATIONS

Resistance Tolerance: $\pm 1\%$ (tolerances to .1% on special order).

Insulation Resistance: 100 megohms, minimum.

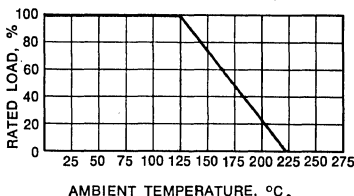
Overvoltage: 1.5 times working voltage for 5 seconds, R shift .8% max.

Thermal Shock: MIL-STD-202, method 107, cond. C, R shift .5% max.

Moisture Resistance: MIL-STD-202, method 106, R shift .8% max.

Loadlife: 1000 hours at rated power, R shift .8% max.

DERATING CURVE



Model No.	Wattage	Max. Continuous Oper. Volt.	Oper. Temp. (Max.)	Dielect. Str'gth	TC ppm/°C†	Resistance		Dimensions			Encapsulation
						Min.	Max.	A	B	C	
MG650	.5	600	225°C	750	80	200Ω	5 Meg	.313 ±.020	.094 ±.015	.025 ±.002	Silicone Conformal
MG660	.6	1,000	225°C	750	80	400Ω	10 Meg	.500 ±.030	.094 ±.015	.025 ±.002	Silicone Conformal
MG680	.8	2,000	225°C	750	80	600Ω	20 Meg	.750 ±.030	.094 ±.015	.025 ±.002	Silicone Conformal
MG710	1.0	4,000	225°C	750	80	800Ω	50 Meg	1.000 ±.040	.094 ±.015	.025 ±.002	Silicone Conformal
MG714	1.0	1,000	225°C	750	80	200Ω	20 Meg	.562 ±.060	.150 ±.030	.032 ±.002	Silicone Conformal
MG715	1.0	2,000	225°C	750	80	400Ω	50 Meg	.750 ±.060	.140 ±.030	.025 ±.002	Silicone Conformal
MG716	1.5	4,000	225°C	750	80	600Ω	75 Meg	1.000 ±.060	.140 ±.030	.025 ±.002	Silicone Conformal
MG720	2.0	6,000	225°C	750	80	1K	150 Meg	1.500 ±.080	.140 ±.030	.025 ±.002	Silicone Conformal
MG721	2.0	4,000	225°C	750	80	200Ω	100 Meg	1.000 ±.050	.240 ±.030	.040 ±.002	Silicone Conformal
MG725	2.5	10,000	225°C	750	80	1.5K	200 Meg	2.000 ±.080	.140 ±.030	.025 ±.002	Silicone Conformal
MG730	3.0	6,000	225°C	1000	80	500Ω	250 Meg	1.500 ±.080	.240 ±.030	.040 ±.002	Silicone Conformal
MG735	3.6	10,000	225°C	1000	80	750Ω	300 Meg	2.000 ±.080	.240 ±.030	.040 ±.002	Silicone Conformal
MG745	5.0	15,000	225°C	1000	80	1K	500 Meg	3.000 ±.100	.240 ±.030	.040 ±.002	Silicone Conformal
MG750	5.0	10,000	225°C	1000	80	400Ω	500 Meg	2.125 ±.060	.315 ±.030	.040 ±.002	Silicone Conformal
MG780	7.5	15,000	225°C	1000	80	600Ω	750 Meg	3.125 ±.060	.315 ±.030	.040 ±.002	Silicone Conformal
MG785	8.0	20,000	225°C	1000	80	800Ω	1000 Meg	4.000 ±.120	.315 ±.030	.040 ±.002	Silicone Conformal
MG810	10.0	25,000	225°C	1000	80	1K	1250 Meg	5.000 ±.120	.315 ±.030	.040 ±.002	Silicone Conformal
MG812	12.5	30,000	225°C	1000	80	1.2K	1500 Meg	6.000 ±.120	.315 ±.030	.040 ±.002	Silicone Conformal
MG815	15.0	30,000	225°C	1000	80	1K	2000 Meg	6.000 ±.120	.350 ±.040	.040 ±.002	Silicone Conformal
MH651	.5	600	225°C	750	80	200Ω	5 Meg	.313 ±.020	.094 ±.006	.025 ±.002	Black Molded
MH661	.6	1,000	225°C	2000	80	400Ω	10 Meg	.500 ±.030	.114 ±.010	.025 ±.002	Black Molded
MH681	.8	2,000	225°C	2000	80	600Ω	20 Meg	.750 ±.030	.114 ±.010	.025 ±.002	Black Molded
MH682	.8	800	225°C	1000	80	200Ω	20 Meg	.400 ±.020	.150 ±.010	.025 ±.002	Black Molded
MH713	1.0	4,000	225°C	2000	80	800Ω	50 Meg	1.000 ±.030	.114 ±.010	.025 ±.002	Black Molded
MH711	1.0	2,000	225°C	2000	80	800Ω	50 Meg	1.200 ±.040	.220 ±.015	.025 ±.002	Black Molded

†Temperature Coefficient: Referenced to 25°C, ΔR taken at -15°C and +105°C

CADDOCK
ELECTRONICS, INCORPORATED

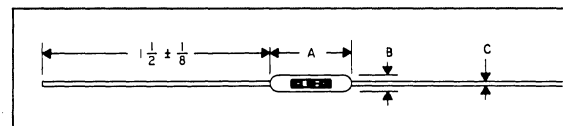
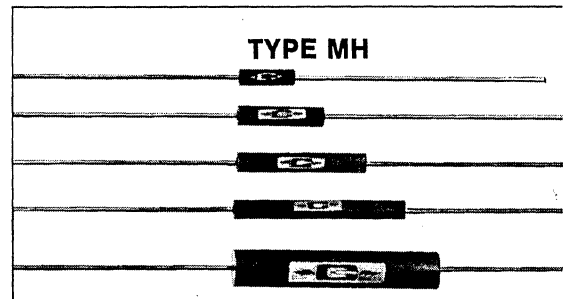
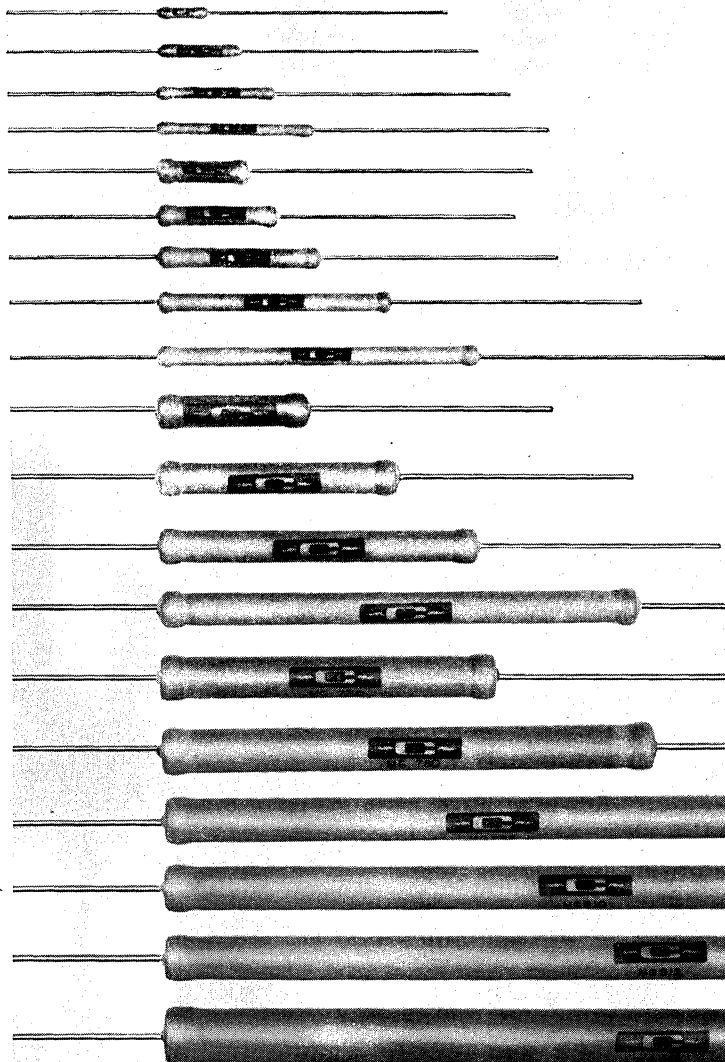
3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507

PHONE: (714) 683-5361 • TWX: 910-332-6108

Type MG & MH Precision High-Voltage Resistors

CADDOCK

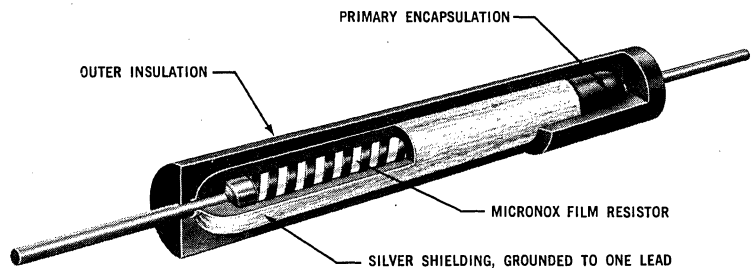
HIGH PERFORMANCE FILM RESISTORS



TYPE MG

Exclusive Shielded Resistor

MODEL MH711, designed for extremely high voltage applications, in very high resistance strings. Unit remains exceptionally stable since shielding prevents film degradation from corona developed in high voltage fields.



CADDOCK

ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507

PHONE: (714) 683-5361 • TWX: 910-332-6108

CADDOCK

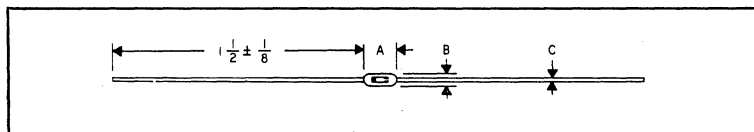
HIGH PERFORMANCE FILM RESISTORS

Type MV Low-R Power Film Resistors

Type MV resistors extend the advantages of Caddock Micronox* resistance films to values as low as 0.5 ohms in a unique non-inductive design. The multiple-path resistance pattern distributes the currents evenly throughout the resistor and reduces the inductance to an absolute minimum.

The exceptional stability of Caddock Micronox* resistors — produced by firing these complex oxide films onto solid ceramic substrates — provides power ratings as high as 10 watts in a compact axial lead configuration that features excellent overload ratings.

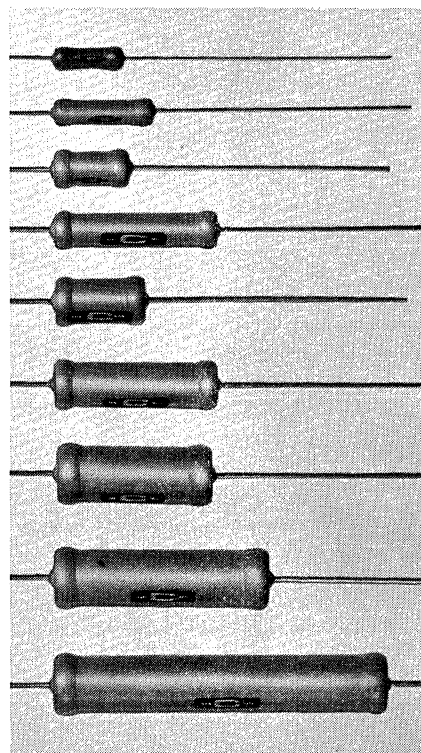
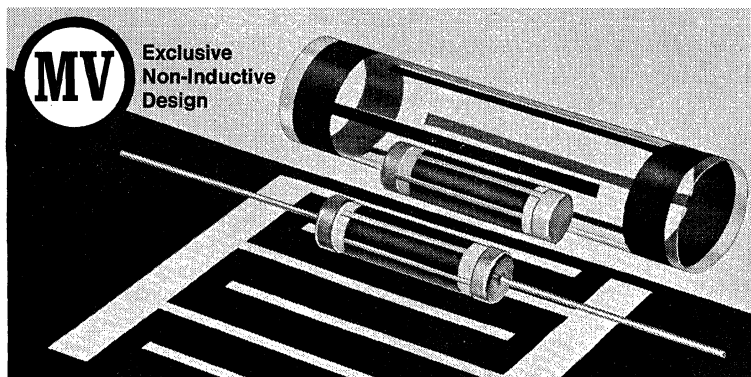
Type MV resistors are ideal for use in high frequency circuits where close resistance tolerances and excellent long-term stability are required.



*Micronox is a registered trademark of Caddock Electronics, Inc.

Model No.	Watt-age	Oper. Temp. (Max.)	Dielect. Str'gth	TC ppm/°C†	Resistance		Dimensions			Encap-sulation	Leadwire
					Min.	Max.	A	B	C		
MV217	1.5	275°C	800	100	5Ω	100Ω	.400 ±.060	.140 ±.030	.025 ±.002	Silicone Conformal	Gold Plated Dumet
MV227	2.0	275°C	800	100	5Ω	100Ω	.575 ±.050	.165 ±.030	.030 ±.002	Silicone Conformal	Gold Plated Dumet
MV228	2.0	275°C	1000	100	3Ω	100Ω	.480 ±.060	.230 ±.030	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MV233	3.0	275°C	1000	100	2Ω	100Ω	.950 ±.060	.230 ±.030	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MV234	3.0	275°C	1000	100	3Ω	100Ω	.570 ±.060	.300 ±.030	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MV251	4.0	275°C	1000	100	1Ω	100Ω	.970 ±.060	.300 ±.030	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MV261	6.0	275°C	1000	100	1Ω	100Ω	.910 ±.060	.350 ±.030	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MV280	8.0	275°C	1000	100	1Ω	100Ω	1.25 ±.070	.350 ±.040	.040 ±.002	Silicone Conformal	Gold Plated Dumet
MV311	10.0	275°C	1000	100	.5Ω	100Ω	2.00 ±.080	.350 ±.040	.040 ±.002	Silicone Conformal	Gold Plated Dumet

†Temperature Coefficient: Referenced to 25°C, ΔR taken at -15°C and +105°C



SPECIFICATIONS

Resistance Tolerance: ±1%.

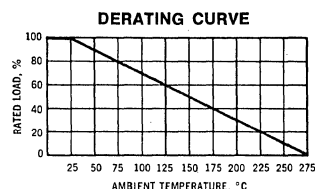
Insulation Resistance: 100 megohms, minimum.

Overload: 5 times rated power for 5 seconds, R shift 1% max.

Thermal Shock: MIL-STD-202, method 107, cond. C, R shift 1% max.

Moisture Resistance: MIL-STD-202, method 106, R shift 1% max.

Loadlife: 1000 hours at rated power, R shift 1% max.



CADDOCK

ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507

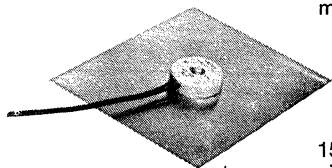
PHONE: (714) 683-5361 • TWX: 910-332-6108

Type MP Chassis Mounted Power Film Resistors

CADDOCK

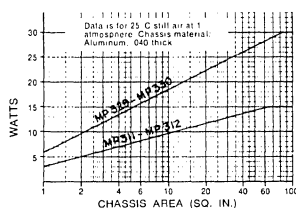
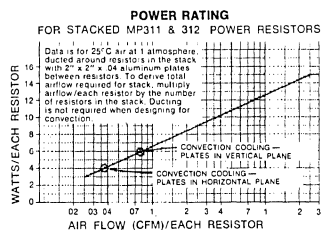
HIGH PERFORMANCE FILM RESISTORS

Type MP Chassis Mounted Power Film Resistors are made with Micronox* resistance films fired onto a ceramic substrate which is thermally bonded to an anodized aluminum base. By mounting this assembly directly to a metal surface for improved heat transfer, these unique resistors provide increased packaging densities in many types of electronic equipment.

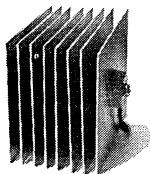
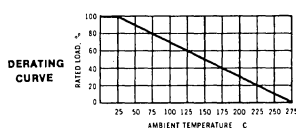


15 and 30 watt ratings are available in two case sizes that permit through-bolt attachment to the chassis or other heat conducting surface. The molded silicone case encapsulates the resistor assembly to meet the requirements of the most stringent environmental specifications.

The outstanding stability of the Type MP Power Film Resistors has been demonstrated in a 4½ year, 40,000 hour program of continuous load-life testing. Extended life stability during these full-power tests has been better than 0.01% per 1000 hours!



These charts of power ratings versus ambient temperature and chassis area show the high power levels that can be achieved with forced air cooling and with convection cooling in either vertical or horizontal orientation.



Stacked Type MP resistor assemblies—constructed by bolting and resistors between aluminum heat dissipating plates—provide a simple means of further improving packaging densities.

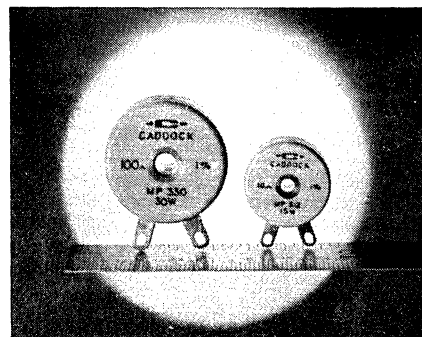
Model No.	Power Rating†	Max. Voltage	Diel. Str.	High Temp. TC‡	Resistance Range		Dimensions				Terminals
					Min.	Max.	A	B	C	D	
MP311	15 Watts	300	600	50	50Ω	200 K	.600	.188	—	.092	12" Min Teflon Leads 26AWG 7x34
MP312	15 Watts	300	600	50	10Ω	200 K	.600	.188	.185	.092	Gold Plated Solder Lugs
MP329	30 Watts	450	1000	50	50Ω	200 K	.850	.250	—	.142	12" Min Teflon Leads 22AWG 7x30
MP330	30 Watts	450	1000	50	10Ω	200 K	.850	.250	.250	.142	Gold Plated Solder Lugs

†Power rating based on chassis mounting — MP311 and MP312 on 6"x4"x2"x.040 aluminum chassis. MP329 and MP330 on 5x7x2x.040 aluminum chassis.

‡TC — 50ppm Referenced to 25°C. ΔR taken at +150°C and +275°C. (Low temp. TC will be nominally —85ppm/°C at —55°C. See typical R-T curve.)

U.S. Patent No's 3,636,493 and 3,649,944 Other patents pending.

*Micronox is a registered trademark of Caddock Electronics, Inc.



SPECIFICATIONS

Resistance Tolerance: $\pm 1\%$ standard (Other tolerances on special order.)

Insulation Resistance: 10,000 Megohms, dry. Method — Mil-R-18546D, para. 4.6.8.

Solderability: Per Mil-R-18546D, para. 3.7, para. 4.6.4.

Terminal Strength: Per Mil-Std-202, Method 211, Cond. A (Pull Test), 5 lbs., and Cond. B (Bend Test). Max. ΔR , .2% or .2Ω, whichever is greater.

Thermal Shock: Per Mil-R-18546D, para. 4.6.9, max. ΔR , .5% or .2Ω, whichever is greater.

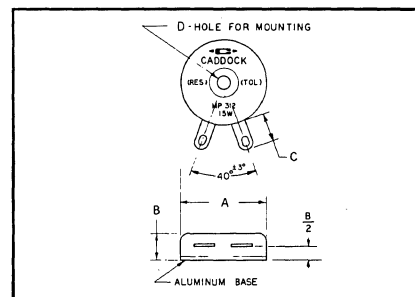
Momentary Overload: 2 times rated power or 1.5 times max. allowable working voltage, whichever gives the lower power, for 5 seconds. Max. ΔR , .5% or .2Ω, whichever is greater.

Moisture Resistance: Mil-Std-202, Method 106B, less steps 7a and 7b, max. ΔR , .5% or .2Ω, whichever is greater.

Life: Per Mil-R-18546D, para. 4.6.12, 1,000 hrs., Max. ΔR , 1% or .2Ω, whichever is greater.

Shock, Medium Impact: 50G, per Mil-Std-202, Method 205, Cond. C.

Vibration, High Frequency: Per Mil-Std-202, Method 204, Cond. B, Max. ΔR , .2% or .2Ω, whichever is greater, through shock and vibration sequence.



CADDOCK

ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507

PHONE: (714) 683-5361 • TWX: 910-332-6108

CADDOCK

HIGH PERFORMANCE FILM RESISTORS

Type MC Precision Chip Resistors and High Resistance Precision Chip Resistors

Caddock introduces the Type MC Precision Chip Resistors — a new and complete line of precision chip resistors that meet the most stringent requirements of all types of hybrid circuits.

The latest advance in Caddock's 12 years of experience in the development and production of high performance film resistors, the Type MC Precision Chip Resistors utilize Micronox* complex oxide resistance films to provide all of these advantages:

- **Extended Resistance Range.**

1 Megohm resistance values are now available in even the smallest of these chips, and the Model MCV Multi-Megohm Chip Resistors include resistance values up to 500 Megohms!

- **Precision Resistance Tolerances.**

The standard resistance tolerance for all models and values is $\pm 1\%$!

- **Higher Operating Temperatures.**

+175°C maximum operating temperature is the standard specification for every model and all Type MC resistors can be operated without derating at +125°C!

- **Lower Temperature Coefficients.**

TCs of 50 PPM/°C and 80 PPM/°C are standard over a 120°C operating temperature range.

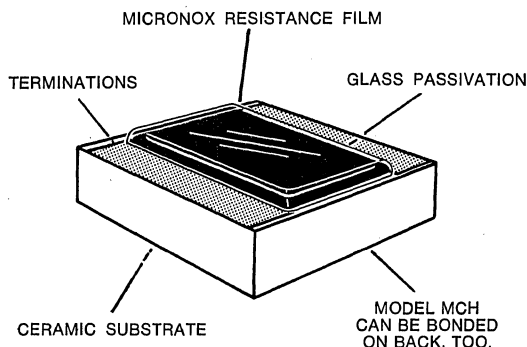
- **Matched Temperature Coefficients.**

TC tracking between any two chip resistors of any type, model and resistance value will stay within 40 PPM/°C over the temperature range from -15°C to +105°C.

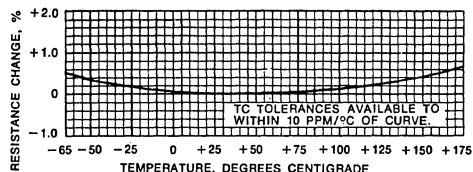
- **Exceptional Stability.**

The high stability of Caddock Micronox* resistance films keeps resistance shifts to a minimum under all thermal and environmental conditions.

There are four basic models to choose from, including chips for wire-bonding, solder reflow and a solderable design with wrap-around tinned terminals.



The typical TC curve shown in this graph illustrates the dish-shaped temperature characteristic of Micronox* resistance films. While the shape of this curve will vary slightly with the resistivity of the film, these resistance films provide a nearly 'zero' TC over a limited temperature range — a feature that can be the source of additional improvements in the stability of many electronic circuits.



For information on price and delivery of both production and evaluation quantities of any of the Type MC Precision Chip Resistors, contact the high performance film resistor specialists at Caddock.

Type MC Precision Chip Resistors are produced under carefully controlled manufacturing and test procedures.

Manufacturing Control.

Type MC Precision Chip Resistors, like all other Caddock High Performance Film Resistors, are produced under strict manufacturing controls with processes which include power conditioning, overvoltage conditioning and maximum temperature conditioning.

Quality Control.

Type MC Resistors receive quality surveillance which reaches from incoming raw materials to your packaged resistors in the shipping area. And our QC system has been approved for conformance to the requirements of NASA NPC200-3 and MIL-I-45208.

*Micronox is a registered trademark of Caddock Electronics, Inc.

CADDOCK
ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507 PHONE: (714) 683-5361 • TWX: 910-332-6108

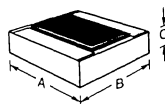
Type MC Precision Chip Resistors and High Resistance Precision Chip Resistors

CADDOCK

HIGH PERFORMANCE FILM RESISTORS

Type MCG and MCH for Wire-Bonding.

- Standard and High Resistance Ranges
- 175°C Maximum Operating Temperatures
- Power Ratings to .25 Watt

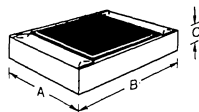


To order this type of chip with an electrically isolated gold backing for die-bonding, specify any of these Model Numbers as Type MCH.

	Model No.	Power Rating	Max. Voltage	Oper. Temp. (Max.)	TC ppm/°C†	Dimensions A ±.005	Dimensions B ±.005	Dimensions C ±.003	Resistance Range Min.	Resistance Range Max.
Standard Resistance Range	MCG 110	.1 W	50	175°C	50	.050	.050	.012	50Ω	40 K
	MCG 120	.2 W	100	175°C	50	.050	.100	.012	100Ω	50 K
	MCG 125	.25 W	150	175°C	50	.075	.150	.012	100Ω	100 K
High Resistance Range	MCG 210	.1 W	50	175°C	80	.050	.050	.012	40 K	1 Meg.
	MCG 220	.2 W	100	175°C	80	.050	.075	.012	50 K	2 Meg.
	MCG 225	.25 W	150	175°C	80	.075	.150	.012	100 K	5 Meg.

Type MCS for Solder Reflow.

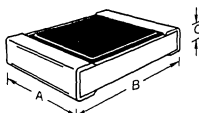
- Standard and High Resistance Ranges
- 175°C Maximum Operating Temperatures
- Power Ratings to .6 Watt
- Working Voltages to 400 Volts



	Model No.	Power Rating	Max. Voltage	Oper. Temp. (Max.)	TC ppm/°C†	Dimensions A ±.005	Dimensions B ±.005	Dimensions C ±.003	Resistance Range Min.	Resistance Range Max.
Standard Resistance Range	MCS 325	.25 W	200	175°C	50	.075	.150	.012	100Ω	100 K
	MCS 330	.3 W	250	175°C	50	.100	.200	.012	100Ω	200 K
	MCS 340	.4 W	250	175°C	50	.150	.200	.027	75Ω	300 K
	MCS 350	.6 W	400	175°C	50	.200	.250	.027	75Ω	500 K
High Resistance Range	MCS 425	.25 W	200	175°C	80	.075	.150	.012	100 K	5 Meg.
	MCS 430	.3 W	250	175°C	80	.100	.200	.012	200 K	20 Meg.
	MCS 440	.4 W	250	175°C	80	.150	.200	.027	30 K	50 Meg.
	MCS 460	.6 W	400	175°C	80	.200	.250	.027	500 K	100 Meg.

Type MCW — Solderable with Wrap-Around Tinned Terminals

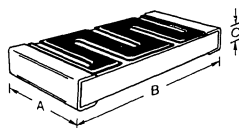
- Standard and High Resistance Ranges
- 175°C Maximum Operating Temperatures
- Power Ratings to .25 Watt



	Model No.	Power Rating	Max. Voltage	Oper. Temp. (Max.)	TC ppm/°C†	Dimensions A ±.005	Dimensions B ±.005	Dimensions C ±.003	Resistance Range Min.	Resistance Range Max.
Standard Resistance Range	MCW 530	.3 W	250	175°C	50	.100	.200	.012	100Ω	200 K
	MCW 540	.4 W	250	175°C	50	.150	.200	.027	75Ω	300 K
	MCW 560	.6 W	400	175°C	50	.200	.250	.027	75Ω	500 K
High Resistance Range	MCW 630	.3 W	250	175°C	80	.100	.200	.012	200 K	20 Meg.
	MCW 640	.4 W	250	175°C	80	.150	.200	.027	30 K	50 Meg.
	MCW 660	.6 W	400	175°C	80	.200	.250	.027	500 K	100 Meg.

Type MCV — Multi-Megohm Chip Resistors

- Resistance Values from 1 Megohm to 500 Megohms!
- Maximum Working Voltages to 2000 Volts!
- Maximum Power Ratings to 1 Watt.
- 175° Maximum Operating Temperature
- Solderable with wrap-around tinned terminations.



	Model No.	Power Rating	Max. Voltage	Oper. Temp. (Max.)	TC ppm/°C†	Dimensions A ±.010	Dimensions B ±.010	Dimensions C ±.005	Resistance Range Min.	Resistance Range Max.
Extended Resistance Range	MCV 770	.75 W	600	175°C	80	.25	.50	.027	1 Meg.	200 Meg.
	MCV 780	.8 W	1000	175°C	80	.25	.75	.027	1 Meg.	250 Meg.
	MCV 790	1.0 W	2000	175°C	80	.25	1.00	.027	1 Meg.	500 Meg.

SPECIFICATIONS

All Type MC Precision Chip Resistors

Resistance Tolerance: ±1% standard. Tolerances to ±0.1% on special order. (Tolerances less than ±1% will have organic passivation.)

Operating Temperature: -55°C to maximum specified temperature.

TC Tracking: 40 PPM/°C maximum between any resistor model and any resistance value. (Ref. 25°C, ΔR taken over range from -15°C and +105°C)

Short Time Overload: 5 times rated power or 1.5 times maximum allowable working voltage, whichever gives the lower power, for 5 seconds. Maximum ΔR .5%.

High Temperature Exposure: R Shift .5% max.*

Resistance to Bonding or Solder Exposure: R Shift .25% max.*

Moisture Resistance: R Shift .5% max.*

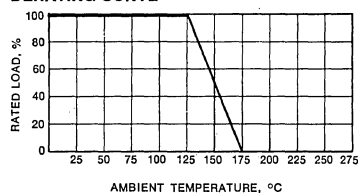
1000 Hour Load Life: R Shift .5% max. when mounted on a heat sink which maintains surface temperature within maximum range.

†Temperature Coefficient: Referenced to 25°C, ΔR taken at -15°C and +105°C.

♦ Dimension does not include thickness of solder deposit.

* Test parameters per applicable portions of Mil-R-55342

DERATING CURVE



CADDOCK

ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507

PHONE: (714) 683-5361 • TWX: 910-332-6108

CADDOCK

HIGH PERFORMANCE FILM RESISTORS

Custom Resistive Devices

For the ultimate in resistor network performance, Caddock produces many types of custom resistive networks with an unsurpassed combination of advantages:

- **High Resistance Ratios**—from 1-to-1 up to 1,000,000-to-1!
- **High Transient Handling Capability**—up to 100 times higher than the rated power level!
- **Extended Resistance Range**—from 1 ohm to 5000 Megohms.
- **Tight Resistance Tolerances**—to 0.05%.
- **Tight Ratio Tolerances**—to 0.025%.
- **Close Ratio Tracking**—to 5 PPM/°C from -15°C to +105°C.
- **Exceptional Resistor Stability**—as close as 0.01% per 1000 hours in extended life.

This combination of advantages in one resistor network often provides a practical — **and immediate** — means for improving the performance and specifications of electronic circuitry and equipment without any changes in the design!

Here are examples of the many high performance custom resistive networks available from Caddock Electronics:

Multimeter and Oscilloscope Input Signal Dividers

Precision voltage dividers with ratios as high as 1,000,000-to-1 are often required for range switching at the input of laboratory instruments. For these applications, Caddock produces single-chip networks with resistance ratios accurate to 0.025% and with the temperature coefficients matched to within 5 PPM/°C over the normal operating temperature range.

R-C Networks

A wide range of capacitance values can be combined with our precision resistors on a single chip. These high stability capacitors may be isolated from the other components on the chip or combined in R-C functions to meet your requirements.

Matched Resistor Sets

Sets of matched resistors with ratios held as close as 0.05% over the range of ratios from 1:1 to 1:100,000 provide solutions to the toughest accuracy problems in voltage dividers, reference networks, feedback networks, current summing networks, and high voltage divider networks. Virtually all of the various types of Caddock Film Resistors can be matched in discrete resistor sets for both tight ratio tolerances and TC tracking — some as tight as 2 PPM/°C over specific temperature ranges — making it practical to select **and intermix** the particular type of resistors needed to meet other important performance requirements.

These matched sets and networks can also be assembled in molded packages or DIP configurations, and in special shapes to meet your design requirements.

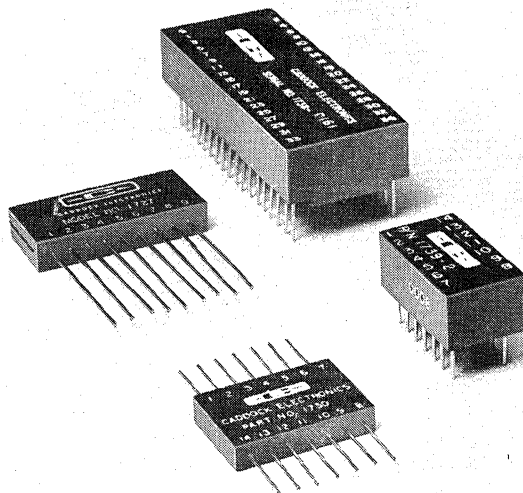
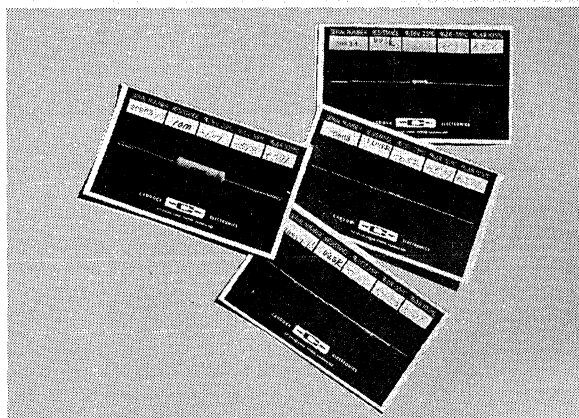
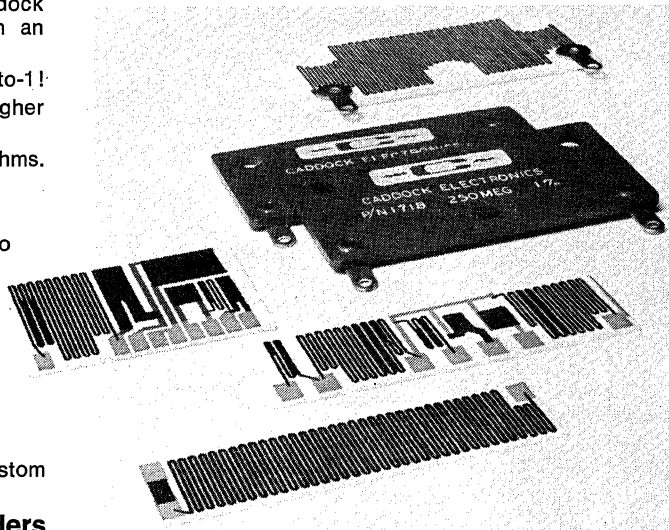
DAC Ladder Networks

Networks with resolution up to 12 binary bits can be produced, and the superior long-term stability of Micronox™ resistance films keeps accuracy higher for longer, more error-free operation of advanced digital systems.

Precision High Voltage Divider Networks

Special packages are available for discrete resistor sets, and flat ceramic substrates provide low profile configurations with integral mounting holes.

TC 'tracking' as close as 2 PPM/°C can be provided, and special encapsulation techniques meet rugged environmental limits.



CADDOCK
ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507

PHONE: (714) 683-5361 • TWX: 910-332-6108

Precision Resistor Networks in DIP and SIP Packages

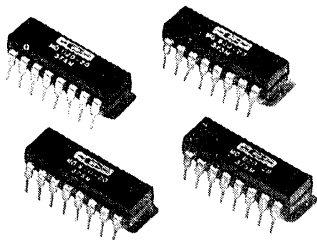
CADDOCK

HIGH PERFORMANCE FILM RESISTORS

The exceptionally high performance of Caddock Micronox* resistance films is now available in many standard DIP and SIP resistor packages that provide a unique combination of advantages:

- Tight Tolerances.
- Tight Resistance Ratios.
- Lower Temperature Coefficients.
- Matched TC Ratios.
- Extended Resistance Range.
- Excellent Transient Handling Capability.
- Outstanding Load-Life Stability.

These advantages make Caddock DIP and SIP Precision Resistor Networks the ideal choice for many high accuracy analog and digital circuits, including —

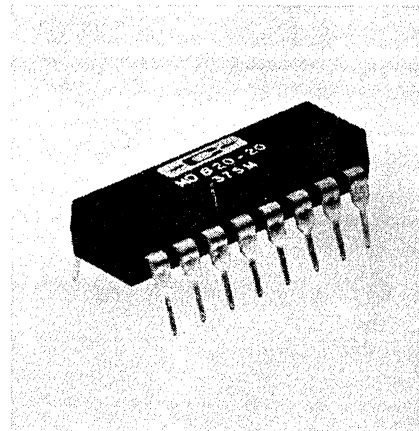
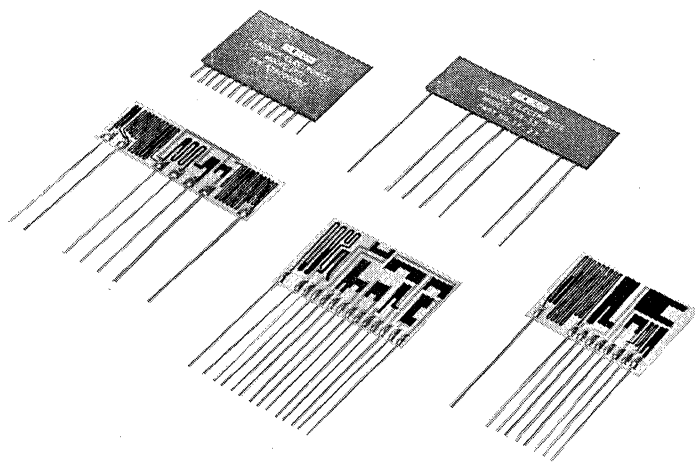


- Precision voltage dividers for multi-range instruments.
- Precision resistor ratios for accurate amplifier gain control.
- Feedback networks for precision power supplies.
- Custom ladder networks for precision D/A and A/D conversion circuits.

The DIP packages are available in all of the standard 14, 16 and 18 pin configurations. SIP packages are available in a wide variety of shapes and sizes to fit the requirements of each application, with standard or custom lead spacings and lengths.

For complete information on the high performance precision resistor network for your application, please call or write directly to the applications engineers at Caddock Electronics.

*Micronox is a registered trademark of Caddock Electronics, Inc.



14, 16 and 18 Pin DIP Packages and Standard and Custom SIP Packages

Resistance Range: 10 ohms to 10 Megohms in standard DIP packages. 1 ohm to 50 Megohms in SIP packages.

Number of Resistors per Package: Up to 36 resistors, depending upon interconnections.

Tolerance: $\pm 0.5\%$ and $\pm 1.0\%$ (Tolerances to $\pm 0.1\%$ on special order.)

Absolute Temperature Coefficient: ± 50 PPM/ $^{\circ}\text{C}$ for values up to 1 Megohm.[§] ± 80 PPM/ $^{\circ}\text{C}$ for values above 1 Megohm.[§]

Ratio Tolerance: $\pm 0.1\%$, $\pm 0.25\%$ or $\pm 0.5\%$, as specified.

Ratio Temperature Coefficient: 40 PPM/ $^{\circ}\text{C}$.[§] Special TCs to 5 PPM/ $^{\circ}\text{C}$.[§]

Power Rating: Up to 1 watt per resistor. Up to 2 watts per package.

Overload: 2.5 times rated voltage for 5 seconds. R shift .25% max.

Voltage Coefficient: To 0.1 PPM/volt when required.

Voltage Rating: 150 volts per resistor or 150 volts between adjacent pins.

Mechanical Configurations: DIP packages are molded of flame-proof high temperature materials and conform to mechanical outline requirements of Mil-R-83401B.

SIP packages include molded or conformal encapsulation and provide lead spacings of .100", .125", .150" and .172" as specified.

SIP package height is typically .300" or .500".

[§] Temperature Coefficient: Referenced to 25 $^{\circ}\text{C}$, ΔR taken at -15°C and $+105^{\circ}\text{C}$.

CADDOCK

ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507

PHONE: (714) 683-5361 • TWX: 910-332-6108

CADDOCK

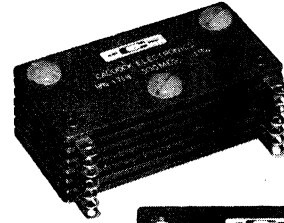
HIGH PERFORMANCE FILM RESISTORS

Multi-Megohm Film Resistors

Model 1718

This Multi-Megohm Resistor is designed to provide non-inductive high resistance values with precise resistance-temperature characteristics. These are especially useful in high resistance voltage dividers where fast response is important. On special order, resistor sets can be provided with voltage ratio accuracy to $\pm 0.01\%$ and temperature tracking within $2\text{ppm}/^\circ\text{C}$.

Construction is high strength alumina substrate with fired-on Micronox resistance film and coated with material specially selected to prevent parallel leakage throughout temperature range. Units are compatible with most RTV potting.



Exclusive modular stack-up package



SPECIFICATIONS

Resistance Range: 1 meg-333 meg

Power Rating: 3 Watts @ 25°C

Max. Working Voltage: 12000 Volts

Resistance Tolerance: $\pm 1\%$ (Tolerances 0.2% on special order)

Terminal Material: Gold Plated Copper

Encapsulation: Conformal Coating

Insulation Resistance: 100,000 Megs, Min. when mounted

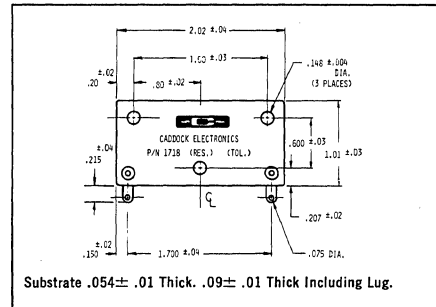
Temperature Coefficient: $\pm 80\text{ PPM}/^\circ\text{C}$
Referenced to 25°C , ΔR taken at -15°C and $+105^\circ\text{C}$

Thermal Shock: Mil-Std 202, Method 107
R shift .5% Max.

Loadlife: 1000 hours at rated power R shift .8% Max.

Mounting: Three 6-32 Nylon Screws with Standoff Spacers, .050 Thick, Supplied with unit

Operating Temperature: -55°C to $+125^\circ\text{C}$



Model 1712

Caddock Multi-Meg Resistors utilize the exclusive Micronox resistance films, developed by Caddock, in a new and unique stack-up package. Extremely high resistance values, with excellent T.C. characteristics, can be specified to fit in an unusually small space by stacking as many units as required. Resistance density as high as 2000 megohms per cubic inch. Absolute T.C. is less than $80\text{ PPM}/^\circ\text{C}$ between -15°C and $+105^\circ\text{C}$. T.C. matching between modules to within $10\text{ ppm}/^\circ\text{C}$ can be provided on special order. Modules may be combined in groups as voltage dividers, and also stacked with a trimmer for extremely fine adjustment of voltage ratio.

SPECIFICATIONS

***Temperature coefficient:** $80\text{ PPM}/^\circ\text{C}$, ref. 25°C , ΔR @ -15°C and $+105^\circ\text{C}$.

Resistance Range (per module): 10 meg. to 200 meg.

Standard resistance tolerance: $\pm 1\%$.

Maximum working voltage: 1000 volts.

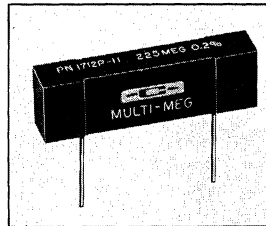
Dielectric strength: 1000 volts.

Moisture resistance: MIL-STD-202, method 106, R shift 0.8% max.

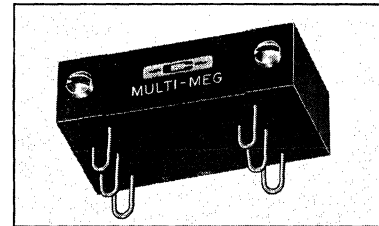
Load Life: 1000 hours at rated power, R shift 0.8% max.

Model 1712S — with solder lug Terminals.

Model 1712P — with pin Terminals.

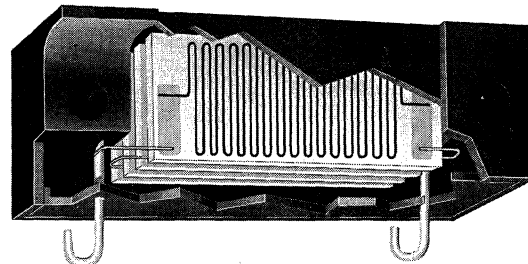


from 10 meg to 200 meg,
 80 PPM T.C. * packaged in
miniature stack-up case

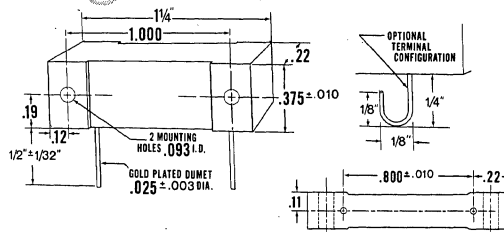
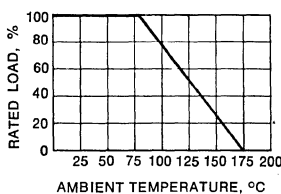


Build resistance values as high as
required with exclusive modular
stacking design

Resistor construction: ceramic resistance wafers potted
in cushioning material, packaged in a rugged molded case.



DERATING CURVE



CADDOCK
ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507 PHONE: (714) 683-5361 • TWX: 910-332-6108

"The CADDOCK Reports" Engineering, Test and Design Data

CADDOCK

HIGH PERFORMANCE FILM RESISTORS

Caddock Electronics maintains a continuous program of reliability and performance testing on all of the many types of resistors presently being produced. In addition to the tests for stability and temperature characteristics that are part of our normal manufacturing procedures, we also perform semi-annual reliability tests to confirm compliance to the most stringent military and industry performance requirements.

The results of these tests, plus other extended life data developed over literally years of continuous testing that verifies performance characteristics, are now available to design engineers in a series of "Caddock Reports." You may request your personal copy of any of these test results by writing or calling to our main offices in Riverside, California.

Reliability Test Reports

These tests are conducted semi-annually to confirm the detailed performance of various types of Caddock High Performance Film Resistors when subjected to the requirements of applicable "Mil" specifications.

The report includes detailed graphs that show the actual performance-stability of five basic types of Caddock resistors. Individual test results for 15 different groups of resistors are shown for each of six tests: Temperature Cycling, Overload, 2000 Hour Load-Life, Moisture Resistance, Low Temperature and Shock and Vibration.

Extended Load-Life Stability Test Report

This report shows the exceptional stability that Caddock resistors deliver under full power conditions. The tests were initiated in May of 1969 on Caddock Type MP Power Film Resistors and are still being conducted at this time.

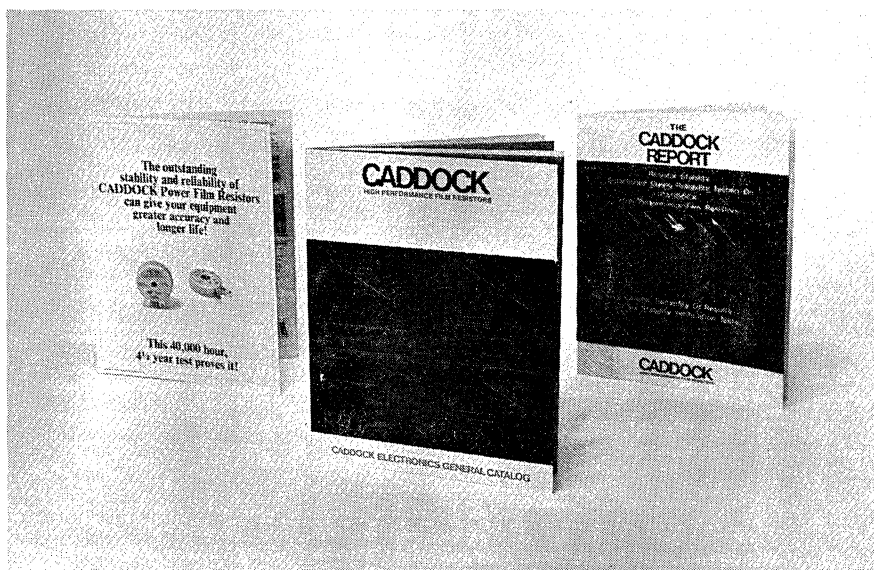
The test report includes a graph of resistor stability as measured over a period of 40,000 hours—a **continuous test period of over 4½ years**—that demonstrates extended-life stability better than 0.01% per 1000 hours! And there have been no failures of any kind during this continuous test program!

This test will be continued indefinitely as a means of verifying the outstanding stability and reliability of Caddock High Performance Film Resistors and the test summary regularly up-dated to show the latest data.

The Caddock General Catalog

Complete specifications and descriptions of all of the many types of Caddock High Performance Film Resistors are included in this catalog. And as new resistor types are introduced by Caddock, additional catalog data is made available.

Detailed information on the performance and availability of all Caddock resistors is available on request.



CADDOCK

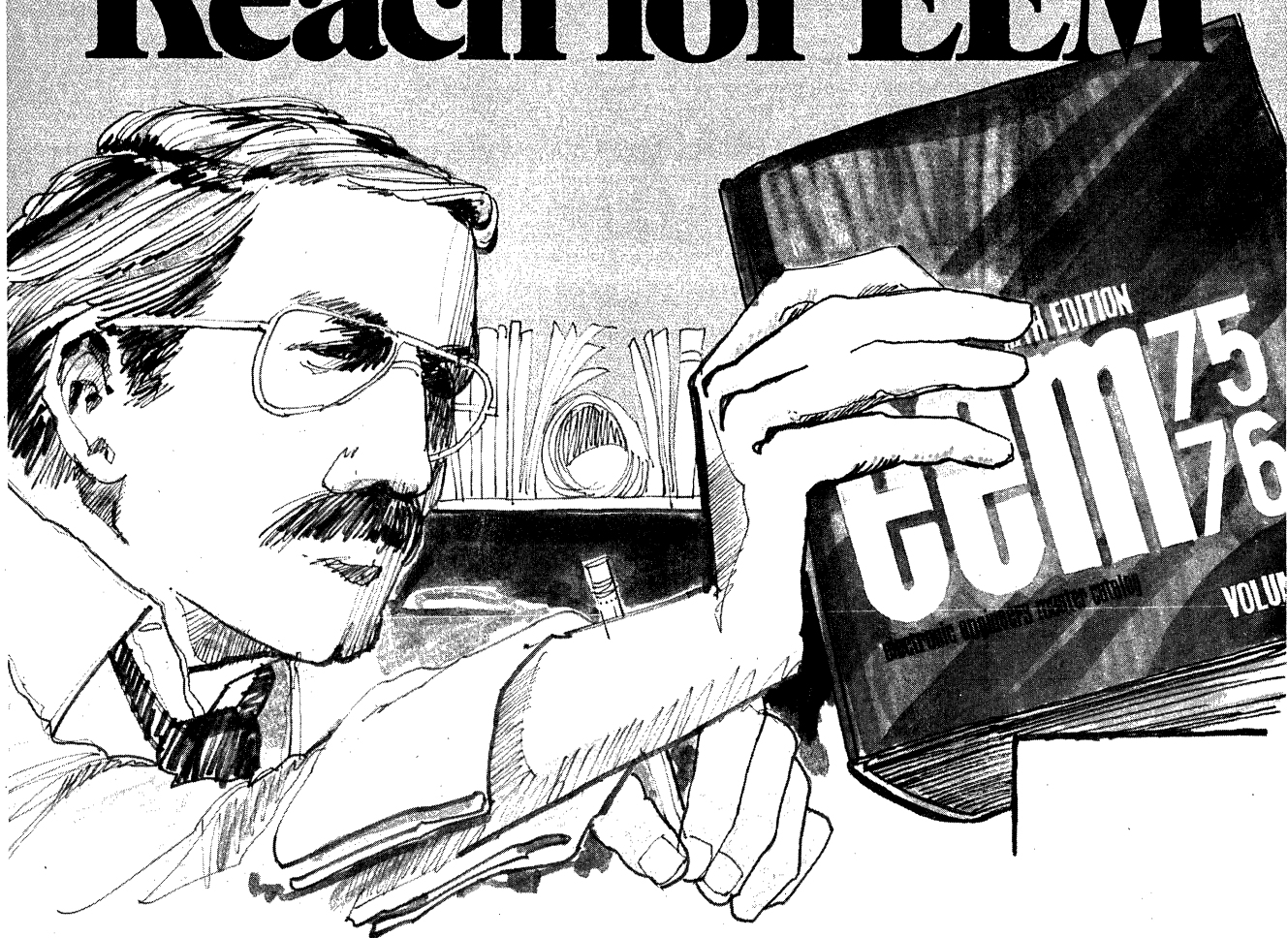
ELECTRONICS, INCORPORATED

3127 CHICAGO AVENUE, RIVERSIDE, CALIFORNIA 92507

PHONE: (714) 683-5361 • TWX: 910-332-6108

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**

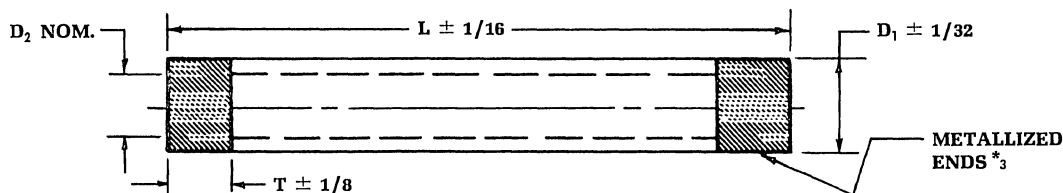


electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

CARBORUNDUM NON-INDUCTIVE POWER RESISTORS

GLOBAR® Non-Inductive Resistor



Specifications

	Type AS	Type SP
Tolerances	Standard 10%, 5% and 20% available	Same
Load-life	Max 5% after 1,000 hrs. at rated load	Same
Short time overload (10 times rated. Power 5 seconds on—90 seconds off.)	2% change	Same
Temperature coefficient	—50°C to +230°C ± .075%/°C max	—55°C to +350°C ± .075%/°C max
Voltage coefficient	Max 1%/kilovolt per inch effective length	Same
Max operating temperature	230°C	350°C
Density	2.5 grams/CM ³	2.2 grams/CM ³
Specific heat	.15-.30 cal/gram/°C	.15-.30 cal/gram/°C
De-rating	Linearly to 0° watts @ 230°C	Linearly to 0° watts @ 350°C
Moisture resistance: Max 2.5% change tested per Mil Std 202B, Method 103		Same

The information, recommendations and opinions set forth herein are offered solely for your consideration, inquiry and verification, and are not, in part or total, to be construed as constituting a warranty or representation for which we assume legal responsibility. Nothing contained herein is to be interpreted as authorization to practice a patented invention without a license.

Ceramic Carbon Composition Type AS

Type No.	Rated Power Watts @ 40° C	Allowable Injection Energy Joules *1	Max Peak Voltage (KV) *2 Standard	Special	L	Dimensions (Inches) D1	D2	T	Resistance Range (ohms) *4 Min	Max
885	15	2,500	4.0	8.0	2½	¾	½	½	7.5	1,000
886	30	5,000	10.0	20.0	5	¾	½	⅝	20.0	2,500
887	50	15,000	15.0	30.0	6	1	¾	½	15.0	2,500
888	75	20,000	22.5	45.0	8	1	¾	⅞	20.0	3,000
889	100	35,000	37.5	75.0	12	1	¾	⅞	30.0	5,000
890	150	50,000	60.0	120	18	1	¾	⅞	50.0	7,500

Ceramic Silicon Composition Type SP

884	22.5	200	1.5		2	½	⅜	¼	1.0	150
885	45	250	1.5		2½	¾	½	½	1.0	100
886	90	500	4.0		5	¾	½	⅝	1.0	250
887	150	1,600	5.0		6	1	¾	½	1.0	250
888	190	2,100	6.0		8	1	¾	⅞	1.0	330
889	275	3,200	10.0		12	1	¾	⅞	1.0	700
890	375	4,200	16.0		18	1	¾	⅞	1.0	1,000
891	750	15,000	16.0		18	2	1½	1	1.0	350
892	1,000	17,500	22.0		24	2	1½	1	1.0	500

*1. Allowable energy per one shot pulse. For continuous duty, pulse repetition rate and duration must be considered.

*2. Peak voltages. Up to 100% increase can be obtained by special dielectric coatings and/or anti-corona terminations.

*3. Nickel metallization standard for AS types. Aluminum metallization standard for SP types. Other metallization available upon request; example: copper, solder-tinned copper or silver.

*4. Refer values other than shown to the plant for special quotation.

CARBORUNDUM® VARISTORS

Standard varistors described below have a 10% tolerance on voltage. Also available: leadless discs and rods, voltages specified at intermediate values or at other currents, and voltage tolerances of $\pm 15\%$ and $\pm 20\%$. Available at extra cost: voltage tolerances of $\pm 5\%$ and $\pm 7\%$, color coding, and special coatings.

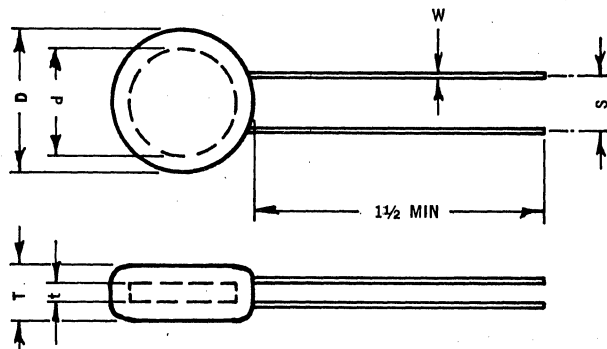


FIGURE 1

Standard disc varistors have a black flame-retardant PVC coating. Also available: Glyptal coating and kinked leads for printed circuit board insertion.

Standard rod varistors have a blue epoxy coating. Available at extra cost: formed leads for printed circuit board insertion.

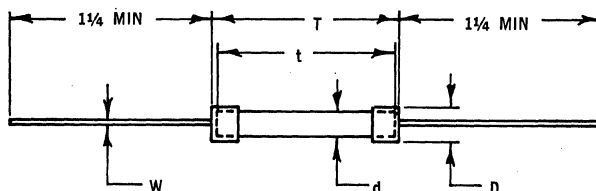
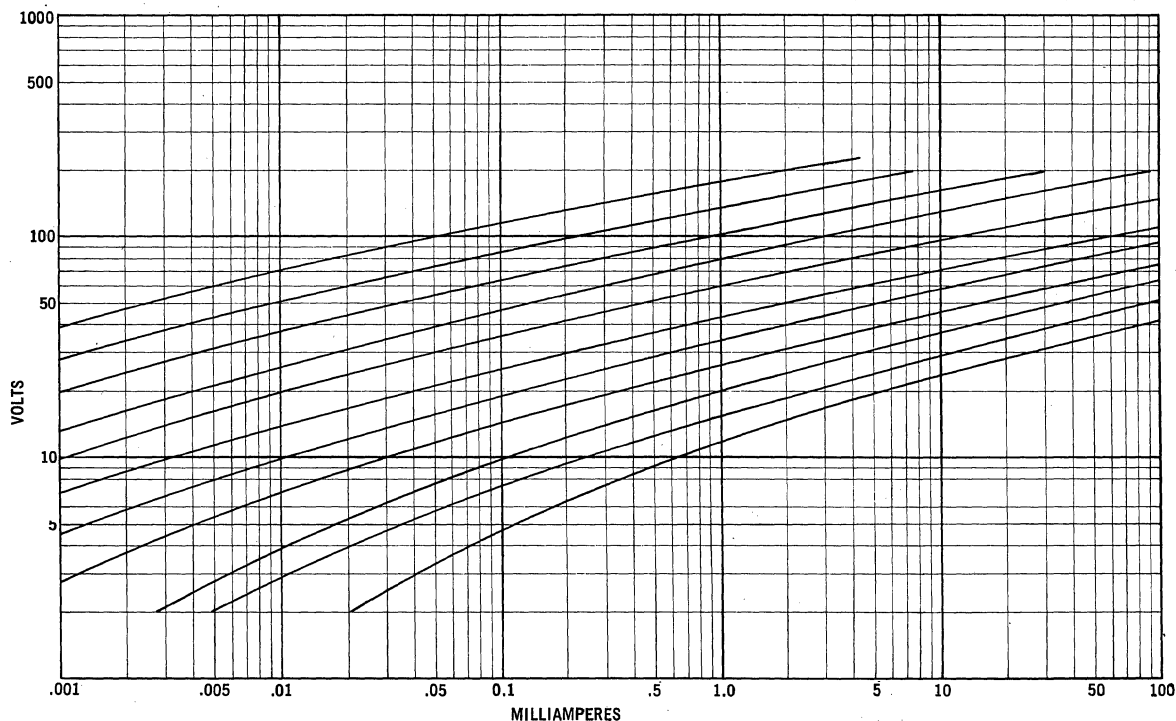


FIGURE 2

	Carborundum Style Number	d ±.030	t ±.030	D max.	T max.	w nom.	s nom.	Peak Voltage	Power Watts	"Curve Factors" Voltage	Current
DISC STYLES (figure 1)	551BNR2-	0.250	0.062	0.400	0.350	0.020	0.125	100	0.250	0.5	0.25
	432BNR2-	0.500	0.062	0.650	0.350	0.032	0.250	100	0.500	0.5	1.0
	379BNR2-	0.500	0.125	0.650	0.400	0.032	0.250	200	0.500	1.0	1.0
	328BNR2-	0.750	0.062	0.900	0.350	0.032	0.375	100	0.750	0.5	2.2
	925BNR2-	0.750	0.100	0.900	0.380	0.032	0.375	150	0.750	0.8	2.2
	613BNR2-	0.750	0.125	0.900	0.400	0.032	0.375	200	0.750	1.0	2.2
	923BNR2-	1.000	0.100	1.150	0.380	0.040	0.375	150	1.500	0.8	4.0
	463BNR2-	1.000	0.125	1.150	0.400	0.040	0.375	200	1.500	1.0	4.0
ROD STYLES (figure 2)	927BNR2-	1.250	0.100	1.400	0.380	0.040	0.375	150	2.250	0.8	6.2
	231BNR4-	0.156	0.625	0.250	0.812	0.032	—	800	0.750	5.0	0.1
	233BNR4-	0.250	0.625	0.375	0.812	0.032	—	800	1.000	5.0	0.25
	234BNR4-	0.250	1.000	0.375	1.188	0.032	—	1500	1.500	8.0	0.25



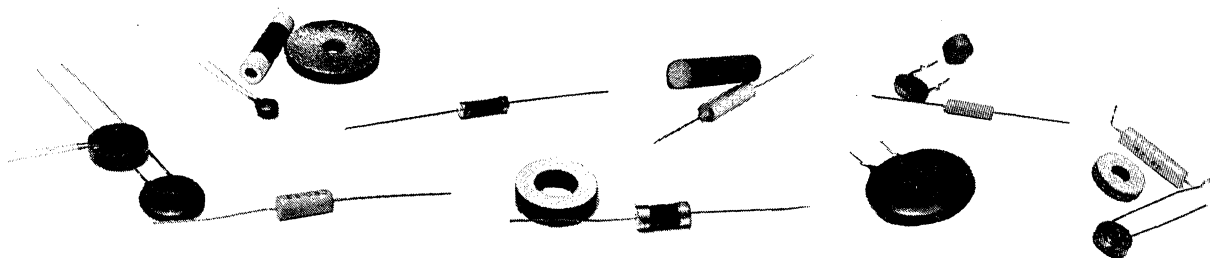
These curves are plotted for a family of variously rated 379BNR2-varistors. The characteristics of other varistor styles are of similar shape, and they can be approximated by using the "curve factors" shown in the above chart. To do this, multiply the voltages on the

ordinate by the voltage curve factor for the style chosen, and multiply the currents on the abscissa by the current curve factor. For a type 233BNR4- varistor, for example, the 10.0 volt, 4.0 milliamper point on the chart would be read as 50.0 volts, 1.0 milliamperes.



RESISTORS, FIXED

CARBORUNDUM® VARISTORS



Carborundum silicon carbide varistors are voltage-dependent resistors which are offered in a wide variety of configurations, including discs, rods, and washers. In addition to the sizes shown on these pages, rods are available up to 18 inches in length, washers are available up to 3½ inches in diameter. Typical uses include limitation of peak discharges, spike suppression, stabilization of voltages, and generation of non-linear functions.

Varistors are specified by the voltage measured across them, suitably toleranced, at some constant current. The slope of the voltage-current characteristic is most often given by the maximum voltage ratio for two specified currents.

In general the characteristic for a varistor may be approximated by the equation:

$$i = Ke^n$$

where i and e are instantaneous current and voltage respectively, K is a proportionality constant, and n is an exponent applicable in the range in which the varistor is used: most often it is between 3 and 5.

The silicon carbide varistor is a "forgiving" component. When hit by a voltage surge, the energy is absorbed throughout its body, not at a junction. A voltage surge beyond the design level causes substantial increase in current and energy absorption, but not a catastrophic failure.

SMALL DISC VARISTORS

Carborundum Part Number	Volts $\pm 10\%$ @ 1.0 ma.	Volts @ 1.0 ma. Volts @ 0.1 ma. (maximum)
432BNR2-406*	6.8	2.70
432BNR2-407	8.2	2.60
432BNR2-408*	10.0	2.50
432BNR2-409	12.0	2.35
432BNR2-410	15.0	2.20
432BNR2-411	18.0	2.10
432BNR2-412	22.0	2.00
432BNR2-413	27.0	1.90
432BNR2-414	33.0	1.84
432BNR2-416	47.0	1.80
432BNR2-418	68.0	1.76
432BNR2-420	100.0	1.72
379BNR2-410*	15.0	2.50
379BNR2-412*	22.0	2.40
379BNR2-414*	33.0	2.30
379BNR2-415	39.0	2.20
379BNR2-416*	47.0	2.10
379BNR2-417	56.0	2.00
379BNR2-418*	68.0	1.95
379BNR2-419	82.0	1.90
379BNR2-420*	100.0	1.84
379BNR2-421	120.0	1.78
379BNR2-422*	150.0	1.74
379BNR2-423	180.0	1.70
328BNR2-400	2.2	3.60
328BNR2-401	2.7	3.40
328BNR2-402*	3.3	3.20
328BNR2-403	3.9	3.00
328BNR2-404*	4.7	2.80
328BNR2-405	5.6	2.60
328BNR2-406	6.8	2.50
328BNR2-407	8.2	2.40
328BNR2-408	10.0	2.30
328BNR2-409	12.0	2.20
328BNR2-410	15.0	2.10
328BNR2-411	18.0	2.00
328BNR2-412	22.0	1.95
328BNR2-413	27.0	1.90
328BNR2-414	33.0	1.85
328BNR2-416	47.0	1.76

Varistors marked with an asterisk (*) are carried by Carborundum distributors.

LARGE DISC VARISTORS

Carborundum Part Number	Volts $\pm 10\%$ @ 5.0 ma.	Volts @ 5.0 ma. Volts @ 0.1 ma. (maximum)
463BNR2-410	15.0	2.40
463BNR2-412	22.0	2.20
463BNR2-414	33.0	2.10
463BNR2-415	39.0	2.02
463BNR2-416	47.0	1.98
463BNR2-417	56.0	1.94
463BNR2-418*	68.0	1.90
463BNR2-419	82.0	1.86
463BNR2-420*	100.0	1.82
463BNR2-421	120.0	1.78
463BNR2-422*	150.0	1.74
463BNR2-423	180.0	1.70
927BNR2-408*	10.0	2.90
927BNR2-409	12.0	2.80
927BNR2-410*	15.0	2.70
927BNR2-411	18.0	2.60
927BNR2-412*	22.0	2.50
927BNR2-413	27.0	2.40
927BNR2-414*	33.0	2.30
927BNR2-416*	47.0	2.20

ROD VARISTORS

Carborundum Part Number	Volts $\pm 10\%$ @ 1.0 ma.	Volts @ 1.0 ma. Volts @ 0.1 ma. (maximum)
233BNR4-417	56.0	2.50
233BNR4-418*	68.0	2.40
233BNR4-419	82.0	2.30
233BNR4-420*	100.0	2.20
233BNR4-421	120.0	2.10
233BNR4-422*	150.0	2.00
233BNR4-423	180.0	1.90
233BNR4-424*	220.0	1.82
233BNR4-425	270.0	1.78
233BNR4-426*	330.0	1.76
233BNR4-428	470.0	1.74
233BNR4-430	680.0	1.70
234BNR4-426	330.0	2.00
234BNR4-427	390.0	1.90
234BNR4-428*	470.0	1.80
234BNR4-429	560.0	1.77
234BNR4-430*	680.0	1.74
234BNR4-431	820.0	1.70
234BNR4-432*	1000.0	1.68

The Carborundum Company, Graphite Products Division, Post Office Box 339,
Niagara Falls, N.Y. 14302 Tel: (716) 278-2521 Telex: 91-555 (CARBO GLO NGF)

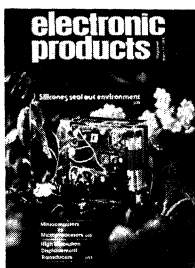
CARBORUNDUM



OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

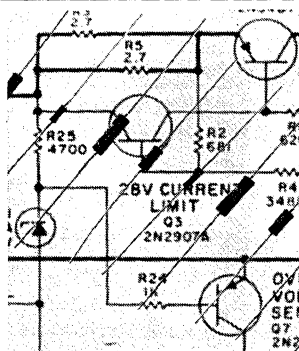
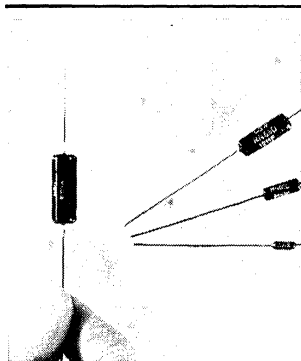
**Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530**



electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.

Resistors



INDEX

Description

EEM
Page No.

METAL FILM RESISTORS

Introduction to Metal Film Resistors

RN55, 60, 65 E—NE Styles

RN55, 60, 65 C—NC Styles

RN50, 55, 60, 65, 70 C—NC Styles

RN55, 60, 65, 70 D—NA Styles

RNC55, 60 H/K—HH, HK Styles

RLR05, 07, 20, 32—HC Styles 2-1450

RL07, 20, 32—C Styles

FP 32, 42

FP 1/2 through FP89—Flameproof, Power

SPECIAL PRODUCTS

TSR Temperature Sensitive Resistor 2-1451

See Section 1500, Page 2-105 for Corning Glass, Ceramic, and Tantalum Capacitors.

NEED MORE INFORMATION?

FOR MORE INFORMATION ON CORNING® ELECTRONIC COMPONENTS. . .

1. Contact your nearest Corning Sales Office . . . (See list of sales offices below)
2. Contact your nearest franchised Corning distributor or representative.
3. Contact: Corning Glass Works
Electronic Products Division
Corning, New York 14830
(607) 974-8652

FOR MORE INFORMATION ON . . .

AVAILABILITIES or PRICING of

Glass, GLASS/K or Ceramic Capacitors
 Call your local franchised Corning distributor, or . . . Call Customer Service at (919) 876-1100.

Resistors

Call your local franchised Corning distributor, or . . . Call Customer Service at (814) 362-5571.

Tantalum Capacitors

Call your local franchised Corning distributor, or . . . Call Customer Service at (207) 282-5111.

PRODUCT CAPABILITIES or PRODUCT PERFORMANCE or PRODUCT SPECIFICATIONS of

Glass, GLASS/K or Ceramic Capacitors
 Call Product Engineering at (919) 876-1100.

Resistors

Call Product Engineering at (814) 362-5571.

Tantalum Capacitors

Call Product Engineering at (207) 282-5111.

APPLICATIONS of all PRODUCTS

Call Applications Engineering at (607) 974-8679.

SALES OFFICES AND MANUFACTURING FACILITIES

HEADQUARTERS

Corning Glass Works
 Electronic Products Division
 Corning, New York 14830
 (607) 974-8652

SALES OFFICES

Corning Glass Works
 Electronic Products Division
 225 Great Road
 Littleton, MA. 01460
 (617) 486-3125

Corning Glass Works
 5725 East River Road
 O'Hare Plaza, Suite 525
 Chicago, IL. 60631
 (312) 693-6830

Corning Glass Works
 500 South Main Street
 P.O. Box 1467
 Orange, CA. 92668
 (714) 541-5275
 (213) 628-7220

Corning Glass Works
 Central Building, Suite 104
 363 Taaffe Avenue
 Sunnyvale, CA. 94086
 (408) 732-5050

Corning Glass Works
 3900 Electronics Drive
 Raleigh, NC. 27604
 (919) 876-1100

MANUFACTURING FACILITIES

Corning Glass Works
 550 High Street
 Bradford, PA. 16701
 (814) 362 5571

Components Incorporated
 313 Elm Street
 Biddeford, ME. 04005
 (207) 282-5111

Corning Glass Works
 Highway 132
 Wilmington, NC. 28401
 (919) 791-5040

Corning Glass Works
 3900 Electronics Drive
 Raleigh, NC 27604
 (919) 876-1100

MAJOR INTERNATIONAL SALES OFFICES

CANADA

Corning Glass Works
 Leaside Plant
 135 Vanderhoof Avenue
 Toronto, Ontario, Canada
 (416) 421-1500

FRANCE

Sovcor Electronique
 11, Chemin de Ronde
 78 Le Vesinet, France
 Ph: 966-5100

GERMANY

Sovcor Elektronik GmbH
 Babenhauser Landstrasse 49
 D-6000 Frankfurt am Main
 Germany
 Ph: 611 652031

ENGLAND

Electrosil Limited
 Pallion
 Post Office Box 37
 Sunderland SR4 6SU
 England
 Ph: Sunderland 71481

BRAZIL

Vidros Corning Brazil Ltda.
 Alameda Ministro Rocha Azevedo, 912
 Caixa Postal 8972
 CEP01410 Sao Paulo
 SP-Brazil
 Ph: 804834, 804691, 801420

JAPAN

Corning International Services, S.A.
 Kowa Building No. 16 Annex
 9-20 Akasaka, 1-Chome
 Minato-Ku, Tokyo, Japan
 Ph: 586-1051

CORNING
ELECTRONICS

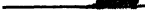
 CORNING GLASS WORKS
Corning, New York 14830

Metal Film Resistors

MIL-R-10509 PRECISION

	Military Type	Corning Type	Military (Commercial) Wattage Rating		Voltage Rating	Resistance Range	Standard Tol. (%)	Temperature Coefficient	Dimensions—Inches (Millimeters)		
			70°C	125°C					Body Length	Body Diameter	Lead Diameter
	RN55E	[NE55]	(1/4)	1/10 (1/8)	200	49.9Ω-1 Meg	.1, .25, .5, 1%	± 25PPM/°C	.245 ± .020 (6.1 ± .51)	.088 ± .010 (2.24 ± .25)	.025 (.63)
	RN60E	[NE60]	(1/2)	1/8 (1/4)	250	49.9Ω-1 Meg	.1, .25, .5, 1%	± 25PPM/°C	.375 ± .025 (9.5 ± .63)	.135 ± .020 (3.4 ± .51)	.025 (.63)
	RN65E	[NE65]	(1)	1/4 (1/2)	300	49.9Ω-1 Meg	.1, .25, .5, 1%	± 25PPM/°C	.575 ± .030 (14.6 ± .76)	.185 ± .015 (4.70 ± .38)	.025 (.63)

MIL-R-10509 PRECISION

	RN55C	[NC55]	(1/4)	1/10 (1/8)	200	49.9Ω-1 Meg	.1, .25, .5, 1%	± 50PPM/°C	.245 ± .020 (6.1 ± .51)	.088 ± .010 (2.24 ± .25)	.025 (.63)
	RN60C	[NC60]	(1/2)	1/8 (1/4)	250	49.9Ω-1 Meg	.1, .25, .5, 1%	± 50PPM/°C	.375 ± .025 (9.5 ± .63)	.135 ± .020 (3.4 ± .51)	.025 (.63)
	RN65C	[NC65]	(1)	1/4 (1/2)	300	49.9Ω-1 Meg	.1, .25, .5, 1%	± 50PPM/°C	.575 ± .030 (14.6 ± .76)	.185 ± .015 (4.70 ± .38)	.025 (.63)

MIL-R-10509 PRECISION

	RN50C	[NC3]	1/10	1/20	200	49.9Ω-100K	1%	± 50 ppm/°C	.145 ± .015 (3.68 ± .38)	.062 ± .004 (1.57 ± .10)	.016 (.41)
	RN55C	[NC4]	1/8	1/10	200	49.9Ω-150K 10Ω-301K	1/2% 1%	± 50 ppm/°C	.225 ± .020 (5.71 ± .51)	.090 ± .008 (2.29 ± .20)	.025 (.63)
	RN60C	[NC5]	1/4	1/8	250	49.9Ω-499K 49.9Ω-1 Meg	1/2% 1%	± 50 ppm/°C	.355 ± .020 (9.02 ± .51)	.148 ± .000 (3.76 ± .000*)	.025 (.63)
	RN65C	[NC6]	1/2	1/4	300	49.9Ω-1 Meg 49.9Ω-1 Meg	1/2% 1%	± 50PPM/°C	.554 ± .021 (14.07 ± .53)	.190 ± .010 (4.83 ± .25)	.025 (.63)
	RN70C	[NC7]	3/4	1/2	350	51.1Ω-1 Meg	1/2%, 1%	± 50 ppm/°C	.719 ± .031 (18.26 ± .79)	.248 ± .015 (6.30 ± .38)	.032 (.81)

MIL-R-10509 PRECISION

	RN55D	[NA55]	1/8 (1/4)	1/10 (1/8)	200	49.9Ω-150K 10Ω-301K	1/2% 1%	± 100PPM/°C	.225 ± .020 (5.71 ± .51)	.090 ± .008 (2.29 ± .20)	.025 (.63)
	RN60D	[NA60]	1/4 (1/2)	1/8 (1/4)	300	49.9Ω-499K 10Ω-1 Meg	1/2% 1%	± 100PPM/°C	.355 ± .020 (9.02 ± .51)	.148 ± .000 (3.76 ± .000)	.025 (.63)
	RN65D	[NA65]	1/2	1/4	350	49.9Ω-1 Meg 10Ω-2 Meg	1/2% 1%	± 100PPM/°C	.554 ± .021 (14.07 ± .53)	.190 ± .010 (4.83 ± .25)	.025 (.63)
	RN70D	[NA70]	3/4	1/2	500	51.1Ω-1 Meg	1/2%, 1%	± 100PPM/°C	.719 ± .031 (18.26 ± .79)	.248 ± .015 (6.30 ± .38)	.032 (.81)

ESTABLISHED RELIABILITY

MIL-R-55182 PRECISION

	RNC55H/K	(HH4/ HK4)	1/10		200	49.9Ω-100K	1%	± 50/PPM/°C ± 100PPM/°C	.225 ± .020 (5.71 ± .51)	.090 ± .008 (2.29 ± .20)	.025 (.63)
	RNC60H/K	(HH5/ HK5)	1/8		250	49.9Ω-499K	1/2% 1%	± 50/PPM/°C ± 100PPM/°C	.355 ± .020 (9.02 ± .51)	.148 ± .000 (3.76 ± .000)	.025 (.63)

ESTABLISHED RELIABILITY

MIL-R-39017

SEMI-PRECISION

	RLR05C	[HC3]	1/8	-	200	10Ω-150K	2, 5%	± 100PPM/°C	.145 ± .015 (3.68 ± .38)	.062 ± .004 (1.57 ± .10)	.016 (.41)
	RLR07C	[HC4]	1/4	-	250	10Ω-300K	2, 5%	± 100PPM/°C	.225 ± .020 (5.71 ± .51)	.090 ± .008 (2.29 ± .20)	.025 (.63)
	RLR20C	[HC5]	1/2	-	350	10Ω-1 Meg	2, 5%	± 100PPM/°C	.355 ± .020 (9.02 ± .51)	.148 ± .000 (3.76 ± .000)	.032 (.81)
	RLR32C	[HC6]	1	-	500	10Ω-1 Meg	2, 5%	± 100PPM/°C	.554 ± .026 (14.07 ± .66)	.190 ± .010 (4.83 ± .25)	.040 (1.02)

METAL FILM RESISTORS

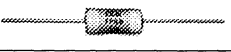
MIL-R-22684 SEMI-PRECISION

	Military Type	Corning Type	Military (Commercial) Wattage Rating 70°C 125°C	Voltage Rating	Resistance Range	Standard Tol. (±)	Temperature Coefficient	Dimensions—Inches (Millimeters)		
								Body Length	Body Diameter	Lead Diameter
	- [C3]		(1/8) (1/10)	200	10Ω-150K	1, 2, 5%	±100PPM/°C	.145 ±.015 (3.68 ±.38)	.062 ±.004 (1.57 ±.10)	.016* (.41)
	RL07S [C4]		1/4 (1/8)	250	10Ω-301K	1, 2, 5%	±100PPM/°C	.225 ±.020 (5.71 ±.51)	.090 ±.008 (2.29 ±.20)	.025 (.63)
	RL20S [C5]		1/2 (1/4)	350	10Ω-1 Meg	1, 2, 5%	±100PPM/°C	.355 ±.020 (9.02 ±.51)	.148 ±.000 (3.76 ±.00)	.032 (.81)
	RL32S [C6]		1 (1/2)	500	10Ω-2 Meg	1, 2, 5%	±100PPM/°C	.554 ±.021 (14.07 ±.53)	.190 ±.010 (4.83 ±.25)	.040 (1.02)
	- [C05]		(1/8) -	200	10Ω-150K	2, 5, 10%	±200PPM/°C	.145 ±.015 (3.68 ±.38)	.062 ±.004 (1.57 ±.10)	.016 (.41)
	RL07S [C07]		1/4	250	10Ω-301K	2, 5, 10%	±200PPM/°C	.225 ±.020 (5.71 ±.51)	.090 ±.008 (2.29 ±.20)	.025 (.63)
	RL20S [CS20]		1/2	350	10Ω-470K	2, 5, 10%	±200PPM/°C	.355 ±.020 (9.02 ±.51)	.148 ±.000 (3.76 ±.00)	.032 (.81)
	RL32S [FP32]		1 -	500	10Ω-1 Meg	2, 5, 10%	±200PPM/°C	.560 ±.030 (14.27 ±.79)	.190 ±.010 (4.83 ±.25)	.040 (1.02)
	RL42S [FP42]		2 -	500	10Ω-1.5 Meg	2, 5, 10%	±200PPM/°C	.687 ±.031 (17.45 ±.79)	.315 ±.010 (8.00 ±.25)	.045** (1.14)

* .020 Also available

** .032 Also available

COMMERCIAL FLAMEPROOF

	Corning Type	Wattage Rating		Voltage Rating	Resistance Range	Standard Tol. (±)	Temperature Coefficient	Dimensions—Inches (Millimeters)		
		25°C	40°C					Body Length	Body Diameter	Lead Diameter
	FP55			1/4W	10Ω-301K	1, 2, 5, 10%	±100PPM/°C	.380 Max* (9.65 Max)	.088 ±.008 (2.24 ±.20)	.025 (.63)
	FP60			1/2W	10Ω-1 Meg	1%	±100PPM/°C	.360 ±.020 (9.14 ±.51)	.148* Max (3.76 Max)	.025 (.63)
	FP1/2			1/2W	10Ω-1 Meg	1, 2, 5, 10%	±150PPM/°C	.360 ±.020 (9.14 ±.51)	.138 ±.012 (3.51 ±.30)	.032 (.81)
	FP1			1W	10Ω-1 Meg	1, 2, 5, 10%	±150PPM/°C	.560 ±.031 (14.22 ±.79)	.190 ±.010 (4.83 ±.25)	.032** (.81)
	FP2	3 1/2	3	2	500	9Ω-1.5 Meg	1, 2, 5, 10%	.687 ±.031 (17.45 ±.79)	.315 ±.010 (8.00 ±.25)	.032*** (.81)
	FP3	4	4	3	500	9Ω-125K	1, 2, 5, 10%	.900 ±.055 (22.86 ±.140)	.315 ±.010 (8.00 ±.25)	.032 (.81)
	FP4	5 1/2	5	4	500	16Ω-125K	1, 2, 5, 10%	1.530 ±.035 (38.86 ±.89)	.315 ±.010 (8.00 ±.25)	.032 (.81)
	FP5	6 1/2	6	5	600	19Ω-125K	1, 2, 5, 10%	1.710 ±.035 (43.43 ±.89)	.315 ±.010 (8.00 ±.25)	.032 (.81)
	FP7	7 1/2	-	7	700	24Ω-125K	1, 2, 5, 10%	2.040 ±.035 (51.82 ±.89)	.315 ±.010 (8.00 ±.25)	.032 (.81)
	FP10	-	10	-	700	24Ω-125K	1, 2, 5, 10%	2.040 ±.035 (51.82 ±.89)	.315 ±.010 (8.00 ±.25)	.032 (.81)
	FP67	5	-	-	500	5Ω-19K	1, 2, 5, 10%	.900 ±.055 (22.86 ±.140)	.315 ±.010 (8.00 ±.25)	.032 (.81)
	FP69	3	-	-	350	2.6Ω-1 Meg	1, 2, 5, 10%	.516 ±.021 (13.11 ±.53)	.225 ±.012 (5.71 ±.30)	.032 (.81)

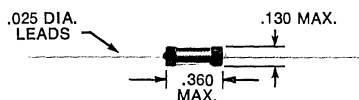
* Clean Lead to Clean Lead

**Available .040" lead

*** Available .045" lead

Special Products

TSR—Temperature Sensitive Resistor



A two terminal component that increases resistance linearly with temperature, the TSR is ideal for sensing, compensation, and control applications where temperature is the independent variable. In addition to its linearity and fast thermal response time, the TSR is ideally suited for high volume usage because of its low cost and specified part-to-part interchangeability.

Specific applications for the TSR include:

- Temperature input for system control applications
- Temperature compensation for circuits or components subjected to wide ambient changes
- Electronic temperature indication
- Fluid level detection (using devices self-heating characteristics)
- Rate of rise detection

Construction—Nickel film on glass substrate, polyimide-coated for environmental protection.

PERFORMANCE CHARACTERISTICS

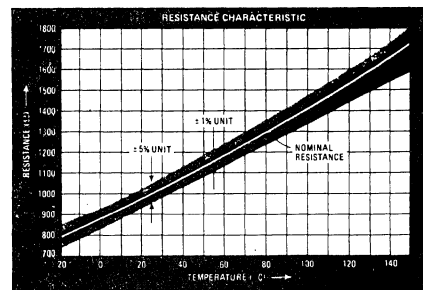
Operating Temperature Range —55°C to +250°C

Resistance 1000Ω @ 25°C

Resistance Tolerance

±1% or ±5% @ 25°C

Temperature Coefficient of Resistance
+5900 ppm/°C



Part-to-Part Resistance Interchangeability

Note: Interchangeabilities are specified from -20°C to +150°C. However, the trends shown on the above graphs can typically be extrapolated over the full operating temperature range of -55°C to +250°C.



EEM PRODUCT INDEX

SECTION 1800

Inductors	PAGE
Coated and molded (MIL-C-15305D)	2•386
Toroids (MIL-T-27C), high current chokes	2•386
Transformers	
DC-DC converter transformers, power transformers	2•387
Custom bobbin coils and custom toroids	2•387

SECTION 2100

Connectors	
Printed circuit, rack and panel, side mount, umbilical, round keyed shell	2•668-2•670

SECTION 3500

Electromechanical Products	
Hysteresis motors, gearhead motors, motor-driven potentiometers, stepping relays	1•944

SECTION 4700

Established Reliability Resistors	
Wirewound and Metal Film... molded and aluminum housed styles	2•1456, 2•1457
Precision Wirewound Resistors	
Axial and radial leads, coated and molded styles	2•1458, 2•1459
Aluminum housed styles for mounting on or through chassis	2•1459, 2•1460

Precision Wirewound Resistors (Continued)	PAGE
Bobbin-wound, non-inductive molded styles	2•1461
Discrete networks	2•1462, 2•1482
Fuse and special resistors	2•1462

Industrial Wirewound Resistors

Silicone coated styles	2•1463
Continuous-wound on fiberglass core, open or cased construction	2•1462

Film Resistors

Deposited carbon...coated and molded styles	2•1466, 2•1469
Metal film...coated and molded styles	2•1467, 2•1468
Metal oxide...coated and molded styles	2•1468, 2•1469
Metal film networks	2•1473-2•1482

Attenuators

Multiple, printed circuit style	2•1470, 2•1471
---------------------------------------	----------------

SECTION 4750

Trimmer Potentiometers	
Wirewound and cermet in military, industrial and commercial styles	2•1644-2•1653

SECTION 5100

Surge Arresters	
Models for PC board, secondary power, high voltage	1•2015

AUTHORIZED U.S. CUSTOMER REPRESENTATIVES

ARIZONA

Scottsdale 85251
Williams & Associates
7117 Third Avenue
Tel: 602-947-4297

CALIFORNIA

Los Alamitos 90720
James S. Heaton Co., South
P.O. Box 206
Tel: 213-598-6676
TWX: 910-341-7295
Redwood City 94063
James S. Heaton Co., North
3696 Haven Avenue
Tel: 415-369-4671
TWX: 910-378-5415

San Diego 92121

James S. Heaton Company
11772 Sorrento Valley Road
Suite 160
Tel: 714-452-1456

COLORADO

Denver 80239
Williams & Associates
4614 Ironton
Tel: 303-373-4730

DISTRICT OF COLUMBIA

Robert L. Wilkinson, Inc.
(See Maryland)

FLORIDA

Palm Beach Gardens 33403
Graham Associates
Box 12221
Tel: 305-622-4049

IDAHO

ES/Chase Co.
(See Oregon)

ILLINOIS

Chicago 60656
D. J. M. Electronic Sales, Inc.
6558 W. Higgins Road
Tel: 312-774-6525
TWX: 910-221-0308

INDIANA

Indianapolis 46226
Scott Electronics, Inc.
8944 East 42nd Street
Suite 210
Tel: 317-897-9976
Fort Wayne 46802
Scott Electronics, Inc.
124 West Washington
Tel: 219-743-1586

IOWA

(See Illinois listing)

KANSAS

Mission 66222
Dale Electronics, Inc.
Suite 214, Foxridge Towers
5700 Broadmoor
Tel: 913-432-9175

KENTUCKY

Louisville 40202
Scott Electronics, Inc.
334 Francis Building
Tel: 502-583-3220

MARYLAND

Towson 21204
Robert L. Wilkinson, Inc.
707 Stevenson Lane
Tel: 301-377-7800

MASSACHUSETTS

Wakefield 01880
Howard C. Jappe
Kaelber & Mack, Inc.
37 Hillcrest Road
Tel: 617-245-9359

MICHIGAN

Detroit 48219
Burcaw Co. & Assoc.
18236 West McNichols Road
Tel: 313-533-7700
Kentwood 49508
Burcaw Co. & Assoc.
1147 Springwood Dr., S.E.
Tel: 616-531-1000

MINNESOTA

Minneapolis 55435
Merrill Franklin Co.
7710 Computer Avenue
Tel: 612-835-6422

MISSOURI

Dale Electronics, Inc.
(See Kansas)

NEW JERSEY

(Southern)
Robert L. Wilkinson, Inc.
(See Pennsylvania)

(Northern)

Fair Lawn 07410
Daniel Miller
Kaelber & Mack, Inc.
9-09 Walsh Place
Tel: 201-797-7782

NEW MEXICO

Albuquerque 87108
Williams & Associates
420 Washington, S.E.
Tel: 505-255-1638

NEW YORK

Buffalo 14202
Maury Farber Associates
203 Jackson Bldg.
220 Delaware Avenue
Tel: 716-856-3543
Manhasset, L. I. 11030
Kaelber & Mack, Inc.
75 Plandome Road
P.O. Box 796
Tel: 516-627-6620

NORTH CAROLINA

Charlotte 28204
Jake Rudisill Associates, Inc.
1225 Harding Place
P.O. Box 4245
Tel: 704-377-6901

OHIO

Columbus 43209
Scott Electronics, Inc.
2677 1/2 Main St.
Tel: 614-236-8619

Dayton 45402

Scott Electronics, Inc.
704 Hulman Bldg.
120 West 2nd Street
Tel: 513-223-2652

Cleveland 44121

Scott Electronics, Inc.
4158 Ruple Road
Tel: 216-291-2600

OKLAHOMA

Tulsa 74114
Edward F. Aymond Company
4624 E. 25th Street
Tel: 918-936-2562

OREGON

Beaverton 97005
ES/Chase Co., P.O. Box 626
Tel: 503-649-6177
TWX: 910-467-8713

PENNSYLVANIA

(Eastern)

Glenside 19038
Robert L. Wilkinson, Inc.
P.O. Box 215
Tel: 215-424-8400

(Western)

Pittsburgh 15238
Scott Electronics, Inc.
1050 Freeport Road
Tel: 412-781-3112

TEXAS

Dallas 75206
Edward F. Aymond Company
Suite 111
4300 N. Central Expressway
Tel: 214-826-7620
TWX: 910-861-4231
Houston 77016
Edward F. Aymond Company
1608 Kowis
Tel: 713-482-5791

VIRGINIA

Robert L. Wilkinson, Inc.
(See Maryland)

WASHINGTON

Edmonds 98020
ES/Chase Co., P.O. Box 249
Tel: 206-774-3586
TWX: 910-449-0871

WISCONSIN

Cambridge 53523
D. J. M. Electronic Sales, Inc.
Route 1, Box 91
Tel: 608-423-4190

CANADA

Scarborough, Ontario
Dale Electronics Canada, Ltd.
18 Howden Road
Tel: 416-759-5631

DALE®

These Dale Distributors maintain an in-depth stock of most Dale products.

ARIZONA

Dalis Electronic Supply
917 North 7th Street
Phoenix 85006
Tel: 602-258-8151

Hamilton/Avnet Corporation
2615 S. 21st Street
Phoenix 85034
Tel: 602-269-1391

CALIFORNIA

Avnet Corporation
10916 Washington Blvd.
Culver City 90230
Tel: 213-559-4111

Frank Shelley Electronics, Inc.
1040 Pico Blvd.
Santa Monica 90405
Tel: 213-392-3913

Shelley-Neumann, Inc.
Suite L
4040 Sorrento Valley Blvd.
San Diego 92121
Tel: 714-453-7133
TWX: 910-337-1276

Hamilton/Avnet Corporation
575 E. Middlefield Road
Mountain View 94040
Tel: 415-961-7000

Hamilton/Avnet Corporation
8917 Complex Drive
San Diego 92123
Tel: 714-279-1550

Shanks & Wright
2045 Kettner Blvd.
San Diego 92101
Tel: 714-239-0176

Shelley-Rodabaugh, Inc.
2444 Old Middlefield Way
Mountain View 94040
Tel: 415-969-1820

COLORADO

Newark-Denver Electronics
2170 So. Grape Street
Denver 80222
Tel: 303-757-3351

Waco Electronics
4616 Ironton Street
Denver 80239
Tel: 303-371-4370

CONNECTICUT

Electro/Comp., Inc.
2415 Main Street
Stratford 06497
Tel: 203-375-5811

FLORIDA

G. S. Marshall Company
10385 Riverside Drive
Palm Beach Gardens 33403
Tel: 305-622-8490

Newark Electronics
1360 N.W. 65th Avenue
Fort Lauderdale 33313
Tel: 305-587-2372

GEORGIA

Jackson Electronics
1135 Chattahoochee Ave., N.W.
Atlanta 30318
Tel: 404-355-2223

ILLINOIS

Allied Radio Corporation
1355 Sleepy Hollow Road
Elgin 60120
Tel: 312-697-8200

Ohm Electronics
649 Vermont Avenue
Palatine 60067
Tel: 312-359-5500

Hamilton/Avnet Electronics
3901 Pace Court
Schiller Park 60176
Tel: 312-678-6310

Bell Industries
7701 North Austin Avenue
Skokie 60076
Tel: 312-282-5400

Newark Electronics
500 North Pulaski Road
Chicago 60624
Tel: 312-638-4411

INDIANA

Ft. Wayne Electronics
3606 Maumee Avenue
Ft. Wayne 46801
Tel: 219-742-4346

Graham Electric Supply, Inc.
133 South Pennsylvania St.
Indianapolis 46204
Tel: 317-634-8202

Ohio Valley Sound
20 E. Sycamore Street
Evansville 47713
Tel: 812-425-6173

Radio Distributing Co.
1212 High Street
South Bend 46624
Tel: 219-287-2911

IOWA

Deeco, Inc.
2500 16th Avenue, S.W.
Cedar Rapids 52405
Tel: 319-365-7551

KANSAS

Radio Supply Co.
115 Laura
Wichita 67211
Tel: 316-267-5216

KENTUCKY

Radio Electronic Equip. Co.
480 Skain Avenue
Lexington 40508
Tel: 606-255-6661

LOUISIANA

Southern Radio Supply Co.
1909 Tulane Avenue
New Orleans 70112
Tel: 504-524-2343

MARYLAND

Radio Electric Service Co.
1026 Cromwell Bridge Road
Baltimore 21204
Tel: 301-823-0070

MASSACHUSETTS

A. W. Mayer Company
38 Border Street
West Newton 02165
Tel: 617-965-1111

Sterling Electronics
51 Spring Street
Watertown 02159
Tel: 617-926-9720

MICHIGAN

Newark Industrial Electric Corp.
3645 Linden Avenue, S.E.
Wyoming 49508
Tel: 616-241-6681

Newark-Detroit Electronics, Inc.
20700 Hubbell Avenue
Oak Park 48237
Tel: 313-548-0250

RS Electronics
12775 Lyndon Street
Detroit 48227
Tel: 313-491-1000

Stotts-Friedman
2035 Eastern, S.E.
Grand Rapids 49507
Tel: 616-241-6731

Wedemeyer Electronic Supply
2280 S. Industrial Highway
Ann Arbor 48107
Tel: 313-665-8611

MINNESOTA

Stark Electronics
112 3rd Avenue, N.
Minneapolis 55401
Tel: 612-332-1325

Gopher Electronics Company
2520 West Larpeur
St. Paul 55113
Tel: 612-645-0241

MISSOURI

Burstein-Applebee Company
3199 Mercier Street
Kansas City 64106
Tel: 816-531-5614

Lectronix, Inc.
306 McDonough Street
St. Charles 63301 (Rear)
Tel: 314-946-6424

Radiolab, Inc.
3814 Main
Kansas City 64111
Tel: 816-561-9935

NEW JERSEY

Allen & Hurley
23 S. Warren Street
Trenton 08608
Tel: 609-393-3300

Garden State Industrial Electronics, Inc.
407 Hope Avenue
Roselle 07203
Tel: 201-241-9000

Wilshire Electronics
312 Clifton Avenue
Clifton 07015
Tel: 201-365-2600

Federated Purchaser
155 U.S. Route 22
Springfield 07081
Tel: 201-376-8900

Newark Electronics Center
303 Monroe Avenue
Kenilworth 07033
Tel: 201-272-8410

Terminal Electronics
1463 Pinewood Street
Rahway Industrial Center
Rahway 07065
Tel: 201-381-5700

NEW MEXICO

Kierulff Electronics Co.
2524 Baylor Drive, S.E.
Albuquerque 87116
Tel: 505-247-1058

Sterling Electronics, Inc.
3530 Pan American
Freeway, N.E.
Albuquerque 87107
Tel: 505-345-6601

NEW YORK

Arrow Electronics, Inc.
900 Broad Hollow Road
Route 110, Farmingdale,
Long Island 11735
Tel: 516-694-6800

Fairmont Electronics
35 South Service Road
Plainville 11803
Tel: 516-694-8200

Hallmark Electronics
215 Oser Avenue
Hauppauge 11787
Tel: 516-273-0030

Harrison Radio Corp.
20 Smith Street,
E. Farmingdale,
Long Island 11735
Tel: 516-293-7990

Higgins & Sheer
123 Dutchess Turnpike
Poughkeepsie 12603
Tel: 914-471-3510

Midway Industrial Electronics, Inc.
24 Maple Avenue
Rockville Centre 11571
Tel: 516-764-2400
TWX: 510-225-3661

Radio Equipment Corp.
196 Vulcan Street
Buffalo 14207
Tel: 716-874-2690

Rome Electronics
216 Erie Blvd., East
Rome 13440
Tel: 315-337-5400

Simcona Electronics Corp.
275 Mt. Read Blvd.
Rochester 14611
Tel: 716-328-3230

Stack Industrial Electronics
45 Washington Avenue
Binghamton 13902
Tel: 607-723-6326

Summit Dist., Inc.
916 Main
Buffalo 14202
Tel: 716-884-3450

Valley Industrial Electronics, Inc.
Commercial Drive
Yorkville 13495
Tel: 315-736-3393

Wilshire Electronics
617 Main Street
Johnson City 13790
Tel: 607-797-1236

NORTH CAROLINA

Brownell-Electro
5141 Bellhaven Blvd.
Charlotte 28214
Tel: 704-394-4341

Kirkman Electronics, Inc.
901 West Second St.
Winston-Salem 27102
Tel: 919-724-0541

OHIO

Hughes-Peters, Inc.
4865 Duck Creek Road
Cincinnati 45227
Tel: 513-351-2000

Hughes-Peters, Inc.
481 East 11th Avenue
Columbus 43211
Tel: 614-294-5351

Lima Radio
150 W. Grand Avenue
Lima 45802
Tel: 419-228-1220

NASCO, Inc.
3203 Plainfield Road
Dayton 45432
Tel: 513-253-8843

Pioneer/Dayton
1900 Troy Street
Dayton 45404
Tel: 513-236-9900

Pioneer Standard Electronics
4800 E. 131st Street
Cleveland 44105
Tel: 216-587-3600

W. M. Pattison Supply Co.
4550 Willow Parkway
Cleveland 44125
Tel: 216-441-3000

Plaintronics Co.
P.O. Box 2265
3100 Plainfield Rd.
Kettering 45429
Tel: 513-253-9176

Winteradio Electronics Supply Corp.
1468 West 25th Street
Cleveland 44113
Tel: 216-621-9383

OKLAHOMA

Oil Capitol Electronics
708 S. Sheridan, Box GG
Tulsa 74115
Tel: 918-836-2541

Radio, Inc.
1000 South Main
Tulsa 74119
Tel: 918-587-9123

OREGON

Almac-Strom Electronics
P.O. Box 25444
Portland 97201
Tel: 503-292-3534
TWX: 910-464-6105

PENNSYLVANIA

Cameradio Company
2801 Liberty Avenue
Pittsburgh 15222
Tel: 412-288-2600

Herbach & Rademan, Inc.
401 E. Erie Avenue
Philadelphia 19134
Tel: 215-426-1700

RPC Electronics

620 Alpha Drive
Pittsburgh 15238
Tel: 412-782-3770

RHODE ISLAND

William Dandreta & Co.
28 Wolcott Street
Providence 02908
Tel: 401-861-2800

TENNESSEE

Electra Distributing Co.
1914 West End Avenue
Nashville 37203
Tel: 615-329-3971

TEXAS

Lenert Company
P.O. Box 2184
1420 Hutchins
Houston 77001
Tel: 713-225-1465

Sterling Electronics
P.O. Box 1229
Houston 77001
Tel: 713-623-6600

McNichols, Inc.
3012 East Yandell Drive
El Paso 79903
Tel: 915-566-2936

Sterling Electronics, Inc.
P.O. Box 20129
2875 Merrell Road
Dallas 75220
Tel: 214-357-9131

Textronics Company
1108 E. Lancaster
Fort Worth 76102
Tel: 817-335-8111
TWX: 910-893-4099

VIRGINIA

I.T.R.
1425 Blue Jay Lane
Richmond 23229
Tel: 804-288-7198
804-285-3931

WASHINGTON

Hamilton/Avnet Corporation
13407 Northrup Way
Bellevue 98005
Tel: 206-624-5930

Radar Electric Co., Inc.
168 Western Avenue, West
Seattle 98119
Tel: 206-282-2511

Almac-Strom Electronics
5811 Sixth Avenue, S.
Seattle 98108
Tel: 206-763-2300
TWX: 910-444-2067

WEST VIRGINIA

McJunkin Corporation
P.O. Box 513
Charleston 25322
Tel: 304-348-5211

Need E-Rel Components?

We helped write the book!

Don't spin your wheels when you shift to established reliability from standard military specifications. Dale has the QPLs and the finished goods stock to save you valuable time. We're offering fast delivery on many established reliability part numbers for both wirewound and metal film resistors and wirewound trimmers.

Fast delivery on many styles

And we can deliver something else, too: *Experience.* Our work in the Minuteman program led to the formulation of the first specifications for established reliability resistors. Since then our materials improvement and failure rate documentation programs have become models in the industry. Today our AGS resistors have a proven failure rate of .000032% per 1,000 hours. *That's established reliability.* Put it to work for you now. Call 402-564-3131 (wirewound styles) or 402-371-0080 (film styles) or dial 800-645-9200 for the name of your Dale representative.



DALE ELECTRONICS, INC.
Columbus, Nebr. 68601
A subsidiary of The Lionel Corporation
In Canada: Dale Electronics Canada Ltd.
In Europe: Dale Electronics GMBH,
8 Munchen 60, Falkweg 51, West Germany

ESTABLISHED RELIABILITY

ESTABLISHED
RELIABILITY

MIL-R-39007, MIL-R-39009
MIL-R-39015, MIL-R-39017
MIL-R-55182

MIL-R-39007
MIL-R-39009
MIL-R-39015
MIL-R-39017
MIL-R-55182





WIREWOUND RESISTORS

APPLICABLE MIL. ENVIRONMENTAL SPECIFICATIONS

■ MIL-R-26

TYPES RS, G, RLS & GL

TEST	MIL-R-26E REQUIREMENT	DALE MAXIMUM RS, G, RLS & GL*
Load Life	$\pm (.5\%+.05\Omega) \Delta R$	$\pm (.5\%+.05\Omega) \Delta R$
Moisture Resistance	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.2\%+.05\Omega) \Delta R$
Temp. Coefficient	30-90 PPM/°C Max.	See tables
Thermal Shock	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.2\%+.05\Omega) \Delta R$
Short Time Overload	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.2\%+.05\Omega) \Delta R$
Dielectric	$\pm (.1\%+.05\Omega) \Delta R$	$\pm (.1\%+.05\Omega) \Delta R$
Low Temp. Storage	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.2\%+.05\Omega) \Delta R$
High Temp. Exposure	$\pm (.5\%+.05\Omega) \Delta R$	$\pm (.5\%+.05\Omega) \Delta R$
Shock	$\pm (.1\%+.05\Omega) \Delta R$	$\pm (.1\%+.05\Omega) \Delta R$
Vibration	$\pm (.1\%+.05\Omega) \Delta R$	$\pm (.1\%+.05\Omega) \Delta R$
Terminal Strength	$\pm (.1\%+.05\Omega) \Delta R$	$\pm (.1\%+.05\Omega) \Delta R$

All ΔR figures shown are maximum, based on units with an initial tolerance of 1% and maximum operating temperature of 275°C.

*GL & RLS physical configurations are not covered in MIL-R-26. Environmental specifications will be same as for RS & G styles.

TYPES CW, HL, NHL, HLM, HLA, HLT & HLW

TEST	MIL-R-26E REQUIREMENT	DALE TYPICAL* HL Tubular & Flat	DALE TYPICAL CW
Load Life	$\pm (3\%+.05\Omega) \Delta R$	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.05\%+.05\Omega) \Delta R$
Moisture Resistance	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.05\%+.05\Omega) \Delta R$	$\pm (.05\%+.05\Omega) \Delta R$
Temp. Coefficient	260-400 PPM/°C	± 50 PPM/°C except on low values	± 50 PPM/°C except on low values
Thermal Shock	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.05\%+.05\Omega) \Delta R$	$\pm (.02\%+.05\Omega) \Delta R$
Short Time Overload	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.05\%+.05\Omega) \Delta R$	$\pm (.02\%+.05\Omega) \Delta R$
Dielectric	$\pm (.01\%+.05\Omega) \Delta R$	$\pm (.01\%+.05\Omega) \Delta R$	$\pm (.01\%+.05\Omega) \Delta R$
Low Temp. Storage	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.02\%+.05\Omega) \Delta R$	$\pm (.02\%+.05\Omega) \Delta R$
High Temp. Exposure	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.1\%+.05\Omega) \Delta R$	$\pm (.1\%+.05\Omega) \Delta R$
Shock	$\pm (.02\%+.05\Omega) \Delta R$	N/A	$\pm (.01\%+.05\Omega) \Delta R$
Vibration	$\pm (.02\%+.05\Omega) \Delta R$	N/A	$\pm (.01\%+.05\Omega) \Delta R$
Terminal Strength	$\pm (.1\%+.05\Omega) \Delta R$	$\pm (.01\%+.05\Omega) \Delta R$	$\pm (.01\%+.05\Omega) \Delta R$

ΔR figures shown are based on units with an initial tolerance of 5% and maximum operating temperature of 350°C.

*NHL, HLM, HLA and HLW physical configurations are not covered in MIL-R-26. However, environmental specifications will be same as for HL tubular and HL flat styles.

■ MIL-R-18546

TYPES RH, HG & PH

TEST	MIL-R-18546	DALE TYPICAL RH, HG & PH*
Load Life	$\pm (.1\%+.05\Omega) \Delta R$	$\pm (.5\%+.05\Omega) \Delta R$
Moisture Resistance	$\pm (.1\%+.05\Omega) \Delta R$	$\pm (.5\%+.05\Omega) \Delta R$
Resistance Temperature Characteristic	± 50 PPM to 2000Ω ± 30 PPM over 2000Ω	See tables
Thermal Shock	$\pm (.5\%+.05\Omega) \Delta R$	$\pm (.25\%+.05\Omega) \Delta R$
Momentary Overload	$\pm (.5\%+.05\Omega) \Delta R$	$\pm (.25\%+.05\Omega) \Delta R$
Dielectric	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.1\%+.05\Omega) \Delta R$
High Temp. Storage	$\pm (.5\%+.05\Omega) \Delta R$	$\pm (.25\%+.05\Omega) \Delta R$
Shock	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.1\%+.05\Omega) \Delta R$
Vibration	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.1\%+.05\Omega) \Delta R$
Terminal Strength	$\pm (.2\%+.05\Omega) \Delta R$	$\pm (.1\%+.05\Omega) \Delta R$

All ΔR figures shown are based on units with an initial tolerance of 1% and maximum operating temperatures of 275°C.

*PH physical configuration is not covered in MIL-R-18546. However, environmental specifications will be same as for RH & HG styles.

■ MIL-R-93

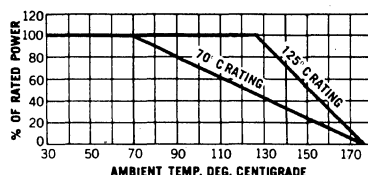
TYPES WWA, MWA & WWP

TEST	MIL-R-93 REQUIREMENT	DALE MAXIMUM	DALE TYPICAL
Moisture	$\pm (.1\%+.05\Omega)$	$\pm (.05\%+.05\Omega) \Delta R$	$\pm .02\% \Delta R$
T.C. (10 ohms and over)	± 20 ppm/°C	± 20 ppm/°C	± 15 ppm/°C
Short Time Overload	$\pm (.1\%+.05\Omega)$	$\pm (.05\%+.05\Omega) \Delta R$	$\pm .01\% \Delta R$
Dielectric	$\pm (.05\%+.05\Omega)$	$\pm (.02\%+.05\Omega) \Delta R$	$\pm .00\% \Delta R$
Low Temp. Storage	$\pm (.2\%+.05\Omega)$	$\pm (.05\%+.05\Omega) \Delta R$	$\pm .02\% \Delta R$
High Temp. Exposure	$\pm (.5\%+.05\Omega)$	$\pm (.10\%+.05\Omega) \Delta R$	$\pm .04\% \Delta R$
Low Temp. Operation	$\pm (.25\%+.05\Omega)$	$\pm (.05\%+.05\Omega) \Delta R$	$\pm .02\% \Delta R$
Temperature Cycling	$\pm (.2\%+.05\Omega)$	$\pm (.15\%+.05\Omega) \Delta R$	$\pm .07\% \Delta R$
Terminal Strength	$\pm (.05\%+.05\Omega)$	$\pm (.01\%+.05\Omega) \Delta R$	$\pm .00\% \Delta R$
Salt Water	$\pm (.25\%+.05\Omega)$	$\pm (.15\%+.05\Omega) \Delta R$	$\pm .03\% \Delta R$
Life	$\pm (.5\%+.05\Omega)$	$\pm (.25\%+.05\Omega) \Delta R$	$\pm .09\% \Delta R$
Shock	$\pm (.1\%+.05\Omega)$	$\pm (.02\%+.05\Omega) \Delta R$	$\pm .00\% \Delta R$
Vibration	$\pm (.1\%+.05\Omega)$	$\pm (.03\%+.05\Omega) \Delta R$	$\pm .01\% \Delta R$

All ΔR figures shown are based on units with an initial tolerance of 1% and maximum operating temperature of 145°C.

DEPENDABLE**DALE****RESISTORS****METAL FILM PRECISION RESISTORS, ESTABLISHED RELIABILITY****■ TYPE EMF**

Failure Rate: Consult factory for current verified failure rate.

**DERATING**

Dale EMF resistors have an operating temperature range of -65° C to +175° C. They must be derated according to the curve above.

DALE TYPE	MIL. TYPE*	70° C RATING	125° C RATING	MAX. WT. (Grams)	MAX. WORKING VOLTAGE	RESISTANCE RANGE (OHMS) By T.C.**		
						T-1 (K)	T-2 (H)	T-9 (J)
EMF 50	RNR50	1/10 w	1/20 w	.11	200	49.9 to 100K	49.9 to 100K	49.9 to 100K
EMF 55	RNR55	1/8 w	1/10 w	.35	200	30.1 to 301K	49.9 to 200K	49.9 to 200K
EMF 60	RNR60	1/4 w	1/8 w	.45	250	24.9 to 1 Meg.	49.9 to 499K	49.9 to 499K
EMF 65	RNR65	1/2 w	1/4 w	.84	300	24.9 to 2 Meg.	49.9 to 1 Meg.	49.9 to 1 Meg.
EMF 70	RNR70	3/4 w	1/2 w	1.6	350	24.9 to 2.49 Meg.	24.9 to 1 Meg.	24.9 to 1 Meg.
EMF 75	—	—	1 w	4.4	500	24.9 to 4.07 Meg.	49.9 to 2.61 Meg.	49.9 to 2.61 Meg.

Standard Resistance Tolerances: .1% (B), .25% (.5) (D) and 1% (F).

*Available in corresponding RNC & RNN styles.

**Extended resistances above and below this range available as Non-MIL parts.

DIMENSIONS

See section on MF resistors. Dimensions on Types RNR50 thru RNR70 will conform to Types RN-50 thru RN-70.

Note: EMF 75 conforms to RN-75.

POWER RATING

Dale EMF power ratings are based on the following two conditions:

1. 0.5% maximum ΔR in 2000 hours load life.
2. 175° C maximum operating temperature.

WIREWOUND PRECISION RESISTORS, ESTABLISHED RELIABILITY**■ TYPE ARS***

Failure rate .000014% per 1000 hours at 50% rated power, 25°C ambient (60% confidence level). Failure defined as $\Delta R > 0.5\%$.

■ TYPE AGS*

Miniature version of ARS Series with BeO core for optimum thermal conductivity, operational stability and increased reliability. Significantly smaller size. Failure rate .000044% per 1000 hours at 50% rated power, 25°C ambient (60% confidence level). Failure defined as $\Delta R > 0.5\%$.

*Available with solderable and weldable leads. AGS-1, AGS-3 have molded construction. Non-inductive styles available.

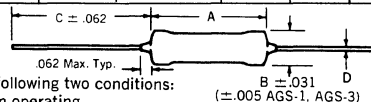
DALE TYPE	MIL-R-39007 TYPE	POWER RATING (watts)	MIN. RES. (ohms)	MAX. RES. (ohms)	MAX. WORKING VOLTAGE	MAX. WEIGHT (grams)	DIM. A	DIM. B	DIM. C	DIM. D
ARS-2	RWR-71	2	0.1	16.2K	180	1.6	.812±.062	.187	1.5	.032
ARS-5	RWR-74	5	0.1	12K	250	4.75	.875±.062	.312	2.0	.040
ARS-10	RWR-78	10	0.1	40K	650	12.00	1.780±.062	.375	2.0	.040
AGS-1	RWR-81	1	0.1	1.0K	25	.35	.276±.005	.100	1.5	.020
AGS-2	RWR-82	1.5	0.1	1.3K	32	.30	.312±.016	.078	1.5	.020
AGS-3	RWR-80	2.25	0.1	3.16K	52	.375	.426±.005	.120	1.5	.020
AGS-5	RWR-89	4	0.1	4.12K	112	1.25	.560±.062	.187	1.5	.032
AGS-10	RWR-84	7	0.1	12.4K	275	4.25	.875±.062	.312	2.0	.040

Tolerance: All established reliability resistors have a standard resistance tolerance of 1%.

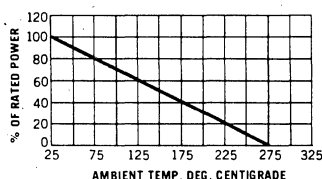
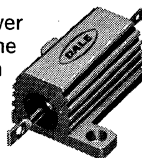
POWER RATING

Dale ARS and AGS power ratings are based on the following two conditions:

1. 0.5% maximum ΔR in 2000 hours load life.
2. 275° C maximum operating temperature.

**■ TYPE ARH**

Advanced design: housed power wirewounds made on the same line and under the same high reliability standards as the ARS and AGS. Failure rate of .01% at 100% rated power.

**DERATING
ARS, AGS, ARH**

At high ambient temperatures, the derating curve above applies.

DALE TYPE	MIL-R- 39009 TYPE	POWER RATING (watts)		RESISTANCE RANGES (ohms)		MAX. WORKING VOLTAGE	MAX. WT. GRAMS
		MTD.	FREE AIR	MIN.	MAX.		
ARRH-5	RER-60	5	3	.1	4.12K	220	3
ARRH-10	RER-65	10	6	.1	5.62K	340	8
ARRH-25	RER-70	20	8	.1	12.1K	650	15
ARRH-50	RER-75	30	10	1.0	39.2K	1400	32

Tolerance: All established reliability resistors have a standard resistance tolerance of 1%.Non-inductive versions also available.

DIMENSIONS: See section on RH resistors.
Types ARH-5 thru 50 will correspond with RH-5 thru 50.

POWER RATING

Dale ARH resistor ratings are based on the following requirements:

1. 275° maximum internal hotspot temperature
2. 1% maximum ΔR in 2000 hour load life
3. Proper heat sink

4x6x2x.040 aluminum chassis = ARH-5 and ARH-10
5x7x2x.040 aluminum chassis = ARH-25 and ARH-50

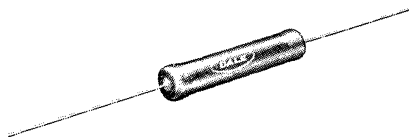
For additional information on Dale Resistors, write or call:

Box 609, Columbus, Nebraska 68601 • 402-564-3131 • Wirewound Resistors

Box 74, Norfolk, Nebraska 68701 • 402-371-0080 • Film Resistors & Networks

DEPENDABLE**DALE®****RESISTORS****WIREWOUND PRECISION RESISTORS, ESTABLISHED RELIABILITY**

(M FAILURE RATE)

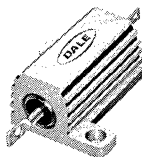


- **TYPE ESS** (Solderable Leads)
- **TYPE ESN*** (Solderable Leads, Non-Inductive)
- **TYPE ESW** (Weldable Leads)
- **TYPE EGS** (Solderable Leads)
- **TYPE EGN*** (Solderable Leads, Non-Inductive)
- **TYPE EGW** (Weldable Leads)

These styles meet the requirements of MIL-R-39007 Failure Rate Level M (1%/1000 hours). See ARS and AGS for lower failure rates.

POWER RATING

Power ratings are based on a maximum ΔR of .5% $\pm .05\Omega$ when operated for 2,000 hours at rated power and at an ambient of +25°C.



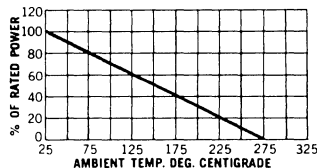
- **TYPE ERH** (Inductive Winding)
- **TYPE ENH** (Non-inductive Winding)

Meet the requirements of MIL-R-39009 Failure Rate Level M (1%/1000 hours). See ARH for lower failure rates.

POWER RATING

Dale ERH and ENH resistor ratings are based on the following requirements:

1. 275°C maximum internal hotspot temperature
 2. 1% maximum ΔR in 2000 hour load life
 3. Proper heat sink
- 4x6x2x.040 aluminum chassis = ERH-5 & ERH-10
5x7x2x.040 aluminum chassis = ERH-25 & ERH-50

**DERATING**

ESS, ESW, EGS, EGW, ERH, ENH
At high ambient temperatures, the derating curve above applies.

RELIABILITY PROGRAMS

The established reliability series are the result of an extensive reliability program at Dale Electronics which includes basic design and materials improvement, special production and test facilities, and trained, reliability-oriented personnel. A separate program group has been set up to provide customer service on

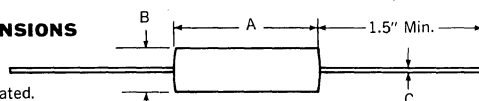
established reliability programs, and the facilities and know-how of the Dale established reliability organization can be directed toward the development of reliability programs for specific user requirements. Inquiries may be directed to your local Dale representative or to the factory.

DALE TYPE	MIL-R-39007 TYPE	POWER RATING (Watts)	RESISTANCE RANGE (Ohms)		MAX. WEIGHT (Grams)	DIMENSIONS		
			.1%	.5% & 1%		A	B	C
EGS-1*	RWR-81S	1	.499-1000	.1-1000	.21	.250	.078	.020
EGW-1*	RWR-81W	1	.499-1000	.1-1000	.21	.250	.078	.020
EGN-1*	RWR-81N	1	10-499	10-499	.21	.250	.078	.020
EGS-2*	RWR-82S	1.5	.499-1300	.1-1300	.23	.312	.078	.020
EGW-2*	RWR-82W	1.5	.499-1300	.1-1300	.23	.312	.078	.020
EGS-3*	RWR-80S	2	.499-2670	.1-2670	.34	.422	.110	.020
EGW-3*	RWR-80W	2	.499-2670	.1-2670	.34	.422	.110	.020
EGN-3*	RWR-80N	2	10-1330	10-1330	.34	.422	.110	.020
ESS-2B	RWR-89S	3	.499-4120	.1-4120	.70	.560	.187	.032
ESW-2B	RWR-89W	3	.499-4120	.1-4120	.70	.560	.187	.032
ESN-2B	RWR-89N	3	10-2050	10-2050	.70	.560	.187	.032
ESS-5	RWR-74S	5	.499-12,100	.1-12,100	4.2	.875	.312	.040
ESW-5	RWR-74W	5	.499-12,100	.1-12,100	4.2	.875	.312	.040
ESN-5	RWR-74N	5	10-6040	10-6040	4.2	.875	.312	.040
EGS-10	RWR-84S	7	.499-12,400	.1-12,400	3.6	.875	.312	.040
EGN-10	RWR-84N	7	10-6190	10-6190	3.6	.875	.312	.040
EGW-10	RWR-84W	7	.499-12,400	.1-12,400	3.6	.875	.312	.040
ESS-10	RWR-78S	10	.499-39,200	.1-39,200	9.0	1.780	.375	.040
ESW-10	RWR-78W	10	.499-39,200	.1-39,200	9.0	1.780	.375	.040
ESN-10	RWR-78N	10	10-19,600	10-19,600	9.0	1.780	.375	.040

Tolerance:

All established reliability resistors have a standard resistance tolerance of 1%.

*Molded models. Others conformal coated.

DIMENSIONS

DALE TYPE	MIL-R-39009 TYPE	POWER RATING (Watts)		RESISTANCE RANGE (Ohms) 1%	MAX. WORKING VOLTAGE	MAX. WEIGHT (Grams)	STANDARD TEMPERATURE COEFFICIENT VALUE RANGES (Ohms)		
		DALE*	MIL				± 50 PPM	± 30 PPM	± 20 PPM
ENH-5	RER-40	7.5 (5)	5	1 to 1.65K	110	3.3	1 to 9.9	10 to 25	26 to 1.65K
ENH-10	RER-45	12.5 (10)	10	1 to 2.8K	190	8.8	1 to 9.9	10 to 40	41 to 2.8K
ENH-25	RER-50	25	20	1 to 6.04K	390	16.5	1 to 9.9	10 to 85	86 to 6.04K
ENH-50	RER-55	50	30	1 to 19.6K	890	35.0	1 to 9.9	10 to 235	236 to 19.6K
ERH-5	RER-60	7.5 (5)	5	0.10 to 3.32K	160	3	1 to 9.9	10 to 49	50 to 3.32K
ERH-10	RER-65	12.5 (10)	10	0.10 to 5.62K	265	6	1 to 9.9	10 to 79	80 to 5.62K
ERH-25	RER-70	25	20	0.10 to 12.1K	550	13	1 to 9.9	10 to 169	170 to 12.1K
ERH-50	RER-75	50	30	0.10 to 39.2K	1250	28	1 to 9.9	10 to 469	470 to 39.2K

Tolerance: All established reliability resistors have a standard resistance tolerance of 1%.

*Figures in parentheses indicate wattage printed on these resistors. They can be rated at 7.5 and 12.5 watts respectively, but will be printed with these higher ratings only upon request.

DIMENSIONS

See section on RH resistors. Types ENH and ERH-5 thru 50 will correspond with RH-5 thru 50.

DOCUMENTATION

Qualification, acceptance and failure-rate maintenance test data is retained by Dale and is available upon request. Lot traceability and identification data is maintained by Dale for 5 years.

DEPENDABLE**DALE****RESISTORS****WIREWOUND PRECISION RESISTORS, SILICONE COATED OR MOLDED**

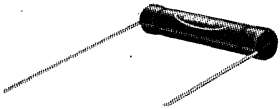
(Available with Weldable Leads)

■ TYPE RS

Meets applicable requirements of MIL-R-26E, MIL-R-26C and MIL-R-23379. Non-inductive (NS) styles available.

■ TYPE LVR

Combines extremely low resistance values with high power and low T.C. Molded body, axial leads.

■ TYPE RLS

Radial leads for printed circuit board mounting. Meets applicable requirements of MIL-R-26E. Non-inductive (NLS) styles available.

DALE TYPE	MIL-R-26 TYPE*	DALE RATING		RESISTANCE RANGE (Ohms)				MAX. ** WORKING VOLTAGE		MAX. WT. GRAMS
		U .05% thru 5%	V 3% & 5%	.05%	.1%	.25%	.5%, 1%, 3%, 5%	U	V	
** RS-1/8	—	.25 W	—	—	—	—	1-950	8.5	—	.15
RS-1/4	—	.4W	—	1-950	.499-950	.499-3.4K	1-3.4K	20	—	.21
RS-1/2	—	.75 W	—	1-1.3K	.499-1.3K	.499-4.9K	1-4.9K	29	—	.23
RS-1A	RW-70	1.0 W	—	1-2.7K	.499-2.7K	.499-10.4K	1-10.4K	52	—	.34
RS-1B	—	1.1 W	—	1-4.0K	.499-4K	.499-15K	1-15K	62	—	.40
RS-2	—	4.0 W	5.5 W	.499-12.7K	.499-12.7K	1-47.1K	1-47.1K	210	250	2.1
RS-2A	—	3.25 W	4.75 W	.499-11.4K	.499-11.4K	1-42.1K	1-42.1K	185	220	.90
RS-2B	RW-79	3.0 W	3.75 W	.499-6.5K	.499-6.5K	1-24.5K	1-24.5K	140	157	.70
RS-2C	—	2.5 W	3.25 W	.499-8.6K	.499-8.6K	1-32.3K	1-32.3K	138	157	1.6
RS-2C-23	RW-69	2.5 W	3.25 W	.499-8.6K	.499-8.6K	1-32.3K	1-32.3K	138	157	1.6
RS-5	—	5.0 W	6.5 W	.499-25.7K	.499-25.7K	1-95.2K	1-95.2K	360	410	4.2
RS-5-69	RW-74	5.0 W	6.5 W	.499-24.5K	.499-24.5K	1-91.0K	1-91.0K	350	400	4.2
RS-5-70	RW-67	5.0 W	6.5 W	.499-25.7K	.499-25.7K	1-95.2K	1-95.2K	360	410	4.2
RS-7	—	7.0 W	9.0 W	.499-41.4K	.499-41.4K	1-154K	1-154K	504	576	4.7
RS-10	—	10 W	13 W	.499-73.4K	.499-73.4K	1-273K	1-273K	858	978	9.0
RS-10-38	RW-78	10 W	13 W	.499-71.5K	.499-71.5K	1-265K	1-265K	846	966	9.0
RS-10-39	RW-68	10 W	13 W	.499-73.4K	.499-73.4K	1-273K	1-273K	858	978	9.0

**Max. working voltage determined at .0008 dia. wire resistance values.

Standard Temperature Coefficients: ± 90 ppm, below 1 Ω ; ± 50 ppm, 1 Ω -9.9 Ω ; ± 20 ppm, 10 Ω and beyond.

***MIL-R-26C, MIL-R-23379 TYPES**

DALE TYPE	MIL-R-26C (G & V)	MIL-R-23379
RS-1A	—	RWP-18
RS-2C	RW-69	—
RS-2C-23	—	RWP-20
RS-5	RW-67	RWP-21
RS-10	RW-68	RWP-23

TYPE LVR STANDARD ELECTRICAL SPECIFICATIONS

DALE TYPE	POWER RATING	RESISTANCE RANGE (Ohms) 1%, 3%, 5%, 10%	TEMPERATURE COEFFICIENT ALL MODELS
LVR-2	2 W	.008 to .332	± 150 PPM/ $^{\circ}$ C from +25 $^{\circ}$ C to -55 $^{\circ}$ C
LVR-5	5 W	.010 to .659	± 60 PPM/ $^{\circ}$ C from +25 $^{\circ}$ C to +125 $^{\circ}$ C
LVR-10	10 W	.010 to .800	± 30 PPM/ $^{\circ}$ C from +125 $^{\circ}$ C to +275 $^{\circ}$ C

POWER RATINGS RS, RLS, G SERIES

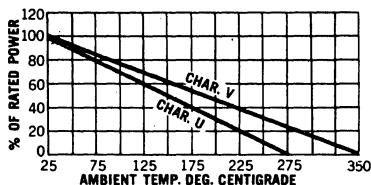
These Series have two power ratings, depending on operating temperature and stability requirements.

CHARACTERISTIC U: 1. 275 $^{\circ}$ C maximum hotspot temperature
2. .5% maximum ΔR in 2000 hour load life

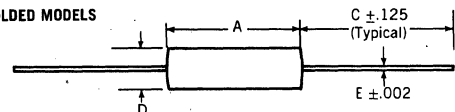
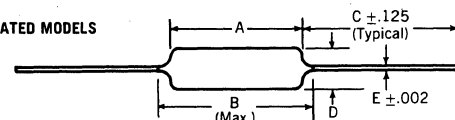
CHARACTERISTIC V: 1. 350 $^{\circ}$ C maximum hotspot temperature
2. 3% maximum ΔR in 2000 hour load life

DERATING RS, RLS, G, LVR

RS, RLS and G coated resistors have an operating temperature range of -55 $^{\circ}$ C to +350 $^{\circ}$ C. Dale RS and LVR molded resistors have an operating temperature range of -55 $^{\circ}$ C to +275 $^{\circ}$ C. They must be derated at high ambient temperatures according to the curves below.

**DIMENSIONS (Consult factory for RLS Types)**

	TYPE	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E
MOLDED MODELS	RS-1/8	.155 $\pm$.015	—	1.500	.065 $\pm$.015	.016
	RS-1/4	.250 $\pm$.015	—	1.500	.078 $\pm$.015	.020
	RS-1/2	.312 $\pm$.015	—	1.500	.078 $\pm$.015	.020
	RS-1A	.422 $\pm$.015	—	1.500	.110 $\pm$.015	.020
	RS-1B	.575 $\pm$.015	—	1.500	.110 $\pm$.015	.020
	LVR-2	.675 $\pm$.010	—	2.00	.250 $\pm$.010	.040
	LVR-5	.927 $\pm$.010	—	2.00	.343 $\pm$.010	.040
	LVR-10	1.828 $\pm$.010	—	2.00	.392 $\pm$.010	.040
	RS-2	.625 $\pm$.062	.765	2.000	.250 $\pm$.032	.040
	RS-2A	.812 $\pm$.062	.890	1.500	.188 $\pm$.032	.032
COATED MODELS	RS-2B	.560 $\pm$.062	.622	1.500	.187 $\pm$.031	.032
	RS-2C	.500 $\pm$.062	.593	1.500	.218 $\pm$.032	.040
	RS-2C-23	.500 $\pm$.062	.593	1.500	.218 $\pm$.032	.032
	RS-5	.875 $\pm$.062	1.000	2.000	.312 $\pm$.032	.040
	RS-5-69	.875 $\pm$.062	.937	2.000	.312 $\pm$.031	.040
	RS-5-70	.875 $\pm$.062	1.000	1.500	.312 $\pm$.031	.032
	RS-7	1.218 $\pm$.062	1.281	2.000	.312 $\pm$.032	.040
	RS-10	1.780 $\pm$.062	1.875	2.000	.375 $\pm$.032	.040
	RS-10-38	1.780 $\pm$.062	1.842	2.000	.375 $\pm$.031	.040
	RS-10-39	1.780 $\pm$.062	1.875	1.500	.375 $\pm$.031	.032

MOLDED MODELS**COATED MODELS**

DEPENDABLE**DALE®****RESISTORS****WIREWOUND PRECISION RESISTORS, SILICONE COATED** (Available with Weldable Leads)**■ TYPE G**

Beryllium oxide core for decreased size, increased stability. Meets applicable specifications of MIL-R-26 and MIL-R-23379. Non-inductive styles available.

■ TYPE GL

Radial leads for printed circuit board mounting. Meets applicable requirements of MIL-R-26E.

DALE TYPE	MIL-R-26 TYPE*	DALE RATING		RESISTANCE RANGE (Ohms)				MAX.** WORKING VOLTAGE		MAX. WT. GRAMS
		U .05% thru 5%	V 3% & 5%	.05%	.1%	.25%	.5%, 1%, 3%, 5%	U	V	
G-1	RW-81	1.0 W	—	1-950	.499-950	.499-3.4K	.1-3.4K	33	—	.20
G-2	—	1.5 W	—	1-1.3K	.499-1.3K	.499-4.9K	.1-4.9K	42	—	.21
G-3	RW-80	2.25 W	—	1-2.7K	.499-2.7K	.499-10.4K	.1-10.4K	80	—	.34
G-5	—	4.0 W	5 W	.499-6.5K	.488-6.5K	.1-24.5K	.1-24.5K	162	184	.80
G-5A	—	4.5 W	6.5 W	.499-11.4K	.499-11.4K	.1-42.1K	.1-42.1K	214	257	.95
G-5C	—	5 W	7 W	.499-8.6K	.499-8.6K	.1-32.3K	.1-32.3K	194	230	1.2
G-6	—	6 W	8 W	.499-12.7K	.499-12.7K	.1-47.1K	.1-47.1K	258	298	2.0
G-10	—	7 W	10 W	.499-25.7K	.499-25.7K	.1-95.2K	.1-95.2K	425	508	3.6
G-12	—	10 W	12 W	.499-41.4K	.499-41.4K	.1-154K	.1-154K	607	665	4.2
G-15	—	15 W	18 W	.499-73.4K	.499-73.4K	.1-273K	.1-273K	1050	1150	7.6

**Maximum Working Voltage determined at .0008 dia. wire resistance values.

***MIL-R-26C, MIL-R-23379 TYPES**

	MIL-R-26C	MIL-R-23379
G-1	—	RWP-17
G-3	—	RWP-19
G-5C	RW-69	—
G-5C-2	—	RWP-20
G-10	RW-67	RWP-21
G-15	RW-68	RWP-23

POWER RATING

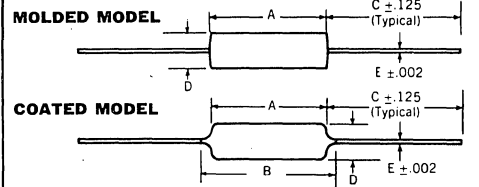
Power ratings of Dale G resistors are 1.4 to 4 times higher than those of conventional wirewound resistors of equivalent size.

Stability When Dale G resistors are operated at the same ratings (Char. U) as conventional Dale RS resistors of equivalent size, the shift in resistance is 50% or less than that of the RS.

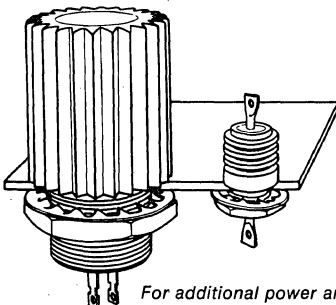
For additional power and derating information, see section on RS resistors.

DIMENSIONS

	TYPE	DIM. A	DIM. B	DIM. C	DIM. D	DIM. E
MOLDED MODELS	G-1	.250±.015	—	1.500	.078±.015	.020
	G-2	.312±.015	—	1.500	.078±.015	.020
	G-3	.422±.015	—	1.500	.110±.015	.020
COATED MODELS	G-5	.562±.062	.640	1.500	.188±.032	.032
	G-5A	.812±.062	.890	1.500	.188±.032	.032
	G-5C	.500±.062	.593	1.500	.218±.032	.040
	G-6	.625±.062	.765	2.000	.250±.032	.040
	G-10	.875±.062	1.000	2.000	.312±.032	.040
	G-12	1.218±.062	1.281	2.000	.312±.032	.040
	G-15	1.780±.062	1.875	2.000	.375±.032	.040

**WIREWOUND POWER RESISTORS, HEAT SINK ENCASED****■ TYPE PH**

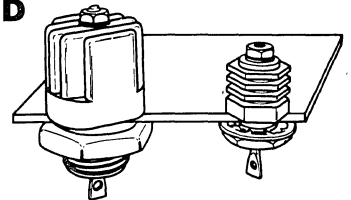
TWO TERMINAL CONFIGURATIONS (PH-10-1, PH-25, PH-50 and PH-100). Thru chassis mounting—two connections required on one or both sides of panel. Meet electrical and environmental requirements of MIL-R-18546.



For additional power and derating information, see section on RH resistors

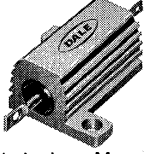
SINGLE TERMINATION, CHASSIS GROUND (PH-10-5 and PH-25-8).

Speeds assembly time as only one connection is required. Often utilized as a drive line resistor in a high speed core memory system using a series termination technique. Non-inductive windings have low reactance properties giving exceptionally fast cycle time.



DALE TYPE	DALE RATING (WATTS)	RESISTANCE RANGES (OHMS)		MAX. WORKING VOLTAGE	MAX.* WT. (GRAMS)	STANDARD TEMPERATURE COEFFICIENT VALUE RANGES (OHMS)†		
		.05%, .1%, .25%	.5%, 1%, 3%			±50 PPM	±30 PPM	±20 PPM
PH-10A	10	1 to 12.7K	.1 to 47.1K	240	6	1 to 9.9	10 to 79	80 to 47.1K
PH-10-1	10	1 to 12.7K	.1 to 47.1K	240	6	1 to 9.9	10 to 79	80 to 47.1K
PH-10-5	10	.5 to 6.3K	.1 to 23.5K	170	6	1 to 9.9	10 to 79	80 to 23.5K
PH-25	25	.5 to 25.7K	.1 to 95.2K	425	22	1 to 9.9	10 to 169	170 to 95.2K
PH-25-8	25	.25 to 12.8K	.1 to 47.7K	300	22	1 to 9.9	10 to 169	170 to 47.7K
PH-50	50	3 to 52K	.1 to 75K	1500	80	1 to 99	100 to 999	1K to 75K
PH-100	100	5 to 35K	.1 to 50K	1700	186	1 to 99	100 to 999	1K to 50K

*A weight increase of 10% should be allowed for non-inductive types. †Consult factory for values below 1Ω and for special T.C. requirements.

DEPENDABLE**DALE****RESISTORS****WIREWOUND POWER RESISTORS, HEAT SINK ENCASED**

Patented design. Mount to the chassis. Provide high power and precision tolerance in a variety of sizes, mounting and terminal configurations. RH and HG types exceed MIL-R-18546. Non-inductive NH styles available.

■ TYPE RH

5 through 250 watts. Bonus power dissipation ability within MIL-R-18546 size.

■ TYPE HG

Beryllium oxide core for optimum heat dissipation. Doubles Mil. Spec. power at no increase in size. Exceptional stability at mil. levels.

DALE TYPE	MIL-R-18546 TYPE	POWER RATING* (WATTS)		RESISTANCE RANGES (OHMS)		MAX. WORKING VOLTAGE	MAX. WT. GRAMS	STANDARD TEMPERATURE COEFFICIENT VALUE RANGES (OHMS)/†		
		DALE**	MIL	.05%, .1%, .25%	.5%, 1%, 3%			±50 PPM	±30 PPM	±20 PPM
RH-5	RE-60	7.5 (5)	5	1 to 6.5K	.1 to 24.5K	160	3	1 to 9.9	10 to 49	50 to 24.5K
RH-10	RE-65	12.5 (10)	10	1 to 12.7K	.008 to 47.1K	265	6	1 to 9.9	10 to 79	80 to 47.1K
RH-25	RE-70	25	20	.5 to 25.7K	.01 to 95.2K	550	13	1 to 9.9	10 to 169	170 to 95.2K
RH-50	RE-75	50	30	.5 to 73.4K	.01 to 273K	1250	28	1 to 9.9	10 to 469	470 to 273K
RH-100	RE-77	100	75	.3 to 50K	.1 to 50K	1900	400	1 to 99	100 to 949	950 to 50K
RH-250	RE-80	250	120	.3 to 75K	.1 to 75K	2300	800	1 to 99	100 to 999	1K to 75K
HG-5	RE-60	15	5	1 to 6.5K	.1 to 24.5K	220	3	1 to 9.9	10 to 49	50 to 24.5K
HG-10	RE-65	20	10	1 to 12.7K	.1 to 47.1K	340	6	1 to 9.9	10 to 79	80 to 47.1K
HG-25	RE-70	35	20	.5 to 25.7K	.1 to 95.2K	650	13	1 to 9.9	10 to 169	170 to 95.2K
HG-50	RE-75	50	30	.5 to 73.4K	.1 to 273K	1400	28	1 to 9.9	10 to 469	470 to 273K

*Rating is based on chassis mounting area and stability.

**NOTE: Figures in parentheses on RH-5 and RH-10 indicate wattage printed on these resistors. New construction allows them to be rated at 7.5 and 12.5 watts—but they will be printed with these higher ratings only upon customer request.

†A weight increase of 10% should be allowed for non-inductive styles.

‡Consult factory for values below 1 ohm and for special T.C. requirements.

POWER RATING RH, HG, PH TYPES

Dale housed resistor ratings are based on the following requirements:

- 275°C maximum internal hotspot temperature
- 1% maximum ΔR in 1000 hour load life for RH-5, 10, 25, 50; PH-10, 25, 50. 3% maximum ΔR in 1000 hour load life for RH-100, 250; PH-100.
- Proper heat sink.
 4x6x2x.040 aluminum chassis = RH-5, 10; HG-5, 10; PH-10
 5x7x2x.040 aluminum chassis = RH-25; HG-25, 50; PH-25
 12x12x.059 aluminum panel = RH-50
 12x12x.125 aluminum panel = RH-100, 250; PH-50, 100

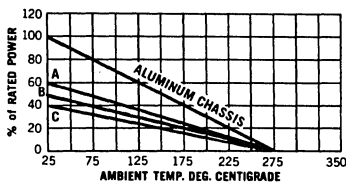
DERATING

Dale housed resistors have an operating temperature range of -55°C to +275°C. Derating is required for reduced chassis mounting area and for high ambient temperatures. The following curves apply to operation of unmounted resistors:

A = RH-5, 10

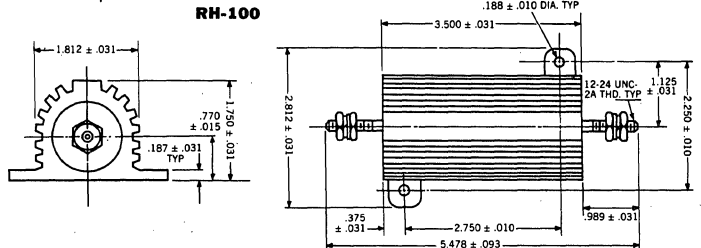
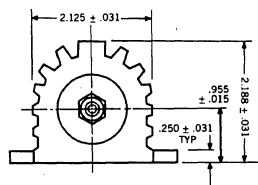
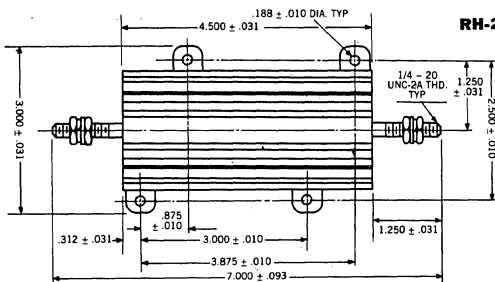
B = RH-25; PH-10, 25

C = RH-50, 100, 250; PH-50, 100; HG-5, 10, 25, 50

**DIMENSIONS—5 thru 50 WATT MODELS—ARH, ERH, RH & HG**

TYPE*	A	B	C	D	E	F	G	H	J	K	L	M	N	P
RH-5, HG-5	±.444 ±.005	±.490 ±.005	±.600 ±.031	±.125 ±.062	±.334 ±.015	±.646 ±.015	±.320 ±.015	±.065 ±.010	±.133 ±.010	±.078 ±.010	±.093 ±.005	±.078 ±.015	±.050 ±.005	±.262 ±.062
RH-10, HG-10	±.562 ±.005	±.625 ±.005	±.750 ±.031	±.1375 ±.062	±.420 ±.015	±.800 ±.015	±.390 ±.015	±.075 ±.010	±.165 ±.010	±.093 ±.010	±.093 ±.005	±.102 ±.015	±.086 ±.005	±.312 ±.062
RH-25, HG-25	±.719 ±.005	±.781 ±.005	±.1.062 ±.031	±.1.938 ±.062	±.550 ±.015	±.1.080 ±.015	±.546 ±.015	±.088 ±.010	±.231 ±.010	±.172 ±.010	±.125 ±.005	±.115 ±.015	±.086 ±.005	±.438 ±.062
RH-50, HG-50	±.1.563 ±.005	±.844 ±.005	±.1.968 ±.031	±.2.781 ±.062	±.630 ±.015	±.1.140 ±.015	±.610 ±.015	±.088 ±.010	±.260 ±.010	±.196 ±.010	±.125 ±.005	±.107 ±.015	±.086 ±.005	±.406 ±.062

*Types ARH, ERH, ENH 5 thru 50 correspond with RH-5 thru 50 dimensions.

RH-100**RH-250**

For additional information, write or phone:
DALE ELECTRONICS, INC.
 Box 609, Columbus, Nebr. 68601 (402-564-3131)

DEPENDABLE**DALE®****RESISTORS****WIREWOUND PRECISION RESISTORS, BOBBIN TYPE** (Available with Weldable Leads)

Non-inductive precision resistors. Epoxy molded for high dielectric strength and complete environmental protection. Meet applicable requirements of MIL-R-93D.

■ TYPE WWA

Patented design insures high stability. Special tolerances and matching available.

■ TYPE MWA

Subminiature size retains Dale's unique bobbin-type design and high protection molding coating.

SPECIAL MODIFICATIONS

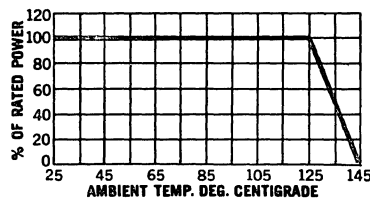
- Special tolerances are available to as low as .005%.
- Resistors can be matched to a tolerance of .001%.
- Special T.C.'s are available to ± 2 ppm/ $^{\circ}$ C over a limited temperature range.
- T.C.'s can be matched to an accuracy of 1 ppm/ $^{\circ}$ C.

POWER RATING

MWA, WWA and WWP power ratings correspond to MIL-R-93 ratings and are based on .5% maximum ΔR in 1500 hours load life. For commercial applications, power ratings may be doubled.

DERATING

Dale MWA, WWA and WWP resistors have an operating temperature range of -55° C to $+145^{\circ}$ C. Derating is required for temperatures above 125° C. The curve at right applies.



*Consult factory for tolerances below .05%.

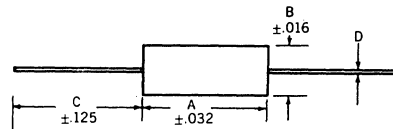
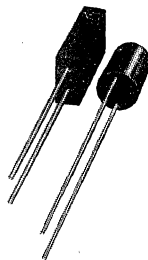
†Although there is no direct mil. model of the same physical size, the Dale type will meet the electrical and environmental requirements of MIL-R-93.

DIMENSIONS

TYPE	DIM. A	DIM. B	DIM. C	DIM. D
MWA-8	.250	.078	1.500	.020
MWA-10	.312	.078	1.500	.020
WWA-13	.375	.125	2.000	.020
WWA-22	.250	.250	2.000	.032
WWA-23	.375	.250	2.000	.032
WWA-24	.500	.250	2.000	.032
WWA-26	.750	.250	2.000	.032
WWA-36	.750	.375	2.000	.032
WWA-38	1.000	.375	2.000	.032
WWA-44	.500	.500	2.00	.032
WWA-45	.625	.500	2.00	.032
WWA-48	1.00	.500	2.00	.032
WWA-412	1.500	.500	2.00	.032
WWA-416	2.00	.500	2.00	.032

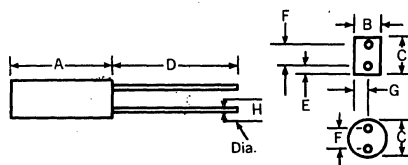
■ TYPE WWP

Rectangular or round printed circuit construction. High resistance per unit volume. Meets applicable requirements of MIL-R-93.

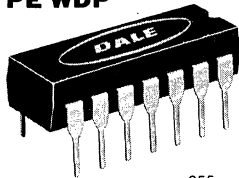


DALE TYPE	MIL-R-93D TYPE	POWER RATING (WATTS)	MINIMUM RESISTANCE RANGE (OHMS)						MAXIMUM RESISTANCE (OHMS) ALL TOLERANCES	MAXIMUM WORKING VOLTAGE	MAXIMUM WEIGHT (GRAMS)
			.02%	.05%	.1%	.25%	.5%	1%			
WWP-18	—	1/8 W	1.5K	600	150	50	25	10	1 Megohm	150 V	1.0
WWP-14	—	1/4 W	1K	400	150	50	25	10	1.5 Megohms	300 V	1.5
WWP-225	RB-71	1/8 W	—	105	50	25	1.0	.1	515K	150 V	1.0

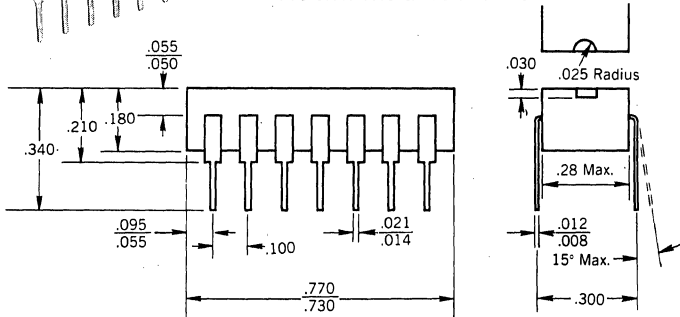
For additional Power Rating and Derating Information, see section on MWA and WWA styles.

**DIMENSIONS**

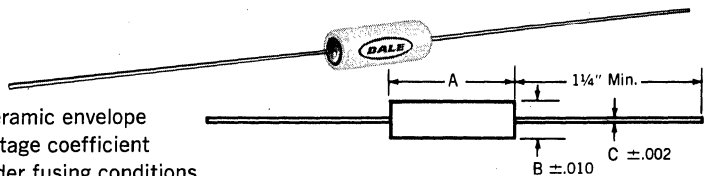
TYPE	A ($\pm .020$)	B ($\pm .020$)	C ($\pm .020$)	D (Min.)	E ($\pm .010$)	F ($\pm .010$)	G ($\pm .010$)	H
WWP-18	.300	.125	.250	1	.062	.125	.062	.032
WWP-14	.600	.125	.250	1	.062	.125	.062	.032
WWP-225	.312	—	.250	1	.025	.200	—	.025

DEPENDABLE**DALE****RESISTORS****WIREWOUND DUAL-IN-LINE PACKAGE****■ TYPE WDP**

- Designed for automatic insertion
- Up to 7 resistors in a 14-pin package
- Optimum heat dissipation in small package
- High temperature stability
- Precision tolerance and T.C

**SPECIFICATIONS****Electrical****Power Rating:** 3.5 watts (up to .5 watts/resistor)**Resistance Range:** 1 Ω to 800 Ω per resistor**Tolerance:** $\pm 0.1\%$ to $\pm 5.0\%$ **Temperature Coefficient:** ± 20 PPM/ $^{\circ}$ C (7 Ω to 800 Ω)
 ± 50 PPM/ $^{\circ}$ C (1 Ω to 6.9 Ω)**Tolerance Match:** .05%**Temperature Coefficient Match:** To 5 PPM/ $^{\circ}$ C, depending on resistance values**Operating Temperature:** -65° C to $+275^{\circ}$ C**Dielectric Strength:** 500 VAC**Insulation Resistance:** 1000 Megohms minimum dry, 100 Megohms minimum after moisture test.**Material****Package:** Silicone molded**Leads:** KOVAR**CUSTOM FUSE RESISTORS****■ TYPE CFR**

- Performs function of resistor and series fuse
- Completely welded construction hermetically sealed in ceramic envelope
- Low temperature coefficient with negligible noise and voltage coefficient
- Predictable fusing times with no flaming or distortion under fusing conditions
- Commercial type fuse resistors also available

**SPECIFICATIONS****Electrical****Tolerance:** 3%, 5% and 10% standard. 1% available for some applications**Dielectric Strength:** 750 VAC 1/4 watt thru 1 watt; 1000 VAC all others**Insulation Resistance:** 10,000 Megohms minimum dry**Temperature Coefficient:** ± 90 PPM/ $^{\circ}$ C below 1 ohm;
 ± 50 PPM/ $^{\circ}$ C 1 ohm thru 9.9 ohms; ± 30 PPM/ $^{\circ}$ C 10 ohms and up**Operating Temperature:** -55° C to $+275^{\circ}$ C**Fusing Times:** 1 millisecond to 1 second depending upon other parameters**Minimum Fusing Current:** Approximately 4 times the continuous operating current obtainable on some designs. Larger ratios produce better designs.**Mechanical****Terminal Strength:** 5 lb. pull test = 1/4 watt thru 1 watt; 10 lb. pull test = all others**Solderability:** Continuous satisfactory coverage when tested in accordance with MIL-R-26E

NOMINAL CONTINUOUS POWER RATING ^a	VALUE RANGE	DIMENSIONS		
		"A" Length	"B" Dia.	"C" Lead Dia.
1/4 W	0.1 Ω to 1.2K Ω	.437 $\pm$.020	.155	.020
1/2 W	0.1 Ω to 1.6K Ω	.437 $\pm$.020	.155	.020
3/4 W	0.2 Ω to 2.5K Ω	.437 $\pm$.020	.155	.020
1-1/2 W	0.3 Ω to 5.3K Ω	.640 $\pm$.031	.243	.032
2-1/2 W	0.45 Ω to 7.4K Ω	.750 $\pm$.031	.250	.032

^aActual power rating will depend on fusing, stability, value and other design requirements.**ORDERING INFORMATION***Please include the following information:*

1. Operating wattage or current, ambient temperature and required resistance stability, (% Δ R/1000 hours).
2. Fusing wattage or current and maximum "blow" time. Also minimum "blow" time, if applicable.
3. Nominal resistance and maximum allowable resistance tolerance, (5% to 10% preferred).
4. Maximum allowable physical size.
5. Voltage to be interrupted.
6. Frequency of power source, wave form, and a brief description of your application.

NON-STANDARD RESISTORS TO YOUR SPECIFICATION

Dale is the industry's acknowledged leader in designing and supplying non-standard resistors. From the thousands of designs in our engineering files, we can select proven methods of solving your specific requirements...faster and at a lower cost. Our capabilities include:

- Extended resistance ranges
- Low reactance
- Very high or very low T.C.
- Special tolerances
- Low noise
- Match of T.C., tolerance, resistance ratio
- Special packaging

For assistance in obtaining non-standard resistors, call:

402-564-3131 • Columbus, Nebraska • DALE WIREWOUND RESISTORS
402-371-0080 • Norfolk, Nebraska • DALE METAL FILM RESISTORS

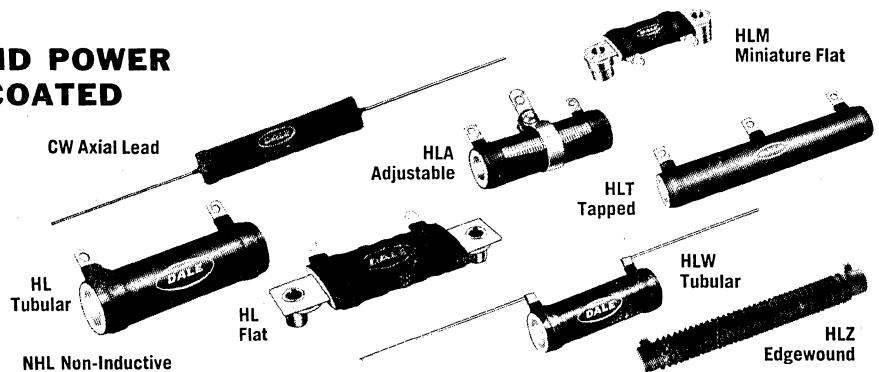
DEPENDABLE**DALE®****RESISTORS**

INDUSTRIAL WIREWOUND POWER RESISTORS, SILICONE COATED

Dale's silicone-coated industrial wirewound resistors assure maintenance of tolerance and T.C. without compromise in mechanical and chemical protection.

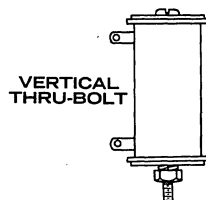
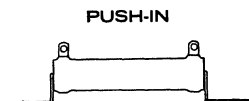
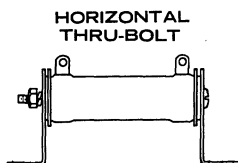
This complete line, except for CW types, also available with vitreous enamel coating. Contact factory for details.

Canadian Customers Contact
DALE ELECTRONICS CANADA LTD.
18 Howden Road • Scarborough, Ontario
Phone: 416-759-5631

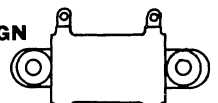


TYPE	APPLICATION	APPLICABLE MIL SPEC AND TYPES	WATTAGE RATING	RESISTANCE RANGE	CORE SIZES	TERMINALS	MOUNTINGS	TOLERANCE
CW Axial Lead	Axial leads. For applications requiring high performance at low cost	MIL-R-26 RW-67, 68, 69	2.5-13 watts	.1 ohm to 100K ohms	Body Dia. .188 to .375" Body Length .500 to 1.781" Leads 1.5 to 2"	Leads	Terminals	±5% (10% below 1 ohm)
HL Tubular	General purpose wirewound resistors with a broad power range.	MIL-R-26 RW-29, 30, 31, 32, 33, 35, 36, 37, 38, 47	5-225 watts	.1 ohm to 1.3 Megohms	O.D. 1/4 to 1-1/8" Length 1-10 1/2"	Lugs	Push-in bracket or thru-bolt	±5% (10% below 1 ohm)
NHL Non-Inductive	High frequency circuits and applications requiring low inductive effect and minimum distributed capacity	None	5-225 watts	1 ohm to 90K ohms	O.D. 1/4 to 1-1/8" Length 1-10 1/2"	Lugs or Leads	Push-in bracket or thru-bolt	±5%
HL Flat	For limited space requiring high power-to-size ratio. Vertical or horizontal stacking.	MIL-R-26 RW-20 thru RW-24	30-95 watts	.1 ohm to 150K ohms	Length 1 1/4 to 6"	Lugs	Thru mount with spacers	±5% (10% below 1 ohm)
HLM Miniature Flat	For limited space, high power-to-size requirements particularly in high vibration areas.	None	10-20 watts	.1 ohm to 51K ohms	Length 3/4 to 2-1/16"	Lugs	Thru mount with spacers	±5% (10% below 1 ohm)
HLA Adjustable	For resistance or voltage adjustment	MIL-R-19365C RX-29, 32, 33, 35, 36, 37, 38, 47	12-225 watts	1 ohm to 100K ohms	O.D. 5/16 to 1-1/8" Length 1 1/2 to 10 1/2"	Lugs	Push-in bracket or thru-bolt	±5%
HLT Tapped	For voltage divider networks	MIL-R-26 RW-22, 23, 24, 33, 35, 36, 37, 38, 47	11-225 watts	.1 ohm to 1.1 Megohms	O.D. 5/16 to 1-1/8" Length 1 1/2 to 10 1/2"	Lugs	Push-in bracket or thru-bolt	±10% each section (±10% total)
HLW Tubular	General application where terminal wires are required for direct electrical connection	None	3-20 watts	.1 ohm to 80K ohms	O.D. 13/64 to 7/16" Length 7/16" to 2"	Lugs with terminal wires	Terminals, thru-bolt or push-in bracket	±5% (10% below 1ohm)
HLZ Edgewound	For heavy duty requirements where space is at a premium. High thermal capacity.	None	35-375 watts	.05 ohm to 32 ohms	O.D. 9/16 to 1-1/8" Length 2 to 10-1/2"	Lugs	Push-in bracket or thru-bolt	±10%

MOUNTING BRACKETS for TUBULAR STYLES



EXCLUSIVE BRACKET DESIGN FOR MINIATURE FLAT STYLE



Mounting strap fits snugly through core and is bound tightly against unit by two eccentric spacers. Eliminates expensive cements and improves heat transfer and power handling capabilities.

DEPENDABLE**DALE****RESISTORS****■ TYPE CP**

- Fireproof inorganic construction
- Special inorganic potting compound provides high thermal conductivity.
- Superior moisture resistance

Construction:

Resistance wire is high quality, premium grade wound onto a woven fiberglass core. Terminals are tinned copper crimped to the wound core with a special brass alloy.

Tolerance: $\pm 10\%$ standard. $\pm 5\%$ also available.

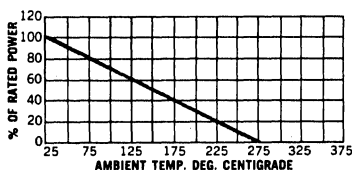
Operating Temperature: -55°C to $+275^{\circ}\text{C}$.

Terminal Strength: 5 lbs.

DIMENSIONAL AND POWER SPECIFICATIONS

DALE TYPE	WATTAGE RATING	EIA STANDARD RS-344 TYPE	RESISTANCE	MAX. WORKING VOLTAGE	DIMENSIONS			
					A $\pm 1/32$	B $\pm 1/32$	C $\pm 1/32$	D $\pm .001$
CP-2	2	CRU2A	.1 to 2.4K	65	11/16	1/4	1/4	.032
CP-3	3	CRU3	.1 to 7.5K	150	7/8	5/16	5/16	.036
CP-5	5	CRU5	.1 to 8.5K	200	7/8	3/8	11/32	.036
CP-7	7	CRU7	.12 to 18K	350	1-25/64	3/8	11/32	.036
CP-10	10	CRU10	.18 to 30K	540	1-7/8	3/8	11/32	.036
CP-15	15	—	.18 to 30K	670	1-7/8	1/2	1/2	.036
CP-20	20	—	.28 to 40K	890	2-1/2	1/2	1/2	.036

NOTE: Above models, except CP-15 and CP-20, available with standoffs on resistor body. To specify, add -3 to part number.

DERATING**Ordering Information:**

When ordering, please specify Dale type, wattage, resistance value and tolerance.

Example: A 2-watt CP resistor with resistance at 1000 ohms and tolerance of $\pm 10\%$ is designated as shown.

CP 2 1K $\pm 10\%$
1 2 3 4

1. Resistor type
2. Wattage
3. Resistance
4. Tolerance

■ TYPES CA and CR**Construction:**

Dale CA and CR Series have a high quality, premium resistance wire wound on woven fiberglass core impregnated with a special grade silicone. Available with special smokeproof coating.

Resistance Range: .1 ohm minimum to 7K, dependent on resistor core length.

Tolerance: $\pm 10\%$ standard, $\pm 5\%$ also available.

Leads: Standard minimum lead length is $1\frac{1}{2}''$.

Standard lead material is tinned copper.

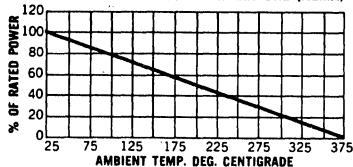
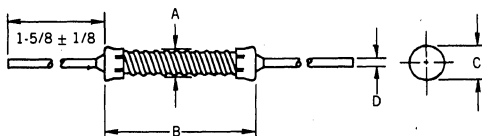
Axial lead pull strength on CA Series is 5 lbs.

DIMENSIONAL AND POWER SPECIFICATIONS

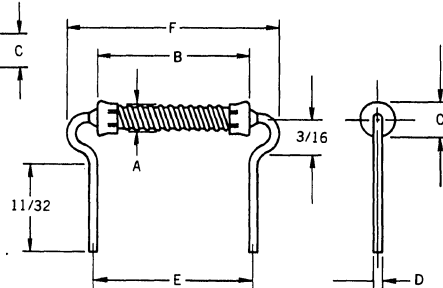
DALE TYPE	DIM. A	DIM. B.		DIM. C (Max.)	DIM. D	DIM. E ($\pm 1/32$)	DIM. F ($\pm 1/32$)	WATTAGE RATING PER INCH
		MIN.	MAX.					
CA-4000	.110	.6	2.0"	.175	.032	NA	NA	4
CA-5000	.150	.6	2.0"	.225	.036	NA	NA	5
CR-4000	.110	.6	2.0"	.175	.032	B + 3/32	B + 7/32	4
CR-5000	.150	.6	2.0"	.225	.036	B + 3/32	B + 7/32	5

DERATING

FOR HIGH AMBIENT TEMPERATURE (NEMA)

**CA SERIES**

CR 4 150 350 Ω $\pm 10\%$
1 2 3 4 5

CR SERIES**Ordering Information:**

When ordering, please specify resistor body length, watts/inch, resistance and tolerance.

Example: A $1\frac{1}{2}''$ unit, 4 watts per inch; 350 ohms, $\pm 10\%$ radial lead unit is designated as shown.

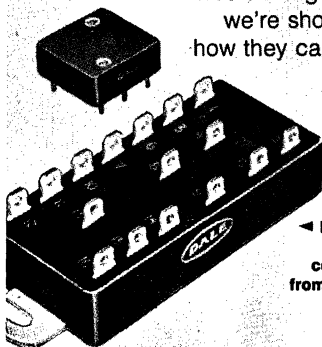
1. Resistor type
2. Core diameter designation
3. Overall resistor body length
4. Resistance
5. Tolerance

How to cut the cost of special resistors

(even if you don't know what you want)

Project costs don't have to escalate when you find you can't use a standard resistor. There are positive ways you can save money and time—and even come out ahead in the bargain.

You can start cutting project costs by reducing what we call "visualization loss". This is the expensive extra time required to figure out an exact set of electrical, physical, environmental and dimensional parameters for the special part you need. *Don't go too far.* Especially don't wait until you're completely bogged down before you ask Dale for help. In electrical terms, we've long since figured out practical ways to deliver resistance as low as .001 ohm... tolerance as low as .01%... T.C. as low as ± 5 ppm and power just as high and as stable as you want it to be. And we can put your non-standard electrical parameters in unique packages that are one part sophistication and one part mid-western ingenuity. Every day we're showing companies how they can bend, squeeze,



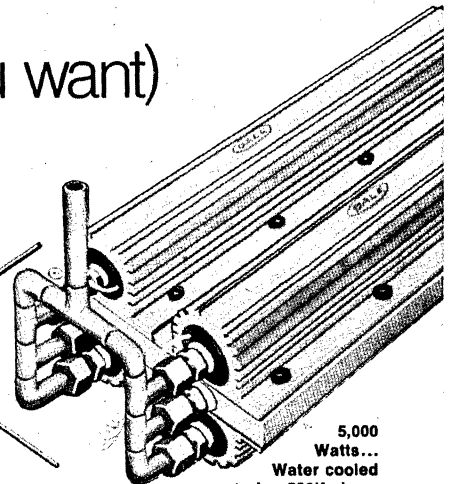
Space-saving P.C. board module containing 3 non-inductive resistors. (Far left)

Network with 16 quick couple connections containing 12 resistors from .025 ohm 50 watts to .1 ohm 10 watts.

High Pulse Wattage railway safety resistor. Special housing for underground use.



Voltage Sensing Shunt...
.05 ohm-24.5K ohms...20 PPM/° C.



5,000 Watts...
Water cooled
.1 ohm-500K ohms,
0.5%-5% tol.

mill, tap, bury and inter-connect resistors for special purposes. We even put in plumbing, when required. Your non-standard resistor may only need a different kind of lead or it may look like a Rube Goldberg nightmare. Either way, you'll find Dale is unique among resistor suppliers in the ability to help you quickly visualize what you need...and to deliver a prototype with a minimum of design lag. We've already designed and built nearly 5,000 special resistors—so it's quite possible we've already blueprinted the design you need.

Call us. You'll be glad to find someone is working to make the basics better.

Send for our free
Functional Guide to Non-Standard Resistors.

DALE ELECTRONICS, INC.
1300 28th Avenue, Columbus, Nebraska 68601
A subsidiary of The Lionel Corporation
In Canada: Dale Electronics Canada Ltd.
In Europe: Dale Electronics GMBH,
8 Munchen 60, Falkweg 51, West Germany



DALE

METAL and CARBON FILM RESISTORS

APPLICABLE MIL. ENVIRONMENTAL SPECIFICATIONS MIL-R-10509

TYPES MF, MFF & CMF

These environmental performance figures are typical for MFF conformally coated resistors. However, this style is dimensionally smaller than the RN types per MIL-R-10509.

REQUIREMENT	CHAR. B		CHAR. D		CHAR. C		CHAR. E	
Mil. Temp. Coefficient	± 500 PPM		+200 -500 PPM		±50 PPM		±25 PPM	
Applicable Dale T.C. Code	T-00 (200 PPM)		T-1 (100 PPM) T-0 (150 PPM)		T-2 (50 PPM)		T-9 (25 PPM)	
POWER RATING	at 70°C		at 70°C		at 125°C		at 125°C	
ENVIRONMENTAL TEST	MIL. MAX.	DALE TYP.	MIL. MAX.	DALE TYP.	MIL. MAX.	DALE TYP.	MIL. MAX.	DALE TYP.
Temperature Cycling	±0.5%ΔR	±0.10%	±0.5%ΔR	±0.10%	±0.25%ΔR	±0.10%	±0.25%ΔR	±0.10%
Low Temp. Operation	±0.5%ΔR	±0.05%	±0.5%ΔR	±0.05%	±0.25%ΔR	±0.05%	±0.25%ΔR	±0.05%
Short Time Overload	±0.5%ΔR	±0.02%	±0.5%ΔR	±0.02%	±0.25%ΔR	±0.02%	±0.25%ΔR	±0.02%
Dielectric Withstanding Voltage	±0.5%ΔR	±0.01%	±0.5%ΔR	±0.01%	±0.25%ΔR	±0.01%	±0.25%ΔR	±0.01%
Effect of Soldering	±0.5%ΔR	±0.02%	±0.5%ΔR	±0.02%	±0.1% ΔR	±0.02%	±0.1% ΔR	±0.02%
Moisture Resistance	±1.5%ΔR	±0.05%	±1.5%ΔR	±0.05%	±0.5% ΔR	±0.05%	±0.5% ΔR	±0.05%
Load Life	±1.0%ΔR	±0.05%	±1.0%ΔR	±0.05%	±0.5% ΔR	±0.15%	±0.5% ΔR	±0.15%
Shock	±0.5%ΔR	±0.01%	±0.5%ΔR	±0.01%	±0.25%ΔR	±0.01%	±0.25%ΔR	±0.01%
Vibration	±0.5%ΔR	±0.01%	±0.5%ΔR	±0.01%	±0.25%ΔR	±0.01%	±0.25%ΔR	±0.01%

All ΔR figures shown are based on units with an initial tolerance of 1%.

TYPES MC & DC

TYPE D This physical configuration is not covered in MIL-R-10509.

REQUIREMENT	CHAR. B		CHAR. D		CHAR. D		CHAR. C		CHAR. E	
Power Rating Temp.	70° C		70° C							
Temperature Coefficient	±500 PPM/° C		+200 -500 PPM/° C							
ENVIRONMENTAL TESTS	MIL. MAX.	DALE TYP.	MIL. MAX.	DALE TYP.	MIL. MAX.	DALE TYP.	MIL. MAX.	DALE TYP.	MIL. MAX.	DALE TYP.
Temperature Cycling	± 0.5% ΔR	± 0.25% ΔR	± 0.5% ΔR	± 0.25% ΔR	± 0.5% ΔR	± 0.10%	± 0.25% ΔR	± 0.1%	± 0.25% ΔR	± 0.10%
Low Temp. Operation	± 0.5% ΔR	± 0.05% ΔR	± 0.5% ΔR	± 0.05% ΔR	± 0.5% ΔR	± 0.05%	± 0.25% ΔR	± 0.05%	± 0.25% ΔR	± 0.05%
Short Time Overload	± 0.5% ΔR	± 0.05% ΔR	± 0.5% ΔR	± 0.05% ΔR	± 0.5% ΔR	± 0.10%	± 0.25% ΔR	± 0.10%	± 0.25% ΔR	± 0.10%
Dielectric Withstanding Voltage	± 0.5% ΔR	± 0.01% ΔR	± 0.5% ΔR	± 0.01% ΔR	± 0.5% ΔR	± 0.01%	± 0.25% ΔR	± 0.01%	± 0.25% ΔR	± 0.01%
Effect of Soldering	± 0.5% ΔR	± 0.01% ΔR	± 0.5% ΔR	± 0.01% ΔR	± 0.5% ΔR	± 0.05%	± 0.1% ΔR	± 0.05%	± 0.1% ΔR	± 0.05%
Moisture Resistance	± 1.5% ΔR	± 0.25% ΔR	± 1.5% ΔR	± 0.25% ΔR	± 1.5% ΔR	± 0.25%	± 0.5% ΔR	± 0.25%	± 0.5% ΔR	± 0.25%
Load Life	± 1.0% ΔR	± 0.10% ΔR	± 1.0% ΔR	± 0.20% ΔR	± 1.0% ΔR	± 0.5%	± 0.5% ΔR	± 0.5%	± 0.5% ΔR	± 0.5%
Shock	± 0.5% ΔR	± 0.10% ΔR	± 0.5% ΔR	± 0.10% ΔR	± 0.5% ΔR	± 0.01%	± 0.25% ΔR	± 0.01%	± 0.25% ΔR	± 0.01%
Vibration	± 0.5% ΔR	± 0.10% ΔR	± 0.5% ΔR	± 0.10% ΔR	± 0.5% ΔR	± 0.01%	± 0.25% ΔR	± 0.01%	± 0.25% ΔR	± 0.01%

DALE

DEPOSITED CARBON RESISTORS (Available with Weldable Leads)

Made of pure crystalline carbon film bonded to selected ceramic cores. Excellent high frequency characteristics. Types MC and DC meet functional requirements of MIL-R-10509F.

■ **TYPE MC** Epoxy Molded

■ **TYPE DC**
Epoxy Conformal Coated

DALE TYPE	MIL. TYPE		POWER RATING (WATTS)		MINIMUM RESISTANCE (OHMS)	MAXIMUM 1% RESISTANCE (OHMS)	MAXIMUM 2% RESISTANCE (OHMS)	MAX. WT. (GRAMS)		MAXIMUM WORKING VOLTAGE
	MC	DC	B	D*				MC	DC	
MC-1/10, DC-1/10	RN-55	—	1/10	1/8	2	400K	400K	.35	.20	200
MC-1/8, DC-1/8	RN-60	—	1/8	1/4	1	3 Megohms	5 Megohms	.45	.30	300
MC-1/4, DC-1/4	RN-65	RN-10	1/4	1/2	2	5 Megohms	6 Megohms	.85	.35	350
MCS-1/2, DCS-1/2	RN-70	RN-20	1/2	3/4	1	10 Megohms	15 Megohms	1.50	.80	500
MC-1, DC-1	RN-75	RN-25	1	—	1	15 Megohms	30 Megohms	4.50	2.8	500
MC-2, DC-2	RN-80	RN-30	2	—	2	100 Megohms	125 Megohms	8.25	5.5	750

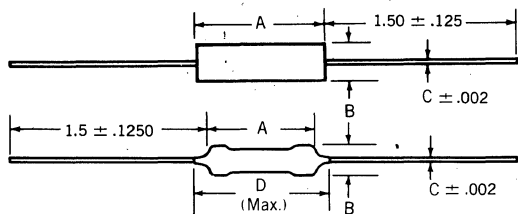
*Applies to MC only. Tolerance: .5%, 1%, 2%.
Temperature Coefficient: -200 PPM to -500 PPM, depending on value within normal resistance range.

DIMENSIONS

DALE TYPE	A	B	C	D
MC-1/10	.260±.010	.095±.005	.025 Dia.	—
MC-1/8	.406±.015	.135±.010	.025 Dia.	—
MC-1/4	.593±.015	.203±.015	.025 Dia.	—
MCS-1/2	.730±.020	.250±.015	.032 Dia.	—
MC-1	1.093±.020	.375±.015	.032 Dia.	—
MC-2	2.188±.020	.375±.015	.032 Dia.	—
DC-1/10	.249±.031	.090±.015	.025 Dia.	.381
DC-1/8	.343±.031	.098±.015	.025 Dia.	.453
DC-1/4	.468±.031	.125±.031	.025 Dia.	.578
DCS-1/2	.562±.062	.187±.031	.032 Dia.	.734
DC-1	.937±.062	.296±.031	.032 Dia.	1.187
DC-2	2.062±.062	.296±.031	.032 Dia.	2.312

TYPE MC

TYPE DC



POWER RATING

Dale MC and DC power ratings are based on 1% maximum ΔR in 1000 hours load life at 70° C.

DERATING

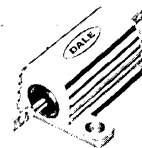
Dale MC and DC resistors have an operating temperature range of -55° C to +165° C. They must be derated at high ambient temperatures from 100% power at 70° C to 0% power at +165° C.

DEPENDABLE**DALE®****RESISTORS****PRECISION METAL FILM RESISTORS** (Available with Weldable Leads)

Vacuum-deposited metal film resistors. Good R.F. characteristics.
Low noise level. Wide choice of tolerances, T.C.'s and resistance.

TYPE M:

Standard values to 100 Meg. Special
order to 300 Meg. See following page.

**■ TYPE MF, LMF, HMF**

Epoxy molded. Meets MIL-R-10509.

■ TYPE MFF, CMF, LFF, HFF

Epoxy conformal coated.

Type CMF meets MIL-R-10509 and MIL-R-22684.

■ TYPE D

Molded in aluminum housing to utilize heat sink effect of chassis. Resistance ranges from 24.9Ω to 2.6 Meg., with power ratings of 4, 8 and 12 watts.

DALE TYPE	MIL-R-10509 TYPE	125° C RATING (Char. C & E)	70° C RATING (Char. D)	MIL-R-22684		MAX. WT. (Grams)	MAX. WORKING VOLTAGE	DIMENSIONS (See Drawing on opposite page)			
				Type	Rating			A	B	C	D
MF50, HMF50	RN-50	1/20 w	—	—	—	.11	200	.150 ± .020	.065 ± .015	.016 Dia.	—
MF-1/10, LMF-1/10, HMF-1/10	RN-55	1/10 w	1/8 w	—	—	.35	200	.260 ± .010	.095 ± .005	.025 Dia.	—
MF-1/8, LMF-1/8, HMF-1/8	RN-60	1/8 w	1/4 w	—	—	.45	300	.406 ± .015	.135 ± .010	.025 Dia.	—
MF-1/4, LMF-1/4, HMF-1/4	RN-65	1/4 w	1/2 w	—	—	.84	350	.593 ± .015	.203 ± .015	.025 Dia.	—
MFS-1/2, LMF-1/2, HMF-1/2	RN-70	1/2 w	3/4 w	—	—	1.6	500	.730 ± .020	.250 ± .015	.032 Dia.	—
MF-1, HMF-1	RN-75	—	1 w*	—	—	4.4	500	1.093 ± .020	.375 ± .015	.032 Dia.	—
MF-2	RN-80	—	2 w*	—	—	7.9	750	2.188 ± .020	.375 ± .015	.032 Dia.	—
CMF-1/10, CMF-55, CMF-07	RN-55	1/10 w	1/8 w	RL-07	1/4 w	.25	200	.249 ± .031	.090 ± .008	.025 Dia.	.381
CMF-1/8, CMF-60, CMF-20	RN-60	1/8 w	1/4 w	RL-20	1/2 w	.50	300	.385 ± .031	.145 ± .015	.025 Dia.	.484
CMF-1/4, CMF-65	RN-65	1/4 w	1/2 w	—	1 w	.80	500	.562 ± .031	.190 ± .015	.025 Dia.	.750
MFF-1/8, LFF-1/8, HFF-1/8	—	1/8 w	—	—	—	.40	300	.343 ± .031	.098 ± .015	.025 Dia.	.453
MFF-1/4, LFF-1/4, HFF-1/4	—	1/4 w	—	—	—	.65	350	.468 ± .031	.125 ± .015	.025 Dia.	.578
MFF-1/2, LFF-1/2, HFF-1/2	—	1/2 w	—	—	—	.95	500	.562 ± .031	.187 ± .031	.032 Dia.	.734
MFF-1, LFF-1, HFF-1	—	—	1 w*	—	—	2.7	500	.937 ± .062	.296 ± .031	.032 Dia.	1.187
MFF-2, LFF-2, HFF-2	—	—	2 w*	—	—	4.7	750	2.062 ± .062	.296 ± .031	.032 Dia.	2.312

*Characteristic B

Tolerance MIL-R-10509 ±1%, ±5%, ±0.25%, ±0.10% standard, MIL-R-22684 ±2%, ±5%. LMF and HMF ±1% standard. Special tolerances and matching on request.

STANDARD T.C. RESISTANCE RANGE (OHMS)*

TYPE	T-0 150 PPM	T-1 100 PPM	T-2 50 PPM	T-9 25 PPM
MF50	24.9-100K	49.9-100K	100-100K	100-100K
HMF50	100K-700K	100K-700K	100K-500K	100K-200K
LMF-1/10	1-9.9	5-30	10-30	15-30
MF-1/10, CMF-1/10, CMF-55	10-499K	30.1-499K	30.1-301K	30.1-301K
HMF-1/10, HFF-1/10	500K-5M	500K-5M	301K-2M	301K-500K
LMF-1/8, LFF-1/8	1-9.9	5-24	10-30	15-30
MF-1/8, MFF-1/8	10-1M	24.9-1M	30.1-499K	30.1-499K
CMF-1/8, CMF-60	10-1M	24.9-1M	30.1-499K	30.1-499K
HMF-1/8, HFF-1/8	1M-10M	1M-10M	499K-3M	499K-1M
LMF-1/4, LFF-1/4	1-9.9	5-24	10-30	15-30
MF-1/4, MFF-1/4	10-2M	24.9-2M	30.1-1M	30.1-1M
CMF-1/4, CMF-65	10-2M	24.9-2M	30.1-1M	30.1-1M
HMF-1/4, HFF-1/4	2M-20M	2M-20M	1M-10M	1M-2M
LMF-1/2, LFF-1/2	1-9.9	5-24	10-24	15-24
MFS-1/2, MFF-1/2	10-2.49M	24.9-2.49M	24.9-1M	24.9-1M
HMF-1/2, HFF-1/2	2.49M-30M	2.49M-30M	1M-20M	1M-3M
MF-1, MFF-1	10-5.11M	24.9-4.02M	49.9-2.61M	49.9-2.61M
HMF-1, HFF-1	5.11M-30M	4.02M-30M	2.61M-20M	2.61M-5M
MF-2, MFF-2	30.1-10M	100-8M	100-6M	200-5.11M

NOTE: T-00 standard for CMF-07 (51Ω to 150K) and CMF-20 (4.3Ω to 470K).

*On Mil types, T-0 and T-1 = Char. D, T-2 = Char. C and T-9 = Char. E.
T-0 and T-1 are available in tolerance of ±.25% and greater only.
11 standard T.C.'s available in -55° C to +175° C range.

LOW T.C. RESISTANCE VALUE RANGES*

TYPE	L-1 (20 PPM)	L-2 (15 PPM)	L-3 (10 PPM)
CMF-1/10 MFF-1/8 MF-1/8	30.1Ω to 300KΩ	49.9Ω to 200KΩ	100Ω to 100KΩ
CMF-1/8 MFF-1/4 MF-1/4	30.1Ω to 499KΩ	49.9Ω to 300KΩ	100Ω to 200KΩ
MFF-1/2 MFS-1/2	30.1Ω to 750KΩ	49.9Ω to 500KΩ	100Ω to 400KΩ

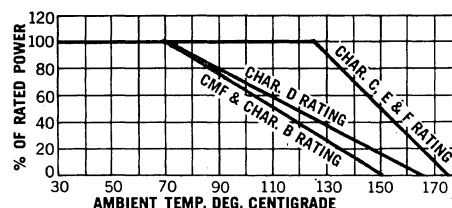
*Over temperature range from 0 to +80° C

POWER RATING

Dale metal film resistors have power ratings depending on operating temperatures of 70° C and 125° C as indicated above. All are based on a maximum ΔR of .5% in 1000 hour load life.

DERATING

Dale metal film resistors have an operating temperature range beginning at -65° C. They must be derated according to the curves at right.



DEPENDABLE**DALE****RESISTORS****PRECISION METAL FILM TO 100 MEG.****1% and 0.5% Tolerance**

Unique combination of precision performance, high reliability, low temperature coefficient and high resistance values at economical prices. High values up to 300 Meg. available on special order.

TYPE NO.	WATTAGE RATING		MAX. CONT. VOLTAGE	SURF. TEMP. RISE °C	LENGTH	DIMENSIONS DIAMETER	LEADS	T.C. IN PPM	RESISTANCE RANGE
	70°C	125°C							
M20D*	.25	.125	250	30	.375" ± .025"	.145" ± .010"	.032" ± .002"	100	10Ω to 500K
M22D	0.5	0.25	350	35	.575" ± .015"	.205" ± .010"	.032" ± .002"	100	10Ω to 2.5 Meg.
M22H								150	High Value 2.51 Meg. to 10 Meg.
M13D	1.0	—	500	50	.840" ± .025"	.285" ± .010"	.032" ± .002"	100	10Ω to 10 Meg.
M13H								150	High Value 10.1 Meg. to 30 Meg.
M14D	2.0	—	1600	60	2.000" ± .060"	.285" ± .010"	.032" ± .002"	100	10Ω to 20 Meg.
M14H								150	High Value 20.1 Meg. to 100 Meg.

*Flameproof molded construction.

MINIATURE OXIDES TO MIL-R-22684B (Molded-Flameproof)

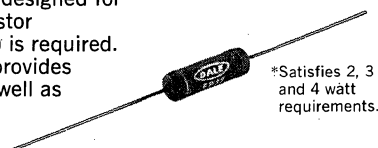
Metal oxide resistors are superior for requirements involving load life with extremely high reliability and stability—up to 100,000 hours or more. They have conclusively outperformed other resistor types under environmental conditions of varying humidities and temperatures or where prolonged operation in a high dissipation and/or ambient temperature is necessary. Their ability to withstand extreme overloads make them ideal for pulse applications where extremely high peak voltages are involved.

TYPE	RATING WATTS	MIL TYPE	RATED VOLTAGE	DIELECTRIC STRENGTH	RESISTANCE RANGE			DIMENSIONS		
					TOL.	MIN.	MAX.	LENGTH	DIAMETER	LEADS
F07	1/4	RL-07	250	1000 V	2%, 5%	10Ω	150K	.250" ± .031"	.090" ± .008"	.025"
F20	1/2	RL-20	350	1000 V	1%, 2%, 5%	10Ω	470K	.375" ± .025"	.145" ± .010"	.032"

TEST CHARACTERISTICS	MAXIMUM CHANGES PER MIL-R-22684	PERFORMANCE DATA—TYPICAL CHANGE F STYLE RESISTORS
Resistance/Temperature Characteristic	200 PPM	200 PPM
Dielectric Withstanding Voltage	±0.5%	±0.1%
Low Temp. Operation	±0.5%	±0.25%
Temperature Cycling	±1%	±0.5%
Moisture Resistance	±1.5%	±0.5%
Short Time Overload	±0.5%	±0.25%
Load Life	±2%	±1%
Terminal Strength	±0.5%	±0.1%
Soldering	±0.5%	±0.25%
Shock	±0.5%	±0.1%
Vibration	±0.5%	±0.1%

POWER OXIDES—2 to 10 WATTS (Flameproof) ±5% and 10% Tolerance

Medium power components specifically designed for applications where a highly reliable resistor (even under abnormal stress conditions) is required. A specially developed coating material provides high flame-retardant characteristics as well as excellent thermal conductivity.



*Satisfies 2, 3 and 4 watt requirements.

DALE TYPE	RATING WATTS 70° C	MAXIMUM LENGTH	DIA.	RESISTANCE RANGE*	
				MIN.	MAX.
FP-32	4*	.906	.328	47Ω	39K
FP-33	6	1.312	.328	30Ω	56K
FP-34	8	1.718	.328	40Ω	68K
FP-35	10	2.093	.328	50Ω	91K

ULTRA LOW VALUES—0.27Ω TO 10Ω

Ultra low value resistors produced by an exclusive process in which passive conductive metal film is diffused in a new arrangement of materials upon the surface of a special ceramic substrate.

TYPE	TOLERANCE	LENGTH	DIAMETER	LEADS	WATTS	RESISTANCE RANGE
A20	1%, 2%, 5%	.400" ± .010"	.145" ± .005"	.032" ± .002"	1/2	0.27Ω-10Ω
A31	2%, 5%, 10%	.687" ± .031"	.203" ± .015"	.032" ± .002"	2	0.27Ω-27Ω

HIGH FREQUENCY LOAD RESISTORS (Tubes)

Carbon film resistors with inherent stability and excellent high frequency characteristics for applications involving high power, high accuracy RF measurements. Ideally suited as non-reactive radio frequency terminations for many applications.

Specifications show only a few standard types available. We invite your inquiries regarding special applications.

ATTENUATOR PADS Write for Bulletin AP13 covering our extensive line of pads.

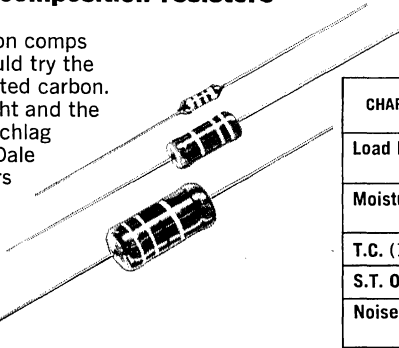
TYPE	LENGTH	O. D.	TERMINAL	I. D.	WATTAGE IN FREE AIR (25°C)
I-273	18" ± 1/16"	1.750" ± .010"	3/4"	1.250" ± .010"	120
I-270	12" ± 1/16"	.875" ± .010"	3/4"	.625" ± .010"	40
I-272	5" ± 1/32"	.562" ± .006"	1/2"	.375" ± .010"	10
I-240	Max. 2.000" Min. 1.937"	.252" .240"	1/4"	Solid Rod	2
I-281	12" ± 1/16"	1.125" ± .010"	1/2"	.875" ± .020"	55

For complete information, write or phone: **DALE ELECTRONICS, INC.**, Box 74, Norfolk, Nebraska 68701, Phone: 402-371-0080

DEPENDABLE**DALE®****RESISTORS**

BEYSCHLAG SUPERIOR QUALITY 5% DEPOSITED CARBON RESISTORS priced competitively with composition resistors

If you are using the best 5% carbon comps made in North America...you should try the world's best semi-precision deposited carbon. Check the comparison chart at right and the general specifications below. Beyschlag resistors are stocked in depth by Dale and handled by leading distributors from coast to coast.



GENERAL SPECIFICATIONS

Load Life $\Delta R/R$ 1000 hours: Less than 2.0%. Continuous operation @ 40°C results in maximum 1.0% change

Shelf Life $\Delta R/R$: < 0.5% after 12 months

Moisture Resistance $\Delta R/R$: < 1.0%

Solderability $\Delta R/R$: < 0.5% $\pm 0.1\%$

Voltage Coefficient: < 5 PPM per Volt

Short Time Overload $\Delta R/R$: < 1.0%

Shock $\Delta R/R$: < 0.5% $\pm 0.1\%$

Insulation Resistance: < $10^{10} \Omega$

H.F. Vibration $\Delta R/R$: < 0.5% $\pm 0.1\%$

Terminal Strength $\Delta R/R$: < 0.2% $\pm 0.1\%$

Low Temp. Operation $\Delta R/R$: < 0.2% $\pm 0.1\%$

CHARACTERISTIC	CARBON COMP per MIL-R-11 limits	BEYSCHLAG
Load Life	Avg. Allowable $\pm 6.0\%$ Max. Allowable $\pm 10.0\%$	Less than 1.0%
Moisture Resistance	Avg. Allowable $\pm 10.0\%$ Max. Allowable $\pm 15.0\%$	Less than 1.5%
T.C. (10 Ω to 1 Meg.)	600 to ± 1800 PPM*	-250 to -500 PPM
S.T. Overload	$\pm 2.5\%$	Less than 0.5%
Noise	Not applicable in Mil. specifications	0.3 microvolt/v**
Resistance to Soldering Heat	$\pm 3.0\%$	Less than 0.2%

*Depending on value and temperature. **Depending upon type and value.

TYPE	WATTS @ 70°C	MAX. BODY LENGTH (Inches)	DIA. (Inches)	LEAD DIA. (Inches)	MAX. WORKING VOLTAGE	DIEL. VOLTAGE DC	RESISTANCE RANGE		
							TOL.	MIN.	MAX.
SBA	1/8	0.160	0.063	0.016	150	300V	$\pm 5\%$ $\pm 2\%$	10 Ω 10 Ω	220K 220K
SBB	1/4	0.250	0.098	0.024	250	500V	$\pm 5\%$ $\pm 2\%$	1 Ω 1 Ω	5.1M 5.1M
SBC	1/2	0.350	0.114	0.028	350	700V	$\pm 5\%$ $\pm 2\%$	1 Ω 1 Ω	5.1M 5.1M
SBE	3/4	0.470	0.157	0.032	500	1000V	$\pm 5\%$ $\pm 2\%$	1 Ω 1 Ω	10M 5.1M
SBF	1	0.554	0.236	0.032	630	1000V	$\pm 5\%$ $\pm 2\%$	1 Ω 1 Ω	22M 5.1M
SBH	2	0.810	0.354	0.032	750	1000V	$\pm 5\%$ $\pm 2\%$	10 Ω 10 Ω	22M 5.1M

HIGH VOLTAGE OXIDE RESISTORS

High Voltage oxide resistors with stability and reliability in high voltage and pulse applications far exceeding that obtained from components previously available. Continuous voltage stress up to 8,000 volts per inch can be applied. In addition, voltage pulses up to 3-1/2 times the magnitude of the continuous rating may be applied without deterioration of the element.

Industrial grade high voltage styles also available. Ask for TO Types F53D, F535D and F54D.



TYPE	WATTS @ 40°C	TERMINATION	DIMENSIONS		WORKING VOLTAGE	PULSE VOLTAGE	TEMP. RISE	RESISTANCE RANGE		
			L	D				TOL.	MIN.	MAX.
F43D	1/2	Standard Wire Leads	1.094"	0.312"	4KV	15KV	26°C	$\pm 2\%$	2M	3,000M
F43KU	1/2	Comb. Lead/Threaded Cap	1.188"	0.312"	4KV	15KV	26°C	$\pm 5\%$		
*F43TU	1/2	Threaded Cap, Both Ends	1.280"	0.312"	4KV	15KV	26°C	$\pm 10\%$	2M	100,000M
F44D	1	Standard Wire Leads	2.000"	0.312"	14KV	50KV	36°C	$\pm 2\%$	2M	10,000M
F44KU	1	Comb. Lead/Threaded Cap	2.094"	0.312"	14KV	50KV	36°C	$\pm 5\%$		
*F44TU	1	Threaded Cap, Both Ends	2.187"	0.312"	14KV	50KV	36°C	$\pm 10\%$	2M	150,000M

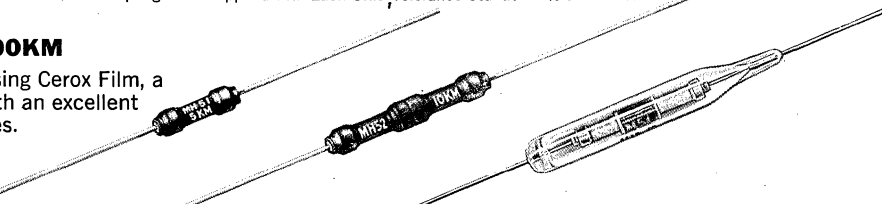
*10-32 x 5/16" Coupling Stud Supplied with Each Unit. Tolerance Std. at $\pm 2\%$ and $\pm 5\%$.

ULTRA HIGH VALUES—TO 1000KM

High Value resistors are manufactured using Cerox Film, a highly stable thick resistance material with an excellent voltage coefficient at high voltage stresses.

Type M51 resistors are vacuum sealed in a glass envelope to which a barrier coating of special silicone lacquer is applied to minimize the effects of surface moisture or contamination.

Types MH51 and MH52 are encapsulated in a sleeve of irradiated polyolefin heat shrunk for intimate contact with the capped body.



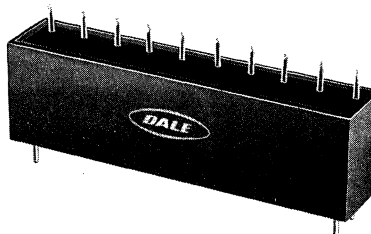
TYPE	WATTS @ 40°C	MAX. VOLT	LENGTH	DIAMETER	LEAD DIA.	RESISTANCE RANGE	TOLERANCE
MH51	1/4	1500	.50"	.140" $\pm .010$ "	.028"	30M- 5KM	5%, 10%, 20%
MH52	1/2	3000	.88"	.140" $\pm .020$ "	.028"	60M-10KM	1%, 2%, 5%, 10%, 20%
M51	1/2	500	1.88"	.216" $\pm .006$ "	.020"	10M-1000KM	1%, 2%, 5%, 10%, 20%

DEPENDABLE**DALE****ATTENUATORS**

TYPE 62-00 MULTIPLE ATTENUATORS

FEATURES

- Units contain 2, 3, 4 or 5 attenuator pads.
- Suitable for direct insertion into printed circuit boards.
- Balanced square pads and unbalanced pads are available.



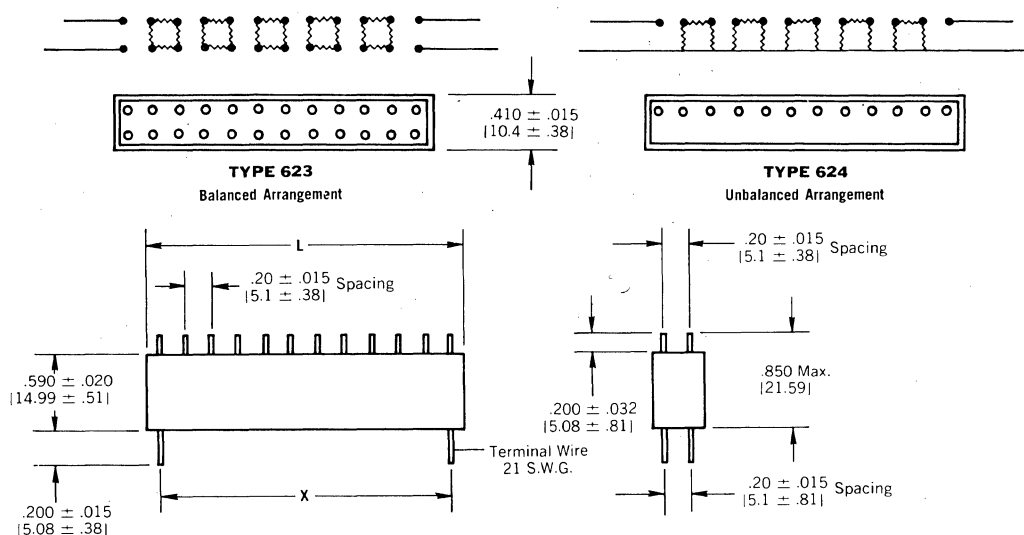
CIRCUIT DESIGN: The individual pads for the input and output form a wiring field on the upper surface. By the use of appropriate wire links, any combination of the pads may be brought into circuit. The choice of a Binary Series of pads enables a range of attenuation from the value of the lowest pad to the sum of all pads, in steps of the lowest value to be selected. For example: a unit containing 1/2, 1, 2 and 4 dB provides 0 to 7½ dB in 1/2 dB steps.

CHARACTERISTIC IMPEDANCE: 75Ω and 600Ω are standard. Other values to special order.

NUMBER OF PADS: 2, 3, 4 or 5

RANGE OF INSERTION LOSS: Standard values of 0.25, 0.5, 1, 2, 4, 6, 8 and 16 dB per pad from the range of 0.1 to 40 dB.

Dimensions in Inches
[Dimensions in Millimeters]



ORDERING INFORMATION

See table for type designation identifying the number of pads and configuration required. Specify characteristic impedance and values of individual pads in the order required, e.g., 6245 600Ω 1+2+4+8 + 16 dB.

TYPE NO.		NO. OF PADS	INCHES [mm] X	INCHES [mm] L
Balanced	Unbalanced			
6232	6242	2	1.0 ± 0.015 [25.4 ± 0.38]	1.2 max. [30.5]
6233	6243	3	1.4 ± 0.015 [35.6 ± 0.38]	1.6 max. [40.6]
6234	6244	4	1.8 ± 0.015 [45.7 ± 0.38]	2.0 max. [50.8]
6235	6245	5	2.2 ± 0.015 [55.9 ± 0.38]	2.4 max. [61.0]

DEPENDABLE**DALE®****ATTENUATORS****GENERAL INFORMATION**

STANDARD IMPEDANCE VALUES: 75 Ω , 140 Ω and 600 Ω . For special requirements, pads can be designed to provide any value of characteristic impedance in a very wide range.

IMPEDANCE ACCURACY: The impedance match is such that when the output terminals are closed by a resistor of the nominal impedance, the return loss against the nominal impedance is greater than 35 dB.

RANGE OF ATTENUATION: Pads can be supplied with any value of insertion loss between 0.1 dB and 40 dB (or between 0.01 neper and 4 nepers).

CONFIGURATION: Available in π , T, balanced π or square and balanced T or H. Units are also available giving change of impedance at minimum insertion loss both for balanced and unbalanced lines.

TERMINAL ARRANGEMENTS: Standard styles are shown in the drawings. These provide for the alternatives of solder lugs, wire leads for conventional wiring and leads for printed wiring.

FREQUENCY RANGE: Frequency range depends on the deviation that can be permitted from the nominal attenuation. This deviation will vary with different values of impedance and insertion loss. For example, 8 dB unbalanced pads of 75 Ω characteristic impedance may be used at any frequency up to 12 Mc and the insertion loss will not deviate by more than 0.2 dB from the value measured at DC. Information on the performance of any pads at high frequencies can be supplied on request.

RATING: Individual elements employed by these networks are rated at 250 milliwatts unless otherwise stated.

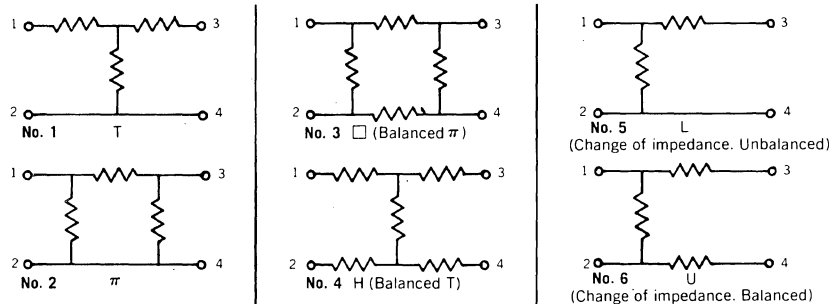
TEMPERATURE RANGE: -40°C to +85°C

BALANCE: In all types of balanced pads, a measurement of resistance made between one input terminal and either output terminal will not differ by more than 3% from a measurement made between the other two terminals.

STABILITY: Under normal ambient conditions, the value of attenuation will not change by more than 0.05 dB. The change after prolonged exposure to humid conditions will not exceed 0.1 dB.

STANDARD TOLERANCE OF INSERTION LOSS: The tolerance of the insertion loss is dependent on the nominal value of insertion loss in accordance with the following table.

Nominal Value of Insertion Loss (dB)	Permissible Departure from Nominal Loss (dB)
Less than 0.25	± 0.03
0.25 or more but less than 0.5	± 0.05
0.5 or more but less than 2.0	± 0.1
2.0 or more but less than 15	± 0.2
15 or more	± 0.25

CONFIGURATIONS AND TERMINAL DIAGRAMS

Standard housings and terminal arrangements are shown here. Configuration of pads, characteristic impedance and insertion loss can be made to customer requirements. The range includes both single and multiple section pads.

When attenuator pads are made from discrete components, film resistors of appropriate stability are used. They are taken from the Dale film resistor production line before terminal wires are fitted. Interconnections in the various attenuators are then made directly from the end caps of the resistors to the terminal tags. Intermediate connections are kept to a minimum and the possibility of dry joints is eliminated.

Pads are encapsulated in resin or encased in a plastic molding which protects them from damage and insures that, under the most severe environmental conditions, there is no change in the electrical properties.

Resistance values are selected to give the correct matching impedance for the pad and to provide an insertion loss well inside the tolerance limits. Attenuators cannot be manufactured to the necessary degree of accuracy by using resistors of preferred values from E.I.A. Series, and

it is essential to employ resistors made to the design calculated value and the appropriate close tolerance.

The reactance of discrete film resistors is low and this insures that the attenuation of the pad is constant over a wide range of frequencies. In some configurations and attenuation values, the insertion loss is constant from DC up to 10 MHz. Relative positioning of resistors is carefully maintained so that characteristic behavior at various frequencies is consistent between different units.

Attenuators are housed in plastic cases made to close dimensional tolerances. The marking is well cured, providing an indelible identification. Insulation between the elements and the surface of the case is maintained at a value in excess of 10^9 ohms at 500 volts DC. Cases are available in different colors and may be used to identify the impedance or other characteristic of the assembly.

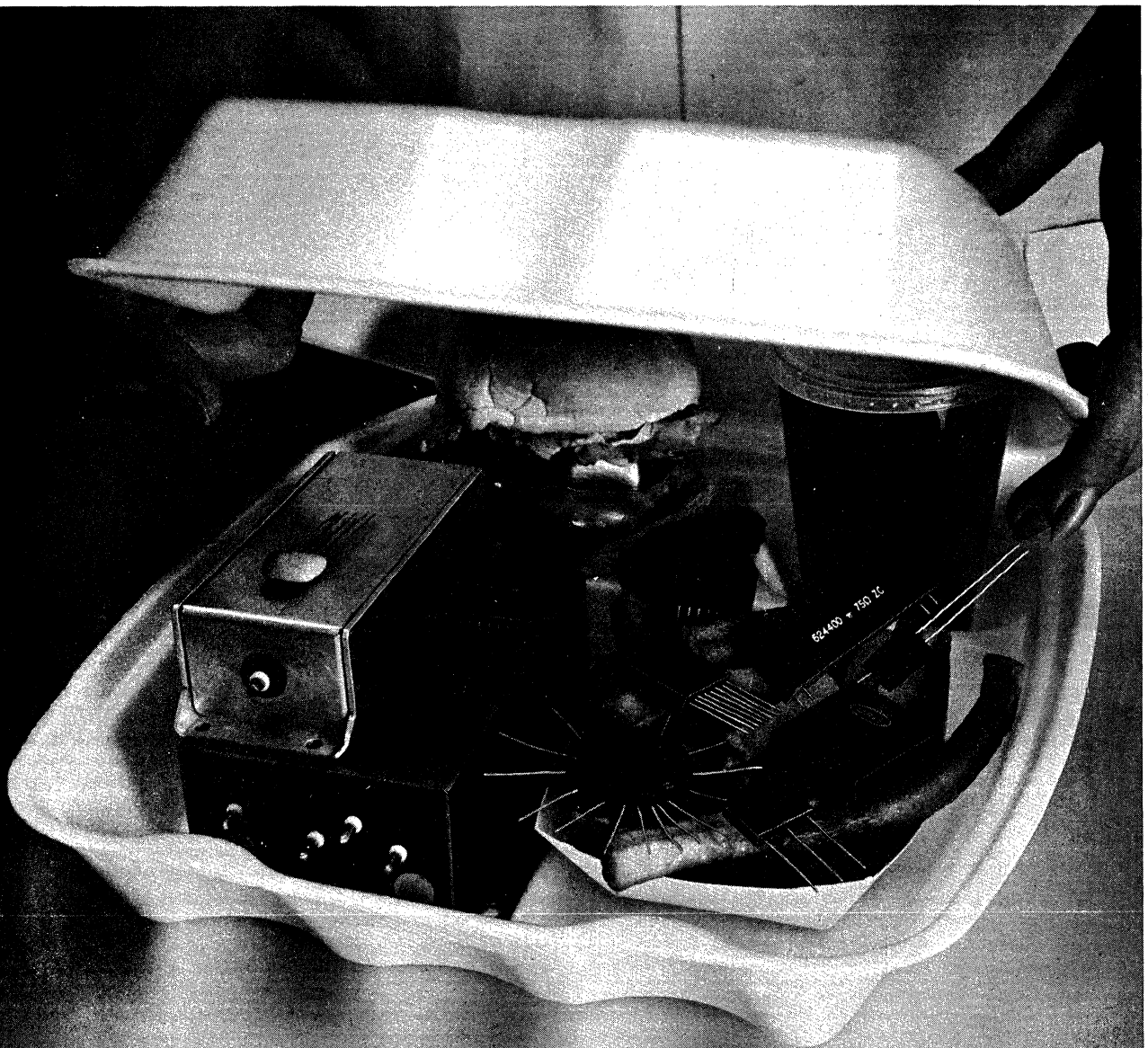
Standard terminals include solder lugs and wire leads for conventional wiring or for direct insertion into printed circuit boards. Other terminal arrangements can be provided to suit particular applications.

DALE ELECTRONICS, INC.

Box 74, Norfolk, Nebraska 68701 • Phone 402-371-0080

A subsidiary of The Lionel Corporation

In Canada: Dale Electronics Canada Ltd. • In Europe: Dale Electronics GmbH, 8 München 60, Falkweg 51, West Germany



Resistance functions ...packaged to go!

Thirty watts and 10 KVDC from a discrete thin film network? Sure! It's all in a day's work for Dale. We're specialists in tailoring the advantages of thin (metal or carbon) discrete film resistors to meet your unique and urgent needs. Dale discrete thin film network capabilities range from simple voltage dividers to complex binary D/A ladders with accuracy to 1/2 LSB.

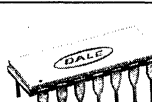
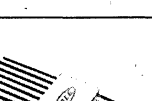
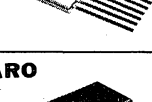
Packaging can vary from coated or molded, single or dual in-line to custom shapes and

enclosures for unusual space and/or heat dissipation requirements. Resistor pairs or sets matched for ratio, T.C. tracking and/or tolerance can also be packaged to go. When what you need isn't in the catalog, call Dale. We cater to special needs. For immediate help with special film resistors, call **402-371-0080**



DALE ELECTRONICS, INC.
P. O. Box 74, Norfolk, Nebraska 68701
In Canada: Dale Electronics Canada Ltd.
In Europe: Dale Electronics GmbH,
8 Munchen 60, Falkweg 51, West Germany
A subsidiary of The Lionel Corporation

DEPENDABLE**DALE****NETWORKS****THICK FILM and DISCRETE NETWORKS**

TYPE	BASIC DESCRIPTION	NO. OF PINS	CONDENSED SPECIFICATIONS
CDP 	DIP style with flame retardant coating. Also available in double width style.	14, 16, 18 (up to 24 in double width)	Power Rating: 1/8 watt maximum/resistor; maximum/package = 1-1/4 watts Resistance Range: 10 Ω to 1 Meg. Tolerance: $\pm$ 2%, 5%, 10% T.C.: $\pm$ 250 PPM/ $^{\circ}$ C
CDM 	DIP style with flat ceramic top. Epoxy coating. Suitable for automatic insertion. Designed to meet MIL-R-83401.	14, 16, 18	Power Rating: .10 watt maximum/resistor; maximum/package = 1-1/4 watts Resistance Range: 10 Ω to 1.0 Meg. Tolerance: $\pm$ 1%, 2%, 5%, 10% T.C.: $\pm$ 300 PPM/ $^{\circ}$ C
LDP 	DIP style with flat ceramic top. Epoxy coating. Suitable for automatic insertion. <i>Complete specifications on following pages.</i>	14, 16, 18	Power Rating: .10 watt maximum/resistor; maximum/package = 1-1/4 watts Resistance Range: 10 Ω to 1.0 Meg. Tolerance: $\pm$ 1%, 2%, 5%, 10% T.C.: $\pm$ 250 PPM/ $^{\circ}$ C
SDM 	DIP style with sandwich-type construction. Designed to meet MIL-R-83401. <i>Complete specifications on following pages.</i>	14, 16, 18	Power Rating: 1/10 watt maximum/resistor; maximum/package = 1-1/4 watts Resistance Range: 10 Ω to 1 Meg., depending on tolerance Tolerance: $\pm$ 1%, 2%, 5%, 10% T.C.: $\pm$ 300 PPM/ $^{\circ}$ C
SDP 	DIP style with sandwich-type construction. <i>Complete specifications on following pages.</i>	14, 16, 18	Power Rating: 1/10 watt maximum/resistor; maximum/package = 1-1/4 watts Resistance Range: 10 Ω to 1 Meg., depending on tolerance Tolerance: $\pm$ 1%, 2%, 5%, 10% T.C.: $\pm$ 250 PPM/ $^{\circ}$ C
CSP 	Single in-line package with flame retardant epoxy coating. Built-in standoffs. Lead spacings .100" and .125". <i>Complete specifications on following pages.</i>	4, 6, 8, 10	Power Rating: 1/8 watt maximum/resistor; maximum/package = 1-1/4 watts Resistance Range: 10 Ω to 1 Meg., depending on tolerance Tolerance: $\pm$ 1%, 2%, 5%, 10%, 20% T.C.: $\pm$ 250 PPM/ $^{\circ}$ C
TKR-36 	Binary ladder network designed for precision digital to analog conversion. Double-width DIP style package with flame retardant epoxy coating.	20	Resistance Value: 1K, 5K, 10K, 20K Accuracy: $\pm$ 1/2, 1, 2 LSB Tolerance: $\pm$ 5% typical
DFP 	Compact, thick film flat pack. Ceramic enclosure. Two internal configurations.	14, 16	Power Rating: .2 watt or .1 watt/resistor, depending on configuration; maximum/package = .65 watt Resistance Range: 20 Ω to 1 Meg., depending on tolerance Tolerance: $\pm$ 2%, 5%, 10%, 20% T.C.: $\pm$ 250 PPM/ $^{\circ}$ C
SPR-ARO 	DIP style with up to 11 discrete resistive elements. For use where tight tolerance and low temperature coefficient are required. Meets functional requirements of MIL-R-10509 and MIL-R-55182.	14, 16	Power Rating: .1 watt maximum/resistor; maximum/package = 1 watt Resistance Range: 10 Ω to 400K Ω Tolerance: $\pm$.05% to 5% T.C.: 10 PPM/ $^{\circ}$ C to 200 PPM/ $^{\circ}$ C

CHIP RESISTORS

RC 	Thick film chip resistor with choice of sizes to allow wide design flexibility in hybrid circuitry. <i>Complete specifications on following pages.</i>	None	Power Rating: 75, 100, 150 and 300 mw Resistance Range: 100 Ω to 500K Ω Tolerance: $\pm$ 1%, 2%, 5%, 10%, 20% T.C.: $\pm$ 250 PPM/ $^{\circ}$ C
--	---	------	--

SPECIALTY NETWORKS

	Discrete precision wirewound and film resistors packaged to your requirements and providing broad flexibility in meeting electrical and physical requirements. <i>Complete specifications on following pages.</i>		
---	--	--	--

DEPENDABLE**DALE®****NETWORKS****TYPE LDP (Sandwich) THICK FILM PACKAGE****FEATURES**

- Compact resistor circuits
- Suitable for automatic insertion
- Eliminates handling individual resistors

**SPECIFICATIONS****ELECTRICAL**

Resistance Range: 10 Ω to 1 Megohm

Temperature Coefficient: ± 250 PPM/ $^{\circ}$ C over a temperature range of -55° C to $+150^{\circ}$ C. (+25 $^{\circ}$ C reference.)

Operating Voltage: 75 VDC typical (2 volts max. per .001" of resistor length).

Power Rating: At 70 $^{\circ}$ C, 1/8 watt maximum/resistor. Total package rating: LDP-14, 1 watt; LDP-16, 1-1/8 watt; LDP-18, 1-1/4 watt.

Ratio Matching: 0.5% available on special request.

T. C. Tracking: 50PPM/ $^{\circ}$ C available on special request...in resistors of similar geometry and value.

Voltage Coefficient: As low as ± 15 PPM/V, depending on resistor geometry and value.

Noise: Depends on resistor geometry and value.

Operating Temp. Range: -55° C to $+150^{\circ}$ C.

MATERIAL

Element: Fused, thick film compositions

Substrate: High purity 95% minimum alumina

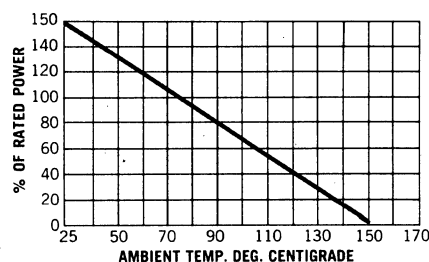
Terminals: Tin-plated Alloy 42 or equivalent

Coating Material: Epoxy between ceramic sandwich

DERATING

Dale thick film dual in-line sandwich packages have an operating temperature range of -55° C to $+150^{\circ}$ C. They should be derated at high ambient temperatures according to the curve at right.

Note: Power rating based on still air hotspot mounted on 1/16" P.C. board at 70 $^{\circ}$ C ambient. See derating curve between 25 $^{\circ}$ C and 70 $^{\circ}$ C.

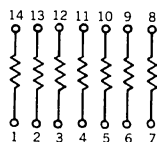
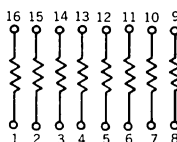
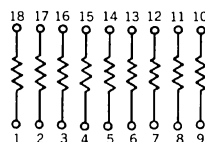
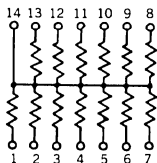
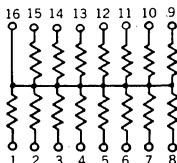
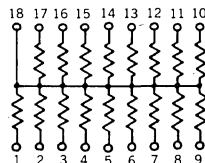
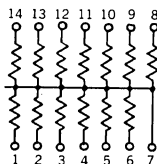
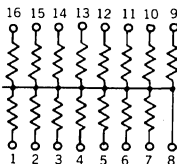
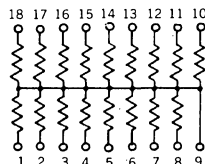
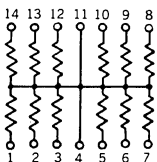
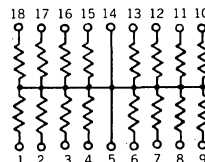


**ENVIRONMENTAL PERFORMANCE
SPECIFICATIONS
MIL-R-83401**

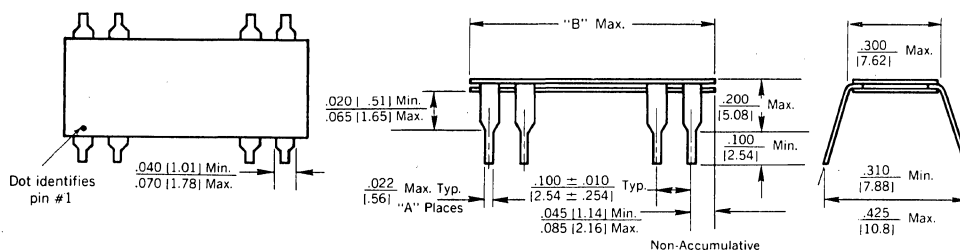
ENVIRONMENTAL TEST	DALE TYPICAL
Temperature Cycling	.10% Δ R
Low Temp. Operation	.10% Δ R
Short Time Overload	.05% Δ R
Resistance to Soldering Heat	.10% Δ R
Moisture Resistance	.20% Δ R
Load Life (1,000 hours)	.10% Δ R
Shock, Medium Impact	.05% Δ R
Vibration	.05% Δ R

DEPENDABLE**DALE®****NETWORKS****TYPICAL SCHEMATICS**

SCHEMATICS: All resistors/package are the same value.
Consult factory for different circuitry and/or mixed values.

LDP-14-01**LDP-16-01****LDP-18-01****LDP-14-02****LDP-16-02****LDP-18-02****LDP-14-03****LDP-16-03****LDP-18-03****LDP-14-04****LDP-18-04****DIMENSIONAL AND TERMINAL CONFIGURATIONS**

Dimensions in Inches
[Dimensions in Millimeters]



SERIES	A	B
LDP-14	14	.760 [19.3]
LDP-16	16	.860 [21.85]
LDP-18	18	.960 [24.4]

ORDERING INFORMATION**LDP**

1. SERIES

14

2. NO. OF PINS

01

3. CONFIGURATION

182

4. RESISTANCE VALUE

G

5. TOLERANCE

1. Series

2. Number of Pins

3. Configurations (see schematics)

4. Resistance Value—the first two digits are significant figures; the last digit specifies the number of zeros to follow. NOTE: For "F" tolerance, the first three digits are significant figures and the last digit specifies the number of zeros to follow.

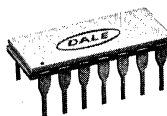
5. Tolerance: F = ±1%, G = ±2%, J = ±5%, K = ±10%, M = ±20%

EXAMPLE:

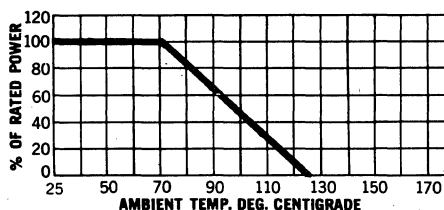
LDP14-01-182G = a thick film resistor with 14 pins with a resistance value of 1800 ohms, tolerance of 2% and the resistor configuration identified as -01 in the drawing above.

DEPENDABLE**DALE®****NETWORKS****TYPE SDM (Sandwich) THICK FILM PACKAGE****MIL-R-83401****FEATURES**

- Compact resistor circuits
- Dual in-lines
- Eliminates handling individual resistors
- 100% conditioning per Group A of MIL-R-83401

**SPECIFICATIONS****ELECTRICAL****Resistance Range:** 10Ω to 1 Megohm**Temperature Coefficient:** ±300 PPM/°C over a temperature range of -55°C to +125°C. (+25°C reference.)**Operating Voltage:** 75 VDC typical (2 volts max. per .001" of resistor length).**Power Rating:** At 70°C, 1/10 watt maximum/resistor. Total package rating: SDM-14, 1 watt; SDM-16, 1-1/8 watt; SDM-18, 1-1/4 watt.**Tolerance:** ±1%, ±2%, ±5%.**Voltage Coefficient:** As low as ±15 PPM/V, depending on resistor geometry and value**Noise:** Depends on resistor geometry and value.**Operating Temp. Range:** -55°C to +125°C**MATERIAL****Element:** Fused, thick film compositions**Substrate:** High purity 95% minimum alumina**Terminals:** Tin-plated Alloy 42 or equivalent**Coating Material:** None**DERATING**

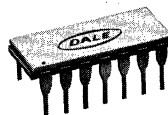
Dale thick film dual in-line sandwich packages have an operating temperature range of -55°C to +125°C. They should be derated at high ambient temperatures according to the curve at right.


**ENVIRONMENTAL PERFORMANCE
SPECIFICATIONS
MIL-R-83401**

ENVIRONMENTAL TEST	DALE TYPICAL
Temperature Cycle	.10%ΔR
Low Temp. Operation	.05%ΔR
Short Time Overload	.05%ΔR
Resistance to Soldering Heat	.15%ΔR
Moisture Resistance	.20%ΔR
Load Life (1,000 hours)	.10%ΔR
Shock, Medium Impact	.05%ΔR
Vibration	.02%ΔR
High Temp. Exposure	.05%ΔR
Low Temp. Storage	.10%ΔR

DEPENDABLE**DALE®****NETWORKS****TYPE SDP (Sandwich) THICK FILM PACKAGE****FEATURES**

- Compact resistor circuits
- Dual in-lines
- Eliminates handling individual resistors

**SPECIFICATIONS****ELECTRICAL**

Resistance Range: 10 Ω to 1 Meg.

Temperature Coefficient: ± 250 PPM/ $^{\circ}$ C over a temperature range of -55° C to $+150^{\circ}$ C ($+25^{\circ}$ C reference.)

Operating Voltage: 75 VDC typical (2 volts max. per .001" of resistor length).

Power Rating: At 70° C, 1/8 watt maximum/resistor.
Total package rating: SDP-14, 1-1/8 watt;
SDP-16, 1-1/4 watt; SDP-18, 1-1/2 watt.

Ratio Matching: 0.5% available on special request.

T. C. Tracking: 50 PPM/ $^{\circ}$ C available on special request...
in resistors of similar geometry and value.

Voltage Coefficient: As low as ± 15 PPM/V, depending on resistor geometry and value.

Noise: Depends on resistor geometry and value.

Operating Temp. Range: -55° C to $+150^{\circ}$ C

MATERIAL

Element: Fused, thick film compositions

Substrate: High purity 95% minimum alumina

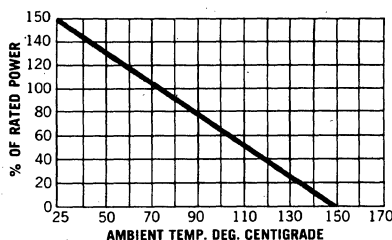
Terminals: Tin-plated Alloy 42 or equivalent

Coating Material: None

DERATING

Dale thick film dual in-line sandwich packages have an operating temperature range of -55° C to $+150^{\circ}$ C. They should be derated at high ambient temperatures according to the curve at right.

Note: Power rating based on still air hotspot mounted on 1/16" P.C. board at 70° C ambient. See derating curve between 25° C and 70° C.

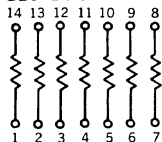
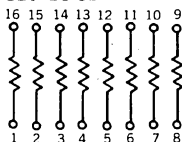
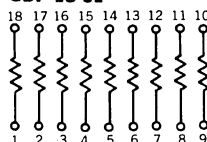
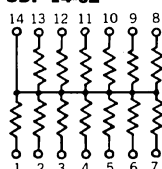
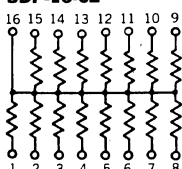
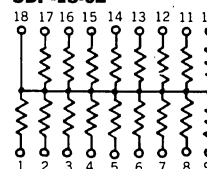
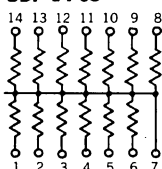
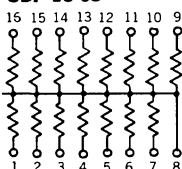
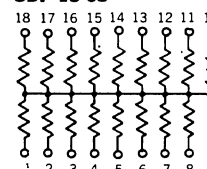
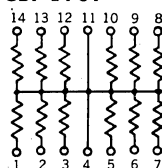
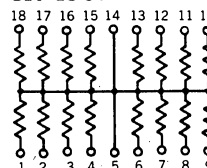


**ENVIRONMENTAL PERFORMANCE
SPECIFICATIONS
MIL-R-83401**

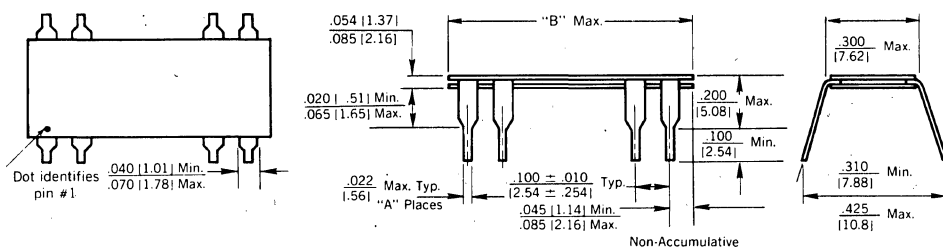
ENVIRONMENTAL TEST	DALE TYPICAL
Temperature Cycle	.10% Δ R
Low Temp. Operation	.05% Δ R
Short Time Overload	.05% Δ R
Resistance to Soldering Heat	.15% Δ R
Moisture Resistance	.20% Δ R
Load Life (1,000 hours)	.10% Δ R
Shock, Medium Impact	.05% Δ R
Vibration	.02% Δ R
High Temperature Exposure	.05% Δ R
Low Temperature Storage	.10% Δ R

DEPENDABLE**DALE®****NETWORKS****TYPICAL SCHEMATICS**

SCHEMATICS: All resistors/package are the same value.
Consult factory for different circuitry and/or mixed values.

SDP-14-01**SDP-16-01****SDP-18-01****SDP-14-02****SDP-16-02****SDP-18-02****SDP-14-03****SDP-16-03****SDP-18-03****SDP-14-04****SDP-18-04****DIMENSIONAL AND TERMINAL CONFIGURATIONS**

Dimensions in Inches
[Dimensions in Millimeters]



SERIES	A	B
SDP-14	14	.760 [19.3]
SDP-16	16	.860 [21.85]
SDP-18	18	.960 [24.4]

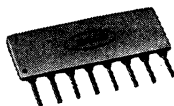
ORDERING INFORMATION

SDP	14	01	182	G
1. SERIES	2. NO. OF PINS	3. CONFIGURATION	4. RESISTANCE VALUE	5. TOLERANCE

1. Series
2. Number of Pins
3. Configurations (see schematics)
4. Resistance Value—the first two digits are significant figures; the last digit specifies the number of zeros to follow. NOTE: For "F" tolerance, the first three digits are significant figures and the last digit specifies the number of zeros to follow.
5. Tolerance: F = $\pm 1\%$, G = $\pm 2\%$, J = $\pm 5\%$, K = $\pm 10\%$, M = $\pm 20\%$

EXAMPLE:

SDP14-182G-01 is a thick film resistor with 14 pins with a resistance value of 1800 ohms, tolerance of 2% and the resistor configuration identified as -01 in the drawing above.

DEPENDABLE**DALE®****NETWORKS****TYPE CSP (Coated) THICK FILM PACKAGE****FEATURES**

- Flame retardant coating
- Compact resistor circuits
- Eliminates handling individual resistors
- Simplifies circuit wiring
- Single in-line package

SPECIFICATIONS**ELECTRICAL**

Resistance Range: 10 Ω to 1.0 Meg.

Temperature Coefficient: ± 250 PPM/ $^{\circ}$ C over a temperature range of -55° C to $+150^{\circ}$ C. ($+25^{\circ}$ C reference.)

Operating Voltage: 75 VDC typical (2 volts max. per .001" of resistor length).

Power Rating: At 70° C, $\frac{1}{8}$ watt maximum/resistor. See dimensional table for power rating by package.

Ratio Match: 0.5% available on special request.

T.C. Tracking: 50 PPM/ $^{\circ}$ C available on special request.

Voltage Coefficient: As low as ± 15 PPM/V, depending on resistor geometry and value.

Noise: Depends on resistor geometry and value

Operating Temp. Range: -55° C to $+150^{\circ}$ C

MATERIAL

Element: Fused, thick film compositions

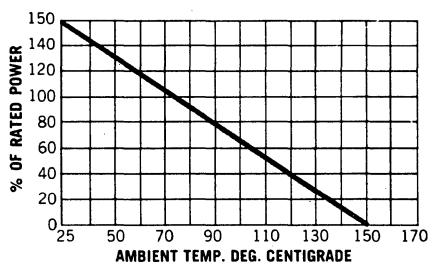
Substrate: High purity 95% minimum alumina

Terminals: Tin-plated alloy 42 or equivalent

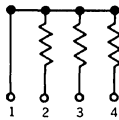
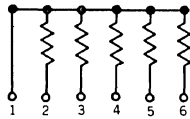
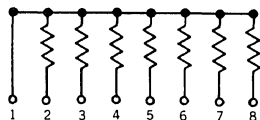
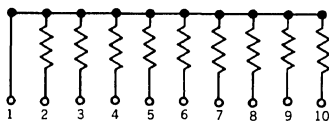
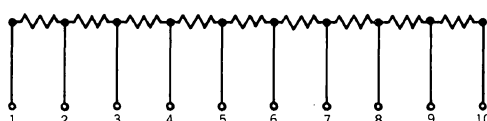
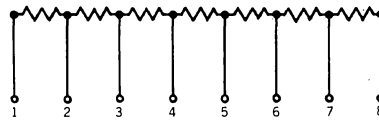
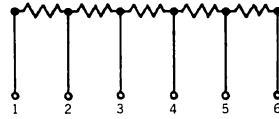
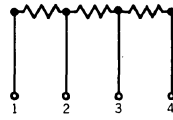
Coating Material: Specially Dale-formulated epoxy

DERATING

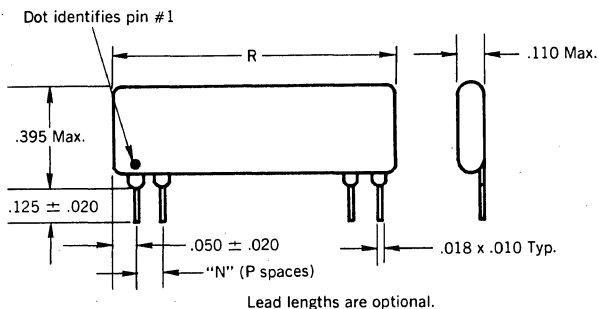
Dale thick film single in-line resistor networks have an operating temperature range of -55° C to $+150^{\circ}$ C. They should be derated at high ambient temperatures according to the following curve:


**ENVIRONMENTAL PERFORMANCE
SPECIFICATIONS
MIL-R-83401**

ENVIRONMENTAL TEST	DALE TYPICAL
Temperature Cycling	$\pm .10\%$ ΔR
Low Temp. Operation	$\pm .10\%$ ΔR
Short Time Overload	$\pm .06\%$ ΔR
Resistance to Soldering Heat	$\pm .10\%$ ΔR
Insulation Resistance	10K Meg. min.
Moisture Resistance	$\pm .25\%$ ΔR
Load Life (1,000 hours)	$\pm 1\%$ ΔR
Shock, Medium Impact	$\pm .10\%$ ΔR
Vibration	$\pm .10\%$ ΔR

DEPENDABLE**DALE®****NETWORKS****TYPICAL SCHEMATICS****-01 CONFIGURATION****CSP-04****CSP-06****CSP-08****CSP-10****-02 CONFIGURATION****SCHEMATICS:**

All resistors/package are the same value.
Consult factory for different circuitry and/or mixed values.

DIMENSIONAL AND TERMINAL CONFIGURATIONS

Note: Power rating based on still air hotspot mounted on 1/16" P.C. board at 70°C ambient. See derating curve between 25°C and 70°C.

MODEL	DIMENSIONS			TERMINALS	POWER RATING (Watts)
	N	P	R		
CSP 04 E	.100 ± .010	3	.450 Max.	4	1/2
CSP 06 E	.100 ± .010	5	.650 Max.	6	3/4
CSP 08 E	.100 ± .010	7	.850 Max.	8	1
CSP 10 E	.100 ± .010	9	1.050 Max.	10	1 1/4
CSP 04 F	.125 ± .010	3	.525 Max.	4	1/2
CSP 06 F	.125 ± .010	5	.775 Max.	6	3/4
CSP 08 F	.125 ± .010	7	1.025 Max.	8	1
CSP 10 F	.125 ± .010	9	1.275 Max.	10	1 1/4

ORDERING INFORMATION

CSP	04	E	01	100	G
1. SERIES	2. NUMBER OF TERMINALS	3. LEAD SPACE CODE	4. CONFIGURATION	5. RESISTANCE VALUE	6. TOLERANCE

1. Series**2. Number of terminals**

3. Lead Spacing Code: E = .100" centers, F = .125" centers

4. Configurations (see schematics)**5. Resistance Value**—The first two digits are significant figures; the last digit specifies the number of zeros to follow.

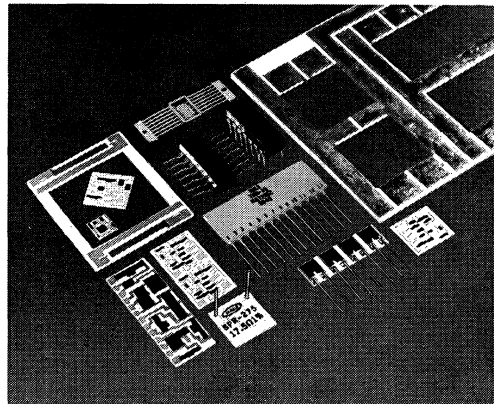
Note: For "F" tolerance, the first three digits are significant figures and the last digit specifies the number of zeros to follow.

6. Tolerance: F = ±1%, G = ±2%, J = ±5%, K = ±10%, M = ±20%**EXAMPLE:**

CSP 04 E-01-100G = a single in-line thick film resistor network with 4 terminals on .100" centers, -01 configuration, resistance of 10 ohms and tolerance of ±2%.

DEPENDABLE**DALE****MICROCIRCUITS****THICK FILM MICROCIRCUITS****FEATURES**

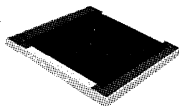
- Custom design allows you to specify design tolerance, packaging, environmental requirements.
- Engineering assistance for production design.
- Specialists in design of networks for high power dissipation.
- Standard dual in-line packaging or modular packaging with screened silicone coating and choice of lead types.
- Wide choice of pre-conditioning options.

CIRCUIT MATERIALS AVAILABLE**Substrates:** Alumina**Terminations:** Wire Leads, Ribbon Leads or Solder Pads**Conductors and Land Areas:** Platinum Gold, Palladium Gold, Gold, Silver, Palladium Silver**Crossovers:** As required**Packaging:** Dual in-line, single in-line, custom**Coating:** Screened Silicone, epoxy, custom**To obtain prototypes for your circuit...**

contact your Dale representative or phone or write Dale at the address below. Dale's Microcircuit Department is geared to assist you with every phase of design—providing the shortest possible leadtime between concept and production ready component.

PRECONDITIONING OPTIONS

- Power Aging
- Temperature & Power
- Temperature Cycling
- Temperature Aging
- Short Time Overload
- Thermal Shock
- X-Ray

THICK FILM CHIP RESISTOR

Resistance Range: 100 Ω to 500K.
10 Ω to 5 Meg. by special order

Tolerance: $\pm 20\%$, $\pm 10\%$, $\pm 5\%$,
 $\pm 2\%$, $\pm 1\%$

Temp. Coefficient: ± 200 PPM
(-55°C to $+150^\circ\text{C}$) $+25^\circ\text{C}$
Reference

Operating Voltage: 50 to 125 VDC
depending on size.

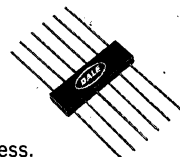
PHYSICAL	SIZE CODE	POWER RATING
.050 x .050	550	75mw
.050 x .075	575	100mw
.050 x .100	5100	150mw
.050 x .150	5150	300mw

WIREWOUND and FILM PACKAGED NETWORKS**FEATURES**

- Choice of linear wirewound, bobbin wirewound, metal film, carbon film or cermet elements
- Less components to stock or handle
- Reduced inspection time
- Ease of assembly
- Matched resistors cannot be mixed or lost
- Complete environmental protection
- Dale networks meet or exceed requirements of MIL-R-26, MIL-R-93 or MIL-R-10509, depending on type of element used
- Packaged to meet your requirements

LADDER NETWORKS

- **Output Accuracy:** $\pm .05\%$ full scale accuracy or $\pm 1/2$ least significant bit, whichever is less.
- **Output Variation with Temp.:** $\pm .1\%$ full scale accuracy or ± 1 least significant bit, whichever is less.
- **Operating Temp. Range** (For Accuracies Specified Above): -55°C to $+70^\circ\text{C}$ (Film Type) -55°C to $+125^\circ\text{C}$ (Wirewound Type).
- **Input Resistance** (All inputs connected): 1K Ω to 500K Ω
- **Output Resistance** (All inputs grounded): 250 Ω to 125K Ω
- **Insulation Resistance:** 100 Megohms minimum.
- **Terminals:** Solderable or weldable wire leads.
- **Packaging:** Epoxy or Silicone resin potting. Transfer molded, Can be encapsulated. Other types of special packaging available to meet your requirements.

**GENERAL RESISTOR ELECTRICAL CAPABILITIES**

	WIREWOUND	FILM (Carbon & Metal)
Power Rating	.1 to 10 W	.02 to .5 W
Resistance Range	1 ohm to 1.5 Meg.	5 ohms to 5 Meg.
Tolerance	.02% to 1%	.1% to 1%
Tolerance Match	.005%	.05%
Temp. Coefficient	5 PPM/ $^\circ\text{C}$ from 0°C to $+75^\circ\text{C}$	25 PPM/ $^\circ\text{C}$
Temp. Coefficient Match	2 PPM/ $^\circ\text{C}$ from 0°C to $+75^\circ\text{C}$	7 PPM/ $^\circ\text{C}$
Resistance Stability	.005%/yr.	.03%/yr.
Operating Temp.	-65°C to $+145^\circ\text{C}$	-55°C to $+175^\circ\text{C}$

BINARY DIGITAL-TO-ANALOG LADDER NETWORKS

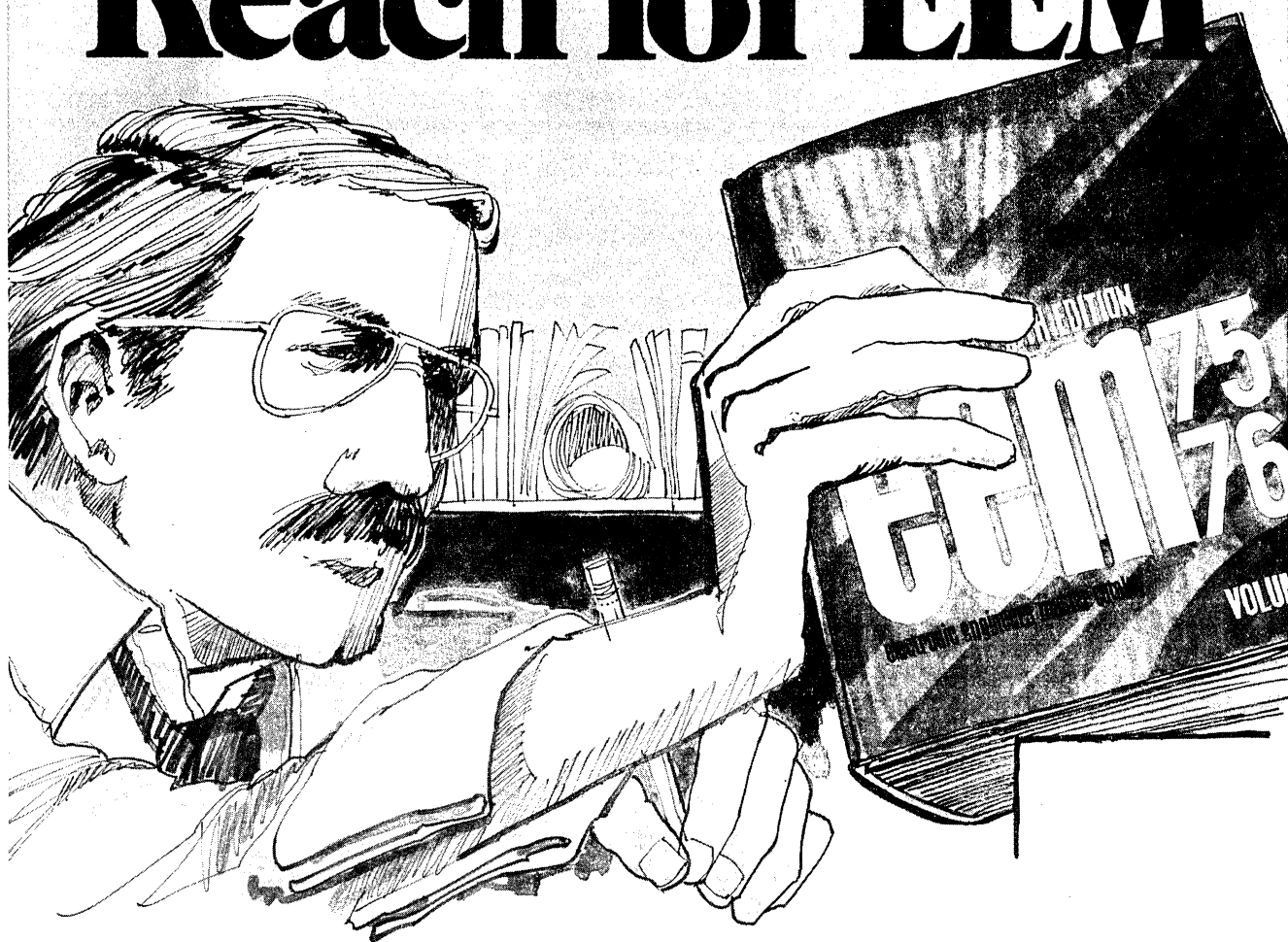
Resistor Parameters for meeting 4 and 8 bit dimensional requirements

	WIREWOUND	FILM
Power Rating	1/8 watt from -55°C to $+125^\circ\text{C}$, derated linearly to 0 at $+145^\circ\text{C}$	1/2 watt from -55°C to $+70^\circ\text{C}$, derated linearly to 0 at $+145^\circ\text{C}$
Temp. Coefficient	0 ± 20 PPM/ $^\circ\text{C}$ from -55°C to $+125^\circ\text{C}$. Lower T.C.'s available upon request	400 PPM/ $^\circ\text{C}$ max. T.C.'s available down to 25 PPM/ $^\circ\text{C}$
Heat Rise	20 $^\circ\text{C}$ max. at rated power	60 $^\circ\text{C}$ max. at rated power

DALE ELECTRONICS, INC., Box 74, Norfolk, Nebraska 68701 Phone: 402-371-0080

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

**COMPANY
HISTORY**

Post Office Box 890
1320 Flaxmill Road
Huntington, Indiana 46750
Telephone (219) 356-4300
TWX 810-333-1530



E-SYSTEMS INC.

Memcor Division

MANUFACTURERS OF

MEMCOR
ELECTRONIC COMPONENTS

OUR HISTORY — AND WE ARE PROUD OF IT . . .

SINCE 1945



. . . a quality line of resistive products

SINCE 1963



. . . a quality line of
resistive products

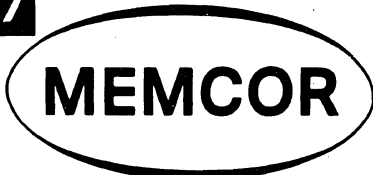
**HARDWICK
HINDLE**

SINCE 1965



. . . a quality line of
resistive products

SINCE 1967



. . . a quality line of
resistive products

TODAY



E-SYSTEMS INC.

Memcor Division

MANUFACTURERS OF

MEMCOR
ELECTRONIC COMPONENTS

. . . a quality line of
resistive products



E-SYSTEMS INC.

Memcor Division

MANUFACTURERS OF

MEMCOR
ELECTRONIC COMPONENTS



E-SYSTEMS INC.
Memcor Division
MANUFACTURERS OF
MEMCOR
ELECTRONIC COMPONENTS

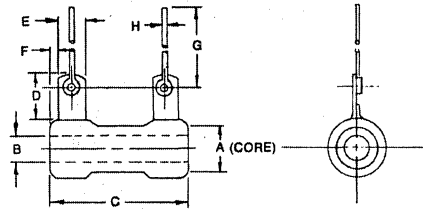
RESISTORS, FIXED

Post Office Box 890
1320 Flaxmill Road
Huntington, Indiana 46750
Telephone (219) 356-4300
TWX 810-333-1530

WIREWOUND RESISTORS

FIXED W/LEADS: TYPE FRL — 5-8, 10-12, 20 WATTS

Mtg. Bracket Mtg. Centers Wt. (Lbs.)	FR5-8 1441-003-001 1 1/2" .012	FR10-12 1441-003-001 2 1/2" .019	FR20 1441-004-001 2 1/2" .033	Mtg. Bracket Mtg. Centers Wt. (Lbs.)	FR5-8 1441-003-001 1 1/2" .012	FR10-12 1441-003-001 2 1/2" .019	FR20 1441-004-001 2 1/2" .033
Ohms	Max. Amps	Max. Amps	Max. Amps	Ohms	Max. Amps	Max. Amps	Max. Amps
0.5		4.90	6.32	750	.10	.12	.16
1	2.29	3.46	4.47	800	.10	.12	.15
1.5	2.30	2.82		900	.094	.11	.15
2	2.00	2.45	3.16	1000	.089	.11	.14
3	1.63	2.00	2.58	1100	.085	.10	
4	1.41	1.73	2.24	1200	.081	.10	.13
5	1.26	1.54	2.00	1250	.080	.097	.12
7.5	1.00	1.26		1500	.073	.089	.12
10	.89	1.09	1.41	1750	.067	.082	.11
12	.81	1.00		2000	.063	.077	.10
15	.73	.89		2250	.059	.073	.094
20	.63	.77		2500	.056	.069	.089
25	.56	.69	.89	3000	.046	.063	.081
30	.51	.63		3500	.043	.058	.075
35	.47	.58		4000	.040	.054	.070
40	.44	.54		4500	.038	.051	.066
50	.40	.49	.63	5000	.036	.049	.063
75	.32	.40	.52	6000	.033	.044	.057
100	.28	.34	.45	7000	.030	.041	.053
125	.25	.31		7500	.029	.036	.051
150	.23	.28	.36	8000	.029	.035	.050
200	.20	.24	.32	9000	.027	.033	.047
225	.18	.23		10000	.026	.032	.043
250	.17	.22	.28	12500	.023	.028	.032
300	.16	.20	.26	15000	.021	.026	.029
350	.15	.18	.24	20000	.018	.022	.026
400	.14	.17	.22	25000	.015	.020	.023
450	.13	.16		30000			
500	.12	.15	.20	50000		.014	.016
600	.11	.14		75000			.013
700	.11	.13	.17	100000			.011



	A	B	C	D	E	F	G	H
FRL5-8W	3/16	.200	1	3/16	3/16	3/32	1 3/4	.036
FRL10-12W	3/16	.200	1 3/4	3/16	3/16	3/32	1 3/4	.036
FRL20W	3/16	1/4	2	3/16	3/16	3/32	1 3/4	.036

FEATURES:

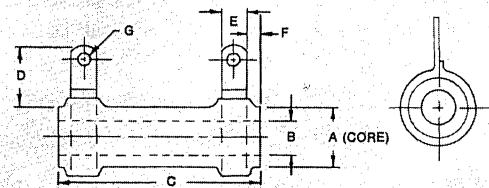
- Tubular construction provides excellent heat dissipation.
- Welded terminals and termination guarantees positive electrical connections.
- Balanced thermal expansion between core, wire and high temperature vitreous enamel assures reliable performance.
- Long term stability results from firing at temperatures exceeding 1000°F.
- Tinned terminals provide reliable solder or mechanical connections.
- Uniform winding and coating provides uniform heat dissipation and excellent appearance.
- Available in Non-inductive winding.
- Supplied with 1/2" solder leads.
- Other hardware available for mounting. See Hardware Section.

SPECIFICATIONS:

- Resistance tolerance $\pm 5\%$... closer tolerance available.
- Temperature coefficient ± 100 PPM ... Lower TC available.
- When dual wattages are shown ... Lower wattages have a maximum "hotspot" of 275°C. Higher wattages have a maximum "hotspot" of 350°C.
- Available resistance range 0.5 ohm to 100,000 ohm.
- Meets or exceeds applicable specifications of MIL-R-26.
- Dimensional Tolerances $\pm .005$.

FIXED W/TABS: TYPE FR — 5-8, 10-12, 20, 25, 50, 100, 160-175, 200-225 WATTS

Mounting Bracket Mounting Centers Wt. (Lbs.)	FR25 1441-005-001 2 3/4" .051	FR50 1441-005-001 4 3/4" .082	FR100 1441-006-001 7 3/4" .2	FR160-175 1441-007-001 9 3/4" .445	FR200-225 1441-007-001 11 3/4" .74
Ohms	Max. Amps	Max. Amps	Max. Amps	Max. Amps	Max. Amps
1	5	7.07	10	13.2	15
2	3.54	5	7.07		10.60
3	2.88	4.07			
4	2.50	3.53			
5	2.24	3.16	4.47	5.92	6.72
10	1.58	2.23	3.16	4.18	4.74
15	1.29			3.24	
25	1	1.41	2	2.64	3
50	.71	1	1.41	1.87	2.12
75	.58	.82	1.15		1.73
100	.50	.71	1	1.32	1.50
150	.41	.58	.82	1.08	
200	.35	.50			
250	.32	.45	.63	.84	.95
500	.22	.32	.45	.59	.67
750	.18	.26	.37		
1000	.16	.22	.32	.42	.47
1500	.13	.18		.34	
2000	.12	.16	.22	.30	.34
2500	.10	.14			
3000	.091				
3500	.084				
4000	.079				
5000	.070	.10	.14	.19	.21
6000	.064				
7500	.057	.081			.17
10000	.050	.071	.10	.13	.15
15000	.036	.057		.11	
20000	.031	.050	.071	.094	.11
25000	.028	.045	.063	.083	
50000	.019	.026	.045	.059	.067
75000	.021	.032	.048		
80000	.012				
100000	.0094	.018	.028	.042	.047



	A	B	C	D	E	F	G
FR5-8	3/16	.200	1	3/16	3/16	3/32	.104
FR10-12	3/16	.200	1 3/4	3/16	3/16	3/32	.104
FR25	3/16	1/4	2	3/16	3/16	3/32	.104
FR50	3/16	3/4	4	3/16	3/16	3/32	.144
FR100	3/4	1/2	6 1/2	3/16	3/16	3/32	.144
FR160-175	1 1/8	3/4	8 1/2	3/16	3/16	3/32	.177
FR200-225	1 1/8	3/4	10 1/2	3/16	3/16	3/32	.177

FEATURES:

- Tubular construction provides excellent heat dissipation.
- Welded terminals and termination guarantees positive electrical connections.
- Balanced thermal expansion between core, wire and high temperature vitreous enamel assures reliable performance.
- Long term stability results from firing at temperatures exceeding 1000°F.
- Tinned terminals provide reliable solder or mechanical connections.
- Uniform winding and coating provides uniform heat dissipation and excellent appearance.
- Available in Non-inductive winding.
- Quick disconnect terminal available as optional feature.
- Standard units supplied with push-in mounting brackets.
- Other hardware available for mounting. See Hardware Section.

SPECIFICATIONS:

- Resistance tolerance $\pm 5\%$... closer tolerance available.
- Temperature coefficient ± 100 PPM ... Lower TC available.
- When dual wattages are shown ... Lower wattages have a maximum "hotspot" of 275°C. Higher wattages have a maximum "hotspot" of 350°C.
- Available resistance range 0.5 ohm to 100,000 ohm.
- Meets or exceeds applicable specifications of MIL-R-26.
- Dimensional Tolerances $\pm .005$... except $\pm .01$ on length of FR100W, FR160-175W and FR200-225W.

WIREWOUND RESISTORS

Fixed W/Leads: Type FRL — 5-8, 10-12, 20 Watts

Fixed W/Tabs: Type FR — 5-8, 10-12, 20, 25, 50, 100, 160-175, 200-225 Watts

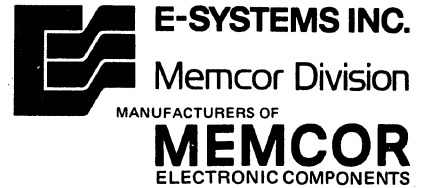


E-SYSTEMS INC.
Memcor Division
MANUFACTURERS OF
MEMCOR
ELECTRONIC COMPONENTS

RESISTORS, FIXED

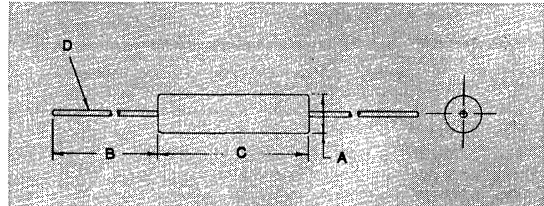
WIREWOUND RESISTORS

Post Office Box 890
1320 Flaxmill Road
Huntington, Indiana 46750
Telephone (219) 356-4300
TWX 810-333-1530



MOLDED SILICONE: TYPE ML — 1, 2, 3 WATTS/OHM VALES 1-10,000

Wt. (Lbs.) Ohms	ML1 .0009 Max. Amps	ML2 .0018 Max. Amps	ML3 .003 Max. Amps	Wt. (Lbs.) Ohms	ML1 .0009 Max. Amps	ML2 .0018 Max. Amps	ML3 .003 Max. Amps
1	1.24	1.5	1.8	220	.083	.10	.12
1.5	1.12	1.22	1.47	250	.077	.094	.11
2	1	1.05	1.27	270	.075	.091	.109
2.5	.87	.97	1.12	300	.071	.086	.10
3	.71	.86	1.04	350	.065	.080	.096
4	.61	.73	.90	400	.061	.075	.090
5	.55	.67	.81	450	.058	.071	.084
6	.49	.60	.73	470	.056	.069	.083
7.5	.45	.55		500	.055	.067	.081
8	.42	.52	.64	600	.050	.061	.073
10	.39	.47	.56	700	.046	.056	
12	.35	.43	.52	750	.045	.055	.065
15	.32	.39	.47	800	.043	.053	.064
20	.27	.33	.42	900	.041	.050	
25	.25	.30	.36	1000	.039	.047	.056
30	.22	.27	.30	1200	.035	.043	.052
35	.207	.25	.29	1500	.032	.039	.047
40	.193	.24	.28	2000	.027	.033	.040
50	.173	.21	.25	2500	.025	.030	.036
60	.156	.19	.23	3000		.027	.033
75	.141	.17	.21	3500		.024	.030
80	.135	.16	.20	4000			.028
90	.128	.16	.19	5000			.025
100	.123	.15	.18	6000			.023
125	.111	.14	.16	7500			.021
150	.1	.12	.15	8000			.020
175	.097	.12	.14	9000			.019
200	.087	.10	.13	10000			.018



	A	B	C	D
ML1	.125	1½	.437	.020
ML2	.205	1½	.560	.032
ML3	.242	1½	.525	.032

FEATURES:

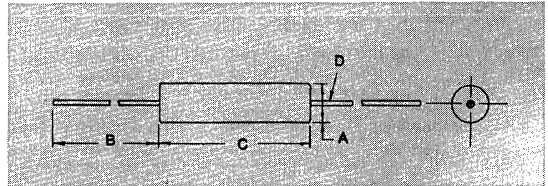
- Uniform molded size facilitates handling with automatic insertion equipment.
- Welded termination and lead/end cap assembly assure maximum reliability.
- Uniformly tinned leads assure reliable electrical and mechanical connections.
- Low temperature coefficient.
- 1% resistance tolerance standard.
- Available with Non-inductive winding.

SPECIFICATIONS:

- Resistance tolerance $\pm 1\%$... Closer tolerance available.
- Temperature coefficient ± 50 PPM ... Lower TC available.
- Available resistance range 1-10,000 Ohm.
- Dielectric withstanding voltage 1000 V.
- Dimensional tolerances $\pm \frac{1}{32}$ ".

W/AXIAL LEADS: TYPE VL — 3, 5, 10 WATTS/OHM VALUES 1-50,000

Wt. (Lbs.) Ohms	VL3 .002 Max. Amps	VL5 .006 Max. Amps	VL10 .014 Max. Amps	Wt. (Lbs.) Ohms	VL3 .002 Max. Amps	VL5 .006 Max. Amps	VL10 .014 Max. Amps
1	1.80	2.24	3.32	600	.073	.091	
1.5	1.47	1.83	2.71	700	.068	.084	
2	1.27	1.58	2.34	750	.065	.082	.12
3	1.04	1.29	1.92	800	.064	.079	
4	.90	1.11	1.66	820		.078	
5	.81	1.00	1.48	900	.060	.074	
7.5	.65	.82	1.21	1000	.056	.071	.11
10	.56	.71	1.05	1100	.054		
12		.65		1200	.052	.065	
15	.47	.58	.86	1500	.047	.058	.086
20	.40	.50	.74	1800		.053	
25	.36	.45	.66	2000	.040	.050	.074
30	.30	.41	.61	2200	.039	.048	
35	.30	.38	.56	2500	.036	.045	.066
40	.28	.35	.51	3000	.033	.041	.061
47	.26	.33		3300	.031	.039	
50	.25	.32	.47	4000	.028	.035	.052
75	.21	.26	.38	4700	.026		
100	.18	.22	.33	5000	.025	.032	.047
125			.29	6000	.023	.029	.043
150	.15	.18	.27	7000	.021	.027	
200	.13	.16	.23	7500	.021	.026	.038
220	.12	.15	.22	8000		.025	
250	.11	.14	.21	8200	.020		
270	.109	.14		9000	.019	.024	
300	.100	.13	.19	10000	.018	.022	.033
330	.099	.12		12000		.020	
350		.12		15000		.018	.027
390	.091			20000		.016	
400	.090	.11	.16	25000		.014	.021
450	.084	.11	.16	35000			.018
500	.081	.10	.15	50000			.015



	A	B	C	D
VL3	$\frac{3}{32}$	1½	$\frac{1}{32}$	.032
VL5	$\frac{5}{16}$	1½	$1\frac{1}{16}$	.036
VL10	$\frac{3}{16}$	1½	$1\frac{1}{8}$	.036

FEATURES:

- Lowest cost Wirewound Resistor with vitreous enamel coating.
- Popular small sizes for circuit board, point-to-point, or terminal board applications.
- Welded terminations and lead/end cap assembly assure maximum reliability.
- Balanced thermal expansion between core, wire and high temperature vitreous enamel assures reliable performance.
- Long term stability results from firing vitreous enamel at temperatures exceeding 1000°F.
- Uniformly tinned leads assure reliable electrical and mechanical connections.
- Uniform winding and coating assure uniform heat dissipation and excellent appearance.
- Low temperature coefficient.
- Available with Non-inductive winding.

SPECIFICATIONS:

- Resistance tolerance $\pm 5\%$... Closer tolerance available.
- Temperature coefficient ± 150 PPM ... Lower TC available.
- Available Resistance Range of 1 to 50,000 Ohm.
- Supplementary insulation is recommended when potential to ground is greater than 500 V.
- Dimensional tolerances $\pm \frac{1}{32}$ ".



Molded Silicone: Type ML — 1, 2, 3 Watts/Ohm Values 7-10,000
Molded Silicone: Type ML — 1, 2, 3 Watts/Ohm Values 1-10,000

**WIREWOUND
RESISTORS**



E-SYSTEMS INC.

Memcor Division

MANUFACTURERS OF

MEMCOR
ELECTRONIC COMPONENTS

RESISTORS, FIXED

Post Office Box 890
1320 Flaxmill Road
Huntington, Indiana 46750
Telephone (219) 356-4300
TWX 810-333-1530

WIREWOUND RESISTORS

ADJUSTABLE: TYPE AR — 10-12, 25, 50, 75, 100, 160-175, 200-225 WATTS

Mounting Bracket Wt. (Lbs.)	AR10 1441-003-001 .02	AR25 1441-005-001 .05	AR50 1441-005-001 .09	AR75 1441-005-001 .15	AR100 1441-005-001 .20	AR160-175 1441-007-001 .50	AR200-225 1441-007-001 .62
Ohms	Max. Amps	Max. Amps	Max. Amps	Max. Amps	Max. Amps	Max. Amps	Max. Amps
1	3.46	5.0	7.07	8.66	10	13.2	15
2	2.45	3.54	5.00				
3	2.00	2.88					
5	1.54	2.24	3.16	3.87	4.47	5.92	6.72
7.5	1.26	1.82					
10	1.09	1.58	2.23	2.74	3.16	4.18	4.74
15	.89	1.25		2.24			
20	.77	1.12					
25	.69	1.00	1.41	1.73	2.00	2.64	3.00
50	.49	.71	1.00	1.22	1.41	1.87	2.12
75	.40	.58	.82	.86	1.00	1.32	1.50
100	.34	.50	.71				
150	.28	.41	.58	.61			
200	.24	.35	.50				
250	.22	.32	.45	.55	.63	.84	.95
300	.20	.29	.41				
400	.17	.25	.35				
500	.15	.22	.32	.39	.45	.59	.67
750	.13	.18	.26	.27	.32	.42	.47
1000	.11	.16	.22				
1500	.089	.13	.18	.19			
2000	.077	.12	.16				
2500	.069	.10	.14	.20	.26	.30	
3000	.603	.01	.13				
3500	.058						
4000		.079					
5000	.049	.070	.10	.12	.14	.19	.21
7500	.040	.057	.081	.10			
10000	.035	.050	.071	.086	.10	.13	.15
12000		.042					
15000		.036	.057	.070			
20000		.031					
25000		.028	.045	.054	.063	.083	.095
50000			.026	.033	.045	.059	.067
75000					.032	.048	.055
100000					.028	.042	.047

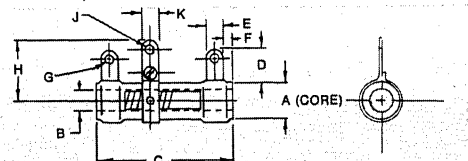
FEATURES:

- Tubular construction provides excellent heat dissipation.
- Welded terminals and termination guarantees positive electrical connections.

- Balanced thermal expansion between core, wire and high temperature vitreous enamel assures reliable performance.
- Long term stability results from firing at temperatures exceeding 1000°F.
- Tinned terminals provide reliable solder or mechanical connections.
- Uniform winding and coating provide uniform heat dissipation and excellent appearance.
- Quick disconnect terminals available as optional features.
- Standard units supplied with push-in mounting brackets.
- Other hardware available for mounting. See Hardware Section.

SPECIFICATIONS:

- Resistance tolerance $\pm 10\%$... Closer tolerance available.
- Temperature coefficient ± 100 PPM ... Lower TC available.
- When dual wattages are shown ...
Lower wattages have a maximum "hotspot" of 275°C.
Higher wattages have a maximum "hotspot" of 350°C.
- Available resistance range 1.0 to 100,000 Ohms.
- Meets or exceeds applicable specifications of MIL-R-19365.
- Dimensional tolerances $\pm \frac{1}{32}"$... except $\pm \frac{1}{16}"$ on length of AR100, AR160-175 and AR200-225.



	A	B	C	D	E	F	G	H	J	K
AR10-12	$\frac{3}{16}$	.200	$1\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{32}$	.104	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$
AR25	$\frac{3}{16}$	$\frac{1}{4}$	2	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{32}$	.144	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$
AR50	$\frac{3}{16}$	$\frac{3}{8}$	4	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{32}$	.144	$\frac{1}{16}$	$\frac{1}{8}$	.173
AR75	$\frac{3}{16}$	$\frac{1}{2}$	6	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{32}$	.144	$\frac{1}{16}$	$\frac{1}{8}$	.173
AR100	$\frac{3}{16}$	$\frac{1}{2}$	$6\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{32}$	.144	$\frac{1}{16}$	$\frac{1}{8}$	.141
AR160-175	$\frac{1}{8}$	$\frac{3}{4}$	$8\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{32}$	.177	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$
AR200-225	$\frac{1}{8}$	$\frac{3}{4}$	$10\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{32}$	.177	$\frac{1}{16}$	$\frac{1}{8}$	$\frac{3}{16}$

OVAL/MINIATURE OVAL: TYPE ZR (Oval) 30, 40, 55 W./TYPE MZ (Min. Oval) 10, 20 W.

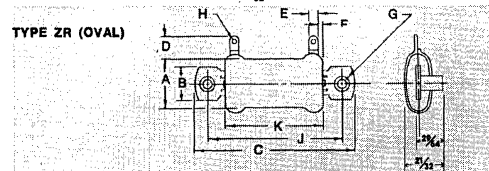
FEATURES:

- Miniaturized oval for maximum power dissipation with lowest profile.
- Welded terminals and termination guarantee positive electrical connections.
- Balanced thermal expansion between core, wire and high temperature vitreous enamel assures reliable performance.
- Long term stability results from firing at temperatures exceeding 1000°F.
- Tinned terminals provide reliable solder or mechanical connections.
- Uniform winding and coating provides uniform heat dissipation and excellent appearance.
- Available with Non-inductive winding.

- Standard hardware allows stacking of units.
- Quick disconnect terminals available as optional features.

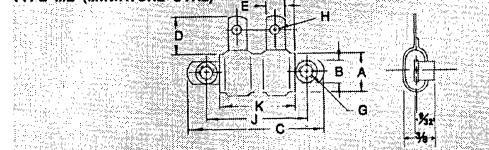
SPECIFICATIONS:

- Resistance tolerance $\pm 5\%$... Closer tolerance available.
- Temperature coefficient ± 100 PPM ... Lower TC available.
- Available resistance range 1 Ohm to 25,000 Ohm.
- Meets or exceeds applicable specifications of MIL-R-26.
- Dimensional Tolerances $\pm \frac{1}{32}"$.



	A	B	C	D	E	F	G	H	J	K
ZR30	1	$\frac{1}{16}$	$2\frac{1}{2}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{32}$	.196	.104	2	$1\frac{1}{4}$
ZR40	1	$\frac{1}{16}$	$3\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{32}$	.196	.104	$2\frac{3}{4}$	$1\frac{1}{4}$
ZR55	1	$\frac{1}{16}$	4 $\frac{3}{4}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{3}{32}$	.196	.104	4 $\frac{1}{4}$	$3\frac{1}{2}$

TYPE MZ (MINIATURE OVAL)



	A	B	C	D	E	F	G	H	J	K
MZ10	$\frac{3}{16}$	$\frac{1}{4}$	$1\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{16}$	.128	.062	1	$\frac{3}{4}$
MZ20	$\frac{3}{16}$	$\frac{1}{4}$	$2\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{8}$	$\frac{1}{16}$	.128	.062	$2\frac{1}{8}$	2

WIREWOUND RESISTORS

Adjustable: Type AR — 10-12, 25, 50, 75, 100, 160-175, 200-225 Watts
Oval/Miniature Oval: Type ZR (Oval) 30, 40, 55 Watts
Type MZ (Min. Oval) 10, 20 Watts



E-SYSTEMS INC.

Memcor Division

MANUFACTURERS OF

MEMCOR
ELECTRONIC COMPONENTS

RESISTORS, FIXED

WIREWOUND RESISTORS

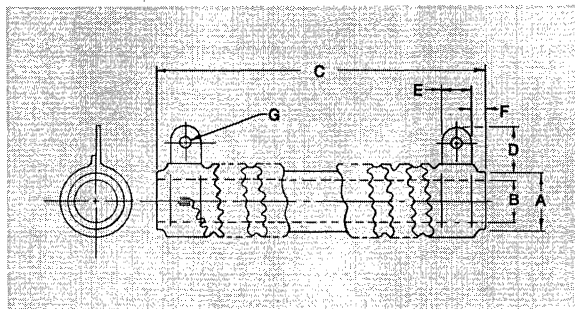
Post Office Box 890
1320 Flaxmill Road
Huntington, Indiana 46750
Telephone (219) 356-4300
TWX 810-333-1530



E-SYSTEMS INC.
Memcor Division
MANUFACTURERS OF
MEMCOR
ELECTRONIC COMPONENTS

EDGEWOOD — TYPE TRU-RIB — 40 TO 1500 WATT

A	B	C	D	E	F	G	Wattage
$\frac{3}{16}$	$\frac{3}{16}$	2	$\frac{11}{16}$	$\frac{5}{16}$	$\frac{1}{8}$	.187	RR-0040
$\frac{3}{16}$	$\frac{3}{16}$	4	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0090
$\frac{3}{4}$	$\frac{1}{2}$	3 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0100
$\frac{3}{16}$	$\frac{3}{16}$	5	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0105
$\frac{3}{4}$	$\frac{1}{2}$	4	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0105
1	$\frac{5}{8}$	4	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0125
$\frac{3}{4}$	$\frac{1}{2}$	5	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0135
1	$\frac{5}{8}$	5	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0150
$\frac{3}{4}$	$\frac{1}{2}$	6	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0160
$\frac{3}{4}$	$\frac{1}{2}$	6 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0180
1 $\frac{1}{8}$	$\frac{3}{4}$	5	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0185
1	$\frac{5}{8}$	6	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0190
1	$\frac{5}{8}$	7	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0215
1 $\frac{1}{8}$	$\frac{3}{4}$	6	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0220
1 $\frac{1}{2}$	1 $\frac{1}{8}$	5	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0270
1 $\frac{1}{8}$	$\frac{3}{4}$	8 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0300
1	$\frac{5}{8}$	10	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0315
1 $\frac{1}{8}$	$\frac{3}{4}$	10 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0375
2 $\frac{1}{2}$	1 $\frac{3}{4}$	6	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0375
1 $\frac{5}{8}$	1 $\frac{1}{8}$	8 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0400
1 $\frac{1}{8}$	$\frac{3}{4}$	11 $\frac{1}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0420
1 $\frac{5}{8}$	1 $\frac{1}{8}$	10 $\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0500
1 $\frac{5}{8}$	1 $\frac{1}{8}$	11 $\frac{3}{4}$	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0550
2 $\frac{1}{2}$	1 $\frac{3}{4}$	12	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-0750
2 $\frac{1}{2}$	1 $\frac{3}{4}$	15	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-1000
2 $\frac{1}{2}$	1 $\frac{3}{4}$	20	$\frac{3}{4}$	$\frac{1}{2}$	$\frac{1}{4}$	.196	RR-1500



FEATURES:

- Heavy duty unit designed for application demanding maximum power dissipation in minimum space.
- Heavy ceramic tubular core provides heat sink for short term overloads.
- Available from 40 to 1500 watts.
- Available with tap or adjustable lug.
- A variety of mounting hardware available. See Hardware section.
- Welded terminals and termination guarantee positive electrical connections.
- Tinned terminals provide reliable solder or mechanical connections.

SPECIFICATIONS:

- Resistance Tolerance $\pm 10\%$.
- Temperature coefficient ± 100 ppm.
- Maximum Hotspot equal 415°C .
- Available resistance range .01 Ω to 198 Ω .
- Meets or exceeds applicable specifications of MIL-R-26.
- Dimensional tolerances $\pm \frac{1}{32}''$... except $\pm \frac{1}{16}''$ on length of 6'' and above.

MILITARY — MADE TO MIL-R-26

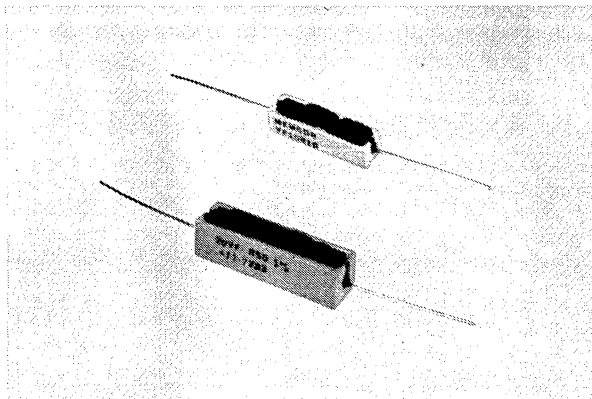
Type		Rated Wattage V Characteristic	Min. Ohms	Max. Ohms
FERRULE	RW10	203	.20	180,000
	RW11	168	.10	160,000
	RW12	125	.10	110,000
	RW13	72	.10	51,000
	RW14	58	.10	43,000
	RW15	29	.10	15,000
	RW16	20	.10	8,200
OVAL	RW20	21	.10	8,200
	RW21	31	.10	16,000
	RW22	53	.10	36,000
	RW23	68	.10	51,000
	RW24	91	.10	75,000
TUBULAR	RW29	11	.10	5,600
	RW30	11	.10	2,700
	RW31	14	.10	6,800
	RW32	17	.10	10,000
	RW33	26	.10	18,000
	RW35	55	.10	43,000
	RW36	78	.10	56,000
	RW37	113	.10	91,000
	RW38	159	.10	150,000
	RW47	210	.10	180,000
AXIAL	RW55	7	.10	5,100
	RW56	14	.10	9,100
	RW57	6.5	.10	3,600
	RW58	11	.10	8,200
	RW59	3	.10	910
	RW67	6.5	.10	3,600
	RW68	11	.10	8,200
	RW69	3	.10	910



E-SYSTEMS INC.
Memcor Division
MANUFACTURERS OF
MEMCOR
ELECTRONIC COMPONENTS

Edgewood — Type TRU-RIB — 40 to 1500 Watt
Military — Made to MIL-R-26

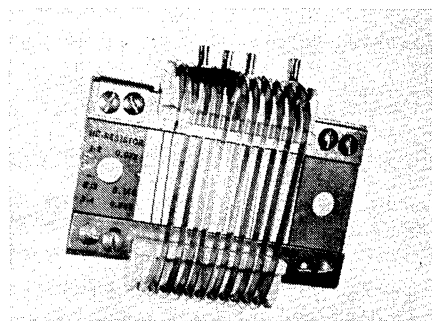
**WIREWOUND
RESISTORS**



TYPE VF/VITREOUS-FIXED

AVAILABLE RESISTANCE RANGE .01-0.5 OHMS

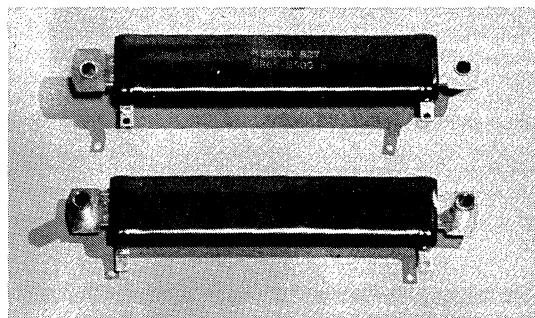
AVAILABLE WATTAGE 3-25 WATTS



TYPE HC/HIGH CURRENT

.05-5.1 OHMS AVAILABLE RESISTANCE RANGE

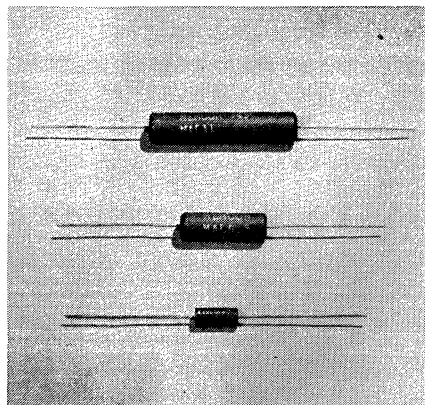
300-2700 WATTS AVAILABLE WATTAGE



TYPE ZR/OVALS

AVAILABLE RESISTANCE RANGE 0.1-50,000 OHMS

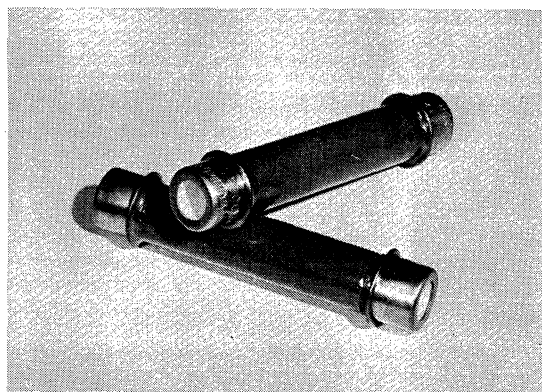
AVAILABLE WATTAGE 65 & 75 WATTS



TYPE ML/MOLDED SILICONE

0.1-50,000 OHMS AVAILABLE RESISTANCE RANGE

5-11 WATTS AVAILABLE WATTAGE



TYPE HD/FERRULE

AVAILABLE RESISTANCE RANGE 1-100,000 OHMS

AVAILABLE WATTAGE 25-200 WATTS

**WIREWOUND
 RESISTORS**

Type VF/Vitreous-Fixed
 Type HC/High Current

Type ZR/Ovals

Type ML/Molded Silicone
 Type HD/Ferrule

RESISTOR HARDWARE

Post Office Box 890
1320 Flaxmill Road
Huntington, Indiana 46750
Telephone (219) 356-4300
TWX 810-333-1530



E-SYSTEMS INC.

Memcor Division

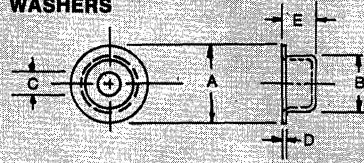
MANUFACTURERS OF

MEMCOR

ELECTRONIC COMPONENTS

WASHERS — CENTERING/MICA

CENTERING WASHERS



MICA WASHERS

Part No. 1321-010-	I.D.	O.D.	Thickness
003	.187	.750	.025
005	.250	.625	.031
007	.312	.750	.025
012	.500	1.000	.031
013	.562	1.125	.031
014	.750	1.375	.031
019	1.125	1.875	.031
020	1.812	3.000	.045

Part No. 1431-026-	A	B	C	D	E	Recommended for Resistors with I.D. of
001	.437	.295	.175	.025	.130	5/16
004	.500	.280	.165	.024	.093	1/4
010	.750	.484	.196	.025	.078	1/2
011	.750	.563	.190	.031	.188	5/8
015	1.125	.719	.265	.032	.187	3/4
017	1.375	1.063	.265	.031	.187	1 1/8
019	2.375	1.688	.265	.026	.187	1 3/4

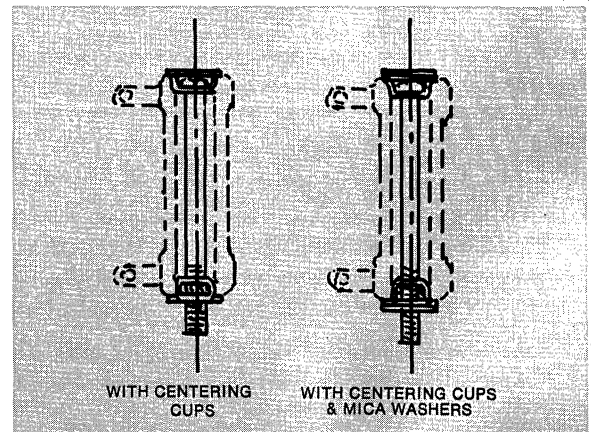
VERTICAL THRU-BOLT MOUNTING

Without Mica Washer Order 1245-004-XXX		With Mica Washer Order 1245-005-XXX	
Resistor Type	XXX	Resistor Type	XXX
FR-AR-5	-001	FR-AR-5	-001
FR-AR-10	-002	FR-AR-10	-002
FR-20	-003	FR-20	-003
FR-AR-25	-004	FR-AR-25	-004
FR-AR-50	-005	FR-AR-50	-005
FR-AR-75	-007	FR-AR-75	-007
FR-AR-100	-012	FR-AR-100	-012
FR-AR-160	-021	FR-AR-160	-020
FR-AR-200	-022	FR-AR-200	-021
RR-40	2" LG. -004	RR-40	2" LG. -004
RR-90	4 -005	RR-90	4 -005
RR-105	5 -006	RR-105	5 -006
RR-135	6 -007	RR-135	6 -007
RR-100	3 1/2 -008	RR-100	3 1/2 -008
RR-105	4 -009	RR-105	4 -009
RR-135	5 -010	RR-135	5 -010
RR-160	6 -011	RR-160	6 -011
RR-180	6 1/2 -012	RR-180	6 1/2 -012
RR-125	4 -013	RR-125	4 -013
RR-150	5 -014	RR-150	5 -014
RR-190	6 -015	RR-190	6 -015
RR-215	7 -016	RR-215	7 -016
RR-315	10 -018	RR-315	10 -017
RR-185	5 -019	RR-185	5 -018
RR-200	6 -020	RR-200	6 -019
RR-300	8 1/2 -021	RR-300	8 1/2 -020
RR-375	10 1/2 -022	RR-375	10 1/2 -021
RR-420	11 1/4 -023	RR-420	11 1/4 -022
RR-270	5 -024	RR-270	5 -023
RR-400	8 1/2 -025	RR-400	8 1/2 -024
RR-500	10 1/2 -026	RR-500	10 1/2 -025
RR-5	11 3/4 -027	RR-5	11 3/4 -026
RR-375	6 -028	RR-375	6 -027
RR-750	12 -029	RR-750	12 -028
RR-1000	15 -030	RR-1000	15 -029
RR-1500	20 -031	RR-1500	20 -030

Two styles of vertical Mounting Hardware are available for all Tubular Resistors. Mica Washers are available where it is desirable to electrically isolate the mounting bolt.

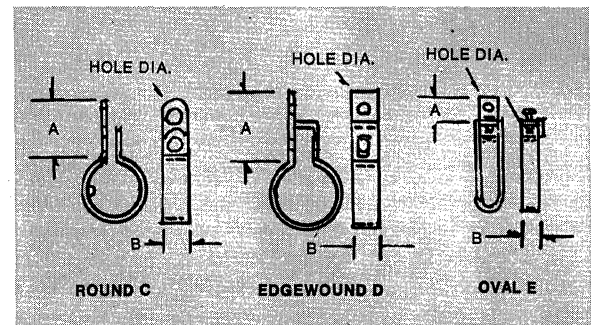
This method of mounting saves horizontal mounting space and in addition provides a "heat sink" for the resistor.

Length of bolts provided are for 1/4" panel mounting — extra length bolts can be supplied per customer request.



ADJUSTABLE LUGS

Part No.	Core Dia.	A	B	C	D	E	Hole Dia.	Silver Cont.	Gauge
1401-075-001	5/16	1 1/2	3/4	X			1/8	X	.020
1401-022-001	7/16	1 1/2	1/4	X			.138	X	.035
1401-076-001	5/16	2 3/4	1/4	X			.173	X	.035
1401-035-002	9/16	5/8	1/4	X			.173		.035
1401-077-001	3/4	2 3/4	1/4	X			.173	X	.035
1401-078-001	1 1/8	1 3/4	1/4	X			5/16	X	.035
1401-917-001	5/16 x 1	3/8	3/4			X	.171		.025
1401-026-001	2 1/2	1 1/4	1/2	X			.190		.031
1401-030-001	3/16	1	3/8		X		.190		.082
1401-030-002	3/4	1	3/8		X		.190		.082
1401-030-003	1	1	3/8		X		.190		.082
1401-030-004	1 1/8	1	3/8		X		.190		.082
1401-030-007	2 1/2	1	3/8		X		.190		.082
1401-030-005	1 1/2	1	3/8		X		.190		.082
1401-030-006	1 3/8	1	3/8		X		.190		.082





E-SYSTEMS INC.

Memcor Division

MANUFACTURERS OF

MEMCOR

ELECTRONIC COMPONENTS

Post Office Box 890
1320 Flaxmill Road
Huntington, Indiana 46750
Telephone (219) 356-4300
TWX 810-333-1530

RESISTOR HARDWARE

CERAMIC BUSHINGS

Fig.	Part No.	A	B	C	D	E	F	G	Core I.D.
1	1431-021-005	1/4	.469	1/16	.313	.170			1/2
2	1431-022-001	1 1/4	.610	3/4	.313	.200	5/8	.187	5/8
1	1431-021-004	1 1/8	.734	1 1/16	.250	.312			3/4
1	1431-021-003	3/4	.484	3/4	.250	.250			1/2
2	1431-022-002	1	.500	3/4	.406	.172	1/2	.187	3/4
2	1431-021-007	1	.609	3/4	.375	.172	1/2	.187	5/8
2	1431-021-008	3/4	.485	3/4	.375	.312	1/2	.187	1/2
2	1431-021-006	3/4	.485	3/4	.375	.172	1/2	.187	1/2
1	1431-021-002	1 1/8	.734	1 1/16	.187	.312			3/4
1	1431-021-001	3/4	.437	3/8	.187	.187			1/2

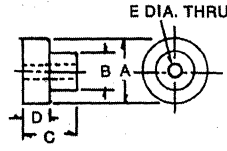


FIG. 1

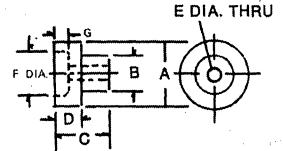


FIG. 2

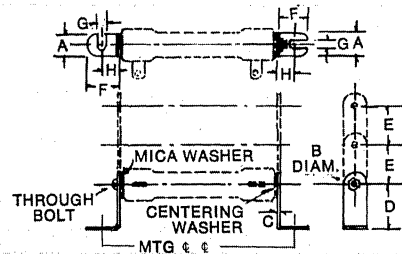
HORIZONTAL THRU-BOLT MOUNTING

	Mfg. CL-CL	Core I.D.	A	B	C	D	E	F	G	H
FR-AR-25	3	3/16	3/4	.187	.047	25/32	15/16	7/8	.250	1/4
FR-AR-50	5	3/16	3/4	.187	.047	25/32	15/16	7/8	.250	1/4
FR-AR-75	7	3/16	3/4	.187	.047	25/32	15/16	7/8	.250	1/4
FR-AR-100	7	1/2	3/4	.187	.047	25/32	1 1/8	7/8	.250	1/4
FR-AR-160	10 1/4	3/4	1 1/8	.215	.062	1	1 3/4	1 1/8	.312	1 1/8
FR-AR-200	12 1/4	3/4	1 1/8	.215	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-40	3	3/16	3/4	.187	.047	25/32	15/16	7/8	.250	1/4
RR-90	5	3/16	3/4	.187	.047	25/32	15/16	7/8	.250	1/4
RR-105	6	3/16	3/4	.187	.047	25/32	15/16	7/8	.250	1/4
RR-135	7	3/16	3/4	.187	.047	25/32	15/16	7/8	.250	1/4
RR-100	4 1/2	1/2	3/4	.187	.047	25/32	1 1/8	7/8	.250	1/4
RR-105	5	1/2	3/4	.187	.047	25/32	1 1/8	7/8	.250	1/4
RR-135	6	1/2	3/4	.187	.047	25/32	1 1/8	7/8	.250	1/4
RR-160	7	1/2	3/4	.187	.047	25/32	1 1/8	7/8	.250	1/4
RR-180	7 1/2	1/2	3/4	.187	.047	25/32	1 1/8	7/8	.250	1/4
RR-125	5 3/4	5/8	1 1/8	.215	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-150	6 3/4	5/8	1 1/8	.215	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-190	7 3/4	5/8	1 1/8	.215	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-215	8 3/4	5/8	1 1/8	.215	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-315	11 3/4	5/8	1 1/8	.215	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-185	6 3/4	3/4	1 1/8	.215	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-220	7 3/4	3/4	1 1/8	.215	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-300	10 3/4	3/4	1 1/8	.215	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-375	12 3/4	3/4	1 1/8	.215	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-420	13	3/4	1 1/8	.215	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-500	12 1/4	1 1/8	1 1/8	.218	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-550	13 1/2	1 1/8	1 1/8	.218	.062	1	1 3/4	1 1/8	.312	1 1/8
RR-750	14 1/8	1 3/4	2 1/2	.193	.062	2 3/4	2 1/4	.375	1.0	
RR-150	22 1/8	1 3/4	2 1/2	.193	.062	2 3/4	2 1/4	.375	1.0	

Horizontal Thru-bolt Hardware is available for customer installation or factory assembly.

Resistors may be stacked 2 and 3 high — using this hardware.

Order as 1245-002-XXX
(for example FR-AR-25 SINGLE — order as 1245-002-001)



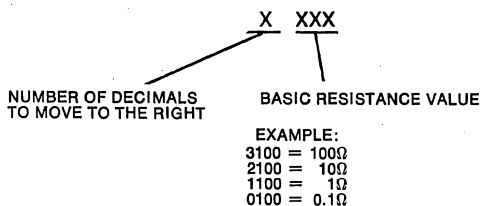
	Single	Double	Triple
FR-AR-25	-001	-002	-003
FR-AR-50	-004	-005	-006
FR-AR-75	-010	-011	-012
FR-AR-100	-022	-023	-024
FR-AR-160	-049	-050	-051
FR-AR-200	-052	-053	-054
RR-40	-001	-002	-003
RR-90	-004	-005	-006
RR-105	-007	-008	-009
RR-135	-010	-011	-012
RR-100	-013	-014	-015
RR-105	-016	-017	-018
RR-135	-019	-020	-021
RR-160	-022	-023	-024
RR-180	-025	-026	-027
RR-125	-028	-029	-030
RR-150	-031	-032	-033
RR-190	-034	-035	-036
RR-215	-037	-038	-039
RR-315	-040	-041	-042
RR-185	-043	-044	-045
RR-220	-046	-047	-048
RR-300	-049	-050	-051
RR-375	-052	-053	-054
RR-420	-055	-056	-057
RR-500	-064		
RR-550	-067		
RR-750	-073		
RR-1500	-079		

HOW TO ORDER MEMCOR RESISTORS

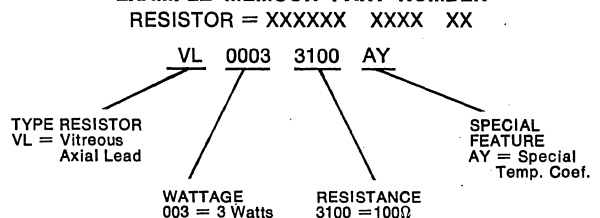
1. Give Memcor type and wattage
i.e. VL3 = Vitreous axial lead 3 watt
2. Give ohmic value and resistance tolerance required

If there are special requirements, a two or three digit alpha call out will appear after the ohmic value; these digits will be assigned by the factory.

RESISTANCE VALUE CODE



EXAMPLE MEMCOR PART NUMBER



RESISTOR HARDWARE

Ceramic Bushings
Horizontal Thru-Bolt Mounting
How to Order Memcor Resistors



E-SYSTEMS INC.

Memcor Division

MANUFACTURERS OF

MEMCOR

ELECTRONIC COMPONENTS

Charles T. Gamble Industries

New Jersey & Fairview Avenue • Riverside, New Jersey 08075 • 609-461-1900



PRECISION WIRE WOUND RESISTORS & NETWORKS

Charles T. Gamble Industries has engineered and designed non inductive precision wire wound resistors to meet and exceed the requirements of MIL-R-93. These resistors are completely sealed against the effects of high humidity and salt water immersion cycling. The material used in the manufacture of our resistors has a very high dielectric strength. The bobbin material used in winding the resistors is one and the same as the encapsulating material. All resistors use resistance wire with very low thermal E.M.F. to the copper leads. Where thermal effects can be disregarded, welded construction with nickel alloy leads may be specified.

- Temperature Coefficient: Standard is $\pm 10\text{PPM}/^\circ\text{C}$. T.C.'s as low as $\pm 2\text{PPM}$ and as high as $6000\text{PPM}/^\circ\text{C}$ can be supplied
- Tolerance available: from $\pm 1.0\%$ to $\pm 0.001\%$

NETWORKS: RC NETWORKS, LADDER NETWORKS, VOLTAGE DIVIDERS, BINARY NETWORKS

Standard Axial Lead Precision Resistors have been designed and engineered to offer high reliability and stability throughout a wide range of environmental factors.

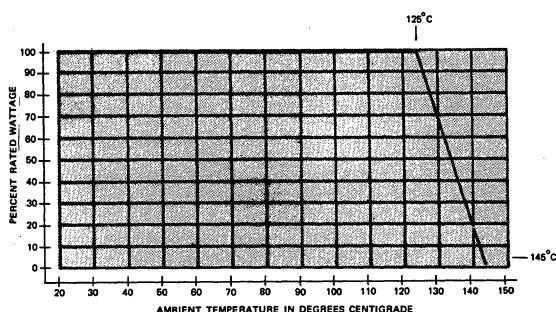
Subminiature Axial Lead Precision Resistors have been designed for applications where space is a prime factor

Printed Circuit Resistors are designed for printed circuit board application, where space is a factor.

Radial Lug Resistors are supplied with a thru hole for mounting to the chassis by means of a #6 thru bolt.

Power Rating —

Maximum wattage ratings at 25°C through 125°C derated to 145°C at zero voltage



STANDARD AXIAL LEAD PRECISION RESISTORS

Type	Military Specs.		Commercial Wattage Rating	Max. Resist. Based on .0007 E Alloy	Military Wattage Rating	Max. Volts	Size	
	New	Old					Length	Dia.
0808AL			.125W	300K		200V	1/4"	1/4"
1108AL	RB56		.125W	350K	.125W	250V	1/2"	1/4"
1208AL			.200W	350K	.250W	225V	3/8"	1/4"
1212AL			.250W	1 meg.		225V	3/8"	3/8"
1608AL	RB55	AFRT 10	.250W	400K	.15 W	184V	1/2"	1/4"
1612AL			.400W	.500 meg.		300V	1/2"	3/8"
1616AL			.500W	1.3 meg.		300V	1/2"	1/2"
2008AL			.500W	.425 meg.		300V	5/8"	1/4"
2012AL			.750W	.600 meg.		600V	5/8"	3/8"
2016AL			.750W	2 meg.		600V	5/8"	1/2"
2408AL	RB54	AFRT 11	.333W	1 meg.	.250W	300V	3/4"	1/4"
2412AL	RB53	AFRT 12	.500W	1.2 meg.	.333W	300V	3/4"	3/8"
3208AL			.500W	1.1 meg.		300V	1"	1/4"
3212AL	RB52	AFRT 13	1.000W	2 meg.	.400W	600V	1"	3/8"
3216AL	RB57	AFRT 14	1.000W	3 meg.	.750W	600V	1"	1/2"
4816AL	RB58	AFRT 15	2.000W	6 meg.	1.000W	900V	1 1/2"	1/2"
6416AL	RB59	AFRT 16	2.500W	10 meg.	1.250W	1200V	2"	1/2"

SUB-MINIATURE AXIAL LEAD PRECISION RESISTORS

Type	Commercial Wattage Rating	Maximum Resistance based on .0007 E Alloy	Maximum Voltage	Size	
				Length	Dia.
250109AL	.120W	25K	50 Volts	1/4"	1/4"
375093AL	.1W	20K	55 Volts	3/8"	3/32"
375109AL	.120W	30K	55 Volts	3/8"	1/4"
375125AL	.125W	50K	72 Volts	3/8"	1/8"
375187AL	.1W	40K	65 Volts	3/8"	3/16"
500156AL	.1W	70K	85 Volts	1/2"	5/32"
625156AL	.15W	100K	125 Volts	5/8"	5/32"

PRINTED CIRCUIT PRECISION RESISTORS

Type	Military Specs.	Commercial Wattage	Military Wattage	Max. Volts	Max. Resist. Based on .0007	Sizes		Lead Spacing	Lead Length
						Length	Dia.		
0808PC		.125W		90V	70K	1/4"	1/4"	.100	1"
1008PC	RB71	.250W	.125W	240V	250K	5/8"	1/4"	.200	1"
1208PC		.200W		200V	200K	3/8"	1/4"	.100	1"
1608PC		.250W		184V	400K	1/2"	1/4"	.100	1"
1612PC	RB70	.500W	.250W	150V	.301 meg.	1/2"	3/8"	.200	1"
2408PC		.333W		300V	1 meg.	3/4"	1/4"	.100	1"
3208PC		.500W		750V	1.1 meg.	1"	1/4"	.100	1"
3212PC		1.000W		1350V	1.75 meg.	1"	3/8"	.250	1"
3216PC		1.250W		1700V	2.50 meg.	1"	1/2"	.250	1"

RADIAL LUG PRECISION RESISTORS

Type	Military Specs.		Commercial Wattage	Military Wattage Rating	Maximum Voltage	Max. Resist. Based on .0007	Size	
	New	Old					Length	Dia.
1616RLU	RB08	AFRT 17	.500W	1/4W	300V	885K	1/2"	1/2"
2020RLU	RB16	AFRT 18	.666W	1/3W	300V	1 meg.	5/8"	5/8"
3220RLU	RB17	AFRT 19	1.000W	1/2W	600V	2.5 meg.	1"	5/8"
4024RLU	RB18		1.500W	3/4W	600V	6.5 meg.	1 1/4"	3/4"
6828RLU	RB19		2.000W	1W	900V	12 meg.	2 1/8"	7/8"

Charles T. Gamble Industries

New Jersey & Fairview Avenue • Riverside, New Jersey 08075 • 609-461-1900



AXIAL LEAD POWER WIRE WOUND SILICONE COATED RESISTORS

GENERAL SPECIFICATIONS

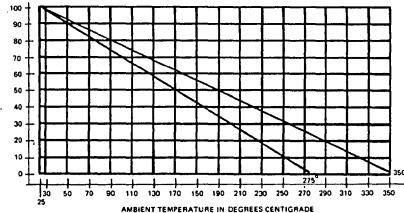
- Designed to meet the requirements of MIL-R-26
- Standard temperature coefficient ± 20 PPM additional TC's available from 5PPM/°C to 5500/°C
- Tolerance: $\pm 1.0\%$ standard. Available to $\pm .01\%$
- Wattage: $\frac{1}{2}$ watt to 20 watts
- Coating—High temperature silicone, with-stands moisture, salt water immersion, and cleaning solutions
- Leads: Tinned copperweld standard, other alloys available

Power Ratings:

Ratings are based on a 25°C ambient and either a 275°C (max.) or 350°C (max.) hotspot temperature

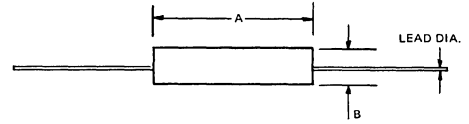
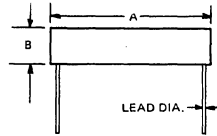
Characteristic U: Will result in .5% max. ΔR in 2000 hour load life

Characteristic V: Will result in a 3% max. ΔR in 2000 hour load life



Non-Inductive Winding:

- For non-inductive winding add prefix N
- Divide maximum resistance values by two
- Multiply maximum working voltage by .707



CTG Type	MIL-R-26 Type	CTG Power Rating		Nominal Dimensions		Maximum Resistance	Max. Cont. Working Voltage	Lead Diam.
		275°C	350°C	Length "A"	Diameter "B"			
CG 1/2A	—	.4	.52	.250 $\pm .031$	.085 $\pm .020$	3.0K	25V	.020
CG 1	—	.75	1	.312 $\pm .032$	.085 $\pm .020$	5.0K	35V	.020
CG 2	RW 70	1	1.5	.406 $\pm .031$	.094 $\pm .031$	8.0K	50V	.020
CG 3	—	1.0	1.1	.531 $\pm .063$	.094 $\pm .031$	9.0K	50V	.020
CG 4	—	2.5	3	.812 $\pm .063$	.188 $\pm .031$	20K	135V	.032
CG 5	RW 69	2.5	3	.500 $\pm .063$	.188 $\pm .063$	20K	130V	.032
CG 6	RW 79	3	—	.560 $\pm .062$	.187 $\pm .031$	20K	135V	.032
CG 7	—	4	5	.625 $\pm .062$	.250 $\pm .062$	35K	175V	.040
CG 8	RW 74	5	—	.875 $\pm .062$	.312 $\pm .031$	70K	300V	.040
CG 9	—	7	8	1.218 $\pm .062$	.312 $\pm .031$	100K	450V	.040
CG 10A	RW 68	10	11	1.875 $\pm .063$ 1.25	.344 $\pm .094$	200K	720V	.032
CG 10	RW 78	10	—	1.78 $\pm .062$	.375 $\pm .031$	200K	720V	.040
CG 11	RW 56	10	14	2.00 $\pm .094$	.469 $\pm .094$	210K	800V	.032
CG 12	—	1.5	1.7	.406 $\pm .031$	.156 $\pm .063$	12K	70V	.020
CG 13	RW 67	5	6.5	1.00 $\pm .094$	.313 $\pm .063$	70K	300V	.032
CG 14	—	1.5	1.7	.375 $\pm .031$	.188 $\pm .063$	12K	40V	.020
CG 15	RW 55	5	7	1.375 $\pm .094$	.469 $\pm .094$	120K	500V	.032
CG 33	—	15	20	2.875 $\pm .094$	.500 $\pm .094$	275K	1000V	.040

Specify Axial or Radial Lead when ordering!



ANODIZED ALUMINUM HOUSED HEAT SINK POWER RESISTORS / 5 WATT TO 250 WATT

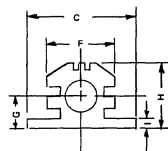
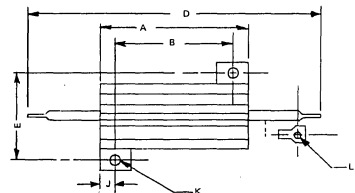
FEATURES

- Meets MIL-R-39009 or MIL-R-18546
- Tolerances 5% to .01%
- Standard temperature coefficient 10 thru 200 ± 50 PPM/°C above 210 ± 20 PPM/°C. Lower T.C.'s available
- All welded construction
- Screw mounts on chassis

SPECIFICATIONS

Type	Style	Wattage		Maximum* Resistance	Maximum Voltage
		Comm.	MIL		
HS 5	RE 60	5	5	5K	160
HS 10	RE 65	10	10	10K	265
HS 25	RE 70	25	20	25K	550
HS 50	RE 75	50	30	60K	1250
HS 100	RE 77	100	75	126K	1990
HS 250	RE 80	250	120	196K	2300

* Based on .007 Ev. Wire



NON INDUCTIVE WOUND: HSN SERIES

Exhibits the same physical and electrical characteristics as the HS Series. Ayrton-Perry winding techniques are utilized to minimize inductance.

Type	A $\pm .031$	B $\pm .005$	C $\pm .015$	D $\pm .062$	E $\pm .005$	F $\pm .015$	G $\pm .010$	H $\pm .015$	I $\pm .010$	J $\pm .010$	K $\pm .005$	L $\pm .005$
HS 5	.600	.444	.646	1.125	.490	.334	.133	.320	.065	.078	.093	.050
HS 10	.750	.562	.800	1.375	.625	.420	.165	.390	.075	.093	.093	.086
HS 25	1.062	.719	1.080	1.938	.781	.550	.231	.546	.088	.172	.125	.086
HS 50	1.968	1.563	1.140	2.781	.844	.630	.260	.610	.088	.196	.125	.086
HS 100	3.500	2.750	2.812	5.478	2.250	1.812	.770	1.750	.187	.375	.188	—
HS 250	4.500	3.875	3.000	7.000	2.500	—	1.000	2.187	.250	.312	.188	—

HSN NON INDUCTIVE STYLES

The above types are available in non inductive winding

Consult the factory for your specific needs

Charles T. Gamble Industries

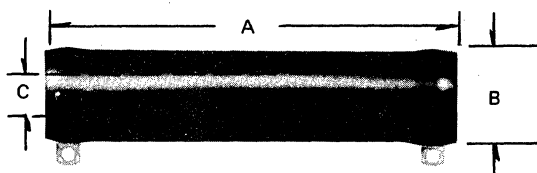
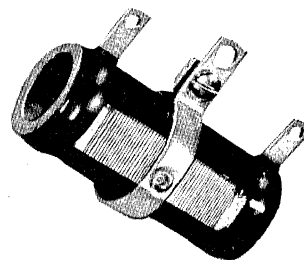
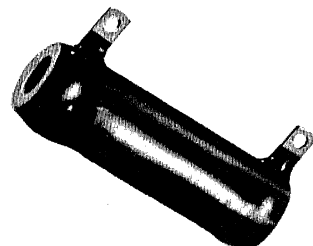
New Jersey & Fairview Avenue • Riverside, New Jersey 08075 • 609-461-1900



RADIAL LUG TYPE VITREOUS POWER WIREWOUND RESISTORS

GENERAL SPECIFICATIONS

- Designed to meet the requirements of MIL-R-26E
- Wound using NiCr or CuNi Resistance Wire Alloys
- Positive center of winding pitch and tension eliminates hot spots
- Military grade of ceramic tube coated with "CTG" high temperature Vitreous Enamel Coating
- Wattage ratings from 5 to 250 watts
- Standard tolerance $\pm 5\%$



Type	Military Spec.	Dimensions			Maximum Resistance	Comm. Watt	MIL Watt	
		A	B	C			G	V
321006	RW30	1	$\frac{5}{16}$	$\frac{3}{16}$	10.0K	5	8	11
561006	RW29	$1\frac{3}{4}$	$\frac{5}{16}$	$\frac{3}{16}$	50.0K	10	8	11
481410	RW31	$1\frac{1}{2}$	$\frac{7}{16}$	$\frac{5}{16}$	45.0K	10	10	14
641410	RW32	2	$\frac{7}{16}$	$\frac{5}{16}$	76.0K	15	12	17
642015	—	2	$\frac{5}{8}$	$2\frac{9}{16}$	100.0K	25	—	—
641812	—	2	$\frac{9}{16}$	$\frac{3}{8}$	100.0K	20	—	—
1282416	RW35	4	$\frac{3}{4}$	$\frac{1}{2}$	338.0K	50	38	55
1281812	—	4	$\frac{9}{16}$	$\frac{3}{8}$	263.0K	50	—	—
1282418	—	$4\frac{1}{2}$	$\frac{3}{4}$	$3\frac{5}{16}$	390.0K	50	—	—
1283624	RW36	4	$1\frac{1}{8}$	$\frac{3}{4}$	500.0K	70	54	78
2082416	—	$6\frac{1}{2}$	$\frac{3}{4}$	$\frac{1}{2}$	600.0K	100	—	—
2083624	—	$6\frac{1}{2}$	$1\frac{1}{8}$	$\frac{3}{4}$	890.0K	100	—	—
2563624	RW38	8	$1\frac{1}{8}$	$\frac{3}{4}$	160K	160	110	159
2723624	—	$8\frac{1}{2}$	$1\frac{1}{8}$	$\frac{3}{4}$	200K	160	—	—
3363624	RW47	$10\frac{1}{2}$	$1\frac{1}{8}$	$\frac{3}{4}$	200K	200	145	210
3843624	RW39	12	$1\frac{1}{8}$	$\frac{3}{4}$	250K	250	166	240

NOTE: Add F or A to end of type number to specify fixed or adjustable type.

Charles T. Gamble Industries

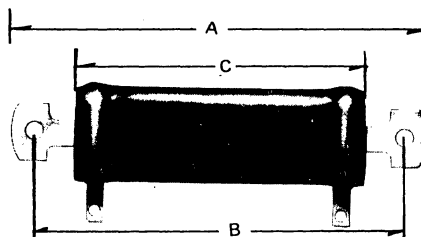
New Jersey & Fairview Avenue • Riverside, New Jersey 08075 • 609-461-1900



OVAL WIREWOUND POWER RESISTORS

GENERAL SPECIFICATIONS

- Designed to meet the requirements of MIL-R-26E
- Through-bracket mounting and oval ceramic construction permit an even distribution of heat
- Design is suitable for multiple stacking
- Wattage ratings from 10 to 75 watts
- Standard tolerance $\pm 5\%$



Type	Military Spec.	Dimensions			Maximum Resistance	Comm. Watt	MIL Watts	
		A	B	C			G	V
4224 0V	—	1¼	¾	1	10K	10	—	—
5032 0V	—	1½	1	1¼	15K	15	—	—
8464 0V	—	2¼ ₆	2	2½ ₆	55K	20	—	—
8040 0V	RW20	2½	2	1¼	10K	30	15	21
10464 0V	RW21	3¼	2¾	2	20K	40	22	31
112152 0V	RW22	4¾	4¼	3½	40K	55	37	53
192152 0V	RW23	6	5½	4¾	50K	65	47	68
216192 0V	RW24	7¼	6¾	6	75K	75	63	91



POWER FLEX LOW RESISTANCE HIGH POWER RESISTORS

GENERAL SPECIFICATIONS

- High watt density — high surface area
- Hot spot temperatures to 415°C
- Tapped and adjustable also available
- High temperature vitreous enamel
- Rugged tinned screw type terminals
- All welded construction
- Standard tolerance 10%
- TCR — 20 PPM to 180 PPM

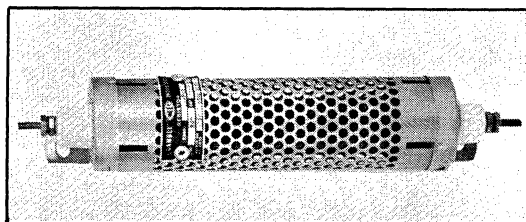
CTG Type	Full Watt Rating	Length	Core	Fixed or Tapped			Tapped Max. No. of Steps	Adjustable	
				Min. Poss. Ohms	Maximum Single Step	Ohms with Max. No. Steps		Min. Poss. Ohms	Max. Poss. Ohms
PF 75	75	3½	¾	0.04	6.0	6.0	1	0.2	6.0
PF 110	110	4½	¾	0.04	9.0	7.0	2	0.3	9.0
PF 125	125	5	¾	0.05	10.0	9.0	2	0.4	10.0
PF 160	160	6½	¾	0.06	15.0	11.0	3	0.5	15.0
PF 155	155	4¾	1½	0.05	12.0	10.0	2	0.4	12.0
PF 225	225	6¾	1½	0.08	18.0	13.0	3	0.7	18.0
PF 240	240	6½	1½	0.09	22.0	17.0	3	0.8	22.0
PF 300	300	8½	1½	0.11	33.0	23.0	5	1.0	33.0
PF 375	375	10½	1½	0.15	40.0	30.0	5	1.4	40.0
PF 420	420	11¾	1½	0.18	50.0	40.0	5	1.5	50.0



CAGE MOUNTED RESISTORS

GENERAL SPECIFICATIONS

- Ventilating metal cage mounting for wall or panel locations where mechanical protection is required
- Terminals are brought out through insulating bushings
- Available in Single thru Four Cage Assemblies
- Wattage — 65 watts per resistor unit (enclosed rating)
- Tolerance $\pm 5\%$ standard



Metal cage mounted units are available as fixed units and can be assembled in series or parallel. Consult the factory with your specifications.

Resistor Products—Chip Resistors

Thin-Film Center-Tapped Chips; Standard Resistance Values;
5 Ω To 510K Ω ; On 30 MIL Square Chips

Features

- Precision
- Excellent Stability
- Low TCR
- Excellent Ratio Tracking
- Withstands High Temperature Assembly
- Nickel-Chromium or Tantalum Nitride
- Passivated
- High Reliability

Hybrid Systems' Thin Film Resistor Chips are specifically designed for use in hybrid circuits. A product innovator, Hybrid Systems, maintains an active R & D effort in support of its high-volume production programs for commercial and MIL-STD requirements.

Compatible With Active Chips, these resistor chips maintain their high performance resistor characteristics through all conventional integrated-circuit manufacturing processes.

Etched Silicon Backing allows easy, reliable die bonding using eutectic, epoxy, or other conventional techniques.

Large Area Aluminum Bonding Pads provide efficient operator location and proven reliable wire bonds.

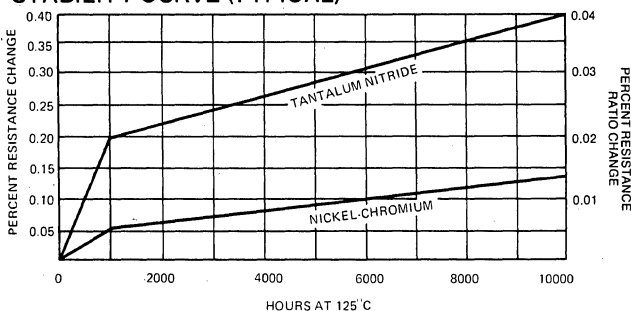
Glass Passivation offers added mechanical protection through assembly and chemical processes.

Excellent Characteristics; Inherent uniformity of individual resistors fabricated by vacuum deposition and photolithography processes results in resistor ratio tracking to 1PPM/ $^{\circ}$ C typically. Individual resistors can be laser-trimmed to within $\pm 0.1\%$.

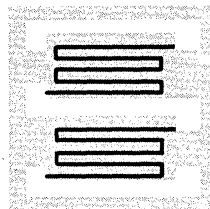
Nickel-Chromium or Tantalum Nitride versions of the thin-film resistor chips are available.

Reliability & Quality Assurance. Life test data proves quality and reliability over thousands of hours. Resistor chips and networks are inspected to the visual criteria specified in MIL-STD 883 Class B as our standard process with Class "A" inspection available upon request. Hybrid Systems' well staffed Quality Assurance and Reliability Department maintains the rigid standards necessary to assure reproducibility from month to month, and year to year. Hybrid Systems' Microelectronics manufacturing facility meets the Quality Assurance requirements of MIL-Q-9858A. Products are processed to meet the stringent requirements of MIL-M38510 and MIL-STD-883 specifications.

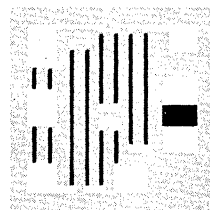
STABILITY CURVE (TYPICAL)



SEE OTHER HYBRID SYSTEMS LISTINGS IN SECTIONS 2000 AND 3130.



Center-Tapped Chips. Nickel-chromium thin-film resistor center tapped chips, with resistance values from 5 Ω to 510K Ω , are supplied in 30 mil. squares. Standard tolerances are 1%, 5% and 10%; custom to 0.01%. Custom ratios up to 10:1 available for most resistor values in this series.



Resistor Networks. Resistor conformity, temperature tracking and stability are all better than with individual resistor chips—typically 1PPM/ $^{\circ}$ C with long-term ratio stability of less than 0.01% after continuous operation at 125 $^{\circ}$ C. A typical network contains approximately 10 resistors trimmed to 0.1% accuracy on a 0.080" x 0.080" x 0.008" silicon chip.

D/A Converter Resistor Network. Standard nickel-chromium or tantalum nitride designs for ladder, scaling, and adapter networks are available in chip and wafer form. Accuracies to 14 bits and TCR-tracking to 1 PPM/ $^{\circ}$ C exemplify network performance as designed for D/A and A/D converters. The networks are laser trimmed to their precise tolerances.

Specifications

CHARACTERISTIC	NICKEL-CHROMIUM	TANTALUM NITRIDE	UNITS
Resistivity Range	50 to 500	100 to 300	$\Omega/\square$
Resistance Range	5 Ω to 10 Meg.	15 to 800K	Ω
Resistance Density	1000M	$\approx 29M$	$\Omega/\text{sq. in.}$
TC of Resistance	0 to +50	-50 to -200	PPM/ $^{\circ}$ C
Tracking	± 1	± 1	PPM/ $^{\circ}$ C
Power Dissipation	300	25	W/sq. in.
Stability-Abs.	<0.1 (125 $^{\circ}$ C)	<0.1 (85 $^{\circ}$ C)	%
Ratio Stability	<0.01 (125 $^{\circ}$ C)	<0.01% (85 $^{\circ}$ C)	%
Temperature Range	-55 to +175	-55 to +85	$^{\circ}$ C
Noise ¹	<0.1	<0.1	$\mu\text{V/V}$
Resistance Tolerance ²	± 5	± 5	%
Resistance Matching ³	$\pm .002$	± 0.01	%
Bonding Pad Size	4x4	5x5	mils
Method of Deposition	Evaporation	Sputtering	
Substrate Material	Silicon Glass Alumina	Silicon	
Conductor	Aluminum	Aluminum	

Notes

1. Measured in accordance with MIL-STD-202, Method 308.
2. Tolerances to 0.1% with laser trimming.
3. Tolerances to 0.002% with laser trimming.

Hybrid Systems CORPORATION
Burlington, Massachusetts 01803

(617) 272-1522
TWX 710-332-7584

Resistor Products—Packaged Networks

Thin-Film Precision Networks—10 Ω To 10M Ω Standard Dual-In-Line And Flatpack Configurations

Features

- Precision Tolerances
- High Stability
- Low TCR
- Low Noise
- Low Capacitance
- MIL-STD Screening

Hybrid Systems specializes in the application of thin-film technology and IC packaging to resistor network functions. For requirements of 2% or better absolute tolerance and/or ratios from 2% to 0.002%, Hybrid Systems offers a cost effective, timely solution. IC wafer fabrication technology and automatic laser trimming, combined with standard IC assembly techniques, provide versatile volume production capability.

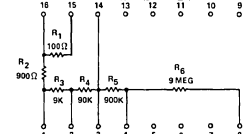
Custom Networks

Hybrid Systems offers a wide range of fast turnaround resistor networks built to your exact specifications. Available in both chip and packaged form, these custom networks can typically be processed from specification to finished product in 6 to 8 weeks. MIL-STD-883 screening available.

A staff of resistor specialists is available to consult and advise on optimal configurations.

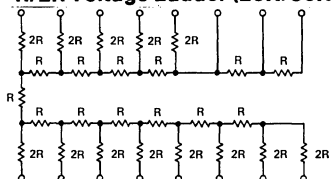
Some typical networks that you may evaluate are:

Decade Divider



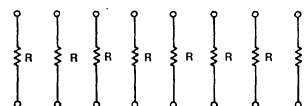
- 100 Ω to 9M Ω Resistance
- 0.01% Ratio Accuracy
- 5 PPM/ $^{\circ}$ C max. Ratio Tracking
- High Voltage Operation (> 1000 V)
- TO-116 (DIL) or 1/4" x 3/8" Flatpack

R/2R Voltage Ladder (25K/50K)



- 0.005% Ratio Accuracy Standard
- 0.002% Ratio Accuracy Available on Request
- 0.004% Ratio Accuracy over 1000 hrs @ 125 $^{\circ}$ C.
- 100 ns Settling to 0.1%
- TO-116 (DIL) or 1/4" x 3/8" Flatpack

8 Resistor Network



- 1% Absolute Accuracy; R = 10K
- 1.0%, 0.1%, 0.01% Ratio Accuracy Available
- 1 PPM/ $^{\circ}$ C Ratio Tracking
- 250 mW per Resistor (1W Total)
- 10:1 Ratio Variation per Resistor Available on Special Request
- TO-116 (DIL) or 1/4" x 3/8" Flatpack

Computer Laser Trimming

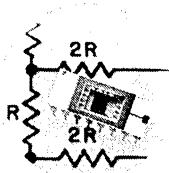
A fully automated laser trimming facility assures both consistency and uniformity for all high accuracy resistor products. This is the most modern trimming capability available anywhere.

Packages

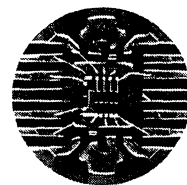
Standard packaging configurations are listed below. Other packaging configurations are available, upon request.

TO	Flat Pack	Dual-In-Line
TO-5	14 Pin	14 Pin
TO-18	16 Pin	16 Pin
	24 Pin	24 Pin

Ceramic/Metal Packages



Designed for commercial and MIL-STD programs.



Low-cost plastic packaged equivalents maintain high accuracy and stability.

MIL-Type Manufacturing, Screening and Inspection Procedures

Procedure

Screen
Internal Visual (Pre-Cap)
Stabilization Bake
Temperature Cycling
Constant Acceleration
Seal
Burn-in-Test
Final Electrical Tests

Method

883-Method 5004 1, Class B
2010
1008 Cond. C
1010 Cond. B
2001 Cond. D
1014
1015
Per unit Electrical specifications
2009

External-Visual

Specifications

CHARACTERISTIC	MIN.	TYP.	MAX.	UNITS
Resistance Range	5	—	10 Meg	Ω
Accuracy—Abs.	—	0.1	—	%
(Δ R)—Ratio	—	0.01	0.002	%
Stability—Abs.	—	—	0.1%/1000 hrs./125 $^{\circ}$ C	%
(Δ R)—Ratio	—	—	0.01%/1000 hrs./125 $^{\circ}$ C	%
TC—Abs.	10	25	50	PPM/ $^{\circ}$ C
—Ratio	0.5	2	5	PPM/ $^{\circ}$ C
Power Dissipation	—	100	300	W/sq. in.
Noise	—	—	0.1	μ V/V
Capacitance	—	<1	10	pF

SEE OTHER HYBRID SYSTEMS LISTINGS IN SECTIONS 2000 AND 3130.

Hybrid Systems
CORPORATION

Burlington, Massachusetts 01803

(617) 272-1522
TWX 710-332-7584

KRL

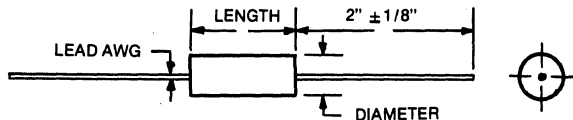
electronics, inc.

28 Bridge Street • Manchester, New Hampshire 03101
Tel. (603) 668-3210 • TWX (710) 220-1662

KRL Precision Wire Wound . . . Axial Lead Resistors

500 SERIES

KRL STYLE	MIL-R-93	MIL-R-39005	DIMENSIONS			POWER in WATTS		MAXIMUM VOLTAGE	MAXIMUM RESISTANCE
			LENGTH ±.015	DIAMETER ±.015	LEAD AWG	MIL 125°C	COMM 125°C		
532			.200	.100	24	.025	.050	100	100K
†533			.260	.100	24	.030	.060	100	150K
†534			.300	.100	22	.040	.080	100	150K
†535			.250	.125	22	.050	.100	150	300K
536			.312	.125	22	.065	.125	200	400K
537			.375	.125	22	.075	.150	200	500K
†538			.375	.187	22	.125	.250	300	600K
†540		RBR-74	.500	.187	22	.150	.300	300	1Meg
550		RBR-75	.295	.250	22	.125	.250	200	900K
555	RB-56	RBR-56	.375	.250	20	.150	.300	300	1Meg
†560	RB-55	RBR-55	.500	.250	20	.175	.350	400	2Meg
†565	RB-54	RBR-54	.750	.250	20	.350	.700	500	3.5Meg
570	RB-53	RBR-53	.750	.375	20	.375	.750	600	4Meg
575	RB-52	RBR-52	1.00	.375	20	.750	1.50	750	5Meg
578			.500	.500	20	.330	.660	400	2Meg
580	RB-57	RBR-57	1.00	.500	20	.850	1.75	850	10Meg
585	RB-58		1.50	.500	20	1.00	2.00	1.5KV	15Meg



THE KRL POLICY

KRL Electronics is a leader in precision wire wound resistors. Our approach to the production process, which includes design and material improvements, modern facilities, dedicated and trained personnel, have established our reputation for HIGH QUALITY and RELIABILITY in the Electronics Industry. That means years of experience in manufacturing goes into every one of our products. Our customers know what they're going to get, right from the beginning. KRL is committed to a program of "ZERO DEFECTS" and is seeking better ways to improve its Quality Products. At KRL, we test 100% of our product 3 to 5 times, during the manufacturing process. This eliminates any possible failures. KRL holds a "ZERO DEFECT" record, with no returns in over 4 years.

**"KRL QUALITY IS REMEMBERED . . .
LONG AFTER THE PRICE IS FORGOTTEN"**

STANDARD SPECIFICATIONS:

RESISTANCE RANGE— 1 Ω to 15Meg Ω 's

TOLERANCES— Standard from 1%, 0.5%, 0.25%, 0.1%, .05%, .02%, and .01% Accuracies to .0025% are available . . . Consult factory.

TEMPERATURE COEFFICIENT— (TCR)

0 $\pm$ 10PPM/ $^{\circ}$ C — 100 Ω and over Closer T.C.'s available to $\pm$ 1PPM/ $^{\circ}$ C

0 $\pm$ 15PPM/ $^{\circ}$ C — 10 Ω to 100 Ω

0 $\pm$ 25PPM/ $^{\circ}$ C — 1 Ω to 10 Ω

0 $\pm$ 90PPM/ $^{\circ}$ C — Less than 1 Ω

TEMPERATURE RANGE— Operating from —55 $^{\circ}$ C to +145 $^{\circ}$ C.

T.C. TRACKING— Available to $\pm$ 1PPM/ $^{\circ}$ C.

RATIO MATCHING— Resistors are available with tolerance and temperature coefficient matching and tracking over a wide temperature range. Resistor sets are packaged in individual envelopes and printed with all matching information . . . Consult Factory.

ENVIRONMENTAL REQUIREMENTS— All KRL precision wire wound resistors are manufactured to meet or exceed the applicable requirements of MIL-R-93 and MIL-R-39005.

MARKING— All resistors are printed with Trade Name, Style, Value, Tolerance and EIA Date Code, when room permits. All markings will meet or exceed MIL-STD-130.

LEAD MATERIAL— Standard lead material is tinned 180 Alloy
Also available in other types . . .

POWER RATING— Available from .05 watts to 2.0 watts. Use column marked COMM, which lists the commercial power rating in watts for all resistors .1% and up. For tighter tolerance resistors, all power ratings shown are maximum watts, refer to the Wattage vs. Tolerance Derating Curve at right.

STABILITY:

Precision Resistors— 0.001% for the first year, 0.0025% over a three year period.

Power Resistors— 0.003% for the first year, 0.005% over a three year period.

MARKING:

All KRL resistors are printed with indelible ink and are completely resistant to all cleaning solvents used for general purpose cleaning of P.C. Boards and assemblies. All markings will meet or exceed MIL-STD-130.

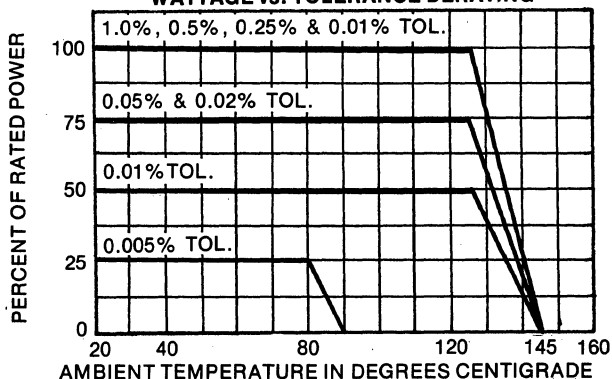
FREQUENCY CHARACTERISTICS:

Resistors above 10K Ω will appear capacitive and have 1 to 5pfs shunt capacitance, depending on value. Below 10K Ω resistors will appear inductive and can typically be controlled to less than 20 micro-henries and for specific applications be controlled down to 1 micro-henry . . . The above applies to Precision Resistors only.

RISE-TIME:

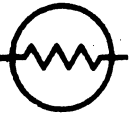
Available to less than 5 nano-seconds, as measured from 10% to 90% of the leading edge of a square wave pulse at 100KHZ applied across the resistor. These type resistors are called "HIGH SPEED" resistors, or Fast Switching Resistors.

WATTAGE vs. TOLERANCE DERATING



KRL electronics, inc.

28 Bridge Street • Manchester, New Hampshire 03101
Tel. (603) 668-3210 • TWX (710) 220-1662



KRL Economy Line Resistors

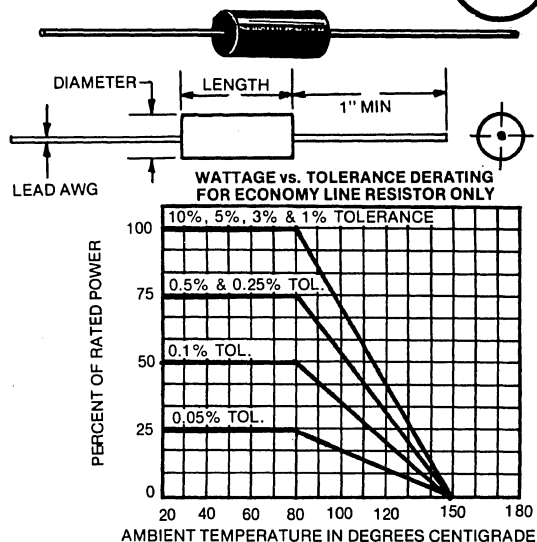
EC SERIES

KRL STYLE	DIMENSIONS			POWER in WATTS COMM	MAXIMUM VOLTAGE	MAXIMUM RESISTANCE
	LENGTH ±.062	DIAMETER ±.032	LEAD AWG†			
EC-10	.390	.100	24	.50	150	100K
EC-12	.530	.100	24	.50	150	120K
†EC-20	.390	.140	20	1.0	200	100K
†EC-22	.530	.140	20	1.2	200	120K
†EC-30	.390	.187	20	1.5	250	100K
†EC-32	.530	.187	20	1.7	250	150K
†EC-34	.560	.187	20	1.8	250	150K
EC-36	.812	.187	20	2.0	300	240K
†EC-40	.500	.250	20	2.0	300	200K
EC-42	.625	.250	20	2.5	300	220K
EC-45	.812	.250	20	2.7	350	250K
EC-50	.875	.312	18	2.8	350	300K
EC-55	1.00	.312	18	3.0	350	500K

†Indicates Most Popular Types

†Lead diameter may vary by one gauge, depending on requirement.

KRL introduces the first true Economy Line Wire Wound Resistors. These resistors are ideally suited to D.C. Circuits and some A.C. applications. KRL EC SERIES are becoming especially popular in Industrial and Consumer applications, where low cost is of prime importance, and all the benefits of wire wounds, as low T.C. and high stability are required. An additional benefit, not offered by other manufacturers is the High Power Handling capability along with higher resistance ranges available from the KRL Economy Line Series.



STANDARD SPECIFICATIONS:

RESISTANCE RANGE— 0.01 Ω to 500K Ω

TOLERANCES— Standard from 10%, 5%, 3%, 1%. Accuracies to 0.05% are available, consult factory.

POWER RATING— .5 WATTS to 3.0 WATTS (See derating curves above)

OPERATING TEMPERATURE RANGE— from -55°C to +150°C.

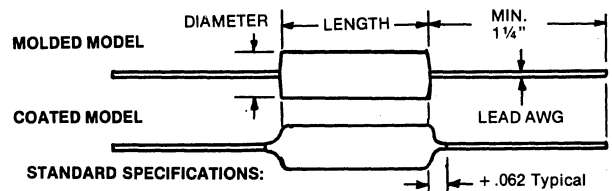
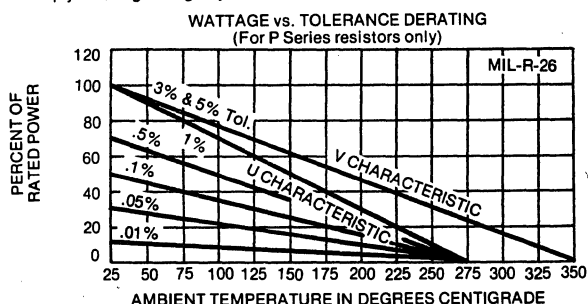
KRL WIRE WOUND POWER RESISTORS:

P SERIES

KRL STYLE	MIL-R-26	MIL-R-39007	WATTAGE RATING		MAX. WORKING VOLTAGE(2)		MAXIMUM RESISTANCE IN OHMS(3)	DIMENSIONS		
			U	V	U	V		LENGTH ±.062	DIAMETER ±.032	LEAD AWG(1)
P-1/2 A			.5	1.0	18	20	3.4K	.250	.094	24
P-1/2			.75	1.2	30	35	4.5K	.280	.094	24
P-1A	RW-70		1.0	1.5	50	55	10K	.406	.094	24
P-1B			1.1	1.6	62	67	12K	.530	.094	24
P-1C			1.0	1.5	28	33	5K	.330	.094	24
†P-2			1.5	2.0	72	79	10K	.385	.187	20
†P-2A	RW-79		3.0	3.75	135	148	22K	.560	.187	20
P-2B		RWR-71	3.25	4.75	185	220	42K	.812	.187	20
†P-2C			3.0	3.5	138	157	32K	.500	.250	20
†P-2D	RW-69		2.5	3.0	135	148	20K	.500	.187	20
†P-3			4.0	5.5	210	250	45K	.625	.250	20
†P-5	RW-74	RWR-74	5.0	6.0	325	375	90K	.875 ± .094	.312 ± .062	18
P-6	RW-67		6.0	6.5	360	400	95K	1.000 ± .094	.312 ± .062	18
P-7			7.0	8.0	360	400	100K	1.200 ± .094	.312 ± .062	18
P-7A	RW-55		7.5	9.0	510	580	150K	1.375 ± .094	.375 ± .062	18
†P-10			10.0	13.0	800	930	250K	1.815 ± .094	.375 ± .062	18
P-10A	RW-78	RWR-78	10.0	12.0	800	930	240K	1.780 ± .094	.375 ± .062	18
†P-10B	RW-68		10.5	14.0	800	930	275K	1.875 ± .094	.375 ± .062	18

†Indicates Most Popular Types.

- (1) Lead diameter may vary by one gauge depending on requirement.
(2) Maximum working voltage determined at .0008" wire size.
(3) Non-Inductive types (NP), divide maximum resistance values by two, and multiply working voltage by .707.



STANDARD SPECIFICATIONS:

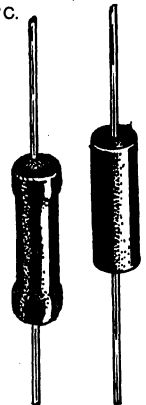
RESISTANCE RANGE— From 0.01 Ω to 275K Ω TOLERANCES— Standard from 10%, 5%, 3%, 1% (See tolerance order code on page 1). Accuracies available to $\pm$.01%, consult factory.

TEMPERATURE COEFFICIENT— (TCR)

0 $\pm$ 10PPM/°C — 100 Ω and over0 $\pm$ 15PPM/°C — 10 Ω to 100 Ω 0 $\pm$ 25PPM/°C — 1 Ω to 10 Ω 0 $\pm$ 90PPM/°C — Less than 1 Ω

Closer T.C.'s available...

All KRL power resistors are Hot Molded or Coated with a Silicone resin, selected to provide superior heat, thermal shock, and moisture resistance. The thermal life of our power resistor silicone coating is outstanding and directly competes with vitreous enamel and ceramic cement type resistors.



CHARACTERISTIC V:
Coated resistors are available in 3% and 5% tolerance only.

CHARACTERISTIC U:
Coated or Molded resistors are available in any tolerance.



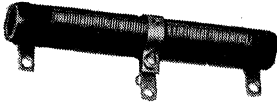
MILWAUKEE

RESISTOR CORPORATION

700 WEST VIRGINIA STREET, MILWAUKEE, WI. 53204
Telephone: (414) 271-9900

WIREWOUND POWER RESISTORS

8 TO 2000* WATTS....VITREOUS ENAMEL, SILICONE OR CEMENT COATED



*STANDARD RESISTORS: 8 THRU 225 WATTS.....
Vitreous Enamel 8,12,20,25,50,100,175 and 200 WATT
are stocked in many values - both fixed and adjustable -
except 8 & 20 watt adjustable. *WRITE FOR STOCK LIST !*

CUSTOM RESISTORS

36 additional wattage ratings are available with different core diameters and lengths. Non-inductive, tapped, live bracket, porcelain bushings, printed circuit board, strip and fuse resistors are manufactured to your specifications. MILWAUKEE will satisfy your resistor requirements with custom values, tolerances, T.C., shapes, sizes and coatings with its engineering leadership.

TERMINALS

All 8, 12 and 20 watt fixed resistors are standard with 1½" tinned leads. They are available with conventional lug terminals.

12 watt adjustable and the 25 through 225 watt fixed and adjustable resistors have lug type terminals.

Available are single and double quick connect and many other special terminals to suit your requirements.

MOUNTING

Spring clips, vertical thru bolts and horizontal L brackets are available on all 8 through 225 watts. For ferrule mountings, special spring clips, mica washers, terminal hardware and other accessories, consult the factory.

*WRITE FOR CATALOG
DESCRIBING VARIOUS
MOUNTING OPTIONS!*

RIBWOUND RESISTORS 40 - 2000 WATT



APPLICATIONS

Particularly useful where high energy is to be dissipated in the lower ohmic ranges. Due to its ability to operate at higher temperatures and dissipate greater heat, the ribwound resistor is almost one-half the physical size of the equivalently rated round-wire style resistor. Ribwound wattage ratings are based on a temperature rise of 375°C. They may be mounted with spring clips (thru 1 ¼" dia.); thru-bolt mounting hardware, individual or multiple-stacked bracket assemblies or live bracket mountings.

MILWAUKEE RIBWOUND RESISTORS are unique in the evenness of the crimping, allowing us to wind considerably higher ohmic values in any given wattage....If you have a particular application....Contact our factory !

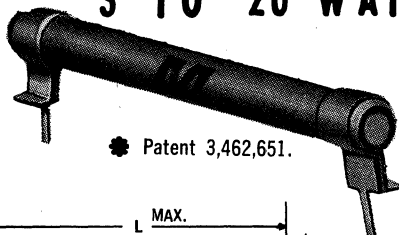
BASIC CONSTRUCTION

Crimped ribbon resistance wire is edge-wound and then locked to the ceramic core with vitreous enamel. Resistance wire is spot-welded to the terminal connectors. Ribwound resistors can be furnished in fixed, adjustable, or tapped styles. Cement coating can be furnished. Several 300 watt units are stocked in both fixed and adjustable styles. Listed are the more popular 300 watt ohmic values. All other wattage ratings and styles are made to order.

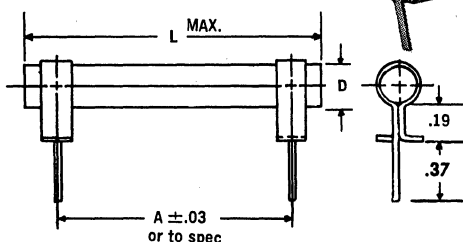
MILWAUKEE's variety of coatings is particularly convenient for the manufacture of resistors for use in many special atmospheres.....

*LET US KNOW OF ANY
SPECIAL PROBLEMS !*

3 TO 20 WATT PRINTED CIRCUIT BOARD RESISTORS



• Patent 3,462,651.



Watts	L	A	D	Max. Ohms
3	1½	0.6	1¼	14K
5	1¼	0.9	1¼	25K
7	1½	1.3	1¼	40K
10	2	1.7	1¼	60K
15	2	1.7	5/16	90K
20	2½	2.2	5/16	110K

↑ FIXED ADJUSTABLE ↓

Watts	L	A	D	Max. Ohms
15	2	1.7	5/16	2K*
20	2½	2.2	5/16	3K*

* For higher ohms, consult factory

FEATURES

- Built-in standoff keeps board cool.
- Mounting feet prevent rocking.
- Power ratings 3 to 20 watts.
- Complete OHM range.
- One-piece, welded terminals
- Rectangular leads .020 x .040 in.
- Silicon base coating. Vitreous enamel coating available.
- Standard tolerance ±5%.
- 20 PPM upon request.



MILWAUKEE

RESISTOR CORPORATION

700 WEST VIRGINIA STREET, MILWAUKEE, WI. 53204
Telephone: (414) 271-9900

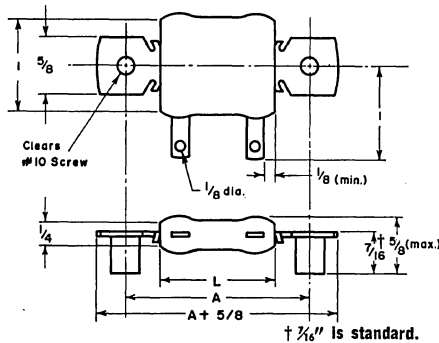
OVALS



OVAL RESISTORS are for use where space saving is desired and where the use of the 'Heat Sink' function of the metal chassis, rack or panel may be employed. Resistance tolerance of $\pm 5\%$ is standard except on low resistance and multi-tapped units. COATINGS of vitreous enamel or silicone base are offered.

OVALS are available in regular or miniature sizes an original development of MILWAUKEE Resistor.

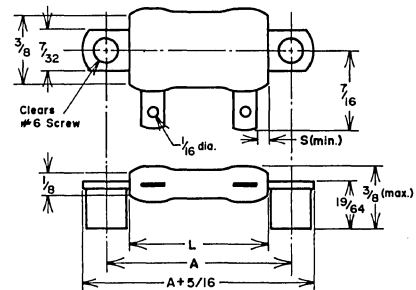
Additional miniature oval core sizes are available increasing the possibility of taps and isolated sections. Other intermediate size are also available. Only regular ovals are available as adjustable.



Watts*	Ohms	Dimensions	
		A	L
30	.10 to 10K	2"	1 1/4"
40	.13 to 25K	2 3/4"	2"
55	.18 to 30K	4 1/4"	3 1/2"
70	.22 to 55K	5 1/2"	4 3/4"
95	.25 to 75K	6 3/4"	6"

*Rating is based on mounting on steel pad 10"x10"x.040".

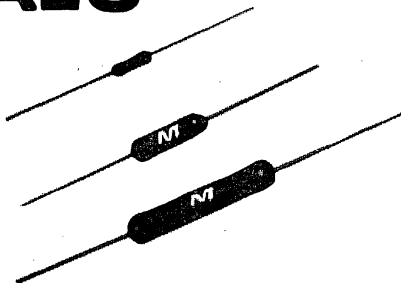
MINIATURE



Watts*	Ohms	Dimensions		
		A	L	S
10	.1 to 5K	1"	3/4"	1/8"
15	.15 to 25K	1 1/4"	1"	1/8"
20	.2 to 50K	2 3/8"	2"	1/8"

*Rating based on mounting on steel panel 10"x10"x.040".

AXIALS



APPLICATIONS

- Electronic Circuitry
- Printed Circuits
- Radio, Television and Sound Reproduction
- Miniature Controls

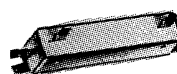
FEATURES

- Rugged yet small.
 - Highly stable.
 - Matched expansion in core caps and coating for temperature stability.
 - Standard 5% tolerance over 1 ohm, available in closer tolerances on request.
 - Wattage ratings based on 325°C rise at 25°C ambient.
 - Standard Stock — 3, 6.5 and 11 watt sizes.
 - Leads Hot Tin Dipped.
- Available in a variety of sizes from 1 watt through 11 watts on request.

CONSTRUCTION

- Wire Wound on Ceramic Core
- All Welded
- Vitreous or Silicone Base Coating

METAL CASE *



*Patent 3,581,266

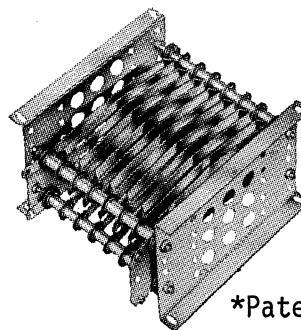


High Heat Sink-flush mounting dissipates heat

20 to 100 Watts - higher on Specials
Quick Connect or Screw Terminals
Save: Space - Cost - Assembly Cost

WRITE FOR ADDITIONAL INFORMATION !

GRIDS *



*Patent 3,212,045

Stud or Deck Mounted, MILWAUKEE's patented pre-formed grid shape assures maximum heat dissipation & cooling.

Pre-formed grid elements assure uni-directional stress motion. Custom design and construction features are most economical utilizing the exclusive MILWAUKEE patented grid system.

PRECISION *thick film* CHIP RESISTORS

why chip resistors?



why MINI-SYSTEMS?

In hybrid construction many have found it cheaper, quicker and easier to use MINI-SYSTEMS' chip resistors for prototypes, short production runs, "odd" high or low values, unique match and/or track specs, "tweak" or trim functions and cross-overs. Size reduction and repairs are easily accomplished with MSI Chip Resistors.

MINI-SYSTEMS has a wide selection of standard chip resistors tailored to fit assorted end uses. They are made from the very finest commercially-available, thick film materials; NO proprietary concoctions or "witches' brews" are used at MSI.

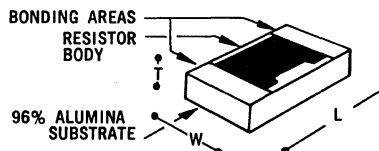
MINI-SYSTEMS has devoted over 6 years to developing and refining the materials and manufacturing processes used in high volume production of over 30 standard types of chip resistors.

MINI-SYSTEMS' quality program assures the customer of the highest possible reliability. Quality control procedures are derived from the requirements of MIL-Q-9858A, and MIL-I-45208A. Inspection records are maintained from the raw material to final processing and testing stage. Total traceability is maintained. Quality assurance inspection points are built into each manufacturing procedure to assure uniformity and conformance to applicable specifications. All resistors manufactured by MINI-SYSTEMS are designed to retain the electrical and mechanical characteristics under conditions set forth in MIL-R-55342

MINI-SYSTEMS' well-known reputation for prompt deliveries is the product of an in-depth inventory and efficient processing of all customers' orders; most orders are on their way within 5 days after we receive them.

CHIP RESISTOR SELECTION CHART					
	Length (L) ±.003"	Width (W) ±.005"	Thickness (T) Typ. / Max	Pwr Rating @ 25°C In Free Air	Type
Flip-Chip® Resistors "Flip Chip" Types	.050"	.050"	.013"/.016"	1/8 W	MSR-4
	.100"	.025"	.013"/.016"	1/10W	MSR-5
	.075"	.050"	.027"/.029"	1/5 W	MSR-13
	.100"	.050"	.027"/.029"	1/4 W	MSR-9
	.100"	.100"	.027"/.029"	1/2 W	MSR-7
	.125"	.244"	.027"/.029"	2 W	MSR-14
	.244"	.125"	.027"/.029"	2 W	MSR-17
	1.000"	.100"	.027"/.029"	4 W	MSR-11
	.050"	.040"	.013"/.016"	50mW	MSR-19
	.150"	.050"	.027"/.029"	300mW	MSR-24
	.393"	.192"	.027"/.029"	2 W	MSR-32
	.496"	.100"	.027"/.029"	2 W	MSR-22
	.494"	.243"	.027"/.029"	4 W	MSR-30
	.661"	.326"	.027"/.029"	8 W	MSR-28
	.661"	.494"	.027"/.029"	12 W	MSR-26
Wire Bond Resistor Types	.035"	.035"	.011"/.013"	35mW	MSR-10
	.050"	.050"	.011"/.013"	1/8 W	MSR-1
	.050"	.050"	.011"/.013"	1/8 W	MSR-2
	.100"	.025"	.011"/.013"	1/10W	MSR-3
	.075"	.050"	.027"/.029"	1/5 W	MSR-12
	.100"	.050"	.027"/.029"	1/4 W	MSR-8
	.100"	.100"	.027"/.029"	1/2 W	MSR-6
	.125"	.244"	.027"/.029"	2 W	MSR-15
	.244"	.125"	.027"/.029"	2 W	MSR-16
	.050"	.040"	.011"/.013"	50mW	MSR-18
	.150"	.050"	.027"/.029"	300mW	MSR-23
	.393"	.192"	.027"/.029"	2 W	MSR-31
	.494"	.243"	.027"/.029"	4 W	MSR-29
	.661"	.326"	.027"/.029"	8 W	MSR-27
	.661"	.494"	.027"/.029"	12 W	MSR-25
*	.060"	.055"	.015"/.025"	1/8 W	WA-4
	.110"	.105"	.027"/.035"	1/2 W	WA-7
	.110"	.055"	.027"/.035"	1/4 W	WA-9
	.085"	.055"	.027"/.035"	1/5 W	WA-13

GLASS OVERLAY ON ALL RESISTIVE ELEMENTS

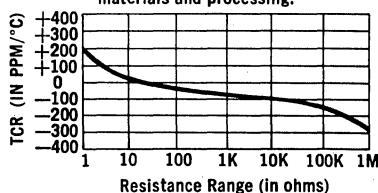


NOTES:

- "Flip-Chip" resistors have solder-tinned (SN-62) end-metallization over high-adhesion palladium-silver.
- Wire bond resistors have 0.0005" gold end-metallization optimized for wire bonding.
- Type WA-resistors have wraparound end-metallization for reflow solder or conductive epoxy attachment.
- MSR-11 is a high-voltage power resistor available on special order to customer's specification.

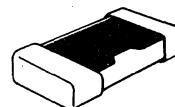
TEMPERATURE COEFFICIENT OF RESISTANCE

Actual TCR varies ±150 PPM/°C from typical, depending on geometry, materials and processing.



* wraparound metallization

TYPES WA-4/7/9/13 are unique design, HI-REL chip resistors having a glass-passivated resistor body "sandwiched" between double-screened electrodes. End metallization is double-dipped, high-adhesive platinum-gold plus solder tinning with "SN-62."



STANDARD OHMIC RANGE
ALL GEOMETRIES
1 ohm to 20 megohms
1/2 ohm to 1000 megohms
ON SPECIAL ORDER

New Products

PRECISION THIN-FILM CHIP RESISTORS

MINI-SYSTEMS' "Nichrome on Ceramic" Thin Film Chip Resistors offer several improvements and unique advantages:

- Extra large gold/nickel bonding pads — ideal for all bonding methods — provide "tie-point" convenience.
- Diamond wheel dicing for precise sizes and geometries.
- Values to 10 Megohms
- Low noise.
- Rapid deliveries.
- Low TCR.

Call, wire or write =M=S=I= for complete information or for your special requirements on =M=S=I= THIN FILM RESISTORS.



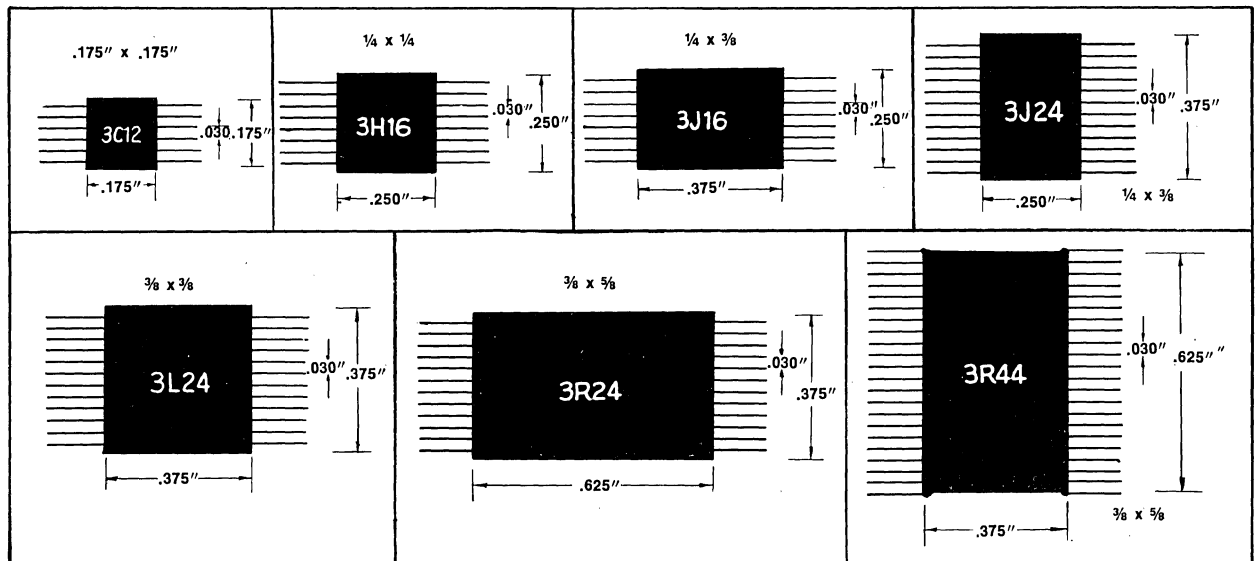
MINI-SYSTEMS, INC.

20 DAVID ROAD, NORTH ATTLEBORO, MASS. 02761
TELEPHONE: (617) 695-0206 • TWX NO. 710-348-0564



MINI-SYSTEMS, INC.

NEW FLAT-PAKS with 0.030" LEAD SPACING *Also DEEP VERSIONS for HYBRID ASSEMBLIES*



OFFERS ADVANTAGES IN —

- SPACE
- WEIGHT
- CONVENIENCE (Provides necessary depth)
- SHOCK & VIBRATION (Shorter wire bonds)
- HIGHER FREQ. (Shorter signal paths)
- ECONOMY (Less gold consumption)

Today's I.C.'s and Hybrid Microcircuits need packages more appropriate for the devices and/or end application. MINI-SYSTEMS proudly presents to the electronics industry a carefully conceived and engineered assortment of completely new hermetic Flat-Paks. These designs will give new possibilities, complement, and in some cases replace, existing Flat-Paks.

MINI-SYSTEMS Packages now and in the future will cater to new I.C. devices and hybrid microcircuit requirements. MINI-SYSTEMS pays consistent attention to quality, customer service and deliveries.

For more information, phone or wire MSI for complete Flat-Pak Catalog, design data and pricing.

Leads	Width	Length	Usable Depth	Minimum Glass Free Area	Part No.
12	.175"	.175"	.032"	.070" x .090"	3C12M
16	.250"	.250"	.040"	.150" x .180"	3H16M
16	.250"	.250"	.080"	.130" x .170"	3H16M-1
16	.375"	.250"	.040"	.250" x .160"	3J16M
16	.375"	.250"	.080"	.240" x .150"	3J16M-1
24	.250"	.375"	.040"	.130" x .290"	3J24M
24	.250"	.375"	.080"	.120" x .280"	3J24M-1
24	.375"	.375"	.040"	.255" x .290"	3L24M
24	.375"	.375"	.080"	.240" x .280"	3L24M-1
24	.625"	.375"	.090"	.480" x .280"	3R24M-1
44	.375"	.625"	.090"	.240" x .530"	3R44M-1

- Mating lids and preforms available.
- Mating ceramic substrates with or without metalization also available.

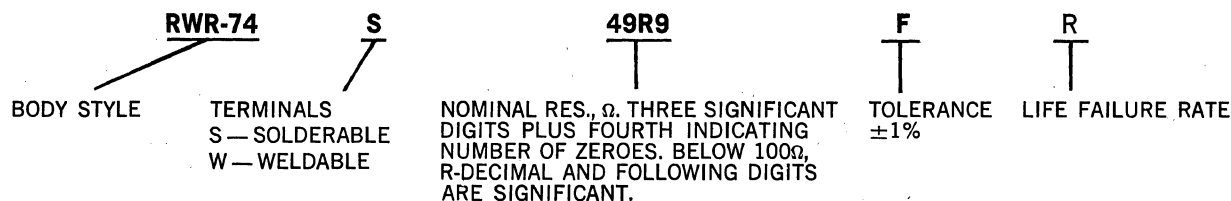


MINI-SYSTEMS, INC.

20 David Road, North Attleboro, Mass. 02761
Tel. (617) 695-0206
TWX NO. 710-348-0564

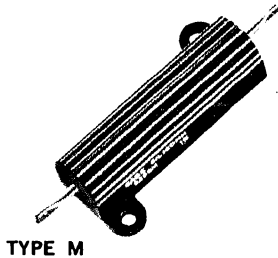
Nytronics Components Group Inc.ORANGE STREET, DARLINGTON, S. C. 29532
(803) 393-5421 • TWX 810-665-2182**SAGE/NYTRONICS
RESISTORS****INDUSTRY'S
FINEST
RESISTORS****MIL-R-39007****ESTABLISHED RELIABILITY****FAILURE RATES M, P, AND R .01%/1000 HRS.****RESISTANCE TOLERANCE $\pm 1\%$** **TEMPERATURE COEFFICIENT:** **± 20 PPM/ $^{\circ}\text{C}$ MAX. 10Ω AND HIGHER** **± 50 PPM/ $^{\circ}\text{C}$ MAX. 1Ω TO 10Ω** **± 90 PPM/ $^{\circ}\text{C}$ MAX. $.1\Omega$ TO 1Ω** **ALL STYLES AVAILABLE WITH
SOLDERABLE (S) OR WELDABLE (W)
TERMINALS****TYPE DESIGNATIONS**

MIL STYLE	DETAIL SPEC. NO.	SAGE STYLE	MIL WATTS @ 25 $^{\circ}\text{C}$	AVAILABLE RESISTANCE RANGE
RWR80S RWR80W	/8C /8C	1009SM 1007SM	2	.10 Ω to 2.67K
RWR81S RWR81W	/9C /9C	259SM 257SM	1	.10 Ω to 1.0K
RWR89S RWR89W	/11B /11B	1249SM 1247SM	3	.10 Ω to 4.12K
RWR84S RWR84W	/10B /10B	1509SM 1507SM	7	.10 Ω to 12.4K
RWR71S RWR71W	/5C /5C	1259SP 1257SP	2	.10 Ω to 16.2K
RWR74S RWR74W	/6B /6B	1509SP 1507SP	5	.10 Ω to 12.1K
RWR78S RWR78W	/7C /7C	1709SP 1707SP	10	.10 Ω to 39.2K

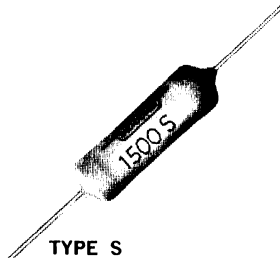
EXAMPLE PART DESIGNATION:

Nytronics Components Group Inc.**SAGE ELECTRONICS CORPORATION**

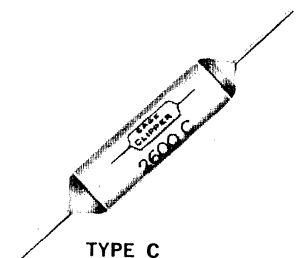
ORANGE STREET, DARLINGTON, S. C. 29532 (803) 393-5421 • TWX 810-665-2182

**SAGE/NYTRONICS
RESISTORS**

TYPE M



TYPE S



TYPE C

**TYPC C CLIPPER
METAL
SHEATHED
RESISTORS**

similar in all respects to Type S, fully insulated plus addition of metal sleeve for heat sink mounting in spring clip holders. Full heat sink rating.

STYLE	Rating Watts
	Full heat sink rating
2200C	6
2250C	6
2550C	11
2600C	14

**TYPE S, NS SILICONE
COATED POWER RESISTORS**
Meet or exceed MIL-R-26E requirements.
N designates non-inductive.

STYLE	Char. U Rating Watts	Nominal Size		Lead Dia.	Maximum	
		Length	Dia.		Standard Regular Winding	Range. Ω Non- Inductive
100S	1	.400	.094	.020	8400	3000
200S	2	.400	.125	.020	11000	3900
300S	3	.400	.187	.020	15000	5300
250S	.5	.250	.078	.020	3800	1350
500S	.8	.312	.078	.020	5000	1750
750S	1	.531	.094	.020	12000	4200
1000S	1	.406	.094	.020	8400	3000
1100S	2	.500	.125	.032	15000	5500
1200S	3	.500	.187	.032	20000	7000
1240S	3	.562	.187	.032	24000	8400
1250S	3	.812	.187	.032	40000	14000
1300S	3	.625	.250	.040	30000	10500
1500S	5	.875	.312	.040	71000	25000
1550S	5	1.000	.312	.040	88000	31000
1600S	7	1.219	.312	.040	114000	40000
1700S	10	1.781	.375	.040	230000	80000
1900S	10	1.375	.431	.040	210000	73000
1950S	11	2.000	.431	.040	314000	110000

MINIATURE SERIES

REGULAR S SERIES

Min. Res. Tol. Available is $\pm 1\%$ on the NS Styles.

SAGE SILICOHM® fixed wirewound units are not ordinary power resistors. They provide remarkable miniaturization vs required wattage performance. Sage has pioneered the area of power handling capacity combined with precision and stability features ordinarily associated with Mil-R-93 resistors.

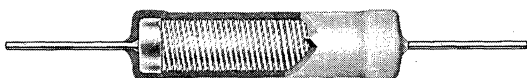
**TYPE SB & NSB
HIGH WATTAGE
COMMERCIAL
BERYLLIA CORE RESISTORS**

STANDARD SOLDERABLE LEADS	RATED WATTS		Approx. Grams WEIGHT
	G	V	
250SB	1	1.5	.18
500SB	1.5	2	.28
1000SB	2.25	2.75	.32
1200SB	3.5	4.5	1.0
1240SB	4	5	1.1
1250SB	4.5	6	1.2
1300SB	6	8	1.8
1500SB	7	9	3.6
1600SB	9	12	4.2
1700SB	14	18	7.3

TYPE S CONSTRUCTION

Showing ceramic core, spaced single layer winding, welded to stainless steel cap, and multiple layer coating.

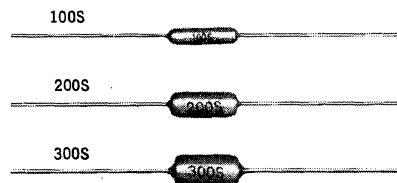
Copperweld leads 60/40 Hot Solder Dip. Lead Length 2" $\pm \frac{1}{16}$ " *
is supplied on all sizes unless otherwise
specified on purchase order.



*Except 250S and 500S Styles, which are 1 1/2" minimum.

**MINIATURE TYPE S
"CORDWOOD" SERIES**

1, 2, 3 watt .4 inch body length



Nytronics Components Group Inc.**SAGE ELECTRONICS CORPORATION**

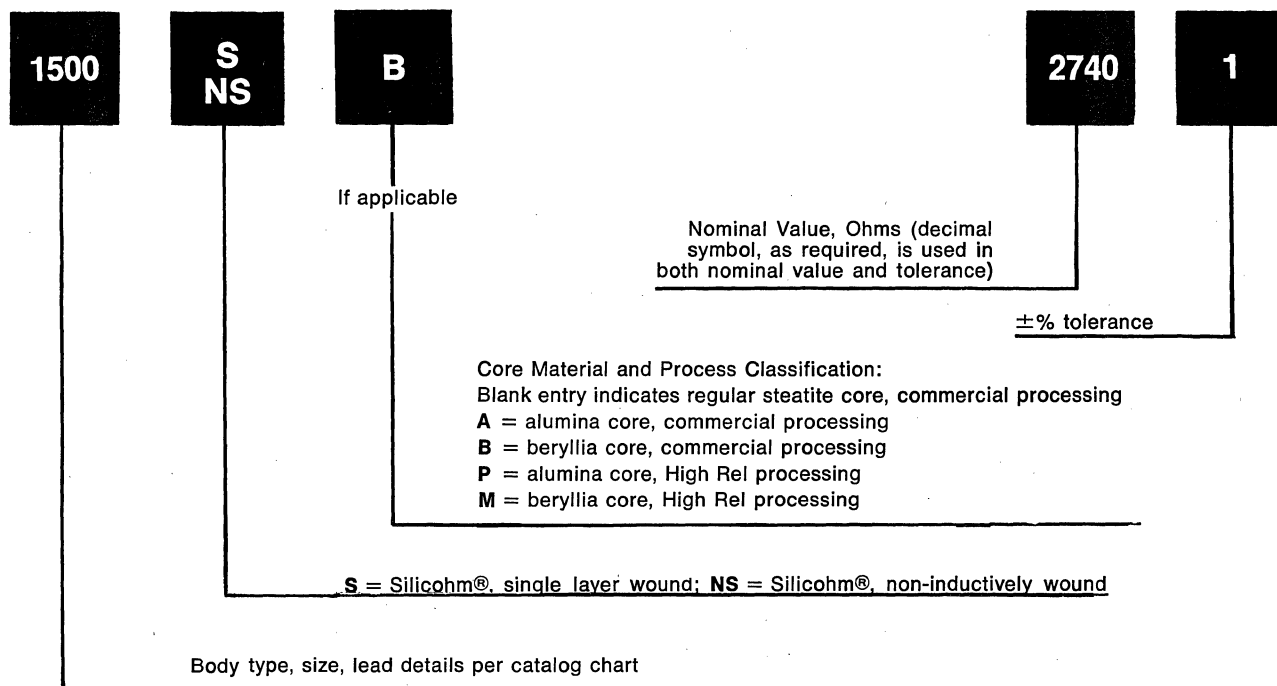
ORANGE STREET, DARLINGTON, S. C. 29532 (803) 393-5421 • TWX 810-665-2182

**SAGE/NYTRONICS
RESISTORS**

TYPE S RESISTOR ITEM DESCRIPTION

Sage Part Number identification consists of a combination of numerals and letters according to the following guide. This is the nomenclature ordinarily marked on resistors and it fully serves the purpose of purchased item description except for limited cases of special testing. Note that grouping of characters is not constant, but varies to fit descriptive need of a given part.

STYLE DESIGNATION



PRICING: On request from factory or any regional office. Item price is based on style designation, ohmic value, tolerance and quantity, plus any special testing if applicable.

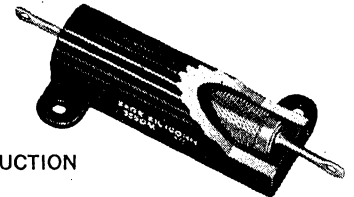
QUALITY ASSURANCE: Sage continuously maintains systems and procedures for quality-reliability administration in conformance with:

MILITARY — MIL-Q-9858, MIL-I-45208A and MIL-STD-790
Our Federal Supply Code No. is 00213
Our Federal Supply Product Class is 5905

GOVERNMENT SOURCE INSPECTION: GSI orders are serviced on a regular basis by the Defense Contract Administration Services.

Nytronics Components Group Inc.**SAGE ELECTRONICS CORPORATION**

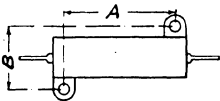
ORANGE STREET, DARLINGTON, S. C. 29532 (803) 393-5421 • TWX 810-665-2182

**SAGE/NYTRONICS
RESISTORS****INDUSTRY'S FINEST RESISTORS . . . Commercial, Military, High Reliability****TYPE M
METAL CLAD
CHASSIS MOUNT
RESISTORS**

TYPE M CONSTRUCTION

Aluminum housed resistors for heat sink mounting. Meet or exceed requirements of MIL-R-18546D. Dielectric strength to 2500 volts rms.

All dimensions are inches nominal. Complete specifications available on request.



STYLE	Rating Watts	A	B	Max. Resistance Ω	
				Regular Winding	Non-Induct.
3105M	8	.444	.490	24,000	8,400
3010M	14	.562	.625	30,000	10,500
3225M	25	.719	.781	71,000	25,000
3550M	50	1.562	.844	230,000	80,000

M suffix designates regular single layer wind.
NM suffix designates non-inductive wind.

**TYPE MB HIGH WATTAGE
BERYLLIUM OXIDE CORES**

STYLE	RATED WATTS 25°C ambient	
	chassis mounted	free air
3105 MB NMB	15	6
3010 MB NMB	20	8
3225 MB NMB	35	14
3550 MB NMB	50	20

MB suffix designates regular single layer wind,
NMB non-inductive wind.

MIL-R-26E TYPE DESIGNATIONS

EXAMPLE: RW69 V 471

↑ ↑ ↑

Body Characteristic, Nominal resistance, Ω . Two significant digits

Style V only plus third indicating number of zeros. Below

(350°C max.) 10 Ω R = decimal and last digit is significant.

TOLERANCE: $\pm 5\%$ for values 1 Ω and up; $\pm 10\%$ below 1 Ω .

TC: ± 260 ppm/°C 20 Ω and up; 400 ppm/°C below 20 Ω .

MIL STYLE	SAGE STYLE	MIL WATTS	DEFINED OHMIC RANGE	
			(Single layer wound .00175 min. wire dia.)	.001 Min. Wire Dia.
RW55V	1900S	7	.1—5100	
RW56V	1950S	14	.1—9100	
RW67V	1550S	6.5	.1—3600	.1—8200
RW68V	1700S	11	.1—8200	.1—20K
RW69V	1200S	3	.1—910	.1—2K

EXAMPLE: RW70 U 49R9 F

↑ ↑ ↑ ↑

Body Characteristic, Nominal resistance, Ω . Three signifi- Tolerance $\pm \%$

Style U only cant digits plus fourth indicating num- B = .1%

(275°C max.) ber of zeros. Below 10 Ω R = decimal D = .5%

and following digits are significant. F = 1.0%

TC: ± 30 ppm/°C 10 Ω and above
 ± 50 ppm/°C 1 Ω to 10 Ω
 ± 90 ppm/°C below 1 Ω

MIL STYLE	SAGE STYLE	MIL WATTS	VOLTAGE Max.	DEFINED OHMIC RANGE		
				Min.	Max. for .001" wire (Navy)	Max. for .0008" wire (all other)
RW70U	1000S	1	—	.1	1210	3160
RW74U	1500S	5	300	.1	12100	38300
RW78U	1700S	10	720	.1	40200	90900
RW79U	1240S	3	135	.1	3570	10500
RW80U	1000SB	2	—	.1	1240	3160
RW81U	250SB	1	25	.1	649	—

MIL-R-18546D TYPE DESIGNATIONS

Example:

RE65 G 1001

↑ ↑ ↑

Style Characteristic, Nominal resistance, Ω . $\pm 1\%$ only.

 275°C Max. Three significant digits plus fourth

 G for regular in- indicating number of zeros. Below

 ductive winding 100 Ω R = decimal and following

 N for non-induc- digits are significant.

 tive winding

T.C. ± 30 ppm/°C 2000 Ω and above
 ± 50 ppm/°C under 2000 Ω

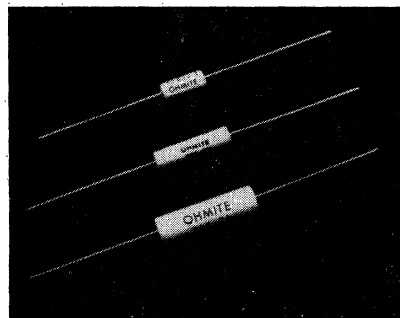
MIL STYLE	SAGE STYLE	MIL WATTS	DEFINED OHMIC RANGE	
			Min.	Max. (.001 wire)
RE60G	3105M	5	.1	3320
RE60N	3105NM	5	1.0	1650
RE65G	3010M	10	.1	5620
RE65N	3010NM	10	1.0	2800
RE70G	3225M	20	.1	12100
RE70N	3225NM	20	1.0	6040
RE75G	3550M	30	.1	39200
RE75N	3550NM	30	1.0	19600

CONSIDER THESE RESISTOR FEATURES:

- Wattage Rating, 1/2 to 50 watts
- T.C. 20 ppm/°C or 10 ppm/°C
- 1000 volt rms body insulation
- Characteristic U or V wattage rating: to 275°C or 350°C
- Power load life stability $< .5\%$ /1000 hours
- Weldable leads when specified
- Non-inductive winding when specified

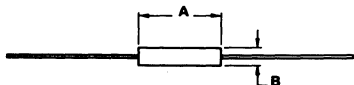
OHMITE® series 99

MOLDED VITREOUS ENAMEL AXIAL LEAD WIREWOUND RESISTORS



SERIES 99

Watt	Type	Resist. Range	Body Dimensions			Leads (1.5" / 38.1 mm) Ga.	Heat Sink Clip No.
		Min.-Max.	Max. L. A (")/mm	Max. Dia. B (")/mm	Max. Dia. B (")/mm		
1.5	995-1A	1-6.65K	.437/11.1	.140/3.6	.24	5900	
2.25	995-2A	1-6.49K	.390/9.9	.219/5.6	20	5902	
3.25	995-3A	1-22.1K	.562/14.3	.234/5.9	20	5904	
5	995-5B	1-53.6K	.953/24.2	.234/5.9	20	5906	
6.5	995-5A	1-80.6K	.937/23.8	.343/8.7	20	5905	
9	995-7A	1-118K	1.233/31.3	.343/8.7	20	5907	
11	995-10A	1-187K	1.796/45.6	.343/8.7	20	5908	



- Unique Molded Construction Provides Consistent Shape and Size
- Exceeds MIL-R-26 Moisture Requirements
- Endures Heat Up to 1500°F
- All Welded Construction
- Ideal for Machine Insertion and High Density Circuits

Series 99 molded vitreous wirewound resistors are high performance components designed for precision instrumentation, medical equipment and other applications demanding high reliability and stable operation. MIL-R-26 approved units are available for Military Application.

An extremely wide range of resistance values can be specified (5% tolerance standard), up to 11 watts with 1 KV dielectric breakdown rating (500 V for 1 W types). Low temperature coefficient values of approx. 0 $\pm$ 30 ppm/°C are typical. Precision molded bodies make them an excellent choice for machine insertion production line techniques. Durable molded bodies withstand harsh solvents.

MECHANICAL

Terminal Strength: Meets MIL-R-26 requirements. Dimensions: See table at left.

ELECTRICAL

Tolerance: $\pm$ 5% std.; $\pm$ 1% to $\pm$ 10% available. Temperature Coefficient: 0 $\pm$ 30 ppm/°C (+25°C to +350°C) for most values. T.C. for low values depends on resistance.

Dielectric Withstanding Voltage: 1 KV (500 V for 1 W types).

Overload, Short Time: 10X rated wattage for 5 sec. (5 W size and larger); 5X rated wattage (under 5 W).

Wattage: Up to 11 watts; see table. Ratings may be increased by using metal mounting clips. See Ohmite Catalog No. 100.

Inductance: Varies with number of turns and wire size. Std. units have single layer winding. Non-inductive (Aryton-Perry) windings available.

MATERIALS

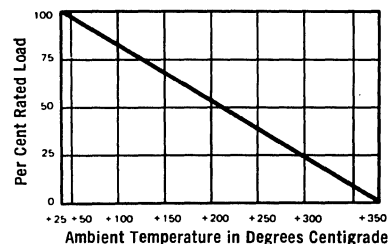
Core: Steatite ceramic, resistant to thermal shock and wide variations in temperature.

Resistance Element: High grade resistance alloy wire, single layer winding. Leads and resistance element welded to metal end caps.

Coating: High performance molded vitreous enamel. Leads: Solder coated.

DERATING

Wattage rating is based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



Popular values are available from Ohmite stock or from your local authorized Ohmite stocking distributor. Refer to Ohmite Catalog No. 300.

ORDERING DATA

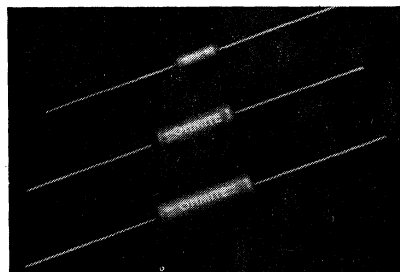
For other than stock values specify style, resistance and tolerance.

For example: 995-1A, 500 ohms, 2% tolerance specifies a 1 watt, 500 ohm molded vitreous enamel resistor with a resistance tolerance of 2%.

For special mechanical or electrical requirements, your inquiry will be given prompt attention.

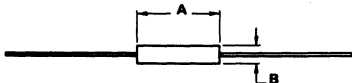
OHMITE® series 22

CONFORMAL VITREOUS ENAMEL AXIAL LEAD WIREWOUND RESISTORS



SERIES 22

Watt	Type	Resist. Range	Body Dimensions			Leads (1.5" / 38.1 mm) Ga.
		Min.-Max.	Max. L. A (")/mm	Max. Dia. B (")/mm	Max. Dia. B (")/mm	
1	221	1-2.5K	.406/10.3	.156/4	.22	
2	222	1-3.9K	.406/10.3	.219/5.6	20	
3	223	1-10K	.562/14.3	.250/6.4	20	
5	225	1-30K	1.000/25.4	.250/6.4	20	
6	226	1-35K	1.031/26.2	.343/8.7	20	
7	227	1-40K	1.250/31.8	.343/8.7	20	
11	220P	5-60K	1.938/49.2	.343/8.7	20	



- Rugged Vitreous Enamel Coating Withstands Severe Humidity and Temperature Cycling

- Economical
- All Welded Construction
- Ideal for Machine Insertion

Advanced conformal vitreous enamel coating protects resistors, even in environments of high heat. These rugged, economical wirewound resistors are recommended for industrial applications where quality construction and reliable operation are prime specifying parameters. 5% tolerance is standard for all wattage sizes. Dielectric breakdown is 1 KV (500 V for 1 W size). Typical T.C. of 0 $\pm$ 30 ppm/°C for 10 Ω values and above.

MECHANICAL

Terminal Strength: Meets MIL-R-26 requirements. Dimensions: See table at left.

ELECTRICAL

Tolerance: $\pm$ 5% std.; $\pm$ 1% to $\pm$ 10% available. Temperature Coefficient: 0 $\pm$ 30 ppm/°C typical for 10 Ω and above.

Dielectric Withstanding Voltage: 1 KV (500 V for 1 W types).

Overload, Short Time: 10X rated wattage for 5 sec. (5 W size and larger); 5X rated wattage for 5 sec. (under 5 W).

Wattage: Up to 11 watts; see table.

Inductance: Varies with number of turns and wire size. Std. units have single layer winding. Non-inductive (Aryton-Perry) windings available.

MATERIALS

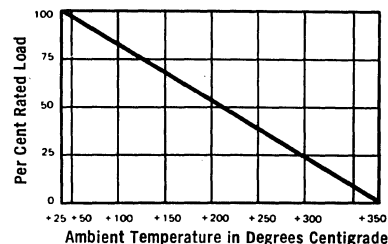
Core: Ceramic, resistant to thermal shock and wide variations in temperature.

Resistance Element: High grade resistance alloy wire, single layer winding. Leads and resistance element welded to metal end caps.

Coating: High performance conformal vitreous enamel. Leads: Solder coated.

DERATING

Wattage rating is based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



ORDERING DATA

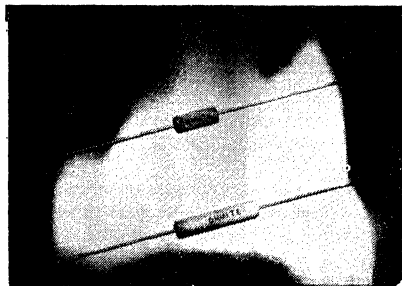
To specify resistors, see below:
Typical No.

22	1	S	R5000	J
SERIES NO. Identifies basic resistor construction.	MISCELLANEOUS SPECIFICATIONS S=Standard winding. N=Non-inductive winding. P=Standard winding with actual wattage rating more than indicated. T=Non-inductive winding with actual wattage rating more than indicated.	RESISTANCE VALUE Value is identified by 4 digits and 1 letter. Resistance is expressed in ohms with the letter "R" signifying a decimal point. "W" is used in all resistance values lower than 1000 Ω . Letter "K" indicates multiples of 1000 Ω .	EXAMPLES: R5000=50K 10000=10K 25000=25K 10000=10K 25000=25K 25K50=25,500 Ω	TOLERANCE F= $\pm$ 1% G= $\pm$ 2% H= $\pm$ 3% J= $\pm$ 5% std. K= $\pm$ 10%

For special mechanical or electrical requirements, your inquiry will be given prompt attention.

OHMITE® series 57 ceron®

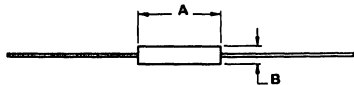
FLAMEPROOF CONFORMAL CERAMIC AXIAL LEAD WIREWOUND RESISTORS



SERIES 57 CERON®

Watt	Type	Resist. Range	Body Dimensions		Leads (1.5"/38.1 mm) Ga.
		Min.-Max.	Max. L. A ("mm)	Max. Dia. B ("mm)	
1	571	1.0-3K	.406/10.3	.156/4	22
2	572	1.0-4K	.406/10.3	.219/5.6	20
3	573	1.0-12K	.562/14.3	.234/5.9	20
5	575	1.0-30K	1.000/25.4	.234/5.9	20
7	577	1.0-50K	1.094/27.8	.343/8.7	20
10	570	1.0-60K	1.813/46.1	.343/8.7	20

©CERON is a registered trade name of Ohmite Mfg. Co.



- Flameproof — WILL NOT IGNITE from any Overload or Exposure to Open Flame
- Ideal for Applications Where High Overloads Could Result in Flaming or Body Deterioration
- Exceeds All Environmental Requirements of MIL-R-26E
- Resists Shock, Vibration, Salt Spray; Immune to Fungus Growth
- All Welded Construction
- Ideal for Machine Insertion

A unique coating on a rugged power wirewound resistor for a spectrum of applications where non-flammability is absolutely essential. Designed for use in data processing equipment, communications equipment, electrically controlled apparatus, medical and home entertainment equipment . . . and similar demanding applications.

MECHANICAL

Terminal Strength: Meets MIL-R-26E requirements. Dimensions: See table at left.

ELECTRICAL

Tolerance: $\pm 5\%$ std.; $\pm 1\%$, $\pm 3\%$, $\pm 10\%$ available. Temperature Coefficient: 0 ± 30 ppm/°C max. Lower T.C. available on special order.

Dielectric Withstanding Voltage: 500 V (250 V for 1 and 2 W sizes). 1 KV available.

Overload, Short Time: 5X rated wattage for 3 seconds. Wattage: Up to 10 watts; see table.

Inductance: Varies with number of turns and wire size. Std. units have single layer winding. Non-inductive (Aryton-Perry) windings available.

MATERIALS

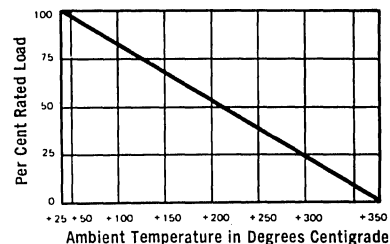
Core: Ceramic, resistant to thermal shock and wide variations in temperature.

Resistance Element: High grade resistance alloy wire, single layer winding. Leads and resistance element welded to metal end caps.

Coating: FLAMEPROOF CERON® conformal ceramic. Leads: Solder coated.

DERATING

Wattage rating is based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



ORDERING DATA

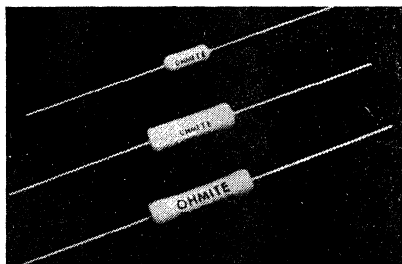
To specify resistors, see below:
Typical No.

57	1	S	R5000	J
OHMITE SERIES NO. Identifies basic resistor construction.	MISCELLANEOUS SPECIFICATIONS S=Standard winding. N=Non-inductive winding.	RESISTANCE VALUE Value is identified by 4 digits and 1 letter. Resistance is expressed in ohms with the letter "R". Signifying a decimal point. "R" is used in all resistance values lower than 1000Ω. Letter "K" indicates multiples of 1000Ω.	TOLERANCE F = $\pm 1\%$ G = $\pm 2\%$ H = $\pm 3\%$ J = $\pm 5\%$ std. K = $\pm 10\%$	Examples: R5000 = 50Ω 1R000 = 1Ω 250R0 = 250Ω 1K000 = 1000Ω 25K00 = 25,000Ω 25K50 = 25,500Ω

For special mechanical or electrical requirements, your inquiry will be given prompt attention.

OHMITE® series 44 ohmicone®

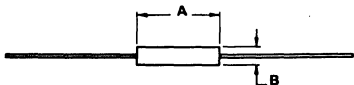
CONFORMAL SILICONE CERAMIC AXIAL LEAD WIREWOUND RESISTORS



SERIES 44 OHMICONE®

Watt	Type	Resist. Range	Body Dimensions		Leads (1.5"/38.1 mm) Ga.
		Min.-Max.	Max. L. A ("mm)	Max. Dia. B ("mm)	
1	441	.5-4K	.437/9.4	.125/3.2	22
2	442	.1-4K	.406/10.3	.219/5.6	20
3	443	.1-15K	.563/14.3	.250/6.4	20
5	445	.1-60K	.937/23.8	.343/8.7	18
7	447	.1-80K	1.250/31.8	.343/8.7	18
10	440	.1-150K	1.843/46.8	.406/10.3	18

©OHMICONE is a registered trade name of Ohmite Mfg.



- Economically Priced with Low T.C.
- Ohmicone® Silicone-Ceramic Coated — Withstands High Temperatures
- Standard Tolerance — 5%
- All Welded Construction
- Ideal for Machine Insertion

Series 44 Ohmicone® conformal silicone ceramic power resistors are designed for a wide range of commercial, industrial, and communications equipment. Primary specifying features are excellent economy and low T.C.

MECHANICAL

Terminal Strength: Meets MIL-R-26 requirements. Dimensions: See table at left.

ELECTRICAL

Tolerance: $\pm 5\%$ std.; $\pm 0.05\%$ to $\pm 10\%$ available. Temperature Coefficient: $>10 - 0 \pm 90$ ppm/°C; 1 to $10\Omega - 0 \pm 50$ ppm/°C; 10Ω and greater — 0 ± 20 ppm/°C.

Dielectric Withstanding Voltage: 500 V (250 V for 1 W size). 1 KV available.

Overload, Short Time: 10X rated wattage for 5 sec. (5 W and larger); 5X rated wattage for 5 sec. (3 W and smaller).

Wattage: Up to 10 watts; see table.

Inductance: Varies with number of turns and wire size. Std. units have single layer winding. Non-inductive (Aryton-Perry) windings available.

MATERIALS

Core: Ceramic, resistant to thermal shock and wide variations in temperature.

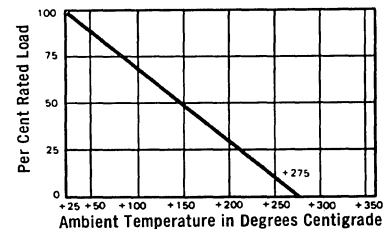
Resistance Element: High grade resistance alloy wire, single layer winding. Leads and resistance element welded to metal end caps.

Coating: High performance conformal silicone ceramic.

Leads: Solder coated.

DERATING

Wattage rating is based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



ORDERING DATA

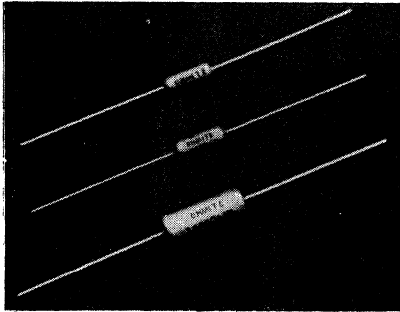
To specify resistors, see below:
Typical No.

44	1	S	R5000	J
OHMITE SERIES NO. Identifies basic resistor construction.	MISCELLANEOUS SPECIFICATIONS S=Standard winding. N=Non-inductive winding.	RESISTANCE VALUE Value is identified by 4 digits and 1 letter. Resistance is expressed in ohms with the letter "R". Signifying a decimal point. "R" is used in all resistance values lower than 1000Ω. Letter "K" indicates multiples of 1000Ω.	TOLERANCE A = $\pm 0.5\%$ B = $\pm 1\%$ W = $\pm 1.25\%$ C = $\pm 2.5\%$ D = $\pm 5\%$ F = $\pm 1\%$ G = $\pm 2\%$ H = $\pm 3\%$ J = $\pm 5\%$ std. K = $\pm 10\%$ Not available for non-inductive types.	Examples: R5000 = 50Ω 1R000 = 1Ω 250R0 = 250Ω 1K000 = 1000Ω 25K00 = 25,000Ω 25K50 = 25,500Ω

For special mechanical or electrical requirements, your inquiry will be given prompt attention.

OHMITE® series 56 beryllia-core acrasil®

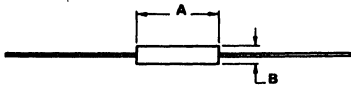
CONFORMAL SILICONE AXIAL LEAD WIREWOUND RESISTORS



SERIES 56 BERYLLIA-CORE ACRASIL®

Watt	Type	Resist. Range	Body Dimensions		Leads (1.5"/38.1 mm) Ga.
		Min.-Max.	Max. L. A ("mm)	Max. Dia. B ("mm)	
1	561	.5-3K	.281/7.1	.098/2.5	24
2	562	.5-10K	.437/11.1	.124/3.1	24
5	565	.1-25K	.624/15.8	.218/5.5	20
6	566	.1-45K	.687/17.4	.281/7.1	18
7	567	1.0-75K	.937/23.8	.343/8.7	18
10	560	1.0-125K	1.280/32.5	.343/8.7	18
15	560P	1.5-250K	1.843/46.8	.406/10.3	18

®ACRASIL is a registered trade name of Ohmite Mfg. Co.



- Beryllium Oxide Core Provides Optimum Heat Dissipation
- Precision Tolerance — 1% Standard
- Small Size
- Exceeds MIL-R-26 Requirements for Mil Applications
- All Welded Construction
- Ideal for Machine Insertion
- High Reliability

High thermal conductivity beryllia cores permit greater heat dissipation in smallest practical package. In addition, silicone coating provides excellent moisture resistance (exceeds MIL-R-26E), high dielectric strength, and protection against effects of shock, vibration, fungus and salt spray. External markings are resistant to most commonly used commercial solvents.

Series 56 Beryllia-Core ACRASIL resistors are recommended for printed circuit board assemblies, terminal-to-terminal, and point-to-point connections in all types of military and industrial equipment calling for a compact, high heat dissipating, precision power resistor.

Series 56 resistors can be supplied reel-taped for machine insertion, if desired. Type 561 (1 W) is ideal for use in cordwood modules, also.

MECHANICAL

Terminal Strength: Meets MIL-R-26 requirements. Dimensions: See table at left.

ELECTRICAL

Tolerance: $\pm 1\%$ std.; $\pm 0.05\%$ to $\pm 5\%$ available. Temperature Coefficient: $>0.1\Omega$ to 1Ω — 0 ± 90 ppm/ $^{\circ}\text{C}$ — 1Ω and greater — 0 ± 20 ppm/ $^{\circ}\text{C}$ (Type 561).

Dielectric Withstanding Voltage: 1 KV (500 V — sizes under 5 W).

Overload, Short Time: 10X rated wattage for 5 sec. (5 W and larger); 5X rated wattage for 3 sec. (under 5 W).

Wattage: Up to 15 W in 7 types: 1, 2, 5, 6, 7, 10 and 15 watts.

Inductance: Varies with number of turns and wire size. Std. units have single layer winding. Non-inductive (Aryton-Perry) windings available.

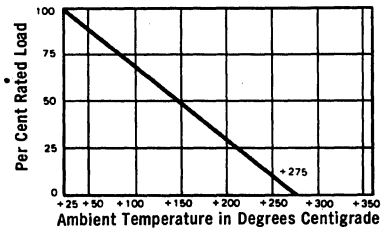
MATERIALS

Core: Beryllia ceramic (high heat conduction).

Resistance Element: High grade resistance alloy wire, single layer winding. Leads and resistance elements welded to metal end caps. Coating: ACRASIL® conformal silicone resin. Leads: Solder coated.

DERATING

Wattage rating is based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



ORDERING DATA

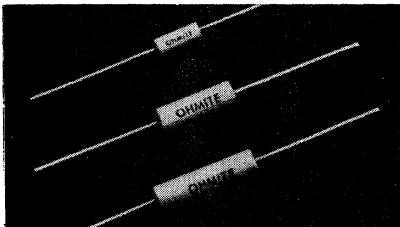
To specify resistors, see below: Typical No.

56	1	S	R5000	J
OHMITE SERIES NO. Identifies basic resistor construction.	MISCELLANEOUS SPECIFICATIONS S=Standard winding. N=Non-inductive winding. P=Standard winding with actual wattage rating more than indicated. T=Non-inductive winding with actual wattage rating more than indicated.	RESISTANCE VALUE Value is identified by 4 digits and a letter. Resistance is expressed in ohms with the letter "R" signifying a decimal point. "M" is used in all resistance values lower than 1000Ω. Letter "K" indicates multiples of 1000Ω. Examples: R5000=500 1R000=100 2500=2500 10K00=10000 25K00=25,000 25K50=25,500	TOLERANCE A = $\pm 0.05\%$ B = $\pm 0.1\%$ W = $\pm 0.25\%$ C = $\pm 0.5\%$ D = $\pm 1\%$ F = $\pm 1\%$ std. G = $\pm 2\%$ H = $\pm 3\%$ J = $\pm 5\%$ K = $\pm 10\%$ Not available for non-inductive types.	

For special mechanical or electrical requirements, your inquiry will be given prompt attention.

OHMITE® series 88 riteohm

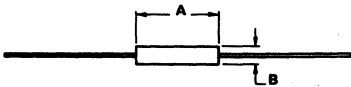
MOLDED SILICONE CERAMIC AXIAL LEAD WIREWOUND RESISTORS



SERIES 88 RITEOHM®

Watt	Type	Resist. Range	Body Dimensions		Leads (1.5"/38.1 mm) Ga.	Heat Sink Clip No.
		Min.-Max.	Max. L. A ("mm)	Max. Dia. B ("mm)		
1	884-1A	.1-10K	.437/11.1	.125/3.2	24	5900
2	884-2	.1-10K	.395/10	.208/5.3	20	5902
3	884-3	.1-34K	.562/14.3	.250/6.4	20	5904
5	884-5	.1-124K	.937/23.8	.343/8.7	18	5905
7	884-7	.1-178K	1.238/31.4	.343/8.7	18	5907
10	884-10	.1-301K	1.843/46.8	.363/9.2	18	5909

®RITEOHM is a registered trade name of Ohmite Mfg. Co.



- Molded Construction — Designed for High Stability, Precision Power Applications
- Low Temperature Coefficient
- 1% Tolerance Standard
- All Molded Construction for Uniform Sizes
- Excellent Breakdown Voltage Rating
- All Welded Construction
- Ideal for Machine Insertion

Series 88 precision power resistors provide high stability, load life ΔR of 0.5% with low T.C. and are recommended for high performance and reliability. All molded construction provides uniformity of sizes and even heat dissipation. Tolerance is 1% standard for 1, 2, 3, 5, 7 and 10 watt types. Clip mounting is possible for up to 100% increase in wattage. Typical T.C. is 0 ± 20 ppm/ $^{\circ}\text{C}$.

MECHANICAL

Terminal Strength: Meets MIL-R-26 requirements. Dimensions: See table at left.

ELECTRICAL

Tolerance: $\pm 1\%$ std.; $\pm 0.05\%$ to $\pm 10\%$ available. Temperature Coefficient: 0 ± 20 ppm/ $^{\circ}\text{C}$ for 10Ω and above.

Dielectric Withstanding Voltage: 1 KV (500 V for 1 W types).

Overload, Short Time: 10X rated wattage for 5 sec. (5 W size and larger); 5X rated wattage (under 5 W).

Wattage: Up to 10 watts; see table. Rating may be increased by using metal mounting clips. See Ohmite Catalog No. 100.

Inductance: Varies with number of turns and wire size. Std. units have single layer winding. Non-inductive (Aryton-Perry) windings available.

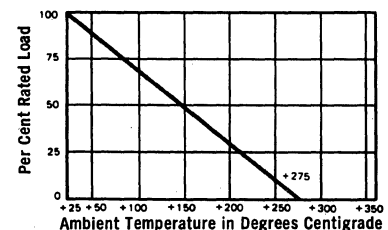
MATERIALS

Core: Ceramic, resistant to thermal shock and wide variations in temperature.

Resistance Element: High grade resistance alloy wire, single layer winding. Leads and resistance element welded to metal end caps. Coating: Molded OHMICONE® — tough, resilient, moisture-resistant, high dielectric silicone ceramic. Leads: Solder coated.

DERATING

Wattage rating is based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.



ORDERING DATA

For other than stock values specify style, resistance and tolerance.

For example: 884-1A, 500 ohms, 1% tolerance specifies a 1 watt, 500 ohm molded silicone ceramic resistor with a resistance tolerance of 1%.

Popular values are available from Ohmite stock or from your local authorized Ohmite stock distributor. Refer to Ohmite Catalog No. 300.

For special mechanical or electrical requirements, your inquiry will be given prompt attention.

OHMITE® series 89 metal-mite™ resistors

FEATURES

- Molded construction
- Screw type mounting on housing
- Chassis design utilizes heat-sink effect
- Conventional power ratings produce high stability
- Housing surface allows for easy identification
- 5 through 50 watt models with standard or non-inductive winding

OHMITE Type	MIL-R-18546 Type	Power Rating* Watts		Resistance Ranges (Ohms) 1% Tolerance	Standard Temperature Coefficient Value Ranges (Ohms)		
		OHMITE**	MIL		±90 ppm	±50 ppm	±20 ppm
8905S	RE60G	7.5(5)	5	.1-24.9K	.1-.99	1-9.99	10-24.9K
8910S	RE65G	12.5(10)	10	.1-49.9K	.1-.99	1-9.99	10-49.9K
8925S	RE70G	25	20	.1-100K	.1-.99	1-9.99	10-100K
8950S	RE75G	50	30	.1-301K	.1-.99	1-9.99	10-301K

*Rating is based on chassis mounting area and stability proper heat sink.

4 x 6 x 2 x .040 aluminum chassis for 5 and 10 watt units

5 x 7 x 2 x .040 aluminum chassis for 25 watt units

12 x 12 x .059 aluminum panel for 50 watt units

**Types 8905 and 8910 will be stamped with wattages shown in parentheses but will be stamped with higher ratings upon customer request.

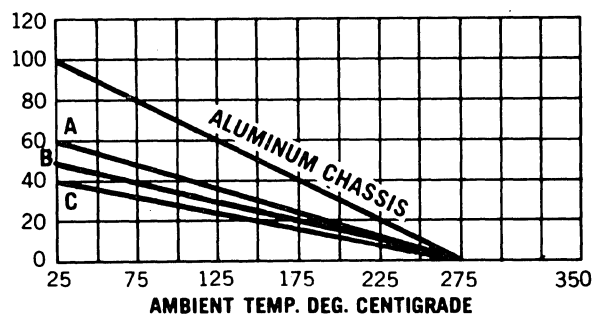
DERATING

Series 89 resistors have an operating temperature range of -55°C to 275°C. Derating is required for reduced chassis mounting area and high ambient temperatures. The following curves apply to operation of unmounted resistors:

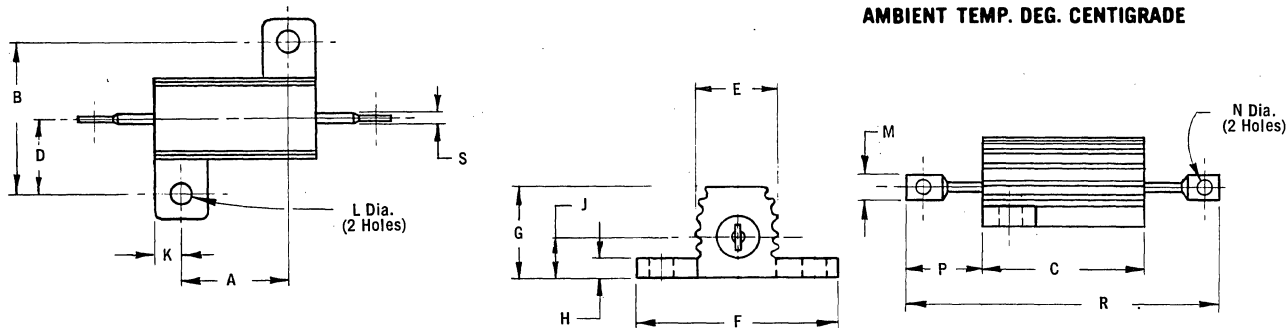
A = 5 and 10 watt units

B = 25 watt units

C = 50 watt units



DIMENSIONS



OHMITE MIL	Watts†	A ±.005	B ±.005	C ±.031	D ±.0025	E ±.015	F ±.015	G ±.015	H ±.010	J ±.015	K ±.010	L ±.005	M Min.	N ±.005	P ±.062	R ±.062	S Min. AWG
8950 RE75	50 30	1.563	.844	1.968	.422	.630	1.140	.610	.088	.260	.196	.125	.140	.086	.438	2.781	12
8925 RE70	25 20	.719	.781	1.062	.391	.550	1.080	.546	.088	.231	.172	.125	.140	.086	.438	1.938	12
8910 RE65	12.5(10) 10	.562	.625	.750	.312	.420	.800	.390	.075	.165 .183	.093	.093	.140	.086	.312	1.375	12
8905 RE60	7.5(5) 5	.444	.490	.600	.245	.334	.646	.320	.065	.133 .156	.078	.093	.085	.050	.266	1.125	16

†Types 8905 and 8910 stamped with wattage shown in parenthesis.

OHMITE® type 200 *brown devil*® fixed resistors



SERIES 200

BROWN DEVIL® (Type 200) resistors, are vitreous enameled, wirewound units long famous for ruggedness and durability in small power resistors. With the emphasis towards miniaturization and the current industry trend towards higher operating temperatures, Ohmite has been able to increase the ratings on two Brown Devil sizes. The 5 watt size is now rated 8 watts and the 10 watt size is now rated 12 watts. The 20 watt unit retains the same rating. The higher ratings may be confidently applied to any 5 or 10 watt unit now in the possession of users or distributors. At this time also, to meet the demand for lower wattage units, Ohmite introduces two, new, small stock sizes — 3 and 5¼ watts.

Standard resistance tolerance is $\pm 5\%$ for values 1 ohm or higher; $\pm 10\%$ for values below 1 ohm. Tinned leads 1½" long: 3 and 5¼ watt, 20 AWG; 8, 12 and 20 watt, 18 AWG.

DIMENSIONS & WEIGHTS

Rating	3W	5¼W	8W	12W	20W
Core Dimen.	¾x.21D	¾x1¼D	1x¾D	1¾x¾D	2x¾D
Weight (lbs.)	.003	.005	.01	.015	.03

Ohms	3 WATT Cat. No.¹ Amps.	5¼ WATT Cat. No.¹ Amps.	8 WATT Cat. No.¹ Amps.	12 WATT Cat. No.¹ Amps.	20 WATT Cat. No.¹ Amps.	Ohms	3 WATT Cat. No.¹ Amps.	5¼ WATT Cat. No.¹ Amps.	8 WATT Cat. No.¹ Amps.	12 WATT Cat. No.¹ Amps.	20 WATT Cat. No.¹ Amps.
0.5	2712 1.73	2822 2.29	1500 2.83	1700A 4.90	1800A 6.32	500	2777 .077	2887 .10	1526 .12	1730 .15	1815 .20
1.0	(2713) 1.65	(2823) 2.19		1701 3.46	1802A 4.47	510					
1.1	(2714) 1.58	(2824) 2.09				560	2778 .073	2888 .097			
1.2	(2715) 1.52	(2825) 2.01				600			1527 .11	1731 .14	
1.3	(2716) 1.41	(2826) 1.87	1500B 2.30	1704 2.82		620	(2779) .070	2889 .092			
1.5	(2717) 1.37	(2827) 1.81				650					1816 .18
1.6	(2718) 1.29	(2828) 1.71				680	2780 .067	2890 .088			
1.8						700			1528 .11	1732 .13	1817 .17
2.0	2719 1.22	2829 1.62	1501 2.00	1705 2.45	1802B 3.16	750	2781 .063	2891 .084	1529 .10	1733 .12	1818 .16
2.2	(2720) 1.17	(2830) 1.54				800			1530 .10	1734 .12	1819 .15
2.4	(2721) 1.12	2831 1.48				820	2782 .060	2892 .080			
2.7	2722 1.05	2832 1.39				900			1531 .094	1735 .11	1820A .15
3.0	2723 1.00	2833 1.32	1502 1.63	1706 2.00	1802C 2.58	910	2783 .057	2893 .076			
3.3	2724 .95	2834 1.24				1000	2784 .055	2894 .072	1532 .089	1736 .11	1821 .14
3.6	2725 .91	2835 1.21				1100	(2785) .052	2895 .069	1533 .085	(1737) .10	
3.9	(2726) .88	2836 1.16				1200	2786 .050	2896 .066	1534 .081	1738 .10	1822 .13
4.0						1250			1535 .080	1739 .097	1823 .12
4.3	2727 .83	2837 1.10	1503 1.41	1707 1.73	1802D 2.24	1300	(2787) .048	2897 .063			
4.7	(2728) .80	2838 1.06				1500	2788 .045	2898 .059	1536 .073	1740 .089	1824 .12
5.0			1504 1.26	1708 1.54	1803 2.00	1600	(2789) .043	(2899) .057			
5.1	2729 .77	2839 1.01				1750			1537 .067	1741 .082	1825 .11
5.6	(2730) .73	2840 .97				1800	(2790) .042	2900 .050			
6.2	2731 .69	2841 .92				2000	2791 .039	2901 .047	1538 .063	1742 .077	1827 .10
6.8	(2732) .66	(2842) .88				2200	2792 .037	2902 .045			
7.5	2733 .63	2843 .84	1505 1.00	1709 1.26		2250			1539 .059	1743 .073	1828 .094
8.2	2734 .60	2844 .80				2400	(2793) .035	2903 .043			
9.1	(2735) .57	(2845) .76				2500			1540 .056	1744 .069	1830 .089
10	2736 .55	2846 .72	1506 .89	1710 1.09	1804 1.41	2700	2794 .033	2904 .041			
11	(2737) .52	(2847) .69				2750					1831 .085
12	(2738) .50	2848 .66	1507 .81	1711 1.00		3000	2795 .032	2905 .039	1541 .046	1745 .063	1832 .081
13	(2739) .48	(2849) .64				3300	2796 .030	2906 .037			
15	2740 .45	2850 .59	1508 .73	1712 .89		3500			1542 .043	1746 .058	1833 .075
16	(2741) .43	2851 .57				3600	(2797) .029	2907 .035			
18	2742 .42	(2852) .54				3900	2798 .028	2908 .034			
20	2743 .39	2853 .51	1509 .63	1713 .77		4000			1543 .040	1747 .054	1834 .070
22	2744 .37	2854 .49				4300	(2799) .026	(2909) .032			
24	2745 .35	2855 .47				4500			1544 .038	1748 .051	1835 .066
25			1510 .56	1714 .69	1805 .89	4700	2800 .025	2910 .031			
27	(2746) .33	2856 .44				5000			1545 .036	1749 .049	1836 .063
30	2747 .32	2857 .42	1511 .51	1715 .63		5100	(2801) .024	2911 .030			
33	(2748) .30	2858 .40				5600	(2802) .023	2912 .028			
35			1512 .47	1716 .58		6000			1546 .033	1750 .044	1837 .057
36	(2749) .29	2859 .38				6200	(2803) .022	2913 .027			
39	2750 .28	2860 .37				6800	(2804) .021	2914 .026			
40			1513 .44	1717 .54		7000			1547 .030	1751 .041	1838 .053
43	(2751) .26	2861 .35				7500	(2805) .020	2915 .025	1548 .029	1752 .036	1839 .051
47	2752 .25	2862 .33				8000			1549 .029	1753 .035	1840 .050
50			1514 .40	1718 .49	1806 .63	8200	2806 .019	2916 .023			
51	2753 .24	2863 .32				8500				(1754) .034	
56	2754 .23	2864 .31				9000			1550 .027	1754A .033	(1840A) .047
62	2755 .22	2865 .29				9100	(2807) .018	(2917) .022			
68	2756 .21	2866 .28				10K	2808 .016	2918 .021	1551 .026	1755 .032	1841 .043
75	2757 .20	2867 .27	1515 .32	1719 .40	1807 .52	11K		(2919) .020		(1756) .030	
82	(2758) .19	2868 .25				12K		2920 .019		1757 .029	
91	(2759) .18	2869 .24				12.5K			1552 .023	1758 .028	1842 .032
100	2760 .17	2870 .23	1516 .28	1720 .34	1808 .45	13K		2921 .019			
110	(2761) .16	2871 .22				13.5K				1759 .027	
120	2762 .16	2872 .21				15K		2922 .017	1553 .021	1761 .026	1843 .029
125			1517 .25	1721 .31		16K		2923 .017		1762 .025	
130	(2763) .15	(2873) .20				17.5K			1554 .019	1763 .024	
150	2764 .14	2874 .19	1518 .23	1722 .28	1809 .36	18K				1764 .024	
160	(2765) .14	2875 .18				20K		2924 .016		1765 .022	1844 .026
180	2766 .13	2876 .17				22.5K		2925 .014	1555 .018	1766 .021	
200	2767 .12	2877 .16	1519 .20	1723 .24	1810 .32	25K			1556 .017	1767 .020	1845 .023
220	2768 .12	2878 .16				30K				1768 .018	1846 .021
225			1520 .18	1724 .23		35K				1769 .017	1847 .019
240						40K				1770 .016	1848 .018
250	2769 .11	2879 .15	1521 .17	1725 .22	1811 .28	45K				1771 .015	(1849) .017
270	2770 .11	2880 .14				50K				1772 .014	1850 .016
300	2771 .10	2881 .13	1522 .16	1726 .20	1812 .26	55K					(1851) .015
330	2772 .095	2882 .12				60K					1852 .015
350			1523 .15	1727 .18	1813 .24	65K					1853 .014
360	2773 .091	2883 .12				70K					(1854) .014
390	(2774) .088	2884 .12				75K					(1855) .013
400						80K					(1856) .013
430	(2775) .083	2885 .11	1524 .14	1728 .17	1814 .22	85K					(1857) .012
450						90K					(1858) .012
470	2776 .080	2886 .11	1525 .13	1729 .16		95K					(1859) .012
						100K					1860 .011

¹ Popular items appear in BOLD print and are usually in stock at authorized Ohmite stocking distributors. Items in LIGHT FACE print are available from stocking distributors but are not normally stocked in depth. Parentheses indicate non-stock standard items subject to a minimum handling charge per item.

OHMITE MFG. CO., a North AMERICAN PHILIPS company / 3601 W. Howard St., Skokie, Illinois 60076 / (312) 675-2600 / TWX 910-223-0805 / TELEX 72-4433

OHMITE® type 270 vitreous enameled fixed resistors



SERIES 270

These lug type resistors are wire-wound on high quality ceramic cores, protected and insulated by Ohmite vitreous enamel — the time-proved standard covering that is the best conductor of heat for a material which must also be a good electrical insulator.

Resistance tolerance is $\pm 5\%$ for values 1 ohm or higher; $\pm 10\%$ below 1 ohm.

Wattage ratings are for use in free air. When resistors are mounted in

closed spaces or where the circulation of air is restricted, they should not be used at more than one-half rating. Currents and voltages for reduced ratings can be obtained by multiplying full rating by the following factors: 75% load = .86, 66% = .81, 50% = .71, 33% = .57, 25% = .50.

Mounting brackets are automatically supplied in individual unit packs; supplied only when specified in bulk pack orders. See page ??, "Mounting Brackets for Tubular Resistors" to specify other brackets.

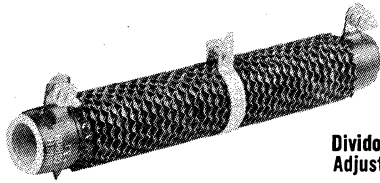
12 WATT			25 WATT			50 WATT		100 WATT		175 WATT		225 WATT	
Free air rating to 5600 Ohms Core: $1\frac{3}{4}'' \times \frac{3}{8}''$ Mtg. Ctr: $2\frac{3}{4}''$ —Av. Wt. .02 lb. Std. Mtg. Brkt.: Cat. No. 5			Free air rating to 12,000 Ohms Core: $2'' \times \frac{1}{2}''$ Mtg. Ctr: $2\frac{3}{4}''$ — Av. Wt. .05 lb. Std. Mtg. Brkt.: No. 9			Free air rating to 25,000 Ohms Core: $4'' \times \frac{1}{2}''$ Mtg. Ctr: $4\frac{3}{4}''$ — Av. Wt. .09 lb. Std. Mtg. Brkt.: No. 9		Free air rating to 60,000 Ohms Core: $6\frac{1}{2}'' \times \frac{3}{4}''$ Mtg. Ctr: $7\frac{3}{8}''$ — Av. Wt. .20 lb. Std. Mtg. Brkt.: No. 12		Free air rating for All Values Core: $8\frac{1}{2}'' \times 1\frac{1}{8}''$ Mtg. Ctr: $9\frac{3}{8}''$ — Av. Wt. .50 lb. Std. Mtg. Brkt.: No. 18		Free air rating for All Values Core: $10\frac{1}{2}'' \times 1\frac{1}{8}''$ Mtg. Ctr: $11\frac{3}{8}''$ — Av. Wt. .62 lb. Std. Mtg. Brkt.: No. 18	
Ohms Resist.	Catalog No. ¹	Max. Amps.	Ohms Resist.	Catalog No. ¹	Max. Amps.	Catalog No. ¹	Max. Amps.	Catalog No. ¹	Max. Amps.	Catalog No. ¹	Max. Amps.	Catalog No. ¹	Max. Amps.
.51	3723	4.86	1	0200J	5.00	0400J	7.07	0600C	10.00	0700C	13.2	0900C	15.00
1.0	3730	3.46	2	0200K	3.54	0400K	5.00	0600D	7.07	0700D	9.35	0900D	10.60
1.5	3734	2.83	3	0200L	2.88	0400L	4.07	0600E	5.77	0700E	7.63	0900E	8.67
2.2	3738	2.34	4	0200N	2.50	0400N	3.53	0600F	5.00	0700F	6.6	0900F	7.50
3.3	3742	1.91	5	0200A	2.24	0400A	3.16	0600A	4.47	0700A	5.92	0900A	6.72
4.7	3746	1.60	10	0200B	1.58	0400B	2.23	0600B	3.16	0700B	4.18	0900B	4.74
6.8	3750	1.33	15	0200R	1.29								
10	3754	1.10	25	0200C	1.00	0400C	1.41	0601	2.00	0701	2.64	0901	3.00
12	3756	1.00	50	0200D	.71	0400D	1.00	0602	1.41	0702	1.87	0902	2.12
15	3758	.89	75	0200E	.58	0400E	.82	0603	1.15	0703	1.52	0903	1.73
18	3760	.82	100	0200F	.50	0400F	.71	0604	1.00	0704	1.32	0904	1.50
22	3762	.74	125					0604B	.90	0704B	1.18		
27	3764	.67	150	0200G	.41	0400G	.58	0605	.82	0705	1.08	0905	1.25
33	3766	.60	200	0200H	.35	0400H	.50						
39	3768	.55	250	0201	.32	0401	.45	0606	.63	0706	.84	0906	.95
47	3770	.53	500	0202	.22	0402	.32	0607	.45	0707	.59	0907	.67
56	3772	.46	750	0203	.18	0403	.26	0608	.37	0708	.48	0908	.55
68	3774	.42	800	0204	.17	0404	.25						
82	3776	.38	1,000	0205	.16	0405	.22	0609	.32	0709	.42	0909	.47
100	3778	.35	1,500	0206	.13	0406	.18	0610	.26	(0710)	.34	0910	.39
120	3780	.32	2,000	0207	.12	0407	.16	0611	.22	0711	.30	0911	.34
150	3782	.28	2,500	0208	.10	0408	.14	0612	.20	(0712)	.26	0912	.30
180	3784	.26	3,000	0209	.091	0409	.13	0613	.18	(0713)	.24	0913	.27
220	3786	.23	3,500	0210	.084								
270	3788	.21	4,000	0211	.079	0410	.11						
330	3790	.19	5,000	0212	.070	0411	.10	0614	.14	0714	.19	0914	.21
390	3792	.18	6,000	0213	.064								
470	3794	.16	7,500	0214	.057	0412	.081	0615	.12	(0715)	.15	0915	.17
560	3796	.15	8,000			0413	.079						
680	3798	.13	10,000	0215	.050	0414	.071	0616	.10	0716	.13	0916	.15
820	3880	.12	12,000	0216	.045	0415	.064						
1,000	3802	.11	15,000	0217	.036	0416	.057	0617	.081	(0717)	.11	0917	.13
1,200	3804	.10	20,000	0218	.031	0417	.050	0618	.071	0718	.094	0918	.11
1,500	3806	.089	25,000	0219	.028	0418	.045	0619	.063	0719	.083	0919	.095
1,800	3808	.082	30,000	0220	.026			0620	.058	(0720)	.076	0920	.087
2,200	3810	.074	35,000	(0221)	.024	0419	.032						
2,700	3812	.067	40,000	0222	.022			0621	.050	0721	.066	0921	.075
3,300	3814	.060	50,000	0224	.019	0420	.026	0622	.045	(0722)	.059	0922	.067
3,900	3816	.055	60,000	0225	.016			0623	.041	(0723)	.054	0923	.061
4,700	3818	.051	70,000	0226	.013								
5,600	3820	.046	75,000			0421	.021	0624	.032	(0724)	.048	0924	.055
6,800	3822	.038	80,000	0227	.012								
8,200	3824	.035	100,000	0229	.0094	0422	.018	0625	.028	0725	.042	0925	.047
10,000	3826	.032	125,000			0423	.017						
12,000	3828	.029	150,000			0424	.015						
15,000	3830	.026	175,000			(0425)	.014						
18,000	(3832)	.024	200,000			0426	.012						
22,000	3834	.021	250,000			0428	.010						
27,000	3836	.019											
33,000	(3838)	.017											
39,000	(3840)	.016											
47,000	(3842)	.015											
51,000	3843	.014											

¹ Popular items appear in BOLD print and are usually in stock at authorized Ohmite stocking distributors. Items in LIGHT FACE print are available from stocking distributors but are not normally stocked in depth. Parentheses indicate non-stock standard items subject to a minimum handling charge per item.

OHMITE MFG. CO., a North AMERICAN PHILIPS company / 3601 W. Howard St., Skokie, Illinois 60076 / (312) 675-2600 / TWX 910-223-0805 / TELEX 72-4433

RESISTORS, FIXED

OHMITE® corrib® HIGH CURRENT LOW OHMS resistors



SERIES 280 & 230

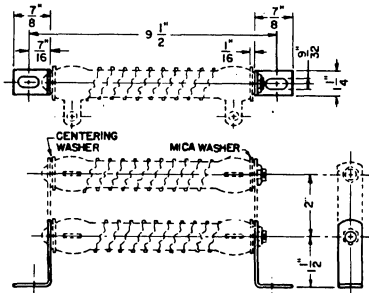
Dividohm®
Adjustable

Ohms	Amps.	Fixed Catalog No.	Dividohm*1 Catalog No.
.10	54.7	2501	2601
.12	50.0	2502	(2602)
.16	43.3	2503	2603
.20	38.7	2504	2604
.25	34.6	2505	2605
.31	31.1	2506	2606
.40	27.4	2507	2607
.50	24.5	2508	2608
.63	21.8	2509	2609
.80	19.3	2510	2610
1.0	17.3	2511	2611
1.2	15.8	2512	(2612)
1.6	13.7	2513	2613
2.0	12.2	2514	2614
2.5	10.9	2515	2615
3.1	9.8	2516	2616
4.0	8.6	2517	2617
5.0	7.7	2518	2618
6.3	6.9	2519	2619
8.0	6.1	2520	2620
10.0	5.5	2521	2621
12.0	5.0	2522	2622
16.0	4.3	2523	2623
20.0	3.8	2524	2624

THRU-BOLT MOUNTING BRACKETS FOR CORRIBS

Includes 2 brackets; bolt; centering, mica, and lock washers; nuts. Diagram below.

No. of Resistors	Catalog No.
1	6126P8 1/2
2	6127P8 1/2
3	6128P8 1/2
4	6129P8 1/2



High current, low resistance, heavy duty units used in motor starting, dynamic braking, etc. "Corrib" type units employ a corrugated ribbon of resistance alloy. This is space-wound edge-wise around a ceramic tube. Vitreous enamel is fused around the alloy ribbon to lock the turns securely in place. Heavy lug terminals. Resistance tolerance is $\pm 10\%$.

Available in fixed or Dividohm® adjustable types. Dividohm® type is similar to fixed and includes one adjustable lug. Rating of Fixed or Dividohm® stock units—300 watts—reduce unit load for stack-mounted resistors; core size (bare) 8 1/2" long x 1 1/8" diameter. Other sizes made to order.

EXTRA ADJUSTABLE LUGS FOR CORRIBS

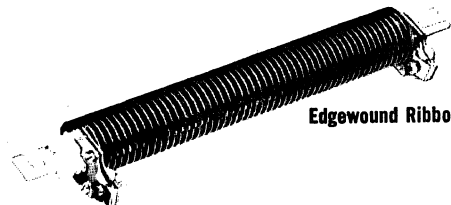
For Dividohm	Lug Catalog No.
2601-2606	1974-B
2610; 2619	
2607-2609	1974-A
2611-2618	
2620-2624	

*Adjustable Lug Stk. No. 1974 supplied with Dividohm.

powr-rib® HIGH CURRENT LOW OHMS resistors

Even higher power handling capability—approximately 700 to 1000 watts—is available in stock, "Powr-Rib" resistors. These are UNCOATED types and are wound either edgewise with ribbon ("Edgewound" type) or with round wire (Round-Wire type).

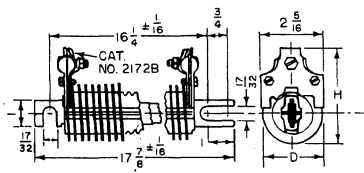
The core of these units consists of ceramic segments on a metal bar which is slotted on both ends for rapid installation. Standard resistance tolerance is $\pm 10\%$. Terminals clamp onto the resistor wire and may be moved in from the ends for intermediate resistance values. Extra terminals available for use as taps. See diagrams for terminals. Terminal Stk. No. 2172G (not shown) has screw connections.



Edgewound Ribbon Type

STYLE 080-5 EDGEWOUND POWR-RIBS

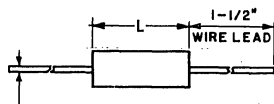
Ohms*	H $\pm 1/8$	D $\pm 1/8$ - 0
.10-.22	3 3/8	2 3/8
.25-1.00	3 1/8	1 7/8
1.30-1.60	2 3/4	1 7/8
2.2, 2.8, 4.5, 5.4	2 1/2	1 3/4
3.5, 6.8, 8.5	2 1/8	1 5/8



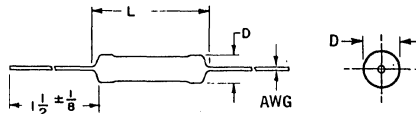
Avg. Weight .18Ω or less, 4 lbs.; .22Ω and up, 2 lbs.

Catalog No.¹	Ohms	Max. Amps.	Catalog No.¹	Ohms	Max. Amps.
2301	.10	100	2318	.67	41
2302	.12	91	2319	.75	39
2303A	.14	89	2312	1.00	33
2304A	.16	78	2319	1.30	29
2305A	.18	75	2313	1.60	26
2306A	.22	68	2331A	2.20	18.4
2306	.25	63	2332A	2.80	16.3
2308A	.30	57	2333A	3.50	14.6
2308	.33	54	2334A	4.50	12.7
2309A	.37	50	2335A	5.40	11.8
2310	.50	47	2336A	6.80	10.3
2317	.60	43	2337A	8.50	9.4

OHMITE® wirewound resistors / axial lead and pc series



AWG Series 88 & 99



Series 22, 44, 56 & 57

OHMITE WIRE WOUND AXIAL LEAD RESISTORS

All of Ohmite's axial lead resistors feature a high quality resistance wire, single layer wound on a cylindrical ceramic core, and welded to metallic end caps. The leads are solder coated, weldable wire 1½" long. Specific

mechanical and electrical parameters are listed in appropriate descriptions and tables for the individual Series below.

AXIAL LEAD WIREWOUND RESISTOR SPECIFYING GUIDE

W A T T S	VITREOUS ENAMEL					W A T T S	FLAMEPROOF CERAMIC					W A T T S	FLAMEPROOF CERAMIC						
	Molded		Conformal				Conformal		Conformal				Conformal		Conformal				
	SERIES 99		SERIES 22				SERIES 22		SERIES 57 CERON®				SERIES 57 CERON®		SERIES 57 CERON®				
	5% Tolerance (1%-10% Available) T.C. ±30 ppm/°C Typical		5% Tolerance (1%-10% Available) T.C. ±30 ppm/°C Typical				5% Tolerance (1%-10% Available) T.C. ±30 ppm/°C Typical		5% Tolerance (1%-10% Available) T.C. ±30 ppm/°C Typical				5% Tolerance (1%-10% Available) T.C. ±30 ppm/°C Typical		5% Tolerance (1%-10% Available) T.C. ±30 ppm/°C Typical				
		Maximum						Maximum						Maximum					
Type	Res. Range	Length (mm)	Dia. (mm)	Leads 1.5" / 38.1 mm Ga.		Type	Res. Range	Length (mm)	Dia. (mm)	Leads 1.5" / 38.1 mm Ga.		Type	Res. Range	Length (mm)	Dia. (mm)	Leads 1.5" / 38.1 mm Ga.			
1.5	995-1A	.1-6.65K	.437/11.1	.140/3.6	24	1	221	.1-2.5K	.406/10.3	.156/4	22	1	571	1.0-3K	.406/10.3	.156/4	22		
2.25	995-2A	.1-6.49K	.390/9.9	.219/5.6	20	2	222	.1-3.9K	.406/10.3	.219/5.6	20	2	572	1.0-4K	.406/10.3	.219/5.6	20		
3.25	995-3A	.1-22.1K	.562/14.3	.234/5.9	20	3	223	.1-10K	.562/14.3	.250/6.4	20	3	573	1.0-12K	.562/14.3	.234/5.9	20		
5	995-5B	.1-53.6K	.953/24.2	.234/5.9	20	5	225	.1-30K	1.000/25.4	.250/6.4	20	5	575	1.0-30K	1.000/25.4	.234/5.9	20		
6.5	995-5A	.1-80.6K	.937/23.8	.343/8.7	20	6	226	.1-35K	1.031/26.2	.343/8.7	20	6							
9	995-7A	.1-118K	1.233/31.3	.343/8.7	20	7	227	.1-40K	1.250/31.8	.343/8.7	20	7	577	1.0-50K	1.094/27.8	.343/8.7	20		
11	995-10A	.1-187K	1.796/45.6	.343/8.7	20	10						10	570	1.0-60K	1.813/46.1	.343/8.7	20		
						11	220P	.5-60K	1.938/49.2	.343/8.7		11							
						15						15							

W A T T S	SILICONE CERAMIC					W A T T S	SILICONE CERAMIC					W A T T S	SILICONE CERAMIC					
	Conformal		Conformal				Conformal		Conformal				Molded		Molded			
	SERIES 44 OHMICONE®		SERIES 56 BERYLLIA-CORE ACRASIL®				SERIES 56 BERYLLIA-CORE ACRASIL®											



**PRECISION POWER WIRE
WOUND RESISTORS AND
HEAT SINK RESISTORS**

Accuracy, quality, inventiveness, economy and ship-date guarantee are keystones in the dozen years Omtronics Manufacturing, Inc. has supplied the manufacturing community. If you see what you require in the following pages, you can count on its availability when we say, either from our Stock Resistor shelves or manufactured for your needs. If you need something special in heat sinks or experimental resistors, let us put our engineers to work for you. Our facilities are as close as your phone.

OMI**CROSS
REFERENCE****CHART**

This is a cross reference between OMI resistors and those of other manufacturers. Exact inter-changeability is not implied as some minor differences may exist. See applicable catalog bulletins for detailed information. The Mil-type designation is shown as a reference only and is not meant to imply qualification approval.

OMI	MIL TYPE	DALE	SAGE	CAL-R	TEPRO	IRC	PRC
T-½A		RS¼	250S	SA01			
T-½		RS½	500S	SA04	TS½S	AS½	05A
T-1A	RW-70	RS1A	1000S	SA15	TS1A	AS1	15A
T-1B		RS1B	750S	SA17	TS1B		20A
T-1C			100S	SA05			
T-2A	RW-79	RS2B	1240S	SA31	TS2B	AS2B	1A
T-2B		RS2A	1250S	SA32	TS2A	AS2A	25A
T-2C	RW-69	RS2C	1230S	SA30	TS2C	AS2	2A
T-3		RS2	1300S	SA35	T52W T53W	AS3	3A
T-5	RW-74	RS5	1500S	SA50	TS5W	AS5	5A
T-6	RW-67		1550S	SA55	TS5C	AS5	7A
T-7		RS7	1600S	SA70	TS7W	AS7	
T-7A	RW-55		1900S	SA95	TS5M	AS40	
T-10	RW-68	RS10	1700S	SA100	TS10W	AS10	10A
T-15							
T-10A	RW-56		1950S	SA125	TS10C	ASC15	
F-1	RW-81	G1	250SB				
F-2		G2	500SB				
F-3	RW-80	G3	100SB				
F-5		G5	1240SB				
F-5A		G5A	1250SB				
F-5C		G5C	1230SB				
F-6		G6	1300SB				
F-10		G10	1500SB				
F-12		G12	1600SB				
F-15		G15	1700SB				
HT-5	RE-60	RH5	3105M	MC80	TM5W		
HT-10	RE-65	RH10	3010M	MC100	TM10W		10CH
HT-25	RE-70	RH25	3225M	MC250	TM25W		25CH
HT-50	RE-75	RH50	3550M	MC500	TM50W		50CH
HT-75							
HT-100	RE-77	RH100					
HT-250							
HF-5		HG5	3105MB				
HF-10		HG10	3010MB				
HF-25		HG25	3225MB				
HF-50		HG50	3550MB				

OMTRONICS MANUFACTURING, INC. • 2406 LEAVENWORTH STREET, OMAHA, NEBRASKA 68105 • (402) 348-9500

NO COMPARABLE
RESISTORS STYLES
FROM SAGE, CAL-R,
TEPRO, OR PRC.

OMI	DALE	IRC
CA-2	CP-2	PW-2
CA-3	CP-3	PW-3
CA-5	CP-5	PW-5
CA-7	CP-7	PW-7
CA-10	CP-10	PW-10
BW-2A	CW-2B	
BW-2C	CW-2C	
BW-3	CW-2	
BW-5	CW-5	
BW-7	CW-7	
BW-10	CW-10	

TOTAL
RANGEOMI
FIXED RESISTORS

T

17 Basic sizes of silicone coated precision resistors from $\frac{1}{2}$ to 10 watts, .05 to 275K ohms.



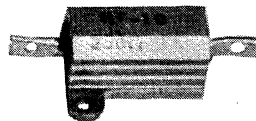
HT

Anodized, aluminum housed precision wire wound resistors for chassis mount. Four sizes, 5-50 watts, .1 to 250K ohms.



HF

Identical models to HT Series but offering increased power ratings through use of beryllium oxide cores.



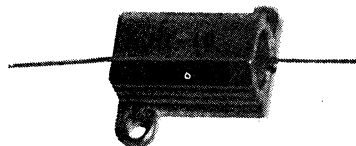
TR

Identical to T Series models in ratings and specifications but are furnished with radial leads. Also available in NR Series, non-inductively wound.



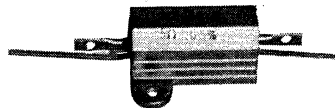
HN

A similar series to HT Series with electrical and physical equivalents but with non-inductive windings.



HFN

Identical to the HF Series above but non-inductively wound.



N

All series of OMI resistors are available in the non-inductive winding form. N or FM converts your order from T and F.



FN

Conversion letters for non-inductive windings of the F Series.



F

10 basic sizes at ratings from 1-15 watts offer greatly increased power ratings over conventional sizes, 0.1 to 250K ohms.



BW

High performance at low cost resistors, specially applicable to industrial uses. 6 sizes, complete welded construction.

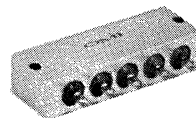


CA

5 sizes of resistors wound on fibre glass cord, potted in ceramic case. High thermal conductivity and moisture resistant.

SPECIAL
DESIGN

OMI offers engineering facilities to prepare and test for you heat sinks and special designs to meet particular needs.

STOCK
RESISTORS

A whole host of stock resistors from .020 to 200K ohms in our standard series to supply normal instant supply.

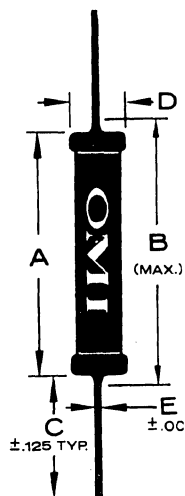


RESISTORS, FIXED

**T
SERIES**

OMI PRECISION POWER RESISTORS AXIAL LEADS

Highly reliable, silicone coated, precision resistors manufactured to meet MIL-R-26 specifications. There are 17 basic sizes with power ratings from 1/2 to 10 watts and resistance ranges from .05 ohms to 275K ohms. Resistance tolerances from .05% to 5% (1%, standard). Temperature coefficient of resistance 2PPM up (20PPM, standard).



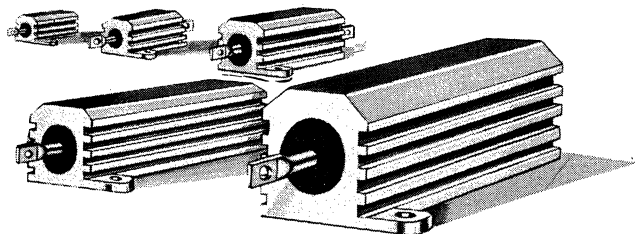
* Max. working voltage determined at .0008 wire.

OMI TYPE	MIL TYPE	OMI WATTAGE RATING		RESISTANCE RANGE		MAX. WORKING VOLTAGE*		Max. Weight Grams	PHYSICAL DIMENSIONS				
		U 275° C	V 350° C	Min.	Max.	U	V		A	B	C	D	E
T-1/2A	—	.4	—	.5	3.4K	18	—	.21	.210 ±.015	.265	1.500	.078 ±.015	.020
T-1/2	—	.75	—	.5	7.5K	31	—	.30	.330 ±.015	.390	1.500	.078 ±.015	.020
T-1A-20	RW-70 U	1.0	—	.1	10K	50	55	.36	.406 ±.031	.437	1.500	.093 ±.031	.020
T-1A	—	1.0	1.25	.1	10K	50	55	.36	.406 ±.031	.437	1.500	.093 ±.031	.020
T-1B	—	1.1	1.30	.1	12K	62	67	.40	.530 ±.015	.590	1.500	.093 ±.031	.020
T-1C	—	1.0	—	.1	5K	28	33	.33	.265 ±.015	.335	1.500	.093 ±.031	.020
T-2	—	1.5	—	.1	10K	72	79	.95	.343 ±.015	.410	1.500	.187 ±.031	.032
T-2A	—	3.0	3.75	.1	22K	135	148	.70	.560 ±.062	.622	1.500	.187 ±.031	.032
T-2A-20	RW-79 U	3.0	—	.1	22K	135	148	.70	.560 ±.062	.622	1.500	.187 ±.031	.032
T-2B	—	3.0	—	.1	40K	170	200	.92	.812 ±.062	.890	1.500	.188 ±.031	.032
T-2C	—	2.5	3.00	.05	32K	138	157	1.5	.500 ±.062	.593	2.000	.218 ±.032	.040
T-2C-20	RW-69 V	2.5	3.00	.05	32K	138	157	1.5	.500 ±.062	.593	2.000	.218 ±.032	.040
T-3	—	4.0	5.50	.05	40K	210	250	2.3	.625 ±.062	.765	2.000	.250 ±.032	.040
T-5	—	5.0	6.00	.05	90K	300	365	4.3	.875 ±.062	.937	2.000	.312 ±.031	.040
T-5-20	RW-74 U	5.0	—	.05	90K	300	365	4.3	.875 ±.062	.937	2.000	.312 ±.031	.040
T-6	—	6.0	6.50	.05	95K	330	376	4.8	1.000 ±.094	1.094	2.000	.312 ±.031	.040
T-6-20	RW-67 V	6.0	6.5	.05	95K	330	376	4.8	1.000 ±.094	1.094	2.000	.312 ±.031	.040
T-7	—	7.0	8.00	.05	100K	350	390	5.2	1.185 ±.062	1.247	2.000	.312 ±.031	.040
T-7A	—	7.0	9.00	.05	150K	504	576	7.0	1.375 ±.094	1.469	2.000	.469 ±.094	.040
T-7A-20	RW-55 V	7.0	9.00	.05	150K	504	576	7.0	1.375 ±.094	1.469	2.000	.469 ±.094	.040
T-10	—	10.0	11.00	.05	250K	788	898	9.0	1.780 ±.062	1.842	2.000	.375 ±.031	.040
T-10-20	RW-78 U	10.0	—	.05	250K	788	898	9.0	1.780 ±.062	1.842	2.000	.375 ±.031	.040
T-10B-20	RW-68 V	10.0	11.00	.05	250K	788	898	9.0	1.875 ±.063 — .125	1.875	2.000	.344 ±.094	.040
T-10A	—	10.5	14.00	.05	275K	799	911	10.0	1.925 ±.062	2.094	2.000	.375 ±.062	.040
T-10A-20	RW-56 V	10.5	14.00	.05	275K	799	911	10.0	2.000 ±.094	2.094	2.000	.469 ±.094	.040
T-15	—	15	18	.1	275K	1000	1000	11.5	2.125 ±.094	2.200	2.000	.469 ±.094	.040

RESISTORS, FIXED

HT
HF

OMI ALUMINUM HOUSED RESISTORS STANDARD & EXTENDED POWER RATINGS



HT Models are anodized, aluminum-housed, precision wire-wound resistors, designed to chassis mount for maximum heat dissipation. They are manufactured to meet or exceed MIL-R-18546 specifications. Four sizes: 5 to 50 watts (mounted), resistance ranges from .1 ohm to 250K, depending on size. Tolerances —1% standard —.05% to 5% available. Temperature coefficient from 2PPM up. (20PPM, standard.)

HF Models are identical in dimensions, resistance ranges, tolerance and temperature coefficients with those of the HT Series, but offer a great increase in their power ratings as similar size through the use of beryllium oxide cores for increased heat dissipation. These are manufactured to exceed MIL-R-18546 power ratings.

STANDARD ELECTRICAL SPECIFICATIONS

OMI Type	MIL Type	Power Rating (Watts)*	Resistance Range		Max. Working Voltage	Max. Weight Grams				
			HF (OMI)	HT						
HF-5	HT-5	RE-60	15	5	5	.1	22K	220	160	3
HF-10	HT-10	RE-65	20	10	10	.1	47K	340	265	7
HF-25	HT-25	RE-70	35	25	20	.1	90K	650	550	14
HF-50	HT-50	RE-75	50	50	30	.1	250K	1400	1250	29
	HT-75			75		.1	75K		1500	120

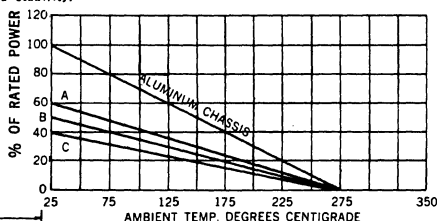
*Rating is based on chassis mounting area and stability.

Chassis Dimensions:

HT-5, HF-5, HT-10 and HF-10 — 6x4x2x.04", Aluminum Chassis.

HT-25, HF-25, HT-50 and HF-50 — 7x5x2x.04", Aluminum Chassis.

HT-75 — 12"x12"x.062, Aluminum Panel.



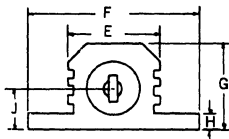
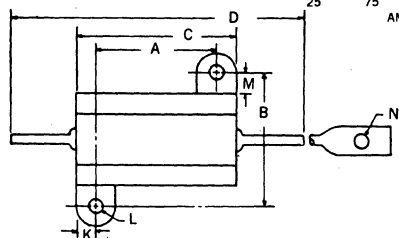
DERATING

OMI, HT and HF resistors have an operating temperature range of —55°C to +275°C. Derating is required for reduced chassis mounting area and for high ambient temperatures. The graph curves shown apply to operation of unmounted resistors. Free air rating.

A = HT-5, HT-10

B = HT-25

C = HT-50, all HF Series and HT-75



DIMENSIONAL SPECIFICATIONS — HOUSED TYPE

TYPE	A	B	C	D	E	F	G	H	J	K	L	M	N
HF-5 HT-5	.444 ±.005	.490 ±.005	.600 ±.031	1.125 ±.062	.334 ±.015	.646 ±.015	.320 ±.015	.065 ±.010	.140 ±.010	.078 ±.010	.093 ±.005	.078 ±.015	.050 ±.005
HF-10 HT-10	.562 ±.005	.625 ±.005	.750 ±.031	1.375 ±.062	.430 ±.015	.800 ±.015	.400 ±.015	.075 ±.010	.190 ±.010	.093 ±.010	.093 ±.005	.102 ±.015	.086 ±.005
HF-25 HT-25	.719 ±.005	.781 ±.005	1.062 ±.031	1.938 ±.062	.530 ±.015	1.080 ±.015	.560 ±.015	.085 ±.010	.260 ±.010	.172 ±.010	.125 ±.005	.115 ±.015	.086 ±.005
HF-50 HT-50	1.563 ±.005	.844 ±.005	1.968 ±.031	2.781 ±.062	.615 ±.015	1.140 ±.015	.615 ±.015	.085 ±.010	.300 ±.010	.196 ±.010	.125 ±.005	.107 ±.015	.086 ±.005
HT-75	2.125 ±.010	1.500 ±.010	2.500 ±.031	3.750 ±.093	1.125 ±.031	1.875 ±.031	1.125 ±.031	.125 ±.015	.625 ±.015	.187 ±.015	.172 ±.005	.187 ±.015	.095 ±.005

OMTRONICS MANUFACTURING, INC. • 2406 LEAVENWORTH STREET, OMAHA, NEBRASKA 68105 • (402) 348-9500

HN
HFN

OMI ALUMINUM HOUSED RESISTORS NON-INDUCTIVELY WOUND

HN and HFN Models with equivalent electrical and physical specifications to the HT and HF Series are also available with non-inductive windings. To order HT, non-inductively wound, specify "HN." To order HF, non-inductively wound, specify "HFN" instead of the basic HT and HF models. **NOTE:** The following conditions apply to non-inductive types as compared to HT or HF:

1. Maximum resistance values must be divided by 2.
2. Maximum working voltage must be multiplied by .707.
3. Maximum weights may slightly exceed those shown above.

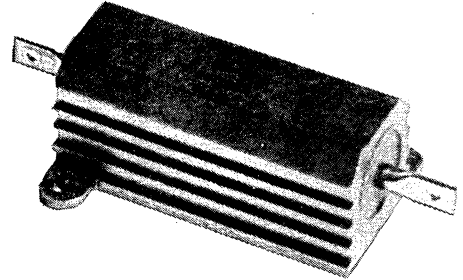
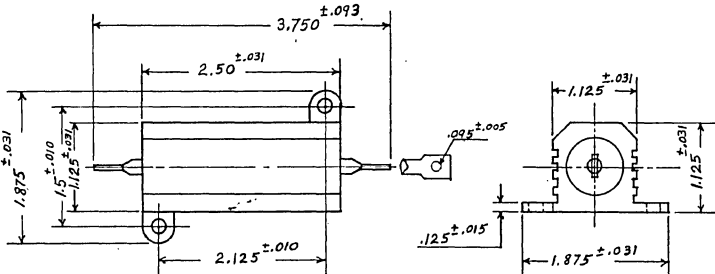
RESISTORS, FIXED

HT

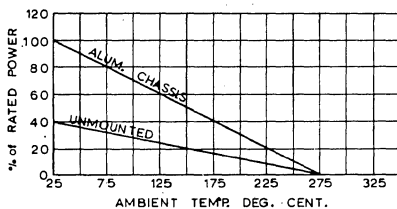
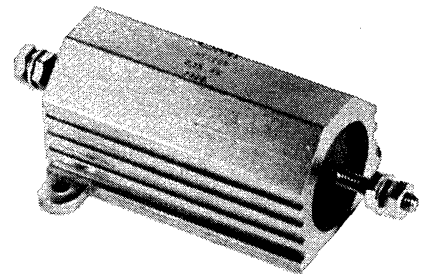
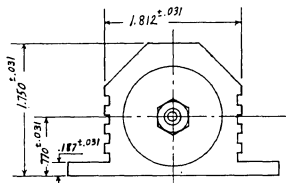
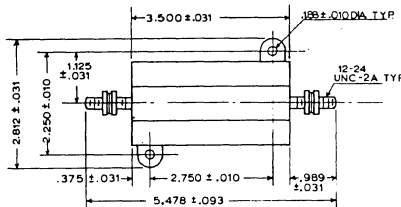
OMI

ALUMINUM HOUSED RESISTORS

HT-75 (75 WATTS)



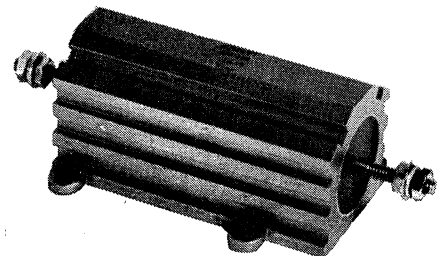
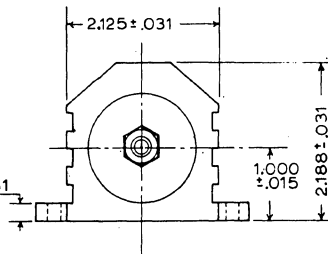
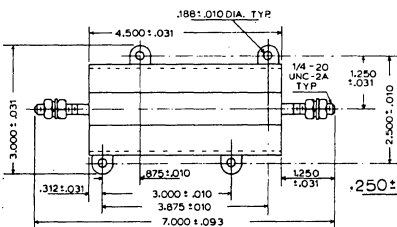
HT-100 (100 WATTS)



STANDARD ELECTRICAL SPECIFICATIONS							
OMI Type	MIL Type	Power Rating (Watts)*		Resistance Range		Max. Working Voltage	Max. Weight Grams
		(OMI) HT	MIL	Min.	Max.	HT	
HT-75		75		.1	75K	1500	120
HT-100	RE-77	100	75	.1	50K	1900	400
HT-250	RE-80	250	120	.1	75K	2500	800

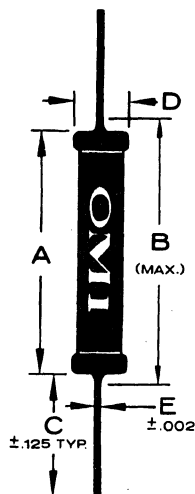
Chassis Dimensions: 12" x 12" x .125 Aluminum Panel

HT-250 (250 WATTS)



**F
SERIES****OMI**
SILICONE COATED RESISTORS
AXIAL LEADS; BERYLIUM OXIDE CORE

The OMI F Series resistors—at ratings from 1 to 15 watts—offer greatly increased power ratings over conventional resistors of equivalent size. All resistors in the F Series are manufactured in accordance with MIL Specs. and are available in ten basic physical sizes with resistance ranges from 0.1 ohm to 250K ohms. Resistance tolerances from 0.05% to 5% (1%, standard) and temperature coefficient of resistance from 2PPM up (20PPM, standard).

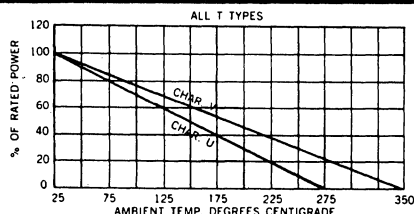


OMI TYPE	MIL TYPE	OMI WATTAGE RATING		RESISTANCE RANGE		MAX. WORKING VOLTAGE*		Max. Weight Grams	PHYSICAL DIMENSIONS				
		U	V	Min.	Max.	Min.	Max.		A	B	C	D	E
F-1	RW-81U	1.0 W	1.5 W	1 to 3.4K	29	35	.21	.21	.250 ±.031	.265	1.500	.078 ±.015	.020
F-2	—	1.5 W	2.0 W	1 to 7.5K	42	48	.21	.21	.312 ±.015	.327	1.500	.078 ±.015	.020
F-3	RW-80U	2.25W	2.75W	.1 to 10K	74	81	.36	.36	.406 ±.031	.437	1.500	.093 ±.032	.020
F-5	—	4.0 W	5 W	.1 to 22K	153	170	.80	.80	.562 ±.062	.640	1.500	.188 ±.032	.032
F-5A	—	4.5 W	6.5 W	.1 to 40K	214	257	.96	.96	.812 ±.062	.890	1.500	.188 ±.032	.032
F-5C	—	5 W	7 W	.1 to 32K	194	230	1.5	1.5	.500 ±.062	.593	2.000	.218 ±.032	.040
F-6	—	6 W	8 W	.1 to 40K	258	298	2.3	2.3	.625 ±.062	.765	2.000	.250 ±.032	.040
F-10	—	7 W	10 W	.1 to 90K	390	467	4.3	4.3	.875 ±.062	1.000	2.000	.312 ±.032	.040
F-12	—	10 W	12 W	.1 to 100K	607	665	5.2	5.2	1.218 ±.062	1.281	2.000	.312 ±.032	.040
F-15	—	15 W	18 W	.1 to 250K	979	1072	9.0	9.0	1.780 ±.062	1.875	2.000	.375 ±.032	.040

* Maximum working voltage determined at .0008 dia. wire.

SPECIAL FEATURES

All features of the conventional precision power resistors, plus the beryllium oxide core for optimum heat dissipation, allow reduction of physical size of resistor while maintaining equivalent power ratings of conventional types.

**DERATING**

Applicable to both F and T Series
Both OMI, T and F Series resistors have an operating temperature range of -55°C to 275°C (characteristic U) or to 350°C (characteristic V). Derating is required for high ambient temperatures in accordance with the curve shown at left.

OMTRONICS MANUFACTURING, INC. • 2406 LEAVENWORTH STREET, OMAHA, NEBRASKA 68105 • (402) 348-9500

**N
FN****OMI**
NON-INDUCTIVE TYPE RESISTORS
AXIAL OR RADIAL LEAD AVAILABLE

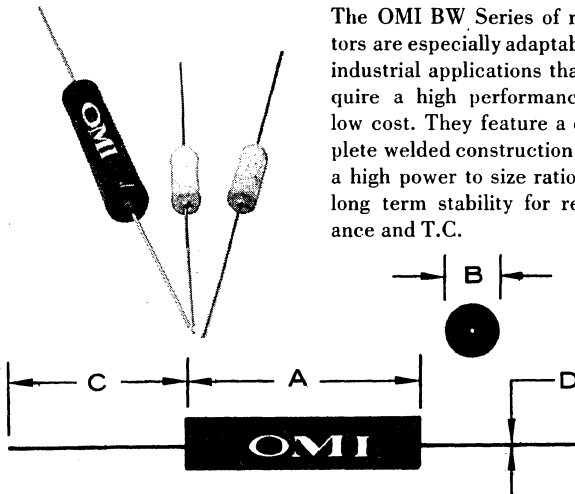
OMI Models of equivalent physical and electrical specifications are available with non-inductive windings. They are identified by the letter "N"; to order non-inductively wound T Series, specify "N"; to order non-inductively wound F Series, specify "FN."

NOTE: The following conditions apply to specifications applicable to the non-inductively wound types, as compared to the basic T or F types.

1. Maximum resistance must be divided by 2.
2. Maximum working voltage must be multiplied by .707.
3. Maximum weights may slightly exceed those shown for the basic T or F types.

**FR
SERIES****OMI**
MINIATURE POWER RESISTORS
WITH RADIAL LEADS

As in the OMI, TR Series, models of equivalent electrical, mechanical, power rating and derating specifications are available in FR3, FR5, FR5A, FR5C, FR6, FR10, FR12, and FR15 dimensions. These models are also available non-inductively wound and identified as the FNR Series.

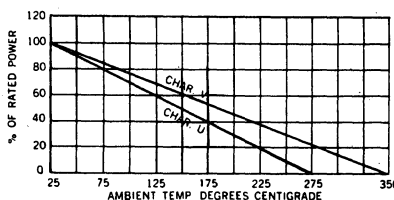
**BW
SERIES****OMI****COMMERCIAL RESISTORS**
AXIAL LEAD POWER WIREWOUND RESISTORS

The OMI BW Series of resistors are especially adaptable to industrial applications that require a high performance at low cost. They feature a complete welded construction with a high power to size ratio and long term stability for resistance and T.C.

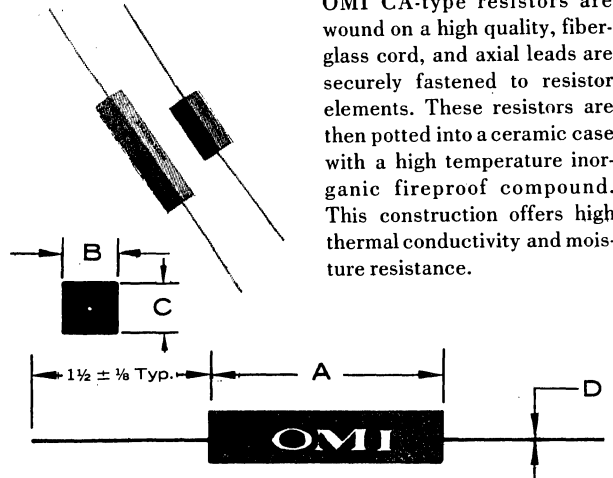
OMI TYPE	BW-2A	BW-2C	BW-3	BW-5	BW-7	BW-10
Power Rating						
275°C	3.0	2.5	4.0	5.0	7.0	10.0
300°C	3.75	3.00	5.50	6.00	8.00	11.00
Resistance Range Available	.1 to 7K	.1 to 10K	.1 to 15K	.1 to 25K	.1 to 50K	.1 to 100K
Max. Weight (Grams)	.7	1.6	2.4	4.4	5.2	9.3
Dimensions in Inches						
A ± .062	.560	.500	.625	.875	1.185	1.780
B ± .032	.187	.218	.250	.312	.312	.375
C ± .125	1.500	2.000	2.000	2.000	2.000	2.000
D ± .001	.032	.040	.040	.040	.040	.040

Tolerance: Standard $\pm 5\%$ 1 ohm and over, 10% below 1 ohm.
T.C. of Resistance ± 50 PPM/°C
Lead Material: Tinned Copperweld Standard

Ordering Information: When ordering, specify OMI Type, Resistance Value and Resistance Tolerance.

OMTRONICS MANUFACTURING, INC. • 2406 LEAVENWORTH**DERATING**

These resistors have an operating temperature range of -55°C to 275°C (characteristic U) or to 350°C (characteristic V). Derating is required for high ambient temperatures in accordance with the curve shown at left.

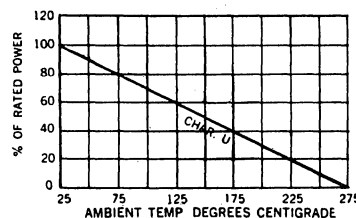
**CA
SERIES****OMI****INDUSTRIAL RESISTORS**
AXIAL LEAD POWER WIREWOUND RESISTORS

OMI CA-type resistors are wound on a high quality, fiber-glass cord, and axial leads are securely fastened to resistor elements. These resistors are then potted into a ceramic case with a high temperature inorganic fireproof compound. This construction offers high thermal conductivity and moisture resistance.

OMI Type	CA-2	CA-3	CA-5	CA-7	CA-10
Wattage Rating at 25°C	2	3	5	7	10
Resistance Range Available	.2 to 2K	.2 to 7K	.2 to 8K	.5 to 15K	.5 to 25K
Dimensions in Inches					
A ± 1/32	11/16	7/8	7/8	1 25/64	1 7/8
B ± 1/32	1/4	5/16	3/8	3/8	3/8
C ± 1/32	1/4	5/16	11/32	11/32	11/32
D ± .001	.032	.036	.036	.036	.036

Tolerance: $\pm 10\%$ Standard; $\pm 5\%$ available above 10 ohms
Operating Temperature: -55°C to 275°C
Temperature Coefficient of Resistance:
 Below 1 ohm 0 ± 400 PPM
 Above 1 ohm 0 ± 200 PPM
Terminal Strength: 5 lbs. minimum

Ordering Information:
 When ordering, specify OMI Type, Resistance Value and Resistance Tolerance.

OMAHA, NEBRASKA 68105**(402) 348-9500****DERATING**

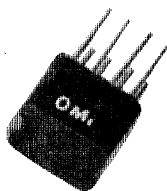
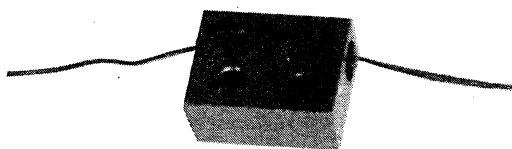
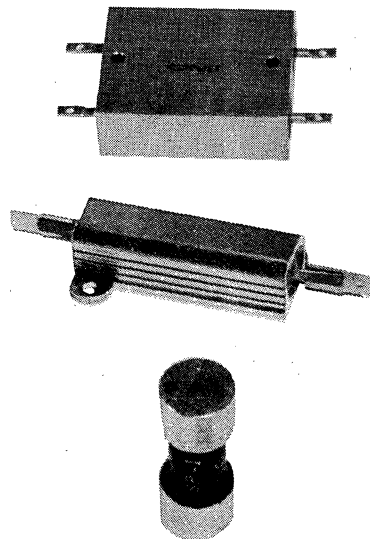
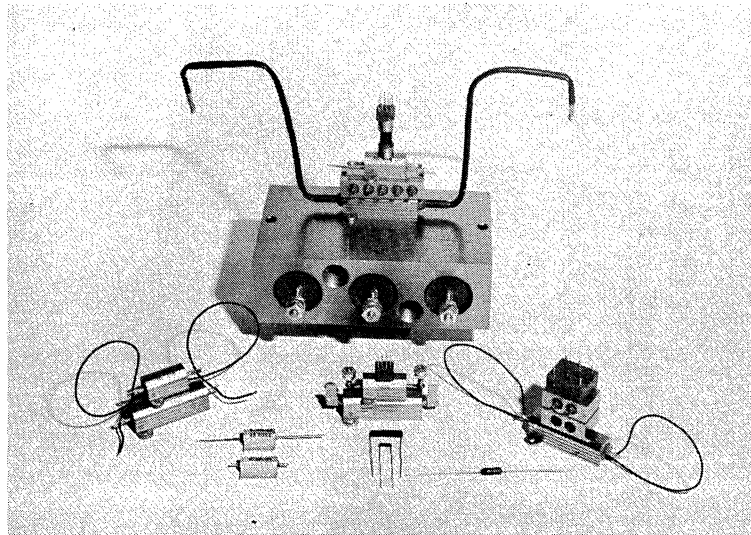
These resistors have an operating temperature range of -55°C to 275°C . Derating is required for high ambient temperatures in accordance with the curve shown at left.

RESISTORS, FIXED

**SPECIAL
DESIGN**

OMI

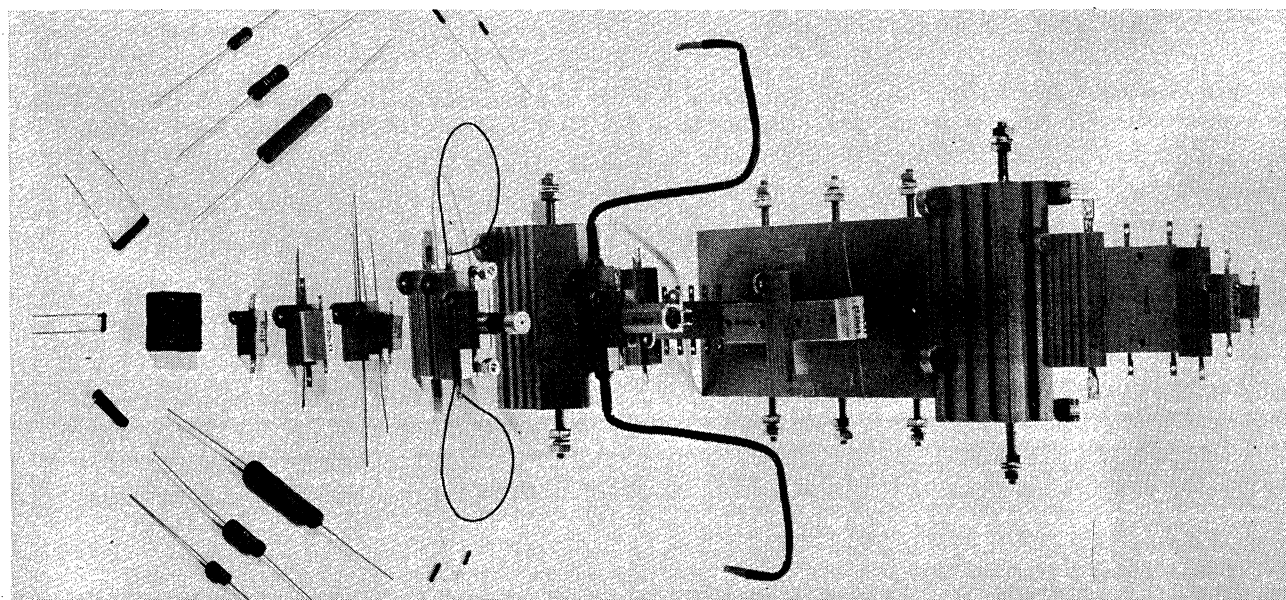
HEAT SINK RESISTORS



OMI cannot show examples of our capabilities in the field of creative heat sink development, because those are limited only by your need and our imagination. We *have* shown a few examples of special design work manufactured for specific client requirements. Our tooling and engineering experience, coupled with our production facilities allows us to invite discussion about your own peculiar requirements.

Give us your parameters and let us go to work. High power capabilities? 4-Wire low value resistors? Special combination of characteristics? High temperature or high pressure demands?

You state the form, the size, the physical forces at work and we'll apply our advanced state of the art to your product.



OMTRONICS MANUFACTURING, INC. • 2406 LEAVENWORTH STREET, OMAHA, NEBRASKA 68105 • (402) 348-9500

**STOCK
RESISTORS**

OMI

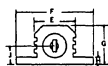
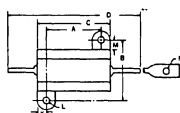
"OFF-THE-SHELF" RESISTORS

Our Stock Resistor program is designed to supply your needs within basic ranges in the most rapid manner possible. When ordering, please indicate fastest shipping method to your point of use. If the resistor specifications you need are not listed here, we invite your inquiry. We may be able to meet your deadline and your requirements outside of our Stock line.

OMI TYPE	PHYSICAL DIMENSIONS — T SERIES				
	A	B	C	D	E
T-1/2	.330±.015	.390	1.500	.078±.015	.020
T-1A	.406±.031	.437	1.500	.093±.031	.020
T-2A	.560±.062	.622	1.500	.187±.031	.032
T-2C	.500±.062	.593	2.000	.218±.032	.040
T-5	.875±.062	.937	2.000	.312±.031	.040
T-10	1.780±.062	1.842	2.000	.375±.031	.040



DIMENSIONAL SPECIFICATIONS — HOUSED TYPE													
Type	A	B	C	D	E	F	G	H	J	K	L	M	N
HT-5	.444 ±.005	.490 ±.005	.600 ±.031	1.125 ±.062	.334 ±.015	.646 ±.015	.320 ±.015	.065 ±.010	.140 ±.010	.078 ±.010	.093 ±.005	.078 ±.015	.050 ±.005
HT-10	.562 ±.005	.625 ±.005	.750 ±.031	1.375 ±.062	.430 ±.015	.800 ±.015	.400 ±.015	.075 ±.010	.190 ±.010	.093 ±.010	.093 ±.005	.102 ±.015	.086 ±.005
HT-25	.719 ±.005	.781 ±.005	1.062 ±.031	1.938 ±.062	.530 ±.015	1.080 ±.015	.560 ±.015	.085 ±.010	.260 ±.010	.172 ±.010	.125 ±.005	.115 ±.015	.086 ±.005
HT-50	1.563 ±.005	.844 ±.005	1.968 ±.031	2.781 ±.062	.615 ±.015	1.140 ±.015	.615 ±.015	.085 ±.010	.300 ±.010	.196 ±.010	.125 ±.005	.107 ±.015	.086 ±.005



SERIES HT POWER RESISTORS

HT-5

5 Watt

.1 ohms to 10K



HT-10

10 Watt

.05 ohms to 12K



HT-25

25 Watt

.02 ohms to 20K



HT-50

50 Watt

.02 ohms to 50K



STANDARD STOCK RESISTANCE VALUES (IN OHMS)

.020	.35	1.1	6.0	30	95	360	750	3600	27.5K
.025	.36	1.2	6.2	33	100	370	800	4000	30K
.033	.39	1.3	6.5	35	110	375	820	4200	33K
.040	.40	1.5	6.8	36	120	390	850	4500	35K
.047	.43	1.6	7.0	39	125	400	900	4700	40K
.068	.45	1.8	7.5	40	130	411	910	5000	47K
.03	.47	2.0	8.0	43	150	425	950	6000	50K
.04	.50	2.2	8.2	45	160	430	1000	6200	56K
.05	.51	2.4	8.5	47	175	450	1200	6800	60K
.08	.55	2.5	9.0	50	180	470	1250	7000	62K
.10	.56	2.7	9.1	51	190	480	1300	7500	75K
.11	.60	3.0	9.5	55	200	500	1400	8000	100K
.12	.62	3.3	10	56	220	510	1500	8200	200K
.13	.65	3.5	11	60	225	540	1600	9000	
.15	.68	3.6	12	62	240	550	1750	10K	
.16	.70	3.9	13	65	250	560	1800	12K	
.18	.75	4.0	15	68	260	580	2000	12.5K	
.20	.80	4.3	16	70	270	590	2200	13K	
.22	.82	4.5	18	75	280	600	2400	14K	
.24	.85	4.7	20	80	300	620	2500	15K	
.25	.90	5.0	22	82	320	650	2700	18K	
.27	.91	5.1	24	85	330	680	3000	20K	
.30	.95	5.5	25	90	340	700	3300	22.5K	
.33	1.0	5.6	27	91	350	710	3500	25K	

SERIES T POWER RESISTORS

T-1/2

1/2 Watt

1 ohm to 5K



T-1A

1 Watt

.5 ohms to 8K



T-2A

2 Watt

.1 ohms to 20K



T-2C

3 Watt

.1 ohms to 25K



T-10

10 Watt

.02 ohms to 200K



T-5

5 Watt

.02 ohms to 60K



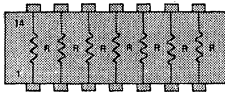
14 PIN

- 7 Resistors — 14 pin
- 13 Resistors — 14 pin
- Packaging is compatible with automatic insertion equipment
- Reduces space and reduces costs

PD 14 — A 14 Pin-7 Resistors

Applications

- Power Gate Pull-up
- Line Terminations
- LED Current Limiting
- ECL Output Pull-down
- Impedance Balancing

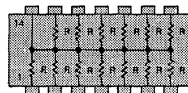


Schematic A

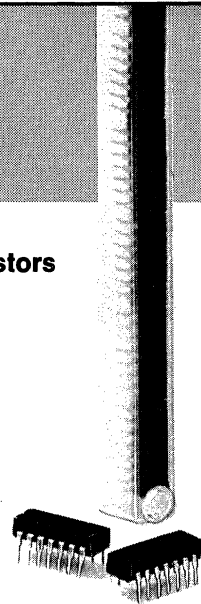
PD 14 — B 14 Pin-13 Resistors

Applications

- TTL Input Pull-down
- Open Collector Pull-up
- MOS/Rom Pull-up/Pull-down
- Power Driver Pull-up
- "Wired OR" Pull-up



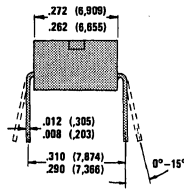
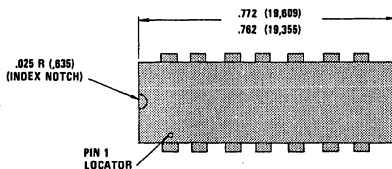
Schematic B



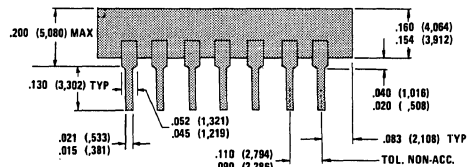
PD 16 — A and PD 16 — B Standard Resistance Values

22	47	100	220	470	1.0K	2.2K	4.7K	9.1K	20K
24	51	110	240	510	1.1K	2.4K	5.1K	10K	22K
27	56	120	270	560	1.2K	2.7K	5.6K	11K	33K
30	62	130	300	620	1.3K	3.0K	6.0K	12K	47K
33	68	150	330	680	1.5K	3.3K	6.2K	13K	68K
36	75	160	360	750	1.6K	3.6K	6.8K	15K	100K
39	82	180	390	820	1.8K	3.9K	7.5K	16K	
43	91	200	430	910	2.0K	4.3K	8.2K	18K	

Standard Tolerance $\pm 2\%$ ($< 100\Omega \pm 5\Omega$)



Max. Inches () Max. mm
Min. Inches () Min. mm



PRODUCT SPECIFICATIONS

Resistance Range 10 ohms to 1 meg ohm
Tolerance Letter designation for ordering
Standard 2% G
Special 5% J
Special 1% F
Special .5% D
Max. number of resistors per Dip available 24
Power Rating 1.5W Total per DIP at 70°C
Max. power per resistor .125W for standard circuits
Temperature Coefficient Track Typical 50 PPM/°C
Special 25 PPM/°C

Temperature Coefficient
of resistance Letter designation for ordering
Standard — $0 \pm 300\text{PPM}/^\circ\text{C}$ M
Special — $0 \pm 200\text{PPM}/^\circ\text{C}$ L
Special — $0 \pm 100\text{PPM}/^\circ\text{C}$ K
Tolerance Ratio Match As low as .5%
Voltage Ratings 100 V max. per resistor,
2000 V max. per DIP package for special circuits
Operating Temperature Range -55°C to $+125^\circ\text{C}$
Encapsulation epoxy transfer molded

ORDERING INFORMATION

Basic Model Number	Number of Pins	Temp. Coeff.	Resistance Value	Tolerance	Schematic
PD	14	M	220 Ω	G	A

Setting New Standards in Reliability
PYROFILM

60 S. Jefferson Road • Whippany, N. J. 07981
(201) 887-8100 • TWX: 710-986-8220

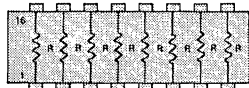
16 PIN

- 8 Resistor — 16 Pin
- 15 Resistor — 16 Pin
- Packaging is compatible with automatic insertion equipment
- Reduces space and reduces costs

PD 16 — A 16 Pin- 8 Resistors

Applications

- Power Gate Pull-up
- Line Terminations
- LED Current Limiting
- ECL Output Pull-down
- Impedance Balancing

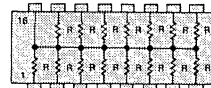


Schematic A

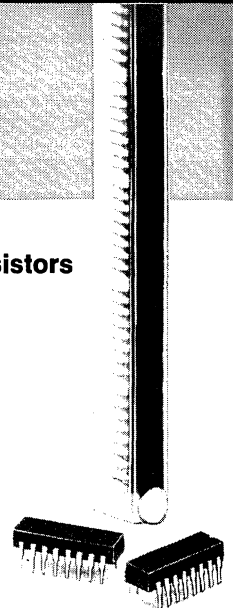
PD 16 — B 16 Pin-15 Resistors

Applications

- TTL Input Pull-down
- Open Collector Pull-up
- MOS/Rom Pull-up/Pull-down
- Power Driver Pull-up
- "Wired OR" Pull-up

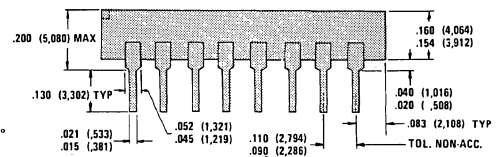
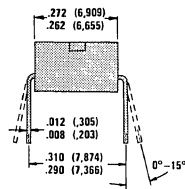
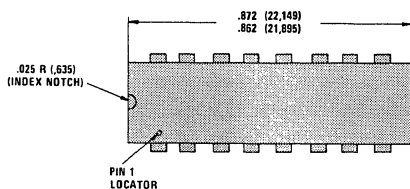


Schematic B



PD 14 — A and PD 14 — B Standard Resistance Values

62	220	1.5K	6.0K	33.0K
68	330	2.0K	6.8K	47.0K
100	470	2.2K	10.0K	68.0K
110	680	3.3K	15.0K	100.0K
150	1.0K	4.7K	22.0K	

Standard Tolerance $\pm 2\%$ ($< 100\Omega \pm .5\Omega$)

Max. Inches	() Max. mm
Min. Inches	() Min. mm

PRODUCT SPECIFICATIONS

Resistance Range 10 ohms to 1 meg ohm
 Tolerance Letter designation for ordering
 Standard 2% G
 Special 5% J
 Special 1% F
 Special .5% D
 Max. number of resistors per Dip available 28
 Power Rating 1.75W Total per DIP at 70°C
 Max. power per resistor .125W for standard circuits
 Temperature Coefficient Track Typical 50 PPM/°C
 Special 25 PPM/°C

Temperature Coefficient
 of resistance Letter designation for ordering
 Standard — $0 \pm 300\text{PPM}/^\circ\text{C}$ M
 Special — $0 \pm 200\text{PPM}/^\circ\text{C}$ L
 Special — $0 \pm 100\text{PPM}/^\circ\text{C}$ K
 Tolerance Ratio Match As low as .5%
 Voltage Ratings 100 V max. per resistor,
 2000 V max. per DIP package for special circuits
 Operating Temperature Range -55°C to $+125^\circ\text{C}$
 Encapsulation epoxy transfer molded

ORDERING INFORMATION

Basic Model Number	Number of Pins	Temp. Coeff.	Resistance Value	Tolerance	Schematic
PD	16	M	220 Ω	G	A

Setting New Standards in Reliability
PYROFILM

60 S. Jefferson Road • Whippany, N. J. 07981
 (201) 887-8100 • TWX: 710-986-8220

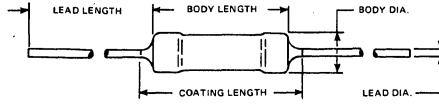
Setting New Standards in Reliability

PYROFILM

60 S. Jefferson Road • Whippany, N. J. 07981 • (201) 887-8100

- Metal Film Resistors ■ Thick & Thin Film Chips
- Microwave Rods, Discs, T-Pads ■ Flange Terminations
- Microwave Stud Mounted Resistors ■ Microwave Pill Shape Terminations ■ Custom Networks - Thick & Thin Film Resistors

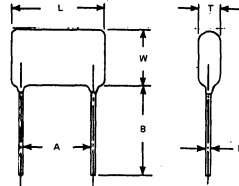
METAL FILM RESISTORS CONFORMAL COATED



PHYSICAL AND ELECTRICAL CHARACTERISTICS												MAXIMUM COATING LENGTH Inches	
PYRO-FILM	MIL-R-55182	RATING Watts		RESISTANCE RANGE		MAX. VOLTAGE**	BODY DIMENSIONS Inches		LEAD DIMENSIONS Inches				
		MIL	Com.	Min.	Max.		Diameter	Length	Dia.	Length	AWG	Standard	Special
PME45	—	—	1/20	25Ω	200K	200	.047 ± .010	0.125 ± .020	.010	1	#30	.160	—
PME50	RNC50*†	1/20	1/8	10Ω	1M	200	.060 ± .015 — .010	.150 ± .020	.016	1	#26	.200	.172
PME55	RNC55*†	1/10	1/8	10Ω	4M	250	.095 ± .015	.250 ± .031	.025	1½	#22	.360	.281
PME60	RNC60*†	1/8	1/4	49Ω	10M	300	.105 ± .015	.390 ± .031	.025	1½	#22	.475	.406
PME62	—	—	1/4	500Ω	20M	1,500	.105 ± .015	0.510 ± .031	.025	1½	#22	.600	.530
PME64	—	—	1/4	500Ω	30M	2,500	.105 ± .015	0.970 ± .031	.025	1½	#22	1.070	.985
PME65	RNC65*†	1/4	1/2	49Ω	20M	400	.156 ± .015	.580 ± .031	.025	1½	#22	.650	.600
PME70	RNC70*†	1/2	1	24Ω	40M	700	.230 ± .015	.730 ± .031	.032	1½	#20	.830	.730
PME75	RN75*	1	2	49Ω	50M	1,000	.365 ± .015	1.050 ± .031	.032	1½	#20	1.165	1.081
PME80	RN80	2	2	100Ω	70M	5,000	.365 ± .015	2.175 ± .031	.032	1½	#20	2.290	2.206

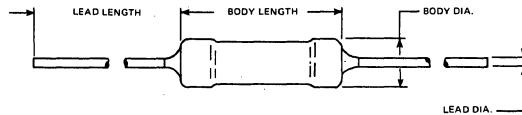
*Qualified to MIL-R-10509F †Qualified to MIL-R-55182 RNC, RNN, & RNR

**Consult factory for extended voltage ratings.

**FLATSO**TM

THICK FILM RESISTORS

PYROFILM TYPE	MAX. WATTAGE	MAX. VOLTAGE	RESISTANCE RANGE (Ohms)	BODY DIMENSIONS			LEAD DIMENSIONS		
				MAX. L	MAX. W	MAX. T	D ± .002	A ± .031	B ± .125
FL 1/4	1/4	350	50Ω - 10M	.300	.300	.100	.020	.200	1.5
FL 1/2	1/2	750	1K - 25M	.525	.300	.125	.025	.400	1.5
FL 1	1	5,000	100K - 120M	1.125	.375	.160	.032	.900	1.5
FL 2	2	10,000	250K - 250M	2.125	.375	.175	.032	1.900	1.5



THICK FILM HIGH VOLTAGE

PYROFILM TYPE	WATTS MAX	VOLTAGE MAX	RESISTANCE RANGE*	BODY DIMENSIONS - INCHES		LEAD DIAM INCHES
				LENGTH	DIAMETER	
PVC55	1/8	250	10K - 50M	.250 ± .031	.105 ± .015	.025
PVC60	1/4	500	10K - 100M	.375 ± .031	.125 ± .020	.025
PVC62	1/4	500	10K - 200M	.510 ± .031	.125 ± .020	.025
PVC64	1/4	1000	10K - 500M	.970 ± .031	.125 ± .020	.025
PVC70	1	3.5KV	10K - 500M	.750 ± .050	.300 ± .020	.032
PVC100	1.5	5KV	10K - 1000M	1.040 ± .050	.300 ± .020	.032
PVC175	3	10KV	20K - 1000M	1.800 ± .050	.300 ± .020	.032
PVC200	3	10KV	20K - 1000M	2.050 ± .050	.300 ± .020	.032
PVC300	3.75	12.5KV	35K - 1000M	3.050 ± .050	.300 ± .020	.032
PVC400	5.25	17.5KV	50K - 1000M	3.980 ± .020	.300 ± .020	.032

*EXTENDED VALUES ARE AVAILABLE CONSULT FACTORY

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

General Sales Office:
700 So. 21st Street
Irvington, N. J. 07111

AMF

RCL Electronics

established reliability
wire-wound resistors

PRECISION RESISTORS/PER MIL R-39005



RCL TYPE #	MIL-R-39005 TYPE	DIMENSIONS		MIL WATT	MAX. VOLTS	MAX. MIL RES.	MILLIMETERS	
		DIAM. ±.015	LENGTH +.020 -.032				DIAM. ±.04	LENGTH +.05 -.08
7009-ER	RBR 56	.250	.344	0.125	150	220K	6.3	8.7
7010-ER	RBR 55	.250	.500	0.15	200	332K	6.3	12.7
7020-ER	RBR 54	.250	.750	0.250	300	562K	6.3	19.05
7030-ER	RBR 53	.375	.750	0.33	400	1.1 Meg.	9.5	19.05
7040-ER	RBR 52	.375	1.000	0.50	600	1.210 Meg.	9.5	25.4

Lead Length: 1½" min. (38.1mm min.). Lead Diameter: #20 AWG .032" (0.8mm).



4060-ER	RBR 71	.250 ±.031	.312 ±.031	0.125	150	150K	6.3 ±0.8	8.0 ±0.8
---------	--------	---------------	---------------	-------	-----	------	-------------	-------------

Standard temp. coefficient ±20 PPM/°C.

Resistance Tolerances Available: .01%, .02%, .05%, .10%, 1.0%

If solderable leads are required use suffix L.

If weldable leads are required use suffix U.

POWER RESISTORS/PER MIL R-39007



RCL TYPE #	MIL-R-39007 TYPE	DIMENSIONS		WATTAGE RATING	MAX. RESIST.	LEAD DIAM. AWG	MILLIMETERS	
		DIAM. ±.031	LENGTH ±.062				DIAM. ±0.8	LENGTH ±1.6
T-2B-71-ER	RWR 71	.188	.812	2.0	16.2K	#20	4.8	20.0
T-5-74-ER	RWR 74	.312	.875	5.0	12.1K	#18	8.0	22.2
B-1-ER	RWR 81	.085 ±.020	.250 ±.032	1.0	1K	#24	2.2 ±0.12	2.4 ±0.8
B-3-ER	RWR 80	.094	.406 ±.032	2.0	2.67K	#24	2.4	11.5 ±0.8
B-5-ER	RWR 89	.187	.560	3.0	4.12K	#20	4.8	14.2

If solderable leads are required use Suffix S

If weldable leads are required use suffix W

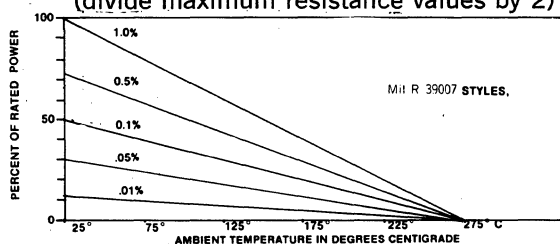
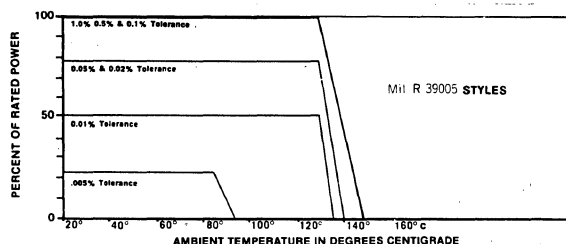
Resistance Tolerances Available: .1%, .5%, 1.0%

Lead length: 1½" minimum.

Standard coefficient ± 20 PPM/°C

Non Inductive Winding: Add Suffix N.

(divide maximum resistance values by 2)



A completely controlled process is used for the manufacture of established reliability units. Every unit is documented and traceable with quality control data. A 100 hour burn-in at rated wattage is performed. Failure rates test results are available.

General Sales Office:
700 So. 21st Street
Irvington, N. J. 07111

AMF

RCL Electronics

SERIES T

silicone coated axial
power wire-wound
resistors

General Specifications Available:

☐ Standard Temperature Coefficient:

Standard T.C.:

±20 PPM/°C. 500Ω up ±30 PPM/°C 10Ω to 499Ω

±50 PPM/°C 1Ω to 9.9Ω ±90 PPM/°C below 1Ω

Lower ohmic values require higher T.C.'s, consult factory for information on specific applications.

Consult factory for lower temperature coefficient requirements.

☐ Tolerance: ±1.0% is standard. Closer tolerances available.

☐ Wattage Range: ½ watts to 14 watts.

☐ Standard Resistance Values: From 0.1 ohms to maximum values as stated in table. For values below 0.1 ohms consult factory.

☐ Coating: RCL's proprietary silicone coating withstands moisture, salt water immersion, and cleansing solutions. It will withstand continuous operation up to 400°C.

☐ Leads: Tinned copperweld is standard.

☐ Dielectric Strength: 500 VAC for T-½A through T-1C, 1000 VAC for all others.

☐ Insulation Resistance: 5000 Megohms minimum at 100 volts D.C.

☐ Wide Temperature Range: From -65°C to +275°C (Characteristic U) or +350° (Characteristic V).



POWER RATINGS:

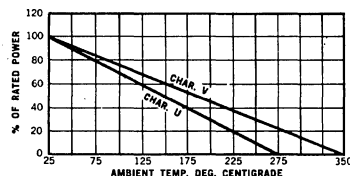
The RCL "T" Series has two power ratings, depending on operating temperature and stability requirements:

CHARACTERISTIC U: 275°C maximum hot-spot temperature.

CHARACTERISTIC V: 350°C maximum hot-spot temperature.

DERATING:

RCL Series "T" resistors have an operating temperature range of -65°C to +275°C (Characteristic U), or to +350°C (Characteristic V).



Ultra-fast delivery
for prototypes and
initial production needs.

RCL TYPE	MIL-R 26 E TYPE	WATTAGE RATING		DIMENSIONS		MAX. RESISTANCE		LEAD DIAM.
		U	V	DIA. ±.031*	LEN. ±.062*	RCL MAX.	MIL-R 26 E MAX.	
T-½A		.4		.078	.220	2.5K		#24
T-½		.75		.078	.330	7.5K		#24
T-1A		1.0	1.25	.093	.406	10K		#24
T-1A-70	RW-70	1.0		.094	.406 ±.031	10K	3.16K	#24
T-1B		1.1	1.30	.093	.530	12K		#24
T-1C		1.0		.093	.280	5K		#24
T-2		1.5		.156	.343	10K		#20
T-2A		3.0	3.75	.187	.500	22K		#20
T-2A-69	RW-69		3.00	.188 ±.063	.500 ±.063	22K	2.K	#20
T-2B		3.0	3.75	.188	.812	40K		#20
T-2B-79	RW-79	3.0		.187	.560	22K	10.5K	#20
T-2C		3.0	3.25	.250	.500	40K		#18
T-3		4.0	5.5	.250	.625	45K		#18
T-5		5.0	6.5	.312	.875	91K		#18
T-5-74	RW-74	5.0		.312	.875	91K	38.3K	#18
T-6		6.0	7.5	.312	1.000	95K		#18
T-6-67	RW-67		6.5	.313 ±.063	1.000 ±.094	95K	8.2K	#20
T-7		7.0	9.00	.312	1.185	100K		#18
T-7A		7.0	9.00	.375	1.375	150K		#18
T-7A-55	RW-55		7.00	.469 ±.094	1.375 ±.094	150K	5.1K	#20
T-10		10.0	13.00	.375	1.812	250K		#18
T-10-78	RW-78	10.0		.375	1.780	260K	90.9K	#18
T-10-68	RW-68		11.00	.344 ±.094	1.875 ±.063 1.125	265K	20K	#20
T-10A		10.5	14.00	.375	1.925	275K		#18
T-10-A-56	RW-56		14.00	.469 ±.094	2.000 ±.094	275K	9.1K	#20

Lead Length: 1¼" (32mm) minimum

* Tolerance applies to all types unless otherwise indicated.

BERYLLIUM OXIDE CORE WIRE-WOUND RESISTORS

For maximum heat dissipation... in smaller sizes. (All specifications same as above... Series T.)

RCL Type	MIL-R-26E	Rated Wattage		Diameter Inches	Dimensions mm	Length Inches	Length mm	Lead Diameter mm	Max. Resistance	
		U	V						MIL	RCL
B-1	RW-81	1	—	.085 ±.020	2.2 ±0.5	.250 ±.032	6.4 ±0.8	#24	0.5	3.4K
B-2	—	1.5	2	.078	2	.312	7.9	#24	0.5	7.5K
B-3	RW-80	2	—	.094	2.4	.406 ±.032	10.3 ±0.8	#24	0.5	3.16K
B-5	—	4	5	.188	4.8	.562	14.3	#20	0.8	25K
B-5A	—	4.5	6.5	.188	4.8	.812	20.6	#20	0.8	42K
B-5C	—	5	7	.218	5.5	.500	12.7	#18	1	32K
B-6	—	6	8	.250	6.4	.625	15.9	#18	1	50K
B-10	—	7	10	.312	7.9	.875	22.2	#18	1	95K
B-12	—	10	12	.312	7.9	1.218	31	#18	1	154K
B-15	—	15	18	.375	9.5	1.780	45.2	#18	1	273K

Lead length 1¼" (32mm) Minimum.

NON-INDUCTIVE WINDING AVAILABLE FOR SERIES "T" OR "B"

☐ For non-inductive winding add prefix "N".

1. Divide maximum resistance values by two.

2. Multiply maximum working voltage by .707.

3. Where possible, specify maximum inductance or capacitance allowable at a specific frequency.

AMF

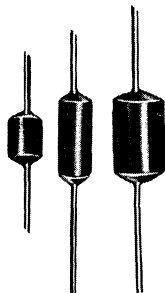
General Sales Office:

700 So. 21st Street

Irvington, N. J. 07111

RCL Electronics

low-cost wire-wound resistors for commercial/industrial applications



RCL Commercial line — low cost, precision wire wound resistors for test equipment, instruments, industrial controls, communications equipment. All the benefits of wire wounds — low T.C., high stability, close tolerance.

- Price competitive with comparable metal film resistors
- Standard T.C. = ± 10 PPM/ $^{\circ}$ C
- Special T.C.'s available on request
- High temperature epoxy coating provides moisture protection
- Lead Length: $1\frac{1}{2}$ " (38.1mm) minimum
- Wattage rating at 60° C ambient; derated to zero at 105° C
- Low noise
- Molded-in leads for structural strength
- Tolerance Available: $\pm 1\%$, 0.5%
- Non-inductive winding available on special order

Style Number	Wattage* Rating	Min. Res.	Max. Res.	Bobbin Diameter $\pm .031$	Bobbin Length $\pm .0625$	Lead Diam. AWG
E-10	.1	0.1 ohm	6K	.1875	.375	#22
E-20	.25	0.1 ohm	13K	.1875	.5	#22
E-30	.5	0.1 ohm	25K	.25	.75	#20

subminiature wire-wound resistors

These extremely small, encapsulated resistors meet and exceed the specifications of MIL-R-93. Special RCL techniques also allow the production of custom sizes at minimal cost to the customer.

Tolerances available: from $\pm 1.0\%$ to $\pm 0.001\%$.

Temperature coefficient: Standard is ± 10 PPM/ $^{\circ}$ C.

Temperature coefficients available as low as ± 2 PPM/ $^{\circ}$ C.



RCL Type	Dia. Inches ($\pm .016$)	Length Inches ($\pm .032$)	Max. Watts	Max. Volts	Max. Res. .001 Wire (25.4 μ)	Max. Res. .0005 Wire (12.7 μ)	Non-inductive	Lead Diam. (Length $1\frac{1}{2}$ " Min.)
7001	.100	.200	0.05	75	10K	—	No	#26AWG
7002	.110	.220	0.1	100	10K	100K	No	#24AWG
7003	.100	.260	0.05	100	10K	150K	No	#24AWG
7004	.100	.300	0.05	100	10K	250K	Yes	#24AWG
7005	.125	.250	0.1	100	10K	300K	Yes	#22AWG
7006	.125	.312	0.1	100	16K	350K	Yes	#22AWG
7007	.1875	.375	0.125	200	60K	700K	Yes	#22AWG
7008	.250	.250	0.150	100	100K	1 Meg.	Yes	#22AWG
7009	.250	.343	0.25	200	127K	1.4 Meg.	Yes	#20AWG
7010	.250	.500	0.33	400	226K	3 Meg.	Yes	#20AWG

Maximum wattage rating is at 25° C through 125° C

wire-wound encapsulated resistors

Lead Length: $1\frac{1}{2}$ " Min. #20 AWG

Non-Inductive Winding

Type	MIL-R-93 Type	Dia. In. ($\pm .015$)	Lgth In. $\pm .031$	Maximum Watts	MIL Wattage	Maximum Volts	Max. Res. .001 Wire
7009	RB-56	.25	.343	0.25	0.125	200	127K
7010	RB-55	.25	.5	0.33	0.15	400	226K
7020	RB-54	.25	.75	0.50	0.25	400	511K
7030	RB-53	.375	.75	0.60	0.33	400	750K
7040	RB-52	.375	1.0	1.00	0.50	800	1.5 Meg.
7044	—	.5	.5	0.50	—	400	1 Meg.
7045	—	.5	.625	0.60	—	400	1 Meg.
7045A	—	.437	.625	0.60	—	400	650K
7050	RB-57	.5	1.0	1.25	0.75	800	2 Meg.
7050A	—	.437	1.0	1.25	—	800	1.5 Meg.
7060	RB-58	.5	1.5	1.50	1.0	900	3 Meg.
7070	RB-59	.5	2	2.00	1.25	1,200	5 Meg.

Maximum wattage rating is from -55° C to $+125^{\circ}$ C.

MILITARY SPECIFICATIONS

- These standard sizes meet the physical dimensions of MIL-R-93.
- Test data and approval information available.
- All RCL types meet or exceed the electrical and environmental characteristics of this specification.

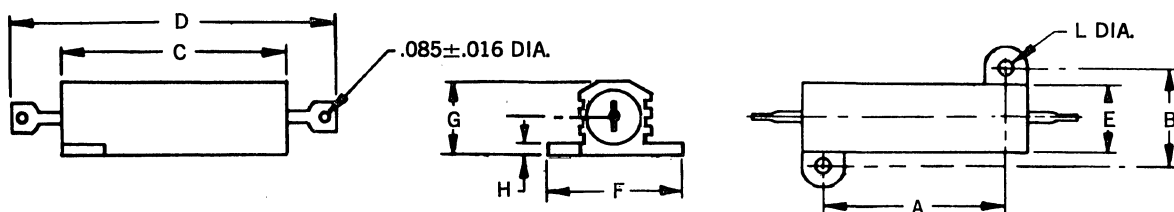
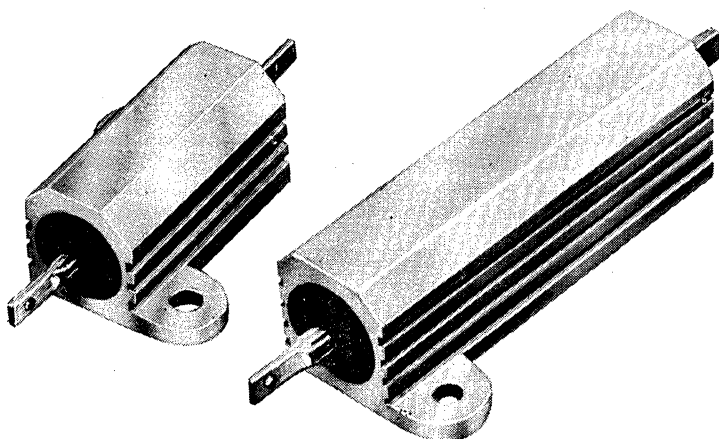
INDUSTRY'S BEST DELIVERY

RESISTORS, FIXED

General Sales Office:
700 So. 21st Street
Irvington, N. J. 07111

AMF

RCL Electronics aluminum housed wire-wound power resistors



TYPE	A	B	C	D	E	F	G	H	L	MIL-Type
Tol.	±.005	±.005	±.032	±.062	±.015	±.015	±.015	±.010	±.005	—
AL-5	.445	.490	.600	1.125	.335	.645	.321	.065	.094	RE-60
AL-10	.562	.625	.750	1.375	.420	.795	.400	.074	.094	RE-65
AL-25	.720	.780	1.060	1.940	.530	1.075	.560	.087	.125	RE-70
AL-50	1.562	.845	1.970	2.780	.615	1.135	.615	.087	.125	RE-75

FEATURES

- Tolerance: $\pm 1\%$ standard. Available to $\pm .05\%$.
- Standard TC:
 ± 20 PPM/ $^{\circ}$ C. 500 Ω up
 ± 30 PPM/ $^{\circ}$ C. 10 Ω to 499 Ω
 ± 50 PPM/ $^{\circ}$ C. 1 Ω to 9.9 Ω
 ± 90 PPM/ $^{\circ}$ C. below 1 Ω
- All popular types, 5 watts through 50 watts
- Molded and welded construction
- Screw mounts on chassis
- Exceptionally high stability at all conventional power ratings
- Utilizes heat-sink effect of chassis
- Clearly marked on top surface of housing for ease of identification after mounting
- Exceeds MIL-R-18546
- Complete protection against environment

NON INDUCTIVE STYLES: (Series "AL" and "ALB")
The same physical and electrical specifications are available with non-inductive winding. They are identified by adding the letter N after the AL identification.

RCL TYPE	MIL-R-18546 TYPE	POWER RATING* (WATTS)		RESISTANCE RANGES (OHMS)	MAX. WORKING VOLTAGE	MAX. WT. GRAMS
		RCL	MIL			
AL-5	RE-60G	7.5	5	.01 to 24.5K	160	3
AL-10	RE-65G	12.5	10	.01 to 47.1K	265	6
AL-25	RE-70G	25	20	.01 to 95.2K	550	14
AL-50	RE-75G	50	30	.01 to 273K	1250	29

* Rating based on chassis mounting.

BERYLLIUM OXIDE CORES FOR GREATER HEAT DISSIPATION

RCL TYPE	MIL-R-18546 TYPE	POWER RATING* (WATTS)		RESISTANCE RANGES (OHMS)	MAX. WORKING VOLTAGE	MAX. WT. GRAMS
		RCL	MIL			
ALB-5	RE-60	15	5	.01 to 24.5K	220	3
ALB-10	RE-65	20	10	.01 to 47.1K	340	6
ALB-25	RE-70	35	20	.01 to 95.2K	650	14
ALB-50	RE-75	50	30	.01 to 273K	1400	29

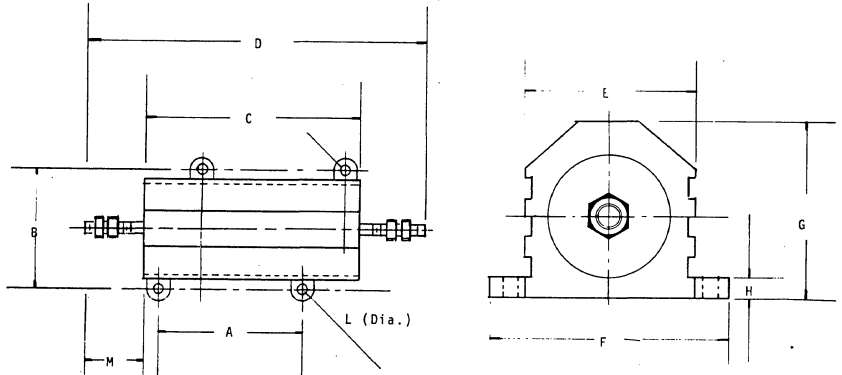
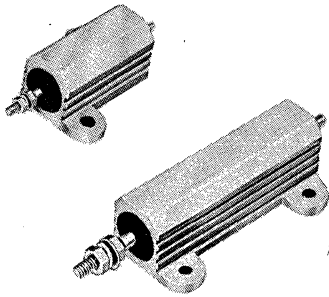
* Rating based on chassis mounting.

AMF

RCL Electronics

General Sales Office:
700 So. 21st Street
Irvington, N. J. 07111

aluminum housed



ENGINEERING NOTES:

△ AL-250 has 4 mounting positions

△ Threads: AL-100: 12-24 UNC-2A typ.
AL-250: 1/4-20 UNC-2A typ.

FEATURES

- Molded and welded construction
- Screw mounts on chassis
- Exceptionally high stability
- Utilizes heat-sink effect of chassis
- Clearly marked on top surface of housing for ease of identification after mounting
- Exceeds MIL-R-18546
- Complete protection against environment

Dimensions (Decimals)

TYPE	A	B	C	D	E	F	G	H	L	M	MIL TYPE
Tol.	±.010	±.010	±.031	±.093	±.031	±.031	±.031	±.031	±.010	±.031	—
AL-100	2.750	2.250	3.500	5.478	1.812	2.812	1.750	.187	.188 (TYP)	.989	RE77
AL-250	3.000	2.500	4.500	7.000	2.125	3.000	2.188	.250	.188 (TYP)	1.250	RE80

RCL TYPE	MIL-R-18546D TYPE	POWER RATING* (WATTS)		RESISTANCE RANGES (OHMS)	MAX. WORKING VOLTAGE	MAX. WT. GRAMS
		RCL	MIL			
AL-100	RE-77G	100	75	.1 to 50K	1900	400
AL-250	RE-80G	250	120	.1 to 75K	2500	800

* Rate based on chassis mounting. See information on Power Rating below.

MATERIAL

Core: Steatite, or Alumina Ceramic

Resistance Wire: Nichrome wire (800Ω/CMF) is standard; other alloys used when required.

End Caps: Stainless steel.

Sealant: Molded construction.

Housing: Anodized Aluminum.

Terminals: Tinned copperweld.

Flame Retardant Construction: Available on special order.

POWER RATING

Both AL-100 and AL-250 Series ratings based on the following requirements:

- 275°C maximum internal hotspot temperature.
 - 1% maximum ΔR in 1000 hour load life.
 - Proper heat sink: 12"x12"x.125 Aluminum Panel.
- D. Derating:**
- Operating temperature range of -55°C to +275°C.
 - Derating is required for reduced chassis mounting area and for high ambient temperatures.

APPLICABLE MIL-SPECIFICATIONS

MIL-R-18546: Meets or exceeds military specifications covering aluminum housed, chassis-mounted resistors.

ELECTRICAL SPECIFICATIONS

Tolerance: $\pm 1.0\%$ is standard. Available to $\pm .05\%$. Closer tolerances may necessitate lowering maximum resistance. Consult RCL for specifics.

Standard T.C.: ± 20 PPM/°C. 500Ω up
 ± 30 PPM/°C. 10Ω to 499Ω
 ± 50 PPM/°C. 1Ω to 9.9Ω
 ± 90 PPM/°C. below 1Ω

Lower ohmic values require higher T.C.'s. Consult factory for information on specific applications.

Dielectric Strength: 5500 VAC on AL-100 and AL-250.

Insulation Resistance: 10,000 megohms min. dry.

NON INDUCTIVE STYLES

The same physical and electrical specifications are available with non-inductive winding. They are identified by adding the letter N after the AL identification.

AMF

General Sales Office:

700 So. 21st Street

Irvington, N. J. 07111

RCL Electronics*special temperature coefficient wire wound resistors*

- Applications include transistor circuits, zener diode temperature compensation, temperature measuring devices.
- Available in a range of temperature coefficients from -50 ppm/ $^{\circ}\text{C}$. to $+6,000$ ppm/ $^{\circ}\text{C}$.
- Values range from 10 ohms to 5 megohms.
- All available with axial or printed circuit leads.
- Available in all physical sizes.
- All meet applicable paragraphs of Mil-R-93D

RCL high positive TC resistors

RCL Type #	Competitive 'SENSISTOR' Type #	Diam. $\pm .015$	Length $\pm .015$	RCL Resistance Range	'SENSISTOR' Resistance Range	Lead Diam. AWG.
8000	TM $\frac{1}{8}$	.140	.406	1 Ohm to 10K	10 Ohms to 6K	#22
8001	TM $\frac{1}{4}$	.200	.585	1 Ohm to 20K	10 Ohms to 10K	#22

RCL has developed its own proprietary special alloy resistance wire which gives the unusually high positive TC of silicon, together with the basic advantages of resistance wire which are:

- Provides temperature compensation.
- Much greater stability for digital and linear integrated circuits.
- Closer resistance tolerances.
- Broader range of resistance values.
- Operating temperature range from -55°C to $+150^{\circ}\text{C}$.
- Derated to zero watts at 150°C .
- Lead length $1\frac{1}{2}$ " ($\pm \frac{1}{8}$ " ; mm lead length 38.1 (± 3.2 mm)).

**Special Temperature Coefficients available (see table below)**

COLD RANGE	HEAT RANGE	R FACTOR
-55°C to $+25^{\circ}\text{C}$	$+25^{\circ}\text{C}$ to $+105^{\circ}\text{C}$	Multiply Max. R by
-50 ± 20	-50 ± 20	1.00
-30 ± 10	-30 ± 10	1.00
± 3	± 3	1.00
± 5	± 5	1.00
± 10	± 10	1.00
± 20	± 20	1.00
$+95 \pm 20$	$+85 \pm 20$	.80
$+110 \pm 10$	$+100 \pm 10$	.80
$+120 \pm 10$	$+110 \pm 10$	.75
$+150 \pm 30$	$+150 \pm 30$	.85
$+180 \pm 20$	$+180 \pm 20$	.80
$+280 \pm 30$	$+280 \pm 30$	.25
$+380 \pm 40$	$+400 \pm 40$	.70
$+700 \pm 200$	$+650 \pm 200$	.60
$+850 \pm 80$	$+850 \pm 80$	.60
$+1100 \pm 100$	$+1050 \pm 100$	.50
$+1250 \pm 100$	$+1150 \pm 100$	.50
$+1500 \pm 200$	$+1450 \pm 200$	.55
$+2600 \pm 200$	$+2550 \pm 200$	.50
$+3400 \pm 300$	$+3600 \pm 300$	.36
$+4000 \pm 400$	$+4500 \pm 400$	.10
$+5000 \pm 300$	$+6000 \pm 300$	.05

Above T.C.'s refer to .001 (25.4 μ) minimum wire diameter. Some alloys available in sizes as low as .0007 (18 μ).

RCL wire-wound printed circuit resistors

- △ All welded construction.
- △ All resistor wire terminations are made at the top of the resistor rather than at the bottom. This does the following:
 - a. protects the joints from damage when submerged in a solder bath.
 - b. by placing these joints as far away as possible from the solder bath, the body acts as a heat sink and thus these terminations are given additional protection.
 - c. this design generally applies to values of 2K and above.
- △ Custom designs on special order.
- △ Different lead spacing can be furnished on request.
- △ Non-inductive winding available.

RCL Type	MIL-R-93D Type	Dia. ($\pm .025$)	Length ($\pm .032$)	Max. Res. Using .001 (25.4 μ)	Max. Res. Using .0006 (15.2 μ)	Wattage	Standard Lead Spacing ($\pm .010$)	Lead Diam. (AWG)
4060	RB-71	.25	.312	100K	500K	.250	.200	#22
4061	—	.25	.375	160K	800K	.250	.200	#22
4062	—	.25	.437	160K	800K	.250	.200	#22
4063	—	.375	.375	185K	1 Meg.	.333	.200	#20
4064	—	.375	.437	250K	1.3 Meg.	.333	.200	#20
4065	RB-70	.375	.5	301K	1.5 Meg.	.333	.200	#20
4066	—	.437	.375	450K	2 Meg.	.400	.300	#20
4067	—	.437	.437	600K	3 Meg.	.400	.300	#20
4068	—	.437	.5	700K	3.5 Meg.	.400	.300	#20

Lead length $1\frac{1}{4}$ " Minimum. Tinned, weldable leads.



RCL Electronics

General Sales Office:
700 So. 21st Street
Irvington, N. J. 07111

low cost commercial wire-wound resistors

SERIES OWR

RCL Series OWR Resistors are available in a wide range of configurations to meet low-cost, high volume applications in the automotive and appliance fields. A range of terminal styles is available and others can be made to user specifications at a nominal cost. Power ratings are 4.5 watts per inch between mounting centers on the standard OWR, and 6 watts per inch between mounting centers on the hi-wattage OWR Resistor. Shown are some of the Terminal Configurations available.

CONSTRUCTION

This RCL Series has a high quality, premium resistance wire wound on woven fiberglass cores im-

pregnated with a special grade silicone. Available with special smokeproof coating.

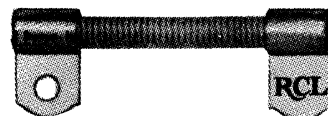
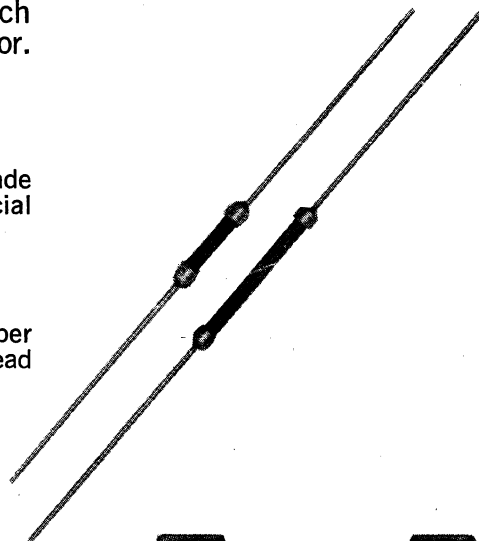
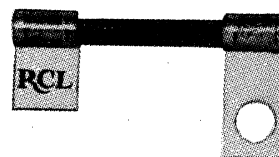
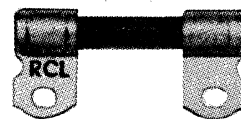
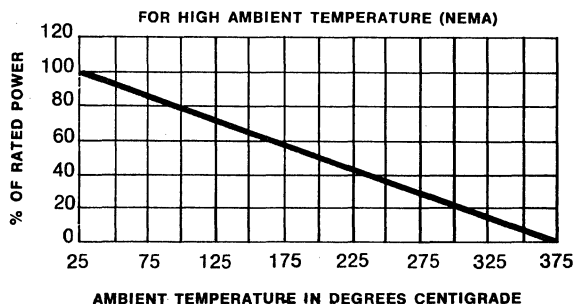
ORDERING INFORMATION

When ordering, please specify resistor body length, watts/inch, resistance and tolerance.

Example: A 1½" unit, 4 watts per inch; 350Ω, ±10% radial lead unit is designated:

OWR-4-350Ω±10%

DERATING



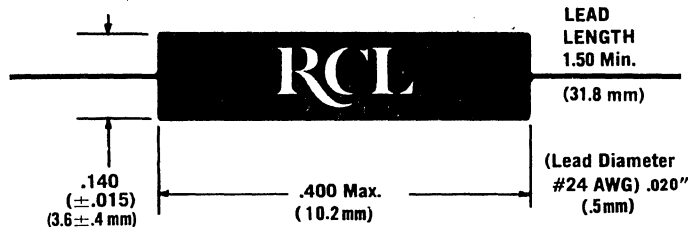
AMF

General Sales Office:
700 So. 21st Street
Irvington, N. J. 07111

RCL Electronics

precision wire-wound fuse resistors

NOW . . . a dual-purpose device that performs the functions of acting both as a precision wirewound resistor and a fuse. Precisely controlled characteristics . . . stable, accurate resistance . . . allows precise control of fusing point and time lag.



GENERAL SPECIFICATIONS ON 500 SERIES

RESISTANCE RANGE: 0.2Ω - 200Ω

RESISTANCE TOLERANCE: 10% STD, 5% AND 2% AVAILABLE

BLOW CHARACTERISTICS: PER TABLE — 2 POINT DEFINITION

STEADY-STATE CONDITIONS: PER TABLE—CURRENT AND POWER RATINGS

OPERATING TEMPERATURE: -55°C TO $+150^{\circ}\text{C}$

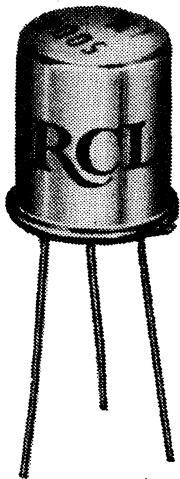
TEMPERATURE COEFFICIENT: ± 50 PPM/ $^{\circ}\text{C}$ MAX

RCL designs and manufactures standard (F500 series) and special fuse-resistors to customer requirements. The fuse resistor acts both as a precision wirewound resistor and as a fusing element with precisely controlled characteristics.

- Affords protection for semiconductor devices
- Eliminates fire hazard and circuit board damage due to overheated components
- Eliminates unnecessary blowing due to transient conditions
- Reduces the number of discrete components required

CONSTRUCTION FEATURES

- SINGLE FUSING ELEMENT — ALL WELDED CONNECTIONS
- CERAMIC SHELL — AIR ENCAPSULATION
- MEETS OR EXCEEDS MIL-R-26 ENVIRONMENTAL CONDITIONS-SPECIFICATIONS
- INTRINSICALLY SAFE — CERAMIC BOBBIN — SINGLE LAYER WOUND



TYPE-T-05R

This new resistor is sealed in a T-05 "Transistor Case" providing hermetically sealed electrostatic and electromagnetic screening. The lead outs are through glass to metal seals.

SPECIFICATIONS

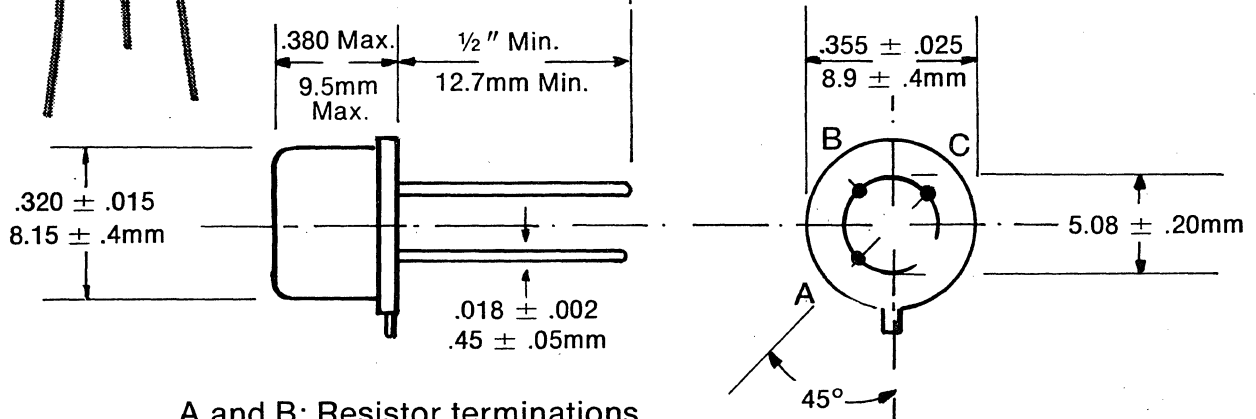
RESISTANCE RANGE: 1Ω to 1 meg. ohm.

STANDARD TOLERANCE: $\pm 1\%$ Available to $\pm .01\%$. Consult factory for details.

TEMPERATURE COEFFICIENT: ± 10 ppm/ $^{\circ}\text{C}$ Standard. For special T.C.'s consult factory.

RATING: 150 milliwatts for temperature rise of 20°C . Maximum volts: 250 V.

CLIMATIC: Sealed for operation from -65°C to $+125^{\circ}\text{C}$.



A and B: Resistor terminations

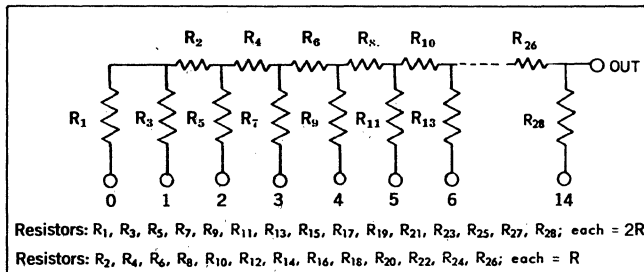
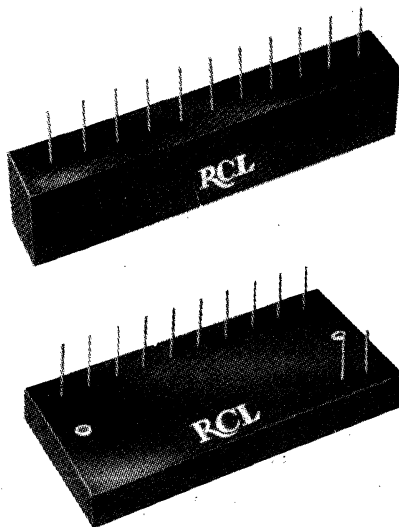
C: Envelope — electrostatic and electromagnetic shielding

AMF

RCL Electronics

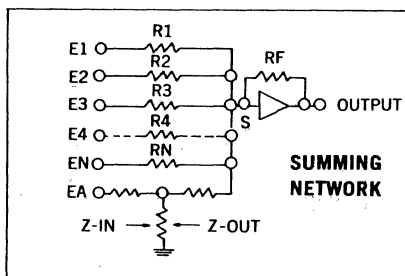
General Sales Office:
700 So. 21st Street
Irvington, N. J. 07111

ladder and summing networks



**RCL makes available ladder networks
in both standard and miniaturized
versions**

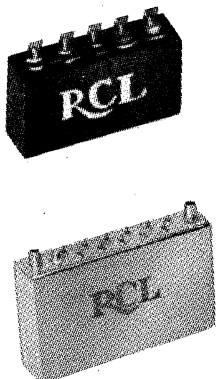
- Maximum total error less than $\frac{1}{2}$ of the smallest word input combinations
- Modular construction
- Interchangeable sub-assemblies



General Specifications Available:

- Ambient operating temperature range ... -55°C to $+125^{\circ}\text{C}$
- Error ... Under .50 of the least significant bit for every input combination
- Resistance Values: 500Ω to $100K$
- Output accuracy to $\pm .01\%$ and $\pm 2 \text{ PPM}/^{\circ}\text{C}$
- Up to 14 bits available
- Wire Wound precision resistors of matched characteristics result in high stability

precision resistance networks



RCL designs, develops and produces packaged resistance networks to individual customer requirements.

A high degree of sophisticated packaging plus miniaturization techniques are available from RCL's network engineering specialists. Typical custom designed networks are shown here.

General Specifications Available:

- Absolute resistor tolerances to $\pm .002\%$
- Ratio tolerances to $\pm .001\%$
- Temperature coefficient match and tracking between resistors within $\pm 1 \text{ PPM}/^{\circ}\text{C}$ from -0°C to $+85^{\circ}\text{C}$
- Long term stability of .001% the first year and .002% over a three year period
- Low reactance and rise times as low as .02 microseconds
- AC resistance match at frequency determined by user
- In AC converter networks, capacitance can be matched to 0.01 MMFD with a shielded network.

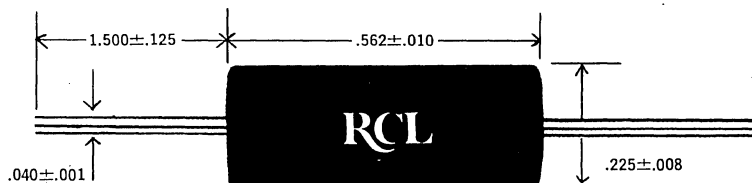
If you have a network problem, send us your complete specifications for a prompt and detailed proposal.

AMF

RCL Electronics

General Sales Office:
700 So. 21st Street
Irvington, N. J. 07111

low cost 2 watt molded wire-wound resistors



TYPE BWR

A general purpose, extremely economical wire wound resistor. Type BWR covers three different wattage requirements in one size resistor.

BWR resistors offer wire wound stability, negligible noise and no catastrophic failures for 2, 1 and 1/2 watt applications. Significant cost savings may be obtained over Fixed Composition Resistors in the categories of 1 watt 5% tolerance, 2 watt 5% and 10% tolerances.

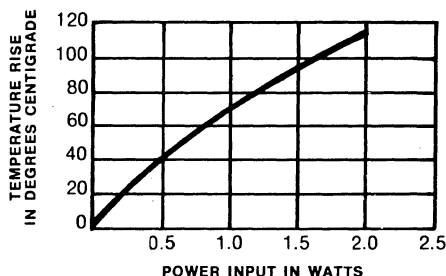
PERFORMANCE CHARACTERISTICS

REQUIREMENT	TYPICAL BWR R LESS THAN	MAXIMUM BWR ΔR
Temperature Coefficient 0.1 Ω - 0.16 Ω	+0.08%/°C	+0.1%/°C
0.10 Ω - 0.62 Ω	+0.06%/°C	+0.08%/°C
0.68 Ω - 2400 Ω	± 0.02 %/°C	± 0.04 %/°C
Low Temperature Operation	± 1.5 %	± 3 %
Temperature Cycling (-55°C to +125°C)	± 1.5 %	± 5 %
Moisture Resistance	± 3 %	± 5 %
Short Time Overload (8 Watts)	± 1.5 %	± 4 %
Load Life	± 5 %	± 10 %
Terminal Strength	± 1 %	± 2 %
Resistance to Soldering Heat	± 2 %	± 4 %
Shock	± 0.5 %	± 2 %
High Frequency Vibration	± 1 %	± 2 %

"Typical ΔR less than" is defined as the maximum ΔR to be expected in 95% of the population of a distribution.

NOTES:

1. Because of inaccuracies common in measuring low resistance values, an allowance of 0.01 Ω should be added to the % ΔR limits.
2. Test conditions are as specified in MIL-R-11 and MIL-STD-202 except where shown in parenthesis.
3. For indication of approximate inductance values, consult factory.



SPECIFICATIONS

MIL-R-11 Style Equivalent for Physical Size Only: RC32

Resistance, Standard: 0.10 Ω thru 2400 Ω .

Resistance Tolerances, Standard: ± 5 %, ± 10 %.

Power Rating: 2 watts @ 70°C
1 watt @ 115°C
1/2 watt @ 137°C; derating to 0 @ 160°C

Maximum Continuous Working Voltage: $\sqrt{PR}$

Minimum Insulation Resistance — Dry: 10,000 Megohms

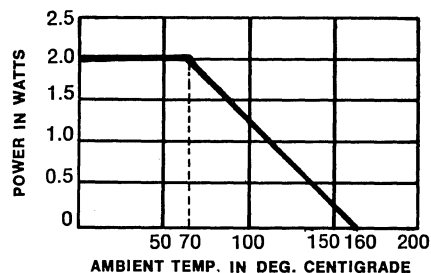
Minimum Insulation Resistance — Wet: 100 Megohms

Minimum Dielectric Withstanding Voltage: Atmospheric Pressure 1000 Volts R.M.S.; Reduced Pressure 625 Volts R.M.S.

Hot Spot Temperature Rise at 2 Watts: 115°C

Current Noise: Negligible

DERATING CURVE TEMPERATURE — POWER



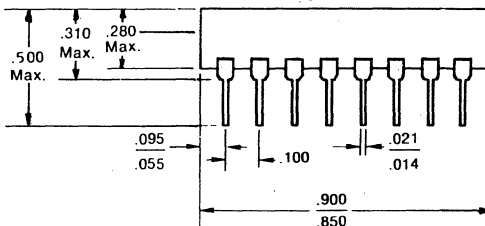
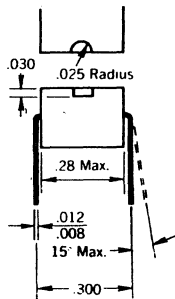
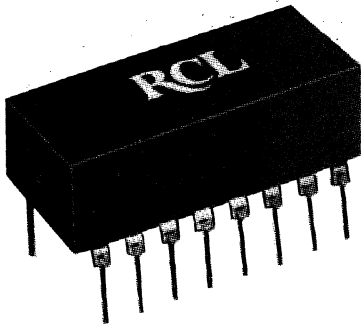
SURFACE TEMPERATURE RISE AT HOT SPOT VS. LOAD

AMF

RCL Electronics

General Sales Office:
700 So. 21st Street
Irvington, N. J. 07111

wire-wound networks (dual-in line package)



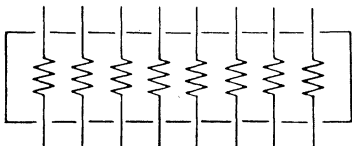
TYPE DPW 16

- Designed for automatic insertion
- Up to 8 resistors in a 16-pin package
- Optimum heat dissipation in small package
- High temperature stability
- Precision tolerance and T.C.

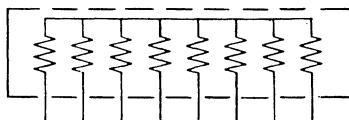
ELECTRICAL SPECIFICATIONS

Power Rating: 4 watts (up to .5 watts/resistor)
Resistance Range: $.5\Omega$ to 1.000Ω per resistor
Temperature Coefficient Match: 10 PPM/ $^{\circ}\text{C}$ Standard
 Available to 2.5 PPM/ $^{\circ}\text{C}$
Tolerance: 1% Standard Available to .05%
Temperature Coefficient: 10Ω to $1000\Omega \pm 20$ PPM/ $^{\circ}\text{C}$
 $.5\Omega$ to $9.9\Omega \pm 50$ PPM/ $^{\circ}\text{C}$
Tolerance Match: .05%
Dielectric Strength: 500 VAC
Insulation Resistance: 1000 Megohms minimum.
 100 Megohms minimum after moisture test

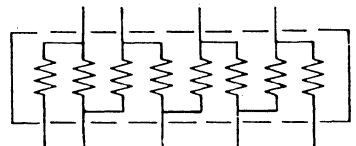
TYPICAL SCHEMATICS



DPW 16



DPW 16A



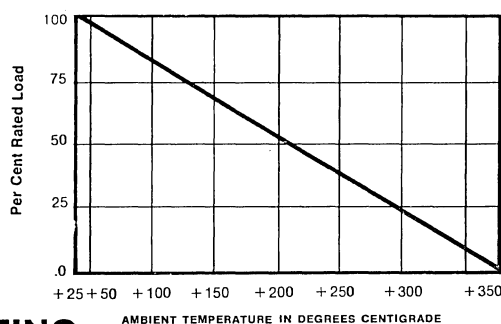
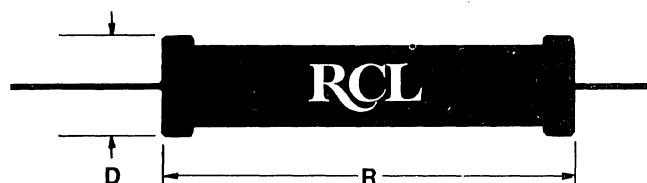
DPW 16B

Also available in 14 pin standard DIP configuration (Up to 7 resistors). Specify DPW 14, DPW 14A, DPW 14B.



General Sales Office:
700 So. 21st Street
Irvington, N. J. 07111

"black jack" vitreous enamel axial lead wire- wound resistors



DERATING

Wattage ratings are based on 25°C Free Air Rating. For higher ambient temperatures, use derating chart.

SERIES V

RCL STYLE	WATTAGE RATING	MAX. RESISTANCE	DIMENSIONS IN INCHES		LEAD DIAM.* AWG (1/4" Min. Lead Length)	DIMENSIONS IN MM.		LEAD (38.1MM)
			MAX. LENGTH (R)	MAX. DIAM. (D)		MAX. LENGTH (R)	MAX. DIAM. (D)	
V1	1	2.5K	.406	.156	#22	10.3	4	0.65
V2	2	3.9K	.406	.219	#20	10.3	5.6	0.8
V3	3	10K	.562	.250	#20	14.3	6.4	0.8
V5	5	30K	1.000	.250	#20	25.4	6.4	0.8
V6	6	35K	1.031	.343	#20	26.2	8.7	0.8
V7	7	40K	1.250	.343	#20	31.8	8.7	0.8
V11	11	60K	1.938	.343	#20	49.2	8.7	0.8

SERIES VT

RCL STYLE	WATTAGE RATING	MIL-R-26 SIZE EQUIVALENT (REF. ONLY)	MAX. RESISTANCE	MAX. DIMENSIONS IN INCHES		LEAD DIAM.* AWG (1/4" Min. Lead Length)	MAX. DIMENSIONS IN MM.		LEAD DIAM. (MM)
				DIAM.	LENGTH		DIAM.	LENGTH	
VT1A	1.5	RW70	8K	.125	.500	#24	3.17	12.7	0.5
VT2	2.0	—	8K	.187	.425	#20	4.8	10.8	0.8
VT2A	2.5	RW69	18K	.218	.600	#20	5.5	15.2	0.8
VT2B-79	3.0	RW79	20K	.218	.650	#20	5.5	16.6	0.8
VT2C	3.5	—	30K	.281	.600	#18	7.14	15.2	1.0
VT3	4.0	—	35K	.281	.750	#18	7.14	19.04	1.0
VT5	5.0	RW74	75K	.344	1.000	#18	8.7	25.4	1.0
VT6	7.0	RW67	80K	.344	1.150	#18	8.7	29	1.0
VT7	9.0	—	90K	.344	1.300	#18	8.7	32	1.0
VT10	12.0	RW78	125K	.406	2.000	#18	10.3	50.8	1.0

* Other Sizes Available

For Other Sizes and Wattage Ratings Consult Factory

- Extremely rugged vitreous construction for military and aerospace circuit applications.
- Meets or exceeds MIL-R-26 specifications.
- Special RCL rugged conformal coating protects against extreme humidity and temperature cycling.
- All-welded construction.
- Ideal for machine insertion.

Standard tolerance $\pm 5\%$ in wattage ratings of 1, 2, 3, 5, 6, 7, and 11 watts. Dielectric breakdown voltage is 1 KV (500 V for 1 W types), T.C. 0 ± 30 PPM/°C (typ.).

MECHANICAL

- ☐ Terminal Strength: Meets or exceeds MIL-R-26.

ELECTRICAL

- ☐ Tolerance: $\pm 5\%$ std.; $\pm 1\%$ to $\pm 10\%$ available.
- ☐ Temperature Coefficient: 0 ± 30 ppm/°C typical for 10Ω or greater.
- ☐ Dielectric Withstanding Voltage: 1 KV (500 V for 1 W types). Overload, Short Time: 10X rated wattage for 5 sec. (5 W size & larger); 5X rated wattage for 5 sec. (under 5 W).
- ☐ Wattage: See Table.
- ☐ Inductance: Varies with no. of turns and wire size. Std. units have single layer winding. Non-inductive (Aryton-Perry) windings available.

MATERIALS

- ☐ Core: Ceramic, resistant to thermal shock and wide variations in temperature.
- ☐ Resistance Element: High grade resistance alloy wire, single layer winding. Leads and resistance element welded to metal end caps.
- ☐ Coating: Consistent, uniform, high performance black vitreous enamel.
- ☐ Leads: Solder coated.

AMF

RCL Electronics

General Sales Office:
700 So. 21st Street
Irvington, N. J. 07111

special products

RCL engineers have designed and produced thousands of unique products to meet special customer applications. Shown are a few typical examples. RCL has an application engineering group directed

toward solving and producing unusual products to fit custom requirements. Our capabilities include extended resistance ranges, extremely low reactance, low thermal EMF and special configuration.

computer resistors

High-density power resistors specifically designed to meet demanding space requirements. Ideal for memory termination. Isolates line drive impulses and terminates lines. RCL engineers can meet all design requirements by adapting nearly any type of configuration. Particularly suited to very low resistance requirements for interface with integrated circuitry.

POWER RATING: 23 WATTS WHEN MOUNTED ON HEAT SINK MAINTAINED AT 75°C.

Resistance Range: From .01Ω to 100Ω.

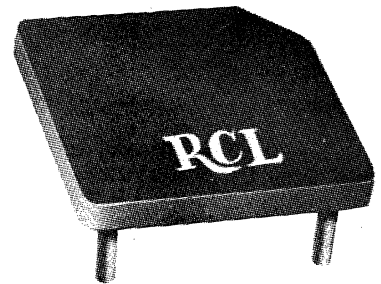
Tolerances: 5% standard. Closer tolerances available. Consult factory.

Dimensions: .5 x .5 x .062.
(Millimeters: 12.7 x 12.7 x 1.6)

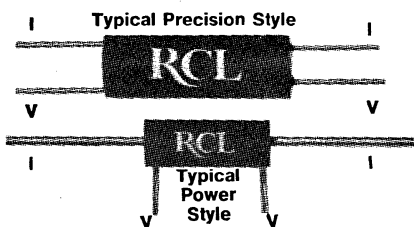
T.C.: ±100 PPM/°C. Closer tolerances available on request.

Terminals: Wire leads.

Max. Temp.: (on open side) 125°C.



4-terminal resistors



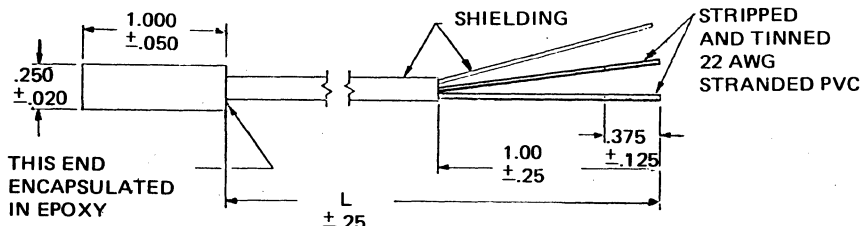
RCL manufactures 4-Terminal Resistor assemblies in both precision and power styles. They are used in current sensing circuits primarily with low resistance values to minimize the effects of lead resistance and lead temperature coefficient. This unique construc-

tion is essential for tight tolerance low value resistors where lead material characteristics are critical.

To order, specify "4-Terminal Construction" with any RCL Resistor Series 7000 (Precision Styles) or Series "T" (Power Styles).

Consult factory for application details or special packaging configurations.

molded temperature compensators



RCL offers a standard line of epoxy encapsulated sensing resistors for temperature compensating applications. The standard resistance tolerance ±5% with tighter tolerances available on special order. Cable lengths from 2.0" to 48.0" are available, with 6.0" standard. Operating temperature range is -55°C to +125°C. Repeatability of tempco within a given lot is ±100PPM.

RCL STYLE	RESISTANCE RANGE	PPM/°C AVERAGE TEMPCO 0°C - 100°C
TC35	10Ω - 50KΩ	3500±350
TC45	10Ω - 10KΩ	4500±450
TC55	10Ω - 5KΩ	5500±550

PRECISION WIREWOUND RESISTORS

Shallco

SHALLCO, INC.

HWY. 301 SOUTH

P.O. BOX 1089

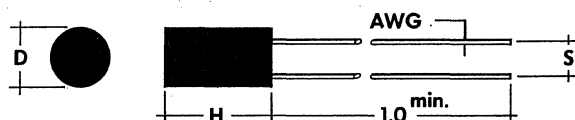
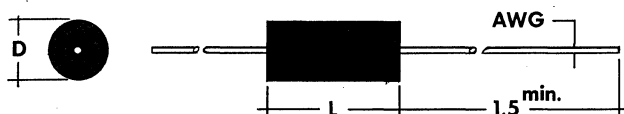
SMITHFIELD, N.C. 27577

TEL. (919) 934-3135

TWX 510-939-1455

AXIAL LEAD SUBMINIATURE SERIES								AXIAL LEAD STANDARD SERIES									
SHALLCO Style	Dimensions			Wattage (Commercial)	Minimum Tolerance	Maximum Resistance	Maximum Voltage	SHALLCO Style	Dimensions			Wattage		Minimum Tolerance	Maximum Resistance	Maximum Voltage	
	D	L	AWG						D	L	AWG	COM	MIL				
SM04	.090	.150	26	.04	.1%	40K	50	100	.250	.343	20	.20	—	.01%	1.8M	300	
SM05	.125	.150	24	.05	.1%	80K	50	101	.250	.500	20	.33	.15	↑	2M	400	
SM-1	.080	.210	26	.04	.1%	60K	50	102	.250	.750	20	.50	.25			3M	400
SM-2	.100	.210	24	.06	.1%	100K	50	103	.375	.885	20	.60	—			5M	400
SM-3	.125	.260	24	.08	.05%	250K	100	104	.500	.500	20	.60	—		5M	400	
SM-4	.125	.375	24	.10	.05%	600K	100	106	.500	1.00	20	1.25	.75	ABOVE 100 OHMS	10M	800	
SM-5	.187	.250	22	.125	.01%	500K	100	107	.500	1.50	20	1.5	1.0			12M	900
SM-6	.187	.295	22	.13	.01%	600K	100	108	.500	2.00	20	2.0	1.25			15M	1000
SM-12	.187	.450	22	.20	.01%	900K	150	112	.250	1.00	22	.75	—		3M	800	
SM-15	.187	.375	22	.15	.01%	700K	100	120	.375	.500	20	.50	—		5M	300	
SM-26	.160	.500	22	.10	.05%	500K	150	121	.375	.750	20	.60	.33	↓	5M	400	
SM-30	.140	.490	24	.10	.05%	400K	100	129	.375	1.00	20	1.00	.50		.01%	6.5M	800

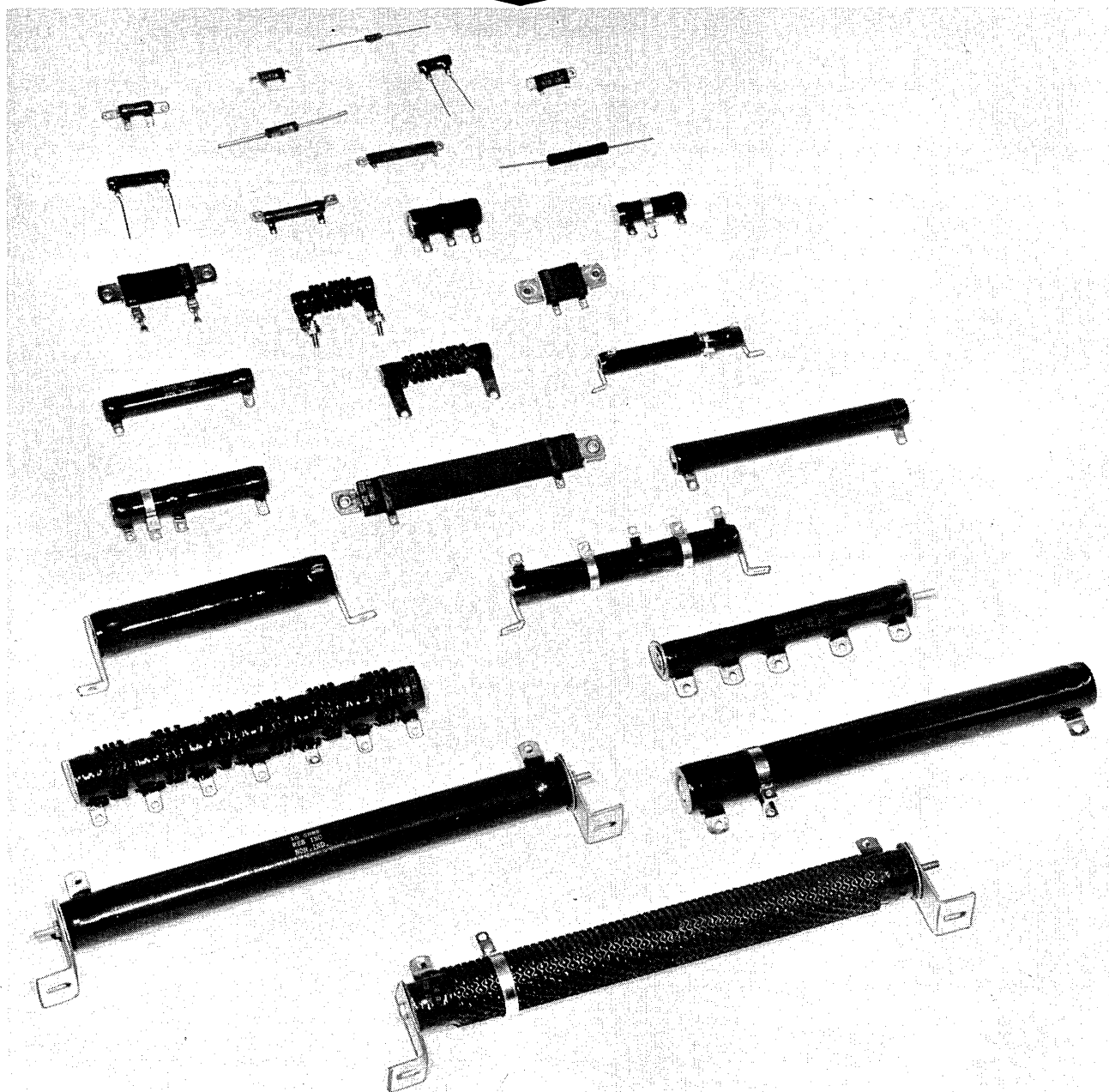
PRINTED CIRCUIT SERIES									FAST RISETIME SERIES (AXIAL)							
SHALLCO Style	Dimensions				Wattage (Commercial)	Minimum Tolerance	Maximum Resistance	Maximum Voltage	SHALLCO Style	Dimensions			Wattage (Commercial)	Minimum Tolerance	Maximum Resistance	Maximum Voltage
	D	H	S	AWG						D	L	AWG				
100PC	.250	.375	.150	22	.25	.01%	500K	100	FSM-3	.125	.260	24	.05	.01%	175K	100
101PC	.250	.500	.150	22	.25	.01%	750K	150	FSM-5	.185	.250	22	.12	↑	200K	100
104PC	.500	.500	.300	20	.50	.01%	2M	400	FSM-6	.185	.295	22	.13		200K	100
105PC	.500	.625	.300	20	.60	.01%	3M	400	FSM-15	.185	.375	22	.15		700K	100
120PC	.375	.500	.200	20	.50	.01%	1.1M	300	F101	.250	.500	22	.25	ABOVE 100 OHMS	1M	150
129PC	.375	1.00	.200	20	.60	.01%	2M	400	F102	.250	.750	22	.30		1.5M	300
130PC	.250	.312	.150	22	.25	.05%	450K	150	F103	.375	.885	20	.50	↓	2M	400
131PC	.250	.312	.200	22	.25	.05%	450K	150	F104	.500	.500	20	.50		3M	400
161PC	.250	.437	.150	22	.20	.01%	700K	150	F106	.500	.625	20	1.0		4M	400
164PC	.250	.500	.200	22	.25	.01%	750K	150	F108	.500	2.00	20	2.0		.01%	10M	1000



REQUEST CATALOG 300 FOR COMPLETE LISTING OF RESISTANCE PRODUCTS

RESISTORS, FIXED

Versatile OHMIC CAPABILITY:



resistors, inc.

CUSTOM DESIGNING,
ENGINEERING, MANUFACTURING

5226 West 26th Street, Chicago, Illinois 60650
Area Code: 312 OLympic 2-7555

AXIAL LEAD			
No.	Watts	Resistance Min. Max.	Dimensions O.D. x Lgth.
3 AX	3	0.1- 10,000	$\frac{1}{4}$ max. x $\frac{1}{16}$
5 AX	5	0.1- 30,000	$\frac{1}{32}$ max. x $1\frac{1}{16}$
10 AX	10	0.1- 50,000	$1\frac{1}{32}$ max. x $1\frac{1}{16}$

FIXED LUG			
No.	Wattage	Resistance Min.-Max.	Max. Dimensions O.D. x Lgth.
1 M	5	0.1- 11,000	$\frac{5}{16} \times 1$
1 $\frac{3}{4}$ M	10	0.1- 50,000	$\frac{5}{16} \times 1\frac{3}{4}$
2 E	20	0.25-100,000	$\frac{7}{16} \times 2$
2 B	25	0.25-100,000	$\frac{7}{16} \times 2$
4 B	50	0.5-175,000	$\frac{7}{16} \times 4$
6 $\frac{1}{2}$ C	100	1.0-300,000	$\frac{3}{4} \times 6\frac{1}{2}$
8 $\frac{1}{2}$ R	160	1.0-300,000	$1\frac{1}{8} \times 8\frac{1}{2}$
10 $\frac{1}{2}$ R	200	1.0-400,000	$1\frac{1}{8} \times 10\frac{1}{2}$

MIL-R-26 FIXED LUG			
RW29V	11	0.10- 5,600	$\frac{7}{16} \times 1\frac{3}{4}$
RW30V	11	0.10- 2,700	$\frac{7}{16} \times 1$
RW31V	14	0.10- 6,800	$\frac{7}{16} \times 1\frac{1}{2}$
RW32V	17	0.10-10,000	$\frac{7}{16} \times 2$
RW33V	26	0.10-18,000	$\frac{7}{16} \times 3$
RW35V	55	0.10-43,000	$\frac{29}{32} \times 4$

ADJUSTABLE			
No.	Wattage	Resistance Min.-Max.	Max. Dimensions O.D. x Lgth.
1¾ MA	10	1.0- 10,000	⅝ x 1¾
2 BA	25	1.0- 25,000	⅝ x 2
4 BA	50	1.0-100,000	⅝ x 4
6 BA	75	1.0-100,000	⅝ x 6
6½ CA	100	1.0-100,000	¾ x 6½
8½ RA	160	1.0-100,000	1⅞ x 8½
10½ RA	200	1.0-100,000	1⅞ x 10½
MIL-R-19365 ADJUSTABLE			
RX29V	11	1- 470	⅝ x 1¾
RX32V	17	1- 910	⅝ x 2
RX33V	26	1-1,500	⅝ x 3
RX35V	55	1-3,600	2⅞ ₃₂ x 4

FLAT OVAL

STACK MTG.

SINGLE MTG.

Watts^a Free Air

Core—L

Min. Ohms

Max. Ohms

Mounting

C

M

30	1¼	0.1	10K	Single Stack	2⅞ 2½	1¾ 2
40	2	0.2	30K	Single Stack	2⅞ 3¼	2½ 2¾
55	3½	0.3	60K	Single Stack	4⅞ 4¾	4 4¼
65	4¾	0.4	85K	Single Stack	5⅞ 6	5¼ 5½
75	6	0.5	100K	Single Stack	6⅞ 7¼	6½ 6¾

	MINIATURE, FLAT OVAL	
Construction similar to above large size resistors.		
WATTS*		
Free Air	Min. Ohms	Max. Ohms
10	1.0	15 K
15	1.0	25 K
20	1.0	50 K
Write for Bulletin RMF 5.0/1068		
*Ratings of large and miniature, flat oval resistors based on mounting on steel panel 10" x 10" x .040". When mounted on non-metallic surface, reduce wattage approximately 15%.		

RIBBON-WOUND RESISTORS									
Watts	Core Size		Ohms Min. Res.	Ohms Max. Res.	Watts	Core Size		Ohms Min. Res.	Ohms Max. Res.
	D	L				D	L		
400	1½	11¼	0.24	18.00	135	¾	5	0.06	4.25
375	1½	10½	0.22	16.50	105	¾	4	0.04	3.00
300	1½	8½	0.17	13.00	100	¾	3½	0.03	2.40
240	1½	6½	0.11	8.20	135	¾	6	0.06	5.50
185	1½	5	0.09	6.40	105	¾	5	0.05	3.65
180	¾	6½	0.08	6.00	90	¾	4	0.04	2.75

RESISTANCE TOLERANCES: Standard: $\pm 5\%$, 1.0 ohm and over. Special: down to $\pm 1\%$.

Write For Complete Catalog

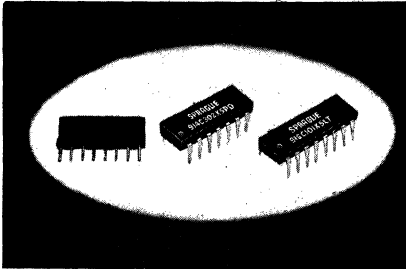
**resistors, inc.**

**CUSTOM DESIGNING,
ENGINEERING, MANUFACTURING**

5226 West 26th Street, Chicago, Illinois 60650
Area Code: 312 OLympic 2-7555

SPRAGUE RESISTORS

METANET® PRECISION RESISTOR NETWORKS



216C 914C 916C

- Designed for use in signal and data processing applications where repetitive resistance values and patterns are required.
- Cut package count, reduce equipment size, minimize costs.
- Up to 28 metal-film resistors on single ceramic base.
- High packaging density – Fewer components to stock, handle, inspect, install.
- Standard resistance tolerance, $\pm 2\%$.
- Typical temp. coefficient, with 250 ppm/°C. Tracking between resistors, ± 50 ppm/°C.
- Type 216C has single in-line configuration for vertical installation on high-density boards. Continuous total power dissipation is 1.5W at +25°C. Derating is linear to +150°C.
- Types 914C and 916C have dual in-line packages compatible with ICs. Continuous power dissipation at 25°C is 3W and 3.5W, respectively. Derating is linear to +150°C.
- Cat. No. Series ending in PE and SR available to 500K Ω on special order.
- For data on Type 216C, see Bulletin 7041. For data on 914C/916C, see Bulletin 7042.

TYPE 216C SINGLE IN-LINE PACKAGE

INDIVIDUAL TERMINATING, PULL-UP/PULL-DOWN, INTERFACE NETWORKS

	R(Ω)	Cat. No.*	R(Ω)	Cat. No.*
	50	216CH500X2LT	1000	216CH102X2PD
	100	216CH101X2LT	2000	216CH202X2PD
	200	216CH201X2PD	3000	216CH302X2PD
	500	216CH501X2PD	4000	216CH402X2PD
			5000	216CH502X2PD

DUAL TERMINATING NETWORKS

	R ₁ (Ω)	R ₂ (Ω)	Cat. No.*
	50	200	216CH400X2TR
	90	660	216CH800X2TR
	220	330	216CH131X2TR
	330	390	216CH181X2TR
	330	470	216CH191X2TR
	390	500	216CH221X2TR

*This is current Cat. No. and is identical to original Cat. No. except for letter H immediately after Type No.

TYPE 914C, 916C DUAL IN-LINE PACKAGE

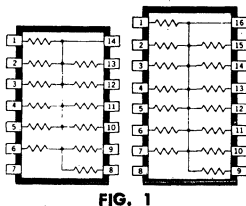


FIG. 1

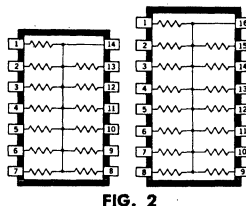


FIG. 2

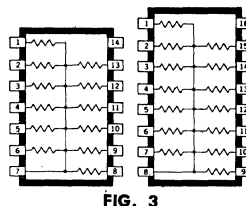


FIG. 3

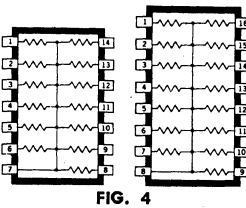


FIG. 4

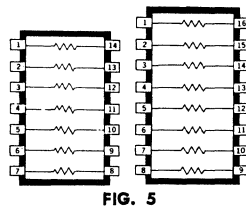


FIG. 5

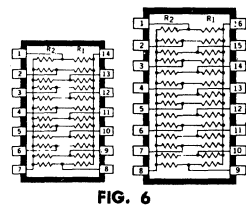


FIG. 6

Fig.	R(Ω)	Catalog Number	
		14-pin	16-pin
4	220	914C221X2LU	916C221X2LU
4	330	914C331X2LU	916C331X2LU
4	470	914C471X2LU	916C471X2LU
4	500	914C501X2LU	916C501X2LU

MULTIPLE ISOLATED RESISTORS

5	50	914C500X2SR	916C500X2SR
5	62	914C620X2SR	916C620X2SR
5	68	914C680X2SR	916C680X2SR
5	100	914C101X2SR	916C101X2SR
5	150	914C151X2SR	916C151X2SR
5	200	914C201X2SR	916C201X2SR
5	220	914C221X2SR	916C221X2SR
5	330	914C331X2SR	916C331X2SR
5	470	914C471X2SR	916C471X2SR
5	500	914C501X2SR	916C501X2SR
5	680	914C681X2SR	916C681X2SR
5	1000	914C102X2SR	916C102X2SR
5	1500	914C152X2SR	916C152X2SR
5	2000	914C202X2SR	916C202X2SR
5	2200	914C222X2SR	916C222X2SR
5	3300	914C332X2SR	916C332X2SR
5	4700	914C472X2SR	914C472X2SR
5	6800	914C682X2SR	916C682X2SR
5	10000	914C103X2SR	916C103X2SR
5	15000	914C153X2SR	916C153X2SR
5	22000	914C223X2SR	916C223X2SR
5	33000	914C333X2SR	916C333X2SR
5	47000	914C473X2SR	916C473X2SR
5	68000	914C683X2SR	916C683X2SR
5	100000	914C104X2SR	916C104X2SR

DUAL TERMINATING NETWORKS

	R ₁	R ₂	Catalog Number	
Fig.	(Ω)	(Ω)	14-pin	16-pin
6	50	200	914C400X2TR	916C400X2TR
6	90	660	914C800X2TR	916C800X2TR
6	220	330	914C131X2TR	916C131X2TR
6	243	390	914C151X2TRA	916C151X2TRA
6	250	375	914C151X2TR	916C151X5TR
6	330	470	914C191X2TR	916C191X2TR
6	330	390	914C181X2TR	916C181X2TR
6	330	680	914C221X2TRA	916C221X2TRA
6	390	500	914C221X2TR	916C221X2TR

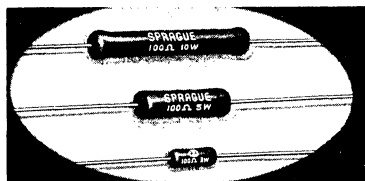
Catalog Number				
Fig.	R(Ω)	14-pin	16-pin	
PULL-UP/PULL-DOWN AND INTERFACE NETWORKS				
1	200	914C201X2PD	916C201X2PD	
1	500	914C501X2PD	916C501X2PD	
1	1000	914C102X2PD	916C102X2PD	
1	2000	914C202X2PD	916C202X2PD	
1	3000	914C302X2PD	916C302X2PD	
1	4000	914C402X2PD	916C402X2PD	
1	5000	914C502X2PD	916C502X2PD	
2	68	914C680X2PE	916C680X2PE	
2	100	914C101X2PE	916C101X2PE	
2	150	914C151X2PE	916C151X2PE	
2	200	914C201X2PE	916C201X2PE	
2	220	914C221X2PE	916C221X2PE	
2	330	914C331X2PE	916C331X2PE	
2	470	914C471X2PE	916C471X2PE	
2	500	914C501X2PE	916C501X2PE	
2	680	914C681X2PE	916C681X2PE	
1	1000	914C102X2PE	916C102X2PE	
2	1500	914C152X2PE	916C152X2PE	
2	2000	914C202X2PE	916C202X2PE	
2	2200	914C222X2PE	916C222X2PE	

Catalog Number				
Fig.	R(Ω)	14-pin	16-pin	
2	3300	914C332X2PE	916C332X2PE	
2	4700	914C472X2PE	916C472X2PE	
2	5600	914C562X2PE	916C562X2PE	
2	6000	914C602X2PE	916C602X2PE	
2	6800	914C682X2PE	916C682X2PE	
2	10000	914C103X2PE	916C103X2PE	
2	15000	914C153X2PE	916C153X2PE	
2	22000	914C223X2PE	916C223X2PE	
2	33000	914C333X2PE	916C333X2PE	
2	47000	914C473X2PE	916C473X2PE	
2	68000	914C683X2PE	916C683X2PE	
2	100000	914C104X2PE	916C104X2PE	
INDIVIDUAL TERMINATING NETWORKS				
3	50	914C500X2LT	916C500X2LT	
3	100	914C101X2LT	916C101X2LT	
3	200	914C201X2LT	916C201X2LT	
3	500	914C501X2LT	916C501X2LT	
4	50	914C500X2LU	916C500X2LU	
4	68	914C680X2LU	916C680X2LU	
4	100	914C101X2LU	916C101X2LU	
4	200	914C201X2LU	916C201X2LU	

†All standard resistor networks shown with $\pm 2\%$ resistance tolerance. For $\pm 5\%$ tolerance (available at lower cost), change "2" to "5" after "X" in catalog number.

SPRAGUE RESISTORS

BLUE JACKET® VITREOUS-ENAMEL WIREWOUND RESISTORS



• Matched Coefficient of Expansion Allows Uniform Expansion of Vitreous Enamel Coating, Ceramic Base, and End Caps, Eliminating Cracking, Cracks, and Protects From Fumes and Humidity

• Standard Resistance Tolerance: $\pm 5\%$

• Improved Miniature Resistors Designed for Thorough Reliability and Stability Under Extreme Operating Conditions

• Windings and Leads Welded to End-Caps for Superior Mechanical Strength

• Fractional-Ohm Values Down to 0.10 Available on Special Order

CATALOG NUMBER							CATALOG NUMBER						
Ohms	239E 1 WATT 1/8" x 3/8"	240E 2 WATTS 3/16" x 3/8"	242E 3 WATTS 13/64" x 1/32"	243E 5 WATTS 13/64" x 15/64"	244E* 7 WATTS 3/16" x 1"	247E 10 WATTS 3/16" x 1 1/4"	Ohms	239E 1 WATT 1/8" x 3/8"	240E 2 WATTS 3/16" x 3/8"	242E 3 WATTS 13/64" x 1/32"	243E 5 WATTS 13/64" x 15/64"	244E* 7 WATTS 3/16" x 1"	247E 10 WATTS 3/16" x 1 1/4"
1	239E1R05	240E1R05	242E1R05	243E1R05	244E1R05	247E1R05	560	239E5615	240E5615	242E5615	—	—	—
1.2	239E1R25	—	—	—	—	—	600	239E6015	240E6015	242E6015	243E6015	244E6015	247E6015
1.5	239E1R55	240E1R55	242E1R55	243E1R55	244E1R55	247E1R55	680	239E6815	240E6815	242E6815	—	—	—
1.8	239E1R85	—	—	—	—	—	700	239E7015	240E7015	242E7015	243E7015	244E7015	247E7015
2	239E2R05	240E2R05	242E2R05	243E2R05	244E2R05	247E2R05	750	—	—	—	243E7515	244E7515	247E7515
2.2	239E2R25	—	—	—	—	—	800	239E8015	240E8015	242E8015	243E8015	244E8015	247E8015
2.7	239E2R27	—	—	—	—	—	820	239E8215	240E8215	242E8215	—	—	—
3	239E3R05	240E3R05	242E3R05	243E3R05	244E3R05	247E3R05	900	239E9015	240E9015	242E9015	243E9015	244E9015	247E9015
3.3	239E3R35	—	—	—	—	—	1000	239E1025	240E1025	242E1025	243E1025	244E1025	247E1025
3.9	239E3R95	—	—	—	—	—	1100	—	—	—	243E1125	244E1125	247E1125
4	239E4R05	240E4R05	242E4R05	243E4R05	244E4R05	247E4R05	1200	239E1225	240E1225	242E1225	243E1225	244E1225	247E1225
4.7	239E4R75	—	—	—	—	—	1400	239E1425	240E1425	242E1425	243E1425	244E1425	247E1425
5	239E5R05	240E5R05	242E5R05	243E5R05	244E5R05	247E5R05	1500	239E1525	240E1525	242E1525	243E1525	244E1525	247E1525
5.6	239E5R65	—	—	—	—	—	1800	239E1825	240E1825	242E1825	243E1825	244E1825	247E1825
6.8	239E6R85	—	—	—	—	—	2000	239E2025	240E2025	242E2025	243E2025	244E2025	247E2025
7.5	239E7R55	240E7R55	242E7R55	243E7R55	244E7R55	247E7R55	2200	239E2225	240E2225	242E2225	243E2225	244E2225	247E2225
8.2	239E8R25	—	—	—	—	—	2500	239E2525	240E2525	242E2525	243E2525	244E2525	247E2525
10	239E1005	240E1005	242E1005	243E1005	244E1005	247E1005	2700	—	240E2725	242E2725	—	—	—
12	239E1205	240E1205	242E1205	243E1205	244E1205	247E1205	3000	—	240E3025	242E3025	243E3025	244E3025	247E3025
15	239E1505	240E1505	242E1505	243E1505	244E1505	247E1505	3300	—	240E3325	242E3325	—	244E3325	247E3325
18	239E1805	240E1805	242E1805	—	—	—	3500	—	240E3525	—	243E3525	244E3525	247E3525
20	239E2005	240E2005	242E2005	243E2005	244E2005	247E2005	3900	—	240E3925	242E3925	—	244E3925	247E3925
22	239E2205	240E2205	242E2205	—	—	—	4000	—	—	242E4025	243E4025	244E4025	247E4025
25	239E2505	240E2505	242E2505	243E2505	244E2505	247E2505	4200	—	—	—	—	244E4225	—
27	239E2705	240E2705	242E2705	—	—	—	4500	—	—	—	243E4525	244E4525	247E4525
30	239E3005	240E3005	242E3005	243E3005	244E3005	247E3005	4700	—	—	242E4725	—	—	—
33	239E3305	240E3305	242E3305	—	—	—	5000	—	—	242E5025	243E5025	244E5025	247E5025
35	—	—	—	243E3505	244E3505	247E3505	5600	—	—	242E5625	—	—	—
39	239E3905	240E3905	242E3905	—	—	—	6000	—	—	242E6025	243E6025	244E6025	247E6025
40	239E4005	240E4005	242E4005	243E4005	244E4005	247E4005	6800	—	—	242E6825	—	—	—
47	239E4705	240E4705	242E4705	—	—	—	7000	—	—	—	243E7025	244E7025	247E7025
50	239E5005	240E5005	242E5005	243E5005	244E5005	247E5005	7500	—	—	242E7525	243E7525	244E7525	247E7525
56	239E5605	240E5605	242E5605	—	—	—	8000	—	—	242E8025	243E8025	244E8025	247E8025
68	239E6805	240E6805	242E6805	—	—	—	8200	—	—	242E8225	—	—	—
75	239E7505	240E7505	242E7505	243E7505	244E7505	247E7505	9000	—	—	242E9025	243E9025	244E9025	247E9025
82	239E8205	240E8205	242E8205	—	—	—	10000	—	—	242E1035	243E1035	244E1035	247E1035
100	239E1015	240E1015	242E1015	243E1015	244E1015	247E1015	11000	—	—	—	—	244E1135	247E1135
120	239E1215	240E1215	242E1215	244E1215	244E1215	247E1215	12000	—	—	—	243E1235	244E1235	247E1235
150	239E1515	240E1515	242E1515	243E1515	244E1515	247E1515	14000	—	—	—	243E1435	244E1435	247E1435
180	239E1815	240E1815	242E1815	—	—	—	15000	—	—	—	243E1535	244E1535	247E1535
200	239E2015	240E2015	242E2015	243E2015	244E2015	247E2015	16000	—	—	—	—	244E1635	247E1635
220	239E2215	240E2215	242E2215	243E2215	244E2215	247E2215	17000	—	—	—	—	244E1735	—
250	239E2515	240E2515	242E2515	243E2515	244E2515	247E2515	18000	—	—	—	243E1835	244E1835	247E1835
270	239E2715	240E2715	242E2715	—	—	—	20000	—	—	—	243E2035	244E2035	247E2035
300	239E3015	240E3015	242E3015	243E3015	244E3015	247E3015	22000	—	—	—	243E2235	244E2235	247E2235
330	239E3315	240E3315	242E3315	—	—	—	25000	—	—	—	243E2535	244E2535	247E2535
350	—	—	—	243E3515	244E3515	247E3515	30000	—	—	—	243E3035	244E3035	247E3035
390	239E3915	240E3915	242E3915	—	—	—	35000	—	—	—	—	244E3535	247E3535
400	239E4015	240E4015	242E4015	243E4015	244E4015	247E4015	40000	—	—	—	—	244E4035	247E4035
450	—	—	—	243E4515	—	—	45000	—	—	—	—	—	247E4535
470	239E4715	240E4715	242E4715	—	—	—	50000	—	—	—	—	—	247E5035
500	239E5015	240E5015	242E5015	243E5015	244E5015	247E5015	55000	—	—	—	—	—	247E5535

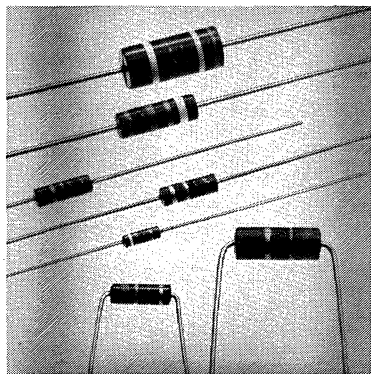
*Available until present stocks are exhausted.

EEM-58-EAF

TRW[®] IRC RESISTORS

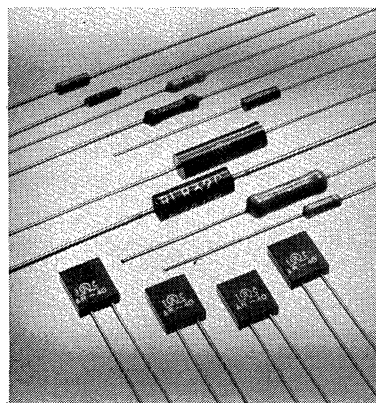
You get exactly the resistor you need for your application.

No compromises. No "favorites." Just quality.



Carbon comp.

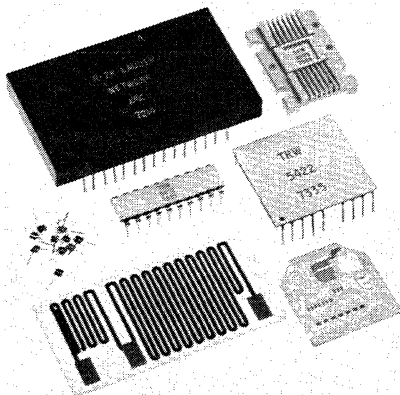
Billions used in consumer, industrial, military applications. TRW/IRC carbon comp. capability ranges from standard commercial types through established reliability RCR's, to ultra-high range (10^{11} ohms). Where you're using carbon comp.'s in automated assembly, TRW/IRC packaging options can help cut the cost of interfacing with your machines. Card packs, lead tape reels, cut and formed leads...we'll be glad to explore the potential economies with you.



Metal Film

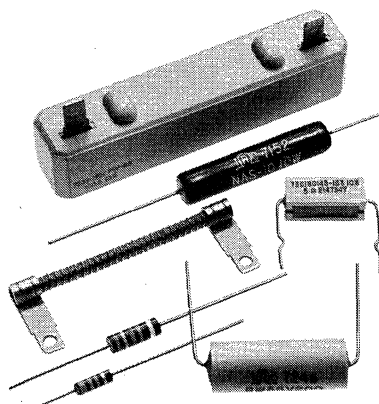
TRW/IRC has brought the state of the art in thin-film to a performance level equaling high-stability wirewounds. Capabilities include resistors with tolerances to $\pm 0.01\%$ and ± 3 PPM T.C. ...high-rel units... precision subminiatures...and, of course

the popular RN's. You can also look at alloy films offering high-temperature and high-voltage capability at low cost.



Resistive Networks

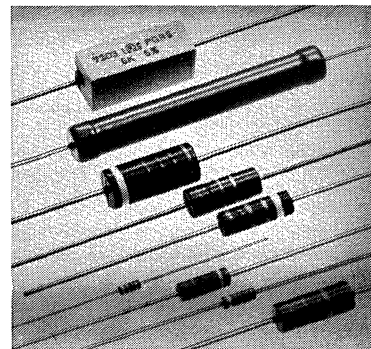
Advanced resistor technology here. These IC compatible, precision tantalum-film circuits provide inherent low noise, excellent stability, and hermetic performance without hermetic cost. Tolerances from 5% to 0.05% available in custom designs. TRW/IRC also offers the industry's most complete line of discrete fixed resistors.



Wirewound

The line starts with molded wirewound resistors—"space-savers" that bridge the cost-performance gap between composition resistors and precision wirewounds. It proceeds to standard, non-insulated types

for appliance/automotive use...to precision subminiatures offering high power density... to low cost fusible, flameproof units for consumer and industrial applications... to tubular and flat power wirewounds with ratings to 250 W.



Metal Glaze™

This is TRW/IRC's thick-film technology—for all types of low power resistor applications. Metal Glaze is widely accepted for its built-in power handling reliability, resistance range, and cost effectiveness. Numerous standard and special designs—precision, semi-precision, flameproof, high-rel, high-voltage.

All types...all technologies... one source

To wrap it up, TRW/IRC offers you the most complete line of fixed resistors in the business, with many of the popular types available from one source—your local TRW/IRC distributor. Having a direct pipeline to each of our plants, he can give you fast delivery.

Contact your local TRW sales office for application assistance, custom designs, and special engineering help when you need it. TRW/IRC Resistors, an Electronic Components Division of TRW, Inc. Plants at Boone, N.C., Burlington, Iowa, and Philadelphia, Pa. Write TRW/IRC Resistors, 401 N. Broad St., Philadelphia, Pa. 19108. Or call (215) 923-8230.

TRW[®] IRC RESISTORS

TRW/IRC RESISTORS

On the shelf...
When you want them.
Where you want them.

The TRW/IRC resistors listed in the table below are those usually carried in stock by our distributors. They're the resistors you're most likely to need, or at least, need in a hurry. When you do, chances are your nearby TRW/IRC distributor can fill your order from his shelves. Other parts and styles are available as well, although not always from stock. Ask your distributor, he'll be happy to discuss your special local stock needs with you.

GENERAL PURPOSE RESISTOR

Carbon Composition MIL-R-39008

RCR07— $\frac{1}{4}$ w
 RCR20— $\frac{1}{2}$ w
 RCR32—1 w

Molded Wirewound

BWH—2 w
 BW-20—1 w

RN GENERAL PURPOSE SEMI PRECISION AND PRECISION METAL GLAZE™ RESISTORS

MIL-R-22684 Type RL

RL07—RG07
 RL20—RG20
 RL32—RG32
 RL42—RG42

MIL-R-10509 Type RN

RN55D—T0-55
 RN60D—T0-60
 RN65D—T0-65
 RN55C—T2-55
 RN60C—T2-60
 RN65C—T2-65

MIL-R-39017 Type RLR

RLR07—RGR07
 RLR20—RGR20
 RLR32—RGR32
 RLR42—RGR42

MIL-R-11 Style Equivalents

RC05—RG- $\frac{1}{8}$
 RC07—RG- $\frac{1}{4}$

M & C SERIES HIGH STABILITY METAL FILM RESISTORS

MIL-R-10509 Style

CCA-T0 (RN60D)
 CCA-T2 (RN60C)
 CCB-T0 (RN65D)
 CCB-T2 (RN65C)
 CEA-T0 (RN55D)
 CEA-T2 (RN55C)
 CEC-T0
 CEC-T2
 MMC-T0 (RN50D)
 MMC-T2 (RN50C)

Established Reliability—

Metal Film Resistors MIL-R-55182

RNC/RNR50K
 RNC/RNR50H
 RNC/RNR55K
 RNC/RNR55H
 RNC/RNR60K
 RNC/RNR60H
 RNC/RNR65K
 RNC/RNR65H

GENERAL PURPOSE MOLDED CARBON COMPOSITION RESISTORS (RC & RCR)

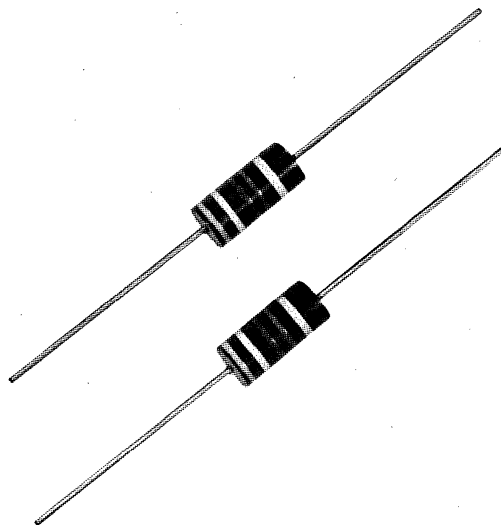
Performance advantages include **strong** lead assemblies. TRW's ribbed shoulder leads are **deeply** imbedded in the molding, defy twisting or pull-out.

TRW leads feature a uniform surface—thanks to an exclusive alloy electroplating process (no hot dipping). You'll find no lumps or voids to degrade solderability.

Moisture protection is another TRW feature. With the element thermally bonded to glass body and embedded in TRW's Selectrez[™] mold jacket, you get a more than 50% boost in moisture protection.

TRW carbon comp.'s also offer outstanding high-temperature characteristics. This results from the resistance element's being bonded to the glass substrate at 500°C, plus the internal heat-sinking action of the talon lead construction.

Altogether, these features—plus superior high-frequency characteristics (see facing page)—mean a top quality resistor with outstanding reliability.

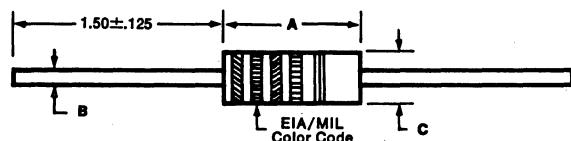


TRW TYPE	GBT-1/4	GBT-1/2	GBT-1
MIL-R-11 Style MIL-R-39008 Style MIL-R-39008 Failure Rate Level Resistance, Standard Resistance, Special (Non Mil) Tolerances, Standard Power Rating Maximum Continuous Working Voltage Minimum Insulation Resistance—Dry Minimum Dielectric Withstanding Voltage Atmospheric Reduced Shunt Capacitance (Avg.) Load Life-Typical ΔR Less Than*	RC07 RCR07 S 2.7 ohms thru 22 Megohms $\pm 5\%$, $\pm 10\%$, $\pm 20\%$ 1/4-watt @ 70°C 250 Volts 10,000 Megohms 100 Megohms 500 Volts, R.M.S. 325 Volts, R.M.S. 0.15 pF $\pm 4\%$	RC20 RCR20 S 2.7 ohms thru 22 Megohms 24 Megohms thru 100 Gigaohms $\pm 5\%$, $\pm 10\%$, $\pm 20\%$ 1/2-watt @ 70°C 350 Volts 10,000 Megohms 100 Megohms 700 Volts, R.M.S. 450 Volts, R.M.S. 0.175 pF $\pm 6\%$	RC32 RCR32 S 2.7 ohms thru 22 Megohms $\pm 5\%$, $\pm 10\%$, $\pm 20\%$ 1-watt @ 70°C 500 Volts 10,000 Megohms 100 Megohms 1000 Volts, R.M.S. 625 Volts, R.M.S. 0.25 pF $\pm 6\%$
Resistance-Temperature Characteristic	Typical ΔR Less Than* From 25°C Reference		
Nominal Resistance (Ohms)	GBT-1/4		GBT-1
	@ -55°C	@ +105°C	@ -55°C @ +105°C
1K and Under	$\pm 2\%$	$\pm 2\%$	$\pm 5\%$ $\pm 4\%$
1.1K to 10K	+8%	$\pm 3\%$	+8% -4%
11K to 100K	+9%	-4%	+9% -4%
110K to 1Meg	+10%	-5%	+11% -4%
1.1Meg to 10Meg	+11%	-5%	+11% -4%
11Meg to 22Meg	+11%	-5%	+11% -4%

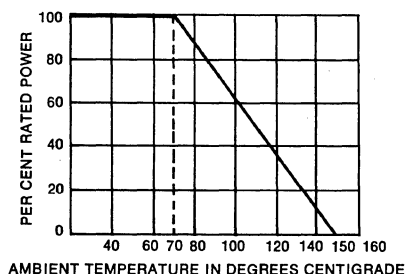
*Typical ΔR Less than" is defined as the maximum ΔR to be expected in 95% of the population of Δ distribution.

DIMENSIONS

	A	B	C
GBT-1/4	.250 $\pm$.015	.025 $\pm$.001	.090 $\pm$.008
GBT-1/2	.390 $\pm$.010	.031 $\pm$.001	.140 $\pm$.008
GBT-1	.562 $\pm$.010	.040 $\pm$.001	.225 $\pm$.008

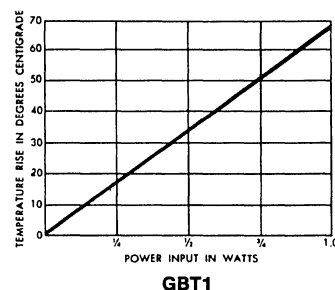
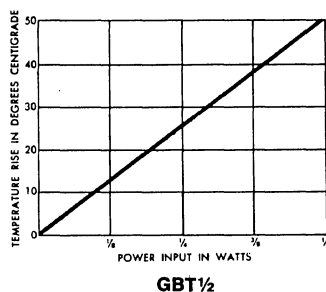
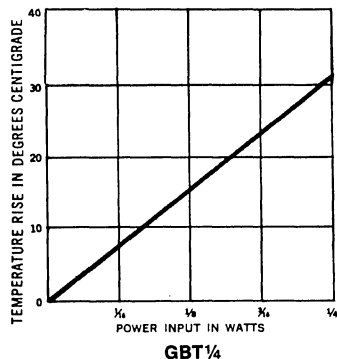


DERATING CURVE TEMPERATURE—POWER



TRW[®] IRC RESISTORS

SURFACE TEMPERATURE RISE AT HOT SPOT VS. LOAD

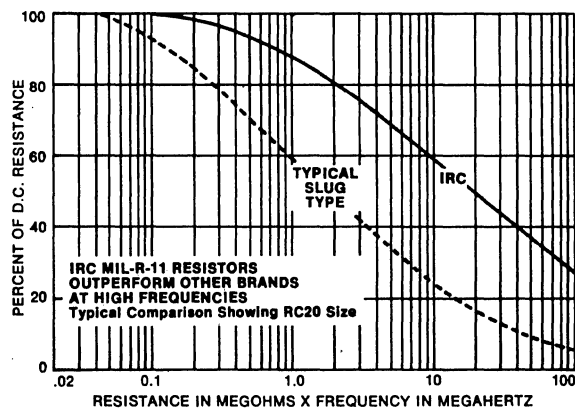


Superior high frequency characteristics

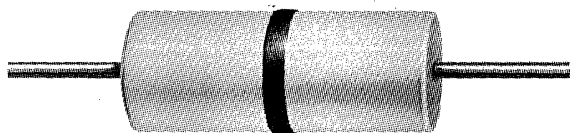
The best high frequency characteristics in a fixed composition resistor are achieved when the ratio of cross-sectional area to resistor length is minimized. TRW/IRC's element has the smallest cross section and fewest carbon binder contacts of any carbon composition resistors.

The low mass resistance element assures low shunt capacitance and superior performance at high frequencies. In high frequency equipment, this results in better pulse shaping with less broadening and truncation and faster response.

TRW/IRC resistors significantly outperform other brands, as shown on the chart.



ZEROHM Molded Jumper Wires



Molded jumper wires or crossovers, as they are sometimes called, are basically interconnection devices between points on a P.C. Board.

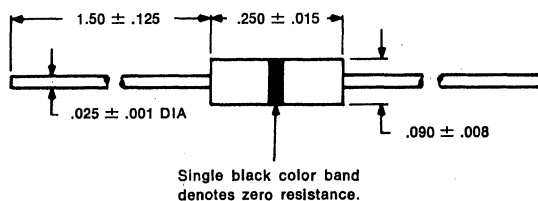
Generally they are used for the following reasons:

- Inability to connect two points on a P.C. Board due to other circuit paths which must be crossed over.
- An after-the-fact design change that requires new point connections.
- Circuit tuning by changing point connections.

TRW's molded jumper wires offer a quick simple solution to these problems. They are especially suited for automatic machine insertion on lead tape or available in all packaging styles including pre-cut and formed for manual insertion.

SPECIFICATIONS

Maximum resistance	0.01 Ω
Lead material	30/70 tin/lead solder-coated copper wire.
Body material	Electrical grade, high performance, molding compound
Min. Insulation resistance—Dry	10,000 meg Ω
Wet	100 meg Ω
Min. Dielectric withstanding voltage	
Atmospheric	500V RMS
Reduced	325V RMS
Insulation flammability	Resistor insulation is self extinguishing within 10 seconds after externally applied flame is removed.



TRW[®] IRC RESISTORS

GENERAL PURPOSE WIREWOUND MOLDED RESISTORS

Type BW-20 (1 Watt) and BWH (2 Watt)

The TRW/IRC Type BWH bridges the cost-performance gap between composition resistors and premium wirewounds. Its 2 watt rating in 1-watt size lets you replace 2 watt units and save space, or use it in 1 watt space with the advantages of a two-times safety factor and wirewound stability. BW-20s come in six types of packaging to cut assembly costs. They fit ½ watt inserting machines, and can be ordered with a wide variety of cut-and-formed lead configurations.

ALLOY RESISTANCE WIRE
Continuously wound on a fiberglass core for greater uniformity and extremely low inductances.

HEAVY MOLD JACKET
Exclusive phenolic plastic jacket provides superior strength and moisture protection.

EIA/MIL COLOR CODE
The first wide band indicates wire-wound construction.

ELECTROPLATED LEADS
Tin/lead coated to provide excellent solderability even after extended shelf storage.

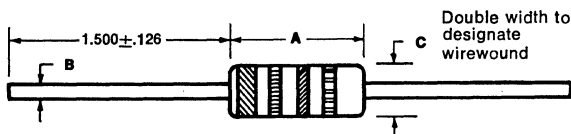
HOT CLAMP TERMINATION
Actual unretouched photomicrograph illustrates the positive termination, inherent stability.

Patent No. 3,319,210

GENERAL PURPOSE WIREWOUND MOLDED RESISTORS

TRW TYPE	BW-20	BWH
EIA RS-344 Style	CRU1	CRU2
MIL-R-11 Style Size Equivalent	RC20	RC32
Resistance, Standard	0.24 Ohms thru 750 Ohms*	0.10 Ohms thru 2400 Ohms*
Tolerance, Standard Special	±5%, ±10% ±2%	±5%, ±10%
Power Rating	1-watt 50°C ½-watt 100°C ¼-watt 125°C, derating to 0 @ 160°C	2-watts @ 70°C 1-watt @ 115°C ½-watt @ 137°C, derating to 0 @ 160°C
Max. Continuous Working Voltage	✓ PR	✓ PR
Min. Insulation Resistance—Dry	10,000 Megohms	10,000 Megohms
Min. Insulation Resistance—Wet	100 Megohms	100 Megohms
Min. Dielectric Withstanding Voltage Atmospheric Pressure Reduced Pressure	700 Volts, R.M.S. 450 Volts, R.M.S.	1000 Volts, R.M.S. 625 Volts, R.M.S.
Hot Spot Temp. Rise at 1-Watt	100°C	115°C
Current Noise	Negligible	Negligible
Marking	Standard EIA/MIL Color Code (double width first band)	Standard EIA/MIL Color Code (double width first band)

*See page 7 for decade values

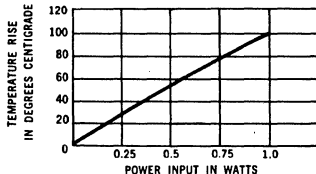


	A	B	C
BW-20	.390 ± .010	.032 ± .001	.140 ± .008
BWH	.562 ± .010	.040 ± .001	.225 ± .008

Typical BW-20 ΔR Less Than**

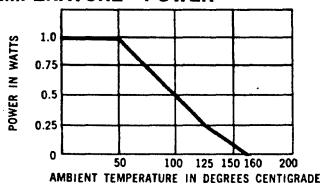
Load Life (50°C) ±3%

SURFACE TEMPERATURE RISE AT HOT SPOT VS. LOAD



Temperature Coefficient†
0.24 Ohms-0.62 Ohms
0.68 Ohms-750 Ohms

DERATING CURVE TEMPERATURE-POWER

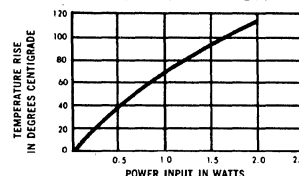


±0.025% / °C
±0.010% / °C
respectively

Typical BWH ΔR Less Than**

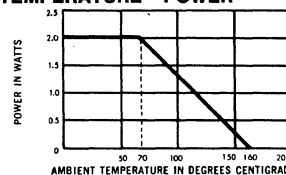
Load Life ±5%

SURFACE TEMPERATURE RISE AT HOT SPOT VS. LOAD



Temperature Coefficient†
0.1 Ohms-0.16 Ohms
0.18 Ohms-0.62 Ohms
0.68 Ohms-2400 Ohms

DERATING CURVE TEMPERATURE-POWER



±0.08% / °C
±0.06% / °C
±0.02% / °C
respectively

**Typical ΔR Less Than is defined as the maximum ΔR to be expected in 95% of the population of a distribution.

†Special TC available

TRW[®] IRC RESISTORS

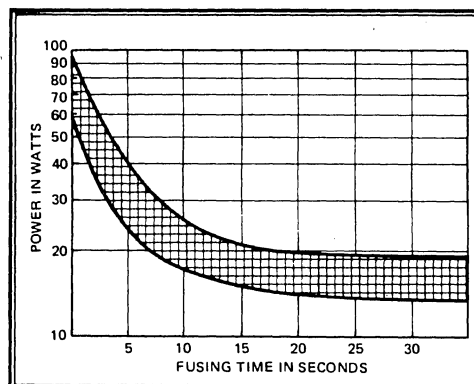
BWF FLAMEPROOF FUSIBLE WIREWOUND RESISTOR

The BWF is an economical fusible/flameproof resistor designed to handle ½, 1 and 2 watt applications where dependable circuit and equipment protection is essential.

The BWF has predictable overload *Fusing Characteristics* and is *Flameproof* under fault conditions up to 1000X rated power. (1000V maximum).

Rated at 2 watts and physically a 1 watt size, the BWF provides space savings and is suited for lead forming or automatic insertion equipment on reels of 2000 units. Other packaging styles are available.

Typical Fusing Characteristics



TRW-BT348 FLAMEPROOF RESISTOR SPECIFICATION HIGHLIGHTS

1. INSTANTANEOUS OVERLOAD

Overloads from 0 to 15 minutes duration. From 4X to 1000X rated power, (or 1000V, whichever is smaller)

- No flaming of resistor
- A paper tissue (Kimwipe #900-S) shall not ignite when resting across or beneath the unit.

2. DYNAMIC OVERLOAD

Wattage increased at 100% increments of rated power every 2 seconds, (after a 1 minute warmup at rated power).

- Same as 1 above.

3. CURRENT LIMITING

Overload applied as in 1. Up to 1000X rated power (or 1000V).

- Current shall limit to less than 1% of the ohms law value.

4. INSULATION FLAMMABILITY

Resistor insulation is self extinguishing after externally applied flame is removed.

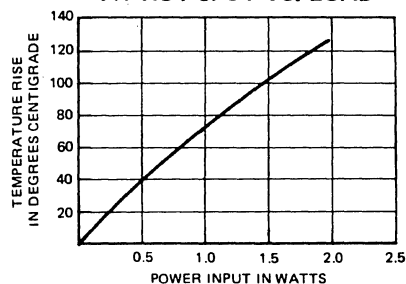
- Extinguishes within 10 seconds.
- Smoking is considered acceptable.

- Equiv. to E.I.A. RS-344 CRU2
- Size Equiv. to MIL-R-11 RC32
- Power Rating @ 70°C 2 Watts
- Resistance Range Minimum 0.10Ω
- Maximum 100Ω
- Purchase Tolerance 5%, 10%
- Maximum Continuous Voltage √ PR
- Loadlife: 2 watts @ 70°C Max. ΔR±10%
- Min. Dielectric Strength
- Atmospheric Pressure 1000V RMS
- Reduced Pressure 625V RMS
- Min. Insulation Resistance
- Dry 10K MegΩ
- Wet 100K MegΩ

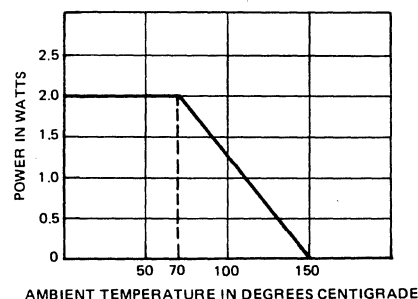
TYPICAL TEMPERATURE COEFFICIENT or ΔR Less Than

0.1Ω — 0.16Ω	.....	+ 800 PPM/°C	or	+ 0.08% /°C
0.18Ω — 0.68Ω	.....	+ 600 PPM/°C	or	+ 0.06% /°C
0.75Ω — 100Ω	.....	± 200 PPM/°C	or	± 0.02% /°C

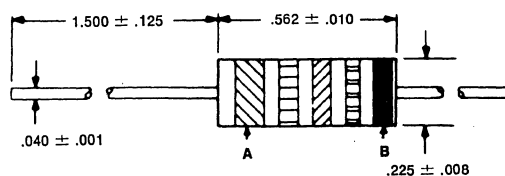
SURFACE TEMPERATURE RISE AT HOT SPOT VS. LOAD



TEMPERATURE CURVE RECOMMENDED POWER DERATING



MARKING AND DIMENSIONS



EIA/MIL COLOR CODE

A = First significant figure is a double width band to designate wirewound

B = Flameproof designator—Blue marking

TRW[®] IRC RESISTORS

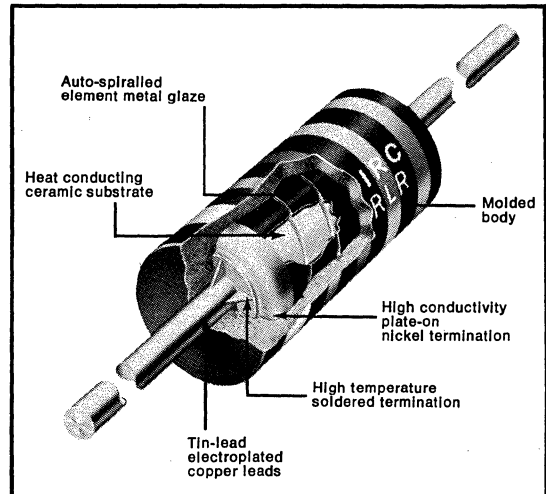
RG GENERAL PURPOSE SEMI PRECISION AND PRECISION METAL GLAZE[™] RESISTORS

Cost effective IRC molded thick film Metal Glaze resistors are designed to provide a combination of ruggedness and performance unmatched anywhere for the price.

The secret is in the proprietary glaze systems, the unique design, and automated production techniques.

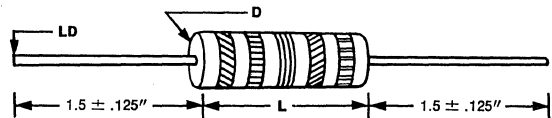
Metal Glaze resistors by the billions are in use worldwide, in all types of applications from missile guidance computers to truck anti skid systems, from telephone receivers to process control instrumentation.

Metal Glaze resistors meet or far exceed such MIL specifications as MIL-R-22684(RL), 10509(RN), 39017(RLR), 55182(RNR). Power Load ΔR 's are often less than $\pm 1\%$, even after 10,000 hours—equivalent to years of equipment life. And these units remain within tolerances even after extended periods of shelf or equipment storage.



DIMENSIONS—See Table

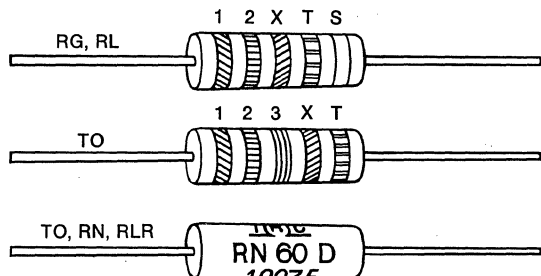
Body Configuration—Molded



IDENTIFICATION

Metal Glaze resistors can be provided with color bands or alpha-numeric printing.

See Table next page for marking by style.



1, 2, 3 = Significant Figures

X = Multiplier

T = Tolerance

S = White Solderable Band (RL)

Black = 0	Green = 5	Brown = $\pm 1\%$ Tol.
Brown = 1	Blue = 6	Red = $\pm 2\%$ Tol.
Red = 2	Violet = 7	Gold = $\pm 5\%$ Tol.
Orange = 3	Gray = 8	Silver = $\pm 10\%$ Tol.
Yellow = 4	White = 9	

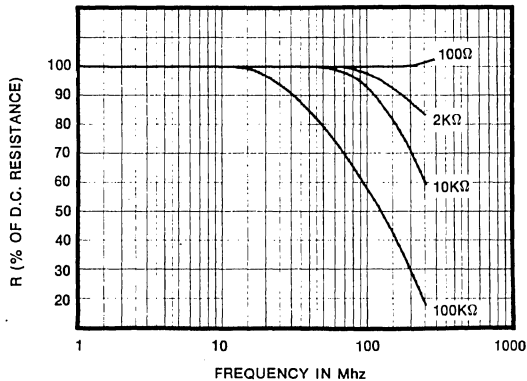
PRODUCT FEATURES

- **Metal Glaze[™] Thick Film Element**—Fused to core at 2000°F—extremely rugged and reliable system—up to 100 times thickness of oxide or evaporated films.
- **Solid Ceramic Substrate**—Provides optimum thermal conductivity—permits maximum power density, lowest T.C. ΔR 's, overload protection, and freedom from mechanical breakage.
- **End-Plated and Soldered Terminals**—Prevents movement, provides excellent electrical and thermal contact. Withstands 20 lb. pull for 5 seconds.
- **Uniform Molded Body**—Best mechanical strength for automated lead forming and insertion equipment.
- **Stability**—Above built-in features provide design tolerances of as low as $\pm 1.5\%$ (depending on purchase tolerance, style, and T.C. selection—see design tolerance discussion, page 6).

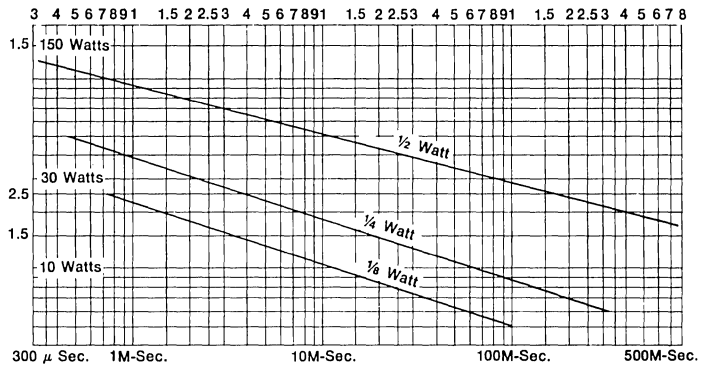
TRW[®] IRC RESISTORS

HIGH FREQUENCY CHARACTERISTICS

RG 1/4 W SIZE

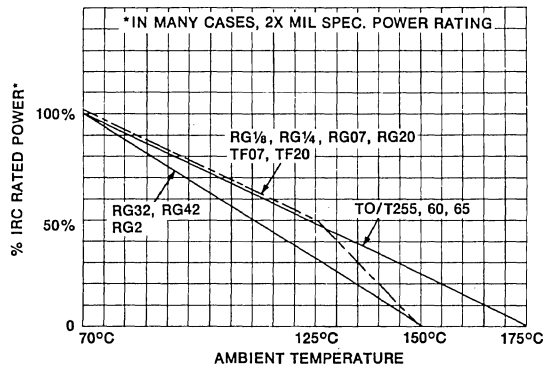


RG PULSE OR SURGE POWER RATING:
MAXIMUM APPLIED POWER/PULSE ON TIME

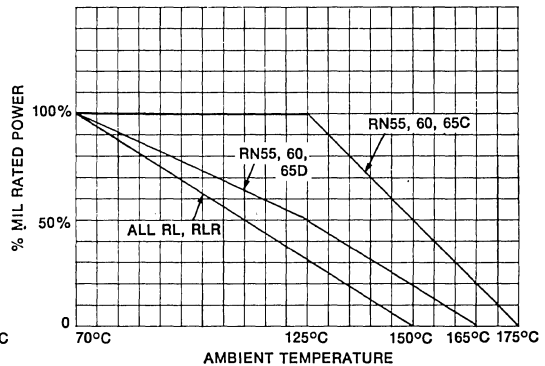


SPECIFICATIONS

COMMERCIAL POWER DERATING—METAL GLAZE
(SEE SPECIFICATION TABLE BELOW)



MIL SPECIFICATION POWER DERATING
(SEE SPECIFICATION TABLE BELOW)



CLASSIFICATION/ CONFIGURATION	IRC TYPE	MIL STYLE	MIL RANGE (Ω)	IRC RANGE (Ω)	TOL. ±%	T.C. (±ppm/°C)	POWER RATING ⁴		VOLTAGE RATING (v)	DIMENSIONS		
							IRC	MIL		L (in.)	D (in.)	LD (in.)
	RG 1/8	RC05 ¹	—	10 – 100K	5	250	1/4 W @ 70°C	1/8 W @ 70°C	200	.150 ± .01	.066 ± .008	.016 ± .002 ⁵
	RG 1/4	RC07 ¹	—	6.2 – 680K	5	250	1/2 W @ 70°C	1/4 W @ 70°C	250	.250 ± .015	.090 ± .008	.025 ± .001
	RG 07	RL07	51 – 150K	10 – 510K	2, 5	200	1/2 W @ 70°C	1/4 W @ 70°C	250	.250 ± .015	.090 ± .008	.025 ± .001
	RG 20	RL20	4.3 – 470K	4.3 – 1M	2, 5	200	1W @ 70°C	1/2 W @ 70°C	350	.390 ± .010	.140 ± .008	.032 ± .002
	RG 32	RL32	10 – 1M	10 – 1M	2, 5	200	1W @ 70°C	1W @ 70°C	500	.562 ± .031	.190 ± .008	.040 ± .002
	RG 42	RL42	10 – 1.5M	10 – 1.5M	2, 5	200	2W @ 70°C	2W @ 70°C	500	.688 ± .040	.318 ± .018	.045 ± .002
Color Banded	RG 2	RC42 ¹	—	10 – 1.5M	5	250	2W @ 70°C	2W @ 70°C	500	.688 ± .040	.318 ± .018	.045 ± .002
	TF 07	RL07 ¹	—	1 – 10	1, 2, 5	100	1/2 W @ 70°C	1/4 W @ 70°C	250	.250 ± .015	.090 ± .008	.025 ± .001
	TF 20	RL20 ¹	—	1 – 10	1, 2, 5	100	3/4 W @ 70°C	1/2 W @ 70°C	350	.390 ± .010	.140 ± .008	.032 ± .002
	T055	RN55D	10 – 301K	10 – 499K	1 ³	100 ³	1/2 W @ 70°C	1/10 W @ 70°C 1/10 W @ 125°C	200	.250 ± .015	.090 ± .008	.025 ± .001
	T255	RN55C	49.9 – 100K	10 – 301K	1 ³	50 ³	1/4 W @ 70°C	1/10 W @ 125°C	200	.250 ± .015	.090 ± .008	.025 ± .001
	T060	RN60D	10 – 1M	10 – 1M	1 ³	100 ³	3/4 W @ 70°C	1/4 W @ 70°C 1/8 W @ 125°C	250	.390 ± .010	.140 ± .008	.025 ± .001
	T260	RN60C	49.9 – 499K	10 – 499K	1 ³	50 ³	3/8 W @ 70°C	1/8 W @ 125°C	250	.390 ± .010	.140 ± .008	.025 ± .001
	T065	RN65D	10 – 1M	10 – 1M	1 ³	100 ³	3/4 W @ 70°C	1/2 W @ 70°C 1/4 W @ 70°C	300	.562 ± .031	.190 ± .008	.025 ± .001
Banded or Stamped	T265	RN65C	49.9 – 348K	10 – 499K	1 ³	50 ³	1/2 W @ 70°C	1/4 W @ 125°C	300	.562 ± .031	.190 ± .008	.025 ± .001
	RGR07	RLR07/R ²	10 – 470K	10 – 470K	2, 5	200	1/4 W @ 70°C	1/4 W @ 70°C	250	.250 ± .015	.090 ± .008	.025 ± .001
	RGR20	RLR20/R ²	4.3 – 1M	4.3 – 1M	2, 5	200	1/2 W @ 70°C	1/2 W @ 70°C	350	.390 ± .010	.140 ± .008	.032 ± .002
	RGR32	RLR32/P ²	10 – 1M	10 – 1M	2, 5	200	1W @ 70°C	1W @ 70°C	500	.562 ± .031	.190 ± .008	.040 ± .002
	RGR42	RLR42/M ²	10 – 1.5M	10 – 1.5M	2, 5	200	2W @ 70°C	2W @ 70°C	500	.688 ± .040	.318 ± .018	.045 ± .002

¹Not QPL listed²Failure rate symbol³See pp. 9–10 for close tolerance & TC⁴See power derating curves above⁵1.00 ± .125 lead length

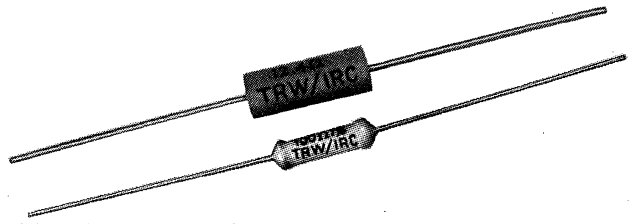
TRW[®] IRC RESISTORS

M&C SERIES HIGH STABILITY METAL FILM RESISTORS

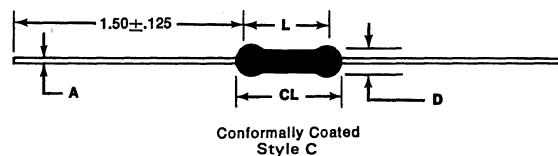
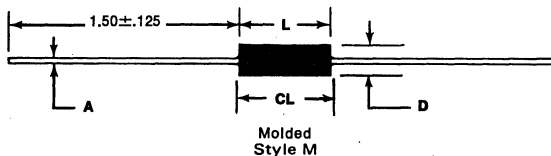
Evolved from the industry's original metal film process. These resistors are manufactured to the tightest controls for best performance with respect to low noise, high stability, and the ultimate in TCs and tolerances for precision applications. Standard tolerances and TCs are available to $\pm 0.1\%$ and $\pm 25 \text{ PPM}/^\circ\text{C}$ respectively. Resistance values are to 100 megohms.

These evaporated metal film resistors will exceed all MIL-R-specification requirements, including the highest reliability level of MIL-R-55182. Voltage coefficient when measured between 1/10 and full rated voltage is typically less than 0.5 PPM/Volt for all values and essentially zero for low and medium values. Typical ΔR for long term life is less than .04%.

The design concept of these resistors offer high strength characteristics for potting applications and automatic insertion.



MIL-R-55182 Char.	IRC T.C. Code	Temperature Coefficient	Temperature Span
K	T0	0 $\pm$ 100PPM/ $^\circ\text{C}$	-55 $^\circ\text{C}$ to +165 $^\circ\text{C}$
H	T2	0 $\pm$ 50PPM/ $^\circ\text{C}$	-55 $^\circ\text{C}$ to +175 $^\circ\text{C}$
J	T9	0 $\pm$ 25PPM/ $^\circ\text{C}$	-55 $^\circ\text{C}$ to +175 $^\circ\text{C}$
	T3	0 to +100PPM/ $^\circ\text{C}$	-55 $^\circ\text{C}$ to +165 $^\circ\text{C}$
	T4	0 to -100PPM/ $^\circ\text{C}$	-55 $^\circ\text{C}$ to +165 $^\circ\text{C}$
	T5	0 $\pm$ 25PPM/ $^\circ\text{C}$	+25 $^\circ\text{C}$ to +145 $^\circ\text{C}$
	T6	0 to +50PPM/ $^\circ\text{C}$	-55 $^\circ\text{C}$ to +165 $^\circ\text{C}$
	T7	0 to -50PPM/ $^\circ\text{C}$	-55 $^\circ\text{C}$ to +165 $^\circ\text{C}$
	T8	0 $\pm$ 25PPM/ $^\circ\text{C}$	+25 $^\circ\text{C}$ to +165 $^\circ\text{C}$
		0 $\pm$ 35PPM/ $^\circ\text{C}$	-55 $^\circ\text{C}$ to +25 $^\circ\text{C}$
	TR	0 to +100PPM/ $^\circ\text{C}$	-55 $^\circ\text{C}$ to +165 $^\circ\text{C}$
		0 to -250PPM/ $^\circ\text{C}$	-55 $^\circ\text{C}$ to +165 $^\circ\text{C}$
	TE	0 to +100PPM/ $^\circ\text{C}$	-55 $^\circ\text{C}$ to +165 $^\circ\text{C}$
		0 to -500PPM/ $^\circ\text{C}$	-55 $^\circ\text{C}$ to +165 $^\circ\text{C}$



PERFORMANCE AND DIMENSIONS

IRC TYPE	MIL TYPE	RNR MIL CHAR	IRC T.C. CODE	MIL RESISTANCE RANGE (Ohms)	IRC RESISTANCE RANGE (Ohms)	MIL POWER RATING (Watts) 70 $^\circ\text{C}$ 125 $^\circ\text{C}$		MIL VOLTAGE RATING (Volts)	DIMENSION IN INCHES					BODY STYLE
									Body Length (L)	Body Diameter (D)	Max. Clean Lead Length (CL)	Lead Gage (A)		
MMC	RNR50 RN50+	K H, J	T0 T2, T9	10-100K 49.9-100K	10-3.2 MEG 49.9-1.1 MEG	1/8	1/2	200	.150 $\pm$.020	.065 $\pm$.010	.200	#26** .016		C
CEA	RN55+	—	T0 T2, T9	—	10-6.5 MEG 30.1-2.3 MEG	1/8	1/2	200	.250 $\pm$.031	.090 $\pm$.010	.325	#22 .0253		C
CCM	RNR55 RN55+	K H, J	T0 T2, T9	20-200K 49.9-200K	20-6.3 MEG 30.1-2.2 MEG	1/8	1/2	200	.250 $\pm$.031	.088 $\pm$.010	.325	#22 .0253		C
MCM	—	—	T0 T2, T9	—	20-301K 30.1-301K	1/8	1/2	200	.250 $\pm$.031	.093 $\pm$.005	.310	#22 .0253		M
CCA	RNR60 RN60+	K H, J	T0 T2, T9	24.9-499K 49.9-499K	10-13 MEG 49.9-4.5 MEG	1/4	1/2	250	.400 $\pm$.031	.140 $\pm$.020	.540	#22 .0253		C
MEA	RN60+	—	T0 T2, T9	—	10-6.5 MEG 30.1-2.3 MEG	1/4	1/2	250	.406 $\pm$.015	.130 $\pm$.010	.545	#22 .0253		M
MEB	RN65+	—	T0 T2, T9	—	10-13 MEG 49.9-4.5 MEG	1/2	1/4	300	.594 $\pm$.015	.203 $\pm$.015	.733	#22 .0253		M
CCB	RNR65 RN65+	K H, J	T0 T2, T9	24.9-1 Meg 49.9-1 Meg	10-24 MEG 49.9-8.4 MEG	1/2	1/4	300	.594 $\pm$.031	.180 $\pm$.020	.734	#22 .0253		C
MEC	RN70+	—	T0 T2, T9	—	10-24 MEG 24.9-8.4 MEG	3/4	1/2	350	.719 $\pm$.020	.261 $\pm$.020	.863	#20 .032		M
CEC	—	—	T0 T2, T9	—	10-24 MEG 49.9-8.4 MEG	1	1/2	350	.594 $\pm$.031	.180 $\pm$.020	.734	#20 .032		C
MEF	RN75+	—	T0 T2, T9	—	49.9-55.5 MEG 49.9-19.5 MEG	1	1	500	1.105 $\pm$.020	.395 $\pm$.020	1.253	#20 .032		M
MEH	RN80+	—	T0 T2, T9	—	100-148 MEG 100-52 MEG	2		750	2.254 $\pm$.020	.395 $\pm$.020	2.378	#20 .032		M

*Gold plated Dumet leads. 100" $\pm$.062" **Lead length, 1.00" $\pm$.062"

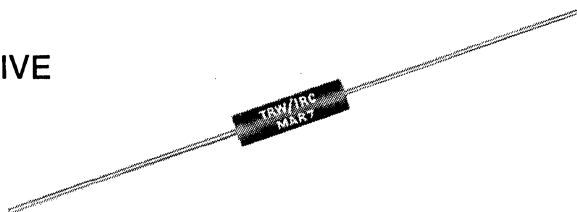
TRW[®] IRC RESISTORS

MAR ULTRA PRECISION, NON-INDUCTIVE METAL FILM RESISTORS

"Where speed and precision count"

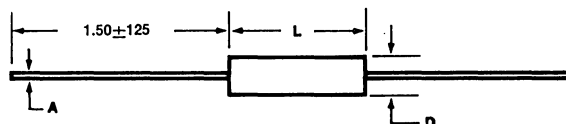
MAR ultra-precision resistors have all of the advantages of evaporated metal film resistors and in addition, precision tolerances to .01% and temperature coefficients to 5 PPM/°C are standard. The inherent low inductance and low capacitance of this design make it ideally suited to high-speed applications requiring a high degree of stability. The rugged epoxy encapsulation provides excellent environmental protection.

Tailored TCs from -100 PPM/°C to +150 PPM/°C are available with TC tolerances to ± 5 PPM/°C.



TYPICAL PERFORMANCE

Load Life 1000 hrs. @ 85°C	.01% ΔR
Temperature Cycle	.002% ΔR
Humidity	.02% ΔR
Noise Index	-40 db
Voltage Coefficient	.02ppm/volt
1 year shelf life	± 15 ppm



PERFORMANCE AND DIMENSIONS

IRC TYPE	RESISTANCE RANGE* (Ohms)	TEMPERATURE COEFFICIENTS -20°C to +85°C ($\pm$ ppm/°C)	TOLERANCES ($\pm$ %)	POWER RATING** @ 85°C (Watts)	VOLTAGE RATINGS (Volts)	DIMENSIONS IN INCHES		
						Body Length (L Max.)	Body Diameter (D Max.)	Lead Gage (A)
MAR3	20 — 100K	T10 = 15	1.00, 0.50, 0.25,	$\frac{1}{2}$ o	200	.191	.082	#26 .016†
MAR5	20 — 250K	T13 = 10	0.10, 0.05, 0.02,	$\frac{1}{4}$ o	250	.281	.102	#22 .025
MAR6	20 — 500K	T16 = 5	0.01	$\frac{1}{8}$	300	.425	.155	#22 .025
MAR7	20 — 1 Meg			$\frac{1}{4}$	500	.650	.195	#22 .025

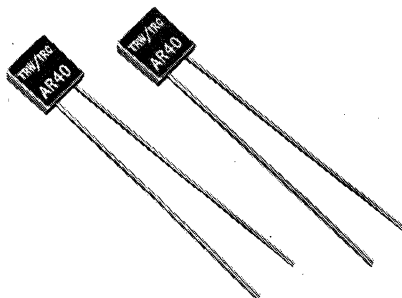
*Wider ranges available, contact factory.

**Higher power ratings available. Contact factory.

†Thread length 1.00 $\pm$.062.

AR40 ULTRA-PRECISION METAL FILM RESISTORS

The AR40 ultra-precision metal film resistor is designed to satisfy those critical design requirements where virtually zero temperature coefficient, stability and absolute accuracy are needed. Temperature coefficients of ± 5 PPM/°C and ± 2 PPM/°C are standard. Standard tolerances are available to .01%. The radial lead design and small case size require a minimum of printed circuit board space. Proven end cap termination assures essentially no degradation during normal circuit board insertion practices.



PERFORMANCE AND DIMENSIONS

TCR CLASS.	STANDARD TEMP. COEFF. (°C)	RESISTANCE RANGE* (Ohms)	STANDARD TOLERANCE ($\pm$ %)	WATTAGE 85°C	DIMENSIONS IN INCHES	
T-18	2 ppm 0 to 60°C 5 ppm -55 to 125°C	20 to 100K	.01, .02, .05, .10, .25, .50, 1.00	.3 watts	Height	.320 $\pm$.020
T-16	5ppm 0 to 60°C 10 ppm -55 to 125°C				Length	.295 $\pm$.010
					Width	.100 $\pm$.010
					Lead spacing	.150 $\pm$.010
					Lead gage #22	.0253**

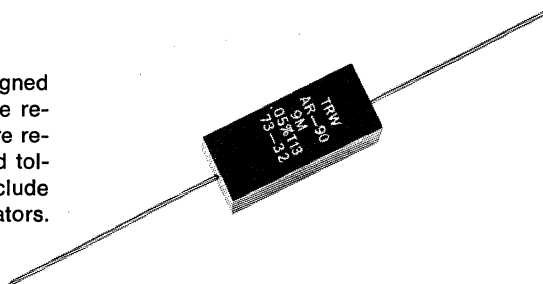
*Wider ranges available, contact factory.

**Lead Length 1.00 minimum

TRW[®] IRC RESISTORS

AR 90 ULTRA-PRECISION HIGH RANGE RESISTORS

The AR90 ultra precision metal film resistor is designed to satisfy those critical design requirements where resistance values between 1 meg Ω and 10 meg Ω are required. Temperature coefficients to 5 PPM/ $^{\circ}$ C and tolerances to .05% are standard. Applications include ultra precision voltage dividers and input attenuators.



PERFORMANCE AND DIMENSIONS

IRC TYPE	RESISTANCE RANGE* (ohms)	TEMPERATURE COEFFICIENTS -20 $^{\circ}$ C to +85 $^{\circ}$ C ($\pm$ PPM/ $^{\circ}$ C)	TOLERANCES	POWER RATING	VOLTAGE RATING	BODY DIMENSIONS (IN.)			
						LENGTH	DEPTH	HEIGHT	LEAD
AR90	1M - 10M	T10 = 5 T13 = 10 T16 = 15	1.0, 0.5, 0.25, 0.1, 0.05	.5W	1000	1.0	0.4	0.4	#22

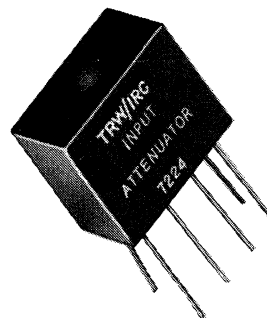
*Wider ranges available. Contact factory.

AR ULTRA-PRECISION RESISTOR NETWORKS

AR Resistor Networks provide the best performance and packaging density for a circuit requiring multiple, inter-dependent precision resistors. The rugged epoxy encapsulation provides maximum environmental protection. AR networks are designed to specific circuit requirements using one of the standard sizes available or special sizes where required.

Features include:

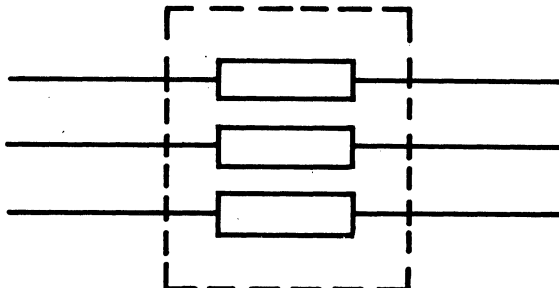
- Lower Effective Cost
- High Density Packaging
- Ratio Matching to 0.005%
- Resistors thermally tied together
- Deliveries comparable to discretes
- All-welded construction
- TC Matching to ± 1 PPM/ $^{\circ}$ C



AR MATCHED RESISTOR SETS

AR Matched Resistor Sets provide ultra-precision resistor performance at the lowest possible cost. Tolerance matching to 0.005% and TC matching to 1 PPM/ $^{\circ}$ C can be specified.

Any TRW/IRC metal film resistors may be obtained as matched sets. The AR series, MAR and AR40 styles are recommended for the most precise tolerance and TC matching requirements.

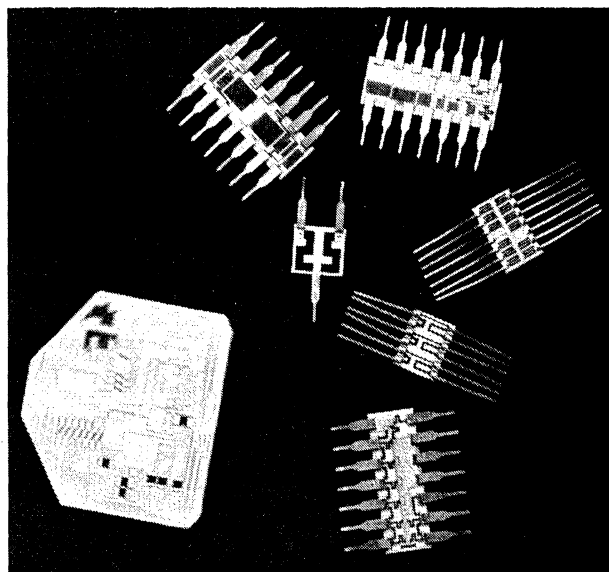


TRW[®] IRC RESISTORS

TaNFilm[™] PRECISION FILM RESISTOR NETWORKS

TRW/IRC TaNFilm precision subminiature resistor networks are made of sputtered tantalum nitride, using proprietary equipment and processes.

TaNFilm is inherently resistant to electrolytic attack, since each resistor is passivated with an anodized surface layer. The processes used in manufacture allow routine tolerances of 0.1% and make tolerances of 0.05% economically feasible. The continuous sputtering process makes TaNFilm very uniform, so resistors track over the full temperature range to a few parts per million. Many hours of test data allow accurate performance prediction. A variety of networks are available, and others can be fabricated to your packaging requirements. Standard configurations are the DIP sandwich pack shown on page 16, and TO-88 type flat packs.



TYPICAL TaNFilm Design CRITERIA¹

Resistance Value	50Ω to 100,000Ω	Drift	≤ 0.25% per year
Tolerance	± 0.05% to ± 1.0%	Noise	≤ -25dB
TCR	-100 ± 25 ppm/°C	Voltage Coefficient	≤ 5 ppm/V
TCR Tracking	to 5 ppm/°C	Series Inductance	≤ 5 nH
Settling Time	to 20nSec.	Shunt Capacitance	≤ 0.1 pF

¹These are not absolute units. Contact factory for your specific requirements.

RESISTOR NETWORKS DUAL IN-LINE PACKAGE

TRW/IRC TaNFilm* resistor networks utilize a Tantalum Nitride resistor film deposited on a high alumina ceramic substrate. Units are molded in standard TO-116 DIP form-factor with 14 and 16 pin terminations.

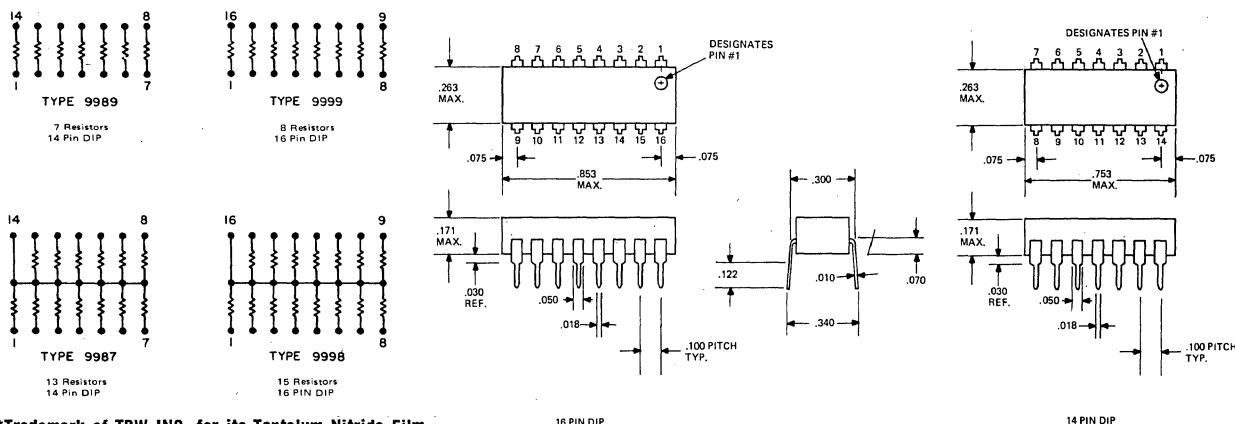
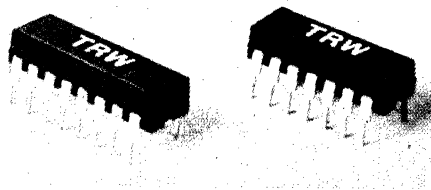
Styles

- 9989 = 7 resistors of equal value, 14 pin DIP
- 9999 = 8 resistors of equal value, 16 pin DIP
- 9987 = 13 resistors of equal value, 14 pin DIP
- 9998 = 15 resistors of equal value, 16 pin DIP

Resistance Values

Types 9987 and 9998
50Ω to 50KΩ

Types 9989 and 9999
50Ω to 100KΩ



*Trademark of TRW INC. for its Tantalum Nitride Film.

TRW[®] IRC RESISTORS

TANFILM[®] R-2R LADDERS

- 12 BIT RESOLUTION
- FULL MIL PERFORMANCE
- TWO PACKAGE STYLES
- FOUR RESISTANCE VALUES
- 12 BIT OR 10 BIT ACCURACY

DESIGN

These 12 Bit R-2R Ladders feature the inherent passivation, low noise and premium performance of TanFilm. They provide $\pm 1/2$ LSB accuracy over the full mil temperature range (-55 to $+125^{\circ}\text{C}$) and retain this accuracy after long operating life in extreme environments. Unlike competitive devices this military grade performance demands no price premium. TanFilm networks provide hermetic performance without the cost and disadvantages of hermetic sealing, because the tantalum nitride film is anodically passivated.

Resistors are sputtered tantalum nitride on 99.5% Alumina ceramic and are anodically passivated. Interconnections are 99.9% pure gold and the gold plated leads are welded to the interconnection film. Complete absence of silver and solder provides absolute insurance against silver and tin migration. The 5430 series features standard dual in-line packaging with rugged, gold plated, copper alloy, shouldered leads for ease of insertion. The 5420 series has two rows of leads .900" apart and is pin compatible with Beckman 811 series networks. The 5200 series are identical with the 5400 except for accuracy.

CIRCUIT AND APPLICATION

The circuit and pinout diagram is shown on the right. The characteristic "R" value may be 5K, 10K, 20K or 25K. Other values may be provided on special order. Standard switch compensation of 5 ohms is built into the four most significant bits. This also may be changed on special order. Three extra application resistors are provided for bipolar operation, Op Amp feedback or output attenuation. Switch or offset compensation may be provided in these resistors if required.

SPECIFICATIONS:

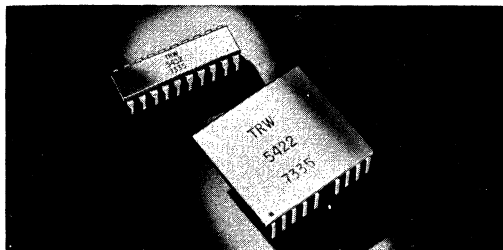
Ladder Resistance Values (R)	5K, 10K, 20K, 25K
Ladder Resistance Tolerance	$\pm 1\%$
Maximum Input Voltage	20V
Settling Time (to 0.1% of final value)	100n sec.
External Switch Compensation (Note 1)	5 Ω
Temperature Range	-55° to 125°C
Ladder Voltage Accuracy	P/N 5200 is ± 488 ppm; 5400 is ± 122 ppm
Application Resistor Voltage Ratio	P/N 5200 is ± 488 ppm; 5400 is ± 122 ppm
Lead Material	Gold Plated Copper Alloy

STABILITY

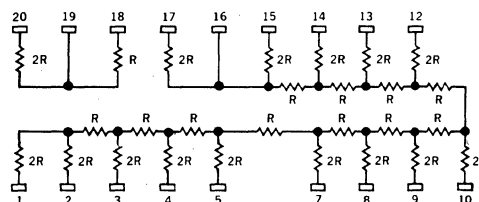
TanFilm 12 Bit Ladders Exhibit specified Maximum Voltage Ratio Error after the following tests:

Operating Life	1000 Hrs. Full Load 100°C
Short Time Overload	10 Seconds 2.5 x Rated Voltage
Thermal Shock	10 Cycles -65°C to $+150^{\circ}\text{C}$
Temperature Cycling	10 Cycles -65°C to $+150^{\circ}\text{C}$
Moisture Cycle - Load/Polar	10 Days 90/98% R.H. Full Load (202-106)
Soldering Heat	10 Seconds @ 260°C
Shock	3000 g's for 0.2 Milliseconds
Vibration	20 g's
Terminal Strength	Per Mil 202-211B

NOTE 1 — CONSULT FACTORY FOR OTHER SWITCH COMPENSATION

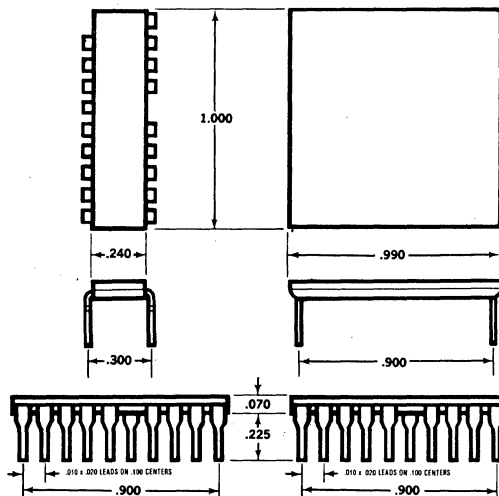


CIRCUIT DIAGRAM



5430
SERIES

5420
SERIES



MARKING

TRW 5XXX
5K - 5R
7332

← Mfg. and Part #
← Resistance & Switch R
← Date Code

ORDERING INFORMATION

Style	Resistance	5K	10K	20K	25K
5420 Series	Part #	5421	5422	5423	5424
5430 Series	Part #	5431	5432	5433	5434
5220 Series	Part #	5221	5222	5223	5224
5230 Series	Part #	5231	5232	5233	5234

TRW[®] IRC RESISTORS

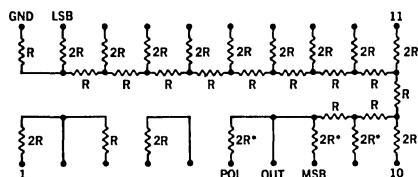
TANFILM[®] R-2R LADDERS

PART & DESCRIPTION

CIRCUIT

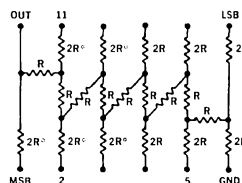
PACKAGE

5512 12 BIT R=10K
5516 12 BIT R=2K
Accuracy $\frac{1}{2}$ LSB
*-15 Ω SWITCH RESISTANCE



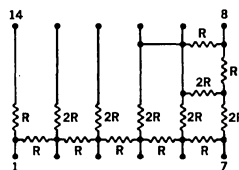
20 PIN
D.I.P.

5445 10 BIT $\frac{1}{8}$ LSB (12 BIT ACCURACY)
5245 10 BIT $\frac{1}{2}$ LSB (10 BIT ACCURACY)
5045 10 BIT 2 LSB (8 BIT ACCURACY)
R=50K
*-150 Ω SWITCH RESISTANCE



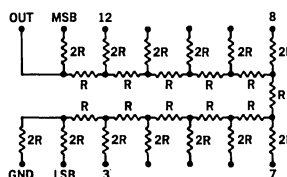
12 PIN
D.I.P.

1045 8 BIT CURRENT SUMMING LADDER
R=500 Ω
RATIO ACCURACY .25% BALANCED



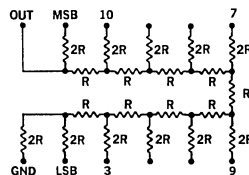
14 PIN
D.I.P.

12 BXXE* 12 BIT R=5K, 25K, 50K
ACCURACY $\frac{1}{2}$ LSB
SWITCH COMPENSATION AVAILABLE



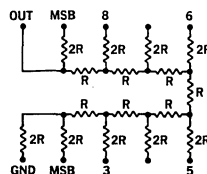
14 PIN
FLAT PACK
.370" x .250"

10 BXXE* 10 BIT R=5K, 25K, 50K
ACCURACY $\frac{1}{2}$ LSB
SWITCH COMPENSATION AVAILABLE



12 PIN
FLAT PACK
.320" x .250"

8 BXXE* 8 BIT R=5K, 25K, 50K
ACCURACY $\frac{1}{2}$ LSB



10 PIN
FLAT PACK
.270" x .250"

*XX INDICATES R VALUE — 05=5K, 25=25K, 50=50K

NOTE: D.I.P. LEADS ON .100 CENTERS, FLAT PACK RIBBON LEADS ON .050" CENTERS

TRW/IRC RESISTORS, AN ELECTRONIC COMPONENTS DIVISION OF TRW INC., 401 N. BROAD ST., PHILADELPHIA, PA. 19108 (215) 922-8900

TRW[®] IRC RESISTORS

TaNFilm[®] 10 BIT BCD ARRAY

- FULL MIL PERFORMANCE
- TWO PACKAGE STYLES
- COMPATIBLE WITH FAIRCHILD μ A722

DESIGN

These BCD Arrays feature the inherent passivation, low noise and premium performance of TaNFilm. They exhibit the specified accuracy over the full Mil temperature range (-55 to $+125^{\circ}\text{C}$) and retain this accuracy after long operating life in extreme environments. Unlike competitive devices this military grade performance demands no price premium. TaNFilm networks provide hermetic performance without the cost and disadvantages of hermetic sealing, because the tantalum nitride film is anodically passivated.

Resistors are sputtered tantalum nitride on 99.5% Alumina ceramic and are anodically passivated. Interconnections are 99.9% pure gold and the gold plated leads are welded to the interconnection film. Complete absence of silver and solder provides absolute insurance against silver and tin migration. Part No. 1107 features standard dual in-line packaging with rugged, gold plated, copper alloy, shouldered leads for ease of insertion. Part No. 1105 has two rows of leads .900" apart and is compatible with Beckman Model 863 networks.

CIRCUIT AND APPLICATION

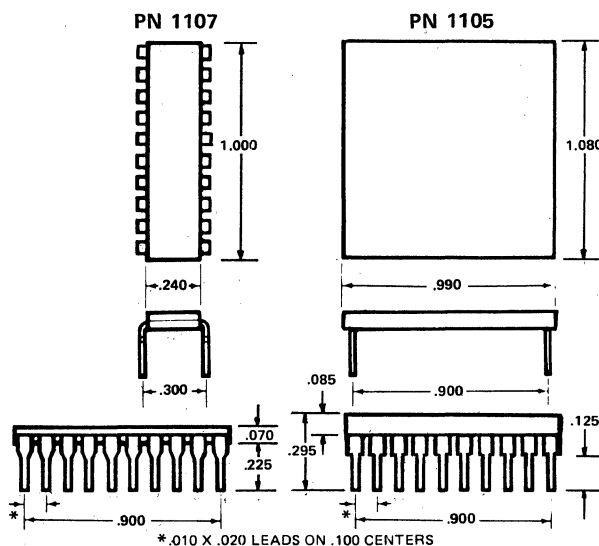
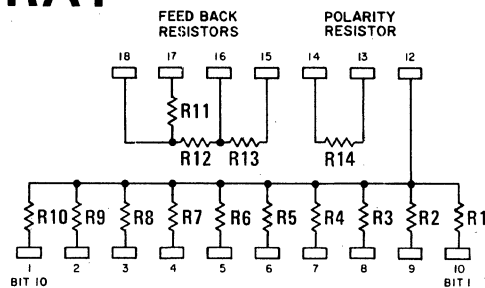
The circuit and pinout diagram is shown on the right. The resistance values are as specified in the Fairchild μ A 722 Data Sheet and the layout is compatible with the Fairchild layout. In addition to the 10 basic current controlling resistors, four application resistors are provided for bipolar operation, feedback or output scaling.

Resistor	Value K ohms	Ratio to R1	Max. Ratio Error
R1	2.547	—	—
R2	5.094	2.000	0.05%
R3	6.379	2.5045	0.05%
R4	12.83	5.036	0.1%
R5	25.80	10.13	0.25%
R6	51.03	20.03	0.5%
R7	63.36	24.88	1.0%
R8	126.3	49.57	2.0%
R9	250.1	98.17	2.0%
R10	495.0	194.3	5.0%
R11	1.5	Note 1	Note 2
R12	3.0	Note 1	Note 2
R13	3.0	Note 1	Note 2
R14	4.0	Note 1	Note 2

Note 1: Absolute tolerance $\pm 1.0\%$

Note 2: TRC Ratio to R1 20 PPM/ $^{\circ}\text{C}$

CIRCUIT DIAGRAM



MARKING

TRW 1105 (or 1107) ← Mfg. and Part #
7442 ← Date Code

SPECIFICATIONS:

Operating Temperature -55°C to 100°C

Storage Temperature -65°C to 150°C

Temperature Coefficient of Resistance -
 -75 to -125 PPM/ $^{\circ}\text{C}$

Maximum Input Voltage - 20V

Maximum Dissipation/Resistor - 50 mW

STABILITY

TaNFilm BCD Arrays will meet the specified maximum ratio errors after the following tests:

Operating Life - 1000 Hours Full Load 100°C

Short Time Overload 10 Sec. 2.5 X rated voltage

Thermal Shock - 50 cycles -65°C to 150°C

Temperature Cycle - 50 cycles -65°C to 150°C

Moisture Cycle-Load/Polar - 10 cycles Mil 202-106

Soldering Heat - 10 seconds @ 260°C

Shock - 3000 gs for 0.2 milliseconds

Vibration - 20 gs

Terminal Strength - Per Mil 202-2113

TRW[®] IRC RESISTORS

MV GENERAL PURPOSE HIGH VOLTAGE RESISTORS

MV resistors are designed for high voltage requirements where high resistance and power are needed. TRW/IRC's exclusive composition film type resistance coating is applied in helical form on a ceramic tube to provide a conducting tube of long effective length.

MV resistors are particularly suited for voltmeter multipliers, bleeders, electrostatic filters, X-ray equipment, probes, voltage dividers, TV high voltage circuits, and similar applications.

WITH LUG TERMINALS, COLLOIDAL SILVER TERMINALS OR AXIAL LEADS

IRC TYPE	TERMINAL TYPE	POWER RATING (Watts)	PEAK VOLTAGE RATING* (KV)	MINIMUM AVAILABLE RESISTANCE		MAXIMUM AVAILABLE RESISTANCE (Mega)	DIMENSIONS IN INCHES			Widths of Silver Bands #15 Term.
				±10% or ±20% Tolerance	±5% Tolerance		Resistor Body Length	Resistor Body Diameter	Ceramic Inside Diameter	
MVC-1	±**	1	3.5	10K	100K	1,000	1.00±.03	.31±.03	Thd. #6-32	N/A
MVC-2	±**	2	7.5	25K	100K	1,000	1.75±.03	.31±.03	Thd. #6-32	N/A
MVC-3	±**	3	15.0	100K	100K	1,000	3.00±.03	.31±.03	Thd. #6-32	N/A
MVC-5	±**	5	30.0	100K	200K	1,000	5.50±.06	.31±.03	Thd. #6-32	N/A
MX-1/2	Axial Leads	1/2	1.5	100K	100K	250	.69±.03	.25±.03	N/A	N/A
MX-1	Axial Leads	1	3.5	100K	100K	1,000	1.00±.03	.25±.03	N/A	N/A
MX-1 1/2	Axial Leads	1.5	7.5	100K	100K	1,000	1.57±.03	.25±.03	N/A	N/A
MX-2	Axial Leads	2	10.0	100K	100K	1,000	2.00±.03	.25±.03	N/A	N/A
MX-3	Axial Leads	3	15.0	100K	100K	1,000	3.00±.06	.25±.03	N/A	N/A
MVH-2	±	4	15.0	100K	150K	1,000	2.50±.06	.56±.03	Thd. #6-32	N/A
MVH-4	±	6	25.0	100K	400K	1,000	4.00±.06	.56±.03	Thd. #6-32	N/A
MVF	12	2	5.0	25K	100K	1,000	1.75±.03	.31±.03	.19±.03	.38±.03
MVP	12, 15, 16, 17	10	15.0	100K	400K	1,000	4.50±.06	.75±.03	.50±.03	.56±.06
MVA	15, 16, 17	20	25.0	200K	1.0meg	1,000	3.50±.06	1.12±.03	.75±.03	.56±.06
MVO	15, 16, 17	30	50.0	400K	2.0meg	1,000	10.5±.06	1.12±.03	.75±.03	.56±.06
MVQ	15, 17	50	50.0	500K	3.5meg	1,000	10.5±.12	2.00±.05	1.56±.03	.88±.06
MVR	15, 17	90	100.0	1meg	7.0meg	1,000	18.5±.12	2.00±.05	1.56±.03	.88±.06

±Solder lug or screw mounted

*Rated continuous working voltage determined by $E = \sqrt{PR}$

E should not exceed value listed in column above

**Also available with axial leads

E = Max. continuous voltage

P = Power in watts

R = Resistance in ohms

TRW/IRC RESISTORS, AN ELECTRONIC COMPONENTS DIVISION OF TRW INC., P.O. BOX 393, BOONE, N.C. 28607 (704) 264-8861

CR SEMI-PRECISION CARBON ALLOY RESISTORS HIGH TEMPERATURE/HIGH VOLTAGE

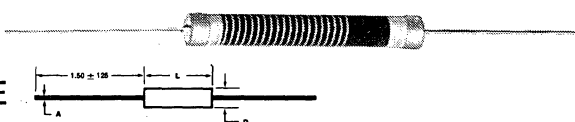
CR resistors are economically priced, high-voltage/high-temperature resistors developed for ballast and bleeder applications. This resistor series was originally designed to operate in inert, vacuum, or oil environments. Construction is completely inorganic with no outgassing, and these uncoated carbon alloy resistors will withstand an open flame of 1600°F.

CR resistors are currently being manufactured in three sizes. Other sizes and protective coatings are available upon request.

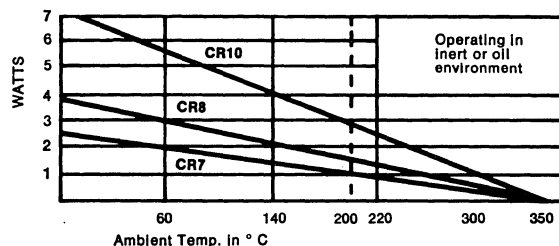
PERFORMANCE AND DIMENSIONS

IRC TYPE	RESISTANCE RANGE (Ohms)	TOLERANCE (±%)	OPERATING TEMPERATURE (°C)	POWER RATING @ 200°C* (Watts)	VOLTAGE RATING* (Volts)	DIMENSIONS IN INCHES		
						Body Length (L Max.)	Body Diameter (D Max.)	Lead Gage (A)
CR6	1Ω—5 Meg	2-5	-65 to ±350	.5	1,000	.342	.095	#22 .025
CR7	500—25 Meg	5	-65 to ±350	1	8,000	.580	.157	#20 .032
CR8	1K—50 Meg	5	-65 to ±350	1.5	12,500	.938	.157	#20 .032
CR9	2K—100 Meg	5	-65 to ±350	2	12,500	.938	.300	#20 .032
CR10	2K—200 Meg	5	-65 to ±350	3	15,000	2.125	.328	#20 .032

*Voltage and wattage dependent on resistance, operating temperature and environment (i.e. Oil, Air, Vacuum, Inert, etc.)



DERATING CURVE



TRW[®] IRC RESISTORS

CGH PRECISION HIGH RANGE, HIGH VOLTAGE METAL GLAZE RESISTORS

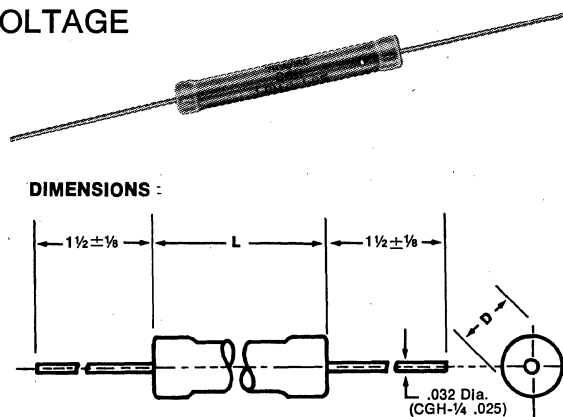
The CGH resistor uses the superior qualities of precision thick film, fired at high temperatures on an extremely stable ceramic substrate. This results in a resistor capable of operating in high ambient temperatures and with excellent high voltage load stability.

CGH resistors are particularly suited for precision high voltage and high impedance applications, such as voltage multipliers, X-ray equipment, and high voltage power supplies where precision tolerances and TCs are required.

SPECIFICATIONS

TRW TYPE	Power Rating @ 110°C (Watts)	VOLTAGE RATING (Volts)	RESISTANCE RANGE (Ohms)	T.C.*
CGH-¼	¼	1,500	301K-20 Meg ohms	T0,T2
CGH-½	½	3,000	500K-40 Meg ohms	T0,T2
CGH-1	1	3,500	1 Meg-100 Meg ohms	T0,T2
CGH-2	2	7,500	1 Meg-200 Meg ohms	T0,T2
CGH-3	3	15,000	1 Meg-300 Meg ohms	T0,T2
CGH-5	5	20,000	1 Meg-500 Meg ohms	T0,T2

*T0 = ±100 PPM, T2 = ±50 PPM. ±200 PPM also available.



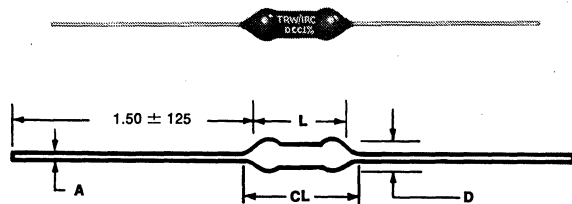
DIMENSIONS :

TRW TYPE	Dimensions in Inches	
	Body Length (L)	Body Diameter (D)
CGH-¼	0.250 ± .031	0.088 ± .010
CGH-½	0.375 ± .031	0.138 ± .016
CGH-1	0.690 ± .062	0.297 ± .031
CGH-2	1.060 ± .062	0.297 ± .031
CGH-3	2.062 ± .062	0.297 ± .031
CGH-5	3.062 ± .062	0.297 ± .031

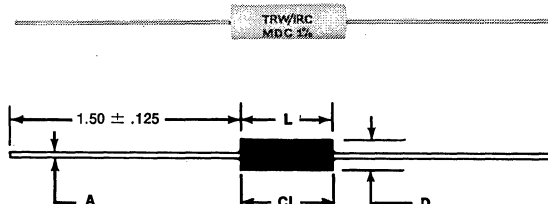
TRW/IRC RESISTORS, AN ELECTRONIC COMPONENTS DIVISION OF TRW INC., P.O. BOX 393, BOONE, N.C. 28607 (704) 264-8861

DC AND MD DEPOSITED CARBON FILM RESISTORS

CONFORMALLY COATED (C) PAINT COATED (P)



MOLDED (M)



IRC TYPE	MIL TYPE	MIL CHAR.	MIL RESISTANCE RANGE (Ohms)	STD. RESISTANCE RANGE* (Ohms)	POWER RATING (Watts)		VOLTAGE RATING (Volts)	Body Length (L)	DIMENSIONS IN INCHES			BODY STYLE
					40° C	70° C			Body Diameter (D)	Max. Clean Lead Length (CL)	Lead Gage (A)	
DCC	RN20	X	10 - 2 Meg	10 - 25 Meg	½	½	350	.594 ± .031	.180 ± .020	.750	#20 .032	C
DCF	RN25	X	10 - 2.49 Meg	10 - 50 Meg	1		500	.938 ± .062	.297 ± .031	1.250	#20 .032	P
DCH	RN30	X	30.1 - 10 Meg	15 - 100 Meg	2		750	2.062 ± .062	.297 ± .031	2.375	#20 .032	P
MDA	RN60	D	10 - 1 Meg	10 - 5 Meg		¼	300	.406 ± .015	.130 ± .010	.545	#22 .0253	M
MDB	RN65	D	10 - 2 Meg	10 - 5 Meg		½	350	.594 ± .015	.203 ± .015	.733	#22 .0253	M
MDC	RN70	D	10 - 2.49 Meg	10 - 25 Meg		1	500	.719 ± .020	.261 ± .020	.863	#20 .032	M
MDF	RN75	B	10 - 5.11 Meg	10 - 50 Meg		1	500	1.105 ± .020	.395 ± .020	1.253	#20 .032	M
MDH	RN80	B	30.1 - 10 Meg	15 - 100 Meg		2	750	2.234 ± .020	.395 ± .020	2.376	#20 .032	M

*These high resistance values, being above the highest MIL-R-10509 top values, have higher temperature coefficients, but otherwise are designed to meet the requirements of the specification. These high re-

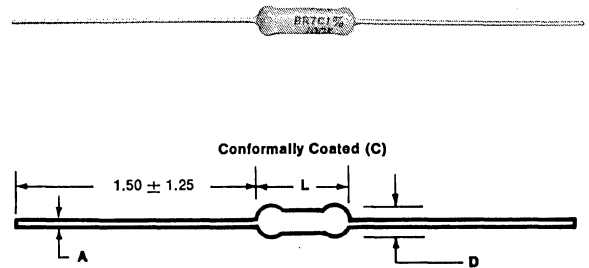
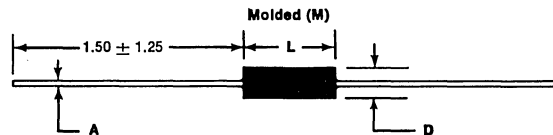
sistance values must be measured carefully under controlled conditions of humidity and temperature, to reduce possible variations due to test conditions and temperature coefficients. Due to higher tempera-

ture coefficient, value above approximately two times MIL maximum will be supplied with a standard tolerance of ±2.0%.

TRW[®] IRC RESISTORS

BR HIGH POWER DENSITY PRECISION THIN FILM RESISTORS

The BR series precision metal film power resistors offer an excellent power-to-size ratio, high frequency response, and exceptionally stable performance. They have power ratings 50% to 100% greater for a given size than formerly was available in metal films. This increased capability is obtained with no performance degradation.



SPECIFICATIONS

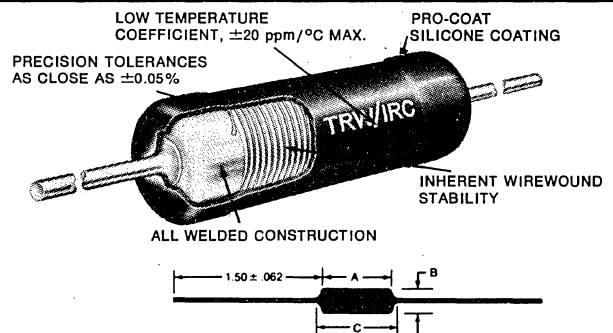
IRC TYPE	RESISTANCE RANGE (Ohms)	TEMPERATURE COEFFICIENT (±ppm/°C)	TOLERANCE (±%)	POWER RATING @ 25°C* (Watts) See Note 4	VOLTAGE RATING (Volts)	DIMENSIONS IN INCHES		
						Body Length (L Max.)	Body Diameter (D Max.)	Lead Gage (A)
BR-3C	10-25K	25, 50, 100	1, 0.5, 0.25, 0.1	1	200	.152±.020	.065±.010	#26 .016
BR-4C	20-100K			1½	300	.250±.031	.088±.010	#22 .0253
BR-4M	20-100K			1½	300	.250±.031	.093±.005	#22 .0253
BR-5M	10-500K			2	300	.406±.015	.130±.010	#22 .0253
BR-7C	10-1Meg			3	525	.594±.031	.180±.020	#20 .032
BR-7M	10-1Meg			3	525	.719±.020	.261±.020	#20 .032
BR-9C	10-5Meg			5	750	.960±.031	.310±.020	#20 .032
BR-9M	10-5Meg			5	750	1.105±.020	.395±.020	#20 .032

NOTES: 1. Derated power rating by 50% for ±0.1% tolerance. 2. BR-3C lead length 1.00±.062. 3. Molded units (M) are flame proof. 4. Power rating and derating is dependent on mounting conditions. Consult factory for mounting information.

TRW/IRC RESISTORS, AN ELECTRONIC COMPONENTS DIVISION OF TRW INC., P.O. BOX 887, BURLINGTON, IOWA 52601 (319) 754-8491

AS MINIATURE PRECISION POWER WIREWOUND RESISTORS

Type AS resistors expand circuit design limits significantly by carrying full power even at 125°C ambient. These resistors meet MIL Characteristic V (MIL-R-26) with an allowable 350°C hot spot. They also feature TRW's Pro-Coat silicone coating, offering high heat capability in a tough, smooth, solvent-resistant coating with high dielectric strength. Available in standard or non-inductive windings.



SPECIFICATIONS

IRC TYPE	STYLES MIL-R-26	IRC POWER RATING 350°C Max. HOT SPOT (Watts)		COMMERCIAL RANGE (Ohms)		VOLTAGE RATING (Volts)	NON-INDUCTIVE RANGE (Ohms)		DIMENSIONS IN INCHES			
		125°C	25°C	Min.	Max.		Min.	Max.	DIM. A ±.032	DIM. B ±.032	DIM. C MAX.	LEAD DIA.
AS-¼		0.25	0.5	1.0	3.4K	70	*	*	.250	.062	.312	.020
AS-½		0.5	1	0.5	6K	100	*	*	.312	.062	.375	.020
AS-1	RW70U	1	2	0.1	7.5K	130	0.1	3.8K	.375	.093	.450	.020
AS-2	RW69V RW79U	2	3	0.1	20K	140	0.5	10K	.500	.218	.625	.032
AS-2A		2.5	4	0.1	42.1K	300	0.5	21K	.812	.187	.937	.032
AS-2B		3	4	0.1	24K	185	0.5	12K	.562	.187	.687	.032
AS-3		3	5	0.1	30K	200	0.5	15K	.687	.250	.812	.040
AS-5	RW74U RW67V	5	7	0.1	60K	400	0.8	30K	.875	.312	1.000	.040
AS-7		7	9	0.1	90K	600	1.0	45K	1.250	.312	1.375	.040
AS-10	RW88V RW78U	10	14	0.1	175K	1000	3.0	50K	1.812	.375	1.937	.040
ASC-10	RW55V	7	10	0.1	90K	600	1.0	45K	1.375	.468	1.468	.040
ASC-15	RW56V	10	15	0.1	175K	1000	3.0	50K	2.000	.468	2.093	.040

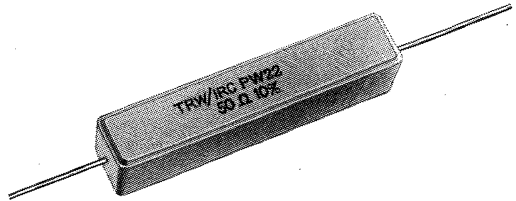
*Inductance on AS-¼ and AS-½ is less than 1µH at 1 MHz. Tolerance available, ±5, 3, 1, and > 0.1%

TRW/IRC RESISTORS, AN ELECTRONIC COMPONENTS DIVISION OF TRW INC., P.O. BOX 393, BOONE, N.C. 28607 (704) 264-8861

TRW[®] IRC RESISTORS

PW GENERAL PURPOSE FIREPROOF POWER RESISTORS

Type PW resistors are available in eight ratings: 2, 3, 5, 7, 10, 15, 22 to 50 watts. All resistors are inorganically constructed and will not support combustion. Available in standard, fusible, and positive T.C. variations.



SPECIFICATIONS

IRC TYPE	POWER RATING (Watts)	RESISTANCE		STANDARD TEMPERATURE COEFFICIENT (-55°C to +275°C)		SPECIAL TEMPERATURE COEFFICIENTS			
		Min.* (Ohms)	Max. (Ohms)	0.06%/°C (Ohms)	0.03%/°C (Ohms)	+0.55%/°C (Ohms)	+0.45%/°C (Ohms)	+0.26%/°C (Ohms)	+0.13%/°C (Ohms)
PW2	2	0.18	2.4K	0.18 to 0.62	0.68 to 2.4K	0.1 to 30	0.24 to 130	0.82 to 120	1.0 to 10
PW3	3	0.1	7.5K	0.1 to 0.27	0.3 to 7.5K	0.1 to 56	0.1 to 270	0.20 to 270	0.24 to 20
PW5	5	0.1	8.5K	0.1 to 0.36	0.39 to 8.5K	0.1 to 68	0.1 to 300	0.24 to 300	0.27 to 22
PW7	7	0.1	18K	0.1 to 0.56	0.62 to 18K	0.1 to 150	0.15 to 680	0.51 to 670	0.62 to 51
PW10	10	0.18	30K	0.18 to 0.91	1.0 to 30K	0.1 to 240	0.24 to 1100	0.82 to 1100	1.0 to 82
PW15	15	0.18	30K	0.18 to 0.91	1.0 to 30K	0.1 to 240	0.24 to 1100	0.82 to 1100	1.0 to 82
PW22	22	0.27	12K	0.27 to 1.3	1.3 to 12K	0.15 to 360	0.36 to 1800	1.25 to 1800	1.5 to 120

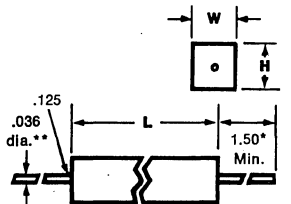
*Consult IRC for lower ranges

Tolerance: $\pm 5\%$ and $\pm 10\%$ (standard) tolerances on Standard Temperature Coefficient Resistors. Ranges below 1 ohm available in $\pm 10\%$ tolerance only.

Dimensions in Inches $\pm .03$

Type	L	W	H
PW2	.69	.25	.25
PW3	.88	.31	.31
PW5	.88	.38	.35
PW7	1.39	.38	.35
PW10	1.88	.38	.35
PW15	1.88	.50	.50
PW22	2.50	.50	.50

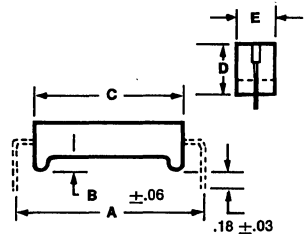
Note: Type PW-50 chassis mounted unit also available. Contact factory.



*1.44 min. on PW2 ** .032 dia. on PW22
Add .125 for clean lead length

Type	A	B	C	D	E
PW-3A	1.25	.06	.88	.38	.31
PW-5A	1.25	.06	.88	.41	.38
PW-7A	1.75	.12	1.39	.47	.38
PW-10A	2.25	.12	1.88	.47	.38
PW-15A	2.25	.12	1.88	.63	.50

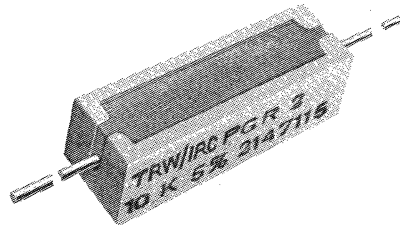
Standard parts are supplied with straight axial leads. Consult factory for available configurations for printed circuit mounting.



PGR METAL GLAZE GENERAL PURPOSE FLAMEPROOF RESISTORS

PGR resistors are inorganically filled, ceramic insulated resistors for use wherever economical flameproof resistors are required, particularly in resistance values 1K and above.

The two main flameproof characteristics are that the resistors open cleanly under overloads and/or will not support combustion.



DIMENSIONS $\pm .03$ " PGR

TYPE	L	W	H	Lead Dia.	Lead Length
PGR-1	.59	.25	.25	.032	1 1/2" $\pm 1/8$
PGR-2	.69	.25	.25	.032	1 1/2" min.
PGR-3	.88	.31	.31	.032	1 1/2" min.

DIMENSIONS $\pm .03$ " PGR-A

TYPE	L	W	d	Lead Dia.	Lead Length
PGR-1A	.59	.25	.31	.032	1 1/2" $\pm 1/8$
PGR-2A	.69	.25	.31	.032	1 1/2" min.
PGR-3A	.88	.31	.38	.032	1 1/2" min.

TYPE PGR SPECIFICATIONS

TYPE	Rated Power @ 70°C Ambient	Resistance Range	Tolerance	Temperature Coefficient
PGR-1	1 WATT	10 Ω -100K Ω	$\pm 5, 10\%$	$\pm .02\%$
PGR-2	2 WATTS	1K-100K Ω	$\pm 5, 10\%$	$\pm .02\%$
PGR-3	3 WATTS	1K-100K Ω	$\pm 5, 10\%$	$\pm .02\%$

Closer tolerances available on request. Dielectric strength—1000 V D.C.

TYPE PW STYLE EQUIVALENT

TYPE	Resistance Range	Tolerance
PW-2	0.18 to 2.4K Ω	$\pm 5, \pm 10\%$
PW-3	0.1 to 7.5K Ω	$\pm 5, \pm 10\%$

$\pm 10\%$ Only Below 1 Ω .

TRW[®] IRC RESISTORS

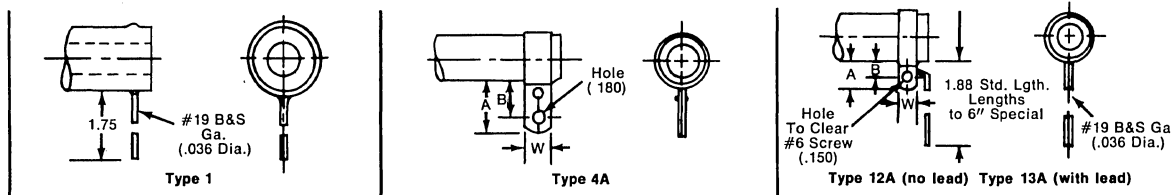
POWER WIREWOUND RESISTORS

TRW/IRC Power Wirewound Resistors are designed to meet or exceed the requirements of MIL-R-26E and are available in a wide range of tubular, flat, ferrule and adjustable styles.

Tubular power wirewound resistors are standard tubular construction with lugs or leads for use in general appli-



cations. They are used in DC and low frequency AC circuits where appreciable power must be dissipated.



PERFORMANCE AND SPECIFICATIONS

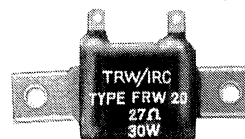
IRC WATTAGE	IRC TYPE	MIL Equiv.	CORE DIMENSION			TERMINALS		RESISTANCE RANGE (Ohms)	
			Length in Inches	O.D. in Inches	I.D. in Inches	Std.	Special		
4	7/8A	RW29	.88	.31	.19	12A	1*, 13A	0.10	10K
5	1A		1.00	.31	.19	13A	1**, 12A	0.10	15K
12	1 3/4A		1.75	.31	.19	13A†	1, 12A	0.10	50K
12	1C		1.00	.44	.27	12A	1, 13A	0.10	20K
15	1 1/2C		1.50	.44	.27	12A	1, 13A	0.10	50K
20	2C	RW32	2.00	.44	.27	13A†	1, 12A	0.10	80K
25	2D	RW33	2.00	.56	.38	12A	1, 4A, 13A	0.10	100K
26	3C		3.00	.44	.27	12A	1, 13A	0.10	150K
30	2 1/2D		2.50	.56	.38	12A	1, 4A, 13A	0.10	150K
35	3D		3.00	.56	.38	12A	1, 4A, 13A	0.10	200K
45	3E	RW35	3.00	.75	.50	12A	4A, 13A	0.15	250K
50	3 1/2E		3.50	.75	.50	12A	4A, 13A	0.20	300K
50	4D		4.00	.56	.38	12A	1, 4A, 13A	0.20	300K
60	4E		4.00	.75	.50	12A	4A, 13A	0.20	350K
60	5D		5.00	.56	.38	12A	1, 4A, 13A	0.25	400K
65	4 1/2E	RW36	4.50	.75	.50	12A	4A, 13A	0.25	400K
75	5E		5.00	.75	.50	12A	4A, 13A	0.27	450K
80	4H		4.00	1.12	.75	4A	—	0.30	525K
100	6 1/2E		6.50	.75	.50	12A	4A, 13A	0.36	600K
120	6H	RW37	6.00	1.12	.75	4A	—	0.47	850K
130	6 1/2H	RW38	6.50	1.12	.75	4A	—	0.56	900K
160	8H		8.00	1.12	.75	4A	—	0.68	1.15 Meg.
175	8 1/2H	RW47	8.50	1.12	.75	4A	—	0.75	1.25 Meg.
225	10 1/2H		10.50	1.12	.75	4A	—	0.91	1.5 Meg.
250	12H		12.00	1.12	.75	4A	—	1.00	1.75 Meg.

NOTE: Non-inductive, tapped, and adjustable resistors also are available.

*6 Watts **8 Watts †12A std. on adjustable type

Flat power wirewound resistors offer a higher power-to-space ratio than tubular configurations. They are offered in self-stacking and snap-in assembly mounting brackets, and quick disconnect male terminals are available.

NOTE: Stack-mounted resistors must be derated to limit the hotspot of the hottest unit to 350°C. For more effi-



cient ventilation, resistors should be mounted with their flat sides (short axis) on a vertical axis.

PERFORMANCE AND SPECIFICATIONS

IRC WATTAGE	IRC TYPE	POWER RATING		DIMENSIONS IN INCHES		RESISTANCE RANGE (ohms)	
		MIL Equiv.	V Watts	Mounting Centers	Core Length		
30	FRW-20	RW20	21	2.00	1.25	0.1	15K
40	FRW-21	RW21	31	2.75	2.00	0.1	35K
55	FRW-22	RW22	53	4.25	3.50	0.20	75K
70	FRW-23	RW23	68	5.50	4.75	0.25	110K
95	FRW-24	RW-24	91	6.75	6.00	0.35	140K

TRW[®] IRC RESISTORS

AW COMMERCIAL WIREWOUND RESISTORS

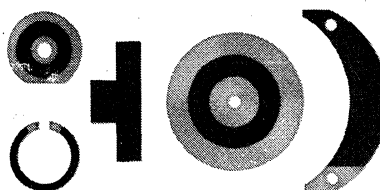
Type AW resistors are available in a wide range of configurations to meet low-cost, high volume applications in the automotive and appliance fields. A range of terminal styles is available, and others can be made to user specifications at a nominal cost. Power ratings are 4.5 watts per inch between mounting centers on the standard AW, and 6 watts per inch between mounting centers on the Hi-Wattage AW resistor.



CONCENTRIC DISCS and STRIPS

Concentric discs and strips are available in power ratings of up to 1 watt per square inch. These resistors are carbon composition film screen on various flat substrates. Available 20 Ω -100K Ω /sq. Standard tolerances are $\pm 20\%$.

Disc resistors are die stamped from resistance strips. Inner and outer rings of colloidal silver are applied to provide contact with coaxial line fixtures. Special configurations and tolerances to $\pm 10\%$ are available.



Applications are variable speed controls in automotive and appliance products, antenna rotor controls wherever a low cost special configuration pot element is required in quantity.

TRW/IRC RESISTORS, AN ELECTRONIC COMPONENTS DIVISION OF TRW INC., P.O. BOX 393, BOONE, N.C. 28607 (704) 264-8861

TRW/IRC APPLICATION/DESIGN CAPABILITY

It is impossible to describe in this catalog all the product variations available from TRW/IRC Resistors. Selected TC's, special tolerances, fixed rise times . . . the unique configurations variations are limited only by our mutual ability to work together.

Beyond this, TRW also offers an application/design capability second to none in the industry—and ready to meet virtually any resistive need you might have.

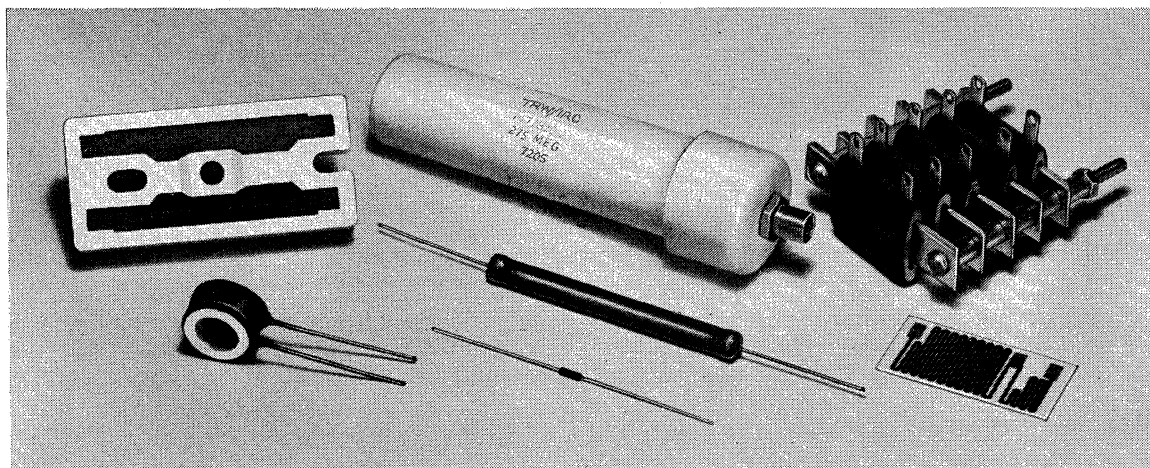
This technology embraces both thin and thick metal film, networks, wirewounds, high-voltage and ultra-precision resistors. In thin-film, for example, it includes tolerance and TC matching down to .01% and 5 PPM/ $^{\circ}$ C respectively. In thick-film, it includes design capabilities in subminiature, tubular substrates—for relays, LED's, and connector applications. In wirewound

resistors and assemblies, it includes specialized TC's, fusible units, and custom configurations.

Too, TRW technology also takes in high-precision tantalum-nitride networks. Because of the high circuit density possible with tantalum units, this technology offers opportunities for extreme miniaturization.

* * *

The foregoing scarcely touches the highlights of TRW/IRC's application/design capability. But most important, whatever your performance, configuration or environmental problem, we urge that you let us work with you at the **design** stage. It's at this point, we believe, that we can offer the greatest help in application and cost effectiveness.



TRW[®] IRC RESISTORS

MIL SPEC DEFINITIONS, TERMINOLOGY

MIL—R—11 (RC) RC07GF153K

RC07 Style/Power (See Tables 1 and 2)	GF "G" = 70°C Max. ambient temperature for full load oper- ation. "F" = Temperature Coefficient which varies (with resistance) from ± 625 ppm/°C to ± 3100 ppm/°C.	153 Resistance First 2 digits significant, 3rd digit "number of zeros." 153 = 15,000 Ω	K Tolerance (See Table 4) K = $\pm 10\%$
---	---	--	--

MIL—R—22684 (RL) RL07SI53J

RL07 Style/Power (See Tables 1 and 2)	S Terminal (Lead) "S" = Solderable	153 Resistance First 2 digits significant, 3rd digit, "number of zeros." 153 = 15,000 Ω	J Tolerance (See Table 4) J = $\pm 5\%$
--	---	---	---

MIL—R—10509 (RN) RN60D1003F

RN60 Style/Power (See Tables 1 and 2)	D Characteristic (See Table 3) D = ± 100 ppm/°C	1003 Resistance First 3 digits significant, 4th digit "number of zeros." 1003 = 100,000 Ω	F Tolerance (See Table 4) F = $\pm 1\%$
--	---	---	---

MIL—R—26 (RW) — Numbering System Complex (See MIL spec) RW55U49R9F

RW55 Style/Power Size/ Construction	U Max. "Hot Spot," derating temperature, insulation resis- tance and moisture resistance. "U" or "V" characteristic.	49R9 Resistance 3 or 4 digits depending on the TC, tolerance, etc. "U" char. has 4 "V" char. has 3	F Tolerance (See Table 4) Only applicable to "U" char.
--	---	--	---

MIL—R—39008 (RCR) RCR07G153JS

RCR07 Style/Power (See Tables 1 and 2)	G Characteristic "G" indicates a max. ambient temperature of 70°C for full load operation, and a TC which varies (with resistance) from ± 625 ppm/°C to ± 1900 ppm/°C.	153 Resistance First 2 digits significant, 3rd digit, "number of zeros." 153 = 15,000 Ω	J Tolerance (See Table 4) J = $\pm 5\%$	S Failure Rate (See Table 5) S = .001%/1000 hours
---	---	---	---	---

MIL—R—39017 (RLR) RLR07C153GR

RLR07 Style/Power (See Tables 1 and 2)	C Terminal (Lead) "C" = Solderable/Weldable	153 Resistance First 2 digits significant, 3rd digit, "number of zeros." 153 = 15,000 Ω	G Tolerance (See Table 4) G = $\pm 2\%$	R Failure Rate (See Table 5) R = $\pm 0.1\%$ /1000 hours
---	--	---	---	--

MIL—R—55182 (RNR) RNR60H1003FS

RNR60 Style, Terminal and Power (See Tables 1 and 2) RNR = Solderable Leads RNC = Solderable/Weldable Leads RNN = Nickel Leads	H Characteristic (See Table 3) H = ± 50 ppm/°C	1003 Resistance First 3 digits significant, 4th digit "no. of zeros." 1003 = 100,000 Ω	F Tolerance (See Table 4) F = $\pm 1\%$	S Failure Rate (See Table 5) S = .001%/1000 hours
---	--	--	---	---

NOTE: The Established Reliability specifications (i.e., MIL-R-39008, MIL-R-39017, and MIL-R-55182) supersede MIL-R-11, MIL-R-22684, and MIL-R-10509 respectively, for all new design. Resistors qualified to the three Established Reliability specifications may be substituted, without limitation, wherever the older MIL devices are specified.

TABLE 1—Resistor Style

RC	Fixed Composition Resistor (MIL-R-11)
RCR	Fixed Composition Resistor, Established Reliability (MIL-R-39008)
RL	Fixed Film Resistor (MIL-R-22684)
RLR	Fixed Film Resistor, Established Reliability (MIL-R-39017)
RN	Fixed Resistor, High Stability (MIL-R-10509)
RNR	Fixed Film Resistor, Established Reliability (MIL-R-55182)
RW	Fixed Wirewound Resistor, Power Type (MIL-R-26)

TABLE 2—

Size/Power @ 70° unless otherwise stated)

05— $\frac{1}{8}$ watt	} MIL-R-11 (RC) MIL-R-39008 (RCR) MIL-R-22684 (RL) MIL-R-39017 (RLR)
07— $\frac{1}{4}$ watt	
20— $\frac{1}{2}$ watt	
32—1 watt	
42—2 watt	
50— $\frac{1}{2}$ watt (@ 125°C)	} MIL-R-10509 (RN) MIL-R-55182 (RNR)
55— $\frac{1}{4}$ watt	
60— $\frac{1}{4}$ watt	
65— $\frac{1}{2}$ watt	
70— $\frac{1}{2}$ watt	
75—1 watt (@ 125°C)	
80—2 watt (@ 125°C)	

TABLE 3—Characteristic

B = ± 500 ppm/°C	} MIL-R-10509 (RN)
C = ± 50 ppm/°C (T2)	
D = $\pm 200, 500$ ppm/°C (T0)	
E = ± 25 ppm/°C (T9)	
F = ± 50 ppm/°C	

H = ± 50 ppm/°C (T2)	} MIL-R-55182 (RNR)
J = ± 25 ppm/°C (T9)	
K = ± 100 ppm/°C (T0)	

NOTE: RL and RLR resistors are ± 200 ppm/°C. There is no temperature coefficient designation in the RL numbering system.

TABLE 4—

Tolerance
K = $\pm 10\%$
J = $\pm 5\%$
G = $\pm 2\%$
F = $\pm 1\%$
D = $\pm 0.5\%$
C = $\pm 0.25\%$
B = $\pm 0.10\%$

TABLE 5—

Failure Rate 1000 Hours (60% Confidence)
M = 1.0%
P = 0.1%
R = .01%
S = .001%

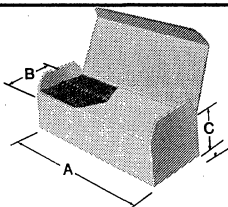
TRW[®] IRC RESISTORS

PACKAGING STYLES

Consult factory for standard package available for the resistor of your choice.

Oriented Bulk:

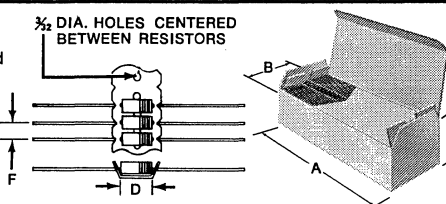
Preferred by manufacturers with their own feeding or taping arrangements. Resistors are axially oriented.



Type	Wattage	Standard Quantity Per Box	A	B	C
GBT-1/4	1/4	2500	10 1/4"	3 1/8"	1 3/4"
GBT-1/2	1/2	2000	10 1/4"	4 1/4"	2 3/8"
GBT-1/2 V	1/2	2000	10 1/4"	4 1/4"	2 3/8"
GBT-1	1	1000	10 1/4"	4 1/4"	2 1/4"
BW-20	1	2000	10 1/4"	4 1/4"	2 3/8"
BWH	2	1000	10 1/4"	4 1/4"	2 1/4"

Grip Strip[®]

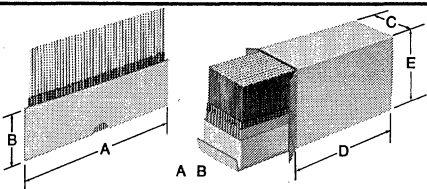
A TRW exclusive. Resistors are held without adhesive in strips for ease of handling and counting.



Type	Wattage	Standard Quantity Per Box	Quantity Per Strip	A	B		D	F
GBT-1/2	1/2	1000	50	10 1/4"	4 1/4"	2 3/8"	.182"	3/16"
GBT-1/2 V	1/2	1000	50	10 1/4"	4 1/4"	2 3/8"	.182"	3/16"
GBT-1	1	1000	40	12"	4 1/4"	4"	.260"	3/16"
BW-20	1	1000	50	10 1/4"	4 1/4"	2 3/8"	.182"	3/16"
BWH	2	1000	40	12"	4 1/4"	4"	.260"	3/16"

Corrugated Card Pack:

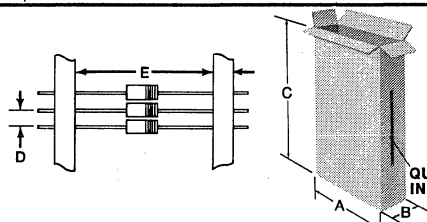
Resistors are inserted into the flutes of corrugated cards.



Type	Wattage	Standard Quantity Per Box	Quantity Per Strip	A	B	C	D	E
GBT-1/4	1/4	1000	50	6 3/4"	1 1/2"	2 1/4"	6 7/8"	3 1/4"
GBT-1/2	1/2	1000	50	8 1/2"	1 1/2"	3 1/4"	8 5/8"	3 5/8"
BW-20	1	1000	50	8 1/2"	1 1/2"	3 1/4"	8 5/8"	3 5/8"

Ammo-Pak[®]:

10,000 resistor package is a continuous lead tape belt. Each lead of the resistor is held between two sets of pressure sensitive tape.

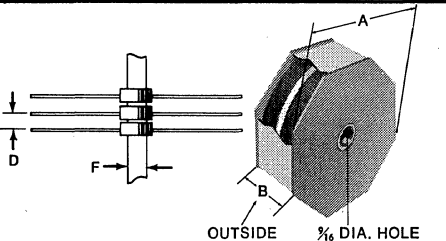


Type	Wattage	Standard Quantity Per Box	A*	B*	C**	D ±.015"	E ±1/16"	F
GBT-1/4	1/4	10,000	10 3/4"	3 3/4"	9 3/4"	.200"	2 1/16"	1/4"
GBT-1/2 V	1/2	10,000	12 1/2"	4"	19"	.200"	2 1/16"	1/4"
GBT-1/2	1/2	10,000	12 1/2"	4"	19"	.200"	2 1/16"	1/4"
BW-20	1	10,000	12 1/2"	4"	19"	.200"	2 1/16"	1/4"

*Subtract 1/4" (**subtract 1/2") for inside carton dimensions.

Body Tape Reel:

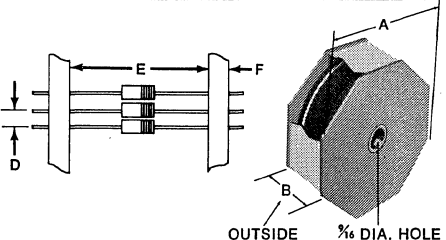
Each resistor body is held by a pressure sensitive tape.



Type	Wattage	Standard Quantity Per Reel	A (Across Corners) Max.	B Max.	D	F
GBT-1/4	1/4	2500	6 1/2"	3 3/4"	.105"	3/16"
GBT-1/2	1/2	5000	9 1/2"	3 3/4"	.105"	3/16"
GBT-1/2 V	1/2	2500	9 1/2"	3 3/4"	.158"	1/4"
GBT-1	1	5000	13 1/2"	3 3/4"	.158"	1/4"
GBT-1/2 V	1/2	2500	9 1/2"	3 3/4"	.158"	1/4"
GBT-1/2	1/2	5000	13 1/2"	3 3/4"	.158"	1/4"
GBT-1	1	2000	13 1/2"	3 3/4"	.260"	3/8"
BW-20	1	2500	9 1/2"	3 3/4"	.158"	1/4"
BW-20	1	5000	13 1/2"	3 3/4"	.158"	1/4"
BWH	2	2000	13 1/2"	3 3/4"	.260"	3/8"

Lead Tape Reel:

Each resistor lead is held between two sets of pressure sensitive tape.



Type	Wattage	Standard Quantity Per Reel	A (Across Corners) Max.	B Max.	D ±.015"	E ±1/16"	F
GBT-1/4	1/4	2500	10 7/8"	3 1/16"	.200"	2 1/16"	1/4"
GBT-1/2	1/2	5000	13 1/2"	3 1/16"	.200"	2 1/16"	1/4"
GBT-1/2 V	1/2	2500	10 7/8"	3 1/16"	.200"	2 1/16"	1/4"
GBT-1	1	2500	10 7/8"	3 1/16"	.200"	2 1/16"	1/4"
GBT-1/2	1/2	5000	13 1/2"	3 1/16"	.200"	2 1/16"	1/4"
GBT-1	1	2000	13 1/2"	3 1/16"	.375"	2 1/8"	1/4"
BW-20	1	2500	10 7/8"	3 1/16"	.200"	2 1/16"	1/4"
BW-20	1	5000	13 1/2"	3 1/16"	.200"	2 1/16"	1/4"
BWH	2	2000	13 1/2"	3 1/16"	.375"	2 1/8"	1/4"

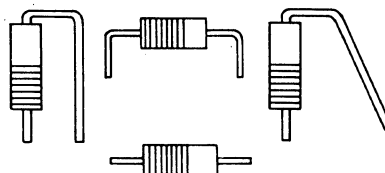
*Other spacing available.

Cut and formed leads

TRW/IRC offers the widest selection of pre-cut and formed units in the industry.

Purchasing of pre-cut units offers the user very significant savings in labor and assembly, as well as savings in valuable plant space, since units take only half the space of other packaging styles.

Drawings shown are for carbon composition types. These packaging styles are available for many wirewound and film resistors with some dimensional variations. Consult your sales representative or the factory for specifications, availability and costs.



CUT AND FORMED LEADS AVAILABLE
CONTACT FACTORY FOR DIMENSIONS



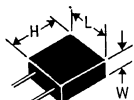
VISHAY RESISTIVE SYSTEMS GROUP

OF VISHAY INTERTECHNOLOGY, INC.

63 LINCOLN HIGHWAY, MALVERN, PA. 19355 • PHONE: (215) 644-1300

• TWX: 510-668-8944

ULTRA-PRECISE RESISTORS WITH TCR TO $\pm 1\text{ppm}/^\circ\text{C}$ (0°C to 60°C)



S102 Series

Stability: 25ppm/yr.
Tolerance: To $\pm 0.005\%$



Hermetic Seal HP202 Series (Radial Leads)

Stability: 5ppm/yr.
Tolerance: To $\pm 0.001\%$

Hermetic Seal HA Series (Axial Leads)

Stability: 5ppm/yr.
Tolerance: To $\pm 0.001\%$

STYLE		S102	S104	S105	S106C	Hermetic Seal	
						HA Series (Axial Leads)	HP Series (Radial Leads)
Dimensions (inches)	H	.320	.520	.520	.520	3/8 dia. x 5/8 Lg. to 1/2 dia. x 1 1/2 Lg.	.430
	L	.295	.565	.810	1.190		.435
	W	.100	.150	.150	.245		.185
Value Range (ohms) and Wattage rating at 125°C		30 to 100K 0.3W	60 to 200K 0.5W	90 to 300K 0.75W	120 to 600K 1.00W	30 at 0.3W to 1 meg. at 1.25W	30 to 100K 0.3W at 25°C (HP202)
Lead Spacing (inches) Leads are #22 AWG Tinned Copper		.150	.400	.650	.900	(Axial)	.150

VALUE ENGINEERED RESISTORS WITH TCR TO $\pm 10\text{ppm}/^\circ\text{C}$ (0°C to 60°C)



V Series (Radial Leads)

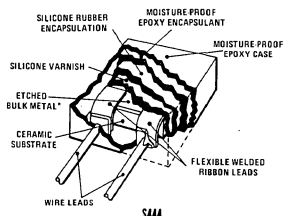


M Series (Axial Leads)

Stability: 30ppm/yr.
Tolerance: To $\pm 0.02\%$

STYLE	V53-1	V53-5	V53-6	V53-7	M53	M55
Dimensions (inches)	H 3/8	1/2	1/2	1/2	3/8" dia. x 3/4"	1/4" dia. x 1/2"
V Series (Leads) are #22 AWG tinned copper	W 3/8	5/8	7/8	1 1/8	Long	Long
M Series (Leads) are #20 AWG tinned copper	D .200	.225	.225	.225		
Value Range (ohms) and Wattage rating (at ambient of 60°C without heat sink)	5 to 75K 0.3W	60 to 150K 0.5W	90 to 225K 0.75W	120 to 300K 1.0W	30 to 75K 0.5W	30 to 50K 0.25W
Lead Spacing (inches)	.150	.400	.650	.900	(Axial)	(Axial)

ESTABLISHED RELIABILITY RESISTORS PER MIL-R-55182/9



S444

	RNC90Y Limits	S444 Capabilities
Tolerance	To: 0.01%	To: 0.005%
TCR	5ppm/°C (-55 to +125°C)	1ppm/°C (0°C to +60°C)
Life at 10,000 hours	ΔR 5000ppm	ΔR 200ppm
Tracking	Not specified	To: 1/2ppm/°C
Shelf Stability	Not specified	50ppm after 10 yrs.
Noise	Not specified	Non measureable
Voltage Coefficient	0.0005% per volt	Negligible

- Small size: 0.100" x 0.300" board space
- Non inductive: 0.08 microhenry max.

- High temperature exposure: 175°C max.
- Power rating: 0.3W at 125°C

"BUILD PRECISION RESISTORS IN HOUSE"

Vishay's In Plant Station package provides the technology, equipment, and techniques to produce high precision resistors in your own laboratory.

- Tolerances: To $\pm 0.005\%$
- TCR of 1ppm/°C (0°C to 60°C)

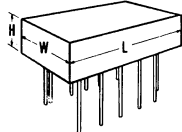
APPLICATIONS:

Breadboarding
Set and forget trimmer

Prototypes
Production

RESISTOR NETWORKS — VOLTAGE DIVIDERS — ATTENUATORS — BCD DECADE MODULES

STANDARD NETWORKS BINARY and R-2R



Model No.	No. Bits	L (inches)
Series 500	4 or 5	0.700
	6, 7, or 8	1.080
	9 or 10	1.300
	11	1.500
	12 or 13	1.660
Series 375	4 or 5	0.730
	6, 7, or 8	1.080
	9 or 10	1.380
	11 or 12	1.680
	13 or 14	2.280
	15	2.590

RESOLUTION TO
16 BITS

FULL SCALE ACCURACY TO
0.001%

RISE TIME
LESS THAN **10** NANOSECONDS

SETTLING TIME
LESS THAN **50** NANOSECONDS

TEMPCO
LESS THAN **1** PPM/°C
FOR ALL VALUES (0°C to 60°C)

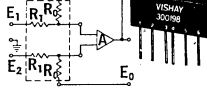
TRACKING TO
1/2 PPM/°C

STABILITY **25** PPM
OVER 3 YRS.

BCD TO 4 DIGITS

UNITIZED RESISTOR CIRCUITS SAVE ALL THESE OPERATIONS:

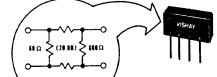
- Multi-component receiving inspection
- Sorting for TCR or ratio match
- Pre-packaging or binning
- Multi-insertions. With only ONE INSERTION you can assemble up to 4 resistors on a PC board, and in 1/2 the space!



Vishay pre-packaged 2 resistor voltage divider. Other configurations available with up to 4 discreet resistors.



VISHAY BCD Decade Module available in any coding system: 1-2-2-4, 1-2-4-8, etc., up to 100K per resistor.



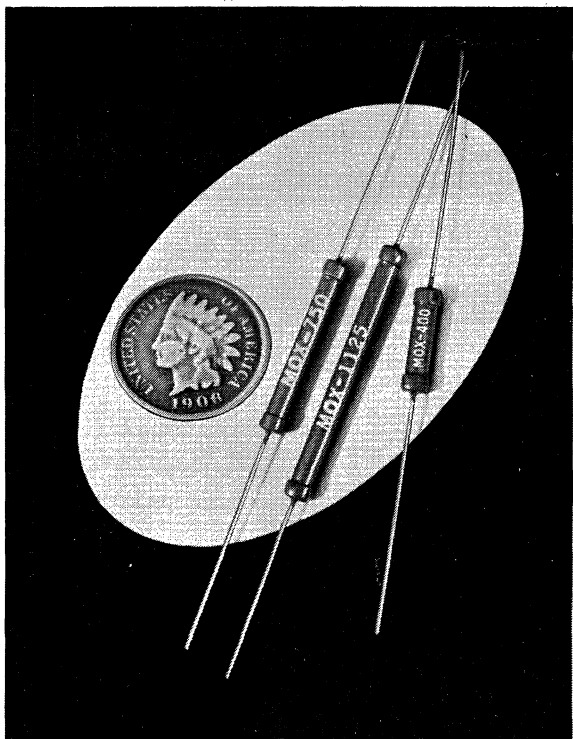
ATTENUATOR MODULES
Virtually noiseless • In no cross coupling. Available in "L", "U", "P", "O", "T", "B", "A", "U", and bridged "T" configurations, with stability of 25ppm/yr., T.C.R. of $\pm 1\text{ppm}/^\circ\text{C}$, and 10 nanoseconds rise time.

HIGH ACCURACY RATIO MATCH

- Each Resistor: 1000 to 75K
- Absolute Tol. each R: $\pm 0.005\%$
- Absolute TCR each R: $\pm 5\text{ppm}/^\circ\text{C}$ (-55°C to $+125^\circ\text{C}$)
- Tol. Match: To .005%
- TCR Match: Within 3ppm/°C (-55°C to $+125^\circ\text{C}$)

VICTOREEN MINI-MOX RESISTORS

*"A" SERIES FOR SUPERIOR RELIABILITY



- VOLTAGE RATING TO 5 kV
- POWER RATING TO 1 WATT
- ± 100 ppm TCR
- FULL LOAD STABILITY $\pm 2\%$ FOR 1000 HOURS AT 70°C
- RESISTANCE VALUES TO 10,000 MEGOHMS

For design of high-voltage, highly-stable miniaturized electronic networks and equipment, the new MINI-MOX resistors have all the ingredients you need for ultra-critical applications. For instance, MINI-MOX resistors are a fraction the size of conventional types . . . 100 ppm TCR or less to 600 megohm; stability better than $\pm 2\%$ for 1000 hours at full load. In addition, typical quantech noise at 20 megohms is less than 1.5 microvolt/volt. All these characteristics combine to provide extremely-rugged and highly-stable resistor configurations that are virtually immune to environmental extremes. MINI-MOX resistors — where power and voltage to size ratios are critical.

RESISTANCE RANGE

See Table I.

VOLTAGE COEFFICIENT

Voltage coefficient depends on a number of resistor parameters, the most influential of which is resistor value. In general, the higher the resistance value, the higher the voltage coefficient. Victoreen tries to maintain a maximum voltage coefficient of 5 ppm/volt over the complete voltage range of the resistor.

STABILITY

Full load drift (rated wattage at 70°C) is less than 2% in 1000 hours. Shelf life or dry circuit drift is less than 0.1% per year.

TEMPERATURE COEFFICIENT

In accordance with Table II, the temperature range for calculating temperature coefficients is -55°C to $+125^{\circ}\text{C}$.

VOLTAGE RANGE

Below critical resistance values, the voltage is limited by the wattage rating of the resistor. Application of the power formula $E^2 = WR$ will indicate the permissible maximum voltage. (Refer to Table I for additional data.)

WATTAGE RATING

Wattage ratings calculated on the basis of 70°C ambient temperature. MOX Series A resistors are derated to zero watts at 180°C.

RESISTOR CONSTRUCTION

Metal oxide glaze on a solid alumina core. A gold termination is used which accommodates a close fitting pressed on welded cap and lead assembly. Leads are tinned domet. Other type leads including tinned copper and gold plated can be supplied. Resistors are marked with Type, Resistance Value and Tolerance. Customer marking available as an option.

COATING

Epoxy Resin

- Resists most industrial solvents.
- Excellent moisture resistance.
- High dielectric and low outgassing.
- Maximum hot spot temperature of 180°C.

***A high power MINI-MOX Resistor is available but its use is recommended only where the additional power dissipation is clearly indicated. Consult the factory for details.**



VICTOREEN INSTRUMENT DIV.

10101 WOODLAND AVENUE • CLEVELAND, OHIO 44104



SHELLER-GLOBE CORPORATION

SPECIFICATIONS

The following test specifications of Mil. Std. 202 are applicable to these resistors.

- MOISTURE RESISTANCE:**
Method 103B, ΔR .25% max. Test condition B.
- TEMPERATURE CYCLING:**
Method 102A test condition C, ΔR .2%.
- DIELECTRIC WITHSTANDING:**
Method 301, 750 volts, ΔR .25%.
- INSULATION RESISTANCE:**
Method 302 test condition A or B, 10,000 megs dry.
- SHOCK:** Method 205D test condition C, ΔR .25%.
- VIBRATION:** Method 204B test condition D, ΔR .2%.
- RESISTANCE TO SOLVENTS:** Method 215.
- TERMINAL STRENGTH:**
Method 211A test conditions A and D, ΔR .25%.

There are no Mil specs specifically written to cover Mox type film resistors. However, the following are useful as reference documents:

Mil-R-10509F Mil-R-22684B Mil-R-39017A Mil-R-55182D

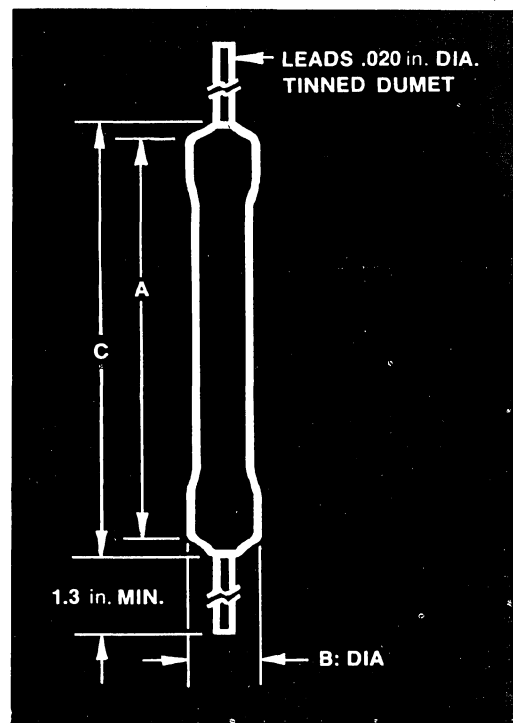


Table I — Resistor Specifications

Model	Resistance Range	Power Rating @ 70°C	Max. Oper. Volts	Available Tolerance	Critical Resistance	Max. Surface Temperature	Max. Dimensions (Inches)		
							A	B	C
MOX-400A	100K- 2500 Megs	.25W	1000V	1, 2, 5 & 10%	4 Megs	180°C	.540	.165	.600
MOX-750A	100K- 5000 Megs	.5W	2000V	1, 2, 5 & 10%	8 Megs	180°C	.860	.165	.920
MOX-1125A	100K-10,000 Megs	1W	5000V	1, 2, 5 & 10%	25 Megs	180°C	1.250	.165	1.310

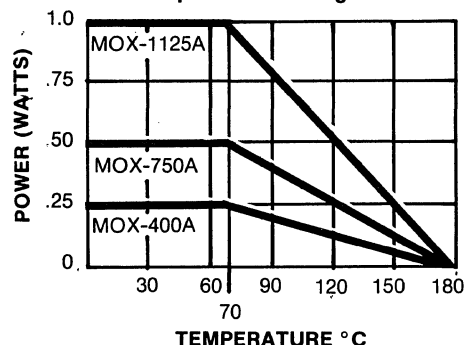
¹Applicable above critical resistance.

²MOX- 400A: Below 1000 megohms, 1%, 2% & 5%; 1000 megohms and above, 2%, 5% & 10%.
MOX- 750A: Below 2000 megohms, 1%, 2% & 5%; 2000 megohms and above, 2%, 5% & 10%.
MOX-1125A: Below 3000 megohms, 1%, 2% & 5%; 3000 megohms and above, 2%, 5% & 10%.

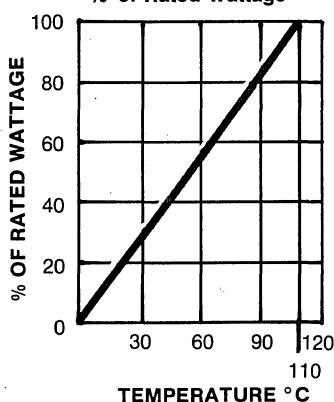
Table II — Temperature Coefficient

Standard Temperature Coefficient	MOX-400A	MOX-750A	MOX-1125A
±100 ppm	100 K ohms to 200 Megs	100 K ohms to 400 Megs	100 K ohms to 600 Megs
±250 ppm	200 Megs to 1000 Megs	400 Megs to 2000 Megs	600 Megs to 3000 Megs
±600 ppm	1000 Megs to 2500 Megs	2000 Megs to 5000 Megs	3000 Megs to 10,000 Megs

Temperature Derating Curves



Temperature Rise Above Ambient vs. % of Rated Wattage



These resistors are capable of dissipating higher wattages than rated if ambient temperatures are lower than 70°C or if forced air or oil cooling is employed. This additional capability can be determined in accordance with the temperature rise and the derating curves.



SHELLER-GLOBE CORPORATION

VICTOREEN INSTRUMENT DIV.

10101 WOODLAND AVENUE • CLEVELAND, OHIO 44104



SUPERIOR RELIABILITY

VICTOREEN MAXI-MOX RESISTORS *“A” SERIES FOR SUPERIOR RELIABILITY

- TOLERANCE TO 1%
- POWER RATINGS TO 7.5 WATTS
- WIDE RESISTANCE RANGE —
10 K OHMS TO 5000 MEGOHMS
- FULL LOAD STABILITY BETTER THAN
 $\pm 1\%$ FOR 2000 HOURS AT 70°C
- EXCELLENT HIGH VOLTAGE,
HIGH TEMPERATURE AND
HIGH FREQUENCY OPERATION
- FULL PROTECTION AGAINST ROUGH
HANDLING AND ENVIRONMENTAL
EXTREMES



MAXI-MOX resistors are available in a range of resistance values, voltage and power ratings which will handle most high voltage applications. From 7.5 kV to 37.5 kV, their high voltage parameters are unexcelled.

VOLTAGE RANGE

Below critical resistance values, the voltage is limited by the wattage rating of the resistor. Application of the power formula $E^2 = WR$, will indicate the permissible maximum voltage. (Refer to Table I for additional data.)

STABILITY

Full load drift (rated wattage at 70°C) is less than 1% in 2000 hours. Shelf or dry circuit drift is less than .1% per year.

RESISTOR CONSTRUCTION

Metal oxide glaze fired on an alumina core at temperatures in excess of 800°C. A gold termination is fired on over the glaze which accommodates a close fitting, pressed on welded cap and lead assembly. Standard lead material is tinned copper, other material including tinned dumet and gold plating can be supplied. An alternate end cap containing a 6-32 threaded hole can also be supplied, in this case the ends of the caps are not coated with protective material. Resistors are marked with Type, Resistance Value and Tolerance. Customer marking available as an option.

VOLTAGE COEFFICIENT

Voltage coefficient depends on a number of resistor parameters, the most influential of which is resistor value. In general, the higher the resistance value, the higher the voltage coefficient. Victoreen tries to maintain a maximum voltage coefficient of 5 ppm/volt over the complete voltage range of the resistor.

WATTAGE RATING

Wattage ratings calculated on the basis of 70°C ambient temperature. MOX Series A resistors are derated to zero watts at 180°C.

TEMPERATURE COEFFICIENT

In accordance with Table II, the temperature range for calculating temperature coefficients is -55°C to $+125^\circ\text{C}$.

COATING

Epoxy Resin

- Resists most industrial solvents.
- Excellent moisture resistance.
- High dielectric and low outgassing.
- Maximum hot spot temperature of 180°C.

***A high power MAXI-MOX Resistor is available but its use is recommended only where the additional power dissipation is clearly indicated. Consult the factory for details.**



VICTOREEN INSTRUMENT DIV.
10101 WOODLAND AVENUE • CLEVELAND, OHIO 44104



SHELLER-GLOBE CORPORATION

SPECIFICATIONS

The following test specifications of Mil. Std. 202 are applicable to these resistors.

- MOISTURE RESISTANCE:**
Method 103B, ΔR .25% max. Test condition B.
- TEMPERATURE CYCLING:**
Method 102A test condition C, ΔR .2%.
- DIELECTRIC WITHSTANDING:**
Method 301, 750 volts, ΔR .25%.
- INSULATION RESISTANCE:**
Method 302 test condition A or B, 10,000 megs dry.
- SHOCK:** Method 205D test condition C, ΔR .25%.
- VIBRATION:** Method 204B test condition D, ΔR .2%.
- RESISTANCE TO SOLVENTS:** Method 215.
- TERMINAL STRENGTH:**
Method 211A test conditions A and D, ΔR .25%.

There are no Mil specs specifically written to cover Mox type film resistors. However, the following are useful as reference documents:

Mil-R-10509F Mil-R-22684B Mil-R-39017A Mil-R-55182D

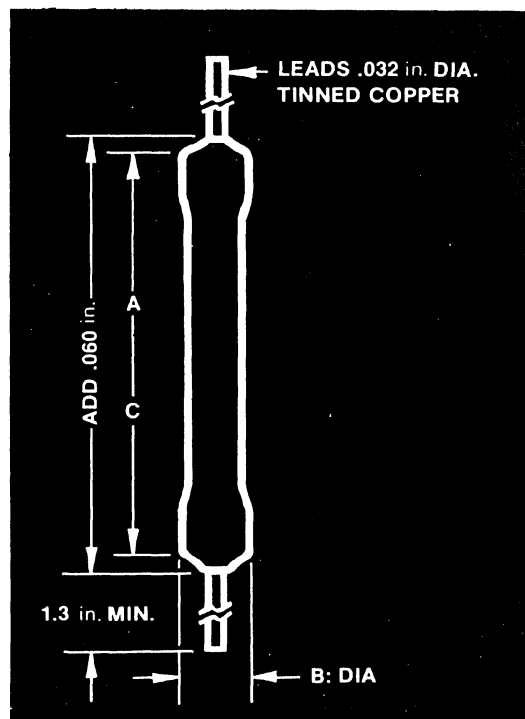


Table I — Resistor Specifications

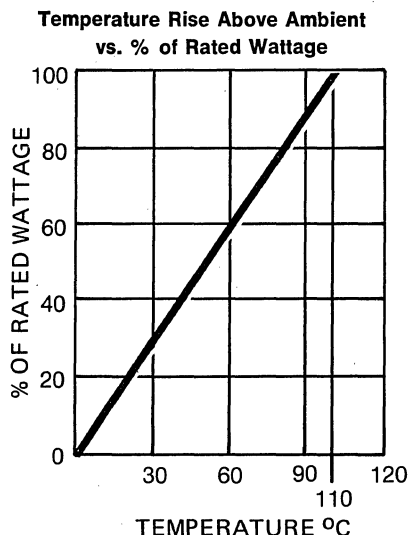
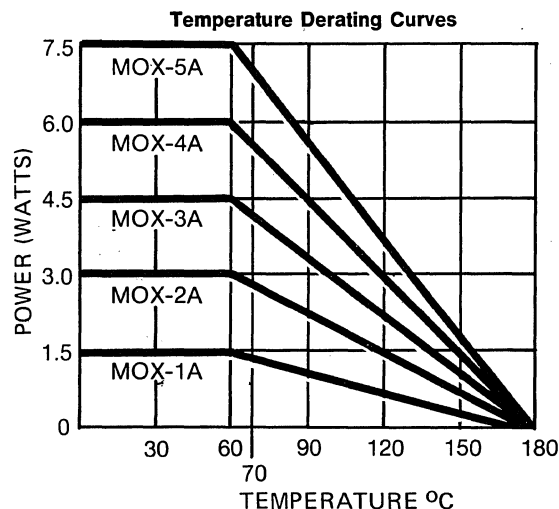
Model	Resistance Range	Power Rating @ 70°C	Max. Oper. Volts	Available Tolerance	Critical Resistance	Max. Surface Temperature	Max. Dimensions (Inches)		
							A	B	C
MOX-1A	10K-1000 Megs	1.5W	7500V	1, 2 & 5%	37.5 Megs	180°C	1.140	.345	1.340
MOX-2A	20K-2000 Megs	3.0W	15,000V	1, 2 & 5%	75 Megs	180°C	2.140	.345	2.340
MOX-3A	30K-3000 Megs	4.5W	22,500V	1, 2 & 5%	112.5 Megs	180°C	3.140	.345	3.340
MOX-4A	40K-4000 Megs	6.0W	30,000V	1, 2 & 5%	150 Megs	180°C	4.140	.345	4.340
MOX-5A	50K-5000 Megs	7.5W	37,500V	1, 2 & 5%	187.5 Megs	180°C	5.140	.345	5.340

¹Applicable above critical resistance.

²Length of the resistor when fitted with ferrule end caps with No. 6-32 tapped hole.

Table II — Temperature Coefficient

Standard Temperature Coefficient	MOX-1A	MOX-2A	MOX-3A	MOX-4A	MOX-5A
±100 ppm	10K-150 Megs	20K-300 Megs	30K-450 Megs	40K-600 Megs	50K-750 Megs
±300 ppm	150-1000 Megs	300-2000 Megs	450-3000 Megs	600-4000 Megs	750-5000 Megs



These resistors are capable of dissipating higher wattages than rated if ambient temperatures are lower than 70°C or if forced air or oil cooling is employed. This additional capability can be determined in accordance with the temperature rise and the derating curves.

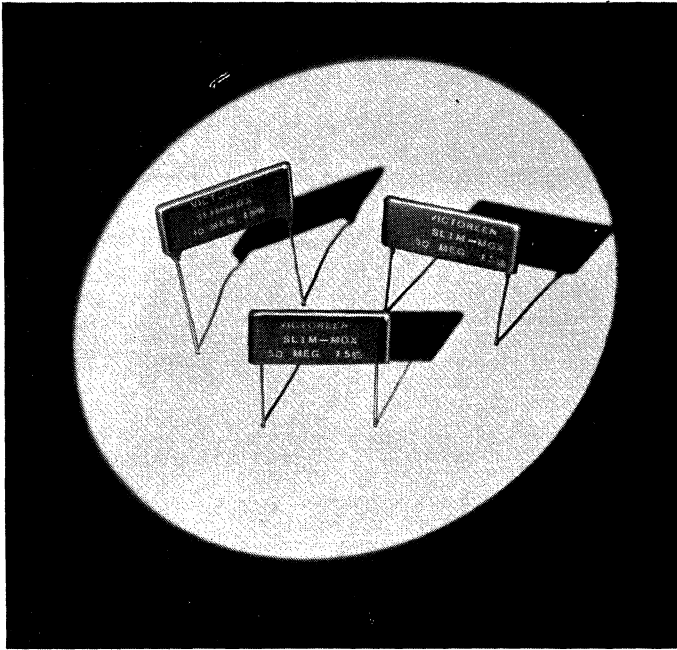


SHELLER-GLOBE CORPORATION

VICTOREEN INSTRUMENT DIV.

10101 WOODLAND AVENUE • CLEVELAND, OHIO 44104





VICTOREEN SLIM-MOX RESISTORS

- **WIDE RESISTANCE RANGE — 1 TO 5000 MEGOHMS**
- **POWER RATING — 2 WATTS**
- **VOLTAGE RATING — 10 kV**
- **FULL LOAD STABILITY — TYPICALLY BETTER THAN $\pm 0.5\%$ FOR 1000 HOURS AT 70°C**
- **EXCELLENT HIGH VOLTAGE, HIGH TEMPERATURE AND HIGH FREQUENCY OPERATION**

Victoreen Metal Oxide Glaze Resistors are the culmination of years of experience in the manufacture of resistors for many special applications requiring precision and reliability. The MOX resistive element is composed of highly stable metal oxides in a special glass matrix fired on high alumina substrates at temperatures in excess of 800°C. The end product is a highly stable resistor that gives improved parameters in all important areas including stability, temperature coefficients, voltage coefficients and power handling capability.

For design of high voltage, highly stable miniaturized electronic networks and equipment, the new SLIM-MOX resistors have all the ingredients you need for ultra-critical applications. For instance, SLIM-MOX resistors are a fraction the size of conventional types; 250 ppm TCR or less to 5000 megohms, stability better than $\pm 1.5\%$ for 1000 hours at full load, low voltage coefficient less than 5 ppm/volt. All these characteristics combine to provide extremely rugged and highly stable resistor configurations that are virtually immune to environmental extremes.

RESISTANCE RANGE

See Table I.

VOLTAGE COEFFICIENT

Voltage coefficient depends on a number of resistor parameters, the most influential of which is resistor

value. In general, the higher the resistance value the higher the voltage coefficient. Victoreen tries to maintain a maximum voltage coefficient of 5 ppm/volt over the complete voltage range of the resistor.

STABILITY

Full load drift (rated wattage at 70°C) is typically 0.5% and conservatively stated as less than $\pm 1.5\%$ in 1000 hours. Shelf life or dry circuit drift is less than 0.1% per year.

VOLTAGE RANGE

In accordance with Table I, except below critical resistance values, the voltage is limited by the wattage rating of the resistor. Application of the power formula $E^2 = WR$, will indicate the permissible maximum voltage.

TEMPERATURE COEFFICIENT

In accordance with Table II. The temperature range for calculating temperature coefficients is -55°C to +125°C.

WATTAGE RATING

Wattage ratings are calculated on the basis of 70°C ambient temperature and derated to zero watts at 150°C. See temperature rise and derating curves. See Table I for ratings.



VICTOREEN INSTRUMENT DIV.
10101 WOODLAND AVENUE • CLEVELAND, OHIO 44104



SHELLER-GLOBE CORPORATION

RESISTOR CONSTRUCTION

Metal oxide glaze on a solid alumina substrate. Leads are tinned copper.

COATING

Excellent environmental protection is afforded. SLIM-MOX resistors, through the use of a conformal epoxy coating, are moisture resistant and resist most industrial solvents. This coating has excellent high temperature properties allowing a maximum hot spot temperature of 150°C. It is compatible with most commonly used potting compounds, offers high dielectric and low outgassing properties.

SPECIFICATIONS

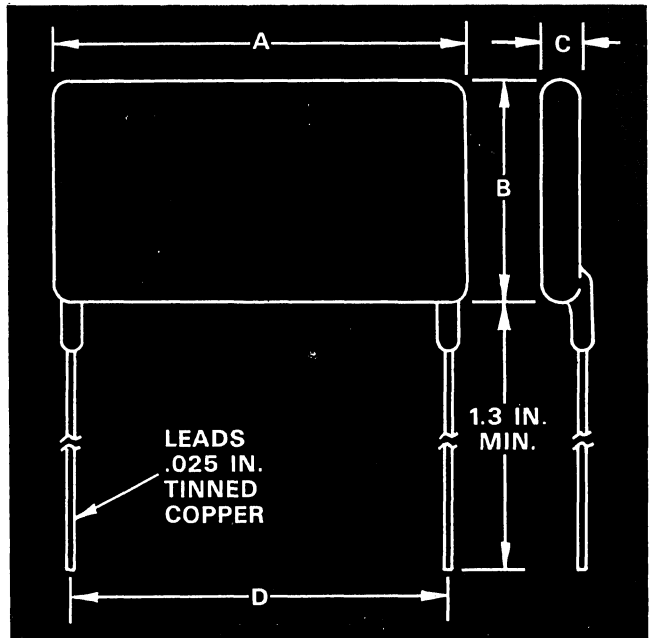


Table I — Resistor Specifications

Model	Resistance Range	Critical Resistance	Power Rating @ 70°C	Maximum* Operating Volts	Available Tolerance	Maximum Surface Temp.	Dimensions (Inches)			
							A	B	C	D
SLIM-MOX 204	1M-5000M	50M	2W	10,000V	15%	150°C	1.03 ±.050	.54 ±.050	.095 ±.050	.835 ±.025

*Applicable above critical resistance.

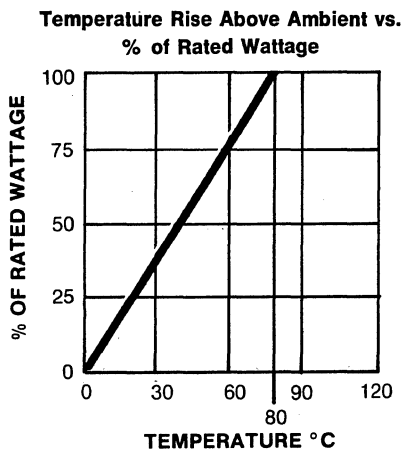


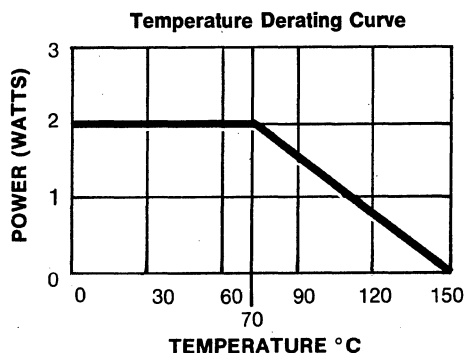
Table II — Temperature Coefficient

Standard Temperature Coefficient	SLIM-MOX 204
±250 ppm	1M to 5000M

The following resistance values are available from stock as "standard" values. Other values can be supplied where quantities warrant special set-up.

Table III — Resistance Values

Standard Resistance Values (Megohms)			
1	10	100	1000
2	20	200	2000
5	50	500	5000



These resistors are capable of dissipating higher wattages than rated if ambient temperatures are lower than 70°C or if forced air or oil cooling is employed. This additional capability can be determined in accordance with the temperature rise and the derating curves.



SHELLER-GLOBE CORPORATION

VICTOREEN INSTRUMENT DIV.

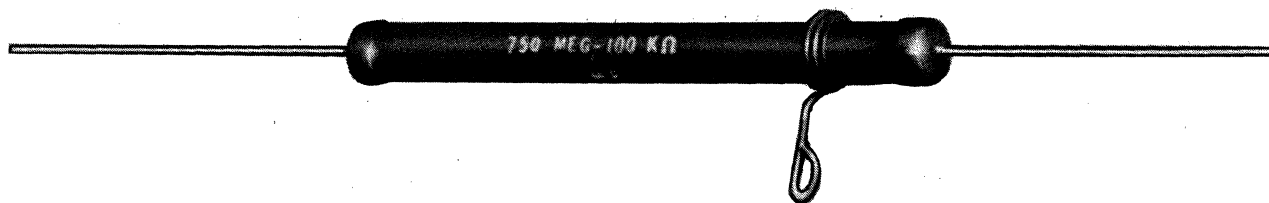
10101 WOODLAND AVENUE • CLEVELAND, OHIO 44104



HIGH VOLTAGE DIVIDERS

VICTOREEN DIVIDER-MOX RESISTORS RD SERIES HIGH VOLTAGE DIVIDERS

- INPUT VOLTAGES TO 30 kV
- RATIOS OF 10,000 TO 1
- OUTPUT VOLTAGE STABILITY OF $\pm 0.1\%$
- TEMPERATURE RANGE, -55°C TO $+125^{\circ}\text{C}$



Victoreen DIVIDER-MOX represents an advanced concept in the area of high voltage resistive divider networks. Through the use of a unique manufacturing process, Victoreen is able to produce a divider network utilizing the basic information available to the design engineer. The effects of T-C matching, V-C, self generated heat and other hard to define and control variables are minimized. The following basic information will enable us to supply a divider tailored to your application.

- Total resistance value of the divider
- Input Voltage
- Output voltage and tolerance
- Output voltage stability over operating temperature extremes (expressed in percent allowable change)

The limits of each of the above parameters are listed below.

RESISTANCE RANGE

See Table I. In order to enhance output voltage stability the total resistance of the divider should be as high as possible in order to minimize self-heating.

VOLTAGE RANGE

Below critical resistance values, the voltage is limited by the wattage rating of the resistor. Application of the power formula $E^2=WR$ will indicate the permissible maximum voltage. (Refer to Table I for additional data.)

WATTAGE RATING

Wattage ratings are calculated on the basis of 70°C ambient temperature. DIVIDER-MOX resistors are derated to zero watts at 180°C .

INPUT/OUTPUT VOLTAGE RATIOS

As indicated in Table I, any ratio between the maximum and minimum specified is available, except for those maximum ratios that exceed our manufacturing limitations.

INPUT VOLTAGE

Maximum in accordance with Table I. Minimum consistent with Input/output voltage ratios.

OUTPUT VOLTAGE

Determined only by input voltage limitations and Input/Output voltage ratios. The best available tolerance is 1%.

OUTPUT VOLTAGE STABILITY

This is the parameter which really defines the precision of a divider and is expressed in terms of percent allowable change over the operating temperature range. Stability is dependent on a number of factors including power dissipation and operating temperature range. While Victoreen DIVIDER-MOX resistors are capable of operating over the full range of characteristics indicated, if power dissipation is limited to 10% of the maximum values indicated, (not an unreasonable figure since most dividers are high resistance devices) stabilities of .1% are obtainable. Operation at higher wattage levels will effect initial (turn-on) stability and additional time must be allowed for the divider to reach temperature equilibrium.

OPERATING TEMPERATURE RANGE

The normal maximum operating temperature extremes used to calculate output voltage stability are -55°C to $+125^{\circ}\text{C}$. Generally speaking, narrower extremes means better stability, wider extremes, of course, sacrifice stability.

DIVIDER CONSTRUCTION

A single high alumina core is utilized with a metal oxide resistive element. The end terminations are gold and accommodate close fitting, pressed on welded cap and lead assemblies. The third terminal is mechanically fastened to a gold termination and the whole assembly is epoxy coated with the same high quality material used on other MOX resistors. Threaded end caps available on MAXI-MOX are available on DIVIDER-MOX as well. Resistors are marked with Type, Resistance Value and Tolerance. Customer marking available as an option.

COATING EPOXY RESIN

- Resists most industrial solvents
- Excellent moisture resistance
- High dielectric and low outgassing
- Maximum hot spot temperature of 180°C



VICTOREEN INSTRUMENT DIV.
10101 WOODLAND AVENUE • CLEVELAND, OHIO 44104



SHELLER-GLOBE CORPORATION

VICTOREEN DIVIDER-MOX RESISTORS

SELECTING THE PROPER VICTOREEN DIVIDER

1. Select the proper divider based on input voltage limitations
2. Determine that the input/output voltage ratio falls within the specified limits.
3. Choose the highest possible divider resistance value commensurate with circuit parameters, the wattage limitations of the divider, and within the specified resistance range.
4. Divide the resistance value selected by the input-output voltage ratio to obtain the tap resistance value. If this is greater than the minimum tap resistance for the divider selected, the divider can be fabricated. If the tap resistance value is less than the minimum, the divider resistance value must be increased or other parameters adjusted.

Example:

1. MOX-2RD; 7.5kV.

Input voltage cannot exceed 7.5 kV (maximum operating volts).

2. Output Required; 7.5V.

$$\frac{7.500V}{7.5V} = I/O \text{ ratio } 1000:1.$$

(Ratio limits from 500-5000 maximum permissible).

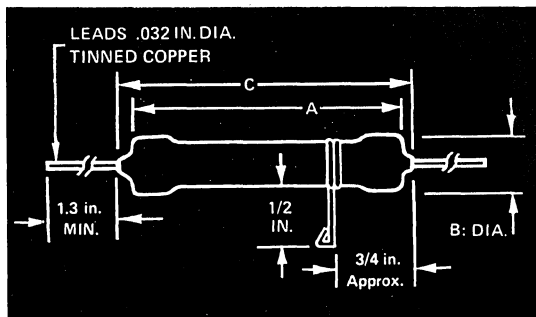
3. Total Divider resistance selected. Resistance selected 100M Ω (resistance range 5 Megs to 500 Megs).

Wattage Limitation; 1.5W.

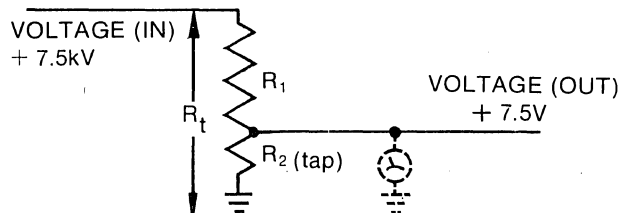
High Stability Wattage; .15W or less.

$$W = \frac{E^2}{R} = \frac{(7.5 \times 10^3)^2 \text{ volts}}{1 \times 10^8 \text{ ohms}} = 56.25 \times 10^{-2} = .5625$$

Wattage does not fall within high stability power rating. However, it does not exceed maximum power rating of 1.5 watts.



4. To select the proper tap resistance, the following formula applies. (Figure 1).



$$R_2 = \frac{V(\text{Out})}{V(\text{In})} \times R_1 = \frac{7.5V}{7500V} \times 100 \text{ Megs}$$

$$= \frac{1}{1000} \times 100 \text{ Megs } R_2 = *100k\Omega$$

*This value must be greater than stated minimum tap resistances of:

MOX-2RD — 10k Ω MOX-4RD — 20k Ω
MOX-3RD — 15k Ω MOX-5RD — 25k Ω

5. Measurement.

When testing MOX-RD Dividers with low impedance meters please note:

$$V(\text{Out}) = V(\text{In}) \times \frac{R_2 \text{ (parallel with R meter)}}{R_1 + R_2 \text{ (parallel with R meter)}}$$

Table 1 — Resistor Specifications

Model	Resistance Range	Power Rating @ 70°C	High Stability Power Rating ³	Max. Oper. Volts	Input/Output Voltage Ratio		Critical Resistance	Minimum Tap Resistance	Maximum Dimensions Inches		
					Min.	Max.			A	B	C
MOX-2RD	5 - 500 Megs	1.5W	0.15W	7.5 kV	500	5,000	37.5 Megs	10K ohms	2.140	.345	2.20
MOX-3RD	4.5-1000 Megs	3.0W	0.30W	15 kV	300	10,000	75 Megs	15K ohms	3.140	.345	3.20
MOX-4RD	6 -1500 Megs	4.5W	0.45W	22.5 kV	300	10,000	112.5 Megs	20K ohms	4.140	.345	4.20
MOX-5RD	7.5-2000 Megs	6.0W	0.60W	30 kV	300	10,000	150 Megs	25K ohms	5.140	.345	5.20

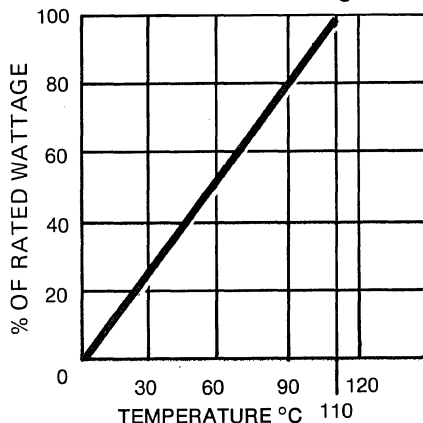
¹Minimum total divider resistance dependent on maximum input/output voltage ratio.

²Derated to 0 watts @ 180°C.

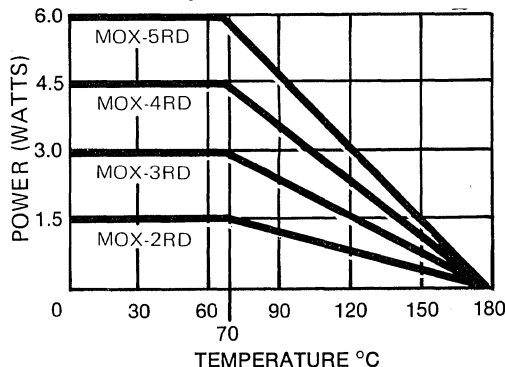
³Recommended maximum power dissipation for highest stability.

⁴Applicable above critical resistance.

Temperature Rise Above Ambient vs. % of Rated Wattage



Temperature Derating Curve



These resistors are capable of dissipating higher wattages than rated if ambient temperatures are lower than 70°C or if forced air or oil cooling is employed. This additional capability can be determined in accordance with the temperature rise and the derating curves.



SHELLER-GLOBE CORPORATION

VICTOREEN INSTRUMENT DIV.

10101 WOODLAND AVENUE • CLEVELAND, OHIO 44104



VICTOREEN • HIGH RESISTANCE • CARBON COATED PRECISION GLASS ENCAPSULATED RESISTORS

Type RX-1 Hi-Meg Resistors

VICTOREEN HI-MEG RESISTORS

Were originally designed for use in electrometer circuits where a high order of performance is required. HI-MEG resistors achieve a high degree of accuracy and stability, and operate at this high level for a long period of time. The HI-MEGS are manufactured in accordance with MIL-R-14293A, characteristic T, and therefore are measured at 20 volts ± 1 volt. Reference to the average voltage coefficient curve below will indicate that deviations from the marked resistance value may be encountered when used at higher voltages. By special order, Victoreen can supply resistors with resistance measurements at specified voltages.

ELEMENT

The resistor element is a carbon coated glass rod, the ends of which are banded with silver to obtain the best electrical contact. Wire leads extend from the ends of the element.

NOISE

The noise level is negligible for most uses.

GLASS SEAL

HI-MEGS are vacuum sealed in a glass envelope which is treated with a special silicone varnish which keeps the resis-

tor relatively free from the effects of moisture. Care should be exercised however, to avoid contamination in handling, such as fingerprints, which might result in reduced effective resistance.

POWER RATING

The power rating for any HI-MEG resistor is equal to one divided by the resistance in megohms.

RESISTANCE

HI-MEG resistors are available in values from 10^7 to 10^{14} ohms.

TOLERANCE

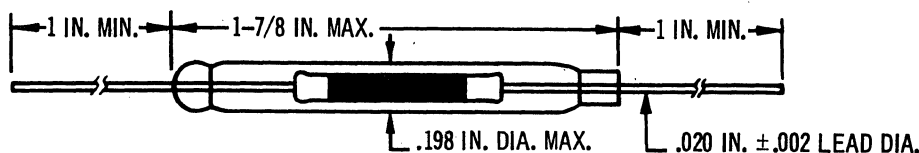
HI-MEG resistors can be supplied in the following tolerances; 1% below 10^{12} ohms, 2% and 5% below 10^{13} ohms, and 10% over the entire range. Refer to the price list for standard tolerance availability.

MAXIMUM WORKING VOLTAGE

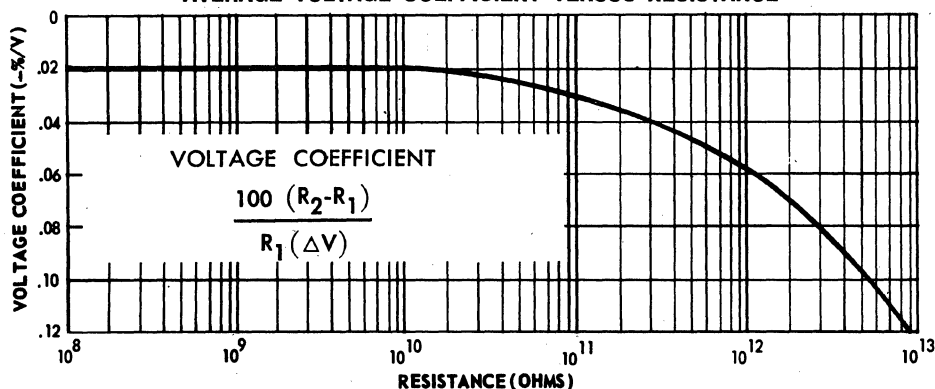
1000 volts.

MAXIMUM OPERATING AMBIENT TEMPERATURE

100°C.

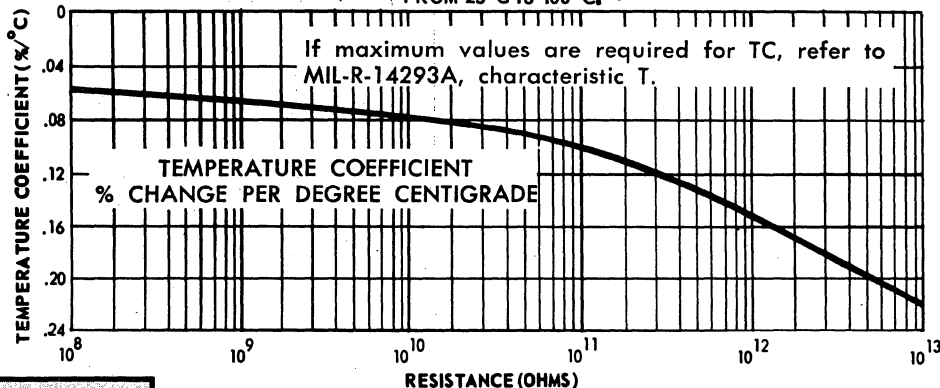


AVERAGE VOLTAGE COEFFICIENT VERSUS RESISTANCE



AVERAGE TEMPERATURE COEFFICIENT VERSUS RESISTANCE

FROM 25°C to 100°C.



VICTOREEN

VICTOREEN INSTRUMENT DIV.

10101 WOODLAND AVENUE • CLEVELAND, OHIO 44104



SHELLER-GLOBE CORPORATION

VICTOREEN RESISTORS

CARBON FILM • GLASS ENCAPSULATED • CONFORMAL COATED

GLASS ENCAPSULATED • HIGH VOLTAGE • HIGH WATTAGE

Types RX-2, RX-3, RX-3HV, RX-4, RX-5 and RX-8

RESISTANCE ELEMENT: Ceramic rod, selected for high quality of composition and surface texture, has pure crystalline carbon deposited on its surface through pyrolysis of hydrocarbon vapor. No filler or binder is used with the carbon.

TERMINALS: Contact terminals are silver plated brass caps securely gripping the ends of the element which are also silvered to obtain the best electrical conductivity.

GLASS SEALS: All resistors are glass-sealed. The deposited carbon resistors are encased in glass envelopes from which the air has been exhausted and a dry, inert gas substituted.

MARKING: All resistors are plainly marked with the type designation, the resistance value and the tolerance.

TOLERANCE: Resistors are made to specified values within the limits shown in the data table. Limited quantities of resistors of any value can be furnished from stock for immediate delivery.

TEMPERATURE COEFFICIENT: ± 500 ppm maximum over temperature range -55° to $+125^{\circ}\text{C}$. TCR is effected by resistance value and resistor type.

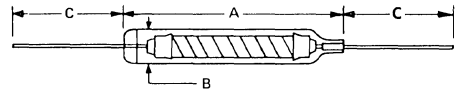
VOLTAGE COEFFICIENT: The coefficient is $-.0002$ for all types and values of resistors listed in the table below.

POWER RATING: The power rating of these resistors should be determined from the "TEMPERATURE DE-RATING CURVES" and/or the "POWER VERSUS RESISTANCE VALUE" curves for the particular application.

CRITICAL RESISTANCE: Resistor performance may be adversely affected by (1) overheating due to overwattage or (2) the application of excessive voltage.

Since $W=E^2/R$, the term "critical resistance" applies to that value of resistance at which both maximum voltage and maximum wattage may be applied. Below this value, the voltage must be limited to that voltage which will produce the maximum rated wattage; above this value, the wattage must be restricted to that wattage which will be produced by the application of maximum rated voltage.

HIGH VOLTAGE SHIELDING: The RX-3HV is designed to meet the difficult requirements encountered when the resistor operates at more than 10 kv above ground. Examples of this would be a resistor used as a series filter in a high voltage power supply or as bleeder strings across such supplies.



Type	Watts Max.	Resistance			Max. Working Voltage	Tolerance %	Max. Temp. $^{\circ}\text{C}$	Dimensions (Inches)			
		Min.	Critical	Max.				A Max.	B Max.	C Min.	Lead Diam.
RX-2	1	500K	9 Meg	50 Meg	3000	1, 2, 5	125	2	.413	1 1/2	.022 $\pm .005$
RX-3	3	1 Meg	33 Meg	200 Meg	10,000	1, 2, 5	125	3 3/8	.413	1 1/2	.022 $\pm .005$
RX-3HV	2	1K	50 Meg	200 Meg	10,000	1, 2, 5	125	3 3/8	.413	1 1/2	.022 $\pm .005$
RX-4	5	200 Ohm	128K	1 Meg	800	1, 2, 5	200	2	.413	1 1/2	.022 $\pm .005$
RX-5	10	200 Ohm	400K	2 Meg	2000	1, 2, 5	200	3 3/8	.413	1 1/2	.022 $\pm .005$
RX-8	2	100 Ohm	281K	10 Meg	750	1, 2, 5*	200	1 1/2	.240	1 3/8	.020 $\pm .002$

*1% tolerance available only below 1 meg.

CONFORMAL COATED (VARNISH) • HIGH FREQUENCY • HIGH VOLTAGE • HIGH POWER

HIGH VOLTAGE • HIGH WATTAGE • HIGH FREQUENCY

HF SERIES HIGH FREQUENCY RESISTORS

The elements of Type HF resistors are applied as a solid coating resulting in a low inductance.

RADIAL LUG TYPE — STYLE 1

Type	Watts Max.	Resistance			Volts Max.	Dimensions (Inches)		
		Min.	Critical	Max.		A	B	Lead Dia. (AWG)
HFA	1	20 Ohms	140K	25 Meg	375	1	3/8	—
HFB	2	35 Ohms	281K	50 Meg	750	1 3/4	3/8	—
HFC	3	65 Ohms	650K	100 Meg	1400	3	3/8	—
HFD	5	120 Ohms	1.35 Meg	100 Meg	2600	5 1/2	3/8	—
HFE	4	30 Ohms	300K	50 Meg	1100	2 1/2	3/8	—
HFF	6	50 Ohms	600K	75 Meg	1900	4	3/8	—
HFG	10	80 Ohms	960K	100 Meg	3100	6 1/2	3/8	—

RADIAL BAND TYPE — STYLE 3

HFX	12	20 Ohms	130K	25 Meg	1250	4 1/2	3/4	—
HFH	20	35 Ohms	380K	50 Meg	2750	6 1/2	1 1/8	—
HFI	30	60 Ohms	750K	100 Meg	4750	10 1/2	1 1/8	—
HFJ	50	65 Ohms	900K	100 Meg	6750	14 1/2	1 1/2	—
HFL	30	25 Ohms	300K	100 Meg	3000	6 1/2	2	—
HFM	90	60 Ohms	800K	100 Meg	8500	18 1/2	2	—

AXIAL LEAD TYPE — STYLE 2

HFAW	1	20 Ohms	140K	25 Meg	375	1 1/8	3/8	20
HFBW	2	35 Ohms	275K	50 Meg	750	2	3/8	20
HFCW	3	65 Ohms	650K	100 Meg	1400	3 3/8	3/8	20
HFDW	5	120 Ohms	1.35 Meg	100 Meg	2600	5 1/8	3/8	20

Wire lead and cap assembly will increase diameter approximately 1/8 inch.

HV SERIES HIGH VOLTAGE RESISTORS

RADIAL LUG TYPE — STYLE 1

Type	Watts Max.	Resistance (Megohms)			Volts Max.	Dimensions (Inches)		
		Min.	Critical	Max.		A	B	Lead Dia. (AWG)
HVA	1	.01	12	7,000	3500	1	3/8	—
HVB	2	.025	28	20,000	7500	1 3/4	3/8	—
HVC	3	.1	75	25,000	15,000	3	3/8	—
HVD	5	.2	180	25,000	30,000	5 1/2	3/8	—
HVE	4	.2	56	25,000	15,000	2 1/2	3/8	—
HVF	6	.4	104	25,000	25,000	4	3/8	—
HVG	10	.7	160	25,000	40,000	6 1/2	3/8	—

AXIAL LEAD TYPE — STYLE 2

HVAW	1	.01	12	7,000	3500	1 1/8	3/8	20
HVBW	2	.025	28	20,000	7500	1 7/8	3/8	20
HVCW	3	.1	75	25,000	15,000	3 3/8	3/8	20
HVDW	5	.2	180	25,000	30,000	5 5/8	3/8	20

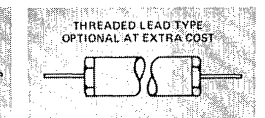
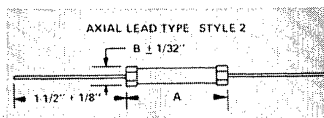
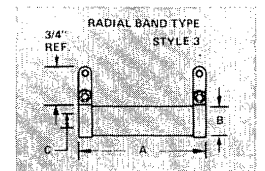
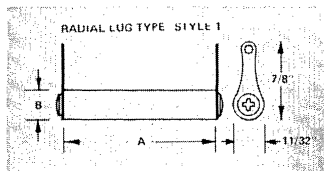
Wire lead and cap assembly will increase diameter approximately 1/8 inch.

HP SERIES HIGH POWER RESISTORS

RADIAL BAND TYPE — STYLE 3

Type	Watts Max.	Resistance (Megohms)			Volts Max.	Dimensions (Inches)		
		Min.	Critical	Max.		A	B	C
HPX	12	0.5	19	50,000	15,000	4 1/2	3/4	1/2
HFA	22	1.0	56	100,000	35KV	6 1/2	1 1/8	3/4
HPB	35	2.0	120	100,000	65KV	10 1/2	1 1/8	3/4
HPC	55	4.0	147	100,000	90KV	14 1/2	1 1/2	1 1/8
HPD	35	2.5	45	100,000	40KV	6 1/2	2	1 1/8
HPE	100	7.5	155	100,000	125KV	18 1/2	2	1 1/8

AVAILABLE TYPE STYLES



High Ohmic High Voltage Resistors — Resistances up to 25,000 megohms. (HV Series)

High Power Resistors — Resistances up to 100,000 megohms. (HP Series)

High Frequency Resistors — Resistances up to 100 megohms. (HF Series)

Victoreen Instrument Division



**10101
Woodland
Avenue,
Cleveland,
Ohio 44104**

SG SELLER-GLOBE CORPORATION

WAGNER HIGH RELIABILITY METAL FILM RESISTORS

HERMETIC SEAL AND NON HERMETIC SEAL PRECISION METAL FILM RESISTORS APPROVED PER MIL-R-55182

LEAKAGE RATE LESS THAN 1×10^{-9} CC/SEC

- Inductance Approximately 0.007 Microhenry
- Capacitance Below 1.0 Picofarad
- Noise Below -20 db (0.1 Microvolt/Volt)
- Temperature Coefficient 50, 25, 10 ppm/°C
- Tolerance 1, 0.5, 0.25, 0.1
- Matched Sets for Tolerance and TC

CHARACTERISTICS		DEFINITION
C	0 ± 50 ppm/°C	Hermetic Seal
E	0 ± 25 ppm/°C	Hermetic Seal
H	0 ± 50 ppm/°C	Non Hermetic Seal
J	0 ± 25 ppm/°C	Non Hermetic Seal
K	0 ± 100 ppm/°C	Non Hermetic Seal
TERMINAL TYPE DEFINITION		
RNC	Solderable and weldable leads	
RNR	Solderable leads	
RNN	Weldable leads	

WAGNER HERMETIC SEALED PRECISION METAL FILM RESISTOR

WATTAGE 125°C	TYPE	T.C. PPM/°C	RESISTANCE RANGE	SIZE IN INCHES			
				Body Length	Body Diameter	Lead Length	Lead Diameter
1/10 WATT	HS47-2B	0 ± 50	24.9 OHMS to 200K	1/4	1/8	1 1/2	.025
	HS47-2A	0 ± 25		±1/32	±1/32	±1/8	±.002
	HS47-2U	0 ± 10					
1/8 WATT	HS48-2B	0 ± 50	24.9 OHMS to 499K	3/8	1/8	1 1/2	.025
	HS48-2A	0 ± 25		±1/16	±1/32	±1/8	±.002
	HS48-2U	0 ± 10					
1/4 WATT	HS55-2B	0 ± 50	24.9 OHMS to 1.5 MEG.	5/8	3/16	1 1/2	.025
	HS55-2A	0 ± 25		±1/16	±1/16	±1/8	±.002
	HS55-2U	0 ± 10					
1/2 WATT	HS52-2B	0 ± 50	24.9 OHMS to 2 MEG.	3/4	1/4	1 1/2	.032
	HS52-2A	0 ± 25		±1/16	±3/32	±1/8	±.002
	HS52-2U	0 ± 10					
1 WATT	HS50-2B	0 ± 50	24.9 OHMS to 3.5 MEG.	1 1/16	3/8	1 1/2	.032
	HS50-2A	0 ± 25		±1/16	±3/32	±1/8	±.002
	HS50-2U	0 ± 10					
2 WATT	HS49-2B	0 ± 50	24.9 OHMS to 6 MEG.	2 3/16	3/8	1 1/2	.032
	HS49-2A	0 ± 25		+3/32	+1/16	±1/8	±.002
	HS49-2U	0 ± 10		-1/16	-1/32		

CONFORMAL COATED (NON FLAMMABLE EPOXY)

MILITARY TYPE	STYLE CHAR.	WAGNER STYLE	TC ppm/°C	RESISTANCE RANGE	BODY LENGTH	BODY DIAMETER	LEAD LENGTH	LEAD DIAMETER
RNC55 RNR55 RNN55 (1/10 Watt)	C	HS47-2B	50	24.9 OHMS to 200K	.250	.109	1 1/2	.025
	H	HR47-2B	50	24.9 OHMS to 200K	±.031	±.031	±1/8	±.002
	E	HS47-2A	25	24.9 OHMS to 200K				
	J	HR47-2A	25	24.9 OHMS to 200K				
	K	HR47-2K	100	24.9 OHMS to 200K				
RNC60 RNC60 RNN60 (1/8 Watt)	C	HS48-2B	50	24.9 OHMS to 500K	.375	.125	1 1/2	.025
	H	HR48-2B	50	24.9 OHMS to 500K	±.062	+ .040	±1/8	±.002
	E	HS48-2A	25	24.9 OHMS to 500K		-.031		
	J	HR48-2A	25	24.9 OHMS to 500K				
	K	HR48-2K	100	24.9 OHMS to 500K				
RNC65 RNR65 RNN65 (1/4 Watt)	C	HS55-2B	50	24.9 OHMS to 1 MEG.	.625	.188	1 1/2	.025
	H	HR55-2B	50	24.9 OHMS to 1 MEG.	+ .031	+ .062	±1/8	±.002
	E	HS55-2A	25	24.9 OHMS to 1 MEG.	-.094	-.031		
	J	HR55-2A	25	24.9 OHMS to 1 MEG.				
	K	HR55-2K	100	24.9 OHMS to 1 MEG.				
RNC70 RNR70 RNN70 (1/2 Watt)	C	HS52-2B	50	24.9 OHMS to 1 MEG.	.750	.250	1 1/2	.032
	H	HR52-2B	50	24.9 OHMS to 1 MEG.	+ .125	+ .078	±1/8	±.002
	E	HS52-2A	25	24.9 OHMS to 1 MEG.	-.062	-.031		
	J	HR52-2A	25	24.9 OHMS to 1 MEG.				
	K	HS52-2K	100	24.9 OHMS to 1.5 MEG.				
RNC75 RNR75 (1 Watt)	E	HS50-2A	25	24.9 OHMS to 2 MEG.	1.062	.375	1 1/2	.032
	J	HR50-2A	25	24.9 OHMS to 2 MEG.	±.062	+ .062	±1/8	±.002

TYPICAL MILITARY DESIGNATION

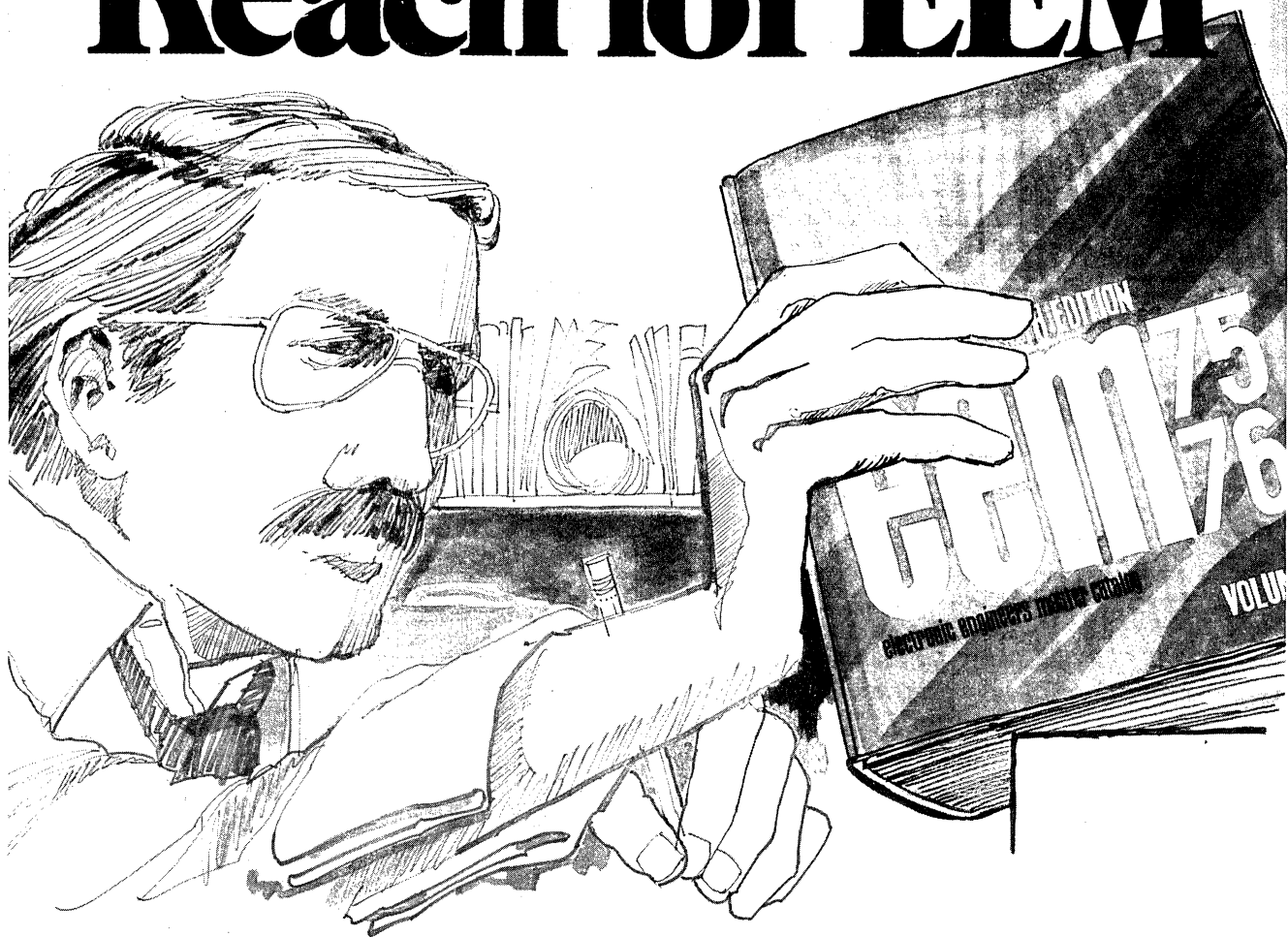
HERMETIC SEAL					NON HERMETIC SEAL				
RNC55	C	49R9	F	R	RNC55	H	49R9	F	R
Style and Terminal Type	Characteristic 50 ppm	Resistance Value	Tolerance	Failure Rate	Style and Terminal Type	Characteristic 50 ppm	Resistance Value	Tolerance	Failure Rate

WAGNER ELECTRIC CORPORATION/Tung-Sol Division

630 W. Mt. Pleasant Avenue. Livingston, N.J. 07039 / TWX: 710-994-4865 Phone: (201) 992-1100: (212) 732-5426

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



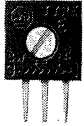
**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

Allen-Bradley Trimming Potentiometers

**TYPE E:**

Cermet, single turn, 0.5W at 70°C, 10 ohms to 2 megs, $\pm 10\%$, pin terminals, linear taper.

**TYPE S:**

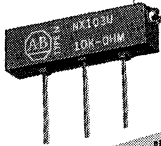
Cermet, single turn, 0.5W at 85°C, 50 ohms to 1 meg, $\pm 10\%$, pin terminals, linear taper.

**TYPE Z:**

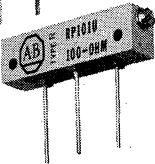
Cermet, single turn, 0.5W at 70°C, 50 ohms to 1 meg, $\pm 10\%$ and $\pm 20\%$, pin terminals, linear taper.

**TYPE RT:**

Cermet, 20 turns, 0.75W at 70°C, 10 ohms to 2.0 megs, $\pm 10\%$, pin terminals, linear taper, .250" or .340" high types.

**TYPE N:**

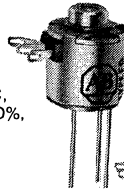
Hot-molded composition, 25 turns, 0.33W at 50°C, 100 ohms to 2.5 megs, $\pm 10\%$ and $\pm 20\%$, pin terminals, linear taper.

**TYPE R:**

Hot-molded composition, 25 turns, 0.25W at 70°C, 100 ohms to 2.5 megs, $\pm 10\%$ and $\pm 20\%$, pin or solder lug terminals, linear taper.

**TYPE F:**

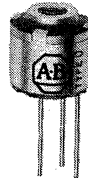
Hot-molded composition, single turn, 0.25W at 70°C, 100 ohms to 5 megs, $\pm 10\%$ and $\pm 20\%$, pin or solder lug terminals, 5 standard tapers.

**TYPE FD:**

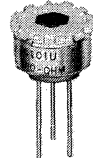
Dual version of Type F; front section: solder lug only, rear: pin or lug. Well suited for Bridged-T or L-pad attenuator applications.

**TYPE BT:**

An all plastic version of the Type FD for excellent performance at high frequencies. Two types available for top or side adjustments. Also well suited for Bridged-T or L-pad attenuator applications.

**TYPE O:**

Hot-molded composition, single turn, 0.4W at 70°C, 100 ohms to 5 megs, $\pm 10\%$ and $\pm 20\%$, pin or solder lug terminals, 5 standard tapers.

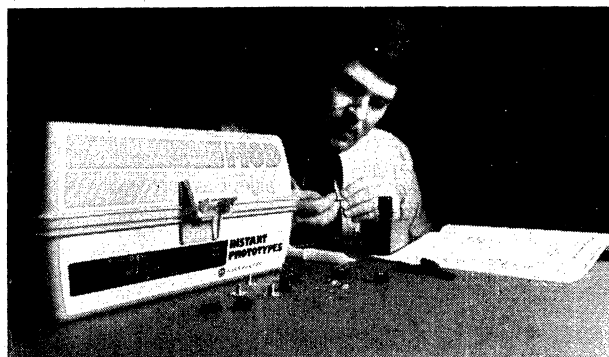
**TYPE Y:**

Hot-molded composition, single turn, 0.25W at 50°C, 100 ohms to 5 megs, $\pm 10\%$ and $\pm 20\%$, pin terminals, 5 standard tapers.

SPECIFICATIONS

Type	Publication Number	Resistance Element and Adjustment Turns	Resistance Range and Tolerance	Power Rating	Voltage Rating (RMS or DC)	Operating Temperature Range	Terminal Types	Case Dimensions in inches, (millimeters)	Enclosure
E	5219	Cermet Single Turn	10 Ohms to 2 Megohms $\pm 10\%$	0.5 Watt @ 70°C	300V	-55°C to +125°C	Pin	0.385 (9,78) Square by 0.197 (5,00) Thick	Immersion Sealed
S	5208		50 Ohms to 1 Megohm $\pm 10\%$	0.5 Watt @ 85°C		-65°C to +150°C		0.375 (9,52) Diameter by 0.375 (9,52)	
Z	5211		50 Ohms to 1 Megohm $\pm 10\%$, $\pm 20\%$	0.5 Watt @ 70°C		-55°C to +125°C		0.250 (6,35) cube	
RT	5237	Cermet 20 Turn	10 Ohms to 2 Megohms $\pm 10\%$	0.75 Watt @ 70°C	300V	-65°C to +125°C	Pin or Solder Lug	L 0.750 (19,05) H 0.250 (6,35) or H 0.340 (8,64) W 0.190 (4,83)	
N	5206	Composition 25 Turn	100 Ohms to 2.5 Megohms $\pm 10\%$, $\pm 20\%$	0.33 Watt @ 50°C		-55°C to +100°C		L 1.250 (31,75) H 0.359 (9,13) W 0.250 (6,35)	
R	5205			0.25 Watt @ 70°C		-55°C to +125°C			
F	5234	Composition Single Turn	100 Ohms to 5 Megohms $\pm 10\%$, $\pm 20\%$	0.25 Watt @ 70°C	350V	-55°C to +120°C	Pin or Solder Lug	0.500 (12,70) Diameter by 0.531 (13,49)	
FD	5231						Front: Lug Rear: Lug or Pin	0.500 (12,70) Diameter by 0.688 (17,46)	
BT	5236	Composition Single Turn		100 Ohms to 5 Megohms $\pm 10\%$, $\pm 20\%$	Contact Factory		Side Adjust: Front: 3 Lugs Rear: 3 Pins Top Adjust: Front: 2 Pins Rear: 2 Pins	0.500 (12,70) Diameter by 0.535 (13,59)	Dust and Splash Resistant
O	5235		0.4 Watt @ 70°C		350V	-55°C to +150°C	Pin or Solder Lug	0.500 (12,70) Diameter by 0.531 (13,49)	Immersion Sealed
Y	5209		0.25 Watt @ 50°C			-55°C to +100°C	Pin	0.500 (12,70) Diameter by 0.359 (9,13)	Dust and Splash Resistant

Allen-Bradley Variable Resistors

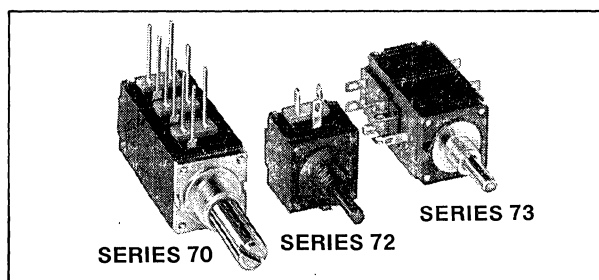


MOD POT Instant Prototypes (MPIP) puts a wide range of MOD POT components at your fingertips. MPIP available from your A-B distributor. Then get your production quantities of MOD POT fast from A-B distributors, assembled to exacting factory standards.

SERIES 70 MOD POT®: Unique modular design offers virtually unlimited configurations: single, double, triple or quadruple. Options include: PC or solder lug terminals, variety of switches, vernier drive, concentric shafts, composition or cermet resistance elements. 50 ohms to 10 megs, $\pm 10\%$ and $\pm 20\%$ (composition); 100 ohms to 1 meg, $\pm 10\%$ (cermet). 1.0W at 70°C (composition); 2.0W at 70°C (cermet).

SERIES 72 MOD POT®: Similar to Series 70 except the case, bushing and shaft are non-metallic for electrical isolation. Available in single or dual combinations only. Power rating is 0.5W at 70°C.

SERIES 73 MOD POT®: Another version of Series 70 for applications that require single or dual section controls.



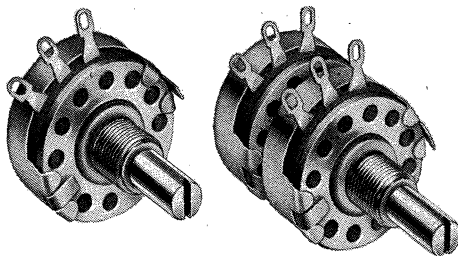
SPECIFICATIONS

Type	Publication Number	Resistance Element	Resistance Range and Tolerance	Power Rating	Voltage Rating (RMS or DC)	Operating Temperature Range	Number of Sections Available	Case Dimensions in inches, (millimeters)	Enclosure
70	5217	Cermet	100 Ohms to 1 Megohm ±10%	2.0 Watts @ 70°C	350V	-55°C to +150°C	1, 2, 3 or 4	0.594 (15,08) Deep by 0.625 (15,88) Square (Single Section)	Dust and Splash Resistant
		Composition	50 Ohms to 10 Megohms ±10%, ±20%	1.0 Watt @ 70°C		-55°C to +120°C			
72	5224	Composition	50 Ohms to 10 Megohms ±10%, ±20%	0.5 Watt @ 70°C		-55°C to +100°C	1 or 2		
73	5225	Cermet	100 Ohms to 1 Megohm ±10%	Contact Factory	Contact Factory				
		Composition	50 Ohms to 10 Megohms ±10%, ±20%						
J (RV4)	5200		Composition	50 Ohms to 5 Megohms ±10%, ±20%	2.25 Watts @ 70°C	500V	-55°C to +120°C	1, 2 or 3	0.625 (15,88) Deep by 1.156 (29,36) Diameter (Single Section)
EJ	5230				2.25 Watts @ 70°C		-55°C to +120°C	1 or 2	
K	5222	3.0 Watts @ 70°C			-55°C to +150°C		1, 2 or 3		
G (RV6)	5201	Composition	100 Ohms to 5 Megohms ±10%, ±20%	0.5 Watt @ 70°C	350V	-55°C to +120°C	1	0.469 (11,91) Deep by 0.500 (12,70) Diameter (Without Switch)	Immersion Sealed
GD	5213			350V		-55°C to +150°C	2		
L	5233					-55°C to +120°C	1		
W	5212	0.5 Watt @ 70°C	-55°C to +150°C						
WR	5220	0.5 Watt @ 70°C	-65°C to +175°C						
CQ	5214	Cermet	100 Ohms to 5 Megohms ±10%	0.5 Watt @ 125°C	300V	-65°C to +150°C	1	0.438 (11,11) Deep by 0.375 (9,52) Diameter	Immersion Sealed
SP	5216		50 Ohms to 1 Megohm ±10% (5% available)	1.0 Watt @ 70°C					

RESISTORS, VARIABLE

TYPE J (RV4):

Standard of the industry for quality. Hot-molded composition, 50 ohm to 5 megs, $\pm 10\%$ and $\pm 20\%$ (special values to 1000 megs available), 2.25W at 70°C, single, dual, triple sections available, variety of switch types for single or dual sections.



TYPE EJ:

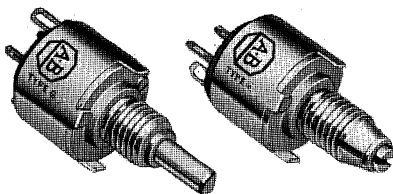
Extra long life version of the Type J with rotational life exceeding one million rotations, single or dual configurations.

TYPE K:

A 3.0W (at 70°C) version of the popular Type J. -55°C to +150°C.

TYPE G (RV6):

Hot-molded composition, 100 ohms to 5 megs, $\pm 10\%$ and $\pm 20\%$, 0.5W at 70°C, single section available with or without SPST switch.

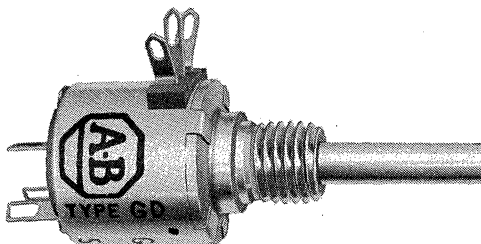


TYPE L:

Hot-molded composition, 100 ohms to 5 megs, $\pm 10\%$ and $\pm 20\%$, 0.8W at 70°C, single section.

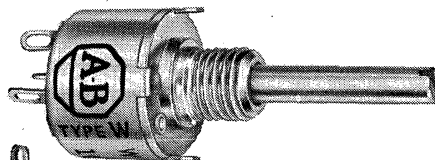
TYPE GD:

Dual section version of Type G. The smallest dual available.



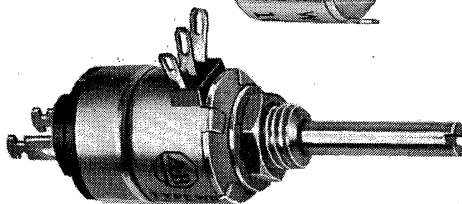
TYPE W:

Hot-molded composition, 100 ohms to 5 megs, $\pm 10\%$ and $\pm 20\%$, 0.5W at 70°C, single section.



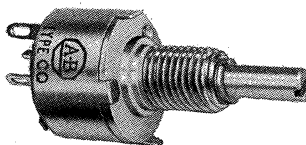
TYPE WR:

Radial-lead version of Type W. Available with switch with contacts that close at start of clockwise rotation (TYPE WRS) or with switch with contacts that close at start of counter-clockwise rotation (TYPE WRH).



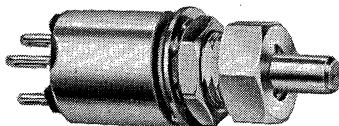
TYPE CQ:

Cermet, 100 ohms to 5 megs, $\pm 10\%$, 0.5W at 125°C, single section.



TYPE SP:

Cermet, 50 ohms to 1 meg, $\pm 10\%$, 1.0W at 70°C, single section. Only $\frac{3}{8}$ " diameter.



Standard options for all types include a variety of shafts, bushings, shaft endings, shaft lengths, and hardware.

Types FD, GD, J and the multi-section MOD POT with composition tracks are well suited for attenuator applications.

Allen-Bradley Hot-Molded Fixed Resistors



HB-RCR42



GB-RCR32



EB-RCR20



CB-RCR07



BB-RCR05

Allen-Bradley hot-molded composition resistors are high-quality units intended for general purpose use in the electronics industry.

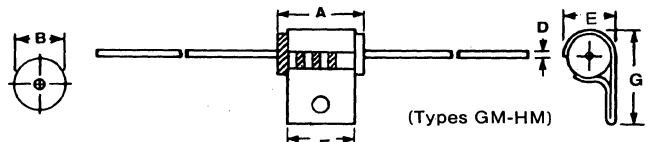
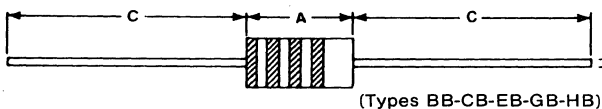
Allen-Bradley Style RCR resistors not only meet all requirements of MIL-R-39008 but also exceed the S level (best level) of Established Reliability of 0.001% failure rate per 1000 hours. And only Allen-Bradley resistors are available in S level reliability in all five wattage sizes over the entire resistance range. The S reliability level is indicated by a yellow 5th color band on the resistor body.

Metal-clad hot-molded resistors (Types GM and HM) are fitted with metal clamps which surround the major portion of the resistor. The metal clamps provide rigid mounting and efficient heat transfer from the resistors to the metal chassis or panels on which they are mounted.

For more information request Publication EC21.

SPECIFICATIONS

Type	Power at 70°C	Resistance Range	Tolerance	Voltage Rating (RMS)	Maximum Ambient Temperature	Dimensions in Inches (millimeters)							
						A	B	C	D	E	F	G	
BB	⅛ watt	2.7 Ohms to 100 Megohms	±5, 10, 20%	150V	+130°C	0.145	0.062	1.000	0.015				
RCR05		2.7 Ohms to 22 Megohms	±5, 10%			(3,68)	(1,59)	(25,40)	(0,38)				
CB	¼ watt	2.7 Ohms to 100 Megohms	±5, 10, 20%	250V	+150°C	0.250	0.090	1.500	0.025				
RCR07		2.7 Ohms to 22 Megohms	±5, 10%			(6,35)	(2,29)	(38,10)	(0,64)				
EB	½ watt	1.0 Ohms to 100 Megohms	±5, 10, 20%	350V		0.375	0.140	1.500	0.033				
RCR20		2.7 Ohms to 22 Megohms	±5, 10%			(9,52)	(3,56)	(38,10)	(0,84)				
GB	1 watt	2.7 Ohms to 100 Megohms	±5, 10, 20%	500V		0.562	0.225	1.500	0.041				
RCR32		2.7 Ohms to 22 Megohms	±5, 10%			(14,29)	(5,72)	(38,10)	(1,04)				
HB	2 watts	10 Ohms to 100 Megohms	±5, 10, 20%	750V		0.688	0.312	1.500	0.045				
RCR42		10 Ohms to 22 Megohms	±5, 10%	500V		(17,46)	(7,94)	(38,10)	(1,14)				
GM	3 watts	2.7 Ohms to 22 Megohms	±5% ±10%	500V		0.562 (14,29)	0.225 (5,72)	1.500 (38,10)	0.041 (1,04)	0.305 (7,75)	0.438 (11,11)	0.656 (16,67)	
HM	4 watts	10 Ohms to 22 Megohms		750V		0.688 (17,46)	0.312 (7,94)	1.500 (38,10)	0.045 (1,14)	0.391 (9,92)	0.562 (14,29)	0.766 (19,45)	



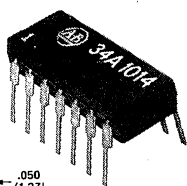
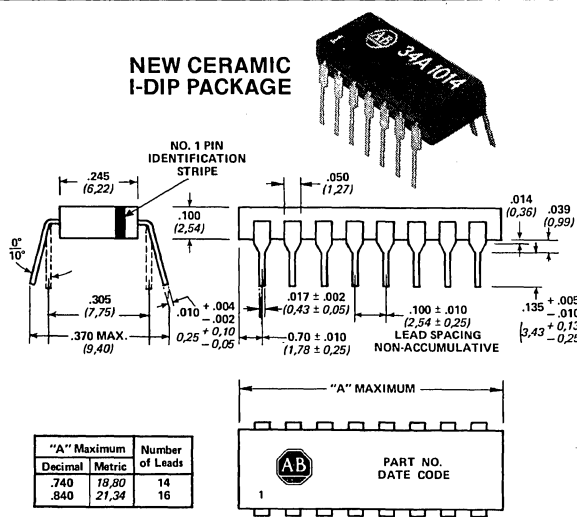




ALLEN-BRADLEY—THE LEADER IN TOTAL NETWORK CAPABILITY

CERMET DIP RESISTOR NETWORKS

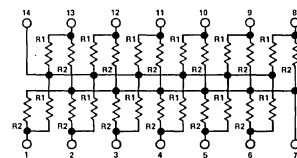
NEW CERAMIC I-DIP PACKAGE



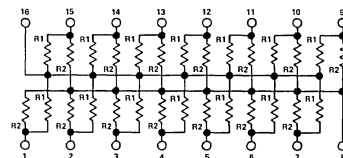
STANDARD • PARALLEL • TERMINATION • NETWORKS

APPLICATIONS:

Series 314E and 316E networks are used in digital IC logic circuits and are especially suited for ECL and TTL applications. For ECL applications the network's circuit configuration serves a dual purpose. The R2 resistors are pull-down resistors and are normally tied to the most negative supply voltage. The R1 resistors, in parallel with the R2 resistors, provide the characteristic impedance for proper transmission line matching. In TTL logic the networks are used in pulse squaring applications.



SERIES 314E



SERIES 316E

PRICES

Quantity	314E	316E
1—24	\$2.15	\$2.30
25—99	\$2.00	\$2.14

Prices and specifications subject to change without notice.

HOW TO ORDER

Example: Require series 316E with characteristic impedance=50Ω. Order part #316E810131.

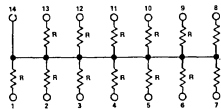
STANDARD RESISTANCE VALUES—SERIES 314E AND 316E

R1/R2	(Characteristic Z ₀ Impedance)
81/130	50
120/200	75
90/660	80
130/210	80
160/260	100
220/330	132
330/680	222
180/390	123

STANDARD • PULL-UP • PULL-DOWN • TERMINATION • NETWORKS

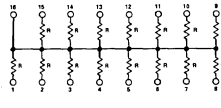
APPLICATIONS:

- Pull-up array for unused TTL gates
- Parallel high speed circuitry
- Wired OR configurations
- Pull-down applications
- TTL-MOS interfacing
- Digital pulse squaring



314A

13 Resistors...
14 Pin DIP

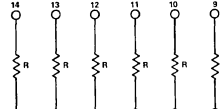


316A

15 Resistors...
16 Pin DIP

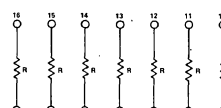
APPLICATIONS:

- Transmission line termination
- Power gate pull-up
- Current limiting
- Logic level translation



314B

7 Resistors...
14 Pin DIP



316B

8 Resistors...
16 Pin DIP

STANDARD RESISTANCE VALUES—SERIES 314A, 314B, 316A, 316B

R (OHMS)						
22	75	270	910	3300	10K	47K
24	82	300	1000	3600	11K	68K
27	91	330	1100	3900	12K	100K
30	100	360	1200	4300	13K	
33	110	390	1300	4700	15K	
36	120	430	1500	5100	16K	
39	130	470	1600	5600	18K	
43	150	510	1800	6000	20K	
47	160	560	2000	6200	22K	
51	180	620	2200	6800	24K	
56	200	680	2400	7500	27K	
62	220	750	2700	8200	30K	
68	240	820	3000	9100	33K	

PRICES

Quantity	314A	316A	314B	316B
1—24	\$1.20	\$1.25	\$1.15	\$1.20
25—99	\$1.10	\$1.13	\$1.07	\$1.10

Prices and specifications subject to change without notice.

HOW TO ORDER

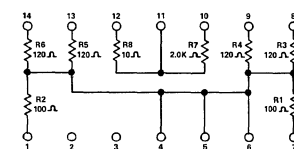
Example: Require Series 314A with resistance value=1000Ω. Order part #314A102.

STANDARD • SENSE AMP • INTERFACE • NETWORKS

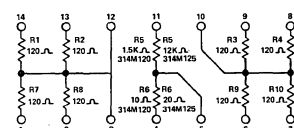
APPLICATIONS:

- Designed for use with 7520 series core memory sense amplifiers.
- Series 314M110 combines a threshold setting divider with balanced sense line termination and far end termination of two sense lines.
- Series 314M120 and 314M125 combine threshold setting dividers with four sense line termination. Following resistor values provide different threshold setting:

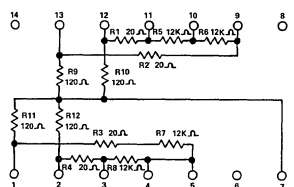
Resistor	314M120	314M125
R5	1.5KΩ	12KΩ
R6	10Ω	20Ω



314M110



314M120 or 314M125



314M130

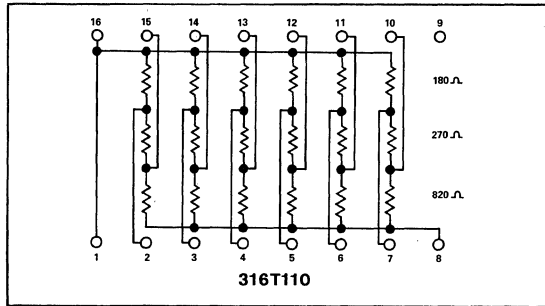
APPLICATIONS:

- Series 314M130 designed for use with μA711 dual voltage comparator in core memory sense amplifier applications.
- Combines four threshold dividers with balanced termination of two lines.

STANDARD TTL TO ECL TRANSLATOR NETWORK

APPLICATIONS:

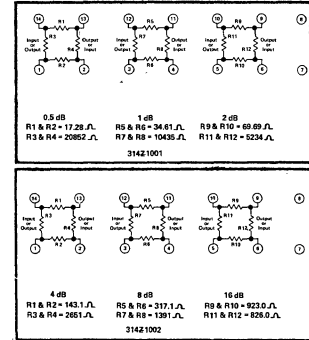
- Series 316T110 provides TTL to ECL translation.
- Contains six TTL to ECL translators.



STANDARD "O" PAD (BALANCED π) ATTENUATORS

APPLICATIONS:

These networks are used primarily in the communications industry where a fixed voltage attenuation is required with impedance matching. Voltage attenuation in steps of 0.5 dB from 0.5 dB to 31.5 dB can be obtained from the Series 314Z networks by the use of one "O" pad, or by placing two or more in series. For example, 20 dB is obtained by placing the 4 dB and 16 dB sections in series.



SPECIFICATIONS:

Characteristic Impedance	600 ohms
Attenuation Tolerance (dB)	±1%
Attenuation Change Due to Temperature	±1% Additional
Resistor Tolerance	±1%
Temperature Coefficient of Resistance	±200 ppm/°C
Power Dissipation Rating at 40°C	150 mw per Attenuator
Frequency Response	Flat to 1 MHz
Operating Temperature	0°C to +70°C

STANDARD NETWORK SPECIFICATIONS

Standard Network	Resistor Tolerance	Temperature Coefficient of Resistance (ppm/°C)	Power Dissipation Rating (Up to 70°C Ambient)	Operating Temperature Range	Resistance Ratios
314A			125 mw/resistor 1.6 watt/package		
314B	±2%	±100	250 mw/resistor 1.6 watt/package	-55°C to +125°C	-----
316A			125 mw/resistor 1.8 watt/package		
316B			250 mw/resistor 1.8 watt/package		
314E	±2%	±100	125 mw/resistor 1.6 watt/package	-55°C to +125°C	-----
316E			125 mw/resistor 1.8 watt/package		
314M110	±2% ±5% (R8 only)	±200	500 mw/resistor (R1 & R2) 100 mw/resistor (R3 through R8)	0°C to +70°C	R3/R4 ±1.5% R5/R6 ±1.5% R7/R8 ±2%
314M120	±2% ±5% (R6 only)	±100	100 mw/resistor	0°C to +70°C	R1/R2 R3/R4 R5/R6 R7/R8 R9/R10 } ±1.5%
314M125					
314M130	±2%	±200	100 mw/resistor	0°C to +70°C	-----
316T110	±2%	±200	125 mw/resistor	0°C to +70°C	-----

PRECISION THIN FILM RESISTOR NETWORKS, LADDERS AND ARRAYS

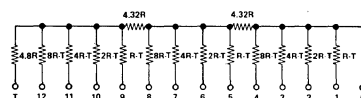
R/2R BINARY CODE LADDER NETWORKS

Ladder networks with fewer bits using the basic schematic of the FN132 are FN114, FN123, FN125, FN131, and FN160.

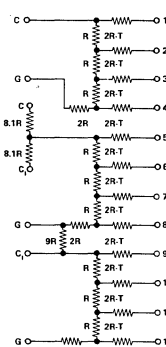


FN132

1-2-4-8 BCD CODE LADDER NETWORKS

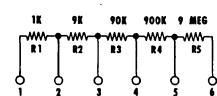


FN130



FN128 & FN129

VOLTAGE DIVIDER NETWORK (Decade Attenuator)

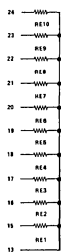


FN207

APPLICATIONS:

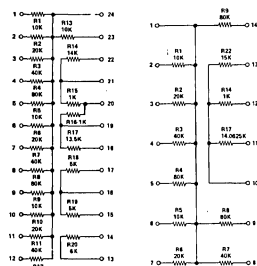
- All ladders—A/D and D/A conversion
- FN207—Input attenuation and range selection in digital instrumentation; particularly in digital voltmeters and multimeters.

CURRENT SUMMING NETWORKS



FN111 & FN112

PRECISION RESISTOR ARRAYS



FN215

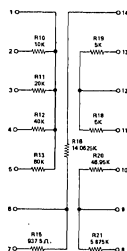
FN226

APPLICATIONS:

- A/D and D/A conversion.
- FN111*—10 bit binary operation.
- FN112*—3 place BCD operation (0 to 399).
- FN215—12 bit conversion—designed for use with Fairchild μA9650 IC.
- FN226**
- FN227**

*Both designed for use with Fairchild μA722 IC.

**Both designed for use with Intersil ICL 8018, 8019, 8020 IC's. FN226 gives 8 bit conversion. FN226 plus FN227 gives 12 bit conversion.



FN227

R/2R BINARY CODE LADDER NETWORKS

Part Number	FN114 (1)	FN123 (1)	FN125 (2)	FN131	FN132	FN160
Number of Bits	12	10	10	10	13	10
Ladder Resistance Value (R)	R=200K T ₁₋₂ =500Ω T ₃₋₁₂ =550Ω	R=50K T ₁₋₂ =500Ω T ₃₋₁₀ =550Ω	R=50K T ₁₋₂ =200Ω T ₃₋₁₀ =550Ω	R=10K T=0	R=5K T=0	R=5K T=0
Ladder Resistance Tolerance	±10%	±10%	±10%	±10%	±10%	±10%
Network Full Scale Accuracy	±½ LSB	±½ LSB	±½ LSB	±½ LSB	±½ LSB	±½ LSB
Operating Temperature Range	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C
Storage Temperature Range	-65°C to +175°C	-65°C to +175°C	-65°C to +175°C	-65°C to +175°C	-65°C to +175°C	-65°C to +175°C
Operating Voltage Range	±100V Maximum	±70V Maximum	±70V Maximum	±30V Maximum	±20V Maximum	±20V Maximum

- (1) May be used with Fairchild 3750/3751 IC.
(2) May be used with Fairchild 3750 IC.

1-2-4-8 BCD CODE LADDER NETWORKS

Part Number	FN128 (1)	FN129 (1)	FN130
Number of Bits	12	12	12
Ladder Resistance Value (R)	R=50K T ₁₋₂ =500Ω T ₃₋₁₂ =500Ω	R=100K T ₁₋₂ =500Ω T ₃₋₁₂ =550Ω	R=10K T=0
Ladder Resistance Tolerance	±10%	±10%	±10%
Network Full Scale Accuracy	±½ LSB	±½ LSB	±½ LSB
Operating Temperature Range	-55°C to +125°C	-55°C to +125°C	-55°C to +125°C
Storage Temperature Range	-65°C to +175°C	-65°C to +175°C	-65°C to +175°C
Operating Voltage Range	±100V Maximum	±140V Maximum	±20V Maximum

(1) May be used with Fairchild 3750/3751 IC.

VOLTAGE DIVIDER NETWORK FN207

Resistance Tolerance on Total Resistance (R_T) at +25°C:
R_T=R₁+R₂+R₃+R₄+R₅=10 Megohms ±0.05%.

Ratio Tolerance at +25°C and from 0 to 1000 volts:

$$\frac{R_1 + R_2 + R_3 + R_4}{R_T} = \frac{1 \text{ Megohm}}{10 \text{ Megohms}} = 0.1 \pm 0.03\%$$

$$\frac{R_1 + R_2 + R_3}{R_T} = \frac{100 \text{ K ohms}}{10 \text{ Megohms}} = 0.01 \pm 0.03\%$$

$$\frac{R_1 + R_2}{R_T} = \frac{10 \text{ K ohms}}{10 \text{ Megohms}} = 0.001 \pm 0.03\%$$

$$\frac{R_1}{R_T} = \frac{1 \text{ K ohm}}{10 \text{ Megohms}} = 0.0001 \pm 0.03\%$$

Temperature Coefficient of Resistance ±25 ppm/°C
TCR Tracking ±5 ppm/°C
Operating Voltage (between pins 1 & 6) 1000 volts max.
Operating Temperature 0°C to +70°C
Storage Temperature -65°C to +175°C

CURRENT SUMMING NETWORKS

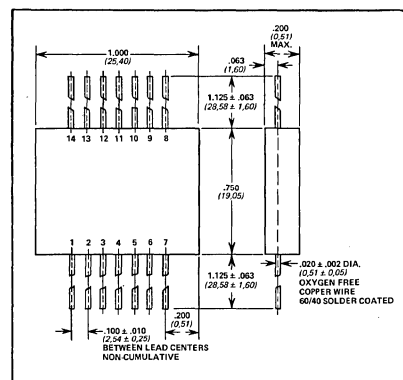
Part Number	Resistor Number (Rej)	FN111				FN112			
		Nominal Resistance (K ohm)	Nominal Ratio (Rej/Rei)	Max. Ratio Tolerance % At 25°C	Max. Ratio Temp. Coeff. (PPM/°C)	Nominal Resistance (K ohm)	Nominal Ratio (Rej/Rei)	Max. Ratio Tolerance % At 25°C	Max. Ratio Temp. Coeff. (PPM/°C)
15	RE1	2.547	1.000	±10% Absolute	±5.0	2.547	1.000	±10% Absolute	±20
16	RE2	5.094	2.000	±0.02	±5.0	5.094	2.000	±0.02	±5.0
17	RE3	10.245	4.022	±0.05	±10	6.379	2.5045	±0.02	±5.0
18	RE4	20.60	8.088	±0.10	±20	12.83	5.036	±0.05	±10
19	RE5	41.43	16.265	±0.20	±20	25.80	10.13	±0.10	±20
20	RE6	81.93	32.17	±0.20	±50	51.03	20.03	±0.20	±50
21	RE7	163.4	64.16	±0.50	±100	63.36	24.88	±0.50	±100
22	RE8	325.7	127.9	±1.0	±200	126.3	49.57	±1.0	±200
23	RE9	644.9	253.2	±2.0	±500	250.1	98.17	±1.0	±200
24	RE10	1275.0	500.8	±2.0	±500	495.0	194.3	±2.0	±500

PRECISION RESISTOR ARRAYS

Part Number	FN215	FN226	FN227
Tolerance—Resistance matching or ratio	R2/R1 = ±0.005% R3/R1 = ±0.01% R4/R1 = ±0.02% R5/R1 = ±1.0% R6/R5 = ±0.05% R7/R5 = ±0.1% R8/R5 = ±0.02% R9/R1 = ±1.0% R10/R9 = ±0.5% R11/R9 = ±1.0% R12/R9 = ±2.0% R13/R1 = ±0.2%	R2/R1 = ±0.0122% R3/R1 = ±0.0244% R4/R1 = ±0.0488% R5/R1 = ±0.096% R6/R1 = ±0.195% R7/R1 = ±0.391% R8/R1 = ±0.781% R9/R1 = ±1.0% R17/R14 = ±0.1% R22/R14 = ±0.5%	R11/R10 = ±1.0% R12/R10 = ±1.0% R13/R10 = ±1.0% R16/R15 = ±1.0% R19/R18 = ±0.1% R21/R20 = ±0.1%
Tolerance—Absolute	R14/R17 = ±0.5% R15/R16 = ±1.0% R18/R19 = ±0.1% R20 = ±1.0%	R1 = ±0.1% R14 = ±1.0%	R10 = ±0.5% R15 = ±1.0% R18 = ±0.5% R20 = ±0.5%
Temperature coefficient of resistance	±25 PPM/°C	±25 PPM/°C	±25 PPM/°C
Temperature coefficient of resistance tracking	±5 PPM/°C	±5 PPM/°C	±5 PPM/°C
Power rating each resistor up to +125°C	50MW	50MW	50MW
Operating temperature range	-55°C to +125°C	0°C to +70°C	0°C to +70°C
Storage temperature range	-65°C to +175°C	-65°C to +175°C	-65°C to +175°C

PACKAGE

Modified flat pack (Diallyl phthalate epoxy material).
(Dip, chip, and conformal coated package styles also available upon request.)



CUSTOM RESISTOR NETWORKS

For more information on custom resistor network capabilities ask for these publications:

Cermet resistor networks—A-B Publication 5850

Thin film resistor networks—A-B Publication 5800

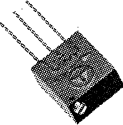
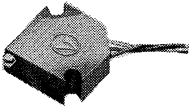
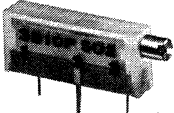
In addition to the standard cermet and precision thin film resistor networks listed on these pages, custom networks can be designed to meet a specific need.



ALLEN-BRADLEY
Electronics Division
Milwaukee, Wisconsin 53204

MICROPOT® WIREWOUND TRIMMING POTENTIOMETERS

**BUNKER
RAMO**
AMPHENOL

Description	Amphenol Model No.	Adjustment Turns	Terminals ²	Resistance Range in Ohms ³	Resistance Tolerance	Temperature Range	Temperature Coefficient Potentiometer (PPM/°C)	Maximum Power Rating in Watts
1¼" Rectangular 	9921 9941*	22	L,S,P	10 to 20K	10 to 75 ±10% 100 ohms to 20K ±5%	-55°C to +125°C	70 ppm	1 @ 40°C
Microminiature ⅜" Square 	2300*	26	P,W,X	10 to 20K	±5%	-55°C to +150°C	50 ppm	¾ @ 85°C
High Temperature 1¼" Rectangular 	27501*	22	P	10 to 20K	±5%	-55°C to +150°C	50 ppm	¾ @ 85°C
High Temperature 1¼" Rectangular 	28501*	22	L,S,P	10 to 20K	±5%	-55°C to +150°C	50 ppm	¾ @ 85°C
Subminiature ½" Square 	29001*	25	P,L,W,X,Y	10 to 20K	±5%	-55°C to +150°C	50 ppm	¾ @ 85°C
Microminiature ¾" Rectangular Solvent-Resistant Vista-Trim 	3810*	15	P, K	10 to 20K	±10%	-55°C to +125°C	100 ppm	1 @ 40°C

* Panel mounting bracket available.

Terminations: L — Color coded wire leads

S — Solder lugs

P — Printed circuit pins

W — Printed circuit pins (edge mount, top adjust leadscrew)

X — Printed circuit pins (edge mount, side adjust leadscrew)

² Terminations: Y — Printed circuit pins — staggered (edge mount, top adjust leadscrew)
K — Printed circuit pins with 0.200" spacing

³ See Catalog T-2 for standard resistance values.

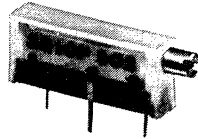
* Humidity Proof

MICROPOT® WIREWOUND TRIMMING POTENTIOMETERS

BUNKER
RAMO

AMPHENOL

Vista-Trim Trimmers Allow Visual Settings of Approximate Desired Values...



Speed Production and Reduce Labor Costs —

Once you've set one Vista-Trim trimmer to a given value, the same (approximate) value can be set on others by visual measurement.

Saves Valuable Time —

Both the element and contact carrier are visible through the semi-transparent top. Approximate final settings can be made with or without an ohmmeter. Example: For 50 ohms, set the contact at half the length of its travel along a 100 ohm element.

Reduce Field Service Time —

The repair of installed equipment is speeded up because the same advantages apply as for new equipment. The technician can visually adjust all units to approximate final settings. This saves time, aids him considerably by allowing quick easy final adjustments to balance the circuits.

Standard Resistances Available

Ohms	Wirewound 3810	Cermet 3805/3815	Film-Met™ 3811
10	X	—	X
20	X	X	X
50	X	X	X
100	X	X	X
200	X	X	X
500	X	X	X
1,000	X	X	X
2,000	X	X	X
5,000	X	X	X
10,000	X	X	X
20,000	X	X	X
50,000	—	X	X
100,000	—	X	—
250,000	—	X	—
500,000	—	X	—
1,000,000	—	X	—

Optional 0.100" or 0.200" Pin Spacing on 3/4" Commercial Trimmers

Amphenol has expanded its entire line of 3/4" rectangular cermet, Film-Met™ and wirewound trimmers to include 0.200" pin spacing. You can now specify 0.100" or 0.200" pin spacing as standard on the following models. To order, indicate the appropriate terminal designation -P, K or Y- in Amphenol's part numbering system for the spacing desired, e.g. 3810P-101 or 6034K-101.

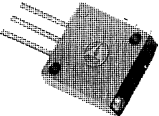
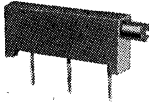
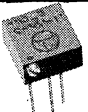
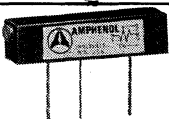
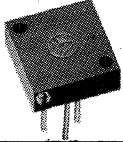
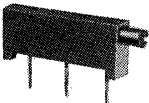
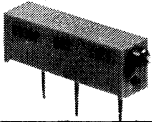
Models Available		Termination Designation	Pin Spacing
3805 3815 6034 3811 3810		P	0.100"
		K	0.200"
6034		Y	0.100"

®MICROPOT — Trademark registered
U.S. Patent Office
Humidity-proof trimmers pass MIL-R-27208A
moisture resistance test.

MICROPOT® INFINITE RESOLUTION TRIMMING POTENTIOMETERS

BUNKER
RAMO

AMPHENOL

	Description	Amphenol Model No.	Adjustment Turns	Terminals ²	Resistance Range in Ohms ³	Resistance Tolerance	Temperature Range	Temperature Coefficient Potentiometer (PPM/°C)
FILM-MET™	Microminiature ⅜" Square 	2301*	26	P,W,X	10 to 10K	±10% (±5% avail.)	-55° to +150°C	50 ppm
	High-Temperature 1¼" Rectangular 	2851*	22	L,S,P	20 to 20K	±10% (±5% avail.)	-55° to +150°C	50 ppm
	Subminiature ½" Square 	2901*	25	P,L,W,Y,X	10 to 20K	±10% (±5% avail.)	-55° to +150°C	50 ppm
	Microminiature ¾" Rectangular Solvent-Resistant Vista-Trim 	3811*	15	P, K	10 to 20K	±10% (±5% avail.)	-55° to +125°C	50 ppm
CERMET	Microminiature ⅜" Square 	2305*	26	P,W,X	10 to 1 Meg.	±10% (±5% avail.)	-55° to +150°C	±150 ppm (±100 ppm avail.▲)
	High Temperature 1¼" Rectangular 	2855*	22	P,L,S	20 to 1 Meg.	±10% (±5% avail.)	-55° to +150°C	±150 ppm (±100 ppm avail.▲)
	Subminiature ½" Square 	2905*	25	P,L,W,Y,X	20 to 10 Meg.	±10% (±5% avail.)	-55° to +150°C	±150 ppm (±100 ppm avail.▲)*
	Microminiature ¾" Rectangular Solvent-Resistant Vista-Trim 	3805 3815*	15	P, K	20 to 1 Meg.	±10% (±5% avail.)	-55° to +125°C	±150 ppm (±100 ppm avail.▲)
	Microminiature ¾" Rectangular 	6034*	15	P,K,Y	10 to 1 Meg.	±10% (±5% avail.)	-55°C to +125°C	±100 ppm

Panel mounting bracket available.

Terminations: L — Color coded wire leads

S — Solder lugs

P — Printed circuit pins

W — Printed circuit pins (edge mount, top adjust leadscrew)

X — Printed circuit pins (edge mount, side adjust leadscrew)

² Terminations: Y — Printed circuit pins — staggered (edge mount, top adjust leadscrew)

K — Printed circuit pins with 0.200" spacing

³ See Catalog T-2 for standard resistance values.

* Humidity Proof

MICROPOT® INFINITE RESOLUTION TRIMMING POTENTIOMETERS

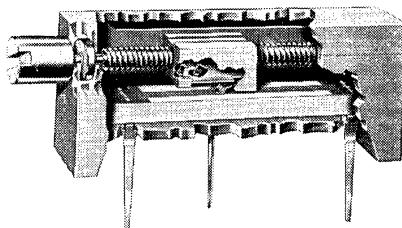
BUNKER
RAMO

AMPHENOL

Maximum Power Rating in Watts	SIZE IN INCHES			Application
	H	W	L	
1/2 @ 85°C	0.198 0.415 0.415	0.375 0.193 0.200	0.375P 0.375W 0.375X	Military Industrial
3/4 @ 85°C	0.32	0.28	1.25	Military Industrial
3/4 @ 85°C	0.220 0.187 0.500 0.575 0.500	0.500 0.500 0.195 0.190 0.195	0.500P 0.500L 0.500W 0.500Y 0.500X	Military Industrial
3/4 @ 40°C	0.31	0.16	0.75	Commercial
1/2 @ 85°C	0.198 0.415 0.415	0.375 0.193 0.200	0.375P 0.375W 0.375X	MIL-R-22097 RJ24
3/4 @ 85°C	0.32	0.28	1.25	MIL-R-22097 RJ11
1/2 @ 85°C	0.220 0.187 0.500 0.575 0.500	0.500 0.500 0.195 0.190 0.195	0.500P 0.500L 0.500W 0.500Y 0.500X	MIL-R-22097 RJ22
3/4 @ 40°C	0.31	0.16	0.75	Commercial
1/2 @ 85°C	0.20	0.16	0.75	Commercial

® MICROPOT — Trademark registered
U.S. Patent Office
Humidity-proof trimmers pass MIL-R-27208A
moisture resistance test.
▲ 1K and up

Film-Met™ by Amphenol*



It's the first major improvement in infinite resolution trimmers since cermet. Film-Met is an exclusive Amphenol resistance element completely different from wirewound and cermet types.

100% METAL ELEMENT — Amphenol's exclusive Film-Met element uses the same vacuum deposition process as precision metal-film fixed resistors. Continuous monitoring techniques during deposition assure maintenance of established performance levels and continuing high quality.

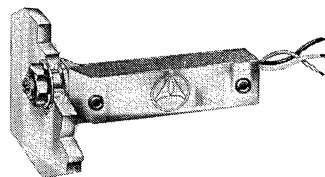
ENDS COMPROMISE — This new trimmer won't always replace wirewounds and cermet. Their characteristics fit many design parameters perfectly. But not all!

SPECIAL OPTIONS

The following trimmer panel mounts are available for the designated Amphenol trimmers. If the panel mount is desired to be pre-assembled to an Amphenol trimmer at the factory, the Amphenol trimmer part number should be specified with the suffix "M", e.g.: 2750P-502M denotes a 2750 trimmer with printed circuit pins, 5000 ohms resistance, and mounted to the applicable panel mount shown below. If the panel mount is desired as a separate item, simply specify the panel mount part number shown below.

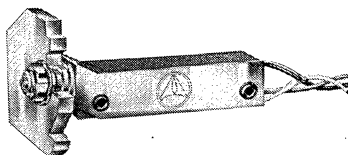
2799 PANEL MOUNT

For 2750 Trimmers



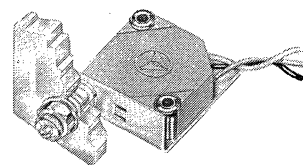
999 PANEL MOUNT

For 992, 994, 2850, 2851 and
2855 Trimmers



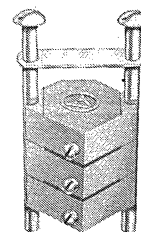
2949 PANEL MOUNT

For 2900, 2901 and 2905 Trimmers



29-63816 STACK STRAP

For 2900, 2901 and 2905 Trimmers



TEMPERATURE COEFFICIENT — Film-Met has a low TCR of ± 50 ppm/°C maximum as standard. Perfect for applications requiring extremely low TCR.

NOISE — For applications requiring critical low noise levels, Film-Met must be your choice. This is especially true in applications where other components feature low thermal noise. Film-Met is now available for that critical job.

SETABILITY — Film-Met contact setability is improved over cermet because of lower contact resistance variation, and vastly improved over the resolution inherent in wirewound trimmers which have limited setability due to the turns of the resistance wire. The lower CRV of Film-Met results from the smooth metallic element surface which provides a low resistance interface with the precious metal contact.

OTHER FEATURES — Your choice for high frequency and pulse applications should also be Film-Met because of its excellent performance characteristics in these areas. Investigate Film-Met performance features for solutions to your circuit problems.

* U.S. Patent No. 3,354,134;
also foreign patents.

PRECISION LINEAR WIREWOUND & CONDUCTIVE-PLASTIC POTENTIOMETERS

**BUNKER
RAMO**

AMPHENOL

	Size in Inches				Amphenol Model No.	Standard Resistance Range, ohms ⁴	Standard Resistance Tolerance	Standard Linearity Tolerance	Temperature Range	Power Rating, watts		Type of Mounting	Max. No. of Sections	Applications
	Dia.	Length	Shaft							Single gang	Added cup			
SINGLE-TURN WIREWOUND	7/8	.685	1/8		751	1K to 50K	±5%	±0.5%	-65°C to +150°C	2	1	Servo bushing	5	Military Industrial
	1 1/8	.665	1/8		752	200 to 100K	±5%	±0.5%	-65°C to +150°C	2	1	Servo bushing	5	Military Industrial
	1 1/8	.867	1/4		749	600 to 250K	±5%	±0.5%	-65°C to +150°C	4	2	Servo bushing	5	Military Industrial
	1 3/4	.827	1/4		757	1K to 300K	±5%	±0.35%	-65°C to +150°C	6	3	Servo bushing	8	Military Industrial
	2.0	.827	1/4		754	800 to 350K	±5%	±0.25%	-65°C to +150°C	8	4	Servo bushing	8	Military Industrial
	3.0	.986	1/4		743	1K to 340K	±5%	±0.25%	-65°C to +150°C	6	5	Servo bushing	8	Military Industrial
SINGLE-TURN CONDUCTIVE PLASTIC	7/8	.666	1/8		751P	250 to 100K	±10%	±0.5%	-55°C to +150°C	1.3	1.3	Servo bushing	5	Military Industrial
	1 1/8	.635	1/8		752P	250 to 150K	±10%	±0.5%	-55°C to +150°C	1.5	1.5	Servo bushing	5	Military Industrial
	1 1/8	.867	1/4		749P	250 to 175K	±10%	±0.4%	-55°C to +150°C	1.8	1.8	Servo bushing	5	Military Industrial
	1 3/4	.827	1/4		757P	500 to 200K	±10%	±0.35%	-55°C to +150°C	2.0	2.0	Servo bushing	8	Military Industrial
	2.0	.934	1/4		754P	500 to 250K	±10%	±0.3%	-55°C to +150°C	2.2	2.2	Servo bushing	8	Military Industrial
	3.0	1.179	1/4		743P	500 to 300K	±10%	±0.25%	-55°C to +150°C	2.5	2.5	Servo bushing	8	Military Industrial

NOTE:

The wirewound and conductive-plastic precision potentiometers described above are also available in a wide range of non-linear functions. Amphenol specializes in customizing potentiometers to fulfill your specific needs. Combinations of potentiometers, torque motors, switches and detent assemblies are but a few of the products that have been engineered and used successfully in military and industrial markets. We welcome your inquiries.

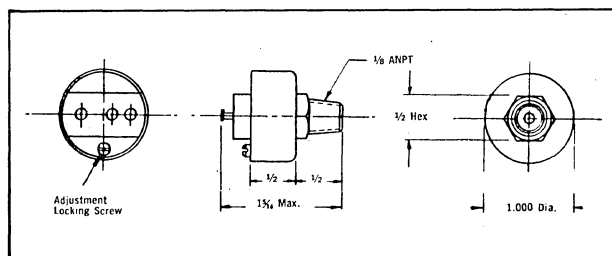
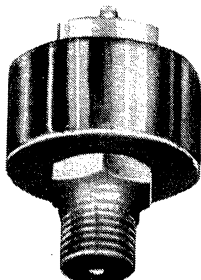
ADJUSTABLE PRESSURE SWITCHES

BUNKER
RAMO

AMPHENOL

MINIATURE ADJUSTABLE
SNAP ACTION
PRESSURE SWITCHES

SPECIFICATION PERFORMANCE DATA Model GAGE



- Miniature size reduces total system weight.
- Field adjustable lowering both installation and maintenance costs.
- Compatible with most pressure medias.
- Reduced size and weight decreases total system package.

GENERAL	MODEL KG-1	MODEL KG-2	MODEL KG-3	MODEL KG-4	MODEL KG-5
Pressure Range	2-15 psig	5-30 psig	8-50 psig	10-100 psig	20-200 psig
Proof Pressure	18 psig	35 psig	55 psig	110 psig	215 psig
Burst Pressure	35 psig	70 psig	120 psig	240 psig	450 psig
Dead Band Max. Oper. Diff.	1.0 psi	2.0 psi	3.0 psi	5.0 psi	10.0 psi
Accuracy	$\pm 1/2$ psi	$\pm 1 1/2$ psi	± 2 psi	± 3.5 psi	$\pm 7 1/2$ psi
Operating Point	Set at mid-range unless otherwise specified				

ELECTRICAL

Switch: Snap action S.P.D.T. (3 terminals).

Electrical Rating: 5 amps. at 125 V. 60 cycle inductive or resistive. 4 amps. at 30 V. d-c, resistive. 2.5 amps. at 30 V. d-c, inductive.

ENVIRONMENTAL

Temperature Limits: -65°F to $+250^{\circ}\text{F}$.

Vibration Limits: 15g, 0-500 Hz (minimum). 10g, 0-2000 available.

Applicable MIL Spec.: MIL-E-5272C.

PHYSICAL

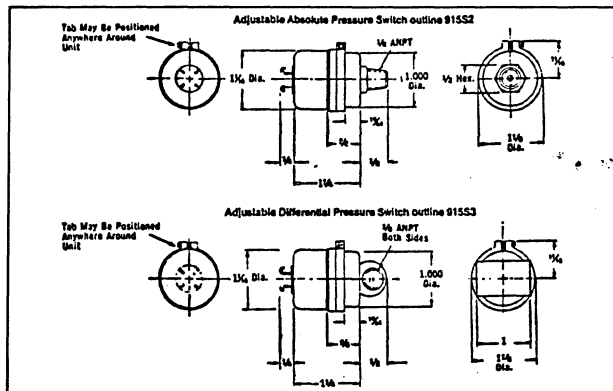
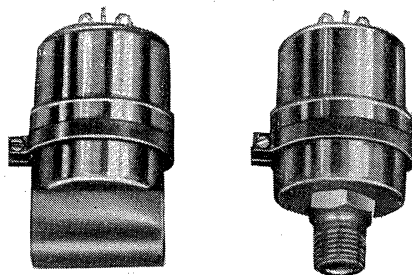
Pressure Connection: $1/8$ " ANPT Male.

Electrical Connections: Made to switch.

Mounting: On pressure fitting.

Weight: $1 1/8$ oz.

Media: Any pressure media compatible with Ni-Span-C.

SPECIFICATION PERFORMANCE DATA
DIFFERENTIAL — ABSOLUTE — Model

GENERAL	Model KD1 Model KA1	Model KD2 Model KA2	Model KD3 Model KA3	Model KD4 Model KA4
Range	0-20 psi	0-40 psi	0-75 psi	0-100 psi
Proof Pressure at Max. Setting	25 psi	48 psi	90 psi	120 psi
Operating Pressure	5-20 psi	7-40 psi	20-75 psi	25-100 psi
Dead Band Maximum	$2 1/4$ psi	$3 1/2$ psi	9 psi	$9 1/4$ psi
Operating Point	Set at mid-range unless otherwise specified			

ELECTRICAL

Switch: Snap action S.P.D.T. (3 terminals).

Electrical Ratings: 5 amps. at 125 V. 60 cycle inductive or resistive. 4 amps. at 30 V d-c, resistive. 2.5 amps. at 30 V. d-c, inductive.

ENVIRONMENTAL

Temperature Limits: -65°F to $+250^{\circ}\text{F}$.

Vibration Limits: 15g, 0-500 Hz (minimum). 10g, 0-2000 available MIL-E-5272C.

MILITARY

Applicable Military Spec. Calibration Shift Per 100°F :

Model KA1 & Model KD1 — 0.64 psi

Model KA2 & Model KD2 — 0.74 psi

Model KA3 & Model KD3 — 1.1 psi

Model KA4 & Model KD4 — 1.15 psi

PHYSICAL

Pressure Connection: Absolute — $1/8$ " ANPT, MaleDifferential — $1/8$ " ANPT, both sides. Female.

Electrical Connections: Hermetic sealed header.

Mounting: On pressure fitting.

Weight: Absolute — $1 5/8$ oz.Differential: $2 1/8$ oz.

Media: Any pressure media compatible with Ni-Span-C.

MICROPOT® PRECISION POTENTIOMETERS

**BUNKER
RAMO**

AMPHENOL

	Size in Inches				Amphenol Model No.	Standard Resistance Range, ohms ¹	Standard Resistance Tolerance	Standard Linearity Tolerance	Temper- ature Range	Max. Power Rating, watts	Type of Mounting	Max. No. of Sections	Applica- tions
	Dia.	Length	Shaft										
3-TURN	1¾	1¾	¼		205-3T ¹	10 to 50K	10Ω ±10% 50-50K ±3%	±0.5%	-55°C to +105°C	3 @ 40°C	Bushing	1	Military Industrial
	7/8	1.182	¼		4100	100 to 100K	100-100K ±5%	±0.25%	-55°C to +125°C	2 @ 40°C	Bushing	1	Industrial Commer- cial
	7/8	.750	¼		4200	100 to 100K	100-100K ±5%	±0.25%	-55°C to +125°C	2 Watts @ 70°C 0 Watts @ 125°C	Bushing	1	Industrial Commer- cial
	7/8	1.455	¼		2150	25 to 100K	25-50Ω ±5% 100-100K ±3%	±0.25%	-55°C to +105°C	3 @ 40°C	Bushing	2	Industrial Commer- cial
10-TURN	7/8	1.573 Serv. 1.448 Bush.	1/8		2100	25 to 120K	100-100K ±3% 25-50Ω ±5% 120K ±5%	±0.25%	-55°C to +125°C	5 @ 40°C	Bushing Servo	3	Military Industrial
	1⅞	2⅞	¼		2200	25 to 300K	25-50Ω ±5% 100-100K ±3% >100K ±5%	100Ω to 100K ±0.25%	-55°C to +105°C	5 @ 40°C	Bushing	3	Industrial Commer- cial
	1¾	2⅞	¼		205 ³	1.15 to 300K	<50Ω ±10% >50Ω ±3%	±0.1%	-55°C to +105°C	5 @ 40°C	Bushing	1	Military Industrial
	2	2⅞ Serv. 2¼ Bush.	¼		900 ²	1 to 100K	<25Ω ±10% <50Ω ±5% >100Ω ±3%	±0.1%	-55°C to +125°C	5 @ 40°C	Bushing Servo	3	Military Industrial

¹ Zero base linearity standard² Absolute linearity standard³ Different mounting configuration than model 2200⁴ See Catalog PD-2 for standard resistance values.

©MICROPOT — Trademark Reg. U.S. Patent Office

MINIATURE PRECISION POTENTIOMETER

BUNKER
RAMO

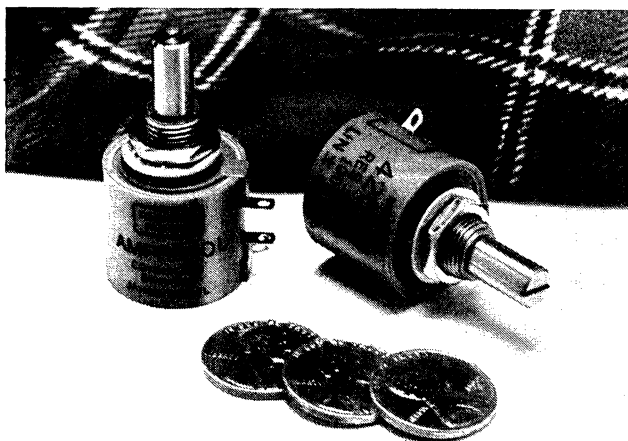
AMPHENOL

ScotPot™

4200 SERIES

FEATURES

- Miniature Precision Potentiometer
- 10 Turn, wire wound
- 7/8" dia. x 3/4" short.
- Low cost!
- Improved performance. Dissipates 2 watts @ 70°C for 1,000 hours.
- Over 1,000,000 revolution life.
- Gold-plated terminations.
- Glass filled nylon case with molded element grooves assures a perfect helix, high linear accuracy.
- Precious metal spring-loaded wiper prevents corrosion and noise.



STANDARD RESISTANCE SPECIFICATIONS

Standard Resistance	Resistance Tolerance	Linearity Tolerance (Ind.)	Resolution		Max. Volts Across Element (70°C)	Max. Amps Through Element (70°C)	Temperature Coefficient		Amphenol Part Number	
			Number of Turns of Wire	%			Resistance Wire	Potentiometer	Bushing One End	
100	±5	±.25	1818	.055	14	.140	±20	±70	4201B-101	
200	±5	±.25	2702	.037	20	.100	±20	±70	4201B-201	
500	±5	±.25	3703	.027	31	.063	±20	±70	4201B-501	
1,000	±5	±.25	4166	.024	44	.044	±20	±70	4201B-102	
2,000	±5	±.25	5555	.018	62.5	.032	±20	±70	4201B-202	
5,000	±5	±.25	6250	.016	100	.020	±20	±70	4201B-502	
10,000	±5	±.25	5882	.017	140	.014	±20	±70	4201B-103	
20,000	±5	±.25	6666	.015	200	.010	±20	±70	4201B-203	
50,000	±5	±.25	7692	.009	310	.0063	±20	±70	4201B-503	
100,000	±5	±.25	12500	.008	450	.0045	±20	±70	4201B-104	

HOW TO ORDER

When placing an order for Standard Scot Pot™ Potentiometers, refer to part number listed under STANDARD RESISTANCE SPECIFICATIONS.

SPECIAL OPTIONS

Many models are offered with special resistances, linearities, tolerances, mountings, markings, taps and shafts upon request. Refer to SPECIAL OPTIONS section.

ELECTRICAL CHARACTERISTICS

Resistance Range: 100 ohms to 100K ohms.

Standard Resistance Tolerance: ±5%.

Linearity Type: Independent.

Standard Linearity Tolerance: ±0.25%.

Power Dissipation: 2 Watts at 70°C.

Electrical Rotation: 3600° +10° -0°.

Absolute Minimum Resistance: 0.1% or 1 Ω whichever is greater.

Standard End Resistance: 0.25% or 1 Ω whichever is greater.

Standard Resolution Range (see standard resistance specification): 0.008% to 0.005%

Insulation Resistance: 1000 megohms minimum.

Noise: 100 ohms ENR maximum.

MECHANICAL CHARACTERISTICS

Mounting Type: Bushing.

Physical Dimensions: 7/8" dia. x 3/4" long.

Bearing Type: Sleeve.

Weight: 1 oz. maximum.

Coil Length: 21.8".

Mechanical Rotation: 3600° +10° -0°.

Stop Strength: 50 in. oz.

Torque: Start — 1.0 oz. in. Run — 1.0 oz. in.

Materials: Housing: Nylon; End Caps: Nylon; Shaft: Stainless Steel; Terminals: Gold Plated; Nut: Brass Nickel Plated; Washer: Steel Cadmium Plated.

Terminal Type: Solder Lug.

Rotational Life: 1,000,000 Revolutions.

Backlash: None

Terminal Marking and Location: See Outline Dimensions.

Shaft: Length — 13/16".

Diameter — .2500/.2495.

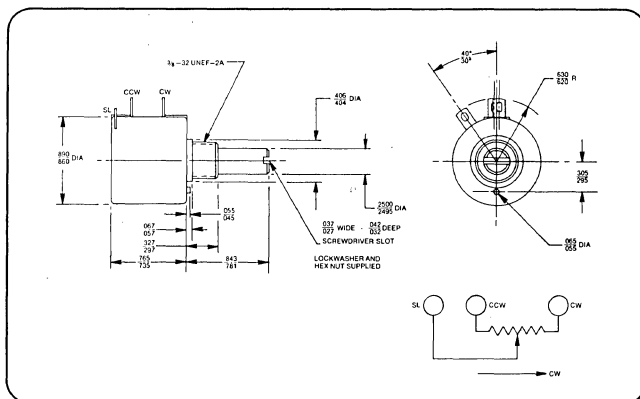
Max. End Play — .010

Radial Play — .003 T.I.R.

Runout — .005 T.I.R.

Mounting Diameter: Pilot Diameter Runout — .004 T.I.R.

Standard Marking: Manufacturers name and nomenclature, resistance value and tolerance, linearity type and tolerance, schematic, and date code.



ENVIRONMENTAL CHARACTERISTICS

Operating Temperature Range: -55°C to +125°C.

Power Rating: 2 watts @ 70°C to Zero @ 125°C.

Temperature Cycling: 5 cycles -55°C to +125°C, 30 minutes @ each temperature per cycle.

High Temperature Exposure: 125°C for 100 Hours.

Low Temperature Exposure: -55°C for 24 hours.

Vibration: 10/500 Hz, .06 DA for 1/2 hour in each of three (3) planes.

Acceleration: 30 G's for one (1) minute in each of three (3) planes.

Shock: 18 shocks in three (3) planes of 30g's.

Humidity Cycling: 95% relative humidity for 12 hours under cycling conditions of -20°C to +75°C, six (6) hours at each temperature for a total of six (6) cycles.

Load Life: 2 Watts at 70°C for 1,000 Hours.

Dielectric Strength: At atmospheric pressure, 1,000 VRMS for one (1) minute.

eem/1975

TRIMMING POTENTIOMETERS

BUNKER
RAMO

AMPHENOL

2905 SERIES

FEATURES

- Meets or exceeds all requirements of MIL-R-22097 style RJ22.
- Cermet element offers infinite resolution... wide resistance range.
- TC of 100 ppm/°C is standard.
- Molded-in terminal pins for greater strength and reliability.
- Gold strap terminations welded directly to resistance element minimizing IR loss.
- MIL-R-22097 RJ22.
- Temperature to 150°C.
- Humidity-Proof.
- 1/2" Square.
- Cermet.

How to Order

When requesting a quotation or placing an order for Standard Micropot® Trimmers refer to part number listed under STANDARD RESISTANCE SPECIFICATIONS

Special Options

Special resistances, performance tolerances, markings, and lead lengths are available upon request. Refer to SPECIAL OPTIONS Catalog Sheet.

Standard Resistance Specifications

Resistance (Ohms)	Resistance Tol. ±10%	Resolution	Max. Volts at 85°C Amb.	Amphenol Part Number†					
				P Terminal	L Terminal	W Terminal	X Terminal	Y Terminal	
10	Infinite	2.2	2905P-100	2905L-100	2905W-100	2905X-100	2905Y-100		
20	Infinite	3.1	2905P-200	2905L-200	2905W-200	2905X-200	2905Y-200		
50	Infinite	5.0	2905P-500	2905L-500	2905W-500	2905X-500	2905Y-500		
100	Infinite	7.0	2905P-101	2905L-101	2905W-101	2905X-101	2905Y-101		
200	Infinite	10.0	2905P-201	2905L-201	2905W-201	2905X-201	2905Y-201		
500	Infinite	15.8	2905P-501	2905L-501	2905W-501	2905X-501	2905Y-501		
1,000	Infinite	22.3	2905P-102	2905L-102	2905W-102	2905X-102	2905Y-102		
2,000	Infinite	31.6	2905P-202	2905L-202	2905W-202	2905X-202	2905Y-202		
5,000	Infinite	50.0	2905P-502	2905L-502	2905W-502	2905X-502	2905Y-502		
10,000	Infinite	70.7	2905P-103	2905L-103	2905W-103	2905X-103	2905Y-103		
20,000	Infinite	100.0	2905P-203	2905L-203	2905W-203	2905X-203	2905Y-203		
25,000	Infinite	111.0	2905P-253	2905L-253	2905W-253	2905X-253	2905Y-253		
50,000	Infinite	158.0	2905P-503	2905L-503	2905W-503	2905X-503	2905Y-503		
100,000	Infinite	223.0	2905P-104	2905L-104	2905W-104	2905X-104	2905Y-104		
250,000	Infinite	300.0	2905P-254	2905L-254	2905W-254	2905X-254	2905Y-254		
500,000	Infinite	300.0	2905P-504	2905L-504	2905W-504	2905X-504	2905Y-504		
1,000,000	Infinite	300.0	2905P-105	2905L-105	2905W-105	2905X-105	2905Y-105		
2,000,000	Infinite	300.0	2905P-205	2905L-205	2905W-205	2905X-205	2905Y-205		
2,500,000	Infinite	300.0	2905P-255	2905L-255	2905W-255	2905X-255	2905Y-255		
5,000,000	Infinite	300.0	2905P-505	2905L-505	2905W-505	2905X-505	2905Y-505		
10,000,000	Infinite	300.0	2905P-106	2905L-106	2905W-106	2905X-106	2905Y-106		

†The last three digits of the part number represent the resistance in standard code. For panel mount add letter M after part number, e.g. —2905P-500M.

Electrical Characteristics

Resistance Values: 10 ohms to 10 megohms (see Standard Resistance Specifications).

Resistance Tolerance: ±10%.

Resolution: Infinite.

End Resistance: 2% of total resistance or 20 ohms, whichever is greater.

Contact Resistance Variation: 3% of total resistance or 20 ohms, whichever is greater.

Usable Potentiometer Range: 100%

Insulation Resistance: Per MIL-R-22097.

Electrical Output: Linear with shaft adjustment.

Mechanical Characteristics

Number of Shaft Adjustment Turns: 25 turns.

Mechanical Stops: Contact idles with no electrical discontinuity.

Shaft Torque: 5.0 oz. in. max.

Rotational Life: 200 cycles min. with no discontinuity.

Terminal Types: P and L per MIL-R-22097, Style RJ22, plus W, X and Y configuration. P = Printed circuit pins; L = Teflon insulated stranded leads; W, X & Y = Printed circuit pins.

Mounting Bracket Available: Amphenol Model 2949; refer to Trimmer Mounting Hardware Catalog Sheet.

Stacking: Mounting holes provided (see Outline Dimensions). Pads provide air space between units.

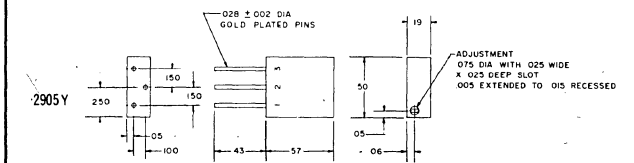
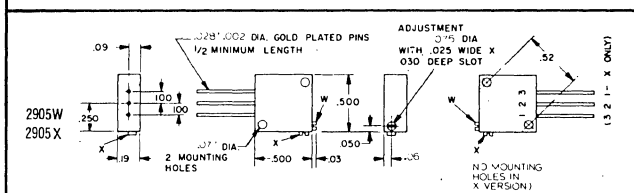
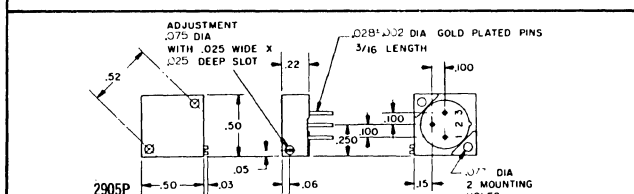
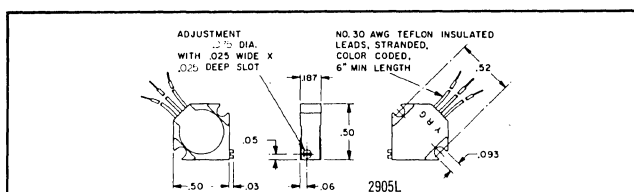
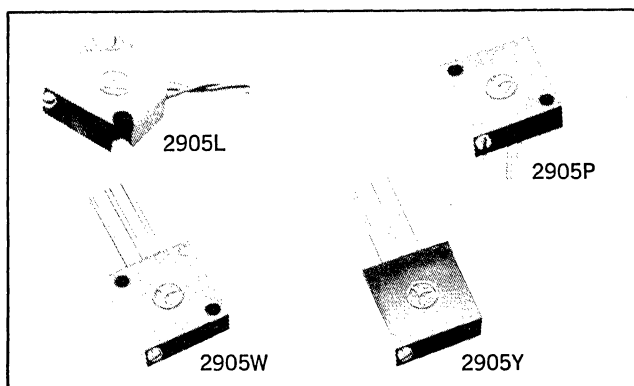
Terminal Strength: Per MIL-R-22097.

Weight: Approx. 3 grams.

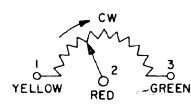
Volume: .055 cu. in.

Marking: Standard manufacturer marking; Mfrs. name and nomenclature, wiring diagram, resistance, date code. (Special marking optional.)

Solderability: Per MIL-R-22097.



See SPECIAL
OPTIONS page
for Stack Strap
and Panel
Mount Options.



TOLERANCES
.00 ±.010
.000 ±.005
Fractions ±1/4

Environmental Characteristics

Operating Temperature Range: -55°C to +150°C (-67°F to +302°F).

Power Rating: 1/2 watt at 85°C derated to zero at 150°C.

Temperature Coefficient of Potentiometer: ±100 ppm/°C.

Thermal Shock: Per MIL-R-22097.

Low Temperature Operation: Per MIL-R-22097.

High Temperature Operation: Per MIL-R-22097.

Vibration: Per MIL-R-22097.

Shock: Per MIL-R-22097.

Humidity-Moisture Resistance: Per MIL-R-22097.

Immersion (Leak Test): Per MIL-R-22097.

Dielectric Strength: 900 volts RMS at room conditions, 350 volts RMS at 80,000 feet per MIL-R-22097.

Salt Spray: Per MIL-R-22097.

Fungus: Non-nutrient materials per MIL-E-5272.

Load Life: 1,000 hours per MIL-R-22097.

TRIMMING POTENTIOMETERS

BUNKER
RAMO AMPHENOL

2305 SERIES

FEATURES

- Meets or exceeds all requirements of MIL-R-22097 style RJ24.
- Cermet element offers infinite resolution... wide resistance range.
- TC as low as 100 ppm/°C is standard.
- Precious metal contact reduces CRV to a minimum and enhances rotational life.
- Molded-in terminal pins for greater strength and reliability.
- Gold strap terminations welded directly to resistance element.
- MIL-R-22097 RJ24.
- Temperature to 150°C.
- Humidity-Proof.
- 3/8" Square.
- Cermet.

How to Order

When requesting a quotation or placing an order for Standard Micropot® Trimmers refer to part number listed under STANDARD RESISTANCE SPECIFICATIONS

Special Options

Special resistances, performance tolerances, markings, and lead lengths are available upon request. Refer to SPECIAL OPTIONS Catalog Sheet.

Standard Resistance Specifications

Resistance (Ohms)	Resistance Tol. ±10%	Resolution	Max. Volts at 85°C Amb.	Amphenol Part Number†		
				P Terminal	W Terminal	X Terminal
1,000,000	Infinite	300.0	2305P-105	2305W-105	2305X-105	
20	Infinite	3.1	2305P-200	2305W-200	2305X-200	
50	Infinite	5.0	2305P-500	2305W-500	2305X-500	
100	Infinite	7.0	2305P-101	2305W-101	2305X-101	
200	Infinite	10.0	2305P-201	2305W-201	2305X-201	
500	Infinite	15.8	2305P-501	2305W-501	2305X-501	
1,000	Infinite	22.3	2305P-102	2305W-102	2305X-102	
2,000	Infinite	31.6	2305P-202	2305W-202	2305X-202	
5,000	Infinite	50.0	2305P-502	2305W-502	2305X-502	
10,000	Infinite	70.7	2305P-103	2305W-103	2305X-103	
20,000	Infinite	100.0	2305P-203	2305W-203	2305X-203	
25,000	Infinite	111.0	2305P-253	2305W-253	2305X-253	
50,000	Infinite	158.0	2305P-503	2305W-503	2305X-503	
100,000	Infinite	223.0	2305P-104	2305W-104	2305X-104	
250,000	Infinite	300.0	2305P-254	2305W-254	2305X-254	
500,000	Infinite	300.0	2305P-504	2305W-504	2305X-504	

†The last three digits of the part number represent the resistance in standard code.

Electrical Characteristics

Resistance Values: 20 ohms to 1 megohm (see Standard Resistance Specifications).

Resistance Tolerance: ±10%.

Resolution: Infinite.

End Resistance: 2% of total resistance or 20 ohms, whichever is greater.

Contact Resistance Variation: 3% of total resistance or 20 ohms, whichever is greater.

Usable Potentiometer Range: 100%

Insulation Resistance: Per MIL-R-22097.

Electrical Output: Linear with shaft adjustment.

Mechanical Characteristics

Number of Shaft Adjustment Turns: 25 turns.

Mechanical Stops: Contact idles with no electrical discontinuity.

Shaft Torque: 5.0 oz. in. max.

Rotational Life: 200 cycles min. with no discontinuity.

Terminal Types: P, W and X configurations, style RJ24, per MIL-R-22097. P, W & X = Printed circuit pins.

Terminal Strength: Per MIL-R-22097.

Weight: 1 gram approx.

Volume: .023 cu. in.

Marking: Standard manufacturer marking: Mfrs. name and nomenclature, wiring diagram, resistance, date code. (Special marking optional.)

Solderability: Per MIL-R-22097.

Environmental Characteristics

Operating Temperature Range: -55°C to +150°C (-67°F to +302°F).

Power Rating: 1/2 watt at 85°C derated to zero at 150°C.

Temperature Coefficient of Potentiometer: ±100 ppm/°C.

Thermal Shock: Per MIL-R-22097.

Low Temperature Operation: Per MIL-R-22097.

High Temperature Operation: Per MIL-R-22097.

Vibration: Per MIL-R-22097.

Shock: Per MIL-R-22097.

Humidity-Moisture Resistance: Per MIL-R-22097.

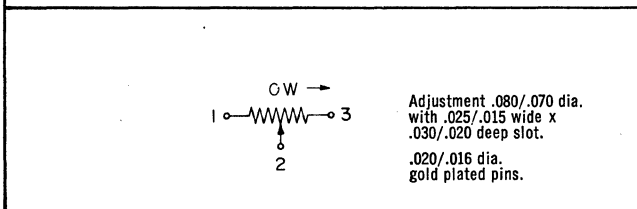
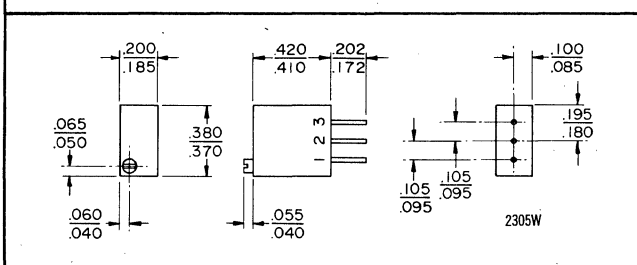
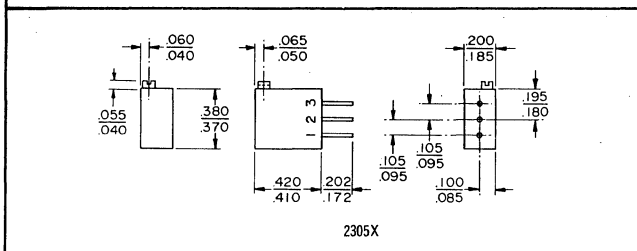
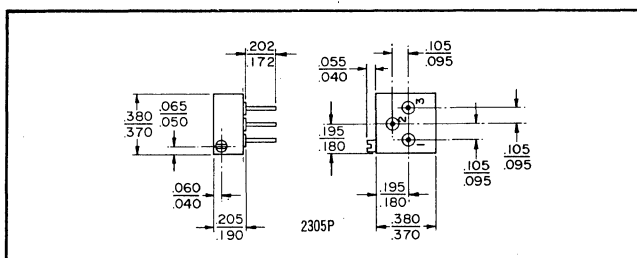
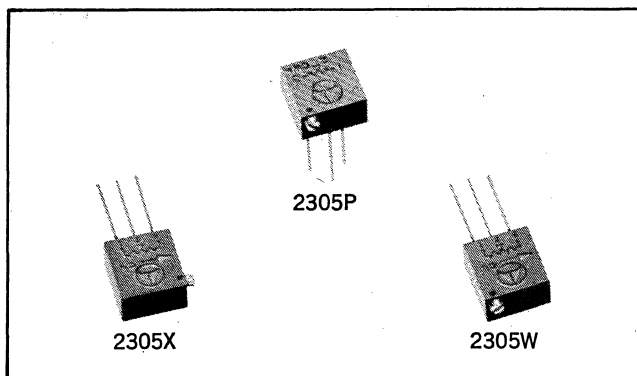
Immersion (Leak Test): Per MIL-R-22097.

Dielectric Strength: 900 volts RMS at room conditions, 350 volts RMS at 70,000 feet per MIL-R-22097.

Salt Spray: Per MIL-R-22097.

Fungus: Non-nutrient materials per MIL-E-5272.

Load Life: 1,000 hours per MIL-R-22097.



TRIMMING POTENTIOMETERS

BUNKER
RAMO

AMPHENOL

2901 SERIES

FEATURES

- Exclusive 100% metallic element offers infinite resolution with excellent low noise characteristics unsurpassed by other infinite resolution elements.
- Performance characteristics compatible with other metal film components.
- Low 50 ppm/°C is standard.
- Internal component design provides low inductance and capacitance.
- Molded-in terminal pins for greater strength and reliability.
- Military-Industrial.
- Temperature to 150°C.
- Humidity-Proof.
- 1/2" Square.
- Film-Met™.

U.S. Patent No. 3,353,134; also foreign patents.

How to Order

When requesting a quotation or placing an order for Standard Micropot® Trimmers refer to part number listed under STANDARD RESISTANCE SPECIFICATIONS

Special Options

Special resistances, performance tolerances, markings, and lead lengths are available upon request. Refer to SPECIAL OPTIONS Catalog Sheet.

Standard Resistance Specifications

Resistance (Ohms) Resistance Tol. ±10%	Resolution	Max. Volts at 85°C Amb.	Amphenol Part Number†				
			P Terminal	W Terminal	X Terminal	L Terminal	Y Terminal
10	Infinite	2.73	2901P-100	2901W-100	2901X-100	2901L-100	2901Y-100
20	Infinite	3.87	2901P-200	2901W-200	2901X-200	2901L-200	2901Y-200
50	Infinite	6.12	2901P-500	2901W-500	2901X-500	2901L-500	2901Y-500
100	Infinite	8.66	2901P-101	2901W-101	2901X-101	2901L-101	2901Y-101
200	Infinite	12.24	2901P-201	2901W-201	2901X-201	2901L-201	2901Y-201
500	Infinite	19.36	2901P-501	2901W-501	2901X-501	2901L-501	2901Y-501
1,000	Infinite	27.38	2901P-102	2901W-102	2901X-102	2901L-102	2901Y-102
2,000	Infinite	38.72	2901P-202	2901W-202	2901X-202	2901L-202	2901Y-202
5,000	Infinite	61.23	2901P-502	2901W-502	2901X-502	2901L-502	2901Y-502
10,000	Infinite	86.60	2901P-103	2901W-103	2901X-103	2901L-103	2901Y-103
20,000	Infinite	122.47	2901P-203	2901W-203	2901X-203	2901L-203	2901Y-203

†The last three digits of the part number represent the resistance in standard code. For panel mount add letter M after part number, e.g. —2901P-500M.

Electrical Characteristics

Resistance Values: 10 to 20,000 ohms (see Standard Resistance Specifications).

Resistance Tolerance: ±10%.

Resolution: Infinite.

End Resistance: 10 ohms or 10% whichever is less.

Contact Resistance Variation: 2% or 20 ohms, whichever is less.

Usable Potentiometer Range: 100%

Insulation Resistance: Per MIL-R-22097.

Electrical Output: Linear with shaft adjustment.

Mechanical Characteristics

Number of Shaft Adjustment Turns: 25 turns.

Mechanical Stops: Contact idles with no electrical discontinuity.

Shaft Torque: 5.0 oz. in. max.

Rotational Life: 200 cycles min. with no discontinuity.

Terminal Types: P and L per MIL-R-22097, Style RJ22, plus W, X and Y configuration. P = Printed circuit pins; L = Teflon insulated stranded leads. W, X & Y = Printed circuit pins.

Mounting Bracket Available: Amphenol Model 2949; Refer to Trimmer Mounting Hardware Catalog Sheet.

Stacking: Mounting holes provided (see Outline Dimensions). Pads provide air space between units.

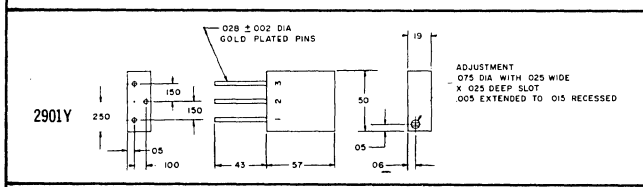
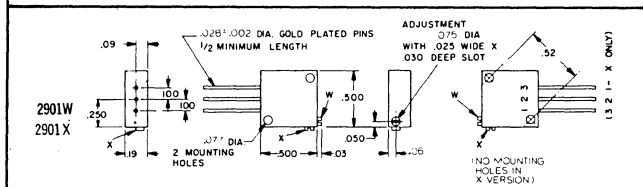
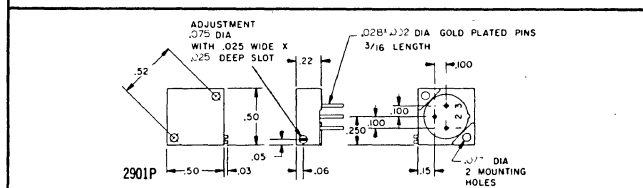
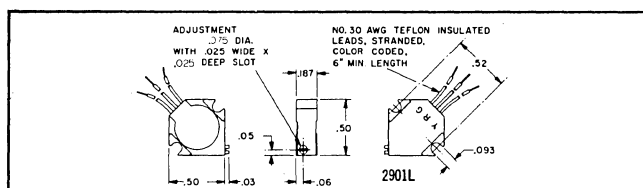
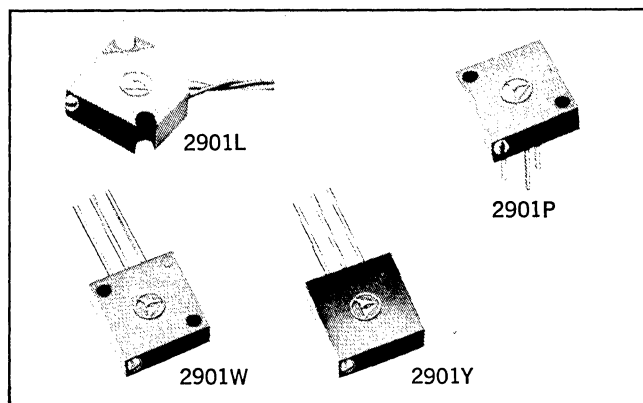
Terminal Strength: Per MIL-R-22097.

Weight: Approx. 3 grams.

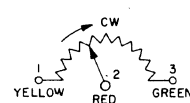
Volume: .055 cu. in.

Marking: Standard manufacturer marking: Mfrs. name and nomenclature, wiring diagram, resistance, date code. (Special marking optional.)

Solderability: Per MIL-R-22097.



See SPECIAL
OPTIONS page
for Stack Strap
and Panel
Mount Options.



TOLERANCES
.00 ±.010
.000 ±.005
Fractions ±1/4

Environmental Characteristics

Operating Temperature Range: -55°C to +150°C (-67°F to +302°F).

Power Rating: 3/4 watt at 85° derated to zero at 150°C

Temperature Coefficient of Potentiometer: 50 ppm/°C.

Temperature Cycling (Thermal Shock): Per MIL-R-22097.

Low Temperature Operation: Per MIL-R-22097.

High Temperature Operation: Per MIL-R-22097.

Vibration: Per MIL-R-22097.

Shock: Per MIL-R-22097.

Humidity-Moisture Resistance: Per MIL-R-22097.

Immersion (Leak Test): Per MIL-R-22097.

Dielectric Strength: 900 volts RMS at room conditions, 350 volts RMS at 80,000 feet per MIL-R-22097.

Salt Spray: Per MIL-R-22097.

Fungus: Non-nutrient materials per MIL-E-5272.

Load Life: 1,000 hours per MIL-R-22097.

TRIMMING POTENTIOMETERS

BUNKER
RAMO

AMPHENOL

2851 SERIES

FEATURES

- Exclusive 100% metallic element offers infinite resolution with excellent low noise characteristics unsurpassed by other infinite resolution elements.
- Performance characteristics compatible with other metal film components.
- Low 50 ppm/°C temperature coefficient.
- Internal component design provides low inductance and capacitance.
- Military-Industrial.
- Temperature to 150°C.
- Humidity-Proof.
- 1 1/4" Rectangular.
- Film-Met™.

U.S. Patent No. 3,353,134; also foreign patents.

How to Order

When requesting a quotation or placing an order for Standard Micropot® Trimmers refer to part number listed under STANDARD RESISTANCE SPECIFICATIONS

Special Options

Special resistances, performance tolerances, markings, and lead lengths are available upon request. Refer to SPECIAL OPTIONS Catalog Sheet.

Standard Resistance Specifications

Resistance (Ohms) Resistance Tol. ±10%	Resolution	Max. Volts at 85°C Amb.	Amphenol Part Number†		
			P Terminal	S Terminal	L Terminal
20	Infinite	3.87	2851P-200	2851S-200	2851L-200
50	Infinite	6.12	2851P-500	2851S-500	2851L-500
100	Infinite	8.66	2851P-101	2851S-101	2851L-101
200	Infinite	12.24	2851P-201	2851S-201	2851L-201
500	Infinite	19.36	2851P-501	2851S-501	2851L-501
1,000	Infinite	27.38	2851P-102	2851S-102	2851L-102
2,000	Infinite	38.72	2851P-202	2851S-202	2851L-202
5,000	Infinite	61.23	2851P-502	2851S-502	2851L-502
10,000	Infinite	86.60	2851P-103	2851S-103	2851L-103
20,000	Infinite	122.47	2851P-203	2851S-203	2851L-203

†The last three digits of the part number represent the resistance in standard code. For panel mount add letter M after part number, e.g. —2851P-500M.

Electrical Characteristics

Resistance Values: 20 to 20,000 ohms (see Standard Resistance Specifications).

Resistance Tolerance: ±10%.

Resolution: Infinite.

End Resistance: 10 ohms or 10% whichever is less.

Contact Resistance Variation: 2% or 20 ohms, whichever is greater.

Continuity: Continuous and unidirectional; maintained for full mechanical range.

Usable Potentiometer Range: 100%

Insulation Resistance: Per MIL-R-22097.

Electrical Output: Linear with shaft adjustment.

Mechanical Characteristics

Number of Shaft Adjustment Turns: 22 turns.

Mechanical Stops: Contact idles with no electrical discontinuity.

Shaft Torque: 8.0 oz. in. max.

Rotational Life: 200 cycles min. with no discontinuity.

Terminal Types: P & L per MIL-R-22097, Style RJ11, plus S configuration. P = Printed circuit; L = Teflon insulated stranded leads; S = Solder lugs.

Mounting Bracket Available: Amphenol Model 999; Refer to Trimmer Mounting Hardware Catalog Sheet.

Stacking: Mounting holes provided (see Outline Dimensions).

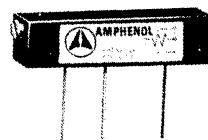
Terminal Strength: Per MIL-R-22097.

Weight: 5 grams approx.

Volume: .109 cu. in.

Marking: Standard manufacturer marking: Mfrs. name and nomenclature, wiring diagram, resistance, date code. (Special marking optional.)

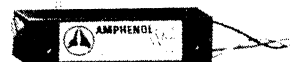
Solderability: Per MIL-R-22097.



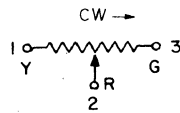
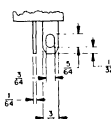
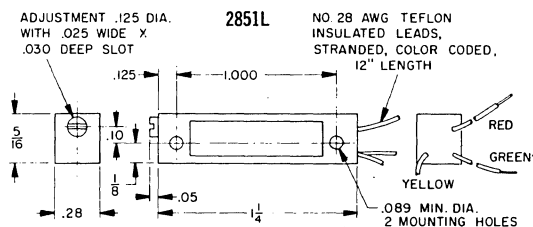
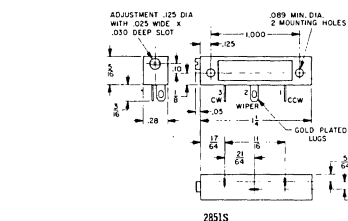
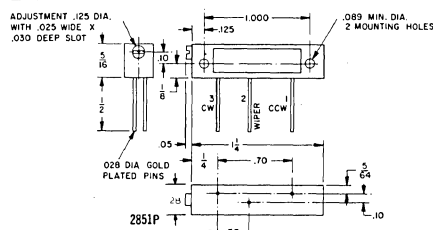
2851P



2851S



2851L



TOLERANCES
.00 ±.010
.000 ±.005
Fractions ±1/4

Environmental Characteristics

Operating Temperature Range: -55°C to +150°C (-67°F to +302°F).

Power Rating: 3/4 watt at 85° derated to zero at 150°C.

Temperature Coefficient of Potentiometer: 100ppm/°C.

Temperature Cycling (Thermal Shock): Per MIL-R-22097.

Low Temperature Operation: -55°C per MIL-R-22097.

High Temperature Exposure: +150°C per MIL-R-22097.

Vibration: Per MIL-R-22097.

Shock: Per MIL-R-22097.

Humidity-Moisture Resistance: Per MIL-R-22097.

Immersion (Leak Test): Per MIL-R-22097.

Dielectric Strength: 900 volts RMS at room conditions, 350 volts RMS at 80,000 feet per MIL-R-22097.

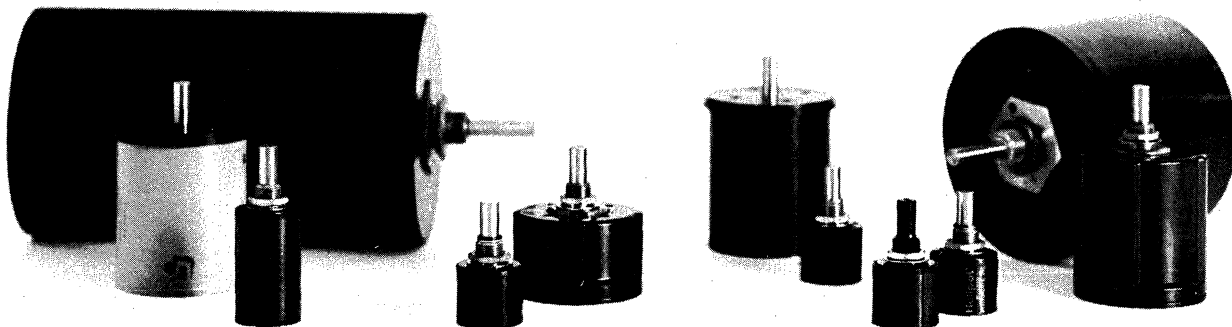
Salt Spray: Per MIL-R-22097.

Fungus: Non-nutrient materials per MIL-E-5272.

Load Life: 1,000 hours per MIL-R-22097.

Beckman®

Multi-turn (wirewound & hybrids) PRECISION POTENTIOMETERS

**Multi-turn**

Housing Diameter (inches)	Number of Turns	Resistance Element	Beckman Model Number	Mounting Type	Bearing Type	Range of Resistance Values (ohms)	Standard Independent Linearity (± %)	Min. Practical Independent Linearity (± %)	Power Rating (watts at °C)	Starting Torque (max., oz.-in.)	Ambient Temperature Range (°C)
7/8" .875" (22,225mm)	3	Wire	7363	Servo	Ball	3-32.3K	0.25	0.15	1.5 at 70	0.6	-65 to 125
		Wire	7366	Bushing	Ball	3-32.3K	0.25	0.15	1.5 at 70	0.8	-65 to 125
	5	Wire	7463	Servo	Ball	5-53.8K	0.25	0.15	1.5 at 70	0.6	-65 to 125
		Wire	7466	Bushing	Ball	5-53.8K	0.25	0.15	1.5 at 70	0.8	-65 to 125
	10	Wire	7216	Bushing	Sleeve	10-125K	0.25	0.05	2.0 at 25	0.6	-65 to 85
		Wire	7221	Bushing	Sleeve	10-125K	0.25	0.05	2.0 at 25	0.6	-65 to 85
		Wire	7223	Servo	Ball	10-125K	0.25	0.05	2.0 at 70	0.6	-65 to 125
		Wire	7233	Servo	Ball	250-125K	0.25	0.05	2.0 at 70	0.6	-65 to 125
		Wire	7246	Bushing	Sleeve	10-125K	0.25	0.25	2.0 at 25	2.0	-25 to 85
		Wire	7263	Servo	Ball	10-107.8K	0.20	0.05	2.0 at 70	0.6	-65 to 125
		Wire	7266	Bushing	Sleeve	10-107.8K	0.20	0.05	2.0 at 70	0.8	-65 to 125
		Wire	7276	Bushing	Sleeve	100-100K	0.25	0.08	2.0 at 25	1.5	-25 to 105
		Hybrid	8103	Servo	Ball	5K-100K	0.25	F.Q.	2.0 at 70	0.6	-65 to 125
		Hybrid	8106	Bushing	Sleeve	5K-100K	0.25	F.Q.	2.0 at 70	0.8	-65 to 125
		Hybrid	8136	Bushing	Sleeve	5K-100K	0.25	F.Q.	2.0 at 25	1.5	-25 to 105
1-13/16" 1.812" (46,038mm)	3	Wire	C	Bushing	Sleeve	5-194.7K	0.50	0.10	3.8 at 25	3.0	-65 to 85
		Wire	9301	Bushing	Sleeve	30-192.6K	0.25	0.04	3.0 at 70	1.3	-65 to 125
		Wire	9303	Servo	Ball	30-192.6K	0.25	0.04	3.0 at 70	1.3	-65 to 125
		Wire	9323	Servo	Ball	35-194.7K	0.40	0.10	3.0 at 40	3.0	-65 to 85
	10	Wire	A	Bushing	Sleeve	10-648K	0.25	0.05	6.2 at 25	3.0	-65 to 85
		Wire	7601	Bushing	Sleeve	100-650K	0.15	0.025	5.0 at 70	1.3	-65 to 125
		Wire	7603	Servo	Ball	100-650K	0.15	0.025	5.0 at 70	1.3	-65 to 125
		Wire	7623	Servo	Ball	100-648K	0.20	0.05	5.0 at 40	3.0	-65 to 85
		Hybrid	8113	Servo	Ball	10K-220K	0.25	F.Q.	5.0 at 40	3.0	-65 to 85
3-5/16" 3.312" (84,138mm)	15	Wire	B	Bushing	Sleeve	40-2 meg	0.5	0.035	10.0 at 40	2.7	-65 to 85
		Wire	BS	Servo	Sleeve	40-2 meg	0.5	0.035	10.0 at 40	2.7	-65 to 85
		Wire	BSP	Servo	Ball	40-2 meg	0.5	0.035	10.0 at 40	2.7	-65 to 85
	25	Wire	D	Bushing	Sleeve	60-3.312 meg	0.5	0.035	15.0 at 40	3.5	-65 to 85
		Wire	DSP	Servo	Ball	60-3.312 meg	0.5	0.035	15.0 at 40	3.5	-65 to 85
		Wire	E	Bushing	Sleeve	125-5.3 meg	0.5	0.035	20.0 at 40	3.5	-65 to 85
	40	Wire	ESP	Servo	Ball	125-5.3 meg	0.5	0.035	20.0 at 40	3.5	-65 to 85

F.Q.— Factory Quote. All specifications subject to change without notice.

SEE ALSO: Trimming potentiometers, dials—Sec. 4750. DIP resistor packages and DIP interface networks—Sec. 4700. Voltage regulators, DAC/ADC products, operational amplifiers, active filters—Sec. 3130.

Beckman

INSTRUMENTS, INC.

HELIPOT DIVISION

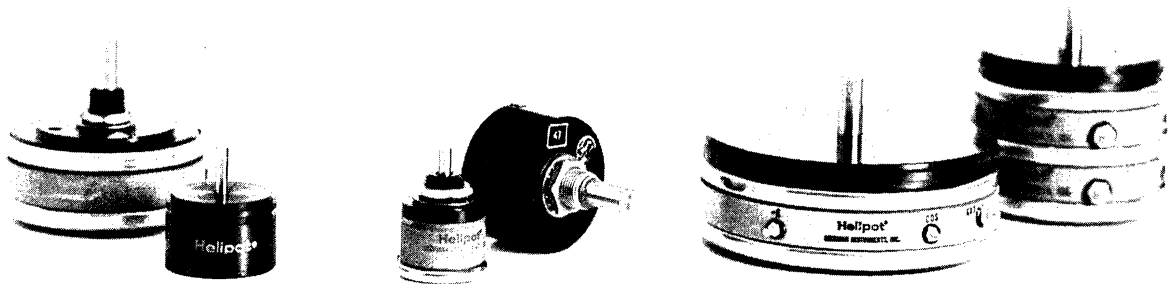
2500 Harbor Boulevard, Fullerton, California 92634

(714) 871-4848 • TWX No. 910-592-1260

Beckman®

Single-turn (wirewound, cermet, conductive plastic & hybrid)

PRECISION POTENTIOMETERS

**Single-turn**

Housing Diameter (inches)	Resistance Element	Beckman Model Number	Mounting Type	Bearing Type	Range of Resistance Values (ohms)	Min. Practical Independent Linearity* ($\pm\%$)	Power Rating (Watts at $^{\circ}\text{C}$)	Starting Torque (max., oz.-in.)	Number of Cups	Ambient Temperature Range ($^{\circ}\text{C}$)
7/8" .875" (22,225mm)	Wire	TP	Bushing	Ball	186-15K	0.2	1.25-70	0.1	4	-65 to 125
	Wire	TSP	Servo	Ball	186-15K	0.2	1.25-70	0.1	4	-65 to 125
	Wire	5101	Bushing	Sleeve	186-116K	0.25	0.75-40	0.2	4	-25 to 85
	Wire	5103	Servo	Ball	186-116K	0.25	0.75-40	0.2	4	-25 to 85
	Cermet	6103	Servo	Ball	150-1 meg	0.3	3.0-85	0.5	4	-65 to 150
	C.P.	6153	Servo	Ball	1K-50K	0.15	1.0-70	0.5	4	-65 to 125
	C.P.	6173	Servo	Ball	900-200K	0.15	1.5-70	0.5	4	-65 to 125
	Hybrid	8201	Bushing	Sleeve	500-10K	0.50	F.Q.	0.75 at 40	0.2	-25 to 85
1-1/16" 1.062" (26,988mm)	Hybrid	8203	Servo	Ball	500-10K	0.50	F.Q.	0.75 at 40	0.2	-25 to 85
	Wire	5203	Servo	Ball	50-17K	0.15	2.0-85	0.15	4	-65 to 150
	Wire	5211	Bushing	Sleeve	50-25K	0.15	1.0-40	0.4	4	-25 to 85
	Wire	5212	Servo	Sleeve	50-25K	0.15	1.0-40	0.4	4	-25 to 85
	Wire	5213	Servo	Ball	50-25K	0.15	1.0-40	0.3	4	-25 to 85
	Cermet	6213	Servo	Ball	50-1 meg	0.25	5.0-85	0.5	4	-65 to 150
	C.P.	6263	Servo	Ball	1K-50K	0.15	1.5-70	0.5	4	-65 to 125
	C.P.	6273	Servo	Ball	840-200K	0.15	2.0-70	0.5	4	-65 to 125
1-5/16" 1.312" (33,338mm)	Wire	5311	Bushing	Sleeve	10-44.6K	0.25	2.0-40	1.0	1	-25 to 85
	Cermet	3301	Bushing	Sleeve	1K-1 meg	0.3	0.75-65	1.0	1	-25 to 105
	Cermet	6301	Bushing	Ball	250-1 meg	0.25	6.0-85	0.7	1	-65 to 150
	Cermet	6303	Servo	Ball	250-1 meg	0.25	6.0-85	0.7	1	-65 to 150
	C.P.	3351	Bushing	Sleeve	1K-50K	0.25	0.75-65	1.0	1	-25 to 105
	C.P.	3371	Bushing	Sleeve	1K-390K	0.25	1.0-65	1.0	1	-25 to 105
	C.P.	6351	Bushing	Ball	1K-50K	0.1	2.0-70	0.7	1	-65 to 125
	C.P.	6353	Servo	Ball	1K-50K	0.1	2.0-70	0.7	1	-65 to 125
1-7/16" 1.438" (36,512mm)	Wire	5401	Bushing	Sleeve	25-50K	0.15	2.0-40	1.6	4	-65 to 85
	Wire	5402	Servo	Sleeve	25-50K	0.15	2.0-70	1.6	4	-65 to 125
	Wire	5403	Servo	Ball	25-50K	0.15	2.0-70	0.6	4	-65 to 125
	Wire	5404	Pilot	Sleeve	25-50K	0.15	2.0-70	1.6	4	-65 to 125
	Wire	5405	Pilot	Ball	25-50K	0.15	2.0-70	0.6	4	-65 to 125
	Wire	5611	Bushing	Sleeve	15-80K	0.10	3.5-70	1.5	4	-65 to 125
	Wire	5612	Servo	Sleeve	15-80K	0.10	3.5-70	1.5	4	-65 to 125
	Wire	5613	Servo	Ball	15-80K	0.10	3.5-70	0.8	4	-65 to 125
2" 2.000" (50,800mm)	Wire	5614	Pilot	Sleeve	15-80K	0.10	3.5-70	1.5	4	-65 to 125
	Wire	5615	Pilot	Ball	15-80K	0.10	3.5-70	0.8	4	-65 to 125
	Wire	5616	Pilot/Servo	Sleeve	15-80K	0.10	3.5-70	1.5	4	-65 to 125
	Wire	5617	Pilot/Servo	Ball	15-80K	0.10	3.5-70	0.8	4	-65 to 125
	Cermet	6601	Bushing	Ball	250-1 meg	0.15	10.0-85	1.5	4	-65 to 150
	Cermet	6603	Servo	Ball	250-1 meg	0.15	10.0-85	1.5	4	-65 to 150
	C.P.	6651	Bushing	Ball	1K-50K	0.1	2.5-70	1.5	4	-65 to 125
	C.P.	6653	Servo	Ball	1K-50K	0.1	2.5-70	1.5	4	-65 to 125
2" 2.000" (50,800mm)	C.P.	6671	Bushing	Ball	1K-336K	0.1	5.0-70	1.5	4	-65 to 125
	C.P.	6673	Servo	Ball	1K-336K	0.1	5.0-70	1.5	4	-65 to 125
	Hybrid	8211	Bushing	Sleeve	1K-25K	0.5	F.Q.	3.5 at 70	1.5	-65 to 125
	Hybrid	8212	Servo	Sleeve	1K-25K	0.5	F.Q.	3.5 at 70	1.5	-65 to 125
	Hybrid	8213	Servo	Ball	1K-25K	0.5	F.Q.	3.5 at 70	0.8	-65 to 125
	Wire	5711	Bushing	Sleeve	25-145K	0.075	5.0-40	1.5	4	-65 to 85
	Wire	5712	Servo	Sleeve	25-145K	0.075	5.0-40	1.5	4	-65 to 85
	Wire	5713	Servo	Ball	25-145K	0.075	5.0-40	1.3	4	-65 to 85
3" 3.000" (76,200mm)	Wire	5714	Pilot	Sleeve	25-145K	0.075	5.0-40	1.5	4	-65 to 85
	Wire	5715	Pilot	Ball	25-145K	0.075	5.0-40	1.3	4	-65 to 85

*Values listed are available on special order. Standard Independent Linearity for all Helipot single-turn precision potentiometers is $\pm 0.5\%$.
 LEGEND TO ABBREVIATIONS: C.P.—Conductive Plastic. Pilot—3 hole/pilot mount. Pilot/Servo—Servo/3 hole pilot mount. F.Q.—Factory quote.
 All specifications subject to change without notice.

Beckman INSTRUMENTS, INC.
HELIPOT DIVISION 2500 Harbor Boulevard, Fullerton, California 92634
 (714) 871-4848 • TWX No. 910-592-1260

Beckman®**TRIMMER SELECTION GUIDE****Trimming Potentiometer Selection...Simplified:**

The six index tables on the facing page provide a convenient method of selecting the Helitrim® Cermet Trimming Potentiometer Model best suited to a specific application. These tables relate, in sets of two, four key parameters, i.e., adjustment turns, power rating, unit size, and maximum operating temperature for all trimming potentiometer models. After locating the model which meets your parameter requirements, refer to the detail specification tables. Reliable Helitrim® Cermet Trimming Potentiometers are available in a wide range of sizes, pin spacings, and performance characteristics. For information on non-standard models, contact your local Beckman distributor or sales engineering representative.

Resistance Ordering Information:

After selecting a specific trimmer, list the resistance value desired (10 — 2 Meg Ω) after the model number.

Example: 89P R10K
 Model Resistance Value

Standard Resistance Values Available Include:

10	100	1K	10K	100K	1 Meg
20	200	2K	20K	200K	2 Meg
—	—	—	25K	250K	
50	500	5K	50K	500K	

Beckman INSTRUMENTS, INC.**HELIPOT DIVISION**2500 Harbor Boulevard, Fullerton, California 92634
(714) 871-4848 • TWX No. 910-592-1260

Beckman®**KEY PARAMETER INDEX****Power Rating (Watts) to Unit Size**

POWER	MODEL	SIZE
0.5 at 25°C	86P	3/4" Long
	66P, 66W, 66X	3/8" Sq.
0.5 at 40°C	91A, 91B, 91C, 91D, 91E, 91S, 91T, 91V, 91W, 91X, 91Y, 91Z	3/8" Dia.
0.5 at 70°C	72P, 72PM, 72PX, 72X, 72XL, 72XW	3/8" Sq.
	62P, 62PA, 62PF, 62PH/82P	1/4" Dia.
0.25 at 85°C	64P	1/4" Sq.
0.5 at 85°C	63P, 63W, 63X	3/8" Sq.
	61M, 61P, 61PA	1/4" Dia.
0.75 at 25°C	89P, 89W, 89X/76P, 77P, 79P	3/8" Long
0.75 at 70°C	78L, 78P, 78S	1 1/4" Long
1.0 at 85°C	55L, 55P, 55S/56L, 56P/58P, 58S	1 1/4" Long
1.5 at 125°C	50, 53, 54	1 1/4" Long

Unit Size to Maximum Operating Temperature

SIZE	MODEL	TEMP.
3/4" Long	76P, 77P, 79P/89P, 89W, 89X/86P	105°C
3/8" Sq.	66P, 66W, 66X	
1 1/4" Long	78L, 78P, 78S	125°C
3/8" Dia.	91A, 91B, 91C, 91D, 91E, 91S, 91T, 91V, 91W, 91X, 91Y, 91Z	
3/8" Sq.	72P, 72PM, 72PX, 72X, 72XL, 72XW	
1/4" Dia.	62P, 62PA, 62PF, 62PH/82P	
3/8" Sq.	63L, 63P, 63W, 63X	150°C
1/4" Dia.	61M, 61P, 61PA	
1/4" Sq.	64P	150°C
1 1/4" Long	55L, 55P, 55S/56L, 56P/58P, 58S	175°C
1 1/4" Long	50, 53, 54	200°C

Adjustment Turns to Maximum Operating Temperature

TURNS	MODEL	TEMP.
15 Turns	76P, 77P, 79P/89P, 89W, 89X	105°C
18 Turns	86P	
20 Turns	66P, 66W, 66X	
1 Turn	62P, 62PA, 62PF, 62PH 72P, 72PM, 72PX, 72X, 72XL, 72XW/82P 91A, 91B, 91C, 91D, 91E, 91S, 91T, 91V, 91W, 91X, 91Y, 91Z	125°C
22 Turns	78L, 78P, 78S	150°C
1 Turn	61M, 61P, 61PA	
20 Turns	63P, 63W, 63X	
22 Turns	64P	150°C
22 Turns	55L, 55P, 55S/56L, 56P/58P, 58S	175°C
32 Turns	50, 53, 54	200°C

Adjustment Turns to Unit Size

TURNS	MODEL	SIZE
1 Turn	61M, 61P, 61PA/62P, 62PA, 62PF, 62PH/82P	1/4" Dia.
	91A, 91B, 91C, 91D, 91E, 91S, 91T, 91V, 91W, 91X, 91Y, 91Z	3/8" Dia.
	72P, 72PM, 72PX, 72X, 72XL, 72XW	3/8" Sq.
15 Turns	89P, 89W, 89X/76P, 77P, 79P	3/8" Long
18 Turns	86P	3/8" Long
20 Turns	66P, 66W, 66X	3/8" Sq.
	63L, 63P, 63W, 63X	
22 Turns	55L, 55P, 55S/56L, 56P 58P, 58S/78L, 78P, 78S	1 1/4" Long
22 Turns	64P	1/4" Sq.
32 Turns	50, 53, 54	1 1/4" Long

Adjustment Turns to Power Rating (Watts)

TURNS	MODEL	POWER
18 Turns	86P	0.5 at 25°C
20 Turns	66P, 66W, 66X	
1 Turn	91A, 91B, 91C, 91D, 91E, 91S, 91T, 91V, 91W, 91X, 91Y, 91Z	0.5 at 40°C
1 Turn	62P, 62PA, 62PF, 62PH 72P, 72PM, 72PX, 72X, 72XL, 72XW 82P	0.5 at 70°C
1 Turn	61M, 61P, 61PA	0.5 at 85°C
20 Turns	63P, 63W, 63X	
15 Turns	89P, 89W, 89X/76P, 77P, 79P	0.75 at 25°C
22 Turns	64P	0.25 at 85°C
22 Turns	78L, 78P, 78S	0.75 at 70°C
22 Turns	55L, 55P, 55S/56L, 56P/58P, 58S	1.0 at 85°C
32 Turns	50, 53, 54	1.5 at 125°C

Power Rating (Watts) to Maximum Operating Temperature

POWER	MODEL	TEMP.
0.5 at 25°C	66P, 66W, 66X 86P	105°C
0.5 at 40°C	91A, 91B, 91C, 91D, 91E, 91S, 91T, 91V, 91W, 91X, 91Y, 91Z	125°C
0.5 at 70°C	62P, 62PA, 62PF, 62PH, 72P, 72PM, 72PX, 72X, 72XL, 72XW 82P	125°C
0.25 at 85°C	64P	150°C
0.5 at 85°C	61M, 61P, 61PA 63P, 63W, 63X	150°C
0.75 at 25°C	89P, 89W, 89X/76P, 77P, 79P	105°C
0.75 at 70°C	78L, 78P, 78S	125°C
1.0 at 85°C	55L, 55P, 55S/56L, 56P/58P, 58S	175°C
1.5 at 125°C	50, 53, 54	200°C

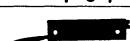
Beckman

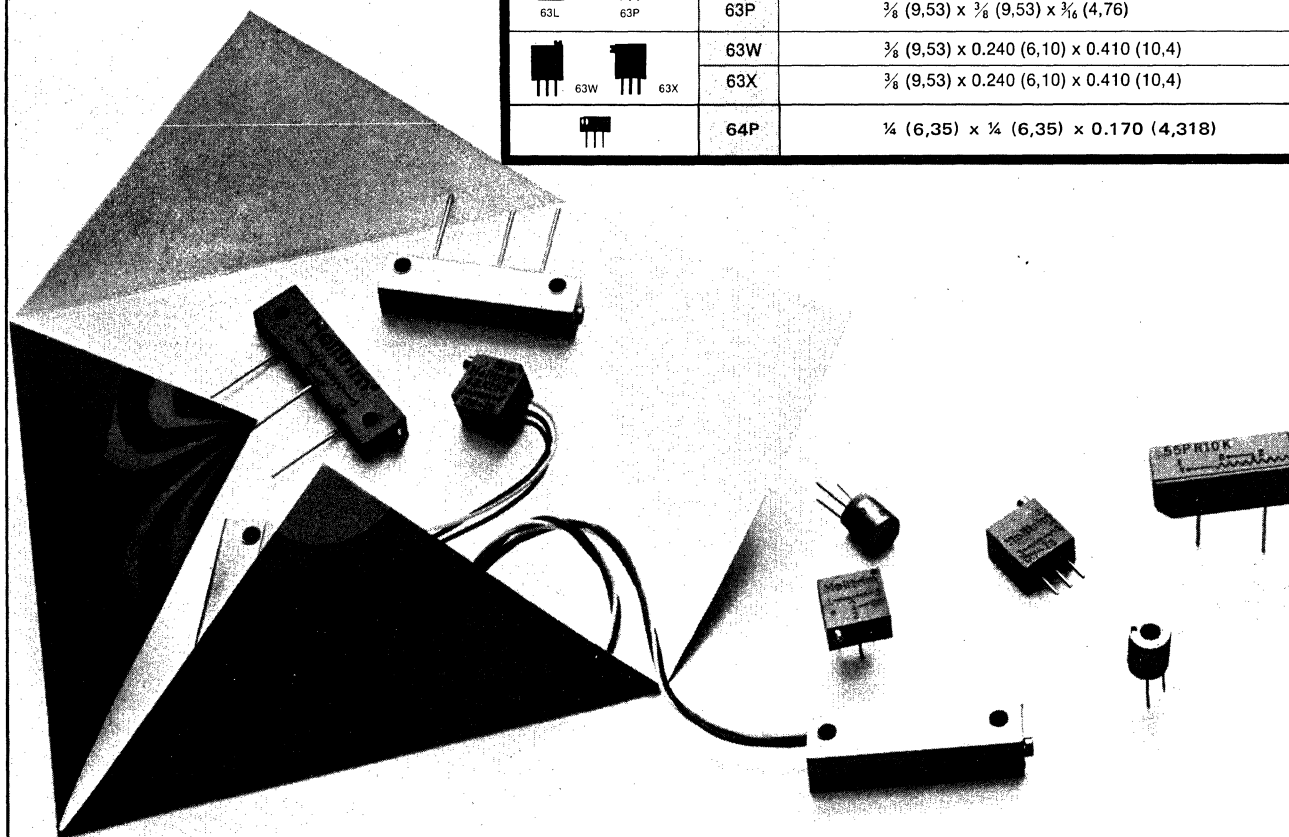
INSTRUMENTS, INC.

HELIPOT DIVISION2500 Harbor Boulevard, Fullerton, California 92634
(714) 871-4848 • TWX No. 910-592-1260

Beckman®**MILITARY TRIMMERS****Military
Cermet Trimming
Potentiometers**

Over 80% of the trimmers listed (military & industrial) are locally distributor stocked. Beckman sales representatives carry in-depth stocks of trimmers and offer same-day deliveries on many quantities. Two additional aids are included in this catalog which further simplify trimmer selection. First, note in the general specifications tables (pp 2 & 4) the column with trimmer outlines. These outlines immediately indicate adjustment screw location for each trimmer. Second, a pin specification chart (pp 6 & 7) is included which will provide useful information, by each individual model, on all pin dimensions and spacings.

	MODEL	DIMENSION INCH (MM) (LxWxH)
	50	1¼ (31,8) x 0.297 (7,54) x ⅝ (7,95)
	53	1¼ (31,8) x 0.292 (7,42) x ⅝ (7,54)
	54	1¼ (31,8) x 0.292 (7,42) x ⅝ (7,54)
	55L	1¼ (31,8) x 0.290 (7,37) x ⅝ (8,74)
	55P	1¼ (31,8) x 0.290 (7,37) x ⅝ (8,74)
	55S	1¼ (31,8) x 0.290 (7,37) x ⅝ (8,74)
	56L	1.25 (31,8) x 0.195 (4,95) x 0.320 (8,13)
	56P	1.25 (31,8) x 0.195 (4,95) x 0.320 (8,13)
	58P	1.25 (31,8) x 0.195 (4,95) x 0.320 (8,13)
	58S	1.25 (31,8) x 0.195 (4,95) x 0.320 (8,13)
	61M	¼ (6,35) Dia. x ⅜ (7,14)
	61P	¼ (6,35) Dia. x ¼ (6,35)
	61PA	⅜ (7,14) x ⅜ (7,14) x ⅜ (9,53)
	63L	⅜ (9,53) x ⅜ (9,53) x 0.240 (6,10)
	63P	⅜ (9,53) x ⅜ (9,53) x ⅜ (4,76)
	63W	⅜ (9,53) x 0.240 (6,10) x 0.410 (10,4)
	63X	⅜ (9,53) x 0.240 (6,10) x 0.410 (10,4)
	64P	¼ (6,35) x ¼ (6,35) x 0.170 (4,318)

**Beckman** INSTRUMENTS, INC.

HELIPOT DIVISION

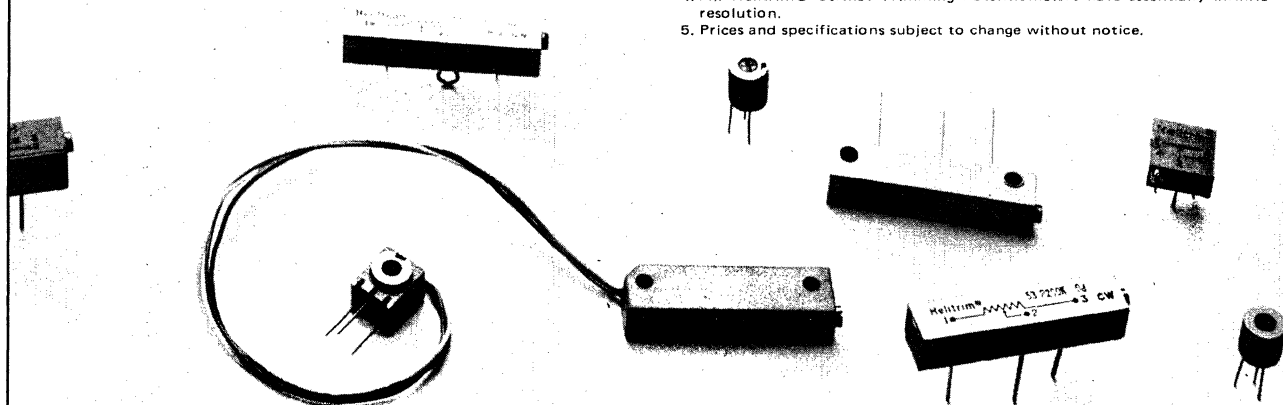
2500 Harbor Boulevard, Fullerton, California 92634
(714) 871-4848 • TWX No. 910-592-1260

Beckman®**MILITARY TRIMMERS**

REMARKS	TURNS	STD. RESIS. RANGE	RESISTANCE TOLERANCE (Note 3)	POWER RATING (WATTS)	TEMPCO (PPM/°C)	MAX. OPER. TEMP.	SEALED	PIN STYLE	STOCK	1-9	PRICE 10-24	25-99
	32	Note 2	$\pm 10\%$ $< 50\Omega$, $\pm 20\%$	1.5 at 125°C	± 100	200 C	No	—		\$8.80	\$8.36	\$7.92
	32	Note 2	$\pm 10\%$ $< 50\Omega$, $\pm 20\%$	1.5 at 125°C	± 100	200 C	No	(A)		7.50	7.13	6.75
	32	Note 2	$\pm 10\%$ $< 50\Omega$, $\pm 20\%$	1.5 at 125°C	± 100	200 C	No	(A)		7.50	7.13	6.75
	22	Note 2	$\pm 10\%$ $< 50\Omega$, $\pm 20\%$	1.0 at 85 C	± 100	175 C	Yes	—	Stock	6.05	5.75	5.45
	22	Note 2	$\pm 10\%$ $< 50\Omega$, $\pm 20\%$	1.0 at 85 C	± 100	175 C	Yes	(A)	Stock	6.05	5.75	5.45
	22	Note 2	$\pm 10\%$ $< 50\Omega$, $\pm 20\%$	1.0 at 85 C	± 100	175 C	Yes	(A)		6.05	5.75	5.45
QPL/RJ12	22	Note 2	$\pm 10\%$ $< 50\Omega$, $\pm 20\%$	1.0 at 85 C	± 100	175 C	Yes	—	Stock	6.05	5.75	5.45
QPL/RJ12	22	Note 2	$\pm 10\%$ $< 50\Omega$, $\pm 20\%$	1.0 at 85 C	± 100	175 C	Yes	(D)	Stock	6.05	5.75	5.45
QPL/RJ12Y	22	Note 2	$\pm 10\%$ $< 50\Omega$, $\pm 20\%$	1.0 at 85 C	± 100	175 C	Yes	(A)	Stock	6.05	5.75	5.45
	22	Note 2	$\pm 10\%$ $< 50\Omega$, $\pm 20\%$	1.0 at 85 C	± 100	175 C	Yes	(A)		6.05	5.75	5.45
TO-5 Pins	1	Note 1	$\pm 10\%$	0.5 at 85 C	± 100	150 C	Yes	(F)		7.15	6.79	6.44
RJ50	1	Note 1	$\pm 10\%$	0.5 at 85 C	± 100	150 C	Yes	(E)	Stock	6.05	5.75	5.45
TO-5 Pins	1	Note 1	$\pm 10\%$	0.5 at 85 C	± 100	150 C	Yes	(F)	Stock	7.15	6.79	6.44
	20	Note 2	$\pm 10\%$	0.5 at 85 C	± 100	150 C	Yes	—	Stock	7.20	6.84	6.48
RJ-24 TO-5 Pins	20	Note 2	$\pm 10\%$	0.5 at 85 C	± 100	150 C	Yes	(F)	Stock	7.20	6.84	6.48
RJ-24	20	Note 2	$\pm 10\%$	0.5 at 85 C	± 100	150 C	Yes	(G)	Stock	7.20	6.84	6.48
RJ-24	20	Note 2	$\pm 10\%$	0.5 at 85 C	± 100	150 C	Yes	(G)	Stock	7.20	6.84	6.48
RJ-26	22	Note 1	+10%	0.25 at 85°C	± 100	150°C	Yes	(F)	Stock	6.00	5.70	5.10

Notes:

- Standard Resistance Values (Ohms) 10, 20, 50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 25K, 50K, 100K, 200K, 250K, 500K, and 1 Meg
- Standard Resistance Values (Ohms) 10, 20, 50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 25K, 50K, 100K, 200K, 250K, 500K, 1 Meg, and 2 Meg
- Tolerances shown as $\pm 10\%$ are for resistance values $\geq 100\Omega$ and $\leq 500\Omega$. Other values are $\pm 20\%$.
- All Helitrim® Cermet Trimming Potentiometers have essentially infinite resolution.
- Prices and specifications subject to change without notice.

**Beckman**

INSTRUMENTS, INC.

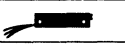
HELIPOT DIVISION

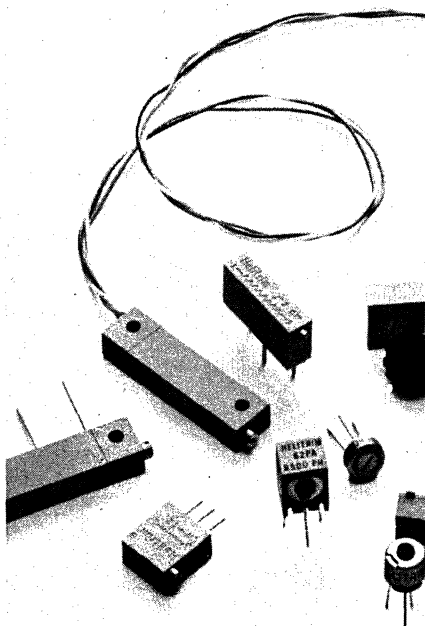
2500 Harbor Boulevard, Fullerton, California 92634

(714) 871-4848 • TWX No. 910-592-1260

Beckman®**INDUSTRIAL TRIMMERS****Industrial
Commercial
Cermet Trimming
Potentiometers****Notes:**

- Standard Resistance Values (Ohms) 10, 20, 50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 25K, 50K, 100K, 200K, 250K, 500K, and 1 Meg
- Standard Resistance Values (Ohms) 10, 20, 50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 25K, 50K, 100K, 200K, 250K, 500K, 1 Meg, and 2 Meg
- Tolerance shown as $\pm 10\%$ are for resistance values $\geq 100\Omega$ and $\leq 500K\Omega$. Other values are $\pm 20\%$.
- All Helitrim® Cermet Trimming Potentiometers have essentially infinite resolution.
- Prices and specifications subject to change without notice.

	MODEL	DIMENSION INCH (MM) (LxWxH)
	62P	$\frac{1}{4}$ (6,35) Dia. x $\frac{1}{4}$ (6,35)
	62PA	$\frac{3}{32}$ (7,14) x 0.290 (7,37) x $\frac{3}{8}$ (9,53)
	62PH	$\frac{1}{4}$ (6,35) Dia. x $\frac{3}{8}$ (7,95)
	66P	$\frac{3}{8}$ (9,53) x $\frac{3}{8}$ (9,53) x 0.200 (5,08)
	66W	$\frac{3}{8}$ (9,53) x 0.200 (5,08) x 0.41 (10,4)
	66X	$\frac{3}{8}$ (9,53) x 0.200 (5,08) x 0.41 (10,4)
	72P	$\frac{3}{8}$ (9,53) x $\frac{3}{8}$ (9,53) x $\frac{3}{8}$ (4,76)
	72PM	$\frac{3}{8}$ (9,53) x $\frac{3}{8}$ (9,53) x $\frac{3}{8}$ (4,76)
	72PX	$\frac{3}{8}$ (9,53) x $\frac{3}{8}$ (9,53) x $\frac{3}{8}$ (4,76)
	72X	$\frac{3}{8}$ (9,53) x $\frac{3}{8}$ (4,76) x $\frac{3}{8}$ (9,53)
	72XL	$\frac{3}{8}$ (9,53) x $\frac{3}{8}$ (4,76) x $\frac{3}{8}$ (9,53)
	72XW	$\frac{3}{8}$ (9,53) x $\frac{3}{8}$ (4,76) x $\frac{3}{8}$ (9,53)
	76P	$\frac{3}{4}$ (19,1) x 0.190 (4,83) x 0.340 (8,64)
	77P	0.750 (19,1) x 0.280 (7,11) x 0.360 (9,14)
	78L	1.25 (31,8) x 0.195 (4,95) x 0.320 (8,13)
	78P	1.25 (31,8) x 0.195 (4,95) x 0.320 (8,13)
	78S	1.25 (31,8) x 0.195 (4,95) x 0.320 (8,13)
	79P	0.750 (19,1) x 0.190 (4,83) x 0.360 (9,14)
	82P	0.250 (6,35) Dia. x 0.150 (3,81)
	86P	0.750 (19,05) x 0.250 (6,35) x 0.200 (5,08)
	89P	0.750 (19,05) x 0.190 (4,83) x 0.250 (6,35)
	89W	0.750 (19,05) x 0.190 (4,83) x 0.250 (6,35)
	89X	0.750 (19,05) x 0.190 (4,83) x 0.250 (6,35)
	91A	$\frac{3}{8}$ (9,53) Dia. x 0.200 (5,08)
	91B	$\frac{3}{8}$ (9,53) Dia. x 0.250 (6,35)
	91C	$\frac{3}{8}$ (9,53) Dia. x 0.250 (6,35)
	91D	$\frac{3}{8}$ (9,53) Dia. x 0.250 (6,35)
	91E	$\frac{3}{8}$ (9,53) Dia. x 0.250 (6,35)
	91S	$\frac{3}{8}$ (9,53) x 0.250 (6,35) x 0.385 (9,78)
	91T	$\frac{3}{8}$ (9,53) x 0.345 (8,76) x 0.385 (9,78)
	91V	$\frac{3}{8}$ (9,53) x 0.400 (10,2) x 0.385 (9,78)
	91W	$\frac{3}{8}$ (9,53) x 0.250 (6,35) x 0.385 (9,78)
	91X	$\frac{3}{8}$ (9,53) x 0.345 (8,76) x 0.385 (9,78)
	91Y	$\frac{3}{8}$ (9,53) x 0.400 (10,2) x 0.385 (9,78)
	91Z	$\frac{3}{8}$ (9,53) x 0.250 (6,35) x 0.385 (9,78)

**Beckman**

INSTRUMENTS, INC.

HELIPOT DIVISION

2500 Harbor Boulevard, Fullerton, California 92634

(714) 871-4848 • TWX No. 910-592-1260

Beckman®**INDUSTRIAL TRIMMERS**

	REMARKS	TURNS	STD. RESIS. RANGE	RESISTANCE TOLERANCE (Note 3)	POWER RATING (WATTS)	TEMPCO (PPM/°C)	MAX. OPER. TEMP.	SEALED	PIN STYLE (Page 6-7)	STOCK	PRICE		
											1-9	10-24	25-99
		1	Note 1	±10%	½ at 70°C	±100	125°C	Yes	(E)	Stock	\$1.95	\$1.85	\$1.76
	TO-5 Pins	1	Note 1	±10%	½ at 70°C	±100	125°C	Yes	(F)	Stock	2.75	2.61	2.48
		1	Note 1	±10%	½ at 70°C	±100	125°C	Yes	(E)		2.75	2.61	2.48
	TO-5 Pins	20	Note 2	±10%	½ at 25°C	±100	105°C	Yes	(F)	Stock	3.85	3.66	3.47
		20	Note 2	±10%	½ at 25°C	±100	105°C	Yes	(G)	Stock	3.85	3.66	3.47
		20	Note 2	±10%	½ at 25°C	±100	105°C	Yes	(G)	Stock	3.85	3.66	3.47
	TO-5 Pins	1	Note 2	±10%	½ at 70°C	±100	125°C	Yes	(F)	Stock	.77	.73	.69
		1	Note 2	±10%	½ at 70°C	±100	125°C	Yes	(H)	Stock	.77	.73	.69
		1	Note 2	±10%	½ at 70°C	±100	125°C	Yes	(I)	Stock	.77	.73	.69
		1	Note 2	±10%	½ at 70°C	±100	125°C	Yes	(F)	Stock	.77	.73	.69
		1	Note 2	±10%	½ at 70°C	±100	125°C	Yes	(G)	Stock	.77	.73	.69
		1	Note 2	±10%	½ at 70°C	±100	125°C	Yes	(I)	Stock	.77	.73	.69
	RJ-11 Pins	15	Note 2	±10%	¾ at 25°C	±100	105°C	Yes	(A)	Stock	2.15	2.04	1.94
		15	Note 2	±10%	¾ at 25°C	±100	105°C	Yes	(B)	Stock	2.15	2.04	1.94
		22	Note 2	±10%	¾ at 70°C	±100	125°C	Yes	—	Stock	3.25	3.09	2.93
		22	Note 2	±10%	¾ at 70°C	±100	125°C	Yes	(A)	Stock	3.25	3.09	2.93
		22	Note 2	±10%	¾ at 70°C	±100	125°C	Yes	(A)		3.25	3.09	2.93
		15	Note 2	±10%	¾ at 25°C	±100	105°C	Yes	(C)	Stock	2.15	2.04	1.94
		1	Note 1	±10%	½ at 70°C	±100	125°C	Yes	(E)	Stock	1.60	1.52	1.44
	TO-116	18	Note 2	±10%	½ at 25°C	±100	105°C	Yes	(J)	Stock	3.50	3.33	3.15
		15	Note 2	±10%	¾ at 25°C	±100	105°C	Yes	(C)	Stock	1.50	1.43	1.35
		15	Note 2	±10%	¾ at 25°C	±100	105°C	Yes	(B)	Stock	1.50	1.43	1.35
	RJ-11 Pins	15	Note 2	±10%	¾ at 25°C	±100	105°C	Yes	(A)	Stock	1.50	1.43	1.35
		1	Note 2	±20%	½ at 40°C	±100	125°C	No	(G)	Stock	.60	.57	.54
	TO-5 Pins	1	Note 2	±20%	½ at 40°C	±100	125°C	No	(F)	Stock	.60	.57	.54
		1	Note 2	±20%	½ at 40°C	±100	125°C	No	(K)	Stock	.60	.57	.54
		1	Note 2	±20%	½ at 40°C	±100	125°C	No	(L)	Stock	.60	.57	.54
		1	Note 2	±20%	½ at 40°C	±100	125°C	No	(M)	Stock	.60	.57	.54
		1	Note 2	±20%	½ at 40°C	±100	125°C	No	(L)	Stock	.60	.57	.54
	TO-5 Pins	1	Note 2	±20%	½ at 40°C	±100	125°C	No	(F)	Stock	.60	.57	.54
		1	Note 2	±20%	½ at 40°C	±100	125°C	No	(K)	Stock	.60	.57	.54
		1	Note 2	±20%	½ at 40°C	±100	125°C	No	(G)	Stock	.60	.57	.54
	TO-5 Pins	1	Note 2	±20%	½ at 40°C	±100	125°C	No	(F)	Stock	.60	.57	.54
		1	Note 2	±20%	½ at 40°C	±100	125°C	No	(K)	Stock	.60	.57	.54
		1	Note 2	±20%	½ at 40°C	±100	125°C	No	(L)	Stock	.60	.57	.54

Beckman

INSTRUMENTS, INC.

HELIPOT DIVISION

2500 Harbor Boulevard, Fullerton, California 92634

(714) 871-4848 • TWX No. 910-592-1260

Beckman**TRIMMER PIN SPECIFICATIONS**

MODEL	PIN DIMENSIONS		INCH MM	PIN SPACINGS (TOP VIEW)	PIN STYLE
Model 53 Model 55P Model 58P Model 76P Model 78P Model 89X	0.030 ±0.001 0.028 ±0.003 0.028 ±0.003 0.028 ±0.003 0.028 ±0.003 0.028 ±0.003	0.762 ±0.025 0.711 ±0.076 0.711 ±0.076 0.711 ±0.076 0.711 ±0.076 0.711 ±0.076			(A)
Model 77P Model 89W	0.040 ±0.005 0.034 ±0.005	1.016 ±0.127 0.863 ±0.127			(B)
Model 79P Model 89P	0.040 ±0.005 0.039 ±0.005	1.016 ±0.127 0.991 ±0.127			(C)
Model 56P	0.028 ±0.003	0.711 ±0.076			(D)
Model 61P Model 61PN Model 62P Model 62PF Model 62PH Model 82P Model 82PF	0.017 ±0.003 0.017 ±0.003 0.017 ±0.003 0.017 ±0.003 0.017 ±0.003 0.020 ±0.005 0.020 ±0.005	0.432 ±0.076 0.432 ±0.076 0.432 ±0.076 0.432 ±0.076 0.432 ±0.076 0.508 ±0.127 0.508 ±0.127			(E)
Model 61M Model 61MN Model 61PA Model 62PA Model 63P* Model 64P* Model 66P* Model 72P Model 72X Model 91B* Model 91T Model 91X*	0.017 ±0.003 0.017 ±0.003 0.017 ±0.003 0.017 ±0.003 0.018 ±0.003 0.018 ±0.003 0.018 ±0.003 0.037 ±0.005 0.037 ±0.005 0.020 ±0.005 0.020 ±0.005 0.020 ±0.005	0.432 ±0.076 0.432 ±0.076 0.432 ±0.076 0.432 ±0.076 0.457 ±0.076 0.457 ±0.076 0.457 ±0.076 0.940 ±0.127 0.940 ±0.127 0.508 ±0.127 0.508 ±0.127 0.508 ±0.127			(F)

*CW and CCW reversed.

Beckman

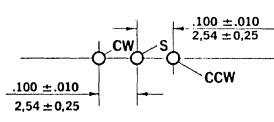
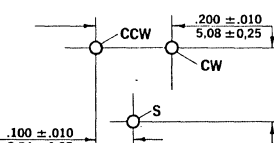
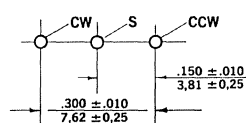
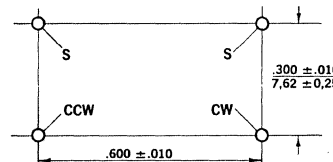
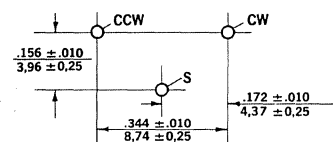
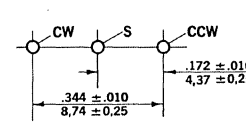
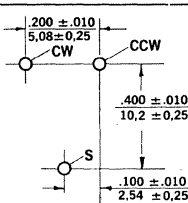
INSTRUMENTS, INC.

HELIPOT DIVISION

2500 Harbor Boulevard, Fullerton, California 92634

(714) 871-4848 • TWX No. 910-592-1260

Beckman®**TRIMMER PIN SPECIFICATIONS**

MODEL	PIN DIMENSIONS		INCH MM	PIN SPACINGS (TOP VIEW)	PIN STYLE
Model 63W Model 63X Model 66W Model 66X Model 72XL Model 91A* Model 91W*	0.024 ±0.005 0.024 ±0.005 0.024 ±0.005 0.024 ±0.005 0.037 ±0.005 0.020 ±0.005 0.020 ±0.005	0,610 ±0,127 0,610 ±0,127 0,610 ±0,127 0,610 ±0,127 0,940 ±0,127 0,508 ±0,127 0,508 ±0,127			(G)
Model 72PM	0.037 ±0.005	0,940 ±0,127			(H)
Model 72PX Model 72XW Model 91S*	0.030 ±0.005 0.037 ±0.005 0.020 ±0.005	0,762 ±0,127 0,940 ±0,127 0,508 ±0,127			(I)
Model 91P (DIP)	0.019 ±0.002	0,483 ±0,05			(J)
Model 91C Model 91V* Model 91Y	0.020 ±0.005 0.020 ±0.005 0.020 ±0.005	0,508 ±0,127 0,508 ±0,127 0,508 ±0,127			(K)
Model 91D Model 91Z*	0.020 ±0.005 0.020 ±0.005	0,508 ±0,127 0,508 ±0,127			(L)
Model 91E	0.020 ±0.005	0,508 ±0,127			(M)

*CW and CCW reversed.

Note: The preceding line drawings indicate pin spacings and are not intended to be used as hole drilling patterns.
Local Helipot sales representatives will provide additional specifications on request.**Beckman**

INSTRUMENTS, INC.

HELIPOT DIVISION

2500 Harbor Boulevard, Fullerton, California 92634

(714) 871-4848 • TWX No. 910-592-1260

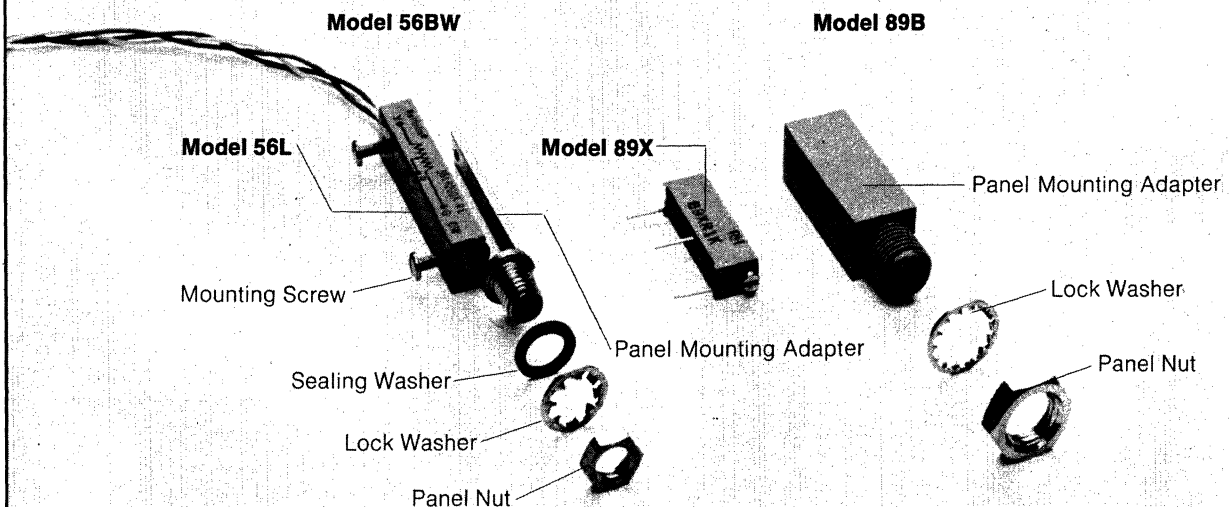
Beckman®**TRIMMER PANEL MOUNT ADAPTERS****Panel Mounted Models:**

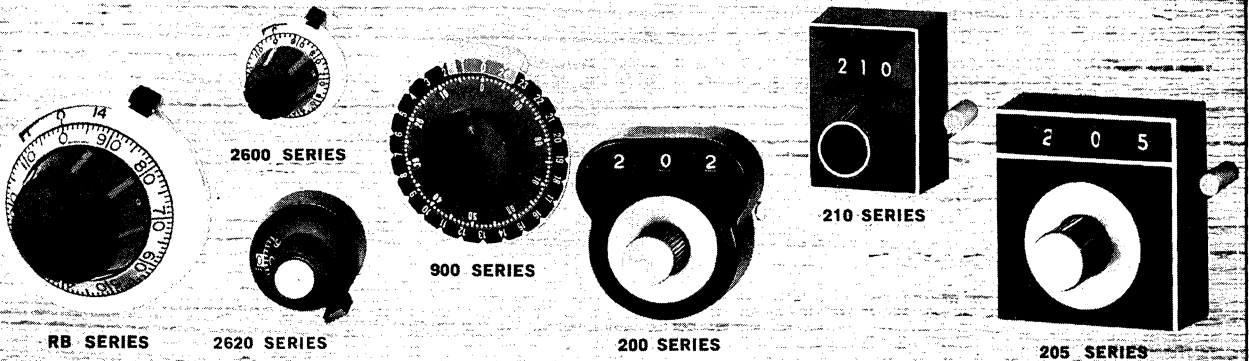
Helitrim® Cermet Trimming Potentiometers may be ordered pre-assembled with panel mounting adapter or separately. The following examples and model by model listing should simplify ordering. Beckman sales representatives will provide additional information upon request.

Example: When ordering Model 56L pre-assembled, specify 56LBW.

Example: When ordering Model 56L with separate unassembled panel mounting adapter, specify 56BW plus 56L trimmer.

Helitrim Trimming Potentiometer Models	To Order Panel Mounting Adapter Pre-Assembled With Trimmer	To Order Panel Mounting Adapter Separately
50	50B R (Resistance Value)	55BW
54	54B R (Resistance Value)	55BW
55L	55LB R (Resistance Value)	55BW
55S	55SB R (Resistance Value)	55BW
56L	56LBW R (Resistance Value)	56BW
58S	58SBW R (Resistance Value)	56BW
78L	78LBW R (Resistance Value)	56BW
78P	78PBW R (Resistance Value)	56BW
78S	78SBW R (Resistance Value)	56BW
89	89PB R (Resistance Value)	89B

**Beckman** INSTRUMENTS, INC.**HELIPOT DIVISION**2500 Harbor Boulevard, Fullerton, California 92634
(714) 871-4848 • TWX No. 910-592-1260

Beckman®**Duodial® & Digidial®****TURNS-COUNTING DIALS****Duodial®**

RB SERIES—1½" diameter dials finished in satin chrome with black-filled numerals and divisions (RBD has matte black finish and white-filled numerals and divisions). Built-in vibration-proof locking mechanism—knob and locking lever cap made of black nylon. Models can be used with most potentiometers, or other device, having from 1 to 15 mechanical turns.

2600 SERIES—Miniature ⅞" diameter versions of the RB Series. Ideally suited for applications where panel space is limited. Primarily for use with ⅞" diameter multi-turn potentiometers but can be used with devices of any size having from 1 to 15 mechanical turns. All models have satin chrome finish, black-filled numerals and divisions, vibration-proof locking mechanism with black nylon cap, and black nylon knob.

2620 SERIES—Compact 1" diameter provides panel space savings while retaining excellent readability. White numerals on black background for fiftieths of a turn, and black numerals on white background for full turns. May be used with devices with from 1 to 10 adjustment turns. Positive locking mechanism prevents accidental changes of setting, due to vibration or sudden shock. Rugged black housing and knob help assure long life and carefree operation. Model 2621 is designed for mounting on ¼" shafts, Models 2626 and 2627 mount on ⅜" shafts.

900 SERIES—Ideally suited to applications where precise settings and readability are required. 4¾" diameter permits greater accuracy of setting. Outer dial is graduated in complete turns, inner vernier dial is graduated in hundredths. Settings can be made easily to three significant figures and estimated accurately to a fourth. For rapid changing of settings, an eccentric finger-hole is provided in the adjustment knob. The inner vernier dial and knob are made of plastic to eliminate body capacitance which might affect the setting. Since the knob is connected to the potentiometer shaft, backlash is thereby eliminated.

Digidial®

200 SERIES—Lightweight, compact dials for fast, accurate readings in hundredths of a turn. Reading units are completely encased in a snap-on plexiglass cover for convenient indexing. White numerals against a black background may be easily read from a wide angle. No built-in mechanical stops so rotation is limited only by the potentiometer, or other device, to which it is coupled. Locking mechanism in the dial permits settings to be accurately locked into place. Series 200 dials are available in three different knob and housing colors (Model 201—blue cover & knob, Model 202—black cover & knob, Model 203—grey cover & knob). All models have an aluminum knob with an insulating vinyl grip.

205 SERIES—Ideally suited for applications requiring maximum readability, or where large diameter potentiometers are used. ⅝" numerals are slightly recessed for protection from glare. Area surrounding the knob is recessed with a fine textured black finish. Friction type locking lever accurately locks dial settings into place.

210 SERIES—Miniature dials that have the same distinctive styling as the 205 Series, yet occupy less than 50% of the panel area. Their small size and excellent readability make them an ideal choice for use with potentiometers having a 1½" diameter or less. They have die cast zinc case finish with matte black anemil. Brushed aluminum locking lever prevents accidental movement and can be actuated without disturbing the setting.

SEE ALSO: Trimming potentiometers, precision potentiometers—Sec. 4750. DIP resistor packages and DIP interface networks—Sec. 4700. Voltage regulators, DAC/ADC products, operational amplifiers, active filters—Sec. 3130.

Prices and specifications subject to change without notice.

DUODIAL® MODELS										DIGIDIAL® MODELS					
	RB RBC RBD	RBJ	2601	2606 2607	2621	2626 2627	901	902	903	904	200	205	210	211	
Counting Capacity, max. turns	15				10				15	25	40	10			
Diameter, nominal (Duodials)	1½⁄₁₆"		⅞"		1"		4¾"				Not Applicable				
Height (Digidials)	Not Applicable						Not Applicable				2½⁄₁₆"		2⅜⁄₃₂"		1²¹⁄₃₂"
Width (Digidials)	Not Applicable						Not Applicable				1¹⁵⁄₁₆"		1⁶⁄₆₄"		1³⁄₃₂"
Depth, from panel face	1"		.791"	2⁹⁄₃₂"	.938"		1½⁄₃₂"				1¹¹⁄₆₄"	1½"	1⁹⁄₃₂"		
For Shaft diameter	¼"	⅜"	⅜"	¼"	⅜"	¼"	¼"				¼"		⅜"		
Max. Shaft extension (from panel face)	1³⁄₁₆"		4¾⁄₆₄"		.816"		2⅜⁄₃₂"				⅞"				
Min. Shaft extension (from panel face)	⁹⁄₁₆"		1⁵⁄₃₂"		¾⁄₆₄"		1⁵⁄₃₂"				1½⁄₃₂"				
Fore Bushing, thread	⅜-32-NEF		¼-32-NEF		⅜-32-NEF		¼-32 NEF		⅜-32 NEF		½-32-NS		⅜-32-NEF		¼-32-NEF
Max Bushing extension (from panel face)	1³⁄₃₂"		1⁹⁄₆₄"	.270"	1⁹⁄₆₄"		.335"				¼"		¼"		⁵⁄₃₂"
Locking Mechanism	Positive Action										Positive Action		Friction Type		
For use with Helipot Precision Potentiometer Models:	7216, 7246 7266, A, C	7221	7221	7216, 7246 7266, A, C	7221	7216, 7246 7266, 7276	901-A, 901C				7216, 7246, 7266, A, C				7221
Price (1-9 Qty)	RB RBC RBD	= \$ 6.25 = \$10.00	\$10.00	2606 = \$ 7.75 2607 = \$8.25	\$5.00	2626 = \$4.75 2627 = \$5.25	\$28.00				201 202 205	\$22.00	\$22.00	\$15.00	\$15.00

Beckman®

INSTRUMENTS, INC.

HELIPOT DIVISION

2500 Harbor Boulevard, Fullerton, California 92634

(714) 871-4848 • TWX No. 910-592-1260



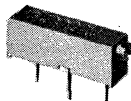
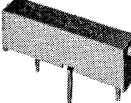
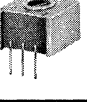
RESISTORS, VARIABLE

CTS OF BERNE, INC.

SUBSIDIARY OF CTS CORPORATION, ELKHART, INDIANA

WORLD LEADER IN CERMET RESISTOR TECHNOLOGY

**INDUSTRIAL
CERMET
TRIMMERS**

CTS Series	Description	Data Sheet	Resistance Range	Unit Price			CTS Series	Description	Data Sheet	Resistance Range	Unit Price		
				1-9	10-24	25-49					1-9	10-24	25-49
186 	Power: $\frac{3}{4}$ @ 25°C $\frac{1}{2}$ @ 85°C Max. Temp: 150°C Resist. Tol: $\pm 10\%$ Dim.: .75 x .25 x .190 No. of Turns: 17	3186	50 Ω - 1 Meg Ω	1.94	1.84	1.75	362S 	Power: $\frac{1}{2}$ @ 85°C Max. Temp: 150°C Resist. Tol: $\pm 20\%$ Dim.: .312 x .355 x .300 No. of Turns: 1 .100" Lead Spacing	3360	50 Ω - 1 Meg Ω	1.52	1.42	1.35
187 	Power: $\frac{3}{4}$ @ 25°C $\frac{1}{2}$ @ 85°C Max. Temp: 150°C Resist. Tol: $\pm 10\%$ Dim.: .75 x .25 x .190 No. of Turns: 17	3186	50 Ω - 1 Meg Ω	1.94	1.84	1.75	362T 	Power: $\frac{1}{2}$ @ 85°C Max. Temp: 150°C Resist. Tol: $\pm 20\%$ Dim.: .312 x .355 x .300 No. of Turns: 1 .100" Lead Spacing	3360	50 Ω - 1 Meg Ω	1.52	1.42	1.35
188 	Power: $\frac{3}{4}$ @ 25°C $\frac{1}{2}$ @ 85°C Max. Temp: 150°C Resist. Tol: $\pm 10\%$ Dim.: .75 x .25 x .190 No. of Turns: 17	3186	50 Ω - 1 Meg Ω	1.94	1.84	1.75	362X 	Power: $\frac{1}{2}$ @ 85°C Max. Temp: 150°C Resist. Tol: $\pm 20\%$ Dim.: .312 x .355 x .300 No. of Turns: 1 TO-5 Lead Spacing	3360	50 Ω - 1 Meg Ω	1.52	1.42	1.35
345 	Power: $\frac{3}{4}$ @ 25°C $\frac{1}{2}$ @ 85°C Max. Temp: 150°C Resist. Tol: $\pm 20\%$ Dim.: .250 dia. x .180 No. of Turns: 1	3345	50 Ω - 500 K Ω	1.67	1.58	1.47	362Y 	Power: $\frac{1}{2}$ @ 85°C Max. Temp: 150°C Resist. Tol: $\pm 20\%$ Dim.: .312 x .355 x .300 No. of Turns: 1 TO-5 Lead Spacing	3360	50 Ω - 1 Meg Ω	1.52	1.42	1.35
345Y 	Power: $\frac{3}{4}$ @ 25°C $\frac{1}{2}$ @ 85°C Max. Temp: 150°C Resist. Tol: $\pm 20\%$ Dim.: .250 dia. x .180 No. of Turns: 1 TO-5 Lead Spacing	3345	50 Ω - 500 K Ω	1.69	1.60	1.49	362U 	Power: $\frac{1}{2}$ @ 85°C Max. Temp: 150°C Resist. Tol: $\pm 20\%$ Dim.: .312 x .355 x .300 No. of Turns: 1 .200" Lead Spacing	3360	50 Ω - 1 Meg Ω	1.52	1.42	1.35
359S 	Power: $\frac{1}{2}$ @ 85°C Max. Temp: 125°C Resist. Tol: $\pm 20\%$ Dim.: .434 x .360 x .298 No. of Turns: 1 .100" Lead Spacing	3360	50 Ω - 1 Meg Ω	1.52	1.42	1.35	375E 	Power: $\frac{1}{2}$ @ 70°C Max. Temp: 125°C Resist. Tol: $\pm 20\%$ Dim.: .370 dia. x .150 .100" Lead Spacing Cent. Term.: .400	3375	50 Ω - 1 Meg Ω	1.49	1.39	1.32
359T 	Power: $\frac{1}{2}$ @ 85°C Max. Temp: 125°C Resist. Tol: $\pm 20\%$ Dim.: .434 x .360 x .298 No. of Turns: 1 .100" Lead Spacing	3360	50 Ω - 1 Meg Ω	1.52	1.42	1.35	375V 	Power: $\frac{1}{2}$ @ 70°C Max. Temp: 125°C Resist. Tol: $\pm 20\%$ Dim.: .370 dia. x .150 .172" Lead Spacing Cent. Term.: .156	3375	50 Ω - 1 Meg Ω	1.49	1.39	1.32
359X 	Power: $\frac{1}{2}$ @ 85°C Max. Temp: 125°C Resist. Tol: $\pm 20\%$ Dim.: .434 x .360 x .298 No. of Turns: 1 TO-5 Term. Spacing	3360	50 Ω - 1 Meg Ω	1.52	1.42	1.35	375S 	Power: $\frac{1}{2}$ @ 70°C Max. Temp: 125°C Resist. Tol: $\pm 20\%$ Dim.: .370 dia. x .150 .100" Lead Spacing	3375	50 Ω - 1 Meg Ω	1.47	1.37	1.30
360S 	Power: $\frac{1}{2}$ @ 85°C Max. Temp: 125°C Resist. Tol: $\pm 20\%$ Dim.: .434 x .360 x .298 No. of Turns: 1 .150" Lead Spacing	3360	50 Ω - 1 Meg Ω	1.52	1.42	1.35	375T 	Power: $\frac{1}{2}$ @ 70°C Max. Temp: 125°C Resist. Tol: $\pm 20\%$ Dim.: .370 dia. x .150 .100" Lead Spacing	3375	50 Ω - 1 Meg Ω	1.47	1.37	1.30
360T 	Power: $\frac{1}{2}$ @ 85°C Max. Temp: 125°C Resist. Tol: $\pm 20\%$ Dim.: .434 x .360 x .298 No. of Turns: 1 .150" Lead Spacing	3360	50 Ω - 1 Meg Ω	1.52	1.42	1.35	375X 	Power: $\frac{1}{2}$ @ 70°C Max. Temp: 125°C Resist. Tol: $\pm 20\%$ Dim.: .370 dia. x .150 .100" Lead Spacing TO-5 Lead Spacing	3375	50 Ω - 1 Meg Ω	1.47	1.37	1.30
							375Y 	Power: $\frac{1}{2}$ @ 70°C Max. Temp: 125°C Resist. Tol: $\pm 20\%$ Dim.: .370 dia. x .150 .100" Lead Spacing TO-5 Lead Spacing	3375	50 Ω - 1 Meg Ω	1.48	1.38	1.31

ORDERING INFORMATION: Place orders using the following address: CTS OF BERNE, INC., 406E Parr Road, Berne, Indiana 46711 • Call and ask for John Henry at (219) 589-3111 • TWX 810-323-1580



RESISTORS, VARIABLE

TRIMPOT PRODUCTS DIVISION

CERMET TRIMMING

POTENTIOMETERS

Choose cermet units for infinite resolution, stability, broad resistance range and good high frequency performance.			Description	Dimensions H x W x L	Terminals	Res. Tol. (%)	Power (Watt) at 70°C	Max. Temp. °C	Nom. Adj. Turns	Humidity Mil Spec	Standard Resistances Ω	PRICES 1-9 10-24 25-49		
	3006	Commercial TRIMPOT Potentiometer	.25x.19x.75	P,W,Y	±10	0.75	125	15	Yes	10-2 Meg	\$1.40 \$1.30 \$1.21			
	3009	Commercial E-Z-TRIM Potentiometer	.35x.19x.75	P,Y	±10	0.75 at 25°C	125	20	Yes	10-2 Meg	1.94 1.84 1.75			
	3059	High Temperature Humidity Proof (RJ12)	.32x.19x1.25	L,P,Y,J	±10	1.0	150	22	Yes	10-2 Meg	3.30 3.14 2.97			
	3082	Humidity Proof Cermet Element	.10x.15x.50	P	±10	0.3 at 85°C	150	10	Yes	10-2 Meg	7.70 7.13 6.42			
	3099	Dual In-Line Package	.25x.19x.75	P	±10	1.0	150	20	Yes	10-2 Meg	3.75 3.35 3.00			
	3262	Humidity Proof High Temperature (RJ26)	.27x.17x.25	P,W,X	±10	0.25 at 85°C	175	12	Yes	10-1 Meg	7.35 6.83 6.13			
	3279	Multi-Turn Commercial	.31x.19x.31	W,X	±10	0.3	150	13	Yes	10-1 Meg	4.24 3.85 3.47			
	3292	Thin Line Cermet Element (RJ24)	.15x.375x.375	L,P,W,X	±10	0.5 at 85°C	175	22	Yes	10-1 Meg	6.83 6.49 6.15			
	3299	Commercial TRIMPOT Potentiometer	.39x.37x.25	P,W,X	±10	0.5	125	25	Yes	100-1 Meg	1.66 1.54 1.44			
	3329	High Performance Cermet Element	.250 dia.x.180 .245x.29x.375	P,H W	±10	0.5 at 85°C	150	240°	Yes	10-1 Meg 10-1 Meg	1.75 1.66 1.57 2.50 2.38 2.25			
	3339	Four Turn Cermet Element	.300 dia.x.25	P,H,W	±20	0.5 at 85°C	150	4	Yes	10-1 Meg	2.50 2.32 2.09			
	3352	Single-Turn Commercial	.415x.365x.145	T,E,P W,H,V	±20	0.75 at 40°C	125	230°	Yes	10-5 Meg	25-49 .54 50-99 .53 100-249 .52			
	3353	Single-Turn Carbon Element	1 3/32 dia.x.3/32	W,P	±20	1/4 W at 60°C	100	300°	No	500 to 500 Meg	.51 .48 .38			
	3359	Single-Turn Cermet Element	.395x.456x.228	W,P	±20	0.75 at 40°C	125	270°	No	100 to 2 Meg	.83 .77 .72			
	3386	Single-Turn Commercial	.375x.375x.19	F,P,R,K W,S,H	±10	0.5 at 85°	125	280°	Yes	100-2 Meg	.65 .63 .60			

Note: Prices on certain pin configurations and resistances are slightly higher than prices illustrated. Bourns reserves the right to change specs and prices at any time. All prices are F.O.B., Riverside, California, USA.

MOST MODELS AVAILABLE FROM YOUR LOCAL DISTRIBUTOR



TRIMPOT PRODUCTS DIVISION

1200 COLUMBIA AVENUE, RIVERSIDE, CALIFORNIA 92507
PHONE (714) 684-1700 • TWX 910-332-1252 • TELEX 676-423

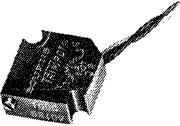
RESISTORS, VARIABLE



TRIMPOT PRODUCTS DIVISION

WIREWOUND TRIMMING

POTENTIOMETERS

Choose wirewound units for high power, stability and low temperature coefficient.											PRICES		
	Description	Dimensions H x W x L	Terminals	Res. Tol. (%)	Power (Watt) at 70°C	Max. Temp. °C	Nom. Adj. Turns	Humidity Mil Spec	Standard Resistances Ω	1-9	10-24	25-49	
	220 High Temperature (RT10)	.32x.18x1.00	L,W,P	±5	1.0	175	15	Yes	10-10K 20-30K	\$9.50 11.29	\$8.80 10.45	\$7.92 9.41	
	3005 Sealed Commercial E-Z-TRIM Potentiometer	.31x.17x.75	P	±10	1.0 at 40°C	125	20	Steady State	10-25K 50K	2.00 2.40	1.85 2.22	1.75 2.10	
	3007 Commercial E-Z-TRIM Potentiometer	.31x.17x.75	P	±10	1.0 at 40°C	125	20	Steady State	10-25K	2.00	1.85	1.75	
	3057 High Temperature Humidity Proof (RTR 12 level M, P) (RT12)	.32x.19x1.25	L,P,Y,J	±5	1.0	150	22	Yes	10-10K 20K 50K 100K	6.22 6.85 7.47 9.45	5.50 6.06 6.60 8.35	4.73 5.25 5.71 7.23	
	3070 High Power Fine Resolution	.31x.31x1.06 .36x.31x1.06	L,S,H P	±5	1.5	175	10	Yes	100-20K 50K	16.68 18.98	16.28 18.60	15.89 18.22	
	3095 Industrial Potentiometer Dual In-Line Package	.25x.19x.75	P	±10	1.0	150	18	Yes	10-25K 50K	3.75 5.00	3.35 4.46	3.00 4.00	
	3250 Humidity proof High Temperature (RT22)	.19x.50x.50 .22x.50x.50	L P,W W66	±5	1.0	175	25	Yes	10-10K 20K & 25K 50K 10-10K 20K & 25K 50K	7.38 8.32 11.00 7.95 8.77 11.58	6.84 7.70 10.20 7.36 8.12 10.72	6.15 6.93 9.17 6.62 7.31 9.66	
	3255 Commercial TRIMPOT Potentiometer	.19x.50x.50 .22x.50x.50	L P,W	±5	1.0 at 50°C	150	25	Steady State	10-10K 20K & 25K 50K	3.51 4.75	3.25 4.40	2.93 3.96	
	3260 Humidity Proof High Temperature (RT26)	.25x.25x.17	H,W	±5	0.2	175	11	Yes	10-1K 2K & 5K 10K & 20K 25K	8.25 9.08 11.55 12.10	7.64 8.41 10.70 11.20	6.88 7.57 9.63 10.09	
	3290 Humidity Proof High Temperature (RT24)	.150x.375x.375	L,W,H P	±5	1.0	175	25	Yes	10-10K 20K & 25K 50K	8.06 9.63 11.11	7.46 8.92 10.29	6.72 8.03 9.27	
	3305 Sealed Commercial TRIMIT Potentiometer	.31x.25x.375 .31 dia.x.19	W P	±5	0.5 at 70°C	125	280°	Steady State	10-5K 10K 20-25K 10-5K 10K 20-25K	2.48 2.75 3.30 1.93 2.20 2.75	2.38 2.64 3.17 1.85 2.11 2.64	2.28 2.53 3.04 1.78 2.02 2.53	

Note: Prices on certain pin configurations and resistances are slightly higher than prices illustrated. Bourns reserves the right to change specs and prices at any time. All prices are F.O.B., Riverside, California, USA.

MOST MODELS AVAILABLE FROM YOUR LOCAL DISTRIBUTOR



TRIMPOT PRODUCTS DIVISION

1200 COLUMBIA AVENUE, RIVERSIDE, CALIFORNIA 92507
PHONE (714) 684-1700 • TWX 910-332-1252 • TELEX 676-423



RESISTORS, VARIABLE

TRIMPOT PRODUCTS DIVISION

MIL-SPEC TRIMMING

POTENTIOMETERS

MIL-R-27208

MIL Style	Description	Qualified Resistance
RT-10	TERMINALS: L,P CHARACTERISTIC: C2	10 Ω -10K
RT-11	TERMINALS: L,P CHARACTERISTIC: C2	10 Ω -20K
RT-12	TERMINALS: L,P,Y CHARACTERISTIC: C2	10 Ω -20K
RT-22	TERMINALS: L,P,W,X CHARACTERISTIC: C2	50 Ω -20K
RT-24	TERMINALS: L,P,W,X CHARACTERISTIC: C2	10 Ω -10K
RT-26	TERMINALS: W,X CHARACTERISTIC: C2	10 Ω -5K

MIL-R-39015

MIL Style	Description	Qualified Resistance
RTR-12 LEVEL M, P	TERMINALS: L,P,Y CHARACTERISTIC: D	10 Ω -20K
RTR-22 LEVEL M, P	TERMINALS: L,P,W,X CHARACTERISTIC: D	500 Ω -20K
RTR-24 LEVEL M, P	TERMINALS: P,W,X CHARACTERISTIC: D	500 Ω -10K

MIL-R-39035

RJR-12 LEVEL M	TERMINALS: L,Y CHARACTERISTICS: C,F	10 Ω -1 Meg
RJR-24 LEVEL M	TERMINALS: P,W,X CHARACTERISTICS: C,F	200 Ω -1 Meg

MIL-R-22097

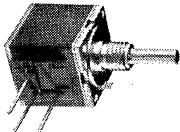
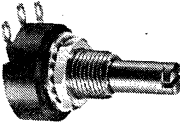
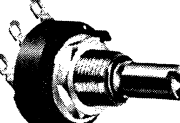
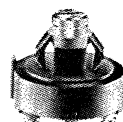
MIL Style	Description	Qualified Resistance
RJ-12	TERMINALS: L,P,Y CHARACTERISTICS: C,F	10 Ω -1 Meg
RJ-22	TERMINALS: L,P,W,X CHARACTERISTICS: C,F	10 Ω -1 Meg
RJ-24	TERMINALS: L,P,W,X CHARACTERISTICS: C,F	10 Ω -1 Meg
RJ-26	TERMINALS: P,W,X CHARACTERISTICS: C,F	10 Ω -1 Meg
RJ-50	TERMINAL: P CHARACTERISTICS: C,F	10 Ω -1 Meg



TRIMPOT PRODUCTS DIVISION

PANEL

POTENTIOMETERS

MODEL NO.	Description	Specifications	Resistance Ω	Price Range 10-24 25-49			
MODEL 80 CERMET OR CONDUCTIVE PLASTIC 	Modular 5/8" Sq. 1-4 Sections 1/4" or 3/8" Bushing Locking or Non-Locking Single or Dual Concentric Shafts	Power @ 70°C Lin.-Sgl. Sec. 2W Mult. Sec. 1W Res. Tol. (Std.) $\pm 10\%$ CRV 1% Max. Temp. +150°C Tempco (ppm/°C) 150 Linearity (Std.) 5%	Cer. C-P	Cermet 50 Ω - 5 Meg (Lin.) 1K - 2.5 Meg (Audio)	4.10 to 4.90	2.38 to 2.95	2.07 to 2.57
							C-P 150 Ω - 5 Meg (Lin.) 1K - 2.5 Meg (Audio)
3852 CERMET 	3/4" Diameter 1/4" or 3/8" Dia. Bushing Locking or Non-Locking Lugs or PC Pins	Power @ 70°C Linear Tapers Res. Tol. (Std.) $\pm 10\%$ CRV 3% Max. Temp. +150°C Min. Temp. -65°C Tempco (ppm/°C) 150 Linearity (Std.) 5%	Cer. C-P	Cermet 50 Ω - 5 Meg (Lin.) 1K - 2.5 Meg (Audio)	2.65 to 3.57	2.36 to 3.13	2.31 to 3.02
							C-P 1K - 100K (Lin.) 2K - 50K (Audio)	2.15 to 2.96	1.93 to 2.61	1.88 to 2.40
3851 CONDUCTIVE PLASTIC							
3856 CERMET — 3 3/4 TURNS 	3/4" Diameter 3/8" Dia. Bushing 1/4" or 1/8" Dia. Shaft Lugs or PC Pins	Power Rating @ 70°C Linear Tapers Audio Tapers Res. Tol. (Std.) $\pm 10\%$ CRV 3% Ind. Linearity 5%		50 Ω - 5 Meg (Linear Tapers) 1000 - 2.5 Meg (Audio Tapers)	6.00 to 6.50	5.35 to 5.75	5.09 to 5.44
3859 CERMET 	3/4" Diameter 3/8" Dia. Plastic Bushing Snap-in or Threaded	Power @ 70°C Linear Tapers Res. Tol. (Std.) $\pm 10\%$ CRV 3% Max. Temp. +150°C Min. Temp. -65°C Tempco (ppm/°C) 150 Linearity (Std.) 5%	Cer. C-P	Cermet 50 Ω - 5 Meg (Lin.) 1K - 2.5 Meg (Audio)	2.15 to 2.65	1.91 to 2.31	1.87 to 2.22
							C-P 1K - 5 Meg (Lin.) 2K - 50K (Audio)	1.97 to 2.47	1.80 to 2.20	1.74 to 2.09
3858 CONDUCTIVE PLASTIC							

Note: Prices on certain pin configurations and resistances are slightly higher than prices illustrated. Bourns reserves the right to change specs and prices at any time. All prices are F.O.B., Riverside, California, USA.



TRIMPOT PRODUCTS DIVISION

1200 COLUMBIA AVENUE, RIVERSIDE, CALIFORNIA 92507
PHONE (714) 684-1700 • TWX 910-332-1252 • TELEX 676-423



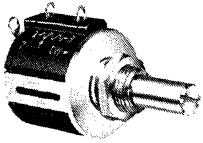
RESISTORS, VARIABLE

PRECISION

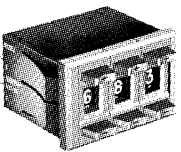
POTENTIOMETERS/DIALS

TRIMPOT PRODUCTS DIVISION

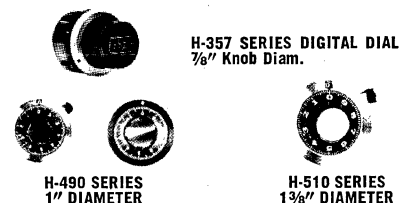
STANDARD INDUSTRIAL BUSHING-MOUNT POTENTIOMETERS — PARTIAL LISTING

Model No.	Description	Specifications	Resistances	1-4	Price Guide 10-24	50-99
3541 HYBRITRON™ POTENTIOMETER (Hybritron Element provides performance advantages of both wirewound and conductive plastic by utilizing composite construction. See Model 3540 for pictorial illustration.)	7/8" Diameter 3/4" Long 10-Turn	Oper. Temp.: -55 to +125°C Linearity: ±0.25% Resis. Tol.: ±10% Temp. Coef.: ±100 ppm/°C Resolution: Infinite Mech. Life: 5,000,000 Shaft Revolutions Output Smoothness: .015% max. Power: 2W @ 70°C	1K-100K	8.40	7.59	6.79
3500 WIREWOUND POTENTIOMETER 	7/8" Diameter 10-Turn	Oper. Temp.: -65 to 125°C Linearity: ±0.2% Mech. Life: 2,000,000 Rev. Power: 2W @ 70°C Resis. Tol. %: ±3	500-125K 150K, 200K 250K 500K	13.60 27.50 41.39	10.88 22.00 33.11	9.52 19.25 28.97
3540, 3543, 3545 WIREWOUND POTENTIOMETER 	7/8" Diameter 3/4" Long 3540 = 10-Turn 3543 = 3-Turn 3545 = 5-Turn	Oper. Temp.: -55 to 125°C Linearity: ±0.25% Resis. Tol. %: ±5 Power: 3540: 2W @ 70°C 3543: 1W @ 70°C 3545: 1.5W @ 70°C Mech. Life: 3540: 1,000,000 Rev. 3543: 300,000 Rev. 3545: 500,000 Rev.	3540: 100Ω to 200K 500K 3543: 20Ω to 50K 3545: 50Ω to 50K	6.25 7.40 7.40	5.65 9.15 7.15	5.05 6.10 5.85

KNOBPOT® POTENTIOMETERS

Model No./Description	Specifications	Resistances	1-9	Price Guide 10-24	50-99
3600 KNOBPOT Potentiometer 3/4" Diameter Clockface Readout 	Dial Acc. -VR: ±0.5% Watt Power: 1.5 @ 25°C Elect. Rotation: 3600° Nom. Oper. Temp.: -65 to 85°C Resis. Tol. (%): ±5	100Ω-100K 200K, 250K	21.79 32.19	21.77 31.42	18.16 26.83
3610 KNOBPOT Potentiometer 7/8" Diameter 10-Turn Digital Readout 	Dial Acc. -VR: ±0.5% Watt Power: 1.5 @ 25°C Elect. Rotation: 3600° Nom. Oper. Temp.: -25 to 85°C Resis. Tol. (%): ±5	100Ω-200K 250K	22.26 30.65	21.73 29.91	18.55 25.54
3680 KNOBPOT Pushbutton Potentiometer 	Dial Acc. -VR: ±0.5% Watt Power: 2 @ 25°C Oper. Temp.: -25 to 85°C Resis. Tol. (%): 1% Rated Life: 100,000 Operations per Decade Resolution: 0.1%	5K to 1 Meg	23.00	21.30	18.19

TURNS-COUNTING DIALS



Part No.	Body Finish	Shaft Dia. (Inches)	Brake	Price 10-24
H-491-1	Clear	3/32	No	\$8.52
H-492-1	Clear	3/32	Yes	8.52
H-493-1	Black	3/32	No	9.20
H-494-1	Black	3/32	Yes	9.20
H-491-2	Clear	1/8	No	8.52
H-492-2	Clear	1/8	Yes	8.52
H-493-2	Black	1/8	No	9.20
H-494-2	Black	1/8	Yes	9.20
H-491-3	Clear	1/4	No	8.00
H-492-3	Clear	1/4	Yes	8.00
H-493-3	Black	1/4	No	8.66
H-494-3	Black	1/4	Yes	8.66
H-510-1	Clear	1/8	Yes	9.60
H-510-2	Clear	1/4	Yes	9.60
H-357-1	Black	1/4	No	6.95
H-357-2	Black	1/4	Yes	6.95

Note: Prices on certain pin configurations and resistances are slightly higher than prices illustrated. Bourns reserves the right to change specs and prices at any time. All prices are F.O.B., Riverside, California, USA.

MOST MODELS AVAILABLE FROM YOUR LOCAL DISTRIBUTOR



TRIMPOT PRODUCTS DIVISION

1200 COLUMBIA AVENUE, RIVERSIDE, CALIFORNIA 92507
PHONE (714) 684-1700 • TWX 910-332-1252 • TELEX 676-423

CLAROSTAT

POTENTIOMETERS
AND POWER RESISTORS

PRODUCT INDEX and PRICE GUIDE*

Catalog No.	Price (Stock Res. Values Only)		Pg. No.
	1-9	1-24	
POTENTIOMETERS			
Wirewound (Precision)			
42-900 (50 to 20K ohms)	\$22.68		6
42-900 (50K and 100K ohms)	\$27.51		6
421A (50 to 20K ohms)	\$16.28		6
421A (50K and 100K ohms)	\$21.19		6
57M	\$12.85		6
57M9	\$12.85		6
57EJA	\$13.31		6
57EJB	\$13.31		6
621A	\$ 8.25		7
731A	\$ 4.69		7
Wirewound (Trimmers)			
761A-2		\$10.19	9
761A-3		\$10.19	9
U39		\$.76	9
Wirewound (Industrial Grade)			
49M (5 ohms only)	\$7.13		8
49M (10 to 10K ohms)	\$6.03		8
49M (15K and 20K ohms)	\$7.13		8
49M9 (5 ohms only)	\$7.34		8
49M9 (10 to 10K ohms)	\$6.25		8
49M9 (15K and 20K ohms)	\$7.34		8
43C1 (5 to 10K ohms)		\$2.60	8
43C1 (15K to 25K ohms)		\$2.95	8
43C1 (30K to 50K ohms)		\$3.47	8
43C2 (5 to 10K ohms)		\$2.89	8
43C2 (15K to 25K ohms)		\$3.25	8
43C2 (30K to 50K ohms)		\$3.82	8
58C1 (1 to 10K ohms)		\$2.60	8
58C1 (15K to 25K ohms)		\$2.95	8
58C1 (30K to 50K ohms)		\$3.47	8
58C2 (1 to 10K ohms)		\$2.89	8
58C2 (15K to 25K ohms)		\$3.25	8
58C2 (30K to 50K ohms)		\$3.82	8
Conductive Plastic (Carbon)			
388N	\$2.55		2
388L	\$2.72		2
470	\$1.95	(Plus Setup Charge)	2
RV6N (Military)	\$5.00		3
RV6L (Military)	\$5.00		3
381N	\$2.93		3
381L	\$3.15		3
381NS	\$4.47		3
381N—Z	\$3.23		3
D381N	\$7.55		3
380C1	\$2.15		4
380C2	\$2.48		4
380C3	\$2.15		4
53C1	\$1.95		4
53C2	\$2.25		4
53C3	\$1.95		4
53C1—Z	\$2.48		4
53C1—RZ	\$2.48		4
D53C1	\$6.77		4
RV4N (Military)	\$1.95		4
RV4L (Military)	\$2.25		4
382-5	\$3.93		5
383-5	\$2.16		5

Catalog No.	Price (Stock Res. Values Only)		Pg. No.
	1-9	1-24	
Cermet			
389N	\$2.97		10
389L	\$3.14		10
389N—Z	\$3.39		10
389-5	\$2.80		10
389-5—Z	\$3.22		10

Catalog No.	Power Watts	Price Range** Stock Values		Pg. No.
		1-9		
POWER RESISTORS VITREOUS ENAMEL				
Fixed Resistors (Tubular)				
VPR5F	8	\$0.61 to \$0.88		11
VPR10F	12	\$0.68 to \$1.10		11
VPR20H	20	\$0.77 to \$1.47		11
VP25K	25	\$0.80 to \$1.86		11
VP50K	50	\$1.25 to \$3.86		11
VK100N	100	\$1.95 to \$4.86		11
VK160W	175	\$3.06 to \$4.18		11
VK200W	225	\$3.45 to \$4.26		11
Fixed Resistors (Axial Lead)				
VC3D	3.25	\$0.65 to \$0.85		12
VC5E	6.5	\$0.65 to \$1.17		12
VC10F	11	\$0.70 to \$1.29		12
Adjustable Resistors (Tubular)				
VP10FA	12	\$0.88 to \$1.03		12
VP25KA	25	\$0.99 to \$1.35		12
VP50KA	50	\$1.50 to \$2.68		12
VP75KA	75	\$2.12 to \$2.87		12
VK100NA	100	\$2.31 to \$3.31		12
VK160WA	175	\$3.49 to \$4.66		12
VK200WA	225	\$3.95 to \$4.86		12

Catalog No.	Price 1-9 Qty.	Pg. No.
CLARODIALS		
411	\$7.75	7
412	\$8.95	7
461	\$8.25	7
462	\$9.45	7

Catalog No.	Price Net	Pg. No.
DECADE BOX		
240C	\$121.05	11
250	\$173.25	11

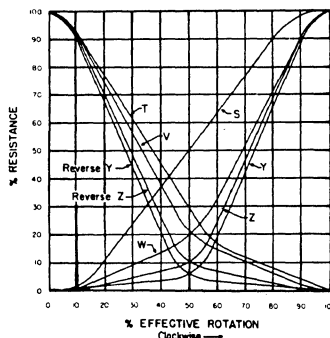
Cat. No.	Packaging	Price Net	Pg. No.
MINIATURE DECADE BOX—Series 260			
260-1 thru 260-7	Single Unit Package of 7	\$ 4.57 \$31.77	12 12

*Prices quoted are for estimation purposes only and are subject to change without notice.
 **Exact price is determined by ohmage.

TAPERS: CARBON ELEMENT

GRAPH EXPLANATION COMPOSITION ELEMENT CONTROLS

- Taper S Straight or uniform resistance change with rotation.
- Taper T Right-hand 30% resistance at 50% of C.C.W. rotation.
- Taper V Right-hand 20% resistance at 50% of C.C.W. rotation.
- Taper W Left-hand 20% resistance at 50% of C.W. rotation.
- Taper Z Left-hand (Log. audio) 10% resistance at 50% C.W. rotation.
- Rev. Z Right-hand 10% resistance at 50% C.C.W. rotation.
- Taper Y Left-hand 5% resistance at 50% of C.W. rotation.

MILITARY
POTENTIOMETERSGENERAL LINE
PRODUCTS

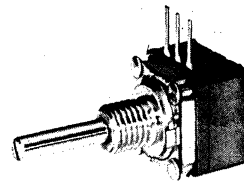
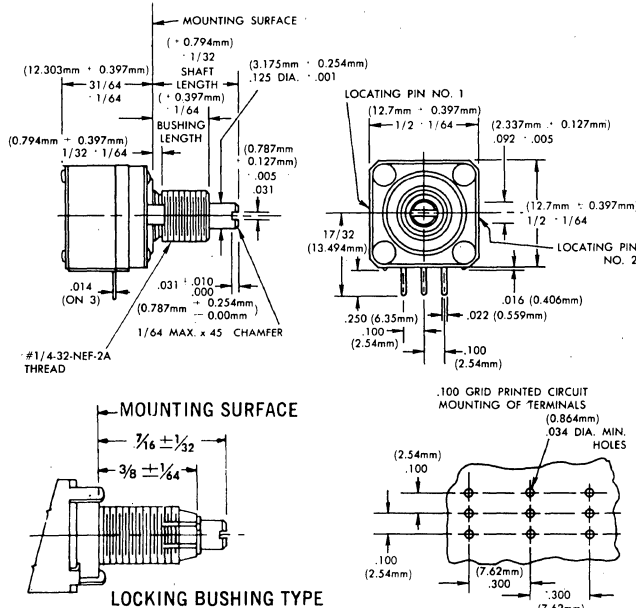
WRITE FOR CATALOG

CLAROSTAT THICK FILM CONDUCTIVE PLASTIC (CARBON) POTENTIOMETERS

BUSHING MOUNTED

1/2" SQUARE MODULAR/0.5 WATT SERIES 388

The series 388 is a completely new potentiometer with characteristics exceeding those costing many times more. Manufactured in a controlled environment, the process includes exclusive Clarostat TempMaturing™ to insure a reliable, homogeneous and strain-free resistance element. The modular design allowing free interchange of resistive elements. The potentiometers are manufactured to meet MIL-R-94C specifications where applicable.



388N

SPECIFICATIONS

Resistance Tolerance: $\pm 10\%$ up to 500K, $\pm 20\%$ above. **Electrical and Mechanical Rotation:** $295^\circ \pm 5^\circ$. **Effective Rotation:** $265^\circ \pm 5^\circ$. **End Resistance:** 4 Ω max. linear. **Dielectric Strength:** 750 VAC for 60 sec atm. **Working Voltage:** 350 Vdc across terminals. **Dynamic Noise:** 1.5% total resistance. **Static Noise:** to 30K Ω : -20 DB, 100K Ω : -12 DB, 1 Meg and over: +3 DB. **Linearity (Independent):** $\pm 5\%$. **Voltage Coefficient:** .008%/volt (max.). **Rotational Life:** 50,000 cycles. **Power Rating:** 5 watt at 70°C . **Torque Range:** 2 to 4.5 oz.-in. **Stop Torque:** 3 lb. in. **Weight:** .018 lb. (typical). **Functional Output:** Linear. **Insulation Resistance:** 1,000 Meg per MIL std. 202. **Resolution:** Infinite. **Shaft Seal:** Yes. **Corrosion Resistant:** Yes. **Terminal Style:** PC pins.

STOCK RESISTANCE VALUES (Linear)

100	5K	250K
250	10K	500K
500	25K	1 Meg.
1K	50K	2.5 Meg.
2500	100K	5 Meg.

DESCRIPTION

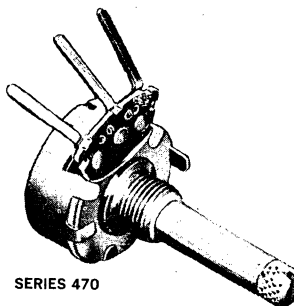
Cat. Nos.	Description
388N	Plain Bushing. (3/8" FMS screwdriver slot shaft with 1/4" plain bushing)
388L	Locking Bushing. (7/16" FMS slotted shaft with 3/8" split bushing)

KIT AVAILABLE

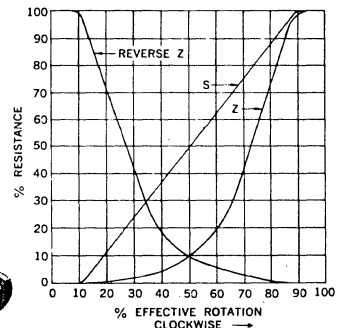
A versatile prototype kit featuring a wide variety of assemblies, will soon be available. Watch for further details.

0.5 WATT/SPECIAL ORDER SERIES 470

Series 470 is an extremely versatile family of high-quality potentiometers. Its multiple configurations and adaptability to any mounting requirements have established its wide use in industry. Particularly, the Series 470 is applicable to radio, television instrumentation and audio work where low noise, close linearity and long rotational life are required. The Series 470 offers a reliable, homogeneous and strain-free conductive plastic resistive element with 2% dynamic noise and 5% independent linearity.



SERIES 470



SPECIFICATIONS

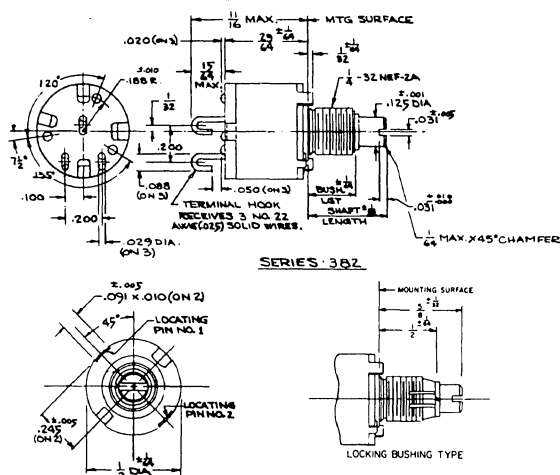
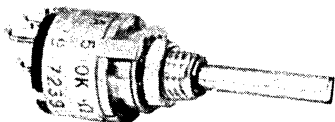
Resistance Range: 150 Ohms to 5 megohms linear; 1K Ohms to 2.5 megohms tapered. **Resistance Tolerance:** Linear up to 500K Ohms, $\pm 10\%$; Above 500K Ohms, $\pm 20\%$; Tapers up to 100K Ohms, $\pm 10\%$; Above 100K Ohms, $\pm 20\%$. **Linearity:** $\pm 5\%$ Independent. **Power Rating:** Linear—0.5 watts at 40°C ; Tapered—0.25 watts at 40°C ; Ganged—Panel section is 1/2 of single section rating and each additional section is 2/3 of single section rating. Full rating at 40°C derated linearly to zero watts at 120°C . **Electrical Rotation:** $300^\circ \pm 5^\circ$ with and without switch. **Tapers:** Right and left hand available. See Chart A. **End Resistance:** Linear Units; 4 Ohms maximum for total resistances up to 250K Ohms, 10 Ohms for resistances 250K Ohms and above. **Dielectric Strength:** 1000 Vac for 60 Seconds at 760 mm Hg., 450 Vac for 60 Seconds at 86 mm Hg. **Working Voltage:** 500 Vdc maximum but power not to exceed rating. **Noise:** 2% of total resistance. 1% available. **Insulation Resistance:** 50 megohms minimum. **Mechanical Rotation:** $300^\circ \pm 5^\circ$ without switch, $330^\circ \pm 5^\circ$ with switch, standard. **Stop Torque:** 8 lb.-in. minimum, Standard, 10 lb.-in. minimum, Special. **Operating Torque Range:** Standard bushing each section 0.5 to 6 oz.-in. High torque 6 to 20 oz.-in. Locking bushing 30 Ω -in. minimum with jam nut tightened to 10 lb.-in. **Weight:** .069 lb. Life: 50,000 cycles (500 cycles locking bushing types) 10 cycles per minute maximum. **Operating Temperature Range:** -55°C to $+120^\circ\text{C}$.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE.

Note: The Series 470 is available on special order only.

CLAROSTAT PAGE 2

LOW NOISE, MIL GRADE (RV6) 0.5 WATT—SERIES RV6



SPECIFICATIONS

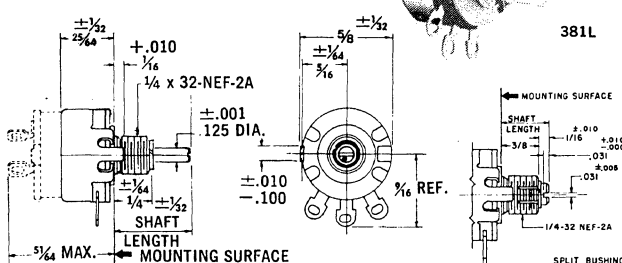
CAT. NO's. AND STOCK VALUES
RV6N AND RV6L

RV6NAY						RV6LAY			
-SD			-SL			-SA		-SD	
101A	103A	254A	254A	501A	153A	101A	104A	101A	101A
103A	254A	254A	501A	153A	101A	104A	101A	253A	251A
153A	504A	504A	102A	253A	251A	154A	251A	503A	501A
253A	105A	105A	252A	503A	501A	254A	501A	104A	102A
503A	205B	101A	502A	104A	102A	504A	102A	154A	252A
404A	255B	251A	103A	154A	252A	105A	252A	254A	502A
154A	505B				502A	205B	502A	604A	
					103A	255B	103A	105A	
					253A	305B	153A		
					503A				

Symbol	Shaft Length*	
	With ¼" Bushing N or S	With ½" Bushing L or T
A	5/8	5/8
D	7/8	7/8
L	3/8	—

ORDERING INFORMATION

STYLE	BUSHING	SWITCH	RESISTANCE (ohms)	RESISTANCE CHARACTERISTIC & OVERALL RESISTANCE TOLERANCE
See above	N - Standard L - locking S - SH, & panel seal T - locking, SH, & panel seal	A - None	First two digits are significant and the last one is the number of zeroes that follow.	C - * C.W. $\pm 10\%$ D - * C.W. $\pm 20\%$ E - * C.W. $\pm 10\%$ F - * C.W. $\pm 20\%$
	TEMPERATURE & MOISTURE RESISTANCE CHARACTERISTICS		OPERATING SHAFT	*10% Res. @ 50%.
	Max. Ambient Temp. 120°C	Max. Resistance Change due to humidity test. 700 M Ω	Min. Insulation Resistance during humidity test. 700 M Ω	
			The 1st letter indicates style; the 2nd letter, insulation from mounting surface. See chart "DI".	Other RVG types not listed available on extended delivery basis.



Cat. No.	Description
381N	Bushing, Plain, ¼" long. Shaft, ¾" long. FMS SD slotted.
381NS	Bushing (same as 381N) but equipped with a factory attached SPST switch. 1a, 125v (ac or dc).
*381N-Z	Bushing—Z-Taper (see pg. 1)
381L	Locking Bushing, 3/8" long. Shaft, 7/16" long. FMS screwdriver slotted.
D381N	Dual ganged Bushing and shaft same as 381N.

SPECIFICATIONS

Resistance Tolerance: Linear, up to 500K Ω $\pm$ 10%, above 500K Ω $\pm$ 20%. Tapers, up to 100K Ω $\pm$ 10%, above 100K Ω $\pm$ 20%. **Power Rating (Watts):** 1 watt maximum continuous power rating for linear taper, but voltage not to exceed rating. Full rating at 70°C, derated linearly to zero watts at 120°C. Derate all non-linear tapers by multiplying wattage rating by 0.5. **Mechanical and Electrical Rotation:** 300° $\pm$ 5° without switch, 325° $\pm$ 5° with switch. **Dynamic Noise:** Linear single contacts maximum initial noise level of 1% of total resistance. Measurement made using a constant current source and oscilloscope detection technique. **Linearity:** $\pm$ 5% Independent. **Working Voltage:** 350 Vdc across end terminals, but power not to exceed rating. **Effective Rotation:** 270° +0° -10°. **Tapers:** Yes. **Dielectric Strength:** 1,000 VAC for 60 Sec. **ATM. Torque Range:** 0.2-6 oz.-in. **Stop Torque:** 6 lb. min. **Weight:** .017 lb. typical. **Functional Output:** Linear or Taper (see Catalog No.'s). **Insulation resistance:** 1,000 Meg Min. **Corrosion Resistant:** Yes.

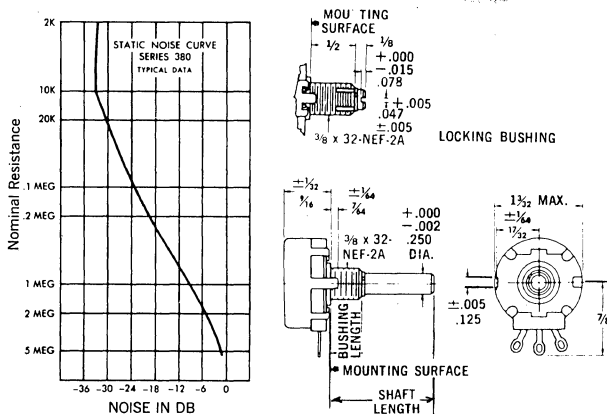
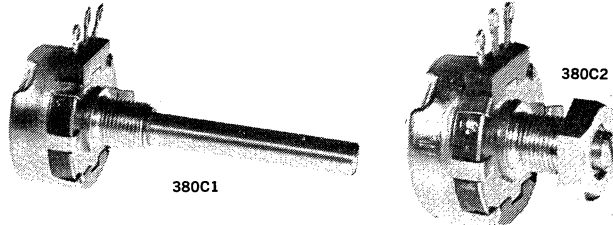
STOCK VALUES

381N, 381NS, 381L LINEAR			DUAL D381N POTENTIOMETERS			TAPERED 381N-Z POTENTIOMETERS		
100	5K	250K	500	5K	50K	10K		250K
250	10K	500K	1000	10K	100K	.25K	"Z"	500K
500	25K	1 Meg		25K		50K	Taper	1 Meg
1000	50K	2.5 Meg		Linear		100K		
2500	100K	5 Meg						

CLAROSTAT THICK FILM CONDUCTIVE PLASTIC (CARBON) POTENTIOMETERS

BUSHING MOUNTED

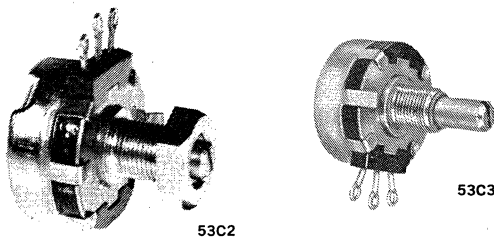
LOW NOISE, LONG LIFE 2 WATT—SERIES 380



Cat. No.	Description	Cross Reference	
		Ohmite	Allen-Bradley
380C1	2" round shaft FMS; 3/8" long bushing with 3/8 x 32-NEF-2A thread.	CU	JAIN200P
380C2	5/8" screwdriver slotted shaft FMS; with a 1/2" split locking bushing.	CLU	JAIL040S
380C3	7/8" screwdriver slotted shaft FMS; 3/8" long bushing with 3/8 x 32-NEF-2A thread.	CMU	JAIN056S

MIL GRADE (STYLE RV4)

2 WATT—SERIES 53



Cat. No.	Description
53C1	2" round shaft FMS; 3/8" long bushing with 3/8 x 32-NEF-2A thread.
53C2	5/8" screwdriver slotted shaft FMS; with a 1/2" split locking bushing.
53C3	7/8" screwdriver slotted shaft FMS; 3/8" long bushing with 3/8 x 32-NEF-2A thread.
53C1SW	Unsealed version of 53C1 available for use with field assembled switches. Order as 53C1 SW see table 1 for switch ordering.
53C1-Z	Same as 53C1 but with Z taper (see chart pg. 2).
53C1-RZ	Same as 53C1 but with Reversed Z taper (see chart pg. 2).
D53C1	Dual ganged. Bushing and shaft same as 53C1.
RV4N	MIL equivalent of Series 53 with plain bushing (see table below).
RV4L	MIL equivalent of Series 53 with shaft lock bushing (see table below).

TABLE 1
SWITCHES FOR 53C1 SW ONLY

Cat. No.	Description
53-10	SPST—3A-125 Vac
53-20	DPST—3A-125 Vac
53-21	(Mod.) DPST—3A-125 Vac/dc

Like the Series 381 the Series 380 is a "Quiet One". A completely new potentiometer with characteristics exceeding those costing many times more. Manufactured in a controlled environment, the process includes exclusive Clarostat Temp-Maturing^(TM) to insure a reliable, homogeneous and strainfree resistance element with 1% dynamic noise and 5% independent linearity. Precision-machine finishing of mechanical parts ensures smoother operation and outstanding mechanical life. Series 380 Potentiometers manufactured to exceed MIL-R-94 specifications. Series 380 C-line Potentiometers feature stainless steel shafts.

SPECIFICATIONS

Resistance Tolerance: Up to 1 Megohm $\pm 10\%$, above 1 Megohm $\pm 20\%$. **Electrical and Mechanical Rotation:** $312^\circ \pm 3^\circ$. **Effective Rotation:** $270^\circ + 10^\circ - 0^\circ$. **End Resistance:** 4Ω maximum for total resistances up to 250K, 10Ω for resistances 250K and higher. **Dielectric Strength:** 1000 Vac for 60 Seconds at ATM pressure. 450 Vac for 60 Seconds 3.4 in. Hg. **Working Voltage:** 500 Vdc across end terminals, but power not to exceed rating. **Power Rating:** 2 watts at 70°C . **Shaft Material:** Stainless steel. **Torque Range:** 1-4 oz.-in. **Operating Temp.:** -55°C to $+120^\circ\text{C}$. **Stop Torque:** 12 lb. in. min. **Weight:** .072 lb. (typical). **Functional Output:** Linear. **Insulation Resistance:** 100 Meg. min. **Dynamic Noise:** Linear single controls maximum initial noise level of 1% of Rt. Measurement made using a constant current source and oscilloscope detection technique. **Static Noise:** See Chart. **Linearity:** $\pm 5\%$ independent. **Voltage Coefficient:** .005%/Volt. maximum. **Rotational Life (Standard):** Rotational life for linear control; 100,000 cycles for units up to and including 100,000 Ohms, except locking type bushing, change not to exceed 5% ΔR , above 100,000 Ohms change not to exceed 10% ΔR .

STOCK VALUES

RESISTANCE OHMS (All Units Linear Taper)					
50	750	3500	20K	100K	500K
100	1000	5000	25K	150K	750K
150	1500	7500	35K	200K	1 Meg
250	2000	10K	50K	250K	1.5 Meg
350	2500	15K	75K	350K	2 Meg
500					5 Meg

A 2-watt potentiometer totally enclosed and sealed against moisture and other environmental factors. Meets the need for a high quality resistance device incorporating high-stability under extreme climatic and operational conditions. 1-1/16" diameter and 9/16" deep, brass nickel plated shaft, bushing and stainless steel cover. Terminals, hot tinned.

SPECIFICATIONS (Dimensions same as Series 380)

Resistance Tolerance: Up to 1 megohm $\pm 10\%$, above 1 megohm $\pm 20\%$. **Electrical and Mechanical Rotation:** $312^\circ \pm 3^\circ$ without switch, $333^\circ \pm 3^\circ$ with switch. **End Resistance:** Per MIL-R-94. **Working Voltage:** 500 Vdc across end term, but power not to exceed rating. **Fabricated in accordance with MIL-R-94 Style RV4.** Items not listed are special, prices and information supplied upon request. **Effective Rotation:** $270^\circ - 10^\circ + 0^\circ$. **Dielectric Strength:** 1,000 VAC, 60 Sec. ATM. **Rotational Life:** 25,000 Cycles. **Power Rating:** 2 watt at 70°C . **Torque Range:** 1-4 oz.-in. **Operating Temp.:** -55°C to $+120^\circ\text{C}$. **Stop Torque:** 12 lb.-in. **Weight:** .072 lb. **Functional Output:** Linear. **Insulation Resistance:** Per MIL-R-94C. **Corrosion Resistant:** MIL-R-94C.

STOCK VALUES

53C1, 53C2, 53C3 Linear				Dual D53C1	Z-Taper 53C1-Z	Reversed Z-Taper 53C1-RZ
50	1500	20K	250K	3 Meg	10K	500K
100	2000	25K	350K	3.5 Meg	25K	1K
150	2500	35K	500K	4 Meg	50K	2.5K
250	3500	50K	750K	5 Meg	100K	5K
350	5000	75K	1 Meg	7.5 Meg	250K	10K
500	7500	100K	1.5 Meg	10 Meg	500K	20K
750	10K	150K	2 Meg		1 Meg	50K
1000	15K	200K	2.5 Meg			400K

CLAROSTAT PAGE 4

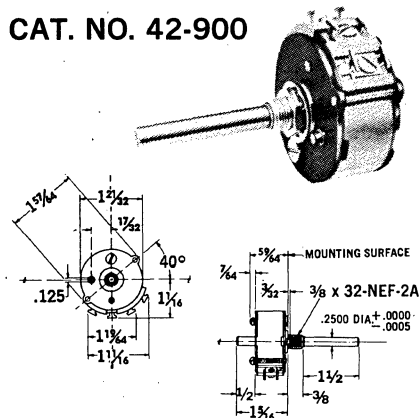
CAT. NO. RV4N AND RV4L2•1631

CLAROSTAT WIREWOUND POTENTIOMETERS

PRECISION POTENTIOMETERS

SINGLE TURN, 3 WATT—SERIES 42

CAT. NO. 42-900

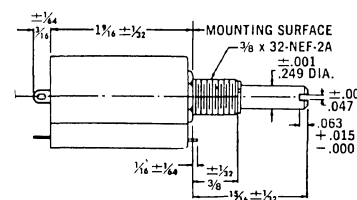
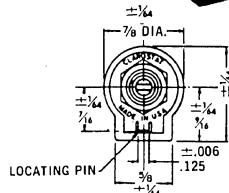
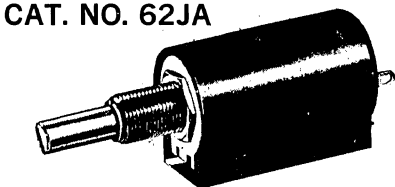


CLAROSTAT WIREWOUND POTENTIOMETERS

PRECISION POTENTIOMETERS

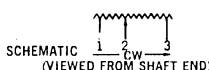
TEN TURN 2 WATT—SERIES 62

CAT. NO. 62JA



SPECIFICATIONS

Resistance Tolerance: $\pm 5\%$. Functional Output: Linear. Absolute Linearity*: $\pm 0.25\%$. Power Dissipation**: 2 Watts at 25°C . Temperature Coefficient of Wire: $\pm 0.00020\Omega/\Omega/^\circ\text{C}$. Dielectric Strength: 1000 Vac. Effective Rotation: 3600 Nom. Degrees. Electrical and Mechanical Rotation: $3600 + 10^\circ - 0^\circ$. Torque: 3 oz. in. max. Stop Torque: 50 oz. in. Bearings: Sleeve Bushing. Insulation Resistance: 1000 Megohms. Life: 100,000 Shaft Rev's. Maximum Speed of Rotation: 60 RPM. Weight: 1.34 oz. Shaft Length/Style: 15/16" FMS/ Slotted. Bushing Length/Style: 3/8"/Plain.



Opens new application areas for the inherent advantages of multi-turn potentiometer design. A precise 10-turn potentiometer offering electrical operating characteristics comparable to units costing far more. The Series 62 was designed specifically for the industrial instrumentation market, based upon the setability and resolution of a quality ten-turn potentiometer including better instrument control and settings for all types of electronic equipment.

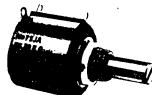
Stock Values	Resolution %	Stock Values	Resolution %
100,000	.012	2,500	.022
50,000	.013	2,000	.023
30,000	.016	1,000	.030
25,000	.017	500	.036
20,000	.019	250	.038
10,000	.024	200	.048
5,000	.026	100	.062

*For 250 Ω , 200 Ω and 100 Ω the linearity is $\pm 0.5\%$ absolute.

**Derted Zero Power at 85°C .

TEN TURN, MINIATURE 2 WATT—SERIES 73

CAT. NO. 73JA



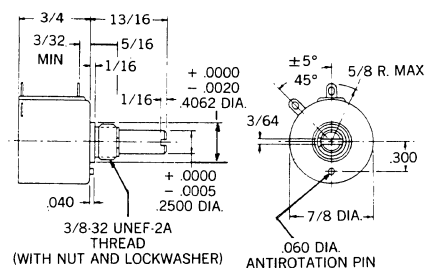
SPECIFICATIONS

Resistance Tolerance: $\pm 5\%$. Electrical/ Mechanical Rotation: $3600 + 10^\circ - 0^\circ$. Effective Rotation: 3600 Nom. End Resistance: 3% of total res. or 1 ohm whichever is greater. Dielectric Strength: 1,000 volts RMS. Working Voltage: 450 V max. Noise (Err.): 100 ohms max. Linearity (Independent): .25%. Rotational Life (Max.): 500,000 cycles. Power Rating: 2 watt at 70° . Shaft Length/Style: 1/2" screwdriver slot. Bushing Length/Style: 5/16 Plain. Shaft Material: Stainless steel. Torque Range: 1.5 oz. in. max. Stop Torque 50 oz. in. min. Functional Output: Linear. Temperature Coefficient of Wire: $\pm 20\text{ ppm}/^\circ\text{C}$ max. Insulation Resistance: 1,000 meg at 500V DC.

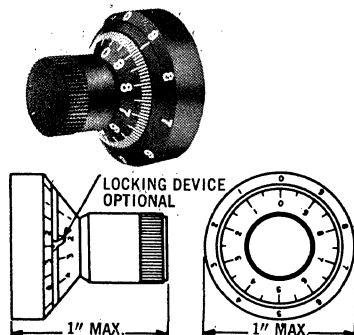
This series has brought the ten-turn potentiometer down in size, down in price and down in wear-outs. Only $\frac{3}{8}$ " body length, priced less than \$4.00 in quantity, and a rotational life of 500,000 cycles.

STOCK VALUES

Standard Resistance Values (Ω)	Resolution (%)
100	0.055
200	0.037
500	0.030
1K	0.025
2K	0.021
5K	0.020
10K	0.017
20K	0.015
25K	0.013
50K	0.011
100K	0.009



CLARODIALS TEN TURN CONCENTRIC SCALE DIALS



Calibrated dials designed for multi-turn potentiometers up to ten turns or other rotary devices. Requires only one inch of panel space. The knob attaches directly to the shaft, and the body of the dial is mounted rigidly to the panel. Therefore, accurate readings with a ratio of 1,000 to one for ten turns are provided with zero backlash and reading error.

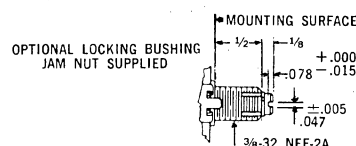
Material is anodized aluminum.

Mounting requirements: 1/4" shaft and 3/8" 32-NEF-2A bushing.

Adapter available for 1/8" diameter shaft.

Cat. No.	Description
411	Commercial 10 Turn, Black Anodize 1/4" Shaft, No Lock
412	Commercial 10 Turn, Black Anodize 1/4" Shaft, With Lock
461	Commercial 10 Turn, Clear Anodize 1/4" Shaft, No Lock
462	Commercial 10 Turn, Clear Anodize 1/4" Shaft, With Lock

4 WATT—SERIES 58C



Wire-wound controls designed primarily for industrial applications. All exposed metal parts have corrosion resistant finishes. Terminals have suitable finish for ease of soldering. Covers are close-fitting with no cutouts resulting in practically a dust-proof, moisture-proof control.

Weight: 0.2 lb. (typical). **Functional Output:** Linear. **Insulation Resistance:** 100 Meg ($\min$). **Corrosion Resistant:** Yes. **Resistance Tolerance:** $\pm 5\%$. **Effective Rotation:** $280^\circ \pm 5^\circ$. **Electrical and Mechanical Rotation:** $300^\circ \pm 5^\circ$. **Independent Linearity:** $\pm 2\%$. **End Resistance:** 1 to 50Ω -0.3 Ω , 51 to 100Ω -0.5 Ω . Over 100 Ω -0.2% of total or 1Ω , whichever is greater. **Working Voltage:** 310 Vdc maximum.

Resistance Tolerance: $\pm 5\%$. **Electrical/Mechanical Rotation:** $300^\circ \pm 5^\circ$. **Effective Rotation:** $280^\circ \pm 5^\circ$. **End Resistance:** 1-500 Ω 51-100 Ω 50 over 100 Ω . 26 of total or 1Ω whichever is greater. **Dielectric Strength:** 1,000 vac 60 seconds ATM. **Working Voltage:** 350 Vdc max. **Linearity (Independent):** $\pm 1\%$. **Mil Spec Reference:** MIL-R-19. **Element Material:** Wire. **Power Rating:** 4 watt at 40°C . **Torque Range:** 0.5-6 oz. in. **Stop Torque:** 8 in. lbs. max. **Insulation Resistance:** 100 meg. min. **Corrosion Resistant:** Yes.

Cat. No.	Description
58C1	2" round shaft FMS; 3/8" long bushing with 3/8-32 NEF-2A thread.
58C2	5/8" screwdriver slotted shaft FMS; with a 1/2" long split locking bushing.

Fabricated in accordance with MIL-R-19 where applicable.

1	20	75	750	5000	30K
2	25	100	1000	7500	40K
4	30	200	1500	10K	50K
6	40	300	2000	15K	
10	50	400	2500	20K	
15	60	500	3000	25K	

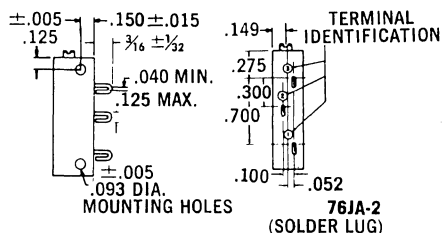
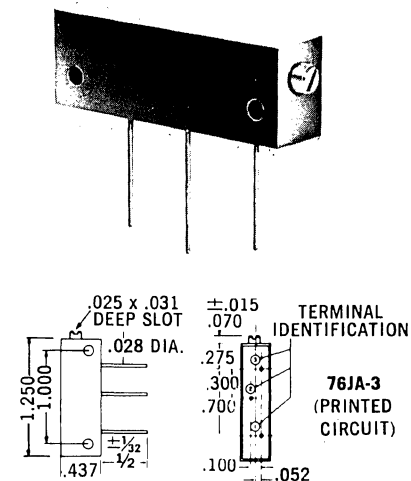
eem/1975

CLAROSTAT WIREWOUND POTENTIOMETERS

TRIMMING POTENTIOMETERS

MINIATURE MULTITURN

.75 WATT—SERIES 76



SPECIFICATIONS

Power Rating: 3/4 watts at 85°C derated to zero power at 150°. **Resistance Tolerance:** $\pm 5\%$. **Temperature Coefficient:** $\pm .0040\%/^{\circ}\text{C}$. **Absolute Minimum End Resistance:** 0.25% of total resistance maximum or 1 Ω . **Electrical/Mechanical Rotation:** 11.5 turns with declutching. **Static Noise (Enr):** 100 ohms (max.) **Stop Torque:** Slip clutch. **Functional Output:** Linear. **Insulation Resistance:** 1,000 Meg (min.). **End Resistance or Over-Travel Resistance:** Maximum increase in resistance to 10% of total resistance. **Effective Rotation:** 11 turns $\pm 1/4$ turn. **Torque:** 1 to 8 oz. in. **Dielectric Strength:** 1000V RMS for 1 minute at atmospheric pressure. **Weight:** 0.16 oz. approx.

Cat. No.	Description
76JA-2	Solder Lug Termination
76JA-3	PC Termination

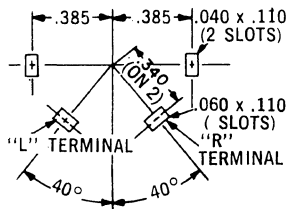
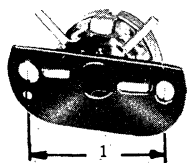
Super Setability! ... made possible through 10 times the resolution ever offered in this popular trimmer configuration. A new approach has made it possible to incorporate approximately 15 times greater winding length. The net result to the user is greater setability on the production line and in the field. Trimming costs in critical circuits drop. Performance of the circuit improves. The package shrinks in size when the Series 76 replaces other high resolution trimmers of several times the size. Panel mounting assembly available.

Stock Values Resistance- Ohms	Nom. Resolution %	Stock Values Resistance- Ohms	Nom. Resolution %
100	0.1	5,000	0.05
200	0.09	10,000	0.04
500	0.08	20,000	0.036
1,000	0.075	(.001 Wire Min.)	
2,000	0.06		

*(.001 Wire Min.)

BUSHINGLESS

2 WATT—SERIES U39



*with bias resistance (U39B).

Universal "Humdinger" Control 2W. Wire-Wound Series U39 is a shaftless potentiometer with the contact arm grounded to the housing. The design of terminals and mounting tabs, meets the following requirements: Above chassis mounting, as a potentiometer or rheostat; printed circuit mounting, as a potentiometer or rheostat. The terminal layout meets the popular industry standards. A fiber adapter plate is furnished with each control for above chassis mounting. Series U39 is ideally suited for radio and television requirements, as well as many in-

dustrial applications. Resistance tolerance $\pm 20\%$. Linear only.

SPECIFICATIONS

Resistance Tolerance: $\pm 20\%$. **Effective Rotation:** $220^{\circ} \pm 5^{\circ}$. **Power Rating:** 2 watts at 40°C. **Terminals:** PC mount. **Torque Range:** 2-10 oz.-in. **Stop Torque:** 3 in.-lbs. max. **Weight:** .009 lb. (typical). **Functional Output:** Linear. **Insulation Resistance:** Ground to case.

Cat. No.	Total Res. Ohms	Cat. No.	Total Res. Ohms	Cat. No.	Total Res. Ohms
U39-1.5	1.5	U39-300	300	U39-1500	1500
U39-5	5	U39-500	500	U39-2000	2000
U39-8	8	*U39-500-100	500	*U39-2000-100	2000
U39-15	15	U39-600	600	U39-3000	3000
U39-50	50	U39-650	650	*U39-3000-700	3000
U39-75	75	U39-700	700	U39-4000	4000
U39-100	100	*U39-700-200	700	*U39-4000-350	4000
U39-125	125	U39-800	800	*U39-4000-1000	4000
U39-150	150	*U39-800-50	800	U39-5000	5000
U39-175	175	U39-1000	1000		
U39-200	200	*U39-1000-100	1000		

CLAROSTAT

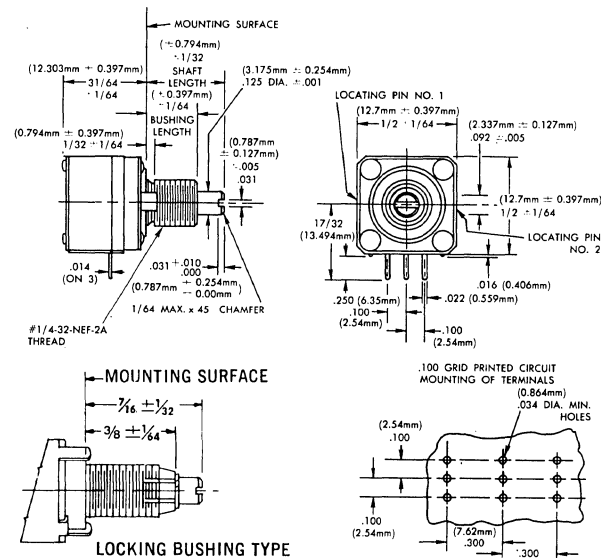
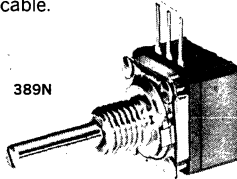
CERMET POTENTIOMETERS

BUSHING MOUNTED

1/2" SQUARE MODULAR 1 WATT

SERIES 389

The series 389 is a completely new potentiometer with characteristics exceeding those costing many times more. Manufactured in a controlled environment, the process includes exclusive Clarostat TempMaturing™ to insure a reliable, homogeneous and strain-free resistance element. The modular design allowing free interchange of resistive elements. These potentiometers are manufactured to meet MIL-R-94C specifications where applicable.



STOCK RESISTANCE VALUES

389N, 389L LINEAR		
100	5K	250K
250	10K	500K
500	25K	1 Meg.
1K	50K	2.5 Meg.
2500	100K	5 Meg.
Z-Taper 389N-Z		
100	5K	250K
250	10K	500K
500	25K	1 Meg.
1K	50K	
2500	100K	

SPECIFICATIONS

Resistance Tolerance: $\pm 10\%$. **Electrical and Mechanical Rotation:** $295^\circ \pm 5^\circ$. **Effective Rotation:** $250^\circ \pm 5^\circ$. **End Resistance:** 4Ω max. linear. **Dielectric Strength:** 900 VAC for 60 Sec. ATM. **Working Voltage:** 350 Vdc across terminals. **Dynamic Noise:** 3% total resistance. **Static Noise:** $100\Omega/\text{sq es} - 24\text{ DB}$, $10K\Omega/\text{sq es} - 9\text{ DB}$, $100K\Omega/\text{sq es} + 1\text{ DB}$. **Linearity (Independent):** $\pm 5\%$. **Voltage Coefficient:** .008%/volt (max.). **Rotational Life:** 25,000 cycles. **Power Rating:** 1 watt at 85°C . **Torque Range:** .2 to 4.5 oz.-in. **Operating Temperature:** -55°C to $+150^\circ\text{C}$. **Stop Torque:** 3 lb.-in. **Weight:** .018 lb. (typical). **Functional Output:** Linear or tapered. **Insulation Resistance:** 100 Meg per MIL std 202. **Resolution:** Infinite. **Shaft Seal:** Yes. **Corrosion Resistant:** Yes. **Terminal Style:** PC pins.

Cat. No.	Description
389N	Plain Bushing (3/4" FMS screwdriver slotted shaft with 1/4" plain bushing)
389L	Locking Bushing (7/16" FMS screwdriver slotted shaft with 3/8" locking bushing)
389N-Z*	Z-taper. Same as 389N mounting

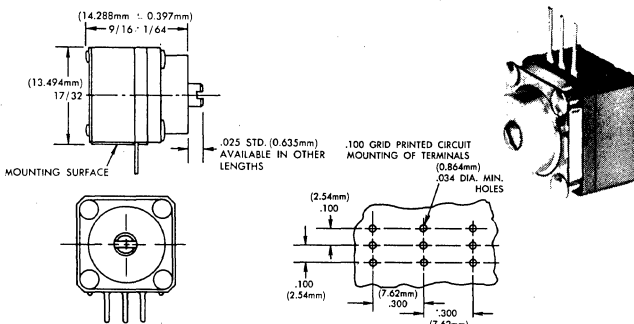
*For complete catalog number add resistance value from chart between N- and -Z.

BUSHINGLESS PC MOUNTED

1/2 WATT SERIES 389-5

CAT. NO. 389-5 and 389-5-Z

The potentiometer 389-5 and 389-5-Z are similar in characteristics to the 389 Series (see above). However, they are designed for bushing-less mounting on a PC board and have a flush screwdriver slot for adjustment. Check the appropriate specifications for the 389 series. Note that 389-5 and 389-5-Z have power ratings of 0.5 watt at 85°C .



STOCK RESISTANCE VALUES

(Linear)		
100	5K	250K
250	10K	500K
500	25K	1 Meg.
1K	50K	2.5 Meg.
2500	100K	5 Meg.
(Z Taper)		
100	5K	250K
250	10K	500K
500	25K	1 Meg.
1K	50K	
2500	100K	

SPECIFICATIONS

(see 389 Series above)

CLAROSTAT

POWER RESISTORS

FIXED RESISTORS TUBULAR

VITREOUS ENAMEL/GREEN OHM V™

Vitreous enamel, wire-wound power resistors are engineered to meet highest quality specifications. Wire windings are finest grade resistance alloy. Designed for utmost

reliability and stability under adverse conditions. Teal green enamel finish withstands over-heating without peeling or cracking. Tolerance, $\pm 5\%$ except values under 1 ohm,

$\pm 10\%$. VPR types (up to 20 watts) have wire lead and lug terminals. VP and VK types (25 watts and up) have lug terminals, and mounting bracket.

LUG AND LEAD 8, 12 AND 20 WATT —SERIES VPR



LUG ONLY 25 TO 225 WATT —SERIES VP AND VK



8-WATT SERIES VPR-5-F CORE 1" x 5/16"

Ohms	Ohms	Ohms	Ohms
1	50	750	4500
1.5	75	800	5000
2	100	900	6000
3	125	1000	7000
4	150	1100	7500
5	200	1200	8000
7.5	225	1250	9000
10	250	1500	10K

12-WATT SERIES VPR-10-F CORE 1-3/4" x 5/16"

Ohms	Ohms	Ohms	Ohms	Ohms
0.4	30	500	3000	13.5K
1	35	600	3500	14.5K
1.2	40	700	4000	15K
1.3	50	750	4500	16K
1.5	75	800	5000	17.5K
2	100	900	6000	18K
2.3	125	1000	7000	20K
4	150	1100	7500	22.5K

20-WATT SERIES VPR-20-H CORE 2" x 7/16"

Ohms	Ohms	Ohms	Ohms	Ohms
0.4	350	1850	7500	55K
0.6	400	2000	8000	60K
0.8	500	2250	9000	65K
5	650	2400	10K	70K
10	700	2500	12.5K	75K
25	750	2750	15K	80K
50	800	3000	20K	85K

25-WATT SERIES VP-25-K CORE 2" x 9/16"

Ohms	Ohms	Ohms	Ohms	Ohms
1	50	800	5000	30K
2	75	1000	6000	35K
3	100	1500	7500	40K
4	150	2000	10K	50K

50-WATT SERIES VP-50-K CORE 4" x 9/16"

Ohms	Ohms	Ohms	Ohms	Ohms
1	100	1000	7500	50K
2	150	1250	8000	55K
3	200	1500	10K	60K
4	250	2000	12K	65K
5	300	2500	15K	70K

100-WATT SERIES VK-100-N CORE 6-1/2" x 3/4"

Ohms	Ohms	Ohms	Ohms	Ohms
1	75	750	7500	60K
2	100	1000	10K	75K
3	125	1500	15K	100K
4	150	2000	20K	200K

175-WATT SERIES VK-160-W CORE 8-1/2" x 1-1/8"

Ohms	Ohms	Ohms	Ohms	Ohms
1	50	750	7500	50K
2	75	1000	10K	60K
3	100	1500	15K	75K
4	125	2000	20K	100K

225-WATT SERIES VK-200-W CORE 10-1/2" x 1-1/8"

Ohms	Ohms	Ohms	Ohms	Ohms
1	50	750	7500	40K
2	75	1000	10K	50K
3	100	1500	12K	60K
4	150	2000	15K	75K

Ohms	Ohms	Ohms	Ohms
12	300	1750	12.5K
15	350	2000	15K
20	400	2250	17.5K
25	450	2500	20K
30	500	3000	22.5K
35	600	3500	25K
40	700	4000	

Ohms	Ohms	Ohms	Ohms	Ohms
5	200	1200	8000	25K
7.5	225	1250	8500	30K
10	250	1500	9000	35K
12	300	1750	10K	40K
15	350	2000	11K	45K
20	400	2250	12K	50K
25	450	2500	12.5K	

Ohms	Ohms	Ohms	Ohms	Ohms
75	850	3500	25K	90K
100	1000	4000	30K	95K
150	1200	4500	35K	100K
200	1250	5000	40K	
250	1500	6000	45K	
300	1750	7000	50K	

Ohms	Ohms	Ohms	Ohms	Ohms
5	200	2500	12K	60K
10	250	3000	15K	70K
15	500	3500	20K	80K
25	750	4000	25K	100K

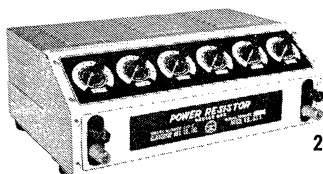
Ohms	Ohms	Ohms	Ohms	Ohms
10	400	3000	20K	175K
25	500	4000	25K	200K
50	750	5000	30K	225K
75	800	6000	35K	250K

Ohms	Ohms	Ohms	Ohms	Ohms
5	200	2500	25K	
10	250	3000	30K	
25	300	4000	40K	
50	500	5000	50K	

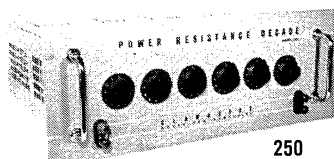
Ohms	Ohms	Ohms	Ohms	Ohms
5	150	2500	25K	
10	250	3000	30K	
25	500	5000	40K	

Ohms	Ohms	Ohms	Ohms	Ohms
5	200	2500	20K	100K
10	250	3000	25K	
25	500	5000	30K	

POWER RESISTOR DECADE BOX



240C



250

The Resistance Decade Box, Model 240-C for bench use — Model 250 for rack mounting, provides any resistance from 1 to 999,999 ohms for working circuits at the flip of a switch. Six front-panel dials enable selection in 1 ohm increments, the total value being read directly from the dial. Each decade has a power rating of 225 watts maximum, 1,000 Vdc or 660 Vac maximum.

Resistance changing switches are of the type that prevent a resistance breakdown between steps, thus protecting delicate meters and measuring instruments in the circuit. Knobs

Suggested Uses: Resistance determination, Load Resistance, Meter Multiplier, Calibrating Meters, providing any desired ohmage as a universal power resistor.

Decade No.	1	2	3	4	5	6
Max. Current Rating (amps)	5	1.5	.5	.15	0.5	.005
Resistance Tolerance	5%	2%	2%	2%	2%	2%

indicate the resistance value being used at a glance.

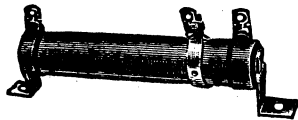
Clarostat GREENOHM Power Resistors are used throughout. These components are wire-wound power resistors on ceramic tubes and coated with an exclusive Clarostat inorganic cold-setting cement, providing the most rugged, long-lasting, trouble-free power resistor available. The resistors are mounted in rigid metal supports. Overall length: 240C: 13" long x 8 1/2" deep x 5 3/4" high, weight 11 1/2 lbs. 250: 19" long x 13 3/4" deep x 7" high (fits in standard 19" relay rack), weight 18 1/2 lbs.

CLAROSTAT

POWER RESISTORS

ADJUSTABLE RESISTORS

VITREOUS ENAMEL/ GREEN OHM V™



Same construction as Greenohm V fixed resistors. Tolerance: $\pm 10\%$. Core Size: VP-10-FA, 1-3/4" x 5/16" dia.; VP-25-KA, 2" x 9/16" dia.; VP-50-KA, 4" x 9/16" dia.; VP-75-KA, 6" x 9/16" dia.; VK-100-NA, 6-1/2" x 3/4" dia.; VK-160-WA, 8-1/2" x 1-1/8" dia.; VK-200-WA, 10-1/2" x 1-1/8" dia.

STOCK VALUES

12 TO 75-WATT

12-WATT SERIES VP-10-FA

Ohms	Ohms	Ohms	Ohms	Ohms
1	50	500	2500	8000
2	75	600	3000	8500
3	100	750	3500	9000
5	150	800	4000	10K
7.5	200	1000	4500	
10	250	1250	5000	
15	300	1500	6000	
20	350	2000	7000	
25	400	2250	7500	

25-WATT SERIES VP-25-KA

Ohms	Ohms	Ohms	Ohms	Ohms
1	50	750	3500	9000
2	75	800	4000	10K
3	100	1000	4500	12K
5	150	1250	5000	15K
7.5	200	1500	6000	20K
10	250	2000	7000	25K
15	300	2250	7200	
20	400	2500	7500	
25	500	3000	8000	

50-WATT SERIES VP-50-KA

Ohms	Ohms	Ohms	Ohms	Ohms
1	100	1250	6000	25K
2	150	1500	7000	30K
3	200	2000	7200	35K
4	250	2250	7500	40K
5	300	2500	8000	50K
10	400	3000	9000	60K
20	500	3500	10K	75K
25	750	4000	12K	80K
50	800	4500	15K	100K
75	1000	5000	20K	

75-WATT SERIES VP-75-KA

Ohms	Ohms	Ohms	Ohms	Ohms
1	200	2000	7200	35K
2	250	2250	7500	40K
3	300	2500	8000	45K
4	400	3000	9000	50K
5	500	3500	10K	60K
10	750	4000	12K	80K
15	800	4500	15K	100K
25	1000	5000	20K	
50	1250	6000	25K	
100	1500	7000	30K	

100 TO 225-WATT

100-WATT SERIES VK-100-NA

Ohms	Ohms	Ohms	Ohms	Ohms
1	25	400	3500	40K
2	50	500	5000	50K
3	100	750	10K	75K
4	150	1000	15K	100K
5	200	1500	20K	
10	250	2000	25K	
15	300	2500	30K	

175-WATT SERIES VK-160-WA

Ohms	Ohms	Ohms	Ohms	Ohms
1	10	250	5000	30K
2	25	500	10K	40K
3	50	1000	15K	50K
4	100	1500	20K	75K
5	150	2500	25K	100K

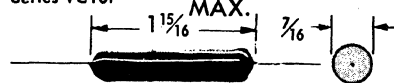
225-WATT SERIES VK-200-WA

Ohms	Ohms	Ohms	Ohms	Ohms
1	20	200	2500	30K
2	25	250	5000	40K
3	50	300	10K	50K
4	75	500	15K	75K
5	100	1000	20K	100K
10	150	1500	25K	

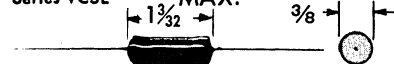
FIXED RESISTORS AXIAL LEAD

AXIAL LEAD 3.25, 6.5 AND 11 WATTS —SERIES VC

Series VC10F



Series VC5E



Series VC3D



Lead Length: 1 1/2" Lead Diameter: .032

Axial lead resistors are particularly adapted to printed circuit, terminal board, and point-to-point wiring applications. These resistors save considerable space because of the elimination of mounting brackets and terminal lugs. Standard resistance tolerance is $\pm 5\%$ for 1 ohm and higher and tolerance below 1 ohm is $\pm 10\%$. Finished with Clarostat's new vitreous shade of teal green.

3.25-WATT SERIES VC3D

Ohms	Ohms	Ohms	Ohms	Ohms	Ohms
1	27	125	470	1.5K	4.7K
1.5	30	150	500	1.75K	5K
2	33	180	550	1.8K	5.6K
3	35	200	600	2K	6K
4	39	220	680	2.2K	6.6K
5	40	225	700	2.25K	7K
7.5	47	250	750	2.5K	7.5K

6.5-WATT SERIES VC5E

Ohms	Ohms	Ohms	Ohms	Ohms	Ohms
1	30	180	600	2.2K	7K
1.5	33	200	680	2.25K	7.5K
2	35	220	700	2.5K	8K
3	39	225	750	2.7K	8.2K
4	40	250	800	3K	9K
5	47	270	820	3.3K	10K
7.5	50	300	900	3.5K	12.5K
10	56	330	1K	3.9K	15K

Standard Packing—10 Per Carton

11-WATT SERIES VC10F

Ohms	Ohms	Ohms	Ohms	Ohms	Ohms
1	30	180	600	2.2K	7K
1.5	33	200	680	2.25K	7.5K
2	35	220	700	2.5K	8K
3	39	225	750	2.7K	8.2K
4	40	250	800	3K	8.5K
5	47	270	820	3.3K	9K
7.5	50	300	900	3.5K	10K
10	56	330	1K	3.9K	11K

Ohms	Ohms	Ohms	Ohms	Ohms	Ohms
10	50	270	800	2.7K	8K
12	56	300	820	3K	8.2K
15	68	330	900	3.3K	9K
18	75	350	1K	3.5K	10K
20	82	390	1.1K	3.9K	
22	100	400	1.2K	4K	
25	120	450	1.25K	4.5K	

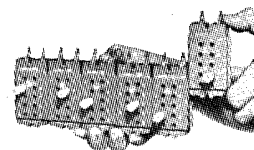
Ohms	Ohms	Ohms	Ohms	Ohms	Ohms
12	68	350	1.1K	4K	17.5K
15	75	390	1.2K	4.5K	18K
18	82	400	1.25K	4.7K	20K
20	100	450	1.5K	5K	22K
22	120	470	1.75K	5.6K	22.5K
25	125	500	1.8K	6K	25K
27	150	560	2K	6.8K	

Ohms	Ohms	Ohms	Ohms	Ohms	Ohms
12	68	350	1.1K	4K	12K
15	75	390	1.2K	4.5K	12.5K
18	82	400	1.25K	4.7K	13.5K
20	100	450	1.5K	5K	15K
22	120	470	1.75K	5.6K	16K
25	125	500	1.8K	6K	17.5K
27	150	560	2K	6.8K	18K

PRECISION RESISTANCE DECADE BOX

MINIATURIZED CLARO-DEC

The most flexible innovation yet in precision resistance decade boxes, the Claro-Dec serves many applications with all the versatility needed for the job. Claro-Decs (within established parameters of current) are used whenever accurate steps of resistance values between .1 ohms and 900K ohms, $\pm 1\%$ are required. Selection of desired steps of resistance is accomplished by insertion of a banana plug into the proper, marked front panel hole on the unit. Individual or multiple Claro-Dec units are flush panel or breadboard mounted with equal ease. Units may be physically ganged by sliding the molded-in tongue-and-groove together and electrically series connected with a supplied wire jumper or accessory banana plug.



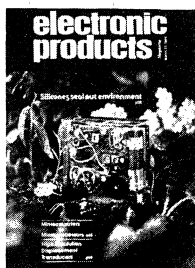
Model	Total Res. of Decade (Ohms)	Resistance Per Step (Ohms)	Accuracy (+C)*	Maximum Current
260-1	0.9	0.1	$\pm 5\%$	1 Amp
260-2	9	1.0	$\pm 1\%$	350 Ma
260-3	90	10	$\pm 1\%$	100 Ma
260-4	900	100	$\pm 1\%$	35 Ma
260-5	9K	1K	$\pm 1\%$	10 Ma
260-6	90K	10K	$\pm 1\%$	3.5 Ma
260-7	900K	100K	$\pm 1\%$	1.0 Ma

*C-Contact resistance, .005-.03 ohms, typical, .01 ohms.

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



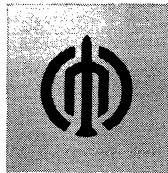
Sign up Now . . .

***Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530***



electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.



CARTER POTENTIOMETERS

RECTILINEAR / WIRE WOUND / CONDUCTIVE PLASTIC

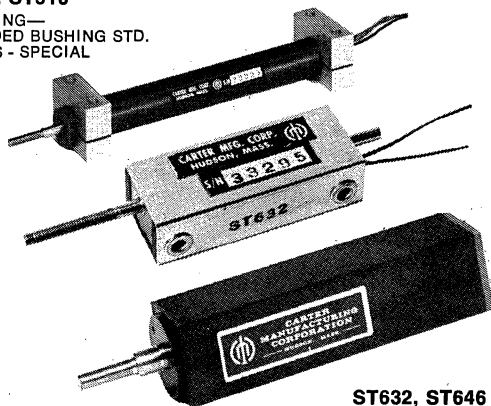
Carter Manufacturing Corp. is an organization of engineers and craftsmen specializing in the unusual in potentiometers and switch engineering and their manufacture. Since our founding in 1955 we have developed full capability in wire

wound and conductive plastic potentiometers. We welcome the opportunity to work with you for your unique requirements as well as standard commercial or mil types.

RECTILINEAR POTENTIOMETERS / WIRE OR CONDUCTIVE PLASTIC

ST476, ST510

MOUNTING—
THREADED BUSHING STD.
CLAMPS - SPECIAL



ST403

ST632, ST646

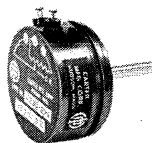
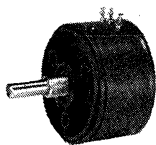
Carter manufactures many custom variations of rectilinear potentiometers. When requesting quotations please specify stroke, resistance, linearity, any taps, any switching, environmental requirements and quantity.

Wire wound and conductive plastic elements can also be furnished for special requirements.

Type	Size	Stroke	Res.Ω	Std. Lin.	Spl. Lin.	Elements	Watts 125°
ST476	1/2" Dia.	To 8"	50K/" Max.	2% Stroke	1% Stroke	1 or 2	1
ST510	3/4" Dia.	To 12"	100K/" Max.	2% Stroke	1% Stroke	1 or 2	1.5
ST403	1 1/4" x 1 1/4"	To 36"	150K/" Max.	2% Stroke	1% Stroke	1 or 2	2
ST632	5/8" x 1/2"	To 4"	60K/" Max.	2% Stroke	1% Stroke	1	.25
ST646	1/2" x 1/2"	To 6"	50K/" Max.	2% Stroke	1% Stroke	1 or 2	1

WIRE WOUND / CONDUCTIVE PLASTIC / SINGLE TURN POTENTIOMETERS MILITARY / COMMERCIAL

COMMERCIAL



MILITARY

GENERAL SPECIFICATIONS

Resistance Tolerance: WW $\pm 5\%$, C/P $\pm 10\%$ Std. (Spl. avail.).

Function Angles: Spl. available.

Rotation: WW with stops, continuous available.

C/P continuous, stops available.

Taps: WW taps to single turn of wire with positive elimination of failure.

C/P taps of low resistance or zero width available.

Power Rating: To zero watts at 150°C.

Ambient Temp.: -65°C to +125°C std. (to 150°C available).

MIL STANDARDS / WIRE WOUND

Size	1/2"	3/8"	1 1/4"	1 1/2"	1 3/8"	1 3/4"	2"	3"
Type	120	118	223	157	136	160	119	236
Mil. Size	05	09	11	15	17	18	20	30
Function Angle	320°	320°	320°	320°	320°	320°	350°	350°
Std. Lin.	$\pm 5\%$	$\pm 4\%$	$\pm 3\%$	$\pm 25\%$	$\pm 2\%$	$\pm 18\%$	$\pm 15\%$	$\pm 1\%$
Spl. Lin.	$\pm 3\%$	$\pm 25\%$	$\pm 2\%$	$\pm 1\%$	$\pm 1\%$	$\pm 09\%$	$\pm 09\%$	$\pm 07\%$
Max. Res.	75KΩ	100KΩ	100KΩ	150KΩ	150KΩ	175KΩ	200KΩ	500KΩ
Watts	2	3	3.5	4	4	4	4.5	5

MIL STANDARDS / CONDUCTIVE PLASTIC

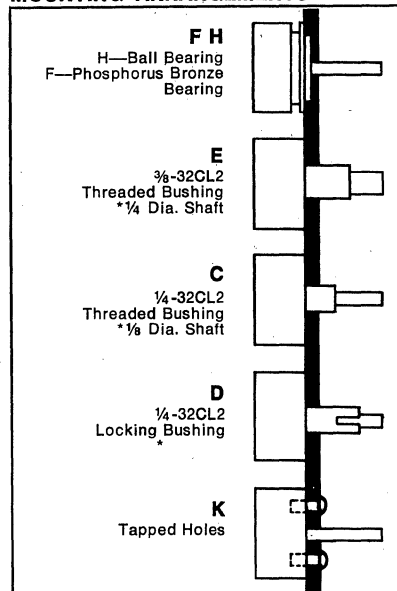
Size	1/2"	3/8"	1 1/4"	1 1/2"	1 3/8"	1 3/4"	2"	3"
Type	CP120	CP118	CP223	CP157	CP136	CP160	CP119	CP236
Mil. Size	05	09	11	15	17	18	20	30
Function Angle	320°	340°	340°	345°	345°	345°	345°	345°
Std. Lin.	$\pm 7\%$	$\pm 5\%$	$\pm 5\%$	$\pm 4\%$	$\pm 4\%$	$\pm 35\%$	$\pm 3\%$	$\pm 25\%$
Spl. Lin.	$\pm 2\%$	$\pm 1\%$	$\pm 05\%$	$\pm 04\%$	$\pm 04\%$	$\pm 03\%$	$\pm 03\%$	$\pm 01\%$
Max. Res.	60KΩ	100KΩ	150KΩ	150KΩ	175KΩ	200KΩ	250KΩ	400KΩ
Watts	1	1.4	1.6	2	2.2	2.6	3	5

COMMERCIAL PLASTIC HOUSING / WIRE WOUND

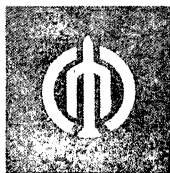
Size	2"	3"	Size	2"	3"
Type	508	511	Type	CP508	CP511
Mil. Size	—	—	Mil. Size	—	—
Function Angle	320°	320°	Function Angle	345°	345°
Std. Lin.	$\pm 25\%$	$\pm 25\%$	Std. Lin.	$\pm 1\%$	$\pm 7\%$
Spl. Lin.	$\pm 2\%$	$\pm 2\%$	Spl. Lin.	$\pm 5\%$	$\pm 25\%$
Max. Res.	250KΩ	500KΩ	Max. Res.	250KΩ	400KΩ
Watts	3	5	Watts	3	5

CONDUCTIVE PLASTIC

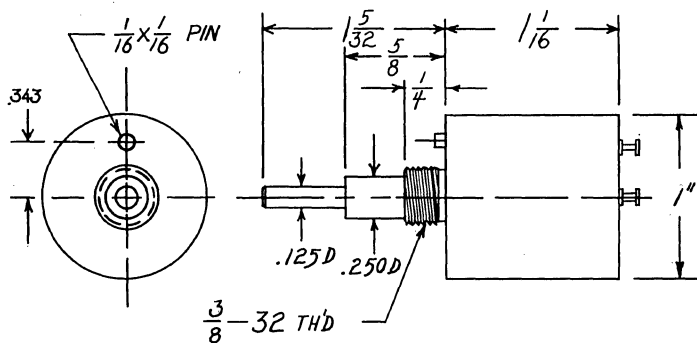
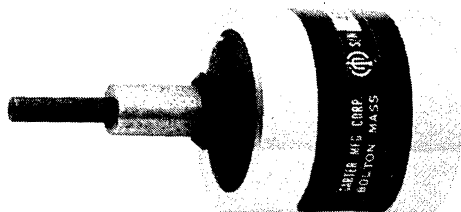
MOUNTING ARRANGEMENTS



CARTER MANUFACTURING CORPORATION
SUGAR ROAD • BOLTON, MASSACHUSETTS 01740 • TELEPHONE (617) 779-5501



CARTER
MANUFACTURING
CORPORATION



These specifications are Carter Manufacturing Corporation standards, however, they do not express the limit of our capability. Frequently applications call for requirements not illustrated by the catalog sheet. Carter welcomes the opportunity to supply your unique needs.

VERNIER DRIVE potentiometers

TYPE CP651 1" DIA.
conductive plastic standard

TYPE 651 1" DIA.
wire wound available

Carter offers the greatest versatility in instrument potentiometers featuring dual control with a direct drive outer shaft and a vernier drive inner shaft. A directly calibrated dial can be mounted on the outer shaft and fine smooth control obtained on the inner shaft.

Vernier ratios of 10:1 and 5:1 are available as standard. The resistance elements are conductive plastic but wire wound can be made. Functions are linear as standard but non-linear can be designed.

These potentiometers are ideal for instruments where fine, smooth control is required such as RC tuning in signal generators, variable frequency filters and wherever fine rotating control of output is desired.

The types and sizes shown are present standards but the dual drive feature can be incorporated into your custom designed potentiometers.

ELECTRICAL SPECIFICATIONS

ELEMENT:

Conductive Plastic

RESISTANCE VALUES:

1000 Ω , 2500 Ω , 5000 Ω standard

Other values available

RESISTANCE TOLERANCE:

$\pm 10\%$, tighter tolerances available

FUNCTION:

Linear $\pm 2\%$ standard, $\pm 1\%$ & $.5\%$ available
non-linear available

ELECTRICAL ANGLE:

$300^\circ \pm 3^\circ$ standard

Any angle less than 345° available

ROTATION:

Continuous, stops available

TAPS:

None. Available at center or other angles

POWER:

1W at 85°C derated to 0 at 125°C

GENERAL SPECIFICATIONS

HIGH VOLTAGE BREAKDOWN:

1000 VRMS

AMBIENT TEMPERATURE RANGE:

-50°C to $+125^\circ\text{C}$

TEMPERATURE COEFFICIENT

-50°C to $+85^\circ\text{C}$ -200 PPM MAX.

$+85^\circ\text{C}$ to $+125^\circ\text{C}$ -300 PPM MAX.

LOAD LIFE:

2000 Hours

SERVICE LIFE

1,000,000 Revolutions

ENVIRONMENTAL PERFORMANCE AND

OTHER DESIGN CRITERIA PER MIL-R-39023

CARTER MANUFACTURING CORPORATION

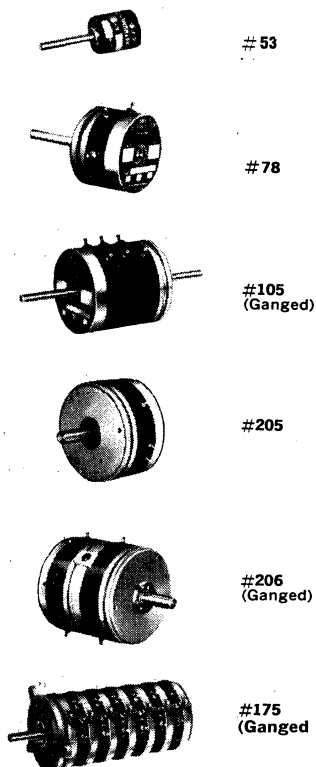
SUGAR ROAD • BOLTON, MASSACHUSETTS 01740 • TELEPHONE (617) 779-5501



Infinite Resolution PRECISION COMPONENTS

ROTARY Single-Turn POTENTIOMETERS

LINEAR-FUNCTIONAL/SINE-COSINE



SPECIFICATIONS

	LINEAR	SINE-COSINE
Mechanical Rotation	360° Continuous	
Electrical Function Angle	350° Nominal	360°
Resistance Range	0.5KΩ-2 MegΩ	500Ω-50KΩ/Quad.
Best Linearity or Conformity	.1% ÷ Inch of Dia.	.3% P-P ÷ Inch of Dia.
Virtual Resolution	1/250,000	
Wattage	Diameter x 2 Watt(s)	
Temperature Range	-55°C to +125°C	
Taps, Maximum No.	Diameter x 6	
Starting Torque (In.-Oz.)	Diameter x .15	Diameter x .3
Guaranteed Life (at 100 R.P.M.)	To 30 Million Cycles Depending on Circuitry	

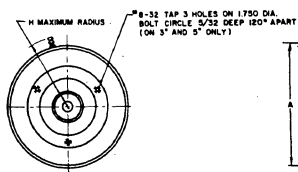
DIMENSIONS

MODEL	53 Linear	78 Linear	105 Linear 106 Sin-Cos	155 Linear 156 Sin-Cos	175 Linear 176 Sin-Cos	175S 205S 305S Linear	205 Linear 206 Sin-Cos	305 Linear 306 Sin-Cos	505 Linear 506 Sin-Cos
A	1/2	7/8	1 1/2	1 3/4	1 3/4	—	2	3	5
B*	.4375	.7500	1.0300	1.3125	1.5620	—	1.8750	2.8750	4.8750
C*	—	—	—	—	—	—	—	.7500	.7500
D*	.1250	.1250	.1250	.1250	.2500	—	.2500	.2500	.2500
E	.060	.040	.040	.062	.060	—	.060	.047	.047
F	.500	.635	.635	.725	.985	—	.985	1.350	1.870
H	**	19/32	11/16	29/32	1 1/2	Each add'l cup adds only .200" Length	1 1/2	1 1/4	2 1/4
K	3/8	3/8	3/8	3/8	3/8	—	3/8	3/8	3/8
L	5/8	3/4	3/4	3/4	3/4	—	3/4	3/4	3/4

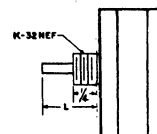
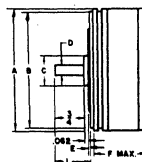
*+.0000
— .0005
** Axial Rear Terminations

Low Torque-Low Inertia Pots are Available in 1 1/4" O.D.

	177 Linear	178 Sin-Cos
Torque, In.-Oz.	.1	.2
Inertia, Oz.-In. ²	.025	.065



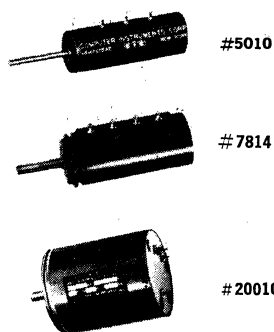
STANDARD



BUSHING MOUNT

ROTARY Multi-Turn POTENTIOMETERS

LINEAR-FUNCTIONAL



SPECIFICATIONS

MODEL	5010	7810**	7820**	7813/7814***	20010
Mechanical Rotation	3600° ±20° -0°	3700° MIN.	7200° ±100° -0°	3600° ±100° -0°	3600° ±110° -0°
Electrical Function Angle	3600° ±10°	3600° ±10°	7200° ±10°	3600° ±5°	3600° ±5°
Resistance Range	5KΩ-500KΩ	—	250Ω-125KΩ	5KΩ-1.5 MegΩ	5KΩ-3 MegΩ
Best Linearity or Conformity	0.1%	.075%	.05%	0.05%	0.01%
Virtual Resolution (Typical)	1/150,000	—	1/200,000	—	1/400,000
Wattage at 25°C	2	—	1	2	4
Temperature Range	-55°C to +125°C				
Taps Maximum No.	—	1	2	—	1
Starting Torque (In.-Oz.) at 25°C	0.2	—	1.5	0.5	1.0
Guaranteed Life (at 100 R.P.M.)	To 100 x 10 ⁶ Revolutions Depending on Circuitry				
Stop Strength	10 IN.-OZ. MAX.				

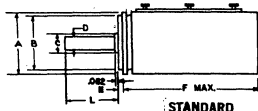
*For voltage reference, specify 0° width taps. For current carrying, specify zero resistance taps.
**Available in Dual Units, same case dimensions and available up to 100 turns (360,000°).
***Model 7813 same as 7814 except for axial rear terminations.

DIMENSIONS

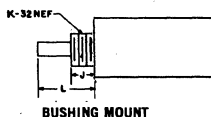
MODEL	5010	7810	7820	7814	20010
A	.500	—	.875	—	2.000
B*	.4735	.750	—	.750	1.875
C	.188	.273	—	—	—
D*	0.937	.1875	.1250	—	.250
E	—	.062	—	—	.035
F	1.531	1.953	1.875	—	2.625
H	.400	.600	.562	—	**
J	—	.250	—	—	.312
K	.250	—	.375	—	—
L	.625	.750	.500	.750	—

*+.0000
— .0005

** Axial Rear Terminations



STANDARD



BUSHING MOUNT



COMPUTER INSTRUMENTS CORPORATION / 92 MADISON AVE., HEMPSTEAD, N.Y. 11550/516-483-8200

LINEAR-FUNCTIONAL

*Available in Dual Units, same case dimensions.
 **Available in Dual Unit providing the resistance and function of both elements is the same.
 ***For voltage reference, specify zero width taps. For current carrying, specify zero resistance taps.
 ****Threaded, ball, spring-return and other shaft endings available.

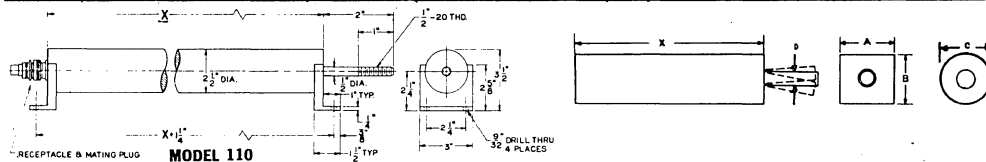
DIMENSIONS

#111

#110

#113

#120



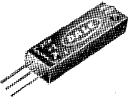
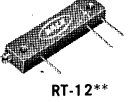
- 

2-1643

DEPENDABLE**DALE®****TRIMMERS****TRIMMER QUICK REFERENCE GUIDE**

- New space-saving low profile models with cermet and wirewound elements
- Mil models including E-Rel
- Panel mount models available in most series

MILITARY GRADE TRIMMER POTENTIOMETERS

ILLUSTRATION	MODEL	SEAL TYPE	CONFIGURATION	STANDARD RESISTANCE & TOLERANCE	POWER RATING	OPERATING TEMP. RANGE	ADJUSTMENT TURNS	HEIGHT	WIDTH	LENGTH
 RT-10**	691	1	• Alternate position Printed Circuit Pins 22 AWG	10 ohms to 100K ohms $\pm 5\%$	1 watt at 70° C, derated to 0 at 175° C	-65° C to 175° C	15 $\pm$ 2	.18	.32	1.00
	680	1	• Printed Circuit Pins 22 AWG							
	697*	2	• 28 AWG Stranded Teflon Leads							
	692*	2	• 26 AWG Solid Leads							
 RT-11**	1287	1	• Printed Circuit Pins 21 AWG	10 ohms to 100K ohms $\pm 5\%$	1 watt at 70° C, derated to 0 at 175° C	-65° C to 175° C	25 $\pm$ 2	.28	.31	1.25
	1288*	2	• Stranded Teflon Leads 28 AWG							
	1299*	1	• Spade Type Solder Lug							
 RT-12**	1680	1	• Printed Circuit Pins 21 AWG	10 ohms to 100K ohms $\pm 5\%$	1 watt at 70° C, derated to 0 at 175° C	-65° C to 175° C	22 $\pm$ 3	.19	.32	1.25
	1697*	2	• Stranded Teflon Leads 28 AWG							
	1692*	2	• 22 AWG Solid Wire							
	1690*	2	• Solder Lug							
 RTR-12	1880	3	• Printed Circuit Pins, Gold Plated Nickel	10 ohms to 20K ohms $\pm 5\%$	.75 watt at 85° C, derated to 0 at 150° C	-65° C to 150° C	22 $\pm$ 3	.19	.32	1.25
	1897	3	• 28 AWG Stranded Teflon Insulated Leads							

*Indicates model is also available in Panel Mount version.

**10 ohms to 20K ohms.

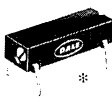
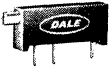
COMMERCIAL/INDUSTRIAL GRADE POTENTIOMETERS**WIREWOUND ELEMENT**

ILLUSTRATION	MODEL	SEAL TYPE	CONFIGURATION	STANDARD RESISTANCE & TOLERANCE	POWER RATING	OPERATING TEMP. RANGE	ADJUSTMENT TURNS	HEIGHT	WIDTH	LENGTH
	2187	4	• Printed Circuit Pins 21 AWG	10 ohms to 100K ohms ±10%	1 watt at 70° C, derated to 0 at 125° C	-65° C to 125° C	25±2	.28	.31	1.25
	2188*	4	• Stranded Vinyl Leads 28 AWG							
	2199*	4	• Spade Type Solder Lug							
	2387	4	} Printed Circuit Terminals	10 ohms to 50K ohms ±10%	0.5 watt at 25° C, derated to 0 at 105° C	-55° C to 105° C	15 turns nominal	.36	.28	1.00
	2317	5								
	2389	4	} Hook-type Solder Lugs							
	2319	5								
	2487	4	} Printed Circuit Terminals	10 ohms to 50K ohms ±10%	1 watt at 40° C, derated to 0 at 125° C	-55° C to 125° C	20 turns nominal	.31	.16	.75
	2417	5								
	721	5	} Printed Circuit Terminals	10 ohms to 50K ohms ±10%	1.0 watt at 70° C, derated to 0 at 125° C	-65° C to 125° C	22±3	.25	.165	.75
	723	5								
	724	5								
Complete specifications on following pages.										
	727	5	} Printed Circuit Terminals, machine insertable	10 ohms to 50K ohms ±10%	1 watt at 70° C, derated to 0 at 125° C	-65° C to 125° C	22±3	.19	.25	.75
	729	5								
Complete specifications on following pages.										

*Indicates model is also available in Panel Mount version.

**Also available in transparent case model, see following pages.

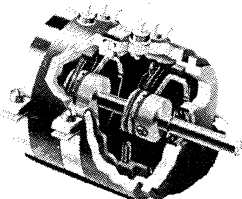
DEPENDABLE**DALE®****TRIMMERS**
COMMERCIAL/INDUSTRIAL GRADE POTENTIOMETERS
CERMET ELEMENT

ILLUSTRATION	MODEL	SEAL TYPE	CONFIGURATION	STANDARD RESISTANCE & TOLERANCE	POWER RATING	OPERATING TEMP. RANGE	ADJUSTMENT TURNS	HEIGHT	WIDTH	LENGTH
	781	5	} Printed Circuit Terminals <i>Complete specifications on following pages.</i>	10 ohms to 2 Megohms $\pm 10\%$	1 watt at 70° C, derated to 0 at 125° C	-55° C to 125° C	22 ± 3	.25	.165	.75
	783	5								
	784	5								
	787	5	} Printed Circuit Terminals, machine insertable } Printed Circuit Terminals, hand insertable <i>Complete specifications on following pages.</i>	10 ohms to 2 Megohms $\pm 10\%$	1 watt at 70° C, derated to 0 at 125° C	-55° C to 125° C	22 ± 3	.19	.25	.75
	789	5								
	8487	4	} Printed Circuit Terminals	10 ohms to 2 Megohms $\pm 10\%$ 100 Ω thru 500K $\pm 20\%$ all other values	.75 watt at 25° C, derated to 0 at 125° C	-55° C to 125° C	20 turns nominal	.31	.16	.75
	8417	5								
	817	6	• Printed Circuit Pins 26 AWG	10 ohms to 2 Megohms $\pm 10\%$ 100 Ω thru 500K $\pm 20\%$ all other values	.3 watt at 85° C, derated to 0 at 150° C	-65° C to 150° C	10 turns nominal	.15	.10	.50
	85	5	• Printed Circuit Terminals, machine insertable • Printed Circuit Terminals, hand insertable	10 ohms to 1 Megohm $\pm 20\%$	.5 watt at 25° C, derated to 0 at 125° C	-55° C to 125° C	12 turns nominal	.19	.265	.28
	85A	5								
	87	5	• Printed Circuit Terminals, machine insertable • Printed Circuit Terminals, hand insertable	10 ohms to 1 Megohm $\pm 20\%$	.5 watt at 25° C, derated to 0 at 125° C	-55° C to 125° C	Single turn	.19	.265	.28
	87A	5								

*Also available in transparent case model, see following pages.

SEAL TYPE IDENTIFICATION

1. Immersion proof per MIL-R-27208
2. Humidity proof per MIL-STD-202, Method 106
3. Sealed per MIL-R-39015
4. Humidity proof per MIL-STD-202, Method 103, Condition B
5. Immersion proof—sealed for board washing, leak tested in 70° C water
6. Immersion proof per MIL-R-22097


PRECISION POTENTIOMETERS—SINGLE TURN

- Precision machined anodized aluminum cups • Molded Diallyl Phthalate liners • Welded tap and terminal construction • Precious metal wipers and slip rings • Flush clamp bands • Gold-plated terminals • Precision sleeve or ball bearings • Centerless ground stainless steel shafts • Single or ganged units.

SPECIFICATIONS:

- Meet requirements of MIL-R-12934 and NAS-710
- Eight physical sizes, 3/4" to 3" diameter
- Electrical angles and functions to specification
- Special mechanical configurations available

ORDERING INFORMATION
WHERE TO ORDER:

From your Authorized Dale Distributor, your Dale Representative, or Dale Electronics, Inc., Box 609, Columbus, Nebraska 68601—PHONE 564-3131 AREA CODE 402 TWX 910-626-8314

TERMS: 1% 10—Net 30 **F.O.B. POINT:** Columbus, Nebraska

SPECIAL CHARGES:

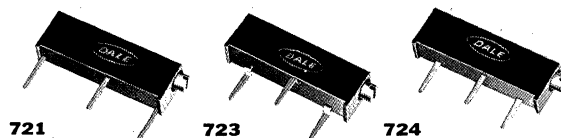
Minimum Order Charge.....\$35.00
Minimum Item Charge.....\$15.00

DALE ELECTRONICS, INC.

P. O. Box 609, Columbus, Nebraska 68601
A subsidiary of The Lionel Corporation

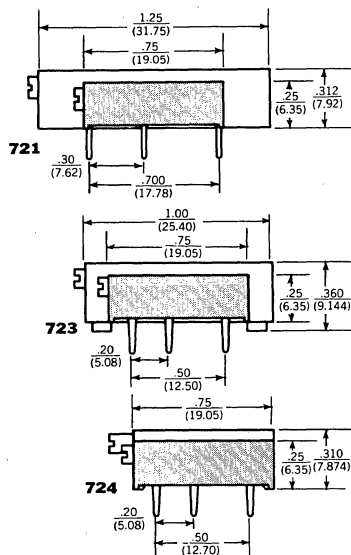
DEPENDABLE**DALE®****TRIMMERS**

LOW COST - HIGH PERFORMANCE LOW PROFILE - WIREWOUND



FEATURES

- All-metal screw and one-piece clutch prevents overtravel damage
- Patented side collector provides excellent setting stability
- A full watt in less space at 70° C
- Three terminal spacings identical to larger models.
- Sealed for production soldering
- 25-turn screwdriver adjustment for better adjustability
- All-welded internal construction



STANDARD RESISTANCE VALUES AND NOMINAL RESOLUTION

Standard tolerance $\pm 10\%$, lower tolerance available.

Resistance (Ohms)	Resolution (%)	Resistance (Ohms)	Resolution (%)
10	1.45	1K	.47
20	1.12	2K	.42
50	.89	5K	.30
100	.81	10K	.25
200	.70	20K	.21
500	.68	50K	.18

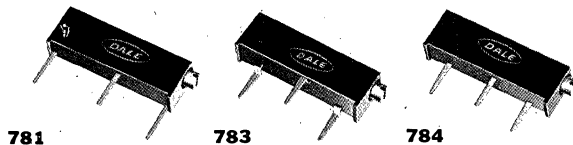
PRINTED CIRCUIT PINS

Model	Location
721	.300 x .700 x .100
723	.200 x .500 x .200
724	.200 x .500 x .100

When ordering, specify model, resistance and tolerance.

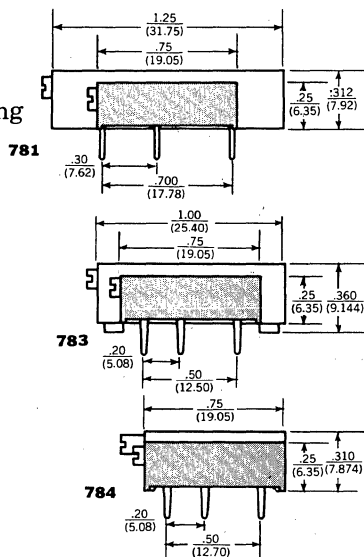
DEPENDABLE**DALE®****TRIMMERS**

LOW COST - HIGH PERFORMANCE LOW PROFILE - CERMET



FEATURES

- All-metal screw and one-piece clutch prevents overtravel damage
- Patented side collector provides excellent setting stability by allowing use of larger element
- A full watt in less space at 70° C
- Three terminal spacings identical to larger models.
- Sealed for production soldering.
- 25-turn screwdriver adjustment for better adjustability
- 1% contact resistance variation



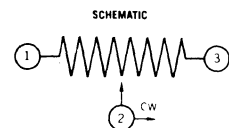
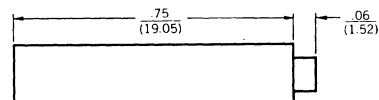
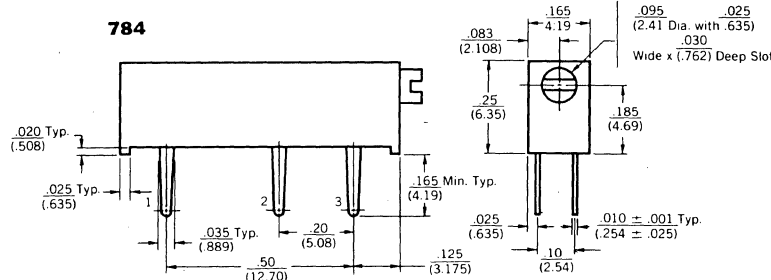
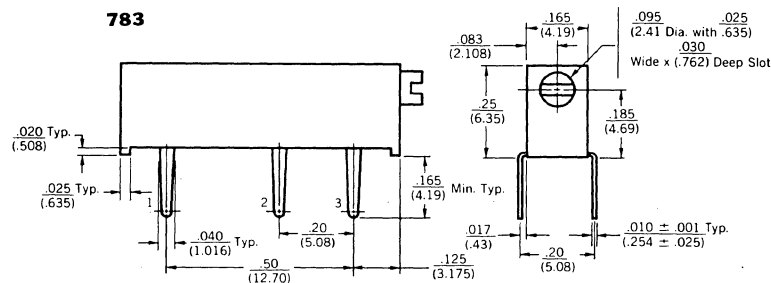
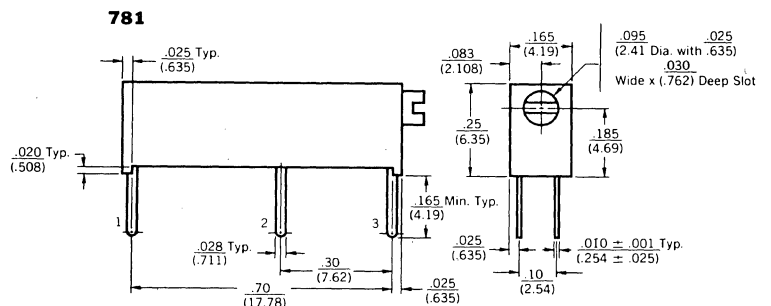
STANDARD RESISTANCE VALUES

Ohms	Ohms
10	20K
20	25K
50	50K
100	100K
200	200K
500	250K
1K	500K
2K	1 Meg.
5K	2 Meg.
10K	

PRINTED CIRCUIT PINS

Model	Location
781	.300 x .700 x .100
783	.200 x .500 x .200
784	.200 x .500 x .100

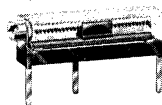
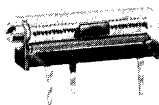
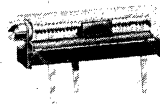
When ordering, specify model, resistance and tolerance.

DEPENDABLE**DALE®****TRIMMERS****SPECIFICATIONS****ELECTRICAL****Resistance Range:** 10 ohms to 2 Megohms**Standard Resistance Tolerance:** $\pm 10\%$ **Absolute Minimum Resistance:** 2 ohms max.**Temperature Coefficient:** ± 100 PPM/°C**Mechanical Life:** 200 cycles without discontinuity**Contact Resistance Variation:** 1 ohm or 1%, whichever is greater.**Insulation Resistance, 500 VDC:** 100 Megohms minimum**Resolution:** Essentially infinite**Adjustability:** Output Resistance = $\pm 0.10\%$
Output Voltage Ratio = $\pm 0.05\%$ **Input Voltage:** 400 VDC (RMS) or within power rating,
whichever is less**Electrical Adjustment:** 22 ± 3 turns**MECHANICAL****Shaft Torque:** 5.0 oz./in. maximum**Mechanical Adjustment:** 25 ± 3 turns**Mechanical Stops:** None. Clutch mechanism permits
overtravel without damage**Weight:** 2.0 grams maximum**Marking:** Dale Part Number, Terminal Numbers,
Resistance Value and Date Code**ENVIRONMENTAL****Power Rating:** 1.25 watt at +25°C
1.00 watt at +70°C
.25 watt at +125°C**Operating Temperature Range:** -55°C to +125°C**Immersion Proof:** Sealed for board washing.
Leak tested at +70°C**Shock:** Per MIL-STD-202, Method 202, 50G
Contact Bounce: 0.1 millisecond maximum
Max. Wiper Shift: 1% plus resolution**Vibration:** Per MIL-STD-202, Method 201, 20G
Contact Bounce: 0.1 millisecond max.
Max. Wiper Shift: 1% plus resolution**Dielectric Strength:** Per MIL-STD-202, Method 301
Room Condition: 1000 VRMS
At 70,000 feet: 250 VRMS**Thermal Shock:** 5 cycles -65°C to +125°C
Resistance Shift: $\pm 2\%$ maximum
Max. Wiper Shift: $\pm 1\%$ **High Temperature Exposure:** 250 hours at +125°C
Resistance Shift: $\pm 2\%$ maximum
Max. Wiper Shift: $\pm 1\%$ **Load Life:** 1000 hours, 1 watt at +70°C
Maximum Shift: $\pm 2\%$ **DIMENSIONAL AND TERMINAL CONFIGURATIONS**Dimensions in inches
(Dimensions in millimeters)

TOLERANCE INCHES .xxx $\pm$.005
 xx $\pm$.010
(TOLERANCE MM) .xxx $\pm$.127
 xx $\pm$.254

DEPENDABLE**DALE®****TRIMMERS**

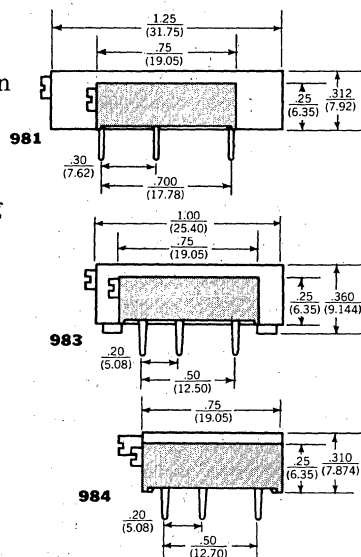
LOW COST - HIGH PERFORMANCE LOW PROFILE - CERMET

**981****983****984**

**NEW
TRANSPARENT
CASE MODELS**

FEATURES

- Transparent cover for determining wiper location
- All-metal screw and one-piece clutch prevents overtravel damage
- Patented side collector provides excellent setting stability by allowing use of larger element
- A full watt in less space at 70° C
- Three terminal spacings identical to larger models.
- Sealed for production soldering
- 25-turn screwdriver adjustment for better adjustability
- 1% contact resistance variation



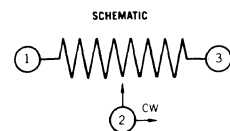
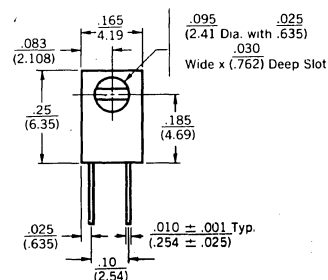
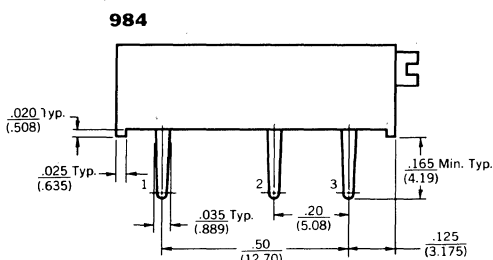
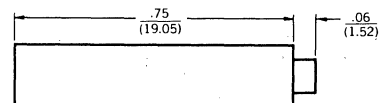
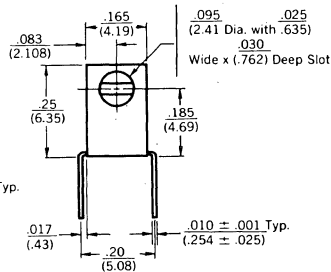
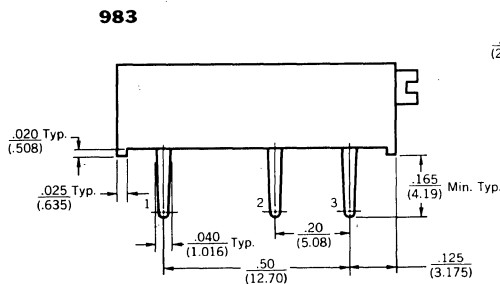
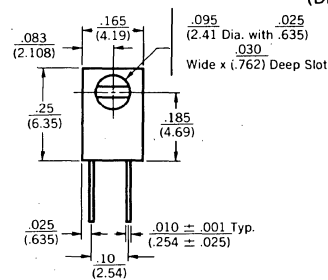
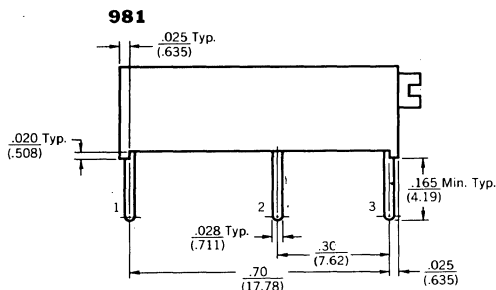
STANDARD RESISTANCE VALUES

Ohms	Ohms
10	20K
20	25K
50	50K
100	100K
200	200K
500	250K
1K	500K
2K	1 Meg.
5K	2 Meg.
10K	

PRINTED CIRCUIT PINS

Model	Location
981	.300 x .700 x .100
983	.200 x .500 x .200
984	.200 x .500 x .100

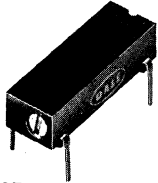
When ordering, specify model, resistance and tolerance.

DEPENDABLE**DALE®****TRIMMERS****SPECIFICATIONS****ELECTRICAL****Resistance Range:** 10 ohms to 2 Megohms**Standard Resistance Tolerance:** $\pm 10\%$ **Absolute Minimum Resistance:** 2 ohms max.**Temperature Coefficient:** ± 100 PPM/ $^{\circ}$ C**Mechanical Life:** 200 cycles without discontinuity**Contact Resistance Variation:** 1 ohm or 1%, whichever is greater.**Insulation Resistance, 500 VDC:** 100 Megohms minimum**Resolution:** Essentially infinite**Adjustability:** Output Resistance = $\pm 0.10\%$
Output Voltage Ratio = $\pm 0.05\%$ **Input Voltage:** 400 VDC (RMS) or within power rating,
whichever is less**Electrical Adjustment:** 22 ± 3 turns**MECHANICAL****Shaft Torque:** 5.0 oz./in. maximum**Mechanical Adjustment:** 25 ± 3 turns**Mechanical Stops:** None. Clutch mechanism permits
overtravel without damage**Weight:** 2.0 grams maximum**Marking:** Dale Part Number, Terminal Numbers,
Resistance Value and Date Code**Solvent Resistance:** Consult representative if using
solvents other than Freon PC, Freon TF, Isopropyl
Alcohol, Methyl or Ethyl Alcohol for cleaning.**ENVIRONMENTAL****Power Rating:** 1.25 watt at $+25^{\circ}\text{C}$
1.00 watt at $+70^{\circ}\text{C}$
.25 watt at $+125^{\circ}\text{C}$ **Operating Temperature Range:** -55°C to $+125^{\circ}\text{C}$ **Immersion Proof:** Sealed for board washing.
Leak tested at $+70^{\circ}\text{C}$ **Shock:** Per MIL-STD-202, Method 202, 50G
Contact Bounce: 0.1 millisecond maximum
Max. Wiper Shift: 1% plus resolution**Vibration:** Per MIL-STD-202, Method 201, 20G
Contact Bounce: 0.1 millisecond max.
Max. Wiper Shift: 1% plus resolution**Dielectric Strength:** Per MIL-STD-202, Method 301
Room Condition: 1000 VRMS
At 70,000 feet: 250 VRMS**Thermal Shock:** 5 cycles -65°C to $+125^{\circ}\text{C}$
Resistance Shift: $\pm 2\%$ maximum
Max. Wiper Shift: $\pm 1\%$ **High Temperature Exposure:** 250 hours at $+125^{\circ}\text{C}$
Resistance Shift: $\pm 2\%$ maximum
Max. Wiper Shift: $\pm 1\%$ **Load Life:** 1000 hours, 1 watt at $+70^{\circ}\text{C}$
Maximum Shift: $\pm 2\%$ **DIMENSIONS AND TERMINAL CONFIGURATIONS**Dimensions in inches
(Dimensions in millimeters)TOLERANCE INCHES .XXX $\pm$.005
XX $\pm$.010
(TOLERANCE MM) .XXX $\pm$.127
XX $\pm$.254

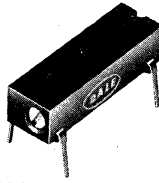
DEPENDABLE**DALE®****TRIMMERS**

DUAL-IN-LINE - WIREWOUND & CERMET MACHINE OR HAND INSERTABLE

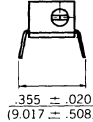
(Includes Transparent Case Models)



727
787
927
987



729
789
929
989



MODELS	BLACK CASE	TRANSPARENT CASE
WIREWOUND	727 729	927 929
CERMET	787 789	987 989

FEATURES

- All-metal screw and one-piece clutch prevents overtravel damage
- Patented side collector provides excellent setting stability
- Dissipates 1 watt at 70° C
- Sealed for production soldering
- All-welded internal construction
- 25-turn screwdriver adjustment for better adjustability

STANDARD RESISTANCE VALUES AND NOMINAL RESOLUTION

Standard tolerance $\pm 10\%$, lower tolerance available.

WIREWOUND MODELS	
Resistance (Ohms)	Resolution %
10	1.45
20	1.12
50	.89
100	.81
200	.70
500	.68
1K	.47
2K	.42
5K	.30
10K	.25
20K	.21
50K	.18

CERMET MODELS	
Ohms	Ohms
10	20K
20	25K
50	50K
100	100K
200	200K
500	250K
1K	500K
2K	1 Meg.
5K	2 Meg.
10K	

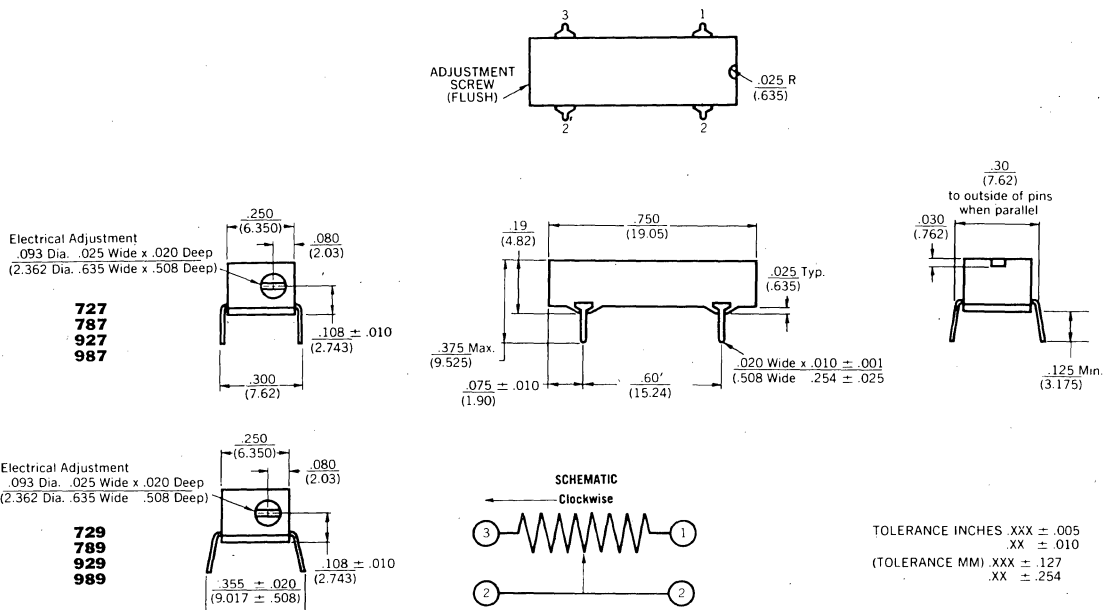
PRINTED CIRCUIT PINS

Model	Location
729	.355 x .600 Free Position
789	
929	
989	
727	.300 x .600 Free Position
787	
927	
987	

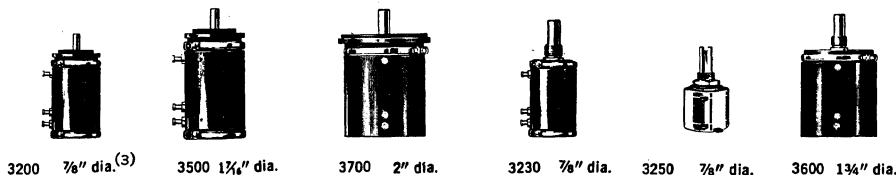
When ordering, specify model, resistance and tolerance.

DEPENDABLE**DALE®****TRIMMERS****SPECIFICATIONS****ELECTRICAL****Resistance Range:** Wirewound = 10 ohms to 50K ohms.

Cermet = 10 ohms to 2 Megohms

Standard Resistance Tolerance: $\pm 10\%$ **Absolute Minimum Resistance:** Wirewound = 0.5% or 1.0 ohm, whichever is greater; Cermet = 2 ohms maximum**Mechanical Life:** 200 cycles**ENR Noise:** Wirewound = 100 ohms maximum**Contact Resistance Variation:** Cermet = standard 1 ohm or 1%, whichever is greater.**Insulation Resistance, 500 VDC:** 100 Megohms minimum**Temperature Coefficient:** Wirewound = ± 50 PPM/ $^{\circ}$ C maximum.
Cermet = ± 100 PPM/ $^{\circ}$ C standard**Adjustability:** Cermet Output Resistance = $\pm 0.10\%$
Voltage Ratio = $\pm 0.05\%$
Wirewound—(See Resolution Table)**Input Voltage:** Cermet = 400 VDC (RMS) or within power rating, whichever is less**Electrical Adjustment:** 22 ± 3 turns**MECHANICAL****Shaft Torque:** 5.0 oz./in. maximum**Mechanical Adjustment:** 25 ± 3 turns**Mechanical Stops:** None. Clutch mechanism permits overtravel without damage**Weight:** 2.0 grams maximum**Marking:** Dale Part No., Terminal Numbers, Resistance Value and Date Code**Solvent Resistance:** Consult representative if using solvents other than Freon PC, Freon TF, Isopropyl Alcohol, Methyl or Ethyl Alcohol for cleaning transparent cases.**ENVIRONMENTAL****Power Rating:** 1.0 watt at 70° C, derated to 0 at 125° C**Operating Temperature Range:** Wirewound = -65° C to $+150^{\circ}$ C. Cermet = -55° C to $+125^{\circ}$ C**Immersion Proof:** Sealed for board washing.
Leak tested in 70° C water**Shock:** Per MIL-STD-202, Method 201, 50G
Contact Bounce: 0.1 millisecond max.
Wirewound Max. Wiper Shift: 1% plus resolution**Vibration:** Per MIL-STD-202, Method 201, 20G
Contact Bounce: 0.1 millisecond max.
Wirewound Max. Wiper Shift: 1% plus resolution**Dielectric Strength:** Per MIL-STD-202, Method 301
Room Condition: 1000 VRMS.
At 70,000 feet: 250 VRMS**Load Life:** 1000 hours, 1 watt at 70° C
Maximum Shift: $\pm 2\%$ **DIMENSIONS AND TERMINAL CONFIGURATIONS**Dimensions in inches
(Dimensions in millimeters)

RESISTORS, VARIABLE



DUNCAN precision wirewound multi-turn potentiometers

MILITARY

COMMERCIAL

ELECTRICAL	3200	3500	3700	3230	3250	3600
Electrical Travel	3600° +4° /-0°	3600° +1° /-0°	3600° +1° /-0°	3600° +10° /-0°	3600° +10° /-0°	3600° +4° /-0°
Normal Resistance Range (Ohms)	100-100K	100-200K	100-300K	100-100K	100-100K	100-300K
Resistance Tolerance: Std.	±3%	±3%	3±%	±3%	±5%	±3%
Power Rating (Watts)	2.5	5	7	2.5	2	7
Linearity: Std.	±0.25%	±0.15%	±0.1%	±0.25%	±.25%	±0.25%
Noise, ENR Max. (Ohms)	100	100	100	100	100	100
Insulation Resistance (Meg. Ohms)	1,000	1,000	1,000	1,000	1,000	1,000
Tempco of Pot, Maximum	.007%/°C	.007%/°C	.007%/°C	.007%/°C	.007%/°C	.007%/°C
MECHANICAL						
Mechanical Travel Turns	10(1)	10(1)	10(2)	10	10	10(2)
Mechanical Life, Revolutions	2,000,000	2,000,000	2,000,000	2,000,000	500,000	2,000,000
Ganged Cups, Maximum	2	2	2	N/A	N/A	2
Taps, Maximum Number	46	110	135	46	N/A	135
Weight (oz): Single Cup	1.3	4.0	4.5	1.3	0.5	3.7
Torque: Start/Run Bushing (oz-in)	0.5/0.5	N/A	1.5/1.2	0.6/0.5	1.0/1.0	1.5/1.2
Start/Run Servo	0.5/0.4	1.0/0.8	1.2/0.8	N/A	N/A	N/A
ENVIRONMENTAL						
Temperature Range (°C), Std.	-65 to +125	-65 to +125	-65 to +125	-55 to +105	-25 to +85	-55 to +105
Meets MIL-R-12934 For: Shock	Yes	Yes	Yes	N/A (4)	N/A	N/A (4)
Humidity	Yes	Yes	Yes	N/A (4)	N/A	N/A (4)
Vibration	Yes	Yes	Yes	N/A (4)	N/A	N/A (4)

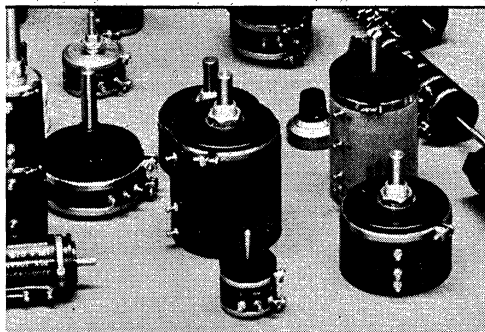
(1) Also available in 3- & 5-turn rotation.

(2) Also available in 3-turn rotation.

(3) Also available in 3/4" diameter.

(4) Environmental specs for commercial pots: enclosed construction, 10G at 2,000 cycles vibration, 50G shock.

N/A means not applicable.



DUNCAN ELECTRONICS
SUBSIDIARY

SYSTRON  DONNER

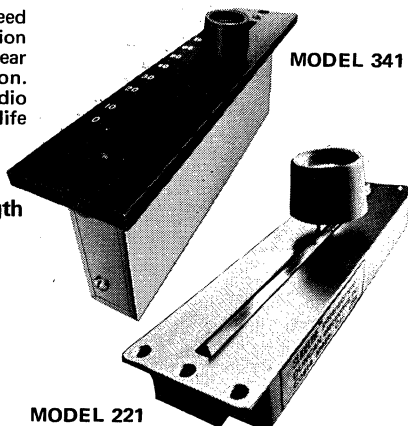
PRECISION POTENTIOMETERS

SLIDELINE® CONTROLS

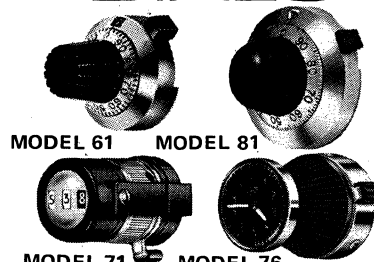
APPLICATIONS: Motor speed and lighting controls; position indicating or control of linear movement; audio signal attenuation. Available in linear and audio functions. Element is same long-life RESOLON conductive plastic as used in military precision pots.

Model Stroke Overall Length

221	2.75"	4.25"
321	2.60"	4.30"
341	4.60"	6.30"
345	4.10"	6.30"



Miniature Turns-Counting DIALS

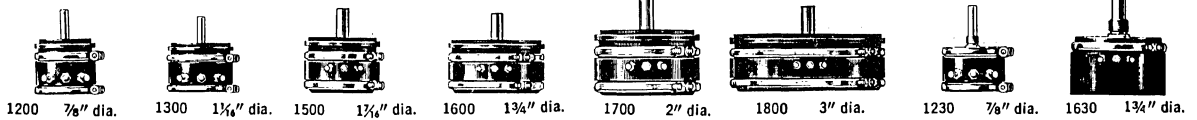


MODEL 71 MODEL 76

Precision designed dials enable accurate positioning of multi-turn devices. Despite compact size, all dials afford optimum readability from any angle and feature positive-action locks. They require minimum in panel drilling and mounting hardware. Write for complete specs on all models.

DUNCAN ELECTRONICS 2865 FAIRVIEW ROAD □ COSTA MESA, CALIFORNIA 92626 □ PHONE: (714) 545-8261 □ TWX 910-595-1128

RESISTORS, VARIABLE



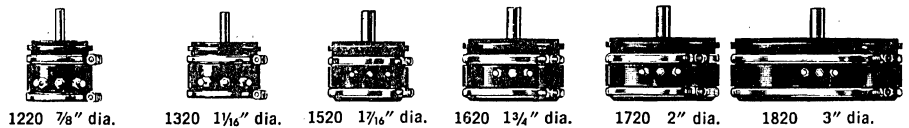
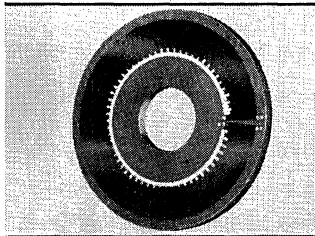
DUNCAN precision wirewound single-turn potentiometers

MILITARY

COMMERCIAL

1200	1300	1500	1600	1700	1800	1230	1630
354° ±2° 100-20K +5% 1.25 ±0.5% 100 1,000 .007%/°C	354° ±2° 100-30K ±5% 2 ±0.5% 100 1,000 .007%/°C	354° ±2° 100-50K ±3% 3 ±0.5% 100 1,000 .007%/°C	354° ±1° 100-50K ±3% 4 ±0.5% 100 1,000 .007%/°C	356° ±1° 100-60K ±3% 5 ±0.5% 100 1,000 .007%/°C	358° ±1° 100-100K ±3% 7 ±0.5% 100 1,000 .007%/°C	354° ±2° 100-20K ±5% 1.25 ±0.5% 100 1,000 .007%/°C	354° ±2° 100-50K ±5% 4 ±0.5% 100 1,000 .007%/°C
1 2,000,000 6 9 0.6 0.2/0.2 0.1/0.1	1 2,000,000 6 9 0.8 0.2/0.2 0.15/0.15	1 2,000,000 8 19 2.2 1.3/0.9 0.6/0.4	1 2,000,000 8 24 2.8 1.4/1.0 0.7/0.5	1 2,000,000 8 26 3.3 1.5/1.1 0.8/0.6	1 2,000,000 8 41 6.5 1.7/1.3 1.0/0.8	1 2,000,000 6 9 0.6 0.3/0.3 N/A	1 2,000,000 6 24 3.0 2.0/1.5 N/A
-65 to +125 Yes Yes Yes	-65 to +125 Yes Yes Yes	-65 to +125 Yes Yes Yes	-65 to +125 Yes Yes Yes	-65 to +125 Yes Yes Yes	-65 to +125 Yes Yes Yes	-55 to +105 N/A (4) N/A (4) N/A (4)	-55 to +105 N/A (4) N/A (4) N/A (4)

Note: Lockwasher & Hex Nut supplied with all Bushing Models.



RESOLON® conductive plastic single-turn potentiometers

MILITARY

ELECTRICAL	1220	1320	1520	1620	1720	1820
Theoretical Electrical Travel (1)	320°	320°	340°	340°	350°	350°
Normal Resistance Range (Ohms)	1K-20K	1K-30K	1K-50K	1K-75K	1K-100K	1K-125K
Extended Resistance Range (Ohms)	500-75K	500-100K	500-125K	750-135K	750-150K	1K-250K
Resistance Tolerance: Standard	10%	10%	10%	10%	10%	10%
Best Practical	2%	2%	2%	2%	2%	2%
Power Rating (Watts) (2)	0.5	0.75	1.0	1.5	2.0	3.0
Linearity: Standard	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%	±0.5%
Best Practical	±0.2%	±0.15%	±0.10%	±0.75%	±0.5%	±0.4%
Output Smoothness	0.1% of Total Applied Voltage					
Insulation Resistance (Meg Ohms)	1,000	1,000	1,000	1,000	1,000	1,000
Dielectric, Volts RMS	1,000	1,000	1,000	1,000	1,000	1,000
Voltage Across Terminals, Max., DC	400	400	400	400	400	400
Tempco of Pot, Maximum	-.03%/°C	-.03%/°C	-.03%/°C	-.03%/°C	-.03%/°C	-.03%/°C
MECHANICAL						
Mechanical Travel	360° Continuous					
Mechanical Life, Revolutions	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000	20,000,000
Ganged Cups, Maximum	6	6	8	8	8	8
Taps, Maximum Number	9	9	19	24	26	41
Moment of Inertia (gm-cm ²)	0.2	0.2	4.0	4.5	5.0	8.5
Weight (oz): Single Cup	0.6	0.8	2.2	2.8	3.3	6.5
Each Additional Cup	0.2	0.5	0.7	0.7	1.0	1.4
Stop Strength (oz-in)	N/A	N/A	N/A	N/A	N/A	N/A
Torque (oz-in): Starting, Servo	0.1	0.15	0.6	0.7	0.8	1.0
Running, Servo	0.1	0.15	0.4	0.5	0.6	0.8
ENVIRONMENTAL						
Temperature Range (°C) Standard	-65 to +125	-65 to +125	-65 to +125	-65 to +125	-65 to +125	-65 to +125
Meets MIL-R-39023 for: Humidity	Yes	Yes	Yes	Yes	Yes	Yes
Vibration	Yes	Yes	Yes	Yes	Yes	Yes
Shock	Yes	Yes	Yes	Yes	Yes	Yes

(1) Greater angles available.

(2) Rated at 60°C. Derated linearly to zero at 125°C.

COMPANY HISTORY

Post Office Box 890
1320 Flaxmill Road
Huntington, Indiana 46750
Telephone (219) 356-4300
TWX 810-333-1530



E-SYSTEMS INC.

Memcor Division

MANUFACTURERS OF

MEMCOR
ELECTRONIC COMPONENTS

OUR HISTORY — AND WE ARE PROUD OF IT . . .

SINCE 1945



. . . a quality line of resistive products

SINCE 1963



. . . a quality line of
resistive products

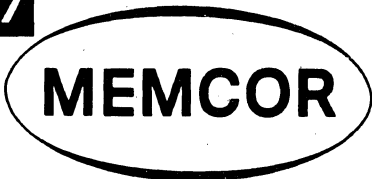
**HARDWICK
HINDLE**

SINCE 1965



. . . a quality line of
resistive products

SINCE 1967



. . . a quality line of
resistive products

TODAY



E-SYSTEMS INC.

Memcor Division

MANUFACTURERS OF

MEMCOR
ELECTRONIC COMPONENTS

. . . a quality line of
resistive products



E-SYSTEMS INC.

Memcor Division

MANUFACTURERS OF

MEMCOR
ELECTRONIC COMPONENTS

WIREWOUND RHEOSTATS

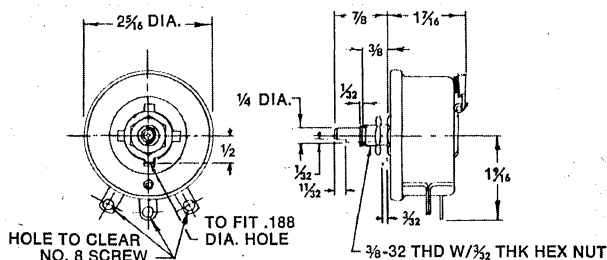
Post Office Box 890
1320 Flaxmill Road
Huntington, Indiana 46750
Telephone (219) 356-4300
TWX 810-333-1530

E-SYSTEMS INC.
Memcor Division
MANUFACTURERS OF
MEMCOR
ELECTRONIC COMPONENTS

50 WATTS/STD. RESISTANCE 1-10,000 OHMS

WT. 0.32 LBS.

Ohms	Max. Amps	Steps (Approx.)
1	7.070	44
2	5.000	44
4	3.530	44
6	2.880	74
8	2.500	82
12	2.040	85
16	1.760	89
22	1.500	98
35	1.190	126
50	1.000	111
80	.790	143
125	.630	177
150	.575	175
225	.470	203
300	.408	215
500	.316	286
800	.250	286
1000	.224	360
1600	.176	368
2500	.141	463
3500	.119	510
5000	.100	442
8000	.079	560
10000	.070	567



FEATURES:

- Vitreous enamel bonds core and base together for uniform heat dissipation and structural integrity.
- Wiper tracks are buffed and polished to assure smooth rotation and uniform wiper contact.
- High strength ceramic hub is used to insulate the shaft and bushing from live parts.
- Wiper design assures minimum backlash.
- The cores on larger rheostats are enameled prior to winding to increase core strength and improve bond between wire and core.
- Rheostats are provided with three terminals to allow use as potentiometers.
- UL approved.
- All wattage sizes are available to MIL-R-22.
- Welded terminals and termination guarantees positive electrical connections.
- Available with quick connect terminals.

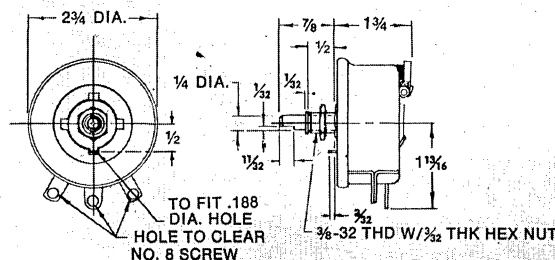
SPECIFICATIONS:

- Resistance Tolerance $\pm 10\%$... Closer Tolerances Available.
- Running Torque - .25 To 2 Inch Pound.
- Standard Resistance 1 - 10,000 Ohm.
- Rotation $300^\circ \pm 5\%$.
- Mounting For Panels Up To $1/4"$.

75 WATTS/STD. RESISTANCE 1-10,000 OHMS

WT. 0.52 LBS.

Ohms	Max. Amps	Steps (Approx.)
1	8.660	27
2	6.120	28
5	3.880	54
7.5	3.160	51
16	2.170	131
25	1.730	113
50	1.230	143
75	1.000	134
100	.866	180
200	.612	186
300	.500	217
400	.433	230
500	.388	291
750	.316	345
1000	.274	351
1500	.224	434
2000	.194	450
2500	.173	448
5000	.123	590
7500	.100	544
10000	.087	568



FEATURES:

- Vitreous enamel bonds core and base together for uniform heat dissipation and structural integrity.
- Wiper tracks are buffed and polished to assure smooth rotation and uniform wiper contact.
- High strength ceramic hub is used to insulate the shaft and bushing from live parts.
- Wiper design assures minimum backlash.
- The cores on larger rheostats are enameled prior to winding to increase core strength and improve bond between wire and core.
- Rheostats are provided with three terminals to allow use as potentiometers.
- UL approved.
- All wattage sizes are available to MIL-R-22.
- Welded terminals and termination guarantees positive electrical connections.
- Available with quick connect terminals.

SPECIFICATIONS:

- Resistance Tolerance $\pm 10\%$... Closer Tolerances Available.
- Running Torque - .5 To 2 Inch Pound.
- Standard Resistance 1 - 10,000 Ohm.
- Rotation $300^\circ \pm 5\%$.
- Mounting For Panels Up To $1/4"$.

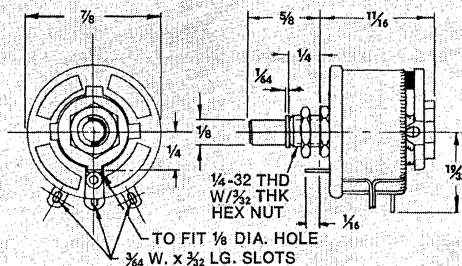
Post Office Box 890
 1320 Flaxmill Road
 Huntington, Indiana 46750
 Telephone (219) 356-4300
 TWX 810-333-1530

WIREWOUND RHEOSTATS

12½ WATT/STD. RESISTANCE 1-5000 OHMS

WT. 0.6 OZ.

Ohms	Max. Amps	Steps (Approx.)
1	3.53	28
2	2.50	29
3	2.04	38
6	1.44	35
10	1.12	50
15	.91	70
25	.71	72
35	.60	82
50	.50	92
75	.41	105
100	.35	102
125	.32	110
175	.27	155
250	.22	170
350	.19	190
500	.16	210
750	.13	200
1000	.11	260
1500	.091	209
2500	.071	323
5000	.050	340



FEATURES:

- Vitreous enamel bonds core and base together for uniform heat dissipation and structural integrity.
- Wiper tracks are buffed and polished to assure smooth rotation and uniform wiper contact.
- High strength ceramic hub is used to insulate the shaft and bushing from live parts.
- Wiper design assures minimum backlash.
- The cores on larger rheostats are enameled prior to winding to increase core strength and improve bond between wire and core.
- Rheostats are provided with three terminals to allow use as potentiometers.
- UL approved.
- All wattage sizes are available to MIL-R-22.
- Welded terminals and termination guarantees positive electrical connections.
- Available with quick connect terminals.

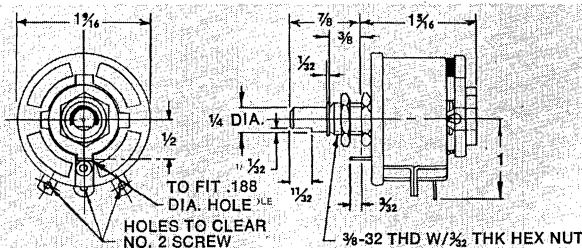
SPECIFICATIONS:

- Resistance Tolerance $\pm 10\%$... Closer Tolerances Available.
- Running Torque - 1 To 6 Inch Ounce.
- Standard Resistance 1 - 5000 Ohm.
- Rotation $300^\circ \pm 5\%$.
- Mounting For Panels Up To $\frac{1}{8}$ ".

25 WATTS/STD. RESISTANCE 1-5000 OHMS

WT. 0.19 LBS.

Ohms	Max. Amps	Steps (Approx.)
1	5.000	30
2	3.540	29
3	2.880	51
6	2.040	50
8	1.770	52
10	1.580	52
15	1.290	74
25	1.000	95
35	.845	107
50	.707	97
75	.575	117
100	.500	123
125	.445	155
175	.375	171
250	.316	159
350	.267	210
500	.222	245
750	.182	286
1000	.155	305
1500	.129	380
2500	.100	300
3500	.084	335
5000	.070	380



FEATURES:

- Vitreous enamel bonds core and base together for uniform heat dissipation and structural integrity.
- Wiper tracks are buffed and polished to assure smooth rotation and uniform wiper contact.
- High strength ceramic hub is used to insulate the shaft and bushing from live parts.
- Wiper design assures minimum backlash.
- The cores on larger rheostats are enameled prior to winding to increase core strength and improve bond between wire and core.
- Rheostats are provided with three terminals to allow use as potentiometers.
- UL approved.
- All wattage sizes are available to MIL-R-22.
- Welded terminals and termination guarantees positive electrical connections.
- Available with quick connect terminals.

SPECIFICATIONS:

- Resistance Tolerance $\pm 10\%$... Closer Tolerances Available.
- Running Torque - .25 To .5 Inch Pound.
- Standard Resistance 1 - 5000 Ohm.
- Rotation $300^\circ \pm 5\%$.
- Mounting For Panels Up To $\frac{1}{4}$ ".

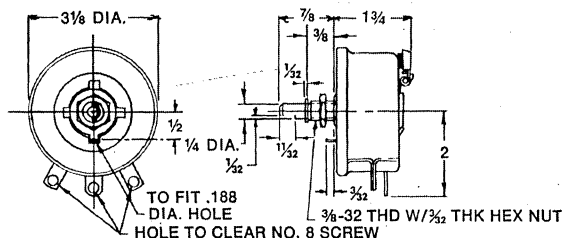
WIREWOUND RHEOSTATS

12½ Watt/Std. Resistance 1-5000 Ohms
 25 Watt/Std. Resistance 1-5000 Ohms

100 WATTS/STD. RESISTANCE 1-10,000 OHMS

WT. 0.64 LBS.

Ohms	Max. Amps	Steps (Approx.)
1	10.000	33
2	7.070	33
3	5.750	30
5	4.470	57
7.5	3.650	60
10	3.160	57
16	2.500	124
25	2.000	107
50	1.410	135
75	1.150	158
100	1.000	168
200	.707	213
300	.575	259
400	.500	270
500	.447	269
750	.365	319
1000	.316	330
1500	.258	402
2000	.224	417
2500	.200	515
5000	.141	560
7500	.115	495
10000	.100	673



FEATURES:

- Vitreous enamel bonds core and base together for uniform heat dissipation and structural integrity.
- Wiper tracks are buffed and polished to assure smooth rotation and uniform wiper contact.
- High strength ceramic hub is used to insulate the shaft and bushing from live parts.
- Wiper design assures minimum backlash.
- The cores on larger rheostats are enameled prior to winding to increase core strength and improve bond between wire and core.
- Rheostats are provided with three terminals to allow use as potentiometers.
- UL approved.
- All wattage sizes are available to MIL-R-22.
- Welded terminals and termination guarantees positive electrical connections.
- Available with quick connect terminals.

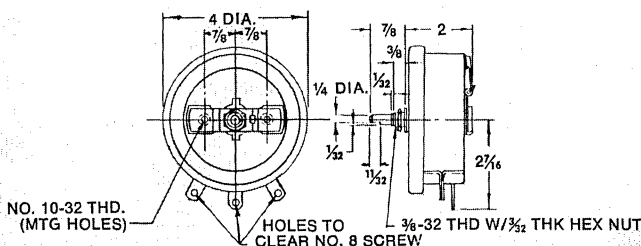
SPECIFICATIONS:

- Resistance Tolerance $\pm 10\%$... Closer Tolerances Available.
- Running Torque - .5 To 2 Inch Pound
- Rotation $300^\circ \pm 5\%$.
- Mounting For Panels Up To $1/4"$.
- Standard Resistance 1 - 10,000 Ohm.

150 WATTS/STD. RESISTANCE 1-10,000 OHMS

WT. 1.1 LBS.

Ohms	Max. Amps	Steps (Approx.)
1	12.300	44
2	8.650	43
3	7.070	74
5	5.480	78
7.5	4.470	81
10	3.880	77
15	1.163	130
25	2.450	114
35	2.070	125
50	1.735	142
75	1.415	170
100	1.225	177
150	1.000	215
200	.865	229
250	.775	285
350	.655	315
500	.548	366
750	.447	335
1250	.346	453
1800	.288	497
2250	.259	511
3000	.224	526
4500	.182	630
7500	.141	894
10000	.122	929



FEATURES:

- Vitreous enamel bonds core and base together for uniform heat dissipation and structural integrity.
- Wiper tracks are buffed and polished to assure smooth rotation and uniform wiper contact.
- High strength ceramic hub is used to insulate the shaft and bushing from live parts.
- Wiper design assures minimum backlash.
- The cores on larger rheostats are enameled prior to winding to increase core strength and improve bond between wire and core.
- Rheostats are provided with three terminals to allow use as potentiometers.
- UL approved.
- All wattage sizes are available to MIL-R-22.
- Welded terminals and termination guarantees positive electrical connections.
- Available with quick connect terminals.

SPECIFICATIONS:

- Resistance Tolerance $\pm 10\%$... Closer Tolerances Available.
- Running Torque - .5 to 3 Inch Pound.
- Rotation $300^\circ \pm 5\%$.
- Mounting For Panels Up To $1/4"$ Or By Means Of F.H. Screws.
- Standard Resistance 1 - 10,000 Ohm.

**WIREWOUND
RHEOSTATS**

100 Watts/Std. Resistance 1-10,000 Ohms
150 Watts/Std. Resistance 1-10,000 Ohms

WIREWOUND RHEOSTATS

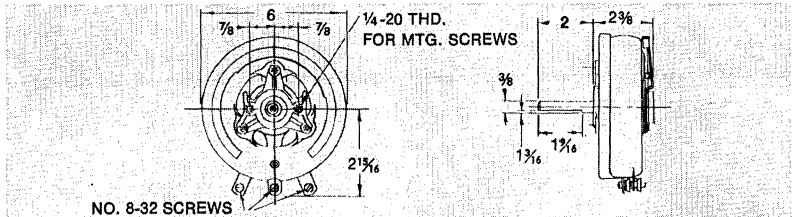
Post Office Box 890
1320 Flaxmill Road
Huntington, Indiana 46750
Telephone (219) 356-4300
TWX 810-333-1530

E-SYSTEMS INC.
Memcor Division
MANUFACTURERS OF
MEMCOR
ELECTRONIC COMPONENTS

225 WATTS/STD. RESISTANCE 1-2500 OHMS

WT. 2 LBS.

Ohms	Max. Amps	Steps (Approx.)
1	15.000	42
2	10.600	42
3	8.660	43
4	7.500	57
5	6.710	57
7.5	5.490	61
10	4.740	103
15	3.870	109
25	3.000	115
50	2.120	183
75	1.730	192
100	1.500	268
150	1.220	256
200	1.060	337
300	.866	323
400	.750	343
700	.567	484
900	.500	493
1200	.433	520
1500	.387	947
1750	.358	603
2000	.336	650
2500	.300	652



FEATURES:

- Vitreous enamel bonds core and base together for uniform heat dissipation and structural integrity.
- Wiper tracks are buffed and polished to assure smooth rotation and uniform wiper contact.
- High strength ceramic hub is used to insulate the shaft and bushing from live parts.
- Wiper design assures minimum backlash.
- The cores on larger rheostats are enameled prior to winding to increase core strength and improve bond between wire and core.
- Rheostats are provided with three terminals to allow use as potentiometers.
- UL approved.
- All wattage sizes are available to MIL-R-22.
- Welded terminals and termination guarantees positive electrical connections.
- Available with quick connect terminals.

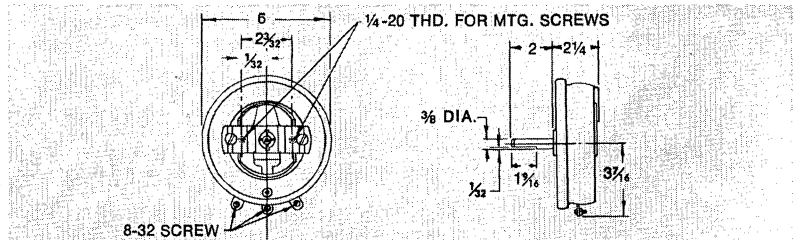
SPECIFICATIONS:

- Resistance Tolerance $\pm 10\%$... Closer Tolerances Available.
- Running Torque - 2.5 To 4 Inch Pound.
- Rotation $310^\circ \pm 5\%$.
- Mounting For Panels Up To $1\frac{1}{4}$ ". Two $\frac{1}{4}$ "-20 By $1\frac{1}{2}$ " Flat Head Screws Are Supplied.
- Standard Resistance 1 - 2500 Ohm.

300 WATTS/STD. RESISTANCE 1-2500 OHMS

WT. 2.6 LBS.

Ohms	Max. Amps	Steps (Approx.)
1	17.320	50
2	12.240	52
3	10.000	52
4	8.660	78
5	7.750	78
7.5	6.320	72
10	5.480	78
15	4.470	144
25	3.460	135
50	2.450	218
75	2.000	225
100	1.730	285
150	1.410	342
200	1.220	363
300	1.000	424
400	.866	454
700	.655	504
900	.578	528
1200	.500	546
1500	.447	678
1750	.414	626
2000	.387	700
2500	.346	708



FEATURES:

- Vitreous enamel bonds core and base together for uniform heat dissipation and structural integrity.
- Wiper tracks are buffed and polished to assure smooth rotation and uniform wiper contact.
- High strength ceramic hub is used to insulate the shaft and bushing from live parts.
- Wiper design assures minimum backlash.
- The cores on larger rheostats are enameled prior to winding to increase core strength and improve bond between wire and core.
- Rheostats are provided with three terminals to allow use as potentiometers.
- UL approved.
- All wattage sizes are available to MIL-R-22.
- Welded terminals and termination guarantees positive electrical connections.
- Available with quick connect terminals.

SPECIFICATIONS:

- Resistance Tolerance $\pm 10\%$... Closer Tolerances Available.
- Running Torque - 2.5 To 5 Inch Pound.
- Rotation $370^\circ \pm 5\%$.
- Mounting For Panels Up To $1\frac{1}{4}$ ". Two $\frac{1}{4}$ "-20 By $1\frac{1}{2}$ " Flat Head Screws Are Supplied.
- Standard Resistance 1 - 2500 Ohm.

E-SYSTEMS INC.
Memcor Division
MANUFACTURERS OF
MEMCOR
ELECTRONIC COMPONENTS

225 Watts/Std. Resistance 1-2500 Ohms
300 Watts/Std. Resistance 1-2500 Ohms

**WIREWOUND
RHEOSTATS**

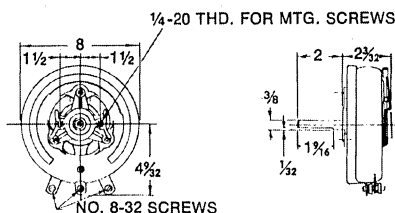
Post Office Box 890
 1320 Flaxmill Road
 Huntington, Indiana 46750
 Telephone (219) 356-4300
 TWX 810-333-1530

WIREWOUND RHEOSTATS

500 WATTS/STD. RESISTANCE 1-2500 OHMS

WT. 4 LBS.

Ohms	Max. Amps	Steps (Approx.)
1	22.300	69
2	15.800	75
3	12.900	78
4	11.200	73
5	10.000	103
8	7.900	103
12.1	6.300	103
16	5.600	188
25	4.470	204
50	3.160	206
80	2.520	327
125	2.000	327
175	1.690	423
250	1.410	488
325	1.240	500
500	1.000	609
750	.817	727
1000	.707	771
1500	.577	935
2000	.500	980
2500	.447	968



FEATURES:

- Vitreous enamel bonds core and base together for uniform heat dissipation and structural integrity.
- Wiper tracks are buffed and polished to assure smooth rotation and uniform wiper contact.
- High strength ceramic hub is used to insulate the shaft and bushing from live parts.
- Wiper design assures minimum backlash.
- The cores on larger rheostats are enameled prior to winding to increase core strength and improve bond between wire and core.
- Rheostats are provided with three terminals to allow use as potentiometers.
- UL approved.
- All wattage sizes are available to MIL-R-22.
- Welded terminals and termination guarantees positive electrical connections.
- Available with quick connect terminals.

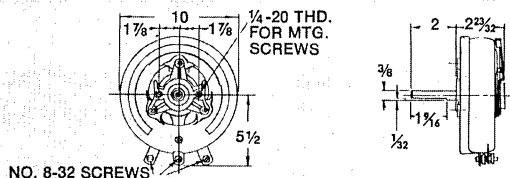
SPECIFICATIONS:

- Resistance Tolerance $\pm 10\%$... Closer Tolerances Available.
- Running Torque - 4.5 To 7 Inch Pound.
- Rotation $325^\circ \pm 3\%$.
- Mounting For Panels Up To 1 1/4". Two 1/4"-20 By 1 1/2" Flat Head Screws Are Supplied.
- Standard Resistance 1 - 2500 Ohm.

750 WATTS/STD. RESISTANCE 1-2500 OHMS

WT. 7.6 LBS.

Ohms	Max. Amps	Steps (Approx.)
1	27.400	71
2	19.400	103
3	15.800	94
5	12.200	102
8	9.650	98
10	8.650	138
16	6.820	140
25	5.470	138
50	3.870	248
80	3.060	250
100	2.740	248
160	2.170	446
200	1.940	442
300	1.580	540
400	1.370	583
600	1.117	684
750	1.000	686
1200	.791	870
1800	.646	1042
2500	.547	1170



FEATURES:

- Vitreous enamel bonds core and base together for uniform heat dissipation and structural integrity.
- Wiper tracks are buffed and polished to assure smooth rotation and uniform wiper contact.
- High strength ceramic hub is used to insulate the shaft and bushing from live parts.
- Wiper design assures minimum backlash.
- The cores on larger rheostats are enameled prior to winding to increase core strength and improve bond between wire and core.
- Rheostats are provided with three terminals to allow use as potentiometers.
- UL approved.
- All wattage sizes are available to MIL-R-22.
- Welded terminals and termination guarantees positive electrical connections.
- Available with quick connect terminals.

SPECIFICATIONS:

- Resistance Tolerance $\pm 10\%$... Closer Tolerances Available.
- Running Torque 3.5 To 7 Inch Pound.
- Rotation $330^\circ \pm 3\%$.
- Mounting For Panels Up To 1 1/4". Two 1/4"-20 By 1 1/2" Flat Head Screws Are Supplied.
- Standard Resistance 1 - 2500 Ohm.

WIREWOUND RHEOSTATS

500 Watts/Std. Resistance 1-2500 Ohms
 750 Watts/Std. Resistance 1-2500 Ohms

WIREWOUND RHEOSTATS

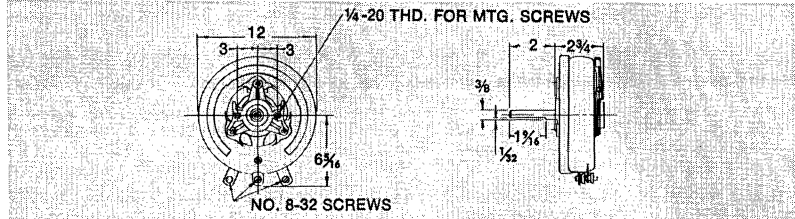
Post Office Box 890
1320 Flaxmill Road
Huntington, Indiana 46750
Telephone (219) 356-4300
TWX 810-333-1530

E-SYSTEMS INC.
Memcor Division
MANUFACTURERS OF
MEMCOR
ELECTRONIC COMPONENTS

1000 WATTS/STD. RESISTANCE 1-2000 OHMS

WT. 10 LBS.

Ohms	Max. Amps	Steps (Approx.)
1	31.600	86
2	22.400	115
3	18.300	125
5	14.100	122
8	11.200	116
10	10.000	114
16	7.900	164
25	6.330	181
50	4.470	321
75	3.650	301
100	3.160	321
160	2.500	328
225	2.110	608
300	1.830	640
400	1.580	685
500	1.410	687
750	1.150	806
1000	1.000	855
1500	.816	1026
2000	.630	1080



FEATURES:

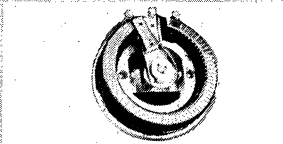
- Vitreous enamel bonds core and base together for uniform heat dissipation and structural integrity.
- Wiper tracks are buffed and polished to assure smooth rotation and uniform wiper contact.
- High strength ceramic hub is used to insulate the shaft and bushing from live parts.
- Wiper design assures minimum backlash.
- The cores on larger rheostats are enameled prior to winding to increase core strength and improve bond between wire and core.
- Rheostats are provided with three terminals to allow use as potentiometers.
- UL approved.
- All wattage sizes are available to MIL-R-22.
- Welded terminals and termination guarantees positive electrical connections.
- Available with quick connect terminals.

SPECIFICATIONS:

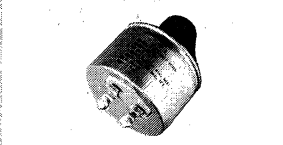
- Resistance Tolerance $\pm 10\%$... Closer Tolerances Available.
- Running Torque 3.5 To 7 Inch Pound.
- Rotation $335^\circ \pm 3\%$.
- Mounting For Panels Up To $1\frac{1}{4}"$. Two $\frac{1}{4}"$ -20 By $1\frac{1}{2}"$ Flat Head Screws Are Supplied.
- Standard Resistance 1 - 2000 Ohm.

SPECIAL RHEOSTATS

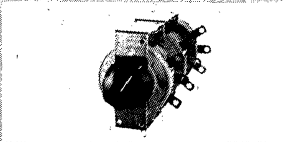
TAPER WINDINGS



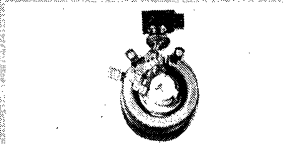
DUST PROOF 50 WATT



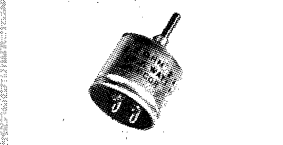
TANDEM ASSEMBLY



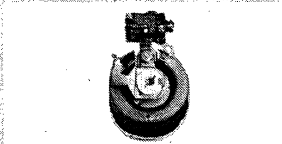
WITH TOGGLE SWITCH



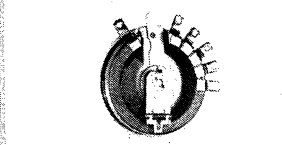
DUST PROOF 12.5 WATT



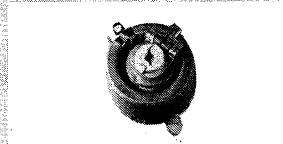
"OFF" POSITION & MICRO-SWITCH



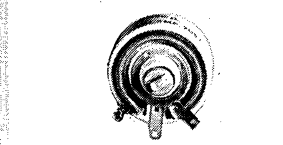
SPECIAL TAPS



360° ROTATION



RE



THE FOLLOWING UNITS ARE AVAILABLE FOR MIL-R-22

Part No.	Military Style	Description	Wattage	Shaft Diameter
RP-0012	M22/01	Unenclosed	12 1/2	1/8
RD-0012	M22/02	Enclosed	6 1/2	1/8
RP-0025	M22/03	Unenclosed	25	1/4
RD-0025	M22/04	Enclosed	12 1/2	1/4
RP-0050	M22/05	Unenclosed	50	1/4
RD-0050	M22/06	Enclosed	25	1/4
RP-0075	M22/07	Unenclosed	75	1/4
RP-0100	M22/08	Unenclosed	100	1/4
RP-0150	M22/09	Unenclosed	150	1/4
RP-0225	M22/10	Unenclosed	225	3/8
RP-0300	M22/11	Unenclosed	300	3/8
RP-0500	M22/12	Unenclosed	500	3/8
RP-0750	M22/13	Unenclosed	750	3/8
RP-1000	M22/14	Unenclosed	1000	3/8

E-SYSTEMS INC.
Memcor Division
MANUFACTURERS OF
MEMCOR

1000 Watts/Std. Resistance 1-2000 Ohms
Special Rheostats

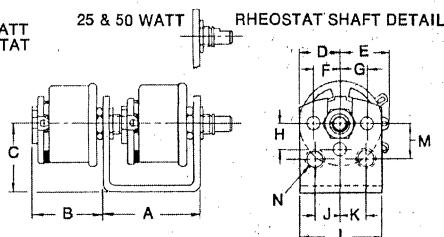
**WIREWOUND
RHEOSTATS**

RHEOSTAT HARDWARE

12½ WATT
RHEOSTAT

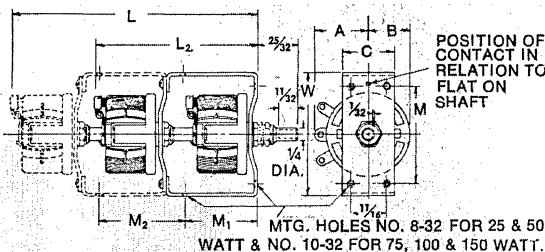
25 & 50 WATT

RHEOSTAT SHAFT DETAIL



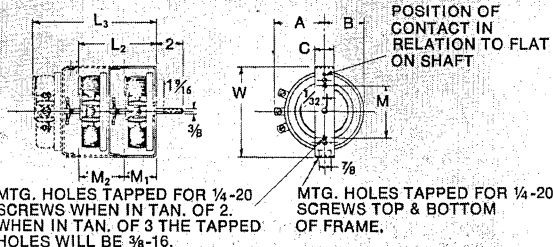
A	B	C	D	E	F	G	H	J	K	L	M	N	Tandem Rheostats
1 $\frac{1}{2}$	1 $\frac{1}{2}$	2 $\frac{1}{2}$	3 $\frac{1}{2}$	1 $\frac{1}{2}$	.250	.250	.250	—	—	3 $\frac{1}{2}$	—	—	TR2-12 $\frac{1}{2}$ Watt
2 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1	—	—	—	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	10-32	TR2-25 Watt
2 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	—	—	—	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	1 $\frac{1}{2}$	10-32	TR2-50 Watt

MULTIPLE MOUNTED ASSEMBLIES



Rheo. Type	Cat. No. 2 In Tandem	Cat. No. 3 In Tandem	A	B	C	L ₂	L ₃	M ₁	M ₂	M	N
R-12½	TR-12½-2	TR-12½-3	$\frac{1}{32}$	$\frac{7}{16}$	$\frac{3}{4}$	$2\frac{1}{4}$	$3\frac{3}{4}$	1	$\frac{1}{4}$	1	$1\frac{1}{8}$
R-25	TR-25-2	TR-25-3	$\frac{1}{16}$	$\frac{2}{32}$	1	$\frac{3}{2}$	$\frac{5}{2}$	$1\frac{1}{16}$	2	$\frac{1}{8}$	$2\frac{3}{8}$
R-50	TR-50-2	TR-50-3	$\frac{1}{8}$	$\frac{1}{32}$	1	$\frac{3}{2}$	$\frac{5}{2}$	$1\frac{1}{16}$	2	$\frac{1}{2}$	3
R-75	TR-75-2	TR-75-3	$\frac{1}{4}$	$\frac{1}{8}$	$\frac{1}{4}$	$\frac{4}{8}$	$\frac{6}{8}$	$1\frac{1}{16}$	$\frac{2}{2}$	$\frac{3}{8}$	$\frac{4}{4}$
R-100	TR-100-2	TR-100-3	$\frac{1}{2}$	$\frac{1}{16}$	$\frac{1}{4}$	$\frac{4}{8}$	$\frac{6}{8}$	$1\frac{1}{16}$	$\frac{2}{2}$	$\frac{3}{4}$	$\frac{4}{4}$
R-150	TR-150-2	TR-150-3	$\frac{2}{32}$	3	$\frac{1}{4}$	$\frac{4}{4}$	$\frac{7}{4}$	$1\frac{1}{16}$	$\frac{2}{2}$	$\frac{3}{4}$	5

MULTIPLE MOUNTED ASSEMBLIES



Rheo. Type	Cat. No. 2 In Tandem	Cat. No. 3 In Tandem	A	B	C	L ₂	L ₃	M ₁	M ₂	M	N
R300	TR-300-2	TR-300-3	3 $\frac{3}{16}$	3	1 $\frac{1}{2}$	6 $\frac{1}{16}$	9 $\frac{9}{16}$	2 $\frac{1}{2}$	3 $\frac{1}{2}$	2 $\frac{3}{8}$	7

A schematic diagram of a three-phase motor with a star (Y) connection. Three windings are shown, each with a terminal on the top and a common terminal at the bottom. The common terminals are connected to a central point, forming a star shape. A vertical line passes through the center of the star.

DEAD SECTION OFF POSITION
WITH DETENT
LEFT POSITION RS-35
(ROUNDED TIE WIRE PLACED AT
INDICATED END OF ROTATION)

RHEOSTAT HARDWARE

**Tandem Mounting Kits and Hardware — 12½, 25, 50 Watt
Multiple Mounted Assemblies
Off-Position 12½ to 300 Watts**



KNOBS AND DIALS

Post Office Box 890
1320 Flaxmill Road
Huntington, Indiana 46750
Telephone (219) 356-4300
TWX 810-333-1530

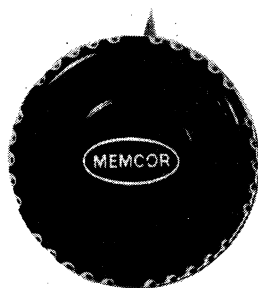


E-SYSTEMS INC.

Memcor Division

MANUFACTURERS OF

MEMCOR
ELECTRONIC COMPONENTS



2519



2518



2511
2521



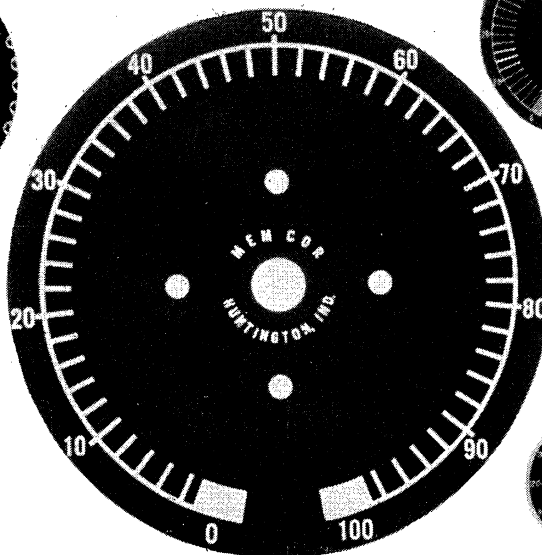
2512
2520



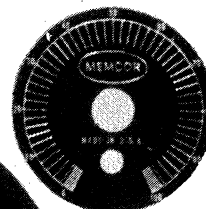
2510



2514



2492-020-003



2491-020-002



2491-020-001



2400



2506



2507



2505



2508

KNOB DESCRIPTION	KNOB DIA.	HOLE DIA.	CAT. NO.	10 DIGIT NOS.
SKIRTED KNOB	3/4	1/8	2400	2491-010-005
BAR KNOB, 1 1/4" LONG	—	1/4	2505	2491-010-010
BAR KNOB, 1 1/4" LONG WITH BRASS BUSHINGS	—	1/4	2506	2491-010-011
BAR KNOB, 1 1/2" LONG WITH BRASS BUSHINGS	—	1/4	2507	2491-010-012
BAR KNOB, 2 1/4" LONG	—	1/4	2508	2491-010-013
FINGER-GRIP KNOB	1 5/8	1/4	2510	2491-010-014
FINGER-GRIP KNOB WITHOUT POINTER	2 3/8	1/4	2511	2492-010-016
FINGER-GRIP KNOB WITH POINTER	2 3/8	1/4	2512	2492-010-001
FINGER-GRIP KNOB WITH POINTER	2 3/8	3/8	2520	2492-010-002
FINGER-GRIP KNOB WITHOUT POINTER	2 3/8	3/8	2521	2492-010-019
SKIRTED KNOB	1 1/2	1/4	2514	2491-010-017
HANDWHEEL WITH BRASS BUSHING	3 3/8	3/8	2518	2492-010-003
HANDWHEEL WITH BRASS BUSHING AND POINTER	3 3/8	3/8	2519	2492-010-004
BAR KNOB, 2 1/4" LONG WITH BRASS BUSHING	—	1/4	2522	2491-010-021

DIAL DESCRIPTION	RHEOSTAT SIZE	PART NO.
1 3/8 Diameter — Black on Aluminum	12 1/2, 25, 50	2491-020-001
2 3/8 Diameter — Black on Aluminum	75, 100, 150, 225, 300	2491-020-002
5 1/2 Diameter — Black on Aluminum	500, 750, 1000	2492-020-003



E-SYSTEMS INC.

Memcor Division

MANUFACTURERS OF

MEMCOR
ELECTRONIC COMPONENTS

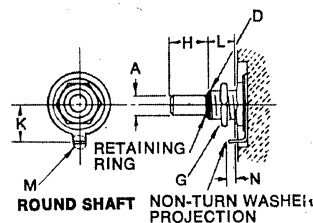
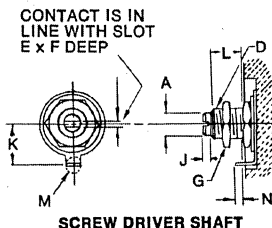
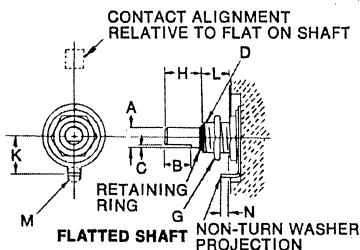
**KNOBS AND
DIALS**

Post Office Box 890
 1320 Flaxmill Road
 Huntington, Indiana 46750
 Telephone (219) 356-4300
 TWX 810-333-1530

RHEOSTAT OPTIONAL FEATURES

SHAFT AND BUSHING OPTIONS

THE FOLLOWING OPTIONAL FEATURES ARE AVAILABLE FOR
 12½-150 WATT RHEOSTATS



Shaft Dia. A	Max. Panel	Bushing Proj. L	Thd. D	B Flat	C	E Slot	F	NUT G	Shaft Ext. H	Shaft Ext. J	TAB LOC. K	TAB HOLE M	N
1/8	1/16 1/8 1/4	3/16 1/4 3/8	1/4-32 1/4-32 1/4-32	Spec Spec Spec	Spec Spec Spec	1/32 1/32 1/32	3/64 3/64 3/64	1/16 1/16 1/16	3/8 3/8 3/8	3/32 3/32 3/32	1/4 1/4 1/4	1/8 1/8 1/8	1/16 1/16 1/16
1/4	1/8 1/4 1/2 3/4 1 1 1/2 2	1/4 3/8 5/8 7/8 1 1/8 1 5/8 2 1/8	3/8-32 3/8-32 3/8-32 3/8-32 3/8-32 3/8-32 3/8-32	1 1/32 1 1/32 1 1/32 1 1/32 1 1/32 1 1/32 1 1/32	1/2 1/2 1/2 1/2 1/2 1/2 1/2	3/64 3/64 3/64 3/64 3/64 3/64 3/64	1/16 1/16 1/16 1/16 1/16 1/16 1/16	3/32 3/32 3/32 3/32 3/32 3/32 3/32	1/2 1/2 1/2 1/2 1/2 1/2 1/2	3/32 3/32 3/32 3/32 3/32 3/32 3/32	1/2 1/2 1/2 1/2 1/2 1/2 1/2	3/16 3/16 3/16 3/16 3/16 3/16 3/16	3/32 3/32 3/32 3/32 3/32 3/32 3/32

LOCKING DEVICES

SHAFT ASSEMBLIES CAN BE SUPPLIED WITH A SUPPLEMENTAL
 LOCKING DEVICE TO PREVENT SHIFTING OF A RESISTANCE SETTING.
 A TAPERED NUT TIGHTENS A SPLIT BUSHING AGAINST THE SHAFT FOR THE LOCKING ACTION.

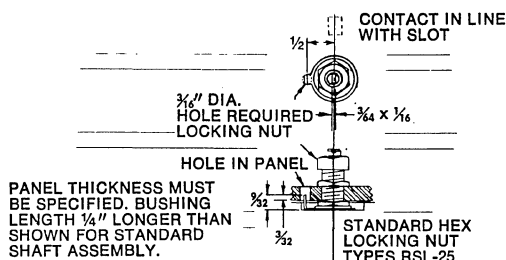
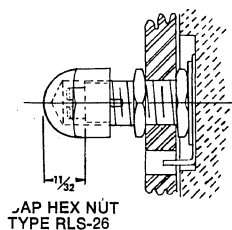


FIGURE ABOVE SHOWS TYPICAL SCREWDRIVER SHAFT LOCKING
 DEVICE. HOWEVER FLATTED OR ROUND SHAFTS CAN HAVE
 LOCKING DEVICES WITH THE RLS-25 LOCKING NUT.

HOW TO ORDER MEMCOR RHEOSTATS

1. Give Memcor type and wattage
 i.e. R25 = Rheostat 25 watt
2. Give ohmic value and resistance tolerance required
3. Specify if any mounting hardware is required
4. Specify if any other special features are required
 i.e. Special tapers for rheostats

If there are special requirements, a two or three digit alpha call out will appear after the ohmic value; these digits will be assigned by the factory.

RESISTANCE VALUE CODE

X XXX
 NUMBER OF DECIMALS TO MOVE TO THE RIGHT BASIC RESISTANCE VALUE
 EXAMPLE:
 3100 = 100Ω
 2100 = 10Ω
 1100 = 1Ω
 0100 = 0.1Ω

EXAMPLE MEMCOR PART NUMBER

RHEOSTAT = XXXXXX XXXX XX
 RH 0025 1100 JAB
 TYPE RHEOSTAT RH = Vitreous Rheostat
 WATTAGE 0025 = 25 Watts
 RESISTANCE 1100 = 1Ω
 SPECIAL FEATURE JAB = Screw Driver Shaft

RHEOSTAT OPTIONAL FEATURES

Shaft and Bushing Options
 Locking Devices
 How to Order Memcor Rheostats



PRECISION POTENTIOMETERS

PRODUCTS AVAILABLE FROM FACTORY STOCK
VOLUME PRODUCTION CAPABILITIES • HYBRID DESIGNS

IMPORTANT

The products shown on the next three pages are low cost precision conductive plastic potentiometers which are available from factory stock. These products are not sold through distributors. Deliveries range from a few days to two weeks.

The last two NEI pages show our custom design capabilities in wirewound and conductive plastic.

In both custom and standard products, NEI has volume production facilities capable of handling millions of units.

"HYBRID" PRECISION POTENTIOMETERS

Since 1958, NEI has been supplying precision potentiometers with either conductive plastic or wirewound elements, depending on each customer's requirements. Each type of element excels in certain characteristics. In general, wirewound elements have lower temperature coefficients of resistance, lower end voltages, and closer as-manufactured linearity. Conductive plastic elements have better resolution (virtually infinite); they can be trimmed to achieve superior linearities because of their infinite resolution; and the smoother surface and higher wear-resistance of the conductive plastic materials yield at least an order of magnitude superiority in mechanical life. (There are additional differences affecting performance and manufacturing cost, but they relate primarily to the design philosophies and manufacturing techniques of the various manufacturers.)

Usually, customer needs can be met by one or the other ... conductive plastic or wirewound technology. Occasionally, however, a requirement comes along which calls for performance characteristics achievable only by using a combination of the two technologies. Until fairly recently, this was not feasible, and the customer had to settle for the better of the two. Over the past few years, techniques have been developed which not only make this "hybrid" approach feasible, but could make it one of the most important developments in the history of potentiometers.

NEI's debut in the hybrid field involved certain types of

recorders and x-y plotters that had been using wirewound potentiometer elements for many years. The recorder manufacturers knew that conductive plastic elements would improve the performance of their instruments; however, replacement of the wirewound elements would have necessitated complete redesign of the span-adjusting circuits in the instruments, using active as well as passive elements. NEI developed a means of coating the wirewound elements with conductive plastic in such a way that the superior temperature coefficient characteristics of the wire were retained, while overall performance was improved through the infinite resolution and superior wear characteristics of the conductive plastic.

"Hybrid" elements have since been developed which combine the better features of each technology with virtually no degradation of performance from the better of the two. These elements yield combined performance characteristics which cannot be attained through any "pure" element technology.

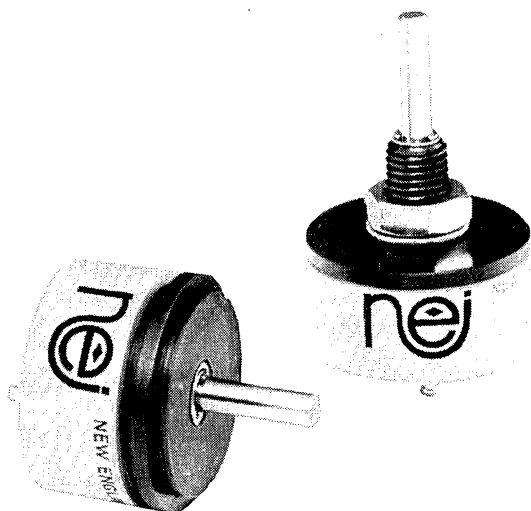
Currently, all "hybrid" elements are produced by coating the wiper path of a wirewound element with conductive plastic. The materials and geometries are usually chosen so that nearly all the current flows in the wirewound element, thereby yielding performance similar to that of "pure" wirewounds for most electrical characteristics except noise and resolution. Noise, resolution, and wear characteristics are similar to those for "pure" conductive plastic elements.



new england instrument company

KENDALL LANE • NATICK, MASS. 01760 • (617) 873-9711 • TWX: 710-360-0398

ECONOPOT® STANDARD CONDUCTIVE PLASTIC MODELS
7/8" DIAMETER • LOW COST • FROM FACTORY STOCK



BUSHING MOUNT

Technical drawing showing the side and rear views of a Bushing Mount. The side view includes the following dimensions and features:

- Top dimensions: $7/8 \pm 1/32$, $7/16$, and $3/8$.
- Left side dimensions: $1/248$ DIA., $1/245$ DIA., $A062$ DIA., and 200 DIA. MAX.
- Internal features: 042 MAX. and $1/64 \times 45$ CHAMFER.
- Bottom dimensions: $3/8-32$ NEF THD. (OPTIONAL), $1/4-32$ (NO PILOT), and 062 .
- Right side dimensions: $7/8$ DIA. and $1/8$.

The rear view shows a circular cross-section with a $45^\circ \pm 5^\circ$ chamfer and a $3/16$ R radius.

REAR VIEW OF REGULAR THREE TERMINAL UNIT

SERVO MOUNT

Technical drawing of a servo mount showing side and end views with dimensions.

Side View Dimensions:

- Top horizontal dimensions: $1/2$, $1/32$, 0.062 , 0.062 , $1/2$
- Left vertical dimensions: $.1248$, $.1245$ DIA., $.750$, $.749$ DIA.
- Internal vertical dimension: $1/64 \pm .45$ CHAMFER
- Right vertical dimensions: $7/8$ DIA., $.781$ DIA. MAX.
- Bottom horizontal dimension: $1/8$

End View Dimensions:

- Top radial dimension: $.5$
- Top angle: 45°
- Bottom radius: $3/16$ R

Unless otherwise specified

REAR VIEW OF
CENTER-TAPPED HOUSING

5 MILLION CYCLE LIFE • $\pm 10\%$ RESISTANCE • -65°C TO $+125^{\circ}\text{C}$
PRECISION BALL BEARINGS (SERVO MODELS)

MODEL NUMBER	OUTPUT SMOOTHNESS	INDEPENDENT LINEARITY (STANDARD)	TOTAL RESISTANCE $\pm 10\%$	PRICE (\$50 PCS. OR MORE)	CHARACTERISTICS — ALL MODELS	
					PARAMETER	VALUE
SERVO MODELS					Terms, definitions and test methods per VRCI standards unless otherwise specified.	
78ESA102	0.5%	1%	1K	\$13.60	Standard Total Resistance Values	1K, 5K, & 10K per table
78ESA502	0.5%	1%	5K	13.60	Standard Independent Linearity	1%, 0.5% & 0.25% per table
78ESA103	0.5%	1%	10K	13.60	Theoretical Electrical Travel	340°
78ESB102	0.25%	0.5%	1K	16.45	Standard Output Smoothness	0.5%, 0.25% & 0.15% per table
78ESB502	0.25%	0.5%	5K	16.45	Standard Life Expectancy	5,000,000 revolutions
78ESB103	0.25%	0.5%	10K	16.45	Resolution	Essentially infinite
78ESC102	0.15%	0.25%	1K	19.55	Standard End Voltage	1% maximum
78ESC502	0.15%	0.25%	5K	19.55	Standard Power Rating	1 watt @ 70°C, derated linearly to 0 @ 125°C
78ESC103	0.15%	0.25%	10K	19.55	Insulation Resistance	1000 Megohms min. @ 500 VDC
BUSHING MODELS					Dielectric Withstanding Voltage	750 volts rms
78EBA102	0.5%	1%	1K	11.55	Standard Torque	1.0 oz.-in. max. — bushing
78EBA502	0.5%	1%	5K	11.55	Weight	16 grams max. — servo
78EBA103	0.5%	1%	10K	11.55	Shock	Per MIL-STD-202, Method 205, condition C
78EBB102	0.25%	0.5%	1K	14.40	Vibration	Per MIL-STD-202, Method 205, condition C
78EBB502	0.25%	0.5%	5K	14.40	Operating Temperature	—65°C to +125°C
78EBB103	0.25%	0.5%	10K	14.40		
78EBC102	0.15%	0.25%	1K	17.50		
78EBC502	0.15%	0.25%	5K	17.50		
78EBC103	0.15%	0.25%	10K	17.50		

2 MILLION CYCLE LIFE • $\pm 20\%$ RESISTANCE • OILITE BEARINGS (SERVO MODELS)

CHARACTERISTICS — ALL MODELS					
MODEL NUMBER	OUTPUT SMOOTHNESS	INDEPENDENT LINEARITY (STANDARD)	TOTAL RESISTANCE ±20%	PRICE (500 Pcs. OR MORE)	PARAMETER VALUE
BUSHING MODELS					Terms, definitions and test methods per VRCI standards unless otherwise specified. Resistance Tolerance ±20% Standard Life Expectancy 2,000,000 revolutions Dielectric Withstanding Voltage 500 volts rms Bearings (Servo models) Oilite
78CBA102	0.5%	1%	1K	\$ 5.49	
78CBA502	0.5%	1%	5K	5.49	
78CBA103	0.5%	1%	10K	5.49	
78CBB102	0.25%	0.5%	1K	8.75	
78CBB502	0.25%	0.5%	5K	8.75	
78CBB103	0.25%	0.5%	10K	8.75	
SERVO MODELS					ALL OTHER SPECIFICATIONS ARE AS SHOWN FOR THE ORIGINAL HIGH RELIABILITY ECONOPOT® (SEE ABOVE).
78CSA102	0.5%	1%	1K	7.60	
78CSA502	0.5%	1%	5K	7.60	
78CSA103	0.5%	1%	10K	7.60	
78CSB102	0.25%	0.5%	1K	9.75	
78CSB502	0.25%	0.5%	5K	9.75	
78CSB103	0.25%	0.5%	10K	9.75	
78CSC102	0.15%	0.25%	1K	12.25	
78CSC502	0.15%	0.25%	5K	12.25	
78CSC103	0.15%	0.25%	10K	12.25	



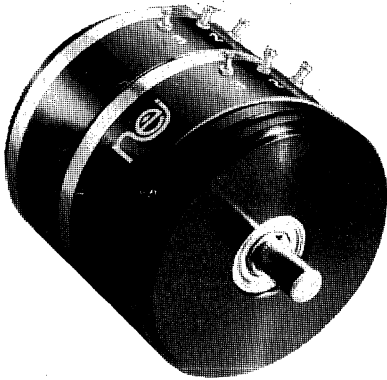
new england instrument company

KENDALL LANE • NATICK, MASS. 01760 • (617) 873-9711 • TWX: 710-360-0398



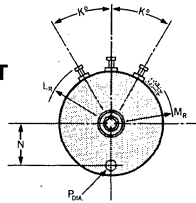
PRECISION POTENTIOMETERS

ECONOPOT® MKII STANDARD CONDUCTIVE PLASTIC MODELS
6 DIAMETERS • GANGABLE • LOW COST • FROM FACTORY STOCK

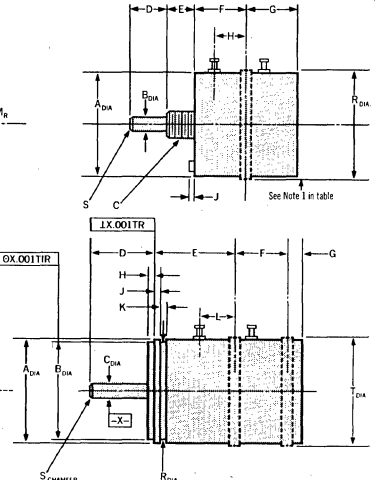
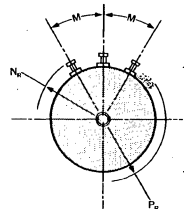


ALL MODELS FEATURE NEI's
RESISTOFILM™ (PATENT #3,457,537)

**BUSHING MOUNT
 MODELS
 (MOUNTING
 HARDWARE
 SUPPLIED)**



**SERVO MOUNT
 MODELS
 (PRECISION
 BALL BEARINGS)**



HOUSING DIAMETER (INCHES)	MODEL NUMBER	MOUNTING TYPE	RANGE OF RESISTANCE ±10%	STANDARD INDEPENDENT LINEARITY (±%)	POWER RATING (WATTS)	GENERAL SPECIFICATIONS	VALUE
						PARAMETER	
0.500	50 BF	Bushing	1K-20K	1 and 0.5	0.5	Theoretical Travel	340°
0.500	50 SF	Servo	1K-20K	1 and 0.5	0.5	Electrical Overtravel	5° min. each end
0.750	34 BF	Bushing	1K-50K	1 and 0.5	0.7	End Voltage	1.5% max.
0.750	34 SF	Servo	1K-50K	1 and 0.5	0.7	Dielectric Withstanding Voltage	1000 V rms
0.875	78 BF	Bushing	1K-50K	1, 0.5, 0.25	1.0	Travel Resolution	virtually infinite
0.875	78 SF	Servo	1K-50K	1, 0.5, 0.25	1.0	Output Smoothness	0.125% (MIL-R-39023)
1.062	116 SF	Servo	1K-50K	1, 0.5, 0.25	1.0	Standard Life Expectancy	10 Million Revolutions
1.250	114 BF	Bushing	1K-50K	1, 0.5, 0.25	1.0	Mechanical Travel	360° continuous
1.437	176 SF	Servo	1K-100K	1, 0.5, 0.25	2.0	Starting Torque (servo models)	1st cup-0.5 oz.-in. max. Ea. add'l cup-0.3 oz.-in. max.
2.000	200 BF	Bushing	1K-100K	1, 0.5, 0.25	2.0		
2.000	200 SF	Servo	1K-100K	1, 0.5, 0.25	2.0		

DIMENSIONS — BUSHING MODELS

TYPE	A ±.005	B +.0000 -.0003	C CL2 THD.	D ±.030	E ±.015	F MAX.	G MAX.	H ±.005	J MAX.	K ±2°	L MAX.	M MAX.	N ±.005	P ±.003	**R MAX.	S CHAMFER ±.010 ±5°
50	.500	.1248	1/4x32	3/8	3/8	.562	.510	.250	.062	30°	.550	.530	.281	.062	.770	1/4x45°
34	.750	.1248	1/4x32	3/8	3/8	.562	.510	.250	.062	30°	.550	.530	.281	.062	.770	1/4x45°
78	.875	.1248	1/4x32	3/8	3/8	.727	.510	.355	.062	30°	.605	.605	.312	.062	.900	1/4x45°
114	1.250	.2498	3/8x32	3/8	3/8	.855	.800	.500	.062	30°	.818	.850	.531	.093	1.320	1/2x45°
200	2.000	.2498	3/8x32	3/8	3/8	1.000	.960	.685	.067	25°	1.165	1.152	.531	.125	2.000	1/2x45°

DIMENSIONS — SERVO MODELS

TYPE	A ±.005	B +.0000 -.0005	C +.0000 -.0003	D ±.030	E MAX.	F MAX.	*G MAX.	H ±.005	J ±.005	K MIN.	L ±.015	M ±2°	N MAX.	P MAX.	R MAX.	S ±.010 ±5°	**T MAX.
50	.500	.4375	.1248	.500	.500	.500	.145	.062	.062	.007	.250	30°	.550	.530	.630	.015x45°	.770
34	.750	.625 .624	.1248	.500	.625	.505	.145	.062	.062	.007	.250	30°	.550	.530	.630	.015x45°	.770
78	.875	.750 .749	.1248	.625	.790	.505	.145	.062	.062	.057	.355	30°	.605	.605	.781	.015x45°	.900
116	1.062	.9688	.1248	.625	.790	.505	.145	.062	.062	.057	.355	25°	.680	.680	.975	.015x45°	1.090
176	1.437	1.3125	.2498	.625	.910	.505	.201	.062	.062	.088	.355	20°	.910	.910	1.312	.030x45°	1.472
200	2.000	1.8750	.2498	.625	.910	.505	.201	.062	.093	.088	.355	15°	1.170	1.152	1.875	.030x45°	2.000

TYPE NO.

MODEL

RESISTOFILM

NO. OF CUPS

LIN. TOL.

RESISTANCE

ORDERING INFORMATION

Type shown would be a 7/8" servo
 mount single cup with 0.5 linearity
 having a resistance value of 10,000Ω

78

S

F

1

B

103

116 = 1 1/8"
 176 = 1 3/4"

S = SERVO
 B = BUSHING

A = ±1%
 B = ±0.5%
 C = ±0.25%

Resistance (Ohms)

1,000 = 102 25,000 = 253
 5,000 = 502 50,000 = 503
 10,000 = 103 100,000 = 104



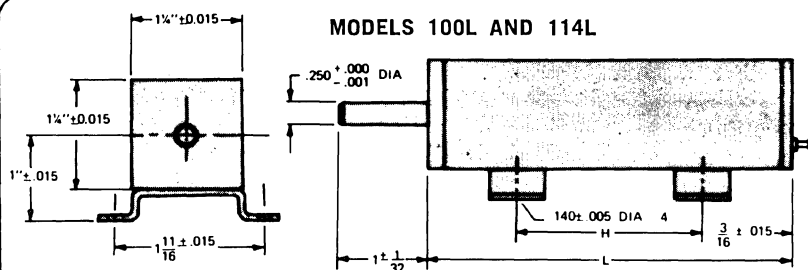
new england instrument company

KENDALL LANE • NATICK, MASS. 01760 • (617) 873-9711 • TWX: 710-360-0398

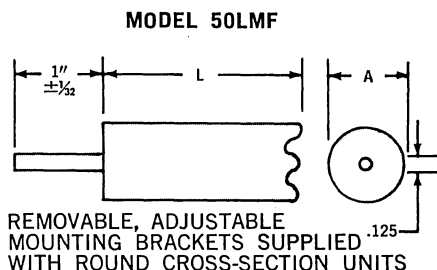


PRECISION POTENTIOMETERS

ECONOPOT® STANDARD LINEAR MOTION MODELS
CONDUCTIVE PLASTIC UNITS FEATURING NEI's RESISTOFILM™



MODELS 100L AND 114L



MODEL 50LMF

MODEL	ELECTRICAL STROKE, E	MECHANICAL STROKE, M	A	B	C	H	L
100L	SPECIFY (UP TO 30")	E + 3/32"	1"	7/8"	1 1/4"	E + 1"	E + 3"
114L	SPECIFY (UP TO 30")	E + 3/32"	1 1/4"	1"	1 1/4"	E + 1"	E + 3"
50LMF	SPECIFY (UP TO 6")	E + 3/32"	1/2"	N.A.	N.A.	N.A.	E + 2"

ELECTRICAL

Resistance per inch of stroke length: 50K ohms per inch maximum
 Stroke length, Standard: up to 30"
 Special: up to 100"
 Number of Elements: single or dual
 Total Resistance Tolerance: ±10%
 Independent Linearity, Standard: ±1%
 Special: ±0.1% (for stroke lengths over 4")
 Power Rating: 0.5 watts per inch stroke at 25°C
 Resolution: essentially infinite
 Insulation Resistance: 1000 megohms minimum

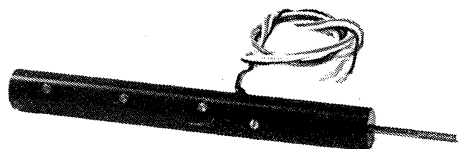
SPECIFICATIONS

Case Width, Standard: 1" or 1 1/4" square & 1/2" O.D. round
 Starting Torque: 4 oz.-in.
 Taps: available (specify location & type i.e.: current or voltage)
 Mounting: flanges or brackets available
 Connectors: available

Note: The shaft can be rotated without detrimental effect to the unit.

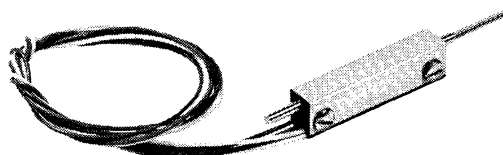
MECHANICAL

OTHER LINEAR MOTION DESIGNS AVAILABLE



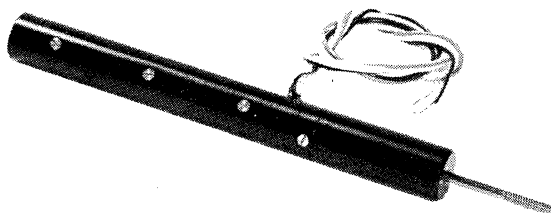
HIGH RELIABILITY DUAL-ELEMENT UNITS

Originally designed to be a rocket propellant valve position monitor, this unit has two potentiometer elements (one for control and one for telemetry), plus a single-pole double-throw switch. Linearity tolerance is only ±0.001" and position reference must be maintained after repeated linear shaft accelerations of 3000 G's. 24 were used in each rocket.



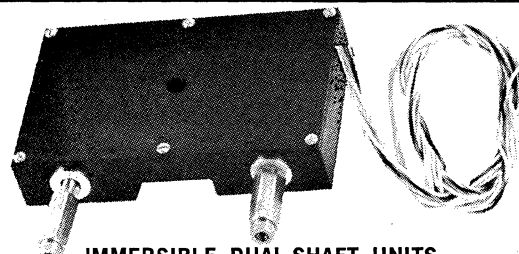
MINIATURE DOUBLE-ENDED UNITS

LMFL-101 Dimensions: 1/4"W x 5/16"D x 1 1/4"L. This conductive plastic design features a double-ended shaft extension and can be actuated from either end, sensing a stroke length of 0.18". High accuracy, long life and infinite resolution characterize this unit. Total resistance is 10K ohms.



WIREWOUND ROUND CROSS-SECTION UNITS

LMWS-205 This wirewound unit is typical of linear motion units designed to meet specific configuration requirements. It features a precisely located center tap, a resistance of 2K ohms ±5%, 0.1% resolution, and an absolute linearity of 0.5%. Mechanical stroke length is 2".



IMMERSIBLE DUAL-SHAFT UNITS

LMFT-121 Dimensions: 1 3/4"L x 2 7/8"W x 1/2"D. This unique package was designed specifically for total immersion in water. It features two separate elements independently actuated. Both are center tapped, with leads provided. Total resistance is 5K ohms with 1% accuracy and 3/4" stroke length.



new england instrument company

KENDALL LANE • NATICK, MASS. 01760 • (617) 873-9711 • TWX: 710-360-0398



PRECISION POTENTIOMETERS

CUSTOM DESIGNS
SINGLE-TURN PRECISION CONDUCTIVE PLASTIC

1/2" DIAMETER
55FT SERIES

3/4" DIAMETER
34FT SERIES

7/8" DIAMETER
78FT SERIES

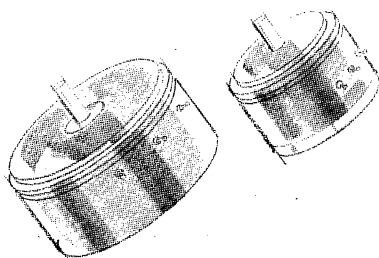
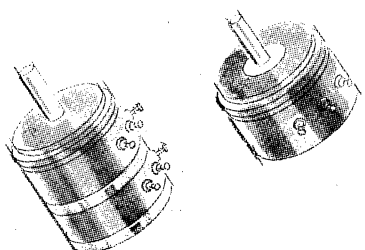
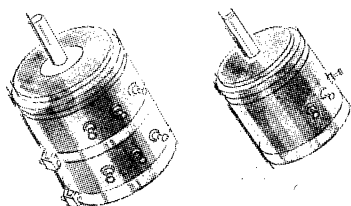
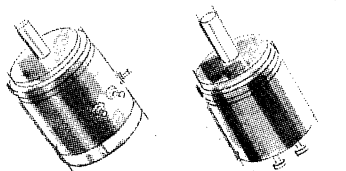
1 1/8" DIAMETER
116FT SERIES

1 1/4" DIAMETER
176FT SERIES

1 5/8" DIAMETER
158FT SERIES

2" DIAMETER
200FT SERIES

3" DIAMETER
300FT SERIES



- LINEAR OR NONLINEAR FUNCTIONS
- MULTIPLE TAPS AVAILABLE
- SINGLE OR MULTI-CUP UNITS
- SERVO OR BUSHING MOUNTS
- AVAILABLE WITH SPRING RETURNS, STOPS, SWITCHES, MOTORS, ETC. DESIGNED IN

GENERAL SPECIFICATIONS — CONDUCTIVE PLASTIC

Resistance Tolerance

Standard: $\pm 10\%$

Theoretical Electrical Travel

Standard: 340°

Ambient Temperature Range

Standard: -55°C to $+150^\circ\text{C}$

Travel Resolution

Essentially infinite

Bearings

Stainless steel ball bearings are standard.

Mechanical Rotation

Normally continuous; however, stops are available.

Life

50 million revolutions

SERIES	DIAMETER	NOMINAL RESISTANCE RANGE	NOMINAL POWER RATING	MAXIMUM STARTING TORQUE	NOMINAL ACCURACY
55 FT	1/2"	1K to 10K	0.5W @ 25°C	0.35 oz.-in.	$\pm 1.0\%$
34 FT	3/4"	1K to 20K	1.0W @ 25°C	0.35 oz.-in.	$\pm 0.75\%$
78 FT	7/8"	1K to 25K	1.0W @ 25°C	0.35 oz.-in.	$\pm 0.75\%$
116 FT	1 1/8"	1K to 50K	1.0W @ 25°C	0.35 oz.-in.	$\pm 0.5\%$
176 FT	1 1/4"	1K to 75K	1.5W @ 25°C	0.50 oz.-in.	$\pm 0.5\%$
158 FT	1 5/8"	1K to 75K	2.0W @ 25°C	0.50 oz.-in.	$\pm 0.5\%$
200 FT	2"	1K to 100K	3.0W @ 25°C	0.75 oz.-in.	$\pm 0.3\%$
300 FT	3"	1K to 100K	5.0W @ 25°C	1.0 oz.-in.	$\pm 0.25\%$

VALUES SHOWN ABOVE ARE NOMINAL. FOR SPECIFIC REQUIREMENTS, REFER TO NEI'S COMPLETE CATALOG OR CONTACT OUR APPLICATIONS ENGINEERING DEPARTMENT.

WAFERPOT™ SINGLE-TURN PRECISION CONDUCTIVE-PLASTIC POTENTIOMETERS

(LINEAR & NONLINEAR FUNCTION POTENTIOMETERS SPECIFICALLY DESIGNED FOR HIGH-DENSITY PACKAGING)

		MODEL 116 FT	MODEL 176 FT	MODEL 200 FT
MECHANICAL	Body Diameter	1 1/8"	1 1/4"	2"
	Length (single cup only)	.680	.680	.680
TYPICAL SPECIFICATIONS	Length each additional cup	.200	.200	.200
	Starting Torque	.35 oz.-in. max.	.50 oz.-in. max.	.75 oz.-in. max.
ELECTRICAL	(per cup, additional)	.25 oz.-in. max.	.35 oz.-in. max.	.50 oz.-in. max.
	Standard Resistance Values	1 K to 50K	1K to 75K	1K to 100K
	Standard Resistance Tolerance	$\pm 10\%$	$\pm 10\%$	$\pm 10\%$
	Standard Accuracy	$\pm 0.5\%$	$\pm 0.5\%$	$\pm 0.3\%$
	Travel Resolution (essentially infinite for all models)			
	Electrical Function Angle	$340^\circ \pm 5^\circ$	$340^\circ \pm 5^\circ$	$340^\circ \pm 5^\circ$
	Power Rating @ 25°C	1.0 watt	1.5 watts	3.0 watts
	(derates linearly to 0 watts @ 125°C)			



new england instrument company

KENDALL LANE • NATICK, MASS. 01760 • (617) 873-9711 • TWX: 710-360-0398



PRECISION POTENTIOMETERS

CUSTOM DESIGNS
SINGLE-TURN PRECISION WIREWOUND TYPES

RELATIVE MERITS OF CONDUCTIVE PLASTIC AND WIREWOUND

The major advantages of conductive plastic potentiometers over wirewounds are infinite resolution and longer life. In most other respects, the two types are comparable. NEI has made it a strong point over the years to maintain **balanced** capability in conductive plastic and wirewound potentiometers. Each has its advantages in given applications, and NEI is the **only** company that can objectively recommend and supply either type.

GENERAL SPECIFICATIONS — WIREWOUND

Resistance Tolerance

Standard: $\pm 5\%$

Theoretical Electrical Travel

Standard: 340°

Ambient Temperature Range

Standard: -55°C to $+125^\circ\text{C}$

Special: -55°C to $+150^\circ\text{C}$

Bearings

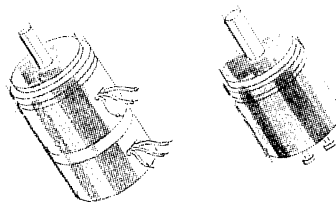
Stainless steel ball-bearings are standard.

Mechanical Rotation

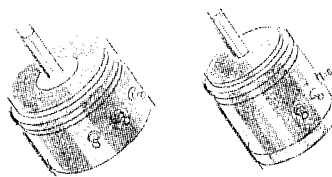
Normally continuous; however, stops are available.

SERIES	DIAMETER	NOMINAL RESISTANCE RANGE	NOMINAL POWER RATING	MAXIMUM STARTING TORQUE	NOMINAL ACCURACY
55W	1/2"	100 Ω to 50K	2W @ 25°C	0.5 oz.-in.	$\pm 3.0\%$
34W	3/4"	100 Ω to 100K	2W @ 25°C	0.45 oz.-in.	$\pm 2.0\%$
78W	7/8"	100 Ω to 150K	2.5W @ 25°C	0.4 oz.-in.	$\pm 1.0\%$
116W	1 1/4"	100 Ω to 150K	3W @ 25°C	0.4 oz.-in.	$\pm 0.75\%$
176W	1 3/8"	100 Ω to 250K	3W @ 25°C	0.5 oz.-in.	$\pm 0.5\%$
158W	1 5/8"	500 Ω to 350K	3.5W @ 25°C	0.65 oz.-in.	$\pm 0.5\%$
200W	2"	500 Ω to 500K	4W @ 25°C	0.80 oz.-in.	$\pm 0.40\%$
300W	3"	500 Ω to 750K	6W @ 25°C	1.0 oz.-in.	$\pm 0.25\%$

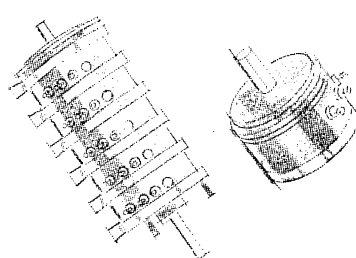
VALUES SHOWN ABOVE ARE NOMINAL. FOR SPECIFIC REQUIREMENTS, REFER TO NEI'S COMPLETE CATALOG OR CONTACT OUR APPLICATIONS ENGINEERING DEPARTMENT.



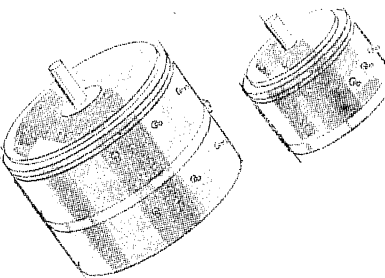
1/2" DIAMETER
55W SERIES



3/4" DIAMETER
34W SERIES



7/8" DIAMETER
78W SERIES



1 1/4" DIAMETER
116W SERIES

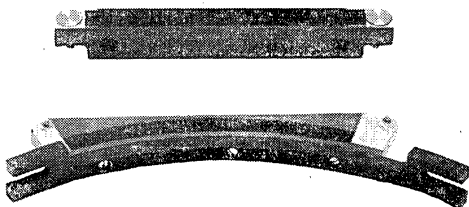
1 3/8" DIAMETER
176W SERIES

1 5/8" DIAMETER
158W SERIES

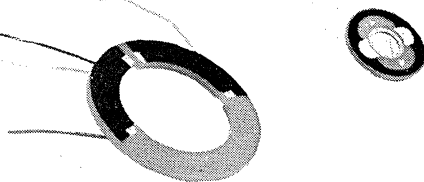
2" DIAMETER
200W SERIES

3" DIAMETER
300W SERIES

WIREWOUND & CONDUCTIVE PLASTIC ELEMENTS & ASSEMBLIES



- LINEAR MOTION
- ROTARY MOTION
- LINEAR FUNCTIONS
- NONLINEAR FUNCTIONS
- SECTOR OR FULL 360°
- ELEMENTS INSTALLED IN YOUR SPECIAL ASSEMBLIES & FULLY TESTED IN OUR ENVIRONMENTAL LABORATORY



new england instrument company

KENDALL LANE • NATICK, MASS. 01760 • (617) 873-9711 • TWX: 710-360-0398



MINELCO

DIVISION OF GENERAL TIME

A TALLEY INDUSTRIES COMPANY

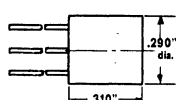
135 SOUTH MAIN STREET ■ THOMASTON, CONNECTICUT 06787 ■ PHONE 203-283-8261 ■ TWX 710-475-1091

Minelco Miniature Trimmer Potentiometers

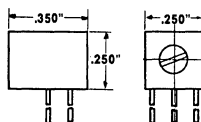
Minelco Miniature Trimmers are recognized as the smallest potentiometers in the world. They are available in a variety of mountings, termination and adjusting styles, and satisfy most installation requirements. They meet all applicable

environmental specifications for military systems.

Because of their small size, lightness of weight, sturdy construction and high reliability, these potentiometers lend themselves to airborne and space exploration applications.



Model MP2



Model MP5

Models MP2 and MP5 WIREWOUND

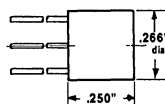
Designed for printed circuit mounting and utilize a precious metal alloy wiper. Both are single turn units that rotate 360 degrees mechanically, are O-Ring sealed and humidity sealed. Standard resistance values range from 20 to 15K ohms.

Model MP2 is a top adjustment trimmer.

Model MP5 offers right angle adjustment.

See Bulletin TP-11 for detailed specifications.

**Model MF2
Model MF2S**



Models MF2 and MF2S METAL FILM

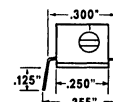
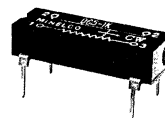
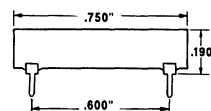
These Metallic Film Trimmers are designed for printed circuit use. They are the smallest trimmer available incorporating the following features in a micro-miniature package: infinite resolution, temperature coefficient <100 ppm, 10 to 100K ohms standard resistance values, and a .250" x .270" size.

Model MF2 rotates 360° continuous.

Model MF2S rotates 300° with stop.

See Bulletin MF2 and MF2S for detailed specifications.

**Model DC5
Model DW5**



Models DC5 and DW5 CERMET and WIREWOUND

Cermet and Wirewound trimmer pots can be manually or automatically inserted. They are sealed against humidity, liquids, potting and soldering compounds. Operating temperatures range from -55°C to +125°C, with a T.C. of 50 ppm/°C on Wirewound and 100 ppm/°C on Cermet. Standard resistance range: 10 to 2 megohms. Designed with stand-off for more efficient circuit board cleaning.

See Bulletins TP14 and TP15 for detailed specifications.

More Miniature Trimmer Potentiometers

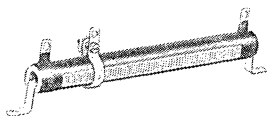
— wirewound — single turn — 20 to 25K ohms — 1/4 to 3/4 watt

See Bulletin P-67
for detailed specifications.

Model No.	PC1	PC2	MS1	MS2	MS4	MS5	MS7	MS37
Applications All models meet applicable military specifications except where noted.	Potted circuits. Insulated-board mounting. Become fixed resistor after potting. Stud mount.	Potted circuits. Printed-circuit mounting. Becomes fixed resistor after potting.	General purpose. Rear chassis, panel or board mounting. Vertical adjustment.	General purpose. Printed-circuit mounting. Vertical adjustment.	General purpose. Chassis, board mounting. Horizontal adjustment.	General purpose. Printed-circuit mounting. Horizontal adjustment.	General purpose. Front panel or chassis mounting. Vertical adjustment.	High power. Chassis, panel or board mounting. Vertical adjustment.
	 L .250" Dia .250"	 L .250" Dia .250"	 L .305" Dia .250"	 L .335" Dia .250"	 H&W .250" L .375"	 H&W .250" L .375"	 L .545" Dia .250"	 L .475" Dia .375"

OHMITE® dividohm® type 210 adjustable vitreous enameled resistors

SERIES 210



"Dividohm" resistors make ideal voltage dividers for original equipment and replacement in transmitters, rectifiers and other apparatus. Such tapped "bleeders" are made by using one or more adjustable lugs, as required. "Dividohms" are also handy for obtaining odd resistance values, for adjusting circuits, and for use on equipment which must be set to meet various line voltages.

"Dividohm" resistors are vitreous enameled resistors on which a narrow strip has been left uncovered to expose a portion of each turn. Contact to any wire in this strip is made by an embossed contact on the adjustable lug (supplied).

WATT RATING: The stated wattage rating applies only when the entire resistance is in the circuit. When the adjustable lug is set at an intermediate point, the wattage rating is reduced in approximately the same proportion, i.e., if the lug is set at half the resistance, the wattage is reduced by one-half. A safe rule to follow is to make sure that the maximum rated current is not exceeded. This should be carefully checked particularly if the resistor will be used as a voltage divider with several adjustable lugs. Resistance tolerance is $\pm 10\%$ for the total resistance value.

12 WATT		25 WATT		50 WATT		75 WATT		100 WATT		175 WATT		225 WATT	
Core: $1\frac{1}{2} \times \frac{3}{4} \times \frac{1}{8}$ " D. Mtg. Ctr: $2\frac{3}{4}$ " Av. Wt. .02 lb. Std. Mtg. Brkt.* No. 5		Core: $2 \times \frac{3}{4} \times \frac{1}{8}$ " D. Mtg. Ctr: $2\frac{3}{4}$ " Av. Wt. .05 lb. Std. Mtg. Brkt.* No. 9		Core: $4 \times \frac{3}{4} \times \frac{1}{8}$ " D. Mtg. Ctr: $4\frac{3}{4}$ " Av. Wt. .09 lb. Std. Mtg. Brkt.* No. 9		Core: $6 \times \frac{3}{4} \times \frac{1}{8}$ " D. Mtg. Ctr: $7\frac{3}{4}$ " Av. Wt. .15 lb. Std. Mtg. Brkt.* No. 9		Core: $8 \times \frac{3}{4} \times \frac{1}{8}$ " D. Mtg. Ctr: $9\frac{3}{4}$ " Av. Wt. .20 lb. Std. Mtg. Brkt.* No. 12		Core: $8 \times \frac{1}{2} \times \frac{1}{8}$ " D. Mtg. Ctr: $9\frac{3}{4}$ " Av. Wt. .50 lb. Std. Mtg. Brkt.* No. 18		Core: $10 \times \frac{1}{2} \times \frac{1}{8}$ " D. Mtg. Ctr: $11\frac{3}{4}$ " Av. Wt. .62 lb. Std. Mtg. Brkt.* No. 18	
Resist. Ohms	Catalog Max. No.1 Amps.	Catalog Max. No.1 Amps.	Catalog Max. No.1 Amps.	Catalog Max. No.1 Amps.	Catalog Max. No.1 Amps.	Catalog Max. No.1 Amps.	Catalog Max. No.1 Amps.	Catalog Max. No.1 Amps.	Catalog Max. No.1 Amps.	Catalog Max. No.1 Amps.	Catalog Max. No.1 Amps.	Catalog Max. No.1 Amps.	Catalog Max. No.1 Amps.
1	1001 3.46	0360 5.00	0560A 7.07	0769A 8.66	0956A 10.0	1156A 13.2	1356A 15.00						
2	1002 2.45	0360B 3.54	0560B 5.00	0769B 6.12	0956B 7.07	1156B 9.35	1356B 10.60						
3	1003 2.00	0361 2.88	0560C 4.07	0769C 5.00	0956C 5.77	1156C 7.63	1356C 8.67						
4			0560D 3.53	0769D 4.33	0956D 5.00	1156D 6.60	1356D 7.50						
5	1004 1.54	0362 2.24	0560 3.16	0769 3.87	0956 4.47	1156 5.92	1356 6.72						
7.5	1005 1.26	0362B 1.82											
10	1006 1.09	0363 1.58	0561 2.23	0770 2.74	0957 3.16	1157 4.18	1357 4.74						
15	1007 .89	0364 1.29											
20	1008 .77	0364B 1.12											
25	1009 .69	0365 1.00	0562 1.41	0772 1.73	0958 2.00	1158 2.64	1358 3.00						
50	1010 .49	0366 .71	0563 1.00	0773 1.22	0959 1.41	1159 1.87	1359 2.12						
75	1011 .40	0367 .58	0564 .82										
100	1012 .34	0368 .50	0565 .71	0774 .86	0960 1.00	1160 1.32	1360 1.50						
150	1013 .28	0369 .41	0566 .58										
200	1014 .24	0370 .35	0567 .50	0774B .61									
250	1015 .22	0371 .32	0568 .45	0775 .55	0960B .63	1160B .84	1360B .95						
300	1016 .20	0371B .29	0568B .41	0775B .50									
350	1017 .18												
400	1018 .17	0371C .25	0568C .35	0775C .43									
500	1019 .15	0372 .22	0569 .32	0776 .39	0961 .45	1161 .59	1361 .67						
600	1020 .14												
750	1021 .13	0373 .18	0570 .26	0777 .32									
800	1022 .12	0374 .17	0571 .25	(0777B) .30									
1000	1023 .11	0375 .16	0572 .22	0778 .27	0962 .32	1162 .42	1362 .47						
1250	1024 .098	0375B .14	0572B .20	0778B .24									
1500	1025 .089	0376 .13	0573 .18	0779 .22	0962B .26	1162B .34	1362B .39						
2000	1026 .077	0377 .12	0574 .16	0780 .19									
2250	1027 .073	0377B .11	(0574B) .15	(0780B) .18									
2500	1028 .069	0378 .10	0575 .14	(0781) .17	0963 .20	1163 .26	1363 .30						
3000	1029 .063	0379 .091	0576 .13	(0781B) .16									
3500	1030 .058	0380 .084	0576B .12	(0782) .15									
4000	1031 .055	0381 .079	0577 .11	0782B .14									
4500	1032 .052	0381B .074	0577B .10	(0782C) .13									
5000	1033 .049	0382 .070	0578 .10	0783 .12	0964 .14	1164 .19	1364 .21						
6000	1034 .045	0383 .064	0578B .091	(0783B) .11									
7000	1035 .042	0383B .060	0578C .084	(0783C) .10									
7500	1036 .040	0384 .057	0579 .081	(0784) .10									
8000	1037 .039	0384B .055	0580 .079	(0784B) .096									
8500	(1038) .037												
9000	1039 .036	0384C .052	(0580B) .074	(0784C) .091									
10000	1040 .035	0385 .050	0581 .071	0785 .086	0965 .10	1165 .13	1365 .15						
12000		0386 .042	0582 .064	(0785B) .079									
15000		0387 .036	0583 .057	(0786) .070	0966 .081	(1166) .11	1366 .13						
20000		0388 .031	0584 .050	(0787) .061	0967 .071	(1167) .094	1367 .11						
25000		0389 .028	0585 .045	0788 .054	0968 .063	(1168) .083	1368 .095						
30000			0586 .036	(0789) .050	(0969) .058	(1169) .076	(1369) .087						
35000													
40000			0587 .029	(0790) .046									
45000				(0791) .043	0970 .050	(1170) .066	1370 .075						
50000			0588 .026	(0792) .035									
60000			(0589) .024	(0793) .033	0971 .045	(1171) .059	1371 .067						
75000				(0794) .030	(0972) .032	(1172) .048	1372 .055						
80000			0590 .021	(0795) .026									
100000			0591 .018	(0796) .023	0973 .028	1173 .042	1373 .047						

* Mounting brackets are automatically supplied in individual unit packs; supplied only when specified in bulk packs.

† Popular items appear in BOLD print and are usually in stock at authorized Ohmite stocking distributors. Items in LIGHT FACE print are available from stocking distributors but are not normally stocked in depth. Parentheses indicate non-stock standard items subject to a minimum handling charge per item.

adjustable lugs

One "Screw Driver Type Adjustable Lug" is supplied with each unit. Lugs with a silver contact button can be ordered from the table shown below.

MOVING THE LUGS: Lugs always should be loosened completely before

moving and not moved except while the current is off, in order to protect the exposed wire from mechanical or electrical injury and to protect the operator from dangerous voltages.

STANDARD

Core Diam. Inches	Screw Driver Type		Bakelite Knob Type	
	New Cat. No.	Old Cat. No.	New Cat. No.	Old Cat. No.
$\frac{3}{16}$	2115	1058	—	—
$\frac{1}{8}$	2121	0358	2122	0359
$\frac{3}{16}$	2125	1958	2126	1959
$\frac{1}{4}$	2133	2158	2134	2159

With SILVER CONTACT BUTTONS

Core Diam. Inches	Screw Driver Type		Bakelite Knob Type	
	New Cat. No.	Old Cat. No.	New Cat. No.	Old Cat. No.
$\frac{3}{16}$	2116	2161	—	—
$\frac{1}{8}$	2123	2164	2124	2165
$\frac{3}{16}$	2127	2166	2128	2167
$\frac{1}{4}$	2135	2170	2136	2171

This adjustable lug, while is illustrated at left, features two advantages — ease of adjustment and less chance of damaging the resistance wire while moving lugs. Available for $\frac{1}{8}$ " cores. Catalog No. 2160

OHMITE® vitreous enameled rheostats (potentiometers)

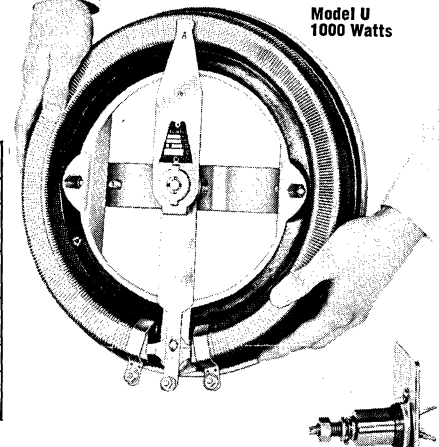
Now, Ohmite offers TWELVE sizes in its line of famous rheostats.

In all Ohmite rheostats, the resistance wire is wound on a solid ceramic core. The turns are locked in place with tough, protective vitreous enamel or Ohmicone® silicone ceramic. Pivoted, universal action mounting of the brush, assures perfect contact. Metal-graphite contact brushes, varied to fit current and resistance, insure good contact with negligible wear of the wire. Terminals at each end of the winding permit connection of the unit as a potentiometer.



Model C
7½ Watts

NOW, FOR ITS RATING,
INDUSTRY'S SMALLEST
RHEOSTAT!



Model U
1000 Watts

Dimensions and Other Parameters	Mod. C Encl.	Model E Unencl. Encl.	Model H	Model J	Model G	Model K	Model L	Model P	Model N	Model R	Model T	Model U
Rated Watts	7½	12½	25	50	75	100	150	225	300	500	750	1000
Resistance Range - Ohms	10 to 5,000	1 to 15,000	1 to 25,000	0.5 to 50,000	0.5 to 50,000	0.5 to 50,000	0.5 to 50,000	1 to 30,000	1 to 50,000	1 to 20,000	1 to 15,000	1 to 20,000
Overall Diameter	.515	7/8	1¼	1½	2½	2¾	3¼	4	5	6	8	10
Overall Depth Behind Panel	7/8	1½	1¾	1¾	1¾	1¾	1¾	2	2½	2¾	3	3
Weight - Lbs.	.017	.037	.053	0.19	0.32	0.52	0.64	1.1	2	2.6	4	7.6
Mtg. Centers (Dimension "M")	(Single-Hole Mounting)							7/8	1¾	1½	1¾	3

MODEL "C" — 7½ WATT* — STANDARD & LOCKING SHAFT

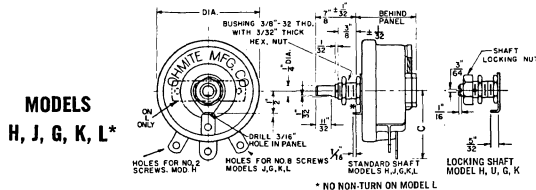
Ohms	Amps	Standard Shaft Catalog No.†	Locking Shaft Catalog No.†	Ohms	Amps	Standard Shaft Catalog No.†	Locking Shaft Catalog No.†
10	.86	4908	4948	250	.17	4917	(4957)
15	.71	4909	(4949)	350	.15	4918	4958
25	.55	4910	(4950)	500	.12	4919	(4959)
35	.46	(4911)	(4951)	750	.10	(4920)	(4960)
50	.39	4912	(4952)	1000	.086	4921	4961
75	.32	(4913)	(4953)	1500	.071	(4922)	(4962)
100	.27	4914	4954	2500	.055	(4923)	4963
150	.22	(4915)	(4955)	3500	.046	(4924)	(4964)
200	.19	4916	(4956)	5000	.039	4925	4965

*Rating on metal panel — unit is silicone-ceramic coated.

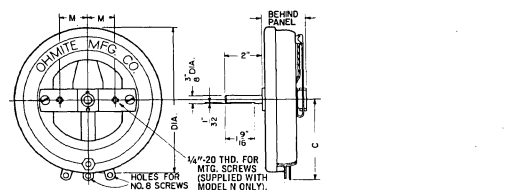
MODEL "E" — 12½ WATT* — UNENCLOSED & ENCLOSED

				Unenclosed				Enclosed			
Total Ohms	Max. Amps	Steps Appr.	Std. Shaft Cat. No.†	Locking Shaft Cat. No.†	Std. Shaft Cat. No.†	Total Ohms	Max. Amps	Steps Appr.	Std. Shaft Cat. No.†	Locking Shaft Cat. No.†	Std. Shaft Cat. No.†
1	3.53	32	0101	L0101	(W0101)	175	.27	146	0114	L0114	(W0114)
2	2.50	28	0102	L0102	(W0102)	200	.25	132	0114A	L0114A	(W0114A)
2.5	2.24	31	(0102A)	(L0102A)	(W0102A)	250	.22	128	0115	L0115	(W0115)
3	2.04	33	0103	L0103	(W0103)	350	.19	149	0116	L0116	(W0116)
5	1.58	61	0103A	L0103A	(W0103A)	500	.16	213	0117	L0117	(W0117)
6	1.44	58	0104	L0104	(W0104)	750	.13	193	0118	L0118	(W0118)
8	1.25	61	0105	L0105	(W0105)	1,000	.11	257	0119	L0119	(W0119)
10	1.12	76	0106	L0106	(W0106)	1,500	.091	255	0120	L0120	(W0120)
15	.91	64	0107	L0107	(W0107)	2,500	.071	277	0121	L0121	(W0121)
25	.71	67	0108	L0108	(W0108)	3,500	.060	313	0122†	L0122†	(W0122)†
35	.60	73	0109	L0109	(W0109)	5,000	.050	355	0123†	L0123†	(W0123)†
50	.50	83	0110	L0110	(W0110)	7,500	.041†	299	0190†	L4190†	(W4190)†
75	.41	101	0111	L0111	(W0111)	10,000	.035†	398	0191†	L4191†	(W4191)†
100	.35	106	0112	L0112	(W0112)	12,500	.031†	434	(0192)†	(L4192)†	(W4192)†
125	.32	132	0113	L0113	(W0113)	15,000	.029†	521	(0193)†	L4193†	(W4193)†
150	.29	125	0113A	L0113A	(W0113A)						

*Rating on metal panel. †Silicone-ceramic coating. ‡7.5KΩ = 305V. max; 10KΩ, 12.5KΩ, and 15KΩ = 350V. max.



MODELS
P, N, R, T, U



25 WATT MODEL "H" — UL Listed

Locking Shaft	Std. Shaft	Total Ohms	Max. Amps	Steps Appr.
L0140	0140	1	5.000	30
L0141	0141	2	3.540	30
L0142	0142	3	2.880	31
L0143	0143	6	2.040	50
L0144	0144	8	1.770	53
L0145	0145	10	1.580	52
L0146	0146	15	1.290	67
L0147	0147	25	1.000	89
L0148	0148	35	.845	98
L0149	0149	50	.707	80
L0150	0150	75	.575	107
L0151	0151	100	.500	142

50 WATT MODEL "J" — UL Listed

Catalog No.†	Total Ohms	Max. Amps	Steps Appr.
0308	0.5	10.000	24
0309	1	7.070	44
0310	2	5.000	43
0311	4	3.530	42
0312	6	2.880	45
0313	8	2.500	43
0314	12	2.040	86
0315	16	1.760	91
0316	22	1.500	100
0317	35	1.190	125
0318	50	1.000	112
0319	80	.790	143
0320	125	.630	176

75 WATT MODEL "G" — UL Listed

Catalog No.†	Total Ohms	Max. Amps	Steps Appr.
1100	0.5	12.300	27
(1101)	1	8.660	27
1102	2	6.120	30
1103	3	5.000	28
1104	5	3.880	53
1105	7.5	3.160	50
1106	10	2.740	53
1107	16	2.170	91
1108	25	1.730	113
1109	50	1.230	142

100 WATT MODEL "K" — UL Listed

Catalog No.†	Total Ohms	Max. Amps	Steps Appr.
0440	0.5	14.100	33
0441	1	10.000	33
0442	2	7.070	32
0443	3	5.750	39
0444	5	4.470	57
0445	7.5	3.650	60
0446	10	3.160	57
0447	16	2.500	88
0448	25	2.000	109
0449	50	1.410	137

150 WATT MODEL "L" — UL Listed

Catalog No.†	Total Ohms	Max. Amps	Steps Appr.
0524	0.5	17.300	29
0525	1	12.300	41
0526	2	8.650	40
0527	3	7.070	42
0528	5	5.480	44
0529	7.5	4.470	75
0530	10	3.880	79
0531	15	3.163	75
0532	25	2.450	120
0533	35	2.070	133
0534	50	1.735	151

Continued on next page

OHMITE® vitreous enameled rheostats (potentiometers)

25 WATT
MODEL "H" — UL Listed

Model	Std. Shaft	Total Ohms	Max. Amps	Steps Approx.
L0152	0152	125	.445	139
L0153	0153	175	.373	154
L0154	0154	250	.316	177
L0155	0155	350	.267	197
L0156	0156	500	.222	220
L0157	0157	750	.182	261
L0158	0158	1,000	.155	278
L0159	0159	1,500	.129	267
L0160	0160	2,500	.100	341
L0161	0161	3,500	.084	315
L0162	0162	5,000	.070	355
L4200	4200†	7,500	.058	439
L4201†	4201†	10,000	.050	476
L4202†	4202†	15,000	.041	431
L4203†	4203†	20,000	.035	422
L4204†	4204†	25,000	.032	527

50 WATT
MODEL "J" — III. Listed

Model No.	Total Ohms	Max. Amps	Steps Approx.
0321	150	.575	170
0322	225	.470	199
0323	300	.408	211
0324	500	.316	284
0325	800	.250	282
0326	1,000	.224	352
0327	1,600	.176	355
0328	2,500	.141	449
0329	3,500	.119	496
0330	5,000	.100	459
0331	8,000	.079	576
0332	10,000	.070	565
4210*	15,000	.058	568
4211*	20,000	.050	599
4212*	25,000	.045	573
4213*	30,000	.041	688
(4214)*	40,000	.035	673
4215*	50,000	.032	842

75 WATT
MODEL "G" — III List

Model No.	Total Ohms	Max. Amps	Steps
1110	75	1.000	134
1111	100	.866	178
1112	200	.612	180
1113	300	.500	211
1114	400	.433	223
1115	500	.388	279
(1116)	750	.316	338
1117	1,000	.274	356
(1118)	1,500	.224	420
1119	2,000	.194	443
(1120)	2,500	.173	441
(1121)	5,000	.123	564
(1122)	7,500	.100	547
1123	10,000	.087	572

100 WATT
MODEL "K" — III Listed

Model	W	H	Ex. Listed
Catalog No.	Total Ohms	Max. Amps	Steps Approx
0450	75	1.150	163
0451	100	1.000	172
0452	200	.707	216
0453	300	.575	261
0454	400	.500	272
0455	500	.447	269
0456	750	.365	326
0457	1,000	.316	343
0458	1,500	.258	404
0459	2,000	.224	426
0460	2,500	.200	423
0461	5,000	.141	543
0462	7,500	.115	528
0463	10,000	.100	704

150 WATT
MODEL "I" — III Listed

Catalog No.	Total Ohms	Max. Amps	Steps Allowed
0535	75	1.415	179
0536	100	1.225	190
0537	150	1.000	225
0538	200	.865	239
0539	250	.775	236
0540	350	.655	265
0541	500	.548	296
0542	750	.447	375
0543	1,250	.346	452
0544	1,800	.288	537
0545	2,250	.259	529
0546	3,000	.224	558
0547	4,500	.182	667
0548	7,500	.141	714
0549	10,000	.122	952

†Silicone-ceramic coating, 500V max.
for 10K Ω and above. Not UL listed.

†Silicone-ceramic coating.
750V max. for 15K Ω and
above. Not UL listed.

**225 WATT
MODEL "P" — UL Listed**

Catalog No. ¹	Total Ohms	Max. Amps	Steps Approx.
(1250)	1.0	15.000	42
1251	2.0	10.600	41
1252	3.0	8.860	61
(1253)	4.0	7.500	58
1254	5.0	6.710	57
(1255)	7.5	5.490	60
1256	10.0	4.740	115
1257	15.0	3.870	108
1258	25.0	3.000	114
1259	50.0	2.120	218
1260	75.0	1.730	206
1261	100	1.500	275
1262	150	1.220	259
1263	200	1.060	345
1264	300	.866	326
1265	400	.750	342
1266	700	.567	483
1267	900	.500	484
1268	1,200	.433	513
1269	1,500	.387	641
(1270)	1,750	.358	603
(1270A)	2,000	.336	690
1271	2,500	.300	679

300 WATT
MODEL "N" — III Listed

MODEL	N	SE Listed	
Catalog No. ¹	Total Ohrs	Max. Amps	Steps Approx.
0650	1.0	17.320	56
0651	2.0	12.240	51
0652	3.0	10.000	51
0653	4.0	8.660	77
0654	5.0	7.750	76
0655	7.5	6.320	72
0656	10.0	5.480	76
0657	15.0	4.470	144
0658	25.0	3.460	134
0659	50.0	2.450	230
0660	75.0	2.000	275
0661	100	1.730	288
0662	150	1.410	345
0663	200	1.220	364
0664	300	1.000	433
0665	400	.866	456
0666	700	.655	500
0667	900	.578	517
0668	1,200	.500	541
0669	1,500	.447	676
(0670)	1,750	.414	625
(0670A)	2,000	.387	714
0671	2,500	.346	720

**500 WATT
MODEL "R"**

Model No.	Total Ohms	Max. Amps	Steps Approx
0849	1.0	22.300	56
0850	1.5	18.200	71
(0851)	2.0	15.800	75
(0852)	2.5	14.100	78
0853	3.0	12.900	79
0854	4.0	11.200	74
0855	5.0	10.000	104
0856	8.0	7.900	104
0857	12.5	6.300	115
0858	16.0	5.600	186
0859	25.0	4.470	205
0860	40.0	3.540	206
0872	50.0	3.160	205
0861	80.0	2.520	316
0862	125	2.000	388
0863	175	1.690	430
0864	250	1.410	494
0865	325	1.240	505
0866	500	1.000	614
0867	750	.817	735
0868	1,000	.707	769
0869	1,500	.577	932
(0870)	2,000	.500	971
0871	2,500	.447	962

**750 WATT
MODEL "T"**

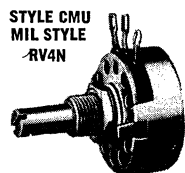
Model No. ¹	Total Ohms	Max. Amps	Steps Approx.
1300	1.0	27.400	72
(1301)	1.5	22.300	72
(1302)	2.0	19.400	96
(1303)	2.5	17.100	101
(1304)	3.0	15.800	96
(1305)	4.0	13.600	94
1306	5.0	12.200	104
1307	8.0	9.650	100
(1308)	10.0	8.650	139
(1309)	12.5	7.750	138
1310	16.0	6.820	139
1311	25.0	5.470	137
1312	50.0	3.870	246
(1313)	80.0	3.060	381
1314	100	2.740	376
1315	160	2.170	476
1316	200	1.940	469
1317	300	1.580	562
1318	400	1.370	593
1319	600	1.117	705
1320	750	1.000	694
1321	1,200	.791	889
(1322)	1,800	.646	1,050
(1322A)	2,000	.610	935
(1323)	2,500	.547	1,170

**1000 WATT
MODEL "II"**

Catalog No. ¹	Total Ohms	Max. Amps	Steps Approx.
1450	1.0	31.600	91
1451	1.5	25.800	90
1452	2.0	22.400	90
1453	2.5	20.000	127
1454	3.0	18.300	114
1455	4.0	15.800	120
1456	5.0	14.100	124
1457	8.0	11.200	118
1458	10.0	10.000	117
(1459)	12.5	8.950	163
1460	16.0	7.900	166
1461	25.0	6.330	162
1462	50.0	4.470	327
1463	75.0	3.650	307
1464	100	3.160	446
1465	175	2.390	490
1466	225	2.110	630
1467	300	1.830	661
1468	400	1.580	704
1469	500	1.410	695
1470	750	1.150	878
1471	1,000	1.000	870
1472	1,500	.816	1,040
1473	2,500	.633	1,040

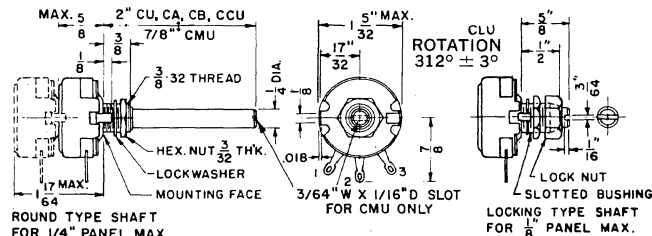
¹ Popular items appear in BOLD print and are usually in stock at authorized Ohmite stocking distributors. Items in LIGHT FACE print are available from stocking distributors but are not normally stocked in depth. Parentheses indicate non-stock standard items subject to a minimum handling charge per item.

OHMITE® molded composition potentiometers



Ohmite molded composition potentiometers (Type AB) provide high quality and dependable performance.

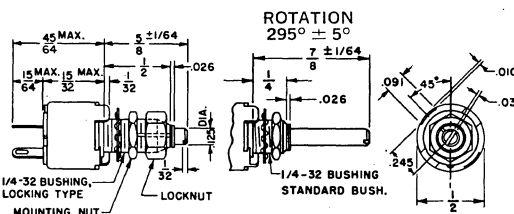
Because the resistance element is a thick, solid-molded ring, longer life and smoother operation are obtained. This is due also to the molded composition contact. Units are dust and splash proof, fungus and corrosion resistant and meet the requirements of military specification MIL-R-94.



STOCK "POTS" — MIL Units are stamped with MIL and Commercial Designations.

Resist.	Type AB (1½" Dia.) Rated 2 Watts						Type AS (½" Dia.) Rated ½ Watt	
	Single Unit ¾" Shaft	Single Unit 2" Shaft			Locking	Dual	Miniature Locking	Miniature ¾" Shaft
	Style CMU (Linear) Comm. & MIL	Style CU (Linear)	Style CA (CW log)	Style CB (CCW log)	Style CLU (Linear) Comm. & MIL	Style CCU (Linear)	Style AS (Linear) Comm. & MIL	Style ASM (Linear) Comm. & MIL
Range or Limited Ohmic Values	50 to 5.0 Meg.	50 to 5.0 Meg.	0.1 Meg. .25 Meg. .5 Meg. 1.0 Meg. 2.5 Meg.	10,000 25,000 50,000	50 to 5.0 Meg.	10,000 25,000 50,000 1.0 Meg. 25 Meg. .5 Meg. 1.0 Meg.	50 to 5.0 Meg.	50 to 5.0 Meg.
Weight	.064 lb.	.084 lb.			.070 lb.	.123 lb.	.017 lb.	.017 lb.

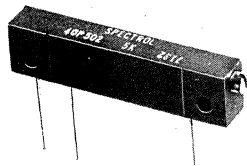
FOR STOCK ITEMS, CALL LOCAL REPRESENTATIVE LISTED IN INDEX



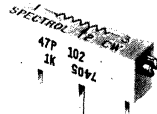
TYPE AS POTENTIOMETERS


Spectrol

TRIMMING POTENTIOMETERS



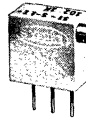
Models 40, RT12



Model 47



Model 50



Models 51, RT24



Models 55, RT22



Model 80



Model 84

Actual size

MODEL NO.	NOMINAL SIZE (INCHES)	NOM. ADJ. TURNS	TERMINAL ¹ STYLE	RESISTANCE TOLERANCE %	MAXIMUM POWER RATING (WATTS)	TEMPCO (PPM/° C)	STANDARD RESISTANCE RANGE (OHMS)	U.S. 50 PC. UNIT PRICE
40 (RT 12 Available)	1.25 Long	22	L,PC,SH	±5	1.0 @ 70° C	±50	10 Ω–10K 20K 50K 100K	2.68 3.15 5.38 6.46
47 (Clear Lid Available)	0.75 Long	20	PC	±10	1.0 @ 40° C	±50	10 Ω–20K	Contact Factory
50	0.38 Square	23	L,PC	±5	0.75 @ 85° C	±50	10 Ω–10K 20K 50K	5.60 6.32 6.75
51 (RT 24 Available)	0.38 Square	23	PC	±5	0.75 @ 85° C	±50	10 Ω–10K 20K	4.16 4.60
55 (RT 22 Available)	0.50 Square	23	L,PC	±5	1.5 @ 70° C	±50	10 Ω–10K 20K 50K	5.60 6.32 6.75
80	0.35 Dia.	310°	PC	±5	1.0 @ 50° C	±50	10 Ω–10K 20K 50K	3.73 4.16 4.53
84	0.50 Dia. (Base)	300°	PC,SH	±5	1.5 @ 70° C	±50	Screw 10 Ω–10K Driver 20K Knob 10 Ω–10K 20K Panel 10 Ω–10K Mt. 20K	2.94 3.30 3.59 4.01 4.66 5.17

¹TERMINATIONS: L – COLOR CODED LEAD WIRES, SH – SOLDER HOOKS, PC – PRINTED CIRCUIT PINS.

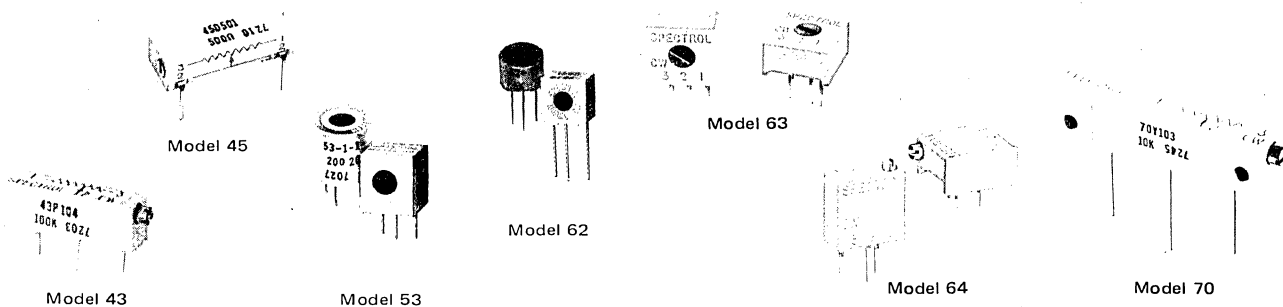
NOTE: ALL TRIMMERS ARE DISTRIBUTOR AUTHORIZED ITEMS.

WIREWOUND

Spectrol

TRIMMING POTENTIOMETERS

Actual size



MODEL NO.	NOMINAL SIZE (INCHES)	NOM. ADJ. TURNS	TERMINAL STYLE	RESISTANCE TOLERANCE %	MAXIMUM POWER RATING (WATTS)	TEMPCO (PPM/° C)	STANDARD RESISTANCE RANGE (OHMS)	U.S. 50 PC. UNIT PRICE
43	0.75 Long	20	PC	±10	0.75 @ 25° C	±100 (100 Ω–2 Meg) –100 to (10 Ω, 20, 50 Ω) +200	10 Ω–2 Meg.	1.15
45	0.75 Long	20	PC (Dual in Line)	±10	0.75 @ 25° C	±100 (100 Ω–2 Meg) –100 to (10 Ω, 20, 50 Ω) +200	10 Ω–2 Meg.	2.01
53	0.34 Dia. Top Adjust 0.31 x 0.34 Side Adjust	240°	PC	±20 (±10 Available)	0.5 @ 85° C	±100 (100 Ω–1 Meg) 0 to (10 Ω, 20 Ω, 50 Ω) +450	10 Ω–1 Meg.	1.59
62	0.25 Dia. Top Adjust 0.24 x 0.18 Side Adjust	220°	PC	20 (±10 Available)	0.75 @ 25° C	±100 (100 Ω–1 Meg) 0 to (10 Ω, 20 Ω, 50 Ω) +450	10 Ω–1 Meg.	1.45
63	0.38 Square	270°	PC	±20	0.5 @ 70° C	±100 (100 Ω–2 Meg) 0 to +250 (10, 20, 50 Ω)	10 Ω–2 Meg.	0.70
64	0.38 Square	25	PC	±20	0.5 @ 70° C	±100 (100 Ω–2 Meg) 0 to +250 (10, 20, 50 Ω)	10 Ω–2 Meg.	1.46
70	1.25 Long	22	L, PC, SH	±10	1.0 @ 85° C	±100 (100 Ω–2 Meg) 0 to (10 Ω, 20 Ω, 50 Ω) +450	10 Ω–1 Meg.	1.79

CERMET

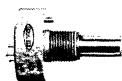
Spectrol

PRECISION POTENTIOMETERS

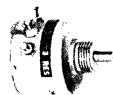
All units shown 1/2 actual size



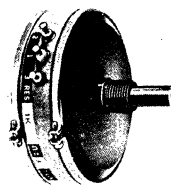
Model 140



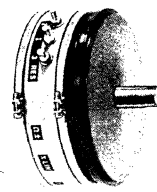
Model 152

Model 152
(Servo)

Model 702



Model 302



Model 302 (Servo)

MODEL NO.	NOMINAL DIA. ² (INCHES)	RESISTANCE RANGE (OHMS)	STANDARD RESISTANCE TOLERANCE	LINEARITY TOLERANCE		MAXIMUM POWER RATING (WATTS)	MOUNTING AVAILABLE	U.S. 50 PC. UNIT PRICE
				STANDARD	BEST PRACTICAL ¹			
100	1.312	5 to 39K	± 3% (± 5% below 50 Ω)	5 Ω to 100 Ω ± 1.0% 100 Ω to 39K ± 0.5%	± .15%	2.75 @ 40° C	Bushing Servo	15.15 19.05
122	1.062	5 to 142K (Bushing 119K Max.)	± 3% (± 5% below 20 Ω)	5 Ω to 200 Ω ± 1.0% 200 Ω to 142K ± 0.5%	± .20%	1.5 @ 70° C	Bushing Servo	14.80 17.10
132	1.312	5 to 39K	± 3% (± 5% below 50 Ω)	5 Ω to 200 Ω ± 1.0% 200 Ω to 39K ± 0.5%	± .20%	2.75 @ 40° C	Bushing	6.30
140	.500	50 to 70K	± 5%	± 1.0%	± .50%	2.0 @ 40° C	Bushing	5.50
152	.875	5 to 40K	± 3% (± 5% below 50 Ω)	5 Ω to 500 Ω ± 1.0% 500 Ω and above ± 0.5%	± .35%	2.0 @ 40° C	Bushing Servo	5.70 9.70
202	1.750	5 to 65K	± 3% (± 5% below 50 Ω)	5 Ω to 50 Ω ± 1.0% 50 Ω to 500 Ω ± .50% 500 Ω to 65 K ± .25%	± .15%	3.5 @ 70° C	Bushing Servo	17.30 19.95
302	2.000	5 to 85K	± 3% (± 5% below 50 Ω)	5 Ω to 50 Ω ± 1.0% 50 Ω to 200 Ω ± .50% 200 Ω to 85K ± .25%	± .10%	4.0 @ 70° C	Bushing Servo	20.65 23.20
402	3.000	10 to 155K	± 3% (± 5% below 100 Ω)	10 Ω to 200 Ω ± .50% 200 Ω to 155K ± .25%	± .75%	6.0 @ 70° C	Bushing Servo	26.90 28.25
702	.875	5 to 109K (Bushing 91K Max.)	± 3% (± 5% below 20 Ω)	5 Ω to 500 Ω ± 1.0% 500 Ω to 109K ± 0.5%	± .25%	1.25 @ 70° C	Bushing Servo	13.95 15.95

¹BEST PRACTICAL LINEARITY FIGURES SHOWN FOR THE VARIOUS MODELS APPLY TO HIGHER RESISTANCE UNITS. CONSULT FACTORY WITH SPECIFIC REQUIREMENTS.

²SIZES SHOWN ARE FOR THE BUSHING MOUNT VERSIONS. SHAFT DIA. .125" FOR MODELS 122, 140, 502, 552, 702, AND CW05; .094" FOR MODELS 162 AND 164; .250" FOR ALL OTHER MODELS.

▶ DISTRIBUTOR AUTHORIZED ITEM.

SINGLE TURN

Spectrol

PRECISION POTENTIOMETERS

All units shown 1/2 actual size



Model 162



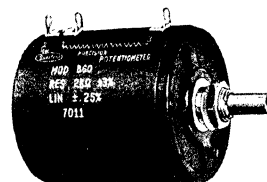
Model HEL 05



Model 534



Model 534 (2 Section)



Model 860

MODEL NO.	NOMINAL DIA ² (INCHES)	RESISTANCE RANGE (OHMS)	STANDARD RESISTANCE TOLERANCE	LINEARITY TOLERANCE		MAXIMUM POWER RATING (WATTS)	MOUNTING AVAILABLE	U.S. 50 PC. UNIT PRICE
				STANDARD	BEST PRACTICAL ¹			
▶ 533	.875	5 to 60K	± 5%	±.25%	±.15%	1.0 @ 70° C	Bushing Servo	5.50 11.00
552	.875	5 to 45K	± 3% (± 5% below 50 Ω)	±.25%	±.125%	1.0 @ 70° C	Bushing Servo	15.55 18.00
▶ 830	1.812	15 to 155K	± 3% (± 5% below 100 Ω)	±.25%	±.05%	3.0 @ 40° C	Bushing	8.75
852	1.812	15 to 155K	± 3% (± 5% below 100 Ω)	±.25%	±.05%	2.0 @ 70° C	Bushing Servo	17.10 20.50
▶ 535	.875	5 to 100K	± 5%	±.25%	±.10%	1.5 @ 70° C	Bushing Servo	5.50 11.00
▶ 162 164	.500	100 to 105K	± 5%	±.30%	±.15%	2.0 @ 40° C	162 Bushing 164 Servo	9.70 12.55
502	.875	15 to 152K	± 3% (± 5% below 100 Ω)	±.25%	±.05%	2.0 @ 70° C	Bushing Servo	15.55 18.00
▶ 534	.875	10 to 200K	± 5%	±.25%	±.075%	2.0 @ 70° C	Bushing Servo	5.05 10.55
802	1.812	20 to 519K	± 3% (± 5% below 200 Ω)	±.25%	±.025%	5.0 @ 70° C	Bushing Servo	17.10 20.50
▶ 860	1.812	20 to 519K	± 3% (± 5% below 200 Ω)	±.25%	±.075%	8.0 @ 40° C	Bushing	8.75
HEL 05	.500	50 to 100K	± 5% (± 10% below 100 Ω)	±1.0%	±.25%	1.5 @ 40° C	Bushing Flange	6.70

3 TURN

5 TURN

10 TURN


Spectrol

CONDUCTIVE PLASTIC AND CERMET POTENTIOMETERS

All units shown ½ actual size



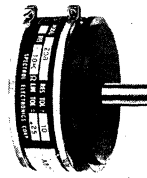
Model 126



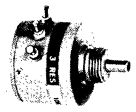
Model 138



Model 158



Model 208

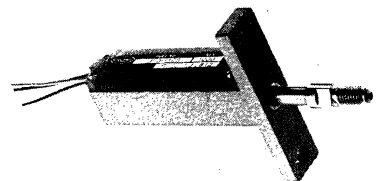
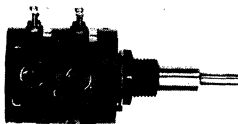


Model 708

MODEL NO.	NOMINAL DIA. (INCHES)	RESISTANCE RANGE (OHMS)	RESISTANCE TOLERANCE	LINEARITY	MAXIMUM POWER RATING (WATTS)	OUTPUT SMOOTHNESS	TEMPCO (PPM/° C)	MOUNTING AVAILABLE	U.S. 50 PC. UNIT PRICE
126	1.062	500 to 50K	± 10% (Special to ± 5%)	± 0.5% (Special to ± .15%)	0.6 @ 70° C	0.1%	± 400	Servo	Contact Factory
128	1.062	500 to 50K	± 10% (Special to ± 5%)	± 0.5% (Special to ± .15%)	1.25 @ 70° C	0.1%	± 400	Bushing Servo	21.95 26.05
138	1.312	500 to 100K	± 10% (Special to ± 2%)	± 0.5%	2.0 @ 40° C	0.1%	± 500	Bushing	9.30
158	.875	500 to 100K	± 10% (Special to ± 2%)	± 1.0% (Special to ± .25%)	1.0 @ 40° C	0.1%	± 500	Bushing Servo	8.55 11.10
208	1.750	500 to 50K	± 10% (Special to ± 5%)	± 0.3% (Special to ± 0.1%)	1.75 @ 70° C	0.1%	± 400	Bushing Servo	27.75 30.70
308	2.000	1K to 100K	± 10% (Special to ± 5%)	± .25% (Special to ± .05%)	2.0 @ 70° C	0.1%	± 400	Bushing Servo	29.50 32.45
408	3.000	1K to 100K	± 10% (Special to ± 5%)	± 0.2% (Special to ± .03%)	3.0 @ 70° C	0.1%	± 400	Bushing Servo	35.00 36.95
708	.875	500 to 50K	± 10% (Special to ± 5%)	± 0.5% (Special to ± 0.2%)	1.0 @ 70° C	0.1%	± 400	Bushing Servo	21.60 25.60
139	1.312	500 to 1 Meg.	± 10% (Special to ± 2%)	± 0.5%	5.0 @ 40° C	0.1% Maximum	± 100 (50K - 300K)	Bushing	12.35
159	.875	100 to 2 Meg.	± 10% (Special to ± 2%)	± 1.0% (Special to ± .25%)	3.5 @ 40° C	0.1% Maximum	± 100 (500 Ω - 2 Meg)	Bushing Servo	11.40 15.40

SINGLE TURN

SPECIAL DESIGNS



The Spectrol group offers a unique capability in providing special designs to meet individual customer requirements and has an engineering and manufacturing record for specials that is unsurpassed in the industry. Unlimited options are available on the basic models listed in this Short Form Catalog. In cases where required, completely special designs are created.

Non-standard configurations, non-linear functions, spring return mechanisms, special torque devices, detents, sector potentiometers, linear motion potentiometers, concentric shaft controls, clutch-brake mechanisms and many other specials have been furnished.

Contact your Spectrol representative for further information.

Spectrol**SWITCHES AND MULTIDIALS®**

All units shown actual size

SUBMINIATURE SWITCHES

Model 87-11-XX



Model 87-21-XX



Model 87-31-XX

MODEL NO. ¹	NOMINAL DIA. (INCHES)	SWITCH ACTION	CONTACT CURRENT RATING	LIFE AT RATED CURRENT	CONTACT RESISTANCE (OHMS)	DESCRIPTION	U.S. 50 PC. UNIT PRICE*
87-11-XX	.500	Positive Detent, 36° Indexing, Stops	250MA @ 28VDC	4,000 Switching Operations, Per Position	.05 Maximum	Screwdriver Adjust	3.25
87-21-XX	.550	Positive Detent, 36° Indexing, Stops	250MA @ 28VDC	4,000 Switching Operations, Per Position	.05 Maximum	Knob Adjust	3.80
87-31-XX	.500	Positive Detent, 36° Indexing, Stops	250MA @ 28 VDC	4,000 Switching Operations, Per Position	.05 Maximum	Bushing Panel Mounting	4.20

TYPICAL SWITCH APPLICATIONS

- Logic switching.
- Internal switching device for optional equipment add-ons.
- Test point switching.
- Adapting main-frame computers to peripheral equipment.
- Standardizing printed circuit boards.
- Selecting operational voltages.
- Selecting calibration resistors.

NUMBER OF POLES AND ACTIVE POSITIONS

NUMBER OF POLES	ACTIVE POSITIONS	ACTIVE TERMINAL PIN NUMBERS	BASIC PART NUMBER
SINGLE-POLE	1	1 (ON-OFF)	87-XX-11
	2	1 and 2	87-XX-12
	3	1 thru 3	87-XX-13
	4	1 thru 4	87-XX-14
	5	1 thru 5	87-XX-15
	6	1 thru 6	87-XX-16
	7	1 thru 7	87-XX-17
	8	1 thru 8	87-XX-18
	9	1 thru 9	87-XX-19
	10	1 thru 10	87-XX-10
TWO-POLE	1	3 and 8 (ON-OFF)	87-XX-21
	2	2, 3, 7, and 8	87-XX-22
	3	2, 3, 4, 7, 8, and 9	87-XX-23
	4	1 thru 4, 6 thru 9	87-XX-24
	5	1 thru 10	87-XX-25
THREE-POLE	1	1, 4, and 8 (ON-OFF)	87-XX-31
	2	1, 2, 4, 5, 8, and 9	87-XX-32
	3	1 thru 6, 8 thru 10	87-XX-33

MULTIDIALS®

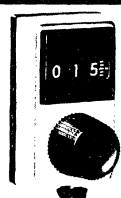
All units shown 1/2 actual size



Model 11



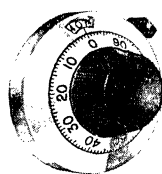
Model 16



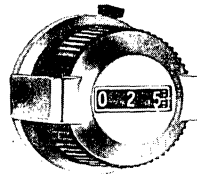
Model 15-1-11



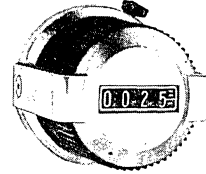
Model 15-2-11



Model 21



Model 25-1-13



Model 25-4-13

MODEL NO.	NOMINAL DIA. (INCHES)	NUMBER OF TURNS	MINOR SCALE DIVISION	SHAFT BORE (INCHES)	FINISH	U.S. 50 PC. UNIT PRICE
11-1-31	1.000	11	1/50 Turn	.250	Satin Chrome	6.95
15-1-11	H 1.750 W 1.000	10 (3 Digit)	1/500 Turn	.250	Satin Chrome	9.70
15-2-11	H 1.750 W 1.000	100 (4 Digit)	1/500 Turn	.250	Satin Chrome	11.40
16-1-11	.875	15	1/50 Turn	.250	Brushed Metal	6.85
21-1-11	1.812	15	1/100 Turn	.250	Satin Chrome	6.72
25-1-13	1.812	11 (3 Digit)	1/500 Turn	.250	Satin Chrome	16.65
25-4-13	1.812	100 (4 Digit)	1/500 Turn	.250	Satin Chrome	17.95

¹ LAST TWO DIGITS DENOTE POLE/POSITION, E.G., SINGLE POLE UP TO 10 POSITIONS, 2 POLE UP TO 5 POSITIONS, AND 3 POLE UP TO 3 POSITIONS.

* PRICES SHOWN FOR SINGLE POLE VERSIONS ONLY.

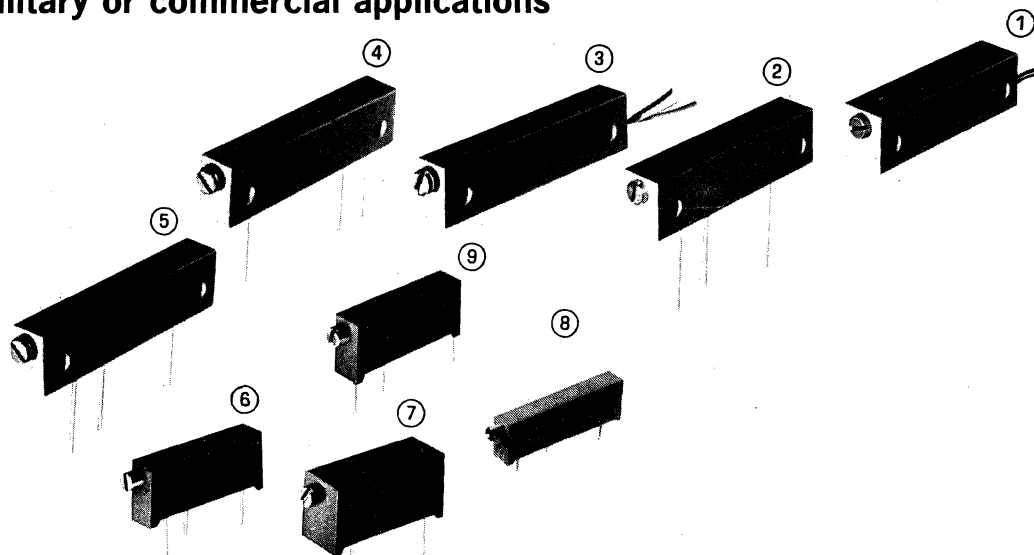
■ MODELS 11 AND 21 ALSO AVAILABLE WITH BRUSHED CHROME FINISH (11-1-31/21-1-31)

NOTE: ALL STANDARD SWITCHES AND DIALS ARE DISTRIBUTOR AUTHORIZED ITEMS.

TRW[®] IRC POTENTIOMETERS

CIRCUITRIM[®] RECTANGULAR TRIMMER POTENTIOMETERS

CERMET (Non-wirewound) or Wirewound provide the widest choice for military or commercial applications



Available from TRW/IRC Distributors

CERMET (Non-wirewound) TRW/IRC Metal Glaze[®]

Illus.	Package L x W x H	TRW/IRC Type	Military Style or Designation	Resistance Ranges $\pm 10\%$ Std.		Terminals	Adjust Turns (Nom)	Power (Watts)
				MIL-Qual.	TRW/IRC			
3	1.25 x .19 x .32	450-00	RJ12L	10 Ω -1 Meg Ω	10 Ω -1 Meg Ω	Leads	22	.75 @ 85°C
4	1.25 x .19 x .32	450-10	RJ12P	10 Ω -1 Meg Ω	10 Ω -1 Meg Ω	P.C. Pins	22	.75 @ 85°C
5	1.25 x .19 x .32	450-20	RJ12Y	10 Ω -1 Meg Ω	10 Ω -1 Meg Ω	P.C. Pins	22	.75 @ 85°C
3	1.25 x .19 x .34	45-00	—	—	100 Ω -1 Meg Ω $\pm 20\%$	Leads	22	.75 @ 70°C
4	1.25 x .19 x .34	45-10	—	—	100 Ω -1 Meg Ω $\pm 20\%$	P.C. Pins	22	.75 @ 70°C
5	1.25 x .19 x .34	45-20	—	—	100 Ω -1 Meg Ω $\pm 20\%$	P.C. Pins	22	.75 @ 70°C
6	.75 x .16 x .31	960-20	—	—	10 Ω -1 Meg Ω	P.C. Pins	20	.75 @ 25°C
7	.75 x .27 x .35	980-20	—	—	10 Ω -1 Meg Ω	P.C. Pins	20	.75 @ 25°C
9	.75 x .16 x .31	989-20	(RJ11P Pin Placement)	—	10 Ω -1 Meg Ω	P.C. Pins	20	.75 @ 25°C

WIREWOUND

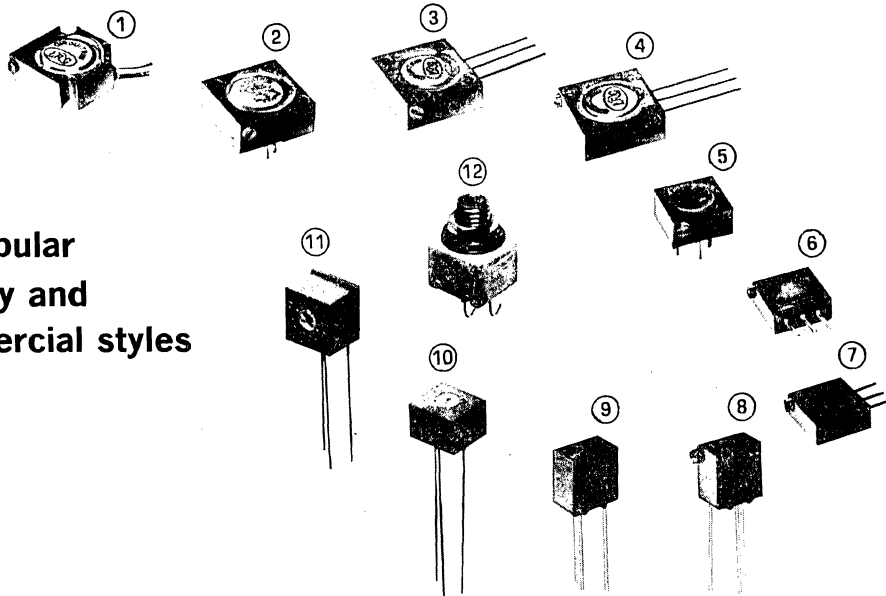
Illus.	Package L x W x H	TRW/IRC Type	Military Style or Designation	Resistance Ranges		Terminals	Adjust Turns (Nom)	Power (Watts)
				MIL-Qual.	TRW/IRC			
1	1.25 x .28 x .32	60-00	RT11CL	—	10 Ω -50K $\pm 10\%$	Leads	22	1.0 @ 70°C
2	1.25 x .28 x .32	60-20	RT11CP	—	10 Ω -50K $\pm 10\%$	P.C. Pins	22	1.0 @ 70°C
3	1.25 x .19 x .32	400-00	RT12C2L	100 Ω -20K	10 Ω -50K $\pm 5\%$	Leads	22	.75 @ 85°C
4	1.25 x .19 x .32	400-10	RT12C2P	100 Ω -20K	10 Ω -50K $\pm 5\%$	P.C. Pins	22	.75 @ 85°C
5	1.25 x .19 x .32	400-20	RT12C2Y	100 Ω -20K	10 Ω -50K $\pm 5\%$	P.C. Pins	22	.75 @ 85°C
3	1.25 x .19 x .34	40-00	—	—	10 Ω -50K Ω $\pm 10\%$	Leads	22	1.0 @ 50°C
4	1.25 x .19 x .34	40-10	—	—	10 Ω -50K Ω $\pm 10\%$	P.C. Pins	22	1.0 @ 50°C
5	1.25 x .19 x .34	40-20	—	—	10 Ω -50K Ω $\pm 10\%$	P.C. Pins	22	1.0 @ 50°C
1	1.25 x .28 x .32	600-00	RT11CP	—	10 Ω -50K $\pm 5\%$	Leads	22	1.0 @ 70°C
2	1.25 x .28 x .32	600-20	RT11CP	—	10 Ω -50K $\pm 5\%$	P.C. Pins	22	1.0 @ 70°C
1	1.25 x .19 x .32	60-00	—	—	10 Ω -50K Ω $\pm 10\%$	Leads	22	1.0 @ 70°C
2	1.25 x .19 x .32	60-10	—	—	10 Ω -50K Ω $\pm 10\%$	P.C. Pins	22	1.0 @ 70°C
—	1.25 x .19 x .32	60-201	—	—	10 Ω -50K Ω $\pm 10\%$	Hook Pins	22	1.0 @ 70°C
8	1" x .31 x .16	901-20	RT11P-RT12Y	—	10 Ω -50K $\pm 5\%$	P.C. Pins	28	1.0 @ 70°C
6	.75 x .16 x .31	910-20	—	—	10 Ω -20K $\pm 10\%$	P.C. Pins	20	1.0 @ 40°C
7	.75 x .27 x .35	930-20	—	—	10 Ω -20K $\pm 10\%$	P.C. Pins	20	1.0 @ 40°C

NOTES: RT11 and RJ11 Mil. Type Trimmers have been removed from Gov't and Mil. Procurement Lists. Future Procurement should call for RT12 and RJ12 Types.
 Trimmer Type 989-20 has .7 x .1 Pin Spacing.
 #12-28 Bushing Mount Fixture available for all 1.25" trimmers. #10-32 used on Type 901-60.

TRW[®] IRC POTENTIOMETERS

CIRCUITRIM[®] SQUARE AND CUBE MULTI-TURN TRIMMERS

All popular
military and
commercial styles



Available from TRW/IRC Distributors

CERMET (Non-wirewound) TRW/IRC Metal Glaze[®]

Illus.	Package L X W X H	TRW/IRC Type	Military Style or Designation	Resistance Ranges $\pm 10\%$ ***		Terminals	Adjust Turns (Nom)	Power (Watts)	
				MIL-Qual.	IRC				
1	1/2"	.5 x .5 x .19	255-00	RJ22CL	10 Ω -1 Meg Ω	10 Ω -1 Meg Ω	Leads	25	.75 @ 70°C
2		.5 x .5 x .22	255-10	RJ22CP	10 Ω -1 Meg Ω	10 Ω -1 Meg Ω	P.C. Pins Bottom	25	.75 @ 70°C
3		.5 x .5 x .19	255-207*	RJ22CX	10 Ω -1 Meg Ω	10 Ω -1 Meg Ω	P.C. Pins Edge	25	.75 @ 70°C
4		.5 x .5 x .19	255-208*	RJ22CW	10 Ω -1 Meg Ω	10 Ω -1 Meg Ω	P.C. Pins Edge	25	.75 @ 70°C
1	1/2"	.5 x .5 x .19	25-00	—	—	100 Ω -1 Meg Ω $\pm 20\%$	Leads	25	.75 @ 70°C
2		.5 x .5 x .22	25-10	—	—	100 Ω -1 Meg Ω $\pm 20\%$	P.C. Pins Bottom	25	.75 @ 70°C
3		.5 x .5 x .19	25-207*	—	—	100 Ω -1 Meg Ω $\pm 20\%$	P.C. Pins Edge	25	.75 @ 70°C
4		.5 x .5 x .19	25-208*	—	—	100 Ω -1 Meg Ω $\pm 20\%$	P.C. Pins Edge	25	.75 @ 70°C
5	3/8"	.375 x .375 x .195	750-10	RJ24CP	10 Ω -1 Meg Ω	10 Ω -1 Meg Ω	P.C. Pins Bottom	19	.5 @ 70°C
6		.375 x .375 x .21	750-207*	RJ24X	—	10 Ω -1 Meg Ω	P.C. Pins Edge	19	.5 @ 70°C
7		.375 x .375 x .21	750-208*	RJ24W	—	10 Ω -1 Meg Ω	P.C. Pins Edge	19	.5 @ 70°C
5	3/8"	.375 x .375 x .195	75-10	—	—	100-1 Meg Ω	P.C. Pins Bottom	19	.5 @ 70°C
6		.375 x .375 x .21	75-207*	—	—	100-1 Meg Ω	P.C. Pins Edge	19	.5 @ 70°C
7		.375 x .375 x .21	75-208*	—	—	100-1 Meg Ω	P.C. Pins Edge	19	.5 @ 70°C
8	3/16"	.312 x .312 x .19	850-20	—	—	10 Ω -1 Meg Ω	P.C. Pins Edge	13	.3 @ 70°C
9		.312 x .312 x .19	850-208	—	—	10 Ω -1 Meg Ω	P.C. Pins Edge	13	.3 @ 70°C

WIREWOUND

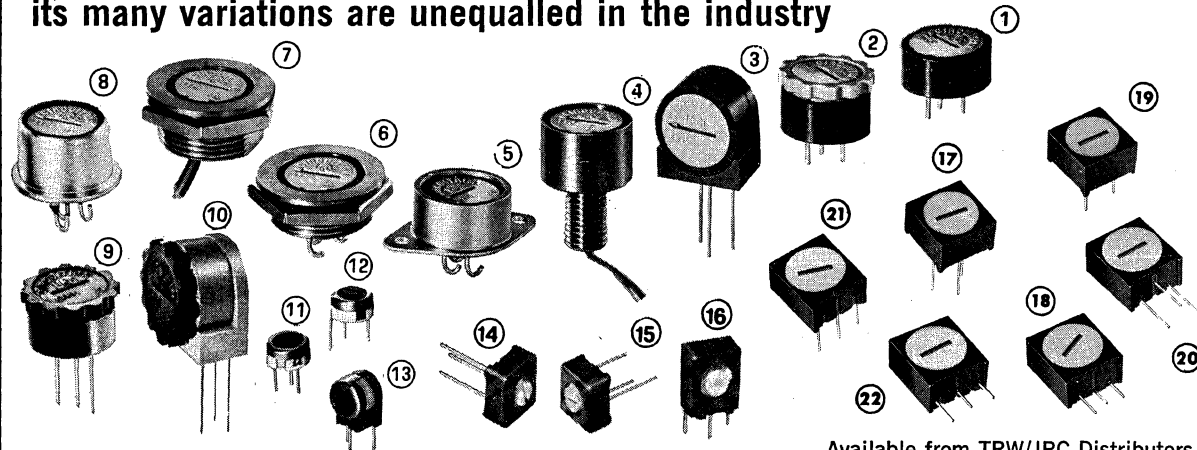
Illus.	Package L x W x H	TRW/IRC Type	Military Style or Designation	Resistance Ranges $\pm 5\%$ Std.		Terminals	Adjust Turns (Nom)	Power (Watts)	
				MIL-Qual.	IRC				
1	1/2"	.5 x .5 x .19	205-00	RT22C2L	50 Ω -20K	10 Ω -50K	Leads	25	1.0 @ 70°C
2		.5 x .5 x .22	205-10	RT22C2P	50 Ω -20K	10 Ω -50K	P.C. Pins Bottom	25	1.0 @ 70°C
3		.5 x .5 x .19	205-207*	RT22C2X	50 Ω -20K	10 Ω -50K	P.C. Pins Edge	25	1.0 @ 70°C
4		.5 x .5 x .19	205-208*	RT22C2W	50 Ω -20K	10 Ω -50K	P.C. Pins Edge	25	1.0 @ 70°C
1	1/2"	.5 x .5 x .19	20-00	—	—	50 Ω -20K $\Omega \pm 10\%$	Leads	25	1.0 @ 50°C
2		.5 x .5 x .22	20-10	—	—	50 Ω -20K $\Omega \pm 10\%$	P.C. Pins Bottom	25	1.0 @ 50°C
3		.5 x .5 x .19	20-207*	—	—	50 Ω -20K $\Omega \pm 10\%$	P.C. Pins Edge	25	1.0 @ 50°C
4		.5 x .5 x .19	20-208*	—	—	50 Ω -20K $\Omega \pm 10\%$	P.C. Pins Edge	25	1.0 @ 50°C
5	3/8"	.375 x .375 x .195	700-10	RT22C2P	10 Ω -10K	10 Ω -20K	P.C. Pins Bottom	21	.75 @ 70°C
6		.375 x .375 x .21	700-207*	RT22X	—	10 Ω -20K	P.C. Pins Edge	21	.75 @ 70°C
7		.375 x .375 x .21	700-208*	RT22W	—	10 Ω -20K	P.C. Pins Edge	21	.75 @ 70°C
5	3/8"	.375 x .375 x .195	70-10	—	—	50 Ω -20K $\Omega \pm 10\%$	P.C. Pins Bottom	21	.75 @ 70°C
6		.375 x .375 x .21	70-207*	—	—	50 Ω -20K $\Omega \pm 10\%$	P.C. Pins Edge	21	.75 @ 70°C
7		.375 x .375 x .21	70-208*	—	—	50 Ω -20K $\Omega \pm 10\%$	P.C. Pins Edge	21	.75 @ 70°C
12	3/8"	.375 x .375 x .340	320**	—	—	50 Ω -20K	Hook Pins Rear	1	1.0 @ 60°C
12	3/8"	.375 x .375 x .340	32	—	—	50 Ω -20K $\Omega \pm 10\%$	Hook Pins Rear	1	1.0 @ 60°C
8	3/16"	.312 x .312 x .19	800-20	—	—	10 Ω -20K	P.C. Pins Edge	15	.6 @ 70°C
9		.312 x .312 x .19	800-208*	—	—	10 Ω -20K	P.C. Pins Edge	15	.6 @ 70°C
10		.312 x .312 x .234	300	—	—	50 Ω -20K	P.C. Pins Bottom	1	.6 @ 60°C
11		.312 x .296 x .344	310	—	—	50 Ω -20K	P.C. Pins Edge	1	1.0 @ 60°C
10	3/16"	.312 x .312 x .234	30	—	—	50 Ω -20K $\Omega \pm 10\%$	P.C. Pins Bottom	1	0.5 @ 60°C
11		.312 x .312 x .344	31	—	—	50 Ω -20K $\Omega \pm 10\%$	P.C. Pins Edge	1	0.5 @ 60°C

*Suffix 207 denotes Lead Screw Location 90° from Pins. **#10-32 bushing on Type 320. ***Unless otherwise indicated.
Suffix 208 denotes Lead Screw Location 180° from Pins.

TRW[®] IRC POTENTIOMETERS

**CIRCUITRIM[®] 100 — The World's most experienced —
Most versatile 1/4" and 1/2" SINGLE TURN TRIMMERS**

its many variations are unequalled in the industry



Available from TRW/IRC Distributors

Illus.	TRW/IRC Type***	Description	Pin Spacing & Mounting	Adjustment Control	Resistance Range & Tolerance	Power (Watts)
--------	-----------------	-------------	------------------------	--------------------	------------------------------	---------------

SINGLE TURN — WIREWOUND

1	100*	1/2" Round x .235 High	.1" Radius, Flat	Top S.D. Slot	10Ω-50K ±5%	1.0 @ 70°C
2	110	1/2" Round x .325 High	.1" Radius, Flat	Top S.D. & Knob	10Ω-50K ±5%	1.0 @ 70°C
3	106-2	1/2" Wide x .56 High	.1" Radius, Vertical	Side S.D. Slot	10Ω-50K ±5%	1.0 @ 70°C
4	108-4	1/2" Wide x .56 High	.1" Radius, Vertical	Side S.D. & Knob	10Ω-50K ±5%	1.0 @ 70°C
5	101-5	1/2" Round x .265 High	.1" Radius, Flange	Top S.D. Slot	10Ω-50K ±5%	1.0 @ 70°C
6	102-5	3/4" Round x .250 Deep	.1" Radius, Flush	Top S.D. Slot	10Ω-50K ±5%	1.0 @ 70°C
7	103-6	3/4" Round x .315 Deep	10" Leads, Flush	Top S.D. Slot	10Ω-50K ±5%	1.0 @ 70°C
8	118-7	1/2" Round x .312 High	10" Leads, Flat	Top S.D. Slot	10Ω-50K ±5%	1.0 @ 70°C
9	500	1/2" Round x .325 High	.1" Radius, Flat	Top S.D. & Knob	10Ω-50K ±5%	1.0 @ 70°C
10	506	1/2" Wide x .56 High	.1" Radius, Vertical	Top S.D. & Knob	10Ω-50K ±5%	1.0 @ 70°C

SINGLE TURN — METAL GLAZE[®] — CERMET

1	150*	1/2" Round x .235 High	.1" Radius, Flat	Top S.D. Slot	10Ω-2 MegΩ ±10%	.75 @ 70°C
2	160	1/2" Round x .325 High	.1" Radius, Flat	Top S.D. & Knob	10Ω-2 MegΩ ±10%	.75 @ 70°C
3	156-2	1/2" Wide x .56 High	.1" Radius, Vertical	Side S.D. Slot	10Ω-2 MegΩ ±10%	.75 @ 70°C
4	158-4	1/2" Wide x .56 High	.1" Radius, Vertical	Side S.D. & Knob	10Ω-2 MegΩ ±10%	.75 @ 70°C
5	151-5	1/2" Round x .265 High	.1" Radius, Flange	Top S.D. Slot	10Ω-2 MegΩ ±10%	.75 @ 70°C
6	152-5	3/4" Round x .250 Deep	.1" Radius, Flush	Top S.D. Slot	10Ω-2 MegΩ ±10%	.75 @ 70°C
7	103-6	3/4" Round x .315 Deep	10" Leads, Flush	Top S.D. Slot	10Ω-2 MegΩ ±10%	.75 @ 70°C
8	118-7	1/2" Round x .312 High	10" Leads, Flat	Top S.D. Slot	10Ω-2 MegΩ ±10%	.75 @ 70°C
9	550	1/2" Round x .235 High	.1" Radius, Flat	Top S.D. & Knob	10Ω-2 MegΩ ±30%	.75 @ 70°C
10	556	1/2" Wide x .56 High	.1" Radius, Vertical	Side S.D. & Knob	10Ω-2 MegΩ ±30%	.75 @ 70°C
17	76-10	3/8" Square x .28 High	.1" Radius, Flat	Top S.D. Slot	100Ω-1 MegΩ ±10%	.5 @ 70°C
18	76-30	3/8" Square x .28 High	.2" Radius, Flat	Top S.D. Slot	100Ω-1 MegΩ ±10%	.5 @ 70°C
19	76-50**	3/8" Square x .28 High	.15 Inline, Flat	Top S.D. Slot	100Ω-1 MegΩ ±10%	.5 @ 70°C
20	76-20**	.2 x .37 x .42 High	.10 Inline, Vertical	Side S.D. Slot	100Ω-1 MegΩ ±10%	.5 @ 70°C
21	76-40**	.2 x .37 x .42 High	.10 Radius, Vertical	Side S.D. Slot	100Ω-1 MegΩ ±10%	.5 @ 70°C
22	76-70**	.2 x .37 x .42 High	.15 Inline, Vertical	Side S.D. Slot	100Ω-1 MegΩ ±10%	.5 @ 70°C

**Also available with C.W. rotation.

***Available with 0.5W @ 85°C rating, testing to MIL-R-22097, as 760 Series, all styles.

1/4" SINGLE TURN METAL GLAZE[®] — CERMET

11	170*	1/4" Round x .17 High	.1" Radius, Flat	Top S.D. Slot	10Ω-1 MegΩ ±20%	.5 @ 85°C
12	171	1/4" Round x .18 High	.1" Radius, Flat	Top S.D. Slot	10Ω-1 MegΩ ±20%	.5 @ 85°C
13	172	1/4" Wide x .31 High	.1" Radius, Vertical	Side S.D. Slot	10Ω-1 MegΩ ±20%	.5 @ 85°C
14	180	1/4" Square x .18 High	.1" Radius Flat	Top S.D. Slot	100Ω-1 MegΩ	.5 @ 70°C
15	181	1/4" Square x .18 High	.1" Centers Flat	Top S.D. Slot	100Ω-1 MegΩ	.5 @ 70°C
16	182	1/4" Square x .312 High	.1" Centers Flat	Side S.D. Slot	100Ω-1 MegΩ	.5 @ 70°C

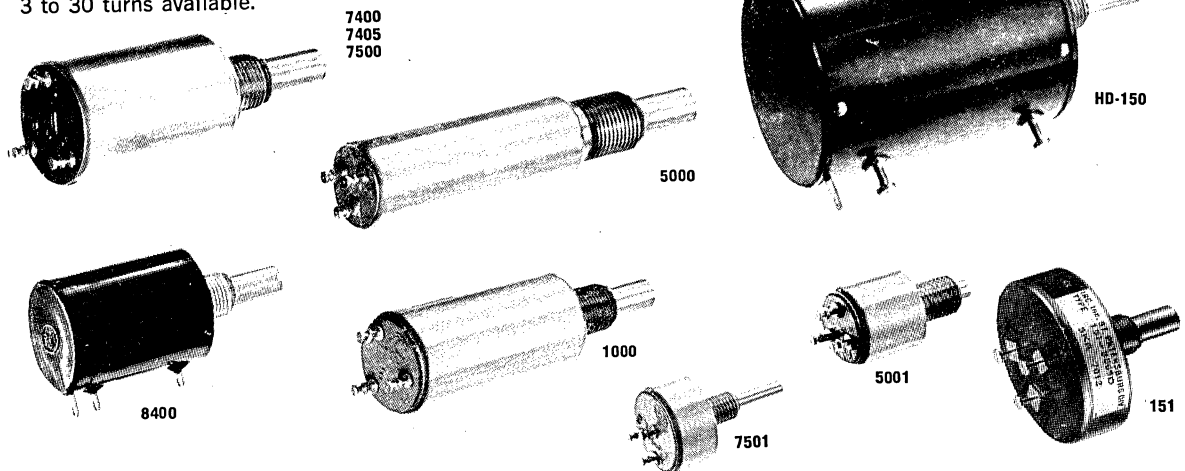
*Basic Mechanical/Electrical Components for these respective series. Mounting variations and type and location of adjustment controls provide versatility and change in model numbering.

TRW[®] IRC POTENTIOMETERS

PRECISION SINGLE TURN and MULTI-TURN POTENTIOMETERS

Wirewound, bushing-mounted, metal or plastic case

Many feature TRW/IRC's exclusive metal to metal stop system and rear terminals for close packaging.
3 to 30 turns available.



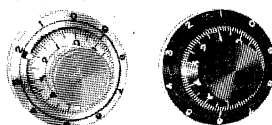
Available from TRW/IRC Distributors

Specifications	Type 5000 1/2" Dia. Metal Case	Type 5001 1/2" Dia. Metal Case	Type 7400 3/4" Dia. Metal Case	Type 7405 3/4" Dia. Metal Case	Type 7500 3/4" Dia. Metal Case
Electrical					
Resistance Range & Tol.	25Ω-100K ±5%	10Ω-50K ±5%	100Ω-100K ±5%	100Ω-50K ±5%	50Ω-250K ±5%
Power Rating	1.5W @ 40°C	2.0W @ 40°C	3.0W @ 40°C	2.0W @ 40°C	3.0W @ 40°C
Operating Temp. Range	-55°C to +125°C	-65°C to +150°C	-65°C to +125°C	-65°C to +125°C	-55°C to +125°C
Linearity (Indep., Std.)	±5%	±5%	±0.25%	±0.5%	±0.25%
Rotation	3600° +4° -0°	320° ±5°	3600° +6° -0°	1800° +6° -0°	3600° +4° -0°
Mechanical					
Dimensions (Dia. x L.B.P.)	1/2" x 1 3/4"	1/2" x 1 1/2"	3/4" x 1 1/4"	3/4" x 1 1/4"	3/4" x 1 1/2"
Bushing (Dia. x L.)	3/8" x 1/2"	1/4" x 3/8"	3/8" x 1/2"	3/8" x 1/2"	3/8" x 1/2"
Shaft (Dia. x L.)	1/4" x 1/2"	1/8" x 1/2"	1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"
Rotation	3600° +4° -0°	320° ±5°	3600° +6° -0°	1800° +6° -0°	3600° +4° -0°
Specifications	Type 7501 3/4" Dia. Metal Case	Type 1000 1" Dia. Metal Case	Type 8400 7/8" Dia. Phenolic Case	Type HD-150 1 1/2" Dia. Phenolic Case	Type 151 1 1/2" Dia. Metal Case
Electrical					
Resistance Range & Tol.	50Ω-75K ±5%	500Ω-200K ±5%	25Ω-100K ±5%	500Ω-600K ±5%	100Ω-100K ±5%
Power Rating	2.25W @ 40°C	3.0W @ 40°C	3.0W @ 40°C	5.0W @ 40°C	3.5W @ 40°C
Operating Temp. Range	-65°C to +150°C	-55°C to +125°C	-55°C to +105°C	-55°C to +100°C	-65°C to +150°C
Linearity (Indep., Std.)	±1%	±0.5%	±0.25%	±3%	±0.5%
Rotation	345° ±5°	3600° +4° -0°	3600° +10° -0°	3600° +4° -0°	350° ±5°
Mechanical					
Dimensions (Dia. x L.B.P.)	3/4" x 3/8"	1" x 1 1/2"	7/8" x 1 1/8"	1 1/2" x 2.0"	1 1/2" x 1 1/2"
Bushing (Dia. x L.)	1/4" x 3/8"	3/8" x 1/2"	3/8" x 1/2"	3/8" x 3/4"	3/8" x 1/2"
Shaft (Dia. x L.)	1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"	1/4" x 1/2"
Rotation	Cont.	3600° +4° -0° Available in 2 to 15 Turns	3600° +15° -0° Also Avail. in 3 & 5 Turns	3600° +4° -0° Also Avail. in 3 & 5 Turns	Cont.

Note: Consult factory for Shaft and Bushing Modifications, Center Taps, Intermediate Turns, best Practical Resistance and Linearity Tolerances and Moisture or Hermetic Sealing.

REVODEX[®] TURNS COUNTING DIALS

Eliminate reading errors.

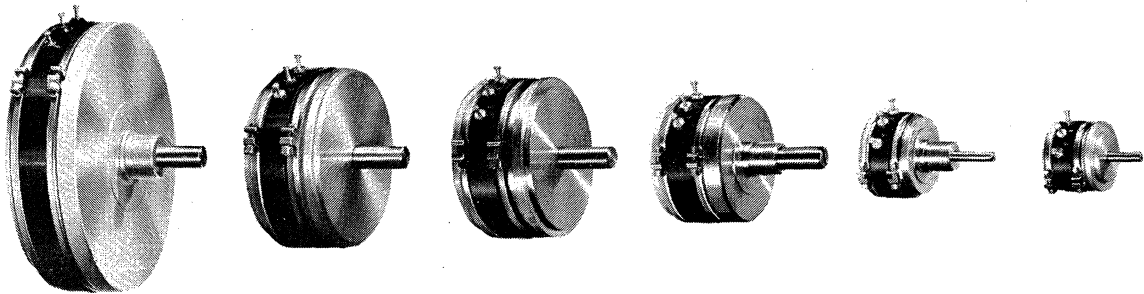


RD-400 Series 1" Dia. 10 Turns
RDK-400 Series 1" Dia. 15 Turns

Revodex[®] Dials are adaptable to all IRC Precision Potentiometers without need for extra panel holes. Life tested for one quarter million cycles. Available in black or clear anodized finish, with or without lock.

TRW[®] IRC POTENTIOMETERS

PRECISION POTENTIOMETERS 7/8" to 3" Diameter 1 to 6 Watts



These high performance devices will equal or exceed the appropriate military specifications, as well as those of competitive devices.

Factory services will supply a wide range of mechanical,

electrical and environmental modifications. Standard options include special shafts, shaft seals, stops, anti-rotation pins... multicup assembly, voltage taps, 1% T.R. tolerance and independent linearity as low as 0.1%.

SPECIFICATIONS

Mfr's Model	Size	Mounting	Linearity*	Power	Torque Starting/Running	Weight Oz. (gm)	Resistance Range
0871-0001	.875 Dia. x .620	Servo 1/8 Shaft Bushing 1/8 Shaft	±.5	1W @ 70°C	0.15	0.6	50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 50K
0871-0002	.875 Dia. x .645	Servo 1/8 Shaft Bushing 1/8 Shaft	±.5	1W @ 70°C	0.15	0.6	50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 50K
1061-0001	1.062 Dia. x .67	Servo 1/8 Shaft Bushing 1/8 Shaft	±.5	1.5W @ 70°C	0.15	0.8	50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 50K
1061-0002	1.062 Dia. x .645	Servo 1/8 Shaft Bushing 1/8 Shaft	±.5	1.5W @ 70°C	0.15	0.8	50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 50K
1441-0001	1.437 Dia. x .800	Servo 1/4 Shaft Bushing 1/4 Shaft	±.5	2W @ 70°C	0.5	1.7	50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 50K
1441-0002	1.437 Dia. x .850	Servo 1/4 Shaft Bushing 1/4 Shaft	±.5	2W @ 70°C	0.5	1.7	50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 50K
1751-0001	1.750 Dia. x .800	Servo 1/4 Shaft Bushing 1/4 Shaft	±.25	2.5W @ 70°C	0.5	2.2	50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 50K
1751-0002	1.750 Dia. x .850	Servo 1/4 Shaft Bushing 1/4 Shaft	±.25	2.5W @ 70°C	0.5	2.3	50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 50K
2001-0001	2.00 Dia. x .800	Servo 1/4 Shaft Bushing 1/4 Shaft	±.25	4W @ 70°C	0.5	3	50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 50K
2001-0002	2.00 Dia. x .850	Servo 1/4 Shaft Bushing 1/4 Shaft	±.25	4W @ 70°C	0.5	3	50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 50K
3001-0001	3.00 Dia. x .800	Servo 1/4 Shaft Bushing 1/4 Shaft	±.25	6W @ 70°C	0.5	5.5	50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 50K
3001-0002	3.00 Dia. x .850	Servo 1/4 Shaft Bushing 1/4 Shaft	±.25	6W @ 70°C	0.5	5.3	50, 100, 200, 500, 1K, 2K, 5K, 10K, 20K, 50K

% RESOLUTION

Model	50Ω	100Ω	200Ω	500Ω	1KΩ	2KΩ	5KΩ	10KΩ	20KΩ	50KΩ	100KΩ
0871	.361	.292	.233	.173	.152	.149	.107	.090	.070	.059	—
1061	.301	.231	.188	.140	.115	.131	.106	.085	.067	.052	—
1441	.253	.201	.172	.143	.106	.087	.093	.072	.058	.044	—
1751	.228	.179	.137	.113	.097	.076	.081	.071	.047	.039	—
2001	—	.177	.138	.111	.089	.066	.071	.065	.044	.033	.027
3001	—	.125	.099	.076	.062	.050	.038	.041	.033	.027	.025

ELECTRICAL CHARACTERISTICS

Resistance Tolerance: ±3%

Effective Electrical Angle: 350° ±2°

End Settings: 1Ω or 0.1% whichever is greater

Noise Ohms ENR: 100 maximum

Dielectric Strength: MIL-R-12934

Sea Level: 1,000 volts AC minimum

Insulation Resistance, 500 volts DC: 1,000 megohms min.

MECHANICAL & PHYSICAL CHARACTERISTICS

Mechanical Angle: Continuous

Shaft Runout: .001 in. (.025mm) T.I.R.

Shaft End Play: .005 in. (.127mm) T.I.R.

Shaft Radial Play: .002 in. (.051mm) T.I.R.

Pilot Surface Runout: .0015 in. (.0381mm) T.I.R.

Lateral Runout: .002 in. (.051mm) T.I.R.

Rotational Life: 1,000,000 shaft revolutions

MECHANICAL & PHYSICAL CHARACTERISTICS (Cont'd)

Moment of Inertia: 16.0 gm cm²

Ganging: 15 cups maximum

Terminals: Gold plated turrets

ENVIRONMENTAL CHARACTERISTICS

Operating Temperature Range: -65°C to 125°C

Temperature Coefficient of Wire: 20 ppm/°C maximum

Humidity: MIL-R-12934, humidity cycling

Vibration: MIL-R-12934, high frequency

Wiper Bounce: 0.1 millisecond maximum

Wiper Shift: 1.0% maximum

Shock: MIL-R-12934, 100G

Wiper Bounce and Wiper Shift: Same as vibration

Rotational Load Life: MIL-R-12934 par. 4.6.20.2, 1,000 hrs.

Resistance Shift: 5.0% maximum

Salt Spray: MIL-R-12934



VISHAY RESISTIVE SYSTEMS GROUP

OF VISHAY INTERTECHNOLOGY, INC.

63 LINCOLN HIGHWAY, MALVERN, PA. 19355 • PHONE: (215) 644-1300

• TWX: 510-668-8944

PRECISION TRIMMERS — HIGH PRECISION

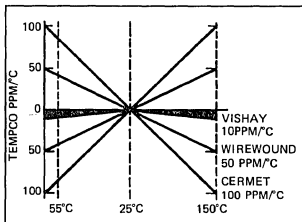
Vishay Bulk Metal® trimmers feature a unique combination of precision, stability, TCR, resolution and setability not available elsewhere. These trimmers are designed to conform to Mil-R-39035, types RJR12 and RJR26.



Model	Description	Term Style	Mil Style	Resistance	Tol	TCR (ppm/°C)	Power	No. of Turns
1202, 3P	1 1/4" Rect.	In Line Pins	RJR12	5Ω to 10K	5%, 10%	10, 20	1/2 w @ 85°C	25
1202, 3Y	1 1/4" Rect.	Staggered Pins	RJR12	5Ω to 10K	5%, 10%	10, 20	1/2 w @ 85°C	25
1202, 3L	1 1/4" Rect.	Wire Leads	RJR12	5Ω to 10K	5%, 10%	10, 20	1/2 w @ 85°C	25
1202, 3LB	1 1/4" Rect.-Panel Mt.	Wire Leads	RJR12	5Ω to 10K	5%, 10%	10, 20	1/2 w @ 85°C	25
1240X	1/4" Square Edge Mt. Side Adj.	TO-5 Pins	RJR26	5Ω to 5K	5%	10	1/4 w @ 85°C	20
1240W	1/4" Square Edge Mt. Top Adj.	TO-5 Pins	RJR26	5Ω to 5K	5%	10	1/4 w @ 85°C	20
1240P	1/4" Square Side Adj.	TO-5 Pins	RJR26	5Ω to 5K	5%	10	1/4 w @ 85°C	20

THE BEST TEMPCO

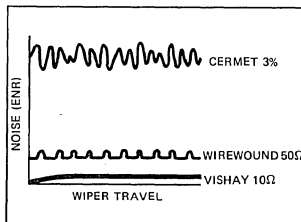
10 ppm/°C



Self compensating characteristics are inherent in the proprietary Bulk Metal® process and produce a dome-shaped T.C. curve with a typical TCR of 5ppm/°C (absolute maximum TCR of 10ppm/°C for all values).

THE LOWEST NOISE

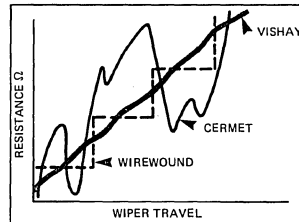
10 Ω ENR



A multi-fingered precious metal alloy wiper in contact with the highly conductive surface of multiple resistance paths virtually eliminates both dynamic noise and catastrophic failures.

THE BEST RESOLUTION SETABILITY

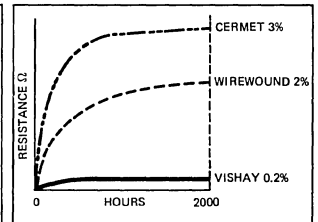
0.05%



The Vishay Bulk Metal® process and the unique patented design assures an accurate setability of less than 0.05% regardless of value while wirewound technology ranges from 1.55% to 0.25%.

THE BEST LOAD LIFE

0.2 %



Only the Vishay Bulk Metal® element can provide a stability of 0.2% max. ΔR through a 2,000 hour load life.

REON POTENTIOMETERS — 1/2" DIA. HOT-MOLDED CARBON

Reon hot molded carbon potentiometers provide stepless and infinitely adjustable resistance values. These lightweight units are made with a unique one-piece cast aluminum alloy housing which provides for their ruggedness

and excellent heat dissipating characteristics.

A special carbon collector brush is designed to provide for minimum element wear, long rotational life, and low operating noise.

ELEMENT:

1/2" diameter molded carbon

RESISTANCE RANGE:

100Ω to 5 Megohms

TOLERANCE:

10%, 20%

ROTATION:

295° ±5°

RESOLUTION:

Infinite

END RESISTANCE:

Less than the requirements of Mil-R-94 D

NOISE:

3% max., 1% avg.

INSULATION RESISTANCE:

100 Megohm min.

DIELECTRIC WITHSTANDING VOLTAGE:

750 Vrms for 1 min at Atmospheric pressure

RESISTANCE TAPER:

A, B, C, D, E, F

POWER RATING:

RV6, B Series 1/2W at 70°C
H, CL, CK Series 1/4W at 70°C
Derate linearly to 0 W at 120°C

TERMINAL TYPES:

RV6, B Series — Lug Type
H Series — 3/64" PC Pin Type
CL, CK Series — 3/16" PC Pin Type

SHAFTS:

RV6, B Series — Stainless Steel slotted (3/8" to 1")
CL Series — Plastic screwdriver adj.
CK Series — Plastic thumb knob adj.
H Series — Stainless Steel slotted (3/2")

STANDARD SHAFT OPTIONS:

3/8" (slotted) Military "SL," Reon "S12"
1/2" (slotted) Military "SB," Reon "S16"
3/8" (slotted) Military "SA," Reon "S20"
7/8" (slotted) Military "SD," Reon "S28"

STANDARD BUSHING OPTIONS: (Plain and Waterseal)

1/4" Military NA, SA, Reon BA2B, BS2B
3/8" (Locking) Military None, Reon BL3B
1/2" (Locking) Military LA, TA, Reon BL4B, BT4B

PANEL MOUNTED

PRINTED CIRCUIT MOUNT



STANDARD BUSHING



PLASTIC SCREW ADJUST.

REON TYPE B or MIL TYPE RV6 All Mil types available.

TYPE CL Other styles available.

POWER EL ABS INC.

1050 SECOND ST. MANCHESTER, N.H. 03102 TWX 710-220-1844 Tel. (603) 625-8994

TYPE EL silicone power

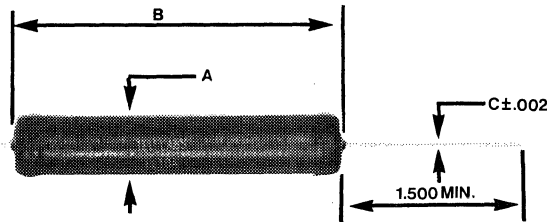
MEET OR EXCEEDS MIL-R-26

Silicone coated units with axial leads provide maximum power dissipation using the smallest package.

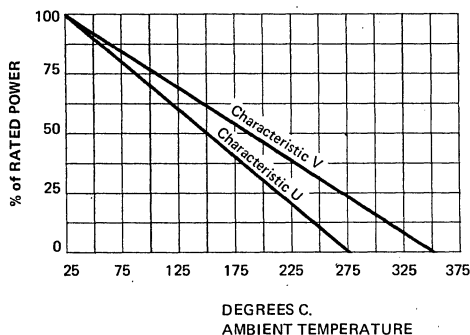
These may be made using standard inductive winding or non-inductive winding. Care must be taken when specifying non-inductive winding as it is possible to achieve only one half the resistance value specified for inductive winding.

A cost savings may be realized as compared to many other precision type units.

Resistance tolerances to 0.05% are available in this series.

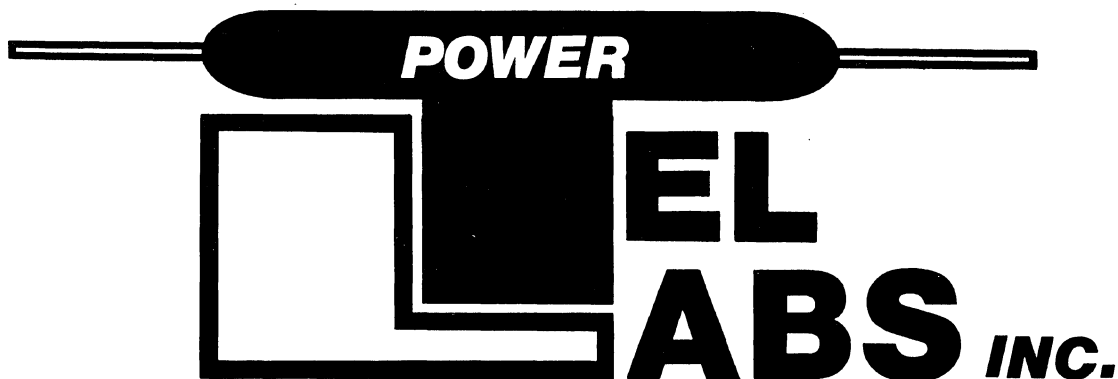


Tel Labs Style	Mil Desig. (RW)	Diameter (A)	Length (B)	Lead Size (C)	Wattage		Radial Leads (special)	Radial Leads Size
					275°C	350°C		
EL¼		.090±.031	.215±.031	.020	0.5W	1.0W	Yes	—
EL½		.090±.031	.280±.031	.020	0.5W	1.0W	Yes	.020
EL1A	RW70	.090±.031	.395±.031	.020	1.0W	1.25W	Yes	.020
EL1B		.090±.031	.530±.031	.020	1.0W	1.25W	Yes	.020
EL1C		.135±.031	.335±.031	.025	1.0W	2.0W	No	—
EL2		.250±.031	.625±.062	.032-.040	3.0W	4.0W	Yes	.032
EL2A		.187±.031	.825±.062	.032	3.25W	4.5W	Yes	.032
EL2B		.187±.031	.625±.062	.032	3.0W	3.5W	Yes	.032
EL2C		.250±.031	.562±.062	.032-.040	3.0W	4.0W	Yes	.032
EL2D		.250±.031	.500±.062	.032-.040	3.0W	4.0W	Yes	.032
EL2E	RW59, 69	.195±.031	.500±.062	.025	2.5W	3.5W	No	—
EL2F		.187±.031	.500±.062	.032	2.5W	3.0W	Yes	.032
EL2G		.187±.031	.430±.062	.032	2.5W	3.0W	Yes	.032
EL2H		.187±.031	.385±.062	.032	2.5W	3.0W	Yes	.032
EL2I	RW79	.195±.031	.560±.062	.032	3.0W	3.5W	Yes	.032
EL3		.295±.031	.500±.062	.032-.040	3.0W	4.0W	Yes	.032
EL5	RW74	.290±.062	.925±.093	.032-.040	5.0W	6.0W	Yes	.032
EL5A	RW57, 67	.350±.062	1.000±.093	.032-.040	5.0W	6.5W	Yes	.032
EL7		.290±.062	1.200±.093	.032-.040	5.0W	6.5W	Yes	.032
EL7A		.350±.062	1.360±.093	.032-.040	5.0W	7.0W	Yes	.032
EL10A	RW58, 68	.350±.062	1.815±.093	.040	10.0W	12.0W	Yes	.032



STYLE	RESISTANCE				NORMAL TEMPERATURE COEFFICIENT			
	0.05%	0.1%	0.25%	0.5%	± 90 PPM	± 50 PPM	± 30 PPM	± 20 PPM
EL¼	10~ -950~	1~ -3.4K	Below 1~	1~ to 6.9~	7~ to 999~	1K - 3.5K		
EL½	10~ -1K	1~ -7K	Below 1~	1~ to 9.9~	10~ to 799~	800~ - 7K		
EL1A	1~ -2K	1~ -10K	Below 1~	1~ to 9.9~	10~ to 999~	1K - 10K		
EL1B	1~ -4K	1~ -12K	Below 1~	1~ to 0.9~	10~ to 1.34K	1.35K - 12K		
EL1C	1~ -2K	1~ -10K	Below 1~	1~ to 9.9~	10~ to 999~	1K - 10K		
EL2	1~ -12K	1~ -40K	Below 1~	1~ to 9.9~	10~ to 4.69K	4.7K - 40K		
EL2A	1~ -10K	1~ -35K	Below 1~	1~ to 9.9~	10~ to 3.49K	3.5K - 35K		
EL2B	1~ -8K	1~ -30K	Below 1~	1~ to 9.9~	10~ to 2.99K	3.0K - 30K		
EL2C	1~ -8K	1~ -30K	Below 1~	1~ to 9.9~	10~ to 2.99K	3.0K - 30K		
EL2D	1~ -7.5K	1~ -27K	Below 1~	1~ to 9.9~	10~ to 2.49K	2.5K - 27K		
EL2E	1~ -8K	1~ -30K	Below 1~	1~ to 9.9~	10~ to 2.99K	3.0K - 30K		
EL2F	1~ -4K	1~ -20K	Below 1~	1~ to 9.9~	10~ to 2.99K	3.0K - 20K		
EL2G	1~ -2K	1~ -10K	Below 1~	1~ to 9.9~	10~ to 2.99K	3.0K - 10K		
EL2H	1~ -2K	1~ -9K	Below 1~	1~ to 9.9~	10~ to 2.99K	3.0K - 9K		
EL2I	1~ -8K	1~ -30K	Below 1~	1~ to 9.9~	10~ to 2.99K	3.0K - 30K		
EL3	1~ -8.3K	1~ -30.5K	Below 1~	1~ to 9.9~	10~ to 2.99K	3.0K - 30.5K		
EL5	.5~ -22K	1~ -70K	Below 1~	1~ to 9.9~	10~ to 7.49K	7.5K - 70K		
EL5A	.5~ -35K	1~ -90K	Below 1~	1~ to 9.9~	10~ to 8.39K	8.4K - 90K		
EL7	.5~ -35K	1~ -90K	Below 1~	1~ to 9.9~	10~ to 8.24K	8.25K - 90K		
EL7A	.5~ -45K	1~ -100K	Below 1~	1~ to 9.9~	10~ to 9.99K	10K - 100K		
EL10A	.5~ -75K	1~ -275K	Below 1~	1~ to 9.9~	10~ to 30.99K	31K - 175K		

We do just one thing, and one thing well!



1050 SECOND ST. MANCHESTER, N.H. 03102 TWX 710-220-1844 Tel. (603) 625-8994

Beryllium Oxide Core

Use of beryllium core allows greater power ratings than exhibited by conventional resistors of equal size.

TEL LABS STYLE	MIL DESIG. (RW)	DIAMETER (A)	LENGTH (B)	LEAD SIZE (C)	Wattage Rating		Maximum Resistance	
					U 275° C	V 350° C	MIL	TEL LABS
BL1	RW81	.078 ± .015	.265 ± .015	.020	1	1.5	649~	3.4K
BL2		.090 ± .031	.395 ± .031	.020	1.5	2	---	4.9K
BL3	RW80	.090 ± .031	.395 ± .031	.020	2.25	2.75	3.16K	10.2K
BL4		.187 ± .031	.625 ± .062	.032	4	5	---	25.0K
BL4A		.187 ± .031	.825 ± .062	.032	4.5	6.5	---	42.2K
BL5		.250 ± .031	.500 ± .062	.032 - .040	5	7	---	33.0K
BL6		.250 ± .031	.625 ± .062	.032 - .040	6	8	---	47.0K
BL7		.300 ± .062	.950 ± .093	.032 - .040	7	10	---	96.0K
BL10		.300 ± .062	1.218 ± .093	.032 - .040	10	12	---	155.0K
BL10A		.350 ± .062	1.815 ± .093	.040	15	18	---	275.0K

Same derating as shown on opposite page.

Units are manufactured using stainless steel end caps, all welded construction and high quality resistance wire.

Coating is of high quality silicone to withstand high temperature operation.

Standard tolerances and temperature coefficient as well as specials are available.

Units are supplied with axial leads.

Non-Inductive (Aryton-Perry) specify as "BLN". Maximum resistance (per chart below) would have to be divided by two.

TYPE EH chassis mount

All welded construction

**aluminum
housed**

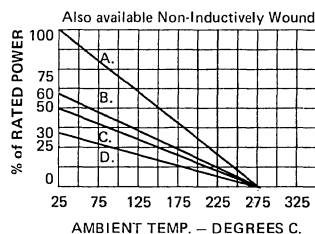
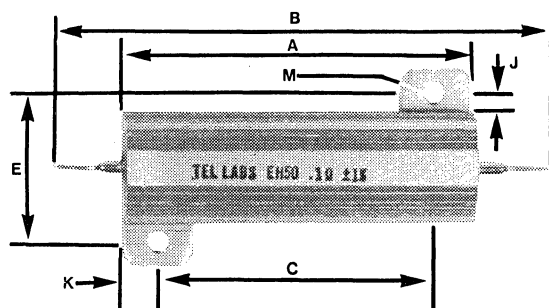
Special molding compound and process assures positive transfer of heat to the case and mounting chassis.

Resistance ranges — per chart below and lower values upon investigation.

Tolerances — .01% thru 5% — close tolerances on low ohms per application only.

For Non-Inductive, add "N" to style number. Maximum resistance value must be decreased by at least one half of maximum value listed in chart.

Units manufactured to meet or exceed the requirements of MIL-R-18546D.



EH5 3.0 GRAMS
EH10 5.6 GRAMS
EH25 11.7 GRAMS
EH50 25.0 GRAMS

A. EH5, 10, 25, 50 Mounted
B. EH10 Unmounted
C. EH5, 25 Unmounted
D. EH50 Unmounted

AMBIENT TEMP. — DEGREES C.

TEL LABS STYLE	A ±.031	C ±.005	E ±.005
EH5	.600	.444	.490
EH10	.750	.562	.625
EH25	1.062	.718	.781
EH50	1.937	1.562	.843

MOUNTING

EH25, 50 5x7x2 Aluminum Chassis

EH5, 10 4x6x2 Aluminum Chassis

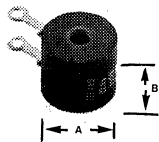
TEL LABS STYLE (Anodized)	WATTAGE		RESISTANCE RANGE	TEMP. COEFFICIENT
	Mounted	Unmounted	1% - 5%	±50 PPM ±20 PPM
EH5	8W	4W	0.1Ω to 22K	0.1Ω to 30Ω OVER 30Ω
EH10	10W	6W	0.1Ω to 40K	0.1Ω to 50Ω OVER 50Ω
EH25	25W	10W	0.1Ω to 70K	0.1Ω to 100Ω OVER 100Ω
EH50	50W	12W	0.1Ω to 250K	0.1Ω to 300Ω OVER 300Ω

Meets or exceeds MIL R-18546D.

We do just one thing, and one thing well!

PRECISION**TEL
LABS
INC.**

1050 SECOND ST. MANCHESTER, N.H. 03102 TWX 710-220-1844 Tel. (603) 625-8994

SL series series

Conformal and Shell encapsulated

Excellent under critical environmental conditions Available with .032 Leads. Specify Letter "X" after style (SL21X)
 Temperature Coefficients from 0 ± 20 PPM/°C to 0 ± 5 PPM/°C
 Matching in sets to 2 PPM
 NonInductively Wound
 Stabilities available on a production basis to 0.005%/year.

MIL R 93D DESIG.	TEL LABS STYLE	A $\pm .015$	B $\pm .031$	MAX. VALUE		WATTAGE		MAX. V.		HOLE CLEARANCE SCREW #
				MIL.	COMM.	MIL.	COMM.	MIL.	COMM.	
	SL21	.500	.500		350K	0.25W	0.5W	300	600	6
RB16	SL31	.500	.687	1 MEG.	1.5 MEG.	0.33W	0.6W		600	6
RB17	SL50	.562	1.000	2 MEG.	3.5 MEG.	0.5W	1.0W	600	1200	6
RB18	SL60	.750	1.250	3.01 MEG.	4.25 MEG.	0.75W	1.5W	600	1200	6
RB19	SL70	.906	2.125	6.03 MEG.	10 MEG.	1.0W	2.0W	900	2400	6

TYPE CR CA CL**series**

CERAMIC CORE RESISTORS

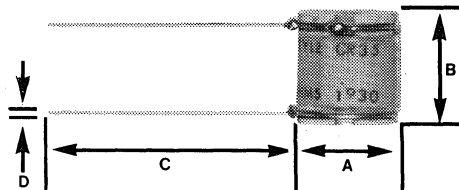
"CR" Ceramic Radial Leads

"CA" Ceramic Axial Leads

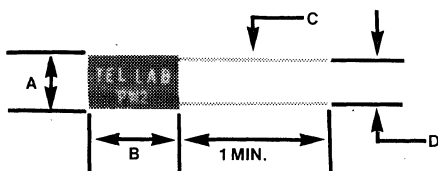
"CL" Ceramic Lugs

Ceramic spool type unit. Windings sealed in varnish. Hole provided for screw mounting. Operate from -65°C to 105°C . Inherently good stability.

Excellent for use under laboratory conditions and most commercial applications.

**TYPE PW series**

Conformal and Shell Encapsulated. Designed Specifically for Printed Circuit Applications. Temperature coefficients from 0 ± 20 PPM to 0 ± 5 PPM Matching to 2 PPM. Inductive or Noninductive Winding. Stabilities available on a production basis to 0.005%/year.



Mil R 93D Desig.	Tel Labs Style	A $\pm .015$	B $\pm .032$	C	D $\pm .015$	MAX. VALUE Mil.	WATTAGE Mil.	MAX. V. Comm.
RB71	PW1	.250	.312	.025	.200	100K	.125W	.300
	PW2	.250	.406	.025	.200	175K	.2W	600
RB70	PW20	.375	.500	.032	.200, .250	301K	.250W	150
	PW40	.468	.625	.032	.250, .300	500K	.3W	600
	PW31	.500	.625	.032	.250, .300	1.75 Meg	.6W	600
	PW10	.406	1.250	.032	.250, .300	1.0 Meg	1.0W	1200
	PW50	.531	1.000	.032	.250, .300	3.0 Meg	1.0W	1200

Style	Diameter A $\pm .015$	Length B $\pm .031$	Lead Diam. D	Max Value (.0005 Wire)	Wattage	Max. V	Hole (clearance) Screw #
CR16	.250	.250	0.20	100K	0.1W	200	0
CR1	.250	.406	.020-0.25	400K	0.15W	400	2
CR23	.281	.343	.020-.025	250K	0.15W	200	2
CR18	.343	.312	.020-.025	400K	0.2W	200	6
CR2	.250	.687	.020-.025	1.25 Meg.	0.25W	400	0
CR20	.375	.437	.020-.032	1.0 Meg.	0.25W	200	4
CR25	.500	.437	.025-.032	1.5 Meg.	0.33W	400	6
CR27	.375	.656	.025-.032	1.5 Meg.	0.5W	400	4
CR31	.500	.625	.025-.032	3.0 Meg.	0.5W	400	6
CR35	.500	.562	.025-.032	3.25 Meg.	0.5W	400	6
CR53	.500	1.000	.025-.032	6.0 Meg.	1.0W	800	6
CR60	.750	1.250	.025-.032	6.0 Meg.	1.5W	800	6
CR71	.812	2.093	.025-.032	20.0 Meg.	2.5W	1600	6

1. All units above may be supplied with Axial Leads, specify "CA".

2. Lugs may be supplied on the following: CL25, CL31, CL35, CL53, CL60, CL71

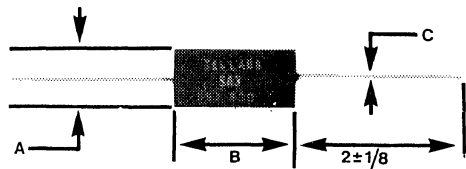
We do just one thing, and one thing well!

PRECISION**TEL
LABS
ABS INC.**

1050 SECOND ST. MANCHESTER, N.H. 03102 TWX 710-220-1844 Tel. (603) 625-8994

TYPE SA epoxy

DESIGNED TO MEET OR EXCEED MILR93D
All units represented may be modified for
minimum inductance and capacitive effects at
frequencies above the audio range. Rise and
decay time characteristics are measured from
10% to 90% of peak pulse amplitude with a
100 kilocycle pulse input.
Temperature coefficients are available to $0 \pm$



4PPM/°C. and T.C. matches are available to
2PPM/°C.

Stabilities of 0.005% per year are available
on a production basis.

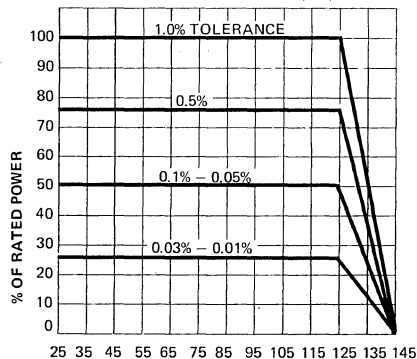
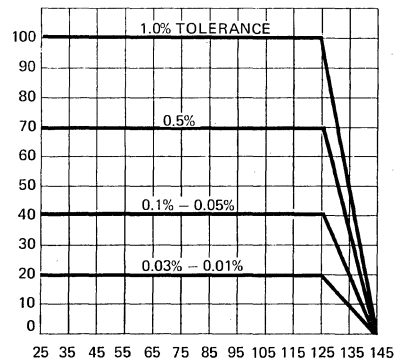
subminiatures

Tel Labs Style	Mil R93D Desig.	Diam. A ± .015	Length B ± .031	Lead Diam. C.	MAX. VALUE		WATTAGE		MAX. VOLTAGE	
					Mil.	Comm.	Mil.	Comm.	Mil.	Comm.
SA1	RB55	.250	.500	.032	226 K	1.1 Meg	.15W	.3W	400	400
SA2	RB54	.250	.750	.032	448 K	2 Meg	.25W	.4W	300	400
SA3	RB53	.375	.750	.032	750 K	8 Meg	.333W	.5W	300	400
SA4	RB52	.375	1.000	.032	1.5 Meg	10 Meg	.5W	.75W	600	800
SA5	RB57	.500	1.000	.032	2 Meg	16 Meg	.75W	1.0W	800	1000
SA6	RB58	.500	1.531	.032	3 Meg	24 Meg	1.0W	1.5W	900	1200
SA7	RB59	.500	2.031	.032	5.11 Meg	24 Meg	1.25W	2.0W	1200	1800
SA11		.250	.625	.032		400 K		.33W		800
SA13		.312	.937	.032		1.2 Meg		.5W		800
SA16	RB56	.250	.375	.032	127 K	205 K	.125W	.25W	200	200
SA19		.250	.250	.032		500 K		.2W		200
SA18		.500	.500	.032		3 Meg		.5W		.500

Tel Labs Style	Diameter A ± .015	Length B ± .031	Lead Diam. C.	Maximum Value	Maximum Wattage	Maximum Voltage
SA9	.135	.312	.025	400 K	.08W	100
SA10	.185	.500	.025	500 K	.2W	100
SA17	.109	.270	.020	200 K	.05W	100
SA20	.165	.500	.025	400 K	.150W	100, 200
SA21	.187	.375	.025	500 K	.125W	100, 200
SA22	.150	.400	.025	190 K	.07W	100
SA24	.125	.250	.020	75 K	.05W	100
SA25	.110	.300	.020	85 K	.05W	100
SA26	.125	.375	.025	140 K	.05W	100
SA29	.100	.300	.025	80 K	.05W	100
SA30	.200	.405	.025	550 K	.13W	100
SA31	.100	.220	.020	70 K	.04W	100

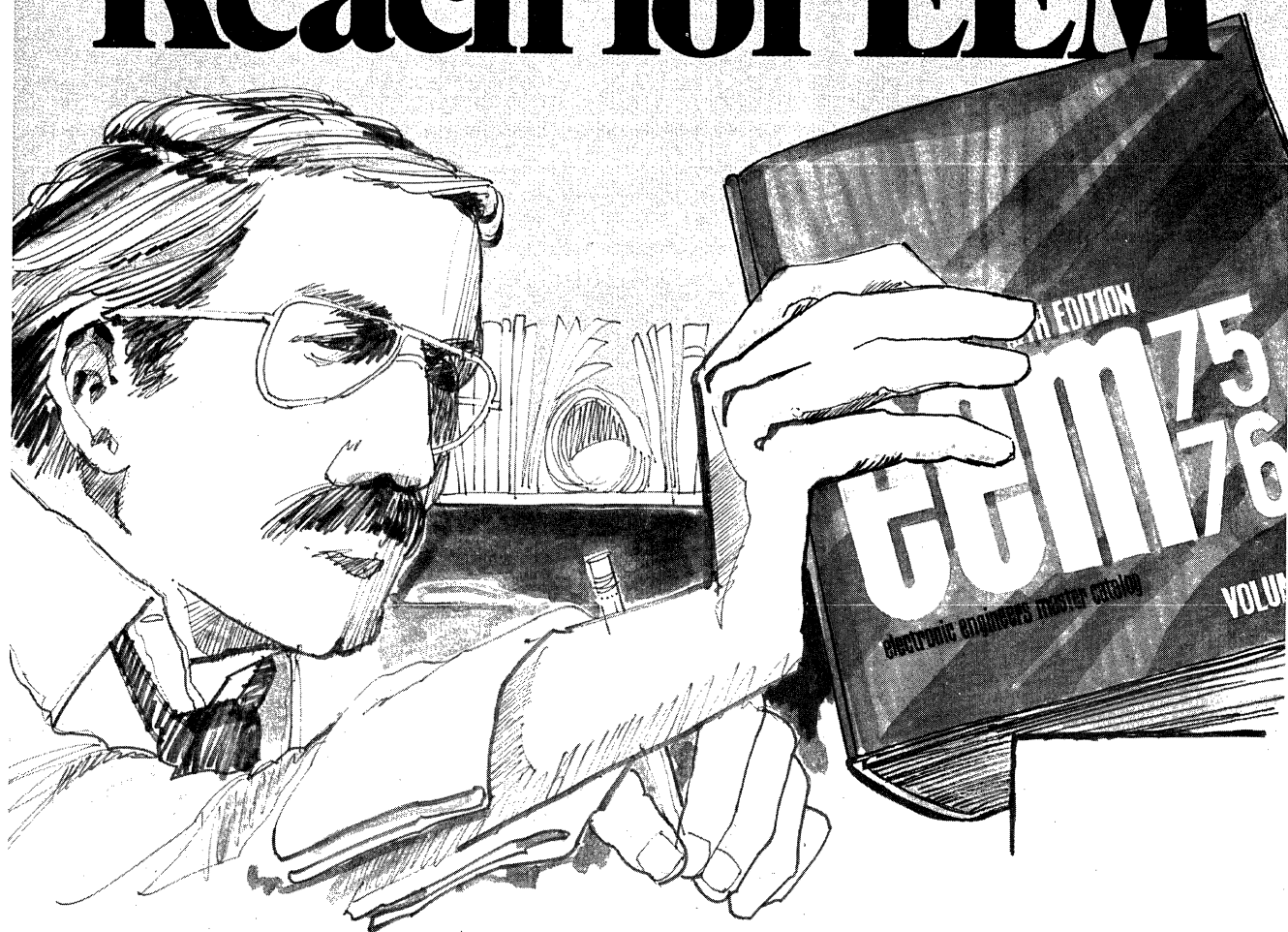
**Derating
Charts****standard series**

SA, SL, & PW

**subminiatures****We do just one thing, and one thing well!**

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

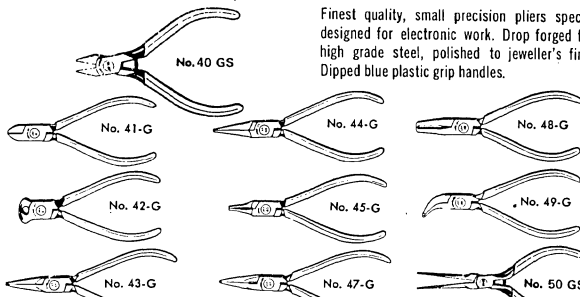
TOOLS BY

CHANNEL LOCK®

MEADVILLE, PA. 16335

Little Champ PRECISION PLIERS

Finest quality, small precision pliers specially designed for electronic work. Drop forged from high grade steel, polished to jeweller's finish. Dipped blue plastic grip handles.

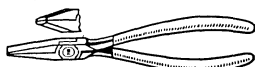


No.	Style	Length	Net
40GS	Flush Cutting, Sharp Nose Diagonal, Coiled Spring	4 1/4"	\$7.60
41G	Diagonal Cutter	4 1/4"	6.00
41GS	Diagonal Cutter, Coiled Spring	4 1/4"	6.50
42G	End Cutting Nipper	4"	6.00
43G	Needle Nose, No Side Cutter, Plain Nose	4 1/4"	5.50
43GS	Needle Nose, No Cutter, Plain Nose, Coiled Spring	4 1/4"	6.00

No.	Style	Length	Net
44G	Plain Nose	4 1/4"	\$5.20
45G	Round Nose	4 1/2"	5.50
47G	Needle Nose, Side-Cutter, Nose Serrations	4 1/4"	6.20
47GS	Needle Nose, Side Cutter, Nose Serrations, Coiled Spring	4 1/4"	6.70
48G	Transverse End Cutter	4 1/4"	6.00
49G	Curved Needle Nose	4 1/2"	5.80
50GS	Extra Long Needle Nose, Coiled Spring	5 1/4"	6.80

Specially Designed ELECTRONICS PLIERS

Four matched, long-reach pliers with precision matched jaws, hand honed cutting edges. Drop forged of special analysis steel, properly heat treated. Polished finish. Smooth, dipped plastic, blue grips.



NO. 718G FLAT NOSE PLIERS

Precision-matched jaws give firm grip in hard-to-reach places.



NO. 728G DIAGONAL CUTTER

Patented wire-stripping notch that really works!



NO. 738G ROUND NOSE PLIERS

You can pick up a hair with these precision machined points.



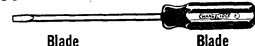
NO. 748G END CUTTER

Fine enough to cut a human hair, sturdy enough to cut 12 gauge copper wire.

SCREWDRIVERS

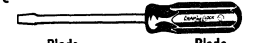
Blades forged from tough chrome vanadium steel. Tips ground lengthwise for greater end strength and snug fit in screw slot. Opaque blue plastic (UL) handles are shockproof, breakproof and shaped for non-slip grip.

ROUND SHANK



No.	Size, In.	List	No.	Size, In.	Net
181RD	1/4 x 1	\$1.12	3161LORD	3/8 x 10	\$2.20
3164RD	3/8 x 4	1.66	144RD	1/4 x 4	2.10
3166RD	3/8 x 6	1.76	146RD	1/4 x 6	2.20
3168RD	3/8 x 8	2.06	5166RD	3/8 x 6	2.48

SQUARE SHANK



No.	Size, In.	List	No.	Size, In.	Net
141SQ	1/4 x 1	\$1.38	5166SQ	3/8 x 6	\$2.62
3164SQ	3/8 x 4	1.76	5168SQ	3/8 x 8	2.88
144SQ	1/4 x 4	2.12	388SQ	1/4 x 8	3.68
146SQ	1/4 x 6	2.34	3812SQ	1/4 x 12	5.08
148SQ	1/4 x 8	2.48			

PHILLIPS SCREWDRIVERS



No.	Size, In.	Net
102-SP	1/4 x 1 1/4	\$2.02
101-P	3/8 x 3	1.88
102-P	1/4 x 4	2.20
103-P	3/8 x 6	2.92
104-P	1/4 x 8	3.58

NUTDRIVERS



Hex	Lgth.	Net	Hex	Lgth.	Net
3/16	3	\$2.06	1/2	3	\$2.06
1/4	3	2.06	3/4	3	2.06
5/16	3	2.06	1	3	2.48
3/8	3	2.06	1 1/4	3	2.48

SCREWDRIVER KIT

Pocket-size, handy bench sets, color coded. Special E-Z Grip handle included.

SCREWDRIVER KIT SD-5

Includes:

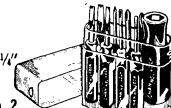
5 Screwdrivers:

1/2", 3/4", 5/8", 3/4", 1/2"

3 Phillips Head:

No. 0, No. 1 and No. 2

Net: \$8.64



NUTDRIVER KIT

Pocket-size, handy bench sets, color coded. Special E-Z Grip handle included.

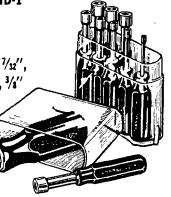
NUTDRIVER KIT ND-1

Includes:

10 Nutdrivers:

1/2", 3/4", 5/8", 3/4", 1/2", 1", 1 1/4", 1 1/2", 1 3/4", 2"

Net: \$11.80



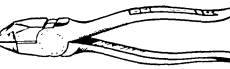
TONGUE AND GROOVE PLIERS



The original, genuine tongue and groove plier. Patented, non-slip undercut channels. Patented reinforcing rib for extra strength. Dipped plastic grips optional at slight extra cost.

No.	Size	Adjust	Capacity	Net
420	9 1/2"	5	1 1/2"	\$5.40
424	4 1/2"	4	3/4"	4.80
426	6 1/2"	5	1/4"	4.20
430	10"	7	2"	5.60
440	12"	7	2 1/4"	6.00
460G	16"	8	4 1/4"	9.00

LINEMEN'S PLIER—Bevel Nose



Polished steel finish. Knurled grips. Side cutter. Dipped plastic grips optional at slight extra cost.

No.	Size	Net
3046	6"	\$6.50
3047	7"	6.80
3048	8 1/2"	8.00

LINEMEN'S PLIER—Rounded Nose



Polished steel finish. Knurled grips. Side cutter. Dipped plastic grips optional at slight extra cost.

No.	Size	Net
346	6"	\$6.50
347	7"	6.80
348	8 1/2"	8.00

LONG NOSE PLIER



Point 1/2" round. Polish steel finish. Knurled grips. Dipped plastic grips optional at slight extra cost.

No.	Size	Side Cutter	Net
317	7 1/2"	With	\$6.50
3017	7 1/2"	Without	5.40
326	6"	With	5.90
3026	6"	Without	4.90

SLIP JOINT PLIERS



Thin Nose. Polished steel. Wire cutting shear

No.	Size	Net
516	6"	\$4.30

With Side Cutter. Polished steel. Precision tool with fine cutting edge.

No.	Size	Net
537	7"	\$7.00

Heavy Duty With Cutter. Finest quality. Polished steel.

No.	Size	Net
546	6"	\$4.30
548	8"	5.00
5410	10"	5.30

TOOL HOLSTERS

Highest quality top grain leather. Stress points reinforced with rivets. Convenient knife or wrench snap.



No.	Size	Pls. Net
1	9 1/4" x 8 1/2"	\$9.64
2	9 1/4" x 10 1/2"	10.74

SUPERIOR PLASTIC GRIPS

For maximum hand comfort, durable molded plastic grips. Blue color for good visibility, reduce grip loss. Easy to install. Order by desired grip size.

Plier Size	Grip Size	Net
6"	Small	\$1.02
7"	Medium	1.10
8", 9 1/4", 10"	Large	1.20

WIREMASTER PLIER



Finest wire-cutting plier ever made. Joint rivet closer to cutting provides 40% more cutting power than standard design pliers. Special enclosed-joint construction holds cutter edges in perfect alignment for life of plier. Dipped plastic grips optional at slight extra cost.

No.	Size	Net
349	9"	\$9.90

ELECTRICIAN'S WIRING PLIER



Triple-use wiring plier: Cuts, strips insulation, loops wire. Patented wire stripping notches strip insulation from 14 and 12 gauge copper wire quickly, cleanly. Dipped plastic grips optional at slight extra cost.

No.	Size	Net
337-W	7"	\$6.80

DIAGONAL CUTTER—Box Joint



Precision honed cutting edges. Polished steel finish. Knurled grips. Dipped plastic grips optional at slight extra cost.

No.	Size	Net
435	5"	\$5.50
436	6"	6.00
437	7"	6.70

HEATSORB CLAMP



Specially designed "heat sink" that prevents heat damage to electronic components during soldering. Also a handy, self-gripping "third hand" that holds and retrieves small parts in close work.

No.	Size	Net
46	5"	\$2.20

ADJUSTABLE WRENCHES



Drop forged of special analysis steel. Chrome plated. Dipped plastic grips optional at slight extra cost.

No.	Size	Cap.	Net	No.	Size	Cap.	Net
804	4"	1/2"	\$5.30	810	10"	1 1/4"	\$7.80
806	6"	3/4"	5.40	812	12"	1 3/4"	11.30
808	8"	1 1/8"	6.10	815	15"	1 3/4"	17.00

ELECTRICIAN'S KNIFE

2 1/2" precision-honed blade.

3" self-locking screwdriver.

Unbreakable phenolic plastic handle.



No.	Closed Length	Net
11	3 1/4"	\$6.38

SKINNING KNIFE

3" precision-honed blade.

Self-locking. Unbreakable phenolic plastic handle.



No.	Closed Length	Net
10	4"	\$7.30



SOLDERING + DESOLDERING + RESOLDERING



LONER[®]

SOLDERING INSTRUMENT

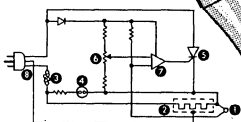
*in a class by itself
...for you alone!*

Model 950 CL080

- 1 Temperature sensor
- 2 50 watt forward flow heat element

Rearward heat flow restrictor
Inter cooling chamber
Easy rest bumper
Handle runs cool

- 3 Fused both for heat and current protection
- 4 Indicator lamp
- 5 Solid state electronic control
- 6 SCR power switch
- 7 Rugged, solidly soldered printed circuit
- 8 Control knob
- 9 High temperature impact polycarbonate handle
- 10 Differential input amplifier



LONER 5-YEAR GUARANTEE: EDSYN guarantees this instrument against defects in material and workmanship as follows: For one year from date of purchase, EDSYN will repair or, at its option, replace any defective part free including labor. For an additional 4 years EDSYN will repair, or at its option, replace any defective part charging only for labor. Guarantee does not include tip or line cord. For service covered by this guarantee return LONER to EDSYN with evidence of date of purchase.

ELECTRONIC COMPONENTS
ARTIFICIALLY AGED FOR
LONG TERM
Temperature STABILITY

OPTIONAL
LISTED
BURN RESISTANT
115V LINE CORDS

UL listing
from
tip to plug

Clearview handle
reveals difference between
soldering instrument and
soldering iron.



Cord strain relief

3 Wire Cord

LONER[®] STORY

FEATURES: A soldering instrument with nothing to hide, we left everything in plain view so that you can best see how a soldering instrument differs from a soldering iron. One instrument performs all soldering cycles from heavy to micro termination — The LONER[®] SOLDERING INSTRUMENT.

SETTING THE TEMPERATURE: A temperature control knob is provided for precise adjustment of tip temperature.

FAST ACCURATE SOLDERING CYCLES: Each soldering cycle is automatically thermally balanced to match termination load with precise preset soldering temperature.

FAST INITIAL WARM-UP: After approximately 45 seconds an indicator lamp tells you when you are at the precise preset soldering temperature by blinking on and off periodically.

NO STICK TIPS: Anti sieze compound is baked onto tip to prevent tip and element seizure, making tip removal easier after prolonged operation.

Triple Mate[™]

PERFECT SOLDERING TIPS
Designed Exclusively for the LONER and Tip16 Soldering Instruments

Work Rated as
GOOD, BETTER
or **BEST** for:

- 1. HEAT TRANSFER
- 2. DURABILITY
- 3. THERMAL LOAD IN WATTS

LONG SPADE

Part No. LT081



- 1 BETTER
- 2 BETTER
- 3 15-25

SPADE

Part No. LT082



- 1 BEST
- 2 BETTER
- 3 20-30

SOLDASIP[®]

Part No. LT083



- 1 GOOD
- 2 GOOD
- 3 15-25

PROBE

Part No. LT084



- 1 BETTER
- 2 BETTER
- 3 15-25

SHORT SPADE

Part No. LT085



- 1 GOOD
- 2 BETTER
- 3 10-25

MINI SPADE

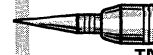
Part No. LT086



- 1 GOOD
- 2 BETTER
- 3 5-20

NEEDLE POINT

Part No. LT087



- 1 GOOD
- 2 BETTER
- 3 5-15

MINI ANGLE FACE

Part No. LT097



- 1 GOOD
- 2 BETTER
- 3 5-15

HEAVY SPADE

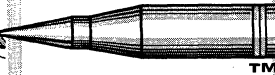
Part No. HS106



- 1 BEST
- 2 BEST
- 3 25-50

HEAVY PROBE

Part No. HP107



- 1 BEST
- 2 BEST
- 3 25-50

SOLDAPULL[®]

DESOLDERING TOOLS

DELUXE DS017



Extremely rugged for volume desoldering. Heavy duty plastic barrel and trigger housing for long, dependable operation. Simple twist-lock separation for fast cleaning. Oversize plunger fully enclosed for safety. Heavy mainspring creates high vacuum pulse. Dynamic damping reduces kickback.

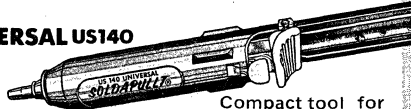
SOLDAPULL[®] III

PT109



Sturdy tool for routine desoldering. Slim profile without sacrifice in performance. Deluxe Model features; fully enclosed plunger shaft; dynamic damping for very low recoil. Preferred by many technicians. Quickly desolders average size components and wiring.

UNIVERSAL US140

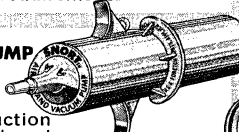


Compact tool for convenient tool box storage. Precision molded plastic barrel and low mass plunger creates rapid vacuum impulse with negligible recoil. Three position plunger adjusts loading span to fit large or small hands. Ample vacuum for most circuit board desoldering requirements.

SNORT[™] AIR and VACUUM PUMP

SN104

Operates similarly to bellows or squeeze bulb. Two-piece plastic construction with built-in spring. Integral cleaning shaft automatically cleans tip. Tool snaps apart easily for routine cleaning.



SNORT[™] MINI VACUUM PUMP

MV124

Mini size less than 6". Ideal for desoldering IC's, transistors, etc. yet ample for larger 1/4 watt resistors.



SOLDAVAC[®]

DESOLDERING TOOLS

DELUXE DS101



For home electronics projects and appliance repair technicians. Ample power for desoldering most consumer products. Special features include fully enclosed plunger shaft for safety, clear plastic barrel for inspecting moving parts. Plunger depresses for compact storage.

STANDARD SV026



Designed for the hobbyist and home electronics enthusiast. Simplified construction for a low priced but effective desoldering tool. Ample vacuum for removing solder from small wiring and miniature components found in transistor radios and Hi-Fi's.

MICRO EXTENSION TIP

insert into regular tip

Tip cleaner needle and spot-tie aid.

ADJUSTABLE EXTENSION TIP AC126

360° swivel tip allows angular adjustment without loss of vacuum. Quickly snaps on or off regular tips.



SOLDASIP[®] RESOLDERING WICK

SW091

Press braid against faulty connection with heated tip, old solder is drawn up leaving connection clean for resoldering.

BURNISHING TOOL

BT028



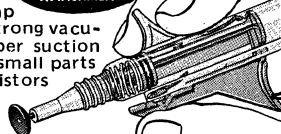
TOOL DEPOT HANDY TOOL HOLDER

TD123



VACUUM Pick Up ATTACHMENT

Miniature pickup easily snaps onto designated vacuum pump tips. Plunger creates strong vacuum at the small rubber suction cup. Easily retrieves small parts as ball bearings, transistors and IC packs from recessed areas.



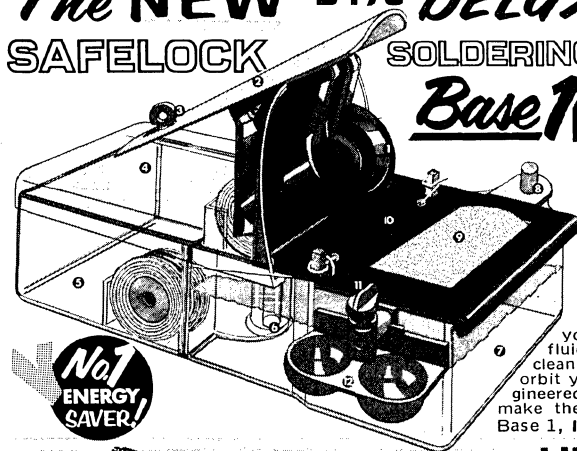
HOW TO Choose AND Use THE WORLD'S

= SOLDER

INTRODUCING

The NEW B170 DELUXE SAFELOCK SOLDERING STATION

Base 1 idle-rest®



No.1 ENERGY SAVER!

EDSYN pioneer in SolderABILITY, presents FANOVISION - graphic motion in a training manual designed to stimulate the mind to SAVE TIME on the line. Available at \$7.95



AT PARTICIPATING DISTRIBUTORS ONLY

NEW...
144 PAGE TRAINING MANUAL
OVER 1,000 ILLUSTRATIONS
IT'S FUN TO LEARN!

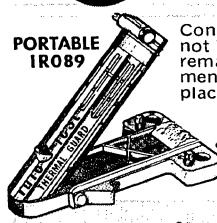


with all these New! features that make it the first fully Engineered Soldering Station!

Again EDSYN® projects the Soldering Technician into the 21st Century, with the NEW Deluxe Base 1 IDLE-REST® Professional Soldering Tool Holder. COMPLETE for storing instruments in a clean, safe, energy saving, static environment, protected by dual safety locks. At your finger tips NEW conveniences as wider base, fluid reservoir, force pump, larger sponge, and twin cleaning sinks, speed up your job performance as you orbit your work station. Blast off with the first fully engineered soldering station to reach your technical sphere - make the quickest recovery with a sound turn around - Base 1, IDLE-REST® Tool Holder.

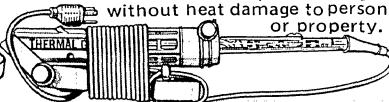
- | | |
|---------------------|-----------------------|
| 1 TOOL SUPPORT | 7 RESERVOIR |
| 2 TOOL RELEASE | 8 PUMP |
| 3 TOOL RELEASE LOCK | 9 SPONGE |
| 4 THERMAL COVER | 10 SPONGE COVER PLATE |
| 5 STORAGE CHAMBER | 11 SELECTOR VALVE |
| 6 MOUNT PORT | 12 CLEANING BASINS |

PORTABLE IR089

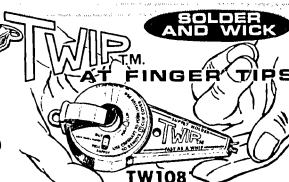
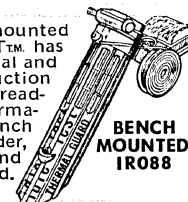


Consumes only 9 watts of power when not in use. Polycarbonate outer jacket remains cool. Tips and heating element last longer. Safety lock holds tool in place. Folds down to allow quick storage without heat damage to person or property.

idle-rest®



Bench mounted IDLE-REST™ has same thermal and polycarbonate construction as portable model. Threaded bushing allows permanent installation on bench top. Two spools of solder, accessory apron and sponge included.



SOLDER AND WICK

ATMOSCOPE T.M. ACCESSORIES

HOT AIR TIP HAI20



Converts LONER Soldering Instrument to hot air generator up to 400°F. Solder as usual without removing attachments. Ideal for shrinking tubing in tight areas, forming small plastic parts, heat testing components, etc. Operates on low pressure air.

Silicone Rubber THERMAL SLEEVE HAI56

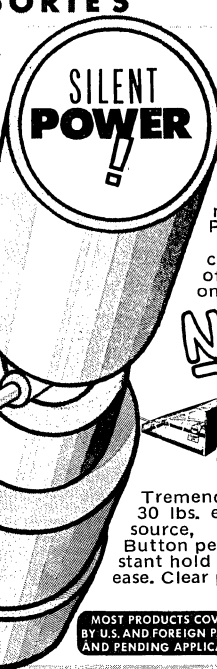


Complete protection of adjacent components or wiring when using ATMOSCOPE Hot Air Tip attachment. Resists high temperature, keeps radiated heat to a safe level.

Converts LONER to a dual soldering and desoldering tool. Large mass head provides high-heat reserve for continuous production line work. Unbreakable desoldering chamber allows fast & safe handling. Simple ONE hand, ONE finger operation. NO FOOT PEDAL NEEDED.



VACUUM TIP AV125



SILENT POWER

New!

VACUUM PUMPS
Automatic Closed-Loop Self Regulating Vacuum Control 100% Pneumatic
High vacuum without motors or electrical parts. Precision trouble-free venturi, vacuum to 22" mercury, from shop air supply of 80 to 120 PSI. Operates on demand, compact, whisper quiet.

New!

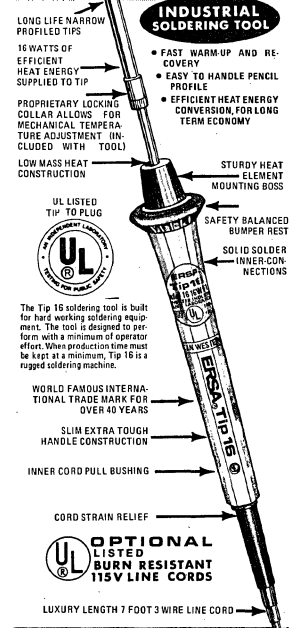
VACUUM HOLDING FIXTURES

Place on any flat surface as desired to fit wide assortment of parts and circuit boards. Tremendous holding power up to 30 lbs. each. Connect to vacuum source. On/Off Button permits instant hold or release. Clear plastic.



MOST PRODUCTS COVERED BY U.S. AND FOREIGN PATENTS AND PENDING APPLICATIONS

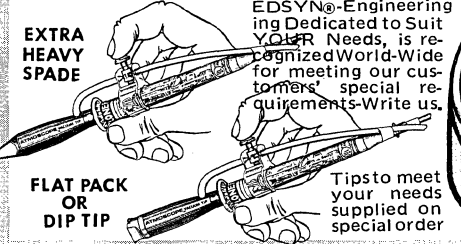
ERSA Tip 16



INDUSTRIAL SOLDERING TOOL

- LONG LIFE NARROW PROFILED TIPS
- 16 WATTS OF EFFICIENT HEAT ENERGY SUPPLIED TO TIP
- PROPRIETARY LOCKING COLLAR ALLOWS FOR MECHANICAL TEMPERATURE ADJUSTMENT (INCLUDED WITH TOOL)
- LOW MASS HEAT CONSTRUCTION
- UL LISTED TIP TO PLUG
- STURDY HEAT ELEMENT MOUNTING BOSS
- SAFETY BALANCED BUMPER REST
- SOLID SOLDER CONNECTIONS
- WORLD FAMOUS INTERNATIONAL TRADE MARK FOR OVER 40 YEARS
- SLIM EXTRA TOUGH HANDLE CONSTRUCTION
- INNER CORD PULL BUSHING
- CORD STRAIN RELIEF
- OPTIONAL UL LISTED BURN RESISTANT 115V LINE CORDS
- LUXURY LENGTH 7 FOOT 3 WIRE LINE CORD

ATMOSCOPE T.M. Customized SPECIAL PURPOSE TIPS



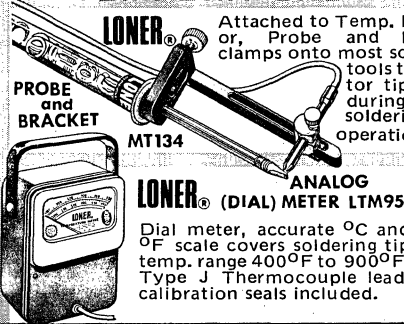
EXTRA HEAVY SPADE

FLAT PACK OR DIP TIP

EDSYN® Engineering Dedicated to Suit YOUR Needs, is recognized World-Wide for meeting our customers' special requirements. Write us.

Tips to meet your needs supplied on special order

TEMPERATURE PROBES and ACCESSORIES



LONER

PROBE and BRACKET

MT134

LONER

(DIAL) METER LTM95

Dial meter, accurate 0°C and 0°F scale covers soldering tip temp. range 400°F to 900°F. Type J Thermocouple lead, calibration seals included.

Attached to Temp. Indicator, Probe and Bracket clamps onto most soldering tools to monitor tip temp. during actual soldering operation.

TEMPERATURE Monitoring ACCESSORIES

Essential for obtaining tip temp. Sensitive probe measures temp. on any flat or curved surface. Slim handle, long tip reaches into recessed areas. Burn resistant cord.

LONER TEMPERATURE PROBE TP110

LONER DIGITAL TEMPERATURE INDICATOR TI128

Precision instr. temp. range 0°F to 1600°F Integrated circuit A/D processing ± 0.5°F accuracy. 1/2" high characters. Type J lead, 115 or 220 VAC - 50 Watts.

© Copyright 1975 EDSYN INC.

MOST PRACTICAL SOLDER HANDLING TOOLS

ALL NEW

BLOW
PROOF

PROBE IV

Check four functions with one instrument!
GC's new PROBE IV lets you test for:

✓Continuity
✓Voltage

✓Polarity
✓Digital Logic

without carrying a multitude of instruments
AND... PROBE IV is lightweight, pocket-size, and comes with its own self-protective carrying pouch. Features positive overvoltage protection in the continuity mode.
5104 \$14.95



CONECUT... MAKES CHASSIS PUNCHES OBSOLETE!

Drill a burr-free hole in seconds in sheet or tube. Saves time—no center punch hole—no pilot hole. Any number of diameter holes can be drilled—the further the tool advances, the larger the hole.

CONECUT SIZES:

3400	Drills holes from 1/4" — 13/16"	\$12.95
3405	Drills holes from 5/8" — 1-3/16"	19.95
3425	Cutting Compound (1 oz. tube)	2.50



3400



3405

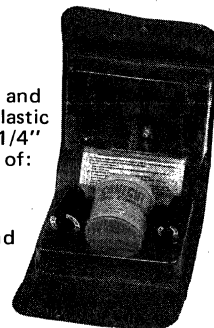


3425

Set of two Conecut burr-free drills and cutting compound in convenient plastic carrying pouch. Hole size range: 1/4" to 1-3/16". Kit contains one each of:

3400	No. 1 Drill
3405	No. 2 Drill
3425	Cutting Compound
3420	CONECUT KIT

\$34.95



RE-TIP®

Cleans soldering iron tips instantly. Simply insert hot iron tip into RE-TIP and then withdraw—all contaminants are instantly removed. Uniformly cleans tips up to 1/4" dia.—prevents contaminated solder joints. Prolongs life tip; tips solder faster, longer. With base for use in shop, or hand held for portable use and tool box.

9482	RE-TIP base & cartridge	\$6.25
9483	Portable RE-TIP (Refill Cartridge Only; Bubble Carded)	2.65
9484	Refill Cartridge only (Boxed)	2.65



PUL-N-INSERTIC®

Inserts or extracts I.C.'s quickly, easily—without damage, while providing maximum protection to I.C.'s leads. Also acts as a heat sink when desoldering I.C.'s. Constructed of high impact plastic. Versatile—for use on the product line, in rework area in the field.

9481 \$4.95



INSERTIC®

Designed to allow quick, accurate positioning for insertion of I.C.'s. Easy to load—will not damage I.C. and provides maximum protection to leads. Scientifically shaped for sure, fatigue-free handling—speeds up I.C. insertion time. Constructed of high impact plastic for years of service. Ideal for use in manufacturing or by the service technician.

9480 \$2.95

QUICK PICK



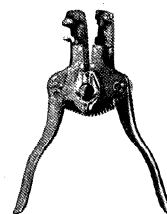
Fast, easy method of removing transistors and capacitors. Quick Pick leaves hands free to desolder leads and hold circuit board. Made of non-magnetic material. 7 different tools fit more than 25 outlines of transistors and can capacitors.

Each tool is approx. .028 size, larger than part being removed. Color coded for fast, easy selection.

9216	(Kit of 7 tools)	\$6.55
9217	(Red, size: .312-.335")	.94
9218	(White, size: .287-.310")	.94
9219	(Blue, size: .262-.285")	.94
9220	(Yellow, size: .212-.235")	.94
9221	(Green, size: .222-.245")	.94
9222	(Mustard, size: .162-.185")	.94
9223	(Orange, size: .183-.206")	.94

AUTOMATIC WIRE STRIPPER

Equipped with "Trig-O-Matic" stay-open feature, this stripper is especially suited for stripping fine and stranded wires. Stay-open feature keeps wires from being crushed. "Off" and "On" mechanism enables use as automatic or standard model. At touch of thumb, trigger releases and jaws go back in place. Interchangeable blades. Patent No. 2,622,461.



744	12 to 22 wire	\$8.84	744-D	16 to 22 wire	\$8.84
744-A	14 to 30 wire	8.84	744-I	8 to 22 wire	8.84
744-B	10 to 18 wire	8.84			



SOLDER-WICK 5' spool

Desolder any connection in seconds. Solder-Wick absorbs molten solder instantly. Eliminates component damaging heat buildup.

684 Size 2—yellow label for miniature printed circuit boards. Pad Size: .060 to .125. **\$1.64**

685 Size 4—blue label for commercial Printed circuit boards and connectors. Pad size: .190 and larger. **\$1.85**



SERVICE TECHNICIAN AND INDUSTRIAL CATALOG FR-75

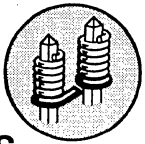
Nearly 2,000 items fully illustrated and described—the complete line of GC chemicals, hardware, alignment tools, printed circuit and technical aids and universal replacement parts.

WRITE FOR CATALOG FR-75



**GARDNER
DENVER**

Wire-Wrap* TOOLS



FOR SOLDERLESS WRAPPED CONNECTIONS

AIR POWERED

WIRE-WRAP* TOOLS

Air powered tools from Gardner-Denver feature low maintenance and dependability for high production service. Bearing mounted, precision engineered rotary vane motors require only air line lubrication for long, dependable operation. Pistol grip or straightline models are available. The tools will wrap 18 thru 32 gauge wire. A backforce nose assembly is an optional feature.

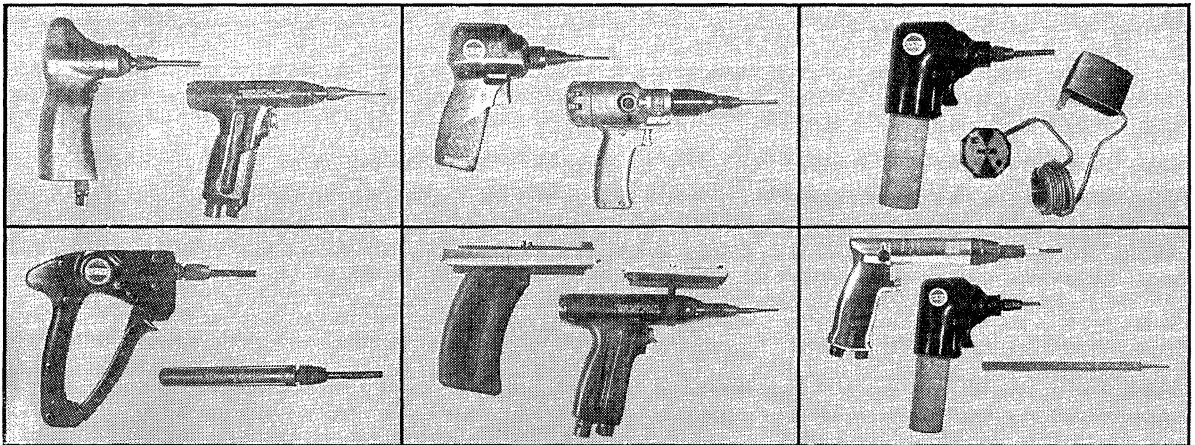
The 14TA1 Strapping Tool (upper left) economically and efficiently makes continuous wire strapping to interconnect terminals with 18 thru 30 gauge bare wire, forming a buss bar of permanent, wrapped connections.

ELECTRIC POWERED WIRE-WRAP TOOLS

The 110 Volt 14B1, with heavy duty aluminum housing, is recommended for high production applications. The 110 Volt 14XA2, lightweight, solid state model, is double insulated and recommended for limited production and service work. Both styles are available with backforce nose assemblies.

BATTERY POWERED WIRE-WRAP TOOLS

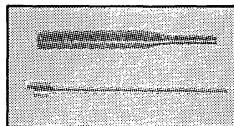
Gardner-Denver battery powered Wire-Wrap tools have been designed for installation, service, repair, or special production, and are especially suited for 30 gauge wire application. They are equipped with a rechargeable nickel-cadmium battery and battery charger package. Thousands of connections are possible from one battery charge, depending on the size of wire being wrapped.



MANUALLY OPERATED WIRE-WRAP TOOLS

The new 14HP-1C hand squeeze Wire-Wrap tool is ideal for telephone installers, electronic technicians and servicemen, when air or electric power is not available. It features a strong, lightweight Lexan housing and a universal collet for all wrapping bits. This tool makes quality wrapped connections with 22 thru 26 gauge wire.

The manual Wire-Wrap tool is excellent for repair or service work in hard-to-reach locations and is designed to wrap 18 thru 30 gauge wire.



WRAPPING BITS AND SLEEVES

Gardner-Denver offers the latest technology and largest selection of wrapping bits and sleeves for making solderless wrapped electrical connections. This list shows only a representative assortment. For complete specifications and application information, contact your nearest Gardner-Denver representative or our Grand Haven, Michigan factory.

CUTTING AND SKINNING TOOLS

The cutting and skinning tool can be either a completely independent hand-held tool or an accessory for mounting on all Gardner-Denver air, electric, or battery powered Wire-Wrap tools. It is designed for cutting and skinning 24 thru 30 gauge wire.

WIRE-WRAP UNWRAPPING TOOLS

Unwrap tools are offered in air powered, electric, battery, hand squeeze and manual styles, with models for removing either right-hand or left-hand wraps.

SOLDERLESS WRAPPING BIT SPECIFICATIONS

AWG	WRAPPING BIT PART NO.	WRAPPING SLEEVE PART NO.	BIT TYPE	TERMINAL HOLE DIAMETER	TERMINAL HOLE DEPTH	MAXIMUM INSULATION DIAMETER
18	504222	18285	STD	.074	1.00	
20	507356	18840	STD	.074	1.00	
20	26495	26245	MOD	.074	1.00	.059
22	505413	18840	STD	.074	1.00	
22	504939	507939	MOD	.074	1.00	.052
22	18632	18840	STD	.086	1.00	
22-24	500131	18840	STD	.074	1.00	
24	502134	502129	STD	.044	1.00	
24	505415	502129	MOD	.044	1.00	.044
24	512058	512056	STD	.0745	1.00	
24	26263	18840	MOD	.074	1.125	.046
26	505279	507100	STD	.039	.750	
26	506445	507100	MOD	.039	.750	.031
26	502118	512056	MOD	.069	1.000	.041
26	504910	512056	STD	.074	1.000	
28	509278	507100	MOD	.036	.750	.030
28	505373	512056	STD	.074	1.000	
30	507063	507100	MOD	.0355	.750	.023
30	507573	507100	MOD	.037	.750	.023
30	507502	507100	MOD	.045	.750	.027
30	501381	512056	MOD	.065	1.000	.027
30	501194	502129	MOD	.069	1.000	.027
30	519936	507100	MOD	.039	.750	.027
30-32	500353	507100	STD	.039	.750	

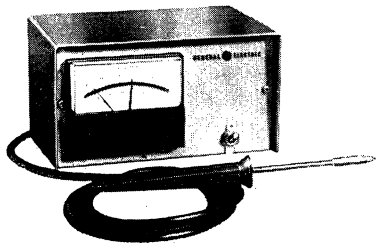
*Registered Trademark of Gardner-Denver Company

GARDNER-DENVER COMPANY, GRAND HAVEN DIVISION, GRAND HAVEN, MICHIGAN 49417 (616) 842-0200



SOLDERING IRONS

TEMPERATURE CONTROLLED SOLDERING IRON — 120 VOLTS; UP TO 135 WATTS



2½-ounce temperature controlled soldering iron maintains selected temperature which can be varied for wide range of work without changing irons or tips. The iron's 135-watt capacity enables it to handle high-mass joints, yet its precision temperature control makes it suitable for the smallest of microminiature jobs without exceeding temperature limitations. Ideal for high production and high

quality work, laboratory use, service shops, and wherever temperature limits are specified.

Description	Cat. No.
Complete Iron — Includes Control Box, Handle and Cordset, and ¼-inch and ⅜-inch Chisel Tip and Heater	6A490

PENLINE-120 SOLDERING IRONS — 120 VOLTS; 25, 30, 40 AND 45 WATTS



Lowest cost GE iron; ideally suited for light to medium production in electronics, communications, and allied industries, for repair and maintenance operations, and by the "do-it-yourself" electronics kit builder.

Handle and 6-foot Cordset

	Two-conductor	6D400*
	Three-conductor, with NEMA standard plug	6D400G2*

Tip and Heater Units — Ironclad

	⅜" Chisel Tip	30 watts	6D410*
	⅜" Chisel Tip	30 watts	6D411*
	⅜" Chisel Tip	45 watts	6D412*

Heater for Threaded Tips

	25 watts	6D415
	30 watts	6D414
	40 watts	6D413*

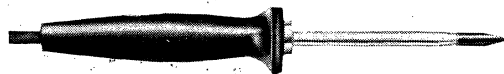
Use interchangeable threaded tips listed below.

INTERCHANGEABLE THREADED TIPS For Penline-120, Pistol-grip, Lightweight, and Midget Irons

Description (Copper Tip, Surface Plating)	Cat. No.
Spade Tips	
⅜" Dia—Nickel	6D4P1
⅜" Dia—Ironclad	6D4P2
⅜" Dia—Nickel	6D4P3
⅜" Dia—Ironclad	6D4P4
Chisel Tips	
⅜" Dia—Nickel	6D4P5
⅜" Dia—Ironclad	6D4P21
⅜" Dia—Nickel	6D4P6
⅜" Dia—Ironclad	6D4P7
⅜" Dia—Nickel	6D4P22
⅜" Dia—Ironclad	6D4P8
⅜" Dia—Nickel	6D4P9
⅜" Dia—Ironclad	6D4P10
⅜" Dia—Nickel	6D4P11
⅜" Dia—Ironclad	6D4P12
Long Chisel Tips	
⅜" Dia—Nickel	6D4P13
⅜" Dia—Ironclad	6D4P14
Pyramid Tips	
⅜" Dia—Nickel	6D4P15
⅜" Dia—Ironclad	6D4P16
⅜" Dia—Nickel	6D4P17
⅜" Dia—Ironclad	6D4P18
Cone Tips	
⅜" Dia—Nickel	6D4P19
⅜" Dia—Ironclad	6D4P20

* UL Listed.

LIGHTWEIGHT SOLDERING IRONS — 120 VOLTS; 40 AND 60 WATTS



Ideal for light and medium production-line soldering and maintenance and repair operations in electronics and communications industries. Tip and heater units can be changed in seconds.

Description	Cat. No.	
Complete Iron — Includes handle and 6-foot cordset, and tip and heater unit — 60 watts		
	¼" Ironclad Chisel Tip	6A273*
	⅜" Ironclad Pyramid Tip	6A283*
	⅜" Ironclad Chisel Tip	6A283G23

Handle and 6-foot Cordset

	Two-conductor	6A273G62
	Three-conductor with NEMA standard plug	6A273G63

Tip and Heater Units — 60 watts

	¼" Ironclad Chisel Tip	6A300
	⅜" Ironclad Pyramid Tip	6A274†
	⅜" Ironclad Chisel Tip	6A301
	⅜" Ironclad Chisel Tip	6A301G4

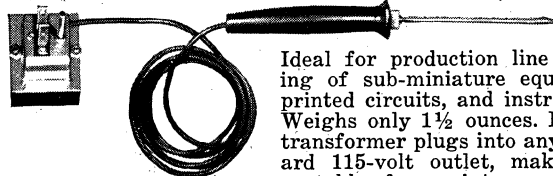
Heater Units for Threaded Tips

	40 watts	6A304
	60 watts	6A301G7

Use interchangeable threaded tips listed in first column.

† Finned one side only.

MINIATURE SOLDERING IRONS — 6 VOLTS, 12 WATTS



Ideal for production line soldering of sub-miniature equipment, printed circuits, and instruments. Weighs only 1½ ounces. Integral transformer plugs into any standard 115-volt outlet, makes iron portable for maintenance work.

Complete Iron — Includes tip and heater unit, 6-foot cordset, and transformer with grounded plug.

	⅛" Chisel Tip	3" Shank	6A428G3
	⅛" Chisel Tip	6" Shank	6A428G4
	⅛" Pyramid Tip	3" Shank	6A428G7
	⅛" Pyramid Tip	6" Shank	6A428G8

Complete Iron Less Transformer — Includes tip and heater unit, and 6-foot cordset with terminals

	⅛" Chisel Tip	3" Shank	6A428G5
	⅛" Chisel Tip	6" Shank	6A428G6

Renewal Tip and Heater Units

	⅛" Chisel Tip	3" Shank	6A429G3
	⅛" Chisel Tip	6" Shank	6A429G4
	⅛" Pyramid Tip	3" Shank	6A429G5
	⅛" Pyramid Tip	6" Shank	6A429G6

Handle and Cordset Only

	6-foot Cordset with Terminals	6A428G62
--	-------------------------------	----------

Renewal Transformer — Includes — 6-foot integral cordset

	6-volt Secondary 115-volt Primary	6A430
--	--------------------------------------	-------

**MIDGET SOLDERING IRONS — 6 VOLTS;
18 to 45 WATTS (with transformers)**



A versatile iron for light production in electronics, and communication industries—handles like a pencil, weighs but 1¼ oz. Tip renewal is easy and fast—complete tip and heater unit can be changed in a few seconds. Heat output can be varied from 25 to 45 watts with standard GE transformers.

Description	Cat. No.
Handle and 6-foot cordset	
For single- and 4-tap transformers	6A203
For transformer with 3-heat switch	6A203G2

Tip and Heater Units — All ironclad tips

¼" Chisel Tip	25 watts	6A211
⅛" Cone Tip	25 watts	6A213
⅜" Pyramid Tip	25 watts	6A215
⅜" Chisel Tip	25 watts	6A217
⅜" Chisel Tip	45 watts	6A211G31

Heater for Threaded Tips

25 watts	6A221
----------	-------

Transformers for Midget Iron — 115-volt Primary†

Single Tap 6.3-volt secondary	6A362G2
Four Tap 5.4/5.7/6.0/6.3-volt secondary	6A364G2
With 3-conductor Cordset & Hubbell No. 5246 Plug	6A364G3
With Three-heat Switch 4.9/6.3/6.9-volt secondary For use only with Handle and Cordset 6A203G2.	6A434

† Single- and four-tap transformers are available with 240-volt primary in quantities of 36 or more, specify catalog number desired and note on order, "except with 240-volt primary." Use interchangeable threaded tips.

**MIGHTY MIDGET SOLDERING IRON — 12 VOLTS;
100 WATTS**



A lightweight iron with high heat capacity for heavy soldering where larger irons, up to 200 watts, prove unwieldy for rapid repetitive soldering, such as production soldering of tuner chassis, tinware, can seams, etc.

Handle and Cordset — Two-conductor

6A210G61	
----------	--

Tip and Heater Unit — Ironclad

½" Chisel Tip	60 watts	6A211G54
½" Chisel Tip	80 watts	6A211G50
½" Chisel Tip	100 watts	6A211G33

Transformer for Mighty Midget — 115-volt primary

Four Tap — for 55/70/85/100 watts (115-volt primary, 12-volt secondary)	6A364G7
--	---------

**6A160 SERIES SOLDERING IRONS — 120 VOLTS,
75 TO 140 WATTS**



Ideal for medium to heavy production, and maintenance and repair operations. Available with any of 12 different tips, calorized or ironclad.

Description	Cat. No.
Complete Iron Less Tip — Includes 6-foot two-conductor cordset	
75 Watts 100 Watts 110 Watts 125 Watts 140 Watts	6A161* 6A162* 6A162G6* 6A162G3* 6A162G12

Tips — Fit all irons listed above

Fig.		A	B	C	D	
A. ½"-Dia. Chisel	Calorized	⅜	⅜	1½	2⅜	6D1P1
	Ironclad	⅜	⅜	1½	2⅜	6D1P2
	Calorized	⅜	⅜	2¼	4	6D1P3
	Ironclad	⅜	⅜	2¼	4	6D1P4
	Calorized	⅜	⅜	1¼	2½	6D1P11
B. ⅜"-Dia. Chisel	Ironclad	⅜	⅜	1½	2⅜	6D1P8
	Calorized	⅜	⅜	1½	2⅜	6D1P6
	Ironclad	⅜	⅜	1½	2⅜	6D1P7
C. ¼"-Dia. Chisel	Ironclad	⅜	⅜	1	3½	6D1P5
D. Cone	Ironclad	⅜	⅜	⅜	2⅜	6D1P12
E. Pointed Chisel	Ironclad	⅜	⅜	1	1½	6D1P9
	Ironclad	⅜	⅜	1	2⅜	6D1P10
F. Slim Chisel	Ironclad	⅜	⅜	⅜	2	6D1P19

Renewal Heater — 120 Volts (Also available for 240-volt operation.)

75 Watts 100 Watts 110 Watts 125 Watts 140 Watts	6A31 6A32 7C342 8A88 7C616
--	--

GENERAL ELECTRIC HEATING SALES OFFICES

Ariz: Phoenix, Montgomery Brothers, Inc., 2225 N. 7th St., 85011, (602) 253-3431.
Calif: Burlingame, Montgomery Bros., Inc., 1831 Bayshore Hwy., 94010, (415) 697-6500.
Los Angeles, Montgomery Bros., Inc., 4820 District Blvd., 90058, (213) 589-6321.
San Diego, Montgomery Bros., Inc., 3762 Midway Drive, 92110, (714) 224-1212.
Colo: Denver, Montgomery Bros., Inc., 2124 S. Birch St., 80222, (303) 759-2749.
Conn: Hamden, Godfrey & Associates, P.O. Box 5541, 06518, (203) 281-1795.
Woodstock, Godfrey & Associates, P.O. Box 164, 06281, (203) 928-0332.
Fla: Miami, Ludlum Associates Co., P.O. Box 1337 IAB, 33148, (305) 592-6523.
Orlando, Ludlum Associates Co., P.O. Box 6274, 32803, (305) 894-7661.
Hawaii: Honolulu, Montgomery Bros., Inc., 1151 Mapunapuna St., 96819, (808) 839-5593.
Ill: Glen Ellyn, Boston-Blackaller Associates, 650 Roosevelt Rd., 60137, (312) 858-6320.
Ind: Indianapolis, George E. Booth Co., 1681 Expo Lane, 46224, (317) 248-9261.
Iowa: Des Moines, The Walling Co., P.O. Box 981, 50304, (515) 288-6091.
La: Baton Rouge, Alford, Woods & Childs, P.O. Box 15622, 70815, (504) 275-5480.
Lake Charles, Alford, Woods & Childs, P.O. Box 5835, 70601, (318) 439-8173.
Monroe, Alford, Woods & Childs, P.O. Box 6076, 71201, (318) 323-3671.
New Orleans, Alford, Woods & Childs, P.O. Box 23572, 70123, (504) 737-4181.
Mich: Detroit, Indust'l Burner Systems, 16911 W. Eight Mile Rd., 48235, (313) 835-5100.
Minn: Minneapolis, J. H. Cox Co., 1314 Broadway N.E., 55413, (612) 789-2535.
Mo: Kansas City, Boschert Equipment Co., 207 Westport Rd., 64111, (816) 561-4050.
St. Louis, Brandwine Equipment Co., 1353 Baur Blvd., 63132, (314) 993-5810.
Neb: Omaha, The Walling Co., P.O. Box 267, 68110, (402) 342-7044.
N.J: Caldwell, Hemmel Co., P.O. Box 267, 07005, (201) 228-2220.
N.Y: Buffalo, Hemmel Co., P.O. Box 764, 14240, (716) 634-9873.
NC: Charlotte, Sloan Associates, Inc., 3230-N Piper Lane, 28208, (704) 523-2122.
Ohio: Cincinnati, Stelter & Brinck, Inc., 5541 Bridgetown Rd., 45211, (513) 574-0880.
Hudson, Angus McArn Co., P.O. Box 256, 44236, (216) 656-2577.
Ore: Portland, Montgomery Brothers, Inc., 935 N.W. 19th Ave., 97209, (503) 223-4197.
Pa: Pittsburgh, Angus McArn Co., P.O. Box 14007, 15239, (412) 795-4130.
St. Louis, R. Schadler Co., P.O. Box 143, 19087, (215) 687-5650.
Tenn: Chattanooga, Coleman Associates, Elder Mountain, Rte. 8, 37409, (615) 821-0235.
Texas: Dallas, Leake Co., P.O. Box 64695, 75206, (214) 826-6350.
Utah: Salt Lake City, Montgomery Brothers, Inc., 2089 W. 2300S, 84119, (801) 363-3555.
Va: Richmond, Sloan Associates, Inc., 2120 Staples Mill Rd., 23230, (804) 359-6051.
Wash: Seattle, Montgomery Brothers, Inc., 5616 Sixth Ave. S., 98108, (206) 762-4100.

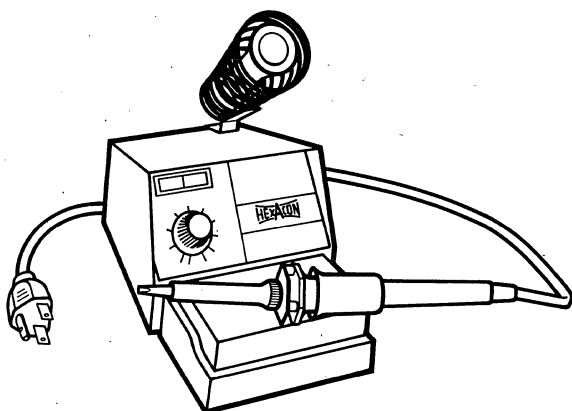
SOLDERING IRONS

HEXAACON

**VOLTAGE RANGE: 6 to 240 • OPERATE IDENTICALLY ON A.C. OR D.C., ANY CYCLE
STANDARD VOLTAGES 110/120, 220/240 • SPECIFY VOLTAGE ON ORDER**

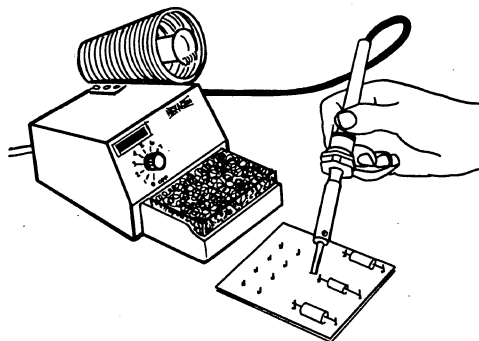
Equipped with extra flexible, high temperature approved cords. Three wire cords available with all irons. Nickel chromium replaceable heating elements, insulated with finest mica, protected by rugged outer housing. Replaceable tips.

POSI-GROUND® AVAILABLE TO PROTECT VOLTAGE SENSITIVE COMPONENTS



THERM-O-TRAC 1001 Controlled Heat Soldering Station

- Temperature sensor "up front" where it belongs
- All solid state electronic switching
- Dial selected temperatures from 500°F to 720° F
- Variation of no more than + 10° F at 720° F idling
- No magnetic field or voltage leakage—safe for sensitive circuitry
- Wide selection of XTRADUR Long Life Tips



DIAL-a-TEMP Soldering Station

- Isolated, low voltage power supply
- Posi-Ground® construction eliminates all voltage leakages for protection of sensitive components
- Internally fused for added safety
- Infinitely variable temperatures from 350° F to 950° F easily selected by dialing
- On-Off Switch with Indicator Light
- Two standard models available:
Catalog No. 1520—Uses 3/16" Tip
Catalog No. 1524—Uses 1/4" Tip
- No special tip requirements—uses standard Xtradur and Durotherm Long-Life plug tips

HEXAACON MINIRONS



- Rugged quality construction that will withstand production line conditions
- Slim-line case promotes maximum visibility
- Lightweight—perfect balance
- Full wattage range 15 to 60 watts

SLIM LINE CASE—
SLIM LINE HANDLE

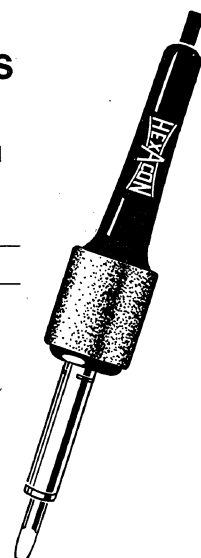
Cat. No.	Watts	Tip Dia.
21A	15	1/8"
21A	20	1/8"
21A	25	1/8"
22A	25	3/16"
22A	30	3/16"
22A	35	3/16"
23A	25	1/4"
23A	30	1/4"
23A	40	1/4"
23A	50	1/4"
23A	60	1/4"

DUROTHERM
and XTRADUR tips

SUPER PENCIL IRONS

- Standard for dependability in production throughout industry.
- Strong fiberglass handle with cool cork finger grip
- Precision wound heavy-duty industrial element

Cat. No.	Watts	Tip Dia.
25S	20	1/8"
25S	25	1/8"
25S	30	1/8"
25S	35	1/8"
25S	40	1/8"
26S	30	3/16"
26S	35	3/16"
26S	40	3/16"
26S	50	3/16"
24S	25	1/4"
24S	30	1/4"
24S	40	1/4"
24S	50	1/4"
24S	60	1/4"

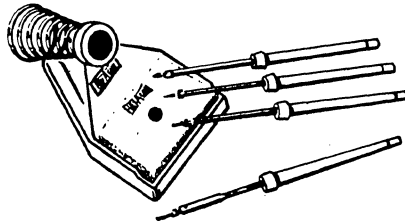


DUROTHERM
and XTRADUR tips

HEXAACON

SOLDERING IRONS

MICRO-MINI IRON AND STAND

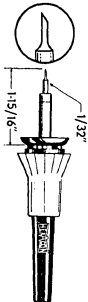


Tip Kit "K" includes
Holder, Iron plus 7 Tips

Iron Specifications

No.	Temp.
M65	650
M65K	
M70	700
M70K	
M75	750
M75K	
M85	850
M85K	
M065	650
M070	700
M075	750
M085	850

HEXAACON HORNET IRONS



H 10 K Kit (12 watts)
H 11 K Kit (17 watts)
H 14 K Kit (20 watts)

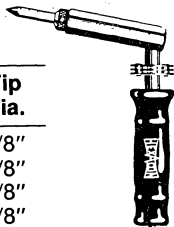
- Lightweight
- Cool Handle

Kits include iron, 2 tips
and sponge.

DUROTHERM and XTRADUR tips

HEAVY DUTY HATCHET IRONS

Cat. No.	Watts	Tip Dia.	Cat. No.	Watts	Tip Dia.
70H	100	3/8"	153H	175	3/8"
74H	125	1/4"	155H	200	3/8"
100H	110	3/8"	200H	200	5/8"
116H	175	3/8"	300H	300	7/8"
150H	150	3/8"			



HEAVY-DUTY SCREW TIP IRONS

Cat. No.	Watt	Tip Dia.
85	90	1/2
120	120	5/8
170	175	1
225	250	1-1/8
350	350	1-3/8
500	500	1-5/8
700	700	1-3/4
800	800	1-3/4



PINPOINT IRONS DUROTHERM and XTRADUR tips

P25	25	1/8"	25H	25	1/8"
P25	35	1/8"	25H	35	1/8"
P25	50	1/8"	25H	50	1/8"
P26	30	3/16"	26H	30	3/16"
P26	40	3/16"	26H	35	3/16"
P26	50	3/16"	26H	50	3/16"
P24	40	1/4"	24H	40	1/4"
P24	50	1/4"	24H	50	1/4"
P24	60	1/4"	24H	60	1/4"



HEAVY DUTY PLUG-TIP IRONS



Cat. No.	Watt	Tip Dia.	Cat. No.	Watt	Tip Dia.
P70	100	3/8	P151	175	1/2
P100	110	3/8	P152	200	1/2
P115	150	3/8	P200	200	5/8
P116	175	3/8	P250	250	5/8
P150	150	3/8	P300	300	7/8
P153	175	3/8	P550	550	1-1/8
P155	200	3/8			



POWERHOUSE IRONS

Cat. No.	Watts	Tip Dia.	Cat. No.	Watts	Tip Dia.
30S	80	1/4"	P34	80	1/4"
P30	40	1/4"	P34	90	1/4"
P30	60	1/4"	P35	80	5/16"
P30	75	1/4"	P35	90	5/16"
P30	80	1/4"	P35	100	5/16"
P34	70	1/4"			



POWERHOUSE IRONS (Hatchet Type)

Cat. No.	Watt	Tip Dia.	Cat. No.	Watt	Tip Dia.
30H	40	1/4"	34H	70	1/4"
30H	50	1/4"	34H	80	1/4"
30H	60	1/4"	34H	90	1/4"
60H	70	1/4"	35H	80	5/16"
30H	75	1/4"	35H	90	5/16"
30H	75	1/4"	35H	90	5/16"
30H	80	1/4"	35H	100	5/16"



"COPPER MISER" IRONS

Cat. No.	Watts	Tip Dia.
P114	100	1/4"
P154	150	1/4"
P238	200	3/8"
P212	200	1/2"
P338	300	3/8"

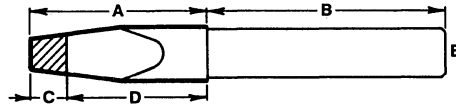


SOLDERING IRON TIPS

HEXAACON

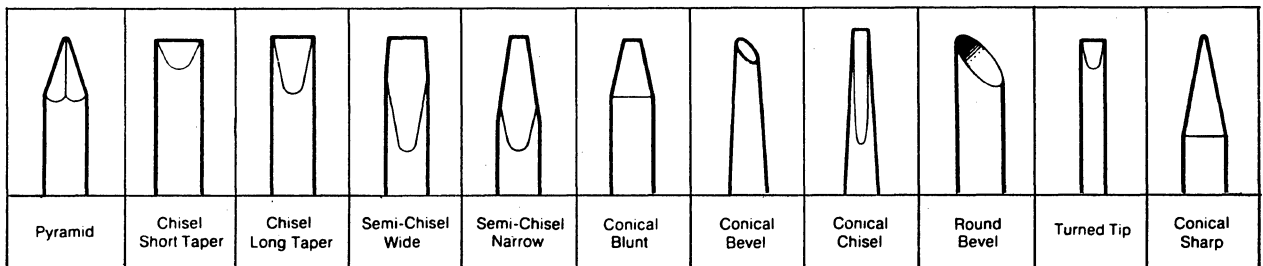
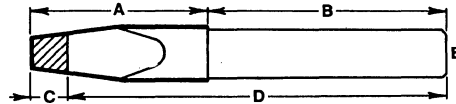
DUROTHERM Iron plated with patented stainless steel bonded to copper shank. Precision ground to tolerance of .001. Lectrotin on working surface and immunized over entire surface.

- A. Heavy Iron Coating
- B. Scale resistant Stainless Steel
- C. Pretinned Lectrotin
- D. Immunized Nickel and Chrome
- E. Iron, Nickel and Chrome coated



XTRADUR Heavy Iron plated over OFHC Copper alloy with shank precision ground to tolerance of .001. Pretinned with Lectrotin process and immunized with Nickel and Chrome.

- A. Heavy Iron Coating
- B. Iron, Nickel and Chrome
- C. Pretinned Lectrotin
- D. Immunized Nickel and Chrome
- E. Iron, Nickel and Chrome coated



CATALOG NUMBERS ARE FOR DUROTHERM TIPS. FOR XTRADUR, SEE NOTES

Tip No.	Style of Point	Tip No.	Style of Point	Tip No.	Style of Point
1/8" x 2-1/4" Fit Iron Nos. 25S, P25, 25H, 21A					
HT248D	Pyramid	HT222D	Conical, blunt	HT693D	R.B., TT 1/16"
HT249D	Chisel, short	HT331D	Conical, sharp	HT104D	R.B., TT 1/32"
HT376D	Chisel, long	HT638D	Round, bevel	HT216D	R.B., groove
HT560D	Semi-chisel	HT361D	Chisel, TT 1/16"	HT244D	Conical, bevel
3/16" x 2-1/4" Fit Iron Nos. 26S, P26, 26H, 22A					
HT251D	Pyramid	HT190D	Semi-chisel, W	HT290D	Chisel, TT 1/8"
HT294D	Chisel, short	HT214D	Conical, blunt	HT548D	S-chisel, N, TT 1/8"
HT195D	Chisel, long	HT281D	Conical, sharp	HT479D	Conical TT 1/8"
HT207D	Semi-chisel, N	HT288D	Pyramid, TT 1/8"	HT220D	R.B., TT 1/16"
1/4" x 2-1/4" Fit Iron Nos. 24S, P24, 24H, 23A					
HT325D	Pyramid	HT102D	Round, bevel	HT513D	Conical, TT 1/8"
HT553D	Chisel, short	HT586D	Conical, S-chisel	HT463D	Chisel, L, TT 3/16"
HT313D	Semi-chisel, W	HT691D	Chisel, TT 1/16"	HT841D	S-chisel, N, TT 1/8"
HT397D	Semi-chisel, M	HT699D	S-chisel, Lg. TT 1/8"	HT692D	Chisel, L, TT 1/8"
HT417D	Semi-chisel, N	HT451D	Chisel, L, TT 1/8"	HT552D	S-chisel, 3/8" Shank
HT418D	Conical, blunt	HT324D	Chisel, S, TT 1/8"		
1/4" x 2-3/4" Fit Iron Nos. P30, 30H, P34, 34H					
HT252D	Pyramid	HT263D	Pyramid, TT 1/8"	HT452D	Conical, TT 1/8"
HT253D	Chisel, short	HT264D	Chisel, SH, TT 1/8"	HT580D	Conical, TT 3/16"
HT202D	S-chisel, Wide	HT356D	Chisel, M, TT 1/8"	HT473D	Chisel, TT 3/16"
HT426D	S-chisel, N	HT685D	Chisel, Lg, TT 1/8"	HT130D	Round, bevel
HT131D	Conical, sharp				
1/4" x 3" Extra long for P30, 30H, P34, 34H. Also for competitive makes					
HT468D	Chisel, long	HT708D	S-chisel, N, Lg	HT487D	Chisel, Lg, TT 1/8"
HT299D	Semi-chisel, W	HT453D	Conical, bevel	HT519D	Chisel, Lg, TT 1/8"
HT328D	Semi-chisel, N	HT234D	Chisel, Lg, TT 5/32"	HT362D	Conical groove
1/4" x 3-3/4" Extra long for P30, 30H, P34, 34H. Also for competitive makes.					
HT563D	Pyramid, long	HT691D	Semi-chisel, N	HT603D	Chisel, Lg, TT 1/8"
HT188D	Chisel, long	HT626D	Pyramid, TT, 1/8"	HT391D	Semi-chisel, N
HT382D	Semi-chisel, W	HT698D	S-chisel, TT 1/8"	HT277D	Chisel, Lg, TT 3/16"
1/4" x 4" Fit Irons P114, P154, P214.					
HT495D	Chis., Lg, TT 3/16"	HT494D	Semi-chisel, N	HT496D	Chisel, long
1/4" x 4-1/4" Fit Irons P114, P154					
HT258D	Pyramid	HT230D	Semi-chisel, W	HT460D	Conical, bevel
HT259D	Chisel, short				
3/8" x 4-1/4" Fit Iron Nos. P100, P150, P238, P338, 100H, 150H					
HT255D	Pyramid	HT266D	Chisel, Sh, TT 1/4"	HT177D	S-chisel, W, TT 1/4"
HT493D	Chisel, short	HT335D	Chisel, Lg, TT 1/4"	HT577D	S-chisel, N, TT 1/4"
HT151D	Chisel, long	HT108D	Conical, sharp	HT145D	Chisel, Sh, TT 3/16"
HT183D	Semi-chisel, N	HT114D	Conical, blunt, Sm	HT475D	S-chisel, N, TT 3/16"
HT593D	Semi-chisel, W	HT240D	Conical, blunt M	HT481D	Chisel, N, Sh, TT 1/8"
HT265D	Pyramid, TT 1/4"				
3/8" x 4" Fit Iron Nos. P100, P150, P238, 100H, 150H; Extra long for P70, 70H; Also other makes.					
HT566D	Pyramid	HT365D	Semi-chisel, thin	HT4300	Round, bevel
HT198D	Chisel, short	HT370D	S-chisel, Lg, N	HT319D	S-chisel, N, TT 1/4"
HT918D	S-chisel, Sh, M	HT140D	Semi-chisel, W		

Tip No.	Style of Point	Tip No.	Style of Point	Tip No.	Style of Point
3/8" x 3-3/4" Fit Iron Nos. P70, 70H; Also fit other makes					
HT254D	Pyramid	HT339D	S-chisel, N, TT 1/4"	HT291D	S-chisel, W, TT 1/4"
HT488D	Chisel, short	HT129D	Semi-chisel, W	HT510D	Conical, sharp
1/2" x 4" Fit Iron Nos. P151, 151H, P152, P212					
HT323D	Chisel, short blunt	HT2030	Conical, blunt		
HT1630	Semi-chisel, N	HT1940	Semi-chisel, thin		
HT444D	S-chisel, long taper				
1/2" x 4-1/4" Fit Iron Nos. P151, P212, 151H					
HT257D	Pyramid	HT293D	Chisel, short	HT446D	S-chisel, Lg, Taper
HT123D	S-chisel, N, TT 3/8"				
5/8" x 4" Fit Iron Nos. P125, P200, 200H, P250					
HT256D	Pyramid	HT891D	Chisel, long	HT178D	Semi-chisel, W
5/8" x 4-1/4" Fit Iron Nos. P200, P250, 200H					
HT260D	Pyramid	HT371D	Semi-chisel, N	HT499D	Chisel, long
7/8" x 4-3/4" Fit Iron Nos. P300, 300H					
HT261D	Chisel, short	HT179D	Semi-chisel, W		
1-1/8" x 5-1/4" Fits No. 500					
HT262X	Chisel	HT229X	Semi-chisel	HT233X	Pyramid

Special types available upon request.

SCREW TIPS All Conventional Semi-chisel Types

Fits Hexacon Xtradur

Tip No.	Dia.	Thread	Iron No.	Tip No.	Dia.	Thread	Iron No.
HT268X	1/2"	5/16-18	60	HT272X	1-1/8"	5/8-11	225
			and 85	HT273X	1-3/8"	5/8-11	350
HT269X	5/8"	5/16-18	120	HT274X	1-5/8"	5/8-11	500
HT271X	1"	1/2-13	170	HT275X	1-3/4"	5/8-11	700

HORNET TIPS

TIPS FOR IRONS Nos. H10 and H11

No.	Dia.	No.	Dia.	No.	Dia.
HT866D	1/32"	HT896D	1/16"	HT871X	1/8"
HT867D	1/32"	HT864X	1/8"	HT873X	1/8"
HT868D	1/16"	HT870X	1/8"		

TIPS FOR IRON No. H14

No.	Dia.	No.	Dia.	No.	Dia.
HT654X	1/8"	HT656X	3/16"	HT658X	1/8"
HT655X	1/8"	HT657X	3/16"	HT659X	1/8"

CATALOG NOS. shown are for DUROTHERM. For XTRADUR substitute "X" for "D", cost approximately 10% less than DUROTHERM.

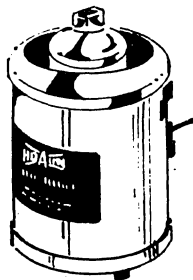
SAMPLE TIPS for your evaluation. Ask for new Tip Sketch Catalog with detailed sketches of 250 Standard Coated Tips.

HEXA-CON

SOLDERING ACCESSORIES

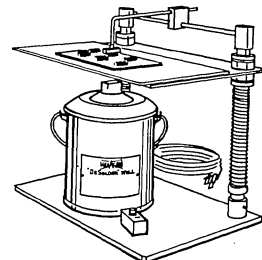
MICRO-CIRCUITRY DESOLDER WELL

- Safe operation . . . will not damage components or boards
- Desolders whole areas at a time
- Semi-automatic . . . plugs in anywhere 110-120 volts or 220-240 volts AC
- Light, portable, all parts replaceable
- 3 wire grounded construction
- No training required . . . simple operation



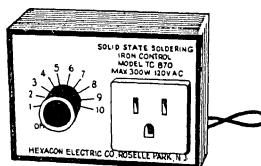
MODEL 9100 Work Position Stage

- Adjustable locator with detachable head can be changed to accommodate wide variety of components
- Lightweight inexpensive fixturing board can be cut to fit different sizes and shapes of PC boards
- Tension easily adjustable to weight of individual board assemblies
- Precision designed and manufactured for maximum flexibility and long use

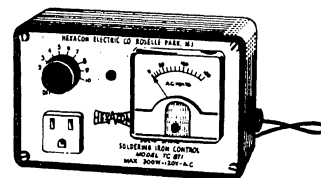


Temperature Control Units

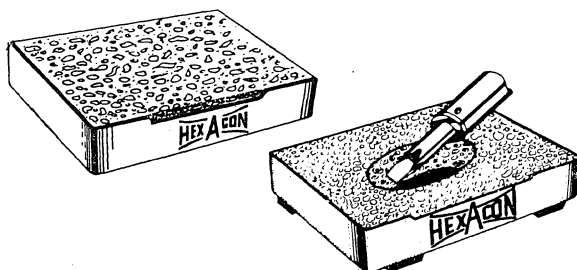
- Controlled AC input provided from 0-95% of line voltage
- Capacity 300 watts on 115 volts
- Solid state circuitry includes built-in fuse protection
- Idling temperature may be readily controlled
- Thermal working zones may be varied by adjusting input control
- Use same iron for different capacity jobs
- Calibrate control settings to maintain proper working ranges as required by government specifications
- Rugged design provides long maintenance, free operational life



Model 870
3 wire grounded design.
Size 1 1/2" x 4".
Weight 10 oz.



Model 871
3 wire design. Comes with voltmeter for visual indication of voltage input to iron. Size 2" x 6 1/4".
Weight 18 oz.



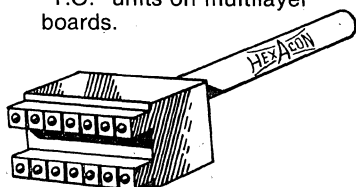
TIP CLEANING SPONGE

Insures reliability of soldered joints and extends tip life. Eliminates contamination caused by wiping rags. Low-sulfur, pure cellulose fine pore sponge. New dross reservoir promotes cleaner sponge surface and prevents overwiping.

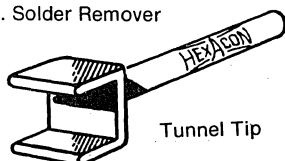
- No. 810 Complete unit (solid sponge)
- No. 812 Complete unit (sponge with hole)
- No. 8101 Solid sponge only
- No. 8121 Sponge with hole

DE-SOLDERING TIPS

For the fast removal and replacement of "I.C." or "T.O." units on multilayer boards.



I.C. Solder Remover



Tunnel Tip

I.C. Remover (1/4" shanks)

Model	Leads
R910	10
R914	14
R916	16

Tunnel Tips (1/4" shanks)

Model	Leads
895F	10
897F	14
898F	16

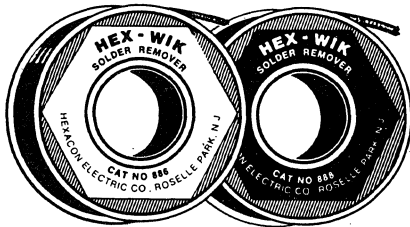
940 SERIES MINI-POT 4 models (temperatures 500° F-800° F)

- Designed for stripping, tinning and soldering heat strippable wires
- Precision wound elements. Entire assembly is grounded for safety
- 3-wire, grounded HI-TEMP (SP3N) cords with NEMA type plugs
- Cool, green, porcelain base, rubber nonskid mount. Can be used in clean room without marring bench
- Compact, lightweight, will not tip over
- All parts are replaceable



SOLDERING ACCESSORIES

HexACON



6 ft. Spools

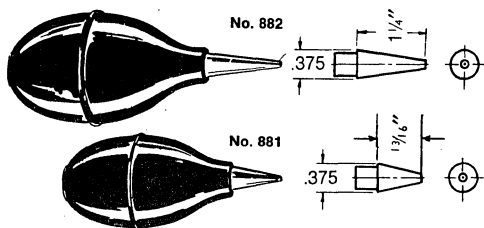
No. 886—1/16"

No. 888—1/8"

Longer lengths available.

HEX-WIK SOLDER REMOVER

- The easiest and most economical method of desoldering printed wiring boards without measling, delamination or lifted pads.
- Simplifies removal and replacement of components
- Can be used for solder removal on plated thru and multi-layer printed wiring board assemblies
- Braid processed for long shelf life insures greater capillary action
- Available in 2 sizes 1/16" for micro work; 1/8" for larger connections
- Meets all military and government specifications



SOLDER SUCKER

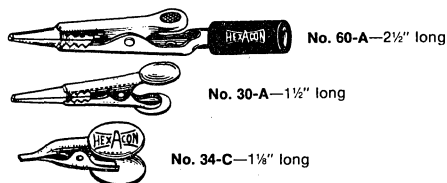
A handy inexpensive tool for the quick removal of solder. Small, lightweight and easy to use. Teflon tiptlets easily changed or replaced.

No. 882 1/4" tiptlet (complete)

No. 8820 Tiptlet only

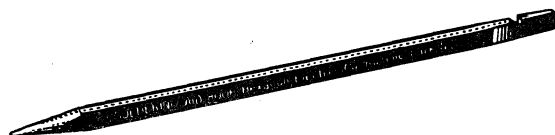
No. 881 13/16" tiptlet (complete)

No. 8810 Tiptlet only



HEAT SINKS with Chrome Plated Copper Tipped Clips

Protect heat sensitive components such as transistors and diodes from thermal damage.

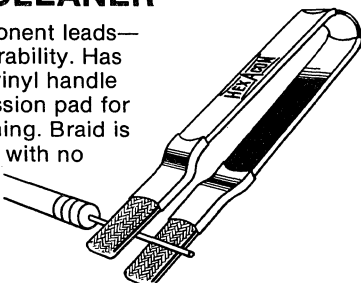


FIBERGLASS SOLDER AID

For inspecting, probing, unsoldering and assembly of printed circuits and other components. Non-conductive. Eliminates scratched circuit boards, broken wire strands.
Cat. No. 800G

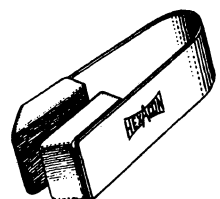
BRAID CLEANER

Cleans component leads—insures solderability. Has comfortable vinyl handle grip; compression pad for contour cleaning. Braid is held securely with no loose ends.
Cat. No. 860



ERASER CLEANER

Designed primarily for the removal of oxides and contamination from P.C. boards and component leads.
Cat. No. 850



HEXACON

SOLDERING IRON HOLDERS

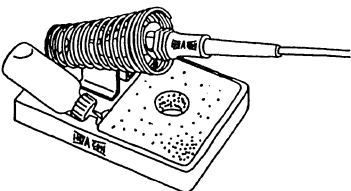
HEAT GUARD SOLDERING IRON HOLDERS

- Cool, safe holder assembly
- Full operator protection
- Protect iron and tip
- Conserve energy — nonheat sinking

MODEL 890

Ceramic Base with Reservoir and Sponge

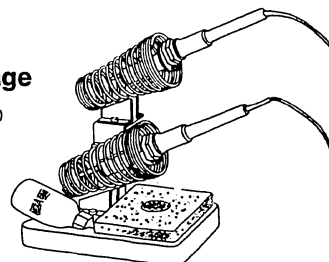
- For instrument irons
- Water injection keeps sponge wet
- Non-skid base — can be used in clean room without marring bench
- Base easily cleaned



MODEL 891

Ceramic Base with Reservoir and Sponge

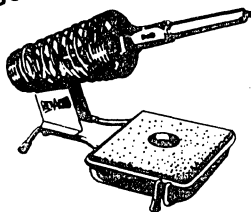
- Same features as Model 890
- Holds two irons
- Irons positioned to prevent cord tangling



MODEL 892

Chrome Base with Sponge

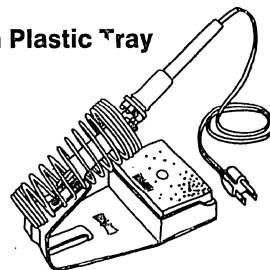
- For instrument irons
- Non-skid stand — can be used in clean room without marring bench
- Sturdy wire construction
- Easily cleaned



MODEL 892A

Plated Steel Base with Plastic Tray

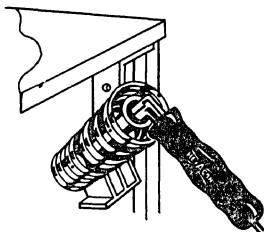
- Designed for instrument irons
- Stable, safe, sturdy construction
- Detachable high temperature plastic tray — easily cleaned



MODEL 893

Bench Mounted

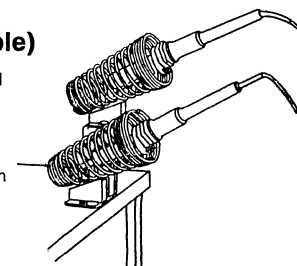
- For under-bench mounting
- Angle adjustable for operator convenience and safety
- Sturdy construction — easily cleaned



MODEL 894

Bench Mounted (Double)

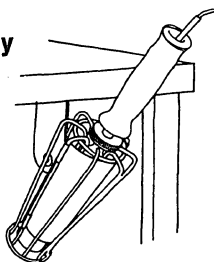
- Irons positioned to prevent cord tangling
- Sturdy construction — easily cleaned
- May be adapted for under-bench mounting



MODEL 899

Bench Mounted Heavy Duty

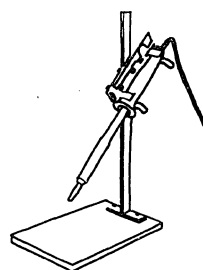
- Rugged design for heavy duty irons
- May be mounted above or below bench
- Holder angle easily adjustable
- Open frame results in cooler iron operation



MODEL 8900

Sturdi-Stand

- Frees operators hands for work handling
- Angle and height of iron easily adjusted
- Sturdy, rigid construction insures stability



OTHER MODELS AVAILABLE

For complete information on Soldering Irons and Accessories, write for Catalog "Soldering Irons." Write for complete tip catalog with 250 standard sizes and shapes. Custom tips designed to specifications.



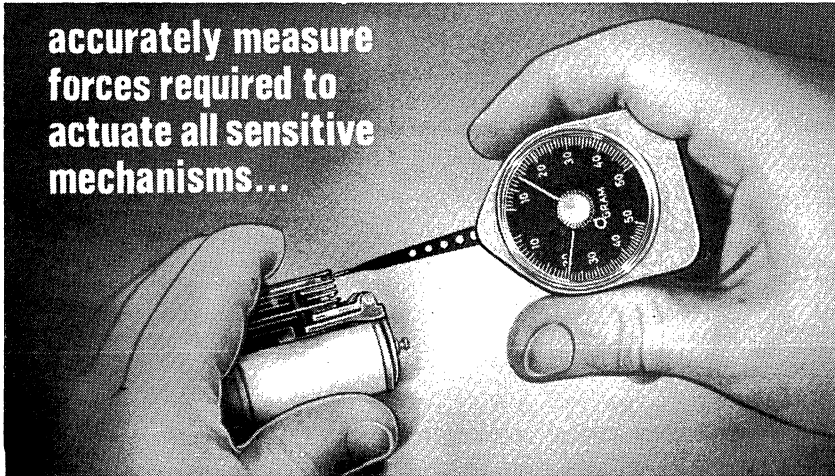
HEXA CON ELECTRIC CO. 156 West Clay Ave., Roselle Park, N.J. U.S.A.

JONARD

GAUGES: Dynamometer dial - Spring tension - Push-pull type

gauges are a must in all departments...

**accurately measure
forces required to
actuate all sensitive
mechanisms...**



Produced in 2 sizes and a total of 13 ranges . . . Simple to use. Just place point of gauge arm perpendicular to force to be measured and read clockwise or counter-clockwise.

All gauges retain reading after measurement . . . No need to look at dial while measuring. Max. reading pointer moves to max. reading +0.01% and remains there until reset.

Small Gauges			Large Gauges		
Jonard type	Range (grams)	Conv. in ounces	Jonard type	Range (grams)	Conv. in ounces
GD-1	0-10	$\frac{3}{8}$	GD-10	10-100	$3\frac{1}{2}$
GD-2	2-20	$\frac{3}{4}$	GD-15	15-150	$5\frac{1}{4}$
GD-3	4-35	1-5/16	GD-20	20-200	7
GD-5	6-50	1 $\frac{1}{4}$	GD-25	30-250	9
			GD-30	40-350	12
			GD-50	61-500	18
			GD-100	100-1000	32
			GD-200	200-2000	70
			GD-400	400-4000	140

- RESEARCH & DEVELOPMENT
- PRODUCTION
- QUALITY CONTROL
- MAINTENANCE & REPAIR

use them for:

- TELECOMMUNICATION EQUIPMENT
- PRECISION INSTRUMENTS
- BUSINESS MACHINES

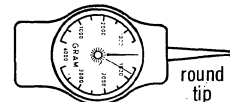
dynamometer type

Indispensable for adjustment of pressure, starting torque or spring tension, where accuracy is required for proper operation. Simple to operate. Measures in both directions—clockwise and counter-clockwise. Gauges are equipped with maximum reading, pointer that retains reading.

Extreme precision and durability built in . . . Made of hard-tempered annealed beryllium copper springs, unbreakable glass face and protected by rigid fitted plastic case.

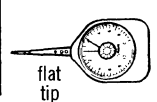
LARGE GAUGE

1 $\frac{1}{2}$ " dial
Weight: 14 oz.



SMALL GAUGE

2 $\frac{1}{2}$ " dial
Weight: 4 $\frac{1}{2}$ oz.



spring type | set and accurately check tension of relay springs, electro-mechanical devices and delicate electronic components

made in 3 basic types:

CENTER ZERO, HEAVY DUTY and PRESET TYPE

All have engraved scales, front and back and can be used both vertically and horizontally.

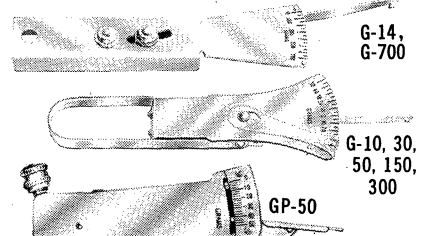
CENTER ZERO—Reads left or right. Adjustable blade, handle closes for protection. 1 $\frac{1}{2}$ " w. × 5" lg. overall.

G-10, 30, 50, 150 & 300
G-10 0-10 gr. (Weco #70F) 1 gr. cal.
G-30 0-30 gr. (Weco #70H) 2 gr. cal.
G-50 0-50 gr. (Weco #70D) 5 gr. cal.
G-150 0-150 gr. (Weco #70J) 10 gr. cal.
G-300 0-300 gr. 25 gr. cal.

HEAVY DUTY—Measure tension of heavier springs. Long spring arm for easy reach.

G-700 0-700 gr. (Weco #62B) Cal. in 50 gr. steps

G-14 0-1,400 gr. (Weco #158A) Cal. in 100 gr. steps
1 $\frac{1}{2}$ " w. × 7 $\frac{1}{2}$ " lg. overall.



PRESET TYPE—Set to required tension by turning screw. Accurate and precise indication that will go no farther than your setting.

GP-50 (Weco dwg. #KN-102873) 0-50 Cal. in 5 gr. steps. Overall length 5 $\frac{1}{4}$ ".

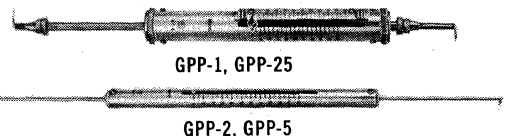
push-pull type

Easy to use in confined areas. With adjustable shafts. Tubular construction with full scale accuracy. Engraved scales. Measure tension or compression of spring loaded devices, actuated levers, relays, microswitches, triggers, pull-pins, pull tests of fine wires, etc.

GPP-1 0-1,000 gr. (Weco #79B) (Dwg #KN-102874) Cal. in 50 gr. steps. $\frac{5}{8}$ " × 9 $\frac{1}{4}$ " lg.
GPP-2 0-110 gr. (Weco #79C) Cal. in 5 gr. steps, $\frac{3}{8}$ " × 11" lg.

GPP-5 Two scales, 0-500 gr. and 0-16 oz. in. Cal. in 50 gr. and 1 oz. in. steps. $\frac{3}{8}$ " × 11" lg.

GPP-25 Two scales, 0-2,500 gr. and 0-80 oz. in. Cal. in 100 gr. and 4 oz. in. steps. $\frac{5}{8}$ " × 9 $\frac{1}{4}$ " lg.



FOR PRICES AND TERMS, SEE PRICE LISTS L-25 AND L-35



Precision tools for electronics, telecommunications and aerospace

JONARD INDUSTRIES CORP. 134 marbledale road • tuckahoe, new york 10707 • phone (914) 793-0700

TWX 710-562-0107 • TELEX 996570

JONARD

BURNISHERS AND CLEANERS

diamond abrasive - contact burnishing tools



cleans contacts effectively!

Exclusive advantages:

- Powerful diamond abrasive
- Flexible
- Long lasting
- Dielectric
- Non-clogging

Only minimum pressure needed to produce perfectly polished contact faces, due to uniformity of diamond particles. Nominal removal of material will not alter gap. Flexible-dielectric plastic shaft permits access to awkward areas. Relays can be serviced without power shutoff. Single spatulas supplied in plastic vial.

D-200 Coarse —.019" thick, double faced, 6" lg.
D-300 Medium —.017" thick, double faced, 6" lg.
D-400 Fine —.011" thick, single face, 6" lg.

K-234 "Diamond" Kit: Consists of 3, assorted or all of one type of above spatulas, in rigid plastic case:



complete assortment of pocket type burnishers for every application...



ECONOMY BURNISHERS. Leave no grit or dust and will not affect contact points. Plastic handles for working on live contacts.

OB-1 For fine contacts. Abrasive coated, 3 1/2" lg. 3/16" wide, .007" thick. Pkg. 12 pcs.
Pkg. 48 pcs.

OB-2 For extra-fine contacts. 3 1/2" lg. x 1/4" wide. .010" thick Pkg. 12 pcs.
Pkg. 48 pcs.

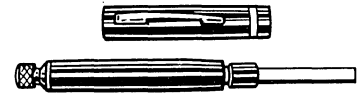
OB-3 General purpose type. Abrasive, coated plated. Hard molded handle. 3 1/2" lg. 1/4" wide, .010" thick. Pkg. 12 pcs.
• Pkg. 24 pcs.

OB-4 For industrial use. Abrasive, coated plated. Hard molded handle. 3 1/2" lg. 1/4" wide, .020" thick. Pkg. 12 pcs.
Pkg. 24 pcs.

POCKET-TYPE BURNISHERS. Used for cleaning general type contacts. Supplied with 6 non-residual abrasive replaceable blades and/or 6 rods stored in pen barrel, as noted. Pen made of sturdy plastic for dielectric work. Length 4 1/2". Diameter 3/8". Blade: 3/16" wide, 1 3/4" long, .007" or .0035" thick.
PB-3 Pen with 6 blades, .0035" thick.
PB-3R (Weco #265C) Same as PB-3 plus 6 abrasive rods.

PB-7 Pen with 6 blades, .007" thick.
B-3 (Weco #266E) Pkg. 25 Repl. blades for PB-3 and PB-3R (.0035")
B-3R (Weco #266C) Pkg. 50 Repl. rods for PB-3R.

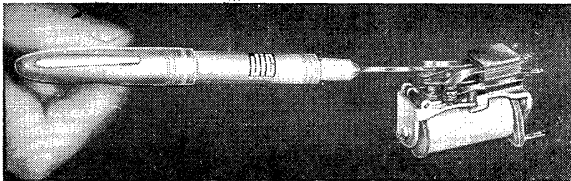
B-7 Pkg. 25 Repl. blades for PB-7 (.007").



PB TYPE

no grit or dust left on contacts with penfile type units

PENFILE POCKET CLEANER-BURNISHER WITH 12 REPLACEMENT BLADES



For all type contacts. Non-residual, do not leave grit or dust on contacts. Hard-tempered steel blade surface insures minimum contact wear. Adjustment of blade—length and rigidity—by varying depth in chuck. Plastic cap for work on "live" contacts. Length 5 1/2". Dia. 3/8".

P-4 PENFILE with 12 blades, 1/4" wide, 1 1/4" long, .007" thick.
P-6 PENFILE with 12 blades, 3/16" wide, 1 3/4" long, .007" thick.

RB-4 Replacement blades for P-4, Pkgs. 25 pcs.

RB-6 Replacement blades for P-6, Pkgs. 25 pcs.

Also available with diamond blades on request.



BC-23

BC-23 BANK CLEANER TOOL
For rotary switches and stepping relays. Dielectric handle for work on "live" equipment. Curved blade has fine abrasive coating. Dia. 1 1/2", overall length 6"

after burnishing: wash and clean with our effective sprays...

KONTACT 60-SPRAY CLEANER

Specially formulated for contacts, switches, controls, etc. Dissolves oxidation and carbonaceous build-up. Leaves protective film. Non-conductive. Will not break circuit or harm insulation. Has injector for hard-to-reach areas. Net Wt. 6 oz.
K-60

JIC-22 ELECTRO-WASH and DEGREASER

Eliminates: Grease—Dirt—Oil and oxidation by powerful flushing spray. Quickly, safely, effectively.

- LEAVES NO RESIDUE
- NON-FLAMMABLE
- SAFE ON ALL MAT'L'S
- DOES NOT CONTAIN CARBON-TET
- HARMLESS TO PLASTICS
- NON-CONDUCTIVE

Leaves components like NEW! Especially made for: P.C.'s, tuners, phone, switching systems, instrumentation, central-office equipment, motors, relays & many other com-

plex mechanisms. 24 oz. Economy can.
JIC-22 Standard pkg: 6 pcs. —12 pcs.

JIC-33 ELECTRO LUBRI-FOAM

Cleans • Lubricates • Protects • Polishes

For ALL electronic/electro-mechanical actuated devices and components.

• EXCLUSIVE FOAMING ACTION • WILL NOT RUN, DRIP, DRY OUT OR CAKE UP • CLEANS, POLISHES AND LUBRICATES CONTACTS • ELIMINATES DISTORTION AND NOISE • SAFE ON ALL PLASTICS • NON-FLAMMABLE
Primarily designed for GOLD, SILVER and precious metal contacts.

New synthetic chemical provides long lasting lubrication which will withstand extremes of temperature and keep contacts clean, polished and lubricated. 8 oz. can.
JIC-33 Standard pkg: 12 pcs. —24 pcs.



6 oz.



8 oz.



24 oz.

FOR PRICES AND TERMS, SEE PRICE LISTS L-25 AND L-35



Precision tools for electronics, telecommunications and aerospace

JONARD

INDUSTRIES CORP. 134 marbledale road • tuckahoe, new york 10707 • phone (914) 793-0700

TWX 710-562-0107

TELEX 996570

JONARD

UNIVERSAL INSTALLATION, SERVICE, ADJUSTMENT & MAINTENANCE KIT- TK-500

**NOW! with just ONE kit... you can INSTALL, SERVICE, ADJUST
& MAINTAIN - Telecommunication Systems - Central Office
Systems (inside and outside the plant) and switchboards.**

This specially designed kit contains ALL the ESSENTIAL and BASIC tools required for the above jobs

Now work on Cross-Bar, PBX, PABX, Penta Conta, cross-bar switch/Casino, springs relays, rotary stepping switches and many other jobs out of ONE kit!

A carefully made SELECTION of tools to fill your needs and simplify your work.

FEATURES:

TOP QUALITY TOOLS: Precision, finely machined and finished to give dependable, durable service.

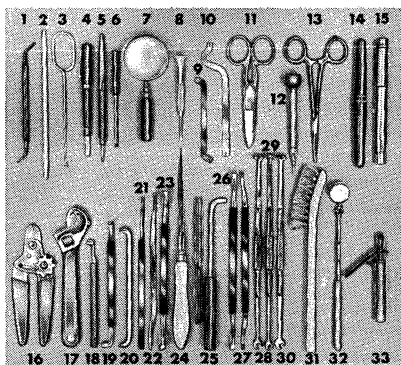
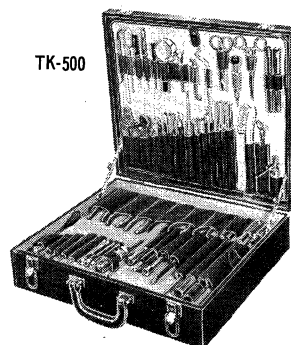
REMOVABLE BOARDS: Easy selection and instant use of ALL tools.

• EXTRA POCKETS FOR YOUR TOOLS. • SEPARATE COMPARTMENTS FOR NOTES & PAPERS. • HANDY PLASTIC BOX FOR SMALL PARTS.

All 76 tools are securely mounted in individual pockets in a highly durable, scratch resistant BARCO case. Withstands years of abuse. Complete kit weighs only 16 lbs. and is 5-1/2" h. x 18-1/4" w. x 16-1/4" d.

TK-500 Complete set of tools with case
TK-500NC Tools alone without case
TK-500M Complete set of tools with case and meter
TKC-50 Tool Case alone
MK-650 Meter and accessories

TK-500



All 3 boards can be removed--for INSTANT SELECTION of ALL tools!

TOOL NO.	JONARD TYPE	DESCRIPTION	TOOL NO.	JONARD TYPE	DESCRIPTION
1	S-457	Wire and spring aid	18	SA-8	Spring adjuster, .058" slot
2	S-389	Orange stick	19	SA-6A	Spring adjuster, .029" slots
3	M-120	Hook Spring, pull	20	SA-24	Spring adj., .040" & .028 slots
4	PB-3R	Pocket type burnisher w/blds. & rods	21	SA-175	Spring adjuster .031" slot
5	S-381	Test probe	22	SA-20	Spring adjuster .024" slots
6	SA-7	Spring adjuster, .015" slot	23	SA-2	Spring adjuster .023" slots
7	K-605	Hand magnifier	24	M-103	Swiss needle file set
8	SD-63	Jewelers screwdriver	25	SA-25	Spring adjuster .032" slot
9	AB-20	Armature adjuster	26	SA-16	Spring adjuster .031" slots
10	SB-22	Stop bender	27	SA-17	Spring adjuster .023" slots
11	FS-66	Filament scissor	28	DW-4	Offset adj. wrench, 1/4"
12	J-23	Screwdriver, guide pin	29	DW-16	Offset adj. wrench, 3/16"
13	M-100S	Retriever clamp (straight)	30	DW-32	Offset adj. wrench, 7/32"
14	OS-84	Precision oiler	31	WB-65	Wire brush, nickel/silver
15	K-606	Penlight	32	IM-64	Inspection mirror
16	WS-61	Wire stripper	33	S-339	Lamp extractor, switchboard
17	K-607	Adjustable wrench			

Separate compartments for papers..Extra pockets for your additional tools.

TOOL NO.	JONARD TYPE	DESCRIPTION	TOOL NO.	JONARD TYPE	DESCRIPTION
34	K-608	Screwholding screwdriver	48	S-451	Offset screwdriver, .028" tips
35	K-609	Standard 6" screwdriver	49	M-130	Ratchet, Offset screwdriver
36	M-140	Beryllium copper screwdriver	50	K-612	Allen wrench set
37	K-610	Std. screwdriver (insulated)	51	K-601	Midget screwdriver, std. No. 0
38	M-311	Skt. wrench, 3/8" x 7/16", 7" lg.	52	K-602	Midget screwdriver, Phillips No. 0
39	M-110	Skt. wrench, 9/32" x 5/16", 4" lg.	53	K-603	Midget nut driver, 3/16" hex
40	K-611	Standard screwdriver (light)	54	K-604	Midget nut driver, 1/4" hex
41	M-160	Comb. Phillips/std. screwdriver	55	PL-4	Groove-grip plier, midget
42	M-160-5	Nut driver, 5/16"	56	PL-8	Duck bill plier, spring
43	M-160-11	Nut driver, 11/32"	57	PLS-2	Diag. angle, cutting/stripping plier
44	M-160-3	Nut driver, 3/8"	58	PLS-5	Heat coil plier, 6" lg.
45	TW-63	Tweezer, curved pts., insul.	59	PL-10	Nose cutting plier
46	TW-57	Tweezer, type AA, fine pt.	60	PL-7	Lineman's plier, 7" lg.
47	S-448	Offset screwdriver, angled			

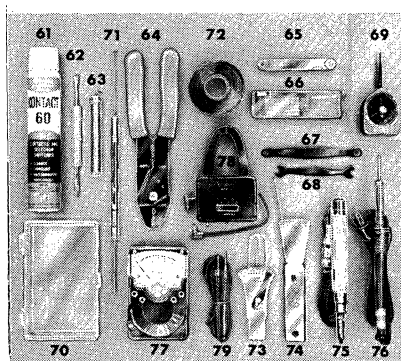
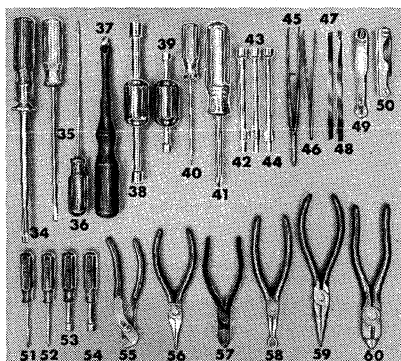
Reference sheet about tools & kit included..also handy compartmented plastic box for small parts.

TOOL NO.	JONARD TYPE	DESCRIPTION	TOOL NO.	JONARD TYPE	DESCRIPTION
61	K-60	Contact cleaner spray	72	K-618	Vinyl electrical tape
62	K-614	Solder aid	73	G-50	Spring tension gauge, 0-50gr.
63	K-615	Solder	74	G-700	Sprng.tens.gauge, hvy.duty, 0-700gr.
64	K-616	Crimping and cutting tool	75	K-619	Circuit tester
65	T-720N	Straight thickness gauge	76	SI-25	Soldering iron
66	T-271	Wire thickness gauge set	77	TM-31	Meter
67	M-78	Box wrench, 1/4" x 9/32" hex	78	TA-10	Adapter
68	M-76	Open end wrench, 1/4" x 15/64"	79	TL-1	Test leads
69	GD-15	Tension gauge, dyn., 15-150gr.			
70	K-617	Plastic box w/spaces f/parts			
71	GPP-2	Push-pull gauge, 0-110gr.			

Reorder tools by
Jonard type No.

OPTIONAL METER ACCESSORY

MK-650 Consists of 1 Multi-meter, 1 Ammeter adapter and set of test leads. Available optional extra.



Precision tools for electronics, telecommunications and aerospace

JONARD INDUSTRIES CORP. 134 marbledale road • tuckahoe, new york 10707 • phone (914) 793-0700

TWX 710-562-0107

TELEX 996570

FOR PRICES AND TERMS, SEE PRICE LISTS L-25 AND L-35

BULLETIN FL-9

JONARD QUIK-WRAP® devices make more uniform, mechanically stable, permanent WIRE WRAP connections!

HAND WRAPPING TOOLS

No bits or sleeves are needed with these handy tools. Use them for shop, service and production wrapping or special requirements.

JONARD#	GAUGE	DESCRIPTION
WD-2000	20	Single ended, .071"x .625" deep.
WD-2400	24	Single ended, .075"x .625" deep.
WD-2001	20	Single ended, w/tunnel, .075"x .625" deep.
WD-2224	22-24	Single ended, w/tunnel, .075"x .625" deep.
WD-2225	22-24	Single ended, .075"x .800" deep.
WD-2600	26	Single ended, .075"x .750" deep.
WDI-2224 (Weco #635A)	22-24	Special; insulated, .073" x .750" deep.
WDI-2426 (Weco #635B)	24-26	Standard; insulated, .073" x .750" deep.

BARE GROUND STRAPPING TOOLS

WDG-2224	22-24	Aluminum anodized handle, knurled, continuous feed.
WDG-2600	26	Aluminum anodized handle, knurled, continuous feed.

HAND UNWRAPPING TOOLS

Like the wrapping tools, these hand unwrapping tools have no separate bits and sleeves. Use them in any location. No power needed.

JONARD#	GAUGE	DESCRIPTION
UDLR-2026	20-26	Double ended, left and right hand, .070"x .750" deep each end.
UDL-2027	20-26	Double ended, left hand, .052" one end, .070" other x 1.25" deep hole.
UDL-2426	24-26	Double ended, left hand, .066" one end, .073" other end, 1" deep hole.
UDR-2426	24-26	Double ended, right hand, .066" one end, .073" other end, 1" deep hole.
UDL-2026	20-26	Single ended, left hand, .070"x .750" deep.
UDL-2028	20-26	Single ended, left hand, insulated, .070"x 2.360" deep, wire release type.
UD-2224 (Weco #'s KS-16492, R-3328)	22-24	Single ended, plastic handle, .070" dia. hole, wire release type, insulated.
UDL-2427	24-26	Single ended, left hand, .072"x 1.81" deep hole.
UDR-2427	24-26	Single ended, right hand, .072"x 1.81" deep hole.

KITS - Convenient to use... easy access... all tools at your fingertips...

WRAPPING TOOL KIT • KW-350

A set of wrapping tools, selected to handle the most popular wire wrap connections.

Handsomely fitted in a durable leather finished case for maximum protection of tools.

WDI-2426 Standard; insulated, .073"x .750" deep hole.

WD-2225 Single ended, w/tunnel, .075"x .625" deep hole.

WD-2000 Single ended, .071"x .625" deep hole.



UNWRAPPING TOOL KIT • KU-360

A set of unwrapping tools, selected to handle the most popular wire unwrap connections.

Set complements the above wrapping tool kit.

Handsomely fitted in a durable leather finished case for maximum protection of tools.

UDL-2027 Double ended, left hand, .052"/.070" x 1.25" deep hole.

UDLR-2026 Double ended, left and right hand, .070"x .750" deep hole.

UDR-2426 Double ended, right hand, .066"/.073" with 1" deep hole.



Manual QUIK-WRAP® GUNS & ACCESSORIES ...

UG-360 UNWRAP TOOL

Unwrap bits are listed here

WG-350 CHUCK TYPE

Easy to use. Make dependable connections at production speeds.

WIRE GAUGE	QUIK - UNWRAP BIT JONARD PART NO.
20-26	BU-2026
20-26	BUP-2026 (For power tools)

The following table lists the necessary bits and sleeves for the wire size and terminal you are working with.

WIRE GAUGE	Regular	Modified	Terminal Hole Dia. x Depth	QUIK-WRAP BIT JONARD PART NO.	QUIK-WRAP SLEEVE JONARD PART NO.
24-26	✓		.075"x .750"	BW-2426	SW-2426
22-24	✓		.075"x .807"	BW-2224	SW-2224
24-26		✓	.075"x .750"	BWM-2426	SW-2224
22		✓	.075"x .750"	BWM-2200	SW-2224

*Modified wrap includes additional 1 1/2 turns with insulation on terminal.

If you cannot find the wrapping tool you need, Jonard will produce it custom to your specifications and requirements.

FOR PRICES AND TERMS, SEE PRICE LISTS L-25 and L-35



Precision tools for electronics, telecommunications and aerospace

JONARD INDUSTRIES CORP. 134 marbledale road • tuckahoe, new york 10707 • phone (914) 793-0700

TWX 710-562-0107

TELEX 996570

MASTER Appliance Corporation FLAMELESS HEAT TOOLS

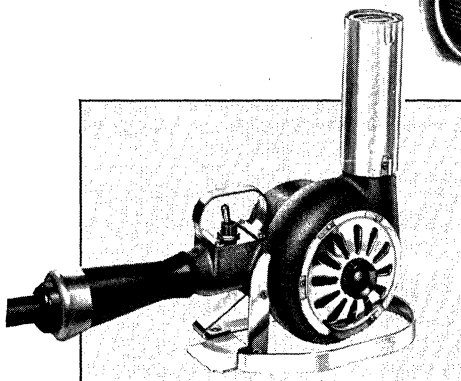
A Complete Broad Line for Your Every Need

HEAT GUN Standard Models

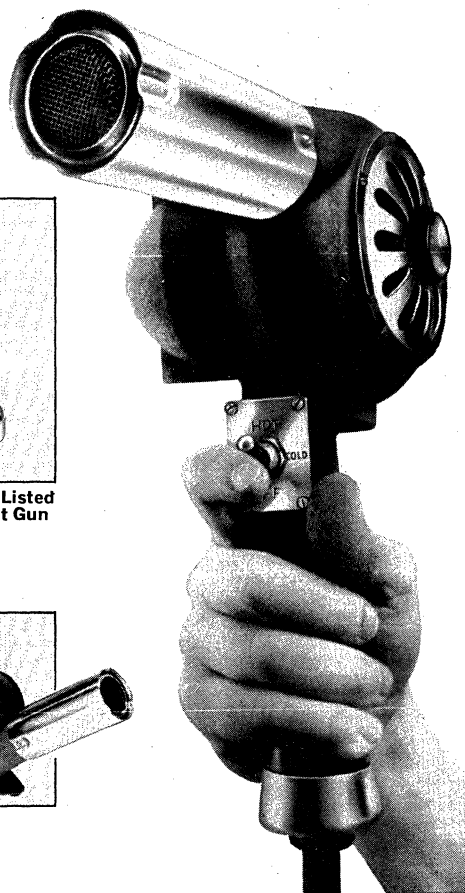
STANDARD MODELS

Standard Model	Temp. F. °	Voltage	Amp.
HG-201	220/320	120	5
HG-202	220/320	230	2.6
HG-301	475/600	120	12
HG-302	475/600	230	6.3
HG-501	650/950	120	14
HG-502	650/950	230	7.5
HG-751	1000/1150	120	18.5
HG-752	1000/1150	230	9.5

Los Angeles approved and chrome models also available

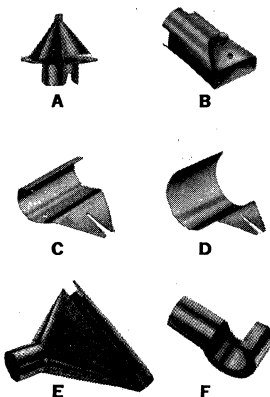


U.L. Listed
Heat Gun



- ★ **CONTOURED, COMFORT-FIT HANDLE.** Gives operator secure grip and balance — at all times. Insures firm, positive control of gun.
- ★ **CONVENIENT 3-WAY SWITCH.** Provides the option of hot, cold or off at the flick of a finger.
- ★ **DOUBLE-JACKETED HEATER HOUSING.** Inner barrel is chrome-plated to prevent rust, corrosion.
- ★ **POWERFUL, HI-SPEED UNIVERSAL MOTOR.** None better made! Perfectly balanced.
- ★ **STURDY, DIE-CAST ALUMINUM HOUSING.** Gives the protection needed against hard knocks in the shop. Lightweight. Reduces arm fatigue.
- ★ **QUIET, EFFICIENT TURBO-FAN.** Cools Motor. Delivers correct heat and velocity where you need it.
- ★ **ADJUSTABLE AIR-INTAKE SHUTTER.** Gives you exact degree of heat you want. Varies velocity — open shutter to decrease temperature, close shutter to increase temperature.
- ★ **ADJUSTABLE, REMOVABLE "SLIDE-ON" BASE.** Standard equipment. 5 3/4" triangular. Adjusts to support gun in various positions.*
- ★ **FLUSH BRUSH HOLDERS.** Brushes can be changed in 60 seconds; easy access — no need to disassemble unit.
- ★ **BIG 1-3/16" DIAMETER NOZZLE.** Designed to direct a powerful flow of heat on the exact area you want. Accommodates a variety of attachments.
- ★ **8-FOOT CORD, OIL RESISTANT NEOPRENE, 3-WIRE MOLDED PLUG.** Size of cord complies with safety code for each gun's amperage requirements. Lighter cords than those provided by Master are potentially dangerous to operator. Special cord lengths and plugs to your specifications are available.

ATTACHMENTS



U.L. LISTED MODELS

Model	Temp. F. °	Voltage	Amp.
HG-1201-U	220/320	120	5
HG-1301-U	475/600	120	12
HG-1501-U	650/950	120	14

U.L. Listed models feature "Mitey-Mite" fuse, a trigger guard that covers the switch, a permanently attached stand, and U.L. Listed wiring.

Attachments: a. **exclusive cone** has 1/4" orifice that focuses heat on a concentrated area and a patented adjustable air diffuser that eliminates back pressure and heat loss. Part No. A-206-HG. b. **Nozzle adapter** — required for baffles A-145-HG and A-150-HG. Part No. A-100-HG. c. **Baffle** — for tubing to 3/4" OD, requires A-100-G adapter. Part No. A-145-HG. d. **Baffle** — for tubing to 1 1/4" OD, requires A-100-HG nozzle adapter. Part No. A-150-HG. e. **Extra wide baffle** — for long tubing to 3/4" OD. Part No. A-203-HG. f. **Baffle** — for tubing to 1 3/4" OD. Part No. A-205-HG.

UL Listed Models

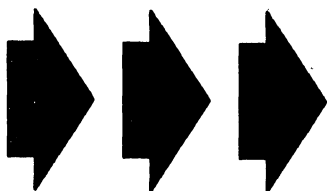
MASTER Heat Guns are U.L. & CSA. listed, Models HG1201U, HG1301U, HG1501U. L.A. listed Models available for all heat guns. Specify "U.L. listed" or "L.A. listed". All U.L. and L.A. models have same basic Specifications shown on chart.

U.L. Listed Heat Guns Meet O.S.H.A. Requirements

MASTER APPLIANCE CORP. • 2420 18TH STREET • RACINE, WISCONSIN • (414) 633-7791

MASTER-MITE^{T.M.} HEAT GUN

ECONOMICAL • RUGGED • LIGHT • VERSATILE



Gun with
Standard 650° F.
Nozzle

Compact heat tool for heat shrinking and other industrial uses. Delivering up to 800° F... weighs only 1¾ lbs. with nozzle. Three interchangeable nozzle heating elements, high impact plastic housing.

7 ft. three conductor-grounded cord for 120 V., 60 Hz., 5.4 amp input. Air cooled barrels deliver 700 feet/minute air velocity and 3.8 CFM of volume. 650° F. nozzle and deflector adapter standard. Otherwise specify element of your choice.

SUGGESTED NOZZLES FOR HEAT SHRINKABLES

Type Tubing	Common or Trade Designation	Approx. Shrink Temp.*** (°F.)	Sugg. Heat Nozzle
Polyester	Mylar*	175	Blue
Polyvinyl Chloride	PVC; Vinyl	250	Silver
Irradiated Polyvinyl Chloride	PVC; Vinyl	250	Silver
Irradiated Butyl	—	250	Silver
Irradiated Polyolefin	—	275	Silver
Polyfluorinated Ethylene Propylene	FEP	300	Silver
Polyvinylidene Fluoride	Kynar**	350	Silver
Irradiated Neoprene	—	350	Silver
Irradiated Silicone	—	350	Silver
Polytetrafluoroethylene	Teflon*; PTFE; TFE	621	Black

*Reg. Trade Name of DuPont

**Reg. Trade Name of Pennsalt

***Based on latest available information

***U.L. Listed**

SEE MASTER'S COMPLETE LINE CATALOG FOR INFORMATION ABOUT OTHER HEAT TOOL MODELS.

REPLACEMENT HEATING-ELEMENT NOZZLES

Color	Avg. Outlet Temp. (½" from Nozzle)	Voltage	Wattage	Cat. No.
Blue	500° F	120	340	20012
Silver	650° F	120	475	20013
Black	800° F	120	525	20014
Blue	500° F	230	340	20033
Silver	650° F	230	475	20034
Black	800° F	230	525	20035

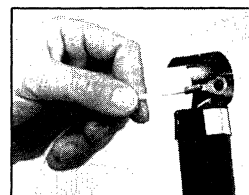
ATTACHMENTS

Catalog No.	Description	
40060	DEFLECTOR ADAPTER encapsulates shrink tubing with even heat. Standard equipment.	
40061	PIN POINT ADAPTER ¼" Concentration of heat	

ORDERING INFORMATION

Description	Shipping Weight	Voltage	Model
Heat Gun with nozzle	3 lbs.	120	10008*
Heat Gun with nozzle	3 lbs.	230	10009
Heat Gun Kit	4 lbs.	120	10011
Heat Gun Kit	4 lbs.	230	10012

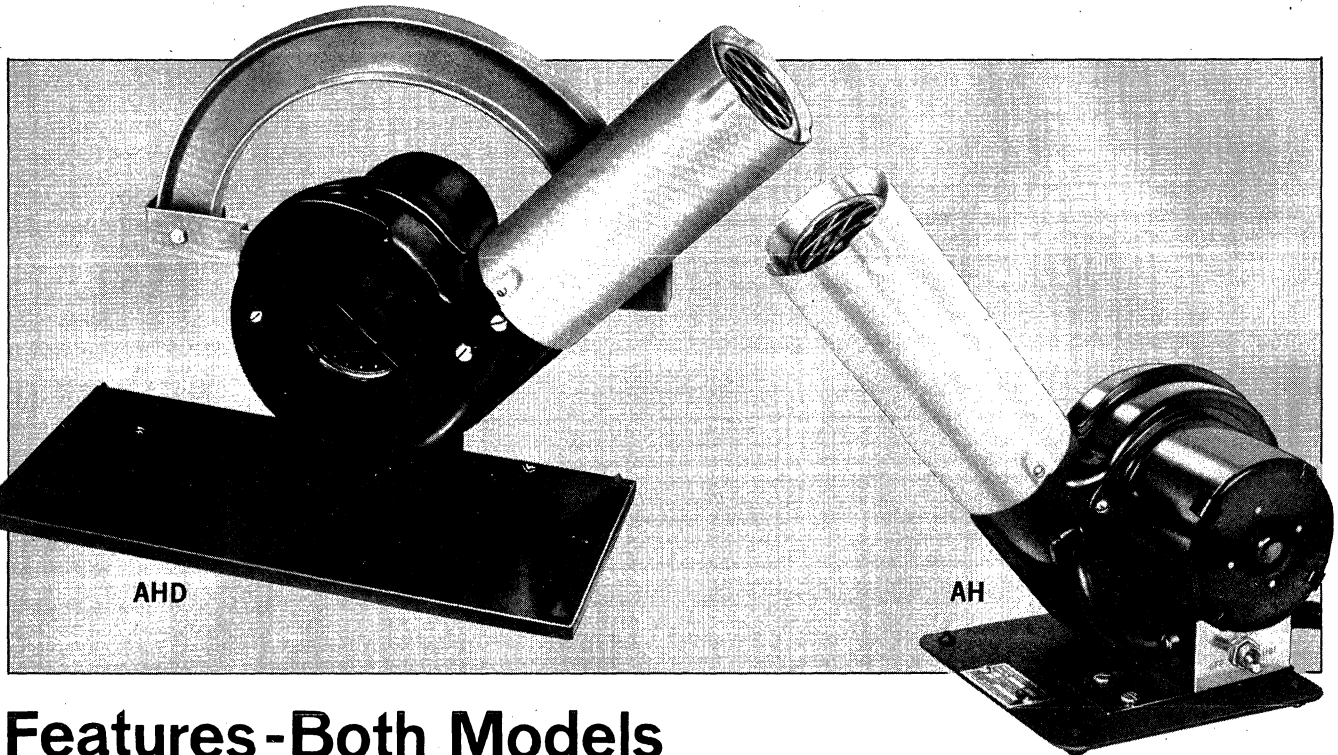
Kit includes 3 elements, both attachments.



MASTER APPLIANCE CORP. • 2420 18TH STREET • RACINE, WISCONSIN • (414) 633-7791

MASTER Appliance Corporation FLAMELESS HEAT BLOWERS

Continuous flow of air up to 800° F.



AHD

AH

Features-Both Models

- ★ **HEAVY-DUTY INDUCTION-TYPE MOTOR FOR CONTINUOUS OPERATION.** Rugged construction insures steady, dependable service day-in, day-out. No brushes to wear out.
- ★ **OVERSIZE TURBO FAN.** Cools the motor. Maintains correct velocity. Built for longer life, peak heat-output efficiency.
- ★ **BIG 2" DIAMETER NOZZLE.** Speeds the job. Directs a steady flow of the correct heat on the work area.
- ★ **CONVENIENT 3-WAY MASTER CONTROL SWITCH.** Lets you switch from hot to unheated air to off at the flick of a finger. Doubles as cooling fan or hot air blower.
- ★ **STURDY 6" x 6" BASE.** Tailor-made for mounting on benches, walls, machines, presses. Perfect for assembly/production line operations.
- ★ **ADJUSTABLE INTAKE ORIFICE.** Controls temperature to heat range required. Open orifice wide for lowest temperature, close partly to reduce air volume and increase the temperature.
- ★ **CONVENIENT REMOVABLE HANDLE.** For portable use, hold blower in any position with this curved well balanced handle. For easy mobility, carry the blower from one place to another.
- ★ **ADJUSTABLE REMOVABLE 6" x 13" BASE.** Provides full 90-degree flexibility. Suited for bench, machine or wall mounting. Large size provides extra secure base when not permanently mounted.

AH SERIES

Model	Temp. F.°	Voltage A.C.	Amp.
AH-301	350	120	10
AH-302	350	230	5.2
AH-501	475	120	14
AH-502	475	230	7.3
AH-751	630	120	18
AH-752	630	230	9.4

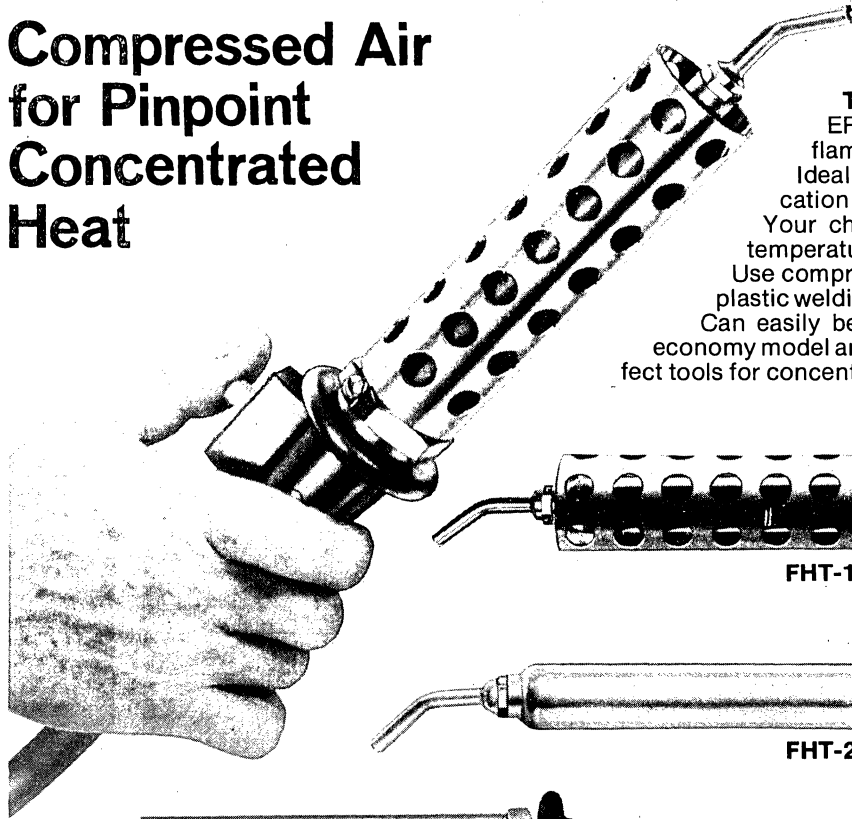
AHD SERIES

Deluxe Model	Temp. F.°	Voltage A.C.	Amp.
AHD-301	350	120	10
AHD-302	350	230	5
AHD-501	475	120	14
AHD-502	475	230	6
AHD-751	630	120	18
AHD-752	630	230	11

MASTER APPLIANCE CORP. • 2420 18TH STREET • RACINE, WISCONSIN • (414) 633-7791

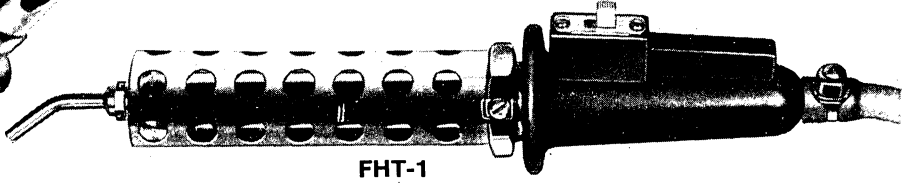
MASTER Appliance Corporation FLAMELESS HEAT TORCHES

Compressed Air for Pinpoint Concentrated Heat



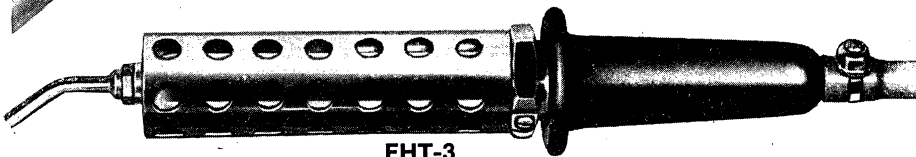
FLAMELESS COMPRESSED-AIR HEAT TORCHES

— Lightweight, portable MASTER compressed air torches pinpoint intense flameless heat precisely where you want it. Ideal for shrink tubing, plastic welding, application of heat to microparts or constricted areas. Your choice of easy snap-in elements provides temperature ranges from 250° to 1000° plus. Use compressed air, nitrogen or inert gas for perfect plastic welding. The Master torch weighs only 1 pound. Can easily be handled by women workers. Low cost economy model and 3 other models to choose from. The perfect tools for concentrated heat — *without a flame* — by Master.

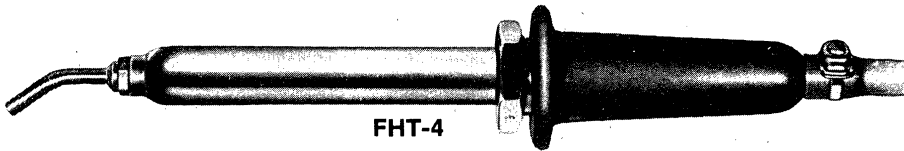


FHT-1

FHT-2



FHT-3



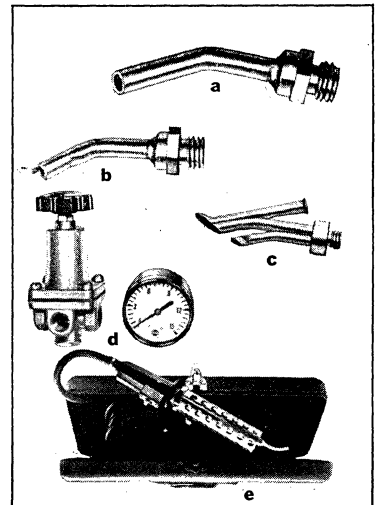
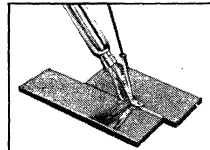
FHT-4

HEAT TORCHES

Model	Description
FHT-1	With Switch and Shield
FHT-2	With Switch Only
FHT-3	With Shield Only
FHT-4	No Switch or Shield

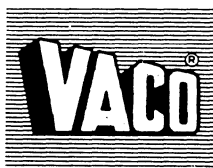
TORCH ELEMENTS

Element Wattage	Temperatures/ Air Pressure	Temperatures/ Air Pressure
250	250° F / 8 p.s.i.	500° F / 2 p.s.i.
350	350° F / 8 p.s.i.	700° F / 2 p.s.i.
450	450° F / 8 p.s.i.	850° F / 2 p.s.i.
550	550° F / 8 p.s.i.	1050° F / 2 p.s.i.



Accessories and attachments: a. **Universal multi-purpose tip;** supplied with each torch. Part No. SS-1. b. **Combination welding and tacking tip;** eliminates need for two tips during welding. Part No. SS-2. c. **Universal highspeed welding tips;** for 1/8" and 5/32" plastic welding rod. Part No. SS-3. For 3/16" plastic welding rod, Part No. SS-4. Either size. d. **Air gauge and regulator;** Part No. A-207-FT. e. **Steel carrying case;** Part No. A-201-FT. **Stand** (not shown); holds torch when not in use; supplied with torch. Part No. A-202-FT.

MASTER APPLIANCE CORP. • 2420 18TH STREET • RACINE, WISCONSIN • (414) 633-7791



Screw Drivers & Nut Drivers

UNCONDITIONALLY GUARANTEED

ROUND BLADE SCREW DRIVERS



Stock No.	Blade Size Inches	O. A. Length	Weight per Pkg.
Pocket Clip Standard Package 12			
A010	3/32 x 1-3/8	3-1/8	1/2 lb.
A230-2	1/8 x 2	3-3/4	1/2 lb.
A130-2	1/8 x 2	3-7/8	1/2 lb.
A130-3	1/8 x 3	4-7/8	1/2 lb.
A116-2	3/32 x 2	4-1/2	1/2 lb.
A116-3	3/32 x 3	5-1/2	1/2 lb.
A116-4	3/32 x 4	6-1/2	1/2 lb.
A131-2	1/8 x 2	4-1/2	1/2 lb.

Electrician & Cabinet Styles Standard Package 6

Stock No.	Blade Size Inches	O. A. Length	Weight per Pkg.
A216-2	1/8 x 2	4-3/4	1/2 lb.
A216-3	1/8 x 3	5-3/4	1/2 lb.
A216-4	1/8 x 4	6-3/4	1/2 lb.
A216-6	1/8 x 6	8-3/4	1/2 lb.
A216-8	1/8 x 8	10-3/4	1/2 lb.
A216-10	1/8 x 10	12-3/4	1/2 lb.
A316-3	3/16 x 3	6-1/2	1 lb.
A316-4	3/16 x 4	7-1/2	1 lb.
A316-6	3/16 x 6	9-1/2	1 lb.
A316-8	3/16 x 8	11-1/2	1 lb.
A316-10	3/16 x 10	13-1/2	1-1/2 lbs.

PHILLIPS BLADE SCREW DRIVERS



Stock No.	Point No.	Overall Length	Weight Per Pkg.
Genuine Phillips Standard Package 6			
P01	0	5-1/4	1/2 lb.
P1	1	6-1/2	1 lb.
P2	2	7-5/8	1-1/2 lbs.
P3	3	10	2 lbs.
P4	4	12-1/2	3-1/2 lbs.

Pocket Clip Standard Package 6

Stock No.	Point No.	Overall Length	Weight Per Pkg.
P12	0	5	1/2 lb.

Stubby Phillips Standard Package 6

Stock No.	Point No.	Overall Length	Weight Per Pkg.
P5	2	3-7/8	1 lb.
P6	1	3	1/2 lb.

BERYLLIUM COPPER NON-MAGNETIC SCREW DRIVER

Standard Package 6

Stock No.	Blade Diameter and Length	O. A. Length	Weight Per Pkg.
VB210	1/8 x 10	12-3/4	1 lb.

INSULATED BLADE DRIVERS

Standard Package 6

Stock No.	Blade Dia. & Length	O. A. Lgth.	Color Key	Weight Per Pkg.
VR261	1/8 x 6	9	Grey	1/2 lb.
VR361	3/16 x 6	9-1/2	Black	1 lb.

REVERSIBLE BLADE DRIVERS

Standard Package 6



Stock No.	Type and Size of Blade	Weight per Pkg.
DU1	#1 Phil. x 1/8 Reg.	1 lb.
DU2	#1 Phil. x 3/16 Reg.	1 lb.
DU4	#2 Phil. x 1/4 Reg.	1-1/2 lbs.
DU5	#2 Phil. x 1/4 Reg. (Stubby)	1 lb.
DU11	#1 Phil. x 3/16 Reg. plus 1/4 hex.	1-1/2 lbs.
DUP12	#1 Phil. x #2 Phil.	1-1/2 lbs.
DU34	3/16 Reg. x 1/4 Reg.	1-1/2 lbs.



Stock No.	Blade Size Inches	O. A. Length	Weight per Pkg.
Keystone Styles Standard Package 6			
A416-3	1/4 x 3	6-5/8	1-1/2 lbs.
A416-4	1/4 x 4	7-5/8	1-1/2 lbs.
A416-6	1/4 x 6	9-5/8	1-1/2 lbs.
A416-8	1/4 x 8	11-5/8	1-1/2 lbs.
A416-10	1/4 x 10	13-5/8	2 lbs.
A516-4	5/16 x 4	8	1-1/2 lbs.
A516-6	5/16 x 6	10	2 lbs.
A516-8	5/16 x 8	12	2-1/2 lbs.

Stubby Styles Standard Package 6

Stock No.	Blade Size Inches	O. A. Length	Weight per Pkg.
A132	1/4 x 1-1/4	3	1 lb.
A135	5/16 x 1-3/4	3-7/8	1 lb.

Offset Drivers Standard Package 6

Stock No.	For Screw No.	O. A. Lgth.	Weight per Pkg.
V01	2 to 6	3	1/2 lb.
V02	6 to 10	4	1/2 lb.
V03	8 to 12	5	1 lb.
V04	12 to 16	6	1-1/2 lbs.

Extra Long Blade Phillips Standard Package 6

Stock No.	Point No.	Overall Length	Weight Per Pkg.
P18	1	11-1/2	1 lb.
P28	2	11-5/8	1-1/2 lbs.
P212	2	15-5/8	2-1/2 lbs.
P202*	2	23-5/8	1 lb. ea.

*Carded—Individually

Offset Phillips Standard Package 6

Stock No.	Blade End	Point No.	Overall Length	Weight Per Pkg.
P120	Dble. End	#18 & #2	11-1/2	1/2 lb.
P230	Dble. End	#28 & #3	11-5/8	1 lb.
P340	Dble. End	#38 & #4	15-5/8	1-1/2 lbs.

VACOMATIC ALL MAGNETIC SCREW DRIVER SET



No. 70035—Magnetic shank holds choice of 4 bits magnetically. Includes 3/16 and 9/32 regular plus #1 and #2 Phillips bits. 9" long. Carded. Std. pkg. 6.

SCREW LAUNCHERS

For Straight Slot Screws
Standard Package 6



Stock No.	Blade Size	O. A. Length	Weight per Pkg.
K21*	1/8 x 3	5-3/4	1/2 lb.
K23	1/8 x 3	5-3/4	1/2 lb.
K28	1/8 x 8	10-3/4	1 lb.
K34	3/16 x 4	7-1/2	1 lb.
K36	3/16 x 6	9-1/2	1 lb.
K38	3/16 x 8	11-1/2	1-1/2 lbs.
K44	1/4 x 4	7-5/8	1-1/2 lbs.
K46	1/4 x 6	9-5/8	1-1/2 lbs.
K48	1/4 x 8	11-5/8	2 lbs.

*Specially ground tip for use on miniature screws

Phillips Screw Launchers Standard Package 6

Stock No.	Length
K13	3
K14	5
(Pocket Clip)	Fits all sizes of Phillips
K15	5
K16	7
K19	9

NUT DRIVERS



Stock No.	Hex Size	O. A. Lgth.	Handle Color	Wt. per Pkg. Lbs.
3" Shaft Length Standard Package 6				
S6	3/16	6-5/8	Black	1
S7	7/32	6-5/8	Amber	1
S8	1/4	6-5/8	Red	1
S9	9/32	6-5/8	Amber	1
S10	5/16	6-5/8	Amber	1
S11	11/32	6-5/8	Green	1
S12	3/8	6-5/8	Blue	1
S14	7/16	7	Brown	1-1/2
S16	1/2	7	Orange	1-1/2

Extra Large Hex Size 4" Shaft Length Standard Package 6

Stock No.	Hex Size	O. A. Lgth.	Handle Color	Wt. per Pkg. Lbs.
S18	9/16	8	Amber	1-1/2
S20	5/8	8	Amber	1-1/2

Stubby Style 1 1/4" Shaft Length Standard Package 6

Stock No.	Hex Size	O. A. Lgth.	Handle Color	Wt. per Pkg. Lbs.
SS8	1/4	3-1/2	Amber	1
SS10	5/16	3-1/2	Amber	1
SS12	3/8	3-1/2	Amber	1

Extra Long 6" Shaft Length Standard Package 6

Stock No.	Hex Size	O. A. Lgth.	Handle Color	Wt. per Pkg. Lbs.
S66	3/16	9-5/8	Black	1
S86	1/4	9-5/8	Red	1
S106	5/16	9-5/8	Amber	1-1/2
S116	11/32	9-5/8	Green	1-1/2
S126	3/8	9-5/8	Blue	1-1/2
S146	7/16	10	Brown	1-1/2
S166	1/2	10	Orange	1-1/2

Super Long 18" Shaft Length Standard Package 3

Stock No.	Hex Size	O. A. Lgth.	Handle Color	Wt. per Pkg. Lbs.
S818	1/4	21-5/8	Amber	3 lbs.
S1018	5/16	21-5/8	Amber	3 lbs.

Magnetic Nut Drivers Magnet in Shank

Stock No.	Hex Size	O. A. Lgth.	Handle Color	Wt. per Pkg. Lbs.
S8M	1/4	6-5/8	Red	1 lb.
S10M	5/16	6-5/8	Amber	1 lb.
S86M	1/4	9-5/8	Red	2 lbs.
S106M	5/16	9-5/8	Amber	2 lbs.
S818M	1/4	21-5/8	Amber	3 lbs.
S1018M	5/16	21-5/8	Amber	3 lbs.

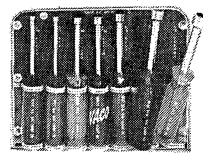


Self Adjusting Nut Driver

No. SA711—Adjusts itself automatically to fit hex head bolts or nuts from 1/4 to 7/16". Simply press and turn. Tempered steel sockets. Std. pkg. 6.

NUT DRIVER KITS & SETS

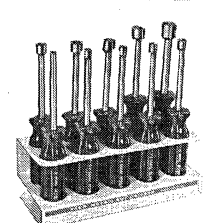
No. K7—Stand up—hang up kit contains the following drivers: S6, S8, S10, S11, S12, S14, and S16. Individually boxed. Wt. 1-1/2 lbs. each.



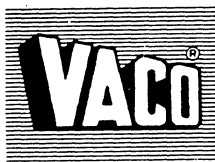
METRIC NUT DRIVERS

3" Length Solid Shaft Bright Blue Handles Standard Pkg. 6.

No. 70200 Metric Nut Driver Set in Metal Stand contains one each of 10 nut drivers above. Measures 7 x 3-1/8 x 7-1/8. Wt. 2-1/2 lbs.



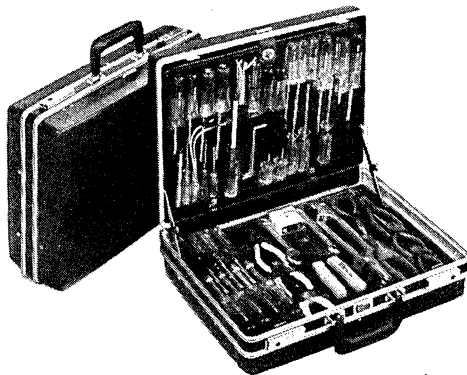
Stock No.	Hex Size	O.A. Lgth.	Weight per Pkg.
70204	4mm	6-3/4	1 lb.
70245	4.5mm	6-3/4	1 lb.
70205	5mm	6-3/4	1 lb.
70255	5.5mm	6-3/4	1 lb.
70206	6mm	6-3/4	1 lb.
70207	7mm	6-3/4	1 lb.
70208	8mm	6-3/4	1 lb.
70209	9mm	6-3/4	1 lb.
70210	10mm	7	1-1/2 lbs.
70211	11mm	7-1/8	1-1/2 lbs.



Super Case & Problem Solving Tools

UNCONDITIONALLY GUARANTEED

THE NEW SUPER CASE



No. 70260—Vaco Super Case holds 48 of the most popular screw drivers, wrenches, pliers, nut drivers and problem solving tools. All store conveniently in sturdy simulated leather case—vinyl tool pockets on removable pallets. Large lid pocket for catalogs, bottom storage area for meters, testers, etc.

Contents

Electrical Tester

No. 70008 Continuity Tester
No. 70129 100-500 Volt Circuit Tester
No. 70219 Twin Head Tester
No. AN2 High Frequency Tester

Screw Drivers

DUL Reversible 3/16 Regular and #1 Phillips
DUH4 Reversible 1/4" Regular and #2 Phillips
BD144 1/4"x4" Bulldriver

71002 #2 Phillips with Cushion Grip Handle
74164 1/4"x4" Regular with Cushion Grip Handle
R20 #2 Point Square Recess (Robertson)
R10 #1 Point Square Recess (Robertson)
CH540 Clutch Head
F710 Reed & Prince (Frearson)
P-2 #2 Genuine Phillips
P-1 #1 Genuine Phillips
P-6 #1 Phillips Stubby
A132 1/4"x1-1/4" Stubby
A130-2 1/8"x2" with Pocket Clip
70035 Magnetic—2 Regular, 2 Phillips Bits
K46 1/4"x6" Split Blade Screw Launcher
K34 3/16"x4" Split Blade Screw Launcher
K23 1/8"x3" Split Blade Screw Launcher
K15 Phillips Split Blade Screw Launcher
Hollow Shaft Nut Drivers
S6 3/16" S12 3/8"
S8 1/4" S14 7/16"
S10 5/16" S16 1/2"
S11 11/32"

Wrenches

7706 6" Adjustable
1214 Ratchet Box, 3/8"x7/16"

Professional Pliers

8203 6" Diagonal Cutter
8102 6" Needle Nose with Cutter
8105 6" Long Nose
8202 5" Diagonal Cutter
8602 6" Vacgruv Adjustable
9101 Midget Long Nose
9201 Midget Diagonal Cutter

Crimping Tool & Wire Stripper

1963 Crimping Tool with Bolt Slicer, Strips & Cuts Wire
WS150 Wire Stripper and Cutter for 24 to 12 HWG

Problem Solving Tools

70128—8 ft. Tape Measure
HK17—Folding Hex Keg Wrench, 7 Sizes
P120—Phillips Offset Driver
V02—Regular Offset Driver
TT31—3 in 1 Tapping Tool
ST49—Spring Tool
220—Snap Ring Plier, External Type

PROBLEM SOLVING TOOLS

Standard Package 6



Neon Tester Screw Drivers	Stock No.	O.A. Length	Wt. Per Std. Pkg.
	AN2	5-1/2	1/2 lb.
	AN44	7-5/8	1 lb.



100-500V Circuit Tester and Driver	TK500	4-1/2	1/2 lb.
------------------------------------	-------	-------	---------



6/12V Tester and Probe	Stock No.	O.A. Length	Wt. Per Std. Pkg.
	TK550	7-3/4	1-1/2 lbs.



Continuity Tester	70008	7-3/4	2 lbs.
-------------------	-------	-------	--------



Spring Tool	ST49	7-1/2	1-1/2 lbs.
-------------	------	-------	------------

No. 99-1 (Handle)	No. 99-8 (1/4" Hex)
No. 99-811 (3/16" Regular)	No. 99-9 (9/32" Hex)
No. 99-250 (1/4" Regular)	No. 99-10 (5/16" Hex)
No. 99-821 (No. 1 Phillips)	No. 99-11 (11/32" Hex)
No. 99-822 (No. 2 Phillips)	No. 99-12 (3/8" Hex)
No. 99-6 (3/16" Hex)	No. 99-14 (7/16" Hex)
No. 99-7 (7/32" Hex)	No. 99-16 (1/2" Hex)

Standard Pkg. 3

Stock No.	Description	Wt. per 3
SLK7	Short Arm 7 Pc.	1 lb.
SLK11	Short Arm 11 Pc.	2 lbs.
SLK13	Short Arm 13 Pc.	2 lbs.
LLK7	Long Arm 7 Pc.	1-1/2 lbs.
LLK11	Long Arm 11 Pc.	3-1/2 lbs.
LLK13	Long Arm 13 Pc.	3-1/2 lbs.
XLK9	Ext. Long 9 Pc.	4 lbs.
70161	Foot Long 7 Pc.	4 lbs.
70172	Odd Ball 7 Pc.	1 lb.
LM10	Metric 10 Pc.	3-1/2 lbs.

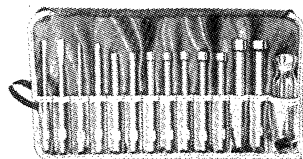


3-in-1 Tapping Tool	TT31	6	1-1/2 lbs.
	ZT31	—	Handle w/2-tang Tap.



Wire Stripper	WSC150	—	1 lb.
---------------	--------	---	-------

VACOMBO KITS



No. 99000 Vacombo Kit with Interchangeable Blades includes special heavy duty handle; 3/16 and 1/4" regular bits; #1 and #2 Phillips bits; and 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, 3/8, 7/16, and 1/2" hex nut driver bits. Specially designed for electronic technicians. Size, 12-3/4 x 7".

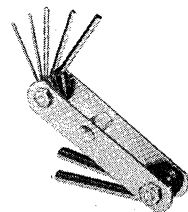
New 99000 Series Components are available individually for replacement use. Specify by number. Packed 6 to a box.



HEX KEY WRENCHES IN PLASTIC POUCHES



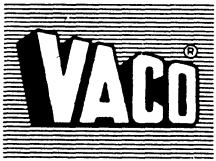
FOLDING TYPE HEX KEY WRENCH SETS



No. HK17—Versatile pocket type set has .050, 1/16, 5/64, 3/32, 1/8, 5/32, and 3/16" hex blades. Wt. 1-1/2 lbs. Standard package 6.

No. 70147—Large size folding hex set has 1/8, 5/32, 3/16, 7/32, 1/4 and 5/16" blades. Standard package 3.

No. 70156—Metric folding hex set has 1.27 mm, 1.5 mm, 2 mm, 2.5 mm, 3 mm, 4 mm, and 5 mm blades. Standard package 6.

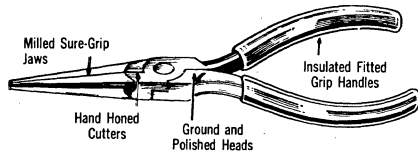


Professional Pliers & Torque Commander Sets

UNCONDITIONALLY GUARANTEED

PRECISION PLIERS

Vaco Pliers are black oxide finished with Cushion Grip Handles
Standard Package 3



Stock No.	Size	Wt. Per Std. Pkg.
-----------	------	-------------------

Short Needle Nose W/Cutter

8101	5"	1 lb.
------	----	-------

Long Needle Nose W/Cutter

8102	6"	1 lb.
8103	7"	1-1/2 lbs.

Curved Needle Nose

8104	6"	1 lb.
------	----	-------

Long Nose

8105	6"	1 lb.
70013	6"	1 lb.

Long Reach Needle Nose

8106	7-1/2"	1-1/2 lbs.
------	--------	------------

Diagonal Cutters

8201	4-1/2"	1 lb.
8202	5"	1 lb.
8203	6"	1-1/2 lbs.
8204	7-1/2"	2 lbs.

Heavy Duty Diagonal Cutter

8205	7-1/4"	2 lbs.
------	--------	--------

H. D. Lineman's Side Cutter

8301	6-1/2"	1-1/2 lbs.
8302	7-1/2"	2 lbs.
8303	8-3/4"	3-1/2 lbs.

H. D. Slip Joint Chrome Finish

8401	6-1/2"	1-1/2 lbs.
8402	8"	2 lbs.

Stock No.	Size	Wt. Per Std. Pkg.
-----------	------	-------------------

Slip Joint w/Cutter Chrome Finish

8403	6-1/2"	2 lbs.
------	--------	--------

Long Flat Nose W/Cutter

8501	6"	1 lb.
------	----	-------

Long Flat Nose

8502	6"	1 lb.
------	----	-------

Long Reach Flat Nose

8503	7-1/2"	1-1/2 lbs.
------	--------	------------

Vacgruv Adjustable Chrome Finish

8602	6"	1-1/2 lbs.
------	----	------------

Vacgruv Adjustable Chrome Finish

8604	10"	2-1/2 lbs.
------	-----	------------

Flush End Nip Plier

70012	7"	2-1/2 lbs.
-------	----	------------

MIDGET PLIERS

Individually Carded
Standard Package 3

Long Nose

150001	4-1/2"	1/2 lb.
--------	--------	---------

Round Nose

150002	4-1/2"	1/2 lb.
--------	--------	---------

Diagonal Cutter

150003	4-1/2"	1/2 lb.
--------	--------	---------

End Cutter

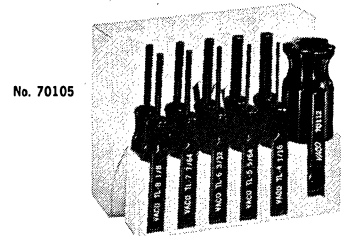
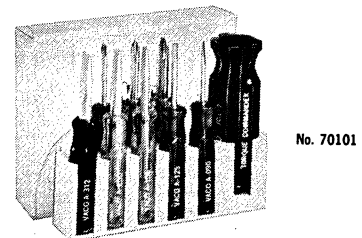
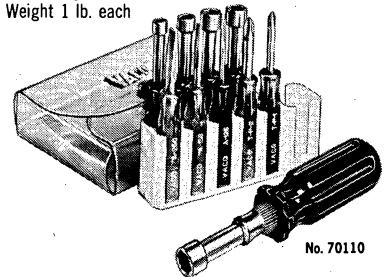
150004	4-1/2"	1/2 lb.
--------	--------	---------

Flat Nose

150005	4-1/2"	1/2 lb.
--------	--------	---------

TORQUE COMMANDER SETS

Standard Package 1
Individually Boxed
Weight 1 lb. each



No. 70101 8-Piece Screw Driver Set consists of Torque Commander handle and one each of: #0, #1, and #2 genuine Phillips, 3/32, 1/8, 3/16, 1/4, and 5/16" regular straight slot drivers.

No. 70103 10-Piece Nut Driver Set consists of Torque Commander handle and one each of: 3/32, 1/8, 5/32, 3/16, 7/32, 1/4, 9/32, 5/16, 11/32, and 3/8" nut drivers.

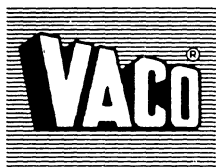
No. 70105 10-Piece (Allen Type) Hex Key Set consists of Torque Commander handle and one each of: 1/16, 5/64, 3/32, 7/64, 1/8, 9/64, 5/32, 3/16, 7/32, and 1/4" hex recess drivers.

No. 70110 10-Piece Combination Set (Screw Drivers and Nut Drivers) consisting of Torque Commander handle and one each of: #1 and #2 genuine Phillips, 1/8, 3/16, and 1/4" regular slot, 3/16, 1/4, 5/16, 11/32, and 3/8" nut drivers.

No. 70137 10-Piece Square Recess Set consists of Torque Commander handle and one each of: #00, #0, #1, #2, and #3 square recess (Robertson), 1/8, 3/16, and 1/4" regular slot, and #1 and #2 Phillips drivers.

No. 70139 10-Piece Mobile Home Set consists of Torque Commander handle and one each of: 3/32, 1/8, 3/16, and 1/4" regular slot, #1 and #2 Phillips, 1/4" hex nut driver, 5/32" clutch head, and #1 and #2 square recessed drivers.

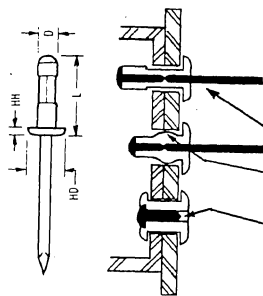
No. 70170 10-Piece Metric Hex Key Set consists of Torque Commander handle and one each of: 1.27 mm, 1.55 mm, 2 mm, 2.5 mm, 3 mm, 4 mm, 4.5 mm, 5 mm, 5.5 mm, and 6 mm drivers.



Specialty Fasteners & Application Tools

UNCONDITIONALLY GUARANTEED

POW'RIVETS AND POW'RIVETERS



VACO POW'RIVETS are the only blind rivets to adapt to hole size variance, and pull up snug regardless of material thickness (within grip range). That's why 4 sizes do the job of 14 ordinary rivets.

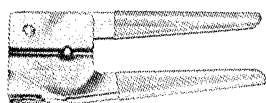
Steps To Apply

Step 1—Insert Pow'Rivet into hole.

Step 2—Mandrel is drawn by Pow'Riveter. Pow'Rivet expands to fill hole.

Step 3—Mandrel snaps off when Pow'Rivet is headed over.

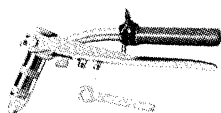
Illustration	Stock No.	Dia. "D"	Lgth. "L"	Grip Range	Head Dia. "HD"	Head Ht. "HH"	Hole Size
	425	1/8	.400	To .250	.215	.044	.136
	528	5/32	.470	To .280	.255	.057	.166
	631	3/16	.530	To .312	.349	.070	.199
	650	3/16	.720	To .500	.349	.070	.199
	400	Assortment Pak					



No. 495 POW'RIVETER is newly designed with offset handles for easier application. Pulls up 1/8" and 5/32" Pow Rivets forming waterproof, dustproof applications every time. Sample supply of Pow Rivets included. Individually carded. Wt. 1-1/2 lbs. each.



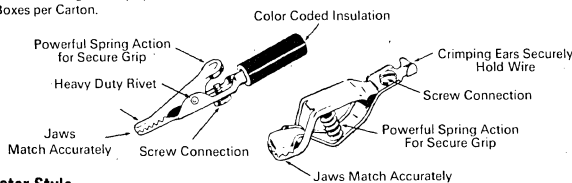
No. 70197 DELUXE POW'RIVETER for professional application of Vaco Pow'Rivets. Four interchangeable heads for use on 3/32, 1/8, 3/32 and 3/16" size rivets. Pouched for convenient storage. Wt. 2 lbs. each.



No. 175002 PROFESSIONAL POW'RIVETER has streamlined head for reaching into deep openings. Includes interchangeable nose pieces for use with 1/8, 5/32 and 3/16" size rivets. Features exclusive outside jaw adjustment, and 2-position stroke adjustment. Wt. 2 lbs. each.

ALLIGATOR & GENERAL PURPOSE CLIPS

Standard Package 50 clips per Box, 5 Boxes per Carton.



Alligator Style

Non-Insulated
Length 2" —
Jaw Opening
5/16"



Insulated
Length
2-3/8" — Jaw
Opening
5/16"



Mini-Gator Style

Length
1-3/32" — Jaw
Opening
3/16"



General Purpose Style

Insulating Boots

Stock No.	Material	Insulation Color
19310	Steel	—
19311	Copper	—
59310	Steel	Black
69310	Steel	Red
59311	Copper	Black
69311	Copper	Red
19312	Steel	—
19313	Copper	—
Stock No.	Length	Jaw Opening
19314	1-1/2	5/16
19315	2	1/2
19324	—	1
(25 Amp)	—	—
19325	—	1-1/4
(50 Amp)	—	—
Stock No.	For No.	Color
19316	19310	Black
19317	or 19311	Red

SNAP RINGS & SNAP RING PLIERS

Snap rings serve one major function—they fit into grooves and furnish a shoulder for holding, locking, or positioning components in housings and bores (internal type) and on shafts and studs (external type). As hard tempered springs, their shear strength—and thus their thrust and impact capacity—is unusually high.

Snap Rings Available in 2 Convenient Pak Sizes

"D" PAKS—Ideal for small quantity user. Plastic boxes packed 5 to standard package.

"C" PAKS—100 rings per box for larger user. Packed 5 to a standard carton.

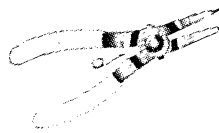
Internal Snap Rings



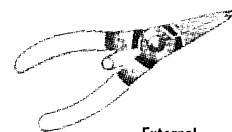
External Snap Rings



Snap Ring Pliers w/Spring Standard Package 3

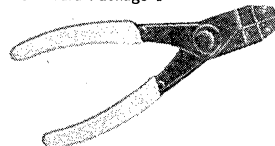


Internal
No. 210 (Straight Tip)
No. 210-45 (45° Tip)
No. 210-90 (90° Tip)

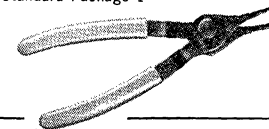


External
No. 220 (Straight Tip)
No. 220-45 (45° Tip)
No. 220-90 (90° Tip)

Interchangeable Tip Pliers w/Spring Standard Package 1



Convertible Snap Ring Pliers Standard Package 1



No. 445—INTERNAL with 4 Sets Interchangeable Tips.

No. 446—EXTERNAL with 4 Sets Interchangeable Tips

No. 444—POUCHED SET of Internal & External with 4 Sets Interchangeable Tips.

No. 448—Set of replacement tips.

The all purpose snap ring plier that can be used for either internal or external by moving thumb screw to other hole.

No. 70195 (Fits rings 3000-X37 to 3000-X100 and 3100-25 to 3100-87).

No. 70234 (Fits rings 3000-X102 to 3000-X162 and 3100-93 to 3100-143).

VACONNECTORS

New exclusive design Vaconector solves wire tapping problems on all electrical work up to 300 volts. No stripping of tapping wire and no cutting of circuit or "run" wire. Easily applied with slip-joint pliers. Three sizes to handle most any job.



Carded Vaconectors Standard Package 5

Stock No.	Fits Wire	Color
B67303	18-14	Blue
B67406	14-12	Yellow
B67407	18-14 & 14-12	Brown
B67000	Assortment of Above	
B67305	Ass't of 67303, 67302 & 67405	
B67408	Ass't of 67302 & 67405	

Vaconector "C" Pak (100 pieces) Bulk Package Standard Package 1

Available in each of the three Vaconector sizes for large installers. Measures 6 x 3-5/8 x 3-1/2. Wt. 1 lb.

Stock No.	Fits Wire	Color
C67303	18-14	Blue
C67406	14-12	Yellow
C67407	18-14 & 14-12	Brown

SINCE
1864



MADE
IN USA

**WALL
BRAND**

Lenk

SOLDERING PRODUCTS

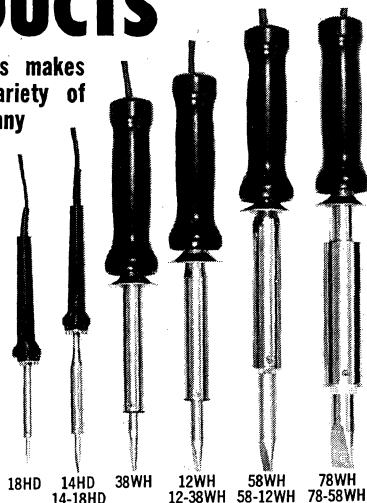
The linking of these two fine, time-tested names makes available to soldering tool users the largest variety of soldering products ever offered by one company

**SOLDERING GUNS • IRONS
PENCILS • TIPS • DESOLDERER
SOLDERS • TORCHES AND FUELS**

HD Type and WH Type Heavy-duty Irons

Wallbrand heavy-duty irons are engineered for highest efficiency performance. Rugged construction assures long-life for demanding production line needs. No radionic interference. Triple-life resistance wire wound on pure mica and constant tip temperature with extra fast recovery permits continuous heavy-duty use. 120 volts AC or DC. Other voltages available on request. Handles remain cool after long hours of operation. Tips are easily changed. Special irons customized to particular requirements.

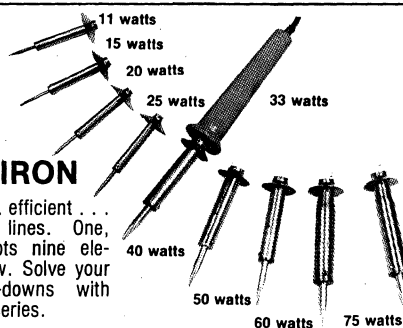
Model	Watt Input	Tip Dia.	Length W/O Tip	Thermo/ Gram Value
18HD	25	1/8"	6 5/8"	300
14HD	40	1/4"	7 1/2"	900
38WH	80	3/8"	10 1/4"	1500
12WH	125	1/2"	10 1/4"	2000
12-38WH	125	3/8"	10 1/4"	2000
12-38HC	155	3/8"	10 1/4"	3500
58WH	200	5/8"	12 1/4"	3500
58-12WH	200	3/8"	12 1/4"	3500
78WH	300	7/8"	12 3/4"	5400
78-58WH	300	5/8"	12 3/4"	5400



Lenk
**LP TORCHES
TORCH FUELS
CORE SOLDERS
PENCIL-TYPE IRONS**

XLS PENCIL IRON

Versatile... reliable... efficient... ideal for production lines. One, ever-cool handle accepts nine elements from 11w to 75w. Solve your production line slow-downs with Wall's XLS pencil iron series.



LIGHTWEIGHT PENCIL-TYPE IRON FOR HEAVY DUTY SOLDERING 80 to 100 WATTS 638 XLS

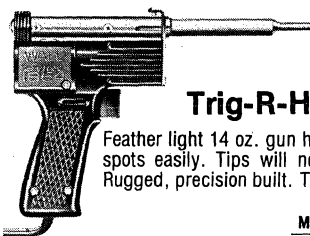
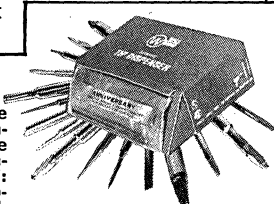
A much needed model between the heavy-duty irons and the light pencils - a sturdy tool for high performance. Cool, comfortable, unbreakable polycarbonate handle. Elements are industrial quality precision wound on highest quality mica, easily replaced in the field. 2 or 3 wire neoprene cord.

Model	Tip Size	Watts	Volts
638XLS	3/8"	80-100	120

SPH Soldering Pencil Holder
Adjusts to any angle
(SIH not shown)
SPH for up to 5/8" shaft
SIH for up to 1" shaft

Tips and Tip Dispenser

Tip sizes from 1/8" through 7/8" in wide variety of configurations for specific industrial and commercial needs. Three grades - Anniversary type: Super finished, iron and chrome plated. Walkiad: Iron coated and chrome plated. For production and critical lab use. Wallbrand: Commercial, copper, nickel plated. Wall's own iron plating facilities produce high quality long-life tips. 1/8" through 3/8" iron plated or copper tips available in handy tip dispenser. Tips individually sealed in color-coded continuous belting, plastic envelope.



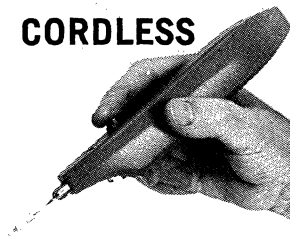
Trig-R-Heat Gun

Feather light 14 oz. gun has no transformer. Reaches hard-to-get at spots easily. Tips will not deform. Heats and recovers instantly. Rugged, precision built. Tip and element assemblies changed easily.

214LT

Model	Tip Size	Max. Watts	Min. Watts	AC/DC Volts	Weight W/O Cord
214LT	1/4"	400	150	120	14 oz.
212LT	1/2"	500	300	120	24 oz.
TIP AND ELEMENT ASSEMBLY					
214TE	1/4"	400	150	120	6 oz.
212TE	1/2"	500	300	120	16 oz.

CORDLESS

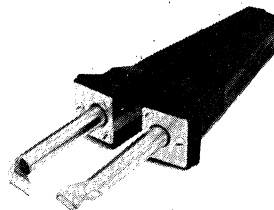


NICKEL CADMIUM BATTERY POWERED Complete with recharger

Has built-in light. Compact - just 8" with tip. Weighs only 6 oz. Heats fast - about 5 seconds. One finger control. Small tip for pinpoint work. Recharges overnight. Can be used while recharging. Over 700°F tip temperature. Solders up to 100 joints per charge.

IC EXTRACTOR

Desolder and remove IC packs intact and salvageable. Desolder 2 and 3 lead components. Wall's new 500/IC Extractor goes where others can't... stays cool and comfortable... reaches operating temperature in 5 minutes. Factory pre-tinned. Chrome plated.



WALL-LENK MANUFACTURING COMPANY

BOX 3349 KINSTON, N. C. 28501 TEL. 919/527-4186

Industrial soldering irons and pencils are built to exceed Federal specification W-S-570. Wallbrand soldering products are UL and CSA listed.



ESTABLISHED 1864
Quality Soldering Products For
Industry, Government, Shop, Home

**NOW – the
HEAVY DUTY IRON
638A-XLS
LIGHTWEIGHT PENCIL
A sturdy tool
for high
performance**

**FROM THE WALL RESEARCH
LABORATORY COMES THIS IN-
TERMEDIATE SOLDERING IRON
FOR MANY USES**

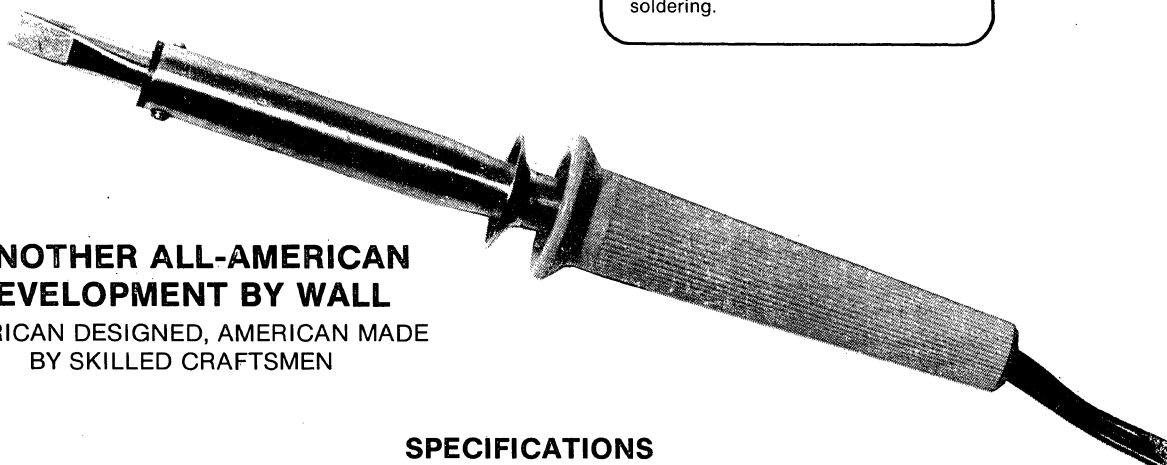
The Wall 638A-XLS is designed as a much-needed model between the heavy irons and the light pencils.

It provides a pencil-type handle on an iron that uses a $\frac{3}{8}$ " diameter tip and will handle considerably heavier soldering operations than our 614XLS-HR (which has a maximum of 75 watts).

This is a lightweight pencil-type iron that is engineered to do heavy duty soldering.

**ANOTHER ALL-AMERICAN
DEVELOPMENT BY WALL**

AMERICAN DESIGNED, AMERICAN MADE
BY SKILLED CRAFTSMEN



SPECIFICATIONS

WATTAGE: 80 and 100 watts at 120 volts. Other wattages and voltages are available on special order.

TIPS: Standard $\frac{3}{8}$ " diameter plug type.

CORE: High temperature non-scaling material is used to eliminate tip set screw freezing and give long element life.

SHAFT: Stainless Steel.

HANDLE: Blue unbreakable polycarbonate — cool, comfortable. No metal liner. The element threads directly to the handle. Strong, secure, simple connection of element to the handle.

CORD: 2 or 3 wire neoprene.

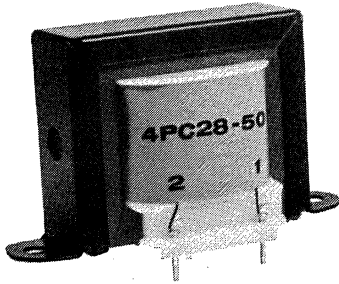
SET SCREW: Stainless Steel.

ELEMENTS: The elements are industrial quality precision wound on highest quality mica. They are easily replaced in the field. The element is unscrewed from the handle and one screw and 2 wire nuts are removed to change the element.

WALL MANUFACTURING COMPANY

P. O. BOX 3349 KINSTON, N. C. 28501
TELEPHONE 919/527-4186

abbott 60~ / 400~ P.C. transformers



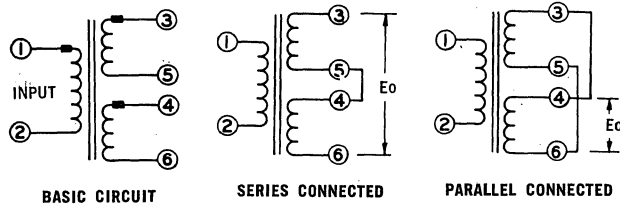
SPECIFICATIONS	6PC SERIES	4PC SERIES
INPUT PRIMARY:	115 vac, 50-400 Hz, 1 Phase	115 vac, 380-420 Hz, 1 Phase
REGULATION:	20% or less from no load to full load	10% or less from no load to full load
SECONDARY VOLTAGE TOLERANCE:	Within 5% of listed output voltage when measured at full load and 115 vac input	
INSULATION TEST:	1000 vac	
OPERATING TEMPERATURE:	85°C maximum ambient	
CONSTRUCTION:	Printed circuit pin plug-in	
TYPICAL EFFICIENCY RANGE:	72%-76%	90%-93%
OPTIONS AVAILABLE:	Other output voltages and 230 vac input are available. Please consult our nearest office for complete information.	

features

- For Printed Circuits
- Close Regulation
- 85°C Operation
- Small Size
- Stock Delivery

The miniature power transformers listed on this page are specifically designed for mounting on printed circuit boards. Two lines are available: the 6PC Series for 60 Hz application, and the 4PC Series for 400 Hz. Small size, reliability and sensible prices are major features of these OEM transformers. Take a good look at these Models. If you don't find what you want, call us for a special quotation.

			60~				400~			
Output Volts (F.L.)	Size	Weight Lbs. Typ.	Output Parallel Connection	Cur. (Amps) Series Connection	Model No.	Price 1-4 pcs.	Output Parallel Connection	Cur. (Amps) Series Connection	Model No.	Price 1-4 pcs.
5V Parallel	1	0.20	0.300	0.150	6PC5-1	\$5.20	2.0	1.0	4PC5-10	\$6.20
10VCT Series	2	0.33	0.800	0.400	6PC5-4	5.35	5.0	2.5	4PC5-25	7.65
	3	0.56	1.500	0.750	6PC5-7	5.60	8.0	4.0	4PC5-40	8.75
6.3V Parallel	1	0.20	0.238	0.119	6PC6-1	5.20	1.58	0.79	4PC6-10	6.20
12.6VCT Series	2	0.33	0.636	0.318	6PC6-4	5.35	4.00	2.0	4PC6-25	7.65
	3	0.56	1.190	0.595	6PC6-7	5.60	8.0	4.0	4PC6-50	8.75
8V Parallel	1	0.20	0.186	0.093	6PC8-1	5.20	1.25	0.625	4PC8-10	6.20
16VCT Series	2	0.33	0.500	0.250	6PC8-4	5.35	3.12	1.56	4PC8-25	7.65
	3	0.56	0.936	0.468	6PC8-7	5.60	6.2	3.1	4PC8-50	8.75
10V Parallel	1	0.20	0.150	0.075	6PC10-1	5.20	1.0	0.5	4PC10-10	6.20
20VCT Series	2	0.33	0.400	0.200	6PC10-4	5.35	2.5	1.25	4PC10-25	7.65
	3	0.56	0.750	0.375	6PC10-7	5.60	5.0	2.5	4PC10-50	8.75
12V Parallel	1	0.20	0.124	0.062	6PC12-1	5.20	0.832	0.416	4PC12-10	6.20
24VCT Series	2	0.33	0.334	0.167	6PC12-4	5.35	2.5	1.25	4PC12-25	7.65
	3	0.56	0.62	0.312	6PC12-7	5.60	4.2	2.1	4PC12-50	8.75
17V Parallel	1	0.20	0.088	0.044	6PC17-1	5.20	0.588	0.294	4PC17-10	6.20
34VCT Series	2	0.33	0.236	0.118	6PC17-4	5.35	1.47	0.735	4PC17-25	7.65
	3	0.56	0.440	0.220	6PC17-7	5.60	2.94	1.47	4PC17-50	8.75
20V Parallel	1	0.20	0.074	0.037	6PC20-1	5.20	0.500	0.250	4PC20-10	6.20
40VCT Series	2	0.33	0.200	0.100	6PC20-4	5.35	1.25	0.625	4PC20-25	7.65
	3	0.56	0.374	0.187	6PC20-7	5.60	2.50	1.25	4PC20-50	8.75
28V Parallel	1	0.20	0.052	0.026	6PC28-1	5.20	0.356	0.178	4PC28-10	6.20
56VCT Series	2	0.33	0.144	0.072	6PC28-4	5.35	0.892	0.446	4PC28-25	7.65
	3	0.56	0.266	0.133	6PC28-7	5.60	1.78	0.89	4PC28-50	8.75
44V Parallel	1	0.20	0.034	0.017	6PC44-1	5.20	0.226	0.113	4PC44-10	6.20
88VCT Series	2	0.33	0.092	0.046	6PC44-4	5.35	0.568	0.284	4PC44-25	7.65
	3	0.56	0.170	0.085	6PC44-7	5.60	1.12	0.56	4PC44-50	8.75
60V Parallel	1	0.20	0.024	0.012	6PC60-1	5.20	0.166	0.083	4PC60-10	6.20
120VCT Series	2	0.33	0.068	0.034	6PC60-4	5.35	0.416	0.208	4PC60-25	7.65
	3	0.56	0.124	0.062	6PC60-7	5.60	0.82	0.41	4PC60-50	8.75



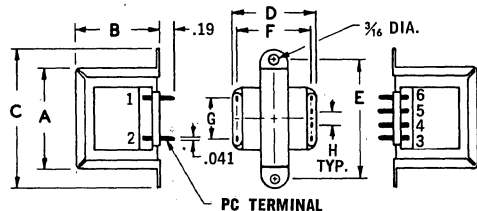
SIZE	A	B	C	D	E	F	G	H
1	1.46	1.22	2.06	1.13	1.75	1.00	.600	.200
2	1.72	1.40	2.35	1.23	2.00	1.10	.750	.250
3	1.96	1.65	2.81	1.43	2.37	1.30	.750	.250

DIMENSIONAL TOLERANCE: .XX = ±.02 .XXX = ±.007

QUANTITY DISCOUNTS

- 1-4 pcs. — price listed.
- 5-9 pcs. — less 4% of the 1-4 piece price.
- 10-24 pcs. — less 8% of the 1-4 piece price.
- 25-49 pcs. — less 13% of the 1-4 piece price.
- 50-99 pcs. — less 19% of the 1-4 piece price.
- Above 100 pcs. — Contact nearest office for an exact quotation.

All Prices subject to change without notice.



EASTERN OFFICE: 1224 Anderson Ave./Fort Lee, New Jersey 07024

(201) 224-6900

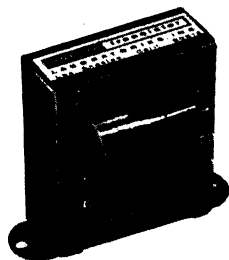
abbott transistor

5180 W. Jefferson Blvd. / Los Angeles 90016

(213) 938-0155

Telex: 69-1398.

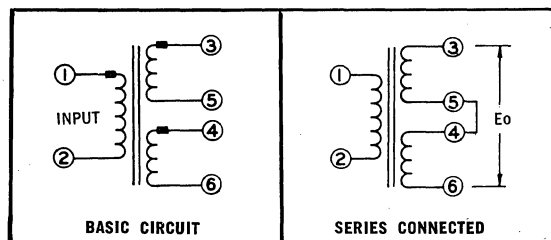
TRANSFORMER DIVISION

abbott**60 industrial power transformers***specifications***INPUT PRIMARY:** 115 VAC (50 to 65 Hz), 1 phase**REGULATION:** 15% max. from no load to full load**SECONDARY VOLTAGE TOLERANCE:** Within 5% of listed output voltage when measured at full load and 115 VAC input**INSULATION TEST:** 1500 VAC**OPERATING TEMP.:** 80°C maximum ambient**APPROXIMATE EFFICIENCY:** Ranges from 80% to 90%**CONSTRUCTION:** Commercial grade using Grain Oriented Silicon Iron for core and heavy insulated synthetic film magnet wire with class "B" rating. Vacuum impregnated with a high quality insulating varnish having a class "H" rating

For 230 VAC input (at no additional cost) add suffix "A" to standard model number. Example: 6B5-10A. Other outputs and/or inputs available on request.

Output Volts (F.L.)	Output Current (Amps)		Size	Weight Lbs. Typ.	Model Number	Price 1-4 pcs.
	Parallel Connection	Series Connection				
5 V Parallel	2.0	1.0	1	1.2	6B5-10	\$ 7.32
10 V.C.T. Series	3.0	1.5	2	1.5	6B5-15	8.15
	6.0	3.0	3	2.2	6B5-30	9.39
	12.0	6.0	4	3.0	6B5-60	11.89
	18.0	9.0	5	4.3	6B5-90	14.66
	26.0	13.0	6	5.5	6B5-130	17.36
	32.0	16.0	7	7.0	6B5-160	20.37
6.3 V Parallel	1.60	0.80	1	1.2	6B6-10	7.32
12.6 V.C.T. Series	2.40	1.20	2	1.5	6B6-15	8.15
	4.80	2.40	3	2.2	6B6-30	9.39
	9.40	4.70	4	3.0	6B6-60	11.89
	14.4	7.20	5	4.3	6B6-90	14.66
	20.6	10.3	6	5.5	6B6-130	17.36
	25.4	12.7	7	7.0	6B6-160	20.37
8 V Parallel	1.20	0.60	1	1.2	6B8-10	7.32
16 V.C.T. Series	1.80	0.90	2	1.5	6B8-15	8.15
	3.60	1.80	3	2.2	6B8-30	9.39
	7.60	3.80	4	3.0	6B8-60	11.89
	11.2	5.60	5	4.3	6B8-90	14.66
	16.2	8.10	6	5.5	6B8-130	17.36
	20.0	10.0	7	7.0	6B8-160	20.37
10 V Parallel	1.0	0.5	1	1.2	6B10-10	7.32
20 V.C.T. Series	1.5	0.75	2	1.5	6B10-15	8.15
	3.0	1.5	3	2.2	6B10-30	9.39
	6.0	3.0	4	3.0	6B10-60	11.89
	9.0	4.5	5	4.3	6B10-90	14.66
	13.0	6.5	6	5.5	6B10-130	17.36
	16.0	8.0	7	7.0	6B10-160	20.37
12 V Parallel	0.82	0.41	1	1.2	6B12-10	7.32
24 V.C.T. Series	1.24	0.62	2	1.5	6B12-15	8.15
	2.50	1.25	3	2.2	6B12-30	9.39
	5.0	2.50	4	3.0	6B12-60	11.89
	7.5	3.75	5	4.3	6B12-90	14.66
	10.82	5.41	6	5.5	6B12-130	17.36
	13.32	6.66	7	7.0	6B12-160	20.37

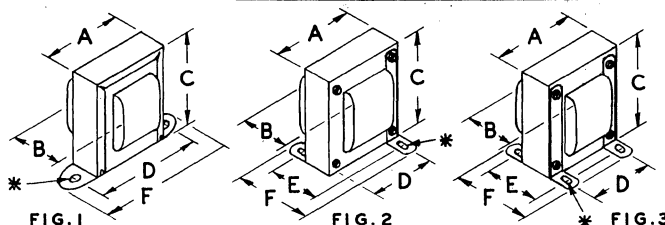
Output Volts (F.L.)	Output Current (Amps)		Size	Weight Lbs. Typ.	Model Number	Price 1-4 pcs.
	Parallel Connection	Series Connection				
17 V Parallel	0.58	0.29	1	1.2	6B17-10	\$ 7.32
34 V.C.T. Series	0.88	0.44	2	1.5	6B17-15	8.15
	1.76	0.88	3	2.2	6B17-30	9.39
	3.52	1.76	4	3.0	6B17-60	11.89
	5.28	2.64	5	4.3	6B17-90	14.66
	7.64	3.82	6	5.5	6B17-130	17.36
	9.40	4.70	7	7.0	6B17-160	20.37
20 V Parallel	0.5	0.25	1	1.2	6B20-10	7.32
40 V.C.T. Series	0.74	0.37	2	1.5	6B20-15	8.15
	1.5	0.75	3	2.2	6B20-30	9.39
	3.0	1.5	4	3.0	6B20-60	11.89
	4.5	2.25	5	4.3	6B20-90	14.66
	6.5	3.25	6	5.5	6B20-130	17.36
	8.0	4.0	7	7.0	6B20-160	20.37
28 V Parallel	0.36	0.18	1	1.2	6B28-10	7.32
56 V.C.T. Series	0.52	0.26	2	1.5	6B28-15	8.15
	1.06	0.53	3	2.2	6B28-30	9.39
	2.14	1.07	4	3.0	6B28-60	11.89
	3.20	1.60	5	4.3	6B28-90	14.66
	4.64	2.32	6	5.5	6B28-130	17.36
	5.70	2.85	7	7.0	6B28-160	20.37
44 V Parallel	0.22	0.11	1	1.2	6B44-10	7.32
88 V.C.T. Series	0.34	0.17	2	1.5	6B44-15	8.15
	0.68	0.34	3	2.2	6B44-30	9.39
	1.36	0.68	4	3.0	6B44-60	11.89
	2.04	1.02	5	4.3	6B44-90	14.66
	2.94	1.47	6	5.5	6B44-130	17.36
	3.62	1.81	7	7.0	6B44-160	20.37
60 V Parallel	0.16	0.08	1	1.2	6B60-10	7.32
120 V.C.T. Series	0.250	0.125	2	1.5	6B60-15	8.15
	0.50	0.25	3	2.2	6B60-30	9.39
	1.0	0.50	4	3.0	6B60-60	11.89
	1.5	0.75	5	4.3	6B60-90	14.66
	2.16	1.08	6	5.5	6B60-130	17.36
	2.66	1.33	7	7.0	6B60-160	20.37

**QUANTITY DISCOUNTS**

- 1-4 pcs. - price listed.
- 5-9 pcs. - less 4% of the 1-4 piece price.
- 10-24 pcs. - less 8% of the 1-4 piece price.
- 25-49 pcs. - less 13% of the 1-4 piece price.
- 50-99 pcs. - less 19% of the 1-4 piece price.
- Above 100 pcs. - Contact nearest office for an exact quotation.

All Prices subject to change without notice.

Size	A	B	C	D	E	F	HOLE*	
1	1.95	1.62	2.31	2.37	—	2.87	.18	FIG. 1
2	2.26	1.87	2.68	2.81	—	3.12	.18	FIG. 1
3	2.57	2.12	3.06	3.12	—	3.56	.18	FIG. 1
4	2.81	2.37	3.37	2.25	2.12	2.70	.2 x .3	FIG. 2
5	3.12	2.62	3.75	2.50	2.25	2.86	.2 x .3	FIG. 2
6	3.44	2.87	4.12	2.75	2.37	2.98	.2 x .3	FIG. 3
7	3.75	3.12	4.50	3.00	2.50	3.11	.2 x .3	FIG. 3

DIMENSIONAL TOLERANCE = ± 0.06
TERMINATION: SOLDER LUGS

EASTERN OFFICE: 1224 Anderson Ave./Fort Lee, New Jersey 07024

(201) 224-6900

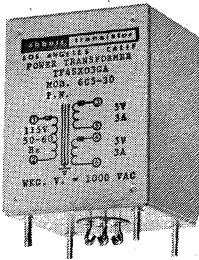
abbott transistor

5180 W. Jefferson Blvd. / Los Angeles 90016

(213) 938-0155

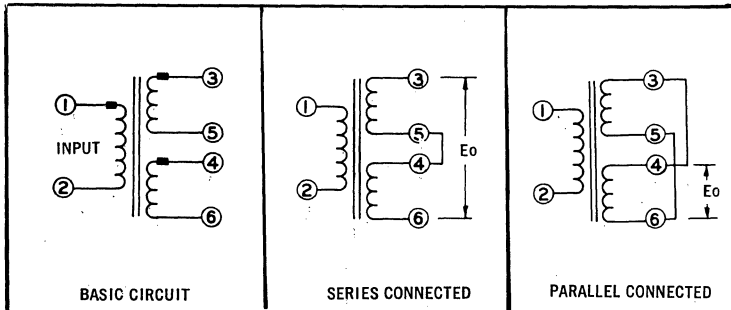
Telex 69-1398

TRANSFORMER DIVISION

abbott**60 MIL-T-27D power transformers***specifications***INPUT PRIMARY:** 115 VAC, (50 to 65 Hz), 1 phase**REGULATION:** 10% no load to full load**SECONDARY VOLTAGE TOLERANCE:** Within 3% of listed output voltage when measured at full load and 115 VAC input**INSULATION TEST:** 1500 VAC**OPERATING TEMP.:** 90°C (194°F), maximum ambient**CONSTRUCTION:** To MIL-T-27D, grade: 4, class "S", life "X" (10,000 hrs.), case: steel (see model No. for size)**WORKING VOLTAGE:** 1000 VAC**EFFICIENCY:** Ranges from 80% to 90% typical

Output Volts (F.L.)	Output Current (Amps)		Size	Weight Lbs. Typ.	Model No.	Price 1-4 pcs.
	Parallel Connection	Series Connection				
5V Parallel 10 V.C.T. Series	1.00	0.50	EB	1.2	6C5-5	\$23.00
	3.00	1.50	FA	2.2	6C5-15	26.00
	6.00	3.00	GA	3.3	6C5-30	31.00
	12.00	6.00	HA	4.7	6C5-60	38.00
	20.00	10.00	JA	7.4	6C5-100	46.00
6.3 V Parallel 12.6 V.C.T. Series	0.80	0.40	EB	1.2	6C6-5	23.00
	2.38	1.19	FA	2.2	6C6-15	26.00
	4.76	2.38	GA	3.3	6C6-30	31.00
	9.52	4.76	HA	4.7	6C6-60	38.00
	20.00	10.00	JA	7.4	6C6-126	46.00
8 V Parallel 16 V.C.T. Series	0.62	0.31	EB	1.2	6C8-5	23.00
	1.86	0.93	FA	2.2	6C8-15	26.00
	3.72	1.86	GA	3.3	6C8-30	31.00
	7.44	3.72	HA	4.7	6C8-60	38.00
	17.50	8.75	JA	7.4	6C8-140	46.00
10 V Parallel 20 V.C.T. Series	0.50	0.25	EB	1.2	6C10-5	23.00
	1.50	0.75	FA	2.2	6C10-15	26.00
	3.00	1.50	GA	3.3	6C10-30	31.00
	6.00	3.00	HA	4.7	6C10-60	38.00
	14.00	7.00	JA	7.4	6C10-140	46.00
12 V Parallel 24 V.C.T. Series	0.40	0.20	EB	1.2	6C12-5	23.00
	1.20	0.60	FA	2.2	6C12-15	26.00
	2.40	1.20	GA	3.3	6C12-30	31.00
	4.80	2.40	HA	4.7	6C12-60	38.00
	11.60	5.80	JA	7.4	6C12-140	46.00
	14.16	7.08	KA	9.8	6C12-170	54.00

Output Volts (F.L.)	Output Current (Amps)		Size	Weight Lbs. Typ.	Model No.	Price 1-4 pcs.
	Parallel Connection	Series Connection				
17 V Parallel 34 V.C.T. Series	0.30	0.15	EB	1.2	6C17-5	\$23.00
	0.88	0.44	FA	2.2	6C17-15	26.00
	1.76	0.88	GA	3.3	6C17-30	31.00
	3.35	1.76	HA	4.7	6C17-60	38.00
	8.20	4.10	JA	7.4	6C17-140	46.00
20 V Parallel 40 V.C.T. Series	10.00	5.00	KA	9.8	6C17-170	54.00
	0.24	0.12	EB	1.2	6C20-5	23.00
	0.72	0.36	FA	2.2	6C20-15	26.00
	1.44	0.72	GA	3.3	6C20-30	31.00
	2.88	1.44	HA	4.7	6C20-60	38.00
28 V Parallel 56 V.C.T. Series	7.00	3.50	JA	7.4	6C20-140	46.00
	8.50	4.25	KA	9.8	6C20-170	54.00
	0.18	0.09	EB	1.2	6C28-5	23.00
	0.54	0.27	FA	2.2	6C28-15	26.00
	1.08	0.54	GA	3.3	6C28-30	31.00
44 V Parallel 88 V.C.T. Series	2.16	1.08	HA	4.7	6C28-60	38.00
	5.00	2.50	JA	7.4	6C28-140	46.00
	6.06	3.03	KA	9.8	6C28-170	54.00
	0.10	0.05	EB	1.2	6C44-5	23.00
	0.30	0.15	FA	2.2	6C44-15	26.00
60 V Parallel 120 V.C.T. Series	0.60	0.30	GA	3.3	6C44-30	31.00
	1.20	0.60	HA	4.7	6C44-60	38.00
	3.16	1.58	JA	7.4	6C44-140	46.00
	3.86	1.93	KA	9.8	6C44-170	54.00
	0.08	0.04	EB	1.2	6C60-5	23.00
	0.24	0.12	FA	2.2	6C60-15	26.00
	0.48	0.24	GA	3.3	6C60-30	31.00
	0.96	0.48	HA	4.7	6C60-60	38.00
	2.32	1.16	JA	7.4	6C60-140	46.00
	2.82	1.41	KA	9.8	6C60-170	54.00

**QUANTITY DISCOUNTS**

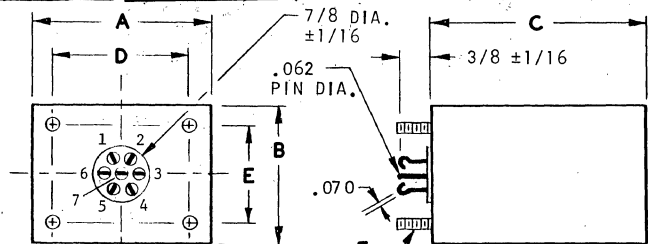
- 1-4 pcs. - price listed.
- 5-9 pcs. - less 4% of the 1-4 piece price.
- 10-24 pcs. - less 8% of the 1-4 piece price.
- 25-49 pcs. - less 13% of the 1-4 piece price.
- 50-99 pcs. - less 19% of the 1-4 piece price.
- Above 100 pcs. - Contact nearest office for an exact quotation.

All Prices subject to change without notice.

Size	A	B	C	D	E	F
EB	1.938	1.812	2.438	1.375	1.250	6-32 x 3/8
FA	2.312	2.062	3.125	1.688	1.438	6-32 x 3/8
GA	2.750	2.375	3.812	2.125	1.750	6-32 x 3/8
HA	3.062	2.625	4.250	2.297	1.859	8-32 x 3/8
JA	3.562	3.062	4.875	2.625	2.125	8-32 x 3/8
KA	3.938	3.375	5.250	3.000	2.438	10-32 x 1/2

DIMENSIONAL TOLERANCE:

DIMENSIONS A, B, C, D, E, AND F PER MIL-T-27D.



EASTERN OFFICE: 1224 Anderson Ave./Fort Lee, New Jersey 07024

(201) 224-6900

abbott transistor

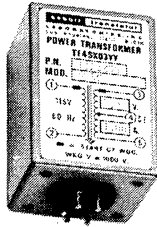
5180 W. Jefferson Blvd. / Los Angeles 90016

(213) 938-0155

Telex: 69-1398

TRANSFORMER DIVISION

abbott

60 transformers

features

- Quality MIL-spec 60 Hz power transformers
- Hermetically sealed
- to meet MIL-T-27D
- 105°C ambient operation
- 5 to 5000 volts
- 5 to 300 watts

DELIVERY IS FROM STOCK

specifications

INPUT PRIMARY: 115 VRMS, 60 Hz ± 5 Hz, 1 phase
INSULATION TEST: 1750 VRMS or 150% of secondary voltage (whichever is higher)

CONSTRUCTION: To MIL-T-27D, grade: 4, class: "S", life: "X" (10,000 hrs.) case: steel

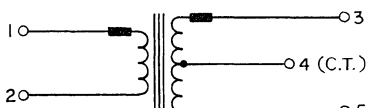
ENVIRONMENT: 105°C maximum ambient temperature. Encapsulated to meet MIL-STD-810B for vibration, shock, acceleration, sand, dust, humidity, salt spray, fungus, sunshine, rain, explosion and altitude (to a vacuum)

WORKING VOLTAGE: 1000 VAC for all transformers with secondary voltages up to and including 1200 VAC; 80% of rated secondary voltage for all others

SECONDARY VOLTAGE TOLERANCE: Within 3% of listed output voltage when measured at full load and 115 VAC input

OUTPUT SECONDARY: See voltage and current of specific models listed. Standard models with outputs from 63 to 5,000 VAC are also available from stock. Contact our nearest office for your free copy of our complete brochure.

TYPICAL CIRCUIT DIAGRAM



PRIMARY

SECONDARY

— refers to in-phase points

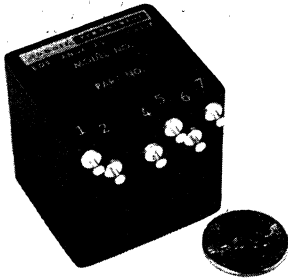
SIZE CHART

Case Size	Width (in.)	Depth (in.)	Height (in.)
A1	1½	1¾	2¾
A2	1¾	2¼	2¾
A3	17/8	2¾	3½
A4	2	2¾	3½
A5	2½	2¾	3½
A6	2¾	3½	3½
A7	2¾	3½	4½
A8	27/8	3¾	4½
A9	3½	3¾	47/8
A10	3¾	4¾	5¼
A11	3¾	4¾	6

Complete size chart and dimensional drawing are shown in our 12 page brochure.

Output Volt	Output Current (Amps)	Size	Wt. lbs.	Model Number	1 pc.	Price 2-4 pcs.	Output Volt	Output Current (Amps)	Size	Wt. lbs.	Model Number	1 pc.	Price 2-4 pcs.
5.0	1.00	A1	1.0	5P5CT	\$45.12	\$37.60	7.27	A9	8.2	160P22CT	74.04	61.70	
	2.00	A2	1.5	10P5CT	46.44	38.70	9.10	A10	10.5	200P22CT	83.04	69.20	
	3.00	A3	2.0	15P5CT	48.72	40.60	13.60	A11	17.0	300P22CT	84.36	70.30	
	4.00	A4	2.5	20P5CT	53.88	44.90	0.20	A1	1.0	5P25CT	45.12	37.60	
	6.00	A5	3.0	30P5CT	54.36	45.30	0.40	A2	1.5	10P25CT	46.44	38.70	
	8.00	A6	3.3	40P5CT	55.56	46.30	0.60	A3	2.0	15P25CT	48.72	40.60	
	16.00	A7	5.0	80P5CT	62.88	52.40	0.80	A4	2.5	20P25CT	53.88	44.90	
6.3	0.79	A1	1.0	5P6.3CT	45.12	37.60	1.20	A5	3.0	30P25CT	54.36	45.30	
	1.58	A2	1.5	10P6.3CT	46.44	38.70	1.60	A6	3.3	40P25CT	55.56	46.30	
	2.38	A3	2.0	15P6.3CT	48.72	40.60	3.20	A7	5.0	80P25CT	62.88	52.40	
	3.16	A4	2.5	20P6.3CT	53.88	44.90	4.80	A8	6.5	120P25CT	64.20	53.50	
	4.76	A5	3.0	30P6.3CT	54.36	45.30	6.40	A9	8.2	160P25CT	74.04	61.70	
	6.35	A6	3.3	40P6.3CT	55.56	46.30	8.00	A10	10.5	200P25CT	83.04	69.20	
	12.70	A7	5.0	80P6.3CT	62.88	52.40	12.00	A11	17.0	300P25CT	84.36	70.30	
	19.00	A8	6.5	120P6.3CT	64.20	53.50							
8.0	0.67	A1	1.0	5P8CT	45.12	37.60	0.18	A1	1.0	5P28CT	45.12	37.60	
	1.25	A2	1.5	10P8CT	46.44	38.70	0.36	A2	1.5	10P28CT	46.44	38.70	
	1.88	A3	2.0	15P8CT	48.72	40.60	0.54	A3	2.0	15P28CT	48.72	40.60	
	2.50	A4	2.5	20P8CT	53.88	44.90	0.71	A4	2.5	20P28CT	53.88	44.90	
	3.76	A5	3.0	30P8CT	54.36	45.30	1.07	A5	3.0	30P28CT	54.36	45.30	
	5.00	A6	3.3	40P8CT	55.56	46.30	1.43	A6	3.3	40P28CT	55.56	46.30	
	10.00	A7	5.0	80P8CT	62.88	52.40	2.86	A7	5.0	80P28CT	62.88	52.40	
	15.00	A8	6.5	120P8CT	64.20	53.50	4.29	A8	6.5	120P28CT	64.20	53.50	
	20.00	A9	8.2	160P8CT	74.04	61.70	5.72	A9	8.2	160P28CT	74.04	61.70	
							7.10	A10	10.5	200P28CT	83.04	69.20	
							10.70	A11	17.0	300P28CT	84.36	70.30	
10.0	0.50	A1	1.0	5P10CT	45.12	37.60	0.16	A1	1.0	5P31CT	45.12	37.60	
	1.00	A2	1.5	10P10CT	46.44	38.70	0.32	A2	1.5	10P31CT	46.44	38.70	
	1.50	A3	2.0	15P10CT	48.72	40.60	0.48	A3	2.0	15P31CT	48.72	40.60	
	2.00	A4	2.5	20P10CT	53.88	44.90	0.64	A4	2.5	20P31CT	53.88	44.90	
	3.00	A5	3.0	30P10CT	54.36	45.30	0.97	A5	3.0	30P31CT	54.36	45.30	
	4.00	A6	3.3	40P10CT	55.56	46.30	1.29	A6	3.3	40P31CT	55.56	46.30	
	8.00	A7	5.0	80P10CT	62.88	52.40	2.58	A7	5.0	80P31CT	62.88	52.40	
	12.00	A8	6.5	120P10CT	64.20	53.50	3.87	A8	6.5	120P31CT	64.20	53.50	
	16.00	A9	8.2	160P10CT	74.04	61.70	5.17	A9	8.2	160P31CT	74.04	61.70	
	20.00	A10	10.5	200P10CT	83.04	69.20	6.40	A10	10.5	200P31CT	83.04	69.20	
							9.67	A11	17.0	300P31CT	84.36	70.30	
12.6	0.40	A1	1.0	5P12.6CT	45.12	37.60	0.14	A1	1.0	5P35CT	45.12	37.60	
	0.79	A2	1.5	10P12.6CT	46.44	38.70	0.29	A2	1.5	10P35CT	46.44	38.70	
	1.19	A3	2.0	15P12.6CT	48.72	40.60	0.43	A3	2.0	15P35CT	48.72	40.60	
	1.59	A4	2.5	20P12.6CT	53.88	44.90	0.57	A4	2.5	20P35CT	53.88	44.90	
	2.38	A5	3.0	30P12.6CT	54.36	45.30	0.86	A5	3.0	30P35CT	54.36	45.30	
	3.18	A6	3.3	40P12.6CT	55.56	46.30	1.14	A6	3.3	40P35CT	55.56	46.30	
	6.35	A7	5.0	80P12.6CT	62.88	52.40	2.28	A7	5.0	80P35CT	62.88	52.40	
	9.53	A8	6.5	120P12.6CT	64.20	53.50	3.43	A8	6.5	120P35CT	64.20	53.50	
	12.70	A9	8.2	160P12.6CT	74.04	61.70	4.57	A9	8.2	160P35CT	74.04	61.70	
	15.90	A10	10.5	200P12.6CT	83.04	69.20	5.71	A10	10.5	200P35CT	83.04	69.20	
							8.59	A11	17.0	300P35CT	84.36	70.30	
14	0.36	A1	1.0	5P14CT	45.12	37.60	0.13	A1	1.0	5P39CT	45.12	37.60	
	0.72	A2	1.5	10P14CT	46.44	38.70	0.26	A2	1.5	10P39CT	46.44	38.70	
	1.07	A3	2.0	15P14CT	48.72	40.60	0.38	A3	2.0	15P39CT	48.72	40.60	
	1.43	A4	2.5	20P14CT	53.88	44.90	0.51	A4	2.5	20P39CT	53.88	44.90	
	2.15	A5	3.0	30P14CT	54.36	45.30	0.77	A5	3.0	30P39CT	54.36	45.30	
	2.86	A6	3.3	40P14CT	55.56	46.30	1.03	A6	3.3	40P39CT	55.56	46.30	
	5.72	A7	5.0	80P14CT	62.88	52.40	2.05	A7	5.0	80P39CT	62.88	52.40	
	8.59	A8	6.5	120P14CT	64.20	53.50	3.07	A8	6.5	120P39CT	64.20	53.50	
	11.40	A9	8.2	160P14CT	74.04	61.70	4.10	A9	8.2	160P39CT	74.04	61.70	
	14.30	A10	10.5	200P14CT	83.04	69.20	5.12	A10	10.5	200P39CT	83.04	69.20	
							7.69	A11	17.0	300P39CT	84.36	70.30	
16	0.34	A1	1.0	5P16CT	45.12	37.60	0.12	A1	1.0	5P43CT	45.12	37.60	
	0.68	A2	1.5	10P16CT	46.44	38.70	0.23	A2	1.5	10P43CT	46.44	38.70	
	0.94	A3	2.0	15P16CT	48.72	40.60	0.35	A3	2.0	15P43CT	48.72	40.60	
	1.25	A4	2.5	20P16CT	53.88	44.90	0.46	A4	2.5	20P43CT	53.88	44.90	
	1.87	A5	3.0	30P16CT	54.36	45.30	0.70	A5	3.0	30P43CT	54.36	45.30	
	2.50	A6	3.3	40P16CT	55.56	46.30	0.93	A6	3.3	40P43CT	55.56	46.30	
	5.00	A7	5.0	80P16CT	62.88	52.40	1.85	A7	5.0	80P43CT	62.88	52.40	
	7.50	A8	6.5	120P16CT	64.20	53.50	2.79	A8	6.5	120P43CT	64.20	53.50	
	10.00	A9	8.2	160P16CT	74.04	61.70	3.70	A9	8.2	160P43CT	74.04	61.70	
	12.50	A10	10.5	200P16CT	83.04	69.20	4.64	A10	10.5	200P43CT	83.04	69.20	
	18.70	A11	17.0	300P16CT	84.36	70.30	6.95	A11	17.0	300P43CT	84.36	70.30	
18	0.28	A1	1.0	5P18CT	45.12	37.60	0.10	A1	1.0	5P48CT	45.12	37.60	
	0.56	A2	1.5	10P18CT	46.44	38.70	0.21	A2	1.5	10P48CT	46.44	38.70	
	0.83	A3	2.0	15P18CT	48.72	40.60	0.31	A3	2.0	15P48CT	48.72	40.60	
	1.11	A4	2.5	20P18CT	53.88	44.90	0.42	A4	2.5	20P48CT	53.88	44.90	
	1.67	A5	3.0	30P18CT	54.36	45.30	0.63	A5	3.0	30P48CT	54.36	45.30	
	2.21	A6	3.3	40P18CT	55.56	46.30	0.83	A6	3.3	40P48CT	55.56	46.30	
	4.44	A7	5.0	80P18CT	62.88	52.40	1.63	A7	5.0	80P48CT	62.88	52.40	
	6.68	A8	6.5	120P18CT	64.20	53.50	2.50	A8	6.5	120P48CT	64.20	53.50	
	8.89	A9	8.2	160P18CT	74.04	61.70	3.33	A9	8.2	160P48CT	74.04	61.70	
	11.10	A10	10.5	200P18CT	83.04	69.20	4.17	A10	10.5	200P48CT	83.04	69.20	
	16.70	A11	17.0	300P18CT	84.36	70.30	6.26	A11	17.0	300P48CT	84.36	70.30	
20	0.25	A1	1.0	5P20CT	45.12	37.60	0.09	A1	1.0	5P55CT	45.12	37.60	
	0.50	A2	1.5	10P20CT	46.44	38.70	0.18	A2	1.5	10P55CT	46.44	38.70	
	0.75	A3	2.0	15P20CT	48.72	40.60	0.27	A3	2.0	15P55CT	48.72	40.60	
	1.00	A4	2.5	20P20CT	53.88	44.90	0.36	A4	2.5	20P55CT	53.88	44.90	
	1.50	A5	3.0	30P20CT	54.36	45.30	0.55	A5	3.0	30P55CT	54.36	45.30	
	2.00	A6	3.3	40P20CT	55.56	46.30	0.73	A6	3.3	40P55CT	55.56	46.30	
	4.00	A7	5.0	80P20CT	62.88	52.40	1.46	A7	5.0	80P55CT	62.88	52.40	
	6.00	A8	6.5	120P20CT	64.20	53.50	2.18	A8	6.5	120P55CT	64.20	53.50	
	8.00	A9	8.2	160P20CT	74.04	61.70	2.91	A9	8.2	160P55CT	74.04	61.70	
	10.00	A10	10.5	200P20CT	83.04	69.20	3.64	A10	10.5	200P55CT	83.04	69.20	
	15.00	A11	17.0	300P20CT	84.36	70.30	5.46	A11	17.0	300P55CT	84.36	70.30	
22	0.23	A1	1.0	5P22CT	45.12	37.60							
	0.45	A2	1.5	10P22CT	46.44	38.70							
	0.68	A3	2.0	15P22CT	48.72	40.60							
	0.91	A4	2.5	20P22CT	53.88	44.90							
	1.36	A5	3.0	30P22CT	54.36	45.30							
	1.82	A6	3.3	40P22CT	55.56	46.30							
	3.64	A7	5.3	80P22CT	62.88	52.40							
	5.45	A8	6.5	120P22CT	64.20	53.50							

Standard models with outputs from 63 to 5,000 VAC are also available from stock. Contact our nearest office for your free copy of our complete brochure.

abbott**400 MIL-T-27D power transformers**

Built to meet the specifications of MIL-T-27D, long life and reliability are major features of these hermetically sealed, ruggedly built power transformers. Encased in epoxy fiberglass and capable of operation at high temperatures, these units have a wide variety of uses in airborne, space and missile applications, and industry as well, where small size and dependability are prime factors. The model 4A series come in power levels of 7 watts, 10 watts, 25 watts, and 50 watts at any voltage between 5 and 120 VAC. The MIL-T-27D, type designation of these units is TF5SX03ZZ. Send us your special requirements.

Output Volts (F.L.)	Output Current (Amps)		Size	Weight Lbs. Typ.	Model Number	Price 1-4 pcs.
	Parallel Connection	Series Connection				
5 V Parallel	1.40	0.70	1	.26	4A5-7	16.00
10 V.C.T. Series	2.00	1.00	2	.30	4A5-10	16.75
	5.00	2.50	3	.47	4A5-25	19.00
	8.00	4.00	4	.77	4A5-40	21.00
6.3 V Parallel	1.11	0.55	1	.26	4A6-7	16.00
12.6 V.C.T. Series	1.58	0.79	2	.30	4A6-10	16.75
	4.00	2.00	3	.47	4A6-25	19.00
	8.00	4.00	4	.77	4A6-50	21.00
8 V Parallel	0.874	0.437	1	.26	4A8-7	16.00
16 V.C.T. Series	1.25	0.625	2	.30	4A8-10	16.75
	3.12	1.56	3	.47	4A8-25	19.00
	6.24	3.12	4	.77	4A8-50	21.00
10 V Parallel	0.70	0.35	1	.26	4A10-7	16.00
20 V.C.T. Series	1.00	0.50	2	.30	4A10-10	16.75
	2.50	1.25	3	.47	4A10-25	19.00
	5.00	2.50	4	.77	4A10-50	21.00
12 V Parallel	0.58	0.29	1	.26	4A12-7	16.00
24 V.C.T. Series	0.84	0.42	2	.30	4A12-10	16.75
	2.08	1.04	3	.47	4A12-25	19.00
	4.16	2.08	4	.77	4A12-50	21.00
17 V Parallel	0.411	0.205	1	.26	4A17-7	16.00
34 V.C.T. Series	0.588	0.294	2	.30	4A17-10	16.75
	1.47	0.735	3	.47	4A17-25	19.00
	2.94	1.47	4	.77	4A17-50	21.00
20 V Parallel	0.350	0.175	1	.26	4A20-7	16.00
40 V.C.T. Series	0.50	0.250	2	.30	4A20-10	16.75
	1.25	0.625	3	.47	4A20-25	19.00
	2.50	1.25	4	.77	4A20-50	21.00
28 V Parallel	0.250	0.125	1	.26	4A28-7	16.00
56 V.C.T. Series	0.356	0.178	2	.30	4A28-10	16.75
	0.892	0.446	3	.47	4A28-25	19.00
	1.78	0.89	4	.77	4A28-50	21.00
44 V Parallel	0.158	0.079	1	.26	4A44-7	16.00
88 V.C.T. Series	0.226	0.113	2	.30	4A44-10	16.75
	0.568	0.284	3	.47	4A44-25	19.00
	1.12	0.56	4	.77	4A44-50	21.00
60 V Parallel	0.116	0.058	1	.26	4A60-7	16.00
120 V.C.T. Series	0.166	0.083	2	.30	4A60-10	16.75
	0.416	0.208	3	.47	4A60-25	19.00
	0.82	0.41	4	.77	4A60-50	21.00

features

- 105°C Ambient Operation
- Built to Meet MIL-T-27D
- 5 to 120 Volts
- 7 to 50 Watts

specifications

INPUT PRIMARY: 115 V, 400 Hz $\pm$ 20 Hz, 1 phase

REGULATION: 10% no load to full load

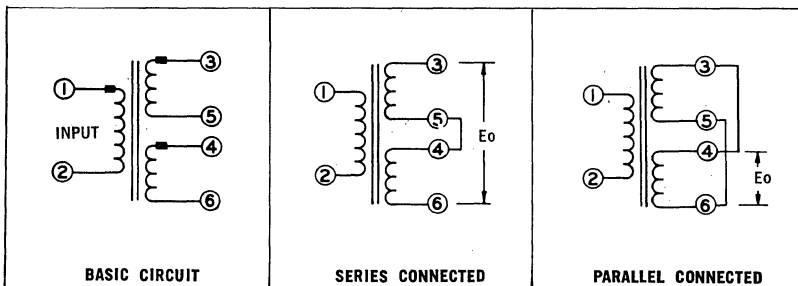
SECONDARY VOLTAGE TOLERANCE: Within 5% when measured at full load and 115 VAC input

INSULATION TEST: 1500 VAC

CONSTRUCTION: To MIL-T-27D, grade: 5, class: "S", life: "X" (10,000 hrs.) case: smaller (see drawing)

ENVIRONMENT: Encapsulated to meet MIL-STD-810B, including vibration, temperature to 105°C, shock, sand, dust, humidity, saltspray, fungus, sunshine, rain, explosion, and altitude (to a vacuum). NOTE: For high altitude operation, encapsulate terminals

OUTPUT SECONDARY: See voltage and current of specific models listed

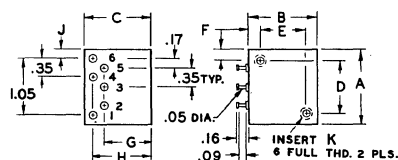
**QUANTITY DISCOUNTS**

- | | |
|----------------|--|
| 1-4 pcs. | - price listed. |
| 5-9 pcs. | - less 4% of the 1-4 piece price. |
| 10-24 pcs. | - less 8% of the 1-4 piece price. |
| 25-49 pcs. | - less 13% of the 1-4 piece price. |
| 50-99 pcs. | - less 19% of the 1-4 piece price. |
| Above 100 pcs. | - Contact nearest office for an exact quotation. |

All Prices subject to change without notice.

Size	A	B	C	D	E	F	G	H	J	K
1	1.37	1.25	1.31	1.00	.87	.19	1.00	1.19	.16	4-40
2	1.50	1.37	1.37	1.12	1.00	.19	1.06	1.25	.22	4-40
3	1.75	1.50	1.56	1.25	1.00	.25	1.25	1.44	.35	6-32
4	2.00	1.62	1.81	1.50	1.12	.25	1.50	1.69	.47	6-32

DIMENSIONAL TOLERANCE = $\pm$.02, EXCEPT F, G, H, J = $\pm$.04



EASTERN OFFICE: 1224 Anderson Ave./Fort Lee, New Jersey 07024

(201) 224-6900

abbott transistor

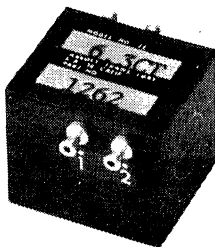
5180 W. Jefferson Blvd. / Los Angeles 90016

(213) 938-0155

Telex: 69-1398

TRANSFORMER DIVISION

abbott

400 transformers

features

- Hermetically sealed
- 105°C operation
- To meet MIL-T-27D
- Designed exclusively for 400 Hz
- For aerospace application
- Molded diallyl phthalate

DELIVERY IS FROM STOCK

specifications

Input Primary

115V, 400 Hz $\pm$ 20 Hz, 1 phase

Regulation

10% no load to full load

Secondary Voltage Tolerance

Within 5% when measured at full load and 115 VAC input

Insulation Test

2500 VDC or 150% of secondary voltage (whichever is higher)

Construction

To MIL-T-27D, grade: 5, class: "S", life: "X" (10,000 hrs.) case: smaller

Environment

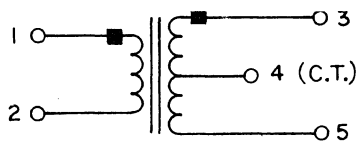
Encapsulated to meet MIL-STD-810B, including vibration to Proc. XII, temperature to 105°C, shock, sand, dust, humidity, salt spray, fungus, sunshine, rain, explosion, and altitude (to a vacuum)

Output Secondary

See voltage and current of specific models listed

Standard models with outputs from 350 to 5,000 VAC are also available from stock. Contact our nearest office for your free copy of our complete brochure.

TYPICAL CIRCUIT DIAGRAM



PRIMARY

SECONDARY

"■" refers to in-phase points

Case Size	Width (in.)	Depth (in.)	Height (in.)	Weight (lbs.)
A	0.87	0.74	0.78	0.06
B	1.25	1.19	0.88	0.12
C	1.43	1.24	1.27	0.26
D	1.47	1.28	1.40	0.29
E	2.31	1.52	1.75	0.75
F	2.75	2.71	2.31	1.84

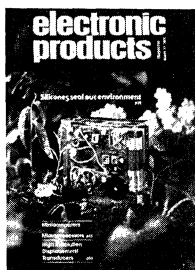
Out-put Volt	Output Current (Amps)	Size	Sec. DCR (ohms)	Model Number	Price 1 Pc.	2-4 Pcs.	Out-put Volt	Output Current (Amps)	Size	Sec. DCR (ohms)	Model Number	Price 1 Pc.	2-4 Pcs.
5.0	0.400	A	0.60	2E5CT	\$28.80	\$24.00	48	0.041	A	57.	2E48CT	\$28.80	\$24.00
	1.200	B	0.144	6E5CT	26.40	22.00		0.125	B	15.30	6E48CT	26.40	22.00
	3.000	C	0.046	15E5CT	27.60	23.00		0.312	C	4.05	15E48CT	27.60	23.00
	4.800	D	0.040	24E5CT	31.20	26.00		0.500	D	3.27	24E48CT	31.20	26.00
	16.000	E	0.009	80E5CT	33.60	28.00		1.660	E	0.40	80E48CT	33.60	28.00
	35.000	F	0.012	175E5CT	66.00	55.00		3.650	F	0.160	175E48CT	66.00	55.00
6.3	0.317	A	1.06	2E6.3CT	28.80	24.00	55	0.036	A	89.	2E55CT	28.80	24.00
	0.950	B	0.24	6E6.3CT	26.40	22.00		0.109	B	17.30	6E55CT	26.40	22.00
	2.380	C	0.088	15E6.3CT	27.60	23.00		0.262	C	7.2	15E55CT	27.60	23.00
	3.800	D	0.107	24E6.3CT	31.20	26.00		0.435	D	3.83	24E55CT	31.20	26.00
	12.800	E	0.016	80E6.3CT	33.60	28.00		1.450	E	0.67	80E55CT	33.60	28.00
	27.800	F	0.019	175E6.3CT	66.00	55.00		3.170	F	0.196	175E55CT	66.00	55.00
8.0	0.250	A	1.63	2E8CT	28.80	24.00	63	0.031	A	100.	2E63CT	28.80	24.00
	0.750	B	0.396	6E8CT	26.40	22.00		0.095	B	24.9	6E63CT	26.40	22.00
	1.880	C	0.135	15E8CT	27.60	23.00		0.238	C	6.51	15E63CT	27.60	23.00
	3.000	D	0.140	24E8CT	31.20	26.00		0.380	D	5.35	24E63CT	31.20	26.00
	10.000	E	0.017	80E8CT	33.60	28.00		1.270	E	0.71	80E63CT	33.60	28.00
	22.000	F	0.010	175E8CT	66.00	55.00		2.770	F	0.20	175E63CT	66.00	55.00
10	0.200	A	2.50	2E10CT	28.80	24.00	70	0.028	A	139	2E70CT	28.80	24.00
	0.600	B	0.587	6E10CT	26.40	22.00		0.085	B	27.1	6E70CT	26.40	22.00
	1.500	C	0.27	15E10CT	27.60	23.00		0.214	C	9.4	15E70CT	27.60	23.00
	2.400	D	0.180	24E10CT	31.20	26.00		0.342	D	8.10	24E70CT	31.20	26.00
	8.000	E	7.2	80E10CT	33.60	28.00		1.140	E	0.80	80E70CT	33.60	28.00
	17.500	F	0.020	175E10CT	66.00	55.00		2.500	F	0.25	175E70CT	66.00	55.00
12.6	0.158	A	4.10	2E12.6CT	28.80	24.00	80	0.025	A	163.	2E80CT	28.80	24.00
	0.475	B	0.99	6E12.6CT	26.40	22.00		0.075	B	39.0	6E80CT	26.40	22.00
	1.180	C	0.32	15E12.6CT	27.60	23.00		0.198	C	13.4	15E80CT	27.60	23.00
	1.900	D	0.225	24E12.6CT	31.20	26.00		0.300	D	9.0	24E80CT	31.20	26.00
	6.350	E	0.030	80E12.6CT	33.60	28.00		1.000	E	0.92	80E80CT	33.60	28.00
	13.900	F	0.021	175E12.6CT	66.00	55.00		2.180	F	0.34	175E80CT	66.00	55.00
14	0.142	A	5.59	2E14CT	28.80	24.00	90	0.022	A	218.	2E90CT	28.80	24.00
	0.428	B	1.11	6E14CT	26.40	22.00		0.067	B	41.0	6E90CT	26.40	22.00
	1.070	C	0.35	15E14CT	27.60	23.00		0.166	C	15.9	15E90CT	27.60	23.00
	1.720	D	0.32	24E14CT	31.20	26.00		0.267	D	12.5	24E90CT	31.20	26.00
	5.600	E	0.04	80E14CT	33.60	28.00		0.890	E	1.08	80E90CT	33.60	28.00
	12.500	F	0.022	175E14CT	66.00	55.00		1.940	F	0.38	175E90CT	66.00	55.00
16	0.125	A	6.63	2E16CT	28.80	24.00	100	0.020	A	283.	2E100CT	28.80	24.00
	0.375	B	1.58	6E16CT	26.40	22.00		0.060	B	59.5	6E100CT	26.40	22.00
	0.940	C	0.54	15E16CT	27.60	23.00		0.150	C	16.8	15E100CT	27.60	23.00
	1.500	D	0.35	24E16CT	31.20	26.00		0.240	D	14.4	24E100CT	31.20	26.00
	5.000	E	0.05	80E16CT	33.60	28.00		0.800	E	1.64	80E100CT	33.60	28.00
	10.900	F	0.025	175E16CT	66.00	55.00		1.750	F	0.52	175E100CT	66.00	55.00
18	0.111	A	9.00	2E18CT	28.80	24.00	110	0.018	A	392.	2E110CT	28.80	24.00
	0.333	B	2.21	6E18CT	26.40	22.00		0.054	B	62.3	6E110CT	26.40	22.00
	0.832	C	0.74	15E18CT	27.60	23.00		0.136	C	22.1	15E110CT	27.60	23.00
	1.330	D	0.40	24E18CT	31.20	26.00		0.218	D	19.5	24E110CT	31.20	26.00
	4.450	E	0.08	80E18CT	33.60	28.00		0.728	E	2.03	80E110CT	33.60	28.00
	9.700	F	0.027	175E18CT	66.00	55.00		1.590	F	0.72	175E110CT	66.00	55.00
20	0.100	A	10.9	2E20CT	28.80	24.00	123	0.016	A	495.	2E123CT	28.80	24.00
	0.300	B	2.78	6E20CT	26.40	22.00		0.048	B	96.0	6E123CT	26.40	22.00
	0.750	C	1.4	15E20CT	27.60	23.00		0.122	C	30.7	15E123CT	27.60	23.00
	1.200	D	0.48	24E20CT	31.20	26.00		0.195	D	21.9	24E123CT	31.20	26.00
	4.000	E	0.09	80E20CT	33.60	28.00		0.650	E	2.35	80E123CT	33.60	28.00
	8.750	F	0.020	175E20CT	66.00	55.00		1.420	F	0.81	175E123CT	66.00	55.00
22	0.091	A	14.6	2E22CT	28.80	24.00	138	0.014	A	550.	2E138CT	28.80	24.00
	0.273	B	2.80	6E22CT	26.40	22.00		0.043	B	133.0	6E138CT	26.40	22.00
	0.680	C	0.92	15E22CT	27.60	23.00		0.108	C	36.0	15E138CT	27.60	23.00
	1.090	D	0.63	24E22CT	31.20	26.00		0.174	D	30.3	24E138CT	31.20	26.00
	3.630	E	0.12	80E22CT	33.60	28.00		0.580	E	3.17	80E138CT	33.60	28.00
	7.900	F	0.020	175E22CT	66.00	55.00		1.260	F	1.14	175E138CT	66.00	55.00
25	0.080	A	20.4	2E25CT	28.80	24.00	157	0.038	B	153.0	6E157CT	26.40	22.00
	0.240	B	3.60	6E25CT	26.40	22.00		0.095	C	53.	15E157CT	27.60	23.00
	0.600	C	1.3	15E25CT	27.60	23.00		0.152	D	36.1	24E157CT	31.20	26.00
	0.900	D	0.68	24E25CT	31.20	26.00		0.508	E	3.60	80E157CT	33.60	28.00
	3.200	E	0.13	80E25CT	33.60	28.00		1.100	F	1.31	175E157CT	66.00	55.00
	7.000	F	0.042	175E25CT	66.00	55.00	175	0.034	B	168.0	6E175CT	26.40	22.00
	0.071	A	30.0	2E28CT	28.80	24.00		0.085	C	56.	15E175CT	27.60	23.00
	0.214	B	4.20	6E28CT	26.40	22.00		0.136	D	49.5	24E175CT	31.20	26.00
	0.535	C	1.83	15E28CT	27.60	23.00		0.455	E	5.50	80E175CT	33.60	28.00
	0.855	D	0.98	24E28CT	31.20	26.00		1.000	F	1.87	175E175CT	66.00	55.00
	2.850	E	0.14	80E28CT	33.60	28.00	200	0.030	B	248.0	6E200CT	26.40	22.00
	6.250	F	0.043	175E28CT	66.00	55.00		0.071	C	65.	15E200CT	27.60	23.00
	0.064	A	25.6	2E31CT	28.80	24.00		0.120	D	57.	24E200CT	31.20	26.00
	0.192	B	5.71	6E31CT	26.40	22.00		0.400	E	5.60	80E200CT	33.60	28.00
	0.485	C	1.62	15E31CT	27.60	23.00		0.875	F	2.65	175E200CT	66.00	55.00
	0.772	D	1.27	24E31CT	31.20	26.00	220	0.027	B	278.	6E220CT	26.40	22.00
	2.470	E	0.18	80E31CT	33.60	28.00		0.068	C	91.5	15E220CT	27.60	23.00
	5.650	F	0.061	175E31CT	66.00	55.00		0.109	D	79.	24E220CT	31.20	26.00
	0.057	A	29.5	2E35CT	28.80	24.00		0.364	E	8.1	80E220CT	33.60	28.00
	0.171	B	6.89	6E35CT	26.40	22.00		0.790	F	2.92	175E220CT	66.00	55.00
	0.428	C	2.28	15E35CT	27.60	23.00	250	0.024	B	407.	6E250CT	26.40	22.00
	0.685	D	1.70	24E35CT	31.20	26.00		0.060	C	141.	15E250CT	27.60	23.00
	2.280	E	0.28	80E35CT	33.60	28.00		0.096	D	114.	24E250CT	31.20	26.00
	5.000	F	0.098	175E35CT	66.00	55.00		0.320	E	11.2	80E250CT	33.60	28.00
								0.700	F	3.95	175E250CT	66.00	55.00
39	0.051	A	38.6	2E39CT	28.80	24.00	275	0.021	B	417.	6E275CT	26.40	22.00
	0.154	B	9.39	6E39CT	26.40	22.00		0.054	C	146.	15E275CT	27.60	23.00
	0.384	C	2.54	15E39CT	27.60	23.00		0.087	D	120.	24E275CT	31.20	26.00
	0.615	D	2.20	24E39CT	31.20	26.00		0.290	E	13.6	80E275CT	33.60	28.00
	2.050	E	0.32	80E39CT	33.60	55.00		0.635	F	4.65	175E275CT	66.00	55.00
	4.480	F	0.110	175E39CT	66.00	55.00	310	0.019	B	592.	6E310CT	26.40	22.00
								0.048	C	160.	15E310CT	27.60	23.00
								0.077	D	180.	24E310CT	31.20	26.00
								0.266	E	14.1	80E310CT	33.60	28.00
								0.565	F	6.80	175E310CT	66.00	55.00

Standard models with outputs from 350 to 5,000 VAC are also available from stock. Contact our nearest office for your free copy of our complete brochure.

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

**Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530**



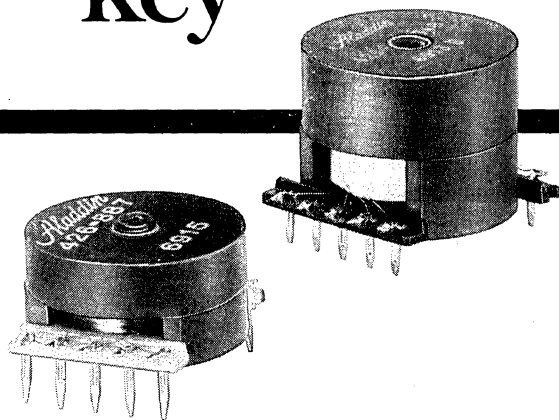
electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.



behind
every
successful
key

there's a coil



Data lovers, how do these frequencies grab you?

600Hz	1200Hz	2025Hz
697Hz	1209Hz	2050Hz
770Hz	1270Hz	2150Hz
852Hz	1336Hz	2200Hz
941Hz	1477Hz	2225Hz
1070Hz	1633Hz	2250Hz
1098Hz	1950Hz	2350Hz

Applications:

As fixed and adjustable inductors for low frequency filters. As transformers for tone frequencies used in push button telephone oscillator circuits and data sets; coupling and impedance matching applications.

Features:

High and low profile units, p/c mounting, fine tuning, tuning adjustment at least $\pm 3\%$ from nominal, TC matches polystyrene capacitors, high Q — custom designs, impregnated coils, for extreme environments.

data coils by

Aladdin

Data Coils, Transformers, Inductors, Filters? We've Got Those Too!

We feature our latest innovations in coils, transformers, inductors and filters in a six-page *Magnetic Components for Telephony* booklet. Telephony applications and configurations are highlighted, making it easier for you to select components. No charge, of course!

Aladdin Electronics

A Division of Aladdin Industries, Inc.
P.O. Box 7263
Sales Office: Plant 3
Nashville, Tennessee 37210
Phone: (615) 255-1776



Aladdin ELECTRONICS

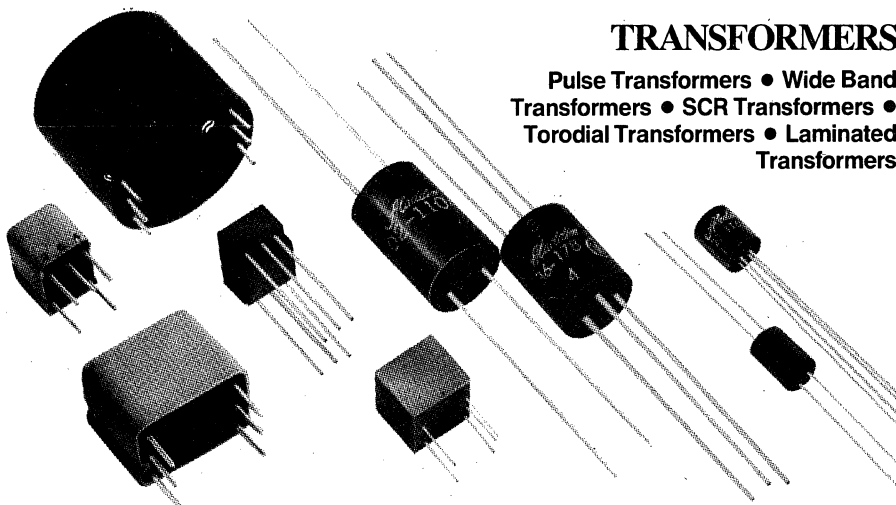
*innovators in ferromagnetic components for
data processing, data communications
and precision industries*

Write for your FREE copy of
the AE "MINILOG" . . .

A concise catalog of Aladdin's most frequently ordered stock components—
data coils, transformers, filters, inductors and strip delay lines. They're all
available *from stock* (on a 48-hour shipping schedule in quantities up to
250). For your copy, write: Aladdin Electronics, P.O. Box 7263,
Nashville, Tennessee 37210.

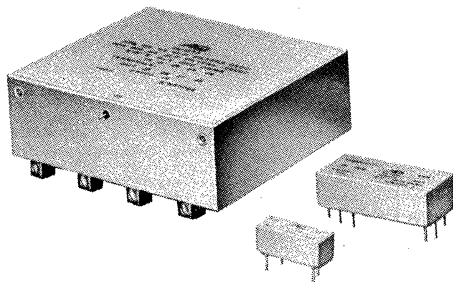
TRANSFORMERS

Pulse Transformers • Wide Band
Transformers • SCR Transformers •
Torodial Transformers • Laminated
Transformers



FILTERS

Low Pass Filters • High Pass Filters
• Band Pass Filters • Band Reject
Filters



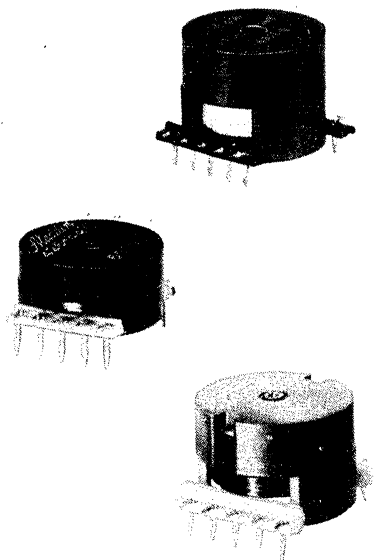
AE can deliver small quantities of any of many
filter designs in less than two weeks—or design
filter units to meet assignment parameters
and deliver evaluation prototypes in less
than three weeks in most cases.

DATA COILS

Data coils in a complete spectrum of frequencies, all utilizing communication-grade ferrite pot cores to assure a high Q factor and excellent temperature stability of inductors while utilizing a small core area.

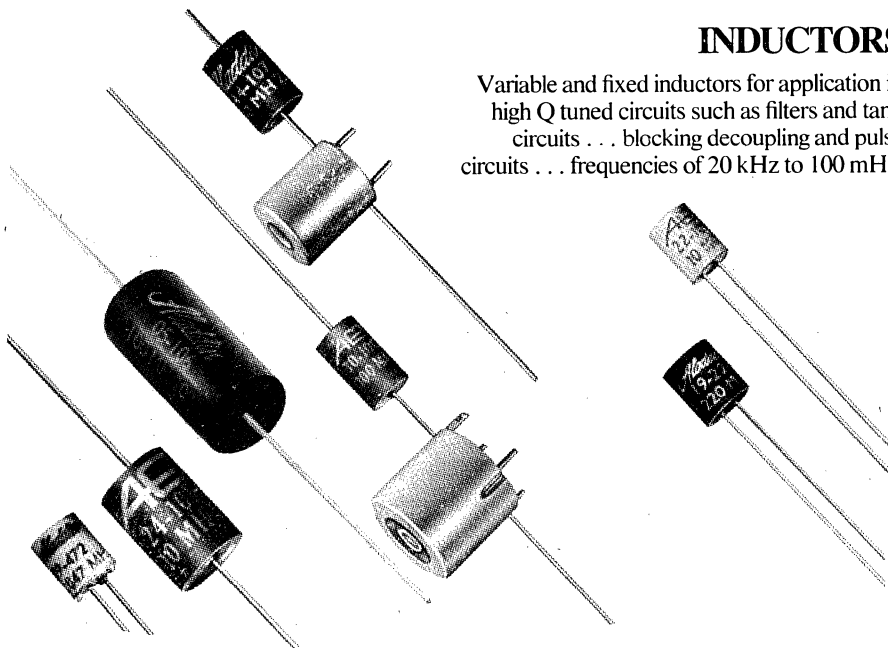
Applications: as fixed and adjustable inductors for low frequency filters . . . as transformers for tone frequencies used in push-button telephone oscillator circuits and data sets . . . coupling and impedance-matching applications.

Features: High and low profile units, p/c mounting, fine tuning, tuning adjustment at least $\pm 3\%$ from nominal, TC matches polystyrene capacitors, high Q—custom designs, impregnated coils for extreme environments.



INDUCTORS

Variable and fixed inductors for application in high Q tuned circuits such as filters and tank circuits . . . blocking decoupling and pulse circuits . . . frequencies of 20 kHz to 100 mHz.



Aladdin
ELECTRONICS

A Division of Aladdin Industries, Inc.
P.O. Box 7263, Nashville, Tennessee 37210

Call the Independent's number (615) 255-1776



introduces
WAIT-A-BIT™
delay lines

What's a WAIT-A-BIT?

- New computer delay line technology—totally unlike conventional lumped or distributed parameter delay lines
- Shorter delays for pulse synchronization and pulse shaping in fast computing machines
- Can be cascaded for timing applications
- Tested automatically for delay time to a precision of ± 0.02 ns, rise time, prepulse distortion, and pulse top distortion
- Tested in conformance with the applicable paragraphs of MIL-D-23859 and MIL-STD-202. Sampled per MIL-STD-105, Level II, 0.4% A.Q.L.

TYPICAL DIP "WAIT-A-BIT" DELAY LINES

PART NUMBER	PINS	TAPS	IMPEDANCE ($\pm 10\%$)	DELAY TIME ns (± 0.5 max.)	RISE TIME* ns (max.)	DCR ohms (max.)
880-0207-20	20	10	50	7	3	3
880-0205-20	20	10	50	5	3	3
880-0204-16	16	8	50	4	3	3
880-0203-12	12	6	50	3	3	2
880-0202-08	8	4	50	2	3	2
880-0201-04	4	2	50	1	3	1
880-0310-20	20	10	75	10	4	3.5
880-0307-20	20	10	75	7.5	3	3.5
880-0306-16	16	8	75	6	3	3
880-0304-12	12	6	75	4.5	3	2
880-0303-08	8	4	75	3	3	2
880-0301-04	4	2	75	1.5	3	1
880-0414-20	20	10	100	14	5	4
880-0410-20	20	10	100	10	4	4
880-0410-16	16	8	100	10	4	4
880-0408-16	16	8	100	8	4	3.5
880-0406-12	12	6	100	6	4	3
880-0404-08	8	4	100	4	4	2
880-0402-04	4	2	100	2	4	1

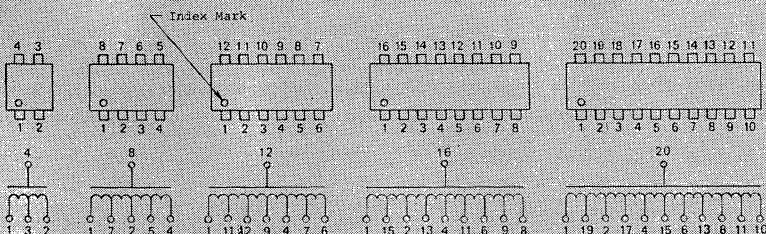
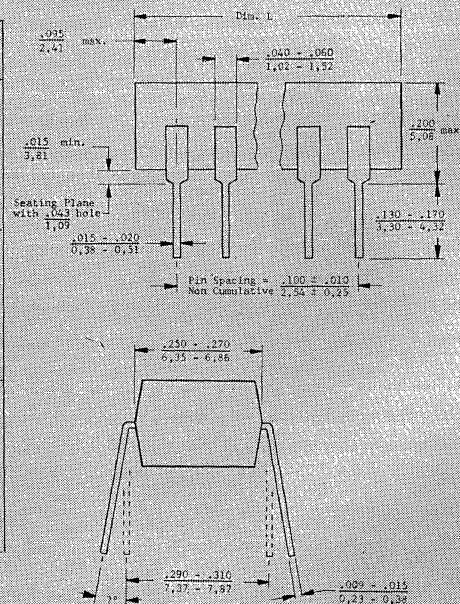
Prepulse and Pulse Top Distortion = $\pm 10\%$

Dielectric Strength = 50 vdc min.

Specifications are tentative and subject to revision

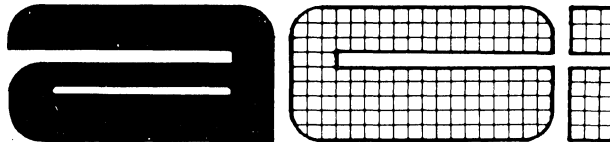
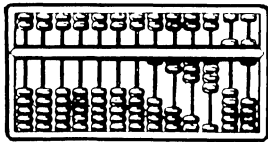
→ = These parts now available.

* Input Rise Time = 2.0 ns



No. of Pins	Dim "L" Max.	
	inch	mm
4 Pin Unit	.280	7.11
8 Pin Unit	.480	12.19
12 Pin Unit	.680	17.27
16 Pin Unit	.880	22.35
20 Pin Unit	1.080	27.43

ALADDIN ELECTRONICS, A Division of Aladdin Industries, Inc. • P.O. Box 7263, Nashville, Tennessee 37210 • Phone (615) 255-1776



abacus controls inc.

69 FOURTH STREET
SOMERVILLE, N.J. 08876
201-526-6010

FERRORESONANT TRANSFORMERS

SPECIFICATIONS:

Input Voltage	100 to 130V/200 to 260V
Frequency	60HZ
Output Voltage	117V
Voltage Regulation	+ 1% Line & Load
Response Time	1HZ
Total Harmonic Distortion	4% MAX

Model No.	Rating VA	Input Volts	Output Volts	Dimensions (Inches)		
				Length	Width	Height
F601	100	100-130	117	7-3/4	4-1/2	5-3/8
F602	200	100-130	117	8-1/2	4-1/2	5-3/8
F605	500	100-130	117	8-3/4	4-1/2	5-3/8
F610	1,000	100-130	117	10-1/2	7-1/8	8-1/4
F615	1,500	100-130	117	11	7-1/8	8-1/4
F620	2,000	200-260	117	11-3/4	7-1/8	8-1/4
F630	3,000	200-260	117	13	10-5/8	12

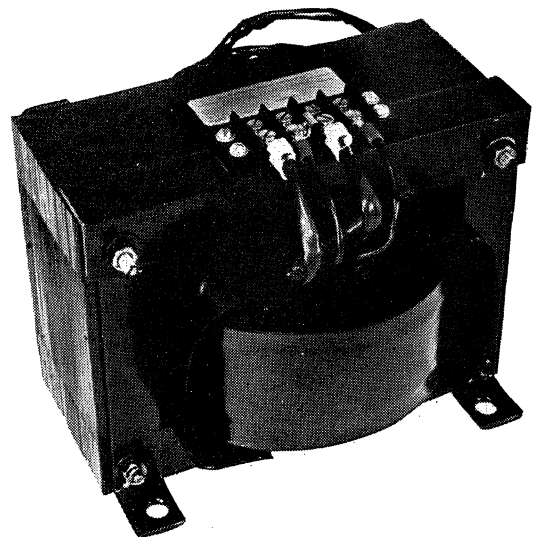
- Available for OEM's uncased. Change prefixes to T.
- Available at 50HZ and 400HZ.
- Available at other voltages and multiple output voltages.

HIGH VOLTAGE CONTROL TRANSFORMERS

SPECIFICATIONS:

Frequency	60HZ +5% (50HZ available)
Voltage Regulation	5% NL to FL
Insulation Resistance	100 Meg ohm Min.
Insulation	NEMA Class B
Dielectric	25KV BIL

Model No.	Rating KVA	Primary Volts	Secondary Volts
M1218	0.75	2400	115/230
M1219	0.75	4160	115/230
M1272	1.5	2400	115/230
M1237	1.5	4160	115/230
M1261	2.0	2400	115/230
M1231	2.0	4160	115/230
M1232	3.0	2400	115/230
M1245	3.0	4160	115/230



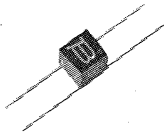
**Motor Controllers • Frequency Converters • Uninterruptible Power
Programmable Power • Battery Chargers • Transformers**

MODEL 4211 MICROTRANSFORMER

.125" x .125" x .125"

Standard Part Numbers — Stock Available

Transformer P/N	Turns Ratio Pri:Sec	Typical Impedance Ω		DCR Ω			Rated Power MW 10KHz
		Pri	Sec	Pri	Sec	Sec	
4211-0001	1:1	15	15	0.85	0.90	25	25
4211-0002	1:1	1K	1K	105	125	25	25
4211-0003	1:1	10K	10K	870	1035	25	25
4211-0004	1:2	10	40	1.3	4.7	25	25
4211-0005	1:2	100	400	10	46	25	25
4211-0006	1:2	500	2000	37	224	25	25
4211-0007	1:4	10	160	0.75	17	25	25
4211-0008	1:5	10	250	1.3	40	25	25



MODEL 4221 MICROINDUCTOR

.125" x .125" x .125"

Standard Part Numbers — Stock Available

Inductor P/N	Inductance* Hy(min) @ 1 V, 1 KHz	DCR Ω	DC ma
4221-0001	0.5h	230	0
4221-0002	3.5h	2000	0
4221-0003	0.1h	53	0
4221-0004	1.0h	525	0

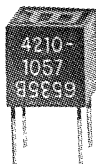
Special Order Modifications Available

MODEL 4210 MICROTRANSFORMER

.250" x .250" x .250"

Standard Part Numbers — Stock Available

Transformer P/N	Turns Ratio Pri:Sec	Typical Impedance Ω		DCR Ω		Rated 400 Hz	Power 1000 Hz	MW 2000 Hz	DC ma	Application
		Pri	Sec	Pri	Sec					
4210-0010	4.46:1	10,000 CT	500	1022	118	5	50	200	0.5	Output
4210-0011	5:1	25,000 CT	1,000	1130	145	2	25	100	.25	Interstage
4210-0012	1:1	1,000 CT	1,000 CT	90	110	5	50	200	.25	Isolation
4210-0013	1:1	10,000 CT	10,000 CT	600	746	4	50	200	0	Driver
4210-0014	1.22:1	900 CT	600	102	83	5	50	200	.75	Output
4210-0015	1:1	10,000	10,000 CT	600	746	4	50	200	0	Isolation
4210-0016	2.24:1	10,000	2,000 CT	1010	282	5	50	200	.25	Driver
4210-0017	3.53:1	150 CT	12	19	1.4	5	50	200	3.0	Output
4210-0018	3.16:1	500 CT	50 CT	55	6	5	50	200	1.5	Output
4210-0019	6.12:1	120 CT	3.2 CT	13	.6	5	50	200	3.0	Output
4210-0020	1.53:1	1,500 CT	600	231	93	5	50	200	1.5	Output
4210-0021	4.46:1	10,000 CT	500 CT	1022	118	5	50	200	.5	Driver
4210-0022	2.89:1	10,000	1,200 CT	1022	248	5	50	200	.5	Driver
4210-0023	5:1	25,000 CT	1,000 CT	1130	145	2	25	100	.25	Interstage
4210-0024	5:1	25,000	1,000	1130	145	2	25	100	.25	Interstage
4210-0025	1:1	600 CT	600 CT	69	23	5	50	200	1.0	Output
4210-0026	1:1	10,000	10,000	600	746	4	25	100	0	Isolation
4210-0028	5:1	30,000	1,200	1180	290	4	25	100	0	Interstage
4210-0030	1:1.1	500 CT	600	46	82	5	50	200	1.0	Output



MODEL 4220 MICROINDUCTOR

.250" x .250" x .250"

Standard Part Numbers — Stock Available

Inductor P/N	Inductance Hy (min) @ 1 V, 1 KHz	Q MIN @ 1 V, 1 KHz	DCR Ω	DC ma*
4220-0001	66	.75	2100	0
4220-0006	2	4	1495	2.0
4220-0007	.08	5	25	4.0
4220-0008	3.5	3.5	1495	1.0
4220-0009	6.0	4.5	1495	.25
4220-0010	.1	6	364	4.0
4220-0011	1	5.5	223	.25
4220-0012	.5	.75	1495	0
4220-0013	50	5.0	364	1.5
4220-0014	.7	5.0	38	1.5
4220-0015	.2	5.0	1495	.75
4220-0016	4.5	3.5		

Inductor P/N	Hy (min) @ 1 V, 1 KHz	Q MIN @ 1 V, 1 KHz	DCR Ω	DC ma*
4220-0001	66	.75	2100	0
4220-0006	2	4	1495	2.0
4220-0007	.08	5	25	4.0

* With DC current applied — approximately — 10% drop in inductance occurs

MODEL 4212 MICROTRANSFORMER

.310" x .410" x .465"

Standard Part Numbers — Stock Available

Transformer P/N	Turns Ratio Pri:Sec	Typical Impedance Ω		DCR Ω		Rated Power MW at 300 Hz	DC ma	Application
		Pri	Sec	Pri	Sec			
4212-0001	14.1:1	200,000	1,000	5300	120	12	0	Input
4212-0002	7.1:1	50,000 CT	1,000 CT	3800	90	25	0	Input
4212-0003	5:1	25,000 CT	1,000 CT	1600	95	30	0.5	Interstage
4212-0004	4.47:1	20,000 CT	1,000 CT	1500	100	30	0.5	Interstage
4212-0005	1:1	10,000 CT	10,000 CT	1000	1300	45	1	Output
4212-0006	2.24:1	10,000 CT	2,000 CT	1000	300	45	1	Driver
4212-0007	2.58:1	10,000 CT	1,500 CT	1000	260	45	1	Driver
4212-0008	2.88:1	10,000 CT	1,200 CT	1000	220	45	1	Driver
4212-0009	1.58:1	5,000 CT	2,000 CT	490	300	45	1	Driver
4212-0010	1.58:1	1,500 CT	600	160	95	65	3	Output
4212-0011	1:1	600 CT	600 CT	70	95	65	3	Output
4212-0012	1:1.09	500 CT	600 CT	65	95	65	3	Output
4212-0013	2:1:1	10,000	10,000 CT	1000	1300*	45	1	Output
4212-0014	1:1	1,000 CT	2,500 Split	80	100	65	2.5	Isolation
4212-0015	2:1:1	600	1,000 CT	70	95*	65	3	Output
4212-0016	4.47:1	10,000 CT	150 Split	1000	80	45	1	Driver
4212-0017	56:1	10,000	500 CT	1200	0.8	65	1	Output
4212-0018	1:1.42	300 CT	3.2	41	98	65	7	Output
4212-0019	22.3:1	1,600 CT	3.2	186	0.8	65	2.5	Output

* Total DCR of split secondaries in series

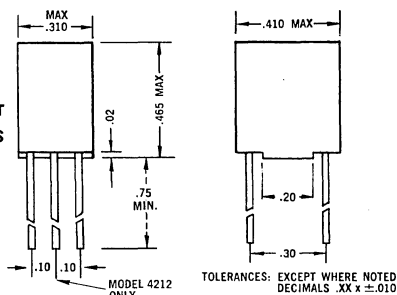
MODEL 4222 MICROINDUCTOR

.310" x .410" x .465"

Standard Part Numbers — Stock Available

Inductor P/N	Inductance Hy(min) @ 300 Hz	Q MIN @ 1 V, 1 KHz	DCR Ω	DC ma*
4222-0001	6 at 15 V	5.0	1800	2.0
4222-0002	3.5 at 5 V	4.0	1200	2.0
4222-0003	1.25 at 3 V	3.5	180	2.0
4222-0004	0.3 at 3 V	3.0	40	4.0
4222-0005	0.1 at 3 V	2.0	15	5.0

Special Order
Modifications
Available





MAGNETICS DIVISION

MINIATURE PLUG-IN POWER TRANSFORMERS FOR PRINTED CIRCUIT APPLICATIONS

Standard Part Numbers — Stock Available



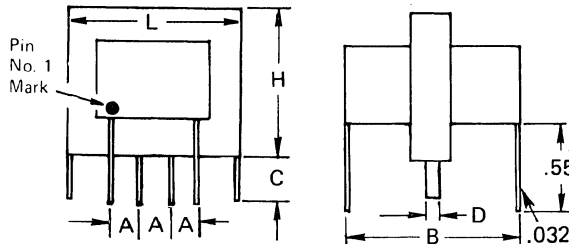
This series of power transformers includes units for transistorized control and instrumentation applications. Primaries are rated at 115 V, 50 to 500 Hz and dual secondaries provide voltages from 4 to 38 volts parallel connected, and 8 to 76 volts series connected. Load regulation will not exceed 20%.

Model No.	Output V.A.	Series Connection	Parallel Connection	Dimensions								Wt. Oz.
				L	W	H	A	B	C	D		
PW-9000	1.2	8 V CT @ 0.150A	4 V @ 0.300A	1.44	1.04	1.24	.197	.93	.28	.197	.31	3.1
PW-9001	4.2	8 V CT @ 0.525	4 V @ 1.05	1.68	1.42	1.38	.236	1.35	.28	.315	.56	5.6
PW-9002	10.0	8 V CT @ 1.25	4 V @ 2.50	1.95	1.48	1.65	.236	1.40	.32	.395	.90	9.0
PW-9003	1.2	15 V CT @ 0.080	7.5 V @ 0.160	1.44	1.04	1.24	.197	.93	.28	.197	.31	3.1
PW-9004	4.2	15 V CT @ 0.280	7.5 V @ 0.560	1.68	1.42	1.38	.236	1.35	.28	.315	.56	5.6
PW-9005	10.0	15 V CT @ 0.670	7.5 V @ 1.34	1.95	1.48	1.65	.236	1.40	.32	.395	.90	9.0
PW-9006	1.2	30 V CT @ 0.040	15 V @ 0.080	1.44	1.04	1.24	.197	.93	.28	.197	.31	3.1
PW-9007	4.2	30 V CT @ 0.140	15 V @ 0.280	1.68	1.42	1.38	.236	1.35	.28	.315	.56	5.6
PW-9008	10.0	30 V CT @ 0.330	15 V @ 0.660	1.95	1.48	1.65	.236	1.40	.32	.395	.90	9.0
PW-9009	1.2	54 V CT @ 0.022	27 V @ 0.044	1.44	1.04	1.24	.197	.93	.28	.197	.31	3.1
PW-9010	4.2	54 V CT @ 0.080	27 V @ 0.160	1.68	1.42	1.38	.236	1.35	.28	.315	.56	5.6
PW-9011	10.0	54 V CT @ 0.190	27 V @ 0.380	1.95	1.48	1.65	.236	1.40	.32	.395	.90	9.0
PW-9012	1.2	76 V CT @ 0.016	38 V @ 0.032	1.44	1.04	1.24	.197	.93	.28	.197	.31	3.1
PW-9013	4.2	76 V CT @ 0.055	38 V @ 0.110	1.68	1.42	1.38	.236	1.35	.28	.315	.56	5.6
PW-9014	10.0	76 V CT @ 0.132	38 V @ 0.264	1.95	1.48	1.65	.236	1.40	.32	.395	.90	9.0

DUAL PRIMARY FOR 115 V OR 230 V POWER TRANSFORMERS

Part No.	Output V.A.	Input Voltage VRMS		Output Voltage
		Series Connection	Parallel Connection	
PW-9500	1.2	230	115	24 V CT @ 0.5 A
PW-9501	4.2	230	115	24 V CT @ .18 A
PW-9502	10.0	230	115	24 V CT @ .42 A

Part No.	Dimensions							Wt. Oz.
	L	W	H	A	B	C	D	
PW-9500	1.44	1.04	1.24	.197	.93	.19	.125	3.1
PW-9501	1.68	1.42	1.38	.236	1.35	.28	.125	5.6
PW-9502	1.95	1.48	1.65	.236	1.40	.32	.187	9.0



MAGNETICS DIVISION

MODEL 4251 .260" x .200" x .750" DUAL-IN-LINE PULSE TRANSFORMER 14 PIN

Transformer P/N	Turns Ratio Pri:Sec	Primary Pulse Induct. μ H (Min.)	ET Const. Volt μ Sec	Leakage Induct. μ H (Max.)	Coupling Capac. pf (Max.)	DC Resistance Ω (Max.)		
						(1-14) Pri	(2-13) Sec	(3-12) Tert
4251-0001	1:1:1	8	1.0	0.30	7	0.16	0.16	0.16
4251-0002	2:1:1	8	1.0	0.70	5	0.16	0.12	0.12
4251-0003	1:1:1	30	2.1	0.30	9	0.19	0.19	0.19
4251-0004	2:1:1	30	2.1	0.70	7	0.19	0.13	0.13
4251-0005	1:1:1	57	2.8	0.30	11	0.34	0.34	0.34
4251-0006	2:1:1	57	2.8	0.70	7	0.34	0.25	0.25
4251-0007	1:1:1	130	2.0	0.30	11	0.34	0.34	0.34
4251-0008	2:1:1	130	2.0	0.70	7	0.34	0.25	0.25
4251-0009	1:1:1	230	2.7	0.30	13	0.55	0.55	0.55
4251-0010	2:1:1	230	2.7	0.70	9	0.55	0.32	0.32
4251-0011	1:1:1	430	3.8	0.30	18	0.75	0.75	0.75
4251-0012	2:1:1	430	3.8	0.70	11	0.75	0.38	0.38

MODEL 4252 .260" x .200" x .860" DUAL-IN-LINE PULSE TRANSFORMER 16 PIN

Transformer P/N	Turns Ratio Pri:Sec	Primary Pulse Induct. μ H (Min.)	ET Const. Volt μ Sec	Leakage Induct. μ H (Max.)	Coupling Capac. pf (Max.)	DC Resistance Ω (Max.)		
						(1-14) Pri	(2-13) Sec	(3-12) Tert
4252-0001	1:1	8	1.0	0.25	7	0.16	0.16	0.16
4252-0002	2:1	8	1.0	0.50	5	0.16	0.12	0.12
4252-0003	1:1	30	2.1	0.25	9	0.19	0.19	0.19
4252-0004	2:1	30	2.1	0.50	7	0.19	0.13	0.13
4252-0005	1:1	57	2.8	0.25	11	0.34	0.34	0.34
4252-0006	2:1	57	2.8	0.50	7	0.34	0.25	0.25
4252-0007	1:1	130	2.0	0.25	11	0.34	0.34	0.34
4252-0008	2:1	130	2.0	0.50	7	0.34	0.25	0.25
4252-0009	1:1	230	2.7	0.25	13	0.55	0.55	0.55
4252-0010	2:1	230	2.7	0.50	9	0.55	0.32	0.32
4252-0011	1:1	430	3.8	0.25	18	0.75	0.75	0.75
4252-0012	2:1	430	3.8	0.50	11	0.75	0.38	0.38



MAGNETICS DIVISION

HIGH RELIABILITY • MIL SPEC • COMMERCIAL • INDUSTRIAL • MICRO AND STANDARD SIZE MAGNETIC COMPONENTS

28151 HIGHWAY 74, ROMOLAND, CA. 92380 PHONE: 714 657-5195 TELEX 67-6446

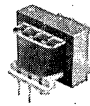
TRANSFORMERS

INDUSTRIAL/COMMERCIAL

TRANSFORMERS

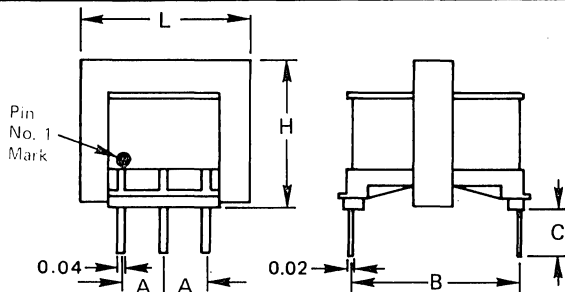
MINIATURE PLUG-IN AUDIO TRANSFORMERS FOR PRINTED CIRCUIT APPLICATIONS

Standard Part Numbers — Stock Available



This series of transformers covers input, output and driver applications with a broad frequency response of ± 3 db from 300-10,000 Hz. It features precision molded terminals for rapid insertion and the primary and secondary windings may be reversed. These units are ideal for impedance matching.

Model No.	Power Level MW	Impedance		Turns Ratio Pri:Sec	DC Resistance		Dimensions							Wt. Oz.
		Pri Ω	Sec Ω		Pri Ω	Sec Ω	L	W	H	A	B	C		
AU-9000	300	1K CT	200K CT	1:13.7	100	2500	1.02	.92	.85	.25	.72	.236	1.12	1.12
AU-9001	300	500 CT	500 CT	1:1.05	40	53	1.02	.92	.85	.25	.72	.236	1.12	1.12
AU-9002	300	20K CT	2K CT	2.98:1	1250	185	1.02	.92	.85	.25	.72	.236	1.12	1.12
AU-9003	150	100 CT	10 CT	2.84:1	18	1.3	0.78	.55	.71	.187	.421	.197	0.55	0.55
AU-9004	150	5K CT	7.5K CT	1:1.22	520	520	0.78	.55	.71	.187	.421	.197	0.55	0.55
AU-9005	150	5K CT	10K CT	1:1.48	520	970	0.78	.55	.71	.187	.421	.197	0.55	0.55
AU-9006	150	5K CT	80K CT	1:3.93	420	3500	0.78	.55	.71	.187	.421	.197	0.55	0.55
AU-9007	150	500 CT	150 CT	1.75:1	42	14	0.78	.55	.71	.187	.421	.197	0.55	0.55
AU-9008	150	1.2K	20K CT	1:4.2	140	1350	0.78	.55	.71	.187	.421	.197	0.55	0.55
AU-9009	150	1500	500 CT	1:6.7:1	100	45	0.78	.55	.71	.187	.421	.197	0.55	0.55
AU-9010	150	10K	200 CT	7:1:1	760	16	0.78	.55	.71	.187	.421	.197	0.55	0.55
AU-9011	150	10K	2K CT	2.24:1	760	140	0.78	.55	.71	.187	.421	.197	0.55	0.55
AU-9012	150	10K	3K CT	1.83:1	750	230	0.78	.55	.71	.187	.421	.197	0.55	0.55

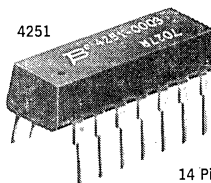


CONVERTER TRANSFORMERS

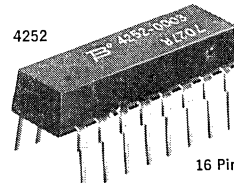
These Transformers are designed for use in self saturating DC to DC or DC to AC converters. They can be used at switching frequencies from 15 KHz to 50 KHz. Utilization of ferrite cores yields efficiencies up to 80%.

Transformer P/N	Typical Input Voltage DC	Turns Ratio			Typical Power Output
		Input	Output	Feedback	
PW-0038	3-6	1 CT	2.8 CT	0.4 CT	500 MW
PW-0044	5-8	1 CT	1.125 CT	0.125 CT	500 MW
PW-0046	3-6	1 CT	2.7 CT	0.47 CT	1000 MW
PW-0096	10-15	1 CT	6.5	0.25	4000 MW

PULSE TRANSFORMERS



14 Pin



16 Pin



TRIGGER TRANSFORMERS PL 9000 SERIES

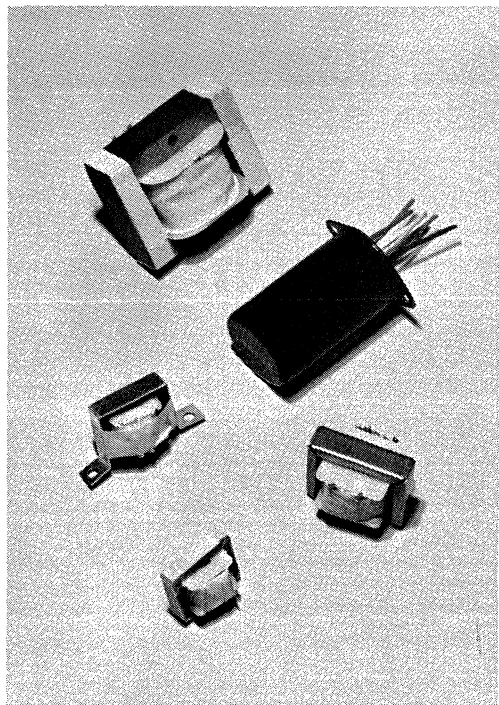
Part No.	Turns Ratio $\pm 10\%$	Primary Inductance μ H (Min.)	Leakage Inductance μ H (Max.)	Interwinding Capacity (pf Max.)	1-2, 3-4, 5-6 DCR (Ω Max.)
PL-9001	1:1	200	3.0	800	1.5 - 1.5
PL-9002	1:1	500	6.0	1500	4.5 - 4.5
PL-9003	1:1	1000	12.0	2000	8 - 8
PL-9004	1:1	2000	13.0	2800	22 - 22
PL-9005	1:1	5000	15.0	3500	18 - 18
PL-9006	1:1:1	200	3.0	800	2 - 2 - 2

Douglas Randall

DIVISION OF WALTER KIDDE & COMPANY, INC. • 6 PAWCATUCK AVE., PAWCATUCK, CONN. 02891 • (203) 599-1750



Special Transformers



AUDIO TRANSFORMERS — Subsonic to ultrasonic

- Coupling —
- Input — Shielded, low level
- Interstage —
- Matching —
- Output —

AUTO TRANSFORMERS

- HIGH VOLTAGE — To 10,000 V test
- ISOLATION — All frequencies, static shield
- LOW VOLTAGE —

POWER TRANSFORMERS — To 500 VA, 50/60 Hz or 400 Hz

- Bias
- Filament
- Multiple Winding
- Plate

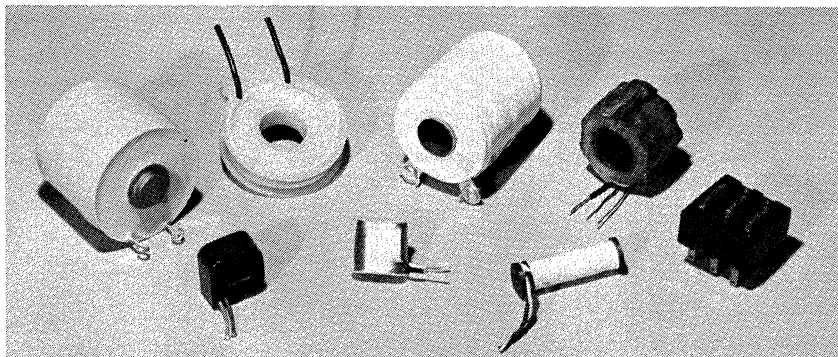
CONSTRUCTIONS —

- Open frame, End Bell, Channels, Cased,
- Molded, Potted, Varnish Impregnated
- P.C. Mount

BOBBIN & INTERWEAVE WINDING

ALL TEMPERATURE CLASSES.

Custom Coils



- BOBBIN WOUND
- TUBE WOUND
- INTERLEAVE WOUND
- INTERWEAVE WOUND
- ENCAPSULATED
- VARNISH IMPREGNATED
- MOLDED
- POTTED

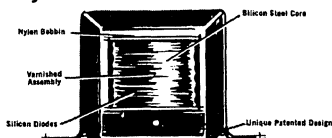
Douglas Randall manufactures specialty transformers and custom wound coils for special requirements and unique applications. Engineering assistance and rapid prototype service are available for new designs. Douglas Randall has perfected a special technique to produce molded coils with or without inserts in moderate quantities at low initial tooling costs. A few typical examples of these molded coils are illustrated above.

WALL PLUG-IN LOW VOLTAGE CONVERTERS/INVERTERS/CHARGERS

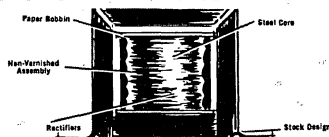
To insure high quality and top performance in our plug-in power supplies and chargers, we make our own low voltage

TRANSFORMERS

using superior materials in a smaller sized unit. The years of successfully satisfying the unique needs of the industry with specialty transformers is "at your service".



WHY IS THIS LOW COST DYNAMIC TRANSFORMER BETTER THAN THIS



STOCK TRANSFORMER COSTING MORE.

In addition to those advantages already pointed out, DYNAMIC TRANSFORMERS can be made to your SPECIFICATIONS in days and in most cases with NO COST for prototypes.

TRANSFORMERS FOR ALL REASONS

- | | |
|---|--|
| ☐ Patented, U/L listed | ☐ Conversion/charging |
| ☐ Internal or External | ☐ Printed circuit |
| ☐ Wall-mounted | ☐ Sub-miniature |
| ☐ Fast-charging | ☐ Ferro-resonant |
| ☐ Power conversion | ☐ Multi-input |
| | ☐ Multi-output |

THE TRANSFORMATION OF POWER

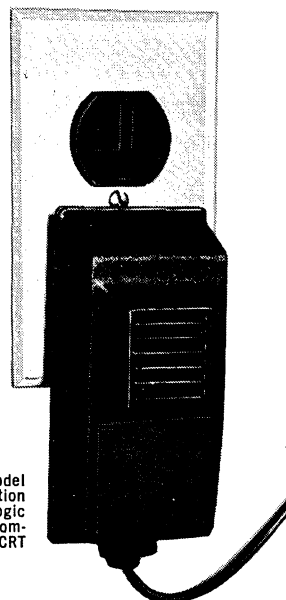
A unique brochure explaining the many advantages and application possibilities of Dynamic's patented U/L listed transformers, converters, chargers and power supplies, technical data sheets and bulletins, are available on specific products. A request on your letterhead or phone our Sales Engineering Department WPX-1.



Designed to be listed under the
U/L • CSA
SPECIFICATIONS



Illustrated at right is the Model 3-1743 presently in production for use with a keyboard logic circuit. Suitable for minicomputers, calculators, remote CRT terminals, etc.



Dynamic Instrument Corp. has designed, developed and patented a complete range of low-voltage, filtered, transistor-regulated power supplies and chargers designed to supply the necessary power to a vast variety of Electronic equipment.

Utilizing a wall plug-in type unit eliminates or greatly reduces the problems involved with UL listing your product. They also remove the major heat source, reduce size and weight, and also greatly increase your design flexibility. The latest design applications of the Dynamic wall plug-in supplies are in conjunction with such sophisticated equipment as mini-computers, calculators, keyboard logic circuits, and remote CRT Terminals.

Just call or write: Dept. WPX-1.

Dynamic's product range and capabilities also cover:

POWER CONVERSION

AC-AC for products requiring low-level AC voltage, AC-DC for small electric motor driven products that do not use batteries.

SECONDARY BATTERY CHARGING

Dynamic Chargers for charging Nickel-Cadmium, Lead-Acid and Manganese-Alkaline Batteries.

AC-DC CONVERSION/CHARGING

Dynamic Converter-Chargers providing rechargeability or instant use of battery operated products.

FAST CHARGING SYSTEMS

Dynamic design and production capability relative to Fast Charging Systems.

TRANSFORMERS

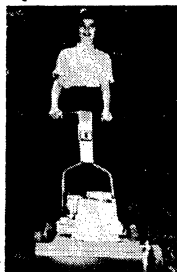
Internal, External and Wall-Mounted Dynamic Transformers.

SPECIALTY TRANSFORMERS

Dynamic Plug-In, Printed Circuit Transformers; Sub-Miniature Transformers; Ferro-resonant Transformers; Multi-Input Voltage and Multi-Output Voltage Transformers.



CONVERTER/CHARGER FOR PORTABLE MEDICAL-ELECTRONIC EQUIPMENT



CHARGER FOR BATTERY ELECTRIC-STARTER SYSTEMS



CHARGER FOR BATTERY OPERATED TOYS



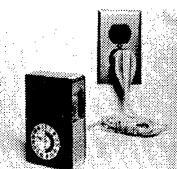
CONVERTER/"FAST" CHARGER FOR MINI-CALCULATORS



CONVERTER/CHARGER FOR MOTOR DRIVEN CAMERAS



AC CONVERTER FOR PORTABLE ELECTRONIC EQUIPMENT



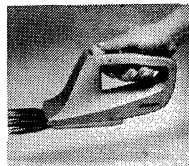
"FAST" CHARGER FOR ELECTRONIC FLASH



DYNAMIC INSTRUMENT CORP.

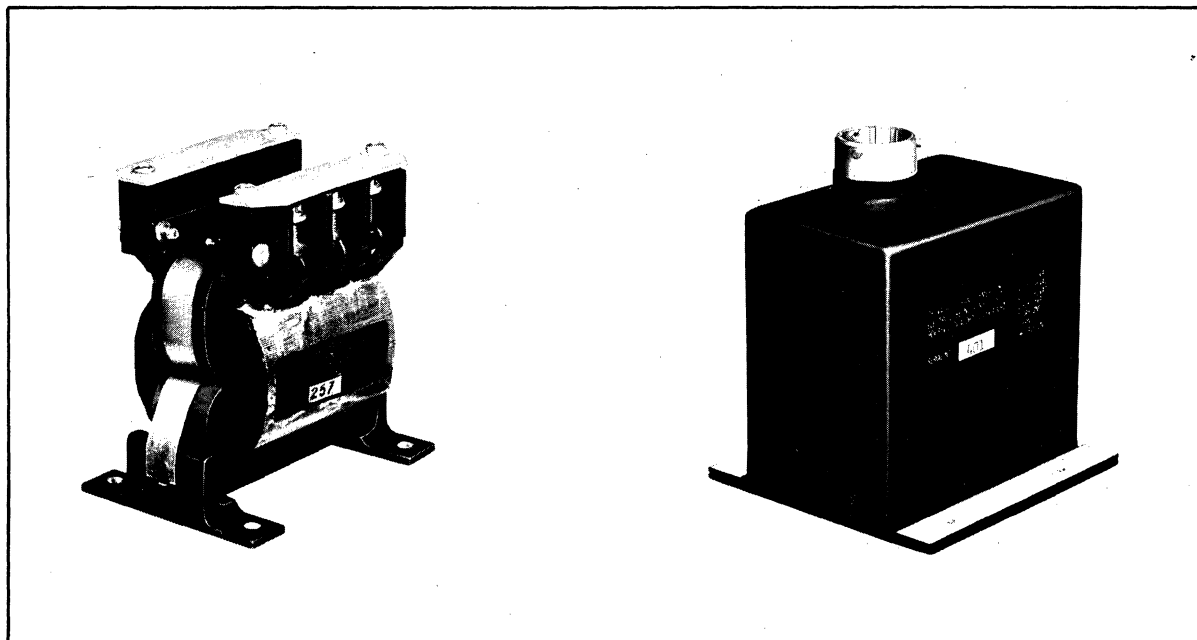
TWX 510-227-9884 CABLE ADDRESS "DYNINST" HAUPPAUGE, N.Y.

933 Motor Parkway
Hauppauge, N. Y. 11787
(516) 234-2900



electrocube transformers

Aluminum Foil Wound



Electro Cube aluminum foil wound transformers are available in the standard models listed on the reverse and also to customer requirements as isolation or auto transformers for frequencies from 25 cycles into the kilocycle range. Units may be single or multi-phase. Open frame, shell enclosure and hermetically sealed configurations can be furnished.

Advantages of these foil wound transformers over conventional wire wound units include:

- higher operating efficiency
- reduced weight
- improved thermal efficiency
- higher temperature operation
- improved regulation
- internal losses
- improved volume efficiency

The ability of a transformer to dissipate heat affects its maximum rating. Electro Cube foil wound coils have the ability to dissipate large amount of heat because there is a direct metallic path to each end of the coil from any point within the coil. Special end treatment of the coil including attachment to a heat sink, can make possible significantly reduced operating temperatures.

Wire wound coils, by comparison, are more difficult to cool. As a result of a limited heat path a lower coefficient of heat transfer and increased resistance due to heat and vice versa, the heat is greatest in that part of the coil least capable of dissipating it. Heat generated by conductors deep within the coil must pass through many thermal barriers of the insulation between the wires.

In addition to thermal efficiency, the materials in Electro Cube foil transformers permit use with higher operating temperatures than are possible with wire coils with equivalent

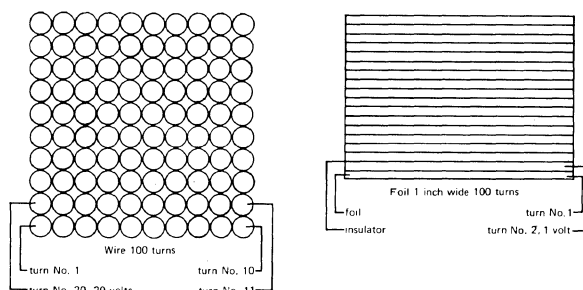


Figure 1. Typical coil sections with 100 volts excitation.

lent insulation ratings. This also contributes to reduced weight and volume.

Figure 1 shows the relative difference in volume required for a 100 turn wire coil and an equivalent foil coil, and the relative use of space for insulation and conductors. It also shows voltage stress and insulation requirements for the two configurations. At 1 volt per turn there would be 20 volts between the 20th and first turn of the wire coil. When the top layer is finished, the last turn may lay against one of the first, resulting in a voltage difference of up to 100 volts. The foil coil never has more than 1 volt between any two conductors, or a 100 to 1 advantage over the wire coil, in this example.

The physical arrangement of the foil windings promotes a lower leakage reactance or power loss in the transformer, which contributes to efficiency and regulation. Together with the lower I^2R loss of the windings, this allows the use of fewer circular mils of conductor area to meet required efficiency and regulation requirements.

electrocube transformers

Auto transformer Specifications

Style		Open coil & core (conformal coated)							Hermetically sealed aluminum case, tin plated, painted black		
Model		FT1004	FT1006	FT1002	FT1005	FT1003	FT1013	FT1001	FT1007	FT1008	FT1009
Rating		350 VA	500 VA	750 VA	750 VA	1.75 KVA	1.75 KVA	2.5 KVA	150 VA	350 VA	750 VA
Input voltage (@ 400 Hz)		110/114/118	110/114/118	115	110/114/118	115	115	115	110/114/118	110/114/118	90/95/110
Output voltage (@ 400 Hz)		28	57 & 97	28	28	200/280/350	230	29	28	28	28
Efficiency (%)		96	95	95	95	95	95	92	90	90	90
Regulation (%)		5	5	4	5	3	3	4	5	5	5
No. terminals		5	6	3	5	5	3	3			
Terminal stud size		10-32	10-32	10-32	10-32	10-32	10-32	10-32			
Weight (lbs max)		.83	.73	1.2	1.32	2.3	2.2	2.7	0.7	1.0	1.99
Size	W	2.25	2.25	2.25	2.25	3.50	3.50	3.5	2.30	2.70	3.05
	L	3.0	3.0	3.00	3.0	3.60	3.60	3.75	3.05	3.05	3.26
	H	3.0	2.75	3.37	3.37	3.75	3.75	4.0	3.12	3.12	3.65

Construction: aluminum foil/Mylar insulation, epoxy impregnated.

Since it is not necessary to duplicate the circular mil area of a copper wire wound transformer and because of the efficient use of the winding area it is possible to use a smaller core volume to support the flux density required for any given load. The smaller core and the lighter weight of the aluminum foil all contribute to a reduction in weight and volume.

ADDITIONAL PRODUCTS AND CAPABILITIES:

Electro Cube manufactures wire wound and foil wound transformers, both laminated and C-core, toroids and special inductors. Through company funded development and testing, Electro Cube introduced the first commercially available autotransformers in 10KVA and lower ratings, and has developed processing techniques that make these devices reliable and economical. Electro Cube also can supply aluminum foil chokes with advantages similar to those of foil wound transformers. Electro Cube also manufactures precision film capacitors, EMI filters and RC networks.

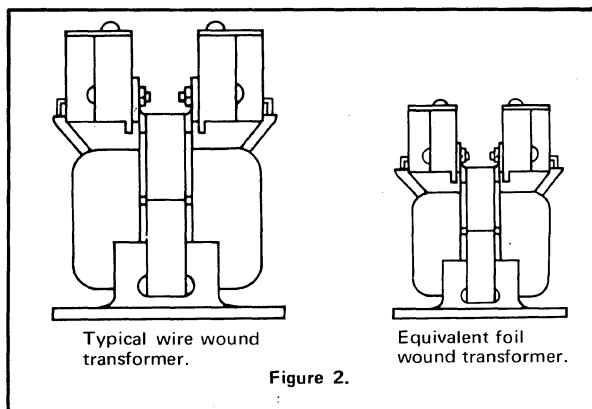


Figure 2.

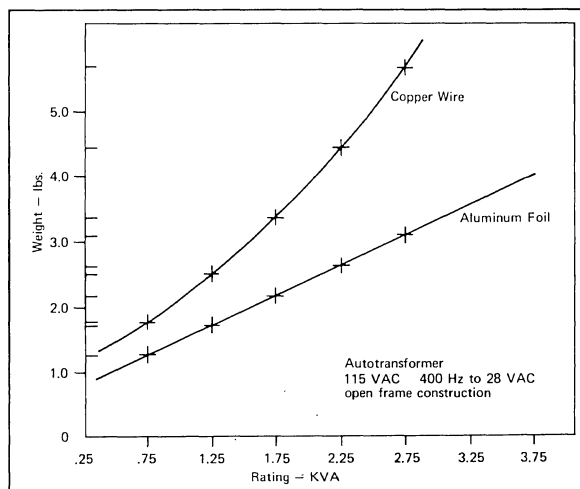


Figure 3. Weight comparison - copper wire vs aluminum foil coil transformers.



electrocube

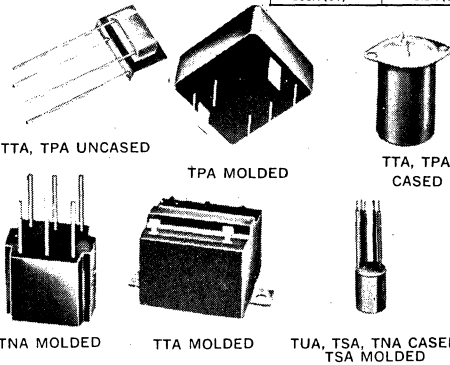
1710 South Del Mar Avenue
San Gabriel, California 91776
Telephone: (213) 283-0511
TWX: 910-589-1609

FREED TRANSFORMER CO., INC.

SUB-MINIATURE TRANSISTOR AUDIO TRANSFORMERS

These high quality miniature transformers are high efficiency audio components featuring hermetic sealing for maximum protection against electrolysis and subsequent corrosion of fine wires caused by moisture penetration. The units are constructed in accordance with MIL-T-27 Specifications. Transistor transformers can also be supplied in an open or encapsulated type of construction.

TYPE		TSA		TNA		TPA		TTA		
MAX. POWER		300 MW		1 W		3 W		5 W		
FREQ. RESPONSE		3-15 KHz ±2 DB		2-15 KHz ±2 DB		.15-15 KHz ±2 DB		.15-15 KHz ±2 DB		
SIZE	UNCASED						$\frac{1}{4} \times \frac{1}{2} \times \frac{1}{4}$		$\frac{1}{4} \times \frac{1}{2} \times \frac{1}{4}$	
	CASED MIL-T-27 -4RX		$\frac{1}{4} \text{ D.} \times \frac{1}{2} \text{ H.}$		$\frac{1}{4} \text{ D.} \times \frac{1}{2} \text{ H.}$		$\frac{1}{4} \text{ D.} \times \frac{1}{2} \text{ H.}$		$\frac{1}{4} \text{ D.} \times \frac{1}{2} \text{ H.}$	
	MOLDED MIL-T-27 -5RX		$\frac{1}{2} \text{ D.} \times \frac{1}{2} \text{ H.}$		$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$		$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$		$\frac{1}{2} \times \frac{1}{2} \times \frac{1}{2}$	
MATCHING IMP.										
Pri.	Sec.	Cat. No.	Max. I (MA) Total Pri.	Max I dc (MA) Unbal. $\frac{1}{2}$ Pri.	Cat. No.	Max I (MA) Total Pri.	Max I dc (MA) Unbal. $\frac{1}{2}$ Pri.	Cat. No.	Max. I (MA) Total Pri.	Max I dc (MA) Unbal. $\frac{1}{2}$ Pri.
150 (CT)	3.2	28	44	12	28	81	16	30	140	20
150 (CT)	12	29	44	12	29	81	16	31	140	20
150 (CT)	50	30	44	12	30	81	16	32	140	20
300 (CT)	3.2	31	32	8	31	58	14	33	100	16
300 (CT)	12	32	32	8	32	58	14	34	100	16
300 (CT)	50	33	32	8	33	58	14	35	100	16
500 (CT)	500	34	25	6	34	45	10	36	78	12
600 (SP)	1.2	1	23	6	1	41	8	1	71	8
600 (SP)	17	2	23	6	2	41	8	2	71	10
600 (SP)	50	35	23	6	35	41	8	3	71	10
600 (SP)	600 (SP)	36	23	6	36	41	8	4	71	10
1K (CT)	1.2K (CT)	22	23	7	22	41	8	37	71	10
1K (CT)	3.2	17	17	4	17	32	6	38	55	8
1K (CT)	50	26	17	4	26	32	6	39	55	8
1.2K (SP)	1.2	5	16	4	5	29	6	40	55	8
1.2K (SP)	50	38	16	4	38	29	6	41	50	8
1.2K (SP)	600 (SP)	6	16	4	6	29	6	42	50	8
2K (SP)	3.2	7	12	3	7	22	5	43	39	6
2K (SP)	12	8	12	3	8	22	5	9	39	6
2K (SP)	50	9	12	3	9	22	5	11	39	6
4K (SP)	3.2	10	9	2	10	16	3	12	27	4
4K (SP)	12	11	9	2	11	16	3	13	27	4
4K (SP)	600 (SP)	12	9	2	12	16	3	14	27	4
10K (SP)	3.2	13	5	1	13	10	2	15	17	3
10K (CT)	50	14	5	1	14	10	2	16	17	3
10K (SP)	600 (SP)	15	5	1	15	10	2	17	17	3
10K	10K	40	10	1	40	10	1.5	18	17	3
10K	10K (SP)	16	5	1	16	10	1.5	20	17	1.8
20K (CT)	50	25	4	.8	25	7	1	21	12	2
20K (CT)	600 (CT)	41	7	.8	41	7	1	22	12	2
25K (CT)	23	3	3	.8	23	7	1	23	11	2
25K (CT)	1.2K (CT)	21	3	.8	21	7	1	24	11	2
50K (CT)	18	2	2	.6	18	4	1	25	8	1
50K (CT)	500 (CT)	17	2	.6	17	4	1	26	8	1
50K (CT)	1.2K (CT)	20	2	.6	20	4	1	27	8	1
100K (CT)	1K (CT)	27	2	.4	27	3	.8	28	5	1
100K (CT)	1.2K (CT)	19	2	.4	19	3	.8	29	5	1



TYPE		TUA		UNCASED		CASED MIL-T-27 -4RX		1/2 D. x 1/2 H.	
MAX. POWER		100 MW							
FREQ. RESPONSE		4-15 KHZ ±2 DB							
MATCHING IMP.									
Pri.	Sec.	Cat. No.	Max. I (MA) Total Pri.	Max. I dc (MA) Unbal. 1/2 Pri.	Pri.	Sec.	Cat. No.	Max. I (MA) Total Pri.	Max. I dc (MA) Unbal. 1/2 Pri.
150 (CT)	3.2	16	26	10	2K (CT)	3.2	28	7	2.5
150 (CT)	12	17	26	10	2K (CT)	12	29	7	2.5
150 (CT)	50	21	26	10	4K (CT)	600	30	7	2.5
300 (CT)	3.2	18	18	7	4K (CT)	3.2	8	5	1.5
300 (CT)	12	22	18	7	4K (CT)	12	9	5	1.5
300 (CT)	500	23	18	7	4K (CT)	600	10	5	1.5
600 (CT)	3.2	1	13	5	10K (CT)	3.2	11	3	1
600 (CT)	12	2	13	5	10K (CT)	12	12	3	1
600 (CT)	50	13	13	5	10K (CT)	50	13	3	1
600 (CT)	600	3	13	5	10K (CT)	600	18	3	1
600 (CT)	1.2K	24	13	5	1K (CT)	1.2K (CT)	31	3	1
1K (CT)	1.2K (CT)	4	10	3.5	20K (CT)	50	32	2	1
1K (CT)	50	25	10	3.5	20K (CT)	600 (CT)	33	2	1
1.2K (CT)	3.2	14	10	3.5	25K (CT)	600 (CT)	34	2	1
1.2K (CT)	50	26	9	3.5	25K (CT)	1.2K (CT)	35	2	1
1.2K (CT)	600	27	9	3.5	50K (CT)	6 (CT)	36	1	1
1.2K (CT)	600	6	9	3.5	50K (CT)	500 (CT)	37	1	1
					50K (CT)	1.2K (CT)	38	1	1

CT = Center Tap. SP = Split Winding.

MINIATURE AUDIO TRANSFORMERS

These high quality, miniature transformers feature hermetically sealed for maximum protection from moisture penetration with subsequent electrolysis and corrosion of fine wires. While primarily intended for non-military equipment, these units are constructed in accordance with MIL-T-27 Specifications.

Frequency response:
±2DB 30-20,000 Hz
±2DB 200-10,000 Hz
All units supplied in DM-20 cases

CASE DIMENSIONS



DM-20 CASE

Height: 1 1/8"
Dia.: 1 1/8"
Mtg. Cen.: 1 1/8" to 1 3/8"
Mtg. 2 holes: 166 x .120
Flange Lgth.: 1 1/32"
Flange D.: .975"

Catalog No.	Application	MIL Type	Impedance Level Ohms		Max. Power Level DBM	Ratio	Equiv. Shield. D.B.	Max. Pri. Side Ma.	D.C. Unbal. Ma.	Catalog No.
			Primary	Secondary						
PMA 1	Line or microphone to single or push-pull grids.	TF4RX10YY	50/200/500	60,000 C.T.	+8	1:11		0	0	PMA 1
PMA 2	Dynamic microphone or speaker voice coil to single or P.P. grid.	TF4RX10YY	4/8	60,000 C.T.	+8	1:86.6		0	0	PMA 2
PMA 3	Line or microphone to single or push-pull grids. Magnetically shielded.	TF4RX10YY	50/200/500	60,000 C.T.	+8	1:11	30	0	0	PMA 3
PMA 4	Single triode plate to single or push-pull grids.	TF4RX10YY	15,000	60,000 C.T.	+8	1:2		0	0	PMA 4
PMA 5*	Single triode plate to push-pull grids.	TF4RX12YY	15,000	60,000 C.T.	+8	1:2		2	2	PMA 5*
PMA 6	Single triode plate to multiple line.	TF4RX16YY	15,000	50/200/500	+8	5.48:1		0	0	PMA 6
PMA 7*	Single triode plate to multiple line.	TF4RX12YY	15,000	50/200/500	+8	5.48:1		2	2	PMA 7*
PMA 8	Push-pull triode plates to multiple line.	TF4RX12YY	30,000 C.T.	50/200/500	-8	7.75:1		2	0.25	PMA 8
PMA 9	Crystal mike or pickup to multiple line.	TF4RX16YY	60,000 C.T.	50/200/500	+8	11:1		0	0	PMA 9
PMA 10	Mixing or matching.	TF4RX16YY	50/200	50/200/500	+8	1:1.50		0	0	PMA 10
PMA 11	Parallel Feed Reactor.	TF4RX20YY	40 hy, 3 ma dc.	3500 ohms d.c. resistance						PMA 11
PMA 12	Microphone or line to grid.	TF4RX10YY	50/200/500	60,000 C.T.	+5	1:11		0	0	PMA 12
PMA 13	Mixing and matching.	TF4RX16YY	150/600	600 C.T.	-8	1:1		0	0	PMA 13
PMA 14	Single triode plate to push-pull grids.	TF4RX15YY	15,000	95,000 Split	+5	1:2.5		0	0	PMA 14
PMA 15*	Single triode plate to push-pull grids.	TF4RX15YY	15,000	95,000 Split	15	1:2.5		4	4	PMA 15*

MINIATURE TRANSISTOR TRANSFORMERS

Catalog No.	MIL Type	Impedance Ohms			Frequency Response Hz	Unbalance Primary Current	D.C. Resistance Ohms		Max. Power Output M.W.	Catalog No.
		Pri.	CT.	Sec.			Pri.	Sec.		
TMA 1*	TF4RX16YY	500		500	1 200 to 15,000	0	18	24	250	TMA 1*
TMA 2*	TF4RX12YY	50K		500	2 300 to 15,000	3	2,200	49	250	TMA 2*
TMA 3*	TF4RX13YY	50K		6	2 300 to 15,000	3	2,200	55	250	TMA 3*
TMA 4*	TF4RX12YY	100K	1.2K	✓	3 300 to 15,000	1	2,790	95	100	TMA 4*
TMA 5*	TF4RX12YY	25K	1.2K	✓	2 200 to 15,000	3	1,740	110	250	TMA 5*
TMA 6*	TF4RX12YY	50K	1.2K	✓	2 300 to 15,000	3	2,200	106	250	TMA 6*
TMA 7*	TF4RX17YY	600/150	1.2K	✓	1 200 to 15,000	4	30	95	250	TMA 7*
TMA 8*	TF4RX12YY	25K		600	2 200 to 15,000	3	1,740	61	250	TMA 8*
TMA 9*	TF4RX12YY	4K	✓	600/150	1 200 to 15,000	1	274	43	250	TMA 9*
TMA 10*	TF4RX13YY	2K		3.2	2 200 to 15,000	10	160	28	250	TMA 10*
TMA 11*	TF4RX13YY	4K	✓	3.2	1 200 to 15,000	1	274	26	250	TMA 11*
TMA 12*	TF4RX13YY	20K		50	2 300 to 15,000	4	1,340	2.9	250	TMA 12*
TMA 13*	TF4RX17YY	1K		50	2 300 to 15,000	8	42.6	2.5	250	TMA 13*
TMA 14*	TF4RX16YY	100K	1K	✓	2 300 to 15,000	0	1,550	16.8	100	TMA 14*

*When ordering open units specify TMO — when ordering encapsulated units specify TMC.

FREED TRANSFORMER CO., INC.

MIL-T-27 COMPONENTS

TRANSISTOR SUPPLY TRANSFORMERS

TST SERIES

Manufactured and Guaranteed to
Specifications MIL-T-27

TST-6 — Frequency 57 Hz to 63 Hz — Primary
115 volts units with * primary 115 and/or
230 volts

TST-4 — Frequency 380 Hz to 1000 Hz —
Primary 115 volts

TST units can be supplied in commercial type construction
(channel or shell type with leads).

**When ordering specify (6) for 57 to 63 Hz and (4) for 380 to 1000 Hz

D.C. to RMS Conversion Chart

Resistive or Inductive Loads		Capacitive Loads	
Full Wave Center Tapped	Full Wave Bridge	Full Wave Center Tapped	Full Wave Bridge
$E_{RMS} = 2.22 E_{dc}$	$E_{RMS} = 1.11 E_{dc}$	$E_{RMS} = 1.6 E_{dc}$	$E_{RMS} = 1.8 E_{dc}$
$I_{RMS} = .75 I_{dc}$	$I_{RMS} = 1.05 I_{dc}$	$I_{RMS} = 1.1 I_{dc}$	$I_{RMS} = 1.55 I_{dc}$

E_{dc} — should include voltage drop across reactor and voltage drop across one diode for F.W.C.T. and voltage drop across two diodes for F.W. Bridge

R.M.S. Output			Case	
Part No.	Volt	Amp	-4	-6
TST (**)-1	6.3 CT	.30	AH	AH
TST (**)-2	6.3 CT	.60	AH	AJ
TST (**)-3	12.6 Split	.80	AJ	EB
TST (**)-4	12.6 Split	1.5	AJ	FA
TST (**)-5	12.6 Split	2.0	AJ	GB*
TST (**)-6	25.2 Split	1.5	EB	GA*
TST (**)-7	25.2 Split	4.0	GB	JA*
TST (**)-8	30 Split	.50	AJ	FA
TST (**)-9	30 Split	1.0	AJ	GB*
TST (**)-10	30 Split	1.5	EB	GA*
TST (**)-11	30 Split	2.0	FA	HA*
TST (**)-12	40 Split	.50	AJ	FA
TST (**)-13	40 Split	1.0	EB	GA*
TST (**)-14	40 Split	1.5	FA	HA*
TST (**)-15	40 Split	2.0	FA	JB*
TST (**)-16	50 Split	.50	AJ	GB*
TST (**)-17	50 Split	1.0	FA	GA*
TST (**)-18	50 Split	1.5	FA	JB*
TST (**)-19	50 Split	2.0	GB	JA*
TST (**)-20	60 Split	.50	AJ	GB*
TST (**)-21	60 Split	1.0	FA	HA*
TST (**)-22	60 Split	1.5	FA	JA*
TST (**)-23	70 Split	.50	EB	GA*
TST (**)-24	70 Split	1.0	FA	JB*
TST (**)-25	70 Split	1.5	GB	JA*
TST (**)-26	80 Split	.25	AJ	FA
TST (**)-27	80 Split	.50	EB	GA*
TST (**)-28	80 Split	1.0	FA	JB*
TST (**)-29	90 Split	.25	AJ	GB*
TST (**)-30	90 Split	.50	EB	GA*
TST (**)-31	90 Split	1.0	FA	JA*
TST (**)-32	100 Split	.25	AJ	GB*
TST (**)-33	100 Split	.50	FA	GA*
TST (**)-34	100 Split	1.20	GA	KB*

STANDARD MILITARY AUDIO TRANSFORMERS

Frequency Response 300-10,000 Hz ± 2 DB

Catalog No.	Application	Type Designation	Impedance Level in Ohms		Ratio	Max. Power Level DBM	Pri. D.C. Per Side in Ma	Max. D.C. unbalance	Case
			Primary	Secondary					
MGA 1	Transformer; interstage, single or P.P. plates to single or P.P. grid	TF4RX15AJ	10,000 C.T.	90,000 split and C.T.	1:3 overall	+15	10	10	AJ
MGA 2	Transformer; matching 600 ohm line to voice coil.	TF4RX16AJ	600 split	4, 8, 16	6.12:1 overall	+33	0	0	AJ
MGA 3	Transformer; input, 600 ohm line to single or P.P. grids.	TF4RX10AJ	600 split	135,000 C.T.	1:15	+15	0	0	AJ
MGA 4	Transformer; matching, 600 ohm line to 600 ohm line.	TF4RX16AJ	600 split	600 split	1:1	+15	0	0	AJ
MGA 5	Transformer; output, single plate 7,600 ohm, 4,800 ohm to 600 ohm line.	TF4RX13AJ	7,600 tap @ 4,800	600 split	3.56:1	+33	40	40	AJ
MGA 6	Transformer; output, single plate 7,600 ohm, 4,800 ohm to voice coil.	TF4RX13AJ	7,600 tap @ 4,800	4, 8, 16	21.8:1	+33	40	40	AJ
MGA 7	Transformer; output, single or P.P. plates to 600 ohm line.	TF4RX13AJ	15,000 C.T.	600 split	5:1	+33	10	10	AJ
MGA 8	Transformer; output, P.P. plates to 600 ohm line.	TF4RX13AJ	24,000 C.T.	600 split	6.32:1	+30	10	1	AJ
MGA 9	Transformer; output, P.P. plates to 600 ohm line.	TF4RX13AJ	60,000 C.T.	600 split	10:1	+27	10	1	AJ

STANDARD MILITARY POWER AND FILAMENT TRANSFORMERS

Primary 105/115/125V 60~

SINGLE PHASE 400 Hz, AND THREE PHASE 60 AND 400 Hz TRANSFORMERS CAN BE SUPPLIED ON SPECIAL ORDER.

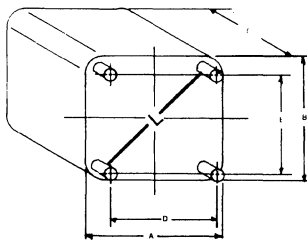
Catalog No.	MIL-T-27 Type Designation	Hi Volt	D.C. Volts	D.C. Amps	Fil. No. 1	Fil. No. 2	Case
MGP 1	TF4RX03HA001	200/100/0/100/200	185	.070	5 6.3V @ 2A	6.3V @ 3A	HA
MGP 2	TF4RX03JB002	650 C.T.	260	.070	5 6.3V @ 2A	6.3V @ 4A	JB
MGP 3	TF4RX03KB006	650 C.T.	245	.150	6.3V @ 3A	6.3V @ 3A	KB
MGP 4	TF4RX03LB003	800 C.T.	318	.175	5V @ 3A	6.3V @ 8A	LB
MGP 5	TF4RX03MB004	900 C.T.	345	.250	5V @ 3A	6.3V @ 8A	MB
MGP 6	TF4RX02KB001	700 C.T.	255	.250			KB
MGP 7	TF4RX02LB002	1100 C.T.	419	.250			LB
MGP 8	TF4RX02NB003	1600 C.T.	640	.250			NB

Catalog No.	MIL-T-27 Type Designation	Secondary Volts	Secondary Current Amps	Secondary Test Volts RMS	Case
MGF 1	TF4RX01EB002	2.5	3.0	2,500	EB
MGF 2	TF4RX01GB003	2.5	10.0	2,500	GB
MGF 3	TF4RX01FB004	5.0	3.0	2,500	FB
MGF 4	TF4RX01HB005	5.0	10.0	2,500	HB
MGF 5	TF4RX01FB006	6.3	2.0	2,500	FB
MGF 6	TF4RX01GB007	6.3	5.0	2,500	GB
MGF 7	TF4RX01JB008	6.3	10.0	2,500	JB
MGF 8	TF4RX01KB009	6.3	20.0	2,500	KB
MGF 9	TF4RX01JB012	2.5	10.0	10,000	JB
MGF 10	TF4RX01KB013	5.0	10.0	10,000	KB

PULSE TRANSFORMERS

Catalog No.	MIL Type	Blocking Oic.	Inter-stage Coupling	Low Power Output	Pulse Voltage Kilovolts	Pulse Duration Micro-seconds	Duty Rate	No. of Windings	Test Voltage KV RMS	Character-istic Impedance Ohms	Case No.
MPT-1	TF4RX35YY	✓	✓		0.25/0.25/0.25	0.2-1.0	.004	3	0.7	250	DM-20
MPT-2	TF4RX35YY	✓	✓		0.25/0.25	0.2-1.0	.004	2	0.7	250	DM-20
MPT-3	TF4RX35YY	✓	✓		0.5/0.5/0.5	0.2-1.5	.002	3	1.0	250	DM-18
MPT-4	TF4RX35YY	✓	✓		0.5/0.5	0.2-1.5	.002	2	1.0	250	DM-18
MPT-5	TF4RX35YY	✓	✓		0.5/0.5/0.5	0.5-2.0	.002	3	1.0	500	DM-20
MPT-6	TF4RX35YY	✓	✓		0.5/0.5	0.5-2.0	.002	2	1.0	500	DM-20
MPT-7	TF4RX35YY	✓	✓	✓	0.7/0.7/0.7	0.5-1.5	.002	3	1.5	200	DM-18
MPT-8	TF4RX35YY	✓	✓	✓	0.7/0.7	0.5-1.5	.002	2	1.5	200	DM-18
MPT-9	TF4RX35YY	✓	✓	✓	1.0/1.0/1.0	0.7-3.5	.002	3	2.0	200	DM-18
MPT-10	TF4RX35YY	✓	✓	✓	1.0/1.0	0.7-3.5	.002	2	2.0	200	DM-18
MPT-11	TF4RX35YY	✓	✓	✓	1.0/1.0/1.0	1.0-5.0	.002	3	2.0	500	DM-01
MPT-12	TF4RX35YY	✓	✓	✓	0.15/0.15/0.3/0.3	0.2-1.0	.004	4	0.7	700	DM-8

MIL CASES,
NOMINAL
DIMENSIONS,
INCHES



Mil Case	A	B	C	D	L	E	Mtg. Lbs.	Wt. Lbs.
AH	1 1/16	1 1/16	1 3/4		1 1/4		6-32 x 3/8	3/8
AJ	1 3/8	1 1/8	2 3/8	1 3/8		1 3/8	6-32 x 3/8	7/8
EA	1 1/16	1 1/16	2 3/4	1 3/8		1 1/4	6-32 x 3/8	1
EB	1 1/16	1 1/16	2 1/16	1 3/8		1 1/4	6-32 x 3/8	7/8
FA	2 1/16	2 1/16	3 3/8	1 1/16		1 1/8	6-32 x 3/8	1 1/4
FB	2 1/16	2 1/16	2 1/2	1 1/16		1 1/8	6-32 x 3/8	1 1/2
GA	2 3/4	2 3/8	3 1/16	2 3/8		1 3/4	6-23 x 3/8	3 1/2
GB	2 3/4	2 3/8	2 1/16	2 3/8		1 3/4	6-32 x 3/8	2 1/2
HA	3 1/16	2 3/8	4 1/4	2 1/16		1 5/8	8-32 x 3/8	4 1/2
HB	3 1/16	2 3/8	3 3/8	2 1/16		1 5/8	8-32 x 3/8	3 1/2
JA	3 1/16	3 1/16	4 3/8	2 3/8		2 3/8	8-32 x 3/8	6
JB	3 1/16	3 1/16	3 3/8	2 3/8		2 3/8	8-32 x 3/8	5
KA	3 1/16	3 3/8	5 1/4	3		2 1/8	10-32 x 1/2	8 1/2
KB	3 1/16	3 3/8	4 3/8	3		2 1/8	10-32 x 1/2	7

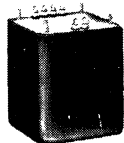
FREED TRANSFORMER COMPANY, INC. 1795 WEIRFIELD ST. (Ridgewood) Brooklyn, N. Y. 11227

TRANSFORMERS FREED TRANSFORMER CO., INC.

TRANSISTORIZED CONVERTERS - TDC LINE

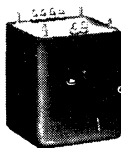
For DC/DC conversion from low voltage DC sources to high voltage DC output. Stock units are available in power capabilities to 45 watts, with input voltages of 6, 12, 24, 28, and 48 volts.

All TDC converters are hermetically sealed and oil filled. Outputs are filtered with ripple less than .1%. Operating temperatures from -55°C to +70°C. They are ruggedly built to withstand shock and vibration.



CAT. #	NOM. VDC INPUT	VDC OUT	MAX 1 OUT MA	CASE SIZE
TDC 6-15-05	6	150	50	
TDC 12-30-15	12	300	150	2 1/2 x 2 1/2 x 3 1/2
TDC 12-25-12	12	250	120	2 1/2 x 2 1/4 x 3 1/2
TDC 12-30-05	12	300	50	2 x 2 1/4 x 3 1/2
TDC 12-20-05	12	200	50	2 x 2 1/4 x 3 1/2
TDC 12-12-12	12	120	120	2 x 2 1/4 x 3
TDC 12-2.4-100	12	24	1000	2 1/4 x 2 1/2 x 3 1/2
TDC 28-30-15	28	300	150	2 1/2 x 2 1/4 x 3 1/2
TDC 28-25-12	28	250	120	2 1/2 x 2 1/4 x 3 1/2
TDC 28-30-05	28	300	50	2 x 2 1/4 x 3 1/2
TDC 28-20-05	28	200	50	2 x 2 1/4 x 3 1/2
TDC 48-20-15	48	200	150	2 1/2 x 2 1/4 x 3 1/2
TDC 48-30-15	48	300	150	2 1/2 x 2 1/4 x 3 1/2

DC TO AC TRANSISTOR INVERTERS - TAC LINE



115 volt outputs at 60 Hz at powers ranging from 50 VA to 350 VA.

Output wave form-square wave; Output frequency - 60 Hz $\pm$ 1 Hz;

Hermetically sealed-oil filled; Maximum operating temperature - 70°C.

AVAILABLE TYPES:			
CAT. #	NOM. VDC IN	OUTPUT VA	SIZE
TAC 6-50	6	50	4 1/2 x 3 1/2 x 4 1/2
TAC 12-50	12	50	4 1/2 x 3 1/2 x 4 1/2
TAC 12-90	12	90	4 1/2 x 3 1/2 x 4 1/2
TAC 12-175	12	175	5 x 4 1/2 x 6
TAC 28-50	28	50	4 1/2 x 3 1/2 x 4 1/2
TAC 28-100	28	100	4 1/2 x 3 1/2 x 4 1/2
TAC 28-175	28	175	5 x 4 1/2 x 6
TAC 28-250	28	250	5 1/2 x 5 x 6 1/2
TAC 28-350	28	350	5 1/2 x 5 x 6 1/2

TAC converters are also available with 400 Hz outputs in three models:

TAC 12-100-4	12	100	4 1/2 x 3 1/2 x 4 1/2
TAC 28-150-4	28	150	4 1/2 x 3 1/2 x 4 1/2
TAC 28-250-4	28	250	5 x 4 1/2 x 6

DC TO AC TRANSISTOR INVERTERS - PTC LINE

A new line of DC/AC inverters for operation from a 12 volt D.C. source. Output is square wave, 115 volts RMS at 60 Hz. Regulated to $\pm$ 2 Hz over an input voltage range of 10.5 to 13.5 VDC.

Efficiency on all units is 80% min. at full load. Ambient temperature to 55°C.

Available models listed below:

CAT. #	VA OUT	SIZE	MTG.
PTC 12-15	15	3 x 2 1/2 x 4	1 1/2 x 1 1/2
PTC 12-50	50	3 1/2 x 3 x 4 1/2	2 x 2 1/2
PTC 12-100	100	5 1/2 x 4 x 5 1/4 HI	3 1/4 x 3 1/2
PTC 12-175	175	7 1/2 x 4 1/2 x 5 1/4 HI	6 x 3 1/2

PTC 12-15 and PTC 12-50 are supplied with 4-terminal headers for input and output connections.

PTC 12-100 and PTC 12-175 use barrier strip terminals and in addition have an auxiliary output receptacle.

DC TO AC TRANSISTOR INVERTERS - VC LINE

A low priced efficient transistor inverter for applications not requiring frequency regulation closer than $\pm$ 5 Hz is available in 15 VA and 100 VA output capabilities. Input nominal 12 V.D.C. Output square wave 115 volt.

Cat. #	Power	Freq.	Size
VC 12-15	15 watt	55-65 Hz	3 x 3 1/2 x 3 1/4 HI.
VC 12-100	100 watt	55-65 Hz	4 1/2 x 3 1/2 x 4 1/2 HI.

MCV - CONSTANT VOLTAGE TRANSFORMERS - MCV (FERRO-RESONANT TRANSFORMERS)

The MCV line of constant voltage transformers provides accurate regulation against line and/or load variations, without the use of tubes or moving parts.

Input Voltage Range 95 to 130

Rated output within : 2% of nominal value. Regulation automatically maintained within : 1%.

Regulation from 25% to full load : 2%.

- MILITARY SPECIFICATIONS
- NO TUBES
- COMMERCIAL
- NO MOVING PARTS
- ACCURATE REGULATIONS
- FAST RESPONSE
- FULLY AUTOMATIC
- SUPPLIED WITH CONDENSERS

Reg. Output in R.M.S. Volts	Output in V.A. P.F.-1	CATALOG NUMBERS			
		60 Cycles		400 Cycles	
		Comm.	Military*	Comm.*	Military*
115	5	MCV65LC	MCV65LM	MCV45LC	MCV45LM
115	25	MCV625LC	MCV625LM	MCV425LC	MCV425LM
115	75	MCV675LC	MCV675LM	MCV475LC	MCV475LM
115	125	MCV6125LC	MCV6125LM	MCV4125LC	MCV4125LM
115	175	MCV6175LC	MCV6175LM	MCV4175LC	MCV4175LM
115	250	MCV6250LC	MCV6250LM	MCV4250LC	MCV4250LM
115	375	MCV6375LC	MCV6375LM	MCV4375LC	MCV4375LM
115	500	MCV6500LC	MCV6500LM	MCV4500LC	MCV4500LM
115	750	MCV6750LC	MCV6750LM	MCV4750LC	MCV4750LM
115	1000	MCV61000LC	MCV61000LM	MCV41000LC	MCV41000LM
26	5	MCV654FC	MCV654FM	MCV454FC	MCV454FM
26	25	MCV6254FC	MCV6254FM	MCV4254FC	MCV4254FM
26	75	MCV6754FC	MCV6754FM	MCV4754FC	MCV4754FM
26	125	MCV61254FC	MCV61254FM	MCV41254FC	MCV41254FM
6.4	5	MCV65FC	MCV65FM	MCV45FC	MCV45FM
6.4	25	MCV625FC	MCV625FM	MCV425FC	MCV425FM
6.4	75	MCV675FC	MCV675FM	MCV475FC	MCV475FM
6.4	125	MCV6125FC	MCV6125FM	MCV4125FC	MCV4125FM

*Condensers are not provided with units. Where condensers are provided they are external to units.

AVAILABLE UPON REQUEST MAGNETIC AMPLIFIERS AND SATURABLE TRANSFORMERS

FREED TRANSFORMER COMPANY, INC. 1795 WEIRFIELD ST. (Ridgewood) Brooklyn, N. Y. 11227

FREED TRANSFORMER CO., INC.

HERMETICALLY SEALED MINIATURE AND SUB-MINIATURE FILTERS TO MIL-F-18327

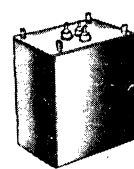
Freed Standard Filters are Hermetically Sealed Miniature and Sub-Miniature high performance components designed for both production and laboratory applications in the Communications and Electronic industry. In order to achieve attenuation requirements not obtainable with one single filter, one can combine several standard filters of different transmission characteristics. Wide Band Pass characteristics are obtainable by combining low and high Pass Units. The astatic construction of inductive components together with special shielding reduces the hum pick-up of the standard filters.

Low Pass Filters: The attenuation characteristics of Low Pass Filters are 6db or less at cut-off frequency • **ILP-ILM Interstage Low Pass Filter.** Characteristic impedance 10,000 ohms, in and out • **LLP-LLM Line Low Pass Filter.** Characteristic impedance 500 to 600 ohms, in and out • **High Pass Filters:** The attenuation characteristics of High Pass Filters are 6db or less at cut-off frequency • **IHP-IHM Interstage High Pass Filter.** Characteristic impedance 10,000 ohms, in and out • **LHP-LHM Line High Pass Filter.** Characteristic impedance 500 to 600 ohms, in and out • **Band Pass Filters:** The attenuation characteristics of Band Pass Filters are 2db or less at plus or minus 3% of center frequency • **IBP-IBM Interstage Band Pass Filter.** Normal input impedance—10,000 ohms. Output impedance .5 megohms. Effective voltage step-up 2:1. (Output voltage to source voltage) • **LBP-LBM Line Band Pass Filter.** Nominal input impedance 500 to 600 ohms. Output impedance .5 megohms. Effective voltage step-up 5:1. (Output voltage to source voltage.)

Special filters in all six types are available upon request.

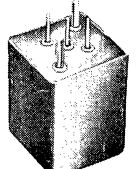
MINIATURE			SUB-MINIATURE		
Catalog No.	Cut-off Frequency Hz		Catalog No.	Cut-off Freq. Hz	Case No.
ILP-100	100	Low Pass Filters attenuation ≅ 35 Db at 1.5 x Fc ≅ 40 Db at 2 x Fc	ILM-300	300	DF-01
ILP-200	200		ILM-500	500	DF-01
ILP-300	300		ILM-750	750	DF-01
ILP-500	500		ILM-1,000	1,000	DF-01
ILP-750	750		ILM-1,500	1,500	DF-01
ILP-1,000	1,000		ILM-2,000	2,000	DF-01
ILP-1,500	1,500		ILM-2,500	2,500	DF-01
ILP-2,000	2,000		ILM-3,000	3,000	DF-01
ILP-2,500	2,500		ILM-5,000	5,000	DF-01
ILP-3,000	3,000		ILM-7,000	7,000	DF-01
ILP-5,000	5,000		ILM-10,000	10,000	DF-01
ILP-7,000	7,000		ILM-15,000	15,000	DF-01
ILP-10,000	10,000		ILM-20,000	20,000	DF-01
ILP-15,000	15,000		ILM-23,000	23,000	DF-01
ILP-20,000	20,000		ILM-25,000	25,000	DF-01
ILP-23,000	23,000		ILM-32,000	32,000	DF-01
ILP-25,000	25,000		ILM-130,000	130,000	DF-01
ILP-32,000	32,000		ILM-150,000	150,000	DF-01
ILP-130,000	130,000				
ILP-150,000	150,000				
LLP-500	500	Low Pass Filters attenuation ≅ 35 Db at 1.5 x Fc ≅ 40 Db at 2 x Fc	LLM-500	500	DF-03
LLP-1,000	1,000		LLM-1,000	1,000	DF-03
LLP-1,500	1,500		LLM-1,500	1,500	DF-02
LLP-1,600	1,600		LLM-1,600	1,600	DF-02
LLP-2,000	2,000		LLM-2,000	2,000	DF-02
LLP-2,500	2,500		LLM-2,500	2,500	DF-02
LLP-3,000	3,000		LLM-3,000	3,000	DF-02
LLP-16,000	16,000		LLM-16,000	16,000	DF-02
LLP-20,000	20,000		LLM-20,000	20,000	DF-02
LLP-70,000	70,000		LLM-70,000	70,000	DF-02
LLP-80,000	80,000		LLM-80,000	80,000	DF-02
IHP-200	200	High Pass Filters attenuation ≅ 35 Db at .67 x Fc ≅ 40 Db at .5 Fc	IHM-300	300	DF-01
IHP-250	250		IHM-400	400	DF-01
IHP-300	300		IHM-500	500	DF-01
IHP-400	400		IHM-1,000	1,000	DF-01
IHP-500	500		IHM-2,000	2,000	DF-01
IHP-1,000	1,000		IHM-3,000	3,000	DF-01
IHP-2,000	2,000		IHM-10,000	10,000	DF-01
IHP-3,000	3,000		IHM-15,000	15,000	DF-01
IHP-10,000	10,000				
IHP-15,000	15,000				
LHP-200	200	High Pass Filters attenuation ≅ 35 Db at .67 x Fc ≅ 40 Db at .5 Fc	LHM-300	300	DF-03
LHP-300	300		LHM-400	400	DF-03
LHP-400	400		LHM-500	500	DF-03
LHP-500	500		LHM-800	800	DF-03
LHP-800	800		LHM-1,000	1,000	DF-02
LHP-1,000	1,000		LHM-2,000	2,000	DF-02
LHP-2,000	2,000		LHM-6,000	6,000	DF-02
LHP-6,000	6,000		LHM-10,000	10,000	DF-02
LHP-10,000	10,000				
IBP-100	100	Band Pass Filters attenuation ≅ 40 Db at 0.5 x Fc and 2 x Fc	IBM-400	400	DF-02
IBP-200	200		IBM-500	500	DF-02
IBP-250	250		IBM-700	700	DF-02
IBP-400	400		IBM-800	800	DF-02
IBP-500	500		IBM-900	900	DF-02
IBP-700	700		IBM-1,000	1,000	DF-02
IBP-800	800		IBM-1,500	1,500	DF-02
IBP-900	900		IBM-2,000	2,000	DF-01
IBP-1,000	1,000		IBM-3,000	3,000	DF-01
IBP-1,500	1,500		IBM-5,000	5,000	DF-01
IBP-2,000	2,000		IBM-7,200	7,200	DF-01
IBP-3,000	3,000		IBM-10,000	10,000	DF-01
IBP-5,000	5,000		IBM-12,000	12,000	DF-01
IBP-7,200	7,200		IBM-15,000	15,000	DF-01
IBP-10,000	10,000		IBM-30,000	30,000	DF-01
IBP-12,000	12,000		IBM-57,600	57,600	DF-01
IBP-15,000	15,000				
IBP-30,000	30,000				
IBP-57,600	57,600				
LBP-100	100	Band Pass Filters attenuation ≅ 40 Db at 0.5 x Fc and 2 x Fc	LBM-300	300	DF-02
LBP-300	300		LBM-400	400	DF-02
LBP-400	400		LBM-600	600	DF-02
LBP-600	600		LBM-700	700	DF-02
LBP-800	800		LBM-1,000	1,000	DF-01
LBP-1,000	1,000		LBM-1,500	1,500	DF-01
LBP-1,500	1,500		LBM-2,000	2,000	DF-01
LBP-2,000	2,000		LBM-3,000	3,000	DF-01
LBP-3,000	3,000		LBM-7,200	7,200	DF-01
LBP-7,200	7,200		LBM-10,000	10,000	DF-01
LBP-10,000	10,000		LBM-14,400	14,400	DF-01
LBP-14,400	14,400		LBM-20,000	20,000	DF-01
LBP-20,000	20,000		LBM-28,800	28,800	DF-01
LBP-28,800	28,800				

ALL MINIATURE FILTERS ARE SUPPLIED IN DF-1 CASE



DF-1 CASE

Height: 2 1/2"
Width: 1 1/8"
Depth: 1 3/8"
Mtg. Cen.: 1 1/2" x 3/4"
Studs: 4 6-32 x 3/8"
Knockout: 3/8" dia.



DF CASE STYLE DF-01

Height: 1 3/8"
Width: 3/4"
Depth: 3/8"
Mtg. Cen.: 3/8" Diag.
Studs: 2 - 4-40

DF-02
Height: 1 3/8"
Width: 1"
Depth: 1"
Mtg. Cen.: 3/4" Diag.
Studs: 2 - 4-40

DF-03
Height: 1 3/8"
Width: 1"
Depth: 1"
Mtg. Cen.: 3/4" Diag.
Studs: 2 - 4-40

SUBMINIATURE TELEMETERING BAND PASS FILTERS

Type No.	Center Frequency Fo - in Hz	Band Width <3DB	Stop Band Attenuation
MTN-4	.4	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-.56	.56	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-.73	.73	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-.96	.96	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-1.3	1.3	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-1.7	1.7	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-2.3	2.3	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-3.0	3.0	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-3.9	3.9	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-5.4	5.4	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-7.35	7.35	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-10.5	10.5	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-14.5	14.5	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-22	22	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-30	30	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-40	40	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-52.5	52.5	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-70	70	±7 1/2%	≅ 38 DB @ 1.75 & .58 Fc
MTN-22	22	±15%	≅ 40 DB @ 2.5 & .4 Fc
MTW-30	30	±15%	≅ 40 DB @ 2.5 & .4 Fc
MTW-40	40	±15%	≅ 40 DB @ 2.5 & .4 Fc
MTW-52.5	52.5	±15%	≅ 40 DB @ 2.5 & .4 Fc
MTW-70	70	±15%	≅ 40 DB @ 2.5 & .4 Fc

DF-01 CASE SIZES DF-02
3/4 x 3/4 x 1 1/2 1 x 1 x 1 1/2
MTN-2.3 Thru MTW-70 MTN-14 Thru MTN 1.7

NULL "T" FILTERS SERIES 1950

Standard models are available for 30, 60 and 120 cycles in a wide range of impedances. Each network will give a minimum of 50 db attenuation at the null frequency.

The null frequency is adjusted to a tolerance of ±2%.

All Null T Filters are hermetically sealed.

Prices on request.

Catalog No.	Frequency
NTF-30	30 Hz
NTF-60	60 Hz
NTF-120	120 Hz

FREED TRANSFORMER CO., INC.

TOROIDAL INDUCTORS

Using the latest developments in the field of magnetic materials and new impregnation and molding techniques the Freed Transformer Co. makes available to the industry the most extensive line of toroidal inductors.

Freed toroids are available in three types of constructions. Open units coated with a special high temperature extremely low loss compound, hermetically sealed in metal cases or molded in special **Freed Epoxy Resin**. Both hermetically sealed and molded units meet the latest military specification MIL-T-27A(graded 1 or 4 and 2 or 5 respectively.) Freed toroidal inductors are supplied with either molypermalloy or carbonyl iron powder cores

1. Temperature Stabilization:

The molypermalloy and carbonyl iron powder cores have a temperature coefficient of inductance. Depending on the degree of temperature stabilization the cores have different temperature coefficients. The degree of stabilization is denoted by a two-letter code.

- SF Non-stabilized cores, $\pm 2\frac{1}{2}\%$ inductance variations from -55°C to $+85^{\circ}\text{C}$.
- SN Non-stabilized cores, $\pm 2\%$ inductance variations from -55°C to $+85^{\circ}\text{C}$.
- SE Temperature stabilized cores, $\pm 0.1\%$ to -0.4% inductance variations from -1.5°C to $+54^{\circ}\text{C}$.
- SB Temperature stabilized cores, $\pm 0.1\%$ inductance variations from $+13^{\circ}\text{C}$ to $+35^{\circ}\text{C}$.
- SD Temperature stabilized cores, $\pm 0.1\%$ inductance variations from -1.5°C to $+54^{\circ}\text{C}$.
- SW Temperature stabilized cores, $\pm 0.25\%$ inductance variations from -54°C to $+85^{\circ}\text{C}$.
- SM Temperature stabilized cores, $\pm 25\%$ -65°C to $+125^{\circ}\text{C}$.
- SP Temperature stable carbonyl iron cores, $\pm 0.3\%$ inductance variations from -55°C to $+85^{\circ}\text{C}$.

The temperature (stabilization) coefficient of an inductor will depend upon the nominal inductance value, operating frequency and A.C. voltage across the coil. Under some unfavorable working conditions the temperature coefficient of inductance corresponding to a given stability characteristic may be exceeded.

Toroids with special requirements such as tapped toroids, toroidal transformers, molded and cased units with dimensions other than standard sizes and high temperature toroids can be supplied on request. Our engineering and laboratory facilities are available for consultation, research and development.

TOROIDAL INDUCTORS

Type	Ω/H	Max. Norm. Idc	Max. Norm. Iac	Max. Norm. Vac	Uncased	Mold	Case	Frequency
TI-1	70	55	73.5	0.46	OS-8	MR-6	DT-3, DT-5	1-15 KHz
TI-1A	68	75	90.5	0.57	OS-9	MR-7	DT-4	1-15 KHz
TI-2	160	90	135	0.85	OS-6	MR-5	DT-3, DT-5	10-50 KHz
TI-3	600	100	67	0.42	OS-6	MR-5	DT-3, DT-5	50-200 KHz
TI-3A	310	150	240	1.5	OS-10	MR-8	DT-4	50-200 KHz
TI-4	110	55	67	0.42	OS-5	MR-4	DT-2, DM-11	1-15 KHz
TI-5	260	28	35	0.22	OS-3	MR-3	DT-1, DM-2	1-15 KHz
TI-6	230	75	125	0.80	OS-10	MR-8	DT-4	10-50 KHz
TI-7	480	40	53	0.33	OS-3	MR-3	DT-1, DM-2	10-50 KHz
TI-8	1,500	50	80	0.5	OS-3	MR-3	DT-1, DM-2	30-75 KHz
TI-9	150	200	240	1.5	OS-10	MR-3	DT-4	30-75 KHz
TI-10	430	125	270	1.7	OS-7	MR-5	DT-3, DT-5	30-75 KHz
TI-11	30	120	190	1.2	OS-11	MR-10	DT-4	1-15 KHz
TI-12	45	100	160	1	OS-9	MR-8	DT-4	1-15 KHz
TI-13	55	140	175	1.1	OS-9	MR-8	DT-4	10-50 KHz
TI-14	580	150	—	—	OS-5	MR-4	DT-2, DM-11	10-100 KHz
TI-15	900	100	—	—	OS-3	MR-3	DT-1, DM-2	10-100 KHz
TI-16	600	16	21	0.13	OS-1	MR-1, MS-1	DST-1	1-15 KHz
TI-17	1,200	20	29	0.18	OS-1	MR-1, MS-1	DST-1	10-50 KHz
TI-18	2,600	30	40	0.25	OS-1	MR-1, MS-1	DST-1	30-75 KHz

Type	Ω/H	Max. Norm. Idc	Max. Norm. Iac	Max. Norm. Vac	Uncased	Mold	Case	Frequency
TI-19	4,500	25	29	0.18	OS-1	MR-1, MS-1	DST-1	50-200 KHz
TI-20	2,750	100	*	*	OS-4	MR-3A	DT-2	20KHz-2MHz
TI-21	1,200	350	*	*	OS-1	MR-1, MS-1	DT-1	100KH -10MHz
TI-22	5,600	210	*	*	OS-2	MR-2	DT-1	50KHz-5MHz
TI-23	7,000	250	*	*	OS-2	MR-2	DT-1	50KHz-5MHz
TI-24	330	15	18	0.11	OS-1	MR-1, MS-1	DST-1	200Hz-12KHz
TI-25	200	20	24	0.15	OS-12	MR-2	DT-1	200Hz-12KHz
TI-26	150	25	32	0.20	OS-3	MR-3	DT-1, DM-3	200Hz-12KHz
TI-27	76.5	50	62	0.39	OS-5	MR-4	DT-2, DM-11	200Hz-12KHz
TI-28	48.5	50	64	0.40	OS-8	MR-6	DT-3, DT-5	200Hz-12KHz
TI-29	33.5	70	88	0.55	OS-9	MR-7	DT-4	200Hz-12KHz
TI-30	28	100	135	0.84	OS-9	MR-8	DT-4	200Hz-12KHz
TI-31	19.5	100	136	0.85	OS-11	MR-10	DT-4	200Hz-12KHz
TI-32	48.5	6	14.5	0.09	OS-3	MR-3	DT-1, DM-2	100Hz-10KHz
TI-33	2,150	8	13	0.08	OS-13	MR-11	DT-6	1-15 KHz
TI-34	1,700	8	9.5	0.06	OS-14	MR-11	DT-6	1-15 KHz
TI-35	4,100	10	18	0.11	OS-13	MR-11	DT-6	10-50 KHz
TI-36	3,950	10	11	0.07	OS-14	MR-11	DT-6	10-50 KHz
TI-37	23.5	10	32	0.20	OS-5	MR-14	DT-2, DM-11	100Hz-10KHz
TI-38	100	4	9.5	0.06	OS-1	MR-1, MS-1	DST-1	100Hz-10KHz

*TI-20 through TI-23 have a very low voltage coefficient and inductance will change very little with voltage. Because of high frequency application, the maximum voltage is limited rather by breakdown than by saturation.

$$\text{Normalized } V_{AC} = \frac{V}{F} \frac{1}{\sqrt{L_H}}$$

$$\text{Normalized } I_{AC} = I_{AC} \sqrt{L_H}$$

$$\text{Normalized } I_{DC} = I_{DC} \sqrt{L_H}$$

where F —operating frequency in Hz

L_H —inductance in henries

I_{AC} —A.C. current in MA

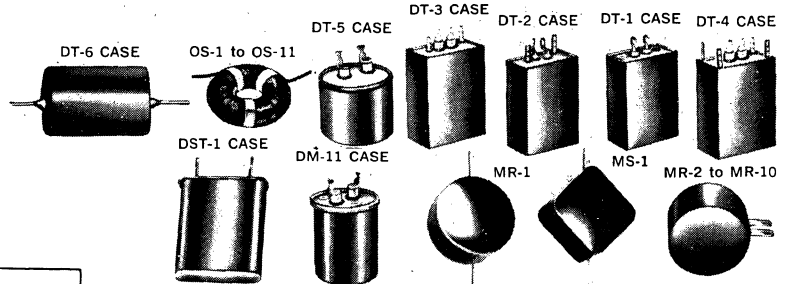
I_{DC} —D.C. current in MA

V —A.C. voltage across the core

UNCASED		
Type	O.D.	Hi.
OS-1	$\frac{5}{8}"$	$\frac{3}{16}"$
OS-2	$\frac{7}{8}"$	$\frac{3}{8}"$
OS-3	1"	$\frac{3}{8}"$
OS-4	1"	$\frac{3}{8}"$
OS-5	$1\frac{1}{8}"$	$\frac{5}{8}"$
OS-6	$1\frac{3}{8}"$	$\frac{7}{8}"$
OS-7	$1\frac{1}{2}"$	$\frac{3}{4}"$
OS-8	$1\frac{7}{8}"$	$1\frac{1}{8}"$
OS-9	$2\frac{1}{4}"$	$1\frac{1}{2}"$
OS-10	$2\frac{3}{4}"$	$1\frac{3}{4}"$
OS-11	$2\frac{3}{4}"$	$1\frac{3}{4}"$
OS-12	$\frac{1}{2}"$	$\frac{3}{4}"$
OS-13	$\frac{3}{4}"$	$\frac{1}{4}"$
OS-14	$\frac{3}{8}"$	$\frac{3}{32}"$

MOLDED			
Type	O.D.	Hi.	Clearance Hole Mounting
MR-1	$\frac{1}{4}"$	$\frac{1}{32}"$	Pig Tails
MR-2	$1\frac{1}{8}"$	$\frac{1}{2}"$	No. 4
MR-3	$1\frac{1}{8}"$	$\frac{1}{2}"$	No. 6
MR-3A	$1\frac{1}{8}"$	$\frac{1}{4}"$	No. 6
MR-4	$1\frac{1}{4}"$	$\frac{3}{4}"$	No. 8
MR-5	$1\frac{1}{2}"$	1"	No. 8
MR-6	$2\frac{1}{2}"$	$\frac{7}{8}"$	No. 8
MR-7	$2\frac{3}{4}"$	$1\frac{1}{8}"$	No. 10
MR-8	$2\frac{1}{2}"$	$1\frac{1}{8}"$	No. 10
MR-9	$2\frac{3}{4}"$	$1\frac{1}{8}"$	No. 10
MR-10	$2\frac{3}{4}"$	$1\frac{1}{8}"$	No. 10
MR-11	$\frac{1}{4}"$	$\frac{1}{4}"$	Pig Tails
MS-1	$\frac{3}{32}" \times \frac{3}{32}"$	$\frac{1}{32}"$	Pig Tails

CASED, UNCASED AND MOLDED UNITS



CASED							
Type	Hi.	Dia.	Length	Width	Mtg.	Mtg. Cen.	Cutout
DT-1	$1\frac{1}{32}"$		$1\frac{1}{8}"$	$\frac{1}{2}"$	2 4-40 inserts	$\frac{3}{4}"$	$\frac{3}{8}" \times \frac{1}{2}"$
DT-2	$1\frac{1}{32}"$		$1\frac{1}{8}"$	$\frac{1}{4}"$	2 6-32 studs	$\frac{7}{8}" \times \frac{3}{32}"$	$\frac{3}{8}" \times \frac{1}{16}"$
DT-3	2"		$1\frac{25}{32}"$	$\frac{7}{8}"$	2 6-32 studs	$1\frac{1}{4}" \times \frac{3}{8}"$	$\frac{3}{8}" \times \frac{3}{4}"$
DT-4	$3\frac{1}{4}"$		$2\frac{3}{4}"$	$1\frac{3}{8}"$	4 8-32 studs	$2\frac{1}{4}" \times \frac{1}{16}"$	$\frac{3}{4}" \times \frac{3}{8}"$
DT-5	$1\frac{1}{8}"$	$1\frac{1}{8}"$			2 6-32 inserts	$1\frac{1}{8}"$	$\frac{3}{8}" \times 1"$
DT-6	$\frac{3}{4}"$	$\frac{1}{2}"$			Pig Tails		
DM-2	1"	$1\frac{1}{8}"$			2 4-40 inserts	$\frac{5}{8}"$	$\frac{3}{8}" \times \frac{7}{8}"$
DM-11	$1\frac{1}{4}"$	$1\frac{3}{8}"$			2 6-32 inserts	$\frac{7}{8}"$	$\frac{3}{8}" \times \frac{3}{8}"$
DST-1	$\frac{3}{32}"$		$\frac{3}{4}"$	$\frac{1}{32}"$	$\frac{1}{4}"$ long pins	To fit $\frac{1}{2}"$ crystal socket	

FREED TRANSFORMER COMPANY, INC.

FREED TRANSFORMER CO., INC.**LOW FREQUENCY TOROIDAL INDUCTORS**

Freq. Range		100 ~ to 10 KC			200 ~ to 12 KC							
TYPE		TI-38	TI-32	TI-37	TI-24	TI-25	TI-26	TI-27	TI-28	TI-29	TI-30	TI-31
Temp. Stability		SF	SF	SF	SN	SN	SN	SN	SN	SN	SN	SN
Size	Uncased Case Mold	OS1 DST1 MR1, MS1	OS3 DT1, DM2 MR3	OS5 DT2, DM11 MR4	OS1 DST1 MR1, MS1	OS12 DT1 MR2	OS3 DT1, DM2 MR3	OS5 DT2, DM11 MR4	OS8 DT3, DT5 MR6	OS9 DT4 MR7	OS9 DT4 MR8	OS11 DT4 MR10
	Nominal Inductance	Catalog Number										
1	MH				F2400	F2450	F2500	F2550	F2600	F2650	F2700	F2750
2	MH				F2401	F2451	F2501	F2551	F2601	F2651	F2701	F2751
3	MH				F2402	F2452	F2502	F2552	F2602	F2652	F2702	F2752
5	MH	F3550			F2403	F2453	F2503	F2553	F2603	F2653	F2703	F2753
7.5	MH	F3551			F2404	F2454	F2504	F2554	F2604	F2654	F2704	F2754
10	MH	F3552			F2405	F2455	F2505	F2555	F2605	F2655	F2705	F2755
15	MH	F3553			F2406	F2456	F2506	F2556	F2606	F2656	F2706	F2756
20	MH	F3554			F2407	F2457	F2507	F2557	F2607	F2657	F2707	F2757
30	MH	F3555			F2408	F2458	F2508	F2558	F2608	F2658	F2708	F2758
50	MH	F3556	F2800	F4000	F2409	F2459	F2509	F2559	F2609	F2659	F2709	F2759
75	MH	F3557	F2801	F4001	F2410	F2460	F2510	F2560	F2610	F2660	F2710	F2760
100	MH	F3558	F2802	F4002	F2411	F2461	F2511	F2561	F2611	F2661	F2711	F2761
150	MH	F3559	F2803	F4003	F2412	F2462	F2512	F2562	F2612	F2662	F2712	F2762
200	MH	F3560	F2804	F4004	F2413	F2463	F2513	F2563	F2613	F2663	F2713	F2763
300	MH	F3561	F2805	F4005	F2414	F2464	F2514	F2564	F2614	F2664	F2714	F2764
400	MH	F3562	F2806	F4006	F2415	F2465	F2515	F2565	F2615	F2665	F2715	F2765
500	MH	F3563	F2807	F4007	F2416	F2466	F2516	F2566	F2616	F2666	F2716	F2766
750	MH	F3564	F2808	F4008	F2417	F2467	F2517	F2567	F2617	F2667	F2717	F2767
1	H	F3565	F2809	F4009	F2418	F2468	F2518	F2568	F2618	F2668	F2718	F2768
1.25	H	F3566	F2810	F4010	F2419	F2469	F2519	F2569	F2619	F2669	F2719	F2769
1.5	H	F3567	F2811	F4011	F2420	F2470	F2520	F2570	F2620	F2670	F2720	F2770
1.75	H	F3568	F2812	F4012	F2421	F2471	F2521	F2571	F2621	F2671	F2721	F2771
2	H	F3569	F2813	F4013	F2422	F2472	F2522	F2572	F2622	F2672	F2722	F2772
2.25	H	F3570	F2814	F4014		F2473	F2523	F2573	F2623	F2673	F2723	F2773
2.5	H	F3571	F2815	F4015		F2474	F2524	F2574	F2624	F2674	F2724	F2774
3	H	F3572	F2816	F4016		F2475	F2525	F2575	F2625	F2675	F2725	F2775
3.5	H	F3573	F2817	F4017		F2476	F2526	F2576	F2626	F2676	F2726	F2776
4	H	F3574	F2818	F4018		F2477	F2527	F2577	F2627	F2677	F2727	F2777
4.5	H	F3575	F2819	F4019		F2478	F2528	F2578	F2628	F2678	F2728	F2778
5	H	F3576	F2820	F4020		F2479	F2529	F2579	F2629	F2679	F2729	F2779
7.5	H	F3577	F2821	F4021		F2480	F2530	F2580	F2630	F2680	F2730	F2780
10	H	F3578	F2822	F4022		F2481	F2531	F2581	F2631	F2681	F2731	F2781
15	H		F2823	F4023			F2532	F2582	F2632	F2682	F2732	F2782
20	H		F2824	F4024			F2533	F2583	F2633	F2683	F2733	F2783
25	H			F4025								
30	H									F2684	F2734	F2784
40	H									F2685	F2735	F2785
50	H									F2686	F2736	F2786
75	H											F2787
100	H											F2788

FREED TRANSFORMER CO., INC.**LOW FREQUENCY TOROIDAL INDUCTORS**

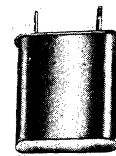
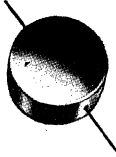
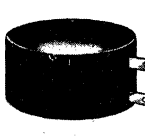
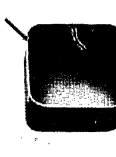
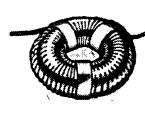
Freq. Range		1 KC to 15 KC								
TYPE		TI-33	TI-34	TI-16	TI-5	TI-4	TI-1	TI-1A	TI-12	TI-11
Temp. Stability		SN	SN	SN	SN, SE, SD	SN, SD, SW	SN	SN, SD, SW	SN, SD, SW	SN, SD, SW
Size	Uncased Case Mold	OS13 DT6 MR11	OS14 DT6 MR11	OS1 DST1 MR1, MS1	OS3 DT1, DM2, MR3	OS5 DT2, DM11, MR4	OS8 DT3, DT5, MR6	OS9 DT4 MR7	OS9 DT4 MR8	OS11 DT4 MR10
Nominal Inductance		Catalog Number								
.25 MH		F2850	F2900							
.5 MH		F2851	F2901							
.75 MH		F2852	F2902							
1 MH		F2853	F2903	F2050				F1500	F1655	F1747
1.5 MH		F2854	F2904							
2 MH		F2855	F2905					F1501	F1656	F1748
2.5 MH		F2856	F2906							
3 MH		F2857	F2907	F2051				F1502	F1657	F1749
4 MH		F2858	F2908					F1503	F1658	F1750
5 MH		F2859	F2909	F2052	F1700	F850	F800	F1504	F1659	F1751
7.5 MH		F2860	F2910					F1505	F1660	
10 MH		F2861	F2911	F2053	F1701	F851	F801	F1506	F1661	F1752
12.5 MH		F2862	F2912							
15 MH		F2863	F2913	F2054	F1702	F852	F802	F1507	F1662	F1753
17.5 MH		F2864	F2914							
20 MH		F2865	F2915							
25 MH		F2866	F2916							
30 MH		F2867	F2917	F2055	F1703	F853	F803	F1508	F1663	F1754
50 MH			F2918	F2056	F1704	F854	F804	F1509	F1664	F1755
75 MH			F2919	F2057	F1705	F855	F805	F1510	F1665	F1756
100 MH			F2920	F2058	F1706	F856	F806	F1511	F1666	F1757
150 MH				F2059	F1707	F857	F807	F1512	F1667	F1758
200 MH				F2060	F1708	F858	F808	F1513	F1668	F1759
300 MH				F2061	F1709	F859		F1514	F1669	F1760
400 MH				F2062	F1710	F860		F1515	F1670	F1761
500 MH				F2063	F1711	F861	F809	F1516	F1671	F1762
600 MH					F1712	F862		F1517	F1672	
700 MH					F1713	F863				
750 MH				F2064			F810	F1518	F1673	F1763
800 MH					F1714	F864				
900 MH					F1715	F865				
1.0 HY				F2065	F1716	F866	F811	F1519	F1674	F1764
1.25 HY				F2066	F1717	F867	F812			
1.5 HY				F2067	F1718	F868	F813	F1520	F1675	F1765
1.75 HY				F2068	F1719	F869	F814			
2 HY				F2069	F1720	F870	F815	F1521	F1676	F1766
2.25 HY						F871	F816			
2.5 HY						F872	F817	F1522	F1677	F1767
2.75 HY						F873	F818			
3 HY						F874	F819	F1523	F1678	F1768
3.5 HY						F875	F820	F1524	F1679	F1769
4 HY						F876	F821	F1525	F1680	F1770
4.5 HY						F877	F822	F1526	F1681	F1771
5 HY						F878	F823	F1527	F1682	F1772
6 HY							F824	F1528	F1683	
7 HY							F825	F1529	F1684	
7.5 HY										F1773
8 HY							F826	F1530	F1685	
9 HY							F827	F1531	F1686	
10 HY							F828	F1532	F1687	F1774
12 HY								F1533	F1688	
15 HY							F829	F1534	F1689	F1775
17 HY								F1535	F1690	
20 HY							F830	F1536	F1691	F1776
25 HY								F1537	F1692	F1777
30 HY								F1538	F1693	F1778
40 HY										F1779
50 HY										F1780

FREED TRANSFORMER COMPANY, INC. 1795 WEIRFIELD ST. (Ridgewood) Brooklyn, N. Y. 11227

FREED TRANSFORMER CO., INC.**MEDIUM FREQUENCY TOROIDAL INDUCTORS**

Freq. Range		10 KC to 50 KC							30 KC to 75 KC			
TYPE		TI-35	TI-36	TI-17	TI-7	TI-6	TI-2	TI-13	TI-18	TI-8	TI-10	TI-9
Temp. Stability		SN	SN	SN	SN	SN, SD SW	SD	SN	SN	SN, SD	SB	SB
Size	Uncased Case Mold	OS13 DT6 MR11	OS14 DT6 MR11	OS1 DST1 MR1, MS1	OS3 DT1, DM2 MR3	OS5 DT2, DM11 MR4	OS6 DT3, DT5 MR5	OS9 DT4 MR8	OS1 DST1 MR1, MS1	OS3 DT1, DM2 MR3	OS7 DT3, DT5 MR5	OS10 DT4 MR9
	Nominal Inductance	Catalog Number										
.1 MH				F2100					F2140	F1821		
.2 MH				F2101					F2141	F1822		
.25 MH		F2950	F3000									
.3 MH				F2102					F2142	F1823		
.4 MH				F2103					F2143	F1824		
.5 MH		F2951	F3001	F2104	F1781				F2144	F1825		
.75 MH		F2952	F3002									
1 MH		F2953	F3003	F2105	F1782	F1726	F1800	F1629	F2145	F1826	F1579	F1554
1.5 MH		F2954	F3004									
2 MH		F2955	F3005	F2106	F1783	F1727	F1801	F1630	F2146	F1827	F1580	F1555
2.5 MH		F2956	F3006									
3 MH		F2957	F3007	F2107	F1784	F1728	F1802	F1631	F2147	F1828	F1581	F1556
4 MH		F2958	F3008	F2108		F1729	F1803	F1632	F2148	F1829	F1582	F1557
5 MH		F2959	F3009	F2109	F1785	F1730	F1804	F1633	F2149	F1830	F1583	F1558
7.5 MH		F2960	F3010	F2110	F1786	F1731		F1634	F2150	F1831	F1584	F1559
10 MH		F2961	F3011	F2111	F1787	F1732	F1805	F1635	F2151	F1832	F1585	F1560
12.5 MH		F2962	F3012									
15 MH		F2963	F3013	F2112	F1788	F1733	F1806	F1636	F2152	F1833	F1586	F1561
17.5 MH			F3014									
20 MH			F3015	F2113	F1789	F1734			F2153	F1834		
25 MH			F3016		F1790					F1835		
30 MH			F3017	F2114	F1791	F1735	F1807	F1637	F2154	F1836	F1587	F1562
40 MH					F1792					F1837		
50 MH				F2115	F1793	F1736	F1808	F1638	F2155	F1838	F1588	F1563
75 MH				F2116	F1794	F1737	F1809	F1639	F2156	F1839	F1589	F1564
100 MH				F2117	F1795	F1738	F1810	F1640	F2157	F1840	F1590	F1565
150 MH					F1796	F1739	F1811	F1641			F1591	F1566
200 MH					F1797	F1740	F1812	F1642			F1592	F1567
250 MH						F1741						
300 MH						F1742	F1813	F1643				F1568
400 MH							F1814	F1644				F1569
500 MH						F1743	F1815	F1645				F1570

CASED, UNCASED AND MOLDED UNITS

				
DT-1 CASE	DT-2 CASE	DT-3 CASE	DT-4 CASE	DT-5 CASE
				
DT-6 CASE	DST-1 CASE	DM-2 CASE	DM-11 CASE	
				
MR-1	MR-2 to MR-10	MS-1	OS-1 to OS-11	

FREED TRANSFORMER COMPANY, INC. 1795 WEIRFIELD ST. (Ridgewood) Brooklyn, N. Y. 11227

FREED TRANSFORMER CO., INC.**HIGH FREQUENCY TOROIDAL INDUCTORS**

Freq. Range		10 KC to 100 KC		50 KC to 200 KC			20KC to 2 MC	50 KC to 5 MC		100 KC to 10 MC
TYPE		TI-15	TI-14	TI-19	TI-3	TI-3A	TI-20	TI-22	TI-23	TI-21
Temp. Stability		SN	SN	SN	SD	SB	SP	SP	SP	SP
Size	Uncased Case Mold	OS3 DT1, DM2 MR3	OS5 DT2, DM11 MR4	OS1 DST 1 MR1, MS1	OS6 DT3, DT5 MR5	OS10 DT4 MR8	OS4 DT2 MR3A	OS2 DT1 MR2	OS2 DT1 MR2	OS1 DT1 MR1, MS1
	Nominal Inductance	Catalog Number								
.010 MH								F2270	F2301	F2240
.015 MH								F2271	F2302	F2241
.020 MH								F2272	F2303	F2242
.030 MH								F2273	F2304	F2243
.040 MH								F2274	F2305	F2244
.050 MH							F2201	F2275	F2306	F2245
.075 MH								F2276	F2307	F2246
.100 MH	F1870			F2180	F1846		F2202	F2277	F2308	F2247
.125 MH										F2248
.150 MH								F2278	F2309	F2249
.200 MH	F1871			F2181	F1847		F2203	F2279	F2310	
.300 MH	F1872			F2182	F1848		F2204	F2280	F2311	
.400 MH	F1873			F2183	F1849			F2281	F2312	
.500 MH	F1874			F2184	F1850		F2205	F2282	F2313	
.600 MH				F2185				F2283		
.700 MH				F2186				F2284		
.750 MH							F2206			
.800 MH				F2187						
.900 MH				F2188						
1 MH	F1875	F1920		F2189	F1851		F2207			
1.5 MH							F2208			
2 MH	F1876	F1921		F2190	F1852		F2209			
2.5 MH							F2210			
3 MH	F1877	F1922		F2191	F1853		F2211			
3.5 MH							F2212			
4 MH	F1878	F1923		F2192	F1854		F2213			
4.5 MH							F2214			
5 MH	F1879	F1924		F2193	F1855		F2215			
7.5 MH	F1880	F1925			F1845					
10 MH	F1881	F1926			F1844	F1856				
15 MH	F1882	F1927				F1857				
20 MH	F1883	F1928				F1858				
25 MH	F1884									
30 MH	F1885	F1929				F1859				
40 MH	F1886					F1860				
50 MH	F1887	F1930				F1861				
75 MH	F1888	F1931				F1862				
100 MH	F1889	F1932				F1863				
150 MH		F1933								
200 MH		F1934								
250 MH		F1935								
300 MH		F1936								

FREED TRANSFORMER CO., INC.

COMMERCIAL GRADE COMPONENTS

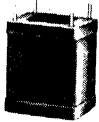
These components are designed to meet the demand for low-cost replacement parts for commercial electronic equipment.

The best commercially available materials have been utilized in the design of these units, to insure reliability and excellent performance characteristics. Vacuum impregnation with a non-hygroscopic varnish to prevent penetration of humidity are employed to give these units long life and trouble-free performance.

230-115 V, 50-60 C.P.S. Stepdown Transformers rated from 25 V A up to 5,000 V A Rating and line booster transformers are included in this series.

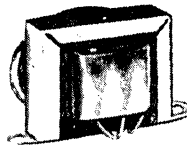
All units, with only a few exceptions, are uncased or of shell-type construction.

Isolation transformers and Stepdown transformers are equipped with line cord and receptacle.

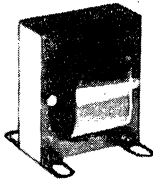


DC

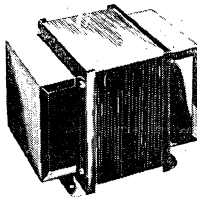
Case No.	Height	Width	Depth	Mfg. Centers	Mfg. Studs
DC2B	3 1/2	2 5/8	2 1/4	2x1 3/4	(4) 8-32
DC4A	3 3/4	3 1/8	3	2 1/2 x 2 1/2	(4) 8-32
DC5C	4 7/8	4 1/8	3 1/2	3 1/8 x 2 3/8	(4) 10-32
DC6A	4 7/8	5	4 1/8	3 3/4 x 3	(4) 10-32
CH40	1 7/8	2 3/8	1 3/8	2	(2) 3/16
CH50	1 11/16	2 13/16	1 3/4	2 3/8	(2) 3/16
CH60	2	3 1/4	1 3/4	2 13/16	(2) 3/16
CH62	2	3 1/4	2 1/8	2 13/16	(2) 3/16
CH70	2 5/8	3 11/16	2 1/4	3 1/8	(2) 3/16
CH80	2 5/8	4	2 3/8	3 1/16	(2) 3/16
FV10	3 1/8	2 1/2	2 1/8	2x2	(4) 13/64 x 2 1/64
FV12	3 1/8	2 1/2	2 11/16	2x2 1/8	(4) 13/64 x 2 1/64
FV22	3 7/8	2 13/16	2 7/8	2 1/4 x 2 1/4	(4) 3/16 x 3/8
FV30	4 1/2	3 1/8	3	2 1/2 x 2 1/4	(4) 13/64 x 2 1/64
HB718	6 1/4	6 1/2	8 1/2	4 3/4 x 4 1/2	(4) 3/32 x 2 1/32
HB728	6 1/4	6 1/2	9 3/4	4 3/4 x 5 3/4	(4) 3/32 x 2 1/32
HB828	6 5/8	7 1/8	9 7/8	5 5/8 x 5 3/4	(4) 3/32 x 2 1/32
HB920	6 5/8	7 7/8	10 1/4	6 1/2 x 7 1/8	(4) 3/32 x 2 1/32
HS300	2 5/8	3	2 1/2	2 1/2 x 2	(4) 3/16 x 3/8
HS303	2 7/8	3	2 1/2	2 1/2 x 2	(4) 3/16 x 3/8
HS306	3 1/4	3	2 1/2	2 1/2 x 2	(4) 3/16 x 3/8
HS307	3 3/8	3	2 1/2	2 1/2 x 2	(4) 3/16 x 3/8
HS503	3 1/2	3 3/4	3 1/8	3 1/8 x 2 1/2	(4) 3/16 x 3/8
HS505	3 3/4	3 3/4	3 1/8	3 1/8 x 2 1/2	(4) 3/16 x 3/8
HS603	3 3/4	4 1/2	3 3/4	3 3/4 x 3	(4) 3/16 x 3/8
HS605	4	4 1/2	3 3/4	3 3/4 x 3	(4) 3/16 x 3/8
HS606	4 1/8	4 1/2	3 3/4	3 3/4 x 3	(4) 3/16 x 3/8
HS610	4 5/8	4 1/2	3 3/4	3 3/4 x 3	(4) 3/16 x 3/8
HS612	4 7/8	4 1/2	3 3/4	3 3/4 x 3	(4) 3/16 x 3/8
HS708	5 7/8	5 1/4	4 3/8	4 3/8 x 3 1/2	(4) 3/32 x 2 1/32
HS709	6	5 1/4	4 3/8	4 3/8 x 3 1/2	(4) 3/32 x 2 1/32
VS100	2 11/16	1 7/8	2 1/4	1 1/2 x 1 7/8	(4) 3/16 x 3/8
VS300	3 5/8	2 5/8	2 3/4	2x1 11/16	(4) 3/16 x 3/8
VS303	3 5/8	2 5/8	3	2x1 3/16	(4) 3/16 x 3/8
VS304	3 5/8	4 1/4	3 1/4	2 1/2 x 3	(4) 3/16 x 3/8
VS306	3 5/8	2 5/8	3 3/4	2x2 1/8	(4) 3/16 x 3/8
VS307	3 5/8	2 5/8	3 1/2	2x2 1/8	(4) 3/16 x 3/8
VS401	3 3/8	2 13/16	3 1/4	2 1/4 x 1 11/16	(4) 3/16 x 3/8
VS501	3 3/8	3 1/4	3 3/8	2 1/2 x 2 1/8	(4) 3/16 x 3/8
VS503	3 3/8	3 1/4	3 3/8	2 1/2 x 2 1/8	(4) 3/16 x 3/8
VS505	3 3/8	3 1/4	3 3/8	2 1/2 x 2 1/8	(4) 3/16 x 3/8
VS506	3 3/8	3 1/4	4 1/4	2 1/4 x 3	(4) 3/16 x 3/8
VS508	3 5/8	2 5/8	3 3/8	2x2 1/8	(4) 3/16 x 3/8
VS601	4 21/32	3 3/8	3 3/8	3x2 1/8	(4) 3/16 x 3/8
VS603	4 21/32	3 3/8	3 3/8	3x2 1/8	(4) 3/16 x 3/8
VS604	4 21/32	3 3/8	4	3x2 1/8	(4) 3/16 x 3/8
VS605	4 21/32	3 3/8	4 1/8	3x2 1/8	(4) 3/16 x 3/8
VS606	4 21/32	3 3/8	4 1/4	3x3 1/8	(4) 3/16 x 3/8
VS610	4 21/32	3 3/8	4 3/4	3x3 1/8	(4) 3/16 x 3/8
VS611	4 21/32	3 3/8	4 7/8	3x3 1/8	(4) 3/16 x 3/8
VS612	4 21/32	3 3/8	5	3x3 1/8	(4) 3/16 x 3/8
VS700	5 7/8	3 3/8	5	3 1/2 x 3 1/4	(4) 3/16 x 3/8
VS706	5 7/8	4 1/8	5 1/2	3 1/2 x 3 3/4	(4) 3/16 x 3/8
VS708	5 7/8	4 1/8	5 3/4	3 1/2 x 4	(4) 3/32 x 2 1/32
VS709	5 7/8	4 1/8	5 7/8	3 1/2 x 4 1/8	(4) 3/32 x 2 1/32
VS714	5 7/8	4 1/8	6 1/2	3 1/2 x 4 3/4	(4) 3/32 x 2 1/32
VS718	5 7/8	4 1/8	7	3 1/2 x 5 1/4	(4) 3/32 x 2 1/32
VS728	5 7/8	4 1/8	8 1/4	3 1/2 x 6 1/2	(4) 3/16 x 3/8



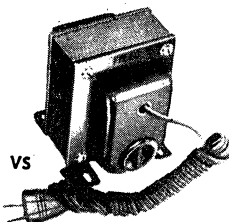
CH



FV



HB



VS

COMMERCIAL GRADE CHOKES

Catalog No.	Inductance in Henries	Rated Current D.C. Ma.	D.C. Resistance	Dielectric Test Voltage	Case Number
RGC 17	40	15	2000	1000	CH 40
RGC 1	4	40	200	1000	CH 40
RGC 2	4	40	400	1000	CH 40
RGC 3	6	50	400	1000	CH 40
RGC 18	20	50	425	1500	CH 60
RGC 4	10	55	400	1500	CH 50
RGC 19	1	75	270	1500	CH 40
RGC 5	10	75	250	1500	CH 60
RGC 6	10	75	250	1500	VS 100
RGC 7	h	100	150	1500	CH 60
RGC 8	h	100	150	1500	VS 100
RGC 9	15	150	100	1500	CH 60
RGC 10	15	150	100	1500	VS 100
RGC 20	17	160	180	2500	VS 306
RGC 11	2	200	60	1500	CH 60
RGC 12	2	200	60	1500	VS 100
RGC 13	17	200	65	1500	CH 80
RGC 21	2	200	100	2500	VS 303
RGC 14	37	200	65	1500	VS 300
RGC 15	28	300	65	1500	CH 80
RGC 16	28	300	65	1500	VS 300
RGC 22	5	300	65	2500	VS 308

FILAMENT TRANSFORMERS

All primaries are for 115V, 50/60 c.p.s.

Catalog No.	Secondary Voltage	Secondary Current Amps	Secondary Test Voltage RMS	Case Size
TF 1	2.5 (C.T.)	7.5	1500	CH60
TF 2	2.5 (C.T.)	10	1500	CH70
TF 3	2.5 (C.T.)	5	7500	DC2B
TF 4	2.5 (C.T.)	10	7500	DC4A
TF 5	5.0 (C.T.)	4	1500	CH60
TF 6	5.0 (C.T.)	5	1500	CH70
TF 7	5.0 (C.T.)	10	1500	CH80
TF 8	5.0 (C.T.)	10	1500	FV10
TF 9	5.0 (C.T.)	20	2500	FV30
TF 10	5.0 (C.T.)	20	10,000	DC5A
TF 11	6.3 (C.T.)	1.35	1500	CH50
TF 12	6.3 (C.T.)	3	1500	CH60
TF 13	6.3 (C.T.)	5	1500	CH70
TF 14	6.3 (C.T.)	7	1500	FV12
TF 15	6.3 (C.T.)	10	1500	FV22
TF 16	10 (C.T.)	5	2500	CH80
TF 17	10 (C.T.)	5	2500	FV10
TF 18	10 (C.T.) or 11 (C.T.) (tapped primary)	12 or 11	7500	DC-5C
TF 19	12.6 (C.T.)	2	1500	CH62

TF 3, 4, 10 & 18 supplied with terminals. All others with leads.

AUTO TRANSFORMERS

To be used as step-down transformer. Equipped with standard receptacle and line cord.

Catalog No.	Transformation	VA Rating	Weight (lbs.)	Case Size
SDT 1*	230/115 V. 50/60 c.p.s.	25	1	CH-60
SDT 2*	230/115 V. 50/60 c.p.s.	50	1 1/4	CH-62
SDT 3	230/115 V. 50/60 c.p.s.	50	2 1/2	VS-300
SDT 4	230/115 V. 50/60 c.p.s.	100	3	VS-401
SDT 5	230/115 V. 50/60 c.p.s.	200	5	VS-501
SDT 6	230/115 V. 50/60 c.p.s.	300	6 1/2	VS-601
SDT 7	230/115 V. 50/60 c.p.s.	400	8	VS-604
SDT 8	230/115 V. 50/60 c.p.s.	500	11	VS-611
SDT 9	230/115 V. 50/60 c.p.s.	750	15	VS-706*
SDT 10	230/115 V. 50/60 c.p.s.	1000	23	VS-718
SDT 11	230/115 V. 50/60 c.p.s.	1500	29 1/2	VS-728
SDT 12*	230/115 V. 50/60 c.p.s.	2000	37	HB-718

*Supplied with leads without line cord and receptacle.

ISOLATION TRANSFORMERS

Electrostatic shield between primary and secondary. Equipped with standard receptacle and line cord.

Catalog Number	Primary Voltage 50/60 c.p.s.	Secondary Voltage	VA Rating	Case Size
IT 1	115	115	50	VS-401
IT 2	115	115	100	VS-503
IT 3	115	115	300	VS-700
IT 4	115	115	500	VS-714
IT 5*	220/440	110/220	250	VS-612
IT 6*	220/440	110/220	500	VS-714

*Supplied with leads without line cords and receptacle.

FREED TRANSFORMER COMPANY, INC.

Variac® Adjustable Autotransformers

VARIAC® MANUALLY OPERATED AUTOTRANSFORMERS

The General Radio Variac autotransformer is a continuously variable unit used to control AC voltage. Features the Duratrak® contact surface, a uniform silver-alloy coating to prevent injurious high-temperature oxidation and resultant brush-track deterioration — track will show no significant wear after 1,000,000 cycles of brush operation. Variac autotransformers are highly efficient, have high thermal capacity, can withstand very high short-term overloads, and do not affect waveform or power factor. Other features: Good regulation; smooth control; long life; linear output voltage; low maintenance; easy installation. All necessary mounting hardware is included with each unit. Portable types, indicated by T in Model No., have an overload protection reset switch, line switch, con-

venience outlet, and a 6-ft. two- or three-wire line cord. Manually operated and motor-driven Variacs are available in a wide variety of voltage and current ratings, with or without cases. All except portable units can be equipped with ball bearings at slightly higher prices; ball bearings, indicated by BB in Model No. of manually operated units, are included with 4- and 6-gang types. **Angle of Rotation:** 320°. **Line Frequency:** 50 and/or 60 Hz unless otherwise specified. **Input Voltages:** 120, 208, 240 or 280 volts. **Output Voltages:** 0-120/140, 0-208, 0-240/280, 0-480 or 0-560 volts, continuously adjustable. **Current Ratings:** 2 to 300 amps.

SINGLE-PHASE MODELS

MANY MODELS, AS NOTED, LISTED UNDER UL RE-EXAMINATION SERVICE AND CSA 120-VOLT INPUT UNITS

Line voltage connection output, 0-120 volts; overvoltage connection output, 0-140 volts.

Model No.	Output Amps		kVA	Description	Size, Inches			Shpg. Lbs.
	Rated	Max.			W.	D.↓	H.	
U2	2.25†	3.0†	0.36	Uncased	3	2 7/8	3 1/4	5
W2M	2.0	2.6	0.31	Cased†	4 1/8	4 3/8	5 1/8	9
W2	2.4	3.1	0.37	Uncased†	3 1/4	3 1/8	3 1/4	6
W5M	5.0	6.5	0.78	Cased†	4 7/8	4 3/8	6 3/4	13
W5	6.0	7.8	0.94	Uncased†	4 1/2	3 3/8	4 1/2	12
W5LM	7.1	9.2	1.1	Cased†	4 7/8	4 3/8	6 3/4	13
W5L	8.5	11.0	1.32	Uncased†	4 1/2	3 3/8	4 1/2	12
W8	8.5	11.0	1.32	Uncased†	4 1/2	4 1/8	4 1/2	15
W8L	10.0	13.0	1.56	Uncased†	4 1/2	4 1/8	4 1/2	15
W10	10.0	13.0	1.56	Uncased†	5 3/4	4 1/8	5 3/4	18
W10M	10.0	13.0	1.56	Cased†	6 3/4	5 1/4	9 1/2	21
W20	20.0	26.0	3.12	Uncased†	7 1/2	4 3/8	7 1/2	27
W20M	20.0	26.0	3.12	Cased†	8 5/8	5 3/8	11 1/8	27
W30M	28.0	32.0	3.84	Cased	11	5 3/4	14 3/4	46
W30	30.0	36.0	4.32	Uncased	10	4 3/2	10 3/4	36
W50M	40.0	45.0	5.40	Cased†	13 1/8	7 1/4	16 3/2	74
W50	50.0	50.0	6.00	Uncased†	12 1/2	6 3/2	12 1/2	65
W30G2M	56.0	64.0	7.7	2-Gang W30M▲	11 3/8	11 1/2	14 1/8	83
W30G2	60.0	72.0	8.6	2-Gang W30▲	10	11 1/8	10 3/4	77
W50G2M	80.0	90.0	10.8	2-Gang W50M▲	13 1/8	16 1/8	17 1/8	160
W50G3M	84.0	96.0	11.5	3-Gang W30M▲	11 3/8	16 1/8	14 1/8	115
W50G2	100.0	100.0	12.0	2-Gang W50▲	12 1/2	15 3/8	12 1/2	147
W30G2	90.0	108.0	13.0	3-Gang W30▲	10	15 1/8	10 3/4	108
W50G3M	120.0	135.0	16.2	3-Gang W50M▲	13 1/8	22 1/2	17 1/8	221
W50G3	150.0	150.0	18.0	3-Gang W50▲	12 1/2	22 3/8	12 1/2	206
W50G4BBM	160.0	180.0	21.6	4-Gang W50BBM▲	13 1/8	28 1/8	17 1/8	313
W50G4BB	200.0	200.0	24.0	4-Gang W50BB▲	12 1/2	28 1/8	12 1/2	288
W50G6BBM	240.0	270.0	32.4	6-Gang W50BBM▲	13 1/8	41 3/8	17 1/8	430
W50G6BB	300.0	300.0	36.0	6-Gang W50BB▲	12 1/2	41 3/8	12 1/2	400

240-VOLT INPUT UNITS

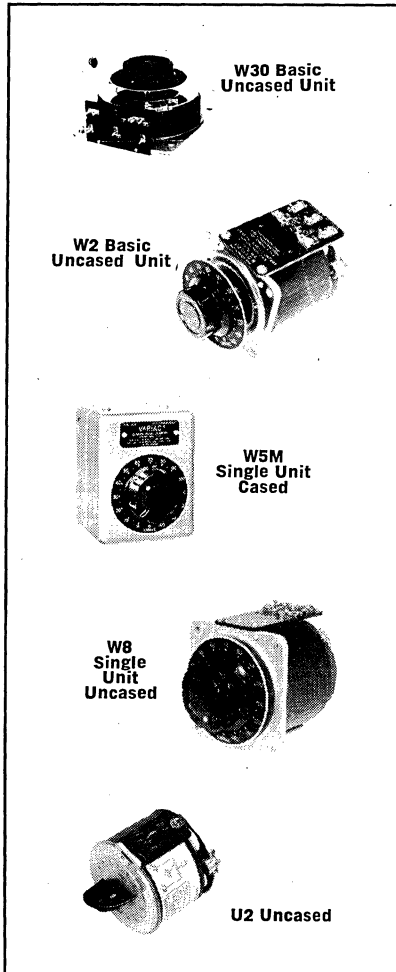
Line voltage connection output, 0-240 volts; overvoltage connection output, 0-280 volts. All types except portable units can also use a 120-volt input.

Model No.	Output Amps		kVA	Description	Size, Inches			Shpg. Lbs.
	Rated	Max.			W.	D.↓	H.	
W5H	2.0	2.6	0.62	Uncased†	4 1/2	3 1/8	4 1/2	10
W5HM	2.0	2.6	0.62	Cased†	4 7/8	4 3/8	6 3/4	13
W10H	4.0	5.2	1.25	Uncased†	5 3/4	4 1/8	5 3/4	18
W10HM	4.0	5.2	1.25	Uncased†	6 3/4	5 1/4	9 1/2	21
W20H	8.0	10.4	2.50	Uncased†	7 1/2	4 3/8	7 1/2	27
W20HM	8.0	10.4	2.50	Cased†	8 5/8	5 3/8	11 1/8	31
W30H	12.0	15.6	3.74	Uncased	10	4 3/2	10 3/4	36
W30HM	12.0	15.6	3.74	Cased	11	5 3/4	14 3/4	46
W50HM	20.0	31.0	7.45	Cased†	13 1/8	7 1/4	16 3/2	76
W50H	25.0	32.5	7.80	Uncased†	12 1/2	6 3/2	12 1/2	67
W30HG2	24.0	31.2	7.50	2-Gang W30H▲	10	11 1/8	10 3/4	75
W30HG2M	24.0	31.2	7.50	2-Gang W30HM▲	11 3/8	11 1/2	14 1/8	81
W30G2M	28.0	32.0	7.70	2-Gang W30M■	11 3/8	11 1/2	14 1/8	83
W30G2	30.0	36.0	8.60	2-Gang W30■	10	11 1/8	10 3/4	77
W50HG2M	40.0	62.0	14.90	2-Gang W50HM▲	13 1/8	16 1/8	17 1/8	165
W50HG2	50.0	65.0	15.60	2-Gang W50H▲	12 1/2	15 3/8	12 1/2	153
W50HG3M	60.0	93.0	22.30	3-Gang W50HM▲	13 1/8	22 1/2	17 1/8	230
W50HG3	75.0	97.5	23.4	3-Gang W50H▲	12 1/2	22 3/8	12 1/2	214
W50HG4BBM	80.0	124.0	29.8	4-Gg. W50HBBM▲	13 1/8	28 1/8	17 1/8	328
W50HG4BB	100.0	130.0	31.2	4-Gang W50HBB▲	12 1/2	28 1/8	12 1/2	300
W50HG6BBM	120.0	186.0	44.6	6-Gg. W50HBBM▲	13 1/8	41 3/8	17 1/8	458
W50HG6BB	150.0	195.0	46.8	6-Gang W50HBB▲	12 1/2	41 3/8	12 1/2	428

*kVA ratings — normal input line voltage times maximum current; maximum current can be drawn at maximum voltage for line voltage connection only. †CSA Approved. ‡Listed ratings are for metal panel mountings, ratings in air, 2.0 and 2.5 amps respectively. §Listed under Re-examination Service of UL. ¶For 60 Hz only; no overvoltage connection supplied. • Series-connected windings; do not use with grounded load. ▲ Parallel-connected windings; one or more W50-P1 chokes required (see below). ■ Also can be used at 120-volt input with 2x the output ratings shown. ↓Depth behind panel except cased types (excluding knobs).

MODEL W50-P1 CHOKE FOR PARALLEL COMBINATIONS

When windings of identical Variacs are paralleled to obtain higher load ratings, it is recommended to use one or more chokes to limit excess circulating current in the event that brushes accidentally get out of line. Use 1 choke for 2 Variacs in parallel; 3 chokes for 3 Variacs; 4 chokes for 5 Variacs; 6 chokes for 6 Variacs. Parallel operation of units smaller than Model W30 is not recommended since the next larger unit is more economical. For W50 Series Variacs, the choke can be mounted directly on the terminal plates.



ACCESSORIES FOR VARIACS REPLACEMENT BRUSHES

Model No.	For Variac Model
VB-1	M2, U2, V2, W2, W5H
VB-2	M5, V5, W5, W5L
VB-3	W8, W8L
VBT-6†	W50
VBT-7†	W50H
VBT-8†	M20, W20
VBT-10	M10, W10
VBT-11	W10H
VBT-12†	W20H
VBT-13†	W30
VBT-14†	W30H

† Brush set.



General Radio

300 BAKER AVENUE, CONCORD, MASS. 01742

NEW YORK [N. Y.] (212) 964-2722, [N. J.] (201) 791-8990
 BOSTON (617) 646-0550 • DAYTON (513) 294-1500
 CHICAGO (312) 992-0800 • WASHINGTON, D. C. (301) 948-7071
 ATLANTA (404) 394-5380 • LOS ANGELES (714) 540-9830
 SAN FRANCISCO (415) 948-8233 • DALLAS (214) 234-3357
 TORONTO (416) 252-3395 • ZURICH (01) 55 24 20

Variac® Adjustable Autotransformers

VARIAC® MANUALLY OPERATED AUTOTRANSFORMERS

W-TYPE MANUAL THREE-PHASE GANGED MODELS

240-VOLT INPUT GANGED UNITS

All units listed require an input of 240 volts except W5LG3M, W5LG3, and W8LG3, which require 208 volts. All have an output range of 0-240 volts except types with H in Model No., 0-280 volts, and types with L in Model No., 0-208 volts. Ball bearings are included with 4- and 6-gang types; available for other types at extra cost.

Model No.	Output Amps		kVA*	Description	Size, Inches			Shpg. Lbs.
	Rated	Max.			W.	D.↓	H.	
W5LG3M	7.1	9.2	3.31	3-Gang W5LMT†	5½	13½	6¾	32
W5LG3	8.5	11.0	3.96	3-Gang W5L†	4½	12½	4½	30
W8LG3	10.0	13.0	4.68	3-Gang W8L†	4½	14¾	4½	36½
W5HG2	2.0	2.6	1.08	2-Gang W5HS	4½	8½	4½	21
W5HG2M	2.0	2.6	1.08	2-Gang W5HMS	5½	8½	6¾	23
W2G3M	2.0	2.6	1.08	3-Gang W2MT†	4½	12½	5¾	21
W2G3	2.4	3.1	1.29	3-Gang W2†	3¼	12½	3¼	19
W10HG2	4.0	5.2	2.16	2-Gang W10HS	5½	10½	5¾	33
W10HG2M	4.0	5.2	2.16	2-Gang W10HMS	7½	10½	9½	37
W5G3M	5.0	6.5	2.70	3-Gang W5MT†	5½	13½	6¾	32
W5G3	6.0	7.8	3.24	3-Gang W5†	4½	12½	4½	30
W8G3	8.5	11.0	4.57	3-Gang W8†	4½	14¾	4½	36
W20HG2	8.0	10.4	4.32	2-Gang W20HS#	7½	10½	7½	55
W20HG2M	8.0	10.4	4.32	2-Gang W20HMS#	9	10½	12½	59
W10G3	10.0	13.0	5.40	3-Gang W10†	5½	15½	5¾	48
W10G3M	10.0	13.0	5.40	3-Gang W10MT†	7½	15½	9½	54
W30HG2	12.0	15.6	6.48	2-Gang W30HS#	10	11½	10¾	75
W30HG2M	12.0	15.6	6.48	2-Gang W30HMS#	11½	11½	14½	81
W20G3	20.0	26.0	10.80	3-Gang W20†	7½	14½	7½	78
W20G3M	20.0	26.0	10.80	3-Gang W20MT†	9	15½	12½	84
W50HG2M	20.0	31.0	12.90	2-Gang W50HMS#	13½	16½	17½	165
W30G3M	28.0	32.0	13.30	3-Gang W30MT†	11½	16½	17½	115
W50HG2	25.0	32.5	13.50	2-Gang W50HS#	12½	15½	12½	153
W30G3	30.0	36.0	15.00	3-Gang W30†	10	15½	10¾	108
W50G3M	40.0	45.0	18.70	3-Gang W50MT†	13½	22½	17½	221
W50G3	50.0	50.0	20.80	3-Gang W50†	12½	22½	12½	206
W50HG4BBM	40.0	62.0	25.80	4-G. W50HBBMS#	13½	28½	17½	328
W50HG4BB	50.0	65.0	27.00	4-G. W50HBB#	12½	28½	12½	300
W50G6BBM	80.0	90.0	37.40	6-G. W50BBMT†	13½	41½	17½	430
W50G6BB	100.0	100.0	41.60	6-G. W50BB†	12½	41½	12½	400

480-VOLT INPUT GANGED UNITS

All Variacs listed are for "Y" connection. Overvoltage circuits are not recommended. Ball bearings are included with 6-gang types; available for remaining types at extra cost. Output voltage range, 0-480 volts.

Model No.	Output Amps		kVA*	Description	Size, Inches			Shpg. Lbs.
	Rated	Max.			W.	D.↓	H.	
W5HG3	2.0	2.6	2.16	3-Gang W5H	4½	12½	4½	29
W5HG3M	2.0	2.6	2.16	3-Gang W5HM	5½	13½	6¾	31
W10HG3	4.0	5.2	4.32	3-Gang W10H	5½	15½	5¾	46
W10HG3M	4.0	5.2	4.32	3-Gang W10HM	7½	15½	9½	52
W20HG3	8.0	10.4	8.65	3-Gang W20H	7½	14½	7½	73
W20HG3M	8.0	10.4	8.65	3-Gang W20HM	9	15½	12½	81
W30HG3	12.0	15.6	13.00	3-Gang W30H	10	15½	10¾	107
W30HG3M	12.0	15.6	13.00	3-Gang W30HM	11½	16½	14½	113
W50HG3M	20.0	31.0	25.80	3-Gang W50HM	13½	22½	17½	230
W50HG3	25.0	32.5	27.00	3-Gang W50H	12½	22½	12½	214
W50HG6BBM	40.0	62.0	51.50	6-Gang W50HBBM▲	13½	41½	17½	458
W50HG6BB	50.0	65.0	54.00	6-Gang W50HBB▲	12½	41½	12½	428

* kVA ratings — normal input line voltage times maximum current; maximum current can be drawn at maximum voltage for line voltage connection only. † "Y" circuit connected. ‡ For 60 Hz only; no overvoltage connection. § Open-delta circuit connected. ¶ Overvoltage connection not recommended. ▲ See previous page for W50-F1 Choke for parallel combinations. ↓ Depth behind panel except cased types (excluding knobs). # Also for single-phase 120-volts input.

SINGLE-PHASE PORTABLE VARIACS

Portable, metered, cased Variacs with 2-wire or 3-wire cord and receptacle, and convenient carrying handle. Meter accuracy is 3% of full scale except 5% for ammetered Model W20HMT3A. Power switch disconnects both sides of line. Meters are switchable under load. Types MT and MT3 have overvoltage connections and corresponding dial scales; line-voltage connections and dial scales on special order.

120-VOLT INPUT

All units have max. output voltage range of 0-140 volts except W5LMT3 which has 0-120 volts. Models W5MT and W10MT come in 2-wire version; all others in 3-wire version.

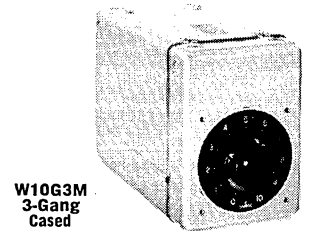
Model No.	Rated Output, Amps	Meter Range (full-scale)			Size, Inches			Shpg. Weight Lbs.
		Amps	Watts	V	W.	D.	H.	
W5MT*†	5.0	.....	.....	.....	47½	43½	6¾	15
W5MT3*†	5.0	.....	.....	.....	47½	43½	6¾	15
W5MT3VM	5.0	.....	.....	150	47½	43½	6¾	19
W5MT3A	5.0	1/5	.....	150	6¾	5¼	9½	19
W5MT3W	5.0	.....	150/750	150	6¾	5¼	9½	19
W5MT3AW	5.0	1/5	150/750	150	11½	5¾	8½	21
W5LMT3§	7.1	.....	.....	.....	47½	43½	6¾	18
W8MT3	10.0	.....	.....	.....	5¾	6½	7	16
W8MT3VM	10.0	.....	.....	150	5¾	6½	7	16
W10MT†	10.0	.....	.....	.....	6¾	5¼	9½	24
W10MT3†	10.0	.....	.....	.....	6¾	5¼	9½	24
W10MT3A	10.0	2/10	.....	150	8½	5¾	11½	30
W10MT3W	10.0	.....	300/1500	150	8½	5¾	11½	30
W20MT3A	18.0	20	.....	150	8½	5¾	11½	34
W20MT3†	18.0	.....	.....	.....	8½	5¾	11½	23

240-VOLT INPUT

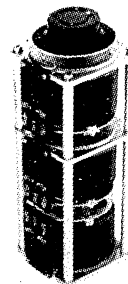
All units have max. output voltage range of 0-280 volts. Models W5HMT and W10HMT come in 2-wire cord and receptacle; all others in 3-wire cord and receptacle.

Model No.	Rated Output, Amps	Watts	V	W.	D.	H.	Shpg. Weight Lbs.
W5HMT†	2.0	.....	.....	47½	43½	6¾	15
W10HMT	4.0	.....	.....	6¾	5¼	9½	24
W10HMT3†	4.0	.....	.....	6¾	5¼	9½	24
W20HMT3†	8.0	.....	.....	8½	5¾	11½	35
W20HMT3A	8.0	10	300	8½	5¾	11½	31

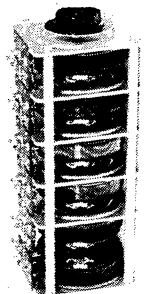
* Listed under UL Re-examination Service. † CSA Approved. § 60 Hz only.



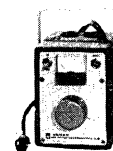
W10G3M
3-Gang
Cased



W5G3
3-Gang
Uncased



W30G6BB
6-Gang
Uncased



W8MT3VM



W8MT3

General Radio

300 BAKER AVENUE, CONCORD, MASS. 01742

Variac[®] Adjustable Autotransformers

VARIAC[®] MANUAL AND MOTOR-DRIVEN AUTOTRANSFORMERS

M-TYPE MANUAL MODELS FOR 350-1200 Hz OPERATION

For use at line frequencies between 350 and 1200 Hz. Equivalent to their Type-W counterparts, but smaller and lighter, and provide better regulation at 400 Hz than 60 Hz models. Conform to most military specifications for shock, vibration, salt spray, tropicalization, altitude, humidity and temperature.

SINGLE-PHASE 120-VOLT INPUT UNITS

Line voltage connection output, 0-120 volts; overvoltage connection output, 0-140 volts.

Model No.	Output Amps		kVA*	Description	Shpg. Wt. Lbs.
	Rated	Max.			
M2	2.4	3.1	0.37	Uncased	4
M5	6.0	7.8	0.94	Uncased	6
M10	10.0	13.0	1.56	Uncased	11
M20	20.0	26.0	3.12	Uncased	18

* kVA ratings — normal input line voltage times maximum current; maximum current can be drawn at maximum voltage for line voltage connection only.

MOTOR DRIVEN MODELS

All W- and M-type Variac autotransformers, both single and ganged, can be supplied with motor drives. Motors are fully enclosed, two-phase gear-reduction servo types having very low moments of inertia; the motor mounting plate is attached to the base end of the autotransformer by means of four heavy corner posts. Gear coupling is used to facilitate precise alignment, eliminate phase shift problems, and permit a number of drive speeds by simple change of gears. Three basic internal-gear motor speeds are available which, with a selection

HOW TO ORDER

W 5 H G 3 D 8 C K M
A B C

A Basic Unit Prefix: Select from table below the desired basic Variac unit, as described elsewhere in these pages.

Variac Prefix No.			Motor Indicator: D () CK					
	2	4	8	16	32	64	128	
M2	X	X	X	X	X	X	X	
M2G2	X	X	X	X	X	X	X	
M2G3	X	X	X	X	X	X	X	
M5	X	X	X	X	X	X	X	
M5G2	X	X	X	X	X	X	X	
M5G3	X	X	X	X	X	X	X	
M10	X	X	X	X	X	X	X	
M10G2	X	X	X	X	X	X	X	
M10G3	X	X	X	X	X	X	X	
M20	X	X	X	X	X	X	X	
M20G2	X	X	X	X	X	X	X	
M20G3	X	X	X	X	X	X	X	
W2	X	X	X	X	X	X	X	
W2G2	X	X	X	X	X	X	X	
W2G3	X	X	X	X	X	X	X	
W5	X	X	X	X	X	X	X	
W5G2	X	X	X	X	X	X	X	
W5G3	X	X	X	X	X	X	X	
W5H	X	X	X	X	X	X	X	
W5HG2	X	X	X	X	X	X	X	
W5HG3	X	X	X	X	X	X	X	
W5L	X	X	X	X	X	X	X	
W5LG2	X	X	X	X	X	X	X	
W5LG3	X	X	X	X	X	X	X	
W8	X	X	X	X	X	X	X	
W8G2	X	X	X	X	X	X	X	
W8G3	X	X	X	X	X	X	X	
W8L	X	X	X	X	X	X	X	
W8LG2	X	X	X	X	X	X	X	

Distributors for Variac[®] autotransformers:

ESCO Incorporated, 221 Crane Street, Dayton, Ohio 45403; (513) 224-9192

Gopher Electronics Co., 2520 West Larpentour Avenue, St. Paul, Minn. 55113; (612) 645-0241

Harrison Electronic Corp., 20 Smith Street, East Farmingdale, L. I., N.Y. 11735; (516) 293-7990

Philadelphia Electronics, Inc., 1225 Vine Street, Philadelphia, Pa. 19170; (215) 568-7444

Westates Electronics Corp., 20151 Bahama Street, Chatsworth, Calif. 91311; (213) 341-4411
255 North Mathilda Avenue, Sunnyvale, Calif. 94086; (408) 733-8383

Industrial Temperature Control, 23419 Ford Road, Dearborn, Mich. 48128; (313) 278-2210

Lafayette Industrial Electronics, 1400 Worcester Street, Natick, Mass. 01760; (617) 969-6100

James W. Clary Co., 1713 2nd Avenue South, Birmingham, Ala. 35233; (205) 322-2486, (800) 292-3467 in Ala., (800) 633-4215 outside Ala.

SINGLE-PHASE 240-VOLT INPUT UNITS

Line voltage connection output, 0-240 volts; overvoltage connection output, 0-280 volts.

Model No.	Output Amps		kVA*	Description	Shpg. Wt. Lbs.
	Rated	Max.			
M2G2	2.4	3.1	0.74	2-Gang M2	6
M5G2	6.0	7.8	1.88	2-Gang M5	12
M10G2	10.0	13.0	3.12	2-Gang M10	18
M20G2	20.0	26.0	6.24	2-Gang M20	34

THREE-PHASE 240-VOLT INPUT UNITS

Line voltage connection output, 0-240 volts; overvoltage connection not recommended.

Model No.	Output Amps		kVA*	Description	Shpg. Wt. Lbs.
	Rated	Max.			
M2G3	2.4	3.1	1.29	3-Gang M2	9
M5G3	6.0	7.8	3.24	3-Gang M5	14
M10G3	10.0	13.0	5.40	3-Gang M10	27
M20G3	20.0	26.0	10.80	3-Gang M20	48

of standard coupling gears, makes possible the assembly of units having nominal full-traverse (320°) speeds of 2, 4, 8, 16, 32, 64 or 128 seconds at 60 Hz (approximately 20% slower at 50 Hz). The 2- and 4-second units are intended for high-speed servo applications; slower speed models are primarily for remote positioning. Cases are available for most models as indicated. All motor-driven Variacs are furnished complete with ball bearings, a 120-volt phase-shift capacitor, and an adjustable microswitch for setting traverse limits.

B Motor Indicator Suffix: Add appropriate suffix for each Variac as indicated by an X in columns below. Suffix indicates seconds for 320° traverse.

C Case Suffix: Add final suffix M if case available and desired. Case fully encloses both motor and Variac.

Variac Prefix No.			Motor Indicator: D () CK					
	2	4	8	16	32	64	128	
W8LG3		X	X	X	X	X	X	
W10	X	X	X	X	X	X	X	
W10G2		X	X	X	X	X	X	
W10G3		X	X	X	X	X	X	
W10H	X	X	X	X	X	X	X	
W10HG2		X	X	X	X	X	X	
W10HG3		X	X	X	X	X	X	
W20		X	X	X	X	X	X	
W20G2		X	X	X	X	X	X	
W20G3		X	X	X	X	X	X	
W20H		X	X	X	X	X	X	
W20HG2		X	X	X	X	X	X	
W20HG3		X	X	X	X	X	X	
W30		X	X	X	X	X	X	
W30G2		X	X	X	X	X	X	
W30G3		X	X	X	X	X	X	
W30H		X	X	X	X	X	X	
W30HG2		X	X	X	X	X	X	
W30HG3		X	X	X	X	X	X	
W50			X	X	X	X	X	
W50G2			X	X	X	X	X	
W50G3			X	X	X	X	X	
W50G4								X
W50G6								X
W50H			X	X	X	X	X	
W50HG2			X	X	X	X	X	
W50HG3			X	X	X	X	X	
W50HG4								X
W50HG6								X



General Radio

300 BAKER AVENUE, CONCORD, MASS. 01742

NEW YORK [N.Y.] (212) 964-2722, [N.J.] (201) 791-8990
BOSTON (617) 646-0550 • DAYTON (513) 294-1500
CHICAGO (312) 992-0800 • WASHINGTON, D.C. (301) 948-7071
ATLANTA (404) 394-5380 • LOS ANGELES (714) 540-9830
SAN FRANCISCO (415) 948-8233 • DALLAS (214) 234-3357
TORONTO (416) 252-3395 • ZURICH (01) 55 24 20

FERROTRAN

ELECTRONICS CO., INC.

MINIATURE TRANSFORMERS

Extremely small rectifier transformers with single or dual secondary winding for electronic designers who wish to design their own solid state power supplies. 115 volt A.C. input, 55-450 cycles ratings below give D.C. outputs for rectifier circuits with condenser input.

SUBMINIATURE UNITS

Channel-frame ($1\frac{3}{8}'' \times 1\frac{1}{8}'' \times 1''$).

Model	Sec. D.C., Volts	Sec. D.C., Current	Price
SM-1	10C.T.	80ma	\$12.50
SM-2	15C.T.	60	12.50
SM-3	20C.T.	50	12.50
SM-4	30C.T.	30	12.50
SM-5	12, 12C.T.	30	16.00
SM-6	15, 15C.T.	25	16.00
SM-7	40	25	13.00
SM-8	50	20	13.00
SM-9	60	17	13.00
SM-10	70	15	13.00

MINIATURE UNITS

Channel-frame ($1\frac{1}{2}'' \times 1\frac{1}{2}'' \times 1\frac{1}{2}''$).

Model	Sec. D.C., Volts	Sec. D.C., Current	Price
R-1	40C.T.	35ma	\$11.50
R-2	30C.T.	50	11.50
R-3	20C.T.	75	11.50
R-4	10C.T.	160	11.50
R-5	20, 20C.T.	50	13.50
R-6	15, 15C.T.	50	13.50
R-7	10, 10C.T.	75	13.50
R-8	6, 6C.T.	100	13.50
R-9	50	30	11.50
R-10	60	27	12.00
R-11	70	22	12.00
R-12	80	20	12.00
R-13	90	18	12.00
R-14	100	18	12.50
R-15	120	15	12.50
R-16	150	15	13.00
R-17	180	10	13.00
R-18	200	10	13.00

The R Series also available in epoxy case for printed circuit boards. $1\frac{1}{8}'' \times 1\frac{1}{8}'' \times 1\frac{1}{2}''$.

INTERMEDIATE UNITS

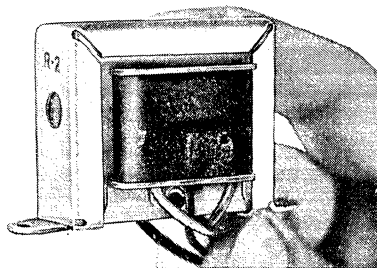
Channel-frame ($2'' \times 1\frac{1}{2}'' \times 1\frac{1}{4}''$).

Model	Sec. D.C., Volts	Sec. D.C., Current	Price
I-1	10C.T.	300ma	\$10.00
I-2	15C.T.	250	10.00
I-3	20C.T.	200	10.00
I-4	25C.T.	175	10.50
I-5	30C.T.	140	10.50
I-6	40C.T.	125	10.50
I-7	20, 20C.T.	125	12.50
I-8	15, 15C.T.	125	12.50
I-9	10, 10C.T.	150	12.50
I-10	50	80	11.00
I-11	75	60	11.50
I-12	100	35	11.50
I-13	150	30	12.00
I-14	180	30	12.00
I-15	200	25	12.00

SUBMINIATURE PC UNITS

Encapsulated transformers in a grey epoxy housing mounted on rigid epoxy forms; incorporates pins for direct soldering to printed circuit boards. $1\frac{1}{8}'' \times 1\frac{1}{4}'' \times 1\frac{1}{4}''$.

Model	Sec. D.C., Volts	Sec. D.C., Current	Price
SM-1A	10	80ma	\$13.00
SM-2A	15	60	13.00
SM-3A	20	50	13.00
SM-4A	30	30	14.00
SM-5A	12, 12	30	15.00
SM-6A	15, 15	25	16.00



R-2 CHANNEL FRAME TRANSFORMER

Transformers shown on this page priced and specified for channel-frame mounting.

STANDARD UNITS

Channel-frame ($2\frac{1}{4}'' \times 2'' \times 1\frac{1}{2}''$).

Model	Sec. D.C., Volts	Sec. D.C., Current	Price
S-1	10C.T.	670ma	\$10.50
S-2	15C.T.	500	10.50
S-3	20C.T.	300	11.00
S-4	30C.T.	225	11.00
S-5	50C.T.	125	11.50
S-6	20, 20C.T.	150	13.50
S-7	15, 15C.T.	200	13.50
S-8	10, 10C.T.	300	13.50
S-9	75	120	11.50
S-10	100	70	11.50
S-11	120	60	12.00
S-12	150	45	12.00
S-13	200	35	12.00

CM SERIES

Channel-frame ($2\frac{5}{8}'' \times 2\frac{3}{8}'' \times 1\frac{3}{4}''$).

Model	Sec. D.C., Volts	Sec. D.C., Current	Price
CM-1	10C.T.	1.0a	\$11.00
CM-2	15C.T.	.75	11.00
CM-3	20C.T.	.60	11.00
CM-4	30C.T.	.40	11.00
CM-5	40C.T.	.3a	11.00
CM-6	80	.14	11.00
CM-7	100	.12	11.00
CM-8	120	.10	12.00
CM-9	150	.07	12.00
CM-10	175	.06	12.00
CM-11	200	.05	12.00

DESIGN INFORMATION

CENTER TAP — All center-tapped units are specified C.T. The ratings, therefore, are for a full-wave circuit. All others are designed for a bridge circuit.

TEST VOLTAGE — 1000 volts, D.C. between primary and secondary, and between secondary windings.

INSULATION — Nylon bobbin; insulating paper between each layer.

LEADS — Flexible leads rated for 105°C.

DUAL SECONDARIES — Transformers shown with two output units give indicated current from each tap.

All transformers listed may be wound for 220 volts, A.C. input.

SPECIAL TRANSFORMERS

There is no extra charge to design transformers with output voltages similar to those shown on this page. Call us for our free estimate. You can rely on our prompt service.

HIGH CURRENT UNITS

Channel-frame ($3'' \times 2\frac{1}{2}'' \times 2''$).

Model	Sec. D.C., Volts	Sec. D.C., Current	Price
H-1	10C.T.	1.3amp	\$14.00
H-2	15C.T.	1.3	14.00
H-3	20C.T.	1.0	14.00
H-4	30C.T.	0.7	14.00
H-5	40C.T.	0.4	14.00
H-6	20, 20C.T.	0.5	16.00
H-7	15, 15C.T.	0.7	16.00
H-8	10, 10C.T.	1.0	16.00
H-9	80	.225	14.00
H-10	100	.180	14.00
H-11	120	.150	14.50
H-12	150	.130	14.50
H-13	175	.110	15.00
H-14	200	.100	15.00
H-15	225	90ma	15.00
H-16	250	80	15.50
H-17	275	70	15.50
H-18	300	65	15.50
H-19	400	50	16.00
H-20	500	40	16.00

RT SERIES

Channel-frame ($3\frac{3}{4}'' \times 2\frac{3}{8}'' \times 3''$).

Model	Sec. D.C., Volts	Sec. D.C., Current	Price
RT-1	10C.T.	5amp	\$17.00
RT-2	15C.T.	3.5	17.00
RT-3	20C.T.	2.5	17.00
RT-4	30C.T.	1.7	17.00
RT-5	40C.T.	1.3	17.00
RT-6	50	1.0	17.00
RT-7	75	.7	18.00
RT-8	100	.5	18.00
RT-9	120	.5	19.00
RT-10	150	.4	19.00
RT-11	180	.4	19.00
RT-12	200	.35	19.00

ISOLATION TRANSFORMERS

Model	Sec. D.C., Volts	Sec. D.C., Current	Price
IH	115	170ma	\$14.00

ENCASED TRANSFORMERS

All listed transformers are available fully encapsulated in a MIL-T-27 can.

The cost of such units is an additional \$10.00 for single secondary transformers and \$12.00 additional for dual secondary units.

Standard connectors are of the hooked solder pin type, mounted dead center on the stud side of the case.

SEE SECTION 4000
FOR LIST OF FERROTRAN POWER SUPPLIES

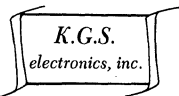


FERROTRAN ELECTRONICS COMPANY, INC.

683 BROADWAY

NEW YORK, N.Y. 10012

PHONES: (212) 254-5810; 254-5636



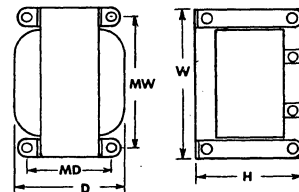
kgs electronics

2029 North Lincoln Avenue • Pasadena, California 91103 • Telephone (213) 798-0787

PASSIVE COMPONENTS

POWER TRANSFORMERS AND HIGH CURRENT CHOKES

- Primary Voltage = 115 V RMS, 60 Hz (Will Operate to 400 Hz).
- Transformer Regulation is 5% No Load to Full Load.
- Transformers Rated for 45°C Temperature Rise.
- All Transformers Have Two Secondary Windings. They Can Be Connected for Parallel or Series Operation.
- Available Immediately from Stock.
- Secondary Voltages between the Standard Units Available.
- All Chokes Have Two Identical Coils. They Can Be Connected in Parallel or Series.
- All Chokes and Transformers Rated for Class R Performance Per MIL-T-27C.



TRANSFORMERS

Power Watts	Part No.	Secondary	
		Es VRMS	Curr. ARMS
100	100-12.8	12.8	8
100	100-28	28	4
100	100-36	36	3
100	100-56	56	2
250	250-12.8	12.8	20
250	250-28	28	9
250	250-36	36	7
250	250-56	56	4.5
500	500-12.8	12.8	40
500	500-28	28	18
500	500-36	36	14
500	500-56	56	9
1000	1000-28	28	36
1000	1000-36	36	28
1000	1000-56	56	18

INDUCTANCE TABLE

Part No.	Series			Parallel		
	Ind. MH	Curr. ADC	DC Res. Ohm	Ind. MH	Curr. ADC	DC Res. Ohm
100-8L	8	6.0	.06	2	12	.015
100-40L	40	3.0	.35	10	6	.09
100-60L	60	2.5	.56	15	5	.14
100-160L	160	1.6	1.35	40	3.3	.34
250-4L	4	15.0	.037	1	30	.009
250-16L	16	8.0	.146	4	16	.037
250-28L	28	6.0	.20	7	12	.05
250-60L	60	4.0	.50	15	8	.125
500-2L	2	34.0	.016	0.5	68	.004
500-8L	8	15.0	.05	2	30	.012
500-16L	16	13.0	.09	4	26	.022
500-28L	28	8.0	.22	7	16	.055
1000-4L	4	30.0	.026	1	60	.007
1000-6L	6	25.0	.038	1.5	50	.01
1000-16L	16	17.0	.10	4	34	.025

TRANSFORMER

Power VA	Dimensions in Inches							Wt. Lb.
	W	H	D	MW	MD	A		
100	3 3/8	2 1/8	3 1/2	2 1/8	3	7/32 x 5/16		5
250	4 1/8	3 3/8	4	3 3/8	3 1/8	7/32 x 5/16		10
500	5 1/4	4 3/8	4 1/2	4 3/8	3 1/2	7/32 x 15/32		16
1000	6 3/8	5 3/8	6	5 3/8	4 1/2	7/32 x 1/2		30

CHOKES

Power VA	W	H	D	MW	MD	A	Wt. Lb.
100	3 3/8	2 1/8	3 1/2	2 1/8	3	7/32 x 5/16	5
250	4 1/8	3 3/8	4	3 3/8	3 1/8	7/32 x 5/16	10
500	5 1/4	4 3/8	4 1/2	4 3/8	3 1/2	7/32 x 15/32	16
1000	6 3/8	5 3/8	6	5 3/8	4 1/2	7/32 x 1/2	27

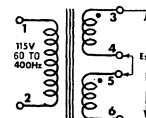
HOW TO ORDER

• CHOKES

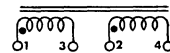
VA Rating | 100 - 8L | Series Inductance in Millihenries

• TRANSFORMERS

VA Rating | 100 - 28 | Secondary RMS Voltage



TRANSFORMERS



CHOKES

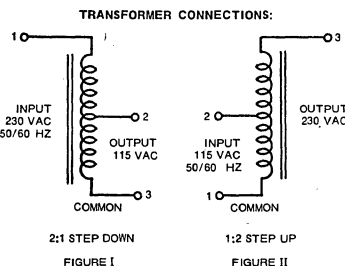
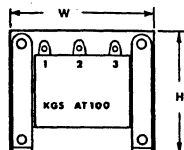
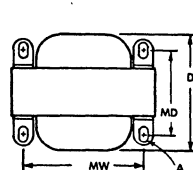
AUTO TRANSFORMERS

FEATURE:

- Small size and weight
- 50/60 Hz operation
- Regulation 5%
- Open frame construction
- Designed to meet MIL-T-27C per TF6RX01

APPLICATIONS:

- Step down, 230 VAC to 115 VAC (Fig. I)
- Step up, 115 VAC to 230 VAC (Fig. II)
- Other voltages*, 5V to 600 VAC @ 30A max., available on special order



HOW TO ORDER

- Standard Parts Listed: By Part Number
- Non-Standard Parts: Specify*

AT100 - Input AC - Output AC
Part No. & VA Rating | 115 V or 230 V | Desired* Voltage

Part No.	Power VA	Dimensions in Inches ±1/16							Wt. Lb.
		W	H	D (Max.)	MD	MW	A		
AT100	100	3.38	2.81	3.00	2.12	2.81	7/32 x 5/16		3
AT200	200	3.38	2.81	3.70	3.00	2.81	7/32 x 5/16		5
AT500	500	4.50	3.75	4.25	3.12	3.75	7/32 x 5/16		10
AT1000	1000	5.25	4.38	4.75	3.62	4.38	7/32 x 13/32		16
AT2000	2000	7.06	6.06	5.75	3.75	5.81	7/16 x 1 1/16		30

400 Hz POWER TRANSFORMERS

- Available immediately from stock.
- Secondary voltages between the standard units at no additional cost.
- Allow two weeks for non-standard voltage transformers.

APPLICATIONS:

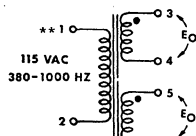
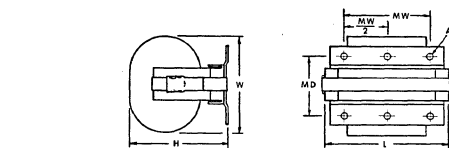
- Isolation
- Power supplies
- Step-down

DESIGN INFORMATION:

- Transformers designed to meet MIL-T-27C per

Transformer TF - 8 - R - X - ZZ
Open Type (02) Rectified & (01) Unrectified Loads
105°C | 10,000 Hrs. Minimum

- All primaries 115 VAC 380-1000 Hz.
- Transformer regulation is 6% no load to full load.
- All transformers have two secondary windings. They can be connected for parallel or series operation.



VA Rating	Overall Dimensions			Mounting Dimensions			Hole A	Wt. Lb.
	W	H	L	MW	MW/2	MD		
100	2.00	2.50	2.56	2.00	NA	1.37	.156	1.2
250	2.50	3.38	3.25	2.50	NA	1.43	.156	2.5
500	4.50	4.38	4.00	3.62	1.81	2.00	.196	6.0
750	4.75	4.50	4.25	3.62	1.81	2.00	.196	7.0

VA Rating	Part No.	Dual Secondary			
		Eo (RMS)		Amps (RMS)	
		P*	S*	P*	S*
100	CC100-6.3	6.3	12.6	16	8
	CC100-26	26	52	4	2
250	CC250-6.3	6.3	12.6	40	20
	CC250-26	26	52	10	5
500	CC500-6.3	6.3	12.6	80	40
	CC500-26	26	52	19	9.5
750	CC750-6.3	6.3	12.6	120	60
	CC750-26	26	52	30	15

*P = Parallel; S = Series

HOW TO ORDER

CC - 100 - 6.3 - **
"C" Core | Secondary Volts
VA Rating

**Specify primary voltage if other than 115 VAC.

CURRENT TRANSFORMERS

FEATURE:

- Accurate and expedient method of measuring AC current to 1000 amps.
- Convenient and easy method to convert AC current to AC or DC voltage.
- Measures AC current with minimum interaction from metering circuits
- Transforms primary current in accordance to $I_p N_p = I_s N_s$
- Rated Class R (105°C) minimum per MIL-T-27C.
- Insulation Test Voltage: 1500 VAC @ 60 Hz.

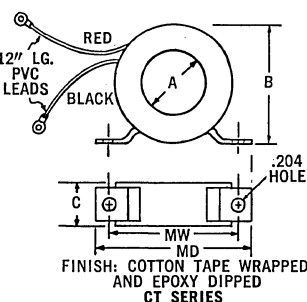
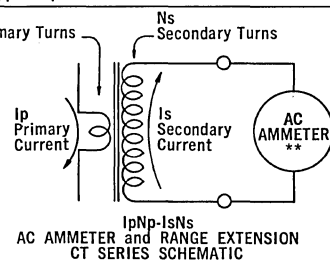
CT SERIES

CT Series Size	Primary Current Amps	Secondary			Dimensions in Inches					Wt. (lb.)
		Meter Current Amps	V RMS @ 60 Hz Max.	Burden @ 60 Hz VA Max. **	A	B	C	MD	MW	
11	20	1	.5	.5						
	30	1	2.5	1						
	50	1	4	2	.90	2.62	1.12	3.31	2.68	.7
	100	1	9	2						
51	40	5	.5	2.5						
	50	5	1	5						
	60	5	1.5	5	1.00	3.25	1.50	3.75	3.12	1.2
	100	5	2.5	5						
52	150	5	3	5						
	200	5	5	5						
	300	5	7	5	1.40	3.50	1.55	4.25	3.62	1.6
	400	5	9	5						
53	500	5	3	5						
	600	5	4	5						
	800	5	5	5	2.00	4.00	1.30	4.75	4.12	1.4
	1000	5	6	5						

**Max. Burden for 2% Accuracy: .48 ohms for 1A Ammeter, .02 ohms for 5A Ammeter.

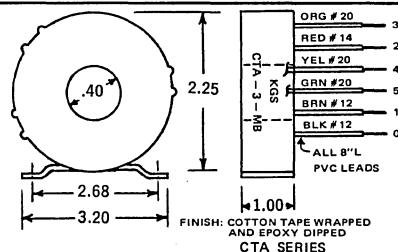
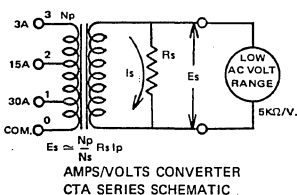
SERIES DESCRIPTION

Series	Description
CT	60-400 Hz toroidal type. Primary is single turn provided by insulated conductor under test. Secondary drives 1A or 5A AC ammeter.
CMC	60-400 Hz EI type. Multiple-turn primary transforms AC current to proportional AC secondary voltage, E_s across R_s , for AC or DC control.
CTA	60-3K Hz multi primary current range toroidal type. This Series conveniently converts low AC voltmeter range into AC current meter. R_s supplied per schematic.



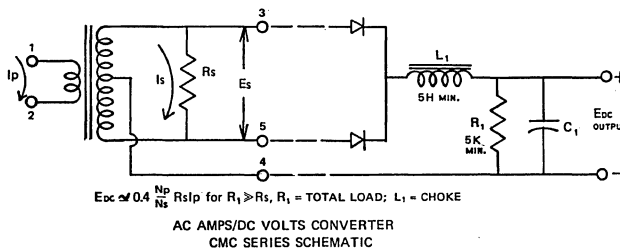
CTA SERIES

CTA Series Part No.	Primary Current Amps	Secondary	
		Full Scale Deflection @ 5K Ω /VAC	Tracking Deviation $\pm$ %
CTA-3-MB	3A 15A, 30A	3	2



CMC SERIES

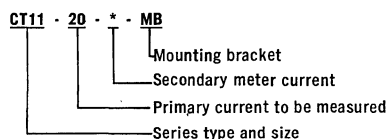
CMC Series Size	Primary Current Amps *	Secondary		
		Burden @ 60 Hz RS (ohms)	Es RMS @ 60 Hz Max.	Tracking Deviation $\pm$ % Es
37	0-1	1K	20	3
	0-5	1K	20	3
	0-10	1K	20	3
	0-20	1K	20	3
	0-30	1K	20	3



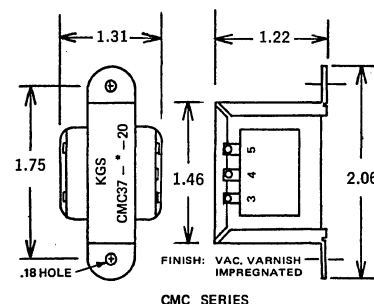
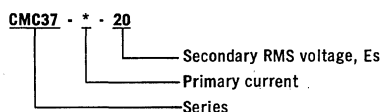
AVAILABILITY:

- Standard units listed generally available from stock.
- Allow 4 weeks delivery for non-standard units.

HOW TO ORDER



CTA SERIES — Order by Part Number



K.G.S.

electronics, inc.

kgs electronics

2029 North Lincoln Avenue • Pasadena, California 91103 • Telephone (213) 798-0787

ISOLATION TRANSFORMER

- Applied for UL listing*
- Built-in line cord and plug*
- Built-in voltage meter
- Built-in circuit breaker protection
- 60 Hz portable
- Electrostatic shield
- Low leakage current
- Hospital grade plug & receptacle available*

*Medical equipment

APPLICATION:

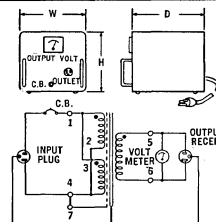
- Isolation Transformer

HOW TO ORDER

IT - 500 - XX
ISOLATION TRANSFORMER VA RATING SECONDARY VOLTAGE IF OTHER THAN 115 VAC

Power Rating VA	Part No.	Voltage		Dimensions in Inches			App. Wt. Lbs.
		Primary VAC	Sec. VAC	W	D	H	
500	IT-500	115	115	6.00	7.00	5.00	20
1000	IT-1000	115	115	6.87	8.00	6.00	35
1500	IT-1500	115	115	8.00	9.00	6.50	50
2000	IT-2000	115	115	8.00	9.00	6.50	60

Leakage Current	
Input Polarity	Output (Term. 5) to Earth Gnd. Leak
Normal	5 μ A Typ.
Reversed	5 μ A Typ.

**FERRO-RESONANT TRANSFORMER**

Ferro-Resonant Transformer (FRT) provides a stable transient-free, regulated DC voltage with short-circuit protection and superior dynamic characteristic. A series of these FRT's are available from KGS ELECTRONICS at almost any output voltage.

FEATURE:

- Wide choice of output voltage from 6 VDC to 240 VDC and up to 500 VA, 20 Amps maximum.
- Designed for maximum efficiency for the given size.
- Line regulation is $\pm 1\%$ (See schematic).
- With an additional resonant capacitor to C1 (about 50%), $\pm 1\%$ line regulation is realized at 95 VAC input with slight increase in overall output voltage E_o .
- No load to full load regulation is 5% to 10% depending on the bleeder value.

APPLICATION:

- Replacement of conventional power transformer for transient suppression.
- Economical and reliable DC power supply, battery charger, etc.

STANDARD RATING AND SIZE

VA Unit	W (in.)	H (in.)	D (in.)	MW (in.)	MD (in.)	LAM (in.)	A (in.)	Wt. (lb.)	Suggested Value*			
									C1 (μ F)	C2 (μ F)	R _{B1} (Watt)	
50	3.13	3.78	2.75	2.62	2.13	1.12	1 $\frac{3}{4}$ x 2 $\frac{3}{4}$	5	1.0	10K	10	
100	5.00	3.75	3.40	4.25	2.50	1.50	1 $\frac{3}{4}$ x 2 $\frac{3}{4}$	8	1.5	22K	20	
200	5.25	5.75	4.00	4.38	2.25	1.12	2 $\frac{1}{2}$ x 1 $\frac{1}{2}$	12	2.0	40K	25	
300	5.25	5.75	4.25	4.38	2.62	1.50	2 $\frac{1}{2}$ x 1 $\frac{1}{2}$	15	3.0	60K	50	
400	5.25	5.75	4.75	4.38	3.12	2.00	2 $\frac{1}{2}$ x 1 $\frac{1}{2}$	19	4.0	80K	75	
500	5.25	5.75	5.50	4.38	3.62	2.50	2 $\frac{1}{2}$ x 1 $\frac{1}{2}$	23	5.0	100K	100	

*1. C1 is a liq-filled AC capacitor, GE type 45F, 660 VAC, or equivalent (supplied at additional cost).

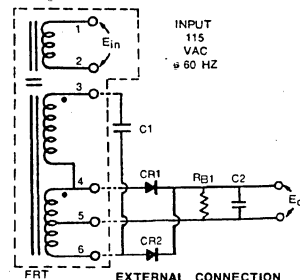
*2. C2 is an aluminum, Computer Grade electrolytic capacitor. K = 1000 WVDC = 1.3 E_o and the capacitance value is based on 25 VDC output voltage, E_o . Use the following equation for the output voltage, E_o other than 25 VDC:

$$C2 = (5 \frac{VA}{E_o}) \cdot K - \mu F \text{ Where: } VA = VA \text{ rating of the output}$$

$$E_o = DC \text{ output voltage}$$

*3. R_{B1} is a recommended 10% bleeder load approximately calculated by $R_{B1} = \frac{10(E_o)^2}{VA}$ — Ohms

*4. Output voltage E_o is held within $\pm 2\%$ of nominal with suggested values of C1, C2, and R_{B1} .

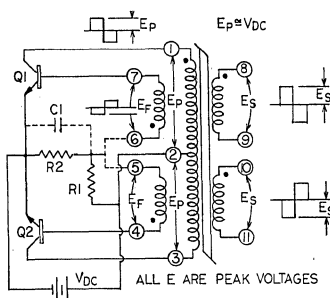
**HOW TO ORDER (Sample shown)**

FRT 200 28
Ferro-Resonant Transformer DC Output Voltage (6 VDC to 240 VDC)
VA Rating (See Table and Note)

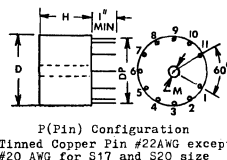
SQUARE CORE SWITCHING TRANSFORMERS**DESIGN FEATURE:**

- Designed to meet: *MIL-T-27C
- Encapsulated $\frac{TF-5-S-X}{130^\circ C \text{ Temp.}}$ Life > 10,000 hrs.
- Vibration • Humidity • Altitude • High Shock

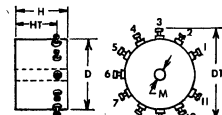
- Insulation Test Voltage: 500 VDC.
- Tolerance: $\pm 5\%$.
- Switching efficiency of 95% attainable.
- Isolated feedback windings.
- Secondary can be connected in series or parallel.
- Output power greater than 50 VA should be driven from another stage.
- Terminals for general application.
- Pins for printed circuit installation.
- Nomenclature simplified for ease of design selection.

**APPLICATION:**

- DC to AC inverter.
- DC to DC converter.
- DC isolation to output AC or DC.
- DC to step-up or step-down.
- Volt-second support, saturable reactor.



P(Pin) Configuration
Tinned Copper Pin #22AWG except #20 AWG for S17 and S20 size



T(Terminal) Configuration
Not available in S8 & S10 size

TABLE I — STANDARD SIZE

S Size	Dimensions in Inches						Wt. (oz.)
	D	H	DT	HT	DP	M	
8	.87	.62	None	None	.77	None	.45
10	1.06	.62	None	None	.90	None	.90
12	1.29	1.00	1.62	.81	1.15	.166	1.80
15	1.50	1.00	1.88	.81	1.35	.166	4.00
17	1.75	1.00	2.13	.81	1.60	.166	4.80
20	2.00	1.25	2.38	1.05	1.80	.166	6.80

HOW TO ORDER

(Sample shown below)

- Refer to Table I for physical size and cost.
- Refer to Table II for secondary volt-ampere rating and switching frequency that correspond to Table I.
- Recommended % feedback range should be such that it will drive the base of the switching transistor by 1.5 to 2.0 V peak.
- Follow the nomenclature shown below to specify your requirements when placing an order.

S12 - 10 - 2.5 - 28 - 6 - 50 - T or P
Switching Transformer Size Secondary Voltages, E_s , in Peak (100 V Max.)
Power Rating in VA Feedback in Percent = $(E_f/E_s) \times 100^{**}$
*Switching Frequency in KHz Nominal DC Input Voltage, $V_{dc} \approx E_f$ (50 VDC Max.)
** E_f = Feedback in Percent $\frac{\text{Feedback in Percent}}{100} \times V_{dc}$

TABLE II STANDARD RATING

S Size	Rating VA	SW Freq. KHz
8	.4	.4
	1.0	1.0
	2.0	2.5
	4.0	*10.0
10	1.0	.4
	2.5	1.0
	5.0	2.5
	10.0	*10.0
12	2.0	.4
	5.0	1.0
	10.0	2.5
	20.0	*10.0
15	5.0	.4
	12.0	1.0
	25.0	2.5
	50.0	*10.0
17	12.0	.4
	25.0	1.0
	50.0	2.5
	100.0	*10.0
20	25.0	.4
	50.0	1.0
	100.0	2.5

***NOTE:**

1. Add 20% to prices for 10 KHz switching
2. Add 10% to these prices for low profile (.2 inches below the standard height, H) available in Pin Configuration

WE ALSO MANUFACTURE POT CORE INDUCTORS & WIDEBAND TRANSFORMERS.
ALL TECHNICAL DATA AND PRICES SUBJECT TO CHANGE WITHOUT NOTICE.
MINIMUM \$25.00 PER ORDER. \$10.00 PER ITEM. F.O.B., PASADENA, CALIFORNIA.

TRANSFORMERS



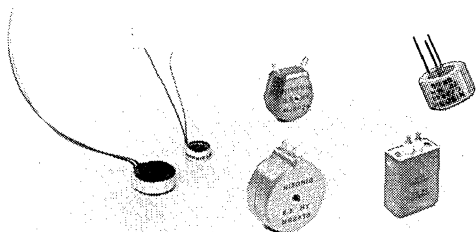
249 N. TROOST • OLATHE, KANSAS 66061
PHONE: 913-782-0012
TELEX: 4-2562

INDUCTORS

Hisonic has long been a leader in the custom development and manufacture of high Q precision inductors. Originally confined to MPP and PI toroidal types, capabilities have been expanded to include ferrite pot core and laminated alloy core types and cover virtually every known construction that applications may require.

Although Hisonic stocks several series (primarily toroidal) most are custom made to specific requirements which results in less compromise in your applications and usually lower cost.

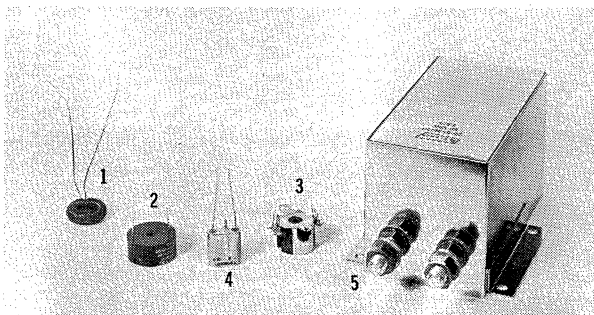
STANDARD
 UNCASSED MOLDED METAL CASSED



*Toroidal Series	Ind. Range	Max Q	Freq Range	DC R Ohms/MH	Uncased Size
J2	5.6MH to 3.3HY	90	Up to 30KHZ	.50	.620D x .30H
J3	2.7 to 470MH	110	20 to 150KHZ	1.1	.620D x .30H
J4	.56 to 33MH	110	100 to 400KHZ	5.1	.620D x .30H
J5	.10 to 10MH	150	250KHZ to 1.5MHZ	8.9	.620D x .30H
R2	6.8MH to 6.8HY	135	Up to 20KHZ	.18	.960D x .40H
R3	3.3 to 470MH	180	10 to 60KHZ	.39	.960D x .40H
R4	1.2 to 68MH	170	40 to 160KHZ	.90	.960D x .40H
S2	6.8MH to 15HY	160	Up to 15KHZ	.10	1.250D x .62H
S3	3.3 to 560MH	225	10 to 60KHZ	.21	1.250D x .62H
T2	22MH to 39HY	210	Up to 15KHZ	.045	1.850D x .85H
V2	68MH to 68HY	245	Up to 8KHZ	.028	2.400D x .92H
W2	100MH to 100HY	260	Up to 6KHZ	.021	2.700D x 1.05H

*Write for Series Bulletins on electrical and case style details

EXAMPLE *CUSTOM INDUCTORS



P/N	Fig.	Description	Characteristics	Type	Size
26-5103 Series	2	Encaps. PC Mtg.	See R Series Std	Tor.	1.06x.5H
06-4000-27	1	DC Filter Choke	250uH@1.5ADC	Tor.	.970Dx.4H
06-4000-39	3	Var. Ind. PC Mtg.	90-110MH Q250	Pot.	.80Dx.5H
26-5034 Series	4	Xtal Case Mtg.	See J Series Std	Tor.	.34x.75x.8H
26-5135-00	5	Shielded Choke	50uH @1.00ADC	Lam	2.65x5x3H

*Advise requirements for recommended solution and quotation

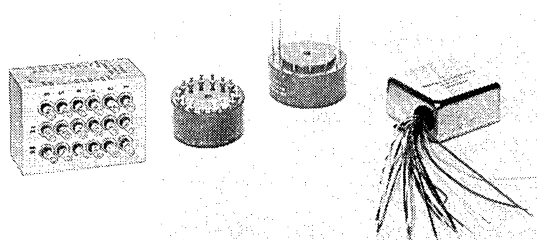
TRANSFORMERS

Hisonic has recognized capabilities in the design and manufacture of transformers, particularly for technically sophisticated custom applications. Thousands of Hisonic converter transformers are "flying" over the world, powering aircraft com/nav equipment. Special signal and matching transformers for both voice and wide video ranges are in use in communication systems.

Constructions include toroidal, pot core and laminated core to commercial and MIL specifications.

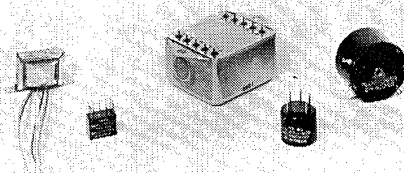
There are few "stock" items, but hundreds of designs and our engineering staff are ready to solve your transformer problems quickly.

EXAMPLE DC CONV/AC POWER



P/N	Input	OP Freq	VA Rating	Output Volts Peak (or RMS)	Size
24-0170-10	10V DC	24KHZ	0.8	20CT	.28x.6x.48H
24-0193-10	14/28V DC	6KHZ	18	4.7,11.5CT,22.5CT,550	1.8 ODx.94H
24-0135-10	14/28V DC	4KHZ	25	9.20CT,11.70	1.8x2.0x.88H
24-0107-10	14/28V DC	2KHZ	27	90/45CT,180/25,180/25	2.1 ODx.88H
24-0202-11	14/28V DC	4KHZ	35	9.5CT,22.5CT,100,100	1.8x2.0x.88H
24-0114-10	14/28V DC	400HZ	75	26, 60	2.9 ODx1.5H
24-0271-10	14/28V DC	5KHZ	80	6.5CT,22.5CT,100,100	2.0x2.0x1.0H
24-0277-10	42V DC	10KHZ	200	100	2.0x2.5x1.2H
24-0177-10	10V AC	400HZ	2	1.4,1.4,10 (RMS)	1.9 ODx.86H
24-0169-10	26V AC	400HZ	17	21/13CT (RMS)	1.0x1.4x1.3H
24-0215-10	115V AC	400HZ	180	20.27,27.42 (RMS)	3.2x3.8x4.1H

EXAMPLE SIGNAL/PULSE/MATCH



P/N	Description	Impedance	Response	Level	Size
24-0239-11	Video Range Match	150:150,25	100KHZ-2.5MHZ	60mw	.63x.63x.44H
24-0275-10	Wide Band Match	135CT:1000	1KHZ-2MHZ	4mw	1.1 ODx.75H
24-0205-10	Voice Band Hybrid	600:600+600	300-3000HZ	100mw	1.0x1.0x1.0H
24-0240-10	Wide Band Hybrid	600:600+600	50HZ-50KHZ	1mw	1.8x2.0x1.0H
24-0171-10	Radio Freq. Hybrid	50:100+100	700KHZ-4MHZ	10mw	.75 ODx.85H
24-0153-10	Pulse Match	10K:40K	tp1.2ms, tr60us	25mw	.53x.53x.7H
24-0180-10	Pulse Output	5:600w/tap	tp.4us, tr.2us	6KW	1.5 ODx.8H



OTHER PRODUCTS: High, Low & Band Pass and Suppression Filters • Tuned Circuits • Amp/Phase Equalizers • Lumped Constant Delay Lines

TRANSFORMERS



MICROTRAN

145 E. Mineola Ave • Valley Stream, N.Y. 11582
Phone: (516) 561-6050 • TWX: 510-225-8412

AUDIO & POWER COMMERCIAL and MIL TRANSFORMERS



• MINIATURE • TELEPHONE • TOROIDAL • INPUT • PLUG-IN • DC-DC
• INDUCTORS • ISOLATION • BRIDGING • POWER • STEP-DOWN • HYBRID

**IMMEDIATE DELIVERY OF CATALOG ITEMS AT FACTORY PRICES
FROM DISTRIBUTORS**

Modified Catalog Items and Custom Transformers on Special Order

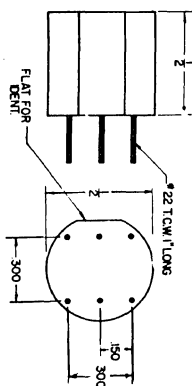
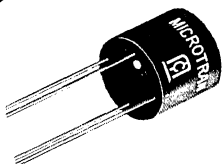
Request
Complete Catalog
and Distributor Listing

Part No.	Net 1-9*	Part No.	Net 1-9*	Part No.	Net 1-9*	Part No.	Net 1-9*	Part No.	Net 1-9*	Part No.	Net 1-9*	Part No.	Net 1-9*	Part No.	Net 1-9*
M1550	\$134.70	M11-M	14.25	M8105	30.90	MMT13-FB	4.65	MT10-AG	11.25	MT30-P	9.75	PM9-M	12.00	SMT16-FB	6.75
M1551	39.60	M11-P	12.45	M8106	18.30	MMT13-H	8.55	MT10-FB	5.10	MT30-PC	4.65	PM11-M	11.40	SMT16-H	10.05
M1552	11.85	M12-A	12.15	M8107	20.70	MMT13-M	8.70	MT10-H	10.20	MT33-A	12.45	PM13-M	11.40	SMT17-B	9.30
M1553	17.25	M12-AG	15.15	M8108	18.45	MMT16-FB	5.10	MT10-M	10.35	MT33-AG	15.45	PM15-F	5.70	SMT17-B	6.90
M1554	64.80	M12-FB	6.75	M8109	20.85	MMT16-H	9.00	MT10-P	9.60	MT33-FB	7.05	PM15-M	10.50	SMT17-H	10.50
M1555	23.55	M12-H	13.35	M8110	18.60	MMT16-M	9.60	MT11-A	10.20	MT33-H	13.65	PM17-M	10.95	SMT17-M	9.35
M1556	15.30	M12-M	11.35	M8111	21.00	MMT17-FB	5.25	MT11-AG	12.60	MT33-M	13.65	PM17-M	10.95	SMT17-M	7.05
M1557	54.75	M12-P	13.40	M8112	15.00	MMT17-H	9.45	MT11-FB	5.25	MT33-P	11.70	PM21-M	11.70	SMT18-H	10.65
M1558	33.60	M13-A	8.40	M8113	34.20	MMT17-M	9.30	MT11-H	11.25	MT33-PC	6.60	PM23-M	11.25	SMT18-H	9.60
M1559	27.60	M13-AG	10.65	M8114	33.00	MMT18-FB	5.40	MT11-M	11.25	MT34-A	12.30	PM25-M	11.55	SMT19-AF	10.50
DCM1-PC	5.40	M13-FB	5.40	M8115	23.55	MMT18-H	9.60	MT11-P	10.20	MT34-AG	15.45	PM27-F	5.55	SMT19-FB	6.60
DCM2-PC	5.55	M13-H	9.90	M8116	34.20	MMT18-M	9.75	MT11-PC	5.25	MT34-FB	7.05	PM27-M	10.20	SMT19-H	9.75
DCM3-PC	5.25	M13-M	10.05	M8117	23.55	MMT19-FB	4.95	MT12-A	8.70	MT34-H	13.65	PM29-M	11.10	SMT19-M	9.30
DCM4-PC	5.40	M13-P	9.60	M8118	33.00	MMT19-H	8.85	MT12-AG	10.50	MT34-M	13.65	PM31-F	7.05	SMT26-B	6.00
5-PC	each	M13-PC	5.40	M8120	9.15	MMT19-M	8.70	MT12-FB	4.35	MT34-P	11.70	PM31-M	10.65	SMT26-H	9.75
DCM6-PC	5.25	M14-A	11.25	M8121	7.80	MMT21-FB	5.40	MT12-H	9.45	MT35-A	12.30	PM33-F	5.25	SMT26-H	7.05
DCM7-PC	5.70	M14-AG	12.75	M8122	19.65	MMT21-H	9.90	MT12-M	9.60	MT35-AG	15.30	PM33-M	10.50	SMT36-H	10.95
DCM8-PC	4.95	M14-FB	6.60	M8132	21.30	MMT21-M	9.75	MT12-P	9.00	MT35-FB	6.90	PM34-F	5.85	SMT36-M	9.75
DCM9-PC	4.95	M14-H	11.70	M8133	21.15	MMT25-FB	5.10	MT12-PC	4.05	MT35-H	13.90	PM34-M	10.80	SMT36-M	9.75
DCM10-PC	5.25	M14-M	11.85	M8134	8.10	MMT25-H	9.30	MT13-A	9.75	MT35-M	13.95	PM35-F	5.40	T1104	5.10
DCM11-PC	4.95	M14-P	10.80	M8151	25.65	MMT25-M	9.00	MT13-AG	11.25	MT35-P	11.55	PM35-M	10.05	T2104	4.65
DCM12-PC	5.25	M14-PC	6.30	M8152	17.40	MMT26-FB	4.95	MT13-FB	4.80	MT35-PC	7.20	PM36-F	6.45	T2106	4.95
DCM13-PC	4.80	M15-A	11.40	M8198	4.80	MMT26-H	9.15	MT13-H	10.05	PC2506	7.95	PM36-M	11.10	T2108	4.65
DCM14-PC	4.65	M15-AG	12.90	M8199	5.40	MMT26-M	8.85	MT13-M	10.35	PC2512	8.25	PM37-F	4.95	T2110	4.95
DCM18-PC	5.70	M15-FB	6.75	M8200	6.75	MMT27-FB	5.40	MT13-P	9.45	PC2524	8.40	PM37-M	10.35	T2220	5.85
DCM19-PC	5.25	M15-H	11.85	M8201	7.35	MMT27-H	9.60	MT14-A	9.00	PC2528	8.55	PM38-F	5.40	T2316	4.80
DCM20-PC	4.35	M15-M	12.00	M8202	11.70	MMT27-M	9.60	MT14-AG	10.50	PC2608	9.00	PM38-M	10.95	T3221	6.60
thru	4.35	M15-P	10.80	M8203	14.85	MMT28-FB	5.25	MT14-FB	4.35	PC2616	9.15	PM39-F	4.45	T4415	5.10
DCM22-PC	each	M15-PC	6.45	M8204	12.60	MMT28-H	9.45	MT14-H	9.45	PC2624	9.15	PM39-M	9.00	T6112	10.00
DCM51-PC	4.05	M-90	1.65	M8205	19.65	MMT28-M	9.75	MT14-M	9.60	PC2628	9.15	PM40-F	8.55	T7410	6.75
DCM52-PC	3.60	M8018	22.80	M8222	13.20	MMT29-FB	5.40	MT14-P	9.00	PC2632	9.30	PM40-M	4.35	T8410	7.20
DCM53-PC	3.45	M8019	26.10	M8223	18.90	MMT29-H	9.60	MT14-PC	4.05	PC2708	8.85	PM41-F	4.05	UM21-F	6.00
M1-A	13.05	M8020	36.00	M8224	15.75	MMT29-M	9.75	MT15-A	9.30	PC2712	8.85	PM41-M	8.10	UM21-M	10.35
M1-AG	15.60	M8021	31.50	M8242	7.65	MMT30-FB	5.10	MT15-AG	10.80	PC2715	8.85	PM90	1.20	UM22-F	5.10
M1-FB	7.80	M8022	33.00	M8243	9.00	MMT30-H	9.30	MT15-FB	4.35	PC2716	8.85	S100-FB	.21	UM22-M	9.00
M1-H	14.10	M8023	37.80	M8244	12.00	MMT30-M	9.60	MT15-H	9.60	PC2724	8.85	S101-S	12.75	UM23-F	5.25
M1-M	14.10	M8024	31.80	M8245	9.60	MMT31-FB	4.95	MT15-M	10.20	PC2728	8.85	S105-S	15.75	UM23-M	10.50
M1-P	12.00	M8025	16.50	M8246	25.95	MMT31-H	9.15	MT15-P	9.30	PC2732	9.00	S107-S	16.50	UM24-M	9.15
M1-S	15.60	M8026	16.50	M8247	17.40	MMT31-M	9.45	MT18-A	11.10	PC4304	5.25	S118-S	12.75	UM25-F	4.50
M2-A	13.65	M8027	12.30	M8251	13.20	MMT32-FB	5.25	MT18-AG	13.50	PC4312	5.40	S130-S	13.80	UM25-M	9.15
M2-AG	16.65	M8030	19.50	M8255	14.55	MMT32-H	9.75	MT18-FB	6.15	PC4316	5.40	SM1-AF	10.65	UM26-F	4.50
M2-FB	8.25	M8031	20.40	M8256	15.45	MMT32-M	9.75	MT18-H	11.85	PC4320	5.55	SM1-FB	7.20	UM26-M	9.15
M2-H	14.85	M8032	18.45	M8278	20.70	MMT33-FB	5.25	MT18-M	12.15	PC4408	5.40	SM1-H	10.05	UM27-F	4.80
M2-M	14.85	M8033	18.45	M8286	10.95	MMT33-H	9.75	MT18-P	10.65	PC4412	5.40	SM1-M	9.90	UM27-M	9.30
M2-P	12.90	M8038	21.30	M8287	10.95	MMT33-M	9.75	MT20-A	12.60	PC4416	5.55	SM2-AF	10.50	UM28-F	3.75
M3-A	12.45	M8039	19.65	M8288	12.15	MMT33-FB	5.40	MT20-AG	15.15	PC4424	5.55	SM2-FB	7.05	UM28-M	5.25
M3-AG	14.85	M8041	13.95	M8289	9.00	MMT35-H	9.90	MT20-FB	7.35	PC4428	5.70	SM2-H	9.60	UM29-M	7.05
M3-FB	7.50	M8042	17.25	M8290	8.70	MMT35-M	9.90	MT20-H	13.65	PC4432	6.00	SM2-M	9.60	UM29-M	8.75
M3-H	13.20	M8043	22.80	M8291	10.95	MT1-A	10.05	MT20-M	13.65	PC6205	7.65	SM3-AF	9.90	UM30-F	6.30
M3-M	13.50	M8044	22.10	M8294	6.15	MT1-AG	11.55	MT20-P	11.85	PC6210	7.65	SM3-FB	6.90	UM30-M	7.05
M3-P	11.70	M8045	25.50	M8295	13.20	MT1-FB	11.85	MT21-A	11.70	PC6211	7.65	SM3-H	9.30	UM31-F	6.00
M3-PC	7.05	M8046	39.60	M8296	13.80	MT1-H	10.50	MT21-AG	14.25	PC6214	7.65	SM3-M	9.90	UM31-M	10.35
M4-A	11.25	M8050	7.35	MM1-FB	6.15	MT1-M	10.65	MT21-FB	6.45	PC6505	7.65	SM4-AF	10.20	UM32-F	6.00
M4-AG	12.75	M8051	13.50	MM1-H	9.75	MT1-P	9.60	MT21-H	12.75	PC6506	6.75	SM4-FB	6.45	UM32-M	9.15
M4-FB	6.60	M8052	15.60	MM1-M	8.55	MT1-PC	5.10	MT21-M	12.75	PC6510	7.20	SM4-H	9.60	UM33-F	6.00
M4-H	11.70	M8053	15.60	MM2-FB	6.30	MT2-A	10.80	MT21-P	10.65	PC6511	7.20	SM4-M	9.90	UM33-M	9.15
M4-M	11.85	M8055	27.60	MM2-H	9.90	MT2-AG	13.35	MT21-PC	6.30	PC6512	7.05	SM5-AF	9.00	UM34-F	6.00
M4-P	10.95	M8056	26.70	MM2-M	8.70	MT2-FB	5.55	MT22-A	11.70	PC6514	7.20	SM5-FB	5.55	UM34-M	10.35
M5-A	10.35	M8059	20.85	MM3-H	9.45	MT2-M	11.85	MT22-FB	6.45	PC6528	7.20	SM5-H	8.55	UM35-F	6.30
M5-AG	11.95	M8060	18.45	MM3-M	8.40	MT2-P	12.75	MT22-H	12.75	PC6605	7.20	SM5-M	9.30	UM35-M	10.95
M5-FB	7.50	M8061	58.50	MM4-FB	5.55	MT3-A	10.35	MT22-M	12.75	PC6608	6.95	SM6-AF	10.50	UM36-F	5.55
M5-H	10.80	M8062	69.60	MM4-H	9.15	MT3-AG	11.85	MT22-P	10.95	PC6610	7.20	SM6-FB	6.90	UM36-M	10.95
M5-M	10.95	M8063	10.50	MM4-M	8.25	MT3-FB	5.70	MT23-A	10.05	PC6611	7.20	SM6-H	8.10	UM37-F	5.70
M5-P	10.65	M8064	13.65	MM5-FB	5.55	MT3-H	10.80	MT23-AG	11.55	PC6614	7.20	SM6-M	9.90	UM37-M	9.75
M5-PC	5.70	M8065	36.00	MM5-H	8.85	MT3-M	10.95	MT23-FB	5.10	PC6616	7.05	SM7-AF	9.15	UM39-F	5.85
M6-A	12.15	M8066	36.00	MM5-M	8.10	MT3-P	9.90	MT23-H	10.35	PC6624	7.05	SM7-FB	5.40	UM39-M	9.75
M6-AG	13.65	M8067	29.10	MM6-FB	5.85	MT3-PC	5.40	MT23-M	10.65	PC6628	7.05	SM7-H	8.55	UM90	1.95
M6-FB	7.20	M8068	17.10	MM6-H	9.45	MT5-A	10.20	MT23-P	9.75	PC6632	7.05	SM7-M	8.40	UM11-FB	4.20
M6-H	12.45	M8069	9.75	MM6-M	8.40	MT5-AG	11.70	MT23-PC	4.65	PC6705	7.20	SM7-P	10.05	UM12-FB	8.75
M6-M	12.75	M8070	14.85	MM7-FB	5.40	MT5-FB	5.55	MT24-A	9.60	PC6708	6.75	SM7-S	6.45	UM2-FB	9.70
M6-P	11.25	M8071	32.10	MM7-H	9.00	MT5-H	10.65	MT24-AG	11.10	PC6710	7.20	SM7-S	9.45	UM20	

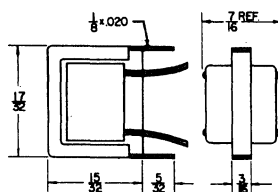
MICROTRAN

VERI & ULTRA MINIATURE TRANSFORMERS

FULL TERMINAL ARRANGEMENTS AND COLOR CODE DESIGNATIONS SUPPLIED WITH EACH UNIT



††See Family Designation in Chart.

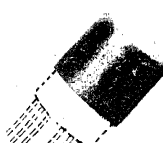
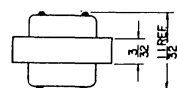
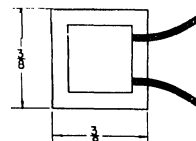
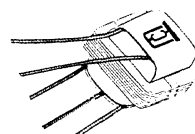


Available on special order without channel as VM-F, $\frac{7}{16}$ " x $\frac{7}{16}$ " x $\frac{1}{2}$ ". Wt.: 16 oz.

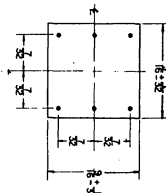
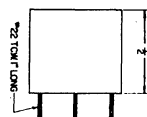
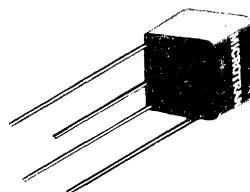
*Add either -F, or -M to Part No. to designate construction. See Photos. Power levels shown are for 7½% maximum distortion.

*Add either -FPB, or -M to Part No. to designate construction. See Photos.

*Overall height with can cemented in place.

**VM90**
UM90

††See Family Designation in Chart.



††See Family Designation in Chart.

TRANSFORMERS

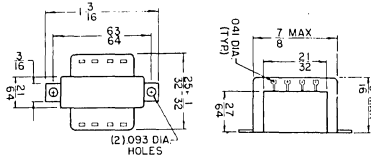
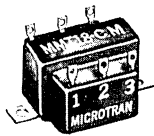


MICROTRAN 145 E. Mineola Ave. • Valley Stream, N.Y. 11582
Phone: (516) 561-6050 • TWX: 510-225-8412

MICRO MINIATURE TRANSFORMERS

The low profile design of this series makes them ideal for use on plug-in printed circuit boards. They are highly suitable where sandwich design requires minimal spacing between modules. Available in a variety of open frame, hermetically sealed, and molded constructions. All units are manufactured in accordance with the requirements of MIL-T-27.

FULL TERMINAL ARRANGEMENTS AND COLOR CODE DESIGNATIONS SUPPLIED WITH EACH UNIT



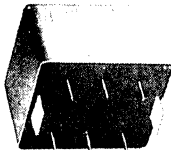
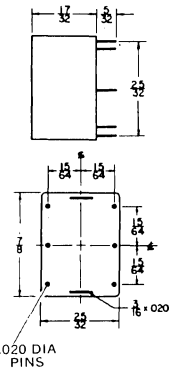
CONTOUR MOLDED MM-CM

Special Order Only

Designed for chassis mounting with solder terminals on top of transformer. Epoxy contour molding provides greatest resistance to extremes of ambient in smallest possible package. Wt.: 1/2 oz. To order add -CM to Part Number, i.e. MM2-CM, MMT1-CM.

MIL DESIGNATION TF5RX††ZZ

††See Family Designation in Chart.



MOLDED MM-M

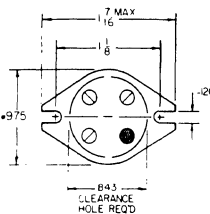
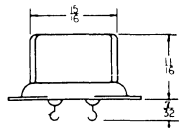
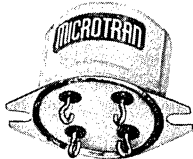
Designed for plug-in printed circuit applications. Cast Epoxy resin provides highest resistance to extremes of ambient. Wt.: 1/2 oz. To order add -M to Part Number, i.e. MM2-M, MMT2-M.

MIL DESIGNATION TF5RX††ZZ
††See Family Designation in Chart.

MICRO-MINIATURE TRANSFORMERS — MM SERIES

Primary and secondary windings may be interchanged to obtain required impedance matching. Note: This will result in slightly different impedance ratios than shown. These units can be used as input, interstage, output, isolation and other impedance matching requirements.

Part No.	Primary Impedance	Secondary Impedance	Pri. DC Unbal. Ma	Oper. Level DBM	Freq. Response ± 2 db	†† Family
MM1-(*)	200/50	250,000/62,500	0	4	200-10,000	10
MM3-(*)	10,000	200	3	20	150-10,000	13
MM2-(*)	10,000	90,000	0	4	150-10,000	10
MM4-(*)	30,000	50	1	20	150-10,000	13
MM7-(*)	30,000	1,200	0.5	20	200-10,000	13
MM6-(*)	100,000	60	0.5	20	250-10,000	13
MM5-(*)	Reactor 50 hy @ 1 Mil DC	4,700 Ohms DC Res.				20



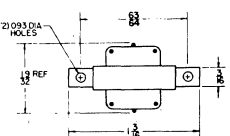
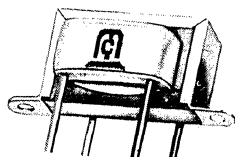
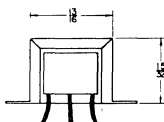
HERMETIC MM-H

Grey Enamel Finish. High Compression Glass Terminals. Wt.: 3/4 oz. To order add -H to Part Number, i.e. MM2-H, MMT3-H.

MIL DESIGNATION TF4RZ††YY
††See Family Designation in Chart.

MICRO-MINIATURE SERIES — MMT SERIES

Part No.	Primary Impedance	Secondary Impedance	Pri. DC Unbal. Ma	Oper. Level DBM	Freq. Response ± 2 db	†† Family
MMT1-(*)	600	600	8	22	200-15,000	17
MMT26-(*)	600 C.T.	600 C.T.	16	22	200-15,000	17
MMT33-(*)	600 C.T.	600/150 Split	16	22	200-15,000	17
MMT9-(*)	600 C.T.	1,200 C.T.	16	22	200-15,000	17
MMT32-(*)	600 C.T.	1,200/300 Split	16	22	200-15,000	17
MMT12-(*)	2,000	3.4	5	28	200-15,000	13
MMT31-(*)	2,000 C.T.	500 C.T.	10	28	200-15,000	13
MMT19-(*)	2,500	2,500 C.T.	2	23	200-15,000	13
MMT13-(*)	4,000 C.T.	3.4	5	28	200-15,000	13
MMT11-(*)	4,000 C.T.	600 C.T.	5	28	200-15,000	12
MMT21-(*)	4,000 C.T.	600/150 Split	5	28	200-15,000	13
MMT25-(*)	7,500 C.T.	600 C.T.	4	22	200-15,000	13
MMT30-(*)	7,500 C.T.	1,200 C.T.	4	22	200-15,000	13
MMT35-(*)	10,000 C.T.	150/37.5 Split	2	20	200-15,000	13
MMT17-(*)	10,000 C.T.	200 C.T.	6	20	200-15,000	13
MMT16-(*)	10,000	1,500 C.T.	1	20	200-15,000	13
MMT28-(*)	10,000 C.T.	1,500 C.T.	2	20	200-15,000	13
MMT29-(*)	10,000 C.T.	10,000 C.T.	2	20	200-15,000	13
MMT10-(*)	25,000	600	1	20	200-15,000	13
MMT27-(*)	25,000 C.T.	600 C.T.	2	20	200-15,000	13
MMT7-(*)	25,000	1,200 C.T.	1	20	200-15,000	13
MMT18-(*)	25,000 C.T.	1,200 C.T.	2	20	200-15,000	13
MMT5-(*)	50,000	6	1	20	200-15,000	13
MMT3-(*)	50,000	600	0.7	20	200-15,000	13
MMT4-(*)	50,000 C.T.	600 C.T.	1.4	20	200-15,000	13
MMT8-(*)	50,000 C.T.	1,200 C.T.	1.4	20	200-15,000	13



OPEN FRAME WITH CHANNEL MM-FB

To order add -FB to Part Number, i.e. MMT3-FB, MM1-FB. Leads #28 PVC 4" long.

Available with plug-in tab mounted channel as type MM-FPB, 2 1/2" mounting centers on Special Order.

Available without channel as type MM-F 3/4" x 1/4" x 1/4". Wt.: .38 oz. on Special Order.

MIL DESIGNATION TF6RX††ZZ
††See Family Designation in Chart.

*Add either -H, -M, -CM, or -FB to Part No. to designate construction. See Photos.

SEE PAGE 2-1756 FOR PRICING

TRANSFORMERS



MICROTRAN

145 E. Mineola Ave. • Valley Stream, N.Y. 11582
Phone: (516) 561-6050 • TWX: 510-225-8412

MINIATURE AUDIO MINIATURE TRANSISTOR TRANSFORMERS

This group of transformers is often referred to as "the designers series." It offers an extensive range of open frame, hermetically sealed, plug-in, printed circuit, contour molded and plug-in molded construction.

In this series, MICROTRAN offers the widest spectrum of electrical and mechanical specifications. ALL TRANSFORMERS LISTED ARE AVAILABLE IN THE CONSTRUCTIONS ILLUSTRATED. All units are manufactured in accordance with the requirements of MIL-T-27.

FULL TERMINAL ARRANGEMENTS AND COLOR CODE DESIGNATIONS SUPPLIED WITH EACH UNIT

MINIATURE TRANSFORMERS — M & MT SERIES

All items shown in charts below are available in any of the mechanical packages shown. These units can be used as input, interstage, output, isolation and other impedance matching applications. Primary and secondary windings may be interchanged to obtain required impedance matching. Note: This will result in slightly different impedance ratios than shown.

Part No.	Primary Impedance	Secondary Impedance	Pri. DC Unbal. Ma	Oper. Level DBM	Freq. Response ± 2 db	†† Family
M3-(*)	7.5/30	50,000	0	5	20-20,000	10
•M12-(*)	50/250 C.T.	50/250/600 C.T.	0	8	20-20,000	16
•M1-(*)	50/250/600 C.T.	50,000	0	5	20-20,000	10
M1-S	Same as M1 above — with dual nickel alloy shield.					
•M2-(*)	50/250/600 C.T.	50,000 C.T.	0	5	20-20,000	10
M14-(*)	200	1/2 Megohm	0	9	80-3,000	10
M15-(*)	10,000	1 Megohm	0	11	100-2,500	10
•M8-(*)	15,000	50/250/600 C.T.	0	8	20-20,000	16
•M9-(*)	15,000	50/250/600 C.T.	4	21	150-20,000	13
M4-(*)	15,000	60,000	4	6	20-15,000	10
M5-(*)	15,000	60,000	4	14	200-20,000	15
M6-(*)	15,000	95,000 C.T.	0	5	20-15,000	10
M7-(*)	15,000	95,000 C.T.	4	11	200-20,000	15
•M10-(*)	30,000 C.T.	50/250/600 C.T.	0	8	30-50,000	16
•M11-(*)	50,000	50/250/600 C.T.	0	5	20-20,000	16
M13-(*)	Reactor	300 hy 0 DC	50 hy @ 3 ma	6000	Ohms D.C.R.	20
M90	Magnetic Shield Mu-Metal slip-on can for MA Series. 25 db shielding.					
•MT2-(*)	100	10 C.T./40 C.T.	100	27	200-20,000	17
MT30-(*)	250 C.T.	500	10	30	200-15,000	17
MT23-(*)	250 C.T.	1000	10	30	200-15,000	17
MT14-(*)	400	10	50	25	200-20,000	17
•MT15-(*)	500 C.T.	210	30	27	300-20,000	17
MT1-(*)	600	600	10	23	200-15,000	17
†MT35-(*)	600	600 C.T. & 600 C.T.	0	5	40-20,000	16
MT26-(*)	600 C.T.	600 C.T.	20	23	200-15,000	17
MT9-(*)	600 C.T.	1,200 C.T.	4	23	200-15,000	17
MT33-(*)	600/150 Split	600/150 Split	20	23	200-20,000	17
•MT22-(*)	600/150 Split	1,200 C.T.	4	23	200-15,000	17
MT29-(*)	1600 C.T.	450	15	30	200-15,000	13
MT12-(*)	2,000	3.4	10	32	200-15,000	13
MT24-(*)	2,500	600 C.T.	10	32	200-15,000	13
•MT13-(*)	4,000 C.T.	3.4	3	32	200-15,000	13
MT11-(*)	4,000 C.T.	600 C.T.	3	32	200-15,000	13
MT21-(*)	4,000 C.T.	600/150 Split	3	32	200-15,000	13
MT25-(*)	7,500 C.T.	600 C.T.	8	32	200-15,000	12
•MT34-(*)	10,000/2,500 Split	2000/500 Split	4	20	200-20,000	13
•MT10-(*)	25,000	600	3	22	200-15,000	13
MT7-(*)	25,000	1,200 C.T.	3	22	200-15,000	13
•MT18-(*)	25,000 C.T.	1,200 C.T.	6	22	200-15,000	13
MT5-(*)	50,000	6	3	20	300-15,000	13
MT3-(*)	50,000	600	3	20	300-15,000	13
MT8-(*)	50,000 C.T.	1,200 C.T.	3	20	300-15,000	13
•MT20-(*)	50,000 C.T.	1200/300 Split	3	20	300-15,000	13
MT6-(*)	100,000	1,200 C.T.	1.4	17	200-15,000	13

*Add either -AG, -H, -M, -CM, -P, -PC, -A, or -FB to Part No. to designate construction. See Photos.
†For telephone line coupling or hybrid telephone line.
•These items not available in -PC construction.

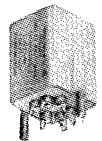


OCTAL PLUG-IN M-P

Sealed Plastic Housing. Wt.: 2 oz. To order add -P to Part Number, i.e. MT3-P, M1-P. Diameter 1 1/2". Height above mtg. surface 1 1/2".

MIL DESIGNATION
TF6RX††ZZ

††See Family Designation in Chart.



MIL CASE M-AG

Grey Enamel Finish. Wt.: 2 3/8 oz. Supplied with compression sealed ceramic terminals in MIL-T-27B AG case (modified). To order add -AG to Part Number, i.e. M2-AG, MT3-AG.

MIL DESIGNATION
TF4RX††YY

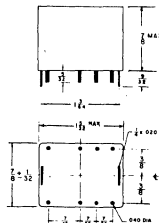
††See Family Designation in Chart.



MOLDED M-M

Designed for plug-in printed circuit applications. Cast Epoxy resin provides highest resistance to extremes of ambient. Wt.: 1 3/4 oz. To order add -M to Part Number, i.e. M2-M, MT3-M.

MIL DESIGNATION TF5RX††ZZ
††See Family Designation in Chart.



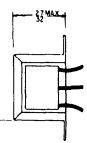
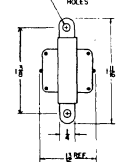
OPEN FRAME WITH CHANNEL M-FB

Wt.: 1.13 oz. To order add -FB to Part Number, i.e. MT3-FB, M1-FB. From stock. Leads 4" long. #28 PVC.

Special Order

Available with plug-in tab channel, 1 1/2" mounting centers as type M-FPB. Available without channel as type M-F 3/4" x 1" x 1 3/4". Wt.: 1 oz.

MIL DESIGNATION TF6RX††ZZ
††See Family Designation in Chart.



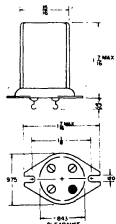
HERMETIC M-H

Grey Enamel Finish. Wt.: 1 1/4 oz. High Compression Glass Terminals. To order add -H to Part Number, i.e. M2-H, MT3-H, from stock.

.120 holes instead of slots, available Special Order Only.

MIL DESIGNATION
TF4RX††YY

††See Family Designation in Chart.

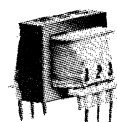
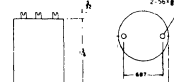


ALUMINUM CASED M-A

Supplied with 2-56 screws. Wt.: 1.25 oz. To order add -A to Part Number, i.e. MT3-A, M1-A.

MIL DESIGNATION TF3RX††YY

††See Family Designation in Chart.

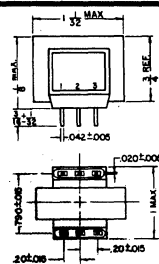


OPEN FRAME PRINTED CIRCUIT M-PC

Wt.: 1.2 oz. To order add -PC to Part Number, i.e. MT3-PC, M3-PC.

MIL DESIGNATION TF6RX††ZZ

††See Family Designation in Chart.



MT21-PC, MT33-PC, MT35-PC have 8 .025 x .015 pins on .150 centers.

SEE PAGE 2-1756 FOR PRICING

TRANSFORMERS



MICROTRAN

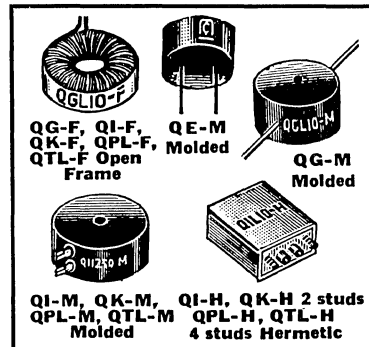
145 E. Mineola Ave • Valley Stream, N.Y. 11582
Phone: (516) 561-6050 • TWX: 510-225-8412

MINIATURIZED INDUSTRIAL & MIL TOROIDAL INDUCTORS

ULTRA-MINIATURE TOROIDAL INDUCTORS — QE-M SERIES

Affords new application opportunities in high density packaging. Ultra miniaturized with low height design. Exceptionally high "Q" and wide frequency range. Available on special order with $\pm 1\%$ inductance tolerance. Frequency range of QEL Series 1 to 300 kHz; QEM, 3 to 500 kHz. Accuracy, $\pm 2\%$. Molded in epoxy resin with .020" x 2" gold-plated nickel alloy leads. Size: .450" dia. x .285".

QE-M Series				QE-M Series			
Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Ea., Lots of 1-9★	Part No.	Inductance	Net Ea., Lots of 1-9★
QEL1-M	1 mH	2.1	25	\$9.45	QEM05-M	.5 mH	\$10.65
QEL2-M	2 mH	3.6	30	9.45	QEM1-M	1 mH	10.65
QEL5-M	5 mH	7.3	35	9.90	QEM2-M	2 mH	10.95
QEL10-M	10 mH	15.8	45	10.35	QEM5-M	5 mH	11.40
QEL15-M	15 mH	20	45	10.35	QEM10-M	10 mH	11.70
QEL25-M	25 mH	32	50	10.65	QEM15-M	15 mH	11.85
QEL50-M	50 mH	69	50	11.10	QEM25-M	25 mH	12.15
QEL100-M	100 mH	185	70	11.25	QEM50-M	50 mH	12.30



MICRO-MINIATURE TOROIDAL INDUCTORS — QG SERIES

Frequency range of QGL Series, to 20 kHz; QGM Series, 2 to 100 kHz. Accuracy, $\pm 2\%$. **QG-F:** Open frame, microcrystalline wax dipped with 4" #28 plastic leads. Size: $\frac{1}{4}$ " dia. x $\frac{1}{2}$ ". **QG-M:** Molded in high temperature epoxy resin with .020" x 2" gold plated nickel alloy leads. Leads may be bent downward for plug-in printed circuit

use. Size: $\frac{7}{8}$ " dia. x $\frac{3}{8}$ ". **QGH:** Hermetically sealed on Special Order Only (\$25.00 set-up charge in lots of 1-249). Size: $\frac{1}{4}$ " dia. x $\frac{1}{2}$ ". **QGH-C:** Hermetic crystal can. Special Order Only; prices set-up charge same as QG-H Series. Size: $\frac{3}{16}$ " x $\frac{1}{2}$ " x $\frac{1}{4}$ ".

QGL SERIES

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QGL5-	5 mH	2.5	30	\$5.10 \$10.95 \$8.40
QGL10-	10 mH	5	33	5.25 11.25 8.55
QGL15-	15 mH	8	34	5.40 11.40 8.70
QGL30-	30 mH	17	37	5.55 11.55 8.85
QGL50-	50 mH	28	40	5.70 11.70 9.00

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QGL100-	100 mH	50	42	\$5.85 \$12.00 \$9.45
QGL250-	250 mH	130	46	6.60 12.45 9.90
QGL500-	500 mH	290	48	7.05 12.90 10.35
QGL1000-	1.0 H	530	51	8.55 14.40 11.85
QGL1500-	1.5H	825	53	10.50 16.50 13.95

QGM SERIES

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QGM1-	1 mH	1.4	22	5.40 10.80 8.70
QGM2-	2 mH	2.5	25	5.55 10.95 8.85
QGM5-	5 mH	6	28	5.85 11.25 9.15
QGM10-	10 mH	12	31	6.00 11.40 9.30

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QGM15-	15 mH	18	32	6.15 11.55 9.45
QGM25-	25 mH	30	35	6.45 11.70 9.75
QGM50-	50 mH	52	37	6.75 12.00 10.05
QGM100-	100 mH	115	39	7.35 12.90 10.35

SUBMINIATURE TOROIDAL INDUCTORS — QIL SERIES

Frequency range to 20 kHz; accuracy, $\pm 2\%$. **QIL-M:** Molded in high temperature epoxy with silver plated turret lugs. Size: $\frac{1}{4}$ " dia. x $\frac{1}{2}$ ". **QIL-H:** Hermetically sealed in metal case with Teflon®

terminals. Size: $\frac{1}{4}$ " x $\frac{1}{2}$ " x $\frac{1}{4}$ ". **QIL-F:** Open frame. Microcrystalline wax dipped with 4" #28 plastic leads. Size: $\frac{1}{4}$ " dia. x $\frac{1}{2}$ ".

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QIL3-	3 mH	.73	36	4.20 8.55 7.05
QIL5-	5 mH	1.1	38	4.20 8.55 7.05
QIL10-	10 mH	2.1	40	4.20 8.55 7.05
QIL15-	15 mH	3.3	42	4.20 8.55 7.20
QIL25-	25 mH	5.3	45	4.35 8.85 7.20
QIL50-	50 mH	11	47	4.35 9.00 7.35
QIL100-	100 mH	22	49	4.50 9.60 7.65

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QIL150-	150 mH	34	50	4.95 9.75 7.80
QIL250-	250 mH	55	53	5.10 9.75 8.25
QIL500-	500 mH	95	55	5.85 10.65 9.00
QIL1000-	1.0 H	210	57	6.75 11.55 9.90
QIL1500-	1.5 H	335	59	8.40 13.20 11.55
QIL2500-	2.5 H	550	61	9.90 14.70 13.20

MINIATURE TOROIDAL INDUCTORS — QK SERIES

Frequency range of QKL Series, to 10 kHz; QKM Series, 5 to 50 kHz. Accuracy, $\pm 2\%$. **QK-F:** Open frame, microcrystalline wax dipped; 4" #28 plastic leads. Size: $\frac{1}{4}$ " dia. x $\frac{5}{8}$ ". **QK-H:** Hermetic with

Teflon terminals. Size: $\frac{1}{4}$ " x $\frac{3}{16}$ " x $\frac{1}{4}$ ". **QK-M:** Molded in high temperature epoxy resin; silver plated turret lugs. Size: $\frac{1}{4}$ " dia. x $\frac{3}{4}$ "; #8 clearance hole.

QKL SERIES

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QKL5-	5 mH	.62	60	5.25 10.65 9.30
QKL10-	10 mH	1.1	66	5.40 10.80 9.45
QKL15-	15 mH	1.7	68	5.55 11.10 9.60
QKL25-	25 mH	2.8	72	5.70 11.25 9.75
QKL50-	50 mH	6	76	5.85 11.85 10.05
QKL100-	100 mH	11	81	6.00 12.00 10.35
QKL150-	150 mH	17	83	6.15 12.15 10.65

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QKL250-	250 mH	28	87	6.45 12.45 10.95
QKL500-	500 mH	63	91	6.75 12.90 11.40
QKL1000-	1.0 H	110	96	7.20 13.35 11.85
QKL1500-	1.5 H	175	98	7.80 14.25 12.75
QKL2500-	2.5 H	275	103	8.55 15.15 13.35
QKL5000-	5 H	645	106	9.90 16.05 14.55
QKL10,000-	10 H	1175	112	10.65 16.95 15.45

QKM SERIES

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QKM2-	2 mH	.45	52	6.00 11.25 9.75
QKM5-	5 mH	1.1	58	6.15 11.40 9.90
QKM10-	10 mH	2.5	62	6.30 11.55 10.05
QKM25-	25 mH	6.5	70	6.45 12.15 10.35
QKM50-	50 mH	11	74	6.60 12.45 10.65

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QKM100-	100 mH	25	79	6.90 12.60 11.10
QKM250-	250 mH	65	87	7.65 13.50 12.00
QKM500-	500 mH	115	92	8.10 14.10 12.60
QKM1000-	1.0 H	250	97	8.70 14.70 13.20

HIGH-Q TOROIDAL INDUCTORS — QPL SERIES

Frequency range to 10 kHz; accuracy, $\pm 2\%$. **QPL-F:** Open frame, microcrystalline wax dipped; 4" #24 leads. Size: $\frac{1}{4}$ " dia. x $\frac{7}{8}$ ". **QPL-H:** Hermetically sealed with Teflon terminals. Size: $\frac{1}{4}$ " x

$\frac{1}{4}$ " x $\frac{3}{4}$ ". **QPL-M:** Molded in high temperature epoxy resin; silver plated turret lugs. Size: $\frac{1}{2}$ " dia. x $\frac{1}{4}$ ".

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QPL25-	25 mH	1.5	100	6.90 15.75 12.15
QPL50-	50 mH	2.5	105	7.05 15.90 12.30
QPL100-	100 mH	6	110	7.20 16.05 12.45
QPL250-	250 mH	15	115	7.35 16.20 12.60
QPL500-	500 mH	25	120	7.50 16.35 12.75
QPL1000-	1.0 H	60	125	7.80 16.65 13.20
QPL1500-	1.5 H	90	130	8.10 16.95 13.35

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QPL2500-	2.5H	150	133	8.70 17.25 13.65
QPL5000-	5.0 H	350	138	9.45 17.70 14.10
QPL7500-	7.5 H	525	140	10.05 18.15 14.55
QPL10,000	10 H	600	142	11.10 18.45 14.85
QPL15,000-	15 H	900	146	12.00 19.80 15.60
QPL25,000-	25 H	1500	150	13.05 21.60 17.40

HIGH-Q TOROIDAL INDUCTORS — QTL SERIES

Frequency range to 15 kHz; accuracy, $\pm 2\%$. **QTL-F:** Open frame, microcrystalline wax dipped; 4" #24 leads. Size: $\frac{2}{4}$ " dia. x $\frac{1}{4}$ ".

QTL-H: Hermetic, Teflon terminals. Size: $\frac{2}{4}$ " x $\frac{1}{4}$ " x $\frac{2}{4}$ ". **QTL-M:** Molded in epoxy resin. Size: $\frac{2}{4}$ " dia. x $\frac{1}{4}$ ".

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QTL25-	25 mH	0.85	127	11.85 22.20 25.20
QTL50-	50 mH	1.5	136	12.00 23.25 25.50
QTL100-	100 mH	2.8	144	12.45 23.40 25.65
QTL150-	150 mH	3.9	149	12.90 23.55 26.10
QTL250-	250 mH	7	156	13.20 24.00 26.70
QTL500-	500 mH	15	164	13.50 24.75 27.75
QTL1000-	1.0 H	27	173	14.40 24.90 28.50

Part No.	Inductance	Typ. DC Res., Ohms	Typ. Dist. Cap., pF	Net Each, Lots of 1-9★
QTL1500-	1.5H	40	177	15.75 25.20 29.40
QTL2500-	2.5 H	70	184	17.25 26.40 30.60
QTL5000-	5 H	140	192	18.00 27.60 32.10
QTL10,000-	10 H	270	200	18.90 28.50 33.00
QTL15,000-	15 H	430	205	21.15 30.90 35.40
QTL25,000-	25 H	850	212	23.55 33.60 37.80
QTL50,000-	50 H	1500	221	26.10 36.00 40.20

IMMEDIATE DELIVERY FROM STOCKING DISTRIBUTORS

★ Quantity pricing schedule is as follows: 1-9 net, 10-49 less 10%, 50-99 less 16 $\frac{2}{3}$ %, 100-249 less 33 $\frac{1}{3}$ %. Contact factory for prices over 249.

† ORDER BY COMPLETE MICROTRAN No. (QGLF-5)

TRANSFORMERS

MICROTRAN 145 E. Mineola Ave. • Valley Stream, N.Y. 11582
Phone: (516) 561-6050 • TWX: 510-225-8412

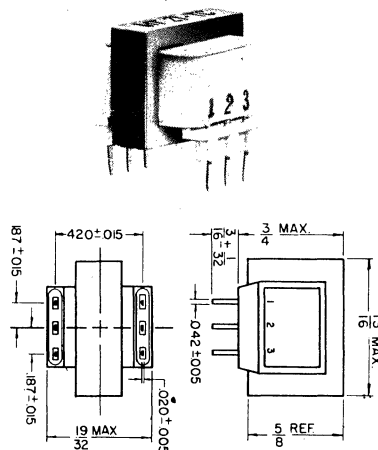
DECI-MINIATURE — FOR PRINTED CIRCUITS LOW LEVEL INPUT TRANSFORMERS

DECI-MINIATURE TRANSFORMERS — DCM SERIES

Frequency Response 200-15,000 Hz + 2 db

These units can be used as input, interstage, output, isolation and other impedance requirements. Primary and secondary windings may be inter-changed to obtain required impedance matching. Note: This will result in slightly different impedance ratios than shown.

Part No.	Primary Impedance	Secondary Impedance	Pri. DC Unbal. Ma	Oper. Level DBM
DCM1-PC	25,000 C.T.	1,200 C.T.	2	18
DCM2-PC	15,000 C.T.	15,000 C.T.	3	19
DCM3-PC	15,000 C.T.	600 C.T.	3	19
DCM4-PC	10,000 C.T.	5,000 C.T.	4	20
DCM5-PC	10,000	2,500/625 Split	2	20
DCM6-PC	10,000 C.T.	1,500 C.T.	4	20
DCM7-PC	5,000 C.T.	80,000 C.T.	6	15
DCM8-PC	4,000 C.T.	1,200 C.T.	6	20
DCM9-PC	4,000 C.T.	600 C.T.	6	20
DCM10-PC	4,000	600/150 Split	3	20
DCM11-PC	2,500 C.T.	2,500 C.T.	8	20
DCM12-PC	2,500	2,500/625 Split	4	20
DCM13-PC	2,500 C.T.	625 C.T.	8	20
DCM14-PC	2,500 C.T.	200 C.T.	8	20
DCM18-PC	600 C.T.	50,000 C.T.	16	20
DCM19-PC	600	8,000/2,000 Split	8	20
DCM20-PC	600 C.T.	200 C.T.	16	20
DCM21-PC	600 C.T.	600 C.T.	16	20
DCM22-PC	250 C.T.	600 C.T.	25	20
DCM51-PC	Choke	10 hy @ 0 ma DC	5 hy @ 3 ma DC	300 Ohms DCR
DCM52-PC	Choke	5 hy @ 0 ma DC	2 hy @ 5 ma DC	155 Ohms DCR
DCM53-PC	Choke	2.5 hy @ 0 ma DC	1 hy @ 7 ma DC	75 Ohms DCR



DECI-MINIATURE DCM-SERIES

New Industrial/Commercial grade miniature printed circuit transformers. Rigid terminals provide fixed mounting centers usually found in expensive molded transformers. Wt.: .5 oz.

LOW LEVEL CHOPPER INPUT TRANSFORMERS

Used in Servo, measuring, and coupling circuits as an Input Transformer for low level amplifiers. Efficiently transfers 30 to 500 C.P.S. transducer or thermocouple signals to instrument amplifiers at signal levels from .5 mV to .5V. Low hum pick-up assured by three Mu-Metal shields. High permeability core provides high efficiency and low distortion. Resin potted to minimize magnetostrictive microphonics. Electrostatic shield brought out to external ground connection to eliminate chassis currents.

Request Engineering Application Bulletin F184

Part No.	Turn Ratio Full Pri. To Full Sec.	1/2 Pri. To Full Sec.	Ind. of Full Pri. @ .5V 60 Hz	Imped. of Full Pri. @ .5V 60 Hz	DC Resistance Full Pri.	Sec.	Fig.
M8025	1:7.7	1:15.4	17.5 hy	6,600	365	4,140	B
M8026	1:3.2	1:6.4	60 hy	22,500	455	3,500	B
M8052	1:4.53	1:9.06	90 hy	34,000	760	5,220	B
M8053*	1:0.5	1:1	140 hy	53,000	920	653	B
M8112	1:0.5	1:1	450 hy	80,000	2,300	1,600	B
M8525	1:7.7	1:15.4	17.5 hy	6,600	365	4,140	BB
M8526	1:3.2	1:6.4	60 hy	22,500	455	3,500	BB
M8552	1:4.53	1:9.06	90 hy	34,000	760	5,220	BB
M8553*	1:0.5	1:1	140 hy	53,000	920	653	BB

*Secondary is center tapped.

All Units 90 dB Magnetic Shielding.



Fig. B

TRIPLE MU-METAL CASE

6-32 x 3/8" mounting studs on 1 1/2" centers. Wt.: 5 oz. 1 3/8" Dia. x 1 1/2" Ht.

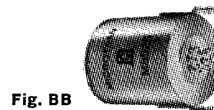


Fig. BB

HERMETICALLY SEALED

Hermetically sealed to meet MIL-T-27. Triple Mu-Metal case, high compression glass terminals, 6-32 x 3/8" mounting studs on 1 1/2" centers; 1" dia. cut-out for terminals. Wt.: 5 oz.

LOW LEVEL MICROPHONE INPUT TRANSFORMERS

These Broadcast Fidelity Input Transformers are Double Mu-metal Shielded

Part No.	Primary Impedance	Secondary Impedance	Magn. Shldg.	Level DBM	Freq. Resp. ±2 db	H	D	W	Fig.
M8027	200	40,000	25	+5	50-20,000	2 3/4	1 3/8 x 7/8	2	D
M8030*	200/50 C.T.	50,000	65	+5	20-20,000	2 1/8	1 1/8	6	C
M8031	600 C.T./150	50,000	65	+5	30-20,000	2 1/8	1 1/8	6	C
M8032†	250 C.T.	50,000	65	+5	20-20,000	2 1/8	1 1/8	6	C
M8033†	50 C.T.	50,000	65	+5	20-20,000	2 1/8	1 1/8	6	C
M1-S	50/250/600 C.T.	50,000	65	+5	20-20,000	1 1/2	1 1/8	3	M-S

*M8030 is designed as a replacement for Ampex No. 1733-1

†M8032 and M8033 mates with sockets on many RCA amplifiers.



SHIELDED PLUG-IN

M8030-1 have 8 pins. M8023-3 have 9 pins. Matches many amplifiers.



SHIELDED CASED

Mounting Centers, 1 3/8" 6-32 x 3/8" studs.



IN-LINE MICROPHONE

Single Mu-Metal shield, electrostatic shield, 20" shielded cable is to be terminated with desired connector.

SEE PAGE 2-1756 FOR PRICING


MICROTRAN

 145 E. Mineola Ave • Valley Stream, N.Y. 11582
 Phone: (516) 561-6050 • TWX: 510-225-8412

MICROPHONE/TRANSDUCER INPUT TRANSFORMERS

 FOR: PROFESSIONAL SOUND STUDIOS — BROADCAST MIXING CONSOLES — CONTROL AND INSTRUMENT AMPLIFIERS
 EQUIVALENT TO IMPORTED EUROPEAN STUDIO GRADE TRANSFORMERS

Additional Ratings Available On Special Order

FEATURES:

- **WIDE BANDWIDTH — BROAD FREQUENCY RESPONSE:** Provided by special gapless lamination construction.
- **EXTREMELY LOW DISTORTION:** Provided by high nickel alloy magnetic core material.
- **NEGLECTIBLE HUM PICK-UP:** Due to nested Mu-Metal shields and unique gapless core construction.
- **SUBMINIATURE SIZE:** Permits close spacing to adjacent circuitry.
- **EASE OF MOUNTING AND ORIENTATION:** Single stud mounting of S100-S Series permits rotation for minimum hum pick-up.
- **POLARIZING VOLTAGE FOR CONDENSER MICROPHONES:** Primaries with split windings or center tap permit simplex +48V powering or +9 to +12V parallel or simplex powering arrangement.
- **LOW MICROPHONICS:** Resin potted to minimize magnetostrictive microphonics normally experienced in low level circuitry.
- **ELECTROSTATIC SHIELDING:** Electrostatic shield brought out to external ground connection eliminates chassis currents.

LOW LEVEL INPUT TRANSFORMERS

Power level range up to +0 dbm. Other impedance ratios available on special order — contact factory.

Part No.	Nominal Turns Ratio Pri:Sec	Nominal Impedance Ratio Primary Secondary	Typical Open Circuit Primary Imped. @ 50 Hz†	Frequency Response‡	Fig.	Replaces Beyer P/N
S101-S	1:20	12.5**	5,000	30-20,000 Hz ± 5 db	-S	TR-BV35704
S101-SP*	1:20	12.5**	5,000	30-20,000 Hz ± 5 db	-SP	STR-BV37704
S105-S	1:15	200	45,000	30-20,000 Hz ± 5 db	-S	TR-145/BV35570
S105-SP*	1:15	200	45,000	30-20,000 Hz ± 5 db	-SP	STR-145/BV37570
S107-S	1:15	200/50 Split	45,000	30-20,000 Hz ± 5 db	-S	TR-145/BV35545
S107-SP*	1:15	200/50 Split	45,000	30-20,000 Hz ± 5 db	-SP	STR-145/BV37545
S118-S	1:5	200/50 Split	5,000	30-20,000 Hz ± 5 db	-S	TR-145/BV35802
S118-SP*	1:5	200/50 Split	5,000	30-20,000 Hz ± 5 db	-SP	STR-145/BV37802
S126-S	1:1	600 C.T.	600	30-20,000 Hz ± 5 db	-S	TR-145/BV35508
S126-SP*	1:1	600 C.T.	600	30-20,000 Hz ± 5 db	-SP	STR-145/BV37508
S130-S	1:1	10,000	100,000	30-20,000 Hz ± 5 db	-S	TR-145/BV35590
S130-SP*	1:1	10,000	100,000	30-20,000 Hz ± 5 db	-SP	STR-145/BV37590
S100-FB					-FB	

†Designed for optional bridging termination use to provide additional 6 db output voltage gain.

‡Frequency response measured with source equal to nominal primary impedance and with unloaded secondary except 100K load on S105 and S107 Series.

*Special order only. Contact factory.

**Designed to couple record head to F.E.T. input.

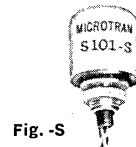


Fig. -S

SINGLE THREADED STUD MOUNTING

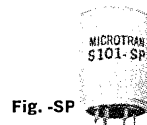
 Double Mu-Metal shielding, 3" color coded leads. $\frac{3}{16}$ " Dia. stud provided with nut. $\frac{5}{8}$ " Dia. x $\frac{1}{4}$ " Ht.


Fig. -SP

PRINTED CIRCUIT MOUNTED

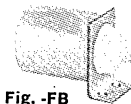
 Double Mu-Metal shielded. $\frac{3}{16}$ " Dia. x $\frac{1}{4}$ " Ht. 7-040 pins $\frac{1}{8}$ " Ht.


Fig. -FB

RIGHT ANGLE MOUNTING BRACKET

 For low profile horizontal mounting of -S Series stud mounted transformers. Supplied with two #2-56 x $\frac{1}{4}$ " self-tapping screws. M.C. $\frac{3}{8}$ ".

TELEPHONE COUPLING TRANSFORMERS

FOR INTERCONNECT OF VOICE/DATA MODEM TERMINALS TO TELEPHONE LINES

Designed to meet telephone company requirements for data and voice access arrangements. Provides line isolation and matching — prevents line imbalance. Permits optimum use of voice-grade telephone lines for broadband data signals. Wide dynamic signal level capability — low distortion.

- **FREQUENCY RESPONSE:** 300-3500 Hz ± 0.5 db
- **LEVEL:** -45 dbm to +7 dbm
- **LONGITUDINAL BALANCE:** 45 db Min.
- **DISTORTION:** 0.5% Max.
- **IMPEDANCE MATCHING:** $\pm 10\%$ over entire frequency range
- **RETURN LOSS:** 26 db Min.

Part No.	Application	Primary Impedance	Secondary Impedance	Fig. No.
T1104	Coupling	600	600	1
T2104	Coupling	600	600	1
T2106	Coupling	600 C.T.	600 C.T.	1
T2108	Coupling	600	900	1
T2110	Coupling*	900	900	1
T6112	Coupling*	600	900, 600 @ 60 ma DC	2
T2220	Hybrid†	600	600/600	1
T3220	Hybrid†	600	600/600	1
T2316	Bridging	4,000	600	1
T4415	Holding Coil	2.0 hy @ 60 ma, 1.3 hy @ 100 ma DC 180 Ω		1
T7410	Holding Coil	1.0 hy @ 0 ma, 0.8 hy @ 25 ma DC, 225 Ω		3
T8410	Holding Coil	1.0 hy @ 0 ma, 0.8 hy @ 40 ma DC, 113 Ω		3

†2 required for Hybrid Operation, Trans-Hybrid loss 45 db typical.

*Electrostatic Shield.

Available on special order with other ratings and construction.

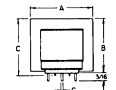
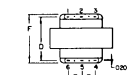
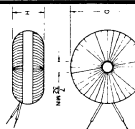
DIMENSIONS

Size Series	Fig.	A	B	C	D	E	F	G	Wt. Oz.
T1000	1	$\frac{3}{4}$	$\frac{1}{16}$	S	.484	.235 $\pm$	$\frac{1}{32}$	.040*	.4
T2000	1	$\frac{9}{16}$	$\frac{2}{32}$	S	.420	.187 $\pm$	$\frac{1}{16}$	.041	.5
T3000	1	$\frac{1}{2}$	$\frac{2}{32}$	S	.781	.200	$\frac{1}{8}$	.041	1.2
T4000	1	$\frac{1}{2}$	$\frac{1}{16}$	$\frac{1}{16}$	1.00	.312 $\pm$	$\frac{1}{32}$	.041	3.5
T6000	2	$\frac{1}{2}$	$\frac{1}{16}$	$\frac{1}{16}$	1.30	.400	$\frac{1}{32}$	.041	9.5

SDo not have standoff.

*Round pins .040" dia.

†Pin location 2 and 5 not used on T1104, T2104, T2108, T2316, and T4415, pin spacing is 2E.


 Fig. 1
 Plug-in printed circuit construction. Vacuum varnish impregnated.

 Fig. 2
 Plug-in printed circuit construction with mounting channel. Vacuum varnish impregnated.

 Fig. 3
 High-Q Toroid. Microcrystalline wax impregnated. Supplied with 4" #28 leads.


Size Series	D	H	Wt. Oz.
T7400	1	$\frac{1}{32}$	$\frac{3}{4}$
T8400	$\frac{1}{4}$	$\frac{5}{8}$	2

REQUEST ENGINEERING APPLICATION BULLETIN F232

SEE PAGE 2-1756 FOR PRICING

TRANSFORMERS

MICROTRAN 145 E. Mineola Ave • Valley Stream, N.Y. 11582
Phone: (516) 561-6050 • TWX: 510-225-8412

DC TO DC CONVERTER TRANSFORMERS

APPLICATIONS: • Portable Radiation Monitors • Infra-Red Detectors • Op-Amp Power Supplies • DC Isolation • Geodetic-Oceanographic-Medical Equipment • Mobile Equipment • High Intensity Flashers • DC Supply for Modular Equipment

A BROAD SELECTION OF RATINGS AND DESIGNS TO FILL YOUR CIRCUIT REQUIREMENTS

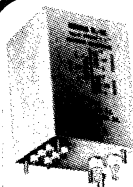


FIG. A



FIG. B

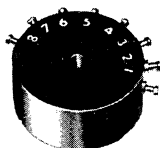


FIG. C

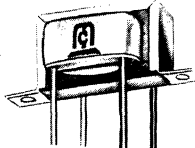


FIG. D

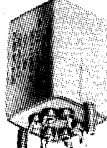


FIG. E

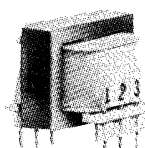


FIG. F

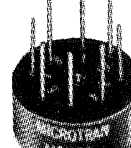


FIG. G

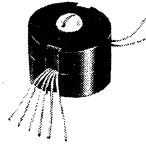


FIG. H

Select the Unit That Meets Your Power and Size Requirements	Cat. No.	Total VA Output	DC Input Volts	DC Output**				Switch Freq. Hz Approx.	Schematic No.	Typical Transistor	Dimensions					Type of Construction	Fig. No.	Approx. Weight Oz.
				Bridge Volts	MA	C.T. Full Wave Volts	MA				D	W	H	Mtg. MD	Centers MW			
NEW 25 mw to 190 mw High Voltage Low Power Miniature Design	M8149	25 mw	3	1000*	25 μ A	—	—	400	3	2N670	1 $\frac{1}{4}$	$\frac{5}{16}$	$\frac{27}{32}$	—	—	Plug-in Printed Circuit	F	1.25
	M8050	25 mw	3	1000*	25 μ A	—	—	400	3	2N670	1 $\frac{1}{16}$	$\frac{1}{16}$	$\frac{27}{32}$	1 $\frac{3}{8}$	—	Laminated — Open Frame	D	1.25
	M8051	25 mw	3	1000*	25 μ A	—	—	400	3	2N670	1	1	1 $\frac{3}{8}$	1 $\frac{1}{8}$	—	Laminated — MIL Case AG	E	2.4
	M8073	25 mw	4	425-500*	50 μ A	—	—	50-3K†	5	2N1305	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	—	—	Laminated — Open Frame	B	.1
	M8074	50 mw	3	535*	90 μ A	—	—	400	6	2N414	1 $\frac{1}{16}$	$\frac{1}{16}$	$\frac{27}{32}$	1 $\frac{3}{8}$	—	Laminated — Open Frame	D	1.25
	M8072	190 mw	2.7	480*	400 μ A	—	—	800	2	2N1307	1 $\frac{1}{16}$	$\frac{1}{16}$	$\frac{27}{32}$	1 $\frac{3}{8}$	—	Laminated — Open Frame	D	1.25
	M8120	190 mw	28	480*	400 μ A	—	—	3.5K	9	2N4355	1 $\frac{1}{16}$	$\frac{1}{16}$	$\frac{27}{32}$	1 $\frac{3}{8}$	—	Laminated — Open Frame	D	1.25
NEW 3 VA Displays Nixie-Panaplex SP-300/SP-700	M8121	3	5	190	15	—	—	20K	11	2N6121	$\frac{3}{16}$ D x $\frac{1}{32}$ H — $\frac{1}{2}$					Pot Core — Open Frame	H	.3
5 VA High Voltage Low Profile Encapsulated	M8115	5	13.8	± 250 or 500	10	250	20	6K	8	2N3054	$\frac{1}{4}$ D x $\frac{3}{4}$ H — .140 Cl. Hole					Toroid — Encapsulated	C	1.1
	M8117	5	28	± 250 or 500	10	250	20	6K	7	2N3054	$\frac{1}{4}$ D x $\frac{3}{4}$ H — .140 Cl. Hole					Toroid — Encapsulated	C	1.1
	M8122	5	5	± 15 or 30	175	15	350	20K	7	2N3055	$\frac{7}{8}$ D x $\frac{1}{2}$ H					Molded Toroid Plug-in	G	1.1
30 VA High Switching Frequency Low Profile Encapsulated	M8132	30	13.8	± 15 or 30	1000	15	2000	20K	7	2N3055	$\frac{1}{4}$ D x $\frac{3}{4}$ H — .140 Cl. Hole					Toroid — Encapsulated	C	1.1
	M8133	30	28	± 15 or 30	1000	15	2000	20K	7	2N3055	$\frac{1}{4}$ D x $\frac{3}{4}$ H — .140 Cl. Hole					Toroid — Encapsulated	C	1.1
40 VA High Voltage Hermetic	M8036	40	13.6	± 225 or 450	90	225	155	800	1	2N442	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{3}{16}$	$\frac{1}{16}$	$\frac{1}{16}$	Laminated — MIL Case FA	A	1 $\frac{1}{4}$ lbs.
50 VA Medium Power Low Profile Encapsulated	M8113	50	13.8	± 14 or 28	1750	14	3500	2.5K	7	2N3055	$\frac{2}{16}$ D x $\frac{1}{4}$ H — .170 Cl. Hole					Toroid — Encapsulated	C	6
	M8114	50	28	± 14 or 28	1750	14	3500	2.5K	7	2N3055	$\frac{2}{16}$ D x $\frac{1}{4}$ H — .170 Cl. Hole					Toroid — Encapsulated	C	6
	M8116	50	13.8	± 35 or 70	700	35	1400	2.5K	7	2N3055	$\frac{2}{16}$ D x $\frac{1}{4}$ H — .170 Cl. Hole					Toroid — Encapsulated	C	6
	M8118	50	28	± 35 or 70	700	35	1400	2.5K	7	2N3055	$\frac{2}{16}$ D x $\frac{1}{4}$ H — .170 Cl. Hole					Toroid — Encapsulated	C	6
125 VA High Voltage High Power Hermetic	M8035	125	13.6	± 250 or 500	250	250	420	800	1	2N442	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{3}{16}$	$\frac{2}{16}$	$\frac{1}{16}$	Laminated — MIL Case GA	A	2 $\frac{3}{4}$ lbs.
	M8034	125	28	± 250 or 500	250	250	420	800	1	2N174	$\frac{2}{16}$	$\frac{2}{16}$	$\frac{3}{16}$	$\frac{2}{16}$	$\frac{1}{16}$	Laminated — MIL Case GA	A	2 $\frac{3}{4}$ lbs.

*Supplied with 4-40 nylon mounting screw and nut in center hole.

▲Full wave and C.T. loads may be simultaneously drawn, but for continuous duty, total V.A. output should not be exceeded.

■For positive and negative voltage supply as utilized in op-amp and similar circuitry, use secondary circuit #10.

*Output when used with suggested schematic.

**Based on approximately 1 volt drop per rectifier.

†Frequency depends on load and bias conditions.

ALL TRANSFORMERS ARE SUPPLIED WITH ENGINEERING BULLETIN, LISTING COMPONENT VALUES & SCHEMATICS

SEE PAGE 2-1756 FOR PRICING



MICROTRAN

145 E. Mineola Ave • Valley Stream, N.Y. 11582
Phone: (516) 561-6050 • TWX: 510-225-8412

400 Hz POWER SUPPLY TRANSFORMERS

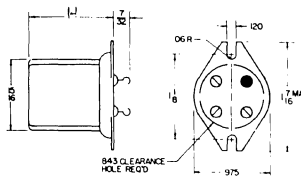
On special order certain units may be obtained in alternate constructions such as Epoxy molded, or open frame. Also available with modified electrical specifications.

FULL TERMINAL ARRANGEMENTS AND COLOR CODE DESIGNATIONS SUPPLIED WITH EACH UNIT

HERMETICALLY SEALED FIGURE A

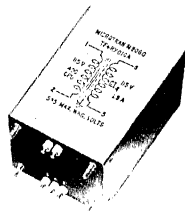
Per MIL-T-27

MIL DESIGNATION TF4RX01XX



HERMETIC — FIGURE B

Height (H) for M8063 — $\frac{1}{4}$ "
M8069 — $\frac{1}{2}$ "
M8058, M8075, M8081, M8082 — $\frac{1}{4}$ "
MIL DESIGNATION TF4RX01YY



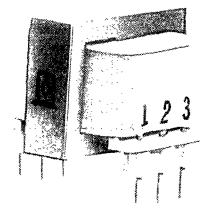
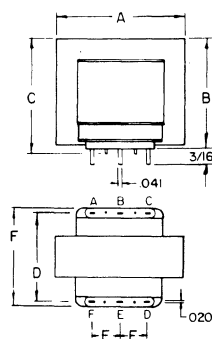
TOROIDAL MOLDED FIGURE C

Molded with $\frac{1}{2}$ " pins for printed circuit applications.
MIL DESIGNATION TF5SX01XX

400 Hz PLUG-IN PC POWER

Compact design for miniature solid-state circuitry. Precision spaced molded-in terminals for power supplies, control equipment, instrument and similar applications. Dual secondaries may be connected in series or parallel for varied voltage and current requirements. 115 V Primary.

Cat. No.	Secondary Parallel	Secondary Series
PC4304	3.15V @ .1A	6.3V C.T. @ .05A
PC4312	12.6V @ .026A	25.2V C.T. @ .013A
PC4316	28V @ .012A	56V C.T. @ .006A
PC4320	35V @ .01A	70V C.T. @ .005A
PC4408	6.3V @ 0.60A	12.6V C.T. @ .30A
PC4412	12.6V @ .030A	25.2V C.T. @ .15A
PC4416	28V @ 0.14A	56V C.T. @ .07A
PC4424	40V @ 0.10A	80V C.T. @ .05A
PC4428	58V @ .066A	116V C.T. @ .033A
PC4432	115V @ .010A, 12.6V @ .150A	



plug-in
printed circuit

DIMENSIONS

Series	A	B	C	D	E	F	Wt. Oz.
PC4300	$\frac{3}{4}$ "	$\frac{1}{2}$ "	†	.420	.187	$\frac{1}{16}$ "	.5
PC4400	$1\frac{1}{4}$ "	$\frac{3}{4}$ "	†	.781	.200	$\frac{3}{16}$ "	1.2

†Do not have standoff.

400 Hz POWER SUPPLY TRANSFORMERS

For Silicon Rectifier Circuitry, and Filament Applications

PRIMARY 105/115/125 VOLTS MIL DESIGNATION TF4RX01XX

Part No.	Secondary		Rectifier Circuit		Fig. A Mil Case XX
	AC Volts	RMS Amps	C.T. Full Wave DC Volts**	F.W. Bridge DC Volts**	
M8063†	2.85	.045	1.5 (Series)	3	YY Fig. B
M8064†	2.85	.045			
M8075†	6.3 C.T.	.6	1.9	3.8	AH YY Fig. B
M8076†	12.6 C.T.	.3	4.7	9.4	AH
M8039	12.6	.8	10.5 (Series)	21 (Series)	AJ
M8077	12.6 C.T.	.8			
	12.6	2	10.5 (Series)	21 (Series)	FA
	12.6 C.T.	2			
M8038	12.6	.3			
	12.6	.3	16 (Series)	32 (Series)	AJ
	12.6	.3			
M8018	18.5 C.T.	1	7.4	14.8	EA
M8019	18.5 C.T.	3	7.4	14.8	FA
M8065	26 C.T.	1.5	10.8	21.6	EA
M8066	26 C.T.	3	10.7	21.5	FA
M8079	26 C.T.	4	10.8	21.6	HA
M8067	30 C.T.	1.5	12.5	25	FB
M8020	35 C.T.	3	14.5	29	GA
M8068	40 C.T.	.2	17	34	AJ
M8041†	50 C.T.	.25	21.5	43	AH
M8080	50 C.T.	.20	21.5	43	AJ
M8069†	60 C.T.	.003	26	52	YY Fig. B
M8070†	65 C.T.	.170	28.4	56.8	AH
M8081†	65 C.T.	.030	28.4	56.8	YY Fig. B
M8021	70 C.T.	1	30	60	FA
M8071	80 C.T.	.90	35	70	FA

**DC Output Volts for resistive or inductive rectifier loads. Output Volts based on approximately 1 Volt drop per rectifier.

†Primary 115 Volts only.

400 Hz TOROIDAL POWER TRANSFORMERS

Toroidal cores permit smaller height and package and greater efficiency. Size and savings up to 30%. Epoxy molded. Printed circuit pins can be bent for chassis mounting. Low phase shift. See Figure C for illustration.

For Applications Requiring Minimum Size and Weight

PRIMARY 115 VOLTS MIL DESIGNATION TF5SX01ZZ

Part No.	Secondary		V. A.	Dimensions		Nominal Wt. Oz.
	Volts	Current ma		O.D.	Height	
M8106	28 C.T.	320	9	$1\frac{1}{2}$ "	$1\frac{1}{8}$ "	2
M8107	28 C.T.	710	20	$1\frac{1}{2}$ "	$1\frac{1}{4}$ "	4
M8108	56 C.T.	160	9	$1\frac{1}{2}$ "	$1\frac{1}{8}$ "	2
M8109	56 C.T.	356	20	$1\frac{1}{2}$ "	$1\frac{1}{4}$ "	4
M8110	115 C.T.	78	9	$1\frac{1}{2}$ "	$1\frac{1}{8}$ "	2
M8111	115 C.T.	170	20	$1\frac{1}{2}$ "	$1\frac{1}{4}$ "	4

.170 Clearance Hole for #8 Screw.

400 Hz ISOLATION POWER TRANSFORMERS

Center Tap Permits Use In Either F.W. Bridge or F.W.C.T. Circuitry

ELECTROSTATIC SHIELDING MIL DESIGNATION TF4RX01XX

Part No.	Input Voltage	Output Voltage	Current RMS Amps	V.A. Rating	Fig. A Mil Case XX
M8082	26	12.6 C.T. 12.6	.15 .15	1.9 1.9	YY Fig. B
M8058	115	115 C.T.	.017	2	YY Fig. B
M8083	115	115 C.T. 12.6 C.T. 12.6	.030 .25 .25	10 Total	AJ
M8084	115	115 C.T.	.12	14	AJ
M8059	115	115 C.T.	.35	40	EB
M8085	115	115 C.T.	.7	80	FA
M8060	115	115 C.T.	1.3	150	GA
M8061*	115	115 C.T.	2.6	300	JA
M8062*	115	115 C.T.	4.4	500	KA

*Primary 105/115/125 Volts.

SEE PAGE 2-1756 FOR PRICING

MICROTRAN 145 E. Mineola Ave. • Valley Stream, N.Y. 11582
Phone: (516) 561-6050 • TWX: 510-225-8412

PLUG-IN PRINTED CIRCUIT POWER TRANSFORMERS

115V & 115/230V 50/60 Hz PRIMARY

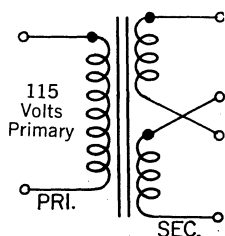
- Compact Design for Miniaturized Solid State Circuitry
- Precision Spaced Molded-in Terminals

For applications such as power supplies, instruments, and control equipment. Constructed per MIL-T-27 Grade 6 Class R. Class S available on special order.

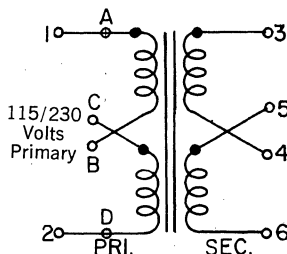
Dual secondaries may be parallel connected to obtain twice the current, or series connected to give twice the voltage of one winding.

Lugs on PC2000 Series provide for 115/230V primary voltage options without changes in PC board.

115V Primary		115/230V Primary		Secondary			
				Parallel Connected		Series Connected	
Part No.	Fig.	Part No.	Fig.	AC Volts	RMS Amps	AC Volts	RMS Amps
SERIES PC6500/PC2500				1½ WATT SERIES			
PC6506	C	PC2506	A	6.3	.250	(Single Secondary)	
PC6512	C	PC2512	A	12.6	.120	25.2 C.T.	.060
PC6524	C	PC2524	A	40.0	.040	80.0 C.T.	.020
PC6528	C	PC2528	A	58.0	.026	116.0 C.T.	.013
SERIES PC6600/PC2600				4½ WATT SERIES			
PC6608	D	PC2608	B	6.3	.700	12.6 C.T.	.350
PC6616	D	PC2616	B	28.0	.156	56.0 C.T.	.078
PC6624	D	PC2624	B	40.0	.110	80.0 C.T.	.055
PC6628	D	PC2628	B	58.0	.066	116.0 C.T.	.033
PC6632	D	PC2632	B	115.0V @ .020A and 12.6V @ .150A			
SERIES PC6700/PC2700				7½ WATT SERIES			
PC6708	D	PC2708	B	6.3	1.200	12.6 C.T.	.600
PC6712	D	PC2712	B	12.6	.600	25.2 C.T.	.300
PC6715	D	PC2715	B	20.0	.370	40.0 C.T.	.185
PC6716	D	PC2716	B	28.0	.270	56.0 C.T.	.135
PC6724	D	PC2724	B	40.0	.180	80.0 C.T.	.090
PC6728	D	PC2728	B	58.0	.130	116.0 C.T.	.065
PC6732	D	PC2732	B	115.0V @ .025A and 12.6V @ .250A			



PC6000 Series



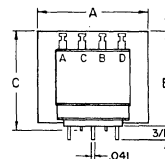
PC2000 Series

DIMENSIONS

Series	Fig.	A	B	C	D	E 6-Pin	E 8-Pin	F	G	H	Wt. Oz.
PC6200/PCT6200	E	1 1/4	7/32	1	1.274	—	.150	1 3/8	—	—	2.3
PC2500	A	1 1/4	1 1/4	1 1/4	1.00	.312	—	1 1/2	—	—	3.2
PC6500/PCT6500	C	1 1/4	1 1/4	1 1/4	1.00	.312	.200	1 1/2	—	—	3.2
PC2600	B	1 1/4	1 1/4	1 1/4	1.10	.400	—	1 1/4	2	2 3/8	6.5
PC6600/PCT6600	D	1 1/4	1 1/4	1 1/4	1.10	.400	.250	1 1/4	2	2 3/8	6.5
PCL6600	F	1 1/4	1 1/2	1 1/4	—	Send For Pin Layout		—	—	—	6.6
PC2700	B	1 1/4	1 1/4	1 1/4	1.30	.400	—	1 1/2	2 3/8	2 1/8	9.5
PC6700/PCT6700	D	1 1/4	1 1/4	1 1/4	1.30	.400	.250	1 1/2	2 3/8	2 1/8	9.5
PC6900/PCT6900	E	1 1/4	1 1/2	1 1/4	2.10	.400	.250	2 1/4	*	—	12.0

*PC6900-FB mounting bracket avail. on special order; four 3/32" holes on 1 1/8" x 2" ctrs.

†Do not have standoff.



PC2500 Series

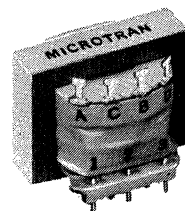
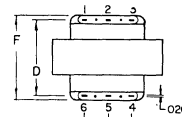


Fig. A



PC2600/PC2700 Series

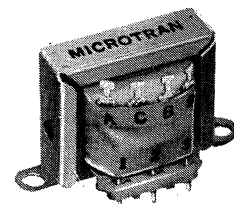
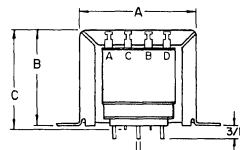
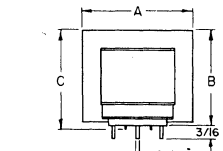
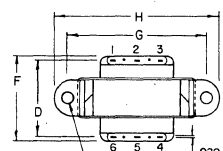


Fig. B



PC6500 Series — 6 Pins
PCT6500 Series — 8 Pins



PC6600 & PC6700 Series
— 6 Pins
PCT6600 & PCT6700 Series
— 8 Pins

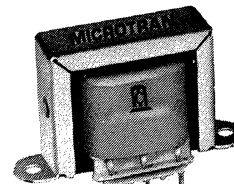
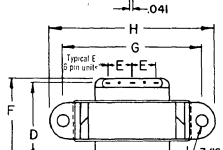
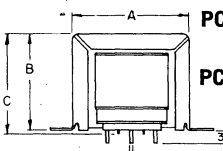
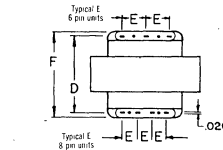


Fig. D

Series PC6500/PCT6500 (Fig. C) may also be used for point to point wiring by cementing the transformer with the terminals opposite mounting surface.

Series PC6600/PCT6600 and PC6700/PCT6700 (Fig. D) may also be supplied for point to point wiring on special order with terminals opposite mounting surface. To order, add -FBR to P/N, i.e. PC6604-FBR and add \$10.00 lot set-up charge.

TRANSFORMERS



MICROTRAN

145 E. Mineola Ave • Valley Stream, N.Y. 11582
Phone: (516) 561-6050 • TWX: 510-225-8412

PLUG-IN PRINTED CIRCUIT POWER TRANSFORMERS

FOR LOGIC & OP AMP POWER SUPPLIES

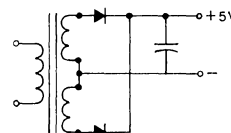
PLUG-IN PRINTED CIRCUIT POWER TRANSFORMERS FOR +5V, AND $\pm 15V$, DC POWER SUPPLIES

For construction of low cost, miniaturized, regulated and unregulated DC power supplies for latest solid-state digital and linear circuitry. Permits packaging flexibility unobtainable with prepackaged power supplies. Low-profile, miniaturized construction permits close stacking of PC boards. Precision spaced molded-in terminals.

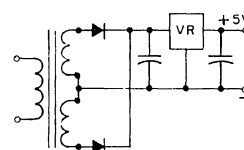
Dimensions/Figs. on Facing Page.

TRANSFORMERS FOR +5V DC UNREGULATED AND REGULATED POWER SUPPLIES

Part No.	Secondary				DC Output			Fig. No.
	Parallel Connected		Series Connected		C.T. F.W. DC Volts	Current ma DC	Schematic No.	
	AC Volts	RMS Amps	AC Volts	RMS Amps				
PC6205	4.50	0.18	9.0 C.T.	0.09	+5	75	1	E
PC6505	4.50	0.36	9.0 C.T.	0.18	+5	150	1	C
PC6605	4.50	1.10	9.0 C.T.	0.55	+5	450	1	D
PCL6605*	4.50	1.10	9.0 C.T.	0.55	+5	450	1	F
PC6705	4.50	2.00	9.0 C.T.	1.00	+5	825	1	D
PC6905	4.50	5.00	9.0 C.T.	2.50	+5	2000	1	E
PC6210	7.75	0.12	15.5 C.T.	0.06	+8.5**	50	2	E
PC6510	7.75	0.22	15.5 C.T.	0.11	+8.5**	90	2	C
PC6610	7.75	0.64	15.5 C.T.	0.32	+8.5**	265	2	D
PCL6610*	7.75	0.64	15.5 C.T.	0.32	+8.5**	265	2	F
PC6710	7.75	1.20	15.5 C.T.	0.60	+8.5**	500	2	D
PC6910	7.75	3.10	15.5 C.T.	1.55	+8.5**	1300	2	E



SCHEMATIC #1
UNREGULATED

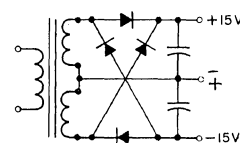


SCHEMATIC #2
REGULATED

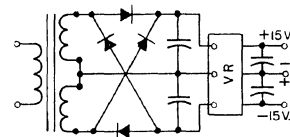
*All primaries 115V 50/60 Hz except PCL6605 and PCL6610 which have 115/230V 50/60 Hz primaries.
**+8.5 DC output volts for input to +5V IC Voltage Regulator, see Schematic 2.

TRANSFORMERS FOR $\pm 15V$ DC DUAL OUTPUT UNREGULATED AND REGULATED POWER SUPPLIES

Part No.	Secondary				DC Output			Fig. No.
	Parallel Connected		Series Connected		C.T. F.W. DC Volts	Current ma DC	Schematic No.	
	AC Volts	RMS Amps	AC Volts	RMS Amps				
PC6211	12.0	0.07	24.0 C.T.	0.035	±15	22	3	E
PC6511	12.0	0.13	24.0 C.T.	0.065	±15	40	3	C
PC6611	12.0	0.40	24.0 C.T.	0.200	±15	120	3	D
PCL6611*	12.0	0.40	24.0 C.T.	0.200	±15	120	3	F
PC6711	12.0	0.76	24.0 C.T.	0.380	±15	220	3	D
PC6911	12.0	1.90	24.0 C.T.	0.950	±15	550	3	E
PC6214	16.0	0.05	32.0 C.T.	0.025	±20**	15	4	E
PC6514	16.0	0.10	32.0 C.T.	0.050	±20**	30	4	C
PC6614	16.0	0.30	32.0 C.T.	0.150	±20**	90	4	D
PCL6614*	16.0	0.30	32.0 C.T.	0.150	±20**	90	4	F
PC6714	16.0	0.56	32.0 C.T.	0.280	±20**	165	4	D
PC6914	16.0	1.40	32.0 C.T.	0.700	±20**	410	4	E



SCHEMATIC #3
UNREGULATED

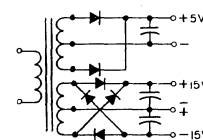


SCHEMATIC #4
REGULATED

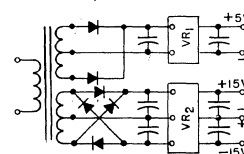
*All primaries 115V 50/60 Hz except PCL6611 and PCL6614 which have 115/230V 50/60 Hz primaries.
** ± 20 DC output volts for input to $\pm 15V$ output IC Voltage Regulator, see Schematic 4.

TRANSFORMERS FOR +5V AND $\pm 15V$ DC TRIPLE OUTPUT UNREGULATED AND REGULATED POWER SUPPLIES

Part No.	Secondary #1		Secondary #2		DC Output #1		DC Output #2		Schematic No.	Fig. No.
	AC Volts	RMS Amps	AC Volts	RMS Amps	C.T. F.W. DC Volts	Cur. ma DC	C.T. C.W. DC Volts	Cur. ma DC		
PCT6230	9.0 C.T.	0.048	24.0 C.T.	0.020	+5	40	± 15	12	5	E
PCT6530	9.0 C.T.	0.072	24.0 C.T.	0.032	+5	60	± 15	20	5	C
PCT6630	9.0 C.T.	0.240	24.0 C.T.	0.080	+5	200	± 15	50	5	D
PCL6630*	9.0 C.T.	0.240	24.0 C.T.	0.080	+5	200	± 15	50	5	F
PCT6730	9.0 C.T.	0.480	24.0 C.T.	0.160	+5	400	± 15	100	5	D
PCT6930	9.0 C.T.	1.200	24.0 C.T.	0.440	+5	1000	± 15	275	5	E
PCT6531	15.5 C.T.	0.048	32.0 C.T.	0.020	+8.5**	40	$\pm 20^{**}$	12	6	C
PCT6631	15.5 C.T.	0.140	32.0 C.T.	0.058	+8.5**	115	$\pm 20^{**}$	35	6	D
PCL6631*	15.5 C.T.	0.140	32.0 C.T.	0.058	+8.5**	115	$\pm 20^{**}$	35	6	F
PCT6731	15.5 C.T.	0.300	32.0 C.T.	0.100	+8.5**	250	$\pm 20^{**}$	60	6	D
PCT6931	15.5 C.T.	0.690	32.0 C.T.	0.298	+8.5**	575	$\pm 20^{**}$	175	6	E



SCHEMATIC #5
UNREGULATED



SCHEMATIC #6
REGULATED

*All primaries 115V 50/60 Hz except PCL6630 and PCL6631 which have 115/230V 50/60 Hz primaries.
**+8.5 and ± 20 DC output volts are for inputs to +5V and $\pm 15V$ IC Voltage Regulators, see Schematic 6.

ALL TRANSFORMERS ARE SUPPLIED WITH ENGINEERING BULLETIN LISTING SUGGESTED COMPONENTS

Bulletin provides typical schematics and suggested components for low-cost, miniaturized, unregulated and regulated power supplies. Regulated units have short circuit, thermal overload and overvoltage protection, and have the following typical specifications: Input 105-125V; Output Voltage $\pm 1V$; Load and Line Regulation $\pm 1\%$ each; Ripple 1mV RMS.

PC/PCT6200 & PCT6900 Series — 8 Pins PC6900 Series — 6 Pins

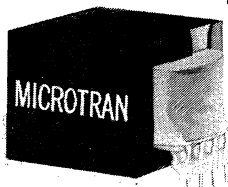
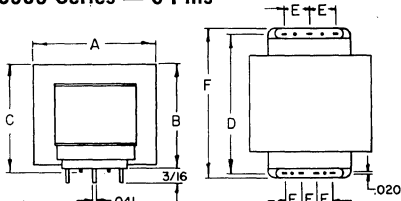


Fig. E



SEE DIMENSION CHART ON FACING PAGE

PCL6600 Series

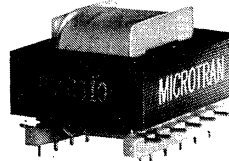
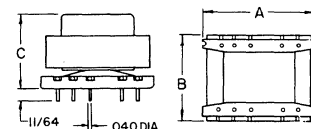


Fig. F



SEE PAGE 2-1756 FOR PRICING

TRANSFORMERS

MICROTRAN 145 E. Mineola Ave • Valley Stream, N.Y. 11582
Phone: (516) 561-6050 • TWX: 510-225-8412

60 Hz POWER TRANSFORMERS

Designed for solid-state and low voltage applications. All units shown are manufactured in accordance with the requirements of MIL-T-27.

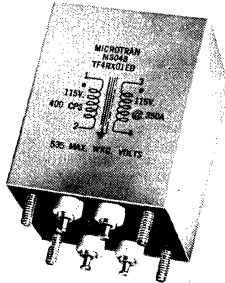
FULL TERMINAL ARRANGEMENTS AND COLOR CODE DESIGNATIONS SUPPLIED WITH EACH UNIT

HERMETICALLY SEALED

PER MIL-T-27

MIL DESIGNATION TF4RX01XX

Also available in open frame construction, see next page.



METHOD OF APPROXIMATING SECONDARY AC CURRENT REQUIREMENTS

Since transformers may be used in many possible configurations, the current ratings shown above are AC-RMS secondary winding currents. When selecting the "Secondary Amp" rating, the conversion chart shown below may be helpful. For exact values of secondary current requirements, use curves prepared by O.H. SHADE "Proc of IRE7/43 Analysis of Rectifier Operation."

Rectifier Type	Filter Type	Approx. Secondary RMS Current
Full Wave Center-Tap	Choke Input	.7 Times DC Current
Full Wave Center-Tap	Capacitor Input	1.2 Times DC Current
Full Wave Bridge	Choke Input	Equal to DC Current
Full Wave Bridge	Capacitor Input	1.8 Times DC Current

60 Hz POWER SUPPLY TRANSFORMERS

For Silicon Rectifier Circuitry, and Filament Applications
PRIMARY 105/115/125 VOLTS MIL DESIGNATION TF4RX01XX

Part No.	Secondary		Rectifier Current C.T. Full Wave DC Volts**	F.W. Bridge DC Volts**	Fig. A Mil Case XX
	AC Volts	RMS Amps			
M8042	6.3 C.T.	.6	1.9	3.8	AJ
M8043	6.3 C.T.	2.0	1.9	3.8	FB
M8086	6.3 C.T.	6.0	1.9	3.8	GA
M8087	12.6 C.T.	3.0	4.7	9.4	GA
M8044	12.6	2.0	10.5 (Series)	21 (Series)	JB
M8022	12.6 C.T.	2.0			
M8088	18.5 C.T.	3.0	7.4	14.8	JB
	26 C.T.	2.5	10.8	21.6	HA
M8152	28 C.T.	.15	11.7	23.4	AJ
M8045	28 C.T.	.6	11.7	23.4	FA
M8055	30 C.T.	2.5	12.5	25	JA
M8023	35 C.T.	3.0	14.5	29	KA
M8089	40 C.T.	.1	17	34	AJ
M8090	40 C.T.	.3	17	34	EA
M8091	40 C.T.	.75	17	34	GB
M8046	49 C.T.	2.5	21	42	LA
M8024	70 C.T.	1.0	30	60	JA
M8056	80 C.T.	.6	35	70	HA

**DC Output for resistive or inductive loads. Output volts based on approx. 1V drop per rectifier.

60 Hz ISOLATION/POWER TRANSFORMERS

Center Tap Permits Use In Either F.W. Bridge or
F.W.C.T. Circuitry Electrostatic Shielding

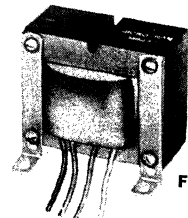
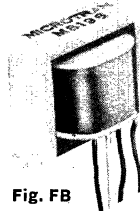
MIL DESIGNATION TF4X01XX

Part No.	Input Voltage	Output Voltage	Current RMS Amps	V. A. Rating	Fig. A Mil Case XX
M8094	115	115 C.T.	.0085	1	AH
M8095	115	115 C.T.	.030	3.5	EA
		12.6 C.T.	.25	3.15	
		12.6	.25	3.15	
M8151	115	115 C.T.	.13	15	FA
M8096*	115	115 C.T.	.35	40	GA
M8078*	115	115 C.T.	.9	100	KA

*Primary 105/115/125 Volts.

FILTER INDUCTORS

1500 Test Volt — May be connected in series or parallel for inductive requirements. Part Numbers listed on left are hermetically sealed per MIL DESIGNATION TF4RX04XX. Part Numbers listed on right are open frame construction.



HERMETIC Part No.	Fig. A Mil Case XX	Series Connected			Parallel Connected			OPEN FRAME Part No.	Open Frame Dimensions				
		Inductance Henrys	DC Amps	DCR Ohms	Inductance Henrys	DC Amps	DCR Ohms		L	W	H	Mtg. Centers	Fig.
M8098	AH	3.5	.050	200	.875	.10	50	M8198	2 1/8	1 1/8	1 1/8	1 3/4	FB
M8099	AJ	1.0	.15	65	.25	.30	16	M8199	2 3/8	1 1/4	1 1/2	2	FB
M8100	EB	.5	.3	30	.125	.6	7.5	M8200	2 1/4	1 3/8	1 5/8	2 3/8	FB
M8101	FB	.32	.6	16	.08	1.2	4	M8201	3 1/4	1 5/8	1 3/8	2 1/8	FB
M8102	JA	.2	1.0	4	.05	2.0	1	M8202	3 3/8	2 3/8	3 1/2	2 1/8 x 2 1/8	K
M8103	JA	.07	2.5	.84	.0175	5.0	.21	M8203	3 3/4	2 7/8	3 1/2	3 1/8 x 2 1/2	K
M8104	JA	.022	4.0	.4	.0055	8.0	.1	M8204	3 3/4	2 3/4	3 1/2	2 1/8 x 2 1/2	K
M8105	KA	.022	5.0	.2	.0055	10.0	.05	M8205	4 1/2	3 1/8	4 1/2	3 3/4 x 2 1/2	K

SEE PAGE 2-1756 FOR PRICING

TRANSFORMERS



MICROTRAN

145 E. Mineola Ave. • Valley Stream, N.Y. 11582
Phone: (516) 561-6050 • TWX: 510-225-8412

60 Hz POWER TRANSFORMERS

60 Hz CONTROL & POWER SUPPLY TRANSFORMERS

For Relays, Silicon Rectifiers Circuitry, and Filament Application Primary 105/115/125 Volts

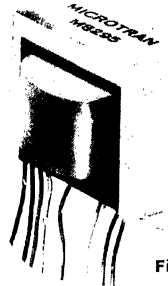


Fig. FB

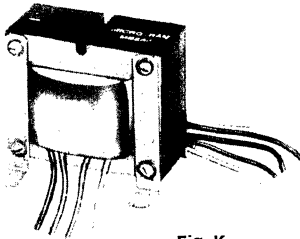


Fig. K

Part No.	Secondary		Rectifier Circuit		Dimensions			Mounting Centers	Figure
	AC Volts	RMS Amps	C.T. Full Wave DC Volts**	F.W. Bridge DC Volts**	L	W	H		
M8242	6.3 C.T.	.6	1.9	3.8	2 3/8	1 3/8	1 1/2	2	FB
M8243	6.3 C.T.	2.0	1.9	3.8	3 1/4	1 5/8	2 1/8	2 1/8	FB
M8286	6.3 C.T.	6.0	1.9	3.8	3 1/8	2 1/8	2 1/4	3 3/8	FB
M8287	12.6 C.T.	3.0	4.7	9.4	3 1/8	2 1/8	2 1/4	3 3/8	FB
M8247†	12	4.0	9.9 (Series)	19.8 (Series)	4 1/8	3 1/8	3 3/4	3 3/8 x 2 1/2	K
M8244	12	4.0							
	12.6 C.T.	2.0	10.5 (Series)	21 (Series)	3 3/8	2 7/8	3 3/2	2 1/8 x 2 1/2	K
	12.6	2.0							
M8222	18.5 C.T.	3.0	7.4	14.8	3 3/8	2 1/2	3 3/2	2 1/8 x 2 1/8	K
M8288	26 C.T.	2.5	10.8	21.6	3	2 3/4	2 3/4	2 1/2 x 2 3/8	K
M8245	28 C.T.	.6	11.7	23.4	3 1/4	2 1/8	1 1/8	2 1/8	FB
M8255	30 C.T.	2.5	12.5	25	3 3/4	2 3/4	3 1/2	3 1/8 x 2 1/4	K
M8223	35 C.T.	3.0	14.5	29	4 1/8	3	3 3/4	3 3/8 x 2 3/8	K
M8289	40 C.T.	.1	17	34	2 3/8	1 3/8	1 1/2	2	FB
M8290	40 C.T.	.3	17	34	2 1/8	1 3/8	1 3/8	2 3/8	FB
M8291	40 C.T.	.75	17	34	3 1/8	2 1/8	2 1/4	3 1/8	FB
M8246	49 C.T.	2.5	21	42	4 1/2	3 1/4	4 1/2	3 3/4 x 2 1/2	K
M8224	70 C.T.	1.0	30	60	3 3/4	2 3/4	3 1/2	3 1/8 x 2 1/4	K
M8256	80 C.T.	.6	35	70	3	2 5/8	2 3/4	2 1/2 x 2 3/8	K

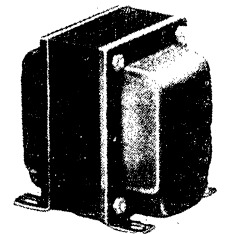
†Secondary may be connected in series to provide 24 Volts @ 4.0 Amps or parallel for 12 Volts @ 8.0 Amps.
**DC Output for resistive or inductive loads. Output volts based on approximately 1 Volt drop per rectifier.

50-60 Hz STEP-DOWN AUTO TRANSFORMERS

240/220V to 120/110V, 50/60 cycle. Equipped with secondary standard receptacle. 6' U.L. approved line cord. Baked Enamel Finish.

Part No.	Application	Dimensions			Mounting Centers	Weight
		L	W	H		
M1552	80 Watt Capacity	3 3/2	2 1/2	2 3/2	3 3/8	3.5 lbs.
M1556	100 Watt Capacity	3 1/8	2 7/8	3 1/2	1 3/4 x 2 1/4	4 lbs.
M1553	150 Watt Capacity	3 1/4	2 7/8	3 1/2	2 1/4 x 2 3/8	5 lbs.
M1555	250 Watt Capacity	3 7/8	3 1/4	3 7/8	2 1/8 x 2 1/2	6 lbs.
M1559	350 Watt Capacity	3 3/4	3 7/8	4 5/8	2 7/8 x 3	7 lbs.
M1558	500 Watt Capacity	4 7/8	3 7/8	4 5/8	3 3/8 x 3	12 lbs.
M1551	750 Watt Capacity	5 1/2	4 1/2	5 3/8	3 1/4 x 3 1/2	16 lbs.
M1557	1000 Watt Capacity	7	4 1/2	5 3/8	5 1/4 x 3 1/2	25 lbs.
M1554	1500 Watt Capacity	8	4 1/2	5 3/8	6 1/4 x 3 1/2	29 lbs.
M1550*	2000 Watt Capacity	8 1/2	4 3/8	6	6 5/8 x 3 3/8	37 lbs.

*Secondary supplied with 1 foot #14-2 wire stripped cable.



VERTICAL END BELL

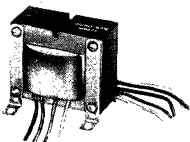


Fig. K

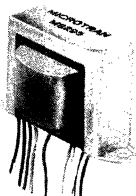


Fig. FB

60 Hz ISOLATION & POWER TRANSFORMERS

Center Tap Permits Use In Either F.W. Bridge or F.W.C.T. Circuitry Electrostatic Shielding

Part No.	Input Voltage	Output Voltage	Current RMS Amps	V.A. Rating	Dimensions			Mounting Centers	Figure
					L	W	H		
M8294	115	115 C.T.	.0085	1	2 1/8	1 1/8	1 3/8	1 3/4	FB
M8295	115	115 C.T.	.030	3.5					
		12.6 C.T.	.25	3.15					
		12.6	.25	3.15	2 1/8	1 1/8	1 5/8	2 3/8	FB
M8251	115	115 C.T.	.13	15	3 3/4	1 5/8	1 1/8	2 1/8	FB
M8296*	115	115 C.T.	.35	40	4	2 1/4	2 1/8	3 3/8	FB
M8278*	115	115 C.T.	.9	100	3 3/4	3 1/4	3 1/2	3 1/8 x 2 3/4	K

*Primary 105/115/125 Volts.

SEE PAGE 2-1756 FOR PRICING

FEATURES: Precision • Repeatability • Stability • No System Trimming Required

SYNCHRO TO RESOLVER CONVERTER TRANSFORMERS

Part No.	Input Voltage Line to Line	Output Voltage RMS Sine & Cos	Frequency Hz.	Input Z K Ohm	Typical Load K Ohm	Accuracy Arc Seconds	Size Inches	Weight Oz.
50890	11.8	6	400	20	100	4 min.	1 x 1/2 x 3/8	.5
10472	11.8	6	400	10	10	5 min.*	3/4 x 1/2 x 3/8	.6
11870	90	6 CT.	60	500	100	60	1.1 x 2.1 x 1.1	4
12092	90	6 CT.	400	500	100	60	1.1 x 2.1 x 1.1	4
12094	90	6 CT.	60 & 400	500	100	60	1.1 x 2.1 x 1.1	4
50460	90	6	400	60	10	60	7/8 x 1 5/8 x 1 1/8	2
50642	11.8	6	400	30	10	60	7/8 x 1 5/8 x 1 1/8	2
50725	90	6	400	500	100	60	1 3/8 x 1 1/2 x 5/8	1.5
50726	90	6 CT.	400	500	100	60	1 3/8 x 1 1/2 x 5/8	1.5
50727	90	3	400	500	100	60	1 3/8 x 1 1/2 x 5/8	1.5
50728	90	3 CT.	400	500	100	60	1 3/8 x 1 1/2 x 5/8	1.5
50737	11.8	6 CT.	400	10	100	60	1 3/8 x 1 1/2 x 5/8	1.5
50738	11.8	6 CT.	400	10	100	60	1 3/8 x 1 1/2 x 5/8	1.5
50739	11.8	3	400	10	100	60	1 3/8 x 1 1/2 x 5/8	1.5
50740	11.8	3 CT.	400	10	100	60	1 3/8 x 1 1/2 x 5/8	1.5
9652	11.8	5	400	100	10	30	1 3/8 x 2 3/4 x 7/8	5
9514	90	4.25	400	1000	10	30	1 3/8 x 2 3/4 x 7/8	5
9561	11.8	1.75	400	10	10	2 min.	1 x 2 x .65	3

RESOLVER TO SYNCHRO CONVERTER TRANSFORMERS

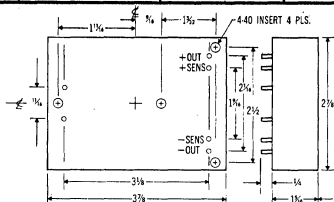
*10472A, 3 Min.

Part No.	Input Voltage 2 Phase, 4 Wire	Output Voltage 3 Phase, 3 Wire (L-L)	Frequency Hz.	Load Typical Minimum Ohms (L-L)	Input Z Typical Ohms Open CKT	Accuracy Arc Minutes	Size Inches	VA Rating
10084	11.8	11.8	400	150	2K	2	1 x 2 x .65H	1
10086	6.0	11.8	400	150	1K	2	1 x 2 x .65H	1
10088	9.0	11.8	400	300	2K	1.5	1 3/8 x 2 3/4 x .65H	0.5
10090	9.0	90	400	2500	2K	1.5	1 3/8 x 2 3/4 x 7/8H	3.2
11999	7.0	11.8	400	50	500	2	2 x 4 x 1H	2.8
50749	7.2	90	60	8000	700	1	1 1/2 x 3 3/8 x 1 1/4H	1
12186	7.0	90	60	4000	250	1	2 x 4 x 1 1/2H	2
52020	9	11.8	400	14	100	3.5	1 1/2 x 2 1/2 x 1 1/4	10
52021	9	90	400	800	100	3.5	2 x 4 x 1 1/4	10
52155	5.9	11.8	400	150	200	2	7/8 x 1 5/8 x 1 1/8H	1
52156	5.9	90	400	8000	200	2	7/8 x 1 5/8 x 1 1/8H	1
52023	9	90	60	800	100	3.5	4 x 8 x 2	10

REGULATED DC
POWER SUPPLIES

MODEL 452

Input: 105-125 VAC. 60 to 400 Hz.
Output: 5 VDC $\pm$ 1%
Temp. Range: -20C to +70°C.
Load Reg: 0.1%.
Line Reg: 0.1%.
Ripple: 5 MV Max.
Stability: $\pm$ 0.1% after warmup.
Temp. Coeff: 0.02%/°C.
Overload Protection: Current Limit Fold Back.

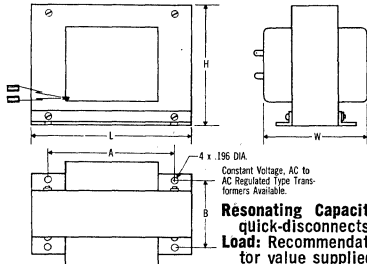


Remote Sensing: To use remote sensing, +sense is connected to +output at the load, and -sense is connected to -output at the load. If the remote sense feature is not used +sense must be connected to +output, and -sense must be connected to -output at the output pins.
Over Volt. Option: SCR Crowbar.

MODEL 453 is rated for 15 VDC, 0 to .33 amps, 15 MV ripple.

MODEL 454 is rated for 5 VDC, 45 VA, larger volume, write for detail spec.

MODEL 455 is rated for 15 VDC, 45 VA, larger volume, write for detail spec.

SELF REGULATING TRANSFORMERS
REGULATED DC OUTPUT

Application: For operation into external FWB with capacitor filters.
DC Voltages: Fixed, from 5 to 30 VDC.
Line Reg: $\pm$ 1% DC for 115 $\pm$ 10% VRMS, 60 Hz input.
Ripple: RMS, 10% of DC average.
Load Regulation: $\pm$ 10%.
Resonating Capacitor: Supplied for connection to quick-disconnects on TFMR.
Load: Recommendations for diodes and filter capacitor value supplied with units.

Magnetic Part No.	Max. DC Volt- Amps	Dimensions in Inches				
		L	W	H	A	B
52005	20	3 3/8	1 1/8	2 7/8	2 1/8	1 1/2
52006	40	3 3/8	2 1/8	2 7/8	2 1/8	2 1/4
52007	60	4 1/8	2 7/8	3 3/8	3 1/8	1 3/4
52008	80	5	2 3/4	3 3/8	4 1/4	1 7/8
52009	150	5 1/8	3	4 1/8	4 3/8	2

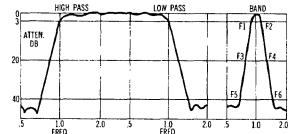
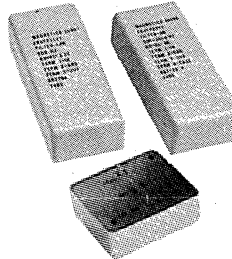
Resonating capacitor requires 1 1/2 x 2 1/4 x H mounting volume. Recommended DC output voltages 5, 6, 12, 24, 30. Order by part number (for rated VA) followed by DC voltage desired such as 52005-12 for 12 VDC @ 20 VA Rated.

LC FILTERS

LOW PASS / HIGH PASS / BAND PASS / BAND STOP

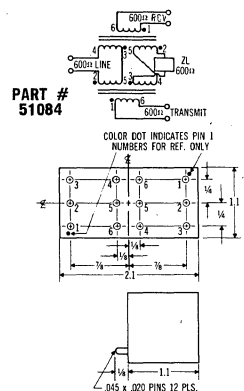
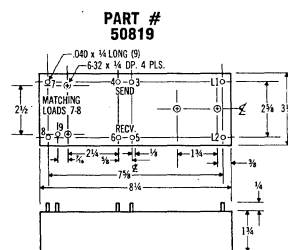
Filters: All types of filters, 200 Hz to 30 MHz, including high performance elliptic function filters.

Computer aided design, with worst case tolerance studies, provide optimum performance, less critical component choice, and makes custom units as simple as "Standards."



For prompt quote provide: Type, Insertion Loss, Desired Attenuation Characteristics, Source Z and Load Z, Quantity and delivery requirements.

AUDIO HYBRID



Imped.: 600 ohm or 900 ohm.
Freq. Response: $\pm$ 0.2 dB — 100 to 4000 Hz.
Longitudinal Bal.: 60 dB Min. — 200 to 3600 Hz.
Insertion Loss: 5 dB Max. — 300 to 3400 Hz.
Trans. Hybrid Loss: 50 dB Min. — 300 to 3400 Hz.
Return Loss: 26 dB Min. — 200 to 3600 Hz.
Operating Level: -30 to +10 DEM.
Maximum Current DC at which unit meets all specs: 0 to 150 MADC to terminals 1 to 2 either polarity.

Freq. Resp.: $\pm$ 0.5 dB
300 to 3500 Hz.
Long. Bal.: 45 dB Min.
Distortion: 0.5% Max.
Imped. Match: $\pm$ 10%
300 to 3500 Hz.
Return Loss: 26 dB Min.
Trans-Hybrid Loss: 45 dB typical.

LET MAGNETICO QUOTE "ALL" YOUR REQUIREMENTS • THE BEST IN TRANSFORMERS
FILTERS • AUDIO HYBRIDS • POWER SUPPLIESLAMINATED
TELEPHONE
MATCHING
PRECISION
INDUCTORSTOROIDAL WINDING
SCOTT-T
INVERTER
CURRENT
WIDEBAND

MAGNETICO INC.

182 MORRIS AVENUE, HOLTSVILLE, N.Y. 11742

TELEPHONE: (516) 654-1166

WIDEBAND TRANSFORMERS

UNBALANCED TO BALANCED TRANSFORMERS

Balanced secondaries center-tapped and dc-isolated from primaries. Mid-band insertion loss less than 0.5 dB. Bandwidth defined at low frequency end by 3 dB drop from mid-band response, at high end by max. VSWR of 1.25.

LOW POWER SERIES (1W)

Series	Radio Frequency		Medium Frequency		Video*	
Cases	BA, BB, HB		BA, BB		LA, LB	
Unb./Bal. (Ω)	Type No.	Bandwidth MHz	Type No.	Bandwidth MHz	Type No.	Bandwidth MHz
50:50	0001	.1-125	0010	.01-80	0009	.001-25
50:75	0101	.1-125	0111	.01-80	0104	.001-25
50:90	0200	.1-125	0202	.01-60	0203	.001-20
50:100	0300	.1-100	0301	.01-60	0311	.001-20
50:124	0307	.1-100	0302	.01-60	0306	.001-20
50:135	0310	.1-100	0312	.01-60	0303	.001-18
50:150	0400	.1-100	0401	.01-60	0415	.001-15
50:200	0500	.1-100	0520	.01-60	0511	.001-15
50:300	0501	.1-100	0521	.01-50	0517	.001-12
50:450	0600	.1-65	0602	.01-40	0603	.001-10
50:600	0700	.1-65	0703	.01-32	0706	.001-8
50:800	0800	.1-60	0801	.01-25	0802	.001-7
50:1200	0900	.1-30	0902	.01-15	0904	.001-6
75:50	1000	.1-100	1001	.01-60	1002	.001-25
75:75	1100	.1-100	1112	.01-60	1102	.001-25
75:90	1200	.1-100	1201	.01-60	1202	.001-20
75:100	1300	.1-100	1310	.01-60	1314	.001-20
75:124	1302	.1-100	1311	.01-60	1301	.001-20
75:135	1317	.1-100	1315	.01-60	1312	.001-20
75:150	1400	.1-100	1405	.01-60	1404	.001-16
75:200	1500	.1-100	1513	.01-60	1516	.001-15
75:300	1501	.1-100	1514	.01-60	1502	.001-15
75:450	1600	.1-60	1601	.01-40	1602	.001-12
75:600	1700	.1-60	1707	.01-32	1704	.001-10
75:800	1800	.1-30	1801	.01-20	1802	.001-10
75:1200	1900	.1-30	1905	.01-15	1902	.001-9
75:1850	1906	.1-15	1901	.01-8	1903	.001-6

*EXTENDED VIDEO SERIES Response down to 20 Hz

Type No.	Unb./Bal.	Bandwidth	Case Styles
0014	50:50	20 Hz-6 MHz	PB
0113	50:75	20 Hz-6 MHz	PB
0315	50:100	20 Hz-6 MHz	PB
0522	50:200	20 Hz-4 MHz	PB
1003	75:50	20 Hz-6 MHz	PB
1111	75:75	20 Hz-6 MHz	LA, LB
1307	75:110	20 Hz-6 MHz	LA, LB
1309	75:124	20 Hz-9 MHz	PB
1408	75:150	20 Hz-6 MHz	PB
1520	75:300	20 Hz-4 MHz	PB

HIGH POWER SERIES

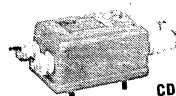
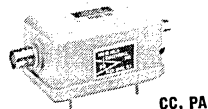
Power Level	10 W	25 W	100 W	1 kW
Cases	HB	BA, BB	BA, BB	KA
MHz Range	.1-30	.1-30	.5-30	2-32
Unb./Bal. (Ω)	Type No.	Type No.	Type No.	Type No.
50:50	0008	0011	0012	0013
50:75	0108	0109	0105	0107
50:100	0309	0308	0304	0314
50:150	0406	0402	0404	0407
50:200	0519	0512	0516	0515
50:300	0514	0518	0506	0513
50:450	0604	0605	0606	0601
50:600	0705	0701	0704	0702
75:75	1105	1110	1118	1108
75:100	1306	1304	1305	1316
75:150	1406	1401	1403	1407
75:200	1517	1519	1512	1518
75:300	1515	1510	1505	1511
75:450	1603	1604	1605	1606
75:600	1709	1703	1708	1705

MANY VARIATIONS AND CUSTOM DESIGNS
ALSO AVAILABLE

ISOLATION TRANSFORMERS UNBALANCED TO UNBALANCED

Ground Isolation in 50 and 75Ω Coaxial Systems

- Flat frequency, linear phase response.
- Insulated BNC connectors.
- 140 dB isolation at power frequencies.



Type No.	Impedance	Bandwidth
0005-CC	50:50	1 kHz-25 MHz
1103-CC	75:75	1 kHz-25 MHz
0112-CC	50:75	1 kHz-25 MHz
1117-CC	75:75	10 Hz- 5 MHz
1116-PA	75:75	20 Hz-20 MHz

10 KV Isolation for Public Utility Data Transmission

6 kHz to 2.5 MHz bandwidths.

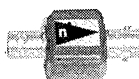
1115-CD: 75Ω coax to 75Ω coax.

1313-CD: 75Ω coax to 124Ω balanced line.

75-202-CF: Two 75Ω coax inputs to 124Ω balanced line in hybrid arrangement.

ULTRA-WIDE COAXIAL MATCHING TRANSFORMERS

Unbalanced to unbalanced transformers. BNC input and output connectors. Low VSWR. 0.1-300 MHz. Available in JA case only.



Type No.	Impedance	Features
0003-JA	50:50	Phase Reversing
1106-JA	75:75	Phase Reversing
0102-JA	50:75	Impedance Adapters
0201-JA	50:90	Impedance Adapters
1203-JA	75:90	Impedance Adapters

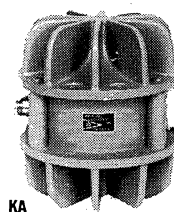
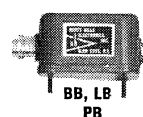
SUBMINIATURE SERIES

NA molded case. 0.1-300 MHz bandwidth.



Type No.	Impedance	Features
0003-NA	50: 50	Unbalanced to Unbalanced Phase Reversing
1106-NA	75: 75	
1200-NA	90: 90	
0007-NA	50: 50	Unbalanced to Unbalanced Phase Reversing DC Isolated
1107-NA	75: 75	
1201-NA	90: 90	
0002-NA	50: 12.5	Unbalanced to Unbalanced Non-Inverting
0508-NA	50:200	
1506-NA	75:300	
0004-NA	50: 50	Unbalanced to Balanced
0509-NA	50:200	
1101-NA	75: 75	
1507-NA	75:300	
0510-NA	50:200	
1508-NA	75:300	Balanced to Balanced

CASE STYLES



OVERALL DIMENSIONS (Inches)

Case	L	W	H
BA	2.3	1.3	1.2
BB	2.6	1.3	1.2
CC	3.5	1.7	1.6
HB	0.9	0.9	0.7
KA	5.4	4.6	5.5
LA	2.8	1.7	1.3
LB	3.2	1.7	1.3
PA	3.0	4.0	2.0
PB	3.0	3.6	2.0

North Hills Electronics, INC.

GLEN COVE, N.Y. 11542 • 516-671-5700

See Section 3450 for Wideband Hybrids and Power Dividers and Section 1800 for Coils.

SPECIALISTS IN SPECIAL TRANSFORMERS

POWER & ELECTRONIC

Your one source for all types...designed and manufactured to your specifications or actual requirements

NWL designs and manufactures transformers:

FURNACE
FILAMENT
HEATING
LIGHTING

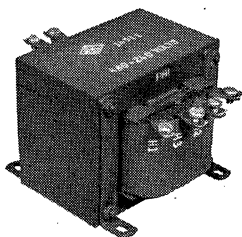
SCR CONTROLS
PLATE
HIGH FREQUENCY
INSTRUMENT
PHASE CHANGING
WELDING

HIGH VOLTAGE
TESTING
HIGH REACTANCE
OUTPUT

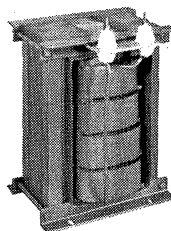
also
SATURABLE
CORE REACTORS

CHOKES
AC REACTORS

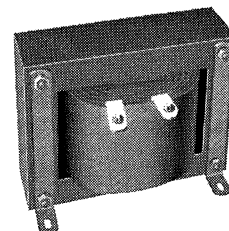
PACKAGED
CONTROLS
AIR CORE REACTORS



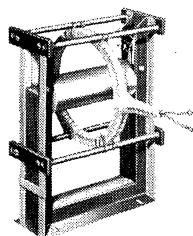
Instrument transformers, current and potential, 1-10,000 amperes, 1-50,000 volts. High accuracy, through type, bus bar, indoor and outdoor.



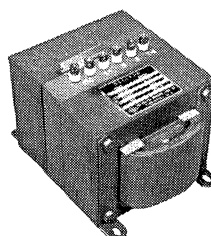
Plate, audio and modulation transformers in sizes from 50 VA to 100 KVA and up to 100,000 volts.



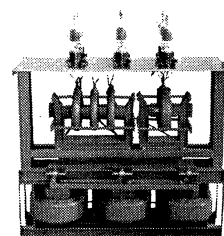
Chokes, linear and swinging. 0.1 milli-henry to 10 henry.



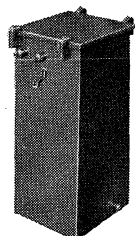
Filament transformers, single and multiple. Up to 100,000 volts, dry and oil types.



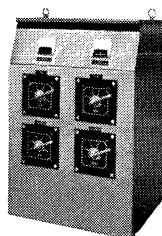
Saturable Core Reactors, from 50 VA to 500 KVA. Single and 3 phase.



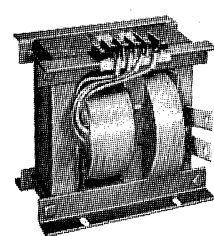
Rectifying transformers and supplies, 1, 2 or 3 phase. 1 to 3,000 amperes, up to 500 KVA.



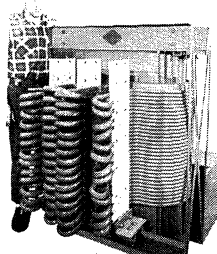
Oil filled specialty and high voltage transformers up to 300 KVA.



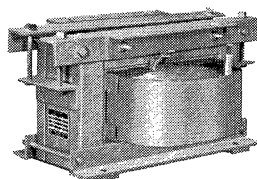
Heating transformers for resistance and induction furnaces. All types. Up to 1200 KVA.



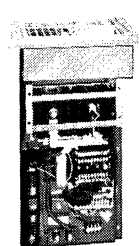
High impedance type transformers, from 50 VA to 50 KVA and up to 10,000 volts.



High power and high current water-cooled transformers.



Reactors, 50 VA to 500 KVA. AC and DC. Linear and swinging.



Solid State SCR Power Controllers.



NWL

TRANSFORMERS

P. O. BOX 455, TRENTON, N. J. 08603 • 609-298-7300

"Call us for quotes or specs."

SPECIAL PULSE TRANSFORMERS AND INDUCTORS FOR TECHNOLOGY MARKETING, INCORPORATED

***** CORE MEMORIES *****

As a prime supplier to TECHNOLOGY MARKETING, INCORPORATED, NPI has developed many pulse transformers and inductors for the latest core memory designs. This new generation of memory systems uses "time shared" electronics to increase system speed and greatly reduce the system cost. These transformers play a major part in achieving memory design goals of 800-900 ns cycle time for a 32k, single card memory with a manufacturing system cost of less than 0.2 cents/bit! NPI pulse transformers provide outstanding reliability, temperature stability, and fast response and recovery (permitting double pulse operation at up to 80% duty cycle—without external damping resistors). They are available in a variety of turns ratios and inductance values and are supplied in industry-standard 16 pin DIP or Dual In-line (DIL) case styles. For more information on applying these pulse transformers to your system, contact NPI or: TECHNOLOGY MARKETING, INC., 3170 Red Hill Avenue, Costa Mesa, California 92626, Phone: (714) 979-1100, TWX: (910) 595-1717.

TECHNOLOGY MARKETING – NPI CROSS REFERENCE TABLE

TMI	NPI	TMI	NPI	TMI	NPI
500-0002	PA 2609	500-1093	PA 2554	500-9072	PA 2312
500-0003	PA 2576	500-1099	NP 2856	500-9073	PA 2313
500-0004	PA 2619	500-1100	NP 2884	500-9084	PA 2323
500-1003	PA 2486	500-1138	PA 2567	500-9085	PA 2322
500-1031	PA 2496	500-9013	PA 2289	500-9086	PA 2383
500-1032	PA 2498	500-9019	PA 2488	500-9091	PA 2346
500-1033	PA 2497	500-9032	PA 2290	500-9093	PA 2391
500-1034	PA 2490	500-9033	PA 2291	500-10045	PA 2412
500-1035	PA 2491	500-9042	PA 2420	610-1129	PA 2569
500-1046	PA 2503	500-9047	PA 2465	610-1049	PA 2516
500-1048	PA 2518	500-9049	PA 2410	610-9035	PA 2393-1
500-1051	PA 2519	500-9050	PA 2292		



OTHER NPI PRODUCTS

NEEDLEWIRES For Core Memory Stringing
 PARYLENE COATING SERVICE For Cores, PC Boards and Substrates
 TRANSFORMERS, INDUCTORS AND COILS For Electronics and Electrical Applications
 DC-DC CONVERTER TRANSFORMERS AND POWER MODULES For Calculators
 SCR AND TRIAC TRIGGER TRANSFORMERS For Power and Motor Speed Control

NANO PULSE INDUSTRIES, INC.
 249-D East Emerson Ave., Orange, California 92665
 (714) 998-2360 TWX-910-593-1617

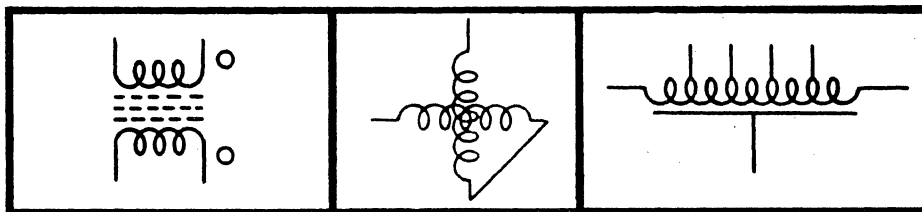


NANO PULSE INDUSTRIES, LTD.
 41 King Yip Street 6FL/B, Kwun Tong,
 Hong Kong Telex-780-4849

REPRESENTED AROUND THE WORLD

EL RAD

MANUFACTURING COMPANY



HIGH QUALITY INDUCTIVE
COMPONENTS FOR COMPUTER
AND INDUSTRIAL APPLICATIONS

Coils Inductors Delay Lines Transformers

El-Rad has been an important supplier of the electronics industry since 1944, the very beginning of the industry's most rapid and exciting growth period.

Constantly building on a policy of product quality, carefully controlled, El-Rad for years has been a prime source of critical components such as coils, delay lines, and pulse transformers; for instruments, radar, computer, and military applications; even miniature but rugged assemblies destined for outer space.

El-Rad engineers, with their skilled know-how, work closely with your own engineering department on all design requirements. The result—design solutions in a minimum of time.

At your command is a sample service that is backed by a well-equipped laboratory, and a very capable model shop. There, working with the most accurate of test and measuring instruments, the emphasis is on practicality, so that the sample you choose can be easily produced in large quantities when desired.

Volume production of critical units and assemblies, requires a stable and skilled work force, which El-Rad provides. El-Rad can give you unusually quick service no matter where you are.

SPECIALISTS IN PRODUCING DIFFICULT-TO-MANUFACTURE
INDUCTANCE ITEMS REQUIRED BY THE ELECTRONICS INDUSTRY

EL RAD

2800 W. Cullom
Chicago, Ill. 60618

Phone (312) 478-7300
TWX (910) 221-0104

NESHAMINY TRANSFORMER CO.

for
all
your
custom
transformer
needs . . .

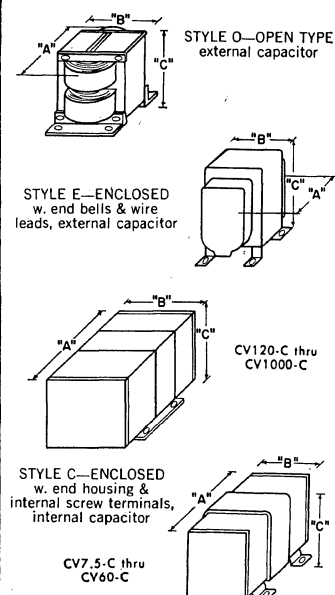
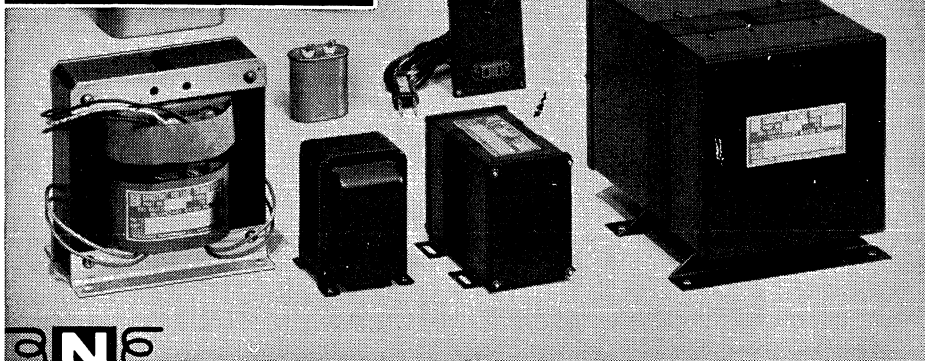


Furlong, Pennsylvania 18925
Call (215) 794-7411

NEW MINIATURE TYPE MCV-1

118 or 5 V output $\pm 1\%$ at 0.6 VA with 95-130 V, 60 cycle input. Only $2\frac{1}{4}"$ by $1\frac{3}{4}"$ dia. including built-in capacitor. (Also made in any voltage and current combination to max. of 0.6 VA @ 60 cy., 5 VA @ 400 cy.)

Cord/Receptacle Adapter Kits



NTC

CONSTANT VOLTAGE TRANSFORMERS

STATIC-MAGNETIC VOLTAGE REGULATING TRANSFORMERS

NORMAL HARMONIC TYPES

- Output capacity from 0.5 to 3,000 VA
- Instantaneous, continuous voltage regulation
- No tubes or manual adjustments
- Ratings made to order at low cost
- Compact, single-unit design
- Low-cost open types for component applications
- Heavy-duty, enclosed types for accessory uses
- Single or multiple secondaries

NTC constant voltage transformers maintain output voltages within one percent with input voltage fluctuations up to 15 percent. Regulation is instantaneous, continuous and completely automatic. Operating on principles of ferro-resonance, the transformers have no tubes, moving parts or separate saturable reactors.

Most important, the design of NTC constant voltage transformers enables their outputs to be made exactly to your specifications—and at decidedly low cost even in small quantities. With only a few basic lamination configurations and windings, virtually any output voltage/current combination can be obtained. *Since the transformers are designed to your specific requirements they often eliminate costly circuitry and expensive components.*

POWER SUPPLIES, too...

Neshaminy's engineering skills are at your service for the design and quantity production of complete, regulated power supplies in any capacity and rating. Let us discuss your next requirement.

Model	Regulated Output Voltage	Input Voltage Range (60 cycles)	VA Output	Nominal Mounting Centers	Approx. Overall Dimensions, Inches A B C	Approx. Net Wt., lbs.	Style
MCV-1	5 or 118	95-130	0.6	$1\frac{1}{4} \times 1\frac{1}{4}$	$1\frac{3}{4}$ dia. x $2\frac{1}{4}$	6 oz	—
CV7.5-E	6.3 or 118	95-130	7.5	$2\frac{3}{8} \times 1\frac{1}{8}$	$2\frac{1}{2} \times 4 \times 2\frac{3}{4}$	3	E
CV7.5-C	6.3 or 118	95-130	7.5	$3 \times 1\frac{1}{8}$	$4\frac{5}{8} \times 3\frac{7}{8} \times 2\frac{3}{4}$	4	C
CV15-E	6.3 or 118	95-130	15	$2\frac{3}{8} \times 1\frac{1}{2}$	$2\frac{7}{8} \times 4 \times 2\frac{3}{4}$	4	E
CV15-C	6.3 or 118	95-130	15	3×2	$5 \times 3\frac{7}{8} \times 2\frac{3}{4}$	5	C
CV30-E	6.3 or 118	95-130	30	$2\frac{3}{8} \times 2\frac{1}{4}$	$3\frac{5}{8} \times 4 \times 2\frac{3}{4}$	6	E
CV30-C	6.3 or 118	95-130	30	$3 \times 2\frac{3}{4}$	$5\frac{3}{4} \times 3\frac{7}{8} \times 2\frac{3}{4}$	7	C
CV60-E	6.3 or 118	95-130	60	$2\frac{3}{8} \times 3\frac{1}{8}$	$4\frac{1}{2} \times 4 \times 2\frac{3}{4}$	8	E
CV60-C	6.3 or 118	95-130	60	$3 \times 3\frac{5}{8}$	$6\frac{5}{8} \times 3\frac{7}{8} \times 2\frac{3}{4}$	9	C
CV120-O	6.3 or 118	95-130	120	$2\frac{1}{4} \times 5\frac{1}{4}$	$4 \times 5\frac{7}{8} \times 5\frac{3}{4}$	12	O
CV120-C	6.3 or 118	95-130	120	$4\frac{5}{8} \times 6\frac{1}{8}$	$9\frac{3}{8} \times 7\frac{1}{4} \times 6$	14	C
CV150-O	6.3 or 118	95-130	150	$2\frac{1}{4} \times 5\frac{1}{4}$	$4 \times 5\frac{7}{8} \times 5\frac{3}{4}$	14	O
CV150-C	6.3 or 118	95-130	150	$4\frac{5}{8} \times 6\frac{1}{8}$	$9\frac{3}{8} \times 7\frac{1}{4} \times 6$	16	C
CV250-O	118	95-130 or 190-260	250	$2\frac{1}{4} \times 5\frac{1}{4}$	$4\frac{3}{8} \times 5\frac{7}{8} \times 5\frac{3}{4}$	24	O
CV250-C	118	95-130 or 190-260	250	$4\frac{5}{8} \times 6\frac{1}{8}$	$9\frac{3}{4} \times 7\frac{1}{4} \times 6$	27	C
CV500-O	118	95-130 or 190-260	500	$3\frac{1}{4} \times 5\frac{1}{4}$	$5\frac{5}{8} \times 5\frac{7}{8} \times 5\frac{3}{4}$	35	O
CV500-C	118	95-130 or 190-260	500	$4\frac{5}{8} \times 6\frac{1}{8}$	$11 \times 7\frac{1}{4} \times 6$	38	C
CV1000-O	118	95-130 or 190-260	1000	$5\frac{1}{4} \times 6\frac{1}{8}$	$8\frac{3}{8} \times 5\frac{7}{8} \times 5\frac{3}{4}$	52	O
CV1000-C	118	95-130 or 190-260	1000	$4\frac{3}{4} \times 6\frac{1}{8}$	$14\frac{7}{8} \times 7\frac{1}{4} \times 6$	56	C

TYPICAL STANDARD MODELS

1% output regulation. Closer regulation to order. Output contains approx 14% total rms harmonic content. SPECIAL MODELS can be made quickly to exact requirements in any step-up or step-down ratio of voltage to current within the desired VA rating and with single or multiple secondaries, with or without center-taps. CV models also available for 50 cycles, and MCV models for 50 or 400 cycles.

NOTES

1. Cord/Receptacle kits, similar to that shown in illustration are available on all "C" style transformers of 118 VAC output rating.

2. Specify required input voltage range on CV transformers from 250 to 1000 VA.

3. To specify output voltage required (6.3 or 118 VAC) add voltage to model number (Example—15 VA cased transformer with 118 VAC output would be model #CV15-118).

4. "C" style units have built-in capacitors. Styles "E" and "O" have external capacitors.

Send us your requirements for a prompt quotation.

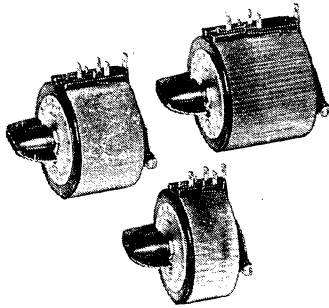
NESHAMINY TRANSFORMER COMPANY

Furlong, Pa. 18925
(215) 794-7411

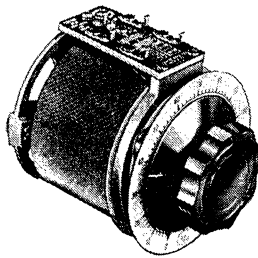
NTC is a division of the Neshaminy Electronic Corporation.

Prices and specifications subject to change without notice

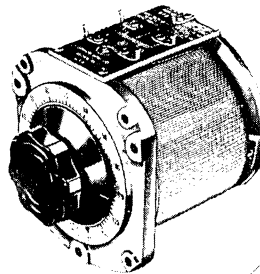
OHMITE® variable transformers



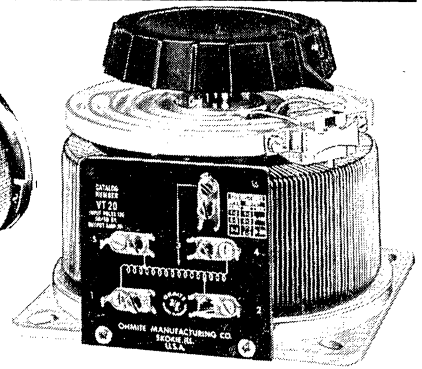
VT1, VT02, VT3 SERIES, SINGLE UNCASED
The VT1, rated 1 ampere, is the smallest commercial variable transformer available.



VT5 SERIES, SINGLE, UNCASED



VT10 SERIES, SINGLE, UNCASED



VT25 SERIES, UNCASED

Unique for the design innovations they incorporate, Ohmite "OHMITRAN" v.t.® variable transformers include exclusive field-proven features. They offer long, low maintenance operation with excellent regulation at any voltage setting within the rated load plus an output free of waveform distortion. (Ratings shown at right are for use in free air.) Enclosed units, units with meters, 2 & 3 in tandem and 3 phase models are available in most models in the basic series.

FEATURES

- Positive current transfer — specially designed brushes are connected through high conductivity contact arms to large slip ring which contacts a wide area of the collector ring.
- Adjustable shaft extends from either side.
- Mounts interchangeable with virtually all other comparable types.
- Direct reading, two scale dial — calibrated for overvoltage connection on front, line voltage connection on reverse side.
- Overvoltage options available.
- UL and CSA listings available in certain models.
- Easily replaceable brushes
- Clockwise or counter-clockwise operation on Series VT5, VT10 and VT25

ENCLOSURES

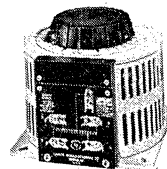
Type	Available for:	Features
B	VT25	EXPOSES TRANSFORMER'S TERMINAL RANGE & MOUNTING BASE
E	All	FOR PERMANENT MOUNTING ON PANEL, ETC.
F	All	STANDARD PORTABLE LINE CORD, OUTLET SOCKET, FUSE
G	VT8 VT25	DELUXE PORTABLE CIRCUIT BREAKER, OVERVOLTAGE — NO OVERVOLTAGE SELECTOR, HANDLE DOUBLES AS EASEL
Metered	VT8 VT25	VOLTMETER VOLTMETER + AMMETER VOLTMETER + WATTMETER

Series Catalog No.	Wt. Lbs.	Dimensions	
		Base	Depth
VT1	1.5	2 ⁷ / ₈ " Diam.	1 ¹ / ₈ "
VT02	2.25	2 ⁷ / ₈ " Diam.	2 ³ / ₈ "
VT3	3	2 ⁷ / ₈ " Diam.	2 ¹ / ₈ "
VT5	5.25	3 ³ / ₈ " Diam.	3 ⁵ / ₈ "
VT10	10.25	4 ⁷ / ₈ " x 5 ¹ / ₈ "	4 ¹ / ₂ "
VT25	22	7 ¹ / ₂ " x 7 ¹ / ₂ "	4 ¹ / ₂ "

BASIC SERIES

Cat. No.	Input Volts	Freq. Hz.	Description	Output	
				Volts	Amps
VT1	120	50 60	Basic Uncased Model	0-120 0-132	1.3
VT1F	120	60	Portable Enclosure	0-132	1.0
VT1N	120	60	Basic Uncased Model	0-120	1.5
VT1NF	120	60	Portable Enclosure	0-120	1.2
VT02	120	50 60	Basic Uncased Model	0-120 0-132	2.0
VT02F	120	60	Portable Enclosure	0-132	1.75
VT02N	120	60	Basic Uncased Model	0-120	2.5
VT02NF	120	60	Portable Enclosure	0-120	2.0
VT2LN	40	60	Hi-Amps, Low Volts	0-40	5.0
VT3	120	50 60	Basic Uncased Model	0-120 0-132	3.0
VT3N	120	60	Basic Uncased Model	0-120	3.3
*VT5	120	50 60	Basic Uncased Model	0-120 0-140	4.75
VT5F	120	60	Portable Enclosure	0-140	4.75
VT4LN	40	50	Hi-Amps, Low Volts	0-40	12.0
*VT10	120	50 60	Basic Uncased Model	0-120 0-140	10.0
VT10F	120	60	Portable Enclosure	0-140	10.0
VT10G	120	50 60	Deluxe Portable Enclosure	0-120 0-140	8.0
VT10H	240	50 60	Basic Uncased Model	0-240 0-280	4.0
VT8LN	40	50	Hi-Amps, Low Volts	0-40	22.0
*VT25	120	50 60	Basic Uncased 20A Model	0-120 0-140	25.0
VT25B	120	50 60	"B" Type Enclosure	0-120 0-140	25.0
VT25H	240	50 60	Basic Uncased Model	0-240 0-280	11.0
VT25HB	240	50 60	"B" Type Enclosure	0-240 0-280	11.0
VT25G	120	50 60	Deluxe Portable Enclosure	0-120 0-140	20.0
VT25F	120	50 60	Portable Enclosure	0-120 0-140	25.0

*Models VT5, VT10 and VT25 have replaced the industry standard VT4, VT8 and VT20 Models.



VT25B



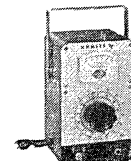
VT02E



VT10G



VT5F

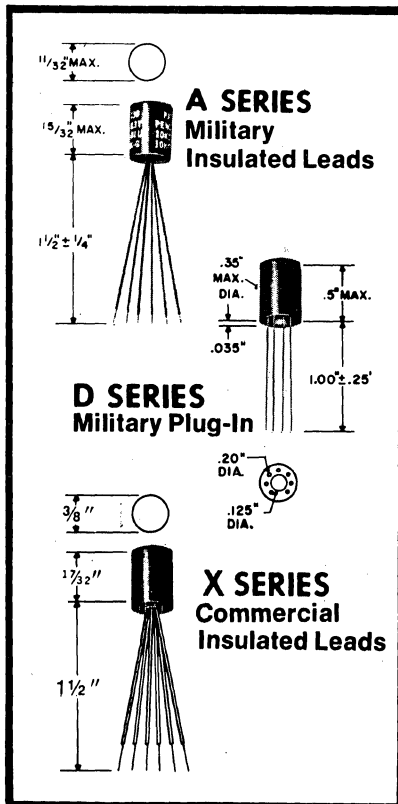


VT10GCV
(with voltmeter)

FOR STOCK ITEMS, CALL LOCAL REPRESENTATIVE LISTED IN INDEX

OHMITE MFG. CO., a North AMERICAN PHILIPS company / 3601 W. Howard St., Skokie, Illinois 60076 / (312) 675-2600 / TWX 910-223-0805 / TELEX 72-4433

PICO's ultra-miniature transformers



SPECIFICATIONS

- **MIL-T-27**
All MILITARY Units Are Designed to MIL-T-27 and Are Hermetically Sealed in a Metal Case. Transformers are Type TF5R21ZZ. Inductors are TF5R20ZZ.
- **FREQUENCY RESPONSE:**
±3 db, 300 Hz - 100 KHz At 1.0 Milliwatt
- **MAXIMUM DISTORTION:**
5% With Rated Power Level at 1 KHz
- **DIELECTRIC STRENGTH:**
All Units Tested at 200 V RMS
- **INSULATION RESISTANCE:**
Greater than 10,000 Megohms at 300 V DC
- **WEIGHT:**
1/10 Ounce
- **OPERATING TEMPERATURE:**
-55° c to 105° c (All Units Can Be Supplied to Class S Requirements 130° c maximum)
Commercial Units have maximum operating temperature of +85°C
- **TERMINALS:**
Solid .018 Diameter Conductor.
Conductor is Gold Plated, Nickel-Iron Core Wire (Dumet) in Accordance with MIL-STD-1276 Type D
- **THERMAL SHOCK:**
25 Cycles, Method 107C. MIL-STD-202D, Test Condition A-1

Send for new 36 page Pico Catalog

(All PICO Products are patented)

TRANSFORMERS

PICO PART NUMBER			PRIMARY IMPEDANCE OHMS	SECONDARY IMPEDANCE OHMS	POWER MILLIWATTS at 1 KHz	PRIMARY UNBALANCED DC CURRENT ma	PRIMARY DC RESISTANCE OHMS	SECONDARY DC RESISTANCE OHMS	PICO PRICES 1-9 *		
A-Series Insulated Leads	D-Series PLUG-IN	X-Series Comm							A-Series	D-Series	X-Series
A1020	D4020	X10200	40	40	600	15	4	4.8	\$ 7.06	\$ 8.04	\$ 5.66
A1025	D4025	X10250	80 ct	32 split	600	12	9.8	6	9.63	10.11	7.11
A1030	D4030	X10300	120 ct	3.2	600	10	10	0.46	7.30	7.67	5.40
A1035	D4035	X10350	120 ct	60 ct	600	10	12	6	9.63	10.11	7.11
A1040	D4040	X10400	120 ct	120 ct	600	10	12	16	9.63	10.11	7.11
A1045	D4045	X10450	150 ct	12	600	10	11	1.5	7.30	7.67	5.40
A1050	D4050	X10500	150 ct	50	600	10	15	5	8.11	8.52	5.99
A1055	D4055	X10550	150 ct	100	600	10	15	10	8.11	8.52	5.99
A1060	D4060	X10600	150 ct	150 ct	600	10	15	17	9.63	10.11	7.11
A1065	D4065	X10650	150	600 ct	600	10	15	60	8.11	8.52	5.99
A1070	D4070	X10700	300 ct	12	600	7	20	1.6	7.30	7.67	5.40
A1075	D4075	X10750	300 ct	50	600	7	30	5	8.11	8.52	5.99
A1080	D4080	X10800	300 ct	150	600	7	30	15	8.11	8.52	5.99
A1085	D4085	X10850	300 ct	300 ct	600	7	30	36	9.63	10.11	7.11
A1090	D4090	X10900	300 ct	600	600	7	19	89	7.66	8.04	5.66
A1092	D4092	X10920	300 ct	600 ct	600	7	30	60	9.63	10.11	7.11
A1095	D4095	X10950	320 ct	3.2	600	7	20	0.46	7.30	7.67	5.40
A1100	D4100	X11000	400	10	600	8	40	1	7.66	8.04	5.66
A1105	D4105	X11050	400 ct	40 split	600	8	46	8	9.63	10.11	7.11
A1110	D4110	X11100	400	100	600	8	40	10	7.66	8.04	5.66
A1115	D4115	X11150	400 ct	120 split	600	8	46	26	9.63	10.11	7.11
A1120	D4120	X11200	400 ct	200	600	8	40	20	8.11	8.52	5.99
A1125	D4125	X11250	400 ct	400 split	600	8	46	74	9.63	10.11	7.11
A1130	D4130	X11300	400 ct	1000 ct	600	8	40	100	11.06	11.61	8.18
A1135	D4135	X11350	400 ct	2000 ct	600	8	40	200	11.06	11.61	8.18
A1140	D4140	X11400	400 ct	4000 ct	600	8	45	550	9.97	10.47	7.37
A1145	D4145	X11450	500 ct	50 ct	600	3	50	5	8.57	9.00	6.33
A1150	D4150	X11500	500	50	600	3	60	8	6.90	7.25	5.10
A1155	D4155	X11550	*500	500	600	3	50	60	8.57	9.00	6.33
A1160	D4160	X11600	500 ct	500 ct	600	3	50	60	8.57	9.00	6.33
A1165	D4165	X11650	500 ct	600	600	5.5	31	90	7.66	8.04	5.66
A1170	D4170	X11700	500 ct	600 ct	600	5.5	50	68	8.57	9.00	6.33
A1175	D4175	X11750	600	3.2	600	3	60	0.58	6.90	7.25	5.10
A1180	D4180	X11850	600 ct	12	600	5	43	1.5	7.66	8.04	5.66
A1185	D4185	X11850	600 ct	50	600	5	60	5	7.66	8.04	5.66
A1190	D4190	X11900	640 ct	3.2	600	5	43	0.46	7.66	8.04	5.66
A1195	D4195	X11950	700	100	600	4	70	10	7.66	8.04	5.66
A1200	D4200	X12000	800 ct	3.2	600	4	51	0.46	7.66	8.04	5.66
A1205	D4205	X12050	800 ct	12	600	4	50	1.5	7.66	8.04	5.66
A1210	D4210	X12100	800 ct	800	600	4	80	80	8.57	9.00	6.33
A1215	D4215	X12150	900 ct	600	600	4	52	89	7.66	8.04	5.66
A1220	D4220	X12200	1000 ct	12	600	3.5	70	1.5	7.66	8.04	5.66
A1225	D4225	X12250	1000 ct	50 ct	600	3.5	100	5	8.57	9.00	6.33
A1230	D4230	X12300	1000	50	600	3	110	8	6.90	7.25	5.10
A1235	D4235	X12350	1000 ct	50	600	3	110	8	8.57	9.00	6.33
A1240	D4240	X12400	1000 ct	1000 ct	600	3	100	100	8.57	9.00	6.33
A1245	D4245	X12450	1000 ct	4000 split	600	3	100	400	11.06	11.61	8.18
A1250	D4250	X12500	1060 ct	3.2	600	3.5	70	0.38	7.06	8.04	5.66
A1255	D4255	X12550	1200	3.2	600	2	100	0.5	6.90	7.25	5.10
A1260	D4260	X12600	1200	1200	600	2	120	120	6.90	7.25	5.10
A1265	D4265	X12650	1500 ct	12	600	3	105	1.5	7.66	8.04	5.66
A1270	D4270	X12700	*1500 ct	600 ct	600	3	150	60	11.06	11.61	8.18
A1275	D4275	X12750	1500 ct	600	600	3	85	89	7.66	8.04	5.66
A1280	D4280	X12800	1500 ct	600 ct	600	3	150	60	8.57	9.00	6.33
A1285	D4285	X12850	*1500	1500	600	3	150	150	8.57	9.00	6.33
A1290	D4290	X12900	1600 ct	3.2	600	3	109	0.38	7.66	8.04	5.66
A1295	D4295	X12950	2000 ct	2000 split	600	3	195	125	9.97	10.47	7.37
A1300	D4300	X13000	1000 ct	16,000 split	125	3.5	120	940	9.97	10.47	7.37
A1305	D4305	X13050	2000 ct	8000 split	125	3	195	450	9.97	10.47	7.37
A1310	D4310	X13100	3000	3000	125	2	300	300	8.04	8.44	5.94
A1315	D4315	X13150	*4000 ct	8000 ct	125	2	320	590	9.97	10.47	7.37
A1320	D4320	X13200	7500 ct	12	125	1	500	1.6	8.04	8.44	5.94
A1325	D4325	X13250	7500 ct	50	125	1	750	5	8.57	9.00	6.33
A1330	D4330	X13300	7500	100	125	1	750	10	8.57	9.00	6.33
A1335	D4335	X13350	7500	600	125	1	750	60	9.42	9.89	6.96
A1340	D4340	X13400	7500	2500	125	1	750	250	9.42	9.89	6.96
A1345	D4345	X13450	*7500 ct	7500 ct	125	1	750	750	11.06	11.61	8.18
A1350	D4350	X13500	8000 ct	3.2	125	1	500	0.38	8.04	8.44	5.94

*Discount Prices: 1-9 Net; 10-24 less 10%; 25-49 less 16%; 50-99 less 23%; 100-499 less 30%

Ordering Instructions: No minimum. Net 30 days F.O.B. Mt. Vernon, New York. P.O. Box 1206

Delivery—
stock to one week

For immediate engineering assistance or to place an order—Call Toll Free 800-431-1064

PICO Electronics, Inc.

50 South MacQuesten Pkwy. Mt. Vernon, New York 10551 • phone 914-699-5514

TRANSFORMERS

PICO PART NUMBER		PRIMARY IMPEDANCE OHMS	SECONDARY IMPEDANCE OHMS	POWER MILLIWATTS at 1 KHz	PRIMARY UNBALANCED DC CURRENT ma	PRIMARY DC RESISTANCE OHMS	SECONDARY DC RESISTANCE OHMS	PICO PRICES 1-9 *	
B-Series Insulated Leads	C-Series (Plug-In)							B-Series	C-Series
B2360	C3360	*8000 ct	1200 ct	125	1	800	120	9.97	10.47
B2365	C3365	*9000 ct	9000 ct	125	1	850	950	9.97	10.47
B2370	C3370	10,000	3.2 ct	125	1	790	0.6	7.66	8.04
B2375	C3375	10,000	100	125	1	1000	10	8.45	8.87
B2380	C3380	10,000	500 ct	125	1	850	50	8.45	8.87
B2385	C3385	10,000 ct	500 ct	125	1	870	50	9.97	10.47
B2390	C3390	10,000	1000	125	1	1000	100	8.45	8.87
B2395	C3395	10,000	1200 ct	125	1	850	130	8.45	8.87
B2400	C3400	10,000 ct	1200 ct	125	1	870	130	9.97	10.47
B2405	C3405	10,000 ct	1500 ct	125	1	850	115	9.22	9.68
B2410	C3410	10,000	2000 ct	125	1	1000	200	9.42	9.89
B2415	C3415	10,000 ct	2000 split	125	1	620	220	9.97	10.47
B2420	C3420	10,000 ct	2000 ct	125	1	870	180	9.97	10.47
B2425	C3425	10,000	2000 ct	125	1	850	180	8.45	8.87
B2430	C3430	10,000	5000	125	1	1000	500	9.97	10.47
B2435	C3435	10,000	7500	125	1	1000	750	9.97	10.47
B2440	C3440	10,000 ct	10,000 ct	125	1	970	1200	9.63	10.11
B2445	C3445	*10,000	10,000	125	1	1000	1300	9.63	10.11
B2450	C3450	15,000	10,000	60	0.75	1500	1000	9.63	10.11
B2455	C3455	20,000	500	60	0.5	2000	50	9.63	10.11
B2460	C3460	20,000	800	60	0.5	800	140	7.66	8.04
B2465	C3465	20,000 ct	800 ct	60	0.5	800	140	8.81	9.25
B2470	C3470	20,000	1000	60	0.5	2000	100	9.63	10.11
B2475	C3475	20,000 ct	1000 split	60	0.5	800	110	11.06	11.61
B2480	C3480	20,000	5000	60	0.5	2000	500	9.63	10.11
B2485	C3485	20,000	10,000	60	0.5	2000	1000	9.63	10.11
B2490	C3490	20,000	20,000	60	0.5	2000	2300	9.63	10.11
B2495	C3495	30,000	5000	60	0.25	2800	500	9.97	10.47
B2500	C3500	30,000	10,000	60	0.25	2800	1000	9.97	10.47
B2505	C3505	30,000	30,000	60	0.25	2800	3500	9.97	10.47
B2510	C3510	40,000 ct	400 split	60	0	2800	38	11.06	11.61
B2515	C3515	40,000	1000	60	0	2800	90	11.06	11.61
B2520	C3520	40,000	2000	60	0	2800	200	11.06	11.61
B2525	C3525	40,000 ct	4000 ct	60	0	2800	370	11.06	11.61
B2530	C3530	40,000	10,000	60	0	2800	930	11.06	11.61
B2535	C3535	40,000	20,000	60	0	2800	2000	11.06	11.61
B2540	C3540	40,000	40,000	60	0	2800	3500	11.06	11.61
B-Shield	C-Shield	Magnetic shield—mu metal case						1.20	1.20

PICO's
ultra-miniature
transformers

B SERIES
Military Insulated Leads

C SERIES
Military Plug-In

FEATURES

- EXTREME RESISTANCE TO THERMAL SHOCK
- ULTRA MINIATURE SIZE
- PICO IS APPROVED QPL SOURCE (MIL-T-27)
- MAGNETIC SHIELDS AVAILABLE
- ELECTROSTATIC SHIELDING CAN BE ADDED
- VARIATION OF STANDARD DESIGNS AVAILABLE
- PRIMARY AND SECONDARY WINDINGS CAN BE USED EITHER AS INPUT OR OUTPUT
- SPECIAL PRODUCTION TECHNIQUES ENSURE UNIFORM SIZE AND LEADS WHICH ARE FREE OF ENCAPSULANT. NO MENISCUS IN LEAD AREA.
- EVERY UNIT IN THIS CATALOG CAN BE MADE WITH A 300 THERMAL CYCLE GUARANTEE USING PICO'S SPECIAL SR CONSTRUCTION. CONTACT FACTORY FOR DETAILS

(All PICO Products are patented)

Send for new 36 page Pico Catalog

* Discount Prices: 1-9 Net; 10-24 less 10%; 25-49 less 16%; 50-99 less 23%; 100-499 less 30%

Ordering Instructions: No minimum. Net 30 days F.O.B. Mt. Vernon, New York. P.O. Box 1206

INDUCTORS

TWO VALUES OF INDUCTANCE, EACH AT A PARTICULAR VALUE OF DC CURRENT, ARE LISTED FOR EACH INDUCTOR. ALL INDUCTORS WITH SPLIT WINDINGS HAVE MEASUREMENTS LISTED FOR BOTH SERIES CONNECTIONS AND PARALLEL CONNECTIONS.

SINGLE WINDINGS

PICO PART NUMBER		INDUCTANCE HENRIES	DC CURRENT ma	DC RESISTANCE OHMS	PICO PRICES 1-9 *	
B-Series Insulated Leads	C-Series (Plug-In)				B-Series	C-Series
B2570	C3570	0.1 .08	4 10	25	6.14	6.45
B2575	C3575	0.9 0.5	2 6	105	6.14	6.45
B2580	C3580	2.5 0.9	2 4	630	6.14	6.45
B2585	C3585	4.5 1.2	2 4	2300	7.30	7.67

SPLIT WINDINGS

PICO PART NUMBER		INDUCTANCE HENRIES	DC CURRENT ma	DC RESISTANCE OHMS	PICO PRICES 1-9 *	
B-Series Insulated Leads	C-Series (Plug-In)				B-Series	C-Series
B2590	C3590	SERIES { 0.1 .08 PARALLEL { .025 .02	4 10 8 20	25 6.5	7.66	8.04
B2595	C3595	SERIES { 0.9 0.5 PARALLEL { 0.23 0.13	2 6 4 12	105 26	7.66	8.04
B2600	C3600	SERIES { 2.5 0.9 PARALLEL { 0.6 0.23	2 4 4 8	630 160	7.66	8.04
B2605	C3605	SERIES { 4.5 1.2 PARALLEL { 1.1 0.3	2 4 4 8	2300 575	8.11	8.52

* Discount Prices: 1-9 Net; 10-24 less 10%; 25-49 less 16%; 50-99 less 23%; 100-499 less 30%

Ordering Instructions: No minimum. Net 30 days F.O.B. Mt. Vernon, New York. P.O. Box 1206

Delivery:
Stock to one week

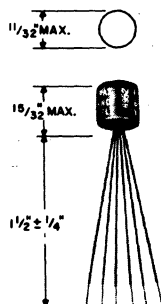
For immediate engineering assistance or to place an order—Call Toll Free 800-431-1064

PICO Electronics, Inc.

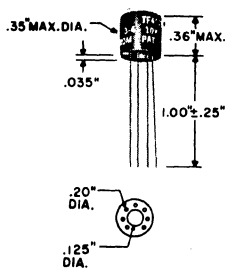
50 South MacQuesten Pkwy. Mt. Vernon, New York 10551 • phone 914-699-5514

PICO's ultra-miniature transformers

B SERIES Military Insulated Leads



C SERIES Military Plug-In



SPECIFICATIONS

- **MIL-T-27:**
All Units Are Designed to MIL-T-27
and Are Hermetically Sealed in a Metal Case
Transformers are Type TF5R21ZZ.
Inductors are TF5R20ZZ.
- **FREQUENCY RESPONSE:**
±3 db, 400 Hz - 100 KHz At 1.0 Milliwatt
- **MAXIMUM DISTORTION:**
5% With Rated Power Level at 1 KHz
- **DIELECTRIC STRENGTH:**
All Units Tested at 200 V RMS
- **INSULATION RESISTANCE:**
Greater than 10,000 Megohms at 300 V DC
- **WEIGHT:**
1/15 Ounce
- **OPERATING TEMPERATURE:**
-55° c to 105° c (All Units Can Be Supplied
to Class 3 Requirements 130° c maximum)
- **TERMINALS:**
Solid .016 Diameter Conductor.
Conductor is Gold Plated, Nickel-Iron Core
Wire (Dumet) in Accordance with MIL-STD-1276
Type D
- **THERMAL SHOCK:**
25 Cycles, Method 107C, MIL-STD-202D,
Test Condition A-1

Send for new 36 page Pico Catalog

(All PICO Products are patented)

**Delivery:
Stock to one week**

For immediate engineering assistance or to place an order—Call Toll Free 800-431-1064

PICO Electronics, Inc.

50 South MacQuesten Pkwy. Mt. Vernon, New York 10551 • phone 914-699-5514

TRANSFORMERS

PICO PART NUMBER		PRIMARY IMPEDANCE OHMS	SECONDARY IMPEDANCE OHMS	POWER MILLIWATTS at 1 KHz	PRIMARY UNBALANCED DC CURRENT ma	PRIMARY DC RESISTANCE OHMS	SECONDARY DC RESISTANCE OHMS	PICO PRICES 1-9*	
B-Series Insulated Leads	C-Series (Plug-In)							B-Series	C-Series
B2020	C3020	40	40	600	15	4	5	\$ 7.66	\$ 8.04
B2025	C3025	80 ct	32 split	600	12	11.5	4	9.63	10.11
B2030	C3030	120 ct	3.2	600	10	10	0.38	7.30	7.67
B2035	C3035	120 ct	60 ct	600	10	10	6	9.63	10.11
B2040	C3040	120 ct	120 ct	600	10	11	12	9.63	10.11
B2045	C3045	150 ct	12	600	10	11	1.5	7.30	7.67
B2050	C3050	150 ct	50	600	10	15	5	8.11	8.52
B2055	C3055	150 ct	100	600	10	15	10	8.11	8.52
B2060	C3060	150 ct	150 ct	600	10	14	16	9.63	10.11
B2065	C3065	150	600 ct	600	10	15	60	8.11	8.52
B2070	C3070	300 ct	12	600	7	20	1.6	7.30	7.67
B2075	C3075	300 ct	50	600	7	30	5	8.11	8.52
B2080	C3080	300 ct	150	600	7	30	15	8.11	8.52
B2085	C3085	300 ct	300 ct	600	7	29	31	9.63	10.11
B2090	C3090	300 ct	600	600	7	20	89	7.66	8.04
B2091	C3091	300 ct	600 ct	600	7	20	89	9.63	10.11
B2095	C3095	320 ct	3.2	600	7	20	0.38	7.30	7.67
B2100	C3100	400	10	600	8	40	1	7.66	8.04
B2105	C3105	400 ct	40 split	600	8	50	6.5	9.63	10.11
B2110	C3110	400	100	600	8	40	10	7.66	8.04
B2115	C3115	400 ct	120 split	600	8	45	25	9.63	10.11
B2120	C3120	400 ct	200	600	8	40	20	8.11	8.52
B2125	C3125	400 ct	400 split	600	8	50	89	9.63	10.11
B2130	C3130	400 ct	1000 ct	600	8	40	100	11.06	11.61
B2135	C3135	400 ct	2000 ct	600	8	40	200	11.06	11.61
B2140	C3140	400 ct	4000 ct	600	8	45	365	9.97	10.47
B2145	C3145	500 ct	50 ct	600	3	65	8.5	8.45	8.87
B2150	C3150	500	50	600	3	65	8.5	6.90	7.25
B2155	C3155	*500	500	600	3	45	55	8.45	8.87
B2160	C3160	500 ct	500 ct	600	5.5	49	52	8.45	8.87
B2165	C3165	500 ct	600	600	5.5	32	89	7.66	8.04
B2170	C3170	500 ct	600 ct	600	5.5	32	89	8.45	8.87
B2175	C3175	600	3.2	600	3	60	0.5	6.90	7.25
B2180	C3180	600 ct	12	600	5	43	1.5	7.66	8.04
B2185	C3185	600 ct	50	600	5	60	5	7.66	8.04
B2190	C3190	640 ct	3.2	600	5	43	0.38	7.66	8.04
B2195	C3195	700	100	600	5	70	10	7.66	8.04
B2200	C3200	800 ct	3.2	600	4	50	0.38	7.66	8.04
B2205	C3205	800 ct	12	600	4	50	1.5	7.66	8.04
B2210	C3210	800 ct	800	600	4	78	82	8.45	8.87
B2215	C3215	900 ct	600	600	4	53	90	7.66	8.04
B2220	C3220	1000 ct	12	600	3.5	70	1.5	7.66	8.04
B2225	C3225	1000 ct	50 ct	600	3	110	8.5	8.45	8.87
B2230	C3230	1000	50	600	3	110	8.5	6.90	7.25
B2235	C3235	1000 ct	50	600	3	110	8	8.45	8.87
B2240	C3240	1000 ct	1000 ct	600	3	98	105	8.45	8.87
B2245	C3245	1000	4000 split	600	3	100	425	11.06	11.61
B2250	C3250	1060 ct	3.2	600	3.5	70	0.38	7.66	8.04
B2255	C3255	1200	3.2	600	2	110	0.45	6.90	7.25
B2260	C3260	1200	1200	600	3	110	125	6.90	7.25
B2265	C3265	1500 ct	12	600	3	105	1.5	7.66	8.04
B2270	C3270	1500 ct	600 ct	600	3	87	90	6.90	7.25
B2275	C3275	1500 ct	600	600	3	87	90	7.66	8.04
B2285	C3285	*1500	1500	600	3	140	155	8.45	8.87
B2290	C3290	1600 ct	3.2	600	3	109	0.38	7.66	8.04
B2295	C3295	2000 ct	2000 split	600	3	180	110	9.97	10.47
B2300	C3300	1000 ct	16,000 split	125	3.5	120	1600	9.97	10.47
B2305	C3305	2000 ct	8000 split	125	3	180	440	9.97	10.47
B2310	C3310	3000	3000	125	3	280	340	8.11	8.52
B2315	C3315	*4000 ct	8000 ct	125	2	300	530	9.97	10.47
B2320	C3320	7500 ct	12	125	1	500	1.6	8.45	8.87
B2325	C3325	7500 ct	50	125	1	750	5	8.45	8.87
B2330	C3330	7500	100	125	1	750	10	8.45	8.87
B2335	C3335	7500	600	125	1	750	60	9.42	9.89
B2340	C3340	7500	2500	125	1	750	250	9.42	9.89
B2345	C3345	*7500	7500	125	1	725	875	9.97	10.47
B2350	C3350	8000 ct	3.2	125	1	500	0.38	8.45	8.87
B2355	C3355	8000	1000	125	1	800	100	9.42	9.89

*Discount Prices: 1-9 Net; 10-24 less 10%; 25-49 less 16%;
50-99 less 23%; 100-499 less 30%

* INCLUDES ELECTROSTATIC SHIELD

Ordering Instructions: No minimum. Net 30 days F.O.B. Mt. Vernon, New York. P.O. Box 1206

TRANSFORMERS

PICO PART NUMBER			PRIMARY IMPEDANCE OHMS	SECONDARY IMPEDANCE OHMS	POWER MILLIWATTS at 1 KHz	PRIMARY UNBAL- ANCED DC CURRENT	PRIMARY DC RESIS- TANCE OHMS	SECONDARY DC RESIS- TANCE OHMS	PICO PRICES 1-9 *		
A-Series Insulated Leads	D-Series Plug-In	X-Series Comm							A-Series	D-Series	X-Series
A1355	D4355	X13550	8000	1000	125	1	800	100	9.42	9.89	6.96
A1360	D4360	X13600	*8000 ct	1200 ct	125	1	640	115	9.97	10.47	7.37
A1365	D4365	X13650	*9000 ct	9000 ct	125	1	850	1080	10.38	10.90	7.68
A1370	D4370	X13700	10,000	3.2	125	1	790	0.6	7.66	8.04	5.66
A1375	D4375	X13750	10,000	100	125	1	1000	10	8.45	8.87	6.25
A1380	D4380	X13800	10,000	500 ct	125	1	780	50	8.45	8.87	6.25
A1385	D4385	X13850	10,000 ct	500 ct	125	1	1000	50	10.24	10.75	7.57
A1390	D4390	X13900	10,000	1000	125	1	1000	100	8.45	8.87	6.25
A1395	D4395	X13950	10,000	1200 ct	125	1	780	110	8.45	8.87	6.25
A1400	D4400	X14000	10,000 ct	1200 ct	125	1	1000	120	10.24	10.75	7.57
A1405	D4405	X14050	10,000 ct	1500 ct	125	1	780	125	9.22	9.68	6.82
A1410	D4410	X14100	10,000	2000 ct	125	1	1000	200	9.42	9.68	6.96
A1415	D4415	X14150	10,000 ct	2000 split	125	1	550	225	9.97	10.47	7.37
A1420	D4420	X14200	10,000 ct	2000 ct	125	1	1000	200	10.24	10.75	7.57
A1425	D4425	X14250	10,000	2000 ct	125	1	780	190	8.45	8.87	6.25
A1430	D4430	X14300	10,000	5000	125	1	1000	500	9.87	10.36	7.29
A1435	D4435	X14350	10,000	7500	125	1	1000	750	9.87	10.36	7.29
A1440	D4440	X14400	10,000 ct	10,000 ct	125	1	975	1175	9.63	10.11	7.11
A1445	D4445	X14450	*10,000	10,000	125	1	1000	1000	10.74	11.28	7.94
A1450	D4450	X14500	15,000	10,000	60	0.5	1500	1000	10.74	11.28	7.94
A1455	D4455	X14550	20,000	500	60	0.5	1600	60	9.63	10.11	7.11
A1460	D4460	X14600	20,000	800	60	0.5	825	110	7.66	8.04	5.66
A1465	D4465	X14650	20,000 ct	800 ct	60	0.5	830	110	8.81	9.25	6.51
A1470	D4470	X14700	20,000	1000	60	0.5	1600	130	9.63	10.11	7.11
A1475	D4475	X14750	20,000 ct	1000 split	60	0.5	800	110	9.97	10.47	7.37
A1480	D4480	X14800	20,000	5000	60	0.5	1600	550	9.63	10.11	7.11
A1485	D4485	X14850	20,000	10,000	60	0.5	1600	1100	9.63	10.11	7.11
A1490	D4490	X14900	20,000	20,000	60	0.5	1600	1850	9.63	10.11	7.11
A1495	D4495	X14950	30,000	5000	60	0.25	1700	500	10.74	11.28	7.94
A1500	D4500	X15000	30,000	10,000	60	0.25	1700	1000	10.74	11.28	7.94
A1505	D4505	X15050	30,000	30,000	60	0.25	1700	2000	10.74	11.28	7.94
A1510	D4510	X15100	40,000 ct	400 split	60	0.25	1700	60	10.74	11.28	7.94
A1515	D4515	X15150	40,000	1000	60	0.25	1700	115	10.74	11.28	7.94
A1520	D4520	X15200	40,000	2000	60	0.25	1700	225	10.74	11.28	7.94
A1525	D4525	X15250	40,000 ct	4000 ct	60	0.25	1700	450	11.13	11.69	8.23
A1530	D4530	X15300	40,000	10,000	60	0.25	1700	1200	10.74	11.28	7.94
A1535	D4535	X15350	40,000	20,000	60	0.25	1700	2300	10.74	11.28	7.94
A1540	D4540	X15400	40,000	40,000	60	0.25	1700	2000	10.74	11.28	7.94
A1545	D4545	X15450	d 100,000	100	30	0	7900	17	12.31	12.93	9.10
A1550	D4550	X15500	d 100,000 ct	500 ct	30	0	7900	85	12.31	12.93	9.10
A1555	D4555	X15550	d 100,000	10,000	30	0	7900	1700	11.85	12.44	8.76
A1560	D4560	X15600	d 200,000	1000	30	0	8500	100	11.85	12.44	8.76
A1565	D4565	X15650	d 200,000 ct	1000 ct	30	0	8500	100	12.59	13.22	9.31
A1570	D4570	X15700	d 200,000	10,000	30	0	8500	1000	14.03	14.73	10.37
A1575	D4575	X15750	d 200,000 ct	20,000	30	0	8500	2900	14.03	14.73	10.37
A1580	D4580	X15800	d 250,000	1000	30	0	10,000	125	14.03	14.73	10.37
A Shield	D Shield		Magnetic shield—mu metal case						1.20	1.20	

* INCLUDES ELECTROSTATIC SHIELD

d RESPONSE AT 100 KHz NOT WITHIN 3db

INDUCTORS

TWO VALUES OF INDUCTANCE, EACH AT A PARTICULAR VALUE OF DC CURRENT, ARE LISTED FOR EACH INDUCTOR. ALL INDUCTORS WITH SPLIT WINDINGS HAVE MEASUREMENTS LISTED FOR BOTH SERIES CONNECTIONS AND PARALLEL CONNECTIONS.

SINGLE WINDINGS

PICO PART NUMBER			INDUCTANCE HENRIES	DC CURRENT ma	DC RESISTANCE OHMS	PICO PRICES 1-9 *		
A-Series	D-Series	X-Series				A	D	X
A1820	D4700	X18200	.075 .018	10 20	10.5	6.14	6.45	4.54
A1830	D4705	X18300	0.3 0.15	4 20	25	6.14	6.45	4.54
A1840	D4710	X18400	1.25 0.5	2 11	100	6.20	6.51	4.58
A1850	D4715	X18500	3.5 1.0	2 5	560	6.14	6.45	4.54
A1860	D4720	X18600	6.0 1.5	2 5	2100	7.30	7.67	5.40
A1870	D4725	X18700	20.0 8.0	1 3	5100	9.22	9.68	6.83

SPLIT WINDINGS

PICO PART NUMBER			INDUCTANCE HENRIES	DC CURRENT ma *	DC RESISTANCE OHMS	PICO PRICES 1-9 *		
A Series	D-Series	X-Series				A	D	X
A1880	D4730	X18800	SERIES { .075 .06 .018 .015	10 30 20 60	10.5 2.6	7.30	7.67	5.40
A1890	D4735	X18900	SERIES { 0.3 0.15 .075 .04	4 20 8 40	25 6.2	8.11	8.52	5.99
A1900	D4740	X19000	SERIES { 3.5 1.0 0.9 0.25	2 5 4 10	560 140	8.11	8.52	5.99
A1910	D4745	X19100	SERIES { 6.0 1.5 1.5 0.38	2 5 4 10	2100 525	8.11	8.52	5.99
A1920	D4750	X19200	SERIES { 20 8 5 2	1 3 2 6	5100 1275	9.97	10.47	7.37

PICO's ultra-miniature transformers

A SERIES

Military Insulated Leads

D SERIES

Military Plug-In

X SERIES

Commercial Insulated Leads

FEATURES

- EXTREME RESISTANCE TO THERMAL SHOCK
- ULTRA MINIATURE SIZE
- PICO IS APPROVED OPL SOURCE (MIL-T-27)
- MAGNETIC SHIELDS AVAILABLE
- ELECTROSTATIC SHIELDING CAN BE ADDED
- VARIATION OF STANDARD DESIGNS AVAILABLE
- PRIMARY AND SECONDARY WINDINGS CAN BE USED EITHER AS INPUT OR OUTPUT
- SPECIAL PRODUCTION TECHNIQUES ENSURE UNIFORM SIZE AND LEADS WHICH ARE FREE OF ENCAPSULANT. NO MENISCUS IN LEAD AREA.
- EVERY UNIT IN THIS CATALOG CAN BE MADE WITH A 300 THERMAL CYCLE GUARANTEE USING PICO'S SPECIAL SR CONSTRUCTION. CONTACT FACTORY FOR DETAILS

POWER TRANSFORMERS (FREQ. 380-1000 Hz)									
PICO PART NUMBER			PRIMARY VOLTAGE (VOLTS)	SECONDARY VOLTAGE (VOLTS)	SECONDARY CURRENT (MILLIAMPS)	PICO PRICES 1-9			
A Series	D Series	X Series				A	D	X	
A1705	D4605	X17050	28	6.3 6.3	30 30	9.97	10.47	7.37	
A1710	D4610	X17100	28	6.3	60	8.45	8.87	6.25	
A1715	D4615	X17150	*28	28	10	9.97	10.47	7.37	
A1720	D4620	X17200	*115	115	2	11.06	11.61	8.18	
A1725	D4625	X17250	115	57.5	4	11.06	11.61	8.18	
A1730	D4630	X17300	115	6.3	40	11.06	11.61	8.18	

Send for new 36 page Pico Catalog

(All PICO Products are patented)

Delivery—
stock to one week

For immediate engineering assistance or to place an order—Call Toll Free 800-431-1064

PICO Electronics, Inc.

50 South MacQuesten Pkwy. Mt. Vernon, New York 10551 • phone 914-699-5514

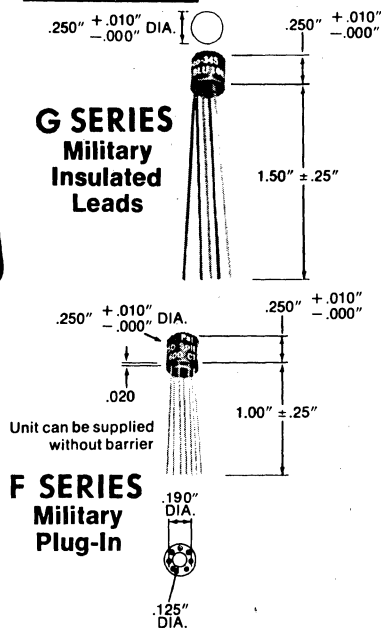
PICO's ultra-miniature AUDIO: transformers

1/4" x 1/4"

FEATURES

- EXTREME RESISTANCE TO THERMAL SHOCK
- ULTRA MINIATURE SIZE
- PICO IS APPROVED QPL SOURCE (MIL-T-27)
- MAGNETIC SHIELDS AVAILABLE
- ELECTROSTATIC SHIELDING CAN BE ADDED
- VARIATION OF STANDARD DESIGNS AVAILABLE
- SPECIAL PRODUCTION TECHNIQUES ENSURE UNIFORM SIZE AND LEADS WHICH ARE FREE OF ENCAPSULANT. NO MENISCUS IN LEAD AREA
- EVERY UNIT IN THIS CATALOG CAN BE MADE WITH A 300 THERMAL CYCLE GUARANTEE USING PICO'S SPECIAL SR CONSTRUCTION. CONTACT FACTORY FOR DETAILS.

TRANSFORMERS



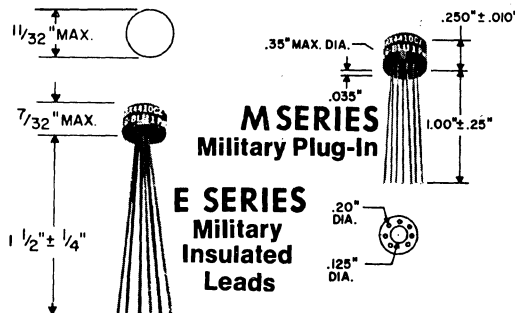
SPECIFICATIONS

- MIL-T-27:
All Units Are Designed to MIL-T-27 and Are Hermetically Sealed in a Metal Case. Transformers are Type TF5R21ZZ. Inductors are TF5R20ZZ.
- FREQUENCY RESPONSE:
±3 db, 400 Hz - 250 KHz At 1.0 milliwatt
- MAXIMUM DISTORTION:
5% With Rated Power Level at 1 KHz
- DIELECTRIC STRENGTH:
All Units Tested at 200 V RMS
- INSULATION RESISTANCE:
Greater than 10,000 Megohms at 300 V DC
- WEIGHT:
1.1 GRAMS
- OPERATING TEMPERATURE:
-55° c to 105° c (All Units Can Be Supplied to Class S Requirements 130° c maximum)
- TERMINALS:
Solid .012 Diameter Conductor. Conductor is Gold Plated, Nickel-Iron Core Wire (Dumet) in Accordance with MIL-STD-1276 Type D. Lead Spacing is 7 Leads 45° Apart on a .19" Diameter Circle.
- THERMAL SHOCK:
25 Cycles, Method 107C, MIL-STD-202D, Test Condition A-1

PICO's ultra-miniature PULSE transformers

FEATURES

- EXTREME RESISTANCE TO THERMAL SHOCK
- ULTRA MINIATURE SIZE
- BUILT TO MIL-T-21038
- MAGNETIC SHIELDS AVAILABLE
- ELECTROSTATIC SHIELDING CAN BE ADDED
- VARIATION OF STANDARD DESIGNS AVAILABLE
- SPECIAL PRODUCTION TECHNIQUES ENSURE UNIFORM SIZE AND LEADS WHICH ARE FREE OF ENCAPSULANT. NO MENISCUS IN LEAD AREA.
- EVERY UNIT IN THIS CATALOG CAN BE MADE WITH A 300 THERMAL CYCLE GUARANTEE USING PICO'S SPECIAL SR CONSTRUCTION. CONTACT FACTORY FOR DETAILS.



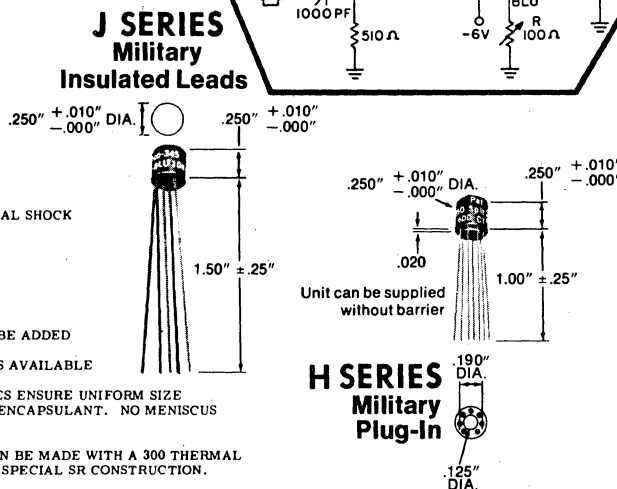
SPECIFICATIONS

- MIL-T-21038:
All Units are Designed to MIL-T-21038 and are Hermetically Sealed in a Metal Case
- DIELECTRIC STRENGTH:
All Units Tested at 200 V RMS
- INSULATION RESISTANCE:
Greater than 10,000 Megohms at 300 V DC
- WEIGHT:
1/20 Ounce
- OPERATING TEMPERATURE:
-55° c to 105° c (All Units Can Be Supplied to Class S Requirements 130° c maximum)
- TERMINALS:
Solid .012 Diameter Conductor. Conductor is Gold Plated, Nickel-Iron Core Wire (Dumet) in Accordance with MIL-STD-1276 Type D
- THERMAL SHOCK:
25 Cycles, Method 107C, MIL-STD-202D, Test Condition A-1

PICO's ultra-miniature PULSE transformers

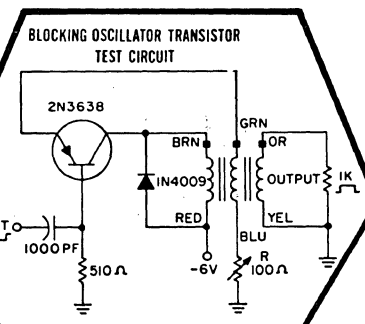
FEATURES

- EXTREME RESISTANCE TO THERMAL SHOCK
- ULTRA MINIATURE SIZE
- BUILT TO MIL-T-21038
- MAGNETIC SHIELDS AVAILABLE
- ELECTROSTATIC SHIELDING CAN BE ADDED
- VARIATION OF STANDARD DESIGNS AVAILABLE
- SPECIAL PRODUCTION TECHNIQUES ENSURE UNIFORM SIZE AND LEADS WHICH ARE FREE OF ENCAPSULANT. NO MENISCUS IN LEAD AREA.
- EVERY UNIT IN THIS CATALOG CAN BE MADE WITH A 300 THERMAL CYCLE GUARANTEE USING PICO'S SPECIAL SR CONSTRUCTION. CONTACT FACTORY FOR DETAILS



SPECIFICATIONS

- MIL-T-21038:
All Units Are Designed to MIL-T-21038 and Are Hermetically Sealed in a Metal Case
- DIELECTRIC STRENGTH:
All Units Tested at 200 V RMS
- INSULATION RESISTANCE:
Greater than 10,000 Megohms at 300 V DC
- WEIGHT:
1.1 GRAMS
- OPERATING TEMPERATURE:
-55° c to 105° c (All Units Can Be Supplied to Class S Requirements 130° c maximum)
- TERMINALS:
Solid .012 Diameter Conductor. Conductor is Gold Plated, Nickel-Iron Core Wire (Dumet) in Accordance with MIL-STD-1276 Type D. Lead Spacing is 7 Leads 45° Apart on a .19" Diameter Circle.
- THERMAL SHOCK:
25 Cycles, Method 107C, MIL-STD-202D, Test Condition A-1



For immediate engineering assistance or to place an order—Call Toll Free 800-431-1064

PICO Electronics, Inc.

50 South MacQuesten Pkwy. Mt. Vernon, New York 10551 • phone 914-699-5514

Delivery:
Stock to one week

TRANSFORMERS

PICO PART NUMBER		PRIMARY IMPEDANCE OHMS	SECONDARY IMPEDANCE OHMS	POWER MILLIWATTS at 1 KHz	PRIMARY UNBALANCED DC CURRENT ma	PRIMARY DC RESISTANCE OHMS	SECONDARY DC RESISTANCE OHMS	PICO PRICES 1-9 *	
F-Series	G-Series							F-Series	G-Series
F5705	G6005	50	50	100	5.0	7.5	9.0	\$ 9.90	\$ 9.43
F5710	G6010	100	100	100	5.0	15	18	9.90	9.43
F5715	G6015	120 ct	3.2	100	4.5	15	0.75	9.90	9.43
F5720	G6020	150 ct	12 split	100	4.0	20	2.4	10.75	10.24
F5725	G6025	300 ct	600 split	100	3.0	40	90	10.75	10.24
F5730	G6030	400 ct	400 split	100	2.5	54	58	11.53	10.98
F5735	G6035	500 ct	50 split	100	2.0	62	10	11.53	10.98
F5740	G6040	500	600	100	2.0	62	90	10.75	10.24
F5745	G6045	600 ct	600 split	100	2.0	70	90	11.53	10.98
F5750	G6050	900 ct	600	100	1.5	130	90	11.83	11.27
F5755	G6055	1K ct	1K split	100	1.5	110	140	11.83	11.27
F5760	G6060	1.5K ct	600 split	100	1.2	175	69	11.83	11.27
F5765	G6065	2K ct	8K split	80	1.0	200	1000	12.68	12.08
F5770	G6070	10K ct	500 split	80	0.5	1000	60	12.98	12.36
F5775	G6075	10K	500	80	0.5	1000	60	12.68	12.08
F5780	G6080	10K ct	1.2K split	80	0.5	1100	160	12.98	12.36
F5785	G6085	10K	1.2K	80	0.5	1100	130	12.68	12.08
F5790	G6090	10K ct	2K split	80	0.5	1100	250	12.98	12.36
F5795	G6095	10K ct	10K ct	80	0.5	1100	1100	11.83	11.27
F5800	G6100	10K	10K	80	0.5	1100	1100	11.53	10.98
F5805	G6105	10K ct	10K split	80	0.5	1100	1100	12.98	12.36
F5810	G6110	25K ct	1K split	50	0.3	2100	130	13.77	13.11
F5815	G6115	25K	1K	50	0.3	2100	130	12.98	12.36
F5820	G6120	30K ct	1.2K	50	0.3	2300	180	13.77	13.11

INDUCTORS

PICO PART NUMBER		INDUCTANCE HENRIES	DC CURRENT ma	DC RESISTANCE OHMS	PRICES 1-9 *	
F-Series	G-Series				F-Series	G-Series
F5825	G6125	SERIES PARALLEL	10.0 2.75 2.5 .65	0 2 0 4	2250	10.75
					560	10.24
F5830	G6130	SERIES PARALLEL	5.5 1.5 1.3 .40	0 2 0 4	1000	10.75
					250	10.24
F5835	G6135	SERIES PARALLEL	.85 .25 .21 .06	1 6 2 12	240	10.75
					60	10.24
F5840	G6140	SERIES PARALLEL	.6 .15 .15 .04	0 5 0 10	144	10.75
					36	10.24

* Discount Prices: 1-9 Net; 10-24 less 10%; 25-49 less 16%;
50-99 less 23%; 100-499 less 30%

Ordering Instructions: No minimum. Net 30 days
F.O.B. Mt. Vernon, New York. P.O. Box 1206

Send for new 36 page Pico Catalog

(All PICO Products are patented)

MILITARY DESIGNATION TP6RX4410CZ TURNS RATIO 4:4:1

PICO PART NUMBER		COUPLING CIRCUIT CHARACTERISTICS								BLOCKING OSCILLATOR CIRCUIT					D.C. RESISTANCE			PICO PRICES 1-9 *	
E-Series	M-Series	P. WIDTH μ SEC.	VOLT OUT	RISE TIME μ SEC.	% OVER SHOOT	DROOP %	% BACK SWING	IMP IN/OUT	FREQ RESP. WITHIN 2DB	P. WIDTH μ SEC.	RISE TIME μ SEC.	% OVER SHOOT	DROOP %	% BACK SWING	BRN RED	OR YEL	GRN BLU	E-Series	M-Series
E5020	M5300	0.05	10	0.018	0	0	10	50	150 KHz-30 MHz	0.05	0.02	0	0	35	0.21	0.23	0.13	6.68	7.40
E5040	M5305	0.1	10	0.02	0	0	5	50	100 KHz-17 MHz	0.1	0.025	0	0	25	0.47	0.56	0.17	6.68	7.40
E5060	M5310	0.2	8	0.035	0	0	5	100	16 KHz-10 MHz	0.2	0.030	0	0	15	1.0	1.25	0.37	6.68	7.40
E5080	M5315	0.5	8	0.06	0	0	0	100	7 KHz-3.3 MHz	0.5	0.05	0	0	15	1.5	1.80	0.54	6.68	7.40
E5100	M5320	1	8	0.15	0	0	5	100	7 KHz-2.3 MHz	1	0.08	0	0	15	2.5	3.1	0.9	6.68	7.40
E5120	M5325	2	8	0.17	0	0	10	100	2.2 KHz-1.3 MHz	2	0.10	0	0	15	3.0	3.7	1.1	6.68	7.40
E5140	M5330	3	8	0.20	0	0	10	100	1.7 KHz-1.5 MHz	3	0.20	0	0	15	4.9	6.0	1.8	6.68	7.40
E5160	M5335	5	8	0.20	0	15	25	200	1.8 KHz-1.5 MHz	5	0.30	0	0	3	8.0	9.7	2.9	6.68	7.40
E5180	M5340	10	8	0.4	0	15	20	200	1.5 KHz-1.2 MHz	10	0.35	0	5	10	13.0	15.8	4.7	6.68	7.40

MILITARY DESIGNATION TP6RX5310CZ TURNS RATIO 5:3:1

E5200	M5345	0.1	8	0.01	0	0	5	140/50	170 KHz-32 MHz	0.1	0.01	0	0	20	0.55	0.40	0.15	6.68	7.40
E5220	M5350	1	8	0.05	0	6	10	280/100	12.5 KHz-3.3 MHz	1	0.02	5	5	5	3.0	2.2	0.9	6.68	7.40
E5240	M5355	5	8	0.09	0	12	25	560/200	15 KHz-4 MHz	5	0.05	0	10	10	9.5	7.0	2.6	6.68	7.40

COUPLING CIRCUIT MEASUREMENTS MADE WITH BRN-RED AS INPUT AND YEL - OR AS OUTPUT, GRN-BLU WINDING IS OPEN: INPUT VOLTAGE = 1V.

MILITARY DESIGNATION TP1RX4410CZ TURNS RATIO 4:4:1

PICO PART NUMBER		COUPLING CIRCUIT CHARACTERISTICS							BLOCKING OSCILLATOR CIRCUIT					PICO PRICES 1-9 *	
H-Series	J-Series	P Width μSec	Volt Out	Rise Time	% Over Shoot	Droop %	% Back Swing	Imp* in/out,	P Width μSec	Rise Time	% Over Shoot	Droop %	% Back Swing	H-Series	J-Series
H5400	J5600	0.05	0.2	0.01	0	0	20	50	0.05	0.01	0	0	35	9.60	8.88
H5405	J5605	0.1	0.5	0.015	0	0	20	50	0.1	0.012	0	0	25	9.60	8.88
H5410	J5610	0.2	1.2	0.02	0	0	20	100	0.2	0.02	0	0	15	9.60	8.88
H5415	J5615	0.5	1.5	0.023	0	5	25	100	0.5	0.023	0	5	15	9.60	8.88
H5420	J5620	1	1.5	0.025	0	20	28	100	1	0.03	0	10	15	9.60	8.88
H5425	J5625	2	1.5	0.028	0	15	23	100	2	0.035	0	10	15	9.60	8.88
H5430	J5630	3	1.5	0.030	0	15	28	100	3	0.04	0	10	15	9.60	8.88
H5435	J5635	5	2	0.035	0	20	20	200	5	0.040	0	15	15	9.60	8.88
H5440	J5640	10	2	0.05	0	25	25	200	10	0.060	0	15	10	9.60	8.88
H5445	J5645	15	2	0.06	0	25	18	200	15	0.07	0	15	15	9.60	8.88
H5450	J5650	25	3	0.1	0	30	30	500	25	0.08	0	15	15	9.60	8.88
H5455	J5655	50	3	0.3	0	20	20	500	50	0.2	0	10	5	9.60	8.88
H5460	J5660	100	6	0.4	0	15	18	500	100	0.35	0	10	15	9.60	8.88

*COUPLING CIRCUIT MEASUREMENTS MADE WITH BRN-RD AS INPUT AND YEL-OR AS OUTPUT, GRN-BLU WINDING IS OPEN.

**Delivery—
stock to one week**

For immediate engineering assistance or to place an order—Call Toll Free 800-431-1064

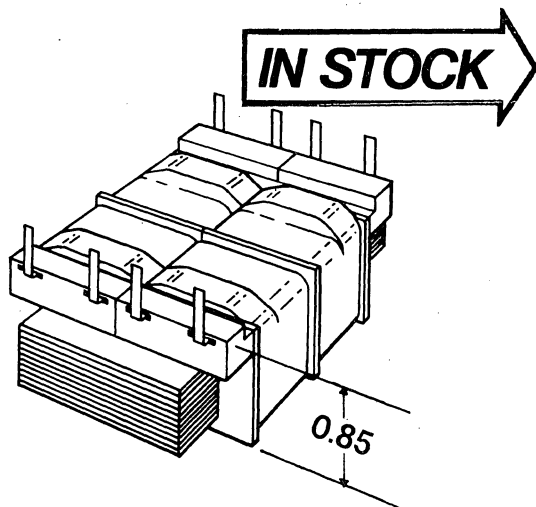
PICO Electronics, Inc.

50 South MacQuesten Pkwy. Mt. Vernon, New York 10551 • phone 914-699-5514

PROMEMCO, INC.

POWER TRANSFORMERS

- Low profile
- P.C. Mounting
- Multi-output
- Computer grade



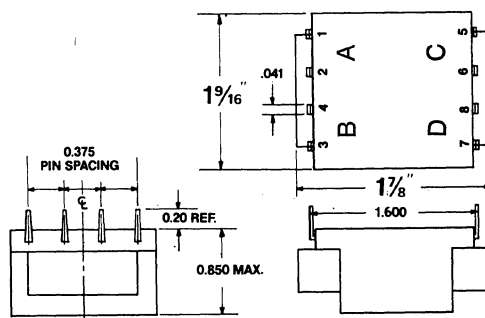
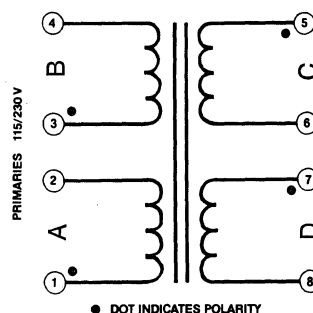
PART No.	SERIES OUTPUT (60 Hz)	PARALLEL OUTPUT (60 Hz)	1-4 PC PRICE
7-10	10 VCT-700 MA	5 V-1.4 A	\$7.50
7-12	12.6 VCT-550 MA	6.3 V-1.1 A	
7-16	16 VCT-400 MA	8 V-800 MA	
7-20	20 VCT-350 MA	10 V-700 MA	
7-24	24 VCT-290 MA	12 V-580 MA	
7-34	34 VCT-200 MA	17 V-400 MA	\$7.90
7-40	40 VCT-175 MA	20 V-350 MA	
7-56	56 VCT-120 MA	28 V-240 MA	
7-88	88 VCT- 75 MA	44 V-150 MA	
7-120	120 VCT- 55 MA	60 V-110 MA	
7-230	230 VCT- 30 MA	115 V- 60 MA	\$10.00
7-5/12	(1-2) 115 V Input (3-4) 15 V-100 MA (5-6) 6V-530 MA (7-8) 15V-100MA		

- 115/230 V INPUT ■ 50/60 HZ
- and 400 HZ OPERATION ■ 7 VA
- and 13 VA RATING ■ LOW
- RADIATED FIELD ■ COMPUTER
- GRADE CONSTRUCTION ■ 7 OZ.
- WEIGHT ■ 0.85 IN. MAX. HIGH
- 40° C TEMPERATURE RISE

These low profile printed circuit mounting, computer grade, power transformers are rated at 7VA (13VA at 400 HZ). Optimum power ratings for the low temperature rise are made possible by over-winding primaries and secondaries, and the use of high quality lamination steel.

The winding configuration minimizes radiated field effects and assures efficient coupling of primary to secondary. Isolated secondaries allow for positive regulators to be employed.

Special designs are available on request. Customization of input/output ratios, operating frequency and operating temperature classification is possible. The unique bobbin design permits the addition of winding taps (up to 4) and electrostatic shielding when required.

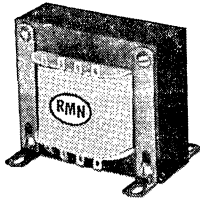
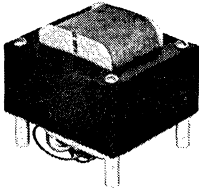


PROMEMCO, INC.

181 BRIDGE ROAD / HAUPPAUGE / NEW YORK 11787 / 516 582-9388

CUSTOM DESIGN

... At Off-the-Shelf Prices!



**PRINTED
CIRCUIT
TYPE**

TRANSFORMERS

COILS AND FILTER CHOKES

BUILT THE WAY YOU WANT THEM - WITH TYPICAL 2-3 WEEK DELIVERY

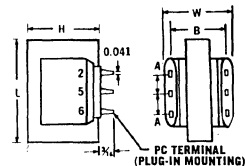
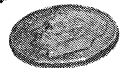
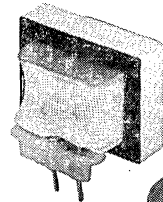
115/230 VAC
50 - 400 Hz.
Power to 450 Watts
100% Tested

PRIMARY — Dual or Single
SECONDARY — Dual or Single
OUTPUT — A Wide Variety
FRAMES — With or Without

Personal
DESIGN ASSISTANCE
From Prototype
To Production

TYPICAL P-C MODELS

SECONDARY VOLTS	PART NUMBER	SECONDARY Ma		DIMENSIONS				
		Series	Parallel	L	W	H	A	B
10 V.C.T. or 5 V SERIES 10 V.C.T. PARALLEL 5 V @ 2 X	AD-10-120	120	240	1-3/8	1-1/8	1-3/16	.312	1.00
	AD-10-440	440	880	1-5/8	1-1/4	1-3/8	.400	1.10
	AD-10-1,000	1,000	2,000	1-7/8	1-7/16	1-5/8	.400	1.30
20 V.C.T. or 10 V SERIES 20 V.C.T. PARALLEL 10 V @ 2 X CURRENT	AD-20-60	60	120	1-3/8	1-1/8	1-3/16	.312	1.00
	AD-20-220	220	440	1-5/8	1-1/4	1-3/8	.400	1.10
	AD-20-500	500	1,000	1-7/8	1-7/16	1-5/8	.400	1.30
24 V.C.T. or 12 V SERIES 24 V.C.T. PARALLEL 12 V @ 2 X CURRENT	AD-24-50	50	100	1-3/8	1-1/8	1-3/16	.312	1.00
	AD-24-180	180	360	1-5/8	1-1/4	1-3/8	.400	1.10
	AD-24-450	450	900	1-7/8	1-7/16	1-5/8	.400	1.30
34 V.C.T. or 17 V SERIES 34 V.C.T. PARALLEL 17 V @ 2 X CURRENT	AD-34-35	35	70	1-3/8	1-1/8	1-3/16	.312	1.00
	AD-34-125	125	250	1-5/8	1-1/4	1-3/8	.400	1.10
	AD-34-300	300	600	1-7/8	1-7/16	1-5/8	.400	1.30
40 V.C.T. or 20 V SERIES 40 V.C.T. PARALLEL 20 V @ 2 X CURRENT	AD-40-30	30	60	1-3/8	1-1/8	1-3/16	.312	1.00
	AD-40-110	110	220	1-5/8	1-1/4	1-3/8	.400	1.10
	AD-40-250	250	500	1-7/8	1-7/16	1-5/8	.400	1.30
88 V.C.T. or 44 V SERIES 88 V.C.T. PARALLEL 44 V @ 2 X CURRENT	AD-88-15	15	30	1-3/8	1-1/8	1-3/16	.312	1.00
	AD-88-50	50	100	1-5/8	1-1/4	1-3/8	.400	1.10
	AD-88-120	120	240	1-7/8	1-7/16	1-5/8	.400	1.30
120 V.C.T. or 60 V SERIES 120 V.C.T. PARALLEL 60 V @ 2 X CURRENT	AD-120-10	10	20	1-3/8	1-1/8	1-3/16	.312	1.00
	AD-120-35	35	70	1-5/8	1-1/4	1-3/8	.400	1.10
	AD-120-85	85	170	1-7/8	1-7/16	1-5/8	.400	1.30



RoMarNetics Inc.

18728 BRYANT ST.
NORTHRIDGE, CALIF. 91324

(213) 886-1812

POWERSTAT® Variable Transformers

New epoxy-coated POWERKOTE Coils make the POWERSTAT line the most outstanding value in variable transformers today. *Without increase in price, size or weight*, only POWERSTAT Variable Transformers give an average of 20% higher current ratings, 10:1 greater overload capability, longer life, greater resistance to fungus, salt spray and other contaminating atmospheres. POWERKOTE Coil commutator bars are embedded in place preventing steady-state operating temperature and severe overloads from distorting the commutator.

POWERSTAT Variable Transformers are designed to deliver continuously adjustable voltage from a-c power lines. They introduce no waveform distortion and feature rugged construction, precious metal plated commutators, excellent regulation, high efficiency and conservative ratings. All manually operated types listed in the charts except the 10B-12, EN116B-EN216B and EN117B-EN217B Series are available with motor drives if desired. Motor-driven speeds are 5, 15, 30 or 60 seconds for full range travel on all except types having -4, -5, or -6 suffixes which do not offer the 5-second speed. Single types in the 116B-216B, 117B-217B, 126-226 and 136B-236B Series are also offered with 2- or 3-wire cord-plug sets. 1156D-1256D Series types are available in ratings to 244 kva.



ADJUSTABLE SPEED DRIVES

All motor-driven units in the 116B-216B, 117B-217B, 126-226, 136B-236B and 146-246 Series are available with adjustable speed

drives which permit the output voltage of the transformer to be controlled over the full range of zero to maximum output voltage at speeds ranging from 5 seconds to 200 seconds. All control circuitry is solid-state and adaptable for present speed systems. The Adjustable Speed Control Potentiometer BHP65455-G1 can be remotely located from the variable transformer.

RATINGS AND SPECIFICATIONS

INPUT		OUTPUT					TYPE	Ship. Wt. Lbs.
Volts	Cycles	Volts	Const. Current Load		Const. Impedance Load			
			Max. Amp.	Max. KVA	Max. Amp.	Max. KVA		
10B-12 SERIES								
Single Phase								
120	50/60	0-120	2.25*	0.27	3†	0.36	10B	2½
120	60	0-132	2.25*	0.30	—	—		
240	50/60	0-240	0.7*	0.17	0.9†	0.22	12	2½
240	50/60	0-264	0.5**	0.13	—	—		
240	50/60	0-240	2.25*	0.54	3†	0.72	10B-2	6
240	60	0-264	2.25*	0.59	—	—		
480	50/60	0-480	0.7*	0.34	0.9†	0.43	12-2	6
480	50/60	0-528	0.5**	0.26	—	—		
Three Phase								
120	50/60	0-120	2.25*	0.47	3†	0.62	10B-2	6
120	60	0-132	2.25*	0.51	—	—		
240	50/60	0-240	0.7*	0.29	0.9†	0.37	12-2	6
240	50/60	0-264	0.5**	0.23	—	—		
240	60	0-240	2.25*	0.94	3†	1.2	10B-3	8½
480	50/60	0-480	0.7*	0.58	0.9†	0.75	12-3	8½
480	60	0-528	0.5**	0.46	—	—		
21-22 SERIES								
Single Phase								
120	50/60	0-120	4.5	0.54	6.5	0.78	21	6
120	50/60	0-140	4.5	0.63	—	—		
240	50/60	0-240	2.25	0.54	3.25	0.78	22	6
240	50/60	0-280	2.25	0.63	—	—		
240	50/60	0-240	4.5	1.1	6.5	1.6	21-2	13½
240	50/60	0-280	4.5	1.3	—	—		
480	50/60	0-480	2.25	1.1	3.25	1.6	22-2	13½
480	50/60	0-560	2.25	1.3	—	—		
Three Phase								
120	50/60	0-120	4.5	0.94	6.5	1.4	21-2	13½
120	50/60	0-140	4.5	1.1	—	—		
240	50/60	0-240	2.25	0.94	3.25	1.4	22-2	13½
240	50/60	0-280	2.25	1.1	—	—		
240	50/60	0-240	4.5	1.9	6.5	2.7	21-3	19
240	60	0-280	4.5	2.2	—	—		
480	50/60	0-480	2.25	1.9	3.25	2.7	22-3	19
480	60	0-560	2.25	2.2	—	—		

*Rating when mounted on metal panel. On bracket or nonmetallic panel, derate 10B Series to 1.75 amp., 12 Series to 0.5 amp.

†Rating when mounted on metal panel. On bracket or nonmetallic panel, derate 10B Series to 2.5 amp., 12 Series to 0.75 amp.

**0.7 amp. maximum in range from 0 to line voltage when mounted on metal panel.



THE

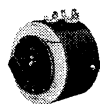
SUPERIOR ELECTRIC
COMPANY

1000 MIDDLE STREET, BRISTOL, CONN. 06010
PHONE: (203) 582-9561

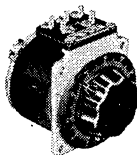
INPUT			OUTPUT				TYPE	Ship. Wt. Lbs.
Volts	Cycles	Volts	Const. Current Load		Const. Impedance Load			
			Max. Amp.	Max. KVA	Max. Amp.	Max. KVA		
116B-216B and 117B-217B SERIES†								
Single Phase								
120	50/60	0-120	10	1.2	13	1.6	116B	12
120	50/60	0-140	10	1.4	—	—		117B†
120	60	0-120	12	1.4	15	1.8	117B†	12
240	50/60	0-240	3.5	0.84	5	1.2	216B	12
240	50/60	0-280	3.5	0.98	—	—		
240	60	0-240	5	1.2	7	1.7	217B†	12
240	50/60	0-240	10	2.4	13	3.1	116B†-2	24
240	50/60	0-280	10	2.8	—	—		
240	60	0-240	12	2.9	15	3.6	117B†-2	24
480	50/60	0-480	3.5	1.7	5	2.4	216B†-2	24
480	50/60	0-560	3.5	2.0	—	—		
480	60	0-480	5	2.4	7	3.4	217B†-2	24
Three Phase								
120	50/60	0-120	10	2.1	13	2.7	116B†-2	24
120	50/60	0-140	10	2.4	—	—		
120	60	0-120	12	2.5	15	3.1	117B†-2	24
240	50/60	0-240	3.5	1.5	5	2.1	216B†-2	24
240	50/60	0-280	3.5	1.7	—	—		
240	60	0-240	5	2.1	7	2.9	217B†-2	24
240	50/60	0-240	10	4.2	13	5.4	116B†-3	36
240	60	0-280	10	4.8	—	—		
240	60	0-240	12	5.0	15	6.2	117B†-3	36
480	50/60	0-480	3.5	2.9	5	4.2	216B†-3	36
480	60	0-560	3.5	3.4	—	—		
480	60	0-480	5	4.2	7	5.8	217B†-3	36
EN116B-EN216B and EN117B-EN217B SERIES								
Single Phase								
120	50/60	0-120	8	0.96	13	1.6	EN116B	15
120	50/60	0-140	8	1.1	—	—		
120	60	0-120	10	1.2	14.5	1.7	EN117B	15
240	50/60	0-240	3	0.72	4.5	1.1	EN216B	15
240	50/60	0-280	3	0.84	—	—		
240	60	0-240	4.4	1.1	5.8	1.4	EN217B	15
240	50/60	0-240	8	1.9	13	3.1	EN116B-2	28
240	50/60	0-280	8	2.2	—	—		
240	60	0-240	10	2.4	14.5	3.5	EN117B-2	28
480	50/60	0-480	3	1.4	4.5	2.2	EN216B-2	28
480	50/60	0-560	3	1.7	—	—		
480	60	0-480	4.4	2.1	5.8	2.8	EN217B-2	28
Three Phase								
120	50/60	0-120	8	1.7	13	2.7	EN116B-2	28
120	50/60	0-140	8	1.9	—	—		
120	60	0-120	10	2.1	14.5	3.0	EN117B-2	28
240	50/60	0-240	3	1.2	4.5	1.9	EN216B-2	28
240	50/60	0-280	3	1.5	—	—		
240	60	0-240	4.4	1.8	5.8	2.4	EN217B-2	28
240	50/60	0-240	8	3.3	13	5.4	EN116B-3	39
240	60	0-280	8	3.9	—	—		
240	60	0-240	10	4.2	14.5	6.0	EN117B-3	39
480	50/60	0-480	3	2.5	4.5	3.7	EN216B-3	39
480	60	0-560	3	2.9	—	—		
480	60	0-480	4.4	3.7	5.8	4.8	EN217B-3	39

†Also available with open construction. Suffix U when ordering.

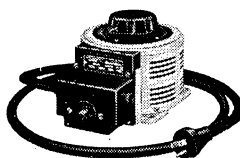
with **POWERKOTE® COILS**



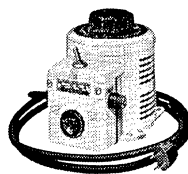
TYPE 10B



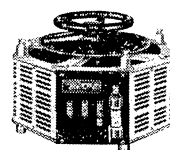
TYPE 21



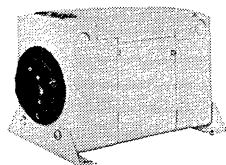
TYPE 3PN126



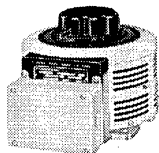
TYPE 116B



TYPE 1156D

TYPE
15MD136BT-2

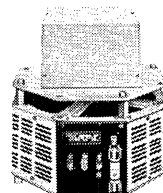
TYPE EN216B-2



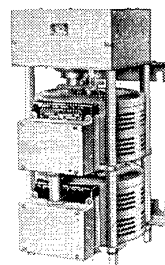
TYPE 136BT



TYPE 146



TYPE 5MB1156D



INPUT		OUTPUT						TYPE	Ship. Wt. Lbs.
Volts	Cycles	Volts	Const. Current Load		Const. Impedance Load				
			Max. Amp.	Max. KVA	Max. Amp.	Max. KVA			
126-226 SERIES†									
Single Phase									
120	50/60	0-120	15	1.8	20	2.4	126	17	
120	50/60	0-140	15	2.1	—	—			
240	50/60	0-240	7.5	1.8	10	2.4			
240	50/60	0-280	7.5	2.1	—	—	226	17	
240	50/60	0-240	15	3.6	20	4.8	126-2	32	
240	50/60	0-280	15	4.2	—	—			
480	50/60	0-480	7.5	3.6	10	4.8			
480	50/60	0-560	7.5	4.2	—	—	226-2	32	
Three Phase									
120	50/60	0-120	15	3.1	20	4.2	126-2	32	
120	50/60	0-140	15	3.6	—	—			
240	50/60	0-240	7.5	3.1	10	4.2			
240	50/60	0-280	7.5	3.6	—	—	226-2	32	
240	50/60	0-240	15	6.2	20	8.3	126-3	49	
240	60	0-280	15	7.3	—	—			
480	50/60	0-480	7.5	6.2	10	8.3			
480	60	0-560	7.5	7.3	—	—	226-3	49	
136B-236B SERIES†									
Single Phase									
120	50/60	0-120	22	2.6	28	3.4	136B	25	
120	50/60	0-140	22	3.1	—	—			
120	50/60	0-120	44	5.3	56	6.7			
120	50/60	0-140	44	6.2	—	—	136B-2 ^{1/2}	52	
240	50/60	0-240	10	2.4	13	3.1	236B	25	
240	50/60	0-280	10	2.8	—	—			
240	50/60	0-240	22	5.3	28	6.7			
240	50/60	0-280	22	6.2	—	—	136B-2	52	
480	50/60	0-480	10	4.8	26	6.2	236B-2	52	
480	50/60	0-560	10	5.6	—	—			
Three Phase									
120	50/60	0-120	22	4.6	28	5.8	136B-2	52	
120	50/60	0-140	22	5.3	—	—			
240	50/60	0-240	10	4.2	13	5.4			
240	50/60	0-280	10	4.8	—	—	236B-2	52	
240	50/60	0-240	22	9.1	28	11.6	136B-3	76	
240	60	0-280	22	10.7	—	—			
480	50/60	0-480	10	8.3	13	10.8			
480	60	0-560	10	9.7	—	—	236B-3	76	
146-246 SERIES†									
Single Phase									
120	50/60	0-120	30	3.6	35	4.2	146	38	
120	50/60	0-140	30	4.2	—	—			
120	50/60	0-120	60	7.2	70	8.4			
120	50/60	0-140	60	8.4	—	—	146-2 ^{1/2}	83	
240	50/60	0-240	15	3.6	19	4.6	246	38	
240	50/60	0-280	15	4.2	—	—			
240	50/60	0-240	30	7.2	35	8.4			
240	50/60	0-280	30	8.4	—	—	146-2	83	
480	50/60	0-480	15	7.2	19	9.1	246-2	83	
480	50/60	0-560	15	8.4	—	—			

†Also available with open construction. Suffix U when ordering.

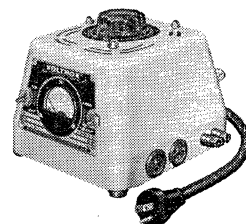
‡Requires also one paralleling choke type T5000B.

§Requires also one paralleling choke type T6053.

INPUT			OUTPUT						TYPE	Ship. Wt. Lbs.
Volts	Cycles	Volts	Const. Current Load		Const. Impedance Load					
			Max. Amps.	Max. KVA	Max. Amps.	Max. KVA				
146-246 SERIES† (contd.)										
Three Phase										
120	50/60	0-120	30	6.2	35	7.3		146-2	83	
120	50/60	0-140	30	7.3	—	—				
240	50/60	0-240	15	6.2	19	7.9		246-2	83	
240	50/60	0-280	15	7.3	—	—				
240	50/60	0-240	30	12.5	35	14.5		146-3	125	
240	60	0-280	30	14.5	—	—				
480	50/60	0-480	15	12.5	19	15.8		246-3	125	
480	60	0-560	15	14.5	—	—				
1156D-1256D SERIES†										
Single Phase										
120	50/60	0-120	50	6.0	55	6.6		1156D	82	
120	50/60	0-140	50	7.0	—	—				
120	50/60	0-120	100	12.0	110	13.2		1156D-2P	169	
120	50/60	0-140	100	14.0	—	—				
120	50/60	0-120	150	18.0	165	19.8		1156D-3P	272	
120	50/60	0-140	150	21.0	—	—				
240	50/60	0-240	28	6.7	28	6.7		1256D	82	
240	50/60	0-280	28	7.8	—	—				
240	50/60	0-240	50	12.0	55	13.2		1156D-2S	156	
240	50/60	0-280	50	14.0	—	—				
240	50/60	0-240	56	13.4	56	13.4		1256D-2P	169	
240	50/60	0-280	56	15.7	—	—				
240	50/60	0-240	84	20.2	84	20.2		1256D-3P	272	
240	50/60	0-280	84	23.5	—	—				
240	50/60	0-240	100	24.0	110	26.4		1156D-4PS	361	
240	50/60	0-280	100	28.0	—	—				
480	50/60	0-480	28	13.4	28	13.4		1256D-2S	156	
480	50/60	0-560	28	15.7	—	—				
480	50/60	0-480	56	26.9	56	26.9		1256D-4PS	361	
480	50/60	0-560	56	31.4	—	—				
Three Phase										
120	50/60	0-120	50	10.4	55	11.4		1156D-20	155	
120	50/60	0-140	50	12.1	—	—				
240	50/60	0-240	28	11.6	28	11.6		1256D-20	155	
240	50/60	0-280	28	13.6	—	—				
240	50/60	0-240	50	20.8	55	22.9		1156D-3Y	230	
240	60	0-280	50	24.2	—	—				
240	50/60	0-240	100	41.6	110	45.7		1156D-6Y	507	
240	50/60	0-280	100	48.5	—	—				
480	50/60	0-480	28	23.3	28	23.3		1256D-3Y	235	
480	60	0-560	28	27.2	—	—				
480	50/60	0-480	56	46.6	56	46.6		1256D-6Y	507	
480	60	0-560	56	54.3	—	—				

VOLTBOX® A-C POWER SUPPLY

Contains POWERSTAT Variable Transformer, voltmeter, three output receptacles, two 5-WAY Binding Posts, "on-off" switch, line-load meter switch, fuse and six-foot cord-plug. Type UC1MB ratings are 120 volt, single phase 50/60 hertz input and 0-140 volt 10 ampere, 1.4 kva output.



TRANSFORMERS

POWERSTAT® Variable Transformers

WITH POWERKOTE® COILS

40-VOLT SERIES

Meet high current, low voltage requirements of low voltage power supplies and a wide range of transistor circuit applications. Manually-operated and motor-driven single, 2- and 3-gang single phase types available.



TYPE 10B-40



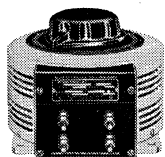
TYPE 21-40

40-VOLT SERIES

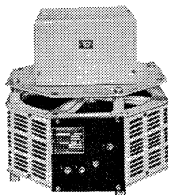
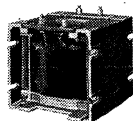
INPUT		OUTPUT				TYPE	Ship. Wt. Lbs.	
Volts	Hertz	Volts	Const. Current Load		Const. Impedance Load			
			Max. Amps.	Max. KVA	Max. Amps.			Max. KVA
Single Phase								
40	60	0-40	7	0.28	9	0.36	10B-40	3 1/2
			18	0.72	22	0.88	21-40	6
			25	1.0	30	1.2	116BU-40	11

LINE CORRECTORS

Used to correct line voltage variations to maintain a constant output voltage or to supply a limited range of output voltage from a stable a-c source. Manually operated and motor-driven types available.



TYPE LC2106D



TYPE 5MBLC2115E

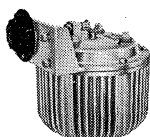
LINE CORRECTOR SERIES

INPUT		OUTPUT		TYPE	Ship. Wt. Lbs.
Volts	Hertz	Volts	Max. Amps.	Max. KVA	
Used as Line Correctors — SINGLE PHASE					
95-135	50/60	115	52	6.0	LC2106D 80
95-135	50/60	115	130	15.0	LC2115E 200
195-255	50/60	230	32.5	7.5	LC2207D 85
205-250	50/60	230	120	27.5	LC2228E 205
400-520	50/60	460	40	18.4	LC2418E 205
Used as Line Correctors — THREE PHASE					
195-255	50/60	230	50	20.0	LC3220D 241
195-255	50/60	230	113	45.0	LC3245E 615
195-255	50/60	230	175	70.0	LC3270D 795
400-520	50/60	460	33	26.3	LC3425D 230
400-520	50/60	460	100	79.7	LC3475E 630
420-500	50/60	460	131	104	LC34100E 630

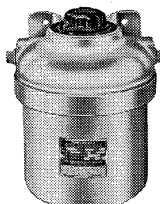
When units of the LC series are used as limited range adjustable transformers, the input voltage is the output voltage shown in the above chart and the output voltage is the input voltage shown in the above chart.

OIL-COOLED AND EXPLOSION-PROOF

Oil-cooled units substantially increase ratings above equivalent air-cooled types and provide a measure of safety. Explosion-proof models are Underwriters' Laboratories listed for Class 1, Group D service. Both are manually operated only.



OIL-COOLED
TYPE O-116B



EXPLOSION-PROOF
TYPE X-116

OIL-COOLED

INPUT		OUTPUT		TYPE††	Ship. Wt. Lbs.
Volts	Hertz	Volts	Max. Amps.	Max. KVA	
120	50/60	0-120	15	1.8	O-116B 32
120	50/60	0-140	15	2.1	O-116B 32
120	50/60	0-140	30	4.2	O-1126 100
240	50/60	0-240	6	1.4	O-216B 32
240	50/60	0-280	6	1.7	O-216B 32
240	50/60	0-280	18	5.0	O-1226 105

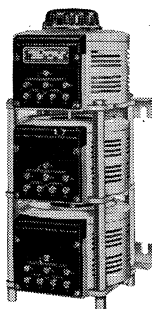
†† Other types available on special order.

EXPLOSION-PROOF

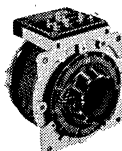
120	50/60	0-120	7.5	0.90	X-116	47
120	50/60	0-140	7.5	1.0	X-116	47
120	50/60	0-140	12	1.7	X-1126	142
240	50/60	0-240	3	0.72	X-216	47
240	50/60	0-280	3	0.84	X-216	47
240	50/60	0-280	6	1.7	X-1226	142

LW136B SERIES

Have three windings. Connections can be made for operation as a source of adjustable low output voltage, a line voltage corrector or a limited range variable transformer. Manually operated and motor-driven, open and enclosed construction types available. Full connections and ratings on request.



TYPE LW136B-3



TYPE LW136BU

LW136B SERIES

INPUT		OUTPUT††		TYPE	Ship. Wt. Lbs.
Volts	Hertz	Volts	Max. Amps.	Max. KVA	
Single Phase					
120/240	50/60	15-0.15	35	0.52	LW136B 25
120/240/480	50/60	30-0.30	35	1.0	LW136B-2 52
120/240	50/60	45-0.45	35	1.6	LW136B-3 76
120/240	50/60	0-30	25	0.75	LW136B 25
120/240/480	50/60	0-60	25	1.5	LW136B-2 52
120/240	50/60	0-90	25	2.2	LW136B-3 76
Three Phase					
120/240	50/60	0-30	25	1.3	LW136B-2 52
120/240	50/60	0-30	43.3	2.2	LW136B-3 76
120/240	50/60	0-52	25	2.2	LW136B-3 76
240/480	60	0-35	43.3	2.6	LW136B-3 76
240/480	60	0-60	25	2.6	LW136B-3 76

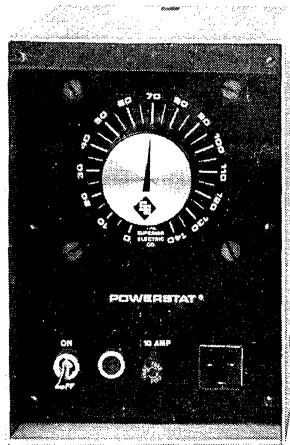
†† LW136B Series ratings are for use as low voltage isolated output transformer.



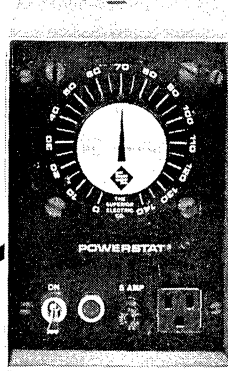
THE SUPERIOR ELECTRIC COMPANY
1000 MIDDLE STREET • BRISTOL, CONN. 06010 • PHONE: (203) 582-9561

TOTALLY ENCLOSED L SERIES POWERSTAT® Variable Transformers

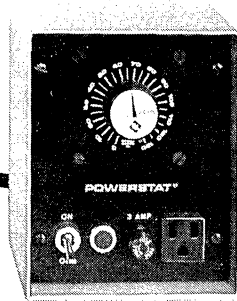
TYPE L116B



TYPE L21



TYPE L10B



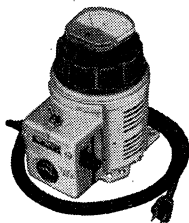
Designed to meet OSHA requirements. For maximum protection and safety, all models are equipped with a grounded NEMA cord-plug assembly, on-off switch, pilot light, grounded output receptacle and fuse. Type L116B has an integrally designed nonprojecting handle. Controls

on the panel are recessed for protection from accidental bumping. All models have slots at the rear to accept wall hanger brackets. They may be hung anywhere and easily removed for use in another location. Type L21 and L116B have POWERKOTE coils.

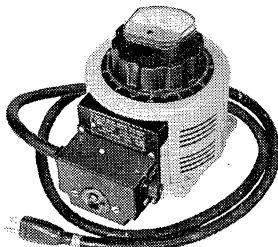
INPUT		OUTPUT			TYPE
VOLTS	HERTZ	VOLTS	CONSTANT CURRENT LOAD		
			MAX. AMP.	MAX. KVA	
120	60	0-132	1.75	0.23	L10B
120	50/60	0-140	4.5	0.63	L21
120	50/60	0-140	10	1.4	L116B

STATIONARY METERED KNOB POWERSTAT® Variable Transformers

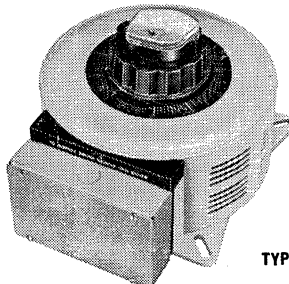
- FOR BACK-OF-PANEL OR GENERAL UTILITY MOUNTING
- ACCURATE VOLTMETER REMAINS STATIONARY INSIDE KNOB RIM. . . DOES NOT TURN WITH THE KNOB
- AVAILABLE IN TYPES TO 4 KVA
- MAXIMUM APPLICATION FLEXIBILITY
- SAVES PANEL SPACE, WIRING AND INSTALLATION COSTS



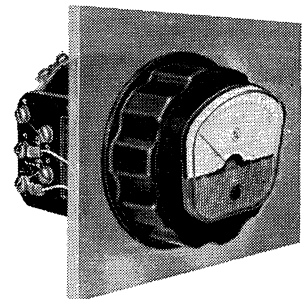
TYPE VS116B



TYPE VS3PN126



TYPE VS146T



TYPE VS150

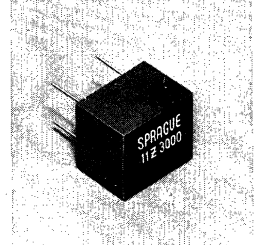
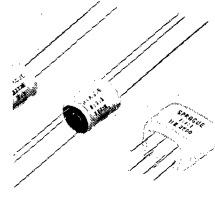
GENERAL UTILITY MOUNTING – Single units (those listed in charts without -2 or -3 suffixes) in the 116B-216B, 117B-217B, 126-226, 136B-236B and 146-246 series are also available with knobs incorporating direct-reading voltmeters. Voltmeters remain stationary as the knob rim is turned, have an accuracy of $\pm 3\%$ of full scale and are insensitive to stray magnetic fields. When ordering, add VS prefix to the type number given in the charts.

BACK-OF-PANEL MOUNTING – Standard cataloged POWERSTAT Variable Transformers in the 21-22 through the 146-246 series designed or adaptable for back-of-panel mounting can be combined with Metered Knob Assemblies. Models for 120 volt service require Metered Knob Assembly VS150 having a 0-150 volt scale and units for 240 volt use require Metered Knob Assembly VS300 having a 0-300 volt scale. Existing models can be retrofitted also.

SPRAGUE PULSE TRANSFORMERS

TYPE 11Z TRIGATE® PULSE TRANSFORMERS

- Specifically designed for commercial and industrial SCR triggering applications where low cost and excellent performance are required.
- Single-ended pulse transformers are designed with leads especially intended for mounting on printed wiring boards; these units are self supporting.
- Balanced pulse characteristics and energy transfer between windings.
- Minimum saturation effect to allow operation where increased pulse widths are required.
- Fast pulse rise time and increased current capability to prevent SCR di/dt failure.
- Operating temperature range of -10 C to +70 C.
- For complete technical data, see latest issue of Sprague Engineering Bulletin 40,003.



UNIT 1 UNIT 2

UNIT 3

Turns Ratio	Catalog Number	Size	Min. Lp (μH)	Max. Ll (μH)	Max. Cc (pF)	Max. DCR (Ω)	60 Cycle Dielectric Test (Volts RMS)	Max. 60 Cy A-C Line Voltage (Volts RMS)
-------------	----------------	------	--------------	--------------	--------------	--------------	--------------------------------------	---

FLEXIBLE LEAD DESIGN (Unit 1 in photo)

1:1	11Z12	.593" D. x .828" L.	200	3	800	1.5-1.5	1600	240
1:1:1	11Z13	.593" D. x .828" L.	200	3	800	2-2-2	1600	240
2:1	11Z14	.593" D. x .828" L.	1000	10	1300	10-2	1600	240
2:1:1	11Z15	.593" D. x .828" L.	1000	15	1300	10-2-2	1600	240
5:1	11Z16	.593" D. x .828" L.	5000	1500	400	19-3	1600	240

PLUG-IN DESIGN with THERMOPLASTIC SHEATH (Unit 2 in photo)

1:1	11Z2000	.775" W. x .968" L. x .800" H.	200	3.0	800	1.5-1.5	1600	240
1:1	11Z2001	.775" W. x .968" L. x .800" H.	1000	12.0	2000	8-8	1600	240
2:1	11Z2003	.775" W. x .968" L. x .800" H.	1000	10.0	1300	10-2	1600	240
5:1	11Z2004	.775" W. x .968" L. x .800" H.	5000	1500	400	19-3	1600	240
1:1:1	11Z2100	.775" W. x .968" L. x .800" H.	200	3.0	800	2-2-2	1600	240
1:1:1	11Z2101	.775" W. x .968" L. x .800" H.	1000	12.0	2000	10-10-10	1600	240
2:1:1	11Z2103	.775" W. x .968" L. x .800" H.	1000	15.0	1300	10-2-2	1600	240
5:1:1	11Z2104	.775" W. x .968" L. x .800" H.	5000	1500	400	20-4-4	1600	240

PLUG-IN DESIGN with PRE-MOLDED CASE (Unit 3 in photo)

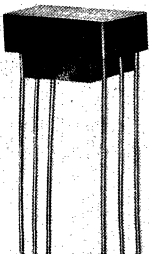
1:1	11Z3000	.775" W. x .950" L. x .750" H.	200	3.0	800	1.5-1.5	1600	240
1:1	11Z3001	.775" W. x .950" L. x .750" H.	1000	12.0	2000	8-8	1600	240
1:1	11Z3002	.775" W. x .950" L. x .750" H.	5000	15.0	3500	18-18	1600	240
2:1	11Z3003	.775" W. x .950" L. x .750" H.	1000	10.0	1300	10-2	1600	240
5:1	11Z3004	.775" W. x .950" L. x .750" H.	5000	1500	400	19-3	1600	240
1:1:1	11Z3100	.775" W. x .950" L. x .750" H.	200	3.0	800	2-2-2	1600	240
1:1:1	11Z3101	.775" W. x .950" L. x .750" H.	1000	12.0	2000	10-10-10	1600	240
1:1:1	11Z3102	.775" W. x .950" L. x .750" H.	5000	15.0	3500	27-27-27	1600	240
2:1:1	11Z3103	.775" W. x .950" L. x .750" H.	1000	15.0	1300	10-2-2	1600	240
5:1:1	11Z3104	.775" W. x .950" L. x .750" H.	5000	1500	400	20-4-4	1600	240

TYPE 66Z SCR TRIGGER TRANSFORMERS

- Pre-molded construction permits slightly lower cost than fully-molded units without sacrifice in humidity resistance.
- Small size for use on pc boards and in encapsulated

modular packages. Case measures .400" W. x .785" L. x .312" H.

- For complete technical data, refer to latest issue of Sprague Engineering Bulletin 40,004.



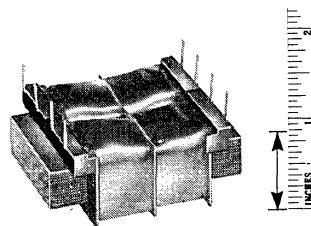
Turns Ratio	Catalog Number	Min. Lp (μH)	Max. Ll (μH)	Max. Cc (pF)	Typ. Vμsec Output Winding	60 Cycle Dielectric Test (Volts RMS)	Max. 60 Cy A-C Line Voltage
1:1:1	66Z900	700	300	25	60	1000	240
1:1:1	66Z903	700	300	25	60	2200	550
1:1:1	66Z930	4800	25	50	110	1000	240
1:1:1	66Z932	4800	25	50	110	2200	550

FROM STOCK

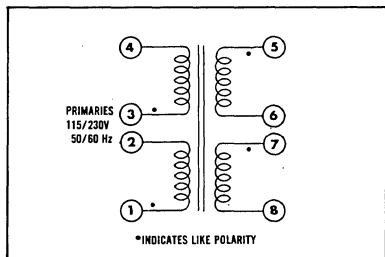
flat plug-in power transformers

FOR PRINTED CIRCUIT APPLICATIONS

ALLOW **ONE INCH** CARD SPACING



MAXIMUM HEIGHT OF 0.850 INCHES — Allows stacking with 1 inch space between PC cards.
6 VA @ 50/60 HZ — in 0.850 inch height, 7 oz. weight - 40°C max. temperature rise.
HUM-BUCKING CONSTRUCTION — Reduced magnetic field - balanced windings.
DUAL PRIMARIES — 115/230 V - 50/60 HZ



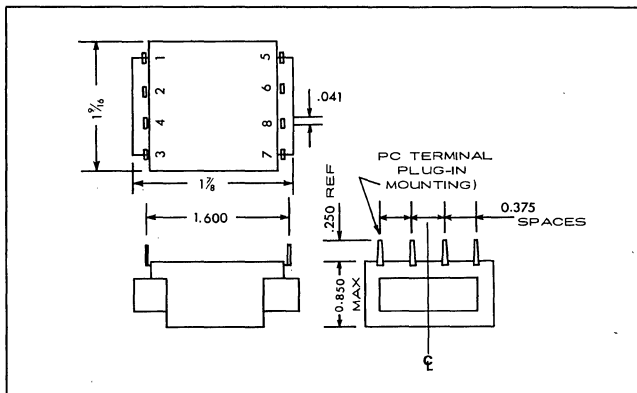
PART NUMBER	SECONDARY*	
	SERIES	PARALLEL
LP-10-600	10V CT @ 600 MA	5V @ 1.2A
LP-12-450	12.6V CT @ 450 MA	6.3V @ 900 MA
LP-16-350	16V CT @ 350 MA	8V @ 700 MA
LP-20-300	20V CT @ 300 MA	10V @ 600 MA
LP-24-250	24V CT @ 250 MA	12V @ 500 MA
LP-34-170	34V CT @ 170 MA	17V @ 340 MA
LP-40-150	40V CT @ 150 MA	20V @ 300 MA
LP-56-100	56V CT @ 100 MA	28V @ 200 MA
LP-88-65	88V CT @ 65 MA	44V @ 130 MA
LP-120-50	120V CT @ 50 MA	60V @ 100 MA
LP-230-25	230V CT @ 25 MA	115V @ 50 MA

*CORRESPONDS TO 30% REGULATION, I.E., NO LOAD SECONDARY VOLTAGE IS 30% HIGHER THAN FULL LOAD.

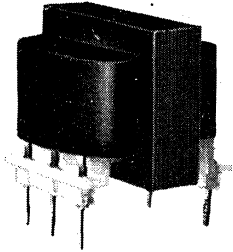
Signals "LP" series of PC plug-in power transformers offer the main advantage of 0.850 inch height with a 6VA rating at 50/60 Hz. This allows its use in PC boards stacked with 1 inch centers.

Construction is semi-toroidal (hum bucking) which results in a reduced radiated magnetic field and balanced windings. All materials used are at least class S in rating.

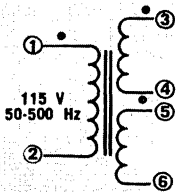
The dual primary and secondary windings offer a large diversity of output combinations with a 115/230V input. The voltages and currents are ideal for power applications in semi-conductor control and instrumentation such as single or dual output DC supplies and isolated control circuit and reference supplies.



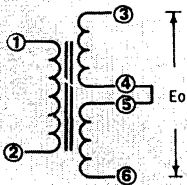
miniature plug-in power transformers



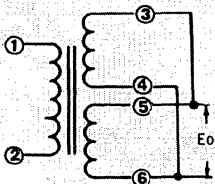
**SINGLE 115V PRIMARY
TYPE PC-6 PINS**



BASIC SCHEMATIC



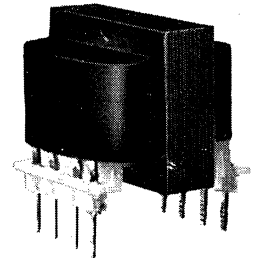
SERIES CONNECTED



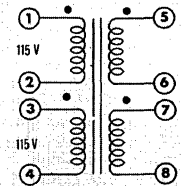
PARALLEL CONNECTED

PRIMARY 50/500 Hz		SECONDARY RMS RATING*		SIZE (VA)
Single 115V (6 Pin)	Dual 115/230V (8 Pin)	Series	Parallel	
PC 10-90	DPC 10-90	10V C.T. @ 90MA	5V @ 180MA	1.0
PC 10-120	DPC 10-120	10V C.T. @ 120MA	5V @ 240MA	1.2
PC 10-440	DPC 10-440	10V C.T. @ 440MA	5V @ 880MA	4.4
PC 10-1000	DPC 10-1000	10V C.T. @ 1A	5V @ 2A	10
PC 10-2400	DPC 10-2400	10V C.T. @ 2.4A	5V @ 4.8A	24
PC 12-70	DPC 12-70	12.6V C.T. @ 70MA	6.3V @ 140MA	1.0
PC 12-100	DPC 12-100	12.6V C.T. @ 100MA	6.3V @ 200MA	1.2
PC 12-350	DPC 12-350	12.6V C.T. @ 350MA	6.3V @ 700MA	4.4
PC 12-800	DPC 12-800	12.6V C.T. @ 800MA	6.3V @ 1.6A	10
PC 12-2000	DPC 12-2000	12.6V C.T. @ 2A	6.3V @ 4A	24
PC 16-55	DPC 16-55	16V C.T. @ 55MA	8V @ 110MA	1.0
PC 16-75	DPC 16-75	16V C.T. @ 75MA	8V @ 150MA	1.2
PC 16-260	DPC 16-260	16V C.T. @ 260MA	8V @ 520MA	4.4
PC 16-640	DPC 16-640	16V C.T. @ 640MA	8V @ 1.28A	10
PC 16-1500	DPC 16-1500	16V C.T. @ 1.5A	8V @ 3A	24
PC 20-45	DPC 20-45	20V C.T. @ 45MA	10V @ 90MA	1.0
PC 20-60	DPC 20-60	20V C.T. @ 60MA	10V @ 120MA	1.2
PC 20-220	DPC 20-220	20V C.T. @ 220MA	10V @ 440MA	4.4
PC 20-500	DPC 20-500	20V C.T. @ 500MA	10V @ 1A	10
PC 20-1200	DPC 20-1200	20V C.T. @ 1.2A	10V @ 2.4A	24
PC 24-35	DPC 24-35	24V C.T. @ 35MA	12V @ 70MA	1.0
PC 24-50	DPC 24-50	24V C.T. @ 50MA	12V @ 100MA	1.2
PC 24-180	DPC 24-180	24V C.T. @ 180MA	12V @ 360MA	4.4
PC 24-450	DPC 24-450	24V C.T. @ 450MA	12V @ 900MA	10
PC 24-1000	DPC 24-1000	24V C.T. @ 1A	12V @ 2A	24
PC 34-25	DPC 34-25	34V C.T. @ 25MA	17V @ 50MA	1.0
PC 34-35	DPC 34-35	34V C.T. @ 35MA	17V @ 70MA	1.2
PC 34-125	DPC 34-125	34V C.T. @ 125MA	17V @ 250MA	4.4
PC 34-300	DPC 34-300	34V C.T. @ 300MA	17V @ 600MA	10
PC 34-700	DPC 34-700	34V C.T. @ 700MA	17V @ 1.4A	24
PC 40-20	DPC 40-20	40V C.T. @ 20MA	20V @ 40MA	1.0
PC 40-30	DPC 40-30	40V C.T. @ 30MA	20V @ 60MA	1.2
PC 40-110	DPC 40-110	40V C.T. @ 110MA	20V @ 220MA	4.4
PC 40-250	DPC 40-250	40V C.T. @ 250MA	20V @ 500MA	10
PC 40-600	DPC 40-600	40V C.T. @ 600MA	20V @ 1.2A	24
PC 56-15	DPC 56-15	56V C.T. @ 15MA	28V @ 30MA	1.0
PC 56-20	DPC 56-20	56V C.T. @ 20MA	28V @ 40MA	1.2
PC 56-80	DPC 56-80	56V C.T. @ 80MA	28V @ 160MA	4.4
PC 56-180	DPC 56-180	56V C.T. @ 180MA	28V @ 360MA	10
PC 56-420	DPC 56-420	56V C.T. @ 420MA	28V @ 840MA	24
PC 88-10	DPC 88-10	88V C.T. @ 10MA	44V @ 20MA	1.0
PC 88-15	DPC 88-15	88V C.T. @ 15MA	44V @ 30MA	1.2
PC 88-50	DPC 88-50	88V C.T. @ 50MA	44V @ 100MA	4.4
PC 88-120	DPC 88-120	88V C.T. @ 120MA	44V @ 240MA	10
PC 88-270	DPC 88-270	88V C.T. @ 270MA	44V @ 540MA	24
PC 120-8	DPC 120-8	120V C.T. @ 8MA	60V @ 16MA	1.0
PC 120-10	DPC 120-10	120V C.T. @ 10MA	60V @ 20MA	1.2
PC 120-35	DPC 120-35	120V C.T. @ 35MA	60V @ 70MA	4.4
PC 120-85	DPC 120-85	120V C.T. @ 85MA	60V @ 170MA	10
PC 120-200	DPC 120-200	120V C.T. @ 200MA	60V @ 400MA	24

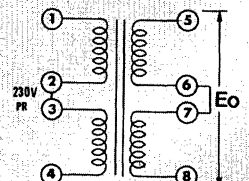
*See Table on opposite page for method of determining RMS Secondary Current.



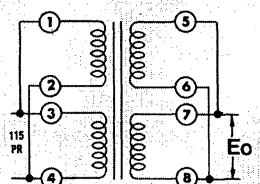
**DUAL 115/230V PRIMARY
TYPE DPC-8 PINS**



BASIC SCHEMATIC



SERIES CONNECTED



PARALLEL CONNECTED

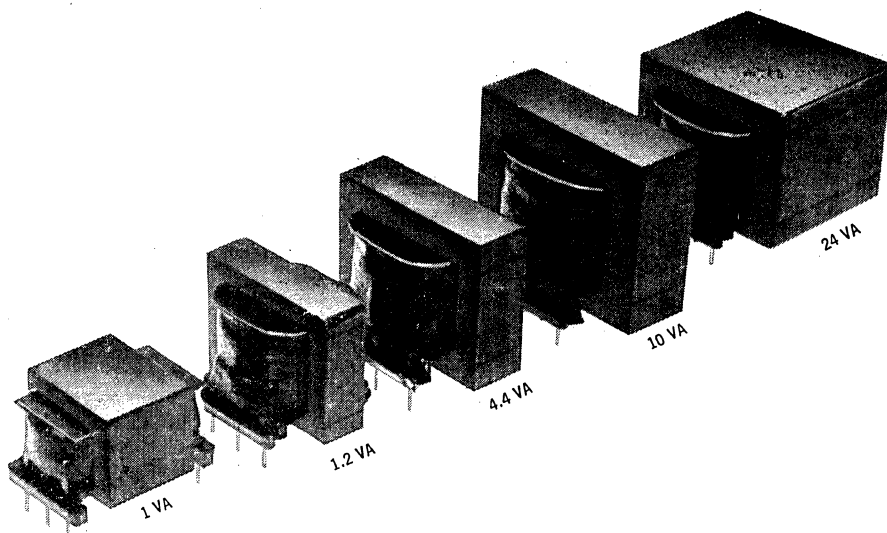
for printed circuit applications

Signal has the most complete and diversified selection of miniature plug-in power transformers. All items are stocked in depth for immediate off-the-shelf delivery.

Primary ratings of 115V (Style PC - 6 Pin) or Dual 115/230V (Style DPC - 8 Pin) are standard for the entire line.

Size 1.0 is used extensively where height is a limiting factor since its height of 0.83 inches allows 1 inch spacing of PC boards. Size 24 is unusual since 24 watt PC transformers are not readily available, especially with a height of 1 3/8 inches.

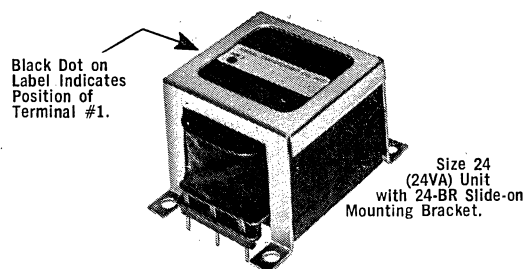
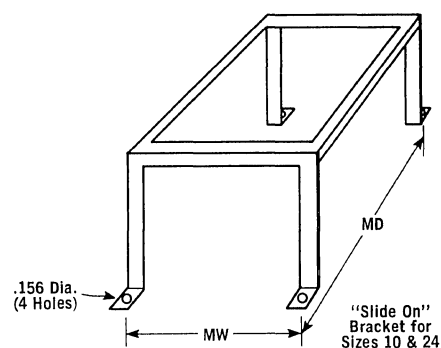
The RMS current ratings are based on a load regulation of 15-20% and **not** on temperature rise (except for the largest item, size 24). Therefore, these ratings may be exceeded without overheating, if the additional drop in full load voltage is acceptable. There is, of course, a limit and it would be best to check with our engineering department on specific units.



DIMENSIONS

SIZE (VA)	L	W	H	A-6 (6 Pin)	A-8 (8 Pin)	B	WT. (oz.)	OPTIONAL BRACKET*		
								No.	MW	MD
1.0	1	1 3/8	0.83	0.250	0.200	1.200	2.5	—	—	—
1.2	1 3/8	1 3/8	1 3/8	0.312	0.200	1.000	3	—	—	—
4.4	1 3/8	1 1/4	1 3/8	0.400	0.250	1.100	5	—	—	—
10	1 7/8	1 1/8	1 3/8	0.400	0.250	1.300	9	10-BR	1 1/4	1 3/8
24	1 3/8	2 1/4	1 3/8	0.400	0.250	2.100	12	24-BR	1 3/8	2

*An optional "Slide On" Mounting Bracket is available for sizes 10 and 24. The brackets do not use up any extra "Floor Space" but add 1/2" to the height of the transformer.



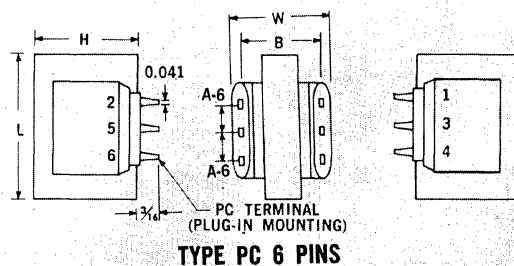
METHOD OF DETERMINING SECONDARY CURRENT RATINGS

Rectifier Type	Filter Type	RMS Secondary Current
Full Wave Center-Tap	Choke Input	.7 x DC Amps
Full Wave Center-Tap	Capacitor Input	1.2 x DC Amps
Full Wave Bridge	Choke Input	= to DC Amps
Full Wave Bridge	Capacitor Input	1.8 x DC Amps

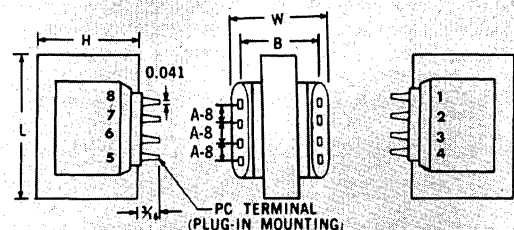
CUSTOM VARIATIONS

Signal has the facilities to provide rapid quotations and delivery of prototypes of your special PC transformer needs. Large quantity runs can be scheduled with reasonable lead times. Please submit your requirements and be assured of our prompt response.

SIGNAL TRANSFORMER CO., INC. / 1 JUNIUS STREET / BROOKLYN, NEW YORK 11212 / (212) 498-5111 / TELEX 12-5709



TYPE PC 6 PINS



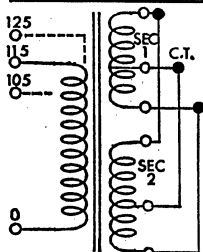
TYPE DPC 8 PINS

SHIPPED FROM
STOCK
IMMEDIATELY

rectifier power transformers

IDEAL FOR USE IN SINGLE OR DUAL DC POWER SUPPLIES

SECONDARY VOLTS	Part No.	Primary Volts 50-500 CPS	RMS Secondary Amps		Mtg. Style	L	W	H	ML	MW	Mtg. Screw	Appr. Lbs.
			Series	Parallel								
10 or 5 V C.T. Series 0 - 2.5 - 5 - 7.5 - 10 V Parallel 0 - 2.5 - 5 V @ 2 x Current	10-0.1	115	0.1	0.2	C	2	1 1/2	1 3/4	1 3/2	—	#8	0.3
	10-0.25	115	0.25	0.5	C	2 3/8	1 1/2	2	2	—	#8	0.5
	10-0.5	115	0.5	1.0	C	2 3/8	1 3/4	2	2	—	#8	0.8
	10-1	115	1	2	C	2 7/8	1 3/4	2 5/8	2 3/8	—	#8	1.0
	10-2	115	2	4	C	3 1/8	2 1/8	2 3/4	2 1/2	—	#8	1.5
	10-4	115	4	8	C	3 3/8	2 3/8	3 1/8	3 1/8	—	#8	2.3
	10-6	115	6	12	B	3 3/8	2 3/4	2 1/4	2 1/4	2 1/8	#8	3.3
	10-8	115	8	16	B	3 3/8	3 1/8	2 1/4	2 1/4	2 1/2	#8	4.0
	10-12	115	12	24	B	3 3/4	3 1/4	3 1/8	3 1/8	2 1/2	#8	5.0
	10-25	115	25	50	B	4 1/2	3 3/4	3 3/4	3 3/4	2 3/4	#10	8.7
	10-50	105, 115, 125	50	100	B	5 1/4	5 1/2	4 3/8	4 3/8	3 3/8	1/4	17.0
	10-100	105, 115, 125	100	200	B	6 3/8	7 1/4	5 3/8	5 1/8	4 3/8	1/4	34.5
12.8 or 6.4 C.T. Series 0 - 3.2 - 6.4 - 9.6 - 12.8 V Parallel 0 - 3.2 - 6.4 V @ 2 x Current	12.8-0.1	115	0.1	0.2	C	2	1 1/2	1 3/4	1 3/2	—	#8	0.3
	12.8-0.25	115	0.25	0.5	C	2 3/8	1 1/2	2	2	—	#8	0.5
	12.8-0.5	115	0.5	1	C	2 7/8	1 5/8	2 5/8	2 3/8	—	#8	0.8
	12.8-1	115	1	2	C	2 7/8	2	2 5/8	2 3/8	—	#8	1.2
	12.8-2A	115	2	4	C	3 1/8	2 1/8	2 3/4	2 1/2	—	#8	1.5
	12.8-2	115	2	4	B	3	2 1/2	2 1/2	2 1/2	2	#8	2.3
	12.8-4	115	4	8	B	3	2 7/8	2 1/2	2 1/2	2 3/8	#8	2.8
	12.8-6	115	6	12	B	3 3/8	3 1/8	2 1/4	2 1/4	2 1/2	#8	4.0
	12.8-8	115	8	16	B	3 3/4	3 1/8	3 1/8	3 1/8	2 1/4	#8	4.5
	12.8-12	115	12	24	B	4 1/8	3 1/4	3 1/8	3 1/8	2 3/8	#10	6.0
	12.8-25	115	25	50	B	5 1/4	4 1/4	4 3/8	4 3/8	2 7/8	#10	12.5
	12.8-50	105, 115, 125	50	100	B	5 1/4	6	4 3/8	4 3/8	3 3/8	1/4	20.7
	12.8-100	105, 115, 125	100	200	B	6 3/8	7 1/4	5 3/8	5 1/8	4 3/8	1/4	34.5
16 or 8 V C.T. Series 0 - 4 - 8 - 12 - 16 V Parallel 0 - 4 - 8 @ 2 x Current	16-0.1	115	0.1	0.2	C	2	1 5/8	1 3/4	1 3/2	—	#8	0.4
	16-0.25	115	0.25	0.5	C	2 3/8	1 3/4	2	2	—	#8	0.7
	16-0.5	115	0.5	1	C	2 7/8	1 5/8	2 5/8	2 3/8	—	#8	0.8
	16-1	115	1	2	C	2 7/8	2	2 5/8	2 3/8	—	#8	1.2
	16-2	115	2	4	C	3 1/8	2 1/4	2 3/4	2 1/2	—	#8	1.7
	16-4	115	4	8	B	3 3/8	2 3/4	2 1/4	2 1/4	2 1/8	#8	3.3
	16-6	115	6	12	B	3 3/4	3 1/8	3 1/8	3 1/8	2 1/4	#10	4.5
	16-8	115	8	16	B	3 3/4	3 1/2	3 1/8	3 1/8	2 3/8	#10	5.4
	16-12	115	12	24	B	4 1/8	3 7/8	3 5/8	3 5/8	3	#10	7.9
	16-25	115	25	50	B	4 1/2	5 3/8	4	3 3/4	4	#10	14.5
	16-50	105, 115, 125	50	100	B	6 3/8	5 3/4	5 3/8	5 1/8	3 3/4	1/4	26.5
	16-100	105, 115, 125	100	200	B	7 1/2	7 1/2	6 3/8	6 3/4	4 3/8	1/4	50.0
24 or 12 C.T. Series 0 - 6 - 12 - 18 - 24 V Parallel 0 - 6 - 12 V @ 2 x Current	24-0.1	115	0.1	0.2	C	2 3/8	1 1/2	2	2	—	#8	0.5
	24-0.25	115	0.25	0.5	C	2 7/8	1 3/4	2 5/8	2 3/8	—	#8	1.0
	24-0.5	115	0.5	1	C	2 7/8	2	2 5/8	2 3/8	—	#8	1.2
	24-1A	115	1	2	C	3 1/8	2 1/8	2 3/4	2 1/2	—	#8	1.5
	24-1	115	1	2	B	3	2 1/2	2 1/2	2 1/2	2	#8	2.3
	24-2	115	2	4	B	3	2 7/8	2 1/2	2 1/2	2 3/8	#8	2.9
	24-4	115	4	8	B	3 3/4	3 1/8	3 1/8	3 1/8	2 1/4	#8	4.5
	24-6	115	6	12	B	4 1/8	3 1/4	3 3/8	3 3/8	2 3/8	#10	5.8
	24-8	115	8	16	B	4 1/8	3 7/8	3 5/8	3 5/8	3	#10	7.9
	24-12	105, 115, 125	12	24	B	4 1/2	4 1/2	3 3/4	3 3/4	3 3/8	#10	11.0
	24-20	105, 115, 125	20	40	B	5 1/4	4 3/4	4 3/8	4 3/8	3 3/8	1/4	15.3
	24-25	105, 115, 125	25	50	B	5 1/4	5 5/8	4 3/8	4 3/8	4 1/8	1/4	19.5
	24-50	105, 115, 125	50	100	B	6 3/8	6 1/4	5 3/8	5 1/8	4 3/8	1/4	31.3
	24-100	115/230	100	200	B	7 1/2	7	6 3/8	6 3/4	4 3/8	1/4	43
36 or 18 V C.T. Series 0 - 9 - 18 - 27 - 36 V Parallel 0 - 9 - 18 V @ 2 x Current	36-0.1	115	0.1	0.2	C	2 3/8	1 5/8	2	2	—	#8	0.5
	36-0.25	115	0.25	0.5	C	2 7/8	1 5/8	2 5/8	2 3/8	—	#8	0.8
	36-0.5	115	0.5	1	C	3 1/8	2	2 5/8	2 3/8	—	#8	1.3
	36-1A	115	1	2	C	3 3/8	2 3/8	3 1/8	3 1/8	—	#8	2.3
	36-1	115	1	2	B	3	2 3/4	2 1/2	2 1/2	2 1/4	#8	2.6
	36-2	115	2	4	B	3 3/8	2 5/8	2 1/4	2 1/4	2 3/8	#8	3.8
	36-4	115	4	8	B	4 1/8	3 3/8	3 3/8	3 3/8	2 5/8	#10	6.8
	36-6	115	6	12	B	4 1/2	3 3/4	3 3/4	3 3/4	2 3/4	#10	8.7
	36-8	105, 115, 125	8	16	B	4 1/2	4 1/2	4 1/8	4 1/8	3 3/8	#10	11.0
	36-12	105, 115, 125	12	24	B	5 1/4	5	4 3/8	4 3/8	3 3/8	1/4	15.0
	36-20	105, 115, 125	20	40	B	6 3/8	5 3/8	5 3/8	5 3/8	3 3/8	1/4	22.8
	36-25	105, 115, 125	25	50	B	6 3/8	5 3/4	5 3/8	5 3/8	3 3/4	1/4	26.5
	36-30	105, 115, 125	30	60	B	6 3/8	6	5 3/8	5 3/8	4 3/8	1/4	31.5
	36-50	115/230	50	100	B	6 3/8	7 1/4	5 3/8	5 3/8	4 3/8	1/4	40.0
	36-100	115/230	100	200	B	7 1/2	9	6 3/4	6 3/4	5 1/8	1/4	63.5
56 or 28 V C.T. Series 0 - 14 - 28 - 42 - 56 V Parallel 0 - 14 - 28 V @ 2 x Current	56-0.1	115	0.1	0.2	C	2 3/8	1 3/4	2	2	—	#8	.8
	56-0.25	115	0.25	0.5	C	2 7/8	2	2 5/8	2 3/8	—	#8	1.2
	56-0.5	115	0.5	1	C	3 3/8	2 1/4	2 3/4	2 1/2	—	#8	1.7
	56-1	115	1	2	B	3 3/8	2 3/8	2 1/2	2 1/2	2 1/4	#8	3.5
	56-2	115	2	4	B	3 3/4	3 1/4	3 1/8	3 1/8	2 1/2	#8	5.0
	56-4	115	4	8	B	4 1/8	3 3/4	3 3/8	3 3/8	3	#10	7.7
	56-6	115	6	12	B	5 1/4	4 1/4	4 3/8	4 3/8	2 7/8	#10	12.0
	56-8	105, 115, 125	8	16	B	5 1/4	5	4 3/8	4 3/8	3 3/8	1/4	17.0
	56-12	105, 115, 125	12	24	B	6 3/8	5 1/4	5 3/8	5 3/8	3 3/8	1/4	22.0
	56-25	105, 115, 125	25	50	B	6 3/8	7 3/8	5 3/8	5 3/8	5 3/8	1/4	38.0
	56-50	115/230	50	100	B	7 1/2	7 1/2	6 1/4	6 3/4	4 7/8	1/4	56.3
	56-100	115/230	100	200	B	7 1/2	11 1/4	6 3/4	6 3/4	8 1/4	1/4	95.0

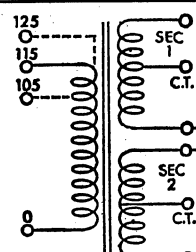


PARALLEL CONNECTED SECONDARIES

All transformers are designed conservatively for a max of 45°C rise above ambient, for use on 115V power line from 50-500 cps. Only prime raw materials are used. Units are thoroughly impregnated and baked with Signal's own high gloss black baking varnish. The transformers and chokes are rugged in construction, well-insulated, and have a consistently uniform appearance. All ratings are at full load current continuous operation.

Electrical ratings have been chosen to cover a wide range of applications. All transformers have two center-tapped secondary windings.

SERIES CONNECTED SECONDARIES



rectifier power transformers

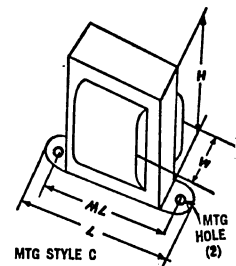
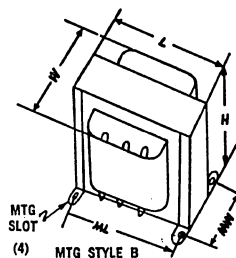
IDEAL FOR USE IN SINGLE OR DUAL DC POWER SUPPLIES

0.1 TO 200 AMPS
2.5 TO 300 VOLTS

SECONDARY VOLTS	Part No.	Primary Volts 50-500 CPS	RMS Secondary Amps		Mtg. Style	L	W	H	ML	MW	Mtg. Screw	Appr. Lbs.
			Series	Parallel								
68 or 34 C.T. Series 0 - 17 - 34 - 51 - 68 V Parallel 0 - 17 - 34 V @ 2 x Current	68-0.1	115	0.1	0.2	C	2 7/8	1 5/8	2 1/4	2 3/8	—	#8	0.8
	68-0.25	115	0.25	0.5	C	2 7/8	2	2 1/4	2 3/8	—	#8	1.2
	68-0.5A	115	0.5	1	C	3 3/8	2 1/4	2 3/4	2 3/8	—	#8	1.7
	68-0.5	115	0.5	1	B	3	2 3/4	2 1/2	2 1/2	2 1/4	#8	2.7
	68-1	115	1	2	B	3 3/8	2 3/4	2 1/2	2 1/2	2 1/4	#8	2.7
	68-2	115	2	4	B	4 1/8	3 3/8	3 1/4	3 1/4	2 5/8	#8	6.8
	68-4	115	4	8	B	4 1/2	4 1/2	4 1/2	3 3/4	3 3/8	#10	11.5
	68-6	105, 115, 125	6	12	B	5 1/4	5	4 3/8	4 3/8	3 3/8	1/4	15.0
	68-8	105, 115, 125	8	16	B	5 1/4	5 1/2	4 3/8	4 3/8	3 7/8	1/4	19.0
	68-12	105, 115, 125	12	24	B	6 3/8	5 3/4	5 1/2	5 1/2	3 3/4	1/4	26.5
	68-25	115/230	25	50	B	6 3/8	7 1/4	5 1/2	5 1/2	5 1/8	1/4	39.7
	68-50	115/230	50	100	B	7 1/2	9	6 1/4	6 3/4	5 1/2	1/4	58.5
80 or 40 C.T. Series 0 - 20 - 40 - 60 - 80 V Parallel 0 - 20 - 40 V @ 2 x Current	80-0.1	115	0.1	0.2	C	2 7/8	1 5/8	2 1/4	2 3/8	—	#8	0.8
	80-0.25	115	0.25	0.5	C	2 7/8	2	2 1/4	2 3/8	—	#8	1.3
	80-0.5A	115	0.5	1	C	3 3/8	2 3/8	3 1/4	3 1/8	—	#8	2.2
	80-0.5	115	0.5	1	B	3	2 3/4	2 1/2	2 1/2	2 1/4	#8	2.8
	80-1	115	1	2	B	3 3/8	3 1/4	2 1/2	2 1/2	2 1/4	#8	4.0
	80-2	115	2	4	B	4 1/8	3 3/8	3 1/4	3 1/4	2 5/8	#10	6.8
	80-4	115	4	8	B	4 1/2	4 1/2	4 1/2	4 1/2	3 7/8	1/4	12.3
	80-6	105, 115, 125	6	12	B	5 1/4	4 3/4	4 3/8	4 3/8	3 7/8	1/4	19.0
	80-8	105, 115, 125	8	16	B	5 1/4	5 1/2	4 3/8	4 3/8	3 7/8	1/4	20.5
	80-12	105, 115, 125	12	24	B	6 3/8	5 3/4	5 1/2	5 1/2	3 3/4	1/4	29.0
	80-25	115/230	25	50	B	6 3/8	6 1/2	5 1/2	5 1/2	4 1/2	1/4	40.3
	80-50	115/230	50	100	B	7 1/2	9	6 1/4	6 3/4	5 1/2	1/4	78.0
88 or 44 C.T. Series 0 - 22 - 44 - 66 - 88 V Parallel 0 - 22 - 44 V @ 2 x Current	88-0.1	115	0.1	0.2	C	2 7/8	1 3/4	2 1/4	2 3/8	—	#8	1.0
	88-0.25	115	0.25	0.5	C	2 7/8	2 1/8	2 1/4	2 3/8	—	#8	1.5
	88-0.5	115	0.5	1	B	3 3/8	2 3/8	3 1/4	3 1/8	—	#8	2.2
	88-1	115	1	2	B	3 3/4	3	3 1/4	3 1/8	2 1/4	#8	4.5
	88-2	115	2	4	B	4 1/8	3 3/8	3 1/4	3 1/4	2 5/8	#10	6.8
	88-4	115	4	8	B	4 1/2	4 1/2	4 1/2	4 1/2	3 1/8	1/4	13.4
	88-6	105, 115, 125	6	12	B	5 1/4	5 1/2	4 3/4	4 3/8	3 7/8	1/4	19.0
	88-8	105, 115, 125	8	16	B	5 1/4	5 3/8	5 1/2	5 1/2	3 3/8	1/4	22.8
	88-12	105, 115, 125	12	24	B	6 3/8	6 1/2	5 1/2	5 1/2	4 1/2	1/4	35.0
	88-25	115/230	25	50	B	6 3/8	7 1/2	5 1/2	5 1/2	4 1/2	1/4	62.0
	88-50	115/230	50	100	B	7 1/2	11	6 1/4	6 3/4	5 1/2	1/4	100.0
120 or 60 C.T. Series 0 - 30 - 60 - 90 - 120 V Parallel 0 - 30 - 60 V @ 2 x Current	120-0.5	115	0.5	1.0	B	3 3/8	2 7/8	2 1/4	2 1/4	2 1/4	#8	3.2
	120-1	115	1	2	B	3 3/4	3 3/8	3 1/4	3 1/4	2 3/4	#8	5.8
	120-2	115	2	4	B	4 1/2	3 3/4	3 3/4	3 3/4	2 3/4	#10	8.5
	120-4	115	4	8	B	5 1/4	5 1/2	4 3/8	4 3/8	3 7/8	1/4	17.0
	120-6	105, 115, 125	6	12	B	6 3/8	6	5 1/2	5 1/2	3 7/8	1/4	27.0
	120-8	105, 115, 125	8	16	B	6 3/8	6 1/2	5 1/2	5 1/2	4 1/2	1/4	34.0
	120-12	105, 115, 125	12	24	B	6 3/8	7 1/4	5 1/2	5 1/2	5 1/2	1/4	42.0
	120-20	105, 115, 125	20	40	B	7 1/2	8	6 1/4	6 3/4	5 3/8	1/4	57.0
160 or 80 C.T. Series 0 - 40 - 80 - 120 - 160 V Parallel 0 - 40 - 80 V @ 2 x Current	160-0.5	115	0.5	1	B	3 3/8	3 1/4	2 1/4	2 1/4	2 1/4	#8	4.0
	160-1	115	1	2	B	4 1/8	3 3/8	3 1/4	3 1/4	2 5/8	#10	6.5
	160-2	115	2	4	B	4 1/2	4 3/8	3 3/4	3 3/4	3 3/8	#10	11.0
	160-4	105, 115, 125	4	8	B	6 3/8	5 1/4	5 1/2	5 1/2	3 1/4	1/4	21.0
	160-8	105, 115, 125	8	16	B	6 3/8	6 3/4	5 1/2	5 1/2	4 7/8	1/4	36.0
	160-12	115/230	12	24	B	7 1/2	6 1/2	6 1/4	6 3/4	5 3/8	1/4	39.8
180 or 90 C.T. Series 0 - 45 - 90 - 135 - 180 V Parallel 0 - 45 - 90 @ 2 x Current	180-0.5	115	0.5	1	B	3 3/8	3 3/8	3 1/4	3 1/4	2 3/4	#8	5.8
	180-1	115	1	2	B	4 1/8	3 7/8	3 3/8	3 3/8	3 1/4	#10	8.2
	180-2	115	2	4	B	5 1/4	5	4 3/8	4 3/8	3 5/8	1/4	15.8
	180-4	115	4	8	B	6 3/8	5 3/4	5 1/2	5 1/2	3 3/4	1/4	27.0
	180-6	105, 115, 125	6	12	B	6 3/8	7 1/4	5 1/2	5 1/2	4 1/2	1/4	37.0
	180-8	105, 115, 125	8	16	B	6 3/8	7 3/4	5 1/2	5 1/2	5 1/2	1/4	42.0
	180-12	105, 115, 125	12	24	B	7 1/2	8 1/4	6 1/4	6 3/4	5 5/8	1/4	62.0
230 or 115 C.T. Series 0-57 1/2-115-172 1/2-230 V Parallel 57 1/2 - 115 V @ 2 x Current	230-0.5	115	0.5	1	B	3 3/4	3 3/8	3 1/4	3 1/4	3	#8	6.5
	230-1	115	1	2	B	4 1/2	3 3/4	3 3/4	3 3/4	3	#10	9.4
	230-2	115	2	4	B	5 1/4	4 3/4	4 3/8	4 3/8	3 3/8	1/4	14.5
	230-4	105, 115, 125	4	8	B	6 3/8	6	5 1/2	5 1/2	4 1/2	1/4	28.4
	230-6	105, 115, 125	6	12	B	6 3/8	7 1/4	5 1/2	5 1/2	5 1/2	1/4	38.0
300 or 150 C.T. Series 0-75-150-225-300V Parallel 0 - 75 - 150 V @ 2 x Current	300-0.5	115	0.5	1	B	4 1/2	3 1/2	3 3/4	3 3/4	2 1/2	#10	7.0
	300-1	115	1	2	B	5 1/4	4 1/8	4 3/8	4 3/8	3	1/4	12.8
	300-2	115	2	4	B	5 1/4	5 3/4	4 3/8	4 3/8	4 1/2	1/4	21.0
	300-4	105, 115, 125	4	8	B	6 3/8	5 3/4	5 1/2	5 1/2	3 7/8	1/4	27.5

METHOD OF DETERMINING SECONDARY CURRENT RATINGS

RECTIFIER TYPE	FILTER TYPE	RMS SECONDARY CURRENT
Full Wave Center-Tap	Choke Input	.7 × DC Amps
Full Wave Center-Tap	Capacitor Input	1.2 × DC Amps
Full Wave Bridge	Choke Input	= to DC Amps
Full Wave Bridge	Capacitor Input	1.8 × DC Amps



filter chokes 0.5 to 1000 amps

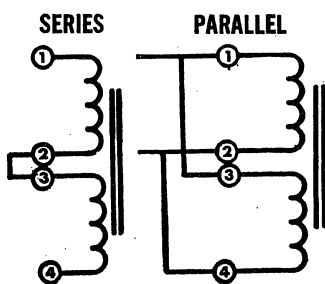
Signal's line of filter chokes is the most extensive available. It is designed to complement the selection of Rectifier Power Transformers so that a set may be specified for power supplies using inductive filters.

The inductance ratings given are minimum values guaranteed at full DC current. All resistance ratings are maximum values. Special variations or intermediate values of inductance, current, or resistance can be supplied promptly and accurately.

FOR MECHANICAL DIMENSIONS REFER TO TRANSFORMER OUTLINES ON PREVIOUS PAGE

PART No.	IND. (MHY)	CURR. (Amps)	RES. (Ohms)	MTG. STYLE	L	W	H	ML	MW	MTG. SCREW	APPR. LBS.
CH-0.5	400	0.5	4.0	C	3 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{3}{4}$	2 $\frac{13}{16}$	—	#8	1.5
CH-1	100	1	1.5	B	3	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2	#8	2.3
CH-2	70	2	0.9	B	3 $\frac{3}{8}$	2 $\frac{3}{4}$	2 $\frac{7}{8}$	2 $\frac{13}{16}$	2 $\frac{1}{8}$	#8	3.2
CH-4	70	4	0.6	B	3 $\frac{3}{4}$	3 $\frac{1}{8}$	3 $\frac{1}{4}$	3 $\frac{1}{8}$	2 $\frac{1}{2}$	#8	5.3
CH-6	40	6	0.4	B	3 $\frac{3}{4}$	3 $\frac{5}{8}$	3 $\frac{1}{4}$	3 $\frac{1}{8}$	3	#8	6.5
CH-8	30	8	0.3	B	4 $\frac{1}{8}$	3 $\frac{5}{8}$	3 $\frac{1}{2}$	3 $\frac{7}{16}$	3	#10	8
CH-12	15	12	0.1	B	5 $\frac{1}{4}$	4	4 $\frac{7}{16}$	4 $\frac{3}{8}$	3 $\frac{1}{8}$	#10	13.7
CH-16	15	16	.08	B	5 $\frac{1}{4}$	4 $\frac{5}{8}$	4 $\frac{7}{16}$	4 $\frac{3}{8}$	3 $\frac{5}{8}$	#10	17.5
CH-20	7	20	.05	B	5 $\frac{1}{4}$	4	4 $\frac{7}{16}$	4 $\frac{3}{8}$	3 $\frac{1}{8}$	#10	13.3
CH-25	5	25	.025	B	5 $\frac{1}{4}$	4 $\frac{3}{4}$	4 $\frac{7}{16}$	4 $\frac{3}{8}$	3 $\frac{7}{8}$	#10	17.8
CH-30	4	30	.01	B	6 $\frac{3}{8}$	5	5 $\frac{3}{8}$	5 $\frac{5}{16}$	3 $\frac{3}{8}$	$\frac{1}{4}$	24.4
CH-50	1.4	50	0.01	B	6 $\frac{3}{8}$	5 $\frac{1}{4}$	5 $\frac{3}{8}$	5 $\frac{5}{16}$	3 $\frac{3}{4}$	$\frac{1}{4}$	26.7
CH-100	0.5	100	0.005	B	6 $\frac{3}{8}$	6 $\frac{1}{4}$	5 $\frac{3}{8}$	5 $\frac{5}{16}$	4 $\frac{1}{8}$	$\frac{1}{4}$	31.4
CH-200	0.3	200	0.001	B	7 $\frac{1}{2}$	7	6 $\frac{1}{2}$	6 $\frac{3}{4}$	4 $\frac{1}{8}$	$\frac{1}{4}$	48.0
CH-250	0.3	250	0.00115	B	7 $\frac{1}{2}$	8	6 $\frac{1}{2}$	6 $\frac{3}{4}$	5 $\frac{1}{8}$	$\frac{1}{4}$	56.0
CH-500	0.055	500	0.00027	B	7 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{3}{4}$	4 $\frac{1}{8}$	$\frac{1}{4}$	50.0
CH-1000	0.015	1,000	0.000065	B	7 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{1}{2}$	6 $\frac{3}{4}$	4 $\frac{3}{8}$	$\frac{1}{4}$	70.0

dual chokes for lower inductance applications

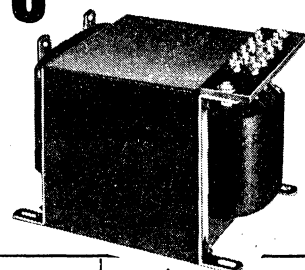


Part No.	Series Connected			Parallel Connected			Mtg. Style	Dimensions					Mtg. Screw	Appr. Lbs.
	Ind. (MHY)	Curr. (Amps)	Res. (Ohms)	Ind. (MHY)	Curr. (Amps)	Res. (Ohms)		L	W	H	ML	MW		
CL-1-2	72	1	1.4	18	2	0.35	C	2 $\frac{7}{8}$	1 $\frac{1}{4}$	2 $\frac{3}{4}$	2 $\frac{3}{8}$	—	#8	0.9
CL-2-4	40	2	0.7	10	4	0.18	C	3 $\frac{1}{8}$	2 $\frac{1}{8}$	2 $\frac{3}{4}$	2 $\frac{1}{2}$	—	#8	1.5
CL-4-8	20	4	0.3	5	8	0.075	B	3	2 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{4}$	#8	3.0
CL-6-12	12	6	0.15	3	12	0.038	B	3 $\frac{3}{8}$	3 $\frac{1}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	#8	4.0
CL-12-24	4.8	12	0.052	1.2	24	0.013	B	3 $\frac{3}{8}$	3 $\frac{1}{8}$	2 $\frac{1}{2}$	2 $\frac{1}{2}$	3	#8	5.3
CL-25-50	1.2	25	0.012	0.3	50	0.003	B	3 $\frac{3}{4}$	3 $\frac{3}{8}$	3 $\frac{3}{8}$	3 $\frac{1}{8}$	2 $\frac{3}{4}$	#8	6.0
CL-50-100	0.5	50	0.0043	0.12	100	0.0011	B	4 $\frac{1}{2}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	3 $\frac{3}{4}$	2 $\frac{1}{2}$	#8	8.0

Signal's Dual Chokes are supplied with 2 windings which may be series or parallel connected with rating shown on chart. This line is basically designed for applications requiring lower inductance values at high currents, such as low voltage, DC supplies or SCR filters. Ideal for use to reduce ripple in our ferro-resonant (CDC) line.

very high current transformers and chokes

250 to 1400 amperes



TRANSFORMERS

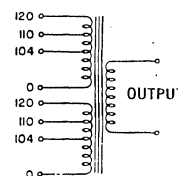
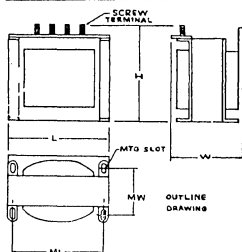
Part No.	Secondary Volts	Secondary Amps.		Dimensions					Mtg. Screw	Appr. Lbs.
		Nominal (45°C rise)	Max. (100°C rise)	L	W	H	ML	MW		
6-250	6	250	350	7½	5	7¼	6¾	3½	¼	32
9-250	9	250	350	7½	5¾	7¼	6¾	4½	¼	40
12-250	12	250	350	7½	6¼	7¼	6¾	4½	¼	48
6-500	6	500	700	7½	6	7¼	6¾	4½	¼	40
9-500	9	500	700	7½	8½	7¼	6¾	6½	¼	60
12-500	12	500	700	7½	9	7¼	6¾	7½	¼	80
3-1000	3	1000	1400	7½	6	7¼	6¾	4½	¼	40
6-1000	6	1000	1400	7½	9	7¼	6¾	7½	¼	80

CHOKES

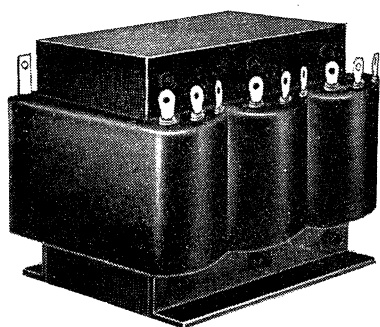
Part No.	Inductance (Milli-hy)	Current (Amperes)	Resis. (Ohms)	L	W	H	ML	MW	Mtg. Screw	Appr. Lbs.
CH-250	.3	250	.00115	7½	8	6¼	6¾	5½	¼	56
CH-500	.055	500	.00027	7½	6½	6¼	6¾	4½	¼	50
CH-1000	.015	1000	.000065	7½	7½	6¼	6¾	5½	¼	70

As shown on the schematic diagram dual primaries are provided. This permits parallel connection for 104, 110, or 120 volts or series connection for 208, 214, 220, 230, and 240 volts. Frequency range is 50 to 500 cps.

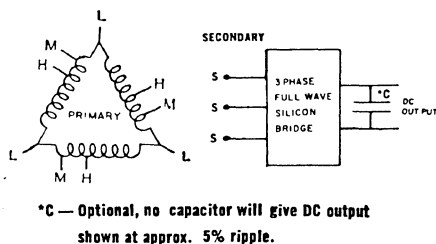
It is important to note that primary taps may be used to adjust the secondary voltages. Line voltages up to 125V (parallel) or 250V (series) may be used on the lowest primary tap. Nickel plated screw terminals are provided on a heavy phenolic board for easy primary connections



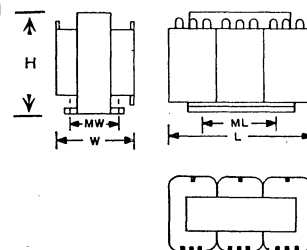
3 phase HIGH CURRENT RECTIFIER TRANSFORMERS



SCHEMATIC DIAGRAM



MECHANICAL DIMENSIONS



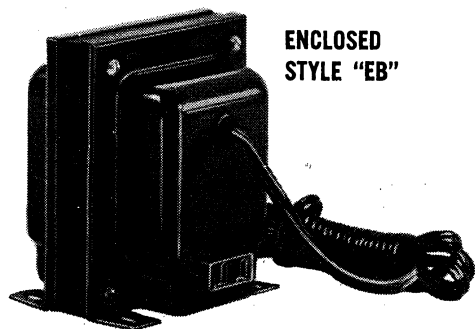
DC OUTPUT VOLTAGE

PART NO.	PRI TAP "L" SUPPLY VOLTAGE		PRI TAP "M" SUPPLY VOLTAGE		PRI TAP "H" SUPPLY VOLTAGE		DC RATED AMPS	APPROX. DIMENSIONS					APX. LBS.
	208	220	208	220	208	220		L	W	H	ML	MW	
3PH 24-50	24	25	26	27.5	28	30	50	7¾	6	5½	4.8	4¾	35
3PH 24-100	24	25	26	27.5	28	30	100	11½	5	8¼	7.2	4	62
3PH 24-200	24	25	26	27.5	28	30	200	11½	8½	8¼	7.2	6¼	90
3PH 48-30	42	44	47	50	52	55	30	7¾	6	5½	4.8	4¾	35
3PH 48-60	42	44	47	50	52	55	60	11½	5	8¼	7.2	4	62
3PH 48-120	42	44	47	50	52	55	120	11½	8½	8¼	7.2	6¼	90

At higher power loads (above 2-3 KVA) it becomes inefficient to use single phase 115 or 230 volt standard lines. With this in mind, our engineering staff has developed a line of 3 phase transformers for use off 208 or 220V 3 phase power lines. These offer the significantly higher

conversion efficiency and lighter power line drain of 3 phase systems. Since the principal application of these items is in high power dc power supplies, output ratings are given in dc voltage and current assuming the use of a 3 phase full wave rectifier.

step down auto transformers 50/60 cycle



ENCLOSED
STYLE "EB"

100-2000 VA — 230/115V

VA	Cat. No.	Width	Depth	Height	Mtg. Centers	Lbs.
120	112	2 $\frac{7}{8}$	2 $\frac{7}{8}$	3 $\frac{1}{2}$	2 $\frac{1}{4}$ x 1 $\frac{3}{4}$	2.5
150	115	2 $\frac{7}{8}$	3 $\frac{1}{8}$	3 $\frac{1}{2}$	2 $\frac{1}{4}$ x 2	3.2
200	120	2 $\frac{7}{8}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	2 $\frac{1}{4}$ x 2 $\frac{1}{8}$	3.5
250	125	2 $\frac{7}{8}$	3 $\frac{3}{8}$	3 $\frac{1}{2}$	2 $\frac{1}{4}$ x 2 $\frac{1}{2}$	4.2
300	130	3 $\frac{1}{4}$	3 $\frac{3}{8}$	3 $\frac{7}{8}$	2 $\frac{1}{2}$ x 2 $\frac{7}{8}$	5
500	150	3 $\frac{3}{4}$	4 $\frac{5}{8}$	3 $\frac{7}{8}$	2 $\frac{1}{2}$ x 3 $\frac{1}{8}$	8
750	175	3 $\frac{3}{4}$	5 $\frac{5}{8}$	3 $\frac{7}{8}$	2 $\frac{1}{2}$ x 4 $\frac{1}{8}$	11
1000	1100	4 $\frac{1}{2}$	5	5 $\frac{3}{8}$	3 $\frac{1}{2}$ x 3 $\frac{1}{2}$	13
1500	1150	4 $\frac{1}{2}$	6	5 $\frac{3}{8}$	3 $\frac{1}{2}$ x 4 $\frac{1}{2}$	20
2000	1200	4 $\frac{1}{2}$	7	5 $\frac{3}{8}$	3 $\frac{1}{2}$ x 5 $\frac{1}{2}$	25

UL APPROVED 2 PRONG LINE CORD
RECEPTACLE LOW REGULATION.
BLACK ENAMEL FINISH.

VA	Cat. No.	Width	Depth	Height	Mtg. Centers	Lbs.
120	112-OF	3 $\frac{3}{8}$	2 $\frac{3}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{16}$ x 1 $\frac{7}{8}$	2.5
150	115-OF	3 $\frac{3}{8}$	2 $\frac{3}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{16}$ x 2 $\frac{1}{8}$	3.2
200	120-OF	3 $\frac{3}{8}$	2 $\frac{3}{4}$	2 $\frac{7}{8}$	2 $\frac{1}{16}$ x 2 $\frac{1}{4}$	3.5
250	125-OF	3 $\frac{3}{8}$	3 $\frac{1}{8}$	2 $\frac{7}{8}$	2 $\frac{1}{16}$ x 2 $\frac{5}{8}$	4.2
300	130-OF	3 $\frac{3}{4}$	3 $\frac{1}{4}$	3 $\frac{1}{8}$	3 $\frac{1}{8}$ x 2 $\frac{1}{2}$	5
500	150-OF	3 $\frac{3}{4}$	4 $\frac{1}{4}$	3 $\frac{1}{8}$	3 $\frac{1}{8}$ x 3 $\frac{1}{2}$	8
750	175-OF	3 $\frac{3}{4}$	5 $\frac{1}{4}$	3 $\frac{1}{8}$	3 $\frac{1}{8}$ x 4 $\frac{1}{2}$	11
1000	1100-OF	5 $\frac{1}{4}$	4 $\frac{1}{2}$	4 $\frac{3}{8}$	4 $\frac{3}{8}$ x 3 $\frac{1}{8}$	13
1500	1150-OF	5 $\frac{1}{4}$	5 $\frac{1}{2}$	4 $\frac{3}{8}$	4 $\frac{3}{8}$ x 4 $\frac{1}{8}$	20
2000	1200-OF	5 $\frac{1}{4}$	6 $\frac{1}{2}$	4 $\frac{3}{8}$	4 $\frac{3}{8}$ x 5 $\frac{1}{8}$	25

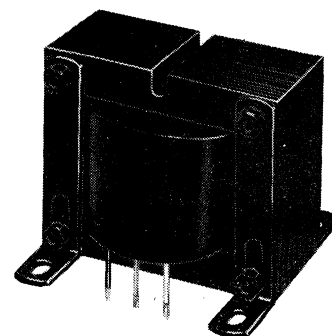
OPEN FRAME STYLE "OF"

(May be used step-up
or step-down)

BLACK ENAMEL FINISH.

8" LEADS

INEXPENSIVE VERSION
FOR USE IN EQUIPMENT.



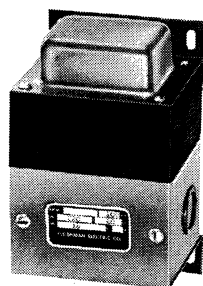
heavy duty-3 to 6 kva 230/115V OR 115/230V MAY BE USED STEP-UP OR STEP-DOWN

"JB." VERY LOW REGULATION. BLACK ENAMEL ENCLOSURES
PANEL MOUNTED. KNOCKOUTS ON ALL SIDES OF JUNCTION BOX.

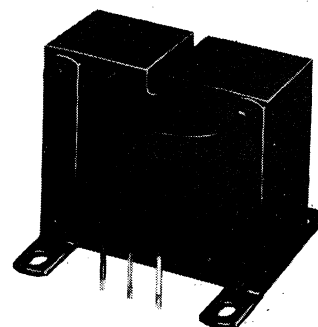
KVA	Cat. No.	Width	Depth	Height	Mtg. Centers	Lbs.
3	1300	9 $\frac{1}{8}$	9 $\frac{1}{8}$	6 $\frac{1}{2}$	8 $\frac{1}{8}$ x 4 $\frac{1}{4}$	35
4	1400	9 $\frac{1}{8}$	9 $\frac{1}{2}$	6 $\frac{1}{2}$	8 $\frac{1}{8}$ x 4 $\frac{3}{4}$	41
5	1500	9 $\frac{1}{8}$	10	6 $\frac{1}{2}$	8 $\frac{1}{8}$ x 5 $\frac{1}{4}$	47
6	1600	9 $\frac{1}{8}$	11 $\frac{1}{4}$	6 $\frac{1}{2}$	8 $\frac{1}{8}$ x 6 $\frac{1}{2}$	60

"OF". BLACK ENAMEL FINISH. OPEN FRAME. 8" LEADS.
INEXPENSIVE VERSION FOR USE IN EQUIPMENT

KVA	Cat. No.	Width	Depth	Height	Mtg. Centers	Lbs.
3	1300-OF	7 $\frac{1}{8}$	5 $\frac{1}{2}$	6 $\frac{1}{8}$	5 $\frac{1}{16}$ x 3 $\frac{3}{4}$	30
4	1400-OF	7 $\frac{1}{8}$	6	6 $\frac{1}{8}$	5 $\frac{1}{16}$ x 4 $\frac{1}{4}$	36
5	1500-OF	7 $\frac{1}{8}$	6 $\frac{1}{2}$	6 $\frac{1}{8}$	5 $\frac{1}{16}$ x 4 $\frac{3}{4}$	41
6	1600-OF	7 $\frac{1}{8}$	7 $\frac{3}{4}$	6 $\frac{1}{8}$	5 $\frac{1}{16}$ x 6	54



STYLE "JB"



STYLE "OF"

industrial grade

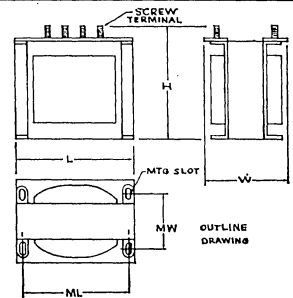
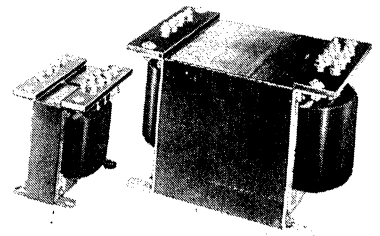
step-up or step-down power isolation-auto transformers

HIGH DEGREE OF VERSATILITY OFFERS MANY POSSIBLE VOLTAGE RATINGS

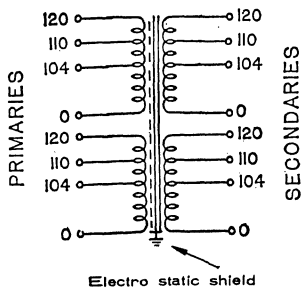
AVAILABLE FROM STOCK FOR IMMEDIATE SHIPMENT

The "DU" and "SU" lines are designed for a maximum of 55°C rise above ambient for use on standard power lines from 50 to 500 Cps. Only prime raw materials are used. Units are thoroughly impregnated and baked with Signal's own high gloss black baking varnish. The transformers are rugged in construction, well-insulated and have a consistently uniform appearance. All ratings are at full load current, continuous operation.

Heavy ¼ inch phenolic terminal boards are provided with plated brass screws and flat washers (10-32 on ¼ and ½ KVA, ¼-20 on larger sizes). Connections can be easily made with a nut driver. It is also simple to alter the inter-connections to change transformer ratings. **Electro static shields are provided grounded to the core.** The connection is made with a lug to ground and may be opened if an ungrounded shield is desired.



DU series 110/220 Dual Primary to 110/220 V. Dual Sec. (Primary & Secondary may be reversed)



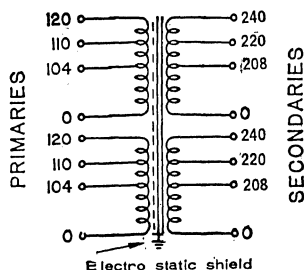
As shown on the schematic diagram the "DU" line is designed with dual primaries and secondaries. All four windings are identically rated at 0/104/110/120 volts. This permits series or parallel connections on either primary or secondary. Therefore, a nominal 110 to 110 volt, 220 to 220 volt, 110 to 220 volt, or 220 to 110 volt transformer can be set up. The winding taps permit intermediate series ratings such as

208, 214, or 230 volts.

It is also possible to make auto-transformer connections by connecting a primary group in series with a secondary group. Such nominal ratings as 440 to 220 volts or 220 to 440 volts can be set-up, in addition to the standard ratings described above. A further advantage to auto-transformer connection is the fact that the KVA rating of a particular type is doubled.

Part No.	KVA	Series Secondaries		Parallel Secondaries		Mechanical Dimensions							Mtg. & Term. Screw	Appr. Lbs.
		Volts	Max. Amps	Volts	Max. Amps	L (Max.)	W (Max.)	H (Max.)	ML ± 1/32	MW ± 1/16				
DU-¼	¼	0/208/220/240	1.1	0/104/110/120	2.2	5½/16	4¼	5¼	4¾	2½	#10	12		
DU-½	½	0/208/220/240	2.3	0/104/110/120	4.6	5½/16	5½	5¼	4¾	3¾	#10	18		
DU-1	1	0/208/220/240	4.5	0/104/110/120	9	7½/16	6¼	7¼	6¾	4¾	¼	33		
DU-2	2	0/208/220/240	9	0/104/110/120	18	7½/16	8¼	7¼	6¾	6	¼	56		
DU-3	3	0/208/220/240	14	0/104/110/120	28	7½/16	9¼	7¼	6¾	7	¼	70		
DU-5	5	0/208/220/240	23	0/104/110/120	46	7½/16	10¾	7¼	6¾	8½	¼	89		
DU-7.5	7.5	0/208/220/240	31	0/104/110/120	62	9	9	8	7½	6½	¼	105		
DU-10	10	0/208/220/240	41	0/104/110/120	83	9	12	8	7½	9	¼	150		

SU series 110/220 Dual Primary to 220/440 V. Dual Sec. (Primary & Secondary may be reversed)



"SU" transformers are similar to "DU" types except that a 220/440 V secondary is provided.

Part No.	KVA	Series Secondaries		Parallel Secondaries		Mechanical Dimensions							Mtg. & Term. Screw	Appr. Lbs.
		Volts	Max. Amps	Volts	Max. Amps	L (Max.)	W (Max.)	H (Max.)	ML ± 1/32	MW ± 1/16				
SU-¼	¼	0/416/440/480	0.55	0/208/220/240	1.1	5½/16	4¼	5¼	4¾	2½	#10	12		
SU-½	½	0/416/440/480	1.15	0/208/220/240	2.3	5½/16	5½	5¼	4¾	3¾	#10	18		
SU-1	1	0/416/440/480	2.25	0/208/220/240	4.5	7½/16	6¼	7¼	6¾	4¾	¼	33		
SU-2	2	0/416/440/480	4.5	0/208/220/240	9	7½/16	8¼	7¼	6¾	6	¼	56		
SU-3	3	0/416/440/480	7	0/208/220/240	14	7½/16	9¼	7¼	6¾	7	¼	70		
SU-5	5	0/416/440/480	11.5	0/208/220/240	23	7½/16	10¾	7¼	6¾	8½	¼	89		
SU-7.5	7.5	0/416/440/480	15.5	0/208/220/240	31	9	9	8	7½	6½	¼	105		
SU-10	10	0/416/440/480	20.5	0/208/220/240	41	9	12	8	7½	9	¼	150		

cut weight, size and cost with

Until the advent of Signal's "2-4-1" Series not much had been done in the design and development of small power transformers to reduce weight and cost.

By incorporating a number of factors into the design of these types we have succeeded in developing a line where for a given VA rating, size, weight, and price are all reduced almost 50%. Hence the name "241" line.

The following features were incorporated into the "241" Series designs:

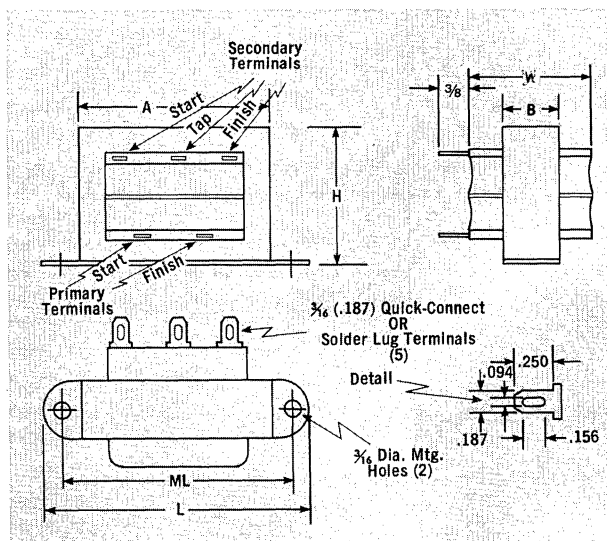
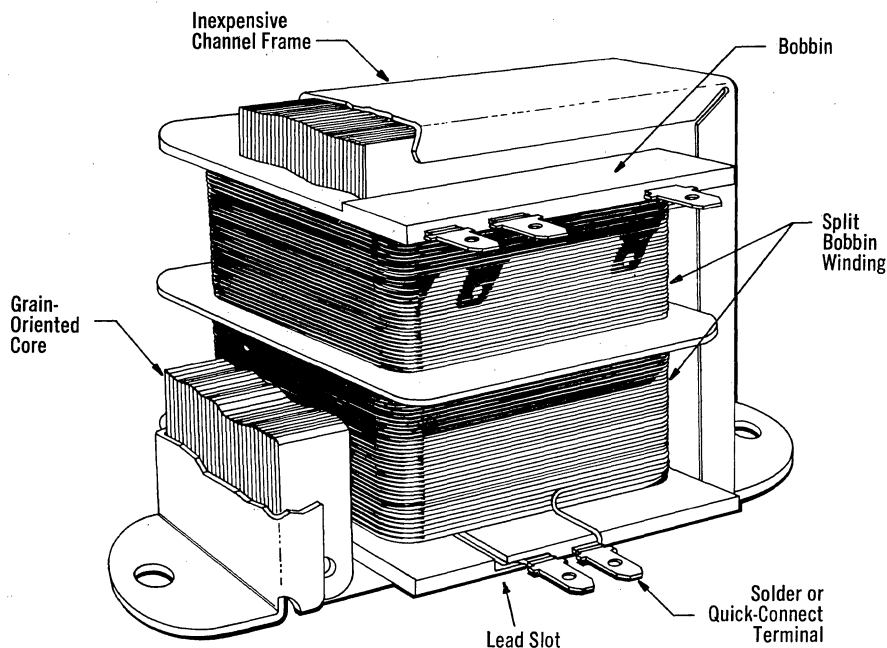
Grain-Oriented Core: By using this type of transformer lamination, with higher saturation flux density and lower core losses, it is possible to reduce the amount of steel and copper required for a given VA rating. Result—less space and weight—lower cost.

Bobbin Winding: Gives more effective utilization of winding area so that the space required for winding is reduced. Automated bobbin winding operation reduces winding time. Again—less space and weight—time savings—lower cost.

Split Bobbin: This special design "splits" the primary and secondary so that they are wound side by side, separated by a bobbin wall. They are not wound concentrically. The result is a better performing design which saves on assembly cost. There is no cross-over of primary and secondary leads, no taping is required over the primary to insulate it from the secondary, a "lead slot" in the bobbin wall eliminates the need to tape start leads. Aside from saving labor costs, the added isolation between windings reduces the capacitance and coupling and minimizes the need for an electro-static shield. 2500V hipot is standard.

Special Terminals: Which are in the bobbin wall can be used as $\frac{3}{16}$ (.187) quick-connects or as solder lugs. This can solve user application problems.

Class "S" Insulation: Rated 125°C maximum total temperature means these designs can be used continuously in ambient temperatures up to 85°C.

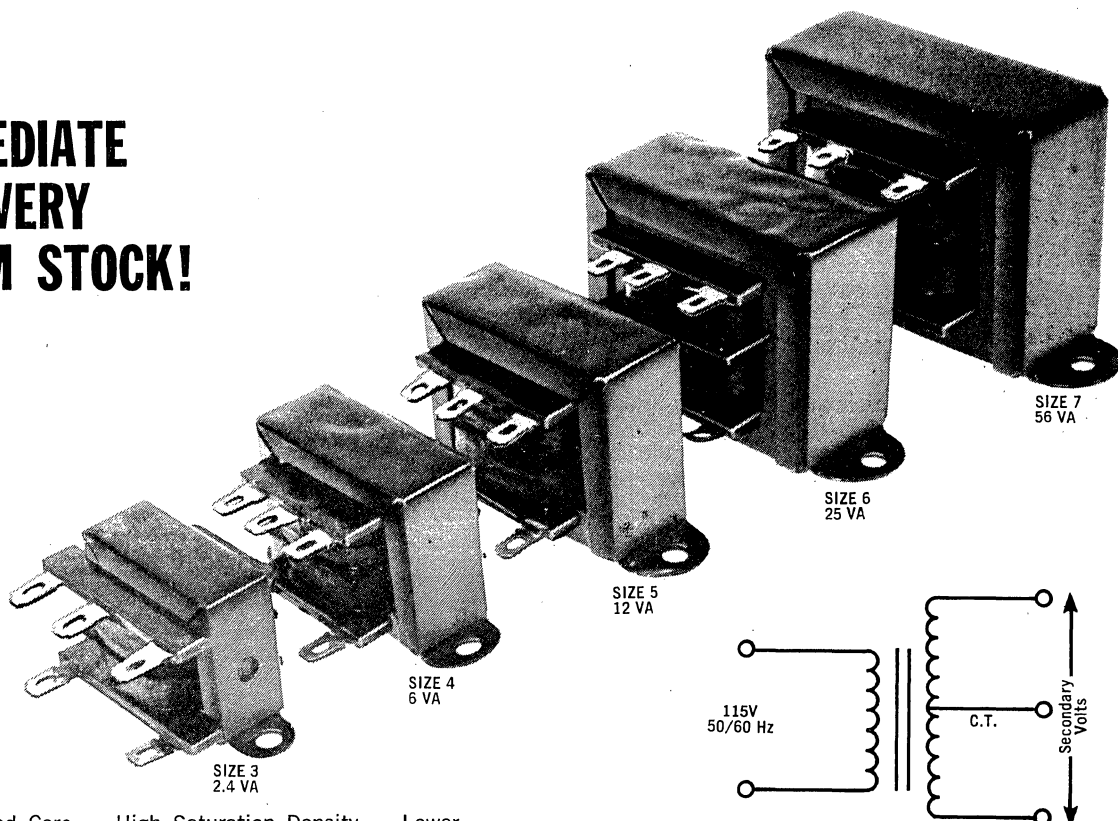


DIMENSIONS

SIZE	VA	L	W	H	A	B	ML	LBS.
3	2.4	2 $\frac{1}{16}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$	1 $\frac{1}{16}$	$\frac{1}{16}$	1 $\frac{3}{4}$	0.25
4	6	2 $\frac{3}{16}$	1 $\frac{1}{4}$	1 $\frac{1}{8}$	1 $\frac{1}{16}$	$\frac{1}{16}$	2	0.44
5	12	2 $\frac{13}{16}$	1 $\frac{3}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{16}$	$\frac{1}{16}$	2 $\frac{3}{8}$	0.7
6	25	3 $\frac{1}{4}$	1 $\frac{1}{2}$	1 $\frac{1}{8}$	2 $\frac{1}{16}$	$\frac{1}{16}$	2 $\frac{1}{2}$	1.1
7	56	3 $\frac{11}{16}$	1 $\frac{13}{16}$	2 $\frac{1}{4}$	2 $\frac{1}{16}$	$\frac{1}{16}$	3 $\frac{1}{8}$	1.7

"2 for 1" series of small power transformers

**IMMEDIATE
DELIVERY
FROM STOCK!**



- Grain-Oriented Core — High Saturation Density — Lower Core Loss — Less Steel and Copper.
- Bobbin Wound — Maximum Utilization of Winding Area — Space and Size Reduced.
- Split Bobbin — Non-Concentric Winding — Lower Capacitance — Better Insulation — 2500V Hipot — No Need for Electro-Static Shield.
- Special Terminal — Solder or Quick-Connect.

METHOD OF DETERMINING SECONDARY CURRENT RATINGS WHEN USED IN RECTIFIER CIRCUIT

Rectifier Type	Filter Type	RMS Secondary Current
Full Wave Center-Tap	Choke Input	.7 x DC Amps
Full Wave Center-Tap	Capacitor Input	1.2 x DC Amps
Full Wave Bridge	Choke Input	= to DC Amps
Full Wave Bridge	Capacitor Input	1.8 x DC Amps

CUSTOM VARIATIONS

Signal is equipped to quote on custom variations of our "241" Types. This service is restricted to designs with a single primary and single secondary, with or without center-tap (a maximum of 5 terminals). The power limit is approximately 60 to 70 VA.

We answer requests promptly and can deliver prototypes in one to three weeks. Production runs can be scheduled with very reasonable lead times.

SECONDARY			SECONDARY		
Volts	Amps	Part No.*	Volts	Amps	Part No.*
10 V. C.T.	0.25A	241-3-10	28 V. C.T.	0.085A	241-3-28
	0.6	241-4-10		0.2	241-4-28
	1.2	241-5-10		0.42	241-5-28
	2.5	241-6-10		0.9	241-6-28
	5.0	241-7-10		2.0	241-7-28
12.6 V. C.T.	0.2A	241-3-12	36 V. C.T.	0.065A	241-3-36
	0.5	241-4-12		0.17	241-4-36
	1.0	241-5-12		0.35	241-5-36
	2.0	241-6-12		0.7	241-6-36
	4.0	241-7-12		1.5	241-7-36
16 V. C.T.	0.15A	241-3-16	48 V. C.T.	0.05A	241-3-48
	0.4	241-4-16		0.125	241-4-48
	0.8	241-5-16		0.25	241-5-48
	1.5	241-6-16		0.5	241-6-48
	3.5	241-7-16		1.2	241-7-48
20 V. C.T.	0.12A	241-3-20	56 V. C.T.	0.045A	241-3-56
	0.3	241-4-20		0.11	241-4-56
	0.6	241-5-20		0.22	241-5-56
	1.25	241-6-20		0.45	241-6-56
	2.8	241-7-20		1.0	241-7-56
24 V. C.T.	0.1A	241-3-24	120 V. C.T.	0.02A	241-3-120
	0.25	241-4-24		0.05	241-4-120
	0.5	241-5-24		0.1	241-5-120
	1.0	241-6-24		0.2	241-6-12
	2.4	241-7-24		0.5	241-7-120

*Explanation of Part Number Series — 2-4-1 Size — 4 Sec. Volts — 36

SIGNAL TRANSFORMER CO., INC. / 1 JUNIUS STREET / BROOKLYN, NEW YORK 11212 / (212) 498-5111 / TELEX 12-5709

TRANSFORMERS PRICE LIST

MAY 1, 1974

Part No.	User Net	Part No.	User Net	Part No.	User Net	Part No.	User Net	Part No.	User Net
10-0.1	\$5.75	68-0.1	\$6.55	CH-30	\$51.00	PC 10-90	\$4.80	DPC 24-35	\$5.80
10-0.25	6.00	68-0.25	7.70	CH-50	58.70	PC 10-120	4.60	DPC 24-50	5.50
10-0.5	6.20	68-0.5A	8.35	CH-100	66.50	PC 10-440	4.80	DPC 24-180	5.70
10-1	6.70	68-0.5	10.90	CH-200	106.00	PC 10-1000	5.05	DPC 24-450	6.00
10-2	8.40	68-1	12.30	CH-250	115.00	PC 10-2400	6.65	DPC 24-1000	7.60
10-4	10.80	68-2	17.10	CH-500	123.00	PC 12-70	4.80	DPC 34-25	5.80
10-6	14.30	68-4	29.50	CH-1000	138.00	PC 12-100	4.60	DPC 34-35	5.50
10-8	15.10	68-6	32.00	CL-1-2	5.40	PC 12-350	4.80	DPC 34-125	5.70
10-12	17.00	68-8	36.50	CL-2-4	6.60	PC 12-800	5.05	DPC 34-300	6.00
10-25	26.50	68-12	63.00	CL-4-8	11.00	PC 12-2000	6.65	DPC 34-700	7.60
10-50	42.00	68-25	80.00	CL-6-12	12.80	PC 16-55	4.80	DPC 40-20	5.80
10-100	71.00	68-50	148.00	CL-12-24	19.00	PC 16-75	4.60	DPC 40-30	5.50
12-8-0.1	5.80	80-0.1	6.65	CL-25-50	20.30	PC 16-260	4.80	DPC 40-110	5.70
12-8-0.25	6.15	80-0.25	8.40	CL-50-100	25.00	PC 16-640	5.05	DPC 40-250	6.00
12-8-0.5	6.60	80-0.5A	9.10	6-250	100.00	PC 16-1500	6.65	DPC 40-600	7.60
12-8-1	7.15	80-0.5	11.20	9-250	130.00	PC 20-45	4.80	DPC 56-15	5.80
12-8-2A	8.30	80-1	13.15	12-250	140.00	PC 20-60	4.60	DPC 56-20	5.50
12-8-2	10.00	80-2	19.25	6-500	138.00	PC 20-220	4.80	DPC 56-80	5.70
12-8-4	12.00	80-4	32.90	9-500	180.00	PC 20-500	5.05	DPC 56-180	6.00
12-8-6	13.80	80-6	37.50	12-500	223.00	PC 20-1200	6.65	DPC 56-420	7.60
12-8-8	14.30	80-8	46.00	3-1000	147.00	PC 24-35	4.80	DPC 88-10	5.80
12-8-12	19.25	80-12	71.50	6-1000	237.00	PC 24-50	4.60	DPC 88-15	5.50
12-8-25	29.70	80-25	95.00	3PH-24-50	140.00	PC 24-180	4.80	DPC 88-50	5.70
12-8-50	44.00	80-50	175.00	3PH-24-100	200.00	PC 24-450	5.05	DPC 88-120	6.00
12-8-100	72.00	88-0.1	6.85	3PH-24-200	320.00	PC 24-1000	6.65	DPC 88-270	7.60
16-0.1	6.00	88-0.25	8.75	3PH-48-30	140.00	PC 34-25	4.80	DPC 120-8	5.80
16-0.25	6.25	88-0.5	9.30	3PH-48-60	200.00	PC 34-35	4.60	DPC 120-10	5.50
16-0.5	6.50	88-1	13.60	3PH-48-120	320.00	PC 34-125	4.80	DPC 120-35	5.70
16-1	7.25	88-2	19.50	DU-1/4	41.50	PC 34-300	5.05	DPC 120-85	6.00
16-2	8.60	88-4	34.00	DU-1/2	52.90	PC 34-700	6.65	DPC 120-200	7.60
16-4	13.00	88-6	38.20	DU-1	89.00	PC 40-20	4.80	10-BR	.35
16-6	15.50	88-8	47.40	DU-2	128.00	PC 40-30	4.60	24-BR	.35
16-8	16.80	88-12	73.20	DU-3	181.00	PC 40-110	4.80	LP 10-600	7.60
16-12	20.20	88-25	98.00	DU-5	239.00	PC 40-250	5.05	LP 12-450	7.60
16-25	37.50	88-50	178.50	DU-7.5	307.00	PC 40-600	6.65	LP 16-350	7.60
16-50	65.00	120-0.5	12.80	DU-10	375.00	PC 56-15	4.80	LP 20-300	7.80
16-100	85.00	120-1	18.00	SU-1/4	42.70	PC 56-20	4.60	LP 24-250	7.80
24-0.1	6.05	120-2	24.00	SU-1/2	54.40	PC 56-80	4.80	LP 34-170	7.80
24-0.25	6.50	120-4	38.00	SU-1	90.70	PC 56-180	5.05	LP 40-150	7.80
24-0.5	7.00	120-6	58.00	SU-2	130.00	PC 56-420	6.65	LP 56-100	8.00
24-1A	8.00	120-8	70.00	SU-3	184.00	PC 88-10	4.80	LP 88-65	8.00
24-1	9.80	120-12	78.00	SU-5	241.00	PC 88-15	4.60	LP 120-50	8.00
24-2	11.40	120-20	110.00	SU-7.5	310.00	PC 88-50	4.80	LP 230-25	8.00
24-4	13.90	160-0.5	13.50	SU-10	378.00	PC 88-120	5.05	ALL 241-3	3.30
24-6	18.50	160-1	19.40	112	12.00	PC 88-270	6.65	ALL 241-4	3.70
24-8	22.80	160-2	29.00	115	12.85	PC 120-8	4.80	ALL 241-5	4.35
24-12	28.80	160-4	44.00	120	13.70	PC 120-10	4.60	ALL 241-6	5.15
24-20	38.00	160-6	70.00	125	14.80	PC 120-35	4.80	ALL 241-7	6.50
24-25	44.50	160-8	69.00	130	17.00	PC 120-85	5.05		
24-50	70.00	160-12	88.00	150	21.00	PC 120-200	6.65		
24-100	102.00	180-0.5	13.90	175	27.50	DPC 10-90	5.80		
36-0.1	6.10	180-1	21.50	1100	36.00	DPC 10-120	5.50		
36-0.25	6.75	180-2	31.70	1150	45.00	DPC 10-440	5.70		
36-0.5	7.55	180-4	50.50	1200	55.00	DPC 10-1000	6.00		
36-1A	9.00	180-6	70.00	1300	88.00	DPC 10-2400	7.60		
36-1	10.20	180-8	74.00	1400	105.00	DPC 12-70	5.80		
36-2	13.00	180-12	105.00	1500	115.00	DPC 12-100	5.50		
36-4	18.75	230-0.5	18.30	1600	130.00	DPC 12-350	5.70		
36-6	23.80	230-1	24.30	112-OF	9.30	DPC 12-800	6.00		
36-8	27.25	230-2	39.00	115-OF	9.90	DPC 12-2000	7.60		
36-12	34.50	230-4	69.00	120-OF	10.70	DPC 16-55	5.80		
36-20	60.00	230-6	75.00	125-OF	12.00	DPC 16-75	5.50		
36-25	70.00	300-0.5	18.90	130-OF	13.80	DPC 16-260	5.70		
36-30	73.00	300-1	31.30	150-OF	18.00	DPC 16-640	6.00		
36-50	80.00	300-2	43.50	175-OF	24.00	DPC 16-1500	7.60		
36-100	157.00	300-4	73.00	1100-OF	32.00	DPC 20-45	5.80		
56-0.1	6.35	CH-0.5	5.50	1150-OF	43.00	DPC 20-60	5.50		
56-0.25	7.50	CH-1	8.00	1200-OF	52.00	DPC 20-220	5.70		
56-0.5	8.20	CH-2	9.40	1300-OF	74.00	DPC 20-500	6.00		
56-1	12.20	CH-4	14.40	1400-OF	90.00	DPC 20-1200	7.60		
56-2	15.25	CH-6	17.60	1500-OF	102.00				
56-4	24.00	CH-8	22.20	1600-OF	115.00				
56-6	31.00	CH-12	29.00						
56-8	35.80	CH-16	32.40						
56-12	58.00	CH-20	30.40						
56-25	78.00	CH-25	42.50						
56-50	145.00								
56-100	219.00								

OEM DISCOUNT SCHEDULE

Qty.	Discount
1-4	NET
5-9	10%
10-24	23%
25-49	32%
50-99	40%
100-249	48%

Terms: Net 30 Days
on Approved Credit.
F.O.B. Factory, N. Y.

**PRICES SUBJECT
TO CHANGE
WITHOUT
NOTICE!**



step-up/step-down ISOLATION – AUTO transformers

STEP-DOWN ISOLATION TRANSFORMERS

PRIMARY: 240 Volts • 50/60 HZ • Line Cord and Plug*

SECONDARY: 120 Volts • Standard Female Receptacle

• Electrostatic Shield • UL Approved Cord and Plug.

Cat No.	VA Watts	Style	DIMENSIONS			Mounting Centers		Appr. Wt.	Net Price
			L	W	H	M1	M2		
S2-50	50	A	2 ³ / ₃₂	3 ¹ / ₁₆	3 ¹ / ₂	2 ¹ / ₄	1 ¹ / ₁₆	3	\$14.81
S2-100	100	A	3 ⁷ / ₃₂	3 ⁷ / ₈	3 ⁷ / ₈	2 ¹ / ₂	2 ³ / ₁₆	5	19.15
S2-150	150	A	3 ¹ / ₂	4 ³ / ₈	4 ¹ / ₄	2 ³ / ₄	2 ¹ / ₁₆	7	21.74
S2-220	220	A	3 ⁷ / ₃₂	4 ⁵ / ₈	4 ⁵ / ₈	3	3 ¹ / ₁₆	9.5	24.17
S2-330	330	A	4 ¹ / ₃₂	5 ¹ / ₄	5 ¹ / ₁₆	3 ¹ / ₂	3 ¹ / ₄	14.5	35.43
S2-500	500	A	4 ¹ / ₂	6 ¹ / ₄	5 ¹ / ₁₆	3 ¹ / ₂	4 ¹ / ₄	21	38.64
S2-700	700	A	5 ¹ / ₂	5 ¹ / ₁₆	6 ¹ / ₁₆	4 ¹ / ₄	3 ¹ / ₂	25	45.46
S2-1000	1000	A	5 ¹ / ₂	6 ¹ / ₁₆	6 ¹ / ₁₆	4 ¹ / ₄	4 ¹ / ₂	35	76.83
S2-1500	1500	B	9	7 ³ / ₄	6 ¹ / ₁₆	8 ¹ / ₄	4 ³ / ₈	42	91.81
S2-2200	2200	B	9	9 ³ / ₈	6 ⁵ / ₁₆	8 ¹ / ₄	6	65	112.74
S2-3300	3300	B	9	11 ⁵ / ₈	6 ⁵ / ₁₆	8 ¹ / ₄	8 ¹ / ₄	95	177.16

*Style A Only; Style B — Knockouts for Conduit Connectors.

ISOLATION TRANSFORMERS

PRIMARY: 120 Volts • 50/60 HZ • Line Cord and Plug*

SECONDARY: 120 Volts • Standard Female Receptacle

• Electrostatic Shield • UL Approved Cord and Plug.

Cat No.	VA Watts	Style	DIMENSIONS			Mounting Centers		Appr. Wt.	Net Price
			L	W	H	M1	M2		
S1-50	50	A	2 ³ / ₃₂	3 ¹ / ₁₆	3 ¹ / ₂	2 ¹ / ₄	1 ¹ / ₁₆	3	\$14.81
S1-100	100	A	3 ⁷ / ₃₂	3 ⁷ / ₈	3 ⁷ / ₈	2 ¹ / ₂	2 ³ / ₁₆	5	19.15
S1-150	150	A	3 ¹ / ₂	4 ³ / ₈	4 ¹ / ₄	2 ³ / ₄	2 ¹ / ₁₆	7	21.74
S1-220	220	A	3 ⁷ / ₃₂	4 ⁵ / ₈	4 ⁵ / ₈	3	3 ¹ / ₁₆	9.5	24.17
S1-330	330	A	4 ¹ / ₃₂	5 ¹ / ₄	5 ¹ / ₁₆	3 ¹ / ₂	3 ¹ / ₄	14.5	35.43
S1-500	500	A	4 ¹ / ₂	6 ¹ / ₄	5 ¹ / ₁₆	3 ¹ / ₂	4 ¹ / ₄	21	38.52
S1-700	700	A	5 ¹ / ₂	5 ¹ / ₁₆	6 ¹ / ₁₆	4 ¹ / ₄	3 ¹ / ₂	25	45.46
S1-1000	1000	A	5 ¹ / ₂	6 ¹ / ₁₆	6 ¹ / ₁₆	4 ¹ / ₄	4 ¹ / ₂	35	76.83
S1-1500	1500	B	9	7 ³ / ₄	6 ¹ / ₁₆	8 ¹ / ₄	4 ³ / ₈	42	91.81
S1-2200	2200	B	9	9 ³ / ₈	6 ⁵ / ₁₆	8 ¹ / ₄	6	65	112.74
S1-3300	3300	B	9	11 ⁵ / ₈	6 ⁵ / ₁₆	8 ¹ / ₄	8 ¹ / ₄	95	177.16

*Style A Only; Style B — Knockouts for Conduit Connectors.

STEP-DOWN AUTO TRANSFORMERS

PRIMARY: 240 Volts • 50/60 HZ • Line Cord and Plug*

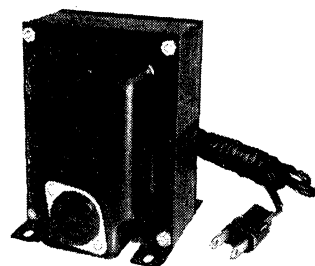
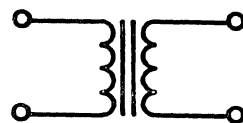
SECONDARY: 120 Volts • Standard Female Receptacle

• UL Approved Cord and Plug.

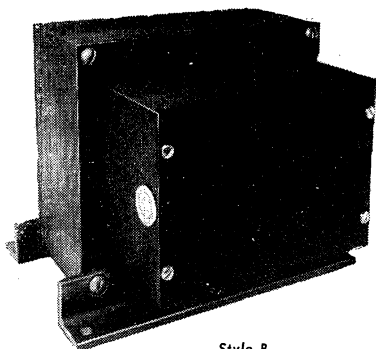
Cat No.	VA Watts	Style	DIMENSIONS			Mounting Centers		Appr. Wt.	Net Price
			L	W	H	M1	M2		
SA-100	100	A	2 ³ / ₃₂	3 ¹ / ₁₆	3 ¹ / ₂	2 ¹ / ₄	1 ¹ / ₁₆	3	\$13.20
SA-150	150	A	2 ³ / ₃₂	3 ³ / ₄	3 ¹ / ₂	2 ¹ / ₄	2 ³ / ₁₆	4	15.14
SA-200	200	A	3 ⁷ / ₃₂	3 ⁷ / ₈	3 ⁷ / ₈	2 ¹ / ₄	2 ³ / ₁₆	5	19.33
SA-300	300	A	3 ¹ / ₂	4 ³ / ₈	4 ¹ / ₄	2 ³ / ₄	2 ¹ / ₁₆	7	24.64
SA-450	450	A	3 ⁷ / ₃₂	4 ⁵ / ₈	4 ⁵ / ₈	3	3 ¹ / ₁₆	9 ¹ / ₂	27.54
SA-650	650	A	4 ¹ / ₃₂	5 ¹ / ₄	5 ¹ / ₁₆	3 ¹ / ₂	3 ¹ / ₄	14 ¹ / ₂	32.53
SA-1000	1000	A	4 ¹ / ₂	6 ¹ / ₄	5 ¹ / ₁₆	3 ¹ / ₂	4 ¹ / ₄	21	37.84
SA-1500	1500	A	5 ¹ / ₂	5 ¹ / ₁₆	6 ¹ / ₁₆	4 ¹ / ₄	3 ¹ / ₂	25	54.75
SA-2000	2000	A	5 ¹ / ₂	6 ¹ / ₁₆	6 ¹ / ₁₆	4 ¹ / ₄	4 ¹ / ₂	35	67.80
SA-3000	3000	B	9	7 ³ / ₄	6 ¹ / ₁₆	8 ¹ / ₄	4 ³ / ₈	42	93.41
SA-4500	4500	B	9	9 ³ / ₈	6 ⁵ / ₁₆	8 ¹ / ₄	6	65	120.79
SA-6500	6500	B	9	11 ⁵ / ₈	6 ⁵ / ₁₆	8 ¹ / ₄	8 ¹ / ₄	95	169.11
SA-8000**	8000	B	10 ³ / ₈	9 ⁵ / ₈	8 ¹ / ₄	9 ⁵ / ₈	6 ⁵ / ₈	90	193.26
SAB-5300†	5300	A	5 ¹ / ₄	8 ¹ / ₁₆	4	3 ¹ / ₄	6 ¹ / ₂	17.5	86.97

*Style A Only **60 HZ Only Style B — Knockouts for Conduit Connector

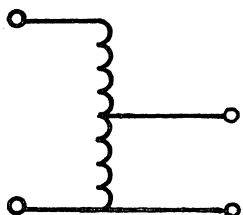
†Step-up/down Auto Transformer. Connections for 208/230 V or 230/208 V, 23 Amp 50/60 HZ



Style A



Style B



STERLING TRANSFORMER CORP.

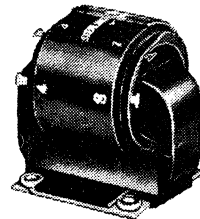
510 DRIGGS AVENUE • BROOKLYN, NEW YORK 11211 • TELEPHONE: (212) 782-4200



ENCAPSULATED **400 cps** *transformers* CLIPPER SERIES

Fig.	Cat. No.	Sec. Volts	Sec. Amp	Insul. Volts (RMS)	Pri. Volts	Mold Size	Net Price
19	4C1	6.3 CT	0.8	1500	115	SM3	\$22.22
19	4C2	6.3 CT	1.2	1500	115	SM2	22.22
19	4C3	6.3 CT	6.8	1500	110/115/120	2	35.67
20	4C4	6.3 6.3	4.9 2.7	1500	115	3	31.89
19	4C5	6.3 CT	7.2	1500	115	35	37.04
21	4C6	6.3 6.3 6.3	7 7 1.5	1500 1500 1500	120	35	36.07
22	4C7	6.3 CT 6.3 CT	7 7	1500 1500	120	4	42.93
21	4C8	6.3 6.3 6.3	13.7 2.9 0.3	1500 1500 1500	115	4	42.93
19	4C9	6.3 CT	12.3	1500	115	5	39.70
21	4C11	6.3 6.3 6.3	2.4 2.5 2.7	1500	115	3	39.70
19	4C26	6.3 CT	2	1500	115	SM1	28.27
19	4C27	6.3 CT	3	1500	115	1A	29.39
19	4C28	6.3 CT	5	1500	115	2	30.44
19	4C29	5 CT	3	2500	115	SM1	28.27
19	4C30	5 CT	6	2500	115	2	30.44
19	4C31	8.5 CT	12	1500	115	5	39.66
19	4C32	8.5 CT	23	1500	115	7	43.96
19	4C33	8.5 CT	35	1500	115	8	47.92
19	4C34	8.5 CT	45	1500	115	9	57.81
18	4C12	14.1	3	1500	115	3	30.25
19	4C35	21 CT	4.5	1500	115	5	39.66
19	4C13	21 CT	9	1500	115	7	34.31
19	4C36	21 CT	18	1500	115	9	57.81
19	4C10	20 CT	0.6	1500	115	SM1	28.27

FREQUENCY
380-1000 cps



FOR MINIMUM SIZE &
MINIMUM WEIGHT
• CONTOUR MOLDED
• HIPERSIL CORES

MIL-T27C
Specifications

MIL Type
TF5SX01ZZ
85°C Max. Ambient
130°C Max.
Oper. Temp.

HIGH SHOCK
EXTREME
ENVIRONMENT
CONDITIONS
LIGHTWEIGHT FOR
AIRBORNE USE
10,000 HOUR
PLUS-LIFE
SERVO
APPLICATIONS
ISOLATIONS
POWER SUPPLIES
AIRBORNE CONTROL
CIRCUITS
MISSILE CIRCUITS



FIG. 18



FIG. 19

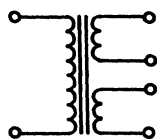


FIG. 20

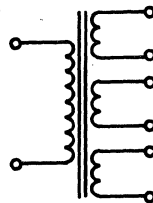


FIG. 21

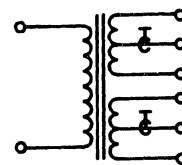


FIG. 22

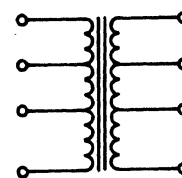


FIG. 23

STERLING TRANSFORMER CORPORATION

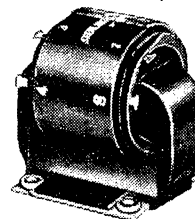
510 DRIGGS AVENUE • BROOKLYN, NEW YORK 11211 • TELEPHONE: (212) 782-4200



ENCAPSULATED **400 cps** *transformers* CLIPPER SERIES

Fig.	Cat. No.	Sec. Volts	Sec. Amp.	Insul. Volts (RMS)	Pri. Volts	Mold Size	Net Price
19	4C37	21 CT	24	1500	115	10	\$69.42
19	4C38	24 CT	4	1500	115	5	39.66
19	4C39	24 CT	8	1500	115	7	43.96
19	4C40	24 CT	16	1500	115	9	57.81
19	4C41	24 CT	21	1500	115	10	69.42
18	4C14	26	0.5	1500	115	SM1	27.57
19	4C15	26 CT	1.5	1500	115	3	28.50
19	4C23	26 CT	3	1500	115	4	34.31
19	4C24	26 CT	5	1500	115	6	40.03
22	4C16	28 CT 6.3 CT	0.8 7	1500	115	3	42.86
19	4C42	41 CT	2.3	1500	115	5	39.66
19	4C43	41 CT	4.5	1500	115	7	43.96
19	4C44	41 CT	9	1500	115	9	57.81
19	4C45	41 CT	12	1500	115	10	69.42
19	4C46	48 CT	2	1500	115	5	39.66
19	4C47	48 CT	4	1500	115	7	43.96
19	4C48	48 CT	8	1500	115	9	57.81
19	4C49	48 CT	10	1500	115	10	69.42
19	4C25	52 CT	2	1500	115	5	39.66
19	4C17	52 CT	0.2	1500	115	SM1	30.76
19	4C18	90 CT	4.5	1500	115	9	57.81
18	4C19	115	.05	1500	115	SM2	22.72
18	4C21	115	2.8	1500	115	8	47.08
23	4C20	105/115/125	0.4	1500	105/115/125	2	32.69
23	4C50	105/115/125	1	1500	105/115/125	6	41.47
23	4C51	105/115/125	2.4	1500	105/115/125	8	48.63
23	4C52	105/115/125	3.2	1500	105/115/125	9	53.30
23	4C53	105/115/125	4	1500	105/115/125	10	70.38
18	4C22	334	.025	1500	115	SM1	25.96

FREQUENCY
380-1000 cps



FOR MINIMUM SIZE &
MINIMUM WEIGHT
• CONTOUR MOLDED
• HIPERSIL CORES

MIL-T27C
Specifications

MIL Type
TF5SX01ZZ
85°C Max. Ambient
130°C Max.
Oper. Temp.

HIGH SHOCK
EXTREME
ENVIRONMENT
CONDITIONS
LIGHTWEIGHT FOR
AIRBORNE USE
10,000 HOUR
PLUS-LIFE
SERVO
APPLICATIONS
ISOLATIONS
POWER SUPPLIES
AIRBORNE CONTROL
CIRCUITS
MISSILE CIRCUITS

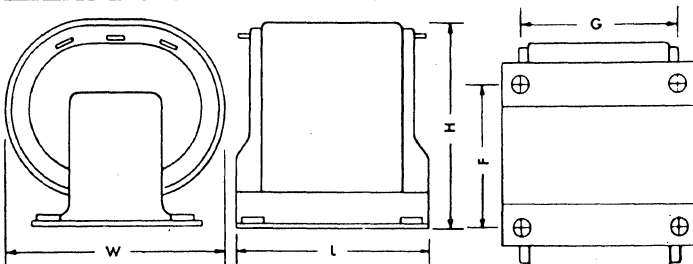
Mold No.	Overall Dimen.			Mtg. Dimen.		App. Wt. (Lbs.)	Mtg. Meth.
	L	W	H	F	G		
SM3	1 1/2	1 1/4	1 1/4	1	Note 1	0.06	Note 1
SM2	1 1/2	1 1/4	1 1/4	1	Note 1	0.10	Note 1
SM1	1 1/2	1 1/2	1 1/4	1 1/8	Note 1	0.16	Note 1
1	1 1/4	1 7/8	1 1/4	1 1/4	1 1/8	0.25	Note 2
1A	1 1/4	1 1/2	1 1/4	1 1/8	1 1/8	0.25	Note 2
2	2	1 1/4	2 1/8	1 1/2	1 1/4	0.40	Note 2
3	2 1/4	1 1/4	2 1/8	1 1/2	1 1/4	0.45	Note 2
35	2 1/4	2 3/8	2 1/4	1 1/2	1 1/4	0.70	Note 2
4	2 1/4	2 3/8	2 1/4	1 1/2	1 1/4	0.90	Note 2
5	2 3/4	2 3/8	2 7/8	1 1/2	2 1/4	1.20	Note 2
6	2 3/4	2 3/8	3 1/8	1 1/2	2 1/4	1.50	Note 2
7	3	2 7/8	3 3/8	1 3/2	2 1/2	2.00	Note 2
8	3 3/8	2 7/8	3 3/8	1 3/2	2 1/2	2.50	Note 2
83	3 3/4	3 1/4	3 3/8	2 1/4	3	3.25	Note 3
86	3 3/4	3 3/4	3 3/8	2 3/4	3 1/8	4.25	Note 3
9	4 1/4	3 3/8	3 7/8	2 3/4	3 1/2	5.00	Note 3
10	4 1/2	3 1/4	3 3/4	2 3/4	3 1/8	6.00	Note 3

Note 1 —
SM Series are two hole mounting with holes on center line. #4-40 Pem nuts are fastened to the bracket.

Note 2 —
#6-32 Pem nuts on bracket are standard.

Note 3 —
#8-32 Pem nuts on bracket are standard.

- All primaries 380-1000 cps
- Dielectric test voltages:
PRIMARYS 1500 Volts RMS
SECONDARIES 1500 Volts RMS
- Epoxy resin used as encapsulant
- Prices subject to change without notice



STERLING TRANSFORMER CORPORATION

510 DRIGGS AVENUE • BROOKLYN, NEW YORK 11211 • TELEPHONE: (212) 782-4200

transistor transformers



UNIVERSAL DC POWER MODULE TRANSFORMERS

High reliability transformers having a tapped primary and single or dual secondary windings which may be connected F.W. bridge or F.W. center tap so as to obtain a wide range of DC voltages and current ratings.

INPUT PRIMARY 115 volts 50-500 cps

TYPE	FIG.		F.W. BRIDGE								F.W. CT			MIL STD'D* HERM SEAL TF 45x02		INDUST. OPEN FRAME	
		AC VOLT	40 5	32.25	28.5	24	20.25	16 5	12	8.25	40.5	24	16.5	Style	Net Pr.	Style	Net Pr.
7K1	1	DC VOLT	53.0	41.0	34	25	24	18	12	6	24	12	6.6	H	\$20.77	F	\$12.72
		DC AMP	.025	.035	.040	.042	.055	.042	.070	.085	.042	.055	.068				
		INPUT CAP	(.1)	(.1)	(.1)	(.1)	(.2)	(.2)	(.2)	(.2)	(.2)	(.2)	(.2)				
7K2	1	DC AMP	.085	.12	.13	.14	.18	.14	.23	.23	.14	.17	.21	H	22.87	L	14.81
		INPUT CAP	(.1)	(.1)	(.1)	(.1)	(.2)	(.2)	(.2)	(.2)	(.2)	(.2)	(.2)				
		DC AMP	.48	.60	.60	.64	1.0	.8	1.2	1.52	.8	.883	.92				
7K3	1	INPUT CAP	(.5)	(.5)	(.5)	(.5)	(1.0)	(1.0)	(2.0)	(2.0)	(1.0)	(1.0)	(2.0)	H	25.53	F	13.13
		DC AMP	1.2	1.5	1.5	1.6	2.5	2.0	3.0	3.8	2.0	2.2	2.8				
		INPUT CAP	(.5)	(.5)	(.5)	(.5)	(1.0)	(1.0)	(2.0)	(2.0)	(1.0)	(1.0)	(2.0)				
7K4	1	DC AMP	3.0	3.5	3.8	4.0	6.0	4.5	7.5	9.0	4.5	5.5	6.7	H	51.05	L	36.49
		INPUT CAP	(1.0)	(1.0)	(1.0)	(1.0)	(2.0)	(2.0)	(4)	(4)	(2.0)	(2.0)	(2.0)				
		DC AMP	7.5	8.5	9.5	10	15	11	19	23	11	13.5	17				
7K6	1	INPUT CAP	(4.0)	(4.0)	(4.0)	(4.0)	(4.0)	(6.0)	(12)	(12)	(6)	(6)	(12)	H	85.03	L	58.27
		DC VOLT	81	64.5	57.0	48	40.5	33	24	16.5	81	48	33				
		DC VOLT	106	82	68	50	48	36	24	12	48	24	13				
7K7	2	DC AMP	0.6	0.75	0.75	0.8	1.25	1.0	1.5	1.9	1.0	1.1	1.4	H	36.12	L	22.55
		INPUT CAP	(.125)	(.125)	(.125)	(.125)	(.25)	(.25)	(.5)	(0.5)	(.25)	(.25)	(.5)				
		DC VOLT	20CT	0.3	16.5	0.3	26	0.2	(.2)	8	0.43	12	0.3					(.5)

TYPE FIG.		PRI TAP	F.W. BRIDGE								F.W. CT					MIL STD * HERM SEAL		INDUST. OPEN FRAME	
			SEC.		CHOKE	INPUT	CAP	INPUT		CHOKE	INPUT	CAP	INPUT		Style	Net Pr.	Style	Net Pr.	
7K8	3	—	20CT	0.3	16.5	0.3	26	0.2	(.2)	8	0.43	12	0.3	(.5)	H	\$18.12	F	\$9.17	
7K9	3	—	20CT	0.6	16.5	0.6	26	0.4	(.4)	9	0.85	13	0.6	(1.0)	H	22.87	F	13.94	
F.W. BRIDGE																			
		SEC. in PARALLEL CONN.								SEC. in SERIES CONN.									
		L																	
7K10	4	L	17	1.5	14	3.0	18.5	2.0	(1.0)	28	1.5	45	1	(.5)	H	\$33.01	L	\$21.57	
		H	21.5	1.5	17.5	3.0	25	2.0	(1.0)	35	1.5	36	1	(.5)					
7K11	4	L	17	4	14	8.0	18.5	5.0	(2.0)	28	4.0	45	2.5	(1.0)	H	53.14	L	38.01	
		H	21.5	4	17.5	8.0	25	5.0	(2.0)	35	4.0	36	2.5	(1.0)					
7K12	4	L	17	9	14	18.0	18.5	12.0	(6.0)	28	9.0	45	6	(4.0)	H	81.32	L	59.75	
		H	21.5	9	17.5	18.0	25	12.0	(6.0)	35	9.0	36	6	(4.0)					
7K13	4	L	34	4.5	28	9.0	43	6.0	(4.0)	56	4.5	85	3.0	(1.0)	H	81.32	L	59.75	
		H	43	4.5	35	9.0	56	6.0	(4.0)	70	4.5	110	3.0	(1.0)					
7K14	4	L	10	20	8.2	20	10	13	(12)	—	—	—	—	—	H	47.82	L	36.97	
		H	—	—	—	—	—	—	—	—	—	—	—	—					

*FOR MILITARY USE REDUCE DC AMP 20%. Note Input Cap = (K) 1000 MFD. in Rectifier Circuit.

HIGH CURRENT TRANSFORMERS AND CHOKES

115V. 50-500 CPS

TRANSFORMERS

TYPE	FIG.	SEC. IN PARALLEL		SEC. IN SERIES		Net Price
		AC Volt	AC Amp	AC Volt	AC Amp	
7K15	5	3.2/6.4	16	3.2/6.4/9.6/12.8	8	\$13.82
7K16	5	3.2/6.4	24	3.2/6.4/9.6/12.8	12	16.37
7K17	5	3.2/6.4	50	3.2/6.4/9.6/12.8	25	34.60
7K18	5	3.2/6.4	100	3.2/6.4/9.6/12.8	50	47.94
7K19	5	6/12	16	6/12/18/24	8	22.97
7K20	5	6/12	24	6/12/18/24	12	28.74

TYPE	FIG.	SEC. IN PARALLEL		SEC. IN SERIES		Net Price
		AC Volt	AC Amp	AC Volt	AC Amp	
7K21	5	6/12	50	6/12/18/24	25	\$45.94
7K22	5	6/12	100	6/12/18/24	50	68.89
7K23	5	9/18	16	9/18/27/36	8	30.28
7K24	5	9/18	24	9/18/27/36	12	29.18
7K25	5	9/18	50	9/18/27/36	25	56.91
7K26	5	9/18	100	9/18/27/36	50	82.36

CHOKES

TYPE	FIG.	INDUCTANCE (Millihenries)	D.C. Amps	DCR (Ω)	Net Price
7K27	9	30	8	0.3	\$20.77
7K28	9	15	12	0.1	26.81

TYPE	FIG.	INDUCTANCE (Millihenries)	D.C. Amps	DCR (Ω)	Net Price
7K29	9	5	25	0.025	\$42.09
7K30	9	1.4	50	0.01	57.37

STERLING TRANSFORMER CORP.

510 DRIGGS AVENUE • BROOKLYN, NEW YORK 11211 • TELEPHONE: (212) 782-4200



transistor transformers

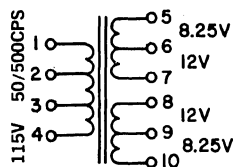


FIG. 1

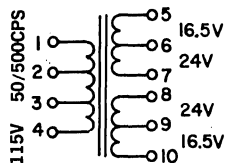


FIG. 2

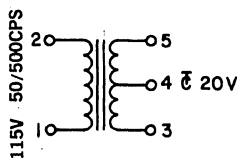


FIG. 3

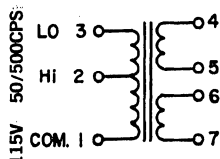


FIG. 4

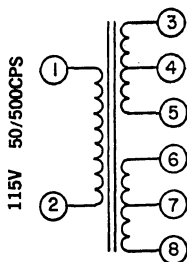


FIG. 5

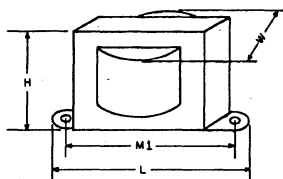


FIG. 6

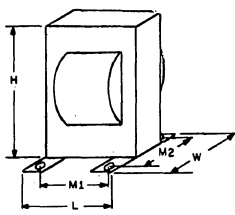


FIG. 7

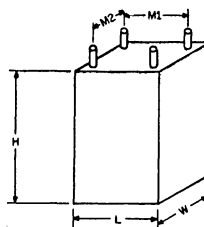


FIG. 8

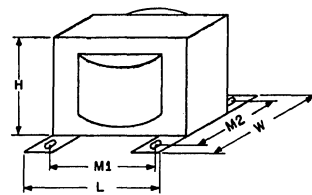


FIG. 9

TYPE	STYLE	FIG.	L	W	H	M1	M2	MTG. HOLES	STUDS
7K1	H	8	1 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{3}{4}$	1 $\frac{1}{4}$	—	—	(2) 6-32
	F	6	2 $\frac{1}{8}$	1 $\frac{1}{4}$	1 $\frac{1}{4}$	1 $\frac{3}{4}$	—	(2) $\frac{3}{16}$	—
7K2	H	8	1 $\frac{1}{8}$	1 $\frac{1}{8}$	2 $\frac{3}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	—	(4) 6-32
	L	7	1 $\frac{3}{8}$	1 $\frac{1}{8}$	2 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	(4) $\frac{5}{32}$	—
7K3	H	8	2 $\frac{1}{8}$	2 $\frac{1}{8}$	3 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{8}$	—	(4) 6-32
	F	6	3 $\frac{3}{4}$	2	2 $\frac{1}{8}$	3 $\frac{1}{8}$	—	(2) $\frac{3}{16}$	—
7K4	H	8	3 $\frac{1}{8}$	2 $\frac{5}{8}$	4 $\frac{1}{4}$	2 $\frac{1}{8}$	1 $\frac{5}{16}$	—	(4) 8-32
	L	7	2 $\frac{7}{8}$	2 $\frac{5}{8}$	3 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{1}{8}$	(4) $\frac{13}{64}$	—
7K5	H	8	3 $\frac{1}{8}$	3 $\frac{1}{8}$	5 $\frac{1}{4}$	3	2 $\frac{1}{8}$	—	(4) 10-32
	L	7	3 $\frac{7}{8}$	3 $\frac{1}{2}$	4 $\frac{5}{8}$	3	2 $\frac{1}{2}$	(4) $\frac{13}{64}$	—
7K6	H	8	5 $\frac{1}{2}$	4 $\frac{1}{2}$	6 $\frac{3}{4}$	3 $\frac{3}{4}$	3	—	(4) $\frac{1}{4}$ -20
	L	7	4 $\frac{1}{8}$	4 $\frac{1}{2}$	5 $\frac{3}{8}$	3 $\frac{1}{2}$	3 $\frac{3}{8}$	(4) $\frac{9}{32}$	—
7K7	H	8	3 $\frac{1}{8}$	2 $\frac{5}{8}$	4 $\frac{1}{4}$	2 $\frac{1}{8}$	1 $\frac{5}{16}$	—	(4) 8-32
	L	7	2 $\frac{7}{8}$	2 $\frac{5}{8}$	3 $\frac{1}{8}$	2 $\frac{1}{4}$	2 $\frac{1}{8}$	(4) $\frac{13}{64}$	—
7K8	H	8	1 $\frac{1}{8}$	1 $\frac{1}{8}$	2 $\frac{1}{8}$	1 $\frac{1}{8}$	1 $\frac{1}{4}$	—	(4) 6-32
	F	6	2 $\frac{7}{8}$	1 $\frac{1}{2}$	1 $\frac{1}{8}$	2 $\frac{3}{8}$	—	(2) $\frac{3}{16}$	—
7K9	H	8	1 $\frac{1}{8}$	1 $\frac{1}{8}$	2 $\frac{3}{4}$	1 $\frac{3}{8}$	1 $\frac{1}{4}$	—	(4) 6-32
	F	6	3 $\frac{1}{8}$	2 $\frac{1}{4}$	2	2 $\frac{1}{8}$	—	(2) $\frac{3}{16}$	—
7K10	H	8	3 $\frac{1}{8}$	2 $\frac{5}{8}$	4 $\frac{1}{4}$	2 $\frac{1}{8}$	1 $\frac{5}{16}$	—	(4) 8-32
	L	7	2 $\frac{7}{8}$	2 $\frac{1}{2}$	3 $\frac{1}{8}$	2 $\frac{1}{4}$	2	(4) $\frac{13}{64}$	—
7K11	H	8	4 $\frac{1}{8}$	3 $\frac{1}{8}$	5 $\frac{1}{8}$	3 $\frac{1}{8}$	2 $\frac{1}{8}$	—	(4) 10-32
	L	7	3 $\frac{7}{8}$	3 $\frac{3}{8}$	4 $\frac{5}{8}$	3 $\frac{1}{8}$	2 $\frac{3}{4}$	(4) $\frac{13}{64}$	—
7K12	H	8	5 $\frac{7}{8}$	4 $\frac{3}{4}$	6 $\frac{1}{8}$	4 $\frac{1}{8}$	3 $\frac{1}{2}$	—	(4) $\frac{1}{4}$ -20
	L	7	4 $\frac{1}{2}$	5 $\frac{1}{4}$	5 $\frac{3}{8}$	3 $\frac{1}{2}$	4 $\frac{1}{8}$	(4) $\frac{9}{32}$	—
7K13	H	8	5 $\frac{7}{8}$	4 $\frac{3}{4}$	6 $\frac{1}{8}$	4 $\frac{1}{8}$	3 $\frac{1}{2}$	—	(4) $\frac{1}{4}$ -20
	L	7	4 $\frac{1}{2}$	5 $\frac{1}{4}$	5 $\frac{3}{8}$	3 $\frac{1}{2}$	4 $\frac{1}{8}$	(4) $\frac{9}{32}$	—
7K14	H	8	3 $\frac{1}{8}$	3 $\frac{3}{8}$	5 $\frac{1}{4}$	3	2 $\frac{1}{8}$	—	(4) 10-32
	L	7	3 $\frac{7}{8}$	3 $\frac{1}{2}$	4 $\frac{5}{8}$	3	2 $\frac{1}{2}$	(4) $\frac{13}{64}$	—
7K15	L	9	3 $\frac{1}{8}$	3	3 $\frac{1}{8}$	3 $\frac{1}{8}$	2 $\frac{1}{4}$	(4) $\frac{13}{64}$	—
7K16	L	9	4 $\frac{1}{8}$	3 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{1}{8}$	2 $\frac{3}{8}$	(4) $\frac{13}{64}$	—
7K17	L	9	5 $\frac{3}{8}$	4 $\frac{1}{4}$	4 $\frac{5}{8}$	4 $\frac{3}{8}$	2 $\frac{7}{8}$	(4) $\frac{9}{32}$	—
7K18	L	9	5 $\frac{3}{8}$	5 $\frac{3}{4}$	4 $\frac{5}{8}$	4 $\frac{3}{8}$	4 $\frac{1}{8}$	(4) $\frac{9}{32}$	—
7K19	L	9	4 $\frac{1}{8}$	3 $\frac{7}{8}$	3 $\frac{1}{2}$	3 $\frac{1}{8}$	3	(4) $\frac{13}{64}$	—
7K20	L	9	4 $\frac{1}{8}$	4 $\frac{1}{2}$	3 $\frac{7}{8}$	3 $\frac{3}{4}$	3 $\frac{3}{8}$	(4) $\frac{13}{64}$	—
7K21	L	9	5 $\frac{3}{8}$	5 $\frac{3}{4}$	4 $\frac{5}{8}$	4 $\frac{3}{8}$	4 $\frac{1}{8}$	(4) $\frac{9}{32}$	—
7K22	L	9	6 $\frac{1}{2}$	6 $\frac{3}{8}$	5 $\frac{5}{8}$	5 $\frac{1}{8}$	4 $\frac{3}{8}$	(4) $\frac{9}{32}$	—
7K23	L	9	4 $\frac{1}{8}$	4 $\frac{3}{8}$	3 $\frac{7}{8}$	3 $\frac{3}{4}$	3 $\frac{3}{8}$	(4) $\frac{13}{64}$	—
7K24	L	9	5 $\frac{3}{8}$	4 $\frac{7}{8}$	4 $\frac{5}{8}$	4 $\frac{3}{8}$	3 $\frac{3}{8}$	(4) $\frac{9}{32}$	—
K725	L	9	6 $\frac{1}{2}$	6	5 $\frac{5}{8}$	5 $\frac{1}{8}$	3 $\frac{3}{4}$	(4) $\frac{9}{32}$	—
7K26	L	9	6 $\frac{1}{2}$	7 $\frac{3}{4}$	5 $\frac{5}{8}$	5 $\frac{1}{8}$	5 $\frac{1}{8}$	(4) $\frac{9}{32}$	—
7K27	L	9	4 $\frac{1}{8}$	3 $\frac{3}{8}$	3 $\frac{1}{2}$	3 $\frac{1}{8}$	3	(4) $\frac{13}{64}$	—
7K28	L	9	5 $\frac{3}{8}$	4 $\frac{1}{4}$	4 $\frac{5}{8}$	4 $\frac{3}{8}$	3 $\frac{3}{8}$	(4) $\frac{9}{32}$	—
7K29	L	9	5 $\frac{3}{8}$	4 $\frac{3}{4}$	4 $\frac{5}{8}$	4 $\frac{3}{8}$	3 $\frac{7}{8}$	(4) $\frac{9}{32}$	—
7K30	L	9	6 $\frac{1}{2}$	5 $\frac{3}{4}$	5 $\frac{5}{8}$	5 $\frac{1}{8}$	4 $\frac{1}{8}$	(4) $\frac{9}{32}$	—

STERLING TRANSFORMER CORP.

510 DRIGGS AVENUE • BROOKLYN, NEW YORK 11211 • TELEPHONE: (212) 782-4200

STACO *variable transformers*

The most versatile and reliable voltage controls available today are variable autotransformers. They are widely used as basic components in the control of voltage, current, power, heat, speed, light and electro-mechanical force in many industrial and laboratory applications.

Staco Variable Autotransformers deliver continuously adjustable output voltage from AC power lines without introducing any wave form distortion or SCR generated noise. All STACO variables offer precious metal-plated commutators, excellent regulation, high efficiency, conservative ratings and feature extremely rugged construction which includes a high temperature foundation material for the commutator surface. This material provides a transformer with a greater tolerance to transients and short term overloads, effectively increasing the reliability of the transformer.

Models are available in various configurations from 1.75 to 300 ampere rating. Choose from panel mounted units, cord and plug types, ganged and/or motor-driven metered models and fully portable deluxe models with or without metering.

Your STACO distributor is capable of assisting you in selecting the particular transformer best suited for your application. Should you require a special or non-standard product for your particular need, STACO's Engineering staff will respond quickly with solutions to your requirements. Often it just requires minor revisions to standard components enabling STACO to keep your costs at a minimum.

Prices shown are List Prices. Contact your STACO distributor or Representative for quantity discount schedule.

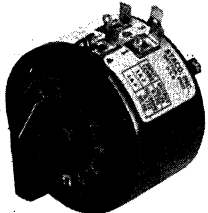


FIG. A

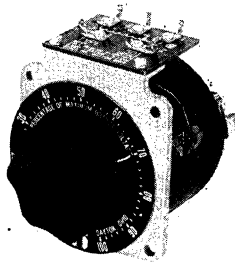


FIG. B

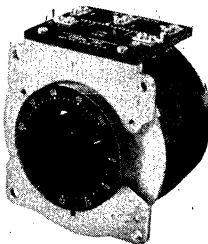


FIG. C

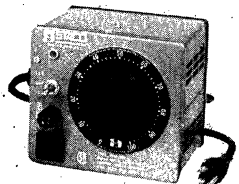


FIG. D

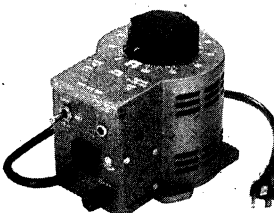


FIG. E

120 VOLT INPUT SINGLE PHASE PANEL MOUNTING

Available in cased or uncased units designed for mounting on panels 1/4" to 5/8" thick. Most units also can be bench mounted.

MFG. TYPE NO.	FIG.	OUTPUT VOLTS	OUTPUT AMPS	KVA	SIZE (INCHES) H x W x D	WT. LBS.	PRICE
171	A	*0-120/132	1.75	0.23	2-13/16 x 2-1/16	3.0	\$ 14.96
201	A	*0-120/132	2.0	0.26	2-13/16 x 2-1/16	3.0	15.23
221	A	*0-120/132	2.25	0.30	2-13/16 x 2-1/4	3.2	15.70
251	A	*0-120/132	2.5	0.33	2-13/16 x 2-7/16	3.5	16.12
291	A	*0-120/132	3.0	0.40	2-13/16 x 2-7/16	3.5	16.59
371	B	*0-120/140	3.75	0.53	3-3/4 x 3-3/4 x 3-1/4	5.0	24.00
501	B	0-120/140	5.0	0.70	3-3/4 x 3-3/4 x 3-5/16	6.0	24.11
1010	B	0-120/140	10.0	1.4	5-5/16 x 5 x 4-3/16	12.0	31.75
1010CT	H	0-120/140	10.0	1.4	6-7/8 x 5 x 4-7/16	12.0	42.49
1210	B	**0-120	12.0	1.4	5-5/16 x 5 x 4-3/16	12.0	34.10
1210CT	H	**0-120	12.0	1.4	6-7/8 x 5 x 4-7/16	12.0	44.10
1510	C	0-120/140	15.0	2.1	6-1/8 x 6-5/8 x 4-3/8	20.0	58.21
2510	C	0-120/140	25.0	3.5	8-3/16 x 7-5/8 x 4-1/8	23.0	84.67
2510CT	J	0-120/140	25.0	3.5	9-5/8 x 7-5/8 x 4-1/8	23.0	101.75
5010	C	0-140	50.0	7.0	12-1/2 x 12-1/2 x 6-1/2	60.0	213.15
5010CT	J	0-140	50.0	7.0	15-5/8 x 14 x 6-1/2	60.0	238.20

CT refers to enclosed coil and terminals *60 cycle operation only at overvoltage **60 cycle operation only

240 VOLT INPUT SINGLE PHASE PANEL MOUNTING

Designed for mounting on panels 1/4" to 5/8" thick

MFG. TYPE NO.	FIG.	OUTPUT VOLTS	OUTPUT AMPS	KVA	SIZE (INCHES) H x W x D	WT. LBS.	PRICE
252	A	0-240/264	0.8	0.19	2-13/16 x 2-7/16	3.5	\$ 25.28
1020	B	0-240/280	3.5	0.98	5-5/16 x 5 x 4-3/16	12.0	38.22
1020CT	H	0-240/280	3.5	0.98	6-7/8 x 5 x 4-7/16	12.0	47.28
1220	B	**0-240	5.0	1.2	5-5/16 x 5 x 4-3/16	12.0	40.57
1220CT	H	**0-240	5.0	1.2	6-7/8 x 5 x 4-7/16	12.0	49.98
1520	C	0-240/280	9.5	2.7	6-1/8 x 6-5/8 x 4-13/16	20.0	58.21
1520CT	J	0-240/280	9.5	2.7	6-3/8 x 9-1/8 x 5	20.0	73.08
2520	C	0-240/280	10.0	2.8	8-3/16 x 7-5/8 x 4-1/8	23.0	84.67
2520CT	J	0-240/280	10.0	2.8	9-5/8 x 7-5/8 x 4-1/8	23.0	101.75
5020	C	0-240/280	28.0	7.8	12-1/2 x 12-1/2 x 6-1/2	60.0	205.80
5020CT	J	0-240/280	28.0	7.8	15-5/8 x 14 x 6-1/2	60.0	238.20

**60 Cycle Operation Only

120 VOLT INPUT SINGLE PHASE CORD & PLUG TYPE

All models feature a protective housing for coil and terminal board and have line cord, matching receptacle, switch, pilot light, fuse and are connected for clockwise knob rotation. Models available with 2 conductor line cord and receptacle (2PF) or a 3-conductor grounded line cord and receptacle (3PN)

MFG. TYPE NO.	FIG.	OUTPUT VOLTS	OUTPUT AMPS	KVA	SIZE (INCHES) H x W x D	WT. LBS.	PRICE
2PF 171	D	**0-132	1.75	0.23	3-15/16 x 3-15/16 x 3-1/2	3.5	\$ 29.45
3PN 171	D	**0-132	1.75	0.23	3-15/16 x 3-15/16 x 3-1/2	3.5	35.39
2PF 371	D	*0-120/140	3.75	0.53	5-3/8 x 6-1/16 x 5-5/8	7.0	35.39
3PN 371	D	*0-120/140	3.75	0.53	5-3/8 x 6-1/16 x 5-5/8	7.0	41.27
2PF 501	D	0-120/140	5.0	0.70	5-3/8 x 6-1/16 x 5-5/8	9.0	38.85
3PN 501	D	0-120/140	5.0	0.70	5-3/8 x 6-1/16 x 5-5/8	9.0	44.78
2PF 1010	E	0-120/140	10.0	1.4	5 x 6-7/8 x 5-5/8	12.0	42.92
3PN 1010	E	0-120/140	10.0	1.4	5 x 6-7/8 x 5-5/8	12.0	49.50
2PF 1210	E	**0-120	12.0	1.4	5 x 6-7/8 x 5-5/8	12.0	50.09
3PN 1210	E	**0-120	12.0	1.4	5 x 6-7/8 x 5-5/8	12.0	55.86
2PF 1510	F	0-120/140	15.0	2.1	5-7/8 x 6-3/8 x 9	21.0	81.73
3PN 1510	F	0-120/140	15.0	2.1	5-7/8 x 6-3/8 x 9	21.0	81.73
2PF 2210	F	0-140	22.0	2.4	5-5/8 x 7-5/8 x 10-3/4	24.0	118.78
3PN 2210	F	0-140	22.0	2.4	5-5/8 x 7-5/8 x 10-3/4	24.0	118.78

*60 cycle operation only on overvoltage

**60 cycle operation only

TRANSFORMERS

240 VOLT INPUT SINGLE PHASE CORD AND PLUG TYPE

Same physical specifications as 120 volt cord and plug types.

MFG. TYPE NO.	FIG.	OUTPUT VOLTS	OUTPUT AMPS	KVA	SIZE (INCHES) H x W x D	WT. LBS.	PRICE
2PF1020	E	0-240/280	3.5	0.98	5 x 6-7/8 x 5-5/8	12.0	\$51.16
3PN1020	E	0-240/280	3.5	0.98	5 x 6-7/8 x 5-5/8	12.0	58.21
2PF1220	E	**0-240	5.0	1.2	5 x 6-7/8 x 5-5/8	12.0	56.54
3PN1220	E	**0-240	5.0	1.2	5 x 6-7/8 x 5-5/8	12.0	59.39
2PF1520	F	0-240/280	9.5	2.7	5-7/8 x 6-3/8 x 9	21.0	83.19
3PN1520	F	0-240/280	9.5	2.7	5-7/8 x 6-3/8 x 9	21.0	83.19
2PF2520	F	0-280	10.0	2.8	5-5/8 x 7-5/8 x 10-3/4	24.0	118.78
3PN2520	F	0-280	10.0	2.8	5-5/8 x 7-5/8 x 10-3/4	24.0	118.78

**60 cycle operation only

120 VOLT & 240 VOLT INPUT METERED CORD & PLUG TYPES

Staco's new series of Metered Cord & Plug type variable transformers eliminate the need for separate metering. Featuring an accurate, high quality pivot and jewel meter conveniently located atop the enclosure for easy, accurate readout. 120V models have 0-150V meter, 240V models have 0-300V meter.

MFG. TYPE NO.	FIG.	INPUT VOLTS	OUTPUT VOLTS	OUTPUT AMPS	KVA	SIZE (INCHES) H x W x D	WT. LBS.	PRICE
2PF1010V	G	120	0-140	10.0	1.4	5 x 6-7/8 x 5-5/8	12.0	\$68.09
3PN1010V	G	120	0-140	10.0	1.4	5 x 6-7/8 x 5-5/8	12.0	70.35
2PF1020V	G	240	0-280	3.5	0.98	5 x 6-7/8 x 5-5/8	12.0	77.81
3PN1020V	G	240	0-280	3.5	0.98	5 x 6-7/8 x 5-5/8	12.0	80.12

120 VOLT INPUT VARIABLE ISOLATION TRANSFORMERS

An exclusive by STACO, for use where the safety of isolation is required. The output voltage is completely isolated from the power line (input voltage). Additional outputs are available on uncased models. These outputs include voltage doubler, series and non-isolated when hooked to the proper terminal supplied.

MFG. TYPE NO.	FIG.	OUTPUT VOLTS	OUTPUT AMPS	KVA	SIZE (INCHES) H x W x D	WT. LBS.	PRICE
J201	B	0-140	2.0	0.28	5-5/6 x 5 x 4-3/4	7.0	\$ 49.77
J401	B	0-140	4.0	0.56	6-1/8 x 6-5/8 x 4-7/16	13.0	109.31
J901	C	0-140	9.0	1.26	8-3/16 x 7-5/8 x 4-3/4	25.0	146.48

DELUXE VARIABLE TRANSFORMERS

Fully portable deluxe models, available with or without metering. Suitable for use in any industrial, classroom or laboratory application. All units supplied in a ventilated case of extruded aluminum and baked-epoxy painted steel. Permanent etched legends, convenient carrying handle, control knobs with positive stops, output receptacles and switches on front panel, pilot lights, circuit breakers, and full view meters.

MFG. TYPE NO.	FIG.	INPUT VOLTS	OUTPUT VOLTS	OUTPUT AMPS	KVA	SIZE (INCHES) H x W x D	WT. LBS.	PRICE
E171	K	**120	0-132	1.75	0.23	4-3/8 x 10-13/16 x 3-5/8	8.0	\$ 41.27
E371	K	120	0-120/140	3.75	0.52	6-1/8 x 11-1/4 x 5	15.0	49.51
E501	K	120	0-120/140	5.0	0.7	6-1/8 x 11-1/4 x 5	16.0	51.87
E501V	L	120	0-120/140	5.0	0.7	6-1/8 x 17-5/8 x 5-7/8	20.0	94.40
E501VA	L	120	0-120/140	5.0	0.7	10 x 15-1/16 x 5-7/8	25.0	156.24
E501VAW	L	120	0-120/140	5.0	0.7	10 x 15-1/16 x 5-7/8	28.0	245.18
E1010	K	120	0-120/140	10.0	1.4	6-1/8 x 11-15/16 x 5-7/8	20.0	91.93
E1010V	L	120	0-120/140	10.0	1.4	6-3/16 x 17-5/8 x 5-7/8	27.0	117.86
E1010VA	L	120	0-120/140	10.0	1.4	10 x 15-1/16 x 5-7/8	33.0	185.69
E1010VAW	L	120	0-120/140	10.0	1.4	10 x 15-1/16 x 5-7/8	35.0	272.90

V = Voltmeter

VA = Voltmeter, Ammeter

VAW = Voltmeter, Ammeter, Wattmeter

**60 cycle operation only

DELUXE ISOLATED VARIABLE TRANSFORMERS

MFG. TYPE NO.	FIG.	INPUT VOLTS	OUTPUT VOLTS	OUTPUT AMPS	KVA	SIZE (INCHES) H x W x D	WT. LBS.	PRICE
EJ201V†	L	120	0-140	2.0	0.28	6-3/16 x 17-5/8 x 5-7/8	16.0	\$ 113.30
EJ401V†	L	120	0-140	4.0	0.56	10 x 15-1/32 x 5-7/8	30.0	146.48
EJ901V†	L	120	0-140	9.0	1.26	10 x 16-5/32 x 7-1/2	43.0	207.17

†Denotes deluxe variable transformers

EJ201V, EJ401V, EJ901V have 0-140 VAC and 0-140 VDC isolated outputs at full rated current available from banana jacks.

Prices shown are List Prices. Contact your STACO distributor or Representative for quantity discount schedule.

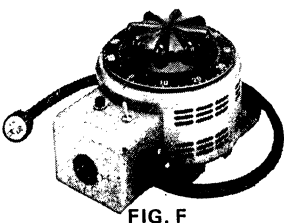


FIG. F

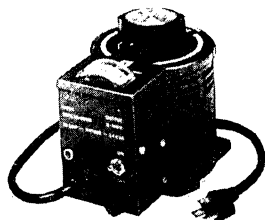


FIG. G

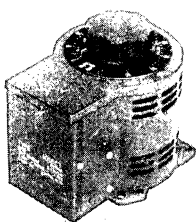


FIG. H

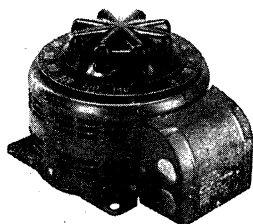


FIG. J

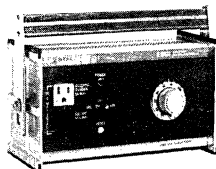


FIG. K



FIG. L



2240 E. Third St., Dayton, Ohio 45403
(513) 253-1191 • TWX: 810/459-1798 • TELEX: 288-032

For information on pushbutton switches, indicators, and pushbutton matrix switch systems, see our pages in the Displays & Readouts section, pages 2-1114, 2-1115.

Technitrol, Inc.

H CASE TRANSFORMERS (Also available in all cases shown)

Turns Ratio Tolerance ±5%	Part No.	Lm μH ±20%	Leakage Inductance Max. Value in μH		Winding Resistance Max. Value in Ohms			Interwinding Cap. Max. Value in pF		Effective Distributed Capacity Shunting Winding N ₁ Max. Value in pF C _D (1, 3, 5 gnd)	ET Rating Volt-μsec Minimum
			L _L (N ₁ -N ₂)	L _L (N ₁ -N ₃)	R(N ₁)	R(N ₂)	R(N ₃)	C ₁ (N ₁ -N ₂)	C ₁ (N ₁ -N ₃)		
1:1:1	11PHC	2,000	1.2	1.2	2.7	2.7	2.7	47	47	5	20
	11LHA	750	0.7	0.7	1.8	1.8	1.8	26	26	4	14
	11HNB	250	0.5	0.5	1.1	1.1	1.1	16	16	4	9
	11EHA	70	0.7	0.7	1.8	1.8	1.8	23	23	4	9
	11DHB	48	0.5	0.5	1.4	1.4	1.4	21	21	4	8
	11BHC	25	0.4	0.4	1.1	1.1	1.1	15	15	4	5.8
	11AHA	15	0.4	0.4	0.9	0.9	0.9	13	13	4	4.6
	118HA	7.5	0.4	0.4	0.7	0.7	0.7	11	11	4	3.5
2:1:1	21PHA	2,500	7.0	8.4	2.8	1.6	1.6	24	22	6	22
	21LHA	750	4.0	4.2	1.7	1.0	1.0	13	12.8	4.5	14
	21HHA	250	2.5	2.6	1.0	0.7	0.7	10	9.7	4	9
	21EHA	70	2.0	2.1	1.8	1.0	1.0	13.7	12.4	4	9
	21DHA	48	1.9	2.0	1.4	0.8	0.8	13	11	4	8
	21BHA	24	1.5	1.6	1.1	0.7	0.7	9.7	8.9	4	5.8
	21AHA	13.5	1.0	1.1	0.9	0.6	0.6	8.5	7.9	3	4.4
	218HA	6.7	0.8	0.9	0.7	0.5	0.5	7.2	6.5	3	3.4
3:1:1	31PHA	2,500	6.5	7.0	2.8	1.2	1.2	21	17	5	22
	31LHA	750	4.0	4.4	1.7	0.8	0.8	10.5	9.1	4	14
	31HHA	250	1.8	2.0	1.0	0.6	0.6	9	8	4	9
	31EHA	68	2.8	3.3	1.8	0.8	0.8	10.8	10.5	4	9
	31DHA	52	2.5	3.0	1.4	0.7	0.7	10.5	9.5	4	8
	31BHA	25	1.8	1.9	1.1	0.6	0.6	8	7.3	3	5.8
	31AHA	15	1.6	1.7	0.9	0.5	0.5	7.2	6.5	3	4.6
	318HA	7.5	1.3	1.4	0.7	0.4	0.4	6.1	5.9	3	3.5
3:3:1	33PHA	2,500	3.0	8.0	2.8	3.1	1.2	30	17	6	22
	33LHA	750	1.3	5.0	1.7	1.8	0.8	18	9.1	5	14
	33HHA	250	0.9	2.0	1.0	1.1	0.6	12	8	5	9
	33EHA	68	1.2	6.0	1.8	1.8	0.8	18.3	10.5	5	9
	33DHA	52	1.0	3.1	1.4	1.4	0.7	16.8	9.2	5	8
	33BHA	25	0.7	1.9	1.1	1.1	0.6	12.4	7.5	4	5.8
	33AHB	15	0.7	1.7	0.9	0.9	0.5	10.3	6.6	4	4.6
	338HA	7.5	0.6	1.4	0.7	0.7	0.4	8.6	5.9	4	3.5
4:2:1	42PHA	2,500	5.0	6.0	2.8	1.6	0.9	24	13.6	5.5	22
	42LHA	750	2.5	4.0	1.7	1.0	0.7	13	7.9	4.5	14
	42HHA	250	1.5	2.4	1.0	0.7	0.5	10	7.2	4	9
	42EHA	77	3.5	5.7	1.8	1.0	0.7	14.2	9.4	4.5	9
	42DHA	53	2.8	5.0	1.4	0.8	0.6	12	8.1	4	8
	42CHA	28	1.8	2.5	1.1	0.7	0.4	10	6.9	4	6
	42AHA	13.5	1.3	2.3	0.9	0.6	0.4	8.2	6.1	4	4.4
	429HA	8.8	1.0	2.2	0.7	0.5	0.4	7.5	5.6	3	3.7

Case	L	W	H
H	.500	.350	.250
G	.650	.425	.350
A	.790	.495	.3125
F	.365	.235	.400
M	.560	.560	.450
K	.500	.350	.250
Z	.485	.350	.350

- Leads Out Bottom
- Temperature Stable and Special Low Leakage Versions Available
- Many Other Units Available in Other Cases and Combinations of Parameters
- **Contact Factory Direct or Write for Catalog**

BALANCED CENTER TAPPED TRANSFORMERS

Turns Ratio Tolerance ±2%	Part No.	mH ±20%	Leakage Inductance Max. Value in μ H L_L (N_1-N_3)	Winding Resistance Max. Value in Ohms		Interwinding Cap. Max. Value in pF C_1 (N_1-N_3)	Effective Distributed Capacity Shunting Winding N_1 Max. Value in pF C_0 (1, 6 gnd)	ET Rating Volt- μ sec Minimum
				R(N_1)	R(N_3)			
1CT:1CT	1ZSHA	6.0	1.26	5.0	5.0	78	9	32
	1ZPHA	2.2	.78	2.9	2.9	42	7	21
	1ZKHA	.40	.56	1.4	1.4	15	5	10.5
	1ZGHA	.14	.49	0.9	0.9	9.7	4.5	6.8

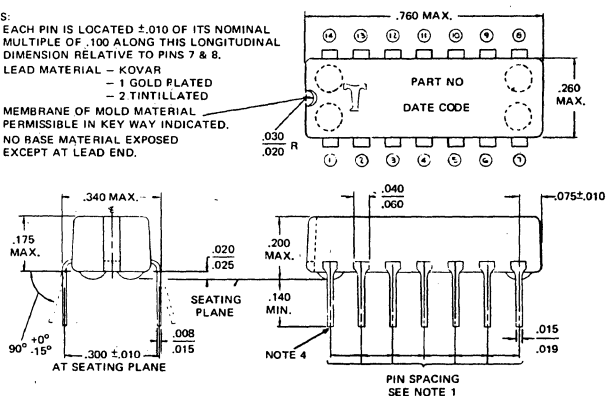
DUAL-IN-LINE PACKAGING

Up to four pulse transformers can be mounted on a common lead frame and encapsulated by transfer moulding. This new concept is compatible with the "DIL" packaging of the Integrated Circuit Industry. The lead frame has no exposed base metal. Optimum pin arrangements and elevated seating plane of the case allow maximum clearance above pad area to enhance board cleaning after assembly and to accommodate other circuits without danger of shorting to the case pins. Controlled manufacturing processes and automatic selection and grading of cores provides maximum reliability. Improved features of the new DIL packages include automated handling for test and insertion, increased PC board packing density, uniform and repetitive PC board hole layout, and minimum ultimate cost.

Specialists in pulse transformers and completely transfer molded, welded DIP delay lines under $\frac{3}{16}$ " high — to 250 ns.

14 LEAD — TECO #166-2100-245 — (See Note 2)

- NOTES:
1. EACH PIN IS LOCATED ± 0.10 OF ITS NOMINAL
MULTIPLE OF .100 ALONG THIS LONGITUDINAL
DIMENSION RELATIVE TO PINS 7 & 8.
 2. LEAD MATERIAL - KOVAR
- 1 GOLD PLATED
- 2 TINTILLATED
 3. MEMBRANE OF MOLD MATERIAL
PERMISSIBLE IN KEY WAY INDICATED.
 4. NO BASE MATERIAL EXPOSED
EXCEPT AT LEAD END.



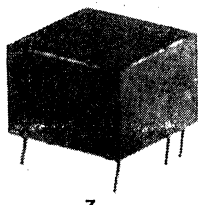
Technitrol, Inc.

1952 E. Allegheny Avenue
Philadelphia, Pa. 19134

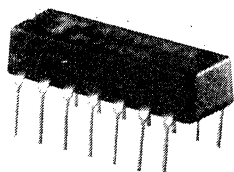
(215) 426-9105

Technitrol, Inc.

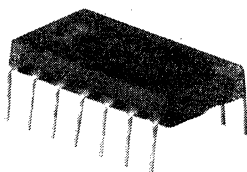
Across Max. Dim.	Across Min. Dim.
.400	.10
.500	.15
.600	.20
.140	.15
.400	.20
.400	.10
.375	.125



Z



DIP

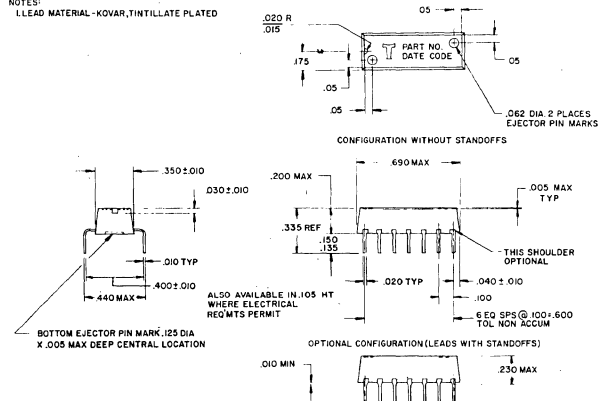


Special

Turns Ratio Tolerance ±5%	Part No.	Lm ±20%	Leakage Inductance Max. Value in μ H		Winding Resistance Max. Value in Ohms			Interwinding Cap. Max. Value in pF		Effective Distributed Capacity Shunting Winding N ₁ Max. value in pF Co (1, 3, 5 gnd)	ET Rating Volt- μ sec Minimum
			L ₁ (N ₁ -N ₂)	L ₁ (N ₁ -N ₃)	R(N ₁)	R(N ₂)	R(N ₃)	C ₁ (N ₁ -N ₂)	C ₁ (N ₁ -N ₃)		
1:1:1	11GGA	0.12	0.5	0.5	1.0	1.0	1.0	13.0	13.0	5	10
	11KGB	0.5	0.7	0.7	1.9	1.9	1.9	24.0	24.0	7	21
	11NGB	1.4	0.9	0.9	2.9	2.9	2.9	36.8	36.8	8	35
	11RGD	5.0	2.2	2.2	5.3	5.3	5.3	77.0	77.0	9	67
	11UGA	12.5	3.0	3.0	8.9	8.9	8.9	127.0	127.0	16	105
2:1:1	21GGA	0.12	1.4	1.5	1.0	0.6	0.6	9.3	7.9	4	10
	21KGA	0.5	2.4	2.5	1.9	1.0	1.0	14.3	12.6	6	21
	21NGB	1.4	2.6	2.7	2.9	1.6	1.6	20.3	17.6	7	35
	21RGA	5.0	7.0	9.1	5.3	2.9	2.9	38.5	33.6	10	67
	21UGA	12.5	12.0	14.5	8.9	4.6	4.6	57.5	39.4	12	105
3:1:1	31GGA	0.12	2.0	2.1	1.0	0.5	0.5	7.9	7.1	4	10
	31KGA	0.5	3.8	3.9	1.9	0.8	0.8	13.8	12.4	6	21
	31NGA	1.3	5.1	5.2	2.9	1.2	1.2	15.9	14.1	8	35
	31RGB	5.0	6.7	7.8	5.3	2.0	2.0	31.6	26.1	12	67
	31UGA	12.5	13.3	15.0	8.9	3.2	3.2	43.5	36.2	15	105
3:3:1	33GGA	0.12	1.3	2.4	1.0	1.0	0.5	11.1	6.9	5	10
	33KGA	0.5	1.4	2.5	1.9	1.9	0.8	19.9	11.4	7	21
	33NGA	1.3	1.5	3.6	2.9	2.9	1.2	28.6	14.8	8	35
	33RGB	5.0	4.5	9.0	5.3	5.3	2.0	49.5	24.7	13	67
	33UGA	12.5	12.5	14.0	8.9	8.9	3.2	75.0	40.0	16	105
4:2:1	42GGB	0.12	1.2	2.8	1.0	0.6	0.5	8.9	6.5	5	10
	42KGA	0.5	2.6	3.4	1.9	1.0	0.6	13.4	9.0	6	21
	42NGA	1.4	3.0	6.5	2.9	1.6	0.9	20.3	12.8	8	35
	42RGA	5.0	6.0	8.0	5.3	2.9	1.4	34.1	20.1	11	67
	42UGA	12.5	12.0	20.0	8.9	4.6	2.4	55.0	30.0	12	105

Turns Ratio Tolerance $\pm 2\%$	Part No.	Lm mH $\pm 20\%$	Leakage Inductance Max. Value in μH L_L (N_1-N_2)	Winding Resistance Max. Value in Ohms		Interwinding Cap. Max. Value in pF C_1 (N_1-N_2)	Effective Distributed Capacity Shunting Winding N_1 Max. Value in pF C_0 (1, 6 gnd)	ET Rating Volt- μsec Minimum
				R(N_1)	R(N_2)			
1CT:1CT	12MGA	1.0	1.5	2.8	2.8	30	9	30
	12QGA	3.3	2.0	4.8	4.8	54	11	55
	12TGA	11.0	3.0	8.6	8.6	125	14	96
	12WGA	33.0	5.0	15.2	15.2	240	21	180

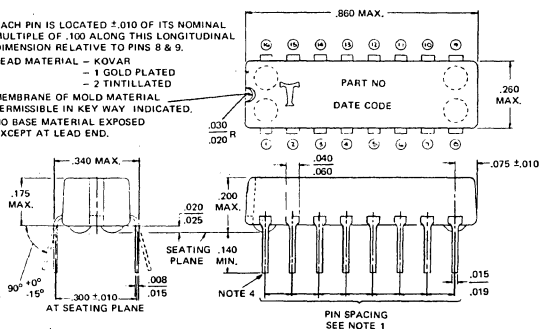
NOTES:
1. LEAD MATERIAL - KOVAR, TINTILLATE PLATED



NOTES:

1. EACH PIN IS LOCATED $\pm .010$ OF ITS NOMINAL MULTIPLE OF .100 ALONG THIS LONGITUDINAL DIMENSION RELATIVE TO PINS 8 & 9.
2. LEAD MATERIAL - KOVAR
 - 1 GOLD PLATED
 - 2 TINTILLATED
3. MEMBRANE OF MOLD MATERIAL PERMISSIBLE IN KEY WAY INDICATED.
4. NO BASE MATERIAL EXPOSED EXCEPT AT LEAD END.

.030



Contact Local Representative or Factory Direct
With Specific Application or Requirements.

L_m	— UP to 2.0 mh maximum for 1:1 turns ratio. UP to 8.0 mh maximum for inductors. “Special Dip” UP to 5.0 mh maximum for 1:1 turns ratio. UP to 20.0 mh maximum for inductors.
L_L	— As low as 0.02% of L_m for the highest permeability cores when C_i is not critical.
C_i	— As low as 3.0 pfd for the highest permeability cores when L_L is not critical.
$L_L \times C_i$	— Lowest $L_L \times C_i$ product available in the industry.

"ET" ratings up to 7.0 volt μ sec. for an $L_M = 1.0$ mh.
 "Special Dip" "ET" ratings up to 15 volt μ sec. for an $L_M = 2.0$ mh.

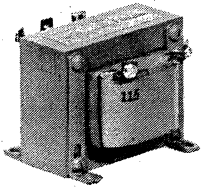
Specialists in pulse transformers and completely transfer molded, welded DIP delay lines under $\frac{3}{16}$ " high — to 250 ns.



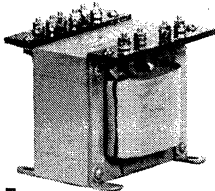
Technitrol, Inc.

1952 E. Allegheny Avenue
Philadelphia, Pa. 19134

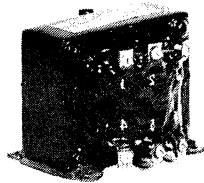
(215) 426-9105

TODD
ENGINEERED• NAME PLATES
• WIRING
• DIAGRAMS**HIGH CURRENT TRANSFORMERS:** 45° TEMP. RISE
MINIMUM
REGULATION

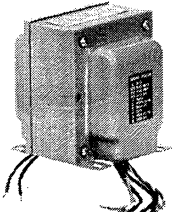
STYLE B



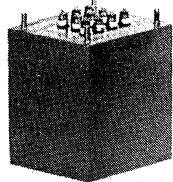
STYLE B (OVER 700 VA)



STYLE BE



STYLE V



STYLE CM

**FOUR STYLES
STOCKED
IN DEPTH**

SECONDARY VOLTS TAP VOLTS	PART NO.	PRIMARY VOLTS 50-500 Hz	RATING VA	SECONDARY AMPS (RMS) SERIES HOOKUP	SECONDARY AMPS (RMS) PARALLEL HOOKUP
10 VOLTS Series 2.5 - 5 - 7.5 - 10 Parallel 2.5 - 5	10 02 10 05 10 10 10 20	115 115 115 115	20 50 100 200	2 5 10 20	4 10 20 40
12.6 VOLTS Series 3.1 - 6.3 - 9.4 - 12.6 Parallel 3.1 - 6.3	12 02 12 05 12 10 12 20	115 115 115 115	24 60 120 240	2 6 10 20	4 10 20 40
24 VOLTS Series 6 - 12 - 18 - 24 Parallel 6 - 12	24 01 24 02 24 04 24 06 24 08 24 12 24 20 24 25 24 30 24 50 24 100	115 115 115 115 115 105, 115, 125 105, 115, 125 105, 115, 125 105, 115, 125 105, 115, 125 115, 230	24 48 96 144 192 288 480 600 720 1200 2400	1 2 4 6 8 12 20 25 30 50 100	2 4 8 12 16 24 40 50 60 100 200
36 VOLTS Series 9 - 18 - 27 - 36 Parallel 9 - 18	36 00 36 01 36 02 36 04 36 06 36 08 36 12 36 20 36 25 36 30 36 50 36 100	115 115 115 115 115 105, 115, 125 105, 115, 125 105, 115, 125 105, 115, 125 105, 115, 125 115, 230 115, 230	18 36 72 144 216 288 432 720 900 1080 1800 3600	0.5 1 2 4 6 8 12 20 25 30 50 100	1 2 4 8 12 16 24 40 50 60 100 200
56 VOLTS Series 14 - 28 - 42 - 56 Parallel 14 - 28	56 00 56 01 56 02 56 04 56 06 56 08 56 12 56 25 56 50 56 100	115 115 115 115 115 105, 115, 125 105, 115, 125 105, 115, 125 115, 230 115, 230	28 56 112 224 336 448 672 1400 2800 5600	0.5 1 2 4 6 8 12 25 50 100	1 2 4 8 12 16 24 50 100 200
64 VOLTS Series 16 - 32 - 48 - 64 Parallel 16 - 32	64 00 64 01 64 02 64 04 64 06 64 08 64 12 64 25 64 50	115 115 115 115 115 105, 115, 125 105, 115, 125 105, 115, 125 115, 230	32 64 128 256 384 512 768 1600 3200	0.5 1 2 4 6 8 12 25 50	1 2 4 8 12 16 24 50 100
80 VOLTS Series 20 - 40 - 60 - 80 Parallel 20 - 40	80 00 80 01 80 02 80 05 80 10 80 25 80 50	115 115 115 115 105, 115, 125 115, 230 115, 230	40 80 160 400 800 2000 4000	0.5 1 2 5 10 25 50	1 2 4 10 20 50 100
120 VOLTS Series 30 - 60 - 90 - 120 Parallel 30 - 60	120 00 120 01 120 02 120 04 120 08 120 12 120 20	115 115 115 115 105, 115, 125 105, 115, 125 105, 115, 125	60 120 240 480 960 1400 2400	0.5 1 2 4 8 12 20	1 2 4 8 16 24 40
180 VOLTS Series 45 - 90 - 135 - 180 Parallel 45 - 90	180 00 180 01 180 02 180 05 180 10	115 115 115 115 105, 115, 125	90 180 360 640 1800	0.5 1 2 5 10	1 2 4 10 20
230 VOLTS Series 57.5 - 115 - 172.5 - 230 Parallel 57.5 - 115	230 00 230 01 230 02 230 05 230 08	115 115 115 105, 115, 125 115, 230	115 230 460 1150 1840	0.5 1 2 5 8	1 2 4 10 16
300 VOLTS Series 75 - 150 - 225 - 300 Parallel 175 - 150	300 00 300 01 300 02 300 05	115 115 115 105, 115, 125	150 300 600 1500	0.5 1 2 5	1 2 4 10

DC TO RMS CONVERSION CHART

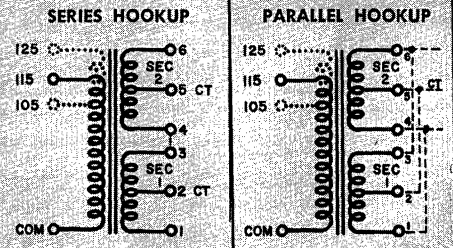
SECONDARY RMS CURRENT = DC CURRENT × FACTOR BELOW			
	Choke Input Filter or Inductive Load	Resistive Load	Capacitor Input Filter or Capacitive Load
FULL WAVE BRIDGE	1.0	1.0	1.8
FULL WAVE C.T.	.7	1.0	1.15

CERTIFIED DATA
AVAILABLE**CUSTOM
VARIATIONS
QUOTED PROMPTLY**

TODD SYSTEMS "HIGH CURRENT TRANSFORMERS & CHOKES" are designed for use in high power rectifier circuits, and high current A.C. applications. "TODD ENGINEERED" designs feature a nominal temperature rise of 45°C., at full load, thus providing outstanding overload capacity. All designs utilize extremely low regulation, varying from 10% in the smallest to 1% in the larger units.

Four styles... select the type best suited for your lab, test rigs, OEM or production equipment

ALL PRICES AND DATA SUBJECT TO CHANGE WITHOUT NOTICE



QUALITY ENGINEERED PRECISION BUILT

TODD SYSTEMS INC.

4 RADFORD PLACE

YONKERS, N. Y., U.S.A.

(914) 963-3400

TODD
ENGINEERED**HIGH CURRENT TRANSFORMERS**

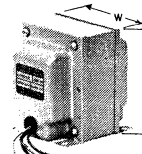
MECHANICAL SPECIFICATIONS SPECIFY STYLE REQUIRED

• BRACKET MTD. (STYLE B) • ENCAPSULATED (STYLE BE)						• FULLY MTD. SHELLS (STYLE V)						• HERMETIC SEALED MIL-T (STYLE CM)						STYLE CM PRICE		PART NO.		
H	W	D	MW	MD	WGT.	PRICE	H	W	D	MW	MD	WGT.	PRICE	H	W	D	MW	MD	WGT.	PRICE		
2½	3	2¼	2½	1½	1¼	9.86	3	2½	2¼	2	1¼	1¼	9.50	3½	3½	3	2½	2½	2½	46.39	10	02
2½	3	2½	2½	2½	2½	14.01	3	2½	2½	2	1½	2½	12.57	3½	3½	3	2½	2½	3½	51.91	10	05
3½	3¾	3¼	3¼	2¾	4¼	24.20	3½	3¼	3½	2½	2¾	4¾	22.02	4½	4½	3½	3½	2½	6½	59.92	10	10
3¾	4½	3¾	3¾	2¾	8¼	30.73	4½	3¾	4½	3	3	8¾	26.90	5½	5	4¼	4¼	3½	12	79.15	10	20
2½	3	2½	2½	1½	1½	11.81	3½	2½	2½	2	1¼	1¾	11.74	3½	3½	3	2½	2½	2¾	48.17	12	02
2½	3	3	2½	2¾	3	15.11	3½	2½	3½	2	2	3¼	13.13	3½	3½	3	2½	2½	4¾	53.35	12	05
3¼	3¾	3¾	3¾	2½	5¼	25.93	3½	3¼	3½	2½	2½	5¼	23.16	4½	4½	3½	3½	2½	7½	67.52	12	10
3¾	4½	4½	3¾	2¾	9	33.15	4½	3¾	4¼	3	3½	9½	29.72	6¼	5¾	4¾	4¾	3½	12½	83.04	12	20
2½	3	2½	2½	1¾	1¾	11.74	3½	2½	2½	2	1½	2¼	11.58	3½	3½	3	2½	2½	3¾	47.83	24	01
2½	3	2½	2½	2	2¼	13.94	3½	2½	2½	2	1¾	2½	13.19	3½	3½	3	2½	2½	3¾	51.27	24	02
3½	3¾	3¾	3¾	2¾	4¼	17.74	3½	3¾	3¾	2½	2½	4¼	15.68	4½	4¼	3½	3½	2½	6¼	56.17	24	04
3½	4½	3¾	3¾	2¾	6¼	24.25	4½	3½	3¾	2¾	2½	6¾	21.43	4½	4½	3½	3½	3	9½	66.95	24	06
3½	4½	4	3¾	3	9	27.36	4½	3½	4¾	2¾	3¾	8½	24.89	4½	4½	3½	3½	3	11½	73.13	24	08
3¾	4½	4¾	3¾	3¾	12	35.74	4½	3¾	5	3	3¾	12½	32.21	5½	5	4¼	4¼	3¾	16	86.05	24	12
4¾	5¼	5	4¾	3½	16½	46.54	5¼	4¾	5½	3½	3½	17	42.54	6¼	5¾	4¾	4¾	3½	22	98.10	24	20
4¾	5¼	5½	4¾	3¾	19½	71.28	5¼	4¾	6	3½	4¾	20	58.79	6¼	5¾	4¾	4¾	3½	24½	132.21	24	25
4¾	5¼	6	4¾	4¾	21¼	74.95	5¼	4¾	6¾	3½	4¾	22	62.03	7½	6¾	5½	5½	4¾	27½	140.13	24	30
5¾	6¾	6¾	5¾	5¾	39	96.50	6½	5½	7¾	4¾	5¾	43	85.36	7½	6¾	5½	5½	4¾	52	174.90	24	50
6¾	7¾	8	6¾	6½	64	139.67	7½	5½	8¾	5¾	6¾	54	126.52	8¾	8	6¾	6¾	5½	74	260.52	24	100
2½	3	2½	2½	1½	1	9.62	2¾	2½	2¼	1¾	1½	1½	9.34	3½	3½	3	2½	2½	2	45.52	36	00
2½	3	2½	2½	1½	1¾	12.73	2¾	2½	2¼	2	1½	2	12.21	3½	3½	3	2½	2½	3	49.78	36	01
2½	3	2½	2½	2¼	3¼	15.44	3½	2½	3¼	2¼	2¾	3½	13.77	4¼	3¾	3¾	3	2½	5¼	54.22	36	02
3½	4½	3¾	3¾	2½	6¾	21.32	4¼	3½	4	2¾	2¾	6¾	18.50	4¾	4½	3¾	3¾	3	9½	62.17	36	04
3¾	4½	4¼	3¾	2½	8¼	31.27	4½	3¾	4½	3	2¾	9¼	28.37	5½	5	4¼	4¼	3¾	13	79.96	36	06
3¾	4½	5¼	3¾	3½	12½	35.74	4½	3¾	5	3	3¾	12¼	32.21	5½	5	4¼	4¼	3¾	17	86.05	36	08
4¾	5¼	5¼	4¾	3¾	16¾	44.06	5½	4½	5¾	3½	4¼	17¼	40.22	6¼	5¾	4¾	4¾	3½	22	96.49	36	12
5¾	6¾	6¾	5¾	3¾	24	74.95	6½	5½	5¾	4¼	3¾	25	62.03	7½	6¾	5½	5¾	4¼	31	140.13	36	20
5¾	6¾	6¾	5¾	4	30	83.47	6½	5½	6	4¼	4	28	70.67	7½	6¾	5½	5¾	4¼	34	151.70	36	25
5¾	6¾	6¾	6	4¾	33	89.57	6½	5½	6¾	4¼	4¾	36	78.60	7½	6¾	5½	5¾	4¼	43	163.89	36	30
6¼	7¾	7¾	5¾	6¾	55	117.86	7½	5½	6¾	4¼	4¾	43	104.22	8¾	7¾	6¾	6¾	5½	61	216.56	36	50
7½	9	9	7½	7	105	196.63	8¾	6½	7¾	5¾	5¾	54	174.90	9½	8¾	7¾	7¾	6½	74	360.10	36	100
2½	3	2½	2½	1½	1¼	12.11	2¾	2½	2¼	1¾	1½	1½	11.17	3½	3½	3	2½	2½	2¾	48.52	56	00
2½	3	2½	2½	2¼	2½	14.29	3	2½	2½	2	2	3¼	12.56	3½	3½	3	2½	2½	4	52.44	56	01
3½	3¾	3¼	3¼	2¾	4¼	18.50	3¾	3¼	3¼	2½	2¾	4¾	16.12	4½	4¼	3¾	3¾	2½	7½	58.30	56	02
3½	4½	4	3¾	3	9	27.84	4¼	3½	4½	2¾	3¾	8½	23.71	4¾	4½	3¾	3¾	3	12½	71.84	56	04
4¾	5¼	4½	4¾	2¾	12	38.98	5¼	4½	4¾	3½	3¾	12½	34.40	6¼	5¾	4¾	4¾	3½	16	90.38	56	06
4¾	5¼	5	4¾	3¾	16¾	58.12	5¼	4½	5¾	3½	4	18	40.52	6¼	5¾	4¾	4¾	3½	22½	96.02	56	08
5¾	6¾	4½	5¾	3¾	24	68.30	6½	5½	5½	4¼	3½	25	60.81	7½	6¾	5½	5¾	4¼	31	137.09	56	12
5¾	6¾	6¾	5¾	5¾	39	101.85	6½	5½	7¼	4¼	5¼	39	82.42	7½	6¾	5½	5¾	4¼	45	190.53	56	25
6¼	7¾	7¾	5¾	7¾	78	155.31	7½	6½	7¾	5¼	6¼	43	126.52	8¾	8	6¾	6¾	5½	85	285.56	56	50
7½	9	11	7½	9	140	242.98	8¾	6½	7¾	5¾	5¾	54	174.90	9½	8¾	7¾	7¾	6½	74	360.10	56	100
2½	3	2½	2½	1½	2	12.73	3	2½	2½	2	1¾	2	11.42	3½	3½	3	2½	2½	3¼	49.78	64	00
2½	3	2½	2½	2¾	3	15.16	3¾	2½	3½	2	2½	2½	13.25	4½	4¼	3¾	3¾	2½	3¾	53.47	64	01
3½	3¾	3¼	3¼	2¾	5	19.82	3¾	3¾	3¾	2½	2¾	4¾	18.78	5½	4½	3¾	3¾	2½	7¼	60.60	64	02
3¾	4½	4¾	3¾	3½	10	30.31	4½	3¾	4½	3	3¾	11	25.94	5½	5	4¼	4¼	3¾	15½	75.24	64	04
3¾	4½	5½	3¾	4¾	15	41.21	4½	3¾	4¾	3	3¾	16	37.16	6½	5¾	4¾	4¾	3¾	22	93.15	64	06
4¾	5¼	5½	4¾	3¾	18	48.78	5½	4½	5¾	3½	4¼	19¼	45.21	6¼	5¾	4¾	4¾	3½	25	99.91	64	08
5½	6¾	6¾	4¾	5¾	3¾	77.38	6½	5½	5¾	4¼	3¾	27	64.82	7½	6¾	5½	5¾	4¼	32½	145.00	64	12
6¼	7¾	7¾	5¾	5¾	50	108.55	7½	6½	5¾	4¼	4¾	32	70.47	7½	6¾	5½	5¾	4¼	57	230.31	64	25
7¾	9	8¼	7½	6¾	95	173.48	8¾	6½	7¾	5¾	5¾	103	131.87	9½	8¾	6¾	6¾	5½	103	311.87	64	50
2½	3	2½	2½	2½	2½	13.72	3	2½	2½	2	2	2½	13.03	3½	3½	3	2½	2½	3¾	50.59	80	00
2½	3	2½	2½	2¼	3½	16.22	3½	2½	3¼	2¼	2¼	3¾	14.51	4¼	3¾	3¾	3	2½	5¼	55.02	80	01
3½	4½	3¾	3¾	2½	6½	22.94	4¼	3½	4	2¾	2¼	6¾	19.76	4½	4½	3¾	3¾	3	9	64.87	80	02
4¾	5¼	5	4¾	3½	17	42.41	5½	4½	5½	3¾	3¾	17½	38.26	4¾	4¼	3¾	3¾	2½	21½	93.87	80	05
5½	6¾	5	5¾	3¾	30	79.37	6½	5½	6	4¼	4	31	66.19	7½	6¾	5½	5¾	4¼	36½	148.01	80	10
6¼	7¾	7¾	5¾	4¼	44	124.31	7½	6½	7¾	5¾	5¾	43	104.22	8¼	7¾	6¾	6¾	4¾	48½	229.84	80	25
7¾	9	9¼	7½	7¾	113	215.42	8¾	6½	7¾	5¾	5¾	54	174.90	9½	8¾	7¾	7¾	6½	74	360.10	80	50
2½	3	2½	2½	2½	3	14.64	3¾	2½	3½	2¼	2	3	13.03	4¼	3¾	3¾	3	2½	4¾	53.01	120	00
3½	3¾	3¾	3¾	2¾	5	19.25	4½	3¾	3½	2½	2¼	4¾	16.82	4¾	4¼	3¾	3¾	2½	6¾	59.35	120	01
3¾	4½	4½	3¾	3¾	11	29.37	4½	3¾	4¾	3	3¾	10½	25.37	5½	5	4¼	4¼	3¾	14	74.90	120	02
4¾	5¼	4¾	4¾	3½	16	46.09	5½	4½	5½	3¾	4	17	42.11	6¼	5¾							

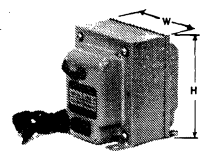
TODD
ENGINEERED**LINE ISOLATION****HIGH
CURRENT CHOKES****LINE ISOLATION****OUTPUT 115 VOLTS**50/60 HERTZ
UL COMPONENTS**STRAIGHT ISOLATION****ELECTROSTATIC SHIELD
CONNECTED TO CORE****TWO STYLES**

CATALOG NUMBER	WATTS (VA)	INPUT VOLTS	HIPOTEST TEST VOLTS	H	W	DIMENSIONS D	MW	MD	WGT.	STYLE LO PRICE	STYLE LRG PRICE
LI-25	25	115	1500	3 1/8	2 1/2	2 1/2	2	1 1/2	1 1/2	18.44	23.32
LI-50	50	115	1500	3 1/2	2 7/8	3	2 1/4	1 7/8	3	20.01	25.78
LI-100	100	115	1500	3 1/2	2 7/8	3 1/2	2 1/4	2 1/4	4	26.32	31.75
LI-175	175	115	1500	4 5/8	3 7/8	3 7/8	3	2 3/4	7	28.65	36.32
LI-250	250	115	1500	4 5/8	3 7/8	4 3/8	3	3 1/4	10	40.23	47.65
LI-350	350	115	1500	4 5/8	3 7/8	5 1/4	3	4 1/8	14	54.27	61.07
LI-500	500	115	1500	6	4 3/8	5 1/2	3 1/4	3 3/8	17 1/2	68.69	77.26
LI-750	750	115	1500	6	4 3/8	6 3/8	3 1/4	4 1/2	24	112.95	121.20
LI-1000	1000	115	1500	6	4 3/8	7 1/4	3 1/4	5 1/2	30	125.43	134.70
LI-1500	1500	115	1500	6 1/2	5 1/2	7 1/2	4 1/4	5 3/8	42	150.80	158.99
LI-2000	2000	115	1500	6 1/2	5 1/2	9	4 1/4	6 7/8	58	182.96	193.88
LI-100-1	100	230	2000	3 1/2	2 7/8	3 1/2	2 1/4	2 1/4	4	25.76	32.78
LI-250-1	250	230	2000	4 5/8	3 7/8	4 3/8	3	3 1/4	10	39.80	48.30
LI-500-1	500	230	2000	6	4 3/8	5 1/2	3 1/4	3 3/8	17 1/2	70.70	80.68
LI-1000-1	1000	230	2000	6	4 3/8	7 1/4	3 1/4	5 1/2	30	133.76	145.75
LI-1500-1	1500	230	2000	6 1/2	5 1/2	7 1/2	4 1/4	5 3/8	42	154.20	164.99
LI-2000-1	2000	230	2000	6 1/2	5 1/2	9	4 1/4	6 7/8	58	181.39	194.96

STYLE LO

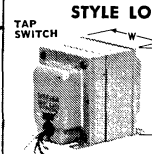
LEAD WIRE
TERMINALS

STYLE LRG

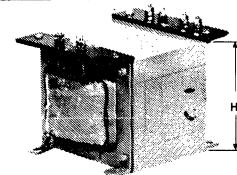
LINE CORD
RECEPTACLE
(W/GROUND)**ADJUSTABLE ISOLATION****ELECTROSTATIC SHIELD
CONNECTED TO CORE**

- PRIMARY TAPPED
- TWO STYLES

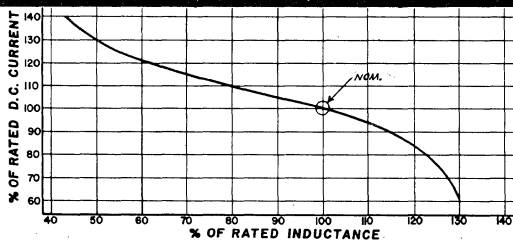
CATALOG NUMBER	WATTS (VA)	INPUT VOLTS	HIPOTEST TEST VOLTS	H	W	DIMENSIONS D	MW	MD	WGT.	STYLE LO PRICE	STYLE LRG PRICE
LI-50-2	50	105/115/125	1500	3 1/2	2 7/8	3 7/8	2 1/4	2 1/2	3	25.27	30.38
LI-100-2	100	105/115/125	1500	3 1/2	2 7/8	4 3/8	2 1/4	3	4 1/2	34.25	40.45
LI-250-2	250	105/115/125	1500	4 5/8	3 7/8	5 1/2	3	4	11 1/2	45.10	52.83
LI-500-2	500	105/115/125	1500	6	4 3/8	5 7/8	3 1/4	4 1/8	19	84.11	93.17
LI-1000-2	1000	105/115/125	1500	6	4 3/8	8 3/8	3 1/4	6 3/8	34	173.65	183.63
LI-50-3	50	210/230/250	2000	3 1/2	2 7/8	3 7/8	2 1/4	2 1/2	3	29.37	34.22
LI-100-3	100	210/230/250	2000	3 1/2	2 7/8	4 3/8	2 1/4	3	4 1/2	39.59	44.53
LI-250-3	250	210/230/250	2000	4 5/8	3 7/8	5 1/2	3	4	11 1/2	44.06	52.69
LI-500-3	500	210/230/250	2000	6	4 3/8	5 7/8	3 1/4	4 1/8	19	83.79	92.23
LI-1000-3	1000	210/230/250	2000	6	4 3/8	8 3/8	3 1/4	6 3/8	34	172.23	181.70

LEAD WIRE
TERMINALSLINE CORD
RECEPTACLE
(W/GROUND)**HI-POWER ISOLATION****ELECTROSTATIC SHIELD
CONNECTED TO CORE****BRACKET MOUNTED**

CATALOG NUMBER	WATTS (VA)	INPUT VOLTS	HIPOTEST TEST VOLTS	H	W	DIMENSIONS D	MW	MD	WGT.	PRICE
LI-2500-4	2500	115/230	2000	6 1/8	7 1/8	8 3/4	5 7/8	7	60	202.93
LI-3000-4	3000	115/230	2000	7 1/2	9	7 7/8	7 1/2	6 1/2	95	363.54
LI-4000-4	4000	115/230	2000	7 1/2	9	9	7 1/2	7 1/2	113	432.64
LI-5000-4	5000	115/230	2000	7 1/2	9	10 1/4	7 1/2	8 7/8	135	460.64
LI-6000-4	6000	115/230	2000	7 1/2	9	11 3/4	7 1/2	10 1/4	168	470.60
LI-2500-5	2500	230/460	2500	6 1/8	7 1/8	8 3/4	5 7/8	7	60	214.77
LI-3000-5	3000	230/460	2500	7 1/2	9	7 7/8	7 1/2	6 1/2	95	380.97
LI-4000-5	4000	230/460	2500	7 1/2	9	9	7 1/2	7 1/2	113	459.41
LI-5000-5	5000	230/460	2500	7 1/2	9	10 1/4	7 1/2	8 7/8	135	490.54
LI-6000-5	6000	230/460	2500	7 1/2	9	11 3/4	7 1/2	10 1/4	168	521.04



SCREW TERMINALS

HIGH CURRENT CHOKES**50/500 HERTZ**DIMENSIONS REFER TO
HIGH CURRENT XFMR SKETCHES

- Matching styles complement high current transformers
- Wide variety of compatible current ratings

INDUCTANCE VARIATION

Graph indicates typical variation of inductance (%) when used at D.C. currents (%) other than the rated values.

Chokes operated at D.C. currents higher than rated value must be run on an intermittent basis to avoid overheating.

CATALOG NUMBER	INDUC- TANCE (mH)	D.C. CURRENT (AMPS)	RESIS- TANCE (OHMS)	• BRACKET MTD. (STYLE B)	• ENCAPSULATED (STYLE BE)	STYLE B	STYLE BE	• FULLY MTD. SHELLS (STYLE V)	STYLE V	• HERMETICALLY SEALED MIL-T (STYLE CM)	STYLE CM
CH-00	200	.5	3.00	2 1/4	2 5/8	2	2	1 3/4	1 1/2	1 3/4	8.00
CH-01	100	1	1.50	2 1/2	2 7/8	2 1/2	2	1 3/4	1 1/2	1 3/4	8.91
CH-02	80	2	.95	2 1/2	3	2 1/2	2 1/2	1 3/4	1 1/2	1 3/4	9.91
CH-04	60	4	.65	3 1/8	3 3/4	3 1/4	2 1/2	2 1/2	2 1/2	2 1/2	16.27
CH-05	50	5	.40	3 1/8	3 3/4	3 3/8	3 1/4	2 1/2	3	6 1/2	16.96
CH-06	40	6	.30	3 1/8	3 3/4	3 3/8	3 1/4	2 1/2	3	6 1/2	17.50
CH-08	30	8	.20	3 1/2	4 1/8	3 7/8	3 3/8	3	4	8 1/2	18.47
CH-12	20	12	.10	4 1/8	5 1/4	4 1/2	4 3/8	3 3/8	5	3 1/2	39.49
CH-16	15	16	.08	4 1/8	5 1/4	4 3/8	4 3/8	3 3/8	5 1/4	3 3/4	42.69
CH-20	10	20	.055	4 1/8	5 1/4	4 3/8	4 3/8	3 3/8	5 1/4	3 3/4	45.55
CH-25	7	25	.03	4 1/8	5 1/4	5	4 3/8	4	5 1/4	4 3/8	47.59
CH-30	5	30	.02	5 3/8	6 3/8	4 1/2	5 1/4	4 1/2	5 1/4	4 3/4	64.56
CH-40	3 1/2	40	.018	5 3/8	6 3/8	4 3/8	5 1/4	4 1/2	5 1/4	4 3/4	69.64
CH-50	2	50	.010	5 3/8	6 3/8	4 3/8	5 1/4	4 1/2	5 1/4	4 3/4	70.96
CH-100	.7	100	.004	5 3/8	6 3/8	5	5 1/4	4 1/2	5 1/4	4 3/4	78.90
CH-200	.35	200	.0007	6 1/8	7 1/8	6 3/8	5 7/8	5 1/2	4 3/4	3 1/2	78.90

QUALITY ENGINEERED PRECISION BUILT

TODD SYSTEMS

INC.

4 RADFORD PLACE

YONKERS, N. Y., U.S.A.

(914) 963-3400

TODD
ENGINEERED**STEPDOWN AUTOTRANSFORMERS**

CONVERT DOMESTIC APPLIANCES FOR USE ON FOREIGN VOLTAGES

50/60 HERTZ—UL COMPONENTSFOR STEP-UP USE MOST UNITS
CAN BE REVERSED OR REWIRED**PORTABLE MODEL****220/240 INPUT
110/120 OUTPUT**

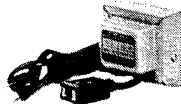
CATALOG NUMBER	RATING WATTS	WEIGHT LBS.	DIMENSIONS H W D	PRICE
SD-35	20	7/8	1 1/2 2 2 1/2	11.91
SD-36	40	1 1/4	1 3/8 2 1/8 3 1/2	13.07
SD-37	60	1 3/8	1 3/8 2 1/8 3 1/2	15.05
SD-41	80	1 3/8	1 3/8 2 1/8 3 1/2	15.90



LINE CORD • RECEPTACLE

NORMAL DUTY MODEL**220/240 INPUT
110/120 OUTPUT**

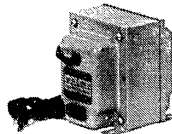
CATALOG NUMBER	RATING WATTS	WEIGHT LBS.	DIMENSIONS H W D	PRICE
SD-24	50	1 1/8	2 1/4 2 3/4 2 1/4	10.59
SD-21	65	1 1/8	2 1/4 2 3/4 2 1/4	11.10
SD-25	80	1 3/8	2 1/4 2 3/4 2 1/8	11.91
SD-23	100	1 3/8	2 1/4 2 3/4 2 1/8	12.59
SD-26	125	2 3/8	2 5/8 3 1/8 2 1/2	14.10
SD-27	150	2 3/8	2 5/8 3 1/8 2 1/2	14.79



LINE CORD • PIGTAIL

HEAVY DUTY MODEL**220/240 INPUT
110/120 OUTPUT**

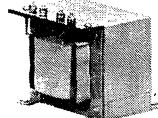
CATALOG NUMBER	RATING WATTS	WEIGHT LBS.	DIMENSIONS H W D	PRICE
SD-15	75	2	3 1/8 2 5/8 3 1/8	15.27
SD-16	100	2 1/4	3 1/8 2 5/8 3 1/4	15.40
SD-17	150	3 1/2	3 1/8 2 5/8 3 3/8	17.32
SD-38	200	3 3/4	3 1/8 2 5/8 4	20.29
SD-12	250	5 1/2	4 5/8 3 3/8 3 3/8	23.68
SD-18	350	6 1/2	4 5/8 3 3/8 3 3/8	27.63
SD-11	500	9 3/4	4 5/8 3 3/8 4 1/4	33.61
SD-19	750	12	4 5/8 3 3/8 5	41.90
SD-13	1000	13 3/4	4 5/8 3 3/8 5 1/4	54.84
SD-14	1500	19	4 5/8 3 3/8 6 5/8	65.02
SD-20	2000	24 1/2	6 4 3/8 6 5/8	127.50
SD-39	2500	35 1/2	6 1/2 5 1/2 6 5/8	220.23



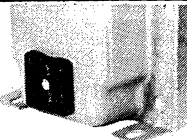
LINE CORD • RECEPTACLE

INDUSTRIAL MODEL**208/220/240 INPUT
110/120 OUTPUT**

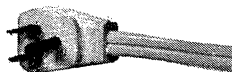
CATALOG NUMBER	RATING WATTS	WEIGHT LBS.	DIMENSIONS H W D	PRICE
SD-28	3000	47	6 1/8 7 1/8 6 1/4	247.64
SD-29	4000	54	6 1/8 7 1/8 7 1/8	323.33
SD-22	5000	59	6 1/8 7 1/8 7 1/2	357.95
SD-30	6000	70	6 1/8 7 1/8 8 1/2	380.63



SCREW TERMINALS

ACCESSORIES**AVAILABLE FOR USE
WHERE APPLICABLE**

3 WIRE RECEPTACLE



3 WIRE LINE CORD



PLUG ADAPTERS

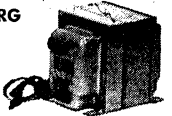


FOREIGN PLUGS

3 TAP REFRIGERATION188/210
210/236 → 105V-50Hz
236/260 115V-60Hz

CATALOG NUMBER	RATING WATTS	WEIGHT LBS.	DIMENSIONS H W D	PRICE
SD-31LRG	350	6 1/2	4 5/8 3 7/8 4 3/8	44.88
SD-32LRG	550	9 1/4	4 5/8 3 7/8 5	47.99
SD-33LRG	750	12	4 5/8 3 7/8 5 1/4	57.39
SD-34LRG	1000	16 1/4	4 5/8 3 7/8 7	73.04
SD-40LRG	1500	23	4 5/8 3 7/8 8 1/2	96.89

STYLE LRG

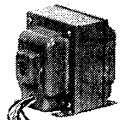


TAP SWITCH

LINE CORD • RECEPTACLE
(GROUNDED)

CATALOG NUMBER	RATING WATTS	WEIGHT LBS.	DIMENSIONS H W D	PRICE
SD-31LO	350	6 1/4	4 5/8 3 7/8 4 1/2	42.63
SD-32LO	550	9	4 5/8 3 7/8 5 1/8	44.58
SD-33LO	750	12	4 5/8 3 7/8 5 1/2	52.49
SD-34LO	1000	16	4 5/8 3 7/8 6 1/2	69.47
SD-40LO	1500	22	4 5/8 3 7/8 8	89.86

STYLE LO



JUNCTION BOX

LEAD WIRE TERMINALS

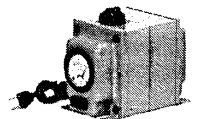
**MULTI-TAPPED
VOLTAGE REGULATOR****METER • SWITCH**

TYPE	PRIMARY VOLTS (SELECTOR SWITCH TAPS)										OUTPUT VOLTS
11	84	92	100	108	115	122	130	138			115
12	84	92	100	108	115	122	130	138			208, 230
21	170	185	200	215	230	245	260	275			115
22	170	185	200	215	230	245	260	275			208, 230

CATALOG NUMBER	TYPE	RATING WATTS	WGT. LBS.	DIMENSIONS H W D	PRICE
MVR-17	11 or 22	150	4 5/8	4 5/8 3 7/8 5	51.80
MVR-18	11 or 22	350	6 1/2	4 5/8 3 7/8 5 1/2	59.70
MVR-11	11 or 22	500	8	4 5/8 3 7/8 5 3/4	67.15
MVR-19	11 or 22	750	11	4 5/8 3 7/8 6 5/8	79.97
MVR-13	11 or 22	1000	13 1/4	4 5/8 3 7/8 7 1/8	101.16
MVR-14	11 or 22	1500	17	6 4 3/8 7 3/8	138.60
MVR-20	11 or 22	2000	22	6 4 3/8 8 1/4	207.13

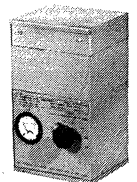
MVR-17	12 or 21	150	6	4 5/8 3 7/8 5 1/8	58.44
MVR-18	12 or 21	350	9	4 5/8 3 7/8 5 7/8	70.43
MVR-11	12 or 21	500	12 1/2	4 5/8 3 7/8 6 3/4	81.30

MVR-19	12 or 21	750	15	4 5/8 3 7/8 7 1/4	100.07
MVR-13	12 or 21	1000	18 3/4	6 4 3/8 7 1/2	124.27
MVR-14	12 or 21	1500	24	6 4 3/8 8 1/2	172.48
MVR-20	12 or 21	2000	30 1/2	6 4 3/8 9 1/4	242.66

UL LINE CORD
& RECEPTACLE**PANEL MOUNTED
VOLTAGE REGULATOR****METER • SWITCH
JUNCTION BOX**

TYPE	PRIMARY VOLTS (SELECTOR SWITCH TAPS)										OUTPUT VOLTS
11	84	92	100	108	115	122	130	138			115
12	84	92	100	108	115	122	130	138			208, 230
21	170	185	200	215	230	245	260	275			115
22	170	185	200	215	230	245	260	275			208, 230

CATALOG NUMBER	TYPE	RATING WATTS	WGT. LBS.	DIMENSIONS H W D	PRICE
PVR-20	11 or 22	2000	29	5 3/8 6 3/8 11 1/4	461.76
PVR-28	11 or 22	3000	40	5 3/8 6 3/8 12 1/4	533.79
PVR-29	11 or 22	4000	49	5 3/8 6 3/8 13 3/8	588.59
PVR-22	11 or 22	5000	57	5 3/8 6 3/8 14 3/8	618.12
PVR-30	11 or 22	6000	63	6 1/8 7 1/8 13 3/4	645.86
PVR-20	12 or 21	2000	44	6 1/8 7 1/8 13	535.63
PVR-28	12 or 21	3000	58	6 1/8 7 1/8 14	624.88
PVR-29	12 or 21	4000	78	6 1/8 7 1/8 15 1/2	666.13
PVR-22	12 or 21	5000	91	6 1/8 7 1/8 16 1/2	707.42
PVR-30	12 or 21	6000	105	6 1/8 7 1/8 18	744.68

• JUNCTION BOX
• LEAD TERMINALS

QUALITY ENGINEERED PRECISION BUILT

TODD SYSTEMS

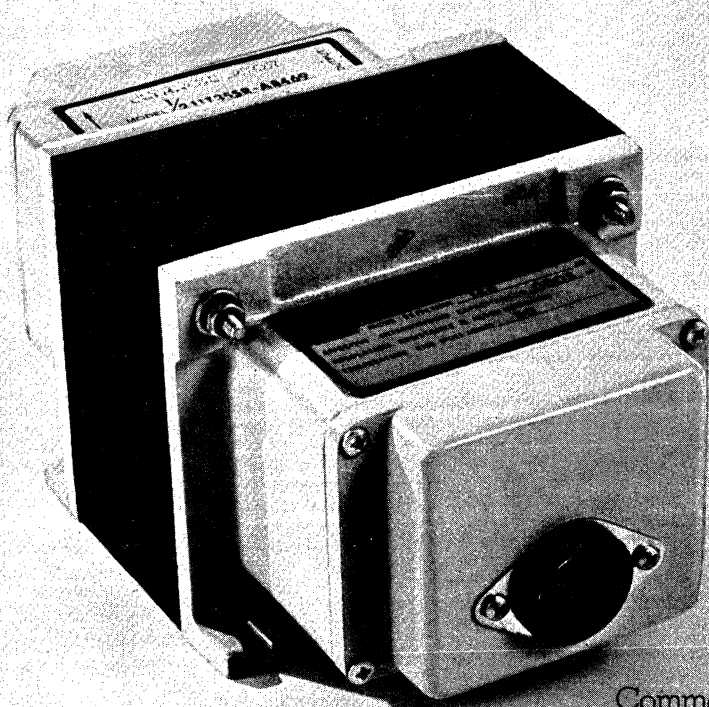
INC.

4 RADFORD PLACE

YONKERS, N.Y., U.S.A.

(914) 963-3400

Topaz Ultra-Isolation Transformers will solve your power line noise problems. We guarantee it.



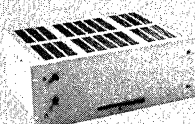
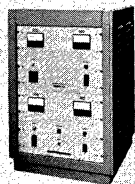
Pete Jorgensen, Magnetics Production Manager at Topaz, was asked recently why the performance of Topaz Ultra-Isolation Transformers is so exceptional. He answered by saying, "Because we have people who have been winding and shielding transformers for 10 years, and they do it unusually well."

Topaz Ultra-Isolation Transformers protect electronic equipment from noisy power lines and protect clean power lines from noise-generating equipment. The unique Topaz box shielding techniques and the meticulous care taken during manufacturing guarantee the effectiveness of Topaz transformers.

Common-mode noise is attenuated by more than 1,000,000 to 1. Effective capacitance between windings is less than 0.0005 picofarads.

So if power line noise is your problem, write or phone. We'll prove that Topaz Ultra-Isolation Transformers will solve your problem. We guarantee it — or your money back.

Or your money back.



Other Products • Uninterruptible Power Systems • Inverters • Frequency Changers • AC Line Regulators

Topaz is also a major supplier of **custom** power conversion equipment. Contact us.

TOPAZ

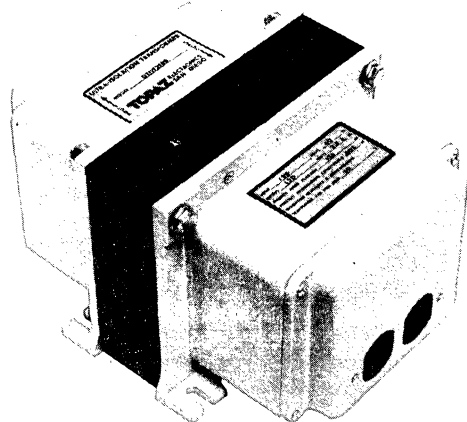
ELECTRONICS

3855 Ruffin Road, San Diego, California 92123 • Phone: (714) 279-0831. TWX (910) 335-1526

TOPAZ

ELECTRONICS

**For eliminating power line noise problems
associated with sensitive equipment**



1. For isolating sensitive instrumentation from noisy power lines.
2. For isolating sensitive power lines from noisy equipment.
3. For isolating noisy equipment from noise-sensitive equipment when both share the same AC power source.
4. For maximum attenuation of common-mode noise (noise between ground and power lines).
5. For excellent attenuation of transverse-mode noise (line-to-line output noise) caused by common-mode noise at the input.
6. For completion of electrostatic guarding of equipment which is protected by an electrostatic shield.
7. For applications in which leakage currents must be kept below critical low levels.

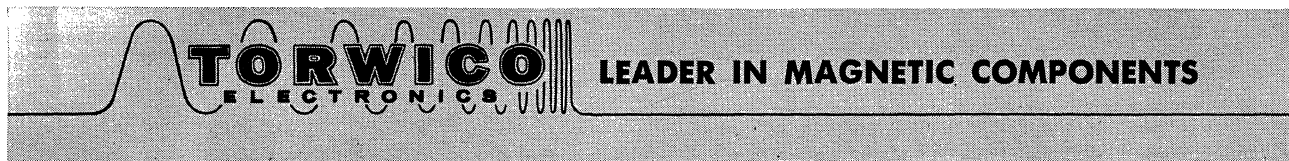
MODEL NUMBER		GUARANTEED EFFECTIVE CAPACITANCE		Primary VAC (Nominal)	Secondary VAC (Nominal)	Terminations	Wt. (Lbs.)	Price Each
Power Rating	≤ .005 pF	≤ .001 pF	≤ .0005 pF					
125 VA	1/811T25SR	1/811T21SR		120	120	Receptacle	11	\$ 75
125				120	120	Terminals	11	105
125			1/811T35SR	120	120	Receptacle	11	140
125	1/811T25ST	1/811T21ST		120	120	Terminals	10	75
125				120	120	Terminals	10	105
125			1/811T35ST	120	120	Terminals	10	140
500 VA	1/211T25SR	1/211T21SR		120	120	Receptacle	18	120
500				120	120	Receptacle	18	155
500			1/211T35SR	120	120	Receptacle	18	205
500	1/211T25ST	1/211T21ST		120	120	Terminals	17	120
500				120	120	Terminals	17	155
500			1/211T35ST	120	120	Terminals	17	205
1.0 kVA	0111T25SR			120	120	Duplex	32	200
1.0	0111T25SR			240	240	Duplex	32	200
1.0	0111T25ST			120	120	Terminals	30	200
1.0	0131T25T			240	120	Terminals	30	200
1.0	0131T25T			240	240	Terminals	30	200
1.0	0155T25T			125/250	115/230	Terminals	67	500
1.0	0111T25TF			120	120	Terminals	37	250
1.0		0111T21SR		120	120	Duplex	32	250
1.0		0131T21SR		240	120	Duplex	32	250
1.0		0111T21ST		120	120	Terminals	30	250
1.0		0131T21ST		240	120	Terminals	30	250
1.0		0131T21ST		240	240	Terminals	30	250
1.0		0131T21ST		240	240	Terminals	30	250
1.0		0155T21TF		125/250	115/230	Terminals	67	500
1.0		0111T21TF		120	120	Terminals	37	250
1.0			0111T35SR	120	120	Duplex	67	625
1.0			0131T35SR	240	120	Duplex	32	335
1.0			0111T35ST	120	120	Terminals	30	335
1.0			0131T35ST	240	120	Terminals	30	335
1.0			0131T35ST	240	240	Terminals	30	335
1.0			0155T35TF	125/250	115/230	Terminals	67	830
1.0			0111T35TF	120	120	Terminals	67	830

MODEL NUMBER GUARANTEED EFFECTIVE CAPACITANCE				Primary VAC (Nominal)	Secondary VAC (Nominal)	Terminations	Wt. (Lbs.)	Price Each
Power Rating	≤ .005 pF	≤ .001 pF	≤ .0005 pF					
2.5 kVA	0211T25SR			120	120	Duplex	45	305
2.5	0231T25SR			240	120	Duplex	45	305
2.5		0211T21SR		120	120	Duplex	45	350
2.5		0231T21SR		240	120	Duplex	45	380
2.5			0211T35SR	120	120	Duplex	45	510
2.5	0211T25ST			240	120	Duplex	45	305
2.5	0231T25ST			240	120	Terminals	44	380
2.5	0233T25ST			240	240	Terminals	44	305
2.5		0211T21ST		120	120	Terminals	44	380
2.5		0231T21ST		240	120	Terminals	44	380
2.5		0233T21ST		240	240	Terminals	44	380
2.5			0211T35ST	120	120	Terminals	44	510
2.5		0231T35ST		240	120	Terminals	44	510
2.5		0233T35ST		240	240	Terminals	44	510
5.0 kVA	0511T25FT			120	120	Terminals	111	565
5.0	0511T25ST			120	120	Terminals	66	460
5.0	0531T25ST			240	120	Terminals	66	460
5.0	0533T25ST			240	240	Terminals	66	460
5.0		0511T21FT		120	120	Terminals	111	710
5.0		0511T21ST		120	120	Terminals	66	575
5.0		0531T21ST		240	120	Terminals	66	575
5.0		0533T21ST		240	240	Terminals	66	575
5.0		0541T21ST		480	120	Terminals	66	575
5.0			0511T35FT	120	120	Terminals	111	945
5.0		0511T35ST		120	120	Terminals	66	770
5.0		0511T35ST		240	120	Terminals	66	770
5.0		0533T35ST		240	240	Terminals	66	770
5.0		0541T35ST		480	120	Terminals	66	770
10 kVA	1033T25ST			240	240	Terminals	164	820
10		1033T21ST	1033T35ST	240	240	Terminals	164	1045
10				240	240	Terminals	164	1390
10	1065T25BT			240/480	120/240	Conduit	222	1430
10		1065T21BT		240/480	120/240	Conduit	222	1800
10			1065T35BT	240/480	120/240	Conduit	222	2480
15 kVA	1533T25ST			240	240	Terminals	203	895
15		1533T21ST		240/480	240	Terminals	203	1245
15			1533T35ST	240	240	Terminals	203	1660
15	1565T25BT			240/480	120/240	Conduit	269	1440
15		1565T21BT		240/480	120/240	Conduit	269	2050
15			1565T35BT	240/480	120/240	Conduit	269	2730
20 kVA	2065T25BT			240/480	120/240	Conduit	332	1840
20		2065T21BT		240/480	120/240	Conduit	332	2323
20			2065T35BT	240/480	120/240	Conduit	332	3050

TOPAZ
ELECTRONICS

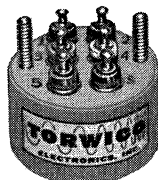
SOLUTIONS TO
POWER PROBLEMS

2-1817

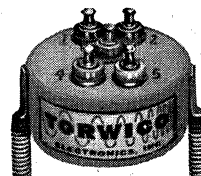


TINYMAX

Miniature 400 Cycle Power Transformers



This Case style
available in
1.5 through 250 VA



This Case style
available in
1.5 through 9 VA

TINYMAX

CONDENSED PERFORMANCE DATA FOR STANDARD TINYMAX 400 CYCLE POWER TRANSFORMERS

VA Rating	Secondary Voltage—VRMS* (Choose any one voltage within limits listed)	O.D. ±1/32	Height ±1/32	Nominal Weight	Nominal Regulation	Nominal Temp. Rise MIL-T-27 (with no heat sink)
1.5	6.0 to 300	1"	15/32"	0.89 oz.	20%	13°C
1.5 (with electrostatic shield)	6.0 to 300	1"	19/32"	1.1 oz.	15%	13°C
3	6.0 to 300	1"	19/32"	1.1 oz.	15%	15°C
3 (with electrostatic shield)	6.0 to 300	1"	13/16"	1.5 oz.	10%	15°C
6	6.0 to 300	1"	13/16"	1.5 oz.	10%	18°C
6 (with electrostatic shield)	6.0 to 300	1"	1 1/16"	2 oz.	8%	18°C
9	6.0 to 300	1"	1 1/16"	2 oz.	8%	23°C
9 (with electrostatic shield)	6.0 to 300	1 3/8"	1 1/8"	3.5 oz.	7%	23°C
16	6.0 to 300	1 3/8"	1 1/8"	3.5 oz.	7%	25°C
25	6.0 to 300	1 3/8"	1 3/8"	4.5 oz.	6%	36°C
50	6.0 to 300	2"	1 1/2"	10 oz.	2.5%	26°C
75	10 to 300	2"	1 3/4"	12 oz.	2.5%	32°C
100	12 to 300	2 1/4"	2"	17 oz.	2%	35°C
250	26 to 300	2 7/8"	2"	27.5 oz.	1.5%	47°C

*with primary 115V, 400 cps

TINYMAX Power Transformers are hermetically sealed in drawn steel cases and shall meet all requirements of MIL-T-27; Military Designation: TF4S01YY.

24 hour delivery for prototype quantities. Don't settle for less—Prices on these custom-engineered transformers equal those of competitive shelf items—Phone today for your comprehensive TINYMAX catalog.

TINYMAX

POWER TRANSFORMERS FOR PRINTED CIRCUIT APPLICATIONS



VA Rating	Secondary Voltage—VRMS* (Choose any one voltage within limits listed)	Dimensions ±1/32"	Nominal Weight	Nominal Regulation	Nominal Temp. Rise
1.5	6.0 to 300	1 1/16" square x 7/16" tall	0.75 oz.	20%	13°C
3	6.0 to 300	1 1/16" square x 9/16" tall	1.0 oz.	15%	15°C
6	6.0 to 300	1 1/16" square x 3/4" tall	1.25 oz.	10%	18°C
9	6.0 to 300	1 1/16" square x 1" tall	1.63 oz.	8%	23°C

*with primary 115V, 400 cps

TINYMAX Power Transformers for printed circuit applications are hermetically sealed in thermoset plastic and shall meet all requirements of MIL-T-27; Military Designation: TF5SX01ZZ.





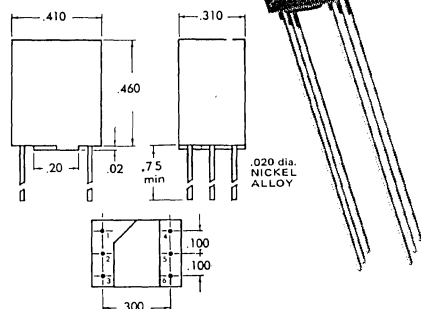
13402 SOUTH 71 HIGHWAY, GRANDVIEW, MO. 64030

PHONE: (816) 761-6314 TWX 910-777-7037

TRANSFORMERS

SUBMINIATURE AUDIO TRANSFORMERS PROTOTYPES IN 48 HOURS UPON REQUEST

LT & LS SERIES



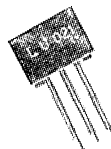
The LS Series is electrically and mechanically the same as the LT Series except for phase relationships between terminals.

LS, LT, and LU Series transformers have successfully passed the rigid requirements of MIL-T-27B, Class R, Grade 5.

Subminiature in size, weighing less than 0.1 ounce, these transformers have tenth inch grid spacing between terminals and are ideally suited for transistor circuit applications which utilize printed circuit board design. All three series have risers on mounting surfaces to facilitate inspection and board cleaning, and also to prevent moisture traps.

A wide range of standard designs are available which meet the requirements of most common applications and allow for rapid delivery of prototype

LU SERIES



Wt. 0.1 oz.

quantities. Special designs are also available in all three types.

The new LU Series exhibits the same electrical characteristics as the LS and LT Series but has been packaged in a "thin line" configuration to allow for closer board spacing for "card cage" applications or where height dimensions are critical.

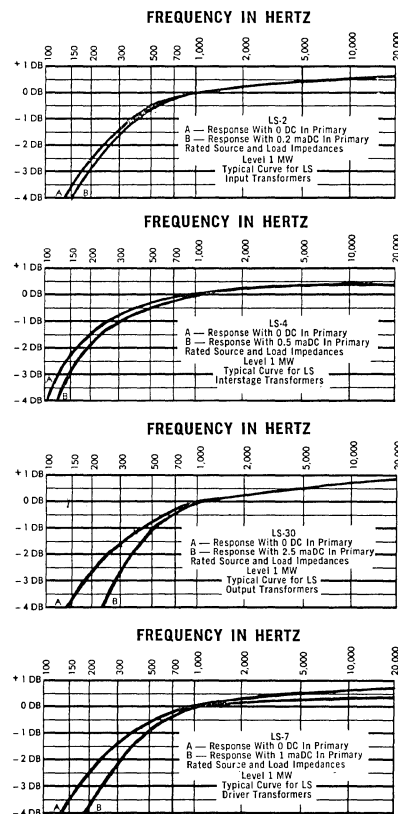
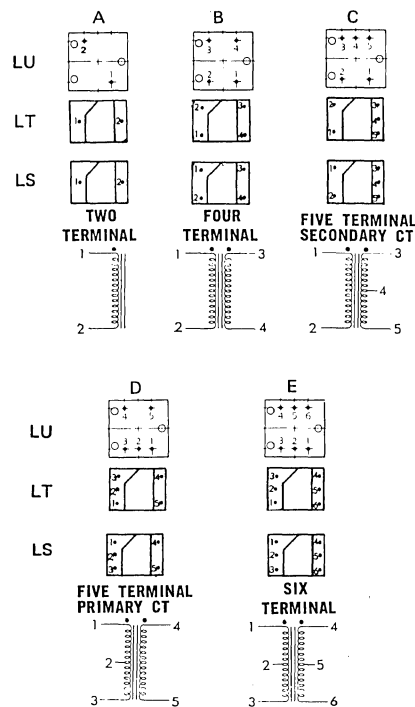
MAGNETIC SHIELDING

LS and LT Series transformers are available with magnetic shields when required. Overall dimensions of transformers with the magnetic shield added are .365 max. x .465 max. x .531 max.

To order transformers with shields installed add 500 to dash numbers shown in the table below. For example: to order an LS-22 with shield, specify LS-522.

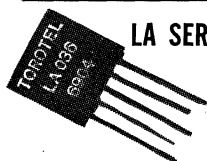
LS, LT or LU No.	MIL-T-27A Designation	Application	Primary Impedance	DC Res. Pri. Ohms	DC ma Pri.	Secondary Impedance	Max. Power MW	Term. Layout
2	TF5RX16ZZ	Input	50,000-CT	3800	.2	1000-CT	25	E
4	TF5RX13ZZ	Interstage	20,000/30,000	1700	.5	800/1200	40	B
5	TF5RX13ZZ	Interstage	20,000/30,000-CT	1700	.5	800/1200-CT	40	E
6	TF5RX13ZZ	Interstage	10,000/12,000-CT	1050	1	1500/1800-CT	50	E
7	TF5RX13ZZ	Driver	10,000/12,000-CT	1050	1	1200/1500-CT	50	E
8	TF5RX13ZZ	Driver	10,000/12,000-CT	1050	1	2000/2500-CT	50	E
9	TF5RX13ZZ	Driver	10,000/12,000-CT	1050	1	500/600-CT	50	E
10	TF5RX17ZZ	Output	500/600	60	3	50/60	50	B
11	TF5RX17ZZ	Output	1000/1200	145	3	50/60	50	B
12	TF5RX17ZZ	Output	600	70	3	3.2	50	B
13	TF5RX13ZZ	Output	1200	120	2	3.2	50	B
14	TF5RX13ZZ	Output	10,000	1160	1	3.2	50	B
15	TF5RX17ZZ	Output	150/200-CT	18	10	12/16	50	D
16	TF5RX17ZZ	Output	300/400-CT	38	7	12/16	50	D
17	TF5RX17ZZ	Output	600/800-CT	75	4.5	12/16	50	D
18	TF5RX17ZZ	Output	1000/1300-CT	120	3.5	12/16	50	D
19	TF5RX13ZZ	Output	1500/2000-CT	180	3	12/16	50	D
20	TF5RX13ZZ	Output	7500/10,000-CT	820	1	12/16	50	D
21	TF5RX13ZZ	Output	300-CT	37	7	600	50	D
22	TF5RX17ZZ	Output	500-CT	60	3	600	50	D
23	TF5RX17ZZ	Output	900-CT	100	4	600	50	D
24	TF5RX17ZZ	Output	1500-CT	170	3	600	50	D
25	TF5RX17ZZ	Output	120/150-CT	15	10	3.2/4	50	D
26	TF5RX17ZZ	Output	320/400-CT	40	6	3.2/4	50	D
27	TF5RX17ZZ	Output	600/750-CT	70	4.5	3.2/4	50	D
28	TF5RX17ZZ	Output	800/1000-CT	100	4	3.2/4	50	D
29	TF5RX13ZZ	Output	1200/1500-CT	125	3	3.2/4	50	D
30	TF5RX13ZZ	Output	1600/2000-CT	190	2.5	3.2/4	50	D
31	TF5RX13ZZ	Output	8000/10,000-CT	820	1	3.2/4	50	D
32	TF5RX13ZZ	Output	10,000-CT	1000	1	10,000-CT	50	E
33	TF5RX13ZZ	Driver	10,000/12,000	1050	1	500/600-CT	50	C
34	TF5RX13ZZ	Driver	20,000	1700	.3	1000	50	B
35	TF5RX17ZZ	Output	1000	135	3	50	50	B
36	TF5RX17ZZ	Output	400-CT	40	3	11	50	D
37	TF5RX13ZZ	Driver	10,000/12,000	1050	1	2000/2500-CT	50	C
38	TF5RX17ZZ	Output	600-CT	72	3	600-CT	50	E
39	TF5RX13ZZ	Output	10,000	1000	1	10,000 split	50	*
40	TF5RX17ZZ	Output	600	72	3	600 split	50	*
41	TF5RX13ZZ	Input	25,000-CT	4300	0.6	1000-CT	30	E
42	TF5RX17ZZ	Isolation	600-CT	90	4	600-CT	30	E
101	TF5RX20ZZ	Choke	6 H @ 2 ma	1700				A
102	TF5RX20ZZ	Choke	1.25 H @ 2 ma	180				A
103	TF5RX20ZZ	Choke	3.5 H @ 2 ma	1100				A
104	TF5RX20ZZ	Choke	.3 H @ 4 ma	42				A

*PRIMARY TERM. 1-2; SECONDARY TERM. 3-4, 5-6

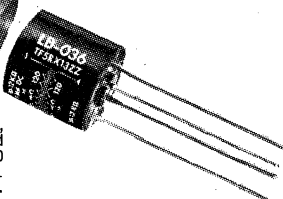
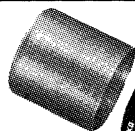


The above are typical response curves up to 20 kHz however many items in this series have useful frequency ranges up to 100 kHz and beyond.

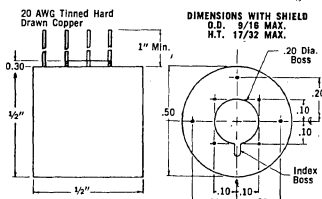
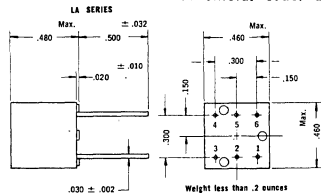
TWX 910-777-7037



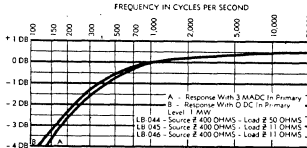
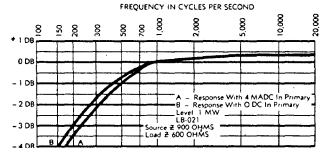
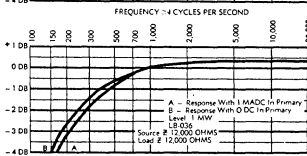
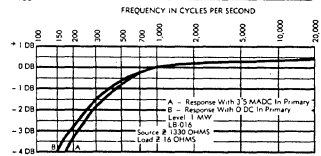
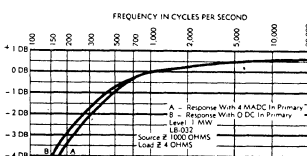
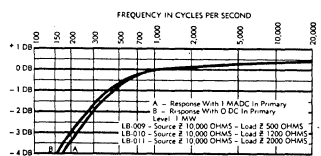
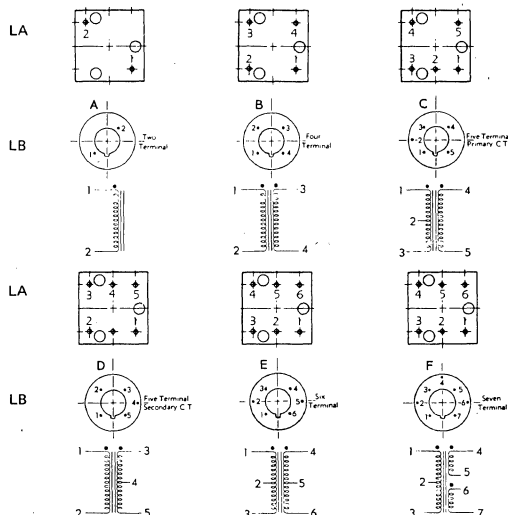
LB SERIES



The LB-500 Magnetic Shield, as shown, may be supplied for all LB Types. Add 500 to Dash Number (i.e. LB-001 with Shield. Order LB-501).



Leads are made of 20 AWG Tinned Hard Drawn Copper. Units utilizing Dumet Wire are available on special request.



LA, No.	MIL Designation	Application	Primary Impedance	DC mA in Pri.	Secondary Impedance	Nom. Pri. Res.	MW Level @ 1 KHz	Term. Out
001	TF5SX13Z2	Interstage	20,000 30,000	.5 5	800 1200	850	50	B
002	TF5SX17Z2	Output	500 600	3 3	50 60	60	100	B
003	TF5SX13Z2	Output	1000 1200	3 3	50 60	115	100	B
004	TF5SX17Z2	Output	600	3	3.2	60	100	B
005	TF5SX13Z2	Output	1200	2	3.2	115	100	B
006	TF5SX13Z2	Output	10,000	1	3.2	790	100	B
007	TF5SX16Z2	Input	200,000	0	1000	8500	25	B
008	TF5SX20Z2	Other Application Reactor 3.5 H @ 2 maDC, 1 H @ 5 maDC	500	0	100,000	630		A
009	TF5SX13Z2	Output or Driver	10,000 12,000	1 1	500-CT 600-CT	800	100	D
010	TF5SX13Z2	Driver	12,000 12,000	1 1	1500-CT	800	100	D
011	TF5SX13Z2	Driver	10,000 12,000	1 1	2500-CT	800	100	D
012	TF5SX17Z2	Single or PP Output	150-CT 200-CT	10 10	12 16	11	500	C
013	TF5SX17Z2	Single or PP Output	300-CT 400-CT	7 7	12 16	20	500	C
014	TF5SX17Z2	Single or PP Output	750-CT 800-CT	5 5	12 16	43	500	C
015	TF5SX17Z2	Single or PP Output	800-CT 1070-CT	5 4	12 16	51	500	C
016	TF5SX13Z2	Single or PP Output	1000-CT 1330-CT	3.5 3.5	12 16	71	500	C
017	TF5SX13Z2	Single or PP Output	1500-CT 2000-CT	3 3	12 16	108	500	C
018	TF5SX13Z2	Single or PP Output	7500-CT 10,000-CT	1 1	16	505	500	C
019	TF5SX17Z2	Output to Line	300-CT	7	600	19	500	C
020	TF5SX17Z2	Output to Line to Line or Mixing	500-CT	5.5	600	31	500	C
021	TF5SX17Z2	Output to Line	900-CT	4	600	53	500	C
022	TF5SX13Z2	Output to Line	1500-CT	3	600	86	500	C
023	TF5SX13Z2	Interstage	20,000-CT 30,000-CT	.5 .5	800-CT 1200-CT	850	100	C
024	TF5SX16Z2	Input	200,000-CT	0	1000-CT	8500	25	E
025	TF5SX13Z2	Other Application Interstage	0 10,000-CT 12,000-CT	0 1 1	100,000-CT 1500-CT 1800-CT	800	100	E
026	TF5SX20Z2	Reactor 6 H @ 2 maDC 1.5 H @ 5 maDC				2100		A
027	TF5SX20Z2	Reactor 1.2 H @ 2 maDC, .5 H @ 11 maDC				100		A
028	TF5SX20Z2	Reactor 3 H @ 4 maDC .15 H @ 20 maDC				31		A
029	TF5SX17Z2	Single or PP Output	120-CT 150-CT	10 10	3.2 4	10	500	C
030	TF5SX17Z2	Single or PP Output	320-CT 400-CT	7 7	3.2 4	20	500	C
031	TF5SX17Z2	Single or PP Output	640-CT 800-CT	5 5	3.2 4	43	500	C
032	TF5SX17Z2	Single or PP Output	800-CT 1000-CT	4 4	3.2 4	51	500	C
033	TF5SX13Z2	Single or PP Output	1060-CT 1330-CT	3.5 3.5	3.2 4	71	500	C
034	TF5SX13Z2	Single or PP Output	1600-CT 2000-CT	3 3	3.2 4	109	500	C
035	TF5SX13Z2	Single or PP Output	8000-CT 10,000-CT	1 1	3.2 4	505	100	C
036	TF5SX13Z2	Isolation or Interstage	10,000-CT 12,000-CT	1 1	10,000-CT 12,000-CT	950	100	E
037	TF5SX13Z2	Driver	10,000-CT 12,000-CT	1 1	1200-CT 1500-CT	800	100	E
038	TF5SX13Z2	Driver	10,000-CT 12,000-CT	1 1	2000-CT 2500-CT	800	100	E
039	TF5SX13Z2	Driver	10,000-CT 12,000-CT	1 1	500-CT 600-CT	800	100	E
040	TF5SX16Z2	Input	100,000	0	1000	1700	70	B
041	TF5SX13Z2	Driver	20,000	.5	1000	1000	100	B
042	TF5SX13Z2	Driver	20,000	.5	1200-CT	1000	100	D
043	TF5SX17Z2	Output	1000	3	50	60	100	B
044	TF5SX17Z2	Output	400	3	50	30	100	B
045	TF5SX17Z2	Output	400	3	11	30	100	B
046	TF5SX17Z2	Single or PP Output	400-CT	3	11	3		
047	TF5SX20Z2	Reactor 10 H @ 0 maDC, 8 H @ .5 maDC				30 650	500	C
048*	TF5SX13Z2	Isolation or Interstage Ratio 1:1:1	2000-CT 2500-CT	3 3	8000 split 10,000 split	195	100	F
049*	TF5SX13Z2	Interstage	10,000-CT 12,000-CT	1 1	2000 split 2400 split	560	100	F
050*	TF5SX13Z2	Interstage	20,000-CT 30,000-CT	.5 .5	1000 split 1500 split	800	100	F
051*	TF5SX13Z2	Interstage	40,000-CT 50,000-CT	.25 .25	400 split 500 split	1700	50	F
052*	TF5SX17Z2	Interstage or Output	400-CT 500-CT	8 8	400 split 500 split	46	500	F
053*	TF5SX17Z2	Interstage	400-CT 500-CT	6 6	500 split 1200 split	46	500	F
054*	TF5SX17Z2	Interstage	500-CT 600-CT	6 6	150 split 40 split	46	500	F
055*	TF5SX17Z2	Interstage	500-CT 80-CT	8 10	50 split 30 split	9.8	500	F
056	TF5SX16Z2	Input	50,000-CT	.3	1000-CT	1900	50	E
057	TF5SX17Z2	Output	600-CT 750-CT	4.5 3	3.2 4	40	500	C
058	TF5SX13Z2	Output	1200-CT 1500-CT	3 3	3.2 4	100	500	C
059	TF5SX16Z2	Input	100K-CT	0	1000-CT	3300	25	E
060	TF5SX13Z2	Driver	10K-CT	1	600-CT	1100	100	E
061	TF5SX13Z2	Interstage	4K-CT	2	10K-CT	440	500	E
062	TF5SX17Z2	Output to Line	1000-CT	3	600-CT	110	500	E
063	TF5SX11Z2	Input	600-CT	4	25K-CT	65	100	E
064	TF5SX17Z2	Isolation	600-CT	4	600-CT	67	100	E
065	TF5SX17Z2	Output	600-CT	4	60	65	100	C
066	TF5SX17Z2	Output Magnetic Shielding Case	600-CT	4	4	65	100	C
500								

*These LA Types have no Primary C-T

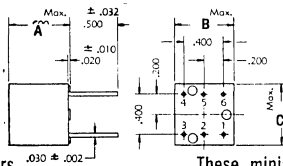


13402 SOUTH 71 HIGHWAY, GRANDVIEW, MO. 64030

PHONE: (816) 761-6314 TWX 910-777-7037

TRANSFORMERS

AUDIO TRANSFORMERS LL & LR SERIES



Series	A	B	C
LL	.600	.590	.590
LR	.925	.800	.710

These tiny, versatile "LL" transformers are provided with .020 risers and 0.1 grid spacing for printed circuit board applications and are manufactured to MIL-T-27, Grade 5, Class S specifications.

RESPONSE: ± 1 db 200 to 50,000 Hz
DISTORTION: 10% Max. at rated power, 200 to 50,000 Hz
WEIGHT: 0.4 OZ

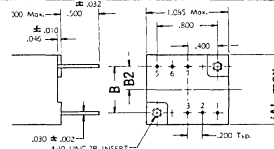
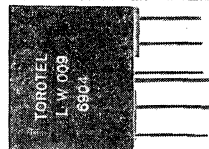
LL No.	MIL-T-27 Designation	Application	Impedance Ohms		DC Resistance Ohms		Max. Pri DC (ma)	Max. 200 Hz Pwr* (mw)
			Pri	Sec.	Pri	Sec.		
001	TF5SX16ZZ	Input	100K-CT	1000-CT	6000	60	0	150
002	TF5SX16ZZ	Interstage	25K-CT	1000-CT	2800	120	0	150
003	TF5SX13ZZ	Interstage	10K-CT	10K-CT	1100	1200	1	150
004	TF5SX13ZZ	Driver	10K-CT	1500-CT	1100	200	1	150
005	TF5SX13ZZ	Output to Line	10K-CT	600-CT	1100	75	1	150
006	TF5SX13ZZ	Interstage	4000-CT	10K-CT	440	1200	1.5	150
007	TF5SX17ZZ	Output to Line	1000-CT	600-CT	100	60	3	150
008	TF5SX17ZZ	Output	1000-CT	4	100	0.4	3	150
009	TF5SX11ZZ	Input	600-CT	25K-CT	65	3500	4	150
010	TF5SX17ZZ	Isolation	600-CT	600-CT	65	75	4	150
011	TF5SX17ZZ	Output	600-CT	60	65	7	4	150
012	TF5SX17ZZ	Output	600-CT	4	65	0.5	4	150
013	TF5SX13ZZ	Driver	10K-CT	2000-CT	1100	240	1	150
014	TF5SX13ZZ	Driver	10K-CT	500-CT	1100	65	1	150
015	TF5SX13ZZ	Line to Line	500-CT	600-CT	55	75	4.5	150
016	TF5SX17ZZ	Output to Line	300-CT	600-CT	33	75	5.5	150

These miniaturized "LR" transformers are manufactured to MIL-T-27, Grade 5, Class S specifications and are ideally suited for a wide range of printed circuit applications.

RESPONSE: ± 1 db 200 to 20,000 Hz
DISTORTION: 10% Max. at rated power, 200 to 20,000 Hz
WEIGHT: 1.0 OZ

LR No.	MIL-T-27 Designation	Application	Impedance Ohms		DC Resistance Ohms		Max. Pri DC (ma)	Max. 200 Hz Pwr* (mw)
			Pri	Sec.	Pri	Sec.		
001	TF5SX13ZZ	Interstage	25K-CT	1000-CT	2600	110	0.5	750
002	TF5SX13ZZ	Interstage	10K-CT	10K-CT	1000	1100	1	750
003	TF5SX13ZZ	Driver	10K-CT	1500-CT	1000	165	1	750
004	TF5SX13ZZ	Output to Line	10K-CT	600-CT	1000	70	1	750
005	TF5SX13ZZ	Output	10K-CT	4	1000	0.5	1	750
006	TF5SX13ZZ	Interstage	4000-CT	10K-CT	400	1100	1.5	750
007	TF5SX13ZZ	Output	1500-CT	15	150	2	2.5	750
008	TF5SX17ZZ	Output to Line	1000-CT	600-CT	100	70	3	750
009	TF5SX17ZZ	Output	1000-CT	4	100	0.5	3	750
010	TF5SX11ZZ	Input	600-CT	25K-CT	60	2900	4	750
011	TF5SX17ZZ	Isolation	600-CT	600-CT	60	70	4	750
012	TF5SX17ZZ	Output	600-CT	60	60	6.5	4	750
013	TF5SX17ZZ	Output	600-CT	15	60	2	4	750
014	TF5SX17ZZ	Output	600-CT	4	60	0.5	4	750
015	TF5SX17ZZ	Output to Line	250	600-CT	25	70	7	750
016	TF5SX13ZZ	Driver	10K-CT	2000-CT	1000	110	1	750
017	TF5SX13ZZ	Driver	10K-CT	500-CT	1000	110	1	750
018	TF5SX17ZZ	Line to Line	500-CT	600-CT	50	70	4.5	750
019	TF5SX17ZZ	Output to Line	300-CT	600-CT	30	70	5.5	750

AUDIO TRANSFORMERS LW & LY SERIES



Series	A	B	B ₂
LW	.900	.600	.300
LY	1.125	.800	.400

"LW" series transformers are manufactured to MIL-T-27, Grade 5, Class S specifications. Riser areas and 0.1 grid spacing make these units ideal for printed circuit board applications.

RESPONSE: ± 1 db 100 to 10,000 Hz
DISTORTION: 1.5% Max. at 60 MW, 200 to 10,000 Hz
WEIGHT: 2.0 OZ.

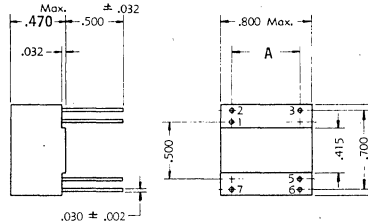
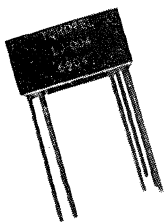
LW No.	MIL-T-27 Designation	Application	Impedance Ohms		DC Resistance Ohms		Max. Pri DC (ma)	Max. 200 Hz Pwr* (watt)
			Pri	Sec.	Pri	Sec.		
001	TF5SX13ZZ	Interstage	10K-CT	10K-CT	800	1050	1	3.5
002	TF5SX13ZZ	Output to Line	10K-CT	600-CT	800	60	1	3.5
003	TF5SX13ZZ	Output	10K-CT	4	800	0.5	1	3.5
004	TF5SX13ZZ	Output	1500-CT	15	110	1.5	2.5	3.5
005	TF5SX17ZZ	Output to Line	1000-CT	600-CT	75	60	3	3.5
006	TF5SX17ZZ	Output	1000-CT	4	75	0.5	3	3.5
007	TF5SX11ZZ	Input	600-CT	25K-CT	45	2700	4	3.5
008	TF5SX17ZZ	Isolation	600-CT	600-CT	45	60	4	3.5
009	TF5SX17ZZ	Output	600-CT	60	45	6.5	4	3.5
010	TF5SX17ZZ	Output	600-CT	15	45	1.5	4	3.5
011	TF5SX17ZZ	Output	600-CT	4	45	0.5	4	3.5
012	TF5SX17ZZ	Output to Line	250	600-CT	20	60	7	3.5
013	TF5SX13ZZ	Interstage	25K-CT	1000-CT	2500	85	0.5	2.5
014	TF5SX13ZZ	Driver	10K-CT	2000-CT	800	170	1	3.5
015	TF5SX13ZZ	Driver	10K-CT	500-CT	800	50	1	3.5
016	TF5SX17ZZ	Line to Line	500-CT	600-CT	50	60	4.5	3.5
017	TF5SX17ZZ	Output to Line	300-CT	600-CT	30	60	5.5	3.5
018	TF5SX13ZZ	Interstage	2500-CT	10K-Split	200	900	1.5	3.5

"LY" series transformers are highly compact, efficient units with power output ratings to 7.5 watts. These transformers are manufactured to MIL-T-27, Grade 5, Class S specifications.

RESPONSE: ± 1 db 60 to 10,000 Hz
DISTORTION: 1% Max. at 250 MW, 200 to 10,000 Hz
10% Max. at rated power, 200 to 10,000 Hz
WEIGHT: 2.5 OZ.

LY No.	MIL-T-27 Designation	Application	Impedance Ohms		DC Resistance Ohms		Max. Pri DC (ma)	Max. 200 Hz Pwr* (watt)
			Pri	Sec.	Pri	Sec.		
001	TF5SX13ZZ	Interstage	10K-CT	10K-CT	700	900	1	6
002	TF5SX13ZZ	Output to Line	10K-CT	600-CT	700	55	1	6
003	TF5SX13ZZ	Output	10K-CT	4	700	0.4	1	6
004	TF5SX13ZZ	Output	1500-CT	15	100	1.5	2.5	7.5
005	TF5SX17ZZ	Output to Line	1000-CT	600-CT	65	55	3	7.5
006	TF5SX17ZZ	Output	1000-CT	4	65	0.4	3	7.5
007	TF5SX17ZZ	Isolation	600-CT	600-CT	40	55	4	7.5
008	TF5SX17ZZ	Output	600-CT	60	40	6	4	7.5
009	TF5SX17ZZ	Output	600-CT	15	40	1.5	4	7.5
010	TF5SX17ZZ	Output	600-CT	4	40	0.4	4	7.5
011	TF5SX17ZZ	Output to Line	250	600-CT	16	55	7	7.5
012	TF5SX13ZZ	Driver	10K-CT	2000-CT	700	150	1	6
013	TF5SX13ZZ	Driver	10K-CT	500-CT	700	45	1	6
014	TF5SX17ZZ	Line to Line	500-CT	600-CT	45	55	4.5	7.5
015	TF5SX17ZZ	Output to Line	300-CT	600-CT	27	55	5.5	7.5
016	TF5SX13ZZ	Interstage	2500-CT	10K-Split	170	800	1.5	7.5

AUDIO TRANSFORMERS — LH & LK SERIES



"LK/LH" Series transformers are the ultimate in compactness and their .470 HT and 0.1 grid spacing provide a most efficient .5" board spacing unit. Designed to meet MIL-T-27C, Grade 5, Class S.

RESPONSE: ± 1 db 200 to 10,000 Hz
DISTORTION: 10% Max. at rated power, 200 to 10,000 Hz
WEIGHT: 0.75 OZ

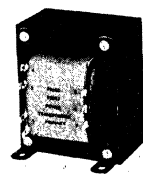
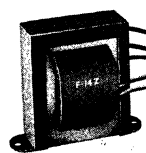
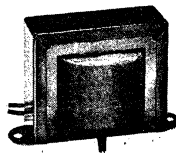
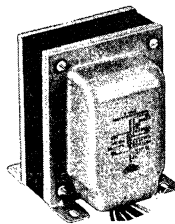
Series	A
LK	.700
LH	.600

LJ No.	Application	Impedance Ohms		DC Resistance Ohms		Max. Pri DC (ma)	Max. 200 Hz Pwr* (mw)
		Pri	Sec.	Pri	Sec.		
001	Interstage	25K-CT	1000-CT	1325	53	0.5	300
002	Interstage	10K-CT	10K-CT	510	525	1	325
003	Driver	10K-CT	1500-CT	510	80	1	325
004	Output to Line	10K-CT	600-CT	510	31	1	325
005	Output	10K-CT	4	510	0.3	1	325
006	Interstage	4000-CT	10K-CT	200	525	1.5	325
007	Output	1500-CT	15	75	1	2.5	325
008	Output to Line	1000-CT	600-CT	50	31	3	325
009	Output	1000-CT	4	50	0.3	3	325
010	Input	600-CT	25K-CT	30	1500	4	300
011	Isolation	600-CT	600-CT	30	31	4	325
012	Output	600-CT	60	30	3	4	325
013	Output	600-CT	15	30	1	4	325
014	Output	600-CT	4	30	0.3	4	325
015	Output to Line	250	600-CT	13	31	7	325
016	Driver	10K-CT	2000-CT	510	26	1	325
017	Driver	10K-CT	500-CT	510	26	1	325
018	Line to Line	500-CT	600-CT	25	31	4.5	325
019	Output to Line	300-CT	600-CT	15	31	5.5	325
020	Isolation	2000-CT	8K Split	100	425	2	300
021	Ratio 1:1:1	10K-CT	2K Split	510	106	1	300

* These power ratings are based upon lowest frequency operation. Much higher ratings are possible at higher operating frequencies.



TRIAD-UTRAD
Litton Distributor Services



A Case

X Case

Z Case

U Case

FILAMENT TRANSFORMERS

single secondary / 50-60 Hz

Type No.	Secondary		Primary Volts	RMS Test Voltage	Case Type	Connections or Lead Holes Used	Case Dimension			Mounting Dimension	
	Volts	Amps					H	W	D	MW	MD
F-1X # F-301X	2.5 CT	3	115 115/230	1500	X	Leads	1 $\frac{1}{8}$	2 $\frac{1}{16}$	1 $\frac{1}{8}$	2 $\frac{3}{8}$	
F-6X #	2.5 CT	6	115 115/230	Pri. 1500 Sec. 2500	X	Leads	1 $\frac{1}{16}$	3 $\frac{1}{16}$	1 $\frac{3}{4}$	2 $\frac{1}{16}$	
F-306X F-3X #	2.5 CT	10	115	Pri. 1500 Sec. 3000	X	Leads	2 $\frac{3}{32}$	3 $\frac{3}{4}$	2 $\frac{1}{8}$	3 $\frac{1}{8}$	
F-5U	2.5 CT	10	115	Pri. 1500 Sec. 7500	U	Leads	3 $\frac{1}{16}$	2 $\frac{1}{2}$	2 $\frac{1}{16}$	2	1 $\frac{7}{8}$
F-7X	5 CT	3	115	1500	X	Leads	1 $\frac{1}{16}$	3 $\frac{1}{16}$	2	2 $\frac{1}{16}$	
F-8X	5 CT	6	115	1500	X	Leads	2 $\frac{3}{32}$	3 $\frac{3}{4}$	2 $\frac{1}{8}$	3 $\frac{1}{8}$	
F-12X	5 CT	8	115	2500	X	Leads	2 $\frac{1}{32}$	4	2 $\frac{1}{4}$	3 $\frac{1}{8}$	
F-9U	5.2 CT	13	115	1500	U	Leads	3 $\frac{1}{16}$	2 $\frac{1}{16}$	3 $\frac{1}{4}$	2 $\frac{1}{4}$	2 $\frac{3}{8}$
F-9A F-15U #	5 CT	15	115	Pri. 1500 Sec. 3000	U	Leads Lugs	3 $\frac{1}{2}$	2 $\frac{1}{8}$	2 $\frac{1}{16}$	2 $\frac{1}{4}$	2 $\frac{3}{8}$
F-10U #	5 CT	14	115	Pri. 1500 Sec. 10,000	U	Leads	3 $\frac{1}{16}$	3 $\frac{1}{16}$	3 $\frac{1}{4}$	2 $\frac{1}{2}$	2 $\frac{1}{16}$
F-11U	5.2 CT	24	115	1500	U	Leads	3 $\frac{1}{16}$	3 $\frac{1}{16}$	3 $\frac{3}{8}$	2 $\frac{1}{2}$	3 $\frac{1}{16}$
F-13X F-313X	6.3	.6	115 115/230	1500	X	Leads	1 $\frac{3}{8}$	2 $\frac{3}{8}$	1 $\frac{3}{8}$	2	
R-84K	6.3†	.6	115	Pri. 1500 Sec. 3500	K	2-Leads	2 $\frac{3}{4}$	2 $\frac{1}{4}$	2 $\frac{1}{16}$	1 $\frac{1}{2}$	2 $\frac{3}{8}$
F-14X # F-314X	6.3 CT	1.2	115 115/230	Pri. 1500 Sec. 2500	X	Leads	1 $\frac{3}{8}$	2 $\frac{1}{16}$	1 $\frac{3}{8}$	2 $\frac{3}{8}$	
F-14Z #	6.3 CT	1.2	115	Pri. 1500 Sec. 2500	Z	Leads	1 $\frac{1}{16}$	2 $\frac{3}{8}$	1 $\frac{3}{8}$	2	
F-52X	6.3†	1.2	115	Pri. 1500 Sec. 5000	X	Leads	1 $\frac{1}{16}$	3 $\frac{1}{16}$	1 $\frac{3}{4}$	2 $\frac{1}{16}$	
F-51X #	6.3-5†	2	115	Pri. 1500 Sec. 5000	X	Leads	1 $\frac{1}{16}$	3 $\frac{1}{16}$	2	2 $\frac{1}{16}$	
F-53X	6.3	4	115	Pri. 1500 Sec. 5000	X	Leads	2 $\frac{1}{32}$	4	2 $\frac{1}{4}$	3 $\frac{1}{8}$	
F-43X # F-16X	6.3	4	115	1500	X	Leads	1 $\frac{1}{16}$	3 $\frac{1}{16}$	2	2 $\frac{1}{16}$	
F-16X	6.3 CT	3	115	Pri. 1500 Sec. 2500	X	Leads	1 $\frac{1}{16}$	3 $\frac{1}{16}$	2	2 $\frac{1}{16}$	
F-316X F-18A	6.3 CT	6	115 115/230	1500	A	1-Leads	3 $\frac{1}{16}$	2 $\frac{1}{32}$	2 $\frac{5}{8}$	2	1 $\frac{1}{16}$
F-18X F-318X	6.3 CT	6	115 115/230	1500	X	Leads	2 $\frac{1}{32}$	4	2 $\frac{1}{4}$	3 $\frac{1}{8}$	
F-19X†	6.3 CT-6 CT	6	115	2000	X	Leads	2 $\frac{1}{32}$	4	2 $\frac{1}{4}$	3 $\frac{1}{8}$	
F-21A	6.3 CT	10	115	1500	A	1-Leads	3 $\frac{1}{32}$	2 $\frac{1}{32}$	3 $\frac{3}{8}$	2 $\frac{1}{4}$	2
F-20U†	6.3 CT-6 CT	11	115	Pri. 1500 Sec. 3000	U	Leads	3 $\frac{1}{2}$	2 $\frac{1}{8}$	3	2 $\frac{1}{4}$	2 $\frac{1}{16}$
F-17U #	6.3 CT Lo-Cap.	15	115	Pri. 1500 Sec. 10,000	U	Pri. Leads Sec. Leads	4 $\frac{1}{4}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{1}{16}$
F-22A F-24U†	6.3 CT 7.5 CT- 6.3 CT	20 8	115	2000 Pri. 1500 Sec. 3000	A U	2-Leads Leads	3 $\frac{3}{8}$ 3 $\frac{1}{2}$	3 $\frac{3}{32}$ 2 $\frac{1}{8}$	4 $\frac{1}{8}$ 2 $\frac{1}{16}$	2 $\frac{1}{2}$ 2 $\frac{1}{4}$	3 2 $\frac{3}{8}$
F-28U†	7.5 CT- 6.3 CT	25	115	Pri. 1500 Sec. 3000	U	Leads & Lugs	4 $\frac{5}{8}$	3 $\frac{1}{16}$	3 $\frac{3}{8}$	3	3 $\frac{1}{16}$
F-31X	10 CT	3	115	2000	X	Leads	2 $\frac{3}{32}$	3 $\frac{3}{4}$	2 $\frac{1}{8}$	3 $\frac{1}{8}$	
F-33U	10 CT	5	115	2000	U	Leads	3	2 $\frac{1}{2}$	2 $\frac{5}{8}$	2	2 $\frac{1}{16}$
F-23U	10 CT	7	115	1500	U	Leads	3 $\frac{1}{2}$	2 $\frac{1}{8}$	2 $\frac{1}{16}$	2 $\frac{1}{4}$	2 $\frac{1}{16}$
F-35U	10 CT	10	115	2000	U	Leads	4 $\frac{1}{8}$	4 $\frac{1}{2}$	3 $\frac{1}{4}$	2 $\frac{3}{4}$	2 $\frac{1}{16}$
F-29U†	12 CT-11 CT 10 CT	11	115	Pri. 1500 Sec. 3000	U	Leads	4 $\frac{3}{8}$	3 $\frac{1}{2}$	3 $\frac{3}{8}$	2 $\frac{3}{4}$	2 $\frac{1}{16}$
F-70X	12.6 CT	1.0	115	1500	X	Leads	1 $\frac{1}{16}$	3 $\frac{3}{8}$	1 $\frac{3}{4}$	2 $\frac{1}{16}$	
F-25X F-325X	12.6 CT	1.5	115 115/230	1500	X	Leads	1 $\frac{1}{16}$	3 $\frac{3}{8}$	2	2 $\frac{1}{16}$	

‡ Static shield. † Tapped primary to produce lower voltages. # 60 cycle operation



TRIAD-UTRAD
Litton Distributor Services

All units in case type X also available on special order with shields added as type SX or with channel frame removed.

FILAMENT / single secondary / 50-60 Hz (Continued)

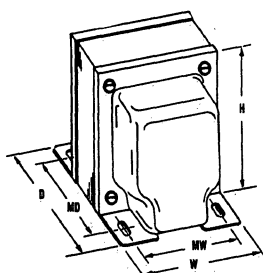
Type No.	Secondary		Primary Volts	RMS Test Voltage	Case Type	Connections or Lead Holes Used	Case Dimension			Mounting Dimension	
	Volts	Amps					H	W	D	MW	MD
F-44X # F-344X	12.6 CT	2	115 115/230	1500	X	Leads	1 $\frac{1}{8}$	3 $\frac{3}{8}$	2	2 $\frac{1}{8}$	
F-26X # F-326X	12.6 CT	2.5	115 115/230	1500	X	Leads	2 $\frac{3}{32}$	3 $\frac{1}{16}$	2	3 $\frac{3}{8}$	
F-40X # F-340X	26.8 CT	1	115 115/230	1500	X	Leads	1 $\frac{1}{8}$	3 $\frac{3}{8}$	2	2 $\frac{1}{8}$	
F-55X F-355X	26.8 CT	1.7	115 115/230	1500	X	Leads	2 $\frac{1}{32}$	4	2 $\frac{1}{4}$	3 $\frac{3}{8}$	
F-57X F-41X # F-341X	25.2 CT	1	115 115/230	1500	X	Leads	1 $\frac{1}{8}$	3 $\frac{3}{8}$	2	2 $\frac{1}{8}$	
	25.2 CT	2	115 115/230	1500	X	Leads	2 $\frac{1}{32}$	4	2 $\frac{1}{4}$	3 $\frac{3}{8}$	
F-56X	25.2 CT	2.8	115	1500	X	Leads	2 $\frac{1}{32}$	4	2 $\frac{1}{4}$	3 $\frac{3}{8}$	
F-50X #	Sec. 6.3-5 Pri. 6.3-5 Special Fil. Line Matching Transformer	2		Pri. 500 Sec. 5000	X	Leads	1 $\frac{1}{8}$	3 $\frac{3}{8}$	2	2 $\frac{1}{8}$	
F-45X # F-345X	24 CT	1	115 115/230	1500	X	Leads	1 $\frac{1}{8}$	3 $\frac{3}{8}$	2	2 $\frac{1}{8}$	
F-46X #	24	1	115	1500	X	Leads	1 $\frac{1}{8}$	3 $\frac{1}{16}$	2 $\frac{1}{8}$	2 $\frac{1}{8}$	
F-54X F-354X	35 CT	1.5	115 115/230	1500	X	Leads	2 $\frac{1}{32}$	4	2 $\frac{1}{4}$	3 $\frac{3}{8}$	
F-58A	50 CT	5	115	1500	A	Leads	4 $\frac{3}{8}$	3 $\frac{1}{16}$	4 $\frac{1}{2}$	3	3 $\frac{3}{8}$
F-59X	60 CT	.4	115	1500	X	Leads	1 $\frac{1}{8}$	3 $\frac{3}{8}$	2	2 $\frac{1}{8}$	

FILAMENT / multiple secondary / primary 115 volt, 50-60 Hz

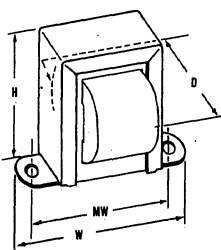
Type No.	Secondary		RMS Test Voltage	Case Type	Connections or Lead Holes Used	Case Dimension			Mounting Dimension	
	Volts	Amps				H	W	D	MW	MD
F-27U	10 CT 2.5 CT	10 10	1500 7500	U	Leads	4 $\frac{3}{8}$	3 $\frac{1}{2}$	3 $\frac{3}{4}$	2 $\frac{3}{4}$	2 $\frac{3}{8}$
F-32A	6.3 CT* 6.3 CT*	3 3	1500	A	1-Leads	3 $\frac{3}{8}$	2 $\frac{1}{32}$	2 $\frac{5}{8}$	2	1 $\frac{1}{16}$
F-34A	6.3 CT* 6.3* 6.3* 6.3*	1.75 1.75 1.75 1.75	1500	A	2-Leads	3 $\frac{3}{8}$	2 $\frac{1}{32}$	3	2	2 $\frac{1}{8}$
F-36A	6.3 CT* 6.3* 6.3* 6.3*	3.5 3.5 3.5 3.5	1500	A	1-Leads	3 $\frac{3}{8}$	3 $\frac{3}{32}$	3 $\frac{1}{2}$	2 $\frac{1}{2}$	2 $\frac{3}{8}$
F-42A	12.6 CT* 12.6*	2.5 2.5	1500	A	1-Leads	3 $\frac{1}{32}$	2 $\frac{1}{32}$	3 $\frac{3}{8}$	2 $\frac{1}{4}$	2
F-83A† #	12.6 CT* 12.6 CT*	5 5	Pri. 1500 Sec. 2500	A	2-Leads	3 $\frac{3}{8}$	3 $\frac{3}{32}$	3 $\frac{3}{4}$	2 $\frac{1}{2}$	2 $\frac{3}{8}$

* Windings may be connected in series to obtain their combined voltage when properly phased. Current will be equal to the current of the lowest winding. Example: Two 6.3V. windings @ 2A. in series would be 12.6V. @ 2A. Windings may also be connected in parallel to obtain combined current. Example: Two 6.3V. windings @ 2A. in parallel would be 6.3V. @ 4A.

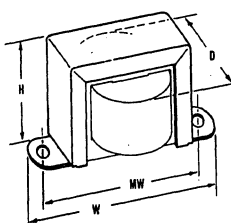
CT for Center Tap. † Tapped primary 105-115-125. # 60 cycle operation.



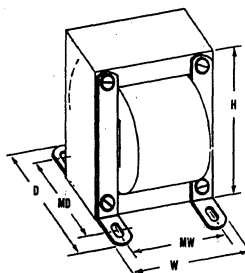
A Case



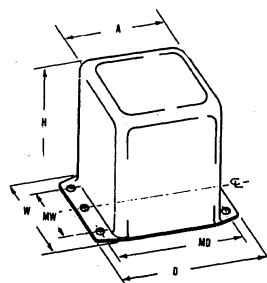
Z Case



X Case

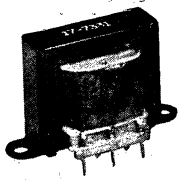


U Case



K Case

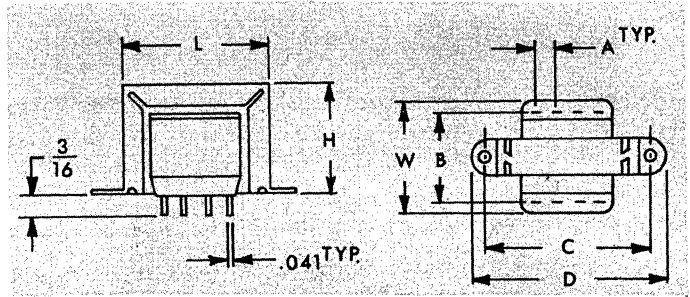
TRIAD-UTRAD
Litton Distributor Services



A



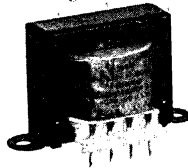
B



LOW-VOLTAGE, LOW-CURRENT PLUG-IN PRINTED CIRCUIT POWER TRANSFORMERS 115 volts, 50/60 Hz Primary

Cat. No.	Fig.	Output Watts	Series Conn.	SECONDARY Parallel Conn.	H.	W.	D.	L.	A.	B.	Pin Dim.
F-131P	B	1½	8V CT @ .188A	4V @ .376A	1⅛	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₆₄	⅝ ₁₆	1	⅜ ₁₆ .041
F-132P	B	1½	15V CT @ .100A	7.5V @ .200A	1⅛	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₆₄	⅝ ₁₆	1	⅜ ₁₆ .041
F-133P	B	1½	30V CT @ .050A	15V @ .100A	1⅛	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₆₄	⅝ ₁₆	1	⅜ ₁₆ .041
F-134P	B	1½	54V CT @ .028A	27V @ .056A	1⅛	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₆₄	⅝ ₁₆	1	⅜ ₁₆ .041
F-135P	B	1½	76V CT @ .020A	38V @ .040A	1⅛	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₆₄	⅝ ₁₆	1	⅜ ₁₆ .041
F-136P	B	1½	116V CT @ .013A	58V @ .026A	1⅛	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₆₄	⅝ ₁₆	1	⅜ ₁₆ .041
F-137P	B	1½	40V CT @ .038A	20V @ .076A	1⅛	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₆₄	⅝ ₁₆	1	⅜ ₁₆ .041
F-141XP	A	4½	8V CT @ .562A	4.0V @ 1.124A	1⅝ ₆₄	2⅜ ₈	1¼	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₃₂	⅜ ₁₆ .041
F-142XP	A	4½	15V CT @ .300A	7.5A @ .600A	1⅝ ₆₄	2⅜ ₈	1¼	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₃₂	⅜ ₁₆ .041
F-143XP	A	4½	30V CT @ .150A	15V @ .300A	1⅝ ₆₄	2⅜ ₈	1¼	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₃₂	⅜ ₁₆ .041
F-144XP	A	4½	54V CT @ .084A	27V @ .168A	1⅝ ₆₄	2⅜ ₈	1¼	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₃₂	⅜ ₁₆ .041
F-145XP	A	4½	76V CT @ .060A	38V @ .120A	1⅝ ₆₄	2⅜ ₈	1¼	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₃₂	⅜ ₁₆ .041
F-146XP	A	4½	116V CT @ .033A	58V @ .066A	1⅝ ₆₄	2⅜ ₈	1¼	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₃₂	⅜ ₁₆ .041
F-147XP	A	4½	40V CT @ .112A	20V @ .224A	1⅝ ₆₄	2⅜ ₈	1¼	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₃₂	⅜ ₁₆ .041
F-151XP	A	7½	8V CT @ .940A	4.0V @ 1.880A	1⅝ ₆₄	2⅜ ₁₆	1⅝ ₃₂	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₁₆	⅜ ₁₆ .041
F-152XP	A	7½	15V CT @ .500A	7.5V @ 1.000A	1⅝ ₆₄	2⅜ ₁₆	1⅝ ₃₂	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₁₆	⅜ ₁₆ .041
F-153XP	A	7½	30V CT @ .250A	15V @ .500A	1⅝ ₆₄	2⅜ ₁₆	1⅝ ₃₂	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₁₆	⅜ ₁₆ .041
F-154XP	A	7½	54V CT @ .140A	27V @ .280A	1⅝ ₆₄	2⅜ ₁₆	1⅝ ₃₂	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₁₆	⅜ ₁₆ .041
F-155XP	A	7½	76V CT @ .100A	38V @ .200A	1⅝ ₆₄	2⅜ ₁₆	1⅝ ₃₂	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₁₆	⅜ ₁₆ .041
F-156XP	A	7½	116V CT @ .065A	58V @ .130A	1⅝ ₆₄	2⅜ ₁₆	1⅝ ₃₂	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₁₆	⅜ ₁₆ .041
F-157XP	A	7½	40V CT @ .188A	20V @ .376A	1⅝ ₆₄	2⅜ ₁₆	1⅝ ₃₂	1⅝ ₆₄	1⅝ ₃₂	1⅝ ₁₆	⅜ ₁₆ .041

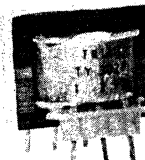
115/230 volts, 50/60 Hz Dual Primary



A-1, A-2



B-1



C

F-333P	B-1	1½	30V CT @ .050A	15V @ .100A	1⅛	1⅝	—	1⅝	1⅝ ₆₄	1	⅜ ₁₆ .041
F-348XP	A-1	4½	12.6V CT @ .350A	6.3V @ .700A	1⅝	1¼	2⅝	1⅝	1¼	1⅝ ₆₄	⅜ ₁₆ .041
F-349XP	A-1	4½	16V CT @ .280A	8V @ .560A	1⅝	1¼	2⅝	1⅝	1¼	1⅝ ₆₄	⅜ ₁₆ .041
F-350XP	A-1	4½	24V CT @ .180A	12V @ .360A	1⅝	1¼	2⅝	1⅝	1¼	1⅝ ₆₄	⅜ ₁₆ .041
F-358XP	A-1	4½	20V CT @ .225A	10V @ .450A	1⅝	1¼	2⅝	1⅝	1¼	1⅝ ₆₄	⅜ ₁₆ .041
F-359XP	A-2	10	24V CT @ .450A	12V @ .900A	1⅝	1⅝	2⅝ ₁₆	1⅝	1¼	1⅝ ₁₆	⅜ ₁₆ .041
F-362XP	A-2	10	20V CT @ .500A	10V @ 1.0A	1⅝	1⅝	2⅝ ₁₆	1⅝	1¼	1⅝ ₁₆	⅜ ₁₆ .041
F-363XP	A-1	7½	230V CT @ .020A	115V @ .040A	1⅝	1¼	2⅝	1⅝	1¼	1⅝ ₆₄	⅜ ₁₆ .041
F-365XP	A-2	10	12.6V CT @ .800A	6.3V @ 1.6A	1⅝	1⅝	2⅝ ₁₆	1⅝	1¼	1⅝ ₁₆	⅜ ₁₆ .041
F-366XP	A-2	10	16V CT @ .640A	8V @ 1.28A	1⅝	1⅝	2⅝ ₁₆	1⅝	1¼	1⅝ ₁₆	⅜ ₁₆ .041

PLUG-IN PRINTED CIRCUIT AUDIO TRANSFORMERS

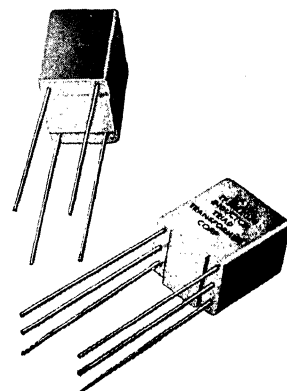
Cat. No.	Fig.	Output MW.	Primary Impedance	Secondary Impedance	Pri. D.C. Unbalance	H.	Dimensions W.	D.	Pin Dim.
TY-141P	C	100	10,000 CT	10,000 CT	4 ma.	⅝	1⅝ ₁₆	1⅝ ₃₂	⅜ ₁₆ .042
TY-142P	C	100	10,000 CT	2,000 CT	4 ma.	⅝	1⅝ ₁₆	1⅝ ₃₂	⅜ ₁₆ .042
TY-143P	C	100	10,000 CT	1,500 CT	4 ma.	⅝	1⅝ ₁₆	1⅝ ₃₂	⅜ ₁₆ .042
TY-144P	C	100	15,000 CT	15,000 CT	4 ma.	⅝	1⅝ ₁₆	1⅝ ₃₂	⅜ ₁₆ .042
TY-145P	C	100	600 CT	600 CT	15 ma.	⅝	1⅝ ₁₆	1⅝ ₃₂	⅜ ₁₆ .042


TRIAD-UTRAD

Litton Distributor Services

RED SPEC TRANSISTOR TRANSFORMERS

Features of the reliable Red Specs: solid epoxy molded case . . . legible, permanent circuit data on every unit . . . base mounting pad for ready inspection of all solder joints . . . high-strength .020-diameter nickel alloy leads . . . no stripping or tinning required . . . operating voltage: 150 volts DC . . . exceptional operation from 100 to 100,000 cycles . . . base dimensions of only .310 by .410 inch . . . total height of just .465 inch . . . weight: 1/10 ounce . . . lowest possible fatigue factor . . . dry hydrogen-annealed Trialloy, deep-drawn .020-inch case available for providing as much as 20 to 45 db magnetic shielding.

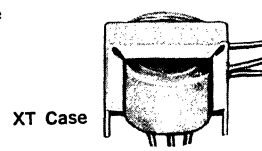
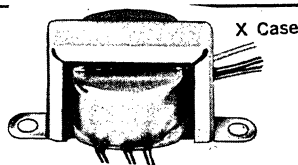


Type No.	MIL Type Number	Power Level in MW	Application	Matching Impedance		Max MA DC Unbalanced in Primary	DC Resistance	
				Primary	Secondary		Primary	Secondary
SP-4	TF5SX16ZZ	10	Input	200,000 CT	1,000 CT	0	5300	100
SP-5	TF5SX16ZZ	25	Input	50,000 CT	1,000 CT	0	3800	75
SP-7	TF5SX16ZZ	10	Input	200,000	1,000	0	5300	100
SP-11	TF5SX13ZZ	40	Interstage	25,000/20,000	1,000/800	.5	1700	115
SP-13	TF5SX13ZZ	40	Interstage	25,000 CT/20,000 CT	1,000 CT/800 CT	.5	1700	115
SP-20	TF5SX13ZZ	50	Driver	10,000 CT	1,200 CT	1	1050	200
SP-21	TF5SX13ZZ	50	Driver	10,000 CT	2,000 CT	1	1050	330
SP-22	TF5SX13ZZ	50	Driver	10,000	2,000 CT/500§	1	1050	146/168§
SP-29	TF5SX13ZZ	50	Driver	10,000 CT	500 CT	1	1050	80
SP-32	TF5SX17ZZ	50	Output	500	50	3	60	8
SP-33	TF5SX17ZZ	50	Output	1,000	50	3	145	8
SP-42	TF5SX17ZZ	50	Output	150 CT	12	10	18	2.7
SP-50	TF5SX17ZZ	50	Output	500 CT	600	3	67	98
SP-51	TF5SX17ZZ	50	Output	900 CT	600	4	104	96
SP-52	TF5SX13ZZ	50	Output	1,500 CT	600	3	168	92
SP-66	TF5SX13ZZ	50	Output-Isolation	10,000 CT	10,000 CT	1	1000	1300
SP-67	TF5SX17ZZ	50	Output-Isolation	600 CT	600 CT	3	72	92
SP-68	TF5SX13ZZ	50	Output-Isolation	10,000	10,000 CT/2500§	1	1000	565/650§
SP-69	TF5SX17ZZ	50	Output-Isolation	600	600 CT/150§	3	72	40/45§
SP-70	TF5SX17ZZ	50	Output-Isolation	600	600	3	72	92
SP-106	TF5SX20ZZ	—	Audio Choke	6HY	—	2	1700	—
SP-107	TF5SX20ZZ	—	Audio Choke	1.25HY	—	2	180	—

CT for Center Tap. § Split Secondary.

MINIATURE AUDIO TRANSFORMERS

Highly dependable Triad Trijets open frame units, Climatite treated (both coil and core) for protection against moisture and for prevention of lamination chatter.



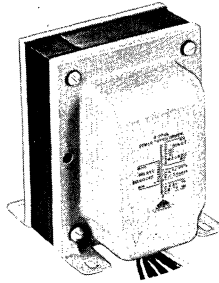
Type No.	Power Output	Application	Matching Impedance		DC Resistance		Overall Turns Ratio	Frequency Response ±3dB	RMS Test Volts	Case Type	Case Dimension			Mounting Dimension MW
			Primary	Secondary	Primary	Secondary					H	W	D	
T-1X‡	1MW.	Line or Mike to Grid	600/250/50	50,000	80	3200	1:9.16	60-15,000	500	X	5/8	1 1/2	3/4	1
T-20X	10MW.	Output-Plate to Line	15,000	600/250/50	1330	58	5:1	60-15,000	500	X	5/8	1 1/2	3/4	1
T-31X‡	10MW.	Line to Line	600/250/50	600/250/50	55	80	1:1	50-15,000	500	X	5/8	1 1/2	3/4	1
T-33X‡	10MW.	Isolation-High Impedance	5000 CT	5000 CT	1500	2200	1:1	60-15,000	500	X	5/8	1 1/2	3/4	1
T-34X	20MW.	Transistor or Line to Transistor or Line	500 CT 2 MA. D.C.	500 CT/125§	45	55	1:1.03	50-20,000	500	X	5/8	1 1/2	1 1/8	1 1/8
T-35X	10MW.	Transistor or Line to Transistor	600 CT 1 MA. D.C.	2000 CT/500§	68	200	1:1.7	50-20,000	500	X	5/8	1 1/2	3/4	1
T-102X	—	Coupling Reactor	6 HY. or 3 MA. D.C.	4 HY- 6 MA. D.C.	295	—	—	—	500	X	5/8	1 1/2	3/4	1

§ Split winding. CT for Center Tap. ‡ Static shield.

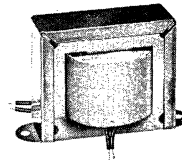


TRIAD-UTRAD
Litton Distributor Services

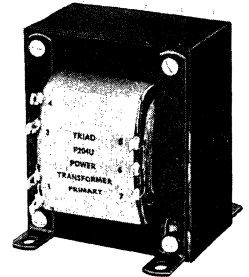
UNIVERSAL RECTIFIER POWER primary 50-60 Hz



A Case



X Case



U Case

Type No.	Primary Volts	Secondary AC		DC Volts		RMS Test Voltage	Case Type	Connections	Case Dimension			Mounting Dimension	
		Volts	Amps	Half Wave	Bridge				H	W	D	MW	MD
F-47U	115	0-17-18	3	6-7	13-14	1500	U	Leads	3	2½	2¾	1⅝	2⅝
F-347U	115/230												
F-48U	115	0-17-18	6	6-7	13-14	1500	U	Leads	3⅜	3⅜	3⅜	2½	2⅞
F-49U	115	36*	3	13	26	1500	U	Leads	4⅝	3⅜	3¾	3	3⅝
		36*	3	13	26								
F-60U	115	0-6.5-13-19.5-26	3	9	18	1500	U	Leads	3⅜	2⅜	2⅝	2¼	2⅝
F-360U	115/230												
F-61U	115	0-24-27-30-33-36	3	13	26	1500	U	Leads	3¾	3⅝	3¼	2½	2⅝
F-361U	115/230												
F-67U #	110-120	0-24-27-30-33-36	8	13	26	1500	U	Leads	4⅝	3⅜	4⅝	3	3⅝
F-63U	115	0-8-9*	2	-	6-7	1500	U	Leads	3⅝	2⅝	2⅝	2	2⅝
		0-8-9*	2	-	6-7								
F-64U	115	0-7-8-9	7	-	5-6-7	1500	U	Leads	3⅝	2⅜	2¾	2¼	2⅝
F-364U	115/230												
F-62U #	105-115-125	9*	10	-	7	1500	U	Leads	4⅝	3⅜	5¼	3	4⅝
		9*	10	-	7								
		9*	10	-	7								
		9*	10	-	7								
F-68U #	115	9 CT*	3.5	-	7	1500	U	Leads	3⅜	3⅜	3⅜	2½	2⅝
		9*	3.5	-	7								
		9*	3.5	-	7								
		9*	3.5	-	7								
F-65U	110-120	0-140-150-160	.75	60	115	1500	U	Leads	3⅜	3⅜	3⅜	2½	2⅝
F-74U	117	28 CT*	2	-	-	1500	U	Lugs	3⅜	3⅜	3¼	2½	2⅝
		28 CT*	2	-	-								
F-79U #	115	0-24-26-28-30	15	11.4	22.8	1500	U	Leads, Lugs	3⅜	4⅝	5½	3¾	4⅝

* Windings may be connected in series to obtain their combined voltage when properly phased. Current will be equal to the current of the lowest winding. Example: Two 6.3V. windings @ 2A. in series would be 12.6V. @ 2A. Windings may also be connected in parallel to obtain the combined current. Example: Two 6.3V. windings @ 2A. in parallel would be 6.3V. @ 4A.

‡ Static Shield. # 60 cycle operation. † Tapped primary to produce lower voltages. § Split winding. CT for Center Tap.

LOW VOLTAGE RECTIFIER / transistor drive voltage, 50-60 Hz

Type No.	Primary Volts	Secondary AC		DC Volts		RMS Test Voltage	Case Type	Connections	Case Dimension			Mounting Dimension	
		Volts	Amps	Half Wave	Bridge				H	W	D	MW	MD
F-94X	115†	10-20 CT-40 CT	.035	15	30	1500	X	Leads	1⅝	2⅝	1⅝	2	
F-90X	115†	10-20 CT-40 CT	.1	15	30	1500	X	Leads	1⅝	2⅝	1⅝	2	2⅝
F-91X	115†	10-20 CT-40 CT	.3	15	30	1500	X	Leads	2⅝	3⅝	2	3⅝	
F-93X	115†	10-20 CT-40 CT	.75	15	30	1500	X	Leads	2⅝	4	2¼	3⅝	
F-92A	115†	10-20 CT-40 CT	1	15	30	1500	A	Leads (2 Holes)	3⅝	2⅝	3	2	2⅝

UNIVERSAL RECTIFIER POWER / primary 117 volts, 50-60 Hz

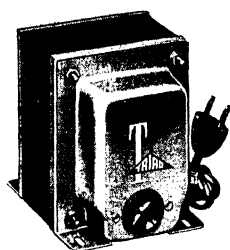
Type No.	Secondary No. 1 AC Volts	Secondary DC Amps		Secondary No. 2		RMS Test Volts	Case Type	Connections	Case Dimensions			Mounting Dimension	
		Full Wave	CT Bridge	AC Volts	DC Amps				H	W	D	MW	MD
F-200A	13 or 18 @ .9 ADC	-	-	13 or 18 @ .9 ADC		1000	A	Leads	3⅜	2⅝	2⅝	2	2
F-202U	11.0 to 29.5	2.0	1.25	-		1000	U	Lugs	3	2⅝	3	2	2⅝
F-203U	12.0 to 30.0	4.0	2.0	-		1000	U	Lugs	3⅜	2⅝	3¼	2¼	2⅝
F-204U	11.5 to 29.0	8.0	4.0	-		1000	U	Lugs	3¾	3⅝	4⅝	2½	2⅝
F-205U	12.0 to 29.5	12.0	6.0	-		1000	U	Lugs	4⅝	3⅝	5⅝	2¾	3¼

LOW VOLTAGE LOW CURRENT / primary 117 volts, 50-60 Hz

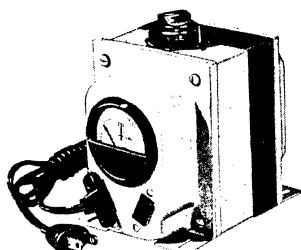
Type No.	Secondary Volts	Secondary Amps	RMS Test Voltage	Case Type	Connections or Lead Holes Used	Case Dimension			Mounting	
						H	W	D	MW	MD
F-112X	14 CT	0.25	1500	X	Leads	1⅝	2⅝	1⅝	2	
F-113X	12	0.15	1500	X	Leads	1⅝	2⅝	1⅝	2	
F-114X	12	0.7	1500	X	Leads	1⅝	2⅝	1⅝	2⅝	
F-115X	24 CT	0.085	1500	X	Leads	1⅝	2⅝	1¼	1¾	
F-116X	24 CT	0.2	1500	X	Leads	1⅝	2⅝	1½	2	
F-117X	24 CT	0.4	1500	X	Leads	1⅝	2⅝	1⅝	2⅝	



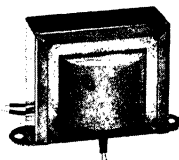
TRIAD-UTRAD
Litton Distributor Services



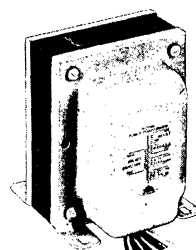
M Case



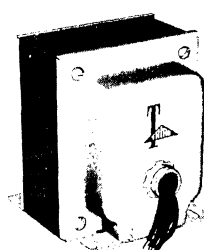
MM Case



X Case



A Case



AC Case

ISOLATION / 50-60 Hz

Type No.	Output Watts (VA)	Primary Volts	Secondary AC		RMS Test Voltage	Case Type	Connections	Lead Holes Used	Case Dimension			Mounting Dimension	
			Volts $\pm 5\%$	Amps					H	W	D	MW	MD
N-48X	15	115	115	.13	1500	X	Leads	—	1 $\frac{1}{16}$	3 $\frac{1}{16}$	2	2 $\frac{3}{8}$	—
N-49X	35	115	57.5-115§	.3	1500	X	Leads	—	2 $\frac{3}{32}$	3 $\frac{1}{16}$	2 $\frac{1}{8}$	3 $\frac{1}{8}$	—
N-51X#	35	115	115	.3	1500	X	Leads	—	2 $\frac{3}{32}$	3 $\frac{1}{16}$	2 $\frac{1}{8}$	3 $\frac{1}{8}$	—
N-68X	50	115-230§	115	.435	1500	X	Leads	—	2 $\frac{3}{32}$	3 $\frac{1}{16}$	2 $\frac{1}{8}$	3 $\frac{1}{8}$	—
N-53M	85	115	115	.74	1500	M	6' Cord, Plug & Socket	—	3 $\frac{1}{32}$	2 $\frac{3}{32}$	3 $\frac{5}{8}$	2 $\frac{1}{4}$	2 $\frac{3}{8}$
N-53MG*											4 $\frac{1}{2}$	3	
N-54M	150	115	115	1.3	1500	M	6' Cord, Plug & Socket	—	3 $\frac{1}{8}$	3 $\frac{3}{32}$	4 $\frac{1}{4}$	2 $\frac{1}{2}$	3
N-54MG*											5 $\frac{1}{8}$	3 $\frac{1}{2}$	
N-73A	150	115	115-230§	.65	1500	A	Leads	1	3 $\frac{1}{8}$	3 $\frac{3}{32}$	3 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$
N-74A	150	115	57.5-115§	1.3	1500	A	Leads	1	3 $\frac{1}{8}$	3 $\frac{3}{32}$	3 $\frac{7}{8}$	2 $\frac{1}{2}$	2 $\frac{3}{4}$
N-67A	150	115-230§	115	1.3	1500	A	Leads	2	3 $\frac{1}{8}$	3 $\frac{3}{32}$	4 $\frac{1}{8}$	2 $\frac{1}{2}$	3
N-55M	250	115	115	2.17	1500	M	6' Cord, Plug & Socket	—	4 $\frac{1}{8}$	3 $\frac{1}{16}$	5	3	3 $\frac{3}{8}$
N-55MG*		115											
N-255MG*		230											
N-66A	250	115-230§	115	2.17	1500	A	Leads	2	4 $\frac{1}{8}$	3 $\frac{1}{16}$	4 $\frac{5}{8}$	3	3 $\frac{3}{8}$
N-57M	500	115	115	4.35	1500	M	6' Cord, Plug & Socket	—	5 $\frac{1}{16}$	4 $\frac{1}{2}$	6 $\frac{1}{4}$	3 $\frac{1}{2}$	5 $\frac{1}{8}$
N-57MG*		115											
N-257MG*		230											
N-59M	1000	115	115	8.7	1500	M	6' Cord, Plug & Socket	—	5 $\frac{1}{16}$	4 $\frac{1}{2}$	8	3 $\frac{1}{2}$	6 $\frac{7}{8}$
N-59MG*		115											
N-259MG*		230											

STEPDOWN AUTOFORMERS / 50-60 Hz

Type No.	Output Watts (VA)	Primary Volts	Secondary		RMS Test Voltage	Case Type	Connections	Case Dimension			Mounting Dimension	
			Volts $\pm 5\%$	Amps				H	W	D	MW	MD
N-1X	50	230	115	.435	1500	X	Leads	2 $\frac{3}{32}$	3 $\frac{1}{16}$	2	3 $\frac{1}{8}$	—
N-3M	85	230	115	.74	1500	M	6' Cord & Plug & Socket	3 $\frac{1}{32}$	2 $\frac{3}{32}$	2 $\frac{1}{8}$	2 $\frac{1}{4}$	1 $\frac{3}{8}$
N-4M	150	230	115	1.3	1500	M	"	3 $\frac{1}{32}$	2 $\frac{3}{32}$	3 $\frac{5}{8}$	2 $\frac{1}{4}$	2 $\frac{3}{8}$
N-5M	250	230	115	2.17	1500	M	"	3 $\frac{7}{8}$	3 $\frac{3}{32}$	4 $\frac{1}{4}$	2 $\frac{1}{2}$	3
N-7M	600	230	115	5.22	1500	M	"	4 $\frac{5}{8}$	3 $\frac{1}{16}$	5	3	3 $\frac{3}{8}$
N-7MG†												
N-9M	1250	230	115	10.85	1500	M	"	5 $\frac{1}{16}$	4 $\frac{1}{2}$	6 $\frac{1}{4}$	3 $\frac{1}{2}$	5 $\frac{1}{8}$
N-9MG†												
N-11M	2000	230	115	17.4	1500	M	"	5 $\frac{1}{16}$	4 $\frac{1}{2}$	8	3 $\frac{1}{2}$	6 $\frac{7}{8}$
N-11MG†												

SIGNALING / 60 Hz

Type No.	Primary Volts	Secondary AC Volts	Amps	RMS Test Voltage	Case Type	Connections	Case Dimension			Mounting Dimension	
							H	W	D	MW	MD
F-102X	115	4-8-12-16-20-24	2	2500	X	Leads	2 $\frac{3}{32}$	3 $\frac{1}{16}$	2 $\frac{1}{2}$	3 $\frac{1}{8}$	—
F-104U	115	4-8-12-16-20-24	4	2500	U	Leads	3 $\frac{1}{2}$	2 $\frac{1}{8}$	2 $\frac{1}{16}$	2 $\frac{1}{4}$	2 $\frac{1}{8}$

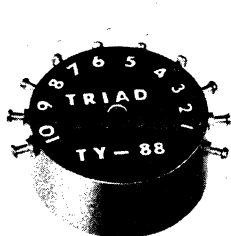
UNIVERSAL ISOLATION

Have four 115-volt windings. Both primary and secondary may be connected for 115 or 230 volts.

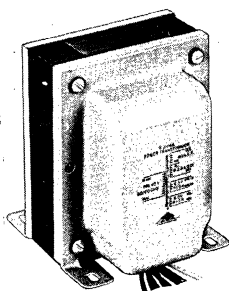
Type No.	Output Watts (VA)		RMS Test Voltage	Case Type	Connections	Lead Holes Used	Case Dimension			Mounting Dimension	
	Isolation	Autoformer					H	W	D	MW	MD
N-64AC	500	1000	1500	AC	Leads	1 Conduit	5 $\frac{1}{16}$	4 $\frac{1}{2}$	5 $\frac{1}{2}$	3 $\frac{1}{2}$	3 $\frac{3}{8}$



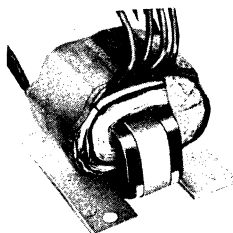
Litton Distributor Services

TRIAD-UTRAD**TRANSISTOR POWER
SUPPLY TRANSFORMERS**

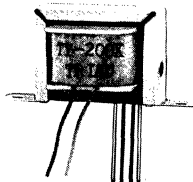
Type EE



A Case



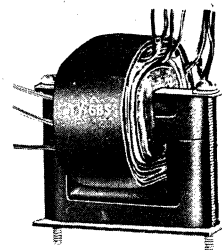
Type L



Type X



Type TZ



Type S

EPOXY MOLDED TOROIDAL TYPE / dc to dc

Type No.	D.C. Source Volts	D.C. Volts out of Rectifier		D.C. Milliamps. Maximum	Case Type	Dimensions—Inches				Weight Lbs.
		F.W. Bridge	F.W. C.T.			T	D	H	M	
TY-78	12.6	250	125	100	EE	1/2	1 3/4	1 1/8	1 1/4	.35
TY-79	12.6	300	150	200	EE	3/4	1 3/4	1	1 1/4	.35
TY-80	12.6	325	162.5	150	EE	3/4	1 3/4	1	1 1/4	.35
TY-81	12.6	375	187.5	200	EE	3/4	2	1	1 1/4	.50
TY-82	12.6	450	225	150	EE	3/4	2	1	1 1/4	.50
TY-83	12.6	500	250	250	EE	1 1/8	2 3/4	1 3/8	3/8	.85
TY-84	12.6	600	300	200	EE	1 1/8	2 3/4	1 3/8	3/8	1.00
TY-85	12.6	600	300	350	EE	1 1/8	2 3/4	1 3/8	3/8	2.00
TY-86	12.6	425	212.5	350	EE	1 1/8	2 3/4	1 3/8	3/8	1.00
TY-88	28	250	125	80	EE	1 1/2	1 3/4	1 1/8	3/4	.25
TY-89	28	300	150	100	EE	1 1/2	1 3/4	1 1/8	3/4	.35
TY-90	28	325	162.5	200	EE	3/4	1 3/4	1	1 1/4	.35
TY-91	28	375	187.5	200	EE	3/4	2	1	1 1/4	.50
TY-92	28	450	225	200	EE	3/4	2	1	1 1/4	.50

OPEN AND VERTICAL SHIELDED TYPES / dc to ac

Type No.	Primary D.C.	Secondary		Case Type	Dimensions—Inches			Mounting Dimensions	
					H	W	D	MW	MD
TY-468	28	110-115-125v	400cps 60 watts	L	1 3/8	2 1/4	2	1 3/8	1 3/8
TY-462	12	110-115-125v	400cps 60 watts	L	1 3/8	2 1/4	2	1 3/8	1 3/8
TY-75A	12	110-115-125v	60cps 115 watts	A	3 3/8	3 3/4	3 1/2	2 1/2	2 1/2
TY-76A	12	110-115-125v	60cps 60 watts	A	3 3/8	2 1/2	2 5/8	2	1 1/8

OPEN TYPE / 12 volt dc to dc

Type No.	D.C. Volts out of Rectifier		D.C. Milliamps. Maximum	Dimensions—Inches			MW
	F.W. Bridge	F.W. C.T.		H	W	D	
TY-68S	250	125	65	1 3/4	1 3/4	1 1/2	1 1/2
TY-74S	600	300	200	2	4 1/8	3	3 3/4
TY-77S†	670	335	180	2	4 7/8	3	3 3/4

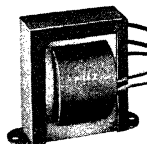
OPEN TYPE / dc to dc converter

Type No.	Input	*Typical operation		Case Type	Dimensions—Inches			
			Output		H	W	D	MW
TY-200X	3 v.DC @ 20 ma.		1050 v.DC @ 25 μa.	X	1 3/8	1 3/8	7/8	1 3/8
TY-201TZ	4 v.DC @ 15 ma.		500 v.DC @ 50 μa.	TZ	7/8	1 1/2	7/8	—
TY-202X	4 v.DC @ 45 ma.		550 v.DC @ 80 μa.	X	1 3/8	1 3/8	7/8	1 3/8

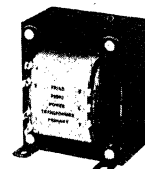
* May vary with circuit components, load requirements, etc. † Has additional winding for bias in SSB transmitters.

CONTROL TRANSFORMERS**6, 12, 24 volt secondaries**

For use with relays, solenoids, small motors, speed changers, pumps, heating elements, control valves for fluids and gases, fans and blowers, electronic tubes, automatic assembly equipment, recording devices, elevators, door openers, low voltage lamps and similar applications.



Z Case



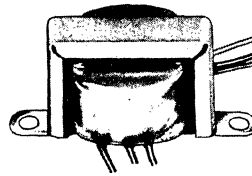
U Case

Type No.	Primary	Secondary		VA Rating	Case Type	Connections	Height Overall	Base Area	Mtg. Dim.
		Parallel	Series						
F-105Z	115V/230V 50/60 CPS on all	6V @ 2A	12V @ 1A	12	Z	Lugs	2 3/8	2 7/8 x 1 3/4	2 3/8
F-106Z		6V @ 4A	12V @ 2A	24	Z	Lugs	2 3/4	3 3/8 x 2	2 3/8
F-107Z		12V @ 4A	24V @ 2A	48	Z	Lugs	3 1/8	3 3/8 x 2 3/8	3 1/8
F-108U		12V @ 8A	24V @ 4A	96	U	Lugs	3 1/2	2 7/8 x 3	2 1/4 x 2 1/4
F-109U		12V @ 16A	24V @ 8A	192	U	Lugs	4 1/8	3 3/4 x 3 1/2	3 x 2 3/4

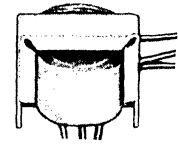


TRIAD-UTRAD
Litton Distributor Services

MINIATURE AUDIO TRANSISTOR TRANSFORMERS



X Case



XT Case

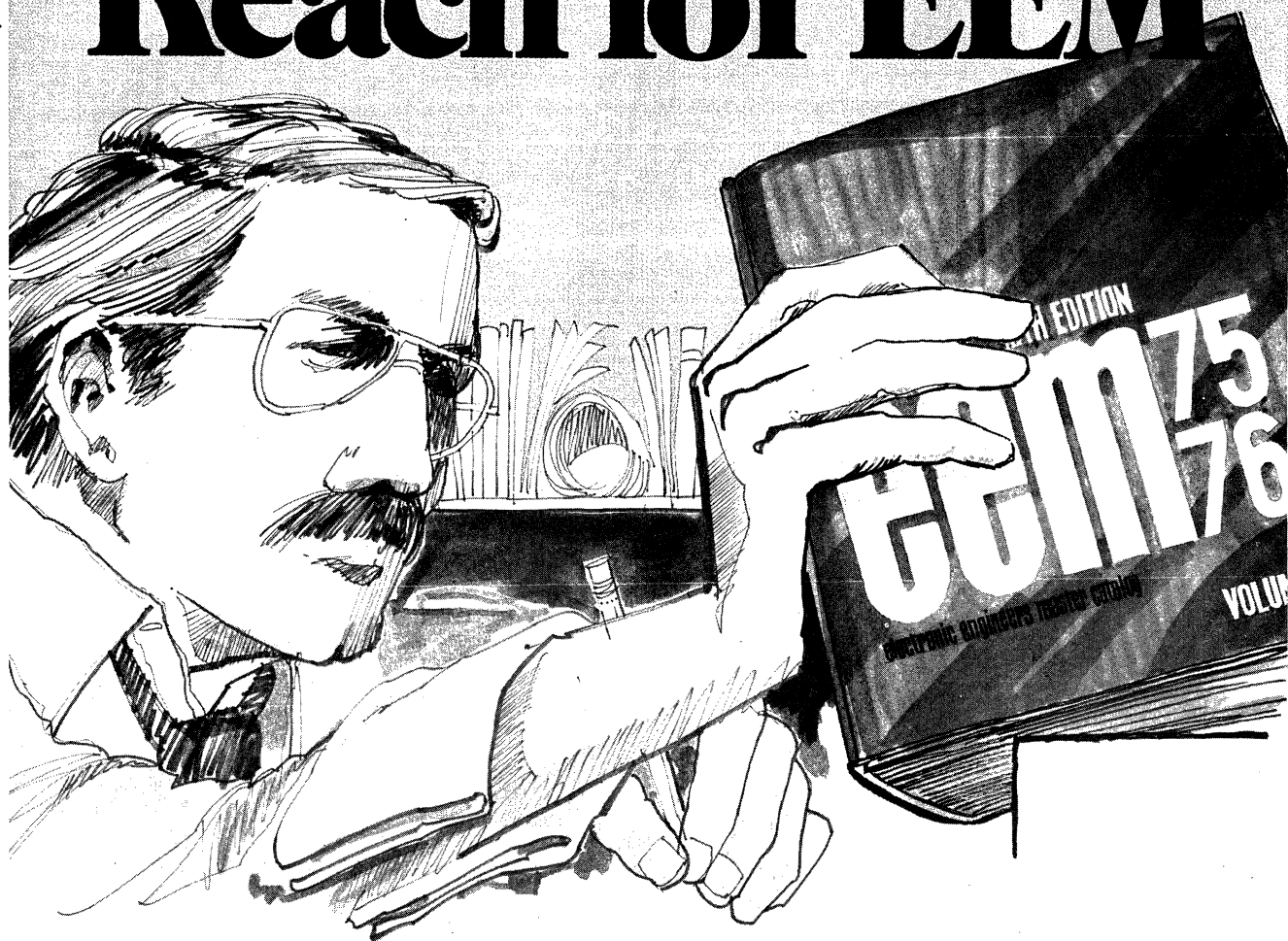
Type No.	Power Output Watts	Application	Matching Impedance		DC Resistance		Overall Turns Ratio	RMS Test Volts	Case Type	Connections	Case Dimension			Mounting Dimension MW
			Primary	Secondary	Primary	Secondary					H	W	D	
TY-27XT	.01	Output-Single or P.P. to Line	500 CT 2MA D.C.	500 CT	37.5	51.5	1:1	500	XT	Leads	1/2	1/8	1/2	1/8
TY-32X	.2	Interstage-Sgl or P.P. to P.P.	200 CT 2MA D.C.	2000 CT	29	233	3.18:1	1000	X	Leads	1 1/8	1 1/8	1	1 1/8
TY-34X	.2	Interstage-Sgl or P.P. to Sgl or P.P.	400 CT 5MA D.C.	2000 CT	41	128	2.25:1	500	X	Leads	1 1/8	1 1/8	1	1 1/8
TY-35X	.1	Interstage-Sgl or P.P. to Sgl or P.P.	500 CT 2MA D.C.	150 CT	57	32	1.82:1	500	X XT	Leads	5/8	1 1/2	1 1/8	1 1/8 5/16
TY-35XT														
TY-36X	.2	Interstage-Sgl to Sgl or P.P.	2000 2MA D.C.	1500 CT	165	140	1.15:1	500	X	Leads	1 1/8	1 1/8	1	1 1/8
TY-37X	.2	Interstage-Sgl or P.P. to Sgl or P.P.	2000 CT 4MA D.C.	8000 CT	200	550	1:2	500	X XT	Leads	1 1/8	1 1/8	1	1 1/8 1 1/8
TY-37XT														
TY-39X	.2	Output-P.P. to V.C.	4000 CT 4MA D.C.	16/8/4	333	1.8	15.7:1	500	X	Leads	1 1/8	1 1/8	1	1 1/8
TY-44X	.2	Output-Sgl to V.C.	1000 10MA D.C.	16/8/4	181	3.8	7.9:1	500	X	Leads	1 1/8	1 1/8	1	1 1/8
TY-45X	.2	Output-Sgl or P.P. to V.C.	500 CT 5MA D.C.	16/8/4	56	3.8	5.2:1	500	X XT	Leads	1 1/8	1 1/8	1	1 1/8 1 1/8
TY-45XT														
TY-47X	.2	Output-Sgl or P.P. to V.C.	2000 CT 10MA D.C.	16/8/4	260	3.95	11.2:1	500	X	Leads	1 1/8	1 1/8	1	1 1/8
TY-49X	.3	Interstage-Sgl or P.P. to Sgl or P.P.	500 CT 12MA D.C.	5000 CT	40	245	1:3.15	500	X	Leads	1 1/8	2 3/8	1 1/8	2
TY-50X	.04	Input-Sgl to Sgl or P.P.	125000 0 D.C.	2000 CT	5500	120	8:1	500	X	Leads	1 1/8	1 1/8	1	1 1/8
TY-51X	.05	Driver-Sgl or P.P. to Sgl or P.P.	2000 CT 10MA D.C.	200 CT	748	120	3.16:1	500	X XT	Leads	5/8	1 1/2	1 1/8	1 1/8 5/16
TY-51XT														
TY-52X	.1	Driver-Sgl or P.P. to Sgl or P.P.	20000 CT 1MA D.C.	2000 CT	2140	327	3.17:1	500	X	Leads	1 1/8	1 1/8	1	1 1/8
TY-56X	.05	Interstage-Sgl to Sgl or P.P.	10000 1MA D.C.	2000 CT	1034	334	2.24:1	500	X	Leads	1 1/8	1 1/8	1	1 1/8
TY-57X	.2	Output-Sgl or P.P. to V.C.	250 CT 10MA D.C.	16/8/4	34.6	3.7	3.94:1	500	X	Leads	1 1/8	1 1/8	1	1 1/8
TY-58X	.2	Output-Sgl or P.P. to V.C.	125 CT 15MA D.C.	8/4	16	2.2	3.97:1	500	X	Leads	1 1/8	1 1/8	1	1 1/8

SMOOTHING FILTER REACTORS

Type No.	Current DC MA.	Inductance Henries	Resistance Ohms	RMS Test Voltage	Case Type	Connections	Lead Holes Used	Case Dimension			Mounting Dimensions	
								H	W	D	MW	MD
C-85X	10	1.5	70	2500	X	Leads	-	1 1/4	2 1/8	1 1/8	1 3/4	
C-30X	15	50	3500	1500	X	Leads	-	1 1/8	2 3/8	1 1/2	2	
C-1X	20	15	1000	1000	X	Leads	-	1 3/8	2 1/8	1 1/4	1 3/4	
C-84X	30	12	400	1500	X	Leads	-	1 3/8	2 3/8	1 3/8	2	
C-3X	50	10	500	1500	X	Leads	-	1 1/8	2 1/8	1 1/2	2 3/8	
C-4X	50	4	360	1500	X	Leads	-	1 1/8	2 3/8	1 1/8	2	
C-6X	65	5	330	1500	X	Leads	-	1 1/8	2 1/8	1 1/2	2 3/8	
C-5X	75	12	390	1000	X	Leads	-	1 1/8	3 1/8	1 1/4	2 1/8	
C-7X	90	10	270	1000	X	Leads	-	1 1/8	3 1/8	2	2 1/8	
C-9X	90	4	100	1500	X	Leads	-	1 1/8	3 1/8	1 3/4	2 1/8	
C-14A	200	6	150	1500	A	Leads	1	3 1/4	2 1/2	2 3/8	2	1 1/8
C-14X	200	6	150	1500	X	Leads	-	2 1/2	4	2 1/4	3 3/8	
C-16A	200	10	150	2500	A	Leads	1	3 1/2	2 1/2	3 1/2	2 1/4	2 3/8
C-21X	225	1.5	65	1500	X	Leads	-	1 1/8	3 1/8	1 3/4	2 1/8	
C-24X	240	1	50	1500	X	Leads	-	1 1/8	2 1/8	1 1/2	2 3/8	
C-27X	290	.7	30	1500	X	Leads	-	1 1/8	2 1/8	1 1/2	2 3/8	
C-36X	300	.5	30	1500	X	Leads	-	1 1/8	2 3/8	1 1/2	2	
C-34X	350	.6	35	1500	X	Leads	-	1 1/8	2 1/8	1 1/2	2 3/8	
C-28X	350	1	35	1500	X	Leads	-	1 1/8	3 1/8	2	2 1/8	
C-29X	375	1.5	50	1500	X	Leads	-	2 3/8	3 1/8	2	3 1/8	
C-40X	600	.32	10	1500	X	Leads	-	1 1/8	3 1/8	2	2 1/8	
C-47U	1A/2A	.3/.075	3/.75	1500	U	Leads	-	3 1/2	2 1/8	3 3/8	2 1/4	2 1/8
C-56U	2.0	.035	.75	1500	U	Lugs	-	2 1/4	2 3/8	2	2 3/8	1 3/4
C-48U	2.5A/5A	.08/.025	.61/.155	1500	U	Lugs	-	3 1/8	3 1/8	3 3/8	2 1/2	3 1/8
C-57U	4.0	.025	.55	1500	U	Lugs	-	3 1/8	3 1/8	2 1/4	2 1/8	2 1/8
C-49U	5A/10A	.032/.0085	.19/.05	1500	U	Leads	-	4 1/4	3 1/2	3 3/8	2 3/4	3 1/8
C-58U	8.0	.01	.15	1500	U	Lugs	-	3 1/8	3 1/4	3	3 1/8	2 1/2
C-59U	12.5	.01	.10	1500	U	Lugs	-	3 1/2	4 1/8	3	3 1/8	2 3/8

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

**Z-
MATCH**

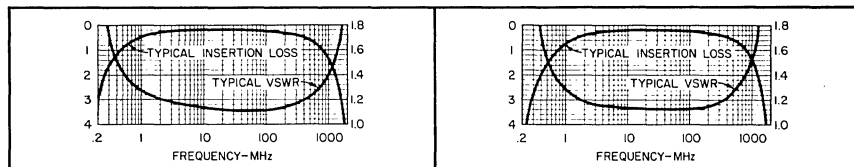
RF/ PULSE TRANSFORMERS

SUBMINIATURE SIZE MIC SUBSTRATE COMPATIBLE DESIGNED TO MEET MIL-T-55631

- 0.5 dB INSERTION LOSS
- UP TO 1.5 GHz BANDWIDTH
- 12.5 TO 600 OHM IMPEDANCE RANGE
- BALANCED AND UNBALANCED CONFIGURATIONS

Their small size, easily solderable or weldable planar ribbon leads, and high performance/high reliability design makes the FP Series transformers ideal for MIC substrate and conventional printed circuit applications.

TYPICAL PERFORMANCE



SPECIFICATIONS

Model FP-518

Model FP-522

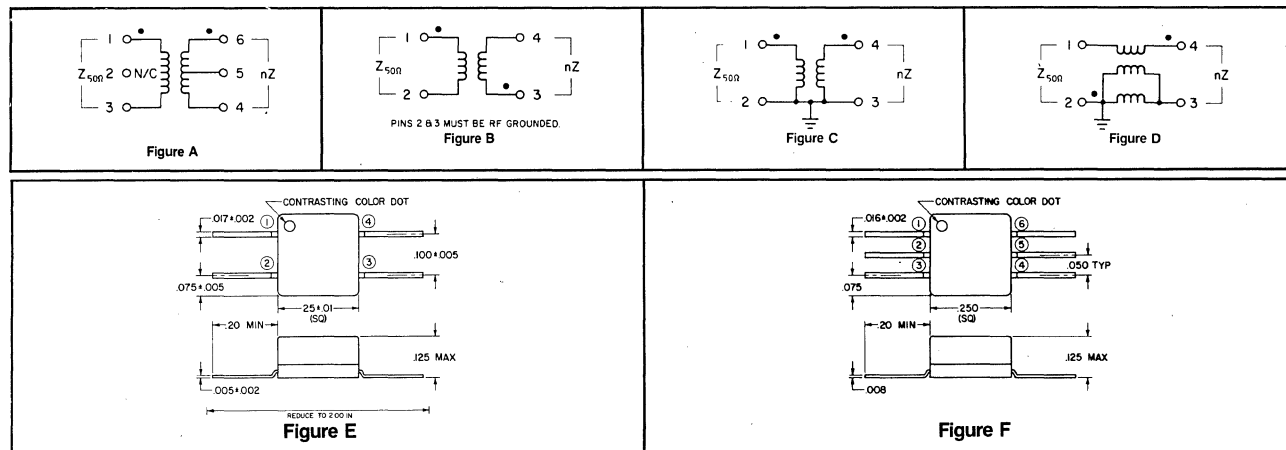
MODEL	DESCRIPTION	GUARANTEED		TYPICAL		PACKAGE	SCHEMATIC	PRICE
		-1 dB Bw MHz-MIN.	MAX. VSWR 2-400 MHz	-3 dB Bw MHz-TYP.	TYP. VSWR -1 dB Bw			
FP-502	50 ohm unbal:12.5 ohm unbal	1-500	1.4:1	.25-750	2:1	Fig. E	Fig. C	\$20.80
FP-504	50 ohm unbal:25 ohm unbal	1-500	1.4:1	.25-750	2:1	Fig. E	Fig. C	\$20.80
FP-510	50 ohm unbal:50 ohm bal	.5-750	1.3:1	.25-2000	1.3:1	Fig. E	Fig. D	\$15.55
FP-512	50 ohm unbal:50 ohm unbal phase reversing DC isolated	1-750	1.3:1	.25-1500	1.3:1	Fig. E	Fig. B	\$15.55
FP-514	50 ohm unbal:75 ohm unbal	1-600	1.3:1	.25-1200	1.8:1	Fig. E	Fig. C	\$20.80
FP-516	50 ohm unbal:100 ohm unbal	1-600	1.3:1	.25-1200	1.8:1	Fig. E	Fig. C	\$20.80
FP-518	50 ohm unbal:200 ohm unbal	1-600	1.3:1	.25-1000	2:1	Fig. E	Fig. C	\$15.55
FP-522	50 ohm unbal:200 ohm bal	1-500	1.3:1	.25-1000	1.5:1	Fig. F	Fig. A	\$20.80

THE FOLLOWING MODELS ARE HIGHER IMPEDANCE AND COVER A REDUCED FREQUENCY RANGE.

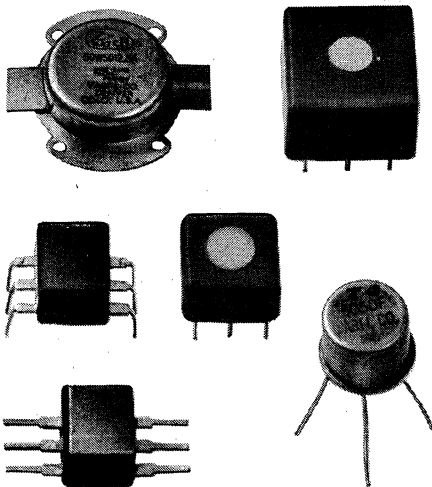
FP-528	50 ohm unbal:200 ohm bal DC isolated, center-tapped	1-400	*1.3:1	.25-600	1.8:1	Fig. F	Fig. A	\$20.80
FP-530	50 ohm unbal:450 ohm unbal	1-100	*1.3:1	.25-150	1.8:1	Fig. E	Fig. C	\$20.80
FP-532	50 ohm unbal:600 ohm bal DC isolated, center-tapped	1-100	*1.3:1	.25-150	1.8:1	Fig. F	Fig. A	\$20.80

*Max. VSWR 1-50 MHz

SCHEMATICS & PACKAGES



WIDE BAND TRANSFORMERS

Z-MATCH


Applications include: Impedance Matching and Interstage Coupling in wide band solid-state circuits, Phase Detection, Voltage/Current Step-up or Step-down, and Pulse Transformation. Available in three figurations, they have become a standard in the industry and are on numerous spec. control drawings for high-reliability military and industrial equipment. They are qualified to MIL-T-55631 and are recommended for a temperature range of -55°C to $+85^{\circ}\text{C}$. VSWR is 1.3:1 maximum to within one octave of the upper and lower 1 dB bandwidth limits. Midband insertion loss .5 dB maximum. Power handling ability for the HF and LF types is 2 watts (tending to increase toward the high end of the range) and 1 watt for TO and DP types, except for units which have the model number preceded by *. These are rated at .5 watt max.

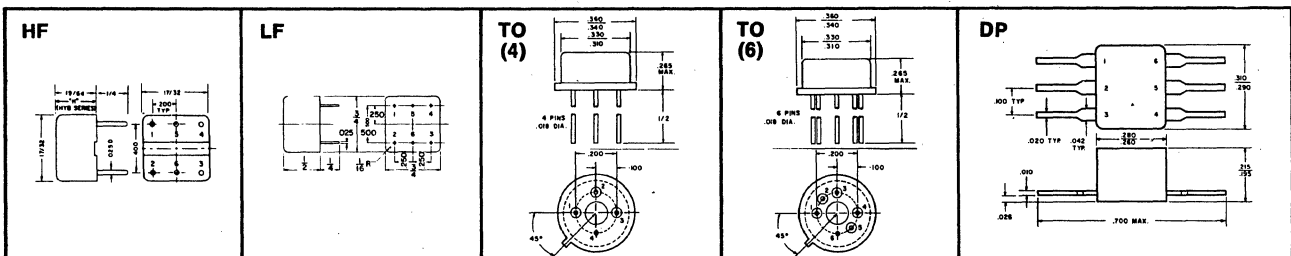
HF and LF types are epoxy-encapsulated and have terminals of phosphor bronze, silver plated. Packaging techniques employed have been evolved over 20 years of continuous production experience, and, although improvements are being investigated constantly, quality is the primary consideration in evaluating the effects of any innovation in methods. TO and DP types, housed in transistor and DIP packages respectively, have the same 100% encapsulated features. Write for applicable bulletins.

NOTE: New Model Number System

To avoid confusion in specifying and/or ordering, we have adopted a new model numbering system as shown in the tables. We ask that the new numbers be used except in cases where the old number is already on a drawing or spare parts list, in which case we will make the translation in our Sales Department.

HIGH FREQUENCY TRANSFORMER SPECIFICATIONS

OLD MODEL NO.	NEW MODEL NUMBERS			DESCRIPTION NUMBERS REPRESENT WINDING IMPEDANCES IN OHMS	RANGE OF FREQUENCY RESP. FOR -1 dB MAX.	SCHEMATIC NUMBER	PRICE 1-9
	HF SERIES	TO SERIES	DP SERIES				
5012.5A	HF-102	TO-202	DP-302	50 unbal./12.5 unbal. 50 unbal./12.5 unbal.	500 KHz - 1 GHz 500 KHz - 500 MHz	2G(N=4) 2G(N=4)	\$20.80 \$20.80
5050C	HF-110	TO-210	DP-310	50 unbal./50 bal. symm. 50 unbal./50 bal. symm.	100 KHz - 700 MHz 500 KHz - 500 MHz	2E 2E	\$15.55 \$15.55
5050F	HF-112	TO-212	DP-312	50 unbal./50 unbal. ph. rev. DC isol. 50 unbal./50 unbal. ph. rev. DC isol.	250 KHz - 500 MHz 250 KHz - 700 MHz	2C 2C	\$15.55 \$15.55
5075A	HF-114	TO-214	DP-314	50 unbal./75 unbal. 50 unbal./75 unbal. ph. rev.	1 MHz - 300 MHz 500 KHz - 300 MHz	2B(N=1.5) 2B(N=1.5)	\$20.80 \$20.80
*50100A	HF-116	TO-216	DP-316	50 unbal./100 unbal. 50 unbal./100 unbal.	100 KHz - 200 MHz 500 KHz - 500 MHz	2G(N=5) 2G(N=5)	\$20.80 \$20.80
50200A	HF-118	TO-218	DP-318	50 unbal./200 unbal.	500 KHz - 500 MHz	2F(N=4)	\$15.55
50200E	HF-122	TO-222	DP-322	50 unbal./200 bal. symm. 50 unbal./200 bal. symm.	250 KHz - 1 GHz 500 KHz - 500 MHz	2I 2I	\$20.80 \$20.80
50200F	HF-124	TO-224	DP-324	50 unbal./200 unbal. ph. rev. DC isol. 50 unbal./200 unbal. ph. rev. DC isol.	400 KHz - 500 MHz 1 MHz - 500 MHz	2D 2D	\$15.55 \$15.55
*50200H	HF-128	TO-228	DP-328	50 unbal./200 bal. symm. DC isol. 50 unbal./200 bal. symm. DC isol.	100 KHz - 200 MHz 250 KHz - 200 MHz	2K(N=4) 2K(N=4)	\$20.80 \$20.80
50450A	HF-130	TO-230	DP-330	50 unbal./450 unbal. 50 unbal./450 unbal.	50 KHz - 50 MHz 500 KHz - 150 MHz	2F(N=9) 2F(N=9)	\$20.80 \$20.80
*50600H	HF-132	TO-232	DP-332	50 unbal./600 bal. DC isol. 50 unbal./600 bal. DC isol.	100 KHz - 100 MHz 500 KHz - 200 MHz	2K(N=12) 2K(N=12)	\$20.80 \$20.80
7575C	HF-136	TO-236	DP-336	75 unbal./75 bal. 75 unbal./75 bal.	250 KHz - 1 GHz 400 KHz - 500 MHz	2E 2E	\$15.55 \$15.55
*75124H	HF-138	TO-238	DP-338	75 unbal./124 bal. DC isol.	50 KHz - 25 MHz	2K(N=1.65)	\$20.80
75300E	HF-144	TO-244	DP-344	75 unbal./300 bal. symm. 75 unbal./300 bal. symm.	500 KHz - 900 MHz 500 KHz - 500 MHz	2I 2I	\$20.80 \$20.80
100100B	HF-148	TO-248	DP-348	100 unbal./100 unbal. ph. rev. 100 unbal./100 unbal. ph. rev.	500 KHz - 1 GHz 500 KHz - 750 MHz	2B(N=1) 2B(N=1)	\$12.90 \$12.90
100100C	HF-150	TO-250	DP-350	100 unbal./100 bal. 100 unbal./100 bal.	250 KHz - 1 GHz 250 KHz - 750 MHz	2E 2E	\$15.55 \$15.55



LOW FREQUENCY TYPES

The wide range of applicability of the Z-Match line of high frequency wide band transformers attracted the attention of customers who, in addition to R.F., were working in the high audio, super-sonic, and ultra-sonic regions. As a result of their continued requests we designed the LF series presented below using the same time-proven construction techniques

FIGURE 1 WIDE BAND TRANSFORMER OUTLINE DRAWINGS

and high reliability features. Power handling ability, VSWR, and insertion loss figures are approximately the same as the HF series described above. Write for applicable bulletins.

Please order LF transformers by the new model number shown, for new designs.



WIDE BAND TRANSFORMERS (CONT.)

LOW FREQUENCY TRANSFORMER SPECIFICATIONS

OLD MODEL NO.	NEW MODEL NO.	DESCRIPTION NUMBERS REPRESENT WINDING IMPEDANCES IN OHMS	RANGE OF FREQUENCY RESP. FOR -1 dB MAX.	SCHEMATIC NUMBER	PRICE 1 - 9
LF-5012.5A	LF-402	50 unbal./12.5 unbal.	10 KHz - 100 MHz	2G(N=4)	\$20.80
LF-5050B	LF-408	50 unbal./50 unbal. ph. rev.	10 KHz - 100 MHz	2B(N=1)	\$12.90
LF-5050C	LF-410	50 unbal./50 bal. symmetrical	10 KHz - 100 MHz	2E	\$15.55
LF-5050F	LF-412	50 unbal./50 unbal. ph. rev. DC isol.	10 KHz - 100 MHz	2C	\$15.55
LF-50200A	LF-418	50 unbal./200 unbal.	10 KHz - 100 MHz	2F(N=4)	\$15.55
LF-50200E	LF-422	50 unbal./200 bal. symmetrical	10 KHz - 100 MHz	2I	\$20.80
LF-50200F	LF-424	50 unbal./200 unbal. DC isol.	10 KHz - 50 MHz	2D	\$15.55
LF-50200H	LF-428	50 unbal./200 bal. DC isolated	10 KHz - 50 MHz	2K(N=4)	\$20.80
LF-50450A	LF-430	50 unbal./450 unbal.	10 KHz - 25 MHz	2F(N=9)	\$20.80
LF-50600H	LF-432	50 unbal./600 bal. DC isolated	10 KHz - 25 MHz	2K(N=12)	\$20.80
LF-50800H	LF-452	50 unbal./800 bal. DC isolated	10 KHz - 10 MHz	2K(N=16)	\$22.50
LF-501800H	LF-454	50 unbal./1800 bal. DC isolated	10 KHz - 5 MHz	2K(N=36)	\$25.00
LF-7575B	LF-434	75 unbal./75 unbal. ph. rev.	15 KHz - 100 MHz	2B(N=1)	\$12.90
LF-7575C	LF-436	75 unbal./75 bal.	15 KHz - 100 MHz	2E	\$15.55
LF-75124H	LF-438	75 unbal./124 bal. DC isolated	10 KHz - 10 MHz	2K(N=1.65)	\$20.80
LF-100100B	LF-448	100 unbal./100 unbal. ph. rev.	10 KHz - 100 MHz	2B(N=1)	\$12.90
LF-100100C	LF-450	100 unbal./100 bal.	10 KHz - 100 MHz	2E	\$15.55

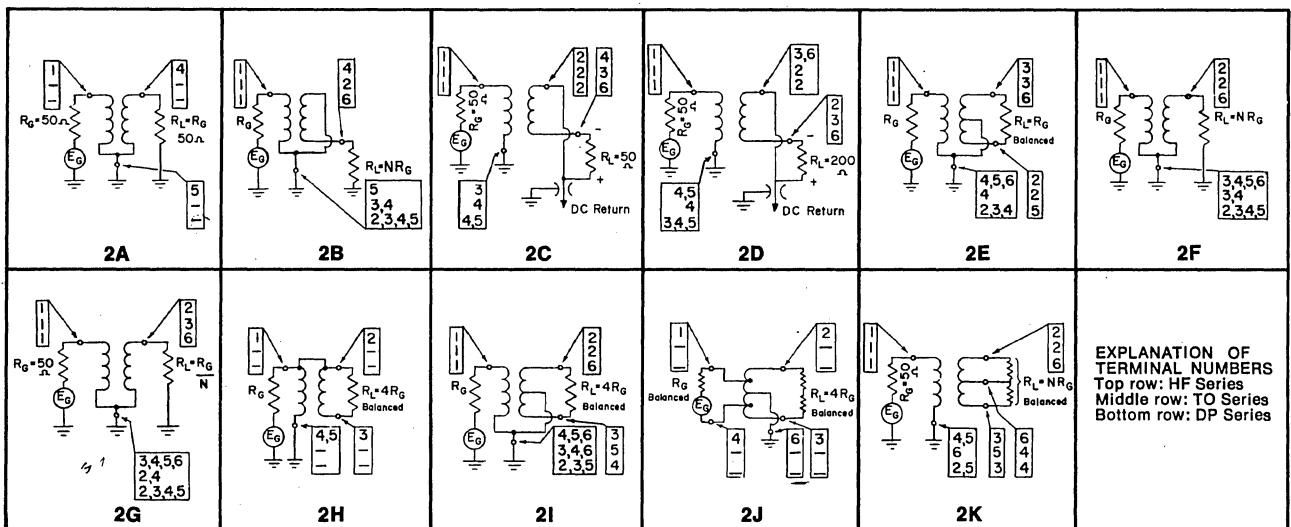


FIGURE 2 SCHEMATICS

POWER WIDE BAND TRANSFORMER

This series was developed for solid state applications in transmitters to permit the cascading of power transistors. The shape was made microstrip compatible and provided with a wide mounting skirt for heat dissipation. They have been used as

antenna couplers and for interstage coupling in Class A linear amplifiers. Per Fig. 3, they will handle up to 50 watts at room temperature, derating 1/2% per °C at higher temperatures. Write for applicable bulletins.

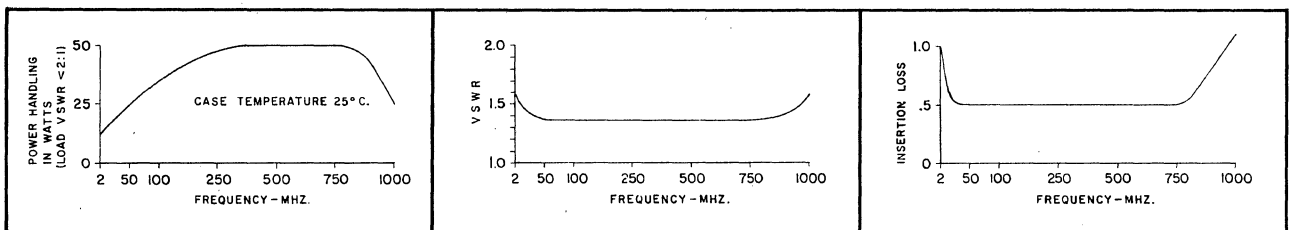


FIGURE 3

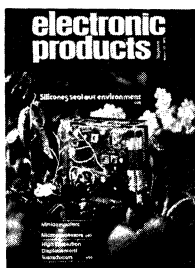
POWER WIDE BAND TRANSFORMER SPECIFICATIONS

MODEL	DESCRIPTION	RANGE OF FREQUENCY RESPONSE = -1 dB MAX.	PRICE 1 - 9
50W5012.5A	50 ohm unbal./12.5 ohm unbal.	2 MHz - 1 GHz	\$ 90.00
50W5050C	50 ohm unbal./50 ohm bal. symmetrical	2 MHz - 1 GHz	\$ 90.00
50W505A	50 ohm unbal./5 ohm unbal.	2 MHz - 750 MHz	\$110.00
50W50200E	50 ohm unbal./200 ohm bal. symmetrical	2 MHz - 1.5 GHz	\$110.00
50W50200A	50 ohm unbal./200 ohm unbal.	2 MHz - 750 MHz	\$110.00

OVER 100,000 STRONG

Every month over 100,000 buyers and specifiers like yourself receive Electronic Products Magazine . . . that makes us the largest electronics magazine around. And we're the largest for a darn good reason . . . we give you what you need: a practical editorial approach . . . one that's application and new product oriented. Editorial that offers solutions to the problems you face in your everyday task of designing and building electronic systems and sub-assemblies. The type of information you can put to use now.

If you're not getting EPM . . . why not write our circulation manager for a qualification form and join the over 100,000 strong.



Sign up Now . . .

**Write: Circulation Manager
Electronic Products Magazine
645 Stewart Avenue,
Garden City, New York 11530**

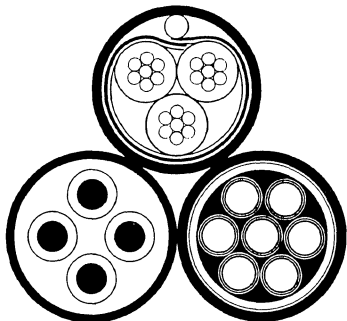


electronic products magazine

Published by United Technical Publications, Inc. Div. of Cox Broadcasting Corp.

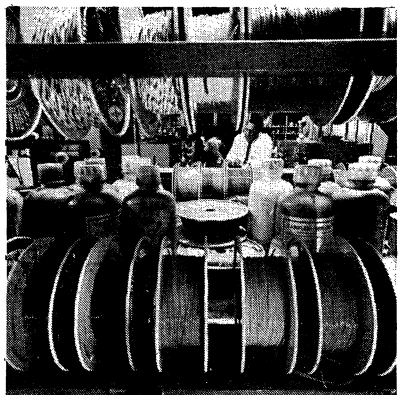
QUICK CUSTOM CABLE

The special or prototype cable you need — From one foot to production requirements — Manufactured and delivered faster than you ever thought possible.



QCC IS

- THE AVAILABILITY OF THE THOUSANDS OF IN-STOCK ITEMS IN THIS CATALOG TO CONSTRUCT THE CABLE YOU NEED.
- THE KNOW-HOW THAT COMES FROM 51 YEARS IN MANUFACTURING
- THE ESSENTIAL MILITARY, COMMERCIAL AND UL APPROVALS.
- THE SPECIALIZED EQUIPMENT TO MANUFACTURE CUSTOM CABLE OF THE HIGHEST QUALITY.
- THE EXPERIENCED PERSONNEL TO HELP YOU IN DESIGNING YOUR CABLE.



A specially prepared customer cable specification sheet may be obtained from Alpha. We can also work from your sketch or blueprint.

Our QCC design department is anxious to work with you in designing cable for maximum efficiency at minimum cost.

QUICK — Alpha can manufacture and deliver special cable constructions faster than you ever thought possible — overnight in some instances. **CUSTOM** — we can make virtually any type of cable you need — and in quantities from one foot to thousands of feet. And the QC part of QCC means just what it says — **QUALITY**. All cable is thoroughly tested for all electrical, mechanical and appearance parameters by our fully equipped quality control laboratory.

Alpha offers you more in-stock military specification and UL wire and cable conductors than any other source in the world. Combine this with our cable engineering manufacturing and test facilities, and you have the answer to all your special, prototype and custom cable needs.

ALPHA WIRE CORPORATION

711 Lidgerwood Ave., Elizabeth, New Jersey 07207 Tel: (201) 925-8000 TWX: 710-996-5895

CALL 7 days a week — 24 hours a day



Hook-Up Wire

Type MW-Uncovered PVC-MIL-W-76B

DESCRIPTION:

Solid or extra flexible stranded tinned copper, color coded medium wall polyvinylchloride insulation. (Nom. wall thickness .016")

CHARACTERISTICS:

Temperature rating -40°C to +80°C. Voltage rating 1000 volts. Resistant to acids, alkalis, oil, flame, moisture and fungus. Passes FR-1 vertical flame test.



Type MW-Nylon Jacket MIL-W-76B

DESCRIPTION:

Extra flexible stranded tinned copper, color coded medium wall polyvinylchloride insulation, clear nylon (polyamide) jacket overall. (Nom. wall thickness .016")

CHARACTERISTICS:

Temperature rating -40°C to +90°C. Voltage rating 1000 volts. Resistant to acids, alkalis, oil, flame, moisture and fungus.



Type MW-Shielded- Nylon Jacket-MIL-W-76B

DESCRIPTION:

Stranded tinned copper, white medium wall polyvinylchloride insulation, braided tinner copper shield, 80% minimum coverage, clear nylon (polyamide) jacket overall, (which can be striped to order for color identification). (Nom. wall thickness .016")

CHARACTERISTICS:

Temperature rating -40°C to +90°C. Voltage rating 1000 volts. Resistant to acids, alkalis, oil, flame, moisture and fungus.



Type MW-Glass Braid MIL-W-76B

DESCRIPTION:

Extra flexible stranded tinned copper, white medium wall polyvinylchloride insulation, color coded flame retardant lacquered glass braid overall. (Nom. wall thickness .016")

CHARACTERISTICS:

Temperature rating -40°C to +80°C. Voltage rating 1000 volts. Resistant to acids, alkalis, oil, flame, moisture and fungus. Passes FR-1 vertical flame test.



Type MW-Glass Braid Shielded-MIL-W-76B

DESCRIPTION:

Extra flexible stranded tinned copper, white medium wall polyvinylchloride insulation, white flame retardant lacquered glass braid with tinned copper shield overall, 80% coverage. (Nom. wall thickness .016")

CHARACTERISTICS:

Temperature rating -40°C to +80°C. Voltage rating 1000 volts. Resistant to acids, alkalis, oil, flame, moisture and fungus. Passes FR-1 vertical flame test.



STRANDED					
Alpha No.	Type Designation	Conductor Size	Strand	Nom. O.D.	Stock Colors
1550	MW-C 24(7)U	24	7/32	.059"	1-27
1551	MW-C 22(7)U	22	7/30	.064"	1-27
1553	MW-C 20(10)U	20	10/30	.073"	1-27
1555	MW-C 18(16)U	18	16/30	.084"	1-27
1557	MW-C 16(26)U	16	26/30	.095"	1-19
1559	MW-C 14(41)U	14	41/30	.110"	1-19
1560	MW-C 12(65)U	12	65/30	.125"	1-19
SOLID					
1561/24	MW-C 24(1)U	24	1	.055"	1-19
1561	MW-C 22(1)U	22	1	.060"	1-19
1563	MW-C 20(1)U	20	1	.066"	1-19
1565	MW-C 18(1)U	18	1	.074"	1-19

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

*STOCK COLORS

- 1—White
- 2—Black
- 3—Red
- 4—Green
- 5—Yellow
- 6—Light Blue
- 7—Brown
- 8—Orange
- 9—Gray (slate)
- 10—Violet (purple)
- 11—White/Black
- 12—White/Red
- 13—White/Green
- 14—White/Yellow
- 15—White/Blue
- 16—White/Brown
- 17—White/Orange
- 18—White/Gray
- 19—White/Violet
- 20—White/Black/Red
- 21—White/Black/Green
- 22—White/Black/Yellow
- 23—White/Black/Blue
- 24—White/Black/Brown
- 25—White/Black/Orange
- 26—White/Black/Gray
- 27—White/Black/Violet

Alpha No.	Type Designation	Conductor Size	Strand	Nom. Jkt. Thickness	Nom. O.D.	Stock Colors
1504	MW-C 22(7)J	22	7/30	.003"	.072"	White, Black, Red
1505	MW-C 20(10)J	20	10/30	.003"	.079"	White
1506	MW-C 18(16)J	18	16/30	.003"	.090"	White
1507	MW-C 16(26)J	16	26/30	.004"	.103"	White
1508	MW-C 14(41)J	14	41/30	.004"	.118"	White
1509	MW-C 12(65)J	12	65/30	.005"	.135"	White

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Alpha No.	Type Designation	Conductor Size	Strand	Nominal Jacket	Nominal O.D.
1370	MW-C 24(7)SJ	24	7/32	.003"	.085"
1371	MW-C 22(7)SJ	22	7/30	.003"	.092"
1372	MW-C 20(7)SJ	20	7/28	.003"	.100"
1373	MW-C 18(19)SJ	18	19/30	.003"	.110"
1374	MW-C 16(19)SJ	16	19/29	.004"	.120"
1375	MW-C 14(19)SU	14	19/27	.004"	.140"
1376	MW-C 12(19)SU	12	19/25	.005"	.156"

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Alpha No.	Type Designation	Conductor Size	Strand	Nominal O.D.	Stock Colors
1590	MW-C 22(7)B	22	7/30	.080"	1-6
1591	MW-C 20(10)B	20	10/30	.085"	1-6
1592	MW-C 18(16)B	18	16/30	.090"	1-6
1593	MW-C 16(26)B	16	26/30	.105"	1-6
1594	MW-C 14(41)B	14	41/30	.120"	1
1595	MW-C 12(65)B	12	65/30	.135"	1

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

ALSO AVAILABLE TO ORDER CUT, STRIPPED AND TINNED.

Alpha No.	Type Designation	Conductor Size	Strand	Stock	Color
1194/24	MW-C 24(7)BS	24	7/32	.091"	White
1194/22	MW-C 22(7)BS	22	7/30	.097"	White
1194	MW-C 20(10)BS	20	10/30	.105"	White
1196	MW-C 18(16)BS	18	16/30	.117"	White
1197	MW-C 16(26)BS	16	26/30	.129"	White

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

ALPHA WIRE CORPORATION

Hook-Up Wire

Type LW-Uncovered PVC MIL-W-76B

REGULAR TINNED CONDUCTOR

DESCRIPTION:

Stranded tinned copper, color coded light wall polyvinylchloride insulation. (Nom. wall thickness .010").

CHARACTERISTICS:

Temperature rating -40°C to +80°C. Voltage rating 300 volts. Resistant to acids, alkalis, oil, flame, moisture and fungus. Passes FR-1 vertical flame test.



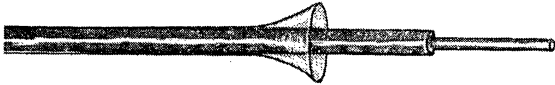
Type LW-Nylon Jacket MIL-W-76B

DESCRIPTION:

Stranded tinned copper, color coded light wall polyvinylchloride insulation, clear nylon (polyamide) jacket overall. Nominal jacket thickness, .002". (Nom. wall thickness .010").

CHARACTERISTICS:

Temperature rating -40°C to +90°C. Voltage rating 300 volts. Resistant to acids, alkalis, oil, flame, moisture and fungus.



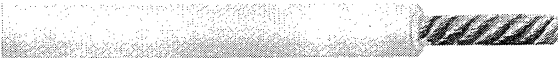
Type HW-Uncovered PVC MIL-W-76B

DESCRIPTION:

Stranded tinned copper, color coded heavy wall polyvinylchloride insulation.

CHARACTERISTICS:

Temperature rating -40°C to +80°C. Resistant to acids, alkalis, oil, flame, moisture and fungus. Passes FR-1 vertical flame test.



Type B-Pre-Bonded Conductor MIL-W-16878D

DESCRIPTION:

Each strand of the conductor is double tinned and then heated, which bonds the individual strands together for easy stripping. Color coded .010" polyvinylchloride insulation. The insulation meets requirements of MIL-W-16878D.

CHARACTERISTICS:

Temperature rating -55°C to +105°C. Voltage rating 600 volts. Resistant to acids, alkalis, oil, flame, moisture, solvents, and fungus. Passes FR-1 vertical flame test.



Alpha No.	Type Designation	Conductor Size	Strand	Nom. O.D.	Stock* Colors
1685	LW-C 30(7)U	30	7/38	.033"	1-19
1686	LW-C 28(7)U	28	7/36	.035"	1-19
1687	LW-C 26(7)U	26	7/34	.038"	1-19
1688	LW-C 24(7)U	24	7/32	.043"	1-19
1689	LW-C 22(7)U	22	7/30	.049"	1-19
1690	LW-C 20(7)U	20	7/28	.060"	1-19

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Alpha No.	Type Designation	Conductor Size	Strand	Nom. O.D.	Stock* Colors
1677	LW-C 26(7)J	26	7/34	.042"	1-19
1678	LW-C 24(7)J	24	7/32	.047"	1-19
1679	LW-C 22(7)J	22	7/30	.053"	1-19
1680	LW-C 20(7)J	20	7/28	.065"	1-19

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

*STOCK COLORS

- 1—White
- 2—Black
- 3—Red
- 4—Green
- 5—Yellow
- 6—Light Blue
- 7—Brown
- 8—Orange
- 9—Gray (slate)
- 10—Violet (purple)
- 11—White/Black
- 12—White/Red
- 13—White/Green
- 14—White/Yellow
- 15—White/Blue
- 16—White/Brown
- 17—White/Orange
- 18—White/Gray
- 19—White/Violet

(Other striped combinations available to order.)

Alpha No.	Type Designation	Conductor Size	Strand	Nom. Wall Thick.	Volt Rating	Nom. O.D.	Stock* Colors
1571	HW-C 22(7)U	22	7/30	.032"	2500	.092"	1-6
1573	HW-C 20(10)U	20	10/30	.032"	2500	.100"	1-6
1575	HW-C 18(16)U	18	16/30	.032"	2500	.112"	1-6
1577	HW-C 16(26)U	16	26/30	.032"	2500	.126"	1, 2, 3
1579	HW-C 14(41)U	14	41/30	.045"	600	.170"	1, 2, 3
1651	HW-C 12(65)U	12	65/30	.045"	600	.186"	1, 2, 3
1653	HW-C 10(105)U	10	105/30	.045"	600	.210"	1, 2, 3
1655	HW-C 8(133)U	8	133/29	.045"	600	.260"	1, 2, 3

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

APPLICATION:

A pre-bonded conductor is the ideal construction when leads are to be cut and stripped for point to point wiring. The pre-bonded conductor maintains much of the flexibility of an ordinary stranded wire but reduces processing and handling costs on soldering, retwisting of strands after stripping and hand tinning operations. Since the individual strands are bonded, expensive induction heating equipment is unnecessary.

Alpha No.	Type Designation	Conductor Size	Strand	Nom. Wall Thickness	Nom. O.D.	Stock* Colors
3154	B-24	24	7/32	.010"	.044"	1-19
3155	B-22	22	7/30	.010"	.051"	1-19
3156	B-20	20	7/28	.010"	.059"	1-19
3157	B-18	18	7/26	.010"	.070"	1-19

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

ALPHA WIRE CORPORATION

Hook-Up Wire

Type B-Uncovered PVC MIL-W-16878D

DESCRIPTION:

Stranded tinned copper, color coded, .010" polyvinylchloride insulation.

CHARACTERISTICS:

Temperature rating —55°C to +105°C. Voltage rating 600 volts. Resistant to acids, alkalis, oil, flame, moisture, solvents, and fungus. Passes FR-1 vertical flame test.



Alpha No.	Type Designation	Conductor Size	Strand	Nom. Wall Thickness	Nom. O.D.	Stock* Colors
1850	B-32	32	7/40	.010"	.028"	1-19
1851	B-30	30	7/38	.010"	.032"	1-19
1852	B-28	28	7/36	.010"	.034"	1-19
1853	B-26	26	7/34	.010"	.038"	1-19
1854	B-24	24	7/32	.010"	.043"	1-19
1854/19	B-24	24	19/36	.010"	.043"	1-19
1855	B-22	22	7/30	.010"	.050"	1-19
1855/19	B-22	22	19/34	.010"	.050"	1-19
1856	B-20	20	7/28	.010"	.058"	1-19
1856/19	B-20	20	19/32	.010"	.058"	1-19
1857	B-18	18	7/26	.010"	.068"	1-19
1857/19	B-18	18	19/30	.010"	.068"	1-19
1858/19	B-16	16	19/29	.010"	.077"	1-19
1859/19	B-14	14	19/27	.010"	.091"	1-19

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

*STOCK COLORS

- 1—White
- 2—Black
- 3—Red
- 4—Green
- 5—Yellow
- 6—Light Blue
- 7—Brown
- 8—Orange
- 9—Gray (slate)
- 10—Violet (purple)

- 11—White/Black
- 12—White/Red
- 13—White/Green
- 14—White/Yellow
- 15—White/Blue
- 16—White/Brown
- 17—White/Orange
- 18—White/Gray
- 19—White/Violet

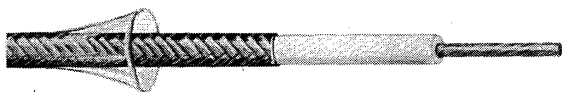
Type B-Nylon Jacket MIL-W-16878D

DESCRIPTION:

Stranded tinned copper, color coded, .010" polyvinylchloride insulation, clear nylon (polyamide) jacket overall.

CHARACTERISTICS:

Temperature rating —55°C to +115°C. Voltage rating 600 volts. Resistant to acids, alkalis, oil, flame, moisture, solvents, and fungus.



Alpha No.	Type Designation	Conductor Size	Strand	Nom. Wall Thick.	Nom. Jkt. Thick.	Nom. O.D.	Stock* Colors
1863	B-26	26	7/34	.010"	.003"	.044"	1-19
1864	B-24	24	7/32	.010"	.003"	.049"	1-19
1864/19	B-24	24	19/36	.010"	.003"	.049"	1-19
1865	B-22	22	7/30	.010"	.003"	.056"	1-19
1865/19	B-22	22	19/34	.010"	.003"	.056"	1-19
1866	B-20	20	7/28	.010"	.003"	.064"	1-19
1866/19	B-20	20	19/32	.010"	.003"	.064"	1-19
1867	B-18	18	7/26	.010"	.003"	.074"	1-19
1867/19	B-18	18	19/30	.010"	.003"	.074"	1-19
1868/19	B-16	16	19/29	.010"	.003"	.085"	1-19
1869/19	B-14	14	19/27	.010"	.004"	.099"	1-19

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

ALPHA WIRE CORPORATION

Hook-Up Wire

Type C-Uncovered PVC MIL-W-16878D

DESCRIPTION:

Stranded tinned copper, color coded .016" polyvinylchloride insulation.

CHARACTERISTICS:

Temperature rating -55°C to $+105^{\circ}\text{C}$. Voltage rating 1000 volts. Resistant to acids, alkalis, oil, flame, moisture, solvents, and fungus. Passes FR-1 vertical flame test.



Type C-Nylon Jacket MIL-W-16878D

DESCRIPTION:

Stranded tinned copper, color coded .016" polyvinylchloride insulation, clear nylon (polyamide) jacket overall.

CHARACTERISTICS:

Temperature rating -55°C to $+115^{\circ}\text{C}$. Voltage rating 1000 volts. Resistant to acids, alkalis, oil, flame, moisture, solvents, and fungus.



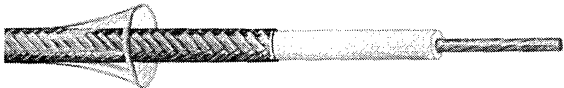
Type C-Shielded Nylon Jacket-MIL-W-16878D

DESCRIPTION:

Stranded tinned copper, white .016" polyvinylchloride insulation, braided tinned copper shield, 90% coverage, clear nylon (polyamide) jacket overall (which can be striped to order for color identification).

CHARACTERISTICS:

Temperature rating -55°C to $+115^{\circ}\text{C}$. Voltage rating 1000 volts. Resistant to acids, alkalis, oil, flame, moisture, solvents, and fungus.



Type D-Uncovered PVC MIL-W-16878D

DESCRIPTION:

Stranded tinned copper, color coded polyvinylchloride insulation.

CHARACTERISTICS:

Temperature rating -55°C to $+105^{\circ}\text{C}$. Voltage rating 3000 volts. Resistant to acids, alkalis, oil, flame, moisture, solvents, and fungus. Passes FR-1 vertical flame test.



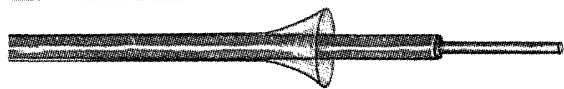
Type D-Nylon Jacket MIL-W-16878D

DESCRIPTION:

Stranded tinned copper, color coded polyvinylchloride insulation. Sizes 24-6, clear nylon (polyamide) jacket overall.

CHARACTERISTICS:

Temperature rating -55°C to $+115^{\circ}\text{C}$. Voltage rating 3000 volts. Resistant to acids, alkalis, oil, flame, moisture, solvents, and fungus.



*STOCK COLORS

- 1—White
- 2—Black
- 3—Red
- 4—Green

- 5—Yellow
- 6—Light Blue
- 7—Brown
- 8—Orange

- 9—Gray (slate)
- 10—Violet (purple)
- 11—White/Black
- 12—White/Red

- 13—White/Green
- 14—White/Yellow
- 15—White/Blue
- 16—White/Brown

- 17—White/Orange
- 18—White/Gray
- 19—White/Violet

ALPHA WIRE CORPORATION

Alpha No.	Type Designation	Conductor Size	Strand	Nom. Wall Thickness	Nominal O.D.	Stock* Colors
1830	C-24	24	7/32	.016"	.058"	1-19
1831	C-22	22	7/30	.016"	.064"	1-19
1832	C-20	20	7/28	.016"	.072"	1-19
1833	C-18	18	7/26	.016"	.082"	1-19
1834	C-16	16	19/29	.016"	.091"	1, 11-19
1835	C-14	14	19/27	.016"	.105"	1, 11-19
1836	C-12	12	19/25	.016"	.124"	1, 11-19

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Alpha No.	Type Designation	Conductor Size	Strand	Nom. Thick. Wall	Nom. Jkt. Thick.	Nom. O.D.	Stock* Colors
1840	C-24	24	7/32	.016"	.002"	.065"	1-19
1841	C-22	22	7/30	.016"	.003"	.072"	1-19
1842	C-20	20	7/28	.016"	.003"	.079"	1-19
1843	C-18	18	7/26	.016"	.003"	.090"	1-19
1844	C-16	16	19/29	.016"	.004"	.099"	1, 11-19
1845	C-14	14	19/27	.016"	.004"	.114"	1, 11-19
1846	C-12	12	19/25	.016"	.005"	.135"	1, 11-19

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Alpha No.	Type Designation	Conductor Size	Strand	Thickness Nom. Wall	Nom. Jkt. Thickness	Nom. O.D.
1470	C-24	24	7/32	.016"	.005"	.091"
1471	C-22	22	7/30	.016"	.005"	.098"
1472	C-20	20	7/28	.016"	.005"	.105"
1473	C-18	18	19/30	.016"	.005"	.115"
1474	C-16	16	19/29	.016"	.005"	.125"
1475	C-14	14	19/27	.016"	.005"	.142"
1476	C-12	12	19/25	.016"	.005"	.156"

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Alpha No.	Type Designation	Conductor Size	Strand	Nom. Wall Thickness	Nominal O.D.	Stock* Colors
1870	D-24	24	7/32	.029"	.082"	1, 2, 3
1871	D-22	22	7/30	.029"	.088"	1, 2, 3
1872	D-20	20	7/28	.029"	.096"	1, 2, 3
1873	D-18	18	7/26	.029"	.106"	1, 2, 3
1874	D-16	16	19/29	.029"	.115"	1, 2, 3
1875	D-14	14	19/27	.029"	.129"	1, 2, 3
1876	D-12	12	19/25	.034"	.158"	1, 2, 3
1877	D-10	10	37/26	.037"	.185"	1
1878	D-8	8	133/29	.040"	.247"	1
1879	D-6	6	133/27	.040"	.290"	1

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.
ALSO AVAILABLE TO ORDER CUT, STRIPPED AND TINNED.

CLEAR NYLON JACKET

Alpha No.	Type Designation	Conductor Size	Strand	Nom. Thick. Wall	Nom. Jkt. Thick.	Nom. O.D.	Stock* Colors
1880	D-24	24	7/32	.029"	.004"	.090"	1, 2, 3
1881	D-22	22	7/30	.029"	.004"	.096"	1, 2, 3
1882	D-20	20	7/28	.029"	.004"	.104"	1, 2, 3
1883	D-18	18	7/26	.029"	.004"	.114"	1, 2, 3
1884	D-16	16	19/29	.029"	.005"	.125"	1, 2, 3
1885	D-14	14	19/27	.029"	.005"	.139"	1, 2, 3
1886	D-12	12	19/25	.034"	.005"	.168"	1, 2, 3
1887	D-10	10	37/26	.037"	.006"	.197"	1
1888	D-8	8	133/29	.040"	.009"	.265"	1
1889	D-6	6	133/27	.040"	.010"	.310"	1

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.
ALSO AVAILABLE TO ORDER CUT, STRIPPED AND TINNED.

UL HOOK-UP WIRE

300 Volts 80°C UL 1007

Passes FR-1 vertical flame test.
Stranded tinned copper, color coded polyvinylchloride insulation.
Temperature rating -10°C to +80°C.
Nom. wall thickness—.016" STOCK COLORS: 1-19

CSA STYLE TR-64

1/64" NOM. WALL THICKNESS

ALPHA NO.	CONDUCTOR SIZE	STRAND	NOM. O.D.
3050	24	7/32	.057"
3051	22	7/30	.065"
3053	20	10/30	.071"
3055	18	16/30	.080"
3057	16	26/30	.095"

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

600 Volts 105°C UL 1015

Passes FR-1 vertical flame test.
Stranded tinned copper, color coded polyvinylchloride insulation.
Temperature rating -10°C to +105°C.
Nom. wall thickness—.032" STOCK COLORS: 1-10

CSA STYLE TEW-105

1/32" NOM. WALL THICKNESS

ALPHA NO.	CONDUCTOR SIZE	STRAND	NOM. O.D.
3071	22	7/30	.095"
3073	20	10/30	.102"
3075	18	16/30	.112"
3077	16	26/30	.125"
3079	14	41/30	.142"

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Semi-Rigid PVC

300 Volts 80°C UL 1061

Stranded tinned copper, color coded semi-rigid polyvinylchloride insulation.
Temperature rating -10°C to +80°C, 300 volts in business machine or electronic computers only.
Internal wiring of computers, and other office and control equipment.

ALPHA NO.	CONDUCTOR SIZE	STRAND	NOM. WALL THICKNESS	NOM. O.D.
3250	24	7/32	.009"	.042"
3251	22	7/30	.009"	.048"
3252	20	7/28	.009"	.056"

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Uncovered PVC

600 Volts 80°C UL 1011

Stranded tinned copper, color coded heavy wall polyvinylchloride insulation.
Temperature rating -40 C to +80 C.

ALPHA NO.	TYPE DESIGNATION	CONDUCTOR SIZE	STRAND	NOM. WALL THICKNESS	NOM. O.D.	STOCK COLORS
2571	HW-C 22(7)U	22	7/30	.032"	.092"	1-6
2573	HW-C 20(10)U	20	10/30	.032"	.100"	1-6
2575	HW-C 18(16)U	18	16/30	.032"	.112"	1-6
2577	HW-C 16(26)U	16	26/30	.032"	.126"	1,2,3
2579	HW-C 14(41)U	14	41/30	.045"	.170"	1,2,3
2551	HW-C 12(65)U	12	65/30	.045"	.186"	1,2,3
2553	HW-C 10(105)U	10	105/30	.045"	.210"	1,2,3
2555	HW-C 8(133)U	8	133/29	.045"	.260"	1,2,3

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

STOCK COLORS

- 1—White
- 2—Black
- 3—Red
- 4—Green
- 5—Yellow

- 6—Light Blue
- 7—Brown
- 8—Orange
- 9—Gray (slate)
- 10—Violet (purple)

Other solid colors and striped combinations available to order.

Nylon Jacket

300 Volts 80°C UL 1008

Stranded tinned copper, color coded .016" polyvinylchloride insulation, clear nylon (polyamide) jacket overall.

ALPHA NO.	TYPE DESIGNATION	CONDUCTOR SIZE	STRAND	NOM. JKT. THICK.	NOMINAL O.D.	STOCK COLORS
3840	C-24	24	7/32	.002"	.065"	1-19
3841	C-22	22	7/30	.003"	.072"	1-19
3842	C-20	20	7/28	.003"	.079"	1-19
3843	C-18	18	7/26	.003"	.090"	1-19
3844	C-16	16	19/29	.004"	.099"	1 & 11-19

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Nylon Jacket 80°C UL 1004

Stranded tinned copper, color coded light wall polyvinylchloride insulation, clear nylon (polyamide) jacket overall.
Nominal Jacket Thickness, .002" (Nom. wall thickness .010")
Temperature rating -40°C to +80°C.

ALPHA NO.	TYPE DESIGNATION	CONDUCTOR SIZE	STRAND	NOM. O.D.	COLORS
3677	LW-C 26(7)J	26	7/34	.042"	1-19
3678	LW-C 24(7)J	24	7/32	.047"	1-19
3679	LW-C 22(7)J	22	7/30	.053"	1-19
3680	LW-C 20(7)J	20	7/28	.065"	1-19

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Teflon 200°C UL 1212, 1213

Single conductor stranded silver plated copper, extruded TFE Teflon insulation.
Temperature rating -65 C to +200 C.
Resistant to acid, alkalis, oil, flame, moisture, solvents and fungus.
Nom. wall thickness—.010". Stock Colors 1-19

ALPHA NO.	CONDUCTOR SIZE	STRAND	NOM. O.D.
6850	32	7/40	.029"
6851	30	7/38	.032"
6852	28	7/36	.036"
6853	26	7/34	.040"
6853/19	26	19/38	.041"
6854	24	19/36	.045"
6854/7	24	7/32	.044"
6855	22	19/34	.051"
6855/7	22	7/30	.050"
6856	20	19/32	.059"
6856/7	20	7/28	.058"

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Teflon 200°C UL 1164, 1180

Single conductor stranded silver plated copper, TFE extruded Teflon insulation.
Temperature rating -65 C to +200 C.
Resistant to acid, alkalis, oil, flame, moisture, solvents and fungus.
Nom. wall thickness—.014". Stock Colors 1-19

ALPHA NO.	CONDUCTOR SIZE	STRAND	NOM. O.D.
6874	24	19/36	.055"
6875	22	19/34	.062"
6876	20	19/32	.070"
6877	18	19/30	.080"
6878	16	19/29	.089"

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

ALPHA WIRE CORPORATION

Ribbon Cable MIL-W-16878D

MIL-W-16878D—TYPES B & C—UL-FR-I ROUND CONDUCTOR, FLAT BONDED Passes FR-1 vertical flame test.

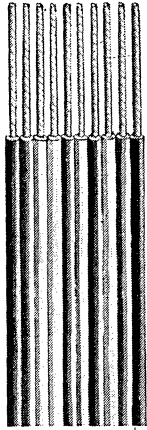
DESCRIPTION: Round conductor, flat bonded ribbon cable has all the advantages of a flat compact profile plus ease of termination and stripping. Saves space, simplifies cable identification, simple to separate and terminate individual conductors. With all standard wire connectors, jacks, pins and terminations. Each conductor, stranded tinned copper, color coded PVC insulation, conductors specially bonded into flat configuration.

CHARACTERISTICS:

Type B Voltage Rating: Temp. Rating:	Type C 600 Volts -55°C to +105°C	Type C 1000 Volts -55°C to +105°C
---	---	--

MIL-W-16878D TYPE B

NOM. WALL .010"



ALPHA NO.	NUMBER CONDUCTORS	CONDUCTOR SIZE	STRAND	NOMINAL O.D. WIDTH X THICKNESS IN INCHES
3530	10	22	19/34	.510 X .051
3531	15	22	19/34	.765 X .051
3532	20	22	19/34	1.05 X .051
3533	30	22	19/34	1.57 X .051
3540	10	24	19/36	.440 X .044
3541	15	24	19/36	.662 X .044
3542	20	24	19/36	.883 X .044
3543	30	24	19/36	1.35 X .044
3550	10	26	7/34	.392 X .039
3551	15	26	7/34	.587 X .039
3552	20	26	7/34	.783 X .039
3553	30	26	7/34	1.19 X .039
3560	10	28	7/36	.351 X .035
3561	15	28	7/36	.523 X .035
3562	20	28	7/36	.701 X .035
3563	30	28	7/36	1.06 X .035
3570	10	30	7/38	.311 X .032
3571	15	30	7/38	.482 X .032
3572	20	30	7/38	1.05 X .032
3573	30	30	7/38	.965 X .032

STANDARD PUT-UP — 100 FEET (Larger put-ups available on special request.)
Special constructions, colors, sizes and types of conductor are available to special order.

MIL-W-16878-D — TYPE C — U.L.2444

NOM. WALL .016"—300 VOLTS—80°C



ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	STRAND	NOM. O.D. WIDTH THICKNESS
3505	5	22	7/30	.065" x .320"
3510	10	22	7/30	.065" x .640"
3515	15	22	7/30	.065" x .960"
3520	20	22	7/30	.065" x 1.92"

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

COLOR CODE OF CONDUCTORS

1—Brown 3—Orange 5—Green 7—Violet 9—White
2—Red 4—Yellow 6—Blue 8—Grey 10—Black

Unshielded Aircraft Wire

MIL-W-5086A

DESCRIPTION:

MIL-W-5086A — Type I — AN-22 thru AN-12 — Single conductor stranded tinned copper, white polyvinylchloride insulation, clear nylon, (polyamide) jacket overall.
MIL-W-5086A — Type II — AN-22 thru AN-12 — Single conductor stranded tinned copper, white polyvinylchloride insulation, white glass braid, clear nylon (polyamide) jacket overall.
MIL-W-5086A — Type II — AN-10 thru AN-0000 — Single conductor stranded tinned copper, white polyvinylchloride insulation, white glass braid, flame retardant nylon lacquered nylon braid overall.

CHARACTERISTICS:

Temperature rating: -55°C to +105°C. Voltage rating: 600 volts. Resists effects of water, oil, aircraft fuels, hydraulic fluid, skydral, ethyleneglycol, alcohol, dilute acids, alkalis, fungus and abrasion.

Shielded Aircraft Wire

UNJACKETED SHIELDED CABLE (MIL-C-7078A Type 1)

Base Wire MIL-W-5086A Type 1

DESCRIPTION:

Each conductor stranded tinned copper, color coded polyvinylchloride insulation. Clear nylon jacket on each conductor, cabled, braided tinned copper shield overall. 85% coverage per Type 1 MIL-5086A, Type 1 MIL-C-7078A.

CHARACTERISTICS:

Temperature rating: -55°C to +105°C. Voltage rating: 600 volts. Resists effects of water, oil, aircraft fuels, hydraulic fluid, skydral, ethyleneglycol, alcohol, dilute acids, alkalis, fungus and abrasion.

UNSHIELDED (MIL-W-5086A) TYPE I

ALPHA NO.	MIL TYPE DESIGNATION	CONDUCTOR SIZE	STRAND	NOMINAL O.D.
1381	AN-22	22	19/34	.068"
1382	AN-20	20	19/32	.078"
1383	AN-18	18	19/30	.088"
1384	AN-16	16	19/29	.098"
1385	AN-14	14	19/27	.117"
1386	AN-12	12	19/25	.137"

UNSHIELDED (MIL-W-5086A) TYPE II

ALPHA NO.	MIL TYPE DESIGNATION	CONDUCTOR SIZE	STRAND	NOMINAL O.D.
1341	AN-22	22	19/34	.075"
1342	AN-20	20	19/32	.085"
1343	AN-18	18	19/30	.095"
1344	AN-16	16	19/29	.105"
1345	AN-14	14	19/27	.125"
1346	AN-12	12	19/25	.143"
1387	AN-10	10	49/27	.189"
1388	AN-8	8	133/29	.240"
1389	AN-6	6	133/27	.293"
1389/1	AN-1	1	817/30	.470"
1389/4	AN-4	4	133/25	.355"
1389/2	AN-2	2	665/30	.425"
1389/0	AN-0	0	1045/30	.525"
1389/00	AN-00	00	1330/30	.590"
1389/000	AN-000	000	1661/30	.645"
1389/0000	AN-0000	0000	2104/30	.715"

ALPHA NO.	NO. OF COND.	MIL TYPE & DESIG.	CONDUCTOR SIZE	STRAND	NOM. O.D. (Inches)	NOM. NET WT. LBS. PER M/FT.
1391	1	AN-22	22	19/34	.090	9.4
1391/2	2	AN-22	22	19/34	.160	23.1
1392	1	AN-20	20	19/32	.100	11.6
1392/2	2	AN-20	20	19/32	.180	33.8
1393	1	AN-18	18	19/30	.110	15.4
1393/2	2	AN-18	18	19/30	.200	37.5
1394	1	AN-16	16	19/29	.120	17.6

NYLON JACKETED SHIELDED CABLE (MIL-C-7078A Type 2)

Base Wire MIL-W-5086A Type 1

DESCRIPTION:

Each conductor stranded tinned copper, color coded PVC insulation clear nylon jacket on each conductor, cabled, braided tinned copper shield. 85% coverage. Clear nylon jacket overall. Per Type 1 MIL-W-5086A; per Type 2 MIL-C-7078A.

ALPHA NO.	NO. OF COND.	MIL TYPE & DESIG.	CONDUCTOR SIZE	STRAND	NOM. JKT. THICKNESS (Inches)	NOM. O.D. (Inches)	NOM. NET WT. LBS. PER M/FT.
6460	1	AN-22	22	19/34	.005	.100	10.2
6461	2	AN-22	22	19/34	.005	.170	23.6
6462	3	AN-22	22	19/34	.005	.180	29.7
6463	1	AN-20	20	19/32	.005	.110	12.0
6464	2	AN-20	20	19/32	.005	.190	34.2
6465	3	AN-20	20	19/32	.005	.200	27.2
6466	1	AN-18	18	19/30	.005	.120	16.3
6467	2	AN-18	18	19/30	.005	.210	39.3
6468	3	AN-18	18	19/30	.005	.220	40.7
6469	1	AN-16	16	19/29	.005	.130	18.4
6470	1	AN-14	14	19/27	.005	.150	26.0
6471	1	AN-12	12	19/25	.005	.170	35.8

COLOR CODE OF CONDUCTORS:

1—White 2—1 White/Blue, 1 White/Red 3—1 White/Blue, 1 White/Red, 1 White/Yellow

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

ALPHA WIRE CORPORATION

RX-7000 Irradiated – Heat Resistant Hook-Up Wire MIL-W-16878 D-UL-1429, 1430, 1472

- HIGH RELIABILITY
- SOLDER IRON RESISTANCE
- INCREASED STRENGTH
- ELIMINATES PRODUCTION DAMAGE

For: • Appliances

• Computer wiring

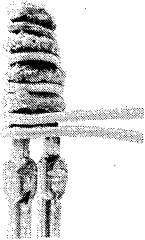
• Business Machines

• Instrumentation and control systems

Passes FR-1 vertical flame test.

RX-7000 is a newly developed hookup wire with an insulation made of irradiated Polyvinylchloride compound (PVC). The irradiation process results in an insulation far superior to ordinary PVC.

RX-7000 withstands higher temperatures than ordinary PVC and, even in direct contact with a soldering iron, will not shrink back, melt, blow or deform. Because of this ability to resist solder iron heat, it is the ideal material to use where high reliability is essential and is particularly valuable in the wiring of tight, high-density systems.



RX7000 and vinyl hook-up wire wrapped over tip of heated solder iron. RX7000 does not burn or char.

UL STYLE 1430 (105°C) – 300 VOLTS
.016 NOM. WALL THICKNESS

ALPHA NO.	SIZE	CONDUCTOR STRAND	NOM. O.D. (INCHES)
7130	24	7/32	.056
7131	22	7/30	.062
7132	20	7/28	.070
7133	18	7/26	.080
7134	16	19/.0117	.091

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

UL STYLE 1429
SOLID AND STRANDED (+80°C)
.010 NOM. WALL THICKNESS

ALPHA NO.	SIZE	CONDUCTOR STRAND	NOM. O.D. (INCHES)
7149	26	7/34	.038
7150	24	7/32	.043
7151	22	7/30	.050
7153	20	7/28	.058
7155	18	7/26	.068
7157	16	19/.0117	.077
7161	22	solid	.045
7161/24	24	solid	.040
7163	20	solid	.054

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

UL STYLE 1472 – STRANDED (+80°C)
– 300 VOLTS
.0075 NOM. WALL THICKNESS

ALPHA NO.	SIZE	CONDUCTOR STRAND	NOM. O.D. (INCHES)
7070	30	7/38	.028
7071	28	7/36	.032
7072	26	7/34	.034
7073	24	7/32	.040
7074	22	7/30	.045
7075	20	7/28	.054

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

MIL-W-16878/D TYPE B STRANDED (+105°C) 600 VOLTS
.010 NOM. WALL THICKNESS

ALPHA NO.	SIZE	CONDUCTOR STRAND	NOM. O.D. (INCHES)
7053	26	7/34	.038
7054	24	7/32	.043
7054/19	24	19/36	.043
7055	22	7/30	.050
7055/19	22	19/34	.050
7056	20	7/28	.058
7056/19	20	19/32	.058
7057	18	7/26	.068
7057/19	18	19/30	.068
7058/19	16	19/.0117	.077

MIL-W-16878/D TYPE C – STRANDED + 105°C – 1000 VOLTS
.016 NOM. WALL THICKNESS

ALPHA NO.	SIZE	CONDUCTOR STRAND	NOM. O.D. (INCHES)
7030	24	7/32	.058
7031	22	7/30	.064
7032	20	7/28	.072
7033	18	7/26	.082
7034	16	19/29	.091
7035	14	19/27	.105
7036	12	19/25	.124

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

STOCK COLORS

1—White	6—Light Blue	11—White/Black	16—White/Brown
2—Black	7—Brown	12—White/Red	17—White/Orange
3—Red	8—Orange	13—White/Green	18—White/Gray
4—Green	9—Gray (slate)	14—White/Yellow	19—White/Violet
5—Yellow	10—Violet (purple)	15—White/Blue	

Tefzel Computer Wire

150°C – 300 VOLTS Passes FR-1 vertical flame test.
EXTREMELY RUGGED AND FLEXIBLE WIRE-WRAP WIRE

Description: Solid silver-plated OFHC copper conductor. Tefzel insulation (copolymer of ethylene and tetra fluoroethylene)

Characteristics: Tefzel is a newly developed insulation that provides a high temperature, thin-wall wire suitable for wire wrap insulation. Tefzel has high cut-thru and abrasion resistance and long flex life. The material has a low dielectric constant of 2.6. Temperature range is from –100°C to +150°C continuous.

Like Teflon, Tefzel is chemically inert, with no known solvent and is rated non-burning or self-extinguishing.

Application: Computer wire, aircraft instrumentation, point-to-point wiring in all compact packaging modules.

SPOOLS

ALPHA NUMBER	CONDUCTOR SIZE	WALL THICKNESS (Inches)	NOMINAL O.D. (Inches)	STOCK COLORS
1805	30	.005	.019	1–10
1806	28	.005	.023	1–10
1807	26	.005	.026	1–10
1808	24	.005	.029	1–10

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Kynar Wire

– 125°C – 300 VOLTS Passes FR-1 vertical flame test.
FOR WIRE WRAP CONNECTIONS.

Description: Solid, silver-plated, oxygen-free, high conductivity (OFHC) copper conductor, extruded Kynar® (Polyvinylidene fluoride) insulation.

Characteristics: Operating temperature through 125°C continuous (U.L. rated at 105°C).

Extremely tough; high cut-through resistance.

Self-extinguishing; will not support combustion.

Resistant to most chemicals and solvents.

Excellent ultra-violet and weathering resistance.

Applications: Designed for use in automatic wire wrapping equipment for applications in the computer and related industries.

ALPHA NO.	COND. SIZE	NOM. WALL THICKNESS	NOM. OD	STOCK COLORS
5951	30	.005"	.020"	1-10
5952	28	.005"	.023"	1-10
5953	26	.005"	.026"	1-9
5954	24	.005"	.030"	1-6

STANDARD PUT-UP: 1000 FT.

CUT LENGTHS — TEFLON & KYNAR

CUT LENGTHS:

Specially cut and both-end stripped lengths for automatic and manual wire-wrap machines and tools. Specify Alpha number and length of wire insulated. Packaged in handy plastic tubes.

STOCK COLORS:	1. White	6. Blue
	2. Black	7. Brown
	3. Red	8. Orange
	4. Green	9. Slate
	5. Yellow	10. Violet
Other sizes, colors and putups available on special order.		

ALPHA NUMBER	COND. GAUGE	LENGTHS OF INSULATED SECTION OF WIRE	LENGTH OF EACH STRIPPED END	NO. OF PIECES PER PACKAGE
5951	30	4"-6"-8"-10"-12"	15/16	200
5952	28	4"-6"-8"-10"-12"	1-1/32	200
5953	26	4"-6"-8"-10"-12"	1-1/2	200
5954	24	4"-6"-8"-10"-12"	1-5/16	200

ALPHA WIRE CORPORATION

Unshielded Intercom Cable

PAIRED CONDUCTORS — PLASTIC JACKET

Passes FR-1 vertical flame test.

DESCRIPTION:

Each conductor tinned copper, color coded polyvinylchloride insulation, conductors twisted into pairs, gray polyvinylchloride jacket overall. Suitable for outdoor installations.

APPLICATIONS:

Balanced intercom systems. Annunciators. Telephones. Nurses call systems. Control circuit cable. Electronic computer cable. Multiple speaker cable. Signal systems. Alarm systems.

CHARACTERISTICS:

Suggested operating temperature: -20°C to $+80^{\circ}\text{C}$. Suggested operating voltage: 200 volts.

22 GAUGE — SOLID CONDUCTORS — 200 VOLTS

ALPHA NO.	NO. OF PAIRS	NO. OF COND.	COND. SIZE	COND. STRAND	NOM. WALL THICKNESS	NOM. JKT. THICKNESS	NOM. O.D.
1300 ©	1	2	22 Solid	1	.010"	.025"	.140"
1302 ©	2	4	22 Solid	1	.010"	.025"	.208"
1304 ©	3	6	22 Solid	1	.010"	.025"	.220"
1305	4	8	22 Solid	1	.010"	.025"	.238"
1307	6	12	22 Solid	1	.010"	.025"	.275"
1307/9	9	18	22 Solid	1	.010"	.025"	.320"
1308/11	11	22	22 Solid	1	.010"	.025"	.340"
1309	13	26	22 Solid	1	.010"	.030"	.370"
1309/15	15	30	22 Solid	1	.010"	.030"	.393"
1310	16	32	22 Solid	1	.010"	.025"	.411"
1311	19	38	22 Solid	1	.010"	.030"	.436"
1312	23	46	22 Solid	1	.010"	.030"	.477"
1313	27	54	22 Solid	1	.010"	.040"	.521"

22 GAUGE — STRANDED CONDUCTORS — 200 VOLTS

1316	1	2	22	7/30	.010"	.025"	.150"
1317	2	4	22	7/30	.010"	.025"	.225"
1318	3	6	22	7/30	.010"	.025"	.238"
1319	4	8	22	7/30	.010"	.025"	.260"
1320	5	10	22	7/30	.010"	.025"	.290"
1322	6	12	22	7/30	.010"	.035"	.320"
1323	9	18	22	7/30	.010"	.035"	.370"
1324	11	22	22	7/30	.010"	.035"	.400"
1327	15	30	22	7/30	.010"	.040"	.450"
1327/19	19	38	22	7/30	.010"	.040"	.480"
1328	23	46	22	7/30	.010"	.040"	.530"
1329	27	54	22	7/30	.010"	.040"	.708"
1329/41	41	82	22	7/30	.010"	.040"	.710"
1330	51	102	22	7/30	.010"	.045"	.800"

18 GAUGE — STRANDED CONDUCTORS — 400 VOLTS

1133	3	6	18	16/30	.016"	.037"	.356"
1136	6	12	18	16/30	.016"	.045"	.540"
1139	9	18	18	16/30	.016"	.055"	.616"
1142	12	24	18	16/30	.016"	.055"	.654"
1145	15	30	18	16/30	.016"	.060"	.760"
1149	19	38	18	16/30	.016"	.070"	.830"
1151	27	54	18	16/30	.016"	.070"	.965"

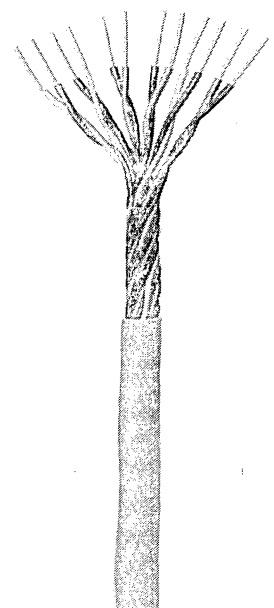
STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

PAIR NO.	COLOR COMBINATION
1	Black paired with Red
2	Black paired with White
3	Black paired with Green
4	Black paired with Blue
5	Black paired with Brown
6	Black paired with Yellow
7	Black paired with Orange
8	Red paired with Green
9	Red paired with White
10	Red paired with Blue
11	Red paired with Yellow
12	Red paired with Brown
13	Red paired with Orange
14	Green paired with Blue
15	Green paired with White
16	Green paired with Brown
17	Green paired with Orange

PAIR NO.	COLOR COMBINATION
18	Green paired with Yellow
19	White paired with Blue
20	White paired with Brown
21	White paired with Orange
22	White paired with Yellow
23	Blue paired with Brown
24	Blue paired with Orange
25	Blue paired with Yellow
26	Brown paired with Orange
27	Brown paired with Yellow
28	Purple paired with Red
29	Purple paired with White
30	Purple paired with Green
31	Purple paired with Blue
32	Purple paired with Brown
33	Purple paired with Yellow
34	Purple paired with Orange

PAIR NO.	COLOR COMBINATION
35	Purple paired with Slate
36	Purple paired with Black
37	Slate paired with Red
38	Slate paired with White
39	Slate paired with Green
40	Slate paired with Blue
41	Slate paired with Brown
42	Slate paired with Yellow
43	Slate paired with Orange
44	Slate paired with Black
45	White/Black paired w. Red
46	White/Black paired w. Green
47	White/Black paired w. Blue
48	White/Black paired w. Brown
49	White/Black paired w. Yellow
50	White/Black paired w. Orange
51	White/Black paired w. Purple

ALPHA WIRE CORPORATION



QCC

Variations in construction, color, put-up, gauge, etc. of products on this page are available through Alpha's QCC service.

© Color Blend

All items on this page available in standard gray jacket or colored black, brown, metallic blue or bronze. Items indicated with © available in above colors and additionally—white, tan, orange, red, yellow, blue and green jackets.

Unshielded Audio Cable

MULTI-CONDUCTOR — PLASTIC JACKET

Passes FR-1 vertical flame test.

DESCRIPTION: Each conductor tinned copper, color coded polyvinylchloride insulation, conductors twisted, gray polyvinylchloride jacket overall. Suitable for outdoor installations.

APPLICATIONS: Intercoms, Interconnecting cables, Remote control circuits, Telephones, Telemetering connecting cable, "Baby Sitter" intercom.

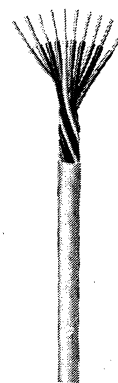
CHARACTERISTICS: Suggested Operating Temperature: -20°C to +80°C.

SOLID

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	STRAND	NOM. WALL THICKNESS	NOMINAL JACKET	NOMINAL O.D.	SUGG. OPER. VOLTAGE
1793	2	22	1	.010"	.020"	.130"	200 V
1794	3	22	1	.010"	.020"	.140"	200 V
1794/4	4	22	1	.010"	.020"	.160"	200 V
1795	2	20	1	.016"	.020"	.170"	350 V
1796	3	20	1	.016"	.020"	.180"	350 V
1796/4	4	20	1	.016"	.020"	.200"	350 V
1797	2	18	1	.016"	.020"	.190"	350 V
1798	3	18	1	.016"	.020"	.200"	350 V
1798/4	4	18	1	.016"	.020"	.220"	350 V
1799	2	16	1	.016"	.020"	.215"	350 V
1799/3	3	16	1	.016"	.020"	.230"	350 V
1799/4	4	16	1	.016"	.020"	.250"	350 V

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

COLOR CODE OF CONDUCTORS: 1—Black 2—Red 3—White 4—Green



STRANDED

1893 *	2	22	7/30	.010"	.020"	.135"	200 V
1894 *	3	22	7/30	.010"	.020"	.145"	200 V
1894/4 *	4	22	7/30	.010"	.020"	.170"	200 V
1895 ©	2	20	10/30	.016"	.020"	.180"	350 V
1896	3	20	10/30	.016"	.020"	.190"	350 V
1896/4	4	20	10/30	.016"	.020"	.215"	350 V
1896/6	6	20	10/30	.016"	.020"	.255"	350 V
1896/8	8	20	10/30	.016"	.020"	.270"	350 V
1896/10	10	20	10/30	.016"	.020"	.335"	350 V
1896/12	12	20	10/30	.016"	.020"	.350"	350 V
1897 ©	2	18	16/30	.016"	.020"	.200"	350 V
1898	3	18	16/30	.016"	.020"	.210"	350 V
1898/6	6	18	16/30	.016"	.020"	.290"	350 V
1898/8	8	18	16/30	.016"	.025"	.315"	350 V
1898/4	4	18	16/30	.016"	.020"	.240"	350 V
1898/10	10	18	16/30	.016"	.025"	.370"	350 V
1898/12	12	18	16/30	.016"	.025"	.385"	350 V
1898/15	15	18	16/30	.016"	.030"	.445"	350 V
1898/19	19	18	16/30	.016"	.030"	.470"	350 V
1898/25	25	18	16/30	.016"	.035"	.558"	350 V
1899	2	16	26/30	.016"	.020"	.225"	350 V
1899/3	3	16	26/30	.016"	.020"	.245"	350 V
1899/4	4	16	26/30	.016"	.020"	.270"	350 V
1891	2	14	41/30	.016"	.020"	.260"	350 V
1891/3	3	14	41/30	.016"	.020"	.280"	350 V
1892	2	12	65/30	.016"	.020"	.300"	350 V
1892/3	3	12	65/30	.016"	.020"	.320"	350 V

* THESE ITEMS NOT LISTED BY UL

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

ALPHA WIRE CORPORATION

COLOR CODE OF CONDUCTORS

1—Black	13—Red/Green
2—Red	14—Red/Yellow
3—White	15—Red/Black
4—Green	16—White/Black
5—Orange	17—White/Red
6—Blue	18—White/Green
7—Brown	19—White/Yellow
8—Yellow	20—White/Blue
9—Purple	21—White/Brown
10—Slate	22—White/Orange
11—Pink	23—White/Gray
12—Tan	24—White/Violet
	25—White/Black/Red

QCC

Variations in construction, color, put-up, gauge, etc. of products on this page are available through Alpha's QCC service.

© Color Blend

All items on this page available in standard gray jacket or colored black, brown, metallic blue or bronze. Items indicated with © available in above colors and additionally—white, tan, orange, red, yellow, blue and green jackets.

Unshielded Audio Cable

MULTI-CONDUCTOR — PLASTIC JACKET

QCC

Variations in construction, color, put-up, gauge, etc. of products on this page are available through Alpha's QCC service.

DESCRIPTION:

Passes FR-1 vertical flame test.

Each conductor stranded tinned copper, color coded polyvinylchloride insulation, conductors twisted, gray polyvinylchloride jacket overall. Suitable for outdoor installations.

APPLICATIONS:

Unbalanced intercom systems. Low voltage relay control cable. P.A. systems. Electronic computer cable. Interconnecting cables. Remote control circuits. Telephones. Telemetering connecting cable. "Baby Sitter" intercom.

CHARACTERISTICS: Suggested Operating Temperature: -20°C to +80°C.

MULTI-CONDUCTOR 22 GAUGE

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	STRAND	NOM. WALL THICKNESS (Inches)	NOM. JKT. THICKNESS (Inches)	NOM. O.D. (Inches)
1172	2	22	7/30	.010	.020	.140
1173	3	22	7/30	.010	.020	.145
1174	4	22	7/30	.010	.020	.170
1175	5	22	7/30	.010	.020	.175
1176	6	22	7/30	.010	.020	.185
1177	7	22	7/30	.010	.020	.190
1178	8	22	7/30	.010	.020	.200
1179	9	22	7/30	.010	.020	.225
1180	10	22	7/30	.010	.020	.235
1181	12	22	7/30	.010	.020	.255
1181/15	15	22	7/30	.010	.020	.280
1181/20	20	22	7/30	.010	.020	.310
1181/25	25	22	7/30	.010	.020	.340
1181/30	30	22	7/30	.010	.020	.365
1181/40	40	22	7/30	.010	.025	.425
1181/50	50	22	7/30	.010	.035	.500
1181/60	60	22	7/30	.010	.035	.530

COLOR CODE OF CONDUCTORS

- | | |
|-----------------------|-----------------------|
| 1—Black | 31—White/Black/Slate |
| 2—Red | 32—White/Black/Purple |
| 3—White | 33—White/Black/Black |
| 4—Green | 34—White/Red/Black |
| 5—Orange | 35—White/Red/Red |
| 6—Blue | 36—White/Red/Green |
| 7—Brown | 37—White/Red/Blue |
| 8—Yellow | 38—White/Red/Brown |
| 9—Purple | 39—White/Red/Purple |
| 10—Slate | 40—White/Green/Black |
| 11—Pink | 41—White/Green/Red |
| 12—Tan | 42—White/Green/Green |
| 13—Red/Green | 43—White/Green/Blue |
| 14—Red/Yellow | 44—White/Green/Brown |
| 15—Red/Black | 45—White/Green/Purple |
| 16—White/Black | 46—White/Blue/Black |
| 17—White/Red | 47—White/Blue/Red |
| 18—White/Green | 48—White/Blue/Green |
| 19—White/Yellow | 49—White/Blue/Blue |
| 20—White/Blue | 50—White/Blue/Brown |
| 21—White/Brown | 51—White/Blue/Purple |
| 22—White/Orange | 52—White/Brown/Black |
| 23—White/Gray | 53—White/Brown/Red |
| 24—White/Violet | 54—White/Brown/Green |
| 25—White/Black/Red | 55—White/Brown/Blue |
| 26—White/Black/Green | 56—White/Brown/Brown |
| 27—White/Black/Yellow | 57—White/Brown/Purple |
| 28—White/Black/Blue | 58—White/Purple/Red |
| 29—White/Black/Brown | 59—White/Purple/Green |
| 30—White/Black/Orange | 60—White/Purple/Blue |

MULTI-CONDUCTOR COMBINATION GAUGES

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	STRAND	NOM. WALL THICKNESS (INCHES)	NOM. JKT. THICKNESS (INCHES)	NOM. O.D. (INCHES)	COLOR CODE CONDUCTOR
1826	6	4-22	7x30	.010	.025	.225	Grn., Wht., Brn., Blue
		2-18	16x30	.018			Blk., Red
1827	7	5-22	7x30	.010	.028	.248	Grn., Wht., Brn., Blue
		2-18	16x30	.018			Orng., Blk., Red
1828	8	6-22	7x30	.010	.028	.250	Grn., Wht., Brn., Blue,
		2-18	16x30	.018			Orng., Yel. Blk., Red

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

Unshielded Control & Audio Cable

INNER CONDUCTORS — 600 VOLTS — 80°C

DESCRIPTION: Passes FR-1 vertical flame test.

Each conductor, stranded tinned copper, color coded PVC insulation with mylar wrap, chrome gray PVC jacket overall. Working voltage — 600 volts. Operating temperature -20°C. +80°C. Inner conductors meet UL Style 1011.

APPLICATION:

Used as industrial control cable for telemetry and automatic control. Widely used as a heavy-duty communications and signaling cable.

16 GAUGE — 19/29 STRANDING Insulation Thickness — 1/32 inches

ALPHA NO.	No. of Conductors	Jacket Thickness (Inches)	Nom. O.D. (Inches)
1064	4	.045	.377
1065	5	.045	.406
1067	7	.045	.458
1069	9	.045	.513
1072	12	.060	.604
1075	15	.060	.654
1079	19	.065	.720
1085	25	.065	.824

14 GAUGE — 19/27 STRANDING Insulation Thickness — 3/64 inches

ALPHA NO.	No. of Conductors	Jacket Thickness (Inches)	Nom. O.D. (Inches)
1274	4	.045	.500
1275	5	.060	.563
1277	7	.060	.634
1279	9	.065	.754
1282	12	.065	.773
1285	15	.080	.905

Standard Spool Put-up: 100 ft., 250 ft., 500 ft., 1000 ft.

COLOR CODE OF CONDUCTORS

- | |
|------------------------|
| 1 — Black |
| 2 — White |
| 3 — Red |
| 4 — Green |
| 5 — Orange |
| 6 — Blue |
| 7 — White/Black |
| 8 — Red/Black |
| 9 — Green/Black |
| 10 — Orange/Black |
| 11 — Blue/Black |
| 12 — Black/White |
| 13 — Red/White |
| 14 — Green/White |
| 15 — Blue/White |
| 16 — Black/Red |
| 17 — White/Red |
| 18 — Orange/Red |
| 19 — Blue/Red |
| 20 — Red/Green |
| 21 — Orange/Green |
| 22 — Black/White/Red |
| 23 — White/Black/Red |
| 24 — Red/Black/White |
| 25 — Green/Black/White |

ALPHA WIRE CORPORATION

Foil Shielded Jacketed Cable



UL STYLE 2092, 2093 & 2094 *

MYLAR SUPPORTED ALUMINUM FOIL SHIELD

DESCRIPTION:

Each conductor stranded tinned copper, color coded polyethylene insulation, conductors cabled, wrapped mylar supported aluminum foil shield, 100% coverage with drain wire laid parallel, aluminum foil facing outward to provide maximum ground, gray pvc jacket overall.

CHARACTERISTICS:

Operating temperature: -20°C to +60°C. Operating voltage: 400 volts. Light weight, reduces cable diameter, and provides 100% shield coverage.

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	NOM. WALL THICK. (INCHES)	NOM. JKT. THICK. (INCHES)	NOM. O.D. (INCHES)	COND. COLOR CODE
2400	2	24 7/32	.016	.020	.160	1, 3
2401	2	22 7/30	.016	.020	.170	1, 3
2402	2	22 7/30	.016	.020	.170	1, 2
2403	3	22 7/30	.016	.020	.185	1, 2, 3
2404	4	22 7/30	.016	.020	.210	1, 2, 3, 4
2411	2	20 10/30	.016	.020	.186	1, 3
2412	2	20 10/30	.016	.020	.186	1, 2
2413	3	20 10/30	.016	.020	.205	1, 2, 3
2414	4	20 10/30	.016	.020	.225	1, 2, 3, 4
2421	2	18 16/30	.016	.020	.210	1, 3
2422	2	18 16/30	.016	.020	.210	1, 2
2423	3	18 16/30	.016	.020	.230	1, 2, 3
2424	4	18 16/30	.016	.020	.255	1, 2, 3, 4
2432	2	16 26/30	.016	.020	.245	1, 2
2433	3	16 26/30	.016	.020	.270	1, 2, 3
2442	2	14 41/30	.020	.030	.310	1, 3
2444	2	12 65/30	.020	.030	.350	1, 3

COLOR CODE OF CONDUCTORS: 1-BLACK 2-RED 3-CLEAR 4-GREEN

* 2 COND.—2092 3 COND.—2093 4 COND.—2094

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

Miniature Foil Shielded Cable

TWO 22 GAUGE CONDUCTORS.

DESCRIPTION:

Each conductor tinned solid or stranded copper, color coded polypropylene insulation, aluminum/Mylar foil shield, drain wire, gray vinyl jacket overall.

APPLICATIONS:

Designed for space-saving in miniature and sub-miniature instrumentation and audio applications.

200 volts, -55°C — +105°C

ALPHA NO.	CONDUCTOR SIZE	COND. STRAND	NOM. WALL THICKNESS (INCHES)	NOM. JKT. THICKNESS (INCHES)	NOM. O.D. (INCHES)
2460	22	Solid	.008	.018	.118
2461	22	7/30	.008	.020	.135

Color Code Of Conductors — Black, Red

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1030 FT.

Multiple Pairs Foil Shielded Overall

22 GAUGE, 38, 51 PAIRS

DESCRIPTION:

Tinned solid copper conductors, with vinyl or polyethylene color coded insulation, cabled in pairs. Aluminum/Mylar foil shield overall. Stranded copper drain wire, chrome vinyl jacket.

APPLICATIONS:

Communications, telephone and sound systems, control and instrumentation cables.

ALPHA NO.	NO. OF PAIRS	COND. SIZE	INSULATION THICKNESS TYPE (INCHES)	NOM. JKT. THICKNESS (INCHES)	NOM. O.D. (INCHES)
2450	38	22	PE .008	.045	.605
2451	51	22	Vinyl .010	.050	.728

Foil Shielded Audio & Data Cable

INDIVIDUALLY SHIELDED MULTIPLE PAIRS — PLASTIC JACKET

DESCRIPTION:

Each conductor, tinned copper, color coded, high density polypropylene conductors twisted into pairs, 20 gauge tinned copper drain wire, Mylar-supported aluminum foil shield, aluminum facing inward, Chrome Gray PVC jacket overall.

CHARACTERISTICS:

Mutual conductance between conductors of a pair, 25 pf/ft. Capacitance of a single conductor to shield, 45 pf/ft.

APPLICATIONS:

For audio, R.F. and pulse applications requiring superior circuit isolation.

#22 — SOLID				NOM. WALL THICK. (INCHES)	NOM. JKT. THICK. (INCHES)	NOM. O.D. (INCHES)
ALPHA NO.	NO. OF PAIRS	NO. OF COND.	COND. STRAND			
6000	3	6	1	.010	.025	.235
6002	6	12	1	.010	.030	.318
6004	9	18	1	.010	.030	.371
6006	11	22	1	.010	.035	.414
6008	15	30	1	.010	.040	.485

#22 — STRANDED				NOM. WALL THICK. (INCHES)	NOM. JKT. THICK. (INCHES)	NOM. O.D. (INCHES)
ALPHA NO.	NO. OF PAIRS	NO. OF COND.	COND. STRAND			
6010	3	6	7/30	.010	.025	.252
6012	6	12	7/30	.010	.030	.342
6014	9	18	7/30	.010	.035	.410
6016	11	22	7/30	.010	.040	.457
6018	15	30	7/30	.010	.040	.523
6020	19	38	7/30	.010	.050	.570
6022	27	54	7/30	.010	.055	.687

#18 — STRANDED				NOM. WALL THICK. (INCHES)	NOM. JKT. THICK. (INCHES)	NOM. O.D. (INCHES)
ALPHA NO.	NO. OF PAIRS	NO. OF COND.	COND. STRAND			
6023	3	6	16/30	.016	.035	.372
6024	6	12	16/30	.016	.045	.555
6025	9	18	16/30	.016	.055	.620
6026	12	24	16/30	.016	.070	.765
6027	15	30	16/30	.016	.070	.830

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

PAIR NO. COLOR COMBINATION OF PAIRS

- 1—Black paired with Red
- 2—Black paired with White
- 3—Black paired with Green
- 4—Black paired with Blue
- 5—Black paired with Brown
- 6—Black paired with Yellow
- 7—Black paired with Orange
- 8—Red paired with Green
- 9—Red paired with White
- 10—Red paired with Brown
- 11—Red paired with Yellow
- 12—Red paired with Brown
- 13—Red paired with Orange
- 14—Green paired with Blue
- 15—Green paired with White
- 16—Green paired with Brown
- 17—Green paired with Orange
- 18—Green paired with Yellow
- 19—White paired with Blue
- 20—White paired with Brown
- 21—White paired with Orange
- 22—White paired with Yellow
- 23—Blue paired with Brown
- 24—Blue paired with Orange
- 25—Blue paired with Yellow
- 26—Brown paired with Orange
- 27—Brown paired with Yellow

QCC

Variances in construction, color, put-up, gauge, etc. of products on this page are available through Alpha's QCC service

PAIR NO. COLOR COMBINATION

- 1—Blue p.w. White
- 2—Orange p.w. White
- 3—Green p.w. White
- 4—Brown p.w. White
- 5—Slate p.w. White
- 6—Blue-White striped p.w. White
- 7—Blue-Orange p.w. White
- 8—Blue-Green striped p.w. White
- 9—Blue-Brown striped p.w. White
- 10—Blue-Slate striped p.w. White
- 11—Orange-White striped p.w. White
- 12—Orange-Green striped p.w. White
- 13—Orange-Brown striped p.w. White
- 14—Orange-Slate striped p.w. White
- 15—Green-White striped p.w. White
- 16—Green-Brown striped p.w. White
- 17—Green-Slate striped p.w. White
- 18—Brown-White striped p.w. White
- 19—Brown-Slate striped p.w. White
- 20—Slate-White striped p.w. White
- 21—Blue p.w. Red
- 22—Orange p.w. Red
- 23—Green p.w. Red
- 24—Brown p.w. Red
- 25—Slate p.w. Red

(NOTE: p.w. — paired with)

PAIR NO. COLOR COMBINATION

- 26—Blue-White striped p.w. Red
- 27—Blue-Orange striped p.w. Red
- 28—Blue-Green striped p.w. Red
- 29—Blue-Brown striped p.w. Red
- 30—Blue-Slate striped p.w. Red
- 31—Orange-White striped p.w. Red
- 32—Orange-Green striped p.w. Red
- 33—Orange-Brown striped p.w. Red
- 34—Orange-Slate striped p.w. Red
- 35—Green-White striped p.w. Red
- 36—Green-Brown striped p.w. Red
- 37—Green-Slate striped p.w. Red
- 38—Brown-White striped p.w. Red
- 39—Brown-Slate striped p.w. Red
- 40—Slate-White striped p.w. Red
- 41—Blue p.w. Black
- 42—Orange p.w. Black
- 43—Green p.w. Black
- 44—Brown p.w. Black
- 45—Slate p.w. Black
- 46—Blue-White striped p.w. Black
- 47—Blue-Orange striped p.w. Black
- 48—Blue-Green striped p.w. Black
- 49—Blue-Brown striped p.w. Black
- 50—Blue-Slate striped p.w. Black
- 51—Orange-White striped p.w. Black

ALPHA WIRE CORPORATION

Spiral Shielded Plastic Jacketed Cable

DESCRIPTION:

Each conductor stranded or solid tinned copper, color coded polyvinylchloride insulation, conductors twisted, spiral wrapped copper shield, gray polyvinylchloride jacket. Nominal jacket thickness .020.

CHARACTERISTICS:

Use of spiral shield makes pigtail off, extremely simple and fast. Excellent for production line work. Provides 95% shielded coverage for audio and RF frequencies. Suggested operating temperature: -20°C to +80°C.

Passes FR-1 vertical flame test.

Braided Shielded Jacketed Cable

DESCRIPTION:

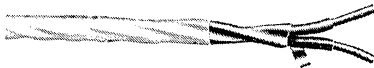
Each conductor tinned copper, color coded polyvinylchloride insulation, conductors twisted, braided copper shield, gray polyvinylchloride jacket overall. Suitable for outdoor installations.

CHARACTERISTICS:

A conventional type of braided shield providing approximately 75% coverage is particularly desirable where flexibility is required. The copper shield allows ease of pigtail soldering. Shield construction provides additional cable strength. Operating temperature: -20°C to +80°C. Nominal jacket thickness .020.

APPLICATIONS:

For public address and sound systems, ideal for recording studios, amateur radio transmitters, shielded power or electronic circuits, wherever an economical shielded cable is required.



UL
1007
FR-1



STRANDED

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	STRAND	NOM. WALL THICKNESS	NOM. O.D.	SUGG. WORKING VOLTAGE
2255	2	22	Solid	.016"	.170"	350V
2254/1	1	22	7/30	.016"	.115"	350V
2254 ©	2	22	7/30	.016"	.175"	350V
2254/3	3	22	7/30	.016"	.190"	350V
2254/4	4	22	7/30	.016"	.200"	350V
2254/6	6	22	7/30	.016"	.235"	350V
2256/1	1	20	10/30	.016"	.130"	350V
2256 ©	2	20	10/30	.016"	.195"	350V
2256/3	3	20	10/30	.016"	.210"	350V
2256/4	4	20	10/30	.016"	.225"	350V
2256/6	6	20	10/30	.016"	.265"	350V
2258/1	1	18	16/30	.016"	.135"	350V
2258 ©	2	18	16/30	.016"	.230"	350V
2258/3	3	18	16/30	.016"	.235"	350V
2258/4	4	18	16/30	.016"	.245"	350V
2260	2	16	26/30	.016"	.240"	350V
2260/3	3	16	26/30	.016"	.245"	350V
2265	2	14	41/30	.020"	.285"	450V
2265/3	3	14	41/30	.020"	.290"	450V
2268	2	12	65/30	.020"	.325"	450V
2268/3	3	12	65/30	.020"	.330"	450V

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	STRAND	NOM. WALL THICKNESS	NOM. O.D.	SUGG. WORKING VOLTAGE
1735	1	22	7/30	.016"	.125"	350V
1736 ©	2	22	7/30	.016"	.185"	350V
1737	3	22	7/30	.016"	.200"	350V
1738	4	22	7/30	.016"	.210"	350V
1740	1	20	10/30	.016"	.135"	350V
1741 ©	2	20	10/30	.016"	.200"	350V
1742	3	20	10/30	.016"	.220"	350V
1743	4	20	10/30	.016"	.230"	350V
1745	1	18	16/30	.016"	.145"	350V
1746 ©	2	18	16/30	.016"	.235"	350V
1747	3	18	16/30	.016"	.245"	350V
1747/4	4	18	16/30	.016"	.255"	350V
1748	2	16	26/30	.016"	.250"	350V
1749	3	16	26/30	.016"	.255"	350V
1750	2	14	41/30	.020"	.290"	450V
1751	3	14	41/30	.020"	.295"	450V
1760	2	12	65/30	.020"	.335"	450V
1761	3	12	65/30	.020"	.340"	450V

SOLID

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	STRAND	NOM. WALL THICKNESS	NOM. O.D.	SUGG. WORKING VOLTAGE
1775*	2	22	1	.016"	.175"	350V
1779	2	20	1	.016"	.210"	350V
1783	2	18	1	.016"	.220"	350V

*With 22 AWG solid tinned copper ground wire under braided copper shield.

© Color Blend

All items on this page available in standard gray jacket or colored black, brown, metallic blue or bronze. Items indicated with © available in above colors and additionally—white, tan, orange, red, yellow, blue and green. Jackets.

QCC

Variations in construction, color, put-up, gauge, etc. of products on this page are available through Alpha's QCC service.

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

COLOR CODE OF CONDUCTORS

1—Black 2—Red 3—White 4—Green 5—Yellow 6—Blue

ALPHA WIRE CORPORATION

UL
1150

Shielded Microphone Cable

PLASTIC JACKET UL STYLE 1150*

DESCRIPTION:

1702-1706: Single conductor, stranded tinned copper, white polyethylene insulation, braided or spiral wrapped tinned copper shield, gray polyvinylchloride jacket overall.

1709-1712: Each conductor stranded tinned copper, color coded polyethylene insulation, cabled with fillers, wrap, braided or spiral wrapped tinned copper shield, gray polyvinylchloride jacket overall.

APPLICATIONS:

1702-1706: All high impedance microphones, lapel, ribbon, velocity, crystal contact, hi-fi interconnecting cables.

1709-1712: All low impedance microphones — carbon, condenser, dynamic.

CHARACTERISTICS:

Suggested operating temperature: -20°C to +80°C.

UL
1354

Low Capacitance Shielded Microphone Cable

CELLULAR FOAM POLYETHYLENE INSULATION — PLASTIC JACKET

DESCRIPTION:

Single conductor, stranded tinned copper, white foam polyethylene insulation, braided tinned copper shield, chrome gray polyvinylchloride jacket.

Two conductors, stranded tinned copper, color coded foam polyethylene insulation, 1 white and 1 black, cabled with fillers, textile wrap, braided tinned copper shield, chrome gray polyvinylchloride jacket.

CHARACTERISTICS:

Suggested operating temperature: -20°C to +80°C. Low loss foam polyethylene provides lower capacitance and attenuation than standard solid polyethylene microphone cables, thereby increasing the effective length of usable cable without loss of signal.

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	STRAND	NOM. WALL THICKNESS	*CAPACITY NOM./FT.	SUG. WORK VOLTAGE	TYPE OF SHIELD	NOM. O.D.
1702	1	26	3/34+	.016"	38 mmf.	1000	Spiral Wrapped	.110"
1703	1	24	10/34	.020"	35 mmf.	3500	Braided	.145"
1704*	1	24	10/34	.040"	23 mmf.	5000	Braided	.190"
1705	1	24	10/34	.016"	45 mmf.	1000	Spiral Wrapped	.110"
1706*	1	20	26/34	.030"	36 mmf.	4000	Braided	.175"
1709	2	24	10/34	.016"	38 mmf.	1000	Spiral Wrapped	.190"
1710	2	22	16/34	.025"	31 mmf.	1000	Braided	.230"
1712	2	20	26/34	.015"	45 mmf.	600	Braided	.245"

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

* Between one conductor and remaining conductors connected to shield.

† Three strands of tinned copper and four strands of tinned copperweld.

*UL LISTING ONLY 1704 & 1706

COLOR CODE OF CONDUCTORS

1—White 2—Black

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	STRAND	NOM. WALL THICKNESS	*CAPACITY NOM./FT.	NOM. JKT. THICKNESS	NOM. O.D.
2311	1	24	10/34	.035"	20 mmf	.030"	.180"
2312	1	24	10/34	.055"	15 mmf	.030"	.225"
2323	2	22	16/34	.035"	††	.030"	.300"

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

* Between one conductor and remaining conductors connected to shield.

† Three strands of tinned copper and four strands of tinned copperweld.

†† Cond. to shield = 19 MMF

Cond. to shield = 12 MMF

COLOR CODE OF CONDUCTORS

1—White 2—Black

Shielded Microphone Cable

RUBBER AND NEOPRENE JACKETS

DESCRIPTION:

Each conductor stranded tinned copper, color coded rubber insulation, wrap, braided tinned copper shield, cotton wrap, tough black rubber or neoprene jacket overall.

APPLICATIONS:

1248-1449: All high impedance microphone, broadcast and heavy duty studio use, communication and audio systems.

1250-1450/16: All low impedance microphone, broadcast and heavy duty studio use. Can also be used for control circuits, video and audio interconnection cable, and as electronic power cables.

CHARACTERISTICS:

Suggested operating temperature: -20°C to +60°C.

Rubber jacketed cable suited for standard duty indoor use.

Neoprene jacketed cable suited for heavy duty outdoor use and direct burial.

Will resist oil, acid, sunlight, aging and abrasion.

UL
1007
FR-1

Communication & Intercom Combination Cables

Passes FR-1 vertical flame test.

INNER CONDUCTORS MEET UL 1007 & FR-1

SHIELDED & UNSHIELDED COMBINATIONS FOR AUDIO & INSTRUMENTATION

DESCRIPTION:

Each conductor stranded, tinned copper, color coded PVC or polypropylene insulation, braided, tinned or aluminum mylar over conductors forming shield. Unshielded conductors paired. Foil shielded cables have solid tinned copper drain for grounding.

APPLICATIONS:

For all station-to-station wiring where shield is necessary to eliminate cross-talk. Used in instrumentation wiring or in various circuits requiring parted or total signal isolation.

CHARACTERISTICS:

Suggested operating temperature: -20°C to +80°C. 350 volts.

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	STRAND	NOM. WALL THICKNESS	TYPE OF JKT.	*NOM. CAP. NOM. MMF/FT.	NOM. O.D.
1248†	1	20	26/34	.025"	Rubber	97	.190"
1249	1	20	26/34	.040"	Rubber	60	.230"
1249/18	1	18	41/34	.040"	Rubber	69	.240"
1449	1	18	41/34	.040"	Neoprene	69	.240"
1250	2	20	26/34	.020"	Rubber	68	.270"
1250/18	2	18	41/34	.020"	Rubber	78	.295"
1450	2	18	41/34	.020"	Neoprene	78	.295"
1450/16	2	16	65/34	.025"	Neoprene	82	.335"

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

* Between one conductor and remaining conductors (if any) connected to shield.

† Mylar wrap under tinned copper shield.

COLOR CODE OF CONDUCTORS

1—Black
2—White

QCC

Variations in construction, color, put up, gauge, etc. of products on this page are available through Alpha's QCC service

Color Blend

All cables on this page available in standard gray jacket or colored black, brown, metallic blue or bronze.

ALPHA NO.	TOTAL NO.	CONDUCTOR NO. SHLD.	CONDUCTOR SIZE	STRAND	INSULATION MATL.	NOM. THICKNESS (Inches)	SHIELD MATL.	NOM. O.D. (Inches)	COLOR CODE
1243	3	1	22	7/30	PVC	.016	BRAID	.200	Wht. — Shld. Bk., Red — Unshld.
2464	4	2	22	7/30	PP	.008	FOIL	.165	Red, Bk., — Shld. Grn., Wht. — Unshld.
1243/4	4	2	22	7/30	PVC	.016	BRAID	.180X .285	Bk., Wht. — Shld. Bk., Red — Unshld.
1243/6	4 (2 prs.)	4	22	7/30	PVC	.016	BRAID	.180X .315	Bk., Wht. — Shld. Bk., Red — Shld.
1243/5	5	3	22	7/30	PVC	.016	BRAID	.200X .300	Bk., Wht., Red — Shld. Bk., Red — Unshld.
1243/3	3	2	20	7/28	PE	.014	FOIL	.212	Bk., Red — Shld. Clear — Unshld.
2465	4	2	20	7/28	PVC	.015	FOIL	.233	Bk., Red — Shld. Grn., Wht. — Unshld.

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

ALPHA WIRE CORPORATION

Telephone Station Cable

Description:

Solid, annealed 22-gauge bare copper conductor, color coded polyethylene insulation, conductors cabled with PVC jacket overall. Jacket designed to resist weathering and abrasion.

Application:

Telephone and intercom installation. May be used in building duct or outside installations. Cable may be easily installed to baseboards or walls with staple gun or clamps. Insulation thickness .015".



22-GAUGE SOLID CONDUCTOR

ALPHA NO.	NO. OF CONDUCTORS	JACKET THICKNESS (Inches)	NOM. O.D. (Inches)	COLOR CODE CONDUCTORS	STANDARD PUT-UP
1202	2	.020	.155	Red, green	100'-500'-1000' spools
1203	3	.020	.163	Red, green yellow	100'-500'-1000' spools
1204	4	.022	.185	Red, green yellow, black	100'-500'-1000' spools

JACKET COLOR: BEIGE

Miniature Shielded Cable

CLEAR PLASTIC JACKET

DESCRIPTION:

Each conductor stranded tinned copper, color coded polyvinylchloride insulation, conductors twisted, fine braided tinned copper shield overall, clear polyvinylchloride jacket overall.

CHARACTERISTICS:

Suggested operating temperature: -20°C to +80°C.
Suggested operating voltage: 200V. Cond. size 28, Strand 7/36.



ALPHA NO.	NO. OF COND.	NOM. WALL THICKNESS	NOM. JKT. THICKNESS	NOM. O.D.
1120	2	.010"	.010"	.105"
1121	3	.010"	.010"	.115"
1122	4	.010"	.010"	.120"

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.
COLOR CODE OF CONDUCTORS: 1—Black 2—Red 3—White 4—Green

Headset Cable

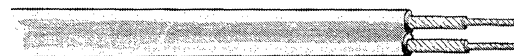
FOR LANGUAGE LABORATORIES

DESCRIPTION:

Conductors consist of combination tinned copper and copperweld strands, color coded, polyethylene insulation. Spiral wrapped, tinned copper shield. Chrome, gray, vinyl jacket. Flat configuration.

APPLICATION:

Extra sturdy, steel reinforced conductor and polyethylene jacket resists pulling and abrasion. Designed for two channel stereo application in audio-visual education, language laboratories, etc.



Conductor Colors — Red & Clear

Alpha No.	No. of Cond.	Conductor Size	Strand	Insulation Thickness (Inches)	Jacket Thickness (Inches)	Nom. O.D. (Inches)
1985	2	25	7/33	.017	.020	108 x .215

Standard Spool Put-up: 100 ft., 250 ft., 500 ft., 1000 ft.

Plastic Speaker Cable

Colored and Clear Insulation

DESCRIPTION:

Conductors parallel, stranded bare copper, color coded polyvinylchloride insulation, conductors separate easily when slit apart.

APPLICATION:

Hi-Fi speaker cable, miniature juke box speaker connection and rear auto speaker extension cable. Clear insulation will blend with interior room decor.

CHARACTERISTICS:

Suggested Operating Temperature: -20°C to +60°C. No. of cond.: 2.



ALPHA NO.	SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D.	STOCK COLORS
1944*	24	7/32	.016"	.057" x .120"	Brn., Blk., Wh., Gray, Tan
1945*	24	7/32	.016"	.057" x .120"	Clear
1948*	22	Solid	.016"	.057" x .120"	Gray
1949*	20	7/28	.020"	.073" x .146"	Gray, Clear
1977	18	41/34	.032"	.115" x .215"	Brn., Blk., Wh., Gray, Clear
1979†	18	41/34	.032"	.115" x .215"	Clear

STANDARD SPOOL PUT-UP: 100 FT., 250 FT., 500 FT., 1000 FT.

*1 Conductor Tinned, 1 Bare.

†U.L. Listed

Hi-Fi and Stereo Interconnecting Cable Phono Wire

DESCRIPTION

1115 and 1116:

Each conductor stranded tinned copper, color coded polyvinylchloride insulation, conductors twisted.

1101-1107:

Each conductor stranded tinned copper, color coded polyvinylchloride insulation, conductors twisted with an extra tight lay for flexibility. When

shielded the overall shield has been specially designed for extreme limpness so as not to impede the movement of the phono arm when tracking.

CHARACTERISTICS:

Suggested Operating Temperature: 55°C to +105°C.

ALPHA NO.	NO. OF COND.	SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. O.D.	SUGG. OPER. VOLTAGE	COLOR CODE
-----------	--------------	------	------------------	---------------------	-----------	---------------------	------------

UNSHIELDED

1115	2	30	7/38	.010"	.065"	200V	Black & Red
1116	3	30	7/38	.010"	.070"	200V	Blk., Red & White

STEREO (Unshielded)

1101	3	32	7/40	.010"	.053"	200V	Blk., Red & White
1102	4	32	7/40	.010"	.061"	200V	Blk., Rd., Wh. & Gr.

STEREO (Shielded)

1105	2	32	7/40	.010"	.055"	200V	Black & Red
1107	4	32	7/40	.010"	.068"	200V	Blk., Rd., Wh. & Gr.

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

ALPHA WIRE CORPORATION

QCC

Variations in construction, color, put-up, gauge, etc. of products on this page are available through Alpha's QCC service.

Shielded Control and Instrumentation Cable

GENERAL PURPOSE MULTI-CONDUCTOR RUBBER INSULATED AND RUBBER JACKET

DESCRIPTION:

Each conductor, stranded tinned copper, color coded rubber insulation, cabled with fillers where necessary, wrap, braided tinned copper shield, wrap, tough black rubber jacket overall.

CHARACTERISTICS:

Suggested Operating Temperature: -20°C to +60°C.

GENERAL PURPOSE MULTI-CONDUCTOR PLASTIC JACKETED CABLE

UL STYLE 2373*, 2093*, 2094**

DESCRIPTION:

Each conductor, stranded tinned copper, color coded, polyethylene insulation, cabled with fillers where necessary, wrap, braided tinned copper shield, chrome gray polyvinylchloride jacket overall.

CHARACTERISTICS:

Suggested Operating Temperature: -20°C to +60°C. Suggested Operating Voltage: 600 Volts.

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. JKT. THICKNESS	NOM. O.D.
1250/18	2	18	41/34	.020"	.035"	.295"
1250	2	20	26/34	.020"	.035"	.270"
1251	3	20	26/34	.020"	.035"	.285"
1252	4	20	26/34	.020"	.035"	.305"
1253	5	20	26/34	.020"	.035"	.330"
1254	6	20	26/34	.020"	.035"	.345"
1255	7	20	26/34	.020"	.035"	.355"
1255/8	8	20	26/34	.020"	.035"	.385"
1255/10	10	20	26/34	.020"	.035"	.440"
1255/12	12	20	26/34	.020"	.065"	.525"
1255/15	15	20	26/34	.020"	.065"	.595"
1255/20	20	20	26/34	.020"	.065"	.660"

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

See color code of conductors below.

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. JKT. THICKNESS	NOM. O.D.
1712*	2	20	26/34	.014"	.030"	.245"
1713+	3	20	26/34	.014"	.035"	.250"
1715**	4	20	26/34	.014"	.035"	.260"
1716	5	20	26/34	.014"	.035"	.275"
1717	6	20	26/34	.014"	.035"	.300"
1719	8	20	26/34	.014"	.035"	.330"
1721	10	20	26/34	.014"	.035"	.375"
1723	12	20	26/34	.014"	.035"	.380"
1726	15	20	26/34	.014"	.035"	.410"
1728	20	20	26/34	.014"	.035"	.455"

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

COLOR CODE OF CONDUCTORS

1—Black	5—Yellow	9—Slate	13—White/Green	17—White/Purple
2—White	6—Blue	10—Purple	14—White/Yellow	18—White/Slate
3—Red	7—Brown	11—White/Black	15—White/Blue	19—Black/Red
4—Green	8—Orange	12—White/Red	16—White/Brown	20—Black/Yellow

MIL-W-16878D

TYPE B & C CABLES

DESCRIPTION:

Each conductor stranded tinned copper. Color coded, polyvinylchloride insulation, cabled, mylar wrap. Braided tinned copper shield 90% coverage, chrome gray polyvinylchloride jacket overall. Temperature rating -55°C to +105°C.

HEAVY-DUTY

MULTI-CONDUCTOR RUGGED NEOPRENE JACKET

DESCRIPTION:

Each conductor stranded tinned copper, color coded rubber insulation, cabled with fillers where necessary, wrap, braided tinned copper shield, wrap, black neoprene jacket overall.

CHARACTERISTICS:

Operating Temperature: -20°C to +60°C. 300 Volts.

#18 GAUGE CABLE

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. JKT. THICKNESS	NOM. O.D.
1450	2	18	41/34	.020"	.035"	.295"
1451	3	18	41/34	.020"	.035"	.305"
1452	4	18	41/34	.020"	.035"	.330"
1454	6	18	41/34	.020"	.035"	.370"
1456	8	18	41/34	.020"	.035"	.420"
1458	10	18	41/34	.020"	.035"	.480"
1459	12	18	41/34	.020"	.065"	.555"
1459/15	15	18	41/34	.020"	.065"	.640"
1459/20	20	18	41/34	.020"	.065"	.730"

#16 GAUGE CABLE

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. JKT. THICKNESS	NOM. O.D.
1450/16	2	16	65/34	.025"	.035"	.335"
1451/16	3	16	65/34	.025"	.035"	.355"
1452/16	4	16	65/34	.025"	.035"	.385"
1454/16	6	16	65/34	.025"	.040"	.445"
1456/16	8	16	65/34	.025"	.040"	.510"

#14 GAUGE CABLE

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. JKT. THICKNESS	NOM. O.D.
1400	2	14	41/30	.030"	.040"	.395"
1401	3	14	41/30	.030"	.040"	.425"
1402	4	14	41/30	.030"	.040"	.455"
1404	6	14	41/30	.030"	.040"	.515"

#12 GAUGE CABLE

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. JKT. THICKNESS	NOM. O.D.
1410	2	12	65/30	.030"	.040"	.440"
1411	3	12	65/30	.030"	.040"	.465"

#10 GAUGE CABLE

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. JKT. THICKNESS	NOM. O.D.
1420	2	10	105/30	.030"	.040"	.495"

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

COLOR CODE OF CONDUCTORS

1—Black	6—Blue	11—White/Black (Braid)	16—White/Brown (Braid)
2—White	7—Brown	12—White/Red (Braid)	17—White/Purple (Braid)
3—Red	8—Orange	13—White/Green (Braid)	18—White/Slate (Braid)
4—Green	9—Slate	14—White/Yellow (Braid)	19—Black/Red (Braid)
5—Yellow	10—Purple	15—White/Blue (Braid)	20—Black/Yellow (Braid)

MINIATURE SHIELDED CONTROL CABLE — 600 VOLT

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. JKT. THICKNESS	NOM. O.D.
3302	2	B-28	7/36	.010"	.012"	.125"
3303	3	B-28	7/36	.010"	.012"	.130"
3304	4	B-28	7/36	.010"	.012"	.140"
3306	6	B-28	7/36	.010"	.015"	.170"
3308	8	B-28	7/36	.010"	.015"	.175"
3310	10	B-28	7/36	.010"	.018"	.210"
3312	12	B-28	7/36	.010"	.018"	.215"
3315	15	B-28	7/36	.010"	.020"	.230"
3320	20	B-28	7/36	.010"	.022"	.260"

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

18 GAUGE HEAVY DUTY SHIELDED CONTROL CABLE — 1000 VOLT

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS	NOM. JKT. THICKNESS	NOM. O.D.
3405	5	C-18	19/30	.016"	.025"	.300"
3408	8	C-18	19/30	.016"	.030"	.350"
3410	10	C-18	19/30	.016"	.035"	.405"
3412	12	C-18	19/30	.016"	.035"	.430"
3415	15	C-18	19/30	.016"	.040"	.470"
3420	20	C-18	19/30	.016"	.045"	.530"
3430	30	C-18	19/30	.016"	.055"	.650"

16 GAUGE SHIELDED CONTROL CABLE — 1000 VOLT

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	CONDUCTOR STRAND	NOM. WALL THICKNESS (INCHES)	NOM. JKT. THICKNESS (INCHES)	NOM. O.D. (INCHES)
3444	4	16	19/29	.016	.031	.326
3445	5	16	19/29	.016	.032	.346
3446	6	16	19/29	.016	.034	.369
3448	8	16	19/29	.016	.041	.424
3450	10	16	19/29	.016	.044	.470
3452	12	16	19/29	.016	.048	.511

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

COLOR CODE OF CONDUCTORS (CONFORMS TO MIL-C-915)

1—Black	9—Green/Black	17—White/Red	25—Green/Black/White
2—White	10—Orange/Black	18—Orange/Red	26—Orange/Black/White
3—Red	11—Blue/Black	19—Blue/Red	27—Blue/Black/White
4—Green	12—Black/White	20—Red/Green	28—Black/Red/Green
5—Orange	13—Red/White	21—Orange/Green	29—White/Red/Green
6—Blue	14—Green/White	22—Black/White/Red	30—Red/Black/Green
7—White/Black	15—Blue/White	23—White/Black/Red	
8—Red/Black	16—Black/Red	24—Red/Black/White	

ALPHA WIRE CORPORATION

Unshielded Control Cable

UL
 SO

HEAVY-DUTY MULTI-CONDUCTOR RUGGED NEOPRENE JACKET — 600 VOLTS
DESCRIPTION:

Each conductor stranded bare copper, color coded rubber insulation, cabled with fillers where necessary, wrap over conductors, heavy duty black neoprene jacket overall. 600 volt operating voltage.

APPLICATIONS:

Remote control of automatic electrical equipment and sub-stations, telemetering, voltage pressure and motor control, signal transmission. Flexible heavy duty neoprene jacketed cable, recommended for outside installation, cable resists oil, ozone, sunlight, moisture, abrasion and impact.


HEAVY-DUTY MULTI-CONDUCTOR

18 GAUGE
41/34 BARE
COPPER
— 2/64"
INSULATION
THICKNESS

ALPHA NO.	NO. OF COND.	NOM. JKT. THICKNESS	NOM. O.D.
4505	5	.078"	.485"
4506	6	.078"	.510"
4508	8	.078"	.560"
4509	9	.078"	.595"
4510	10	.078"	.620"
4514	14	.094"	.710"

16 GAUGE
65/34 BARE
COPPER
— 2/64"
INSULATION
THICKNESS

4605	5	.078"	.520"
4606	6	.078"	.540"
4607	7	.078"	.540"
4608	8	.078"	.580"
4610	10	.094"	.720"
4612	12	.094"	.745"
4614	14	.094"	.765"
4616	16	.094"	.810"
4619	19	.094"	.840"
4620	20	.094"	.890"

4622	22	.094"	.920"
4624	24	.109"	1.000"
4626	26	.109"	1.030"
4630	30	.109"	1.080"
4637	37	.109"	1.130"
4640	40	.109"	1.210"
4644	44	.109"	1.275"
4650	50	.125"	1.320"
4660	60	.125"	1.470"

ALPHA NO.	NO. OF COND.	NOM. JKT. THICKNESS	NOM. O.D.
4705	5	.095"	.675"
4706	6	.094"	.705"
4707	7	.094"	.710"
4708	8	.094"	.760"
4709	9	.094"	.810"
4710	10	.094"	.870"
4712	12	.094"	.900"

14 GAUGE
41/30 BARE
COPPER
— 3/64"
INSULATION
THICKNESS

4805	5	.094"	.740"
4806	6	.094"	.790"
4807	7	.094"	.790"
4808	8	.094"	.820"
4809	9	.109"	.900"
4810	10	.109"	1.010"
4812	12	.109"	1.040"
4816	16	.109"	1.160"
4818	18	.109"	1.220"

12 GAUGE
65/30 BARE
COPPER
— 3/64"
INSULATION
THICKNESS

4825	5	.094"	.800"
4826	6	.094"	.850"
4828	8	.094"	.910"
4830	10	.109"	1.120"

10 GAUGE
104/30 BARE
COPPER
— 3/64"
INSULATION
THICKNESS

STANDARD SPOOL PUT-UP: CUT TO SPECIFIC LENGTHS—
ALL ORDERS NON-CANCELLABLE **COLOR CODE:** The color code of neoprene jacketed control cables conforms to I.P.C.E.A. standards either with full color code or surface printed with color name and number.

GENERAL PURPOSE MULTI-CONDUCTOR RUBBER INSULATED & RUBBER JACKET
DESCRIPTION:

Each conductor stranded tinned copper, color coded rubber insulation, cabled with fillers, where necessary, wrap, tough black rubber jacket overall.

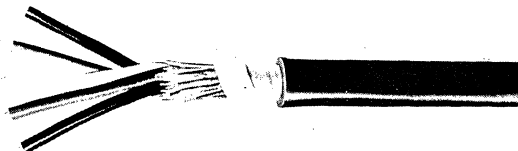
Nominal wall thickness .020". Nominal jacket thickness .035".

CHARACTERISTICS:

Suggested operating temperature —20°C to +60°C.

ALPHA NO.	NO. OF COND.	CONDUCTOR SIZE	STRAND	NOM. O.D.
1244	2	20	26/34	.240"
1245	3	20	26/34	.255"
1246	4	20	26/34	.275"
1247	5	20	26/34	.300"
1247/6	6	20	26/34	.315"
1247/7	7	20	26/34	.325"
1247/8	8	20	26/34	.360"
1247/10	10	20	26/34	.410"
1247/12	12	20	26/34	.435"
1247/15	15	20	26/34	.505"
1247/20	20	20	26/34	.570"

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.


COLOR CODE OF CONDUCTORS

- | | |
|-----------|-------------------------|
| 1—Black | 11—White/Black (Braid) |
| 2—White | 12—White/Red (Braid) |
| 3—Red | 13—White/Green (Braid) |
| 4—Green | 14—White/Yellow (Braid) |
| 5—Yellow | 15—White/Blue (Braid) |
| 6—Blue | 16—White/Brown (Braid) |
| 7—Brown | 17—White/Purple (Braid) |
| 8—Orange | 18—White/Slate (Braid) |
| 9—Slate | 19—Black/Red (Braid) |
| 10—Purple | 20—Black/Yellow (Braid) |

QCC

Variations in construction, color, put-up, gauge, etc. of products on this page are available through Alpha's QCC service.

ALPHA WIRE CORPORATION

Teflon Cables Shielded

Fire Resistant for Alarm Systems

Braid over Shield

UL 1212, 1213 CONDUCTORS / MIL-W-16878 D / TYPE E

DESCRIPTION:

Each conductor stranded silver plated copper, Type E extruded TFE .010" insulation, color coded, cabled, braided silver plated copper shield, 90% coverage, braided white fused Teflon impregnated, fiberglass braid overall.

CHARACTERISTICS:

Temperature rating -65°C to +200°C. Voltage rating 600 volts. Resistant to acids, alkalis, oil, flame, moisture, solvents and fungus. Passes FR-1 vertical flame test.



TFE Tape Jacket over Shield

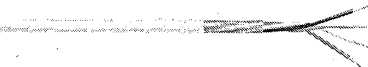
UL 1212, 1213 CONDUCTORS / MIL-W-16878 D / TYPE E

DESCRIPTION:

Each conductor stranded silver plated copper, Type E extruded TFE .010" insulation, color coded, cabled, braided silver plated copper shield, 90% coverage, sintered wrapped white Teflon tape jacketed overall.

CHARACTERISTICS:

Temperature rating -65°C to +200°C. Voltage rating 600 volts. Resistant to acids, alkalis, oil, flame, moisture, solvents and fungus. Passes FR-1 vertical flame test.



No Outer Jacket

UL 1212, 1213 CONDUCTORS / MIL-W-16878 D / TYPE E

DESCRIPTION:

Each conductor stranded silver plated copper, Type E extruded TFE .010" insulation, braided silver plated copper shield over conductor(s), 90% coverage.

CHARACTERISTICS:

Temperature rating -65°C to +200°C. Voltage rating 600 volts. Resistant to acids, alkalis, oil, flame, moisture, solvents and fungus. Passes FR-1 vertical flame test.



FEP Extruded Jacket over Shield

DESCRIPTION:

Each conductor stranded silver plated copper, Type E extruded TFE insulation color coded, cabled, braided silver plated copper shield 90% coverage, extruded FEP white Teflon jacket overall.

CHARACTERISTICS:

Temperature rating -65°C to +200°C. Voltage rating 600 volts. Resistant to acids, alkalis, oil, flame, moisture, solvents and fungus. Extruded FEP Teflon jacket is tough and abrasion resistant. Passes FR-1 vertical flame test.



Alpha No.	No. of Cond.	W/TFE Braid
24 GAUGE - 19/36 STRAND		
2811	1	.083
2811/2	2	.126
2811/3	3	.134
2811/4	4	.146
2811/5	5	.159
2811/6	6	.172
2811/7	7	.172
2811/8	8	.186
2811/9	9	.200
2811/10	10	.217
2811/12	12	.224
2811/15	15	.254
22 GAUGE - 19/34 STRAND		
2814	1	.089
2814/2	2	.138
2814/3	3	.146
2814/4	4	.160
2814/5	5	.175
2814/6	6	.190
2814/7	7	.190
2814/8	8	.206
2814/9	9	.222
2814/10	10	.241

(Continued)

Alpha No.	No. of Cond.	W/TFE Braid
22 GAUGE - 19/34 STRAND		
2814/12	12	.254
2814/15	15	.282
20 GAUGE - 19/32 STRAND		
2817	1	.097
2817/2	2	.156
2817/3	3	.165
2817/4	4	.182
2817/5	5	.196
2817/6	6	.214
2817/7	7	.214
2817/8	8	.232
2817/9	9	.256
2817/10	10	.278
18 GAUGE - 19/30 STRAND		
2819	1	.107
2819/2	2	.176
2819/3	3	.186
2819/4	4	.206
2819/5	5	.226
2819/6	6	.252
2819/7	7	.252
2819/8	8	.274

(Continued)

Alpha No.	No. of Cond.	W/TFE Braid
18 GAUGE - 19/30 STRAND		
2819/9	9	.295
2819/10	10	.322
16 GAUGE - 19/29 STRAND		
2820	1	.117
2820/2	2	.198
2820/3	3	.203
2820/4	4	.223
2820/5	5	.250
2820/6	6	.274
2820/7	7	.274
2820/8	8	.297
14 GAUGE - 19/27 STRAND		
2804	1	.131
2804/2	2	.225
2804/3	3	.244
2804/4	4	.269
2804/5	5	.296
2804/6	6	.324
12 GAUGE - 19/25 STRAND		
2803	1	.150
2803/2	2	.268
2803/3	3	.285
2803/4	4	.314

Alpha No.	No. of Cond.	W/TFE Tape Wrap
24 GAUGE - 19/36 STRAND		
2821	1	.095
2821/2	2	.138
2821/3	3	.146
2821/4	4	.158
2821/5	5	.171
2821/6	6	.184
2821/7	7	.184
2821/8	8	.198
2821/9	9	.212
2821/10	10	.229
2821/12	12	.236
2821/15	15	.266
22 GAUGE - 19/34 STRAND		
2824	1	.101
2824/2	2	.150
2824/3	3	.158
2824/4	4	.172
2824/5	5	.187
2824/6	6	.202
2824/7	7	.202
2824/8	8	.218
2824/9	9	.234
2824/10	10	.253

(Continued)

Alpha No.	No. of Cond.	W/TFE Tape Wrap
22 GAUGE - 19/34 STRAND		
2824/12	12	.266
2824/15	15	.294
20 GAUGE - 19/32 STRAND		
2827	1	.109
2827/2	2	.168
2827/3	3	.177
2827/4	4	.194
2827/5	5	.208
2827/6	6	.226
2827/7	7	.226
2827/8	8	.246
2827/9	9	.268
2827/10	10	.290
18 GAUGE - 19/30 STRAND		
2829	1	.119
2829/2	2	.188
2829/3	3	.198
2829/4	4	.218
2829/5	5	.238
2829/6	6	.264
2829/7	7	.264
2829/8	8	.286

(Continued)

Alpha No.	No. of Cond.	W/TFE Tape Wrap
18 GAUGE - 19/30 STRAND		
2829/9	9	.307
2829/10	10	.334
16 GAUGE - 19/29 STRAND		
2826	1	.129
2826/2	2	.210
2826/3	3	.215
2826/4	4	.235
2826/5	5	.262
2826/6	6	.286
2826/7	7	.286
2826/8	8	.309
14 GAUGE - 19/27 STRAND		
2825	1	.143
2825/2	2	.237
2825/3	3	.256
2825/4	4	.281
2825/5	5	.308
2825/6	6	.336
12 GAUGE - 19/25 STRAND		
2823	1	.162
2823/2	2	.280
2823/3	3	.297
2823/4	4	.326

Alpha No.	No. of Cond.	Nom. O.D.
24 GAUGE - 19/36 STRAND		
2809	1	.069
2809/2	2	.112
2809/3	3	.120
2809/4	4	.132
2809/5	5	.142
2809/6	6	.158
2809/7	7	.158
2809/8	8	.172
2809/9	9	.186
2809/10	10	.203
2809/12	12	.210
2809/15	15	.240
22 GAUGE - 19/34 STRAND		
2812	1	.075
2812/2	2	.124
2812/3	3	.132
2812/4	4	.146
2812/5	5	.161
2812/6	6	.176
2812/7	7	.176
2812/8	8	.192
2812/9	9	.208
2812/10	10	.227

(Continued)

Alpha No.	No. of Cond.	Nom. O.D.
22 GAUGE - 19/34 STRAND		
2812/12	12	.240
2812/15	15	.268
20 GAUGE - 19/32 STRAND		
2815	1	.083
2815/2	2	.142
2815/3	3	.151
2815/4	4	.168
2815/5	5	.182
2815/6	6	.200
2815/7	7	.200
2815/8	8	.218
2815/9	9	.242
2815/10	10	.264
18 GAUGE - 19/30 STRAND		
2818	1	.093
2818/2	2	.162
2818/3	3	.172
2818/4	4	.192
2818/5	5	.212
2818/6	6	.238
2818/7	7	.238
2818/8	8	.260

(Continued)

Alpha No.	No. of Cond.	Nom. O.D.
18 GAUGE - 19/30 STRAND		
2818/9	9	.281
2818/10	10	.308
16 GAUGE - 19/29 STRAND		
2807	1	.103
2807/2	2	.184
2807/3	3	.189
2807/4	4	.209
2807/5	5	.236
2807/6	6	.259
2807/7	7	.259
2807/8	8	.283
14 GAUGE - 19/27 STRAND		
2806	1	.117
2806/2	2	.211
2806/3	3	.230
2806/4	4	.255
2806/5	5	.282
2806/6	6	.310
12 GAUGE - 19/25 STRAND		
2805	1	.136
2805/2	2	.254
2805/3	3	.271
2805/4	4	.300

Alpha No.	No. of Cond.	Conductor Size	Strand	Nom. Wall Thick.	Nom. Jkt. Thick.	Nom. O.D.	Nom. Cap. in MMF	Shield to Cond.	Cond. to Cond.
2831	1	24	19/36	.010"	.010"	.085"	45	—	—
2831/2	2	24	19/36	.010"	.010"	.130"	35	25	25
2831/3	3	24	19/36	.010"	.010"	.135"	35	20	20
2834	1	22	19/34	.010"	.010"	.091"	55	—	—
2834/2	2	22	19/34	.010"	.010"	.150"	45	25	25
2834/3	3	22	19/34	.010"	.010"	.158"	35	25	25
2837	1	20	19/32	.010"	.010"	.100"	55	—	—
2837/2	2	20	19/32	.010"	.010"	.168"	95	25	25
2837/3	3	20	19/32	.010"	.010"	.178"	85	25	25

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT. — CABLES CONTAINING 5 OR MORE CONDUCTORS ARE ALSO AVAILABLE BY THE FOOT; MIN. ORDER 25 FT.

COLOR CODE OF CONDUCTORS

- 1—White
- 2—Black
- 3—Red
- 4—Green
- 5—Yellow
- 6—Blue
- 7—Brown
- 8—Orange
- 9—Slate
- 10—Violet
- 11—White/Black
- 12—White/Brown
- 13—White/Red
- 14—White/Orange
- 15—White/Yellow

OTHER TYPES, SIZES, CONSTRUCTIONS AVAILABLE THROUGH ALPHA QCC*

*Quick Custom Cable

ALPHA WIRE CORPORATION

15/5 PVC Nylon Control Cable 600 Volts 90° C

UL
PT-N



MEETS UL, ASTM, IPCEA S-61-402

DESCRIPTION:

Bare stranded copper conductor, .015 PVC insulation, .005 nylon jacket over each conductor, moisture resistant tape, black PVC jacket overall. Conductors color coded per IPCEA.

APPLICATION:

Widely used for all types of control and signal circuits. Moisture resistant, suitable for underground burial.

ALPHA No.	No. of Cond.	Jacket Thick. (In.)	Approx. O.D. (In.)	ALPHA No.	No. of Cond.	Jacket Thick. (In.)	Approx. O.D. (In.)
7500	2 (Flat)	.045	.200 x .295	7513	14	.060	.560
7501	2	.045	.310	7514	15	.060	.590
7502	3	.045	.310	7515	16	.060	.590
7503	4	.045	.335	7517	18	.060	.620
7504	5	.045	.360	7518	19	.060	.620
7505	6	.045	.395	7519	20	.060	.650
7506	8	.045	.420	7520	21	.060	.650
7507	8	.045	.420	7521	22	.060	.680
7508	9	.045	.455	7522	23	.060	.680
7509	10	.045	.490	7523	24	.060	.720
7511	12	.045	.505				

20/10 PE Nylon Unshielded Station Control Cable

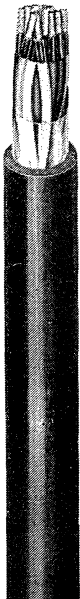
HEAVY-DUTY MULTI-CONDUCTOR PLASTIC JACKET—600 VOLTS

DESCRIPTION:

Each conductor stranded bare copper, .020 polyethylene insulation,*.010" polyvinylchloride jacket over each conductor, color coded, cabled with filters where necessary, moisture resistant tape, black polyvinylchloride jacket overall. 600 volt operating voltage.

APPLICATIONS:

Remote control of automatic electrical equipment, recording and relaying devices, telemetering, switchgear operations and indicators, substation operation, temperature voltage, pressure and motor control, dimensional tolerance on automatic quality control.



16 GAUGE — 26/30 BARE COPPER

ALPHA NO.	NO. OF COND.	NOM. JKT. THICKNESS	NOM. O.D.
4102	2	.045"	.320"
4103	3	.045"	.340"
4105	5	.045"	.400"
4106	6	.045"	.435"
4107	7	.045"	.435"
4108	8	.045"	.480"
4110	10	.060"	.580"
4112	12	.060"	.590"
4114	14	.060"	.605"
4116	16	.060"	.665"

ALPHA NO.	NO. OF COND.	NOM. JKT. THICKNESS	NOM. O.D.
4119	19	.060"	.690"
4121	21	.060"	.735"
4122	22	.060"	.760"
4124	24	.060"	.805"
4126	26	.060"	.805"
4130	30	.080"	.900"
4137	37	.080"	.965"
4140	40	.080"	1.010"
4150	50	.080"	1.100"
4160	60	.080"	1.200"

14 GAUGE — 19/27 BARE COPPER

ALPHA NO.	NO. OF COND.	NOM. JKT. THICKNESS	NOM. O.D.
4202	2 Rd.	.045"	.380"
4203	3 Rd.	.045"	.390"
4204	4	.045"	.425"
4205	5	.045"	.465"
4206	6	.045"	.520"
4207	7	.045"	.520"
4208	8	.060"	.580"
4209	9	.060"	.635"
4210	10	.060"	.690"
4212	12	.060"	.705"

ALPHA NO.	NO. OF COND.	NOM. JKT. THICKNESS	NOM. O.D.
4214	14	.060"	.750"
4216	16	.060"	.785"
4219	19	.060"	.835"
4224	25	.080"	1.010"
4227	27	.080"	1.200"
4230	30	.080"	1.070"
4234	34	.080"	1.140"
4237	37	.080"	1.160"
4240	40	.080"	1.175"

12 GAUGE — 19/25 BARE COPPER

ALPHA NO.	NO. OF COND.	NOM. JKT. THICKNESS	NOM. O.D.
4302	2 Twin	.045"	.415"
4303	3 Rd.	.045"	.445"
4304	4	.045"	.485"
4305	5	.045"	.530"
4306	6	.045"	.610"
4307	7	.060"	.610"
4308	8	.060"	.660"
4309	9	.060"	.700"
4310	10	.060"	.770"
4312	12	.060"	.790"
4314	14	.060"	.830"

ALPHA NO.	NO. OF COND.	NOM. JKT. THICKNESS	NOM. O.D.
4315	15	.080"	.915"
4316	16	.080"	.915"
4318	18	.080"	.970"
4319	19	.080"	.970"
4320	20	.080"	1.020"
4322	22	.080"	1.050"
4325	25	.080"	1.130"
4327	27	.080"	1.050"
4330	30	.080"	1.200"
4334	34	.080"	1.270"
4337	37	.080"	1.285"

STANDARD SPOOL PUT-UP: CUT TO SPECIFIC LENGTHS — MIN. 25 FT. ALL ORDERS

- * 16 gauge — .015" Polyethylene Insulation
- 14 & 12 gauge — .020" Polyethylene Insulation

NON-CANCELLABLE

COLOR CODE: The color code of Plastic-jacketed control cables conforms to I.P.C.E.A. standards either with full color code or surface printed with color name and number.

All items this page available cut to customer's length requirement. Minimum order 25 ft. per item. All orders non-cancellable.

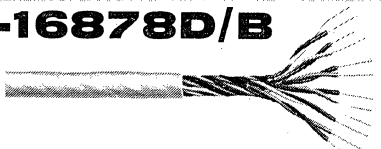
ALPHA WIRE CORPORATION

Irradiated Conductor Cable 600 Volts 105°C

IRRADIATED INNER CONDUCTORS WILL NOT MELT OR CHAR AT SOLDER IRON HEAT RESISTS ABRASION. Passes FR-1 vertical flame test.

DESCRIPTION: Stranded tinned copper conductors, color-coded, irradiated PVC (RX-7000) insulation, (braided, tinned copper shield,) white PVC jacket overall.

A miniature shielded cable with both military specifications and UL listings. Ideal for application on crowded circuit boards where terminals must be soldered. Prevents shrink-back, melting or charring when used in production line soldering. RX-7000 insulation is far tougher and more abrasion-resistant than ordinary non-irradiated PVC.

MIL-W-16878D/B
UL
1429


Nom. Jacket Thickness — .025" Nom. Insulation Thickness — .010"
UNSHIELDED

ALPHA NO.	NO. OF COND.	SIZE	CONDUCTOR STRAND	NOM. O.D. (INCHES)
6621	1	24	7/32	.090
6622	2	24	7/32	.129
6623	3	24	7/32	.139
6624	4	24	7/32	.150
6631	1	22	7/30	.098
6632	2	22	7/30	.149
6633	3	22	7/30	.155
6634	4	22	7/30	.168
6641	1	20	7/28	.105
6642	2	20	7/28	.163
6643	3	20	7/28	.178
6644	4	20	7/28	.187
6651	1	18	7/26	.115
6652	2	18	7/26	.182
6653	3	18	7/26	.193
6654	4	18	7/26	.212

SHIELDED

ALPHA NO.	NO. OF COND.	SIZE	CONDUCTOR STRAND	NOM. O.D. (INCHES)
7621	1	24	7/32	.115
7622	2	24	7/32	.158
7623	3	24	7/32	.164
7624	4	24	7/32	.176
7631	1	22	7/30	.122
7632	2	22	7/30	.172
7633	3	22	7/30	.180
7634	4	22	7/30	.193
7661	1	20	7/28	.130
7662	2	20	7/28	.188
7663	3	20	7/28	.197
7664	4	20	7/28	.212
7671	1	18	7/26	.140
7672	2	18	7/26	.208
7673	3	18	7/26	.218
7674	4	18	7/26	.237

Color Code of Conductors:
1. White 2. Black 3. Red 4. Green

STANDARD SPOOL PUT-UP:
100 FT., 500 FT., 1000 FT.

QCC

Variations in construction, color, put-up, gauge, etc. of products on this page are available through Alpha's QCC service.

Shielded - Nylon PVC Conductors

Passes FR-1 vertical flame test.

DESCRIPTION:

Each conductor stranded tinned copper, .010" polyvinylchloride insulation, color coded, clear nylon (polyamide) jacket, conductors cabled, braided tinned copper shield 90% coverage, white polyvinylchloride jacket overall.

CHARACTERISTICS:

Temperature rating —55°C to +105°C. Voltage rating 600 volts, resistant to acids, alkalis, oil, flame, moisture, fungus, solvents. Nom. wall thickness, .010". Nom. nylon thickness, .003".

MIL-W-16878D/B

ALPHA NO.	NO. OF COND.	SIZE	CONDUCTOR STRAND	NOM. OVERALL JACKET (In.)	NOM. O.D. (In.)
3200	1	26	7/34	.010	.087
3201	2	26	7/34	.014	.138
3202	3	26	7/34	.014	.142
3203	4	26	7/34	.016	.162
3210	1	24	19/36	.010	.092
3211	2	24	19/36	.016	.152
3212	3	24	19/36	.016	.161
3213	4	24	19/36	.017	.172
3220	1	22	19/34	.010	.100
3221	2	22	19/34	.016	.168
3222	3	22	19/34	.017	.178
3223	4	22	19/34	.019	.194
3230	1	20	19/32	.010	.106
3231	2	20	19/32	.019	.186
3232	3	20	19/32	.019	.196
3233	4	20	19/32	.021	.218
3240	1	18	19/30	.012	.120
3241	2	18	19/30	.021	.210
3242	3	18	19/30	.022	.227
3243	4	18	19/30	.023	.250
3245	1	16	19/29	.016	.137
3246	2	16	19/29	.023	.236
3247	3	16	19/29	.023	.240
3248	4	16	19/29	.025	.274

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.
Color Code: 1. White 2. Black 3. Red 4. Green

22 GAUGE, 5-12 CONDUCTOR CABLE.

ALPHA NO.	NO. OF COND.	SIZE	CONDUCTOR STRAND	NOM. OVERALL JACKET (In.)	NOM. O.D. (In.)
3335	5	22	19/34	.020	.212
3336	6	22	19/34	.020	.235
3337	8	22	19/34	.025	.257
3340	10	22	19/34	.025	.284
3342	12	22	19/34	.030	.310

STANDARD IPCEA COLOR CODE

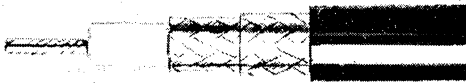
Color Blend

All cables available in standard white jackets or may be colored grey, black, brown, metallic blue, bronze, tan, orange, red, yellow, blue or green.

ALPHA WIRE CORPORATION

Coaxial Cables

POLYETHYLENE DIELECTRIC



ALL TYPES LISTED CONFORM TO LATEST REVISION MIL-C-17: C-Bare Copper, TC-Tinned Copper, SC-Silver Covered Copper, CW-Copper Covered Steel, PE-Solid Polyethylene, SSP-Semi Solid Polyethylene, BP-Black Polyethylene—Type IIIA, NP-Natural Polyethylene—Type III, V-Polyvinylchloride—Type I, NCV-Non-Contaminating Polyvinylchloride—Type IIIA.

ALPHA No.	RG Cable Type	Inner Conductor		Nom. O.D.	Dielectric Mat.	O.D.	Shields		O.D.	Jacket Mat.	O.D.	Armor (.0126 Alum. Wire)	Opr. Volts RMS	Lbs. Per M/Ft.	Nom. Imped. Ohms	Nom. Cap. MMF/Ft.
		Mat.	Strand				Inner	Outer								
9006A	6A/U	CW	1	.0285	PE	.189	SC	C	.264	NCV	.336		2700	74	75	20
9008	8/U	C	7/.0285	.086	PE	.295	C	—	.340	V	.415		5000	105	52	29.5
9008A	8A/U	C	7/.0285	.086	PE	.295	C	—	.340	NCV	.415		5000	99	52	29.5
9009B	9B/U	SC	7/.0285	.086	PE	.285	SC	SC	.355	NCV	.430		5000	126	50	30
9011	11/U	TC	7/.0159	.048	PE	.295	C	—	.340	V	.415		5000	94	75	20.5
9011A	11A/U	TC	7/.0159	.048	PE	.292	C	—	.340	NCV	.412		5000	89	75	20.5
9012A	12A/U	TC	7/.0159	.048	PE	.292	C	—	.340	NCV	.412	.475	5000	113	75	20.5
9014A	14A/U	C	1	.102	PE	.383	C	C	.463	NCV	.558		7000	201	52	29.5
9017A	17A/U	C	1	.188	PE	.695	C	—	.760	NCV	.885		11000	462	52	29.5
9019A	19A/U	C	1	.250	PE	.925	C	—	.990	NCV	1.135		14000	720	52	29.5
9022B	22B/U	C	Two 7/.0152	.047	PE	.291	TC	TC	.355	NCV	.430		1000	124	95	16
9055	55/U	C	1	.032	PE	.121	TC	TC	.176	NP	.206		1900	31	53.5	28.5
9055B	55B/U	SC	1	.032	PE	.121	TC	TC	.176	BP	.206		1900	32	53.5	28.5
9058	58/U	C	1	.032	PE	.121	TC	—	.150	V	.200		1900	24	53.5	28.5
9058A	58A/U	TC	19/.0071	.0375	PE	.120	TC	—	.150	V	.199		1900	25	50	29.5
9058C	58C/U	TC	19/.0071	.0375	PE	.120	TC	—	.150	NCV	.199		1900	25	50	29.5
9059	59/U	CW	1	.0253	SSP	.150	C	—	.191	V	.250		2300	36	73	21
9059B	59B/U	CW	1	.023	PE	.150	C	—	.191	NCV	.246		2300	36	75	20.5
9062	62/U	CW	1	.025	SSP	.151	C	—	.191	V	.250		750	34	93	13.5
9062A	62A/U	CW	1	.025	SSP	.151	C	—	.191	NCV	.249		750	34	93	13.5
9063B	63B/U	CW	1	.0253	SSP	.295	C	—	.340	NCV	.415		1000	78	125	10
9071B	71B/U	CW	1	.025	SSP	.151	C	TC	.208	BP	.250		750	42	93	13.5
9174	174/U	CW	7/.0063	.019	PE	.060	TC	—	.088	V	.105		1500	7	50	30
9212	212/U	SC	1	.056	PE	.189	SC	SC	.265	NCV	.336		3000	85	50	29.5
9213	213/U	C	7/.0296	.090	PE	.292	C	—	.340	NCV	.412		5000	100	50	30.5
9214	214/U	SC	7/.0296	.090	PE	.292	SC	SC	.360	NCV	.432		5000	129	50	30.5
9215	215/U	C	7/.0296	.090	PE	.292	C	—	.340	NCV	.412	.475	5000	122	50	30.5
9217	217/U	C	1	.106	PE	.380	C	C	.463	NCV	.555		7000	202	50	30
9218	218/U	C	1	.195	PE	.690	C	—	.760	NCV	.880		11000	457	50	30
9219	219/U	C	1	.195	PE	.690	C	—	.760	NCV	.880	.945	11000	507	50	30
9223	223/U	SC	1	.036	PE	.120	SC	SC	.176	NCV	.216		1900	36	50	30

All dimensions are maximum except where indicated.

TEFLON DIELECTRIC CONDUCTORS SILVER PLATED COPPERWELD

CHARACTERISTICS: Operating temperature 200°C.

ALPHA No.	RG Type	Cond.	Nom. Wall Thick.	Nom. Jkt. Thick.	Jacket Type	Max. O.D.	Cap. Nom.	Imped. Ohms	Max. Oper. Voltage
9178B	178B/U	7/.004	.012	.010	Extruded FEP	.075	27.9	50±2	1000
9179B	179B/U	7/.004	.021	.010	Extruded FEP	.105	20.4	75±3	1200
9180B	180B/U	7/.004	.045	.010	Extruded FEP	.145	15.3	93±2	850
9187A	187A/U	7/.004	.024	.012	Fused TFE Tape	.110	19.5	75±3	1200
9188A	188A/U	7/.0067	.020	.012	Fused TFE Tape	.110	27.5	50±2	1200
9195A	195A/U	7/.004	.045	.014	Fused TFE Tape	.155	14.5	95±3	1500
9196A	196A/U	7/.004	.011	.012	Fused TFE Tape	.080	28.5	50±2	1000

CATV, MATV, CCTV Coaxial Cable 6/U, 8/U, 11/U, 59U TYPES.

These cables are designed specifically for commercial and CATV, MATV and CCTV applications.

ALPHA NO.	TYPE	SIZE		DIELECTRIC* MATERIAL	SHIELD*	JACKET MATERIAL	NOM. O.D.	NOM. IMPED. ANCE (ohms)	CH. 2	CH. 5	CH. 13	CH. 14	CH. 33	STOCK COLORS
9843	6/U	18 solid	BC	Foam PE	Foil	PVC	.242	75	1.5	1.9	3.1	5.0	7.0	Blk., Wht., Gray
9846	8/U	13 (7X21)	BC	Foam PE	BBC	PVC	.407	50	1.2	1.7	2.5	3.9	5.5	Black Only
9847	11/U	14 solid	BC	Foam PE	BBC	PE	.405	75	1.0	1.3	2.1	3.6	4.8	Black Only
9848	58/U	20 solid	BC	Foam PE	BTC	PVC	.195	50	4.2	4.7	7.0	10.4	15.3	Black Only
9830	59/U	22 solid	BCW	Solid PE	BBC	PVC	.242	75	2.0	2.7	4.5	6.8	10.0	Black Only
9840	59/U	22 solid	BCW	Foam PE	BBC	PVC	.242	75	2.2	2.8	4.5	6.0	9.8	Black Only
9844	59/U	22 solid	BCW	Foam PE	Foil	PVC	.218	80	1.9	2.6	3.8	6.5	9.1	Blk., Wht., Gray

*BBC — Braided Bare Copper
BTC — Braided Tinned Copper
Foil — Aluminum/Polyester Tape with 4-28 AWC Tinned Copper-weld drain wires
BCW — Bare Copper Weld
BC — Bare Copper
Foam PE — Unicellular Foamed Polyethylene

STANDARD PUT-UP: 1000 FT.



Computer Cables

Passes FR-1 vertical flame test.

Computer Cable

UL STYLE 2343

DESCRIPTION:

Each conductor stranded tinner copper. Color coded 80°C PVC insulation. Cabled with PVC fillers, .001" clear mylar wrap. Braided tinned copper shield (85% coverage). Gray PVC jacket.

APPLICATION:

Interconnection of computer modules.

Alpha No.	No. of Cond.	Cond. Gauge	Strand	Wall Thick. (in.)	Jacket Thick. (in.)	Nom. O.D. (in.)
2458	6	18	16/30	.016	.062	.394

Computer Coaxial Cable



UL STYLE 2386 — DESIGNED FOR INTERCONNECTION OF DATA SYSTEM COMPONENTS

Individual mini. coax cables, grouped together under common overall shield (where indicated) and jacket.

Individual miniature coax cables consist of #26 AWG solid silver-plated copper conductor, air-spaced, flame-retardant polyethylene dielectric (.025" polyethylene thread helically wound around conductor; overall .018" polyethylene tube) spiral-wrapped 29 AWG tinned copper drain wire, braided tinned copper shield, overall .016" PVC jacket. Nom. diam. .155".

The completed cable is constructed of the miniature coaxial cables (described above) cabled with PVC fillers, clear mylar wrap, overall gray PVC jacket. Shielded cables employ braided tinned copper shields with spirally-wrapped #26 AWG solid copper alloy drain wires.

APPLICATION:

These cables are specifically designed for the most widely used computer systems. Used for interconnection of modules and data transmission.

CHARACTERISTICS OF COAXIAL CONDUCTORS

Nom. Imped., 95 ohms; Attenuation at 400 MC Max., 10.2 db/100 ft.; Velocity Propagation, 83%; Voltage 750 volts max.; Jacket Thick., .085".

Alpha No.	No. of Indiv. Coaxial Cables	Nominal O.D. (in.)
2453	20	.978
2454	24	1.075
SHIELDED		
2456*	24	1.110

*Jacket Thickness, .080"

Above items available cut to customer's length requirement. Minimum order 25 ft. per item. All orders non-cancellable.

Micro-Miniature Coaxial Cable

50, 75, 100 OHM IMPEDANCES FOR COMPUTER, INSTRUMENTATION AND ULTRA-COMPACT WIRING

DESCRIPTION:

Center conductor, solid silver-plated copper with 40 micro-inch minimum plating. Cellular polypropylene or FEP *Teflon dielectric. Aluminized Mylar shield, 30 AWG, solid silver-plated copper drain wire — parallel to center conductor. Flame-retardant Vylex (laminated Mylar*) blue-colored jacket overall. Dielectric mat'l. cellular polypropylene #9450, FEP.

CHARACTERISTICS:

Extremely small and flexible with high cut-through resistance. Provides uniform characteristic impedance, low losses and low propagation delays. Cross-talk kept to minimum.

APPLICATION:

Computer wiring, high density packaging, point-to-point wiring, micro miniature systems.

Alpha No.	Impedance (Ohm)	Conductor AWG	Nom. Cable O.D. (in.)
9500	100	32	.080
9475	75	30	.065
9450	50	32	.040

Standard Put-up — 100 Ft.

*T.M. DuPont

ALPHA WIRE CORPORATION

Neoprene Welding Cable

DESCRIPTION:

Stranded bare copper conductor, tape wrap, black neoprene rubber insulation.

CHARACTERISTICS:

Lightweight, flexible cables with high resistance to abrasion, impact, flexing, and twisting.

RECOMMENDED CABLE SIZES:

The sizes of cable recommended by the Machine Group of the NEMA Electric Welding Section for standard hand welding equipment based on lengths up to 90 ft. that is, 45 ft. of welding cable and 45 ft. of return cable, are as follows:

100 — Ampere Welder — 4 AWG	300 — Ampere Welder — 1/0 AWG
150 — Ampere Welder — 3 AWG	400 — Ampere Welder — 2/0 AWG
200 — Ampere Welder — 2 AWG	500 — Ampere Welder — 2/0 AWG
600 — Ampere Welder — 3/0 AWG	



ALPHA NO.	CONDUCTOR SIZE	STRAND	NOM. OVERALL DIAMETER (Inches)
6112	6	266/30	0.38"
6113	4	420/30	0.43"
6114	3	532/30	0.43"
6115	2	665/30	0.51"
6116	1	833/30	0.54"
6117	1/0	1057/30	0.61"
6118	2/0	1317/30	0.67"
6119	3/0	1622/30	0.74"
6120	4/0	2109/30	0.86"

ALPHA NO.	IPCEA CABLE RATING CURRENT (I) CARRYING CAPACITY (Amperes)	VOLTAGE DROP PER 100 FT. AT 60° C (Volts)	APPROX. NET WT. LB. PER M/FT.
6112	75	3.58	134
6113	100	3.18	187
6114	150	3.70	233
6115	200	3.92	299
6116	250	3.88	365
6117	300	3.72	457
6118	375	3.68	555
6119	450	3.51	698
6120	550	3.41	871

All items this page available cut to customer's length requirement. Minimum order 25 ft. per item.
All orders non-cancellable.

Telemetry & Supervisory Shielded Control Cable

DESCRIPTION:

Each conductor bare solid copper, high molecular weight polyethylene insulation, color coded, twisted into pairs, cabled with a non-hygroscopic binder tape .008" aluminum shield, black polyethylene jacket overall. Operating voltage 300 volts.

Double jacketed types (3903-4060 below) same except for additional inner black polyethylene jacket over binder, and .005" copper shield.

APPLICATIONS:

Remote control of rocket recording data and test-firing control, transmission of signals which telemeter temperature, voltage pressure, etc. control of multiple circuits, measuring devices, quality control equipment, radar antenna. For aerial, duct and conduit installations.

Double jacketed types have higher dielectric strength and suited for direct burial installations.



22 AWG SOLID NOM. INSUL. THICKNESS .015"

ALPHA NO.	NO. OF PAIRS	NOM. JKT. THICKNESS	NOM. O.D.	APPROX. LBS./M
3706	6	.060"	.51"	108
3712	12	.060"	.62"	171
3718	18	.060"	.71"	210
3725	25	.060"	.79"	266
3750	50	.070"	1.05"	510

19 AWG SOLID NOM. INSUL. THICKNESS .015"

3806	6	.060"	.56"	140
3812	12	.060"	.70"	232
3818	18	.060"	.80"	301
3825	25	.060"	.91"	426
3850	50	.070"	1.20"	767

16 AWG SOLID NOM. INSUL. THICKNESS .020"

3863	3	.060"	.56"	160
3864	6	.060"	.69"	240
3865	12	.060"	.88"	400
3866	18	.070"	1.04"	560
3867	25	.070"	1.18"	720
3868	50	.080"	1.62"	1350

DOUBLE JACKET — HEAVY DUTY

22 AWG SOLID NOM. INSUL. THICKNESS .015"

ALPHA NO.	NO. OF PAIRS	NOM. JKT. THICKNESS INNER	NOM. JKT. THICKNESS OUTER	NOM. O.D.	APPROX. LBS./M
3906	6	.047"	.060"	.56"	149
3912	12	.047"	.060"	.67"	226
3918	18	.047"	.060"	.76"	281
3925	25	.047"	.060"	.84"	374
3950	50	.047"	.070"	1.10"	645

19 AWG SOLID NOM. INSUL. THICKNESS .015"

4006	6	.047"	.060"	.61"	200
4012	12	.047"	.060"	.75"	297
4018	18	.047"	.060"	.85"	415
4025	25	.047"	.080"	.96"	558
4050	50	.047"	.070"	1.25"	929

COLOR CODE: Fully color coded in accordance with REA standards.

ALPHA WIRE CORPORATION

Tinned Copper Braid

TO MIL SPEC QQ-B-575A, ASTM-B-33

FLAT

DESCRIPTION: A woven tinned copper braid which is manufactured completely round as outlined in Mil Spec QQ-B-575. Each strand of the braid is soft drawn tinned copper wire. The braid is self-supporting and maintains its round configuration. The percentage of shielding coverage is 95% or more when placed over a mandrel of an equivalent diameter to the inside braid diameter.

APPLICATIONS: Maximum shielding against electrostatic interference for wires, cables and other components. Also as a protective covering against mechanical abrasion and stresses.

TUBULAR

DESCRIPTION: A woven braid, composed of tinned copper strands, which is rolled flat at time of manufacture to a specific width depending upon construction.

APPLICATIONS: Flat braid is usually employed for its current carrying capacity and its extreme flexibility. It is generally used as a high current conductor at low voltages. Battery grounding is typical of this application. It is also used as a bonding strap in vehicles and aircraft to help eliminate ignition interference. Because of its extreme flexibility it can be used in confined areas or as electrical connections on moving parts.

FLAT BRAID

APPLICATIONS: A woven braid, composed of tinned copper strands, which is rolled flat at time of manufacture to a specific width depending upon construction.

ALPHA No.	Nom. I.D. When Rounded	Braid Construction AWG of Indiv. Ends	Carriers	Total No. of Indiv. Ends	Approx. AWG Equiv.	Nom. Circular Mills	*Current Carrying Capacity (Amps)	Put-up Code
1221	.025	36	8	8	27	200	4.0	1, 2, 3
1222	1/32"	36	16	16	24	400	6.0	1, 2, 3
1223	3/64"	36	24	24	22	600	7.0	1, 2, 3
1224	1/16"	36	16	48	19	1200	11.0	1, 2, 3
1229	3/32"	36	24	72	18	1800	16.0	1, 2, 3
1230	1/8"	36	24	120	15	3000	25.0	1, 2, 3
1231	3/16"	36	24	168	14	4200	32.0	1, 2, 3
1232	1/4"	36	48	288	12	7200	46.0	1, 2, 3
1233/2	5/16"	36	48	384	10	9600	53.0	1, 2, 3
1233	3/8"	36	48	384	10	9600	53.0	1, 2, 3
1234	1/2"	36	48	832	7	20800	85.0	1, 2, 3
1235	5/8"	36	48	832	7	20800	85.0	1, 2, 3
1239	1"	30	48	336	5	33700	100.0	1, 2, 3
1240	1 1/8"	30	48	528	3	53064	150.0	1
1241	1 1/4"	30	48	1248	00	125424	280.0	1
1242	2"	30	48	1536	000	154368	310.0	1
1242/4	3"	30	48	2256	0000	225000	390.0	1, 2

*Values shown are for bare cable in free air at 30°C (86°F) and intended as a reference guide only. Actual values will depend on permissible temperature rise, permissible voltage drop and other conditions of service.

OVAL COMMERCIAL BRAID

2132	1/16"	34	16	32	19	1192	11.0	1, 2, 3
2136	3/64"	34	24	120	14	4770	32.0	1, 2, 3
2140	1/8"	34	24	144	13	5724	38.0	1, 2, 3
2142	3/16"	34	24	168	12	6678	41.0	1, 2
2144	1/4"	34	24	192	11	7632	46.0	1, 2
2146	5/16"	34	48	336	9	13356	62.0	1
2148	3/8"	34	48	384	8	14264	64.0	1
2150	1/2"	34	48	480	7	19080	81.0	1
2152	5/8"	34	48	528	7	20988	85.0	1

TINNED COPPER TUBULAR BRAID

2160	1/32"	36	24	24	22	600	7.0	1, 2
2162	1/16"	36	24	48	19	1200	11.0	1, 2
2163	3/64"	36	24	72	18	1800	16.0	1, 2
2164	1/8"	36	24	96	16	2400	19.0	1, 2
2166	3/16"	36	24	120	15	3000	25.0	1, 2
2167	1/4"	36	24	144	12	3600	30.0	1, 2
2168	5/16"	36	24	168	11	4200	32.0	1, 2
2170	3/8"	34	24	192	10	4800	36.0	1
2171	1/2"	30	24	240	9	5400	40.0	1
2171/1	5/8"	30	24	288	8	6000	44.0	1
2172	3/4"	30	24	336	7	6600	48.0	1
2173	7/8"	30	24	384	6	7200	52.0	1
2174	1"	30	24	432	5	7800	56.0	1
2175	1 1/8"	30	48	528	3	8800	66.0	1
2175/1	1 1/4"	30	48	576	2	9600	72.0	1
2176	1 1/2"	30	48	624	2	10400	78.0	1

EXTRA LARGE TINNED COPPER TUBULAR BRAID

2177	7/8"	30	48	336	5	33700	100.0	1, 2
2178	1"	30	48	384	4	38600	120.0	1, 2
2179	1 1/8"	30	48	432	4	43300	130.0	1, 2
2180	1 1/4"	30	48	480	3	48150	145.0	1, 2
2181	1 3/8"	30	48	528	3	53000	150.0	1, 2
2182	1 1/2"	30	48	576	2	57775	165.0	1, 2

SILVER PLATED TUBULAR BRAID

APPLICATIONS: Silver plated braid is used where a high operating temperature (200°C) and corrosion resistance is required.

2191	1/16"	36	24	48	19	1200	11.0	1, 2
2193	3/64"	36	24	72	18	1800	16.0	1, 2
2194	1/8"	36	24	96	16	2400	19.0	1, 2
2195	3/16"	36	24	120	15	3000	25.0	1, 2
2196	1/4"	36	24	144	12	3600	30.0	1, 2
2197	5/16"	34	24	168	11	4200	32.0	1, 2
2198	3/8"	34	24	192	10	4800	36.0	1, 2

PUT-UP CODE: 1-50 FT., 2-100 FT.
3-250 FT.

ALPHA WIRE CORPORATION

Low Leakage Medical Safety Cable

300 VOLTS 66% LESS LEAKAGE THAN CONVENTIONAL SJT POWER CORD LOW MUTUAL CAPACITANCE

DESCRIPTION

A specially designed low leakage power cable that greatly reduces danger of electrical shock in medical and dental applications. Each conductor stranded and annealed copper. Insulation color coded FEP Teflon. Low dielectric constant polyethylene fillers provide wider conductor spacing. Paper tape wrap over core with red PVC jacket overall. Maximum leakage, 10 ft. length at 120 V is 6 microamperes to green, 16 microamperes through jacket.

APPLICATION

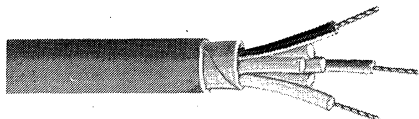
The inherent danger of electrical shock due to faulty internal or power connections on medical test and analytical equipment is greatly reduced by use of this cable. The wider conductor spacing necessary for low leakage is obtained by utilization of the special low dielectric constant fillers and core.

* T.M. DuPont

3 CONDUCTOR

Black — White — Green

This item cut to customer's requirements — Min. 25' per item non-cancellable



ALPHA NUMBER	COND. SIZE AWG	NOMINAL THICKNESS INSULATION	JACKET	NOMINAL O.D.
1980	18	.031"	.050"	.430"
1981	16	.031"	.050"	.475"

Bus Bar Tinned Copper

SOLID WIRE — SOFT DRAWN

DESCRIPTION: Pure electrolytic soft, drawn, solid, copper properly annealed and tinned for quick soldering.

APPLICATIONS: Winding of coils. Antennas. Point to point wiring. Bus-bar. Component leads. Ground wire.

SPECIFICATIONS MIL-W-3861 TYPE S —
QQ-W-343 TYPE S — ASTM-B-33



ALPHA NO.	CONDUCTOR SIZE	NOMINAL CIRCULAR MIL AREA	NOMINAL O.D.
299/3	30 AWG	100.5	.010"
299/2	28 AWG	159.8	.013"
299/1	26 AWG	254.1	.016"
299	24 AWG	404.0	.020"
298	22 AWG	642.4	.025"
297	20 AWG	1022.0	.033"
296	18 AWG	1642.0	.040"
295	16 AWG	2583.0	.051"
286	14 AWG	4107.0	.065"
289	12 AWG	6530.0	.082"
292	10 AWG	10380.0	.103"
292/8	8 AWG	16510.0	.129"
292/6	6 AWG	26250.0	.162"

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.

Antenna-Aerial Wire

APPLICATIONS Recommended especially for ship, short-wave and transmitter antennas where

1161-1164: high tensile strength and corrosion resistance is required
1161 and 1163: Government specification MIL-W-13276 and MIL-W-13074.

APPLICATIONS For short wave and transmitter antennas. Suitable for commercial and

136 and 112: amateur use. Easy to install, no "backlash."



ALPHA NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	BREAKING STRENGTH	CONDUCTOR TYPE	NOMINAL O.D.
1161	12	7/20	650 Lbs.	Silicon Bronze	.100"
1163	10	7/18	1000 Lbs.	Silicon Bronze	.122"
1164	8	7/16	1600 Lbs.	Silicon Bronze	.150"
136	16	7/24	—	Bare Copper	.060"
112	14	7/22	—	Bare Copper	.075"

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

Teflon Hook-Up Wire

Type E MIL-W-16878D

DESCRIPTION: Stranded silver plated copper, .010" nominal wall thickness extruded TFE Teflon insulation — 65°C to +200°C, voltage rating 600 volts.



ALPHA NO.	CONDUCTOR SIZE	STRAND	MIN. O.D.
5851	30	7/38	.028"
5852	28	7/36	.031"
5853	26	7/34	.035"
5854	24	19/36	.040"
5854/7	24	7/32	.039"
5855	22	19/34	.046"
5855/7	22	7/30	.045"
5856	20	19/32	.054"
5856/7	20	7/28	.053"
5857	18	19/30	.064"
5858	16	19/29	.073"

***STOCK COLORS**

- 1—White
- 2—Black
- 3—Red
- 4—Green
- 5—Yellow
- 6—Light Blue
- 7—Brown
- 8—Orange
- 9—Gray (slate)

- 10—Violet (purple)
- 11—White/Black
- 12—White/Red
- 13—White/Green
- 14—White/Yellow
- 15—White/Blue
- 16—White/Brown
- 17—White/Orange
- 18—White/Gray
- 19—White/Violet

STANDARD SPOOL PUT-UP: 100 FT., 1000 FT.
ALSO AVAILABLE TO ORDER CUT, MARKED AND STRIPPED

ALPHA WIRE CORPORATION

Service & Power Cords

UL

DESCRIPTION: RUBBER PORTABLE CORDS, TYPE SV, SJ,
Each conductor stranded bare copper, separator, color coded rubber insulation, cabled with fillers, separator, tough black rubber jacket overall.

NEOPRENE PORTABLE CORDS, TYPE SVO, SJO, & SO
Each conductor stranded bare copper, separator, color coded, rubber insulation cabled with fillers, separator, black neoprene jacket overall. Oil, grease, ozone, acid, moisture resistant.

CHARACTERISTICS & APPLICATIONS:

Suggested Operating Temperatures: -20°C to +60°C.



U.L. TYPE	TYPE OF USAGE	VOLTAGE RATING
SV, SVO	Light appliances such as fans, mixers, and office equipment.	300V
SJ, SJO	Medium appliances, small motors, tools, amplifiers, speakers.	300V
SO	Heavy duty equipment, generators, heaters, tools, air-conditioners.	600V

RUBBER PORTABLE CORD 300 VOLT — NOM. JKT. THICKNESS .032" STATIONARY SERVICE

ALPHA NO.	TYPE	NO. OF COND.	COND. SIZE	NOM. THICKNESS INS.	CURRENT CARRYING CAPACITY IN AMPS	NOM. O.D.
1951	SV	2	18	.016"	7	.250"
1951/3	SV	3	18	.016"	7	.260"
1952	SJ	2	18	.032"	7	.305"
1952/3	SJ	3	18	.032"	7	.330"
1953	SJ	2	16	.032"	10	.330"
1953/3	SJ	3	16	.032"	10	.360"

NEOPRENE PORTABLE CORD 300 VOLT — NOM. JKT. THICKNESS .032" STATIONARY SERVICE

1931	SVO	2	18	.016"	7	.250"
1932	SJO	2	18	.032"	7	.305"
1932/3	SJO	3	18	.032"	7	.330"
1933	SJO	2	16	.032"	10	.330"
1933/3	SJO	3	16	.032"	10	.360"

STANDARD SPOOL PUT-UP: 50 FT., 100 FT., 250 FT.

COLOR CODE OF CONDUCTORS: 1—White 2—Black 3—Green 4—Red

NEOPRENE 600 VOLT PORTABLE CORD — TYPE SO

ALPHA NO.	NO. OF COND.	COND. SIZE	NOM. THICKNESS INS.	NOM. JKT. THICKNESS	CURRENT CARRYING CAPACITY IN AMPS	NOM. O.D.
1934	2	18	.030"	.060"	7	.390"
1934/3	3	18	.030"	.060"	7	.405"
1934/4	4	18	.030"	.060"	6	.435"
1935	2	16	.030"	.060"	10	.405"
1935/3	3	16	.030"	.060"	10	.430"
1935/4	4	16	.030"	.060"	8	.485"
1936	2	14	.045"	.075"	15	.530"
1936/3	3	14	.045"	.075"	15	.560"
1936/4	4	14	.045"	.075"	12	.605"
1937	2	12	.045"	.090"	20	.600"
1937/3	3	12	.045"	.090"	20	.635"
1937/4	4	12	.045"	.090"	16	.665"
1938	2	10	.045"	.090"	25	.640"
1938/3	3	10	.045"	.090"	25	.690"
1938/4	4	10	.045"	.090"	20	.745"

STANDARD SPOOL PUT-UP: 50 FT., 100 FT., 250 FT.

Replacement Cord Sets — 300 VOLTS — 7 AMPS.

DESCRIPTION: Heavy duty, abrasion resistant replacement cord sets. Conductor bare copper, vinyl or rubber, color coded insulation, cotton fillers, rubber or vinyl jacket overall. One end fitted with molded two or three conductor male plug, one end jacket stripped back, 1½ inches with ⅝ inches bare conductors exposed.

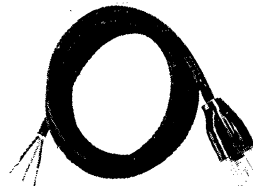
APPLICATION: TYPE SV - SVT

For small tools, business machines and light-duty equipment.

TYPE SJ - SJT

For heavier duty tools, electric saws, small motors, grinders, saws and sanders.

PACKAGING: All cords sets available in individual boxes or coiled and tied in bulk packages.



UL TYPE SV, SVT — COND. SIZE 18 *STD. PKG. 1 & 25 PIECES

ALPHA NO.	UL TYPE	NO. COND.	COND. SIZE	STRAND	CORD LENGTH (FEET)	CORD MATERIAL	COLOR	NOM. O.D. (INCHES)
600	SV	2	18	41/34	6	Rubber	Black	.245
602	SV	2	18	41/34	9	Rubber	Black	.245
775	SV	3	18	41/34	6	Rubber	Black	.267
776	SV	3	18	41/34	8	Rubber	Black	.267
777	SVT	3	18	41/34	6	Vinyl	Gray	.257

UL TYPE SJ, SJT — 3 CONDUCTORS

615	SJ	3	18	16/30	6	Rubber	Black	.330
778	SJ	3	18	16/30	8	Rubber	Black	.330
616	SJ	3	18	16/30	9	Rubber	Black	.330
779	SJT	3	18	16/30	8	Vinyl	Gray	.330
618	SJ	3	16	26/30	6	Rubber	Black	.365

*Packed one to box or bulk packed, No. 616 and 618 1 and 10 pieces.

Extension Cord Sets

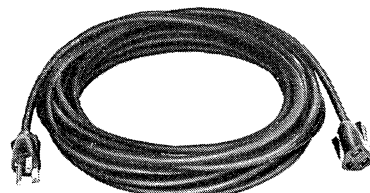
U.L. AND C.S.A. LISTED

DESCRIPTION:

Extension cord sets manufactured for lasting service with a flexible 2 or 3 conductor quality black rubber cord. This rugged cord has a black molded plastic male and female plug on either end to fit conventional sockets and plugs. Extension cords have a 300 volt rating

APPLICATION:

Small business machines, vacuum cleaners, lamps, movie projectors, or any other home appliance. 3 conductor cord used when 1 conductor requires grounding.



2-CONDUCTOR

ALPHA NO.	COND. SIZE	COND. STRAND	AMP RATING	U.L. TYPE	NOM. O.D.	CORD LENGTH (FT.)
620	18	41/34	7	SV	.245"	6
628	16	26/30	10	SJ	.325"	10

3-CONDUCTOR — AMP RATING 7, TYPE SJ

ALPHA NO.	COND. SIZE	COND. STRAND	NOM. O.D. OF CORD	CORD LENGTH (FT.)
636	18	16/30	.330"	10
638	18	16/30	.330"	25
640	16	26/30	.365"	15
642	16	26/30	.365"	25
644	16	26/30	.365"	50

ALPHA WIRE CORPORATION

Neoprene Retractable Communication Cords

RETRACTILE COMMUNICATION COIL CORDS

Retracted Lengths 2 & 4 Feet — Extended Lengths 12 & 25 Feet

DESCRIPTION:

Multi-conductor communication cord manufactured with extra flexible #23 AWG-21/36 tinned soft cadmium copper for maximum flex life. Insulated with rubber for communication circuits of maximum 120 working volts.

PVC Retractable Communication Cords

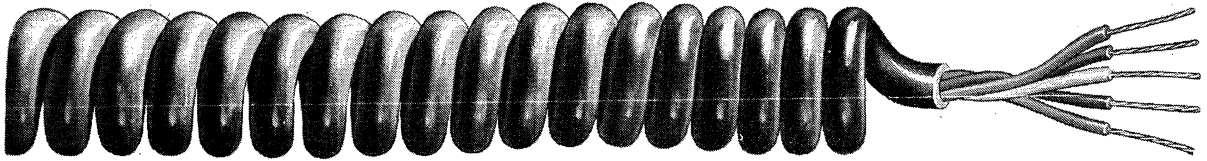
RETRACTED LENGTHS 1, 2, 3 & 4 FEET
EXTENDED LENGTHS 6, 12, 18 & 25 FT.

DESCRIPTION:

Durable, long lasting plastic retractile coil cords. Economically priced, but offering maximum flex resistance and long life. Each conductor is stranded tinned copper P.V.C. insulation and P.V.C. jacket over all.

CHARACTERISTICS:

Suggested operating temperature: -20°C to +60°C. 23 AWG conductor — 21/36 strands, 120 volts, 1 amp.



2 FT. LGTHS.	4 FT. LGTHS.	NO. OF CONDS.	NOM. COIL O.D.	CORD O.D.
680/2	680/4	2	3/4"	.215"
681/2	681/4	3	13/16"	.220"
682/2	682/4	4	15/16"	.250"
683/2	683/4	5	1-1/16"	.285"
684/2	684/4	6	1-1/8"	.305"
685/2	685/4	7	1-1/4"	.320"

COLOR CODE OF CONDUCTORS

- 1—Black 5—Blue
2—White 6—Yellow
3—Red 7—Brown
4—Green

RETRACTILE COMMUNICATION CORDS (Shielded)

Retracted Lengths 2 & 4 Feet — Extended Lengths 12 & 25 Feet

DESCRIPTION: Same as above, except that shielded conductors are individually shielded with a cadmium copper shield to eliminate external electrical interference.

2 FT. LGTHS.	4 FT. LGTHS.	NO. OF CONDS.	CONDUCTOR SIZE	CONDUCTOR STRAND	VOLTAGE RATING	SHIELDING	NOM. COIL O.D.	NOM. CORD O.D.	COLOR CODE OF CONDUCTORS
690/2	690/4	1	24	41/40	75	Shielded	5/8"	.160"	White
692/2	692/4	2	1-23	21/36	120	Unshielded	7/8"	.240"	Black
			1-24	41/40	75	Shielded			White
694/2	694/4	3	2-23	21/36	120	Unshielded	7/8"	.240"	Black & Red
			1-24	41/40	75	Shielded			White
696/2	696/4	4	2-23	21/36	120	Unshielded	1"	.270"	Red & Black
			2-24	41/40	75	Individually Shielded			White & Green

MINIATURE RETRACTILE COMMUNICATIONS CORDS

Retracted Length 2 Feet — Extended Length 10 Feet

DESCRIPTION: A small diameter plastic cord with stranded tinned copper conductors for maximum flexibility, insulated and jacketed with polyvinylchloride. Each cord is available in a 2 ft. retracted length with a 6" straight lead on each end.

ALPHA NO.	NO. OF CONDS.	SIZE	CONDUCTOR STRAND	AMP. RATING	VOLT. RATING	NOM. COIL O.D.	NOM. CORD O.D.
651	2	28	19/40	0.5	100	1/2"	.135"
652	4	28	19/40	0.5	100	1/2"	.150"

For 3 conductor, use 4 conductor with one lead unused

COLOR CODE OF CONDUCTORS
1—Black 2—White
3—Green 4—Red

UNSHIELDED

1 FT LGTHS	2 FT LGTHS	3 FT LGTHS	4 FT LGTHS	NO. OF CONDS.	NOM. COIL O.D.	NOM. CORD O.D.
702	702/2	702/3	702/4	2	3/4"	.200
703	703/2	703/3	703/4	3	3/4"	.210
704	704/2	704/3	704/4	4	13/16"	.240
705	705/2	705/3	705/4	5	1"	.285
706	706/2	706/3	706/4	6	1 1/8"	.305
707	707/2	707/3	707/4	7	1 1/4"	.320
			708/4	8	1 3/32"	.360
			710/4	10	1 5/32"	.380
			712/4	12	1 7/32"	.410
			715/4	15	1 9/32"	.470

- COLOR CODE: 1. Black 6. Yellow 11. White/Green
2. White 7. Brown 12. White/Blue
3. Red 8. Orange 13. White/Yellow
4. Green 9. White/Black 14. White/Brown
5. Blue 10. White/Red 15. White/Orange

SHIELDED

Braided tinned copper shield

2 FT LGTHS	4 FT LGTHS	NO. OF CONDS.	NOM. COIL O.D.	NOM. CORD O.D.	SHIELDED	COLOR CODE OF CONDUCTORS
720/2	720/4	1	5/8"	.160	Shielded	White
722/2	722/4	2	7/8"	.225	Individually Shielded	White & Black
723/2	723/4	3	1"	.250	2 Unshielded 1 Shielded	Black & Red White
724/2	724/4	4	1 1/4"	.270	2 Unshielded 2 Individually Shielded	Red & Green White & Black

Neoprene Retractable Power Cords



Retracted Lengths 2 & 4 Feet — Extended Lengths 12 & 25 Feet

RETRACTILE POWER CORD SETS

Retracted Length 18" — Extended Length 7 1/2 Feet

DESCRIPTION: Coiled power cord with a sturdy molded male plug on one end.

2 FT. LGTHS.	4 FT. LGTHS.	NO. OF CONDS.	CONDUCTOR SIZE	CONDUCTOR STRAND	U.L. TYPE	AMP. RATING	VOLT. RATING	NOM. COIL O.D.	NOM. CORD O.D.
660/2	660/4	2	18	41/34	SVO	7	300	7/8"	.260"
760/2	760/4	3	18	41/34	SVO	7	300	1"	.275"
661/2	661/4	2	18	41/34	SJO	7	300	1-3/16"	.320"
662/2	662/4	3	18	41/34	SJO	7	300	1-3/8"	.350"
663/2	663/4	4*	18	41/34	SJO	5.6	300	1-7/16"	.385"
664/2	664/4	2	16	65/34	SJO	10	300	1-3/8"	.360"
665/2	665/4	3	16	65/34	SJO	10	300	1-7/16"	.390"
666/2	666/4	4*	16	65/34	SJO	8	300	1-1/2"	.425"
670/2	670/4	3	16	41/34	SO	10	600	1-13/16"	.470"
671/2	671/4	4*	16	65/34	SO	8	600	1-7/8"	.500"
673/2	673/4	3	14	41/30	SO	15	600	2-1/8"	.560"
674/2	674/4	4*	14	41/30	SO	12	600	2-1/4"	.605"

COLOR CODE OF CONDUCTORS
1—Black 2—White
3—Green 4—Red

ALPHA NO.	NO. OF CONDS.	CONDUCTOR SIZE	CONDUCTOR STRAND	U.L. TYPE	NOM. COIL O.D.	NOM. CORD O.D.
654	2	18	41/34	SVO	7/8"	.260"
656	3	18	41/34	SJO	1-3/8"	.350"
657	2	16	65/34	SJO	1-3/8"	.360"
658	3	16	65/34	SJO	1-7/16"	.390"

COLOR CODE OF CONDUCTORS
1—Black 2—White 3—Green

RETRACTILE TEST LEAD WIRE

Retracted Length 12" — Extended Length 6 Feet

ALPHA NO.	CONDUCTOR SIZE	CONDUCTOR STRAND	AMP. RATING	VOLT. RATING	NOM. COIL O.D.	NOM. CORD O.D.	COLOR CODE
650	20	41/36	4	5,000	3/4"	.165"	BLACK OR RED.

ALPHA WIRE CORPORATION

Test Lead Wire

DESCRIPTION:

Single conductor, extra flexible stranded tinned soft annealed copper, separator, color coded rubber insulation, smooth satin finish. Available in black, red. No. 1639 also available in green.

APPLICATIONS:

As test leads in analyzers, oscillators, multi-meters, and all other types of testing apparatus or wherever an extra flexible insulated wire is required. Heavy duty type designed for television, therapeutic equipment, analyzers, oscillators, etc.

Suggested operating temperature: -20°C to $+60^{\circ}\text{C}$.



ALPHA NO.	CONDUCTOR SIZE	NOM. WALL STRAND THICKNESS	VOLTAGE BREAKDOWN	SUGG. WORKING VOLTAGE	NOM. O.D.
1632	20	41/36	.040"	6,000 $\pm$	1500 V .125"
1635	20	41/36	.047"	12,000 $\pm$	3000 V .140"
1636	18	65/36	.045"	20,000 $\pm$	5000 V .140"
1638	18	65/36	.090"	29,000 $\pm$	10000 V .230"
1639	18	65/36	.047"	20,000 $\pm$	5000 V .145"

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

$\pm$ 60 Cycles *Military type specification MIL-W-13169B

E-Z-Strip Lamp Cord

Conductors parallel, stranded extra flexible bare copper, polyvinylchloride jacket overall. Slit in jacket to permit "E-Z" separation. Plastic insulation. 2 conductors. UL listed.



ALPHA NO.	CONDUCTOR SIZE	NOM. WALL STRAND THICKNESS	U/L TYPE	NOMINAL O.D.	STOCK COLORS
1977	18	41/34	.032" SPT-1	.215" x .115"	Brn., Blk., Wh., Gray, Tan
1978	18	41/34	.045" SPT-2	.285" x .150"	Brown
1979	18	41/34	.032" SPT-1	.215" x .115"	Clear

STANDARD SPOOL PUT-UP: 100 FT., 250 FT., 500 FT., 1000 FT.

Measuring and Coiling Machine

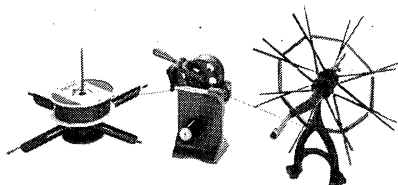
EASY TO USE — HAND OPERATED

The ideal unit for in-plant or distributor use for measuring and dispensing small coils of wire from larger spools or coils.

Set-up consists of a heavy-duty measuring unit with capacity to 10,000 feet. Digital register accurately indicates feet and inches dispensed in large, easy-to-read numerals. Measuring unit has spring-loaded rollers that are easily set for proper tension by adjusting control knob. All type of wire and cable, from small gauge hook-up wire to large cables, may easily and accurately be measured. Unit has capacity up to one inch O.D. wire and cable.

Wire winder has adjustable arms that may be set to the desired size coil. After coiling, arms open to flat position so coil may easily be removed.

Dispensing reel designed to hold all diameters of spools, reels or coils. Alpha No. W-MD-1



Cable Clamps

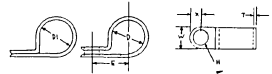
FOR WIRE, CABLE, TUBING — DURABLE, LIGHTWEIGHT, NON-ABRASIVE

ETHYL CELLULOSE CLAMPS: -65°F to $+175^{\circ}\text{F}$.

An all-purpose clamp that has excellent corrosion, moisture and shock-resistant properties. Specially treated with ultra-violet inhibitor compound for long-lasting outdoor as well as inside applications.

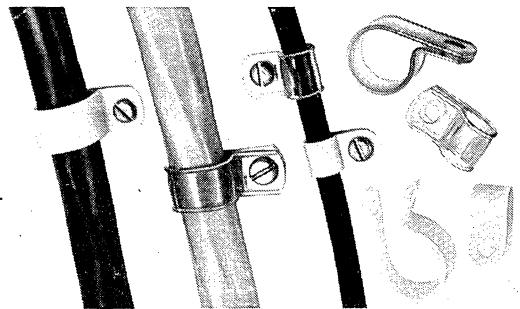
NYLON CLAMPS: MIL-C-21565 (NAS), MIL-P-17091-B, MIL-P-20693, MIL-STD-24E -60°F to $+175^{\circ}\text{F}$.

Ideal for high temperature applications, for application to surfaces subject to vibration or mechanical stress. Inside surfaces are smooth, with rounded edges to prevent jacket chafing and damage.



CELLULOSE	NYLON	D (Inches)	DI (Inches)
CCL-1/8	NCL-1/8	1/8	.115
CCL-3/16	NCL-3/16	3/16	.172
CCL-1/4	NCL-1/4	1/4	.234
CCL-5/16	NCL-5/16	5/16	.297
CCL-3/8	NCL-3/8	3/8	.359
CCL-7/16	NCL-7/16	7/16	.422
CCL-1/2	NCL-1/2	1/2	.484
CCL-9/16	NCL-9/16	9/16	.547
CCL-5/8	NCL-5/8	5/8	.609
CCL-11/16	NCL-11/16	11/16	.672
CCL-3/4	NCL-3/4	3/4	.734
CCL-7/8	NCL-7/8	7/8	.859
CCL-1	NCL-1	1	.984
CCL-1 1/8	NCL-1 1/8	1 1/8	1.102
CCL-1 1/4	NCL-1 1/4	1 1/4	1.227
CCL-1 3/8	NCL-1 3/8	1 3/8	1.352
CCL-1 1/2	NCL-1 1/2	1 1/2	1.477

STANDARD PACKAGE 100-1000 pieces



DIMENSIONS

Clamp Thickness (T)

NCL-1/8 — NCL-1/2
— .050"

All other clamps —
— .060"

Clamp Width (W)

NCL-1/8 — NCL-1/2
— 3/8 All other
clamps — 1/2

Mounting Hole Dia. (H)

Distance from clamp edge
to mounting hole (X) — 7/32"

LAB KITS

An assortment of clamps designed for the laboratory and prototype work.

CCL - KIT - 1 — Sizes 1/8" - 1/2" — 250 pieces
CCL - KIT - 2 — Sizes 9/16" - 1 1/2" — 100 pieces

NCL - KIT - 1 — Sizes 1/8" - 1/2" — 250 pieces
NCL - KIT - 2 — Sizes 9/16" - 1 1/2" — 100 pieces

STOCK COLORS

Cellulose (CCL) Amber,
Nylon (NCL) White, Black

ALPHA WIRE CORPORATION

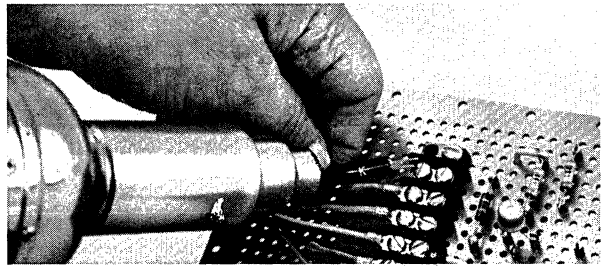
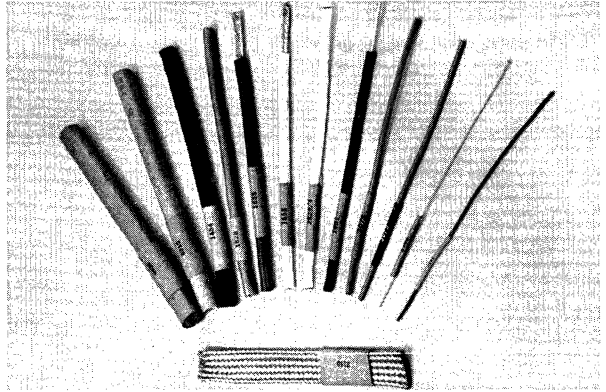
Alpha can supply you with all your tubing needs... Ready to use! Cut & marked!

These catalog pages contain the industry's largest selection of tubing — all available in standard packages from your Alpha stocking distributor. Alpha also offers you the opportunity to save both time and cost by purchasing these same items through your distributor, **specially cut to size or marked.**

Markings are hot stamped in accordance with UL specifications. We can print circuit numbers, letters, company names or any other identifying information you require in choice colors. Automatic precision equipment can cut your tubing to the exact length necessary to simplify your production or installation requirements.

These services are available at nominal charges with prompt delivery. Contact your Alpha sales representative or see your local Alpha distributor for full details.

The chart provided can help you specify your requirements. Use this chart to determine how many feet you will need of any tubing to produce the required number of tubing pieces. For further information or specifications call your Alpha rep.



**Everything in
tubing in all sizes,
colors, packages-
marked & cut to
your specifications**

Estimator Chart for Cut Tubing Pieces

Chart relates the length of tubing required, to the necessary footage to make 1,000 pieces; and to number of individual pieces that can be cut from 1,000' of material.

Length Inches	Ft. Req. per M Pieces	No. Pieces in 1M Ft.	Length Inches	Ft. Req. per M Pieces	No. Pieces in 1M Ft.	Length Inches	Ft. Req. per M Pieces	No. Pieces in 1M Ft.	Length Inches	Ft. Req. per M Pieces	No. Pieces in 1M Ft.
1/8	10.4	96,000	3 1/8	255.2	3,950	6 1/8	505.2	1,975	9 1/8	755.2	1,300
3/8	15.7	64,000	3 3/8	260.5	3,850	6 3/8	510.4	1,950	9 3/8	760.4	1,300
1/4	20.9	48,000	3 1/2	265.7	3,800	6 1/2	515.6	1,925	9 1/2	765.7	1,300
			3 3/4	270.9	3,700	6 3/4	520.8	1,900	9 3/4	770.8	1,275
5/8	26.1	38,400	3 5/8	276.1	3,650	6 5/8	526.0	1,900	9 5/8	776.1	1,275
3/4	31.3	32,000	3 3/2	281.3	3,600	6 3/2	531.3	1,875	9 3/2	781.3	1,275
7/8	36.5	27,500	3 1/2	286.5	3,500	6 1/2	536.5	1,850	9 1/2	786.5	1,250
1/2	41.7	24,000	3 1/2	291.7	3,450	6 1/2	541.7	1,825	9 1/2	791.7	1,250
5/16	46.9	21,400	3 1/2	296.9	3,400	6 1/2	546.9	1,800	9 1/2	796.9	1,250
9/16	52.1	19,200	3 1/2	302.1	3,350	6 1/2	552.1	1,800	9 1/2	802.1	1,225
1/2	57.3	17,500	3 1/2	307.3	3,300	6 1/2	557.3	1,775	9 1/2	807.3	1,225
3/4	62.5	16,000	3 1/2	312.5	3,200	6 1/2	562.5	1,775	9 1/2	812.5	1,225
1/2	67.7	14,800	3 1/2	317.7	3,150	6 1/2	567.7	1,750	9 1/2	817.7	1,200
3/4	73.0	13,750	3 1/2	323.0	3,100	6 1/2	572.9	1,725	9 1/2	823.0	1,200
1/2	78.2	12,800	3 1/2	328.2	3,050	6 1/2	578.1	1,725	9 1/2	828.1	1,200
1	83.4	12,000	4	333.4	3,000	7	583.4	1,700	10	833.4	1,200
1/2	88.6	11,300	4 1/8	338.6	2,950	7 1/8	588.6	1,700	10 1/8	838.6	1,175
1/2	93.8	10,700	4 1/8	343.8	2,800	7 1/8	593.7	1,650	10 1/8	843.7	1,175
1/2	99.0	10,100	4 1/8	349.0	2,850	7 1/8	598.9	1,650	10 1/8	848.9	1,150
1/2	104.2	9,600	4 1/8	354.2	2,800	7 1/8	604.2	1,650	10 1/8	854.1	1,150
1/2	109.4	9,150	4 1/8	363.3	2,775	7 1/8	609.4	1,625	10 1/8	859.4	1,150
1/2	114.6	8,750	4 1/8	364.6	2,725	7 1/8	614.6	1,625	10 1/8	864.5	1,150
1/2	119.8	8,350	4 1/8	369.9	2,700	7 1/8	619.8	1,600	10 1/8	869.8	1,125
1/2	125.0	8,000	4 1/8	375.0	2,650	7 1/8	625.0	1,600	10 1/8	875.0	1,125
1/2	130.2	7,700	4 1/8	380.3	2,625	7 1/8	630.2	1,575	10 1/8	880.2	1,125
1/2	135.5	7,400	4 1/8	385.4	2,575	7 1/8	635.4	1,575	10 1/8	885.4	1,125
1/2	140.7	7,150	4 1/8	390.7	2,550	7 1/8	640.6	1,550	10 1/8	890.6	1,100
1/2	145.9	6,900	4 1/8	395.9	2,525	7 1/8	645.8	1,550	10 1/8	895.9	1,100
1 1/8	151.1	6,650	4 1/8	401.1	2,475	7 1/8	651.0	1,525	10 1/8	901.0	1,100
1 1/8	156.3	6,400	4 1/8	406.2	2,450	7 1/8	656.2	1,500	10 1/8	906.2	1,100
1 1/8	161.5	6,200	4 1/8	411.5	2,425	7 1/8	661.4	1,500	10 1/8	911.5	1,075
2	166.7	6,000	5	416.7	2,400	8	666.7	1,500	11	916.7	1,075
2 1/8	171.9	5,850	5 1/8	421.9	2,350	8 1/8	671.9	1,475	11 1/8	921.8	1,075
2 1/8	177.1	5,650	5 1/8	427.1	2,325	8 1/8	677.1	1,475	11 1/8	927.0	1,075
2 1/8	182.3	5,500	5 1/8	432.3	2,300	8 1/8	682.3	1,450	11 1/8	932.2	1,050
2 1/8	187.5	5,350	5 1/8	437.5	2,275	8 1/8	687.5	1,450	11 1/8	937.4	1,050
2 3/8	192.7	5,200	5 3/8	442.8	2,250	8 3/8	692.7	1,425	11 3/8	942.7	1,050
2 3/8	198.0	5,100	5 3/8	447.9	2,225	8 3/8	698.0	1,425	11 3/8	947.9	1,050
2 3/8	203.2	4,950	5 3/8	453.2	2,200	8 3/8	703.2	1,400	11 3/8	953.1	1,025
2 3/8	208.4	4,800	5 3/8	458.4	2,175	8 3/8	708.4	1,400	11 3/8	958.3	1,025
2 3/8	213.6	4,700	5 3/8	463.6	2,150	8 3/8	713.6	1,400	11 3/8	963.5	1,025
2 3/8	218.8	4,600	5 3/8	468.8	2,125	8 3/8	718.8	1,375	11 3/8	968.7	1,025
2 3/8	224.0	4,500	5 3/8	474.0	2,100	8 3/8	723.9	1,375	11 3/8	973.9	1,000
2 3/8	229.2	4,400	5 3/8	479.2	2,075	8 3/8	729.2	1,350	11 3/8	979.1	1,000
2 3/8	234.4	4,300	5 3/8	484.4	2,050	8 3/8	734.4	1,350	11 3/8	984.3	1,000
2 3/8	239.6	4,200	5 3/8	489.6	2,025	8 3/8	739.6	1,350	11 3/8	989.5	1,000
2 3/8	244.8	4,100	5 3/8	494.8	2,000	8 3/8	744.8	1,325	11 3/8	994.7	1,000
3	250.0	4,000	6	500.0	2,000	9	750.0	1,325	12	1,000	1,000

ALPHA WIRE CORPORATION

Irradiated Polyolefin Shrinkable Tubing

**FIT®-221
POLYOLEFIN**
MIL-I-23053/5
UL RECOGNIZED COMPONENT*
AMS-3636B, 3637B

The single most widely used type of FIT Shrinkable Tubing, FIT-221 is manufactured from irradiated cross-linked polyolefin. FIT-221 is an all-purpose tubing with excellent physical, chemical and electrical properties. It meets the most stringent military and industrial requirements for a highly reliable, thin wall insulation.

CHARACTERISTICS:

High resistance to fungus and chemicals. Self-extinguishing. Will not crack or peel.

APPLICATIONS:

General purpose insulation, strain relief, jacketing material and as component insulation. Material is easily and permanently marked.

SPECIFICATIONS:

Operating Temperature—55° C to +135° C. Shrinkage Temperature: 135° C. Tensile strength: 2500 psi. Ultimate elongation: 400%. Longitudinal shrinkage: 5% maximum. Dielectric strength: 1300 volts/mil. Non-flammable—self-extinguishing. Specific gravity: 1.3 maximum.

Alpha No. and Size	Min. I.D. Before Shrinkage (Inches)	Recovered I.D. After Shrinkage (Inches)	Recovered Nom. Wall Thickness (Inches)	Standard Package			Bulk Pkg. 4' Lgths.
				4' Lengths Total Ftg.	2' Lengths Total Ftg.	6" Lengths Total Ftg.	
FIT-221-3/64"	.046	.023	.016	100'	100'	20'	1,000
FIT-221-1/16"	.063	.031	.017	100'	100'	18'	1,000
FIT-221-3/32"	.093	.046	.020	100'	100'	16'	1,000
FIT-221-1/8"	.125	.062	.020	100'	100'	14'	1,000
FIT-221-3/16"	.187	.093	.020	100'	100'	12'	1,000
FIT-221-1/4"	.250	.125	.025	100'	100'	10'	1,000
FIT-221-3/8"	.375	.187	.025	100'	100'	8'	1,000
FIT-221-1/2"	.500	.250	.025	20'	20'	7'	200
FIT-221-3/4"	.750	.375	.030	20'	20'	6'	200
FIT-221-1"	1.000	.500	.035	20'	20'	4'	200
FIT-221-1 1/2"	1.500	.750	.040	20'	20'	2.5'	200
FIT-221-2"	2.000	1.000	.045	20'	20'	1.5'	200
FIT-221-3"	3.000	1.500	.050	8'	8'	1'	100
FIT-221-4"	4.000	2.000	.055	8'	8'	.5'	100

STOCK COLORS—Black, White, Red, Yellow, Blue, and Clear.

STANDARD PACKAGE FIT-221 Tubing is available ONLY in the specified packages.

When ordering, indicate package desired.

*UL marked tubing available on request.

**MAY BE CUT AND MARKED
TO YOUR SPECIFICATIONS.**

PACKAGED ASSORTMENTS

FIT-221—Assorted sizes and colors per box—contains an assortment of 6" lengths in various sizes and colors. Every length identified as to size and supplied in black, white, red, yellow, blue, and clear.

Alpha No.	Tubing Size Range	Lengths Per Box
FIT-221 MS-1	3/64" thru 3/16"	30
FIT-221 MS-2	1/4" thru 3/4"	16
FIT-221 MS-3	1" thru #4	10

Pre-cut lengths of FIT-221 in the two most popular cut sizes. Packaged in poly bags and boxes. Specify size.

Alpha No. and Size	No. Cut Pcs. 1/2" or 1"	Alpha No. and Size	No. Cut Pcs. 1/2" or 1"
FIT-221-3/64"	1000	FIT-221-3/8"	1000
FIT-221-1/16"	1000	FIT-221-1/2"	100
FIT-221-3/32"	1000	FIT-221-3/4"	100
FIT-221-1/8"	1000	FIT-221-1"	100
FIT-221-3/16"	1000	FIT-221-1 1/2"	100
FIT-221-1/4"	1000	FIT-221-2"	100

ALPHA WIRE CORPORATION

Irradiated Vinyl Shrinkable Tubing

**FIT-105
VINYL**

MINIMAL LONGITUDINAL SHRINKAGE MIL I-23053/2, AMS 3582

A specially formulated polyvinylchloride tubing, that is mechanically strong, extremely flexible and significantly different from non-irradiated heat shrinkable tubing. Unlike non-irradiated PVC tubing, FIT-105 shrinks evenly and will not split when shrunk. Non-irradiated tubing has a much greater waste factor, with longitudinal shrinkage approximately 20%. FIT-105 will shrink less than 10% of its original length.

CHARACTERISTICS:

Extremely flexible. Will not cold flow or melt. Easily marked.

SHRINKAGE RATIO:

To 50% of original size (2:1) when temperature of 175°C (347°F.) is applied.

Controlled shrinkage within seven seconds at 166°C (325°F.)

LONGITUDINAL SHRINKAGE

Less than 10%.

APPLICATIONS:

Jacketing of cable harnesses, insulation and covering of components, bus bar insulation, tab disconnects; jacketing of cable cores with many of the qualities of the finest extruded plastic jackets.

SPECIFICATIONS:

Temperature operating range: -35°C. to +105°C. Minimum shrink temperature: 175°C. Tensile Strength: 2600 psi. Elongation: 250%. Dielectric strength: 750 volts/mil. Flame resistance: Non-burning. Fungus resistant. Fluid Resistant to: Hydrocarbons, solvents, aqueous solutions, acids, bases.

DIMENSIONS CHART

Alpha No. and Size	Minimum I.D. Before Shrinking (Inches)	Recovered I.D. After Shrinking (Inches)	Nominal Wall Thickness (Inches)	Standard Put-up (Feet)
FIT-105-3/64	.046	.023	.020	25, 100, 500
FIT-105-1/16	.062	.031	.020	25, 100, 500
FIT-105-3/32	.093	.046	.020	25, 100, 200
FIT-105-1/8	.125	.062	.025	25, 100, 200
FIT-105-3/16	.187	.093	.025	25, 100, 200
FIT-105-1/4	.250	.125	.025	25, 100, 200
FIT-105-3/8	.375	.187	.030	25, 100, 200
FIT-105-1/2	.500	.250	.030	25, 100
FIT-105-3/4	.775	.375	.035	25, 100
FIT-105-1	1.000	.500	.040	25, 100
FIT-105-1-1/2	1.500	.750	.045	25, 100
FIT-105-2	2.000	1.000	.050	10, 25, 50

Stock Color: Black.

Long Lengths—Packaging: Maximum Three Lengths Per Put-Up.

PACKAGED ASSORTMENTS

FIT-105-MS—Assorted sizes per box—contains an assortment of 6" lengths in various sizes. Every length identified as to size and supplied in black only.

Alpha No.	Tubing Size Range	Lengths Per Box
FIT-105-MS-1	3/64" thru 1/4" (6 sizes)	10 lengths per size (60 lengths)
FIT-105-MS-2	3/8" thru 1" (4 sizes)	10 lengths per size (40 lengths)

**MAY BE CUT AND MARKED
TO YOUR SPECIFICATIONS.
SEE PAGE 3.**

ALPHA WIRE CORPORATION

Shrinkable Cable and Connector Sleeves

FIT-700

ASTM-D 2671

FIT-700 sleeves are made with an inner pre-coating of moisture-resistant mastic. When heated, the tubing shrinks down while the mastic flows to totally encapsulate the wire splice or connector and the cable insulation.

Two types available: **Standard Wall Sleeves**—used in most general applications where wall thickness is adequate—for use up to cable rated at 600 volts. **Heavy wall sleeves**—for applications where extra mechanical protection or minimum wall thickness is needed or where Western Underground Specifications must be met.

CHARACTERISTICS:

Tough—ideal for URD direct burial installations. Provides exceptional mechanical protection. Excellent electrical insulation and environmental sealing. Protects against moisture penetration. Corrosion resistant.

SHRINKAGE RATIO:

To 1/3 of original size when temperature of 132°C. (275°F.) is applied.

APPLICATIONS:

Protection of underground or overhead cables, splices, crab joints, distribution assemblies, coaxial cables, telephone connectors. Usage in many applications having large diameter differences between cable OD's and connector OD's.

SPECIFICATIONS:

Temperature operating range: -40°C. to +135°C. Minimum shrink temperature: 132°C. (275°F.) Tensile strength: 2400 psi. Dielectric strength: 300 volts/mil.

STANDARD WALL SLEEVES

Alpha No.	Min. I.D. Expanded (Inches)	Max. Reg. I.D. (Inches)	Nom. Reg. Wall Thickness (Inches)	Std. Lengths (Inches)
FIT-700-1	.750	.250	.075	6-9-12
FIT-700-2	1.300	.400	.080	6-9-12
FIT-700-3	1.500	.500	.080	6-9-12
FIT-700-4	2.000	.750	.080	9
FIT-700-5	2.750	1.000	.080	6-12

HEAVY WALL SLEEVES

Alpha No.	Min. I.D. Expanded (Inches)	Max. Reg. I.D. (Inches)	Nom. Reg. Wall Thickness (Inches)	Std. Lengths (Inches)
FIT-700-21	.750	.220	.110	6-9-12
FIT-700-22	1.200	.300	.170	6-9-12
FIT-700-23	1.500	.500	.170	6-9-12
FIT-700-24	2.000	.600	.170	6-9-12
FIT-700-25	3.300	1.000	.170	6-12
FIT-700-26	4.500	1.500	.170	6-12

Stock Color: Black.

STANDARD PACKAGE
Packaged in Boxes,
With One Size Per Box

Length of Sleeve	No. Lengths Per Pkg.
6"	12
9"	8
12"	6

ASSORTMENT

FIT-700 MS-1

10—6" lengths including all sizes of **standard wall** sleeves

FIT-700 MS-2

10—6" lengths including all sizes of **heavy wall** sleeves

Irradiated Polyolefin Adhesive-Lined Shrinkable Tubing

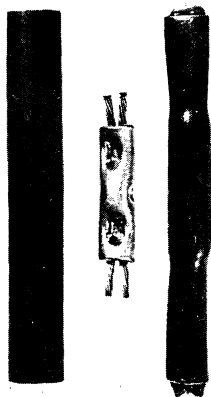
FIT-750
ADHESIVE LINED POLYOLEFIN

For Sealing, Protecting Electronic Components and Splices

FIT-750 is a newly developed polyolefin tubing with a specially designed adhesive lining that melts as the tubing is shrunk. The thermoplastic adhesive adheres to a wide variety of plastic, rubber and metal surfaces. When heated to 121°C, the tubing shrinks to one-half of its supplied size while the adhesive melts and completely coats the object.

CHARACTERISTICS: Protects parts from moisture and corrosion.

SPECIFICATIONS: Tubing—Tensile strength: 1500 psi. Elongation: 200% minimum. Low temperature flex: -55°C. Heat aging: 336 hr/175°C, 150% elongation. Dielectric strength: 500 volts/mil. Fungus resistance: Does not support growth. Water absorption: 24 hr/25°C, 0.5% maximum. Adhesive—Peel strength: Polyethylene, 20 lb/in. width; Neoprene, 10 lb/in. width; PVC, 30 lb/in. width; Lead, 5 lb/in. width; Steel, 15 lb/in. width; Thickness applied, .005 in.



ALPHA WIRE CORPORATION

Alpha No. and Size	Supplied Diameter (Inches)	Recovered Diameter (Inches)	Recommended Wall Thickness	Standard Package 4' Length
FIT-750-1/4	.250	.125	.025	100'
FIT-750-3/8	.375	.187	.025	100'
FIT-750-1/2	.500	.250	.025	100'
FIT-750-3/4	.750	.375	.030	100'
FIT-750-1	1.000	.500	.035	100'
FIT-750-1-1/2	1.500	.750	.040	100'

Stock Color: Black.

FIT-300 SURFACE IRRADIATED POLYOLEFIN

MIL-I-23053/4, AMS 3664

OUTER WALL AREA SHRINKS—INNER WALL AREA MELTS

A unique one piece, surface irradiated heat shrinkable tubing made from irradiated cross-linked polyolefins upon heating. As the inner area of the wall melts, and is forced into crevices and interstices the outer area of the tubing wall shrinks. Upon cooling, the entire mass becomes a rigid, tough homogenous molding.

CHARACTERISTICS:

Semi-rigid. Encapsulates. Moisture-proofs.

SHRINKAGE RATIO:

As high as 6 to 1, shrinks when temperature of 135°C (275°F) is applied. Less than 10% longitudinal shrinkage.

APPLICATIONS:

Moisture-proof encapsulation of components, electrical cable junctions and splices; mechanical shield for covering rough surfaces; vibration shield.

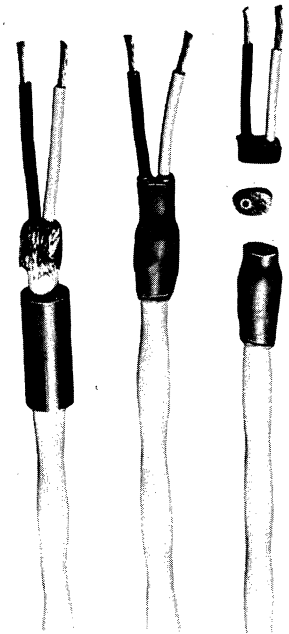
SPECIFICATIONS:

Temperature Operating Range: -55°C to +110°C. Minimum Shrink Temperature: +135°C. Tensile strength: 2,500 psi, Elongation: 400%. Dielectric strength: 1,100 volts/mil. Flame Resistance: Not flame retardant. Fluid Resistance: Hydrocarbons, solvents, aqueous solutions, acids, bases.

DIMENSIONS CHART

Alpha No. and Size	Min. I.D. Before Shrinkage (Inches)	Recovered Max. I.D. After Shrinkage (Inches)	Nominal Recovered Tot. Wall Thickness (Inches)	Nominal Recovered Meltable Wall Thickness (Inches)	Standard Packages		Stock Colors
					4' Lgths. Total Footage	6' Lgths. Total Footage	
FIT-300-1/8"	.125	.023	.038	.020	100'	7'	Brown, Black
FIT-300-3/16"	.187	.060	.043	.025	100'	6'	Slate, Black
FIT-300-1/4"	.250	.080	.047	.027	100'	5'	White, Black
FIT-300-3/8"	.375	.135	.050	.030	100'	4'	Red, Black
FIT-300-1/2"	.500	.195	.055	.035	20'	3'	Blue, Black
FIT-300-3/4"	.750	.313	.065	.040	20'	2'	Yellow, Black
FIT-300-3/10"	.300	.050	.100	.065	100'	2'	Blue, Black

*Heavy walled tubing for use where a large volume of meltable material is needed.



MAY BE CUT AND MARKED TO YOUR SPECIFICATIONS.

FIT-600 NEOPRENE

MIL R-46846 TYPE 1, CLASS 1

MIL I-23053/1, AMS 3623

A highly flexible, durable, heavy wall, heat shrinkable neoprene tubing. Manufactured from a specially formulated neoprene that provides a unique combination of outstanding physical properties.

CHARACTERISTICS:

Rugged—highly abrasion resistant. Shrinks to approximately 50% size. Will not split or crack when shrunk over irregularly shaped objects. Inert.

SHRINKAGE RATIO:

To approximately 50% of original size when temperature of 175°C. (346 F.) is applied. Less than 10% longitudinal shrinkage.

APPLICATIONS:

Fabrication of in-house short-run cables and harnesses, prototypes, repairs, and where special protection from abrasion is required over individual wires or jacketed cables.

SPECIFICATIONS:

Minimum shrink temperature: 175°C. (346°F.) Tensile strength: 1,800 psi. Elongation: 250%. Dielectric strength: 300 volts/mil. Self-extinguishing. Resistant to fungus, chemicals, solvents.

DIMENSIONS CHART

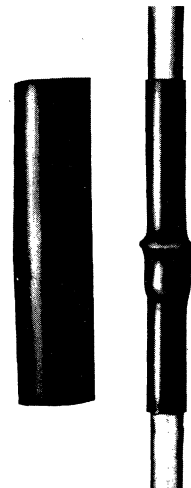
Alpha No. and Size	Minimum I.D. Before Shrinkage (Inches)	Recovered I.D. After Shrinkage (Inches)	Nominal Wall Thickness (Inches)	Standard Put-up (Feet)
FIT-600-1/4	.250	.143	.035	25.100
FIT-600-3/8	.375	.214	.040	25.100
FIT-600-1/2	.500	.286	.048	25.100
FIT-600-5/8	.625	.375	.052	25.100
FIT-600-3/4	.750	.428	.057	25.100
FIT-600-7/8	.875	.500	.065	25.100

Alpha No. and Size	Minimum I.D. Before Shrinkage (Inches)	Recovered I.D. After Shrinkage (Inches)	Nominal Wall Thickness (Inches)	Standard Put-up (Feet)
FIT-600-1	1.00	.570	.070	25.100
FIT-600-1-1/4	1.25	.714	.087	25.100
FIT-600-1-1/2	1.50	.857	.095	25.100
FIT-600-1-3/4	1.75	1.00	.107	25.100
FIT-600-2	2.00	1.14	.110	25.100
FIT-600-3	3.00	1.71	.125	25.50

PACKAGED ASSORTMENTS
Assorted Sizes of 6" Lengths

Alpha No.	Tubing Size Range	Lengths Per Box
FIT-600 MS-1	1/4"-7/8"	12
FIT-600 MS-2	7/8"-3"	12

Stock Color: Black.



ALPHA WIRE CORPORATION

Heat Shrinkable Tubing

TERMINAL SLEEVES SHRINKS AND MELTS

One Size Fits Most Applications / 4½ to 1 Shrinkage Ratio
Meltable Inner Wall Encapsulates Terminal in Tough Moisture-proof Sleeve

FIT-521

FIT-521 is a flame-retardant polyolefin tubing that has been selectively cross-linked. When heat of 135°C is applied, the inner wall melts while the outer wall shrinks down. As a result, terminal is completely encapsulated and insulated in a hard, tough, molding. Because of its enlarged shrinkage ratio, FIT-521 may be used over irregularly shaped objects and easily slips over most common wire terminals, including ring, spade and lug types.

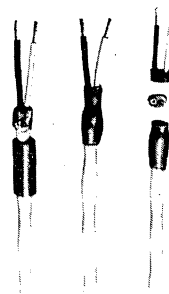
STANDARD PACKAGE					
4' LENGTHS			CUT PIECES		
Tot. Ftg.	No. Lgths.	½" Lgth. Tot. Ftg.	No. Pieces	1" Lgth. Tot. Ftg.	No. Pieces
100'	25	25	600	25	300

CHARACTERISTICS

Tensile Strength, 1500 psi
Ult. Elongation, 200 min.
Spec. Gravity, 1.35 max.
Low Temp. Flex., no cracking at -55°C
Flammability, ASTM - 876
Fungus, Solvent, Oil and Water Resistant

DIMENSIONS

Min. Expanded I.D. as Supplied, .315"
Max. Recovered I.D., .070"
Longitudinal Shrinkage, 15% max.
Standard Color, black
Nom. Rec. Wall, .055"



SEMI-RIGID TUBING

UL — SAE — AMS LISTED / For Maximum Strength At All Stress Points / MIL-1-23053/6

FIT-295

Alpha FIT-295 Shrinkable Tubing is designed to provide maximum mechanical strength at stress or connection points. An extremely strong, heavy wall, abrasion-resistant, extruded tubing FIT-295 is supplied in expanded form and easily slips over the object to be covered.

When a temperature of approximately 275°F (135°C) is applied, Alpha FIT-295 immediately returns to its predetermined size (approximately ½ smaller) and forms a permanent tight-fitting mechanical bond. Longitudinal shrinkage is less than 5% when completely recovered.

Controlled shrinkage to the correct predetermined size takes place within seven seconds at 275°F to 300°F.

DIMENSIONS CHART — Stock Color: Black

ALPHA No.	Size	(Dimen. in Inches)			(Dimen. in Feet)	
		Min. I.D. Before Shrink-ing	Recov'd I.D. Shrink-ing	Nom. Thick.	Standard Pkg. 4' Lgths. Tot. Ftg.	6" Lgths. Tot. Ftg.
FIT-295-¼	¼	.046	.023	.020	100	20
FIT-295-⅓	⅓	.063	.032	.020	100	18
FIT-295-½	½	.093	.045	.020	100	16
FIT-295-⅝	⅝	.125	.063	.020	100	14
FIT-295-¾	¾	.187	.093	.025	100	12
FIT-295-1	1	.250	.125	.025	100	10
FIT-295-1½	1½	.375	.187	.030	100	8
FIT-295-2	2	.500	.250	.030	20	7

PACKAGED ASSORTMENTS

FIT-295-MS — Contains an assortment of 6" lengths in all sizes. Every length identified as to size.

ALPHA No.	Tubing Size Range	Lengths Per Box
FIT-295-MS-1	¼" thru 1½" (8 sizes)	5 lengths per size (40 lengths)



TERMINAL INSULATION / 4 SIZES FIT MOST CONNECTORS / UL LISTED

Shrinks 2.3 to 1 (58% Shrinkage) / 125°C 600 Volts / Four Sizes Fit Most Electrical Connectors

FIT-200 is an irradiated semi-rigid industrial grade polyolefin that is designed primarily as a strain relief and insulation for electrical terminals of all types. FIT-200 is available in black only.

Because of its 58% shrinkage ratio, the four sizes of FIT-200 will easily fit over most of the common electrical terminations in use today.

FIT-200 shrinks at a temperature of 275°F to 300°F. Longitudinal shrinkage is 10% maximum, FIT-200 provides excellent insulation and mechanical relief and may be easily marked or cut to size.

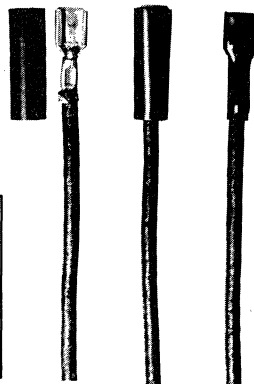
Available in 4' Lengths — 6" Lengths or ready to use pre-cut 1" pieces.

FIT-200

DIMENSIONS CHART

ALPHA No.	(Dimen. in Inches)			Recommended Terminal Sizes (Inches)		Standard Pkgs. (Dimen. in Feet)		
	Min. Expanded I.D.	Max. Recov'd I.D.	Nom. Recov'd Wall	Ring, Spade Male Disconnect Width Up To	Female Disconnect	4' Lgths. Tot. Ftg.	6" Lgths. Tot. Ftg.	Cut Pieces 1" Lgths. Tot. Ftg.
FIT-200-1	.220	.095	.025	.220	⅜	100	12	15
FIT-200-2	.300	.125	.025	.300	⅜	100	10	12
FIT-200-3	.350	.150	.027	.350	⅜	100	8	10
FIT-200-4	.460	.200	.030	.460	⅜	20	7	8

PACKAGED ASSORTMENTS: FIT-200-MS-1, 120, 1" cut pieces, all sizes — FIT-200-MS-2, 60, 6" lengths, all sizes



ALPHA WIRE CORPORATION

Heat Shrinkable Tubing

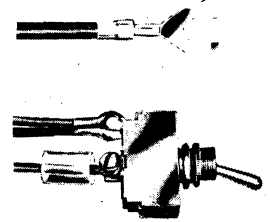
IRRADIATED KYNAR TUBING
MIL-I-23053-4 / UL, SAE, AMS Listed

High Temperature Tubing. Clear and non-flammable. A tough, thin wall tubing with outstanding cut-through and abrasion resistance. Semi-rigid polyvinylidene fluoride.

FIT-350

DIMENSIONS CHART — Stock Color: Clear					
ALPHA No.	(Dimen. in Inches)			Standard Pkg. 4' Lgths. 8' Lgths. Tot. Ftg. Tot. Ftg.	
	Minimum I.D. Before Shrinking	Recovered I.D. After Shrinking	Recovered Nom. Wall Thickness		
FIT-350-3/4	.046	.023	.010	100	16
FIT-350-3/8	.063	.031	.010	100	14
FIT-350-3/32	.093	.046	.010	100	12
FIT-350-1/8	.125	.062	.010	100	10
FIT-350-1/4	.187	.093	.010	100	8
FIT-350-3/16	.250	.125	.012	100	6
FIT-350-1/8	.375	.187	.012	100	4
FIT-350-1/2	.500	.250	.012	20	2
FIT-350-3/4	.750	.375	.017	20	1
FIT-350-1	1.000	.500	.019	20	.5

Standard Package: FIT-350 tubing is available only in the specified packages. When ordering, indicate package desired (6" or 4').

**HIGH TEMPERATURE TEFLON**
— CONFORMS TO: MIL-I-23053/12

Continuous Operating Range — 67°C, +250°C / Outstanding Chemical and Solvent Resistance
Non-Flammable / High Mechanical Strength and Lowest Coefficient of Friction

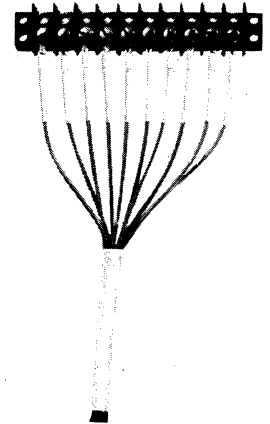
FIT-500 heat shrinkable tubing has the same high resistance to chemical and corrosive agents as ordinary Teflon tubing (Alpha TFI-200 and TFI-250). It is non-burning non-corrosive and has excellent electrical characteristics that remain stable throughout its electrical range.

FIT-500

When a temperature of 327°C is applied to FIT-500, the tubing shrinks to approximately 65% of its supplied size returning to its original pre-determined diameter. Longitudinal shrinkage is less than 10%.

FIT-500 forms a tight, flexible, protective covering for wires, and electronic components, is recommended for use as a mechanical shield and is ideal for friction-proofing.

DIMENSIONS CHART — Stock Color: Natural					
ALPHA No.	(Dimen. in Inches)			Standard Pkg. 2' Lgths. 4' Lgths. Tot. Ftg. Tot. Ftg.	
	Min. I.D. Before Shrinking	Recov'd I.D. After Shrinking	Nom. Recov'd Wall Thick.		
FIT-500-30	.030	.022	.009	100	
FIT-500-28	.035	.025	.009	100	
FIT-500-26	.040	.028	.010	100	
FIT-500-24	.050	.032	.010	100	
FIT-500-22	.055	.037	.010	100	
FIT-500-20	.060	.044	.012	100	
FIT-500-18	.076	.052	.012	100	
FIT-500-16	.093	.063	.012	100	
FIT-500-14	.121	.078	.012	100	
FIT-500-12	.153	.096	.012	50	
FIT-500-10	.191	.116	.012	50	
FIT-500-8	.240	.144	.015	50	
FIT-500-6	.302	.178	.015	20	
FIT-500-4	.370	.224	.015	20	
FIT-500-2	.340	.278	.015	20	
FIT-500-0	.470	.347	.015	20	

**FEP. TEFLON REQUIRES LESS HEAT / 400°C OPERATING TEMPERATURE**
Shrinkage Ratio, 2:1 (50% Shrinkage) / Designed for Use with Heat-Sensitive Components

All of the outstanding electrical, chemical and mechanical advantages of Teflon® tubing are now available in FEP tubing, without the drawback of high shrinkage temperature requirements.

Heat-sensitive components, solid state devices, solder joints, may now be insulated with FEP Teflon® without damage. FEP tubing is applied as a natural, transparent tubing and requires heat of 200°F-350°F to shrink.

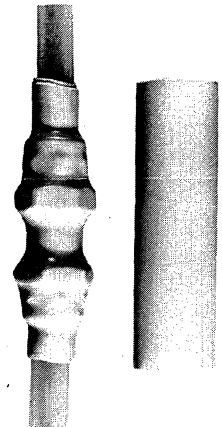
FIT-400**PACKAGED ASSORTMENTS**
Assorted Sizes of 6" Lengths

ALPHA No.	Tubing Size Range	Lengths Per Box
FIT-400-MS-1	24-9	18
FIT-400-MS-2	8-0	18

DIMENSIONS CHART — Stock Color: Natural					
ALPHA No.	Size (AWG)	(Dimen. in Inches)			Standard Pkg. (Feet)
		Expanded Inside Dia.	Recov'd Inside Dia.	Nom. Wall Thick.	
FIT-400-24	24	.032	.027	.008	100
FIT-400-22	22	.037	.032	.008	100
FIT-400-20	20	.046	.039	.008	100
FIT-400-18	18	.061	.049	.008	100
FIT-400-16	16	.076	.061	.009	100
FIT-400-14	14	.093	.072	.009	100
FIT-400-12	12	.116	.089	.009	100
FIT-400-10	10	.142	.114	.010	100
FIT-400-9	9	.159	.124	.010	100
FIT-400-8	8	.181	.143	.010	100
FIT-400-7	7	.198	.158	.011	100
FIT-400-6	6	.227	.180	.011	100
FIT-400-5	5	.249	.198	.011	100
FIT-400-4	4	.292	.226	.011	100
FIT-400-3	3	.312	.249	.011	100
FIT-400-2	2	.367	.280	.012	100
FIT-400-1	1	.400	.311	.012	100
FIT-400-0	0	.442	.349	.012	100

†Lengths

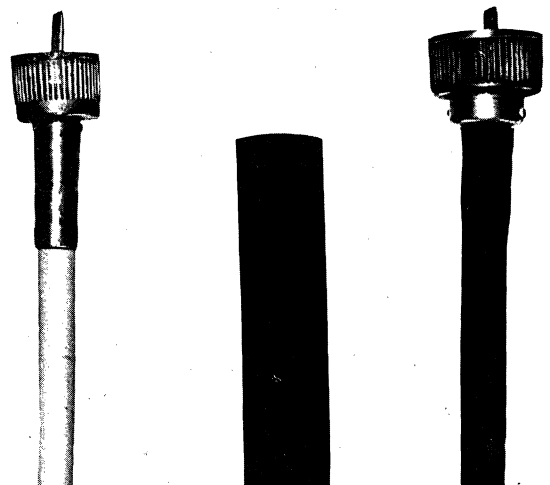
Sizes 24 — 6-random lengths, min. 3' each
Sizes 5 — 0-random lengths, min. 1' each

**NON-IRRADIATED — INDUSTRIAL GRADE — ECONOMICALLY PRICED**

FIT-100 is a flexible, thin-wall PVC tubing that shrinks to 50% of its diameter when heated to 200°F. After shrinking, FIT-100 forms a smooth, tight-fitting mechanical and electrical insulation. FIT-100 has high strength and good dielectric properties and resists most chemicals and oils. The material is resistant to sunlight, moisture and fungus. Longitudinal shrinkage is 20%.

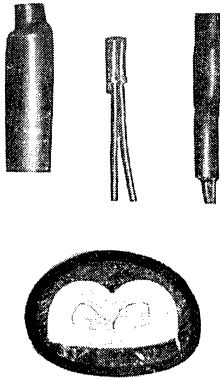
FIT-100**DIMENSIONS CHART — Stock Colors: Black and Clear**

ALPHA No.	(Dimen. in Inches)		
	Expanded I.D.	Recovered I.D.	Recovered Wall Thick.
FIT-100-1/8"	.125	.063	.025
FIT-100-3/16"	.188	.093	.025
FIT-100-1/4"	.250	.125	.025
FIT-100-3/8"	.375	.187	.025
FIT-100-1/2"	.500	.250	.025
FIT-100-3/4"	.750	.375	.025
FIT-100-1"	1.00	.500	.025

**ALPHA WIRE CORPORATION**

Heat Shrinkable Tubing Products — Fit® Caps and Boots

FIT-CAP-P

**FIT-CAP-P COMPLETELY POTS CONNECTIONS / ASSURES ABSOLUTE ELECTRICAL PROTECTION**

Type P potting FIT-CAPS offer an inexpensive method of encapsulating crimped electrical connections. When heated with any Alpha heat tool, the outer jacket quickly shrinks, forcing the meltable inner wall to flow into every irregularity of the crimp.

Absolute electrical protection is assured since it is impossible to produce Type P caps with pinholes or weak areas. Type P caps have proven quick and easy to apply in comparison with tape wrapping and slip-on tubing. P-Caps can be applied in half the time as consumed by other insulating methods.

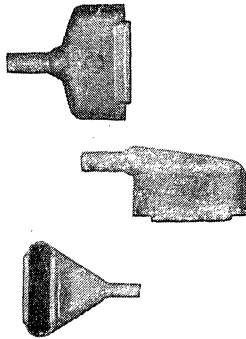
Typical Dielectric Strength — 1100 volts per MIL.

Volume Resistivity — 10^{16} ohm-cm. minimum.

DIMENSIONS CHART — Stock Color: Black — Standard Package: 100, 1000 Pieces

ALPHA No.	Overall Length	(Dimen. in Inches)		Nominal Thickness
		I.D. Before Shrinking	Recovered I.D.	
CAP-P-1/8	.875	.125	.023	.045
CAP-P-3/16	1.060	.187	.060	.062
CAP-P-1/4	1.120	.250	.080	.078
CAP-P-3/8	1.375	.375	.090	.082
CAP-P-1/2	1.500	.500	.090	.100

FIT-BOOTS

**FIT-BOOTS — FOR D-SUBMINIATURE CONNECTORS* SHRINKS TIGHT OVER CONNECTOR SHELLS**

Designed specifically for subminiature rectangular connectors manufactured by ITT-CANNON, CINCH and Amphenol-Borg. FIT-BOOTS replace metal molds and plotting forms used on molded harnesses. FIT-BOOTS provide a strain relief, a convenient handle, and seal out contaminants. The boots are molded of a heat shrinkable, modified polyolefin compound with excellent physical and electrical properties. Any Alpha Heat Gun may be used to shrink boots.

* T.M. I.T.T. — CANNON

DIMENSIONS CHART

ALPHA No.	TOP ENTRY Fits		ALPHA No.	END ENTRY Fits		ALPHA No.	SIDE ENTRY Fits	
	Cannon-Cinch	Amphenol Series-17		Cannon-Cinch			Cannon-Cinch	
FIT-BOOT-1	DE-9	XX09X	FIT-BOOT-6	DE-9		FIT-BOOT-11	DE-9	
FIT-BOOT-2	DA-15	XX15X	FIT-BOOT-7	DA-15		FIT-BOOT-12	DA-15	
FIT-BOOT-3	DB-25	XX25X	FIT-BOOT-8	DB-25		FIT-BOOT-13	DB-25	
FIT-BOOT-4	DC-37	XX37X	FIT-BOOT-9	DC-37		FIT-BOOT-14	DC-37	
FIT-BOOT-5	DD-50	XX50X	FIT-BOOT-10	DD-50		FIT-BOOT-15	DD-50	

IRRADIATED POLYOLEFIN FIT-CAPS

Made of flame resistant, extremely tough, abrasion-resistant polyolefin tubing, the caps shrink and seal the ends of one or more wires, making a firmly encapsulated, moisture-resistant termination. Controlled shrinkage to the correct predetermined size takes place within seven seconds at 275°F to 300°F. Shrinkage Ratio 2:1.

DIMENSIONS CHART — Standard Package: 100, 1000 Pieces

ALPHA No.	(Dimen. in Inches)				
	Min. I.D. Before Shrinking	Recovered I.D. After Shrinking	Nominal Wall Thickness	Nominal Length	Stock Colors
CAP-1	.063	.025	.016	3/4	White
CAP-2	.125	.050	.020	1	Red
CAP-3	.250	.100	.025	1 1/4	Slate
CAP-5	.350	.175	.035	1 3/4	Brown
CAP-4	.500	.250	.040	1 1/2	Black

SELF-ENCAPSULATING FIT-CAPS

Molded caps are made of a molded, heat shrinkable, cross-linked polyolefin with two inserts. The insert at the closed end of the cap melts and flows between the splice forming a moisture proof encapsulation. The insert near the open end acts as a dam, preventing the molten material from flowing out beyond the cap. Cap shrinks and melts at 275°F.

DIMENSIONS CHART — Stock Color: Black — Standard Package: 10, 25 Pieces

ALPHA No.	(Dimen. in Inches)				
	Min. I.D. Before Shrinking	Recovered I.D. After Shrinking	Nominal Inner Wall Thickness	Nominal Outer Wall Thickness	Nominal Length
CAP-11	.160	.080	.013	.040	1.12
CAP-12	.250	.120	.020	.050	1.25
CAP-15	.360	.180	.030	.060	1.50

MOLDED FIT-CAPS

Alpha molded FIT-CAPS are made of molded polyolefin that shrinks when heated (275°F) to a predetermined size and shape. Molded FIT-CAPS provide a tough, abrasion resistant outer covering for wire and cable terminations. Shrinkage ratio, 2:1.

DIMENSIONS CHART — Stock Color: Black — Standard Package: 10, 25 Pieces

ALPHA No.	(Dimen. in inches)			
	Min. I.D. Before Shrinking	Recovered I.D. After Shrinking	Nominal Wall Thickness	Nominal Length
CAP-21	.16	.08	.04	1.12
CAP-22	.25	.12	.05	1.15
CAP-22	.36	.18	.06	1.40
CAP-24	.50	.25	.07	1.87
CAP-25	.75	.37	.08	2.70
CAP-26	1.00	.50	.09	3.50
CAP-27	1.50	.75	.10	4.00
CAP-28	2.00	1.00	.11	4.50

ALPHA WIRE CORPORATION

MOISTURE RESISTANT FEEDTHROUGH SEAL

IRRADIATED HEAT SHRINKABLE TUBING

MEETS MIL-1-81765, MIL-E-917, MIL-STD-454

- Only five sizes covers cables from .38"—2½"
- Reduces installation time and costs

Alpha's FIT-Seals are a molded heat-shrinkable part that provides a moisture-proof, strain-relieved feedthrough with maximum simplicity and reliability.

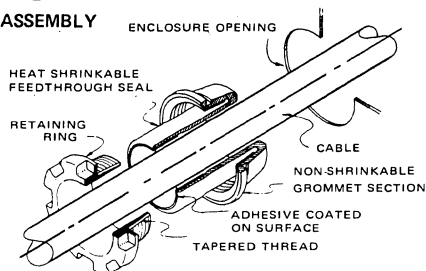
FIT-Seals may be used for ship-board, aircraft, instrument electrical, control box, or cabinet applications. The FIT-Seal replaces more complex feedthroughs that require many sizes to cover a complete range and several parts. Fit-Seals may be used with plastic jacketed or armored cables or piping. The seal contains two parts, a sealing boot and a retaining ring. Installation requires access to only one side of an enclosure and quick shrinkage may be accomplished with any Alpha heat-gun.

Heat causes the molded boot to shrink tightly against the cable while a pre-coated adhesive melts and flows to fill all voids and establish a moistureproof seal.

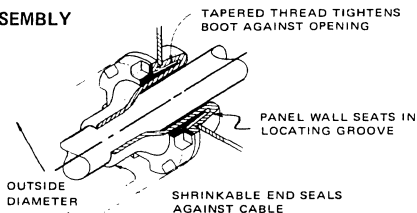
Performance meets or exceeds requirements established for U.S. Navy and Coast Guard Vessels.

FIT-SEAL

BEFORE ASSEMBLY



AFTER ASSEMBLY



ALPHA NO.	CABLE O.D. RANGE (inches)	DRILLED OR PUNCHED HOLE
FIT-SEAL-2	.38 - .70	1.285 ± .030
FIT-SEAL-3	.65 - 1.05	1.750 ± .030
FIT-SEAL-4	1.00 - 1.35	2.055 ± .030
FIT-SEAL-5	1.28 - 1.80	2.930 ± .030
FIT-SEAL-6	1.77 - 2.50	3.808 ± .030

Standard Package: One seal per box

FIT-JACS

Fit-Jacs are preformed shapes that provide excellent mechanical, environmental and electrical protection for solid state devices. A convenient and easy way to protect delicate and valuable components. Fit-Jacs shrink instantly to their predetermined size and configuration when only the extended lower "skirt" is heated. Shrinking may be accomplished by use of hot air gun or soldering iron.

Fit-Jac material remains clear after shrinkage so that printed nomenclature on devices may easily be identified.

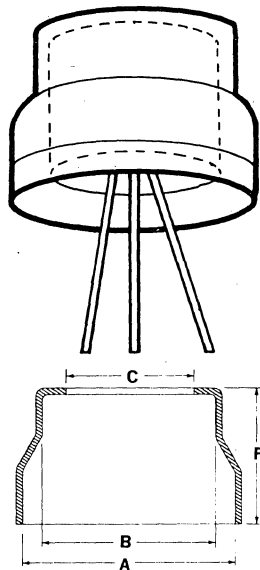
SPECIFICATIONS:

Fit-Jac 1-5

Operating Temp.: 135°C; Dielectric Strength: 1300V/Mil;
Shrink Temp.: 275°F.

Fit-Jac 6, 7

Operating Temp.: 175°C; Dielectric Strength 1500V/Mil;
Shrink Temp.: 350°F.



ALPHA NO.	DESIGNED TO INSULATE	MATERIAL	A +.015	B +.015	C Max.	F +.025
FIT-JAC 1	DIODE-P2-X	FIT-295	.410	.290	.215	.400
FIT-JAC 2	JEDEC TO-5	FIT-295	.410	.335	.250	.345
FIT-JAC 3	JEDEC TO-18	FIT-295	.255	.200	.150	.260
FIT-JAC 4	JEDEC TO-39	FIT-295	.410	.325	.250	.250
FIT-JAC 5	JEDEC TO-99	FIT-295	.410	.335	.250	.265
FIT-JAC 6	JEDEC TO-5	FIT-350	.410	.335	.250	.345
FIT-JAC 7	JEDEC TO-18	FIT-350	.255	.200	.150	.260

Standard Package: 100 pieces

FIT-KITS

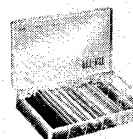
THE IDEAL R & D, OR PROTOTYPE SAMPLERS

FIT-KIT-1

Contains more than 70 - 6" lengths of 7 widely used types of Fit-Tubing in a variety of colors. A compartmented clear plastic box allows easy storage and quick identification. KIT-1 includes lengths of FIT-105, FIT-221, FIT-295, FIT-300, 350, FIT-CAPS and FIT MARKERS. Box measures 6½" x 11" x 2".

FIT-KIT-2

Contains all the items in FIT-KIT-1 plus 6" lengths of FIT-200, FIT-400, FIT-500, FIT-600, FIT-700, and 1" cut pieces of FIT-200 and FIT-521. This kit is the complete engineering, prototype, or laboratory inventory of all Alpha Fit-Tubing products. KIT-2 consists of two 6½" x 11" x 2" compartmented clear plastic boxes packed in cardboard sleeve.

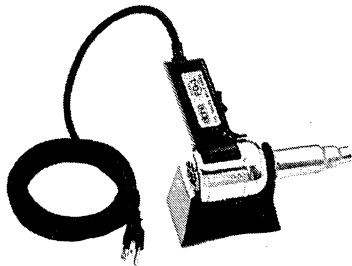


ALPHA WIRE CORPORATION

Miniature Hot Air Gun FG-1

A new miniature heat gun that has been developed for shrinking all fit tubing. A durable, electric motor driven unit that delivers a high volume of air to the nozzle. Easily replaceable heat elements, 3 position rocker switch. Lightweight — Use as bench or hand unit. Heating element, part no. HS-1 is easily replaced.

AMPERAGE RATING — 7
OPERATING VOLTAGE — 115 AC
WEIGHT OF GUN — 1½ lbs.

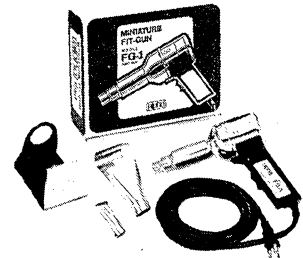
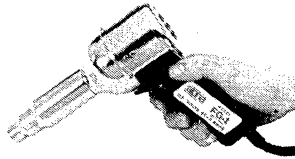


TYPICAL TEMPERATURES

175°C (347°F) without adapter
205°C (401°F) with adapter only
230°C (446°F) with tubing reflector

Temperatures will vary with fluctuations in line voltage.

Operation: For optimum shrinking, an initial 60-second warm-up time is recommended. For longer element life, run 30-seconds with cooling on, before switching gun off.



Hot Air Gun

**TURBO FAN — PROVIDES TEMPERATURES UP TO 1000°F. HG-1 TO 500° F
HG-2 750° TO 1000°F.**

DESCRIPTION:

Flameless, quiet operating, hot air torches that may be used for portable operations or secured permanently to a bench by means of a mounting bracket.

Heavy duty construction to withstand continuous operation use, the HG-1 is the recommended tool for shrinking ALL FIT tubing, except FIT 500 Teflon tubing. Both have adjustable air intake to control temperature and a double jacketed housing of die cast aluminum. Equipped with an 8 ft. neoprene jacketed 3-wire cord and plug and adaptor for 2 prong receptacle.

HG-1 & HG-2

SPECIFICATIONS:	
Voltage	115v, AC/DC
Amperage	14 amp
Air Volume	35 CFM at 3000 FPM velocity
Overall height	8"
Nozzle length	4"
Overall length	11"
Nozzle diameter	1½"
Base plate	5¾" each side (triangular shaped)
Power cord	8' neoprene jacketed 3 conductor cord with adaptor for 2 prong receptacle.

Hot Air Pencil FG-4

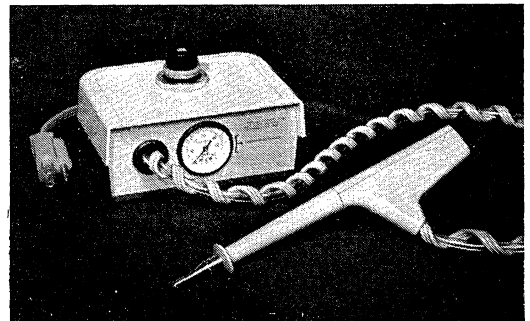
CONTROLS AIRFLOW TEMPERATURE, VELOCITY AND DIRECTION

Designed specifically for precise selective heating of smaller diameter tubing and sleeves. Heat may be concentrated exactly where it is required resulting in labor saving installation and repair.

Allows operator to work in crowded circuit areas without damaging heat-sensitive components and wire with a minimum of fatigue. Utilizes factory or shop compressed air supply.

Unit complete with stand, regulator, needle point tip, sleeve reflector, and tubing reflector.

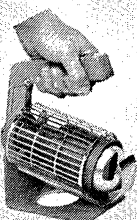
Input Power — 120 VAC, 4 AMP.
Airflow — 60 PSIG MIN., 4 CFM.



HOT AIR PENCIL FG-4

Infra-Red Heat Gun FG-5

**SHRINKS TUBING SAFELY — IN SECONDS!
UTILIZES INFRARED ENERGY — NO MOVING PARTS — NOISELESS**



Used for all shrinkable tubing products. Just press the switch and a burst of infrared energy shrinks tubing in seconds. May be used as a hand gun or as a permanent bench tool. Ellipsoidal reflector focuses heat from a quartz iodine lamp onto the tubing. Most of visible light is optically filtered to eliminate eyestrain. Reflectors designed to allow operator to observe the entire shrinking process, minimizing faulty installation.

The gun is noiseless, light-weight and eliminates annoying heat buildup. Unit comes with easily interchangeable tubing reflectors and small sleeve reflector. Replacement parts are readily available.

Input Power — 105-120 VAC, 50-60 HZ, 4.2 AMP.
Normal Lamplife — More than 1000 hours (intermittent).
Weight — 1.6 lbs.

Flame Torch Kit FG-10

**IDEAL PROPANE TORCH FOR IN-FIELD USE
SUPPLIES SOFT YELLOW FLAME FOR SHRINKING TUBING WITHOUT DAMAGE**

The FG-10 flame torch has been specifically designed for shrinking tubing without scorching or damaging encapsulated material, wire or cable. The FG-10 provides a flame of even temperature without the hard blue flame present in ordinary propane units.

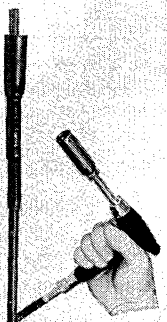
FG-10 Includes:

- 1 — Pistol grip torch.
- 1 — Valve assembly with control knob for attachment to ordinary propane bottle (not supplied). Assembly includes belt clip and torch holding hook.
- 1 — 6' L.P.G. propane hose*.

NOTE:

FG-10 Flame Torch, as all flame devices, should be used only where safety regulations and working conditions permit.

*Other lengths of L.P.G. hose may be used. Available from local suppliers.



ALPHA WIRE CORPORATION

Alpha Zipper Tubing

UL Recognized Component — Easy To Use

Ideal for Prototypes — Short Run Cables

Adds Extra Mechanical Protection

Eliminates Tape-Wrapping or Other "Make-Do" Jacketing Material

Alpha zipper tubing allows you to jacket any group of wires or cables in just seconds. It is the ideal jacketing material for all short run and prototype cable applications. Zipper tubing is ideal for use in the plant, on the job, in the field or anywhere where extra protection or a short run or prototype cable jacket is needed.

Zipper tubing is supplied on a spool and consists of a plastic jacket with matching tracks on each side. When the zipper tubing is formed into a circular shape, the two tracks at each end interlock to form a continuous and circling cable jacket. Closure of zipper tubing is simplified by use of a slide that matches the track and will lock continuously as it is pulled. The end result is a permanent jacket or protective cover.

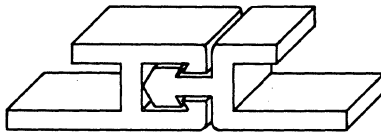
Standard Track

Standard track allows the material to be easily opened at any point to make breakouts, or bring other lines into the cable line being jacketed.



Loc-Trac®

Alpha has developed a new type of track, Loc-Trac®, that provides a permanent, flex-resistant seal. This track will not pop open even when the jacketed material is bent in a U-shape. It requires no sealant or any adhesive to hold together.



Specifications for all types of Alpha Zipper Tubing

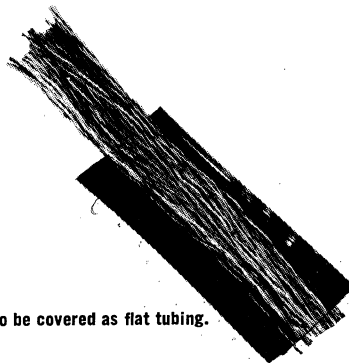
Material:	Polyvinylchloride
Track Thickness (when closed):	Std. .095" Loc-Trac® .150
Dielectric Strength V/mil:	759
Tensile Strength P.S.I.:	3810
Ultimate Elongation:	255%
Operating Temperature Upper Limit:	106°C
Cold Brittleness:	-86°C
Fungus-proof:	Will Not Support Fungus
Flammability:	Self-extinguishing
Lateral Pull Strength (unsealed):	42.7 pounds/inch
Lateral Pull Strength (permanently sealed):	59.8 pounds/inch

Accessories

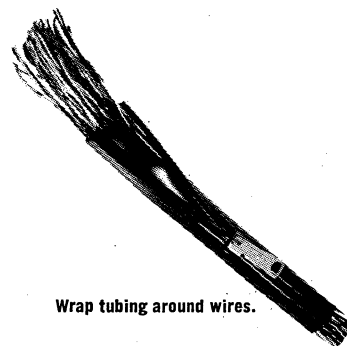
PB-200 (Seals Standard Track Zipper Tubing) —Special Compound Liquid Sealer. Available in sizes: 1 oz., 2 oz., 4 oz., 1 pt., 1 pt., 1 gal. Each container is supplied with a brush for easy application of the sealer. 4 oz. of PB-200 will seal approximately 1000 ft.

AB-295 — Standard Track. **AB-395** Loc-Trac® Metal Sliders. 1 supplied free with every 25 feet. Additional sliders may be ordered separately.

Place wire to be covered as flat tubing.



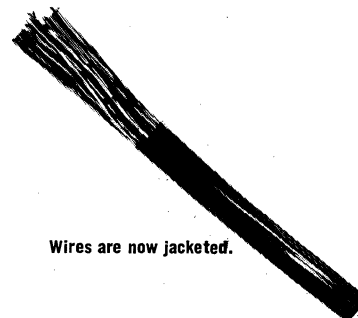
Wrap tubing around wires.



Zip up with slider provided.



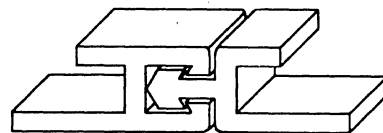
Wires are now jacketed.



ALPHA WIRE CORPORATION

Zipper Tubing

LOC-TRAC®

**Loc-Trac® ZIP-41 All Purpose****MIL-I-631 D/C PVC TUBING—20°C—+105°C .020 WALL THICKNESS**

Alpha No.	Diameter (Inches)	Approx. Flat Width (Inches)	Stock Colors
ZIP-41-1/2"	1/2	2	Clear, Black
ZIP-41-5/8"	5/8	2-3/8	Clear, Black
ZIP-41-3/4"	3/4	2-3/4	Clear, Black
ZIP-41-7/8"	7/8	3-1/8	Clear, Black
ZIP-41-1"	1	3-9/16	Clear, Black
ZIP-41-1-1/8"	1-1/8	3-15/16	Clear, Black
ZIP-41-1-1/4"	1-1/4	4-1/8	Clear, Black
ZIP-41-1-1/2"	1-1/2	4-7/8	Clear, Black
ZIP-41-1-3/4"	1-3/4	5-5/8	Clear, Black
ZIP-41-2"	2	6-3/8	Clear, Black

Alpha No.	Diameter (Inches)	Approx. Flat Width (Inches)	Stock Colors
ZIP-41-2-1/4"	2-1/4	7-1/2	Clear, Black
ZIP-41-2-1/2"	2-1/2	8-1/4	Clear, Black
ZIP-41-2-3/4"	2-3/4	9-1/8	Clear, Black
ZIP-41-3"	3	10	Clear, Black
ZIP-41-3-1/4"	3-1/4	10-3/4	Clear, Black
ZIP-41-3-1/2"	3-1/2	11-1/2	Clear, Black
ZIP-41-3-3/4"	3-3/4	12-1/4	Clear, Black
ZIP-41-4"	4	13	Clear, Black

Standard Put-up: 100 Ft., 50 Ft., 25 Ft.

Loc-Trac® ZIP-41M Heavy Duty**MIL-I-631 D/C PVC TUBING—20°C—+105°C .040 WALL THICKNESS**

Alpha No.	Diameter (Inches)	Approx. Flat Width (Inches)	Stock Colors
ZIP-41M-1/2"	1/2	2	Clear, Black
ZIP-41M-5/8"	5/8	2-3/8	Clear, Black
ZIP-41M-3/4"	3/4	2-3/4	Clear, Black
ZIP-41M-7/8"	7/8	3-1/8	Clear, Black
ZIP-41M-1"	1	3-9/16	Clear, Black
ZIP-41M-1-1/8"	1-1/8	3-15/16	Clear, Black
ZIP-41M-1-1/4"	1-1/4	4-1/8	Clear, Black
ZIP-41M-1-1/2"	1-1/2	4-7/8	Clear, Black
ZIP-41M-1-3/4"	1-3/4	5-5/8	Clear, Black
ZIP-41M-2"	2	6-3/8	Clear, Black

Alpha No.	Diameter (Inches)	Approx. Flat Width (Inches)	Stock Colors
ZIP-41M-2-1/4"	2-1/4	7-1/2	Clear, Black
ZIP-41M-2-1/2"	2-1/2	8-1/4	Clear, Black
ZIP-41M-2-3/4"	2-3/4	9-1/8	Clear, Black
ZIP-41M-3"	3	10	Clear, Black
ZIP-41M-3-1/4"	3-1/4	10-3/4	Clear, Black
ZIP-41M-3-1/2"	3-1/2	11-1/2	Clear, Black
ZIP-41M-3-3/4"	3-3/4	12-1/4	Clear, Black
ZIP-41M-4"	4	13	Clear, Black

Standard Put-up: 100 Ft.

Loc-Trac® ZIP-60 Foil Shielded**ALUMINUM FOIL LAMINATED BETWEEN PVC JACKETS****MIL-I-631 D/C PVC TUBING—20°C—+105°C .020 WALL THICKNESS**

Alpha No.	Diameter (Inches)	Approx. Flat Width (Inches)	Stock Colors
ZIP-60-1/2"	1/2	2	Gray
ZIP-60-5/8"	5/8	2-3/8	Gray
ZIP-60-3/4"	3/4	2-3/4	Gray
ZIP-60-7/8"	7/8	3-1/8	Gray
ZIP-60-1"	1	3-9/16	Gray
ZIP-60-1-1/8"	1-1/8	3-15/16	Gray
ZIP-60-1-1/4"	1-1/4	4-1/8	Gray
ZIP-60-1-1/2"	1-1/2	4-7/8	Gray
ZIP-60-1-3/4"	1-3/4	5-5/8	Gray
ZIP-60-2"	2	6-3/8	Gray

Alpha No.	Diameter (Inches)	Approx. Flat Width (Inches)	Stock Colors
ZIP-60-2-1/4"	2-1/4	7-1/2	Gray
ZIP-60-2-1/2"	2-1/2	8-1/4	Gray
ZIP-60-2-3/4"	2-3/4	9-1/8	Gray
ZIP-60-3"	3	10	Gray
ZIP-60-3-1/4"	3-1/4	10-3/4	Gray
ZIP-60-3-1/2"	3-1/2	11-1/2	Gray
ZIP-60-3-3/4"	3-3/4	12-1/4	Gray
ZIP-60-4"	4	13	Gray

Standard Put-up: 100 Ft.

ALPHA WIRE CORPORATION

Zipper Tubing

STANDARD TRACK



Standard ZIP-31 All Purpose

MIL-I-631 D/C PVC TUBING—20°C—+105°C .020 WALL THICKNESS

Alpha No.	Diameter (Inches)	Approx. Flat Width (Inches)	Stock Colors
†ZIP-31-1/4"	1/4	1-15/16	Clear, Black
†ZIP-31-3/8"	3/8	1-5/8	Clear, Black
ZIP-31-1/2"	1/2	2	Clear, Black
ZIP-31-5/8"	5/8	2-3/8	Clear, Black
ZIP-31-3/4"	3/4	2-3/4	Clear, Black
ZIP-31-7/8"	7/8	3-1/8	Clear, Black
ZIP-31-1"	1	3-9/16	Clear, Black
ZIP-31-1-1/8"	1-1/8	3-15/16	Clear, Black
ZIP-31-1-1/4"	1-1/4	4-1/8	Clear, Black
ZIP-31-1-1/2"	1-1/2	4-7/8	Clear, Black
ZIP-31-1-3/4"	1-3/4	5-5/8	Clear, Black

Alpha No.	Diameter (Inches)	Approx. Flat Width (Inches)	Stock Colors
ZIP-31-2"	2	6-3/8	Clear, Black
ZIP-31-2-1/4"	2-1/4	7-1/2	Clear, Black
ZIP-31-2-1/2"	2-1/2	8-1/4	Clear, Black
ZIP-31-2-3/4"	2-3/4	9-1/8	Clear, Black
ZIP-31-3"	3	10	Clear, Black
ZIP-31-3-1/4"	3-1/4	10-3/4	Clear, Black
ZIP-31-3-1/2"	3-1/2	11-1/2	Clear, Black
ZIP-31-3-3/4"	3-3/4	12-1/4	Clear, Black
ZIP-31-4"	4	13	Clear, Black

Standard Put-up: 25 Ft./50 Ft./100 Ft.

Standard ZIP-31M Heavy Duty

MIL-I-631 D/C PVC TUBING—20°C—+105°C .040 WALL THICKNESS

Alpha No.	Diameter (Inches)	Approx. Flat Width (Inches)	Stock Colors
†ZIP-31M-1/4"	1/4	1-5/16	Clear, Black
†ZIP-31M-3/8"	3/8	1-5/8	Clear, Black
ZIP-31M-1/2"	1/2	2	Clear, Black
ZIP-31M-5/8"	5/8	2-3/8	Clear, Black
ZIP-31M-3/4"	3/4	2-3/4	Clear, Black
ZIP-31M-7/8"	7/8	3-1/8	Clear, Black
ZIP-31M-1"	1	3-9/16	Clear, Black
ZIP-31M-1-1/8"	1-1/8	3-15/16	Clear, Black
ZIP-31M-1-1/4"	1-1/4	4-1/8	Clear, Black
ZIP-31M-1-1/2"	1-1/2	4-7/8	Clear, Black
ZIP-31M-1-3/4"	1-3/4	5-5/8	Clear, Black

Alpha No.	Diameter (Inches)	Approx. Flat Width (Inches)	Stock Colors
ZIP-31M-2"	2	6-3/8	Clear, Black
ZIP-31M-2-1/4"	2-1/4	7-1/2	Clear, Black
ZIP-31M-2-1/2"	2-1/2	8-1/4	Clear, Black
ZIP-31M-2-3/4"	2-3/4	9-1/8	Clear, Black
ZIP-31M-3"	3	10	Clear, Black
ZIP-31M-3-1/4"	3-1/4	10-3/4	Clear, Black
ZIP-31M-3-1/2"	3-1/2	11-1/2	Clear, Black
ZIP-31M-3-3/4"	3-3/4	12-1/4	Clear, Black
ZIP-31M-4"	4	13	Clear, Black

Standard Put-up: 100 Ft.

Standard ZIP—50 Foil Shielded

ALUMINUM FOIL LAMINATED BETWEEN PVC JACKETS

MIL-I-631 D/C PVC TUBING—20°C—+105°C .020 WALL THICKNESS

Alpha No.	Diameter (Inches)	Approx. Flat Width (Inches)	Stock Colors
†ZIP-50-1/4"	1/4	1-5/16	Gray
†ZIP-50-3/8"	3/8	1-5/8	Gray
ZIP-50-1/2"	1/2	2	Gray
ZIP-50-5/8"	5/8	2-3/8	Gray
ZIP-50-3/4"	3/4	2-3/4	Gray
ZIP-50-7/8"	7/8	3-1/8	Gray
ZIP-50-1"	1	3-9/16	Gray
ZIP-50-1-1/8"	1-1/8	3-15/16	Gray
ZIP-50-1-1/4"	1-1/4	4-1/8	Gray
ZIP-50-1-1/2"	1-1/2	4-7/8	Gray
ZIP-50-1-3/4"	1-3/4	5-5/8	Gray

Alpha No.	Diameter (Inches)	Approx. Flat Width (Inches)	Stock Colors
ZIP-50-2"	2	6-3/8	Gray
ZIP-50-2-1/4"	2-1/4	7-1/2	Gray
ZIP-50-2-1/2"	2-1/2	8-1/4	Gray
ZIP-50-2-3/4"	2-3/4	9-1/8	Gray
ZIP-50-3"	3	10	Gray
ZIP-50-3-1/4"	3-1/4	10-3/4	Gray
ZIP-50-3-1/2"	3-1/2	11-1/2	Gray
ZIP-50-3-3/4"	3-3/4	12-1/4	Gray
ZIP-50-4"	4	13	Gray

Standard Put-up: 100 Ft.

†Because of small inside diameter, these sizes cannot be closed by using the slider. The tracks must be closed by manual pressure.
AVAILABLE IN 20 SIZES: 1/4" — 4"

ALPHA WIRE CORPORATION

PVC-105 Polyvinylchloride Plastic TubingUL LISTED ASTMD-876, D-9222 MIL-I-6310 TYPE F, FORM U,
GRADE C, CLASS 1, CATEGORY 1

DESCRIPTION: The superior mechanical, thermal, and electrical properties of Alpha PVC-105, coupled with its economical cost have led to an ever increasing use of this all-purpose insulating material. Another major advantage of Alpha PVC-105 is its high degree of flexibility, which is maintained even under severe environmental conditions.

Rated for temperatures as high as 105°C, PVC-105 has a high dielectric strength that remains unaffected by increasing temperature throughout its range. PVC-105 maintains a high resistance to the agents of heat, oil, chemical corrosion and fungi with no loss in tensile strength, or flexibility. Other features include an exceptional resistance to abrasion and indefinite shelf life.

Alpha PVC-105 is compounded with first quality, non-migratory resinous type plasticizers. Carefully selected stabilizers and modifiers added in the manufacturing process, counteract chemical and environmental degradation. Under adverse conditions Alpha PVC-105 retains its flexibility which permits it to cling to and protect irregular shapes. An unusually simple to handle insulating material, PVC-105 "snakes" well under all environmental conditions.

APPLICATIONS: Designed and manufactured for general electronic, aircraft and electrical applications involving temperatures as high as 105°C. Especially useful to protect wires and cables subject to abrasion or where a flexible tubing with a high degree of resistivity to oil, chemicals or solvents is necessary.

DIMENSIONS CHART**Cut-Pieces**

Pre-cut, ready to use tubing pieces in 1/2" and 1" lengths are available from stock. Cut pieces are available from stock in packages of 100, 500, 1000 pieces. When ordering specify Alpha number, add suffix CP, length of cut piece, 1/2" or 1" and quantity (100, 500, 1000).

ALPHA NO.	SIZE	NOM. INSIDE DIA. (Inch.)	NOM. WALL THICKNESS (Inch.)	STOCK COLORS	STANDARD PUT-UPS
PVC-105/24	24	.022	.013	1-6	100', 1000' Spools
PVC-105/22	22	.027	.012	1-6	100', 1000' Spools
PVC-105/20	20	.034	.016	1-6	100', 1000' Spools
PVC-105/19	19	.038	.016	1-6	100', 1000' Spools
PVC-105/18	18	.042	.016	1-6	100', 1000' Spools
PVC-105/17	17	.047	.016	1-6	100', 1000' Spools
PVC-105/16	16	.053	.016	1-6	100', 1000' Spools
PVC-105/15	15	.059	.016	1-6	100', 1000' Spools
PVC-105/14	14	.066	.016	1-6	100', 500' Spools
PVC-105/13	13	.076	.016	1-6	100', 500' Spools
PVC-105/12	12	.085	.016	1-6	100', 500' Spools
PVC-105/11	11	.095	.016	1-6	100', 500' Spools
PVC-105/10	10	.106	.016	1-6	100', 500' Spools
PVC-105/9	9	.118	.020	1-6	100', 500' Spools
PVC-105/8	8	.133	.020	1-6	100', 500' Spools
PVC-105/7	7	.148	.020	1-6	100', 500' Spools
PVC-105/6	6	.166	.020	1-6	100', 500' Spools
PVC-105/5	5	.186	.020	1-6	100', 500' Spools
PVC-105/4	4	.208	.020	1-6	100', 250' Coils
PVC-105/3	3	.234	.020	1-6	100', 250' Coils

* STOCK COLORS 1—Clear 2—Black 3—White 4—Yellow 5—Red 6—Green

ALPHA NO.	SIZE	NOM. INSIDE DIA. (Inch.)	NOM. WALL THICKNESS (Inch.)	STOCK COLORS	STANDARD PUT-UPS
PVC-105/2	2	.263	.020	1-6	100', 250' Coils
PVC-105/1	1	.294	.020	1,2,3	100', 250' Coils
PVC-105/0	0	.330	.020	1,2,3	100', 250' Coils
PVC-105/1/8"	1/8"	.312	.025	1,2,3	100', 250' Coils
PVC-105/3/8"	3/8"	.375	.025	1,2,3	100', 250' Coils
PVC-105/1/2"	1/2"	.438	.025	1,2,3	100', Coils
PVC-105/1/2" A	1/2"	.500	.025	1,2,3	100', Coils
PVC-105/5/8"	5/8"	.562	.030	1,2,3	100', Coils
PVC-105/3/4"	3/4"	.625	.030	1,2,3	100', Coils
PVC-105/3/4"	3/4"	.750	.035	1,2,3	50', Coils
PVC-105/7/8"	7/8"	.875	.035	1,2,3	50', Coils
PVC-105/1"	1"	1.000	.035	1,2,3	50', Coils
PVC-105/1 1/8"	1 1/8"	1.125	.035	1,2	50', Coils
PVC-105/1 1/4"	1 1/4"	1.250	.040	1,2	50', Coils
PVC-105/1 1/2"	1 1/2"	1.375	.040	1,2	50', Coils
PVC-105/1 3/4"	1 3/4"	1.500	.045	1,2	50', Coils
PVC-105/1 3/4"	1 3/4"	1.750	.055	1,2	50', Coils
PVC-105/2"	2"	2.000	.060	1,2	50', Coils
PVC-105/2 1/4"	2 1/4"	2.250	.065	1,2	50', Coils
PVC-105/2 1/2"	2 1/2"	2.500	.070	1,2	50', Coils

*UL FILE NO. ON REQUEST

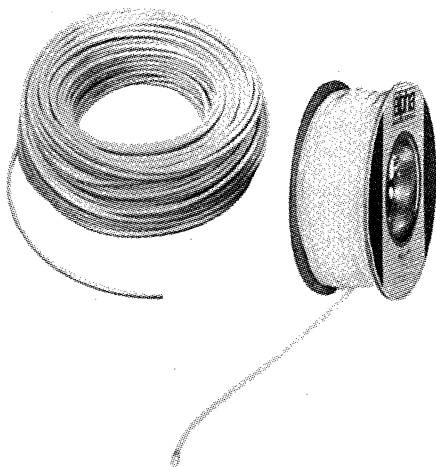
PVC-80 Extruded Low Temperature Vinyl TubingLOW TEMPERATURE VINYL — MIL-I-7444C CLASS I, TYPE I (Clear), TYPE III (Black)
—67.8°C TO +80°C

PVC-80 tubing maintains its flexibility and brittleness resistance to -67.8°C. An ideal insulating material where adverse temperatures and weathering conditions prevail. It is easily marked and cut. Has good corrosion resistance and fungus resistant characteristics.

CHARACTERISTICS: Operating temp. -67.8°C to +80°C. Highly flexible. High cut-through resistance. Flame resistant.

APPLICATIONS: All harnessing, component and cable protection where extreme low temperature conditions prevail.

SPECIFICATIONS: Tensile strength 2000 psi. Min. vol. resistivity 10⁹ ohmcm. Dielectric constant max. at 1 KC—4.5.



Alpha No. and Size (AWG)	Nom. Inside Dia. (Inch.)	Nom. Wall Thick. (Inch.)	STANDARD PUT-UPS	Alpha No. and Size (AWG)	Nom. Inside Dia. (Inch.)	Nom. Wall Thick. (Inch.)	STANDARD PUT-UPS
PVC-80-24	.022	.012	25', 100', 500', 1000'	PVC-80-2	.263	.020	25', 100', 250'
PVC-80-22	.027	.012	25', 100', 500', 1000'	PVC-80-1	.294	.020	25', 100', 250'
PVC-80-20	.034	.016	25', 100', 500', 1000'	PVC-80-0	.330	.020	25', 100', 250'
PVC-80-19	.038	.016	25', 100', 500', 1000'	PVC-80-5/8"	.312	.025	25', 100', 250'
PVC-80-18	.042	.016	25', 100', 500', 1000'	PVC-80-3/8"	.375	.025	25', 100'
PVC-80-17	.047	.016	25', 100', 500', 1000'	PVC-80-1/2"	.438	.025	25', 100'
PVC-80-16	.053	.016	25', 100', 500', 1000'	PVC-80-1/2"	.500	.025	25', 100'
PVC-80-15	.059	.016	25', 100', 500', 1000'	PVC-80-5/8"	.562	.030	25', 50'
PVC-80-14	.066	.016	25', 100', 500'	PVC-80-3/4"	.625	.030	25', 50'
PVC-80-13	.076	.016	25', 100', 500'	PVC-80-3/4"	.750	.035	25', 50'
PVC-80-12	.085	.016	25', 100', 500'	PVC-80-7/8"	.875	.035	25', 50'
PVC-80-11	.095	.016	25', 100', 500'	PVC-80-1"	1.000	.035	25', 50'
PVC-80-10	.106	.016	25', 100', 500'	PVC-80-1 1/8"	1.125	.035	25'
PVC-80-9	.118	.020	25', 100', 500'	PVC-80-1 1/4"	1.250	.040	25'
PVC-80-8	.133	.020	25', 100', 500'	PVC-1 3/8"	1.375	.040	25'
PVC-80-7	.148	.020	25', 100', 500'	PVC-80-1 1/2"	1.500	.045	25'
PVC-80-6	.166	.020	25', 100', 500'	PVC-80-1 3/4"	1.750	.055	25'
PVC-80-5	.186	.020	25', 100', 500'	PVC-80-2"	2.000	.060	25'
PVC-80-4	.208	.020	25', 100', 250'	PVC-80-2 1/4"	2.250	.065	25'
PVC-80-3	.234	.020	25', 100', 250'	PVC-80-2 1/2"	2.500	.070	25'

STOCK COLORS: Clear and Black.

*Spools **Coils

MAY BE CUT AND MARKED TO YOUR SPECIFICATIONS

ALPHA WIRE CORPORATION

Teflon Extruded Tubing

DESCRIPTION: Alpha Teflon Tubing is unmatched by any other type of tubing for use in electrical applications at high frequencies and temperatures. Teflon is rated for continuous operation at 250°C, and retains an exceptional toughness and its flexibility throughout its temperature range.

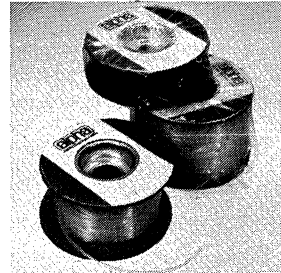
Alpha Teflon Tubing has the further advantage of a high degree of resistance to flexural fatigue and repetitive stresses; coefficient of friction lower than that of any other known solid; and a dielectric constant and power factor lower than that of any other known solid. This tubing will not crack or become brittle during aging.

Because of its resistance to soldering iron temperature, Alpha Teflon Tubing will not shrink back during the soldering

process. Alpha Teflon Tubing will not melt and flow as do conventional thermoplastic materials. At high frequencies, its dielectric strength is many times that of other insulating materials.

Alpha Teflon Tubing is chemically inert, has zero moisture absorption and its insulation resistance properties are unaffected by heat aging or temperature use up to 250°C.

APPLICATIONS: A thin flexible insulation, Alpha Teflon tubing permits a miniaturization and compactness of design never before possible. Invaluable in any application where a high heat resistant, flexible, non-flammable, chemical solvent and corrosion-resistant material is required.



MEETS MIL-I-22129C

AMS 3651, 3653 FED. SPEC. P-403A

THIN WALL TEFLON TUBING (TFT-200)

ALPHA NO.	SIZE	NOM. INSIDE DIA. (Inch.)	NOM. WALL THICKNESS (Inch.)	STOCK COLORS	STANDARD PUT-UPS
TFT-200/30	30	.012	.009	Nat., Blk.,	100' Spools
TFT-200/28	28	.015	.009	Nat., Blk.,	100' Spools
TFT-200/26	26	.018	.010	Nat., Blk.,	100' Spools
TFT-200/24	24	.022	.010	Nat., Blk.,	100' Spools
TFT-200/22	22	.027	.010	Nat., Blk.,	100' Spools
TFT-200/20	20	.034	.012	Nat., Blk.,	100' Spools
TFT-200/19	19	.038	.012	Nat., Blk.,	100' Spools
TFT-200/18	18	.042	.012	Nat., Blk.,	100' Spools
TFT-200/17	17	.047	.012	Nat., Blk.,	100' Spools
TFT-200/16	16	.053	.012	Nat., Blk.,	100' Spools
TFT-200/15	15	.059	.012	Nat., Blk.,	100' Spools
TFT-200/14	14	.066	.012	Nat., Blk.,	100' Spools
TFT-200/13	13	.076	.012	Nat., Blk.,	100' Spools

* RANDOM LENGTHS PACKED IN 100' COILS

ALPHA NO.	SIZE	NOM. INSIDE DIA. (Inch.)	NOM. WALL THICKNESS (Inch.)	STOCK COLORS	STANDARD PUT-UPS
TFT-200/12	12	.085	.012	Nat., Blk.,	100' Spools
TFT-200/11	11	.095	.012	Nat., Blk.,	100' Spools
TFT-200/10	10	.106	.012	Nat., Blk.,	100' Spools
TFT-200/9	9	.118	.015	Nat., Blk.,	100' Coils*
TFT-200/8	8	.133	.015	Nat., Blk.,	100' Coils*
TFT-200/7	7	.148	.015	Natural Only	100' Coils*
TFT-200/6	6	.166	.015	Natural Only	100' Coils*
TFT-200/5	5	.186	.015	Natural Only	100' Coils*
TFT-200/4	4	.208	.015	Natural Only	100' Coils*
TFT-200/3	3	.234	.015	Natural Only	100' Coils*
TFT-200/2	2	.263	.015	Natural Only	100' Coils*
TFT-200/1	1	.294	.015	Natural Only	100' Coils*
TFT-200/0	0	.330	.015	Natural Only	100' Coils*

STANDARD WALL TEFLON TUBING (TFT-250)

Similar in characteristics to TFT-200 (Thin Wall Tubing), but for use in application where additional dielectric values and mechanical strength are necessary.

ALPHA NO.	SIZE	NOM. INSIDE DIA. (Inch.)	NOM. WALL THICKNESS (Inch.)	STOCK COLORS	STANDARD PUT-UPS
TFT-250/24	24	.022	.012	Natural Only	100' Spools
TFT-250/22	22	.027	.012	Natural Only	100' Spools
TFT-250/20	20	.034	.016	Natural Only	100' Spools
TFT-250/19	19	.038	.016	Natural Only	100' Spools
TFT-250/18	18	.042	.016	Natural Only	100' Spools
TFT-250/17	17	.047	.016	Natural Only	100' Spools
TFT-250/16	16	.053	.016	Natural Only	100' Spools
TFT-250/15	15	.059	.016	Natural Only	100' Spools
TFT-250/14	14	.066	.016	Natural Only	100' Spools
TFT-250/13	13	.076	.016	Natural Only	100' Spools
TFT-250/12	12	.085	.016	Natural Only	100' Spools
TFT-250/11	11	.095	.016	Natural Only	100' Spools

* RANDOM LENGTHS PACKED IN 100' COILS

ALPHA NO.	SIZE	NOM. INSIDE DIA. (Inch.)	NOM. WALL THICKNESS (Inch.)	STOCK COLORS	STANDARD PUT-UPS
TFT-250/10	10	.106	.016	Natural Only	100' Spools
TFT-250/9	9	.118	.020	Natural Only	100' Coils*
TFT-250/8	8	.133	.020	Natural Only	100' Coils*
TFT-250/7	7	.148	.020	Natural Only	100' Coils*
TFT-250/6	6	.166	.020	Natural Only	100' Coils*
TFT-250/5	5	.186	.020	Natural Only	100' Coils*
TFT-250/4	4	.208	.020	Natural Only	100' Coils*
TFT-250/3	3	.234	.020	Natural Only	100' Coils*
TFT-250/2	2	.263	.020	Natural Only	100' Coils*
TFT-250/1	1	.294	.020	Natural Only	100' Coils*
TFT-250/0	0	.330	.020	Natural Only	100' Coils*

ALPHA WIRE CORPORATION

TFT 200-250-300-400

Extruded Teflon Tubing (TFE)

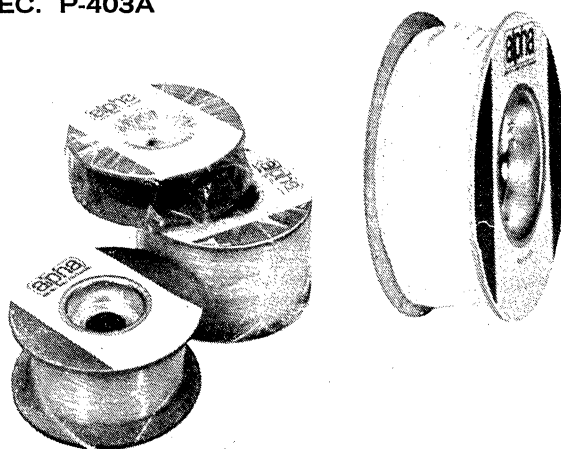
MIL-I-22129C, AMS-3651B, 3655, 3653 — FED. SPEC. P-403A
 -65°C TO +260°C OPERATING TEMPERATURE

Alpha Teflon Tubing offers all the unique thermal, electrical and mechanical properties of Teflon. Teflon Tubing is rated for continuous operation at 260°C and retains an exceptional toughness and flexibility throughout its range. At high frequencies, the dielectric strength of Teflon is many times that of other insulating materials. Teflon Tubing is completely inert and has zero moisture absorption. Standard wall Teflon (TFT-250) has the same characteristics as thin wall tubing (TFT-200) but is used where higher dielectric values and additional mechanical strength is required.

CHARACTERISTICS: Operating temperature, -65°C to +260°C. High dielectric strength. Chemically inert. Zero moisture absorption.

APPLICATIONS: Insulation of components, connectors, all electrical and electronic apparatus requiring high thermal insulation and superior dielectric qualities.

SPECIFICATIONS: Tensile strength 5000-75000 PSI. Completely non-flammable. Min. Vol. Res. 10¹⁷ Ohm-cm. Ultimate elongation — 300-500%. Dielectric strength — 1400 V/Mil. Dielectric constant — 2.2. Abrasion resistance — fair.



TFT-200 THIN WALL

ALPHA NO. AND SIZE	NOM. INSIDE DIA. (INCH.)	NOM. WALL THICK. (INCH.)	STANDARD PUT-UPS	ALPHA NO. AND SIZE	NOM. INSIDE DIA. (INCH.)	NOM. WALL THICK. (INCH.)	STANDARD PUT-UPS	ALPHA NO. AND SIZE	NOM. INSIDE DIA. (INCH.)	NOM. WALL THICK. (INCH.)	STANDARD PUT-UPS
†TFT-200/30	.012	.009	100', 1000'	†TFT-200/16	.053	.012	100', 1000'	‡TFT-200/7	.148	.015	100' Coils*
†TFT-200/28	.015	.009	100', 1000'	†TFT-200/15	.059	.012	100', 1000'	‡TFT-200/6	.166	.015	100' Coils*
†TFT-200/26	.018	.010	100', 1000'	†TFT-200/14	.066	.012	100', 500'	‡TFT-200/5	.186	.015	100' Coils*
†TFT-200/24	.022	.010	100', 1000'	†TFT-200/13	.076	.012	100', 500'	‡TFT-200/4	.208	.015	100' Coils*
†TFT-200/22	.027	.010	100', 1000'	†TFT-200/12	.085	.012	100', 500'	‡TFT-200/3	.234	.015	100' Coils*
†TFT-200/20	.034	.012	100', 1000'	†TFT-200/11	.095	.012	100', 500'	‡TFT-200/2	.263	.015	100' Coils*
†TFT-200/19	.038	.012	100', 1000'	†TFT-200/10	.106	.012	100', 500'	‡TFT-200/1	.294	.015	100' Coils*
†TFT-200/18	.042	.012	100', 1000'	†TFT-200/9	.118	.015	100', 500'	‡TFT-200/0	.330	.015	100' Coils*
†TFT-200/17	.047	.012	100', 1000'	†TFT-200/8	.133	.015	100' Coils*				

STOCK COLORS: †Natural, Black. ‡Natural Only.

*RANDOM LENGTHS PACKED IN 100' COILS.

TFT-250 STANDARD WALL

ALPHA NO. AND SIZE	NOM. INSIDE DIA. (INCH.)	NOM. WALL THICK. (INCH.)	STANDARD PUT-UPS	ALPHA NO. AND SIZE	NOM. INSIDE DIA. (INCH.)	NOM. WALL THICK. (INCH.)	STANDARD PUT-UPS	ALPHA NO. AND SIZE	NOM. INSIDE DIA. (INCH.)	NOM. WALL THICK. (INCH.)	STANDARD PUT-UPS
TFT-250/24	.022	.012	100', 1000'	TFT-250/14	.066	.016	100', 500'	TFT-250/6	.166	.020	100' Coils*
TFT-250/22	.027	.012	100', 1000'	TFT-250/13	.076	.016	100', 500'	TFT-250/5	.186	.020	100' Coils*
TFT-250/20	.034	.016	100', 1000'	TFT-250/12	.085	.016	100', 500'	TFT-250/4	.208	.020	100' Coils*
TFT-250/19	.038	.016	100', 1000'	TFT-250/11	.095	.016	100', 500'	TFT-250/3	.234	.020	100' Coils*
TFT-250/18	.042	.016	100', 1000'	TFT-250/10	.106	.016	100', 500'	TFT-250/2	.263	.020	100' Coils*
TFT-250/17	.047	.016	100', 1000'	TFT-250/9	.118	.020	100', 500'	TFT-250/1	.294	.020	100' Coils*
TFT-250/16	.053	.016	100', 1000'	TFT-250/8	.133	.020	100' Coils*	TFT-250/0	.330	.020	100' Coils*
TFT-250/15	.059	.016	100', 1000'	TFT-250/7	.148	.020	100' Coils*				

STOCK COLORS: Natural.

*RANDOM LENGTHS PACKED IN 100' COILS.

TFT-300 — TEFLON TUBING FRACTIONAL

SIZES MIL-I-22129C AMS 3653
 FED. SPEC. P-403A

Same specifications as TFT-250, but sized by fractional increments.

ALPHA NO. AND SIZE	NOM. I.D. (INCH.)	NOM. WALL THICK. (INCH.)
TFT-300-1/8	.125	.020
TFT-300-3/16	.192	.020
TFT-300-1/4	.255	.020
TFT-300-5/16	.321	.020
TFT-300-3/8	.387	.025
TFT-300-7/16	.451	.025
TFT-300-1/2	.515	.025
TFT-300-9/16	.643	.025
TFT-300-5/8	.772	.030
TFT-300-3/4	.902	.035
TFT-300-1	1.030	.035
TFT-300-1 1/4	1.287	.040
TFT-300-1 1/2	1.550	.040

STOCK COLOR: Natural.
 STANDARD PUT-UP: 50' RANDOM LENGTHS.

TFT-400 — TEFLON TUBING EXTRA THIN WALL

All the electrical, mechanical and chemical characteristics of Teflon, with an extra thin wall.

ALPHA NO. AND SIZE	INSIDE DIA. (INCH.)	NOM. WALL THICK. (INCH.)	STANDARD PUT-UP	ALPHA NO. AND SIZE	INSIDE DIA. (INCH.)	NOM. WALL THICK. (INCH.)	STANDARD PUT-UP
TFT-400-30	.012	.006	100', 500', 1000'	TFT-400-14	.066	.008	100', 500'
TFT-400-28	.015	.006	100', 500', 1000'	TFT-400-13	.076	.008	100', 500'
TFT-400-26	.018	.006	100', 500', 1000'	TFT-400-12	.085	.008	100', 500'
TFT-400-24	.022	.006	100', 500', 1000'	TFT-400-11	.095	.008	100', 500'
TFT-400-22	.027	.006	100', 500', 1000'	TFT-400-10	.106	.008	100', 500'
TFT-400-20	.034	.006	100', 500', 1000'	TFT-400-9	.118	.008	100', 500'
TFT-400-19	.038	.006	100', 500', 1000'	TFT-400-8	.133	.008	100', 500'
TFT-400-18	.042	.006	100', 500', 1000'	TFT-400-7	.148	.008	100', 500'
TFT-400-17	.047	.006	100', 500', 1000'	TFT-400-6	.166	.010	100'
TFT-400-16	.053	.006	100', 500', 1000'	TFT-400-5	.186	.010	100'
TFT-400-15	.059	.006	100', 500', 1000'	TFT-400-4	.208	.010	100'

STOCK COLORS: Natural, Black, White, Red, Green, Blue, Orange, Violet, Brown, Gray, Yellow.

*Spools **Coils

ALPHA WIRE CORPORATION

Lacing Cords and Tapes

MIL-T-713 & MIL-T-43435

TYPES OF LACING CORD

Flat Braided Tape: This tape has been specifically designed to create a wider contact area with the insulation, so that it does not flow away from the contact point. It is more flexible and easier on the user's hands. When knotted it will not slip, and is recommended for all types of harness work.

Round Twisted Cord: This type, while it may be used for plastic and rubber insulated wire, is particularly suited for wire having a secondary insulation or those utilizing a textile as an insulating material.

MATERIALS

Nylon: Synthetic fiber, resistant to: Fungus, flame, acids, abrasion. Excellent tensile strength, lightweight, small size.

Dacron: Retains all the above characteristics of nylon, plus: less elongation, better resistance to acids, no appreciable discoloration.

FINISHES

ge: A synthetic rubber-like resin formulated with a non-mercuric compound which lends the finish fungicidal properties. This finish permits easier handling and better knot retention. This finish has a melting point in excess of 190°F and will soften, but not flow, at 140°F.

mw: A micro-crystalline wax with a melting point above 130°F compounded with a fungicide which does not contain either copper or mercuric materials. Excellent knot retention, yet finish does not have too great a "waxy" feel to the user. MW is soft, pliable, easy to tie and meets Government Spec. MIL-T-713.

am: A thermoplastic synthetic resin with a melting point above 350°F for use where a "wax-free" type is specified. It is non-dusting or flaking, dry finish with good knot tying qualities.

sr: A special continuous coating of fungistatic synthetic rubber containing no corrosive compounding ingredients. Knots tied with this finish will not slip. It is extremely pliable and soft and will not injure the user's hands. This finish will not flake or dust.



NYLON TWISTED CORD MIL-T-713 — WH., BLK.

NO.	CLASS	TYPE	TENSILE STRENGTH	FINISH	NOM. DIAM. (Inches)	YARDS PER POUND	STANDARD PUT-UP
LC-113	I	PTWINE	70 lbs.	MW	.050	560	8 oz. Spis.
LC-114	II	PTWINE	48 lbs.	MW	.035	750	8 oz. Spis.
LC-115	III	PTWINE	32 lbs.	MW	.030	1180	8 oz. Spis.

NYLON & DACRON FLAT BRAIDED TAPE MIL-T-43435 — 500 YD. SPLS. WH., BLK.

NO.	SIZE	TYPE	TENSILE STRENGTH	FINISH	NOM. WIDTH (Inches)	NOM. THICK. (Inches)	MATERIAL
LC-136	3	I	50 lbs.	B (MW)	.090 ³ / ₃₂	.012	Nylon
LC-162	3	II	50 lbs.	B (MW)	.090 ³ / ₃₂	.012	Dacron

NYLON FLAT BRAIDED TAPE — WH., BLK.

NO.	TENSILE STRENGTH	FINISH	NOMINAL WIDTH (Inches)	NOMINAL THICKNESS (Inches)	STANDARD PUT-UP
LC-132	50 lbs.	GE	³ / ₃₂	.014	500 yd. Tubes
LC-134	30 lbs.	MW	¹ / ₁₆	.010	500 yd. Spis.
LC-136	50 lbs.	MW	³ / ₃₂	.014	500 yd. Spis.
LC-140	50 lbs.	SR	³ / ₃₂	.014	500 yd. Spis.
LC-143	50 lbs.	AM	³ / ₃₂	.014	500 yd. Spis.

Teflon Coated Fiberglass Lacing Tape

A braided flat tape that is easy to handle and will remain securely tied even when subject to shock, vibration and continued handling. Teflon lubricated glass fibers minimize end fray. Operating temperature to 550°F — up to 1,000°F for shorter periods.

CHARACTERISTICS:

Operating temperature —350°F to +550°F. Self-extinguishing. No elongation, creep or tension relaxation. High tensile strength. Resists all chemicals and contaminants.

APPLICATIONS:

For bundling and harnessing wires and cables subject to high temperature environments.



Alpha No.	Break Strength Min. Avg. Lbs.	Nom. Width (Inches)	Nom. Thickness (Inches)	Nom. Weight lbs./K Yds.	Standard Put-up Spool/Yards
LC-201	40	.048	.012	1.8	500
LC-202	80	.062	.014	2.2	500
LC-203	100	.078	.016	3.0	250
LC-204	130	.090	.016	3.2	250
LC-205	170	.125	.016	4.4	250
LC-206	250	.225	.018	8.2	250

Standard Color: Natural (White).

Spiral Wrap Tubing

FOR PERMANENT OR TEMPORARY WIRE AND CABLE HARNESING AND BUNDLING
AVAILABLE IN FIVE TYPES TO FIT ALL APPLICATIONS

- Easy to Apply
- Meets Military and UL Specifications
- Holds Wire Bundles Securely
- Permits Leadoffs or Tapoffs at Any Point

Wire harnessing, cabling and bundling work is simplified with the use of Alpha's SW Series spiral wrap tubing. SW tubing clings tightly to the wire and cable being bundled, yet is flexible and simple to apply. All types maintain elasticity even when bent around sharp edges or subject to repeated handling.

Breakouts or tapoff connections may be made through the openings of the wrap. SW spiral wrap is constructed from several semi-rigid tubing types and then cut on a continual spiral.

POLYETHYLENE

For general use. Meets Fed. Spec. L-P 390, MIL-I-631D, Type A MIL-P-26692, MIL-E-16400, MIL-P-3803, MIL-E-5400F.

NYLON

Higher temperature to 240°F (121°C). Meets MIL-M-20693A, MIL-17091B.

FLAME-RESISTANT POLYETHYLENE

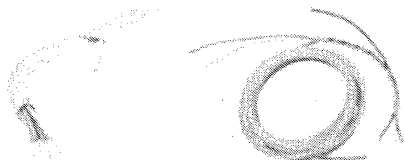
Self-extinguishing. Meets ASTM D635, UL-70, MIL-E-500F.

TEFLON

Temperatures to 250°C non-flammable. Meets MIL-I-22129C, AMS 3653C.

ULTRA VIOLET RESISTANT POLYETHYLENE

Heavy duty, abrasion resistant. For outdoor use, resists effects of sunlight and weathering.



Alpha Number	Material	Nom. O.D. (Inches)	Nom. Wall Thickness (Inches)	Pitch (Inches)	Max. Diam. Inner Bundle (Inches)	Color	Standard Put-up (Feet)
SW-1	Polyethylene	.125	.031	.250	1/2	Natural	25, 100, 500
SW-2		.250	.046	.375	2		25, 100, 500
SW-3		.375	.052	.437	3		25, 100
SW-4		.500	.060	.562	4		25, 100
SW-5		.750	.065	.750	5		25, 100
SW-6		1.000	.095	1.000	6		25, 100
SW-10	Flame Resistant Polyethylene	.125	.031	.250	1/2	White	25, 100, 500
SW-11		.250	.046	.375	2		25, 100, 500
SW-12		.375	.052	.437	3		25, 100
SW-13		.500	.060	.562	4		25, 100
SW-14		.750	.065	.750	5		25, 100
SW-20	Nylon	.125	.016	.250	1/2	Natural	25, 100, 500
SW-21		.250	.025	.375	2		25, 100, 500
SW-22		.375	.035	.437	3		25, 100
SW-23		.500	.035	.562	4		25, 100
SW-30	Teflon	.125	.030	.250	1/2	Natural	25, 100
SW-31		.250	.030	.375	2		25, 100
SW-32		.375	.030	.437	2-1/2		25, 100
SW-33		.500	.030	.562	3		25, 100
SW-34		.750	.030	.750	3-1/2		25, 100
SW-35		1.000	.040	1.000	4		25, 100
SW-40	Ultra-Violet Resistant Polyethylene	.125	.030	.250	1/2	Black	25, 100, 500
SW-41		.250	.045	.375	2		25, 100, 500
SW-42		.375	.050	.437	3		25, 100, 500
SW-43		.500	.060	.562	4		25, 100
SW-44		.750	.065	.750	5		25, 100
SW-45		1.000	.095	1.000	6		25, 100

ALPHA WIRE CORPORATION

Acrylic Impregnated Fiberglass Sleeving

PIF-150

MIL-I-3190C, GRADE C-1, NEMA TYPE 6, CLASS F INSULATION +155°C

Alpha's PIF-150 sleeving is a Class F (155°C) electrical insulation made of a closely woven fiberglass, thoroughly impregnated, then coated with modified acrylic resins. Extremely tough and flexible, AIF tubing can be knotted, bent or formed into any shape without loss of dielectric.

CHARACTERISTICS: Continuous use at 155°C. Won't blister or flow at 225°C for 15 minutes. Extremely tough and flexible. Compatible with most insulating and encapsulating materials.

APPLICATIONS: Motor leads, transformer leads, insulation over terminations, coils and components.

SPECIFICATIONS: Abrasive resistant, in accordance with MIL-T-5438. Rate of burning, NEMA-VSI-1962 and MIL-I-3190C. Min. volume resistivity, 10¹⁰ (OHM-cm). Dielectric constant, max. at 1 KC. 2.5 Corona resistance, good. Resistant to oils, acids and alkalis.



ALPHA NO. AND SIZE (AWG)	NOM. I.D. (INCH.)	STANDARD PUT-UP	ALPHA NO. AND SIZE (AWG)	NOM. I.D. (INCH.)	STANDARD PUT-UP
PIF-150-24	.022	100', 500', 1000'	PIF-150-6	.166	25', 100'
PIF-150-22	.027	100', 500', 1000'	PIF-150-5	.186	25', 100'
PIF-150-20	.034	100', 500', 1000'	PIF-150-4	.208	25', 100'
PIF-150-18	.042	100', 500', 1000'	PIF-150-3	.234	25', 100'
PIF-150-17	.047	100', 400', 1000'	PIF-150-2	.263	25', 100'
PIF-150-16	.053	100', 500', 1000'	PIF-150-1	.294	25', 100'
PIF-150-15	.059	100', 500', 1000'	PIF-150-0	.338	25', 100'
PIF-150-14	.066	100', 500'	PIF-150-3/8"	.387	25', 100'
PIF-150-13	.076	100', 500'	PIF-150-7/16"	.450	25', 100'
PIF-150-12	.085	100', 500'	PIF-150-1/2"	.512	25', 100'
PIF-150-11	.095	100', 500'	PIF-150-5/8"	.640	25', 100'
PIF-150-10	.106	100', 500'	PIF-150-3/4"	.768	25', 100'
PIF-150-9	.118	100', 500'	PIF-150-7/8"	.893	25', 100'
PIF-150-8	.133	100', 500'	PIF-150-1"	1.018	25', 100'
PIF-150-7	.148	100', 500'			

*Sizes 6 to 1" packaged in 36" lgths. STOCK COLOR: Natural.

Vinyl Impregnated Fiberglass Sleeving

PIF-130

MIL-I-3190B, CLASS B, GRADE B (130°C)

Woven fiberglass braid impregnated with a heat resistant, extremely tough and flexible plastic insulation. Fiberglass treated to remove all organic matter and resist fraying. Completely compatible with all insulation and conductor types.

CHARACTERISTICS: Resistant to bending, knotting and twisting. Fray resistant. Will not support combustion. High chemical resistance. Simple to "pushback." Fungus resistant.

APPLICATIONS: Motor, generator and transformer leads. Component protection.

SPECIFICATIONS: Max. low temperature flexibility, -20°C. Dielectric strength, 4000 volts. Oil resistant. Tensile strength, 1500 PSI, min. Ultimate elongation, 350%.



ALPHA NO.	SIZE	WALL THICKNESS MAX. (INCHES)	WALL THICKNESS MIN. (INCHES)	STANDARD PUT-UP
PIF-130-24	24	.022	.016	100', 500', 1000' Spools
PIF-130-22	22	.022	.016	100', 500', 1000' Spools
PIF-130-20	20	.022	.016	100', 500', 1000' Spools
PIF-130-18	18	.022	.016	100', 500', 1000' Spools
PIF-130-16	16	.028	.020	100', 500', 1000' Spools
PIF-130-14	14	.028	.020	100', 500' Spools
PIF-130-12	12	.028	.020	100', 500' Spools
PIF-130-10	10	.028	.020	100', 500' Spools
PIF-130-8	8	.028	.020	100', 500' Spools
PIF-130-6	6	.028	.020	100', 250' Spools
PIF-130-4	4	.036	.026	100', 250' Spools
PIF-130-2	2	.036	.026	100', 250' Spools
PIF-130-0	0	.042	.030	100' Coils
PIF-130-3/8"	3/8"	.042	.030	100' Coils
PIF-130-7/16"	7/16"	.042	.030	100' Coils
PIF-130-1/2"	1/2"	.042	.030	100' Coils
PIF-130-5/8"	5/8"	.042	.030	100' Coils
PIF-130-3/4"	3/4"	.042	.030	100' Coils
PIF-130-7/8"	7/8"	.042	.030	100' Coils
PIF-130-1"	1"	.042	.030	100' Coils

STOCK COLOR: Black.

Silicone Rubber Coated Fiberglass Sleeving

PIF-200

MIL-I-3190C, MIL-I-8057, NEMA TYPE 5, CLASS H (200°C), GRADE A (800V)

A closely woven (braided) fiberglass, uniformly coated with silicone rubber. Provides extreme flexibility to -85°C and heat protection to 200°C. The fiberglass sleeving material is heat set, cuts clearly and will not fray. PIF-200 is easy to handle and extremely tough with superior physical and electrical properties. Easy to "pushback" and form over components, connections and cables.

CHARACTERISTICS: Highly flexible—without loss of dielectric strength. Abrasive resistant. Flame resistant — meets NEMA and ASTM standards. Superior resistance to weather, fungus, ozone and sunlight. Compatible with all insulating materials.

APPLICATIONS: Insulating electrical connections, motor leads, transformer leads, components and connections in appliances, instruments and all types of electrical apparatus.

SPECIFICATIONS: Heat aging, 1000 hours at 250°C without dielectric change. Maximum brittle point, 70°C. Cut-through resistance, excellent. Insulation resistance, 1,000,000 megohms/ft. Tensile strength, 800-1000 PSI. Dielectric constant, 3.2 maximum at 1 KC.



ALPHA NO. AND SIZE (AWG)	INSIDE DIAMETER (INCHES)		STANDARD PUT-UP
	MAX.	MIN.	
PIF-200-24	.027	.020	100', 500', 1000' Spools
PIF-200-22	.032	.025	100', 500', 1000' Spools
PIF-200-20	.039	.032	100', 500', 1000' Spools
PIF-200-18	.049	.040	100', 500', 1000'
PIF-200-17	.053	.047	100', 500', 1000'
PIF-200-16	.060	.051	100', 500', 1000' Spools
PIF-200-15	.067	.059	100', 500', 1000' Spools
PIF-200-14	.073	.064	100', 500'
PIF-200-13	.080	.072	100', 500' Spools
PIF-200-12	.089	.080	100', 500' Spools
PIF-200-11	.103	.091	100', 500' Spools
PIF-200-10	.112	.102	100', 500' Spools
PIF-200-9	.124	.114	100', 500' Spools
PIF-200-8	.141	.130	100', 500' Spools
PIF-200-7	.158	.144	100', 500' Spools
PIF-200-6	.178	.162	25', 100'
PIF-200-5	.198	.181	25', 100'
PIF-200-4	.226	.204	25', 100'
PIF-200-3	.249	.229	25', 100'
PIF-200-2	.278	.258	25', 100'
PIF-200-1	.311	.290	25', 100'
PIF-200-0	.347	.325	25', 100'
PIF-200-3/8"	.401	.375	25', 100'
PIF-200-7/16"	.462	.438	25', 100'
PIF-200-1/2"	.524	.501	25', 100'
PIF-200-5/8"	.655	.625	25', 100'

*Sizes 6 to 5/8" packaged in 36" lengths. STOCK COLOR: Natural.

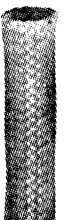
Braided Fiberglass Sleeving

PIF-240

CLASS C (240°C) INSULATION, NEMA VSI-1962

An extremely flexible, abrasion resistant sleeving, ideal for applications necessitating insulation to operate at 240°C (1200°F). Heat treated to remove all organic matter and to render the glass braid fray-resistant. Completely compatible with all insulation and conductor types.

CHARACTERISTICS: Extreme flexibility. Fray resistant. Flame resistant. Chemical resistant. Fungus resistant.



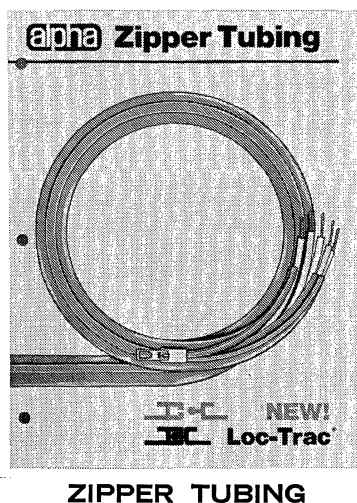
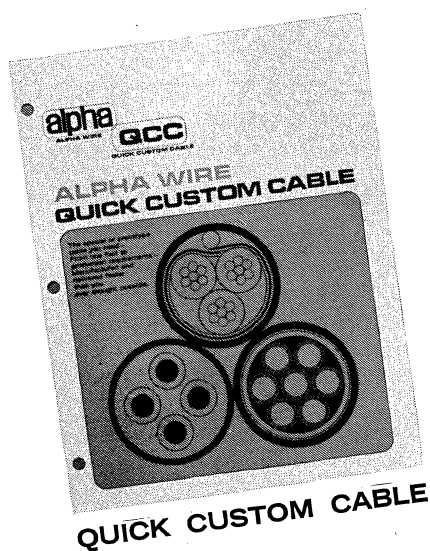
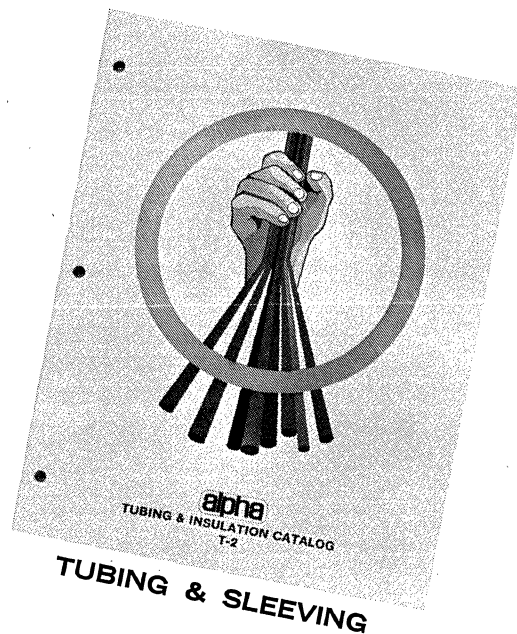
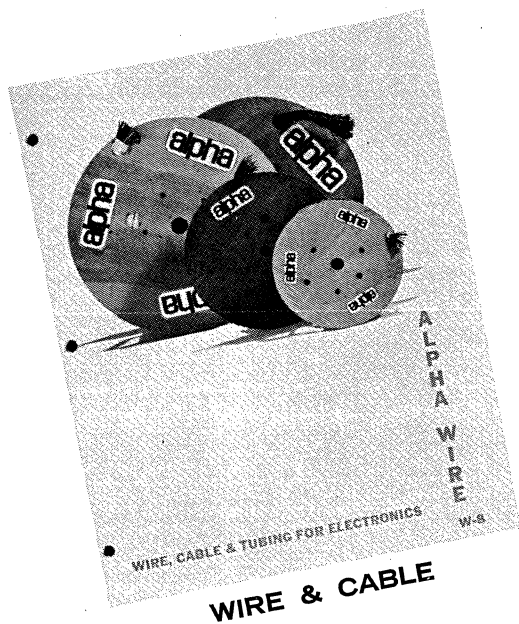
ALPHA NO. AND SIZE (AWG)	NOM. I.D. (INCH.)	APPROX. WALL (INCH.)	ALPHA NO. AND SIZE (AWG)	NOM. I.D. (INCH.)	APPROX. WALL (INCH.)
PIF-240-24	.022	.012	PIF-240-6	.166	.015
PIF-240-22	.027	.012	PIF-240-5	.186	.015
PIF-240-20	.034	.012	PIF-240-4	.208	.015
PIF-240-18	.042	.012	PIF-240-3	.234	.018
PIF-240-17	.047	.013	PIF-240-2	.263	.018
PIF-240-16	.053	.013	PIF-240-1	.294	.018
PIF-240-15	.059	.015	PIF-240-0	.338	.018
PIF-240-14	.066	.015	PIF-240-3/8"	.387	.022
PIF-240-13	.076	.015	PIF-240-7/16"	.450	.022
PIF-240-12	.085	.015	PIF-240-1/2"	.512	.022
PIF-240-11	.095	.015	PIF-240-5/8"	.640	.022
PIF-240-10	.106	.015	PIF-240-3/4"	.768	.022
PIF-240-9	.118	.015	PIF-240-7/8"	.893	.022
PIF-240-8	.133	.015	PIF-240-1"	1.018	.022
PIF-240-7	.148	.015			

STANDARD PUT-UP: 100 FT.

STOCK COLOR: Natural.

ALPHA WIRE CORPORATION

WRITE FOR COMPLETE LITERATURE ON...

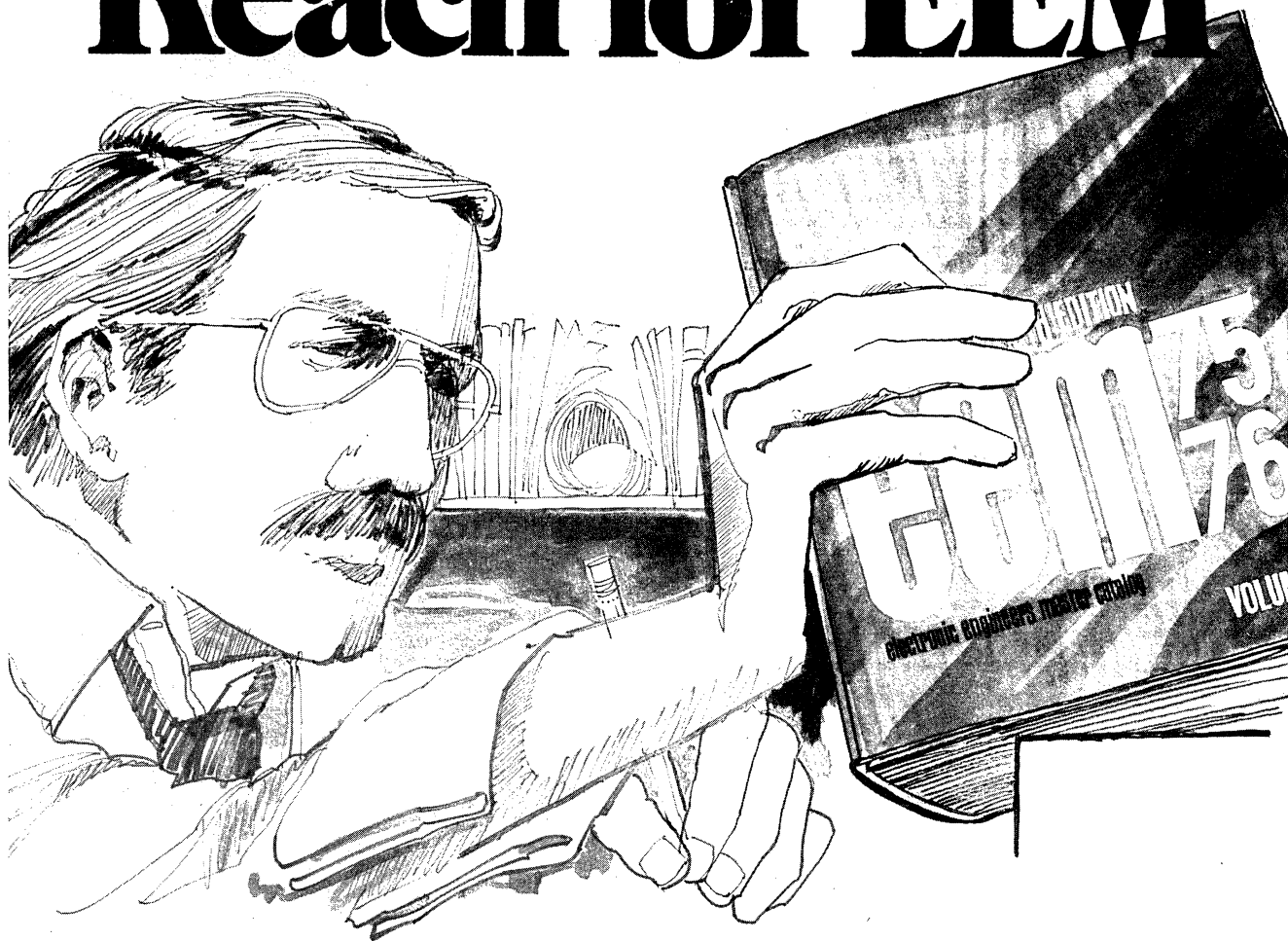


ALPHA WIRE CORPORATION

711 Lidgerwood Avenue, Elizabeth, New Jersey 07207

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700



shielded sound and broadcast audio cables

TWO CONDUCTOR SHIELDED CABLES

Description	Trade Number	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Cond. Color Coding	Percent Shield Coverage	Nom. *Cap. (pF/ft)	Nom. **Cap. (pF/ft)	Suggested Working Voltage	Standard Spool Lengths in ft.
 BELDFOIL®	8640	28 (Solid)	.0025	.020	.090	Blk, Red	100	55	105	100	250, 500
		Solid copper, GEOSOL™ insulated (solderable—no stripping required), twisted pair, BELDFOIL aluminum-polyester shield, 30 AWG solid tinned Copperweld ▲ drain wire, WHITE vinyl jacket. Maximum operating temperature 105°C. Ideal for Instrumentation and Audio Console Work where Subminiaturization is Required. The BELDFOIL shield combines high cable reliability with ease of termination.									
 BELDFOIL	8450•	22 (Solid)	.006	.018	.118	Blk, Red	100	40	76	200	100, 250, 500, T-1000 (Convert-a-pak)
	8451•	22 (7x30)	.008	.020	.135	Blk, Red	100	34	67	200	100, 250, 500, T-1000 (Convert-a-pak)
	*9451	22 (7x30)	.008	.020	.135	Blk, Red	100	34	67	200	500, T-1000 (Convert-a-pak)
		The jacket and shield on 9451 are bonded so both can be removed on automatic stripping equipment. Tinned copper, polypropylene insulated, twisted pair, stranded (8450 solid) tinned copper drain wire, BELDFOIL aluminum-polyester shield, paper wrap, 8450 and 8451 BLACK or GRAY vinyl jacket, 9451 GRAY vinyl jacket. Belden's Miniature Type Broadcast Audio and Instrumentation Cables occupy 1/2 to 3/4 less space than standard cables. The BELDFOIL shield combines high cable reliability with ease of termination.									
 BELDFOIL	9452	24 (19x36)	.008	.020	.135	Blk, Red	100	30	58	200	100, 500, 1000
		Tinned copper, polypropylene insulated, twisted pair, noise reducing tape, 24 AWG stranded tinned copper drain wire, BELDFOIL aluminum-polyester shield, BLACK vinyl jacket. Balanced pair instrumentation cable featuring short lay cabling to minimize pick-up of electromagnetic interference and special conductive textile tape to minimize microphonic noise.									
 BELDFOIL	8641•	24 (7x32)	.014	.025	.160	Blk, Clear	100	22	42	350	100, 500, 1000
	8761•	22 (7x30)	.014	.025	.167	Blk, Clear	100	24	47	350	500, 1000
	8762•	20 (7x28)	.014	.028	.196	Blk, Clear	100	27	49	350	100, 250, 500, 1000
	8760•	18 (16x30)	.018	.028	.222	Blk, Clear	100	24	44	450	250, 500, 1000
	8719	16 (19x29)	.025	.030	.274	Blk, Clear	100	24	47	600	500, 1000
	8720•	14 (19x27)	.032	.035	.340	Blk, Clear	100	24	47	750	500, 1000
	8718•	12 (19x25)	.037	.040	.400	Blk, Clear	100	25	49	1000	500, 1000
		Tinned copper, polyethylene insulated, twisted pair, BELDFOIL aluminum-polyester shield, stranded tinned copper drain wire, (24 AWG for 8641, 22 AWG for 8761, and 20 AWG for 8760 and 8762, 18 AWG for 8719, 16 AWG for 8720, 14 AWG for 8718), chrome vinyl jacket. The BELDFOIL shield combines high cable reliability with ease of termination.									
 BELDFOIL	*9154	20 (7x28)	.012	.031	.194	Blk, Red	100	60	100	300	500, 1000
		Tinned Copper, vinyl insulated, twisted pair, BELDFOIL aluminum-polyester shield, 22 AWG stranded tinned copper drain wire, rose gray vinyl jacket. Underwriters' Laboratories, Inc. Listed (Wires, Mics.) 90V Max.									
 BELDFOIL	83394	22 (7x30)	.015	.030	.204	Blk, Wht	100	22	42	1000 DC	25, 100, 500
		Tinned copper, insulated with FEP TEFLON®, twisted pair, noise reducing tape, 22 AWG (7x30) nickel coated copper drain wire, special BELDFOIL shield, red Silicone rubber jacket. +150°C maximum, -70°C minimum operating temperature. Jacket working voltage: 1000V DC, shield to ground.									
	83393	20 (7x28)	.020	.030	.245	Blk, Red	100	22	42	1000 DC	25, 100, 500
BELDFOIL High Temperature TEFLON and Silicone Δ		Tinned copper, insulated with FEP TEFLON, twisted pair, noise reducing tape, 20 AWG (10x30) nickel coated copper drain wire, special BELDFOIL shield, yellow Silicone rubber jacket. +150°C maximum, -70°C minimum operating temperature. Jacket working voltage: 1000V DC, shield to ground.									

★ New Item

• Belden U.S. Patent 3,032,604.

* Capacitance between conductors.

▲ Trademark of Copperweld Steel Co.

** Capacitance between 1 conductor and other conductor connected to shield.

■ Trademark of DuPont

☐ Passes the FR-1 vertical flame test.

△ For additional high temperature shielded cables see Belden page 8.

shielded sound, broadcast
audio cables and instrumentation cables



TWO CONDUCTOR SHIELDED CABLES (Cont'd)

Description	Trade Number	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Cond. Color Coding	Percent Shield Coverage	Nom. *Cap. (pF/ft.)	Nom. **Cap. (pF/ft.)	Suggested Working Voltage	Standard Spool Lengths in ft.
	8437	22 (Solid)	.015	.025	.200	Blk, Red	88	48	85	200	500, 1000
	8441	22 (16x34)	.015	.025	.210	Blk, Red	86	49	86	200	100, 500, 1000
	Tinned copper, vinyl insulated, twisted pair, 8437 solid tinned copper drain wire, 8441 stranded tinned copper drain wire, tinned copper braid shield, black vinyl jacket. For other multi-conductor braid shielded cables see Belden page 7.										
	8739	22 (Solid)	.015	.025	.160	Blk, Red	97.0	38	66	350	100, 500, 1000
	8737	22 (7x30)	.015	.025	.170	Blk, Red	97.0	40	70	350	100, 250, 500, 1000
	8759	20 (7x28)	.015	.025	.195	Blk, Red	88.6	47	79	350	100, 500, 1000
	8790	18 (7x26)	.020	.028	.231	Red, Wht	81.5	53	92	450	100, 250, 500, 1000
	8780	16 (19x29)	.023	.030	.266	Blk, Wht	88.0	57	98	450	100, 500, 1000
	Tinned copper, vinyl insulated, twisted pair, tinned copper spiral wrapped shield, chrome vinyl jacket.										
	8208	18 (16x30)	.020	.025	.255	Red, Wht	80.0	46	77	200	100, 500, 1000
	Tinned copper, rubber insulated, twisted pair, separator, braided tinned copper shield, chrome vinyl jacket.										

INSTRUMENTATION CABLES

Instrumentation cable provides the vital communications link between sensing devices and read-out equipment. Because of the many and diverse conditions of environment and stress under which instrumentation cables must transmit information—in usable form, without distortion or change—cable characteristics should always be carefully matched with the specific requirements of the particular application.

The scientific, medical and industrial uses of instrumentation cable are vast and ever growing. Some of the common

uses for instrumentation cable are in the measurement of pressure, speed, resistance and temperature.

Belden manufactures a wide variety of precision instrumentation wire using several types of insulating materials, conductors and shields to meet a wide variety of electrical, physical and thermal requirements.

Many Belden Instrumentation Cables are unique in the field and have been engineered for specific application problems.

THREE CONDUCTOR SHIELDED CABLES

Description	Trade Number	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Cond. Color Coding	Percent Shield Coverage	Nom. *Cap. (pF/ft.)	Nom. **Cap. (pF/ft.)	Suggested Working Voltage	Standard Spool Lengths in ft.
	8731	22 (Solid)	.015	.025	.178	Blk, Red, Wht	76.2	36	63	350	500, 1000
	8791	18 (7x26)	.020	.028	.236	Blk, Red, Wht	78.2	47	84	450	100, 500, 1000
	Tinned copper, vinyl insulated, conductors cabled, tinned copper spiral wrapped shield, chrome vinyl jacket.										
	9770	22 (7x30)	.008	.020	.145	Blk, Red, Wht	100	32	60	200	250, 500, 1000
	Tinned copper, polypropylene insulated, conductors cabled, BELDFOIL aluminum-polyester shield, 22 AWG stranded tinned copper drain wire, brown vinyl jacket.										

For underground burial recommendations of all types of vinyl, polyethylene, Hypalon and neoprene jacketed cables, please write for Technical Data Bulletin T/8-6.

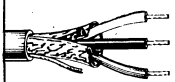
•Belden U.S. Patent 3,032,604.

☐ Passes the FR-1 vertical flame test. *Capacitance between conductors. **Capacitance between 1 conductor and other conductors connected to shield.



shielded instrumentation, strain gauge
and communication cables

THREE CONDUCTOR SHIELDED CABLES (Cont'd)

Description	Trade Number	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Cond. Color Coding	Percent Shield Coverage	Nom. *Cap. (pF/ft.)	Nom. **Cap. (pF/ft.)	Suggested Working Voltage	Standard Spool Lengths in ft.
 BELDFOIL®	8771•	22 (7x30)	.014	.025	.175	Blk, Red, Clear	100	23	41	350	250, 500, 1000
	8772•	20 (7x28)	.014	.028	.200	Blk, Red, Clear	100	27	51	350	500, 1000
	8770•	18 (16x30)	.018	.028	.236	Blk, Red, Clear	100	24	48	450	500, 1000
	8618•	16 (19x29)	.025	.030	.300	Blk, Red, Clear	100	26	50	600	500, 1000
Tinned copper, polyethylene insulated, conductors cabled, BELDFOIL aluminum-polyester shield, stranded tinned copper drain wire (22 AWG for 8771, 20 AWG for 8770 and 8772, and 18 AWG for 8618), CHROME vinyl jacket, (8772 ROSE-GRAY or CHROME).											
 BELDFOIL High Temperature TEFLON and Silicone Δ	83395	22 (7x30)	.015	.030	.213	Blk, Red, Wht	100	20	35	1000 DC	25, 100, 500
	Tinned copper, insulated with FEP TEFLON, conductors cabled, noise reducing tape, 22 AWG (7x30) nickel coated copper drain wire, special BELDFOIL shield, red Silicone rubber jacket. +150°C maximum, -70°C minimum operating temperature. Jacket working voltage: 1000V DC, shield to ground.										
	8643	30 (7x38)	.005	.010	.086	Blk, Red, Wht	95	25	43	200	100, 250
Tinned copper, polypropylene insulated, conductors cabled around textile strength member, tinned copper braid shield, chrome vinyl jacket. For other multi-conductor braid shielded cables see Belden page 7.											
 BELDFOIL	8735	22 (7x30)	.015	.025	.199	Blk, Red, Wht	70	34	60	350	15, 50, 100, 500, 1000
	Tinned copper, vinyl insulated, conductors cabled, tinned copper braid shield, chrome vinyl jacket.										

FOUR CONDUCTOR SHIELDED CABLES

Description	Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Cond. Color Coding	Percent Shield Coverage	Nom. *Cap. (pF/ft.)	Nom. **Cap. (pF/ft.)	Suggested Working Voltage	Standard Spool Lengths in ft.
 BELDFOIL®	8434•	4	25 (7x33) 3 copper 4 Copperweld	.013	.020	.165	Red, Blk, Grn, Clear	100	25	40	400	100, 500, 1000
Tinned copper, polyethylene insulated, black and red conductors under BELDFOIL aluminum-polyester shield, stranded drain wire, green and clear conductors under over-all BELDFOIL aluminum-polyester shield, chrome vinyl jacket. Pairs cabled on common axis to reduce diameter. Ø												
 BELDFOIL	8723•	4	22 (7x30)	.008	.019	.165	Red, Blk, Grn, Wht	100	35	62	400	100, 500, 1000
Tinned copper, polypropylene insulated, black and red under a BELDFOIL aluminum-polyester shield, green and white under a BELDFOIL aluminum-polyester shield, 24 AWG stranded tinned copper common drain wire, chrome vinyl jacket. Pairs cabled on common axis to reduce diameter. Ø												
 BELDFOIL	8728	4	22 (7x30)	.008	.026	.198	Red, Blk, Grn, Wht	100	35	62	400	500, 1000
Tinned copper, polypropylene insulated, conductors cabled in pairs, each pair BELDFOIL aluminum-polyester shielded with 24 AWG stranded tinned copper drain wire, polyester film over each shield, overall BELDFOIL aluminum-polyester shield and 24 AWG stranded tinned copper drain wire, chrome vinyl jacket. Pairs cabled on common axis to reduce diameter. Ø												
 BELDFOIL	8729•	4	22 (19x34)	.015	.050	.265	Red, Blk, Grn, Clear	100	22	42	600	500, 1000
Tinned copper, polyethylene insulated, conductors cabled, BELDFOIL aluminum-polyester shield, 3—23 AWG solid tinned Copperweld and 1—25 AWG stranded tinned Copperweld drain wires, white vinyl jacket. Belden U.S. Patent 3,673,316 and Belden Canadian Patent 875,187.												
 BELDFOIL	83396	4	22 (7x30)	.015	.030	.222	Red, Blk, Grn, Wht	100	20	35	1000 DC	25, 100, 500
 High Temperature TEFLON and Silicone Δ												
Tinned copper, insulated with FEP TEFLON, conductors cabled, noise reducing tape, 22 AWG (7x30) nickel coated copper drain wire, special BELDFOIL shield, red Silicone rubber jacket. +150°C maximum, -70°C minimum operating temperature. Jacket working voltage: 1000V DC, shield to ground.												

☐ Passes the FR-1 vertical flame test.

•Belden U.S. Patent 3,032,604.

ØRequest Technical Data Bulletin T/8-21 before planning high and low level circuits in the same cable.

*Capacitance between conductors.

**Capacitance between 1 conductor and other, conductors connected to shield.

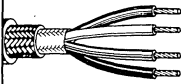
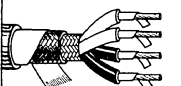
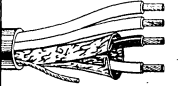
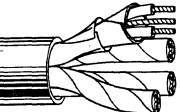
Δ For additional high temperature shielded cables see Belden page 8.

ELECTRONIC DIVISION/BELDEN CORPORATION, P.O. BOX 1331, RICHMOND, IN 47374 (317) 966-6661

shielded instrumentation, strain gauge
and communication cable



FOUR CONDUCTOR SHIELDED CABLES (Cont'd)

Description	Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Cond. Color Coding	Percent Shield Coverage	Nom. *Cap. (pF/ft)	Nom. **Cap. (pF/ft)	Suggested Working Voltage	Standard Spool Lengths in ft.
	8404	4	20 (26x34)	.015	.033	.248	Red, Blk, Grn, Clear	87	25	45	600	15, 100, 250, 500, 1000
	Tinned copper, polyethylene insulated, conductors cabled, rayon braid, tinned copper braid shield, chrome vinyl jacket. For other multi-conductor braid shielded cables see Belden page 7.											
	8407	4	16 (65x34)	.032	.043	.422	Red, Blk, Grn, Wht	84	30	55	600	100, 250
	Tinned copper, separator, rubber insulated, conductors cabled, rayon braid, tinned copper braid shield, cotton wrap, black neoprene jacket. For other multi-conductor braid shielded cables see Belden page 7.											
	8424	4	20 (26x34)	.020	.040	.295	Red, Blk, Grn, Wht	83.5	35	60	600	50, 100, 250, 500, 1000
	Tinned copper, cotton wrap, rubber insulated, conductors cabled, rayon braid, tinned copper braid shield, cotton wrap, black rubber jacket. For other multi-conductor braid shielded cables see Belden page 7.											
 BELDFOIL®	*9155•	2 shielded 2 unshielded	20 (7x28) 18 (16x30)	.018 .018	.031	.256	Blk, Red, Grn, Wht	100	22	40	300	500, 1000
	Tinned copper, polyethylene insulated, BELDFOIL aluminum-polyester shield over 20 AWG twisted pair, 22 AWG stranded tinned copper drain wire, rose gray vinyl jacket. Underwriters' Laboratories, Inc. Listed (Style 2094).											
	8724•	2 shielded 2 unshielded	22 (7x30) 22 (7x30)	.008 .008	.019	.165	Red, Blk, Grn, Wht	100	34	67	200	250, 500, 1000
	8722•	2 shielded 2 unshielded	20 (7x28) 20 (7x28)	.015 .015	.028	.230	Red, Blk, Grn, Wht	100	60	99	350	500, 1000
	Tinned copper, 8722 vinyl insulated 8724 polypropylene insulated, BELDFOIL aluminum-polyester shield over 2 conductors, stranded tinned copper drain wire (22 AWG for 8722 and 24 AWG for 8724) CHROME, 8722 CHROME or WHITE vinyl jacket. Pairs cabled on common axis to reduce diameter. Ø											
	8732	2 shielded 2 unshielded	22 (7x30) 22 (7x30)	.015 .015	.030	.188x .296	Blk, Clear Blk, Clear	62	21	37	350	100, 500, 1000
	Tinned copper, polyethylene insulated, conductors cabled, tinned copper braid shield over 1 pair, chrome vinyl jacket.											
 BELDFOIL	8730•	2 shielded 2 unshielded	22 (7x30) 22 (7x30)	.008 .008	.030	.205	Red, Blk, Grn, Wht	100	34	67	200	500, 1000
	Tinned copper, polypropylene insulated, BELDFOIL aluminum-polyester shield over 1 pair with 24 AWG stranded tinned copper drain wire, chrome vinyl jacket. Pairs cabled on separate axes for reduced magnetic coupling.											
MULTIPLE PAIR AUDIO, COMMUNICATION AND INSTRUMENTATION CABLES												
 BELDFOIL	9784•	12 (6 Pair)	24 (7x32)	.020	.037	.494	See chart on Page 10	100	12	22	60	500, 1000
	Tinned copper, foam polypropylene insulation, conductors cabled, each pair individually BELDFOIL shielded with 24 AWG drain wire, chrome vinyl jacket.											
	8725•†	8 (4 Pair)	20 (7x28)	.015	.030	.360	Red, Blk Grn, Wht Wht/Red, Wht/Blk Wht/Grn, Wht/Yel	100	27	49	400	500, 1000
Tinned copper conductors, polypropylene insulated, four groups of two conductors with 22 AWG drain wire, each group individually BELDFOIL shielded with polyester tape wrap, chrome vinyl jacket.												

☐ Passes the FR-1 vertical flame test.

★ New Item

• Belden U.S. Patent 3,032,604.

Ø Request Technical Data, Bulletin T/8-21 before planning high and low level circuits in same cable.

† Cabled around common axis—request Technical Data Bulletin T/8-21 before planning high and low level circuits in same cable.

○ Color code is per the Western Regional Strain Gauge Standard.

*Capacitance between conductors. **Capacitance between 1 conductor and other conductors connected to shield.

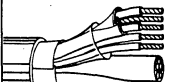


audio and communication cables

MULTIPLE TRIPLETS AUDIO, COMMUNICATION AND INSTRUMENTATION CABLES

Description	Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Cond. Color Coding	Percent Shield Coverage	Nom. *Cap. (pF/ft)	Nom. **Cap. (pF/ft)	Suggested Working Voltage	Standard Spool Lengths in ft.
	9771•	21 7 (Triplets)	22 (7x30)	.008	.045	.550	Blk, Red, Grn	100	32	60	300	500
	9772•	36 12 (Triplets)	22 (7x30)	.008	.060	.740	Blk, Red, Grn	100	32	60	300	500
BELDFOIL®	Tinned copper, polypropylene insulated, conductors cabled in triplets each shielded with BELDFOIL aluminum-polyester shield, 22 AWG stranded tinned copper drain wire, with .020" white vinyl jacket, individual triplet jackets identified by color coded stripes, triplets cabled, overall chrome vinyl jacket.											

MULTIPLE QUADS AUDIO AND COMMUNICATION CABLES

	8726•	12 3 (Quads)	22 (7x30)	.008	.035	.330	Red, Blk, Grn, Wht	100	34	67	200	100, 500, 1000
	8727•	28 7 (Quads)	22 (7x30)	.008	.040	.450	Red, Blk, Grn, Wht	100	34	67	200	100, 500, 1000
BELDFOIL	Tinned copper, polypropylene insulated, cabled in quads, BELDFOIL shield over black and red conductors, 24 AWG stranded tinned copper drain wire. Each quad is 8724 (on Belden page 4) except for tape shield folding and a clear polyester tape instead of a vinyl jacket. Shields color coded, overall chrome vinyl jacket. Request Technical Data Bulletin T/8-21 before planning high and low level circuits in same cable.											

SPECIAL AUDIO AND COMMUNICATION CABLES

	8734	3 1 shielded 2 unshielded	22 (7x30) 22 (7x30)	.015 .015	.025	.194	Wht Blk, Red	82	—	79	350	100, 500, 1000
	Tinned copper, vinyl insulated, tinned copper braid shield over 1 conductor, 3 conductors cabled, chrome vinyl jacket.											
	8763•	3 2 shielded 1 unshielded	20 (7x28) 20 (7x28)	.014 .014	.028	.210	Blk, Red Clear	100	26	48	350	500, 1000
	Tinned copper, polyethylene insulated, conductors cabled, BELDFOIL aluminum-polyester shield over 2 conductors, 20 AWG stranded tinned copper drain wire, chrome vinyl jacket.											
	8733•	3 Conductors shielded	22 (7x30)	.014	.030	.205	Blk, Red, Clear	100	—	51	350	100, 500
	Tinned copper, polyethylene insulated, each conductor separately BELDFOIL aluminum-polyester shielded, drain wire for each conductor is tinned cadmium bronze ribbon under BELDFOIL, conductors cabled, chrome vinyl jacket.											
	8788•	5 3 shielded 2 unshielded	22 (7x30) 22 (7x30)	.015 .015	.028	.236	Blk, Red, Grn Yel, Blue	100	—	125	350	500
	Tinned copper, vinyl insulated, 3 conductors each separately BELDFOIL shielded, drain wire for each conductor is tinned cadmium bronze ribbon under BELDFOIL, 2 conductors unshielded, cabled around a non-hygroscopic filler, chrome vinyl jacket.											
	8783	3 Conductors unshielded	1-20 (10x30) 2-16 (26x30)	.020 .020	.025	.250	Blue, Grn, Org	—	—	—	450	100, 500
	Tinned copper, vinyl insulated, conductors cabled, chrome vinyl jacket.											
	8786•	6 4 shielded 2 unshielded	24 (7x32) 22 (7x30)	.015 .015	.028	.256	Blk, Grn, Red, Yel Blu, Wht	100	—	—	350	100, 500
	Tinned copper, vinyl insulated, conductors cabled, 4 conductors cabled under BELDFOIL aluminum-polyester shield, 2 conductors unshielded, 22 AWG drain wire, chrome vinyl jacket.											

☐ Passes the FR-1 vertical flame test.

•Belden U.S. Patent 3,032,604.

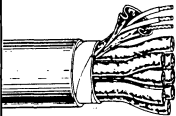
*Capacitance between conductors.

**Capacitance between 1 conductor and other conductors connected to shield.

shielded paired audio, sound and data cables



MULTIPLE PAIR INDIVIDUALLY SHIELDED AUDIO AND SOUND CABLES

Description	Trade Number	No. of Pairs	Stranding	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Nom. *Cap. (pF/ft)	Nom. **Cap. (pF/ft)	Standard Spool Lengths in ft.
22 GAGE VINYL INSULATION  BELDFOIL®	8767•	3	Solid	.013	.037	.279	40	77	100, 500, 1000
	8768•	6	Solid	.013	.037	.394	40	77	100, 500, 1000
	8764•	9	Solid	.013	.040	.440	40	77	100, 500, 1000
	8765•	11	Solid	.013	.040	.485	40	77	100, 500, 1000
	8766•	15	Solid	.013	.045	.540	40	77	100, 500, 1000

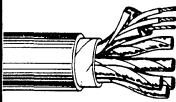
22 AWG Tinned copper, vinyl insulated, twisted pairs, each pair and its drain wire under BELDFOIL aluminum-polyester shield, overall chrome vinyl jacket. 300 Volts suggested working voltage.

Underwriters' Laboratories, Inc. Listed (Style 2464)

Vinyl insulation is used for ease of stripping and soldering. Recommended for audio frequency applications requiring excellent circuit isolation.

Insulation resistance between shields. 100 megohms/M' nom.
Capacitance between adjacent shields. 115 pF/ft nom.
Voltage breakdown between adjacent shields. 1500 volts nom.
Working voltage between adjacent shields. . . . 50 volts max.

MULTIPLE PAIR INDIVIDUALLY SHIELDED AUDIO AND DATA CABLES

Description	Trade Number	No. of Pairs	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Nom. *Cap. (pF/ft)	Nom. **Cap. (pF/ft)	Standard Spool Lengths in ft.
18 AND 22 GAGE POLYPROPYLENE INSULATION  BELDFOIL	8777•	3	22 (7x30)	.010	.030	.265	30	55	100, 250, 500, 1000
	8778•	6	22 (7x30)	.010	.037	.394	30	55	100, 250, 500, 1000
	8774•	9	22 (7x30)	.010	.040	.440	30	55	100, 250, 500, 1000
	8775•	11	22 (7x30)	.010	.040	.485	30	55	100, 250, 500, 1000
	*9768•	12	22 (7x30)	.010	.040	.485	30	55	100, 250, 500, 1000
	8776•	15	22 (7x30)	.010	.045	.540	30	55	100, 250, 500, 1000
	*9769•	17	22 (7x30)	.010	.055	.610	30	55	100, 250, 500, 1000
	8769•	19	22 (7x30)	.010	.055	.620	30	55	100, 250, 500, 1000
	8773•	27	22 (7x30)	.010	.070	.760	30	55	100, 250, 500, 1000
	250, 500 & 1000 ft. lengths +20% -0 length tolerance.								
	*9873•	3	20 (10x30)	.013	.035	.330	30	55	100, 250, 500, 1000
	*9874•	6	20 (10x30)	.013	.040	.470	30	55	100, 250, 500, 1000
	*9875•	9	20 (10x30)	.013	.045	.530	30	55	100, 250, 500, 1000
	*9876•	11	20 (10x30)	.013	.045	.575	30	55	100, 250, 500, 1000
	*9877•	12	20 (10x30)	.013	.045	.575	30	55	100, 250, 500, 1000
	*9878•	13	20 (10x30)	.013	.055	.620	30	55	100, 250, 500, 1000
	*9879•	15	20 (10x30)	.013	.055	.660	30	55	100, 250, 500, 1000
	9773•	3	18 (16x30)	.016	.035	.372	30	55	500, 1000
	9774•	6	18 (16x30)	.016	.045	.545	30	55	500, 1000
	9775•	9	18 (16x30)	.016	.055	.620	30	55	500, 1000
	9776•	12	18 (16x30)	.016	.070	.765	30	55	500, 1000
	9777•	15	18 (16x30)	.016	.070	.830	30	55	500, 1000

Tinned copper, polypropylene insulated, twisted pairs, each pair and its stranded tinned copper drain wire (22 AWG on 22 AWG and 20 AWG series, 20 AWG on 18 AWG series) under BELDFOIL aluminum-polyester shield, overall chrome vinyl jacket. 300 volts suggested working voltage for 22 AWG; 350 volts for 20 AWG; 400 volts for 18 AWG.

Insulation resistance between shields 100 megohms/M' nom.
Capacitance between adjacent shields. 115 pF/ft nom.
Voltage breakdown between adjacent shields. 1500 volts nom.
Working voltage between adjacent shields. . . . 50 volts max.

Recommended for audio, pulse and radio frequency applications requiring superior circuit isolation. Polypropylene insulation is used for excellent high frequency properties and mechanical toughness.

*New Item ☐ Passes the FR-1 vertical flame test.

•Belden U.S. Patent 3,032,604.

*Capacitance between conductors. **Capacitance between 1 conductor and other conductor connected to shield.

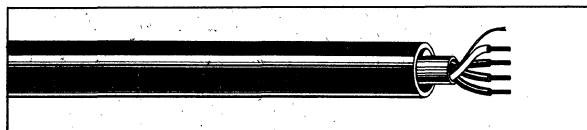
ELECTRONIC DIVISION/BELDEN CORPORATION, P.O. BOX 1331, RICHMOND, IN 47374 (317) 966-6661



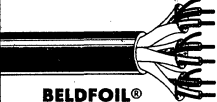
direct burial, audio and data cables
mil-w-16878 shielded cables

DIRECT BURIAL CABLES

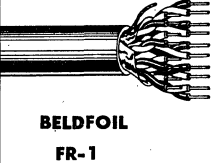
Most Belden standard or special cable can be supplied in matching conduit for direct burial installations. This means a lower initial cost than cable and conduit purchased separately, plus it eliminates the expense of pulling cable. Conduit manufactured with black, high molecular weight polyethylene that meets REA and ASTM requirements.



MULTIPLE PAIR INDIVIDUALLY SHIELDED DIRECT BURIAL, AUDIO AND DATA CABLE

Description	Trade Number	No. of Pairs	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Nom. *Cap. (pF/ft)	Nom. **Cap. (pF/ft)	Standard Spool Lengths in ft
	★9883•	3	20 (10x30)	.013	.040	.340	30	55	500, 1000
	★9886•	6	20 (10x30)	.013	.045	.480	30	55	500, 1000
Tinned copper, polypropylene insulated, BELDFOIL aluminum-polyester shield over individually twisted pairs with 22 AWG stranded tinned copper drain wire, black High Density Polyethylene jacket. This cable is especially designed for direct burial installation.									

MULTIPLE PAIR SHIELDED SOUND AND CONTROL CABLE

	★9302	2	22 (Solid)	.015	.028	.211	35	—	100, 500, 1000
	★9306	6	22 (Solid)	.010	.035	.315	35	—	100, 500, 1000
	★9309	9	22 (Solid)	.010	.037	.364	35	—	100, 500, 1000
	★9315	15	22 (Solid)	.010	.040	.430	35	—	100, 500, 1000
	★9319	19	22 (Solid)	.010	.040	.455	35	—	100, 500, 1000
	★9327	27	22 (Solid)	.010	.045	.560	35	—	100, 500, 1000
Tinned copper, vinyl insulated twisted pairs, overall BELDFOIL aluminum-polyester shield, stranded tinned copper drain wire, chrome vinyl jacket. Underwriters' Laboratories, Inc. Listed (Wires, Misc.) 90V Max.									

MULTI-CONDUCTOR SHIELDED CABLES

MIL-W-16878-TYPE B SHIELDED CABLES

All of these cables have passed the FR-1 vertical flame test

Suitable for general purpose use in communications and instrumentation applications. Cables have excellent resistance to moisture, weather, ozone, acids, alkali and flame.

Description	Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Nom. Nylon Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Cond. Color Coding	Percent Shield Cov.	Nom. *Cap. (pF/ft)	Nom. **Cap. (pF/ft)	Standard Spool Lengths in Ft.
	9971	1	24 (19x36)	.010	.003	.010	.090	Wht	93	—	75	100, 500, 1000
	9961	1	20 (19x32)	.010	.003	.010	.109	Wht	93	—	100	100, 500, 1000
	9951	1	16 (19x29)	.010	.003	.016	.139	Wht	93	—	125	100, 500, 1000
	9972	2	24 (19x36)	.010	.003	.016	.156	Wht, Blk	91	40	70	100, 500, 1000
	9962	2	20 (19x32)	.010	.003	.020	.192	Wht, Blk	92	55	95	100, 500, 1000
	9952	2	16 (19x29)	.010	.003	.025	.238	Wht, Blk	92	70	120	100, 500, 1000
	9973	3	24 (19x36)	.010	.003	.016	.164	Wht, Blk, Red	91	40	70	100, 500, 1000
	9963	3	20 (19x32)	.010	.003	.020	.202	Wht, Blk, Red	91	55	95	100, 500, 1000
	9953	3	16 (19x29)	.010	.003	.025	.250	Wht, Blk, Red	91	70	120	100, 500, 1000
	9974	4	24 (19x36)	.010	.003	.016	.171	Wht, Blk, Red, Grn	92	40	70	100, 500, 1000
	9964	4	20 (19x32)	.010	.003	.020	.212	Wht, Blk, Red, Grn	92	55	95	100, 500, 1000
	9954	4	16 (19x29)	.010	.003	.023	.270	Wht, Blk, Red, Grn	91	70	120	100, 500, 1000

Stranded tinned copper, vinyl insulated, clear nylon jacket, conductors cabled, tinned copper braid shield, white vinyl jacket.
Suggested working voltage —600 volts

Manufactured to current Government specifications and subsequent revisions. ★ New Item FR-1 or ☐ Passes the FR-1 vertical flame test.

*Capacitance between conductors.

**Capacitance between one conductor and other conductors connected to shield.

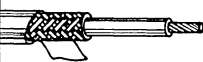
● Belden U.S. Patent 3,032,604.

high temperature shielded cables



MULTIPLE CONDUCTOR CABLE INSULATED WITH TEFLON MIL-W-16878 TYPE E SHIELDED CABLES

All of these cables have passed the FR-1 vertical flame test.

Description	Trade Number*	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Conductor Color Coding	Percent Shield Coverage	Nom. *Cap. (pF/ft)	Nom. **Cap. (pF/ft)	Standard Spool Lengths in Feet
 SINGLE CONDUCTOR	83301	30 (7x38)	.010	.010	.074	Wht	90	—	30	100, 500, 1000
	83302	28 (7x36)	.010	.010	.078	Wht	90	—	35	100, 500, 1000
	83303	26 (7x34)	.010	.010	.082	Wht	90	—	40	100, 500, 1000
	83304	24 (19x36)	.010	.010	.088	Wht	90	—	51	100, 500, 1000
	83305	22 (19x34)	.010	.010	.094	Wht	90	—	60	100, 500, 1000
	83306	20 (19x32)	.010	.010	.103	Wht	90	—	67	100, 500, 1000
	83307	18 (19x30)	.010	.010	.113	Wht	90	—	75	100, 500, 1000
	83308	16 (19x29)	.011	.012	.123	Wht	90	—	89	100, 500, 1000
 TWO CONDUCTOR	83315	30 (7x38)	.010	.010	.106	Wht, Blk	90	15	27	100, 500, 1000
	83316	28 (7x36)	.010	.010	.112	Wht, Blk	90	18	32	100, 500, 1000
	83317	26 (7x34)	.010	.010	.120	Wht, Blk	90	20	36	100, 500, 1000
	83318	24 (19x36)	.010	.010	.132	Wht, Blk	90	22	40	100, 500, 1000
	83319	22 (19x34)	.010	.010	.144	Wht, Blk	90	26	46	100, 500, 1000
	83320	20 (19x32)	.010	.012	.162	Wht, Blk	90	28	52	100, 500, 1000
	83321	18 (19x30)	.010	.012	.188	Wht, Blk	90	30	55	100, 500, 1000
	83322	16 (19x29)	.011	.012	.200	Wht, Blk	90	33	59	100, 500, 1000
 THREE CONDUCTOR	83330	30 (7x38)	.010	.010	.111	Wht, Blk, Red	90	14	25	100, 500, 1000
	83331	28 (7x36)	.010	.010	.117	Wht, Blk, Red	90	17	30	100, 500, 1000
	83332	26 (7x34)	.010	.010	.126	Wht, Blk, Red	90	19	33	100, 500, 1000
	83333	24 (19x36)	.010	.010	.136	Wht, Blk, Red	90	22	38	100, 500, 1000
	83334	22 (19x34)	.010	.012	.156	Wht, Blk, Red	90	24	41	100, 500, 1000
	83335	20 (19x32)	.010	.012	.175	Wht, Blk, Red	90	27	45	100, 500, 1000
	83336	18 (19x30)	.010	.012	.196	Wht, Blk, Red	90	28	52	100, 500, 1000
	83337	16 (19x29)	.011	.012	.218	Wht, Blk, Red	90	30	56	100, 500, 1000
 FOUR CONDUCTOR	83345	30 (7x38)	.010	.010	.119	Wht, Blk, Red, Grn	90	13	24	100, 500, 1000
	83346	28 (7x36)	.010	.010	.126	Wht, Blk, Red, Grn	90	16	28	100, 500, 1000
	83347	26 (7x34)	.010	.010	.135	Wht, Blk, Red, Grn	90	18	32	100, 500, 1000
	83348	24 (19x36)	.010	.012	.151	Wht, Blk, Red, Grn	90	20	36	100, 500, 1000
	83349	22 (19x34)	.010	.012	.166	Wht, Blk, Red, Grn	90	23	40	100, 500, 1000
	83350	20 (19x32)	.010	.012	.185	Wht, Blk, Red, Grn	90	25	44	100, 500, 1000
	83351	18 (19x30)	.010	.012	.215	Wht, Blk, Red, Grn	90	27	50	100, 500, 1000
	83352	16 (19x29)	.011	.014	.235	Wht, Blk, Red, Grn	90	29	54	100, 500, 1000

Stranded silver coated copper conductors, insulated with Type E extruded TFE TEFLON, color coded, cabled, braided silver plated copper shield, white TFE TEFLON tape wrapped jacket.

MIL-SPEC: MIL-W-16878 Type E

TEMPERATURE RATING: —65°C to 200°C

VOLTAGE: 600 Volts (RMS)

Manufactured to Current Government Specifications and Subsequent Revisions.

☐ Passes the FR-1 vertical flame test.

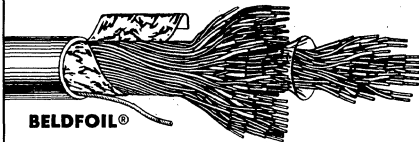
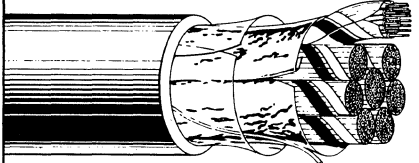
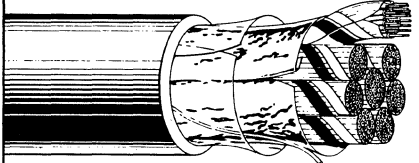
*Capacitance between conductors.

**Capacitance between one conductor and other conductors connected to shield.

shielded paired sound and control cables
data, instrumentation and computer cables



38, 51 AND 102 PAIR CABLES

Description	Trade Number	No. of Pairs	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Standard Spool Lengths in ft.
	8752•	38	22 (Solid)	.008	.045	.600	250, 500, 1000
		All lengths +20% —0 Length Tolerance					
	8751•	51	22 (Solid)	.010	.050	.700	250, 500, 1000, 1500
		All lengths +20% —0 Length Tolerance					
	9753	102	22 (Solid)	.010	.085	1.100	250, 500, 1000, 1500
		All lengths +20% —0 Length Tolerance					

Tinned copper, 8751 and 9753 vinyl insulated, 8752 polypropylene insulated, twisted pairs, BELDFOIL aluminum-polyester shield overall, 22 AWG (7x30) stranded drain wire, chrome vinyl jacket. 200 Volts suggested working voltage.

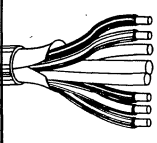
For color coding information on 8751 and 8752 write for Technical Data Bulletin T/8-4.

For color coding information on 9753 write for Technical Data Bulletin T/8-22.

SPECIAL DATA, INSTRUMENTATION AND COMPUTER CABLES

These cables are intended for those applications with special requirements such as miniature size, low capacitance for minimum signal distortion or good electrical characteristics. They are recommended for

both analog and digital systems. Special cable designs are available to satisfy unique physical and electrical requirements.

	Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Cond. Color Coding	Percent Shield Coverage	Nom. *Cap. (pF/ft)	Nom. **Cap. (pF/ft)	Suggested Working Voltage	Standard Spool Lengths in ft									
	9640	3 Shielded	28 (Solid)	.0025	.015	.087	Blk, Red, Blue	100	60	110	100	25, 50									
		2 Shielded					Grn, Wht														
		Solid copper, GEOSOL™ insulated (solderable—no stripping required), conductors cabled, 3 conductor group shielded from 2 conductor group (Patent No. 3,291,891), overall BELDFOIL aluminum-polyester shield, white vinyl jacket. 105°C maximum operating temperature.																			
		This miniature 5 conductor cable which consists of a shielded pair and a shielded triplet is ideal for use in instrumentation work where miniaturization is required. The patented construction offers circuit isolation between groups as well as overall shielding from external noise sources making it adaptable to low level signal circuits.																			

Description	Trade Number	AWG & (Stranding) Material	Insulation	Shield and Material	Jacket	Nom. O.D. (Inch)	Nom. Imp. (Ohms)	Nom. Vel. of Prop.	Nom. Cap. (pF/ft)	Nom. Attenuation per 100' MHz	Standard Spool Lengths in ft
	8700	28 (Solid) tinned copper	Polypropylene	Bare copper braid	Black vinyl	.054	32	66%	48	400	25, 50, 100, 250
		91 Percent shield coverage.									
	9754	26 (Solid) silver coated cadmium copper	Semi-solid flame retardant Polyethylene	BELDFOIL with two silver coated cadmium copper drain wires	Gray vinyl	.166	95	84%	13.5	100 200 300 400	500, 1000
		Underwriters' Laboratories, Inc., Listed (Style 1299)									
	9272	2 Cond. 20 (7x28) tinned copper	Polyethylene color coded	Tinned copper braid	Blue vinyl	.242	78	66%	19.7	100 200 400 900	100, 500, 1000
	9271	2 Cond. 25 (7x33) tinned copper	Polyethylene color coded	BELDFOIL with stranded tinned copper drain wire	Blue vinyl	.242	124	66%	12.2	1 10 20 50	100, 500, 1000

 Passes the FR-1 vertical flame test.

•Belden U.S. Patent 3,032,604.

*Capacitance between conductors.

**Capacitance between 1 conductor and other conductors connected to shield.

ELECTRONIC DIVISION/BELDEN CORPORATION, P.O. BOX 1331, RICHMOND, IN 47374 (317) 966-6661



unshielded paired sound and control cables

MULTIPLE PAIR UNSHIELDED SOUND AND CONTROL CABLES

All of these cables have passed the FR-1 vertical flame test.

TYPICAL APPLICATION: Balanced line sound systems.

Made with 80°C vinyl plastic compounds for high dielectric strength and the best physical properties, such as free stripping, small diameter and tear

resistance. It also resists the effects of water, sun, oil, grease and ozone. The conductors are paired with a short-lay twist for conductor balance, providing a quiet circuit, free from cross talk.

Description	Trade Number	No. of Pairs	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Suggested Working Voltage	Standard Spool Lengths in ft.
ALL CONSTRUCTIONS: Tinned copper, vinyl insulated, twisted pairs, chrome vinyl jacket.	22 SOLID Underwriters' Laboratories, Inc. Listed (Wires, Misc.) 90V Max.							
	8740	1	22 (Solid)	.015	.025	.150	300	100, T-500, and T-1000 (Convert-a-Pak)
	8741	2	22 (Solid)	.015	.028	.201	300	100, 1000, T-500 (Convert-a-Pak)
	8742	3	22 (Solid)	.015	.030	.240	300	100, 500, 1000
	8757	4	22 (Solid)	.015	.030	.255	300	500, 1000
	*9158	5	22 (Solid)	.012	.040	.298	300	500, 1000
	8743	6	22 (Solid)	.010	.035	.305	200	100, 500, 1000
	*9160	8	22 (Solid)	.012	.040	.336	300	500, 1000
	8744	9	22 (Solid)	.010	.037	.354	200	100, 500, 1000
	8753	11	22 (Solid)	.010	.037	.384	200	100, 500, 1000
	8754	13	22 (Solid)	.010	.037	.409	200	100, 500, 1000
	8745	15	22 (Solid)	.010	.040	.420	200	100, 500, 1000
	8755	19	22 (Solid)	.010	.040	.480	200	500, 1000
	8756	23	22 (Solid)	.010	.040	.510	200	500, 1000
	8746	27	22 (Solid)	.010	.045	.550	200	250, 500, 1000, 2000
	All lengths +20% -0 Length Tolerance							
	22 STRANDED							
	9744	2	22 (7x30)	.015	.028	.230	300	500, 1000
	9745	3	22 (7x30)	.015	.030	.280	300	500, 1000
	9746	4	22 (7x30)	.015	.030	.295	300	500, 1000
	8747	6	22 (7x30)	.010	.035	.320	200	100, 500, 1000
	8748	9	22 (7x30)	.010	.037	.389	200	100, 500, 1000
	9747	12	22 (7x30)	.010	.040	.440	200	500, 1000
	8749	15	22 (7x30)	.010	.040	.455	200	100, 500, 1000
	9748	19	22 (7x30)	.010	.040	.520	200	500, 1000
	9749	23	22 (7x30)	.010	.045	.570	200	500, 1000
	8750	27	22 (7x30)	.010	.045	.595	200	250, 500, 1000, 2000
	All lengths +20% -0 Length Tolerance							
	20 STRANDED Underwriters' Laboratories, Inc. Listed (Wires, Misc.) 90V Max.							
	*9750	3	20 (10x30)	.012	.040	.301	300	100, 500, 1000
	*9751	6	20 (10x30)	.012	.040	.370	300	100, 500, 1000
	*9752	9	20 (10x30)	.012	.040	.447	300	100, 500, 1000
	*9755	15	20 (10x30)	.012	.040	.535	300	100, 500, 1000
	18 STRANDED 8690, 9156, 9157 and 9161 are Underwriters' Laboratories, Inc. Listed (Wires, Misc.) 90V Max.							
	9740	1	18 (16x30)	.018	.030	.220	400	500, 1000
	*9156	2	18 (16x30)	.012	.035	.241	300	500, 1000
	8690	3	18 (16x30)	.018	.037	.362	400	100, 500, 1000
	*9157	4	18 (16x30)	.012	.040	.353	300	500, 1000
	*9159	5	18 (16x30)	.012	.050	.409	300	500, 1000
	8691	6	18 (16x30)	.018	.045	.550	400	100, 500, 1000
	*9161	8	18 (16x30)	.012	.050	.469	300	500, 1000
	8692	9	18 (16x30)	.018	.055	.638	400	100, 500, 1000
	9741	12	18 (16x30)	.018	.055	.690	400	500, 1000
	9742	15	18 (16x30)	.018	.060	.800	400	500, 1000
	9743	19	18 (16x30)	.018	.070	.880	400	500, 1000

★ New Item ☐ Passes the FR-1 vertical flame test.



data instrumentation and computer cables

two conductor unshielded cables

SPECIAL DATA, INSTRUMENTATION AND COMPUTER CABLES (Cont'd)

Description	Trade Number	AWG & (Stranding) Material	Insulation Nom. Core O.D. (Inch)	Shield and Material	Jacket	Nom. O.D. (Inch)	Nom. Imp. (Ohms)	Nom. Vel. of Prop. (%)	Nom. Cap. (pF/ft)	Nom. Attenuation per 100' MHz | db	Standard Spool Lengths in ft.
200 OHM VIDEO TWINAX 	★9851	2 cond. 29 AWG Solid Silver Coated Copperweld	Cellular Flame Retardant Polyethylene	BELDFOIL overall	Chrome vinyl	.245	200	76%	6.7	—	100, 500, 1000
Underwriters' Laboratories, Inc., Listed (Style 2606)											
DUAL—200 OHM VIDEO TWINAX 	★9852	Same as above except 4 cond.	Same as above	BELDFOIL over pairs and overall	Black vinyl	.490	200	78%	6.5	—	100, 500, 1000
Underwriters' Laboratories, Inc., Listed (Style 2606)											
62A/U 	★9269	22 AWG Solid bare Copperweld	Semi-Solid Polyethylene (.146)	1 Bare Copper	Black Non-Contaminating vinyl	.242	93	84%	13.5	100 200 400 900	3.1 4.4 6.3 11.0
Underwriters' Laboratories, Inc., Listed (Style 1354)											
FR-1 	★9268	22 AWG Solid bare Copperweld	Semi-solid Flame Retardant Polyethylene (.146)	1 Bare Copper	Black vinyl	.264	93	80%	14.5	100 200 400 900	3.1 4.4 6.3 11.0
Underwriters' Laboratories, Inc., Listed (Style 1354)											

COPPER TAPE SHIELDED PAIRED CABLES

Description	Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Cond. Color Coding	Percent Shield Coverage	Nom. *Cap. (pF/ft)	Nom. **Cap. (pF/ft)	Suggested Working Voltage	Standard Spool Lengths in ft.
	★9853	6 3 (Pairs)	22 (Solid)	.010 plus .0025 Nylon	.042	.299	Wht/Blu Wht/Org Wht/Grn	100	38	64	300	100, 250, 500, 1000
	★9856	12 6 (Pairs)	22 (Solid)	.010 plus .0025 Nylon	.050	.450	Wht/Blu Wht/Org Wht/Grn Wht/Brn Wht/Gry Red/Blu	100	38	64	300	100, 250, 500, 1000
Tinned Copper, vinyl insulated with Nylon over, Copper foil tape shielded twisted pairs, black vinyl jacket. Similar to MIL-C-23437 except Copper foil shield in place of copper braid.												

TWO CONDUCTOR UNSHIELDED CABLES

Description	Trade Number	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Conductor Color Coding	Available Jacket Colors	Nominal O.D. (Inch)	Suggested Working Voltage	Standard Spool Lengths in ft.
 Copper, vinyl insulated PARALLEL	8781	22 (Solid)	.016	—	1 cond. tinned	Chrome	.060x .120	100	100, 500, 1000
	8782	24 (7x32)	.017	—	1 cond. tinned	Chrome, Sand, White, Clear	.058x .115	300	25, 50, 100, 500, 1000
	8649	20 (7x28)	.020	—	1 cond. tinned	Chrome, Clear	.073x .146	300	100, 500, 1000
 Copper, vinyl insulated, CABLED	8481	22 (Solid) bare	.015	—	Brn, Tan	—	.112	350	100, 500, 1000
	*9151	22 (7x30)	.012	—	Brown or White 1 cond. tinned	—	.108	300	500, 1000
	Underwriters' Laboratories, Inc. Listed (Misc. Wire)								
	*9152	20 (10x30)	.012	—	Brown or White 1 cond. tinned	—	.125	300	500, 1000
	Underwriters' Laboratories, Inc. Listed (Misc. Wire)								
	8482	19 (Solid) bare	.015	—	Brn, Tan	—	.130	350	100, 500, 1000
	8492	19 (Solid)	.025	—	Brown or White 1 cond. tinned	—	.170	600	1000
	*9153	18 (16x30)	.012	—	Brown or White 1 cond. tinned	—	.142	300	500, 1000
Underwriters' Laboratories, Inc. Listed (Misc. Wire)									

★ New Item

*Capacitance between conductors.

**Capacitance between 1 conductor and other conductor connected to shield.

FR-1 or ☐ Passes the FR-1 vertical flame test.



two and three conductor unshielded cables
control and audio cables
TWO CONDUCTOR UNSHIELDED CABLES (Cont'd)

Description	Trade Number	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Conductor Color Coding	Available Jacket Colors	Nominal O.D. (Inch)	Suggested Working Voltage	Standard Spool Lengths in ft.
Without JACKET 	8460	18 (7x26) tinned	.020	—	Blk. Wht	—	.175	450	100, 500, 1000
	8470	16 (19x29) tinned	.023	—	Blk. Wht	—	.195	600	500, 1000
With JACKET 	8740	22 (Solid) tinned	.015	.025	Blk, Red	Chrome	.150	200	100, T-500 and T-1000 (Convert-a-pak)
	8442	22 (7x30) tinned	.015	.025	Blk, Red	Chrome, Rose Gray	.165	350	500, 1000
SOLID 	8442—Underwriters' Laboratories, Inc. Listed (Wires, Misc.) 90V Max.								
	8205	20 (10x30) tinned	.018	.025	Blk, Red	Chrome, Rose Gray	.190	350	100, 500, 1000 500, 1000
STRANDED 	8205—Underwriters' Laboratories, Inc. Listed (Wires, Misc.) 90V Max.								
	8486	19 (Solid) bare	.015	.025	Brn, Tan	Chrome	.162	350	500, 1000
Copper, vinyl insulated, twisted pair, vinyl jacket.	8461	18 (7x26) tinned	.020	.028	Blk, Wht	Chrome, Rose Gray	.226	450	100, 500, 1000 500, 1000
	8461—Underwriters' Laboratories, Inc. Listed (Wires, Misc.) 90V Max.								
	9740	18 (16x30) tinned	.018	.030	Blk, Red	Chrome	.220	400	500, 1000
	8471	16 (19x29) tinned	.023	.030	Blk, Wht	Chrome	.256	600	500, 1000
	8473	14 (19x27) tinned	.031	.035	Blk, Wht	Chrome	.332	600	500, 1000
	8477	12 (19x25) tinned	.031	.040	Blk, Wht	Chrome	.384	600	500, 1000

THREE CONDUCTOR UNSHIELDED CABLES

Description	Trade Number	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Conductor Color Coding	Nominal O.D. (Inch)	Suggested Working Voltage	Standard Spool Lengths in ft.
	8701	22 (Solid)	.016	—	Chrome 1 cond. tinned	.060x .190	100	100, 500, 1000
	Copper, vinyl insulated, PARALLEL							
Without JACKET 	8483	19 (Solid)	.015	—	Brn, Gray, Tan	.132	350	100, 500, 1000
	Bare copper, vinyl insulated, CABLED.							
With JACKET 	8443	22 (7x30) tinned	.010	.025	Blk, Grn, Red	.150	200	25, 100, 250, 500, 1000
	8487	19 (Solid) bare	.015	.025	Brn, Gray, Tan	.180	350	500, 1000
	Copper, vinyl insulated, CABLED, chrome vinyl jacket.							

VINYL MULTIPLE CONDUCTOR CONTROL AND AUDIO CABLES (NOT PAIRED)

Description	Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Color Code Chart No.	Suggested Working Voltage	Standard Spool Lengths in ft.
22 GAGE 	8443	3	22 (7x30)	.010	.025	.150	1	200	25, 100, 250, 500, 1000
	8444	4	22 (7x30)	.010	.025	.168	1	200	25, 100, 250, 500, 1000
	8445	5	22 (7x30)	.010	.025	.180	1	200	25, 100, 250, 500, 1000
	9430	7	22 (7x30)	.010	.025	.200	1	200	500, 1000
	8456	10	22 (7x30)	.010	.030	.260	1	200	100, 500, 1000
	8457	12	22 (7x30)	.010	.030	.260	1	200	100, 500, 1000
	8458	15	22 (7x30)	.010	.040	.320	2R	200	100, 500, 1000
	9431	20	22 (7x30)	.010	.040	.345	2R	200	500, 1000
	8459	25	22 (7x30)	.010	.040	.370	2R	200	100, 500, 1000
	9432	30	22 (7x30)	.010	.040	.400	2R	200	500, 1000
	9433	40	22 (7x30)	.010	.040	.455	2R	200	500, 1000
	9434	50	22 (7x30)	.010	.045	.500	2R	200	500, 1000

For color coding refer to Belden page 14.

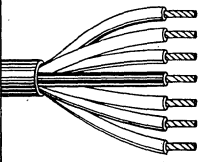
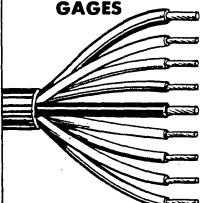
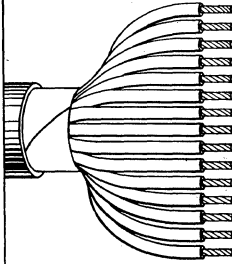
☐ Passes the FR-1 vertical flame test.



multiple conductor unshielded cables

VINYL MULTIPLE CONDUCTOR CONTROL AND AUDIO CABLES (NOT PAIRED)

All of these cables have passed the FR-1 vertical flame test.

Description and Gauge	Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Color Code Chart No.	Suggested Working Voltage	Standard Spool Lengths in ft.
20 & 18 GAGE All of the 20 Gage cables are Underwriters Laboratories Inc. Listed (Wires, Misc.). Tinned copper, vinyl insulated, conductors cabled, chrome vinyl jacket.  Tinned copper, vinyl insulated, conductors cabled, chrome vinyl jacket.	*9444	4	20 (10x30)	.012	.030	.208	1	300	100, 500, 1000
	*9445	5	20 (10x30)	.012	.030	.230	1	300	100, 500, 1000
	*9439	7	20 (10x30)	.012	.030	.250	1	300	100, 500, 1000
	*9455	9	20 (10x30)	.012	.035	.310	1	300	100, 500, 1000
	*9457	12	20 (10x30)	.012	.035	.330	1	300	100, 500, 1000
	*9458	15	20 (10x30)	.012	.040	.380	2	300	100, 500, 1000
	8489	4	18 (16x30)	.018	.030	.250	1	400	100, 250, 500, 1000
	8465	5	18 (16x30)	.018	.037	.286	1	400	100, 250, 500, 1000
	8467	7	18 (16x30)	.018	.037	.324	1	400	100, 250, 500, 1000
	8469	9	18 (16x30)	.018	.037	.379	1	400	100, 250, 500, 1000
	8466	12	18 (16x30)	.018	.040	.412	2R	400	100, 250, 500, 1000
	8468	15	18 (16x30)	.018	.045	.490	2R	400	100, 500, 1000
	8619	19	18 (16x30)	.018	.045	.505	2R	400	500, 1000
	9626	25	18 (16x30)	.018	.060	.600	2R	400	500, 1000
COMBINATION GAGES  Tinned copper, vinyl insulated, conductors cabled, chrome vinyl jacket.	8446	6	4-22 (7x30) 2-18 (16x30)	.010 .018	.025	.222	1	200 400	15, 100, 250, 500, 1000
	8447	7	5-22 (7x30) 2-18 (16x30)	.010 .018	.028	.246	1	200 400	100, 250, 500, 1000
	8448	8	6-22 (7x30) 2-18 (16x30)	.010 .018	.028	.250	1	200 400	15, 100, 250, 500, 1000
	8449	9	7-22 (7x30) 2-18 (16x30)	.010 .018	.028	.261	1	200 400	15, 100, 250, 500, 1000
16 & 14 GAGE  Tinned copper, vinyl insulated, conductors cabled, chrome vinyl jacket.	8620	4	16 (19x29)	.030	.045	.375	2	600	100, 500, 1000
	9620	5	16 (19x29)	.030	.045	.405	2	600	100, 500, 1000
	8621	7	16 (19x29)	.030	.045	.455	2R	600	100, 500, 1000
	9621	9	16 (19x29)	.030	.045	.510	2R	600	500, 1000
	8622	12	16 (19x29)	.030	.060	.600	2R	600	100, 500, 1000
	8623	15	16 (19x29)	.030	.060	.685	2R	600	100, 500, 1000
	8624	19	16 (19x29)	.030	.065	.715	2R	600	100, 500, 1000
	9622	25	16 (19x29)	.030	.065	.820	2R	600	500, 1000
	8627	4	14 (19x27)	.045	.045	.495	2	600	100, 500, 1000
	9623	5	14 (19x27)	.045	.060	.560	2	600	100, 500, 1000
	8628	7	14 (19x27)	.045	.060	.630	2R	600	100, 500, 1000
	8629	12	14 (19x27)	.045	.065	.770	2R	600	100, 500, 1000

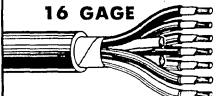
★ New Item ☐ Passes the FR-1 vertical flame test. For color coding refer to Belden page 14. 2R Same as IPCEA except ring band striping.

ELECTRONIC DIVISION/BELDEN CORPORATION, P.O. BOX 1331, RICHMOND, IN 47374 (317) 966-6661

multiple conductor unshielded cables
and telephone cables

TYPE SO NEOPRENE MULTIPLE CONDUCTOR CONTROL CABLES (NOT PAIRED)

General purpose industrial and utility control applications, remote control of automatic electric equipment and motor control. Heavy duty neoprene jacket offers excellent resistance to oils, acids, oxidation, weathering, ozone, abrasion and impact.

Description	Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Color Code Chart No.	Suggested Working Voltage	Standard Spool Lengths in ft.
 16 GAGE Bare copper, rubber insulated, conductors cabled with fillers, black neoprene jacket.	9420	5	16 (65x34)	.032	.078	.520	2R	600	100, 500, 1000
	9422	7	16 (65x34)	.032	.078	.560	2R	600	100, 500, 1000
	9424	9	16 (65x34)	.032	.078	.610	2R	600	100, 500, 1000
	9425	12	16 (65x34)	.032	.094	.720	2R	600	100, 500, 1000
	9427	16	16 (65x34)	.032	.094	.800	2R	600	100, 500, 1000
	9429	20	16 (65x34)	.032	.094	.880	2R	600	100, 500

Underwriters' Laboratories, Inc. Listed.

ELECTRICAL POWER AND CONTROL CABLES—MIL-C-3432

Electrical power and control cables intended for use in electrical and electronic applications. These cables are intended for military applications to transmit power and control signals. These medium duty cables are suitable for small portable tools, sound equipment, radio receivers and motor leads. The tough flexible jacket is resistant to the mechanical abuse and extreme humidity and temperature conditions normally encountered in the intended applications.

Description	Trade Number	Type Designation	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Suggested Working Voltage	Standard Spool Lengths in ft.
	9215	CO-02 MGF (2/18) 0310	2	18 (41x34)	.033	.039	.310	600	500, 1000
	9216	CO-02 MGF (2/16) 0335	2	16 (65x34)	.033	.047	.335	600	500, 1000
	9217	CO-02 MGF (2/14) 0400	2	14 (41x30)	.036	.047	.400	600	500, 1000
	9218	CO-03 MGF (3/18) 0340	3	18 (41x34)	.033	.047	.340	600	500, 1000
	9219	CO-03 MGF (3/16) 0365	3	16 (65x34)	.033	.047	.365	600	500, 1000
Tinned copper conductors, rubber insulated, cabled with fillers, cotton serve, black rubber jacket. Conductor color coding: (1) White, (2) Black, (3) Green.									

Manufactured to current Government specifications and subsequent revisions.

IPCEA COLOR CODE Chart No. 2 & 2R

(Insulated Power Cable Engineers Association)

2R—These Cables feature a ring band striping.

COLOR CODE Chart No. 1

Conductor	Color
1st	Black
2nd	Red
3rd	Green
4th	White
5th	Brown
6th	Blue
7th	Orange
8th	Yellow
9th	Purple
10th	Gray
11th	Pink
12th	Tan

18 Gage conductors in cables 8446 through 8449 are Black and Red.

Conductor	Color	Conductor	Color	Conductor	Color
1st	Black	18th	Orange/Red	35th	Wht/Red/Org
2nd	White	19th	Blue/Red	36th	Org/Wht/Blue
3rd	Red	20th	Red/Green	37th	Wht/Red/Blue
4th	Green	21st	Orange/Green	38th	Blk/Wht/Grn
5th	Orange	22nd	Blk/Wht/Red	39th	Wht/Blk Grn
6th	Blue	23rd	Wht/Blk/Red	40th	Red/Wht/Grn
7th	White/Black	24th	Red/Blk/Wht	41st	Grn/Wht/Blue
8th	Red/Black	25th	Grn/Blk/Wht	42nd	Org/Red/Grn
9th	Green/Black	26th	Org/Blk/Wht	43rd	Blue/Red/Grn
10th	Orange/Black	27th	Blue/Blk/Wht	44th	Blk/Wht/Blue
11th	Blue/Black	28th	Blk/Red/Grn	45th	Wht/Blk/Blue
12th	Black/White	29th	Wht/Red/Grn	46th	Red/Wht/Blue
13th	Red/White	30th	Red/Blk/Grn	47th	Grn/Org/Red
14th	Green/White	31st	Grn/Blk/Org	48th	Org/Red/Blue
15th	Blue/White	32nd	Org/Blk/Grn	49th	Blue/Red/Org
16th	Black/Red	33rd	Blue/Wht/Org	50th	Blk/Org/Red
17th	White/Red	34th	Blk/Wht/Org		

TELEPHONE CABLES

Description	Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Cond. Color Coding	Standard Spool Lengths in ft.
 Bare copper, polyethylene insulated, conductors cabled, rose gray vinyl jacket.	8795	2	22 (Solid)	.016	.022	.160	Red, Grn	T-500 (Convert-a-pak) and 1000' spools
	8794	3	22 (Solid)	.016	.022	.168	Red, Grn, Yel	T-500 (Convert-a-pak) and 1000' spools
	9794	4	22 (Solid)	.016	.025	.190	Grn, Red, Yel, Blk	T-500 (Convert-a-pak) and 1000' spools
Underwriters' Laboratories, Inc. Listed (Wires, Misc.) 90V Max.								
Underwriters' Laboratories, Inc. Listed (Wires, Misc.) 90V Max.								

☐ Passes the FR-1 vertical flame test.



microphone and shielded power supply cables

MICROPHONE CABLES

Belden Microphone Cables are designed for flexible service at audio frequencies. They are used not only for microphones, but also for home entertainment equipment, instruments, tape recorders and shielded power supplies.

Shielded single conductor cables are used in high impedance systems, while multiple conductor cables are used in

low impedance applications.

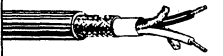
All cables are precision-engineered and manufactured to transmit clear signals and to cancel out hum pick-up and crosstalk interference. They are designed to withstand the flexing and normal abuse of studio, laboratory and home usage.

RUBBER, HYPALON® AND NEOPRENE MICROPHONE AND SHIELDED POWER SUPPLY CABLES

Description	Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Percent Shield Coverage	Suggested Working Voltage	Impedance (Ohms)	Nom. *Cap. (pF/ft)	Nom. **Cap. (pF/ft)	Standard Spool Lengths in ft.
 SINGLE CONDUCTOR	8410	1	25 (7x33)	.063	.025	.245	80	3000 DC	52	—	33	25, 50, 100, 250, 500
			3 strands copper, 4 strands Copperweld tinned, cellulose yarn braid, rubber insulated, rayon braid, tinned copper braid shield, cellulose yarn wrap, black rubber jacket.									
 MINIATURE	8413	2	24 (45x40)	.019	.025	.190	100	300	—	30	55	15, 25, 50, 100, 250, 500
	8406	3	24 (45x40)	.019	.025	.223	100	300	—	35	60	100, 500
			Tinned cadmium bronze, cotton serve, rubber insulated, cabled with fillers, 100% coverage conductive textile wrap shield, tinned copper braid shield, cotton serve, black rubber jacket.									
 MULTIPLE CONDUCTOR	8412	2	20 (26x34)	.020	.043	.268	84	600	—	30	55	25, 50, 100, 250, 500, 1000
	8402	2	20 (26x34) Brown Hypalon jacket.	.020	.040	.268	84	600	—	30	55	100, 250, 500
	8428	2	18 (41x34) Black neoprene jacket.	.022	.038	.295	91	600	—	35	60	100, 500, 1000
	8408	2	16 (65x34) Brown Hypalon jacket—Heavy Duty	.032	.040	.385	84	600	—	30	55	100, 500
	8423	3	20 (26x34)	.020	.040	.277	84	600	—	35	60	50, 100, 250, 500, 1000
	8424	4	20 (26x34)	.020	.040	.295	83.5	600	—	35	60	50, 100, 250, 500, 1000
	8407	4	16 (65x34) Black neoprene jacket—Heavy Duty	.032	.043	.422	84	600	—	30	55	100, 250
	8425	5	20 (26x34)	.020	.040	.323	76	600	—	35	60	100, 250
	8426	6	20 (26x34)	.020	.040	.349	90	600	—	35	60	100, 250
	8427	7	20 (26x34)	.020	.043	.360	90	600	—	35	60	100, 250
	8418	8	20 (26x34)	.020	.043	.386	92	600	—	35	60	100, 250

CONDUCTOR COLOR CODING: (1) White, (2) Black, (3) Red, (4) Green, (5) Blue, (6) Brown, (7) Yellow, (8) Orange.

VINYL MICROPHONE AND SHIELDED POWER SUPPLY CABLES

 SINGLE CONDUCTOR	8411	1	25 (7x33)	.020	.020	.144	72	3500 DC	52	—	40	15, 25, 50, 100, 250, 500, 1000
	8401	1	25 (7x33)	.043	.025	.200	74	5000 DC	57	—	25	15, 25, 50, 100, 250, 500, 1000
			3 strands copper, 4 strands Copperweld tinned, braided textile, polyethylene insulated, tinned copper braid shield, chrome vinyl jacket.									
 MINIATURE	8420	2	24 (45x40)	.015	.020	.185	77	500	—	22	40	15, 25, 50, 100, 250, 500
			Tinned cadmium bronze, cotton wrap, polyethylene insulated, cabled with fillers, rayon braid, tinned copper braid shield, chrome vinyl jacket.									
 MULTIPLE CONDUCTOR	8422	2	22 (16x34)	.023	.023	.231	87	1000	—	18	32	15, 25, 50, 100, 250, 500, 1000
	8403	3	20 (26x34)	.015	.033	.244	89	600	—	25	45	15, 50, 100, 250, 500, 1000
	8404	4	20 (26x34)	.015	.033	.248	87	600	—	23	40	15, 100, 250, 500, 1000
	8405	5	20 (26x34)	.015	.035	.275	83	600	—	23	40	250, 500, 1000

CONDUCTOR COLOR CODING: (1) Clear, (2) Black, (3) Red, (4) Green, (5) Blue ■Trademark of DuPont.

☐ Passes the FR-1 vertical flame test.

PLASTIC CABLES RECOMMENDED FOR: Lower capacitance, lower loss, greater ozone and oil resistance, lighter weight, smaller diameter.
RUBBER CABLES RECOMMENDED FOR: Greater abrasion and impact resistance and extra limpness so cable will lie flat on stage or studio floor.
NEOPRENE AND HYPALON CABLES RECOMMENDED FOR: Outside use, cold weather applications. Resistant to effects of sun, oil and ozone.

*Capacitance between conductors.

**Capacitance between 1 conductor and remaining conductors (if any) connected to shield.

retractile cables and cords



RETRACTILE CORDS

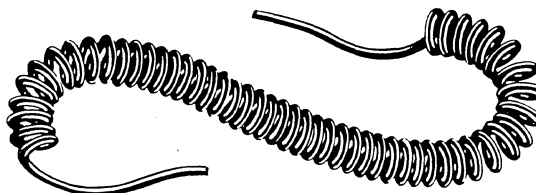
Retractable cords keep telephone and microphone cables from tangling and cluttering desk tops, communications consoles and the front seats of motor vehicles. Belden manufactures a full line of high quality retractile coiled cord products for a wide number of applications.

Belden retractile cables and cords are used for telephone equipment; ham and citizen band radios; hand and

desktop microphones; language lab equipment; musical instruments; mobile controls and mobile communications equipment and for a variety of assorted industrial applications.

The specially designed conductors and shields of Belden retractile cords are constructed to withstand rugged use and to minimize replacement frequency.

Belden's full line of retractile cords shown in this catalog will meet most of your requirements. For any custom or unusual cord and cable application contact Belden's Special Custom Design Center

RETRACTILE
MICROPHONE CABLES

Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nominal O.D. (Inch)	Nominal Coil O.D. (Inch)	Percent Shield Coverage	Nominal ***Cap. (pF/cord)	Retracted Length (Inch)	Practical Extended Length (Feet)	Standard Put-Up
8409	4 unshielded	28 (7x36)	.005	.050	.165	7/8	No shield	—	12	6	1
Tinned copper, nylon insulated, neoprene jacket. 6" straight portion at each end cut blunt.											
8415	4 unshielded	23 (21x36)	.020	.055	.250	7/8	No shield	—	11 1/2	6	1, 50
5 strands TCW, 16 strands TC, rubber insulated, paper tape, neoprene jacket. 6" straight portion at each end cut blunt.											
9415	4 unshielded	23 (21x36)	.020	.055	.250	7/8	No shield	—	30	15	1, 15
5 strands TCW, 16 strands TC, rubber insulated, paper tape, neoprene jacket. 6" straight portion at each end cut blunt.											
8499	1 shielded	24 (45x40)	.019	.043	.170	1 1/8	80	285	7 1/2	4	1
Tinned cadmium bronze, rubber insulated, spiral TC shield, cotton wrap, neoprene jacket. 6" straight portion at each end cut blunt.											
8605	1 shielded	24 (19x36)	.021	.042	.160	1 1/8	87	680	21 1/2	12	1
Tinned copper, polypropylene insulated, spiral TC shield, Gray PVC jacket. 6" straight portion at each end cut blunt.											
8497	3 1 shielded 2 unshielded	23 (21x36)	.020	.046	.250	7/8	100	510	11 1/2	6	1, 50
5 strands TCW, 16 strands TC, rubber insulated, conductive textile wrap shield plus BELDFOIL® aluminum-polyester shield with drain wire same as conductors, paper tape, neoprene jacket. 6" straight portion at each end cut blunt.											
9417	3 1 shielded 2 unshielded	23 (21x36)	.020	.046	.250	7/8	100	1200	30	15	1, 15
5 strands TCW, 16 strands TC, rubber insulated, conductive textile wrap shield plus BELDFOIL aluminum-polyester shield with drain wire same as conductors, paper tape, neoprene jacket. 6" straight portion at each end cut blunt.											
8491	4 2 individually shielded 2 unshielded	23 (21x36)	.020	.050	.275	1 1/8	100	510	12	6	1
5 strands TCW, 16 strands TC, rubber insulated, conductive textile wrap shield plus BELDFOIL aluminum-polyester shield with drain wire same as conductors, paper tape, neoprene jacket. 6" straight portion at each end cut blunt.											
9416	4 2 individually shielded 2 unshielded	23 (21x36)	.020	.050	.275	1 1/8	100	1200	30	15	1, 15
5 strands TCW, 16 strands TC, rubber insulated, conductive textile wrap shield plus BELDFOIL aluminum-polyester shield with drain wire same as conductors, paper tape, neoprene jacket. 6" straight portion at each end cut blunt.											
8490	5 unshielded	23 (21x36)	.020	.045	.265	7/8	No shield	—	11 1/2	6	1
5 strands TCW, 16 strands TC, rubber insulated, paper tape, neoprene jacket. 6" straight portion at each end cut blunt.											

CONDUCTOR COLOR CODING: (1) White, (2) Black, (3) Red, (4) Green, (5) Blue.

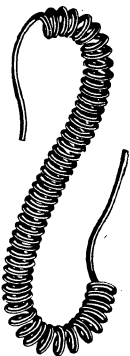
***Capitance of shielded conductor.



retractile power control cables and
telephone cords

NEOPRENE RETRACTILE POWER CONTROL CABLES

Underwriters' Laboratories, Inc. Listed. Certified to C.S.A. Standards.

Description	Trade Number	No. of Cond.	Type	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Nom. Coil O.D. (Inch)	Retracted Length (Inch)	Practical Extended Length (Feet)	Standard Put-Up
	8601	2	SVO	18 (41x34)	.016	.045	.270	1 5/8	12	6	1
	9476	2	SVO	18 (41x34)	.016	.045	.270	1 5/8	24	12	1,15
	9477	2	SVO	18 (41x34)	.016	.045	.270	1 5/8	48	25	1,15
	9478	3	SVO	18 (41x34)	.016	.045	.275	1 5/8	24	12	1,15
	9479	3	SVO	18 (41x34)	.016	.045	.275	1 5/8	48	25	1,15
	8602	3	SJO	18 (41x34)	.031	.045	.360	1 3/8	12	6	1
	9480	3	SJO	18 (41x34)	.031	.045	.360	1 3/8	24	12	1
	9481	3	SJO	18 (41x34)	.031	.045	.360	1 3/8	48	25	1
	8603	3	SJO	16 (65x34)	.031	.045	.370	1 7/8	12	6	1
	9484	3	SJO	16 (65x34)	.031	.045	.370	1 7/8	24	12	1
	9485	3	SJO	16 (65x34)	.031	.045	.370	1 7/8	48	25	1
	9482	4	SJO	18 (41x34)	.031	.045	.385	1 7/8	24	12	1
	9483	4	SJO	18 (41x34)	.031	.045	.385	1 7/8	48	25	1
<i>Bare copper, paper wrap, rubber insulated, cabled with fillers, paper tape wrap, black neoprene jacket. 12" straight portion each end (except 6" straight portion on 8601, 8602, 8603). Jacket removed 1 1/2" each end.</i> Conductor Color Coding: (1) White, (2) Black, (3) Green, (4) Red.											

VINYL RETRACTILE TELEPHONE CORDS

Description	Trade Number	No. of Cond.	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Nom. Coil O.D. (Inch)	Retracted Length (Inch)	Practical Extended Length (Feet)	Standard Put-Up
	8495	3	23 (21x36)	.020	.041	.220	7/8	10	4 1/2	1
	<i>Bare cadmium bronze, vinyl insulated, conductors cabled, paper tape wrap, black vinyl jacket. One end stripped 2 3/4", spade terminals attached and hook strain relief clamped over jacket. Other end stripped 3 3/8" and spade terminals attached.</i> Conductor Color Coding: (1) White, (2) Black, (3) Red. Black Jacket only.									
	9443	4	31 (Tinsel)	.010	.031	.195	3/4	10 1/2	5	1,15
	9440	4	31 (Tinsel)	.010	.031	.195	3/4	22	10	1,15
	9441	4	31 (Tinsel)	.010	.031	.195	3/4	33	15	1,15
	9442	4	31 (Tinsel)	.010	.031	.195	3/4	48	25	1,15
	<i>Tinsel conductors, vinyl insulated, vinyl jacket. One end stripped 7", spade terminals attached and hook strain relief clamped over jacket. Other end has red and black conductors pulled out of jacket and cut to 3" length, spade terminals attached, molded plastic strain relief, 6 3/4" jacket remains on 2 white conductors, spade terminals attached.</i> Jacket colors available in black, light beige or white.									



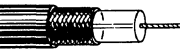
75 OHM PRECISION VIDEO CABLES

The 9231 is a precision 75 ohm Video cable manufactured with rigid control of concentricity and all dimensional tolerances offering superior return loss characteristics; a quality Video transmission cable which provides exceptional picture definition and eliminates problems resulting from periodicity. It has a non-contaminating vinyl jacket for more flexibility. The double braid 8281 75 ohm Video cable is made to tight tolerances for excellent return loss performance.

Our 8279, miniature 75 ohm Video cable is for applications where space is critical. The gray vinyl and black polyethylene jackets are made of non-contaminating, non-migratory compounds.

Typical Application: Video signal transmission in Color and Monochrome TV studios.

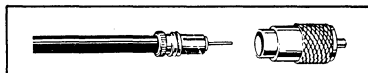
100% SWEEP TESTED

Description	Trade Number	AWG & (Stranding) Material	Nom. O.D. (Inch)	Percent Shield Coverage	Nom. Impedance (Ohms)	Nom. Velocity of Propagation	Nom. Cap. (pF/ft.)	Nom. Attenuation per 100' kHz or MHz	db	Standard Spool Lengths in ft.
	9231*	20 (Solid) bare copper	.304	96.4	75	66%	21	10 kHz 100 kHz 1 MHz 4.5 MHz 10 MHz 100 MHz	.06 .08 .25 .45 .78 2.70	500, 1000
	Conductor, polyethylene insulated, tinned copper double braid shield, gray non-contaminating vinyl jacket. Nom. Core O.D. .198" Underwriters' Laboratories, Inc. Listed (Style 1354)									
	8281*	20 (Solid) bare copper	.304	96.4	75	66%	21	10 kHz 100 kHz 1 MHz 4.5 MHz 10 MHz 100 MHz	.06 .08 .25 .45 .78 2.70	500, 1000
Conductor, polyethylene insulated, tinned copper double braid shield, black polyethylene jacket. Nom. Core O.D. .200"										
 Miniature	8279**	23 (7x31) bare compacted copper	.220	96	75	66%	21	10 kHz 100 kHz 1 MHz 4.5 MHz 10 MHz 100 MHz	.14 .15 .35 .80 1.30 4.90	100, 250, 500
	Conductor, polyethylene insulated, tinned copper braid shield, black polyethylene jacket. Nom. Core O.D. .146" Compacted conductor combines impedance uniformity of solid conductor and "nick-resistance" of stranded conductor.									



For Use on 9231 and 8281.

8299 Adapter for use with PL-259 connector. 25 in a box.



COAXIAL CABLES***

Description	Trade Number	RG No.	AWG & (Stranding) Material	Insulation Nom. Core O.D. (Inch)	No. of Shields and Material	Jacket	Nom. O.D. (Inch)	Nom. Imp. (Ohms)	Nom. Vel. of Prop.	Nom. Cap. (pF/ft.)	Nom. Attenuation per 100' MHz	db	Standard Spool Lengths in ft.
	8237	8/U JAN-C-17A	13 (7x21) bare copper	Polyethylene (.285)	1 bare copper	Black vinyl	.405	52	66%	29.5	100 200 400 900	2.0 3.0 4.7 7.8	50, 100, 500, 1000
	9251	8A/U MIL-C-17D	13 (7x21) bare copper	Polyethylene (.285)	1 bare copper	Black non-contaminating vinyl	.405	52	66%	29.5	100 200 400 900	2.0 3.0 4.7 7.8	100, 500, 1000
	Underwriters' Laboratories, Inc. Listed (Style 1354)												
	8214	8/U Type	11 (7x19) bare copper	Cellular Polyethylene (.285)	1 bare copper	Black vinyl	.405	50	78%	26.0	50 100 200 300 400	1.2 1.8 2.6 3.3 3.8	50, 100, 500, 1000
	Underwriters' Laboratories, Inc. Listed (Style 1354)												
	8242	9/U JAN-C-17A	13 (7x21) silver coated copper	Polyethylene (.280)	2-inner-silver coated outer-bare copper	Gray non-contaminating vinyl	.420	51	66%	30.0	100 200 400 900	1.9 2.8 4.1 6.5	100, 1000
	Underwriters' Laboratories, Inc. Listed (Style 1354)												
	8238	11/U JAN-C-17A	18 (7x26) tinned copper	Polyethylene (.285)	1 bare copper	Black vinyl	.405	75	66%	20.5	100 200 400 900	2.0 2.9 4.2 6.5	100, 500, 1000
	8261†	11A/U MIL-C-17D	18 (7x26) tinned copper	Polyethylene (.285)	1 bare copper	Black non-contaminating vinyl	.405	75	66%	20.5	100 200 400 900	2.0 2.9 4.2 6.5	500, 1000

†Manufactured to current Government specifications and subsequent revisions.

☐ Passes the FR-1 vertical flame test.

*Request Technical Data Bulletin T/8-16 for connector information.

**Request Technical Data Bulletin T/8-17 for connector information.

***RG/U cables combine low capacitance and low attenuation. The virgin polyethylene insulation assures constant electrical characteristics regardless of changes in frequency or temperature. Note: Max. rating of polyethylene in 80°C (176°F).

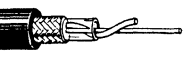
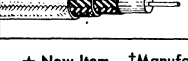
REQUEST QUOTATIONS ON PRODUCTION QUANTITIES OF RG/U CABLES NOT LISTED.

ELECTRONIC DIVISION/BELDEN CORPORATION, P.O. BOX 1331, RICHMOND, IN 47374 (317) 966-6661



RG/U transmission line cables

COAXIAL CABLES (Cont'd)

Description	Trade Number	RG No.	AWG & (Stranding) Material	Insulation Nom. Core O.D. (Inch)	No. of Shields and Material	Jacket	Nom. O.D. (Inch)	Nom. Imp. (Ohms)	Nom. Vel. of Prop.	Nom. Cap. (pF/ft.)	Nom. Attenuation per 100' MHz db	Standard Spool Lengths in ft.
	9250	22B/U MIL-C-17D	2 cond. 18 (7x.0152) bare copper, one conductor has tinned center strand	Poly-ethylene (.285)	2 tinned copper	Black non-contaminating vinyl	.420	95	66%	16.0	100 3.0 200 4.5 400 6.8 900 11.0	100, 500, 1000
	8240	58/U JAN-C-17A	20 (Solid) bare copper	Poly-ethylene (.116)	1 tinned copper	Black vinyl	.195	53.5	66%	28.5	100 4.1 200 6.2 400 9.5 900 14.5	25, 50, 100, 500, 1000
Underwriters' Laboratories, Inc. Listed (Style 1354)												
	8259	58A/U JAN-C-17A	20 (19x.0071) tinned copper	Poly-ethylene (.116)	1 tinned copper	Black vinyl	.195	50	66%	30.8	100 5.3 200 8.2 400 12.6 900 20.0	25, 50, 100, 500, 1000
	8262†	58C/U MIL-C-17D	20 (19x.0071) tinned copper	Poly-ethylene (.116)	1 tinned copper	Black non-contaminating vinyl	.195	50	66%	30.8	100 5.3 200 8.2 400 12.6 900 20.0	500, 1000
Underwriters' Laboratories, Inc. Listed (Style 1354)												
	8219	58A/U Type	20 (19x32) tinned copper	Cellular Poly-ethylene (.116)	1 tinned copper	Black vinyl	.195	50	78%	26.0	100 4.8 200 6.9 400 10.1 900 15.5	100, 500, 1000
Underwriters' Laboratories, Inc. Listed (Style 1354)												
	8241	59/U JAN-C-17A	22 (Solid) bare Copperweld	Poly-ethylene (.146)	1 bare copper	Black vinyl	.242	73	66%	21.0	100 3.4 200 4.9 400 7.1	25, 50, 100, 500, 1000
	8263†	59B/U MIL-C-17D	.023 (Solid) bare Copperweld	Poly-ethylene (.146)	1 bare copper	Black non-contaminating vinyl	.242	75	66%	20.5	100 3.4 200 4.9 400 7.1 900 11.1	500, 1000
	*9259	59/U Type	22 (6x30) bare (1x29) copper	Cellular poly-ethylene (.146)	1 bare copper	Black vinyl	.242	75	78%	17.3	100 2.6 200 3.8 400 5.6	50, 100, 500, 1000
Recommend for camera to recorder to monitor connections. Stranded center conductor adds the flexibility needed to resist severe twisting, bending and other stresses which occur in many CCTV applications. 100% SWEEP TESTED. Underwriters' Laboratories, Inc. Listed (Style 1354)												
	8254	62/U JAN-C-17A	22 (Solid) bare Copperweld	Semi-solid Poly-ethylene (.146)	1 bare copper	Black vinyl	.242	93	84%	13.5	100 3.1 200 4.4 400 6.3 900 11.0	100, 500, 1000
	*9269†	62A/U	22 AWG Solid Bare Copper weld	Semi-Solid Poly-ethylene (.146)	1 bare Copper	Black non-contaminating vinyl	.242	93	84%	13.5	100 3.1 200 4.4 400 6.3 900 11.0	500, 1000, 2000
Underwriters' Laboratories, Inc., Listed (Style 1354)												
	8255	62B/U MIL-C-17D	24 (7x32) bare Copperweld	Semi-solid Poly-ethylene (.146)	1 bare copper	Black non-contaminating vinyl	.242	93	84%	13.5	100 3.1 200 4.4 400 6.3 900 11.0	500, 1000
Underwriters' Laboratories, Inc. Listed (Style 1354)												
	*9268	62A/U Type	22 AWG Solid Bare Copperweld	Semi-solid Flame Retardant Poly-ethylene (.146)	1 bare copper	Black vinyl	.264	93	80%	14.5	100 3.1 200 4.4 400 6.3 900 11.0	500, 1000, 2000
Underwriters' Laboratories, Inc., Listed (Style 1354)												
	9252	122/U MIL-C-17D	22 (27x36) tinned copper	Poly-ethylene (.096)	1 tinned copper	Black non-contaminating vinyl	.160	50	66%	30.8	100 7.0 200 11.0 400 16.5 900 28.0	100, 500, 1000
Underwriters' Laboratories, Inc. Listed (Style 1354)												
	83241 TEFLON	141A/U MIL-C-17D	18 (Solid) silver coated Copperweld	TFE TEFLON (.116)	1 silver coated copper	Brown fiber glass	.190	50	69.5%	29.0	400 9.0 Max.	100, 500, 1000
	83242† TEFLON	142B/U MIL-C-17D	18 (Solid) silver coated Copperweld	TFE TEFLON (.116)	2 silver coated copper	Tinted Brown FEP	.195	50	69.5%	29.0	400 9.0 Max.	100, 500, 1000

★ New Item † Manufactured to current Government specifications and subsequent revisions.

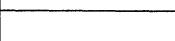
FR-1 or ☐ Passes the FR-1 vertical flame test.

REQUEST QUOTATIONS ON PRODUCTION QUANTITIES OF RG/U CABLES NOT LISTED.

RG/U transmission line cables



COAXIAL CABLES (Cont'd)

Description	Trade Number	RG No.	AWG & (Stranding) Material	Insulation Nom. Core O.D. (Inch)	No. of Shields & Material	Jacket	Nom. O.D. (Inch)	Nom. Imp. (Ohms)	Nom. Vel. of Prop.	Nom. Cap. (pF/ft.)	Nom. Attenuation per 100' MHz db	Standard Spool Lengths in ft.	
	8216	174/U MIL-C-17D	26 (7x34) bare Copperweld	Polyethylene (.060)	1 tinned copper	Black vinyl	.100	50	66%	30.8	100 200 400	8.8 13.0 20.0	100, 500, 1000
Underwriters' Laboratories, Inc. Listed (Style 1418)													
	83265† TEFLON	178B/U MIL-C-17D	30 (7x38) silver coated Copperweld	TFE TEFLON (.034)	1 silver coated copper	Tinted Brown FEP	.070	50	69.5%	29.0	400	29.0 Max.	100, 500
	83264† TEFLON	179B/U MIL-C-17D	30 (7x38) silver coated Copperweld	TFE TEFLON (.063)	1 silver coated copper	Tinted Brown FEP	.100	75	69.5%	19.5	400	21.0 Max.	100, 500, 1000
	83266† TEFLON	180B/U MIL-C-17D	30 (7x38) silver coated Copperweld	TFE TEFLON (.102)	1 silver coated copper	Tinted Brown FEP	.140	95	69.5%	15.0	400	17.0 Max.	100, 500
	8267†	213/U MIL-C-17D	13 (7x21) bare copper	Polyethylene (.285)	1 bare copper	Black non-contaminating vinyl	.405	50	66%	30.8	100 200 400 900	2.0 3.0 4.7 7.8	500, 1000
Underwriters' Laboratories, Inc. Listed (Style 1354)													
	8268	214/U MIL-C-17D	13 (7x.0296) silver coated copper	Polyethylene (.285)	2 silver coated copper	Black non-contaminating vinyl	.425	50	66%	30.8	100 200 400 900	2.0 3.0 4.7 7.8	500, 1000
Underwriters' Laboratories, Inc. Listed (Style 1354)													
	9273†	223/U MIL-C-17D	19 (Solid) silver coated copper	Polyethylene (.116)	2 silver coated copper	Black non-contaminating vinyl	.206	50	66%	30.8	100 200 400 900	4.8 7.0 10.0 16.0	100, 500, 1000
Underwriters' Laboratories, Inc. Listed (Style 1354)													
	83284† TEFLON	316/U MIL-C-17D	26 (7x.0067) silver coated Copperweld	TFE TEFLON (.060)	1 silver coated copper	Tinted Brown FEP	.098	50	69.5%	29.0	400	20.0 max.	100, 500, 1000
	9221	—	30 (7x38) tinned copper	Cellular Polypropylene (.056)	1 tinned copper	Black vinyl	.097	75	78%	17.4	100 200 400 900	10.5 17.0 26.5 49.0	25, 100, 500
Underwriters' Laboratories, Inc. Listed (Style 1375)													
	8218	—	27 (7x35) bare Copperweld	Polyethylene (.100)	1 tinned copper	Black vinyl	.150	75	66%	20.5	100 200 400 900	5.7 8.4 12.5 23.0	100, 500, 1000
	8227 Twinaxial	—	20 (7x28) 1 tinned copper 1 bare copper	Polyethylene (.240)	1 tinned copper	Black vinyl	.325	100	66%	15.5	100 200 300 400	4.1 6.4 8.4 10.2	500
	9272 Twinaxial	—	20 (7x28) tinned copper	Polyethylene color coded	1 tinned copper	Blue vinyl	.242	78	66%	19.7	100 200 400 900	7.5 11.0 16.0 25.0	100, 500, 1000
Twinaxial transmission line cables offer low-loss signal transmission which remains unaffected by outside signals or noise fields. Recommended for RF applications requiring a cross talk free, balanced operation.													
	9222 Triaxial	—	20 (7x28) tinned copper	Polyethylene (.116)	2 tinned copper	Yellow vinyl	.242	50	66%	30.8	100 200 400 900	5.0 7.0 10.3 16.2	100, 500,
Conductor, polyethylene insulated, tinned copper braid shield, polyethylene insulated, tinned copper braid shield, yellow vinyl jacket.													
	*9267 Triaxial	59/U Type Double Shield	20 (Solid) bare copper	Cellular Polyethylene (.146)	2 bare copper	Black Neoprene	.360	75	78%	17.3	1 50 100 300	0.3 1.8 2.6 4.8	100, 500, 1000
Bare copper conductor, cellular polyethylene insulated, bare copper braid shield, polyethylene insulated, bare copper braid shield, black neoprene jacket.													

★ New Item REQUEST QUOTATIONS ON PRODUCTION QUANTITIES OF RG/U CABLES NOT LISTED.

† Manufactured to current Government specifications and subsequent revisions.

ELECTRONIC DIVISION/BELDEN CORPORATION, P.O. BOX 1331, RICHMOND, IN 47374 (317) 966-6661



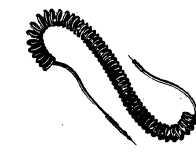
RG/U transmission line cables catv-matv coaxial cables

COAXIAL CABLES (Cont'd)

Description	Trade Number	RG No.	AWG & (Stranding) Material	Insulation Nom. Core O.D. (Inch)	No. of Shields and Material	Jacket	Nom. O.D. (Inch)	Nom. Imp. (Ohms)	Nom. Vel. of Prop.	Nom. Cap. (pF/ft.)	Nom. Attenuation per 100' MHz	db	Standard Spool Lengths in ft.
 Conductor, cellular polyethylene insulated, bare copper braid shield, polyethylene insulated, bare copper braid shield, black polyethylene jacket.	8232	59/U Type Double Shield 100% SWEEP TESTED.	20 (Solid) bare Copperweld	Cellular Polyethylene (.146)	2 bare copper	Black Polyethylene	.315	75	78%	17.3	50 1.8 100 2.6 200 3.8 300 4.8 400 5.6		500, 1000, 2000
	8233	11/U Type Double Shield 100% SWEEP TESTED.	14 (Solid) bare copper	Cellular Polyethylene (.285)	2 bare copper	Black Polyethylene	.475	75	78%	17.3	50 1.0 100 1.5 200 2.2 300 2.8 400 3.3		500, 1000, 2000
	8700	—	28 (Solid) tinned copper	Polypropylene (.023)	1 bare copper	Black vinyl	.054 91 Percent shield coverage.	32	66%	48.0	400 55.0		25, 50, 100, 250

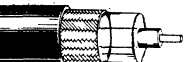
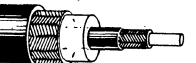
test prod wire and high voltage cables

TEST PROD WIRE

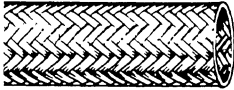
Description	Trade Number	AWG & (Stranding)	Insulation Thickness (Inch)	Nom. O.D. (Inch)	Breakdown Voltage	Suggested Working Voltage†	Standard Package	Standard Spool Lengths in ft.
 Tinned copper, separator, rubber insulated, red or black	8899	18 (65x36) *7' of red and 7' of black.	.045	.144	20,000	5,000	—	10, 14*, 25** 100**, 500**, 1000
	8897	18 (65x36)	.045	.144	20,000 Manufactured per MIL-W-13169	5,000	—	500
	8898	18 (65x36)	.088	.230	29,000	10,000	—	10, 25, 100, 500
 Miniature	8890	24 (45x40)	.019	.066	10,000	1,000	—	25, 100, 500
 With Prods Stranded tinned copper, rubber insulated with 4" long solderless threaded plastic "phone tip" test prod 3/8" diameter on one end and 1" long solderless threaded plastic "phone tip" test prod 3/8" diameter on the other end. 5 ft. in length retracts to 8 inches. Is recommended for use with multimeters.	8878	20 (42x36)	.063	.173	20,000	5,000	1 pair Red and Black	—
	8879	20 (42x36)	.063	.173	20,000	5,000	1 pair Red and Black	—
								Tinned copper, rubber insulated, 5 ft. in length retracts to 8 inches.

†For intermittent duty only. All breakdown voltages and suggested working voltages are AC RMS values.

HIGH VOLTAGE CABLE

Description	Trade Number	AWG & (Stranding)	Insulation Thickness (Inch)	Jacket Thickness (Inch)	Nom. O.D. (Inch)	Jacket Color	Breakdown Voltage	Suggested Working Voltage	Standard Spool Lengths in ft.
	8870	22 (Solid) Copperweld	.142	.020	.440	Black	160,000 DC	80,000 DC	100, 250
									Solid Copperweld, conductive polyethylene§, polyethylene insulation, tinned copper braid equipotential sheath, black polyethylene jacket.
	8871	16 (Braided)	.270	.025	.830	Black	400,000 DC	200,000 DC	25, 100, 250
									Tinned copper braid (CMA equivalent to 16 AWG) over solid polyethylene rod, black conductive polyethylene§, clear polyethylene insulation, tinned copper braid, black polyethylene jacket.

§KORONA-GUARD™ over inner conductor combined with a copper wire braid over the dielectric provides uniform distribution of voltage stress. Very high-voltage DC cable for applications from 200 KVDC to 400 KVDC is available from Belden on special order. Contact Electronic Sales Service Department for AC or pulse applications.



SHIELDING AND BONDING CABLES

Cables conforming to QQB575 can be manufactured on a special order basis.
Braided tinned copper.
Standard Spool: 10, 50, 250 feet.^o

Trade Number	Stranding	Approx. CMA	Recommended Current (Amps.)	Nom. I.D. Round (Inch)	Nom. Flat Width (Inch)
8676	16x36	400	5.5	1/32	3/4
8674	24x36	600	7.5	3/64	1/16
8652	96x40	920	10.0	1/16	3/32
8653	48x36	1200	12.0	3/32	7/64
8654	72x36	1800	16.0	7/64	1/8
8664	96x36	2400	20.0	1/8	3/32
8660	96x34	3800	27.0	3/4	3/16
8668	120x34	4700	30.0	5/32	7/32
8663	168x34	6700	38.0	7/32	1/4
8661	192x34	7600	42.0	7/32	3/8

^o8657, 8658, 8659 Available only in 10' & 50' put-ups.

Trade Number	Stranding	Approx. CMA	Recommended Current (Amps.)	Nom. I.D. Round (Inch)	Nom. Flat Width (Inch)
8669	336x34	13300	61.5	13/32	7/16
8672	528x36	13200	61.0	—	7/16
8671	864x36	21600	84.0	—	15/16
8662	576x34	22900	88.0	—	15/32
8655	360x30	36000	120.0	—	3/8
8670	480x30	48000	145.0	—	3/4
8656	576x30	57600	165.0	—	7/8
8657	768x30	76800	195.0	—	1 1/8
8658	1056x30	105600	235.0	—	1 3/8
8659	1680x30	168000	320.0	—	1 1/2

Dimensions shown are approximate, due to pliable nature of braided cables.
For additional sizes, see current BRAIDED AND STRANDED COPPER CABLE CATALOG.

hook-up and lead wire

STYLE 1061 300V—80°C THIN WALL HOOK-UP WIRE

Underwriters' Laboratories, Inc. Listed. All of these hook-up wires have passed the FR-1 vertical flame test.

Description	Trade Number	AWG & (Stranding)	Insulation Thickness (Inch)	Nominal O.D. (Inch)	Stock Colors	Standard Spool Lengths in ft.
 Tinned copper, semi-rigid vinyl insulation.	*9977	28 (Solid)	.009	.031	1, 2, 3, 4, 5, 7, 8, 9, 10, 13	1000
	9976	26 (Solid)	.009	.034	1, 2, 3, 4, 5, 7, 8, 9, 10, 13	1000
	9975	24 (Solid)	.009	.038	1, 2, 3, 4, 5, 7, 8, 9, 10, 13	1000

Suitable for wire wrap applications.

IRRADIATED PVC HOOK-UP WIRE

Underwriters' Laboratories, Inc. Listed. All of these hook-up wires have passed the FR-1 vertical flame test.

Description	Trade Number	MIL-W-16878 Type	Style No.	AWG & (Stranding)	Nom. Insulation Thickness (Inch)	Nom. O.D. (Inch)	Stock Colors	Standard Spool Lengths in ft.
 Tinned copper, Irradiated PVC Insulated.	83402	B-26 Δ	1429	26 (Solid)	.010	.039	2, 4, 5, 6, 9, 10	1000
	83403	B-24 Δ	1429	24 (Solid)	.010	.044	2, 4, 5, 6, 9, 10	1000
	83404	B-22 Δ	1429	22 (Solid)	.010	.050	2, 4, 5, 6, 9, 10	1000
	83412	B-26	1429	26 (7x34)	.010	.039	2, 4, 5, 6, 9, 10	1000
	83413	B-24	1429	24 (7x32)	.010	.044	2, 4, 5, 6, 9, 10	1000
	83414	B-22	1429	22 (7x30)	.010	.050	2, 4, 5, 6, 9, 10	1000
	83415	B-20	1429	20 (7x28)	.010	.058	2, 4, 5, 6, 9, 10	1000
	83416	B-18	1429	18 (7x26)	.010	.068	9 & 10	1000
	83423	B-24	1429	24 (19x36)	.010	.045	1 thru 10	1000
	83424	B-22	1429	22 (19x34)	.010	.051	1 thru 10	1000
	83425	B-20	1429	20 (19x32)	.010	.059	9	1000
	83443	C-24	1430	24 (7x32)	.016	.058	1 thru 10	1000
	83444	C-22	1430	22 (7x30)	.016	.064	9 & 10	1000
	83445	C-20	1430	20 (7x28)	.016	.072	9 & 10	1000
	83446	C-18	1430	18 (7x26)	.016	.082	9	1000

Manufactured to current Government specifications and subsequent revisions.

★ New Item

☐ Passes the FR-1 vertical flame test.

Δ Solid Conductor not recognized in MIL-W-16878.

STOCK COLORS

1 Brown 3 Orange 5 Green 7 Violet (purple) 9 White 13 Dark Blue
2 Red 4 Yellow 6 Light Blue 8 Gray (slate) 10 Black



high temperature wire and cable

TEFLON

TEFLON is a fluorinated thermoplastic with outstanding thermal, physical and electrical properties. However, the basic resin and the processing costs are relatively high, therefore, TEFLON is generally restricted to applications requiring its special characteristics.

Belden TEFLON wire products are highly recommended for miniature cable applications, because of their superior

thermal and electrical properties. TEFLON is especially suitable for internal wiring—soldering applications where insulation melt back is a specific problem. Belden wiring products, insulated with TEFLON are outstanding in their resistance to oil, oxidation, heat, sunlight, flame and their ability to remain flexible at low temperatures. They all have excellent resistance to ozone, water, alcohol, gasoline, acids, alkalis, aromatic hydrocarbons and solvents.

TYPE E—MIL-W-16878 TEFLON—600V—200°C HOOK-UP WIRE

All Of These Hook-Up Wires Have Passed The FR-1 Vertical Flame Test.

Description	Trade Number	Type Designation	AWG & (Stranding)	Insulation Thickness (Inch)	Nom. O.D. (Inch)	Stock Colors	Standard Spool Lengths in Ft.
 Concentrically stranded silver coated copper conductor insulated with extruded TFE TEFLON.	83000	E-30	30 (7x38)	.010	.033	1 thru 10	100, 500, 1000
	83001	E-28	28 (7x36)	.010	.036	1 thru 10	100, 500, 1000
	83002	E-26	26 (7x34)	.010	.041	1 thru 10	100, 500, 1000
	83003	E-24	24 (19x36)	.010	.046	1 thru 10	100, 500
	83004	E-24	24 (7x32)	.010	.045	1 thru 10	100, 500, 1000
	83005	E-22	22 (7x30)	.010	.051	1 thru 10	100, 500, 1000
	83006	E-22	22 (19x34)	.010	.052	1 thru 10	100, 500, 1000
	83007	E-20	20 (19x32)	.010	.060	1 thru 10	100, 500, 1000
	83008	E-20	20 (7x28)	.010	.059	1 thru 10	100, 500
	83009	E-18	18 (19x30)	.010	.071	1 thru 10	100, 500, 1000
	83010	E-16	16 (19x29)	.010	.080	1 thru 10	100, 500, 1000

TYPE EE—MIL-W-16878 TEFLON—1000V—200°C HOOK-UP WIRE

All Of These Hook-Up Wires Have Passed The FR-1 Vertical Flame Test.

Description	Trade Number	Type Designation	AWG & (Stranding)	Insulation Thickness (Inch)	Nom. O.D. (Inch)	Stock Colors	Standard Spool Lengths in Ft.
 Concentrically stranded silver coated copper conductor insulated with extruded TFE TEFLON.	83023	EE-24	24 (19x36)	.014	.053	1 thru 10	100, 500
	83025	EE-22	22 (7x30)	.014	.058	1 thru 10	100, 500
	83026	EE-22	22 (19x34)	.014	.060	1 thru 10	100, 500, 1000
	83027	EE-20	20 (19x32)	.014	.068	1 thru 10	100, 500, 1000
	83028	EE-20	20 (7x28)	.014	.066	1 thru 10	100, 500
	83029	EE-18	18 (19x30)	.014	.079	1 thru 10	100, 500, 1000
	83030	EE-16	16 (19x29)	.014	.086	1 thru 10	100, 500, 1000

TYPE ET—MIL-W-16878 TEFLON—250V—200°C MINIATURE HOOK-UP WIRE

All Of These Hook-Up Wires Have Passed The FR-1 Vertical Flame Test.

Description	Trade Number	Type Designation	AWG & (Stranding)	Insulation Thickness (Inch)	Nom. O.D. (Inch)	Stock Colors	Standard Spool Lengths in Ft.
 Concentrically stranded silver coated copper conductor insulated with extruded TFE TEFLON.	83041	ET-32	32 (7x40)	.006	.021	1 thru 10	100, 1000
	83043	ET-30	30 (7x38)	.006	.024	1 thru 10	100, 1000
	83045	ET-28	28 (7x36)	.006	.027	1 thru 10	100, 1000
	83046	ET-26	26 (7x34)	.006	.031	1 thru 10	100, 1000
	83047	ET-24	24 (7x32)	.006	.036	1 thru 10	100, 1000
	83048	ET-24	24 (19x36)	.006	.037	1 thru 10	100, 1000
	83049	ET-22	22 (7x30)	.006	.042	1 thru 10	100, 1000
	83050	ET-22	22 (19x34)	.006	.044	1 thru 10	100, 1000

Manufactured to current Government specifications and subsequent revisions.

☐ Passes the FR-1 vertical flame test.

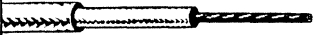
STOCK COLORS

1 Brown	3 Orange	5 Green	7 Violet (purple)	9 White
2 Red	4 Yellow	6 Light Blue	8 Gray (slate)	10 Black

hook-up and lead wire, mil-w-16878 hook-up wire

**STYLE 1009 & 1014—90°C (CSA-TYPE TRB)**

Underwriters' Laboratories, Inc., Listed. All of these hook-up wires have passed the FR-1 vertical flame test.

Description	Trade Number	AWG & (Stranding)	Insulation Thickness (Inch)	Nom. O.D. (Inch)	Stock Colors	Standard Spool Lengths in ft.
 Tinned copper, vinyl insulated, cotton braid, lacquered.	8937	22 (7x30)	.016	.091	1, 2, 3, 4, 5, 9, 10, 13	100, 1000
	8936	20 (10x30)	.017	.098	1, 2, 3, 4, 5, 9, 10, 13	100, 1000
	8935	18 (16x30)	.017	.113	1, 2, 3, 4, 5, 9, 10, 13	100, 1000
	8934	16 (26x30)	.017	.126	1, 2, 3, 4, 5, 9, 10, 13	100, 500
	8933*	14 (41x30)	.031	.177	1, 2, 3, 4, 5, 9, 10, 13	100, 500

Rated 600V peak for electronic circuits only—300V for other applications. Style 1009.

*Rated 2500V peak for electronic circuits only—600V for other applications. Style 1014.

STYLE 1015 600V—105°C (CSA-600V-TYPE TEW)

Underwriters' Laboratories, Inc., Listed. All of these hook-up wires have passed the FR-1 vertical flame test.

Description	Trade Number	AWG & (Stranding)	Insulation Thickness (Inch)	Nom. O.D. (Inch)	Stock Colors	Standard Spool Lengths in ft.
 Tinned copper, vinyl insulated.	8920	22 (7x30)	.031	.095	1, 2, 3, 4, 5, 9, 10, 13	100, 1000, 5000
	8919	20 (10x30)	.031	.102	1, 2, 3, 4, 5, 9, 10, 13	100, 1000, 4000
	8918	18 (16x30)	.031	.112	1, 2, 3, 4, 5, 9, 10, 13	100, 1000, 4000
	8917	16 (26x30)	.031	.126	1, 2, 3, 4, 5, 9, 10, 13	100, 500, 1000
	8916	14 (41x30)	.031	.141	1, 2, 3, 4, 5, 9, 10, 13	100, 500

Rated 2500V peak for electronic circuits.

MIL-W-16878 HOOK-UP WIRE

Covers insulated wire for the internal wiring of meters, panels and electrical or electronic equipment at temperatures ranging from 105°C to 200°C. The many types available in different voltages and thermal ratings are listed on

the following pages to meet your individual requirements. For 200°C wire and cable, see Belden pages 8 & 23. Multi-conductor Mil-Spec cables can be found on pages 7, 8 & 14.

TYPE B—MIL-W-16878—VINYL—600V-105°C

All of these hook-up wires have passed the FR-1 vertical flame test.

Description	Trade Number	Type Designation	AWG & (Stranding)	Insulation Thickness (Inch)	Nom. O.D. (Inch)	Stock Colors on Standard Spools	
						100'	1000'
 Tinned copper, vinyl insulated.	8599	B-32	32 (7x40)	.010	.029	1 thru 10	1 thru 10
	8598	B-30	30 (7x38)	.010	.032	1 thru 10	1 thru 10
	8597	B-28	28 (7x36)	.010	.035	1 thru 10	1 thru 10
	8505	B-26	26 (7x34)	.010	.039	1 thru 10 14 thru 22	1 thru 10 14 thru 22
	8509	B-24	24 (19x36)	.010	.045	1 thru 10	1 thru 10
	8504	B-24	24 (7x32)	.010	.044	1 thru 10 14 thru 22	1 thru 10 14 thru 22
	8503	B-22	22 (7x30)	.010	.050	1 thru 10 14 thru 22	1 thru 10 14 thru 22
	8502	B-20	20 (7x28)	.010	.058	1 thru 10 14 thru 22	1 thru 10 14 thru 22
	8501	B-18	18 (7x26)	.010	.068	1 thru 10 14 thru 22	1 thru 10 14 thru 22
	8500	B-16	16 (19x29)	.010	.077	1 thru 10 14 thru 22	1 thru 10 14 thru 22

☐ Passes the FR-1 vertical flame test.

Manufactured to current Government specifications and subsequent revisions.



Power Cords

THREE CONDUCTOR POWER SUPPLY CORDS

**TYPE SJO NEOPRENE
(RETRACTILE)**

CONVENIENCE AND SAFETY. Dangling cords can be messy, troublesome and unsafe. Retractable cords stay neat, allow free movement of the appliance or tool, and prevent accidents. Rubber insulation and neoprene jackets retain full retracting memory through thousands of stretching cycles.

Tan Flag Label.

Certified to C.S.A. Standards



NEMA 5-15P



MOLDED VINYL GROUNDING PLUG PH-185

OUTER JACKET STRIPPED 1/4",
CONDUCTORS STRIPPED 1/2" AND TINNED

Trade Number	Retracted Length (inches)	Practical Extended Lgth. (ft.)	AWG (Stranding)	Nom. O.D. (inches)	Rating	Type of Cordage	Color
17447	12	6	18 (41x34)	.360	1250 Watts 10A-125V	SJO Neoprene	Black



NEMA 5-15P



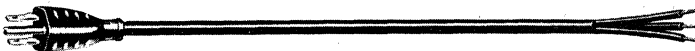
MOLDED VINYL GROUNDING PLUG PH-173

OUTER JACKET STRIPPED 1/4",
CONDUCTORS STRIPPED 1/2" AND TINNED

Trade Number	Retracted Length (inches)	Practical Extended Lgth. (ft.)	AWG (Stranding)	Nom. O.D. (inches)	Rating	Type of Cordage	Color
17448	12	6	16 (65x34)	.370	1625 Watts 13A-125V	SJO Neoprene	Black
17449	24	12	16 (65x34)	.370	1625 Watts 13A-125V	SJO Neoprene	Black



NEMA 5-15P.



MOLDED VINYL GROUNDING PLUG PH-185

OUTER JACKET STRIPPED 2",
CONDUCTORS STRIPPED AND TWISTED 1/4"**TYPE SJT VINYL, SJ RUBBER
AND SJO NEOPRENE**

For all tools such as sanders, saws, grinders and polishers requiring grounding. Three conductor cords now mandatory for drills 1/4" and larger by Underwriters' Laboratories, Inc.

Tan Flag Label.

Certified to C.S.A. Standards

Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
17406	6	18 (16x30)	.328	1250 Watts 10A-125V	SJ Rubber	Black
17405	6	18 (16x30)	.328	1250 Watts 10A-125V	SJT Vinyl	Gray
17408	8	18 (16x30)	.328	1250 Watts 10A-125V	SJ Rubber	Black
17407	8	18 (16x30)	.328	1250 Watts 10A-125V	SJT Vinyl	Gray
17409	8	18 (16x30)	.328	1250 Watts 10A-125V	SJO Neoprene	Black
17412	12	18 (41x34)	.328	1250 Watts 10A-125V	SJ Rubber	Black
17419	9	16 (65x34)	.353	1625 Watts 13A-125V	SJ Rubber	Black
17422	12	16 (65x34)	.353	1625 Watts 13A-125V	SJ Rubber	Black
17425	15	16 (65x34)	.353	1625 Watts 13A-125V	SJ Rubber	Black

TWO CONDUCTOR POWER SUPPLY CORDS

Information and Application



MOLDED VINYL GROUNDING PLUG PH-290B

OUTER JACKET STRIPPED 1½"
CONDUCTORS STRIPPED AND TWISTED ¾"

TYPE SV RUBBER AND SVT VINYL

Three conductor SV and SVT cords now recognized as a Standard for some small tools, business machines and instruments which previously required a three conductor SJ Cord.

Tan Flag Label.

Certified to C.S.A. Standards

Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
17236	6	18 (41x34)	.265	1250 Watts 10A-125V	SV Rubber	Black
17238	8	18 (41x34)	.265	1250 Watts 10A-125V	SV Rubber	Black
17237	6	18 (41x34)	.253	1250 Watts 10A-125V	SVT Vinyl	Gray
17239	8	18 (41x34)	.253	1250 Watts 10A-125V	SVT Vinyl	Gray

Information and Application



MOLDED VINYL PLUG PH-289A

CONDUCTORS SPLIT 1", STRIPPED
AND TWISTED ¾"

TYPE SPT VINYL AND SP RUBBER PARALLEL LAMP CORDS

For Lamps, Radios, Desk Fans and Small Appliances. Long life plastic resists cracking and aging. Popular lengths and colors.

Tan Flag Label.

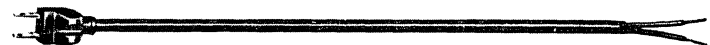
17106, 17109 & 17112 are
Certified to C.S.A. Standards

Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
17106	6	18 (41x34)	.110 x .207	1250 Watts 10A-125V	SPT-1 Vinyl	Brown, Gray or Ivory
17109	9	18 (41x34)	.110 x .207	1250 Watts 10A-125V	SPT-1 Vinyl	Brown, White
17112	12	18 (41x34)	.110 x .207	1250 Watts 10A-125V	SPT-1 Vinyl	Brown, White
17126	6	18 (41x34)	.110 x .213	1250 Watts 10A-125V	SP-1 Rubber	Brown
17129	9	18 (41x34)	.110 x .213	1250 Watts 10A-125V	SP-1 Rubber	Brown

TYPE SVT VINYL AND SV RUBBER

For Food Mixers, Blenders and Small Appliances. Tan Flag Label.

Certified to C.S.A. Standards



MOLDED VINYL CORD-HOLDER PLUG PH-289E

OUTER JACKET STRIPPED 1½"
CONDUCTORS STRIPPED AND TWISTED ¾"

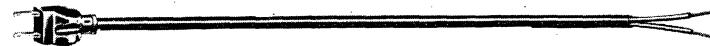
Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
17205	6	18 (41x34)	.243	1250 Watts 10A-125V	SVT Vinyl	Black, Gray
17206	6	18 (41x34)	.245	1250 Watts 10A-125V	SV Rubber	Gray

TYPE SJ RUBBER

For Mixers, Blenders, Washing Machines and Appliances using fractional horse power motors that do not require a three conductor grounding cord.

Tan Flag Label.

Certified to C.S.A. Standards



MOLDED VINYL CORD-HOLDER PLUG PH-289F

OUTER JACKET STRIPPED 1½"
CONDUCTORS STRIPPED AND TWISTED ¾"

Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
17308	8	18 (16x30)	.298	1250 Watts 10A-125V	SJ Rubber	Black
17310	10	18 (16x30)	.298	1250 Watts 10A-125V	SJ Rubber	Black



Power Cords

TWO CONDUCTOR POWER SUPPLY CORDS

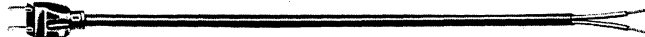
Information and Application

TYPE SJ RUBBER

For Mixers, Blenders, Washing Machines and Appliances using fractional horse power motors that do not require a three conductor grounding cord.
Tan Flag Label.
Certified to C.S.A. Standards



NEMA 1-15P



MOLDED VINYL CORD-HOLDER PLUG PH-289G

OUTER JACKET STRIPPED 1½" CONDUCTORS STRIPPED AND TWISTED ½"

Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
17328	8	16 (26x30)	.323	1625 Watts 13A-125V	SJ Rubber	Black
17330	10	16 (26x30)	.323	1625 Watts 13A-125V	SJ Rubber	Black

TYPE SVO NEOPRENE (RETRACTILE)

CONVENIENCE AND SAFETY. Dangling cords can be messy, troublesome and unsafe. Retractable cords stay neat, allow free movement of the appliance or tool, and prevent accidents. Rubber insulation and neoprene jackets retain full retracting memory through thousands of stretching cycles.
Tan Flag Label.
Certified to C.S.A. Standards



NEMA 1-15P



MOLDED VINYL PLUG PH-289B

OUTER JACKET STRIPPED 1½", CONDUCTORS STRIPPED ½" AND TINNED

Trade Number	Retracted Length (inches)	Practical Extended Lgth (ft.)	AWG (Stranding)	Nom. O.D. (inches)	Rating	Type of Cordage	Color
17249	12	6	18 (41 x 34)	.270	1250 Watts 10A-125V	SVO Neoprene	Black

BUSINESS MACHINE CORDS

TYPE SJT AND SVT VINYL

17359 fits Burroughs, Monroe and Victor 10 key Adding Machines as well as late Friden models and the Burroughs Sensimatic Bookkeeping Machine and Pentron Tape Recorder (Triumph model) which requires a dummy center contact. Features CORD-HOLDER plug. 17260 fits Revere Projectors and many business machines which do not require a dummy center contact.
Blue Flag Label.
Certified to C.S.A. Standards



NEMA 1-15P



MOLDED VINYL CORD-HOLDER PLUG PH-289F

MOLDED VINYL CONNECTOR PH-104 WITH DUMMY CENTER CONTACT

Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
17359	10	18 (16x30)	.298	875 Watts 7A-125V	SJT Vinyl	Gray



NEMA 1-15P



MOLDED VINYL CORD-HOLDER PLUG PH-289E

MOLDED VINYL CONNECTOR PH-103

Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
17260	8	18 (41x34)	.243	875 Watts 7A-125V	SVT Vinyl	Gray

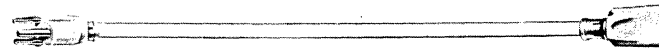
THREE CONDUCTOR PROJECTOR AND BUSINESS MACHINE CORDS

TYPE SVT VINYL

Can be used for Revere and Eastman Kodak projectors, Friden, Victor, Hewlett-Packard, Marchant business machines, and DuKane audio equipment.
Blue Flag Label.
Certified to C.S.A. Standards



NEMA 5-15P



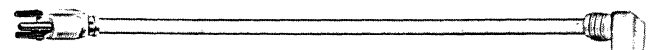
MOLDED VINYL GROUNDING PLUG PH-290B

MOLDED VINYL 3-CONTACT CONNECTOR PH-104

Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
17258	8	18 (41x34)	.253	875 Watts 7A-125V	SVT Vinyl	Gray



NEMA 5-15P



MOLDED VINYL GROUNDING PLUG PH-290B

MOLDED VINYL 3-CONTACT CONNECTOR PH-326

Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
★17257	8	18 (41x34)	.253	875 Watts 7A-125V	SVT Vinyl	Gray

★ New Item

Power Cords



THREE CONDUCTOR BUSINESS MACHINE CORD AND RECEPTACLE

Information and Application

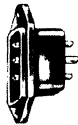
TYPE SVT VINYL

For use on U.S. and Canadian electronic instruments, business machines, test equipment, desk top computers and appliances. Federal Stock No. FSN-6150-351-3405. Connector mates with 17252 or Switchcraft EAC-301

Blue Flag Label Certified to C.S.A. Standards

★17252 RECESSED
POWER RECEPTACLE

The recessed power receptacle mates with the 17250 cord set. May be used for equipment for use in the U.S., Canada and European countries. Rating: 250V, 6 AMPS.



NEMA 5-15P

MOLDED VINYL GROUNDING PLUG PH-290B

MOLDED VINYL
GROUNDING
CONNECTOR SPH-386

Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
★17250	7½	18 (41x34)	.253	1250 Watts 10A-125V	SVT Vinyl	Black

THREE CONDUCTOR COMMERCIAL VACUUM CLEANER CORDS

TYPE SJT VINYL

These three conductor power supply cords are for use with commercial vacuum cleaners and other appliances requiring grounding.

Tan Flag Label.

Certified to C.S.A. Standards

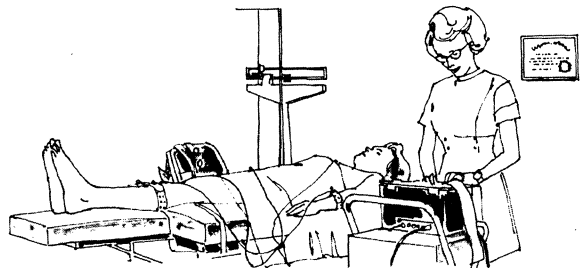


NEMA 5-15P

MOLDED VINYL 3-PRONG
GROUNDING PLUG PH-185JACKET STRIPPED 1½" CONDUCTORS
STRIPPED AND TWISTED ¾"

Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
17276	20	16 (26x30)	.353	1625 Watts 13A-125V	SJT Vinyl	Gray
★17403	32	16 (26x30)	.353	1625 Watts 13A-125V	SJT Vinyl	Gray

Belden SJT Type Low-Leakage 60-cycle Power Cords reduce the hazards of shock due to current leakage between the two conductors and from the conductors out through the jacket. Maximum leakage at 120 VAC is 6 microamps to green and 16 microamps to jacket. Designed for hospital use and critical medical applications.



LOW-LEAKAGE POWER CORDS PATENT PENDING

TYPE SJT VINYL LOW-LEAKAGE

This power cord reduces the hazards of shock due to current leakage between the two conductors and from the conductors out through the jacket.

Tan Flag Label



NEMA 5-15P

IMPACT RESISTANT NYLON
GROUNDING PLUG

Cut Blunt

Trade Number	Length of Cord (ft.)	AWG (Stranding)	Nom. O.D. (Inches)	Rating	Type of Cordage	Color
★17301	8	16 (65x34)	.580	1625 Watts 13A-125V	SJT Vinyl Low-Leakage	Gray

★New Item.

Cimco

TEFLON* INSULATED HIGH TEMPERATURE WIRE, CABLE AND TUBING

Cimco manufactures both standard and custom-made wire and cable for aircraft, missiles, computers, electronic assemblies, and many other applications using TEFLON* insulated cable, tubing and hook-up wire.

Cimco

BONDING TREATMENT

Surface treatment to increase bondability for use with potting compounds.

*REGISTERED DUPONT TRADEMARK

WRITE FOR CATALOG ON COMPLETE SPECIFICATIONS

wire & cable co.

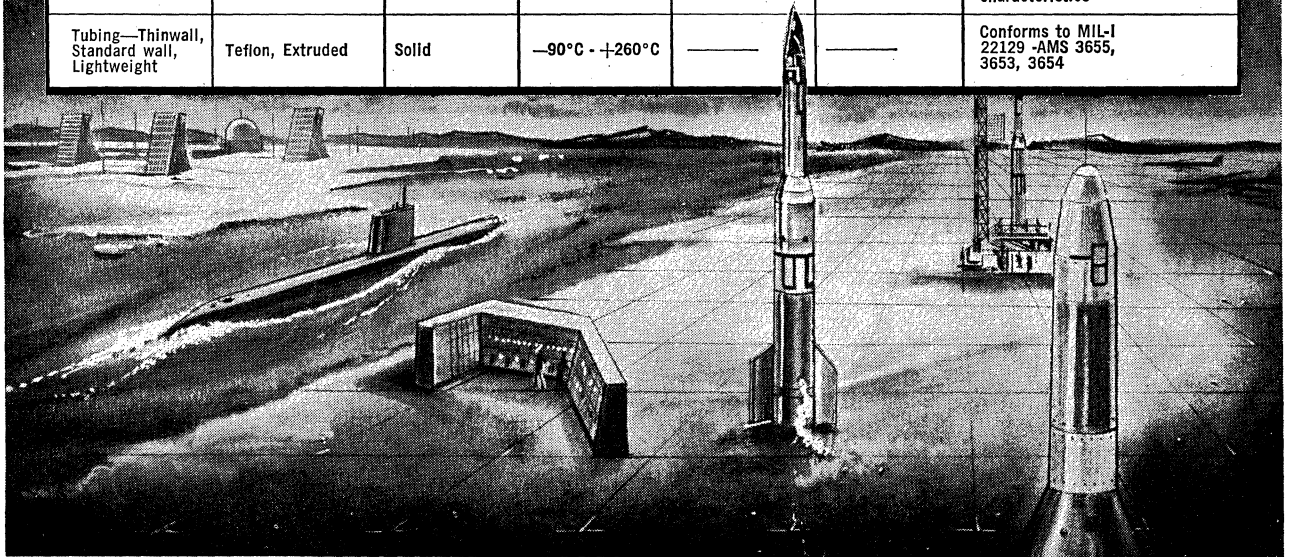
250 W. CRESCENT AVE.,

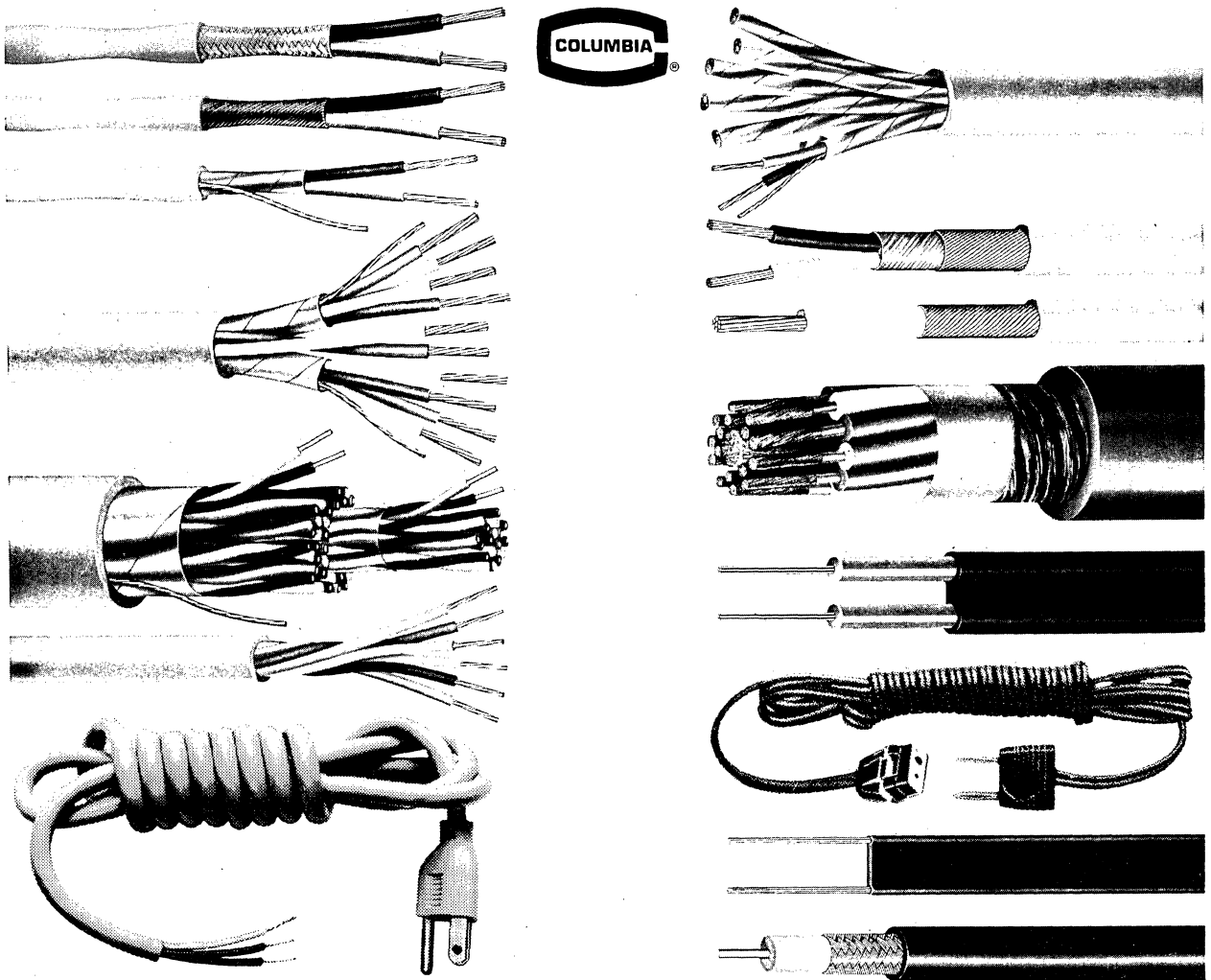
ALLENDALE, N. J. 07401 PHONE 201-327-2522



S P E C I F I C A T I O N S

WIRE, CABLE OR TUBING	PRIMARY INSULATION	COLORS MIL-STD-104	OPERATING TEMPERATURE	JACKETS	SHIELDING	REMARKS
High Temperature Hook-up Wire	Teflon, Extruded	Solid & Striped	-90°C - +260°C	—	Silver Plated or Tinned Copper	Conforms to MIL-W-16878 Types E, EE & ET or other special specifications as required.
Cables A	Teflon, Extruded Teflon Tape Wrapped	Solid & Striped	-54°C - +105°C	PVC	Silver Plated or Tinned Copper	Any combinations of conductors and shielding required.
Cables B	Teflon, Extruded Teflon Tape Wrapped	Solid & Striped	-54°C - +120°C	Nylon Braid Nylon Extruded	Silver Plated or Tinned Copper	Any combinations of conductors and shielding required.
Cables H	Teflon, Extruded Teflon Tape Wrapped	Solid & Striped	-90°C - +260°C	Fiberglass-Teflon	Silver Plated Copper	Any combinations of conductors and shielding required.
Cables C	Teflon, Extruded Teflon Tape Wrapped	Solid & Striped	-90°C - +260°C	Teflon Tape	Silver Plated Copper	Any combinations of conductors and shielding required.
Airframe Wire	Teflon Tape Plus Impregnated Glass	Solid Only	-60°C - +260°C	—	—	MIL-W-7139B
Miniature Coaxial Cable	Teflon, Extruded	Jackets Only Solid & Striped	-90°C - +260°C	Teflon Tape, Fiberglass-Teflon Nylon & PVC	Silver Plated or Tinned Copper	Conforms to MIL-C-17B
Low Capacitance Cable	Teflon Air-weave	Natural	-90°C - +260°C -90°C - +260°C -54°C - +105°C -54°C - +120°C	Teflon Tape, Fiberglass-Teflon PVC Nylon	Silver Plated or Tinned Copper	Special constructions as low as 8.0 mm/ft.
High Voltage Cable	Teflon Tape	Solid & Striped	-90°C - +260°C	Teflon Tape, Fiberglass-Teflon	Silver Plated Copper	High voltage lead wire or cable excellent corona resistance characteristics
Tubing—Thinwall, Standard wall, Lightweight	Teflon, Extruded	Solid	-90°C - +260°C	—	—	Conforms to MIL-I 22129 -AMS 3655, 3653, 3654





Columbia is complete!

Whatever you need in wire, cable and cordsets—Columbia has the product for you...all top quality...one of the largest lines in the industry.

TABLE OF CONTENTS

Audio Cables, Shielded	2•1912-2•1915	Neoprene Jacketed Cables, Shielded	2•1916, 2•1917
Audio Cables, Unshielded	2•1915-2•1917	Neoprene Jacketed Cables, Unshielded	2•1919
Business Machine Cords	2•1921	Parallel Bonded Cables	2•1918
CATV Cables	2•1919, 2•1920	Portable Cord	2•1919
CCTV Cables	2•1919, 2•1920	Power Supply Cords	2•1921
Coaxial Cables	2•1919, 2•1920	Quad Cables	2•1913, 2•1914
Coaxial Cable Assemblies	2•1920	RG/U Double Shielded Cables	2•1919
Communication Cables, Shielded	2•1912-2•1915	RG/U Transmission Lines	2•1919, 2•1920
Communication Cables, Unshielded	2•1915-2•1917	RG/U Type Transmission Lines	2•1919, 2•1920
Control Cables, Shielded	2•1916, 2•1917	Replacement Cords	2•1921
Control Cables, Unshielded	2•1917, 2•1918	Ribbon Cables	2•1918
Cordsets	2•1921	Rubber Cables, Shielded	2•1916, 2•1917
Data Cables, Shielded	2•1914	Rubber Cables, Unshielded	2•1917, 2•1919
Extension Cords	2•1921	S Jacketed Cordage	2•1919
Hook-up Wire		SI Jacketed Cordage	2•1919
UL 1007 CSA TR-64	2•1918	SJO Jacketed Cordage	2•1919
UL 1015 CSA TEW	2•1918	Small Appliance Cords	2•1921
Instrumentation Cables, Shielded	2•1913, 2•1914	SO Control Cables	2•1919
Intercom Cables, Shielded	2•1912-2•1915	SO Jacketed Cordage	2•1919
Intercom Cables, Unshielded	2•1915, 2•1916	SPT Cordage	2•1919
Lamp Cord	2•1919	SV Jacketed Cordage	2•1919
Language Lab Cable	2•1915	SVO Jacketed Cordage	2•1919
MATV Cables	2•1919, 2•1920	Telephone Cables	2•1915-2•1917
Microphone Cables	2•1916	Test Lead Wire	2•1918, 2•1919
Multi Conductor Paired, Unshielded	2•1915	Underwriters' Laboratories Listed	
Multi Conductor Unpaired, Unshielded	2•1916-2•1918	Portable Cordage	2•1919
		Hook-up Wire	2•1918

**SHIELDED AUDIO CABLE****BRAID SHIELD, PVC JACKET, DRAIN WIRE**

Stock Color: Black jacket.

Construction: Tinned copper conductors, color-coded PVC insulation, conductors cabled, tinned copper braid shield, tinned copper drain wire, PVC jacket overall.

Specifications: -20°C to +60°C. Passes FR-1 vertical flame test.

Color Code: Black, Red.

Applications: Shielded cable for recording studios, radio transmitters, sound systems, broadcast use.

Put-up: 100', 500' and 1000' spools (other Put-ups also available).

Columbia No.	No. of Cond.	Size AWG	Stranding	Nom. Insul. Thck.	Nom. Jkt. Thck.	Nom. O.D. In.
2676	2	22	Solid	.015	.025	.200
2677	2	22	16/34	.015	.025	.210

BRAID SHIELD, PVC JACKET

Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded PVC insulation, conductors cabled, tinned copper braid shield, PVC jacket overall.

Specifications: -20°C to +60°C. Passes FR-1 vertical flame test.

Color Code: Black, Red, White, Green.

Applications: Shielded cable for recording studios, radio transmitters, sound systems and electronic circuits where shielding is required.

Put-up: 100', 500' and 1000' spools (other Put-ups also available).

Columbia No.	No. of Cond.	Size AWG	Stranding	Nom. Insul. Thck.	Nom. Jkt. Thck.	Nom. O.D. In.
2695	2	20	Solid	.015	.025	.205
2696	2	18	Solid	.015	.025	.220
2679	2	22	7/30	.015	.025	.200
2678	3	22	7/30	.015	.025	.210
2680	4	22	7/30	.015	.025	.225
2681	2	20	10/30	.015	.025	.215
1332	3	20	10/30	.015	.025	.225
2683	4	20	10/30	.015	.025	.245
2686	2	18	16/30	.018	.025	.245
2687	3	18	16/30	.018	.025	.260
2688	4	18	16/30	.018	.025	.280
2689	2	16	26/30	.018	.025	.270
2690	3	16	26/30	.018	.025	.285
2691	2	14	41/30	.020	.030	.320
2692	3	14	41/30	.020	.030	.335
2693	2	12	65/30	.020	.030	.360
2694	3	12	65/30	.020	.030	.380

SPIRAL SHIELD, PVC JACKET

Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded PVC insulation, conductors cabled, tinned copper spiral wrapped shield, PVC jacket overall.

SPIRAL SHIELD, PVC JACKET (CONT'D)

Specifications: -20°C to +60°C. Passes FR-1 vertical flame test.

Color Code: Black, Red, White, Green, Yellow, Blue.

Applications: Cable for recording studios, radio transmitters, sound systems and electronic circuits where shielding is required. Spiral shield allows ease of pigtail soldering.

Put-up: 100', 500' and 1000' spools (other Put-ups also available).

Columbia No.	No. of Cond.	Size AWG	Stranding	Nom. Insul. Thck.	Nom. Jkt. Thck.	Nom. O.D. In.
2884	2	22	Solid	.015	.025	.175
2885	3	22	Solid	.015	.025	.180
2882	2	22	7/30	.015	.025	.175
1335	3	22	7/30	.015	.025	.190
1337	4	22	7/30	.015	.025	.210
1341	6	22	7/30	.015	.025	.245
2888	2	20	10/30	.015	.025	.200
2893	3	20	10/30	.015	.025	.210
2769	4	20	10/30	.015	.025	.225
2770	6	20	10/30	.015	.025	.265
2892	2	18	16/30	.020	.025	.230
2768	3	18	16/30	.020	.025	.245
2894	4	18	16/30	.020	.025	.265
2895	2	16	26/30	.023	.025	.255
2896	3	16	26/30	.018	.025	.270
2897	2	14	41/30	.020	.025	.290
2898	3	14	41/30	.020	.030	.320
2899	2	12	65/30	.020	.030	.345
2900	3	12	65/30	.020	.030	.365

MYLAR/ALUMINUM FOIL SHIELDED AUDIO CABLE

Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded polyethylene insulation, conductors cabled, wrapped with Flexfoil® mylar supported aluminum foil shield with foil facing to outside, stranded tinned copper drain wire, PVC jacket overall.

Specifications: -20°C to +60°C. Jacket only passes FR-1 vertical flame test.

Color Code: Black, Clear, Red, Green.

Applications: 100% shielded cable for recording studios, broadcast sound systems and electronic circuits where RF shielding is required.

Put-up: 100', 500' and 1000' spools (other Put-ups also available).

Columbia No.	No. of Cond.	AWG (Stranding)	Jacket Thck. In.	Nom. Insul. In.	Nom. O.D. In.
2513	2	24 (7/32)	.025	.015	.160
2514	2	22 (7/30)	.025	.015	.170
2526	3	22 (7/30)	.025	.015	.180
2523	4	22 (7/30)	.025	.015	.195
2524	2	20 (10/30)	.025	.015	.185
2525	3	20 (10/30)	.028	.015	.205
2534	2	18 (16/30)	.028	.018	.222
2535	3	18 (16/30)	.028	.018	.236
2536	2	16 (26/30)	.030	.025	.285
2537	3	16 (26/30)	.030	.025	.300
2538	2	14(41/30)	.032	.035	.350
2539	2	12(65/30)	.037	.040	.410

MINIATURE SIZE

Requires 1/2 to 3/4 less space than standard broadcast cables. Same construction as above, but with color-coded polypropylene insulation, .008" thick. Color Code: 1, Black; 2, Red; 3, White.

Columbia No.	No. of Cond.	AWG (Stranding)	Jacket Thck. In.	Nom. Insul. In.	Nom. O.D. In.
2515	2	22 (Solid)	.018	.008	.125
2516	2	22 (7/70)	.020	.008	.135
2517	3	22 (7/30)	.020	.008	.145



SPECIAL SHIELDED AUDIO & COMMUNICATION CABLE PVC JACKET



Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded PVC insulation, 4 conductors cabled, Flexfoil® aluminum/polyester shield over 4 cabled conductors, 22 gauge TC drain wire, 2 conductors unshielded, PVC jacket overall.

Specifications: -20°C to +60°C.

Applications: Special cable for audio and communications use.

Put-up: 100', 500' and 1000' spools. (Other put-ups also available.)

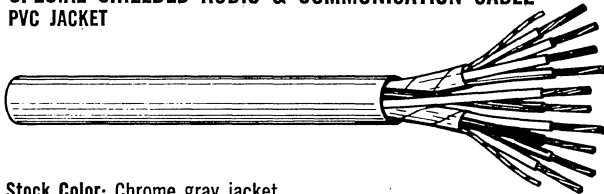
Cat. No.	No. of Cond.	Cond. Size	Cond. Strand.	Nom. Insul. Thck. (In.)	Nom. Jkt. Thck. (In.)	% Shld. Cov.	Sugg. Work. Volt.	Nom. O.D. (In.)
01345	6	4-24 shielded 2-22 unshielded	7/32 7/30	.015	.028	100	350V	.258

■ PASSES THE FR-1 VERTICAL FLAME TEST.

COLOR CODE OF CONDUCTORS

Shielded		Unshielded	
Cond.	Color	Cond.	Color
1	Black	3	Red
2	Green	4	Yellow

SPECIAL SHIELDED AUDIO & COMMUNICATION CABLE PVC JACKET



Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded PVC insulation, cabled in 2 quads, each quad with 24 gauge tinned drain wire, Flexfoil® shield over each quad, plus 2 unshielded conductors, PVC jacket overall. Foil facing to inside.

Specifications: -20°C to +60°C.

Applications: Special cable for audio and communications use.

Put-up: 100' and 500' spools. (Other put-ups also available.)

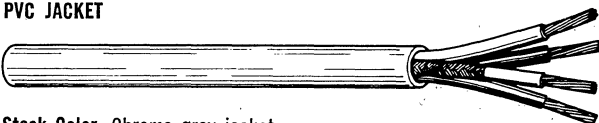
Cat. No.	No. of Cond.	Cond. Size	Cond. Strand.	Nom. Insul. Thck. (In.)	Nom. Jkt. Thck. (In.)	% Shld. Cov.	Sugg. Work. Volt.	Nom. O.D. (In.)
0408S	10	4-24 shielded 4-24 shielded 2-22 unshielded	7/32 7/32 7/30	.012 .012 .015	.030	100 100	350V	.310

■ PASSES THE FR-1 VERTICAL FLAME TEST.

COLOR CODE OF CONDUCTORS

1st Quad		2nd Quad		Unshielded	
Cond.	Color	Cond.	Color	Cond.	Color
1	Gray	1	Red	1	White
2	White	2	Brown	2	Blue
3	Blue	3	Yellow		
4	Green	4	Orange		

SHIELDED INSTRUMENTATION & COMMUNICATION QUAD CABLE PVC JACKET



Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded PVC insulation, tinned copper braid shield over one conductor, conductors cabled, PVC jacket overall.

Specifications: -20°C to +60°C.

Applications: Special cable for audio, communications and instrumentation use.

Put-up: 100', 250' and 500' spools. (Other put-ups also available.)

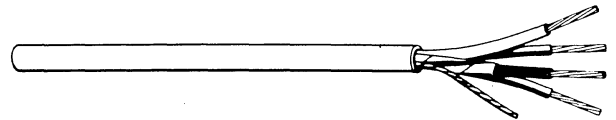
SHIELDED INSTRUMENTATION & COMMUNICATION QUAD CABLE PVC JACKET (CONTINUED)

Cat. No.	No. of Cond.	Cond. Size	Cond. Strand.	Nom. Insul. Thck. (In.)	Nom. Jkt. Thck. (In.)	App. % Shld. Cov.	Sugg. Work. Volt.	Nom. O.D. (In.)
01336	4	1-20 shielded 3-20 unshielded	10/30	.015	.025	82	300V	.220

COLOR CODE OF CONDUCTORS

Shielded		Unshielded	
Cond.	Color	Cond.	Color
1	White	1	Black
		2	Red
		3	Green

SHIELDED INSTRUMENTATION & COMMUNICATION QUAD CABLE PVC JACKET



Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded polypropylene insulation, each pair shielded with Flexfoil® aluminum polyester shield, stranded tinned copper drain wire, cables paired on common axis to reduce O.D., PVC jacket overall. Foil facing to outside. Drain wire 24 gauge, 7/32.

Specifications: -20°C to +60°C.

Applications: Special cable for audio, communications and instrumentation use.

Put-up: 100', 500' and 1000' spools. (Other put-ups also available.)

Cat. No.	No. of Cond.	Cond. Size	Cond. Strand.	Nom. Insul. Thck. (In.)	Nom. Jkt. Thck. (In.)	% Shld. Cov.	Sugg. Work. Volt.	Nom. O.D. (In.)	Nom. Cap.* PF/ Ft.	Nom. Cap.** PF/ Ft.
01352	4	22	7/30	.008	.025	100	400V	.170	35	62

*Capacitance between conductors.

**Capacitance between one conductor and other conductor connected to shield.

COLOR CODE OF CONDUCTORS

No. 1 pair	Black, red	No. 2 pair	Green, white
------------	------------	------------	--------------

SHIELDED INSTRUMENTATION & COMMUNICATION QUAD CABLE PVC JACKET



Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded polypropylene insulation, cabled in pairs, each pair Flexfoil® aluminum/polyester shielded, with stranded tinned copper drain wire, overall Flexfoil® aluminum foil/polyester shields and stranded, 24 gauge, 7/32, tinned copper drain wire, cabled on common axis to reduce O.D., PVC jacket overall.

Specifications: -20°C to +60°C.

Applications: Special cable for audio, communications and instrumentation use.

Put-up: 500' and 1000' spools. (Available put-ups also available.)

Cat. No.	No. of Cond.	Cond. Size	Cond. Strand.	Nom. Insul. Thck. (In.)	Nom. Jkt. Thck. (In.)	% Shld. Cov.	Sugg. Work. Volt.	Nom. O.D. (In.)	Nom. Cap.* PF/ Ft.	Nom. Cap.** PF/ Ft.
01353	4	22	7/30	.008	.025	100	400V	.195	35	62

*Capacitance between conductors.

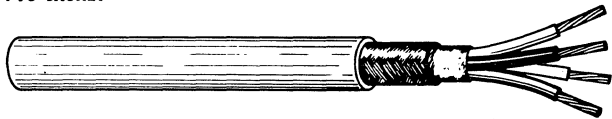
**Capacitance between one conductor and other conductor connected to shield.

COLOR CODE OF CONDUCTORS

No. 1 pair	Black, red	No. 2 pair	Green, white
------------	------------	------------	--------------



SHIELDED INSTRUMENTATION & COMMUNICATION QUAD CABLE PVC JACKET



Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded polyethylene insulation, cabled, filled where required, clear mylar wrap, tinned copper braid shield, PVC jacket overall.

Specifications: -20°C to +60°C. Suggested working voltage 600V.

Applications: Special cable for audio, communications and instrumentation use.

Put-up: 100', 500' and 1000' spools. (Other put-ups also available.)

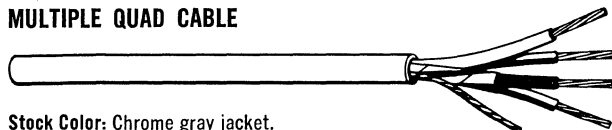
Cat. No.	No. of Cond.	Cond. Size	Cond. Strand.	Nom. Insul. Thck. (In.)	Nom. Jkt. Thck. (In.)	App. % Shld. Cov.	Sugg. Work. Volt.	Nom. O.D. (In.)	Nom. Cap. * PF/FT.	Nom. Cap. ** PF/FT.
01644	4	20	26/34	.015	.045	87	600V	.290	25	45

*Capacitance between conductors.

**Capacitance between one conductor and other conductor connected to shield.

Color Code: Black, white, red, green.

SHIELDED INSTRUMENTATION/COMMUNICATION MULTIPLE QUAD CABLE



Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors. Cat. No. 1340 color-coded polypropylene insulation. Cat. No. 1331 color-coded PVC insulation. Cat. No. 1343 color-coded polyethylene insulation. Flexfoil® aluminum foil/polyester shield (foil facing to outside) over 2 conductors, stranded tinned copper drain wire (Cat. No. 1340 - 24 gauge, Cat. No. 1331 and 1343 - 22 gauge), one shielded pair and 2 singles cabled on common axis to reduce O.D. PVC jacket overall.

Specifications: -20°C to +60°C. Suggested working voltage: Cat. No. 1340 — 200V, Cat. No. 1331 and 1343 — 350V, Cat. No. 1331 entire cable passes FR-1, Cat. Nos. 1340 and 1343 jacket only passes FR-1.

Color Code: Shielded — Black Red; Unshielded — Green White.

Applications: Special cable for audio, communications and instrumentation use.

Put-up: 100', 250', 500' and 1000' spools (other Put-ups also available).

Columbia No.	No. of Cond.	AWG (Stranding)	Nom. Insul. In.	Jacket Thck. In.	Nom. O.D. In.
01340	4	22 (7/30)	.008	.020	.168
01331	4	20 (10/30)	.015	.025	.215
01343	4	2-20 (10/30) Shld 2-18 (16/30) Unshld	.018 .018	.031	.256

INDIVIDUALLY SHIELDED MULTIPLE PAIR AUDIO/DATA CABLE



Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded polypropylene insulation, cabled in pairs, each pair and its drain wire under Flexfoil® aluminum foil/polyester shield, PVC jacket overall.

Jacket: +60°C. Conductors: +105°C. Suggested working voltage: 22 gauge — 300V; 20 gauge — 350V; 18 gauge — 400V. 100 Megohms/M insulation resistance between shields. 115PF/FT. capacitance between adjacent shields. 1500V voltage breakdowns between adjacent shields. 50V working voltage between adjacent shields. 22 gauge and 20 gauge series — 22 gauge drain wire; 18 gauge series — 20 gauge drain wire. JACKET ONLY PASSES FR-1 VERTICAL FLAME TEST.

Color Code: Chart II Page 2•1915

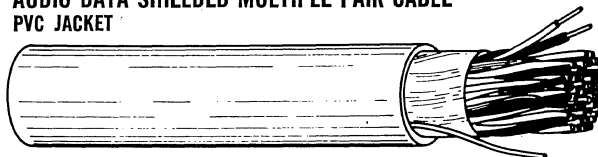
Applications: For audio RF and pulse applications requiring superior circuit isolation. The use of polypropylene insulation results in excellent high frequency properties and mechanical durability.

Put-up: 100', 500' and 1000' spools.**

INDIVIDUALLY SHIELDED MULTIPLE PAIR AUDIO/DATA CABLE (CONT'D)

Columbia No.	No. of		AWG (Stranding)	Nom. Insul. Thck.	Jacket Thck. In.	Nom. O.D. In.
	Pairs	Cond.				
06040	3	6	22 (7/30)	.008	.030	.265
06041	6	12	22 (7/30)	.008	.035	.320
06042	9	18	22 (7/30)	.008	.040	.380
06043	11	22	22 (7/30)	.008	.040	.415
06059	12	24	22 (7/30)	.008	.040	.430
06044	15	30	22 (7/30)	.008	.045	.510
06060	17	34	22 (7/30)	.008	.055	.525
06045	19	38	22 (7/30)	.008	.055	.550
06046	27	54	22 (7/30)	.008	.070	.670
06052	3	6	20 (10/30)	.013	.035	.315
06053	6	12	20 (10/30)	.013	.040	.420
06054	9	18	20 (10/30)	.013	.045	.500
06055	11	22	20 (10/30)	.013	.045	.545
06056	12	24	20 (10/30)	.013	.045	.560
06057	13	26	20 (10/30)	.013	.055	.610
06058	15	30	20 (10/30)	.013	.055	.640
06047	3	6	18 (16/30)	.016	.035	.375
06048	6	12	18 (16/30)	.016	.045	.495
06049	9	18	18 (16/30)	.016	.055	.575
06050	12	24	18 (16/30)	.016	.070	.705
06051	15	30	18 (16/30)	.016	.070	.785

AUDIO DATA SHIELDED MULTIPLE PAIR CABLE PVC JACKET



Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded PVC insulation, cabled in pairs, overall Flexfoil® aluminum foil/polyester shield, stranded tinned copper drain wire, PVC jacket overall.

Specifications: -20°C to +60°C. UL listed (Wires Misc.). 90V max.

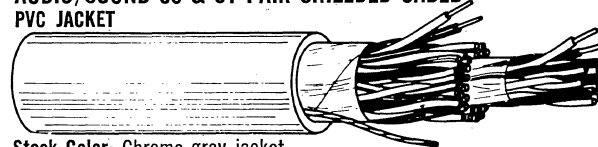
Put-up: 100', 500' and 1000' spools. (Other put-ups also available.)

Cat. No.	No. of Pairs	No. of Cond.	Cond. Size	Cond. Strand.	Nom. Insul. Thck. (In.)	Nom. Jkt. Thck. (In.)	Nom. O.D. (In.)	Nom. Cap.* PF/FT.
01670	2	4	22	Solid	.015	.025	.210	35
01671	6	12	22	Solid	.010	.025	.285	35
01672	9	18	22	Solid	.010	.030	.340	35
01673	15	30	22	Solid	.010	.035	.435	35
01674	19	38	22	Solid	.010	.035	.465	35
01675	27	54	22	Solid	.010	.045	.570	35

*Capacitance between conductors.

SEE COLOR CODE, Chart II Page 2•1915

AUDIO/SOUND 38 & 51 PAIR SHIELDED CABLE PVC JACKET



Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded polypropylene insulation (Cat. No. 06438) or PVC insulation (Cat. No. 06451) conductors cabled in pairs, Flexfoil® aluminum foil/polyester shield provides 100% coverage with foil facing to outside, 22 gauge 7/30 tinned copper drain wire laid parallel, PVC jacket overall.

Jacket: +60°C. Conductors: +105°C. Cat. No. 06438: JACKET ONLY PASSES FR-1 VERTICAL FLAME TEST. Cat. No. 06451: ENTIRE CABLE PASSES FR-1 VERTICAL FLAME TEST. Suggested working voltage 200V.

Applications: Multiple pair cable for audio and sound use with overall shield.

Put-up: Cut to specified length. Minimum 25', maximum 1500'.

Cat. No.	No. of Pairs	No. of Cond.	Cond. Size	Cond. Strand.	Nom. Insul. Thck. (In.)	Nom. Jkt. Thck. (In.)	Nom. O.D. (In.)
06438	38	76	22	Solid	.008	.045	.565
06451	51	102	22	Solid	.010	.050	.685

Color Code Top Next Page.



AUDIO/SOUND 38 & 51 PAIR SHIELDED CABLE (CONT'D)

PVC JACKET

No. of Pairs	Color Coding □	No. of Pairs	Color Coding □
1	Blue p/w White	25	Slate (Gray) p/w Red
2	Orange p/w White	26	Blue/White striped p/w Red
3	Green p/w White	27	Blue/Orange striped p/w Red
4	Brown p/w White	28	Blue/Green striped p/w Red
5	Slate (Gray) p/w White	29	Blue/Brown striped p/w Red
6	Blue/White striped p/w White	30	Blue/Slate (Gray) striped p/w Red
7	Blue/Orange striped p/w White	31	Orange/White striped p/w Red
8	Blue/Green striped p/w White	32	Orange/Green striped p/w Red
9	Blue/Brown striped p/w White	33	Orange/Brown striped p/w Red
10	Blue/Slate (Gray) striped p/w White	34	Orange/Slate (Gray) striped p/w Red
11	Orange/White striped p/w White	35	Green/White striped p/w Red
12	Orange/Green striped p/w White	36	Green/Brown striped p/w Red
13	Orange/Brown striped p/w White	37	Green/Slate (Gray) striped p/w Red
14	Orange/Slate (Gray) striped p/w White	38	Brown/White striped p/w Red
15	Green/White striped p/w White	39	Brown/Slate (Gray) striped p/w Red
16	Green/Brown striped p/w White	40	Slate (Gray)/White striped p/w Red
17	Green/Slate (Gray) striped p/w White	41	Blue p/w Black
18	Brown/White striped p/w White	42	Orange p/w Black
19	Brown/Slate (Gray) striped p/w White	43	Green p/w Black
20	Slate (Gray)/White striped p/w White	44	Brown p/w Black
21	Blue p/w Red	45	Slate (Gray) p/w Black
22	Orange p/w Red	46	Blue/White striped p/w Black
23	Green p/w Red	47	Blue/Orange striped p/w Black
24	Brown p/w Red	48	Blue/Green striped p/w Black
		49	Blue/Brown striped p/w Black
		50	Blue/Slate (Gray) striped p/w Black
		51	Orange/White striped p/w Black

□ First color in stripe combination is body color. Second or third colors are stripes. Example: White/Black/Red. Other striped combinations available to order.

PAIRED MULTI-CONDUCTOR CABLE (UNSHIELDED)

Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded PVC insulation, conductors paired with a short lay twist for conductor balance providing a circuit free from cross talk, pairs cabled, PVC jacket overall.

Specifications: —20°C to +60°C. Passes FR-1 vertical flame test.

Color Code: consult factory.

Applications: Heavy-duty intercom and audio cable for intercom systems, signal systems, annunciators, nurse's call systems, multiple speaker systems, control circuit cables.

Put-up: 100', 500' and 1000' spools.**

Columbia No.	No. of Pairs	Cond.	AWG (Stranding)	Jacket Thick. In.	Nom. Insul. Thick.	Nom. O.D. In.
SOLID CONDUCTORS						
UL listed (Wires, Misc.) 90V max.						
04008	1	2	22 (Solid)	.025	.015 200V	.150
04010	2	4	22 (Solid)	.025	.015 300V	.210
04014	3	6	22 (Solid)	.025	.015 300V	.225
04015	4	8	22 (Solid)	.025	.015 300V	.240
04016	5	10	22 (Solid)	.025	.012 300V	.260
04017	6	12	22 (Solid)	.025	.012 200V	.280
04018	7	14	22 (Solid)	.025	.012 200V	.295
04019	8	16	22 (Solid)	.025	.012 300V	.305
04020	9	18	22 (Solid)	.030	.012 200V	.335
04022	11	22	22 (Solid)	.030	.012 200V	.370
04024	13	26	22 (Solid)	.035	.012 200V	.410
04026	15	30	22 (Solid)	.035	.012 200V	.430
04028	16	32	22 (Solid)	.035	.012 200V	.440
04029	19	38	22 (Solid)	.035	.012 200V	.460
04031	23	46	22 (Solid)	.040	.012 200V	.525
04030	27	54	22 (Solid)	.040	.012 200V	.565
04032	41	82	22 (Solid)	.045	.012 200V	.685
04038	51	102	22 (Solid)	.060	.012 200V	.765
STRANDED CONDUCTORS						
06010	2	4	22 (7/30)	.025	.010 300V	.210
06014	3	6	22 (7/30)	.025	.010 300V	.230
06015	4	8	22 (7/30)	.025	.010 300V	.250
06017	6	12	22 (7/30)	.025	.010 200V	.275
06019	9	18	22 (7/30)	.030	.010 200V	.295
06023	12	24	22 (7/30)	.030	.010 200V	.385
06026	15	30	22 (7/30)	.040	.010 200V	.455
06027	19	38	22 (7/30)	.035	.010 200V	.470
06028	23	46	22 (7/30)	.040	.010 200V	.530
06030	27	54	22 (7/30)	.040	.010 200V	.570

PAIRED MULTI-CONDUCTOR CABLE (Cont'd)

Columbia No.	No. of Pairs	Cond.	AWG (Stranding)	Jacket Thick. In.	Nom. Insul. Thick.	Nom. O.D. In.
STRANDED CONDUCTORS (CONT'D)						
06032	31	62	22 (7/30)	.050	.010 200V	.635
06033	41	82	22 (7/30)	.060	.010 200V	.730
06025	51	102	22 (7/30)	.060	.010 200V	.780
UL listed (Wires, Misc.) 90V max.						
06113	3	6	20 (10/30)	.025	.015 300V	.260
06114	6	12	20 (10/30)	.030	.015 300V	.350
06115	9	18	20 (10/30)	.035	.015 300V	.447
06116	15	30	20 (10/30)	.040	.015 300V	.585
06101	1	2	18 (16/30)	.030	.018 400V	.220
UL listed (Wires, Misc.) 90V max.						
06118	2	4	18 (16/30)	.035	.018 400V	.316
06103	3	6	18 (16/30)	.035	.018 400V	.330
06119	4	8	18 (16/30)	.035	.018 400V	.370
06120	5	10	18 (16/30)	.035	.018 400V	.400
06106	6	12	18 (16/30)	.045	.018 400V	.550
UL listed (Wires, Misc.) 90V max.						
06121	8	16	18 (16/30)	.040	.018 400V	.500
06109	9	18	18 (16/30)	.040	.018 400V	.545
06110	12	24	18 (16/30)	.050	.018 400V	.640
06111	15	30	18 (16/30)	.060	.018 400V	.750
06112	19	38	18 (16/30)	.060	.018 400V	.800

CONDUCTOR COLOR CODE CHART II

No. Prs.	Paired Colors	No. Prs.	Paired Colors	No. Prs.	Paired Colors
1	Black, Red	18	Green, Yellow	35	Purple, Slate
2	Black, White	19	White, Blue	36	Purple, Black
3	Black, Green	20	White, Brown	37	Slate, Red
4	Black, Blue	21	White, Orange	38	Slate, White
5	Black, Brown	22	White, Yellow	39	Slate, Green
6	Black, Yellow	23	Blue, Brown	40	Slate, Blue
7	Black, Orange	24	Blue, Orange	41	Slate, Brown
8	Red, Green	25	Blue, Yellow	42	Slate, Yellow
9	Red, White	26	Brown, Orange	43	Slate, Orange
10	Red, Blue	27	Brown, Yellow	44	Slate, Black
11	Red, Yellow	28	Purple, Red	45	W/B*, Red
12	Red, Brown	29	Purple, White	46	W/B*, Green
13	Red, Orange	30	Purple, Green	47	W/B*, Blue
14	Green, Blue	31	Purple, Blue	48	W/B*, Brown
15	Green, White	32	Purple, Brown	49	W/B*, Yellow
16	Green, Brown	33	Purple, Yellow	50	W/B*, Orange
17	Green, Orange	34	Purple, Orange	51	W/B*, Purple

* White body with black stripe.

DUAL CHANNEL AUDIO CABLE SHIELDED

PVC JACKET

Stock Color: Chrome gray jacket.

Applications: Each conductor 3 strands tinned copper, 4 strands tinned copperweld, color-coded polyethylene insulation over each conductor, each conductor individually shielded with tinned copper spiral shield, conductors laid parallel, PVC jacket overall, red conductor ridged for polarity identification.

Specifications: —20°C to +60°C.

Construction: Dual channel audio cable for language laboratories, audio laboratories and head sets. Rip-type construction for easy separation of conductors when split apart.

Put-up: 100', 250' and 500' spools. (Other put-ups also available.)

Cat. No.	No. of Cond.	Cond. Size	Cond. Strand.	Nom. Insul. Thck. (In.)	Nom. Jkt. Thck. (In.)	Nom. O.D. (In.)	Nom. Cap.* PF/Ft.
01375	2	25	7/33	.020	.020	.110 x .220	35 each channel

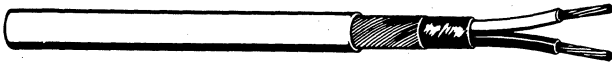
*Capacitance between conductor and shield. This cable also available with aluminum foil Mylar (and individual drain wires) in lieu of spiral shield.

COLOR CODE OF CONDUCTORS

Cond.	Color
1	Clear
2	Red



TWO-CONDUCTOR MICROPHONE CABLE SPIRAL SHIELD



Stock Color: Silver gray jacket.

Construction: Tinned copper conductors, color-coded polyethylene insulation, cabled with fillers, textile wrap, spiral tinned copper shield, high gloss Flexlife® jacket.

Specifications: -20°C to +60°C.

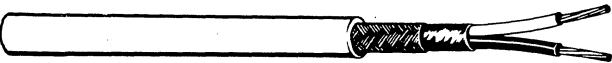
Color Code: White, Black.

Applications: For use with low impedance microphones. Flexlife jacket provides extreme flexibility, high abrasion resistance and outstanding appearance.

Put-up: 100', 250', 500' and 1000'spools (other Put-ups also available).

Columbia No.	Impedance	AWG (Stranding)	Nom. Insul. Thick. In.	Jkt. Thick. In.	Nom. O.D. In.
1323	Low	22 (16/34)	.025	.025	.225
1328	Min. Low	24 (10/34)	.016	.030	.190

BRAIDED SHIELD



Stock Color: Silver gray jacket.

Construction: Tinned copper conductors, color-coded polyethylene insulation, cabled with fillers, textile wrap, braided tinned copper shield, high gloss Flexlife jacket.

Specifications: -20°C to +60°C.

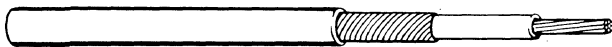
Color Code: White, Black.

Applications: For use with low impedance microphones. Flexlife jacket provides extreme flexibility, high abrasion resistance and outstanding appearance.

Put-up: 100', 250', 500' and 1000'spools (other Put-ups also available).

Columbia No.	Impedance	AWG (Stranding)	Nom. Insul. Thick. In.	Jkt. Thick. In.	Nom. O.D. In.
1322	Low	22 (16/34)	.025	.025	.235

ONE-CONDUCTOR MICROPHONE CABLE SPIRAL SHIELD



Stock Color: Silver gray jacket. (Cat. No. 01359 available in black jacket.)

Construction: Single conductor 3/33 strands tinned copper, 4/33 strands tinned copper/braid, white foam polyethylene dielectric, spiral tinned copper shield, high gloss Flexlife® jacket.

Specifications: -20°C to +60°C.

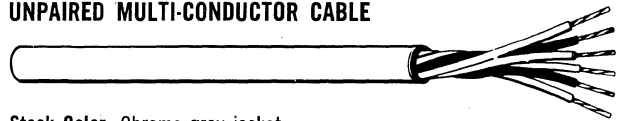
Applications: For use with high impedance microphones and hi-fi interconnecting cables. Flexfoam dielectric (foam polyethylene) provides as much as 35% lower capacitance than the best standard solid polyethylene dielectric microphone cables. Flexfoam cables are the most flexible plastic microphone cable available, with limpness almost equal to rubber and with better abrasion resistance.

Put-up: 100', 250', 500' and 1000'spools (other Put-ups also available).

Columbia No.	Microphone Type	Thick. In.		Nom. Cap. MMF/Ft.	Nom. O.D. In.
		Insulation	Jacket		
1359	Min.	.016	.012	39	.085
1369	Lapel	.030	.020	19	.130
1389	Crystal	.050	.025	18	.185
1395	Crystal	.075	.030	11	.245
1314*	Crystal	.040	.020	25	.155

* Solid polyethylene dielectric.

UNPAIRED MULTI-CONDUCTOR CABLE



Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors (Cat. Nos. 02754 and 02755 are bare copper), color-coded PVC insulation, PVC jacket overall, conductors cabled.

Specifications: -20°C to +60°C. All items pass FR-1 vertical flame test. **Color Code:** Chart III.

Applications: PA systems, unbalanced intercom systems, interconnecting cables, remote control circuits, telephones, low-voltage relay control cables.

Put-up: 100', 500' and 1000' spools (other Put-ups also available).

SOLID CONDUCTORS

Columbia No.	No. of Cond.	AWG (Stranding)	Nom. Insul. Thick. In.	Nom. Jacket Thick. In.	Nom. O.D. In.
4008	2	22 (1)	.012	.025	.150
4310	3	22 (1)	.012	.025	.150
4311	2	20 (1)	.015	.025	.175
2754	2	19 (1)	.015	.025	.180
2755	3	19 (1)	.015	.025	.190

STRANDED CONDUCTORS

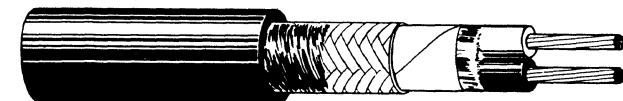
6348	2	22 (7/30)	.015	.025	.165
4062	3	22 (7/30)	.010	.025	.160
4063	4	22 (7/30)	.010	.025	.170
4064	5	22 (7/30)	.010	.025	.185
4066	6	22 (7/30)	.010	.025	.200
4088	7	22 (7/30)	.010	.025	.200
4065	8	22 (7/30)	.010	.025	.215
4070	9	22 (7/30)	.010	.025	.230
4071	10	22 (7/30)	.010	.025	.250
4067	12	22 (7/30)	.010	.025	.260
4073	15	22 (7/30)	.010	.025	.320
4069	18	22 (7/30)	.010	.030	.315
4075	20	22 (7/30)	.010	.030	.330
4076	25	22 (7/30)	.010	.030	.370
4077	30	22 (7/30)	.010	.030	.385
4078	40	22 (7/30)	.010	.040	.455
4079	50	22 (7/30)	.010	.040	.500
4087	60	22 (7/30)	.010	.040	.535
6351	2	20 (10/30)	.015	.025	.190
6352	3	20 (10/30)	.015	.025	.200
6353	4	20 (10/30)	.015	.025	.215
6355	5	20 (10/30)	.015	.030	.240
6356	7	20 (10/30)	.015	.030	.265
6357	9	20 (10/30)	.015	.035	.310
6358	15	20 (10/30)	.015	.040	.395
2830	2	18 (16/30)	.018	.025	.220
2831	3	18 (16/30)	.018	.025	.230
2404	4	18 (16/30)	.018	.025	.255
2405	2	16 (26/30)	.023	.025	.250
2406	3	16 (26/30)	.023	.025	.265
2409	2	14 (41/30)	.030	.030	.332
2410	2	12 (65/30)	.030	.030	.370

CONDUCTOR COLOR CODE CHART III.

No. 2754 has red and white conductors; No. 2755 has red, white and green; Nos. 2830, 2405, 2409 and 2410 have black and white. All other cables above have conductors as indicated in this table. First color is body; second or third colors are stripes.

No.	Color	No.	Color	No.	Color
1	Black	10	Gray	19	White/Yellow
2	Red	11	Pink	20	White/Blue
3	White	12	Tan	21	White/Brown
4	Green	13	Red/Green	22	White/Orange
5	Orange	14	Red/Yellow	23	White/Gray
6	Blue	15	Red/Black	24	White/Violet
7	Brown	16	White/Black	25	White/Black/Red
8	Yellow	17	White/Red		
9	Purple	18	White/Green		

SHIELDED CONTROL CABLE



Stock Color: Black jacket.

Construction: Tinned copper conductors, color-coded rubber insulation, cabled, filled where required, clear mylar wrap, tinned copper braided shield, cotton wrap, neoprene jacket or rubber jacket.

Specifications: -20°C to +60°C. Suggested working voltage 350V.

**SHIELDED CONTROL CABLE (CONT'D)**

Color Code: Chart IV.

Applications: Control circuits, video and audio interconnecting cables, broadcast and studio use. Precision engineered to prevent cross-talk and eliminate hum pick-up. Neoprene and rubber jackets are resistant to impact and abrasion and have extra limpness. For outside installations, neoprene is recommended being resistant to oil, ozone, moisture and sunlight.

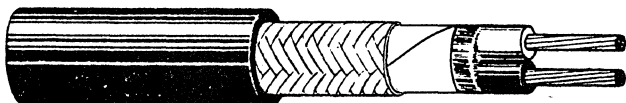
Put-up: 100', 500' and 1000' spools (other Put-ups also available).

RUBBER JACKET — HEAVY DUTY

Columbia No.	No. of Cond.	AWG (Stranding)	Nom. Insul. Thick. In.	Nom. Jacket Thick. In.	Nom. O.D. In.
1303	2	18 (41/34)	.020	.035	.295
1300	1	20 (26/34)	.040	.035	.230
1302	2	20 (26/34)	.020	.035	.270
1304	3	20 (26/34)	.020	.035	.285
1305	4	20 (26/34)	.020	.035	.305
1308	5	20 (26/34)	.020	.035	.330
1310	6	20 (26/34)	.020	.035	.345
1312	7	20 (26/34)	.020	.035	.360
1313	8	20 (26/34)	.020	.035	.385
1315	10	20 (26/34)	.020	.035	.440
1316	12	20 (26/34)	.020	.065	.525
1317	15	20 (26/34)	.020	.065	.595
1325	20	20 (26/34)	.020	.065	.660

NEOPRENE JACKET — HEAVY DUTY

1201	1	18 (41/34)	.040	.035	.240
1202	2	18 (41/34)	.020	.035	.295
1203	3	18 (41/34)	.020	.035	.305
1204	4	18 (41/34)	.020	.035	.330
1206	6	18 (41/34)	.020	.035	.370
1208	8	18 (41/34)	.020	.035	.420
1210	10	18 (41/34)	.020	.035	.480
1212	12	18 (41/34)	.020	.065	.555
1215	15	18 (41/34)	.020	.065	.640
1220	20	18 (41/34)	.020	.065	.730
1602	2	16 (65/34)	.025	.035	.335
1603	3	16 (65/34)	.025	.035	.355
1604	4	16 (65/34)	.025	.035	.385
1606	6	16 (65/34)	.025	.040	.445
1608	8	16 (65/34)	.025	.040	.510
1610	10	16 (65/34)	.025	.040	.575
1612	2	14 (41/30)	.030	.040	.395
1613	3	14 (41/30)	.030	.040	.425
1614	4	14 (41/30)	.030	.040	.455
1616	6	14 (41/30)	.030	.040	.515
1622	2	12 (65/30)	.030	.040	.440
1623	3	12 (65/30)	.030	.040	.465
1624	4	12 (65/30)	.030	.040	.505
1632	2	10 (105/30)	.030	.040	.495
1633	3	10 (105/30)	.030	.040	.520

POLYETHYLENE INSULATION AND PVC JACKET

Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded polyethylene insulation, cabled, filled where required, clear mylar wrap, tinned copper braid shield, PVC jacket overall.

Specifications: -20°C to +60°C. Suggested working voltage 600V. Jacket only passes FR-1 vertical flame test.

Color Code: Chart IV.

Applications: Low capacity cable for control circuits, video and audio interconnecting cables, broadcast and studio use. Precision engineered to prevent cross-talk and eliminate hum pick-up. Low capacitance, light weight.

Put-up: 100', 500' and 1000' spools. (Other put-ups also available.)

SHIELDED CONTROL CABLE (CONT'D)**CONDUCTORS 20 GA 26/34 STR T.C.**

Columbia No.	No. of Cond.	Nom. Insul. Thick. In.	Nom. Jacket Thick. In.	Nom. O.D. In.
1642	2	.015	.040	.250
1643	3	.015	.045	.270
1644	4	.015	.045	.290
1645	5	.015	.045	.310
1646	6	.015	.045	.325
1648	8	.015	.045	.350
1650	10	.015	.045	.390
1652	12	.015	.045	.405
1655	15	.015	.045	.440
1660	20	.015	.045	.480

UNSHIELDED CONTROL CABLE**RUBBER INSULATION AND RUBBER JACKET**

Stock Color: Black jacket.

Construction: Tinned copper conductors, color-coded rubber insulation, cabled, filled where required, cotton wrap, rubber jacket.

Specifications: -20°C to +60°C. Suggested working voltage 350V.

Color Code: Chart IV.

Applications: Control circuits, broadcast and studio use, traffic and fire alarm control, temperature control systems, other multiple control applications. Resistant to impact and abrasion. Extra limpness.

Put-up: 100', 500' and 1000' spools (other Put-ups also available).

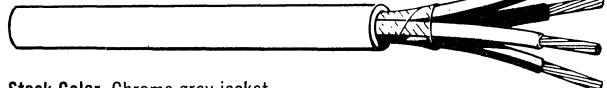
CONDUCTORS 20 GA 26/34 STR T.C.

Columbia No.	No. of Cond.	Nom. Insul. Thick. In.	Nom. Jacket Thick. In.	Nom. O.D. In.
3602	2	.020	.035	.240
3603	3	.020	.035	.255
3604	4	.020	.035	.275
3605	5	.020	.035	.300
3606	6	.020	.035	.315
3607	7	.020	.035	.325
3608	8	.020	.035	.360
3610	10	.020	.035	.410
3612	12	.020	.035	.435
3615	15	.020	.035	.505
3620	20	.020	.035	.570

CONDUCTOR COLOR CODE CHART IV.

First color is body color; second color is stripe.

No.	Color	No.	Color	No.	Color
1	Black	8	Orange	15	White/Blue
2	White	9	Gray (Slate)	16	White/Brown
3	Red	10	Purple	17	White/Purple
4	Green	11	White/Black	18	White/Gray
5	Yellow	12	White/Red	19	Black/Red
6	Blue	13	White/Green	20	Black/Yellow
7	Brown	14	White/Yellow		

UNSHIELDED CONTROL CABLE**PVC INSULATION/PVC JACKET**

Stock Color: Chrome gray jacket.

Construction: Tinned copper conductors, color-coded PVC insulation, mylar binder overall (no mylar binder on Cat. Nos. 02404, 02420, 02421, 02422), PVC jacket, conductors cabled.

Specifications: -20°C to +60°C. Suggested working voltage: 18GA — 400V, 16GA - 12GA — 600V. Pass FR-1 vertical flame test.

Color Code: Chart V (Page 2•1918) 18GA cables UL (wires, misc.).

Applications: Interconnecting cables for electronic equipment, control circuits, broadcast and studio use, temperature control systems.

Put-up: 100', 500' and 1000' spools (other Put-ups also available).



UNSHIELDED CONTROL CABLE

PVC INSULATION / PVC JACKET (CONT'D)

Columbia No.	No. of Cond.	AWG (Stranding)	Nom. Insul. In.	Jacket Thck. In.	Nom. O.D. In.
02404	4	18 (16/30)	.018	.030	.260
02420	5	18 (16/30)	.018	.037	.300
02421	7	18 (16/30)	.018	.037	.324
02422	9	18 (16/30)	.018	.037	.379
02412	12	18 (16/30)	.018	.040	.430
02423	15	18 (16/30)	.018	.045	.490
02424	19	18 (16/30)	.018	.045	.515
02433	25	18 (16/30)	.018	.060	.625
02425	4	16 (19/29)	.030	.045	.375
02434	5	16 (19/29)	.030	.045	.410
02435	7	16 (19/29)	.030	.045	.445
02436	9	16 (19/29)	.030	.045	.510
02427	12	16 (19/29)	.030	.060	.610
02428	15	16 (19/29)	.030	.060	.675
02429	19	16 (19/29)	.030	.065	.725
02436	25	16 (19/29)	.030	.065	.830
02430	4	14 (19/27)	.045	.045	.485
02437	5	14 (19/27)	.045	.060	.560
02431	7	14 (19/27)	.045	.060	.605
02438	9	14 (19/27)	.045	.065	.715
02432	12	14 (19/27)	.045	.065	.800
02439	15	14 (19/27)	.045	.080	.920
02440	4	12 (65/30)	.045	.045	.540
02442	7	12 (65/30)	.045	.060	.675
02444	10	12 (65/30)	.045	.080	.900

CONDUCTOR COLOR CODE CHART V

No.	Color	No.	Color	No.	Color
1	Black	10	Orange/Black	19	Blue/Red
2	White	11	Blue/Black	20	Red/Green
3	Red	12	Black/White	21	Orange/Green
4	Green	13	Red/White	22	Black/White/Red
5	Orange	14	Green/White	23	White/Black/Red
6	Blue	15	Blue/White	24	Red/Black/White
7	White/Black	16	Black/Red	25	Green/Black/White
8	Red/Black	17	White/Red		
9	Green/Black	18	Orange/Red		

CONTROL CABLE MULTI-CONDUCTOR FLAT RIBBON

PVC INSULATION



Stock Color: See table below.

Construction: Tinned copper conductors, color-coded PVC insulation per MIL-W-16878 Type C, conductors bonded to form flat ribbon cable.

Specifications: -55°C to +105°C. Suggested working voltage 1000V.

Applications: Circuit connections, interconnecting assemblies; wiring harnesses for sliding drawers, drop panels and racks. Reduces installation time, space and weight. Conductors easily separated for termination. Resistant to oil, flame, acids, moisture, fungus and solvents. Contact factory for custom designed ribbon cables consisting of different gauge sizes and number of conductors.

Put-up: 100', 500' and 1000' spools. (Other put-ups also available.)

Cat. No.	No. of Cond.	Cond. Size	Cond. Strand.	Nom. Insul. Thck. (In.)	Nom. O.D. (In.)
06625	4	22	7/30	.016	.065 x .260
06626	8	22	7/30	.016	.065 x .520
06627	12	22	7/30	.016	.065 x .780
06628	16	22	7/30	.016	.065 x 1.040
06629	20	22	7/30	.016	.065 x 1.300

COLOR CODE OF CONDUCTORS

Cond. Color	Cond. Color	Cond. Color	Cond. Color	Cond. Color
1.....Black	5.....Yellow	9.....Gray	13.....Red	17.....Blue
2.....Brown	6.....Green	10.....White	14.....Orange	18.....Violet
3.....Red	7.....Blue	11.....Black	15.....Yellow	19.....Gray
4.....Orange	8.....Violet	12.....Brown	16.....Green	20.....White

☐ First color in stripe combination is body color. Second or third colors are stripes. Example: White/Black/Red. Other solid colors and striped combinations available to order.

SPECIAL CONSTRUCTIONS AVAILABLE.
CONSULT FACTORY.



UL HOOK UP WIRE STYLE 1015, CSA TYPE TEW

Stock Colors: See table below.

Construction: Tinned copper conductor, color-coded PVC insulation.

Specifications: -40°C to +105°C, 600V. Resistant to acids, oil, alkalis, flame, moisture and fungus.

Color Code: Chart VI

Applications: Internal wiring of electronic and electrical equipment.

Put-up: 100' and 1000' spools (other Put-ups also available).

Columbia No.	AWG (Stranding)	Nom. Insul. Thck. In.	Voltage Rating	Nom. O.D. In.
2117	22 (1)	.032	600	.090
2118	20 (1)	.032	600	.097
2119	18 (1)	.032	600	.105
2100	24 (7/32)	.032	600	.088
2101	22 (7/30)	.032	600	.095
2102	20 (10/30)	.032	600	.102
2103	18 (16/30)	.032	600	.112
2104	16 (26/30)	.032	600	.125
2105	14 (41/30)	.032	600	.142

UL HOOK UP WIRE UL STYLE 1007 CSA TR-64

Stock Colors: See table below.

Construction: Tinned copper conductor, color-coded PVC insulation.

Specifications: -40°C to +80°C, 300V. Resistant to acids, oil, alkalis, flame, moisture and fungus.

Applications: Internal wiring of electronic and electrical equipment.

Color Code: Chart VI

Put-up: 100' and 1000' spools (other Put-ups also available).

Columbia No.	AWG (Stranding)	Nom. Insul. Thck. In.	Voltage Rating	Nom. O.D. In.
2003	24 (1)	.016	300	.054
2004	22 (1)	.016	300	.059
2028	20 (1)	.016	300	.066
2052	18 (1)	.016	300	.079
2053	16 (1)	.016	300	.089
2015	24 (7/32)	.016	300	.056
2016	22 (7/30)	.016	300	.062
2040	20 (10/30)	.016	300	.071
2064	18 (16/30)	.016	300	.080
2065	16 (26/30)	.016	300	.095

STOCK COLORS CHART VI

1 White 3 Red 5 Yellow 7 Brown 9 Gray (slate)
2 Black 4 Green 6 Light Blue 8 Orange 10 Violet (purple)

Stripe combinations also available — consult factory.

RUBBER TEST LEAD WIRE

Stock Colors: See table below.

Stock Color: Black or Red. (Other colors available on special order.)

Construction: Extra flexible stranded tinned soft annealed copper conductor, color-coded rubber insulation.

Specifications: -20°C to +60°C. All breakdown voltages and suggested working voltages are AC RMS values.

Applications: Test lead wire for use in multimeters, analyzers, oscillators and other applications requiring extra flexible insulated wire.

Put-up: 250', 500' and 1000' spools (other Put-ups also available).

Columbia No.	Color*	AWG (Stranding)	Nom. Insul. Thck. In.	Sug. Working Voltage	Nom. O.D. In.
1326	*	20 (41/36)	.040	1,500V	.125
1319	*	20 (41/36)	.047	3,000V	.140
1321	*	18 (65/36)	.045	5,000V	.140
1318	*	18 (65/36)	.088	10,000V	.230

* Available in red or black; please specify.

PLASTIC TEST LEAD WIRE

Stock Color: Black or red. (Other colors available on special order.)

Construction: Extra flexible stranded tinned soft annealed copper conductor, color-coded extra flexible, high gloss Flexlife® plastic insulation.

Specifications: -20°C to +60°C, 5000V. Insulation resistant to acids, oil, alkalis, flame, moisture and fungus. All breakdown voltages and suggested working are AC RMS values.



PLASTIC TEST LEAD WIRE (CONT'D)

Applications: Test lead wire for use in multimeters, analyzers, oscillators, and other applications requiring extra flexible insulated wire. Flexlife plastic insulation is durable and has a high-gloss finish.

Put-up: 250' and 500' spools (other Put-ups also available).

Columbia No.	Color*	AWG (Stranding)	Nom. Insul. Thick. In.	Sug. Working Voltage	Nom. O.D. In.
01320	Black or Red	18 (65/36)	.045	5,000V	.140

PORTABLE SERVICE AND POWER CORD



Copper: Bare soft annealed. Stranding per ASTM-B-174 and ASTM-B-173.

Insulation of inner conductors: Synthetic Rubber (SBR) per IPCEA Pub. No. S-19-81 (4th Edition) Part 3.7.1 (SBR); N.E.M.A. Publication No. WC-3-1964; and UL Subject 62, Class 3.

Temperature Range: 60°C (140°F) to -37°C (-35°F).

Color Code Conductors: 2 conductor — Black, White; 3 conductor — Black, White, Green; 4 conductor — Black, White, Green, Red.

Foundation: Conductors twisted together with fillers to make a round core; separator over core.

Neoprene Jacket: Black Neoprene: 60°C (140°F) to -37°C (-35°F) per IPCEA Pub. No. S-19-81 (4th Edition) Part 7.7.5.1; NEMA Pub. No. WC-3-1964; ASTM D-752; and UL Subject 62, Class 15.

Rubber Jacket: Black Synthetic Rubber (SBR) 60°C (140°F) to -37°C (-35°F) per IPCEA Pub. No. S-19-81 (4th Edition) Part 7.7.5.1; NEMA Pub. No. WC-3-1964; and UL Subject 62, Class 6.

Jacket Marking: All sizes surface printed* showing gauge, number of conductors, voltage and type.

Neoprene Use: For heavy (SO) and light (SJO) service such as tools, power extensions, motor and welding leads, portable machinery, floor polishers and sanders, battery chargers, portable stage light, garage portable lights, sound equipment, washing machines, refrigerators, sewing machines, and other electrical equipment. Type SVO — for vacuum cleaners, home food mixers, office equipment, and other light duty requirements.

Rubber Use: For heavy (S) and light (SJ) service such as tools, power extensions, motor and welding leads, portable machinery, floor polishers and sanders, battery chargers, portable stage lights, garage portable lights, sound equipment, washing machines, refrigerators, sewing machines, and other electrical equipment. Type SV — for vacuum cleaners, home food mixers, office equipment, and other light duty requirements.

Neoprene Environment: For use in areas where exposed to oil, ozone, grease, chemicals or solvents.

Rubber Environment: Useful cord life is reduced where exposed to oil, ozone, grease, chemicals or solvents. Cords to be used in such environments are Neoprene SO.

NEOPRENE JACKET

Columbia No.	No. of Cond.	Size AWG	Type	Volt Rating	Nom. Insul.	Current Amps	Nom. O.D. In.
1477	2	18	SVO	300V	1/64	7	.250
1478	2	18	SJO	300V	2/64	7	.305
1479	3	18	SJO	300V	2/64	7	.330
1481	2	16	SJO	300V	2/64	10	.330
1482	3	16	SJO	300V	2/64	10	.360
1484	2	18	SO	600V	2/64	7	.385
1485	3	18	SO	600V	2/64	7	.400
1487	2	16	SO	600V	2/64	10	.400
1488	3	16	SO	600V	2/64	10	.425

RUBBER JACKET

Columbia No.	No. of Cond.	Size AWG	Type	Volt Rating	Nom. Insul.	Current Amps	Nom. O.D. In.
1420	2	18	SV	300V	1/64	7	.250
1425	2	18	SJ	300V	2/64	7	.305
1435	3	18	SJ	300V	2/64	7	.330
1438	4	18	SJ	300V	2/64	6	.370
1445	2	16	SJ	300V	2/64	10	.330
1450	3	16	SJ	300V	2/64	10	.360
1448	4	16	SJ	300V	2/64	8	.400
1500	2	14	S	600V	3/64	15	.527
1505	3	14	S	600V	3/64	15	.557
1509	4	14	S	600V	3/64	12	.602
1510	2	12	S	600V	3/64	20	.597
1515	3	12	S	600V	3/64	20	.632

RUBBER JACKET (CONT'D)

Columbia No.	No. of Cond.	Size AWG	Type	Volt Rating	Nom. Insul.	Current Amps	Nom. O.D. In.
1517	2	10	S	600V	3/64	25	.637
1519	3	10	S	600V	3/64	25	.687

PLASTIC JACKET CONSTRUCTION

Copper: Bare soft drawn annealed, Class K stranding per ASTM-B-174 and ASTM-B-173.

Insulation: Polyvinyl chloride, resistant to oils, water, acids, alkalies and ozone. 60°C — UL Class II. Black, gray and white SVT.

Temperature Range: 60°C (140°F) to -20°C (-4°F).

Color Code Conductors: 2 conductor — black, white.

3 conductor — black, white, green.

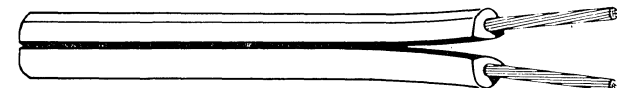
Foundation: Conductors twisted together with fillers to make a round core; separator over core.

Jacket: 60°C. Black, gray or white (SVT) or black (SJT) UL Class II, non marking 60°C (140°F) to -20°C (-4°F) polyvinyl chloride, resistant to oil, water, acid, alkali, ozone and abrasion. Jacket meets specifications per ASTM-D-1047. SVT jacket ribbed to help cord remain clean.

Columbia No.	No. of Cond.	Size AWG	Type	Voltage Rating	Nom. Insul.	Current Amps	Nom. O.D. In.
01554	2	18	SVT	300V	1/64	7	.250
01556	3*	18	SVT	300V	1/64	7	.264
01496	2	18	SJT	300V	2/64	7	.305
01497	3	18	SJT	300V	2/64	7	.330
01498	2	16	SJT	300V	2/64	10	.325
01499	3	16	SJT	300V	2/64	10	.355

*Two Conductor W/3rd Conductor for Grounding Only.

TYPE SPT LAMP AND POWER CORD

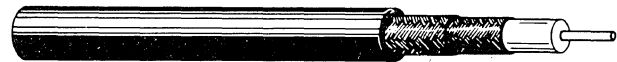


Plastic lamp cord with polarity ridge over one conductor. Rip type construction. UL Listed. For fans, lamps, radios, TV, stereo speakers, signs, etc. Specify Brown, White, Gray or Black.

Columbia No.	No. of Cond.	AWG (Strand)	Type	Current Amps	Nom. O.D. In.
1415	2	18 (41/34)	SPT-1	7	.107 x .210
1402	2	16 (65/34)	SPT-2	10	.155 x .296

RG TYPE COAXIAL CABLES

DOUBLE BRAIDED SHIELD



RG/U No.	Cat. No.	Jkt.	Shld.	Di-elec. Matl.	Cond. Ea.	Nom. O.D. (In.)	Nom. % of Vel.	Nom. Cap.	Features
6A	01168	PVC	Double Brd BC	PE	21 BCW	.336	66	20.5	Flexlife®

* Max. Shield Coverage • Nom. Impedance 75 ohms • Tested for 100% Sweep

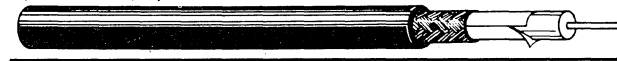
DOUBLE BRAIDED SHIELD WITH INNER PE JACKET



RG/U No.	Cat. No.	Jkt.	Shld.	Di-elec. Matl.	Cond. Ea.	Nom. O.D. (In.)	Nom. % of Vel.	Nom. Cap.	Features
11	05027	PE	Double Brd BC	FPE	14 BC	.475	78	17.3	Permaline®

* Max. Shield Coverage • Nom. Impedance 75 ohms • Tested for 100% Sweep

ALUMINUM FOIL/ALUMINUM BRAID SHIELD



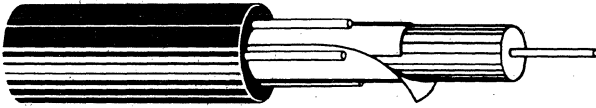
RG/U No.	Cat. No.	Jkt.	Shld.	Di-elec. Matl.	Cond. Ea.	Nom. O.D. (In.)	Nom. % of Vel.	Nom. Cap.	Features
6	05775	PVC	—	FPE	18 BC	.270	78	17.3	UL 1594 100% Swept Messenger
59	05776	PVC	—	FPE	20 BCW	.242	78	17.3	
59	05780	PVC	—	FPE	20 BCW	.242	78	17.3	
59	05770	PVC	—	FPE	22 BCW	.242	78	16.3	
59	05781	PVC	—	FPE	20 BCW	.242	78	17.3	

* Max. Shield Coverage • Nom. Impedance 75 ohms •



RG TYPE COAXIAL CABLES (CONT'D)

ALUMINUM FOIL WITH SOLID TINNED COPPERWELD DRAIN WIRES



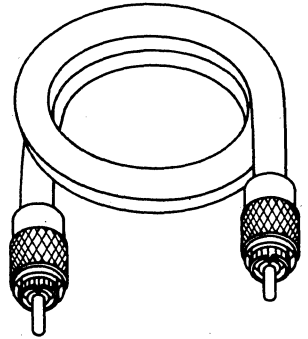
RG/U No.	Cat. No.	Jkt.	Shld.	Di-elec. Mat'l.	Cond. Ea.	Nom. O.D. (In.)	Nom. % of Vel.	Nom. Cap.*	Features
11	05026	PVC	—	FPE	14 BC	.380	78	17.3	UL 1594
59	05750	PVC	—	PE	22 BCW	.242	66	20.5	Dura Color®
59	05755	PVC	—	FPE	22 BCW	.242	78	17.5	Foam Dura Color®
59/6	05760	PVC	—	FPE	18 BC	.242	78	17.5	Super Dura Color®
59/6	05761	PVC	—	FPE	18 BC	.380	78	16.3	Messenger
						x .242			

* Max. Shield Coverage • Nom. Impedance 75 ohms • Tested for 100% Sweep

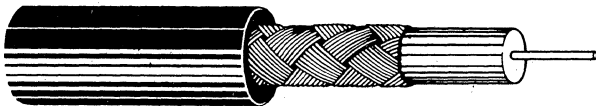
COAXIAL CABLE ASSEMBLIES

Low loss Foam Coaxial Cable Assemblies for citizens band, commercial, amateur, and marine installations.

Quality assembled and soldered for strength, durability, and weather resistance. PL-259 connectors and lugs protected with bright, attractive, tarnish resistant finish.



BRAID SHIELD



RG/U No.	Catalog No.	Shield Cover-age	Jkt.	Shld.	Di-elec-tric Mat'l.	Cond. Ga.	Nom. O.D. (Ins.)	Nom. Imp. (Ω)	Nom. % Vel. of Prop.	Nom. Cap. mmf/ft.	Features	Tested
8	01154	MIL	PVC	BC	PE	13(7x21)BC	.405	52	66	29.5	JANC17A	—
8	01198	Max.	PVC	BC	FPE	11(7x19)BC	.405	50	78	26	Super flex®	—
8	05015	Max.	PE	BC	FPE	11(7x19)BC	.405	50	78	26	Perma-foam®	—
8	01113	Comm'l	PVC	BC	PE	13(7x21)BC	.405	50	—	29.5	—	—
8	01109	Comm'l	PVC	BC	FPE	13(7x21)BC	.405	50	—	26	—	—
8	05013	Comm'l	PE	BC	FPE	13(7x21)BC	.405	50	—	26	—	—
11	01160	MIL	PVC	BC	PE	18(7x26)TC	.405	75	66	20.5	—	—
11	05025	Max.	PE	BC	FPE	14BC	.405	75	78	17.3	Perma-line Messenger	100% Sweep
11	05020	Max.	PE	BC	FPE	14 BC	.760x	75	78	17.3	—	100% Sweep
							.405					
58	01166	MIL	PVC	TC	PE	20BC	.195	53	66	28.5	UL1594	—
58	05045	Max.	PE	TC	FPE	20BC	.195	53	78	26	Perma-line®	—
58A	01178	MIL	PVC	TC	PE	20(19str)TC	.195	50	66	30.8	JANC17A	—
58A	01188	Max.	PVC	TC	FPE	20(19str)TC	.195	50	78	26	Super flex®	—
58	01117	Comm'l	PVC	TC	PE	20BC	.195	50	—	28.5	—	—
58	01116	Comm'l	PVC	TC	FPE	20BC	.195	50	—	26	—	—
59	01104	MIL	PVC	BC	PE	22BCW	.242	73	66	21	UL1594	100% Sweep
59	01102	Max.	PE	BC	FPE	20BCW	.242	75	78	17.3	—	—
59	01103	Max.	PVC	BC	FPE	22strBC	.242	75	78	17.3	UL1594	100% Sweep
59	01105	Max.	PVC	BC	FPE	22BCW	.242	75	78	16.3	UL1594	100% Sweep
59	01135	Max.	PVC	BC	FPE	22BCW	.242	75	78	16.3	Super-flex®	100% Sweep
59	05035	Max.	PE	BC	FPE	22BCW	.242	75	78	16.3	Perma-foam®	100% Sweep
59	05038	Max.	PE	BC	FPE	22BCW	.400x	75	78	16.3	Messenger	100% Sweep
							.242					
59	01110	Comm'l	PVC	BC	PE	22BCW	.242	75	—	21	—	—
59	01112	Comm'l	PVC	BC	FPE	22BCW	.242	75	—	16.3	—	—
59	05135	Comm'l	PE	BC	FPE	22BCW	.242	75	—	16.3	—	—
174	01156	Max.	PVC	TC	PE	26(7x34)BCW	.100	50	66	30.8	—	—

Max. = Maximum Coverage
Mil. = Military
Comm'l. = Commercial
PE = Polyethylene
FPE = Foam Polyethylene
PVC = Polyvinyl Chloride

BRD = Braid
BC = Bare Copper
BCW = Bare Copperweld
TC = Tinned Copper
STR = Stranded

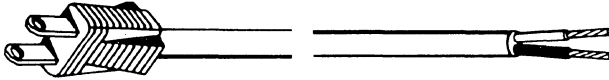
Part Number	Description	
RG8/U TYPE		
90803-62	3'	RG8/U Type foam Cable PL-259 both ends
90820-62	20'	RG8/U Type foam Cable PL-259 both ends
90821-62	20'	RG8/U Type foam Cable PL-259 One End — Spade Lugs Other End
90850-62	50'	RG8/U Type foam Cable PL-259 both ends
90875-63	75'	RG8/U Type foam Cable PL-259 both ends
90800-63	100'	RG8/U Type foam Cable PL-259 both ends
RG58/U TYPE		
95818-62	18"	RG58/U Type foam Cable PL-259 both ends
95803-62	3'	RG58/U Type foam Cable PL-259 both ends
95812-62	12'	RG58/U Type foam Cable PL-259 both ends
95813-62	12'	RG58/U Type foam Cable PL-259 One End — Spade Lugs Other End
95820-62	20'	RG58/U Type foam Cable PL-259 both ends
95821-62	20'	RG58/U Type foam Cable PL-259 One End — Spade Lugs Other End
95850-62	50'	RG58/U Type foam Cable PL-259 both ends
95875-62	75'	RG58/U Type foam Cable PL-259 both ends
95800-62	100'	RG58/U Type foam Cable PL-259 both ends

**POWER SUPPLY AND REPLACEMENT CORDS**

Molded plastic male cap on one end. Other end has outer jacket removed, conductors stripped; all cords hanked. UL Listed. Rated for 125 VAC. For portable tools, appliances, etc.

TWO-CONDUCTOR

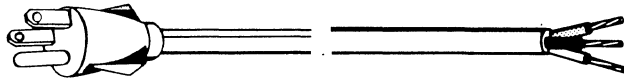
Outer Jacket Stripped 1½", Conductors Stripped ¾" — UL Listed.



Columbia No.	AWG Size	Type	Length Ft.	Rating Amps	Color
20250	18	SV	6	10	Black
20254	18	SV	12	10	Black
20327	18	SVT	6	10	Black
24516	18	SJ	6	10	Black
20258	18	SJ	10	10	Black
24546	18	SJT	6	10	Gray
24549	18	SJT	9	10	Gray
20260	16	SJ	8	13	Black
20262	16	SJ	10	13	Black

THREE-CONDUCTOR

SV and SVT Cords — Outer Jacket Stripped 1½", Conductors Stripped ¾". SJ and SJT Cords — Outer Jacket Stripped 2", Conductors Stripped ¾". S Cords — Outer Jacket Stripped 2". Conductors Stripped ¾". UL Listed and Meet OSHA Requirements.

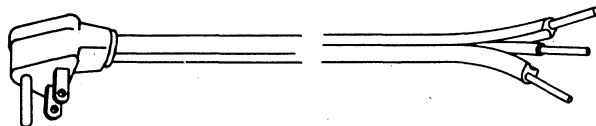


Columbia No.	AWG Size	Type	Length Ft.	Rating Amps	Color
20330*	18	SVT	6	10	Gray
20331*	18	SVT	8	10	Gray
20264	18	SJ	6	10	Black
20314	18	SJ	8	10	Black
20317	18	SJ	12	10	Black
24936	18	SJT	6	10	Gray
24939	18	SJT	9	10	Gray
24926	16	SJ	6	13	Black
20324	16	SJ	8	13	Black
24929	16	SJ	9	13	Black
24932	16	SJ	12	13	Black
24946	16	SJT	6	13	Gray
24949	16	SJT	9	13	Gray
20332	14	S	9	15	Black

*Also available in rubber (Type SV).

POWER SUPPLY CORDS — GENERAL PURPOSE

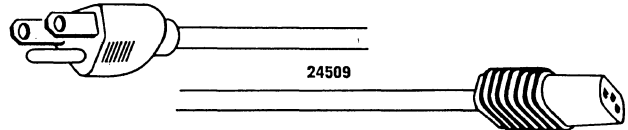
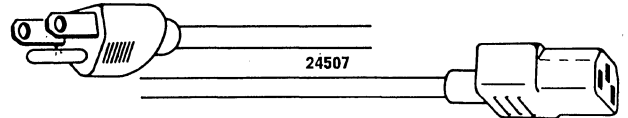
Right angle cap, free end split 1¼", Stripped ¾", Grounding Conductor — UL Listed.



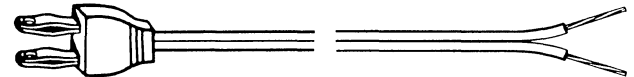
Columbia No.	Cord Type	Length Ft.	Color	Type Package	Rating
24108	16/3 SPT	8	Gray	Bulk	13A-125V

BUSINESS MACHINE POWER SUPPLY CORDS

UL Listed.



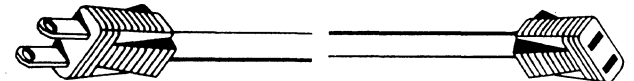
Columbia No.	Cord Type	Length Ft.	Color	Type Package	Rating
24507	18/3 SVT	8	Gray	Hanked	10A-125V
24509	18/3 SVT	8	Gray	Hanked	10A-125V

SMALL APPLIANCE CORDS

Columbia No.	AWG Size	Type	Length Ft.	Rating Amps	Color
24586	18/2	SPT-1	6	10	Brown or White
24589	18/2	SPT-1	9	10	
24597	18/3	SPT-1	8	10	

EXTENSION CORDS

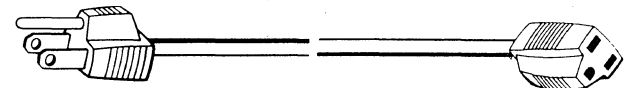
Molded plastic cap and connector. UL Listed. For portable cord appliances, business machines, etc. Rated at 125 VAC. All cords hanked.

TWO-CONDUCTOR

Columbia No.	AWG Size	Type	Length Ft.	Rating Amps	Color
20272	18	SV	6	10	Black
26010	18	SJ	10	10	Black
26025	18	SJ	25	10	Black
26110	16	SJ	10	13	Black

THREE-CONDUCTOR

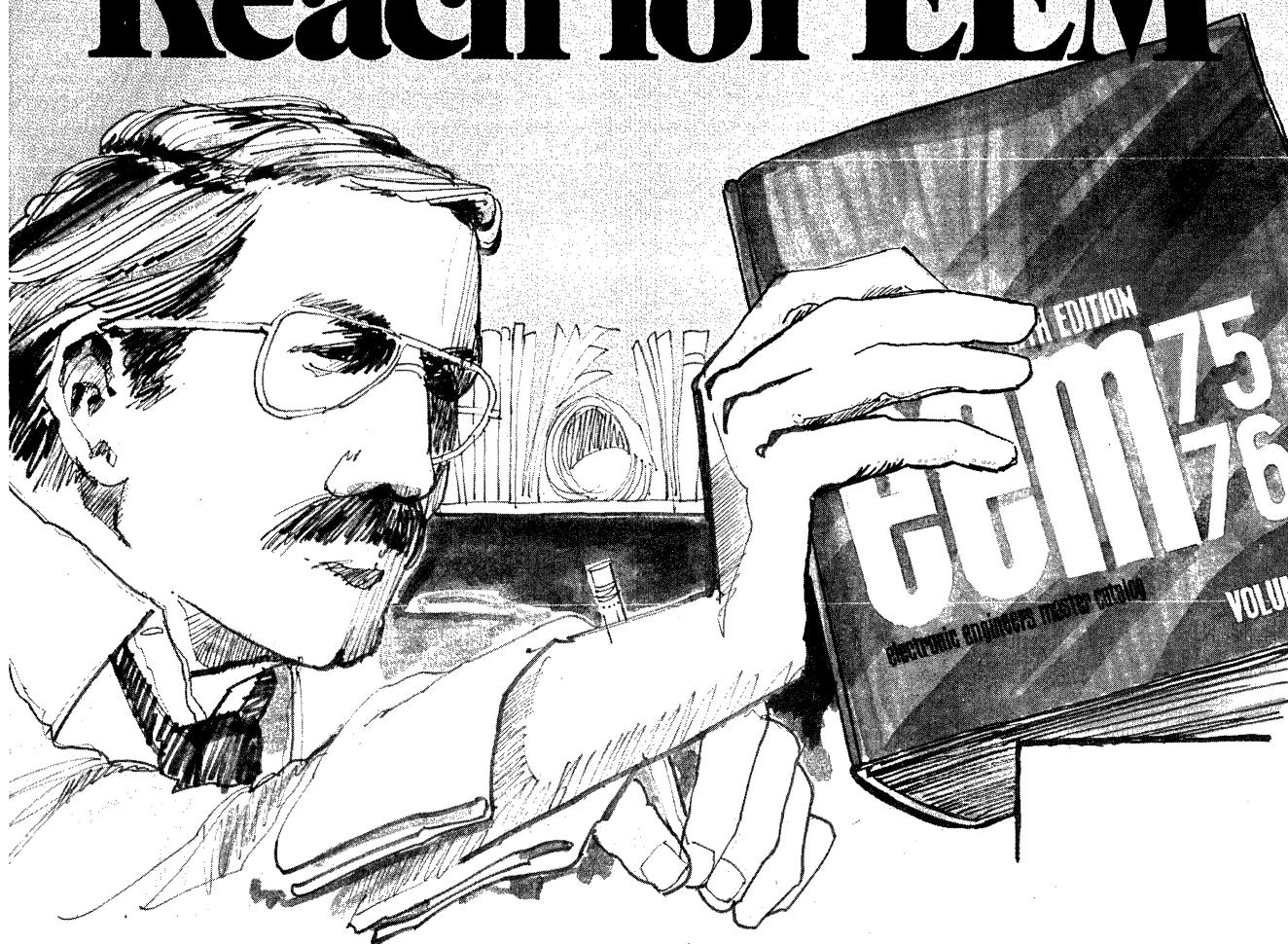
Rubber — UL Listed — Meets OSHA Requirements. For Indoor Use.



Columbia No.	AWG Size	Type	Length Ft.	Rating Amps	Color
20288	18	SJ	10	10	Black
26525	18	SJ	25	10	Black
20294	16	SJ	15	13	Black
26625	16	SJ	25	13	Black

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

FOR EVERY ELECTRONIC NEED...

CONSOLIDATED

OFFERS THE PROPER WIRE OR CABLE

CYPRUS HOOK-UP WIRES

Thermoplastic insulated electronic wires approved to 105°C ratings.

CYPRUS TYPE CT-B

Meeting IPCEA-NEMA Standards for use on both AC and DC circuits.

CYPRUS INSTRUMENTATION CABLES

Specifically designed to transmit low pulse signals for a variety of electronic applications.

High quality wires, manufactured by Cyprus Wire & Cable Company, Rome, New York, represent the highest quality in electronic wiring applications. Manufactured under the strictest quality control checks by the best craftsmen in the industry, these products are your assurance of consistently dependable performance. The quality of the products from Cyprus has established them as one of the leading manufacturers of all major electronic applications.

Consolidated will serve your every electronic need. Our distribution center is stocked with a large variety of wire constructions—and we can meet your special specifications, too.

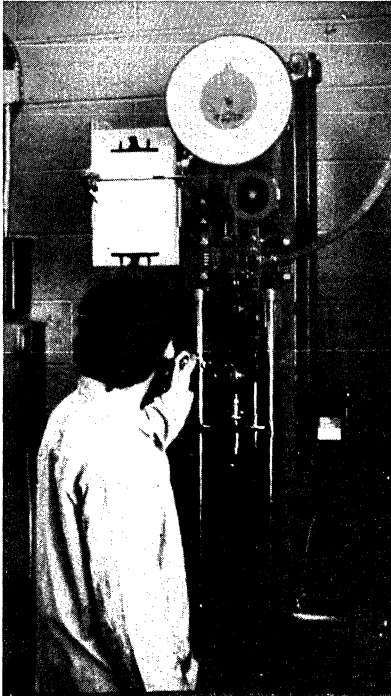
We welcome your inquiry and assure you that our highly trained staff will carefully study your particular needs. If you have a request for a special construction, call on Consolidated. Specify Cyprus... it assures you of unfailing performance.

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

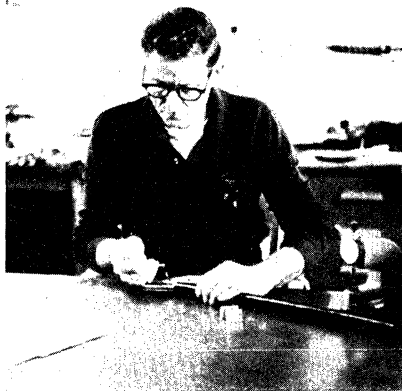
1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



RESEARCH AND DEVELOPMENT...



Research and Development, along with constant quality control checks on the physical, electrical and dimensional characteristics of wire and cable, gives assurance of a consistently reliable product.



This infra-red spectrophotometer characterizes organic materials used in the manufacture of wire and cable by measuring the radiation absorbed at various wave lengths.

At Cyprus Wire & Cable Company, research and development is a day-in, day-out program, assuring you of a thoroughly developed, uniformly high-quality product.

Consolidated's recognized reputation for high-quality merchandise and its own engineering and testing facilities are supported by the modern research and development laboratories at Cyprus' R&D Center. Here metallurgists, electrical engineers, chemists and scientists of many disciplines combine their talents to develop better products for you.

The never-ending search for new and better materials for Consolidated Wire products is a way of life at Cyprus' R&D Laboratories. This is where the quality control we're so proud of begins.

Supporting this program of research and development at the laboratory level, every foot of wire that leaves the plant must pass rigid inspections. These products meet or exceed all relevant Underwriters Laboratories, IPCEA, NEMA and other standards.

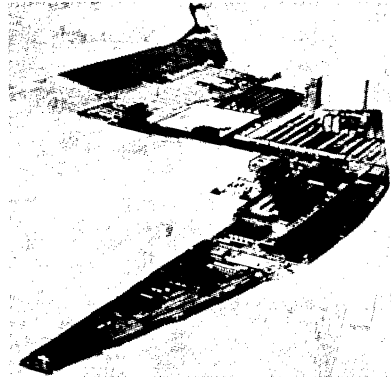


PRODUCTION...

Production by modern wire producing and processing facilities guarantees you a dependable source of supply.

The latest plastic insulating materials, tested in the Cyprus labs, are integrated into the manufacturing facilities to insure Consolidated's customers of the most modern materials for the finished product. As new materials and techniques are developed, they are integrated into the line. The Cyprus/Consolidated coalition represents years of experience and know-how in wire and cable manufacture.

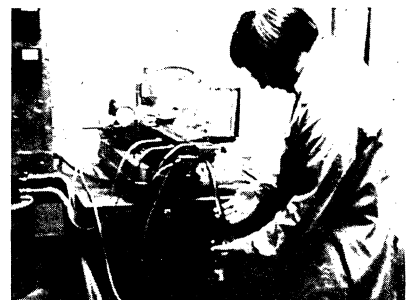
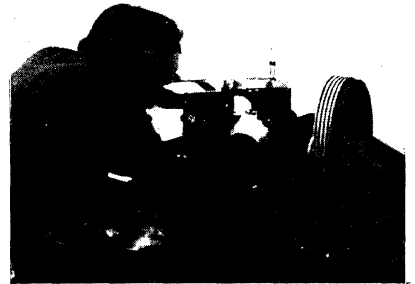
Cyprus Wire & Cable facilities comprise all the necessary equipment for the processing of wire from refined copper bar rod and aluminum to a variety of finished products. Consolidated's own enviable position of providing superior service is strengthened by the facilities of Cyprus Wire & Cable. Here is a plant that never stands still. As newer and more sophisticated equipment and manufacturing methods are developed, Cyprus modernizes. Modernization and expansion programs for Cyprus' facilities, mean that you can count on prompt and reliable service from Consolidated.



Here's the more than 236 acres of Cyprus Rome plant, research laboratories and executive offices in Rome, New York.



Metallurgical microscope gives visual analysis and permits photo micrography of the crystalline structure of electrical conductor and other metal samples used in the manufacture of wire and cable.



A Brabender Plasti-Carder and a laboratory extruder in Research and Development assure that the best possible extrusion techniques are employed resulting in the manufacture of a superior product.



PRODUCT INDEX

Aerial Accessories	46
Aerial and Duct Communication Cable.....	22, 23, 24
Aerial Kits	45, 46
Aerial Wire	39
Air Conditioner Cable	35
Anode Lead Cable	13, 41
Antenna Cord	42
Annunciator Wire	38
Audio Cable	16, 17, 18, 19, 20, 21, 34, 44
Automotive Cable	36
Bare Copper Wire	38, 39
Bell Wire	38
Bonding Strap	40
Braided Copper	40
Broadcast Studio Cable	16, 17, 18, 19, 20, 21, 44
Bronze Wire	39
Bus Bar Wire	38, 39
"CL" Pushback Wire	42
"CATV" Cable	25, 32
Cathode Ray Tube Cable	13, 41
Coaxial Cable	28, 29, 30, 31, 32
Communication Cable	16, 17, 18, 19, 20, 21, 22, 23, 24
Control Cable (shielded)	18, 19, 20, 23
Control Cable (unshielded)	19, 20, 21, 27, 35
Copper — Bare	38, 39
Copper — Braided Tinned	40
Copper — Solid Tinned	38, 39
Copper — Stranded Bare	39
Copper — Stranded Tinned	39
Cord — Power, Service	35
Cord Sets	44
Dial Cable	38
Direct Burial Cable	23, 24
Electrical Cordage	34, 35
Extension Cord Set	43, 44
Hi-Fi Interconnecting Cable	16, 17, 18, 20, 21, 34
Hi Voltage Wire	13, 41
Hook-up Wire General Purpose	15, 42
Plastic	7, 8, 9, 10, 11, 12, 15
Cotton	42
Glass	8, 9, 12, 13, 14
Nylon	7, 8, 9, 10, 11, 12
Ignition Wire	36
Inter-communication Cable	16, 17, 18, 19, 20, 21, 34
Irradiated PVC Hook-up Wire	13
Juke Box Speaker Cable	16, 34
Kynar (wire wrap)	13
Lacquered Wire	36, 41, 42
Lamp Cord	34, 35
Line Cord	43, 44
"MATV" Cable	32
Magnet Wire	37, 38
Microphone Cable — Plastic	16, 19
Microphone Cable — Rubber	18

Military Specifications:	
MIL-C-17C	28, 29, 30, 31
MIL-W-76B, Type LW, MW and HW	7, 8, 9
MIL-W-16878D, Type B, C and D	10, 11
MIL-W-16878D, Type E and EE	13, 14
MIL-W-5086, Type 1 and 2	12
MIL-W-7078, Type 1 and 2	12
Multi-Conductor Cable — Shielded	16, 17, 18, 19, 20, 21, 22, 43, 44
Multi-Conductor Cable — Unshielded	16, 17, 19, 20, 21, 22, 26, 35
Neoprene Cable	18, 35
Paired Inter-Communicating Cable	20, 21, 22, 23
Phono Pick-up and Grid Wire — Shielded	34
Phono Pick-up and Grid Wire — Unshielded	34
Phonograph Multiple Cable	34
Phonograph Pick-up Cable	34
Power Cord Sets	43, 44
Pushback Wire	42
R.G.U. Coaxial Cables	28, 29, 30, 31
Replacement Cords	44
Resistance Wire	38
Retractable Coil Cords	43
Rubber Covered Cable — Shielded	18
Rubber Covered Cable — Unshielded	19, 35
Service Cord	35
Shielded Audio and Data Cable	20, 23
Shielding — Braided Copper	40
Shielded — Hook-up Wire	7, 8, 12, 14
Shielded Microphone Cable	18, 19
Shielded Multi-Conductor Cable	16, 17, 18, 19, 20, 23
Speaker Cable Rubber Covered	34
Speaker Cable — Shielded	16, 17
Speaker Cable — Unshielded	34
Stereo Phono Pick-up Arm Cable — Shielded	16, 34
Stereo Phono Pick-up Arm Cable — Unshielded	34
Teflon	13, 14
Telemetry and Data Cable	20, 23, 24, 27
Telephone Wire and Cable	20, 21, 22, 23, 24
TV Power Supply (Cheater) Cords	44
Television Wire and Cable	21, 28, 29, 30, 32, 33
Test Lead Wire	41
Tinned Copper — Solid	38, 39
Tinned Copper — Stranded	39
Transmission Line — Shielded	28, 29, 30, 31, 32, 33
Transmission Line — Unshielded	32, 33
U/L Lamp Cord — Plastic	34
U/L Lamp Cord — Rubber	34
U/L Service Cord — Neoprene	35
U/L Service Cord — Rubber	35
Underground — Plastic Covered Cable	23, 24
Weatherproof Cable	16
"ZIP" Cord	34



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

WIRE/CABLE/HARNESSES & ACCESSORIES

NUMERICAL INDEX

Consolidated No.	Page No.	Consolidated No.	Page No.	Consolidated No.	Page No.	Consolidated No.	Page No.	Consolidated No.	Page No.	Consolidated No.	Page No.	Consolidated No.	Page No.
501	45	1111	42	1486	44	2820	43	4072	34	4443	28	4582	32
502	45	1121	42	1487	44	2821	43	4074	34	4444	28	4585	32
506	45	1126	42	1488	44	2822	43	4077	34	4445	28	4601	41
507	45	1131	42	1489	44	2824	43	4079	34	4446	28	4611	41
512	45	1161	42	1490	44	2825	43	4202	35	4447	28	4616	41
516	45	1310	40	1494	44	2827	43	4207	35	4448	28	4621	41
517	45	1311	40	1501	44	2830	43	4212	35	4449	28	4622	41
518	45	1312	40	1502	44	2831	43	4214	35	4450	28	4623	41
522	45	1314	40	1504	46	2850	43	4217	35	4451	28	4624	13 & 41
531	45	1315	40	1517	46	2852	43	4222	35	4452	28	4625	13 & 41
532	45	1316	40	1581	46	2854	43	4224	35	4453	28	4626	13 & 41
541	45	1317	40	1600	46	2856	43	4227	35	4454	28	4700	30
542	45	1318	40	1602	46	2857	43	4232	35	4455	28	4701	30
551	45	1319	40	1701	18	2858	43	4234	35	4457	29	4702	30
552	45	1320	40	1702	18	2859	43	4237	35	4458	29	4703	30
615	46	1321	40	1703	18	2870	43	4242	35	4459	29	4704	30
635	46	1322	40	1704	18	2871	43	4244	35	4460	29	4705	30
801	15	1323	40	1705	18	2872	43	4247	35	4461	29	4706	30
803	15	1324	40	1706	18	2873	43	4252	35	4462	29	4707	30
811	15	1325	40	1707	18	2874	43	4254	35	4463	29	4708	30
813	15	1326	40	1708	18	2875	43	4257	35	4464	29	4709	30
816	15	1340	40	1709	18	3006	44	4262	35	4465	29	4710	30
817	15	1341	40	1710	18	3008	44	4264	35	4466	28	4711	30
819	15	1342	40	1711	18	3421	39	4267	35	4467	28	4712	30
821	15	1343	40	1712	18	3451	39	4272	35	4468	28	4713	30
823	15	1344	40	1713	18	3461	39	4274	35	4469	28	4714	30
827	15	1345	40	1714	18	3465	39	4307	35	4470	28	4715	30
831	15	1346	40	1715	18	3466	39	4312	35	4471	28	4716	30
833	15	1347	40	1716	18	3467	39	4314	35	4472	28	4717	30
837	15	1348	40	1717	18	3468	39	4317	35	4474	28	4718	30
841	15	1349	40	1718	18	3501	39	4322	35	4475	28	4719	30
843	15	1350	40	1719	18	3521	39	4324	35	4476	29	4720	30
846	15	1351	40	1721	19	3551	39	4327	35	4477	29	4721	30
847	15	1386	40	1722	19	3561	39	4332	35	4478	29	4722	30
851	15	1387	40	1723	19	3601	39	4334	35	4479	29	4723	30
856	15	1388	40	1724	19	3621	39	4337	35	4480	29	4724	30
861	15	1389	40	1725	19	3651	39	4342	35	4481	29	4725	30
865	15	1390	40	1726	19	3661	39	4344	35	4482	28	4726	30
866	15	1391	40	1727	19	3786	39	4347	35	4483	28	4727	30
869	15	1392	40	1728	19	3791	39	4352	35	4484	28	4728	30
871	15	1393	40	1732	19	3796	39	4354	35	4485	28	4729	30
875	15	1394	40	1733	19	3801	39	4357	35	4486	28	4730	30
876	15	1395	40	1734	19	3811	39	4362	35	4487	28	4731	30
879	15	1396	40	1735	19	3815	39	4364	35	4488	29	4732	30
881	15	1397	40	1736	19	3816	39	4367	35	4489	29	4733	30
885	15	1398	40	1737	19	3817	39	4372	35	4490	29	4734	30
889	15	1399	40	1738	19	3818	39	4374	35	4491	29	4735	30
890	15	1401	34	1740	19	3819	39	4401	28	4492	29	4736	30
891	15	1402	34	1741	19	3821	39	4402	28	4493	29	4737	30
892	15	1406	34	1742	19	3831	39	4403	28	4494	29	4738	30
893	15	1407	34	1743	19	3841	39	4404	29	4495	29	4739	30
894	15	1410	34	2000	37 & 38	3845	39	4405	28	4496	29	4740	30
901	13	1436	38	2010	38	3846	39	4406	29	4497	29	4741	30
902	13	1440	38	2506	44	3847	39	4407	29	4498	29	4742	30
903	13	1445	38	2509	44	3848	39	4408	29	4499	29	4743	30
904	13	1450	38	2516	44	3851	39	4409	29	4500	33	4744	30
920	13	1455	18	2519	44	3861	39	4410	28	4502	33	4745	30
921	13	1456	18	2706	44	3871	39	4411	29	4503	33	4746	30
922	13	1457	19	2709	44	4026	36	4412	28	4504	33	4747	30
923	13	1458	19	2712	44	4027	36	4415	28	4506	33	4748	30
924	13	1459	19	2715	44	4028	36	4419	28	4507	33	4749	30
925	13	1460	18	2801	43	4029	36	4422	29	4509	33	4750	30
926	13	1461	19	2802	43	4030	36	4423	29	4510	33	4751	30
1001	41	1462	18	2803	43	4031	36	4426	29	4515	33	4752	30
1002	41	1463	18	2804	43	4032	36	4427	29	4517	33	4753	30
1006	41	1464	18	2805	43	4036	36	4428	29	4518	33	4754	30
1007	41	1465	18	2806	43	4038	36	4429	29	4521	33	4755	31
1045	42	1466	18	2807	43	4041	36	4430	29	4524	33	4756	31
1048	42	1467	18	2808	43	4042	36	4432	28	4525	33	4757	31
1051	42	1470	34	2809	43	4043	36	4433	28	4527	33	4758	31
1056	42	1478	34	2810	43	4044	36	4435	28	4530	32	4759	31
1061	42	1479	34	2811	43	4051	36	4436	28	4532	32	4761	30
1066	42	1481	44	2812	43	4052	36	4437	28	4535	32	4762	31
1091	42	1482	44	2813	43	4053	36	4438	28	4538	33	4840	25
1096	42	1483	44	2814	43	4056	36	4439	28	4559	32	4845	25
1101	42	1484	44	2815	43	4057	36	4440	28	4569	32	4850	25
1106	42	1485	44	2816	43	4058	36	4441	28	4575	32	4855	25

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



NUMERICAL INDEX

Consolidated No.	Page No.	Consolidated No.	Page No.	Consolidated No.	Page No.	Consolidated No.	Page No.	Consolidated No.	Page No.	Consolidated No.	Page No.	Consolidated No.	Page No.
4875	25	5476	21	6100	23	7630	27	8420	24	9310	10	9707	12
4880	25	5477	21	6106	23	7634	27	8425	24	9311	10	9708	12
5123	34	5480	21	6110	23	7637	27	8450	24	9312	10	9709	12
5124	34	5481	21	6112	23	7640	27	9001	7	9313	10	9710	12
5137	34	5482	21	6118	23	7702	27	9002	7	9314	10	9711	12
5140	34	5483	21	6125	23	7703	27	9003	7	9315	10	9713	12
5142	34	5484	21	6150	23	7704	27	9004	7	9316	10	9714	12
5144	34	5485	21	6170	23	7705	27	9005	7	9317	10	9715	12
5148	34	5486	21	6175	23	7706	27	9006	7	9318	10	9716	12
5151	22	5487	21	6200	23	7707	27	9007	7	9320	10	9717	12
5152	22	5488	21	6220	23	7708	27	9010	7	9321	10	9718	12
5153	22	5489	21	6250	23	7709	27	9011	7	9323	10	9719	12
5155	22	5490	21	6300	23	7710	27	9012	7	9324	10	9720	12
5156	22	5491	21	6400	23	7712	27	9013	7	9325	10	9721	12
5157	22	5492	21	6606	23	7714	27	9014	7	9400	11	9722	12
5158	22	5493	21	6610	23	7715	27	9015	7	9401	11	9723	12
5159	22	5511	16	6612	23	7716	27	9016	7	9402	11	9724	12
5161	22	5516	16	6615	23	7718	27	9017	7	9403	11	9725	12
5165	22	5526	16	6618	23	7719	27	9018	7	9404	11	9800	14
5167	22	5538	16	6620	23	7720	27	9019	7	9405	11	9801	14
5171	22	5541	16	6625	23	7722	27	9020	7	9410	11	9802	14
5181	22	5543	16	6630	23	7725	27	9021	7	9411	11	9803	14
5191	22	5547	16	6640	23	7727	27	9022	7	9412	11	9804	14
5201	22	5551	16	6650	23	7730	27	9023	7	9413	11	9805	14
5205	22	5556	16	6675	23	7734	27	9024	7	9414	11	9806	14
5211	22	5557	16	6706	23	7737	27	9025	8	9415	11	9807	14
5221	22	5561	16	6710	23	7802	27	9026	8	9500	11	9808	14
5226	22	5568	16	6712	23	7803	27	9027	8	9501	11	9809	14
5231	22	5569	16	6715	23	7804	27	9028	8	9502	11	9810	14
5236	22	5570	17	6718	23	7805	27	9029	8	9503	11	9811	14
5241	22	5571	17	6720	23	7806	27	9030	8	9504	11	9812	14
5251	22	5572	17	6725	23	7807	27	9031	8	9505	11	9813	14
5271	22	5573	17	6750	23	7808	27	9032	8	9506	11	9814	14
5286	22	5574	17	6775	23	7809	27	9033	8	9507	11	9815	14
5289	22	5575	17	7001	44	7810	27	9034	8	9508	11	9820	14
5292	22	5576	17	7002	44	7812	27	9035	8	9509	11	9821	14
5297	22	5577	17	7003	44	7815	27	9036	8	9600	13	9822	14
5303	20	5578	17	7004	44	7816	27	9037	8	9601	13	9823	14
5306	20	5579	17	7005	44	7820	27	9038	8	9602	13	9824	14
5309	20	5580	17	7006	44	7902	27	9039	8	9603	13	9825	14
5311	20	5581	17	7007	44	7903	27	9040	8	9604	13	9826	14
5315	20	5582	17	7008	44	7904	27	9041	8	9605	13	9827	14
5323	20	5583	17	7502	27	7905	27	9042	8	9606	13	9828	14
5326	20	5584	17	7503	27	7906	27	9100	9	9607	13	9829	14
5329	20	5585	17	7505	27	7907	27	9101	9	9608	13	9830	14
5331	20	5586	17	7506	27	7908	27	9102	9	9609	13	9831	14
5335	20	5587	17	7507	27	7909	27	9103	9	9610	13	9832	14
5339	20	5588	17	7508	27	7910	27	9104	9	9611	13	9833	14
5347	20	5589	17	7510	27	7912	27	9105	9	9612	13	9834	14
5353	20	5590	17	7512	27	7915	27	9106	9	9613	13	9835	14
5356	20	5591	17	7514	27	7916	27	9107	9	9614	13	9836	14
5359	20	5594	17	7516	27	7920	27	9108	9	9615	13	9837	14
5362	20	5596	17	7519	27	8006	24	9110	9	9616	13	9838	14
5365	20	5597	17	7521	27	8012	24	9111	9	9620	13	9839	14
5400	21	5601	20	7522	27	8016	24	9112	9	9621	13	9840	14
5401	21	5603	20	7524	27	8018	24	9200	9	9622	13	9841	14
5406	21	5606	20	7526	27	8025	24	9201	9	9623	13	9842	14
5411	21	5609	20	7530	27	8050	24	9202	9	9624	13	9843	14
5416	21	5612	20	7537	27	8100	24	9203	9	9625	13	9844	14
5421	21	5615	20	7540	27	8110	24	9204	9	9626	13	9845	14
5426	21	5619	20	7550	27	8112	24	9205	9	9627	13	9846	14
5431	21	5627	20	7560	27	8118	24	9210	9	9628	13	9847	14
5432	21	5640	35	7602	27	8125	24	9211	9	9629	13	9848	14
5434	21	5641	35	7603	27	8150	24	9212	9	9630	13	9849	14
5438	21	5642	35	7604	27	8200	24	9213	9	9631	13	9850	14
5440	21	5643	35	7605	27	8220	24	9214	9	9632	13	9851	14
5442	21	5644	35	7606	27	8306	24	9215	9	9633	13	9852	14
5446	21	5645	35	7607	27	8310	24	9300	10	9634	13	9853	14
5448	21	5646	35	7608	27	8312	24	9301	10	9635	13	9854	14
5450	21	5901	16	7609	27	8318	24	9302	10	9636	13	9855	14
5460	21	5902	16	7610	27	8320	24	9303	10	9700	12	9856	14
5470	21	6006	23	7612	27	8325	24	9304	10	9701	12	9857	14
5471	21	6012	23	7614	27	8350	24	9305	10	9702	12	9858	14
5472	21	6018	23	7616	27	8406	24	9306	10	9703	12	9859	14
5473	21	6025	23	7619	27	8410	24	9307	10	9704	12		
5474	21	6050	23	7624	27	8412	24	9308	10	9705	12		
5475	21	6075	23	7627	27	8418	24	9309	10	9706	12		



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

MIL-W-76

Catalog Number	Type Designation	Size & (Stranding)	Insulation Thickness (Inch)	Nom. O.D. (Inch)	Stock Colors on Standard Spools			Stock Colors*		
					100'	500'	1000'			
TYPE MW — VINYL — 1000V — 80C		Tinned copper, vinyl insulated, medium wall. The polyvinylchloride insulation is flame and ozone resistant and is inert to most chemicals, oils, and solvents.							0 Black 1 Brown 2 Red 3 Orange 4 Yellow 5 Green 6 Dark Blue 7 Violet (Purple) 8 Gray (Slate) 9 White 11 Tan 12 Pink 13 Light Blue 90 White/Black 91 White/Brown 92 White/Red 93 White/Orange 94 White/Yellow 95 White/Green 96 White/Blue 97 White/Violet 98 White/Gray 901 White/Black/Brown 902 White/Black/Red 903 White/Black/Orange 904 White/Black/Yellow 905 White/Black/Green 906 White/Black/Blue 907 White/Black/Violet 908 White/Black/Gray	
STRANDED CONDUCTOR										
9001	MW-C-24-(7)-U	24(7x32)	.017	.058	As Listed	As Listed	As Listed			
9002	MW-C-22-(7)-U	22(7x30)	.017	.064	As Listed	As Listed	As Listed			
9003	MW-C-20-(10)-U	20(10x30)	.017	.070	As Listed	As Listed	As Listed			
9004	MW-C-18-(16)-U	18(16x30)	.017	.080	As Listed	As Listed	As Listed			
9005	MW-C-16-(26)-U	16(26x30)	.019	.098	As Listed	As Listed	As Listed			
9006	MW-C-14-(41)-U	14(41x30)	.020	.111	As Listed	As Listed	As Listed			
9007	MW-C-12-(65)-U	12(65x30)	.020	.130	As Listed	As Listed	As Listed			
SOLID CONDUCTOR										
9010	MW-C-22-(1)-U	22 (Solid)	.017	.059	As Listed	As Listed	As Listed			
9011	MW-C-20-(1)-U	20 (Solid)	.017	.066	As Listed	As Listed	As Listed			
9012	MW-C-18-(1)-U	18 (Solid)	.017	.074	As Listed	As Listed	As Listed			
9013	MW-C-16-(1)-U	16 (Solid)	.017	.085	As Listed	As Listed	As Listed			
TYPE MW — SHIELDED — 1000V — 80C		Tinned copper, polyvinylchloride insulation. Medium wall, tinned copper shield overall.								9 Vinyl insulation. White only.
9014	MW-C-24-(7)-S	24(7x32)	.017	.082	9	9	9			
9015	MW-C-22-(7)-S	22(7x30)	.017	.088	9	9	9			
9016	MW-C-20-(10)-S	20(10x30)	.017	.094	9	9	9			
9017	MW-C-18-(16)-S	18(16x30)	.017	.104	9	9	9			
9018	MW-C-16-(26)-S	16(26x30)	.019	.122	9	9	9			
9019	MW-C-14-(41)-S	14(41x30)	.020	.135	9	9	9			
9020	MW-C-12-(65)-S	12(65x30)	.020	.154	9	9	9			
TYPE MW — SHIELDED — NYLON JACKET — 1000V — 80C		Tinned copper, polyvinylchloride insulation. Medium wall, tinned copper shield, nylon jacket.								9 Vinyl insulation. White only.
9021	MW-C-22-(7)-SJ	22(7x30)	.017	.095	9	9	9			
9022	MW-C-20-(7)-SJ	20(10x30)	.017	.101	9	9	9			
9023	MW-C-18-(16)-SJ	18(16x30)	.017	.112	9	9	9			
9024	MW-C-16-(19)-SJ	16(26x30)	.019	.131	9	9	9			

* Stock Color Numbers in Accordance to Military Type Designation and EIA Color Coding.

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



MIL-W-76

Catalog Number	Type Designation	Size & (Stranding)	Insulation Thickness (Inch)	Nom. O.D. (Inch)	Stock Colors on Standard Spools			Stock Colors*
					100'	500'	1000'	
Tinned copper, polyvinylchloride insulated. Medium wall, lacquered glass braid overall.								0 Black 1 Brown 2 Red 3 Orange 4 Yellow 5 Green 6 Dark Blue 7 Violet (Purple) 8 Gray (Slate) 9 White 90 White/Black 91 White/Brown 92 White/Red 93 White/Orange 94 White/Yellow 95 White/Green 96 White/Blue 97 White/Violet 98 White/Gray
9025	MW-C-22(7)-B	22(7x30)	.017	.076	As Listed	As Listed	As Listed	
9026	MW-C-20(10)-B	20(10x30)	.017	.084	As Listed	As Listed	As Listed	
9027	MW-C-18(16)-B	18(16x30)	.017	.094	As Listed	As Listed	As Listed	
9028	MW-C-16(26)-B	16(26x30)	.019	.112	As Listed	As Listed	As Listed	
9029	MW-C-14(41)-B	14(41x30)	.020	.125	9,90thru98	9,90thru98	9,90thru98	
9030	MW-C-12(65)-B	12(65x30)	.020	.144	9, 90, 92	9, 90, 92	9, 90, 92	
Tinned copper, polyvinylchloride insulated. Medium wall, lacquered glass braid, tinned copper shield overall.								9 Vinyl insulation. White only.
9031	MW-C-22(7)-BS	22(7x30)	.017	.102	9	9	9	
9032	MW-C-20(7)-BS	20(10x30)	.017	.108	9	9	9	
9033	MW-C-18(16)-BS	18(16x30)	.017	.108	9	9	9	
9034	MW-C-16(19)-BS	16(26x30)	.019	.136	9	9	9	
9035	MW-C-14(19)-BS	14(41x30)	.020	.149	9	9	9	
9036	MW-C-12(19)-BS	12(65x30)	.020	.168	9	9	9	
Tinned copper, polyvinylchloride insulated. Medium wall, clear nylon jacket overall.								0 Black 1 Brown 2 Red 3 Orange 4 Yellow 5 Green 6 Dark Blue 7 Violet (Purple) 8 Gray (Slate) 9 White 90 White/Black 91 White/Brown 92 White/Red 93 White/Orange 94 White/Yellow 95 White/Green 96 White/Blue 97 White/Violet 98 White/Gray
9037	MW-C-22(7)-J	22(7x30)	.017	.069	As Listed	As Listed	As Listed	
9038	MW-C-20(10)-J	20(10x30)	.017	.075	As Listed	As Listed	As Listed	
9039	MW-C-18(16)-J	18(16x30)	.017	.086	As Listed	As Listed	As Listed	
9040	MW-C-16(26)-J	16(26x30)	.019	.106	As Listed	As Listed	As Listed	
9041	MW-C-14(41)-J	14(41x30)	.020	.118	0, 1, 3, 4, 5, 9	0, 1, 3, 4, 5, 9	0, 1, 3, 4, 5, 9	
9042	MW-C-12(65)-J	12(65x30)	.020	.139	0, 1, 3, 4, 5, 9	0, 1, 3, 4, 5, 9	0, 1, 3, 4, 5, 9	

* Stock Color Numbers in Accordance to Military Type Designation and EIA Color Coding.

**CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS**

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

MIL-W-76

TYPE HW — VINYL
— Gauges 16-22
2500V, Gauges
6-14 600 — 80C


Tinned copper, polyvinylchloride insulated. Heavy wall.

Catalog Number	Type Designation	Size & (Stranding)	Insulation Thickness (Inch)	Nom. O.D. (Inch)	Stock Colors on Standard Spools		
					100'	500'	1000'
9100	HW-C-22(7)-U	22(7x30)	.034	.098	As Listed	As Listed	As Listed
9101	HW-C-20(10)-U	20(10x30)	.034	.104	As Listed	As Listed	As Listed
9102	HW-C-18(16)-U	18(16x30)	.034	.114	As Listed	As Listed	As Listed
9103	HW-C-16(26)-U	16(26x30)	.034	.128	0, 2, 9	0, 2, 9	0, 2, 9
9104	HW-C-14(41)-U	14(41x30)	.048	.171	0, 2, 9	0, 2, 9	0, 2, 9
9105	HW-C-12(65)-U	12(65x30)	.048	.191	0, 2, 9	0, 2, 9	0, 2, 9
9106	HW-C-10(105)-U	10(105x30)	.048	.214	0, 2, 9	0, 2, 9	0, 2, 9
9107	HW-C-8(133)-U	8(133x29)	.048	.261	0, 2, 9	0, 2, 9	0, 2, 9
9108	HW-C-6(133)-U	6(133x27)	.048	.296	0, 2, 9	0, 2, 9	0, 2, 9

0 Black
1 Brown
2 Red
3 Orange
4 Yellow
5 Green
6 Dark Blue
7 Violet (Purple)
8 Gray (Slate)
9 White

TYPE HW — GLASS BRAID —
600V — 80C


Tinned copper, polyvinylchloride insulated. Heavy wall, lacquered glass braid.

9110	HW-C-10(105)-B	10(105x30)	.048	.232	As Listed	As Listed	As Listed
9111	HW-C-8(133)-B	8(133x29)	.048	.279	As Listed	As Listed	As Listed
9112	HW-C-6(133)-B	6(133x27)	.048	.314	As Listed	As Listed	As Listed

9 White
90 White/Black
92 White/Red

TYPE LW — VINYL
— 300V — 80C


Tinned copper, polyvinylchloride insulated. Light wall.

9200	LW-C-30(7)-U	30(7x38)	.011	.034	0 thru 9	0 thru 9	0 thru 9
9201	LW-C-28(7)-U	28(7x36)	.011	.037	As Listed	As Listed	As Listed
9202	LW-C-26(7)-U	26(7x34)	.011	.041	As Listed	As Listed	As Listed
9203	LW-C-24(7)-U	24(7x32)	.011	.046	As Listed	As Listed	As Listed
9204	LW-C-22(7)-U	22(7x30)	.012	.054	As Listed	As Listed	As Listed
9205	LW-C-20(10)-U	20(10x30)	.012	.060	As Listed	As Listed	As Listed

0 Black
1 Brown
2 Red
3 Orange
4 Yellow
5 Green
6 Dark Blue
7 Violet (Purple)
8 Gray (Slate)
9 White
90 White/Black
91 White/Brown
92 White/Red
93 White/Orange
94 White/Yellow
95 White/Green
96 White/Blue
97 White/Violet
98 White/Gray

TYPE LW — NYLON JACKET
— 300V — 90C


Tinned copper, polyvinylchloride insulated. Light wall, clear nylon jacket overall.

9210	LW-C-30(7)-J	30(7x38)	.011	.039	0 thru 9	0 thru 9	0 thru 9
9211	LW-C-28(7)-J	28(7x36)	.011	.042	As Listed	As Listed	As Listed
9212	LW-C-26(7)-J	26(7x34)	.011	.046	As Listed	As Listed	As Listed
9213	LW-C-24(7)-J	24(7x32)	.011	.051	As Listed	As Listed	As Listed
9214	LW-C-22(7)-J	22(7x30)	.012	.059	As Listed	As Listed	As Listed
9215	LW-C-20(10)-J	20(10x30)	.012	.065	As Listed	As Listed	As Listed

0 Black
1 Brown
2 Red
3 Orange
4 Yellow
5 Green
6 Dark Blue
7 Violet (Purple)
8 Gray (Slate)
9 White
90 White/Black
91 White/Brown
92 White/Red
93 White/Orange
94 White/Yellow
95 White/Green
96 White/Blue
97 White/Violet
98 White/Gray

* Stock Color Numbers in Accordance to Military Type Designation and EIA Color Coding.

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



MIL-W-16878

Catalog Number	Type Designation	Size & (Stranding)	Insulation Thickness (Inch)	Nom. O.D. (Inch)	Stock Colors on Standard Spools			Stock Colors*
					100'	500'	1000'	
TYPE B — VINYL — 600V — 105C								
Tinned copper, polyvinylchloride insulated.								
9300	B-32	32(7x40)	.010	.029	0 thru 9	0 thru 9	0 thru 9	0 Black
9301	B-30	30(7x38)	.010	.032	0 thru 9	0 thru 9	0 thru 9	1 Brown
9302	B-28	28(7x36)	.010	.035	0 thru 9, 90 thru 98	0 thru 9, 90 thru 98	0 thru 9, 90 thru 98	2 Red
9303	B-26	26(7x34)	.010	.039	0 thru 9, 90 thru 98	0 thru 9, 90 thru 98	0 thru 9, 90 thru 98	3 Orange
9304	B-24	24(19x36)	.010	.045	9,90 thru 98	9,90 thru 98	9,90 thru 98	4 Yellow
9305	B-24	24(7x32)	.010	.044	As Listed	As Listed	As Listed	5 Green
9306	B-22	22(19x34)	.010	.051	9,90 thru 98	9,90 thru 98	9,90 thru 98	6 Dark Blue
9307	B-22	22(7x30)	.010	.050	As Listed	As Listed	As Listed	7 Violet (Purple)
9308	B-20	20(19x32)	.010	.059	As Listed	As Listed	As Listed	8 Gray (Slate)
9309	B-20	20(7x28)	.010	.058	As Listed	As Listed	As Listed	9 White
9310	B-18	18(19x30)	.010	.069	As Listed	As Listed	As Listed	11 Tan
9311	B-18	18(7x26)	.010	.068	0 thru 9, 90 thru 98	0 thru 9, 90 thru 98	0 thru 9, 90 thru 98	12 Pink
9312	B-16	16(19x29)	.010	.077	0 thru 9, 90 thru 98	0 thru 9, 90 thru 98	0 thru 9, 90 thru 98	13 Light Blue
TYPE B — VINYL-NYLON JACKET — 600V — 115C								
Tinned copper, polyvinylchloride insulated, nylon jacket overall.								
9313	B-32	32(7x40)	.010	.035	0 thru 9	0 thru 9	0 thru 9	90 White/Black
9314	B-30	30(7x38)	.010	.038	0 thru 9	0 thru 9	0 thru 9	91 White/Brown
9315	B-28	28(7x36)	.010	.041	As Listed	As Listed	As Listed	92 White/Red
9316	B-26	26(7x34)	.010	.045	As Listed	As Listed	As Listed	93 White/Orange
9317	B-24	24(19x36)	.010	.051	As Listed	As Listed	As Listed	94 White/Yellow
9318	B-24	24(7x32)	.010	.050	As Listed	As Listed	As Listed	95 White/Green
9319	B-22	22(19x34)	.010	.057	As Listed	As Listed	As Listed	96 White/Blue
9320	B-22	22(7x30)	.010	.056	As Listed	As Listed	As Listed	97 White/Violet
9321	B-20	20(19x32)	.010	.065	As Listed	As Listed	As Listed	98 White/Gray
9322	B-20	20(7x28)	.010	.064	As Listed	As Listed	As Listed	
9323	B-18	18(19x30)	.010	.075	9,90 thru 98	9,90 thru 98	9,90 thru 98	
9324	B-18	18(7x26)	.010	.074	As Listed	As Listed	As Listed	
9325	B-16	16(19x29)	.010	.083	As Listed	As Listed	As Listed	

* Stock Color Numbers in Accordance to Military Type Designation and EIA Color Coding.



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

MIL-W-16878

Catalog Number	Type Designation	Size & (Stranding)	Insulation Thickness (Inch)	Nom. O.D. (Inch)	Stock Colors on Standard Spools			Stock Colors*	
					100'	500'	1000'		
TYPE C — VINYL — 1000V — 105C									
Tinned copper, polyvinylchloride insulated.									
9400	C-24	24(7x23)	.018	.060	9,90thru98	9,90thru98	9,90thru98	0 Black 1 Brown 2 Red 3 Orange 4 Yellow 5 Green 6 Dark Blue 7 Violet (Purple) 8 Gray (Slate) 9 White 90 White/Black 91 White/Brown 92 White/Red 93 White/Orange 94 White/Yellow 95 White/Green 96 White/Blue 97 White/Violet 98 White/Gray	
9401	C-22	22(7x30)	.018	.066	As Listed	As Listed	As Listed		
9402	C-20	20(7x28)	.018	.074	As Listed	As Listed	As Listed		
9403	C-18	18(7x26)	.018	.084	As Listed	As Listed	As Listed		
9404	C-16	16(19x29)	.018	.093	9,90thru98	9,90thru98	9,90thru98		
9405	C-14	14(19x27)	.018	.107	9,90thru98	9,90thru98	9,90thru98		
TYPE C — VINYL-NYLON JACKET — 1000V — 115C									
Tinned copper, polyvinylchloride insulated, nylon jacket overall.									
9410	C-24	24(7x32)	.018	.066	9,90thru98	9,90thru98	9,90thru98		
9411	C-22	22(7x30)	.018	.072	As Listed	As Listed	As Listed		
9412	C-20	20(7x28)	.018	.080	As Listed	As Listed	As Listed		
9413	C-18	18(7x26)	.018	.091	As Listed	As Listed	As Listed		
9414	C-16	16(19x29)	.018	.100	9,90thru98	9,90thru98	9,90thru98		
9415	C-14	14(19x27)	.018	.114	9,90thru98	9,90thru98	9,90thru98		
TYPE D — VINYL — 3000V — 105C									
Tinned copper, polyvinylchloride insulated.									
9500	D-24	24(7x23)	.030	.084	9,90thru98	9,90thru98	9,90thru98		
9501	D-22	22(7x30)	.030	.090	As Listed	As Listed	As Listed		
9502	D-20	20(7x28)	.030	.098	As Listed	As Listed	As Listed		
9503	D-18	18(7x26)	.030	.108	As Listed	As Listed	As Listed		
9504	D-16	16(19x29)	.030	.117	9,90thru98	9,90thru98	9,90thru98		
9505	D-14	14(19x27)	.030	.131	9,90thru98	9,90thru98	9,90thru98		
9506	D-12	12(19x25)	.035	.160	9,90thru98	9,90thru98	9,90thru98		
9507	D-10	10(37x26)	.035	.181	9,90thru98	9,90thru98	9,90thru98		
9508	D-8	8(133x29)	.040	.245	9,90thru98	9,90thru98	9,90thru98		
9509	D-6	6(133x27)	.040	.290	9,90thru98	9,90thru98	9,90thru98		

* Stock Color Numbers in Accordance to Military Type Designation and EIA Color Coding.

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



MIL-W-5086 AIRCRAFT WIRE & CABLE TYPES 1 & 2 — 600 VOLT

UNSHIELDED

Catalog Number	Type Designation	Size & (Stranding)	Nom. O.D. (Inch)	Spec. Type	Stock Colors on Standard Spools			Stock Color*
					100'	500'	1000'	

Additional Description — MIL-W-5086 Type I — AN-22 thru AN-12
Stranded tinned copper, white polyvinylchloride, clear nylon jacket insulation.

9700	AN-22	22(19x34)	.068	No. 1	9	9	9
9701	AN-20	20(19x32)	.078	No. 1	9	9	9
9702	AN-18	18(19x30)	.088	No. 1	9	9	9
9703	AN-16	16(19x29)	.098	No. 1	9	9	9
9704	AN-14	14(19x27)	.117	No. 1	9	9	9
9705	AN-12	12(37x28)	.137	No. 1	9	9	9

Additional Description — MIL-W-5086 Type II — AN-22 thru AN-12
Stranded tinned copper, white polyvinylchloride insulation, saturated glass braid, clear nylon jacket.

9706	AN-22	22(19x34)	.075	No. 2	9	9	9
9707	AN-20	20(19x32)	.085	No. 2	9	9	9
9708	AN-18	18(19x30)	.095	No. 2	9	9	9
9709	AN-16	16(19x29)	.105	No. 2	9	9	9
9710	AN-14	14(19x27)	.125	No. 2	9	9	9
9711	AN-12	12(37x28)	.143	No. 2	9	9	9

Additional Description — MIL-W-5086 Type II — AN-10 thru AN-00
Stranded tinned copper, white polyvinylchloride insulation, saturated glass braid, nylon braid, nylon lacquer.

9713	AN-10	10(37x26)	.189	No. 2	9	9	9
9714	AN-8	8(133x29)	.240	No. 2	9	9	9
9715	AN-6	6(133x27)	.293	No. 2	9	9	9
9716	AN-4	4(133x25)	.355	No. 2	9	9	9
9717	AN-2	2(665x30)	.425	No. 2	9	9	9
9718	AN-0	0(1045x30)	.525	No. 2	9	9	9
9719	AN-00	00(1330x30)	.590	No. 2	9	9	9

White only (9)



MIL-C-7078 — TYPE II — 600 VOLT

SHIELDED



Additional Description — MIL-W-5086 Type I — AN-22 thru AN-12
Stranded tinned copper, white polyvinylchloride insulation, nylon jacket, braided tinned copper shield. Nylon outer jacket.

9720	AN-22	22(19x34)	.092	No. II	9	9	9
9721	AN-20	20(19x32)	.102	No. II	9	9	9
9722	AN-18	18(19x30)	.112	No. II	9	9	9
9723	AN-16	16(19x29)	.122	No. II	9	9	9
9724	AN-14	14(19x27)	.141	No. II	9	9	9
9725	AN-12	12(19x25)	.161	No. II	9	9	9



* Stock Color Numbers in Accordance to Military Type Designation and EIA Color Coding.

**CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS**

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

TEFLON

TYPE E MIL-W-16878 — 600 VOLTS

Concentrically stranded silver coated copper conductor,
extruded TFE Teflon insulated.



Catalog Number	Type Designation	Size & (Stranding)	Nom. O.D. (Inch)
9600	E-32	32(7x40)	.032
9601	E-30	30(7x38)	.032
9602	E-28	28(7x36)	.035
9603	E-26	26(19x38)	.039
9604	E-26	26(7x34)	.039
9605	E-24	24(19x36)	.044
9606	E-24	24(7x32)	.044
9607	E-22	22(19x34)	.050
9608	E-22	22(7x30)	.050
9609	E-20	20(19x32)	.058
9610	E-20	20(7x28)	.058
9611	E-18	18(19x30)	.069
9612	E-18	18(7x26)	.069
9613	E-16	16(19x29)	.080
9614	E-14	14(19x27)	.095
9615	E-12	12(19x25)	.115
9616	E-10	10(37x26)	.131

TYPE EE MIL-W-16878 — 1000 VOLTS

Concentrically stranded silver coated copper conductor,
extruded TFE Teflon insulated.

Catalog Number	Type Designation	Size & (Stranding)	Nom. O.D. (Inch)
9620	EE-32	32(7x40)	.042
9621	EE-30	30(7x38)	.042
9622	EE-28	28(7x36)	.045
9623	EE-26	26(19x38)	.049
9624	EE-26	26(7x34)	.049
9625	EE-24	24(19x36)	.054
9626	EE-24	24(7x32)	.054
9627	EE-22	22(19x34)	.060
9628	EE-22	22(7x30)	.060
9629	EE-20	20(19x32)	.068
9630	EE-20	20(7x28)	.068
9631	EE-18	18(19x30)	.079
9632	EE-18	18(7x26)	.079
9633	EE-16	16(19x29)	.089
9634	EE-14	14(19x27)	.110
9635	EE-12	12(19x25)	.129
9636	EE-10	10(37x26)	.149

IRRADIATED PVC

U.L. STYLE 1429 AND 1534 — FLAME RETARDANT



Catalog Number	AWG Size	Stranding	Style	Insul. Thick. (Inch)	Nom. O.D. (Inch)	Catalog Number	AWG Size	Stranding	Style	Insul. Thick. (Inch)	Nom. O.D. (Inch)
920	26	7x34T.C.	1429	.010	.039	924	18	7x26T.C.	1429	.010	.068
921	24	7x32T.C.	1429	.010	.044	925	16	19x29T.C.	1429	.010	.077
922	22	7x30T.C.	1429	.010	.050	926	14	19x27T.C.	1534	.016	.091
923	20	7x28T.C.	1429	.010	.058						

Underwriter's Laboratories, Inc. Listed — Equal to MIL-W-16878 Type "B".

KYNAR INSULATED HOOKUP WIRE FOR WIRE WRAP APPLICATIONS

Especially suited for computer, business machine usage and other areas where space is limited. (For automatic point to point application.)

The conductor is OFHC (Oxygen Free High Conductivity) Annealed Copper, Silver Plated.

The insulation is Kynar, a Vinylidene Fluoride Plastic with unique characteristics.

Mechanically Tough; Operating Temperature Up to 125°C Continuous, Assigned U.L. Rating 105°C.



Catalog Number	AWG Size	Stranding	Insul. Thick. (Inch)	Nom. O.D. (Inch)	U.L. Style	Catalog Number	AWG Size	Stranding	Insul. Thick. (Inch)	Nom. O.D. (Inch)	U.L. Style
901	30	Solid	.005	.020	1422 & 1426	903	26	Solid	.005	.026	1422 & 1426
902	28	Solid	.005	.023	1422 & 1426	904	24	Solid	.005	.030	1422 & 1426

HIGH VOLTAGE AND ANODE LEAD CABLE

U.L. STYLE 3239 — FLAME RETARDANT

Catalog Number	AWG Size	Stranding*	Rulan Insul. (Inch)	PVC Jacket (Inch)	Nom. O.D. (Inch)
4624	22	7x30T.C.	.025	.020	.120
4625	22	7x30T.C.	.030	.020	.130
4626	22	7x30T.C.	.045	.020	.160



* Can also furnish pre-bond overcoat and topcoat conductor.

NOTE: Minimum purchase per item 1000 ft.

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



SHIELDED TEFLON CABLES — MIL-W-16878

Each conductor stranded silver plated copper Type E extruded Teflon .010" insulation — 90% braided silver copper shield, also supplied with either a Teflon impregnated Fiberglass braid or Teflon fused tape overall jacket.

Temperature rating — 65°C to +260°C. Voltage rating 600 volts.

Catalog Number	Number of Conductors	Size & (Stranding)	Nom. O.D. (Inch)	Catalog Number	Number of Conductors	Size & (Stranding)	Nom. O.D. (Inch)
----------------	----------------------	--------------------	------------------	----------------	----------------------	--------------------	------------------

NO OUTER COVERING OVER SHIELD

9800	1	24(19x36)	.069	9808	1	20(19x32)	.083
9801	2	24(19x36)	.112	9809	2	20(19x32)	.142
9802	3	24(19x36)	.120	9810	3	20(19x32)	.151
9803	4	24(19x36)	.132	9811	4	20(19x32)	.168
9804	1	22(19x34)	.075	9812	1	18(19x30)	.093
9805	2	22(19x34)	.124	9813	2	18(19x30)	.162
9806	3	22(19x34)	.132	9814	3	18(19x30)	.172
9807	4	22(19x34)	.146	9815	4	18(19x30)	.192

Stock Colors: 1 — Black; 2 — White; 3 — Red; 4 — Green.

Catalog Numbers 9800 thru 9859. Specify color coding when ordering. Standard spool put up Catalog Numbers 9800 thru 9859: 100 ft., 500 ft., 1000 ft.

TEFLON TAPE WRAP JACKET OVER SHIELD

9820	1	24(19x36)	.084	9830	3	20(19x32)	.167
9821	2	24(19x36)	.128	9831	4	20(19x32)	.184
9822	3	24(19x36)	.135	9832	1	18(19x30)	.109
9823	4	24(19x36)	.148	9833	2	18(19x30)	.178
9824	1	22(19x34)	.090	9834	3	18(19x30)	.189
9825	2	22(19x34)	.140	9835	4	18(19x30)	.208
9826	3	22(19x34)	.148	9836	1	16(19x29)	.123
9827	4	22(19x34)	.162	9837	2	16(29x29)	.200
9828	1	20(19x32)	.099	9838	3	16(19x29)	.218
9829	2	20(19x32)	.158	9839	4	16(19x29)	.235

TEFLON IMPREGNATED BRAID OVER SHIELD

9840	1	24(19x36)	.081	9850	3	20(19x32)	.163
9841	2	24(19x36)	.126	9851	4	20(19x32)	.180
9842	3	24(19x36)	.133	9852	1	18(19x30)	.106
9843	4	24(19x36)	.144	9853	2	18(19x30)	.174
9844	1	22(19x34)	.088	9854	3	18(19x30)	.185
9845	2	22(19x34)	.137	9855	4	18(19x30)	.205
9846	3	22(19x34)	.144	9856	1	16(19x29)	.120
9847	4	22(19x34)	.158	9857	2	16(19x29)	.195
9848	1	20(19x32)	.097	9858	3	16(19x29)	.213
9849	2	20(19x32)	.154	9859	4	16(19x29)	.228

Color Numbers in accordance to Military Type Designation and EIA Color Coding.

NOTE: Minimum purchase per item 1000 ft.



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

UL LISTED HOOK-UP WIRE

ROME SYNTHINOL — UL TYPE HOOK-UP AND LEAD WIRES

TINNED COPPER

UL-300V-80C (CSA — TR-64) FR-1 Flame Test

Catalog Number	Size AWG	Stranding	Nom. Ins. Thickness	Volts	Max. Dia. (Inches)
803	24	Solid	1/64	300	.055
801	22	Solid	1/64	300	.065
811	20	Solid	1/64	300	.071
841	18	Solid	1/64	300	.080
817	16	Solid	1/64	300	.094
819	24	7 x No. 32	1/64	300	.059
821	22	7 x No. 30	1/64	300	.069
831	20	10 x No. 30	1/64	300	.078
846	18	16 x No. 30	1/64	300	.085
816	16	26 x No. 30	1/64	300	.095
881	20 2/Condr.	10 x No. 30	.025	300	.170

UL-600V-105C (CSA-Tew) FR-1 Flame Test

Catalog Number	Size AWG	Stranding	Nom. Ins. Thickness	Volts	Max. Dia. (Inches)
851	22	Solid	1/32	600	.097
856	20	Solid	1/32	600	.104
861	18	Solid	1/32	600	.112
866	22	7 x No. 30	1/32	600	.102
871	20	10 x No. 30	1/32	600	.110
876	18	16 x No. 30	1/32	600	.119
890	16	26 x No. 30	1/32	600	.127
891	14	41 x No. 30	1/32	600	.141
892	12	65 x No. 30	1/32	600	.160
893	10	105 x No. 30	1/32	600	.194
894	8	133 x No. 29	3/64	600	.255

*“TOPCOAT” COPPER CONDUCTOR

UL-360V-80C (CSA — TR-64) FR-1 Flame Test

*Stranded copper conductor passed through molten tin bath bonding individual strands together.

Catalog Number	Size AWG	Stranding	Nom. Ins. Thickness	Volts	Max. Dia. (Inches)
813	24	7 x No. 32	1/64	300	.059
823	22	7 x No. 30	1/64	300	.069
833	20	10 x No. 30	1/64	300	.078
843	18	16 x No. 30	1/64	300	.085

UL-600V-105C (CSA-Tew) FR-1 Flame Test

Catalog Number	Size AWG	Stranding	Nom. Ins. Thickness	Volts	Max. Dia. (Inches)
865	22	7 x No. 30	1/32	600	.102
875	20	10 x No. 30	1/32	600	.110
885	18	16 x No. 30	1/32	600	.119

*“HEAVY TIN” COPPER CONDUCTOR

*Stranded “Double” Tin Copper Conductor — Tinning sufficiently thick to allow fusing of strands during induction heating.

UL-300V-80C (CSA — TR-64) FR-1 Flame Test

Catalog Number	Size AWG	Stranding	Nom. Ins. Thickness	Volts	Max. Dia. (Inches)
827	22	7 x No. 30	1/64	300	.069
837	20	10 x No. 30	1/64	300	.078
847	18	16 x No. 30	1/64	300	.085

UL-600V-105C (CSA-Tew) FR-1 Flame Test

Catalog Number	Size AWG	Stranding	Nom. Ins. Thickness	Volts	Max. Dia. (Inches)
869	22	7 x No. 30	1/32	600	.102
879	20	10 x No. 30	1/32	600	.110
889	18	16 x No. 30	1/32	600	.119

Stock Colors: Black, Blue, Brown, Green, Orange, Pink, Red, Gray, Violet, White, Yellow.

Standard spool size available subject to manufacturing put-up.

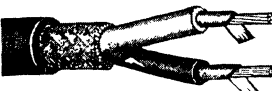
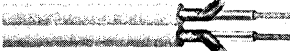
CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: “CON WIRE” • CHICAGO, ILL. 60616



DATA, INSTRUMENTATION AND SOUND SYSTEM CABLES

STANDARD SPOOL PUT-UP: 100 FT., 250 FT., 500 FT. and 1000 FT.

	Catalog Number	Type	Size & Stranding	Specifications and General Applications	Insul. Thickness (Inches)	Nom. Dia. (Inches)
 EXTENSION WIRING SHIELDED — PLASTIC JACKET	5511	2 Condr.	22 Solid	Tinned copper vinyl plastic insulation, wires twisted together — 1 condr. red — 1 condr. black — and a spiral tinned copper shield with .020" tubed gray vinyl plastic jacket.	.015	.170
 PAIRED CABLE SHIELDED — PLASTIC JACKET	5516	2 Pair 4 Condr.	22 7x30	Stranded tinned copper vinyl plastic insulation. 2 pair cabled (4 conductors — 1 pair black & white with braided tinned copper shield mylar tape — 1 pair black & brown unshielded — both pair bunched and .020" gray vinyl plastic jacket overall.	.015	.168x .276
 EXTENSION SPEAKERS SHIELDED — FOR LONG RUNS	5526	2 Condr.	20 10x30	Tinned copper vinyl plastic insulation, wires twisted together — 1 condr. red — 1 condr. black — closely woven tinned copper shield.	.015	.215
 EXTENSION SPEAKERS SHIELDED — PLASTIC JACKET	5568	2 Condr.	22 7x30	Tinned copper vinyl plastic insulation, 2 condrs. — cabled black and red — tinned copper spiral wrapped shield .023" chrome vinyl plastic jacket.	.015	.166
	5569	3 Condr.	22 7x30	Tinned copper vinyl plastic insulation, 3 condrs. — cabled black, red, white — tinned copper spiral shield — chrome vinyl plastic jacket.	.015	.193
	5538	2 Condr.	18 16x30	Stranded tinned copper vinyl plastic insulation, wires twisted together, 1 condr. red, 1 condr. white. Spiral tinned copper shield and .020" gray vinyl plastic jacket overall.	.015	.225
	5543	2 Condr.	20 10x30	Same as 5538 1 condr. red — 1 condr. black.	.015	.185
	5541	2 Condr.	18 16x30	Stranded tinned copper vinyl plastic insulation, wires twisted together. 1 condr. red — 1 condr. white, closely woven braided tinned copper shield and .020" gray vinyl plastic jacket overall.	.015	.260
 JUKE BOX SPEAKER CABLE	5547	2 Condr.	24 7x32	Stranded 1 condr. bare copper — 1 condr. tinned copper. 2 condrs. parallel vinyl plastic insulation. Colors: gray, white, brown, clear.	.015	.058x .115
 DUAL CHANNEL AUDIO CABLE FOR STEREO & LANGUAGE LABORATORIES	5587	2 Condr.	24 7x32	Tinned copper conductor. Spiral tinned copper individual shield, .020" gray vinyl jacket.	.018	.106x .213
 ELECTRIC GUITARS — HIGH IMPEDANCE LAPEL MICROPHONES	5551	1 Condr.	22 16x34	Stranded tinned copper polyethylene insulation closely spiral tinned copper shield with .020" gray vinyl jacket.	.020	.135
 INTERCOMMUNICATING SOUND SYSTEM	5556	2 Condr.	19 Solid	Bare copper vinyl plastic insulation, wires twisted together — 1 condr. brown — 1 condr. tan.	.015	.115
	5561	3 Condr.	19 Solid	Same as 5556 — 1 condr. brown — 1 condr. tan — 1 condr. gray.	.015	.132
 INTERCOMMUNICATING SOUND SYSTEM	5557	2 Condr.	19 Solid	Same as 5556 except .025" outer gray PVC jacket.	.015	.162
 SHIELDED PAIRED CONTROL CABLE	5901	38 Pair	22 Solid	Tin copper polypropylene insulation. Color coded twisted pairs. Overall mylar aluminum foil shield. 22 AWG (7x30) T.C. drain. .045" gray plastic jacket.	.008	.600
	5902	51 Pair	22 Solid	Tin copper vinyl insulation. Color coded. Same as 5901 except .050" gray plastic jacket.	.010	.700

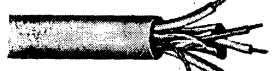


CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

INTERCOMMUNICATION AND SOUND SYSTEM CABLES

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

	Catalog Number	Type	Size & Stranding	Specifications and General Applications	Nom. Jkt. Thickness (Inches)	Nom. Dia. (Inches)
 SHIELDED 2 AND 3 CONDUCTOR	5572	2 Condr.	22 7x30	Tinned copper conductors. .016" Polyethylene insulation color coded black and red. Mylar aluminum shield stranded tinned copper drain wire gray vinyl jacket.	.025	.170
	5573	2 Condr.	20 10x30	Same as 5572 color coded black and white.	.025	.200
	5574	2 Condr.	18 16x30	Same as 5573	.030	.225
	5575	2 Condr.	16 26x30	Same as 5573	.030	.250
	5589	2 Condr.	14 41x30	Same as 5573	.030	.320
	5596	2 Condr.	12 19x25	Same as 5573	.040	.400
	5576	3 Condr.	22 7x30	Same as 5572 color coded black, white and red.	.025	.210
	5577	3 Condr.	20 10x30	Same as 5576	.025	.235
	5578	3 Condr.	18 16x30	Same as 5576	.025	.240
	5590	3 Condr.	16 26x30	Same as 5576	.030	.255
 UNSHIELDED WITH JACKET	5579	2 Condr.	22 7x30	Tinned copper conductors. .015" Vinyl insulation. Color coded black and red.	.020	.165
	5580	2 Condr.	20 10x30	Same as 5579 color coded black and white.	.025	.190
	5581	2 Condr.	18 16x30	Same as 5580	.030	.225
	5582	2 Condr.	16 26x30	Same as 5580	.030	.245
	5583	2 Condr.	14 41x30	Same as 5580	.030	.310
	5597	2 Condr.	12 19x25	Same as 5580	.040	.380
 WITHOUT JACKET	5584	2 Condr.	22 Solid	Tinned copper conductors. .015" Vinyl insulation twisted. Color coded brown and tan.		.115
	5585	2 Condr.	18 16x30	.018" insulation. Same as 5584. Color coded black and white.		.175
	5586	2 Condr.	16 26x30	.020" insulation. Same as 5585.		.195
 MINIATURE BROADCAST AUDIO CABLE	5570	2 Condr.	22 7x30	Tinned copper .010" Polyethylene insulation color coded black and red. Mylar aluminum shield stranded tinned copper drain wire gray vinyl jacket.	.016	.140
	5588	2 Condr.	22 Solid	Same as 5570	.016	.120
 2 PAIR MINIATURE AUDIO AND SOUND CABLE	5594	2 Pair	22 7x30	Tinned copper polypropylene insulation. Each pair shielded. Mylar aluminum shield and drain wire. Color coded same as 5571.	.019	.165
	5571	2 Pair	22 7x30	Tinned copper .009" Polyethylene insulation 1 pair black and red with Mylar aluminum shield. 1 pair white and green both pairs twisted with stranded tinned copper ground wire gray vinyl jacket.	.019	.165

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



SHIELDED AND JACKETED CABLES CONTROL AND MICROPHONE TYPE

SHIELDED
RUBBER JACKETSHIELDED AND
JACKETED CABLES
CONTROL AND
MICROPHONE TYPE
MULTI-CONDUCTOR
CABLES

Catalog Number	No. of Condr.	Size & (Stranding)	Special Use	Specifications	Finished O.D. (Inches)	Nom. Capac. per ft. (mmf)	Stock Colors
1460	1	20(26x34)	Crystal microphone	Tinned copper, wall of live rubber; cotton fillers and wrap; tinned copper braid shield; cotton wrap rubber jacket overall.	.240	33.	
1462	2	20(26x34)	Low impedance microphones	Same as 1460; color coded	.268	68.	
1456	2	18(41x34)	Heavy duty studio cable	Same as 1460; color coded	.295	80.	
1463	3	20(26x34)	Low impedance microphones	Same as 1460; color coded	.277	85.	
1464	4	20(26x34)	Low impedance microphones	Same as 1460; color coded	.295	95.	
1465	5	20(26x34)	Interconnecting power cable for all electronic uses	Same as 1460; color coded	.323		
1466	6	20(26x34)	Same as 1465	Same as 1460; color coded	.349		
1467	7	20(26x34)	Same as 1465	Same as 1460; color coded	.360		
1455	8	20(26x34)	Same as 1465	Same as 1460; color coded	.386		

SHIELDED
NEOPRENE
JACKET

Catalog Number	No. of Condr.	Size & (Stranding)	Specifications	Finished O.D. (Inches)
1701	1	18(41x34)	Tinned copper, yarn serve; wall of live rubber; cotton fillers and wrap; tinned copper braid shield; cotton wrap neoprene jacket overall.	.235
1702	2	18(41x34)	Same as 1701, color coded	.295
1703	3	18(41x34)	Same as 1701, color coded	.305
1704	4	18(41x34)	Same as 1701, color coded	.330
1708	6	18(41x34)	Same as 1701, color coded	.430
1709	8	18(41x34)	Same as 1701, color coded	.465
1710	10	18(41x34)	Same as 1701, color coded	.480
1711	12	18(41x34)	Same as 1701, color coded	.550
1712	15	18(41x34)	Same as 1701, color coded	.630
1713	20	18(41x34)	Same as 1701, color coded	.725

- 1 Black
- 2 White
- 3 Red
- 4 Green
- 5 Yellow
- 6 Blue
- 7 Brown
- 8 Orange
- 9 Gray (slate)
- 10 Purple
- 11 White/Black
- 12 White/Red
- 13 White/Green
- 14 White/Yellow
- 15 White/Blue
- 16 White/Brown
- 17 White/Purple
- 18 White/Gray (slate)
- 19 Black/Red
- 20 Black/Yellow

SHIELDED
NEOPRENE
JACKET

1705	2	16(65x34)	Same as 1701, color coded	.320
1706	3	16(65x34)	Same as 1701, color coded	.340
1707	4	16(65x34)	Same as 1701, color coded	.355
1714	2	14(41x30)	Same as 1701, color coded	.395
1715	3	14(41x30)	Same as 1701, color coded	.425
1716	4	14(41x30)	Same as 1701, color coded	.450
1717	2	12(65x30)	Same as 1701, color coded	.440
1718	3	12(65x30)	Same as 1701, color coded	.465
1719	4	12(65x30)	Same as 1701, color coded	.500

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

CONTROL CABLES SHIELDED AND UNSHIELDED

	Catalog Number	No. of Cond.	Size & (Stranding)	Special Use	Specifications	Finished O.D. (Inches)	Nom. Capac. per ft. (mmf)	Stock Colors
SHIELDED PLASTIC JACKET 	1721	1	24(7x32)	Low Capacitance	Tinned copper polyethylene insulation with a close spiral tinned copper shield. Gray vinyl plastic jacket.	.132	29.	
	1461	1	22(16x34)	Lapel microphone	Same as 1721	.125	36.	
	1457	1	22(16x34)	Crystal, Ribbon and other high impedance microphones	Same as 1721 except heavier polyethylene insulation on conductor.	.200	25.	
	1458	2	22(16x34)	Low impedance microphones and control cable	Tinned copper conductors polyethylene insulation conductors; black and clear. Cabled with fillers rayon serve, spiral tinned copper shield. Gray vinyl plastic jacket.	.231	32.	
	1459	1	20(26x34)	Lapel microphone	Tinned copper wire, with polyethylene to .087" O.D. with a closely tinned copper shielded braid, and a heavy black plastic jacket overall.	.175	40.	
	1722	2	20(26x34)	Same as 1458	Same as 1458 except braided tin copper shield.	.245	32.	
	1723	3	20(26x34)	Same as 1458	Same as 1722	.250	45.	
	1724	4	20(26x34)	Same as 1458	Same as 1722	.255	45.	
	1725	5	20(26x34)	Same as 1458	Same as 1722	.275	45.	
	1726	6	20(26x34)	Same as 1458	Same as 1722	.300		
	1727	7	20(26x34)	Same as 1458	Same as 1722	.330		
	1728	8	20(26x34)	Same as 1458	Same as 1722	.375		
	1740	10	20(26x34)	Same as 1458	Same as 1722	.380		
	1741	12	20(26x34)	Same as 1458	Same as 1722	.385		
	1742	15	20(26x34)	Same as 1458	Same as 1722	.415		
	1743	20	20(26x34)	Same as 1458	Same as 1722	.455		
SHIELDED AND JACKETED CABLES CONTROL AND MICROPHONE TYPE MULTI-CONDUCTOR CABLES 								
UNSHIELDED RUBBER JACKET 								

- 1 Black
- 2 White
- 3 Red
- 4 Green
- 5 Yellow
- 6 Blue
- 7 Brown
- 8 Orange
- 9 Gray (slate)
- 10 Purple
- 11 White/Black
- 12 White/Red
- 13 White/Green
- 14 White/Yellow
- 15 White/Blue
- 16 White/Brown
- 17 White/Purple
- 18 White/Gray
- 19 Black/Red
- 20 Black/Yellow

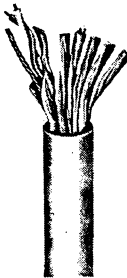
STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



MULTIPLE PAIR SHIELDED AND UNSHIELDED CABLE **MULTIPLE PAIR INDIVIDUALLY SHIELDED AUDIO AND DATA CABLE**

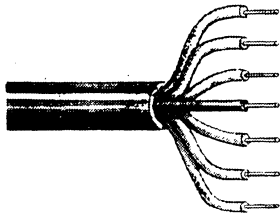
	Catalog Number	Type	Size & Stranding	Specifications and General Applications	Nom. Jkt. Thickness (Inches)	Nom. Dia. (Inches)	Color Coding For Paired Intercom Cables
22 AWG SOLID  SHIELDED PAIRS	5303	3 Pair	22 Solid	Tinned copper conductor .010". Polypropylene insulation. Mylar aluminum shield and tinned copper drain wire, each pair. Overall gray vinyl jacket.	.028	.250	PAIRED INTERCOMMUNICATING CABLES COLOR CODING Identification is simple with Consolidated Intercom Cables because they are all color coded. See chart below. 1 Black paired with Red 2 Black paired with White 3 Black paired with Green 4 Black paired with Blue 5 Black paired with Yellow 6 Black paired with Brown 7 Black paired with Orange 8 Red paired with White 9 Red paired with Green 10 Red paired with Blue 11 Red paired with Yellow 12 Red paired with Brown 13 Red paired with Orange 14 Green paired with White 15 Green paired with Blue 16 Green paired with Yellow 17 Green paired with Brown 18 Green paired with Orange 19 White paired with Blue 20 White paired with Yellow 21 White paired with Brown 22 White paired with Orange 23 Blue paired with Yellow 24 Blue paired with Brown 25 Blue paired with Orange 26 Brown paired with Yellow 27 Brown paired with Orange
	5306	6 Pair	22 Solid	Same as 5303	.037	.330	
	5309	9 Pair	22 Solid	Same as 5303	.040	.390	
	5311	11 Pair	22 Solid	Same as 5303	.040	.420	
	5315	15 Pair	22 Solid	Same as 5303	.045	.485	
22 AWG STRANDED 	5323	3 Pair	22 7x30 Overall	Tinned copper .010" polypropylene insulation. Mylar aluminum shield and tinned copper drain wire each pair. Overall gray vinyl jacket.	.030	.265	
	5326	6 Pair	22 7x30	Same as 5323	.037	.355	
	5329	9 Pair	22 7x30	Same as 5323	.040	.425	
	5331	11 Pair	22 7x30	Same as 5323	.040	.455	
	5335	15 Pair	22 7x30	Same as 5323	.045	.525	
	5339	19 Pair	22 7x30	Same as 5323	.055	.575	
	5347	27 Pair	22 7x30	Same as 5323	.070	.705	
	18 AWG STRANDED 	5353	3 Pair	18 16x30	Tin copper .016" polypropylene insulation. Mylar aluminum shield and tinned copper drain wire each pair. Overall gray vinyl jacket.	.035		.372
5356		6 Pair	18 16x30	Same as 5353	.045	.555	
5359		9 Pair	18 16x30	Same as 5353	.055	.620	
5362		12 Pair	18 16x30	Same as 5353	.070	.765	
5365		15 Pair	18 16x30	Same as 5353	.070	.830	
MULTIPLE PAIR UNSHIELDED AUDIO CABLE							
18 AWG STRANDED 	5601	1 Pair	18 16x30	Tin copper .016" vinyl insulation cabled into pairs. Overall gray vinyl jacket.	.020	.220	
	5603	3 Pair	18 16x30	Same as 5601	.035	.362	
	5606	6 Pair	18 16x30	Same as 5601	.045	.540	
	5609	9 Pair	18 16x30	Same as 5601	.055	.615	
	5612	12 Pair	18 16x30	Same as 5601	.055	.650	
	5615	15 Pair	18 16x30	Same as 5601	.060	.760	
	5619	19 Pair	18 16x30	Same as 5601	.070	.830	
	5627	27 Pair	18 16x30	Same as 5601	.070	.965	
						STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.	



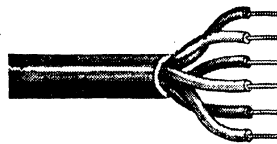
CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

UNSHIELDED AUDIO CABLE MULTICONDUCTOR — PLASTIC JACKET



STRANDED CONDUCTORS — 300 VOLTS



STRANDED CONDUCTORS — 600 VOLTS

Catalog Number	Type	Size & Stranding	Specifications and General Applications	Nom. Diam. (Inches)	Catalog Number	Type	Size & Stranding	Specifications and General Applications	Nom. Diam. (Inches)	Color Coding For Multiple Intercom Cables	
22 AWG					16 AWG					CHART 1* 1 Black 2 Red 3 Green 4 White 5 Brown 6 Blue 7 Orange 8 Yellow 9 Purple 10 Slate 11 Pink 12 Tan	
5400	2 Cond.	22 7x30	Tinned copper conductor .010" vinyl plastic insulated cabled gray vinyl plastic jacket overall	.130	5480	4 Cond.	16 19x29	Tin Copper .030" PVC cables .045" Gray outer PVC Jkt.	.375		
5401	3 Cond.	22 7x30	Same as 5400	.145	5488	5 Cond.	16 19x29	Same as 5480	.405		
5406	4 Cond.	22 7x30	Same as 5400	.175	5481	7 Cond.	16 19x29	Same as 5480	.455		
5411	5 Cond.	22 7x30	Same as 5400	.180	5489	9 Cond.	16 19x29	Same as 5480	.510		
5416	6 Cond.	22 7x30	Same as 5400	.205	5482	12 Cond.	16 19x29	Same as 5480 Except .060" Jacket	.600		
5421	7 Cond.	22 7x30	Same as 5400	.215	5483	15 Cond.	16 19x29	Same as 5480 Except .060" Jacket	.650		
5426	8 Cond.	22 7x30	Same as 5400	.225	5484	19 Cond.	16 19x29	Same as 5480 Except .065" Jacket	.715		
5431	9 Cond.	22 7x30	Same as 5400	.245	5490	25 Cond.	16 19x29	Same as 5480 Except .065" Jacket	.820		
5432	10 Cond.	22 7x30	Same as 5400	.250	14 AWG						CHART 2** 1 Black 2 White 3 Red 4 Green 5 Orange 6 Blue 7 White/Black 8 Red/Black 9 Green/Black 10 Orange/Black 11 Blue/Black 12 Black/White 13 Red/White 14 Green/White 15 Blue/White 16 Black/Red 17 White/Red 18 Orange/Red 19 Blue/Red 20 Red/Green 21 Orange/Green 22 Black/White/Red 23 White/Black/Red 24 Red/Black/White 25 Green/Black/White 26 Orange/Black/White 27 Blue/Black/White 28 Black/Red/Green 29 White/Red/Green 30 Red/Black/Green 31 Green/Black/Orange 32 Orange/Black/Green 33 Blue/White/Orange 34 Black/White/Orange 35 White/Red/Orange 36 Orange/White/Blue 37 White/Red/Blue 38 Black/White/Green 39 White/Black/Green 40 Red/White/Green 41 Green/White/Blue 42 Orange/Red/Green 43 Blue/Red/Green 44 Black/White/Blue 45 White/Black/Blue 46 Red/White/Blue 47 Green/Orange/Red 48 Orange/Red/Blue 49 Blue/Red/Orange 50 Black/Orange/Red 51 White/Black/Orange 52 Red/Orange/Black 53 Green/Red/Blue 54 Orange/Black/Blue 55 Blue/Black/Orange 56 Black/Orange/Green 57 White/Orange/Green 58 Red/Orange/Green 59 Green/Black/Blue 60 Orange/Green/Blue
5434	12 Cond.	22 7x30	Same as 5400	.260							
5438	16 Cond.	22 7x30	Same as 5400	.268	5485	4 Cond.	14 19x27	Tin copper .045" PVC cabled .045" Gray outer PVC Jkt.	.495		
5440	20 Cond.	22 7x30	Same as 5400	.300	5491	5 Cond.	14 19x27	Same as 5485 Except .060" Jacket	.560		
5442	25 Cond.	22 7x30	Same as 5400	.330	5486	7 Cond.	14 19x27	Same as 5485 Except .060" Jacket	.630		
5446	30 Cond.	22 7x30	Same as 5400	.375	5492	9 Cond.	14 19x27	Same as 5485 Except .065" Jacket	.750		
5448	40 Cond.	22 7x30	Same as 5400	.425	5487	12 Cond.	14 19x27	Same as 5485 Except .065" Jacket	.770		
5450	50 Cond.	22 7x30	Same as 5400	.500	5493	15 Cond.	14 19x27	Same as 5485 Except .080" Jacket	.900		
5460	60 Cond.	22 7x30	Same as 5400	.530							
STRANDED CONDUCTORS — 400 VOLTS											
18 AWG											
5470	4 Cond.	18 16x30	Tin copper .018" PVC cabled .030" Gray outer PVC Jkt.	.250	5474	12 Cond.	18 16x30	Same as 5470 Except .040" Jacket	.412		
5471	5 Cond.	18 16x30	Same as 5470 Except .037" Jacket	.295	5475	15 Cond.	18 16x30	Same as 5470 Except .065" Jacket	.475		
5472	7 Cond.	18 16x30	Same as 5470 Except .037" Jacket	.324	5476	19 Cond.	18 16x30	Same as 5470 Except .045" Jacket	.505		
5473	9 Cond.	18 16x30	Same as 5470 Except .037" Jacket	.379	5477	25 Cond.	18 16x30	Same as 5470 Except .060" Jacket	.600		

* Catalog No.'s 5400 thru 5434 and 5470 thru 5473 Color Coding Chart 1

** Catalog No.'s 5438 thru 5460 and 5474 thru 5493 Color Coding Chart 2

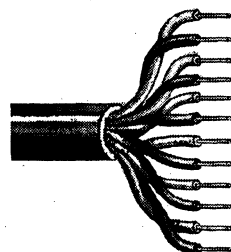
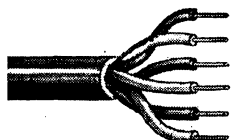
STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



UNSHIELDED INTERCOM CABLE

**PAIRED
CONDUCTORS
SOLID AND
STRANDED
PLASTIC JACKET**


Catalog Number	Type	Size & (Stranding)	Specifications and General Applications	Nominal Diameter (Inches)	Color Coding For Paired Intercom Cables
STRANDED					PAIRED INTERCOMMUNICATING CABLES COLOR CODING Identification is simple with Consolidated Intercom Cables because they are all color coded. See chart below. 1 Black prd. w. Red 2 Black prd. w. White 3 Black prd. w. Green 4 Black prd. w. Blue 5 Black prd. w. Brown 6 Black prd. w. Yellow 7 Black prd. w. Orange 8 Red prd. w. Green 9 Red prd. w. White 10 Red prd. w. Blue 11 Red prd. w. Yellow 12 Red prd. w. Brown 13 Red prd. w. Orange 14 Green prd. w. Blue 15 Green prd. w. White 16 Green prd. w. Brown 17 Green prd. w. Orange 18 Green prd. w. Yellow 19 White prd. w. Blue 20 White prd. w. Brown 21 White prd. w. Orange 22 White prd. w. Yellow 23 Blue prd. w. Brown 24 Blue prd. w. Orange 25 Blue prd. w. Yellow 26 Brown prd. w. Orange 27 Brown prd. w. Yellow 28 Purple prd. w. Red 29 Purple prd. w. White 30 Purple prd. w. Green 31 Purple prd. w. Blue 32 Purple prd. w. Brown 33 Purple prd. w. Yellow 34 Purple prd. w. Orange 35 Purple prd. w. Slate 36 Purple prd. w. Black 37 Slate prd. w. Red 38 Slate prd. w. White 39 Slate prd. w. Green 40 Slate prd. w. Blue 41 Slate prd. w. Brown 42 Slate prd. w. Yellow 43 Slate prd. w. Orange 44 Slate prd. w. Black 45 White/Black prd. w. Red 46 White/Black prd. w. Green 47 White/Black prd. w. Blue 48 White/Black prd. w. Brown 49 White/Black prd. w. Yellow 50 White/Black prd. w. Purple 51 White/Black prd. w. Purple
5201	1 Pr. 2 Condr.	22 Solid	Tinned copper conductor .010" vinyl plastic insulation. Cabled, gray vinyl plastic jacket overall	.130	
5205	2 Pr. 4 Condr.	22 Solid	Same as 5201	.190	
5211	3 Pr. 6 Condr.	22 Solid	Same as 5201	.220	
5221	5 Pr. 10 Condr.	22 Solid	Same as 5201	.250	
5226	6 Pr. 12 Condr.	22 Solid	Same as 5201	.275	
5231	7 Pr. 14 Condr.	22 Solid	Same as 5201	.280	
5236	8 Pr. 16 Condr.	22 Solid	Same as 5201	.300	
5241	9 Pr. 18 Condr.	22 Solid	Same as 5201	.320	
5251	11 Pr. 22 Condr.	22 Solid	Same as 5201	.340	
5271	15 Pr. 30 Condr.	22 Solid	Same as 5201	.400	
5286	27 Pr. 54 Condr.	22 Solid	Same as 5201	.510	
5289	31 Pr. 62 Condr.	22 Solid	Same as 5201	.555	
5292	41 Pr. 82 Condr.	22 Solid	Same as 5201	.630	
5297	51 Pr. 102 Condr.	22 Solid	Same as 5201	.735	
SOLID					
5151	1 Pr. 2 Condr.	22(7x30)	Tinned copper conductor .010" vinyl plastic insulation. Cabled, gray vinyl plastic jacket overall	.145	
5152	2 Pr. 4 Condr.	22(7x30)	Same as 5151	.210	
5153	3 Pr. 6 Condr.	22(7x30)	Same as 5151	.230	
5155	5 Pr. 10 Condr.	22(7x30)	Same as 5151	.265	
5156	6 Pr. 12 Condr.	22(7x30)	Same as 5151	.290	
5157	7 Pr. 14 Condr.	22(7x30)	Same as 5151	.300	
5158	8 Pr. 16 Condr.	22(7x30)	Same as 5151	.320	
5159	9 Pr. 18 Condr.	22(7x30)	Same as 5151	.355	
5161	11 Pr. 22 Condr.	22(7x30)	Same as 5151	.370	
5165	15 Pr. 30 Condr.	22(7x30)	Same as 5151	.450	
5167	27 Pr. 54 Condr.	22(7x30)	Same as 5151	.570	
5171	31 Pr. 62 Condr.	22(7x30)	Same as 5151	.635	
5181	41 Pr. 82 Condr.	22(7x30)	Same as 5151	.710	
5191	51 Pr. 102 Condr.	22(7x30)	Same as 5151	.800	

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT. ALL ITEMS.

**CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS**

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

TELEPHONE AND COMMUNICATION CABLE

AERIAL AND DUCT INSTALLATION — MEETS REA-PE-22

DESCRIPTION: Each conductor bare solid copper, color coded polyethylene insulation, insulated conductors paired, pairs cabled with non-hygroscopic tape wrap, .008" corrugated aluminum shield, black polyethylene jacket overall.

CHARACTERISTICS: Average mutual capacitance—.083 microfarads/mile. Minimal cross talk.

APPLICATIONS: A tough, long lasting communication cable that can withstand moisture, ultra-violet and weathering.



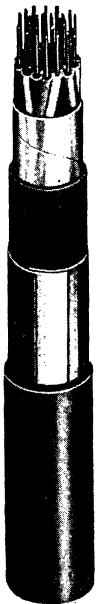
Catalog Number	No. of Pairs	Nom. Jkt. Thick. (Inches)	Nom. O.D. (Inches)	Ship. Wt. Lbs. M/Ft.
#22 AWG — SOLID				
6606	6	.060	.420	95
6612	12	.060	.490	137
6618	18	.060	.560	201
6625	25	.060	.630	245
6650	50	.060	.800	420
6675	75	.060	.980	596
6610	100	.070	1.120	807
6615	150	.070	1.320	1,083
6620	200	.070	1.500	1,485
6630	300	.080	1.810	2,160
6640	400	.090	2.050	2,705
#19 AWG — SOLID				
6706	6	.060	.500	136
6712	12	.060	.630	235
6718	18	.060	.730	318
6725	25	.060	.820	419
6750	50	.070	1.120	753
6775	75	.070	1.320	1,070
6710	100	.080	1.520	1,455
6715	150	.080	1.790	2,051
6720	200	.090	2.090	2,657

DIRECT BURIAL INSTALLATION — MEETS REA-PE-23

DESCRIPTION: Each conductor bare solid copper, color coded polyethylene insulation, insulated conductors paired, pairs cabled with non-hygroscopic tape wrap, polyethylene inner jacket, .005" corrugated copper, or .010" corrugated aluminum shield, black polyethylene jacket overall.

CHARACTERISTICS: Average mutual capacitance .166 microfarads/mile. Minimal cross talk.

APPLICATIONS: Impervious to moisture, abrasion resistant, suitable for direct burial.



#22 AWG — SOLID				
6006	6	.040	.480	150
6012	12	.040	.550	170
6018	18	.040	.620	241
6025	25	.040	.690	302
6050	50	.040	.860	478
6075	75	.040	1.040	680
6100	100	.040	1.180	886
6150	150	.050	1.400	1,258
6200	200	.050	1.560	1,557
6300	300	.060	1.890	2,173
6400	400	.060	2.130	2,853
#19 AWG — SOLID				
6106	6	.040	.560	168
6112	12	.040	.690	290
6118	18	.040	.790	367
6125	25	.040	.880	480
6170	50	.050	1.180	871
6175	75	.050	1.400	1,246
6110	100	.050	1.580	1,568
6250	150	.060	1.890	2,236
6220	200	.060	2.170	2,986

STANDARD PUT-UP: CUT TO SPECIFICATION — MIN. 25 FT. — COLOR CODE — per IPCEA.

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



TELEMETERING AND DATA SHIELDED CONTROL CABLE

DESCRIPTION: Each conductor bare solid copper, high molecular weight polyethylene insulation, color coded, twisted into pairs, cabled with a non-hygroscopic binder tape .008" aluminum shield, black polyethylene jacket overall. Operating voltage 300 volts.

Double jacketed types (8306-8420 below), same except for additional inner black polyethylene jacket over binder, and .005" copper shield, or .010" aluminum shield.

APPLICATIONS: Remote control of rocket recording data and test-firing control, transmission of signals which tele-meter temperature, voltage pressure, etc. control of multiple circuits, measuring devices, quality control equipment, radar antenna. For aerial, duct and conduit installations.

Double jacketed types have higher dielectric strength and suited for direct burial installations.



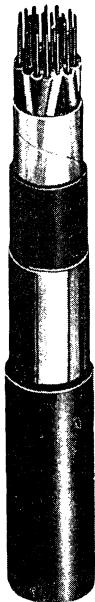
#22 AWG — SOLID

Catalog Number	No. of Pairs	Nom. Insul. Thick. (Inches)	Nom. Jkt. Thick. (Inches)	Nom. O.D. (Inches)	Approx. Lbs. M/Ft.
8006	6	.012	.060	.420	95
8012	12	.012	.060	.490	137
8018	18	.012	.060	.560	201
8025	25	.012	.060	.630	245
8050	50	.012	.060	.800	420
8100	100	.012	.060	1.120	807
8200	200	.012	.060	1.500	1,485

#19 AWG — SOLID

Catalog Number	No. of Pairs	Nom. Insul. Thick. (Inches)	Nom. Jkt. Thick. (Inches)	Nom. O.D. (Inches)	Approx. Lbs. M/Ft.
8016	6	.015	.060	.500	136
8112	12	.015	.060	.630	235
8118	18	.015	.060	.730	318
8125	25	.015	.060	.820	419
8150	50	.015	.060	1.120	753
8110	100	.015	.060	1.520	1,455
8220	200	.015	.060	2.090	2,657

DOUBLE JACKET — HEAVY DUTY



#22 AWG — SOLID

Catalog Number	No. of Pairs	Nom. Insul. Thick. (Inches)	Nom. Jkt. Thick. (Inches)		Nom. O.D. (Inches)	Approx. Lbs. M/Ft.
			Inner	Outer		
8306	6	.012	.047	.040	.480	150
8312	12	.012	.047	.040	.550	170
8318	18	.012	.047	.040	.620	241
8325	25	.012	.047	.040	.690	302
8350	50	.012	.047	.040	.860	478
8310	100	.012	.047	.050	1.180	886
8320	200	.012	.047	.050	1.560	1,597

#19 AWG — SOLID

Catalog Number	No. of Pairs	Nom. Insul. Thick. (Inches)	Nom. Jkt. Thick. (Inches)		Nom. O.D. (Inches)	Approx. Lbs. M/Ft.
			Inner	Outer		
8406	6	.015	.047	.040	.560	168
8412	12	.015	.047	.040	.690	290
8418	18	.015	.047	.040	.790	367
8425	25	.015	.047	.040	.880	480
8450	50	.015	.047	.040	1.180	871
8410	100	.015	.047	.050	1.580	1,568
8420	200	.015	.047	.050	2.220	2,986

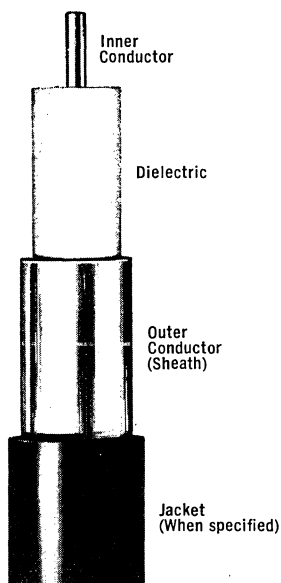
STANDARD PUT-UP: CUT TO SPECIFICATION — MIN. 25 FT.



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

UNIFOAM CABLE SPECIFICATIONS



Consolidated Unifoam CATV cable
 Inner Conductor: High purity (99.9% minimum) soft, uncoated copper
 Dielectric: Cellular polyethylene
 Outer Conductor (sheath): High purity (99.6% minimum) seamless aluminum
 Jacket (when specified): Black, high molecular weight polyethylene

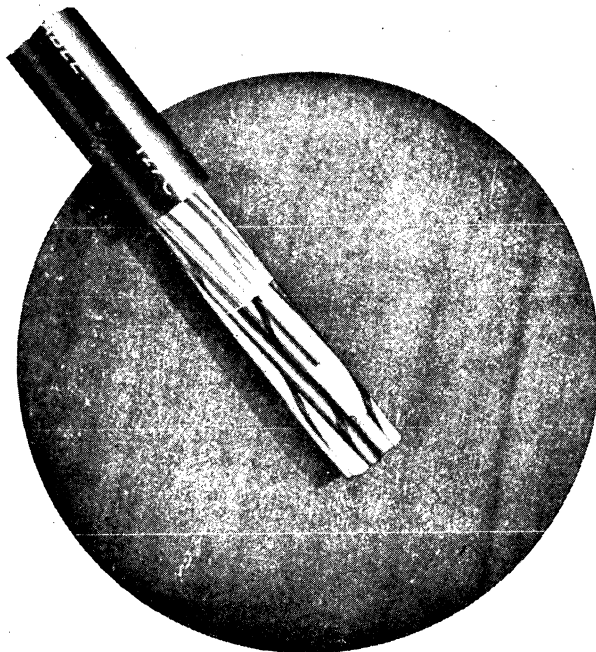
Trade Size	0.412"	1/2"	3/4"
Catalog Number, Plain	4840	4850	4875
Catalog Number, Jacketed	4845	4855	4880
Dimensions, Packaging, Weight			
Inner conductor diameter, Inches	0.078 ±.001	0.098 ±.001	0.146 ±.001
Sheath O.D., Inches	0.412 Nom.	0.500 Nom.	0.750 Nom.
Maximum, Inches	0.418	0.507	0.760
Minimum, Inches	0.406	0.493	0.740
Max.-Min. at any section, Inches	0.009 Max.	0.010 Max.	0.015 Max.
Nominal wall, Inches	0.025	0.025	0.037
Jacket (when specified) O.D., Inches	0.512 Nom.	0.600 Nom.	0.850 Nom.
Jacket thickness, Inches	0.050 Nom.	0.050 Nom.	0.050 Nom.
Standard Length, Feet	1200 ±10%	1200 ±10%	1200 ±10%
Net Weight, Lbs./M Ft. Plain	76	107	231
Net Weight, Lbs./M Ft. Jacketed	105	141	285
Reel, Flange Dia., Inches	28 or 33	33	48
Traverse, Inches	18	18	24
Mechanical Properties			
Conductor Adhesion, Lbs. (Force required to extract conductor from 12" section)	75 Min.	100 Min.	150 Min.
Max. Pulling Tension, Lbs.	155	190	420
Min. Bending Radius, Inches	4.5	5.0	7.5
Electrical Characteristics			
Capacitance, pf/ft.	16.7 ±1	16.7 ±1	16.7 ±1
Velocity of Propagation, %	81 ±3	81 ±3	81 ±3
Characteristic Impedance, Ohms	75 ±2	75 ±2	75 ±2
*Inner Conductor DC Resistance @ 68F, Ohms/M Ft.	1.71 ±0.5	1.08 ±.03	0.49 ±.02
*Outer Conductor DC Resistance @ 68F, Ohms/M Ft.	0.44 ±.02	0.36 ±.02	0.16 ±.01
Dielectric Strength, Insulation	3.5 kv	4.3 kv	5 kv
Dielectric Strength, Jacket	5 kv	5 kv	5 kv
*Conductor resistance at any temperature t(F°) may be determined by multiplying these values by the following: Inner conductor: [1+0.00218 (t-68)] Outer conductor: [1+0.00224 (t-68)]			
SWEEP TESTING — STRUCTURAL UNIFORMITY			
Each length of Consolidated Unifoam CATV cable is checked for structural uniformity over the frequency range of 5 - 220 MHz. This includes the 88 - 105 MHz FM band and the 105 - 174 MHz band, as well as all 12 VHF TV channels. Factory acceptance standards require that each length of cable have a Structural Return Loss (SRL) at least 28 db. down at any frequency within this range. The 28 db. value is not subject to any frequency weighting factors.			

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



CYPRUS CONTROL CABLES TYPES CT-B and CT-C TYPES CT-B/CT-C



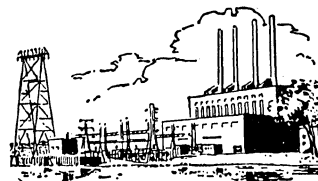
Meeting IPCEA-NEMA standards for use on both AC and DC circuits, these control cables are designed to handle a wide range of applications. Lighter in weight, smaller in diameter and more flexible than conventional rubber insulated multi-conductors cables, Cyprus CT Thermoplastic insulated control cables are easy to handle, store and install.

Cyprus/Rome CT control cables are available with various types of copper, bronze or copper clad stainless shielding to provide electrostatic or electromagnetic protection. Shielding also provides added physical protection and acts as a positive deterrent against rodent or insect attack.

Synthanol (polyvinylchloride) is used for jacketing individual conductors as well as for an over-all jacket. Synthanol provides added resistance to heat and to chemical and corrosive attack. It also provides mechanical protection and is a flame retardant barrier for the cable insulation.

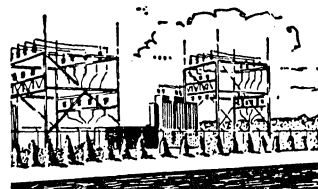
600 volt rated Type CT-B cables are primarily for use in general applications, while 1000 volt rated Type CT-C cables are more frequently used in connection with heavy magnetic trip devices, where induced over-voltages may occur.

Both CT-B and CT-C are made with bare stranded copper conductors, individually insulated and fully color-coded. These cables are suitable for all types of installations — aerial, conduit, duct, tray, direct burial — in wet or dry locations.



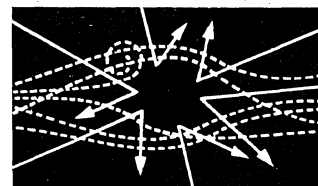
USES:

In power generating stations and substations as well as throughout industry in both manufacturing and processing plants.



RATINGS:

For AC and DC circuits. Type CT-B is rated 600 volts. Type CT-C, 1000 volts. Both are recommended for operation at 90°C. maximum continuous conductor temperature.



INSULATION:

Polyethylene insulation is used on individual conductors since it has proven superior to many other dielectric materials used on solid insulated cables. This material is particularly well suited for DC circuits in moist locations where electro-osmosis may be a problem.

Along with its important outstanding electrical properties, polyethylene also resists acids, alkalis and oils. It is thus capable of standing up well under many hazardous environmental conditions.



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

UNSHIELDED STATION CONTROL CABLE

HEAVY DUTY MULTI-CONDUCTOR PLASTIC JACKET —
TYPE CT-B CONTROL CABLE — 600 VOLTS

Catalog Number	No. of Cond.	Nom. Jkt. Thick. (Inches)	Nom. O.D. (Inches)	Catalog Number	No. of Cond.	Nom. Jkt. Thick. (Inches)	Nom. O.D. (Inches)
----------------	--------------	---------------------------	--------------------	----------------	--------------	---------------------------	--------------------

16 GAUGE — 26/30 BARE COPPER

7502	2	.045	.330	7519	19	.060	.690
7503	3	.045	.350	7521	21	.060	.730
7505	5	.045	.410	7522	22	.060	.760
7506	6	.045	.440	7524	24	.060	.810
7507	7	.045	.440	7526	26	.060	.820
7508	8	.045	.480	7530	30	.060	.900
7510	10	.045	.580	7537	37	.060	.960
7512	12	.045	.600	7540	40	.060	1.00
7514	14	.045	.630	7550	50	.080	1.10
7516	16	.045	.660	7560	60	.080	1.19

14 GAUGE — 7/22 BARE COPPER

7602	2 Twin	.045	*	7614	14	.060	.744
7603	3 Rd.	.045	.419	7616	16	.060	.798
7604	4	.045	.425	7619	19	.060	.808
7605	5	.045	.462	7624	24	.080	.947
7606	6	.045	.481	7627	27	.080	1.002
7607	7	.045	.502	7630	30	.080	1.110
7608	8	.060	.556	7634	34	.080	1.118
7609	9	.060	.622	7637	37	.080	1.124
7610	10	.060	.657	7640	40	.080	1.290
7612	12	.060	.696				

12 GAUGE — 7/20 BARE COPPER

7702	2 Twin	.045	**	7715	15	.060	.832
7703	3 Rd.	.045	.460	7716	16	.060	.901
7704	4	.045	.471	7718	18	.080	.928
7705	5	.045	.523	7719	19	.080	.943
7706	6	.045	.564	7720	20	.080	.966
7707	7	.060	.599	7722	22	.080	1.01
7708	8	.060	.644	7725	25	.080	1.09
7709	9	.060	.690	7727	27	.080	1.129
7710	10	.060	.727	7730	30	.080	1.168
7712	12	.060	.775	7734	34	.080	1.201
7714	14	.060	.807	7737	37	.080	1.257

10 GAUGE — 7/18 BARE COPPER

7802	2	.045	.27x.45	7809	9	.060	.777
7803	3	.045	.483	7810	10	.060	.830
7804	4	.060	.569	7812	12	.080	.915
7805	5	.060	.618	7815	15	.080	.93
7806	6	.060	.640	7816	16	.080	.99
7807	7	.060	.671	7820	20	.080	1.11
7808	8	.060	.700				

9 GAUGE — 19/22 BARE COPPER

7902	2	.045	.29x.48	7909	9	.060	.831
7903	3	.045	.526	7910	10	.060	.900
7904	4	.060	.604	7912	12	.080	.978
7905	5	.060	.659	7915	15	.080	.99
7906	6	.060	.670	7916	16	.080	1.10
7907	7	.060	.716	7920	20	.080	1.70
7908	8	.060	.760				



DESCRIPTION: Each conductor, stranded bare copper, .020" polyethylene insulation, .010" polyvinylchloride jacket over each conductor, color coded, cabled with fillers where necessary, moisture resistant tape, black polyvinylchloride jacket overall, 600 volt operating voltage. Approved per IPCEA-NEMA standards.

* Flat Dimension .233" x .366"

** Flat Dimension .252" x .404"

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



RG TYPE COAXIAL CABLES



Non-Contaminating Low Temp. Black Jkt.		Vinyl & Poly. Jackets		Armor O.D.	Jacket O.D.	Vinyl Jacket	Shields		Dielectric O.D.	Center Conductor	V.P. %	Cap. Mmfd./ Ft.	Max. Oper. Volts Rms.	Nom. Imp. Ohms
Number RG/U	Catalog Number	Number RG/U	Catalog Number				Outer	Inner						
5B	4432				.332	Black	S	S	.185	.053S	65.9	29.5	3000	50
6A	4433				.332	Black	C	C	.185	.21CW	65.9	20	2700	75
		8	4415		.405	Black		C	.285	7/21	65.9	29.5	4000	52
8A	4435				.405	Black		C	.285	7/.0296	65.9	30.5	4000	52
		9	4436		.420	Gray	C	S	.280	7/21S	65.9	30	4000	51
9A	4437				.420	Gray	S	S	.280	7/21S	65.9	30	4000	51
9B	4438				.425	Black	S	S	.285	7/.0296S	65.9	30.5	4000	50
10A	4439			.475	.405	Black		C	.285	7/.0296	65.9	30.5	4000	50
		11	4419		.405	Black		C	.285	7/26T	65.9	20.5	4000	75
11A	4440				.405	Black		C	.285	7/26T	65.9	20.5	4000	75
12A	4441			.475	.405	Black		C	.285	7/26T	65.9	20.5	4000	75
13A	4443				.425	Black	C	C	.285	7/26T	65.9	20.5	4000	75
14A	4468				.545	Black	C	C	.370	.106	65.9	30	5500	52
17A	4482				.870	Black		C	.680	.188C	65.9	29.5	11000	52
18A	4483			.945	.870	Black		C	.680	.188C	65.9	29.5	11000	52
		21	4444		.322	Gray	S	S	.185	16N	65.9	29	2700	53
21A	4445				.332	Black	S	S	.185	.053N	65.9	30	2700	50
		22	4471		.405	Black		T	.285	Two 7/.0152	65.9	16	1000	95
22B	4475				.420	Black	T	T	.285	Two 7/.0152	65.9	16	1000	95
		29	4446		.184	Poly		T	.116	20	65.9	28.5	1900	53.5
		54A	4469		.250	Poly		T	.178	7/.0152	65.9	26.5	3000	58
		55	4447		.206	Poly	T	T	.116	20	65.9	28.5	1900	53.5
55A	4448				.216	Black	S	S	.116	.035S	65.9	29.5	1900	50
55B	4484				.206	Black	T	T	.116	20S	65.9	28.5	1900	53.5
		58	4405		.195	Black		T	.116	20	65.9	28.5	1900	53.5
58A	4449				.195	Black		T	.116	19/.0071T	65.9	29.5	1900	50
58B	4474				.195	Black		T	.116	20	65.9	28.5	1900	53.5
58C	4450				.195	Black		T	.116	19/.0071T	65.9	29.5	1900	50
		59	4401		.242	Black		C	.146	22CW	65.9	21	2300	73
		59	4402		.242	Gray		C	.146	22CW	65.9	21	2300	73
59	4403				.242	White		C	.146	22CW	65.9	21	2300	73
59A	4451				.242	Black		C	.146	.023CW	65.9	20.5	2300	75
59B	4470				.242	Black		C	.146	.023CW	65.9	20.5	2300	75
		62	4452		.242	Black		C	.146**	22CW	84	13.5	750	93
62A	4453				.242	Black		C	.146**	22CW	84	13.5	750	93
62B	4472				.242	Black		C	.146	7x32CW	84	13.5	750	93
		63	4454		.405	Black		C	.285**	22CW	84	10	1000	125
63B	4455				.405	Black		C	.285**	22CW	84	10	1000	125
71A	4466				.245	Black	T	T or C	.146**	22CW	84	13.5	750	93
71B	4485				.250	Black	T	C	.146	22CW	84	13.5	750	93
74A	4486			.615	.545	Black	C	C	.370	10C	65.9	29.5	7000	52
79B	4487			.475	.405	Black		C	.285	22CW	84	10	1000	125
		83	4410		.405	Black		C	.240	10C	65.9	44	2000	35
		100	4412		.242	Black		C	.146	19/.0147C	65.9	44	2000	35

** Semi-Solid Dielectric

N—Nichrome

C—Copper

S—Silvered Copper

CW—Copperweld

T—Tinned Copper

F—Formvar



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

RG TYPE COAXIAL CABLES



Non-Contaminating Low Temp. Black Jkt. Number RG/U	Catalog Number	Vinyl & Poly. Jackets		Armor O.D.	Jacket O.D.	Vinyl Jacket	Shields		Dielectric O.D.	Center Conductor	V.P. %	Cap. Mmfd./ Ft.	Max. Oper. Volts Rms.	Nom. Imp. Ohms
		Number RG/U	Catalog Number				Outer	Inner						
108A	4465	108	4464		.235	Black		T	.079 ea.	Two 7/28T	68	23.5	1000	78
					.235	Black		T	.079 ea.	Two 7/28T	65.9	23.5	1000	78
		111	4422	.480	.420	Gray	T	T	.285	Two 7/.152T	65.9	16	1000	95
111A	4423			.490	.420	Gray	T	T	.285	Two 7/.152T	65.9	16	1000	95
		114	4426		.405	Black		C	.285	.007CW		6.8	1000	185
114A	4427				.405	Black		C	.285	.007CW		6.8	1000	185
122	4457				.160	Black		T	.096	27/36T	65.9	29.5	1900	50
130	4428				.625	Black		T	.472	Two 7/21C	65.9	17	3000	95
131	4429			.710	.625	Black		T	.472	Two 7/21C	65.9	17	3000	95
133A	4430				.405	Black		C	.285	21C	65.9	16.2	1000	95
		164	4404		.870	Black		C	.680	.1045C			10000	75
		177	4406		.895	Black	S	S	.680	.195C			11000	50
		181	4407		.640	Black		C	.210	Two 7/26C		12	3500	125
212	4488				.332	Black	S	S	.185	.0556S	65.9	29.5	3000	50
213	4489				.405	Black		C	.285	7X.0296C	65.9	29.5	5000	50
214	4490				.425	Black	S	S	.285	7X.0296C	65.9	29.5	5000	50
215	4497				.475	Black		C	.285	7/.029C	65.9	29.5	4000	50
216	4491				.425	Black	C	C	.285	7X.026TC	65.9	20.5	5000	75
217	4492				.545	Black	C	C	.370	.106C	65.9	29.5	7000	50
218	4493				.870	Black		C	.680	.195C	65.9	29.5	11000	50
219	4494			.945	.870	Black		C	.680	.195C	65.9	29.5	11000	50
		220	4408		1.120	Black		C	.910	.260C	65.9	29.5	14000	50
		221	4409	1.195	1.120	Black		C	.910	.260C	65.9	29.5	14000	50
222	4495				.332	Black	S	S	.185	.0556N	65.9	29.0	2700	50
223	4496				.216	Black	S	S	.116	.035S	65.9	29.5	1900	50
		224	4411	.615	.545	Gray	C	C	.370	.106C	65.9	29.5	5500	52

MINIATURE COAXIAL CABLE

		174	4459		.105	Black		T	.060**	7/.0063CW		30		50
--	--	-----	------	--	------	-------	--	---	--------	-----------	--	----	--	----

FOAM POLYETHYLENE COAXIAL CABLE

		8	4477		.405	Black		C	.285	7/21C	80	24.5	1500	50
11	4476				.405	Black		C	.285	14C	80	16.5	3000	75
		58	4498		.195	Black		T	.116	20C	80	28.5	1900	53.5
		59	4478		.242	Black		C	.107	22CW	80	17	500	72
62	4479				.242	Black		C	.146	.023CW	80	14.5	700	93

FOAM POLYETHYLENE TRIAXIAL CABLE DOUBLE SHIELD DOUBLE JACKET

11	4480				.460	Black	C	C	.285	14C	80	16.5	3000	75
59	4481				.315	Black	C	C	.107	.032CW	80	17	500	72

TRIAxIAL CABLE DOUBLE SHIELD DOUBLE JACKET

RG/U Type	Catalog Number	Impedance In Ohms	Jacket Diameter	Vinyl Jacket	Shields		O.D. Dielectric	Inner Conductor	V.P. %	Cap. Mmfd./Ft.	Max. Oper. Volts Rms.
					1st	2nd					
Triaxial 58A	4463	50	.285	Black	T	T	.116	19.0071T	65.9	28.5	1900
Triaxial 59	4460	73	.325	Black	C	C	.146	22CW	65.9	21.0	2300
Triaxial 11	4461	75	.460	Black	C	C	.285	14C	65.9	20.5	4000
Triaxial 8	4462	52	.490	Black	C	C	.285	7/21C	65.9	29.5	4000

** Semi-Solid Dielectric

N—Nichrome

C—Copper

S—Silvered Copper

CW—Copperweld

T—Tinned Copper

F—Formvar

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



TEFLON COAXIAL CABLE



Number R&U	Catalog Number	Inner Conductor	Dielectric Material	Nominal Diameter of Dielectric (Inch)	Type of Shielding Braids	Protective Covering	Nominal Over-all Diameter (Inch)	Nominal Capacitance (Mmfd./Ft.)	Maximum Operating Voltage (Volts Rms)	Nominal Imped. (Ohms)
62C	4700	.0253 Silver Covered Copper Steel	F-3	.146	Silver Covered Copper Single Braid	V	.242	14.5	750	93
87A	4701	7/.032 Silver Covered Copper	F-1	.280	Silver Coated Copper Double Braid	V	.425	29.5	5000	50
94	4702	19/.0025 Silver Covered Copper	F-2	.292	Copper Double Braid	V	.445	29.0	7000	50
94A	4703	19/.0254 Silver Plated Copper	F-2	.370	Copper Double Braid	V	.500	27.0	7000	50
115	4704	7/.028 Silver Covered Copper	F-2	.250	Silver Coated Copper Double Braid	V	.375	29.5	5000	50
115A	4705	7/.028 Silver Covered Copper	F-2	.255	Silver Coated Copper Double Braid	V	.415	29.5	5000	50
116	4706	7/.032 Silver Covered Copper	F-1	.280	Silver Coated Copper Double Braid	V with armor	.490	29.5	5000	50
117	4707	.188 Copper	F-1	.620	Copper Single Braid	V	.730	29.0	7000	50
117A	4708	.188 Copper	F-1	.620	Copper Single Braid	V	.730		7000	50
118	4709	.188 Copper	F-1	.620	Copper Single Braid	V with armor	.795	29.0	7000	50
118A	4710	.188 Copper	F-1	.620	Copper Single Braid	V with armor	.780		7000	50
119	4711	.102 Copper	F-1	.332	Copper Double Braid	V	.465	29.0	6000	50
120	4712	.102 Copper	F-1	.332	Copper Double Braid	V with armor	.525	29.0	6000	50
126	4713	7/.0203 Karma or Equal	F-1	.185	Karma or Equal Single Braid	V	.280	29.0	3000	50
140	4714	.025 Silver Coated Copper Steel	F-1	.146	Silver Coated Copper Single Braid	V	.233	21.0	2300	75
141	4715	.0359 Silver Plated Copper Weld	F-1	.116	Silver Coated Copper Single Braid	V	.190	28.5	1900	50
141A	4716	.039 Silver Covered Copper Steel	F-1	.116	Silver Coated Copper Single Braid	V	.190	28.5	1900	50
142	4717	.0359 Silver Covered Copper Steel	F-1	.116	Silver Coated Copper Double Braid	V	.206	28.5	1900	50
142A	4718	.039 Silver Covered Copper Steel	F-1	.116	Silver Coated Copper Double Braid	V	.206	28.5	1900	50
142B	4719	.039 Silver Covered Copper Steel	F-1	.116	Silver Coated Copper Double Braid	FEP	.195	28.5	1900	50
143	4720	.057 Silver Plated Copper Weld	F-1	.185	Silver Coated Copper Double Braid	V	.325	28.5	3000	50
143A	4721	.059 Silver Covered Copper Steel	F-1	.185	Silver Coated Copper Double Braid	V	.325	28.5	3000	50
144	4722	7/.0179 Silver Covered Copper Steel	F-1	.285	Silver Coated Copper Single Braid	V	.410	20.5	5000	75
146	4723	.007 Copper Covered Steel	F-3	.285	Copper Single Braid	V	.375	6.0	1000	190
161	4724	7/38 Silver Plated Cadmium Bronze	F-1	.057	Single Silver Copper	Extruded Black Nylon	.090	20.0	1000	70
165	4725	7/.032 Silver Covered Copper	F-1	.285	Silver Covered Copper Single Braid	V	.410		5000	50
166	4726	7/.032 Silver Covered Copper	F-1	.285	Silver Covered Copper Single Braid	V with armor	.460		5000	50
178	4727	7/.0039 Silver Plated Copper Weld	F-1	.036	Silver Plated Copper Single Braid	KEL-F	.079	27.9	1000	50
178A	4728	7/.004 Silver Covered Copper Steel	F-1	.034	Silver Plated Copper Single Braid	KEL-F	.075	27.9	1000	50
178B	4729	7/.004 Silver Covered Copper Steel	F-1	.034	Silver Covered Copper Single Braid	FEP	.075		1000	50
179	4761	7/.004 Silver Covered Copper Steel	F-1	.063	Silver Covered Copper Single Braid	KEL-F	.100		1200	75

Continued on following page

F-1 — Solid Teflon F-2 — Taped Teflon F-3 — Air Spaced Teflon

V — High Temperature Lacquer Impregnated Fiberglass Braid with Teflon Tape Between Shield and Jacket.

VI — Polyester Fiber Impregnated with High Temperature Lacquer over Wrapped or Extruded Silicone Impregnated Fiberglass

IIA — Low Temperature Black Polyvinylchloride Non-Contaminating

FEP — Fluorinated Ethylene Propylene Copolymer, 200° Teflon

TFE — Tetrafluoroethylene Propylene Copolymer, 250°C Teflon



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

TEFLON COAXIAL CABLE



Number Rg/U	Catalog Number	Inner Conductor	Dielectric Material	Nominal Diameter of Dielectric (Inch)	Type of Shielding Braids	Protective Covering	Nominal Over-all Diameter (Inch)	Nominal Capacitance (Mmfd./Ft.)	Maximum Operating Voltage (Volts Rms)	Nominal Imped. (Ohms)
179A	4730	7/.004 Silver Covered Copper Steel	F-1	.063	Silver Plated Copper Single Braid	KEL-F	.105	20.0	1200	75
179B	4731	7/.004 Silver Covered Copper Steel	F-1	.063	Silver Covered Copper Single Braid	FEP	.105		1200	75
180	4732	7/.0039 Silver Covered Copper Steel	F-1	.103	Silver Plated Copper Single Braid	KEL-F	.141	15.3	1500	93
180A	4733	7/.004 Silver Covered Copper Steel	F-1	.102	Silver Plated Copper Single Braid	KEL-F	.145	14.5	1500	95
180B	4734	7/.004 Silver Covered Copper Steel	F-1	.102	Silver Covered Copper Single Braid	FEP	.145		1500	95
187	4735	7/.004 Silver Covered Copper Steel	F-1	.060	Silver Covered Copper Single Braid	Teflon	.110		1200	75
187A	4736	7/.004 Silver Covered Copper Steel	F-1	.060	Silver Covered Copper Single Braid	TFE	.110		1200	75
188	4737	7/.0067 Silver Covered Copper Steel	F-1	.060	Silver Covered Copper Single Braid	Teflon	.110		1200	50
188A	4738	7/.0067 Silver Covered Copper Steel	F-1	.060	Silver Covered Copper Single Braid	TFE	.110		1200	50
195	4739	7/.004 Silver Covered Copper Steel	F-1	.102	Silver Covered Copper Single Braid	Teflon	.155		1500	95
195A	4740	7/.004 Silver Covered Copper Steel	F-1	.102	Silver Covered Copper Single Braid	TFE	.155		1500	95
196	4741	7/.004 Silver Covered Copper Steel	F-1	.034	Silver Covered Copper Single Braid	Teflon	.080		1000	50
196A	4742	7/.004 Silver Covered Copper Steel	F-1	.034	Silver Covered Copper Single Braid	TFE	.080		1000	50
209	4743	19/.037 Silver Covered Copper	F-3	.500	Silver Covered Copper Double Braid	VI	.750		3200	50
210	4744	.0253 Silver Covered Copper Steel	F-3	.146	Silver Covered Copper Single Braid	V	.242	14.5	750	93
211	4745	.190 Copper	F-1	.620	Copper Single Braid	V	.730		7000	50
211A	4746	.190 Copper	F-1	.620	Copper Single Braid	V	.730		7000	50
225	4747	7/.0312 Silver Covered Copper	F-1	.285	Silver Covered Copper Double Braid	V	.430		5000	50
226	4748	19/.0254 Silver Covered Copper	F-2	.370	Copper Double Braid	V	.500		7000	50
227	4749	7/.0312 Silver Covered Copper	F-1	.285	Silver Covered Copper Double Braid	V with armor	.490		5000	50
228	4750	.190 Copper	F-1	.620	Copper Single Braid	V with armor	.795		7000	50
228A	4751	.190 Copper	F-1	.620	Copper Single Braid	V with armor	.795		7000	50
235	4752	7/.028 Copper	F-2	.255	Silver Covered Copper Double Braid	VI	.490		5000	50
279	4762	19/.005 Silver Covered Copper Steel	F-1	.110	Silver Covered Copper Single Braid	V	.145	17.3	1500	75
280	4753	.1144 Copper	F-2	.327	Silver Covered Copper Double Braid	IIA	.480	27.5	4000	50
281	4754	19/.0378 Silver Covered Copper	F-2	.500	Silver Covered Copper Double Braid	VI	.750	29.5	4000	50
301	4755	7/.0203 Karma	F-1	.185	Karma Single Braid	FEP	.245	29.0	3000	50
302	4756	.025 Silver Covered Copper Steel	F-1	.146	Silver Covered Copper Single Braid	FEP	.206	21.0	2300	75
303	4757	.039 Silver Covered Copper Steel	F-1	.116	Silver Covered Copper Single Braid	FEP	.170	28.5	1900	50
304	4758	.059 Silver Covered Copper Steel	F-1	.185	Silver Covered Copper Double Braid	FEP	.280	28.5	3000	50
316	4759	7/.0067 Silver Covered Copper Steel	F-1	.060	Silver Covered Copper Single Braid	FEP	.102		1200	50

F-1 — Solid Teflon F-2 — Taped Teflon F-3 — Air Spaced Teflon

V — High Temperature Lacquer Impregnated Fiberglass Braid with Teflon Between Shield and Jacket.

VI — Polyester Fiber Impregnated with High Temperature Lacquer over Wrapped or Extruded Silicone Impregnated Fiberglass

IIA — Low Temperature Black Polyvinylchloride Non-Contaminating

FEP — Fluorinated Ethylene Propylene Copolymer, 200° Teflon

TFE — Tetrafluoride Ethylene Propylene Copolymer, 250°C Teflon

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

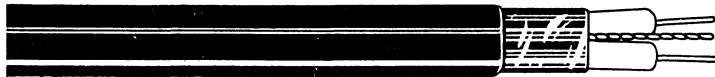


SHIELDED AND UNSHIELDED — "CONCO-FOAM" (Low Loss Foam Polyethylene All Channel Color TV Cable)



Conco-Foam assures excellent VHF, UHF, Color and B/W TV reception in uncongested and fringe regions. Will provide far greater signal than any other unshielded twin lead cable. Assures highest efficiency even when exposed to weathering and atmospheric conditions.

Conco-Foam assures excellent VHF, UHF, Color and B/W TV reception in crowded areas where reception is critical. Mylar-aluminum shielding provides strong and clean signals, eliminating electrical noise and ghost signals. Conco-Foam can be attached to mast, installed in gutters, conduit, or underground.

AWG and Stranding	Color	Nom. O.D. (Inches)	Nom. Velocity of Propagation	Nom. Cap. (Mmf/Ft.)	Nom. Attenuation Per 100'	Spool Put-Up*
4530 "CONCO-FOAM"						
20 - 7 Strands	Black	.150 x .410	80.3%	4.9	100MC/1.04 DB 500MC/3.5 DB 900MC/4.5 DB	**50', 100' ***75' 500', 1000'
4532 "CONCO-FOAM"						
22 - 7 Strands	Black	.160 x .400	80%	5.3	100MC/1.4 DB 500MC/3.8 DB 900MC/5.6 DB	500', 1000'
Bare Copper, 2 conductors parallel, white Conco-Foam insulation, overall Black polyethylene jacket with web. ** Furnished individually packed coils.						
						
4535 SHIELDED "CONCO-FOAM"						
22 - 7 Strands	Black	.275 x .455	76.5%	6.8	50MC/2.0 DB 100MC/2.8 DB 200MC/4.1 DB 400MC/5.9 DB 675MC/7.5 DB	**50', 100' ***75' 500', 1000'
Copperweld, 2 conductors, white Conco-Foam insulation, mylar aluminum foil shield, stranded tin copper drain wire, outer Black polyethylene jacket. * Spade terminals available with Catalog 4535. ** Furnished individually packed coils.						

MATV - CATV COAXIAL CABLE — 75 ohm 82 channel



100% Sweep Tested to provide quality free operation.

Conco-Color—AX is manufactured for distribution systems carrying both UHF and VHF. Cable loss is about half of ordinary RG59/U coax and less than twin lead. Ideal for homes and stores.

AWG and Stranding	Primary Insulation	Shield and Material	Jacket	Nom. O.D. (Inches)	Nom. Imp. Ohms	Nom. Vel. of Prop.	Nom. Cap.
4575 82 CHANNEL COLOR COAX 75 OHMS							
18 Solid Bare Copper	Cellular Polyethylene	Mylar Aluminum Foil Shield & 4 Drain Wires	White, Black Gray, PVC	.242	75	78%	17.3
4585 82 CHANNEL COLOR COAX 75 OHMS							
18 Solid Bare Copper	Cellular Polyethylene	Mylar Aluminum Foil Shield & Aluminum Braid	Black PVC	.242	75	78%	17.3
4559 82 CHANNEL COLOR COAX 75 OHMS							
22 Solid Bare Copperweld	Cellular Polyethylene	Mylar Aluminum Foil Shield & 4 Drain Wires	White, Black PVC	.242	75	78%	16.8
4569 82 CHANNEL COLOR COAX 75 OHMS							
22 Solid Bare Copperweld	Cellular Polyethylene	Mylar Aluminum Foil Shield & Aluminum Braid	Black PVC	.242	75	78%	16.3
							
AWG and Stranding	Primary Insulation	Dielectric O.D. (Inches)	Shield	Jacket	Nominal O.D. (Inches)	Spool Put-Up	
4582 CONCO-COLOR — AX 82 CHANNEL CABLE							
18 Solid Bare Copper	Foam Polyethylene	.184	34 AWG Braid Bare Copper	Black PVC	.270	500', 1000'	

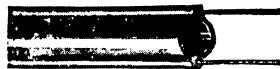


CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

TELEVISION AND ROTOR CABLE

Nominal Electrical Properties

	Catalog Number	Type	Size & Stranding	Specifications and General Applications	Nom. Diam. (Inches)	Frequency (mc)	Attenuation Per 100 Ft.	Impedance (Ohms)	Velocity of Propagation (%)	Capacitance Per Ft. (Mmf)
	4500	2 Cond.	22 7x30	Both conductors bare copper; flexible stranding; conductors parallel; insulated with brown polyethylene.	.055 x .365	50	.72	300	85	4.6
	4503	2 Cond.	20 7x28	Same as 4500	.072 x .400	50	.72	300	85	4.6
	4504	2 Cond.	20 7x28	Same as 4500	.080 x .400	50	.72	300	85	4.6
	4506	2 Cond.	20 7x28	Same as 4500	.100 x .400	50	.72	300	85	4.6
	4527	2 Cond. Round	20 7x28	Copper conductors; tubular design protects against exterior hazards. USE: For UHF and VHF.	.350	30	.63	300	84	5.6
	4507	3 Cond.	20 7x28	Two bare, one tinned copper conductor; flexible stranding; conductors parallel; clear polyethylene insulation. USE: Same as 4503.	.072 x .365	50	.72	300	85	4.6
	4509	4 Cond.	20 7x28	Same as 4503 except three conductors bare copper, one conductor tinned. Brown polyethylene insulation overall. USE: Rotor Aerials.	.072 x .400	50	.72	300	85	4.6
	4510	4 Cond.	20 7x28	Same as 4509	.072 x .400	50	.72	300	85	4.6
	4517	5 Cond.	20 7x28	Same as 4509	.072 x .400	50	.72	300	85	4.6
	4515	4 Cond.	22 7x30	Copper conductors. .010 thermoplastic insulation over each conductor color coded with gray jacket overall. USE: Rotor Aerials.	.160					
	4518	5 Cond.	22 7x30	Same as 4515	.170					
	4521	8 Cond.	22 7x30	Same as 4515	.205					
	4524	4 Cond.	20 7x28	Same as 4515	.180					
	4525	5 Cond.	20 7x28	Same as 4515	.190					
	4538	8 Cond.	6x22 7x30 2x18 16x30	Same as 4515 For heavy duty rotors.	.250					

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



STEREO, PHONO, AND SPEAKER CABLES

SPEAKER CABLE

Catalog Number	Type	Size & Stranding	Special Use	Specifications	Finished O.D. (Inches)
5137	2 Condr.	24 7x32	Juke box speaker cable.	Stranded 1 conductor bare copper — 1 conductor tinned copper — 2 conductors parallel .015 vinyl plastic insulation. Colors: gray, brown, white clear.	.058 x .115
5142	2 Condr.	22 7x30	Speaker Cable "PLT"	Same as 5148. Colors: clear, gray, brown, black, white.	.060 x .120
5140	2 Condr.	20 10x30	Lamp Cord "PLT"	Two conductors bare copper parallel .015 vinyl insulation. Colors: black, gray, brown, white clear. 1 conductor ribbed for identification.	.080 x .165
5144	2 Condr.	20 26x34	Lamp Cord "XT"	Same as 5140 except .032 vinyl insulation.	.100 x .190
5148	2 Condr.	18 16x30	Speaker Cable "PLT"	Stranded 1 conductor bare copper — 1 conductor tinned copper — 2 conductors parallel .016 vinyl insulation. Color: clear.	.090 x .185



Catalog Number	Type	Size & Stranding	U.L. Type	Nom. Insulation Thickness (Inches)	Nom. O.D. (Inches)
RUBBER PARALLEL PORTABLE CORDAGE					
4072	2 Condr.	18(41x34)	SP-1	$\frac{1}{32}$	.220 x .120
4074	2 Condr.	16(65x34)	SP-2	$\frac{3}{64}$	.300 x .160
PLASTIC PARALLEL PORTABLE CORDAGE					
4077	2 Condr.	18(41x34)	SPT-1	$\frac{1}{32}$	.215 x .115
4079	2 Condr.	16(65x34)	SPT-2	$\frac{3}{64}$	.300 x .160

Colors: Black, Brown, White, Gray.

STANDARD SPOOL PUT-UP: 25 FT., 50 FT., 100 FT., 250 FT., 500 FT., 1000 FT.



MULTI-CONDUCTOR PHONO CABLE

Catalog Number	Type	Size & Stranding	Special Use	Specifications	Finished O.D. (Inches)
5123	3 Condr.	Two 16 26x30 One 18 10x30	Phono and Juke box cable.	2 conductors No. 16 - 1/64" thermoplastic insulation, 1 conductor No. 20 - 1/64" thermoplastic insulation, all individually color coded. All conductors grouped into cable form with gray vinyl plastic jacket.	.215
5124	4 Condr.	18 Solid	Phono and Juke box cable.	Same as 5123	.225



STEREO CABLE — HI-FI, STEREO

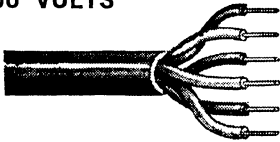
Catalog Number	Type	Size & Stranding	Specifications	Insul. Thick. (Inches)	Finished O.D. (Inches)
1470	1 Condr.	24 16x.005	Bare copper; flexible stranding; vinylite plastic insulation; tinned copper braid — SHIELDED.	.010	.070
1478	2 Condr.	32 7x40	Tinned copper; flexible stranding. Vinyl Plastic insulation; Black and Red.	.009	.050
1401	3 Condr.	32 7x40	Same as 1478. Black, Red, White.	.009	.055
1402	4 Condr.	32 7x40	Same as 1478. Black, Red, Green, White.	.009	.070
1479	2 Condr.	32 7x40	Same as 1478 and tinned copper braid — SHIELDED.	.009	.057
1406	3 Condr.	32 7x40	Same as 1401 and tinned copper braid — SHIELDED.	.009	.063
1407	4 Condr.	32 7x40	Same as 1402 and tinned copper braid — SHIELDED.	.009	.070
1410	2 Condr.	32 7x40	Individually SHIELDED and twisted conductors.	.009	.055 x .055

STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.

**CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS**

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

UNSHIELDED MULTICONDUCTOR CABLE — PLASTIC JACKET

STRANDED
CONDUCTORS
300 VOLTS

Catalog Number	Type	Size & Stranding	Specifications and General Applications	Nom. Diam. (Inches)	Color Coding For Multiple Intercom Cables
5640	2 Condr.	20(10x30)	Tin copper .012 PVC ins. minimum .020 gray PVC jacket.	.180	CHART 1* 1 Black 2 Red 3 Green 4 White 5 Brown 6 Blue 7 Orange 8 Yellow 9 Purple 10 Slate 11 Pink 12 Tan
5641	3 Condr.	20(10x30)	Same as 5640	.190	
5642	4 Condr.	20(10x30)	Same as 5640	.208	
5643	5 Condr.	20(10x30)	Same as 5640	.225	
5644	7 Condr.	20(10x30)	Same as 5640	.240	
5645	9 Condr.	20(10x30)	Same as 5640	.300	
5646	12 Condr.	20(10x30)	Same as 5640	.320	
STANDARD SPOOL PUT-UP: 100 FT., 500 FT., 1000 FT.					

ELECTRICAL CORDAGES — UNDERWRITERS APPROVED

RUBBER SHEATHED
SERVICE CORD
UNDERWRITERS APPROVED

SPECIFICATIONS AND APPLICATION

Extra flexible bare copper cotton served. 1/32" rubber insulation color coded conductors cable with fillers, cotton wrap and black, tough rubber jacket.

For all electronic equipment, household appliances, garden and power tools.

Catalog Number	Type	AWG Size	U.L. Type	Current Carrying Capacity	Voltage Rating	Nom. O.D. (Inches)
4202	2 Condr.	18	SV	5 Amps.	300	.250
4207	2 Condr.	18	SJ	5 Amps.	300	.310
4212	3 Condr.	18	SJ	5 Amps.	300	.345
4214	4 Condr.	18	SJ	5 Amps.	300	.360
4217	2 Condr.	16	SJ	7 Amps.	300	.340
4222	3 Condr.	16	SJ	7 Amps.	300	.375
4224	4 Condr.	16	SJ	7 Amps.	600	.395
4227	2 Condr.	18	S	5 Amps.	600	.390
4232	3 Condr.	18	S	5 Amps.	600	.405
4234	4 Condr.	18	S	5 Amps.	600	.435
4237	2 Condr.	16	S	7 Amps.	600	.410
4242	3 Condr.	16	S	7 Amps.	600	.430
4244	4 Condr.	16	S	7 Amps.	600	.485
4247	2 Condr.	14	S	15 Amps.	600	.540
4252	3 Condr.	14	S	15 Amps.	600	.560
4254	4 Condr.	14	S	15 Amps.	600	.605
4257	2 Condr.	12	S	20 Amps.	600	.605
4262	3 Condr.	12	S	20 Amps.	600	.635
4264	4 Condr.	12	S	20 Amps.	600	.665
4267	2 Condr.	10	S	25 Amps.	600	.640
4272	3 Condr.	10	S	25 Amps.	600	.690
4274	4 Condr.	10	S	25 Amps.	600	.745

NEOPRENE SHEATHED
SERVICE CORD
UNDERWRITERS APPROVED

SPECIFICATIONS AND APPLICATION

Same specifications as 4200 Series except black Neoprene jacket.

For all types of equipment exposed to oils, acid and excessive moisture.

4307	2 Condr.	18	SJO	5 Amps.	300	.310
4312	3 Condr.	18	SJO	5 Amps.	300	.345
4314	4 Condr.	18	SJO	5 Amps.	300	.360
4317	2 Condr.	16	SJO	7 Amps.	300	.340
4322	3 Condr.	16	SJO	7 Amps.	300	.375
4324	4 Condr.	16	SJO	7 Amps.	600	.395
4327	2 Condr.	18	SO	5 Amps.	600	.390
4332	3 Condr.	18	SO	5 Amps.	600	.405
4334	4 Condr.	18	SO	5 Amps.	600	.435
4337	2 Condr.	16	SO	7 Amps.	600	.410
4342	3 Condr.	16	SO	7 Amps.	600	.430
4344	4 Condr.	16	SO	7 Amps.	600	.485
4347	2 Condr.	14	SO	15 Amps.	600	.540
4352	3 Condr.	14	SO	15 Amps.	600	.560
4354	4 Condr.	14	SO	15 Amps.	600	.605
4357	2 Condr.	12	SO	20 Amps.	600	.605
4362	3 Condr.	12	SO	20 Amps.	600	.635
4364	4 Condr.	12	SO	20 Amps.	600	.665
4367	2 Condr.	10	SO	25 Amps.	600	.640
4372	3 Condr.	10	SO	25 Amps.	600	.690
4374	4 Condr.	10	SO	25 Amps.	600	.745

STANDARD PUT-UP: 25 FT., 50 FT., 100 FT., 250 FT.

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



AUTOMOTIVE CABLES

Manufactured to meet all specifications (S.A.E.)
Standards Society of Automotive Engineers

PLASTIC INSULATED AUTOMOTIVE WIRE

	Catalog Number	Size & Stranding	Description and Application	Colors Available (Specify)	Nom. Dia. (Inches)
PRIMARY WIRE 	4026	18	Bare Copper Flexible Stranding Tough Plastic Insulation. Resistant to Flame, Oil, Gasoline, Grease, Acid, Fungus and most solvents.	Red-Black	.092
		16x30			
	4027	16	Same as 4026	Red-Blue-Black-Green-Yellow-Brown-White	.105
		19x29			
	4028	14	Same as 4026	Red-Blue	.123
		19x27			
	4029	12	Same as 4026	Black-Green-Red-Blue	.183
		19x25			
	4030	10	Same as 4026	Black	.183
		19x23			
4038	8	Same as 4026	Black	.215	
	19x21				
4036	6	Same as 4026	Black	.283	
	37x21				
SPARK PLUG WIRE 7 MM. 	4032	16	Same as 4026 Except Red Plastic Jacket. Recommended where excessive exposure to Oil, Acid and Alkali is encountered.	Red	.276
		19x29			
RED PLASTIC	STANDARD SPOOL PUT-UP: 25 FT., 100 FT., 500 FT., 1000 FT.				

RUBBER INSULATED AUTOMOTIVE WIRE

SPARK PLUG WIRE 7 MM. 	4031	16	Tinned Copper—Black Hypalon Sheathed. Recommended for all Passenger Cars, Light Trucks, Tractors and Marine Engines.	Black	.276	
		19x29				
Black Neoprene Sheathed						
PRIMARY LACQUERED WIRE 	4051	14	Same as 4010	Yellow-Red & Black Markers	.147	
		19x27				
	4056	14	Same as 4010	Black	.147	
		19x27				
	4052	12	Same as 4010	Yellow-Red & Black Markers	.175	
		19x25				
	4057	12	Same as 4010	Black	.175	
		19x25				
	4053	10	Same as 4010	Yellow-Red & Black Markers	.190	
		19x23				
4058	10	Same as 4010	Black	.190		
	19x23					
BATTERY CHARGING WIRE 	4041	12	Bare Copper Paper Wrapped Tough Rubber Compound Resistant to Acid, etc.	Black	.205	
		65x30				
	4042	10	Same as 4041	Black	.228	
		105x30				
	4043	8	Same as 4041	Black	.253	
		49x25				
	4044	6	Same as 4041	Black	.314	
		49x23				
	STANDARD SPOOL PUT-UP: 25 FT., 100 FT., 500 FT., 1000 FT.					



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

PROTECTA-METAL SPOOLS

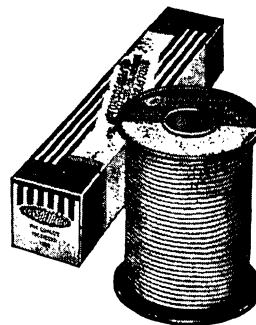
Popular, profitable specialty wire packaged for easy selling in radio-electrical, scientific, specialty and hardware.

Wide variety of sizes and insulations.

Keeps stock in perfect order, always saleable.

Supplied on spools as shown and in heavier weights.

Here is a handy and convenient way to stock small quantities of wire. It prevents wire from matting or tangling.



	Plain Enamel			Single Formvar			Heavy Formvar			Size		
	Size	¼ Lb.	½ Lb.	1 Lb.	¼ Lb.	½ Lb.	1 Lb.	¼ Lb.	½ Lb.		1 Lb.	
MAGNET WIRE No. 2000 The correct wire for practically any application. Magnet wire is indispensible in the manufacture and repair of both radio and audio frequency coils, transformers, chokes, speaker field coils, short wave coils, tuners, transmitters, etc. Also widely used in the construction and repair of motors, generators, dynamos, etc. Larger Quantities At Same Per Pound List	14	\$0.85	\$1.40	\$ 2.51	\$1.10	\$ 1.90	\$ 3.40	\$1.20	\$ 2.00	\$ 3.65	14	
	15	\$0.86	\$1.45	\$ 2.55	\$1.15	\$ 2.00	\$ 3.40	\$1.20	\$ 2.10	\$ 3.70	15	
	16	\$0.90	\$1.50	\$ 2.60	\$1.20	\$ 2.10	\$ 3.50	\$1.30	\$ 2.10	\$ 3.75	16	
	17	\$0.92	\$1.55	\$ 2.60	\$1.22	\$ 2.15	\$ 3.50	\$1.30	\$ 2.25	\$ 3.80	17	
	18	\$0.95	\$1.60	\$ 2.60	\$1.30	\$ 2.20	\$ 3.60	\$1.35	\$ 2.30	\$ 3.85	18	
	19	\$0.97	\$1.62	\$ 2.65	\$1.35	\$ 2.25	\$ 3.60	\$1.40	\$ 2.35	\$ 3.90	19	
	20	\$0.98	\$1.65	\$ 2.70	\$1.38	\$ 2.30	\$ 3.74	\$1.40	\$ 2.40	\$ 3.90	20	
	21	\$1.00	\$1.70	\$ 2.80	\$1.40	\$ 2.30	\$ 3.75	\$1.45	\$ 2.40	\$ 4.00	21	
	22	\$1.02	\$1.71	\$ 2.85	\$1.40	\$ 2.35	\$ 4.00	\$1.48	\$ 2.50	\$ 4.10	22	
	23	\$1.04	\$1.72	\$ 3.00	\$1.42	\$ 2.40	\$ 4.10	\$1.50	\$ 2.50	\$ 4.15	23	
	24	\$1.06	\$1.74	\$ 3.15	\$1.45	\$ 2.45	\$ 4.20	\$1.55	\$ 2.55	\$ 4.75	24	
	25	\$1.08	\$1.85	\$ 3.30	\$1.50	\$ 2.55	\$ 4.40	\$1.70	\$ 2.75	\$ 5.00	25	
	26	\$1.10	\$1.90	\$ 3.40	\$1.55	\$ 2.60	\$ 4.65	\$1.80	\$ 2.85	\$ 5.50	26	
	27	\$1.12	\$1.94	\$ 3.50	\$1.60	\$ 2.70	\$ 4.85	\$1.90	\$ 3.00	\$ 5.60	27	
	28	\$1.15	\$2.00	\$ 3.70	\$1.70	\$ 2.80	\$ 5.00	\$2.00	\$ 3.05	\$ 5.80	28	
	29	\$1.17	\$2.07	\$ 3.80	\$1.75	\$ 2.85	\$ 5.20	\$2.02	\$ 3.20	\$ 5.90	29	
	30	\$1.26	\$2.14	\$ 3.85	\$1.80	\$ 3.00	\$ 5.25	\$2.04	\$ 3.40	\$ 6.00	30	
	SPECIAL MAGNET WIRES In addition to the standard listing shown here, we maintain an extensive stock of all other sizes in round rectangular and square magnet wire.	31	\$1.38	\$2.20	\$ 4.00	\$2.00	\$ 3.10	\$ 5.50	\$2.40	\$ 3.60	\$ 6.60	31
		32	\$1.39	\$2.26	\$ 4.02	\$2.00	\$ 3.20	\$ 5.65	\$2.40	\$ 3.75	\$ 6.75	32
		33	\$1.43	\$2.40	\$ 4.20	\$2.05	\$ 3.40	\$ 5.85	\$2.50	\$ 3.95	\$ 7.00	33
34		\$1.46	\$2.70	\$ 4.35	\$2.20	\$ 3.80	\$ 6.05	\$2.60	\$ 4.25	\$ 7.25	34	
35		\$1.66	\$2.90	\$ 4.85	\$2.40	\$ 4.00	\$ 6.75	\$2.80	\$ 4.55	\$ 8.00	35	
36		\$2.45	\$3.95	\$ 7.00	\$3.60	\$ 5.65	\$ 9.75	\$4.25	\$ 6.75	\$10.00	36	
37		\$2.61	\$4.40	\$ 7.80	\$4.00	\$ 6.00	\$10.25	\$4.75	\$ 7.25	\$12.00	37	
38		\$2.81	\$4.75	\$ 8.70	\$4.65	\$ 6.90	\$11.75	\$5.60	\$ 7.50	\$14.00	38	
39		\$3.16	\$5.65	\$ 9.50	\$5.00	\$ 8.00	\$13.00	\$6.00	\$ 9.50	\$16.00	39	
40		\$4.01	\$8.00	\$13.00	\$7.60	\$11.75	\$17.50	\$8.50	\$13.10	\$22.00	40	
VARIOUS OTHER INSULATIONS Film Technical Classification ENAMEL — oleoresinous FORMVAR — poly vinyl acetal POLY THERMALEZE SODEREZE — polyurethane THERMALEZE — epoxide polyester NYFORM — formvar, nylon sheath NYLEZE — polyurethane nylon sheath NYLON BONDEZE GRIPEZE LECTRON — acrylic ISONSEL — terephthalic polyester ALKANVAR — terephthalic polyester SYLKVD ENAMELED COTTON AND COMBINATIONS SILK AND COMBINATIONS CELANESE AND COMBINATIONS GLASS AND COMBINATIONS PAPER AND COMBINATIONS		Double Cotton Covered			Single Nyleze			Heavy Nyleze				
		Size	¼ Lb.	½ Lb.	1 Lb.	¼ Lb.	½ Lb.	1 Lb.	¼ Lb.	½ Lb.	1 Lb.	Size
		14	\$1.25	\$2.40	\$ 4.35	\$1.20	\$ 2.00	\$ 3.60	\$1.20	\$ 2.00	\$ 3.75	14
		15	\$1.30	\$2.65	\$ 4.40	\$1.24	\$ 2.15	\$ 3.75	\$1.25	\$ 2.10	\$ 3.80	15
		16	\$1.35	\$2.70	\$ 4.75	\$1.30	\$ 2.25	\$ 3.85	\$1.30	\$ 2.20	\$ 4.00	16
		17	\$1.38	\$2.75	\$ 4.80	\$1.35	\$ 2.30	\$ 3.95	\$1.35	\$ 2.30	\$ 4.10	17
		18	\$1.40	\$2.80	\$ 4.95	\$1.37	\$ 2.35	\$ 4.00	\$1.40	\$ 2.40	\$ 4.15	18
		19	\$1.44	\$2.85	\$ 5.25	\$1.40	\$ 2.40	\$ 4.00	\$1.45	\$ 2.50	\$ 4.20	19
		20	\$1.46	\$2.95	\$ 5.50	\$1.45	\$ 2.45	\$ 4.05	\$1.50	\$ 2.60	\$ 4.30	20
		21	\$1.64	\$3.15	\$ 5.75	\$1.48	\$ 2.50	\$ 4.10	\$1.55	\$ 2.65	\$ 4.40	21
	22	\$1.72	\$3.25	\$ 6.00	\$1.50	\$ 2.51	\$ 4.20	\$1.60	\$ 2.70	\$ 4.50	22	
	23	\$1.84	\$3.45	\$ 6.25	\$1.54	\$ 2.58	\$ 4.40	\$1.62	\$ 2.75	\$ 4.60	23	
	24	\$1.92	\$3.65	\$ 6.70	\$1.58	\$ 2.60	\$ 4.60	\$1.65	\$ 2.80	\$ 5.00	24	
	25	.....	.....	.....	\$1.65	\$ 2.70	\$ 4.75	\$1.75	\$ 3.00	\$ 5.50	25	
	26	.....	.....	.....	\$1.67	\$ 2.75	\$ 5.10	\$1.85	\$ 3.10	\$ 5.60	26	
	27	.....	.....	.....	\$1.70	\$ 2.85	\$ 5.25	\$1.90	\$ 3.20	\$ 5.80	27	
	28	.....	.....	.....	\$1.75	\$ 2.90	\$ 5.50	\$1.95	\$ 3.30	\$ 6.10	28	
	29	.....	.....	.....	\$1.80	\$ 3.00	\$ 5.70	\$2.00	\$ 3.50	\$ 6.30	29	
	30	.....	.....	.....	\$1.88	\$ 3.15	\$ 5.80	\$2.10	\$ 3.60	\$ 6.50	30	
	31	.....	.....	.....	\$2.00	\$ 3.25	\$ 5.95	\$2.40	\$ 3.75	\$ 7.00	31	
	32	.....	.....	.....	\$2.15	\$ 3.35	\$ 6.00	\$2.45	\$ 4.00	\$ 7.30	32	
	33	.....	.....	.....	\$2.20	\$ 3.60	\$ 6.25	\$2.60	\$ 4.10	\$ 7.50	33	
	34	.....	.....	.....	\$2.30	\$ 3.80	\$ 6.75	\$2.70	\$ 4.50	\$ 7.75	34	
	35	.....	.....	.....	\$2.40	\$ 4.15	\$ 7.25	\$2.90	\$ 5.00	\$ 8.25	35	
	36	.....	.....	.....	\$2.80	\$ 5.75	\$ 8.00	\$4.00	\$ 6.50	\$11.75	36	
	37	.....	.....	.....	\$3.40	\$ 6.50	\$ 9.75	\$4.50	\$ 7.50	\$12.50	37	
	38	.....	.....	.....	\$4.00	\$ 7.25	\$11.25	\$5.50	\$ 8.25	\$14.00	38	
	39	.....	.....	.....	\$4.75	\$ 8.25	\$12.50	\$6.10	\$ 9.75	\$14.50	39	
	40	.....	.....	.....	\$9.00	\$17.40	\$31.75	\$8.75	\$11.00	\$16.00	40	

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



RESISTANCE WIRE

BARE NICKEL CHROMIUM — No. 2000

Size	1 Oz.	¼ Lb.	1 Lb.	Size	1 Oz.	¼ Lb.	1 Lb.
14	.....	\$1.85	\$ 6.95	28	\$1.38	\$ 3.30	\$13.10
15	.....	\$1.90	\$ 7.05	29	\$1.50	\$ 3.73	\$13.95
16	.....	\$1.95	\$ 7.15	30	\$1.65	\$ 3.95	\$14.75
17	.....	\$2.00	\$ 7.25	31	\$1.70	\$ 4.10	\$15.30
18	.....	\$2.05	\$ 7.30	32	\$1.75	\$ 4.25	\$15.91
19	.....	\$2.10	\$ 7.50	33	\$1.95	\$ 4.60	\$18.30
20	\$1.00	\$2.20	\$ 7.65	34	\$2.10	\$ 5.20	\$20.90
21	\$1.05	\$2.25	\$ 8.10	35	\$2.25	\$ 5.69	\$21.95
22	\$1.08	\$2.35	\$ 8.49	36	\$2.50	\$ 6.15	\$22.84
23	\$1.12	\$2.60	\$ 9.30	37	\$3.30	\$ 8.00	\$29.80
24	\$1.14	\$2.75	\$10.10	38	\$4.10	\$10.05	\$36.28
25	\$1.25	\$2.90	\$10.90	39	\$4.25	\$10.40	\$39.50
26	\$1.30	\$3.15	\$11.65	40	\$4.50	\$11.20	\$42.15
27	\$1.35	\$3.20	\$12.50				

BUS BAR WIRE — No. 2000

BARE COPPER WIRE				TINNED COPPER WIRE			
Size	¼ Lb.	½ Lb.	1 Lb.	Size	¼ Lb.	½ Lb.	1 Lb.
14	\$0.90	\$1.68	\$2.70	14	\$1.05	\$1.85	\$2.90
15	\$0.95	\$1.70	\$2.76	15	\$1.15	\$1.90	\$3.00
16	\$1.00	\$1.80	\$3.10	16	\$1.20	\$2.10	\$3.20
17	\$1.01	\$1.88	\$3.15	17	\$1.25	\$2.15	\$3.30
18	\$1.02	\$1.90	\$3.16	18	\$1.30	\$2.25	\$3.35
19	\$1.05	\$1.92	\$3.20	19	\$1.35	\$2.30	\$3.45
20	\$1.06	\$1.94	\$3.25	20	\$1.40	\$2.35	\$3.55
21	\$1.06	\$1.96	\$3.35	21	\$1.44	\$2.40	\$3.60
22	\$1.07	\$1.98	\$3.45	22	\$1.46	\$2.45	\$3.65
23	\$1.10	\$2.00	\$3.50	23	\$1.48	\$2.47	\$3.70
24	\$1.12	\$2.04	\$3.56	24	\$1.50	\$2.48	\$3.80
25	\$1.12	\$2.04	\$3.58	25	\$1.55	\$2.50	\$3.82
26	\$1.14	\$2.10	\$3.62	26	\$1.57	\$2.52	\$3.85
27	\$1.20	\$2.18	\$3.66	27	\$1.59	\$2.54	\$4.00
28	\$1.24	\$2.20	\$3.75	28	\$1.60	\$2.65	\$4.40
29	\$1.26	\$2.22	\$3.85	29	\$1.65	\$2.75	\$4.50
30	\$1.28	\$2.26	\$3.90	30	\$1.68	\$2.80	\$4.55
31	\$1.30	\$2.30	\$3.94	31	\$1.75	\$2.90	\$4.65
32	\$1.32	\$2.32	\$3.96	32	\$1.77	\$3.00	\$4.70
33	\$1.34	\$2.34	\$4.06	33	\$1.80	\$3.50	\$4.84
34	\$1.36	\$2.35	\$4.25	34	\$1.85	\$3.55	\$4.86
35	\$1.37	\$2.40	\$4.40	35	\$1.90	\$3.60	\$5.00
36	\$1.38	\$3.00	\$5.75	36	\$2.40	\$4.20	\$6.75
37	\$1.90	\$3.40	\$6.00	37	\$2.50	\$4.50	\$7.00
38	\$1.92	\$3.60	\$6.25	38	\$2.55	\$4.70	\$7.40
39	\$1.94	\$3.75	\$6.50	39	\$2.60	\$4.80	\$7.50
40	\$2.00	\$4.25	\$6.60	40	\$2.65	\$4.90	\$7.75

MAGNET WIRE — No. 2010

Size Wire	Plain Enameled	Size Wire	Plain Enameled	Size Wire	Plain Enameled	Size Wire	Plain Enameled
14	25 Ft.	22	133 Ft.	30	590 Ft.	38	1980 Ft.
16	40 Ft.	24	200 Ft.	32	805 Ft.	40	2430 Ft.
18	48 Ft.	26	292 Ft.	34	1150 Ft.		
20	85 Ft.	28	420 Ft.	36	1560 Ft.		

BARE NICKEL CHROMIUM
RESISTANCE CHART

B & S Gauge	Ohms Per Ft. 68°F	B & S Gauge	Ohms Per Ft. 68°F
14	.1648	28	4.251
15	.2078	29	5.286
16	.2595	30	6.750
17	.3333	31	8.523
18	.4219	32	10.55
19	.5208	33	13.39
20	.6592	34	17.00
21	.8310	35	21.52
22	1.055	36	27.00
23	1.322	37	33.33
24	1.671	38	42.19
25	2.107	39	55.10
26	2.670	40	70.24
27	3.348		

ANNUNCIATOR (BELL) WIRE



SUPPLIED IN ASSORTED COLORS

An all around utility wire consisting of a single and two conductors of No. 18 wire, plastic insulation.

Catalog Number	Type
1450	Single Conductor
1445	Two Conductor Twisted

STANDARD SPOOL PUT-UP:
¼ LB., ½ LB., 1 LB., 7 LB.

PHOSPHOR BRONZE DIAL CABLE

BRAIDED phosphor bronze over a pure black linen, lubricated core for exceptional strength and wearing qualities.

Cat. No.	Size (Ins.)	Stranding	Dia. (Ins.)
1436	⅛	16x36	.125

STRANDED phosphor bronze over a concealed white nylon core for exceptional flexibility. Manufactured to highest precision standards, insuring utmost accuracy.

Cat. No.	Size (Ins.)	Stranding	Dia. (Ins.)
1440	⅛	42x35	.125

STANDARD SPOOL PUT-UP:
25 FT., 100 FT., 500 FT., 1000 FT.



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

AERIAL WIRE

COPPER



	Catalog Number	Size	Stranding	Breaking Strength Pounds	Type	Nom. Dia. (Inches)
STRANDED BARE	3501	18	7x26	67 Lbs.	Bare Copper	.046
	3521	16	7x24	106 Lbs.	Bare Copper	.057
	3551	14	7x22	167 Lbs.	Bare Copper	.072
	3561	12	7x20	262 Lbs.	Bare Copper	.092
STRANDED TINNED	3601	18	7x26	67 Lbs.	Tinned Copper	.046
	3621	16	7x24	106 Lbs.	Tinned Copper	.057
	3651	14	7x22	167 Lbs.	Tinned Copper	.072
	3661	12	7x20	262 Lbs.	Tinned Copper	.092
SOLID BARE	3801	15	Solid	98 Lbs.	Bare Copper	.057
	3811	14	Solid	124 Lbs.	Bare Copper	.064
	3786	12	Solid	197 Lbs.	Bare Copper	.080
	3791	10	Solid	314 Lbs.	Bare Copper	.102
	3796	8	Solid	480 Lbs.	Bare Copper	.128
AERIAL AND BUS BAR SOLID TINNED	3848	30	Solid	.....	Tinned Copper	.010
	3847	28	Solid	.....	Tinned Copper	.013
	3846	26	Solid	.....	Tinned Copper	.016
	3819	24	Solid	12 Lbs.	Tinned Copper	.020
	3818	22	Solid	20 Lbs.	Tinned Copper	.025
	3817	20	Solid	31 Lbs.	Tinned Copper	.032
	3816	18	Solid	49 Lbs.	Tinned Copper	.040
	3815	16	Solid	73 Lbs.	Tinned Copper	.051
	3821	14	Solid	124 Lbs.	Tinned Copper	.064
	3831	12	Solid	197 Lbs.	Tinned Copper	.081
	3841	10	Solid	314 Lbs.	Tinned Copper	.102
	3845	8	Solid	480 Lbs.	Tinned Copper	.128
SOLID ENAMELED	3851	14	Solid	124 Lbs.	Enameled	.064
	3861	12	Solid	197 Lbs.	Enameled	.082
	3871	10	Solid	314 Lbs.	Enameled	.102
	STANDARD PUT-UP: 50 FT., 75 FT., 100 FT., 1000 FT.					

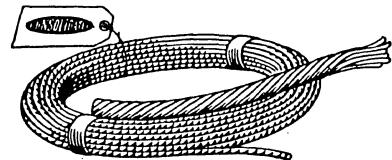
PHOSPHOR BRONZE

Recommended for short wave and transmitting aerials.

Tested and used by Army and Navy.

Amazing improvement for reception and transmission.

Phosphor bronze is recognized as the most efficient, practical wire obtainable for short wave and transmitting aerials. It will not stretch or sag and is superinductive.



PHOSPHOR BRONZE	3421	16	7x24	230 Lbs.	Bronze	.058
	3451	14	7x22	360 Lbs.	Bronze	.073
	3461	12	7x20	570 Lbs.	Bronze	.092
	3465	10	7x18	895 Lbs.	Bronze	.116
	3466	8	7x16	1400 Lbs.	Bronze	.146
	3467	6	7x14	2200 Lbs.	Bronze	.184
	3468	4	7x12	3400 Lbs.	Bronze	.232
STANDARD PUT-UP: 500 FT., 1000 FT.						

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



TINNED COPPER SHIELDING**SHIELDING AND BONDING TYPE CABLE**

	Catalog Number	Approx. I.D. (Inches)	Size & Number of Wires	Approx. AWG	Carrying Capacity in Amperes
FLAT BRAID 	1386	$\frac{1}{32}$	16x36	24	7
	1387	$\frac{3}{64}$	24x36	23	7
	1388	$\frac{3}{32}$	48x36	19	12
	1389	$\frac{7}{64}$	72x36	18	14
	1390	$\frac{1}{8}$	96x36	18	15
	1391	$\frac{3}{16}$	120x36	15	23
	1392	$\frac{1}{4}$	168x36	14	30
	1393	$\frac{3}{8}$	288x36	11	50
	1394	$\frac{1}{2}$	386x36	10	55
	1395	$\frac{5}{8}$	528x36	10	61
TUBULAR BRAID PER QQ-B-575 	1396	$\frac{3}{4}$	832x36	7	80
	1397	$2\frac{5}{32}$	832x36	7	80
	1398	1	912x36	7	84
	1399	$1\frac{3}{8}$	336x30	7	105
	1310	$\frac{1}{32}$	24x36	22	7
	1311	$\frac{1}{16}$	48x36	19	11
	1312	$\frac{5}{64}$	72x36	18	16
	1314	$\frac{7}{64}$	96x36	16	19
	1315	$\frac{1}{8}$	120x36	15	25
	1316	$\frac{5}{32}$	240x36	12	40
	1317	$1\frac{1}{64}$	168x36	14	32
	1318	$1\frac{3}{64}$	192x34	11	46
	1319	$\frac{1}{4}$	384x36	10	53
	1320	$\frac{9}{32}$	120x30	9	60
	1321	$\frac{3}{8}$	384x36	10	53
	1322	$\frac{7}{16}$	240x30	6	90
	1323	$\frac{1}{2}$	528x36	9	62
	1324	$\frac{9}{16}$	480x30	3	145
OVAL COMMERCIAL BRAID 	1325	$2\frac{1}{32}$	768x30	1	190
	1326	$2\frac{5}{32}$	864x36	7	88
	1340	$\frac{1}{32}$	24x34	20	9
	1341	$\frac{1}{16}$	32x34	19	11
	1342	$\frac{7}{64}$	64x34	16	20
	1343	$\frac{1}{8}$	72x34	15	25
	1344	$1\frac{1}{64}$	120x34	14	32
	1345	$\frac{3}{16}$	144x34	13	38
	1346	$\frac{1}{4}$	168x34	12	41
	1347	$\frac{3}{8}$	192x34	11	46
	1348	$\frac{1}{2}$	336x34	9	62
	1349	$\frac{5}{8}$	384x34	8	64
	1350	$1\frac{1}{16}$	480x34	7	81
	1351	$2\frac{5}{32}$	528x34	7	85

STANDARD SPOOL PUT-UP: 50 FT., 100 FT., 250 FT., 500 FT., 1000 FT.

**CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS**

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

TEST PROD WIRE



Single conductor, extra flexible stranded tinned soft annealed copper, wrap, color coded rubber insulation.

STANDARD SPOOL PUT-UP: 10 FT., 100 FT., 250 FT., 500 FT., 1000 FT.

Catalog Number	Size	Stranding	Nom. Wall Thickness (Inches)	Voltage Breakdown	Nom. O.D. (Inches)
1001	20	41x36	.043	10,000	.140
1002	18	65x36	.045	12,000	.140
1006	18	65x36	.088	25,000	.230

MILITARY TYPE MIL-W-131169B

1007	18	65x36	.047	12,000	.150
------	----	-------	------	--------	------

HIGH VOLTAGE AND ANODE LEAD CABLE



Flame Retardant Polyethylene Plastic Insulation for high voltage leads to cathode-ray tubes in television receivers, oscilloscopes, power supplies and other uses, requiring a high-voltage cable. Special features: minimum surface leakage, corona resistance and high dielectric strength.

STANDARD SPOOL PUT-UP: 25 FT., 100 FT., 250 FT., 500 FT., 1000 FT.

U.L. STYLE 3239 (FR-1)

Catalog Number	Size	Stranding	Description	Ins.	Working Volts	Nom. O.D. (Inches)
4601	20	7x28	Extra flexible tinned copper wire; Flame retardant Polyethylene Plastic Insulation; red cellulose acetate yarn braid with 2 white tracers; lacquer coating.	.035	10,000	.136
4611	20	7x28	Same as No. 4601 except heavier insulation; solid red braid.	.065	20,000	.198
4616	20	10x30	Extra flexible tinned copper flame retardant polyethylene insulation, white.	.035	10,000	.108
4621	20	10x30	Same as No. 4616 except heavier insulation, white and red.	.065	20,000	.168
4622	18	41x34	Same as No. 4621 except .015" red PVC outer jacket.	.057	40,000	.195
4623	22	7x30	Same as No. 4622 except outer .020" PVC jacket. Colors: black, red and blue.	.030	17,000	.130
4624*	22	7x30	Tin copper rulan insulation PVC jacket UL style 3239 "FR-1".	.025	20,000	.120
4625*	22	7x30	Same as 4624	.030	30,000	.130
4626*	22	7x30	Same as 4624	.045	40,000	.160

* Can also furnish pre-bond overcoat and topcoat conductor on catalog numbers 4624, 4625, and 4626.

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



HOOK-UP WIRE

STA-PUT PUSHBACK

STRIPS AND REMAINS BACK FOR CLEAN TERMINAL

Seven colors for each: Black, Blue, Brown, Green, Red, Yellow, White. Be sure to specify color when ordering. Packaged in handsome 3-color display carton for easy merchandising by dealer.

Catalog Number	Size	Stranding	Specifications	Finished O.D. (Inches)
1048	18	16x30	Tinned copper conductor; cotton serve and cotton braid thorough paraffin impregnation.	.072
1101	20	10x30	Same as 1048	.068
1091	22	7x30	Same as 1048	.066
1045	18	Solid	Same as 1048	.070
1106	20	Solid	Same as 1048	.067
1096	22	Solid	Same as 1048	.065

HI-Q LO-LOSS PUSHBACK

High efficiency wire ideal for use where high conductivity with negligible loss is essential. Push-back insulation will not creep.

7 colors: Black, Blue, Brown, Green, Red, Yellow, White.

Catalog Number	Size	Stranding	Specifications	Finished O.D. (Inches)
1051	22	7x30	Tinned pure copper; serve of cellulose acetate yarn; cotton braid overall with high gloss lacquer.	.065
1056	20	10x30	Same as 1051	.066
1061	22	Solid	Same as 1051	.064
1066	20	Solid	Same as 1051	.065

STRANDED RUBBER HOOK-UP AND LEAD-IN WIRE

Catalog Number	Size	Stranding	Specifications	Insulation Thickness (Inches)	Finished O.D. (Inches)
1121	20	10x30	Highly flexible, tinned copper, paper served, live non-cracking wall of black rubber insulation.	$\frac{1}{32}$	.102
1126	18	16x30	Same as 1121	$\frac{1}{64}$	.085
1131	18	16x30	Same as 1121	$\frac{1}{32}$	.115
1111	18	16x30	Soft drawn tinned copper wire; cotton wrap; colored rubber overall insulation.	$\frac{1}{64}$	.090

EXTRA FLEXIBLE AC-DC ANTENNA CORD

Recommended for use as an antenna wire for AC-DC radio sets, for antenna loops and all other purposes where an extremely flexible covered wire is required. May be used for replacement purposes or original installations.

Catalog Number	Size	Stranding	Specifications	Insulation Thickness (Inches)	Finished O.D. (Inches)
1161	24	16x36	16 strands No. 36 tinned copper wire, covered with a brown vinyl plastic insulation.	.010	.050

STANDARD SPOOL PUT-UP: 25 FT., 100 FT., 1000 FT.



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

RETRACTILE COIL CORDS

POWER CORDS (Underwriters' Approved)

ALL JACKETING NEOPRENE — ALL CORDS 48" RETRACTED, APPROX. 25' EXTENDED

Catalog Number	Condr. AWG	Stranding	U.L. Type	Cordage O.D. (Inches)	Coil O.D. (Inches)	Amp Rating	Max. Working Voltage
2801	2/18	41x34	SVO	.250	1	7	300
2802	2/18	41x34	SJO	.310	1¼	7	300
2803	3/18	41x34	SJO	.330	1½	7	300
2804	4/18	41x34	SJO	.360	1½	5.6	300
2805	2/16	65x34	SJO	.330	1½	10	300
2806	3/16	65x34	SJO	.365	1½	10	300
2807	3/16	65x34	SO	.470	1⅞	10	600
2808	4/16	65x34	SJO	.395	1⅞	8	300
2809	4/16	65x34	SO	.500	1⅞	8	600
2810	5/16	65x34	SO	.550	1⅞	8	600
2811	2/14	41x30	SO	.535	2	15	600
2812	3/14	41x30	SO	.560	2⅛	15	600
2813	4/14	41x30	SO	.605	2¼	12	600
2814	2/12	65x30	SO	.605	2¼	20	600
2815	3/12	65x30	SO	.635	2⅜	20	600
2816	4/12	65x30	SO	.665	2½	16	600

* Conductor Color Coding: 1—Black, 2—White, 3—Green, 4—Red, 5—Blue

POWER CORDS

ALL JACKETING NEOPRENE — ALL CORDS 48" RETRACTED, APPROX. 25' EXTENDED

Catalog Number	Condr. AWG	Stranding	Cordage O.D. (Inches)	Coil O.D. (Inches)	Amp Rating	Max. Working Voltage
2020	5/18	41x34	.440	1¾	5.6	300
2821	7/18	41x34	.500	1⅞	5.6	300
2822	2/12	65x30	.610	2¼	17	600
	4/18	41x34		6	600	
2824	6/16	65x34	.545	2	8	600
2825	6/16	65x34				
	1/14	41x30	.575	2⅛	8	600
2827	7/12	65x30	.775	2¾	16	300

TEST LEADS (Red or Black)

24" RETRACTED, APPROX. 12' EXTENDED

Catalog Number	Condr. AWG	Cordage O.D. (Inches)	Coil O.D. (Inches)	Amp Rating	Max. Working Voltage
2830	1/20 Black	.165	¾	4	1000
2831	1/20 Red	.165	¾	4	1000

SHIELDED AND TINSEL MICROPHONE CORDS

ALL JACKETING NEOPRENE

ALL CORDS 48" RETRACTED, APPROX. 25' EXTENDED

Catalog Number	Condr. AWG	Cordage O.D. (Inches)	Coil O.D. (Inches)
2850	1/24 (S)	.160	⅝
2852	1/23 1/24 (S)	.200	⅞
2854	2/23 1/24 (S)	.240	⅞
2856	2/23 1/24 (S)	.270	1¼
2857	3 Tinsel	.201	⅞
2858	4 Tinsel	.220	⅞
2859	5 Tinsel	.285	1

* Conductor Color Coding: 1—Black, 2—White, 3—Red, 4—Green, 5—Blue (S) SHIELDED

COMMUNICATION AND ELECTRONIC CONTROL CORDS

ALL JACKETING NEOPRENE

ALL CORDS 48" RETRACTED, APPROX. 25' EXTENDED

Multi-conductors stranded communication cord No. 23 AWG, tinned copper wire. Lengths can be cut to exact requirement. Maximum working voltage 120 volts. Current carrying capacity 1 ampere Nom. cond. resistance .022 ohms per linear foot.

Catalog Number	Condr. AWG	Stranding	Cordage O.D. (Inches)	Coil O.D. (Inches)
2870	2/23	21x36	.200	¾
2871	3/23	21x36	.210	¾
2872	4/23	21x36	.240	⅞
2873	5/23	21x36	.285	1
2874	6/23	21x36	.305	1⅞
2875	7/23	21x36	.320	1¼

* Conductor Color Coding: 1—Black, 2—White, 3—Red, 4—Green, 5—Blue, 6—Yellow, 7—Brown

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

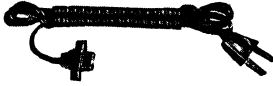
1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



CORD SETS

TV POWER SUPPLY (CHEATER)
PLASTIC CORD

Underwriters' Approved



Extra flexible parallel cord type SPT-1 (P.O.T.). Soft molded connector and attached soft molded cap.

No. 2506 6 Ft. Cord Set
No. 2509 9 Ft. Cord Set
No. 2516 6 Ft. Cord Set—"Polarized"
No. 2519 9 Ft. Cord Set—"Polarized"

CUBE TAP EXTENSION CORD

Underwriters' Approved

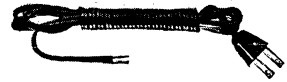


3-way extension tap Type SPT-1 (P.O.T.). Flexible cord and soft molded-on cap.

No. 2706 6 Ft. Cord Set
No. 2709 9 Ft. Cord Set
No. 2712 12 Ft. Cord Set
No. 2715 15 Ft. Cord Set

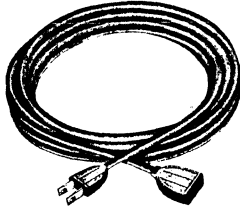
REPLACEMENT
POWER CORD SET

Underwriters' Approved



Extra flexible parallel cord type SPT-1 (P.O.T.) and soft molded-on cap—hanked—ends of cord stripped and tinned.

No. 3006 6 Ft. Cord Set
No. 3008 8 Ft. Cord Set

POWER EXTENSION CORD
WITH MOLDED-ON CAP AND CONNECTOR

UL LISTED CORD

Modern design extension power cords with approved molded-on caps and connector. Packed in individual clear plastic bags for easy identification. Consolidated power cords for both indoor and outdoor.

2 CONDUCTOR UL LISTED

Catalog Number	Length	Type
7001	25 Ft.	No. 18—2/c
7001	50 Ft.	No. 18—2/c
7001	100 Ft.	No. 18—2/c
7002	25 Ft.	No. 16—2/c
7002	50 Ft.	No. 16—2/c
7002	100 Ft.	No. 16—2/c
7003	25 Ft.	No. 14—2/c
7003	50 Ft.	No. 14—2/c
7003	100 Ft.	No. 14—2/c
7004	25 Ft.	No. 12—2/c
7004	50 Ft.	No. 12—2/c
7004	100 Ft.	No. 12—2/c

3 CONDUCTOR UL LISTED

Catalog Number	Length	Type
7007	25 Ft.	No. 18—3/c
7007	50 Ft.	No. 18—3/c
7007	100 Ft.	No. 18—3/c
7008	25 Ft.	No. 16—3/c
7008	50 Ft.	No. 16—3/c
7008	100 Ft.	No. 16—3/c
7005	25 Ft.	No. 14—3/c
7005	50 Ft.	No. 14—3/c
7005	100 Ft.	No. 14—3/c
7006	25 Ft.	No. 12—3/c
7006	50 Ft.	No. 12—3/c
7006	100 Ft.	No. 12—3/c

MULTI-COLOR CABLES

FLEXIBLE COTTON BRAIDED

For speakers, tester, battery hook-up, etc.

STANDARD SPOOL PUT-UP: 100 FT., 250 FT., 500 FT., 1000 FT.



Catalog Number	Type	Size	Stranding	Specifications	Insulation Thickness (Inches)	Finished O.D. (Inches)
1481	1 Conductor	20	10x30	Tinned flexible copper; plastic insulation; bunched individual conductors; heavy brown cotton braid over-all; color coded.	1/4	.150
1482	2 Conductors	20	10x30	Same as 1481	1/4	.175
1483	3 Conductors	20	10x30	Same as 1481	1/4	.200
1484	4 Conductors	20	10x30	Same as 1481	1/4	.275
1485	5 Conductors	20	10x30	Same as 1481	1/4	.250
1486	6 Conductors	20	10x30	Same as 1481	1/4	.260
1487	7 Conductors	20	10x30	Same as 1481	1/4	.275
1488	8 Conductors	20	10x30	Same as 1481	1/4	.300
1489	9 Conductors	20	10x30	Same as 1481	1/4	.310
1490	10 Conductors	20	10x30	Same as 1481	1/4	.325
1494	11 Conductors	20	10x30	Same as 1481	1/4	.335

ANALYZER CABLE

STANDARD SPOOL PUT-UP: 100 FT., 250 FT., 500 FT., 1000 FT.

Catalog Number	Type	Size	Stranding	Specifications	Insulation Thickness (Inches)	Finished O.D. (Inches)
1501	8 Conductors	2-14 6-18	41x30 16x30	Extra flexible tinned copper; plastic insulation; color coded; Brown cotton braid overall.	1/4	.300
1502	9 Conductors	2-14 7-18	41x30 16x30	Same as 1501	1/4	.320

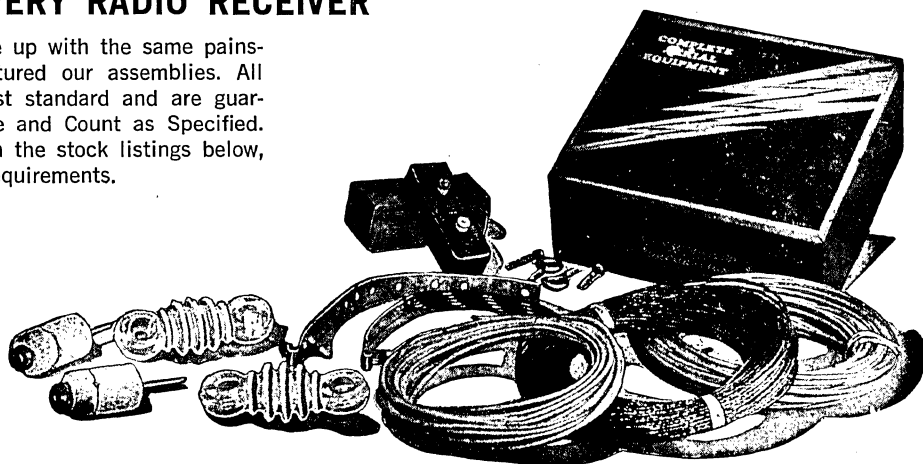


CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

AERIAL KITS FOR EVERY RADIO RECEIVER

Consolidated Aerial Kits are made up with the same painstaking care that has always featured our assemblies. All materials and parts are of highest standard and are guaranteed as to Length, Weight, Size and Count as Specified. If your needs are not answered in the stock listings below, write us regarding your special requirements.



50 FOOT SERIES

THE PRICE LEADER No. 506

50 feet 7x26 Bare Copper Aerial Wire
25 feet No. 16 Rubber Covered Lead-in Wire
1 Adjustable Ground Clamp
2 Porcelain Insulators
2 Porcelain Nail Knobs
1 Window Lead-in Strip
Installation Instructions

No. 507

Contains 1 Underwriter Approved Lightning Arrester, otherwise same as No. 506

A SUPER VALUE No. 501

50 feet 7x26 Bare Copper Aerial Wire
35 feet No. 16 Rubber Covered Lead-in Wire
1 Adjustable Ground Clamp
2 Porcelain Insulators
2 Porcelain Nail Knobs
1 Window Lead-in Strip
Installation Instructions

No. 502

Contains 1 Underwriter Approved Lightning Arrester, otherwise same as No. 501

DE LUXE AERIAL No. 512

50 feet 7x22 Tinned Aerial Wire
35 feet No. 16 Rubber Covered Lead-in Wire
1 Underwriter Approved Lightning Arrester
2 Porcelain Insulators
2 Porcelain Nail Knobs
1 Shur Grip Ground Clamp
1 Duco Window Lead-in Strip
Installation Instructions

60 FOOT SERIES

No. 516 PRICE KIT

Contains 60 feet 7x26 Bare Copper Aerial Wire, otherwise same as No. 501.

No. 517

Contains 60 feet 7x26 Bare Copper Aerial Wire, 1 Underwriter Approved Lightning Arrester, otherwise same as No. 501.

No. 518 AERIAL

Contains 60 feet 7x22 Tinned Aerial Wire, otherwise same as No. 512.

75 FOOT SERIES

75 FOOT SPECIAL No. 531

75 feet 7x26 Bare Copper Aerial Wire
25 feet No. 16 Rubber Covered Lead-in Wire
1 Adjustable Ground Clamp
2 Porcelain Insulators
2 Porcelain Nail Knobs
1 Window Lead-in Strip
Installation Instructions

No. 532

Contains 1 Underwriter Approved Lightning Arrester, otherwise same as No. 531.

SUPERFINE AERIAL No. 522

75 feet 7x24 Tinned Aerial Wire
25 feet No. 16 Rubber Covered Lead-in Wire
1 Underwriter Approved Lightning Arrester
2 Porcelain Insulators
2 Porcelain Nail Knobs
1 Shur Grip Ground Clamp
1 Duco Window Lead-in Strip
Installation Instructions

100 FOOT SERIES

EXTRA VALUE No. 541

100 feet 7x26 Bare Copper Aerial Wire
25 feet No. 16 Rubber Covered Lead-in Wire
1 Adjustable Ground Clamp
2 Porcelain Insulators
2 Porcelain Nail Knobs
1 Window Lead-in Strip
Installation Instructions

No. 542

Contains 1 Underwriter Approved Lightning Arrester, otherwise same as No. 541.

No. 551

Contains 100 feet 7x24 Copper Aerial Wire, otherwise same as No. 541.

No. 552

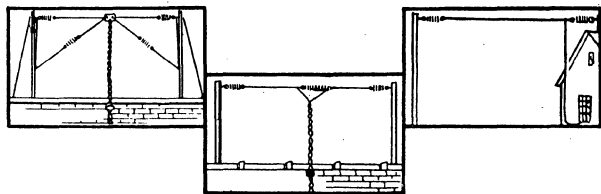
Contains 100 feet 7x24 Aerial Wire, 1 Underwriter Approved Lightning Arrester, otherwise same as No. 541.

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

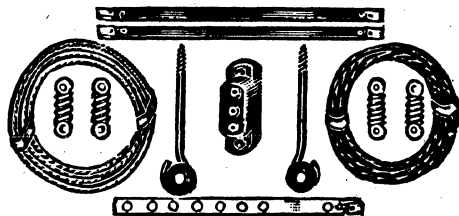


No. 615 UNIVERSAL LIMITED ALL-WAVE ANTENNA SYSTEM WITH BALANCED TRANSMISSION



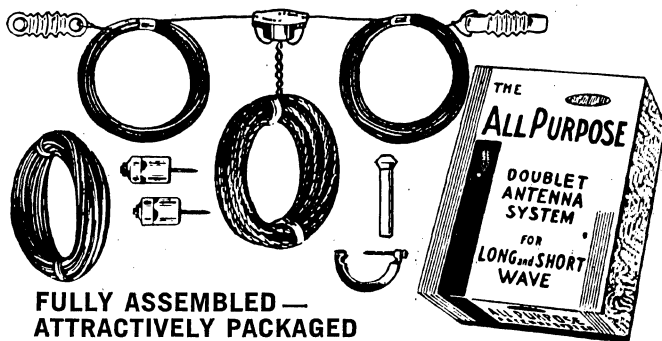
The various types of Marconi and Doublet Antenna systems which may be erected with this kit are all extremely efficient, being based on advanced antenna design which permits uniform reception on the short wave bands and eliminates local noise interference which is so prevalent at the higher frequencies. Effectively eliminates interference set up by power transformers, street cars, and other electrical equipment. The kit provides complete parts for the erection of practically every type of limited antenna of double or other design. An instruction sheet packed with each kit gives detailed instructions for the various type of aerals that may be erected.

LIST OF PARTS



- 1—100 ft. coil Bare Aerial Wire
- 1—50 ft. coil Twisted Rubber Covered Transmission Line
- 4—Porcelain Insulators
- 1—Doublet Lightning Arrestor
- 1—Doublet Window Lead-in Strip
- 1—Ground Clamp
- Installation Instructions
- Attractive 3 Colored Carton

No. 635 LIMITED ALL-PURPOSE DOUBLET ANTENNA KIT



FULLY ASSEMBLED — ATTRACTIVELY PACKAGED

The Super Limited All-Purpose Doublet Antenna System is sold as a completely assembled unit. The coils of double wire are joined and soldered to the twisted transmission lead-in. Insulators are also attached ready for instant installation.

A TRUE DOUBLET — FOR BOTH SHORT AND LONG WAVE RECEPTION

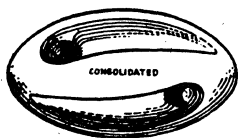
A scientifically designed, high efficiency doublet, all wave antenna system for limited world-wide reception. Kit is complete in all details, ready assembled for quick, convenient installations. Only the finest parts are used in its assembly, assuring utmost efficiency in operation. On all modern types of superheterodyne receivers tuning two or three bands, this limited All-Purpose Doublet antenna will show a marked improvement in reception. Also provides a remarkable pick-up in signal strength on the short wave 16-49 meter band. Both units of the doublet, because of their length and method of assembly are tuned to the opposite ends of the short wave range, providing for uniform pick-up efficiency on all intervening frequencies.

COMPLETELY ASSEMBLED SYSTEM

- 2—30 ft. coils 7x24 Bare Copper Wire
- 1—50 ft. coil Twisted and Braided overall Transmission Wire
- 3—3-inch Porcelain Insulators
- 1—10 ft. coil Ground Wire
- 1—Ground Clamp
- 2—Porcelain Nail Knobs
- 1—Instruction Sheet

RADIO SPECIALTIES

AIRPLANE INSULATOR



No. 1581

A specially designed insulator that provides great tensile strength. A valuable accessory for the serviceman who specializes in antenna installation. Made of highly glazed porcelain, shaped to shed moisture.

PORCELAIN INSULATOR



No. 1600

A sturdily constructed insulator at a price that defies competition. Made of the highest grade porcelain, with a high gloss finish that sheds moisture.

DUCO LACQUERED LEAD-IN-STRIP



No. 1504

Made of soft drawn flexible copper, covered with a heavy black cotton braid. The braid is thoroughly weatherproofed, with a number of coats of DUCO Lacquer. Made extra thin to assure its use on snug fitting case-maments. Highly polished finish—absolutely weatherproofed. Contains a Fahnestock clip at each end.

ZINC STRAP CLAMP



No. 1517

A well made zinc clamp which provides positive contact with a permanent connection. Regularly finished with a strong, over-sized copper nut and bolt. A Fahnestock clips is provided for the lead-in connection. For use in all sizes of pipe up to 2 inches in diameter.

PORCELAIN NAIL KNOBS



No. 1602

Porcelain Nail Knobs are a necessity for aerial lead-in and for all types of outside wiring. They are made of durable porcelain with correctly grooved jaws that hold firmly with a bulldog grip, without piercing the insulation. Nail is rust-resisting and provided with a stop to prevent separation of the units. Top buffer pad prevents breakage during installation.



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

CROSS REFERENCE CHART

BELDEN — CONSOLIDATED

COMPARABLE OR IDENTICAL

(See Respective Page Number for Complete Description)

Belden Number	Consolidated Number	Belden Number	Consolidated Number	Belden Number	Consolidated Number	Belden Number	Consolidated Number	Belden Number	Consolidated Number
8000	3551	8403	1723	8527	9007	8742	5211	9252	4457
8002	3521	8404	1724	8528	9012	8743	5226	9273	4496
8008	2000	8405	1725	8529	9011	8744	5241	9415	2872
8009	2000	8407	1707	8530	9010	8745	5271	9416	2856
8011	3831	8408	1705	8531	9013	8746	5286	9417	2854
8012	3821	8410	1460	8535	9039	8747	5156	9430	5421
8013	3815	8411	1721	8536	9038	8748	5159	9431	5440
8014	1161	8412	1462	8537	9037	8749	5165	9432	5446
8019	3816	8415	2872	8541	9700	8750	5167	9433	5448
8020	3817	8416	5587	8542	9701	8751	5902	9434	5450
8021	3818	8418	1455	8543	9702	8752	5901	9435	1401
8022	3819	8419	1406	8544	9703	8753	5251	9436	1402
8023	3846	8422	1458	8545	9704	8758	5526	9437	1407
8024	3847	8423	1463	8546	9705	8759	5543	9439	5644
8025	3848	8424	1464	8547	9719	8760	5574	9440	5642
8040	2000	8425	1465	8548	9718	8761	5572	9445	5643
8041	2000	8426	1466	8549	9717	8762	5573	9445	5643
8042	2000	8427	1467	8550	9716	8764	5309	9457	5646
8043	2000	8428	1702	8551	9715	8765	5311	9477	2801
8044	2000	8429	1479	8552	9714	8766	5315	9481	2802
8045	2000	8430	1478	8553	9713	8767	5303	9483	2803
8046	2000	8431	1470	8554	9711	8768	5306	9485	2806
8047	2000	8437	5511	8555	9710	8769	5339	9620	5488
8048	2000	8441	5568	8556	9709	8770	5578	9621	5489
8049	2000	8442	5579	8557	9708	8771	5576	9622	5490
8050	2000	8443	5401	8558	9707	8772	5577	9623	5491
8051	2000	8444	5406	8559	9706	8773	5347	9624	5492
8052	2000	8445	5411	8561	9030	8774	5329	9625	5493
8053	2000	8446	5416	8562	9029	8775	5331	9626	5477
8054	2000	8447	5421	8563	9028	8776	5335	9740	5601
8055	2000	8448	4538	8564	9027	8777	5323	9741	5612
8056	2000	8449	5431	8565	9026	8778	5326	9742	5615
8057	2000	8450	5588	8566	9025	8781	5584	9743	5619
8058	2000	8451	5570	8567	9215	8782	5547	9744	5152
8059	2000	8452	4202	8568	9214	8783	5123	9745	5153
8060	2000	8455	1735	8569	9213	8790	5538	9770	5576
8061	2000	8456	5432	8570	9212	8850	9725	9773	5353
8062	2000	8457	5434	8571	9211	8851	9724	9774	5356
8063	2000	8458	5438	8580	9108	8852	9723	9775	5359
8064	2000	8459	5442	8581	9107	8853	9722	9776	5362
8065	2000	8460	5581	8582	9106	8854	9721	9777	5365
8066	2000	8461	5581	8583	9105	8855	9720	83000	9601
8067	2000	8462	4072	8584	9104	8866	4622	83001	9602
8068	2000	8463	4517	8585	9103	8868	4623	83002	9604
8069	2000	8464	4509	8586	9102	8869	4624	83003	9605
8070	2000	8465	5471	8596	9302	8874	2507	83004	9606
8071	2000	8466	5474	8598	9301	8879	2830-1	83005	9608
8072	2000	8467	5472	8599	9300	8880	9020	83006	9607
8073	2000	8468	5475	8601	2801	8881	9019	83007	9609
8074	2000	8469	5473	8602	2803	8882	9017	83008	9610
8075	2000	8470	5586	8603	2806	8883	9015	83009	9611
8076	2000	8471	5582	8618	5590	8884	9018	83010	9613
8077	2000	8472	4217	8619	5476	8886	9016	83023	9625
8078	2000	8473	5583	8620	5480	8887	9014	83025	9628
8079	2000	8477	5597	8621	5481	8888	4077	83026	9627
8080	2000	8478	4207	8622	5482	8889	2509	83027	9629
8081	2000	8481	5584	8623	5483	8892	9023	83028	9630
8082	2000	8482	5556	8624	5484	8893	9021	83029	9631
8083	2000	8483	5561	8627	5485	8894	9024	83030	9633
8084	2000	8484	4524	8628	5486	8895	2506	83241	4716
8085	2000	8485	4525	8629	5487	8896	9022	83242	4719
8086	2000	8486	5557	8649	5140	8897	1007	83264	4731
8205	5580	8488	4521	8653	1388	8898	1006	83265	4729
8208	5541	8489	5470	8654	1389	8899	1002	83266	4734
8212	4478	8490	2873	8661	1393	8916	891	83267	4736
8213	4476	8491	2856	8662	1397	8917	890	83269	4738
8214	4477	8492	5556	8664	1390	8918	876	83270	4742
8215	4433	8495	2873	8669	1394	8919	871	83282	4757
8216	4459	8497	2854	8671	1398	8920	866	83284	4759
8221	4478	8499	2850	8672	1395	8950	9405	83304	9820
8228	4575	8500	9312	8674	1387	8951	9404	83305	9824
8230	4503	8501	9311	8676	1386	8952	9403	83306	9828
8232	4481	8502	9309	8680	4036	8953	9402	83307	9832
8233	4480	8503	9307	8681	4038	8954	9401	83308	9836
8235	4523	8504	9305	8682	4030	8955	9400	83318	9821
8237	4415	8505	9303	8683	4029	8956	9415	83319	9825
8238	4419	8507	9308	8684	4028	8957	9414	83320	9828
8240	4405	8508	9306	8685	4027	8958	9413	83321	9833
8241	4401	8509	9304	8689	4031	8959	9412	83322	9837
8242	4436	8510	9325	8690	5603	8960	9411	83333	9322
8243	4438	8511	9324	8691	5606	8963	9509	83334	9826
8254	4452	8512	9322	8692	5609	8964	9508	83335	9830
8255	4472	8513	9320	8718	5596	8965	9507	83336	9834
8258	4485	8514	9318	8719	5575	8966	9506	83337	9838
8259	4449	8515	9316	8720	5569	8967	9505	83338	9842
8261	4440	8516	9323	8723	5594	8968	9504	83348	9823
8262	4450	8517	9321	8724	5571	8969	9503	83349	9827
8263	4470	8518	9319	8731	5569	8970	9502	83350	9831
8267	4489	8519	9317	8732	5516	8971	9501	83351	9835
8268	4490	8520	9006	8735	5569	9085	4532	83352	9839
8275	4527	8521	9005	8737	5568	9090	4535	83412	920
8285	4532	8522	9004	8738	5501	9233	4559	83413	921
8290	4535	8523	9003	8739	5511	9234	4559	83414	922
8401	1457	8524	9002	8740	5201	9250	4475	83415	923
8402	1462	8525	9001	8741	5205	9251	4435	83416	924

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS



1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

CROSS REFERENCE CHART**ALPHA — CONSOLIDATED****COMPARABLE OR IDENTICAL**

(See Respective Page Number for Complete Description)

Alpha Number	Consolidated Number	Alpha Number	Consolidated Number	Alpha Number	Consolidated Number	Alpha Number	Consolidated Number	Alpha Number	Consolidated Number
112	3551	1172	5400	1307/9	5241	1505	9038	1775	5511
136	3521	1173	5401	1308/11	5251	1506	9039	1793	5201
286	3821	1174	5406	1309/15	5271	1507	9040	1828	4538
289	3831	1175	5411	1313	5286	1508	9041	1830	9400
292	3841	1176	5416	1313/31	5289	1509	9042	1831	9401
392-8	3845	1177	5421	1313/41	5292	1550	9001	1832	9402
295	3815	1178	5426	1314	5297	1551	9002	1833	9403
296	3816	1179	5431	1316	5151	1553	9003	1834	9404
297	3817	1181	5434	1317	5152	1555	9004	1835	9405
298	3818	1181/15	5438	1318	5153	1557	9005	1840	9410
299	3819	1181/20	5440	1320	5155	1559	9006	1841	9411
299/1	3846	1181/25	5442	1322	5156	1560	9007	1842	9412
299/2	3847	1181/30	5446	1323	5159	1561	9010	1843	9413
299/3	3848	1181/40	5448	1324	5161	1563	9011	1844	9414
650	2830/1	1181/50	5450	1327	5165	1565	9012	1846	9415
660/4	2801	1181/60	5460	1329	5167	1567	9013	1850	9300
661/4	2802	1182	1482	1329/31	5171	1571	9100	1851	9301
662/4	2803	1183	1483	1329/41	5181	1573	9101	1852	9302
663/4	2804	1184	1484	1330	5191	1575	9102	1853	9303
664/4	2805	1186	1486	1341	9706	1577	9103	1854	9305
665/4	2806	1187	1487	1342	9707	1579	9104	1854/19	9304
666/4	2808	1188	1488	1343	9708	1590	9025	1855	9307
670/4	2807	1190	1490	1344	9709	1591	9026	1855/19	9306
671/4	2809	1194	9032	1345	9710	1592	9027	1856	9309
672/4	2811	1194/22	9031	1346	9711	1593	9028	1856/19	9308
673/4	2812	1196	9033	1350	9014	1594	9029	1857	9311
674/4	2813	1197	9034	1351	9015	1595	9030	1857/19	9310
675/4	2814	1200	1470	1352	9016	1632	1001	1858/19	9312
676/4	2815	1222	1386	1353	9017	1636	1002	1860	9313
677/4	2816	1223	1387	1354	9018	1638	1006	1861	9314
680/4	2870	1224	1388	1365	9019	1639	1007	1862	9315
681/4	2871	1229	1390	1356	9020	1640	4624	1863	9316
682/4	2872	1230	1391	1371	9021	1641	4616	1864	9318
683/4	2873	1231	1392	1372	9022	1642	4621	1864/19	9317
684/4	2874	1232	1393	1373	9023	1645	4622	1865	9320
685/4	2875	1233	1395	1374	9024	1651	9105	1865/19	9319
690/4	2850	1233/2	1394	1381	9700	1653	9106	1866	9322
692/4	2852	1234	1396	1382	9701	1655	9107	1866/19	9321
694/4	2854	1235	1398	1383	9702	1657	9108	1867	9324
696/4	2856	1239	1399	1384	9703	1675	9210	1867/19	9323
1064	5480	1243/4	5516	1385	9704	1676	9211	1868/19	9325
1065	5488	1244	1732	1386	9705	1677	9212	1870	9500
1067	5481	1245	1733	1387	9713	1678	9213	1871	9501
1069	5489	1246	1734	1388	9714	1679	9214	1872	9502
1072	5482	1247	1735	1389	9715	1680	9215	1873	9503
1075	5483	1247/6	1736	1389/4	9716	1685	9200	1874	9504
1079	5484	1247/7	1737	1389/2	9717	1686	9201	1875	9505
1085	5490	1247/8	1738	1389/0	9718	1687	9202	1876	9506
1100	1478	1249	1460	1389/00	9719	1688	9203	1877	9507
1101	1401	1250	1462	1400	1714	1689	9204	1878	9508
1102	1402	1250/18	1456	1401	1715	1690	9205	1879	9509
1105	1479	1251	1463	1402	1716	1702	1461	1891	5583
1106	1406	1252	1464	1410	1717	1703	1721	1893	5400
1107	1407	1253	1465	1411	1718	1704	1457	1894	5401
1110	1410	1254	1466	1449	1701	1705	1461	1894/4	5406
1133	5603	1255	1467	1450	1702	1706	1459	1895	5640
1136	5606	1255/8	1455	1450/16	1705	1710	1458	1896	5641
1142	5612	1274	5485	1451	1703	1712	1722	1896/4	5642
1145	5615	1275	5491	1451/16	1706	1713	1723	1896/12	5646
1149	5619	1277	5486	1452	1704	1715	1724	1897	5581
1151	5627	1279	5492	1452/16	1707	1716	1725	1898/4	5470
1157	4509	1282	5487	1454	1708	1717	1726	1898/12	5474
1158	4517	1285	5493	1456	1709	1719	1728	1898/15	5475
1159	3421	1300	5201	1458	1710	1721	1740	1898/19	5476
1160	3451	1302	5205	1459	1711	1723	1741	1898/25	5477
1161	3461	1304	5211	1459/15	1712	1726	1742	1899	5582
1163	3465	1307	5226	1459/20	1713	1728	1743	1900	5584
1164	3466	1307/7	5231	1504	9037	1746	5541	1912	5556

**CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS**

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

CROSS REFERENCE CHART

ALPHA — CONSOLIDATED (Continued)

COMPARABLE OR IDENTICAL

(See Respective Page Number for Complete Description)

Alpha Number	Consolidated Number	Alpha Number	Consolidated Number	Alpha Number	Consolidated Number	Alpha Number	Consolidated Number	Alpha Number	Consolidated Number
1918	881	2163	1312	2821/4	9823	4107	7507	5952	902
1921	5585	2164	1314	2824	9824	4108	7508	5953	903
1924	5586	2166	1315	2824/2	9825	4110	7510	5954	904
1932	4307	2167	1316	2824/3	9826	4112	7512	6000	5303
1932/3	4312	2168	1317	2824/4	9827	4114	7514	6002	5306
1932/4	4314	2170	1318	2827	9828	4116	7516	6004	5309
1933	4317	2171	1319	2827/2	9829	4119	7519	6006	5311
1933/3	4322	2171/1	1320	2827/3	9830	4121	7521	6008	5315
1933/4	4324	2172	1321	2827/4	9831	4122	7522	6010	5323
1934	4327	2173	1322	2829	9832	4124	7524	6012	5326
1934/3	4332	2174	1323	2829/2	9833	4126	7526	6014	5329
1934/4	4334	2175	1324	2829/3	9834	4130	7530	6016	5331
1935	4337	2175/1	1325	2829/4	9835	4137	7537	6018	5335
1935/3	4342	2176	1326	2850	9600	4150	7550	6020	5339
1935/4	4344	2254	5568	2851	9601	4160	7560	6022	5347
1936	4347	2254/1	5551	2852	9602	4202	7602	6460	9720
1936/3	4352	2254/3	5569	2853	9604	4203	7603	6463	9721
1936/4	4354	2256	5543	2854	9603	4204	7604	6466	9722
1937	4357	2258	5543	2854/7	9606	4205	7605	6469	9723
1937/3	4362	2402	5572	2855	9607	4206	7606	6470	9724
1937/4	4364	2403	5576	2855/7	9608	4207	7607	6471	9725
1938	4367	2412	5573	2856	9609	4208	7608	6630	4524
1938/3	4372	2413	5577	2856/7	9610	4209	7609	6631	4525
1938/4	4374	2422	5574	2857	9611	4210	7610	6632	4521
1944	5547	2423	5578	2858	9613	4212	7612	7053	920
1945	5547	2432	5575	2859	9614	4214	7614	7054	921
1946	5140	2433	5590	2859/10	9616	4216	7616	7055	922
1947	5140	2442	5589	2859/12	9615	4219	7619	7056	923
1951	4202	2443	5591	2874	9625	4224	7624	7057	924
1952	4207	2444	5596	2875	9627	4227	7627	7058	925
1952/3	4212	2450	5901	2876	9629	4230	7630	9006A	4433
1952/4	4214	2451	5902	2877	9631	4234	7634	9008	4415
1953	4217	2460	5588	2878	9633	4237	7637	9008A	4435
1953/3	4222	2461	5570	2879	9634	4240	7640	9009B	4438
1953/4	4224	2809	9800	2879/10	9636	4302	7702	9011	4419
1954	4227	2809/2	9801	2879/12	9635	4303	7703	9011A	4440
1954/3	4232	2809/3	9802	3050	819	4304	7704	9012A	4441
1954/4	4234	2809/4	9803	3051	821	4305	7705	9014A	4468
1955	4237	2811	9840	3053	831	4306	7706	9017A	4482
1955/3	4242	2811/2	9841	3055	846	4307	7707	9022B	4475
1955/4	4244	2811/3	9842	3071	866	4308	7708	9055	4447
1956	4247	2811/4	9843	3073	871	4309	7709	9055B	4484
1956/3	4252	2812	9804	3075	876	4310	7710	9058	4405
1956/4	4254	2812/2	9805	3077	890	4312	7712	9058A	4449
1957	4257	2812/3	9806	3079	891	4314	7714	9058C	4450
1957/3	4262	2812/4	9807	3706	8006	4315	7715	9059	4401
1957/4	4264	2814	9844	3712	8012	4316	7716	9059B	4470
1958	4267	2814/2	9845	3718	8018	4318	7718	9062	4452
1958/3	4272	2814/3	9846	3725	8025	4319	7719	9062A	4453
1958/4	4274	2814/4	9847	3750	8050	4320	7720	9063B	4455
1967	4027	2815	9808	3806	8016	4322	7722	9071B	4485
1977	5148	2815/2	9809	3812	8112	4325	7725	9161	4724
1979	5148	2815/3	9810	3818	8118	4327	7727	9174	4459
1982	4079	2815/4	9811	3825	8125	4330	7730	9178B	4729
1985	5587	2817	9848	3850	8150	4334	7734	9179B	4731
2130	1340	2817/2	9849	3906	8306	4337	7737	9180B	4734
2132	1341	2817/3	9850	3912	8312	5160	4503	9187A	4736
2134	1342	2817/4	9851	3918	8318	5165	4506	9188A	4738
2136	1343	2818	9812	3925	8325	5851	9601	9195A	4740
2138	1344	2818/2	9813	3950	8350	5852	9602	9196A	4742
2140	1345	2818/3	9814	4006	8406	5853	9604	9212	4488
2142	1346	2818/4	9815	4012	8412	5854	9605	9213	4489
2144	1347	2819	9852	4018	8418	5854/7	9606	9214	4490
2146	1348	2819/2	9853	4025	8425	5855	9607	9215	4497
2148	1349	2819/3	9854	4050	8450	5855/7	9608	9217	4492
2150	1350	2819/4	9855	4102	7502	5856	9609	9218	4493
2152	1351	2821	9820	4103	7503	5856/7	9610	9219	4494
2160	1310	2821/2	9821	4105	7505	5857	9611	9223	4496
2162	1311	2821/3	9822	4106	7506	5858	9613	9224	4411
						5951	901	9316	4759

CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616



MILITARY AND GOVERNMENT SPECIFICATIONS

WIRES AND CABLES

WE WELCOME YOUR INQUIRIES FOR THE FOLLOWING, SPECIFY TYPE DESIGNATION

SPECIFICATION	SPECIFICATION	SPECIFICATION
MIL-C-17C	MIL-C-11097A	MIL-C-27212A
MIL-W-76B	MIL-C-11311	MIL-C-27300A
MIL-C-442B	MIL-C-11440	MIL-C-27500
MIL-W-583B	MIL-C-11540	MIL-C-55036
MIL-I-631D	MIL-C-12349	MIL-C-55040
MIL-C-915A	MIL-C-12432B	
MIL-C-1892	MIL-C-12881	BUR. YARDS & DOCKS
MIL-C-1907	MIL-W-12995	SPEC. 9YG
MIL-C-2194D	MIL-C-13017	
MIL-C-2486C	MIL-C-13021	AIR FORCE MANUAL
MIL-C-2681	MIL-W-13074	AFM-88-15
MIL-C-3078	MIL-W-13075	
MIL-W-3093	MIL-C-13077	J-C-90a
MIL-W-3104	MIL-W-13169B	J-C-94
MIL-C-3162A	MIL-C-13268	J-C-98
MIL-C-3432B	MIL-C-13273	J-C-103b
MIL-C-3458A	MIL-W-13276	J-C-129a
MIL-C-3849	MIL-C-13294B	J-C-138
MIL-W-3861	MIL-C-13486A	
MIL-C-3883	MIL-C-13745	
MIL-C-3884	MIL-C-13770	
MIL-L-3930B	MIL-C-13777C	INTERIM
MIL-C-4921	MIL-C-13892	J-C-129b
MIL-W-5086A	MIL-C-15479C	J-C-0094a
MIL-C-5136B	MIL-C-16839C	J-C-00103c
MIL-C-5186	MIL-W-16878D	J-C-00115
MIL-C-5252B	MIL-C-17235	
MIL-W-5274A	MIL-C-17621	
MIL-C-5756B	MIL-C-17818	CORPS. of ENGRS.
MIL-C-5898A	MIL-C-18266	GUIDE SPEC. 303-01
MIL-L-6477B	MIL-C-18869A	1404.04
MIL-C-7072A	MIL-C-18913	
MIL-C-7078A	MIL-C-18959A	
MIL-W-7139A	MIL-C-18961A	QQ-W-343
MIL-W-8777A	MIL-C-18962A	QQ-A-351d
MIL-C-8817	MIL-W-19150A	QQ-A-365b
MIL-E-9085A	MIL-W-19381A	QQ-B-575
MIL-E-9088A	MIL-C-19547	
MIL-C-9660	MIL-W-19583	
MIL-C-10065A	MIL-C-19654	CAA-701c
MIL-C-10255	MIL-C-19787B	CAA-893b
MIL-P-10255	MIL-C-19883A	
MIL-C-10392B	MIL-C-21609	
MIL-C-10581B	MIL-C-22759	L-824
MIL-P-10582	MIL-C-23206	
MIL-C-10769	MIL-C-25038	
MIL-C-10820B	MIL-C-25326	
MIL-C-10993A	MIL-C-25622	
MIL-C-11060	MIL-C-27072	



CONSOLIDATED WIRE & ASSOCIATED CORPORATIONS

1633 S. CLINTON ST. • (312) 421-4441 • Cable Address: "CON WIRE" • CHICAGO, ILL. 60616

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

DAFLEX 105 PLASTIC TUBING**105°C POLYVINYLCHLORIDE (PVC) MEETS MIL-I-631D SPECS**

Specifically compounded vinyl resins for superior all around performance. UL approved for 105°C, conforms to Spec MIL-I-631D Type F, Form U, Grades A and C, Class 1 and 2, Category 1. Resistant to heat, oil, water, chemical corrosion, fungi and aging. Very hi abrasion resistance. Will retain its flexibility. Suitable for covering and protecting wires and cables. Designed for electrical, electronic and aircraft applications. Non-flammable. Meets ASTM—D876, ASTM—D922.

D105 compounded with non-migratory resin type plasticizers. Retains its flexibility, permitting it to cling and protect irregular shapes. D105 snakes well under practically all conditions.

DIMENSIONAL TOLERANCES OF DAFLEX 105

DAFLEX No.	Size	Old Daburn No.	Nom. I.D.	Nom. Wall	Specify Std. Put-Up Spool or Coil	ASTM Tolerance, Inches	Wall Thickness Inches
D105-24	24	808	.022"	.012"	25', 100', 1000'	.020 .027	.012 ± .002
D105-22	22	811	.027"	.012"	25', 100', 1000'	.025 .032	.012 ± .002
D105-20	20	813	.034"	.016"	25', 100', 1000'	.032 .039	.016 ± .003
D105-19	19	—	.038"	.016"	100', 1000'	.044 .036	.016 ± .003
D105-18	18	814	.042"	.016"	25', 100', 1000'	.040 .049	.016 ± .003
D105-17	17	—	.047"	.016"	100', 1000'	.054 .045	.016 ± .003
D105-16	16	815	.053"	.016"	25', 100', 1000'	.051 .061	.016 ± .003
D105-15	15	—	.059"	.016"	100', 500'	.067 .057	.016 ± .003
D105-14	14	816	.066"	.016"	25', 100', 500'	.064 .072	.016 ± .003
D105-13	13	—	.076"	.016"	100', 500'	.080 .072	.016 ± .003
D105-12	12	817	.085"	.016"	25', 100', 500'	.081 .089	.016 ± .003
D105-11	11	—	.095"	.016"	100', 500'	.101 .091	.016 ± .003
D105-10	10	825	.106"	.016"	25', 100', 500'	.102 .112	.016 ± .003
D105-9	9	—	.118"	.020"	100', 500'	.124 .114	.020 ± .003
D105-8	8	818	.135"	.020"	25', 100', 500'	.129 .141	.020 ± .003
D105-7	7	—	.148"	.020"	100', 500'	.158 .144	.020 ± .003
D105-6	6	826	.166"	.020"	25', 100', 250'	.162 .178	.020 ± .003
D105-5	5	—	.186"	.020"	100', 250'	.198 .182	.020 ± .003
D105-4	4	819	.208"	.020"	25', 100', 250'	.204 .224	.020 ± .003
D105-3	3	—	.234"	.020"	100', 250'	.249 .229	.020 ± .003
D105-2	2	820	.263"	.020"	100', 250'	.258 .278	.020 ± .003
D105-1	1	—	.295"	.020"	100', 250'	.311 .289	.020 ± .003
D105-0	0	—	.330"	.020"	100', 250'	.347 .325	.020 ± .003
D105-3/8"	3/8"	821	.312"	.025"	100', 250'	.3125 .334	.025 ± .003
D105-1/2"	1/2"	822	.375"	.025"	100', 250'	.375 .399	.025 ± .003
D105-5/8"	5/8"	—	.438"	.025"	100', 250'	.462 .438	.025 ± .003
D105-3/4"	3/4"	823	.500"	.025"	100', 250'	.500 .524	.025 ± .003
D105-7/8"	7/8"	—	.562"	.030"	50', 100'	.592 .562	.030 ± .003
D105-1"	1"	824	.625"	.030"	50', 100'	.625 .655	.030 ± .005
D105-1 1/8"	1 1/8"	827	.750"	.035"	50', 100'	.750 .786	.035 ± .005
D105-1 1/4"	1 1/4"	860	.875"	.035"	50', 100'	.875 .911	.035 ± .005
D105-1 1/2"	1 1/2"	861	1.000"	.035"	50'	1.000 1.036	.035 ± .005
D105-1 3/4"	1 3/4"	—	1.125"	.040"	50'	1.125 1.161	.035 ± .005
D105-1 7/8"	1 7/8"	862	1.250"	.040"	50'	1.250 1.286	.040 ± .005
D105-2"	2"	—	1.375"	.040"	50'	1.375 1.411	.040 ± .005
D105-1 1/2"	1 1/2"	863	1.500"	.045"	50'	1.500 1.536	.045 ± .005
D105-1 3/4"	1 3/4"	863	1.750"	.055"	50'	1.812 1.750	.055 ± .008
D105-2"	2"	829	2.000"	.060"	50'	2.000 2.070	.060 ± .010
D105-2 1/4"	2 1/4"	864	2.250"	.065"	50'	2.250 2.330	.065 ± .010
D105-2 1/2"	2 1/2"	865	2.500"	.070"	50'	2.500 2.590	.070 ± .010

COLORS AVAILABLE FROM STOCK:

All sizes 24 thru 2 1/2": Clear, black, white.

ALSO STOCKED—Sizes 2 thru 7: Clear, black, white, yellow.

Sizes 8 thru 14: All above plus green, red.

Sizes 15 thru 24: All above plus blue. Additional Colors Available.

INDUSTRIAL, MEDICAL & LABORATORY TUBING AVAILABLE

ALL THE ABOVE TUBING CAN BE ORDERED CUT OR CUT AND MARKED TO YOUR SPECIFICATIONS

DAFLEX AND DAFLON TUBING**PLASTIC - FIBERGLASS - TEFLON TUBING COMPARATIVE PROPERTIES CHART**

DAFLEX AND DAFLON TUBING	D105	D74	D130	D1200	DTT500 DTT550
Maximum Operating Temperature	105°C	80°C	130°C	1200°F	Continuous Service 250°C
Maximum Low Temperature Flexibility	-30°C	-67°C	-20°C	—	-90°C
Dielectric Strength Dry-V/MIL	1000 @ .015 Wall 900 @ .030 Wall	650 @ .015 Wall 300 @ .030 Wall	4000	Determined by Space Factor	1400 @ .010 Wall 850 @ .020 Wall
Dielectric Constant	6.0	4.5	7.0	—	2.2
Flammability	Self-Extinguishing	Self Extinguishing	Self Extinguishing	Will not burn	Non-flammable
Tensile Strength (PSI)	2700-3300	2200	1500-2000 (coating material only)	—	5000 - 7500
Ultimate Elongation	300 - 400%	375 - 450%	300 - 400%	—	300 - 500%
Minimum Volume Resistance Ohm-CM	10 ¹⁰	—	10 ⁷	—	10 ¹⁷
Fungus Resistance	Excellent	Excellent	Good	Excellent	Completely Inert
Oil Resistance	Excellent	Excellent	Excellent	Excellent	Superior
Abrasion Resistance	Excellent	Fair	Excellent	—	Fair
Chemical Corrosion Resistance	Excellent	Good	Excellent	Excellent	Completely Inert
Applicable Specs	MIL-I-631D UL E-51336 Grade A & C Type F, Form U Class 1 & 2 Category 1 ASTM-D876 ASTM-D922 MIL-T-5438	MIL-I-7444B MIL-I-22076B	MIL-I-3190B Class B, Grade B ASTM-D372 NEMA-VS-1 MIL-I-21557 MIL-T-5438 UL E-20344	NEMA VSI	MIL-T-22129C MIL-P-14078A AMS-3651B AMS-3653 AMS-3654 AMS-3655 MIL-C-17D UL E-33531
Gamma Radiation Dosage to 25% Degradation Ergs/Gram	10 ¹⁰	10 ⁹	10 ⁹	—	10 ⁷
Corona Resistance	Excellent	Good	Excellent	—	Good

DABURN ELECTRONICS & CABLE CORP. • 2360 HOFFMAN ST., BRONX, N.Y. 10458 (212) 295-0050 TWX 710-593-4145

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

DAFLEX AND DAFLOX COMPARATIVE PROPERTIES CHART • DAPRENE TUBING • MIL-SPEC**DAFLEX AND DAFLOX SHRINKABLE PRODUCTS COMPARATIVE PROPERTIES CHART**

DAFLEX & DAFLOX HEAT SHRINKABLE TUBING	Neoprene* SH-162	Vinyl (PVC) In Colors SH-265	Heavy Wall PVC SH-267	Irradiated Polyolefin SH-275	Semi-Rigid Polyolefin SH-290	Tefzel* SH-300
Continuous Operating Temperature	212°F	105°C 220°F	105°C 221°F	135°C 275°F	135°C 275°F	180°C 356°F
Shrinkage Temperature	160°F	95°C 200°F	95°C 200°F	120°C 250°F	120°C 250°F	149°C 300°F
Shrinkage Ratio Minimum	2:1 (50%)	2:1 (50%)	2:1 (50%)	2:1 (50%)	2:1 (50%)	1½:1
Longitudinal Change	15%	10%	10%	5%	5%	—
Tensile Strength, PSI Minimum	1800	2000	2000	2400	2600	6500
Ultimate Elongation %	800	200	200	400	400	200
Low Temperature Flexibility	-55°C -67°F	-10°C +14°F	-10°C +14°F	-55°C -67°F	-55°C -67°F	-67°C -85°F
Specific Gravity (ASTM D792)	1.40	1.40	1.40	1.30 Color Tubing 1.0 Clear Tubing	1.26 Color Tubing 1.0 Clear Tubing	1.70
V/MIL. Minimum Dielectric Strength (ASTM D149)	200	700	600	500	500	400
Water Absorption Maximum (MIL-I-23053)	1.0%	1%	1%	.1%	.1%	.03%
Fungus Resistance (MIL-I-7444)	Good	Excellent	Excellent	Excellent	Excellent	Excellent
Corrosion (MIL-I-23053)	Good	2.0% Max. Per MIL-I-631	2.0% Max. Per MIL-I-631	Non-corrosive	Non-corrosive	Non-corrosive
Flammability (MIL-I-23053)	Self-Ext.	Self-Ext.	Self-Ext.	Self-Ext.†	Self-Ext.†	Non-flammable
Resistance to Soldering Iron	Poor	Poor	Poor	Good	Good	Excellent
Applicable Specs	MIL-R-46846 MIL-I-23053B/1 UL E-33531	MIL-I-20353/2 MIL-I-631 ASTM-D-792 ASTM-D-149 ASTM-D-638 ASTM-D-150 MIL. STD. 104 UL E-51336	MIL. STD. 104 UL E-20344 ASTM-D-792 MIL-I-631	MIL-I-23053/5 MIL-I-7444B ASTM-D-792 ASTM-D-149 ASTM-D-638 ASTM-D-150 ASTM-14-53T ASTM-150-54T MIL. STD. 104 L-P 406 UL E-51336	MIL-I-2353B MIL-I-7444B ASTM-D-792 ASTM-D-149 ASTM-D-638 ASTM-D-150 MIL. STD. 104 UL E-51336	SH-300
Temperature Limits	-67 to 212°F	-25 to +221°F	-25 to +221°F	-67 to +275°F	-67 to +275°F	-150 to +350°F

*Dupont. ®Pennsalt Chemical Co. †Clear tubing is not flame retardant.

DAPRENE™ HEAT SHRINKABLE NEOPRENE TUBING

This tubing meets or exceeds MIL-R-46846 and MIL-I-23053B/1. Shrinks down 50% of its supplied inside diameter, upon exposure to heat of 160°F—will remain elastomeric—with no cracks. Longitudinal shrinkage 15% upon complete shrinkage. Partial shrinkage begins at 130°F. Will protect solder joints, terminals, fittings, pipes; used for harnessing, and jacketing wires, medical equipment, etc. Resists corrosion, chemicals, flame; good mechanical and electrical strength. Available in expanded sizes from ¼" through 4". **COLOR:** Black. Tubing must be stored below 100°F.

**PROPERTIES:****ELECTRICAL**

Dielectric Strength: Min. 200 V/Mil.
Volume Resistivity: Ohm/Cm, 10¹⁰ Min.

CHEMICAL

Solvent Resistance: Excellent.
Corrosion Resistance: Good.
Water Absorption: 1.0% Max.
Flammability: Self Extinguishing 15 Sec.

PHYSICAL

Temperature Range: -67°F to 212°F.
Elongation: 300% Min.
Tensile Strength: Min. 1800 PSI.
Specific Gravity: 1.40 Max.
Heat Resistance: 212°F for 96 Hrs.
Heat Shock: 301°F for 5 Hrs. No Cracking.
Hardness: Shore A Durometer 85±5.

STORAGE INSTRUCTIONS

For Maximum Dimensional Stability:
1 Month Under 100°F, 12 Months
Under 70°F. Avoid Direct Sunlight.

DAPRENE™ SH162 HEAT SHRINKABLE NEOPRENE TUBING 2:1

DABURN Cat. No.	Size	I.D. Before Shrinking As Supplied	Recovered Dimensions (After Heating)	
			I.D. Maximum	Wall Thickness
SH162-¼"	¼"	.250"	.125"	.035" ± .010"
SH162-⅜"	⅜"	.375"	.188"	.040" ± .010"
SH162-½"	½"	.500"	.250"	.048" ± .015"
SH162-⅝"	⅝"	.625"	.313"	.052" ± .015"
SH162-¾"	¾"	.750"	.375"	.057" ± .015"
SH162-7/8"	7/8"	.875"	.438"	.065" ± .015"
SH162-1"	1"	1.000"	.600"	.070" ± .020"
SH162-1¼"	1¼"	1.250"	.625"	.087" ± .020"
SH162-1½"	1½"	1.500"	.750"	.095" ± .020"
SH162-1¾"	1¾"	1.750"	.875"	.107" ± .020"
SH162-2"	2"	2.000"	1.000"	.110" ± .020"

STD. PKGE.: 100 ft. (random lengths — 10 ft. minimum). * Neoprene—Dupont.

FOR SHRINKING TUBING SEE PAGE 6 FOR HEAT GUN AND ACCESSORIES

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

AND HEAVY WALL SHRINKABLE PVC TUBING • SHRINKABLE TUBING ASSORTMENTS**DAFLEX AND DAFLOX SHRINKABLE PRODUCTS COMPARATIVE PROPERTIES CHART**

Kynar® SH-350	Teflon® FEP SH-400	4:1TFE SH-421	Shrink/Melt Teflon® SM-450	Teflon® TFE SH-621	Shrinkable Tape ST-275	Shrinkable Polyolefin Boots/Transistors	Melt Liner DML
232°C 450°F	200°C 400°F	288°C 500°F	232°C 450°F	250°C 480°F	125°C 257°F	135°C 275°F	—
175°C 347°F	184°C 300°F	327°C 621°F	327°C 621°F	327°C 621°F	121°C 250°F	135°C 275°F	135°C 275°F
2:1 (50%)	1¼:1	4:1	1½:1	1½:1	1½:1 (30%)	—	—
10%	10-20%	10-20%	5-25%	10-20%	30%	—	—
4500	3000	3000	2500	3000	1200	1500	2000
150	200	200	200	200	200	250 Min.	200
-55°C -67°F	-67°C -85°F	-67°C -85°F	-170°C -275°F	-67°C -85°F	-55°C -67°F	-55°C -67°F	-75°C -100°F
1.8	2.16	2.2	2.17	2.20	1.2 Max.	1.4	1.0
1000	500	500	500	500	115	200	800
.5%	.01%	.01%	—	.01%	.1%	.2%	.1%
Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Pass	Excellent
Non-corrosive	Non-corrosive	Non-corrosive	Non-corrosive	Non-corrosive	Non-corrosive	Non-corrosive	Non-corrosive
Self-Ext. Good	Non-flammable Excellent	Non-flammable Excellent	Non-flammable Excellent	Non-flammable Excellent	Self-Ext. Good	Self-Ext. Good	— Poor
ASTM-D-638 ASTM-D-570 ASTM-D-876 ASTM-D-792 ASTM-D-257 MIL-I-7444	MIL-I-23053/11	MIL-I-23053/12 AMS-3584	SM-450	MIL-I-20353B MIL-I-22129C MIL-I-7444B ASTM-D-638 ASTM-D-149 ASTM-D-792 ASTM-D-150 MIL. Std. 104 L-P 406	ASTM-D-150 ASTM-D-1000 ASTM-D-570 ASTM-D-638 ASTM-D-792 MIL. Std. 104	MIL-I-7444 ASTM-D-570 ASTM-D-257 ASTM-D-149 ASTM-D-412 ASTM-D-792	ASTM-D-570 ASTM-D-150 ASTM-D-876 ASTM-D-638
-67 to 450°F	-275 to +400°F	-275 to +400°F	-275 to +450°F	-275 to +500°F	-67 to +257°F	-67 to +275°F	—

DABURN SHRINKABLE HEAVY WALL POLYVINYLCHLORIDE TUBING

This heavy wall PVC tubing shrinks 50% in diameter when heated to 200°F for one minute or less, and has the same characteristics as the DAFLEX SH-265 All Purpose Series, except for its heavier wall. The heavier wall allows for additional protection where industry requires. DAFLEX SH-267 Tubing meets or exceeds the performance requirements of MIL-I-20353/2 Class 2 but not the dimensional requirements because of the wall thickness. It meets or exceeds UL specs, including FR-1.

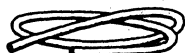
DAFLEX Cat. No.	Equiv. I.D. AWG	Nom. Expanded I.D. As Supplied	Recovered†		Std. Pkg.
			Max. I.D.	Nom. Wall	
SH-267-½"	14	.125" 3.16mm	.063" 1.57mm	.032" .081mm	1000'
SH-267-¾"	12-10	.187" 4.76mm	.093" 2.38mm	.032" .081mm	1000'
SH-267-1"	8	.250" 6.35mm	.125" 3.16mm	.032" .081mm	1000'
SH-267-1¼"	6	.312" 7.93mm	.156" 3.95mm	.032" .081mm	500'
SH-267-1½"	4	.375" 9.53mm	.187" 4.76mm	.032" .081mm	500'
SH-267-2"	2	.500" 12.70mm	.250" 6.35mm	.032" .081mm	500'

†When full recovery is allowed.

COLOR: Black. Additional colors available to order.

DABURN SHRINKABLE POLYVINYLCHLORIDE ALL PURPOSE**SHRINKABLE RATIO: 2:1 (50%)**

Flexible, shrinks 50% on heat application, approximately 15% longitudinal contraction. Suitable for insulating components and cables in varying shapes and diameters. Has a higher resistance to oils than low density polyethylene. Conforms to MIL-I-631D, Type F, Form U, Grade A and C, Class 1 and 2, Cat. 1. Controlled shrinkage on application of heat to predetermined size takes place at temperatures below 200°F (one minute or less). For maximum dimensional stability: Store under 100°F for 1 month; under 85°F for 4 months; under 70°F for 12 months. Meets or exceeds MIL-I-23053B/2 Class 2, File No. E-51336. UL approved. OPERATING TEMP.: -20°C to +105°C.

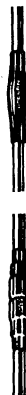


FR-1 CAT. NOS. INDICATE EXPANDED SIZE

SHRINKABLE TUBING ASSORTMENTS

DAFLEX Cat. No.	Lengths Per Pack	Tubing Size
SH-265-PA1	30	¼" thru ¾"
SH-265-PA2	16	¼" thru ¾"
SH-265-PA3	10	1"

COLORS: Black, White, Clear, Red. Each pack contains an assortment of 6" lengths in mixed sizes and colors (specify).



DAFLEX Cat. No.	Equiv. I.D. AWG	Before Shrinking I.D. Expanded As Supplied	Max. Recovered I.D.	Recovered Nom. Wall†	Standard Package
SH-265-¼"	22-20	.063"	.031"	.020"	100', 250', 1000'
SH-265-½"	18-16	.093"	.046"	.020"	100', 250', 1000'
SH-265-¾"	14	.125"	.062"	.020"	100', 250', 1000'
SH-265-1"	12-10	.187"	.093"	.020"	100', 250', 1000'
SH-265-1¼"	8	.250"	.125"	.025"	100', 250', 1000'
SH-265-1½"	6	.312"	.156"	.025"	100', 250', 500'
SH-265-1¾"	4	.375"	.187"	.025"	100', 100', 500'
SH-265-2"	2	.500"	.250"	.025"	25', 100', 500'
SH-265-2½"		.750"	.375"	.030"	25', 100', 500'
SH-265-3"		1.000"	.500"	.035"	25', 50', 500'
SH-265-3½"		1.500"	.750"	.035"	25', 50', 100'
SH-265-4"		2.000"	1.000"	.040"	25', 50', 100'

COLORS: Black, White, Clear, Red. Additional colors available.

†When full recovery is allowed.

FOR SHRINKING TUBING SEE PAGE 6 FOR HEAT GUN AND ACCESSORIES

DABURN ELECTRONICS & CABLE CORP. • 2360 HOFFMAN ST., BRONX, N.Y. 10458 (212) 295-0050 TWX 710-593-4145

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

SHRINKABLE IRRADIATED POLYOLEFIN TUBING • PACKAGED ASSORTMENTS
TEFZEL* • KYNAR®**SHRINKABLE IRRADIATED POLYOLEFIN TUBING**

This series is designed for maximum mechanical strength at stress or points of connection. It is strong and abrasion resistant and is supplied in expanded sizes. It insulates, jackets, splices, encapsulates, weatherproofs components, connectors, cables and irregular shaped objects. When exposed to heat (300°F) the tubing shrinks 50% in diameter, 5% longitudinal contraction. Controlled shrinkage to exact requirement takes place. Meets or exceeds MIL-I-23053B/5 Class 1 and 2. Available with UL approval. UL File No. E-51336. AMS 3636B 3637A.



Cat. Nos. Indicate EX-
PANDED Size. Shrinkage
Ratio: 2:1 (50%)

DAFLEX SH-275 All Purpose	DAFLEX SH-290 Semi-Rigid	Equiv. I.D. AWG	Before Shrinkage As Supplied Expanded I.D.	Recov- ered I.D.	Recovered Nom. Wall*	Standard Package
SH-275-1/8"	SH-290-1/8"	22-20	.063"	.031"	.016"	100', 250'
SH-275-3/32"	SH-290-3/32"	18-16	.093"	.046"	.020"	100', 250'
SH-275-1/16"	SH-290-1/16"	14	.125"	.062"	.020"	100', 250'
SH-275-3/16"	SH-290-3/16"	12-10	.187"	.093"	.020"	100', 250'
SH-275-1/4"	SH-290-1/4"	8	.250"	.125"	.025"	100', 250'
SH-275-5/16"	SH-290-5/16"	6	.312"	.156"	.025"	100', 200'
SH-275-3/8"	SH-290-3/8"	4	.375"	.187"	.025"	100', 200'
SH-275-1/2"	SH-290-1/2"	2	.500"	.250"	.025"	100', 200'
SH-275-3/4"	SH-290-3/4"	3/8	.750"	.375"	.030"	100', 200'
SH-275-1"		1/2	1.000"	.500"	.035"	100', 200'
SH275-1 1/2"		3/4	1.500"	.750"	.040"	12** 24**
SH275-2"		1"	2.000"	1.000"	.045"	12** 24**
SH275-3"		1 1/2"	3.000"	1.500"	.050"	12** 24**
SH275-4"		2"	4.000"	2.000"	.055"	12** 24**

STOCK COLORS: Black, White, Red, Clear. Additional colors available. Although processed by hi-energy radiation the Dabflex SH-275 and SH-290 shrinkable tubings do not at any time become radioactive or possess any residual radioactivity. *Wall thickness will be less if recovery is restricted.

**4' lengths. SHRINKABLE POLYOLEFIN END CAPS & TAPE AVAILABLE.

SPECIFICATIONS—All Tests Made on Tubing in Recovered Dimension

Continuous Operating Temp: 135°C	Shrinkage Ratio: 2:1 (50%)
Longitudinal Change: 5% Max.	Dielectric Strength: 500 V/MIL Min.
Tensile Strength: 1500 PSI Min.	Dielectric Constant: 2.87 Max.
Ultimate Elongation: 200% Min.	Corrosive Resistance: Non-Corrosive
Special Gravity: 1.29 Max.	Resistance to Soldering Iron: Excellent
Low Temp. Flexibility (-54°C):	Fuel, Oil, Solvent, Acid, Alkali,
No Cracking	Hydraulic Fluid Resistance: Excellent

PACK ASSORTMENTS

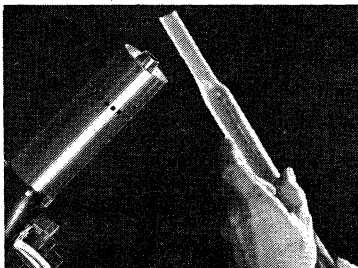
DAFLEX Cat. No.	Lengths Per Pack	Tubing Size
SH-275-PA1	30	1/8" thru 3/8"
SH-275-PA2	16	1/4" thru 3/4"
SH-275-PA3	10	1"

COLORS: Black, White, Clear, Red. Each pack contains an assortment of 6' lengths in mixed sizes and colors (specify).

DAFLEX SHRINKABLE TEFZEL* TUBING

DAFLEX SH-300 Shrinkable Tefzel Tubing is the new high-temperature polymer designed to offer an unusual combination of ruggedness, chemical resistance and dielectric properties, over a very wide temperature range. While Tefzel is much like Teflon*, it is superior in mechanical ruggedness. It shrinks 30% and is non-flammable in air. It shrinks down at 300°F (150°C) and will operate up to 230° for short periods.

Operating Temperature: -54°C to +180°C.



DAFLEX Cat. No.	Size	Minimum Expanded I.D.	Maximum Recovered† I.D.	Recovered† Wall
SH-300-3/16"	3/16"	.187"	.025"	.012"
SH-300-1/4"	1/4"	.250"	.166"	.015"
SH-300-3/8"	3/8"	.375"	.250"	.015"
SH-300-1/2"	1/2"	.500"	.345"	.015"
SH-300-3/4"	3/4"	.750"	.500"	.020"
SH-300-1"	1"	1.00"	.665"	.025"
SH-300-1 1/4"	1 1/4"	1.25"	.835"	.030"

STANDARD COLOR: Transparent. Shrinks 30%

Standard Package: 100' (4' Lengths).

*Dupont

†When full recovery is allowed.

DAFLEX MELTABLE LINER

DAFLEX Meltable Liner Series. DML, in conjunction with heat shrinkable tubing, allows the encapsulation of one end, of both ends, or of the entire unit. It will prevent corrosion and moisture penetration. DML is economical because only the amount actually necessary to seal, need be used. DAFLEX DML is a thermoplastic tubing which flows, melts and sticks to most low temperature plastics, fabrics and many metals, upon the application of heat. It begins to melt and flow at 175°F.

NOTE: End Caps may be made relatively inexpensively by slipping a piece of DML into shrinkable tubing, placing both over an object and heating. While the tubing is still warm, simply punch one end with a pair of pliers and allow to cool. Note: This liner is to be used in conjunction with shrinkable tubing.

DAFLEX Cat. No.	For Heat Shrinkable Tubing Having An Expanded I.D. of	Supplied I.D. (Minimum)	Supplied O.D. (Minimum)	Standard Put-Up
DML-3/32"	.093" 2.38mm	.054" 1.35mm	.084" 2.10mm	100', 500', 1000'
DML-1/16"	.125" 3.18mm	.089" 2.22mm	.115" 2.87mm	100', 500', 1000'
DML-3/16"	.187" 4.76mm	.151" 3.77mm	.177" 4.42mm	100', 500', 1000'
DML-1/4"	.250" 6.35mm	.210" 5.25mm	.248" 6.20mm	100', 500'
DML-3/8"	.375" 9.53mm	.337" 8.42mm	.375" 9.37mm	100', 200'
DML-1/2"	.500" 12.70mm	.437" 10.9mm	.475" 11.8mm	100', 200'
DML-3/4"	.750" 19.05mm	.693" 17.3mm	.739" 18.4mm	100', 200'
DML-1"	1.00" 25.40mm	.940" 23.5mm	.985" 24.6mm	100'
DML-1 1/2"	1.50" 38.10mm	1.440" 36.0mm	1.48" 37.0mm	100'

STANDARD COLOR: Clear. Other colors available to order.

Special cut lengths available to order.

Properties	Method of Test	Result
Tensile Strength	ASTM D 638-6 IT	2,000 PSI
Ultimate Elongation	ASTM D 638-6 IT	200%
Density	ASTM D 1505	.093
Operating Temperature		-75° to 100°C
Dielectric Strength	ASTM D 876	800 Volts Mil
Dielectric Constant	ASTM D 150	2.70
Dissipation Factor	ASTM D 150	0.01
Water Absorption	ASTM D 570	0.1%
Solvent Resistance		Good
Oil Resistance		Excellent
Hydraulic Fluid Resistance		Excellent
Acid and Alkali Resistance		Excellent
Fungus Resistance		Inert
Corrosion Resistance		Non-Corrosive
Standard Color		Clear

DAFLEX HEAT SHRINKABLE IRRADIATED KYNAR® TUBING

DAFLEX KYNAR, a semi-rigid shrinkable polyvinylidene fluoride tubing, is free from flaws, pin holes, seams, cracks or inclusions. It is a tough, high temperature, thin wall tubing with high cut through and abrasion resistance. It shrinks 50% in diameter and 10% longitudinally when heated to approximately 347°F. DAFLEX Shrinkable KYNAR tubing will not cold flow, melt or split when shrunk over irregularly shaped objects. Conforms to MIL-I-23053/8.

Operating Temperature: -55°C to +175°C.

DAFLEX Cat. No.	Expanded I.D. As Supplied	Recovered I.D. Max.	Recovered Wall	Standard Package 4' Lgths. Tot. Ftg.	6' Lgths. Tot. Ftg.
SH-350-3/16"	.046"	.023"	.010"	100	16
SH-350-1/8"	.063"	.031"	.010"	100	14
SH-350-3/32"	.093"	.046"	.010"	100	12
SH-350-1/16"	.125"	.062"	.010"	100	10
SH-350-3/16"	.187"	.093"	.010"	100	8
SH-350-1/4"	.250"	.125"	.012"	100	6
SH-350-3/8"	.375"	.187"	.012"	100	4
SH-350-1/2"	.500"	.250"	.012"	20	2
SH-350-3/4"	.750"	.375"	.017"	20	1
SH-350-1"	1.000"	.500"	.019"	20	.5

*Dupont ©Pennsalt Chemical Co.

STANDARD COLOR: Clear.

ALL THE ABOVE TUBING CAN BE ORDERED CUT OR CUT AND MARKED TO YOUR SPECIFICATIONS

DABURN ELECTRONICS & CABLE CORP. • 2360 HOFFMAN ST., BRONX, N.Y. 10458 (212) 295-0050 TWX 710-593-4145

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

**HEAT SHRINKABLE TEFLON* TUBING • FEP • TFE • DUAL WALL
DUAL-WALL TEFLON* ENCAPSULATING SHRINKABLE TUBING****NEW**

DAFLON SM-450 is a new dual wall shrink and melt Teflon tubing which gives a tight, moisture-proof seal. It is made from two types of Teflon. The outer wall is TFE Teflon and the inner lining is FEP Teflon. When heated to 400°F the FEP melts and at 621°F the TFE shrinks tightly. The FEP is squeezed into a solid or near solid mechanical encapsulation. DAFLON SM-450 tubing protects against most environmental hazards involving pull, vibration, moisture, chemicals, etc. It may be used over wires, terminals, splices, connectors and as a strain relief and end cap.

Operating Temperature: 450°F.



DAFLON Cat. No.	Nom. I.D. Size	Nom. Expanded I.D.	Nom. Expanded Wall	Recovered I.D.
SM-450-1	1/2"	.036" .92mm	.022"	.000"***
SM-450-2	3/8"	.060" 1.52mm	.028"	.000"***
SM-450-3	1/4"	.130" 3.30mm	.031"	.000"***
SM-450-4	5/16"	.160" 4.06mm	.032"	.000"***
SM-450-5	3/16"	.190" 4.83mm	.035"	.062"
SM-450-7	1/4"	.250" 6.35mm	.036"	.125"
SM-450-9	1/2"	.350" 8.89mm	.036"	.190"
SM-450-11	3/4"	.450" 11.43mm	.055"	.312"
SM-450-13	1 1/8"	.700" 17.78mm	.055"	.440"
SM-450-16	1"	.950" 24.13mm	.065"	.680"

Standard Package: 100' in 1 to 3 ft. lengths. Special lengths available to order.
**Will fully close off.

DAFLON SH-400 (FEP)

Made with Modified TEFLON† FEP will shrink over inserted objects upon exposure to moderate heat. Heretofore, many joints, parts, components, devices could not be protected because of hi temperature required for shrinkage. FEP TEFLON†, which has a continuous service temperature of 400°F., will shrink

at 300°F. Supplied in natural (transparent) color. Complete shrinkage at 350°F. Now, many heat sensitive products can use the permanent protection of TEFLON.† Will not burn or support flame, long lengths available. Will not split or melt. Extruded. Meets MIL-I-23053/11.

DAFLON Cat. No.	Size	I.D.	Min. Exp. I.D.	Recovered Max. I.D.	Recovered Wall Thickness*
SH-400-24	24	.023"	.031"	.027"	.008"
SH-400-22	22	.028"	.036"	.032"	.008"
SH-400-20	20	.034"	.045"	.039"	.008"
SH-400-18	18	.042"	.060"	.049"	.008"
SH-400-16	16	.053"	.075"	.061"	.009"
SH-400-14	14	.066"	.092"	.072"	.009"
SH-400-12	12	.085"	.115"	.089"	.009"
SH-400-10	10	.108"	.141"	.114"	.010"
SH-400-9	9	.118"	.158"	.124"	.010"
SH-400-8	8	.136"	.180"	.143"	.010"
SH-400-7	7	.148"	.197"	.158"	.011"
SH-400-6	6	.170"	.225"	.180"	.011"
SH-400-5	5	.186"	.248"	.198"	.011"

*All items on this page are available cut to length or cut and marked.



DAFLON Cat. No.	Size	I.D.	Min. Exp. I.D.	Recovered Max. I.D.*	Recovered Wall Thickness*
SH-400-4	4	.214"	.290"	.226"	.011"
SH-400-3	3	.234"	.310"	.249"	.011"
SH-400-2	2	.268"	.365"	.280"	.012"
SH-400-1	1	.294"	.400"	.311"	.012"
SH-400-0	0	.336"	.440"	.349"	.012"
SH-400-3/8	3/8"	.375"	.500"	.383"	.015"
SH-400-1/2	1/2"	.437"	.580"	.448"	.020"
SH-400-5/8	5/8"	.500"	.666"	.510"	.020"
SH-400-3/4	3/4"	.580"	.750"	.580"	.025"
SH-400-7/8	7/8"	.666"	.866"	.666"	.030"
SH-400-1"	1"	.750"	1.000"	.750"	.035"

STANDARD PACKAGE: 100 Ft., 4 Ft. Min. Length. † DUPONT
*When full recovery permitted.

DAFLON SHRINK SERIES SH-621**TFE TUBING MIL-I-23053/12**

Made of modified TEFLON† polytetrafluorethylene will shrink when heated to 621°F. Suitable where hi temp protection is required. Extruded. Will not support combustion, dielectric strength (20 Mil Wall) 850 V/M, low temp. brittle point -66°F, superior chemical resistance.

DAFLON Cat. No.	Nominal Tubing Size	Minimum Expanded I.D.	Recovered Dimensions Maximum I.D.	Wall Thickness
SH-621-26	26	.046"	.022"	.009"
SH-621-24	24*	.050"	.027"	.010"
SH-621-22	22*	.055"	.032"	.010"
SH-621-20	20*	.060"	.039"	.012"
SH-621-19	19	.065"	.043"	.012"
SH-621-18	18*	.076"	.049"	.012"
SH-621-17	17	.085"	.054"	.012"
SH-621-16	16*	.093"	.061"	.012"
SH-621-15	15	.110"	.067"	.012"
SH-621-14	14*	.120"	.072"	.012"
SH-621-13	13	.140"	.080"	.012"
SH-621-12	12*	.150"	.089"	.012"
SH-621-11	11	.170"	.101"	.012"
SH-621-10	10*	.191"	.112"	.012"



DAFLON Cat. No.	Nominal Tubing Size	Minimum Expanded I.D.	Recovered Dimensions Maximum I.D.	Wall Thickness
SH-621-9	9	.205"	.124"	.015"
SH-621-8	8†	.240"	.141"	.015"
SH-621-7	7	.270"	.158"	.015"
SH-621-6	6†	.302"	.178"	.015"
SH-621-5	5	.320"	.198"	.015"
SH-621-4	4†	.370"	.224"	.015"
SH-621-3	3	.390"	.249"	.015"
SH-621-2	2†	.430"	.278"	.015"
SH-621-1	1	.450"	.311"	.015"
SH-621-0	0†	.470"	.347"	.015"
SH-621-3/8	3/8"†	.560"	.399"	.020"
SH-621-1/2	1/2"†	.655"	.462"	.020"
SH-621-5/8	5/8"†	.750"	.524"	.020"

STANDARD PACKAGE: 100 Feet. Additional Sizes and Colors to Order.

STANDARD PUT-UP: 36" Straight Lengths — One Foot Minimums Size 11 thru 1/2"; Size 26-14 3' Min. Length.

WALL TOLERANCES: 26 thru 22 ± .002; 20 thru 10 ± .003; 9 thru 0 ± .004. †Stock sizes.

DAFLEX 4:1 SHRINKABLE PTFE TUBING

DAFLON SH-421 Shrinkable Teflon Tubing recovers to approximately 25% of its expanded size when heated to the gel point (621°F). Thus it is now possible to use shrinkable Teflon tubing, with its excellent chemical and physical properties, over objects which require more than the standard 2:1 shrinkdown ratio (see SH-621).

NOTE: Tubing should be allowed to recover at least 50%.

Conforms to MIL-I-23053/12 and AMS-3584. Operating Temp.: -85°F to +500°F.

DAFLON Cat. No.	Nom. Size	Expanded Min. I.D.	Recovered Max. I.D.	Nom. Wall	User Cost
SH-421-3/4	3/4"	.078"	.025"	.009"	\$52.50/C'
SH-421-1/2	1/2"	.125"	.038"	.010"	\$3.82/C'
SH-421-3/8	3/8"	.187"	.050"	.012"	\$62.25/C'

DAFLON Cat. No.	Nom. Size	Expanded Min. I.D.	Recovered Max. I.D.	Nom.* Wall	User Cost
SH-421-1/4	1/4"	.250"	.063"	.012"	78.00/C'
SH-421-3/16	3/16"	.312"	.079"	.012"	90.75/C'
SH-421-3/8	3/8"	.375"	.096"	.012"	99.75/C'
SH-421-1/2	1/2"	.500"	.144"	.015"	146.25/C'
SH-421-5/8	5/8"	.625"	.178"	.015"	196.50/C'
SH-421-3/4	3/4"	.750"	.225"	.015"	240.00/C'
SH-421-7/8	7/8"	.875"	.244"	.015"	295.50/C'
SH-421-1"	1"	1.000"	.278"	.015"	324.00/C'
SH-421-1 1/4	1 1/4"	1.250"	.347"	.015"	465.00/C'

Standard Package: 100' in 4 ft. lengths. Tubing may be ordered cut to length.
STANDARD COLOR: Natural (Clear). *When full recovery is allowed.

DABURN No. HG1 — Heat Gun for SH-162, SH-265, SH-267, SH-275, SH-290, ST-275, SH-300 Series.

DABURN No. HG2 — Heat Gun for SH-400, SH-421, SH-621, SH-450, SH-350 Series.

DABURN ELECTRONICS & CABLE CORP. • 2360 HOFFMAN ST., BRONX, N.Y. 10458 (212) 295-0050 TWX 710-593-4145

DABURN**DABURN electronics & cable corp.**

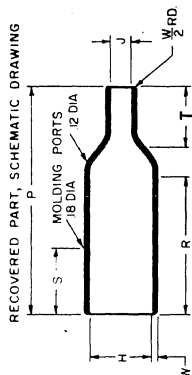
WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

HEAT SHRINKABLE MOLDED BOOTS • HEAT GUN**DAFLEX SHRINKABLE MOLDED PARTS**

DAFLEX SHRINKABLE MOLDED PARTS are made from expanded, irradiated polyolefin. When heated to 275°F they recover (shrink) to a pre-determined configuration. These parts provide a tough outer covering with excellent electrical, mechanical, and thermal insulation as well as affording cosmetic appearance to assemblies and terminations.

DAFLEX STRAIGHT SHRINKABLE BOOTS

They are larger at one end so that they can accommodate electrical connectors and terminations.



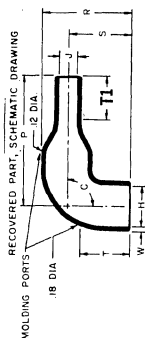
DAFLEX Cat. No.	Dimensions in Inches								
	^H Min. Exp.	^H Max. Rec.	^J Min. Exp.	^J Max. Rec.	^P Rec. ±20%	^R Rec. ±10%	^S Rec. ±10%	^T Rec. ±10%	^W Rec. ±20%
DB-313-23	.92	.41	.92	.22	1.50	.90	.60	.40	.06
DB-313-24	1.12	.56	1.12	.26	2.18	1.30	.70	.65	.07
DB-313-25	1.22	.70	1.22	.28	2.60	1.50	.70	.70	.07
DB-313-26	1.42	.88	1.42	.33	2.90	1.70	.70	.70	.07
DB-313-27	1.68	1.11	1.68	.39	3.90	2.50	.70	.70	.08
DB-313-28	2.04	1.38	2.04	.62	4.90	2.60	1.00	1.60	.12
DB-313-29	2.60	1.75	2.60	.80	6.35	3.55	1.00	1.90	.15

Standard Package: 5



AS SUPPLIED

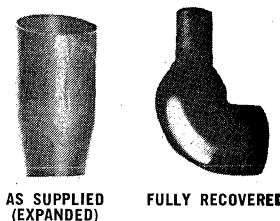
FULLY RECOVERED

DAFLEX RIGHT ANGLE BOOTS

DAFLEX Cat. No.	Dimensions in Inches									
	Min. Exp.	Max. Rec.	Min. Exp.	Max. Rec.	P Rec. ±10%	R Rec. ±10%	S Rec. ±10%	T Rec. ±10%	T ₁ Rec. ±10%	W Rec. ±10%
DB-333-24	1.12	.56	1.12	.26	1.06	.95	.73	.70	.28	.06
DB-333-25	1.25	.70	1.25	.28	1.40	1.20	.81	.70	.34	.07
DB-333-26	1.50	.88	1.50	.33	1.70	1.40	.90	.70	.50	.07
DB-333-27	1.70	1.10	1.70	.38	2.10	1.70	1.10	.70	.62	.08
DB-333-28	2.06	1.38	2.06	.62	3.10	2.10	1.30	1.00	1.20	.13

Standard Package: 5

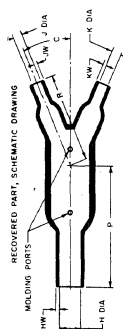
NOTE: C — Exp. ±10°, 180 — Rec. ±5°, 90

AS SUPPLIED
(EXPANDED)

FULLY RECOVERED

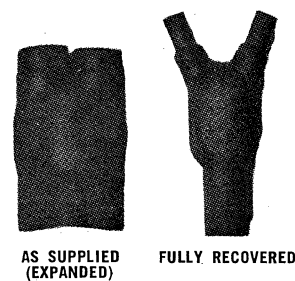
DAFLEX TRANSITIONS

DAFLEX Transitions protect break outs of wire and cable in an electrical harness. Standard configurations are the "1 to 2" variety. "1 to 3" is available to order.



DAFLEX Cat. No.	Dimensions in Inches									
	Min. Exp.	Max. Rec.	Min. Exp.	Max. Rec.	P Rec. ±10%	R Rec. ±10%	HW Rec. ±20%	JW & KW Rec. ±20%	C Exp. ±10°	Rec. ±5°
DT-493-12	.52	.24	.26	.12	.88	.76	.06	.04	.10	22.5
DT-493-13	1.06	.49	.52	.24	1.81	1.55	.10	.06	.10	22.5
DT-493-14	1.52	.71	1.06	.49	2.58	3.22	.12	.10	.10	22.5

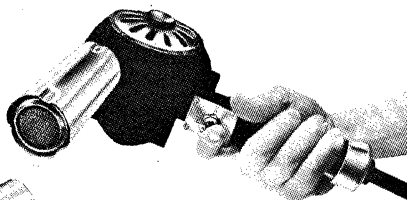
Standard Package: 5

AS SUPPLIED
(EXPANDED)

FULLY RECOVERED

HOT AIR GUN AND ACCESSORIES**FOR DAFLEX SHRINKABLE TUBING**DABURN
Cat. No.HG1 — For SH-162, SH-265, SH-267, SH-275,
SH-290, ST-275, SH-300 Series.HG2 — For SH-400, SH-421, SH-621, SH-450,
SH-350 Series.

A flameless heat source; light in weight; portable and/or permanent mounting.

ADAPTOR HGA-02Concentrates heat
and allows use of
baffle.**BAFFLE PLATE HGB-01**For tubing up to
1 1/4" O.D. Made
to concentrate
hot air.

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

PER MIL-W-16878D PLASTIC HOOK-UP WIRE • MIL-W-5086 • MIL-C-7078**TYPE B — HIGH TEMPERATURE VINYL 600 VOLT — PER MIL-W-16878D**

DESCRIPTION: One conductor stranded tinned copper, with -55°C to +105°C rated high temperature thermoplastic, light wall insulation.

TYPE B — UNCOVERED VINYL

DABURN Cat. No.	Mil-W-16878D Type Designation	Size AWG	Conductor Strand	Nom. O.D.
2500/32	B-32	32	7/40	.028"
2500/30	B-30	30	7/38	.030"
2500/28	B-28	28	7/36	.033"
2500/26	B-26	26	7/34	.037"
2500/24	B-24	24	7/32	.043"
2501/24	B-24	24	19/36	.043"
2500/22	B-22	22	7/30	.048"
2501/22	B-22	22	19/34	.048"
2500/20	B-20	20	7/28	.057"
2501/20	B-20	20	19/32	.057"
2500/18	B-18	18	7/26	.067"
2501/18	B-18	18	19/30	.067"
2500/16	B-16	16	19/29	.077"
2500/14	B-14	14	19/27	.091"

Available with Braided Shield Overall.

STD. PUT-UP: 100 Ft., 1000 Ft. Prebonded tinned copper conductor avail. to order.

STOCK COLORS: Black, Red, Brown, Blue, Orange, White, Yellow, Green, Gray, Purple, White/Black, White/Red, White/Green, White/Yellow, White/Blue, White/Brown, White/Orange, White/Gray, White/Violet.

TYPE B — NYLON JACKET

DABURN Cat. No.	Mil-W-16878D Type Designation	Size AWG	Conductor Strand	Nom. O.D.
2510/32	B-32	32	7/40	.032"
2510/30	B-30	30	7/38	.036"
2510/28	B-28	28	7/36	.039"
2510/26	B-26	26	7/34	.042"
2510/24	B-24	24	7/32	.047"
2511/24	B-24	24	19/36	.047"
2510/22	B-22	22	7/30	.053"
2511/22	B-22	22	19/34	.053"
2510/20	B-20	20	7/28	.065"
2511/20	B-20	20	19/32	.065"
2510/18	B-18	18	7/26	.075"
2511/18	B-18	18	19/30	.075"
2510/16	B-16	16	19/29	.085"
2510/14	B-14	14	19/27	.099"

STD. PUT-UP: 100 Ft., 1000 Ft. NYLON JACKET THICKNESS: 32-20 .002, 18-16 .003

TYPE C — HIGH TEMPERATURE VINYL 1000 VOLT

SPECIFICATION MIL-W-16878D

DESCRIPTION: One conductor similar to Type B — Heavier wall Hi-Temp. Thermoplastic insulation. Nom. wall .016".

TYPE C — UNCOVERED VINYL

DABURN Cat. No.	Mil-W-16878D Type Designation	Size AWG	Minimum Strand	Nom. O.D.
2515/24	C-24	24	7/32	.058"
2515/22	C-22	22	7/30	.064"
2515/20	C-20	20	7/28	.072"
2515/18	C-18	18	7/26	.082"
2515/16	C-16	16	19/29	.091"
2515/14	C-14	14	19/27	.105"
2515/12	C-12	12	19/25	.135"

STD. PUT-UP: 100 Ft.-1000 Ft. Available with Braided Shield Overall.

STOCK COLORS: Black, Red, Brown, Blue, Orange, White, Yellow, Green, Gray, Purple. Also available in tracer colors.

TYPE C — NYLON JACKET

DABURN Cat. No.	Mil-W-16878D Type Designation	Size AWG	Conductor Strand	Nom. O.D.
2520/24	C-24	24	7/32	.061"
2520/22	C-22	22	7/30	.070"
2520/20	C-20	20	7/28	.079"
2520/18	C-18	18	7/26	.090"
2520/16	C-16	16	19/29	.099"
2520/14	C-14	14	19/27	.114"
2520/12	C-12	12	19/25	.135"

STD. PUT-UP: 100 Ft., 1000 Ft. NYLON JACKET THICKNESS: 24 .002, 22-18 .003, 16-14 .004

TYPE D — HIGH TEMPERATURE VINYL 3000 VOLT

SPECIFICATION MIL-W-16878D

DESCRIPTION: One conductor stranded tinned copper similar to Type C — Heavier wall Hi-Temp. thermoplastic insulation. Nom. wall: 24 thru 14 .032", 12 thru 6 .040", 4 thru 2 .045".

TYPE D — UNCOVERED VINYL

DABURN Cat. No.	Mil-W-16878D Type Designation	Size AWG	Conductor Strand	Nom. O.D.
2525/24	D-24	24	7/32	.084"
2525/22	D-22	22	7/30	.089"
2525/20	D-20	20	10/30	.097"
2525/18	D-18	18	16/30	.107"
2525/16	D-16	16	26/30	.116"
2525/14	D-14	14	41/30	.130"
2525/12	D-12	12	65/30	.163"
2525/10	D-10	10	105/30	.182"
2525/8	D-8	8	133/29	.247"
2525/6	D-6	6	133/27	.291"
2525/4	D-4	4	133/25	.355"
2525/2	D-2	2	665/30	.425"

STD. PUT-UP: 100 Ft.-1000 Ft.

ALL THE ABOVE CAN BE ORDERED CUT AND STRIPPED TO YOUR SPECIFICATIONS.

TYPE D — NYLON JACKET

DABURN Cat. No.	Mil-W-16878D Type Designation	Size AWG	Conductor Strand	Nom. O.D.
2525N/24	D-24	24	7/32	.090"
2525N/22	D-22	22	7/30	.096"
2525N/20	D-20	20	10/30	.104"
2525N/18	D-18	18	16/30	.114"
2525N/16	D-16	16	26/30	.125"
2525N/14	D-14	14	41/30	.139"
2525N/12	D-12	12	65/30	.168"
2525N/10	D-10	10	105/30	.197"
2525N/8	D-8	8	133/29	.265"
2525N/6	D-6	6	133/27	.310"

STD. PUT-UP: 100 Ft., 1000 Ft. Nylon Jacket; Clear Polyimide.

AIRCRAFT PLASTIC HOOK-UP WIRE

SPECIFICATIONS MIL-W-5086A and MIL-C-7078A (105°C Rating)

DESCRIPTION: Type 1 MIL-W-5086A — One conductor stranded tinned copper with plastic insulation nylon jacket overall. Type 2 MIL-W-5086A — One conductor stranded tinned copper, plastic insulation, nylon lacquered glass braid. Color: White. Additional colors available to order.

MIL-W-5086A UNSHIELDED (Supersedes) AN-J-C-48A) — 600 V RATING

DABURN Cat. No.	Mil. Type	Type	Conductor Strand.	Nom. O.D.
2601/22	AN-22	No. 1	19/34	.070"
2601/20	AN-20	No. 1	19/32	.080"
2601/18	AN-18	No. 1	19/30	.090"
2601/16	AN-16	No. 1	19/29	.100"
2601/14	AN-14	No. 1	19/27	.120"
2601/12	AN-12	No. 1	19/25	.140"
2602/22	AN-22	No. 2	19/34	.068"
2602/20	AN-20	No. 2	19/32	.078"
2602/18	AN-18	No. 2	19/30	.088"
2602/16	AN-16	No. 2	19/29	.098"

DABURN Cat. No.	Mil. Type	Type	Conductor Strand.	Nom. O.D.
2602/14	AN-14	No. 2	19/27	.117"
2602/12	AN-12	No. 2	19/25	.137"
2602/10	AN-10	No. 2	37/26	.189"
2602/8	AN-8	No. 2	133/29	.240"
2602/6	AN-6	No. 2	133/27	.297"
2602/4	AN-4	No. 2	133/25	.355"
2602/2	AN-2	No. 2	665/30	.412"
2602/0	AN-0	No. 2	1045/30	.518"
2602/00	AN-00	No. 2	1330/30	.588"

STANDARD PUT-UP: 100 Ft., 1000 Ft.

MIL-C-7078A SHIELDED (Supersedes AN-C-168) 600 V RATING

DESCRIPTION: One conductor stranded tinned copper w/plastic insulation, nylon jacket w/tinned copper shielded braid overall. Color: White under shield. Additional types to order.

DABURN Cat. No.	Size AWG	Mil. Type	Type	Conductor Strand.	Nom. O.D.
2605/22	22	AN-22	No. 1	19/34	.100"
2605/20	20	AN-20	No. 1	19/32	.110"
2605/18	18	AN-18	No. 1	19/30	.124"

STANDARD PUT-UP: 100 Ft., 1000 Ft.

ALL WIRE ON THIS PAGE CAN BE CUT AND STRIPPED TO YOUR SPECIFICATION.

DABURN ELECTRONICS & CABLE CORP. • 2360 HOFFMAN ST., BRONX, N.Y. 10458 (212) 295-0050 TWX 710-593-4145

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

TEFLON* HOOK-UP WIRE • MIL-SPEC • UL • TYPE F AND FF PER MIL-W-16878D**TEFLON* WIRE
TYPE E — 600 VOLTS
SPEC. MIL-W-16878D**

High Temperature Rating —90°C to +250°C

Single conductor, stranded silver plated copper, .010" TFE Teflon® insulation. Acid, alkalis, oil, flame, moisture, fungus, solvent resistant.

DABURN Extruded Cat. No.	DABURN Wrapped Cat. No.	Size MIL Type Designation	Strand	Max. Dia. Over Insul.
2401	—	E-32	7/40	.033"
2402	—	E-30	7/38	.036"
2403	2415/28	E-28	7/36	.039"
2404	2415/26	E-26	7/34	.043"
2404S	—	E-26(1)	1	.040"
2405	2415/24	E-24	19/36	.048"
2405-7	—	E-24	7/32	.048"
2405S	—	E-24(1)	1	.045"
2406	2415/22	E-22	19/34	.054"
2406-7	—	E-22	7/30	.054"
2406S	—	E-22(1)	1	.048"
2407	2415/20	E-20	19/32	.062"
2407-7	—	E-20	7/28	.062"
2407S	—	E-20(1)	1	.056"
2408	2415/18	E-18	19/30	.074"
2409	2415/16	E-16	19/29	.079"
2409/14	—	E-14	19/27	.097"
2409/12	—	E-12	19/25	.120"
2409/10	—	E-10	37/26	.139"

STD. PUT-UP: 100 Ft., 500 Ft., 1000 Ft.

COLORS: Black, Brown, Red, Orange, Yellow, Green, Blue, Purple, Gray, White, White/Black, White/Red, White/Green, White/Yellow, White/Blue, White/Brown, White/Orange, White/Gray, White/Violet.

Additional special custom construction available to order.

TEFLON* WIRE**MIL-W-16878D — TYPE EE
Extruded (1000 Volts) MIL-W-16878D**

DESCRIPTION: Single conductor silver plated copper wire concentrically stranded and insulated with .016 TFE extruded TEFLON* insulation.

TEMPERATURE RATING: —90°C to +260°C, 1000 volts.

DABURN Cat. No.	MIL Type Designation	Size AWG	Strand	Nom. O.D.
2428/24	EE-24	24	19/36	.055"
2428/22	EE-22	22	19/34	.062"
2428/20	EE-20	20	19/32	.070"
2428/18	EE-18	18	19/30	.080"
2428/16	EE-16	16	19/29	.089"
2428/14	EE-14	14	19/27	.106"
2428/12	EE-12	12	19/25	.124"
2428/10	EE-10	10	37/26	.145"
2428/8	(wrapped) EE-8	8	133/29	.210"

STANDARD SPOOL PUT-UP: 250 Ft., 500 Ft., 1000 Ft. Solid conductors available.

EE-6 and EE-4 wrapped are available to order.

STOCK COLORS: 1—White, 2—Black, 3—Red, 4—Green, 5—Yellow, 6—Blue, 7—Brown, 8—Orange, 9—Gray (Slate), 10—Violet (Purple).

**SUBMINIATURE TEFLON* HOOK-UP WIRE
PER MIL-W-16878D — TYPE ET — 250 VOLTS, 200°C**

Thin miniature hook-up wire is suitable in miniature slip ring assemblies, as interconnecting wire between wafers in microminiature electronic circuitry, instrument wire, medical wire, subminiature thermo-couple lead wire, strain gauge wire, etc. Provides lighter weight, greater flexibility and hi temperature resistance. Size Nos. 32 thru 20 conform to MIL-W-16878D type ET 250 volts, 200°C. Silver plated copper conductor.

DABURN Cat. No.	MIL Type	AWG Size	Min. Strand	Nom. O.D.
2427/36	—	36	7/44	.018"
2427/34	—	34	7/42	.020"
2427/32	ET-32	32	7/40	.021"
2427/30	ET-30	30	7/38	.024"
2427/28	ET-28	28	7/36	.027"
2427/26	ET-26	26	7/34	.031"
2427/24	ET-24	24	7/32	.036"
2427/22	ET-22	22	7/30	.042"
2427/20	ET-20	20	7/28	.049"

STANDARD SPOOL PUT-UPS: 500 Ft., 1000 Ft.
Microminiature Teflon hook-up wire available to order.**TEFLON* TFE AIRFRAME LEAD WIRE MIL-W-7139B**

CLASS 1: 600V Silver Coated Copper Conductor for —65°C to +200°C Operation.

CLASS 2: 600V Nickel Coated Copper Conductor for +260°C Operation.

DABURN Cat. No. Class 1	DABURN Cat. No. Class 2	Size AWG	Strand	Nom. O.D.
2426-22	2425-22	22	19/34	.085"
2426-20	2425-20	20	19/32	.095"
2426-18	2425-18	18	19/30	.110"
2426-16	2425-16	16	19/29	.130"
2426-14	2425-14	14	19/27	.143"
2426-12	2425-12	12	19/25	.163"

STANDARD SPOOL PUT-UPS: 500 Ft., 1000 Ft.

STANDARD COLOR: Class 1 — White/Blue Tracer; Class 2 — White/Orange Tracer.

ADDITIONAL SIZES AVAILABLE.

*TEFLON—DuPont

ALL ITEMS ON THIS PAGE AVAILABLE CUT TO LENGTH

DABURN ELECTRONICS & CABLE CORP. • 2360 HOFFMAN ST. • BRONX, N.Y. 10458 • 212 295-0050 • TWX-710-593-4145**UL TEFLON* WIRE
UL STYLE 1213**

Silver plated conductors of extruded TFE.

Nom. wall .010". UL rated for 105°C.

DABURN No.	Size	Strand	Nom. O.D.
2410/32	32	7/40	.029"
2410/30	30	7/38	.032"
2410/28	28	7/36	.036"
2410/26	26	19/38	.040"
2410/26-7	26	7/34	.041"
2410/24	24	19/36	.045"
2410/24-7	24	7/32	.044"
2410/22	22	19/34	.051"
2410/22-7	22	7/30	.050"
2410/20	20	19/32	.059"
2410/20-7	20	7/28	.058"

STD. PUT-UP: 1000'. UL Style 1212 available to order.

Nickel conductors available to order. Tracer colors available.

UL STYLE 1180 — 300V — 200°C

Silver plated conductors of extruded TFE. Nom. wall 1/4". UL rated for 200°C.

Nickel plated conductors available to order.

DABURN No.	Size	Strand	Nom. O.D.
2411/24	24	19/36	.055"
2411/22	22	19/34	.064"
2411/20	20	19/32	.070"
2411/18	18	19/30	.080"
2411/16	16	19/29	.089"

STD. COLORS: 1—Black, 2—Brown, 3—Red, 4—Orange, 5—Yellow, 6—Green, 7—Blue, 8—Violet, 9—Gray, 10—White.

Tracer colors available.

UL STYLE 1164 — 300V — 150°C

Silver plated conductors of extruded TFE. Nom. wall 1/4". UL rated for 150°C.

Nickel plated conductors available to order.

DABURN No.	Size	Strand	Nom. O.D.
2412/24	24	19/36	.055"
2412/22	22	19/34	.064"
2412/20	20	19/32	.070"
2412/18	18	19/30	.080"
2412/16	16	19/29	.090"

STD. COLORS: 1—Black, 2—Brown, 3—Red, 4—Orange, 5—Yellow, 6—Green, 7—Blue, 8—Violet, 9—Gray, 10—White.

Tracer colors available.

SILICONE RUBBER HOOK-UP WIRE**MIL-W-16878D — TYPES F & FF**

TYPE F — 600V • TYPE FF — 1000V

Single conductor, stranded tinned copper. Extruded silicone rubber overall. Temp. to 200°C.

DABURN No.	MIL Type Designation	Size AWG	Strand	Nom. O.D.
2620/28	F-28	28	7/36	.046"
2622/28	FF-28	28	7/36	.078"
2620/26	F-26	26	7/34	.050"
2622/26	FF-26	26	7/34	.082"
2620/24	F-24	24	19/36	.055"
2622/24	FF-24	24	19/36	.087"
2620/22	F-22	22	19/34	.062"
2622/22	FF-22	22	19/34	.094"
2620/20	F-20	20	19/32	.070"
2622/20	FF-20	20	19/32	.102"
2620/18	F-18	18	19/30	.080"
2622/18	FF-18	18	19/30	.112"
2620/16	F-16	16	19/29	.088"
2622/16	FF-16	16	19/29	.120"
2620/14	F-14	14	19/27	.118"
2622/14	FF-14	14	19/27	.165"
2620/12	F-12	12	19/25	.137"
2622/12	FF-12	12	19/25	.184"
2622/10	FF-10	10	37/26	.205"
2622/8	FF-8	8	133/29	.290"
2622/6	FF-6	6	133/27	.333"
2622/4	FF-4	4	133/25	.390"

COLOR: White. Additional colors, sizes and types to order, thru size 4/0

STD. PUT-UP: 500 Ft., 1000 Ft.

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

TFE • FEP TEFLON* CABLES • H FILM KAPTON* WIRE
MIL-W-16878D INSTRUMENTATION — SHIELDED • UNSHIELDED

DESCRIPTION: One or more conductors, each conductor silver plated concentrically stranded copper wire, Type E Extruded TFE .010" insulation. When shielded, braided silver plated copper shield over conductor(s), 90% shield coverage. When covered, either a TEFLON* impregnated fiberglass braid or a

**TEFLON*
IMPREGNATED
BRAID OVER SHIELD**

Daburn No.	Conds.	Size	Strand	Nom. O.D.
2444	1	26	7/34	.075"
2444/2	2	26	7/34	.119"
2445	1	24	19/36	.081"
2445/2	2	24	19/36	.126"
2445/3	3	24	19/36	.133"
2445/4	4	24	19/36	.144"
2445/5	5	24	19/36	.156"
2446	1	22	19/34	.088"
2446/2	2	22	19/34	.137"
2446/3	3	22	19/34	.144"
2446/4	4	22	19/34	.158"
2446/5	5	22	19/34	.172"

STANDARD SPOOL PUT-UPS: 250 Ft., 500 Ft., 1000 Ft.
CONDUCTOR COLOR CODE: 1—White, 2—Black, 3—Red, 4—Green, 5—Yellow.

**SHIELDED
BRAID
OVERALL**

Daburn Cat. No.	Conds.	Size	Strand	Nom. O.D.
2434	1	26	7/34	.066"
2434/2	2	26	7/34	.104"
2435	1	24	19/36	.068"
2435/2	2	24	19/36	.112"
2435/3	3	24	19/36	.120"
2435/4	4	24	19/36	.132"
2435/5	5	24	19/36	.140"
2436	1	22	19/34	.075"
2436/2	2	22	19/34	.124"
2436/3	3	22	19/34	.132"
2436/4	4	22	19/34	.146"
2436/5	5	22	19/34	.154"

STANDARD SPOOL PUT-UPS: 250 Ft., 500 Ft., 1000 Ft.
CONDUCTOR COLOR CODE: 1—White, 2—Black, 3—Red, 4—Green, 5—Yellow.

H FILM KAPTON* WIRE — DALITE™**HIGH TEMPERATURE HOOK-UP AND AIRFRAME WIRE**
200°C CONTINUOUS TEMPERATURE RATING (a)

INSULATED WITH DUPONT KAPTON* POLYIMIDE FILM WITH TEFLON* FEP HEAT SEALED COATING CONFORMS TO MIL-W-60904 & MIL-W-81381.

CHARACTERISTICS: Dalite™ insulated wire provides high temperature stability, low temperature flexibility, high radiation resistance, resistance to cold flow, impervious to most chemicals, high dielectric strength, low dielectric constant, smaller diameters and lighter weight than any other comparable wire used for continuous operation up to 200°C. This hook-up wire meets the test requirements of MIL-W-16878 for 300 V, 600 V and 1000 V with smaller wall thicknesses, weight and dimensions.

(a) Temperature based on lowest temperature rating of materials in the insulation — FEP 200°C. Will pass 96 hour heat age tests at 250°C per MIL-W-16878.

DESCRIPTION: Single conductor, silver plated annealed copper conductors, Type H* Polyimide film with Teflon* FEP coating tape wrapped.



DABURN No.	Type Designation	Size AWG	Strand	Voltage Rating (rms)	Nom. Wall	Nom. O.D.	Weight Per 1000' (lbs.)
2490/30	HF 30	30	7/38	600	.0045"	.021"	0.52
2495/30	HHF 30	30	7/38	1000	.006"	.024"	0.57
2490/28	HF 28	28	7/36	600	.0045"	.024"	0.75
2495/28	HHF 28	28	7/36	1000	.006"	.027"	0.83
2490/26	HF 26	26	7/34	600	.0045"	.028"	1.11
2495/26	HHF 26	26	7/34	1000	.006"	.031"	1.21
2490/24	HF 24	24	19/36	600	.0045"	.034"	1.78
2495/24	HHF 24	24	19/36	1000	.006"	.037"	1.90
2490/22	HF 22	22	19/34	600	.0045"	.041"	2.71
2495/22	HHF 22	22	19/34	1000	.006"	.044"	2.86
2490/20	HF 20	20	19/32	600	.0045"	.049"	4.18
2495/20	HHF 20	20	19/32	1000	.006"	.052"	4.35
2490/18	HF 18	18	19/30	600	.0045"	.059"	6.46
2495/18	HHF 18	18	19/30	1000	.006"	.062"	6.67
2490/16	HF 16	16	19/29	600	.0045"	.066"	8.16
2495/16	HHF 16	16	19/29	1000	.006"	.069"	8.39

STD. COLOR: Natural Gold.

STD. PUT-UP: 1000 Ft.

*DUPONT

Striping and solid colors available. Variations of conductor material—to special order.

ALL ITEMS ON THIS PAGE AVAILABLE CUT TO LENGTH

DABURN ELECTRONICS & CABLE CORP. • 2360 HOFFMAN ST., BRONX, N.Y. 10458 (212) 295-0050 TWX 710-593-4145

.010" TEFLON* fused, double reversed tape jacket overall. Fungus, solvent, moisture, flame, acid, alkali and oil resistant Multiconductors are twisted. TEMPERATURE RATING: -65°C to +260°C. VOLTAGE RATING: 600 Volts

**TEFLON*
TAPE WRAP JACKET
OVER SHIELD**

Daburn No.	Conds.	Size	Strand	Nom. O.D.
2454	1	26	7/34	.078"
2454/2	2	26	7/34	.125"
2455	1	24	19/36	.084"
2455/2	2	24	19/36	.128"
2455/3	3	24	19/36	.135"
2455/4	4	24	19/36	.148"
2455/5	5	24	19/36	.162"
2456	1	22	19/34	.090"
2456/2	2	22	19/34	.140"
2456/3	3	22	19/34	.148"
2456/4	4	22	19/34	.162"
2456/5	5	22	19/34	.183"

STANDARD SPOOL PUT-UPS: 250 Ft., 500 Ft., 1000 Ft.
CONDUCTOR COLOR CODE: 1—White, 2—Black, 3—Red, 4—Green, 5—Yellow.

**NO SHIELD—TEFLON*
IMPREGNATED
FIBERGLASS OVERALL**

Daburn Cat. No.	Conds.	Size	Strand	Nom. O.D.
2464	1	26	7/34	.040"
2464/2	2	26	7/34	.080"
2465	1	24	19/36	.044"
2465/2	2	24	19/36	.088"
2465/3	3	24	19/36	.096"
2465/4	4	24	19/36	.108"
2465/5	5	24	19/36	.116"
2466	1	22	19/34	.051"
2466/2	2	22	19/34	.100"
2466/3	3	22	19/34	.108"
2466/4	4	22	19/34	.122"
2466/5	5	22	19/34	.131"

STANDARD SPOOL PUT-UPS: 250 Ft., 500 Ft., 1000 Ft.
CONDUCTOR COLOR CODE: 1—White, 2—Black, 3—Red, 4—Green, 5—Yellow.
Special cable constructions and colors available.

FEP TEFLON* CABLE**FEP EXTRUDED JACKET OVER SHIELD**

DESCRIPTION: Each conductor silver plated stranded copper wire, Type E extruded TFE .010" insulation. Color coded, braided silver plated copper shield — 90% coverage, FEP white teflon jacket overall.

TEMPERATURE RATING: -65°C to +200°C. VOLTAGE RATING: 600 V.

DABURN No.	Conds.	Size	Strand	Nom. O.D.
2480	1	24	19/36	.085"
2480/2	2	24	19/36	.130"
2480/3	3	24	19/36	.135"
2480/4	4	24	19/36	.148"
2481	1	22	19/34	.091"
2481/2	2	22	19/34	.150"
2481/3	3	22	19/34	.158"
2481/4	4	22	19/34	.172"
2482	1	20	19/32	.100"
2482/2	2	20	19/32	.168"
2482/3	3	20	19/32	.178"
2482/4	4	20	19/32	.193"
2483	1	18	19/30	.110"
2483/2	2	18	19/30	.188"
2483/3	3	18	19/30	.207"
2483/4	4	18	19/30	.222"
2484	1	16	19/29	.123"
2484/2	2	16	19/29	.220"

CONDUCTOR COLOR CODE: 1—White, 2—Black, 3—Red, 4—Green
STD. PUT-UP: 500 Ft., 1000 Ft.

*Dupont

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

COMPUTER WIRE • UL WIRE WRAP • HIGH TEMPERATURE WIRE**KYNAR® HOOK-UP WIRE — UL APPROVED****300V — 125°C**

Suitable for wire-wrap applications. High cut through resistance. Self-extinguishing. Resistant to most chemicals and solvents. Ultra-violet and weather resistant.

DESCRIPTION: Solid, silver plated, oxygen-free, high conductivity (OFHC) copper conductor, extruded Kynar (polyvinylidene fluoride insulation). To UL Style #1422.

DABURN Cat. No.	Size	Nom. Ins. Wall	Nom. O.D. ±.001"	Stock Colors
D1422/30	30	.005"	.020"	1-10
D1422/28	28	.005"	.023"	1-10
D1422/26	26	.005"	.026"	1-9
D1422/24	24	.005"	.030"	1-6

PUT-UP: 1000 Ft., 10,000 Ft. Special Hub Spools. Other UL styles to order.

KYNAR HOOK-UP WIRE—Cut, Stripped Lengths

Cut to length. Each end stripped. Ready for use on automatic and/or manual wire-wrap machines and tools. Packaged in tubes, 200 pieces per size.

DABURN Cat. No.	Length of Insulation†	Length Stripped Each End	No. Pcs. Per Pkg.	Stock Colors
D1422-30	4"-6"-8"-10"-12"	1½"	200	1-10
D1422-28	4"-6"-8"-10"-12"	1½"	200	1-10
D1422-26	4"-6"-8"-10"-12"	1½"	200	1-9
D1422-24	4"-6"-8"-10"-12"	1½"	200	1-6

†When ordering indicate Cat. No., length and color; i.e. D1422-30-8"-6. Kynar #30 cut 8" long. Light Blue Color. ©Pennsalt Chemical Co.

COLORS: 1—White, 2—Black, 3—Red, 4—Green, 5—Yellow, 6—Light Blue 7—Brown, 8—Orange, 9—Gray, 10—Violet. Additional colors to order.

TEFZEL* COMPUTER WIRE**300V — 150°C**

Suitable for high temperature, thin wall wire-wrap computer applications. It has high cut-through, abrasion and chemical resistance, a dielectric constant of 2.6 Tefzel passes IEEE Standard 383-1974 vertical flame test for cables in nuclear power plants suitable for use in computers, aircraft instrumentation and wirewrap applications.

DESCRIPTION: Solid silver plated, oxygen-free, high conductivity (OFHC) copper conductor, Tefzel (a modified copolymer of ethylene and tetrafluoroethylene) overall.

DABURN Cat. No.	Size	Nom. Ins. Wall	Nom. O.D.	Stock Colors
D1522-30	30	.005"	.019"	1-10
D1522-28	28	.005"	.023"	1-10
D1522-26	26	.005"	.026"	1-10
D1522-24	24	.005"	.029"	1-10

TEFZEL* WIRE — Cut, Stripped Lengths

Packaged cut to length and stripped. Ready to use on point-to-point terminations. Each tube has 200 pieces per size.

DABURN Cat. No.	Length of Insulation	Nom. Length Stripped Each End	Stock Colors
D1522-30	4"-6"-8"-10"-12"	1½"	1-10
D1522-28	4"-6"-8"-10"-12"	1½"	1-10
D1522-26	4"-6"-8"-10"-12"	1½"	1-9
D1522-24	4"-6"-8"-10"-12"	1½"	1-6

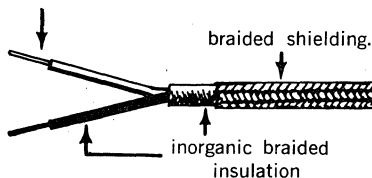
*Dupont

DABURN HIGH TEMPERATURE LEAD WIRE

Small Diameters and High Temperature performance make an outstanding combination for these unique constructions. Basic wire conforms to MIL-W-3861 spec. shielding per MIL-N-46026A. 600V RMS.

800°F TEMPERATURE RATING

nickel clad copper



One conductor high temperature aircraft and missile lead wire for operation between 500°F and 800°F. Nickel clad copper conductors with glass braided fiber insulation impregnated with silicone varnish. Multiconductor and shielded construction will be manufactured to customer's specifications.

DABURN Cat. No.	Size	Strand	CMA	Nom. O.D.
2497/18	18	19/.010"	1900	.085"
2497/20	20	19/.008"	1216	.075"
2497/22	22	19/.0063"	755	.070"

STANDARD PUT-UP: 500 Ft., 1000 Ft.

1500°F TEMPERATURE RATING

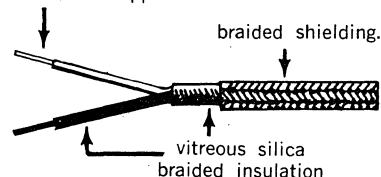
One conductor high temperature radiation resistant aircraft and missile lead wire for operation between 800°F and 1500°F. Nickel clad copper conductors with inorganic, braided insulation. Useful up to 1500°F providing moisture resistance is not required. Multiconductor and shielded construction can be made to customer's specs.

DABURN Cat. No.	Size	Strand	CMA	Nom. O.D.
2498/18	18	19/.010"	1900	.085"
2498/20	20	19/.008"	1216	.075"
2498/22	22	19/.0063"	755	.070"

STANDARD PUT-UP: 500 Ft., 1000 Ft.

2000°F TEMPERATURE RATING

nickel clad copper



One conductor high temperature radiation resistant aircraft and missile lead wire for operation between 1500°F and 2000°F. Nickel clad copper conductors with vitreous silica braided insulation and a braided shielding. Useful up to 2000°F providing no initial moisture resistance or abrasion resistance is required. Multiconductor construction can be made to customer's specifications.

DABURN Cat. No.	Size	Strand	CMA	Nom. Insulation Thickness	Braid Ni. Shield	Nom. O.D.
2499/18	18	19/.010"	1900	.025"	16-5-36	.122"
2499/20	20	19/.008"	1216	.025"	24-3-36	.112"
2499/22	22	19/.0063"	755	.027"	24-3-36	.108"

STANDARD PUT-UP: 500 Ft., 1000 Ft.

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

UL & CSA HOOK-UP WIRE • KYNAR® KINKLESS TEST LEAD WIRE SILICONE RUBBER LEAD WIRE • HIGH VOLTAGE CABLE • SHIELDED HOOK-UP WIRE RUBBER KINKLESS TEST LEAD WIRE

Suitable as Test Lead Wire in analyzers, instruments, oscillators, meters, etc. Wherever extra flexibility and limpness is necessary. Single conductor, extra flexible stranded soft tinned copper, separator, wall color coded rubber, smooth wax finish.

OPERATING TEMPERATURE: -20°C to +60°C. COLORS: Red, Black.

DABURN No.	Size	Strand	Nom. Insul. Wall	Sugg. Voltage	O.D. Nom.
2715	20	41/36	3/4"	3,000V	.137"
2716	18	65/36	3/4"	5,000V	.145"
*2718	18	65/36	3/4"	5,000V	.145"
2717	18	65/36	3/4"	10,000V	.210"

* Types WS-16/U Black, WS17/U Red Per MIL-W-13169.

STD. PUT-UP: 100 Ft., 500 Ft., 1000 Ft.

PLASTIC KINKLESS TEST LEAD WIRE

Soft formulation vinyl maximum flexibility. Temperature stability from -80°C to +115°C. Exceed requirements for MIL-I-3930A Type JP (PVC). Suitable for test leads, etc. Resistant to gasoline and oil. Excellent abrasion Resistance.

DESCRIPTION: One conductor tinned copper stranded, special formulation vinyl insulation — smooth surface.

OPERATING TEMPERATURE: -80°C to +115°C. 5000V rating.

COLORS: Black, Red, Yellow, Green, White, Blue.

DABURN No.	Size	Strand	Ins.	Nom. O.D.
2722/22	22	26/36	.032"	.100"
2722/20	20	27/34	.032"	.104"
2722/18	18	65/36	.032"	.112"
2722/16	16	65/34	.032"	.129"

STD. PUT-UP: 100 Ft., 500 Ft., 1000 Ft.

UL PLASTIC HOOK-UP WIRE

300 VOLT UL APPROVED — 80°C

STYLE 1007, CSA TR-64

DABURN No.	Size	Strand	Nom. Ins. Wall	Nom. O.D.
2628/24	24	7/32	.016"	.057"
2628/22	22	7/30	.016"	.065"
2628/20	20	10/30	.016"	.070"
2628/18	18	16/30	.016"	.080"
2628/16	16	26/30	.016"	.095"

COLORS: Black, Red, Green, Yellow, Blue, Brown, White, Orange, Gray, Purple.

STD. PUT-UP: 100 Ft., 500 Ft., 1000 Ft.

SEMI-RIGID BUSINESS MACHINE WIRE — U.L.

300 VOLT 80°C — STYLE 1061

Stranded tinned copper, color coded semi-rigid polyvinylchloride insulation. Has Temperature Rating of -10°C to +80°C, 300 volts in electronic computers or business machines only.

DESCRIPTION: One Conductor stranded tinned copper, semi-rigid PVC.

DABURN No.	Size	Strand	Nom. Ins. Wall	Nom. O.D.
2660/26	26	7/34	.009"	.039"
2660/24	24	7/32	.009"	.041"
2660/22	22	7/30	.009"	.048"
2660/20	20	7/28	.009"	.056"
2660/18	18	7/26	.009"	.072"

STD. PUT-UP: 500 Ft., 1000 Ft. Available with Solid Conductor.

600 VOLT 80°C — STYLE 1011

DESCRIPTION: One conductor stranded annealed tinned copper, PVC insulation.

DABURN No.	Type Designation	Size	Strand	Nom. Ins. Wall	Nom. O.D.	Stock Colors
2611/22	HW-C 22(7/U	22	7/30	.033"	.092"	1-10
2611/20	HW-C 20 10/U	20	10/30	.033"	.100"	1-10
2611/18	HW-C 18 16/U	18	16/30	.033"	.112"	1-10
2611/16	HW-C 16 26/U	16	26/30	.033"	.126"	1-5
2611/14	HW-C 14 41/U	14	41/30	.045"	.170"	1-5
2611/12	HW-C 12 65/U	12	65/30	.045"	.186"	1-4
2611/10	HW-C 10 105/U	10	105/30	.045"	.210"	1-4
2611/8	HW-C 8 133/U	8	133/29	.045"	.260"	1-4

STD. PUT-UP: 100 Ft., 1000 Ft.

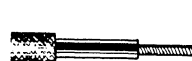
COLORS: 1—White, 2—Black, 3—Red, 4—Green, 5—Yellow, 6—Light Blue, 7—Brown, 8—Orange, 9—Gray, 10—Violet. * Additional colors to order.

SILICONE RUBBER LEAD WIRE

600 VOLT — 200°C

FLEXIBILITY FROM -104°C TO +400°C

Suitable for high-heat and hi-frequency applications. Resistant to acids, alkali, oil. Retains physical properties under extremes. Low power factor, low dielectric constant. Tinned copper, stranded, silicone rubber insulation, glass braid, lacquered. Color: White. Additional Colors Available.



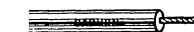
DESCRIPTION: One conductor, tinned copper strands, silicone rubber insulation, glass braid, lacquered.

STOCK COLOR: White.

STD. PUT-UP: 100 Ft., 500 Ft., 1000 Ft.

HI-VOLTAGE CABLE

One conductor, stranded copper tinned, rulan — flame retardant — polyethylene insulation, braided tinned copper overall when shielded. Used as hi-voltage leads in electronic equipment to minimize RF radiation in equipment.

UNSHIELDED

DESCRIPTION: One conductor, stranded copper tinned, rulan (flame retarding type) polyethylene insulation. Available white/red tracer. Temp. Rating: 105°C.

Shielded: Same as above with tinned copper braided shield overall. Special construction available to order.

Daburn Size No.	AWG	Strand	Ins. Wall	Nom. Voltage AC	Breakdown DC	Nom. O.D.
2641	22	7/30	.047"	5,000	10,000	.124"
2642	20	10/30	.047"	5,000	10,000	.125"
2643	20	10/30	.068"	10,000	20,000	.168"
2644	18	16/30	.047"	5,000	10,000	.134"
2645	18	16/30	.068"	10,000	20,000	.178"
2648	18	16/30	.095"	16,000	40,000	.235"
2649	18	16/30	.124"	26,000	60,000	.285"

SHIELDED

Daburn Size No.	AWG	Strand	Ins. Wall	Nom. Voltage AC	Breakdown DC	Nom. O.D.
2652	20	10/30	.095"	16,000	40,000	.252"
2655	18	16/30	.095"	16,000	40,000	.255"
2656	16	26/30	.095"	16,000	40,000	.276"

STD. PUT-UP: 100 Ft., 500 Ft., 1000 Ft.

KYNAR® WIRE

300V — 125°C UL APPROVED

Suitable for wire wrap applications. High cut through resistance. Self-extinguishing. Resistant to most chemicals and solvents. Ultra-violet and weather resistant. DESCRIPTION: Solid, silver plated, oxygen-free, high conductivity (OFHC) copper conductor, extruded Kynar (polyvinylidene fluoride) insulation. To UL Style #1422.

DABURN No.	Size	Nom. Ins. Wall	Nom. O.D. ±.001"	Stock Colors
D1422/30	30	.005"	.020"	1-10
D1422/28	28	.005"	.023"	1-10
D1422/26	26	.005"	.026"	1-9
D1422/24	24	.005"	.030"	1-6

COLORS: 1—White, 2—Black, 3—Red, 4—Green, 5—Yellow, 6—Light Blue, 7—Brown, 8—Orange, 9—Gray, 10—Violet. * Additional colors to order. PUT-UP: 100 Ft., 1000 Ft. Special Hub Spools. Other UL styles to order.

SHIELDED HOOK-UP WIRE

One conductor, tinned copper stranded, polyvinylchloride insulation, lacquered glass braid, overall tinned copper shielded braid.

OPERATING TEMPERATURE: -20°C to +60°C.

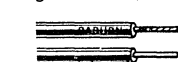
600V Rating

DABURN No.	Size	Strand	Nom. Ins. Wall	Nom. O.D.
2727/22	22	7/30	.016"	.095"
2727/20	20	10/30	.016"	.105"
2727/18	18	16/30	.016"	.125"
2727/16	16	26/30	.016"	.135"
2727/14	14	41/30	.016"	.155"
2727/12	12	65/30	.016"	.175"
2727/10	10	105/30	.025"	.200"

STD. PUT-UP: 1000 Ft.

600 VOLT UL APPROVED — 105°C (CSA 600V — 90°C) STYLE 1015, CSA TR-32

Resistant to acids, alkalis, oil, flame, fungus and moisture. Temperature Rating: -10°C to +105°C.



DESCRIPTION: One conductor stranded annealed copper tinned, plastic insulation.

COLORS: Black, Red, Green, Yellow, Blue, White, Orange, Gray, Purple. STANDARD PUT-UP: 100 Ft., 500 Ft., 1000 Ft.

STRIPPED AND/OR MARKED TO ORDER

DABURN No.	Size	Strand	Nom. Ins. Wall	Nom. O.D.
2630	22	7/30	.032"	.095"
2631	20	10/30	.032"	.102"
2632	18	16/30	.032"	.112"
2633	16	26/30	.032"	.126"
2633/14	14	41/30	.032"	.142"

SOLID

Daburn No.	Size	Strand	Nom. Ins. Wall	Nom. O.D.
2635/20	22	1	.032"	.095"
2635/20	20	1	.032"	.102"

®Pennsalt Chemical Co. ALL THE ABOVE MAY BE ORDERED CUT AND/OR STRIPPED AND/OR MARKED TO ORDER
DABURN ELECTRONICS & CABLE CORP. • 2360 HOFFMAN ST., BRONX, N.Y. 10458 (212) 295-0050 TWX 710-593-4145

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

HI-VOLT CORONA RESISTANT TEFLON* CABLE®

Voltage Rating at Sea Level • Voltage Rating at 80,000 feet,
approximately 1/3 lower

- Minimum life expectancy: 10,000 hours.

SMALL SIZE:

You do not need bulky, thick, insulation jacketing as used with silicone rubber and polyethylene insulations to get your hi-voltage requirements. Wire used is MIL-SPEC QQ-W-343 and MIL-W-16878D. Insulation used conforms to and surpasses MIL-SPEC-W-16878D

AVOID CORONA PROBLEMS:

Corona resistant Teflon construction is specifically designed to retard and prevent corona penetration. Temperature variations from -60° to +300°C have no life effect on the corona resistant Teflon. In addition, there is no stress or crack failure under severe, adverse conditions including mechanical strain, moisture, corona or chemical conditions.

DESCRIPTION:

Single Conductor, Stranded Silver Plated Copper, Corona Resistant Teflon* Insulation.

TEMPERATURE RATING:

-90°C to +250°C.

VOLTAGE RATING:

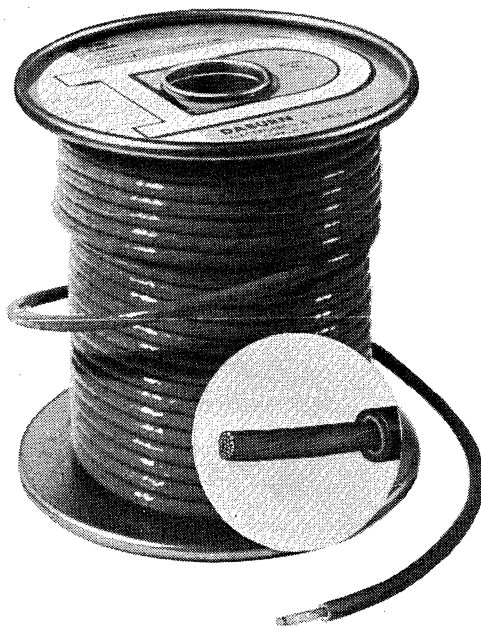
Based on insulation thickness.

AVAILABLE COLORS:

White, Black, Red, Green, Yellow, Lt. Blue, Brown, Orange, Gray, Violet. (Also available in tracer colors)

PUT-UP: 250', 500', 1000'

* DUPONT

**ADDITIONAL SIZES AND VOLTAGES AVAILABLE**

DABURN No.	AWG Size	Strand	Voltage Rating AC	DC	Max. O.D.
CRT-12-2	12	19/25	2500	10,000	.142"
CRT-12-2.5	12	19/25	3750	12,500	.152"
CRT-12-3	12	19/25	4500	15,000	.162"
CRT-12-3.5	12	19/25	5300	17,500	.172"
CRT-12-4	12	19/25	6000	20,000	.182"
CRT-12-5	12	19/25	7500	25,000	.202"
CRT-12-6.5	12	19/25	10,000	32,500	.232"
CRT-12-8	12	19/25	12,000	40,000	.262"
CRT-12-10	12	19/25	15,000	50,000	.302"
CRT-14-2	14	19/27	2500	10,000	.124"
CRT-14-2.5	14	19/27	3750	12,500	.134"
CRT-14-3	14	19/27	4500	15,000	.144"
CRT-14-3.5	14	19/27	5300	17,500	.154"
CRT-14-4	14	19/27	6000	20,000	.164"
CRT-14-5	14	19/27	7500	25,000	.184"
CRT-14-6.5	14	19/27	10,000	32,500	.214"
CRT-14-8	14	19/27	12,000	40,000	.244"
CRT-14-10	14	19/27	15,000	50,000	.284"
CRT-16-2	16	19/29	2500	10,000	.109"
CRT-16-2.5	16	19/29	3750	12,500	.119"
CRT-16-3	16	19/29	4500	15,000	.129"
CRT-16-3.5	16	19/29	5300	17,500	.139"
CRT-16-4	16	19/29	6000	20,000	.149"
CRT-16-5	16	19/29	7500	25,000	.169"
CRT-16-6.5	16	19/29	10,000	32,500	.199"
CRT-16-8	16	19/29	12,000	40,000	.229"
CRT-16-10	16	19/29	15,000	50,000	.269"
CRT-18-2	18	19/30	2500	10,000	.102"
CRT-18-2.5	18	19/30	3750	12,500	.112"
CRT-18-3	18	19/30	4500	15,000	.122"
CRT-18-3.5	18	19/30	5300	17,500	.132"
CRT-18-4	18	19/30	6000	20,000	.142"
CRT-18-5	18	19/30	7500	25,000	.162"
CRT-18-6.5	18	19/30	10,000	32,500	.192"
CRT-18-8	18	19/30	12,000	40,000	.222"
CRT-18-10	18	19/30	15,000	50,000	.262"
CRT-20-2	20	19/32	2500	10,000	.092"
CRT-20-2.5	20	19/32	3750	12,500	.102"
CRT-20-3	20	19/32	4500	15,000	.112"
CRT-20-3.5	20	19/32	5300	17,500	.122"

DABURN No.	AWG Size	Strand	Voltage Rating AC	DC	Max. O.D.
CRT-20-4	20	19/32	6000	20,000	.132"
CRT-20-5	20	19/32	7500	25,000	.152"
CRT-20-6.5	20	19/32	10,000	32,500	.192"
CRT-20-8	20	19/32	12,000	40,000	.212"
CRT-20-10	20	19/32	15,000	50,000	.252"
CRT-22-2	22	19/34	2500	10,000	.084"
CRT-22-2.5	22	19/34	3750	12,500	.094"
CRT-22-3	22	19/34	4500	15,000	.104"
CRT-22-3.5	22	19/34	5300	17,500	.114"
CRT-22-4	22	19/34	6000	20,000	.124"
CRT-22-5	22	19/34	7500	25,000	.144"
CRT-22-6.5	22	19/34	10,000	32,500	.174"
CRT-22-8	22	19/34	12,000	40,000	.204"
CRT-22-10	22	19/34	15,000	50,000	.244"
CRT-24-2	24	19/36	2500	10,000	.077"
CRT-24-2.5	24	19/36	2750	12,500	.087"
CRT-24-3	24	19/36	4500	15,000	.097"
CRT-24-3.5	24	19/36	5300	17,500	.107"
CRT-24-4	24	19/36	6000	20,000	.117"
CRT-24-5	24	19/36	7500	25,000	.137"
CRT-24-6.5	24	19/36	10,000	32,500	.167"
CRT-24-8	24	19/36	12,000	40,000	.197"
CRT-24-10	24	19/36	15,000	50,000	.237"
CRT-26-2	26	7/34	2500	10,000	.071"
CRT-26-2.5	26	7/34	3750	12,500	.081"
CRT-26-3	26	7/34	4500	15,000	.091"
CRT-26-3.5	26	7/34	5300	17,500	.101"
CRT-26-4	26	7/34	6000	20,000	.111"
CRT-26-5	26	7/34	7500	25,000	.131"
CRT-26-6.5	26	7/34	10,000	32,500	.161"
CRT-26-8	26	7/34	12,000	40,000	.191"
CRT-26-10	26	7/34	15,000	50,000	.231"
CRT-28-2	28	7/36	2500	10,000	.067"
CRT-28-2.5	28	7/36	3750	12,500	.077"
CRT-28-3	28	7/36	4500	15,000	.087"
CRT-28-3.5	28	7/36	5300	17,500	.097"
CRT-28-4	28	7/36	6000	20,000	.117"
CRT-28-5	28	7/36	7500	25,000	.127"
CRT-28-6.5	28	7/36	10,000	32,500	.157"
CRT-28-8	28	7/36	12,000	40,000	.187"
CRT-28-10	28	7/36	15,000	50,000	.227"

© Copyright Daburn 1968. *Dupont

DABURN ELECTRONICS & CABLE CORP. • 2360 HOFFMAN ST., BRONX, N.Y. 10458 (212) 295-0050 TWX 710-593-4145

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

NEW**FLAT RIBBON CABLE • TYPES B & C PER MIL-W-16878D•UL FR-1****SOLID COLORS**

DESCRIPTION: Each conductor is stranded T.C. with extruded PVC insulation, bonded together to form a flat ribbon cable. Conductors separate easily for clean terminations with standard wire connectors, jacks and pins. Ribbon cable saves space and time on circuit interconnecting assemblies, wiring harnesses, sliding drawers and drop assemblies and simplifies identification. Resists acid, alkalis, flame, moisture, oil, solvents and fungus.

TEMPERATURE RATING: -55°C to +105°C. Insulation meets or exceeds UL FR1 vertical flame test.

Per MIL-W-16878D — TYPE B — 600 V

DABURN No.	Cond.	Size	Strand	Nom. Wall	Nom. O.D.
1805/10	10	22	19/34	.010"	.510" x .051"
1805/15	15	22	19/34	.010"	.765" x .051"
1805/20	20	22	19/34	.010"	1.20" x .051"
1805/30	30	22	19/34	.010"	1.53" x .051"
1806/10	10	24	19/36	.010"	.430" x .043"
1806/15	15	24	19/36	.010"	.645" x .043"
1806/20	20	24	19/36	.010"	.860" x .043"
1806/30	30	24	19/36	.010"	1.30" x .043"
1807/10	10	26	7/34	.010"	.370" x .037"
1807/15	15	26	7/34	.010"	.555" x .037"
1807/20	20	26	7/34	.010"	.740" x .037"
1807/30	30	26	7/34	.010"	1.11" x .037"
1808/10	10	28	7/36	.010"	.340" x .034"
1808/15	15	28	7/36	.010"	.510" x .034"
1808/20	20	28	7/36	.010"	.680" x .034"
1808/30	30	28	7/36	.010"	1.020" x .034"
1809/10	10	30	7/38	.010"	.310" x .031"
1809/15	15	30	7/38	.010"	.465" x .031"
1809/20	20	30	7/38	.010"	.620" x .031"
1809/30	30	30	7/38	.010"	.930" x .031"

Per MIL-W-16878D — TYPE C — UL2444

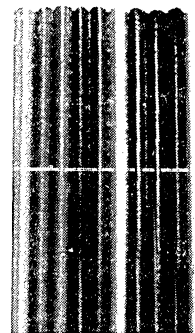
DABURN No.	Cond.	Size	Strand	Nom. Wall	Nom. O.D.
1823/5	5	22	7/30	.016"	.065" x .325"
1823/10	10	22	7/30	.016"	.065" x .650"
1823/15	15	22	7/30	.016"	.065" x .975"
1823/20	20	22	7/30	.016"	.065" x 1.300"

STANDARD PUT-UP: 100 Ft., 1000 Ft.

COLOR CODE: Solid Colors.

COLOR CODE: 1—Brown, 2—Red, 3—Orange, 4—Yellow, 5—Green, 6—Blue, 7—Violet, 8—Gray, 9—White 10†—Black.

†Beyond 10 conductors, code is repeated.

SOLID COLORS**INDIVIDUALLY COLOR CODED WITH STRIPES****Per MIL-W-16878D — TYPE B — 600 V**

DESCRIPTION: Each conductor stranded tinned copper, polyvinyl-chloride insulation, bonded to form flat ribbon cable. Conductors are color coded and separate easily for clean terminations. Saves space, time on circuit and interconnecting assemblies, wiring harnesses, sliding drawers and drop assemblies.

Rated: -55°C to +105°C

DABURN No.	Cond.	Size	Strand	Nom. Wall	Nom. O.D.
1804/4	4	24	7/32	.010"	.043" x .172"
1804/8	8	24	7/32	.010"	.043" x .344"
1804/12	12	24	7/32	.010"	.043" x .516"
1804/16	16	24	7/32	.010"	.043" x .688"
1804/20	20	24	7/32	.010"	.043" x .860"

STD. PUT-UP: 250 Ft., 500 Ft., 1000 Ft.

CONDUCTOR COLOR CODE: Same as noted below for C-22 Series.

Per MIL-W-16878D TYPE C

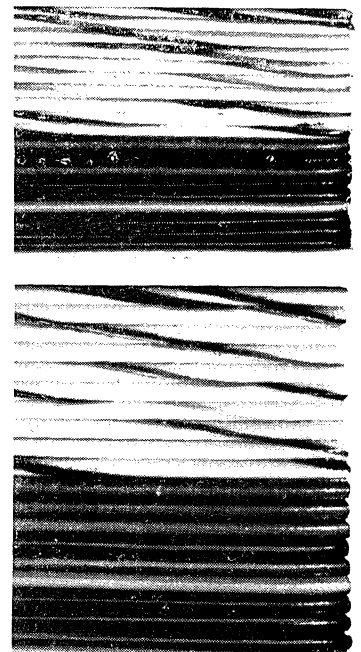
VOLTAGE RATING: 1000 VOLTS

DABURN No.	Cond.	Size	Strand	Nom. Wall	Nom. O.D.
1822/4	4	22	7/30	.016"	.065" x .260"
1822/8	8	22	7/30	.016"	.065" x .520"
1822/12	12	22	7/30	.016"	.065" x .780"
1822/16	16	22	7/30	.016"	.065" x 1.040"
1822/20	20	22	7/30	.016"	.065" x 1.300"

STD. PUT-UP: 250 Ft., 500 Ft., 1000 Ft.

CONDUCTOR COLOR CODE — INDIVIDUALLY CODED:

1—White	6—Lt. Blue	11—Wh/Black	16—Wh/Brown
2—Black	7—Brown	12—Wh/Red	17—Wh/Orange
3—Red	8—Orange	13—Wh/Green	18—Wh/Gray
4—Green	9—Gray	14—Wh/Yellow	19—Wh/Violet
5—Yellow	10—Violet	15—Wh/Blue	20—Wh/Blk/Red

INDIVIDUAL COLORS

**ADDITIONAL SIZES & TYPES
AVAILABLE TO ORDER**

DABURN ELECTRONICS & CABLE CORP. • 2360 HOFFMAN ST., BRONX, N.Y. 10458 (212) 295-0050 TWX 710-593-4145

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

HEAVY DUTY TWISTED PAIRS INTERCOM CABLES — (Stranded)

Where larger conductors are indicated, we suggest these No. 18 gauge cables. Rugged yet flexible — abrasion resistant. Gray vinyl jacket overall.

Standard intercom color coding for paired cables applies 300v.

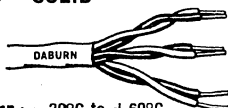
DABURN No.	Pairs	Cond.	Size	Nom. O.D.
3003/3	3	6	18-16/30	.365"
3003/6	6	12	18-16/30	.560"
3003/9	9	18	18-16/30	.650"
3003/15	15	30	18-16/30	.875"

STD. PUT-UP: 500 Ft., 1000 Ft.

**PLASTIC INTERCOMMUNICATION CABLES****TWISTED PAIRS — SOLID**

Each Cond. #22 Solid Tinned Copper, .010" wall (Operating Temp. -20°C to +60°C). Vinyl plastic insulation, conductors color coded, twisted pairs, cabled, gray vinyl jacket overall. Suitable for outdoor installations.

Operating Voltage: 200 Volts. Operating Temp.: -20°C to +60°C.



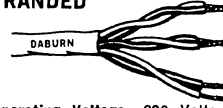
DABURN No.	Pairs	Cond.	Size	Nom. Jacket	Nom. O.D.
3000	1	2	22 Solid	.020"	.130"
3000/2	2	4	22 Solid	.020"	.205"
3000/3	3	6	22 Solid	.020"	.215"
3000/6	6	12	22 Solid	.020"	.275"
3000/9	9	18	22 Solid	.020"	.310"
3000/11	11	22	22 Solid	.020"	.340"
3000/13	13	26	22 Solid	.025"	.385"
3000/15	15	30	22 Solid	.025"	.390"
3000/16	16	32	22 Solid	.025"	.415"
3000/27	27	54	22 Solid	.035"	.505"
3000/31	31	62	22 Solid	.035"	.555"
3000/41	41	82	22 Solid	.035"	.630"
3000/51	51	102	22 Solid	.045"	.735"
3000/76	76	152	22 Solid	.070"	.970"
3000/101	101	202	22 Solid	.080"	1.140"

STD. PUT-UP: 100 Ft., 500 Ft., 1000 Ft. Other pairs available to order.

TWISTED PAIRS — STRANDED

Each Cond. #22 7/30 Tinned Copper, .010" wall vinyl plastic insulation, conductors color coded, twisted pairs, cabled, gray vinyl jacket overall. Suitable for outdoor installations.

Operating Temperature: -20°C to +60°C. Operating Voltage: 200 Volts.



DABURN No.	Pairs	Cond.	Size	Strand	Nom. O.D.
3002	1	2	22	7/30	.145"
3002/2	2	4	22	7/30	.210"
3002/3	3	6	22	7/30	.225"
3002/4	4	8	22	7/30	.235"
3002/5	5	10	22	7/30	.245"
3002/6	6	12	22	7/30	.290"
3002/9	9	18	22	7/30	.350"
3002/11	11	22	22	7/30	.365"
3002/15	15	30	22	7/30	.455"
3002/19	19	38	22	7/30	.480"
3002/23	23	46	22	7/30	.530"
3002/27	27	54	22	7/30	.570"
3002/31	31	62	22	7/30	.635"
3002/41	41	82	22	7/30	.710"
3002/51	51	102	22	7/30	.800"

STD. PUT-UP: 100 Ft., 500 Ft., 1000 Ft.

CONDUCTOR COLOR CODE CHART FOR PAIRED INTERCOM CABLES**PAIR NO. COLOR COMBINATION**

- 1—Black paired with Red
- 2—Black paired with White
- 3—Black paired with Green
- 4—Black paired with Blue
- 5—Black paired with Brown
- 6—Black paired with Yellow
- 7—Black paired with Orange
- 8—Red paired with Green
- 9—Red paired with White
- 10—Red paired with Blue
- 11—Red paired with Yellow
- 12—Red paired with Brown
- 13—Red paired with Orange
- 14—Green paired with Blue
- 15—Green paired with White
- 16—Green paired with Brown
- 17—Green paired with Orange

PAIR NO. COLOR COMBINATION

- 18—Green paired with Yellow
- 19—White paired with Blue
- 20—White paired with Brown
- 21—White paired with Orange
- 22—White paired with Yellow
- 23—Blue paired with Brown
- 24—Blue paired with Orange
- 25—Blue paired with Yellow
- 26—Brown paired with Orange
- 27—Brown paired with Yellow
- 28—Purple paired with Red
- 29—Purple paired with White
- 30—Purple paired with Green
- 31—Purple paired with Blue
- 32—Purple paired with Brown
- 33—Purple paired with Yellow
- 34—Purple paired with Orange

PAIR NO. COLOR COMBINATION

- 35—Purple paired with Slate
- 36—Purple paired with Black
- 37—Slate paired with Red
- 38—Slate paired with White
- 39—Slate paired with Green
- 40—Slate paired with Blue
- 41—Slate paired with Brown
- 42—Slate paired with Yellow
- 43—Slate paired with Orange
- 44—Slate paired with Black
- 45—White/Black paired w. Red
- 46—White/Black paired w. Green
- 47—White/Black paired w. Blue
- 48—White/Black paired w. Brown
- 49—White/Black paired w. Yellow
- 50—White/Black paired w. Orange
- 51—White/Black paired w. Purple

MULTI-CONDUCTOR — PLASTIC JACKET UNSHIELDED AUDIO — FLEXIBLE

Each Cond. #22 7/30 Tinned Copper, stranded, .010" wall plastic insulation, color coded, twisted, gray vinyl jacket overall. Suitable for signal, P.A. systems, computer cable—for outdoor use.

Operating Voltage: 200 Volts. Operating Temperatures: -20°C to +60°C.



STD. PUT-UP: 500 Ft.

DABURN No.	Cond.	Size	Strand	Nom. Wall	Nom. Jacket	Nom. O.D.
3054/2	2	22	7/30	.010"	.020"	.140"
3054/3	3	22	7/30	.010"	.020"	.145"
3054/4	4	22	7/30	.010"	.020"	.170"
3054/5	5	22	7/30	.010"	.020"	.175"
3054/6	6	22	7/30	.010"	.020"	.185"
3054/7	7	22	7/30	.010"	.020"	.190"
3054/8	8	22	7/30	.010"	.020"	.200"
3054/9	9	22	7/30	.010"	.020"	.225"
3054/10	10	22	7/30	.010"	.020"	.235"
3054/12	12	22	7/30	.010"	.020"	.255"
3054/15	15	22	7/30	.010"	.020"	.280"
3054/20	20	22	7/30	.010"	.020"	.310"
3054/25	25	22	7/30	.010"	.020"	.340"
3054/30	30	22	7/30	.010"	.020"	.365"
3054/40	40	22	7/30	.010"	.025"	.425"
3054/50	50	22	7/30	.010"	.035"	.500"
3054/60	60	22	7/30	.010"	.035"	.530"

STD. PUT-UP: From 2 thru 7 cond. 500 ft.; from 8 thru 30 cond. 250 ft.

MULTI-CONDUCTOR COLOR CODE CHART**CONDUCTOR COLOR CODE:**

- | | | |
|-------------------|-------------------------|-------------------------|
| 1 — Black | 21 — White/Brown | 41 — White/Green/Red |
| 2 — Red | 22 — White/Orange | 42 — White/Green/Green |
| 3 — White | 23 — White/Gray | 43 — White/Green/Blue |
| 4 — Green | 24 — White/Violet | 44 — White/Green/Brown |
| 5 — Orange | 25 — White/Black/Red | 45 — White/Green/Purple |
| 6 — Blue | 26 — White/Black/Green | 46 — White/Blue/Black |
| 7 — Brown | 27 — White/Black/Yellow | 47 — White/Blue/Red |
| 8 — Yellow | 28 — White/Black/Blue | 48 — White/Blue/Green |
| 9 — Violet | 29 — White/Black/Brown | 49 — White/Blue/Blue |
| 10 — Slate | 30 — White/Black/Orange | 50 — White/Blue/Brown |
| 11 — Pink | 31 — White/Black/Slate | 51 — White/Blue/Purple |
| 12 — Tan | 32 — White/Black/Purple | 52 — White/Brown/Black |
| 13 — Red/Green | 33 — White/Black/Black | 53 — White/Brown/Red |
| 14 — Red/Yellow | 34 — White/Red/Black | 54 — White/Brown/Green |
| 15 — Red/Black | 35 — White/Red/Red | 55 — White/Brown/Blue |
| 16 — White/Black | 36 — White/Red/Green | 56 — White/Brown/Brown |
| 17 — White/Red | 37 — White/Red/Blue | 57 — White/Brown/Purple |
| 18 — White/Green | 38 — White/Red/Brown | 58 — White/Purple/Red |
| 19 — White/Yellow | 39 — White/Red/Purple | 59 — White/Purple/Green |
| 20 — White/Blue | 40 — White/Green/Black | 60 — White/Purple/Blue |

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

AUDIO, DATA SHIELDED, MICROPHONE AND CONTROL CABLES

COLOR CODE CHART FOR PAIRED INTERCOM CABLES SEE PAGE 2-1986

**AUDIO & DATA SHIELDED CABLE
INDIVIDUALLY ALUMINUM MYLAR FOIL SHIELDED PAIRS
STRANDED CONDUCTOR**

DESCRIPTION: Each conductor **stranded**, copper tinned, hi density polyethylene insulation, color coded, conductors — twisted pairs. #22 stranded tinned copper wire. Aluminum foil mylar shield over each pair and copper tinned drain wire. Overall chrome grey PVC jacket. Nom. cap. between conds. of a pair, 25 PF/FT. Capacitance of a single conductor to shield, 45 PF/FT.

Sugg. Working Voltage: 300V.

DABURN Cat. No.	No. of Pairs	No. of Conds.	Cond. Strand	Nom. Wall	Nom. Jkt.	Nom. O.D.
2932/3	3	6	7/30	.010"	.025"	.235"
2932/6	6	12	7/30	.010"	.030"	.320"
2932/9	9	18	7/30	.010"	.035"	.370"
2932/11	11	22	7/30	.010"	.040"	.415"
2932/15	15	30	7/30	.010"	.040"	.485"
2932/19	19	38	7/30	.010"	.050"	.530"
2932/27	27	54	7/30	.010"	.055"	.645"



STD. PUT-UP: 500 Ft., 1000 Ft. Construction variations to order.

INDIVIDUALLY SHIELDED PAIRS — STRANDED COND.

DESCRIPTION: Polyethylene insulated, individually twisted and shielded pairs of #22 stranded T.C., cabled with #24 AWG stranded T.C. drain wire. Chrome PVC jacket overall. Nom. capacitance between conductors 35 pf/ft.

DABURN Cat. No.	No. of Pairs	No. of Conds.	Cond. Strand	Nom. Wall	Nom. Jkt.	Nom. O.D.
2933/2	2	4	7/30	.008"	.020"	.200"

INDIVIDUALLY SHIELDED MULTIPLE PAIR — SOLID COND.

This construction reduces the bulk in required cables. Multipaired #22 solid tinned copper, vinyl insulated .013", cabled in pairs. Aluminum foil mylar shield over each pair and drain wire, overall gray vinyl jacket. Nom. Cap. between Conds. 40 MMF/FT. Nom. Cap. between 1 Cond. and others connected to shield — 77 MMF/FT.

DABURN Cat. No.	Pairs	Conds.	Nom. Jacket	Nom. O.D.
2930/3	3	6	.030"	.252"
2930/6	6	12	.037"	.345"
2930/9	9	18	.040"	.410"
2930/11	11	22	.040"	.458"
2930/15	15	30	.045"	.510"
2930/19	19	38	.055"	.630"
2930/27	27	54	.070"	.770"

STD. PUT-UP: 500 Ft., 1000 Ft. Construction Variations Available to Order.

**ALUMINUM MYLAR FOIL SHIELD
PLASTIC JACKETED CABLE**

Extremely light in weight, provides 100% shield coverage — small diameters. Each cond. tinned copper, stranded color coded polyethylene insulation, twisted, drain wire, aluminum mylar foil shield, gray polyvinylchloride jacket overall. Drain wire provides quick and easy grounding.

OPERATING TEMPERATURE: -20°C to +60°C. OPERATING VOLTAGE: 400 Volts.

DABURN Cat. No.	Cond.	Size	Strand	Nom. Wall	Nom. Jacket	Nom. O.D.
2960	2	22	7/30	.015"	.020"	.160"
2960/3	3	22	7/30	.015"	.020"	.185"
2960/4	4	22	7/30	.015"	.020"	.205"
2961	2	20	10/30	.015"	.020"	.185"
2961/3	3	20	10/30	.015"	.020"	.205"
2961/4	4	20	10/30	.015"	.020"	.225"
2962	2	18	16/30	.017"	.020"	.220"
2962/3	3	18	16/30	.017"	.020"	.235"
2962/4	4	18	16/30	.017"	.020"	.255"
2963	2	16	26/30	.017"	.020"	.255"
2963/3	3	16	26/30	.017"	.020"	.275"
2964	2	14	41/30	.017"	.020"	.295"
2964/3	3	14	41/30	.017"	.020"	.305"

STD. PUT-UP: 500 Ft., 1000 Ft.

CONDUCTOR COLOR CODE: 1—Black, 2—Red, 3—White, 4—Green.

SHIELDED CABLE

Suitable for P.A. and sound systems, installation in schools, hospitals and institutions, transmitters, electronic circuits, etc. Construction allows ease of pigtail. Shield provides additional strength for cable. Each conductor tinned copper, PVC insulation, color coded, twisted, braided T-C shield, gray PVC jacket overall. Suitable for outdoor installations.

OPERATING TEMPERATURE: -20°C to +60°C.

DABURN Cat. No.	Cond.	Size	Strand	Nom. Wall	Nom. Jacket	Operating Voltage	Nom. O.D.
2970	2	22	7/30	.017"	.020"	350V	.175"
2970/3	3	22	7/30	.017"	.020"	350V	.195"
2971	2	20	10/30	.017"	.020"	350V	.195"
2971/3	3	20	10/30	.017"	.020"	350V	.215"
2972	2	18	16/30	.017"	.020"	350V	.235"
2972/3	3	18	16/30	.017"	.020"	350V	.245"
2974	2	16	26/30	.017"	.020"	350V	.255"
2974/3	3	16	26/30	.017"	.020"	350V	.260"
2975	2	14	41/30	.020"	.020"	450V	.290"
2975/3	3	14	41/30	.020"	.020"	450V	.295"
2976	2	12	65/30	.020"	.020"	450V	.335"
2976/3	3	12	65/30	.020"	.020"	450V	.340"

CONDUCTOR COLOR CODE: 1—Black, 2—Red, 3—White.

STD. PUT-UP: 500 Ft., 1000 Ft.

**PLASTIC JACKETED
BRAIDED COPPER SHIELD****SHIELDED PLASTIC MICROPHONE CABLE**

Will withstand abuse and is resistant to oil, moisture, aging. Have low capacitance. Hi insulation resistance and low attenuation. Will not strain or mark.

2772 — For hi impedance microphone

2773 — For crystal, ribbon, etc. mikes. All are suitable for hi-fi interconnecting cables.

2774 — For hi impedance lapel mikes.

OPERATING TEMPERATURE: -20°C to +60°C.

SHIELDED MICROPHONE CABLE ONE CONDUCTOR

Uses tinned copper spiral shield — for ease in soldering — extremely flexible-plastic.

DABURN Cat. No.	Cond.	Size	Strand	Shield	Nom. Cap./Ft.	Sugg. Work. Voltage	Nom. O.D.
2770	1	25	7/33	Spiral	23	3000	.159"
2771	1	25	7/33	Spiral	33	1000	.120"
2772	1	20	26/34	Braid	36	4000	.175"
2773	1	25	7/33*	Braid	34	3500	.144"
2774	1	25	7/33*	Braid	23	5000	.190"

* 3 strand tinned copper, 4 strand tinned copperweld.

**MULTICONDUCTOR
MICROPHONE CABLE**

Each conductor tinned copper, polyethylene insulation — color coded, twisted with filars, textile wrap, tinned copper braid shield, gray vinyl jacket overall.

OPERATING TEMPERATURE: -20°C to +60°C.

†Spiral T.C. Shield

DABURN Cat. No.	Cond.	Size	Strand	Nom. Cap./Ft.	Sugg. Work. Voltage	Nom. O.D.
2782	2	22	16/34	31 MMF	1000	.231"
2782/20	2	20	26/34	45 MMF	600	.240"
2782/24†	2	24	10/34	38 MMF	1000	.190"

**SHIELDED ULTRA LOW CAPACITY
MICROPHONE CABLE**Plastic Jacket — Cellular Foam Polyethylene Insulation
BRAIDED SHIELD

DESCRIPTION: Constructed with white foam polyethylene insulation, braided tinned copper shield, chrome gray vinyl jacket. The low loss foam polyethylene construction has lower capacitance and attenuation than standard polyethylene mike cables as much as 50%.

This increases the effective length of cable as much as 50% without signal loss.

OPERATING TEMPERATURE -20°C to +60°C.

DABURN Cat. No.	Cond.	Size	Strand	Nom. Cap./Ft.	Nom. Jacket	Nom. O.D.
2890	1	26	7/34*	30MMF	.020"	.114"
2891	1	24	10/34	20MMF	.030"	.180"
2892	1	24	10/34	15MMF	.030"	.220"
2893	2	22	16/34	11MMF	.030"	.295"

STD. PUT-UP: 100 Ft., 250 Ft., 500 Ft., 1000 Ft.

CONDUCTOR COLOR CODE: 1—White, 2—Black.

* 3 strands tinned copper, 4 strands tinned copperweld.

**PLASTIC JACKETED AUDIO AND
MULTICONDUCTOR CABLE
SPIRAL WRAPPED COPPER SHIELD**

Suitable for P.A. and sound systems, schools, hospitals, institutions, recording studios, paging and call systems. Each conductor copper tinned, plastic insulation, color coded, twisted, spiral

wrapped tinned, copper shield, gray plastic jacket. Temp.: -20 to +60°C. Simplifies pigtail. Provides almost 100% shielding coverage.

DABURN Cat. No.	Cond.	Size	Strand	Nom. Insul.	Nom. Jacket	Sugg. Working Voltage	Nom. O.D.
2949	2	22	1	.017"	.020"	350V	.170"
2950	2	22	7/30	.017"	.020"	350V	.170"
2950/1	1	22	7/30	.017"	.020"	350V	.115"
2950/3	3	22	7/30	.017"	.020"	350V	.190"
2950/4	4	22	7/30	.017"	.020"	350V	.200"
2950/6	6	22	7/30	.017"	.020"	350V	.235"
2952	2	20	10/30	.017"	.020"	350V	.190"
2952/1	1	20	10/30	.017"	.020"	350V	.129"
2952/3	3	20	10/30	.017"	.020"	350V	.205"
2952/4	4	20	10/30	.017"	.020"	350V	.222"
2952/6	6	20	10/30	.017"	.020"	350V	.260"
2953	2	18	16/30	.017"	.020"	350V	.230"
2953/1	1	18	16/30	.017"	.020"	350V	.133"
2953/3	3	18	16/30	.017"	.020"	350V	.230"
2953/4	4	18	16/30	.017"	.020"	350V	.245"
2954	2	16	26/30	.017"	.020"	350V	.235"
2954/4	4	16	26/30	.017"	.020"	350V	.255"
2954/3	3	16	26/30	.017"	.020"	350V	.245"
2955	2	14	41/30	.020"	.025"	450V	.285"
2955/3	3	14	41/30	.020"	.025"	450V	.292"
2955/4	4	14	41/30	.020"	.025"	450V	.310"
2956	2	12	65/30	.020"	.025"	450V	.325"
2956/3	3	12	65/30	.020"	.025"	450V	.335"

STD. PUT-UP: 250 Ft., 500 Ft., 1000 Ft.

CONDUCTOR COLOR CODE: 1—Black, 2—Red, 3—White, 4—Green.

CONSTRUCTION VARIATION TO ORDER

DABURN ELECTRONICS & CABLE CORP. • 2360 HOFFMAN ST., BRONX, N.Y. 10458 (212) 295-0050 TWX 710-593-4145

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

Long Lasting Service — useful wherever cords must change length or position. Extend to approximately six times its retracted length. Returns to its original shape or length when released. Eliminates tangling, twisting or knots. Cords are UL and CSA approved.

RETRACTILE POWER CORDS

RETRACTED LENGTHS: 1, 2, 3 & 4 FT. • EXTENDED LENGTHS: 6, 12, 18 & 25 FT.

UL APPROVED — NEOPRENE JACKETED CORD

Operating Temperature: -20°C to +60°C

DABURN CAT. NOS.	RETRACTED LENGTHS				No. Conds.	Size	Strand	UL1 and CSA Type	Amps	Volt Rating	Coil Nom. O.D.	Cord Nom. O.D.
4 Ft.* Length	3 Ft. Length	2 Ft. Length	1 Ft. Length									
986-4	986-3	986-2	986-1	2	18	41/34	SVO	7	300	7/8"	.250"	
986/3-4	986/3-3	986/3-2	986/3-1	3	18	41/34	SVO	7	300	1"	.275"	
987-4	—	—	—	2	18	41/34	SVT	7	300	7/8"	.250"	
989-4	989-3	989-2	989-1	2	18	41/34	SJO	7	300	1 1/8"	.310"	
989/3-4	989/3-3	989/3-2	989/3-1	3	18	41/34	SJO	7	300	1 3/8"	.330"	
989/4-4	989/4-3	989/4-2	989/4-1	4	18	41/34	SJO	5.6	300	1 1/4"	.360"	
989/5-4	—	989/5-2	—	5	18	41/34	—	5.6	300	1 3/4"	.440"	
989/7-4	—	989/7-2	—	7	18	41/34	—	5.6	300	1 7/8"	.500"	
990-4	—	—	—	2	18	41/34	SJT	7	300	1 3/8"	.310"	
991-4	991-3	991-2	991-1	2	16	65/34	SJO	10	300	1 3/8"	.330"	
991/3-4	991/3-3	991/3-2	991/3-1	3	16	65/34	SJO	10	300	1 7/8"	.365"	
991/4-4	991/4-3	991/4-2	—	4	16	65/34	SJO	8	300	1 3/8"	.395"	
991/5-4	—	991/5-2	—	5	16	65/34	SO	8	600	2"	.540"	
991/6-4	—	991/6-2	—	6	16	65/34	—	8	600	2 1/8"	.550"	
991/7-4	—	991/7-2	—	7	6/16 1/14	#16-65/34 #14-41/30	—	#16-8 #14-12	600	2 1/4"	.600"	
993-4	993-3	993-2	—	2	14	41/30	SO	15	600	2"	.535"	
993/3-4	993/3-3	993/3-2	—	3	14	41/30	SO	15	600	2 1/8"	.560"	
993/4-4	993/4-3	993/4-2	—	4	14	41/30	SO	12	600	2 1/4"	.605"	
994-4	994-3	994-2	—	2	12	65/30	SO	20	600	2 1/4"	.605"	
994/3-4	994/3-3	994/3-2	—	3	12	65/30	SO	20	600	2 3/8"	.635"	
994/4-4	994/4-3	994/4-2	—	4	12	65/30	SO	16	600	2 1/2"	.665"	
994/6-4	—	994/6-2	—	6	2/12 4/18	#12-65/30 #18-41/34	—	#12-17 #18-6	600	2 1/4"	.605"	
994/7-4	—	994/7-2	—	7	12	65/30	—	16	600	2 3/8"	.775"	

† Wherever UL type is shown, approved by CSA Testing Laboratories.
‡ Preferred Put-up.

Std. Pkg. 5

CONDUCTOR COLOR CODE: 1-Black, 2-White, 3-Green, 4-Red, 5-Blue, 6-Brown, 7-Yellow.

UL APPROVED RETRACTILE POWER CORD SETS

18" Retracted — Approx. 9 Ft. Extended — 300V — UL Approved

For portable use. Mobile and office equipment. Neoprene jacketed cord sets with molded male plug on one end. OPERATING VOLTAGE 300 VOLTS

DABURN Cat. No.	Conds.	AWG Size	Strand	Type UL	Coil O.D.	Cord O.D.
980	2	18	41/34	SVO	7/8"	.250"
980/3	3	18	41/34	SVO	1"	.275"
981	2	18	41/34	SJO	1 1/8"	.310"
981/3	3	18	41/34	SJO	1 1/8"	.330"
982	2	16	65/34	SJO	1 3/8"	.330"
982/3	3	16	65/34	SJO	1 3/8"	.365"

CONDUCTOR COLOR CODE: 1-Black, 2-White, 3-Green.

Std. Pkg. 10

RETRACTILE TEST LEAD WIRE

Stretch coiled kinkless test lead wire description. 12" coil — wire stretches to approx. 6 feet. One conductor #20 stranded copper rubber insulation .165 O.D. Colors: Red, Black. Coil O.D. 3/4". Working Voltage: 1000V, 4 Amps.

DABURN No.	Lgth.	Size	Strand	Coil O.D.	Cord O.D.
984 A	12"	20	41/36	3/4"	.165"
984	24"	20	41/36	3/4"	.165"

12" Extends Approx. 6 Ft.

24" Extends Approx. 12 Ft.

Specify Color, Red or Black
Std. Pkg. 6**DABURN MINIATURE RETRACTILE COMMUNICATION CORDS**

2 Feet Retracted — 10 Ft. Extended

Miniature size. Suitable for compact equipment. Black plastic jacket overall. Operating Temperature: -20°C to +60°C

DABURN No.	Conds.	Size	Strand	Coil O.D.	Cord O.D.
975/28	2	28	19/40 T.C.	1/2"	.135"
977/28	4	28	19/40 T.C.	1/2"	.150"

RETRACTILE COMMUNICATION CORD PREPARED

Retracted length 12" — extended length 6 feet.

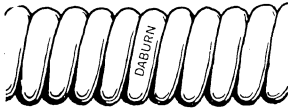
Same as our regular communication cord but each end is prepared, stripped and tinned as indicated.

Daburn No.	No. Cond.	Size & Strand	Coil O.D.	Cord O.D.	PREPARED
966	3	#23-21/36	13/16"	.220"	1 END: Lgth 1 1/4". Conductor stripped and tinned. Other end: Total Lgth 1 1/2" jacket removed.
967	4	#23-21/36	15/16"	.250"	1 END: Total length 1". Conductors stripped and tinned. Other end: Total Lgth 1 1/2" jacket removed.
968	5	#23-21/36	1-1/16"	.285"	1 END: Total Lgth 4 3/4". Conductors stripped and tinned. Other end: Total Lgth 4 3/4" conds. stripped and tinned.

CONDUCTOR COLOR CODE: 1-Black, 2-White, 3-Red, 4-Green, 5-Blue
Std. Pkg. 10.

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

**RETRACTILE COMMUNICATION CORDS****RETRACTILE COMMUNICATION COIL CORDS**

RETRACTED LENGTHS 2, 3 & 4 FT. — EXTENDED LENGTHS 12, 18 & 25 FT.

Multi-conductors stranded extra flexible #23 AWG 21/36 tinned soft copper for long flex life. Neoprene or "Danyon" plastic jacketed cable for long life. 120 volt working, current carrying capacity 1 amp. Nom. cond. resist. .022 ohms per linear foot, .185 ohms per retracted foot.

For communication equipment such as ham operations, telephone car carriers, radio equipment, head sets, etc.

OPERATING TEMPERATURE: -20°C to +60°C

MAXIMUM VOLTAGE: 100V

DANYON PLASTIC JACKETED

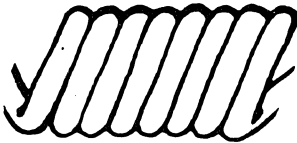
DABURN Cat. Nos. 4 Ft.†	Retracted Lengths 3 Ft.	2 Ft.	No. Cond.	Size	Strand	Nom. Coil O.D.	Nom. Cord O.D.
975D-4	975D-2	975D-2	2	23	21/36	5/8"	.220"
976D-4	976D-3	976D-2	3	23	21/36	3/4"	.230"
977D-4	977D-3	977D-2	4	23	21/36	7/8"	.255"
978D-4	978D-3	978D-2	5	23	21/36	1"	.265"
978D/6-4	978D/6-3	978D/6-2	6	23	21/36	1 1/8"	.305"
978D/7-4	978D/7-3	978D/7-2	7	23	21/36	1 3/8"	.325"
978D/8-4	978D/8-3	978D/8-2	8	23	21/36	1 1/4"	.360"
978D/10-4	978D/10-3	978D/10-2	10	23	21/36	1 3/8"	.380"
978D/12-4	978D/12-3	978D/12-2	12	23	21/36	1 1/2"	.390"
978D/15-4	978D/15-3	978D/15-2	15	23	21/36	1 5/8"	.400"

CONDUCTOR COLOR CODE: 1—Black, 2—White, 3—Red, 4—Green, 5—Blue, 6—Yellow, 7—Brown, 8—Orange, 9—White/Black Tracer, 10—White/Red Tracer, 11—White/Green Tracer, 12—White/Blue Tracer, 13—White/Yellow Tracer, 14—White/Brown Tracer, 15—White/Orange Tracer. †Preferred Put-Up Std. Pkg.: 5

NEOPRENE JACKETED

DABURN Cat. Nos. Retracted Length 4 Ft.	No. Cond.	Size	Strand	Nom. Coil O.D.	Nom. Cord O.D.
975-4	2	23	21/36	3/4"	.200"
976-4	3	23	21/36	1 1/8"	.210"
977-4	4	23	21/36	7/8"	.240"
978-4	5	23	21/36	1"	.285"
978/6-4	6	23	21/36	1 1/8"	.305"
978/7-4	7	23	21/36	1 1/4"	.320"
—	—	—	—	—	—
—	—	—	—	—	—
—	—	—	—	—	—
978/15-4	15	23	21/36	1 1/2"	.470"

CONDUCTOR COLOR CODE: 1—Black, 2—White, 3—Red, 4—Green, 5—Blue, 6—Yellow, 7—Brown.

**SHIELDED RETRACTILE COMMUNICATION CORDS**

RETRACTED LENGTHS 1, 2 & 4 FT. — EXTENDED LENGTHS 6, 12 & 25 FT.

Single and multi-conductors. Shielded mike cables. Neoprene or "Danyon" plastic jacketed shielded conductors are individually shielded. Shield can be pigtailed for soldering. Safe — Reliable.

OPERATING TEMPERATURE: -20°C to +60°C

DANYON PLASTIC JACKETED

DABURN Cat. Nos. 4 Ft.†	Retracted Lengths 2 Ft.	1 Ft.	No. Cond.	Size	Strand	Nom. Coil O.D.	Nom. Cord O.D.	Volt Rating	Capacitance MMF Lin. Ft.	MMF Retr. Ft.
995D-4	995D-2	995D-1	1	24(S)	41/40	5/8"	.160"	75	56	440
999D-4	999D-2	999D-1	2	2-23 (Ind. S & J)	21/36	7/8"	.225"	100	56	450
997D-4	997D-2	997D-1	3	2-23 1-23(S)	21/36	1 1/8"	.250"	100	56	450
998D-4	998D-2	998D-1	4	2-23 2-23 (Ind. S & J)	21/36	1 1/8"	.290"	100	56	450

†Preferred Put-Up. STANDARD PACKAGE: 10. CONDUCTORS ARE COLOR CODED.

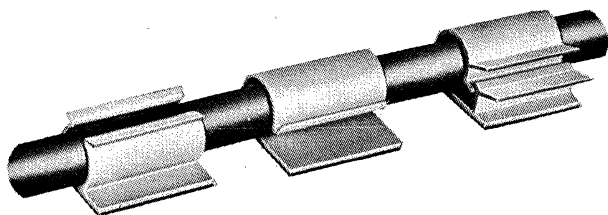
NEOPRENE JACKETED

DABURN Cat. Nos. Retracted Lengths 4 Ft.	No. Cond.	Size	Strand	Nom. Coil O.D.	Nom. Cord O.D.	Volt Rating	Capacitance MMF Lin. Ft.	MMF Retr. Ft.
995-4	1	24(S)	41/40	5/8"	.160"	75	56	440
996-4	2	1-23 1-24(S)	21/36 41/40	3/4"	.210"	100 75	56	450
997-4	3	2-23 1-24(S)	21/36 41/40	7/8"	.240"	100 75	56	450
998-4	4	2-23 2-24(S**)	21/36 41/40	1"	.270"	100 75	56	450

STANDARD PACKAGE: 10. CONDUCTORS ARE COLOR CODED. **Individually shielded.

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

DABURN FASTENING DEVICES**STIK KLIPS™ • TENSION CLIPS • COMPONENT CLIPS • WIRE TIES****DABURN STIK KLIPST™ — SELF ADHESIVE**

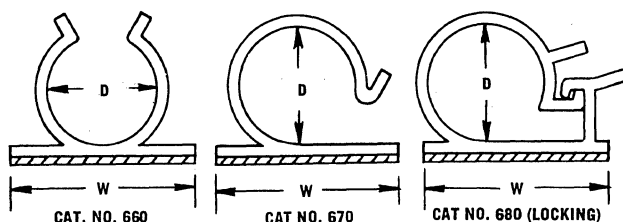
For fast secure mounting on smooth surfaces. No need to screw, nail or staple in place. Fastens in a flash — just peel off the protective backing and press in place on a clean, dry surface. For best results allow a few seconds for adhesive to set before applying lead.

These plastic clips are insulating, strong and elastic. They have many uses, such as keeping telephone wires off the floor, holding wire, cable, tubing, rods, etc. in position.

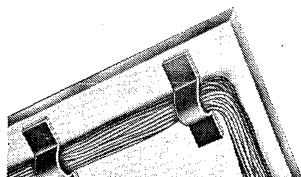
Material: PVC

Color: Gray

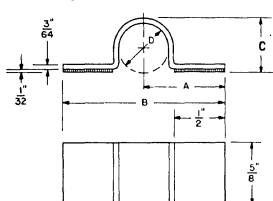
Temp. Range: -10°F to +175°F



DABURN Cat. No.	D	W	Std. Pkg.
660-1/8	1/8"	3/4"	100, 1000
660-1/4	1/4"	3/4"	100, 1000
660-3/8	3/8"	3/4"	100, 1000
660-1/2	1/2"	1"	100, 1000
660-3/4	3/4"	1"	100, 1000
670-1/8	1/8"	3/4"	100, 1000
670-1/4	1/4"	3/4"	100, 1000
670-3/8	3/8"	3/4"	100, 1000
670-1/2	1/2"	1"	100, 1000
670-3/4	3/4"	1"	100, 1000
680-1/4	1/4"	3/4"	100, 1000
680-1/2	1/2"	1"	100, 1000
680-3/4	3/4"	1"	100, 1000

OVER-THE-TOP STIK KLIP™

MATERIAL: PVC
COLOR: Black
TEMP. RANGE: -30°F to +170°F



Daburn's "over-the-top Stik Klip" is a fast and convenient self adhesive clip. Simply remove the protective paper backing of the adhesive tape and press into place. The unique configuration of the Stik-Klip allows for channeling of wire or tubing bundles up to 1/2" in diameter.

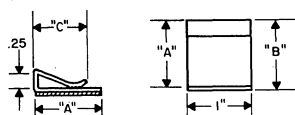
DABURN Cat. No.	A	B	C	D*
690-1/8	4 1/4"	1 7/32"	1 1/4"	1/8"
690-1/4	4 5/8"	1 7/16"	1 3/4"	1/4"
690-3/8	4 9/16"	1 11/32"	2 1/4"	3/8"
690-1/2	5 1/4"	1 21/32"	3 1/4"	1/2"

STANDARD PACKAGE: 100 Ft., 1000 Ft. *Object should be less than.

RIBBON CABLE STIK KLIPST™

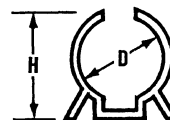
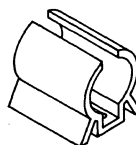
COLOR: Gray
TEMP. RANGE: -30°F to +170°F

Daburn Ribbon Cable Stik Clips are designed for holding laminated or round conductor ribbon cable in place between components. This plastic, self-adhesive clip has a serrated edge which prevents slippage and allows runs of ribbon cable horizontally, vertically or diagonally. Maximum recommended thickness of cable is .245".



DABURN Cat. No.	A	B	C
675-1/2	.500"	.56"	.30"
675-1	1.00"	1.05"	.85"

STANDARD PACKAGE: 100 Ft., 1000 Ft.

DABURN COMPONENT CLIPS

Hold and insulate, electrical and electronic components, accessories — spare parts. Holds firmly and still permits fast and easy insertion. Convenient for fastening clips and retainers for transistors, batteries, fuses, capacitors, resistors, lamps, etc. These Daburn clips are made of black vinyl (polyvinylchloride). Has high dielectric strength. Can be mounted with screws, rivets or other fastening means.

MATERIAL: Rigid Vinyl.

TEMPERATURE RANGE: -20° to +165°F.

STANDARD PACKAGE: 100, 1000.

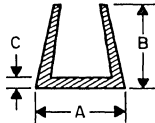
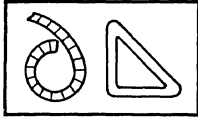
DABURN Stock No.	Diam.	H Height	L Length	E Diam. of Hole	F Dist. Bet. Holes
600-1/4"	1/4"	1 1/32"	1/2"	3/32"	—
600-3/16"	3/16"	1 1/32"	1/2"	3/32"	—
600-3/8"	3/8"	1/2"	1/2"	3/32"	—
600-7/16"	7/16"	1/2"	1/2"	3/32"	—
600-1/2"	1/2"	5/8"	1/2"	3/32"	—
600-9/16"	9/16"	5/8"	1/2"	3/32"	—
600-5/8"	5/8"	5/8"	1/2"	3/32"	—
600-11/16"	11/16"	3/4"	1/2"	3/32"	—
600-3/4"	3/4"	7/8"	1/2"	3/32"	—
600-7/8"	7/8"	1"	1/2"	3/32"	—
600-1"	1"	1 1/4"	1 1/8"	3/32"	3/4"
600-1 1/8"	1 1/8"	1 1/2"	1 1/8"	3/32"	3/4"
600-1 1/2"	1 1/2"	1 3/4"	1 3/4"	3/32"	3/4"

FOR ADDITIONAL FASTENING DEVICES, PAGES 25, 26.

*Diameter of product to be held.

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

GROMMETS • CLIPS • CABLE CLAMPS • WIRE TIES**NEW****DAFLEX FLEXIBLE CONTINUOUS GROMMETS — SOLID OR SERRATED**

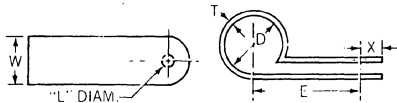
With only Five sizes you can finish and protect regularly and irregularly shaped openings from causing abrasion and cut-through damage to wires, cables, etc. Just cut the continuous grommet to your desired circumferential length (see the chart below) and slip it on to the edge of the hole. It stays in place securely.

Daflex continuous grommets are available in natural polyethylene* and natural nylon**, solid or serrated. They are packaged in convenient 50 foot and 100 foot put-ups.

DAFLEX Solid Grommet Cat. No.		DAFLEX Serrated Grommet Cat. No.		For Panel Thickness	Nom. Dimensions Inches		
Polyethylene	Nylon	Polyethylene	Nylon		A	B	C
DPG-2	DNG-2	DPGS-2	DNGS-2	to .036" (#20 Gauge)	.100"	.125"	.040"
DPG-3	DNG-3	DPGS-3	DNGS-3	.037"-.105" (19-12 Gauge)	.156"	.156"	.045"
DPG-4	DNG-4	DPGS-4	DNGS-4	.106"-.164" (11-8 Gauge)	.205"	.155"	.045"
DPG-5	DNG-5	DPGS-5	DNGS-5	.165"-.187"	.280"	.185"	.045"
DPG-6	DNG-6	DPGS-6	DNGS-6	.188"-.250"	.328"	.188"	.045"

*Conforms to MIL-I-631

**Conforms to MIL-M-22096 Ty4

NYLON CABLE CLAMPS**MADE OF DU PONT "ZYTEL" 101 NYLON RESIN**

Meets MIL-P-26093A and MIL-P-17091A Amend. 2

Light and tough these nylon cable clamps are used as a clamp, strain relief, clip hanger, fastener or strap. Smooth non-abrasive surfaces, rounded edges will not cause shorts or grounds in cable. Insoluble in solvents, gasoline, oils, hydraulic fluids, alcohol, acids, alkalis. Temperature range —60°F to +300°F. Does not support combustion. Inside matte finish. Prevents slippage and is self aligning. Snaps on cable. Meets MIL-P-26093A specs. fungus resistant.

DABURN No.	To Fit Size	D	E	W	T	L	X
625	1/8"	.125	.316	3/8	.050	.177	.227
626	3/16"	.187	.378	3/8	.050	.177	.277
627	1/4"	.250	.409	3/8	.050	.177	.227
628	5/16"	.312	.441	3/8	.050	.177	.277
629	3/8"	.375	.471	3/8	.050	.177	.277
630	7/16"	.437	.519	3/8	.050	.177	.277
631	1/2"	.500	.550	3/8	.050	.177	.277
631A	7/16"	.563	.625	1/2	.060	.177	.227
632	9/16"	.625	.634	1/2	.060	.177	.227
632A	11/16"	.687	.752	1/2	.060	.177	.227
633	3/4"	.750	.718	1/2	.060	.177	.227
634	7/8"	.875	.760	1/2	.060	.177	.227
635	1"	1.000	.802	1/2	.060	.177	.227
636	1 1/8"	1.125	.968	1/2	.062	.204	.250
637	1 1/4"	1.250	1.156	1/2	.062	.204	.250
638	1 1/2"	1.500	1.188	5/8	.070	.204	.250

Std. Pkg. 100, 500, 1000. Teflon Cable Clamps available.

ETHYL CELLULOSE CABLE CLAMPS

Ethocel recommended for general use. Combines light weight and chemical resistance with excellent shock resisting properties in temp. range from —40°F to +185°F. Approved 7-21-44 Army-Navy Aeronautical AN-742. Also made to meet MIL STD. 242A (Ships). Suitable indoor-outdoor. Std. Pkg. 100, 1000.

DABURN No.	To Fit Size	D	E	W	T	L	X
615	1/8"	.125	.325	1/2	.060	.204	3/32
615A	3/16"	.188	.390	1/2	.060	.204	3/32
615B	1/4"	.250	.421	1/2	.060	.204	3/32
615C	5/16"	.313	.457	1/2	.060	.204	3/32
615D	3/8"	.375	.483	1/2	.060	.204	3/32
615E	7/16"	.438	.531	1/2	.060	.204	3/32
616	1/2"	.500	.562	1/2	.060	.204	3/32
616A	9/16"	.563	.625	1/2	.060	.204	3/32
616B	5/8"	.625	.610	1/2	.060	.204	3/32
616C	11/16"	.688	.666	1/2	.060	.204	3/32
616D	3/4"	.750	.766	1/2	.060	.204	3/32
616E	7/8"	.875	.813	1/2	.060	.204	3/32
617	1"	1.000	.906	1/2	.060	.204	3/32
617A	1 1/8"	1.125	.969	1/2	.060	.204	3/32
617B	1 1/4"	1.250	1.156	1/2	.060	.204	3/32
617C	1 1/2"	1.5	1.0625	5/8	.070	.204	3/32

Std. Pkg. 100, 500, 1000. Teflon Cable Clamps available.

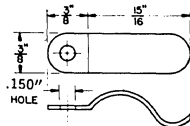
DABURN ALUMINUM CABLE CLAMPS

Made of hard drawn aluminum, light weight. Useful when mounting resonant lines, elements for beams, etc. Strong, durable, rust-proof.

DABURN No.	To Fit Size	Width	Length	Thickness	Clearance Hole For	Std. Pkg.
651A	1/8"	1/2"	1 1/2"	.050"	8	100
651	1/4"	1/2"	7/8"	.050"	8	100
652	3/16"	1/2"	1 1/2"	.050"	8	100
653	3/8"	1/2"	1"	.050"	8	100
654	1/2"	1/2"	1 1/8"	.050"	8	100
654A	5/8"	1/2"	1 1/4"	.050"	8	50
655	3/4"	3/4"	1 3/4"	.090"	10	50
657	7/8"	3/4"	1 5/8"	.090"	10	50
656	1"	3/4"	1 3/4"	.090"	10	50
656A	1 1/8"	3/4"	1 7/8"	.090"	10	50

NYLON TENSION CLIPS

Holds cable-wire-tubing-pipe-panels-many and varied uses. Made of nylon, they are insulating, non-corrosive and weather resistant. Easily fastened, easily removed. Strong and elastic.



CAPACITY 3/8" ROUND

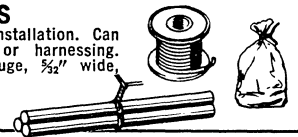
DABURN Cat. No. 641
STD. PKG. 100, 1000
Natural Color

TEMPERATURE: +10°F to +170°F

PLASTIC WIRE TIES

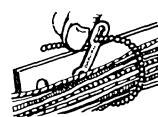
Useful for temporary or permanent installation. Can be adapted for immediate bundling or harnessing. Plastic insulated. Has .016" steel gauge, 3/32" wide, 30 lb. test.

TEMPERATURE: —20°F to +200°F.



DABURN Cat. No.	Standard Package
603	Plastic Wire Ties 100', 500', 1000'

COLORS: White. Blue. Red. Green. Yellow. Additional colors available.

DABURN PUSH BUTTON WIRE TIES

Push button wire ties for harnessing wire. 5" in length, each tie is adjustable to 16 different diameters. Made of strong polyethylene, it is inert chemically and heat resistant. Breaking strength 45 to 95 lbs. After the tie is placed in hole for anchoring, wires can be replaced or added by loosening tie and pulling tight again. Designed to fit .250" to .265" hole in a .031" to .140" thick panel. Material conforms to Spec. LP590. Temp. to +200°F

DABURN Cat. No.	(Specify Color)	Standard Package
601-4A	Red, Blue, Yellow	100, 1000

DABURN**DABURN electronics & cable corp.**

WIRE • CABLE • TUBING • MIL/COMM • SWITCHES • ELECTRONIC HARDWARE

ELECTRONIC LACING CORDS AND TAPES • HEAT GUN • SPIRAL WRAP • ANTENNA KIT**LACING CORD-TAPE TO MEET MIL-T-713C TYPE P*****AND MIL-T-43435 COMP. P-TYPE S****NYLON FLAT BRAIDED LACING TAPE**

Nylon fiber flat braided impregnated with MW microcrystalline fungicidal wax. Stays flat. Designed to create a wider contact to distribute the stress. Flexible. Won't slip when knotted. Resistant to fungus, flame, abrasion, acids, MIL-T-43435 (new) supersedes MIL-T-713 (old).

Daburn No.	Color	(New) Size	(Old) Class	Nom. Width	Nom. Thickness	Tensile Strength	Standard Put-Up Tubes
2035	Natural White	1	—	.200"	.014"	150 lbs.	250 yd.
2035B	Black	1	—	.200"	.014"	150 lbs.	250 yd.
2036	Natural White	2	1	.120"	.014"	80 lbs.	250 yd.
2036B	Black	2	1	.120"	.014"	80 lbs.	250 yd.
2037	Natural White	3	2*	.090"	.014"	50 lbs.	500 yd.
2037B	Black	3	2*	.090"	.014"	50 lbs.	500 yd.
2038	Natural White	4	3	.065"	.010"	30 lbs.	500 yd.
2038B	Black	4	3	.065"	.010"	30 lbs.	500 yd.
2039	Natural White	5	4	.046"	.010"	15 lbs.	500 yd.
2039B	Black	5	4	.046"	.010"	15 lbs.	500 yd.

DACRON FLAT BRAIDED LACING TAPE

Dacron fiber flat braided impregnated with non-slip fungicidal finish. Will not cut or damage insulation. Stays flat. Has all characteristics of nylon with elongation, better resistance to acids.

DABURN No.	Color	Nom. Width	Thickness Nom.	Tensile Strength	Standard Put-Up Tubes
2041	Natural White	.120"	.014"	80	250 yd.
2041B	Black	.120"	.014"	80	250 yd.
2042	Natural White	.090"	.014"	48	500 yd.
2042B	Black	.090"	.014"	48	500 yd.
2043	Natural White	.060"	.010"	35	500 yd.
2043B	Black	.060"	.010"	35	500 yd.
2044	Natural White	.046"	.010"	25	500 yd.
2044B	Black	.046"	.010"	25	500 yd.

TEFLON* FIBERGLASS FLAT BRAIDED LACING TAPE

Teflon coated fiberglass flat braided lacing tape bonded for high temp. operations (550°F). Stays flat— for strength, stability. Teflon finish increases strength and abrasion resistant surface. Will not cut or damage insulation.

DABURN No.	Color	Nom. Width	Thickness Nom.	Ibs. Test	Standard Put-Up Tubes
2045	White	.170"	.025"	150	250 yd.
2046	White	.120"	.020"	90	250 yd.
2047	White	.080"	.020"	70	500 yd.

TEFLON* FLAT BRAIDED LACING TAPE for high temperature operations (550°F)

DABURN No.	Color	Nom. Width	Thickness Nom.	Test Ibs.	Standard Put-Up Tube
2048	Brown	.100"	.016"	35	250 yd.
2049	Brown	.075"	.010"	15	500 yd.

**ROUND TWISTED NYLON LACING CORD**

Manufactured to meet MIL-T-713A, Type P specification, Comp. position P, Classes 2, 2, 1. Wax finish— compounded with fungicide to resist mildew. Easy to tie.

PUT-UP ON 1 LB. TUBES

DABURN No.	Color	Class	Tensile Strength	Nom. Diam.	Yds. Per Tube
2070	Natural	1	70 lbs.	.039"	600
2070B	Black	1	70 lbs.	.039"	600
2071	Natural	2	48 lbs.	.029"	800
2071B	Black	2	48 lbs.	.029"	800
2072	Natural	3	32 lbs.	.025"	1140
2072B	Black	3	32 lbs.	.025"	1140
2072/1	Natural	4	20 lbs.	.020"	2400
2072/1B	Black	4	20 lbs.	.020"	2400

ROUND TWISTED LINEN LACING CORD

Manufactured from pure flax treated with microcrystalline wax compounded with fungicide to resist mildew. Classes 1, 2, 3 meet MIL-T-713C Type N specifications.

4 OZ. TUBE		8 OZ. TUBE		1 LB. TUBES					
DABURN No.	Yds.	DABURN No.	Yds.	DABURN No. Nat.	DABURN No. Bk.	Yds.	Class	Ply	Lb. Test
2073	210	2074	425	2075	—	850	—	4	.036" 22
2076	150	2077	300	2078	2078B	600	3	6	.044" 33
2082	115	2083	235	2084	2084B	470	2	8	.051" 50
2079	100	2080	200	2081	2081B	400	—	9	.054" 56
2085	75	2086	150	2087	2087B	300	1	12	.063" 72

SPIRAL WRAP — PLASTIC TUBING FOR HARNESSES

Available in four formulations: Polyethylene, Rulan (flame retardant) Polyethylene, Nylon and Teflon. Easily applied. Twists on easily. Can be flexed repeatedly without cracking or breaking. Reusable, bends around sharp corners. Expandable. Per MIL-P-22692, MIL-I-631D, MIL-P-3803

**POLYETHYLENE**

TEMP. RANGE: -105°F to +200°F

DABURN Cat. No. Natural		Covers Wire Groups	Outside Diam.	Nom. Wall	Standard Package
Black*					
605-1/8"	605B-1/8"	1/8" to 1/2"	1/8"	.031"	100', 500', 1000'
605-3/16"	605B-3/16"	1/8" to 1"	3/16"	.031"	100', 500', 1000'
605-1/4"	605B-1/4"	3/16" to 2"	1/4"	.045"	100', 500', 1000'
605-3/8"	605B-3/8"	3/8" to 3"	3/8"	.058"	100', 500', 1000'
605-1/2"	605B-1/2"	3/4" to 4"	1/2"	.058"	100', 500', 1000'

*Black Polyethylene is Ultra Violet Resistant and Recommended for Outdoor Use.

RULAN (White)

TEMP. RANGE: -10°F to +200°F

606-1/8"	1/8" to 1/2"	1/8"	.030"	100', 500', 1000'
606-1/4"	3/16" to 1 1/2"	1/4"	.058"	100', 500', 1000'
606-3/8"	3/8" to 2"	3/8"	.058"	100', 500', 1000'
606-1/2"	3/4" to 4"	1/2"	.060"	100', 500', 1000'

Per MIL-P-17091B, MIL-P-20693 & MIL-M-22096

NYLON

TEMP. RANGE: -212°F to +300°F

607-1/8"	607B-1/8"	1/8" to 1/2"	1/8"	.030"	100', 500'
607-1/4"	607B-1/4"	3/16" to 2"	1/4"	.025"	100', 500'
607-3/8"	607B-3/8"	3/8" to 3"	3/8"	.035"	100', 500'
607-1/2"	607B-1/2"	3/4" to 4"	1/2"	.035"	100', 500'

*Black Nylon is Recommended for Outdoor Use.

TEFLON (Natural)

TEMP. RANGE: -450°F to +500°F

608-1/8"	1/8" to 1/2"	1/8"	.031"	100', 500'
608-1/4"	3/16" to 2"	1/4"	.030"	100', 500'
608-3/8"	3/8" to 2 1/2"	3/8"	.030"	100', 500'
608-1/2"	3/4" to 3"	1/2"	.030"	100', 500'

COLOR: Natural (White).

HOT AIR GUN AND ACCESSORIES

FOR DAFLEX SHRINKABLE TUBING



DABURN Cat. No.

- HG1 — For SH-162, SH-265, SH-267, SH-275, SH-290, ST-275, SH-300 Series.
HG2 — For SH-400, SH-421, SH-621, SH-450, SH-350 Series.

A flameless heat source; light in weight; portable and/or permanent mounting.

ADAPTOR HGA-02

Concentrates heat and allows use of baffle.

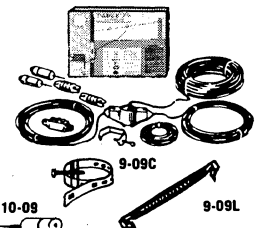
BAFFLE PLATE HGB-01

For tubing up to 1 1/4" O.D. Made to concentrate hot air.

**DABURN ALL-WAVE ASSEMBLED ANTENNA KIT**

Designed for reception of overseas radio signals & programs. Utilizes the Hertz principle — balanced line consists of:

- 2—30' coils 7/24 copper wire (2366/16)
- 1—40' coil transmission cable (2996)
- 1—Center insulator (10-68)
- 2—Porcelain insulators (10-06)
- 2—Lead-in strips (9-09L)
- 1—Ground clamp (9-09C)
- 2—Nail-on knobs (10-09)



DABURN Cat. No.	Standard Package
9-09	All Wave Kit 12
10-09	Nail-on Knob, Glazed 100
9-09L	Lead-in Strip 50
9-09C	Ground Clamp 50



DEARBORN

*America's
Full-Service Source
For Wire, Cable,
Insulation and Electronic
Accessories*



- Aircraft Wire
- Appliance and Fixture Wire
- Audio Cables
- Automotive Wire
- Braid — Flat, Oval and Round
- Braided, Silicone Wire
- Bus Bar Wire
- Coaxial Cable
- Computer Cables, U.L.
- Cords and Cord Sets
- "E", "EE", and "ET" Teflon Wire & Cable
- High Voltage Wire
- Hookup Wire
- Kynar Wire Wrap
- Lacing Cord and Twine
- Machine Tool Wire "MTW"
- Magnet Wire
- Microphone Cables
- Miniature Shielded Cables
- Multi-Conductor Cables
- Control Cables - Plastic and Neoprene
- Replacement Cords
- Rotor Cable
- Silicone Wire
- Speaker Cable
- S, SJ, SJT, SO, SVO, SV, SVT, SPT and HPN Cordage
- Test Prod Wire
- Welding and Welding Power Supply Cable
- PVC Tubing
- Teflon Tubing
- Heat Shrink Tubing

■ **WE STOCK** one of the most comprehensive inventories of wire, cable and insulation in the United States. In most cases we can ship your needs within 24 hours.

Dearborn will also custom fabricate to your specifications. Our services include Special Cables, Neoprene Jacketing, Striping, Marking, Numbering, Lettering, Cutting and Stripping, Terminating, Harness Assemblies, Molded Plugs and Cord Sets, and Cabling. Any combination of conductors with special braids or shields can be made into a cable to your exact requirements by our special order department.

We will be pleased to quote on your blueprints, sketches, or job specifications.

■ YES, WE HAVE IT!

The vast selection of merchandise listed on the following pages represents only a partial amount of the thousands of wire, cable and insulation items stocked by Dearborn.

Our 52 page catalog will give you full details on the complete Dearborn line. Send for it, or call us for information on stock or special constructions.

PRODUCT INDEX

Aircraft Wire	
MIL-W-5086A Type I & II	12, 13
MIL-W-7078A Type I & II	13
MIL-W-7139B Type I & II	11
MIL-W-8777B-MS25471	12
Appliance & Fixture Wire	
AA, AF, Asbestos Insulated Hookup Wire	22
Braided Silicone Hookup Wire	22
Silicone, Glass Braid Hookup Wire	22
Lacquered Cotton Braid, Hookup Wire	22
Audio Cables	
Foil Shielded, Plastic Jacketed	6
Individually Shielded, Multi-Conductor, Plastic Jacketed	6
Shielded Audio Cables, Plastic Jacket	5
Shielded Audio Cables, Rubber Jacket	28
Shielded Audio Cables, Neoprene Jacket	28
Unshielded Multi-Conductor, Plastic Jacket	4
Unshielded Multi-Conductor, Rubber Jacket	5
Unshielded Paired Cables, Plastic Jacket	4
Automotive Wire	20
Braid — Flat, Oval & Round	8

Bus Bar Wire	8
Business Machine Wire & Cables	23
Circuit Monitor	7
Coaxial Cable	14
Coaxial Cable Assemblies	8
Computer Cables, U.L.	
Multi-Conductor, Unshielded	24, 25
Multi-Conductor, Shielded	24, 25
Pairs, Unshielded	24, 25
Pairs, Shielded	24, 25
Control Cables	6
Cordage, UL and CSA	21
Cords & Cord Sets	5
Hookup Wire to MIL-SPEC	
MIL-W-76B	9, 10
MIL-W-5086A	12, 13
MIL-W-7078A	13
MIL-W-7139B	11
MIL-W-8777B	12
MIL-W-16878D	2, 13
Hookup Wire, U.L.	
1007	23
1009	22

U.L. TEFLON* HIGH TEMP LEAD WIRE

- U.L. Style 1180 — 300 v. — 200°C — .015" TFE Insulation
- U.L. Style 1199 — 600 v. — 200°C — .020" TFE Insulation

CONSTRUCTION

Conductors: Conductors are silver plated stranded copper wire. Solid conductors available upon request.

APPLICATIONS

Used where high temperatures and space are a problem. Good abrasion resistance and small O.D.s at voltage and temperature specified conserve space.

U.L. TEFLON LEAD WIRE

AWG SIZE	U.L. STYLE 1180 DEARBORN PART NO.	NOM. O.D.	U.L. STYLE 1199 DEARBORN PART NO.	NOM. O.D.	500°	1000°
26	22607-UL	.050	22607-UL6	.062	0.9	0.9
24	22407-UL	.055	22407-UL6	.067	0.9	0.9
22	22207-UL	.060	22207-UL6	.072	0.9	0.9
20	22007-UL	.068	22007-UL6	.080	0.9	0.9
18	21819-UL	.079	21819-UL6	.091	0.9	0.9
16	21619-UL	.089	21619-UL6	.102	0.9	0.9
14	—	—	21419-UL6	.117	0.9	0.9
12	—	—	21219-UL6	.136	0.9	0.9
10	—	—	21037-UL6	.157	0.9	0.9
8	—	—	128133-UL6	.231	0.2, 9	0.2, 9

*218133-UL6 has .032" insulation.

*DuPont T.M.

CORONA RESISTANT HIGH VOLTAGE WIRE

- High Dielectric Strength
- Flame Retardant
- Abrasion Resistant
- Easy to Strip

CONSTRUCTION

Conductors: All conductors are tinned copper, flexible stranding. Also available on special order with silver plated copper conductors, nickel plated copper conductors and pure nickel conductors. Pure nickel increases rating to 260°C (500°F).

Insulation: High temperature, high voltage silicone rubber for easy stripping. High dielectric strength, flame retardant.

APPLICATIONS

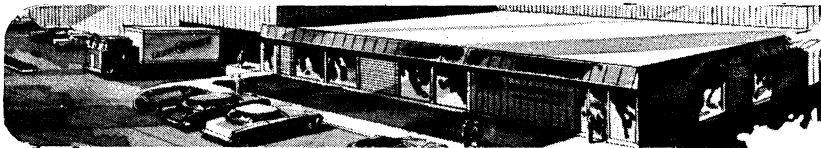
Recommended for stoves, heaters, furnaces, dryers, motors, therapeutic devices, signs, lighting fixtures and special electronic devices where high temperatures are incurred. Military applications include use on jet aircraft, atomic submarines and related equipment.

COLOR: Natural.

200°C SILICONE HIGH TEMPERATURE, HIGH VOLTAGE WIRE

DEARBORN NO.	AWG SIZE	WALL THICKNESS	NOM. O.D.	O.C. VOLTAGE LISTING
392245	22 (STR'D)	.045"	.120	10 KV.
392250	22 (STR'D)	.050"	.130	12 KV.
392260	22 (STR'D)	.060"	.150	15 KV.
392275	22 (STR'D)	.075"	.180	20 KV.
392045	20 (STR'D)	.045"	.126	10 KV.
392060	20 (STR'D)	.060"	.156	15 KV.
392075	20 (STR'D)	.075"	.186	20 KV.
391845	18 (STR'D)	.045"	.137	10 KV.
391875	18 (STR'D)	.075"	.197	20 KV.
391890	18 (STR'D)	.090"	.227	30 KV.
391845	16 (STR'D)	.045"	.149	10 KV.
391660	16 (STR'D)	.060"	.179	15 KV.
391675	16 (STR'D)	.075"	.209	20 KV.
391690	16 (STR'D)	.090"	.239	30 KV.
391445	14 (STR'D)	.045"	.163	10 KV.
391460	14 (STR'D)	.060"	.193	15 KV.
391475	14 (STR'D)	.075"	.223	20 KV.
391490	14 (STR'D)	.090"	.253	30 KV.
391245	12 (STR'D)	.045"	.185	10 KV.
391290	12 (STR'D)	.090"	.275	30 KV.
391045	10 (STR'D)	.045"	.206	10 KV.
391090	10 (STR'D)	.090"	.296	30 KV.
390860	8 (STR'D)	.060"	.267	15 KV.
390660	6 (STR'D)	.060"	.304	15 KV.
390460	4 (STR'D)	.060"	.352	15 KV.
390260	2 (STR'D)	.060"	.412	15 KV.

1015-TEW	23
1028	23
1061	23
1429	2
1430	2
1283	23
1284	23
Irradiated Hookup Wire	2
Kynar	4
Lacing Cord	8
Microphone Cables	5
Multi-Conductor Cables	4, 5, 6, 24, 25, 28
Neoprene Jacketed Control Cables	6
S, SJ, SJT, SO, SVO, SV, SVT, SPT and HPN Cordage	21
Teflon	
Cables Shielded	3
Wire & Cables, UL & CSA	26, 27
Welding & Welding Supply Cable	20
Tubing	
MIL-SPEC Tubing	7
Heat Shrinkable Tubing	7
PVC Tubing	7
Teflon Tubing	7



DEARBORN WIRE AND CABLE CO.

9299 EVENHOUSE AVENUE
ROSEMONT, ILLINOIS 60018
All Phones: (312) 696-1000



DEARBORN

MIL SPEC MIL-W-16878D HOOKUP WIRE TYPES B & C

Single conductor, stranded tinned copper

TYPE B
Insulation PVC .010" wall thickness, color coded.
Temperature rating: -55°C to +105°C. Voltage rating: 600 volts.

TYPE B — NYLON
Same as above but with clear nylon jacket (.003" wall) over PVC insulation increasing temperature rating to +115°C.

TYPE B — PREBONDED
Double tinned strands are heated which fuses the individual strands together in order to prevent fraying. Allows easy stripping and insertion in holes in lugs, circuit boards, etc. Color coded .010" PVC insulation to MIL-W-16878D. Temperature rating: -55°C to +105°C. Voltage rating: 600 volts.

TYPE C
Insulation PVC .017" wall thickness. Temperature rating: -55°C to +105°C. Voltage rating: 1000 volts.

TYPE C — NYLON
Same as above but with clear nylon jacket which increases temperature rating to +115°C.

TYPE C — SHIELD AND NYLON JACKET
Basic type C with 90% coverage braided tinned copper shield and clear nylon .005" jacket overall.

COLOR CODE ON HOOKUP WIRE: 0—Black • 1—Brown • 2—Red • 3—Orange • 4—Yellow • 5—Green • 6—Blue • 7—Violet • 8—Grey • 9—White • 90—White/Black • 91—White/Brown • 92—White/Red • 93—White/Orange • 94—White/Yellow • 95—White/Green • 96—White/Blue • 97—White/Violet • 98—White/Gray

OTHER COLORS AND STRIPE COMBINATIONS AVAILABLE UPON REQUEST

CROSS-LINKED IRRADIATED HOOKUP WIRE

XLV DUAL SERVICE HOOKUP WIRE

UL AND MIL-SPEC HOOKUP AND LEAD WIRE

CROSS-LINKED POLYVINYL CHLORIDE INSULATION

MIL-W-16878/2 — TYPE C									
XLV U.L. STYLE 1430									
DEARBORN NO.	MIL TYPE	U.L. STYLE	AWG SIZE	STRANDING	NOM. INSUL. THICKNESS	NOM. O.D.	STOCK COLORS	STOCK PUT UP (FT)	
272407	C-24	1430	24	7/32	.016	.058	0-9	1000	
272407F	C-24	1430	24	7/32	.016	.058	0-9	1000	
272207	C-22	1430	22	7/30	.016	.064	0-9	1000	
272207F	C-22	1430	22	7/30	.016	.064	0-9	1000	
272007	C-20	1430	20	7/28	.016	.072	0-9	1000	
272007F	C-20	1430	20	7/28	.016	.072	9only	1000	
271819	C-18	1430	18	19/30	.016	.082	9only	1000	
271807F	C-18	1430	18	19/30	.016	.082	9only	1000	
271619	C-16	1430	16	19/29	.016	.092	9only	1000	
271419	C-14	1430	14	19/27	.016	.105	9only	1000	
271219	C-12	1430	12	19/25	.016	.124	9only	1000	

F — SUFFIX INDICATES FUSED OR PREBONDED STRANDS

WIRE/CABLE/HARNESSES & ACCESSORIES

105°C TYPE B, 800 VOLT									
DEARBORN NO.	MIL TYPE	SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS			
173207	B-32	32	7/40	.028	.010	0-9			
173007	B-30	30	7/38	.032	.010	0-9			
172807	B-28	28	7/36	.034	.010	0-9 & 90-98			
172607	B-26	26	7/34	.038	.010	0-9 & 90-98			
172619	B-26	26	19/38	.038	.010	0-9 & 90-98			
172407	B-24	24	7/32	.044	.010	0-9 & 90-98			
172419	B-24	24	19/36	.044	.010	0-9 & 90-98			
172207	B-22	22	7/30	.051	.010	0-9 & 90-98			
172219	B-22	22	19/34	.051	.010	0-9 & 90-98			
172007	B-20	20	7/28	.058	.010	0-9 & 90-98			
172019	B-20	20	19/32	.058	.010	0-9 & 90-98			
171807	B-18	18	7/26	.068	.010	0-9 & 90-98			
171819	B-18	18	19/30	.068	.010	0-9 & 90-98			
171619	B-16	16	19/29	.077	.010	0-9 & 90-98			
171419	B-14	14	19/27	.091	.010	0-9 & 90-98			

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

105°C TYPE B, BONDED CONDUCTOR, 800V.									
DEARBORN NO.	MIL TYPE	SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS			
192407	B-24	24	7/32	.043	.010	0-9 & 90-98			
192207	B-22	22	7/30	.050	.010	0-9 & 90-98			
192007	B-20	20	7/28	.058	.010	0-9 & 90-98			
191807	B-18	18	7/26	.068	.010	0-9 & 90-98			

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

115°C TYPE B, NYLON JACKET (.003"), 800 V.									
DEARBORN NO.	MIL TYPE	SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS			
183207	B-32	32	7/40	.035	.010	0-9 & 90-98			
183007	B-30	30	7/38	.039	.010	0-9 & 90-98			
182807	B-28	28	7/36	.041	.010	0-9 & 90-98			
182607	B-26	26	7/34	.044	.010	0-9 & 90-98			
182619	B-26	26	19/38	.044	.010	0-9 & 90-98			
182407	B-24	24	7/32	.050	.010	0-9 & 90-98			
182419	B-24	24	19/36	.050	.010	0-9 & 90-98			
182207	B-22	22	7/30	.057	.010	0-9 & 90-98			
182219	B-22	22	19/34	.057	.010	0-9 & 90-98			
182007	B-20	20	7/28	.064	.010	0-9 & 90-98			
182019	B-20	20	19/32	.064	.010	0-9 & 90-98			
181807	B-18	18	7/26	.074	.010	0-9 & 90-98			
181819	B-18	18	19/30	.074	.010	0-9 & 90-98			
181619	B-16	16	19/29	.085	.010	0-9 & 90-98			
181419	B-14	14	19/27	.099	.010	0-9 & 90-98			

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

105°C TYPE C, 1000 VOLT									
DEARBORN NO.	MIL TYPE	SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS			
202407	C-24	24	7/32	.058	.017	0-9 & 90-98			
202419	C-24	24	19/36	.058	.017	0-9 & 90-98			
202207	C-22	22	7/30	.065	.017	0-9 & 90-98			
202219	C-22	22	19/34	.065	.017	0-9 & 90-98			
202007	C-20	20	7/28	.072	.017	0-9 & 90-98			
202019	C-20	20	19/32	.072	.017	0-9 & 90-98			
201807	C-18	18	7/26	.082	.017	0-9 & 90-98			
201819	C-18	18	19/30	.082	.017	0-9 & 90-98			
201619	C-16	16	19/29	.092	.017	0-9 & 90-98			
201419	C-14	14	19/27	.105	.017	0-9 & 90-98			

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

115°C TYPE C, NYLON JACKET (.003"), 1000 V.									
DEARBORN NO.	MIL TYPE	GAUGE SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS			
212407	C-24	24	7/32	.064	.017	0-9 & 90-98			
212419	C-24	24	19/36	.064	.017	0-9 & 90-98			
212207	C-22	22	7/30	.071	.017	0-9 & 90-98			
212219	C-22	22	19/34	.071	.017	0-9 & 90-98			
212007	C-20	20	7/28	.079	.017	0-9 & 90-98			
212019	C-20	20	19/32	.079	.017	0-9 & 90-98			
211807	C-18	18	7/26	.090	.017	0-9 & 90-98			
211819	C-18	18	19/30	.090	.017	0-9 & 90-98			
211619	C-16	16	19/29	.100	.017	0-9 & 90-98			
211419	C-14	14	19/27	.113	.017	0-9 & 90-98			

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

115°C TYPE C, SHIELDED, NYLON JACKET, 1000 V.									
DEARBORN NO.	MIL TYPE	GAUGE SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS			
222407	C-24	24	7/32	.086	.017	9 Only			
222207	C-22	22	7/30	.093	.017	9 Only			
222007	C-20	20	7/28	.102	.017	9 Only			
221819	C-18	18	19/30	.112	.017	9 Only			
221619	C-16	16	19/29	.122	.017	9 Only			
221419	C-14	14	19/27	.138	.017	9 Only			

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

MIL-W-16878/1 — TYPE B

XLV U.L. STYLE 1429

DEARBORN NO.	MIL TYPE	U.L. STYLE	AWG SIZE	STRANDING	NOM. INSUL. THICKNESS	NOM. O.D.	STOCK COLORS	STOCK PUT UP (FT)
252807	B-28	1429	28	7/36	.010	.035	0-9	1000
252607	B-26	1429	26	7/34	.010	.039	0-9	1000
252607F	B-26	1429	26	7/34	.010	.039	0-9	1000
252407	B-24	1429	24	7/32	.010	.044	0-9	1000
252407F	B-24	1429	24	7/32	.010	.044	0-9	1000
252419	B-24	1429	24	19/36	.010	.045	0-9	1000
252207	B-22	1429	22	7/30	.010	.050	0-9	1000
252207F	B-22	1429	22	7/30	.010	.050	0-9	1000
252219	B-22	1429	22	19/34	.010	.051	0-9	1000
252007	B-20	1429	20	7/28	.010	.058	0-9	1000
252007F	B-20	1429	20	7/28	.010	.058	0-9	1000
252019	B-20	1429	20	19/32	.010	.059	0-9	1000
251819	B-18	1429	18	19/30	.010	.068	9only	1000
251807	B-18	1429	18	7/26	.010	.068	9only	1000
251807F	B-18	1429	18	7/26	.010	.068	9only	1000
251619	B-16	1429	16	19/29	.010	.078	9only	1000
252601		1429	26 (1)		.010	.039	0-9	1000
252401		1429	24 (1)		.010	.044	0-9	1000
252201		1429	22 (1)		.010	.050	0-9	1000

F — SUFFIX INDICATES FUSED OR PREBONDED STRANDS

All above can be supplied in multi-conductor, with shield and XLV jacket or multi-conductor, and XLV jacket.

COLOR CODE ON HOOKUP WIRE: 0—Black • 1—Brown • 2—Red • 3—Orange • 4—Yellow • 5—Green • 6—Blue • 7—Violet • 8—Grey • 9—White

OTHER COLORS AND STRIPE COMBINATIONS AVAILABLE UPON REQUEST

THE XLV IS ESPECIALLY SUITABLE FOR AEROSPACE, MILITARY AND INDUSTRIAL ELECTRONIC EQUIPMENT

Dual service hook-up wire insulated with a polyvinyl chloride which has been cross-linked by an irradiation process. This process changes the linear molecular configuration of the PVC and connects molecules through a network of chemical bonds. This specially processed insulation "XLV" becomes extremely burn-thru and heat resistant. The shrinkback or heat flow normally encountered when applying a hot soldering iron does not occur when using "XLV" hook-up wire.

This resistance to heat also prevents distortion of the insulation when the wire is subjected to temporary overloads and high temperatures.

Cross linking the PVC by irradiation also increases the abrasion resistance and makes it much superior to regular vinyl insulations.

The table below lists both the UL and military specifications to which "XLV" wire is manufactured.

Note that since the military and U.L. specifications vary, the temperature and voltage ratings assigned differ for the same wire as per the chart.

SPECIFICATIONS	MAX. OPER. TEMPS.	MAXIMUM VOLTAGE
MIL-W-16878/1 TYPE B	105°C	600 V. RMS
U.L. AWM STYLE 1429	80°C	Voltage not specified for general appliance hook-up usage. 300 volt peak for electronic use only.
MIL-W-16878/2 TYPE C	105°C	1000 V. RMS.
U.L. AWM STYLE 1430	105°C	300 VOLT RMS 600 VOLT PEAK For electronic use only.

See other U.L. & CSA products starting with page 21.



DEARBORN

MIL-W-16878D TEFLON* HOOKUP WIRE

TYPE E, 600 VOLT

Single conductor, stranded or solid silver plated copper, extruded TFE Teflon insulation. Voltage rating: 600 volts. Temperature rating: -65°C to +200°C.

TYPE EE, 1000 VOLT

Same as Type E, except for insulation thickness and voltage rating of 1000 volts.

TYPE E, SPIRAL WRAPPED FUSED TEFLON

Same as Type E—600 volt but with spiral wrapped fused Teflon insulation.

TYPE EE, SPIRAL WRAPPED FUSED TEFLON

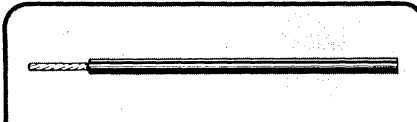
Same as Type EE, but with spiral wrapped fused Teflon insulation.

DEARBORN NO.	TYPE & CONDUCTOR	NOM. WALL THICKNESS	NOM. O.D.	STOCK COLORS
	AWG SIZE & STRANDS			100' 1000'
13207W	E-32 7/40	.010	.029	0-9 0-9
13007W	E-30 7/38	.010	.032	0-9 0-9
12807W	E-28 7/36	.010	.035	0-9 0-9
12619W	E-26 19/38	.010	.040	0-9 0-9 & 90-98
12607W	E-26 7/34	.010	.039	0-9 0-9 & 90-98
12419W	E-24 19/36	.010	.045	0-9 0-9 & 90-98
12407W	E-24 7/32	.010	.044	0-9 0-9 & 90-98
12219W	E-22 19/34	.010	.052	0-9 0-9 & 90-98
12207W	E-22 7/30	.010	.050	0-9 0-9 & 90-98
12019W	E-20 19/32	.010	.060	0-9 0-9 & 90-98
12007W	E-20 7/28	.010	.058	0-9 0-9 & 90-98
11819W	E-18 19/30	.010	.070	0-9 0-9 & 90-98
11807W	E-18 7/26	.010	.068	0-9 0-9 & 90-98
11619W	E-16 19/29	.011	.077	0-9 0-9 & 90-98
11419W	E-14 19/27	.011	.094	0-9 0-9 & 90-98
11219W	E-12 19/25	.012	.113	0-9 0-9 & 90-98
11037W	E-10 37/26	.012	.135	0-9 0-9 & 90-98

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

DEARBORN NO.	TYPE & CONDUCTOR	NOM. WALL THICKNESS	NOM. O.D.	STOCK COLORS
	AWG SIZE & STRANDS			100' 1000'
23207	EE-32 7/40	.015	.039	0-9 0-9
23007	EE-30 7/38	.015	.042	0-9 0-9
22807	EE-28 7/36	.015	.045	0-9 0-9
22607	EE-26 7/34	.015	.049	0-9 0-9 & 90-98
22619	EE-26 19/38	.015	.050	0-9 0-9 & 90-98
22407	EE-24 7/32	.015	.054	0-9 0-9 & 90-98
22419	EE-24 19/36	.015	.055	0-9 0-9 & 90-98
22207	EE-22 7/30	.015	.060	0-9 0-9 & 90-98
22219	EE-22 19/34	.015	.062	0-9 0-9 & 90-98
22007	EE-20 7/28	.015	.068	0-9 0-9 & 90-98
22019	EE-20 19/32	.015	.070	0-9 0-9 & 90-98
21819	EE-18 19/30	.015	.079	0-9 0-9 & 90-98
21619	EE-16 19/29	.016	.089	0-9 0-9 & 90-98
21419	EE-14 19/27	.017	.105	0-9 0-9 & 90-98
21219	EE-12 19/25	.017	.124	0-9 0-9 & 90-98
21037	EE-10 37/26	.017	.145	0-9 0-9 & 90-98
28133	EE-8 133/29	.020	.207	0,2,9 0,2,9

STOCK PUT UP: 100 FT., 1000 FT., AND BULK



TYPE E, 600 VOLT

DEARBORN NO.	TYPE & CONDUCTOR	NOM. WALL THICKNESS	NOM. O.D.	STOCK COLORS
	AWG SIZE & STRANDS			100' 1000'
13207	E-32 7/40	.010	.029	0-9 0-9
13007	E-30 7/38	.010	.032	0-9 0-9
12807	E-28 7/36	.010	.036	0-9 0-9
12619	E-26 19/38	.010	.040	0-9 0-9 & 90-98
12607	E-26 7/34	.010	.039	0-9 0-9 & 90-98
12419	E-24 19/36	.010	.045	0-9 0-9 & 90-98
12407	E-24 7/32	.010	.044	0-9 0-9 & 90-98
12219	E-22 19/34	.010	.052	0-9 0-9 & 90-98
12207	E-22 7/30	.010	.050	0-9 0-9 & 90-98
12019	E-20 19/32	.010	.060	0-9 0-9 & 90-98
12007	E-20 7/28	.010	.058	0-9 0-9 & 90-98
11819	E-18 19/30	.010	.070	0-9 0-9 & 90-98
11807	E-18 7/26	.010	.068	0-9 0-9 & 90-98
11619	E-16 19/29	.011	.077	0-9 0-9 & 90-98
11419	E-14 19/27	.011	.094	0-9 0-9 & 90-98
11219	E-12 19/25	.012	.113	0-9 0-9 & 90-98
11037	E-10 37/26	.012	.135	0-9 0-9 & 90-98

**SOLID CONDUCTOR

DEARBORN NO.	TYPE & CONDUCTOR	NOM. WALL THICKNESS	NOM. O.D.	STOCK COLORS
	AWG SIZE & STRANDS			100' 1000'
13201	E-32 1/32	.010	.029	0-9 0-9
13001	E-30 1/30	.010	.032	0-9 0-9
12801	E-28 1/28	.010	.035	0-9 0-9
12601	E-26 1/26	.010	.039	0-9 0-9
12401	E-24 1/24	.010	.044	0-9 0-9
12201	E-22 1/22	.010	.050	0-9 0-9
12001	E-20 1/20	.010	.058	0-9 0-9

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

*Not MIL Spec.

COLOR CODE ON HOOKUP WIRE: 0—Black • 1—Brown • 2—Red • 3—Orange • 4—Yellow • 5—Green • 6—Blue • 7—Violet • 8—Grey • 9—White • 90—White/Black • 91—White/Brown • 92—White/Red • 93—White/Orange • 94—White/Yellow • 95—White/Green • 96—White/Blue • 97—White/Violet • 98—White/Gray

* Du Pont T.M.

OTHER COLORS AND STRIPE COMBINATIONS AVAILABLE UPON REQUEST

MIL-W-16878D SHIELDED TEFLON* CABLES

- NO OUTER COVERING OVER SHIELD
- TEFLON IMPREGNATED BRAID OVER SHIELD
Braided natural or white Teflon impregnated fiberglass braid overall.
- FEP EXTRUDED JACKET OVER SHIELD
Tough abrasion resistant extruded white FEP Teflon jacket overall.
- TEFLON TAPE WRAP JACKET OVER SHIELD
Sintered wrapped white Teflon tape jacketed overall.

Each conductor stranded silver plated copper, Type E extruded TFE Teflon .010" color coded insulation. Braided silver plated copper shield, 90% coverage. Voltage rating: 600 volts. Temperature rating: -65°C to +200°C. Resistant to acids, alkalis, oil, flame, moisture, solvents and fungus.

*Dupont T.M.

DEARBORN NO.	NO. OF COND.	CONDUCTOR	NOM. O.D. AT MAX. WIDTH HIGH POINT	PUT UP (FT.)
		AWG SIZE STRANDING		
72401	1	24 19/36	.085	100 & 1000
72402	2	24 19/36	.130	100 & 1000
72403	3	24 19/36	.135	100 & 1000
72201	1	22 19/34	.091	100 & 1000
72202	2	22 19/34	.150	100 & 1000
72203	3	22 19/34	.158	100 & 1000
72001	1	20 19/32	.100	100 & 1000
72002	2	20 19/32	.168	100 & 1000
72003	3	20 19/32	.178	100 & 1000
71801	1	18 19/30	.110	100 & 1000
71802	2	18 19/30	.188	100 & 1000
71803	3	18 19/30	.207	100 & 1000
71601	1	16 19/29	.123	100 & 1000
71602	2	16 19/29	.220	100 & 1000
71603	3	16 19/29	.235	100 & 1000

NO OUTER COVERING OVER SHIELD

DEARBORN NO.	NO. OF COND.	CONDUCTOR	NOM. O.D. AT MAX. WIDTH HIGH POINT	PUT UP (FT.)
		AWG SIZE STRANDING		
42401	1	24 19/36	.069	100 & 1000
42402	2	24 19/36	.112	100 & 1000
42403	3	24 19/36	.120	100 & 1000
42404	4	24 19/36	.132	100 & 1000
42201	1	22 19/34	.075	100 & 1000
42202	2	22 19/34	.124	100 & 1000
42203	3	22 19/34	.132	100 & 1000
42204	4	22 19/34	.146	100 & 1000
42001	1	20 19/32	.083	100 & 1000
42002	2	20 19/32	.142	100 & 1000

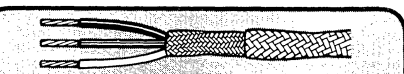


TEFLON TAPE WRAP OVERALL

DEARBORN NO.	NO. OF COND.	CONDUCTOR	NOM. O.D. AT MAX. WIDTH HIGH POINT	PUT UP (FT.)
		AWG SIZE STRANDING		
62401	1	24 19/36	.095	100 & 1000
62402	2	24 19/36	.140	100 & 1000
62403	3	24 19/36	.147	100 & 1000
62404	4	24 19/36	.159	100 & 1000
62201	1	22 19/34	.102	100 & 1000
62202	2	22 19/34	.154	100 & 1000
62203	3	22 19/34	.162	100 & 1000
62204	4	22 19/34	.176	100 & 1000
62001	1	20 19/32	.110	100 & 1000
62002	2	20 19/32	.170	100 & 1000
62003	3	20 19/32	.175	100 & 1000
62004	4	20 19/32	.213	100 & 1000
61801	1	18 19/30	.120	100 & 1000
61802	2	18 19/30	.190	100 & 1000
61803	3	18 19/30	.219	100 & 1000
61804	4	18 19/30	.237	100 & 1000
61601	1	16 19/29	.130	100 & 1000
61602	2	16 19/29	.230	100 & 1000
61603	3	16 19/29	.240	100 & 1000
61604	4	16 19/29	.270	100 & 1000



DEARBORN NO.	NO. OF COND.	CONDUCTOR	NOM. O.D. AT MAX. WIDTH HIGH POINT	PUT UP (FT.)
		AWG SIZE STRANDING		
42003	3	20 19/32	.153	100 & 1000
42004	4	20 19/32	.168	100 & 1000
41801	1	18 19/30	.093	100 & 1000
41802	2	18 19/30	.162	100 & 1000
41803	3	18 19/30	.172	100 & 1000
41804	4	18 19/30	.192	100 & 1000
41601	1	16 19/29	.103	100 & 1000
41602	2	16 19/29	.184	100 & 1000
41603	3	16 19/29	.200	100 & 1000
41604	4	16 19/29	.230	100 & 1000



DEARBORN NO.	NO. OF COND.	CONDUCTOR	NOM. O.D. AT MAX. WIDTH HIGH POINT	PUT UP (FT.)
		AWG SIZE STRANDING		
52401	1	24 19/36	.081	100 & 1000
52402	2	24 19/36	.126	100 & 1000
52403	3	24 19/36	.133	100 & 1000
52404	4	24 19/36	.144	100 & 1000
52201	1	22 19/34	.088	100 & 1000
52202	2	22 19/34	.137	100 & 1000
52203	3	22 19/34	.144	100 & 1000
52204	4	22 19/34	.158	100 & 1000
52001	1	20 19/32	.097	100 & 1000
52002	2	20 19/32	.154	100 & 1000
52003	3	20 19/32	.163	100 & 1000
52004	4	20 19/32	.180	100 & 1000
51801	1	18 19/30	.106	100 & 1000
51802	2	18 19/30	.174	100 & 1000
51803	3	18 19/30	.185	100 & 1000
51804	4	18 19/30	.205	100 & 1000
51601	1	16 19/29	.117	100 & 1000
51602	2	16 19/29	.196	100 & 1000
51603	3	16 19/29	.225	100 & 1000
51604	4	16 19/29	.255	100 & 1000

COLOR CODE OF CONDUCTORS: 1st Conductor—White • 2nd Conductor—Black • 3rd Conductor—Red • 4th Conductor—Green

DEARBORN WIRE AND CABLE CO. 9299 Evenhouse Avenue, Rosemont, Illinois 60018 • Phone (312) 696-1000



DEARBORN

UNSHIELDED AUDIO CABLE

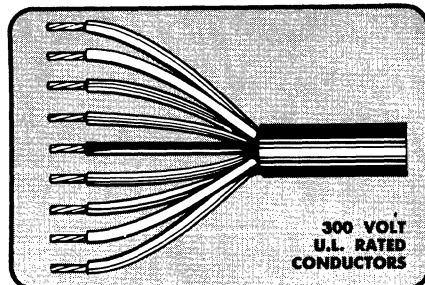
MULTICONDUCTOR PLASTIC JACKETED

Stranded or solid tinned copper conductors. Color coded polyvinylchloride insulation. Conductors cabled and covered with a gray PVC jacket overall. Suitable for outdoor usage. Recommended for P.A. systems, intercom connecting cables, remote control circuits, relay circuits, telephones, and telemetering circuits.

All inner conductors are U.L. styles as follows: No. 22-Style 1061, Nos. 20, 18 and 16 are Style 1007, No. 14 and No. 12 are Styles 1335 and 1336.

Temperature ratings

On Style 1061 and 1007 are -10°C to $+80^{\circ}\text{C}$; on Styles 1335 and 1336 ratings are -10°C to $+90^{\circ}\text{C}$.



300 VOLT
U.L. RATED
CONDUCTORS

NO. 22 AWG MULTI-CONDUCTOR							
DEARBORN NO.	NO. OF COND.	SIZE	STRAND-ING	NOM. WALL THICK.	NOM. JKT. THICK.	NOM. O.D.	COLOR CODE CHART
832202	2	22	7/30	.010	.020	.140	1
832203	3	22	7/30	.010	.020	.145	1
832204	4	22	7/30	.010	.020	.170	1
832205	5	22	7/30	.010	.020	.175	1
832206	6	22	7/30	.010	.020	.185	1
832207	7	22	7/30	.010	.020	.190	1
832208	8	22	7/30	.010	.020	.200	1
832209	9	22	7/30	.010	.020	.225	1
832210	10	22	7/30	.010	.020	.235	1
832212	12	22	7/30	.010	.020	.255	1
832215	15	22	7/30	.010	.020	.280	2
832220	20	22	7/30	.010	.020	.310	2
832224	24	22	7/30	.010	.020	.325	2
832225	25	22	7/30	.010	.020	.330	2
832230	30	22	7/30	.010	.020	.365	2
832240	40	22	7/30	.010	.025	.452	2
832250	50	22	7/30	.010	.035	.500	2
832260	60	22	7/30	.010	.035	.530	2

NO. 20 AWG MULTI-CONDUCTOR							
DEARBORN NO.	NO. OF COND.	SIZE	STRAND-ING	NOM. WALL THICK.	NOM. JKT. THICK.	NOM. O.D.	COLOR CODE CHART
832002	2	20	10/30	.016	.020	.180	1
832003	3	20	10/30	.016	.020	.190	1

NO. 18 AWG MULTI-CONDUCTOR							
DEARBORN NO.	NO. OF COND.	SIZE	STRAND-ING	NOM. WALL THICK.	NOM. JKT. THICK.	NOM. O.D.	COLOR CODE CHART
831802	2	18	16/30	.018	.020	.200	2
831803	3	18	16/30	.018	.025	.210	2
831804	4	18	16/30	.018	.030	.250	1
831805	5	18	16/30	.018	.037	.286	1
831806	6	18	16/30	.018	.037	.310	1
831807	7	18	16/30	.018	.037	.325	1
831808	8	18	16/30	.018	.037	.350	1
831809	9	18	16/30	.018	.037	.379	1
831812	12	18	16/30	.018	.040	.417	2
831815	15	18	16/30	.018	.045	.490	2
831819	19	18	16/30	.018	.045	.505	2

NO. 16 AWG MULTI-CONDUCTOR							
DEARBORN NO.	NO. OF COND.	SIZE	STRAND-ING	NOM. WALL THICK.	NOM. JKT. THICK.	NOM. O.D.	COLOR CODE CHART
831602	2	16	19/29	.030	.025	.256	2
831603	3	16	19/29	.030	.030	.300	2
831604	4	16	19/29	.030	.045	.375	2

NO. 14 AWG MULTI-CONDUCTOR							
DEARBORN NO.	NO. OF COND.	SIZE	STRAND-ING	NOM. WALL THICK.	NOM. JKT. THICK.	NOM. O.D.	COLOR CODE CHART
831402	2	14	19/27	.031	.035	.332	2
831403	3	14	19/27	.031	.035	.400	2
831404	4	14	19/27	.045	.045	.495	2

NO. 12 AWG MULTI-CONDUCTOR							
DEARBORN NO.	NO. OF COND.	SIZE	STRAND-ING	NOM. WALL THICK.	NOM. JKT. THICK.	NOM. O.D.	COLOR CODE CHART
831202	2	12	19/25	.031	.040	.384	2
831203	3	12	19/25	.031	.040	.425	2

COLOR CODE CHART NO. 1

1-Black	11-Pink	21-White/Brown
2-Red	12-Tan	22-White/Orange
3-Green	13-Red/Green	23-White/Gray
4-White	14-Red/Yellow	24-White/Violet
5-Brown	15-Red/Black	25-White/Black/Red
6-Blue	16-White/Black	26-White/Black/Green
7-Orange	17-White/Red	27-White/Black/Yellow
8-Yellow	18-White/Green	28-White/Black/Blue
9-Purple	19-White/Yellow	29-White/Black/Brown
10-Slate	20-White/Blue	30-White/Black/Orange

COLOR CODE CHART NO. 2 (IPCEA)

1-Black	21-Orange/Green	41-Green/White/Blue
2-White	22-Black/White/Red	42-Orange/Red/Green
3-Red	23-White/Black/Red	43-Blue/Red/Green
4-Green	24-Red/Black/White	44-Black/White/Blue
5-Orange	25-Green/Black/White	45-White/Black/Blue
6-Blue	26-Orange/Black/White	46-Red/White/Blue
7-White/Black	27-Blue/Black/White	47-Green/Orange/Red
8-Red/Black	28-Black/Red/White	48-Orange/Red/Blue
9-Green/Black	29-White/Red/Green	49-Blue/Red/Orange
10-Orange/Black	30-Red/Black/Green	50-Black/Orange/Red
11-Blue/Black	31-Green/Black/Orange	51-White/Black/Orange
12-Black/White	32-Orange/Black/Green	52-Red/Orange/Blue
13-Red/White	33-Blue/White/Orange	53-Green/Red/Blue
14-Green/White	34-Black/White/Orange	54-Orange/Black/Blue
15-Blue/White	35-White/Red/Orange	55-Blue/Black/Orange
16-Orange/White	36-Orange/White/Blue	56-Black/Orange/Green
17-White/Red	37-White/Red/Blue	57-White/Orange/Green
18-Orange/Red	38-Black/White/Green	58-Red/Orange/Green
19-Blue/Red	39-White/Black/Green	59-Green/Black/Blue
20-Red/Green	40-Red/White/Green	60-Orange/Green/Blue

STANDARD PUT UP FOR ALL ABOVE — 100', 500', 1000'

UNSHIELDED
PAIRED CONDUCTORS
INTERCOM CABLES

PAIRED CONDUCTOR, PLASTIC JACKETED CABLES

Stranded or solid tinned copper conductors. Color coded polyvinylchloride .010" insulation. Conductors are twisted into pairs, cabled and jacketed overall with a gray PVC jacket. Temperature rating: -20°C to $+80^{\circ}\text{C}$. Conductors are U.L. Style 1061. Suitable for outdoor usage. Recommended for remote control circuits, relay circuits, balanced intercom systems, multiple speaker cable, telephones, call systems, etc. Suggested operating voltage: 300 volts maximum.

MINIATURE CABLE/Shielded Clear Plastic Jacket

Tinned copper conductors, insulated with color coded polyvinylchloride. Conductors are twisted and shielded with a fine braided tinned copper shield. Clear, .010" polyvinylchloride jacket overall. Suggested maximum operating voltage: 200 V. Temperature rating: -20°C to $+60^{\circ}\text{C}$.



DEARBORN NO.	NO. OF COND.	COND. SIZE	STRAND-ING	NOM. WALL THICK.	NOM. O.D.	STOCK PUT UP (FT.)
942802	2	28	7/36	.010	.105	100, 500 & 1000
942803	3	28	7/36	.010	.115	100, 500 & 1000
942804	4	28	7/36	.010	.120	100, 500 & 1000

COLOR CODE OF CONDUCTORS: 1-Black • 2-Red • 3-White • 4-Green

COLOR CODING OF PAIRS

PAIR NO.	COLOR COMBINATION	PAIR NO.	COLOR COMBINATION
1-Black paired with Red		27-Brown paired with Orange	
2-Black paired with White		28-Purple paired with Red	
3-Black paired with Green		29-Purple paired with White	
4-Black paired with Blue		30-Purple paired with Green	
5-Black paired with Yellow		31-Purple paired with Blue	
6-Black paired with Brown		32-Purple paired with Brown	
7-Black paired with Orange		33-Purple paired with Yellow	
8-Red paired with White		34-Purple paired with Orange	
9-Red paired with Green		35-Purple paired with Slate	
10-Red paired with Blue		36-Purple paired with Black	
11-Red paired with Yellow		37-Slate paired with Red	
12-Red paired with Brown		38-Slate paired with White	
13-Red paired with Orange		39-Slate paired with Green	
14-Green paired with White		40-Slate paired with Blue	
15-Green paired with Blue		41-Slate paired with Brown	
16-Green paired with Yellow		42-Slate paired with Yellow	
17-Green paired with Brown		43-Slate paired with Orange	
18-Green paired with Orange		44-Slate paired with Black	
19-White paired with Blue		45-White/Black paired with Red	
20-White paired with Yellow		46-White/Black paired with Green	
21-White paired with Brown		47-White/Black paired with Blue	
22-White paired with Orange		48-White/Black paired with Brown	
23-Blue paired with Yellow		49-White/Black paired with Yellow	
24-Blue paired with Brown		50-White/Black paired with Orange	
25-Blue paired with Orange		51-White/Black paired with Purple	
26-Brown paired with Yellow			

KYNAR

INSULATED HOOKUP
WIRE FOR WIRE WRAP
APPLICATIONS

Especially suited for computer, business machine usage and other areas where space is limited. (For automatic point to point application.)

The miniaturization of computers and business machines has created special problems in the wiring of components and associated programming equipment. Essentially there is a need for wire with a tough insulation that is resistant to abrasion and cold flow. It should function at operating temperatures up to 125°C . The Wire-Wrap type of termination requires a high conductivity low corrosive surface on the conductor. Dearborn Kynar insulated wire fulfills these needs.

KYNAR HOOK-UP WIRE						
DEARBORN NO.	AWG SIZE	INSUL. THICK.	NOM. O.D.	U.L. STYLE	STOCK COLORS AVAILABLE	
773001	30(1)	.005"	.0195"	1422	0, 1, 2, 3, 4, 5, 6, 8, 9	
772801	28(1)	.0035"	.020"	1432	0, 1, 2, 5, 6, 9	
772601	26(1)	.005"	.027"	1422	2, 4, 5, 6, 8, 9	
772401	24(1)	.010"	.042"	1327	2, 4, 5, 6, 9	

ALL SUPPLIED ON SPECIALLY DESIGNED LARGE HUB REELS, 1,000' MINIMUM
CODE COLORING: 0-Black • 1-Brown • 2-Red • 3-Orange • 4-Yellow
5-Green • 6-Blue • 7-Violet • 8-Gray • 9-White



U.L. PARALLEL LAMP CORD

DEARBORN NO.	SIZE & NO. OF COND.	STRAND-ING	TYPE OF INSUL.	NOM. WALL THICK.	U.L. TYPE	NOM. O.D.
1182S	18/2	41/34	Rubber	.032	SP-1	.220 x .120
1182T	18/2	41/34	Plastic	.032	SPT-1	.215 x .115
1182T2	18/2	41/34	Plastic	.048	SPT-2	.255 x .143
3182N	18/2	41/34	Neoprene	.048	HPN	.272 x .142
3162N	16/2	65/34	Neoprene	.048	HPN	.295 x .150

Stock Colors: 1182S — Available Brown, Black, White. 1182T — Available Brown, Black, White, Gray, Tan, Clear. 1182T2 — Available Brown, Black. 3182N & 3162N — Black only. 1182T2 3182N 3162N — Stock Putups 250 - 1000. 1182S - 1182T — Stock Putups: 25, 100, 500, 1000.



PARALLEL CORD WITH PLUG

DEARBORN NO.	SIZE & NO. OF COND.	STRAND-ING	TYPE OF INSUL.	NOM. O.D.	U.L. TYPE	CORD LENGTH
9550	18/2	41/34	Plastic, Brn.	.110x.207	SPT-1	6 ft.
9551	18/2	41/34	Plastic, Brn.	.110x.207	SPT-1	9 ft.
9552	18/2	41/34	Neoprene	.140x.276	HPN	6 ft.

Construction: 18/2 SPT-1 or HPN cord with a molded plastic plug on one end and other end conductor split 1" stripped, twisted 5/8"



EXTENSION CORDS — 2 CONDUCTOR

DEARBORN NO.	COND. SIZE	COND. STRANDING	RATING (AMPS.)	U.L. STYLE	NOM. O.D.	CORD LENGTH FT.
9620	18/2	41/34	7	SV	.245	6
9622	18/2	41/34	7	*SV	.245	9
9624	18/2	16/30	7	SJ	.300	10
9626	18/2	16/30	7	SJ	.300	25
9628	16/2	26/30	10	SJ	.325	10
9630	16/2	26/30	10	SJ	.325	25
9632	16/2	26/30	10	SJ	.325	50
9634	16/2	26/30	10	SJ	.325	100

3 CONDUCTOR

DEARBORN NO.	COND. SIZE	COND. STRANDING	RATING (AMPS.)	U.L. STYLE	NOM. O.D.	CORD LENGTH FT.
9636	18/3	16/30	7	SJ	.330	10
9638	18/3	16/30	7	SJ	.330	25
9639	18/3	16/30	7	SJ	.330	50
9640	16/3	26/30	10	SJ	.365	15
9641	16/3	26/30	10	SJ	.365	10
9642	16/3	26/30	10	SJ	.365	25
9644	16/3	26/30	10	SJ	.365	50



REPLACEMENT CORDS — 2 CONDUCTOR

DEARBORN NO.	COND. SIZE	COND. STRANDING	RATING (AMPS.)	U.L. STYLE	NOM. O.D.	CORD LENGTH FT.
9600	18/2	41/34	7	*SV	.245	6
9602	18/2	41/34	7	*SVT	.245	6
9604	18/2	41/34	7	SVT	.245	6
9606	18/2	16/30	7	SJ	.300	8
9608	18/2	16/30	7	SJ	.300	10
9610	16/2	26/30	10	SJ	.325	8
9612	16/2	26/30	10	SVT	.325	10

3 CONDUCTOR

DEARBORN NO.	COND. SIZE	COND. STRANDING	RATING (AMPS.)	U.L. STYLE	NOM. O.D.	CORD LENGTH FT.
9601	18/3	41/34	7	SV	.255	6
9603	18/3	41/34	7	SV	.255	8
9609	18/3	41/34	7	*SVT	.255	6
9615	18/3	16/30	7	SJ	.330	6
9617	18/3	16/30	7	SJ	.330	8
9637	18/3	16/30	7	*SJT	.330	8
9643	18/3	16/30	7	SJO	.330	8
9619	16/3	26/30	10	SJ	.365	9



3 CONDUCTOR AIR CONDITIONER CORDS

DEARBORN NO.	COND. SIZE	COND. STRANDING	U.L. TYPE	NOM. O.D. OF CORD	CORD LENGTH FT.
9645	14	41/30	SPT-3	.175 x .475	3
9646	14	41/30	SPT-3	.175 x .475	6
9647	14	41/30	SPT-3	.175 x .475	9
9648	14	41/30	SPT-3	.175 x .475	12
9649	14	41/30	SPT-3	.175 x .475	15

DEARBORN

SERVICE, POWER AND REPLACEMENT CORDS AND CORDAGE

**U.L. PARALLEL LAMP CORD**

Stranded extra-flexible bare copper, parallel conductors, insulated with Rubber, (SP-1), or Polyvinyl (SPT-1-SPT-2) or Neoprene (HPN). JACKET OVERALL. Slit in jacket between conductors for ease in separation. Applications: Small appliances, radios, clocks; the HPN is suitable for coffeemakers, fry pans, soldering irons, etc. Temperature Rating: 20°C to +60°C. Suggested Operating Voltage: 300 V.

EXTENSION CORD SETS

Flexible, 2 or 3 conductor, high quality black rubber cords. Black molded plastic male plug on one end, molded plastic female plug on other end. Will fit conventional sockets and plugs. Voltage rating: 300 volts. The 3 conductor cord is used where 1 conductor requires grounding, such as for hand tools, garden edgers, etc. * This item supplied in grey.

REPLACEMENT CORDS

Flexible high quality Black Rubber, Plastic and Neoprene Cords. Types SV and SJ are rubber insulated and jacketed. Types SVT and SJT are plastic insulated and jacketed. Type SJO is rubber insulated and neoprene jacketed. One end has molded black plastic straight plug (either 2 prong or 3 prong depending on 2 or 3 conductor cable). The other end of the jacket is stripped back 1 1/2" with 5/8" of the conductors stripped. Voltage rating: 300 volts. The 3 conductor cord is used where 1 conductor is required for grounding. * This item supplied in grey.

AIR CONDITIONER EXTENSION CORDS

Flat, parallel 3 conductor SPT-3, grey plastic cord with a molded 3 blade right angle plug on one end and a female 3 wire U ground connector molded on the other end. Rating: 125 volts, 15 Amps.

SHIELDED MICROPHONE, SOUND, AND INTERCOM CABLES**SOUND AND INTERCOM CABLES**

Each conductor is solid or stranded tinned copper (See Chart), insulated with color coded polyvinylchloride. Conductors are twisted and shielded with either a spiral wrapped tinned copper shield or a tinned copper braided shield — 20°C to +60°C. Ideal for all types of public

address or sound work, recording studios, and other types of audio circuits requiring shielding. Sizes 16 thru 22 rated at 350 V working voltage. Sizes 14 and 12 are rated at 450 Volts working voltage. .020" nom. jacket, thk. of chrome PVC.



SPIRAL SHIELDED INTERCOM CABLE

DEARBORN NO.	NO. OF COND.	COND. SIZE	STRANDING	NOM. WALL THICK.	NOM. O.D.
692202	2	22	7/30	.016	.175
692203	3	22	7/30	.016	.190
692204	4	22	7/30	.016	.200
692206	6	22	7/30	.016	.235
692001	1	20	10/30	.016	.130
692002	2	20	10/30	.016	.195
692003	3	20	10/30	.016	.210
692004	4	20	10/30	.016	.225
692006	6	20	10/30	.016	.265
691801	1	18	16/30	.016	.135
691802	2	18	16/30	.016	.230
691803	3	18	16/30	.016	.235
691804	4	18	16/30	.016	.245
691602	2	16	26/30	.016	.240
691603	3	16	26/30	.016	.245
691402	2	14	41/30	.020	.285
691403	3	14	41/30	.020	.290
691202	2	12	65/30	.020	.325
691203	3	12	65/30	.020	.330

STANDARD PUT UPS: 100 FT., 500 FT., 1000 FT.

BRAIDED SHIELD INTERCOM CABLE

DEARBORN NO.	NO. OF COND.	COND. SIZE	STRANDING	NOM. WALL THICK.	NOM. O.D.
812202	2	22	Solid	.016	.175
742202	2	22	7/30	.016	.185
742203	3	22	7/30	.016	.200
742204	4	22	7/30	.016	.210
742001	1	20	10/30	.016	.135
812002	2	20	Solid	.016	.210
742002	2	20	10/30	.016	.210
742003	3	20	10/30	.016	.220
742004	4	20	10/30	.016	.230
741801	1	18	16/30	.016	.145
811802	2	18	Solid	.016	.220
741802	2	18	16/30	.016	.235
741803	3	18	16/30	.016	.245
741804	4	18	16/30	.016	.255
741602	2	16	26/30	.016	.250
741603	3	16	26/30	.016	.255
741402	2	14	41/30	.020	.290
741403	3	14	41/30	.020	.295
741202	2	12	65/30	.020	.335
741203	3	12	65/30	.020	.340

STANDARD PUT UP: 100 FT., 500 FT., 1000 FT.

COLOR CODE OF CONDUCTORS: 1—Black • 2—Red • 3—White • 4—Green • 5—Yellow • 6—Blue
DEARBORN WIRE AND CABLE CO. 9299 Evenhouse Avenue, Rosemont, Illinois 60018 • Phone (312) 696-1000

MICROPHONE CABLE

RUBBER OR NEOPRENE JACKETED MIKE CABLE — Stranded tinned copper conductor with color coded rubber insulation. Cotton wrap, braided tinned copper shield; cotton wrap, tough black neoprene or rubber jacket overall.

RUBBER JACKETED MIKE CABLE

DEARBORN NO.	NO. OF COND. & SIZE	STRAND-ING	WALL THICK.	NOM. CAP. PER FT.	NOM. JKT. THICK.	NOM. O.D.
662001	1-20	26/34	.040	60 MMF	.035	.230
662002	2-20	26/34	.020	68 MMF	.035	.270
661801	1-18	41/34	.040	69 MMF	.035	.240
661802	2-18	41/34	.020	78 MMF	.035	.295

NEOPRENE JACKETED MIKE CABLE

DEARBORN NO.	NO. OF COND. & SIZE	STRAND-ING	WALL THICK.	NOM. CAP. PER FT.	NOM. JKT. THICK.	NOM. O.D.
601801	1-18	41/34	.040	69 MMF	.035	.240
601802	2-18	41/34	.020	78 MMF	.035	.295
601602	2-16	65/34	.025	82 MMF	.035	.335

STANDARD PUT UP: 100 FT., 500 FT., 1000 FT.
CAPACITY MEASURED BETWEEN 1 CONDUCTOR AND SHIELD AND ANY OTHER REMAINING CONDUCTORS.

PLASTIC JACKETED MIKE CABLE — Single or 2 conductor stranded tinned copper. White (on 1 conductor) or White and Black (on 2 conductor) polyethylene insulation. Braided or spiral wrapped tinned copper shield, with gray chrome PVC jacket overall.

BRAIDED SHIELD MIKE CABLE

DEARBORN NO.	NO. OF COND. & SIZE	STRAND-ING	WALL THICK.	NOM. CAP. PER FT.	NOM. JKT. THICK.	NOM. O.D.
732001	1-20	26/34	.030	36 MMF	.030	.175
682002	2-20	26/34	.014	45 MMF	.030	.245

SPIRAL SHIELD MIKE CABLE

DEARBORN NO.	NO. OF COND. & SIZE	STRAND-ING	WALL THICK.	NOM. CAP. PER FT.	NOM. JKT. THICK.	NOM. O.D.
722201	1-22	16/34	.016	36 MMF	.020	.125
722401	1-24	7/32	.020	29 MMF	.020	.132
722202	2-22	16/34	.016	32 MMF	.030	.231

STOCK PUT UP: 100 FT., 500 FT., 1000 FT.
CAPACITY MEASURED BETWEEN ONE CONDUCTOR AND REMAINING CONDUCTOR AND SHIELD CONNECTED TOGETHER.



DEARBORN

MULTI-CONDUCTOR UNSHIELDED CONTROL CABLE

NEOPRENE OR PLASTIC

PLASTIC JACKETED 15/5 CONTROL CABLES, 600 VOLT, VN20, 90°C

Stranded bare copper conductors, insulated with .015" PVC color coded insulation and .005" Nylon jacket over each conductor; cabled with fillers. Moisture resistant tape, and a black Polyvinyl-chloride jacket overall. Used for controlling temperature, voltage, pressure and relay circuits and many other electronic and electrical circuits. All conductors color coded to IPCEA Standards (see bottom, this page).

* .020" on sizes 14 and 12; .015" on size 16.

RUBBER INSULATED CONDUCTORS, NEOPRENE JACKETED

Stranded bare copper conductors, with color coded rubber insulation; cabled with fillers; cotton wrapped; tough Neoprene jacket overall. Used for remote control circuits. Flexible stranding and heavy duty Neoprene jacket combined, make this cable suitable for outdoor usage under extreme conditions. Neoprene jacket resists sunlight, oil, moisture, ozone, abrasion and impact.

NEC COLOR CODE FOR CONTROL CABLES: 1—Black • 2—White • 3—Red • 4—Green • 5—Orange • 6—Blue • 7—Yellow • 8—Brown • 9—Slate • 10—Purple • 11—Black/White • 12—Red/White • 13—Orange/White • 14—Blue/White • 15—Yellow/White • 16—Brown/White • 17—Slate/White • 18—Purple/White • 19—Red/Black • 20—Orange/Black • 21—Blue/Black • 22—Yellow/Black • 23—Brown/Black • 24—Slate/Black • 25—Purple/Black • 26—Black/Red • 27—Blue/Red • 28—Yellow/Red • 29—Brown/Red • 30—Slate/Red • 31—Purple/Red • 32—Black/Orange • 33—Blue/Orange • 34—Yellow/Orange • 35—Brown/Orange • 36—Slate/Orange • 37—Purple/Orange • 38—Black/Blue • 39—Red/Blue • 40—Orange/Blue

IPCEA COLOR CODING: 1—Black • 2—White • 3—Red • 4—Green • 5—Orange • 6—Blue • 7—White/Black • 8—Red/Black • 9—Green/Black • 10—Orange/Black • 11—Blue/Black • 12—Black/White • 13—Red/White • 14—Green/White • 15—Blue/White • 16—Black/Red • 17—White/Red • 18—Orange/Red • 19—Blue/Red • 20—Red/Green



UNSHIELDED CONTROL CABLE (PLASTIC)

DEARBORN NO.	NO. CONDUCTOR	AWG SIZE	JKT. THICKNESS	NOM. O.D.
701602	2	16	.045	.295
701603	3	16	.045	.310
701604	4	16	.045	.335
701605	5	16	.045	.360
701606	6	16	.045	.395
701607	7	16	.045	.395
701608	8	16	.045	.420
701609	9	16	.045	.455
701610	10	16	.045	.490
701611	11	16	.045	.505
701612	12	16	.045	.505
701614	14	16	.060	.560
701616	16	16	.060	.595
701620	20	16	.060	.650
701402	2	14	.045	.325
701403	3	14	.045	.345
701404	4	14	.045	.375
701405	5	14	.045	.405
701406	6	14	.045	.440
701407	7	14	.045	.440

DEARBORN NO.	NO. CONDUCTOR	AWG SIZE	JKT. THICKNESS	NOM. O.D.
701408	8	14	.045	.475
701409	9	14	.045	.510
701410	10	14	.060	.585
701411	11	14	.060	.605
701412	12	14	.060	.605
701414	14	14	.060	.630
701416	16	14	.060	.665
701420	20	14	.060	.735
701202	2	12	.045	.365
701203	3	12	.045	.385
701204	4	12	.045	.420
701205	5	12	.045	.460
701206	6	12	.060	.500
701207	7	12	.060	.500
701208	8	12	.060	.570
701209	9	12	.060	.615
701210	10	12	.060	.665
701211	11	12	.060	.685
701212	12	12	.060	.685
701214	14	12	.060	.720
701216	16	12	.080	.760
701220	20	12	.080	.880

25 FT. MINIMUM ORDER — CUT TO LENGTH — NO RETURNS



UNSHIELDED CONTROL CABLES (NEOPRENE)

DEARBORN NO.	NO. CONDUCTOR	SIZE AWG	INSULATION THICKNESS	JACKET THICKNESS	NOMINAL O.D.
711805	5	18	1/32	5/64	.490
711806	6	18	1/32	5/64	.525
711808	8	18	1/32	5/64	.570
711809	9	18	1/32	5/64	.620
711810	10	18	1/32	5/64	.630
711814	14	18	1/32	5/64	.710
711605	5	16	1/32	5/64	.530
711606	6	16	1/32	5/64	.570
711607	7	16	1/32	5/64	.570
711608	8	16	1/32	5/64	.605
711610	10	16	1/32	5/64	.740
711612	12	16	1/32	5/64	.760
711614	14	16	1/32	5/64	.785
711616	16	16	1/32	5/64	.820
711620	20	16	1/32	5/64	.920
711622	22	16	1/32	5/64	.930
711624	24	16	1/32	5/64	1.010
711626	26	16	1/32	5/64	1.030
711630	30	16	1/32	5/64	1.050

DEARBORN NO.	NO. COND.	SIZE AWG	INSULATION THICKNESS	JACKET THICKNESS	NOMINAL O.D.
711637	37	16	1/32	7/64	1.140
711640	40	16	1/32	7/64	1.175
711650	50	16	1/32	7/64	1.520
711660	60	16	1/32	7/64	1.610
711405	5	14	3/64	6/64	.695
711406	6	14	3/64	6/64	.750
711407	7	14	3/64	6/64	.760
711408	8	14	3/64	6/64	.820
711409	9	14	3/64	6/64	.925
711410	10	14	3/64	6/64	.930
711412	12	14	3/64	6/64	.935
711205	5	12	3/64	6/64	.750
711206	6	12	3/64	6/64	.810
711207	7	12	3/64	6/64	.870
711208	8	12	3/64	6/64	.920
711209	9	12	3/64	7/64	1.000
711210	10	12	3/64	7/64	1.000
711212	12	12	3/64	7/64	1.050
711216	16	12	3/64	7/64	1.160
711005	5	10	3/64	6/64	.830
711006	6	10	3/64	6/64	.890
711008	8	10	3/64	7/64	1.060
711010	10	10	3/64	7/64	1.160

25 FT. MINIMUM ORDER — CUT TO LENGTH — NO RETURNS



INDIVIDUALLY SHIELDED PAIRS

STRANDED CONDUCTORS

DEARBORN NO. OF PAIRS	NO. CONDUCTOR	SIZE & STRANDING	NOM. JKT. THICK.	NOM. O.D.	STOCK PUT UP (FT.)	
962201	1	22-7/30 ‡	.020	.135	100, 500 & 1000	
962203	3	22-7/30	.025	.252	100, 500 & 1000	
962206	6	22-7/30	.030	.342	100, 500 & 1000	
962209	9	22-7/30	.035	.410	100, 500 & 1000	
962211	11	22-7/30	.040	.457	100, 500 & 1000	
962215	15	22-7/30	.040	.523	100, 500 & 1000	
962219	19	22-7/30	.050	.570	100, 500 & 1000	
962227	27	54	22-7/30	.055	.687	100, 500 & 1000
961803	3	6	18-16/30	.035	.372	1000
961806	6	12	18-16/30	.045	.555	1000
961809	9	18	18-16/30	.055	.620	1000
961812	12	24	18-16/30	.070	.765	1000
961815	15	30	18-16/30	.070	.830	1000

COLOR COMBINATION OF PAIRS

Pair No.	Pair No.	Pair No.
1—Black and Red	10—Red and Blue	15—White and Blue
2—Black and White	11—Red and Yellow	20—White and Yellow
3—Black and Green	12—Red and Brown	21—White and Orange
4—Black and Blue	13—Red and Orange	22—White and Green
5—Black and Yellow	14—Green and White	23—Blue and Yellow
6—Black and Brown	15—Green and Blue	24—Blue and Brown
7—Black and Orange	16—Green and Yellow	25—Blue and Orange
8—Red and White	17—Green and Brown	26—Brown and Yellow
9—Red and Green	18—Green and Orange	27—Brown and Orange

† .008" Polypropylene insulation ▲ Grey or Black Jacket - Specify Color



FOIL SHIELDED, MULTI-CONDUCTOR CABLE

DEARBORN NO.	NO. CONDUCTOR	AWG SIZE	STRAND-ING	NOM. JKT. THICK.	NOM. O.D.	STOCK PUT UP (FT.)
972202	2	22	7/30	.025	.167	100, 500 & 1000
972203	3	22	7/30	.025	.175	100, 500 & 1000
972204	4	22	7/30	.025	.190	100, 500 & 1000
972002	2	20	10/30	.025	.195	100, 500 & 1000
972003	3	20	10/30	.025	.200	100, 500 & 1000
972004	4	20	10/30	.028	.215	100, 500 & 1000
971802	2	18	16/30	.028	.223	100, 500 & 1000
971803	3	18	16/30	.028	.236	100, 500 & 1000
971804	4	18	16/30	.028	.250	100, 500 & 1000
971602	2	16	26/30	.030	.275	100, 500 & 1000
971603	3	16	26/30	.030	.300	100, 500 & 1000
971402	2	14	41/30	.035	.340	100, 500 & 1000
971403	3	14	41/30	.035	.400	100, 500 & 1000

Color Code: 1—Black • 2—Clear • 3—Red • 4—Green



2 PAIR MINIATURE AUDIO AND SOUND CABLE 1 - Shielded — 1 - Unshielded

DEARBORN NO.	NO. OF PAIRS	NO. CONDUCTOR	SIZE & STRANDING	NOM. JKT. O.D.	PUT UP (FT.)
970001	2	4	22-7/30	.165	100, 500 & 1000
970002	2	4	20-10/30	.230	100, 500 & 1000

DATA AND AUDIO CABLE

• MINIATURE SOUND CABLE

INDIVIDUALLY SHIELDED MULTIPLE PAIRS

Tinned copper conductors, either stranded or solid (see tables), insulated with high density color coded .010" Polyethylene, conductors twisted into pairs. Along with a #22 gauge stranded tinned copper drain wire, each pair is shielded with a Mylar supported aluminum foil shield. Covered with a Grey PVC jacket overall. Used for all circuits requiring isolation between pairs. Especially suitable for multiple audio and data control circuits. Mylar Wrap between shields and jacket.

* .016" on #18 gauge † #20 on #18 gauge

FOIL SHIELDED, PLASTIC JACKETED, MULTI-CONDUCTOR CABLE

Stranded tinned copper conductors, insulated with .015" thick color coded Polyethylene insulation. Conductors are cabled and, along a No. 22S tinned copper stranded drain wire laid parallel, are shielded with aluminum foil Mylar backed shield. Gray PVC jacket overall. This type of shielding provides 100% effective shielding and is suitable for audio and data work where cross talk must be reduced to a minimum. Temperature rating: — 20°C to +60°C. Operating voltage rating: 400 volts.

‡ No. 20 on No. 18, No. 16, No. 14.

§ .025" on No. 16, .032" on No. 14.

2 PAIR MINIATURE AUDIO AND SOUND CABLE

Tinned copper, .009" Polypropylene insulation on 970001. 1 pair of black and red shielded with Mylar aluminum shield. Other pair of white and green twisted, not shielded. Both pairs twisted with #22 stranded T.C. drain wire and chrome vinyl jacket overall.

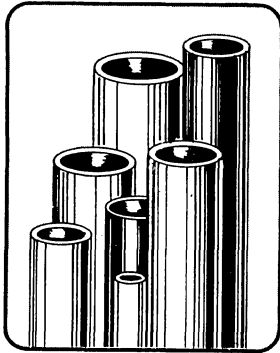
¶ .015" PVC on 970002

EXTRUDED TUBING

- PLASTIC
- POLYVINYL CHLORIDE
- HIGH AND LOW TEMPERATURE
- MIL SPEC & U.L.

• TFE TEFLON*
(MIL-I-22129B)

- Lightwall
- Thinwall
- Standard Wall



"PVC" U.L./MIL 105°C

Dearborn No.	Size	Nom. I.D. Inches	Nom. Wall Thickness	Stock Put Up (Ft.)
SM24	24	.022	.012	100 & 1000
SM22	22	.027	.012	100 & 1000
SM20	20	.034	.016	100 & 1000
SM19	19	.038	.016	100 & 1000
SM18	18	.042	.016	100 & 1000
SM17	17	.047	.016	100 & 1000
SM16	16	.053	.016	100 & 1000
SM15	15	.059	.016	100 & 1000
SM14	14	.066	.016	100 & 500
SM13	13	.076	.016	100 & 500
SM12	12	.085	.016	100 & 500
SM11	11	.095	.016	100 & 500
SM10	10	.106	.016	100 & 500
SM9	9	.118	.020	100 & 500
SM8	8	.133	.020	100 & 500
SM7	7	.148	.020	100 & 500
SM6	6	.166	.020	100 & 500
SM5	5	.186	.020	100 & 200
SM4	4	.208	.020	100 & 200
SM3	3	.234	.020	100 & 200
SM2	2	.263	.020	100 & 200
SM1	1	.294	.020	100 & 200
SM0	0	.330	.020	100 & 200
SM516	5/16	.312	.025	100 & 200
SM380	3/8	.375	.025	50 & 100
SM716	7/16	.438	.025	50 & 100
SM120	1/2	.500	.025	50 & 100
SM916	9/16	.562	.030	50
SM580	5/8	.625	.030	50
SM340	3/4	.750	.035	50
SM780	7/8	.875	.035	50
SM100	1	1.000	.035	50
SM114	1-1/4	1.250	.040	25
SM138	1-3/8	1.375	.040	25
SM112	1-1/2	1.500	.045	25
SM134	1-3/4	1.750	.055	25
SM200	2	2.000	.060	25
SM214	2-1/4	2.250	.065	25
SM212	2-1/2	2.500	.070	25

STOCK COLORS: Black, White, Red, Yellow, Blue, Green and Clear.

■ **POLYVINYL CHLORIDE "SM" 105°C U.L./MIL** This is a high temperature tubing meeting both U.L. and MIL-I-631C, Type F, Form U, Grade C, Class 1, (FUNGUS RESISTANT), Category 1 requirements. Temperature rating: -20°C to +105°C. Specs: MIL-I-631C, ASTM D-922 Grade C. U.L. File number on request.

■ **TFE TEFLON TUBING** Extruded TFE Teflon in three Wall Thicknesses. Lightwall: (.006" to .012"), Thinwall: (.009" to .015"), Standard: (.010" to .020"). Operating Temperature Range: -65°C to +250°C. Unaffected by soldering iron temperatures. Dearborn extruded Teflon tubing is chemically inert, has zero moisture absorption and its dielectric strength at high frequencies surpasses other types of insulation even at maximum operating temperatures.

These three wall thicknesses offer an excellent choice for use in miniaturization and compactness of design, especially where high heat, and a chemical solvent and corrosion resistant material is desired.

Meets requirements of—MIL-I-22129B, MIL-P-14077, MIL-P-14078, AMS-3651, AMS-3653.

COLOR CODE: 1—Clear or Natural • 2—Black • 3—Red • Other colors available on Special Order.

* Du Pont Trademark.

LIGHTWALL / TEFLON

Dearborn No.	Size	Nom. I.D. Inches	Nom. Wall Thickness	Stock Put Up (Ft.)
LW30	30	.012	.006	Spools 100 & 1000
LW28	28	.015	.006	100 & 1000
LW26	26	.018	.006	100 & 1000
LW24	24	.022	.006	100 & 1000
LW22	22	.027	.006	100 & 1000
LW20	20	.034	.006	100 & 1000
LW19	19	.038	.006	100 & 1000
LW18	18	.042	.006	100 & 1000
LW17	17	.047	.006	100 & 1000
LW16	16	.053	.006	100 & 1000
LW15	15	.059	.006	100 & 1000
LW14	14	.066	.008	100 & 500
LW13	13	.076	.008	100 & 500
LW12	12	.085	.008	100 & 500
LW11	11	.095	.008	100 & 500
LW10	10	.102	.008	100 & 500
LW9	9	.114	.008	100 & 500
LW180	1/8	.120	.008	100 & 500

Items below on Coils

LW8	8	.129	.008	100
LW7	7	.144	.008	100
LW6	6	.162	.010	100
LW5	5	.182	.010	100
LW4	4	.204	.010	100
LW3	3	.229	.010	50
LW140	1/4	.250	.010	50
LW2	2	.258	.010	50
LW1	1	.289	.010	50
LW516	5/16	.313	.012	50
LW0	0	.325	.012	50

THINWALL / TEFLON

Dearborn No.	Size	Nom. I.D. Inches	Nom. Wall Thickness	Stock Put Up (Ft.)
TW30	30	.013	.009	Spools 100 & 1000
TW28	28	.015	.009	100 & 1000
TW26	26	.018	.009	100 & 1000
TW24	24	.022	.009	100 & 1000
TW22	22	.027	.009	100 & 1000
TW20	20	.034	.012	100 & 1000
TW19	19	.038	.012	100 & 1000
TW18	18	.042	.012	100 & 1000
TW17	17	.047	.012	100 & 1000
TW16	16	.053	.012	100 & 1000
TW15	15	.059	.012	100 & 1000
TW14	14	.066	.012	100 & 500
TW13	13	.076	.012	100 & 500
TW12	12	.085	.012	100 & 500
TW11	11	.095	.012	100 & 500
TW10	10	.106	.012	100 & 500
TW9	9	.118	.015	100 & 500
TW180	1/8	.125	.015	100 & 500

Items below on Coils

TW8	8	.138	.015	100
TW7	7	.148	.015	100
TW6	6	.166	.015	100
TW5	5	.188	.015	100
TW4	4	.208	.015	100
TW3	3	.234	.015	50
TW140	1/4	.250	.015	50
TW2	2	.263	.015	50
TW1	1	.294	.015	50
TW516	5/16	.312	.015	50
TW0	0	.330	.015	50

STANDARD WALL / TEFLON

Dearborn No.	Size	Nom. I.D. Inches	Nom. Wall Thickness	Stock Put Up (Ft.)
SW24	24	.022	.012	Spools 100 & 1000
SW22	22	.027	.012	100 & 1000
SW20	20	.034	.016	100 & 1000
SW19	19	.038	.016	100 & 1000
SW18	18	.042	.016	100 & 1000
SW17	17	.047	.016	100 & 1000
SW16	16	.053	.016	100 & 1000
SW15	15	.059	.016	100 & 1000

Items below on Coils

SW14	14	.066	.016	100 & 500
SW13	13	.076	.016	100 & 500
SW12	12	.085	.016	100 & 500
SW11	11	.095	.016	100 & 500
SW10	10	.106	.016	100 & 500
SW9	9	.118	.020	100 & 500
SW180	1/8	.125	.020	100 & 500
SW8	8	.133	.020	100
SW7	7	.148	.020	100
SW6	6	.166	.020	100
SW5	5	.186	.020	100
SW4	4	.208	.020	100
SW3	3	.234	.020	50
SW140	1/4	.250	.020	50
SW2	2	.263	.020	50
SW1	1	.294	.020	50
SW516	5/16	.313	.020	50
SW0	0	.330	.020	50



DEARBORN

HEAT SHRINKABLE TUBING

STYLE ST-301



STYLE ST-301

100' — 25 x 4' LENGTHS PER BOX					6" LENGTHS
DEARBORN NO.	EXP. SIZE	MIN. I.D.	REC. I.D.	WALL THICK	NO. OF LENGTHS PER BOX
ST-301-3/16	3/16"	.046"	.023"	.016"	40
ST-301-1/6	1/16"	.063"	.031"	.017"	36
ST-301-3/32	3/32"	.093"	.046"	.020"	32
ST-301-1/8	1/8"	.125"	.062"	.020"	28
ST-301-3/16	3/16"	.187"	.093"	.020"	24
ST-301-1/4	1/4"	.250"	.125"	.025"	20
ST-301-3/8	3/8"	.375"	.187"	.025"	16
20' — 5 x 4' LENGTHS PER BOX					6" LENGTHS
ST-301-1/2	1/2"	.500"	.250"	.025"	14
ST-301-3/4	3/4"	.750"	.375"	.030"	12
ST-301-1	1"	1.00"	.500"	.035"	8
ST-301-1 1/2	1 1/2"	1.50"	.750"	.040"	5
ST-301-2	2"	2.00"	1.00"	.045"	3
8' — 2 x 4' LENGTHS PER BOX					6" LENGTHS
ST-301-3	3"	3.00"	1.50"	.050"	2
ST-301-4	4"	4.00"	2.00"	.055"	1

Specify 4' or 6' Box When Ordering.
Stock Colors: Clear, Black, Red and White — Specify Color.

STYLE ST-301 POLYOLEFIN HEAT SHRINKABLE TUBING TO MIL-I-23053B/5, U.L. APPROVED

Dearborn Style ST-301 Heat Shrinkable Tubing is an irradiated, thermally stabilized, polyolefin product which meets or exceeds MIL-I-23053B/5, AMS 3636B and AMS 3637B. ST-301 shrinks to 50% of diameter at 121°C (250°F) in 7 seconds, and has an operating temperature range of -55°C (-67°F) to +135°C (+275°F).

MIL-I-23053/5 — CLASS I (COLORED INSULATION)

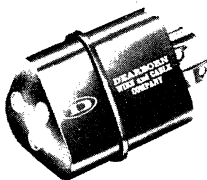
MIL-I-23053/5 — CLASS II (CLEAR INSULATION)

All sizes are shown and supplied in expanded inside diameters. Stock Colors: Black, Red, White and Clear. Clear is Non-Flame Retardant. All other colors are Flame Retardant under MIL-I-23053B/5. Additional colors available on special order. Supplied in either 4 ft. or 6 inch lengths, and 6 inch Assortments. Suitable for all military applications as well as industrial and commercial uses.

ST-301 Kit Assortments Available in 6" lengths. Assorted colors AST-301-1-6 — 3/4" thru 3/4" (30) Lengths. AST-301-2-6 — 1/4" thru 3/4" (16) Lengths.

Detects Faulty Circuits Instantly!

CIRCUIT MONITOR



HELPS PREVENT FIRE DAMAGE, AND LOSS!

The Circuit Monitor detects whether or not proper ground and AC polarity are available from 115 Volt 3 wire power outlets for safe operation of power tools, appliances, office machines, lab and other electrical equipment. It does the job instantly and accurately without the inconvenience of handling probes and meters.

Dearborn No.	Description
5102B	Circuit Monitor in Box.
5012C	Circuit Monitor on Card for Display Rack.

EASY TO USE. Simply plug into 3 wire receptacle and lights on Circuit Monitor will indicate the following:

- ⚡ O & K Circuit Okay
- ⚡ O only Improper Ground
- ⚡ K only Improper Neutral
- ⚡ O & X Reversed Polarity
- ⚡ K & X Reversed Ground
- ⚡ None Power is OFF


DEARBORN
**MIL-W-3861 TYPE S, QQ-W-343 TYPE S, ASTM B-33
UNINSULATED TINNED OR SILVER PLATED COPPER WIRE**
FLAT BRAID

Tinned copper strands, woven and rolled flat to specific width depending on construction, number of strands, etc.

Used for bonding, straps, grounding, or connecting moving parts. Recommended for high current usage.

TUBULAR BRAID

Tinned copper braid woven in completely round configuration as outlined in MIL-SPEC QQ-B-575. All strands soft drawn tinned copper. Shielding is 95% or more when placed over equivalent diameter mandrel to the inside diameter of the tubular braid. Used as both shielding and protective covering.

SOFT DRAWN SOLID WIRE

Properly annealed, pure electrolytic soft, drawn, solid, tinned or silver plated copper wire used for applications such as point to point wiring, component leads, and ground wire.

*FLAT TINNED COPPER BRAID						
DEARBORN NO.	NOM. FLAT WIDTH (INCHES)	TOT. NO. INDIV. STRANDS	SIZE EACH STRAND AWG	NOM. CIRCULAR MIL AREA	STOCK PUT UPS (FT.)	
91221	.025	8	36	200	100, 500 & 1000	
91222	1/32	16	36	400	100, 500 & 1000	
91223	3/64	24	36	600	100, 500 & 1000	
91224	3/32	48	36	1200	100, 500 & 1000	
91229	1/8	72	36	1800	100, 500 & 1000	
91230	3/16	120	36	3000	100, 500 & 1000	
91231	1/4	168	36	4200	100, 500 & 1000	
91232	3/8	288	36	7200	100, 500 & 1000	
91233	1/2	384	36	9600	100, 500 & 1000	
91234	3/4	832	36	20,800	100, 500 & 1000	
91235	1	832	36	20,800	100, 500 & 1000	
91239	1-3/8	336	30	33,700	100, 500 & 1000	
91240	1-1/2	528	30	53,064	100, 500 & 1000	
91241	1-3/4	1248	30	125,424	100, 500 & 1000	
91242	2	1536	30	154,368	100, 500 & 1000	

*Commercial Type.

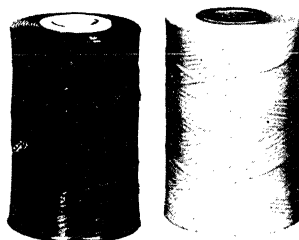
TINNED COPPER TUBULAR BRAID						
DEARBORN P/N	SIZE I.D. INCHES	TOTAL NO. INDIVIDUAL STRANDS	SIZE EACH STRAND AWG	NOM. CIRCULAR MIL AREA	STOCK PUT UPS (FT.)	
92160	1/32	24	36	600	100	
92162	1/16	48	36	1200	100	
92164	7/64	96	36	2400	100	
92166	1/8	120	36	3000	100	
92168	11/64	168	36	4200	100	
92170	13/64	192	34	7630	100	
92171	1/4	384	36	9600	100	
92172	3/8	384	36	9600	100	
92174	1/2	528	36	13,200	100	
92175	9/16	480	30	48,240	100	
92176	25/32	864	36	21,600	100	
92177	* 7/8	336	30	33,700	50 & 100	
92178	* 1	384	30	38,600	50 & 100	
92179	* 1-1/8	432	30	43,330	50 & 100	
92180	* 1-1/4	480	30	48,150	50 & 100	
92181	* 1-3/8	528	30	53,000	50 & 100	
92182	* 1-1/2	576	30	57,775	50 & 100	

UNINSULATED TINNED COPPER WIRE				
DEARBORN NO.	CONDUCTOR SIZE	NOM. CIRCULAR MIL AREA	NOM. O.S.	STOCK PUT UPS (FT.)
938	38	16.0	.004	100 & 1000
936	36	25.0	.005	100 & 1000
934	34	39.7	.006	100 & 1000
932	32	64.0	.008	100 & 1000
930	30	100.5	.010	100 & 1000
928	28	159.8	.013	100 & 1000
926	26	254.1	.016	100 & 1000
924	24	404.0	.020	100 & 1000
922	22	642.4	.025	100 & 1000
920	20	1,022.0	.033	100 & 1000
918	18	1,642.0	.040	100 & 1000
916	16	2,583.0	.051	100 & 1000
914	14	4,107.0	.065	100 & 1000
912	12	6,530.0	.082	100 & 1000
910	10	10,380.0	.103	100 & 1000
908	8	16,510.0	.129	100 & 1000
906	6	26,250.0	.162	100 & 1000

UNINSULATED SILVER PLATED WIRE				
DEARBORN NO.	CONDUCTOR SIZE	NOM. CIRCULAR MIL AREA	NOM. O.S.	STOCK PUT UPS (FT.)
922SPC	22	642.4	.025	100 & 1000
920SPC	20	1,022.0	.033	100 & 1000
918SPC	18	1,642.0	.040	100 & 1000
916SPC	16	2,583.0	.051	100 & 1000
914SPC	14	4,107.0	.065	100 & 1000

Surfix SPC denotes Silver Plated Copper

LACING TAPES & TWINE MEETING AND EXCEEDING MILITARY AND COMMERCIAL SPECIFICATIONS.

**NYLON LACING TAPE
MIL-T-43435 TYPE I**


- **INDUSTRIAL PRICING!**
- **SAME DAY SHIPMENT!**

Designed to Meet and Exceed MIL-T-713D, Type P, and MIL-T-43435 Types I, II, and IV, also AMS 3815, AMS 3816, AMS 3817.

FINISHES AND COATINGS

- **W — WAX, MIL SPEC "B"**

A microcrystalline fungicidal wax which exceeds military specifications, provides excellent knot retention and is suitable for either lacing or spot ties.

- **G — SYNTHETIC RUBBER, MIL SPEC "C"**

A special continuous coating of fungicidal synthetic elastomer (rubber) which exceeds Mil Spec requirements, ties easily and exhibits outstanding knot holding characteristics.

- **A — SYNTHETIC RESIN, MIL SPEC "E"**

A synthetic rubber-like resin formulated with fungicidal ingredients. Handling characteristics are excellent, knot retention is outstanding; meets or exceeds Mil Spec requirements. Operational Temperature Ranges: -67°F to +250°F on all items.

NYLON LACING TWINE MIL-T-713D TYPE P

Round twisted nylon fiber impregnated with microcrystalline fungicidal wax.

POLYESTER LACING TAPE MIL-T-43335 TYPE II

Flat braided polyester yarn impregnated with special finishes to military specifications. Available in 500-yard spools.

NYLON LACING TAPE MIL-T-43435 TYPE I

Flat braided high-tensacity nylon yarn impregnated with microcrystalline fungicidal wax or impregnations to meet military specifications. Available in 500-yard spools.

NYLON LACING TAPE MIL-T-43435 TYPE I

Flat braided high-tensacity nylon yarn impregnated with microcrystalline fungicidal wax or impregnations to meet military specifications. Available in 500-yard spools.

MIL SPEC SIZE	DEARBORN PART NO.	TEST TENSILE STRENGTH	WIDTH	COLOR	FINISH	MIL SPEC FINISH
3	805032W	50 lbs.	.090"	Natural	A	E
3	805032B	50 lbs.	.090"	Black	A	E
4	802534W	25 lbs.	.062"	Natural	W	B
4	802534B	25 lbs.	.062"	Black	W	B
3	805036W	50 lbs.	.090"	Natural	W	B
3	805036B	50 lbs.	.090"	Black	W	B
3	805040W	50 lbs.	.090"	Natural	G	C
3	805040B	50 lbs.	.090"	Black	G	C

POLYESTER LACING TAPE MIL-T-43335 TYPE II

Flat braided polyester yarn impregnated with special finishes to military specifications. Available in 500-yard spools.

MIL SPEC SIZE	DEARBORN PART NO.	TEST TENSILE STRENGTH	WIDTH	COLOR	FINISH	MIL SPEC FINISH
3	805058W	50 lbs.	.090"	Natural	A	E
3	805058B	50 lbs.	.090"	Black	A	E
3	805062W	50 lbs.	.090"	Natural	W	B
3	805062B	50 lbs.	.090"	Black	W	B

NYLON LACING TWINE MIL-T-713D TYPE P

Round twisted nylon fiber impregnated with microcrystalline fungicidal wax.

MIL SPEC CLASS	DEARBORN PART NO.	TEST TENSILE STRENGTH	NOM. DIAM.	PUT-UP 1 LB. SPOOL (LENGTH)	COLOR	FINISH	MIL SPEC FINISH
1	807013W	70 lbs.	.039"	550 yds.	Natural	W	B
1	807013B	70 lbs.	.039"	550 yds.	Black	W	B
2	804814W	48 lbs.	.029"	750 yds.	Natural	W	B
2	804814B	48 lbs.	.029"	750 yds.	Black	W	B
3	803215W	32 lbs.	.025"	1100 yds.	Natural	W	B
3	803215B	32 lbs.	.025"	1100 yds.	Black	W	B

LOW LOSS FOAM COAXIAL CABLE ASSEMBLIES

For Amateur, Commercial, Marine and Citizens Band Installations

Ready to use assemblies offering amazing new levels of performance. Special tarnish proof finish on PL-259 Connectors defies the elements. The low loss Polyfoam dielectric used in the core of these coaxial cables cuts transmission and receiving losses up to 35%, effecting coverage over greater distances.

NOTE: 50', 100' and 250' cables have PL-259 Connectors attached to both ends. 6', 15' and 20' cables have PL-259 Connector on one end and spade lugs at the opposite end.



RG 58/U TYPE 53.3 OHM		75 OHM	
DEARBORN NO.	LENGTH	DEARBORN NO.	LENGTH
6058F/CL6	6' long	6058F/C50	50' long
6058F/CL15	15' long	6058F/C100	100' long
6058F/CL20	20' long	6058F/C250	250' long
6058F/C50	50' long	CONNECTORS AND ADAPTERS ONLY	
6058F/C100	100' long		
RG 8/U TYPE 50 OHM		DEARBORN NO.	DESCRIPTION
6008F/C50	50' long	UG 175/U	Adapter Connectors
6008F/C100	100' long	PL-259	

DEARBORN WIRE AND CABLE CO. 9299 Evenhouse Avenue, Rosemont, Illinois 60018 • Phone (312) 696-1000

DEARBORN**MIL SPEC MIL-W-76B HOOKUP WIRE**

Single conductor, stranded or solid tinned copper.

Insulation: PVC. Temperature rating: -40°C to +80°C (90°C with nylon jacket). Resistant to acids, alkalis, oils, flame, moisture, solvents and fungus.

TYPE LW

Insulation thickness .010". Voltage ratings 300 volts.

TYPE MW

Insulation thickness .016". Voltage rating 1000 volts.

TYPE MW — NYLON JACKET

Insulation thickness .016". Nylon jacket .002" to .005" depending on conductor size. Voltage rating 1000 volts.

TYPE MW — SHIELDED

Insulation thickness .016". Braided shield overall, 90% coverage. Voltage rating 1000 volts.

**80°C TYPE LW, 300 VOLT**

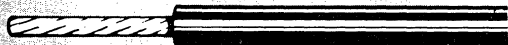
DEARBORN NO.	TYPE DESIGNATION AND SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS
STRANDED CONDUCTOR					
283007	LW-C30 (7) U	7/38	.034	.010	0-9 & 90-98
282807	LW-C28 (7) U	7/36	.037	.010	0-9 & 90-98
282607	LW-C26 (7) U	7/34	.041	.010	0-9 & 90-98
282407	LW-C24 (7) U	7/32	.046	.010	0-9 & 90-98
282207	LW-C22 (7) U	7/30	.053	.010	0-9 & 90-98
282007	LW-C20 (7) U	7/28	.060	.010	0-9 & 90-98
SOLID CONDUCTOR					
283001	LW-C30 (1) U	1/30	.031	.010	0-9 & 90-98
282801	LW-C28 (1) U	1/28	.035	.010	0-9 & 90-98
282601	LW-C26 (1) U	1/26	.038	.010	0-9 & 90-98
282401	LW-C24 (1) U	1/24	.042	.010	0-9 & 90-98
282201	LW-C22 (1) U	1/22	.047	.010	0-9 & 90-98
282001	LW-C20 (1) U	1/20	.054	.010	0-9 & 90-98

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

**90°C TYPE MW, NYLON JK'T. (.003"), 1000 V.**

DEARBORN NO.	TYPE DESIGNATION AND SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS
312407	MW-C24 (7) J	7/32	.063	.016	0-9
312207	MW-C22 (7) J	7/30	.071	.016	0-9
312010	MW-C20 (10) J	10/30	.078	.016	0-9
311816	MW-C18 (16) J	16/30	.086	.016	0-9
311619	MW-C16 (19) J	19/29	.098	.016	0-9
311419	MW-C14 (19) J	19/27	.113	.016	0, 2, 9
311219	MW-C12 (19) J	19/25	.134	.016	0, 2, 9

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

**80°C TYPE MW, 1000 VOLT**

DEARBORN NO.	TYPE DESIGNATION AND SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS
STRANDED CONDUCTOR					
302407	MW-C24 (7) U	7/32	.058	.016	0-9 & 90-98
302207	MW-C22 (7) U	7/30	.065	.016	0-9 & 90-98
302010	MW-C20 (10) U	10/30	.072	.016	0-9 & 90-98
301816	MW-C18 (16) U	16/30	.080	.016	0-9 & 90-98
301619	MW-C16 (19) U	19/29	.091	.016	0-9 & 90-98
301419	MW-C14 (19) U	19/27	.105	.016	0-9 & 90-98
301219	MW-C12 (19) U	19/25	.124	.016	0-9 & 90-98
SOLID CONDUCTOR					
302401	MW-C24 (1) U	1/24	.055	.016	0-9 & 90-98
302201	MW-C22 (1) U	1/22	.059	.016	0-9 & 90-98
302001	MW-C20 (1) U	1/20	.066	.016	0-9 & 90-98
301801	MW-C18 (1) U	1/18	.074	.016	0-9 & 90-98
301601	MW-C16 (1) U	1/16	.085	.016	0-9 & 90-98
301401	MW-C14 (1) U	1/14	.098	.016	0-9 & 90-98

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

**80°C TYPE MW, SHIELDED, 1000 VOLT**

DEARBORN NO.	TYPE DESIGNATION AND SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS
332407	MW-C24 (7) S	7/32	.080	.016	9 Only
332207	MW-C22 (7) S	7/30	.087	.016	9 Only
332010	MW-C20 (10) S	10/30	.094	.016	9 Only
331816	MW-C18 (16) S	16/30	.102	.016	9 Only
331619	MW-C16 (19) S	19/29	.113	.016	9 Only
331419	MW-C14 (19) S	19/27	.121	.016	9 Only
331219	MW-C12 (19) S	19/25	.146	.016	9 Only

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

COLOR CODE ON HOOKUP WIRE: 0—Black • 1—Brown • 2—Red • 3—Orange • 4—Yellow • 5—Green • 6—Blue • 7—Violet • 8—Grey • 9—White
 90—White/Black • 91—White/Brown • 92—White/Red • 93—White/Orange • 94—White/Yellow • 95—White/Green • 96—White/Blue • 97—White/Violet • 98—White/Gray
 OTHER COLORS AND STRIPE COMBINATIONS AVAILABLE UPON REQUEST

**DEARBORN****MIL SPEC MIL-W-76B HOOKUP WIRE**

Single conductor stranded tinned copper.

Insulation: PVC with and without shield, with and without lacquered glass braid or nylon jacketing. **Temperature rating:** -40°C to +80°C (90°C with nylon jacket). Resistant to acids, alkalis, oils, flame, moisture, solvents and fungus.

TYPE MW — GLASS BRAID

Insulation thickness .016 with glass braid overall. Voltage rating 1000 volts.

TYPE MW — SHIELDED — NYLON

PVC insulation .016, braided shield 90% coverage, and clear nylon jacket overall.

TYPE MW — GLASS BRAID — SHIELD

Insulation thickness .016 with glass braid and shield overall.

TYPE HW

Insulation thickness .031 on sizes No. 22 thru No. 16, .045 on sizes No. 14 thru No. 6. For voltage rating see chart.

TYPE HW — GLASS BRAID

Same as HW with addition of lacquered glass braid overall.

**80°C TYPE MW, GLASS BRAID, 1000 VOLT**

DEARBORN NO.	TYPE DESIGNATION AND SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS
322407	MW-C24 (7) B	7/32	.068	.016	0-9, 90 & 92
322207	MW-C22 (7) B	7/30	.075	.016	0-9, 90 & 92
322010	MW-C20 (10) B	10/30	.082	.016	0-9, 90 & 92
321816	MW-C18 (16) B	16/30	.090	.016	0-9, 90 & 92
321619	MW-C16 (19) B	19/29	.101	.016	0-9, 90 & 92
321419	MW-C14 (19) B	19/27	.115	.016	9, 90, 92
321219	MW-C12 (19) B	19/25	.134	.016	9, 90, 92

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

**80°C TYPE MW, GLASS BRAID, SHIELDED, 1000 VOLT**

DEARBORN NO.	TYPE DESIGNATION AND SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS
352407	MW-C24 (7) BS	7/32	.091	.016	9 Only
352207	MW-C22 (7) BS	7/30	.097	.016	9 Only
352010	MW-C20 (10) BS	7/30	.105	.016	9 Only
351816	MW-C18 (16) BS	16/30	.117	.016	9 Only
351619	MW-C16 (19) BS	19/29	.129	.016	9 Only
351419	MW-C14 (19) BS	19/27	.143	.016	9 Only
351219	MW-C12 (19) BS	19/25	.162	.016	9 Only

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

**80°C TYPE MW, SHIELDED, NYLON JACKET, 1000 VOLT**

DEARBORN NO.	TYPE DESIGNATION AND SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS
342407	MW-C24 (7) SJ	7/32	.086	.016	9 Only
342207	MW-C22 (7) SJ	7/30	.094	.016	9 Only
342010	MW-C20 (10) SJ	10/30	.101	.016	9 Only
341816	MW-C18 (16) SJ	16/30	.110	.016	9 Only
341619	MW-C16 (19) SJ	19/29	.122	.016	9 Only
341419	MW-C14 (19) SJ	19/27	.137	.016	9 Only
341219	MW-C12 (19) SJ	19/25	.157	.016	9 Only

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

**80°C TYPE HW**

Nos. 22, 20, 18, 16—2500 VOLTS • Nos. 14, 12, 10, 8, 6—600 VOLTS

DEARBORN NO.	TYPE DESIGNATION AND SIZE	STRANDING	NOM. O.D.	WALL THICKNESS	STOCK COLORS
362207	HW-C22 (7) U	7/30	.095	.031	0-9
362010	HW-C20 (10) U	10/30	.102	.031	0-9
361816	HW-C18 (16) U	16/30	.110	.031	0-9
361619	HW-C16 (19) U	19/29	.121	.031	0, 2, 9
361419	HW-C14 (19) U	19/27	.163	.045	0, 2, 9
361219	HW-C12 (19) U	19/25	.182	.045	0, 2, 9
361037	HW-C10 (37) U	37/26	.205	.045	0, 2, 9
368133	HW-C8 (133) U	133/29	.262	.045	0, 2, 9
366133	HW-C6 (133) U	133/27	.305	.045	0, 2, 9

80°C TYPE HW, GLASS BRAID, 600 VOLT

371037	HW-C10 (37) B	37/26	.218	.045	9, 90, 92
378133	HW-C8 (133) B	133/29	.275	.045	9, 90, 92
376133	HW-C6 (133) B	133/27	.318	.045	9, 90, 92

STOCK PUT UP: 100 FT., 1000 FT., AND BULK

COLOR CODE ON HOOKUP WIRE: 0—Black • 1—Brown • 2—Red • 3—Orange • 4—Yellow • 5—Green • 6—Blue • 7—Violet • 8—Grey • 9—White
90—White/Black • 91—White/Brown • 92—White/Red • 93—White/Orange • 94—White/Yellow • 95—White/Green • 96—White/Blue • 97—White/Violet • 98—White/Gray
OTHER COLORS AND STRIPE COMBINATIONS AVAILABLE UPON REQUEST

DEARBORN WIRE AND CABLE CO. 9299 Evenhouse Avenue, Rosemount, Illinois 60018 • Phone (312) 696-1000

DEARBORN**MIL-W-16878D, TYPE ET, TEFLON**

DEARBORN P/N	TYPE & CONDUCTOR AWG SIZE & STRAND.	NOM. WALL THICKNESS	NOM. O.D.	STOCK P.U. (FT.)	STOCK COLORS
33207	ET-32 7/40	.006	.021	500 & 1000	0-9
33219	ET-32 19/44	.006	.023	500 & 1000	0-9
33007	ET-30 7/38	.006	.024	500 & 1000	0-9
33019	ET-30 19/42	.006	.024	500 & 1000	0-9
32807	ET-28 7/36	.006	.027	500 & 1000	0-9
32819	ET-28 19/40	.006	.027	500 & 1000	0-9
32607	ET-26 7/34	.006	.031	500 & 1000	0-9
32619	ET-26 19/38	.006	.031	500 & 1000	0-9
32407	ET-24 7/32	.006	.036	500 & 1000	0-9
32419	ET-24 19/36	.006	.036	500 & 1000	0-9
32207	ET-22 7/30	.006	.042	500 & 1000	0-9
32219	ET-22 19/34	.006	.042	500 & 1000	0-9
32007	ET-20 7/28	.006	.050	500 & 1000	0-9
32019	ET-20 19/32	.006	.050	500 & 1000	0-9

TEFLON* INSULATED AIRCRAFT, MISSILE AND ELECTRONIC WIRE AND CABLE

MIL-W-16878D, TYPE ET

Voltage rating: 250 volts. Temperature rating: -65°C to +200°C. Single conductor stranded silver plated copper, extruded TFE Teflon insulation.

MIL-W-7139B, CLASS I WIRE

Voltage rating: 600 volts. Temperature rating: -65°C to +200°C. Silver plated copper, insulated with layers of TFE Teflon, interspersed with layers of Teflon impregnated fiberglass. Color is white with blue tracer. Teflon impregnated fiberglass braid overall.

MIL-W-7139B, CLASS II WIRE

Voltage rating: 600 volts. Temperature rating: -65°C to +260°C. Nickel coated copper, insulated with layers of TFE Teflon, interspersed with layers of Teflon impregnated fiberglass. Color is white with orange tracer. Teflon impregnated fiberglass braid overall.

• All Teflon wire and cable listed here is resistant to acids, alkalis, oil, flame, moisture, solvents, fungus, aircraft fuels, hydraulic fluid, skydral, ethylene glycol and alcohol.

**MIL-W-7139B, CLASS II WIRE**

DEARBORN P/N	CONDUCTOR AWG SIZE & STRANDING	NOMINAL O.D. FINISHED WIRE	STOCK PUT UP (FT.)
82219N	22 19/34	.087	500 & 1000
82019N	20 19/32	.097	500 & 1000
81819N	18 19/30	.112	500 & 1000
81619N	16 19/29	.132	500 & 1000
81419N	14 19/27	.147	500 & 1000
81219N	12 19/25	.167	500 & 1000
81037N	10 37/26	.197	500 & 1000
88133N	8 133/29	.250	500 & 1000
86133N	6 133/27	.293	500 & 1000
84133N	4 133/25	.350	500 & 1000
82665N	2 665/30	.435	500 & 1000
81817N	1 817/30	.480	500 & 1000
80001N	0 1045/30	.540	500 & 1000
80002N	00 1330/30	.590	500 & 1000
80003N	000 1665/30	.654	500 & 1000
80004N	0000 2109/30	.743	500 & 1000

**MIL-W-7139B, CLASS I WIRE**

DEARBORN P/N	CONDUCTOR AWG SIZE & STRANDING	NOMINAL O.D. FINISHED WIRE	STOCK PUT UP (FT.)
82219	22 19/34	.087	500 & 1000
82019	20 19/32	.097	500 & 1000
81819	18 19/30	.112	500 & 1000
81619	16 19/29	.132	500 & 1000
81419	14 19/27	.147	500 & 1000
81219	12 19/25	.167	500 & 1000
81037	10 37/26	.197	500 & 1000
88133	8 133/29	.250	500 & 1000
86133	6 133/27	.293	500 & 1000
84133	4 133/25	.350	500 & 1000
82665	2 665/30	.435	500 & 1000
81817	1 817/30	.480	500 & 1000
80001	0 1045/30	.540	500 & 1000
80002	00 1330/30	.590	500 & 1000
80003	000 1665/30	.654	500 & 1000
80004	0000 2109/30	.743	500 & 1000

COLOR CODE ON HOOKUP WIRE: 0—Black • 1—Brown • 2—Red • 3—Orange • 4—Yellow • 5—Green • 6—Blue • 7—Violet • 8—Grey • 9—White

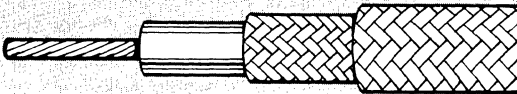
*DuPont TM

OTHER COLORS AND STRIPE COMBINATIONS AVAILABLE UPON REQUEST

DEARBORN WIRE AND CABLE CO. 9299 Evenhouse Avenue, Rosemount, Illinois 60018 • Phone (312) 696-1000

**DEARBORN****MIL SPEC AIRCRAFT WIRE****MIL-W-8777B - MS 25471
SILICONE AIRCRAFT WIRE**

These wires are intended for installation in aircraft electrical systems where potential does not exceed 600 volts (RMS). Temperature limits are -55°C to $+200^{\circ}\text{C}$. Single conductor silver plated copper, silicone rubber insulation, glass and dacron braid impregnated with high temperature lacquer and a white dacron braid and high temperature lacquer overall. Resistant to aircraft fuels, hydraulic fluid, oils, water, skydral, ethyleneglycol, dilute acids, alcohol, alkalis, fungus and abrasion.

**MIL-W-8777B - MS 25471
SILICONE AIRCRAFT WIRE**

DEARBORN P/N	MIL P/N	AWG SIZE	STRANDING	NOM. O.D.	PUT UP (FT.)
162219	MS 25471-22	22	19/34	.085	100 & 1000
162019	MS 25471-20	20	19/32	.095	100 & 1000
161819	MS 25471-18	18	19/30	.110	100 & 1000
161619	MS 25471-16	16	19/29	.125	100 & 1000
161419	MS 25471-14	14	19/27	.143	100 & 1000
161219	MS 25471-12	12	19/25	.163	100 & 1000
161049	MS 25471-10	10	49/27	.193	100 & 1000
168133	MS 25471-8	8	133/29	.248	100 & 1000
166133	MS 25471-6	6	133/27	.303	100 & 1000
164133	MS 25471-4	4	133/25	.360	100 & 1000

ALSO AVAILABLE

MIL-W-5086A — TYPE III

MIL-W-5274A — TYPE I, CLASS A

MIL-W-5274A — TYPE II, CLASS A

MIL-W-22759 — TYPE I

MS — 21985

MS — 21986

NAS 702, TYPES U AND S, CLASSES A, B, C

NAS 703, TYPES U, S, SJ, CLASSES A AND C

CALL DEARBORN ON ALL YOUR WIRE REQUIREMENTS

**MIL-W-5086A
UNSHIELDED AIRCRAFT WIRE**

For use as airframe wire at temperatures within the range of -55°C to $+105^{\circ}\text{C}$. Voltage rating is 600 volts. Both types are resistant to water, aircraft fuels, hydraulic fluid, oils, skydral, ethyleneglycol, dilute acids, alcohol, alkalis, fungus and abrasion.

TYPE I — AN-22 THRU AN-12

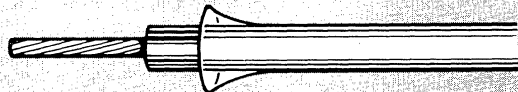
Single conductor stranded tinned copper with white PVC insulation and a clear (polyamide) nylon jacket overall.

TYPE II — AN-22 THRU AN-12

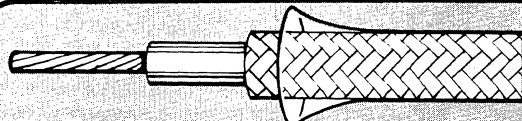
Single conductor stranded tinned copper with white PVC insulation, white glass braid and a clear nylon jacket overall.

TYPE II — AN-10 THRU AN-0000

Single conductor stranded tinned copper with white PVC insulation, white glass braid, flame retardant nylon lacquered nylon braid overall.

**MIL-W-5086A TYPE I**

DEARBORN P/N	MIL P/N	AWG SIZE	STRANDING	NOM. O.D.	PUT UP (FT.)
102219	AN-22	22	19/34	.068	100 & 1000
102019	AN-20	20	19/32	.078	100 & 1000
101819	AN-18	18	19/30	.088	100 & 1000
101619	AN-16	16	19/29	.098	100 & 1000
101419	AN-14	14	19/27	.117	100 & 1000
101219	AN-12	12	19/25	.137	100 & 1000

**MIL-W-5086A TYPE II**

DEARBORN P/N	MIL P/N	AWG SIZE	STRANDING	NOM. O.D.	PUT UP (FT.)
AN-22 THROUGH AN-12					
112219	AN-22	22	19/34	.075	100 & 1000
112019	AN-20	20	19/32	.085	100 & 1000
111819	AN-18	18	19/30	.095	100 & 1000
111619	AN-16	16	19/29	.105	100 & 1000
111419	AN-14	14	19/27	.125	100 & 1000
111219	AN-12	12	19/25	.143	100 & 1000
AN-10 THROUGH AN-0000					
111049	AN-10	10	49/27	.189	100 & 1000
118133	AN-8	8	133/29	.240	100 & 1000
116133	AN-6	6	133/27	.293	100 & 1000
114133	AN-4	4	133/25	.355	100 & 1000
112665	AN-2	2	665/30	.425	100 & 1000
111817	AN-1	1	817/30	.470	100 & 1000
110001	AN-0	0	1045/30	.525	100 & 1000
110002	AN-00	00	1330/30	.590	100 & 1000
110003	AN-000	000	1661/30	.645	100 & 1000
110004	AN-0000	0000	2104/30	.715	100 & 1000

DEARBORN**MIL-W-5086A-MIL-C-7078A****SHIELDED AIRCRAFT WIRE FOR ELECTRICAL SYSTEMS****BASE WIRE, MIL-W-5086A, TYPE I,
MIL-C-7078A, TYPE I**

Stranded tinned copper conductors, with color coded Polyvinylchloride insulation and a clear Nylon jacket on each conductor; cabled, with a braided tinned copper shield (85% coverage) overall.

**BASE WIRE, MIL-W-5086A, TYPE II,
MIL-C-7078A, TYPE II**

Stranded tinned copper conductors, insulated with white PVC, color coded glass braid on each conductor. Each conductor has clear Nylon jacket over glass braid insulation. Conductors are cabled and have braided tinned copper shield (85% coverage) overall.

**BASE WIRE, MIL-W-5086A, TYPE I,
MIL-C-7078A, TYPE II**

Same as MIL-C-7078A, Type I, Base Wire, MIL-W-5086A, Type I, with addition of a clear Nylon jacket over the shield.

**BASE WIRE, MIL-W-5086A, TYPE II,
MIL-C-7078A, TYPE II**

Same as MIL-C-7078A, Type I, Base Wire, MIL-W-5086A, Type II, with addition of clear Nylon jacket over the shield.

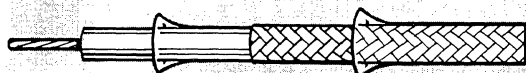
GENERAL CHARACTERISTICS — Temperature rating: -55°C to +105°C. Voltage rating: 600 Volts. Resistant to effects of oil, water, hydraulic fuel, skydrol, aircraft fuels, ethyleneglycol, alcohol, dilute acids, alkalis, fungus, and abrasion.

UNJACKETED SHIELDED CABLE MIL-C-7078A/TYPE I**BASE MIL-W-5086A, TYPE I**

DEARBORN NO.	NO. COND.	MILITARY DESIG. & SIZE	STRANDING	NOM. O.D.	STOCK PUT UPS (FT.)
122201	1	AN-22	19/34	.090	500 & 1000
122202	2	AN-22	19/34	.160	500 & 1000
122203	3	AN-22	19/34	.170	500 & 1000
122001	1	AN-20	19/32	.100	500 & 1000
122002	2	AN-20	19/32	.180	500 & 1000
122003	3	AN-20	19/32	.190	500 & 1000
121801	1	AN-18	19/30	.110	500 & 1000
121802	2	AN-18	19/30	.200	500 & 1000
121803	3	AN-18	19/30	.210	500 & 1000
121601	1	AN-16	19/29	.120	500 & 1000
121401	1	AN-14	19/27	.140	500 & 1000
121201	1	AN-12	19/25	.160	500 & 1000

**BASE MIL-W-5086A, TYPE II**

DEARBORN NO.	NO. COND.	MILITARY DESIG. & SIZE	STRANDING	NOM. O.D.	STOCK PUT UPS (FT.)
132201	1	AN-22	19/34	.095	500 & 1000
132202	2	AN-22	19/34	.170	500 & 1000
132203	3	AN-22	19/34	.180	500 & 1000
132001	1	AN-20	19/32	.105	500 & 1000
132002	2	AN-20	19/32	.190	500 & 1000
132003	3	AN-20	19/32	.200	500 & 1000
131801	1	AN-18	19/30	.115	500 & 1000
131802	2	AN-18	19/30	.210	500 & 1000
131803	3	AN-18	19/30	.224	500 & 1000
131601	1	AN-16	19/29	.125	500 & 1000
131401	1	AN-14	19/27	.150	500 & 1000
131201	1	AN-12	19/25	.165	500 & 1000

NYLON JACKETED SHIELDED CABLE MIL-C-7078A/TYPE II**BASE MIL-W-5086A, TYPE I**

DEARBORN NO.	NO. COND.	MILITARY DESIG. & SIZE	STRANDING	NOM. O.D.	STOCK PUT UPS (FT.)
142201	1	AN-22	19/34	.100	500 & 1000
142202	2	AN-22	19/34	.170	500 & 1000
142203	3	AN-22	19/34	.180	500 & 1000
142001	1	AN-20	19/32	.110	500 & 1000
142002	2	AN-20	19/32	.190	500 & 1000
142003	3	AN-20	19/32	.200	500 & 1000
141801	1	AN-18	19/30	.120	500 & 1000
141802	2	AN-18	19/30	.210	500 & 1000
141803	3	AN-18	19/30	.220	500 & 1000
141601	1	AN-16	19/29	.130	500 & 1000
141401	1	AN-14	19/27	.150	500 & 1000
141201	1	AN-12	19/25	.170	500 & 1000

**BASE MIL-W-5086A, TYPE II**

DEARBORN NO.	NO. COND.	MILITARY DESIG. & SIZE	STRANDING	NOM. O.D.	STOCK PUT UPS (FT.)
152201	1	AN-22	19/34	.105	500 & 1000
152202	2	AN-22	19/34	.180	500 & 1000
152203	3	AN-22	19/34	.190	500 & 1000
152001	1	AN-20	19/32	.115	500 & 1000
152002	2	AN-20	19/32	.200	500 & 1000
152003	3	AN-20	19/32	.210	500 & 1000
151801	1	AN-18	19/30	.125	500 & 1000
151802	2	AN-18	19/30	.220	500 & 1000
151803	3	AN-18	19/30	.234	500 & 1000
151601	1	AN-16	19/29	.135	500 & 1000
151401	1	AN-14	19/27	.160	500 & 1000
151201	1	AN-12	19/25	.175	500 & 1000

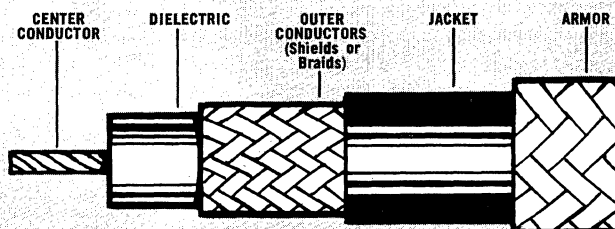
COLOR CODE: 1 Conductor — White • 2 Conductors — 1 White/Blue, 1 White/Red • 3 Conductors — 1 White/Blue, 1 White/Red, 1 White/Yellow.


DEARBORN

RG COAXIAL CABLE

Dearborn has the most complete selection of RG Coaxial Cable in the nation, manufactured to meet the needs of government and industry...backed by America's most dependable quality warranty.

Nomenclature



Operating Temperature Limits for Cable Jackets

MILITARY DESIGNATION	JACKET TYPE	TEMPERATURE LIMITS
TYPE I	Black Polyvinylchloride	-40°C to +80°C
TYPE II	Grey Polyvinylchloride	-25°C to +80°C
TYPE IIa	Black or Grey Polyvinylchloride	Under 1/4" O.D. -55°C to +90°C Over 1/4" O.D. -40°C to +90°C
TYPE IIIa	Black Polyethylene	-55°C to +85°C
TYPE IV	Black Synthetic Rubber	Under 1/2" -55°C to +80°C Over 1/2" -40°C to +80°C
TYPE V	Fiberglass Braid	-55°C to +250°C
TYPE VI	Silicon-Rubber Dacron Braid	-55°C to +175°C
TYPE VII	Teflon (PTFE)	-55°C to +250°C
TYPE VIII	Synthetic Rubber	-55°C to +75°C
TYPE IX	Teflon (FEP)	-55°C to +200°C

CABLE JACKET TYPES

TYPE I (MIL-C-17)—Description: Black Polyvinylchloride. Characteristics: Excellent weathering and abrasion properties, but is of the contaminating type and will cause cable attenuation to increase with age. Can be used for direct burial.

TYPE II (JAN-C-17A)—Description: Grey Polyvinylchloride. Characteristics: A semi-noncontaminating jacket.

TYPE IIA (MIL-C-17)—Description: Black or Grey Polyvinylchloride. Characteristics: Noncontaminating. Good weathering and abrasion resistant properties. Can be used for direct burial.

TYPE IIIA (MIL-C-17)—Description: Black Polyethylene. Characteristics: Moisture resistant,

abrasion resistant, defies ultra violet damage. Noncontaminating; recommended for direct burial.

TYPE IV (MIL-C-17)—Description: Black Synthetic Rubber. Characteristics: This jacket material is used only on high voltage pulse cables. The basic material is polymerized chloroprene.

TYPE V (MIL-C-17)—Description: Fiberglass Braid. Characteristics: Impregnated with silicone varnish to provide abrasion resistance and a moisture seal.

TYPE VI (MIL-C-17)—Description: Silicone Rubber Dacron Braid. Characteristics: Two wraps of silicone rubber impregnated fiberglass tape which is fused into a homogeneous layer. A

dacron braid is applied, followed by a high temperature fluorocarbon lacquer.

TYPE VII (MIL-C-17)—Description: Teflon (Polytetrafluoroethylene). Characteristics: Either extruded or tape wrapped. Withstands high temperatures; chemically inert; insoluble in liquids and gases.

TYPE VIII (MIL-C-17)—Description: Synthetic Rubber. Characteristics: This material is a polychloroprene compound and is used with only a few pulse cables. Its primary use is as a jacket material for multiconductor cables.

TYPE IX (MIL-C-17)—Description: Teflon (Fluorinated Ethylene Propylene). Characteristics: Excellent weathering properties and chemically inert. Maximum operating temperature of 200°C.

EXPLANATION OF NOMENCLATURE

CENTER CABLE CONDUCTORS

Center cable conductors may be solid or stranded wires, or in some cases, a tube. Selection is made on the mechanical and electrical properties desired. Solid wires result in lowest cable attenuation. Stranding permits increased cable flexibility but also increases attenuation. Bare, tinned, or silver plated copper wire is usually used for center conductors. Other materials are Copperweld, Cadmium Bronze, Aluminum, Nichrome and Karma.

DIELECTRICS (CABLE)

EXTRUDED POLYETHYLENE

Low cost, flexibility, ease of application, high dielectric strength and low dielectric constant make it well suited for RF applications. It is the most commonly used low temperature cable dielectric.

FOAM CORE (CELLULAR POLYETHYLENE)

An excellent low temperature dielectric formed by expanding polyethylene with millions of bubbles of an inert gas. Its low dielectric constant of 1.5 for Foam Core compared to 2.26 for solid polyethylene permits the design of lower attenuation and low capacity cables.

TEFLON

Teflon will withstand high temperature applications. It has high dielectric strength and a very low dielectric constant. Its ability to withstand exposure to gases and liquids makes it the dielectric selected where other materials would be inadequate.

CABLE OUTER CONDUCTORS

SHIELDS† OR BRAID

The outer conductor is usually made of a metal braid but it can be a solid tube. The braid is used where flexibility is a vital factor; the tubular construction is used where a high degree of shielding is required. Tubular construction also provides lower cable attenuation. Two adjacent braids offer better shielding action than one braid. Generally speaking braids are either copper, tinned copper or silver plated copper.

† Armor

**RG COAXIAL
CABLE****DEARBORN****PHYSICAL PROPERTIES****ELECTRICAL PROPERTIES**

RG/U No.	Dearborn No.	Armor O.D.	Jkt. O.D.	Jkt. Type	Shields		Dielec- tric O.D. & Type	Center Cond.	Lbs. Per 1000 Ft.	Nom. Imped. Ohms	Nom. Cap. Mmfd./ft.	Max. Operating Volt.(Rms)	V.P. %	ENGINEERING DATA
					Outer	Inner								
5	6005	—	.332*	I	C	C	.185P	16C	83	52.5	28.5	3000	65.9	—
5A	6005A	—	.338*	II	S	S	.181P	16S	83	50.5	28.5	3000	65.9	Replaced 212/U
5B	6005B	—	.328*	IIa	S	S	.181P	16S	83	50.0	28.5	3000	65.9	Now designated as 212/U
6	6006	—	.332*	II	C	S	.185P	21CW	80	75.0	20.0	2700	65.9	Replaced by 6A
6A	6006A	—	.332*	IIa	C	S	.185P	21CW	80	75.0	20.0	2700	65.9	Small video cable
7	6007	—	.370*	I	—	C	.250ASP	19C	80	97.0	12.5	1000	84.0	Replaced by 63B/U
8	6008	—	.405*	I	—	C	.285P	7/21C	105	52.0	29.5	5000	65.9	—
8A	6008A	—	.405*	IIa	—	C	.285P	7/21C	105	52.0	29.5	5000	65.9	Now designated as 213/U
9	6009	—	.420*	II Grey	C	S	.280P	7/21S	128	51.0	30.0	5000	65.9	—
9A	6009A	—	.420*	II Grey	S	S	.280P	7/21S	128	51.0	30.0	5000	65.9	—
9B	6009B	—	.405*	IIa	S	S	.280P	7/21S	127	50.0	30.0	5000	65.9	Now designated as 214/U
10	6010	.475*	.405	II	—	C	.285P	7/21C	129	52.0	29.5	5000	65.9	Replaced by 10A/U
10A	6010A	.475*	.405	IIa	—	C	.285P	7/21C	129	52.0	29.5	5000	65.9	84/U with armor now desig. 215/U
11	6011	—	.405*	I	—	C	.285P	7/26TC	92	75.0	20.5	5000	65.9	Medium flexible video cable
11A	6011A	—	.405*	IIa	—	C	.285P	7/26T	92	75.0	20.5	5000	65.9	—
12	6012	.475*	.405	II Grey	—	C	.285P	7/26TC	116	75.0	20.5	5000	65.9	Replaced by 12A/U
12A	6012A	.475*	.405	IIa	—	C	.285P	7/26TC	114	75.0	20.5	5000	65.9	11A/U with armor
13	6013	—	.420*	I	C	C	.280P	7/26TC	121	74.0	20.5	5000	65.9	—
13A	6013A	—	.420*	IIa	C	C	.280P	7/26TC	121	74.0	20.5	5000	65.9	Now designated as 216/U
14	6014	—	.545*	II Grey	C	C	.370P	10C	205	52.0	29.5	7000	65.9	Replaced by 14A/U
14A	6014A	—	.545*	IIa	C	C	.370P	10C	205	52.0	29.5	7000	65.9	Now designated as 217/U
15	6015	—	.545*	I	C	C	.370P	15CW	197	75.0	20.5	5000	65.9	Replaced by 11A/U & 12A/U
17	6017	—	.870*	II Grey	—	C	.680P	.188C	463	52.0	29.5	11,000	65.9	—
17A	6017A	—	.870*	IIa	—	C	.680P	.188C	460	52.0	29.5	11,000	65.9	Now designated as 218/U
18	6018	.945*	.870	IIa	—	C	.680P	.188C	515	52.0	29.5	11,000	65.9	Replaced by 18A/U
18A	6018A	.945*	.870	II	—	C	.680P	.188C	515	52.0	29.5	11,000	65.9	Now designated as 219/U
19	6019	—	1.120*	II	—	C	.910P	.250C	740	52.0	29.5	14,000	65.9	Replaced by 19A/U
19A	6019A	—	1.120*	IIa	—	C	.910P	.250C	740	52.0	29.5	14,000	65.9	Now designated as 220/U
20	6020	1.195*	1.120	II	—	C	.910P	.250C	800	52.0	29.5	14,000	65.9	Replaced by 20A/U
20A	6020A	1.195*	1.120	IIa	—	C	.910P	.250C	800	52.0	29.5	14,000	65.9	Now designated as 221/U
21	6021	—	.332*	II	S	S	.185P	16N	87	53.0	29.0	2700	65.9	Replaced by 21A/U
21A	6021A	—	.332*	IIa	S	S	.185P	16N	80	53.0	29.0	2700	65.9	Now designated as 222/U
22	6022	—	.405*	I	—	TC	.285P	Two 7/.0152C	103	95.0	16.0	1000	65.9	—
22A	6022A	—	.420*	II	TC	TC	.285P	Two 7/.0152C	131	95.0	16.0	1000	65.9	Replaced by 22B/U
22B	6022B	—	.420*	IIa	TC	TC	.285P	Two 7/.0152C	130	95.0	16.0	1000	—	Twin cond. bal. cable (paired)
23	6023	—	.650 .945*	I	C	C	Two Cores .380P	Two 7/21	380	125.0	12.0	3000	—	Replaced by 23A/U
23A	6023A	—	.650 .945*	IIa	C	C	Two Cores .380P	Two 7/21C	360	125.0	12.0	3000	—	—
24	6024	.735* 1.034	.650* .945*	I	C	C	.380P	Two 7/21C	430	125.0	12.0	3000	—	Replaced by 24A/U
24A	6024A	.735* 1.034	.650* .945*	IIa	C	C	Two Cores .380P	Two 7/21C	410	125.0	12.0	3000	—	Replaced by 23A/U with armor
29	6029	—	.184*	III	—	TC	.116P	20C	21	53.0	28.5	1900	65.9	Replaced by 58/U
34	6034	—	.625*	I	—	C	.455P	7/.21C	230	71.0	21.5	5200	65.9	Replaced by 34B/U
34A	6034A	—	.630*	IIa	—	C	.460P	7/.0249	224	75.0	20.5	6500	65.9	Replaced by 34B/U
34B	6034B	—	.630*	IIa	—	C	.460P	7/.0249	224	75.0	21.5	6500	65.9	Hi-power, low atten. flexible cable
35	6035	.945*	.870	II	—	C	.680P	9c	458	71.0	—	10,000	65.9	Replaced by 35B/U
35A	6035A	.945*	.870	IIa	—	C	.680P	9c	454	71.0	—	10,000	65.9	Replaced by 35B/U
35B	6035B	.945*	.870	IIa	—	C	.680P	.1045C	454	75.0	—	10,000	65.9	Hi-power low attenuation. Same as 164/U armored

KEY TO ABBREVIATIONS:

C—Bare Copper P—Polyethylene
S—Silvered Copper CW—Copperweld
CT—Bare Copper tube

N—Nichrome
TC—Tinned Copper

ASP—Air Spaced Polyethylene
SSP—Semi-Solid Polyethylene
CCP—Conductive Coated Polyethylene

T—Teflon
TT—Teflon Tape
AST—Air Spaced Tetrafluorethylene

* Nominal Overall Diameter

K—KARMA
SCW—Silvered Copperweld
SCB—Silver Plated Cadmium Bronze

**DEARBORN****RG COAXIAL
CABLE**

PHYSICAL PROPERTIES										ELECTRICAL PROPERTIES				
RG/U No.	Dearborn No.	Armor O.D.	Jkt. O.D.	Jkt. Type	Shields		Dielectric O.D. & Type	Center Cond.	Lbs. Per 1000 Ft.	Nom. Imped. Ohms	Nom. Cap. Mmf./ft.	Max. Operating Volt.(Rms)	V.P. %	ENGINEERING DATA
					Outer	Inner								
54	6054	—	.275*	I	—	C	.185P	7/26C	41	58.0	21.0	2500	—	Replaced by 54A/U
54A	6054A	—	.250*	III	—	TC	.178P	7/.0152C	40	58.0	27.0	3000	—	—
55	6055	—	.206*	III	TC	TC	.116P	20C	36	53.0	28.5	1900	65.9	Replaced by 55B/U
55A	6055A	—	.216*	IIa	S	S	.116P	.035S	34	50.0	30.5	1900	65.9	Replaced by 223/U
55B	6055B	—	.206*	IIa	TC	TC	.116P	20S	34	53.5	28.5	1900	65.9	—
57	6057	—	.625*	I	—	TC	.472P	Two 7/21C	248	95.0	16.0	3000	65.9	Replaced by 57A/U
57A	6057A	—	.625*	IIa	—	TC	.472P	Two 7/21C	225	95.0	16.0	3000	65.9	—
58	6058	—	.195*	I	—	TC	.116P	20C	28	53.5	28.5	1900	65.9	—
58A	6058A	—	.195*	I	—	TC	.116P	19/.0071TC	29	52.0	28.5	1900	65.9	—
58B	6058B	—	.195*	IIa	—	TC	.116P	20C	25	53.5	28.5	1900	65.9	—
58C	6058C	—	.195*	IIa	—	TC	.116P	19/.0071TC	25	50.0	28.5	1900	65.9	—
59	6059	—	.242*	I	—	C	.146P	22CW	32	73.0	21.0	2300	65.9	Video cable
59A	6059A	—	.242*	IIa	—	C	.146P	.023CW	32	75.0	20.5	2300	65.9	Replaced by 59B
59B	6059B	—	.242*	IIa	—	C	.146P	.023CW	32	75.0	21.5	2300	65.9	—
62	6062	—	.242*	I	—	C	.146ASP	22CW	38	93.0	13.5	750	84.0	—
62A	6062A	—	.242*	IIa	—	C	.146ASP	22CW	37	93.0	13.5	750	84.0	Low capacitance cable
62B	6062B	—	.242*	IIa	—	C	.146ASP	7/32CW	30	93.0	13.5	750	84.0	Similar to 62A/U
62C	6062C	—	.242	V	—	S	.146AST	22SCW	36	93.0	13.5	750	84.0	Reassigned 210/U
63	6063	—	.405*	I	—	C	.285ASP	22CW	88	125.0	10.0	1000	84.0	Replaced by 63B/U
63B	6063B	—	.405*	IIa	—	C	.285ASP	22CW	84	125.0	10.0	1000	84.0	Low capacitance air spaced cable
71	6071	—	.250*	I	TC	C	.146ASP	22CW	46	93.0	13.5	750	84.0	Replaced by 71B/U
71A	6071A	—	.250*	I	TC	TC	.146ASP	22CW	46	93.0	13.5	750	84.0	—
71B	6071B	—	.250*	IIIa	TC	TC	.146ASP	22CW	45	93.0	13.5	750	84.0	—
74	6074	.615*	.545	II	C	C	.370P	10C	234	52.0	29.5	5500	65.9	Replaced by 74A/U
74A	6074A	.615*	.545	IIa	C	C	.370P	10C	236	52.0	29.5	7000	65.9	Now designated as 224/U
—	6075sm	—	.150	I	—	C	.100P	7/.0056CW	.7	75.0	20.5	2500	65.9	Subminiature
79	6079	.475*	.405	I	—	C	.285ASP	22CW	136	125.0	10.0	1000	84.0	Replaced by 79B/U
79A	6079A	.415*	.405	I	—	C	.285P	22CW	114	125.0	11.0	1000	—	Replaced by 79B/U
79B	6079B	.475*	.405	IIa	—	C	.285ASP	22CW	111	125.0	10.0	1000	84.0	63B/U with armor
83	6083	—	.405*	I	—	C	.240P	10C	122	35.0	44.0	2000	—	—
85A	6085A	Ld. Shth. Armor 1.565	.870	IIa	—	C	.680P	9C	2,910	75.0	21.5	10,000	65.9	RG84A/U with armor special
87A	6087A	—	.425	V	S	S	.280T	7/20S	174	50.0	29.5	5000	69.5	Replaced by 225/U
88A/U	6088A	—	.515*	IV	4 TC	—	—	19/.0117TC	180	45.0	50.0	—	—	Pulse cable formerly 88B/U
94	6094	—	.445*	V	C	C	.292TT	19/.0225S	247	50.0	27.0	7000	70.0	Replacement only, new design 226/U
94A	6094A	—	.500*	V	C	C	.370TT	19/.0224S	445	50.0	27.0	7000	—	Reassigned 226/U
100	6100	—	.242*	I	—	C	.146P	10/.0147C	74	35.0	44.0	2000	—	—
108	6108	—	.235*	II	—	TC	OverEa.Cond. .079P	Two 7/28TC	31	78.0	24.5	1000	68.0	Replaced by 108A/U
108A	6108A	—	.235*	IIa	—	TC	OverEa.Cond. .079P	Two 7/28TC	30	78.0	20.0	1000	68.0	Shielded twisted pair
111	6111	.490*	—	II	TC	TC	.285P	Two 7/.0152C	146	95.0	16.0	1000	65.9	22A/U with armor
111A	6111A	.490*	.420	IIa	TC	TC	.285P	Two 7/.0152C	145	95.0	16.0	1000	65.9	22B/U with armor
114	6114	—	.405*	I	—	C	.285ASP	33CW	87	185.0	6.8	1000	88.0	Low capacitance cable
114A	6114A	—	.405*	IIa	—	C	.285SSP	33CW	87	185.0	7.5	1000	88.0	Special low capacitance cable
115	6115	—	.375	V	S	S	.250TT	7/21S	139	50.0	29.5	5000	70.0	Used where expan. & contrac. are prob.
115A	6115A	—	.415	V	S	S	.250TT	7/21S	159	50.0	29.5	5000	70.0	—
116	6116	.475	.425	V	S	S	.280T	7/20S	224	50.0	29.5	5000	69.5	Replaced by 227/U
117	6117	—	.730	V	—	C	.620T	.188C	450	50.0	29.0	7000	69.5	Replaced by 211/U
117A	6117A	—	.730	V	—	C	.620T	.188C	450	50.0	29.0	7000	69.5	Replaced by 211A/U
118	6118	.795	.730	V	—	C	.620T	.188C	610	50.0	29.0	7000	69.5	Replaced by 228/U

* Nominal Overall Diameter

DEARBORN**PHYSICAL PROPERTIES****ELECTRICAL PROPERTIES**

RG/U No.	Dearborn No.	Armor O.D.	Jkt. O.D.	Jkt. Type	Shields		Dielectric O.D. & Type	Center Cond.	Lbs. Per 1000 Ft.	Nom. Imped. Ohms	Nom. Cap. Mmfd./ft.	Max. Operating Volt.(Rms)	V.P. %	ENGINEERING DATA
					Outer	Inner								
118A	6118A	.780	.730	V	—	C	.620T	.188C	600	50.0	29.5	7000	69.5	Replaced by 228A/U
119	6119	—	.465	V	C	C	.332T	.102C	225	50.0	29.5	6000	69.5	—
120	6120	.525	.465	V	C	C	.332T	.102C	282	50.0	29.5	6000	69.5	119/U with armor
122	6122	—	.160*	IIa	—	TC	.096P	27/36TC	20	50.0	29.5	1900	65.9	Similar to 58A/U except smaller
126	6126	—	.280	V	—	K	.185T	7/24K	76	50.0	28.5	3000	68.5	High attenuation
130	6130	—	.625*	I	—	TC	.472P	Two 7/.0285C	220	95.0	17.0	8000	—	Same as 57A/U except more flexible
131	6131	.710*	.625*	I	—	TC	.472P	Two 7/.0285C	295	95.0	17.0	8000	—	130/U with armor
133	6133	—	.405*	I	—	C	.280P	21C	94	95.0	16.2	4000	—	Replaced by 133A/U
133A	6133A	—	.405*	IIa	—	C	.280P	21C	89	95.0	16.2	4000	—	—
140	6140	—	.233	V	—	S	.146T	.025SCW	45	75.0	21.0	2300	69.5	High temperature similar to 59A/U
141	6141	—	.190	V	—	S	.116T	.0359SCW	35	50.0	28.5	1900	69.5	—
141A	6141A	—	.190	V	—	S	.116T	.039SCW	32	50.0	28.5	1900	69.5	High temperature similar to 58C/U
142	6142	—	.206	V	S	S	.116T	.0359SCW	45	50.0	28.5	1900	69.5	—
142A	6142A	—	.206	V	S	S	.116T	.039SCW	45	50.0	28.5	1900	69.5	High temperature similar to 55A/U
142B	6142B	—	.195	IX	S	S	.116T	.039SCW	42	50.0	28.5	1900	69.2	—
143	6143	—	.325	V	S	S	.185T	.057SCW	102	50.0	28.5	3000	69.5	—
143A	6143A	—	.325	V	S	S	.185T	.059SCW	102	50.0	28.5	3000	69.5	High temperature similar to 58/U
144	6144	—	.410	V	—	S	.285T	7/25SCW	120	75.0	20.5	5000	69.5	High temperature similar to 11/U
146	6146	—	.375	V	—	C	.285AST	.007CW	108	190.0	6.0	1000	—	High temperature, low capacitance
149	6149	—	.405	I	—	TC	.285CCP	7/26TC	92	75.0	20.5	5000	65.9	11/U low noise
150	6150	.475	.405	I	—	TC	.285CCP	7/26TC	116	75.0	20.5	5000	65.9	149/U with armor
161	6161	—	.082	External Nylon Bk.	—	S	.057T	7/.004SCB	6.1	70.0	20.0	1000	69.5	—
164	6164	—	.870	IIa	—	C	.680P	.1045C	389	75.0	21.0	10,000	65.9	35B/U less armor
165	6165	—	.410	V	—	S	.285T	7/.032S	140	50.0	29.5	5000	69.5	—
166	6166	.460	.410	V	—	S	.285T	7/.032S	172	50.0	29.5	5000	69.5	165/U with armor
174	6174	—	.100	I	—	TC	.060P	7/34CW	7.5	50.0	30.0	1500	65.9	—
174A	6174A	—	.100	IIa	—	TC	.060P	7/0063	.8	50.0	30.8	1500	—	Miniature data trans.
177	6177	—	.895	IIa	S	S	.680P	.195C	460	50.0	30.5	1100	65.9	—
178	6178	—	.079	KEL-F	—	S	.036T	7/.0039S	5.4	50.0	27.9	1000	69.5	Replacement only, new design 178B/U
178A	6178A	—	.075	KEL-F	—	S	.034T	7/.004SCW	6	50.0	27.9	1000	69.5	Replacement only, new design 178B/U
178B	6178B	—	.075	IX	—	S	.034T	7/.004SCW	6.2	50.0	28.5	1000	69.5	—
179	6179	—	.090	KEL-F	—	S	.056T	7/.004SCW	8	70.0	19.5	1000	69.5	Replacement only, new design 179A/U
179A	6179A	—	.105	KEL-F	—	S	.063T	7/.004SCW	9.6	75.0	19.5	1200	69.5	Replacement only, new design 179B/U
179B	6179B	—	.105	IX	—	S	.063T	7/.004SCW	9.6	75.0	19.5	1200	69.5	High temperature miniaturized cable
180	6180	—	.141	KEL-F	—	S	.103T	7/.004SCW	18	93.0	15.5	1500	69.5	—
180A	6180A	—	.145	KEL-F	—	S	.102T	7/.004SCW	19	95.0	15.0	1800	69.5	Replacement only, new design 180B/U
180B	6180B	—	.145	IX	—	S	.102T	7/.004SCW	19	95.0	15.0	1500	69.5	—
181	6181	—	.640	IIa	—	C	.210P	Two 7/26C	200	12.5	12.0	3500	—	Unbalanced cable
187	6187	—	.110	VII	—	S	.063T	7/.004SCW	11	75.0	19.5	1200	69.5	Replacement only, new design 187A/U
187A	6187A	—	.110	VII	—	S	.060T	7/.004SCW	11	75.0	19.5	1200	69.5	High temperature miniaturized cable
188	6188	—	.110	VII	—	S	.060T	7/.0067SCW	11	50.0	29.0	1200	69.5	Replacement only, new design 188A/U
188A	6188A	—	.110	VII	—	S	.060T	7/.0067SCW	11	50.0	29.0	1200	69.5	High temperature miniaturized cable
195	6195	—	.155	VII	—	S	.102T	7/.004SCW	21	95.0	15.0	1500	69.5	Same as 189B/U except H.O. conductor
195A	6195A	—	.155	VII	—	S	.102T	7/.004SCW	21	95.0	15.0	1500	69.5	For FEP jacket type, refer to 180B/U
196	6196	—	.080	VII	—	S	.034T	7/.004SCW	5.8	50.0	28.5	1000	69.5	High temperature miniaturized cable
196A	6196A	—	.080	VII	—	S	.034T	7/.004SCW	5.9	50.0	28.5	1000	69.5	For Fep jacket type, refer to 178B/U
209	6209	—	.745	VI	S	S	.500AST	19/.0378S	432	50.0	26.5	3200	84.0	High power, high flex coaxial
210	6210	—	.242	V	—	S	.146AST	22SCW	40	93.0	14.5	750	84.0	Replaces 62C/U

KEY TO ABBREVIATIONS:

C—Bare Copper P—Polyethylene
S—Silvered CW—Copperweld
Copper CT—Bare Copper tube

N—Nichrome ASP—Air Spaced Polyethylene
TC—Tinned SSP—Semi-Solid Polyethylene
Copper CCP—Conductive Coated Polyethylene

T—Teflon
TT—Teflon Tape
AST—Air Spaced Tetrafluorethylene

* Nominal Overall Diameter

K—KARMA
SCW—Silvered Copperweld
SCB—Silver Plated Cadmium Bronze

**DEARBORN****RG COAXIAL
CABLE**

PHYSICAL PROPERTIES										ELECTRICAL PROPERTIES				
RG/U No.	Dearborn No.	Armor O.D.	Jkt. O.D.	Jkt. Type	Shields		Dielectric O.D. & Type	Center Cond.	Lbs. Per 1000 Ft.	Nom. Imped. Ohms	Nom. Cap. Mmfd./ft.	Max. Operating Volt.(Rms)	V.P. %	ENGINEERING DATA
211	6211	—	.730	V	—	C	.620T	.190C	450	50.0	29.0	7000	69.5	Formerly 117/U
211A	6211A	—	.730	V	—	C	.620T	.190C	450	50.0	29.5	7000	69.5	Formerly 117A/U
212	6212	—	.332	IIa	S	S	.185P	.0556S	83	50.0	29.5	3000	65.9	Formerly 5B/U
213	6213	—	.405	IIa	—	C	.285P	7/.0296C	120	50.0	29.5	3000	65.9	Formerly 8A/U
214	6214	—	.425	IIa	S	S	.285P	7/.0296S	127	50.0	29.5	3000	65.9	Formerly 9B/U
215	6215	.475	.405	IIa	—	C	.285P	7/.0296C	149	50.0	29.5	3000	65.9	Formerly 10A/U
216	6216	—	.425	IIa	C	C	.285P	7/261C	130	75.0	20.5	5000	65.9	Formerly 13A/U
217	6217	—	.545	IIa	C	C	.370P	.106C	220	50.0	29.5	7000	65.9	Formerly 14A/U
218	6218	—	.870	IIa	—	C	.680P	.195C	467	50.0	29.5	11,000	65.9	Formerly 17A/U
219	6219	.945	.870	IIa	—	C	.680P	.195C	515	50.0	29.5	11,000	65.9	Formerly 18A/U
220	6220	—	1.120	IIa	—	C	.910P	.260C	740	50.0	29.5	14,000	65.9	Formerly 19A/U
221	6221	1.195	1.120	IIa	—	C	.910P	.260C	800	50.0	29.5	14,000	65.9	Formerly 20A/U
222	6222	—	.332	IIa	S	S	.185P	.0556N	84	50.0	29.0	2700	65.9	Formerly 21A/U
223	6223	—	.216	IIa	S	S	.116P	.035S	36	50.0	29.5	1900	65.9	Formerly 55A/U
224	6224	.615	.545	IIa	C	C	.370P	.106C	236	50.0	29.5	7000	65.9	Formerly 74A/U
225	6225	—	.430	V	S	S	.285T	7/.0312S	174	50.0	29.5	5000	69.5	Formerly 87A/U
226	6226	—	.500	V	C	C	.370TT	19/.0254S	247	50.0	29.5	7000	70.0	Formerly 94A/U
227	6227	.490	.430	V	S	S	.285T	7/.0312S	224	50.0	29.5	5000	69.5	Formerly 116/U
228	6228	.795	.730	V	—	C	.620T	.190C	625	50.0	29.5	7000	69.5	Formerly 118/U
228A	6228A	.784	.730	V	—	C	.620T	.190C	625	50.0	29.5	7000	69.5	Formerly 118A/U
235	6235	—	.470	VI	S	S	.255TT	7/.028S	180	50.0	29.5	5000	70.0	115A/U with Type VI jacket
264	6264	—	.750 .245	I	C	Over Ea. C	.176P	Four 19/27C	340	40.0	38.0	—	65.9	Four individual coaxials cabled together
264A	6264A	—	.750	IIa	C	Over Ea. C	.176P	Four 19/27C	340	40.0	38.0	—	65.9	Four individual coaxials cabled together
280	6280	—	.480	IIa	S	S	.327AST	.114C	179	50.0	27.5	4000	—	—
281	6281	—	.750	VI	S	S	.500AST	19/.0378S	400	50.0	29.0	4000	—	—
298	6298	—	.650	Poly Foamed	—	—	.115P	7/24CW	108	—	—	—	—	MIL-C-22667A
301	6301	—	.245	IX	—	K	.185T	7/.0203K	65	50.0	29.0	3000	—	Same as 126/U except for FEP jacket
302	6302	—	.206	IX	—	S	.146T	.025SCW	45	75.0	21.0	2300	69.5	Same as 140/U except for FEP jacket
303	6303	—	.170	IX	—	S	.116T	.039SCW	35	50.0	28.5	1900	69.5	Same as 141A/U except for FEP jacket
304	6304	—	.280	IX	S	S	.185T	.059SCW	102	50.0	28.5	3000	69.5	Same as 143A/U except for FEP jacket
307A	6307A	—	.270	Poly Foamed	S	S	—	19/.0058S	51	—	75.0	—	—	Special triaxial
316	6316	—	.102	IX	—	S	.060T	7/.0067SCW	11	50.0	29.0	1200	69.5	Same as 188/U except for FEP jacket
317	6317	—	.710	IV	—	TC	.446T	Two Cores 7/.0290	—	95.0	15.4	10,000	—	Water blocked
318	6318	—	1.125	IIIa	—	1.005 CT	.795SSP	OD .358 ID .287	53	50.0	22.0	44KW	—	—
319	6319	—	2.000	IIIa	—	1.83 CT	1.57SSP	OD .688 ID .588	104	50.0	22.0	145KW	—	—
321	6321	—	2.850	None	—	2.85 CT	SSP	OD 1.14	121	50.0	21.7	320KW	—	—
322	6322	—	3.040	PE	—	2.85 CT	SSP	OD 1.14	178	50.0	21.7	320KW	—	—
323	6323	—	1.060	PE	—	.980 CT	Foam	.312CT	42	50.0	25.6	1480	—	—
324	6324	—	.980	None	—	.980 CT	Foam	.312CT	32	50.0	25.6	1480	—	—
325	6325	—	.350	PUR	S	S	.26P	19/.0200SAL	10	50.0	26.3	750	—	Low loss
326	6326	—	.697	PUR	S	S	.55P	19/.040SAL	24	50.0	26.3	1700	—	Low loss
327	6327	—	1.010	PUR	S	S	.84	19/.064SAL	55	50.0	26.3	2500	—	Low loss
328	6328	—	1.460	IV	ITC IGS	ITC	1.065R	.485TCB	146	25.0	85.0	20,000	—	—
329	6329	—	.700	IV	ITC IGS	ITC	.380R	19/.0117	35.3	50.0	50.0	15,000	—	—

* Nominal Overall Diameter

DEARBORN**PHYSICAL PROPERTIES****ELECTRICAL PROPERTIES**

RG/U No.	Dearborn No.	Armor O.D.	Jkt. O.D.	Jkt. Type	Shields		Dielectric O.D. & Type	Center Cond.	Lbs. Per 1000 Ft.	Nom. Imped. Ohms	Nom. Cap. Mmfd./ft.	Max. Operating Volt.(Rms)	V.P. %	ENGINEERING DATA
					Outer	Inner								
330	6330	—	.242	—	—	IS	Foam	S	—	50.0	25.0	—	—	—
331	6331	—	.600	IIIa	—	.500 Al. Tube	.450Foam	.162C	18.7	50.0	25.0	2500	—	RG231 jacketed
332	6332	—	.875	None	—	.875 Al. Tube	.801F	.280C	46.6	50.0	25.0	4500	—	Per MIL-C-23806
333	6333	—	1.015	IIIa	—	.875 Al. Tube	.801F	.288C	54.8	50.0	25.0	4500	—	RG332 jacketed
334	6334	—	.500	None	—	.500 Al. Tube	.450F	.098C	10.9	75.0	17.0	2500	—	Per MIL-C-23806
335	6335	—	.625	IIIa	—	.500 Al. Tube	.450F	.098C	19.3	75.0	17.0	2500	—	RG334 jacketed
336	6336	—	.875	None	—	.875 Al. Tube	.801F	.173C	31.5	75.0	17.0	4000	—	Per MIL-C-23806
337														—
359														—
360	6360	—	.825	IIIa	—	.750 Al. Tube	.676F	.243C	39.7	50.0	25.0	4000	—	Per MIL-C-23806
366	6366	—	.620	IIIa	—	.540 CT	Foam	160C	—	50.0	26.6	4000	—	—
367	6367	—	5.200	IIIa	—	.500 Corr. CT	Corr. CT	—	459	50.0	21.7	830KW	—	—
369	6369	—	.470	IIIa	—	.390 Al. Tube	.318P	.117C	14.0	50.0	24.0	700	—	—
370	6370	—	.390	None	—	.390 Al. Tube	.318P	.117C	10	50.0	24.0	700	—	—
372														—
373														—
374	6374	—	.650	Foam	—	—	.160P	.0285C	9.7	—	—	—	—	Buoyant antenna
375										—	—	—	—	—
376	6376	—	1.060	IIIa	—	Corr. Al. Tube	Foam	.312CT	39	50.0	26.0	6000	—	—
377	6377	—	.530	None	—	.530 Al. Tube	T	.165S Tube	17	50.0	24.0	1000	—	—
378	6378	—	2.000	IIIa	—	1.830 Al. Tube	SSP	.713CT	62	50.0	22.1	145KW	—	—
379														—
381														—
382			1.625	—	—	Al. Tube	—	—	—	50.0	—	—	—	—
383	6383	—	.650	Foam	—	—	P	2 Cond. .0403	—	100.0	—	—	—	200016 tens. Twisted par.
384	6384	—	.650	Foam	—	Flat C Braid	P	.0508C	—	50.0	30.8	—	—	Buoyant antenna 600 psig
385	6385	—	.660	Option	—	.500 Corr. Al.	.425SS PTFE	.153SC	17.8	50.0	25.0	1500	—	Low loss
386	6386	—	.650	Foam	—	—	P	.0508CCS	—	—	—	—	—	400 lb. break
388	6388	—	.545	IIIa	—	.144 S	P	SC	—	50.0	30.8	—	—	Watertight see RG14A
389	6389	—	.875	IIIa	S	S	.635PE	.250C AL	36.6	50.0	22.8	2000	—	Replace RG189
391	6391	—	.405	IIa	—	TC	.285PE	7/.0159TC	9.2	72.0	—	5000	—	Low noise
392	6392	.475	.405	IIa	—	TC	.285PE	7/.0159TC	11.4	72.0	—	5000	—	RG391 Armored
393	6393	—	.390	IX	S	S	.285T	7/.0312	16.5	50.0	29.4	5000	—	Moisture proof RG225
397	6397	—	.360	IX	S	S	.270AST	7/.032S	12.5	50.0	28.0	2000	—	Low loss RG393
400	6400	—	.195	IX	S	S	.116T	19/.007SPC	5	50.0	29.3	1900	—	—
401	6401	—	.250	None	—	.250 CT	.215T	.0645SPC	8.1	50.0	29.3	3000	—	Semiflex RG304
402	6402	—	.141	None	—	.141 Tube	.119T	.036SCCS	3.2	50.0	29.3	2500	—	Semiflex RG142B
403	6403	—	.116	IX	S	S	.034T	7/.004S	.7	50.0	29.3	2500	—	Triaxial RG178B
404	6404	—	.075	IX	—	S	.034T	7/.004SCCS	.55	50.0	31.5	2000	—	Low noise RG178B

KEY TO ABBREVIATIONS:

C—Bare Copper P—Polyethylene N—Nichrome ASP—Air Spaced Polyethylene
 S—Silvered CW—Copperweld TC—Tinned SSP—Semi-Solid Polyethylene
 Copper CT—Bare Copper tube Copper CCP—Conductive Coated Polyethylene
 SAL—Silvered Aluminum PE—Polyethylene

T—Teflon
 TT—Teflon Tape
 AST—Air Spaced Tetrafluorethylene
 PUR—Polyurethane

*** Nominal Overall Diameter**

K—KARMA
 SCW—Silvered Copperweld
 SCB—Silver Plated Cadmium Bronze
 CORR—Corrugated



DEARBORN

TRIAxIAL CABLE DOUBLE SHIELD, DOUBLE JACKET

RG/U TYPE	DEARBORN NO.	JACKET O.D.	JACKET TYPE	OUTER SHIELDS	INNER SHIELDS	DIELECTRIC O.D. & TYPE	CENTER CONDUCTOR	LBS. PER 1000 FT.	NOM. IMPED. OHMS	NOM. CAP. MMFD/FT.	MAX. OPERATING VOLT. (RMS)	V.P. %
58A	6058AT	.285	1	TC	TC	.116P	19/0071TC	62	52	28.5	1900	65.9
59	6059T	.305	1	C	C	.146P	22CW	88	73	21.0	2300	65.9
11	6011T	.460	1	C	C	.285P	7/26TC	178	75	20.5	5000	65.9
8	6008T	.490	1	C	C	.285P	7/21TC	188	52	29.5	5000	65.9

LOW LOSS COAXIAL CABLE WITH (FOAM) CELLULAR POLYETHYLENE DIELECTRIC

Compared to ordinary RG/U cable of similar size, the attenuation of cellular polyethylene (Foam Core) dielectric cable is reduced by as much as 35%. These cables are well suited for CATV, Closed Circuit or MATV; ideal for use in amateur, commercial or citizen band installations. All are made to adapt to unusual terrain problems and resist damage from weather extremes.

RG/U TYPE	DEARBORN NO.	JACKET O.D.	JACKET TYPE	SHIELD	DIELECTRIC O.D. & TYPE	CENTER CONDUCTOR	LBS. PER 1000 FT.	NOM. IMPED. OHMS	NOM. CAP. MMFD/FT.	MAX. OPERATING VOLT. (RMS)	V.P. %
8	6008F	.405	I	C	.285 FC	7/19C	93	50	24.5	1500	80
11	6011F	.405	I	C	.285 FC	7/26C	88	75	16.5	1300	80
58	6058F	.195	I	C	.116 FC	20C	21.5	50	17.0	1000	80
59	6059F	.242	I	C	.146 FC	20C	32	75	17.3	1000	80

FOAM POLYETHYLENE TRIAXIAL CABLE DOUBLE SHIELD, DOUBLE JACKET

11	6011FT	.475	1	C	.285 FC	14C	178	75	16.5	1300	80
59	6059FT	.315	1	C	.146 FC	22CW	88	75	17.3	1000	80

AUTOMOTIVE WIRE

TYPE G.P.T. — SAE, TYPE I, PRIMARY WIRE

Single conductor, stranded bare copper. Color coded polyvinylchloride insulation. Resistant to grease, oil, gasoline, acid and ageing.

G.P.T. SAE TYPE 1 AUTOMOTIVE WIRE

DEARBORN NO.	AWG SIZE	STRAND-ING	NOM. WALL THICK-NESS	NOM. O.D.	STOCK COLORS	STOCK PUT UP (FT.)	DEARBORN NO.	AWG SIZE	STRAND-ING	NOM. WALL THICK-NESS	NOM. O.D.	STOCK COLORS	STOCK PUT UP (FT.)
992007	20	7/28	.023	.084	2, 0	100 & 1000	991219	12	19/25	.026	.142	0, 1, 2, 4, 5, 6, 9	100 & 1000
991816	18	16/30	.023	.093	2, 0	100 & 1000	991019	10	19/23	.031	.175	2, 9, 0	100 & 500
991619	16	19/29	.023	.102	0, 1, 2, 4, 5, 6, 9	100 & 1000	990865	8	65/26	.040	.230	2, 0	100 & 500
991419	14	19/27	.023	.117	0, 1, 2, 4, 5, 6, 9	100 & 1000	990649	6	49/23	.049	.282	2, 0	100 & 500

WELDING CABLE



INDUSTRO-FLEX NEOPRENE WELDING CABLE

The Industro-Flex Neoprene series is a new development which utilizes No. 30 stranding. It has a smaller O.D. and still retains flexibility at lower prices than the standard Neoprene welding cable.

NEOPRENE AND RUBBER WELDING CABLES

These cables are constructed of stranded bare copper conductors, with a tape wrap and either a neoprene or rubber jacket overall as specified in tables below. All have extra fine stranding, are extremely flexible and have high resistance to abrasion, impact, flexing and twisting.

INDUSTRO-FLEX NEOPRENE WELDING CABLE						NEOPRENE WELDING CABLE						RUBBER WELDING CABLE					
DEARBORN NO.	AWG SIZE	STRAND-ING	NOM. O.D.	CURRENT CARRYING CAP. (AMPS)	PUT UP SOLD PER FT.	DEARBORN NO.	AWG SIZE	STRAND-ING	NOM. O.D.	CURRENT CARRYING CAP. (AMPS)	PUT UP SOLD PER FT.	DEARBORN NO.	AWG SIZE	STRAND-ING	NOM. O.D.	CURRENT CARRYING CAP. (AMPS)	PUT UP SOLD PER FT.
820600	6	259/30	.376	75	25' Min.	500600	6	1050/36	.400	75	25' Min.	510600	6	1050/36	.400	75	25' Min.
820400	4	413/30	.420	100	25' Min.	500400	4	1057/34	.450	100	25' Min.	510400	4	1057/34	.450	100	25' Min.
820300	3	532/30	.455	150	25' Min.	500300	3	1344/34	.490	150	25' Min.	510300	3	1344/34	.490	150	25' Min.
820200	2	665/30	.495	200	25' Min.	500200	2	1680/34	.560	200	25' Min.	510200	2	1680/34	.560	200	25' Min.
820100	1	840/30	.550	250	25' Min.	500100	1	2142/34	.610	250	25' Min.	510100	1	2142/34	.610	250	25' Min.
820001	1/0	1050/30	.615	300	25' Min.	500001	1/0	2667/34	.680	300	25' Min.	510001	1/0	2667/34	.680	300	25' Min.
820002	2/0	1323/30	.690	375	25' Min.	500002	2/0	3360/34	.730	375	25' Min.	510002	2/0	3360/34	.730	375	25' Min.
820003	3/0	1680/30	.740	450	25' Min.	500003	3/0	4270/34	.810	450	25' Min.	510003	3/0	4270/34	.810	450	25' Min.
820004	4/0	2121/30	.835	500	25' Min.	500004	4/0	5355/34	.900	500	25' Min.	510004	4/0	5355/34	.900	550	25' Min.

COLOR CODE: 0—Black • 1—Brown • 2—Red • 3—Orange • 4—Yellow • 5—Green • 6—Blue • 7—Violet • 8—Gray • 9—White.

DEARBORN

**GENERAL CHARACTERISTICS**

Temperature rating: -20°C to +60°C.

Voltage rating: Types SV, SVT, SJ, SJT, and SJO are 300 V rated; Type S and SO are 600 V rated. On SJO two types are listed: Stationary and Constant Service. Constant Service has more flexible stranding.

TYPES SV, SJ AND S/RUBBER CORD CONSTRUCTION

Conductors are stranded bare copper. Separator, color coded rubber insulation, cabled with fillers. Separator and tough rubber jacket overall.

TYPES SVT AND SJT PLASTIC CORDS

Types SVT and SJT are plastic insulated and plastic jacketed. Construction is same as SV and SJ. Jacket is black.

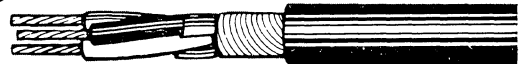
TYPES SJO AND SO/NEOPRENE CORD CONSTRUCTION

Conductors are stranded bare copper. Separator, color coded rubber insulation cabled with fillers. Separator and black neoprene jacket overall. Resistant to oil, grease, ozone, acid and moisture.



SERVICE AND POWER CORDS-RUBBER NEOPRENE AND PLASTIC

U.L. LISTED & C.S.A. APPROVED



600 VOLT RUBBER & NEOPRENE HEAVY DUTY CORDS

DEARBORN NO.	U.L. TYPE	SIZE & NO. OF COND.	NOM. INSUL. THICK.	NOM. JKT. THICK.	NOM. O.D.	STOCK PUT UP (FT.)
TYPE S, RUBBER						
2182	S	18/2	.030	.060	.390	50, 100, 250 & 1000
2183	S	18/3	.030	.060	.405	50, 100, 250 & 1000
2184	S	18/4	.030	.060	.435	50, 100, 250 & 1000
2162	S	16/2	.030	.060	.405	50, 100, 250 & 1000
2163	S	16/3	.030	.060	.430	50, 100, 250 & 1000
2164	S	16/4	.030	.060	.485	50, 100, 250 & 1000
2142	S	14/2	.045	.075	.530	50, 100, 250 & 1000
2143	S	14/3	.045	.075	.560	50, 100, 250 & 1000
2144	S	14/4	.045	.075	.605	50, 100, 250 & 1000
2122	S	12/2	.045	.090	.600	50, 100 & 250
2123	S	12/3	.045	.090	.635	50, 100 & 250
2124	S	12/4	.045	.090	.665	50, 100 & 250
2102	S	10/2	.045	.090	.640	50, 100 & 250
2103	S	10/3	.045	.090	.690	50, 100 & 250
2104	S	10/4	.045	.090	.745	50, 100 & 250
2082	S*	8/2	.050	.090	.700	50 & 100
2083	S*	8/3	.050	.090	.750	50 & 100
2084	S*	8/4	.050	.090	.820	50 & 100
2062	S*	6/2	.050	.100	.820	50 & 100
2063	S*	6/3	.050	.100	.885	50 & 100
2064	S*	6/4	.050	.100	.975	50 & 100

DEARBORN NO.	U.L. TYPE	SIZE & NO. OF COND.	NOM. INSUL. THICK.	NOM. JKT. THICK.	NOM. O.D.	STOCK PUT UP (FT.)
TYPE SO, NEOPRENE						
4182	SO	18/2	.030	.060	.390	50, 100, 250 & 1000
4183	SO	18/3	.030	.060	.405	50, 100, 250 & 1000
4184	SO	18/4	.030	.060	.435	50, 100, 250 & 1000
4162	SO	16/2	.030	.060	.405	50, 100, 250 & 1000
4163	SO	16/3	.030	.060	.430	50, 100, 250 & 1000
4164	SO	16/4	.030	.060	.485	50, 100, 250 & 1000
4142	SO	14/2	.045	.075	.530	50, 100, 250 & 1000
4143	SO	14/3	.045	.075	.560	50, 100, 250 & 1000
4144	SO	14/4	.045	.075	.605	50, 100, 250 & 1000
4122	SO	12/2	.045	.090	.600	50, 100 & 250
4123	SO	12/3	.045	.090	.635	50, 100 & 250
4124	SO	12/4	.045	.090	.665	50, 100 & 250
4102	SO	10/2	.045	.090	.640	50, 100 & 250
4103	SO	10/3	.045	.090	.690	50, 100 & 250
4104	SO	10/4	.045	.090	.745	50, 100 & 250
4082	SO	8/2	.050	.090	.700	50 & 100
4083	SO	8/3	.050	.090	.750	50 & 100
4084	SO	8/4	.050	.090	.820	50 & 100
4062	SO	6/2	.050	.090	.820	50 & 100
4063	SO	6/3	.050	.090	.885	50 & 100
4064	SO	6/4	.050	.090	.975	50 & 100

300 VOLT, RUBBER & NEOPRENE CORDS

DEARBORN NO.	U.L. TYPE	SIZE & NO. OF COND.	NOM. INSUL. THICK.	NOM. JKT. THICK.	NOM. O.D.	STOCK PUT UP (FT.)
SV & SJ RUBBER (STATIONARY SERVICE)						
1182V	SV	18/2	.016	.032	.245	50, 100, 250 & 1000
1183V	SV	18/3	.016	.032	.255	50, 100, 250 & 1000
1182	SJ	18/2	.032	.032	.305	50, 100, 250 & 1000
1183	SJ	18/3	.032	.032	.330	50, 100, 250 & 1000
1184	SJ	18/4	.032	.032	.370	50, 100, 250 & 1000
1162	SJ	16/2	.032	.032	.330	50, 100, 250 & 1000
1163	SJ	16/3	.032	.032	.360	50, 100, 250 & 1000
1164	SJ	16/4	.032	.032	.400	50, 100, 250 & 1000
1142	SJ	14/2	.032	.032	.370	50, 100, 250 & 1000
1143	SJ	14/3	.032	.032	.390	50, 100, 250 & 1000
1144	SJ	14/4	.032	.032	.420	50, 100, 250 & 1000

SVT & SJT PLASTIC CORDS

DEARBORN NO.	U.L. TYPE	SIZE & NO. OF COND.	NOM. INSUL. THICK.	NOM. JKT. THICK.	NOM. O.D.	STOCK PUT UP (FT.)
8182	SVT	18/2	.016	.032	.245	50, 100, 250 & 1000
8183	SVT	18/3	.016	.032	.255	50, 100, 250 & 1000
*8184	SVT	18/4	.016	.032	.265	50, 100, 250 & 1000
7183	SJT	18/3	.032	.032	.330	50, 100, 250 & 1000
7163	SJT	16/3	.032	.032	.360	500 & 1000

SJO, SVO NEOPRENE (STATIONARY SERVICE)

DEARBORN NO.	U.L. TYPE	SIZE & NO. OF COND.	NOM. INSUL. THICK.	NOM. JKT. THICK.	NOM. O.D.	STOCK PUT UP (FT.)
3182	SJO	18/2	.032	.032	.305	50, 100, 250 & 1000
3182V	SVO	18/2	.032	.032	.305	50, 100, 250 & 1000
3183	SJO	18/3	.032	.032	.330	50, 100, 250 & 1000
3184	SJO	18/4	.032	.032	.370	50, 100, 250 & 1000
3162	SJO	16/2	.032	.032	.330	50, 100, 250 & 1000
3163	SJO	16/3	.032	.032	.360	50, 100, 250 & 1000
3164	SJO	16/4	.032	.032	.400	50, 100, 250 & 1000
3142	SJO	14/2	.032	.032	.370	50, 100, 250 & 1000
3143	SJO	14/3	.032	.032	.390	50, 100, 250 & 1000
3144	SJO	14/4	.032	.032	.420	50, 100, 250 & 1000

SJO NEOPRENE (CONSTANT SERVICE)

DEARBORN NO.	U.L. TYPE	SIZE & NO. OF COND.	NOM. INSUL. THICK.	NOM. JKT. THICK.	NOM. O.D.	STOCK PUT UP (FT.)
3182C	SJO	18/2	.032	.032	.305	50, 100, 250 & 1000
3183C	SJO	18/3	.032	.032	.330	50, 100, 250 & 1000
3184C	SJO	18/4	.032	.032	.370	50, 100, 250 & 1000
3162C	SJO	16/2	.032	.032	.330	50, 100, 250 & 1000
3163C	SJO	16/3	.032	.032	.360	50, 100, 250 & 1000
3164C	SJO	16/4	.032	.032	.400	50, 100, 250 & 1000

*NOT UL LISTED.


DEARBORN

APPLIANCE AND FIXTURE WIRE


U.L. LISTED

SILICONE RUBBER TYPES

HIGH TEMPERATURE BRAIDLESS SILICONE RUBBER WIRE

Braidless silicone is easy stripping, and has excellent physical strength and mechanical properties. Recommended for stoves, dryers, motors and electronic devices where high temperatures are incurred. All conductors are of stranded tinned copper. U.L. Style 3212—Sizes 10 thru 22; U.L. Style 3213—Sizes 2 thru 8; U.L. Style 3214—Sizes 00 thru 1.

HIGH TEMPERATURE SILICONE RUBBER WIRE WITH GLASS BRAID

High temperature silicone rubber insulation for easy stripping. Lacquered glass braid overall gives additional abrasion resistance. Lacquer prevents fraying of braid. Used for appliance and hookup wire. U.L. Style 3071 on AWG Sizes: Nos. 18, 16, 14, and 12. U.L. Style 3075 on AWG Size No. 10.

150°C, BRAIDLESS SILICONE, 600 VOLT

DEARBORN NO.	AWG SIZE	STRAND-ING	WALL THICKNESS	NOM. O.D.	STOCK COLORS	STOCK PUT UP (FT.)
392207	22	7/30	3/64	.129	9	500
392010	20	10/30	3/64	.135	0, 9	500
391816	18	16/30	3/64	.143	0, 2, 9	500
391626	16	26/30	3/64	.156	0, 2, 9	500
391441	14	41/30	3/64	.173	0, 2, 9	100 & 500
391265	12	65/30	3/64	.194	0, 2, 9	100 & 500
391065	10	65/28	3/64	.228	0, 9	100 & 500
390854	8	54/25	4/64	.295	0, 9	100 & 500
390684	6	84/25	4/64	.338	0, 9	100 & 500
394133	4	133/25	4/64	.397	0, 9	100 & 250
392259	2	259/26	4/64	.467	0, 9	100 & 250
391259	1	259/25	5/64	.542	0, 9	100 & 250
390001	0	259/24	5/64	.594	0, 9	100 & 250
390002	00	259/23	5/64	.674	0, 9	100 & 250

200°C, SILICONE, GLASS BRAID, 600 VOLT

DEARBORN NO.	AWG SIZE	STRAND-ING	WALL THICKNESS	NOM. O.D.	STOCK COLORS	STOCK PUT UP (FT.)
431816	18	16 x 30	1/32	.131	0, 9	500
431626	16	26 x 30	1/32	.144	0, 9	500
431441	14	41 x 30	1/32	.159	0, 9	500
431241	12	41 x 28	1/32	.180	0, 9	500
431065	10	65 x 28	3/64	.236	0, 9	500

ASBESTOS INSULATED TYPES

TYPE AA. U.L. Style C-2130, 150°C; 300 Volts. Designed for wiring of electric ranges, grills, space heaters and other types of electrical heating devices where heat but not moisture is present. Maximum copper temperature is 200°C (392°F).

TYPE AF. U.L. Style AF 3200, 150°C; 300 Volts. Stranded copper conductor; tape, felted asbestos insulation—flame, heat and moisture resistant. Approved for all types of interior illumination, particularly fluorescent devices, and all high wattage units, especially where socket temperatures exceed 90°C (194°F).

150°C TYPE AA, ASBESTOS, 300 VOLT

DEARBORN NO.	AWG SIZE	STRAND-ING	WALL THICKNESS	NOM. O.D.	STOCK COLORS	STOCK PUT UP (FT.)
451665	16	65/34	.075	.210	White	250
451400	14	104/34	.075	.230	White	250
451200	12	168/34	.075	.250	White	250
451000	10	261/34	.085	.285	White	250
450800	8	471/34	.085	.335	White	250
450600	6	665/34	.090	.390	White	250
450400	4	1057/34	.090	.425	White	250
450200	2	1680/34	.090	.500	White	250

150°C TYPE AF, 300 VOLT

DEARBORN NO.	AWG SIZE	STRAND-ING	WALL THICKNESS	NOM. O.D.	STOCK COLORS	STOCK PUT UP (FT.)
481816	18	16/30	1/32	.111	0, 2, 9	500
481626	16	26/30	1/32	.123	0, 2, 9	500
481441	14	41/30	1/32	.141	0, 2, 9	500
481265	12	65/30	3/64	.191	0, 2, 9	500
481000	10	105/30	3/64	.217	0, 2, 9	250

VINYL INSULATED WIRE

VINYL, COTTON BRAID, LACQUERED INSULATED WIRE

U.L. Styles 1009, 1014, 1025, 1265. Stranded tinned copper conductor, PVC insulation color coded; lacquered cotton braid overall. Excellent resistance to abrasion. Wide usage in electronic and transformer industries.

VINYL, LACQ'D COTTON BRAID

DEARBORN NO.	SIZE AWG	STRAND-ING	PVC INSUL. THK.	NOM. O.D.	UL STYLE	STOCK COLOR	STOCK PUT UP (FT.)
90°C — 300 VOLT							
472207F	22	7/30	1/64	.091	1009	0-6, 9	250 & 1000
472207	22	7/30*	1/64	.091	1009	0-6, 9	250 & 1000
472010F	20	10/30	1/64	.098	1009	0-6, 9	250 & 1000
472010	20	10/30*	1/64	.098	1009	0-6, 9	250 & 1000
471816	18	16/30	1/64	.113	1009	0-6, 9	250 & 1000
471626	16	26/30	1/64	.126	1009	0-6, 9	250 & 1000
90°C — 600 VOLT							
471441	14	41/30	1/32	.177	1014	0,2,4,5,9	250 & 1000
471265	12	65/30	1/32	.199	1014	0, 2	250
471065	10	65/28	1/32	.222	1014	0 Only	250
470884	8	84/27	3/64	.293	1025	0 Only	250
470684	6	84/25	4/64	.369	1265	0 Only	250

* Bonded

COLOR CODE: 0—Black • 1—Brown • 2—Red • 3—Orange • 4—Yellow • 5—Green • 6—Blue • 7—Violet • 8—Gray • 9—White.
OTHER COLORS AVAILABLE ON SPECIAL ORDER

DEARBORN WIRE AND CABLE CO. 9299 Evenhouse Avenue, Rosemount, Illinois 60018 • Phone (312) 696-1000

STYLE 1007, U.L. HOOK-UP WIRE

Voltage rating: 300 Volts. Temperature rating: -10°C to +80°C. 1/64" Polyvinylchloride insulation over stranded tinned copper.

STYLE 1061, U.L. SEMI-RIGID BUSINESS MACHINE WIRE

Voltage rating: 300 Volts. Temperature rating: -10°C to +80°C. .009" Polyvinylchloride insulation over solid or stranded tinned copper.

**"TEW" FLAME RETARDANT, FR-1 STYLES
1015, 1028, 1283, 1284 600 VOLT, 105°C
AND FR-1 STYLE 1007, 300 VOLT, 80°C**

The polyvinylchloride insulation used on this series has the necessary additives that enable the wire to pass the Vertical Flame Test as prescribed by the Underwriter Laboratories for this UL style. All this wire is imprinted with the symbol FR-1 indicating it is covered by the above specifications. See page 22 for high voltage Flame Resistant wire.

DEARBORN



THERMOPLASTIC INSULATED HOOKUP WIRE



U.L. AND C.S.A.
APPROVED



**X-L POLYETHYLENE, U.L. STYLES 3173, 3199,
125°C — 600 VOLT, 105°C — 300 VOLT**

The Polyethylene insulation used on this series of lead wire is chemically cross-linked, which increases the moisture resistance, solvent resistance and aging characteristics. When momentary high temperatures caused by overloads or shorts occur, the insulation does not deform as quickly as if not cross-linked. Typical applications include small motors, control panels, dry transformers, etc. Recommended maximum baking cycles: 300°F for 24 hrs. — 325°F for 12 hrs. — 350°F for 8 hours.

300 VOLT, 80°C, U.L. STYLE 1007

DEARBORN PART NO.	AWG SIZE	STRAND- ING	NOM. O.D.	NOM. WALL THICK.	DEARBORN PART NO.	AWG SIZE	STRAND- ING	NOM. O.D.	NOM. WALL THICK.	DEARBORN PART NO.	AWG SIZE	STRAND- ING	NOM. O.D.	NOM. WALL THICK.
402801	28	1/28	.047	1/64	402407F	24	7/32	.058	1/64	401801	18	1/18	.074	1/64
402807	28	7/36	.049	1/64	402201	22	1/22	.059	1/64	401816	18	16/30	.080	1/64
402601	26	1/26	.050	1/64	402207	22	7/30	.065	1/64	401816F	18	16/30	.080	1/64
402607	26	7/34	.052	1/64	402207F	22	7/30	.065	1/64	401601	16	1/16	.085	1/64
402607F	26	7/34	.052	1/64	402001	20	1/20	.066	1/64	401626	16	26/30	.094	1/64
402401	24	1/24	.055	1/64	402010	20	10/30	.070	1/64	PUT UP: 500 FT., 1000 FT., AND BULK STOCK COLORS: 0-9				
402407	24	7/32	.058	1/64	402010F	20	10/30	.070	1/64					

U.L. SEMIRIGID STYLE 1061

DEARBORN NO.	AWG SIZE	STRAND- ING	NOM. WALL	NOM. O.D.	STANDARD PUT UP (FT.)	STOCK COLORS
422601	26	1/26	.009	.036	500, 1000 & 5000	0-9
422607	26	7/34	.009	.037	500, 1000 & 5000	0-9
422401	24	1/24	.009	.041	500, 1000 & 5000	0-9
422407	24	7/32	.009	.042	500, 1000 & 5000	0-9
422201	22	1/22	.009	.046	500, 1000 & 5000	0-9
422207	22	7/30	.009	.049	500, 1000 & 5000	0-9
422001	20	1/20	.009	.052	500, 1000 & 5000	0-9
422007	20	7/28	.009	.057	500, 1000 & 5000	0-9
422010	20	10/30	.009	.057	500, 1000 & 5000	0-9
421801	18	1/18	.009	.060	500, 1000 & 5000	0-9
421807	18	7/26	.009	.067	500, 1000 & 5000	0-9
421816	18	16/30	.009	.067	500, 1000 & 5000	0-9
421626	16	26/30	.009	.076	500, 1000 & 5000	0-9

XL - 125°C - 600 VOLT U.L. STYLE 3173

DEARBORN NO.	AWG SIZE	STRAND- ING	NOM. WALL	NOM. O.D.	STANDARD PUT UP (FT.)	STOCK COLORS
752207	22	7/30	1/32	.094	1000 & 5000	0 only
752010	20	10/30	1/32	.102	1000 & 5000	0 only
751816	18	16/30	1/32	.112	1000 & 5000	0 only
751626	16	26/30	1/32	.125	1000 & 5000	0 only
751441	14	41/30	1/32	.143	1000 & 5000	0 only
751265	12	65/30	1/32	.164	1000 & 3000	0 only
751065	10	65/28	1/32	.187	1000 & 2000	0 only

XL - 105°C - 300 VOLTS U.L. STYLE 3199

DEARBORN NO.	AWG SIZE	STRAND- ING	NOM. WALL	NOM. O.D.	STANDARD PUT UP (FT.)	STOCK COLORS
762207	22	7/30	1/64	.066	1000 & 5000	0, 2, 4, 5, 9
762010	20	10/30	1/64	.072	1000 & 5000	0, 2, 4, 5, 9
761816	18	16/30	1/64	.082	1000 & 5000	0, 2, 4, 5, 9
761626	16	26/30	1/64	.109	1000 & 5000	0, 2, 4, 5, 9

FR-1 105°C — 600 VOLT, U.L. STYLES 1015, 1028, 1283, 1284

DEARBORN NO.	AWG SIZE	STRAND- ING	NOM. O.D.	NOM. WALL THICK.	UL TYPE	DEARBORN NO.	AWG SIZE	STRAND- ING	NOM. O.D.	NOM. WALL THICK.	UL TYPE	DEARBORN NO.	AWG SIZE	STRAND- ING	NOM. O.D.	NOM. WALL THICK.	UL TYPE
782601	26	1/26	.080	1/32	1015	781816F	18	16/30	.110	1/32	1015	781259	1	259/25	.525	5/64	1284
782607	26	7/34	.083	1/32	1015	781601	16	1/16	.115	1/32	1015	781836	1	836/30	.535	5/64	1284
782607F	26	7/34	.083	1/32	1015	781626	16	26/30	.124	1/32	1015	780001	1/0	1045/30	.580	5/64	1284
782401	24	1/24	.085	1/32	1015	781401	14	1/14	.130	1/32	1015	780002	2/0	1330/30	.640	5/64	1284
782407	24	7/32	.088	1/32	1015	781441	14	41/30	.141	1/32	1015	780003	3/0	1661/30	.680	5/64	1284
782407F	24	7/32	.088	1/32	1015	781201	12	1/12	.145	1/32	1015	780004	4/0	2107/30	.785	5/64	1284
782201	22	1/22	.093	1/32	1015	781265	12	65/30	.160	1/32	1015	FR-1 80°C — 300 VOLT, STYLE 1007					
782207	22	7/30	.095	1/32	1015	781001	10	1/10	.166	1/32	1015						
782207F	22	7/30	.095	1/32	1015	781000	10	105/30	.194	1/32	1015	792407	24	7/32	.057	1/64	1007
782001	20	1/20	.098	1/32	1015	788133	8	133/29	.255	3/64	1028	792207	22	7/30	.065	1/64	1007
782010	20	10/30	.100	1/32	1015	786133	6	133/27	.335	4/64	1283	792010	20	10/30	.071	1/64	1007
782010F	20	10/30	.100	1/32	1015	784133	4	133/25	.390	4/64	1283	791816	18	16/30	.080	1/64	1007
781801	18	1/18	.104	1/32	1015	782133	2	133/23	.460	4/64	1283	791626	16	26/30	.095	1/64	1007
781816	18	16/30	.110	1/32	1015	782665	2	665/30	.470	4/64	1283						

(F) After number indicates fused or prebonded.

PUT UP: STYLES 1015 AND 1028: 500 FT., 1000 FT., AND BULK; STYLES 1283 AND 1284: 100 FT. AND 1000 FT.; STYLE 1007: 1000 FT. AND 5000 FT.

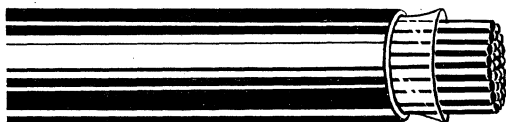
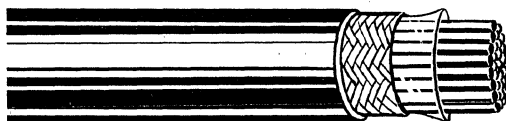
STOCK COLORS: STYLES 1015 AND 1028: 0-9; STYLES 1283 AND 1284: 0, 2, 9; STYLE 1007: 0-9.

COLOR CODE ON HOOKUP WIRE: 0—Black • 1—Brown • 2—Red • 3—Orange • 4—Yellow • 5—Green • 6—Blue • 7—Violet • 8—Grey • 9—White

Consult Factory for Further Details on Striped Colors

**DEARBORN**

COMPUTER TYPE MINIATURE CONTROL CABLES MULTI-CONDUCTOR STYLES 2343 AND 2344

**MULTI-CONDUCTOR, UNSHIELDED****MULTI-CONDUCTOR, SHIELDED**

The cables listed below, multiconductor, with or without shield are designed for computer use.

The individual conductors are stranded tinned copper. Numbers 22, 24 are 7 strand, No. 20 is 19 strand. Insulated with .010" wall of PVC to MIL-W-16878D Type B. On this usage, conductors are rated 105°C and 600 V. working voltage. The conductors also meet UL Style 1061, rated 80°C, 300 V. working voltage.

Conductors are cabled by the planetary method and laid contrahelically for best flexibility, with a Mylar tape barrier placed under shields. All shielded cables are of tinned copper braid overall of 85% - 90% coverage per MIL-C-7078.

The jacket over the shield is black 105°C Vinyl per MIL-I-631 Type F. All materials are fungus resistant and self extinguishing.

All items approved under UL STYLE 2343 or 2344* for computer usage: +80°C, 300 Volts. On non-UL service can be used at 40°C to +105°C, 600 Volts.

MULTI-CONDUCTOR UNSHIELDED CABLES

DEARBORN NO.	NO. OF COND.	COND. SIZE	COND. O.D.	JACKET WALL	NOM. O.D.	WEIGHT LBS./M
562405	5	24	.044	.062	.220	32
562407	7	24	.044	.062	.250	40
562412	12	24	.044	.062	.300	53
562415	15	24	.044	.062	.330	65
562419	19	24	.044	.062	.340	73
562427	27	24	.044	.062	.390	85
562437	37	24	.044	.062	.420	120
562448	48	24	.044	.062	.470	142
562460	60	24	.044	.062	.510	170
562205	5	22	.050	.062	.260	40
562207	7	22	.050	.062	.275	48
562212	12	22	.050	.062	.330	72
562215	15	22	.050	.062	.350	85
562219	19	22	.050	.062	.370	96
562227	27	22	.050	.062	.430	130
562237	37	22	.050	.062	.480	163
562248	48	22	.050	.062	.530	210
562260	60	22	.050	.062	.570	255
562005	5	20	.058	.062	.275	49
562007	7	20	.058	.062	.290	59
562012	12	20	.058	.062	.360	90
562015	15	20	.058	.062	.390	110
562019	19	20	.058	.062	.410	128
562027	27	20	.058	.062	.490	166
562037	37	20	.058	.062	.520	220
562048	48	20	.058	.062	.580	275
562060	60	20	.058	.062	.640	335

MULTI-CONDUCTOR, OVERALL SHIELD CABLES

DEARBORN NO.	NO. OF COND.	COND. SIZE	COND. O.D.	JACKET WALL	NOM. O.D.	WEIGHT LBS./M
572405	5	24	.044	.062	.245	44
572407	7	24	.044	.062	.275	55
572412	12	24	.044	.062	.325	68
572415	15	24	.044	.062	.350	80
572419	19	24	.044	.062	.365	88
572427	27	24	.044	.062	.415	102
572437	37	24	.044	.062	.445	140
572448	48	24	.044	.062	.495	172
572460	60	24	.044	.062	.535	205
572205	5	22	.050	.062	.285	50
572207	7	22	.050	.062	.295	58
572212	12	22	.050	.062	.355	87
572215	15	22	.050	.062	.380	101
572219	19	22	.050	.062	.395	111
572227	27	22	.050	.062	.455	150
572237	37	22	.050	.062	.510	193
572248	48	22	.050	.062	.560	245
572260	60	22	.050	.062	.600	295
572005	5	20	.058	.062	.300	59
572007	7	20	.058	.062	.315	69
572012	12	20	.058	.062	.385	105
572015	15	20	.058	.062	.415	137
572019	19	20	.058	.062	.435	158
572027	27	20	.058	.062	.515	196
572037	37	20	.058	.062	.550	255
572048	48	20	.058	.062	.610	320
572060	60	20	.058	.062	.670	385

COLOR CODE — MULTI-CONDUCTOR

0—Black	11—White/Brown	21—White/Black/Orange	31—White/Brown/Blue	41—White/Orange/Green	52—White/Blue/Violet
1—Brown	12—White/Red	22—White/Black/Yellow	32—White/Brown/Violet	42—White/Orange/Blue	53—White/Blue/Grey
2—Red	13—White/Orange	23—White/Black/Green	33—White/Brown/Grey	43—White/Orange/Violet	54—White/Violet/Grey
3—Orange	14—White/Yellow	24—White/Black/Blue	34—White/Red/Orange	44—White/Orange/Grey	55—White/Black/Brown/Red
4—Yellow	15—White/Green	25—White/Black/Violet	35—White/Red/Yellow	45—White/Yellow/Green	56—White/Black/Brown/Orange
5—Green	16—White/Blue	26—White/Black/Grey	36—White/Red/Green	46—White/Yellow/Blue	57—White/Black/Brown/Yellow
6—Blue	17—White/Violet	27—White/Brown/Red	37—White/Red/Blue	47—White/Yellow/Violet	58—White/Black/Brown/Green
7—Violet	18—White/Grey	28—White/Brown/Orange	38—White/Red/Violet	48—White/Yellow/Grey	59—White/Black/Brown/Blue
8—Grey	19—White/Black/Brown	29—White/Brown/Yellow	39—White/Red/Grey	49—White/Green/Blue	60—White/Black/Brown/Violet
9—White	20—White/Black/Red	30—White/Brown/Green	40—White/Orange/Yellow	51—White/Green/Grey	

PUT UP: 500 FT. AND 1000 FT. NO DEPOSIT REELS

DEARBORN WIRE AND CABLE CO. 9299 Evenhouse Avenue, Rosemount, Illinois 60018 • Phone (312) 696-1000

DEARBORN

COMPUTER TYPE MINIATURE CONTROL CABLES STYLES 2343 AND 2344, PAIRED CABLES



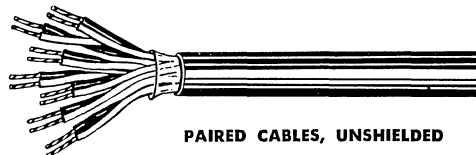
The paired cables listed below, with or without shield are designed for computer use.

The individual conductors are stranded tinned copper. Numbers 22, 24 are 7 strand, No. 20 is 19 strand. Insulated with .010" wall of PVC to MIL-W-16878D Type B. On this usage, conductors are rated 105°C and 600 V. working voltage. The conductors also meet UL Style 1061, rated 80°C, 300 V. working voltage.

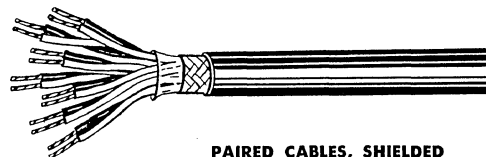
Pairs are cabled by the planetary method and laid contra-helically for best flexibility, with a Mylar tape barrier placed under shields. All shielded cables are of tinned copper braid overall of 85%-90% coverage per MIL-I-7078.

The jacket over the shield is black 105°C Vinyl per MIL-I-631 Type F. All materials are fungus resistant and self extinguishing.

All items approved under UL STYLE 2343 or 2344* for computer usage: +80°C, 300 Volts. On non-UL service can be used at 40°C to +105°C, 600 Volts.



PAIRED CABLES, UNSHIELDED



PAIRED CABLES, SHIELDED

PAIRED CABLES, UNSHIELDED

DEARBORN NO.	NO. OF PAIRS	COND. SIZE	COND. O.D.	JACKET WALL	NOM. O.D.	WEIGHT LBS./M
582405	5	24	.044	.062	.330	52
582407	7	24	.044	.062	.350	60
582412	12	24	.044	.062	.435	90
582415	15	24	.044	.062	.485	110
582419	19	24	.044	.062	.505	126
582427	27	24	.044	.062	.590	167
582437	37	24	.044	.062	.660	216
582448	48	24	.044	.062	.745	270
582460	60	24	.044	.062	.815	325
582205	5	22	.050	.062	.365	56
582207	7	22	.050	.062	.390	82
582212	12	22	.050	.062	.470	120
582215	15	22	.050	.062	.545	145
582219	19	22	.050	.062	.560	170
582227	27	22	.050	.062	.600	230
582237	37	22	.050	.062	.750	300
*582248	48	22	.050	.062	.850	375
*582260	60	22	.050	.062	.980	460
582005	5	20	.058	.062	.395	82
582007	7	20	.058	.062	.440	108
582012	12	20	.058	.062	.540	163
582015	15	20	.058	.062	.600	196
582019	19	20	.058	.062	.630	235
582027	27	20	.058	.062	.745	320
582037	37	20	.058	.062	.820	420
*582048	48	20	.058	.080	.950	530
*582060	60	20	.058	.080	1.040	650

PAIRED CABLES WITH OVERALL SHIELD

DEARBORN NO.	NO. OF PAIRS	COND. SIZE	COND. O.D.	JACKET WALL	NOM. O.D.	WEIGHT LBS./M
592405	5	24	.044	.062	.355	67
592407	7	24	.044	.062	.375	75
592412	12	24	.044	.062	.460	115
592415	15	24	.044	.062	.510	140
592419	19	24	.044	.062	.530	161
592427	27	24	.044	.062	.620	211
592437	37	24	.044	.062	.690	266
592448	48	24	.044	.062	.775	330
*592460	60	24	.044	.062	.845	390
592205	5	22	.050	.062	.390	77
592207	7	22	.050	.062	.415	100
592212	12	22	.050	.062	.495	150
592215	15	22	.050	.062	.575	185
592219	19	22	.050	.062	.580	210
592227	27	22	.050	.062	.670	280
592237	37	22	.050	.062	.780	357
*592248	48	22	.050	.062	.880	445
*592260	60	22	.050	.062	.960	535
592005	5	20	.058	.062	.420	102
592007	7	20	.058	.062	.465	123
592012	12	20	.058	.062	.570	203
592015	15	20	.058	.062	.630	241
592019	19	20	.058	.062	.660	280
592027	27	20	.058	.062	.775	380
*592037	37	20	.058	.080	.850	490
*592048	48	20	.058	.080	.980	605
*592060	60	20	.058	.080	1.070	735

COLOR CODING ON TWISTED PAIRS

- | | | | | | |
|----------------------|-----------------------|-----------------------|------------------------|-----------------------------|-----------------------------|
| 1. White with Black | 11. Black with Red | 21. Brown with Green | 31. Orange with Yellow | 41. Green with Violet | 51. White/Black with Green |
| 2. White with Brown | 12. Black with Orange | 22. Brown with Blue | 32. Orange with Green | 42. Green with Grey | 52. White/Black with Blue |
| 3. White with Red | 13. Black with Yellow | 23. Brown with Violet | 33. Orange with Blue | 43. Blue with Violet | 53. White/Black with Violet |
| 4. White with Orange | 14. Black with Green | 24. Brown with Grey | 34. Orange with Violet | 44. Blue with Grey | 54. White/Black with Grey |
| 5. White with Yellow | 15. Black with Blue | 25. Red with Orange | 35. Orange with Grey | 45. Violet with Grey | 55. White/Brown with Black |
| 6. White with Green | 16. Black with Violet | 26. Red with Yellow | 36. Yellow with Green | 46. White/Black with Black | 56. White/Brown with Brown |
| 7. White with Blue | 17. Black with Grey | 27. Red with Green | 37. Yellow with Blue | 47. White/Black with Brown | 57. White/Brown with Red |
| 8. White with Violet | 18. Brown with Red | 28. Red with Blue | 38. Yellow with Violet | 48. White/Black with Red | 58. White/Brown with Orange |
| 9. White with Grey | 19. Brown with Orange | 29. Red with Violet | 39. Yellow with Grey | 49. White/Black with Orange | 59. White/Brown with Yellow |
| 10. Black with Brown | 20. Brown with Yellow | 30. Red with Grey | 40. Green with Blue | 50. White/Black with Yellow | 60. White/Brown with Green |

PUT UP: 500 FT. AND 1000 FT. NO DEPOSIT REELS

**DEARBORN**U.L.
LISTED**U.L. LISTED HIGH TEMPERATURE TEFLON* WIRE**

Dearborn supplies a variety of high temperature insulated wires that are listed by the Underwriters Laboratories. The types shown here fall into the category of appliance wiring material (AWM) and are covered by the Flexible Cord and Fixture Wire Standard and UL Standard 758.1 for insulated single conductor appliance wiring material. Among a variety of requirements, the latter document assigns ratings regarding the duty group, flame retardance, temperature

rating, voltage rating, service flexibility, resistance to abnormal temperature, oil resistance, water resistance and gasoline resistance where applicable. All of the following Underwriters styles are flame retardant and will satisfy the FR-1 designation of UL.

This section lists only the most commonly used conductors. In many instances, the Underwriter's Laboratories allow the use of other materials. Consult factory for further details.

* DuPont TM

U.L. STYLES 1164 & 1180

DEARBORN NO.	AWG SIZE	STRAND-ING	NOM. O.D. OVER INSULATION INCH (MM)
22801UL3	28	Solid	.042(1.07)
22807UL3	28	7/36	.045(1.14)
22819UL3	28	19/40	.045(1.14)
22601UL3	26	Solid	.045(1.14)
22607UL3	26	7/34	.048(1.22)
22619UL3	26	19/38	.048(1.22)
22401UL3	24	Solid	.049(1.24)
22407UL3	24	7/32	.053(1.35)
22419UL3	24	19/36	.053(1.35)
22201UL3	22	Solid	.054(1.37)
22207UL3	22	7/30	.060(1.52)
22219UL3	22	19/34	.060(1.52)
22001UL3	20	Solid	.061(1.55)
22007UL3	20	7/28	.068(1.73)
22019UL3	20	19/32	.068(1.73)
21807UL3	18	7/26	.079(2.00)
21819UL3	18	19/30	.079(2.00)
21619UL3	16	19/29	.086(2.18)
21419UL3	14	19/27	.102(2.59)
21219UL3	12	19/25	.120(3.05)

STOCK COLORS: 0-9

U.L. STYLES 1226 & 1227

DEARBORN NO.	AWG SIZE	STRAND-ING	NOM. O.D. OVER INSULATION INCH (MM)
13201AUL	32	Solid	.027(.686)
13207AUL	32	7/40	.029(.734)
13001AUL	30	Solid	.029(.734)
13007AUL	30	7/38	.032(.813)
12801AUL	28	Solid	.032(.813)
12807AUL	28	7/36	.035(.889)
12601AUL	26	Solid	.035(.889)
12607AUL	26	7/34	.038(.965)
12619AUL	26	19/38	.038(.965)
12401AUL	24	Solid	.040(1.02)
12407AUL	24	7/32	.043(1.09)
12419AUL	24	19/36	.043(1.09)
12201AUL	22	Solid	.046(1.17)
12207AUL	22	7/30	.050(1.27)
12219AUL	22	19/34	.050(1.27)
12001AUL	20	Solid	.054(1.37)
12007AUL	20	7/28	.058(1.47)
12019AUL	20	19/32	.058(1.47)

STOCK COLORS: 0-9

U.L. STYLES 1198 & 1199

DEARBORN NO.	AWG SIZE	STRAND-ING	NOM. O.D. OVER INSULATION INCH (MM)
22601UL6	26	Solid	.060(1.52)
22607UL6	26	7/34	.063(1.60)
22619UL6	26	19/38	.063(1.60)
22401UL6	24	Solid	.064(1.63)
22407UL6	24	7/32	.068(1.73)
22419UL6	24	19/36	.068(1.73)
22201UL6	22	Solid	.069(1.75)
22207UL6	22	7/30	.077(1.96)
22219UL6	22	19/34	.077(1.96)
22001UL6	20	Solid	.079(2.00)
22007UL6	20	7/28	.083(2.11)
22019UL6	20	19/32	.083(2.11)
21807UL6	18	7/26	.093(2.36)
21819UL6	18	19/30	.093(2.36)
21619UL6	16	19/29	.101(2.57)
21419UL6	14	19/27	.116(2.95)
21219UL6	12	19/25	.136(3.45)
21037UL6	10	37/26	.157(3.99)
28133UL6	8	133/29	.237(5.94)
26133UL6	6	133/27	.268(6.81)
24133UL6	4	133/25	.321(8.15)
22665UL6	2	665/30	.401(10.2)
21836UL6	1	836/30	.474(12.1)

STOCK COLORS: 0-2-9

U.L. STYLES 1330 & 1331

DEARBORN NO.	AWG SIZE	STRAND-ING	NOM. O.D. OVER INSULATION INCH (MM)
22601AUL6	26	Solid	.060(1.52)
22607AUL6	26	7/34	.063(1.60)
22619AUL6	26	19/38	.063(1.60)
22401AUL6	24	Solid	.064(1.63)
22407AUL6	24	7/32	.068(1.73)
22419AUL6	24	19/36	.068(1.73)
22201AUL6	22	Solid	.069(1.75)
22207AUL6	22	7/30	.077(1.96)
22219AUL6	22	19/34	.077(1.96)
22001AUL6	20	Solid	.079(2.00)
22007AUL6	20	7/28	.083(2.11)
22019AUL6	20	19/32	.083(2.11)
21807AUL6	18	7/26	.093(2.36)
21819AUL6	18	19/30	.093(2.36)
21619AUL6	16	19/29	.101(2.57)
21419AUL6	14	19/27	.116(2.95)
21219AUL6	12	19/25	.136(3.45)
21037AUL6	10	37/26	.157(3.99)
28133AUL6	8	133/29	.237(5.94)
26133AUL6	6	133/27	.268(6.81)
24133AUL6	4	133/25	.321(8.15)
22665AUL6	2	665/30	.401(10.2)
21836AUL6	1	836/30	.474(12.1)

STOCK COLORS: 0-9

U.L. STYLES 1212 & 1213

DEARBORN NO.	AWG SIZE	STRAND-ING	NOM. O.D. OVER INSULATION INCH (MM)
13201UL	32	Solid	.027(.686)
13207UL	32	7/40	.029(.734)
13219UL	32	19/44	.029(.734)
13001UL	30	Solid	.029(.734)
13007UL	30	7/38	.032(.813)
13019UL	30	19/42	.032(.813)
12801UL	28	Solid	.032(.813)
12807UL	28	7/36	.035(.889)
12819UL	28	19/40	.035(.889)
12601UL	26	Solid	.035(.889)
12607UL	26	7/34	.038(.965)
12619UL	26	19/38	.038(.965)
12401UL	24	Solid	.040(1.02)
12407UL	24	7/32	.043(1.09)
12419UL	24	19/36	.043(1.09)
12201UL	22	Solid	.046(1.17)
12207UL	22	7/30	.050(1.27)
12219UL	22	19/34	.050(1.27)
12001UL	20	Solid	.054(1.37)
12007UL	20	7/28	.058(1.47)
12019UL	20	19/32	.058(1.47)

STOCK COLORS: 0-9

**OTHER U.L. STYLES
AVAILABLE
UPON REQUEST**

UL STYLE	VOLTAGE	TEMP. (C)	INSULATION
1332	300	200°	FEP
1333	300	150°	FEP
1335		200°	FEP-H
1371		105°	TFE
1394		200°	TFE-H
1508	30	105°	Tetzel
1512		105°	TFE
1513		105°	Tetzel
1516		105°	Tetzel
1517		105°	Tetzel
1523		105°	Tetzel
1538	90	105°	FEP
1558		125°	Tetzel
1570	600	250°	TFE
1586		105°	Tetzel
1609	125	105°	Tetzel

UL STYLES 1164 AND 1180

CONDUCTOR: Silver plated copper. On special order nickel plated copper conductors are available. **INSULATION:** Extruded "Teflon" TFE, .013" min. (average) wall. **TEMPERATURE RATING:** UL 1180-200°C. **VOLTAGE RATING:** 300 volts rms. **USE:** For internal wiring of appliances, also suitable for immersion in gasoline, gasoline vapor and 80°C oil. **TEMPERATURE IDENTIFICATION MARKER:** UL 1164-Brown, UL 1180-Black. Dearborn standard temperature identification is a longitudinally applied stripe in size 18 AWG and larger. Sizes 20 AWG and smaller do not require temperature identification. Upon request and at an additional charge, surface printing can be provided.

UL STYLES 1198 AND 1199

CONDUCTOR: Silver plated copper. On special order nickel plated copper conductors are available under series 3XTN-UL. **INSULATION:** Extruded "Teflon" TFE, .020" min. (average) wall. **TEMPERATURE RATING:** UL 1198-150°C, UL 1199-200°C. **VOLTAGE RATING:** 600 volts rms, 2500 volts peak for electronic use. **USE:** Internal wiring of appliances, also suitable for immersion in gasoline, gasoline vapor and 80°C oil. **TEMPERATURE IDENTIFICATION MARKER:** UL 1198-Brown, UL 1199-Black. Dearborn standard temperature identification is a longitudinally applied stripe in size 18 AWG and larger. Sizes 20 AWG and smaller do not require temperature identification. Upon request and at an additional charge, surface printing can be provided. Consult factory for availability of sizes 1/0 thru 4/0.

UL STYLES 1212 AND 1213

CONDUCTOR: Silver plated copper. On special order, nickel plated copper or silver plated high strength high conductivity copper alloy conductors are available. **INSULATION:** Extruded "Teflon" TFE, .008" min. (average) wall. **TEMPERATURE RATING:** UL 1212 and UL 1213-105°C. **VOLTAGE RATING:** Not specified. **USE:** In office appliances where exposed to temperatures not exceeding 80°C or 105°C or to oil at temperatures not exceeding 60°C, and where not subjected to undue mechanical abuse. Temperature identification on the wire is not required on these styles. Consult factory for tracer or stripe on special.

DEARBORN**UL STYLES 1226 AND 1227**

CONDUCTOR: Tin plated copper. Constructions with silver plated copper or silver plated high strength high conductivity copper alloy are available on request. **INSULATION:** Extruded "Teflon" FEP, .008" min. (average) wall. **TEMPERATURE RATING:** UL 1226-80°C, UL 1227-105°C. **VOLTAGE RATING:** Not specified. **USE:** In office appliances where exposed to temperatures not exceeding 80°C and 105°C or oil at temperatures not exceeding 60°C, and where not subjected to undue mechanical abuse. Temperature identification of the wire is not required for these styles.

UL STYLES 1330 AND 1331

CONDUCTOR: Tin plated copper. **INSULATION:** Extruded "Teflon" FEP, .020" min. (average) wall, sizes 26-10 AWG, .030" min. (average) wall, sizes 8-2 AWG. **TEMPERATURE RATING:** UL 1330-200°C, may be used with tin plated copper conductors only where the individual strand diameter is .015" (26 AWG) or larger. UL 1331-150°C. **VOLTAGE RATING:** 600 volts rms. **USE:** For general appliance wiring where not subjected to temperatures exceeding 200°C for style 1330 (see above limiting note), or 150°C for style 1331. Suitable for immersion in gasoline, gasoline vapor and 80°C oil. Constructions with silver plated copper are available on request; this version has an unrestricted 200°C temperature rating for style 1330. For sizes 18 AWG and larger, temperature identification is indicated by a black marker thread for style 1330 and a brown marker thread for style 1331, located under the insulation. Sizes 20 AWG and smaller do not require temperature identification.

CSA APPROVED HIGH TEMPERATURE TEFLON APPLIANCE WIRE



CSA INSULATION REQUIRED MIN. AVG. WALL	CSA VOLTAGE RATING	CSA TEMPERATURE RATING DEGREES (C)	WIRE SIZES
.010	150	150	32-16
.016(1/64")	300	200	28-12
.031(1/32")	600	200	28-12

**STANDARD WALL INSULATION
RATED AT 300 VOLTS AND 200°C**

CONDUCTOR: Silver plated copper; constructions with nickel plated copper or nickel conductors can be supplied. Consult factory for details. **INSULATION:** Extruded "Teflon" TFE, 1/4" (0.4mm) minimum wall thickness. Surface printed for product identification in sizes 24 AWG and larger. **USE:** For internal wiring of electronic, photographic, refrigeration and air conditioning equipment, ballast and incandescent lampholder leads, ovens, flood lights, business machines, clothes dryers and electric stoves.

STOCK COLORS: AWG SIZES 12 THROUGH 24 = 0-2-9.
AWG SIZES 26 THROUGH 28 = 0-9.

**THIN WALL INSULATION
RATED AT 150 VOLTS AND 150°C**

CONDUCTOR: Silver plated copper. Constructions with nickel plated copper or nickel conductors can be supplied. Consult factory for details. **INSULATION:** Extruded "Teflon" TFE, .010" (0.25mm) min. average wall thickness. Surface printed for product identification in sizes 24 AWG and larger. **USE:** For internal wiring of process control and computer equipment.

STOCK COLORS: AWG SIZES 16 THROUGH 24 = 0-2-9.
AWG SIZES 26 THROUGH 32 = 0-9.

* For availability of other color and stripe combinations, consult factory.

**HEAVY WALL INSULATION
RATED AT 600 VOLTS AND 200°C**

CONDUCTOR: Silver plated copper. Constructions with nickel plated copper or nickel conductors can be supplied. Consult factory for details. **INSULATION:** Extruded "Teflon" TFE, 1/2" (0.79mm) min. wall thickness. Surface printed for product identification in sizes 24 AWG and larger. **USE:** For internal wiring of electronic, photographic, refrigeration and air conditioning equipment, ballast and incandescent lampholder leads, infrared ovens, flood lights, business machines, clothes dryers and electric stoves.

STOCK COLORS: 0-2-9.

STANDARD WALL				
DEARBORN NO.	AWG SIZE	STRANDING	NOM. O.D. OVER INSULATION INCH (MM)	
22801CSA	28	Solid	.048(1.29)	
22807CSA	28	7/36	.050(1.34)	
22819CSA	28	19/40	.050(1.34)	
22601CSA	26	Solid	.051(1.37)	
22607CSA	26	7/34	.054(1.45)	
22619CSA	26	19/38	.054(1.45)	
22401CSA	24	Solid	.055(1.40)	
22407CSA	24	7/32	.059(1.59)	
22419CSA	24	19/36	.059(1.59)	
22201CSA	22	Solid	.060(1.52)	
22207CSA	22	7/30	.065(1.75)	
22219CSA	22	19/34	.065(1.75)	
22001CSA	20	Solid	.068(1.73)	
22007CSA	20	7/28	.073(1.96)	
22019CSA	20	19/32	.073(1.96)	
21819CSA	18	19/30	.082(2.21)	
21619CSA	16	19/0117	.089(2.26)	
21419CSA	14	19/0147	.103(2.62)	
21219CSA	12	19/0185	.122(3.10)	

THIN WALL				
DEARBORN NO.	AWG SIZE	STRANDING	NOM. O.D. OVER INSULATION INCH (MM)	
13201CSA	32	Solid	.031(.787)	
13207CSA	32	7/40	.032(.813)	
13219CSA	32	19/44	.033(.838)	
13001CSA	30	Solid	.033(.838)	
13007CSA	30	7/38	.035(.889)	
13019CSA	30	19/42	.035(.889)	
12801CSA	28	Solid	.036(.914)	
12807CSA	28	7/36	.038(.965)	
12819CSA	28	19/40	.038(.965)	
12601CSA	26	Solid	.039(.991)	
12607CSA	26	7/34	.042(1.06)	
12619CSA	26	19/38	.042(1.06)	
12407CSA	24	7/32	.047(1.19)	
12419CSA	24	19/36	.047(1.19)	
12207CSA	22	7/30	.053(1.34)	
12219CSA	22	19/34	.053(1.34)	
12007CSA	20	7/28	.061(1.54)	
12019CSA	20	19/32	.061(1.54)	
11819CSA	18	19/30	.070(1.77)	
11619CSA	16	19/0117	.079(2.01)	

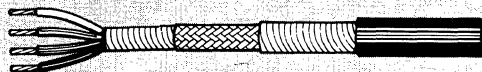
HEAVY WALL				
DEARBORN NO.	AWG SIZE	STRANDING	NOM. O.D. OVER INSULATION INCH (MM)	
22801CSA6	28	Solid	.078(2.10)	
22807CSA6	28	7/36	.080(2.15)	
22819CSA6	28	19/40	.080(2.15)	
22601CSA6	26	Solid	.081(2.18)	
22607CSA6	26	7/34	.084(2.26)	
22619CSA6	26	19/38	.084(2.26)	
22401CSA6	24	Solid	.085(2.16)	
22407CSA6	24	7/32	.089(2.39)	
22419CSA6	24	19/36	.089(2.39)	
22201CSA6	22	Solid	.090(2.28)	
22207CSA6	22	7/30	.095(2.55)	
22219CSA6	22	19/34	.095(2.55)	
22001CSA6	20	Solid	.097(2.46)	
22007CSA6	20	7/28	.103(2.77)	
22019CSA6	20	19/32	.103(2.77)	
21819CSA6	18	19/30	.112(3.01)	
21619CSA6	16	19/0117	.120(3.05)	
21419CSA6	14	19/0147	.134(3.40)	
21219CSA6	12	19/0185	.153(3.88)	

COLOR CODE: 0—Black • 1—Brown • 2—Red • 3—Orange • 4—Yellow • 5—Green • 6—Blue • 7—Violet • 8—Grey • 9—White

DEARBORN**RUBBER OR NEOPRENE SHIELDED**

RUBBER OR NEOPRENE JACKETED. Conductors of stranded tinned copper with color coded .020" rubber insulation*. Cables with fillers; cotton wrapped; braided tinned copper shield. Cotton wrap and tough black rubber or neoprene jacket overall. Neoprene and rubber jackets are impact and abrasion resistant. Neoprene is recommended for outdoor use because of its oil, ozone, moisture and sunlight resistance. Used for control circuits, studios, audio circuits, etc. Designed to eliminate cross-talk and hum pick-up. Temperature rating: -20°C to +60°C.

*.040 on single conductor

**SHIELDED CONTROL CABLES (NEOPRENE)**

DEARBORN NO.	NO. COND.	SIZE OF COND. AWG	STRAND-ING	NOM. JKT. THICK.	NOM. O.D.	STOCK PUT UP (FT.)
601801	1	18	41/34	.035	.240	100, 500 & 1000
601802	2	18	41/34	.035	.295	100, 500 & 1000
601803	3	18	41/34	.035	.305	100, 500 & 1000
601804	4	18	41/34	.035	.330	100, 500 & 1000
601806	6	18	41/34	.035	.370	100, 500 & 1000
601808	8	18	41/34	.035	.420	100, 500 & 1000
601810	10	18	41/34	.035	.480	100, 500 & 1000
601812	12	18	41/34	.065	.555	100, 500 & 1000
601815	15	18	41/34	.065	.640	100, 500 & 1000
601820	20	18	41/34	.065	.730	100, 500 & 1000
601602	2	16	65/34	.035	.335	100, 500 & 1000
601603	3	16	65/34	.035	.355	100, 500 & 1000
601604	4	16	65/34	.035	.385	100, 500 & 1000
601606	6	16	65/34	.040	.445	100, 500 & 1000
601608	8	16	65/34	.040	.510	100, 500 & 1000
601610	10	16	65/34	.040	.575	100, 500 & 1000
601402	2	14	41/30	.040	.395	100, 500 & 1000
601403	3	14	41/30	.040	.425	100, 500 & 1000
601404	4	14	41/30	.040	.455	100, 500 & 1000
601406	6	14	41/30	.040	.515	100, 500 & 1000
601202	2	12	65/30	.040	.440	100, 500 & 1000
601203	3	12	65/30	.040	.465	100, 500 & 1000
601204	4	12	65/30	.040	.505	100, 500 & 1000
601002	2	10	105/30	.040	.495	100, 500 & 1000
601003	3	10	105/30	.040	.520	100, 500 & 1000

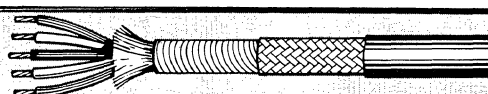
SHIELDED CONTROL CABLES (RUBBER)

DEARBORN NO.	NO. COND.	SIZE OF COND. AWG	STRAND-ING	NOM. JKT. THICK.	NOM. O.D.	STOCK PUT UP (FT.)
661801	1	18	41/34	.035	.240	100, 500 & 1000
661802	2	18	41/34	.035	.295	100, 500 & 1000
662001	1	20	36/34	.035	.230	100, 500 & 1000
662002	2	20	26/34	.035	.270	100, 500 & 1000
662003	3	20	26/34	.035	.285	100, 500 & 1000
662004	4	20	26/34	.035	.305	100, 500 & 1000
662005	5	20	26/34	.035	.330	100, 500 & 1000
662006	6	20	26/34	.035	.345	100, 500 & 1000
662007	7	20	26/34	.035	.355	100, 500 & 1000
662008	8	20	26/34	.035	.385	100, 500 & 1000
662010	10	20	26/34	.035	.440	100, 500 & 1000
662012	12	20	26/34	.065	.525	100, 500 & 1000
662015	15	20	26/34	.065	.595	100, 500 & 1000
662020	20	20	26/34	.065	.660	100, 500 & 1000

COLOR CODE: 1—Black • 2—White • 3—Red • 4—Green • 5—Yellow • 6—Blue • 7—Brown • 8—Orange • 9—Slate • 10—Purple • 11—White/Black
12—White/Red • 13—White/Green • 14—White/Yellow • 15—White/Blue • 16—White/Brown • 17—White/Purple • 18—White/Slate • 19—Black/Red • 20—Black/Yellow

MULTI-CONDUCTOR SHIELDED AND UNSHIELDED CONTROL CABLES**PLASTIC — SHIELDED**

PLASTIC JACKETED. Conductors of stranded tinned copper, with color coded .014" thick Polyethylene insulation. Cabled with fillers; wrapped with rayon; shielded with braided tinned copper shield. Covered with chrome grey Polyvinylchloride jacket overall. Temperature rating: -20°C to +60°C. Operating voltage: 600 V.

**SHIELDED CONTROL CABLES (PLASTIC)**

DEARBORN NO.	NO. COND.	SIZE OF COND. AWG	STRAND-ING	NOM. JKT. THICK.	NOM. O.D.	STOCK PUT UP (FT.)
682002	2	20	26/34	.030	.245	100, 500 & 1000
682003	3	20	26/34	.035	.250	100, 500 & 1000
682004	4	20	26/34	.035	.260	100, 500 & 1000
682005	5	20	26/34	.035	.275	100, 500 & 1000
682006	6	20	26/34	.035	.300	100, 500 & 1000
682008	8	20	26/34	.035	.330	100, 500 & 1000
682010	10	20	26/34	.035	.375	100, 500 & 1000
682012	12	20	26/34	.035	.380	100, 500 & 1000
682015	15	20	26/34	.035	.410	100, 500 & 1000
682020	20	20	26/34	.035	.455	100, 500 & 1000

RUBBER — UNSHIELDED

Stranded tinned copper conductors, color coded rubber insulation. Cabled with fillers; cotton wrapped; tough rubber jacket overall. These cables are extremely flexible and are suitable for heavy duty usage. Temperature rating: -20°C to +60°C. Insulation thickness on individual conductors is .020".

**UNSHIELDED CONTROL CABLES (RUBBER)**

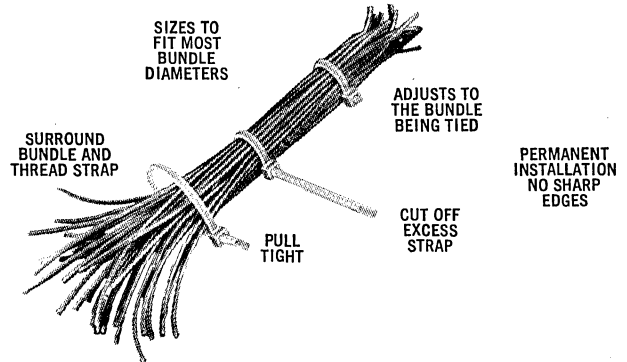
DEARBORN NO.	NO. COND.	SIZE OF COND. AWG	STRAND-ING	NOM. JKT. THICK.	NOM. O.D.	STOCK PUT UP (FT.)
652002	2	20	26/34	.035	.240	100, 500 & 1000
652003	3	20	26/34	.035	.255	100, 500 & 1000
652004	4	20	26/34	.035	.275	100, 500 & 1000
652005	5	20	26/34	.035	.300	100, 500 & 1000
652006	6	20	26/34	.035	.315	100, 500 & 1000
652008	8	20	26/34	.035	.360	100, 500 & 1000
652010	10	20	26/34	.035	.410	100, 500 & 1000
652012	12	20	26/34	.035	.435	100, 500 & 1000
652015	15	20	26/34	.035	.505	100, 500 & 1000
652020	20	20	26/34	.035	.570	100, 500 & 1000



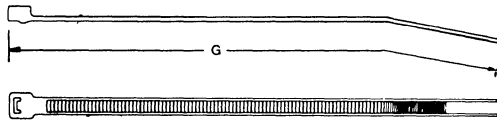
FASTRAPS™ CABLE TIES— SERIES 60

PERMANENT WIRE AND CABLE TIES THREE STYLES — EIGHT LENGTHS STANDARD AND HEAVY DUTY WEIGHTS

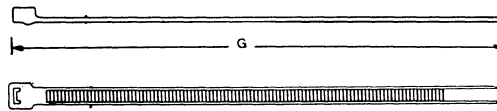
- HIGH DIELECTRIC STRENGTH, HIGH TENSILE STRENGTH AND OUTSTANDING RESILIENCE
- RESISTANCE TO ABSORPTION AND ABRASION, AND CHEMICAL DETERIORATION FROM SOLVENTS, OIL, GREASE
- MOLDED FROM NYLON — WHITE (NATURAL) IS STANDARD COLOR — OTHER COLORS AVAILABLE
- DESIGNED TO MEET MS-3367 AND MIL-S-23190



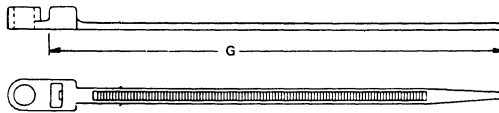
FASTRAPS Bent Tip Cable Tie Designed for Easy Threading Standard Duty (Model 6005)



FASTRAPS Straight Tip Cable Tie ... Provides Maximum Strength Heavy Duty (Model 6006)



FASTRAPS Cable Tie with Mounting Hole Heavy Duty, Straight Tip (Model 6007) .250" mounting hole Standard Duty, Bent Tip (Model 6008) .205" mounting hole



Order Part No.	Bundle Max. Dia.	Min. Tensile Stngth	Length G	Mtg. Hole Dia.
6005-0350 NAT	5/8"	18	3.750	—
6005-0400 NAT	3/4"	18	5.125	—
6005-0550 NAT	1 1/4"	30	6.125	—
6005-0675 NAT	1 3/4"	50	7.50	—
6005-1100 NAT	3"	50	11.0	—
6005-1400 NAT	4"	50	14.0	—
6006-1400 NAT	3 1/2"	120	14.0	—
6006-2100 NAT	6"	120	21.0	—
6006-2800 NAT	8"	120	28.0	—
6007-1400 NAT	3 1/2"	120	14.0	.250"
6007-2100 NAT	6"	120	21.0	.250"
6007-2800 NAT	8"	120	28.0	.250"
6008-0550 NAT	1 1/4"	30	6.625	.205"
6008-0675 NAT	1 3/4"	50	7.875	.205"

ORDERING INFORMATION:

Color: NAT = White (Natural) Nylon
Other colors available (50,000 pc. min. order)

Length: 0350 = 3 1/2", 0400 = 4", 0550 = 5 1/2", 0675 = 6 3/4", 1100 = 11", 1400 = 14", 2100 = 21", 2800 = 28"

Basic Stem Number for FASTRAPS Type

REUSABLE, ECONOMICAL WIRE AND CABLE TIES



Stem No.	Material	Available Length (Dimension A Above)	Color Availability
6002	Nylon	4", 5", 6", 8", 10"	Natural
6003	Polyethylene	4", 5", 6", 8", 10"	Natural, Red, Yellow, Blue, Green in 10" only

HOW TO ORDER

From chart, determines material and color.
Length (Dim. A), 0400 = 4", 0500 = 5", 0600 = 6", 0800 = 8", 1000 = 10".
Red = Red, Yel = Yellow, Blu = Blue, Nat = Natural.
Example: 6003-0500 Yel
Orders a Yellow Polyethylene beaded chain that is 5" long.

SCREW-DOWN CABLE CLAMPS

HOW TO ORDER



From chart, determines material, width, thick., hole size.
From nom. bundle dia. Dash No. chart. (Note Limitations by Stem No.)
(Note Limitations in Stem No. Chart.) Nat = Natural, Blk = Black, Amb = Amber.

Example: 6021-08-NAT orders a natural color nylon clamp, 3/8" wide, with a .203" hole size which will accommodate a bundle of wires 1/2" in diameter.

Dash No.	Bundle Dia.	Dash No.	Bundle Dia.	Dash No.	Bundle Dia.	Dash No.	Bundle Dia.
—02	1/8"	—07	3/4"	—12	3/4"	—19	1 3/4"
—03	3/8"	—08	1/2"	—13	1 1/8"	—20	1 1/4"
—04	1/4"	—09	3/8"	—14	7/8"	—22	1 3/8"
—05	3/4"	—10	5/8"	—16	1"	—24	1 1/2"
—06	3/8"	—11	1 1/8"	—18	1 1/8"		

Stem No.	Material	Width of Clamp	Nom. Thick.	Screw Hole Size	Nom. Bundle Dia. Availability (See Chart)	Color Availability
6021	NYLON	3/8"	.050"	.203"	—02 thru —08	Natural or Black
6022	NYLON	1/2"	.060"	.203"	—08 thru —24	Natural or Black
6023	POLYPROPYLENE	1/2"	.060"	.203"	—02 thru —24	Natural
6024	CELLULOSE	1/2"	.060"	.203"	—02 thru —24	Amber

FASTRAPS Convenience Clamps



Made of lightweight, durable, inert PVC. Adhesive backed for easy mount. Spring loaded — easy to use.

3/4" wide by .050" nominal thickness. Accepts up to 1/2" bundle diameter. Black only.

Part No. 6025-08-BLK

FASTRAPS Tie Mount



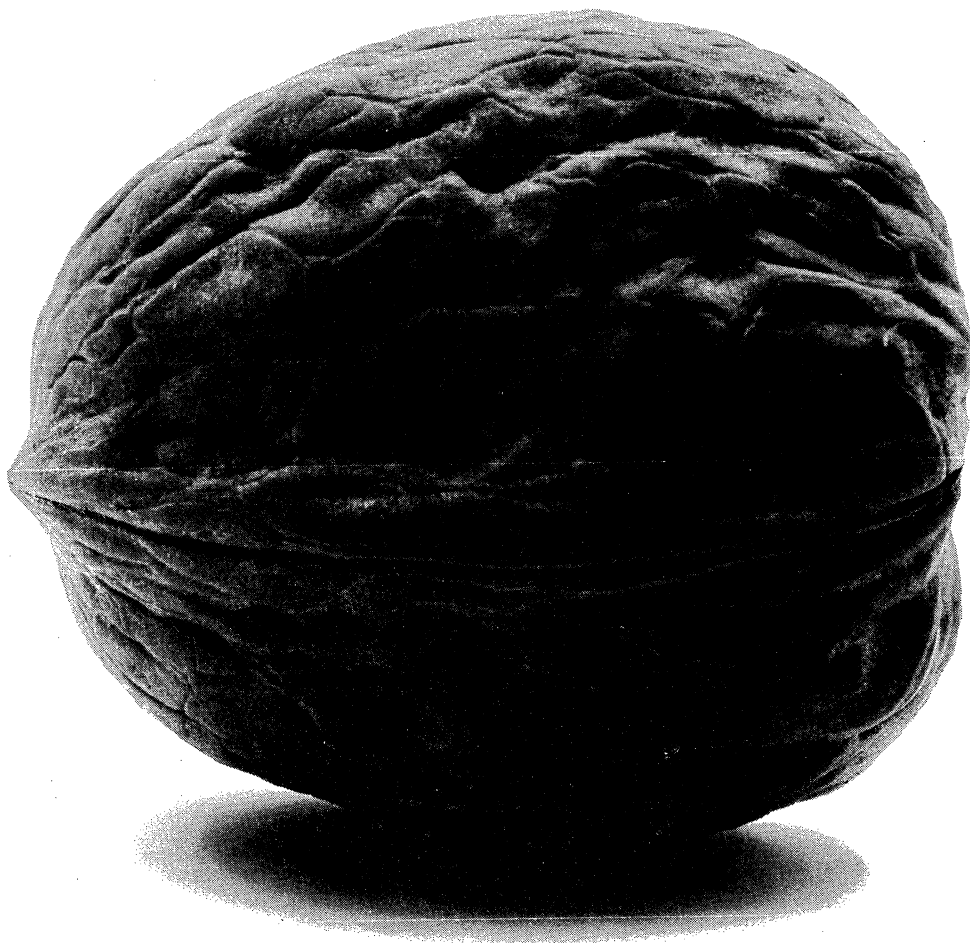
Molded nylon, mounting comes with adhesive back and screw hole.

Tie slips through slots and around bundle 1 1/4" square. Accepts #6 screw. Accommodates ties up to .055" x .190. Part No. 6030-A-1



Available locally through your Grayhill distributor

GRAYHILL, INC. • 569 Hillgrove Avenue • LaGrange, Illinois 60525 • (312) 354-1040 • TWX 910-683-1850



We specialize in flat cable and flexible circuit problems nobody else can crack.

A lot of people make flat cable. A lot of people make flexible circuits. We're one of the few who make both.

But the big difference isn't only what we can manufacture, it's what we can design.

Hughes CONTOURTM Cable solved problems for the Viking Mars probe. We worked out solutions for the Minuteman missiles. We cracked tough packaging problems for shipboard and airborne systems, radar, sonar, high-speed computers.

And we can crack your tough ones, too.

Not wild-eyed, super-expensive,

forever-and-a-day solutions. Practical solutions. Maybe even less-expensive-in-the-long-run solutions.

And once we design it, we'll make it. In one of the industry's newest, most complete facilities.

Think of it this way. If it's simple and easy, anybody can do it, including us. But the tough nut is our specialty.

A tour? Or a consultation to discuss your design requirements? Just call (714) 549-5701 and ask for Dave Cianciulli.

Or write: 17150

Von Karman
Avenue, Irvine,
California 92705.

HUGHES

HUGHES AIRCRAFT COMPANY
CONNECTING DEVICES DIV.



HUGHES MICROELECTRONICS LTD.: EUROPE — Res Hera Apartment 64, Passage International 28, Brussels 1000, Belgium. Telephone 17.91.72
UNITED KINGDOM — Clive House, 12-18 Queens Road, Weybridge, Surrey, England. Telephone Weybridge 47262

Cimco

TEFLON* INSULATED HIGH TEMPERATURE WIRE, CABLE AND TUBING

Cimco manufactures both standard and custom-made wire and cable for aircraft, missiles, computers, electronic assemblies, and many other applications using TEFLON* insulated cable, tubing and hook-up wire.



BONDING TREATMENT

Surface treatment to increase bondability for use with potting compounds.

*REGISTERED DUPONT TRADEMARK

WRITE FOR CATALOG ON COMPLETE SPECIFICATIONS



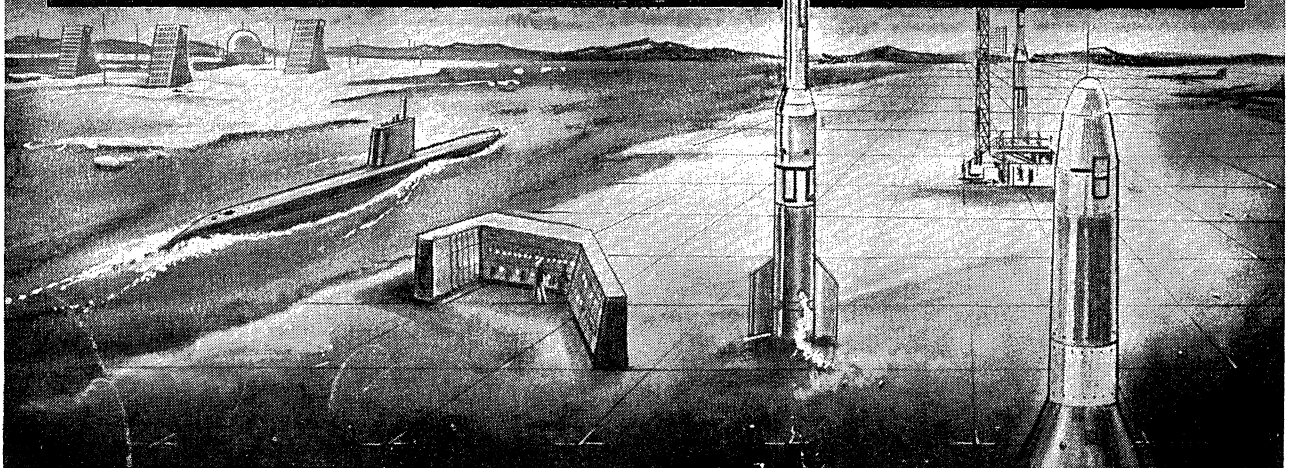
wire & cable co.

250 W. CRESCENT AVE..

ALLENDALE, N. J. 07401 PHONE 201-327-2522

S P E C I F I C A T I O N S

WIRE, CABLE OR TUBING	PRIMARY INSULATION	COLORS MIL-STD-104	OPERATING TEMPERATURE	JACKETS	SHIELDING	REMARKS
High Temperature Hook-up Wire	Teflon, Extruded	Solid & Striped	-90°C - +260°C	————	Silver Plated or Tinned Copper	Conforms to MIL-W-16878 Types E, EE & ET or other special specifications as required.
Cables A	Teflon, Extruded Teflon Tape Wrapped	Solid & Striped	-54°C - +105°C	PVC	Silver Plated or Tinned Copper	Any combinations of conductors and shielding required.
Cables B	Teflon, Extruded Teflon Tape Wrapped	Solid & Striped	-54°C - +120°C	Nylon Braid Nylon Extruded	Silver Plated or Tinned Copper	Any combinations of conductors and shielding required.
Cables H	Teflon, Extruded Teflon Tape Wrapped	Solid & Striped	-90°C - +260°C	Fiberglass-Teflon	Silver Plated Copper	Any combinations of conductors and shielding required.
Cables C	Teflon, Extruded Teflon Tape Wrapped	Solid & Striped	-90°C - +260°C	Teflon Tape	Silver Plated Copper	Any combinations of conductors and shielding required.
Airframe Wire	Teflon Tape Plus Impregnated Glass	Solid Only	-60°C - +260°C	————	————	MIL-W-7139B
Miniature Coaxial Cable	Teflon, Extruded	Jackets Only Solid & Striped	-90°C - +260°C	Teflon Tape, Fiberglass-Teflon Nylon & PVC	Silver Plated or Tinned Copper	Conforms to MIL-C-17B
Low Capacitance Cable	Teflon Air-weave	Natural	-90°C - +260°C -90°C - +260°C -54°C - +105°C -54°C - +120°C	Teflon Tape, Fiberglass-Teflon PVC Nylon	Silver Plated or Tinned Copper	Special constructions as low as 8.0 mmf/ft.
High Voltage Cable	Teflon Tape	Solid & Striped	-90°C - +260°C	Teflon Tape, Fiberglass-Teflon	Silver Plated Copper	High voltage lead wire or cable excellent corona resistance characteristics
Tubing—Thinwall, Standard wall, Lightweight	Teflon, Extruded	Solid	-90°C - +260°C	————	————	Conforms to MIL-I 22129 -AMS 3655, 3653, 3654



MARKEL
 SINCE 1922

Insulating Tubings and Sleeveings— High Temperature Wire and Cable

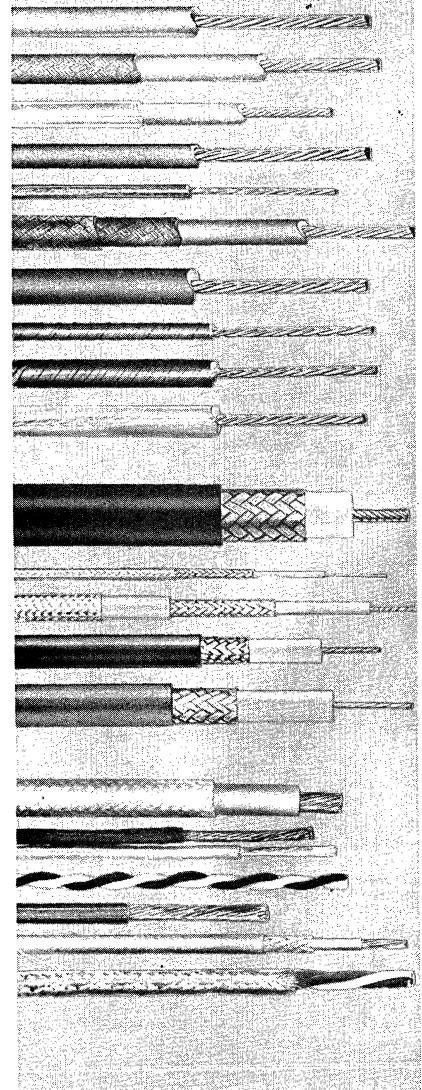
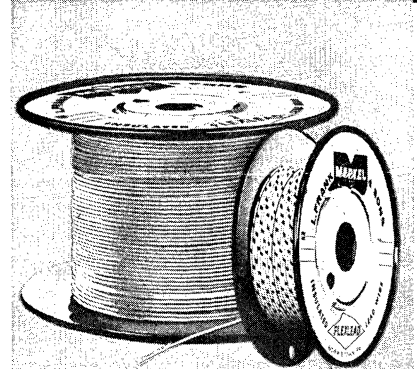
**TEFLON* TFE & FEP, PFA, SILICONE RUBBER,
OR TEFZEL* INSULATED LEADWIRE**



MIL-W-16878/D

*TM of DuPont

TYPE	VOLTS	COPPER CONDUCTOR	INSULATION MATERIAL
E	600	Stranded, Silver-Coated	Extruded TFE
E	600		Wrapped Sintered TFE Tape
EE	1000		Extruded TFE
EE	1000		Wrapped Sintered TFE Tape
ET	300		Extruded TFE
ET	300		Wrapped Sintered TFE Tape
K	600	Stranded, Silver-Coated or Tin-Coated	Extruded FEP
KK	1000		
KT	300		
F	600	Stranded, Tin-Coated	Extruded Silicone Rubber
F	600		Extr. S.R. with Silicone Resin-Impregnated Glass Braid Jacket
FF	1000		Extruded Silicone Rubber
FF	1000		Extr. S.R. with Silicone Resin-Impregnated Glass Braid Jacket



MIL-W-22759

TYPE	VOLTS	COPPER CONDUCTOR	INSULATION MATERIAL
/1	600	Stranded, Silver-Coated	TFE and TFE-Coated Fiberglass
/2	600	Stranded, Nickel-Coated	
/3	600	Stranded, Nickel-Coated	
/4	600	Stranded, Silver-Coated	TFE-glass-TFE medium weight
/5	600		TFE-glass-FEP medium weight
/6	600	Stranded, Nickel-Coated	Abrasion-resistant Extruded TFE
/7	600	Stranded, Silver-Coated	
/8	600	Stranded, Nickel-Coated	Abrasion-resistant Extruded TFE medium weight
/9	1000	Stranded, Silver-Coated	
/10	1000	Stranded, Nickel-Coated	Extruded TFE
/11	600	Stranded, Silver-Coated	
/12	600	Stranded, Nickel-Coated	
/16	600	Stranded, Tin-Coated	ETFE, medium weight
/17	600	Silver-Coated	
/18	600	Stranded, Tin-Coated	ETFE
/19	600	High-Strength	
/20	1000	Copper Nickel-Coated	Extruded TFE
/21	1000	Copper Alloy Silver-Coated	
/22	600	Alloy Silver-Coated	
/23	600	Nickel-Coated	

NOTE: While PFA is not specifically called out in MIL-W-16878/D or MIL-W-22759, it will meet all the requirements of the specification where TFE is indicated. In addition, PFA can be extruded in long, continuous fault-free lengths since it is melt-extrudable.

FLEXLEAD Wire for Wire-Wrap Applications. Markel stocks Tefzel-insulated, silver-coated, solid copper conductor wire in the following sizes:

#24 AWG 0.0305 ± .0015
 #26 AWG 0.027 ± .0015
 #30 AWG 0.0195 ± .001

FLEXLEAD Fused Twisted Pair. This unique Teflon-insulated twisted pair construction finds wide application in computers and similar circuitry. The fusing, which will withstand predetermined pulls to separate the individual wires, keeps the wires evenly twisted for easier assembly and uniform capacitance and inductance. Ask for a test sample and prices.

Insulating Tubings and Sleeveings— High Temperature Wire and Cable

MARKEL
SINCE 1922

UL STYLE NUMBERS AVAILABLE

REQ'D STYLE	TYPE INSULATION	SIZE RANGE	WALL THICKNESS	RATING	JACKET REQ'D
1164	TFE	#28-#10	.013"	150°C 300V	
1180	TFE	#28-#10	.013"	200°C 300V	
1198	TFE	#26-#6	.020" to .045"	150°C 600V	
1199	TFE	#26-#6	.020" to .045"	200°C 600V	
1212	TFE	#32-#20	.008"	80°C	
1213	TFE	#32-#20	.008"	105°C	
1226	FEP	#32-#20	.008"	80°C	
1227	FEP	#32-#20 #18-#14	.008" to .013"	105°C	
1292	FEP	#26-#20	.006"	105°C	Nylon
1330	FEP	#26-#6	.020" to .045"	200°C 600V	
1331	FEP	#26-#6	.020" to .045"	150°C 600V	
1332	FEP	#28-#10	.013"	200°C 300V	
1333	FEP	#28-#10	.013"	150°C 300V	
1371	TFE FEP	#32-#6	.0055" to .020"	105°C	
1508	TEFZEL	#32-#20	.0055"	105°C 30V	
1513	TEFZEL	#32-#20	.005"	105°C	
1516	TEFZEL	#32-#20	.004"	105°C	
1517	TEFZEL	#32-#20	.006"	105°C	
1523	TEFZEL	#32-#20	.005"	105°C	
1538	TFE FEP	#32-#6	.0055" to .020"	105°C 125V	
1577	TFE FEP	#32-#16	12 Mils	200°C	
1586	TEFZEL	#32-#6	.0055" to .020"	105°C	
1609	TEFZEL	#32-#6	.0055" to .020"	105°C 125V	
3066	Silicone Rubber	#28-#20	1/32"	200°C 600V	
3067	Silicone Rubber	#28-#20	1/32"	200°C 600V	Fiberglass
3068	Silicone Rubber	#28-#20	1/64"	150°C 300V	Fiberglass
3069	Silicone Rubber	#26-#20	1/32"	150°C 600V	Fiberglass
3070	Silicone Rubber	#18-#12	1/32"	150°C 600V	Fiberglass
3071	Silicone Rubber	#18-#14	1/32"	200°C 600V	Fiberglass

REQ'D STYLE	TYPE INSULATION	SIZE RANGE	WALL THICKNESS	RATING	JACKET REQ'D
3074	Silicone Rubber	#12	1/32"	200°C 600V	Fiberglass
3075	Silicone Rubber	#10	3/64"	200°C 600V	Fiberglass
3099	Silicone Rubber	#20-#16	1/32"	150°C 300V	
3100	Silicone Rubber	#12	1/32"	150°C 300V	Fiberglass
3101	Silicone Rubber	#10	3/64"	150°C 600V	Fiberglass
3113	Silicone Rubber	#18	1/16"	150°C 600V	
3122	Silicone Rubber	#26-#20	1/64"	200°C 300V	Fiberglass
3123	Silicone Rubber	#24-#16	1/32"	150°C 600V	
3125	Silicone Rubber	#8-#2	1/16"	200°C 600V	Fiberglass
3126	Silicone Rubber	#1-4/0	5/64"	200°C 600V	Fiberglass
3127	Silicone Rubber	#8-#2	1/16"	150°C 600V	Fiberglass
3128	Silicone Rubber	#1-4/0	5/64"	150°C 600V	Fiberglass
3132	Silicone Rubber	#30-#16	1/64"	150°C 300V	
3133	Silicone Rubber	#30-#16	1/32"	150°C 600V	
3134	Silicone Rubber	#18-#12	1/32"	150°C 600V	
3135	Silicone Rubber	#18-#14	1/32"	200°C 600V	
3136	Silicone Rubber	#26-#20	3/64"	150°C 300V	
3137	Silicone Rubber	#26-#20	3/64"	150°C 600V	
3138	Silicone Rubber	#18-#12	3/64"	150°C 600V	
3139	Silicone Rubber	#18-#12	3/64"	200°C 600V	
3140	Silicone Rubber	#26-#20	1/16"	150°C 300V	
3141	Silicone Rubber	#26-#20	1/16"	150°C 600V	
3142	Silicone Rubber	#18-#12	1/16"	150°C 600V	
3143	Silicone Rubber	#18-#12	1/16"	200°C 600V	
3144	Silicone Rubber	#12	3/64"	200°C 600V	Fiberglass
3145	Silicone Rubber	#12	1/16"	200°C 600V	Fiberglass
3180	Silicone Rubber	#32 Min.	.023"	150°C 300V	
3210	Silicone Rubber	#18-#12	1/16"	150°C 600V	Fiberglass
3211	Silicone Rubber	#26-#14	1/32"	150°C 300V	

REQ'D STYLE	TYPE INSULATION	SIZE RANGE	WALL THICKNESS	RATING	JACKET REQ'D
3212	Silicone Rubber	#26-#10	1/64"	150°C 600V	
3213	Silicone Rubber	#8-#2	1/16"	150°C 600V	
3214	Silicone Rubber	#1-4/0	5/64"	150°C 600V	
3215	Silicone Rubber	#18-#16	1/16"	150°C 600V	
3216	Silicone Rubber	#14-#10	5/64"	150°C 600V	
3239	Silicone Rubber	#24-#10	10KV-.040" 20KV-.050" 30KV-.075" 40KV-.097"	25KV-.062" —All 150°C	
5031	Silicone Asbestos	#26-#16	Special	150°C 300V	
5032	Silicone Asbestos	#26-#16	Special	200°C 600V	
SF-1	Silicone Rubber	#18	1/64"	200°C 300V	Fiberglass
SF-2	Silicone Rubber	#18-#14	1/32"	200°C 600V	Fiberglass
SFF-1	Silicone Rubber	#18	1/64"	150°C 300V	Fiberglass
SFF-2	Silicone Rubber	#18-#14	1/32"	150°C 600V	Fiberglass

CANADIAN STANDARDS ASSOCIATION

CSA	TFE	SIZE RANGE	WALL THICKNESS	RATING
CSA	TFE	#32-#16	.011"	150°C 150V
CSA	TFE	#28-#10	.016"	200°C 300V
CSA	TFE	#28-#8	.031"	200°C 600V
CSA	TFE	#28-#8	.047"	200°C 600V
CSA	TFE	#28-#8	.047"	200°C 1000V

NOTE: Sizes #18 and larger must be temperature and/or manufacture marked. Some UL styles and all CSA types require marking of all sizes

CSA SR-INSULATED EQUIPMENT WIRE TYPES

CSA	TYPE	SIZE RANGE	WALL THICKNESS	RATING	JACKET REQ'D
CSA SEW-1	Silicone Rubber	Solid #22-#16 Stranded #18-#16	16 Mils	200°C 300V	Fiberglass
CSA SEWF-1	Silicone Rubber	Stranded #22-#16	16 Mils	150°C 300V Copper 200°C Nickel	Fiberglass
CSA SEW-2	Silicone Rubber	Solid #10-#22-#12 Str. #10-#18-#12	47 Mils 31 Mils 47 Mils 31 Mils	200°C 600V	Fiberglass
CSA SEWF-2	Silicone Rubber	Str. #10-#22-#12	47 Mils 31 Mils	600V 150°C Copper 200°C Nickel	Fiberglass

FLEXLEAD MB Bondable Teflon. The Markel MB process can be factory-applied to any of the FLEXLEAD Teflon wires, extruded or tape-wrapped, and renders the surface bondable with commonly used elastomeric and epoxy-base potting and encapsulating compounds. Without affecting the color or electrical properties of the insulation, the MB treatment provides a bond with up to 150 psi pull-out strength, and a surface that is receptive to marking and printing.

FLEXLEAD Coaxial Cables. Markel manufactures a complete line of both standard and special RG/U coaxial cables. In accordance with specifications, types are available with silver-plated copper, plated or unplated copper-covered steel, or bare copper-center conductor; one or

two braided shields; tape-wrapped Teflon shield guards; and outer jacketing of impregnated fiberglass braid or Teflon (extruded or tape-wrapped). For complete data, ask for a FLEXLEAD Coaxial Cable Specifications folder.

FLEXLEAD Special Constructions. Because wiring problems cannot always be solved with standard materials, Markel's capacity for engineering high-temperature wire and cable construction to meet particular needs has grown steadily with the demand. We can combine insulations—Teflon, silicone rubber, fiberglass, nylon-shielding, fillers, liners, and jacket materials—with single, twisted-pair or multiple conductors—to provide a special cable construction for any temperature range from -90° to 260°C. For more data ask for a FLEXLEAD Wire and Cable Selector.

Ask for data sheets, prices, and samples of FLEXLEAD wire constructions



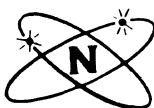
SOURCE for EXCELLENCE in Insulating Tubings and Sleeveings • High Temperature Wire and Cable

L. FRANK MARKEL & SONS, INC.

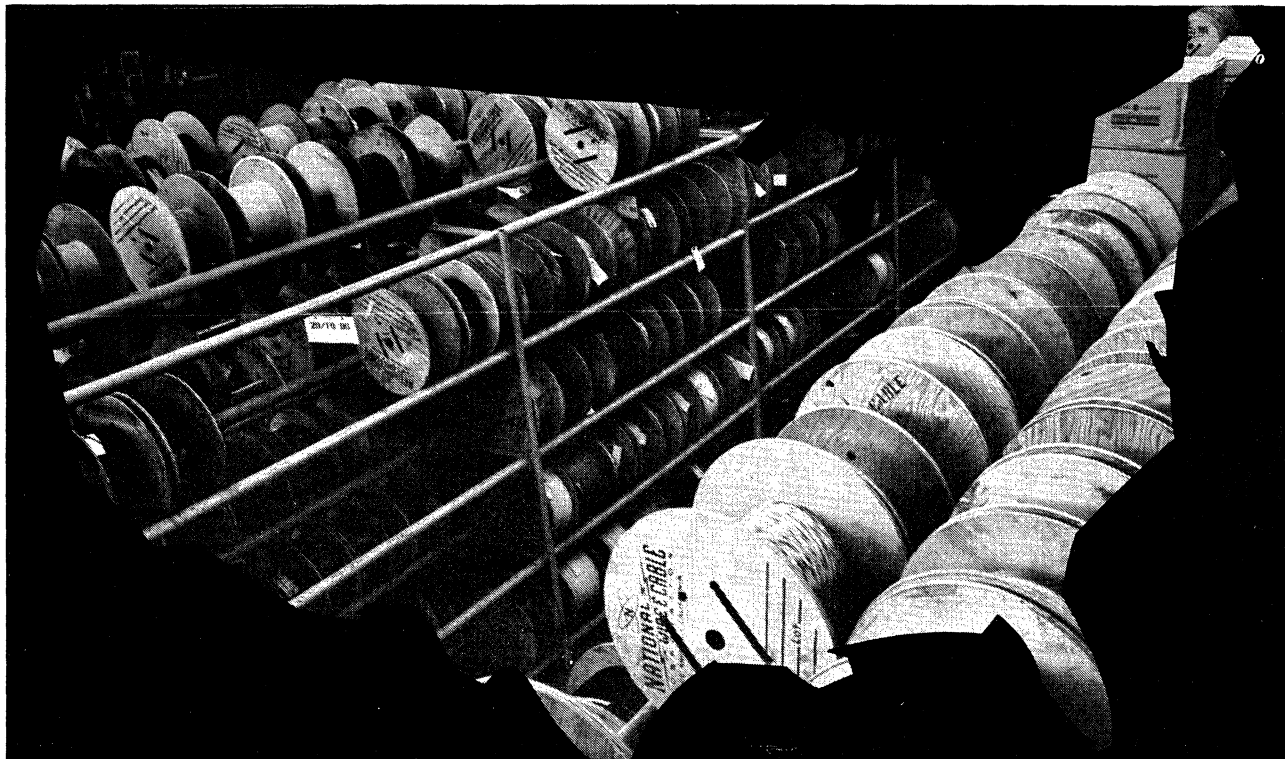
NORRISTOWN, PENNSYLVANIA 19404

Telephone: 215-272-8960 • TWX: 510-660-0190

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



Partial view of Los Angeles warehouse. Additional warehouses in Orlando, Florida, and San Francisco area.

Why National Wire?

As a manufacturer of wire and cable products . . . with warehouses on both East and West coasts, National Wire & Cable is ready to fill your immediate needs. Choose from our standard lines of wire or cable . . . OR let us design and custom manufacture exactly what you require for your application.

Our wire inventory is now over 160 million feet, and our 500 different standard multi-conductor cables total in excess of 1.3 million feet!

When you call National Wire, you'll find we are especially well equipped to handle your large as well as minimal requirements. If our "standard" items won't meet your application, we have the wire inventory, the machinery, the expertise to come up with exactly what you need. 86,000

square feet of manufacturing area and our expert engineering staff are at your disposal!! All cable components are produced within our own facility in order to assure complete quality control.

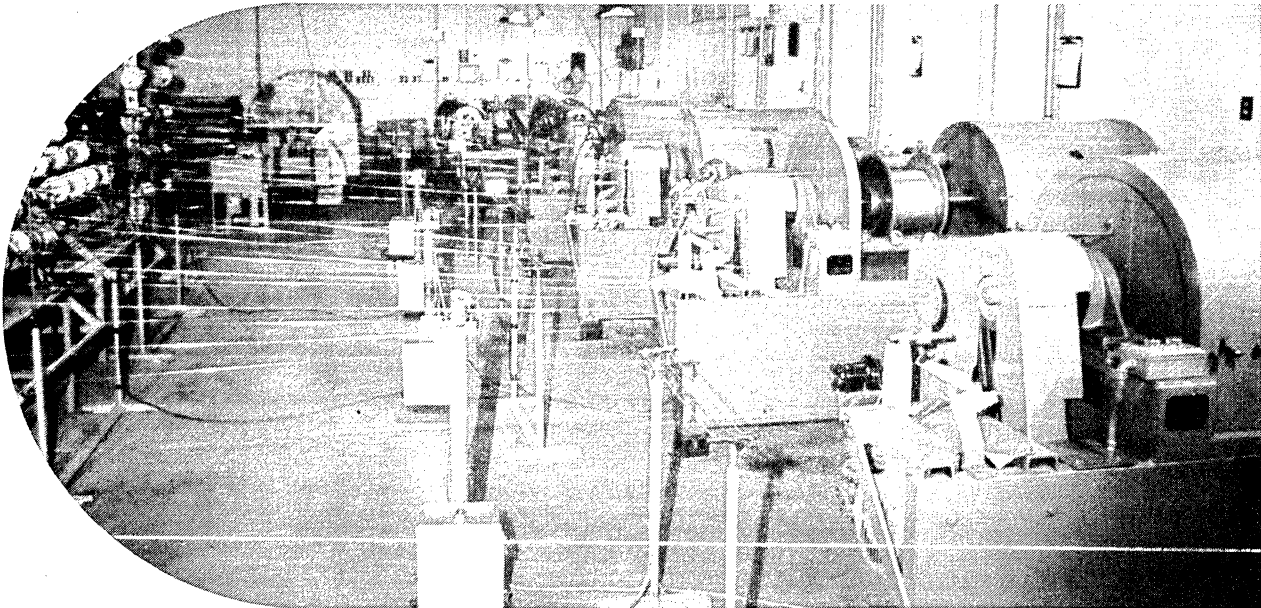
Review the following catalog pages. If you need some assistance with your specific requirement, call our factory direct, or call our representative nearest you.

(See list on Page 2•2046.)

NATIONAL WIRE AND CABLE CORPORATION

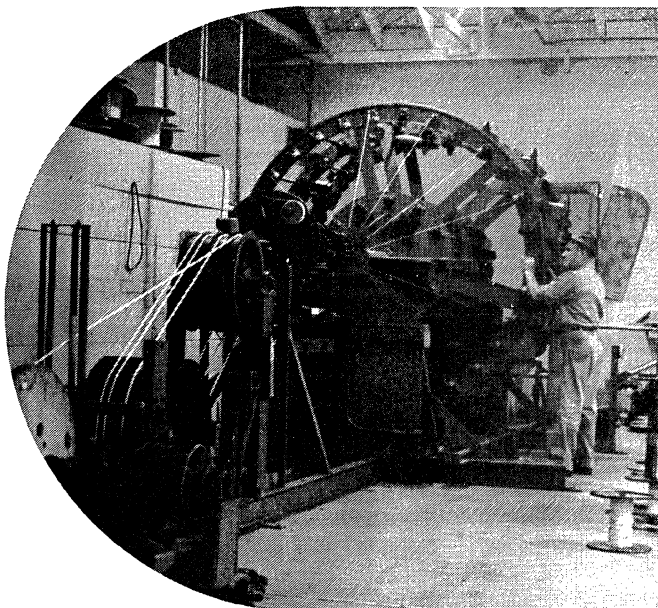


136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



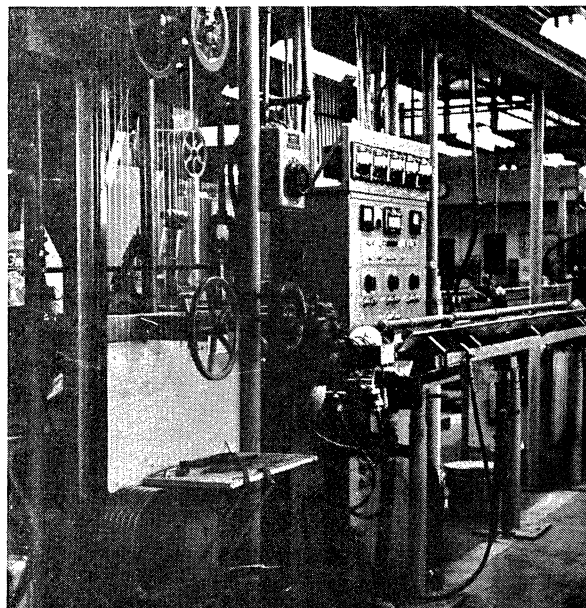
CONDUCTOR STRANDING

Batteries of stranding machines shown in National Wire & Cable's Los Angeles plant.



PLANETARY CABLER

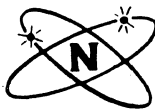
View of National's planetary cablers — one of 22.



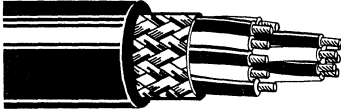
WIRE & CABLE EXTRUDING

View of Thermoplastic Extruded — one of many.

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



(NX1922J shown)

National Wire & Cable Corporation manufactures a complete line of MINIATURE low voltage signal and control cable. Available as cabled pairs or cabled singles, with optional overall shield. Conductors are stranded tinned copper with .010" wall of vinyl primary insulation for use up to 105°C per MIL-W-16878 Type B. Insulated for 600 volts working voltage. (Also meets U.L. AWM Type 1061; 300 volt, 80°C.) All are coded using 10 standard colors plus stripes on white per MIL-STD-681.

All conductors are planetary cabled and contra-helically laid for optimum flexibility, with a Mylar tape barrier under shields. Shielded cables have a tinned copper braid overall, of 85-90% coverage per MIL-C-7078; and braid angles below 40° for easy pushback.

The outer jacket is black abrasion-resistant 105°C. vinyl meeting MIL-I-631 Type F. All materials are self-extinguishing and fungus resistant. All items are U.L. LISTED STYLE 2343 COMPUTER CABLE; rated 80°C. (Higher temp. ratings apply for any non-U.L. service.)

Standard Putups: 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

Miniature Signal & Control Cables Single Conductors (NX Series)

IN STOCK

MIL - SPEC U.L. LISTED COMPUTER GRADE STYLE 2343

For light duty, gray jacketed version of these cables in the U.L. Style 2464, see Pages 2•2033-2•2036 NQ Series.

TECHNICAL DATA (all cables)

Insulation

Breakdown Voltage: Greater than 5000 volts AC RMS, 60 cps.

Capacitance:

Nominal capacitance from a wire to all else in a cable ranges from 45. to 70. pf/ft. at 1. kc, depending on gauge and position.

Insulation Leakage:

200. megohms/1000 ft. min. @ 500. VDC from any conductor to all else in cable.

Sheath Leakage:

10. megohms/1000 ft. min. @ 500 VDC from shield or conductor group through sheath to ground.

Temperature Range:

Suitable for continuous use from -40°C. to +105°C. (U.L. Service limited to +80°C.)

Bending

Characteristics:

All cables are suitable for flexing to a circle diameter of 6. cable diameters from +105°C. to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C.

MULTICONDUCTOR STOCK CABLED SINGLES

Cond: 22, 24 are 7 strand; 20 AWG is 19 strand

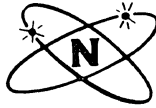
UNSHIELDED

PART NO.	NO. COND.	COND. AWG	COND. O.D.	JKT. WALL	CABLE O.D.	WEIGHT LB/M'
NX-524 J	5	24	.045	.062	.220	32 Lbs.
NX-724 J	7	24	.045	.062	.250	40 Lbs.
NX-1224J	12	24	.045	.062	.300	53 Lbs.
NX-1524J	15	24	.045	.062	.330	65 Lbs.
NX-1924J	19	24	.045	.062	.340	73 Lbs.
NX-2724J	27	24	.045	.062	.390	85 Lbs.
NX-3724J	37	24	.045	.062	.420	120 Lbs.
NX-4824J	48	24	.045	.062	.470	142 Lbs.
NX-6024J	60	24	.045	.062	.510	170 Lbs.
NX-522 J	5	22	.050	.062	.200	40 Lbs.
NX-722 J	7	22	.050	.062	.270	48 Lbs.
NX-1222J	12	22	.050	.062	.330	72 Lbs.
NX-1522J	15	22	.050	.062	.350	85 Lbs.
NX-1922J	19	22	.050	.062	.370	96 Lbs.
NX-2722J	27	22	.050	.062	.430	130 Lbs.
NX-3722J	37	22	.050	.062	.480	163 Lbs.
NX-4822J	48	22	.050	.062	.530	210 Lbs.
NX-6022J	60	22	.050	.062	.570	255 Lbs.
NX-520 J	5	20	.057	.062	.275	49 Lbs.
NX-720 J	7	20	.057	.062	.290	59 Lbs.
NX-1220J	12	20	.057	.062	.360	90 Lbs.
NX-1520J	15	20	.057	.062	.390	110 Lbs.
NX-1920J	19	20	.057	.062	.410	128 Lbs.
NX-2720J	27	20	.057	.062	.490	166 Lbs.
NX-3720J	37	20	.057	.062	.520	220 Lbs.
NX-4820J	48	20	.057	.062	.580	275 Lbs.
NX-6020J	60	20	.057	.062	.640	335 Lbs.

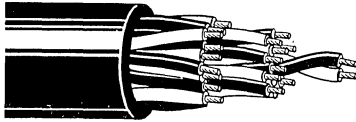
OVERALL SHIELDED

PART NO.	NO. COND.	COND. AWG	COND. O.D.	JKT. WALL	SHIELD AWG	CABLE O.D.	WEIGHT LB/M'
NX-524 SJ	5	24	.045	.062	36	.245	44 Lbs.
NX-724 SJ	7	24	.045	.062	36	.275	55 Lbs.
NX-1224SJ	12	24	.045	.062	36	.325	68 Lbs.
NX-1524SJ	15	24	.045	.062	36	.350	80 Lbs.
NX-1924SJ	19	24	.045	.062	36	.365	88 Lbs.
NX-2724SJ	27	24	.045	.062	36	.415	102 Lbs.
NX-3724SJ	37	24	.045	.062	36	.445	140 Lbs.
NX-4824SJ	48	24	.045	.062	36	.495	172 Lbs.
NX-6024SJ	60	24	.045	.062	36	.535	205 Lbs.
NX-522 SJ	5	22	.050	.062	36	.285	50 Lbs.
NX-722 SJ	7	22	.050	.062	36	.295	58 Lbs.
NX-1222SJ	12	22	.050	.062	36	.355	87 Lbs.
NX-1522SJ	15	22	.050	.062	36	.380	101 Lbs.
NX-1922SJ	19	22	.050	.062	36	.395	111 Lbs.
NX-2722SJ	27	22	.050	.062	36	.455	150 Lbs.
NX-3722SJ	37	22	.050	.062	34	.510	193 Lbs.
NX-4822SJ	48	22	.050	.062	34	.560	245 Lbs.
NX-6022SJ	60	22	.050	.062	34	.600	295 Lbs.
NX-520 SJ	5	20	.057	.062	36	.300	59 Lbs.
NX-720 SJ	7	20	.057	.062	36	.315	69 Lbs.
NX-1220SJ	12	20	.057	.062	36	.385	105 Lbs.
NX-1520SJ	15	20	.057	.062	36	.415	137 Lbs.
NX-1920SJ	19	20	.057	.062	36	.435	158 Lbs.
NX-2720SJ	27	20	.057	.062	36	.515	196 Lbs.
NX-3720SJ	37	20	.057	.062	34	.550	255 Lbs.
NX-4820SJ	48	20	.057	.062	34	.610	320 Lbs.
NX-6020SJ	60	20	.057	.062	34	.670	385 Lbs.

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



(NXP1924J shown)

National Wire & Cable Corporation manufactures a complete line of MINIATURE low voltage signal and control cable. Available as cabled pairs or cabled singles, with optional overall shield. Conductors are stranded tinned copper with .010" wall of vinyl primary insulation for use up to 105°C per MIL-W-16878 Type B. Insulated for 600 volts working voltage. (Also meets U.L. AWM Type 1061; 300 volt, 80°C.) All are coded using 10 standard colors plus stripes on white per table below.

All conductors are planetary cabled and contra-helically laid for optimum flexibility, with a Mylar tape barrier under shields. Shielded cables have a tinned copper braid overall, of 85-90% coverage per MIL-C-7078; and braid angles below 40° for easy pushback.

The outer jacket is black abrasion-resistant 105°C. vinyl meeting MIL-I-631 Type F. All materials are self-extinguishing and fungus resistant. All items are U.L. LISTED STYLE 2343 COMPUTER CABLE; rated 80°C. (Higher temp. ratings apply for any non-U.L. service.)

Standard Putups: 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

† Denotes U.L. Style 2344.

Miniature Signal & Control Cables Twisted Pairs (NXP Series)

IN STOCK MIL - SPEC

U.L. LISTED COMPUTER GRADE STYLE 2343 & 2344

For light duty, gray jacketed version of these cables in the U.L. Style 2464, see Pages 2•2033-2•2036 NQ Series.

TECHNICAL DATA (all cables)

Insulation Breakdown Voltage:	Greater than 5000 volts AC RMS, 60 cps.
Capacitance:	Nominal capacitance from a wire to all else in a cable ranges from 45. to 70. pf/ft. at 1. kc, depending on gauge and position.
Insulation Leakage:	200. megohms/1000 ft. min. @ 500. VDC from any conductor to all else in cable.
Sheath Leakage:	10. megohms/1000 ft. min. @ 500 VDC from shield or conductor group through sheath to ground.
Temperature Range:	Suitable for continuous use from -40°C. to +105°C. (U.L. Service limited to +80°C.)
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6. cable diameters from +105°C. to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C.
Impedance:	Balanced: 87. ohms ±5% Unbalanced: 52. ohms ±5%

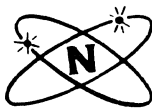
MULTI-CONDUCTOR STOCK CABLED PAIRS

UNSHIELDED							OVERALL SHIELDED							
PART NO.	NO. PAIRS	COND. AWG	COND. O.D.	JKT. WALL	CABLE O.D.	WEIGHT LB/M'	PART NO.	NO. PAIRS	COND. AWG	COND. O.D.	JKT. WALL	SHLD. AWG	CABLE O.D.	WEIGHT LB/M'
NXP-524 J	5	24	.045	.062	.330	52 Lbs.	NXP-524 SJ	5	24	.045	.062	36	.355	67 Lbs.
NXP-724 J	7	24	.045	.062	.350	60 Lbs.	NXP-724 SJ	7	24	.045	.062	36	.375	75 Lbs.
NXP-1224J	12	24	.045	.062	.435	90 Lbs.	NXP-1224SJ	12	24	.045	.062	36	.460	115 Lbs.
NXP-1524J	15	24	.045	.062	.485	110 Lbs.	NXP-1524SJ	15	24	.045	.062	36	.510	140 Lbs.
NXP-1924J	19	24	.045	.062	.505	126 Lbs.	NXP-1924SJ	19	24	.045	.062	36	.530	161 Lbs.
NXP-2724J	27	24	.045	.062	.590	167 Lbs.	NXP-2724SJ	27	24	.045	.062	34	.620	211 Lbs.
NXP-3724J	37	24	.045	.062	.660	216 Lbs.	NXP-3724SJ	37	24	.045	.062	34	.690	266 Lbs.
NXP-4824J	48	24	.045	.062	.745	270 Lbs.	NXP-4824SJ	48	24	.045	.062	34	.775	330 Lbs.
NXP-6024J	60	24	.045	.062	.815	325 Lbs.	NXP-6024SJ*	60	24	.045	.062	34	.845	390 Lbs.
NXP-522 J	5	22	.050	.062	.365	56 Lbs.	NXP-522 SJ	5	22	.050	.062	36	.390	.77 Lbs.
NXP-722 J	7	22	.050	.062	.390	82 Lbs.	NXP-722 SJ	7	22	.050	.062	36	.415	100 Lbs.
NXP-1222J	12	22	.050	.062	.470	120 Lbs.	NXP-1222SJ	12	22	.050	.062	36	.495	150 Lbs.
NXP-1522J	15	22	.050	.062	.545	145 Lbs.	NXP-1522SJ	15	22	.050	.062	34	.575	185 Lbs.
NXP-1922J	19	22	.050	.062	.550	170 Lbs.	NXP-1922SJ	19	22	.050	.062	34	.580	210 Lbs.
NXP-2722J	27	22	.050	.062	.640	230 Lbs.	NXP-2722SJ	27	22	.050	.062	34	.670	280 Lbs.
NXP-3722J	37	22	.050	.062	.750	300 Lbs.	NXP-3722SJ	37	22	.050	.062	34	.780	357 Lbs.
NXP-4822J	48	22	.050	.080	.850†	375 Lbs.	NXP-4822SJ	48	22	.050	.080	34	.880†	445 Lbs.
NXP-6022J	60	22	.050	.080	.930†	460 Lbs.	NXP-6022SJ	60	22	.050	.080	34	.960†	535 Lbs.
NXP-520 J	5	20	.057	.062	.395	82 Lbs.	NXP-520 SJ	5	20	.057	.062	36	.420	102 Lbs.
NXP-720 J	7	20	.057	.062	.440	108 Lbs.	NXP-720 SJ	7	20	.057	.062	36	.465	123 Lbs.
NXP-1220J	12	20	.057	.062	.540	163 Lbs.	NXP-1220SJ	12	20	.057	.062	34	.570	203 Lbs.
NXP-1520J	15	20	.057	.062	.600	196 Lbs.	NXP-1520SJ	15	20	.057	.062	34	.630	241 Lbs.
NXP-1920J	19	20	.057	.062	.630	235 Lbs.	NXP-1920SJ	19	20	.057	.062	34	.660	280 Lbs.
NXP-2720J	27	20	.057	.062	.745	320 Lbs.	NXP-2720SJ	27	20	.057	.062	34	.775	380 Lbs.
NXP-3720J	37	20	.057	.062	.820	420 Lbs.	NXP-3720SJ	37	20	.057	.080	34	.850†	490 Lbs.
NXP-4820J	48	20	.057	.080	.950†	530 Lbs.	NXP-4820SJ	48	20	.057	.080	34	.980†	605 Lbs.
NXP-6920J	60	20	.057	.080	1.040†	650 Lbs.	NXP-6020SJ	60	20	.057	.080	34	1.070†	735 Lbs.

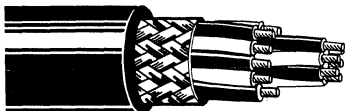
COLOR CODING USED IN TWISTED PAIRS

PR#	PAIR COLORS	PR#	PAIR COLORS	PR#	PAIR COLORS	PR#	PAIR COLORS	PR#	PAIR COLORS	PR#	PAIR COLORS
1	White with Black	11	Black with Red	21	Brown with Green	31	Orange with Yellow	41	Green with Violet	51	Wht/Blk with Green
2	White with Brown	12	Black with Orange	22	Brown with Blue	32	Orange with Green	42	Green with Gray	52	Wht/Blk with Blue
3	White with Red	13	Black with Yellow	23	Brown with Violet	33	Orange with Blue	43	Blue with Violet	53	Wht/Blk with Violet
4	White with Orange	14	Black with Green	24	Brown with Gray	34	Orange with Violet	44	Blue with Gray	54	Wht/Blk with Gray
5	White with Yellow	15	Black with Blue	25	Red with Orange	35	Orange with Gray	45	Violet with Gray	55	Wht/Brn with Black
6	White with Green	16	Black with Violet	26	Red with Yellow	36	Yellow with Green	46	Wht/Blk with Black	56	Wht/Brn with Brown
7	White with Blue	17	Black with Gray	27	Red with Green	37	Yellow with Blue	47	Wht/Blk with Brown	57	Wht/Brn with Red
8	White with Violet	18	Brown with Red	28	Red with Blue	38	Yellow with Violet	48	Wht/Blk with Red	58	Wht/Brn with Orange
9	White with Gray	19	Brown with Orange	29	Red with Violet	39	Yellow with Gray	49	Wht/Blk with Orange	59	Wht/Brn with Yellow
10	Black with Brown	20	Brown with Yellow	30	Red with Gray	40	Green with Blue	50	Wht/Blk with Yellow	60	Wht/Brn with Green

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



(NW1918SJ shown)

National Wire & Cable Corporation manufactures a complete line of multiple conductor control cable. Conductors are stranded tinned copper with $\frac{1}{64}$ " wall of vinyl primary insulation for use up to 105°C per MIL-W-16878 Type C.* Insulated for 1000 volts working voltage. Color coded using 10 standard colors plus stripes on white per MIL-STD-681.

All conductors are planetary cabled and contra-helically laid for optimum flexibility, with a Mylar tape serve over cable bundle. Shielded cables have a tinned copper braid overall, of 85-90% coverage per MIL-C-7078, and braid angles below 40° for easy pushback.

The outer jacket is black abrasion-resistant 105°C vinyl meeting MIL-I-631 Class F. All materials are self-extinguishing and fungus resistant. All cables are U.L. LISTED STYLE 2343; rated 80°C. (Higher temp. ratings apply to any non-U.L. service.) Specify polyurethane sheath for extreme rough usage or low-temp. service.

Standard Putups: 100, 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

* Insulated wires also meet U.L. style 1007 and CSA type TR-64.

† Denotes U.L. Style 2344.

Heavy Duty Signal & Control Cables Single Conductors (NW Series)

IN STOCK

MIL-SPEC U.L. LISTED—STYLE 2343 & 2344

TECHNICAL DATA (all cables)

Insulation Breakdown Voltage:	Greater than 8000 volts AC RMS, 60 cps.
U.L. Voltage Rating:	300 volts RMS AC (appliance use). 600 volts RMS AC (electronic use).
Military Voltage Rating:	1000 volts RMS.
Capacitance:	Nominal capacitance from a wire to all else in the cable ranges from 40 to 65 mmfd per ft., @ 1000 cps; dependent on gauge and position.
Insulation Leakage Res.:	200. megohms/1000 ft. min. at 500 VDC from any conductor to all else in cable.
Sheath Leakage Res.:	10. megohms/1000 ft. min. at 500 VDC from overall shield through sheath to outside world.
Usable Temp. Range:	Suitable for continuous use from +105°C to -55°C.
Cold Bending Capability:	All cables are suitable for flexing to a circle diam. of approx. 6 cable diameters from +105°C to -20°C; Recommended flex diameter should be greater than 20 cable diam. for flexing at -40°C. For continuous flexing applications consult factory.

Conductor sizes 22, 20, 18, 16, 14 & 12 gauge. 22 AWG is 7 strand. All others 19 strand.

UNSHIELDED

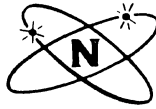
PART NO.	NO. COND.	COND. AWG	JKT. THICK	CABLE O.D.	WEIGHT PER M'
NW-722 J	7	22	.060	.315	40 Lbs.
NW-1222J	12	22	.060	.385	70 Lbs.
NW-1922J	19	22	.060	.440	110 Lbs.
NW-2722J	27	22	.060	.510	160 Lbs.
NW-3722J	37	22	.060	.565	200 Lbs.
NW-4822J	48	22	.060	.635	245 Lbs.
NW-6022J	60	22	.060	.695	300 Lbs.
NW-7222J	72	22	.060	.755	360 Lbs.
NW-8822J	88	22	.060	.820	425 Lbs.
NW-10222J	102	22	.080	.920†	485 Lbs.
NW-720 J	7	20	.060	.340	50 Lbs.
NW-1220J	12	20	.060	.420	105 Lbs.
NW-1920J	19	20	.060	.485	160 Lbs.
NW-2720J	27	20	.060	.565	210 Lbs.
NW-3720J	37	20	.060	.630	280 Lbs.
NW-4820J	48	20	.060	.710	360 Lbs.
NW-6020J	60	20	.060	.775	435 Lbs.
NW-7220J	72	20	.080	.885†	485 Lbs.
NW-8820J	88	20	.080	.960†	580 Lbs.
NW-10220J	102	20	.080	1.030†	670 Lbs.
NW-718 J	7	18	.060	.370	75 Lbs.
NW-1218J	12	18	.060	.460	135 Lbs.
NW-1918J	19	18	.060	.535	225 Lbs.
NW-2718J	27	18	.060	.625	300 Lbs.
NW-3718J	37	18	.060	.700	390 Lbs.
NW-4818J	48	18	.060	.790	510 Lbs.
NW-6018J	60	18	.080	.905†	600 Lbs.
NW-7218J	72	18	.080	.985†	720 Lbs.
NW-716 J	7	16	.060	.395	95 Lbs.
NW-1216J	12	16	.060	.495	155 Lbs.
NW-1916J	19	16	.060	.575	230 Lbs.
NW-2716J	27	16	.060	.615	320 Lbs.
NW-3716J	37	16	.060	.755	430 Lbs.
NW-4816J	48	16	.080	.895†	625 Lbs.
NW-6016J	60	16	.080	.975†	750 Lbs.
NW-714 J **	7	14	.060	.435	150 Lbs.
NW-1214J **	12	14	.060	.555	240 Lbs.
NW-1914J **	19	14	.060	.645	370 Lbs.
NW-2714J **	27	14	.060	.760	515 Lbs.
NW-512 J **	5	12	.060	.460	175 Lbs.
NW-712 J **	7	12	.060	.500	225 Lbs.
NW-1212J **	12	12	.060	.680	375 Lbs.
NW-1912J **	19	12	.060	.745	560 Lbs.

OVERALL SHIELDED

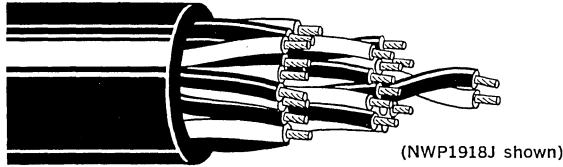
PART NO.	NO. COND.	COND. AWG	T.C. SHIELD	JKT. THICK	CABLE O.D.	WEIGHT PER M'
NW-722 SJ	7	22	No. 36	.060	.340	55 Lbs.
NW-1222SJ	12	22	No. 34	.060	.410	90 Lbs.
NW-1922SJ	19	22	No. 34	.060	.465	145 Lbs.
NW-2722SJ	27	22	No. 34	.060	.535	200 Lbs.
NW-3722SJ	37	22	No. 34	.060	.590	245 Lbs.
NW-4822SJ	48	22	No. 34	.060	.660	300 Lbs.
NW-6022SJ	60	22	No. 34	.060	.720	355 Lbs.
NW-7222SJ	72	22	No. 34	.060	.780	425 Lbs.
NW-8822SJ	88	22	No. 34	.080	.895†	500 Lbs.
NW-10222SJ	102	22	No. 34	.080	.945†	560 Lbs.
NW-720 SJ	7	20	No. 34	.060	.365	68 Lbs.
NW-1220SJ	12	20	No. 34	.060	.445	125 Lbs.
NW-1920SJ	19	20	No. 34	.060	.510	195 Lbs.
NW-2720SJ	27	20	No. 34	.060	.590	250 Lbs.
NW-3720SJ	37	20	No. 34	.060	.655	325 Lbs.
NW-4820SJ	48	20	No. 34	.060	.735	415 Lbs.
NW-6020SJ	60	20	No. 34	.060	.800	500 Lbs.
NW-7220SJ	72	20	No. 34	.080	.910†	555 Lbs.
NW-8820SJ	88	20	No. 34	.080	1.035†	660 Lbs.
NW-10220SJ	102	20	No. 34	.080	1.055†	750 Lbs.
NW-718 SJ	7	18	No. 34	.060	.395	95 Lbs.
NW-1218SJ	12	18	No. 34	.060	.485	170 Lbs.
NW-1918SJ	19	18	No. 34	.060	.560	265 Lbs.
NW-2718SJ	27	18	No. 34	.060	.650	350 Lbs.
NW-3718SJ	37	18	No. 34	.060	.725	445 Lbs.
NW-4818SJ	48	18	No. 34	.060	.815	575 Lbs.
NW-6018SJ	60	18	No. 34	.080	.930†	680 Lbs.
NW-7218SJ	72	18	No. 34	.080	1.010†	820 Lbs.
NW-716 SJ	7	16	No. 34	.060	.420	125 Lbs.
NW-1216SJ	12	16	No. 34	.060	.520	195 Lbs.
NW-1916SJ	19	16	No. 34	.060	.600	275 Lbs.
NW-2716SJ	27	16	No. 34	.060	.640	375 Lbs.
NW-3716SJ	37	16	No. 34	.060	.780	500 Lbs.
NW-4816SJ	48	16	No. 34	.080	.920†	700 Lbs.
NW-6016SJ	60	16	No. 34	.080	1.000†	830 Lbs.
NW-714 SJ **	7	14	No. 34	.060	.465	180 Lbs.
NW-1214SJ	12	14	No. 34	.060	.580	280 Lbs.
NW-1914SJ	19	14	No. 34	.060	.670	420 Lbs.
NW-2714SJ	27	14	No. 34	.060	.785	575 Lbs.
NW-512 SJ	5	12	No. 34	.060	.485	210 Lbs.
NW-712 SJ	7	12	No. 34	.060	.525	265 Lbs.
NW-1212SJ	12	12	No. 34	.060	.705	430 Lbs.
NW-1912SJ	19	12	No. 34	.060	.770	625 Lbs.

**Not listed under UL styles 2343 or 2344 in these gauges.

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



(NWP1918J shown)

Identical to National's NW-Series Cables except offered as twisted pairs.

National Wire & Cable Corporation manufactures a complete line of multiple pair control cables. Conductors are of tinned copper strand with 1/4" vinyl primary insulation for use up to 105°C per MIL-W-16878D Type C. Insulated for 1000 volts working voltage. Conductors are color coded using 10 standard basic colors, plus spiral tracers on white per table below.

All pairs are planetary cabled and contra-helically laid with a Mylar tape serve over the cable bundle. The overall jacket is a 105°C black vinyl plastic per MIL-I-631; or may be Neoprene to MIL-R-6855 Class 2 Grade 60 specification. (Neoprene at added cost).

SHIELDED CABLES

National Multiple Conductor SHIELDED CABLES are to the same specifications as above with addition of tinned copper braided shield over cable complex with 85-90% coverage to MIL-C-7078A.

Heavy Duty Signal & Control Cables Twisted Pairs (NWP Series)

IN STOCK MIL-SPEC

U.L. LISTED

TECHNICAL DATA (all cables)

Insulation Breakdown Voltage:	Greater than 8,000 volts AC RMS, 60 cps.
Capacitance:	Nominal capacitance wire to wire for a pair ranges from 27. to 40. mmfd/ft. Capacitance from both wires tied together measured to all else in common ranges from 35. to 60. mmfd/ft. dependent on gauge and position. Overall shield has negligible effect on W-W capacitance.
Insulation Leakage Res.:	200. megohms / 1000 ft. min. at 500 VDC from any conductor to all else in cable.
Sheath Leakage Res.:	10. megohms / 1000 ft. min. at 500 VDC from overall shield through sheath to outside world.
Usable Temp. Range:	Suitable for continuous use from +105°C to -55°C.
Cold Bending Capability:	All cables are suitable for flexing to a circle diam. of approx. 6 cable diameters from +105°C to -20°C; Recommended flex diameter should be greater than 20 cable diam. for flexing at -40°C. For continuous flexing applications consult factory.

UNSHIELDED OVERALL

PART NO.	NO. OF PAIRS	COND. GA.	JKT. THICK	O. D.	WEIGHT
NWP-722 J	7	22	.045	.470	90 Lbs.
NWP-1222J	12	22	.050	.600	150 Lbs.
NWP-1922J	19	22	.050	.700	200 Lbs.
NWP-2722J	27	22	.055	.830	280 Lbs.
NWP-3722J	37	22	.060	.960	370 Lbs.
NWP-4822J	48	22	.060	1.080	470 Lbs.
NWP-6022J	60	22	.060	1.200	560 Lbs.
NWP-720 J	7	20	.050	.520	120 Lbs.
NWP-1220J	12	20	.050	.660	200 Lbs.
NWP-1920J	19	20	.050	.800	290 Lbs.
NWP-2720J	27	20	.060	.960	420 Lbs.
NWP-3720J	37	20	.060	1.100	500 Lbs.
NWP-4820J	48	20	.060	1.240	620 Lbs.
NWP-6020J	60	20	.060	1.380	750 Lbs.
NWP-718 J	7	18	.050	.580	150 Lbs.
NWP-1218J	12	18	.050	.740	290 Lbs.
NWP-1918J	19	18	.060	.920	400 Lbs.
NWP-2718J	27	18	.060	1.080	560 Lbs.
NWP-3718J	37	18	.060	1.240	750 Lbs.
NWP-4818J	48	18	.060	1.400	900 Lbs.
NWP-716 J	7	16	.050	.640	180 Lbs.
NWP-1216J	12	16	.060	.840	300 Lbs.
NWP-1916J	19	16	.060	1.020	430 Lbs.
NWP-2716J	27	16	.060	1.200	720 Lbs.
NWP-3716J	37	16	.060	1.380	1000 Lbs.

OVERALL SHIELDED

PART NO.	NO. OF PAIRS	COND. GA.	JKT. THICK	O. D.	WEIGHT
NWP-722 SJ	7	22	.045	.495	135 Lbs.
NWP-1222SJ	12	22	.050	.630	206 Lbs.
NWP-1922SJ	19	22	.050	.730	260 Lbs.
NWP-2722SJ	27	22	.055	.860	358 Lbs.
NWP-3722SJ	37	22	.060	.990	460 Lbs.
NWP-4822SJ	48	22	.060	1.110	570 Lbs.
NWP-6022SJ	60	22	.060	1.230	675 Lbs.
NWP-720 SJ	7	20	.050	.550	170 Lbs.
NWP-1220SJ	12	20	.050	.690	260 Lbs.
NWP-1920SJ	19	20	.050	.830	355 Lbs.
NWP-2720SJ	27	20	.060	.990	510 Lbs.
NWP-3720SJ	37	20	.060	1.130	603 Lbs.
NWP-4820SJ	48	20	.060	1.270	735 Lbs.
NWP-6020SJ	60	20	.060	1.410	880 Lbs.
NWP-718 SJ	7	18	.050	.610	205 Lbs.
NWP-1218SJ	12	18	.050	.770	360 Lbs.
NWP-1918SJ	19	18	.060	.950	487 Lbs.
NWP-2718SJ	27	18	.060	1.110	660 Lbs.
NWP-3718SJ	37	18	.060	1.270	865 Lbs.
NWP-4818SJ	48	18	.060	1.430	1030 Lbs.
NWP-716 SJ	7	16	.050	.670	240 Lbs.
NWP-1216SJ	12	16	.060	.870	377 Lbs.
NWP-1916SJ	19	16	.060	1.050	520 Lbs.
NWP-2716SJ	27	16	.060	1.230	830 Lbs.
NWP-3716SJ	37	16	.060	1.410	1330 Lbs.

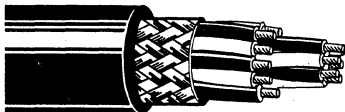
COLOR CODING USED ON TWISTED PAIRS

PR #	PAIR COLORS	PR #	PAIR COLORS	PR #	PAIR COLORS	PR #	PAIR COLORS	PR #	PAIR COLORS	PR #	PAIR COLORS
1.	WHITE WITH BLACK	11.	BLACK WITH RED	21.	BROWN WITH GREEN	31.	ORANGE WITH YELLOW	41.	GREEN WITH VIOLET	51.	WHT/BLK WITH GREEN
2.	WHITE WITH BROWN	12.	BLACK WITH ORANGE	22.	BROWN WITH BLUE	32.	ORANGE WITH GREEN	42.	GREEN WITH GRAY	52.	WHT/BLK WITH BLUE
3.	WHITE WITH RED	13.	BLACK WITH YELLOW	23.	BROWN WITH VIOLET	33.	ORANGE WITH BLUE	43.	BLUE WITH VIOLET	53.	WHT/BLK WITH VIOLET
4.	WHITE WITH ORANGE	14.	BLACK WITH GREEN	24.	BROWN WITH GRAY	34.	ORANGE WITH VIOLET	44.	BLUE WITH GRAY	54.	WHT/BLK WITH GRAY
5.	WHITE WITH YELLOW	15.	BLACK WITH BLUE	25.	RED WITH ORANGE	35.	ORANGE WITH GRAY	45.	VIOLET WITH GRAY	55.	WHT/BRN WITH BLACK
6.	WHITE WITH GREEN	16.	BLACK WITH VIOLET	26.	RED WITH YELLOW	36.	YELLOW WITH GREEN	46.	WHT/BLK WITH BLACK	56.	WHT/BRN WITH BROWN
7.	WHITE WITH BLUE	17.	BLACK WITH GRAY	27.	RED WITH GREEN	37.	YELLOW WITH BLUE	47.	WHT/BLK WITH BROWN	57.	WHT/BRN WITH RED
8.	WHITE WITH VIOLET	18.	BROWN WITH RED	28.	RED WITH BLUE	38.	YELLOW WITH VIOLET	48.	WHT/BLK WITH RED	58.	WHT/BRN WITH ORANGE
9.	WHITE WITH GRAY	19.	BROWN WITH ORANGE	29.	RED WITH VIOLET	39.	YELLOW WITH GRAY	49.	WHT/BLK WITH ORANGE	59.	WHT/BRN WITH YELLOW
10.	BLACK WITH BROWN	20.	BROWN WITH GRAY	30.	RED WITH GRAY	40.	GREEN WITH BLUE	50.	WHT/BLK WITH YELLOW	60.	WHT/BRN WITH GREEN

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



(NWH1916SJ shown)

National Wire & Cable Corporation manufactures a complete line of extra heavy duty multi-conductor control cables. Conductors are of tinned copper strand with $\frac{1}{32}$ " wall of polyvinylchloride primary insulation for use up to 105°C.

Insulated conductors meet all of the following specs:[†]

MIL-W-16878 Type D 3000 volts working
Underwriters Lab. Type 1015 2500 VOLT ELECTRONIC USE
600 VOLT APPLIANCE USE

I.P.C.E.A. * Spec. S61-402 600 volts working
Conductors are color coded using 10 standard basic colors, plus spiral tracers on white per MIL-STD. 681.

All conductors are planetary cabled and contra-helically laid with a Mylar tape serve over the cable bundle. The overall jacket is a 105°C black polyvinyl chloride Thermoplastic meeting I.P.C.E.A. S61-402 and MIL-I-631 Class F; or may be Neoprene to MIL-R-6855 Class 2 Grade 60 specification. (Neoprene at added cost).

SHIELDED CABLES

National Multiple Conductor SHIELDED CABLES are to the same specifications as above with addition of tinned copper braided shield over cable complex with 85-90% coverage to MIL-C-7078A. STANDARD PUT-UPS: 500 ft. and 1000 ft. No-deposit reels.

Extra Heavy Duty Control Cables Single Conductors (NWH Series)

MIL-SPEC & I.P.C.E.A.

TECHNICAL DATA (all cables)

Insulation Breakdown Voltage:	Greater than 12,000 volts AC RMS, 60 cps.
Capacitance:	Nominal capacitance from a wire to all else in the cable ranges from 40 to 65 mmfd per ft., @ 1000 cps; dependent on gauge and position.
Insulation Leakage Res.:	200. megohms / 1000 ft. min. at 500 VDC from any conductor to all else in cable.
Sheath Leakage Res.:	10. megohms / 1000 ft. min. at 500 VDC from overall shield through sheath to outside world.
Usable Temp. Range:	Suitable for continuous use from +105°C to -55°C.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C. to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°C. For continuous flexing applications consult factory.

MULTI-CONDUCTOR STOCK CABLES

Conductor sizes 22, 20, 18, 16, 14 & 12 gauge, 22 AWG is 7 strand. All others 19 strand.

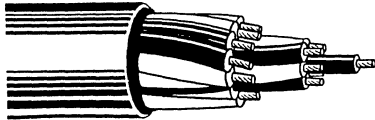
UNSHIELDED						OVERALL SHIELDED						
PART NO.	NO. COND.	COND. AWG.	JKT. THICK	CABLE O.D.	WEIGHT PER M'	PART NO.	NO. COND.	COND. AWG.	T.C. SHIELD	JKT. THICK	CABLE O.D.	WEIGHT PER M'
NWH-722 J	7	22	.045	.360	50 Lbs.	NWH-722 SJ	7	22	No. 36	.045	.390	65 Lbs.
NWH-1222J	12	22	.050	.470	85 Lbs.	NWH-1222SJ	12	22	No. 34	.050	.500	105 Lbs.
NWH-1922J	19	22	.060	.560	130 Lbs.	NWH-1922SJ	19	22	No. 34	.060	.590	170 Lbs.
NWH-2722J	27	22	.060	.650	190 Lbs.	NWH-2722SJ	27	22	No. 34	.060	.680	240 Lbs.
NWH-3722J	37	22	.060	.740	240 Lbs.	NWH-3722SJ	37	22	No. 34	.060	.770	300 Lbs.
NWH-4822J	48	22	.080	.830	300 Lbs.	NWH-4822SJ	48	22	No. 34	.080	.860	360 Lbs.
NWH-6022J	60	22	.080	.910	370 Lbs.	NWH-6022SJ	60	22	No. 34	.080	.940	440 Lbs.
NWH-7222J	72	22	.080	.970	450 Lbs.	NWH-7222SJ	72	22	No. 34	.080	1.000	520 Lbs.
NWH-8822J	88	22	.080	1.050	530 Lbs.	NWH-8822SJ	88	22	No. 34	.080	1.080	600 Lbs.
NWH-10222J	102	22	.080	1.140	600 Lbs.	NWH-10222SJ	102	22	No. 34	.080	1.170	680 Lbs.
NWH-720 J	7	20	.040	.360	60 Lbs.	NWH-720 SJ	7	20	No. 34	.040	.390	80 Lbs.
NWH-1220J	12	20	.050	.480	125 Lbs.	NWH-1220SJ	12	20	No. 34	.050	.510	145 Lbs.
NWH-1920J	19	20	.060	.570	190 Lbs.	NWH-1920SJ	19	20	No. 34	.060	.600	225 Lbs.
NWH-2720J	27	20	.060	.680	250 Lbs.	NWH-2720SJ	27	20	No. 34	.060	.710	290 Lbs.
NWH-3720J	37	20	.060	.750	330 Lbs.	NWH-3720SJ	37	20	No. 34	.050	.780	375 Lbs.
NWH-4820J	48	20	.060	.860	420 Lbs.	NWH-4820SJ	48	20	No. 34	.060	.890	475 Lbs.
NWH-6020J	60	20	.080	.930	520 Lbs.	NWH-6020SJ	60	20	No. 34	.080	.960	580 Lbs.
NWH-7220J	72	20	.080	1.040	585 Lbs.	NWH-7220SJ	72	20	No. 34	.080	1.070	660 Lbs.
NWH-8820J	88	20	.080	1.120	700 Lbs.	NWH-8820SJ	88	20	No. 34	.080	1.150	780 Lbs.
NWH-10220J	102	20	.080	1.220	820 Lbs.	NWH-10220SJ	102	20	No. 34	.080	1.250	900 Lbs.
NWH-718 J	7	18	.040	.410	90 Lbs.	NWH-718 SJ	7	18	No. 34	.040	.440	110 Lbs.
NWH-1218J	12	18	.050	.540	160 Lbs.	NWH-1218SJ	12	18	No. 34	.050	.570	195 Lbs.
NWH-1918J	19	18	.060	.660	265 Lbs.	NWH-1918SJ	19	18	No. 34	.060	.690	305 Lbs.
NWH-2718J	27	18	.060	.770	350 Lbs.	NWH-2718SJ	27	18	No. 34	.060	.800	400 Lbs.
NWH-3718J	37	18	.080	.870	470 Lbs.	NWH-3718SJ	37	18	No. 34	.080	.900	520 Lbs.
NWH-4818J	48	18	.080	.980	610 Lbs.	NWH-4818SJ	48	18	No. 34	.080	1.010	680 Lbs.
NWH-6018J	60	18	.080	1.080	720 Lbs.	NWH-6018SJ	60	18	No. 34	.080	1.110	810 Lbs.
NWH-7218J	72	18	.080	1.300	860 Lbs.	NWH-7218SJ	72	18	No. 34	.080	1.330	940 Lbs.
NWH-716 J	7	16	.040	.430	110 Lbs.	NWH-716 SJ	7	16	No. 34	.040	.460	140 Lbs.
NWH-1216J	12	16	.050	.580	180 Lbs.	NWH-1216SJ	12	16	No. 34	.050	.610	220 Lbs.
NWH-1916J	19	16	.060	.700	270 Lbs.	NWH-1916SJ	19	16	No. 34	.060	.730	315 Lbs.
NWH-2716J	27	16	.060	.820	380 Lbs.	NWH-2716SJ	27	16	No. 34	.060	.850	435 Lbs.
NWH-3716J	37	16	.080	.920	510 Lbs.	NWH-3716SJ	37	16	No. 34	.080	.950	580 Lbs.
NWH-4816J	48	16	.080	1.060	725 Lbs.	NWH-4816SJ	48	16	No. 34	.080	1.090	800 Lbs.
NWH-6016J	60	16	.080	1.160	880 Lbs.	NWH-6016SJ	60	16	No. 34	.080	1.160	960 Lbs.
NWH-714 J	7	14	.050	.510	170 Lbs.	NWH-714 SJ	7	14	No. 34	.050	.540	200 Lbs.
NWH-1214J	12	14	.050	.640	270 Lbs.	NWH-1214SJ	12	14	No. 34	.050	.670	310 Lbs.
NWH-1914J	19	14	.060	.780	410 Lbs.	NWH-1914SJ	19	14	No. 34	.060	.810	460 Lbs.
NWH-2714J	27	14	.080	.920	580 Lbs.	NWH-2714SJ	27	14	No. 34	.080	.950	640 Lbs.
NWH-512 J	5	12	.050	.530	190 Lbs.	NWH-512 SJ	5	12	No. 34	.050	.560	225 Lbs.
NWH-712 J	7	12	.050	.580	250 Lbs.	NWH-712 SJ	7	12	No. 34	.050	.610	290 Lbs.
NWH-1212J	12	12	.060	.780	410 Lbs.	NWH-1212SJ	12	12	No. 34	.060	.810	465 Lbs.
NWH-1912J	19	12	.080	.920	610 Lbs.	NWH-1912SJ	19	12	No. 34	.080	.950	775 Lbs.

* All cables meet commercial I.P.C.E.A. Spec. S61-402 for 600. volt service. [†] Commercial voltage ratings are very conservative.

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



(NQ1928J shown)

GRAY PVC JACKET

National Wire & Cable Corporation manufactures a complete line of highly flexible micro-miniature low-voltage instrument control cable. These are available as cabled pairs or singles, with optional overall shield of either foil with drain or a braided shield.

Conductors are stranded tinned copper with .010" wall of tough extruded polyvinyl chloride primary insulation, rated for 300 volt use at +80°C under U. L. listed style 1061.* All are color coded using ten standard colors plus white with stripes per MIL-STD-681. Coded pairs use the same sequence as type NXP and NWP.

Conductors are planetary cabled and helically laid for optimum flexibility, with a barrier under braids. Shielded cables have a tinned copper braid of 90% coverage per MIL-C-7078, with braid angles below 40° for easy pushback; or have a 100% coverage foil shield in intimate contact with a drain wire for easy termination. See Section 3 of our master catalog for relative shield effectiveness.

Outer jacket is highly flexible abrasion-resistant gray polyvinyl chloride thermoplastic, meeting the requirements of U.L. listed style 2464.**

All materials are flame retardant and fungus resistant. Standard Putups: 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

* Wire also meets MIL-W-16878 type B, rated 600 volts, +105°C.

** Jacket material is military rated for +105°C; meets MIL-I-631, Class F.

Miniature Signal & Control Cables Single Conductors (NQ Series)

**EXTRA FLEXIBLE —
GRAY PVC JACKET**

MIL-SPEC & U.L. LISTED

STYLE 2464

TECHNICAL DATA (all cables)

Insulation break-down voltage:	Greater than 3000 volts AC RMS, 60cps.
Capacitance:	Nominal capacitance from a wire to all else in a cable ranges from 25 to 45 pf/ft at 1kc, depending on gauge and position.
Insulation Leakage:	200 megohms/1000 feet minimum @ 500VDC from conductor to all else in cable.
Sheath Leakage:	10 megohms/1000 feet minimum @ 500VDC from shield or conductor group through sheath to ground.
Temperature Range:	U.L. rating: +80°C per U.L. style 2464. Military: Continuous use from -40°C to +105°C.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°. For continuous flexing applications consult the factory.
Foil Shielded Cables:	The nominal overall diameter of foil shielded cables will be .006" greater than the non-shielded cables of the same conductor count and wire size.
Characteristic Impedance: (NQP Paired Cables)	Ranges from 150 ohms to 45 ohms, dependent on wire size (AWG), geometry and drive method. Consult our technical staff for data on specific cable types.

MULTI-CONDUCTOR STOCK CABLED SINGLES

UNSHIELDED CABLES

OVERALL SHIELDED CABLES

Part No.	No. Cond.	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O/A Diam.	Wgt. LB/M'
NQ-228 J	2	28	.034	.031	.135	8
NQ-328 J	3	28	.034	.031	.142	9
NQ-428 J	4	28	.034	.031	.150	11
NQ-528 J	5	28	.034	.031	.161	12
NQ-628 J	6	28	.034	.031	.171	13
NQ-728 J	7	28	.034	.031	.171	14
NQ-828 J	8	28	.034	.031	.196	19
NQ-928 J	9	28	.034	.031	.206	22
NQ-1028 J	10	28	.034	.031	.206	23
NQ-1228 J	12	28	.034	.031	.212	25
NQ-1528 J	15	28	.034	.031	.231	28
NQ-1928 J	19	28	.034	.031	.241	33
NQ-2728 J	27	28	.034	.031	.282	42
NQ-3728 J	37	28	.034	.031	.311	55

NQ-226 J	2	26	.038	.031	.144	9
NQ-326 J	3	26	.038	.031	.150	11
NQ-426 J	4	26	.038	.031	.160	13
NQ-526 J	5	26	.038	.031	.171	15
NQ-626 J	6	26	.038	.031	.183	17
NQ-726 J	7	26	.038	.031	.183	18
NQ-826 J	8	26	.038	.031	.210	23
NQ-926 J	9	26	.038	.031	.222	25
NQ-1026 J	10	26	.038	.031	.222	26
NQ-1226 J	12	26	.038	.031	.228	30
NQ-1526 J	15	26	.038	.031	.249	35
NQ-1926 J	19	26	.038	.031	.261	42
NQ-2726 J	27	26	.038	.031	.306	55
NQ-3726 J	37	26	.038	.031	.339	70
NQ-4826 J	48	26	.038	.031	.384	92

Part No.	No. Cond.	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O/A Diam.	Wgt. LB/M'
NQ-228 SJ	2	28	.034	.031	.159	16
NQ-328 SJ	3	28	.034	.031	.165	17
NQ-428 SJ	4	28	.034	.031	.173	20
NQ-528 SJ	5	28	.034	.031	.184	21
NQ-628 SJ	6	28	.034	.031	.194	23
NQ-728 SJ	7	28	.034	.031	.194	24
NQ-828 SJ	8	28	.034	.031	.219	31
NQ-928 SJ	9	28	.034	.031	.229	35
NQ-1028SJ	10	28	.034	.031	.229	36
NQ-1228SJ	12	28	.034	.031	.235	38
NQ-1528SJ	15	28	.034	.031	.254	42
NQ-1928SJ	19	28	.034	.031	.264	48
NQ-2728SJ	27	28	.034	.031	.305	60
NQ-3738SJ	37	28	.034	.031	.333	75

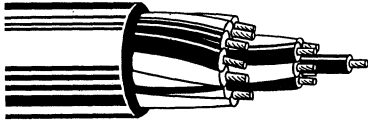
NQ-226 SJ	2	26	.038	.031	.167	17
NQ-326 SJ	3	26	.038	.031	.173	20
NQ-426 SJ	4	26	.038	.031	.183	22
NQ-526 SJ	5	26	.038	.031	.194	25
NQ-626 SJ	6	26	.038	.031	.205	28
NQ-726 SJ	7	26	.038	.031	.205	29
NQ-826 SJ	8	26	.038	.031	.233	36
NQ-926 SJ	9	26	.038	.031	.245	39
NQ-1026SJ	10	26	.038	.031	.245	40
NQ-1226SJ	12	26	.038	.031	.251	44
NQ-1526SJ	15	26	.038	.031	.272	51
NQ-1926SJ	19	26	.038	.031	.284	58
NQ-2726SJ	27	26	.038	.031	.329	75
NQ-3726SJ	37	26	.038	.031	.362	92
NQ-4826SJ	48	26	.038	.031	.407	117

(continued on following page)

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



(NQ1928J shown)

Miniature Signal & Control Cables Single Conductors (NQ Series)

**EXTRA FLEXIBLE —
GRAY PVC JACKET**

MIL-SPEC & U.L. LISTED

STYLE 2464

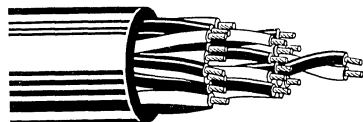
MULTI-CONDUCTOR STOCK CABLED SINGLES continued from previous page.

UNSHIELDED CABLES							OVERALL SHIELDED CABLES						
Part No.	No. Cond.	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O/A Diam.	Wght. LB/M'	Part No.	No. Cond.	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O/A Diam.	Wght. LB/M'
NQ-224 J	2	24	.043	.031	.154	11	NQ-224 SJ	2	24	.043	.031	.177	20
NQ-324 J	3	24	.043	.031	.161	13	NQ-324 SJ	3	24	.043	.031	.184	22
NQ-424 J	4	24	.043	.031	.172	15	NQ-424 SJ	4	24	.043	.031	.195	25
NQ-524 J	5	24	.043	.031	.185	18	NQ-524 SJ	5	24	.043	.031	.208	29
NQ-624 J	6	24	.043	.031	.198	21	NQ-624 SJ	6	24	.043	.031	.221	33
NQ-724 J	7	24	.043	.031	.198	23	NQ-724 SJ	7	24	.043	.031	.221	35
NQ-824 J	8	24	.043	.031	.229	27	NQ-824 SJ	8	24	.043	.031	.252	41
NQ-924 J	9	24	.043	.031	.242	30	NQ-924 SJ	9	24	.043	.031	.265	45
NQ-1024 J	10	24	.043	.031	.242	32	NQ-1024SJ	10	24	.043	.031	.265	47
NQ-1224 J	12	24	.043	.031	.249	37	NQ-1224SJ	12	24	.043	.031	.272	53
NQ-1524 J	15	24	.043	.031	.273	44	NQ-1524SJ	15	24	.043	.031	.296	61
NQ-1924 J	19	24	.043	.031	.286	53	NQ-1924SJ	19	24	.043	.031	.309	71
NQ-2724 J	27	24	.043	.031	.337	70	NQ-2724SJ	27	24	.043	.031	.360	92
NQ-3724 J	37	24	.043	.031	.374	93	NQ-3724SJ	37	24	.043	.031	.397	118
NQ-4824 J	48	24	.043	.031	.425	120	NQ-4824SJ	48	24	.043	.031	.453	148
NQ-6024 J	60	24	.043	.031	.462	145	NQ-6024SJ	60	24	.043	.031	.490	176
NQ-222 J	2	22	.050	.031	.166	13	NQ-222 SJ	2	22	.050	.031	.189	23
NQ-322 J	3	22	.050	.031	.174	17	NQ-322 SJ	3	22	.050	.031	.197	27
NQ-422 J	4	22	.050	.031	.186	20	NQ-422 SJ	4	22	.050	.031	.209	31
NQ-522 J	5	22	.050	.031	.201	25	NQ-522 SJ	5	22	.050	.031	.224	37
NQ-622 J	6	22	.050	.031	.216	28	NQ-622 SJ	6	22	.050	.031	.239	41
NQ-722 J	7	22	.050	.031	.216	31	NQ-722 SJ	7	22	.050	.031	.239	44
NQ-822 J	8	22	.050	.031	.251	36	NQ-822 SJ	8	22	.050	.031	.274	52
NQ-922 J	9	22	.050	.031	.266	40	NQ-922 SJ	9	22	.050	.031	.289	57
NQ-1022 J	10	22	.050	.031	.266	43	NQ-1022SJ	10	22	.050	.031	.289	60
NQ-1222 J	12	22	.050	.031	.274	50	NQ-1222SJ	12	22	.050	.031	.297	67
NQ-1522 J	15	22	.050	.031	.301	60	NQ-1522SJ	15	22	.050	.031	.324	79
NQ-1922 J	19	22	.050	.031	.316	73	NQ-1922SJ	19	22	.050	.031	.339	93
NQ-2722 J	27	22	.050	.031	.374	100	NQ-2722SJ	27	22	.050	.031	.397	125
NQ-3722 J	37	22	.050	.031	.416	142	NQ-3722SJ	37	22	.050	.031	.434	169
NQ-4822 J	48	22	.050	.031	.474	169	NQ-4822SJ	48	22	.050	.031	.502	201
NQ-6022 J	60	22	.050	.031	.590	210	NQ-6022SJ	60	22	.050	.031	.618	245
NQ-220 J	2	20	.057	.031	.182	17	NQ-220 SJ	2	20	.057	.031	.205	28
NQ-320 J	3	20	.057	.031	.191	23	NQ-320 SJ	3	20	.057	.031	.214	35
NQ-420 J	4	20	.057	.031	.205	28	NQ-420 SJ	4	20	.057	.031	.228	41
NQ-520 J	5	20	.057	.031	.223	33	NQ-520 SJ	5	20	.057	.031	.246	47
NQ-620 J	6	20	.057	.031	.240	39	NQ-620 SJ	6	20	.057	.031	.263	54
NQ-720 J	7	20	.057	.031	.240	43	NQ-720 SJ	7	20	.057	.031	.263	58
NQ-820 J	8	20	.057	.031	.281	51	NQ-820 SJ	8	20	.057	.031	.304	69
NQ-920 J	9	20	.057	.031	.298	55	NQ-920 SJ	9	20	.057	.031	.321	74
NQ-1020 J	10	20	.057	.031	.298	60	NQ-1020SJ	10	20	.057	.031	.321	79
NQ-1220 J	12	20	.057	.031	.307	70	NQ-1220SJ	12	20	.057	.031	.330	90
NQ-1520 J	15	20	.057	.031	.339	85	NQ-1520SJ	15	20	.057	.031	.362	107
NQ-1920 J	19	20	.057	.031	.356	103	NQ-1920SJ	19	20	.057	.031	.379	126
NQ-2720 J	27	20	.057	.031	.423	143	NQ-2720SJ	27	20	.057	.031	.451	171
NQ-3720 J	37	20	.057	.031	.472	190	NQ-3720SJ	37	20	.057	.031	.500	221
NQ-218 J	2	18	.068	.031	.202	23	NQ-218 SJ	2	18	.068	.031	.225	35
NQ-318 J	3	18	.068	.031	.213	29	NQ-318 SJ	3	18	.068	.031	.236	42
NQ-418 J	4	18	.068	.031	.229	37	NQ-418 SJ	4	18	.068	.031	.252	51
NQ-518 J	5	18	.068	.031	.250	44	NQ-518 SJ	5	18	.068	.031	.273	60
NQ-618 J	6	18	.068	.031	.270	52	NQ-618 SJ	6	18	.068	.031	.293	69
NQ-718 J	7	18	.068	.031	.270	59	NQ-718 SJ	7	18	.068	.031	.293	76
NQ-818 J	8	18	.068	.031	.318	68	NQ-818 SJ	8	18	.068	.031	.341	88
NQ-918 J	9	18	.068	.031	.338	75	NQ-918 SJ	9	18	.068	.031	.361	97
NQ-1018 J	10	18	.068	.031	.338	82	NQ-1018SJ	10	18	.068	.031	.361	104
NQ-1218 J	12	18	.068	.031	.349	96	NQ-1218SJ	12	18	.068	.031	.372	119
NQ-1518 J	15	18	.068	.031	.386	117	NQ-1518SJ	15	18	.068	.031	.409	142
NQ-1918 J	19	18	.068	.031	.406	144	NQ-1918SJ	19	18	.068	.031	.434	171
NQ-2718 J	27	18	.068	.031	.484	206	NQ-2718SJ	27	18	.068	.031	.513	238

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



(NQP1928J shown)

Miniature Signal & Control Cables Twisted Pairs (NQP Series)

**EXTRA FLEXIBLE —
GRAY PVC JACKET**

MIL-SPEC & U.L. LISTED

STYLE 2464

GRAY PVC JACKET

National Wire & Cable Corporation manufactures a complete line of highly flexible micro-miniature low-voltage instrument control cable. These are available as cabled pairs or singles, with optional overall shield of either foil with drain or a braided shield.

Conductors are stranded tinned copper with .010" wall of tough extruded polyvinyl chloride primary insulation, rated for 300 volt use at +80°C under U. L. listed style 1061.* All are color coded using ten standard colors plus white with stripes per MIL-STD-681. Coded pairs use the same sequence as type NXP and NWP.

Conductors are planetary cabled and helically laid for optimum flexibility, with a barrier under braids. Shielded cables have a tinned copper braid of 90% coverage per MIL-C-7078, with braid angles below 40° for easy pushback; or have a 100% coverage foil shield in intimate contact with a drain wire for easy termination. See Section 3 of our master catalog for relative shield effectiveness.

Outer jacket is highly flexible abrasion-resistant gray polyvinyl chloride thermoplastic, meeting the requirements of U.L. listed style 2464.**

All materials are flame retardant and fungus resistant. Standard Putups: 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

* Wire also meets MIL-W-16878 type B, rated 600 volts, +105°C.

** Jacket material is military rated for +105°C; meets MIL-I-631, Class F.

TECHNICAL DATA (all cables)

Insulation break-down voltage:	Greater than 3000 volts AC RMS, 60cps.
Capacitance:	Nominal capacitance from a wire to all else in a cable ranges from 25 to 45 pF/ft at 1kc, depending on gauge and position.
Insulation Leakage:	200 megohms/1000 feet minimum @ 500VDC from conductor to all else in cable.
Sheath Leakage:	10 megohms/1000 feet minimum @ 500VDC from shield or conductor group through sheath to ground.
Temperature Range:	U.L. rating: +80°C per U.L. style 2464. Military: Continuous use from -40°C to +105°C.
Bending Characteristics:	All cables are suitable for flexing to a circle diameter of 6 cable diameters from +105°C to -20°C. Recommended flex diameter should be greater than 20 cable diameters for flexing at -40°. For continuous flexing applications consult the factory.
Foil Shielded Cables:	The nominal overall diameter of foil shielded cables will be .006" greater than the non-shielded cables of the same conductor count and wire size.
Characteristic Impedance: (NQP Paired Cables)	Ranges from 150 ohms to 45 ohms, dependent on wire size (AWG), geometry and drive method. Consult our technical staff for data on specific cable types.

MULTI-CONDUCTOR STOCK CABLED SINGLES

UNSHIELDED CABLES

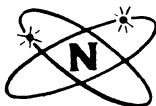
Part No.	No. Cond.	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O/A Diam.	Wght. LB/M'
NQP- 228J	2	28	.034	.031	.206	15
NQP- 328J	3	28	.034	.031	.217	16
NQP- 428J	4	28	.034	.031	.234	20
NQP- 528J	5	28	.034	.031	.255	23
NQP- 628J	6	28	.034	.031	.276	29
NQP- 728J	7	28	.034	.031	.276	28
NQP- 828J	8	28	.034	.031	.325	34
NQP- 928J	9	28	.034	.031	.346	41
NQP-1028J	10	28	.034	.031	.346	39
NQP-1228J	12	28	.034	.031	.357	43
NQP-1528J	15	28	.034	.031	.395	55
NQP-1928J	19	28	.034	.031	.416	61
NQP- 226J	2	26	.038	.031	.222	20
NQP- 326J	3	26	.038	.031	.234	21
NQP- 426J	4	26	.038	.031	.253	26
NQP- 526J	5	26	.038	.031	.277	34
NQP- 626J	6	26	.038	.031	.300	37
NQP- 726J	7	26	.038	.031	.300	38
NQP- 826J	8	26	.038	.031	.355	52
NQP- 926J	9	26	.038	.031	.370	60
NQP-1026J	10	26	.038	.031	.370	51
NQP-1226J	12	26	.038	.031	.382	59
NQP-1526J	15	26	.038	.031	.420	75
NQP-1926J	19	26	.038	.031	.441	85
NQP-2726J	27	26	.038	.031	.530	115

OVERALL SHIELDED CABLES

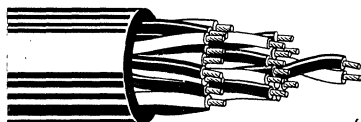
Part No.	No. Cond.	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O/A Diam.	Wght. LB/M'
NQP- 228SJ	2	28	.034	.031	.229	28
NQP- 328SJ	3	28	.034	.031	.240	29
NQP- 428SJ	4	28	.034	.031	.257	35
NQP- 528SJ	5	28	.034	.031	.278	37
NQP- 628SJ	6	28	.034	.031	.299	46
NQP- 728SJ	7	28	.034	.031	.299	45
NQP- 828SJ	8	28	.034	.031	.348	55
NQP- 928SJ	9	28	.034	.031	.369	63
NQP-1028SJ	10	28	.034	.031	.369	61
NQP-1228SJ	12	28	.034	.031	.380	66
NQP-1528SJ	15	28	.034	.031	.423	81
NQP-1928SJ	19	28	.034	.031	.444	88
NQP- 226SJ	2	26	.038	.031	.245	34
NQP- 326SJ	3	26	.038	.031	.257	36
NQP- 426SJ	4	26	.038	.031	.276	42
NQP- 526SJ	5	26	.038	.031	.300	52
NQP- 626SJ	6	26	.038	.031	.323	56
NQP- 726SJ	7	26	.038	.031	.323	57
NQP- 826SJ	8	26	.038	.031	.378	75
NQP- 926SJ	9	26	.038	.031	.393	85
NQP-1026SJ	10	26	.038	.031	.393	76
NQP-1226SJ	12	26	.038	.031	.405	84
NQP-1526SJ	15	26	.038	.031	.448	103
NQP-1926SJ	19	26	.038	.031	.469	115
NQP-2726SJ	27	26	.038	.031	.558	152

(continued on following page)

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



(NQP1928J shown)

Miniature Signal & Control Cables Twisted Pairs (NQP Series)

**EXTRA FLEXIBLE —
GRAY PVC JACKET**

MIL-SPEC & U.L. LISTED

STYLE 2464

MULTI-CONDUCTOR STOCK CABLED SINGLES continued from previous page.

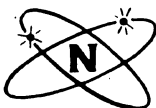
UNSHIELDED CABLES

Part No.	No. Cond.	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O/A Diam.	Wght. LB/M'
NQP- 224J	2	24	.043	.031	.242	24
NQP- 324J	3	24	.043	.031	.256	26
NQP- 424J	4	24	.043	.031	.277	32
NQP- 524J	5	24	.043	.031	.304	40
NQP- 624J	6	24	.043	.031	.330	46
NQP- 724J	7	24	.043	.031	.330	47
NQP- 824J	8	24	.043	.031	.392	65
NQP- 924J	9	24	.043	.031	.410	75
NQP-1024J	10	24	.043	.031	.410	65
NQP-1224J	12	24	.043	.031	.423	74
NQP-1524J	15	24	.043	.031	.471	95
NQP-1924J	19	24	.043	.031	.497	108
NQP-2724J	27	24	.043	.031	.590	141
NQP- 222J	2	22	.050	.031	.266	30
NQP- 322J	3	22	.050	.031	.282	33
NQP- 422J	4	22	.050	.031	.306	42
NQP- 522J	5	22	.050	.031	.336	51
NQP- 622J	6	22	.050	.031	.366	62
NQP- 722J	7	22	.050	.031	.366	64
NQP- 822J	8	22	.050	.031	.436	87
NQP- 922J	9	22	.050	.031	.466	100
NQP-1022J	10	22	.050	.031	.466	88
NQP-1222J	12	22	.050	.031	.472	102
NQP-1522J	15	22	.050	.031	.526	131
NQP-1922J	19	22	.050	.031	.556	143
NQP-2722J	27	22	.050	.031	.662	198
NQP- 220J	2	20	.057	.031	.298	39
NQP- 320J	3	20	.057	.031	.317	45
NQP- 420J	4	20	.057	.031	.344	57
NQP- 520J	5	20	.057	.031	.379	70
NQP- 620J	6	20	.057	.031	.414	85
NQP- 720J	7	20	.057	.031	.414	89
NQP- 820J	8	20	.057	.031	.495	121
NQP- 920J	9	20	.057	.031	.518	139
NQP-1020J	10	20	.057	.031	.518	124
NQP-1220J	12	20	.057	.031	.537	144
NQP-1520J	15	20	.057	.031	.599	176
NQP-1920J	19	20	.057	.031	.634	205
NQP- 218J	2	18	.068	.031	.338	52
NQP- 318J	3	18	.068	.031	.360	60
NQP- 418J	4	18	.068	.031	.392	77
NQP- 518J	5	18	.068	.031	.433	96
NQP- 618J	6	18	.068	.031	.474	117
NQP- 718J	7	18	.068	.031	.474	122
NQP-1218J	12	18	.068	.031	.618	188

OVERALL SHIELDED CABLES

Part No.	No. Cond.	Cond. AWG	Cond. Diam.	Jkt. Wall	Nom. O/A Diam.	Wght. LB/M'
NQP- 224SJ	2	24	.043	.031	.265	39
NQP- 324SJ	3	24	.043	.031	.279	42
NQP- 424SJ	4	24	.043	.031	.300	50
NQP- 524SJ	5	24	.043	.031	.327	59
NQP- 624SJ	6	24	.043	.031	.353	67
NQP- 724SJ	7	24	.043	.031	.353	68
NQP- 824SJ	8	24	.043	.031	.415	91
NQP- 924SJ	9	24	.043	.031	.433	102
NQP-1024SJ	10	24	.043	.031	.433	92
NQP-1224SJ	12	24	.043	.031	.451	102
NQP-1524SJ	15	24	.043	.031	.499	127
NQP-1924SJ	19	24	.043	.031	.525	142
NQP-2724SJ	27	24	.043	.031	.618	185
NQP- 222SJ	2	22	.050	.031	.289	47
NQP- 322SJ	3	22	.050	.031	.305	51
NQP- 422SJ	4	22	.050	.031	.329	62
NQP- 522SJ	5	22	.050	.031	.359	73
NQP- 622SJ	6	22	.050	.031	.389	86
NQP- 722SJ	7	22	.050	.031	.389	88
NQP- 822SJ	8	22	.050	.031	.464	116
NQP- 922SJ	9	22	.050	.031	.494	131
NQP-1022SJ	10	22	.050	.031	.484	119
NQP-1222SJ	12	22	.050	.031	.500	134
NQP-1522SJ	15	22	.050	.031	.554	167
NQP-1922SJ	19	22	.050	.031	.584	180
NQP-2722SJ	27	22	.050	.031	.690	245
NQP- 220SJ	2	20	.057	.031	.321	58
NQP- 320SJ	3	20	.057	.031	.340	65
NQP- 420SJ	4	20	.057	.031	.367	79
NQP- 520SJ	5	20	.057	.031	.402	95
NQP- 620SJ	6	20	.057	.031	.437	112
NQP- 720SJ	7	20	.057	.031	.437	116
NQP- 820SJ	8	20	.057	.031	.523	154
NQP- 920SJ	9	20	.057	.031	.546	174
NQP-1020SJ	10	20	.057	.031	.546	159
NQP-1220SJ	12	20	.057	.031	.565	181
NQP-1520SJ	15	20	.057	.031	.627	216
NQP-1920SJ	19	20	.057	.031	.662	248
NQP- 218SJ	2	18	.068	.031	.361	74
NQP- 318SJ	3	18	.068	.031	.383	83
NQP- 418SJ	4	18	.068	.031	.415	103
NQP- 518SJ	5	18	.068	.031	.461	124
NQP- 618SJ	6	18	.068	.031	.502	148
NQP- 718SJ	7	18	.068	.031	.502	153
NQP-1218SJ	12	18	.068	.031	.646	230

NATIONAL WIRE AND CABLE CORPORATION



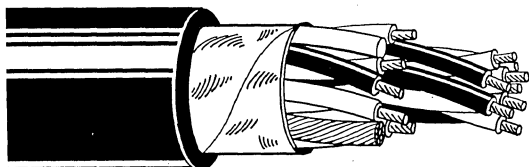
136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569

Manufactured by our affiliate,
Dynatronic Cable Engineering Corp.

THE D-200 SERIES CABLES ARE MULTIPLE-PAIR FLEXIBLE CABLES DESIGNED FOR TRANSMISSION OF DIGITAL PULSE SIGNALS BETWEEN A COMPUTER AND ITS PERIPHERAL EQUIPMENT.

UL LISTED
U.S. Pat. No. 3489844

D-200 XX (XX designates number of pairs)



D-200 XXRF

DESIGN FEATURES OF THE D-200 SERIES DIGITAL DATA CABLE

Unlike conventional flexible cable construction, the primary features offered by the D-200 series data cable are the high and accurately controlled characteristic impedance of every pair, regardless of its position in the cable and special geometry chosen to reduce crosstalk.

ADVANTAGES

1. Less crosstalk and noise from mismatched loads, due to proper matching.
2. Uniform light loading on drivers allows direct I.C. drive, accurate prediction of current demands from power supply, and driver power dissipation.
3. Proper load match reduces re-reflection and inversion noise where driver end is not matched to line. (Typical of TTL.)
4. Special geometry and pair construction provides exceptionally close capacitance balance between pair wires, reducing differential crosstalk.

USAGE

We recommend use of balanced drive and differential-input line receivers for lowest crosstalk and best pulse-reduction, utilizing the 110 ohm balanced impedance of the pairs. With such a system, TTL and MECL speeds have been used on D-200 cable at 1 mc data rates over 1000 ft.

Where the system is single-ended drive and receive, all pairs exhibit the 78 ohm impedance. Since these line receivers cannot discriminate between noise and the desired signal, crosstalk limits the cable distance over which transmission is reliable. Typical runs for DTL having 50 ns risetimes are 200 ft. Where risetimes can be slowed to longer than 100 ns, run lengths are practical to 500 ft. Without differential line reception, runs over 500 ft are not recommended for D-200 cable due to external noise aspects.

The D-210 series cable are recommended for high noise or long-run application. (Utilizing individual shields.)

Although use of balanced drive and differential line reception will avoid most noise problems, there are some installations where the expected external noise is unknown but assumed to be very great. Here, the use of data cables

Digital Data Transmission Cables (D-200 Series)

Low Voltage Computer Cable

having individually-shielded pairs may be considered as conservative engineering practice. The assurance of a lower received noise may justify the increased size, cost and rise-time.

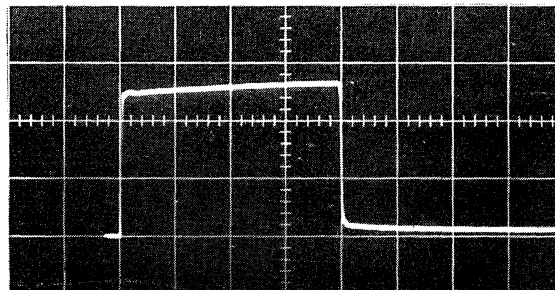
For these high noise-long run applications, Dynatronic Cable Engineering Corp has developed the D-210 series data cables. Electrical performance is essentially the same as the D-200 series cables, which use only an overall shield. An overall tinned-copper shield braid may be specified on either series by the suffix -RF on the part number. Standard D-200 shield is aluminum-mylar foil.

For runs of 1000-5000 ft. or where extra-fast output pulse risetime is required, we offer the D-220 series cable: a larger version of the D-200 series having improved transmission properties with sufficient mechanical strength for long pulls in conduit. Consult factory for technical data.

PULSE TRANSMISSION LOSS in D-series data cables causes a moderate amplitude loss, with definite rounding of the leading and trailing edges from 50% to 90% amplitude. The photos below (for a 1.25 megabit clock rate) show typical waveforms. The D-220 and D-222 series cables offer even lower losses than the D-200 or D-210 cables for long-run or fast-clocked applications.

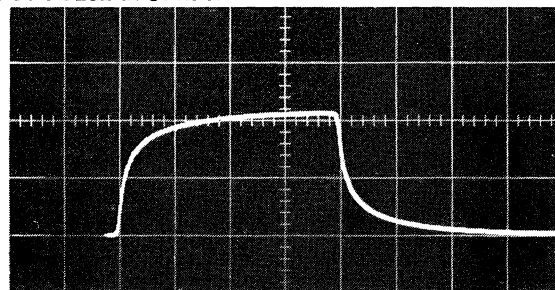
Contact our factory engineering staff for detailed pulse-shape versus distance information, or for special applications.

INPUT PULSE



Horizontal: 200. ns/cm
Vertical : 2. volts/cm

OUTPUT PULSE at 500.FT.



Horizontal: 200. ns/cm
Vertical : 2. volts/cm

NATIONAL WIRE AND CABLE CORPORATION



Digital Data Transmission Cables (D-200 Series continued)

Low Voltage Computer Cable

136 San Fernando Rd., Los Angeles, Calif. 90031

Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569

Manufactured by our affiliate, Dynatronic Cable Engineering Corp.

STANDARD DATA CABLE CONSTRUCTIONS — D-200 SERIES

Part No.	No. of Pairs	Cond. AWG.	Delay NS/FT	Cable Diam.	Weight (Lbs. per M Ft.)	UL Style No.
D-200-15	15	24	1.61	.510"	120.	2448
D-200-20	20	24	1.61	.635"	160.	2448
D-200-24	24	24	1.61	.660"	180.	2448
D-200-27	27	24	1.61	.690"	210.	2448
D-200-30	30	24	1.61	.710"	230.	2448
D-200-33	33	24	1.61	.750"	250.	2448
D-200-42	42	24	1.61	.840"	280.	2448
D-200-50	50	24	1.61	.910"	320.	2448

TECHNICAL DATA

All items available in 50 ft. multiples.

Characteristic	Balanced	Single-ended*
Characteristic Impedance	110. ohms $\pm 5\%$	78. ohms $\pm 4\%$
Capacitance	14. pf/ft.	21. pf/ft.
Signal Delay	1.61 ns/ft.	1.61 ns/ft.
DC Resistance/100 ft.	5.6 ohms loop	2.8 ohms
Insulation Breakdown	6. KV min. DC	6. KV min. DC
Insulation Resistance	> 1000. megohms/M'	> 1000. megohms/M'
Temperature Range	-20. C up to +80. C	
Min. Bend Radius	6 x cable diameter	

*One conductor of each pair tied to common.

STANDARD DATA CABLE CONSTRUCTIONS — D-210 SERIES INDIVIDUALLY SHIELDED DATA PAIRS

Part No.	No. of Pairs	Z ₀	Delay NS/FT	Cond. AWG.	Cable Diam.	Sheath
D-210-1	1	110.	1.61	24	.220	PVC
D-210-12	12	110.	1.61	24	.980	PVC
D-210-15	15	110.	1.61	24	1.06	PVC
D-210-20	20	110.	1.61	24	1.20	PVC
D-210-30	30	110.	1.61	24	1.42	PVC
D-210-40	40	110.	1.61	24	1.69	PVC
D-210-48	48	110.	1.61	24	1.76	PVC

TECHNICAL DATA

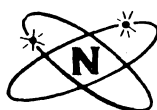
All items available in 50 ft. multiples.

Characteristic	Balanced**	Single-ended*
Characteristic Impedance	110. ohms $\pm 5\%$	63. ohms $\pm 4\%$
Capacitance	14. pf/ft.	23.5 pf/ft.
Signal Delay	1.61 ns/ft.	1.61 ns/ft.
DC Resistance/100 ft.	5.6 ohms loop	2.8 ohms
Insulation Breakdown	6. KV min. DC	6. KV min. DC
Insulation Resistance	> 1000. megohms/M'	> 1000. megohms/M'
Temperature Range	-20. C up to +80. C	
Min. Bend Radius	9 x cable diameter	

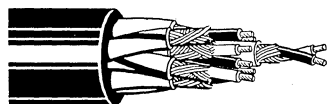
**Both driven, one inverted. *One conductor of each pair tied to common.

We invite your telephone inquiries for technical information on data cables. Contact Mr. Frank Motley or Mr. Ralph Wells in our Engineering Dept.

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



(NTP722J shown)

Military & U.L. RFI Shielded Pair Cables (NTP Series)

MEETS U.L. STYLE-2343 OR 2344 FOR COMPUTER USE.

INDIVIDUALLY SHIELDED & JACKETED PAIRS

National Wire & Cable Corporation manufactures a complete line of flexible multi-pair cables in which each pair is individually twisted, shielded and plastic-jacketed.

Provides a minimum of crosstalk between signal channels, plus complete isolation between shields. Excellent for analog signals. All jackets moisture-proof. Suitable for use in duct, conduit, aerial or burial installations.

Conductors are stranded tinned copper with .010" vinyl primary insulation, plus .004" nylon insulation over the vinyl per MIL-W-16878 Type B. Insulation for 600 volts working rating at 105°C. Color coded: White and black (all conductors are 19 strand.)

Shielding is tinned copper braid with 90% minimum coverage per MIL-C-7078, and shield angle below 40 degrees for easy push-back.

Jackets over shields are extruded 105°C white polyvinyl chloride plastic per MIL-I-631, Class F; Color coded with stripes per MIL-STD-681, starting with 9. All pairs are planetary cabled and contra-helically laid with a mylar tape serve over the cable bundle. The overall sheath is abrasion-resistant black 105°C vinyl thermoplastic per MIL-I-631, Class F.

Optional overall shielding of cabled bundle is 90% minimum coverage of tinned copper braid applied per MIL-C-7078 over the tape serve under sheath.

Standard Putups: 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

WITHOUT OVERALL SHIELD

Part No.	No. Pairs	Cond. AWG	Jacket Thick.	Cable O.D.	Weight Per M'
NTP-722J	7	22	.062	.625	260 Lbs.
NTP-1222J	12	22	.070	.820	435 Lbs.
NTP-1922J	19	22	.080	.980	660 Lbs.
NTP-2722J	27	22	.080	1.15	910 Lbs.
NTP-3722J	37	22	.085	1.200	1,200 Lbs.
NTP-4822J	48	22	.090	1.520	1,570 Lbs.
NTP-720J	7	20	.070	.685	300 Lbs.
NTP-1220J	12	20	.080	.890	500 Lbs.
NTP-1920J	19	20	.080	1.065	755 Lbs.
NTP-2720J	27	20	.085	1.270	1,055 Lbs.
NTP-3720J	37	20	.090	1.445	1,400 Lbs.
NTP-716J	7	16	.075	.845	430 Lbs.
NTP-1216J	12	16	.080	1.105	700 Lbs.
NTP-1916J	19	16	.085	1.325	1,075 Lbs.

STANDARD CONSTRUCTIONS

WITH OVERALL SHIELD

Part No.	No. Pairs	Cond. AWG	Jacket Thick.	Cable O.D.	Weight Per M'
NTP-722SJ	7	22	.062	.650	310 Lbs.
NTP-1222SJ	12	22	.070	.845	500 Lbs.
NTP-1922SJ	19	22	.075	1.005	700 Lbs.
NTP-2722SJ	27	22	.080	1.120	1,000 Lbs.
NTP-3722SJ	37	22	.085	1.355	1,290 Lbs.
NTP-4822SJ	48	22	.090	1.545	1,700 Lbs.
NTP-720SJ	7	20	.070	.710	355 Lbs.
NTP-1220SJ	12	20	.080	.920	570 Lbs.
NTP-1920SJ	19	20	.080	1.090	840 Lbs.
NTP-2720SJ	27	20	.085	1.295	1,155 Lbs.
NTP-3720SJ	37	20	.090	1.470	1,500 Lbs.
NTP-716SJ	7	16	.080	.870	500 Lbs.
NTP-1216SJ	12	16	.080	1.130	795 Lbs.
NTP-1916SJ	19	16	.085	1.350	1,185 Lbs.

High Temperature "Teflon"® Insulated Cables (NZ Series)

MIL-SPEC FOR ROUGH USAGE & EXTREME ENVIRONMENTS

National Wire & Cable Corp., manufactures a standard line of TEFLON®-INSULATED multi-conductor signal and control cables designed for extreme environments and rough usage.

Construction is widely used in aerospace and industrial applications requiring a near-ultimate in cable physical and electrical performance plus high reliability.

Conductors are stranded silver-plated copper, insulated with .010" of extruded TFE Teflon®; rated at 600 volts working from -65°C to +260°C per MIL-W-16878 Type E. Conductors are color coded using 10 standard colors plus spiral stripes on white per MIL-STD-681. (All conductors are 19 strand.)

All conductors are planetary cabled and contra-helically laid for optimum flexibility, with a Mylar tape wrap over the cabled bundle. The outer sheath is abrasion-resistant black Neoprene per MIL-S-6855, Class 2, Grade 60.

Optional overall shield is a 90% coverage tinned copper braid over the tape wrap per MIL-C-7078.

Standard Putups: 500 and 1000 ft. No-deposit reels. For shorter quantities or specific lengths, consult factory.

© Trademark, E. I. DuPont Co.

TECHNICAL DATA

Insulation Breakdown Voltage: Greater than 4000 volts RMS, 60 Hz.

Capacitance: Nominal capacitance from a wire to all else in cable ranges from 25 to 45 mmfd/ft. dependent on gauge and position in cable bundle.

Insulation Leakage Resistance: 5000 Megohms per 1000 ft.; minimum from any wire to all else in cable.

Sheath Leakage Resistance: 20 Megohms/ft. minimum; from shield through sheath to saline bath after 24 hr. at 25°C.

Usable Temperature Range: Suitable for continuous use from -55°C to +75°C in flexing service or stored.

Cold Bending Capability: All cables are suitable for bending to a circle diameter as small as 4 times their diameter from -55°C to +75°C. Continuous flexing to less than 6 times diameter is not recommended below -40°C.

General Performance: All materials are self-extinguishing after exposure to flame. Non-nutrient to fungus. Highly resistant to ozone, oils, mild acids and bases, high humidity.

WITHOUT OVERALL SHIELD

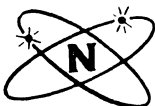
Part No.	No. Cond.	Cond. AWG	Jacket Thick.	Cable O.D.	Weight Per M'
NZ-720J	7	20	.062	.300	70 Lbs.
NZ-1220J	12	20	.062	.365	100 Lbs.
NZ-1920J	19	20	.078	.445	145 Lbs.
NZ-2720J	27	20	.078	.505	210 Lbs.
NZ-3720J	37	20	.093	.590	260 Lbs.
NZ-4820J	48	20	.093	.650	330 Lbs.
NZ-6020J	60	20	.093	.705	400 Lbs.
NZ-716J	7	16	.062	.355	95 Lbs.
NZ-1216J	12	16	.078	.470	160 Lbs.
NZ-1916J	19	16	.078	.540	235 Lbs.
NZ-2716J	27	16	.093	.655	325 Lbs.
NZ-3716J	37	16	.093	.720	435 Lbs.
NZ-4816J	48	16	.093	.805	545 Lbs.

STANDARD CONSTRUCTIONS

WITH OVERALL SHIELD

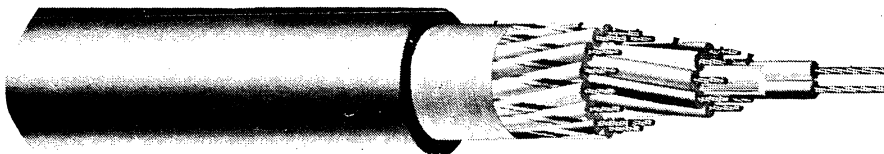
Part No.	No. Cond.	Cond. AWG	Jacket Thick.	Cable O.D.	Weight Per M'
NZ-720SJ	7	20	.062	.325	80 Lbs.
NZ-1220SJ	12	20	.062	.400	115 Lbs.
NZ-1920SJ	19	20	.078	.470	165 Lbs.
NZ-2720SJ	27	20	.078	.535	240 Lbs.
NZ-3720SJ	37	20	.093	.616	300 Lbs.
NZ-4820SJ	48	20	.093	.675	370 Lbs.
NZ-6020SJ	60	20	.093	.730	450 Lbs.
NZ-716SJ	7	16	.062	.380	110 Lbs.
NZ-1216SJ	12	16	.078	.495	190 Lbs.
NZ-1916SJ	19	16	.078	.565	270 Lbs.
NZ-2716SJ	27	16	.093	.680	370 Lbs.
NZ-3716SJ	37	16	.093	.745	485 Lbs.
NZ-4816SJ	48	16	.093	.830	605 Lbs.

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569

Complete Wire & Cable Mill Facilities To Meet Your Needs!



TRY OUR SERVICE, AND SEE!

NATIONAL WIRE & CABLE CORPORATION IS UNIQUE AMONG THE LEADING MANUFACTURERS OF CONTROL AND INSTRUMENTATION CABLE FOR THE ELECTRONIC AND AEROSPACE INDUSTRY. **UNIQUE, DUE TO OUR HUGE WIRE INVENTORY** — OVER 100 MILLION FEET IN STOCK — WHICH ALLOWS VERY RAPID DELIVERY OF CABLE, AND EXCELLENT SERVICE TO OUR WIRE CUSTOMERS.

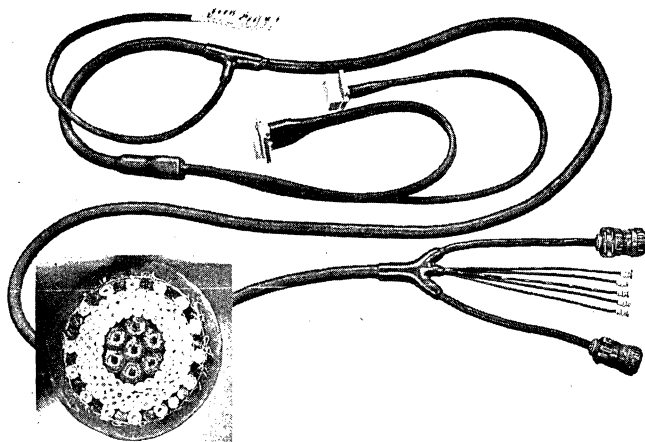
Custom Made Cable to Your Specifications

AVAILABLE PROMPTLY — AND AT LOWER COST THAN YOU MAY SUPPOSE—BECAUSE NATIONAL WIRE HAS:

1. The organization & experience to handle short-runs or rush schedules with consistent quality
2. All types of mill machinery for fabricating cable and all intermediate operations.
3. An enormous wire inventory to draw from for material for your cable (over 100 million feet in stock)
4. Technical consultants to aid you in properly specifying your cable needs and construction

COMPLETE FACILITIES FOR FABRICATING ALL CONSTRUCTIONS

- COPPER CONDUCTOR FABRICATION
- CONDUCTOR INSULATION EXTRUSION
- INSULATION CODING & STRIPPING
- ELECTRICAL SHIELDING
- TWISTING & SUBCABLE FABRICATION
- PLANETARY CABLE FABRICATION
- CABLE SHEATH EXTRUSION
- CABLE ASSEMBLY FABRICATION

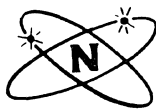


Mr. DESIGNER: May we suggest

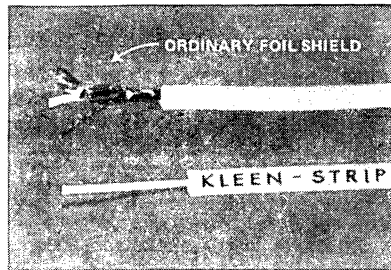
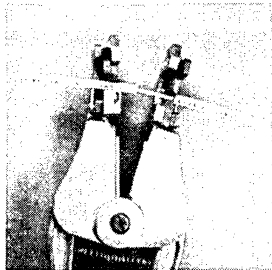
- A. Request a copy of our complete Master Catalog. Write to us on your company letterhead or phone us directly in Los Angeles with your request
Then . . .
- B. Check our catalog section and the instrumentation cable section for any of our standard stock cables which may meet your needs.
- C. Review our cable designer's check list in the "Technical Information" section of the Master Catalog. Note any topics on which you may need information or recommendations.
- D. Call National Wire & Cable Corp. (213-225-5611) and discuss your needs with our Technical Consultants. They speak your language and will have the answers you need.
- E. Our Consultants will assist you in design, obtain cost and delivery information, and provide formal quotations and drawings, and assist with sales and procurement liaison.
- F. Send us your prints for your custom cables for review and quotation. Where necessary, National Wire and Cable will provide engineering at no cost to fit your needs.

CONTACT NATIONAL WIRE & CABLE CORPORATION OR OUR REPRESENTATIVE FOR ACTION

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569



National Wire and Cable Corporation manufactures a full line of small shielded instrumentation cables using our "NAFOIL KLEEN-STRIP" self stripping foil shield construction, plus non-fraying NABOND bonded stranded conductors.

Since the foil shield of "NAFOIL KLEEN-STRIP" is integrally fusion-bonded to the cable jacket, stripping the jacket from the end of the cable automatically removes the foil shield in the same operation.

This eliminates hand untwisting and trimming of foil shields. Excellent for automatic machine stripping.

Insulated conductor and "drain" wire use National's "NABOND" bonded stranded wire which eliminates frayed wire ends. The "NABOND" process lightly bonds the tinning of all strands. "NABOND" wire acts like a solid wire during stripping and wiring operations. Subsequent flexure breaks the bonding and the wire returns to its flexible condition. Offers the convenience of solid wire during manufacture, with the reliability of stranded wire for normal use.

All wires are stranded, bonded, tinned copper with .010" vinyl insulation for use up to +80°C @ 300 volts (U.L. Style 1061). Also rated 105°C @ 600 volts per MIL-W-16878/1.

Foil shield is ½ MIL Mylar with .00035" Aluminum, 50% overlap. Bare drain wire is the same as used in insulated conductors.

Overall jacket is 105 C. polyvinyl chloride thermoplastic per MIL-I-631 Class B and exceeds U.L. requirements. Jacket wall thickness .031". For extra flexible applications, these cables are also available with .002 jacket wall.

Nafoil Kleen-Strip® Foil-Shielded Audio & Instrumentation Cables (NKS Series)

COMPUTER GRADE U.L. LISTED SELF-STRIPPING FOIL SHIELD

Self stripping feature saves preparation
time . . . increases production.

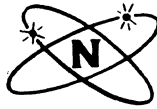
TECHNICAL DATA

U.L. Voltage Rating:	300. Volts RMS AC (U.L. Style 1061)
Military Rating:	600. Volts RMS AC (Mil-W-16878/1)
Breakdown Voltage:	Greater than 3000. Volts RMS AC
Insulation	Higher than 200. Megohms per 1000 ft at 500. V.D.C. from any conductor to all else.
Leakage Resistance:	
Jacket	Higher than 10 Megohms per 1000 ft at 500. V.D.C. from shield through Jacket to water bath.
Leakage Resistance:	
Capacitance:	See Table Below.
Shield Leakage	Nominal "Look-Through" capacitance from conductor group through the shield to water bath is less than 2.pf/1000 ft. Reinforcing action of bonded jacket reduces "Window" effects caused by flexure.
Capacitance:	
Usable Temp. Range:	U.L. +80° Military: -40° to +105°C
Cold Bend:	All cables are suitable for flexing to a circle diameter of approx. 6 cable diameters from +80°C to -40°C.

STANDARD "KLEEN-STRIP" SHIELDED CABLES

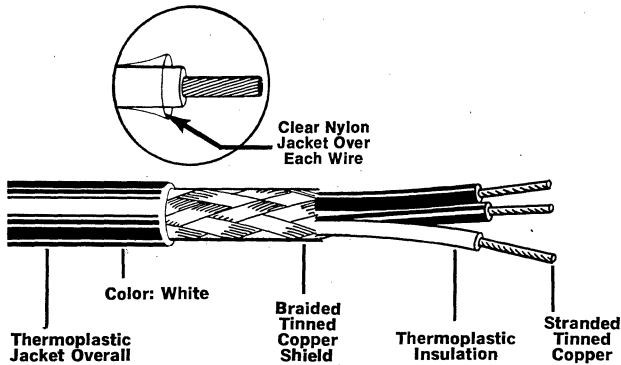
SINGLE CONDUCTOR SHIELDED & JACKETED	CONDUCTOR AWG & STRANDING	NATIONAL PART NO.	INSULATION DIAMETER	DRAIN WIRE AWG & STRANDING	JACKET THICKNESS	DIAMETER OVER JKT.	CAPACITANCE PF/FT		RESISTANCE OHMS/MFT
							W-S	W-W	
	26 (7)	NKS-261	.038	26 (7)	.022	.108	97.8	—	42.9
	24 (7)	NKS-241	.043	24 (7)	.022	.119	170.9	—	26.8
	22 (7)	NKS-221	.050	22 (7)	.022	.130	131.5	—	16.7
	20 (7)	NKS-201	.057	20 (7)	.022	.148	167.2	—	10.5
2-CONDUCTOR SHIELDED & JACKETED (U.L. STYLE 2464)	CONDUCTOR AWG & STRANDING	NATIONAL PART NO.	INSULATION DIAMETER	DRAIN WIRE AWG & STRANDING	JACKET THICKNESS	DIAMETER OVER JKT.	CAPACITANCE PF/FT		RESISTANCE OHMS/MFT
							W-S	W-W	
	26 (7)	NKS-262	.038	26 (7)	.022	.128	85.6	46.9	42.9
	24 (7)	NKS-242	.043	24 (7)	.022	.140	94.4	51.8	26.8
	22 (7)	NKS-222	.050	22 (7)	.022	.150	115.1	63.1	16.7
	20 (7)	NKS-202	.057	20 (7)	.022	.166	146.29	46.9	10.5
3-CONDUCTOR SHIELDED & JACKETED (U.L. STYLE 2464)	CONDUCTOR AWG & STRANDING	NATIONAL PART NO.	INSULATION DIAMETER	DRAIN WIRE AWG & STRANDING	JACKET THICKNESS	DIAMETER OVER JKT.	CAPACITANCE PF/FT		RESISTANCE OHMS/MFT
							W-S	W-W	
	26 (7)	NKS-263	.038	26 (7)	.022	.134	80.8	44.0	42.9
	24 (7)	NKS-243	.043	24 (7)	.022	.147	89.2	48.6	26.8
	22 (7)	NKS-223	.050	22 (7)	.022	.158	108.7	59.2	16.7
	20 (7)	NKS-203	.057	20 (7)	.022	.175	138.3	75.2	10.5
4-CONDUCTOR SHIELDED & JACKETED (U.L. STYLE 2464)	CONDUCTOR AWG & STRANDING	NATIONAL PART NO.	INSULATION DIAMETER	DRAIN WIRE AWG & STRANDING	JACKET THICKNESS	DIAMETER OVER JKT.	CAPACITANCE PF/FT		RESISTANCE OHMS/MFT
							W-S	W-W	
	26 (7)	NKS-264	.038	26 (7)	.022	.144	79.	42.	42.9
	24 (7)	NKS-244	.043	24 (7)	.022	.158	88.	46.	26.8
	22 (7)	NKS-224	.050	22 (7)	.022	.170	107.	57.	16.7
	20 (7)	NKS-204	.057	20 (7)	.022	.189	136.	73.	10.5

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569

Braided Audio & Instrumentation 1, 2 & 3 Conductor Shielded Cables



(3 conductor shielded and jacketed shown)

TYPE B NYLON
SHIELDED AND JACKETED
-54°C TO +105°C
600 VOLTS (WORKING)

TYPE B NYLON SINGLE CONDUCTOR

GAUGE OF CON- DUCTORS	NATIONAL CATALOG NUMBER	NO. OF STRANDS PER COND.	GA. OF STRANDS	NOM. DIAM. OVERALL WIRE (INCHES)	NOMINAL VALUES OF CAPACITANCE PER FOOT		NOM. WT. PER 1000 FT. (LBS.)
					WIRE-WIRE MMF/FT	WIRE-SHIELD MMF/FT	
24	NB1936N1SJ	19	36	.097		70.5	16.9
22	NB1934N1SJ	19	34	.110		102.1	18.7
20	NB1932N1SJ	19	32	.120		113.4	21.1
18	NB1930N1SJ	19	30	.123		118.9	24.6
16	NB1929N1SJ	19	29	.134		123.6	27.7

TYPE B NYLON TWO CONDUCTOR

GAUGE OF CON- DUCTORS	NATIONAL CATALOG NUMBER	NO. OF STRANDS PER COND.	GA. OF STRANDS	NOM. DIAM. OVERALL WIRE (INCHES)	NOMINAL VALUES OF CAPACITANCE PER FOOT		NOM. WT. PER 1000 FT. (LBS.)
					WIRE-WIRE MMF/FT	WIRE-SHIELD MMF/FT	
24	NB1936N2SJ	19	36	.151	35.1	59.5	24.4
22	NB1934N2SJ	19	34	.170	40.0	61.3	28.4
20	NB1932N2SJ	19	32	.190	47.6	74.9	32.3
18	NB1930N2SJ	19	30	.215	57.6	97.4	40.0
16	NB1929N2SJ	19	29	.236	62.7	106.2	46.1

TYPE B NYLON THREE CONDUCTOR (see illustration)

GAUGE OF CON- DUCTORS	NATIONAL CATALOG NUMBER	NO. OF STRANDS PER COND.	GA. OF STRANDS	NOM. DIAM. OVERALL WIRE (INCHES)	NOMINAL VALUES OF CAPACITANCE PER FOOT		NOM. WT. PER 1000 FT. (LBS.)
					WIRE-WIRE MMF/FT	WIRE-SHIELD MMF/FT	
24	NB1936N3SJ	19	36	.165	36.3	67.7	26.8
22	NB1934N3SJ	19	34	.178	40.9	71.8	31.6
20	NB1932N3SJ	19	32	.199	49.6	80.1	38.4
18	NB1930N3SJ	19	30	.229	53.8	87.5	48.8
16	NB1929N3SJ	19	29	.254	60.8	92.5	58.0

*NOTE: Other conductor combinations available on request.

NATIONAL CABLE MOLDING CORPORATION

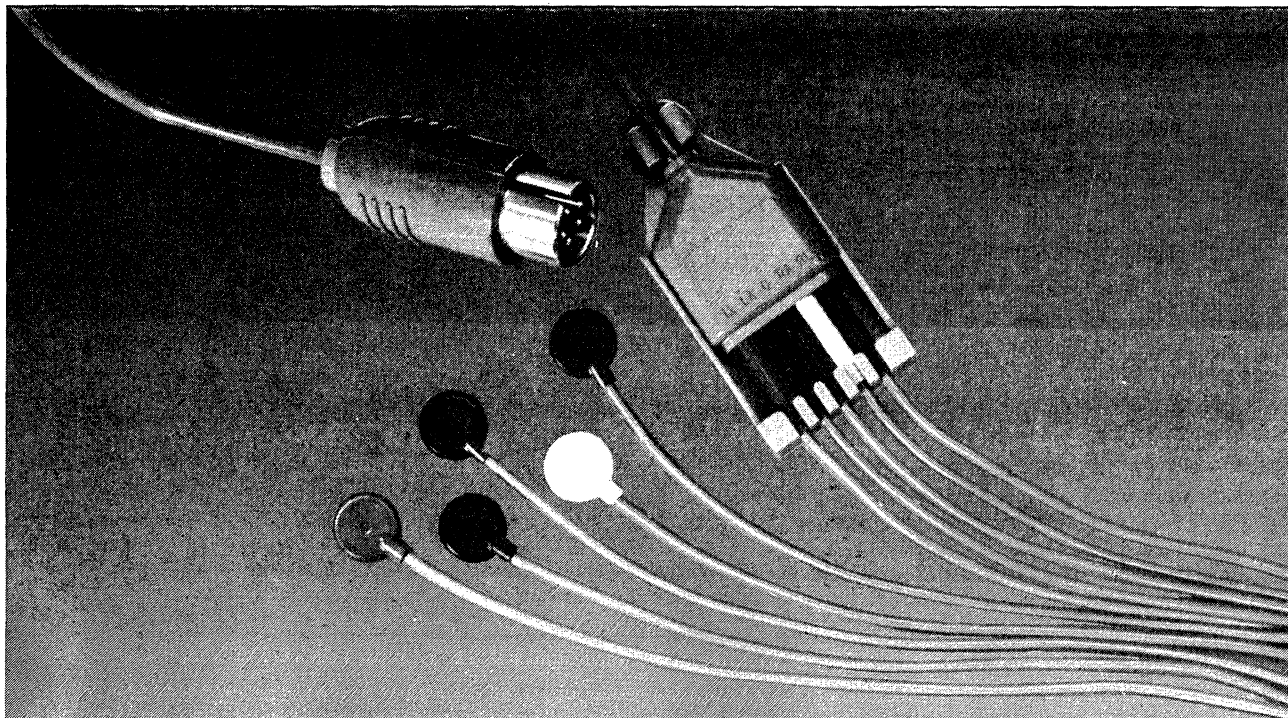


Molded Instrumentation Cables for all Types of Medical & Electronic Applications

AN AFFILIATE OF NATIONAL WIRE & CABLE CORPORATION

136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569

AN AFFILIATE OF NATIONAL WIRE & CABLE CORPORATION



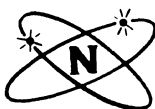
SPECIALISTS IN INJECTION-MOLDING OF CONNECTORS DIRECTLY ONTO CABLE!

INTEGRAL-MOLDED ELECTRONIC CABLE/CONNECTOR ASSEMBLIES

Utilizing integral cable molding techniques, National Cable Molding Corporation (NCM) manufactures all components "in-house" from wire insulation to cable manufacture, connector assembly, tooling and molding the entire unit ready for use!

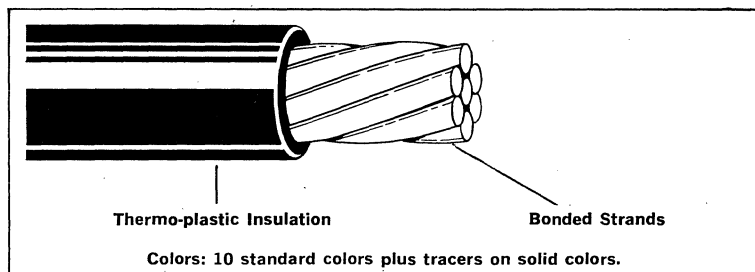
Write or call Mr. Frank W. Motley today for technical information or assistance. Phone: (213) 225-5611.

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569

Nabond® Bonded Stranded Electronic Hookup Wire



A NABOND® STRANDED CONDUCTOR IN YOUR WIRE ELIMINATES PRE-TINNING BEFORE FORMING WIRE TO A TERMINAL.

1. Forms just like a solid wire . . . no loose strands.
2. Extra tinning ensures better soldering.
3. Absolutely smooth and round . . . NOT just a tin dip coat.

WHAT IT IS:

NABOND is a special bonding technique used on the tinned stranded copper conductors in an insulated wire.

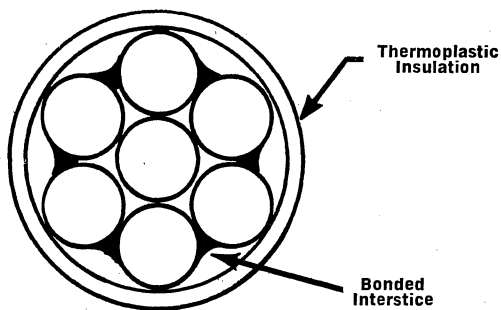
The tinning on NABOND strands is slightly heavier than regular. The strands are cabled into a bundle to form the conductor. The conductor is then passed through a special process which lightly bonds the tinning on each strand. The resulting conductor is still smooth and round, yet may be formed as though it were a solid wire, without pre-tinning

normally needed to hold the strands.

With repeated flexing, Nabond strand-bonds break free, allowing the stranded conductor to return to its flexible condition.

NABOND is available with either 600 or 300 volt insulation for U.L. service. NABOND exceeds U.L. Appliance Wiring Material requirements for copper conductors.

NABOND ELIMINATES PRE-TINNING!



NABOND is a wire identical to U.L. wires, except that the tinned strands are bonded together.

Pre-tinning is not required before soldering or forming. NABOND strand is smooth and flexible, yet is as easy to form and solder as a solid wire.

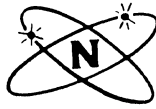
U.L. AWM STYLE 1061 WITH NABOND FR-1 RATED	GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
	26	NB734UB	7	34	.019	.038	42.9	1.5
	24	NB732UB	7	32	.024	.043	26.8	3.0
	22	NB730UB	7	30	.030	.050	16.7	3.8
	20	NB1030UB	10	30	.038	.057	10.5	5.7
	18	NB1630UB	16	30	.048	.068	6.57	8.0

U.L. AWM STYLE 1007 WITH NABOND FR-1 RATED	24	NC732UB	7	32	.024	.058	26.8	3.2
	22	NC730UB	7	30	.030	.063	16.7	4.
	20	NC1030UB	10	30	.038	.072	10.5	6.
	18	NC1630UB	16	30	.048	.082	6.57	8.5

ALSO AVAILABLE IN UL STYLE 1015

10 STANDARD COLORS AND TRACERS

NATIONAL WIRE AND CABLE CORPORATION



136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569

U/L Listed Wire CSA Listed Wire

- Wires listed by the Underwriter's Laboratories, Inc. for operation in an air or an oil environment. U.L. File #E35793.
- Wires listed by the Canadian Standards Association for radio or electronic uses. CSA File #LR-20482

U/L Style 1061

Appliance wiring material available as FR-1 rated 80-degree C Service. .009" semi-rigid vinyl insulation U/L rated: 300-volt service. Meets Mil W-1687D Type B.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
28	N304-736U	7	36	.015	.034	69.0	1.0
26	N304-734U	7	34	.019	.038	42.9	1.5
24†	N304-1936U	19*	36	.024	.043	26.8	2.0
22†	N304-1934U	19*	34	.030	.050	16.7	3.0
20	N304-1932U	19*	32	.038	.057	10.5	4.75
18	N304-1930U	19	30	.048	.068	6.57	6.5
16	N304-1929	19	29	.057	.077	4.85	9.0

U/L Style 1007

Appliance wiring available as FR-1 rated 80-degree C Service. 1/64" vinyl insulation U/L rated: 300 volt appliance, use 600 volt electronic use. Meets Mil-W-1678D Type C. Also approved by CSA as Type TR-64 radio wiring for 90-degree C Service. Colors: 10 standard colors plus tracers on solid colors.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
24†	N303-1936U	19*	36	.024	.058	26.8	2.75
22†	N303-1934U	19*	34	.030	.063	16.7	3.75
20	N303-1932U	19*	32	.038	.072	10.5	5.50
18	N303-1930U	19	30	.048	.082	6.57	8.0
16	N303-1929U	19	29	.057	.090	4.85	10.0

U/L Style 1015

Appliance wiring material available as FR-1 rated 105-degree C Service 1/32" vinyl insulation U/L rated, 2500 volts electronic use, 600 volt appliance use. Meets Mil W 18878D Type D. Colors: 10 standard colors plus tracers on solid colors.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
24†	N600-1936U	19*	36	.024	.082	26.8	4.0
22†	N600-1934U	19*	34	.030	.090	16.7	5.2
20†	N600-1932U	19*	32	.038	.098	10.5	7.3
18	N600-1930U	19	30	.048	.108	6.57	10.0
16	N600-1929U	19	29	.057	.117	4.85	12.0
14	N600-1927U	19	27	.071	.130	3.05	17.1
12	N600-1925U	19	25	.090	.162	1.92	27.4
10	N600-4927U	49	27	.111	.181	1.24	38.6

CSA/Type TR-32 Radio Wire

Rated: 90-degree C 600 volt, 1/32" vinyl insulation. Also listed as CSA Appliance Wiring Material 90-degree 600 V. Meets U/L Style 1015 & Mil-W-16878D Type D.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
24†	N307-732U	*19	36	.024	.082	26.8	4.0
22†	N307-730U	*19	34	.030	.090	16.7	5.2
20	N307-1932U	*19	32	.038	.098	10.5	7.3
18	N307-1930U	19	30	.048	.108	6.57	10.0
16	N307-1929U	19	29	.057	.117	4.85	12.0
14	N307-1927U	19	27	.071	.130	3.05	17.1
12	N307-1925U	19	25	.090	.162	1.92	27.4
10	N307-4927U	49	27	.111	.181	1.24	38.6

*Also available in 7 strands

CSA Listed Type TR-64 Radio Wire

Rated 90-degree C 300 volt, 1/64" vinyl insulation. Meets U/L Style 1007 & Mil-W-16878D Type C.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
24†	N308-732U	*7	32	.024	.058	28.4	2.75
22†	N308-730U	*7	30	.030	.063	19.0	3.50
20	N308-1932U	*19	32	.038	.072	13.12	5.25
18	N308-1930U	19	30	.048	.082	7.89	6.75
16	N308-1929U	19	29	.057	.090	4.97	10.0

†Also available as NABOND

Also available with Nylon Jacket

NATIONAL WIRE AND CABLE CORPORATION



Military Electronic Hookup Wire

136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569

MIL-W-16878/1

Type BU

For internal wiring of electronic equipment.
.010" wall vinyl primary insulation. No outer covering.
—53-degree C to +105-degree C, 600 V, R.M.S. (working).
Also available as NABOND.
Meets U/L Style 1061.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
32	NB740U	7	40	.009	.028	179.0	0.70
30	NB738U	7	38	.012	.031	111.0	0.75
28	NB736U	7	36	.015	.034	69.0	1.0
26	NB734U	7	34	.019	.038	42.9	1.5
24	NB1936U	*19	36	.024	.043	26.8	2.0
22	NB1934U	*19	34	.030	.050	16.7	3.0
20	NB1932U	*19	32	.038	.057	10.5	4.5
18	NB1930U	19	30	.048	.068	6.57	6.5
16	NB1929U	19	29	.057	.077	4.85	9.0
14	NB1927U	19	27	.071	.091	3.05	14.0

*Also available in 7 strands

MIL-W-16878/1

Type BN

For internal wiring of electronic equipment.
Vinyl primary insulation with Nylon jacket overall.
—54-degree C to +115-degree C, 600 V, R.M.S. (working). Meets U/L Style 1006.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
32	NB740N	7	40	.009	.032	179.0	0.75
30	NB738N	7	38	.012	.036	111.0	1.0
28	NB736N	7	36	.015	.039	69.0	1.25
26	NB734N	7	34	.019	.044	42.9	1.75
24	NB1936N	*19	36	.024	.049	26.8	2.25
22	NB1934N	*19	34	.030	.056	16.7	3.25
20	NB1932N	*19	32	.038	.063	10.5	4.75
18	NB1930N	19	30	.048	.074	6.57	7.0
16	NB1929N	19	29	.057	.083	4.85	9.0
14	NB1927N	19	27	.071	.098	3.05	14.7

*Also available in 7 strands

MIL-W-16878/2

Type CU

For internal wiring of meters, panels & electronic equipment, .015" Wall Vinyl primary insulation (no outer covering).
—54° C to +105° C, 1000 Volts, R.M.S. (working).
Also available as NABOND.
Meets U/L Style 1007 and CSA TR-64.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
24	NC1936U	*19	36	.024	.058	26.8	2.75
22	NC1934U	*19	34	.030	.063	16.7	3.75
20	NC1932U	*19	32	.038	.072	10.5	5.50
18	NC1930U	19	30	.048	.082	6.57	8.0
16	NC1929U	19	29	.057	.090	4.85	10.0
14	NC1927U	19	27	.071	.104	3.05	15.0
12	NC1925U	19	25	.090	.124	1.92	24.0

*Also available in 7 strands

MIL-W-L 16878/3

Type DU

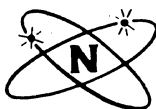
Resists the effect of salt water, aviation fuel, motor oil, ethylene glycol and alcohols (methyl or ethyl).
.031" Wall Vinyl primary insulation. No outer covering.
—54-degree C to +105-degree, 3000 V, R.M.S. (working). Meets U/L Style 1015 and CSA TR-32.

GAUGE (AWG)	NATIONAL CATALOG NUMBER	NO. OF STRANDS	GA. OF STRANDS (AWG)	NOM. DIAM. OF STRANDED CONDUCTOR (INCHES)	NOM. FIN. WIRE DIAM. (INCHES)	MAX. RESISTANCE (dc) AT 25°C OHMS/1000 FT.	NOM. WT. PER 1000 FT. (LBS.)
24	ND1936U	*19	36	.024	.082	26.8	4.0
22	ND1934U	*19	34	.030	.090	16.7	5.2
20	ND1932U	*19	32	.038	.098	10.5	7.3
18	ND1930U	19	30	.048	.108	6.57	10.0
16	ND1929U	19	29	.057	.117	4.85	12.0
14	ND1927U	19	27	.071	.130	3.05	17.1
12	ND1925U	19	25	.090	.162	1.92	27.4
10	ND4927U	49	27	.111	.181	1.24	38.6
8	ND13329U	133	29	.167	.246	0.726	70.5
6	ND13327U	133	27	.210	.290	0.444	104.0

*Also available in 7 strands.

NOTE: THE ABOVE WIRES COME IN 10 STANDARD COLORS PLUS TRACERS ON SOLID COLORS.

NATIONAL WIRE AND CABLE CORPORATION



Nafoam® & Nafoil® Special Shielded Data & Instrumentation Cables

136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569

Designed for Low Level or Low Capacitance Needs

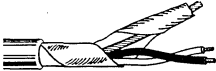
All feature extremely low dielectric leakage both in insulation and outer sheath.

Suitable for very long runs in tray or conduit. (1000. ft and up).

SINGLE CONDUCTOR SHIELDED

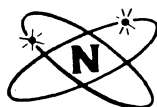
	Part Number	AWG & Stranding	Drain AWG & Stranding	Insulation & Thickness	Jacket Thickness	Nom. O.D.	Shield % Coverage	Capacitance mmfd/ft	Working Voltage	Surge Impedance Ohms	Temp. °F
	S10-516	28(7x38)	—	.086" NAFOAM	.015" pvc	.242"	TC Braid 90% *	12	3000	120	+180
	S10-328-1	22(19x34)	—	.042" NAFOAM	.020" pvc	.182"	90% Braid	20.7	1000	60	+180
	S10-328-2						100% NAFOIL & Braid	20.7	1000		
	S10-680	22(19x34)	22(7x30)	.032" poly	.016" pvc	.160"	NAFOIL & Drain	30	3000	—	+180
	S10-679	22(19x34)	24(7x32)	.010" pvc .002" nylon	.015" pvc	.120"	100% NAFOIL & Drain	100	600	25	+221

TWO CONDUCTOR SHIELDED

	S10-010-1	22(19x34)	—	.042" NAFOAM	.020" pvc	.285"	90% Braid	10.6 W-W	1000	120	+180
	S10-010-2						100% NAFOIL + Braid				
	S10-010-3						NAFOIL only				
	S10-681	22(19x34)	22(7x30)	.025" NAFOAM	.020" poly	.190"	100% NAFOIL & Drain	15-W-W	600	84	+180
	S10-686	22(19x34)	22 (7x30)	.018" NAFOAM	.020" poly	.175"	100% NAFOIL & Drain	20	600	63	+180
	S10-362-1 *S10-362-2	22(19x34)	22(7x30)	.010" pvc .002" nylon	.020" poly	.163"	100% NAFOIL & Drain	40 W-W	600	52	+221

*Same specifications as S10-362-1 except Jacket Thickness is .020" pvc.

NATIONAL WIRE AND CABLE CORPORATION



**CONTACT OUR SALES OFFICE
OR REPRESENTATIVE
NEAREST YOU!**

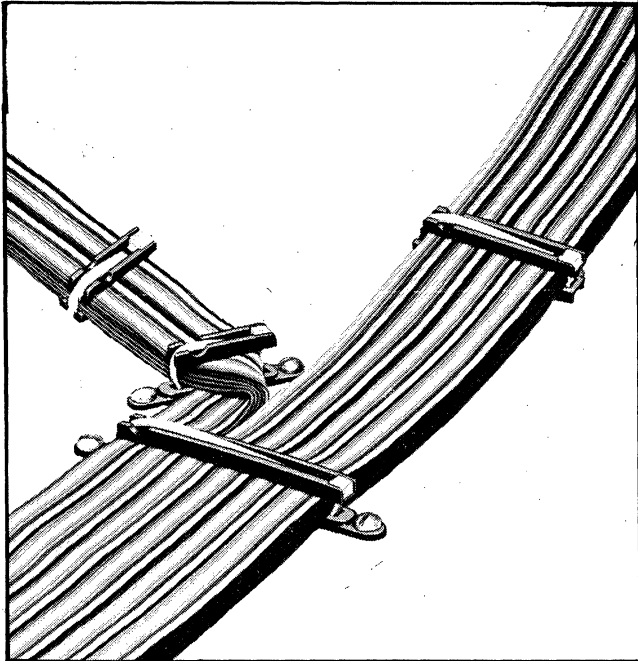
136 San Fernando Rd., Los Angeles, Calif. 90031
Phone (213) 225-5611, TWX: 910-321-4155, Fed. Stock Code H4-04569

Local Sales Offices & Reps

STATE	REPRESENTATIVE	PHONE	STATE	REPRESENTATIVE	PHONE
Ariz	Phoenix, K. Jahn Co.	602-956-9060	Mo	Raytown, Production Automation	816-737-0066
Ark	Ft. Smith, Electro-Related Prod.	501-783-7323	NY	Huntington, National Wire & Cable Corp	516-757-6549
Cal	Los Angeles, National Wire & Cable Corp.	213-225-5611	NY	Ontario Center, Kehoe Comp. Sls.	315-524-2491
Cal	San Mateo, National Wire & Cable Corp.	415-344-3066	NY	Ontario Center, National Wire & Cable Corp.	315-524-2401
Cal	La Jolla, Rep Sales Co.	714-454-1500	NC	Charlotte, J. Rudisill Assocs.	704-377-6901
Colo	Arvada, Arrowhead Sls. Co.	303-423-5556	Ohio	Cincinnati, Luebbe Sls. Co.	513-871-4211
Conn	Wethersfield, Com/Pak Ltd., Inc.	203-563-4784	Ohio	Cleveland, Luebbe Sls. Co.	216-333-0425
Fla	Maitland, J. W. Barrett Assocs.	305-678-0172	Ohio	Dayton, Luebbe Sls. Co.	513-294-0426
Fla	North Miami, J. W. Barrett Assocs.	305-681-4957	Pa	Delmont, Luebbe Sls. Co.	412-468-4019
Fla	St. Petersburg, J. W. Barrett Assocs.	813-345-3585	Pa	Wynnewood, H. J. Fairbanks Co.	215-642-5816
Fla	Melbourne, J. W. Barrett Assoc.	305-727-2491	Tex	Fort Worth, J. H. Gibbs Assocs.	817-237-1455
Fla	Orlando, National Wire & Cable Corp.	305-898-3801	Utah	Salt Lake City, Arrowhead Sls. Co.	801-487-4716
Ill	Northfield, H. S. Tollaksen Co.	312-441-6644	Wash	Olympia, Bergford Assocs.	206-866-2001
Md	Glen Burnie, Faion Lott Co.	301-744-4611			
Mass	Needham Heights, Com/Pak Ltd.	617-444-1259	CANADIAN & EUROPEAN REPRESENTATIVES		
Mich	Southfield, Luebbe Sls. Co.	313-357-0355	Germany	Hochwaldstrasse, H. H. Lehmann	2262
Minn	Minneapolis, Technical Assocs.	612-929-6721	England	Surrey, G. A. Stanley Palmer Ltd.	01-979-7254
Mo	Hazelwood, Production Automation	314-731-2331	Downsview	Ontario, Canada, Cantronics Ltd.	412-661-2494

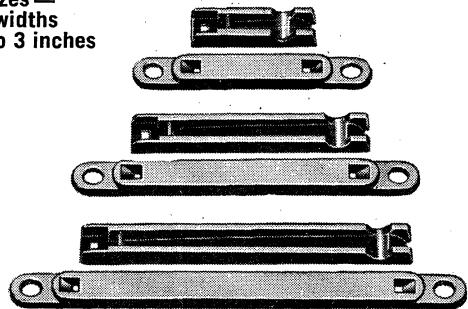
PANDUIT® wiring components

PANDUIT® FLAT CABLE MOUNT *

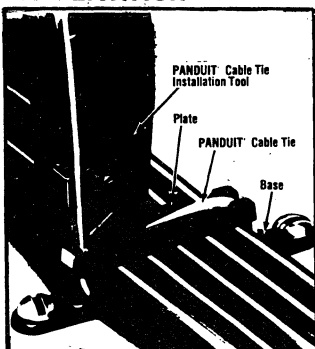


Combination of PANDUIT® Cable Tie and unique Flat Cable Accessory provides...secure method of mounting or bundling flat cable

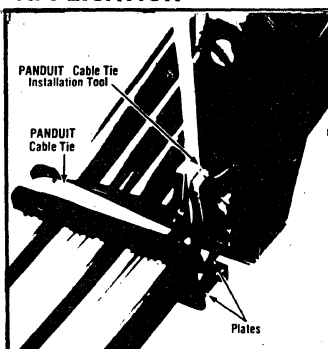
3 sizes —
for widths
up to 3 inches



MOUNTING APPLICATION



BUNDLING APPLICATION



- Secures stacked cables, folds, and breakouts
- Secures laminated and molded bus bars
- Available in 1", 2" and 3" widths — accommodates flat cable widths of 0-3"
- Secure location of flat cables reduces variations in transmission characteristics such as crosstalk, impedance and capacitance
- Can be used in applications where vibration and strain is a factor
- Strong, 100% nylon — safe, will not damage the flat cable
- Removable and reusable
- Can be used with any type of flat cable

* Patent Pending

SELECTION CHART FOR PANDUIT® FLAT CABLE MOUNTS and PAN-TY® CABLE TIES

For Flat Cable Width (up to)	FOR MOUNTING† Use one (1) each of the following and one (1) cable tie	FOR BUNDLING Use two (2) each of the following and one (1) cable tie	MAXIMUM FLAT CABLE STACK HEIGHT (inches)			
			PANDUIT PAN-TY PLT1.5I Cable Tie	PANDUIT PAN-TY PLT2I Cable Tie	PANDUIT PAN-TY PLT3I Cable Tie	PANDUIT PAN-TY PLT4I Cable Tie
1"	FCPI1 FCBI1(-S10 or -A)	FCPI1	.8	2.0	3.7	5.2
2"	FCPI2 FCBI2(-S10 or -A)	FCPI2	—	1.0	2.7	4.2
3"	FCPI3 FCBI3(-S10 or -A)	FCPI3	—	—	1.7	3.2

Can be mounted with screws or commercial adhesive.

† For base with #10 screw hole use suffix -S10. For base to be mounted with commercial adhesive (supplied by user) use suffix -A.

PANDUIT

CORP. 17301 RIDGELAND AVENUE, TINLEY PARK, ILLINOIS 60477
PHONE (312) 532-1800 TELEX 25-4560

SOLD THROUGH AUTHORIZED PANDUIT DISTRIBUTORS

PANDUIT® wiring components

PAN-TY® CABLE TIES

- One-piece, all nylon. No twisting; no metal barb.
- Self-locking types — hand or tool installed; or releasable types — hand applied.
- Curved tip for faster harnessing.

CABLE TIES

Cat. No. & Cross-section	Bundle Dia. Min./Max.	Approx. Length
PLT1M Miniature Tie	3/16"-3/4"	3 7/8"
PLT1.5M Miniature Tie	3/16"-1 1/4"	5 1/2"
PLT1.5I Intermediate Tie	3/16"-1 1/4"	5 1/2"
PLT2M Miniature Tie	3/16"-2"	8"
PLT2I Intermediate Tie	3/16"-2"	8"
PLT2S Standard Tie	3/16"-1 3/4"	7 1/4"
PLT3I Intermediate Tie	3/16"-3"	11 1/2"
PLT3S Standard Tie	3/16"-3"	11 1/2"
PLT4I Intermediate Tie	3/16"-4"	14 1/2"
PLT4S Standard Tie	3/16"-4"	14 1/2"
PLT4H Heavy Tie	3/16"-4"	14 1/2"
PLT8H Heavy Tie	3/16"-9"	30 5/8"

CLAMPS

PLC1M-S4 Miniature Clamp	3/16"-3/4" #4 Screw	4 3/8"
PLC1.5I-S8 Intermediate Clamp	3/16"-1 1/4" #8 Screw	6 1/8"
PLC2S-S6 Standard Clamp	3/16"-1 3/4" #6 Screw	7 1/2"
PLC2S-S10 Standard Clamp	3/16"-1 3/4" #10 Screw	7 1/8"
PLC4H-S25 Heavy Clamp	3/16"-4" 1/4" Screw	15 1/4"

STA-STRAP® CABLE TIES

- All nylon. No twisting; no metal barb.
- Self locking — hand or tool installed. Releasable prior to final tensioning.

CABLE TIES

Catalog Number and Cross-section	Bundle Dia. Min./Max.	Approx. Length
SST1M Miniature Tie	0-3/4"	4"
SST1.5M Miniature Tie	0-1 1/4"	5 1/2"
SST1.5I Intermediate Tie	0-1 1/4"	5 1/2"
SST1.5S Standard Tie	0-1 1/4"	5 3/4"
SST2I Intermediate Tie	0-2"	8 3/8"
SST2S Standard Tie	0-1 3/4"	6 3/4"
SST2H Heavy Tie	0-2"	8"
SST3I Intermediate Tie	0-3"	11"
SST3S Standard Tie	0-3"	11"
SST4I Intermediate Tie	0-4"	14 3/4"
SST4S Standard Tie	0-4"	15"
SST4H Heavy Tie	0-4"	14 3/4"
SST8H Heavy Tie	0-8"	27 1/2"

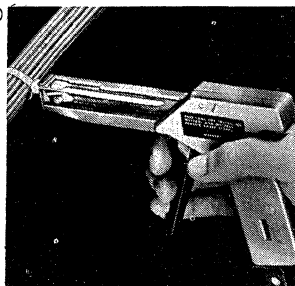
Applicable sizes of PAN-TY and STA-STRAP cable ties are recognized under the Components Program of Underwriters' Laboratories, Inc.

- Complete Line of Accessories including Mounts and Harness Board Accessories Available

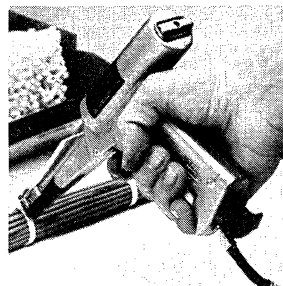
PANDUIT®

CABLE TIE INSTALLATION TOOLS

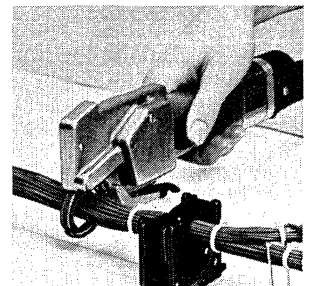
A complete tooling program to meet all production requirements for fast, neat harnessing.



GS2B installation manual tool provides uniform tensioning and cutoff of all PANDUIT® miniature, intermediate and standard cross-section cable ties, clamps and markers; meets MIL-T-81306(AS), MS90387-1. Also available is GS4H manual installation tool for all standard and heavy ties; meets MIL-T-81306(AS), MS-90387-2.

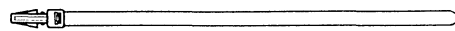


PPTS hand-operated pneumatic cable tie installation tool. Installs all PANDUIT miniature, intermediate and standard cross-section cable ties, clamps and markers. Uses standard 70-80 psi air.



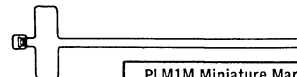
PATIM fully automatic cable tie installation tool. Automatically feeds cable tie around bundle, tensions the tie, and cuts off flush in less than 1 second. Weighs just 1 3/4 lbs. Accommodates bundles up to 3/4" dia.

PUSH MOUNT TIES

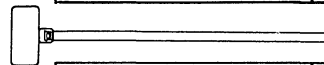


Cat. No. & Cross-section	Bundle Dia. Min./Max.	Approx. Length
PLP1.5I Intermediate Push Mount Tie	3/16"-1 1/4"	6 1/8"
PLP2S Standard Push Mount Tie	3/16"-1 3/4"	7 7/8"

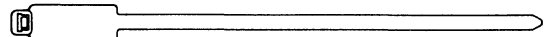
MARKER TIES



PLM1M Miniature Marker Tie	3/16"-3/4"	4"
PLM2M Miniature Marker Tie	3/16"-2"	8"



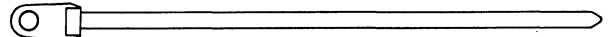
PLF1M Miniature Flag Marker Tie	3/16"-3/4"	4 3/8"
---------------------------------	------------	--------



PLM2S Standard Marker Tie	3/16"-1 3/4"	7 1/4"
PLM4S Standard Marker Tie	3/16"-4"	14 1/2"

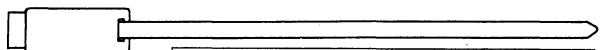
- Complete line of cable ties, clamps and marker ties. Meet all applicable Military Specifications.
- Standard color natural nylon and 10 other colors available.

CLAMPS



Catalog Number and Cross-section	Bundle Dia. Min./Max.	Approx. Length
SSC2S-S6 Standard Clamp	0-1 3/4" #6 Screw	7 1/8"
SSC2S-S10 Standard Clamp	0-1 3/4" #10 Screw	7 1/8"
SSC4S-S6 Standard Clamp	0-4" #6 Screw	15 1/8"
SSC4S-S10 Standard Clamp	0-4" #10 Screw	15 1/8"
SSC4H-S25 Heavy Clamp	0-4" 1/4" Screw	15 1/8"

MARKER TIES



SSM2S Standard Marker Tie	0-1 3/4"	6 3/4"
SSM4S Standard Marker Tie	0-4"	14 3/4"

PANDUIT®

17301 RIDGELAND AVENUE, TINLEY PARK, ILLINOIS 60477
PHONE (312) 532-1800 TELEX 25-4560

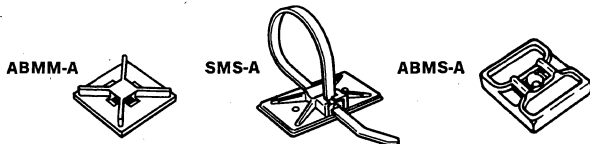
SOLD THROUGH AUTHORIZED PANDUIT DISTRIBUTORS

PANDUIT® wiring components

PANDUIT® MOUNTING & HARNESSING ACCESSORIES

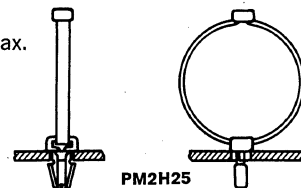
ADHESIVE BACKED MOUNTS

- Just peel backing paper off and apply to clean dry surface.

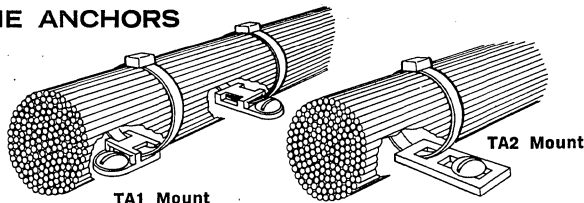


PUSH MOUNT

- For panel thickness $\frac{1}{8}$ " max. Hole diam. nom. $\frac{1}{4}$ ".



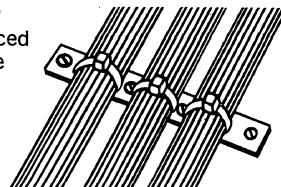
TIE ANCHORS



MULTIPLE TIE PLATES

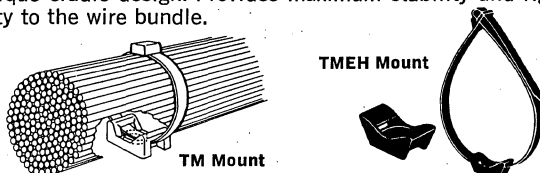
- Used for securing closely spaced parallel wire bundles. Available to hold from 1 to 6 bundles

MTP1S to MTP5S
MTP1H to MTP6H



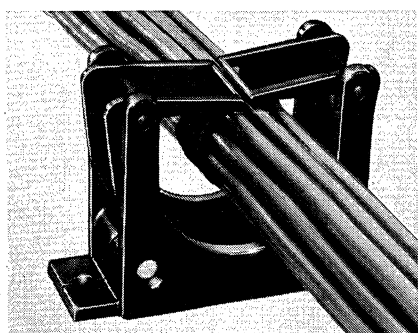
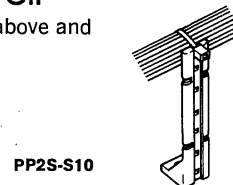
TIE MOUNTS

- Unique cradle design. Provides maximum stability and rigidity to the wire bundle.



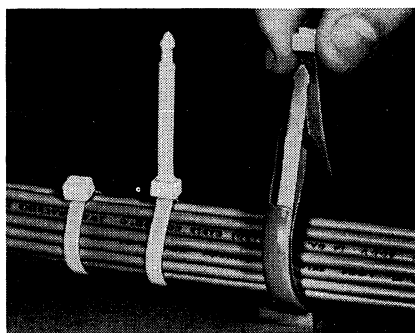
PAN-POLE® Stand Off

- Supports wire harness above and away from surface.



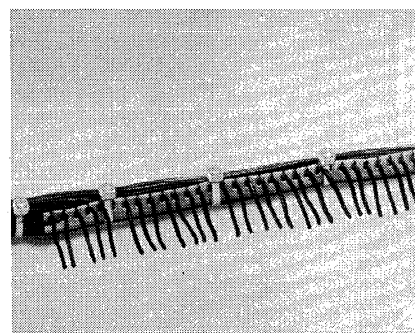
ELASTIC RETAINER (ER.5-E4 and ER1.25-E4)

- Unique, versatile, forms tight uniform harnesses. Two sizes.



PAN-RING® ACCESSORY (PR1 and PR2)

- Automatically threads PANDUIT® STA-STRAP® cable ties into head — speeds harness tying. Two sizes.



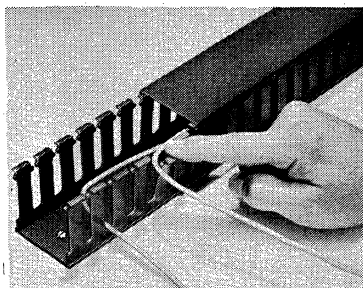
FANNING STRIP (FS156 and FSH40)

- Positive method (including strip and holder) for assuring that wires are held in sophisticated wiring harnesses.

PANDUCT®

PLASTIC WIRING DUCT

- Patented snap-in slot design provides complete accessibility, easiest method of inserting or removing wires, even with terminations attached.
- Unique rounded edge design of fingers protects wire insulation and personnel from cutting and abrasion.
- Non-slip cover prevents vibration slippage. Available for all width sizes.
- Recognized under the Components Program of Underwriters' Laboratories, Inc. Meets J.I.C. requirements. Approved by Canadian Standards Association.
- Standard color: light gray. Standard length: 6 ft.



Nominal Duct Size W x H	Nominal Duct Size W x H	Nominal Duct Size W x H
.5 x .5	1 x 3	3 x 1
.5 x .62	1 x 4	3 x 1.25
.5 x 1	1.5 x 1.5	3 x 2
.5 x 1.25	1.5 x 2	3 x 3
.5 x 1.75	1.5 x 3	3 x 4
.75 x .75	1.5 x 4	3 x 5
.75 x 1	2 x 1	4 x 1.5
.75 x 1.5	2 x 2	4 x 2
.75 x 2	2 x 3	4 x 3
1 x 1	2 x 4	4 x 4
1 x 1.5	2.5 x 3	4 x 5
1 x 2		

PANDUIT

CORP.

17301 RIDGELAND AVENUE, TINLEY PARK, ILLINOIS 60477
PHONE (312) 532-1800 TELEX 25-4560

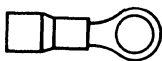
SOLD THROUGH AUTHORIZED PANDUIT DISTRIBUTORS

PANDUIT® wiring components

PAN-TERM® TERMINALS, SPLICES, DISCONNECTS, WIRE JOINTS and INSTALLATION TOOLS



Listed by Underwriters' Laboratories, Inc. and approved by Canadian Standards Association. PAN-TERM terminating devices have successfully passed the test requirements of U.L. specification 486 and CSA specification C22.2 No. 65 where indicated in Bulletin T-1 which lists the complete line.



**Ring Tongue
Terminals—Nylon and
Vinyl Self-insulated**

Wire range 22-18 and 16-14. Stud sizes 4 through 3/8.
Wire range 12-10. Stud sizes 6 through 3/8.
Expanded and extra-expanded insulation wire range 16-14. Stud sizes 4 through 3/8.
Expanded insulation wire range 12-10. Stud sizes 6 through 3/8.



**Ring Tongue Terminals
Non-insulated**

Wire range 22-18 and 16-14. Stud sizes 4 through 3/8.
Wire range 12-10. Stud sizes 6 through 3/8.



**Fork Tongue
Terminals**

NYLON SELF-INSULATED
Wire range 22-18 and 16-14. Stud sizes 6 through 1/4.
Wire range 12-10. Stud sizes 6 through 1/4.

VINYL SELF-INSULATED

Wire range 22-18 and 16-14. Stud sizes 6 through 10.
Wire range 12-10. Stud sizes 8 through 1/4.
Expanded insulation wire ranges 22-18 and 16-14. Stud sizes 6 through 10.
Expanded insulation wire range 12-10. Stud sizes 8 through 1/4.



**Fork Tongue—
Non-insulated**

Wire range 22-18, 16-14 and 12-10.
Stud sizes 6 through 1/4.



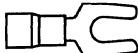
**Flanged Fork Terminals
Nylon Self-insulated**

Wire range 22-18 and 16-14. Stud sizes 6 through 10.
Wire range 12-10. Stud sizes 8 and 10.



**Flanged Fork Terminals
Non-insulated**

Wire range 22-18. Stud size 8.
Wire range 16-14. Stud sizes 6 and 8.
Wire range 12-10. Stud size 10.



**Locking Fork Terminals
Vinyl Self-insulated**

Wire range 22-18 and 16-14. Stud sizes 6 through 10.
Wire range 12-10. Stud sizes 6 through 1/4.
Expanded insulation wire range 22-18 and 16-14. Stud sizes 6 through 10.
Expanded insulation 12-10. Stud sizes 6 through 1/4.



**Locking Fork Terminals
Non-insulated**

Wire range 22-18 and 16-14. Stud sizes 6 through 10.
Wire range 12-10. Stud sizes 6 through 1/4.



Female Disconnects

NYLON SELF-INSULATED
Wire range 16-14. Tab size .250 x .032, .187 x .020.
VINYL SELF-INSULATED
Wire range 22-18, 16-14 and 12-10*
*(.250 tab size only).
Tab size .250 x .032, .187 x .020, .110 x .020, and .110 x .032



**Female Disconnects—
Non-insulated**

Wire range 22-18, 16-14 and 12-10*
*(.250 tab size only).
Tab size .250 x .032, .187 x .020, .110 x .020, and .110 x .032



**Female Disconnects
Fully Pre-insulated**

FULLY VINYL INSULATED
Wire range 22-18 and 16-14.
Tab size .250 x .032 and .187 x .020.



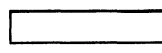
**Male Disconnects—
Vinyl Self-insulated**

Wire range 22-18 and 16-14. Tab size .145 x .032 and .250 x .032



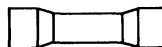
**Male Disconnects—
Non-insulated**

Wire range 22-18 and 20-14. Tab size .145 x .032 and .250 x .032



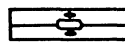
**Butt Type Splices—
Nylon Self-insulated**

Wire range 22-18, 16-14 and 12-10.



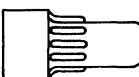
**Butt Type Splices—
Vinyl Self-insulated**

Wire range 22-18, 16-14 and 12-10.



**Butt Type Splices—
Non-insulated**

Wire range 22-18, 16-14 and 12-10.



**One Piece Wire Joints—
Nylon Self-insulated**
Three types range from minimum of 2 #24 wires to a maximum of 4 #12 wires.



One Piece Wire Joints—Non-insulated
Three types ranging from minimum of 2 #14 wires to 4 #10 wires.

Installation Tools

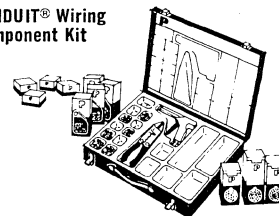


CT-100 Tool crimps PAN-TERM insulated and non-insulated terminals, splices, disconnects and wire joints on wire ranging from #10 to #22. Also cuts and strips wire, and cuts popular screws.



CT-200 Tool installs non-insulated PAN-TERM terminals, disconnects and splices on wire ranging from #10 to #22.

PANDUIT® Wiring Component Kit



K-205 Combination Kit includes PAN-TY® cable ties, PAN-TERM® terminals and splices, cable tie installation tool and terminal application tool all in durable steel box with convenient compartments. Also available for maintenance and construction wiring are Cable Tie Kits and Terminal Kits.

PANDUIT

CORP.

SOLD THROUGH AUTHORIZED PANDUIT DISTRIBUTORS

17301 RIDGELAND AVENUE, TINLEY PARK, ILLINOIS 60477

PHONE (312) 532-1800 TELEX 25-4560

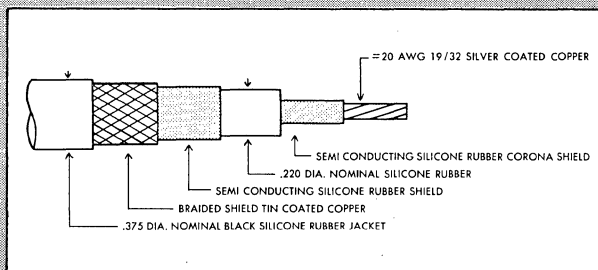
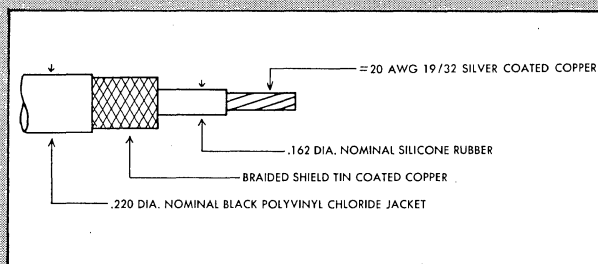
ROWE

Hi-V Cable, Wire

And Interconnections

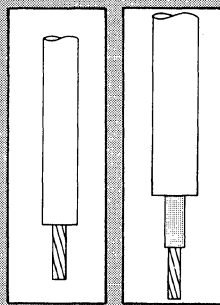
Rowe Industries high-voltage cable, wire and interconnections are ideally suited for a variety of industrial and military applications including accelerators, radar, x-ray, ECM, etc. Hi-V is available in high-voltage single-conductor, coaxial and triaxial wire, and combines semi-conducting corona-suppressing layers with thermosetting materials to provide noise-free, corona-free cable and wire.

Coaxial Types



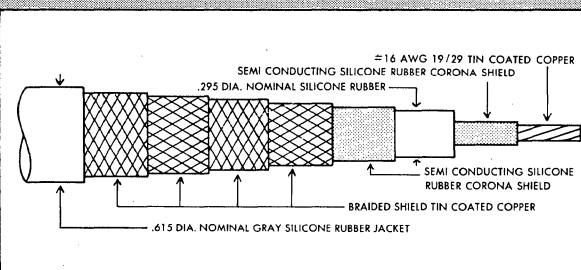
- FEATURES:**
- 5-100 KV minimum voltage ratings.
 - 8-22 AWG corona-free & ozone resistant.
 - 80°C to 200°C operating temperature.
 - Excellent for high-pulse applications & for use with Rowe high-voltage miniature coaxial connector series, "G" series connectors, RFI-EMI applications, Rowe high-pulse connector series & Rowe R75 connector series. All types offer high flexibility.

Single Conductor, Unshielded Types

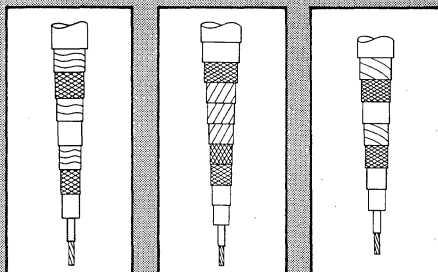


FEATURES:

- 5-60 KVDC minimum voltage ratings.
- 10-20 AWG corona-free, ozone-resistant material.
- 200°C operating temperatures.
- High flexibility at high & low temperatures.



Triaxial Types



FEATURES:

- 10-100 KV minimum voltage ratings, conductors to inner shield.
- 1-5 KV minimum voltage ratings, inner shield to outer shield.
- 50-100 PF/ft.
- 8-12 AWG
- 200°C operating temperature.
- Corona-free and ozone-resistant.
- High flexibility.
- For use with Rowe LL and RTX triaxial connector series. Excellent for high pulse applications. Several recommended for RFI-EMI applications.

ROWE

All-Temp

Silicone Rubber Wire and Cable



**GIVE us a hellish environment —
We love it!**

Rowe's silicone rubber insulation gives better performance and endurance than natural rubber and thermoplastic insulation for maintaining circuit integrity while resisting damage from high heat, extreme cold, moisture and the effects of most oils, fuels, solvents and chemicals. It is also highly resistant to fungus and ozone.

"FOREMOST IN SPECIALIZED INTERCONNECTIONS"

ROWE

INDUSTRIES

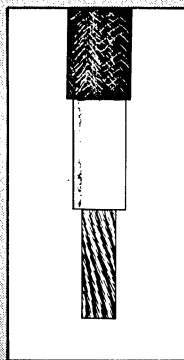


6100 BENOIRE ROAD, TOLEDO, OHIO 43612
PHONE (419) 729-9761. TWX 810-442-1734
or contact rep (listed under "Sales Offices")

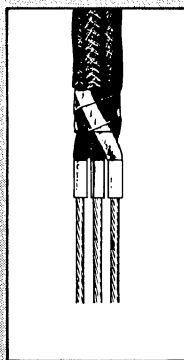
**ASK ABOUT OUR CUSTOM FABRICATIONS
FOR UNUSUAL APPLICATIONS**

PHONE NOW
(419) 729-9761

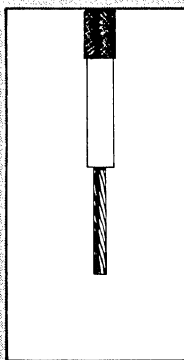
WEST COAST: (213) 235-2070



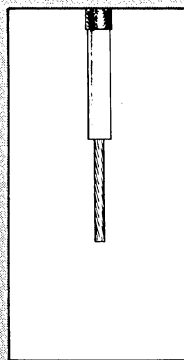
POWER CABLE
for 600 volts and up.



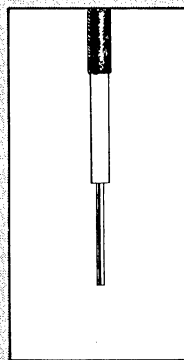
CONTROL CABLE
for 600 volts and up.



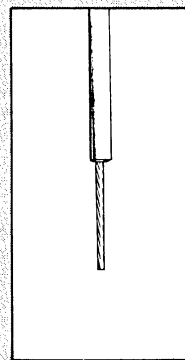
**APPLIANCE &
FIXTURE WIRE**
for 300 volts and up.



**APPARATUS &
MOTOR LEAD WIRE**
for 600 volts and up.



LIGHTING WIRE
for 600-volt transmission with solid tinned copper conductor, silicone rubber insulation and fiberglass braided covering.



NEW, All-Temp NB
especially suited for motor lead wire. No braided covering necessary. Tinned copper, stranded or solid tinned copper conductor. Silicone rubber insulation in ten colors. Ask for application information.

All the above wire and cable feature tinned copper, stranded conductors, silicone rubber insulation, with fiberglass braided covering.

AVAILABLE AS STANDARDS OR CUSTOM DESIGNED.

Fit these features...

Heat stability to 250° • Flexibility to -90°C • Unaffected by severe thermal cycling • Age-resistant • Unaffected by ultraviolet radiation • Resistant to moisture and chemicals • Highly flame retardant • Unaffected by ozone or corona • Tough enough for unbraided lead wires.

with these industries & applications

High heat locations such as furnaces, ovens, ranges • Aircraft, spacecraft, ships, locomotives, polar equipment • Refrigerators, freezers, washers, dryers, cars, trucks • Power tools, radio, television sets, transformers • Power plants, pulverizing mills, foundries, cement plants • Kilns, soaking pits, ceramic ovens • Rolling mills, arc furnaces, steel mills, glass manufacturing • Computers, office equipment • Sanitary, food equipment.

"FOREMOST IN SPECIALIZED INTERCONNECTIONS"

ROWE INDUSTRIES



6100 BENORE ROAD, TOLEDO, OHIO 43612
 PHONE (419) 729-9761. TWX 810-442-1734
 or contact rep (listed under "Sales Offices")

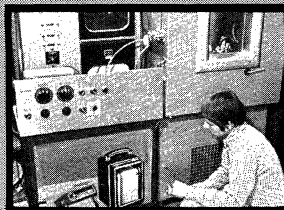
DESIGN • DEVELOPMENT • MANUFACTURING

Specialized Wire and Cable

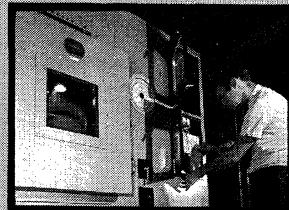
Since 1947, Rowe Industries has been noted for quality and reliability in high-voltage, corona-free connectors and cable assemblies.

Rowe's expertise has always included the incorporation of wire and cable in cable assemblies, including long experience in molding neoprene, butyl and silicone rubber and using braids of aluminum, copper, fiberglass, dacron and many other materials.

TEST FACILITIES FOR

All-Temp AND**Hi-V** WIRE AND CABLE

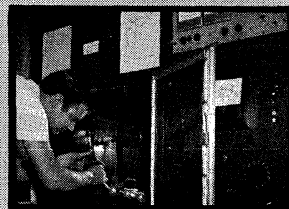
Life testing facilities.



High-altitude pressure chamber.



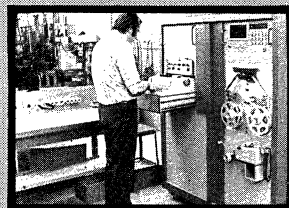
RFI-EMI-EMP test chamber.



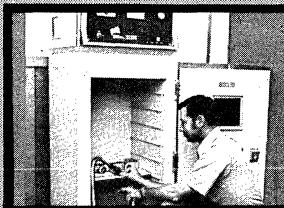
High-voltage, corona and dielectric test chamber.



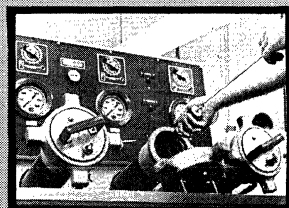
Humidity chamber.



DIT-MCO computerized random access testing.



X-Ray Equipment



Hydrostatic pressure testing.



**Be sure to see
 Rowe Industries High-Voltage,
 Corona-Free Connectors
 and Cable Assemblies
 In Section 2100 of this EEM**

- Single contact
- Coaxial (standard, miniature, subminiature)
- Triaxial
- Multiple contact
- Low-voltage, molded-on

We design, develop and manufacture to meet your commercial, industrial and military needs.

**CALL 419-729-9761 FOR
 NO-OBLIGATION INFORMATION
 WEST COAST: (213) 235-2070**

CALL OR SEND FOR LITERATURE

CLIP AND MAIL TODAY

Rowe Industries, 6100 Benore Road, Toledo, Ohio 43612

Gentlemen: Please send technical literature I've checked. Thank you.

- | | |
|---|---|
| ☐ Corona: simple techniques to eliminate it | ☐ 75 KV coax connectors (R75 Series) |
| ☐ H.V. In-Line Disconnects and Anode Connectors thru 60 KV | ☐ Lanyard/Umbilical Connectors |
| ☐ Rowe multi-contact H.V. connectors | ☐ Triaxial Connectors thru 30 KV |
| ☐ Sub-Miniature H.V. coax connectors thru 15 KV | ☐ Triaxial Connectors thru 55 KV |
| ☐ RG cable H.V. connectors (JA Series) | ☐ Molded-On Interconnections |
| ☐ Miniature Coax Connectors thru 30 KV | ☐ Low-Voltage Multi-Pin Connectors (Insta-Change Series) |
| ☐ Corona-free coax connectors thru 20 KV | ☐ High-Voltage Cable & Wire |
| ☐ Corona-free high pulse coax connectors thru 40 KV | ☐ "All-Temp" High Temperature Wire and Cable |
| | ☐ SRML, SF-2, SFF-2, Aircraft & Locomotive |

Print Name _____

Company _____

Address _____

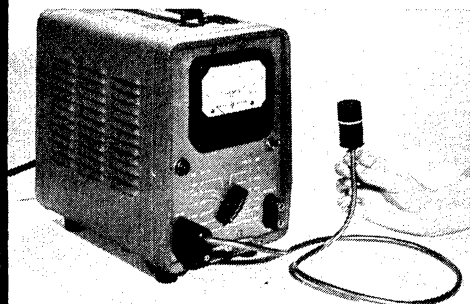
City _____ Zip _____

complete shielding accessories & mica

MAGNETIC SHIELD DIVISION



Perfection Mica Company
740 Thomas Drive
Bensenville, Illinois 60106
(312) 766-7800 TWX (910) 256-4815

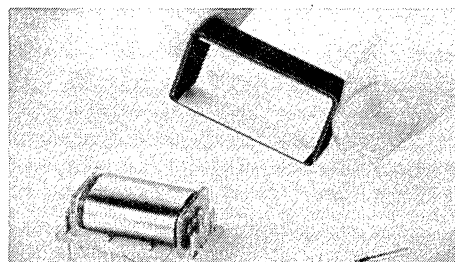


LAB KITS & PROBES

Perfection Mica's recently introduced e.m.i. shielding lab kit contains Netic and Co-Netic shielding material, double-side adhesive tape for shield construction and an LK-101 A.C. magnetic pick-up probe (output 20 millivolts/gauss @ 60Hz) . . . all for only \$99.50. Higher sensitivity probes of 60 millivolts/gauss are available on individual order.

COMPONENT SHIELDS

Perfection Mica stocks many standard shield enclosures for relays, reed switches, transformers, CRT's, small motor assemblies, etc. High attenuation shields can also be quickly fabricated for special component or sub-assembly configurations. Call Perfection Mica for a fast estimate on any of your shielding needs.

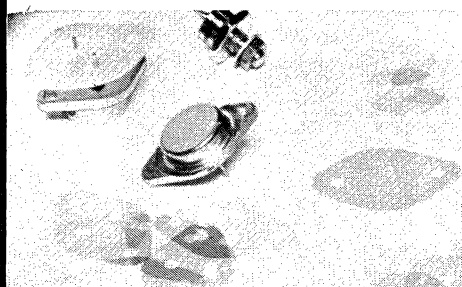
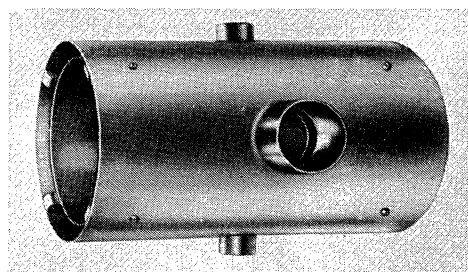


INTER-8 WEAVE CABLE

The special twisted configuration of individual wire leads within Inter-8 Weave Cable provides lower pick-up or radiation between interconnections. Typical performance improvement is -20 db for radiation and -12 db for pick-up. Plain or Co-Netic shielded cables are available in wire size 24 AWG in lengths up to 500 feet.

ZERO GAUSS CHAMBERS

Zero gauss chambers provide the ultimate in magnetic shielding. Perfection Mica's general-purpose zero gauss chamber (ZG-102), offers a significant reduction in both static and time varying fields normally found in laboratory and research environments. A Helmholtz coil system can be incorporated so that known fields can be generated for calibration purposes. Three concentrically spaced Co-Netic chambers with closed ends and two removable covers with openings for cable egress are provided.

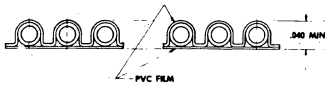


MICA INSULATORS

All types of mica available. Supplied in clear, natural, and built-up sheet stock in thicknesses ranging from .001" to .062". Save tooling expense on many varieties of fabricated parts including semi-conductor insulators in .001" to .003" thickness with .002" hole tolerances. Excellent heat dissipation and high dielectric strength improves breakdown protection and efficiency of semi-conductors.

**SPECTRA-STRIP****COMPLETE RIBBON CABLE INTERCONNECTION SYSTEMS**

SPECTRA-STRIP 3C™ LAMINATED RIBBON CABLE

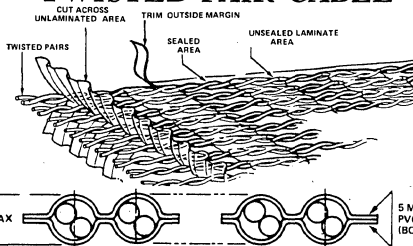


The design flexibility of Laminated 3C (Controlled Characteristics Cable) provides precise spacing of conductors to control such critical parameters as impedance, capacitance, crosstalk and attenuation. Standard with uniform .050" conductor spacing, compatible with standard Insulation Displacement Connectors, (IDCs), 3C cable can also be ordered with other controlled conductor spacing. Round conductors are available from 6 to 32 AWG, insulated or uninsulated. Also available are flat conductors and a variety of standard UL recognized styles.

STANDARD CONFIGURATION

Standard 3C cables are available in 28 AWG 7-strand conductor, with 10 to 60 conductors per cable, laminated between sheets of .005" PVC film. Standard color codes are Br-R-O-Y-Gr-BI-Vi-Gy-Wh-Blk, repeat; or all gray with one edge red. PVC insulation meets MIL-W-16878D Type B, listed by UL. Special configurations, intermixed sizes, choice of conductor sizes from 6 to 36 AWG, spacing, color coding and insulation are readily available. Up to 100 conductors may be ordered in a single cable. Single-side shielding or ground plane shields are also available to meet specific crosstalk and impedance requirements.

3C™ INTERMITTENT LAMINATE TWISTED PAIR CABLE



Intermittent lamination on 3C Twisted Pair cable permits quick laminate peel-back, untwisting of insulated conductor pairs, and preparation for termination. Unbonded twisted pairs are positioned side by side on controlled centers and laminated between .005" sheets of PVC film at approximately 3/4-inch intervals along the length of the cable. Cutting across an unaminated area provides access to free conductor pairs, easy to separate and terminate.

Intermittent Laminated Twisted Pair cable may be ordered in any color code (with one conductor of each pair either white or black), in uniform or mixed sizes from 22 to 30 AWG, with any standard laminate film, and with any number of twisted pairs up to a maximum cable width of 6 inches.

DOUBLE-TWIST™ LAMINATED TWISTED PAIR CABLE

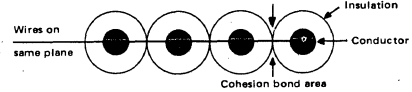


Easier to separate and terminate than bonded twisted pair cable, Spectra-Strip Double-Twist cable incorporates individually-insulated conductors twisted together in pairs, but not bonded to one another. The cable is comprised of a series of two twisted pairs placed side by side, and laminated together intermittently in a "pocket" of PVC film. Grooves or "nip areas" can be incorporated between sets of two twisted pairs, permitting a set to be separated from the main cable without removing lamination from the entire cable. Grooves can be placed anywhere in the cable, after any even-numbered pair.

Double-Twist cable can be ordered with any number of pairs (in multiples of two pairs), in conductor sizes from 22-30 AWG. Conductor sizes can be uniform or mixed. Standard insulation is .005" PVC, with other laminates and thicknesses available. Any color code can be ordered, with one conductor in each pair black or white.

SPECTRA-STRIP® BONDED RIBBON CABLE

BONDED CABLE CROSS-SECTION



Spectra-Strip Bonded flat ribbon cable is compatible with all standard terminating techniques. Constructed of stranded or solid round conductors insulated with PVC and bonded together in a flat plane, bonded cable saves space and reduces costs. Consistent wire geometry assures repeatable and reproducible electrical characteristics, while the bonded cable's flexibility and configuration permit it to conform to package contour. UL-listed styles are available.

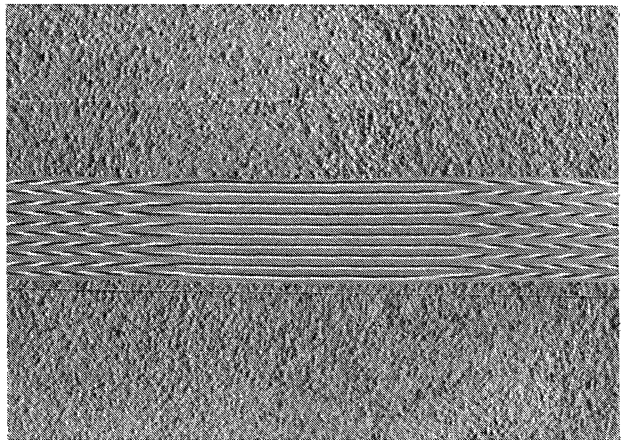
STANDARD CONFIGURATION

Standard bonded cables range from 10 to 30 conductors, 22 to 30 AWG, in 7- or 19-strand wire. Standard color code is Br-R-O-Y-Gr-BI-Vi-Gy-Wh-Blk, repeat. Special configurations with solid conductors (26-30 AWG), 2 to 100 conductors, variety of color coding and intermixed conductor sizes may be ordered.

SPECTRA-TWIST® CABLE

Spectra-Twist Bonded twisted pair cable controls crosstalk at less cost than shielding, and is especially useful in communications and data processing applications. Individually insulated round conductors are twisted in pairs and bonded together in a single plane to form a flexible, flat ribbon cable. Spectra-Twist incorporates all the advantages of single-conductor bonded cable: compatibility with standard terminating techniques, consistent, repeatable electrical characteristics, narrowness of width, and conformation to package contour.

NEW! TWIST 'N' FLAT™ LAMINATED TWISTED PAIR CABLE



New Spectra-Strip Twist 'n' Flat™ twisted pair cable provides for multiple conductor termination by alternating lengths of twisted pairs positioned on controlled centers, with areas of untwisted parallel conductors. Termination of one, several, or all twisted pairs in the cable may be made at any of the parallel-conductor areas.

Standard configuration provides 10 twisted pairs of 28 AWG stranded wire, alternately twisted for 18" and separated as parallel conductors for 3". For special applications, any color coding, conductor sizes or standard laminates are available. Any number of twisted pairs may be ordered, up to a maximum of 26 pairs, and lengths of twisted and parallel areas may be varied to customer requirement.

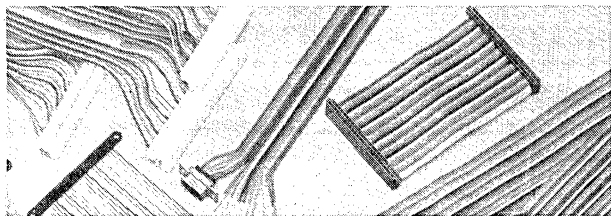
ONLY FROM SPECTRA-STRIP: CUSTOM FLAT RIBBON CABLES AND SYSTEMS

Only Spectra-Strip makes "specials" a standard product line. Many applications ideally require unusual cable configurations, special limitations, mixed conductor sizes (even combinations of single conductors and twisted pairs in a single cable), shields or ground planes, specific color codes or other special considerations not usually met by off-the-shelf standards.

Special requirements are our specialty—give us all available information on your application, and our engineers will devise a ribbon cable solution to your interconnection problem and your budget. Don't settle for what's available; select what you **really** need from Spectra-Strip.

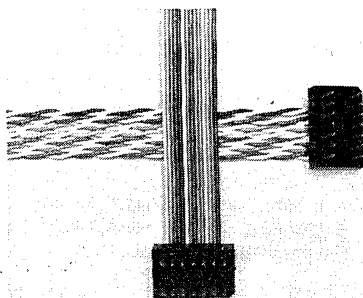
**SPECTRA-STRIP**

7100 Lampson Avenue, Garden Grove, California 92642 / Tel.: (714) 892-3361 TWX: (910) 596-1314
720 Sherman Avenue, Hamden, Connecticut 06514 / Tel.: (203) 281-3200 TWX: (710) 465-1020

SPECTRA-STRIP CUSTOM CABLE ASSEMBLIES AND HARNESSES

Interconnections have become a critical component in today's sophisticated electronic systems, rather than an unwelcome afterthought. Spectra-Strip's complete selection of flat ribbon cables and components, and our established interconnection design experience enables us to design and produce your complete system or subsystem, ready for installation. Spectra-Strip's manufacturing facilities conserve yours, saving you both time and labor costs on production quantities.

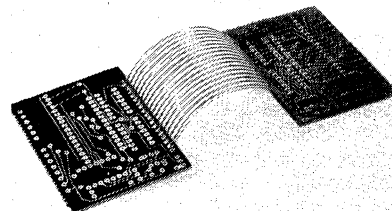
Call on Spectra-Strip for your total interconnection needs. We'll do the job from start to finish, or any portion thereof.

IC INTERCONNECT ASSEMBLIES

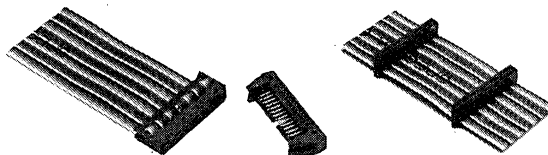
Pre-assembled flat ribbon cable IC interconnections from Spectra-Strip provide a fast, efficient and inexpensive solution to complicated bussing and crossovers between PC boards, backplanes and other IC circuitry. Standard with 26 AWG 7-strand wire and 14- or 16-pin Dual-In-line plugs at one or both ends, Spectra-Strip's IC interconnect assemblies are available in other sizes and terminations to suit your specific requirements.

SPECTRA-STRIP JUMPER ASSEMBLIES

Low-cost, labor-saving Spectra-Strip Jumper Assemblies eliminate connectors by providing precise, controlled conductor positioning, with pre-tinned wire leads ready to solder directly to PC boards. Supplied in specified lengths or continuous rolls, pre-stripped at intervals, S-S jumper assemblies are made to your specification from solid or stranded conductors in sizes 22-30 AWG. Specify desired conductor size, pitch, number of conductors, insulation, color coding, assembly length and strip length. Standards are in stock, ready for installation.

**FLAT RIBBON CABLE CONNECTORS**

Flat ribbon cable users need flat ribbon cable connectors, and Spectra-Strip has a complete selection — Insulation Displacement (IDC) types; straight, right-angle and protected-pin Headers; DIP sockets and plugs for IC connections — whatever your application requires. Complete your flat ribbon cable needs with Spectra-Strip's wide selection of components.

**SPECTRA-STRIP HOOK-UP WIRE**

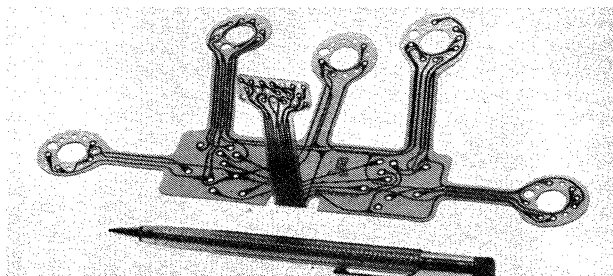
All hook-up wire is **not** alike, and Spectra-Strip makes its own wire specifically to insure controlled, consistent quality, concentricity of conductor and insulation, longer flex life, strength and ruggedness for its own cable products. Now the best hook-up wire on the market is available to you at competitive prices, in all standard AWG sizes,

ten colors for coding with special colors and stripes available, solid or stranded conductors. Also available is a wide variety of CSA classes and UL recognized styles. Call on Spectra-Strip for better-than-average delivery on **much** better-than-average hook-up wire.

SPECTRA-FLEX™ FLEXIBLE CIRCUITS

Today's electronic designers are rapidly discovering an efficient means of saving space, reducing weight and volume, eliminating expensive connectors, and saving labor costs on assembly, inspection and testing with Spectra-Flex flexible circuits. In some applications, conversion from conventional rigid PC boards to Spectra-Flex circuits has saved as much as 50% in labor costs, 60% in weight and 80% in volume. An entire flexible circuit system becomes a single component, which can be folded up and installed in any available space in your equipment package.

For a total concept in flexible printed circuits, Continental Circuits Corp., a subsidiary of Spectra-Strip, offers a complete service: design analysis, engineering, prototype preparation, drafting and design, material specification, environmental testing, and continuous-process production. Order any quantity, from prototypes to mass production. Contact us for complete details.

**CONTINENTAL CIRCUITS CORP.**

subsidiary of
6324 W. Cambridge St., Minneapolis, MN. 55416
Tel.: (612) 920-8781 TWX: (910) 576-3484

SPECTRA-STRIP 

STANDARD WIRE & CABLE CO.

A COMPLETE SOURCE FOR ELECTRICAL WIRE, CABLE & CORD

Branch offices and warehouses, Coast to Coast, enables us to give you FAST DELIVERY of over 25,000 Wire & Cable items.

SWC experts can solve your specific Wire & Cable problems. We custom design, engineer and develop to provide the most practical solutions for your wire applications.

Depicted are several condensed pages of the most complete Wire & Cable catalog in the industry. Send for your free copy.

INSTRUMENTATION CONTROL CABLE

CABLES MADE TO ORDER 600 VOLT 105° C

APPLICATIONS: interconnecting cables for electronic equipment, telemetering, instrumentation, control, computers.

CONDUCTORS: stranded, tinned copper per Type "B" to MIL-W-16878D
24 AWG — 7/32 20 AWG — 7/28
22 AWG — 7/30 18 AWG — 7/26

INSULATION: .010 nominal wall semi-rigid 105°C to minus 55°C Vinyl per Type "B" to MIL-W-16878D, 600 volts.

CODED: NUMBERED consecutively in black on white insulation at approximately 1 inch intervals.

CABLED: round with fillers where needed

JACKET: black flexible Vinyl. 105°C to minus 40°C

ENGINEERING CHARACTERISTICS:

Temperature rating 150°C to minus 40°C. Resistant to flame, moisture and many oils and chemicals.

Approximate capacitance between adjacent conductors in pico farads per foot:

24 AWG: 32
22 AWG: 35
20 AWG: 38
18 AWG: 41

CONSTRUCTIONS
AS SHOWN

24 AWG CONDUCTORS			22 AWG CONDUCTORS			20 AWG CONDUCTORS			18 AWG CONDUCTORS			
No. Cond.	Catalog Number	Jacket Thick.	Cable O.D.	Catalog Number	Jacket Thick.	Cable O.D.	Catalog Number	Jacket Thick.	Cable O.D.	Catalog Number	Jacket Thick.	Cable O.D.
2	5001	.025	.143	5101	.025	.155	5201	.025	.171	5301	.025	.191
3	5002	.025	.150	5102	.025	.163	5202	.025	.181	5302	.025	.202
4	5003	.025	.162	5103	.025	.176	5203	.025	.196	5303	.025	.220
5	5004	.025	.174	5104	.025	.190	5204	.025	.211	5304	.025	.239
6	5005	.025	.187	5105	.025	.205	5205	.025	.229	5305	.025	.259
7	5006	.025	.187	5106	.025	.205	5206	.025	.229	5306	.025	.259
8	5007	.025	.201	5107	.025	.221	5207	.025	.247	5307	.025	.280
9	5008	.025	.214	5108	.025	.236	5208	.025	.265	5308	.025	.301
10	5009	.025	.231	5109	.025	.255	5209	.025	.287	5309	.030	.337
11	5010	.025	.231	5110	.025	.255	5210	.025	.287	5310	.030	.337
12	5011	.025	.238	5111	.025	.263	5211	.025	.297	5311	.030	.348
13	5012	.025	.249	5112	.025	.276	5212	.030	.321	5312	.030	.365
14	5013	.025	.249	5113	.025	.276	5213	.030	.321	5313	.030	.365
15	5014	.025	.263	5114	.025	.291	5214	.030	.339	5314	.035	.395
20	5015	.025	.289	5115	.030	.331	5215	.035	.383	5315	.040	.446
25	5016	.030	.329	5116	.030	.365	5216	.035	.423	5316	.040	.493
30	5017	.030	.347	5117	.035	.396	5217	.040	.457	5317	.045	.531
35	5018	.035	.383	5118	.035	.425	5218	.045	.501	5318	.050	.581
40	5019	.035	.397	5119	.040	.451	5219	.045	.510	5319	.050	.602
45	5020	.040	.437	5120	.040	.485	5220	.050	.569	5320	.050	.649
50	5021	.040	.455	5121	.045	.516	5221	.050	.593	5321	.050	.677
60	5022	.040	.481	5122	.045	.545	5222	.050	.627	5322	.055	.727
70	5023	.045	.535	5123	.050	.605	5223	.055	.695	5323	.060	.805
80	5024	.050	.564	5124	.050	.627	5224	.055	.720	5324	.060	.834
90	5025	.050	.589	5125	.050	.655	5225	.055	.753	5325	.060	.873
100	5026	.050	.633	5126	.055	.715	5226	.060	.821	5326	.065	.951
110	5027	.050	.652	5127	.055	.737	5227	.060	.845	5327	.065	.980
120	5028	.050	.665	5128	.055	.751	5228	.060	.863	5328	.065	1.000

THESE CABLES ARE MADE TO ORDER



STRANDED CONDUCTORS

VINYL INSULATION

MYLAR®
TAPE

VINYL
JACKET

CONSTRUCTIONS AS SHOWN

24 AWG CONDUCTORS				22 AWG CONDUCTORS				20 AWG CONDUCTORS				18 AWG CONDUCTORS			
No. Con.	Catalog Number	Jacket Thick.	Cable O.D.	Catalog Number	Jacket Thick.	Cable O.D.	Catalog Number	Jacket Thick.	Cable O.D.	Catalog Number	Jacket Thick.	Cable O.D.	Catalog Number	Jacket Thick.	Cable O.D.
2	5001.S	.025	.166	5101.S	.025	.178	5201.S	.025	.194	5301.S	.025	.214			
3	5002.S	.025	.173	5102.S	.025	.186	5202.S	.025	.204	5302.S	.025	.225			
4	5003.S	.025	.185	5103.S	.025	.199	5203.S	.025	.219	5303.S	.025	.243			
5	5004.S	.025	.197	5104.S	.025	.213	5204.S	.025	.234	5304.S	.025	.262			
6	5005.S	.025	.210	5105.S	.025	.228	5205.S	.025	.252	5305.S	.025	.282			
7	5006.S	.025	.210	5106.S	.025	.228	5206.S	.025	.252	5306.S	.025	.282			
8	5007.S	.025	.224	5107.S	.025	.244	5207.S	.025	.270	5307.S	.025	.303			
9	5008.S	.025	.237	5108.S	.025	.259	5208.S	.025	.288	5308.S	.025	.324			
10	5009.S	.025	.254	5109.S	.025	.278	5209.S	.025	.310	5309.S	.030	.367			
11	5010.S	.025	.254	5110.S	.025	.278	5210.S	.025	.310	5310.S	.030	.367			
12	5011.S	.025	.261	5111.S	.025	.286	5211.S	.025	.320	5311.S	.030	.378			
13	5012.S	.025	.272	5112.S	.025	.299	5212.S	.030	.351	5312.S	.030	.395			
14	5013.S	.025	.272	5113.S	.025	.299	5213.S	.030	.351	5313.S	.030	.395			
15	5014.S	.025	.286	5114.S	.025	.314	5214.S	.030	.369	5314.S	.035	.425			
20	5015.S	.025	.312	5115.S	.030	.361	5215.S	.035	.413	5315.S	.040	.476			
25	5016.S	.030	.359	5116.S	.030	.395	5216.S	.035	.453	5316.S	.040	.523			
30	5017.S	.030	.377	5117.S	.035	.426	5217.S	.040	.487	5317.S	.045	.561			
35	5018.S	.035	.413	5118.S	.035	.455	5218.S	.045	.531	5318.S	.050	.611			
40	5019.S	.035	.427	5119.S	.040	.481	5219.S	.045	.540	5319.S	.050	.632			
45	5020.S	.040	.467	5120.S	.040	.515	5220.S	.050	.599	5320.S	.050	.679			
50	5021.S	.040	.485	5121.S	.045	.546	5221.S	.050	.623	5321.S	.050	.707			
60	5022.S	.040	.511	5122.S	.045	.575	5222.S	.050	.657	5322.S	.055	.753			
70	5023.S	.045	.565	5123.S	.050	.635	5223.S	.055	.725	5323.S	.060	.839			
80	5024.S	.050	.594	5124.S	.050	.657	5224.S	.055	.750	5324.S	.060	.864			
90	5025.S	.050	.619	5125.S	.050	.685	5225.S	.055	.783	5325.S	.060	.903			
100	5026.S	.050	.663	5126.S	.055	.745	5226.S	.060	.851	5326.S	.065	.981			
110	5027.S	.050	.682	5127.S	.055	.767	5227.S	.060	.875	5327.S	.065	1.010			
120	5028.S	.050	.695	5128.S	.055	.781	5228.S	.060	.893	5328.S	.065	1.030			

INSTRUMENTATION CONTROL CABLE WITH OVERALL SHIELD 600 VOLT 105° C

APPLICATIONS: interconnecting cables for electronic equipment, telemetering, instrumentation, control, computers.

CONDUCTORS: stranded, tinned copper per type "B" to MIL-W-16878D
24 AWG—7/32 22 AWG—7/30 20 AWG—7/28 18 AWG—7/26

INSULATION: .010 nominal wall semi-rigid 105°C to minus 55°C Vinyl per Type "B" to MIL-W-16878D, 600 volts.

CODED: NUMBERED consecutively in black on white insulation at approximately 1 inch intervals.

CABLED: with fillers where needed for roundness.

OVERALL SHIELD: braided tinned copper, 80% coverage.

JACKET: black flexible Vinyl. 105°C to minus 40°C.

ENGINEERING CHARACTERISTICS:

Temperature rating 105°C to minus 40°C. Resistant to flame, moisture and many oils and chemicals.

Approximate capacitance between adjacent conductors in pico farads per foot:

24 AWG: 32 22 AWG: 35 20 AWG: 38 18 AWG: 41

Dimensions Are Nominal

These Cables Are Made To Order

®DuPont Trademark

MULTIPLE PAIR CONTROL CABLE, EACH PAIR SHIELDED**300 VOLT 75° C**

VINYL JACKET

MYLAR®
TAPEALL/MYLAR®
FOIL SHIELDPOLYETHYLENE
INSULATION

APPLICATIONS: monitoring, data recording and conveyance of information, such as telemetering, communication, temperature, pressure and flow.

CONDUCTORS: stranded, tinned, soft copper

22 AWG — 7/30

18 AWG — 16/30

20 AWG — 7/.0121

16 AWG — 26/30

INSULATION: high dielectric strength, low loss polyethylene

22 AWG — .015 nominal wall

18 AWG — .020 nominal wall

20 AWG — .015 nominal wall

16 AWG — .020 nominal wall

PAIRS: are formed by twisting 2 conductors with an uninsulated stranded tinned copper drain wire (for terminating shield). 22 AWG and 20 AWG pairs utilize a 22 AWG drain wire; 18 AWG and 16 AWG pairs a 20 AWG drain wire.

PAIR SHIELDS: each pair is shielded with Mylar® supported Aluminum Foil, spirally wrapped. The aluminum foil is .00035 inch thick and the Mylar® supporting film is .0005 inch thick.

CABLED: round with fillers where needed

BINDER: .001 inch thick Mylar® tape

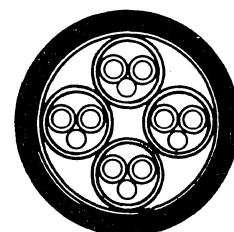
®DuPont Trademark

JACKET: black flexible Vinyl, 80°C to minus 40°C

ENGINEERING CHARACTERISTICS:

Temperature rating 75°C to minus 40°C. Resistant to flame, moisture and many oils and chemicals. **Approximate capacitance** in pico farads per foot:

	Mutual	Between one cond. and other cond. tied to shield
22 AWG Pair	25	48
20 AWG Pair	30	56
18 AWG Pair	28	53
16 AWG Pair	35	67

CONSTRUCTIONS
AS SHOWNCROSS SECTION
OF CABLE

DIMENSIONS ARE NOMINAL — THESE CABLES MADE TO ORDER

22 AWG PAIRS			20 AWG PAIRS			18 AWG PAIRS			16 AWG PAIRS		
No. Catalog Pairs Number	Jacket Thick.	Cable O.D.	Catalog Number	Jacket Thick.	Cable O.D.	Catalog Number	Jacket Thick.	Cable O.D.	Catalog Number	Jacket Thick.	Cable O.D.
2 5401-S	.030	.295	5501-S	.030	.315	5601-S	.035	.390	5701-S	.040	.450
3 5402-S	.030	.315	5502-S	.030	.335	5602-S	.035	.415	5702-S	.040	.480
4 5403-S	.030	.345	5503-S	.030	.365	5603-S	.040	.465	5703-S	.045	.535
5 5404-S	.035	.385	5504-S	.035	.410	5604-S	.045	.520	5704-S	.050	.600
6 5405-S	.035	.420	5505-S	.040	.460	5605-S	.050	.575	5705-S	.050	.655
9 5406-S	.045	.510	5506-S	.045	.545	5606-S	.050	.670	5706-S	.055	.775
12 5407-S	.050	.580	5507-S	.050	.625	5607-S	.055	.765	5707-S	.060	.885
15 5408-S	.050	.645	5508-S	.055	.700	5608-S	.060	.860	5708-S	.065	.995
19 5409-S	.050	.675	5509-S	.055	.735	5609-S	.065	.915	5709-S	.070	1.055
27 5410-S	.060	.830	5510-S	.060	.890	5610-S	.070	1.105	5710-S	.080	1.285
50 5411-S	.070	1.105	5511-S	.075	1.200	5611-S	.080	1.480	5711-S	.090	1.715

**SEND FOR SWC's
TECHNICAL MANUAL AND
CATALOG CONTAINING
MANY SPECIAL FEATURES**

120 pages of the most comprehensive technical information in the wire industry.

Complete Technical Information on Wire & Cable Products.

Wire Tables, Charts and Conversion Factors.

Manual of Coaxial Cable.
Military Specifications Evaluation Guide.

Glossary of Wire & Cable Terminology.

**For Free Copy Write to
Literature Department CE**

HOME OFFICE

Standard WIRE & CABLE CO.

OVERLAND AT LAWLER - LOS ANGELES, CALIFORNIA 90034

(AREA CODE 213) 870-9231 • 870-4647 • TWX 910-340-6758 • TELEX 65-3423

STANCABLE

EASTERN DIVISION

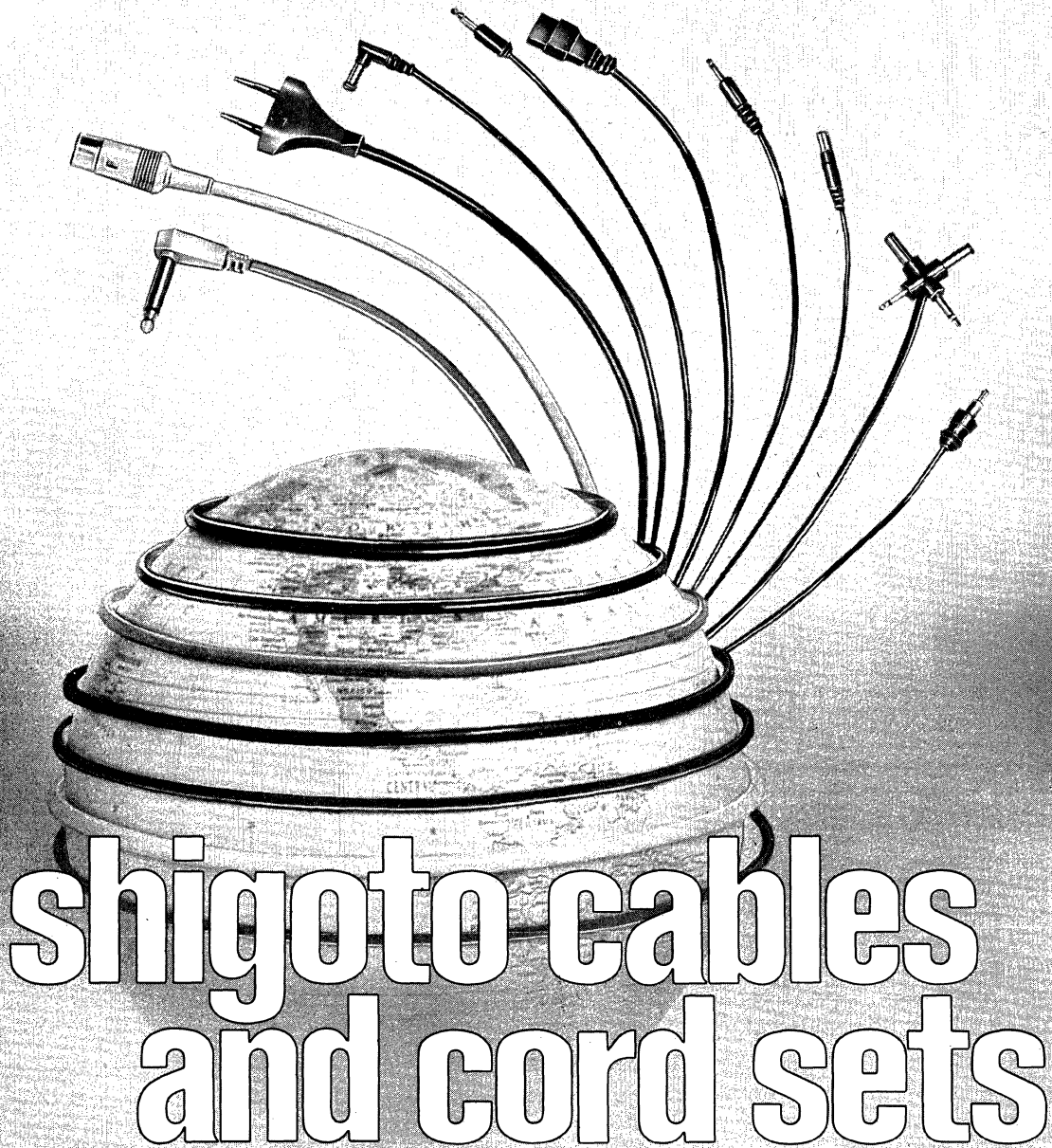
ATTLEBORO, MASSACHUSETTS, 40 Townsend Road, (617) 226-1500, TELEX: 92-7795

BRANCH OFFICES

PALO ALTO, CALIFORNIA 94301
644 EMERSON ST., SUITE 20
PHONE (415) 328-3082
TELEX 34-8375

VANCOUVER, WASH. 98660
1238 MAIN STREET
PHONE (206) 696-4645
TELEX 36-0847

PHOENIX, ARIZONA 85031
1626 SOUTH 51st AVE.
PHONE (602) 269-2501
TELEX 66-8441



shigoto cables and cord sets

...we go to any lengths ...we go to any ends.

That's why Shigoto can help make your ends meet. From hundreds of standard combinations to unusual characteristics that meet your own requirements. Even U.L. and C.S.A. approved. Our volume production for O.E.M.'s in electronics, communications, automotive, appliances, and practically every other industry, takes all the variables out of price-performance differences. Shigoto's ability to consistently produce top quality assemblies, when combined with large quantities, always brings in the prices you need. Unmatched quality has become our standard, our reliability and delivery schedules will become yours. Call, write, or wire your specs. At Shigoto, you'll find we'll go to any ends, to any lengths, to satisfy you.

 ***Shigoto Industries Ltd.***

350 Fifth Avenue, New York, N.Y. 10001/ (212) 695-0200/ Telex 224219

One of the World's Largest Manufacturing Importers

TRW[®] HOLYOKE WIRE & CABLE

TOTAL CAPABILITY IN PRECISION CABLE ASSEMBLIES

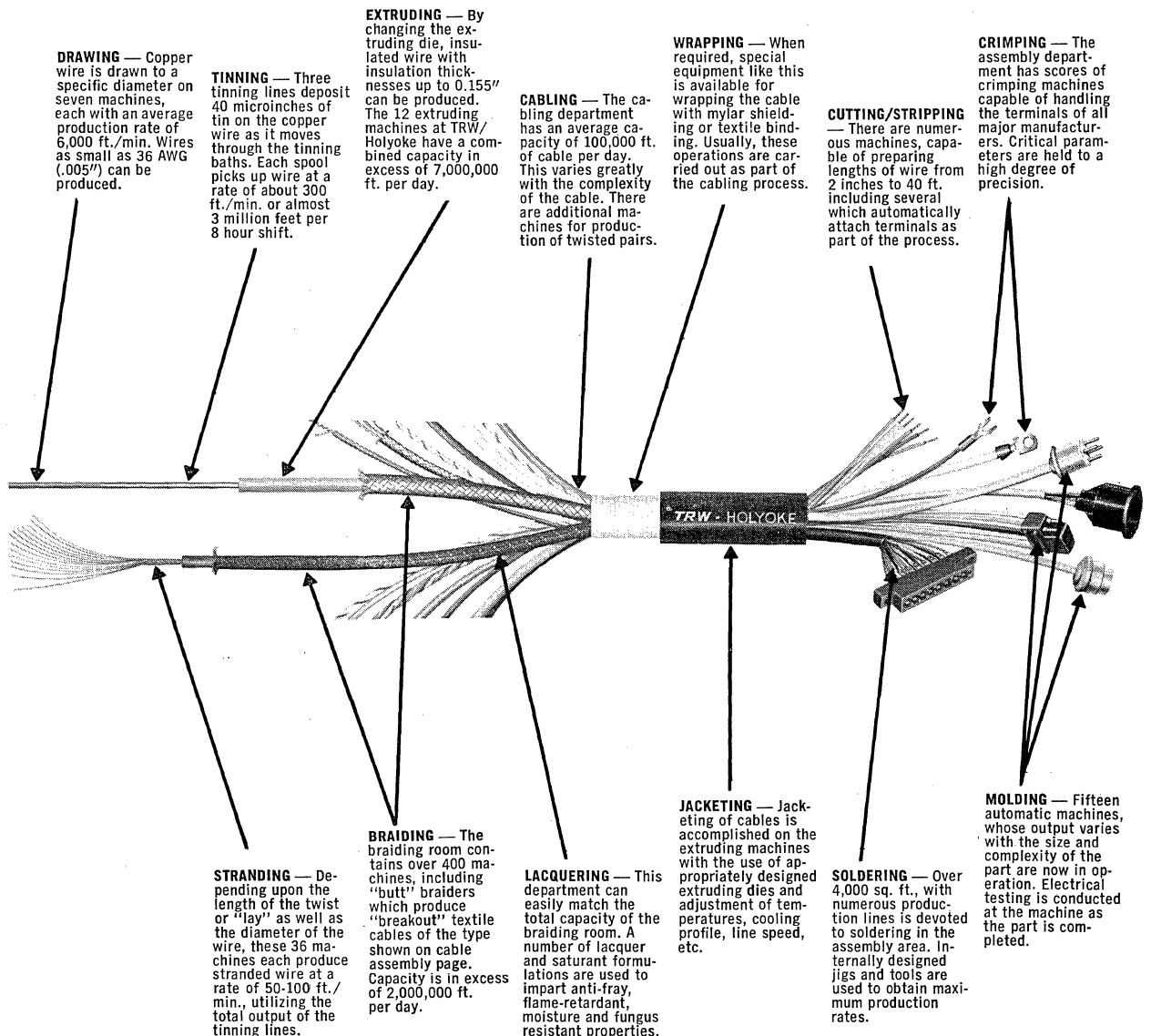
At TRW/Holyoke Wire and Cable, "total capability" in the manufacture of precision cable assemblies and harnesses is a blend of complete facilities, advanced technology, and wide experience.

Every manufacturing step — from the drawing of individual copper wires to the attaching of hardware and molding of

the connector — is performed internally to achieve maximum cost effectiveness and control of product quality.

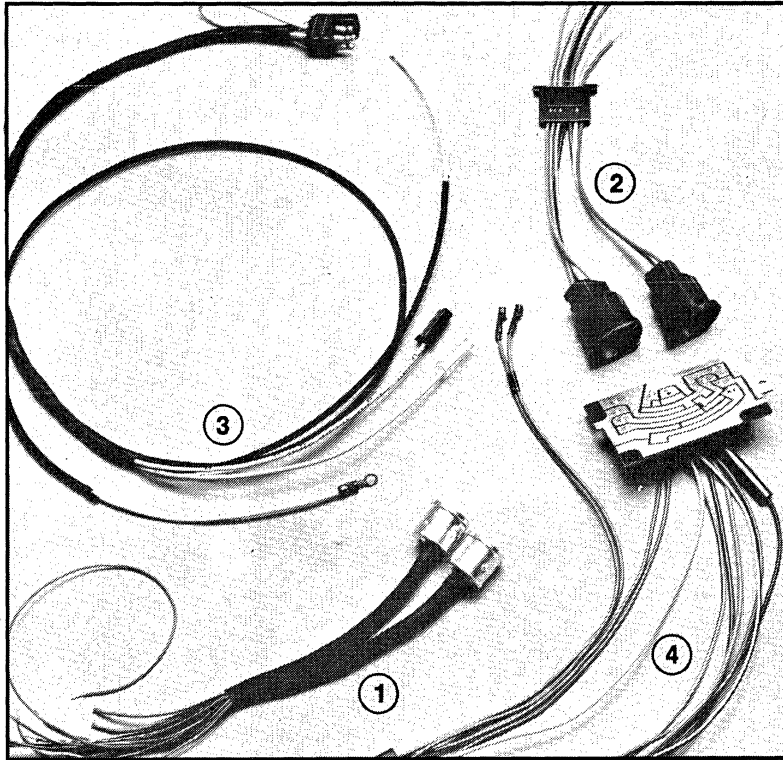
Through its complete in-house wire and cable manufacturing facilities, TRW/Holyoke is equipped to fabricate any cable assembly or harness, regardless of its complexity.

Laced or textile braided assemblies, with shielded break-outs and solder or crimp attachment of any single or multiple termination can be supplied. Dies for molded connector assemblies are designed and built internally for a wide range of molding materials.



TRW/HOLYOKE WIRE & CABLE, AN ELECTRONIC COMPONENTS DIV. OF TRW INC. / 720 MAIN STREET / HOLYOKE, MASS. 01040

TRW[®] HOLYOKE WIRE & CABLE



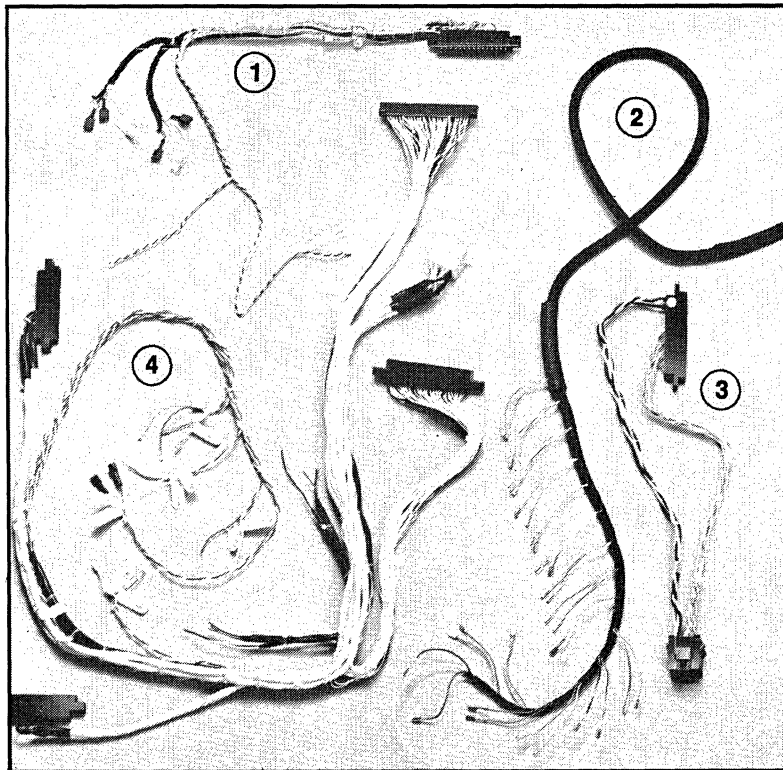
CABLE ASSEMBLIES

Automotive cable assemblies produced by TRW/Holyoke cover the range from low voltage, low current semiconductor circuit devices to high power, high reliability types — all with the appropriate environmental terminations and connectors.

1. Passenger car rear seat control cable assembly incorporating Y-shaped "break-put" nylon braiding to two solder-terminated female connectors.
2. Dual connector electronic ignition cable assembly with molded grommet and molded-in blade contacts in pull-apart insulator shells.
3. Semi-trailer refrigeration system nylon braided cable assembly, for high reliability control application. Coded aircraft type connectors, terminated with pre-insulated crimped terminals and molded automotive type plug.
4. Automobile climate control cable assembly with crimp insertable contacts in male plugs and crimp contacts riveted to a printed circuit board switch panel.

TRW/Holyoke's most complex assemblies are those supplied to the computer industry. The combining of many type of conductors, terminals and connectors in a single harness is not uncommon. TRW/Holyoke can incorporate special PC boards or connectors provided by the customer, or will purchase these for the customer, in addition to producing any special molding dies that may be required. Complete testing facilities are available — no matter how complex the harness assembly.

1. Thirty conductor cable assembly with four molded tapehead connectors, 50 position edge connector and miscellaneous wire terminations.
2. Thirty-two conductor cable using unique braiding technique that allows shielding the entire length of each breakout section. Continuous nylon braid to end of breakout combines minimum cable diameter with high flexibility.
3. Fifteen crimp-insertable terminations (4 twisted pairs, 7 single) in nylon plug and PC connector assembly.
4. Sixty-six conductor harness assembly with four crimp insertable terminal edge connectors, crimp plug and miscellaneous terminals.



TRW[®] HOLYOKE WIRE & CABLE

WIRE & CABLE

The manufacture of single-insulated conductors is a highly technical process that requires precision control of a variety of production parameters, including temperature, wire diameter, die size, and production rate.

Establishment of these parameters is the result of an intimate knowledge of equipment capabilities and material characteristics. At TRW/Holyoke this knowledge is based on over sixty years of experience.

Critical requirements, such as low cross talk levels in telecommunication and EDP cables, minimum impedance discontinuities in RF cables, and enhanced flame retardancy in home entertainment wires and wiring devices, are regularly engineered into products. The requirements of Underwriters' Laboratories fulfilled through design engineering.

Any combination of single wires, twisted pairs, and coaxial cable, in any number, with necessary fillers and bindings can be incorporated into a cable. The only limitation is that the cable diameter not exceed 1.75"; flat braided (woven) cable, up to 0.5" width. Flat rainbow (ribbon) cable is available with 2 to 43 parallel conductors.

Manufacturing Options

Conductors

Copper, copper covered steel, cadmium bronze, phosphor bronze, precious metal alloys.

10 through 30 AWG

Solid or Stranded or Tinsel

Stranding from 7 to 500 strands

Bare or Tinned

Topcoat, Overcoat, Heavy Tinned — fused

Insulations

Polyethylene

Kynar***

Polypropylene

Polyurethane

Polyvinyl Chloride (PVC)

Silicone Rubber

FEP Teflon**

Nylon

Tefzel**

Insulation wall thickness from .002" to .155"

Textile Braids

Celanese*

Cotton

Dacron**

Glass

Nylon

Orlon**

Rayon

... with or without lacquer

Shieldings

Conductive Vinyl

Aluminized Mylar**

Spiral Wrapped and Braided Copper

***Pennwalt Corp. T.M.

**DuPont T.M.

*Celanese Corp. T.M.

G — 52 Pair Telephone Cable

Semi-rigid thin wall insulated #24AWG solid conductors with band marked color coding. Conductors paired with programmed lay for minimum cross-talk. Assembled into 25 pair units with coding binders and four spare conductors, with flexible PVC sheath overall. Overall diameter .625". Rated at 80°C.

H — High Voltage Lead Wire

Tinned copper conductors, solid or stranded, covered with flame retardant high dielectric strength insulation with 105°C. PVC jacket. Construction is designated as UL style #3239 and can be provided in a variety of conductors and voltage ratings to 40 KV.

I — Telephone Distribution Cable

25 pairs #24AWG solid conductors with thin wall semi-rigid insulation, spiral stripe coded. Pairs cabled with flexible bunch lay. PVC sheath extruded overall with nylon ripcord under sheath. O.C. is 0.375".

J — Mini Computer Memory Bank Cable

36 conductors with flexible stranding, PVC insulation and spiral stripe coding. 12 con-

ductors separately cabled with aluminized mylar shield and drain wire. Entire assembly cabled with cotton binder and PVC jacket.

K — High Flexibility Shielded Audio and Control Cable

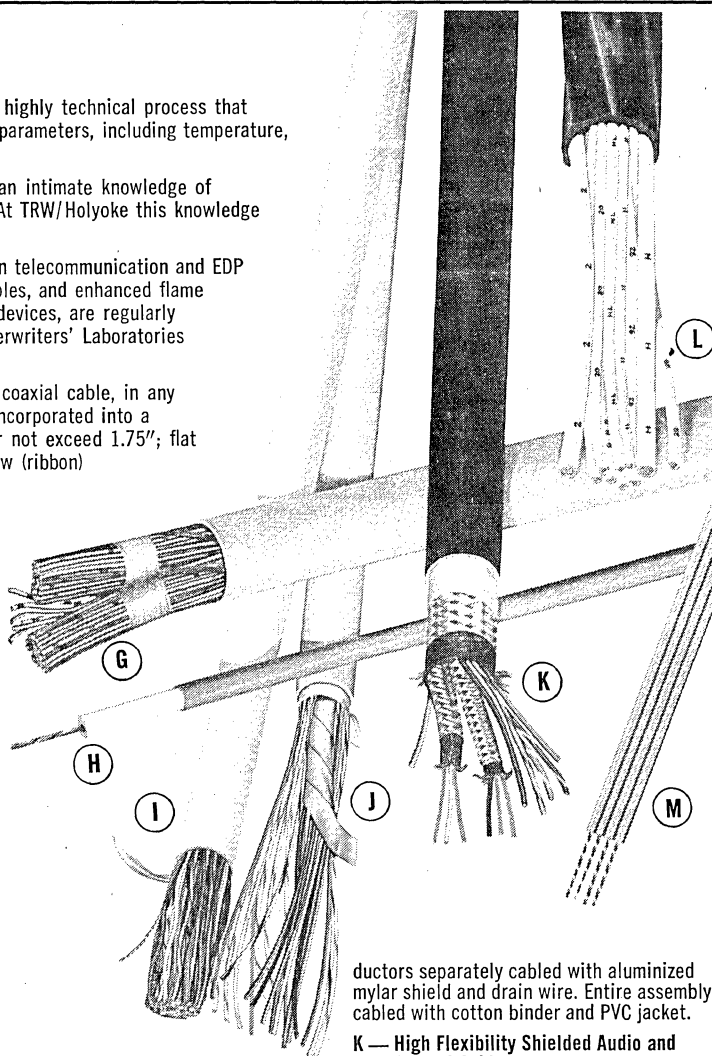
Cable core of seven #24AWG PVC insulated single conductors and two triple conductor cables of #24AWG stranded conductors PVC insulated with color coded textile braiding. These three conductors are then nylon braided as a unit and copper-braid shielded. The entire cable core is nylon braided and copper shielded with a PVC jacket overall.

L — Power and Control Cable

Nine #18AWG and two #12AWG stranded conductors insulated with 105°C. thermoplastic, then covered with lacquered glass braid and extruded nylon. Cabled with extruded thermoplastic jacket overall. Rated 600 volts, -55°C to +105°C. For on-the-road tractor-trailer interconnection.

M — Environmental Resistant Flat Cable

Four stranded conductors simultaneously insulated with high performance extruded silicone rubber compound to form an extremely flexible high reliability cable for military applications. Rated at 300V., -100°C. to +200°C., moisture, fungus and radiation resistant.



MICRO-COAX

The RELIABLE Semi-

Micro-Coax semi-rigid coaxial cable transmits and/or receives a high-speed, high-frequency microwave signal. It is the most dependable, predictable way of achieving:

- low loss, total shielding at or near theoretical value
- elimination of radiation leakage
- lowest possible attenuation
- unequalled VSWR performance through 18 GHz
- miniaturization of power componentry

STANDARD GENERAL PURPOSE 50 OHM MICRO-COAX CABLES

Standard 50 ohm Micro-Coax Cables feature low VSWR and low attenuation covering the entire microwave spectrum. They have good power handling ability and excellent interface dimensions for SMA, SMB, and Type N and TNC connectors.

Micro-Coax Part Number	Normal Impedance and Tolerance (ohms)	Outer (1) Conductor Diameter $\pm .001''$	Dielectric Diameter $\pm .001''$	Center Conductor Diameter (inches)	Center Conductor Material	Minimum Inside Bend Radius (inches)	Max. Temp. (°C)	Weight (lbs./100')	Dielectric Strength (VRMS, 60 Hz)	Safe Maximum Voltage Under Normal Usage (VRMS, 60 Hz)	Higher Order Mode (GHz)	Typical Attenuation (dB/100')/Power Kilowatts (CW)				
												0.5 GHz	1.0 GHz	5.0 GHz	10.0 GHz	20.0 GHz
UT-85	50.0 $\pm$ 1.5	.0865**	.066	.0201	SPCW	.125	150	1.4	2500	1500	60	13.0/0.221	19.0/0.151	44.0/0.065	64.5/0.045	96.0/0.030
UT-85C	50.0 $\pm$ 1.5	.0865**	.066	.0201	SPC	.125	150	1.4	2500	1500	60	13.0/0.221	19.0/0.151	44.0/0.065	64.5/0.045	96.0/0.030
UT-141	49.0 $\pm$ 1.0	.141 *	.116	.0359	SPCW	.250	175	3.2	5000	1900	34	7.5/0.742	11.0/0.506	26.0/0.214	39.5/0.140	60.5/0.091
UT-141A	50.0 $\pm$ 1.0	.141 **	.1185	.0359	SPCW	.250	175	3.2	5000	1900	33	7.5/0.742	11.0/0.506	26.0/0.214	39.5/0.140	60.5/0.091
UT-141AA	50.0 $\pm$ 0.5	.141 **	.1185	.0359	SPCW	.250	175	3.2	5000	1900	33	7.5/0.742	11.0/0.506	26.0/0.214	39.5/0.140	60.5/0.091
UT-141B	50.0 $\pm$ 1.0	.141 *	.1185	.0359	SP BeCu	.250	175	3.2	5000	1900	33	8.5/0.742	12.0/0.506	28.0/0.214	41.0/0.140	62.0/0.091
UT-141C	50.0 $\pm$ 1.0	.141 **	.1185	.0359	SPC	.250	175	3.2	5000	1900	33	7.5/0.742	11.0/0.506	26.0/0.214	39.5/0.140	60.5/0.091
UT-141L	50.0 $\pm$ 1.0	.141	.1185	.0359	Tophet Ct	.250	175	3.2	5000	1900	33	45.0/0.742	57.5/0.506	130.0/0.214	187.0/0.140	268.0/0.091
UT-250A	50.0 $\pm$ 0.5	.250 *	.209(2)	.0640	SPC	.375	200	10.0	7000	3000	19	4.3/2.622	6.4/1.762	16.5/0.683	26.0/0.434	41.0/0.275
UT-325A	50.0 $\pm$ 1.0	.325(2)	.285(2)	7x .0312	SPC	.750	200	14.5	7500	3000	14	3.0/4.733	5.0/2.840	13.0/1.092	20.5/0.693	
UT-390	50.0 $\pm$ 0.5	.390(2)	.330(2)	.102	SPC	.750	200	25.0	12000	6000	12	3.0/5.512	4.5/3.675	12.0/1.378	19.0/0.870	

ULTRAMINIATURE 50 OHM MICRO-COAX CABLES

Ultraminiature 50 ohm Micro-Coax Cables provide maximum impact of signal clarity. They meet the demands of package density, optimum VSWR and attenuation as a function of size. They feature total shielding for the elimination of signal loss and noise, and are ideal for low power, high reliability applications.

UT-8	50.0 $\pm$ 5.0	.008	.0045	.002	C	.032	85	.10	250	150		141.0/63.0/	200.0/89.5/	448.0/202.0/	288.0/	413.0/
UT-13	50.0 $\pm$ 4.0	.013	.010	.0031	SPCW	.063	85	.10	250	150		51.0/0.005	72.0/0.004	163.0/0.002	233.0/0.001	334.0/
UT-20	50.0 $\pm$ 3.0	.023	.017	.005	SPCW	.063	85	.10	750	500	240					
UT-34	50.0 $\pm$ 3.0	.034 **	.027	.008	SPCW	.125	100	.19	2000	750	150	32.0/0.019	45.5/0.013	104.0/0.006	149.0/0.004	215.0/0.003
UT-47	50.0 $\pm$ 2.5	.047 **	.037	.0113	SPCW	.125	100	.38	2000	1000	109	22.0/0.035	31.0/0.015	71.5/0.011	103.0/0.007	151.0/0.005
UT-70-50 (Old No. UT-701)	50.0 $\pm$ 2.0	.070	.059	.0179	SPC	.125	150	.79	2300	1200	68	14.5/0.163	21.0/0.113	49.0/0.048	71.0/0.033	105.0/0.022

AIR ARTICULATED (SPLINE) 50 OHM MICRO-COAX CABLES

Air articulated cables provide excellent impedance matching, low weight, low loss transmission lines. Although special care must be taken in bending and installation of these cables, they provide properties not found in solid dielectric cables.

Micro-Coax Part Number	Outer Conductor Diameter $\pm .002''$	Dielectric Diameter $\pm .001''$	Number of TFE Splines	Center Conductor SPC Outside Diameter $\pm .001''$	Center Conductor Inside Diameter $\pm .002''$	Minimum Inside Bend Radius (inches)	Max. Temp. (°C)	Weight (lbs./100')	Dielectric Strength (VRMS, 60 Hz)	Safe Maximum Voltage Under Normal Usage (VRMS, 60 Hz)	Higher Order Mode (GHz)	Typical Attenuation (dB/100')/Power Kilowatts (CW)				
												0.5 GHz	1.0 GHz	5.0 GHz	10.0 GHz	12.0 GHz
OFHC Copper																
UT-S-250-50	.250	.221	3	.087	.066	3.0	200	5.6	4000	1400	21.0	3.7/0.46	5.4/0.32	13.8/0.12	21.5/0.08	25.0/0.07
UT-S-325-50	.325	.285	5	.110	.090	5.0	200	9.5	5000	2000	16.4	2.8/0.61	4.2/0.41	11.0/0.15	16.5/0.10	19.0/0.09
UT-S-375-50	.375	.325	5	.125	.085	5.0	200	15.0	5000	2200	14.4	2.5/0.68	3.7/0.46	9.2/0.19	14.3/0.12	17.0/0.10
UT-S-390-50	.390	.340	5	.136	.096	5.0	200	16.3	5000	2200	13.6	2.3/0.74	3.4/0.50	8.0/0.21	12.0/0.14	15.0/0.11
UT-S-500-50	.500	.450	5	.174	.134	6.0	200	21.0	7500	3000	10.4	1.8/0.94	2.7/0.63	6.0/0.28	10.0/0.16	
1100 Aluminum																
UT-S-250-50 AL	.250	.221	3	.087	.066	3.0	200	2.6	4000	1400	21.0	4.2/0.37	6.5/0.26	17.5/0.09	24.3/0.06	27.5/0.05
UT-S-325-50 AL	.325	.285	5	.110	.090	5.0	200	4.5	5000	2000	16.4	3.4/0.49	5.0/0.33	13.2/0.12	20.8/0.08	23.6/0.07
UT-S-390-50 AL	.390	.340	5	.136	.096	5.0	200	7.5	5000	2200	13.6	2.8/0.60	4.2/0.40	11.4/0.15	18.3/0.11	21.0/0.08
UT-S-500-50 AL	.500	.450	5	.174	.134	6.0	200	11.0	7500	3000	10.4	2.3/0.76	3.4/0.51	9.7/0.22	15.9/0.13	

Micro-Coax semi-rigid coaxial cable offers these outstanding performance characteristics:

Attenuation: The solid center conductor of a Micro-Coax Cable provides the optimum geometric surface for transmission. • Impedance Matching: Low VSWR. The dielectric is controlled to exacting tolerances to minimize reflected power loss. • Shielding: Isolation is greater than 130 dB. There is virtually no extraneous signal pick-up. • Packaging: Metallic tubular outer conductor offers minimum size and maximum conductor integrity. Copper jackets can be soldered directly to circuit boards. • Workability: Micro-Coax is easily bent, coiled, stripped, machined, soldered, or connected without impairing performance. Ends can be quickly and dependably prepared.

CABLE PROPERTIES: Copper outer conductors • Teflon® PTFE dielectrics • Wide variety of outer conductor diameters • Capacitance 29.0 pF/ft • Velocity of propagation 70%

TYPICAL APPLICATIONS: Microwave transmission lines • Amplifier shielding or isolation • Totally shielded interconnections • Microwave delay lines

CABLE PROPERTIES: Copper outer conductor • Teflon® PTFE or FEP dielectrics • Capacitance 29.0 pF/ft • Ultraminiature sizes • Velocity of propagation 70%

TYPICAL APPLICATIONS: High reliability miniature packages • Miniature delay lines • Printed circuit wiring • High-speed computers

CABLE PROPERTIES: Low attenuation • Low weight • Copper or aluminum outer conductors • Tubular copper center conductors • Teflon® PTFE spline dielectrics

TYPICAL APPLICATIONS: Space craft interconnections • Antenna feed cables • Liquid level sensing devices • Low loss receivers

Rigid Coaxial Cable

MICRO-COAX

50 OHM MICRO-COAX CABLES WITH SPECIAL OUTER CONDUCTORS

Aluminum or stainless steel outer conductor materials are used in 50 ohm Micro-Coax Cables to optimize such properties as resistance to corrosion, the ability to withstand temperature extremes, and weight.

Micro-Coax Part Number	Nominal Impedance and Tolerance (ohms)	Outer Conductor Diameter $\pm .001$ " ⁽¹⁾	Dielectric Diameter $\pm .001$ "	Center Conductor Diameter (inches)	Center Conductor Material	Minimum Inside Bend Radius (inches)	Max. Temp. (°C)	Weight (lbs./100') or Capacitance (pF/ft)	Dielectric Strength (VRMS, 60 Hz)	Safe Maximum Voltage Under Normal Usage (VRMS, 60 Hz)	Higher Order Mode (GHz)	Typical Attenuation (dB/100')/Power Kilowatts (CW)				
												0.5 GHz	1.0 GHz	5.0 GHz	10.0 GHz	20.0 GHz
UT- 20SS	50.0 $\pm$ 3.0	.020	.015	.005	SPCW	.125	150	.10	750	500	240	81.0/0.007	114.0/0.006	258.0/0.003	367.0/0.001	524.0/
UT- 85SS	50.0 $\pm$ 1.5	.0865	.066	.0201	SPCW	.250	200	1.3	2500	1500	60	19.5/0.227	28.0/0.115	64.5/0.067	93.5/0.046	137.0/0.031
UT-141SS	50.0 $\pm$ 1.0	.141	.118	.0359	SPCW	.500	250	3.1	5000	1900	33	11.0/0.913	16.0/0.622	38.0/0.263	56.0/0.172	83.5/0.112
UT-141 AL (1100)	50.0 $\pm$ 1.5	.141	.118	.0359	SPCW	.250	150	1.9	5000	1900	33	8.0/0.527	11.5/0.359	28.0/0.152	41.5/0.099	64.0/0.064
UT-141 AL (5052)	50.0 $\pm$ 1.0	.141	.118	.0359	SPCW	.250	175	1.9	5000	1900	33	8.5/0.647	12.5/0.441	30.0/0.187	45.5/0.122	68.0/0.079
UT-250 AL (1100)	50.0 $\pm$ 1.0	.250	.209 ⁽²⁾	.064	SPC	.375	175	6.4	7000	3000	19	4.5/1.900	6.8/0.127	17.5/0.496	27.0/0.315	43.0/0.199
UT-250 AL (5052)	50.0 $\pm$ 0.5	.250	.209 ⁽²⁾	.064	SPC	.375	200	6.4	7000	3000	19	5.0/0.226	7.0/0.152	18.5/0.591	28.5/0.375	45.0/0.237
UT-325 AL (1100)	50.0 $\pm$ 1.5	.325 ⁽²⁾	.285 ⁽²⁾	7x .0312	SPC	.750	175	10.5	7500	3000	14	2.2/0.382	3.3/0.257	9.5/0.965	16.0/0.610	

(1) For plated conductor allow additional $\pm .001$ "

(2) Dimensional tolerance $\pm .002$ "

(3) Dimensional tolerance $\pm .003$ "

(4) IP: Irradiated polyethylene.

*: Tin-plated (TP)

•: Silver-plated (SP)

SPC: Silver-plated copper.

SPCW: Silver-plated, copper-clad steel.

SPBeCu: Silver-plated beryllium copper.

304SS: Type 304 Stainless steel.

SPCT: Silver-plated copper tube.

AL: Aluminum

10, 15, 25, 70, 75, 93 and 95 OHM MICRO-COAX CABLES

Copper-jacketed Micro-Coax Cables designed to meet close tolerances in both impedance and capacitance. Sizes range from 0.034 inch through 0.250 inch outside diameters. Total shielding eliminates undersized coupling while copper jacket facilitates direct soldering.

UT- 34-25 (Old No. UT- 25)	25 $\pm$ 3.0	.034	.024	.0126	SPCW	.125	100	58.5	500	200	143.7	47.5/0.013	67.5/0.009	153.0/0.004	218.5/0.003	313.5/0.001
UT- 34-95	95 $\pm$ 4.0	.034	.027	.0028	SPCW	.125	100	15.4	2000	1000	17.5	40.5/0.013	57.5/0.009	131.0/0.004	188.0/0.003	270.0/0.001
UT- 47-70	70 $\pm$ 3.0	.047	.0375	.0071	SPCW	.125	100	20.6	2000	1000	11.8	23.5/0.150	33.5/0.110	77.5/0.045	112.0/0.030	163.0/0.019
UT- 43-10 (Old No. UT-10)	10 $\pm$ 3.0	.043	.036	.0285	SPC	.250	100	145.0	500	200	81.0	61.5/0.013	87.0/0.009	179.5/0.004	281.5/0.003	402.5/0.001
UT- 90-25	25 $\pm$ 3.0	.090	.073	.040	SPC	.125	175	58.5	1000	750	46.0	15.5/0.182	22.0/0.130	51.5/0.056	75.0/0.038	111.0/0.026
UT- 85-70 (Old No. UT- 70)	70 $\pm$ 2.0	.085	.056	.0113	SPCW	.125	175	20.6	2000	1200	78.0	15.0/0.190	22.0/0.130	50.5/0.057	74.0/0.039	109.5/0.026
UT- 85-75 (Old No. UT-852)	75 $\pm$ 1.0	.085	.067	.0113	SPCW	.125	150	19.3	2500	1200	67.0	14.0/0.205	20.0/0.143	46.5/0.062	68.0/0.042	100.5/0.028
UT- 85-93 (Old No. UT-851)	93 $\pm$ 1.5	.085	.073	.008	SPCW	.125	150	15.6	2500	1200	65.0	15.0/0.190	21.5/0.133	50.0/0.057	73.0/0.039	107.5/0.027
UT-130-93 (Old No. UT- 93)	93 $\pm$ 1.0	.130	.1055	.0113	SPCW	.250	175	15.6	3000	1500	45.0	10.5/0.488	15.0/0.341	36.5/0.140	53.5/0.095	80.5/0.063
UT-141-15	15 $\pm$ 3.0	.141	.114	.080	SPC	.250	175	97.0	1000	750	27.0	9.0/0.618	13.0/0.428	32.0/0.173	47.5/0.117	71.5/0.077
UT-141-70	70 $\pm$ 1.0	.141	.107	.0201	SPCW	.250	175	20.6	5000	2000	41.0	8.5/0.655	12.5/0.445	30.0/0.185	44.5/0.125	67.5/0.082
UT-141-70C	70 $\pm$ 1.0	.141	.107	.0201	SPC	.250	175	20.6	5000	2000	41.0	8.5/0.655	12.5/0.445	30.0/0.185	44.5/0.125	67.5/0.082
UT-141-75	75 $\pm$ 1.0	.141	.118	.0201	SPCW	.250	175	19.3	5000	2000	38.0	8.0/0.696	11.5/0.484	28.0/0.198	41.5/0.133	63.5/0.087
UT-141-75C	75 $\pm$ 1.0	.141	.118	.0201	SPC	.250	175	19.3	5000	2000	38.0	8.0/0.696	11.5/0.484	28.0/0.198	41.5/0.133	63.5/0.087
UT-250-75	75 $\pm$ 1.0	.250 ⁽²⁾	.210 ⁽²⁾	.0359	SPCW	.500	200	19.3	7000	3000	21.0	4.5/2.505	6.5/1.735	17.5/0.644	27.0/0.418	42.5/0.265

CABLE PROPERTIES: Copper outer conductors • Teflon® PTFE dielectric • Velocity of propagation 70% • Total shielding

TYPICAL APPLICATIONS: CATV amplifier wiring • Capacitor sections • Low impedance matching for solid state units • Quarter-wave transformer sections

MICRO-COAX CABLE ASSEMBLIES

The usefulness of Micro-Coax semi-rigid coaxial cable is increased by its ability to be formed or fabricated into simple or complex geometric assemblies. Coiling, bending, stripping, and soldering, attaching connectors and other secondary operations result in

delivery of maximum power in minimum space. The fabrication potential of Micro-Coax Cable is practically limitless, meeting mechanical and environmental requirements in phase matching, attenuation and VSWR optimization, assembly, encapsulating and insulating, and delay calibration. UTI provides finished assemblies, pretested and ready for installation.

CONDUCTOR MATERIALS

OUTER CONDUCTOR: Copper, beryllium copper, stainless steel, stainless steel over copper, aluminum 1100, aluminum 5052, silver, lead, phosphor bronze, invar, niobium, brass 70/30. They may be electro-plated with silver, tin, cadmium, gold or solder.

INNER CONDUCTOR: Silver plated copper, silver plated copper-clad steel, unplated copper, stranded copper, silver plated beryllium copper, aluminum, gold, lead, niobium, palladium, stainless steel, Tophet C¹, tungsten, tubular beryllium copper, silver plated tubular beryllium copper, silver plated tubular stainless steel, tubular stainless steel, silver tube over stainless steel tube.

DIELECTRIC OR INSULATING MATERIALS

Solid Teflon TFE², solid Teflon FEP², Teflon spline TFE, Tefzel², solid polyolefin, polyolefin foam, irradiated polyolefin, H film, polyvinylchloride, Mylar², magnesium oxide powder, aluminum oxide powder, Kynar³, kel-F, silicone rubber, nylon.

MICRO-COAX DELAY LINES

Micro-Coax Delay Lines are a highly reliable method of providing short delays in radio frequency and microwave signals. They are available with delays of 5 to 100 nanoseconds as standard or custom units. Comprehensive test data is available on all Micro-Coax Delay Lines.

WAVEGUIDE DELAY LINES

UTI Waveguide Delay Lines are constructed of thin wall aluminum tubing supported by an alloy casting, and thus delay values are frequency sensitive. Waveguide delay lines offer greatly reduced loss when compared with coaxial types. Longer delays can be generated without intermediate amplification. A change in delay characteristics can be utilized to form a pulse compression network to use in calibrating radar, altimeters, and range finding equipment.

1. Trademark W. B. Driver Company. 2. Trademark or tradename duPont. 3. Tradename Pennwalt Corporation.



UNIFORM TUBES, INC.

... a UTI Company

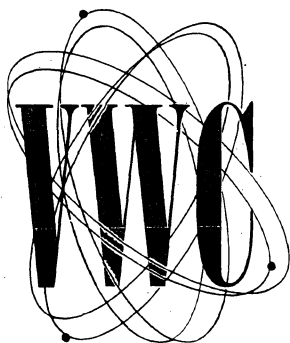
COLLEGEVILLE, PA., U.S.A. 19426

Catalogs on Request

PHONE 215/539-0700

TWX: 510-660-6107

TELEX: 84-6428



VICTOR

WIRE AND CABLE CORP.

3601 HOLDREGE AVENUE • LOS ANGELES, CALIF. 90016
TELEPHONE (213) 870-9933 •

CERTIFIED WIRE FOR INDUSTRY

QPL The largest and only "QPL" listed manufacturer of Polyethylene PVC, and Teflon® coaxial cable on the west coast to RG/U call-outs. Manufactured to the latest revision of MIL-C-17D.

DESC and UL Approved
Approved in-plant test facilities by authorization of DESC and Underwriters Laboratories.

HOOK-UP WIRE

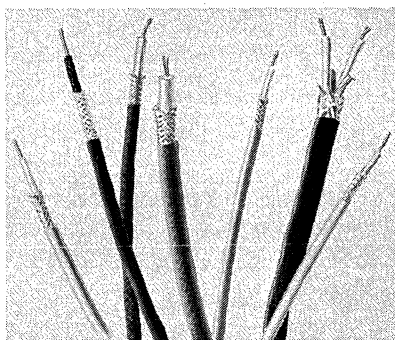


Victor Wire and Cable maintains a large inventory of several types of military and industrial hook-up wires. The military hook-up wires includes, among others — MIL-W-76 . . . MIL-W-5086A Type I, II, III, . . . MIL-C-7078A Type I, II . . . MIL-W-16878D Type B, B/N, C, C/N, D, D/N, E, EE, ET, J, JN, K, KK, KT . . . MIL-W-81044.

Industrial hook-up wires include UL Styles — 1004, 1007, 1011, 1012, 1015, 1061 . . . Hi voltage teflon® wire . . . business machine wire . . . Hi voltage Polyethylene wire . . . Kapton insulated wire . . . test lead wire . . . thermocouple wire.

If you have a special application Victor can design hook-up wire to meet your most exacting requirements.

COAXIAL CABLE

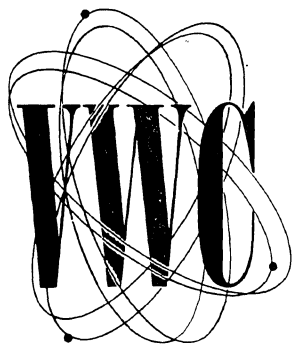


Victor Wire and Cable offers a complete line of Coaxial and Triaxial Cables that meet the requirements of Military Specification MIL-C-17. In addition Victor has designed hundreds of specialty coaxial cables to meet exacting electrical, mechanical, and environmental requirements — low capacitance . . . low attenuation . . . low noise . . . small overall diameter . . . low dielectric constant . . . high flexibility . . . high temperature . . . low temperature.

OUR SPECIALTY

SPECIALLY DESIGNED AND ENGINEERED CABLE
SPECIAL COAXIAL CABLE TO CUSTOMER PRINTS AND ENGINEERED DESIGNS

VICTOR WIRE AND CABLE CORP.



VICTOR

WIRE AND CABLE CORP.

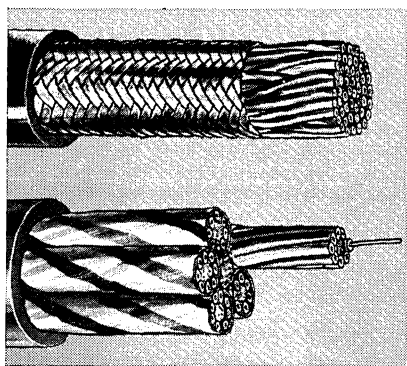
3601 HOLDREGE AVENUE • LOS ANGELES, CALIF. 90016
TELEPHONE (213) 870-9933 •

CERTIFIED WIRE FOR INDUSTRY

QPL The largest and only "QPL" listed manufacturer of Polyethylene PVC, and Teflon® coaxial cable on the west coast to RG/U call-outs. Manufactured to the latest revision of MIL-C-17D.

DESC and UL Approved
Approved in-plant test facilities by authorization of DESC and Underwriters Laboratories.

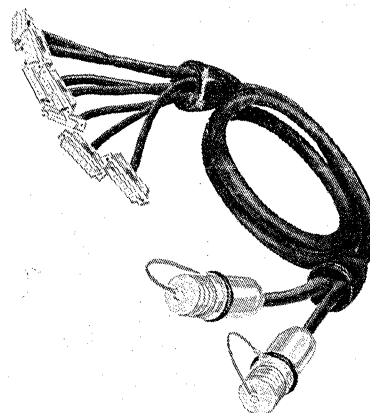
MULTI-CONDUCTOR CABLE



Victor has the capability to supply multi-conductor cable to exacting requirements to meet any environmental conditions. We have manufactured multi-conductor cables for almost every application — radar . . . closed circuit T.V. . . . color T.V. camera cable . . . remote control guidance . . . audio systems . . . monitoring equipment and community antenna systems.

Our Engineering staff is continually designing multi-conductor cables for specific applications. If you have a requirement for a special cable application — call VICTOR.

CABLE ASSEMBLIES



TERMINATIONS, MOLDINGS, HARNESSES

Victor Wire and Cable offers a service that is only equalled by the largest and most sophisticated cable companies. It is important to state that every production stage of termination, molding, and harnessing takes place at Victor Wire and Cable. Therefore we offer a quality controlled, in-house assembly program unequalled in the industry.

Victor Wire and Cable provides all types of termination and assembly work for Coaxial, Multi Conductor cable and harnesses with 100% accuracy and at low cost. Our custom engineering service is qualified to design cables, and cable assemblies to meet the most critical applications. Our customer guarantee is many years of experience.

OUR SPECIALTY

SPECIALLY DESIGNED AND ENGINEERED CABLE
SPECIAL COAXIAL CABLE TO CUSTOMER PRINTS AND ENGINEERED DESIGNS

VICTOR WIRE AND CABLE CORP.

WOVEN ELECTRONICS

P.O. Box 189/Mauldin, South Carolina 29662
Phone (803) 963-5131/TWX-810-287-2091

YOUR COMPLETE SOURCE FOR FLAT INTERCONNECTS

Ribbon Cable

IC Interconnects

Custom Harnesses

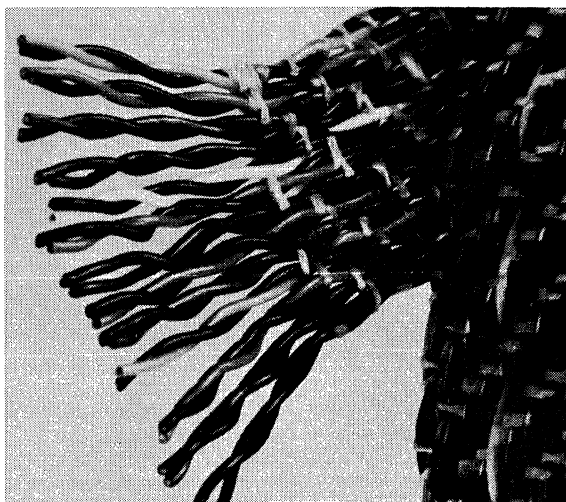
A total source for flat interconnect systems, Woven Electronics produces woven cable assemblies to your specifications for conductors, spacing, insulation, color coding, marking—all requirements including special features such as breakouts, fold lines, tinning and connector terminations.

Simple jumpers to massive multi-layer programmed harnesses. Delivered in absolute conformance to your system requirements, ready for drop-in.

Flat woven cabling gives you broadest design capabilities, superior performance and control characteristics of individually insulated leads and precise positioning, without the restrictions of bonded or laminated forms.

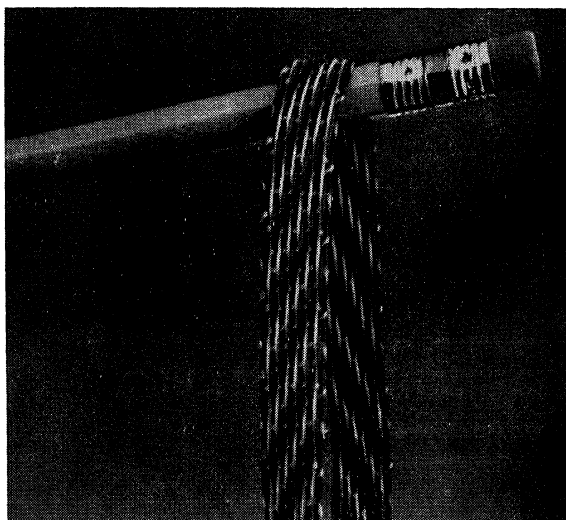
CUSTOM CABLE-BILITY UNLIMITED

- Any quantity of leads, up to 400 and more
- Fast, easy lead exposure
- Combine varied sizes and conductor types
- Complete NEMA color code
- Programmed breakouts
- Leads pre-stripped and tinned
- Use standard or specialized connectors
- Any insulation, natural or synthetic
- Flexible, stackable, tackable
- Shielding and jacketing
- Expert technical assistance
- Design and testing services
- Rigid quality assurance



TWISTED SETS

Twisted pairs, triads and quads in single or multiple layers. Facilitates routing. Conserves space in packaging. Rugged and durable. Easy lead exposure without affecting adjacent insulations. Best method of ribbonizing TFE, FEP, polyimide, asbestos, fiberglass and other exotic insulations.



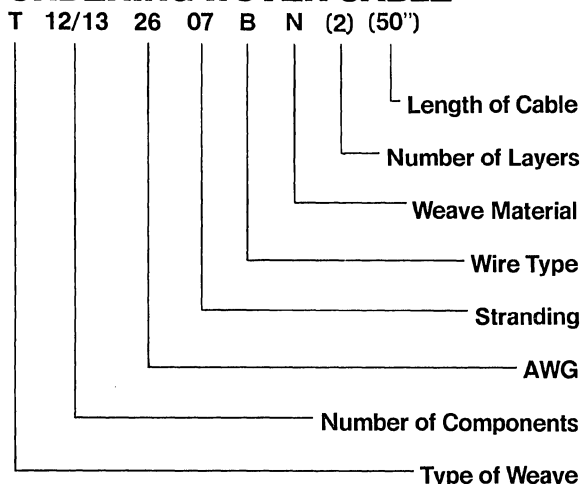
ULTRA-FLEXIBLE CABLES

Extreme flexibility achieved through the use of fine wire strands. Commonly used for in-movement interconnects. Withstands continuous flexing without delamination. Retains insulation continuity.

WOVEN ELECTRONICS

P.O. Box 189/Mauldin, South Carolina 29662
Phone (803) 963-5131/TWX-810-287-2091

ORDERING WOVEN CABLE



Six basic characteristics of woven cable are indicated by this numbering code.

Type of Weave

S—Standard Weave (plain and box weave)

T—Twill Weave

SpT—Stack Weave. Number in parentheses at end of order number designates number of layers.

A—Accordion Fold

PS—Programmed Standard

HS—Woven Harness

CIC—Matched Impedance

C—Covered Cable

Number of Components

Fold lines are indicated by /, between the number of components desired on each side of the fold line. More than one fold line may be indicated in this manner: 12/13/26/12.

TP following number of components indicates they are Twisted Pairs. TT are Traids.

AWG

Size of wire—22, 24, 26, 30, etc.

Stranding

Number of strands required to make up the AWG size.

Wire Type

Using letters from MIL-W-16878D, such as Type B, C, E, ET, EE. Or at this point show UL style of wire required—UL-1007, UL-1061, etc.

Weave Material

A full range of natural and synthetic binding fibers are employed in the production of woven cable—Kapton, Teflon, Nylon, Nomex, or natural blends of cotton and linen.

Most commonly specified:

N—Nylon

NX—Nomex

D—Dacron

Pp—Polypropylene

G—Glass

Number of Layers

When ordering stack-weave cable show number of layers, in parentheses, at end of numbering code.

Length of Cable

When ordering programmed cable (PS, HS, CIC), show length in inches, in parentheses, at end of numbering code.

For special requirements, drawings and detailed notes may be used. Dimensional drawings are necessary for all harnesses, accordion fold units and programmed lead units.

If a special array of conductors is needed, list and number each conductor. Indicate colors required. If using standard NEMA color code and repeat, simply note—"NEMA and repeat."

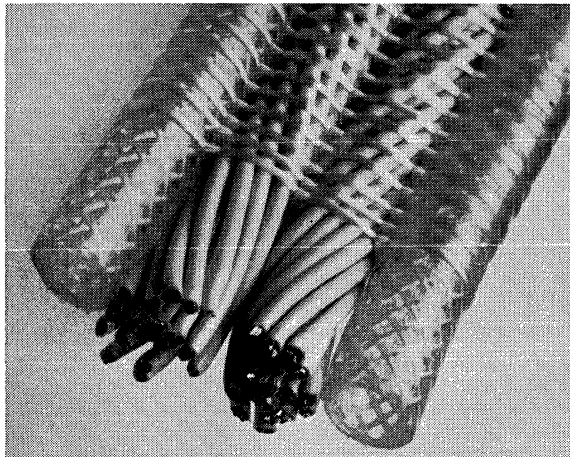
Woven-in, non-conductor area may be specified for folding and/or cutting. Cut line provides fastest method of lead separation, no hazards of tearing or damaging insulation. Fold lines facilitate compaction from flat to stacked single cable. Allows passage through small openings.

Minimum order.....\$50.00

Minimum length.....100 feet

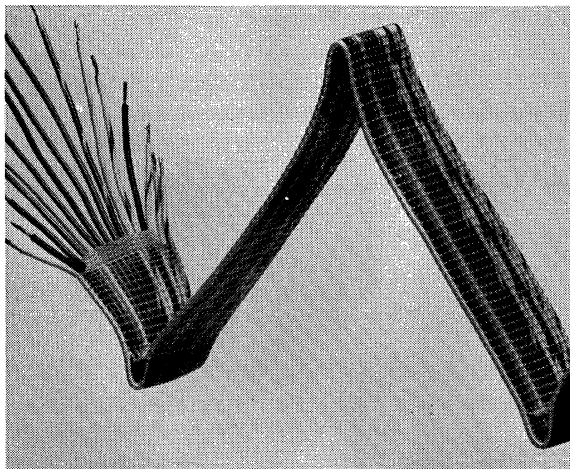
WOVEN ELECTRONICS

P.O. Box 189/Mauldin, South Carolina 29662
Phone (803) 963-5131/TWX-810-287-2091



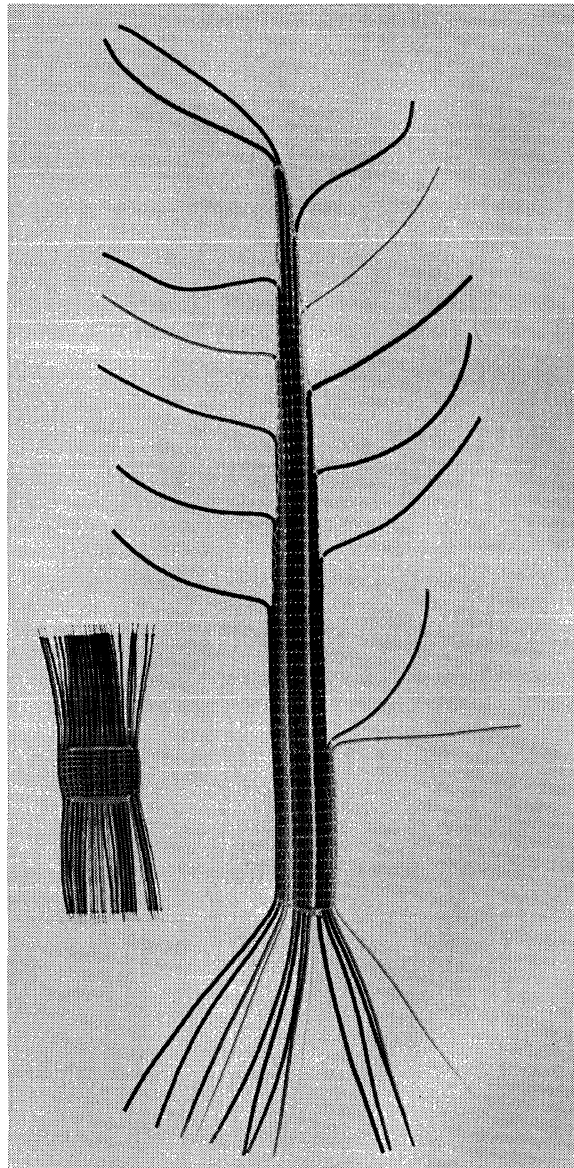
MULTI-FUNCTION CABLES

Specialized assemblies for diverse industrial applications. Air, liquid or gas carrying tubes may be woven in a package with electrical conductors. Organize fiber-optic bundles to distribute data—multiple light-emitting diode arrays, etc. Combine varied conductor sizes and functions.



ACCORDION FOLD

Permanently pre-folded. Strain-relief threads at each fold prevent flexing fatigue of conductors. Reinforced edges prevent wear from drawer movements or other obstructions. Any length. Allows varied combinations of conductor types, color, groupings, insulations.

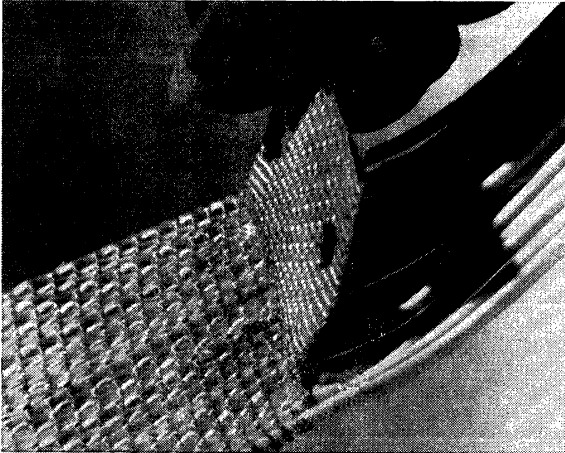


CUSTOM HARNESSES AND JUMPERS

Woven and/or hand-tied to properly match application requirements. Specifically designed and manufactured for your needs. Complete with branches, breakouts, and terminations—connectors as specified. Fully equipped, tooled, ready to plug in. Programmed jumpers for point-to-point hookup.

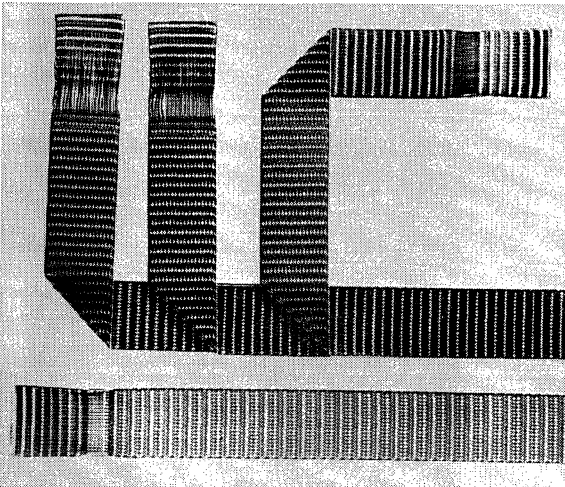
WOVEN ELECTRONICS

P.O. Box 189/Mauldin, South Carolina 29662
Phone (803) 963-5131/TWX-810-287-2091



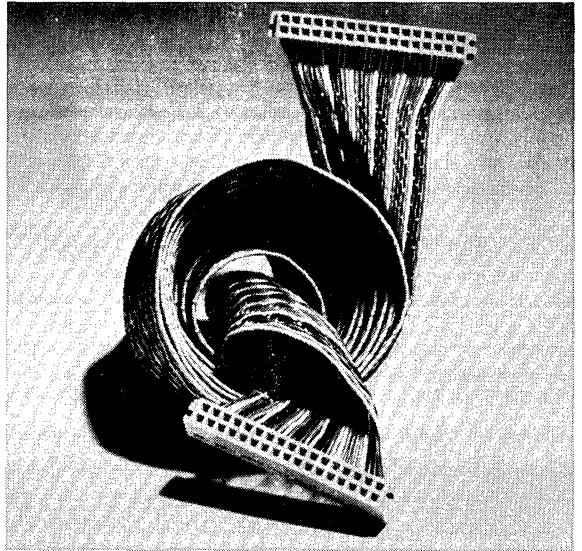
STRAIN-RELIEF TABS

Woven-in as part of cable or harness. Tack, epoxy or fasten tab to secure cable in place. Protects termination by relieving pressure from conductor ends.



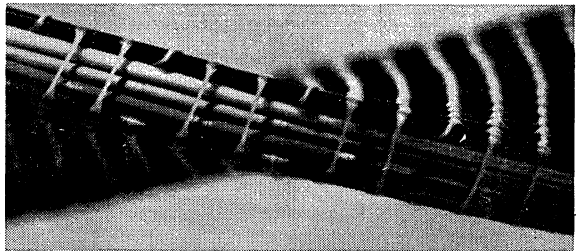
MATCHED IMPEDANCE CABLE

Replaces laminated circuitry to provide increased computer efficiency with less cable bulk. Impedance controlled to less than 10% deviation in acceptable ranges. Fold, roll, twist without delamination or appreciably changing impedance. Configuration of signal lines and position of ground planes minimize crosstalk. Lengths and leads pre-programmed for your application.



INTERCONNECT ASSEMBLIES

Complete IC Interconnect assemblies with standard connectors. Tighter signal control. Higher performance reliability and durability at competitive price levels.



STACK WEAVE CABLES

Multiple layers of parallel lay or twisted sets organize conductors in tight, space-saving pattern. Programmed array maintains precise lead orientation. Conductors of varied sizes, functions and insulations are combined with no risk of tearing or splitting.

FOR ADDITIONAL INFORMATION

A nearby Woven Electronics representative will be pleased to assist. Call collect for the name of our representative in your area, or for full details on Woven Electronics products and application-engineering services.

JACKETING WITH DUR-X-THANE® POLYETHYLENE, PVC OR BLOWN NEOPRENE

METHODS DESIGNED FOR BETTER QUALITY AND BETTER SERVICE

An important feature in maintaining the quality of our products is our ability to design and construct the tools necessary to do the job. We guarantee continuous performance of equipment & continuity of production.

The exacting specifications of Whitmor's space-age customers require a stringent quality assurance program. Our Q.C. meets Mil-Q-9858 & Mil-I-45208 with modifications required by customers. The same quality consciousness is applied to commercial work. We guarantee trouble free cable and wire!

Whitmor
has what it takes
to build cables
for tough jobs!

20,000 square feet housing modern,
high speed equipment makes it
possible to fill orders on a
24 hour basis, if
required.

WHITMOR WIRE AND CABLE CORPORATION

Manufacturers of custom, multiple conductor, Mil-Spec and U.L. approved cables.

CABLED WITH
OTHER CABLE

EMI/RFI
SHIELDING

METAL OR
PLASTIC WRAPPING

UNSHIELDED					SHIELDED**				
MULTI-CONDUCTOR STOCK CABLES / All wire 19 strand					STOCK				
PART NO.	COND. AWG	NO. COND.	JKT. THICK.	CABLE O.D.	JKT. THICK.	CABLE O.D.	JKT. THICK.	CABLE O.D.	JKT. THICK.
W-227*	22	7	.040	.280	.030	.260	.040	.305	.030
W-2212*	22	12	.050	.380	.030	.340	.050	.405	.030
W-2219*	22	19	.060	.450	.040	.410	.060	.475	.040
W-2227*	22	27	.060	.530	.040	.490	.060	.555	.040
W-2237*	22	37	.060	.580	.040	.540	.060	.605	.040
W-2248*	22	48	.060	.660	.050	.640	.060	.685	.050
W-2261*	22	61	.060	.710	.050	.690	.060	.735	.050
W-2272*	22	72	.060	.775	.060	.775	.060	.800	.060
W-207*	20	7	.040	.300	.030	.280	.040	.325	.030
W-2012*	20	12	.050	.400	.030	.360	.050	.425	.030
W-2019*	20	19	.060	.475	.040	.435	.060	.500	.040
W-2027*	20	27	.060	.560	.040	.520	.060	.585	.040
W-2037*	20	37	.060	.610	.040	.570	.050	.640	.040
W-2048*	20	48	.060	.700	.050	.680	.060	.725	.050
W-2061*	20	61	.060	.750	.060	.750	.060	.775	.060
W-2072*	20	72	.060	.840	.060	.840	.060	.865	.060
W-187*	18	7	.040	.335	.030	.315	.040	.360	.030
W-1812*	18	12	.050	.450	.040	.430	.050	.475	.040
W-1819*	18	19	.060	.550	.040	.510	.060	.575	.040
W-1827*	18	27	.060	.650	.050	.630	.060	.675	.050
W-1837*	18	37	.060	.720	.050	.700	.060	.745	.050
W-1848*	18	48	.060	.820	.060	.820	.060	.845	.060
W-1861*	18	61	.060	.890	.060	.890	.060	.915	.060
W-1872*	18	72	.060	.995	.060	.995	.060	1.020	.060
W-167*	16	7	.040	.370	.030	.350	.040	.395	.030
W-1612*	16	12	.050	.500	.040	.480	.050	.525	.040
W-1619*	16	19	.060	.600	.040	.560	.060	.625	.040
W-1627*	16	27	.060	.685	.050	.665	.060	.710	.050
W-1637*	16	37	.060	.755	.060	.755	.060	.780	.060
W-1648*	16	48	.060	.865	.060	.865	.060	.890	.060
W-1661*	16	61	.060	.935	.060	.935	.060	.960	.060
W-147*	14	7	.050	.420	.040	.400	.050	.445	.040
W-1412*	14	12	.050	.550	.040	.530	.050	.575	.040
W-1419*	14	19	.060	.645	.050	.625	.060	.670	.050
W-1427*	14	27	.060	.775	.060	.775	.060	.800	.060
W-125*	12	5	.050	.445	.040	.400	.050	.470	.040
W-127*	12	7	.050	.480	.040	.460	.050	.505	.040
W-1212*	12	12	.060	.650	.050	.650	.060	.675	.050
W-1219*	12	19	.060	.820	.060	.820	.060	.845	.060

*Designate jacketing desired as follows: V=vinyl X=Dur-X-thane P=polyethylene N=neoprene - Mil-S-6855 - Class 2 - Grade 60
EXAMPLE: W-1827P=Cable w/27 conductors, 18 gauge wire, w/polyethylene jacketing. **Add "S" to PART NO. for Shielded cable.
Other constructions available on request using 1/32" PVC insulation (3000 V, Military Type D); (600 V, Style 1015 U.L. Commercial)

TECHNICAL DATA

Whitmor Wire and Cable Corporation manufactures a complete line of multiple conductor control cables. All conductors are Type C per MIL-W-16878, insulated for 1000 V and 105° C. Conductors are color coded per MIL-STD 681. All conductors are planetary cabled and contra-helically laid with Mylar tape over the cable bundle.

®Dur-X-thane is Whitmor's Registered T.M. for extruded Polyurethane.

SHIELDED CABLES: Same specifications as above with additions of tinned copper braided shield over cable complex with 85%-95% coverage to MIL-C-7078A, cables shipped on non-returnable reels.

CABLED WITH OTHER WIRES

INDIVIDUAL WIRES
INSULATED,
COLOR CODED,
LETTERED AND
IDENTIFIED.



WHITMOR WIRE AND CABLE CORPORATION

13161 SHERMAN WAY ■ NORTH HOLLYWOOD, CALIFORNIA 91605 ■ PHONE: (213) 764-6296

18TH EDITION

EEM 75 76

MANUFACTURERS AND SALES OFFICES DIRECTORY

This index provides an alphabetical listing of manufacturers supplying electronic equipment, instrumentation, components, materials and fabrication services. Included for each company are addresses, phone numbers, TWX numbers where applicable, selected distributors, and who to contact for information on pricing, applications and customer service. A condensed list of products made by the company appears below each name, as well as Federal Supply Code (FSC) numbers, Qualified Parts List (QPL) numbers and minimum order data. When available, free literature is also listed.

Boldfaced listings indicate those manufacturers who have provided catalog data in the white pages of EEM. Volume numbers appear first, before the bullet, the page number is listed after it. Many companies have placed their representative symbol before their names as an aid to identification.

All SYSTEMS, 344 New Albany Rd., Moorestown, N.J., 08057, Tel: 609-234-4420, TWX: 710-897-1190; Empl.: 65

Products manufactured: Amplifiers, Antennas, Cable Assemblies & Harnesses, CATV Systems & Equipment, Coders, Comm. Systems, Comparators, Converters, Counters, Data Acquisition & Reduction Systems, Demodulators, Diplexers, Antenna, Encoders, Generators, Gyros (All Types), Kits, Test Equipment, Modulator/Demodulators, Modulators, All Kinds, Monitors, Mounts, Multipliers, Radar Systems, Receivers, Services, Assembly, Production & Test, Servo Systems, Shifters, Synthesizers, Testers, Timers, Underwater Communication, Detection, Navigation, etc. Equipment

AARON-DAVIS CO., 1720 22nd St., Santa Monica, Cal., 90404, Tel: 213-829-1834; Empl.: 12

Products manufactured: Inverters, Power Supplies

Local Sales Offices & Reps.

Ariz Phoenix, Cleveland Entrs. 602-264-1969
Cal San Diego, Rochette & Assocs. 714-282-4616
Cal San Gabriel, Rochette & Assocs. 213-285-1251
Colo Littleton, Cleveland Entrs. 303-771-6242
Md Silver Spring, Rep-Tron 301-593-4844
NM Albuquerque, Cleveland Entrs. 505-298-7671

ABA INDUSTRIES, INC., Box 517, Pinellas Pk., Fla., 33565, Tel: 813-546-3571; FSC No: 26795; Empl.: 200

For info on price: D. J. Morrison; Application info: B. W. Harting; Customer service: D. J. Morrison; Delivery info: D. J. Morrison

Products manufactured: Antenna Rotators, Antennas, Controls/Control Eqpt., Drives & Drive Mechanisms (Dial), Mounts, Multiplexers, Pedestals, Radar, Services, Assembly, Production & Test, Servo Systems, Tracking Systems

Local Sales Offices & Reps.

Md Timonium, De Shawn Assocs. 301-252-4878
Tex Ft. Worth, J. T. Honston Assocs. 817-265-2931

ABACUS CONTROLS INC., 65 Fourth St., Somerville, N.J., 08876, Tel: 201-526-6010; Empl.: 20
p. 1•1026; p. 2•1731

Products manufactured: Amplifiers, Chargers, Battery, Coils Including Assemblies & Forms, Controls/Control Eqpt., Converters, Generators, Inverters, Oscillators, Power Supplies, Protectors, Reactors, Regulators, Shifters, Synthesizers, Testers, Transformers, Voltage Sources

ABACUS ELCTRNS. CORP., 10 Hudson Terr., Dobbs Ferry, N.Y., 10522, Tel: 914-693-1450; Empl.: 25

Products manufactured: Bezels, Shielded & Unshielded, Boards, Printed Circuit, Bushings, Glass, Plastic, Metal, Rubber, Etc., Clamps & Clips, Connectors, Dials, Fasteners, Handles For Cabinets, Circuit Boards, Racks, etc., Locks, Dial & Shaft, Services, Assembly, Production & Test, Sockets, Spacers, Terminal Blocks, Boards & Strips, Terminals

ABBOTT SCREW & MFG. CO., 6525 N. Clark St., Chicago, Ill., 60626, Tel: 312-761-8400; Empl.: 161; Minimum order: \$50

For info on price: J. O'Connor; Application info: F. Vosecky; Customer service: F. Harkabus; Delivery info: M. Gerber

Free literature available: Steloc Engineering Guide & Price List, Steloc Engineering Guide & Price List (Distributor), Capability Booklet (Intro. to our facilities)

Products manufactured: Fasteners, Pins

ABBOTT TRANSISTOR LABS., Industrial Div., 5176 W. Jefferson Blvd., Los Angeles, Cal., 90016, Tel: 213-930-1040; Empl.: 12 p. 1•1047-1056
Customer service: C. Montour

Products manufactured: Power Supplies

Local Sales Offices & Reps.

NJ Fort Lee, Abbott Transistors 201-224-6900

abbott transistor

ABBOTT TRANSISTOR LABS., Power Supply Div., 5200 W. Jefferson Blvd., Los Angeles, Cal., 90016, Tel: 213-936-8185, Telex: 69-1398; FSC No: 15755; Empl.: 125; Minimum order: \$10 p. 1•1038-1046

Customer service: A. Hilbert

Free literature available: 60 page Power Supply Catalog listing complete specifications and prices of over 3500 standard power modules.

Products manufactured: Converters, Inverters, Power Supplies

Local Sales Offices & Reps.

NJ Fort Lee, Abbott Transistor Lab., Inc. 201-224-6900

ABBOTT TRANSISTOR LABS., Transformer Div., 5176 W. Jefferson Blvd., Los Angeles, Cal., 90016, Tel: 213-930-1040; Empl.: 12 p. 2•1720-1725
Customer service: W. Lovett

Free literature available: 12 page transformer catalog of miniature 60 Hz and 400 Hz power transformers.

Products manufactured: Transformers

Local Sales Offices & Reps.

NJ Fort Lee, Abbott Transistors 201-224-6900

ABESTO CORP., Ackerman St., Bloomfield, N.J., 07003, Tel: 201-338-6814; Minimum order: \$25.

For info on price: R. Kay; Application info: R. Kay; Customer service: R. Steinman; Delivery info: B. Scarpelli

Products manufactured: Bumpers, Coatings, Grommets, Rubber, Services, Assembly, Production & Test, Tubing

ABLE CABLE DIV., 115 S. Northwest Hwy., Barrington, Ill., 60010, Tel: 312-381-2460; Empl.: 25; Minimum order: \$15

Customer service: R. A. Knaack

Products manufactured: Cable Assemblies & Harnesses

Local Sales Offices & Reps.

Ill Barrington, W. Biery 312-381-7333

Ill Downers Grove, E. Joyner & Co. 312-968-8383

Tex Dallas, G. Weinreich & Assoc. 214-321-2800

ABLESTIK LABORATORIES, 833 W. 182nd St., Gardena, Cal., 90248, Tel: 321-6252, TWX: 910-346-7606; FSC No: 21109; Minimum order: \$25

For info on price: H. E. Harris; Application info: N. Nygard; Customer service: H. E. Harris; Delivery info: Order Desk

Products manufactured: Adhesives (All Types)

Local Sales Offices & Reps.

Cal Los Altos, Neal Olson-Ablestik 415-326-8358

Mass Sudbury, L. J. Maroni Assocs. 617-443-2170

NY Camillus, H. C. Murray 315-487-0634

NY Hartsdale, Powell-Pendergraph 914-761-7792

Pa Colmar, E. Lasky Assocs. 215-822-2510

Tex Dallas, Waddle Sls. Co. 214-638-2860

Wisc Milwaukee, Process Technology 414-464-6620

ABRAMS INSTR., 606 E. Shiawassee, Lansing, Mich., 48901, Tel: 517-484-9441, TWX: 810-251-0785; Empl.: 35

Customer service: M. Gates

Products manufactured: Counters, Indicators, Motors, Services, Assembly, Production & Test, Timers

Local Sales Offices & Reps.

Ariz Scottsdale, J.A. Swanson Assocs. 602-946-6950

Cal N. Hollywood, Jewett Co. 213-789-8103

Kans Leawood, Thunderbird Tech. Sls. & Svcs., Inc. 913-642-7220

Kans Wichita, Thunderbird Tech. Sls. & Svcs., Inc. 314-567-6488

Md Ellicott City, McCourt Co. 301-465-4515

Mo St. Louis, Thunderbird Tech. Sls. & Svcs., Inc. 314-567-6488

Ohio Cincinnati, Loesch Assocs. 606-331-4332

Ohio Cleveland, Loesch Assocs. 216-241-4581

ACCEL INDL HEAT SINK, 5338 Alhambra, Los Angeles, Cal., 90032, Tel: 213-221-9188

Customer service: Order Desk

Free literature available: Pictorial description of 60 heat sinks available from stock. Economy mounting hole patterns for most often used transistor/semiconductor devices and ordering information to insure customers desired hole pattern lay out and other features such as length of part & finish.

Products manufactured: Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

Ala Huntsville, Repcom 205-852-3305

Cal San Diego, J.S. Heaton Co. 714-452-1456

Cal San Francisco, P. O'Neal & Assocs. 415-924-1691

Fla Ft. Lauderdale, Repcom 305-564-1929

Fla Melbourne, Repcom 305-254-1877

Fla Miami Springs, Repcom 305-887-8723

Fla Orlando, Repcom 305-894-7217

Ga Warner Robins, Repcom 312-923-1393

Ill Mt. Prospect, Anatronix Assoc. 312-296-2468

Minn Minneapolis, C.R. Leeds Co., Div. Jewellmont Corp. 612-333-5393

Ohio Canton, CSA Equip. Sls. Co. 216-456-1359

ACCESSORIES FOR ELECTRONICS, 23-25 Bell Blvd., Box 56, Bayside, N.Y., 11360, Tel: 212-939-5474; Empl.: 15

Customer service: P. Johnson

Free literature available: Catalog #723-Transistor Pads, P.C. Jacks & Terminals, Clips, Clamps, Circuit Card Ejectors, Grounding Terminals, Wire Ties, I.C. & Relay Pads, Transistor Covers, Busing - Captive Hardware Flysheet showing P.C. Card Guides, Bobbins, Diode Sleeves, Capacitor Pads & Cone Nuts.

Products manufactured: Bobbins, Winding, Coil & Transformer, Bushings, Glass, Plastic, Metal, Rubber, Etc., Capacitor, Hardware, Clamps & Clips, Connectors, Fasteners, Guides, Circuit Board, Holder & Carriers, Holders, Circuit Board (Production Type), Insulators & Insulation, Jacks (All Types), Packages, Integrated Circuit, Pads, Transistor Mounting, Pins, Plug & Jack Sets, Pullers, Resistor, Hardware, Services, Assembly, Production & Test, Sockets, Spacers, Terminals

Local Sales Offices & Reps.

Cal Garden Grove, H. Miller 714-893-4670

Cal Los Angeles, Corcoran Assocs. 213-823-2425

Fla Hallandale, L.M. Bairstow Assoc. 305-927-2421

Md Baltimore, Stitzer Assocs. 301-823-2600

Mass Melrose, Accessories for Elctrn. 617-665-0666

Minn Brainerd, M. (Red) Johnson 218-963-7875

NY Buffalo, R.A. Murray Co. 716-632-6913

NY DeRuyter, S.A. Caputo 315-682-2920

Ohio Dayton, Buckeye Components 513-278-4279

Pa Paoli, Stitzer Assocs. 215-644-5500

Wash Seattle, W. Spaulding Co. 206-282-9173

FOR: Can., Toronto, Electreop Ltd. 416-787-1257

ACCESSO-WIRE, Box 76, Garvnl. Trm., Garnersville, N.Y., 10923, Tel: 914-947-1220; Empl.: 18; Minimum order: \$50

Customer service: S. L. Roth

Products manufactured: Cable Assemblies & Harnesses, Cable, Connectors, Fasteners, Heat Guns, Production, Lubricants, Services, Assembly, Production & Test, Splices, wire (Including, Butt & Cap Types), Terminal Blocks, Boards & Strips, Testers, Wire, Wire & Cable Ties, Wire Markers, Wire Nuts, Wire Strippers

ACCUMET ENGINEERING CORP., 25 Broad St., Hudson, Mass., 01749, Tel: 617-568-8311; Minimum order: \$50

Customer service: J. B. Snook

Products manufactured: Crystals, Resistors, Semiconductor Wafer Fabrication, Substrates

ACCURATE ELECTRONICS CO., 2635 So. Wabash Ave., Chicago, Ill., 60616, Tel: 312-225-7500; Empl.: 25; Minimum order: \$15

For info on price: D. B. Lytle; Application info: F. DiLegge; Customer service: F. DiLegge; Delivery info: T. Valenziano

Free literature available: Literature describes our products including features, specifications and industries where used. they are broken down into Power Conversion Units, Battery Chargers, Battery Back Up Systems, and Magnet Controllers.

Products manufactured: Chargers, Battery, Power Supplies, Transformers

Local Sales Offices & Reps.

Ill Chicago, Ropek & Cahill 312-287-7292

NY New York City, NEPA 212-867-0340

NC Charlotte, Engineering Sls. Co. 803-253-4004

Ohio Cleveland, Hird & Son 216-331-7272

Tex Houston, R & K Engrg. & Sls. Corp. 713-465-8367

Utah Salt Lake City, D. W. Richardson Co. 801-467-9714

Wisc Milwaukee, G. T. Stephenson & Assoc. 414-273-7275

ACCURIDE, Div. of Standard Precision, 12311 S. Shoemaker, Santa Fe Springs, Cal., 90670, Tel: 213-944-6236, TWX: 910-338-0256; Minimum order: \$35

Products manufactured: Cable Retractors, Simulators

Local Sales Offices & Reps.

Cal San Jose, Accuride 408-249-4707

Colo Golden, B. Callister & Assocs. 303-761-0992

Fla Ft. Lauderdale, Orbe 305-564-8571

Ga Atlanta, Davidson Co. 404-993-4570

Ill Arlington Heights, Accuride 312-259-7282

Mass Holliston, Accuride 617-492-2474

Mich Grand Rapids, J.E. Mackay Co. 616-451-4990

Minn Minneapolis, E.C. Elctrn. Sls. 612-831-0229

NY Kirkville, RMJ Inds. 315-656-7285

Ohio Troy, R.J. Pugh & Assoc. 513-335-7846

Okla Tulsa, Blair Engrg. 918-663-9850

Pa Philadelphia, Accuride 215-233-3000

Tex Dallas, Blair Engrg. 214-352-8411

ACCUTRONICS-A HAMMOND CORP., 628 North St., Geneva, Ill., 60134, Tel: 312-232-2600, TWX: 910-237-1680; FSC No: 16484; Empl.: 80

p. 1*280-282; p. 2*346,347

For info on price: G. Dewar; Application info: G. Dewar; Customer service: J. Vill Wock; Delivery info: G. Dewar

Free literature available: Catalog covers various types of oscillators from 1Hz to 250 MHz, (3) conversion charts.

Products manufactured: Boards, Printed Circuit, Boards, Printed Wiring, Universal, Delay Lines, Generators, Oscillators

ACDC ELECTRONICS, 401 Jones Rd., Oceanside, Cal., 92054, Tel: 714-757-1880, TWX: 910-322-1470; Empl.: 400; Minimum order: \$50

p. 1*1027-1036

For info on price: J. Hall; Application info: R. Abbott; Customer service: J. Hall; Delivery info: J. Hall

Products manufactured: Power Supplies, Transformers

Local Sales Offices & Reps.

Ala Huntsville, Beacon Elctrn. Assocs. 205-881-5031

Ariz Scottsdale, OEM Specialties 602-948-3360

Cal Lawndale, Group Three Elctrn Ward Davis Assocs. 213-542-5581

Cal San Diego, Harvey King, Inc. 714-276-7541

Cal Sunnyvale, Group Three Elctrn Ward Davis Assocs. 408-245-4392

Colo Denver, PLS Assocs. 303-771-0140

Conn Hamden, J & J Assocs. 203-624-7800

Fla Ft. Lauderdale, Beacon Elctrn. Assocs. 305-776-6074

Fla Maitland, Beacon Elctrn. Assocs. 305-647-3498

Ga Atlanta, Beacon Elctrn. Assocs. 404-351-3654

Ill Des Plaines, Cozzens & Cudahy, Inc. 312-298-3600

Ind Indianapolis, Cozzens & Cudahy, Inc. 317-244-2456

Mass Kensington, Elctrn. Mktg. Assocs. 301-881-5300

Mass Burlington, J & J Assocs. 617-272-2606

Mich Detroit, WKM Assocs. 312-892-2500

Minn Minneapolis, Cozzens & Cudahy, Inc. 612-884-4336

Mo Kansas City, Cozzens & Cudahy, Inc. 816-454-5836

Mo St. Louis, Cozzens & Cudahy, Inc. 314-423-1234

NJ Fort Lee, Tech. Mktg. Assocs. 201-224-6911

NM Albuquerque, PLS Assocs. 505-255-2330

NY East Syracuse, Ossmann Instrs., Inc. 315-437-6666

NY Rochester, Ossmann Instrs., Inc. 716-328-2230

NY Vestal, Ossmann Instrs., Inc. 607-785-9947

Ohio Cleveland, WKM Assocs. 216-272-0445

Ohio Dayton, WKM Assocs. 513-434-7500

Okla Norman, Data Mktg. Assocs. 405-364-8320

Pa King of Prussia, Elctrn. Mktg. Assocs. 215-248-5050

Pa Pittsburgh, WKM Assocs. 412-892-2953

SC Spartanburg, Beacon Elctrn. Assocs. 803-583-7615

Tex Dallas, Data Mktg. Assocs. 214-661-0300

Tex Houston, Data Mktg. Assocs. 713-686-9627

Tex San Antonio, Data Mktg. Assocs. 512-828-0937

ACE PLASTIC CO., INC., 91-54 Van Wyck Expwy., Jamaica, N.Y., 11435, Tel: 212-523-5500; Empl.: 100; Minimum order: \$25

Customer service: I. Steinberg

Products manufactured: Services, Assembly, Production & Test, Tubing

ACHESON COLLOIDS CO., Div. Acheson Inds., 1635 Washington Ave., Port Huron, Mich., 48060, Tel: 313-984-5581, TWX: 810-231-5265; Empl.: 150; Minimum order: \$25

For info on price: J. Anderson; Application info: J. J. Coniglio; Customer service: F. Clary; Delivery info: R. R. Powers

Products manufactured: Chemicals, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Conductive Plastic Materials, Fabrics, Conductive, Films, Heaters & Heating Elements, Inks For Thick Film Microcircuits, Insulators & Insulation, Kits, Breadboarding (For Engineers), Kits, Shielding, Lubricants, Materials, Graphite, Materials, Self-Lubricating, Metal Compounds, Foils, Powders, Sheet, Stock, Metal Oxides, Metals, Paints, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Rubber, Services, Assembly, Production & Test, Shields

Local Sales Offices & Reps.

Cal LaMirada 714-523-8812

Ga Atlanta 404-451-7452

Ill Chicago 312-664-2032

Ind South Bend 219-272-8511

Mass Boston 617-662-6787

Mich Detroit 313-352-6639

NJ Elizabeth 201-353-0414

NY Rochester 716-381-7610

Ohio Cincinnati 513-631-6750

Ohio Cleveland 216-521-1900

Pa Melvern 215-644-4886

Tex Dallas 817-292-4264

ACME BATTERY CORP., 700 Canal St., Stamford, Conn., 06904, Tel: 203-324-4125; Empl.: 40

For info on price: L. M. Dorfingler; Application info: L. Schub; Customer service: L. M. Dorfingler; Delivery info: L. M. Dorfingler

Products manufactured: Batteries

ACME ELECTRIC, 748 Water St., Cuba, N.Y., 14727, Tel: 716-968-2400, TWX: 510-245-2700; Empl.: 1200

For info on price: R. Milne; Application info: D. Chesner; Customer service: R. Milne; Delivery info: R. Milne

Free literature available: Basic Transformer Catalog; Communications Power Products Catalog; PS2L Solid State Load Bank Brochure; Switching Power Supplies, Linear 20KHZ Brochure.

Products manufactured: Chargers, Battery, Chokes, Coils Including Assemblies & Forms, Converters, Eliminators, Battery, Inverters, Loads, Electronic Variable, Power Supplies, Regulators, Transformers

Local Sales Offices & Reps.

Ala Birmingham, Hopper & McCoy 205-822-2536
 Ariz Phoenix, Abbott Sls. Co. 602-252-6171
 Cal Los Angeles, J. Blesso & Assocs. 213-921-6387
 Cal Oakland, Baxter Co. 415-654-3177
 Colo Denver, Western Reps. 303-986-6025
 Conn Wolcott, G.P. Dannecker 203-879-4005
 Fla Jacksonville, Glenn Assocs. 904-744-1247
 Fla Miami, Glenn Assocs. 305-592-7335
 Fla Orlando, Glenn Assocs. 305-293-7402
 Fla Tampa, Glenn Assocs. 813-879-5890
 Ga Atlanta, Hopper & McCoy 404-872-5802
 Haw Kailua, R.A. Kemp Co. 808-839-5593
 Ill Chicago, Weinstein & White 312-787-0166
 Ind Indianapolis, A.L. Pickens Co. 317-632-9379
 Iowa Cedar Rapids, Arnie Sell & Assocs. 319-393-4225

Iowa Davenport, Arnie Sell & Assocs. 319-359-1295
 Kans Prairie Village, R.E. Gooley Co. 913-813-0200
 Ky Louisville, A.L. Pickens Co. 502-491-4215
 La New Orleans, Associated Mfrs. Agents 504-522-6267

Md Pikesville, Wilson Assocs. 301-252-2231
 Mich Detroit, Buschagen Geldersma & Gratch 313-535-6550

Mich Grand Rapids, Buschagen Geldersma & Gratch 616-361-5335
 Minn St. Paul, H.A. Cullen & Assoc. 612-646-7371
 Miss Jackson, Associated Mfrs. Agents 601-969-0661

Mo St. Louis, Burgoyne Electrical Sls. 314-521-3162
 Neb Omaha, A. Sell & Assocs. 402-391-4068
 NH Nashua, R.P. Reese 603-883-2407

NJ Carstadt, R.W. Noel & Co. 201-935-7171
 NY Manlius, E.D. Sweeney 315-682-6915
 NY Rochester, G.N. Mergel 716-334-6909

NY Vestal, W.J. Frey 607-748-8053
 NC Greensboro, Barber-Ayers & Assoc. 919-273-3629

Ohio Chagrin Falls, Lusty - Thomson, Inc. 216-543-8181
 Ohio Westerville, P.R. Collier 800-362-2279

Okla Oklahoma City, J. Pitts 405-232-0011
 Pa Oreland, Cusick Electrical Sls. 215-886-2100
 Pa Pittsburgh, M.F. Smith Assocs. 412-276-5303

Tenn Memphis, Hicks Sls. Agency 901-396-5725
 Tenn Nashville, Hopper & McCoy 615-883-7557
 Tex Houston, Burrus & Matthews 713-227-5205

Tex Irving, Burrus & Matthews 214-251-3031
 Tex Longview, Burrus & Matthews 214-758-9841
 Va Richmond, Barber-Ayers & Assoc. 703-288-7772

Wash Seattle, H.M. Denny Co. 206-282-7200
 FOR: Can., Scarborough, Ont., J.H. McKechnie 416-465-5409

ACME ELEC. HEATING CORP., 4685 E. 11th, Hialeah, Fla., 33013

Customer service: J. B. Sampson 305-685-8326

Products manufactured: Cable, Furnaces, Heaters & Heating Elements, Ovens, Solder Pots & Baths, Thermocouples, Elements & Accessories

ACME MODEL ENGRG. CO., 654 Bergen Blvd., Ridgefield, N.J., 07657, Tel: 201-943-7650; Empl.: 16

For info on price: A. Asfar; Application info: F. Risdell; Customer service: F. Parks; Delivery info: A. Arenas

Products manufactured: Boards, Printed Circuit, Bushings, Glass, Plastic, Metal, Rubber, Etc., Chassis, Metal, Clamps & Clips, Eyelets, Fasteners, Holder & Carriers, Labels, Pressure-Sensitive, Adhesive, Printers, Retainers, Services, Assembly, Production & Test, Springs (All Types), Terminal Blocks, Boards & Strips, Terminals, Tubing

ACME PLASTIC PRODUCTS CO., INC., 9629 N. 22nd Ave., Phoenix, Ariz., 85021, Tel: 602-997-9844; Empl.: 6

Products manufactured: Services, Assembly, Production & Test

ACOPIAN CORP., Box 585, Easton, Pa., 18042, Tel: 215-258-5441, TWX: 510-651-4949; FSC No: 14749; Minimum order: \$10 p. 1*1057

For info on price: J. Joseph; Application info: T. Skopal; Customer service: T. Skopal; Delivery info: J. Joseph

Free literature available: Power supplies offering a choice of performance levels and mechanical configurations. PC-mounting, narrow profile, plug-in, unregulated, premium performance, rack mounting, multiple output.

Products manufactured: Power Supplies, Suppressors

Local Sales Offices & Reps.

Ala Huntsville, Gentry Assoc. 205-534-9771
 Ariz Scottsdale, Williams Assoc. 602-947-4297
 Cal Los Angeles, Basic Sys. Co. 213-938-2833
 Cal Palo Alto, Held & Mollard, Inc. 415-965-9321
 Cal San Diego, Basic Sys. Co. 714-279-9641
 Colo Denver, Williams Assoc. 303-373-4730
 Conn Enfield, Meas. Equip. Co. 203-745-9050
 Fla Orlando, Gentry Assoc. 305-894-4401
 Ill Wheeling, Potter-Mac Co. 312-541-4600
 Kans Shawnee Mission, Maury & Bettis Co. 913-362-0772

Kans Wichita, Maury E. Bettis Co. 316-685-7441
 Md Ellicott City, Doss Elctns. 301-465-1336
 Mass Wakefield, Meas. Equip. Co. 617-245-4870

Mich Birmingham, J.C. Hofstetter Co. 313-643-7203
 Mich Grand Rapids, J.C. Hofstetter Co. 616-942-0650
 Minn Minneapolis, Kirby & Assoc. 612-377-3239

Mo St. Louis, Maury E. Bettis Co. 314-429-2099
 NM Albuquerque, Williams Assoc. 505-255-1638
 NY Elbridge, L-Tron Corp. 315-689-3787

NY Latham, L-Tron Corp. 518-785-5032
 NY Tonawanda, L-Tron Corp. 716-691-8887
 NY Woodbury, J.N. Sweeney & Co. 516-692-4222

NC Charlotte, Jake Rudisill Assoc., Inc. 704-377-6901
 Ohio Dayton, J.C. Hofstetter Co. 513-296-1010

Ohio Medina, J.C. Hofstetter Co. 216-725-4477
 Okla Tulsa, Norvell Assoc. 918-663-1247
 Pa Ardmore, Martin Elec. Co. 215-649-6332

Pa Reading, Beil & Whitaker 215-779-2610
 Tex Dallas, Norvell Assocs. 214-350-6771
 Tex Houston, Norvell Assocs. 713-774-2568

ACOUSTIC POWER SYSTEMS, 2051F E. Cerritos, Anaheim, Cal., 92806, Tel: 714-535-5490; Empl.: 5

Customer service: Frank M. Tillou

Free literature available: Reprints of ASME paper entitled "A New Shaker for Modal Testing of Large Structures in the Seismic Frequency Range".

Products manufactured: Testers

Local Sales Offices & Reps.

Cal Walnut Creek, Dale-Dahl Assocs. 415-933-9555
 Colo Littleton, Eissler Sls. & Svcs. 303-794-1779
 Conn New Haven, Vibration Sls. & Svc. 203-389-1527
 Fla Orlando, Triflex 305-895-3152
 NJ Teaneck, L. Rudnick 201-836-7392
 Tex Dallas, Merit Co. 214-620-0021

ACRODYNE CONTROLS, Box 1044, Janosville, Wisc., 53545, Tel: 608-752-9081; Empl.: 12; Minimum order: \$25

Customer service: R. Mowris

Products manufactured: Motors, Relays, Switches

ACROMARK CO., 60 Locust/Dept. 397, Berkeley Hts., N.J., 07922, Tel: 201-464-6474; Empl.: 50

Customer service: W. H. Schmidt

Free literature available: Catalog Pages 410, 610, 630 & 9AH; Also Catalog Page 14 L, 14 M and 20 C.

Products manufactured: Machines/Machinery, Production, Nameplates

Local Sales Offices & Reps.

Cal Long Beach, J. Dan Culp Sls. 213-531-2591
 Cal Walnut Creek, Advanced Test Sys. 415-937-4225

Colo Denver, Plateau Machinery Co. 303-758-0135
 Ill Downers Grove, Midwest Tech. Ser. 312-968-4343

Mass Southwick, Electron Sls. Co. 413-569-3109
 Mich Adrian, E. Loncki 313-263-6539
 NY Skaneateles, Tech-Sonic Assocs. 315-685-6144

NC High Point, H. Bull 919-882-8997
 Ohio Cincinnati, Lohrer Ind. Equip. 513-574-2700
 Tenn Memphis, E.H. Carlson 901-682-3207

Tox Houston, Mercer Engrs. 713-529-6121
 Wash Hoodsport, G.M. Earsley Co. 206-877-9707

ACROMAG, INC., 30785 Wixom Rd., Wixom, Mich., 48096, Tel: 313-624-1541; Empl.: 45; Minimum order: \$10

Customer service: Sls DePt.

Products manufactured: Amplifiers, Controls/Control Eqpt., Converters, Indicators, Isolators, Monitors, Relays

Local Sales Offices & Reps.

Cal Palo Alto, Priz Co. 415-328-9333
 Cal Santa Fe Springs, D.A. Matthews/Assoc. 213-693-5432

Colo Denver, Control Equip. Corp. 303-399-6931
 Fla Jacksonville, L.E. Rogers Co. 904-743-5877
 Fla Ruskin, L.E. Rogers Co. 813-645-1453

Ga Atlanta, R. Freeman Assocs. 404-281-9065
 Ill Schaumburg, Carvel Engrg. Co. 312-885-8800
 La Baton Rouge, Petro-Chem. Equip. Co. 504-927-4380

La Metairie, Petro-Chem. Equip. Co. 504-586-9337
 Mass Norwell, Bordewieck Engrg. & Sls. 617-859-4915

Mich Ann Arbor, H.C. Haym Assocs. 313-971-8552
 Mich Marquette, NWR Elctns. Corp. 906-743-5877
 Mich Saginaw, H.C. Haym Assocs. 517-799-0873

Minn Edina, NWR Elctns. Corp. 612-831-6240
 Minn Virginia, NWR Elctns. Corp. 218-741-5080
 Mo St. Louis, Scherrer Instr. Co. 314-644-5362

Neb Omaha, Control Sls., Inc. 402-342-1717
 NJ Montclair, E.C. Smith & Assocs. 201-783-6668
 NY Albany, O.R. Lawrence Co. 518-456-4444

NY Buffalo, O.R. Lawrence Co. 716-839-4422
 NY New York, E.C. Smith & Assocs. 212-682-6880
 NY Syracuse, O.R. Lawrence Co. 315-455-5599

NC Matthews, W.K. Hile Co. 704-847-9125
 Ohio Chagrin Falls, J. Kilroy Corp. 216-247-8997
 Ohio Cincinnati, G.H. Drysdale & Assoc. 513-752-2069

Okla Tulsa, D. Allert Co. 918-743-7705
 Ore Portland, McLaren, Inc. 503-297-2248
 Pa Bridgeville, Instr. Svcs., Inc. 412-221-3601

Pa Devon, B & A Assocs. 215-888-5173
 Tenn Knoxville, W.K. Hile Co. 615-588-1061
 Tenn Memphis, M. Watson Co. 901-272-7495

Tex Houston, Gay Engrg. & Sls. 713-869-3306
 Tex Midland, Gebhart & Boyd Assoc. 915-697-1171
 Utah Salt Lake City, Specialty Sls. Co. 801-262-2979

Va Chester, W.K. Hile Co. 804-271-0014
 Wash Bellevue, McLaren, Inc. 206-454-3400
 WVva St. Albans, Instr. Svcs., Inc. 304-722-2953

Wisc Oconomowoc, Bookor Co. 414-873-4000
 EXP: Boston, Extch Int'l. 617-227-7090

ACRON CORP., 1095 Towbin Ave., Lakewood, N.J., 08701, Tel: 201-364-7200; Empl.: 40; Minimum order: \$25

For info on price: L. D. Fykse; Application info: S. Heritage; Customer service: S. Heritage; Delivery info: S. Heritage

Free literature available: Acro-lar Dialer; Sound Discriminator - Audio Detector; LG-800 - Burglar-Fire Alarm Panel; Acro-Dial - Repertory Dialer; Acro-Probe - Logic Probe.

Products manufactured: Alarms, Detectors, Power Supplies, Probes

Local Sales Offices & Reps.

Ariz Phoenix, Mountain West Alarm 602-263-8831
 Cal Glendale, Detectronics 213-240-4035
 Cal Hayward, Consolidated Communications Corp. 415-888-5115

Conn New Britain, Newbrite Industries, Ltd. 203-229-1840
 Fla Miami, Gulfstream Assoc. 305-885-2907

Ga Atlanta, Detectronics 404-875-8601
 Ind Michigan City, S & B Distrs. 219-872-0569
 Mass Watertown, Detectronics 617-929-1245

Mich Detroit, Alarm Supp. Co. 313-255-2303
 Pa Pittsburgh, Triangle Elctns. Co. 412-441-9659
 Tex Dallas, Detectronics 214-363-7377

ACTION LABS INC., 3238 Washington Ave. N., Minneapolis, Minn., 55412, Tel: 612-522-4391; Empl.: 45

For info on price: D. R. Kubas; Customer service: D. R. Kubas; Delivery info: D. R. Kubas

Products manufactured: Cable Assemblies & Harnesses, Services, Assembly, Production & Test

ACTIVE CONTROL INSTRUMENTATION, Box 194, E. Northport, N.Y., 11731, Tel: 516-864-2111; Empl.: 6

p. 1*228,229
 For info on price: M. Probor; Customer service: Cust. Svc.

Free literature available: Detail sheets (specification control drawings) giving specifications, size, description of operation, applications and ordering information for each of the models shown on catalog page (display ad). Request specific model.

Products manufactured: Alarms, Amplifiers, Controls/Control Eqpt., Converters, Current Sensors, Indicators, Isolators, Monitors, Probes, Protectors, Services, Assembly, Production & Test, Signal Averagers, Transducers

ACTIVE & PASSIVE COMPONENTS, 6 Aerial Way, Syosset, N.Y., 11791, Tel: 516-433-5311, TWX: 510-221-1807; Empl.: 50

For info on price: S. Bernstein; Application info: J. Milton; Customer service: Sls Dept; Delivery info: Sls Dept

Free literature available: Metallized film capacitor catalog R. F. Interference Filter catalog

Products manufactured: Capacitors, Fixed, Filters

Local Sales Offices & Reps.

Ala	Huntsville, Repcom Inc.	205-534-9959
Ariz	Phoenix, R.L. Davis Co.	602-955-2266
Cal	Encino, El Tec Systems	213-981-9881
Cal	Oakland, MHR Sls. Agency	415-569-1584
Fla	Ft. Lauderdale, R. Adams	305-564-1929
Fla	Melbourne, Repcom Inc.	305-254-1877
Fla	Miami Springs, L. Hatfield	305-887-8723
Fla	Orlando, J. Gilbert	305-894-7217
Fla	Seminole, G. Tillett	813-393-0584
Ga	Warner Robins, O. Bowman	912-923-1393
Ill	Glenview, Crimson Engrg. Co.	312-724-1780
Ind	Fort Wayne, W.W. Bieberich, Inc.	219-432-2537
Md	Baltimore, Bernard White & Co.	301-484-5400
Mass	Brookline, Harman Assocs.	617-232-6687
Mich	Detroit, Nicon Assocs.	313-341-7688
Minn	Minneapolis, G. E. Arneson & Co.	612-920-2086
NJ	Cherry Hill, Jay Assocs.	609-662-0399
NJ	Kenilworth, Ventronics, Inc.	201-272-9282
NY	Fayetteville, Graydon-Sherman	315-637-9861
NY	Pittsford, Graydon-Sherman	716-381-8838
Tex	Addison, Southland Comps.	214-233-0603
Tex	Houston, Southland Comps.	713-782-4575
Wash	Kirkland, T. Brian Ind.	206-827-5811
FOR:	Can., Montreal, Solid State Engrg. Co.	514-481-3313

A C TRANSFORMER CORP., 89 Madison St., Newark, N.J., 07105, Tel: 201-589-8574; Empl.: 13; Minimum order: \$25

Customer service: G. Giangrande

Products manufactured: Transformers

ACUREX, 485 Clyde, Mountain View, Cal., 94042, Tel: 415-964-3200, TWX: 910-379-6593; Empl.: 385

Customer service: E. L. Rossiter

Free literature available: 1) WDC Brochure - List Standard Products; 2) Torque - Outlines Standard Torque Systems.

Products manufactured: Comm. Systems, Data Acquisition & Reduction Systems, Indicators, Monitors, Transmission Systems, Data

ACUSHNET CAPACITOR CO., 720 Belleville, New Bedford, Mass., 02745, Tel: 617-999-3291, TWX: 710-344-6451; Empl.: 300; Minimum order: \$100.

For info on price: J. Pedro; Application info: W. O'Mara; Customer service: A. Ovellette; Delivery info: A. Ovellette

Products manufactured: Capacitors, Fixed, Networks

Local Sales Offices & Reps.

Ala	Huntsville, TMA	205-883-7893
Ariz	Tempe, Gassner & Clark	602-968-9037
Cal	Hawthorne, WCV Co.	213-772-4479
Cal	San Carlos, F. Kottmeier	415-592-8333
Colo	Denver, Electrodyn	303-757-7679
Fla	Pompano Beach, TMA	305-942-0774
Ill	Chicago, Gassner & Clark	312-345-4245
Ind	Indianapolis, F. Campisano	513-662-1616
Iowa	Cedar Rapids, Gassner & Clark	319-393-5763
Kans	Leawood, Thunderbird Sls.	913-642-7220
Md	Baltimore, Burgin-Kreh	301-788-5200
Mass	Lexington, J.E. Boeing Co.	617-862-2500
Mich	Detroit, Carrier & Gable	313-444-8980
Minn	Minneapolis, J. Barnes Sls.	612-474-2907
Mo	St. Louis, Thunderbird Sls.	314-567-6488
NJ	Cherry Hill, J. Barrett Assoc.	609-429-1551
NJ	Orange, Comtronic Sls.	516-741-8966
NY	Garden City, Comtronic Sls.	516-741-8966
NY	Ithaca, B. Dean	607-272-2187
NC	Winston-Salem, Burgin-Kreh	919-768-4174
Ohio	Cincinnati, F. Campisano	513-662-1616
Okla	Oklahoma City, Ammon-Rizos	405-373-2748
Pa	Pittsburgh, G. Root Co.	412-561-4125
Tex	Dallas, Ammon-Rizos	214-233-5591
Va	Lynchburg, Burgin-Kreh	703-845-5600
Wash	Seattle, B. Blum Assoc.	206-282-2590

AD AUTOMATION, 830 Linden Ave., Rochester, N.Y., 14625, Tel: 716-381-2370; Empl.: 80; Minimum order: \$40

For info on price: M. Boone; Application info: N. Webb; Customer service: N. Webb; Delivery info: M. Boone

Free literature available: ADA 71/7 - Adapt 10K - programmable leakage and continuity tester - testing any complex wiring system up to 10,000 inputs and outputs.

Products manufactured: Testers

Local Sales Offices & Reps.

Cal	So San Francisco, Howard & Co.	415-589-3050
Cal	Van Nuys, Elliott Assoc.	213-781-8454
Md	Riverdale, Riggs Assocs.	301-927-3380
Mass	Chelmsford, S&S Elctns.	617-273-0115

A. D. DATA SYS., INC., 830 Linden Ave., Rochester, N.Y., 14625, Tel: 716-381-2370; Empl.: 75; Minimum order: \$40 p. 1-127

For info on price: M. Boone; Application info: N. Webb; Customer service: N. Webb; Delivery info: M. Boone

Free literature available: Brochure: 73-1 Scan-A-Meter - Low Priced Data logger with multiple Analog Input.

Products manufactured: Analyzers, Antenna Switching Matrices, Clocks (All Types), Comm. Systems, Converters, Data Acquisition & Reduction Systems, Data Loggers, Matrices, Computer, Monitors, Multiplexers, Relays, Scanners, Switches, Testers

Local Sales Offices & Reps.

Cal	San Francisco, Howard & Co.	415-589-3050
Cal	Van Nuys, Gordon Elliot	213-873-6862
Md	Riverdale, Riggs Assocs.	301-927-3380
Mass	Chelmsford, S&S Elctns.	617-256-8731

AD-VANCE MAGNETICS, 226 E. 7th St., Rochester, Ind., 46975, Tel: 219-223-3158, TWX: 810-290-0294; Empl.: 17; Minimum order: \$25 p. 2-1210,1211

For info on price: J. Loebig; Application info: R. D. Vance; Customer service: K. Nixon; Delivery info: J. Loebig

Free literature available: Magnetic Shielding Alloys, CRT Shields, P-M Shields, Shielding Chambers, Tape Data Protectors, Shielding Foil, Special Fabricated Magnetic Shields, TWT Shields, Storage Tube Shields, Scan Converter Shields, Transformer Shields, Indicator Shields

Products manufactured: Alloys, Chamber, Environmental Test, Containers, Foil, Metal Compounds, Foils, Powders, Sheet, Stock, Pickups, Telephone (For Recording), Shields, Wire Strippers

Local Sales Offices & Reps.

Cal	Los Altos, Frauman Assoc.	415-941-0660
Cal	Pasadena, A-F Sls.	213-681-5631
Conn	Meriden, A. Allison	203-237-9232
Ill	Westchester, Brouillette	312-345-6500
Md	Baltimore, D.K. Jones Assoc.	301-752-0577
NJ	Fairlawn, Harris Assoc.	201-796-5200
Ohio	Dayton, Gemini Inc.	513-890-5394
Pa	Westchester, Curley Assoc.	215-692-6886
Tex	Dallas, Techno Assoc.	214-357-9213

ADALET MFG. CO., Div. Scott & Fetzer Co., 4801 W. 150th St., Cleveland, Ohio, 44135, Tel: 216-267-9000; FSC No: 73389; Empl.: 134; Minimum order: \$25

For info on price: J. Larsen; Application info: A. J. Hermanson; Customer service: N. Rutti; Delivery info: N. Rutti

Products manufactured: Boxes, Junction, Outlets & Wall Plates, Bushings, Glass, Plastic, Metal, Rubber, Etc., Cases, Equipment, Instrument, Meter, Switches

Local Sales Offices & Reps.

Ala	Birmingham, C.W. Ashby Co.	205-879-1651
Cal	Emeryville, G.E. Honn Co.	415-653-0737
Cal	Los Angeles, H.R. "Tex" Benike Assocs.	213-263-7451
Colo	Denver, Electrical Agencies Co.	303-623-8245
Fla	W. Palm Beach, Dineen Assocs.	305-968-6332
Ga	Atlanta, All South Agency	404-874-6301
Ill	Rosemont, L. Butter & Assocs., Inc.	312-671-5040
Ind	Indianapolis, Bennett Elec. Sls. Co.	317-257-1426
Kans	Shawnee Mission, Stover & Assocs.	913-649-6600
La	Metairie, General Power & Control Corp.	504-834-1345
Md	Pikesville, Wilson Assocs., Inc.	301-252-2231
Mass	Boston, C.C. Pierce Co., Inc.	617-268-8816

Mich	Detroit, Engel-Klaes Co.	313-342-9220
Minn	Minneapolis, Pinkney & Assocs., Inc.	716-839-3373

Mo	St. Louis, A. Haumesser Co.	314-781-1225
Neb	Omaha, Electrical Prods. Co.	402-393-7350
NM	Albuquerque, R.B. Black Co.	505-265-0144
NY	Bronx, W.D. Schofield Assocs.	212-933-2900
NY	Rochester, Canavan-Scanlon Assocs., Inc.	716-442-0720

NY	Syracuse, Canavan-Scanlon Assocs., Inc.	315-437-1271
----	---	--------------

NC	Charlotte, Adams-Gamble-Whiting Inc.	704-377-3489
----	--------------------------------------	--------------

Ohio	Cincinnati, C.J. Leesman Sls. Co.	513-681-2081
Ohio	Columbus, C.J. Leesman Sls. Co.	614-457-4700
Okla	Tulsa, C. Mullen & Assocs.	918-749-4991
Pa	Jenkintown, P. Jacobson Assocs.	215-884-5524
Pa	Pittsburgh, R.E. Grinder	412-242-3533
Tex	Dallas, W.J. Heumme Agency	214-339-3600
Tex	Houston, Ampco	713-523-7486
Utah	Salt Lake City, B. Cable & Equip. Co.	801-364-3452

Va	Portsmouth, H.K. Spencer	703-488-3041
Wash	Seattle, Strohecker, Inc.	206-623-0357
WVa	Charleston, Skaff Engrg. Co.	304-342-0131
Wisc	Milwaukee, A.W. Schwind Co.	414-276-9988

ADAMS-RUSSELL CO., INC., 280 Bear Hill Rd., Waltham, Mass., 02154, Tel: 617-890-2540, TWX: 710-324-1614; Empl.: 350

For info on price: C.M. Jones; Application info: R.E. Snyder; Customer service: C.M. Jones; Delivery info: C.M. Jones

Free literature available: Application notes "Receiving System Design Using Active Antennas" "Some Considerations in the Specification of a Radio Frequency Distribution System" "RF Matrix Switching System" Catalog of Standard Products

Products manufactured: Amplifiers, Antenna Feed Systems, Antenna Switching Matrices, Antennas, Cable Assemblies & Harnesses, Couplers, Direction Finders, Dividers, Shifters, Switches, Waveguides & Adapters

ADAMS-SMITH INC., Box 363, Needham, Mass., 02192, Tel: 617-263-1400; Empl.: 12

Customer service: R. J. LaBonte

Products manufactured: Computers, Editing Equipment, Tape

ADAMS & WESTLAKE CO., 1025 W. Michigan St., Elkhart, Ind., 46514, Tel: 219-264-1141; Empl.: 642

For info on price: C. H. Goshorn; Application info: J. Borrelli; Customer service: C. Goshorn; Delivery info: C. Goshorn

Free literature available: Adlakes extensive line of Mercury Wetted, Mercury Displacement, and Dry Reed Relays and Solid State Devices are illustrated with dimensional diagrams and photos accompanying product descriptions.

Products manufactured: Relays, Switches

Local Sales Offices & Reps.

Ala	Birmingham, M-G Elctns. & Equip. Co.	205-328-4525
Cal	Santa Fee Springs, Sierra-Pacific Engrg.	213-921-9634
Cal	Walnut Creek, P.W. Jasin Co.	415-935-6339
Conn	Berlin, White Sls. Co.	203-224-0423
Fla	Hollywood, W.B. Wimberly Co.	305-961-0227
Fla	Orlando, W.B. Wimberly Co.	305-425-3083
Ill	Chicago, Adams & Westlake Co.	312-346-6232
Mass	Needham, White Sls. Co.	617-444-3676
Mich	Royal Oak, R.H. Jackson Co.	313-342-5059
Mo	Independence, B. Gribble	816-SY6-4333
Mo	St. Louis, Wells-White Co.	314-726-5151
NJ	Newark, Adams & Westlake Co.	201-623-6532
NY	East Northport, Adams & Westlake Co.	516-368-4096

NY	Fayetteville, M.P. Andrews, Inc.	315-637-5291
Ohio	Cincinnati, Beedle Equip. Co.	513-793-0140
Pa	Pittsburgh, R.F. Clark Co.	412-242-9500
Pa	Radnor, W. Henry Cordray Sls. Co.	215-687-1366

Tex	Addison, Southland Engrg. & Sls., Inc.	214-233-0603
-----	--	--------------

Tex	Houston, Southland Engrg. & Sls., Inc.	713-782-4575
-----	--	--------------

Wash	Seattle, Eicher-Richards Co.	206-LA3-7888
------	------------------------------	--------------

FOR: Can., Toronto 15, Ont., Lisle-Metrix Ltd. 416-249-9151

Local Distributors

Ala	Birmingham, MG Elctns. & Equip. Co.	3112 6th Ave. S. 205-328-4525
-----	-------------------------------------	-------------------------------

NJ Fair Lawn, Relay Specialties, 1300 Plaza Rd.
201-797-3313
Okla Tulsa, Radio, 1000 Main St. S.918-587-9123
Pa McKeesport, Barno Radio Co., 5403 W.
Smithfield412-664-9394

ADAR ASSOCS., INC., 11B North Ave., Burlington, Mass.,
01803, Tel: 617-273-1850, TWX: 710-332-8878; Empl: 55
For info on price: R. Hollenberg; Application info: R.
Hollenberg; Customer service: T. Schulte; Delivery
info: R. Hollenberg

Free literature available: DR12/20 brochure, DR32
brochure, DR64 brochure, Series 300 - Manual
Memory Programmer, Model 550 -
Programmer/Verifier, Model 520 - Automated
Universal Memory Duplicator, Model 510 - Tape
Reader

Products manufactured: Generators, Pulsers, Logic
Test, Test Systems, Testers

Local Sales Offices & Reps.

Ala Huntsville, Beacon Elctns. Assoc.
205-881-5031
Ariz Phoenix, Mesa Engrg.602-943-9213
Cal Anaheim, F.L. Wolfe, Inc.714-956-8220
Cal Culver City, F.L. Wolfe, Inc.213-559-7200
Cal Palo Alto, Coherent Mktg. Assocs.
415-327-2217
Cal San Diego, Mesa Engrg.714-278-8021
Cal Sunnyvale, Adar West Coast408-734-3937
Colo Boulder, Mile High Elctns.303-444-5615
Fla Fort Lauderdale, Beacon Elctns. Assoc.
305-776-6074
Fla Maitland, Beacon Elctns. Assoc.305-647-3498
Ga Atlanta, Beacon Elctns. Assoc.404-351-3654
Md Randallstown, Beacon Elctns. Assoc.
301-922-1248
Mass Waltham, W.M. Hague Co.617-899-5600
NJ Wayne, K&J Assocs.201-694-3334
NY E. Setauket, K&J Assocs.516-751-8686
NY Rochester, K&J Assocs.716-232-6640
SC Spartanburg, Beacon Elctns. Assoc.
803-582-4613
Va Falls Church, Beacon Elctns. Assoc.
703-534-1673

ADAPTER/CHARGER PRDTS., 7807 N. Poiner Lane,
Peoria, Ill., 61614, Tel: 309-691-0810; Empl: 50

For info on price: P. Smith; Application info: J. Planck
Free literature available: Wall plug-in power
supplies and chargers.

Products manufactured: Alarms, Chargers, Battery,
Power Supplies

Local Sales Offices & Reps.

Cal Santa Ana, Spectrum Assoc.714-835-4114
Fla Orlando, Data Rep. Inc.305-843-5224
Minn Minneapolis, Jos. Co. Sls. Engrg.612-835-5858

ADC PRODS., 4900 W. 78th St., Minneapolis, Minn.,
55435, Tel: 612-835-6800, TWX: 910-576-2832; Empl:
723; Minimum order: \$50p. 2-444-449
Customer service: Communication Comp. Sls.

Free literature available: ADC Products
Catalog-Description and price list for ADC's
standard communication components.

Products manufactured: Cords, Jacks (All Types),
Panels, Plug & Jack Sets, Plugs, Terminal Blocks,
Boards & Strips

Local Sales Offices & Reps.

Cal Menlo pk., ADC Western Sls. Office
415-323-1386
Colo Denver, Parker-Webster Co.303-770-1972
Conn Bloomfield, Zaslow Sls. Co.203-242-7781
Ill Oakbrook, Whitmore Assocs.312-325-4727
Minn Minneapolis, ADC Midwestern Sls. Off.
612-835-6800
NJ Cherry Hill, Danco Corp.609-424-5590
NM Albuquerque, A.Q. Elctns.505-255-8701
NY Syracuse, ADC Northeast Sls. Office
315-458-3747
Ohio Cincinnati, J.W. Murray & Assoc.513-662-1616
Ohio Cleveland, C.A. Robinson Co.216-381-9049
Tex Dallas, ADC Dallas Sls. Office214-241-6783

Local Distributors

Fla Jacksonville, Southeast Elctns., Inc., 1125
Rosselle St., Box 2517
Ga Atlanta, Ack Radio Supply Co., 554 Deering Rd.
N.W.
Ga Atlanta, Power & Tele. Sup., Box 43223
404-691-6813
Ga Decatur, Southern Telephone Supply Co., Box
833404-457-5512
Ill Chicago, Newark Elctns., 500 N. Pulaski Rd.
312-638-4411

Ind Indianapolis, RA-Dis-Co., 814 N. Senate Ave.
317-637-5571
Kans Lenexa, North Elect. Sup., 10951 Lakeview Ave.
913-888-9800

Mo Kansas City, Alexander Elctns., 1820
Wyandotte St.
NJ Rahway, Terminal Elctns., Pinewood St.
201-381-5700

NY New York, Gray Bar Elec. Co., 420 Lexington
Ave.
NY New York, Harvey Elctns., 2 W. 45th St.
212-582-1500

NY Woodbury, Harvey Radio Co., 60 Crossways
Park W.516-921-8700
NC Lexington, Power & Telephone Supply, Box 1063
704-249-0256

Ohio Columbus, Buckeye Tele. Co., 125 Kinnear Rd.
614-488-0655

Ohio Dayton, ESCO, Inc., 221 Crane St.513-224-9192
Pa Philadelphia, Philadelphia Elec., 112 N. 12th St.
215-568-7400

Tenn Kingsport, Radio Elctns. Supply, Box 827
Tenn Memphis, Power & Tele. Sup., 2690 Yale Ave.
901-324-8811

Tenn Nashville, Electra Distr. Co., 1914 East End Ave.
Tex Dallas, Southern Telephone Supply, 8808
Sovereign Row214-631-5340

Tex Ft. Worth, Allied Elctns., 401 E. 8th St.
817-336-5401

For: Can., Brockville, Ont., Automatic Elec. Supply,
100 Strowger Blvd.613-342-6621
For: Can., Montreal, Que., Payette Radio Ltd., 730 St.
Jacques St.514-866-6681

For: Can., Toronto, Ont., Electro Sonic Supply, 543
Yonge St.416-924-9301

ADCOR ELECTRONIC PACKAGING CORP., 50 E. 41st St.,
New York, N.Y., 10017, Tel: 212-532-6862; Empl: 10

For info on price: A. Chertoff; Application info: A.
Chertoff; Customer service: S. Russell; Delivery info:
S. Russell

Free literature available: Universal PC Cards:
applications data packaging densities, artwork
design parameters, manufacturing specifications.
Intermediate & high density connector
configurations. Computable wire-wrapping
guards.

Products manufactured: Backpanel Interconnect
Systems, Boards, Plug-In, Boards, Printed Circuit,
Boards, Printed Wiring, Universal, Connectors,
Integrated Circuit Packaging Systems, Services,
Assembly, Production & Test

ADCOTECH CORP., 575 Maude Ave., Sunnyvale, Cal.,
94086, Tel: 408-733-2820

Customer service: Sls. Dept.

Free literature available: Literature includes a lead
straightener ad, sheet covering adcotech product
lines, and data sheets on Adcotech's model
4300-S lead straightener, trim & form tools, and
Adcotech's line of bench-type air presses.

Products manufactured: Kits, Marking (Dial,
Instrument, Equipment, etc.),
Machines/Machinery, Production, Services,
Assembly, Production & Test, Tools

ADDINGTON LABORATORIES, INC., Corp. Hdqts., 2975

Scott Blvd., Santa Clara, Cal., 95050, Tel: 408-249-8050;
Empl: 180

ADDINGTON LABS, INC., Cable & Connector Div., 1043
DiGiulio Ave., Santa Clara, Cal., 95050, Tel:
408-248-5515, TWX: 910-338-0138

Customer service: J. Campbell

Products manufactured: Cable, Connectors,
Feedthrus & Seals, Environmental

Local Sales Offices & Reps.

Cal Fullerton, Engineer System Products
714-879-5500
Md Baltimore, Wright & Assoc.301-398-3748
NY Huntington Station, Gray & Reed Assoc.
516-433-3333

ADDINGTON LABS., INC., Microwave Comps. Div., 1043
DiGiulio Ave., Santa Clara, Calif., 95050, Tel:
408-248-5511, TWX: 910-338-0138; Empl: 70

Customer service: L. Becker

Products manufactured: Circulators, Ferrite,
Direction Finders, Filters, Isolators, Multiplexers,
Shifters, Switches

Local Sales Offices & Reps.

Ariz Phoenix, Elctn. Enterprises602-946-9860
Cal Los Altos, Stout-Loeswick415-948-3265
Colo Boulder, J. Smith & Assocs.303-442-7100

DC Washington, Applied Eng. Consultants
202-783-7319

Kans Wichita, Eugene Carbiener Assoc.
316-682-5782

Md Ellicott City, Applied Engrg. Consultants
301-465-1272

Mass Lexington, Eugene F. Delfino Co.617-449-4141
NJ Westfield, Gray & Reed Assoc.201-233-6116

NM Las Cruces, Elctn. Enterprises505-524-0126
NY Huntington Sta., Gray & Reed Assoc.
516-433-3333

NY Syracuse, Lightstone Corp.315-454-3209
Ohio Dayton, Berberick Assocs.513-433-0342

Pa Newtown Square, SWR Assoc.215-356-8550
Tex Dallas, Texas Avionics214-368-3566

FOR: Can., Georgetown, Ont., RDB Sheppard
Agencies Ltd.416-877-9846

ADDINGTON LABS, INC., Semiconductor Div., 680 W.
Maude Ave., Sunnyvale, Cal., 94086, Tel: 408-733-3883,
TWX: 910-339-9230

Products manufactured: Diodes

ADDINGTON LABS., INC., Solid State Prods. Div., 680 W.
Maude Ave., Sunnyvale, Cal., 94086, Tel: 408-245-6810,
TWX: 910-339-9230; Empl: 120

Customer service: B. White

Products manufactured: Discriminators, Generators,
Multipliers, Oscillators

Local Sales Offices & Reps.

Cal Los Altos, Stout-Loeswick415-948-3265
Cal Los Angeles, Basic Systems Corp.
213-938-2833

Fla Clearwater, Southeastern Component Sales
813-531-8324
Kans Wichita, Eugene Carbiener Assoc.
316-682-5782

Md Silver Springs, Eastern Instrumentation
301-681-6500

Mass Lowell, Russell Engrg. Services617-458-7146
NM Las Cruces, Electronic Enterprises
505-524-0126

NY Bridgeport, Lightstone Corp.315-699-5747
NY Huntington Station, Gray & Reed Assoc.
516-433-3333

Ohio Dayton, Ashby Associates513-252-5627
Pa Newton Square, SWR Assoc.215-356-8550

Tex Dallas, Texas Avionics214-363-6324
FOR: Can., Georgetown, Ont., RDB Sheppard
Agencies Ltd.416-877-9846

ADDISON DIV. MUIRHEAD, INC., 1101 Bristol Rd.,
Mountainside, N.J., 07092, Tel: 201-233-0610, Telex:
13-8275; Empl: 10; Minimum order: \$10

Customer service: R. M. Seelagy

Free literature available: Maze Master - low cost
cable tester, Auto Scan - high speed portable fault
finder, Auto Trak - self-programming fault finder
system, BITS - Backplane Integrated Test System
and Short Form Catalog - brief description of each
product. Above brochures provided
w/specifications and Price List.

Products manufactured: Cable Fault Locators, Test
Systems, Testers

Local Sales Offices & Reps.

Ariz Phoenix, Zeus, Inc.602-253-6104
Cal Corona Del Mar, D. E. Ward714-675-3839
Cal San Jose, H. Sharpe Assocs.408-257-3635
Colo Denver, Zeus, Inc.303-770-4400
Conn Hamden, Instr. Conslts. Inc.203-288-5246
Ill Wheaton, Engrg. Prods. Assoc.312-653-6826
Iowa Cedar Rapids, Tech. Reps. Inc.319-363-2489
Md Silver Spring, ARA Elctns.301-565-2584
Mass Waban, Instr. Conslts., Inc.617-969-9881
Mich Detroit, Electro Entrs.313-521-1500
Minn Minneapolis, Engrg. Prods. Assoc.
612-925-1883

Mo Hazelwood, Tech. Reps., Inc.314-731-5200
Mo Peculiar, Tech. Reps., Inc.816-737-1414

NM Albuquerque, Zeus, Inc.505-268-3941
NY DePew, Labtronics716-685-4111

NY Schenectady, Labtronics518-372-6649
NY Syracuse, Labtronics315-454-9314

NY Ulster Park, Labtronics914-471-2806
Ohio Cleveland, Electro Entrs.216-261-7670

Ohio Dayton, Electro Entrs.513-426-6071
Pa Glenside, ARA Elctns.215-887-5250

Pa Pittsburgh, Electro Entrs.412-371-8497
Utah Salt Lake City, Zeus Inc.810-466-4924

Wash Seattle, J.B. Jolly Co.206-938-4166

ADDMASTER CORP., 416 Junipero Serra Dr., San
Gabriel, Cal., 91776, Tel: 213-285-1121; Empl: 400

Customer service: D. Moore

Free literature available: "Paper Tape Equipment" - describes Line of Readers and Accessories. "Model 56 Printer" - Description of and Interface Instructions for OEM Printer.

Products manufactured: Printers, Readers

Local Sales Offices & Reps.

Ala	Huntsville, Scientific Devices	205-536-1969
Cal	Los Altos, Sys. Mktg. Conslts.	415-968-4180
Colo	Denver, Grifco	303-722-4674
Conn	New Canaan, R.H. Sturdy Co.	203-966-2580
Fla	Fort Lauderdale, Scientific Devices	305-721-4260
Fla	Orlando, Scientific Devices	305-841-8180
Fla	St. Petersburg, Scientific Devices	813-521-1720
Ill	Chicago, Scientific Sls.	312-775-7594
Ind	Indianapolis, Scientific Sls.	317-253-4606
Md	Bethesda, S & S Assocs.	301-654-1434
Mass	Wellesley Hills, R.H. Sturdy Co.	617-235-2330
Minn	Bloomington, Scientific Sls.	612-881-3300
NJ	Ridgewood, Instrumentation Sls.	201-445-5210
NM	Albuquerque, Fry-Gates Co.	505-298-1875
NY	Schenectady, N.W. Alexander & Assoc.	518-377-0581
NC	Burlington, Scientific Devices	919-228-6279
Ohio	Akron, Shamrock Elctn. Sls.	216-686-3796
Ohio	Dayton, Shamrock Elctn. Sls.	513-298-3052
Pa	Cambridge Springs, Shamrock Elctn. Sls.	814-398-8348
Pa	King of Prussia, S & S Assoc.	215-265-3450
Wash	Seattle, Delcom Sls. Co.	206-248-0090

ADEC INC., 12 Kulick Rd., Fairfield, N.J., 07006, Tel: 201-575-1570; Empl.: 30

Customer service: D. L. Wiesen

Products manufactured: Antennas, Handsets, Chestsets, Headphones, Headsets, Etc., Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds, Speaker Systems, Speakers

ADRE CO., Box 6415, Milwaukee, Wisc., 53209, Tel: 414-352-3531; Empl.: 50; Minimum order: \$15

Customer service: G.B. Herrider

Free literature available: Adre catalog #F3-271: Benefits, features & prices of contact burnishing tools and kits for maintaining or restoring full power capacity to precious metal electrical contacts.

Products manufactured: Burnishers, Contact, Chemicals, Metal Compounds, Foils, Powders, Sheet, Stock, Tools

ADRET CORPORATION, 1887 Lititz Pike, Lancaster, Pa., 17601, Tel: 717-569-7059, TWX: 510-657-4434

For info on price: P. D. Beckwith; Application info: P. D. Beckwith; Customer service: E. C. Odell; Delivery info: P. D. Beckwith

Free literature available: CATALOG - Covers complete line of Synthesizers (12 models) covering 0.001 Hz to 110 MHz with high spectral purity. All programmable. SERIES 6000 BROCHURE - Programmable Frequency Synthesizers to 600 MHz with 0.01 Hz resolution; and Spectrum Analyzers with 120 db dynamic range, 10 Hz bandwidth and 5 Hz accuracy.

Products manufactured: Analyzers, Generators, Oscillators, Synthesizers

Local Sales Offices & Reps.

Ala	Huntsville, J. L. Highsmith	205-881-3294
Cal	Los Altos, Systems Mark. Cons.	415-941-7122
Cal	S. Pasadena, QPL	213-687-3705
Colo	Englewood, Zeus, Inc.	303-770-4400
Fla	Orlando, J. L. Highsmith & Co.	305-293-5202
Md	Rockville, TE Corp.	301-340-0303
Mass	Stoneham, Ken Corp.	617-438-5464
Mich	Detroit, Electro Sls	313-526-8800
NM	Albuquerque, Trembley Assocs.	505-293-4444
NC	Charlotte, J. L. Highsmith & Co.	704-333-7743
Ohio	Cleveland, Electro Sls	216-261-5440
Pa	Pittsburgh, Electro Sls	412-371-9449
Tex	Richardson, Scientific Sls Co.	214-231-6541
Va	Richmond, J. L. Highsmith & Co.	805-272-5888
Wash	Bellevue, Topp Engin. Sls Corp.	206-747-5400

ADRET CORPORATION cont'd

Advertisement

Programmable Frequency Synthesizers to 600 MHz with 0.01 Hz resolution, AM, FM, PM, Sweep and Search. Special inquiries invited.

Spectrum Analyzers to 110 MHz with 120 db dynamic range, 5 Hz accuracy, 10 Hz bandwidth.

ADTOOL CORP., 10 Ronald Dr., Montreal W P Q, Can., Tel: 514-482-2548; Empl.: 18

For info on price: D. Derry; Delivery info: J. St Louis

Products manufactured: Benches, Consoles, Stools, Tables, Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chemicals, Cleaners & Solvents, Cleaners, Ultrasonic, Cutters, Wire, Hand Operated, Drawers, Sliding, Drivers, Nut, Flux, Brazing & Soldering Materials, Heat Guns, Production, Heat Sinks, Soldering, Lamps, Machines/Machinery, Production, Pliers, Scissors, Screwdrivers, Solder (All Types), Solder Pots & Baths, Soldering Accessories, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools, Tools, Tweezers, Hand & Vacuum, Wire Strippers, Wire Twisters, Wrenches

Local Sales Offices & Reps.

FOR: Can., Montreal West, Que., Adtool Corp.
FOR: Can., Toronto, Ont., Adtool Corp.

ADVANCE CONVERSION DEVICES CO., 109 Eighth St., Passaic, N. J., 07055, Tel: 201-778-0707; Empl.: 24
p. 1-1084, 1085

Products manufactured: Chargers, Battery, Controls/Control Eqpt., Converters, Inverters, Monitors, Power Supplies

Local Sales Offices & Reps.

Md	Annapolis, Hayden Assocs.	202-296-6059
Tex	Dallas, Data Aids Assocs.	214-620-1551
Tex	Houston, Data Aids Assocs.	713-862-6685
Wash	Seattle, Datacom Assocs.	206-285-2525

ADVANCE ROSS ELCTRNS. CORP., 135 S. La Salle St., Chicago, Ill., 60603, Tel: 312-K13-660; Empl.: 110

Customer service: C. Connors

Products manufactured: Cores, Magnetic, Substrates

Local Sales Offices & Reps.

Ill	Chicago, M. Gottlieb Assocs.	312-775-1151
Ind	Fort Wayne, G. Bieberich	219-432-2537
Mass	Carlsile, Carlisle Tech. Sls.	
NJ	Ringwood, Harvey Assocs.	201-962-7871

ADVANCE WEIGHT SYSTEMS, INC., Box 663, 19 S. 10th St., Battle Creek, Mich., 49016, Tel: 616-962-6657; Empl.: 7

Customer service: A. R. Oxley

Free literature available: Brochures and Data Sheets covering our complete line of weigh cells, weight meters and automatic controls for weighing systems.

Products manufactured: Amplifiers, Cells, Load, Indicators, Signal Conditioners & Equipment, Transducers

ADVANCED CIRCUITRY, Litton Systems Inc., 4811 W. Kearney St., Springfield, Mo., 65803, Tel: 417-862-0751, TWX: 910-775-4705; Empl.: 635

Products manufactured: Boards, Printed Circuit, Boards, Printed Wiring, Universal, Circuits, Printed, Multilayer, Terminal Blocks, Boards & Strips

Local Sales Offices & Reps.

Cal	Canoga Park, A.C.D. of Litton	213-884-7230
Cal	Garden Grove, A.C.D. of Litton	714-539-1515
Cal	San Diego, S & R Elctns.	714-565-8411
Cal	San Jose, A.C.D. of Litton	408-227-3800
Colo	Littleton, A.C.D. of Litton	303-794-6395
Fla	Tampa, A.C.D. of Litton	813-988-4224
Ill	Chicago, Carlson Elctn. Sls.	312-774-4812
Mass	Woburn, Bel-Mac Corp.	617-935-6810
Mich	Flint, Tech-Nearing Ind. Inc.	313-232-7332
Minn	Minneapolis, Giefer Sls. Co.	612-884-2395
NJ	Flanders, A.C.D. of Litton	201-584-0772
NJ	Lakewood, A.C.D. of Litton	201-367-1130
NY	Guilderland, Solder Pot	518-355-1829
Ohio	Englewood, A.C.D. of Litton	513-836-7488
Pa	Ft. Washington, Kirk-Sandell Inc.	215-643-2100

Tex	Plano, A.C.D. of Litton	214-423-4880
Va	Richmond, A.C.D. of Litton	804-794-6288
Wisc	Milwaukee, Carlson Elctn. Sls.	414-476-2790

ADVANCED DEVICES LAB, 316 Mathew St., Santa Clara, Cal., 95050; Empl.: 93

For info on price: C. H. Handley 408-241-6551; Application info: C. H. Handley; Customer service: C. H. Handley; Delivery info: M. Carter 408-241-9282

Free literature available: Specification sheets

Products manufactured: Controls/Control Eqpt., Detectors, Transducers

Local Sales Offices & Reps.

Cal	Santa Clara	408-241-9282
Ill	Elk Grove Village	312-437-3269
NJ	Long Branch	201-229-7424

ADVANCED DIGITAL RESEARCH, 1901 Old Middlwy Way, Mountain View, Cal., 94043, Tel: 415-965-1303; Empl.: 7; Minimum order: \$25

Customer service: R. A. Hein

Free literature available: Several data sheets and users manuals.

Products manufactured: Testers

ADVANCED DYNAMIC INSTRS. DIV., Electodyne, Inc., Box 358, Alexandria, Va., 22313, Tel: 703-836-4641; Empl.: 5; Minimum order: \$25

Customer service: C. C. Vincentz

Free literature available: Vibration Test Systems brochure covering equipment manufactured, technical specifications and prices.

Products manufactured: Accelerometers, Amplifiers, Analyzers, Calibrators, Equalizers, Meters, Power Supplies, Testers, Transducers

Local Sales Offices & Reps.

Ala	Huntsville, Ridge Instrs. Co.	205-837-3211
Cal	Montebello, TUCUL Engrg. Co.	213-728-7397
Cal	Mt. View, Morse Assocs.	415-968-7722
Fla	Orlando, Newco & Assocs.	305-293-7700
Ga	Tucker, Ridge Instr. Co.	404-939-1554
Ill	Des Plaines, Maher Engrg. Co.	312-824-2124
Md	Silver Spring, ARA Elctns. of MD.	301-565-2585
Mass	Acton, E.E. Specialists	617-259-9200
NM	Tosya, Dyma Electronics	505-758-2686
Ohio	Dayton, Li/Corp.	513-434-6367
Pa	Glenside, ARA Electronics, Inc.	215-887-5250
Tex	Dallas, Merit Co.	214-352-8040
FOR:	Can., Montreal, Que., J. G. Weiss Co. Ltd.	515-489-6887

ADVANCED HIGH VOLTAGE INC., 14532 Arminta St., Van Nuys, Cal., 91402, Tel: 213-997-7222; Empl.: 13
p. 1-1090-1092

Customer service: M. J. Alexander

Free literature available: 32 Page Catalog of High Voltage Sources (and low voltage sources insulated for High Voltage use) to 75 Kilovolts and 400 watts. Inputs are either line (AC) or DC.

Products manufactured: Converters, Loads, Electronic Variable, Power Supplies

Local Sales Offices & Reps.

NY	Great Neck, EAC Assocs.	516-466-9798
Tex	Dallas, Bouco Sls. Assocs.	214-247-6708
Va	Annandale, J. Hopkins & Assoc.	703-323-1641

ADVANCED KINETICS, 1231 Victoria St., Costa Mesa, Calif., 92627, Tel: 714-646-7165; Empl.: 32

For info on price: R. L. Gradishar; Application info: R. W. Waniek; Customer service: R. L. Gradishar; Delivery info: R. L. Gradishar

Products manufactured: Amplifiers, Bolometers, Calibrators, Cameras, Chamber, Environmental Test, Choppers, Coils Including Assemblies & Forms, Controls/Control Eqpt., Current Sources, Demagnetizers, Detectors, Discharge Systems, Indicators, Electroplating Equipment & Supplies, Energy, Integrators, Electronic, Interferometer Systems, Lamps, Lasers & Laser Systems, Magnetizers, Magnetometers, Magnets, Meters, Modulators, All Kinds, Monitors, Power Supplies, Spectrometers, Switches, Testers, Transducers, Tubes

ADVANCED MATERIALS SYSTEMS, 72 Elm St. N., Attleboro, Mass., 02703, Tel: 617-695-1401; Empl.: 100

For info on price: L. Toth; Customer service: C. Landis

Products manufactured: Metals, Services, Assembly, Production & Test, Wire

Local Sales Offices & Reps.

Conn	West Hartford, R.S. Pettigrew & Co.	203-233-8533
------	-------------------------------------	--------------

Ill Chicago, Electro-Comp. Sls.312-763-3636
 Mass West Newton, R.S. Pettigrew & Co.617-969-5770
 NJ Asbury Park, Lancaster Industrial Sls.201-988-5401
 Pa Lancaster, Lancaster Industrial Sls.717-397-2942

ADVANCED MEMORY SYS., INC., 1275 Hammerwood Ave., Sunnyvale, Cal., 94086, Tel: 408-734-4330, TWX: 910-339-9369; Empl.: 650

For info on price: D. Green; Application info: B. Flansburg Ext. 381; Customer service: P. Brown Ext. 300; Delivery info: P. Brown Ext. 300

Free literature available: 6002, 6003, 7001 Data Sheets: Specifications that each product is capable of performing. Application Notes: More technical, Engrg. information on particular product. Bitscoops: Literature dealing with a product or application.

Products manufactured: Integrated Circuit Devices, Memory Systems

Local Sales Offices & Reps.

Ariz Phoenix, Hecht-Henschen Co.602-275-4411
 Cal Los Altos, Cain-White Co.415-948-6533
 Cal Norwalk, Bertrand & Zoolian213-921-9791
 Cal Sunnyvale, Advanced Memory Sys.408-734-1842

Colo Boulder, R.G. Entprs.303-447-9211
 Ind Indianapolis, Technical Reps.317-849-6454
 Md Baltimore, Stemler Assocs.301-944-8262
 Mass Cambridge, Data Memory Assocs.617-868-4728

Mass Randolph, Advanced Memory Sys.617-828-2181
 Mich Southfield, Luebbe Sls.313-357-0355
 Minn St. Paul, Cahill Assocs.612-646-7217

NJ Barrington, Stemler Assocs.215-644-3477
 NJ Ridgewood, Instrumentation Sls. Co.201-445-5210
 NY Plainview, Central Assocs.516-433-0808

Ohio Cincinnati, Luebbe Sls.513-871-4211
 Ohio Cleveland, Luebbe Sls.216-333-0425
 Ohio Dayton, Luebbe Sls.513-294-0426

Okla Tulsa, Norvell Assocs.918-663-1247
 Pa Delmont, Luebbe Sls.412-468-4019
 Tex Dallas, Norvell Assocs.214-350-6771
 Tex Houston, Norvell Assocs.713-774-2568
 Va Alexandria, Stemler Assocs.703-548-7818

FOR: Can., Montreal, Que.I, J.G. Weiss Co.610-421-3512
 FOR: Can., North Vancouver, B.C., J.G. Weiss Co.604-987-3833
 FOR: Can., Steinbach, Manitoba, J.G. Weiss Co.204-326-6405
 FOR: Can., Toronto, Ont., J.G. Weiss Co.416-766-0843

ADVANCED MICRO DEVICES, 901 Thompson Pl., Sunnyvale, Cal., 94086, Tel: 408-732-2400, TWX: 910-339-9280; Empl.: 750

For info on price: O. Bailey Ext. 341; Application info: S. Simonsen Ext. 266; Customer service: J. Verhelst Ext. 576; Delivery info: J. Verhelst Ext. 570

Products manufactured: Indicators, Integrated Circuit Devices



ADVANCED POWER, INCORPORATED
 Economy thru Advanced Technology.

ADVANCED POWER INC., 1621 S. Sinclair St., Anaheim, Cal., 92806, Tel: 714-997-0034, TWX: 910-593-1332; Empl.: 45; Minimum order: \$25

For info on price: K. Nelson; Application info: G. Mousel; Customer service: K. Nelson; Delivery info: K. Nelson

Free literature available: Controfluxer product catalog #A1173 APS D.C. power supply series bulletin #APS974

Products manufactured: Power Supplies, Regulators, Transformers

Local Sales Offices & Reps.

Ind Fort Wayne, Advanced Comp Sls219-432-2546
 Ind Indianapolis, Advanced Comp. Sls.317-545-6441

Md Silver Spring, Rep-Tron301-593-4844
 Minn St. Paul, Northport Engrg612-698-3841
 Ohio Milford, Knight Tech. Sls.513-831-1513
 Ore Eugene, J. A. Tudor & Assoc.503-686-1252
 Ore Portland, J. A. Tudor & Assoc.503-288-5154
 Pa Norristown, Data Engrg Co.215-279-8146
 Wash Seattle, J. A. Tudor & Assoc.206-682-7444
 Wash Spokane, J. A. Tudor & Assoc.509-327-3328

ADVANCED POWER INC. cont'd

Advertisement

CONTROFLUXER - regulator/filters, AC line;
 CONTROFLUXER - DC power supplies;
 APS series economy OEM DC power supplies;
 High frequency SCR switching Controfluxer DC power supplies;
 Custom designed AC & DC power conditioners.

A E G TELEFUNKEN, 570 Sylvan Ave., Englewood Cliffs, N.J., 07632, Tel: 201-568-8570, Telex: 135497; Minimum order: \$100

Customer service: J. Szafranski

Products manufactured: Amplifiers, Cells, Photoconductive, Photoemissive, Photovoltaic, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Crystals, Delay Lines, Detectors, Diodes, Display Devices/Displays, Films, Integrated Circuit Devices, Isolators, Lamps, Monitors, Potentiometers, Power Supplies, Rectifiers, Regulators, Thyristors (Includes Silicon Controlled Rectifiers), Transistors, Tubes, Valves, Vacuum

AEL, INC., Richardson Rd., Colmar, Pa., 18915, Tel: 215-822-2929, TWX: 510-661-4976; Empl.: 1500

Customer service: T. J. Keffer X241

Free literature available: In addition to company capability and facility literature, brochures covering each product line.

Products manufactured: Amplifiers, Analyzers, Antenna Feed Systems, Antenna Switching Matrices, Antenna Towers & Supports, Antennas, Attenuators, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Cable, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Circuits, Printed, Multilayer, Comm. Systems, Connectors, Converters, Counters, Couplers, Detectors, Diodes, Direction Finders, Display Devices/Displays, Dividers, Drivers, Switch, Duplexers, Microwave, Filters, Generators, Horns, Microwave, Isolators, Limiters, Microwave Integrated Circuits (MIC's), Mixer-Preamplifiers, Microwave, Mixers, Modulators, All Kinds, Mounts, Multipliers, Networks, Oscillators, Power Supplies, Preselector-Mixers, Preselectors, Radar Systems, Receivers, Rectifiers, Services, Assembly, Production & Test, Shifters, Simulators, Switches, Terminals, Testers, Transceivers, Transistors, Transmitters

Local Sales Offices & Reps.

Ala Huntsville, Reynolds & Assocs., Inc.205-536-1941
 Ariz Phoenix, Shefler-Kahn Co.602-258-7893
 Cal Anaheim, Blair Assocs.714-635-1350
 Cal Inglewood, L & M Engrg.213-674-6850
 Cal San Jose, L & M Engrg.408-292-3220
 Colo Denver, Shefler-Kahn Co.303-232-0873
 Fla Clearwater, Reynolds & Assocs., Inc.813-726-2373

Fla Ft. Lauderdale, Reynolds & Assocs., Inc.305-581-6611
 Fla Hollywood, Reynolds & Assocs., Inc.305-987-6720
 Fla Palm Beach, Reynolds & Assocs.305-622-6850
 Fla Satellite Beach, Reynolds & Assocs.305-773-4700

Fla St. Petersburg, Reynolds & Assocs.813-360-1484
 Ga Atlanta, Reynolds & Assocs., Inc.404-252-5360
 Haw Honolulu, Har-Kom Hawaii, Inc.808-587-178
 Ill Northfield, Wright Travis Associates312-441-6055

Md Timonium, Deshawn Assocs.301-252-4878
 Mass Needham, Addeco Corp.617-444-4754
 NM Albuquerque, Shefler-Kahn Co.505-265-7077
 NY E. Syracuse, OSSMORE Instr.315-437-6666
 NY Melville, ASTROREP Inc.516-423-2266
 NC Greensboro, Reynolds & Assocs., Inc.919-275-3725

Ohio Dayton, Ashby Assocs.513-252-5627
 Pa Plymouth Meeting, Scientific Devices215-825-9515
 Tex Irving, Kemco, Inc.214-255-0537
 Wash Seattle, Rush Drake Assocs.206-763-2755

AEL COMMUNICATIONS CORP., SUB. OF AMER. ELCTRN. LABS. INC., Box 507, Lansdale, Pa., 19446, Tel: 215-822-2929, TWX: 510-661-4976; Empl.: 100

Free literature available: Covers AELCC facilities and activities in a handsome and resilient 3-ring binder.

Products manufactured: Amplifiers, Attenuators, Cable, CATV Systems & Equipment, Connectors, Converters, Filters, Services, Assembly, Production & Test, Television Systems & Equipment Closed-Circuit

Local Sales Offices & Reps.

Mo Ballwin, R. Hood314-227-3212
 Pa Lansdale, J. Sacco215-822-2929

AEMCO DIV., Midtex, Inc., 1650 Tower Blvd., Mankato, Minn., 56001, Tel: 507-387-6521, TWX: 910-565-2244; Empl.: 600p. 1-1548-1572

Products manufactured: Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Panels, Relays, Sockets, Suppressors, Switches, Timers, Transformers

Local Sales Offices & Reps.

Ala Huntsville, Twentieth Century Mktg.205-772-9237
 Cal Inglewood, J. Berman Co.213-776-1281
 Cal Oakland, Moulthrop Sls.415-261-7676
 Colo Denver, Barnhill Five303-426-0222
 Fla Maitland, Hutto-Hawkins-Peregoy305-831-2474

Ill Downers Grove, Richmar Elctns. Corp.312-968-0118
 Kans Overland Park, Beams Co.913-341-7744
 Mich Detroit, Nicon Assocs.313-341-7688
 NH Nashua, Bell Controls603-882-6985
 NJ Ridgewood, Ballou Inc.201-444-6990
 NY Buffalo, R.F. Lamb Co.716-832-5517
 Ohio Dayton, K.W. Elctn. Sls.513-890-2150
 Pa Philadelphia, Professional Sls. Assoc.215-676-2918

Tex Richardson, Oeler & Menelaides214-234-6334
 Wash Seattle, C.B. Parson & Co.206-762-7373
 EXP: Montreal 355, Que., Can., Caba Elctns. Ltd.514-381-2523

Local Distributors

Ariz Phoenix, Moltronics, 2746 W. Palm La.602-272-7951
 Cal Mt. View, Powell Elctns., 411 Fairchild Dr.415-964-0820
 Cal San Diego, Moltronics, 7969 Engineer Rd.714-278-5020
 Cal Santa Clara, Fisher Brownell, 338 L Edward Ave.408-294-6183
 Cal Santa Clara, Moltronics, 337 Mathew St.408-244-7600
 Cal Southgate, Moltronics, 5160 E. Imperial Hwy.213-773-6521

Fla Oakland Park, Peerless Radio Corp., 1040 N.E. 43rd Ct.305-566-5966
 Ill Addison, Lectron Control, 524 S. Westgate St., Unit C312-543-8460
 Ill Arlington Heights, S & R Corp., 2420 East Oakton312-593-2545

Iowa Cedar Rapids, J. Vrbik Co., Three 50th Street N.E.319-377-8244
 Mass Cambridge, Apollo Elctns., 200 Second St.617-868-3120

Mass Lowell, F. McCartin Co., 181 Market St.617-454-9101
 Mo Kirkwood, Winslow Design & Sls., 206 N. Clay Ave.314-645-2400
 Mo St. Louis, Electric Controls, 2735 Mercantile Dr.314-645-2400

NY Buffalo, Genesee Radio & Parts Co., 2550 Delaware Ave.716-858-1287
 NY Hempstead, Kahgan Comps., 556 Peninsula Blvd.516-538-2300
 NY Rochester, Masline Elctns., 511 Clinton Avenue So.716-546-5373
 NY Woodside, Switches Unlimited, 49-1143 Ave.212-651-0945

Ohio Akron, Sun Radio Co., 110 E. Market St.216-434-2171

Ohio Toledo, Fee & McCarthy, Inc.419-245-2400
 Pa Erie, Erie Corp. Contractors, 1968 Buffalo Rd.214-357-4576
 Tex Dallas, Component Specialties, 2560 Elctns. La.214-357-4576
 Tex Houston, Comp. Specialties, 7313 Ashcroft, Suite 202713-771-7237

Wisc Milwaukee, Marsh Elctns., 6047 W. Beloit Rd.414-545-8500
 For: Can., Scarborough, Ont., Carsten Elctns., 52 Howden Rd.416-751-2371

AERO-MOTIVE MFG CO., 1-94 At Miller Rd., Kalamazoo, Mich., 49001; Minimum order: \$20

Customer service: B. Rowe 616-381-1202
Products manufactured: Reels, Cord & Cable

AEROCOM, 3090 S.W. 37th Ave., Miami, Fla., 33133, Tel: 305-448-6503; Empl.: 100

Customer service: F. I. Stacy
Products manufactured: Amplifiers, Comm. Systems, Controls/Control Eqpt., Receivers, Transmitters, Transponders

Local Sales Offices & Reps.
Cal Los Angeles, Aeronautical Elctn. Sls. Corp. 213-670-5166

AEROFLEX LABS., INC., South Service Rd., Plainview, N.Y., 11803, Tel: 516-694-6700, TWX: 510-224-6417; Empl.: 150; Minimum order: \$100

p. 1-929-931
For info on price: N. L. Russell; Application info: M. Ruderman; Customer service: A. Garrett; Delivery info: A. Garrett

Free literature available: TQ Series Torquers (MIL-SPEC), ValueLine Series Torquers, Brushless DC Motors, Part Nos. Tech Data, and Dimensions for above.

Products manufactured: Antenna Rotators, Antennas, Controls/Control Eqpt., Counters, Motors, Mounts, Pedestals, Radar, Servo Systems, Simulators, Tachometers, Testers, Tracking Systems

Local Sales Offices & Reps.
Cal Aptos, Allen & Sweeney Assoc. 408-688-7114
Cal Torrance, Allen & Sweeney Assocs. 213-373-3318

Conn Thomaston, Tygren Co. 203-264-6880
Ill Lombard, Quadtron Assocs. 312-627-6800
Kans Wichita, D & O Engrg. Co. 316-264-7358
Md Lutherville, P. Knox & Co. 301-252-1288
Mass Stoneham, K & D Assoc. 617-438-3121
Mich Farmington Hills, H. Lowell Co. 313-851-7474
Minn St. Paul, Vikeland Sls. 612-645-4647
Ohio Fairborne, Tech. Assocs. 513-878-2484
Pa Jenkintown, Stein Instrumentation 215-885-2370

Tex Houston, Aid Elctns. 713-777-3882
Tex Irving, Aid Elctns. 214-259-4761
Wash Seattle, G.M. Gillet & Assoc. 206-284-3344
EXP: New York City, N.Y., Fratham Co. 212-687-9390

AEROLITE ELEXS CORP., 2207 Summit Ave., Union City, N.J., 07087, Tel: 201-863-2955; Empl.: 60; Minimum order: \$50

For info on price: A. Veres; Customer service: A. Veres; Delivery info: D. Palmer

Products manufactured: Alarms, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, CATV Systems & Equipment, Couplers, Lamps, Services, Assembly, Production & Test, Sockets

AEROSPACE AVIONICS, INC., Airport International Plaza, 110 Wilbur Pl., Bohemia, N.Y., 11716, Tel: 516-589-9200, TWX: 510-228-7889; Empl.: 200

Products manufactured: Amplifiers, Annunciators, Controls/Control Eqpt., Converters, Inverters, Power Supplies

AEROTRONIC ASSOCs., INC., Riverside Dr., Contoocook, N.H., 03229, Tel: 603-746-3141; Empl.: 70

For info on price: M. Longley; Customer service: P. White; Delivery info: P. White

Free literature available: Aerotronic's new model 707-241 (Mem 1024) 80 position dynamic burn-in system for MOS memories is a complete system including plug-in cards (devices), power supplies, clock and line drivers and indicators.

Products manufactured: Chamber, Environmental Test, Clamps & Clips, Heat Exchangers & Systems, Meters, Testers

Local Sales Offices & Reps.
Cal Mt. View, Aerotronic Assoc. West 415-961-7440
Fla Longwood, Saber Assocs. 305-422-3666
Ill Des Plaines, Cozzens & Cudahy 312-298-3600
Ind Indianapolis, Cozzens & Cudahy 317-244-2456
Minn Minneapolis, Cozzens & Cudahy 612-884-4336
Mo St. Louis, Cozzens & Cudahy 314-423-1234
NM Albuquerque, Electronic Enptrs. 505-256-3561

AEROVOX INDS., INC., 740 Belleville Ave., New Bedford, Mass., 02741, Tel: 617-994-9661, TWX: 710-344-6985; Minimum order: \$200

Customer service: T. P. Richards

Free literature available: Oil capacitor catalog; Product bulletin on non-PCB "environmental" capacitors.

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.
Ala Huntsville, 20th Century Mktg. 205-772-9237
Cal Woodland Hills, Interstate Mktg. Assocs. 213-883-7606
Del Greenville, H. Anderson 302-655-2917
Fla Oviedo, Conley & Assocs. 305-365-3283
Ill Chicago, T. B. Hunter Assocs. 312-777-2500
Ill Wheaton, J-C OEM Sls. 312-668-7621
Ind Indianapolis, F. J. Campisano Co. 317-247-8623
Mass Lexington, J. E. Boeing Co. 617-862-2500
Mich Southfield, Carrier & Gable 313-444-8980
Minn Minneapolis, Comstrand 612-560-5300
Mo Grandview, Bencke & McCaul 816-765-2998
NJ Cherry Hill, J. N. Barrett Assocs. 609-429-1551
NY Garden City, Comtronic Assocs. 516-741-8966
NY Ithaca, B. Dean 607-272-2187
Ohio Cincinnati, F. J. Campisano Co. 513-662-1616
Pa Pittsburgh, G. S. Root & Co. 412-561-4125
Tex Dallas, Hale & Assocs. 214-250-8791
Tex Houston, Ammon & Rizos Co. 713-781-6240
Wash Bellevue, Western Tech. Sls. 206-641-3900

AERTECH INDUSTRIES, 825 Stewart Dr., Sunnyvale, Cal., 94086, Tel: 408-732-0880, TWX: 910-339-9207; Empl.: 326

For info on price: F. Brewer X-467; Customer service: R. Williams X-514; Delivery info: B. Wright X-462

Products manufactured: Amplifiers, Capacitors, Fixed, Circulators, Ferrite, Converters, Couplers, Detectors, Diodes, Diplexers, Antenna, Dividers, Filters, Integrated Circuit Devices, Isolators, Limiters, Microwave Integrated Circuits (MIC's), Mixer-Preamplifiers, Microwave Mixers, Monitors, Mounts, Multipliers, Oscillators, Preselector-Mixers, Preselctors, Receivers, Tuners

Local Sales Offices & Reps.
Cal Los Altos, J. Stone & Assocs. 415-948-4563
Cal Los Angeles, Fetty-Schodenuve, Inc. 213-651-4050

Colorado Boulder, H. Bass & Assocs. 303-499-7509
Fla Fort Lauderdale, Snow Co. 305-563-2448
Ga Chamblee, E.G. Holmes & Assocs. 404-451-6161
Ill Northfield, Feller Assocs. 312-446-8065
Kans Shawnee Mission, Tech. Sls. Assocs. 913-888-3330

Md Ellicott City, Doss Elctns., Inc. 301-465-1336
Mass Natick, Wayland Engrg Sls. 617-655-6080
Mo St. Louis, Tech. Sls. Assocs. 314-725-5361
NM Albuquerque, Trembley Assocs. 505-293-4444
NY Jericho, Dal-tech Devices Inc. 516-433-7448
NY Syracuse, Syracuse Tech Reps 315-488-0222
Pa Elkins Park, Snow Assocs. 215-379-4700
Tex Richardson, Lear Assocs. 214-231-5388
Wash Seattle, Delcom Sls. Co. 206-248-0090

AETNA ENGRG., 3249 Overland Ave., Los Angeles, Cal., 90034, Tel: 213-836-4016; Empl.: 10

Customer service: T. A. Zimmerman
Products manufactured: Services, Assembly, Production & Test

AFI INDUSTRIES INC., 400 Warburton Pl., Long Branch, N.J., 07740, Tel: 201-229-8300

Products manufactured: Circuits, Hybrid, Thick Film, Multipliers, Rectifiers

AGASTAT DIV., See Control Prods. Div. Amerace Esna

AGFA-GEVAERT, INC., 275 North St., Teterboro, N.J., 07608, Tel: 201-288-4100, TWX: 710-990-6137; Empl.: 750; Minimum order: \$100

Customer service: E. Haggerty Ext. 211

Products manufactured: Films, Lenses, Optical & Camera, Paper, Graphic Recording, Tapes, Recording, Magnetic (All Types)

Local Sales Offices & Reps.
Cal Brisbane, AGFA-GEVAERT, Inc. 415-467-2330
Cal Glendale, AGFA-GEVAERT, Inc. 213-246-8141
Ga Atlanta, AGFA-GEVAERT, Inc. 404-355-7450
Ill Chicago, AGFA-GEVAERT, Inc. 312-267-9100
Mass Waltham, AGFA-GEVAERT, Inc. 617-890-5430
NY New York, AGFA-GEVAERT, Inc. 212-685-6641
Tex Dallas, AGFA-GEVAERT, Inc. 214-631-7290

AGNEW-HIGGINS, INC., Box 15423, Santa Ana, Cal., 92705, Tel: 714-893-1301; Empl.: 45

For info on price: A. Urabe; Application info: H. Wildermuth; Customer service: A. Urabe; Delivery info: T. Cobb

Free literature available: Catalog WS 773: comprehensive 12-page summary of clean work stations & clean fume hoods offered with selection guide which explains the effectiveness of the laminar flow principle.

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Blowers & Fans & Accessories

Local Sales Offices & Reps.
Cal Los Angeles, Weightman Assocs. 213-645-6060
Cal San Francisco, Howard & Co. 415-589-3050
Colo Denver, Vinson Assocs., Inc. 303-757-5151
Fla Winter Haven, W.K. Ousley, Inc. 813-294-6441
Ga Atlanta, Spillane & Assocs. 404-252-5145
Md Silver Spring, Normco Assocs. 301-567-6569
Mass Norwood, S. Pierce, Inc. 617-762-3164
NM Albuquerque, Vinson Assocs., Inc. 505-265-5991

NY Rochester, T. Ferguson Sls. Inc.
Ohio Dayton, H. Noyes & Assocs. 513-274-2871
Tex San Antonio, Alchem Assocs. 512-434-7596

Advertisement

CLEAN AIR TO WORK IN - From the manufacturers of the world's first laminar flow clean rooms. Laminar-Flow Clean Work Stations - Modular sizes: tabletop models, floor models, downflow fume hoods, with a full range of accessories: stainless steel counter tops, filter service gauges, etc. Blower-Filter Modules for converting existing rooms into CLEAN rooms. Blower-Filter stand units for converting existing work stations into CLEAN work stations. Free factory consultation on your clean room needs. All equipment guaranteed in writing to meet Fed. Std. 209.

AIKEN INDUSTRIES, 200 Park Ave., New York, N.Y., 10017, Tel: 301-475-8961; Empl.: 50; Minimum order: \$50

For info on price: P. R. Hanback; Application info: W. P. Riendeau; Customer service: P. R. Hanback; Delivery info: F. Clark

Products manufactured: Circuit Breakers, Protectors

Local Sales Offices & Reps.
Cal Oakland, Richard B. Peters Co. 415-835-5135
Cal Panorama City, C. E. Yost 213-781-8966
Cal Pasadena, T. W. Yeakle 213-684-2275
Ill Barrington, Perhats Assocs. 312-381-6360
Mich Southfield, Eynon-Weyand Assocs. 313-354-3430

Ohio Cleveland, Rockford Controls Ohio 216-731-5250

Ohio Dayton, Rockford Controls Ohio 513-278-7362
Pa Jenkintown, Arnold Assocs. 215-742-0600
Pa Monroeville, Rockford Controls Ohio 412-373-3531

Wash Bellevue, Pacific Consultants 206-454-2504
FOR: Can., Montreal, Que., Major Sls. Dists. 514-844-1720

AIKEN INDUSTRIES, INC., Communications & Electronics Div., 9125 Gaither Rd., Gaithersburg, Md., 20760, Tel: 301-948-5210, TWX: 710-828-9706; Empl.: 220; Minimum order: \$100

Customer service: Mktg. Dept.

Free literature available: Trade magazines

Products manufactured: Amplifiers, Antenna Switching Matrices, Comm. Systems, Counters, Dividers, Meters, Receivers, Switches, Tuners

Local Sales Offices & Reps.
Cal Santa Clara 408-244-8852

AIL, Comac Road, Deer Park, N.Y., 11729, Tel: 516-595-3094, TWX: 510-227-6073; Empl.: 3100

Customer service: R. H. Frechen

Products manufactured: Amplifiers, Analyzers, Detectors, Diplexers, Antenna, Equalizers, Filters, Radar Systems, Radiometers, Receivers, Simulators

Local Sales Offices & Reps.
Cal Los Angeles, D.O. Ness 213-641-1322
Ohio Dayton, A.P. Vogel 513-254-3511
Va Arlington, S. Collin 703-521-3300

AILTECH, 815 Broad Hollow Rd., Farmingdale, N. Y., 11735, Tel: 516-595-6471, TWX: 510-224-6558; Empl.: 200

Products manufactured: Amplifiers, Analyzers, Attenuators, Calibrators, Cavities, Microwave, Converters, Diodes, Gages, Generators, Insertion Loss Measurement Systems, Meters, Mixer-Preamplifiers, Microwave Mixers, Oscillators, Preselectors, Receivers, Standards, Testers, Transducers, Transmitters

Local Sales Offices & Reps.

Ala Huntsville, Beacon Electronics 205-881-5031
 Ariz Scottsdale, Inter-Mountain Engrg. Co. 602-947-7379
 Cal La Jolla, Ward/Davis Assoc. 714-459-3351
 Cal Lawndale, Ward/Davis Assoc. 213-542-7740
 Cal Los Angeles, Ailtech, West Coast Oper. 213-965-4911
 Cal Sunnyvale, Ward/Davis Assoc. 408-245-4392
 Colo Boulder, Herb Bass Assoc. 303-499-7509
 Fla Maitland, Beacon Elctns. 305-647-3498
 Fla Palm Beach Gardens, Beacon Elctns. 305-622-2770
 Ga Atlanta, Ailtech 404-939-2016
 Ill Chicago, K. Meyers Co. 312-774-6440
 Ind Indianapolis, K. Meyers Co. 317-243-6681
 Kans Shawnee Mission, EIR Co. 913-362-0919
 Mass Burlington, R. J. Sickles Assocs. 617-272-7285
 Mich Detroit, Micro Sls. Corp. 313-482-1229
 Minn Minneapolis, K. Meyers Co. 612-920-7080
 Mo Hazelwood, EIR Co. 314-895-4100
 NJ Palasades Park, Scientific Dev. East 201-945-3962

NM Albuquerque, Inter-Mountain Engrg. Co. 505-344-2212
 NY East Syracuse, Ossmann Instrs. 315-437-6666
 NY Rochester, Ossmann Instrs. 716-328-2230
 Ohio Dayton, Micro Sls. Corp. 513-885-4171
 Ohio Medina, Micro Sls. Corp. 216-725-4568
 Ore Lake Oswego, Hudson Assoc. 503-227-4916
 Pa Ambler, W & M Assocs. 215-643-4119
 SC Spartanburg, Beacon Elctns. 803-582-4613
 Tex Houston, Scientific Dev. 713-623-4250
 Tex Richardson, Scientific Dev. 214-231-8106
 Tex San Antonio, Scientific Dev. 512-694-6251
 Va Alexandria, Dyna Rep Co. 703-354-1222
 Wash Bellevue, Hudson Assoc. 206-455-0773
 Wash Seattle, Drake Assoc. 206-763-2755
 FOR: Can., Brampton Ont., Baytronix Ltd. 416-453-1252
 FOR: Can., Montreal, Quebec, Baytronix Ltd. 514-342-4281
 FOR: Can., Ottawa, Ontario, Baytronix Ltd. 613-728-0113
 FOR: Can., Vancouver, B.C., National Electrolab Ltd. 604-879-9161

AILTECH, 19535 E. Walnut Dr., City of Industry, Cal., 91748, Tel: 213-965-4911; Minimum order: \$25

For info on price: B. Philp Ext. 256; Application info: T. D. Eccles Ext. 226; Customer service: B. Philp Ext. 256; Delivery info: B. Philp Ext. 256

Products manufactured: Amplifiers, Analyzers, Gages, Generators, Meters, Oscillators, Preselector-Mixers, Preselectors, Transducers

Local Sales Offices & Reps.

Ala Huntsville, Beacon 205-881-5031
 Ariz Scottsdale, I.M.E.C. 602-947-7379
 Cal City of Industry 213-965-4911
 Cal San Fran., Ailtech 415-321-2533
 Colo Boulder, Herb Bass Assoc. 303-499-7509
 Conn Hamden, Scientific Devices 203-248-9361
 Ga Atlantic, Beacon 404-351-3654
 Ill Chicago, K. W. Meyers 312-774-6440
 Kans Shawnee Mission, E.I.R. Co. 913-362-0919
 Mass Burlington, R. J. Sickles Assoc. 617-272-7285
 NM Albuquerque, I.M.E.C. 505-883-9010
 NY E. Syracuse, Ossmann Instrs. 315-437-6666
 NY Farmingdale, E.I.R. Co. 516-595-7541
 Ohio Centerville, Micro Sales Corp. 513-885-4171
 Pa Ambler, W & M Assoc. 215-643-4119
 Tex Richardson, Scientific Dev. 214-231-8106
 Wash Seattle, R. S. Drake Assoc. 206-763-2755

AIMSCO INC., 2110 W. Ruffnes St., Seattle, Wash., 98199, Tel: 206-284-5563, TWX: 910-444-1333; Empl.: 25; Minimum order: \$10

Customer service: C. Ernst

Free literature available: 832 page fastener guidebook catalog.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Eyelets, Fasteners, Grommets, Handles For Cabinets, Circuit Boards, Racks, etc., Locks, Dial & Shaft

Local Sales Offices & Reps.

Cal Oakland 415-836-2405
 Colo Denver 303-892-6650
 Ore Portland 503-223-4377
 Utah Salt Lake City 801-364-0120
 Wash Seattle 206-284-5563

AIPHONE USA, 2116 N. Pacific Ave., Seattle, Wash., 98103, Tel: 206-634-3040, Telex: 32-0288; Empl.: 6

Products manufactured: Comm. Systems

Local Sales Offices & Reps.

Cal N. Hollywood, Basset & Moore, Inc. 213-877-7129
 Cal Oakland, H. Gabriel Sls. 415-465-5361
 Colo Denver, McCloud & Raymond Co. 303-756-1589
 Fla Maitland, Hutto-Hawkins-Pergov, Inc. 305-831-2474
 Ga Atlanta, H. W. Phillips Co. 404-237-7564
 Ill Chicago, G. Duval Co. 312-774-5115
 Ind Mulberry, Maish Sls. 317-296-2322
 Mass Needham, Piper Assocs. 617-449-1144
 Mich Detroit, Burcaw Co. & Assoc. 313-533-7700
 Minn Minneapolis, J. E. M. Anderson Co. 612-823-6459
 Mo Kansas City, K.S.W. Assocs. 816-358-5240
 NY Flushing, Bettan Sls. 212-591-7600
 NY Liverpool, Lewis-Dunnigan Co. 315-622-2133
 Ohio Columbus, Mandabach & Assocs. 614-235-0265
 Pa Levittown, Sher Sls. Co. 215-946-6200
 Tex Dallas, Miller & Assocs. 214-661-5002
 Wash Seattle, R. Merritt Co. 206-682-7337

AIR-O-TRONICS PRODS., Box K, Morrisville, N.Y., 13408,

Tel: 315-684-3705; Empl.: 10; Minimum order: \$10

Customer service: S. F. Trush

Free literature available: Solid State Timer Catalog & Flexcon Single Contact Flexible Test Connector Flyer

Products manufactured: Connector Adapters, Connectors, Controls/Control Eqpt., Leads, Test & Adaptors, Plug Adapters, Probes, Relays, Socket Adapters, Soldering Accessories, Timers

Local Sales Offices & Reps.

Cal Los Angeles, W. S. Harmon Co. 213-682-5536
 Ill Chicago, Electro-Kinetics

AIR PRODS. & CHEMS., INC., Box 538, Allentown, Pa., 18105, Tel: 215-395-4911, TWX: 510-651-3686; Empl.: 13000

Products manufactured: Chemicals, Coatings, Controls/Control Eqpt., Etchants, Printed Circuit, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Services, Assembly, Production & Test, Torches, Soldering, Welding & Access.

Local Sales Offices & Reps.

Ala Birmingham 205-870-5603
 Ala Dothan 205-794-5422
 Ala Mobile 205-433-6513
 Ala Muscle Shoals 205-381-0542
 Ark Little Rock 501-375-1256
 Cal Long Beach 213-830-5200
 Cal Mountain View 415-961-4560
 Conn Glastonbury 203-633-6485
 Fla Dania 305-920-2085
 Fla Jacksonville 904-786-2662
 Fla Panama City 904-763-1672
 Fla Pensacola 904-432-1406
 Fla Tallahassee 904-222-3015
 Fla Tampa 813-621-2477
 Ga Albany 912-432-0538
 Ga Chamblee 404-451-2712
 Ga Columbus 404-323-1349
 Ill Granite City 618-452-8100
 Ill Hillside 312-449-5850
 Ind Shelbyville 317-392-1731
 Ind South Bend 219-288-4941
 Iowa Cedar Rapids 319-366-7371
 Iowa Des Moines 515-243-8131
 Iowa Fort Dodge 515-576-7159
 Iowa Sioux City 712-252-4466
 Ky Louisville 502-451-6340
 Ky Paducah 502-443-4589
 La New Orleans 504-254-1590
 Md Baltimore 301-477-2882
 Md Hyattsville 301-864-2345
 Md Salisbury 301-742-3800
 Mass Framingham 617-879-4810
 Mich Detroit 313-893-7420
 Minn Shakopee 612-445-4610
 Miss Clarksdale 601-624-2547
 Miss Greenwood 601-453-5421
 Miss Jackson 301-366-1433
 Miss Tupelo 601-842-5138
 Mo Kansas City 816-421-5495
 Mo St. Louis

Neb Grand Island 308-382-1695
 Neb Lincoln 402-464-3191
 Neb Omaha 402-341-5500
 NJ Camden 609-365-4500
 NJ Iselin 201-548-4600
 NJ Menlo Park 201-548-4600
 NY Rochester 716-436-7780
 NC Asheville 704-254-0958
 NC Charlotte 704-523-9421
 NC Greensboro 919-299-1361
 NC Raleigh 919-828-4462
 Ohio Cleveland 216-781-2800
 Ohio Middletown 513-424-1281
 Okla Oklahoma City 405-232-3456
 Okla Tulsa 918-627-2266
 Pa Creighton 412-226-1511
 Pa Hometown 717-467-2981
 Pa York 717-848-1407
 SD Rapid City 605-342-4490
 Tenn Chattanooga 615-265-1019
 Tenn Kingsport 615-247-7193
 Tenn Knoxville 615-522-5153
 Tenn Memphis 901-947-1141
 Tex Arlington 817-265-5185
 Tex Houston 713-869-7507
 Va Hampton 804-826-5430
 Va Richmond 804-358-4913
 Va Roanoke 703-343-3683
 WVa Parkersburg 304-485-1691
 Wisc Milwaukee 414-494-8785

AIR QUIP-ROBLEYCO, Box 1118, Richardson, Tex., 75080, Tel: 214-234-3285; FSC No: 53507; Empl.: 7

For info on price: D. Roberts; Application info: F. Roberts; Customer service: B. Wessley; Delivery info: D. Roberts

Free literature available: Technical data sheet showing styles, sizes, colors, tolerances and dimensional outline drawings. Sample kit available on request.

Products manufactured: Pullers

Local Sales Offices & Reps.

Ariz Phoenix, Arrowhead Sales Co. 602-277-7148
 Cal Hawthorne, Emperor Sales 213-679-4080
 Cal Woodland Hills, Cal-Ward Sales 213-883-2202
 Colo Arvada, Arrowhead Sales 303-423-1056
 Fla Tampa, S. K. Wallace Assoc. 813-961-1537
 Ga Jonesboro, S. K. Wallace Assoc. 404-471-6297
 Ill Elk Grove Village, Midwest Meridan Corp. 312-437-6531
 Iowa Cedar Rapids, Midwest Meridan Corp. 319-365-6561
 Mass Wellesley, R. P. Mahan Co. 617-237-1040
 Mich Grand Rapids, Midwest Meridan Corp. 616-949-7798
 Mo St. Louis, Midwest Meridan Corp. 314-878-4441
 NJ Redbank, H.J. Sundermeyer 201-842-0726
 NC Greensboro, S. K. Wallace Assoc. 909-292-0487
 Ohio Dayton, Midwest Meridan Corp. 513-276-4137
 Tenn Memphis, S. K. Wallace Assoc. 901-682-2281
 Tex Richardson, Robleyco 214-234-3285
 FOR: Can., Toronto, Ont., J-Tronics 416-429-6324

AIR-VAC ENGRG. CO., 100 Gulf St., Milford, Conn., 06460, Tel: 203-874-2541; Empl.: 30; Minimum order: \$10

For info on price: M. Sullivan; Application info: L. Vacca; Customer service: C. Lasto; Delivery info: M. Sullivan

Free literature available: Vacuum Handling of small parts; vacuum removal and reflow removal of multi-lead components from P.C.B.; Air operated vacuum pumps capable of 29.7" Hg.

Products manufactured: Pumps, Vacuum, Soldering Accessories, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools, Tools, Tweezers, Hand & Vacuum

Local Sales Offices & Reps.

Cal Alameda, WILNAT Co. 415-483-9629
 Cal Northridge, P. Dooley Co. 213-360-2231
 Conn Guilford, The Ober Co. 203-453-4361
 Fla Miami, Ludlum Assocs. 305-885-2514
 Ga Roswell, Electro Rep Assocs. 404-993-1332
 Ill Downers Grove, The Tipler Corp. 312-969-4343
 Mich Detroit, E & E Engrg., Inc.
 Minn Minneapolis, Air Engrg. & Supply
 Mo Kansas City, Burke Sls. Co. 816-842-5551
 NH Spofford, Bahr Sls. Co. 603-352-5444
 NJ Hohokus, D.J. Fisher Co. Inc. 201-652-0090
 NM Albuquerque, TOLTEC Corp. 505-268-4366
 NY Syracuse, Mr. J. V. Costello 315-472-0322
 NC Charlotte, Electro Rep Assocs. 704-527-2530
 Ohio Medina, McShane 216-725-4568
 Tex Dallas, PESO 214-369-3181

Wash Seattle, Vandy206-789-3300
 Wisc Brookfield, D. R. Manecke Co.414-782-2525
 EXP: Hallandale, Florida, EMEC, Inc.305-925-6366
 FOR: Can., Toronto, Ontario, Willer Engrg. Ltd.
 416-783-3373

AIRBORN, INC., 4321 Airborn Dr., Addison, Tex., 75001,
 Tel: 214-233-2000; FSC No: 10400; QPL No: Multiple;
 Empl: 150; Minimum order: \$15p. 2-452-455

For info on price: Order Desk; Application info: Appl.
 Desk; Customer service: Order Desk; Delivery info:
 Order Desk

Products manufactured: Connectors, Contacts,
 Electrical

Local Sales Offices & Reps.

Cal Los Angeles, Air Born213-670-7983
 Cal Sunnyvale, Cutlass Elctns. N.408-733-5885
 Fla Satellite Beach, Reynolds & Assoc.
 305-773-4700
 Ga Atlanta, Reynolds & Assocs.404-252-5360
 NJ Denville, Grimm, Siegel Assocs., Inc.
 201-625-1900
 NY E. Northport, Airborn516-757-6534
 NC Charlotte, Reynolds & Assocs.704-527-2536
 Wash Bellevue, B. Waddell206-822-0211

AIR BORNE CONTROLS, 9939 Glenoaks Blvd., Sun
 Valley, Cal, 91352

AIRCO INDUSTRIAL GASES, 575 Mountain Ave., Murray
 Hill, N.J., 07974, Tel: 201-464-8100, TWX: 710-984-7992

Products manufactured: Analyzers,
 Controls/Control Eqpt., Gages

Local Sales Offices & Reps.

Ariz Phoenix602-273-1255
 Cal City of Industry213-338-5566
 Cal San Leandro415-483-8560
 Conn New Haven203-777-4436
 Ga Atlanta404-351-2850
 Ill Broadview312-681-8950
 Ill East Alton618-462-6857
 Kans Lawrence913-843-1404
 La Metairie504-887-8596
 Mass South Acton617-263-7767
 Mich Southfield313-355-9494
 Mich Southfield313-355-9494
 Minn St. Paul612-645-6431
 NY Albany518-489-3719
 NY Buffalo716-852-4702
 Ohio Cleveland216-842-9330
 Pa King of Prussia215-265-3900
 Pa Pittsburgh412-562-3700
 Wash Seattle206-762-7251
 Wash Vancouver206-695-1255

AIRCO ELCTRNS., Resistor Plant, Bolivar Rd., Box 547,
 Bradford, Pa., 16701, Tel: 814-362-5536, TWX:
 510-695-5921; Empl: 1000p. 2-368,369,1408,1409
 Customer service: R. Butler

Products manufactured: Capacitors, Fixed, Coils
 Including Assemblies & Forms, Resistors

Local Sales Offices & Reps.

Ala Huntsville, CSC205-883-7794
 Ariz Scottsdale, Mercury Eng. Sales602-945-1927
 Cal El Segundo, Varigon313-644-3611
 Cal Santa Ana, Dave Tevis Elctns.714-558-0268
 Cal Sunnyvale, Quad Rep408-733-7300
 Colo Boulder, R. G. Enterprises303-447-9211
 Conn Newton, Gerber Sls.203-426-3440
 Fla Terra Ceia, CSC813-360-7460
 Ill Chicago, C. L. Greenslade Sls.312-561-0156
 Ind Ft. Wayne, J. Kilfoil Co.219-749-0113
 Kans Shawnee Mission, Mid-America Electronics
 Mkt.913-236-4800
 Mass Waltham, Gerber Sales617-890-8040
 Mich Troy, C. B. Jensen & Assoc.313-643-0506
 Minn Hopkins, Grayden & Flemmer612-941-1120
 NM Albuquerque, A. Q. Electronics505-255-8701
 NY Fayetteville, R. W. Jackson Co.315-637-3851
 NY Floral Park, MOS Assocs.516-694-5923
 NC Sanford, CSC919-832-1897
 Ohio Cincinnati, J. Kilfoil Co.513-791-6150
 Ohio Cleveland, Perry Lohse & Co.216-381-4424
 Okla Tulsa, Vista Assoc.918-627-7557
 Pa Fairview Village, R. Hilderbrand215-247-6225
 Tex Richardson, Vista Assoc.214-235-4547
 Wash Seattle, H. S. Thorpe Co.206-784-3333

AIRCO ELCTRNS., Div. Airco, Inc., Grand Plaza, 945
 Grand Ave., Nogales, Ariz., 85621, Tel: 602-287-5851,
 TWX: 910-973-9794; Empl: 1000

p. 2-368,369,1408,1409

Products manufactured: Chokes, Coils Including
 Assemblies & Forms

Refer to Airco Elctrns., Bradford, Pa. for Sales
 Office information.

AIRCO ELCTRNS., Special Comps. Oper., Packard Rd.
 at 47th, Niagara Falls, N.Y., 14302, Tel: 716-285-6971,
 TWX: 710-524-1653; Empl: 1000

p. 2-368,369,1408,1409

Customer service: E. Westgren

Products manufactured: Networks, Resistors

Refer to Airco Elctrns., Bradford, Pa. for Sales
 Office Information.

AIRCOM, INC., Rte. 16B, Union, N.H., 03887, Tel:
 603-473-2323; Empl: 10

Free literature available: Catalog E Shows our
 complete line of catalog passive waveguide
 components covering the frequency range from
 1-90 GHz.

Products manufactured: Adapters, Waveguide,
 Antennas, Attenuators, Bends & Twists,
 Microwave, Cavities, Microwave, Couplers, Delay
 Lines, Detectors, Dividers, Dummy Loads, Filters,
 Generators, Horns, Microwave, Impedance
 Converters, Microwave, Junctions, Hybrid,
 Microwave, Line Stretchers, Microwave,
 Mismatches, Microwave, Precision, Mixers,
 Mounts, Oscillators, Probes, Shifters, Sliding
 Loads, Microwave, Slotted Lines, Microwave,
 Switches, Tees, Terminals, Transmitters, Tuners,
 Waveguides & Adapters

AIRCRAFT & ELEX SPCLTYS, Box 126, Plainfield, Ind,
 46168, Tel: 317-839-2551; FSC No: 00529; Empl: 150;
 Minimum order: \$15

For info on price: C. W. Martin; Application info: C.
 Selby; Customer service: C. R. Johnson; Delivery info:
 C. R. Johnson

Products manufactured: Braid, Cable, Cable
 Assemblies & Harnesses, Cable, Lead Assemblies
 & Receptacles, Wire, Wire Shielding

AIRCRAFT APPLIANCES EQPT, 152 E. Dr., Brmalea, Ont,
 Can., Tel: 416-459-0920, TWX: 610-492-4396; Empl: 250
 Customer service: A. R. Doe Ext 234

Products manufactured: Alternators, Generators,
 Motors, Tachometers

AIRFLYTE ELCTRNS. CO., Box 207, Bayonne, N.J.,
 07002, Tel: 201-436-2230, TWX: 710-729-4489; Empl:
 60; Minimum order: \$25p. 1-932,933

For info on price: J. Piret; Application info: J. Piret;
 Customer service: D. O'Brien; Delivery info: D.
 O'Brien

Products manufactured: Brushes & Brush
 Assemblies, Commutators, Contact Strips, Finger,
 Contacts, Electrical, Counters, Encoders,
 Generators, Indicators, Services, Assembly,
 Production & Test, Slip-Rings & Assemblies,
 Switches, Terminal Blocks, Boards & Strips,
 Timers

Local Sales Offices & Reps.

Ariz Phoenix, N. G. Ganem Co.602-945-0839
 Cal Pasadena, RDX Corp.213-681-3451
 Cal Sunnyvale, RDX Corp.408-734-4500
 Conn No. Haven, Kitchen & Kutchin203-239-0212
 Fla Miami Bch., Geartner Assocs.305-861-3661
 Fla Orlando, Geartner Assocs.305-299-1000
 Ill Park Ridge, RF Specialists312-698-2044
 Ind Ft. Wayne, R. F. Specialists219-485-8982
 Kans Prairie Village, R. G. Sls.913-381-8812
 Md Baltimore, R. P. Luce & Co.301-752-8200
 Mass Lexington, Kitchen & Kutchin617-862-8230
 NJ Clifton, Avionics Equip., Inc.201-772-1955
 NY Rochester, R. P. Kennedy Co.716-271-6322
 Pa Philadelphia, R. P. Luce & Co.215-884-8365
 Tex Dallas, Jacobson Co.214-363-7584
 FOR: Can., Rexdale, Ont., F. Eakin Ltd.416-638-0451

AIRMATIC/BECKETT-HARCUM, 185 Park Dr.,
 Wilmington, Ohio, 45177, Tel: 513-382-1691; Empl: 89;
 Minimum order: \$20

Customer service: N. E. Holder

Products manufactured: Air Cleaners & Filters
 (Shielded & Unshielded), Controls/Control Eqpt.,
 Couplings, Drills & Accessories, Hand & Power,
 Gages, Switches, Tubing, Valves, Solenoid

AIRPAX ELCTRNS., INC., Cambridge Div., Woods Rd.,
 Cambridge, Md., 21613, Tel: 301-228-4600, TWX:
 710-865-9655; Empl: 550

For info on price: Sales Off; Application info: Sales
 Off; Customer service: L. Slaughter

Products manufactured: Choppers, Circuit Breakers,
 Limiters, Protectors, Seals, Switches

Local Sales Offices & Reps.

Ariz Phoenix, Gramer & Company602-279-1231
 Cal Mt. View, Airpax Elctns., Inc.415-965-0355
 Cal Pico Rivero, Westrep213-949-2551
 Fla Fern Park, M. G. Assoc.305-841-8793
 Ind Indianapolis, A. D. Moore Co.317-291-6550
 Iowa Cedar Rapids, Reid Assocs., Inc.319-362-6302
 La Bossier City, Deeco Controls318-746-2141
 Md Silver Spring, Rep-Tron Inc.301-593-4844
 Mass Wellesley Hills, Airpax Elctns., Inc.
 617-237-2600
 Mich Southfield, Automatic Controls313-354-1190
 Minn Hopkins, Fred Peterson Co.612-941-5400
 Mo St. Louis, Harris-Hanson Co.314-432-3611
 NY Great Neck, J. Di Blasi Assocs., Inc.
 516-482-4040
 NY Syracuse, C.W. Floring315-478-2149
 NC Winston-Salem, L.G. White919-725-3612
 Ohio Cleveland, Baehr, Greenleaf & Assoc.
 216-221-9030
 Ohio Dayton, C.P. Haskell513-298-3331
 Okla Tulsa, T.J. Ray Co.918-627-1515
 Pa Pittsburgh, Friday Engrg. Sls.412-341-1444
 Tex Dallas, Stevens Sls.214-350-2476
 Tex Houston, Haltom Co.713-782-5625
 Tex Odessa, Barnco Co.915-332-0293
 Wash Seattle, Don Smith Sls.206-633-3160
 Wisc Wauwatosa, Larsen Assocs.414-258-0529
 FOR: Can., Port Credit, Ont., Leonard Elec., Ltd.
 416-274-3454

AIRPAX ELCTRNS., Controls Div., 6801 W. Sunrise Blvd.,
 Ft. Lauderdale, Fla., 33313, Tel: 305-587-1100, TWX:
 510-955-9866; Empl: 200; Minimum order: \$25

For info on price: R. Knabe; Application info: R.
 Knabe; Customer service: M. Morgan; Delivery info:
 M. Morgan

Free literature available: General Catalog 0200,
 Meter Catalog 0200G

Products manufactured: Amplifiers, Converters,
 Counters, Indicators, Meters, Probes, Relays,
 Switches, Tachometers, Transducers

Local Sales Offices & Reps.

Cal Mountain View, Airpax Elctns.415-965-0355
 Cal Santa Fe Springs, Sls. Engrs. Ltd.714-521-8673
 Colo Littleton, Aztec Entprs.303-795-0250
 Fla Fern Park, M. G. Assocs.305-841-8793
 Ill Chicago, K-W Assoc.312-792-2618
 Ill Downers Grove, Richmar Elctns.312-968-0118
 Ind Indianapolis, Electro Engrg. & Sls.
 317-547-5273
 Iowa Cedar Rapids, Reid Assoc.319-362-6302
 La Baton Rouge, Process Specialty Co.
 504-937-0644
 La Bossier City, Deeco Co.318-742-0856
 Md Phoenix, Rebco Sls301-592-8907
 Mass Wellesley Hills, Airpax Elctns.617-237-2600
 Mich Southfield, Automatic Controls Co.
 313-354-1190
 Minn Minneapolis, E.J. Doyle Co.612-827-5847
 Mo Kansas City, Harris-Hanson Co.816-444-9494
 Mo St. Louis, Harris-Hanson Co.314-432-3611
 NJ Wallington, Comp-Tech Sales201-935-5454
 NM Albuquerque, Aztec Entprs.505-255-2440
 NY Buffalo, R.M. Newell Co.716-632-0662
 NY Great Neck, J. DiBlasi Assocs.516-482-4040
 NY New Hyde Park, Comp-Tech Sls.516-593-2628
 NY Syracuse, C.W. Floring & Assoc.315-478-2149
 NC Charlotte, MacGuire & Crawford Instr. Co.
 704-366-3454
 Ohio Cincinnati, J.W. Murray & Assoc.513-662-1616
 Ohio Medina, T-M-T Ind'l Controls216-725-7989
 Okla Tulsa, Lucas Controls918-749-6491
 Pa Harleysville, T. Jackson & Assocs.
 215-643-5560
 Pa Pittsburgh, Friday Engrg. Sls.412-341-1444
 Tenn Hixson, G. Grant Co.615-875-4633
 Tenn Memphis, Engineered Instrs.901-743-3402
 Tex Dallas, Stevens Sls.214-350-2476
 Tex Houston, Haltom Co.713-782-5625
 Tex Odessa, Barnco, Inc.915-332-0293
 Va Roanoke, Process Specialties703-345-5683
 Va Rockville, Virginia Meter & Controls Co.
 804-285-4228
 Wash Bellevue, Southwell Controls Ltd.206-454-1140
 Wisc Wauwatosa, Larsen Assocs.414-258-0529

AIRPOT CORP., 27 Lois St., Norwalk, Conn., 06851, Tel:
 203-846-2021; Minimum order: \$10

For info on price: M.E. Barrelle; Application info: L.
 Wilcox; Customer service: M. Gaberman; Delivery
 info: M.E. Barrelle

Free literature available: Bulletins showing applications and performance characteristics as well as selection guide for ordering.

Products manufactured: Dampers, Servo, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Mounts, Shafts & Adapters

AIRTROL CORP., 203 W. Hawick St., Rockton, Ill., 61072, Tel: 815-624-8051; Empl.: 30

For info on price: N. K. Anderson; Application info: N. K. Anderson; Customer service: N. K. Anderson; Delivery info: G. Bauer

Free literature available: General Product Brochure spec sheets on individual product lines subfractional shaded pole motors-booster duct fans blazer and zephyr fans.

Products manufactured: Blowers & Fans & Accessories, Motors

Local Sales Offices & Reps.

Ariz	Phoenix, RDX Corp.	602-267-8162
Cal	Los Angeles, R. Meussdorffer & Assocs.	213-788-0771
Cal	San Diego, J. C. Henberger Co.	714-223-7114
Cal	San Francisco, RDX Corp.	408-734-4500
Conn	SIR Assocs.	203-268-2560
Fla	Orlando, J. K. Kessler & Assocs.	305-323-9282
Fla	Tampa, J. K. Kessler & Assocs.	813-248-5078
Ill	Chicago, Momak Sls.	312-654-4524
Md	Baltimore, Naudain Assocs.	301-442-2270
Mass	Boston, SIR Assocs.	617-861-9646
Mich	Detroit, C. W. Anderson Assocs.	313-642-1250
Minn	Minneapolis, G. E. Arneson & Co.	612-835-2177
NJ	Camden, Naudain Assocs.	609-235-1801
NJ	Newark, P. H. Werner	201-376-9440
NY	Buffalo, E. E. Harries & Co.	716-671-6365
NY	New York, P. H. Werner	201-376-9440
NY	Syracuse, E. E. Harries & Co.	315-637-9871
Ohio	Dayton, Dynel Co.	513-434-6467
Pa	Philadelphia, Naudain Assocs.	609-235-1801
Tex	Dallas, J. B. Guenther	214-691-8500
Tex	Houston, J. B. Guenther	713-468-0232
Wash	Seattle, D. C. Grover & Assocs.	206-588-1310
Wisc	Milwaukee, B. Colman Co.	414-464-5900

AIRTRON, Div. Litton Inds., 200 E. Hanover Ave., Morris Plains, N.J., 07950, Tel: 201-539-5500, TWX: 710-986-7473; FSC No: 80006; Empl.: 350; Minimum order: \$35

For info on price: M. Grosso; Application info: E. Strong; Customer service: N. T. Trojanowski

Products manufactured: Amplifiers, Antenna Feed Systems, Antennas, Attenuators, Chokes, Circulators, Ferrite Couplers, Crystals, Detectors, Dividers, Dummy Loads, Filters, Flanges, Waveguide, Gaskets, Shielding, R-F-Also See Shields, R-F, Isolators, Junctions, Hybrid, Microwave, Limiters, Mixer-Preamplifiers, Microwave, Mixers, Modulators, All Kinds, Oscillators, Shifters, Shutters, Microwave, Strip-Line Components, Microwave, Switches, Tees, Terminals, Tubing, Tuners, Waveguides & Adapters

Local Sales Offices & Reps.

Ariz	Scottsdale, Carter Assocs.	602-947-4355
Cal	Canoga Park, Microwave Tech. Sls.	13-340-0542
Cal	Redwood City, Parks & Pruitt Assoc.	415-364-1640
DC	Wash D.C., T. Britt Assoc.	202-628-0707
Fla	Pompano Beach, Precision Mktg.	305-971-8270
Kans	Olathe, Bob Rush Assocs.	913-782-1177
Md	Baltimore, Frank Dickson-Airtron	301-823-0923
Mass	Lexington, Zieco, Inc.	617-681-8300
NJ	Cherry Hill, H. J. White Co.	609-428-4544
NJ	Fort Lee, Tech. Mktg.	
NY	Liverpool, R & D Assocs.	513-622-2350
Ohio	Dayton, A. Grimm	513-299-8461
Tex	Richardson, Texport Elctns.	214-690-4004
Wash	Seattle, D. Smith Sls. Co.	206-633-3160

AITKEN COMMUNICATIONS INC., 701 S 10th St., Taft, Cal, 93268, Tel: 805-765-5403; Empl.: 4
Customer service: K. Aitken

Free literature available: Descriptions of and pictures of the two main products - Broadcast Automation and an Oilfield Control Unit.

Products manufactured: Controls/Control Eqpt.

AJAX MAGNETHERMIC CORP., 1745 Overland Ave., N.E., Warren, Ohio, 44482, Tel: 216-372-2529; Empl.: 450

For info on price: J. K. McLaughlin; Application info: R. Hoek; Customer service: L. Jones; Delivery info: L. Hielman

Products manufactured: Converters, Furnaces, Generators, Heaters & Heating Elements, Motor Electric Generator Sets, Multipliers

AKG DIV., North American Philips Corp., 100 E. 42nd St., New York, N.Y., 10017; Empl.: 20

For info on price: S. R. Ravich 212-697-3600 Ext. 349; Application info: G. Langoon 212-697-3600 Ext. 595; Customer service: W. Kroesen 212-392-0100; Delivery info: L. Kinigson 212-697-3600 Ext. 410

Products manufactured: Handsets, Chestsets, Headphones, Headsets, Etc., Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds, Transducers

Local Sales Offices & Reps.

Cal	Culver City, Marshank Sls. Co.	213-559-2591
Cal	Walnut Creek, MacPherson Sls. Co.	415-937-1482
Cal	Denver, B & B Elctn. Prods.	303-934-2123
Conn	Stamford, J. B. Anthony Co.	203-585-2027
Fla	Miami, World Wide Prods.	305-754-5475
Ga	Atlanta, Fidelicom Inc.	404-458-3616
Ill	Chicago, T. Pappas & Assocs.	312-685-2338
Iowa	Des Moines, B.E.A.M.S. Inc.	515-282-0292
Md	Silver Spring, Taub Sls. Inc.	301-622-0300
Mass	Natick, VF Sales Inc.	617-237-6544
Mich	Ferndale, Shalco Inc.	313-547-4771
Minn	Minneapolis, T. B. Allen & Assocs.	612-926-7658

NY	Syracuse, Paston-Hunter Co.	315-437-2992
Ohio	Cleveland, J. B. Parent Co.	216-333-9955
Tex	Houston, Wyborny Sls. Co.	713-772-0961
Wash	Seattle, Earl & Brown Co.	206-284-1121

AKRO-MILS, INC., Box 989, Akron, Ohio, 44309, Tel: 216-253-5593; Minimum order: \$25

Customer service: D. Martin

Free literature available: Catalog 7-1 Akro-Mils modular storage cabinets. Describes 10 different drawer sizes available in modular cabinets ranging from 1-1/4"x2-3/4"x5-7/8" up to 16-3/4"x3"x11".

Products manufactured: Bins, Part Storage, Cabinets & Accessories, Containers

AKRON PORCELAIN CO., 2719 Cory Ave., Akron, Ohio, 44314, Tel: 216-745-2159; Empl.: 130
Customer service: R. G. McCann

Free literature available: 1. "Electrical Porcelain" 2. Plastic "Sheet" showing custom molded parts.

Products manufactured: Services, Assembly, Production & Test

ALADDIN ELCTRS., 701 Murfreesboro Rd., Nashville, Tenn., 37210, Tel: 615-748-3335; Empl.: 250; Minimum order: \$110 p. 2-1727-1730

For info on price: M. Elliott; Application info: J. Marshall; Customer service: M. Elliott; Delivery info: M. Elliott

Products manufactured: Chokes, Coils Including Assemblies & Forms, Delay Lines, Filters, Transformers

Local Sales Offices & Reps.

Cal	Los Altos, Ewing-Foley	415-941-4525
Cal	So. Pasadena, Aladdin Elctns.	213-799-7714
Cal	Denver, E. W. Johnson Co.	303-985-4810
Fla	Winter Park, Young & Lawrence Assoc.	305-647-6929
Ill	Chicago, Electro-Comp. Sales	312-763-3636
Ind	Indianapolis, Schroeder & Loomis	317-251-4571
Iowa	Cedar Rapids, Seltco Sales Corp.	319-362-8155
Md	Timonium, Barnhill & Assoc.	301-252-6350
Mass	Needham, Deever Sls. Engrg.	617-444-4200
Mich	Southfield, Luebbe Sls. Co.	513-357-0355
Minn	Minneapolis, F. B. Hill	612-941-5270
Mo	Kansas City, Automatic General Sls.	816-333-8206
NY	Rochester, R.P. Kennedy Co.	716-271-6322
NC	Raleigh, Barnhill & Assoc.	919-876-7825
Ohio	Cincinnati, Luebbe Sls. Co.	513-871-4211
Ohio	Cleveland, Luebbe Sls. Co.	216-333-0425
Pa	Delmont, Luebbe Sls. Co.	412-468-4019
Tex	Dallas, G. Weinreich & Assoc.	214-321-2800
Va	Lynchburg, Barnhill & Assoc.	703-246-4624

ALAN INDUSTRIES INC., PO Box 1203, Columbus, Ind., 47201, Tel: 812-372-8869; FSC No: 52750; Empl.: 15; Minimum order: \$10

For info on price: W. Kennedy; Application info: F. Walker; Customer service: F. Walker; Delivery info: W. Kennedy

Products manufactured: Attenuators, Detectors, Dividers, Dummy Loads, Switches, Terminals

Local Sales Offices & Reps.

Ariz	Tempe, Gassner & Clark	602-968-9037
Cal	Los Altos, Stout-Loeswick, Inc.	415-948-3265
Cal	Santa Ana, California Electronic Mktg.	714-835-2702
Cal	Woodland Hills, California Electronic Mktg.	213-884-7867
Fla	Clearwater, Saber Assocs.	813-441-1301
Fla	Lighthouse Point, Saber Assocs.	305-943-3076
Fla	Longwood, Saber Assocs.	305-241-3351
Ga	Woodstock, Saber Assocs.	404-432-9825
Ill	Chicago, K. W. Meyers Co.	312-774-6440
Ind	Indianapolis, K. W. Meyers Co.	317-243-6681
Md	Bethesda, S & S Assocs.	301-654-1434
Mass	Waltham, Scientific Devices-New England	617-894-5637
Minn	Minneapolis, K. W. Meyers co.	612-920-7080
NY	Tuckahoe, Asco Elctns.	914-779-8110
Pa	King of Prussia, S & S Assocs.	215-265-3450
FOR:	Can., Don Mills, Ont., Tech Assocs.	416-445-7490

ALAU ENGRG., 515 South Palm, Alhambra, Cal, 91803, Tel: 213-289-2172; Minimum order: \$25

Customer service: A. Braun

Products manufactured: CATV Systems & Equipment, Comm. Systems, Connector Adapters, Switches

ALBEROX CORP., New Bedford Ind'l Pk., New Bedford, Mass., 02745, Tel: 617-995-1725; Empl.: 80; Minimum order: \$50 p. 2-4566

For info on price: H. Mathieu; Application info: A. J. Coutu; Customer service: H. Mathieu; Delivery info: H. Mathieu

Free literature available: Alberox High Voltage Terminal Bushings and Custom Ceramic-to-Metal Seals. Catalog 472.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Connectors, Feedthrus & Seals, Environmental, Headers, Insulators & Insulation, Seals, Services, Assembly, Production & Test, Terminals

Local Sales Offices & Reps.

Cal	Santa Cruz, K. Lloyd	408-426-3424
Fla	Orlando, Buchanan & Abrams Assoc.	305-898-7444
Ill	Chicago, Weldin Sls. Co.	312-267-4944
Ind	Indianapolis, J. C. Butler	317-253-5143
Mass	Weston, J. Goode Assocs.	617-235-3900
NJ	Haddonfield, Keefe Elctn. Sls. Co.	609-429-4650
NY	Pompey, S. F. Foster Co.	315-677-3333
NY	Valley Stream, Levison Sls. Co.	516-561-9696

ALCO ELECTRONIC PRODS., INC., 1551 Osgood St., North Andover, Mass., 01845, Tel: 617-685-4371, TWX: 710-342-0552; Empl.: 60

p. 1-1926,1927; p. 2-1076-1078
For info on price: L. Fontaine 688-0126; Application info: T. J. Clark 685-4371; Customer service: G. Sweeney 685-4371; Delivery info: G. Sweeney 685-4371

Free literature available: Alco will supply upon request catalogs or data sheets of any products shown in EEM. All literature is self-descriptive.

Products manufactured: Caps, Lenses, Indicator Light, Controls/Control Eqpt., Counters, Display Devices/Displays, Drivers & Decoders For Readouts, Indicators, Keyboards, Alphanumeric & Decimal, Knobs, Lamps, Lights, Meters, Monitors, Power Supplies, Probes, Relays, Sockets, Switch Mounting Plates, Switches, Terminal Blocks, Boards & Strips, Testers

Local Sales Offices & Reps.

Ariz	Phoenix, W. Bert Knight Co.	602-242-3057
Ark	Little Rock, J.Y. Schoonmaker Co.	501-375-2168
Cal	Daly City, R. Del. Bucchia & Assocs.	415-756-1664
Cal	Newport Beach, W. Bert Knight, Inc.	714-833-8250
Cal	San Diego, Camel Elctns. Inc.	303-757-6191
Conn	Newton, Gerber Sls. Corp.	203-428-3440
Fla	No. Miami Beach, Irby & Connolly, Inc.	305-949-5197
Fla	Orlando, Irby & Connolly, Inc.	305-894-8471
Ill	Glen Ellyn, Rockford Controls Co.	312-469-6016
Ind	Greenwood, Valentino-Schillinger E. Assoc.	317-888-2260
Ind	South Bend, Valentino-Schillinger E. Assoc.	219-219-6258
Iowa	Marion, Thomas & Modrcin Assoc.	319-377-6261

Kans Shawnee Mission, Thomas & Modrcin Assoc. 913-432-2131
Md Towson, Habco Elctns. 301-825-9637
Mass E. Longmeadow, Gerber Sls. Corp. 413-525-3059
Mass Waltham, Gerber Sls. Corp. 617-890-8040
Mich Southfield, Champagne Sls. Co. 313-354-0270
Minn St. Paul, Countryman Assocs. 612-645-9151
Mo Hazelwood, Thomas & Modrcin Assoc. 314-895-4700
NJ Keasbey, Addem II 516-567-5900
NY Dewitt, Tri-Tech Elctns. 315-446-2881
NY E. Rochester, Tri-Tech Elctns. 716-381-2722
NY Huntington Station, Addem I 516-567-5900
NY Larchmont, Tri-Tech Elctns. 914-834-4423
Ohio Cincinnati, Luebbe Sales Co. 513-871-4211
Ohio Cleveland, Luebbe Sales Co. 216-333-0425
Ohio Dayton, Luebbe Sales Co. 513-294-0426
Okla Tulsa, J.Y. Schoonmaker Co. 918-936-1423
Pa Feasterville, PSA Inc. 215-355-6244
Pa Pittsburgh, Trymax Co. 412-823-8400
Tex Dallas, J.Y. Schoonmaker Co. 214-357-8481
Tex Houston, J.Y. Schoonmaker Co. 713-926-9510
Utah Salt Lake City, Camel Elctns. Inc. 801-355-6181
Va Lynchburg, Habco Elctns. 804-384-5236
Wash Seattle, D. Smith Sls. Co. 206-633-3160
FOR: Can., Montreal, Que., Canadian Gen. Elec. 514-733-9911
FOR: Can., Toronto, Ont., Canadian Gen. Elec. 416-537-4481

Local Distributors
Ala Huntsville, Mock Elctns., 2310 Memorial Pky. S. 205-539-2401
Cal Burbank, Woods Co., 2012 Burbank Blvd. 213-849-3211
Cal Hayward, Dunlap Elctns., Box 3607 415-783-9260
Cal Inglewood, Cal. Switch & Signal, 1009 Arbor Vitae 213-776-3550
Cal Los Angeles, Cal. Elctns. Supp., 1911 Armacost W. 213-477-8561
Cal Los Angeles, Elec. Switch, 2478 Fletcher Dr. 213-664-1141
Cal Mountain View, Abacus Elctns. Co., 1065 Terra Bella Ave. 415-961-1500
Cal Oakland, Brill Elctns., 610 E. 10th St. 415-834-5888
Cal Palo Alto, Zack Elctns., 654 High St. 415-326-5432
Cal Riverside, Elctn. Supp., 2846 Third 714-787-9220
Cal Sunnyvale, Acacia Sls., 384 San Alejo 408-735-0100
Cal Sunnyvale, Cramer/San Francisco, 720 Palomar Ave. 408-739-3011
Fla Miami, Elctn. Equip., 2701 N.W. 42nd Ave. 305-871-3500
Fla Tampa, Lykes Elctn., 5426 W. Crenshaw 813-229-1885
Ill Chicago, Newark Elctns., 500 N. Pulaski Rd. 312-638-4411
Ill Rosemont, Advent Elctns., 7110 N. Lyndon Ave. 312-298-4210
Kans Wichita, Interstate Elctns., 1330 E. First St. 316-264-6317
Md Gaithersburg, Pioneer Washington, 9100 Gaither Rd. 301-948-0710
Mass Bellingham, Dowiak Assocs., 356 Hartford Ave. 617-966-0404
Mass Burlington, Wilshire Elctns. N/E, One Wilshire Rd. 617-272-8200
Mass Framingham, Future Elctns., 225 Worcester Rd. 617-879-0860
Mass Lynn, Land Elctns., 9 Rear Franklin St. 617-592-2220
Mass Newton, Cramer Elctns., 85 Wells Ave. 617-969-7700
Mich Ann Arbor, Advent, 254 S. Wagner Rd. 313-769-8650
Mich Farmington, Harvey/Michigan, 23461 Ind'l. Pk. Dr. 313-477-1650
Minn St. Paul, Ragon, 1136 W. Larpenteur St. 612-488-0201
Mo St. Louis, Olive Elctn. Supp., 6662 Olive Blvd. 314-863-7800
NJ Haddonfield, Mid Atlantic Elctns., 140 Haddon Ave. 609-428-8288
NY Binghamton, Harvey/Federal Elctns., Vestal Pky. 607-748-8211
NY Buffalo, Summit Dist., 916 Main St. 716-884-3450
NY Farmingdale, Arrow Elctns., 900 Broad Hollow Rd. 516-694-6800
NY Hempstead, Elctn. Equip., 741 Peninsula Blvd. 516-538-5510
NY Lynbrook, Peerless Radio, 19 Wilbur St. 516-593-2121

Ohio Columbus, Hughes-Peters, 481 E. 11th Ave. 614-294-5351
Ohio Dayton, Stotts-Friedman Co., 108 N. Jefferson St. 513-224-1111
Pa Cornwells Heights, Reliance Merchandizing, 195 Ind'l. Pk. 215-638-8200
Pa Philadelphia, Almo Elctns., 9815 Roosevelt Blvd. 215-676-6000
Pa Pittsburgh, Cameradio, 2801 Liberty 412-391-7400
Tenn Knoxville, Ind'l. Elctns., Governor Sevier Hwy. 615-573-7135
Tex Dallas, All State, 510 S. Good Latimer Expwy. 214-651-0242
Tex Houston, Lenert Co., 1420 Hutchins St. 713-225-1465
Utah Salt Lake City, W.H. Bintz Co., 433 W. 3rd South 801-363-5821
Va Arlington, Arlington Elctns., 3636 Lee Highway 703-524-2412
Wisc Milwaukee, Marsh Elctns., 6047 Beloit Rd. 414-645-6500
For: Can., Vancouver, B.C., L.A. Varah, 2077 Albert St. 604-873-3211

ALCONOX INC., 217 Park Ave. S., New York, N.Y., 10003, Tel: 212-473-1300; Empl: 10; Minimum order: \$50
For info on price: E. P. Fenlon; Application info: E. P. Fenlon; Customer service: R. Salazar; Delivery info: R. Salazar
Free literature available: Cleaning Guide - outlines proper procedure to obtain clean surfaces, Brochure - describes qualities of our detergents.
Products manufactured: Cleaners & Solvents

ALDEN SYS. CO., INC., Box A, Dept. 262, Westboro, Mass., 01581, Tel: 617-368-8556; Empl: 5
Customer service: G. Morrison
Free literature available: "More Dollars From Less Space" brochure 22 pages, describes cost cutting techniques in lab and factory production lines. "NPR #28 display utility turntable." "NPR #29 packaging work center."
Products manufactured: Benches, Consoles, Stools, Tables, Recorders

ALDSHIR MFG., 111 Lake, Tuckahoe, N.Y., 10707; Empl: 8; Minimum order: \$25
Customer service: G. Shirley 914-779-1297
Free literature available: Omnidaptor Fact Sheet (Describes world's only universal 45 RPM adaptor). AP-1 Catalog Sheet (Lists all models of replacement 45 RPM adaptors manufactured by Aldshir plus makes and models from original sources and cross-referencing).
Products manufactured: Phonographs, Parts & Accessories

ALERT TECHNOLOGY, INC., 2910 MacArthur Blvd., Northbrook, Ill., 60062, Tel: 312-498-0940; Empl: 6; Minimum order: \$40
Customer service: A. M. Cutshaw
Free literature available: Literature on Digital Probe Checks Integrated Circuit Logic & Ordering Information.
Products manufactured: Probes, Pulsers, Logic Test, Testers

Local Sales Offices & Reps.
Ill Des Plaines, Coombs Assocs. 312-298-4830
Ind Ft. Wayne, Coombs Assocs. 219-747-0402
Mo St. Louis, Coombs Assocs. 314-567-3657
Wisc Greendale, Coombs Assocs. 414-421-2300

ALESSI INDUSTRIES, 3195 Bldg. C, Airport Loop Dr., Costa Mesa, Cal., 92626, Tel: 714-979-8912; FSC No: 50093; Empl: 7; Minimum order: \$25
Customer service: V. Alessi
Free literature available: Alessi Dice Matrix Test Station; Microprobe Test Station; Micropositioner Test Station; Micropositioner; Test Probe Fixture; Four-Point Probes; Map/Test Station.
Products manufactured: Controls/Control Eqp., Semiconductor Wafer Fabrication, Testers

Local Sales Offices & Reps.
Ariz Scottsdale, Electronic Entrs. 602-946-9860
Cal Palo Alto, Coherent Mktg. Assoc. 415-327-2217
Cal Santa Ana, Schlins-Richardson 714-832-1949
Ill Chicago, Electro-Tech Mktg. Assoc. 312-588-4535
Mass Malden, Controlyne 617-321-1733
NJ Upper Montclair, Controlyne 201-746-8900
Tex Richardson, R. S. Marston Co. 214-235-3577
Wash Seattle, Demarest & Assoc. 206-523-0600

ALFORD MFG. CO., 120 Cross St., Winchester, Mass., 01890, Tel: 617-729-8050, TWX: 710-348-1063; Empl: 48; Minimum order: \$20
Customer service: G. Cohen
Free literature available: Instruments and Components Catalogs
Products manufactured: Adapters, Waveguide, Attenuators, Bridges, Calibrators, Detectors, Diplexers, Antenna, Dividers, Dummy Loads, Junctions, Hybrid, Microwave, Line Stretchers, Microwave, Probes, Shifters, Sliding Loads, Microwave, Slotted Lines, Microwave, Switches, Tees, Terminals, Waveguides & Adapters

ALISSA MFG. CO., 2800 La Cienega Ave., Los Angeles, Cal., 90034, Tel: 213-559-7480 p. 2-24-27
Products manufactured: Capacitors, Variable, Testers

ALL AMERICAN TOOL & MFG. CO., 80

NY	Plainview, R. Smith Assocs.	516-681-3155
NY	Syracuse, Lenard Co.	315-GR 9-9191
NC	Charlotte, B. Henry Assocs.	704-375-8958
Ohio	Dayton, C. V. Clark Co.	513-294-7337
Pa	Easton, Frank Liberman	215-253-3100
Pa	Philadelphia, Mid-Eastern Assocs.	215-842-2810
Tex	Arlington, Kentron Eng. Sls.	817-265-8292
Tex	Dallas, Kentron Eng. Sls.	214-352-7535
Va	McLean, D. Carwithen	703-821-3131
Wash	Bellevue, TMS Enterprises	
FOR:	Can., Mississauga, Ont., D. R. Beattie	416-822-4414
FOR:	Can., Mississauga, Rayshield, c/o David R. Beattie Ltd.	416-822-4414

ALLAC PRODS DIV., Bacon Inds., Inc., 192 Pleasant St., Watertown, Mass., 02172, Tel: 617-926-2550; Empl.: 18; Minimum order: \$25

For info on price: Sales Dept.; Application info: T. Willett; Customer service: T. Willett; Delivery info: Sales Dept.

Free literature available: Allaco Products, supplies free Data Sheets on the epoxy & urethane potting compounds & adhesives that we manufacture.

Products manufactured: Adhesives (All Types), Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Conductive Plastic Materials, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Rubber

ALLARD INSTR., Div. of Applied Fluidics, 770 Main St., Westbury, N.Y., 11590, Tel: 516-334-8742, TWX: 510-222-8695; Empl.: 17 p. 1*601; p. 2*1121

Customer service: P. Sorrentino

Free literature available: Fluidic leak detector LD100; Century series Electronic leak detector ELD100, ELD200; AFI fluidic controller FC100A; Electromagnetic Indicators (Composite), Type 102, Type 101, Type 104, Type 109, Type 110, Type 108, Type 120, Type 219, Type 129, Type 124.

Products manufactured: Actuators, Annunciators, Display Devices/Displays, Indicators

Local Sales Offices & Reps.
Cal Pico Rivera, Westrep 213-949-2551

ALLEGHENY LUDLAM STEEL CO., 2000 Oliver Bldg., Pittsburgh, Pa., 15222, Tel: 412-261-5300, TWX: 412-642-3045; Empl.: 20,000

Products manufactured: Foil, Laminations, Seals, Shields

Local Sales Offices & Reps.		
Cal	Los Angeles	213-685-9550
Cal	S. San Francisco	415-583-9855
Conn	Windsor	203-688-5241
Ga	Atlanta	404-394-9613
Ill	Chicago	312-774-8600
Mass	Boston	617-879-8342
Mich	Detroit	313-564-6900
Mo	St. Louis	314-991-2900
NY	Buffalo	716-633-8800
NY	New York	914-694-1880
Ohio	Cincinnati	513-351-8000
Okl	Cleveland	216-333-9300
Pa	Philadelphia	215-839-7370
Tenn	Memphis	901-767-6962
Tex	Houston	713-529-2647
Wash	Seattle	206-GL4-6950
Wisc	Milwaukee	414-258-5900

ALLEN AVIONICS, INC., Div. A.K. Allen Co., 255 E. 2nd St., Mineola, N.Y., 11501, Tel: 516-248-8080; Minimum order: \$35 p. 1*422-427,532-537

Products manufactured: Attenuators, Coils Including Assemblies & Forms, Delay Lines, Equalizers, Filter Synthesizers, Filters, Networks, Synthesizers

Local Sales Offices & Reps.		
Ala	Gadsden, Nickerson Co.	205-547-7718
Cal	Culver City, E.V. Roberts & Assocs.	213-870-9561
Cal	Palo Alto, Adtek Assocs.	415-323-5414
Cal	San Diego, E.V. Roberts & Assocs.	714-565-4535
Colo	Golden, J.F. Hurlbut Co.	303-279-7796
Fla	Oldsmar, Nickerson Co.	813-855-4209
Fla	Tampa, Nickerson Co.	813-885-1416
Ga	Decatur, Nickerson Co.	404-321-4678
Ill	Chicago, Electro-Tech Mktg. Assocs.	312-588-4535
Kans	Prairie Village, Engrg. Svcs.	913-649-4000
Md	Baltimore, D.K. Jones & Assocs.	301-752-0577
Mass	Natick, Wayland Engrg. Sls.	617-655-6080
Minn	Anoka, K. Haugen & Assocs.	612-421-3395
Mo	St. Louis, Engrg. Svcs.	314-997-1515

NJ	Cherry Hill, H.J. White Co.	609-428-4544
NY	Woodbury, J.N. Sweeney & Co.	516-692-4222
NC	Kannapolis, Nickerson Co.	704-932-6772
Ohio	Dayton, Ashby Assocs.	513-252-5627
Tex	Dallas, Texas Avionics	214-368-3566
Wash	Seattle, Underwood & Underwood Inc.	206-243-2133
EXP:	Stamford, Conn., Dage Corp.	203-324-3123

Advertisement

Allen Avionics manufactures passive delay lines, filters, attenuators and passive networks. 3 day delivery on LC filters to customers specifications. We are unique in our field in that we build lumped delay lines having time delay to rise time ratios of up to 300/1. We are the sole supplier of the Spiradel delay line.

ALLEN-BRADLEY CO., 1201 S. Second St., Milwaukee, Wisc., 53204, Tel: 414-671-2000, TWX: 910-262-3451; Empl.: 6500 p. 2*1410-1417,1584-1591

Customer service: D. Newmann
Free literature available: Publication RO - Complete bound catalog. Publication 6024 - Brief catalog of line.

Products manufactured: Attenuators, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Controllers, Programmable, Controls/Control Eqpt., Cores, Magnetic, Isolators, Lights, Magnets, Motors, Networks, Potentiometers, Pullers, Relays, Resistors, Solenoids, Switches, Timers

Local Sales Offices & Reps.		
Ala	Birmingham	205-879-4641
Alas	Anchorage, J.A. Tudor & Assoc.	907-274-6350
Ariz	Phoenix, E. P. Weller Co.	602-959-6000
Ark	Little Rock, C.H. Stout Inc.	501-372-2555
Cal	City of Commerce	213-724-5713
Cal	Newport Beach, W.B. Knight Co.	714-833-8250
Cal	South San Francisco	415-871-0200
Colo	Denver	303-936-7303
Conn	Stratford	203-378-7364
Fla	Fort Lauderdale	305-771-0400
Fla	Jacksonville, Van & Smith Co.	904-384-2376
Fla	Miami, C.R. Lee & Assoc.	305-444-7414
Fla	Orlando, Van & Smith Co.	305-425-7026
Fla	Tampa, Van & Smith Co.	813-877-8393
Ga	Atlanta, R.E. Wilson Co.	404-876-8833
Haw	Honolulu, R.J. Austin & Assoc.	808-395-4011
Ill	Chicago	312-922-9302
Ill	Rockford	815-965-8795
Ind	Fort Wayne	219-745-7068
Ind	Indianapolis	317-293-5223
Ind	Merrillville	219-769-7770
Iowa	Bettendorf	319-355-5316
Ky	Louisville, Rietze Co.	502-893-2571
La	Metairie	504-888-2281
La	Shreveport, C.H. Stout of Shreveport Inc.	318-221-5555
Me	Portland	207-772-3555
Md	Baltimore	301-265-5600
Mass	Agawam	413-785-1984
Mass	Framingham	617-879-5900
Mich	Flint	313-232-9341
Mich	Grand Rapids, E.B. Dewey Co.	616-454-1825
Mich	Kalamazoo, E.B. Dewey Co.	616-344-6163
Mich	Lansing	517-393-8600
Mich	Madison Heights	313-583-9400
Minn	St. Paul	612-636-5050
Mo	Kansas City	816-421-4595
Mo	Maryland Heights	314-567-6326
Neb	Omaha, Midwest Equipment Co.	402-734-1020
NJ	Bloomfield	201-338-4600
NM	Albuquerque	505-265-7723
NY	Albany	518-869-5373
NY	Buffalo	716-634-2711
NY	Rochester	716-461-3660
NY	Syracuse	315-463-4501
NC	Charlotte	704-372-3287
NC	Greensboro	919-272-5870
Ohio	Akron	216-253-2106
Ohio	Cincinnati	513-793-7580
Ohio	Cleveland	216-391-2855
Ohio	Columbus	614-263-6881
Ohio	Dayton	513-294-4466
Ohio	Toledo	419-841-7726
Okl	Tulsa, J.W. Elder Co.	918-583-9149
Ore	Eugene, J.A. Tudor & Assoc.	503-686-1252
Ore	Portland, J.A. Tudor & Assoc.	503-288-5154
Pa	Allentown	215-437-2401
Pa	Erie	814-868-8214
Pa	King of Prussia	215-337-1990

Pa	Pittsburgh	412-923-1844
Pa	York	717-848-2239
SC	Greenville	803-235-1280
Tenn	Knoxville	615-588-0591
Tenn	Memphis, C.H. Stout of Tennessee Inc.	901-362-1616
Tenn	Nashville	615-834-1860
Tex	Dallas	214-748-6356
Tex	Houston	713-225-0747
Tex	San Antonio	512-732-4362
Utah	Salt Lake City, Stevens Sls. Co.	801-487-8971
Va	Richmond	804-282-4285
Wash	Seattle, J.A. Tudor & Assoc.	206-682-7444
Wash	Spokane, J.A. Tudor & Assoc.	509-327-3328
WVa	Charleston, S.C. Payne	304-343-1393
Wisc	Appleton	414-731-3202
Wisc	Milwaukee	414-671-2000

Local Distributors

Ariz	Phoenix, Kierulff Elctns., 2633 East Buckeye Rd.	602-273-7331
Cal	El Segundo, Liberty Elctns., 124 Maryland St.	213-322-8100
Cal	Los Angeles, Kierulff Elctns., Inc., 2585 Commerce Way	213-685-5511
Cal	Mountain View, Elmar Elctns., Inc., 2288 Charleston Rd.	415-961-3611
Cal	San Diego, Kierulff Elctns., 8797 Balboa Ave.	714-278-2112
Colo	Denver, Cramer/Denver Elctns., 5465 E. Evans Pl. at Hudson	303-758-2100
Conn	North Haven, Cramer/Conn, 35 Dodge Ave.	203-239-5641
Fla	Hollywood, Cramer/Hollywood, 4035 N. 29th Ave.	305-923-8181
Fla	Orlando, Cramer/Orlando, 345 N. Graham Ave. Box 20214	305-894-1511
Ga	Atlanta, Cramer/Atlanta, 3923 Oakcliff Indl. Ct.	404-448-9050
Ill	Chicago, Newark Elctns., 500 N. Pulaski Rd.	312-638-4411
Ind	Ft. Wayne, Ft. Wayne Elctns. Supply, Sub. of Graham Elctns. Supply, 3606 E. Maumee Ave.	219-423-3422
Ind	Indianapolis, Graham Elctns. Supply, 133 S. Pa. St.	317-634-8202
Md	Gaithersburg, Cramer/Washington, 16021 Indl. Dr.	301-948-0110
Mass	Newton, Cramer Elctns., 85 Wells Ave.	617-969-7700
Minn	Minneapolis, Newark-Minneapolis Elctns., 336 Hoover St., N.E.	612-331-6350
NJ	Somerset, Schweber Elctns., 43 Belmont Dr.	201-469-6008
NY	Westbury, Schweber Elctns., Jericho Tpke.	516-334-7474
Ohio	Cincinnati, Newark Elctns. Corp., 9799-G Princetown Rd.	513-874-5115
Ohio	Cleveland, Schweber Elctns. Corp., 23880 Commerce Pk. Dr.	216-464-2970
Pa	Philadelphia, Almo Elctns., Roosevelt Blvd. at Blue Grass Rd.	215-676-6000
Tex	Dallas, Solid State Elctns. of Tex, 2643 Manana Dr. Box 20299	214-352-2601
Tex	Houston, Harrison Equip., 1616 McGowen Ave.	713-224-9131
Utah	Salt Lake City, Cramer/Utah, 391 West 2500 So.	801-487-4131
Wash	Seattle, Kierulff Elctns., 5940 Sixth Ave., So.	206-763-1550
For:	Can., Downsview, Ont., Cescio Elctns., 24 Martin Ross Ave.	416-661-0220
For:	Can., Montreal, Que., Cescio Elctns. Ltd., 4050 Jean Talon St. W.	514-735-5511
For:	Can., Ottawa, Ont., Cescio Elctns., 1300 Carling Ave.	613-729-5118
For:	Can., Que., Cescio Elctns. Ltd., 98 Rue St. Vallier, Ouest	418-524-4641

ALLEN BRADLEY, Sys. Div., 747 Alpha Dr., Highland Heights, Ohio, 44143, Tel: 216-449-6700, TWX: 810-427-2975; Empl.: 250

For info on price: J. Caputo; Application info: P. Zilko; Customer service: R. Martin; Delivery info: J. Caputo

Free literature available: Allen-Bradley NC Series 4000 and CNC 7300 systems provide full capability for all turning, milling and machining center applications. The numerous features and available options are described in two NC brochures. Programmable Controller is expandable, easily programmed by ladder diagrams, and self-checking. Bulletin 1774 discusses solid-state control features and modular construction for memory (up to 8K) and inputs/outputs (1,024) available. Bulletin 1750 and 1755 describe the two versions of PMC. Read-only and Read-write memory are available.

Products manufactured: Programmable, Controls/Control Eqpt. Controllers,

Local Sales Offices & Reps.

Ala Birmingham, Allen-Bradley Co. 205-879-4641
 Ala Anchorage, Allen-Bradley Co. 907-274-6350
 Ariz Phoenix, Ind'l. C. 602-959-8620
 Ark Little Rock, C.H. Stout, Inc. 501-374-8201
 Cal Los Angeles, Allen-Bradley Co. 213-724-5713
 Cal S. San Francisco, Allen-Bradley Co. 415-761-3225

Colo Denver, Allen-Bradley 303-936-7303
 Conn Bridgeport, Allen-Bradley 203-378-7364
 Fla Jacksonville, Van & Smith Co. 904-384-2376
 Fla Miami, C.R. Lee & Assoc. 305-444-7414
 Fla Orlando, Van & Smith Co. 305-425-7026
 Fla Tampa, Van & Smith Co. 813-877-8393
 Ga Atlanta, R.E. Wilson Co. 404-876-8833
 Haw Honolulu, R.J. Austin & Assocs. 808-395-4011
 Ill Chicago, Allen-Bradley Co. 312-922-9302
 Ill Rockford, Allen-Bradley Co. 815-965-8795
 Ind Fort Wayne, Allen-Bradley Co. 219-745-7068
 Ind Gary, Allen-Bradley Co. 219-769-7770
 Ind Indianapolis, Allen-Bradley Co. 317-293-5223
 Iowa Davenport, Allen-Bradley Co. 319-355-2831
 Ky Louisville, Rietze Co. 502-893-2571
 La New Orleans, Allen-Bradley Co. 504-888-2281
 La Shreveport, C.H. Stout of Shreveport, Inc. 318-425-5485

Me Portland, Allen-Bradley Co. 207-772-3555
 Md Baltimore, Allen-Bradley Co. 301-265-5600
 Mass Boston, Allen-Bradley Co. 617-879-5900
 Mass Springfield, Allen-Bradley Co. 413-732-3430
 Mich Detroit, Allen-Bradley Co. 313-583-9400
 Mich Flint, Allen-Bradley Co. 313-232-9341
 Mich Grand Rapids, E.B. Dewey Co. 616-454-1825
 Mich Kalamazoo, E.B. Dewey Co. 616-344-6163
 Mich Lansing, Allen-Bradley Co. 517-393-8600
 Minn St. Paul, Allen-Bradley Co. 612-636-5050
 Mo Kansas City, Allen-Bradley Co. 816-421-4595
 Mo Saint Louis, Allen-Bradley Co. 314-567-6326
 Neb Omaha, Midwest Equip. Co. 402-341-7600
 NJ Bloomfield, Allen-Bradley Co. 201-338-4600
 NM Albuquerque, W. Doidge Sis. Co. 505-256-0307
 NY Albany, Allen-Bradley Co. 518-869-5373
 NY Buffalo, Allen-Bradley Co. 716-873-7617
 NY Rochester, Allen-Bradley Co. 716-461-3660
 NY Syracuse, Allen-Bradley Co. 315-463-4501
 NC Charlotte, Allen-Bradley Co. 704-372-3287
 NC Greensboro, Allen-Bradley Co. 919-272-5870
 Ohio Akron, Allen-Bradley Co. 216-253-2106
 Ohio Cincinnati, Allen-Bradley Co. 513-793-7580
 Ohio Cleveland, Allen-Bradley Co. 216-391-2855
 Ohio Columbus, Allen-Bradley Co. 614-263-6881
 Ohio Dayton, Allen-Bradley Co. 513-294-4466
 Ohio Toledo, Allen-Bradley Co. 419-841-7726
 Okla Tulsa, J.W. Elder Co. 918-583-9149
 Ore Eugene, J.A. Tudor & Assocs. 503-686-1252
 Ore Portland, J.A. Tudor & Assocs. 503-288-5154
 Pa Allentown, Allen-Bradley Co. 215-437-2401
 Pa Erie, Allen-Bradley Co. 814-868-8214
 Pa Philadelphia, Allen-Bradley Co. 215-337-1990
 Pa Pittsburgh, Allen-Bradley Co. 412-923-1844
 Pa York, Allen-Bradley Co. 717-848-2239
 SC Greenville, Allen-Bradley Co. 803-268-1391
 Tenn Knoxville, Allen-Bradley Co. 615-588-0591
 Tenn Memphis, C.H. Stout of Tenn., Inc. 901-362-1616

Tenn Nashville, Allen-Bradley Co. 615-834-1860
 Tex Dallas, Allen-Bradley Co. 214-748-6356
 Tex Houston, Allen-Bradley Co. 713-225-0747
 Tex San Antonio, Allen-Bradley Co. 512-732-4362
 Utah Salt Lake City, Stevens Sis. Co. 801-467-5489
 Va Norfolk, Allen-Bradley Co. 804-499-0218
 Va Richmond, Allen-Bradley Co. 804-282-4825
 Wash Seattle, J.A. Tudor & Assocs. 206-682-7444
 Wash Spokane, J.A. Tudor & Assocs. 509-327-3328
 WV Charleston, S.C. Payne-Mgr. 304-343-1393
 WVa Appletton, Allen-Bradley Co. 414-731-3202
 Wisc Milwaukee, Allen-Bradley Co. 414-671-2000

ALLEN ELCTRNS. DIV., Allen Organ Co., Macungie, Pa.,
 18062, Tel: 215-965-9801; Empl.: 500; Minimum order:
 \$30

Customer service: M.F. Nelson

Products manufactured: Coils Including Assemblies
 & Forms, Oscillators

ALLEN MFG. CO., Drawer 570, Hartford, Conn., 06101,
 Tel: 203-242-8511, TWX: 710-425-0099; Empl.: 420;
 Minimum order: \$50

For info on price: G. Merrick; Application info: M.
 Kubick; Customer service: G. Merrick; Delivery info:
 G. Merrick

Products manufactured: Adhesives (All Types),
 Fasteners, Pins, Screwdrivers, Tools, Wrenches

ALLIANCE MFG. CO., North American Phillips Co.,
 Alliance, Ohio, 44601, Tel: 216-821-5360

Products manufactured: Antenna Rotators, Motors

ALLIED CHEMICAL CORP., Specialty Chemicals Div., Box
 1087R, Morristown, N.J., 07960, Tel: 201-455-2000;
 Empl.: 30000

Products manufactured: Chemicals, Cleaners &
 Solvents, Etchants, Printed Circuit,
 Machines/Machinery, Production

Local Sales Offices & Reps.

Cal Los Angeles
 Ill Palatine
 Mass Burlington
 NJ Saddle Brook
 Tex Houston

ALLIED CONTROL CO., See Gould Inc., Allied Control
 Div.

ALLIED SYSTEMS CORP., Box 11005, Greensboro,
 N.C., 27409, Tel: 919-299-2294; Empl.: 25 p. 2-458,459

For info on price: E. V. Saude; Customer service: V.
 Buie; Delivery info: E. V. Saude

Free literature available: Catalogs 567 and 677 offer
 two complete lines of Patchboard Programming
 Systems with more than twenty-one models and
 sizes from 200 positions to 5120 positions with
 associated Patchcords and Hardware. Special
 Systems on Request.

Products manufactured: Boards, Programming,
 Cable Assemblies & Harnesses, Connectors,
 Contacts, Electrical, Controllers, Programmable,
 Cords, Covers, Protective (Including Dust), Jack
 Covers, Kits, Programming Board, Lead
 Assemblies & Receptacles, Leads, Test &
 Adaptors, Panels, Pins, Plugs, Probes, Services,
 Assembly, Production & Test, Splices, wire
 (Including, Butt & Cap Types), Terminal Blocks,
 Boards & Strips, Terminals, Tools

Local Sales Offices & Reps.

Ala Huntsville, Tech-Rep Assocs., Inc. 205-881-5925
 Cal Long Beach, Cairns Engrg. Sis. Corp. 213-432-7444
 Cal San Carlos, Electro Pacific 415-593-1334
 Fla Ft. Lauderdale, Tech-Rep Assocs., Inc. 305-792-0962
 Fla Indian Rocks Beach, Tech-Rep Assocs., Inc. 813-595-2834
 Mass Waltham, ICM Co. 617-891-8059
 Minn Minneapolis, Paul Ericson & Assocs. 612-884-1969
 NY New Hook, R. P. Kennedy Co. 914-876-2700
 NY Rochester, R. P. Kennedy Co. 716-271-6322
 Va Arlington, H. J. Heffernan Co. 703-522-6666

ALLIS-CHALMERS, Box 512, Milwaukee, Wisc., 53201,
 Tel: 414-475-2000, TWX: 910-262-3444; Empl.: 26000

Products manufactured: Controls/Control Eqpt.,
 Motor & Generator Armatures, Rotors, Stators,
 Motor Electric Generator Sets, Regulators, Relays,
 Switches, Transformers

Local Sales Offices & Reps.

Cal Los Angeles 213-726-0931
 Cal Walnut Creek 415-937-3111
 Colo Lakewood 303-238-7920
 Fla Tampa 813-877-9541
 Ga Atlanta 404-261-3970
 Ill Oak Park 312-383-6600
 Ind Indianapolis 317-783-3265
 Mass Boston 617-482-3700
 Mich Kalamazoo 616-343-1621
 Mich Southfield 313-352-6870
 Minn Bloomington 612-944-1500
 Mo St. Louis 314-991-5270
 NJ Union 201-687-3700
 NY Rochester 716-436-2883
 NC Charlotte 704-384-0412
 Ohio Akron 216-836-7996
 Ohio Cleveland 216-333-9090
 Ohio Norwood 513-351-6700
 Ohio Norwood 513-351-9000
 Okla Tulsa 918-587-9163
 Pa Haverford 215-527-0900
 Pa York 717-755-0942
 Tex Dallas 214-369-7300
 Tex Houston 713-522-1081
 Va Richmond 703-282-7678
 Wash Bellevue 206-454-3481
 Wisc Milwaukee 414-475-4799
 Wisc Milwaukee 414-475-3441

ALMA, Div. Develco Inc., 530 Logue Ave., Mountain View,
 Cal., 94043, Tel: 415-968-3903, TWX: 910-379-6588;
 Empl.: 80; Minimum order: \$50

For info on price: G. Patterson; Customer service: R.
 Rondoe

Free literature available: Product Brochures and
 Application Notes.

Products manufactured: Testers

Local Sales Offices & Reps.

Ala Huntsville, Saber Assocs. 205-534-3387
 Cal San Diego, QPL, Inc. 714-453-4150
 Cal South Pasadena, QPL, Inc. 213-682-3705
 Fla Lighthouse Point, Saber Assocs. 305-943-3076
 Fla Longwood, Saber Assocs. 305-422-3686
 Fla St. Petersburg, Saber Assocs. 813-441-1301
 Ill Chicago, Sea, Inc. 312-282-6694
 Ind Carmel, Sea, Inc. 317-846-2593
 Md Gaithersburg, Data Time, Inc. 301-948-7666
 Md Randallstown, Beacon North, Inc. 301-922-1248
 Mass Waltham, W.M. Hague Co. 617-899-5600
 Minn Minneapolis, Sea, Inc. 612-425-4455
 NJ Fairfield, KLS Assocs. 201-227-2900
 NC Raleigh, Saber Assocs. 919-787-9675
 Pa Abington, Bach-Stewart Assocs. 215-885-1550
 Tex Austin, Crockett Southwest Co. 512-451-8269
 Tex Irving, Crockett Southwest Co. 214-251-1776
 Va Falls Church, Beacon North, Inc. 703-534-1673
 Wash Seattle, R.S. Drake Assocs. 206-763-2755
 Wisc Waukesha, Sea, Inc. 414-547-6637

Advertisement

Alma manufactures a broad line of
 integrated circuit (IC) testers which
 include the models 380C and 480B
 bench-top digital IC testers, the Alma
 550 linear IC tester, the model 720
 watch IC/module tester, and the Alma
 760 RAM IC tester. Phone your
 nearest Alma representative (listed
 above) for a demonstration.

ALMOND INSTRS. CO., 1223 East Edna Pl., Covina, Cal.,
 91724, Tel: 213-967-4151; Empl.: 45

Products manufactured: Converters, Discriminators,
 Memory Systems, Modulator/Demodulators,
 Modulators, All Kinds, Oscillators, Power
 Supplies, Recorders

ALNOR INSTRUMENT CO., 7301 N. Caldwell Ave., Niles,
 Ill., 60648, Tel: 312-647-7866; Empl.: 160; Minimum
 order: \$15

For info on price: J. J. Kuska; Application info: M. D.
 Carlson; Customer service: M. D. Carlson; Delivery
 info: M. Fink

Free literature available: Temperature measuring &
 control instruments, air-velocity meters, dew point
 apparatus & thermocouples

Products manufactured: Controllers,
 Programmable, Controls/Control Eqpt., Meters,
 Thermocouples, Elements & Accessories, Wire

Local Sales Offices & Reps.

Ala Birmingham, Ind'l. Htg. & Finishing Co. 205-822-4456
 Ala Anchorage, Hoteco Div.-Amstan, Inc. 907-274-4485
 Ariz Phoenix, Portis & Assocs. 602-947-4379
 Ark Little Rock, McCallister Equip. Co. 501-375-4474
 Cal Costa Mesa, Tech. Prods. & Controls 714-646-8585
 Cal San Francisco, Elctrn. Engrg. Ltd. 415-593-2189
 Colo Denver, D. E. Bond Assocs. 303-756-1234
 Fla Miami, Florida Precision Inst. Co. 305-324-1731
 Ga Atlanta, Measure-Trol Co. 404-255-7249
 Haw Honolulu, Controls, Inc. 808-841-7333
 Ind Indianapolis, Electro Engrg. Sis. 317-547-5273
 Iowa Cedar Rapids, Mueller Sis. Corp. 319-365-1196
 Iowa Davenport, Mueller Sis. Corp. 319-324-4962
 La New Orleans, M. Erichson Co. 504-834-9360
 Md Baltimore, Jobe & Co. 301-235-3502
 Mass Boston, Osgood Engrg. Co. 617-933-4744
 Mich Detroit, B. Turpin Co. 313-272-0746
 Minn Minneapolis, Mueller Sis. Corp. 612-544-8888
 Mo St. Louis, Ind'l. Svc. Labs. 314-535-5760
 NJ Union City, M. Stock, Inc. 201-864-2140
 NY Buffalo, Thermal Systems, Inc. 716-662-5560
 NY New York City, M. Stock, Inc. 212-227-4380
 NY Rochester, Thermal Systems, Inc. 716-377-1970
 NY Syracuse, Thermal Systems, Inc. 315-458-5202
 NC Charlotte, A.D. Penn Co. 704-847-4426
 Ohio Cincinnati, Beedle Equip. Co. 513-793-0140

Ohio Cleveland, Alnor Instr. Co. 216-464-2225
 Okla Tulsa, J. Schoeffler Co. 918-742-5331
 Ore Portland, Fairman B. Lee Co. 503-236-9515
 Pa Philadelphia, Wistex 215-337-1240
 Pa Pittsburgh, L.H. Boleky Co. 412-761-8994
 Tex Dallas, Gay Sls. Co. 214-368-2325
 Tex Houston, Patterson Equip. Co. 713-666-1451
 Utah Salt Lake City, Control Equip. Co. of S/L
 801-487-7741
 Va Richmond, Virginia Tech. Assoc. 703-266-9654
 Wash Seattle, Fairman B. Lee Co. 206-244-7262
 Wisc Milwaukee, Mueller Sls. Corp. 414-781-5310
 EXP: Chicago, Ill, A. Torres Export 312-539-3663

ALPHA COMPONENTS CORP., 115 Eucalyptus Dr., El Segundo, Cal., 90245, Tel: 213-322-7780; Empl.: 12; Minimum order: \$25

For info on price: J. T. Cataldo; Application info: J. T. Cataldo; Customer service: D. J. Hardy; Delivery info: D. J. Hardy

Products manufactured: Blowers & Fans & Accessories, Chargers, Battery, Comm. Systems, Counters, Diodes, Power Supplies, Rectifiers, Relays, Resistors, Transformers, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

Ariz Phoenix, B.G. Sls. 602-266-7252
 Cal Los Angeles, D. Forth Assoc. 213-338-4816
 Cal San Francisco, Weseloh & Assoc. 415-961-0565
 Fla Oldsmar, L.A. Assoc. 813-855-4209
 Md Joppa, J.C. Merican 301-679-6989
 Minn Minneapolis, Smith Sales Co. 612-377-3187
 Miss Greenwood, L.R. Massey 601-453-3038
 NY Brooklyn, I. Brown Co. 212-493-1379
 NY Camillus, Trademark Elex Assoc. 315-488-5518
 NY Northport, Production Sls. Assoc. 516-757-0336
 Ore Portland, Dale Weber Co. 503-234-7671
 Tex Dallas, Techno Assocs. 214-357-9213
 EXP: Calif. Beverly Hills, Itonra International
 213-272-0011

ALPHA DATA INCORPORATED, 20750 Marilla Street, Chatsworth, Cal, 91311, Tel: 213-882-6500, TWX: 910-494-4914; Empl.: 35

Customer service: L. T. Lincoln

Free literature available: Magnetic Disc Memories: ALPHA DATA 10-inch and 16-inch Disc Memories are optimized to meet the requirements of your system in terms of storage, capacity, transfer rate and access times. Plug compatible computer/controllers. Integrated Circuit Tester Model 1416:

A new fully automatic digital IC tester designed to evaluate virtually all types of digital TTL and DTL circuits.

Products manufactured: Memory Systems, Testers

Local Sales Offices & Reps.

Ariz Phoenix, Thorson Co. 602-956-5300
 Cal Mountain View, Scientific Devices
 415-964-4230
 Cal San Diego, Mesa Elctns. 714-278-8021
 Colo Littleton, Data Sys. Mktg. 303-795-1960
 Conn Avon, Instrument Dynamics 203-678-1088
 Fla Lighthouse Point, Saber Assocs. 305-943-3076
 Ga Woodstock, Saber Assocs. 404-432-9625
 Haw Honolulu, Aloha Assocs. 808-941-1574
 Ill Addison, Midwest Mktg. M. R. 312-279-2442
 Kans Mission, Midwest Mktg. M. R. 913-384-3737
 Md Silver Spring, L. G. White & Assocs.
 301-585-3141
 Mass Wakefield, Instrument Dynamics 617-245-5100
 Mich Southfield, DATA-TRON 313-354-6421
 Mo Florissant, Midwest Mktg. M. R. 314-831-0342
 NJ Ridgewood, Hansen Assocs. 201-652-7055
 NM Albuquerque, Scientific Devices-Albuquerque
 505-268-6729
 NY Schenectady, N. W. Alexander & Assocs.
 518-377-0581
 NC Raleigh, Saber Assocs. 919-834-3961
 Ohio Dayton, DATA-TRON 513-223-8421
 Ohio Wickliffe, DATA-TRON 216-585-8421
 Pa Audubon, Holmes Assocs. 215-666-0636
 Tex Houston, Data Appls. Corp. 713-661-4501
 Tex Richardson, Data Appls. Corp. 214-231-4846
 Utah Bountiful, Data Sys. Mktg. 801-295-3457

ALPHA ELECTRONIC SERVICES, 8431 Monroe Ave., Stanton, Cal., 90680, Tel: 714-821-4400; Empl.: 47; Minimum order: \$10

For info on price: D. Valdez; Application info: D. E. Lippincott; Customer service: C. Moore; Delivery info: R. Paumier

Free literature available: Catalog containing specifications and applications information on miniature thick film hybrid tone encoders/decoders, tone generators and selective signalling tone devices. Prices are included.

Products manufactured: Circuits, Hybrid, Thick Film, Comm. Systems, Controls/Control Eqpt., Decoders, Encoders, Filters, Generators, Receivers, Transmitters

Local Sales Offices & Reps.

Cal Hayward, Solid State Comms. 415-785-4610

ALPHA INSTR. INC., 20 Sylvan Rd., Woburn, Mass., 01801, Tel: 617-935-5150, TWX: 710-393-1236; FSC No: 17540; Empl.: 300; Minimum order: \$50

For info on price: W. Minks; Application info: J. Richmond; Customer service: H. Miller; Delivery info: H. Miller

Free literature available: Alpha microwave diodes catalog and alpha solid state control devices catalog.

Products manufactured: Attenuators, Detectors, Diodes, Limiters, Switches

Local Sales Offices & Reps.

Ariz Phoenix, Thorson Co. 602-956-5300
 Cal Los Altos, Stout-Loeswick 415-948-3265
 Cal Los Angeles, Cain Technology 213-476-2251
 Colo Arvada, Cleveland Enter. 303-423-3707
 Fla Clearwater, Southeastern Sls. 813-531-8324
 Ill Park Ridge, RF Specialists 312-698-2044
 Ind Ft. Wayne, RF Specialists 219-485-8982
 Md Glen Burnie, Micro-Comp 301-761-4600
 Mass Lexington, Lancer Assoc. 617-861-1720
 Mich Warren, DEM Elctns. Sls. 313-755-6660
 Mo St. Louis, Boweng Reps. 314-429-7327
 NM Albuquerque, Cleveland Enter. 505-345-2481
 NY E. Syracuse, Ossmann Instrs. 315-437-6666
 NY Great Neck, Trionic Assocs. 516-466-2300
 Ohio Dayton, Rixan Assocs. 513-278-4216
 Pa Lafayette Hill, M. Lader Co. 215-825-3177
 Tex Dallas, Cain and Co. 214-233-6809

ALPHA METALS, INC., 56 Water St., Jersey City, N.J., 07304, Tel: 201-434-6778, Telex: 125-798; Empl.: 400

Customer service: H. Greenberg

Free literature available: Alpha Product Package - mini catalog, Preforms handbook - primer on use of solder preforms, Ionograph - device measures ionic contamination, Pot-Rite - solder analysis.

Products manufactured: Alloys, Chemicals, Cleaners & Solvents, Cleaners, Ultrasonic, Coatings, Flux, Brazing & Soldering Materials, Forms, Wire, Laminates, Metal Compounds, Foils, Powders, Sheet, Stock, Metal Oxides, Metals, Preforms, Precious Metal, Services, Assembly, Production & Test, Solder (All Types), Soldering Accessories, Standards

Local Sales Offices & Reps.

Cal Santa Ana 714-547-7315
 Cal Sunnyvale 408-727-0630
 Ill Des Plaines 312-297-0730

ALPHA WIRE CORP., 711 Lidgerwood Ave., Elizabeth, N.J., 07207, Tel: 201-925-8000, TWX: 710-996-5895; Empl.: 250

p. 1-44, 45; p. 2-1835-1880

For info on price: B. Finn; Application info: T. Rame;

Customer service: P. Dietlin; Delivery info: P. Dietlin

Free literature available: T-2 Tubing Catalog, W-8 Wire & Cable Catalog, Teflon Cable Brochure, Zipper Tubing Brochure

Products manufactured: Blowers & Fans & Accessories, Braid, Cable, Cabinets & Accessories, Cable, Caps, Forms & Tapes, Heat Shrinkable, Chassis, Circuit Board Mounting, Chassis, Metal, Clamps & Clips, Cords, Tubing, Wire, Wire Markers, Wire Shielding

Local Sales Offices & Reps.

Ariz Phoenix, Sheffer-Kahn Co., Inc. 602-258-7893
 Cal Inglewood, J. Berman Co. 213-776-1281
 Cal Oakland, Moulthrop Sls., Inc. 415-261-7676
 Fla Maitland, Hutto-Hawkins-Peregory, Inc.
 305-831-2474
 Ga Atlanta, Millar Elctns., Inc. 404-261-6160
 Ill Chicago, GNB Assoc. 312-673-4050
 Ind Indianapolis, Mktg. Engrs., Inc. 317-456-1523
 Mich St. Clair Shores, J.M. Thorpe Co. 313-779-6363
 Minn Minneapolis, Clark R. Gibb Co. 612-377-1200
 Mo Kansas City, L.F. Florence Co. 816-561-7222
 NJ Elizabeth, Alpha Wire Corp. 201-925-8000
 NY Rochester, Marsey Sls., Inc. 716-442-9700
 Ohio Cleveland, Marlow Assocs., Inc. 216-932-0900
 Tex Dallas, J.Y. Schoonmaker Co., Inc.
 214-357-8481
 Wash Seattle, Earl & Brown Co., Inc. 206-284-1121

FOR: Can., Downsview, Ont., F. Eakin, Limited
 416-245-3600

A L S ELECTRONICS CORP., 733 E. Edna Pl., Covina, Cal., 91723, Tel: 213-966-7431, TWX: 910-584-1812; Empl.: 40

p. 1-1087

For info on price: S. Kurzet; Customer service: Pres.

Products manufactured: Converters, Inverters, Power Supplies

ALTEC DIV., Altec Corp., 1515 S. Manchester Ave., Anaheim, Calif., 92803, Tel: 714-774-2900, TWX: 910-591-1142; Empl.: 1100

Customer service: R. J. Foulies

Products manufactured: Amplifiers, Attenuators, Bridges, Chokes, Coils Including Assemblies & Forms, Comm. Systems, Equalizers, Filters, Generators, Meters, Microphones, All Kinds, Mixers, Networks, Panels, Pickups, Telephone (For Recording), Speaker Systems, Speakers, Transformers

ALTHOR PRODS., 202 Bay 46th St., Brooklyn, N.Y., 11214, Tel: 212-373-7444; FSC No: 14998; Empl.: 7; Minimum order: \$2

Customer service: G. Strum

Free literature available: Leaflet UB-72 (with current Price Change List) on Clear Polystyrene Plastic Boxes for storage or display & See-Thru Plastic Drawer Cabinets. Circular BL-74- Blank Labels - Self-Adhesive.

Products manufactured: Cabinets & Accessories, Containers, Labels, Pressure-Sensitive, Adhesive

AMRAD CORPORATION, Box 876, Paris, Tex., 75460, Tel: 214-785-4544, TWX: 910-860-5941

Products manufactured: Capacitor, Hardware, Caps, Forms & Tapes, Heat Shrinkable, Clamps & Clips, Cords, Fasteners, Retainers, Strain Reliefs, Cable & Wire, Tubing, Wire & Cable Ties

Local Sales Offices & Reps.

Ill Chicago, Ropak-Cahill, Inc. 312-287-7292
 Mich Benton Harbor, Ken-Mor Assocs. 616-927-3134
 NY Flushing, Miller Co. 212-263-4446
 Ohio Cleveland, Loesch Assocs. 216-241-4581

AMATOM ELECTRONIC HARDWARE, Div. MITE Corp., 446 Blake St., New Haven, Conn., 06515, Tel: 203-397-3311; FSC No: 06540; Empl.: 55; Minimum order: \$10

p. 2-457, 1258

For info on price: Sls. Dept.; Application info: W. Bailey; Customer service: F. De Fonzo; Delivery info: M. Cousins

Products manufactured: Bumpers, Bushings, Glass, Plastic, Metal, Rubber, Etc., Caps, Lenses, Indicator Light, Clamps & Clips, Connector Adapters, Connectors, Contacts, Electrical, Couplings, Fasteners, Grommets, Handles For Cabinets, Circuit Boards, Racks, etc., Insulators & Insulation, Knobs, Lamps, Lights, Locks, Dial & Shaft, Pads, Transistor Mounting, Posts, Sockets, Spacers, Splices, wire (Including, Butt & Cap Types), Strain Reliefs, Cable & Wire, Terminal Blocks, Boards & Strips, Terminals

Local Sales Offices & Reps.

Cal Pasadena, T.W. Yeakle 213-684-2275
 Cal Santa Clara, Novatronix 408-243-9530
 Colo Denver, Novatronix 408-243-9530
 Conn Bethany, Reps. Corp. 203-393-0024
 Fla Miami, S.K. Wallace Assocs. 305-691-1654
 Fla Tampa, S.K. Wallace Assocs. 813-932-3568
 Ga Jonesboro, S.K. Wallace Assocs. 404-471-6297
 Ill Downers Grove, S.W. Anderson Co.
 312-964-2600
 Ill Glen Ellyn, S.W. Anderson Co. 312-489-7182
 Ind Crown Point, S.W. Anderson Co. 219-663-1707
 Ind Indianapolis, S.W. Anderson Co. 317-255-1971
 Mass Topsfield, Reps. Corp. 617-426-0541
 Minn Minneapolis, C.E. Bohlig Co. 612-922-7011
 NY New Rochelle, A & M Assocs. 914-235-4672
 NY Syracuse, Lenard Co. 315-479-9191
 NC Greensboro, S.K. Wallace Assocs.
 919-292-0487

Ohio Cincinnati, J.O. Olsen Co. 513-922-2176
 Ohio Cleveland, J.O. Olsen Co. 216-752-5444
 Pa Birchrunville, Jadelectronics Assocs.
 215-647-5151
 Pa Pittsburgh, J.O. Olsen Co. 412-279-2550
 Tenn Memphis, S.K. Wallace Assocs. 901-682-2281
 Tex Garland, G.V. Peck Co. 214-341-8311
 Tex Houston, G.V. Peck Co. 713-664-1435
 Wash Seattle, Blum & Assocs. 206-284-4082
 Wisc Milwaukee, S.W. Anderson Co. 414-476-5100

Local Distributors

Ariz	Phoenix, Gramer Distributing, 100 W. Camelback Rd., Suite 101B	602-279-1231
Cal	Los Angeles, Mil-Com Dists., 1616 Cotner Ave.	213-478-0525
Cal	San Francisco, Zack Elctns., 1444 Market St.	415-626-1444
Ind	Indianapolis, Ra-Dis-Co., 814 N. Senate Ave.	317-637-5571
Ind	South Bend, Radio Distributing, 1212 High St.	219-287-2911
Md	Baltimore, Radio Elec. Svc. Co., 1026 Cromwell Bridge Rd.	301-823-0070
Mass	Cambridge, Apollo Elctns., 101 Binney St.	617-868-3120
NC	Raleigh, Southeastern Radio Supply Co., 414 Hillsborough St.	919-828-2311
Okla	Tulsa, S & S Radio Supply Co., 537 S. Kenosha	918-582-8242
Tex	Houston, Lenert Co., Box 2184	713-225-1465
Wash	Seattle, Ron Merritt Co., 1320 Prospect St.	206-622-0177
Wisc	Madison, Satterfield Elctns., Box 1438	608-257-4801

AMERICAN AEROSPACE CONTROLS, INC., 131
Verdi St., Farmingdale, N.Y., 11735, Tel: 516-694-5100;
Empl.: 30; Minimum order: \$25

p. 1•230-232,2330-2332
For info on price: Order Desk; Application info: G. D. D'Abramo; Customer service: G. D. D'Abramo; Delivery info: Mrs. Roberts

Free literature available: General Catalog, Short Form Catalog, Data Sheets on Each Product.

Products manufactured: Current Sensors, Generators, Magnetoresistors, Hall, Monitors, Multipliers, Relays, Transducers

Local Sales Offices & Reps.
 Cal Los Angeles, Dyna Sls. Co. 213-268-1175
 Mass Newton Center, Daner Hayes, Inc.

Ohio	Cleveland, Instrumentation Sys.	216-486-0782
Ohio	Dayton, Instrumentation Sys.	513-294-2838
Pa	Pittsburgh, Instrumentation Sys.	412-243-1111

AMERICAN AIRLINE FREIGHT SYSTEM, 633 3rd Ave.,
New York, N.Y., 10017

Customer service: Freight Cust. Sve.
Free literature available: Brochures on all of our product lines from handling a one pound shipment

Products manufactured: Containers

Local Sales Offices & Reps.
 Ariz. Phoenix R. C. Goss 602 272 1221

Ariz	Phoenix, R. C. Gass	602-273-1221
Cal	Los Angeles, J. C. Boyd	213-776-2520
Cal	San Diego, T. J. Stokes	714-235-5400
Cal	San Francisco, B. C. James	415-761-1300

DC	Washington, H. W. Jones	202-393-6460
Ill	Chicago, R. L. Kragel	312-641-3131
Md	Baltimore, G. J. Martin	301-761-1300

Mass	Boston, M. F. Brueckner	617-567-7700
Mich	Detroit, W. G. Patrick	313-291-7550
Mo	St. Louis, J. P. Bowlin	314-426-5522

NY	Albany, L. H. Larche	518-869-5321
NY	Buffalo, R. H. Butler	716-632-6007
NY	New York, H. W. Coron	212-656-3325

Ohio	Cincinnati, R. R. Trenkamp	606-283-3271
Ohio	Cleveland, M. E. Bradley	216-265-6660
Ohio	Dayton, C. A. Tucker	513-898-5511
Ohio	Columbus, R. J. Fitzhugh	614-291-5521

Okl	Oklahoma City, R. T. Fitzhugh	405-885-5391
Pa	Philadelphia, T. C. Johnson	215-365-5060
Tex	Dallas, K. M. Miller	214-574-3520
Tex	El Paso, H. P. Hallock	915-778-8181

Tex	El Paso, H. F. Hancock	915-778-3484
Tex	Houston, D. J. Charleston	713-228-5237
Tex	San Antonio, G. L. Allison	512-824-1401
Utah	Salt Lake City, J. J. Woerner	801-328-2531

FOR: Can., Toronto, G. J. Britz 416-676-2511

AMERICAN ALUMINUM CO., 230 Sheffield St., Dept.

EEM, Mountainside, N.J., 07092, Tel: 201-AD 3-3500;
Empl.: 125
For info on price: T. Moser; Application info: D.

Stanley; Customer service: R. R. King; Delivery info:
D. Stanley
Free literature available: Literature contains

illustrations and brief explanations of engineered products AMALCO has manufactured to our customers specifications.

Products manufactured: Cases, Equipment,
Instrument, Meter, Cases, Transit, Chassis, Metal,
Containers

Local Sales Offices & Reps.
 Ariz Scottsdale, F. Schoeffler Assocs. ... 602-948-3470
 Cal Downey, E. Shyffer & Assoc. 213-928-1824
 Cal Palmdale, A. H. H. & Co. 818-337-0000

Colo Denver, W. Purdy Co. 303-777-1411

Colo	Denver, W. Purdy Co.	303-777-1411
Fla	Orlando, Hi-Co Assocs.	305-273-0571
Ga	Decatur, H. M. Walton Co.	404-482-2579
Ill	Northfield, H. S. Tollaksen Co.	312-441-6844
Ind	Indianapolis, Russell Sales Co.	317-547-0166
Md	North East, Progressive Assocs.	301-287-6422
Mich	Birmingham, W. A. Baumstark Co.	313-644-1120
Minn	Wayzata, Schlenker & Assocs.	610-473-5171
Mo	St. Louis, R. Pratt & Assocs.	314-426-0420
NJ	Boonton, Winter Assocs.	201-334-3434
NJ	Collingswood, K. Randall Co.	609-854-3323
NY	Plainville, Flower Hill Prods.	516-420-8555
NY	Rochester, Upstate Component Sls.	716-288-1080
NY	Troy, New-Co Assocs.	518-56-0539
NC	Greensboro, Mfr. Sls. Co.	919-274-2474
Ohio	Bay Village, T. R. Heekin	216-871-6939
Pa	Villanova, C.I.V. Co.	215-525-7005
Ri	Peace Dale, G. Forman Co., Inc.	401-789-3001
Tx	Dallas, J. M. Spell Co.	214-620-0040
Tx	Houston, Traton, Inc.	713-782-8234
WVa	Wheeling, D & L Sls. Co.	304-232-0040

**Products manufactured: Amplifiers, Converters,
Data Acquisition & Reduction Systems,
Memories, Buffer, Memory Systems**

AMERICAN CHEMICAL ETCHING, INC., 13730 Desmond St., Pacoima, Cal., 91331, Tel: 213-896-1188; Empl.: 16

Test, Shields, Springs (All Types), Strip-Line Components, Microwave

AMERICAN ELECTRIC CABLE CO., 181 Appleton St.,
Holyoke, Mass., 01040, Tel: 413-539-9893; Empl.: 100
For info on price: H. Peterson; Application info: W.M.
Mason. Customers serving: W.M. Mason. Delivery info:

Assemblies & Harnesses, Cable, Services,
Assembly, Production & Test, Solder (All Types),
Strips, Wire, Wire Shielding, Wire Strippers, Wire
Twisters

Mass Holyoke, American Electric Cable Co. 413-539-9893

		314-822-3015
NJ	Hohokus, D.J. Fisher Co., Inc.	201-652-0090
NY	E. Syracuse, Mac-Tron Sales & Engrg., Co.	

FOR: Can., Montreal, Que., McIntyre Agencies Ltd.
514-731-9618

AMERICAN ELEC. HEATER, 6110 Cass Ave., Detroit

Products manufactured: Cleaners, Ultrasonic, Heat

Local Sales Offices & Reps.

Ariz	Phoenix, Maddox Sls. Co.	602-274-3807
Cal	Pico Rivera, Maddox Sls. Co.	213-949-5433

Fla	Clearwater, H.R. Gross Co.	813-446-6649
Ga	Atlanta, Millar Electr. Inc.	404-261-6160
Ill	Mt. Prospect, American Electrical Heater Co.	312-352-6815

		312-253-6813
Ind	Indianapolis, Sukup & Cox Inc.	317-253-5501

Iowa Des Moines, K. Kelly & Co. 515-255-5501
 Kans Shawnee Mission, K. Kelly & Co. 913-722-0000
 La Metairie, F. McKinney Sls. Co. 504-887-1723
 Md New Carrollton, W. A. Brown Co. 301-577-4527
 Mass Wayland, Ellingwood Inc. 617-358-2883
 Mo St. Louis, K. Kelly & Co. 314-968-3800
 NM Albuquerque, Maddox Sls. Co. 505-298-2422
 NY Cicero, Advanced Comps Corp. 315-699-2671
 NY Clinton, Advanced Comp Corp. 315-853-6438
 NY Elmhurst, Wilson Assoc. 212-899-0929
 NY Endicott, Advanced Comp Corp. 607-785-3191
 NY Scottsville, Advanced Comp Corp. 716-889-1429

NC Raleigh, Millar Elctr. Inc. 919-787-9585
 Ohio Wickliffe, Associate Sls. Co. 216-585-5445
 Okla Tulsa, J.F. McKinney Sls. Co. 918-742-6791
 Ore Portland, J.W. Eckersley Co. 503-246-3183
 Pa Norristown, American Electrical Heater Co. 215-272-4818
 Tex Dallas, J.F. McKinney Sls. Co. 214-631-9450
 Tex Houston, J.F. McKinney Sls. Co. 713-774-3232
 Va Alexandria, W. A. Brown Co. 703-836-1800
 FOR: Can., Downsview, Ontario, Len Finkler Ltd. 416-830-9103
 FOR: Can., Montreal, Quebec, Len Finkler Ltd. 514-342-9800
 FOR: Can., N. Vancouver, B.C., Len Finkler Ltd. 604-988-2713
 FOR: Can., Sherwood Park, Alberta, Len Finkler Ltd. 403-699-2979

AMERICAN ELECTRONIC CONTROLS, 25 Clark Dr.,
 Barrington, N.J., 08007, Tel: 609-546-5792; Empl.: 23
 Customer service: R. Patterson

Products manufactured: Controls/Control Eqpt.,
 Deposition Equipment, Vacuum & Accessories,
 Heaters & Heating Elements, Test Equipment,
 Testers, Timers



AMERICAN ELECTRONICS, INC., 1600 E Valencia Dr.,
 Fullerton, Cal., 92631, Tel: 714-871-3020, TWX:
 910-592-1256; FSC No: 89321; Empl.: 150; Minimum
 order: \$100

Customer service: B. G. Guy 714-871-3020
 Free literature available: Hi-Cycle
 Inductor-Alternators, 400 cycle Motor-Generator
 Sets, Permanent Magnet DC Motors,
 Compensated Computing Resolvers &
 Amplifiers, DC Motors, Resolvers, Stepper
 Motors

Products manufactured: Alternators, Converters,
 Generators, Motor & Generator Armatures,
 Rotors, Stators, Motor Electric Generator Sets,
 Motors, Resolvers, Synchro, Servo Systems,
 Tachometers

Local Sales Offices & Reps.
 Cal Los Angeles, Products Supply Co. 213-659-1858
 Cal Los Angeles, Sumitomo Shoji Amer. 213-627-4783
 Ill Chicago, Engineered Sls Co. 312-867-8434
 Ohio Lakewood, Power Engrg. Sales 216-221-9090
 Wash Seattle, Instrument Lab. 206-283-5850

AMERICAN GAS & CHEMICALS CO., LTD., 511 E. 72nd
 St., New York, N.Y., 10021, Tel: 212-535-7336; Empl.:
 25
 Products manufactured: Detectors

AMERICAN INSTR. CO., Div. Travenol Labs. Inc., 8030
 Georgia Ave. - Dept. D16-2, Silver Spring, Md., 20910,
 Tel: 301-JU 9-1727, TWX: 710-825-9621; Empl.: 572
 For info on price: R. Dennis; Application info: F.
 Quinn; Customer service: R. Dennis; Delivery info: R.
 Dennis

Products manufactured: Alarms, Baths, Controlled
 Temperature (Air & Liquid), Chamber,
 Environmental Test, Controls/Control Eqpt., Data
 Acquisition & Reduction Systems, Indicators

Local Sales Offices & Reps.
 Cal Santa Ana, American Instr. Co. 714-557-2120
 Cal Sausalito, American Instr. Co. 415-332-4726
 Colo Denver, American Instr. Co. 303-422-6313
 Fla Gainesville, American Instr. Co. 904-378-4612
 Haw Kailua, American Instr. Co. 808-254-2491
 Ill Barrington, American Instr. Co. 312-381-5120
 Mass Bedford, American Instr. Co. 617-275-0014
 NJ Collingswood, American Instr. Co. 609-854-6633
 NY Babylon, American Instr. Co. 212-353-3663

NY Pittsford, American Instr. Co. 716-334-0110
 NC Black Mountain, American Instr. Co. 704-669-6100
 Ohio Cleveland, American Instr. Co. 216-248-5920
 Tex DeSoto, American Instr. Co. 214-224-1222
 Tex Humble, American Instr. Co. 713-446-7551
 FOR: Can., Don Mills, Ont., American Instr. Co. 416-247-0485

AMERICAN LAVA CORP., Sub 3M Co., Cherokee Blvd. &
 Mfg. Rd., Chattanooga, Tenn., 37405, Tel:
 615-265-3411, TWX: 810-573-5216; Empl.: 2000

Products manufactured: Capacitors, Fixed, Circuits,
 Printed, Multilayer, Coatings, Compounds,
 Encapsulating, Insulating, Molding, Potting, Cores,
 Ceramic, Feedthrus & Seals, Environmental, Heat
 Sinks, Soldering, Holder & Carriers, Insulators &
 Insulation, Packages, Integrated Circuit, Seals,
 Services, Assembly, Production & Test,
 Substrates, Terminals, Thermocouples, Elements
 & Accessories, Tubes, Tubing

Local Sales Offices & Reps.
 Ariz Scottsdale, American Lava 602-948-6750
 Cal Los Angeles, 3M Co. 213-726-1511
 Cal San Francisco, 3M Co. 415-761-1155
 Conn Orange, American Lava 203-795-3254
 Ill Bedford Park, 3M Co. 312-585-7800
 Ind Indianapolis, American Lava 317-888-2196
 Mass Boston, 3M Co. 617-449-0300
 Minn St. Paul, 3M Co. 612-733-8407
 NJ West Caldwell, 3M Co. 201-227-9100
 NY Phoenix, American Lava 315-695-3335
 Ohio Cleveland, 3M Co. 216-267-1800
 Pa Philadelphia, 3M Co. 215-742-0200
 Tenn Chattanooga, American Lava 615-877-1677
 Tex Dallas, 3M Co. 214-327-7311
 Va Roanoke, American Lava 703-989-3572

AMERICAN MAGNETICS CORP., P.O. Box 8, Cartersville,
 Ill., 62918, Tel: 618-985-4838; Empl.: 120; Minimum
 order: \$25

For info on price: V. R. Stoner; Application info: R. E.
 Hume; Customer service: V. R. Stoner; Delivery info:
 R. L. Watson

Products manufactured: Chokes, Coils Including
 Assemblies & Forms, Reactors, Transformers

Local Sales Offices & Reps.
 Fla Miami, L. P. Hench Co. 305-652-4991
 Ind Fort Wayne, Component/Insulation Corp. 219-485-7114
 Iowa Cedar Rapids, D. Taylor 319-364-2282
 Mass Newton Upper Falls, Brookdale Elctns. Engrg. 617-244-6969
 Mich Birmingham, Forand Sls. Co. 313-644-0087
 NY Glen Oaks, S. Oser 212-343-4506
 NY Rochester, L. G. Marchese Assoc. 716-342-7664
 Ohio Cleveland, Component/Insulation Corp. 216-521-3570
 Okla Tulsa, Component's Inc. 918-583-9149
 Pa Norberth, S. A. Jeffries 215-664-8500
 Tex Dallas, United Comps. 214-324-1448

AMERICAN MAGNETICS, Box R, Oak Ridge, Tenn.,
 37830, Tel: 615-482-1056; Empl.: 8

For info on price: D. L. Coffey; Application info: K. R.
 Efferson; Customer service: E. T. Henson; Delivery
 info: E. T. Henson

Products manufactured: Coils Including Assemblies
 & Forms, Magnets

AMERICAN MICROSYSTEMS, INC., 3800 Homestead Rd.,
 Santa Clara, Cal., 95051, Tel: 408-246-0330, TWX:
 910-338-0018; Empl.: 3000; Minimum order: \$50

For info on price: R. Konrad; Application info: R.
 Konrad; Customer service: M. Jones; Delivery info: M.
 Jones

Products manufactured: Display Devices/Displays,
 Integrated Circuit Devices, Semiconductor Wafer
 Fabrication

Local Sales Offices & Reps.
 Ariz Phoenix, Hecht, Henschen & Assocs. 602-275-4411
 Cal Manhattan Beach, American Micro-systems 213-379-2452
 Cal Mountain View, American Micro-systems 415-969-0610
 Fla Altamonte Springs, American Micro-systems 305-830-8889
 Ill Elk Grove Village, American Micro-systems 312-437-6496
 Mass Norwood, American Micro-systems 617-762-0726
 Mich Brighton, Lowrey & Assocs. 313-227-7067
 Mich Livonia, American Micro-systems 313-478-9339

Minn Minneapolis, American Micro-systems 612-546-3354
 NY Monsey, American Micro-systems 914-352-5333
 NY Syracuse, Precision Sls. Co. 315-458-2223
 Okla Oklahoma City, Parvin Sls. Co. 503-649-6177
 Ore Beaverton, E. S. Chase Co. 215-643-0217
 Pa Ambler, American Micro-systems 412-366-5056
 Pa Pittsburgh, Compu Graphs 214-239-9148
 Tex Addison, Parvin Sls. Co. 713-784-9900
 Tex Houston, Parvin Sls. Co. 214-231-5721
 Tex Richardson, American Micro-systems 206-774-8586
 Wash Edmonds, E. S. Chase Co. 214-231-5721

AMERICAN MONARCH CORP., 2801-37th Ave., N.E.,
 Minneapolis, Minn., 55421, Tel: 612-788-9161; Empl.:
 175

For info on price: R. Sutherland; Application info: L.
 Anderson; Customer service: R. Sutherland; Delivery
 info: R. Sutherland

Products manufactured: Chassis, Metal, Chokes,
 Converters, Eliminators, Battery, Inverters, Power
 Supplies, Testers, Transformers

Local Sales Offices & Reps.
 Cal Santa Clara, Cummings & Assocs. 408-241-3444
 Cal Woodland Hills, Cummings & Assocs. 213-340-6036
 Fla St. Petersburg, Lanagan Sls. Co. 813-822-1192
 Ill Oak Park, Wasson-Gallagher Inc. 312-261-7517
 Md Baltimore, J.A. Maguire & Co. 301-377-0223
 Mass Lexington, Circuit Sls. Co. 617-861-0567
 Mich Birmingham, Forand Sls. Co. 313-644-0087
 NJ Pennsauken, J.A. Maguire & Co. 609-665-5136
 NJ Plainfield, J.A. Maguire & Co. 201-754-6400
 NY Camillus, Ontec 315-488-2203
 NY Fayetteville, Ontec 716-773-9319
 NY Grand Island, Ontec 516-881-8444
 NY Plainview, Preisick Assoc. 716-464-8636
 NY Rochester, Ontec 919-723-5980
 NC Winston Salem, J.A. Maguire & Co. 405-373-2748

Okla Oklahoma City, Ammon & Rizos Co. 918-633-8518
 Okla Tulsa, Ammon & Rizos Co. 214-233-5591
 Tex Dallas, Ammon & Rizos Co. 713-729-1233
 Tex Houston, Ammon & Rizos Co. 214-233-5591

AMERICAN OPTICAL CORP., Sci. Instr. Div., Eggert &
 Sugar Rds., Buffalo, N.Y., 14215, Tel: 716-895-4000;
 Empl.: 1500

Products manufactured: Microscopes

Local Sales Offices & Reps.
 Cal Los Angeles 213-245-6454
 Cal San Francisco 415-826-8300
 Colo Denver 303-321-1010
 Ga Atlanta 404-881-1426
 Ill Chicago 312-671-3506
 Md Silver Spring 301-585-3681
 Mass Boston 617-782-2538
 Mich Detroit 313-962-0919
 Minn Minneapolis 612-823-8261
 Mo St. Louis 314-631-1155
 NY Buffalo 716-895-4000
 NY New York City 212-986-2300
 Ohio Cincinnati 513-421-4414
 Ohio Cleveland 216-241-0737
 Pa Philadelphia 215-568-1448
 Pa Pittsburgh 412-281-9513
 Tenn Memphis 901-525-4401
 Tex Dallas 214-747-8361
 Tex Houston 713-526-1731

AMERICAN POWER DEVICES, 7 Andover St., Andover,
 Mass., 01810

AMERICAN POWER SYSTEMS CORP., 51 Jackson St.,
 Worcester, Mass., 01608, Tel: 617-753-8103; Empl.: 51
 Products manufactured: Power Supplies

Local Sales Offices & Reps.
 Cal Pasadena, P. Nurches Co. 213-681-8957
 Conn Madison, United Comps. Inc. 203-562-4002
 Conn New Haven, United Comps. Inc. 203-562-4002
 Mass Attleboro, United Comps. Inc. 617-225-0556
 Mass Worcester, Ampsco Mktg. Corp. 617-753-8103
 NY Roslyn Heights, Trauco Assoc. Inc. 516-621-3223
 RI Saunderstown, United Comps. Inc. 401-295-8342

AMERICAN RADIO RELAY LEAGUE, 225 Main St.,
 Newington, Conn., 06111, Tel: 203-666-1541; Empl.: 80
 Free literature available: Catalogue sheets showing
 our various publications.

Products manufactured: Technical Books

AMERICAN RESCH. CORP., Rte. 6 & New Britain Ave., Farmington, Conn., 06032, Tel: 203-677-2693; Empl.: 15
For info on price: J. Shamroth; Customer service: T. Augustyn

Products manufactured: Chamber, Environmental Test

AMERICAN SAFETY RAZOR, P.O. Box 500, Staunton, Va., 24401

AMERICAN SMELTING & REFINING CO., 120 Broadway, New York, N.Y., 10005

AMERICAN SWITCH CORP., Sadler St., Gloucester, Mass., 01930, Tel: 617-281-2224; Empl.: 8
Customer service: R. T. Armitage

Free literature available: Comprehensive catalog listing all electrical & mechanical specs plus features, new product insert sheets cross reference sheet price schedule, and listing reps. & distributors.

Products manufactured: Switches

Local Sales Offices & Reps.

Ariz	Scottsdale, Chewer Electronic Sls.	602-994-3288
Cal	Encino, V & L Assocs.	213-986-9703
Cal	San Carlos, D.H. Ross Co.	415-691-4411
Cal	Arvada, Cleveland Entrs. Inc.	303-423-3707
Conn	Wallingford, Com-Sale Assocs.	203-269-7964
Fla	Hollywood, W. Ben Wimberly Co.	305-961-6962
Fla	Orlando, W. Ben Wimberly Co.	305-423-2514
Ga	Smyrna, Fausett of Georgia	404-436-5169
Ill	Streamwood, Al Holte & Assocs.	312-837-4066
Ind	Fort Wayne, Needler Sls. Co. Inc.	219-447-2123
Iowa	Cedar Rapids, J. Vrbik Co.	319-377-8244
Md	Baltimore, Bernard White & Co.	301-484-5400
Mass	Gloucester, American Switch Corp.	617-281-2224
Mass	Waltham, Com-Sale Assocs.	617-890-0011
Minn	Minneapolis, Hasse & Assocs.	612-535-2671
Mo	Saint Louis, Gordon Fixman Eng'g. Co.	314-725-5219
NJ	Teaneck, Stan Axelrod Assocs.	201-836-2661
NM	Albuquerque, Cleveland Entrs. Inc.	505-298-7671
NY	Port Washington, P.D. Aaron Assoc.	516-883-0600
NY	Syracuse, Nycorn Inc.	315-437-8343
Ohio	Vandalia, W.J. Braver & Assoc., Inc.	513-898-1224
Ohio	Wickliffe, W.J. Braver & Assoc., Inc.	216-943-0601
Pa	Pittsburgh, W.J. Braver & Assoc., Inc.	412-921-3213
Tex	Dallas, McCoy Assocs.	214-350-9931
Tex	Houston, McCoy Assocs.	713-649-5756
Va	Vinton, Fausett of Georgia	703-890-1128
Wash	Seattle, R.K. Squibb, Inc.	206-632-2450

Local Distributors

Ariz	Scottsdale, Vanguard Supply Co., 10333 N. Scottsdale Rd.	602-948-2240
Cal	Anaheim, Henry Radio Co., 931 N. Euclid St.	714-772-9200
Cal	Buena Pk., S.J. Radio Elctns., 6001 Beach Blvd.	714-521-1906
Cal	Burlingame, Rose Electr. Dist. Co., 846 Stanton Rd.	415-697-0224
Cal	Canoga Pk., Sandy's Electr. Supply, 21305 Saticoy St.	213-346-8353
Cal	Costa Mesa, Mar-Vac Elctns., 1829 Newport Blvd.	714-540-3280
Cal	Long Beach, Scott Radio Supply, 266 Alamitos Ave.	213-437-8629
Cal	Los Angeles, Control Parts Distributors, 1252 W. Temple St.	213-625-1488
Cal	Los Angeles, Elec. Switches, 2478 Fletcher Dr.	213-664-1141
Cal	San Jose, Peninsula Elctn. Supply, 980 S. First St.	408-294-8781
Cal	San Rafael, Elctns. Plus, 823 Fourth St.	415-457-0466
Cal	Santa Monica, Master Distributors, 1553 17th St.	213-395-2637
Cal	Van Nuys, Patane Avionics, 5937 Kester Ave.	213-968-4455
Fla	Miami, Farreys Hdw. Co., 7225 NW Seventh Ave.	305-754-5451
Ill	Streamwood, GTI Supply, 517 Hillside Dr.	312-837-4066
Iowa	Cedar Rapids, Jerry Vrbik Co., Three 50th St. N.E.	319-377-8244
Md	Beltsville, Treeko Sls., 10739 Tucker St.	301-937-8260

Md	Bethesda, Empire Electr. Supply, 4907 Rugby Ave.	301-656-3300
Mass	Cambridge, Apollo Electr., 101 Binney St.	617-868-3120
Mass	Waltham, QPL Elctn. Distributors, 47 Calvary St.	617-924-4100
Mich	Grand Haven, GTI Supply, Beechtree Marion	616-842-5430
Minn	Minneapolis, Industrial Components, 5280 W. 74th St.	612-831-2666
NH	Londonderry, Yankee Electr. Supply, Grenier Ind. Village	603-625-9746
NJ	Colonia, Pamco Elctns., 1333 St. George St.	201-574-9366
NJ	Fairfield, Industrial Elctns., 1275 Bloomfield Ave.	201-575-8420
NJ	Hackensack, Tide Electr., 97 S. State St.	201-488-3900
NJ	Rockaway, Electrospec, 11 Bank St.	201-625-2300
NY	Melville, Prime Electronics, 275 Broadhollow Rd.	516-420-1600
NY	Mt. Vernon, QAR Industrial Elctn. Sls., 621 S. Columbus Ave.	914-699-2224
NY	Port Washington, Connector Concepts Corp., 735 P. Washington Blvd.	516-883-0600
Ore	Portland, EOFF Electric Co., 509 NW 10th Ave.	503-222-9411
Pa	Philadelphia, Simco Electronics, 3907 N. Broad St.	214-748-6533
Tex	Dallas, All State Elctns., 510 S. Good Latimer St.	214-341-2990
Tex	Dallas, Dallas Instruments, 10205 Plano Rd.	214-634-7870
Tex	Dallas, KA Elctn. Sls., 1220 Majesty	817-531-2961
Tex	Fort Worth, Industry Elctns. Supply, 1818 E. Dagget Ave.	214-259-7544
Tex	Irving, EDCO Elctns., 614 Plymouth Pk. Ctr.	512-226-0247
Tex	San Antonio, Sherman Elctns. Supply, 720 San Pedro Ave.	713-782-3060
Tex	Stafford, Southwest Elctns., 12725 Royal Dr.	206-282-2511
Wash	Seattle, Radar Electric Co., 168 Western Ave. W.	

AMERICAN TECHNICAL CERAMICS, 1 Norden La., Huntington Sta., N.Y., 11746, Tel: 516-271-9600, TWX: 510-226-6993; FSC No: 29990; Empl.: 150 p. 2+28-31

For info on price: Cust. Sls. & Svc.; Application info: W. F. Hamilton; Customer service: Cust. Sls. & Svc.; Delivery info: Cust. Sls. & Svc.

Free literature available: Send for the following ATC literature: "UHF/Microwave Capacitors" product catalog, THE RF CAPACITOR HANDBOOK, "ATC UHF/Microwave Capacitor Kits", RF Capacitor Technical Chart.

Products manufactured: Capacitors, Fixed, Capacitors, Variable

Local Sales Offices & Reps.

Ala	Huntsville, FM Assocs.	205-536-9990
Ariz	Phoenix, Thorson Co.	602-956-5300
Cal	Burbank, Wright Engrg. Co.	213-843-7240
Cal	San Jose, Allgood North	408-288-6731
Fla	Orlando, FM Assocs.	305-851-5710
Fla	Tequesta, FM Assocs.	305-746-3126
Ill	Chicago, Tech. Sls.	312-237-7210
Md	Randallstown, C. Malinow & Co.	301-922-2092
Mass	Natick, Wayland Engrg. Sls.	617-655-6080
Mo	Kansas City, Harris-Hanson Co.	816-444-9494
Mo	St. Louis, Harris-Hanson Co.	314-432-3611
NM	Albuquerque, Technology Marketing Assocs.	303-841-3435
NY	Liverpool, R & D Assocs.	315-622-2350
NY	Syracuse, Nycorn, Inc.	315-437-8343
NC	Greensboro, FM Assocs.	919-294-2754
Ohio	Dayton, Berberich Assocs.	513-433-0342
Tex	Addison, Parvin Sls.	214-239-9148
Tex	Houston, Parvin Sls.	713-721-1054
Wash	Bellevue, Thorson Co.	206-455-9180

AMERICAN TIME PRODUCTS, BULOVA WATCH, 61-20 Woodside Ave., Woodside, N.Y., 11377, Tel: 212-335-6000; Minimum order: \$100

p. 1+4,295,1006,1007,1124

Customer service: R. Ansell

Products manufactured: Amplifiers, Analyzers, Bridges, Calibrators, Choppers, Coders, Coils Including Assemblies & Forms, Comparators, Controls/Control Eqpt., Crystals, Decoders, Demodulators, Detectors, Drivers, Chopper, Filters, Generators, Indicators, Inverters, Keyers, Tone, Light Choppers, Meters, Modulator/Demodulators, Modulators, All Kinds, Monitors, Oscillators, Power Supplies, Records, Frequency Test, Regulators, Scanners, Servo Systems, Standards, Switches, Timers, Transducers, Tuning Forks

Local Sales Offices & Reps.

Ariz	Scottsdale, Carter Assocs.	602-947-4355
Cal	Palo Alto, A. Barrauck	415-327-7711
Ill	Chicago, Tech. Rep. Inc.	312-761-0548
Minn	Minneapolis, Torkelson Assocs.	612-835-2414
NY	Buffalo, H.C. Johnson Agencies	716-632-7880
NY	Mamaroneck, Cane Tech. Sls.	914-698-4411
Pa	Glenshaw, H.C. Johnson Agencies	716-482-3000
Tex	Richardson, Carl Tinch Sls. Co.	214-231-1322
EXP:	New York, N.Y., C. Tennant	212-679-1300

AMERICAN TRANS-COIL CORP., 124-06 101st Ave., Richmond Hill, N.Y., 11419, Tel: 212-441-5207; Empl.: 50

Customer service: W. T. Clancy

Free literature available: Bulletins listing items we (ATC) supply for specific military equipment ie: AN/GRC-106-Bulletin #125. Items listed are cross referenced to U.S. Govt. Drawings, Fed. Stock No., and O.E.M. Part No.

Products manufactured: Amplifiers, Chokes, Coils Including Assemblies & Forms, Discriminators, Filters, Networks, Oscillators, Reactors, Transformers

Advertisement

American Trans-Coil Specializes in Military type Coils Transformers and Filters Tolerances within one quarter of one percent. For prototype and production quantities of linear permeable tuned R.F. and I.F. transformers, B.F.O.'s discriminator transformers, R.F. oscillators, toroids, networks and filters-active and passive, send your specifications or drawings for responsive quotations.

AMERICAN ULTRAVIOLET, 320 Commerce St., Chatham, N.J., 07928, Tel: 201-635-8355, Telex: 139266; Empl.: 14; Minimum order: \$15

For info on price: G. W. Fitzgerald 201-635-8355; Application info: G. W. Fitzgerald 201-635-8355; Customer service: J. S. Raymond 201-635-8356; Delivery info: D. M. Loges 201-635-8357

Products manufactured: Lamps, Lights, Radiometers, Sockets, Ultraviolet Inspection Lighting

AMERICAN USED COMPUTER CORP., Box 68, Kenmore Sta., Boston, Mass., 02215, Tel: 617-261-1100, TWX: 710-321-6388

Products manufactured: Computers, Converters, Memory Systems, Printers, Punched Card Equipment

AMERICAN VECTOR/TDC, 201 Culver Rd., Dayton, N.J., 08810, Tel: 201-329-4683, TWX: 710-983-4448; Empl.: 175 p. 1+1083

Products manufactured: Amplifiers, Controls/Control Eqpt., Converters, Generators, Inverters, Oceanographic Equip. (Electronic), Oscillators, Power Supplies, Regulators, Services, Assembly, Production & Test, Shifters, Signal Conditioners & Equipment, Standards, Testers, Transformers, Transmitters, Underwater Communication, Detection, Navigation, etc. Equipment, Voltage Sources

Local Sales Offices & Reps.

Cal	Inglewood, L & M Engrg. Inc.	213-674-6850
Cal	San Diego, Qualtrons	714-224-6555
Cal	Santa Clara, L & M Engrg. Inc.	408-243-2891
Ill	Chicago, K. W. Meyers Co.	312-774-6440
Ind	Indianapolis, K. W. Meyers Co.	317-243-6681
Md	Silver Spring, Gawler-Knoop Co.	301-589-4406
Mass	Attleboro, Electronic Sls. of New England	617-222-4078
Minn	Minneapolis, K. W. Meyers Co.	612-920-7080

NJ	Englewood, Central Assocs.	201-568-0808
NM	Albuquerque, Rustco Entrs.	505-296-6474
NY	Plainview, Central Assocs.	516-433-0808
NY	Rochester, Scientific Devices	716-334-2445
Ohio	Cleveland, Automated Equip. & Eng.	216-462-2855
Pa	Philadelphia, W. F. Assocs.	215-224-4120
Pa	Pittsburgh, Automated Equip. & Eng.	412-931-7616
Tex	Houston, Scientific Sls. Co.	713-781-2711
Tex	Richardson, Scientific Sls. Co.	214-231-6541
Wash	Seattle, Hayes Tech.	206-763-2210
FOR:	Can., Scarborough, Ontario, J. De Groot Assoc.	416-264-2991

AMERICAN VIDEOINETICS CORP., 795 Kifer Rd., Sunnyvale, Cal., 94086, Tel: 408-732-2000, TWX: 910-339-9362; Empl.: 70; Minimum order: \$25

For info on price: R. Meyering; Application info: L. Lehman; Customer service: L. Leahman; Delivery info: R. Meyering

Free literature available: 1. Datacord tape memory systems. Product specifications & application notes on all digital recording devices offered by AVC. 2. Magnetic Head Products. All magnetic head products.

Products manufactured: Heads, Recording Playback, Erase, Memory Systems, Recorders

AMERICAN ZETTLER, INC., 16881 Hale Ave., Irvine, Cal., 92705, Tel: 714-540-4190; Empl.: 70

p. 1•1574-1577,1932

Products manufactured: Covers, Protective (Including Dust), Relays, Retainers, Sockets, Solenoids, Switches

Local Sales Offices & Reps.

Ala	S.E. Huntsville, Elmar Assocs.	215-881-0274
Ariz	Tempe, J.F. Hurlbut Co.	602-968-5962
Cal	Mountain View, G.C. Woempner Co.	415-964-5454
Cal	Santa Monica, Rep Assocs.	213-829-5401
Colo	Golden, J.F. Hurlbut Co.	303-279-7996
Conn	North Haven, Forsberg Sls.	203-239-5111
Fla	Maitland, Barrett Assocs.	305-678-0172
Fla	Miami, Barrett Assocs.	305-681-4957
Ga	Atlanta, Elmar Assocs.	404-938-2821
Ill	Elk Grove Village, Knoblock & Assocs.	312-593-5940
Ind	Indianapolis, Quad-El Inc.	317-356-5449
Kans	Shawnee Mission, Florence & Meyer Inc.	913-722-5210
Kans	Wichita, Florence & Meyer Inc.	316-838-7226
Mass	Brockton, Forsberg Sls.	617-522-6300
Minn	Minneapolis, R.W. Marshall Co.	612-929-0457
Mo	St. Charles, Florence & Meyer	314-724-6690
NJ	Cherry Hill, Danco Elctrn. Sls. Corp.	609-424-5590
NY	Alexander, B.H. Tollefson Assocs.	716-591-1219
NY	Auburn, B.H. Tollefson Assocs.	315-253-4109
NY	Lynbrook, MWM Assocs.	516-593-6190
NY	Rochester, B.H. Tollefson Assocs.	716-271-4141
NC	Raleigh, Elmar Assocs.	919-787-2841
Ohio	Cincinnati, R. Makin Assocs.	513-232-5588
Tex	Dallas, R. Martin Assocs.	214-361-8584
Tex	Houston, R. Martin Assocs.	713-462-4077
Wash	Seattle, Thorsen Co.	206-455-9180
Wisc	Milwaukee, Devos/Prinz	414-272-0356
For:	Can., Ottawa, Ont., Lake Engrg.	613-729-6090
For:	Can., Richmond, B.C., Lake Engrg.	604-277-0414
For:	Can., Scarborough, Ont., Lake Engrg.	416-751-5980
For:	Can., St. Laurent, Que., Lake Engrg.	514-747-2441
For:	Can., Winnipeg, Man., Lake Engrg.	604-889-7966

AMERICAN ZETTLER, INC. cont'd

Advertisement

Alois Zettler, a Swiss company, is one of the largest relay and switch manufacturers in Europe. American Zettler, a wholly owned subsidiary, follows the traditional Swiss observance of quality and precision. Assembly and checkout facilities in the United States are staffed by highly skilled and experienced circuit analysts who are on call to assist you in specifying any relay or switch application. A complete stock of products assures you of immediate, off-the-shelf delivery. Our engineers will be glad to provide you with free samples of American Zettler relays and switches and discuss your problems at no cost or obligation. Simply call or write one of the Sales-Engineering Representatives listed, or contact our headquarters in Irvine, California.

AMERSIL, INC., 685 Ramsey Ave., Hillside, N.J., 07205, Tel: 201-688-4500; Empl.: 100; Minimum order: \$25
Customer service: Sls. Dept.

Free literature available: Amersil Price list EM-9503-3 Covers a complete line of fused quartz and fused silica products designed to meet the exacting specifications required by the electronic industry.

Products manufactured: Machines/Machinery, Production, Quartz, Fused, Silica, Fused, Substrates, Tubing

Local Sales Offices & Reps.

Cal	Pasadena, Amersil, Inc.
Mass	Plymouth, Amersil, Inc.
Ohio	Cleveland, Amersil, Inc.
Tex	Dallas, Roy Tindal & Assocs.
FOR:	Can., Toronto, Ont., Engelhard Inds. Div.

AMETEK, Applies Materials Div., Station Square Two, Paoli, Pa., 19301, Tel: 215-647-2121
Customer service: R. Menard

Free literature available: Electro Deposition of Aluminum-Four-Page Bulletin AM-102 Describes Ametek, Applied Materials Process For Ambient Temperature Electro Deposition of Aluminum.

Products manufactured: Services, Assembly, Production & Test

Advertisement

Selective gold plating of electronic components such as semiconductors and electrical contacts in production quantities. Also, ambient temperature electrodeposition of aluminum on microelectronic parts to provide excellent corrosion resistance and conductivity. Request free descriptive literature from AMETEK, Applied Materials.

AMETEK CONTROLS DIVISION, 860 Pennsylvania Blvd., Feasterville, Pa., 19047, Tel: 215-355-6900; Empl.: 100

Products manufactured: Coils Including Assemblies & Forms, Controls/Control Eqpt., Demodulators, Indicators, Meters, Power Supplies, Transducers, Transformers, Wire

AMETEK, HUNTER SPRING DIVISION, One Spring Ave., Hatfield, Pa., 19440, Tel: 215-822-2971, TWX: 510-661-4888; FSC No: 6635; QPL No: 43560; Empl.: 375; Minimum order: \$25

For info on price: A. Haag; Application info: A. Haag; Customer service: R. Hager; Delivery info: A. Haag

Products manufactured: Forms, Wire, Gages, Mounts, Reels, Cord & Cable, Springs (All Types)

AMETEK/LAMB ELECTRIC, 627 Lake St., Kent, Ohio, 44240, Tel: 216-673-3451; Empl.: 1000

For info on price: R. Page; Application info: E. J. Moore; Customer service: K. Wagner; Delivery info: R. Page

Free literature available: LC 101 - Capabilities Brochure; LC 102 - Product Selection Guide.

Products manufactured: Blowers & Fans & Accessories, Motors, Pumps, Vacuum

Local Sales Offices & Reps.

Cal	Thousand Oaks, J. H. Leadam	805-497-2817
Colo	Denver, N. Novosel	303-623-4583
Ill	Elk Grove, L. L. Chamberlain	312-255-3097
Minn	Minneapolis, L. D. Dykstra	612-888-9044
NJ	Morristown, W. W. Washnock	201-267-3772
NY	Rochester, P. J. Trevelier	716-436-5700
Ohio	Ravenna, S. W. Mackey	216-296-8867

AMF ELECTRICAL PRODS., Development Div., 1025 N. Royal St., Alexandria, Va., 22314, Tel: 703-548-7221, TWX: 703-931-4209; Empl.: 243

Customer service: Mrs. Jensen

Products manufactured: Alarms, Amplifiers, Annunciators, Cable Assemblies & Harnesses, Circuits, Hybrid, Thick Film, Computers, Oceanographic Equip. (Electronic), Transponders, Underwater Communication, Detection, Navigation, etc. Equipment

AMGLO CORP., 5301 Wesley Terr., Rosemont, Ill., 60018, Tel: 312-671-4321; Empl.: 21

Customer service: D. Novy

Products manufactured: Capacitors, Fixed, Flashers, Lamps, Power Supplies, Tubes

AMI/COAST MAGNETICS, INC., 1207 N. LaBrea Ave., Inglewood, Cal., 90301, Tel: 213-673-3245; FSC No: 22558; Empl.: 50

For info on price: A. Jones; Customer service: J. Zarate; Delivery info: A. Jones

AMP CAPITRON DIV./AMP INC., 1595 S. Mt. Joy St., Elizabethtown, Pa., 17022, Tel: 717-367-1105, TWX: 510-657-4561

p. 1•128,129,526,527,1088,1089; p. 2•450,451

Products manufactured: Cable, Connectors, Converters, Filters, Lead Assemblies & Receptacles, Modulators, All Kinds, Networks, Power Drivers, Hybrid (High Current, High Voltage), Power Supplies, Programmers, Punched Card Equipment, Punches, Chassis, Readers, Transformers

Local Sales Offices & Reps.

Cal	Compton	213-537-4490
Cal	Cupertino	408-255-3830
DC	Wash	202-293-6936
DC	Washington	202-293-6939
Fla	Orlando	305-341-7771
Ill	Hoffman-Estates	312-885-0720
Mass	Needham	617-444-4839
NY	Canadaiga	315-394-0930
NY	Manhasset	516-627-5418
Tex	Richardson	214-231-2118

AMP INC., Ind'l. Div., Box 3608, Harrisburg, Pa., 17105, Tel: 717-564-0100, TWX: 510-657-4110; Empl.: 12,000

Products manufactured: Boards, Programming, Cable, Capacitors, Fixed, Clamps & Clips, Connector Adapters, Connectors, Contacts, Electrical, Converters, Cords, Data Acquisition & Reduction Systems, Fasteners, Filters, Jacks (All Types), Kits, Terminal, Lamps, Lead Assemblies & Receptacles, Lights, Machines/Machinery, Production, Modulators, All Kinds, Networks, Panels, Plugs, Power Supplies, Punched Card Equipment, Readers, Relays, Sockets, Splicers, Coaxial Cable, Splices, wire (Including, Butt & Cap Types), Switches, Terminals, Tools, Transformers, Tubing

Local Sales Offices & Reps.

Cal	Compton	213-537-4490
Cal	Cupertino	408-255-3830
DC	Washington	204-484-9596
Ga	Atlanta	404-934-6363
Ill	Elk Grove Village	312-439-5800
Mass	Weston	617-891-7500
Mich	Southfield	313-645-5590
Minn	Minneapolis	12-831-8242
NJ	Cranford	201-278-4382
NY	Pittsford	716-385-2860
Ohio	Columbus	614-486-0276
Pa	Berwyn	215-647-6060
Tex	Dallas	14-357-9151

AMP SPECIAL INDUSTRIES, Valley Forge, Pa., 19482, Tel: 215-647-1000, Telex: 84-6405; Empl.: 600

For info on price: A. Salvucci; Application info: F. Harned; Customer service: A. Salvucci; Delivery info: A. Salvucci

Free literature available: Product information bulletins (data sheets); catalog-most widely used products; brochures for specific industries, or product mix:

Products manufactured: Boards, Programming, Caps, Forms & Tapes, Heat Shrinkable, Clamps & Clips, Compounds, Encapsulating, Insulating, Molding, Potting, Connectors, Cords, Cutters, Wire, Hand Operated, Ducts, Wiring, Integrated Circuit Packaging Systems, Kits, Connector, Kits, Terminal, Lamps, Machines/Machinery, Production, Punched Card Equipment, Readers, Relays, Sockets, Splices, wire (Including, Butt & Cap Types), Switches, Terminal Blocks, Boards & Strips, Terminals, Tools, Tubing, Wire & Cable Ties, Wire Strippers

Local Sales Offices & Reps.

Alas Anchorage, Yukon Radio Supp.
Cal Compton, AMP Special Industries
213-639-1691
Cal San Mateo, AMP Special Industries
415-573-7722
Colo Denver, AMP Special Industries 303-756-9453
Ga Atlanta, AMP Special Industries 404-939-7604
Haw Honolulu, AMP Special Industries 538-3774
Ill Elk Grove Village, AMP Special Industries
312-439-7800
Mass Weston, AMP Special Industries 617-899-6700
Mich Southfield, AMP Special Industries
313-557-1210
Minn Minneapolis, AMP Special Industries
612-927-5444
Mo Kansas City, AMP Special Industries
816-753-6245
NJ Cranford, AMP Special Industries 201-276-8300
Ohio Cincinnati, AMP Special Industries
513-821-6650
Pa Paoli, AMP Special Industries 215-647-3250
Pa Philadelphia, AMP Special Industries
215-647-3250
Pa Pittsburgh, AMP Special Industries
412-344-7900
Tex Dallas, AMP Special Industries 214-631-0850

AMERICAN MICROWAVE INDS., INC., 140 Fourth Ave., Waltham, Mass., 02154, Tel: 617-890-4750, TWX: 710-324-6377; Empl.: 234

For info on price: E. J. DeVita; Application info: B. W. Cooper; Customer service: C. Lewis; Delivery info: Sls. Dept.

Products manufactured: Adapters, Waveguide, Attenuators, Bends & Twists, Microwave, Cable Assemblies & Harnesses, Caps, Connector, Connector Adapters, Connectors, Couplers, Detectors, Dividers, Dummy Loads, Junctions, Hybrid, Microwave, Microwave Integrated Circuits (MIC's), Mixers, Modulators, All Kinds, Strip-Line Components, Microwave, Switches, Terminals, Tools, Waveguides & Adapters

Local Sales Offices & Reps.

Cal Anaheim, American Microwave Ind. S/W
714-956-1800
Cal Santa Clara, American Microwave Ind. N/W
408-249-5172
Colo Boulder, J. Smith & Assoc. 303-442-7100
Fla Palm Bay, Spartech Assoc. 305-727-8045
Ga Smyrna, Spartech Assoc. 404-432-3644
Kans Shawnee Mission, Tech. Sls. Assoc.
913-888-3330
Md Lanham, Brimberg Assoc., Inc. 301-552-2200
Mass Burlington, Burlington Sls. 617-272-7655
NM Albuquerque, J. Smith & Assoc. 505-265-3406
NY Syracuse, C.W. Floring & Assoc. 315-478-2149
NY Tuckahoe, Asco Electronics 914-779-8110
Ohio Dayton, Genelco 513-299-1819
Ore Beaverton, Arneson Assoc. 503-646-6064
Pa Plymouth Meeting, R. Mar Co. 215-825-2841
Tex Ft. Worth, W. Pat Fraita Co., Inc. 817-738-2394
Wash Redmond, Desco, Northwest 206-455-9325

AMPEREX ELECTRONIC CORP., Electro-Optical Devices Div., Box 278, Slatersville, R.I., 02876, Tel: 401-762-3800, TWX: 710-382-6332; Empl.: 250

p. 1-2350, 2351

Products manufactured: Capacitors, Fixed, Cavities, Microwave, Cells, Photoconductive, Photoemissive, Photovoltaic, Coils Including Assemblies & Forms, Connectors, Couplers, Detectors, Diodes, Intensifiers, Image, Oscillators, Rectifiers, Scanners, Switches, Thyristors (Includes Silicon Controlled Rectifiers), Transistors, Tubes, Yokes

Local Sales Offices & Reps.

Ala Huntsville, NAPECC 205-543-7351
Ariz Phoenix, NAPECC 602-279-9588
Cal N. Hollywood, NAPECC 213-762-2118

Cal San Diego, NAPECC 714-453-5440
Cal Santa Clara, NAPECC 408-249-1134
Colo Denver, NAPECC 303-922-8434
Fla Ft. Lauderdale, NAPECC 305-772-2840
Ill Elk Grove Vill., NAPECC 312-593-8220
Ind Indianapolis, NAPECC 317-257-6547
Mass Waltham, NAPECC 617-899-7100
Mich Southfield, NAPECC 313-357-4288
NJ Rochelle Park, NAPECC 201-843-4810
NY Hicksville, NAPECC 516-931-6200
Ohio Dayton, NAPECC 513-278-7351
Pa King of Prussia, NAPECC 215-265-4240
Tex Dallas, NAPECC 214-691-2141
Va Richmond, NAPECC 804-282-6515
Wash Bellevue, NAPECC 206-746-3600

AMPEREX ELECTRONIC CORP., Hicksville Div., Box 418 - 230 Duffy Ave., Hicksville, N.Y., 11802, Tel: /516-931-6200, TWX: 501-221-1839; Empl.: 400

p. 1-2352, 2353

Products manufactured: Amplifiers, Batteries, Cable, Capacitors, Variable, Cavities, Microwave, Cells, Photoconductive, Photoemissive, Photovoltaic, Circulators, Ferrite, Detectors, Diodes, Oscillators, Photomultiplier Tube Housings, Printers, Rectifiers, Spark Gaps, Speaker Systems, Speakers, Switches, Thermocouples, Elements & Accessories, Thyristors (Includes Silicon Controlled Rectifiers), Transducers, Transistors, Tubes, Wire

Local Sales Offices & Reps.

Ala Huntsville, NAPECC
Ariz Phoenix, NAPECC
Cal N. Hollywood, NAPECC
Cal San Diego, NAPECC 714-453-2925
Cal Santa Clara, NAPECC
Col Denver, NAPECC
Conn Shelton, Comark Assocs. 203-929-4884
Fla Ft. Lauderdale, NAPECC
Fla Winter Park, NAPECC
Ind Indianapolis, NAPECC
Ill Elk Grove Village, NAPECC 312-593-8220
Kans Olathe, B.C. Elctrn. Sls.
Mass Waltham, NAPECC 617-899-7100
Mich Hazelwood, B.C. Elctrn. Sls.
Mich Southfield, NAPECC
Minn Minneapolis, Siedara Assocs. 612-533-2294
NJ Rochelle Park, NAPECC
NY Endicott, Tech-Mark, Inc. 607-748-7473
NY Fairport, Tech-Mark
NY Hicksville, NAPECC
NY Liverpool, Tech-Mark
NY Pleasant Valley, Tech-Mark
NY Port Chester, Radiation Elctrn.
NC Raleigh, Candor Co.
Ohio Dayton, NAPECC
Ore Portland, Western Tech. Sls.
Pa King of Prussia, NAPECC
SC Myrtle Beach, Candor Co. 803-448-5213
Tenn Chattanooga, Candor Co.
Tex Dallas, NAPECC
Va Richmond, NAPECC
Wash Bellevue, NAPECC
Wash Bellevue, Western Technical Sls.
FOR: Can. Vancouver, B.C., Philips
FOR: Can., Montreal, Que., Philips Elctrn. Inds., Ltd.
FOR: Can., Toronto 17, Ont., Philips Elctrn. Inds., Ltd.

AMPEREX ELECTRONIC CORP., Providence Pike, Slatersville, R.I., 02876, Tel: 401-762-9000, TWX: 710-387-1591; FSC No: 73445; Empl.: 388; Minimum order: \$100

For info on price: Cust Svc; Application info: Mktg Svcs; Delivery info: Cust Svc

Products manufactured: Amplifiers, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Delay Lines, Diodes, Integrated Circuit Devices, Rectifiers, Regulators, Transformers, Transistor, Diode, Thyristor Heat Dissipators, Transistors, Tubes, Yokes

Local Sales Offices & Reps.

Ala Huntsville 205-534-7351
Ariz Phoenix 602-279-9588
Cal North Hollywood 213-762-2118
Cal San Diego 714-453-9250
Cal Santa Clara 408-249-1134
Colo Denver 303-922-8434
Fla Fort Lauderdale 305-772-2840
Fla Winter Park 305-678-2522
Ill Elk Grove Village 312-593-8220
Ind Indianapolis 317-257-6547
Mass Waltham 617-899-7100
Mich Southfield 313-357-4288
NJ Rochelle Park 201-843-4810
NY Hicksville 516-931-6200
Ohio Dayton 513-278-7351
Pa King of Prussia 215-265-4240

Tex Dallas 214-691-2141
Va Richmond 703-282-6515

AMPERITE CO., INC., 600 Palisade Ave., Union City, N.J., 07087, Tel: 201-UN 4-9504; Empl.: 76

Products manufactured: Relays

AMPEX CORP., 401 Broadway, Redwood City, Cal., 94063, Tel: 415-367-2011, TWX: 415-364-9034; Empl.: 14000

Products manufactured: CATV Systems & Equipment, Cores, Magnetic, Demagnetizers, Duplicators, Editing Equipment, Tape, Erasers, Magnetic Tape (Bulk), Heads, Recording Playback, Erase, Memory Systems, Mixers, Recorders, Services, Assembly, Production & Test, Splicing Equipment, Magnetic Tape, Tape Recording Accessories, Tape Search Equipment, Tapes, Recording, Magnetic (All Types), Television Systems & Equipment Closed-Circuit

AMPHENOL CADRE DIV., Bunker Ramo Corp., 20 Valley St., Endicott, N.Y., 13760, Tel: 607-754-4444; Empl.: 750

p. 2-460, 461

Customer service: E. Exley

Free literature available: TC-1 Telephone Products Catalog-Standard products such as running cable, delta splices, & custom capabilities. FC-1 describes Cadre's capabilities in custom interconnection, backplane wiring, cable & harness assemblies. ACCESS&T describes our selective decapsulation process.

Products manufactured: Backpanel Interconnect Systems, Boards, Printed Wiring, Universal, Braid, Cable, Cable Assemblies & Harnesses, Cable, Clamps & Clips, Compounds, Encapsulating, Insulating, Molding, Potting, Machines/Machinery, Production, Services, Assembly, Production & Test, Strain Reliefs, Cable & Wire, Strip-Line Components, Microwave

(Refer to Amphenol Sales Div for sales office information)

AMPHENOL CANADA LTD., 44 Metropolitan Rd., Scarborough, (Ont.), Can., Tel: 416-291-4401, TWX: 06-217-676; Empl.: 125

p. 2-460, 461

For info on price: R. M. Newbord 416-291-4401; Application info: R. M. Newbord 416-291-4401; Customer service: E. Farquharson 416-291-1621; Delivery info: E. Farquharson 416-291-1621

Free literature available: Catalog FC-3. Containing application data and mechanical, electrical and dimensional specifications on 481 and 482 series filter connector systems. Performance data is also included.

Products manufactured: Connectors, Filters

Refer to Amphenol Sales Div. for sales off. information

AMPHENOL COMPS. GRP. MKTG., Bunker Ramo Corp., 900 Commerce Dr., Oak Brook, Ill., 60521, Tel: 312-654-3100, TWX: 910-651-0191

Products manufactured: Services, Assembly, Production & Test

Refer to Amphenol Sales Div. for sales office information

AMPHENOL COMPONENT MKTG. SVC., 2875 S. 25th Ave., Broadview, Ill., 60153, Tel: 312-345-4260, TWX: 910-226-1961; Minimum order: \$50

p. 2-460, 461

Customer service: L. F. Edwards

Free literature available: 760 series cooling fan catalog - long life ball bearing & extra thin fans 390 series cooling fans-catalog-lowest cost fans 279 catalog-miniature epoxy encapsulated power supplies

Products manufactured: Blowers & Fans & Accessories, Power Supplies

Local Sales Offices & Reps.

Ala Huntsville, Young & Lawrence Assoc., Inc.
205-539-6575
Ariz Phoenix, MR Engineering Sales Co.
602-959-5150
Cal Los Angeles, M. A. Stolaroff Co. 213-295-7781
Cal San Diego, M. A. Stolaroff Co. 714-234-6905
Cal Santa Clara, Nova-Troxix 408-243-9530
Colo Boulder, Comp. Prods. Sls. Co. 303-444-2730
Fla Ft. Lauderdale, Young & Lawrence Assoc.
305-563-6717
Fla St. Petersburg, Young & Lawrence Assoc., Inc.
813-894-0026
Fla Winter Park, Young & Lawrence Assoc., Inc.
305-647-6929

Ill	DesPlaines, Lincoln, Hodges & Assocs.	312-297-3810
Ind	Indianapolis, Marketing Engineers Inc.	317-546-1523
Kans	Wichita, Dy-Tronic, Inc.	316-943-6221
Md	Baltimore, J.R. Daniels & Co.	301-825-3330
Mass	Lexington, J.E. Boeing Co., Inc.	617-862-2500
Mich	Benton Harbor, Ken-Mor Assocs., Inc.	616-927-3134
Mich	Rochester, Ken-Mor Assocs., Inc.	313-651-1890
Minn	Minneapolis, Milt Westland Assocs.	612-866-5002
Mo	Hazelwood, DY-Tronix Inc.	314-731-5799
Mo	Kansas, Dy-Tronix, Inc.	816-761-6543
NY	Jamaica, S-J Sls. Assocs., Inc.	212-291-3232
NY	Syracuse, C. W. Floring & Assoc.	315-478-2149
NC	Raleigh, Candor Co.	919-876-4999
Ohio	Dayton, The Whelan Corp.	513-434-7551
Pa	King of Prussia, Montero Assocs.	215-265-0634
Pa	Media, W. Reeves Assocs., Inc.	215-566-6709
SC	Myrtle Beach, Candor Co.	803-448-8361
Tenn	Chattanooga, Candor Co.	615-894-7454
Tex	Austin, K&H Sls. Co.	512-836-2842
Tex	Plano, K & H Sls. Co.	214-423-6520
Va	Lynchburg, Candor Co.	804-846-6579
Wash	Bellvue, Ruggles Technical Sls.	206-455-2778
Wisc	Waukesha, Lincoln, Hodges & Assocs.	414-542-3087

Local Distributors

Ariz	Phoenix, Moltronics of Ariz., 2746 West Palm La.	602-272-7951
Cal	Garden Grove, Allied Elctns., 12311 Industry St.	213-598-6605
Cal	San Carlos, Sterling Elctns., 1061 Industrial Way	415-592-2353
Cal	San Diego, Moltronics, 7969 Engineer Rd.	
Cal	South Gate, Moltronics, 5610 East Imperial Hwy.	213-773-6521
Cal	Sunnyvale, Acacia Sls., 384 San Aleso Ave.	408-735-0100
Colo	Lakewood, Acacia Sls., 11111 W. 8th Ave.	303-232-2882
Ill	Elgin, Allied Elctns., 1355 Sleepy Hollow Rd.	312-697-8200
Ind	Fort Wayne, Fort Wayne Elctns. Supply, 3606 Maumee Ave.	219-423-3422
Ind	Indianapolis, Graham Elctns., 133 S. Pennsylvania	317-634-8202
Ind	Indianapolis, Meunier Elctn. Supply, 3409 E. Washington	317-635-3511
Ind	Indianapolis, Ra-Dis-Co., 814 N. Senate Ave.	317-637-5571
Ind	South Bend, Radio Distributing Co., 1212 High St.	219-287-2911
Ky	Louisville, P.I. Burks Co., 842 S. 7th St.	502-589-3960
Md	Baltimore, Technico, 1404 Bare Hills Ave.	301-828-6416
Md	Savage, Pytronics Inds., 8220 Wellmorr Ct.	301-792-7000
Mass	Braintree, Allied Elctns., One Century Circle, Campanelli Industrial Pk.	617-848-4150
Mass	Watertown, DRW Elctns. Corp., 600 Pleasant St.	617-923-1900
Minn	Minneapolis, Industrial Comps., 5280 W. 74th St.	612-831-2666
NY	Binghamton, Federal Elctns., Box 1208	607-748-8211
NY	Farmingdale, DRW Elctns. Corp., 100 Milbar Blvd.	516-249-2660
NC	Greensboro, Technico, 6223 Tri Port Ct.	919-294-1065
Ohio	Cincinnati, Schuster Elec. Co., 11320 Grooms Rd.	513-984-1600
Ohio	Medina, DRW Elctns. Corp., 7409 Spencer Lake Rd.	216-725-6422
Pa	Montgomeryville, Pytronics Inds., Stump Rd., Box 433	215-643-2850
Tex	Dallas, Solid State Elctns. Co., 2643 Manana Dr.	214-352-2601
Tex	Fort Worth, Allied Elctns., 401 E. 8th St.	817-336-5401
Tex	Houston, Solid State Elctns. Co., Box 36849	
Utah	Salt Lake City, W.H. Bintz Co., 433 W. Third St., Box 1350	801-363-5821
Va	Norfolk, Priest Elctns., 6431 Tidewater Dr.	703-855-0141
Wash	Seattle, Zepher Elctns. Sls. Co., 647 Industrial Dr.	206-242-2517

AMPHENOL CONNECTOR DIV., Bunker Ramo Corp., 2801 S. 25th Ave., Broadview, Ill., 60153, Tel: 312-261-2000, TWX: 910-226-1974; Empl.: 1000
p. 2-460,461

Products manufactured: Caps, Connector, Clamps & Clips, Connector Adapters, Connectors, Contacts, Electrical, Lead Assemblies & Receptacles, Plug Adapters, Plugs, Strain Reliefs, Cable & Wire, Thermocouples, Elements & Accessories, Tools

Refer to Amphenol Sales Div. for sales office information.

AMPHENOL CONNECTOR DIV., CONTROLS OPERS., Bunker Ramo Corp., 2801 S. 25th Ave., Broadview, Ill., 60153, Tel: 312-261-2000, TWX: 910-226-1974; Empl.: 250 p. 2-460,461

Products manufactured: Counters, Dials, Gages, Potentiometers, Resistors, Switches, Transducers

Refer to Amphenol Sales Div. for sales office information.

AMPHENOL CONNECTOR DIV., SAMS OPERS., Bunker Ramo Corp., 9201 Independence Ave., Chatsworth, Cal., 91311, Tel: 213-341-0710, TWX: 910-494-1211; Empl.: 500 p. 2-460,461

Products manufactured: Braid, Cable, Cable, Connectors, Feedthrus & Seals, Environmental, Plugs, Services, Assembly, Production & Test, Terminals, Wire

Refer to Amphenol Sales Div. for sales office information.

AMPHENOL IND'L DIV., Bunker Ramo Corp., 1830 S. 54th Ave., Chicago, Ill., 60650, Tel: 312-242-1000, TWX: 910-229-1541; Empl.: 2000 p. 2-460,461

Products manufactured: Boards, Programming, Caps, Connector, Clamps & Clips, Connector Adapters, Connectors, Contacts, Electrical, Cords, Holder & Carriers, Jacks (All Types), Kits, Connector, Pins, Plugs, Shields, Sockets, Strain Reliefs, Cable & Wire, Terminals, Tools

Refer to Amphenol Sales Div. for sales office information.

AMPHENOL RF DIV., Bunker Ramo Corp., 33 E. Franklin St., Danbury, Conn., 06810, Tel: 203-743-9272, TWX: 710-456-0281; Empl.: 700 p. 2-460,461

For info on price: A. Kasiewicz; Application info: Adv. Mgr.; Customer service: Prod. Mgr.

Products manufactured: Adapters, Waveguide, Antenna Switching Matrices, Arresters, Electrical Surge, Lightning, Cable Assemblies & Harnesses, Cable, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Delay Lines, Feedthrus & Seals, Environmental, Horns, Microwave, Integrated Circuit Packaging Systems, Jack Adapters (All Types), Kits, Connector, Lead Assemblies & Receptacles, Line Stretchers, Microwave, Packages, Integrated Circuit, Plug Adapters, Relays, Seals, Shifters, Shutters, Microwave, Slide Rules (Circuitry Computing), Strip-Line Components, Microwave, Switches, Tees, Terminals, Tools, Waveguides & Adapters

Refer to Amphenol Sales Div. for sales office information

AMPHENOL SALES DIV., Bunker Ramo Corp., 2875 S. 25th Ave., Broadview, Ill., 60153, Tel: 312-345-4260, TWX: 910-226-1961 p. 2-460,461

Products manufactured: Cable Assemblies & Harnesses, Caps, Connector, Clamps & Clips, Connector Adapters, Connectors, Contacts, Electrical, Dials, Pins, Plugs, Potentiometers, Power Supplies, Services, Assembly, Production & Test, Shields, Sockets, Strain Reliefs, Cable & Wire, Switches, Tools, Transducers

Local Sales Offices & Reps.

Cal	Los Angeles, Amphenol Sls. Div.	213-649-5015
Cal	San Francisco, Amphenol Sls. Div.	408-732-8990
Colo	Denver, Amphenol Sls. Div.	303-758-8033
DC	Washington, Amphenol Sls. Div.	703-525-2818
Fla	Orlando, Amphenol Sls. Div.	305-647-5504
Ill	Chicago, Amphenol Sls. Div.	312-345-9000
Ind	Indianapolis, L.M. DeVoe Co.	317-257-1227
Kans	Kansas City, Amphenol Sls. Div.	913-888-7223
Mass	Boston, R. Purinton	617-475-7055
Minn	Minneapolis, Amphenol Sls. Div.	612-835-4595
Mo	St. Louis, Amphenol Sls. Div.	314-895-1400
NY	New York, Amphenol Sls. Div.	516-364-2270
NY	Syracuse, Amphenol Sls. Div.	315-455-5786
NC	Greensboro, Amphenol Sls. Div.	919-275-8644
Ohio	Dayton, Amphenol Sls. Div.	513-294-0461
Pa	Philadelphia, Amphenol Sls. Div.	609-234-3434
Tex	Dallas, Amphenol Sls. Div.	214-235-8318
Wash	Seattle, Amphenol Sls. Div.	206-455-2525

EXP: Broadview, Ill., Amphenol Sls. Div.

312-345-4260

Local Distributors

See Page 2-463 for Amphenol local distributor listings.

AMPLICA INC., 780 Lakefield/Bldg. F, Westlake Village, Cal., 91361, Tel: 213-889-8700, TWX: 910-336-1546; FSC No: 51025; Empl.: 19

Customer service: J.A. Cole

Products manufactured: Amplifiers, Converters, Isolators

Local Sales Offices & Reps.

Cal	Mt. View, D. Lay Assocs.	415-968-7500
Cal	Westlake Village, MCA Repco	213-889-5553
Fla	Clearwater, Southeastern Comp. Sls. Inc.	813-531-8324
Ill	Park Ridge, RF Specialists	312-698-2044
Mass	Reading, Geder-Rotondi Assoc.	617-944-3105
NY	Bayside, R. Diamond	212-423-7330
Pa	Ambler, WM Assocs.	215-643-4119
Tex	Arlington, N&W Sls.	817-461-4443
Va	Alexandria, Vanguard Eng. Sls.	703-768-1660
Wash	Seattle, R. Drake Assoc.	206-763-2755
EXP:	Los Angeles, Cal., Trans-World Trade	213-472-0444
FOR:	Can., Montreal260, Que., Soquelec, Ltd.	514-482-6427

AMPLIFIER RESEARCH CORP., 160 School House Rd., Souderton, Pa, 18964, Tel: 215-723-8181; Empl.: 10
p. 1-2,3

For info on price: D. W. Roth; Application info: D. R. Shepherd; Customer service: D. W. Roth; Delivery info: D. W. Roth

Free literature available: Data Folder: Contains individual data sheets for broad band, high power RF amplifiers giving complete specifications and performance data. Price schedule showing price & delivery for small quantities also included.

Products manufactured: Amplifiers, Transformers

Local Sales Offices & Reps.

Cal	Los Angeles, RF Assocs.	213-478-1586
Cal	Palo Alto, RF Assocs.	415-494-3331
Conn	Hamden, Scientific Devices	203-298-9361
Fla	Orlando, Trux Assocs.	305-859-2160
Ill	Chicago, Elctn. Instr. Assocs.	312-271-3774
Ind	Indianapolis, Elctn. Instr. Assocs.	317-257-7231
Md	Woodbine, Morar Assocs.	301-924-2169
Mass	Waltham, Scientific Devices-New England	617-894-5637
NJ	Westfield, Gray & Reed Assocs.	201-233-6116
NY	New York, Gray & Reed Assocs.	516-433-3333
Pa	Melrose Park, R. Meyers Assoc.	215-224-1663
Tex	Dallas, Airep Elctns. Inc.	214-827-2120
EXP:	Indianapolis, Ind., Texscan Tech. Prods.	317-357-8781
FOR:	Can., Winnipeg R2V-0X1, Electrodesign Ltd.	204-338-5050
FOR:	Can., La Salle 650, Quebec, Electrodesign Ltd.	514-363-5120
FOR:	Can., Ottawa 7, Ont., Electrodesign Ltd.	613-745-0541
FOR:	Can., Toronto 19, Ont., Electrodesign Ltd.	416-787-0991

AMPOWER SEMICONDUCTOR CORP., 375 Kings Highway, Smithtown, N.Y., 11787, Tel: 516-582-6767; FSC No: 52333; Empl.: 45

Customer service: J. Krasny

Free literature available: Short Form Catalog; list of JAN, JAN-TX, JAN-TXV power transistors.

Products manufactured: Transistors

Local Sales Offices & Reps.

Ariz	Scottsdale, Fred Board Assoc.	602-994-9388
Cal	Lafayette, Phillips Assoc.	415-284-2579
Cal	Marina Del Rey, Westaironics	213-821-7958
Fla	Orlando, Geartner Assoc.	305-299-1000
Ill	Bellwood, FIAT Eng'g	312-547-6200
Ind	Ft. Wayne, Delesa Sls.	219-483-9537
Md	Towson, L.H. Kolman Assco.	301-752-8756
NJ	Holbrook, R.O.M.E.	516-488-7777
Ohio	Dayton, Oliver Penrod Assoc.	513-258-2143
Pa	Colmar, E.L. Asso.	512-622-2510
Pa	Erie, ECCO Sls.	814-452-3762
Tex	Richardson, Thornton-Leeper Assoc.	214-231-6891

AMPRO CORP., 2220 Maplewood Ave., Willow Grove, Pa., 19090, Tel: 215-657-3100; Minimum order: \$25

For info on price: A. Meyer; Application info: E. M. Mullin; Customer service: H. N. Larkin; Delivery info: R. F. Grochowski

Free literature available: CARTRIDGE TAPE EQUIPMENT - Radio broadcasting and recording studio playback and record, endless loop type equipment. CONSOLES: - Audio mixers, 4 channel thru 12 channel, available in monaural, dual monaural, stereo and dual stereo, rotary and slide faders up to 48 inputs.

Products manufactured: Amplifiers, Cases, Equipment, Instrument, Meter, Recorders, Tape Recording Accessories, Tape Search Equipment, Transports, Tape (all kinds)

AMPROBE INSTR., Div. SOS Consolidated Inc., 630 Merrick Rd., Lynbrook, N.Y., 11563, Tel: 516-LY 3-5600

Products manufactured: Meters, Monitors, Probes, Pyrometers, Recorders, Testers, Transducers

AMTRON DIV., Sippican Corp., 14820 S. Kedzie Ave., Midlothian, Ill., 60445, Tel: 312-389-3955, TWX: 910-689-4494; FSC No: 5808; Empl.: 400; Minimum order: \$15

Customer service: L. Burdick

Free literature available: Application Notes: Controls for Automation Switchboard Brochures: Military and Commercial Relays Brochures: Solid State and Time Delay

Products manufactured: Comm. Systems, Controls/Control Eqpt., Counters, Relays, Switchboards, Timers

AMUNEAL MFG. CORP., 4737 Darrah St., Philadelphia, Pa., 19124, Tel: 215-635-3000; FSC No: 23740; Empl.: 35; Minimum order: \$25

For info on price: S.M. Kamens; Application info: E. Kunz

Free literature available: Our catalogue describes a complete line of standard and custom shields for magnetic sensitive tubes and components. Sample of Wrap Around Shielding Foil is supplied in our catalogue available for engineering evaluation.

Products manufactured: Foil, Shields

Local Sales Offices & Reps.

Cal	Redwood City, Parks & Pruitt Assocs.	415-364-1640
Cal	Santa Ana, C.E.M., Inc.	714-835-2702
Colo	Denver, Walter Engrg. Assocs.	303-777-5585
Fla	Hallandale, L.M. Bairstow Assocs.	305-927-2421
Ill	Wilmette, Crest Assocs.	312-256-5202
Ind	Indianapolis, Crest Assocs.	317-844-2800
Md	Pikesville, A. Wetterhahn Co.	301-484-6376
Mass	Framingham, L. Roffer Co.	617-877-4900
Mich	Jackson, Norwood Scroggs Co.	517-750-1170
Minn	Minneapolis, R-J, Inc.	612-922-1425
NJ	Oaklyn, A. Wetterhahn Co.	609-858-3003
NY	Queens Village, Buscaglia Assocs.	212-468-3666
Ohio	Cincinnati, R. Makin Assocs.	513-232-5588

Advertisement

Amuneal offers a complete line of standard and custom shields for magnetic-sensitive tubes and components, including weld-fabricated or spun CRT shields, printed circuit shields, drawn can shields, and foil Wrap-Around Shielding, supplied in rolls. Amuneal "U-Tile-Mu" Shielding Tiles, 6"x6" or 12"x12", with pressure-sensitive adhesive backing, provide a simple, versatile means for do-it-yourself magnetic shielding of rooms, test chambers, cabinets, etc. Ask for literature. Free sample of wrap-around shielding included.

A. M. W. CORP., 78 Bow, Arlington, Mass., 02174, Tel: 617-643-9600; Empl.: 25

For info on price: W. C. Mears 617-643-9600; Application info: F. F. Maxant 617-641-0080; Customer service: E. Murphy 617-643-9600; Delivery info: L. Kelly 617-641-0080

Free literature available: Brochures (flyers) on overseeing machine, versamatic, hydropress & linamatic giving characteristics & specifications. Facilities listing of machine shop & assembly equipment & capabilities

Products manufactured: Cams, Machines/Machinery, Production, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Cal	Los Angeles, Gane Brothers & Lane, Inc.	213-R19-8388
Cal	San Francisco, Gane Brothers & Lane, Inc.	415-396-3290
Ga	Atlanta, Gane Bros. & Lane Inc.	404-758-1411
Ill	Chicago, Gane Bros. & Lane, Inc.	312-666-5840
Mo	St. Louis, Gane Bros. & Lane, Inc.	314-OL2-2700
NY	New York City, Gane Bros. & Lane, Inc.	212-WA5-0400
NY	Port Washington, Robbins & Bendror Assoc.	516-868-7220
Tex	Dallas, Gane Bros. & Lane, Inc.	214-ME7-0700
Wash	Seattle, Gane Bros. & Lane, Inc.	206-622-5454

THE ANACONDA COMPANY BRASS DIVISION, 414 Meadow St., Waterbury, Conn., 06720, Tel: 203-757-2021, TWX: 710-477-0925; Empl.: 5000

Free literature available: Anaconda Publication #C-25 offers electrical properties and uses of copper conductors including physical and electrical uses in engineering design with dimensions, weights, etc.

Products manufactured: Alloys, Bus Bars & Systems, Conduit, Electrical, Tubing

Local Sales Offices & Reps.

Cal	Oakland	415-562-2131
Cal	Paramount	213-636-0321
Colo	Denver	303-534-8764
Conn	Waterbury	203-757-2021
Fla	Tampa	813-839-5363
Ga	Atlanta	404-261-4681
Ill	Hinsdale	312-242-1414
Ind	Indianapolis	317-546-1151
Iowa	Cedar Rapids	319-364-2465
Mass	Braintree	617-848-6680
Mich	Detroit	313-554-3500
Minn	Minneapolis	612-920-6393
Miss	Jackson	601-354-4391
Mo	Kansas City	816-753-3341
Mo	St. Louis	314-966-0606
NY	Amherst	716-835-3915
NY	New York City	212-697-1166
NY	Syracuse	315-422-1205
NC	Charlotte	704-568-2422
Ohio	Cincinnati	513-421-9050
Ohio	Cleveland	216-251-1105
Ohio	Worthington	614-888-1985
Pa	Frazier	215-647-0600
Pa	Pittsburgh	412-341-5185
Tex	Dallas	214-368-6311
Tex	Houston	713-529-4741
Wisc	Milwaukee	414-258-7600

THE ANACONDA CO., Wire and Cable Div., Greenwich Office Park 3, Greenwich, Conn., 06830, Tel: 203-661-0090, TWX: 710-579-2970

Products manufactured: Cable, Cams, Wire, Wire Shielding

ANADEX INSTRS., INC., 7833 Haskell Ave., Van Nuys, Cal., 91406, Tel: 213-782-9527, TWX: 910-495-1762; Empl.: 75; Minimum order: \$25

For info on price: K. A. Matthews; Application info: A. B. Lappas; Customer service: L. Stanberry; Delivery info: C. Porter

Free literature available: 26-page Catalog describing all Anadex standard products.

Products manufactured: Comparators, Converters, Counters, Detectors, Generators, Meters, Printers, Signal Conditioners & Equipment, Synthesizers, Timers

Local Sales Offices & Reps.

Ala	Huntsville, Currie, Peak & Frazier, Inc.	205-536-5650
Ariz	Scottsdale, PLS Assocs., Inc.	602-957-9110
Cal	Los Altos, J. Stone & Assocs.	415-948-4563
Cal	Los Angeles, Basic Sys.	213-938-2833
Cal	San Diego, Basic Sys.	714-279-9641
Colo	Denver, PLS Assocs.	303-771-0140
Conn	W. Hartford, Instrument Assocs.	203-525-9367
Fla	Orlando, Currie, Peak & Frazier, Inc.	305-855-0843
Ill	Chicago, Pivan Engrg. Co.	312-539-4838
Ind	Indianapolis, Pivan Engrg. Co.	317-253-1681
Kans	Mission, Pivan Engrg. Co.	913-722-1030
Md	Wheaton, SONCO	301-942-9420
Mass	Bedford, Instrument Assocs.	617-275-0700
Mich	Farmington, Carter, McCormic & Peirce, Inc.	313-477-7700
Minn	Minneapolis, Pivan Engrg. Co.	612-537-4501

Mo	St. Louis, Pivan Engrg. Co.	314-567-3636
NJ	Fort Lee, Tech. Mktg. Assocs.	201-224-6911
NM	Albuquerque, PLS Assocs., Inc.	505-255-2330
NY	E. Syracuse, Ossmann Instrs., Inc.	315-437-6666

NY	Rochester, Ossmann Instrs., Inc.	716-328-2230
NY	Vestal, Ossmann Instrs., Inc.	607-785-9947
NC	Greensboro, Currie, Peak & Frazier, Inc.	919-273-3040

Ohio	Cleveland, Carter, McCormic & Peirce, Inc.	216-333-5650
Ohio	Dayton, Carter, McCormic & Peirce, Inc.	513-278-5873

Okla	Norman, Data Mktg. Assocs.	405-364-8320
Pa	Blue Bell, SONCO	215-CH2-8460
Pa	Pittsburgh, Carter, McCormic & Peirce, Inc.	412-824-3760

Tex	Dallas, Data Mktg. Assocs.	14-661-0300
Tex	Houston, Data Mktg. Assocs.	713-686-9627
Wash	Seattle, R.S. Drake Assocs., Inc.	206-763-2755
Wisc	Brookfield, Pivan Engrg. Co.	414-786-1940

ANADYNE, 12741 Los Nietos Rd., Santa Fe Springs, Cal., 90607, Tel: 213-698-7991, TWX: 910-586-1881; Empl.: 100 p. 1-1108,1109

Products manufactured: Converters, Power Supplies

Local Sales Offices & Reps.

Ariz	Scottsdale, J. Smith & Assocs.	602-943-4131
Cal	Oakland, Mouthrop Sls. Inc.	415-261-7676
Conn	Durham, Marr Assocs.	203-349-9691
Fla	Ft. Lauderdale, UniRep, Inc.	305-527-1556
Md	Baltimore, Stitzer Assocs.	301-823-2600
Minn	Minneapolis, Bitronics Sls. Co.	612-866-3035
NJ	Wallington, Comp-Tech Sls.	201-935-5454
NM	Albuquerque, J. Smith & Assocs.	505-255-2111
NY	New Hyde Park, Comp-Tech Sls.	516-593-2628
Okla	Tulsa, T. Burton Sls.	918-936-2562
Tex	Addison, Campion Sls. Co.	214-239-9196

ANALOG DEVICES, Box 280, Rte. 1, Ind'l. Pk., Norwood, Mass., 02062, Tel: 617-329-4700, TWX: 710-394-6577; Empl.: 1000 p. 1-608

For info on price: K. Rutherford Ext. 302; Application info: K. Rutherford Ext. 302; Customer service: P. Bosworth Ext. 380

Free literature available: 1975 PRODUCT GUIDE-272 pages - Contains product descriptions and selection guides to all Analog Devices' product lines. Written for designers of instruments used in electronic measurement and designers of computer based control systems.

Products manufactured: Amplifiers, Capacitors, Fixed, Circuits, Hybrid, Thin-Film, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Coatings, Comm. Systems, Comparators, Computers, Converters, Data Acquisition & Reduction Systems, Demodulators, Detectors, Display Devices/Displays, Dividers, Expanders, Data, Films, Hybrid Voltage Regulators, Indicators, Integrated Circuit Devices, Integrators, Electronic, Isolators, Meters, Modulator/Demodulators, Multiplexers, Multipliers, Networks, Potentiometers, Power Supplies, Process Control Systems, References, D-C Voltage, Regulators, Resistors, Resolvers, Synchro, Semiconductor Wafer Fabrication, Services, Assembly, Production & Test, Servo Systems, Substrates, Switches, Synchro Transmitters, Solid-State, Technical Books, Transistors, Transmission Systems, Data

Local Sales Offices & Reps.

Ala	Huntsville, Currie, Peak & Frazier	205-536-5650
Cal	Long Beach, Analog Devices Inc.	213-595-1783
Cal	Los Altos, Analog Devices, Inc.	415-941-4874
Colo	Boulder, Moore/Eiler Assoc.	303-665-3351
Fla	Orlando, Currie, Peak & Frazier	305-855-0843
Ill	Chicago, Analog Devices, Inc.	312-894-3300
Ill	Northfield, Torkelson Assoc.	312-446-9085
Ind	Indianapolis, Torkelson Assoc.	317-244-7867
Kans	Shawnee Mission, Tech. Sales, Assoc.	913-888-3330
Md	Silver Spring, Rep-Tron, Inc.	301-593-4844
Mich	Detroit, Electro Sales Assoc.	313-526-8800
Minn	Minneapolis, Torkelson Assoc.	612-835-2414
Mo	Ferguson, Tech-Sales Assocs.	314-725-5361
NM	Albuquerque, Moore/Eiler Assoc.	505-292-3322
NY	Binghamton, Labtronics, Inc.	607-748-0509
NY	Depew, Labtronics, Inc.	716-685-4111
NY	Syracuse, Labtronics, Inc.	315-454-9314
NY	Ulster Park, Labtronics, Inc.	518-372-6649
NY	Woodbury, Harwood-Sandler Assoc.	516-692-6100
NC	Greensboro, Currie, Peak & Frazier	919-273-3040
Ohio	Cleveland, Electro Sales Assoc.	216-261-5440

Ohio	Dayton, Electro Sales Assoc.	513-426-5551
Pa	Ambler, Wyncote Instru. Co.	215-643-2440
Pa	Middletown, Wyncote Instrumentation Co.	717-944-0950
Pa	Pittsburgh, Electro Sales Assoc.	412-371-9449
Tex	Houston, Data Applications Corp.	713-661-4501
Tex	Richardson, Analog Devices, Inc.	214-231-5094
Tex	San Antonio, Data Applications Corp.	512-732-7176
Wash	Seattle, Avionics Liaison, Inc.	206-767-3870
FOR:	Can., Downsview, Ont., Tracoe Elctns. Corp.	416-638-0052
FOR:	Can., Montreal, Que., Tracoe Elctns. Corp.	514-341-4163
FOR:	Can., Ottawa, Ont., Tracoe Elctns. Corp.	613-820-0269
FOR:	Can., West Vancouver, B.C., Tracoe Elctns. Western Ltd.	604-926-3411

ANALOG DEVICES, RESISTOR PDT., 1665 Buffalo Rd., Rochester, NY, 14624, Tel: 717-247-6773

Free literature available: Custom spec. guide - resistor networks; Custom spec. guide - precircuits; Standard thin film precision resistor networks -

Products manufactured: Attenuators, Circuits, Hybrid, Thin-Film, Cores, Magnetic, Films, Networks, Resistors, Standards

Local Sales Offices & Reps.

Ala	Huntsville, Currie, Peak & Frazier	205-536-5650
Cal	Long Beach, Analog Devices	213-595-1783
Cal	Los Altos, Analog Devices	415-941-4874
Colo	Denver, Moore/Eiler Assocs.	303-449-4262
Fla	Orlando, Currie, Peak & Frazier	305-855-0843
Ill	Northfield, Torkelson Assoc.	312-446-9085
Ill	Rosemount, Analog Devices	312-297-8710
Ind	Indianapolis, Torkelson Assoc.	317-244-7867
Kans	Shawnee Mission, Technical Sls.	913-888-3330
Md	Silver Spring, Reptron, Inc.	301-593-4844
Mich	Detroit, Electro Sls. Assoc.	313-526-8800
Minn	Minneapolis, Torkelson Assoc.	612-835-2414
Mo	Ferguson, Technical Sls.	314-725-5361
NJ	Irvington, Harwood Sandler Assocs.	201-399-3748
NM	Albuquerque, Moore/Eiler Assoc.	505-292-3322
NY	Binghamton, Labtronics, Inc.	607-748-0509
NY	Dewey, Labtronics, Inc.	716-685-4111
NY	Syracuse, Labtronics, Inc.	315-454-9314
NY	Woodbury, Harwood-Sandler Assoc.	516-692-6100

NC	Greensboro, Currie, Peak & Frazier	919-273-3040
----	--	--------------

Ohio	Cleveland, Electro Sls. Assoc.	216-261-5440
Ohio	Dayton, Electro Sls. Assoc.	513-426-5551
Okl	Tulsa, Data Appls. Corp.	214-231-4846
Pa	Ambler, Wyncote Instrumentation	215-643-2440
Pa	Pittsburgh, Electro Sls. Assoc.	412-371-9449
Tex	Houston, Data Appls. Corp.	713-661-4501
Tex	Richardson, Data Appls. Corp.	214-231-4846
Tex	San Antonio, Data Appls. Corp.	512-732-7176
Wash	Seattle, Avionics Liason	206-767-3870
FOR:	Can., Downsview, Ont., Tracoe	416-638-0052
FOR:	Can., Montreal, Que., Tracoe	514-341-4163
FOR:	Can., Ottawa, Ont., Tracoe	613-820-0269
FOR:	Can., West Vancouver, B.C., Whittaker Elctns., Ltd.	604-926-3411

ANALOG DEVICES, Semiconductor Div., 829 Woburn St., Wilmington, Mass, 01887

ANALOGIC CORP., Audubon Rd., Wakefield, Mass., 01880, Tel: 617-246-0300, TWX: 710-348-0425; Empl: 245; Minimum order: \$25 p. 1-130-133, 602,603

For info on price: Tech. Support Grp.; Application info: W. Appell, Ext. 179; Customer service: R. R. Roediger; Delivery info: G. Fisher, Ext. 126

Free literature available: Data Sheets

Products manufactured: Amplifiers, Calibrators, Converters, Data Acquisition & Reduction Systems, Indicators, Integrated Circuit Devices, Meters, Multiplexers, Power Supplies, Signal Conditioners & Equipment, Standards, Voltage Sources

Local Sales Offices & Reps.

Ala	Huntsville, Reynolds & Assocs.	205-536-1941
Ariz	Scottsdale, BFA Corp.	602-946-4215
Cal	Costa Mesa, Meas. Assocs.	714-540-7160
Cal	San Francisco, Wm. C. Benison	415-398-2211
Colo	Denver, BFA Corp.	303-744-3301
Conn	Guilford, R.H. Sturdy Co.	203-453-5424
Fla	Clearwater, Reynolds & Assocs.	813-726-2373
Fla	Ft. Lauderdale, Reynolds & Assocs.	305-581-6611
Fla	Hollywood, Reynolds & Assocs.	305-987-6720
Fla	Palm Beach Gardens, Reynolds & Assocs.	305-622-4336

Fla	Satellite Beach, Reynolds & Assocs.	305-773-4700
Fla	St. Petersburg, Reynolds & Assocs.	813-360-1484
Ga	Atlanta, Reynolds & Assocs.	404-252-5360
Ill	Chicago, Berndt Assoc. Inc.	312-283-0713
Ind	Carmel, Berndt Assoc. Inc.	317-844-0114
Md	Baltimore, Jay Co.	301-252-8494
Mass	Wellesley Hills, R.H. Sturdy Co.	617-235-2330
Mich	Detroit, WKM Assocs.	313-892-2500
NJ	Ridgewood, Hansen Assocs.	201-652-7055
NM	Albuquerque, BFA Corp.	505-292-1212
NM	Las Cruces, BFA Corp.	505-523-0601
NY	Dewitt, DB Assocs.	315-446-0220
NY	New York City, Hansen Assocs.	212-947-0379
Ohio	Cleveland, WKM Assocs.	216-267-0445
Ohio	Dayton, WKM Assocs.	513-434-7500
Ore	Beaverton, Arneson Assoc.	503-643-5754
Pa	Norristown, Data Engrg. Co.	215-279-8146
Pa	Pittsburgh, WKM Assocs.	412-892-2953
Tex	Dallas, Data Aids Assocs.	214-620-1551
Tex	Houston, Data Aids Assocs.	13-862-6685
Utah	Salt Lake City, BFA Corp.	801-466-6522
Va	McLean, Jay Co.	703-790-5666
Wash	Seattle, Arneson Assoc.	206-762-7664
Wisc	Brookfield, Berndt Assoc.	414-786-6950

ANALYTICAL MEASUREMENTS, 31 Willow St., Chatham, N.J., 07928, Tel: 201-273-7500; Empl: 35

For info on price: T.P. Scarinzi; Application info: F.G. Pauly; Customer service: F.D. Moore; Delivery info: F.G. Pauly

Products manufactured: Controls/Control Eqpt., Indicators, Kits, Test Equipment, Recorders

ANAREN MICROWAVE, INC., 185 Ainsley Drive, Syracuse, N.Y., 13205, Tel: 315-476-7901, TWX: 710-541-1507; FSC No: 31597; Empl: 165

For info on price: D. Gustin; Application info: J. Krastel; Customer service: D. Gustin; Delivery info: D. Gustin

Free literature available: General Product Catalog, Pin Attenuator Bulletins, Balanced Mixer Bulletins, Ultra-Miniature Hybrids Bulletin, Phase/Amplitude Tracking Receiver Front End Catalog, Various Hybrid & Power Divider Bulletins.

Products manufactured: Antenna Feed Systems, Attenuators, Comparators, Converters, Couplers, Demodulators, Detectors, Diodes, Discriminators, Dividers, Junctions, Hybrid, Microwave, Mixers, Modulator/Demodulators, Modulators, All Kinds, Multiplexers, Networks, Shifters, Strip-Line Components, Microwave

Local Sales Offices & Reps.

Ariz	Phoenix, The Thorson Co.	602-956-5300
Cal	Los Angeles, Cain Technology	213-476-2251
Cal	Palo Alto, Waldman Assocs.	415-961-4100
Colo	Denver, The Thorson Co.	303-355-3521
Fla	Palm Bay, Spar Tech Assocs.	305-727-8045
Ga	Smyrna, Spar Tech Assocs.	404-432-3644
Ill	Park Ridge, R.F. Specialists	312-698-2044
Ind	Fort Wayne, R.F. Specialists	219-485-8982
Md	Davidsonville, R.L. Engrg.	301-760-5533
Mass	Reading, Geder-Rotondi Assocs.	617-944-3105
NM	Albuquerque, The Thorson Co.	505-265-5655
NY	Greenvale, Bertram D. Aaron & Co.	516-621-0630

NY	Skaneateles, Robtron	315-685-5731
Pa	Philadelphia, Eastern Instrumentation of Phila., Inc.	215-927-7777
Tex	Houston, Kemco, Inc.	713-467-1061
Tex	Irving, Kemco, Inc.	214-255-0537
Wash	Seattle, Rush S. Drake Assocs., Inc.	206-763-2755

ANCHOR BOLT & SCREW, 2950 W. Grand, Chicago, Ill., 60622, Tel: 312-252-2200; Empl: 100; Minimum order: \$50

Free literature available: "Product Line Sheet" "Fastener Engineering Handbook" - engineering specifications for fasteners "Thread Dimension Card"

Products manufactured: Fasteners

Local Sales Offices & Reps.

Colo	Denver, Central Western Sls.	303-534-4733
Ind	Columbus, Ritter, Inc.	812-372-1534
Iowa	W. Des Moines, Product Comps.	515-277-1783
Mich	Lansing, Marketing Professionals	517-484-0828
Mich	Southfield, Coskey-Gates Assoc.	313-354-5522
Minn	Minneapolis, G.L. Engstrom & Assoc.	612-546-0001
Mo	Maryland Hts., D.F. Adams & Assoc.	314-567-1785
SC	Columbia, G.E. Younginger & Assoc.	803-772-6671
Tex	Houston, Manco Metals	713-664-8084

Wisc	Milwaukee, Anchor Bolt & Screw Co.	414-342-4800
------	---	--------------

ANCHOR PLASTICS, 36-36 36th, Long Island City, N.Y., 11106, Tel: 212-729-1494, Telex: 12-362; Empl: 200

For info on price: H. Katz; Application info: H. Katz; Customer service: H. Katz; Delivery info: R. Kuhn

Free literature available: Design Guide- custom extrusions of thermoplastic shapes - tubes, rods, mouldings - fully illustrated. Applications, special surface finishes and fastening data are included.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Clamps & Clips, Coils Including Assemblies & Forms, Couplings, Dials, Gaskets, Shielding, R-F-Also See Shields, R-F, Phonographs, Parts & Accessories, Retainers, Scales, Dial, Services, Assembly, Production & Test, Shafts & Adapters, Slide Rules (Circuitry Computing), Strips, Tubing

ANCHOR SPECIALTY MFG. INC., 300 Hollister Rd., Teterboro, N.J., 07608, Tel: 201-288-1939; Empl: 10

Customer service: W. Zablocky

Products manufactured: Cabinets & Accessories, Cable, Clamps & Clips, Jigs And Fixtures, Chassis & Circuit Board, Leads, Test & Adaptors, Panels, Racks, Services, Assembly, Production & Test, Switchboards, Testers

ANDERSEN & ASSOC., WALTHER M.A., 4 Main St. Ext., Tariffville, Conn., 06081, Tel: 203-658-7666; FSC No: 52045; Empl: 18

For info on price: V. W. Andersen; Application info: R. L. Sawin; Customer service: S. E. Rittenburg; Delivery info: V. W. Andersen

Free literature available: Catalog sheets.

Products manufactured: Controls/Control Eqpt., Decade Boxes, Delay Lines, Memory Systems, Modulator/Demodulators, Standards, Transducers

ANDERSEN LABS., INC., 1280 Blue Hills Ave., Bloomfield, Conn., 06002, Tel: 203-242-0761, TWX: 710-425-2390; Empl: 300 p. 1-428,429,

Customer service: R. T. Ruder

Products manufactured: Delay Lines, Filters, Lasers & Laser Systems, Memory Systems, Modulator/Demodulators, Recorders

ANDERSON JACOBSON, 1065 Morse Ave., Sunnyvale, Cal., 94086, Tel: 408-734-4030; Empl: 450

Customer service: T. B. Zmach

Products manufactured: Modulator/Demodulators, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Cal	Inglewood, Anderson Jacobson	213-674-4051
Cal	San Diego, Anderson Jacobson	714-484-0149
Ga	Atlanta, Anderson Jacobson	404-451-2744
Ill	Northbrook, Anderson Jacobson	312-498-4220
Md	Rockville, Anderson Jacobson	301-424-1767
Mass	Burlington, Anderson Jacobson	617-273-1420
Minn	St. Paul, C. Papeleux	612-333-7228
NJ	Hackensack, Anderson Jacobson	201-488-2525
NY	New York, Anderson Jacobson	212-594-9630
NY	Rochester, Anderson Jacobson	716-436-2420
Ohio	Cincinnati, Anderson Jacobson	513-793-5556
Pa	King of Prussia, Anderson Jacobson	215-265-3446
Pa	Pittsburgh, Chiodo	412-881-8989

ANDREW ANTENNA CO. LTD., 606 Beech St., Whitby, Ont., Can., Tel: 668-3348, TWX: 610-384-2754; Empl: 120

For info on price: R. Zedic 52; Application info: R. Zedic 52; Customer service: B. Correll 32; Delivery info: B. Correll 32

Free literature available: New product bulletins.

Products manufactured: Antenna Feed Systems, Antennas, Bends & Twists, Microwave, Cable, Connectors, Dehydrators, Waveguides & Adapters

ANDREW CORP., 10500 W. 153rd St., Orland Park, Ill., 60462, Tel: 312-349-3300, TWX: 910-651-3340; Empl: 600

Customer service: H. Woodbury

Products manufactured: Antennas, Cable, Waveguides & Adapters

Local Sales Offices & Reps.

Cal	Claremont	714-626-3505
Cal	Palo Alto	415-323-3139
Colo	Denver	303-222-1579

Md	Rockville	301-762-1900
NJ	Hawthorne	201-652-1310
Tex	Richardson	214-235-1279

ANGSTROHM PRECISION, INC., Box 1827, Hagerstown, Md., 21740, Tel: 301-739-8722, TWX: 710-853-6834; FSC No: 17745; QPL No: Multiple; Empl.: 250; Minimum order: \$50

For info on price: T. M. Hart; Application info: T. M. Hart; Customer service: T. Brown; Delivery info: T. Brown

Free literature available: Literature describing Angstrom hi-reliability metal film resistors approved to MIL-R-55182 and MIL-R-10509, ladder networks, plus-R large positive temperature coefficient silicon resistors, and vitreous enameled wire-wound ring rheostats approved to MIL-R-22.

Products manufactured: Networks, Potentiometers, Resistors

Local Sales Offices & Reps.

Ala	Huntsville, Twentieth Century Mktg., Inc.	205-772-9237
Ariz	Tempe, Argus Sls.	602-967-8709
Cal	Los Altos, Recht Assocs.	415-941-0338
Cal	Van Nuys, JFD Sls. Office	213-785-0487
Colo	Denver, Camel Elctns.	303-757-6191
Fla	Clearwater, Perrott Assocs., Inc.	813-531-5513
Fla	Orlando, Perrott Assocs., Inc.	305-275-1132
Ill	Hinsdale, MoMak Sls.	312-654-4524
Ind	Greenwood, Valentine-Schillinger & Assoc.	317-888-2260
Ind	South Bend, Valentine-Schillinger & Assoc.	219-291-6258
Md	Ellicott City, Doss Elctns., Inc.	301-465-1336
Mass	Framingham, JFD Sls. Office	617-872-4943
Minn	St. Louis Park, Beta Engrg.	612-925-4422
Mo	Blue Springs, CHESCO	816-229-1404
Mo	St. Charles, CHESCO	314-946-6677
NJ	East Hanover, HLM Assoc.	201-386-0794
NY	New Hartford, JFD Sls. Office	315-732-3507
NY	Northport, H.L.M. Assocs.	516-423-1818
Ohio	Chagrin Falls, Pine Sls. Co.	216-247-6198
Ore	Portland, C.K. Shanks & Assoc.	503-292-5656
Pa	Philadelphia, S.K. Macdonald, Inc.	215-545-1205
Pa	Pittsburgh, S.K. Macdonald Inc.	412-366-2643
Tex	Dallas, United Comps.	214-324-1448
Wash	Seattle, C.K. Shanks & Assoc.	206-632-4290
Wisc	Milwaukee, Star Engrg. Sls.	414-645-3680

ANIXTER-MARK, Anixter Comms. Sys., 5439 W. Fargo, Skokie, Ill., 60076, Tel: 312-675-1500; Empl.: 49; Minimum order: \$10

Customer service: E.N. Lamarre

Free literature available: Grid Antennas; CB Antennas.

Products manufactured: Antenna Feed Systems, Antennas, Cable Assemblies & Harnesses, Wire

Local Sales Offices & Reps.

Cal	Los Angeles, RF Assocs.	213-478-1586
Cal	Palo Alto, RF Assocs. Co.	415-494-3331
Mass	Waltham, Meas. Consultant Corp.	617-890-4400
NJ	Merchantville, L. Adezro Sls. Co.	609-662-3540

ANN ARBOR TERMINALS, INC., 6107 Jackson Rd., Ann Arbor, Mich., 48103, Tel: 313-769-0926, TWX: 810-223-6033; Empl.: 45; p. 1-134-140

For info on price: K. Straith; Application info: K. Straith; Customer service: S. Clark; Delivery info: D. Evans

Free literature available: SHORT FORM CATALOG. 8-page descriptive brochure on entire product line. Provides basic specifications and applications information on all CRT display electronics.

Products manufactured: CATV Systems & Equipment, Display Devices/Displays, Generators, Keyboards, Alphanumeric & Decimal, Memory Systems, Monitors, Television Systems & Equipment Closed-Circuit, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic), Tubes

Local Sales Offices & Reps.

Ariz	Scottsdale, BFA Corp.	602-946-4215
Cal	Santa Clara, Ann Arbor Terminals	408-249-6046
Colo	Denver, BFA Corp.	303-744-3301
Fla	Orlando, Technical Assocs.	305-894-7531
Ill	Chicago, SEA, Inc.	312-282-6694
Ind	Carmel, SEA, Inc.	317-846-2593
Minn	Minneapolis, SEA, Inc.	612-425-4455
NM	Albuquerque, BFA Corp.	505-296-8303
NM	Las Cruces, BFA Corp.	505-523-0601

Pa	Jenkintown, Stein Instrumentation	215-885-2370
SC	Spartanburg, Technical Assocs.	803-579-2904
Tex	Dallas, Remtek, Inc.	214-387-2855
Utah	Salt Lake City, BFA Corp.	801-466-6522
Wash	Seattle, Rush Drake Assocs.	206-763-2755
Wisc	Milwaukee, SEA, Inc.	414-547-6637

ANNIS R B CO., 1101 N. Delaware, Indianapolis, Ind., 46202, Tel: 317-637-9282; Empl.: 10; Minimum order: \$5

Customer service: R. B. Annis

Free literature available: Pocket Magnetometers; Enclosed Demagnetizers; Open Style Demagnetizers; Audiophile Han-D-Kits; Notes on Demagnetizing; Split Core C.Ts; Hi-Flux Magnetic Equip.; Products; Dymograph Balancers; Special Magnetic Equip.

Products manufactured: Coils Including Assemblies & Forms, Demagnetizers, Erasers, Magnetic Tape (Bulk), Indicators, Magnetizers, Magnetometers, Meters, Power Supplies, Recorders, Tape Recording Accessories, Transformers

Advertisement

DEMAGNETIZERS Annis Demagnetizers available from small hand held units to heavy industrial types. Over 1000 varieties to choose from.

MACHINES, BALANCING Precision Annis Dynograph Balancers for production balancing of smaller rotors.

METERS, GAUSS Measure magnetic residuals in tape recording equipment, tools & steel parts.

TRANSFORMERS, INSTRUMENT Annis Split Core Current Transformers. Ranges from 150 to 6000/5 amperes. Six sizes. Will operate direct writing recorders.

ANODYNE INC., 1270 N.W. 165th St., N. Miami Beach, Fla., 33169, Tel: 305-621-3641, TWX: 810-848-7200; Empl.: 150; Minimum order: \$45

For info on price: E. T. Turney, Jr.; Application info: E. T. Turney, Jr.; Customer service: E. T. Turney, Jr.; Delivery info: D. Pare

Free literature available: Facilities Brochure, Catalog.

Products manufactured: Labels, Pressure-Sensitive, Adhesive, Nameplates

Local Sales Offices & Reps.

Conn	Vernon, G-M Assocs.	203-646-4443
Ind	Fort Wayne, Given Co.	219-432-5585
Mass	Framingham, G-M Assocs.	617-872-4871
Mich	Birmingham, D.L. Touhy Assocs.	313-645-5700
NJ	Marlton, N. Krouse Assocs.	609-424-3543
NJ	Mountain Lakes, Components for Elctns.	201-334-2921

ANRO ELEX INDS. LTD., 300 Wildcat Rd., Downsview, Ont, Can., Tel: 416-661-2600; Empl.: 85

Customer service: E.H. Jones

Free literature available: Coils and low pressure switches literature.

Products manufactured: Coils Including Assemblies & Forms, Switches

ANSLEY ELCTNS. CORP., Sub. Thomas & Betts Corp., 3208 Humboldt St., Los Angeles, Cal., 90031, Tel: 213-223-2331, TWX: 910-321-3938; Empl.: 200

Customer service: V. Saccone

Products manufactured: Boards, Printed Circuit, Cable Assemblies & Harnesses, Cable, Circuits, Flexible, Connectors, Jumpers, Strain Reliefs, Cable & Wire, Tools

Local Sales Offices & Reps.

Ala	Huntsville, Technology Mktg.	205-883-7893
Cal	(NO) San Jose, Ansley Elctns.	408-267-2434
Cal	(SO) San Diego, L.L. Stoakes	714-274-6281
Colo	Littleton, Simpson Assocs.	303-794-8381
Conn	Madison, JEMCO Sls.	203-245-1505
Fla	S.E. Pampano Beach, TMA	305-942-0774
Ill	Des Plaines, Ansley Elctns. Inc.	312-298-5545
Ind	Fort Wayne, J & B Engrg. Sls. Co.	219-483-2813
Kans	Kansas City, Harris-Hanson Co.	816-444-9494
Md	Baltimore, Burgin Kreh Assoc., Inc.	301-788-5200
Mass	Amherst, JEMCO Sales	617-326-3436

Mich	Grand Rapids, R.P. Urban	616-245-0511
Mo	(East) St. Louis, Harris-Hanson Co.	314-432-3611
NH	Amherst, JEMCO Sls.	617-328-3436
NY	(Upstate) Shortsville, Ansley Elctns. Corp.	315-289-3400
NC	Winston-Salem, Burgin-Kreh Assoc.	919-788-4174
Okl	Tulsa, R.D. Spooner Co.	918-936-2562
Pa	Doyestown, Ansley Elctns. Corp.	215-345-1800
Tex	Dallas, R.D. Spooner	214-357-6636
Tex	Houston, R.D. Spooner Co.	713-783-3640
Va	Lynchburg, Burgin-Kreh Assoc., Inc.	804-845-5600

ANTENNA CORP. OF AMERICA, P.O. Box 865, Burlington, Iowa, 52601, Tel: 319-753-1625; Minimum order: \$10

Customer service: W. Picker 319-753-2095

Products manufactured: Amplifiers, Antenna Rotators, Antenna Towers & Supports, Antennas, Arresters, Electrical Surge, Lightning, Cable, CATV Systems & Equipment, Connectors, Couplers, Mounts, Television Systems & Equipment, Closed-Circuit, Terminals, Transformers, Wire

Local Sales Offices & Reps.

Ariz	El Dorado, D. Bellow Sls.	501-863-8325
Cal	San Carlos, P & J Ents.	415-591-4689
Cal	Van Nuys, A. Szerlip Sls. Co.	213-782-1765
Colo	Greeley, G. Moss Elctns.	303-353-1452
Fla	Ft. Lauderdale, Sproch Sls.	305-587-3792
Ga	Douglasville, I. Jones	404-942-1596
Ill	Centralia, Bob Dunn Sls. Co.	618-533-1775
Iowa	Weaver, W.L. Brookhiser	319-372-2513
Mass	Braintree, Rudolph-MacInnis Assoc.	617-843-0908
Mich	Kentwood, Cecil Geer Co.	616-534-9449
Minn	Minneapolis, HMR	612-920-8200
Mo	Liberty, Lectoro Reps	816-781-2522
NJ	Moorestown, DiVincent & Legato Assoc.	609-235-8299
NY	Camillus, Callahan-Ferguson Co.	315-487-3870
NY	Elizabethtown, J. Grandrath	516-962-4500
NY	Yonkers, J. Brown Elec. Sls.	914-779-7330
Tex	Dallas, Townsend Sls. Co.	214-241-7791
Tex	Lewisville, J.M. Greiten	214-434-2870
Wash	Seattle, Fleehart & Sullivan	206-522-1533

ANTENNA DESIGNS, INC., 802 Washington St., Burlington, Iowa, 52601

ANTENNA RESEARCH ASSOCIATES, INC., 11317 Frederick (Box 196), Beltsville, Md., 20705, Tel: 301-937-8888; Empl.: 15; Minimum order: \$25

For info on price: H. W. Rapalus; Application info: R. W. Masters; Customer service: H. W. Rapalus; Delivery info: H. W. Rapalus

Free literature available: Technical specification sheets which include a descriptive commentary on the specific systems involved.

Products manufactured: Antenna Feed Systems, Antenna Rotators, Antennas, Couplers, Radar Systems

Local Sales Offices & Reps.

Tex	Corpus Christi	512-882-6591
-----	----------------	--------------

ANTENNA SPECIALISTS CO., 12435 Euclid Ave., Cleveland, Ohio, 44106

ANTENNACRAFT, Box 1005, Burlington, Iowa, 52601

M M NEWMAN CORP., Antex Div., Marblehead, Mass., 01945, Tel: 617-631-7100; Empl.: 8; Minimum order: \$10

For info on price: F. McCarron; Application info: A. Foresta; Customer service: P. Cohen; Delivery info: F. McCarron

Products manufactured: Caps, Forms & Tapes, Heat Shrinkable, Heat Guns, Production, Kits, Cable-End Sealing, Soldering Accessories, Soldering Guns, Irons & Desoldering Tools, Tubing, Wire Markers

ANZAC ELECTRONICS, 39 Green St., Waltham, Mass., 02154

A. P. CIRCUIT CORP., 865 West End Ave., New York, N.Y., 10025, Tel: 212-222-0876; Empl.: 8; p. 1-528,529

Customer service: F. Ellern

Free literature available: Filter Catalog - describes both variable frequency modules and fixed frequency modules. Frequency Covered 0.01 Hz-20 MHz. Examples of applications are included.

Products manufactured: Analyzers, Filters

Local Sales Offices & Reps.

Ohio Cleveland, S. Sterling 216-442-8080
Va Fairfax, Shibley Assocs. 703-591-3008

A.P. PRODUCTS, 72 Corwin Dr., Painesville, Ohio, 44077,
Tel: 216-357-5597

APAHOUSE CORP. OF N.E., 101 Walnut St., Watertown,
Mass., 02172, Tel: 617-924-1500; FSC No: 53721; Empl.:
80

For info on price: F. Gately; Application info: F.
Gately; Customer service: F. Gately; Delivery info: I.
Goldfine

Products manufactured: Bus Bars & Systems,
Cabinets & Accessories, Chassis, Metal, Dials,
Panels, Scales, Dial, Services, Assembly,
Production & Test, Terminal Blocks, Boards &
Strips

APM-HEXSEAL, 44 Honeck St., Englewood, N.J., 07631,
Tel: 201-569-5700; Empl.: 80; Minimum order: \$50

For info on price: C. J. Czapsinski; Application info: C.
J. Czapsinski; Customer service: S. Hoffman; Delivery
info: F. Miller

Free literature available: Environmental seals for
switches, sealscrews & nuts, miniature o-rings,
armored power connectors, lamp diffusers,
custom engineered splash covers.

Products manufactured: Connectors, Fasteners,
Feedthrus & Seals, Environmental, Rubber

Local Sales Offices & Reps.

Ariz Phoenix, Zeus 602-258-7519
Cal Costa Mesa, Porter Co.
Cal Encino, Porter Co. 213-788-2350
Colo Englewood, Zeus, Inc. 303-770-4400

Conn Newton, Gerber Sls. Corp. 203-426-3440
Fla Orlando, Buchanan & Abrams Assoc.
305-898-7444

Ill Hinsdale, Hill-Gray Assoc. 312-325-4810
Ind Fort Wayne, Val-Skol Sls., Inc. 219-742-9122

Ind Indianapolis, Val-Skol Sls., Inc. 317-926-5063
Iowa Cedar Rapids, Penzner-Mankus Assoc.
319-362-9177

Kans Overland Park, Penzner-Mankus Assoc.
913-381-0004

Kans Wichita, Penzner-Mankus Assoc. 316-254-2662
Mass E. Longmeadow, Gerber Sls. Corp.
413-525-3059

Mass Waltham, Gerber Sls. Corp. 617-890-8040
Mich Troy, C.B. Jensen & Assoc. 313-643-0506

Minn St. Paul, Northport Engrg. 612-698-3841
NM Albuquerque, Zeus, Inc. 505-256-9831

NY Great Neck, L. Tylini Co. 516-466-9070
NY Syracuse, Rep-Tech, Inc. 315-437-2845

Ohio Cincinnati, Val-Skol Sls., Inc. 513-563-6790
Ohio Cleveland Hgts., Val-Skol Sls., Inc.
216-462-2822

Ohio Columbus, Val-Skol Sls., Inc. 614-291-4123
Pa Paoli, T. Griffin Co. 215-647-1550

Tex Dallas, R.P. Votteler 214-823-2320
Utah Salt Lake City, Zeus, Inc. 801-486-2317

Wash Seattle, Blum & Assocs. 206-285-2590

API INSTRUMENTS, See LFE Corp., Process Control Div.

APOLLO CORP., 465, Suwa, Takatsuku, Kawasaki, Japan,
Tel: 044-811-2161; Empl.: 30

For info on price: M. Kohmoto; Application info: M.
Kishita; Customer service: M. Kohmoto; Delivery info:
M. Kohmoto

Products manufactured: Lamps, Relays, Tubes

APOLLO LASERS INC., 6357 Arizona Cir., Los Angeles,
Cal., 90045, Tel: 213-776-3343, Telex: 69-8204; Empl.:
60; Minimum order: \$50

For info on price: R. T. Pittak; Application info: W. T.
Wegner; Customer service: W. T. Wegner

Products manufactured: Lasers & Laser Systems,
Scribers, Welding Equipment & Access.
(Excluding Equip. for Semiconductor Devices)

APPLETON ELECTRONIC DIV., Appleton Electric Co.,
2950 N. Paulina, Chicago, Ill., 60657

APPLIED CIRCUITS, INC., 31-24 14th St., Long Island
City, N.Y., 11106, Tel: 212-274-6001; Empl.: 20

p. 2-345

Customer service: Customer Service Dept.
Products manufactured: Boards, Plug-In, Boards,
Printed Circuit, Boards, Printed Wiring, Universal

APPLIED CONTROL CO., 1275 Bloomfield Ave., Fairfield,
N.J., 07006, Tel: 201-227-5454; Empl.: 23; Minimum
order: \$100

For info on price: S. Richer; Application info: W.
Merel; Customer service: W. Merel; Delivery info: S.
Richer

Free literature available: Model 71000 SCR Motor
Controls; Model 3000 Series Modular Controllers
containing, contractors, signal conditioners, limit
alarms, time integral totalizers; Model 7000 Series
ARL Lamp Power Supplies

Products manufactured: Alarms, Amplifiers,
Annunciators, Chargers, Battery, Comparators,
Controls/Control Eqpt., Detectors, Gages,
Indicators, Monitors, Power Supplies, Regulators,
Relays, Services, Assembly, Production & Test,
Servo Systems, Signal Conditioners & Equipment,
Testers, Totalizers, Digital

Advertisement

SPECIALISTS IN CONTROL SYSTEMS and INSTRUMENTA- TION ENGINEERING AND MANU- FACTURING FOR

- SET POINT & MOTOR CON-
TROL
- PANELS & CONSOLES
- POWER SOURCES

ELECTRONIC CONTROLS FOR INDUSTRY

APPLIED DATA COMMUN., 1509 E. McFadden Ave.,
Santa Ana, Cal., 92705, Tel: 714-547-6954; Empl.: 12

Customer service: Roger Saville

Free literature available: Series 41 Data Sheets,
Tech Notes, Price List-Program Loading Unit
Series 42 -3M Tape Cartridge System Series 61
IBM Compatible Floppy Disk System

Products manufactured: Enclosures, Module,
Plug-In, Recorders

Local Sales Offices & Reps.

Ariz Phoenix, Thorson Co. 602-956-5300
Cal Los Altos, C. White 415-948-6533
Cal Santa Ana, Applied Data Comms. 714-547-6954

Colo Golden, J. F. Hurlbut Co. 303-279-7796
Fla Ft. Lauderdale, Reynolds & Assoc.
305-581-6611

Ga Atlanta, Reynolds & Assoc. 404-252-5360
Ind Munster, Bexdata 312-221-1411

Md Wheaton, Sonco 301-942-9420
Mass Lynnfield, Newmar 617-245-7960

Minn Edina, Bexdata 612-835-5220
NY Rochester, K. & J. Assoc. 716-232-6640

Tex Richardson, Lear Assoc. 214-231-5388
Wash Bellevue, Brennen Assoc. 206-454-9332

APPLIED DESIGN CO., 2465 Sheridan Dr., Tonawanda,
N.Y., 14150, Tel: 716-837-4400; Empl.: 150

For info on price: T. Y. Smith; Application info: E. A.
Berger; Customer service: H. E. Kellar; Delivery info:
H. E. Kellar

Free literature available: General Descriptive
Literature

Products manufactured: Cases, Equipment,
Instrument, Meter, Cases, Transit, Containers,
Services, Assembly, Production & Test

APPLIED DIGITAL DATA SYS., INC., 100 Marcus Blvd.,
Hauppauge, N.Y., 11787, Tel: 516-231-5400, TWX:
510-227-9886; Empl.: 127

For info on price: R. Kaufman; Application info: J.
Friedman; Customer service: R. Petrilak; Delivery info:
W. Posner

Free literature available: 980, 880, 580, 680, 380, 780,
"A" Series, 815 printer, Data Sheets Included

Products manufactured: Computers, Terminal
Equipment, Digital, Terminals, Data Display
(including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Cal Los Angeles 714-539-7731
Cal San Jose 408-292-5822

DC Washington 301-933-5999
Fla Miami 305-279-9179

Ga Marietta 404-992-2190
Ill Chicago 312-530-1100

Mass Boston 617-468-7231
NY Hauppauge 516-231-5400

Pa Pittsburgh 412-931-5050
Tex Houston 713-376-3801

APPLIED ELECTRO TECHNOLOGY, INC., 2220 S.
Anne St., Santa Ana, Cal., 92704, Tel: 714-556-6570,
TWX: 910-595-1797; FSC No: 52797; Empl.: 20;
Minimum order: \$25 p. 1-1578, 1579

For info on price: L. Daniel; Application info: H.
Whitmore; Customer service: L. Daniel; Delivery info:
L. Daniel

Free literature available: Phase Sequence Relay
Catalog 1A-1; Phase Sequence Indicator Catalog
2A-1; Time Delay Relay Catalog 3B-1; Time Delay
Relay Catalog 3A-1; Flasher Catalog 4A-1.

Products manufactured: Circuits, Hybrid, Thin-Film,
Clocks (All Types), Controllers, Programmable,
Controls/Control Eqpt., Converters, Counters,
Current Sensors, Generators, Indicators, Lamp
Drivers, Monitors, Power Supplies, Relays,
Testers, Timers

APPLIED FLUIDICS INC., 770 Main St., Westbury, N.Y.,
11590, Tel: 516-334-8742; Empl.: 20

Customer service: Pat Sorrentino

Free literature available: Brochure on Century Series
Electronic Leak Detectors.

Products manufactured: Detectors

Local Sales Offices & Reps.

Cal Pico Rivera, Westrep 213-949-2551

APPLIED GRAPHICS, 58 Shore, Glenwood Landing, N.Y.,
11547, Tel: 516-676-1211; Empl.: 29; Minimum order:
\$50

Customer service: K. DiMaggio

Free literature available: Applied Graphics PSM 75
pressure sensitive graphic tape catalog containing
a comprehensive listing of tapes, screen and color
sheets, transfer lettering and related supplies.

Products manufactured: Tapes, Films & Foils,
Pressure Sensitive

APPLIED MAGNETICS CORP., Magnetic Head Div., 75
Robin Hill Rd., Goleta, Calif., 93017, Tel: 805-964-4881,
TWX: 910-334-1195; Empl.: 3600

For info on price: W.P. Graham; Application info: W.P.
Graham; Customer service: J. Patin; Delivery info: J.
Patin

Products manufactured: Heads, Recording
Playback, Erase

Local Sales Offices & Reps.

Ariz Scottsdale, Barnhill Five 602-947-5745
Cal Santa Clara, King Assoc. 408-249-1022

Colo Denver, Barnhill Five 303-426-0222
Mass Wakefield, Data Engrg. Svc. 617-245-6666

NJ Livingston, Graydon-Sherman, Inc.
201-994-9055

NM Albuquerque, Barnhill Five 505-293-5955
NY Fayetteville, Graydon-Sherman, Inc.
315-637-9861

Ohio Dayton, Ashby Assocs., Inc. 513-252-5627
Tex Richardson, Oeler & Menelades 214-234-6334

Utah Salt Lake City, Barnhill Three 801-487-1327

APPLIED MATERIALS INC., 3050 Bowers Ave., Santa
Clara, Cal., 95051, Tel: 408-249-5555, Telex: 34-6332;
Empl.: 450

Products manufactured: Controllers,
Programmable, Controls/Control Eqpt.,
Generators, Machines/Machinery, Production,
Semiconductor Wafer Fabrication, Services,
Assembly, Production & Test

APPLIED MICROWAVE, Div. Epsco Inc., 411
Providence Hwy., Westwood, Mass., 02090, Tel:
617-329-1500, TWX: 710-348-0484; FSC No: 15894;
Empl.: 150; Minimum order: \$25 p. 1-901-904

Customer service: H. Clark

Free literature available: Data sheets/brochures
with detailed specifications of high power
microwave signal sources and cavity oscillators;
ECM, radar, TACAN, altimeter, IFF simulators; and
data conversion systems.

Products manufactured: Amplifiers, Cavities,
Microwave, Converters, Generators, Modulators,
All Kinds, Oscillators, Simulators, Synthesizers,
Test Systems, Transmitters

Local Sales Offices & Reps.

Ariz Scottsdale, PLS Assoc. 602-957-9110
Cal Anaheim, Blair Assoc. 714-635-1350

Cal San Jose, Mich Assocs. 408-246-7330
Colo Denver, PLS Assoc. 303-771-0140

Fla Fort Lauderdale, Snow Co. 305-563-2448
Ill Northfield, Feller Assoc. 312-446-8065

Mass Waban, Bawer Assoc. 617-244-6572
NJ Haworth, Central Assoc. 201-568-0808

NM Albuquerque, PLS Assoc. 505-255-2330

NY Plainview, Central Assoc.516-433-0808
 NY Syracuse, Syracuse Tech. Reps.315-488-0222
 Tex Fort Worth, Carey Wolf & Assoc.817-738-1996
 Tex Houston, Carey Wolf & Assoc.714-721-2442
 Va Annandale, J. Hopkins Assoc.703-323-1641
 Wash Seattle, Datacom Assoc.206-285-2525
 EXP: Hallandale, Fla., Emec, Inc.305-925-6366

APPLIED MOTORS INC., Box 106, 4808 Boeing Dr., Rockford, Ill., 61105, Tel: 815-397-2006; Empl.: 120; Minimum order: \$10

For info on price: R. A. Baird; Application info: R. A. Baird; Customer service: J. E. Malinowski; Delivery info: V. M. Gaines

Free literature available: Model BA bulletin - motors for low voltage battery powered systems; Model SR bulletin - motors for SCR speed control systems; Model VC bulletin - motors with integral bridge rectifiers; REDI LINE motor-generator bulletin.

Products manufactured: Motor Electric Generator Sets, Motors

Local Sales Offices & Reps.

Ala Birmingham, East South Sls. Co.205-323-2223
 Cal Hawthorne, W. H. Del Mar213-756-1431
 Cal Mountain View, Claypool Controls Co.415-968-7488
 Conn Ridgefield, E. S. Williams Co.203-438-7474
 Ill Chicago, Clarkson Engrg. Co.312-286-2314
 Mass Marblehead, Canner Assocs.617-599-4740
 Minn Burnsville, R. E. Norene & Assoc.612-890-1333
 Mo St. Louis, Terry & Hodges314-965-0746
 NY Rochester, A. F. Zissler716-586-6232
 Ohio Dayton, Rockford Controls Ohio513-278-7362
 Okla Tulsa, Dynamic Component Sls.918-749-1689
 Pa Broomall, J. C. Whiddett Co.215-353-6343
 Pa Monroeville, Rockford Controls Ohio412-373-2531
 Tex Bellaire, Dynamic Component Sls.713-668-7729
 Tex Dallas, Dynamic Component Sls.214-363-6191
 Wisc Cedarburg, R. E. Norene & Assoc.414-377-5440

APPLIED RESEARCH INC., 76 S. Bayles Ave., Port Washington, N.Y., 11050, Tel: 516-883-5700, TWX: 510-223-0822; Empl.: 50 p. 2+1276, 1277
 For info on price: C. G. Costas; Application info: A. M. Scandurra; Customer service: C. G. Costas; Delivery info: C. G. Costas

Products manufactured: Amplifiers, Attenuators, Converters, Couplers, Filters, Multipliers, Switches, Terminals

Local Sales Offices & Reps.

Cal Anaheim, Blair Assocs.714-635-1350
 Cal Portola Valley, Kipp Assocs.415-851-0123
 Mass Waban, Bawer Assocs.617-244-6572
 NY Bridgeport, Lightstone Corp.315-699-3209
 NY Port Washington, ARI516-883-5700
 Pa Newtown Square, SWR Assocs.215-356-8550
 Tex Dallas, Texas Avionics214-368-3566
 Va Fairfax, Schibley Assocs.703-591-3008

APPLIED SYSTEMS CORP., 26401 Harper Ave., St. Clair Shores, Mich., 48081, Tel: 313-779-8700; Empl.: 6

Products manufactured: Alarms, Analyzers, Comm. Systems, Computers, Controllers, Programmable, Controls/Control Eqpt., Data Acquisition & Reduction Systems, Data Loggers, Integrated Circuit Devices, Monitors, Process Control Systems, Recorders, Test Systems, Testers, Timers, Totalizers, Digital, Transmission Systems, Data

A. P. W. CO., INC., 72 W. Main, Rockaway, N. J., 07866, Tel: 201-627-0643; Empl.: 18

For info on price: L. Rowe; Application info: A. Pfeil; Customer service: A. K. Pfeil; Delivery info: A. K. Pfeil

Free literature available: Free Listings

Products manufactured: Coils Including Assemblies & Forms, Solenoids

Local Sales Offices & Reps.

NY Seaford, H. Abbott516-781-5256

AQUALARM INC., 544 W. 182nd, Gardena, Cal., 90248, Tel: 213-321-5873; Empl.: 10; Minimum order: \$25

Customer service: J. Herscovitz

Free literature available: Brochure - describes alarm system & emphasizes features. Catalogue sheet - lists and shows products and accessories. Installation instructions - for-do-it-yourself installation, covers all applications of the different types of switches.

Products manufactured: Alarms, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Switches

ARCO ELCTRNS., See PFC Mfg. Div.

ARCO ELECTRONICS INC., Community Drive, Great Neck, N.Y., 11021, Tel: 516-487-0500, TWX: 510-223-0888; Empl.: 490 p. 1+547; p. 2+32-39,619

Products manufactured: Boards, Plug-In, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Boards, Programming, Capacitors, Fixed, Capacitors, Variable, Connector Adapters, Connectors, Networks, Pins, Relays, Socket Adapters, Sockets

Local Sales Offices & Reps.

Cal Anaheim, Lo-Dan Inc.714-956-1560
 Cal Chatsworth, Arco Pacific213-882-8707
 Cal San Carlos, Lo-Dan Inc.415-592-4600
 Cal San Diego, Lo-Dan Inc.714-279-6383
 Cal Van Nuys, Obie Mktg. Co.213-997-1124
 Fla No. Miami, L. Haas Co. Inc.305-949-9143
 Ill Chicago, Lassers & Co.312-673-4050
 Ind Indianapolis, Advanced Comp. Sls.317-545-6441
 Mass Lynn, Keene Sls.617-595-2300
 Mich Southfield, Reps. Elctn. Prods.313-354-9066
 Minn St. Paul, Northport Engrs. Inc.612-698-3841
 NJ Teaneck, Stan Axelrod Assoc.201-836-6661
 NY Rochester, L-Mar Assoc.716-328-5240
 Ohio Cleveland, Marlow Assoc. Inc.216-932-0900
 Ohio Dayton, Marlow Assoc. Inc.513-426-6270
 Tex Dallas, Berthold Sls. Co.214-526-8329
 Tex Dallas, EBR, Inc.214-942-2716
 Wash Seattle, DMS/Vantage206-784-6800
 Wash Seattle, Vantage Corp.206-455-3460
 EXP: Great Neck, Arco N.Y.516-487-0500

ARCO WIRE & CABLE, 5168 Vineland Ave., N. Hollywood, Cal., 91601, Tel: 213-877-3376; Empl.: 10; Minimum order: \$25

For info on price: E.L. Paul; Application info: B.B. Poole; Customer service: B. LeGault; Delivery info: B. LeGault

Free literature available: Line Card

Products manufactured: Cable Assemblies & Harnesses, Cable, Cords, Wire

Advertisement

Thermocouple Wire
 High Temperature Wire
 Teflon Hookup Wire
 Teflon Coaxial Cable
 U/L Wire and Cable
 Aircraft Wire and Cable

ARCOLECTRIC SWITCH CORP., Box 348, 11120 Chandler Blvd., No. Hollywood, Cal., 91603, Tel: 213-985-3130; Minimum order: \$35

p. 1+1959; p. 2+1125

For info on price: L. Lewis; Application info: L. Lewis; Customer service: J. Thomson; Delivery info: L. Lewis

Free literature available: Complete catalog covering switches: Toggle, Push-Button, Rocker etc., and indication lights neon, and lamp holders.

Products manufactured: Caps, Lenses, Indicator Light, Lamp Adapters, Lamps, Lights, Sockets, Switch Handle Boots, Switches

AREMCO PRODS., INC., Box 429, Ossining, N.Y., 10562, Tel: 914-762-0685; Empl.: 12; Minimum order: \$25

For info on price: Order Dept.; Application info: R. M. Soberman; Customer service: Order Dept.; Delivery info: Order Dept.

Products manufactured: Adhesives (All Types), Alloys, Cleaners & Solvents, Coatings, Crystals, Drills & Accessories, Hand & Power, Gages, Graphite Parts, Materials, Graphite, Metals, Ovens, Services, Assembly, Production & Test, Substrates, Tools, Tubing

Local Sales Offices & Reps.

Cal Torrance, Cal. Tech. Svcs.213-320-1310
 Fla Winterhaven, S&S Sales Reps.813-293-7304

ARENBERG ULTRASONIC LAB INC., 94 Green, Jamaica Plain, Mass., 02130, Tel: 617-522-8640; Empl.: 17; Minimum order: \$20

Customer service: Robert J. Toronto 617-522-4038

Free literature available: Brochures describing our line of ARULAB test equipment including high voltage pulsed RF oscillator, amplifiers, pre-amplifier, attenuators and auxiliary equipment.

Products manufactured: Amplifiers, Attenuators, Cable Assemblies & Harnesses, Coils Including Assemblies & Forms, Detectors, Generators, Power Supplies

A.R.F. PRODUCTS, Box 3226, Boulder, Colo., 80303, Tel: 303-443-4844, TWX: 910-940-3446; FSC No: 15196; Empl.: 24

For info on price: J. D. Ellington; Application info: A. B. Przedpelski; Customer service: J. D. Ellington; Delivery info: J. D. Ellington

Products manufactured: Alarms, Amplifiers, Cavities, Microwave, Comm. Systems, Controls/Control Eqpt., Couplers, Data Acquisition & Reduction Systems, Filters, Generators, Meters, Networks, Oscillators, Ovens, Receivers, Synthesizers, Transmitters, Transponders

Local Sales Offices & Reps.

Ariz Tempe, PLS Assocs.602-957-9110
 Colo Denver, PLS Assocs.303-771-0140
 NM Albuquerque, PLS Assocs.505-255-2330

ARGA CONTROLS, 35 E. Glenarm, Pasadena, Cal., 91105, Tel: 213-682-3314; FSC No: 50290; Empl.: 12; Minimum order: \$25

For info on price: D. Umland; Application info: H. Galman; Customer service: H. Galman; Delivery info: A. Raines

Products manufactured: Controllers, Programmable, Controls/Control Eqpt., Converters, Indicators, Meters, Monitors, Relays, Signal Conditioners & Equipment, Transducers

Local Sales Offices & Reps.

Cal Long Beach, Emerson Kirk Engrg. Co.213-439-9559
 Cal Oakland, W. Nott & Co.312-258-5202
 Ill Wilmette, Crest Assocs. Inc.312-258-5202
 Ind Indianapolis, Crest Assocs.317-844-2800
 Kans Prairie Village, Engineering Svcs. Co.913-649-4000
 Mo St. Louis, Engineering Svcs. Co.314-997-1515
 Ore Beaverton, Arneson Assocs.503-646-3416
 Va Falls Church, Beacon Elctn. Assocs.703-534-1673
 Wash Seattle, Arneson Assocs.206-762-7664

ARGOS PRODUCTS CO., INC., 600 S. Sycamore St., Genoa, Ill., 60135, Tel: 815-784-5118; Empl.: 85; Minimum order: \$25

For info on price: R.M. Johnson; Application info: A.T. Hoyne; Customer service: A. Andree; Delivery info: A. Andree

Free literature available: 1. Eight page sound system components catalog; 2. Twelve page sound column selection and installation guide; 3. Audiophile Sound Systems flyer; 4. Sound column flyer; 5. Engineering Assistance Program brochure.

Products manufactured: Baffles, Speaker, Public Address Systems, Speaker Systems

Local Sales Offices & Reps.

Ark El Dorado, D. Bellow Sls.501-863-8325
 Cal Culver City, W. Alderson Co.213-870-1030
 Cal San Francisco, Meyer, Ross & Fleming, Inc.415-285-8880
 Colo Denver, K-C Marketers, Inc.303-733-5561
 Fla North Miami, Winfield Elctn. Sls.305-945-6544
 Ga Atlanta, Murphy & Cota404-875-2525
 Haw Honolulu, G. Piety Factors, Inc.808-839-9059
 Ill Chicago, G. McL. Cole Co.312-774-3535
 Ind Indianapolis, C. Scheffler Co.317-253-6337
 La Kenner, D. Bellow Sls.504-729-4550
 Mass North Scituate, W.A. Hendrickson Co.617-545-0652
 Mich Plymouth, J. Malcolm Flora, Inc.313-453-4296
 Minn St. Paul, W. Engelbretson612-222-2338
 Mo Kansas City, Nevco, Inc.816-421-1751
 NJ Fort Lee, TMC Sls. Corp.201-944-5665
 NY Camillus, Callahan-Ferguson315-487-3870
 NC Burlington, Murphy & Cota404-875-2525
 Ohio Richmond, Bear Mktg.216-659-3131
 Ore Salem, B.J. Walling503-363-6445
 Pa Enon Valley, Nebco Assocs.216-457-2333
 Tenn Memphis, D. Bellow Sls.901-365-9437
 Tex Richardson, Campion Sls. Co.214-238-8145
 Va Stinson Assocs.215-896-7378
 Wash Seattle, Pacnor Mktg.206-284-8020
 Wisc Milwaukee, J. Kiehm414-545-6083
 EXP: New York, Roburn Agencies, Inc.212-989-5939

ARI INDS., INC., 9000 King St., Franklin Pk., Ill., 60131,
Tel: 312-671-0511, TWX: 910-227-0052; Empl.: 100;
Minimum order: \$50

For info on price: D. Boyce; Application info: D. Mackenzie; Customer service: E. Kapustka; Delivery info: A. Yavitz

Free literature available: Thermocouples; Heaters; Hi Temp. Cable; Self powered Newtron Detectors; Temp. Controllers.

Products manufactured: Cable, Connectors, Controls/Control Eqpt., Thermocouples, Elements & Accessories, Transducers, Wire

Local Sales Offices & Reps.

Ariz Scottsdale, Inter-Mountain Engrg. 602-947-7379

Cal Laguna Beach, Marchi-Barus Assocs. 714-497-1815

Cal Redwood City, Marchi Assocs. 415-364-3411

Colo Denver, Davis Assocs. 303-744-6644

Conn North Haven, Forsberg Sls. 203-239-5111

Ill Northfield, Itronics 312-446-3231

Ind Indianapolis, Process Heat & Control 317-542-8331

Md Baltimore, Wilt Cooke & Comp. 301-685-1511

Mass Brockton, Forsberg Sls. 617-522-6300

Mich Clawson, Instr. Specialties 313-435-3311

Minn Minneapolis, Industria 612-929-6224

Mo St. Louis, Maise Equip. Co. 314-241-4351

NM Albuquerque, Rustco Enptrs. 505-296-6474

NY Flushing, Tri-State 212-358-1010

NY Rochester, Nickles Engrg. 216-247-8997

Ohio Chagrin Fall, The Jerry Kilroy Corp. 513-522-8340

Ohio Cincinnati, Schlemmer Assocs. 215-643-4702

Pa Blue Bell, W. Gregory & Co. 713-225-6626

Tex Houston, Instrs. 804-264-2588

Va Richmond, Advance Control Equip. Co. 804-264-2588

ARIES ELECTRONICS, Box 231, Frenchtown, N.J., 08825,
Tel: 201-996-4096, TWX: 510-235-3391; FSC No: 51167;
Minimum order: \$25

Customer service: W. Sinclair

Products manufactured: Boards, Plug-In, Boards, Printed Circuit, Boards, Programming, Connectors, Headers, Jumpers, Packages, Integrated Circuit, Sockets

Local Sales Offices & Reps.

Ariz Scottsdale, Sales Engrg. 602-945-5781

Cal Palo, Alto, Engineering Assoc. 415-326-7842

Cal Pasadena, P. Nurches Co. 213-681-8967

Colo Wheatridge, Waugaman Assoc. 303-423-1020

Fla Lighthouse Point, Saber Assoc. 305-943-3076

Ill Des Plaines, Coombs Assoc. 312-298-4830

Md Baltimore, J. A. Maguire & Co. 301-377-0223

Mass Waltham, Betronic Assoc. 617-894-8400

Mich Lathrup Village, R. C. Nordstrom & Co. 313-559-7373

Mo Kansas City, L. F. Florence Co. 816-561-7222

NJ Ho-Ho-Kus, D. J. Fisher Co. 201-652-0092

NJ Pennsauken, J. A. Maguire & Co. 609-665-5136

NY Elbridge, L-Tron Corp. 315-689-3787

NC Winston-Salem, J. A. Maguire & Co. 919-884-7688

Ohio Dayton, Midwest Mktg. Assoc. 513-433-2511

Tex Arlington, Ion Assoc. 817-461-9661

Wash Kirkland, Todd-Brian Inds. 206-827-5811

Local Distributors

Cal Mt. View, Ratel Elctns., 815 Maude Ave. 415-965-2010

Fla Margate, Controlled Dist., 2922 N. State Rd. 7 305-971-4950

Ill Mundelein, J & R Enptrs., 668 Tower Rd. 312-566-2030

Tex Richardson, Air Quip Sls., 909 Business Pky. 214-234-3285

Utah Salt Lake, Alta-Land Elec., 2280 Main St. 801-486-7227

ARISTO GRID LAMP PRDTS., 65 Harbor, Port Washington, N.Y., 11050, Tel: 516-767-6575; Empl.: 15;
Minimum order: \$15

Customer service: P. Hellman

Products manufactured: Lamps, Lights, Ultraviolet Inspection Lighting, X-Ray Inspection Equipment

ARMCO STEEL CORP., 703 Curtis St., Middletown, Ohio, 45043

Products manufactured: Metal Compounds, Foils, Powders, Sheet, Stock

Local Sales Offices & Reps.

Ala Mountain Brook 205-879-0166

Ariz Phoenix 602-274-0528

Cal Los Angeles 213-776-5191

Colo Englewood 303-761-2414

Ga Atlanta 404-325-9740

Ill Chicago 312-782-4082

Ind Indianapolis 317-257-5491

Iowa Bettendorf 319-355-7722

Iowa Des Moines 515-278-2801

Kans Wichita 316-685-4248

Ky Louisville 502-426-3120

La Metairie 504-887-6910

La Shreveport 318-861-2427

Md Baltimore 301-825-5300

Mass Wellesley Hills 617-235-8350

Mich Detroit 313-444-1144

Mich Grand Rapids 616-363-7731

Minn Minneapolis 612-521-7661

Miss Jackson 601-362-0248

Mo Clayton 314-727-9385

Mo Joplin 417-624-0697

Mo Kansas City 816-483-7666

Mo Springfield 417-883-5025

Neb Omaha 402-346-3911

NJ Englewood Cliffs 201-947-4454

NM Albuquerque 505-265-5993

NY Buffalo 716-839-3180

NC Greensboro 919-273-6927

Ohio Cleveland 216-644-7474

Ohio Columbus 614-846-7110

Ohio Dayton 513-298-4301

Ohio Fairfax 513-272-0904

Okla Oklahoma City 405-848-8771

Okla Tulsa 918-663-2550

Pa Bala-Cynwyd 215-839-6750

Pa Pittsburgh 412-391-2900

SD Sioux Falls 605-336-0063

Tenn Memphis 901-683-8201

Tenn Nashville 615-298-5443

Tex Dallas 214-526-7821

Tex Houston 713-621-7700

Tex Lubbock 806-763-2888

Tex San Antonio 512-736-3166

Wash Bellevue 206-454-5450

Wisc Milwaukee 414-271-5628

ARMEL ELECTRONICS, 1601 75th, N. Bergen, N.J., 07047,
Tel: 201-869-4300, TWX: 201-868-0069; FSC No: 91663;
Empl.: 55; Minimum order: \$20

Customer service: V. A. Pasqualino

Products manufactured: Connectors, Sockets, Terminal Blocks, Boards & Strips, Terminals

Local Sales Offices & Reps.

Cal Culver City, Deangelo, Rothman & Co. 213-398-6239

Md Baltimore, R. A. Wafer Assocs. 301-744-1133

Mass Newtown Upper Falls, Brookdale Elctns. 617-244-6969

ARMSTRONG CORK CO., W. Liberty St., Lancaster, Pa., 17604, Tel: 717-397-0611, TWX: 717-560-4405; Empl.: 24,000

Customer service: S. W. Eby

Free literature available: Armstrong Insulation Products: Sixteen page brochure with complete descriptions and specifications for Armalex and Armalok insulation materials.

Products manufactured: Adhesives (All Types), Compounds, Encapsulating, Insulating, Molding, Potting, Heaters & Heating Elements, Insulators & Insulation, Seals

Local Sales Offices & Reps.

Cal Burlingame, Armstrong Cork Co., Ind. Prods. Div. 415-697-3025

Ill Park Ridge, Armstrong Cork Co., Ind. Products Div. 312-696-3130

Mich Oak Park, Armstrong Cork Co., Ind. Products Div. 313-968-7700

Mo St. Louis, Armstrong Cork Co., Ind. Products Div. 314-863-7979

NY Saddle Brook, Armstrong Cork Co., Ind. Products Div. 201-843-0300

NC Charlotte, Armstrong Cork Co., Ind. Products Div. 704-372-2720

Ohio Cincinnati, Armstrong Cork Co., Ind. Prods. Div. 513-563-4160

SC Greenville, Armstrong Cork Co., Ind. Prods. Div. 803-288-0881

ARNOLD ENGINEERING CO., Box "G", Marengo, Ill., 60152, Tel: 815-568-2000, TWX: 910-642-2790; Empl.: 1500

Products manufactured: Cores, Ceramic, Cores, Magnetic, Foil, Laminations, Magnetizers, Magnets, Shielding Beads, Ferrite

Local Sales Offices & Reps.

Ariz Scottsdale, C.T. Fink & Assocs. 602-992-9884

Cal Fullerton, Arnold Engrg. Co. 714-871-1560

Cal Menlo Park, Straube Assocs. 415-323-2476

Cal Palo Alto, Arnold Engrg. Co. 415-326-9302

Cal San Bernardino, Shankman Assoc. 714-997-0660

Mass Lexington, Arnold Engrg. Co. 617-862-2804

Mich Jackson, Arnold Engrg. Co. 517-784-5663

Minn Minneapolis, F.W. Ladky Assocs. 612-545-1494

Mo Hazelwood, Centech Inc. 314-731-4220

Mo Raytown, Centech Inc. 816-358-8100

Neb Ogallala, Ogallala Elctns. 308-284-4093

NJ Leonia, Arnold Engrg. Co. 201-461-8150

NJ Leonia, Ontec 201-461-8150

NY Rochester, Ontec 716-464-8636

NC Raleigh, Arnold Engrg. Co. 919-828-3270

Ohio Shaker Heights, Arnold Engrg. Co. 216-283-7580

Pa King of Prussia, H. Hackett Assocs. 215-265-7864

Tex Dallas, Arnold Engrg. Co. 214-821-4654

Wisc Madison, F.W. Ladky Assocs. 608-222-0900

Wisc Milwaukee, F.W. Ladky Assocs. 414-964-8060

ARNOLD MAGNETICS CORP., 11520 Jefferson Blvd., Culver City, Cal., 90230, Tel: 213-870-7014, TWX: 910-343-6468; Empl.: 50; Minimum order: \$15

p. 1-1093-1105

For info on price: J. McGann; Application info: R. Pizer; Customer service: J. McGann; Delivery info: J. McGann

Free literature available: Short form catalog Design as you order Toroidal winding machine Dummy Power Supply Sample

Products manufactured: Converters, Counters, Decade Boxes, Filters, Inverters, Machines/Machinery, Production, Power Supplies, Transformers

Local Sales Offices & Reps.

Cal Mountain View, Nor-Cal Assocs. 415-961-8121

Cal San Diego, Daniels & Doty Sls. Co. 714-560-6266

Colo Boulder, Scientific Devices, Intermountain 303-449-9466

Mass Stoneham, Ken Corp. 617-438-5464

Mo Kansas, Pem Sls. 314-427-7200

NJ Wallington, Com-Tech Sls. 201-935-5454

Ohio Cleveland, Bock Assoc. 216-331-5212

Pa Media, W. Reeves Assocs. 215-566-6709

Tex Richardson, Texpco. 214-690-4004

ARNOUX CORP., 35 Anacapa St., Santa Barbara, Cal., 93101, Tel: 805-963-3476; Empl.: 20

p. 1-604,605

Products manufactured: Analyzers, Comm. Systems, Converters, Data Acquisition & Reduction Systems, Data Loggers, Decommutators, Telemetering, Indicators, Meters, Multiplexers, Power Supplies

ARRA INC., Antenna & Radome Resch. Assocs., 15 Harold Ct., Bay Shore, N.Y., 11706, Tel: 516-231-8400, TWX: 510-227-6231; Empl.: 45

p. 2-1278,1279

Products manufactured: Adapters, Waveguide, Attenuators, Bands & Twists, Microwave, Calibrators, Couplers, Dividers, Drivers, Switch, Dummy Loads, Duplexers, Microwave, Filters, Junctions, Hybrid, Microwave, Kits, Training Aid, Limiters, Line Stretchers, Microwave, Mismatches, Microwave, Precision, Modulators, All Kinds, Oscillators, Shifters, Strip-Line Components, Microwave, Switches, Teas, Terminals, Transmitters, Waveguides & Adapters

Local Sales Offices & Reps.

Ala Huntsville, Saber Assoc. 205-534-3387

Ariz Phoenix, R.A. Mayes Co. 602-279-5243

Cal Los Angeles, R F Assocs. Inc. 213-478-1586

Cal Palo Alto, R F Assocs. Inc. 415-327-3331

Colo Boulder, R.A. Mayes Co. 303-444-0782

Fla Lighthouse Point, Saber Assoc. 305-943-3076

Fla Longwood, Saber Assoc. 305-422-3686

Fla St. Petersburg, Saber Assoc. 813-441-1301

Ill Northfield, Feller 312-446-8065

Iowa Cedar Rapids, Tech Reps. 319-363-2489

Kans Olathe, Tech Reps. 913-782-1177

Md Ellicott City, Doss Elctns. 301-485-1336

Mass Cochituate, Micronic Assocs. 617-872-6561

Mo Hazelwood, Tech. Reps. 314-731-5200

NJ Hackettstown, EAC Assoc. 201-852-5987

NJ Newtown Sq., SWR Assoc. 215-356-8550

NM Albuquerque, R. A. Mayes 505-292-2330

NY Great Neck, EAC 516-466-9798

NY Syracuse, Tesco Mktg. Assocs. 315-463-4566

NC Raleigh, Saber Assoc. 919-834-3961

Pa Newton Sq., SWR Assocs. Corp. 215-356-8550

Tex Houston, R.A. Mayes 713-466-8325

Tex Richardson, R.A. Mayes 214-235-3043

Utah Centerville, R.A. Mayes Co. 801-292-6781

EXP: Fla., Hallandale, Emec Inc. 305-925-6366

ARROW-HART, INC., 103 Hawthorn St., Hartford, Conn., 06106, Tel: 203-249-8471, Telex: 99328
p. 1•233-236, 1580-1585, 1933; p. 2•621

Products manufactured: Caps, Connector, Circuit Breakers, Connector Boxes & Strips, Power Outlet, Connectors, Controls/Control Eqpt., Dials, Lights, Motors, Relays, Switches, Timers

Local Sales Offices & Reps.

Ariz	Phoenix	602-957-2860
Ark	Little Rock, Carlton Bates	501-562-9100
Ark	Marion	901-525-6585
Cal	Cerritos	213-773-1736
Cal	Sacramento	916-444-5769
Cal	San Diego	714-287-1300
Cal	San Rafael	415-472-5071
Cal	Santa Clara	408-249-0515
Conn	Hartford	203-249-8471
Ga	Decatur	404-981-4940
Ill	Bensenville	312-595-7750
La	Metalair	504-733-6287
Md	Baltimore	301-467-6886
Mass	Norwood	617-762-3660
Mich	Southfield	313-352-6810
Minn	Minnetonka	612-935-0173
Mo	St. Louis	314-351-0770
NJ	Cinnaminson	609-829-4777
NJ	Teterboro	201-288-3600
NY	Endicott	607-785-0785
NY	Hamburg	716-649-5322
NY	Herkimer	315-866-0443
NY	Honeyoye Falls	716-227-2630
NY	Mt. Vernon, QAR Ind.	914-699-2224
NY	Syracuse	518-684-6703
NY	Stuyvesant	315-479-5595
Ohio	Cincinnati	513-793-8300
Ohio	Cleveland	216-651-7733
Ore	Portland	503-234-4563
Tex	Garland	214-270-5441
Va	Richmond	804-262-9556
Wash	Bellevue	206-747-3730
Wisc	Milwaukee	414-351-0840

ARROW-M, 250 Sheffield Ave., Mountinside, N.J., 07092, Tel: 201-232-4260, Telex: 138-213; Minimum order: \$50 p. 1•1586-1595

For info on price: T. E. Gottlick; Application info: F. Buccino; Customer service: F. Buccino; Delivery info: F. Buccino

Free literature available: Catalogs, Test Reports, Technical Info.

Products manufactured: Counters, Meters, Relays, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Powertronics	205-852-6347
Ariz	Phoenix, Arrowhead Sis Corp.	602-277-7148
Cal	Pico Rivera, Westrep	213-949-2551
Cal	San Diego, Westrep	714-276-0751
Cal	Santa Clara, Westrep	408-984-0350
Conn	Madison, United Components Inc.	203-562-4002
Fla	Casselberry, EIR Inc.	305-830-9600
Fla	Palm Beach, EIR Inc.	305-585-7957
Fla	Plantation, EIR Inc.	305-791-6390
Ill	Chicago, Brock & Cushman	312-622-4110
Ind	Carmel, Giesting Assoc.	316-844-8171
Mich	Detroit, Nicon Assoc.	313-341-7688
Minn	St. Paul, Skor	612-645-6461
NH	Pelham, United Components Inc.	617-454-2751
NJ	Haddonfield, Thomas Assoc. Inc.	609-854-3011
NJ	Plainfield, Meg Electronic Sis.	201-757-4332
NC	Thomasville, Powertronics	919-476-6727
Ohio	Columbus, T. Mulligan & Assoc.	614-457-2242
RI	Saunderstown, United Components Inc.	617-226-0556
Tex	Addison, Dunbar Assoc.	214-239-7151

Local Distributors

Fla	W. Palm Beach, Nurmi Elctn. Supply Inc., 1727 Donna Rd.	305-686-8553
NJ	Fair Lawn, Relay Specialties, 1300 Plaza Rd.	201-797-3313
NY	Ontario Center, Pace Elctn. Prods., Box 161	315-524-2491

ART WIRE & STAMPING CO., 9 Wing Dr., Cedar Knolls, N.J., 07927, Tel: 201-267-2000, Telex: 13-6455; Empl.: 100

Free literature available: Art of Wire Forming; Knurled Terminals; Keyboard Contacts; Wire Forms and Stampings; We Have A Way With Wire.

Products manufactured: Connectors, Forms, Wire, Pins, Services, Assembly, Production & Test, Terminals, Wire

Local Sales Offices & Reps.

Ariz	Scottsdale, J. Hagestad	602-945-8415
------	-------------------------	--------------

Cal	Downey, Corbett-Smith	213-927-2788
Cal	San Francisco, D.R. Cox	415-441-8666
Ind	Indpls, Hoster & Sietloff	317-844-9921
Kans	Kansas City, L. Bruns	913-AT 9-5242
Mich	Detroit, W. Crawford Assoc.	313-836-8121
Minn	St. Paul, R. Bittrick	612-626-6178
Tex	Dallas, P. Scanlon	214-AD 1-4661

ARTECH CORP., 2816 Fallfax Dr., Falls Church, Va., 22042, Tel: 703-560-3292

Free literature available: Brochure contains information on R.F. attenuators, vacuum-ultraviolet lamps and detectors, and testing and coating services.

Products manufactured: Boards, Printed Circuit, Cells, Photoconductive, Photoemissive, Photovoltaic, Crayons, Coatings, Pellets, etc., Temperature Indicating, Detectors

Local Sales Offices & Reps.

Kans	Kansas City, Nevco	816-421-1751
------	--------------------	--------------

ARTISAN ELCTRNS. CORP., 5 Eastmans Rd., Parsippany, N.J., 07054, Tel: 201-887-7100; Empl.: 150; Minimum order: \$15

For info on price: A. Seman; Application info: A. Bastian; Customer service: M. Minter; Delivery info: M. Minter

Free literature available: Specification Data on General Purpose Relays; Specification Data on Industrial Solenoids; Specification Data on Solid State Timers; Specification Data on Solid State Programmers; Cross Reference Literature on General Purpose Relays.

Products manufactured: Annunciators, Coils Including Assemblies & Forms, Controls/Control Eqpt., Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Drivers, Solenoid, Flashers, Indicators, Panels, Recorders, Relays, Solenoids, Switches, Testers, Timers

Local Sales Offices & Reps.

Cal	Los Altos, Herb Waldek Assoc.	415-964-4699
Cal	San Gabriel, P.F. Wiley Co.	213-663-8028
Conn	Bloomfield, Zaslow Sis.	203-242-7781
Conn	Milford, Zaslow Sis.	203-878-1094
Fa	Orlando, Geartner Associates	305-299-1000
Ill	Northfield, Such & Assocs. Inc.	312-446-8934
Md	Hyattsville, Eastern Components	301-577-2925
Mass	Lowell, Zaslow Sis.	617-458-8452
Mass	Northboro, Zaslow Sis.	617-393-8150
Mich	Farmington, Oliver Stirling	313-851-7373
Minn	Minneapolis, Delta Assoc.	612-560-6240
NJ	N. Caldwell, Masin-Esco	201-226-2550
NY	Chappaqua, Masin-Esco	914-CE 8-8337
NY	Fayetteville, Graydon-Sherman	315-637-9861
NY	Syosset, Masin-Esco	516-364-0310
Ohio	Cincinnati, G & H Sis. Co.	513-771-8231
Ohio	Grove City, G & H Sis. Co.	614-878-1128
Pa	Philadelphia, Eastern Comps.	215-836-1616
Tex	Irving, Aid Elctnrs.	214-159-4761
FOR:	Can., Downsview, Ontario, Zaslow Sis.	416-727-1211

ARTOS ENGRG. CO., 15600 W. Lincoln Ave., New Berlin, Wisc., 53151, Tel: 414-782-3300, Telex: 26-9549; Empl.: 300

For info on price: H. T. Randar; Application info: M. Randar; Customer service: R. O. Dusel; Delivery info: P. Woboril

Products manufactured: Machines/Machinery, Production, Wire Strippers

Local Sales Offices & Reps.

Cal	Fullerton, C. Martin	
Conn	Stamford, Artos Engrg. Co.	
Ga	Atlanta, Artos Engrg.	
Ill	Morton Grove, Artos Engrg. Co.	

ARTRONIC INSTR. CO., 11232 Triangle La., Silver Spring, Md., 20902, Tel: 301-949-1131; FSC No: 09446 p. 1•430,431

Customer service: M. E. Pugh

Free literature available: General catalog.

Products manufactured: Delay Lines, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Filters, Networks, Reactors, Transformers

ARVIN FREQUENCY DEVICES, Elctn. Sys. Div., Arvin Inds., 15th St. Plant, Columbus, Ind., 47201, Tel: 812-379-3842, TWX: 810-352-1272; Empl.: 30

Products manufactured: Oscillators

Local Sales Offices & Reps.

Cal	Los Angeles, E. Landa	213-879-0770
Cal	San Diego, Tauber Assocs.	714-274-7242
Iowa	Cedar Rapids, HR Brown Sis. Co.	319-366-0635

Mass	Needham, Addelco	617-444-4754
NY	Great Neck, EAC Assocs., Inc.	516-466-9798
EXP:	Chicago, Ill., E.D. Magnus Assocs.	312-334-1502

ASARCO INTERMETALLICS CORP., 120 Broadway, New York, N.Y., 10005

ASHMAN INDUSTRIES (1966) LTD., 66 Brock Rd., Greensville Dundas, Ont., Can., Tel: 416-628-6371; Empl.: 48

For info on price: H. Rushton; Customer service: S. Harathyan; Delivery info: M. Booker

Free literature available: Catalogue

Products manufactured: Benches, Consoles, Stools, Tables, Boards, Plug-In, Boards, Printed Circuit, Cabinets & Accessories, Cable Assemblies & Harnesses, Cases, Equipment, Instrument, Meter, Chassis, Metal, Decade Boxes, Panels, Power Supplies, Racks, Services, Assembly, Production & Test

ASHLAND ELEC. PRODS., 32-02 Queens Blvd., L.I.C., N.Y., 11101, Tel: 212-EX 2-4010; Empl.: 150 p. 1•486,487,934-937

For info on price: R. Lukasik; Application info: R. Lukasik; Customer service: J. Parks; Delivery info: J. Parks

Free literature available: We offer a catalog which describes Ashland's product line, this consists of fractional horsepower electric motors, axial fans and centrifugal blowers. Electrical and mechanical specifications are included.

Products manufactured: Blowers & Fans & Accessories, Motor & Generator Armatures, Rotors, Stators, Motors

Local Sales Offices & Reps.

Cal	Burlingame, W.J. Purdy	415-347-7701
Cal	Los Angeles, C. Repp	213-GR 7-4475
Cal	Sacramento, Wm. J. Purdy Co.	916-481-0971
Colo	Denver, Wm. J. Purdy Co.	303-777-1411
Fla	Fern Park, M. G. Assocs.	305-841-8793
Ill	Chicago, Berndt Assoc.	312-283-0713
Md	Riversdale, Riggs Assocs.	301-927-3380
Mass	Brookline, Harman	617-232-6687
Minn	Minneapolis, Electronic Innovators	612-884-7471
Miss	Corinth, Remco	601-287-5369
NM	Albuquerque, W. J. Purdy Co.	505-266-7959
NY	Brooklyn, Eastern Elctn. Sis.	212-763-5180
NY	Fairport, TAC Assocs.	716-377-1742
NY	Utica, Elcom Sis.	315-732-6445
Ohio	Akron, Augnat Assocs.	216-725-6087
Pa	Doylstown, T.O.E. Sales	201-568-5747
Tenn	Bristol, Remco	615-968-4195
Tex	Dallas, RMC & Assoc.	214-363-0166
Wash	Kirkland, Todd-Brian	206-827-5811
FOR:	Can., Montreal West, Que., Hooker Elec.	514-487-5151

ASSEMBLED PRODUCTS CO., Box 750, St. Albans, Vt., 05478; Empl.: 22

Customer service: A. Sherry 802-893-4513

Products manufactured: Cable, Relays, Wire

ASSOCIATE GENERAL LABS., INC., 8934 W. Ogden Ave., Brookfield, Ill., 60513, Tel: 312-485-1135; Empl.: 11

Customer service: A. Schroeder

Products manufactured: Machines/Machinery, Production, Services, Assembly, Production & Test

ASSOCIATED ENGRG. & MFG. CORP., 546 Valley Rd., Upper Montclair, N.J., 07043, Tel: 201-783-7800; Empl.: 69; Minimum order: \$100

For info on price: D.M. Fox; Application info: D.M. Fox; Customer service: J. Reid; Delivery info: J. Francis

Products manufactured: Caps, Connector, Connectors, Metals, Relays, Sockets, Switches, Terminals, Wire

ASSOCIATED ENVIRONMENTAL SYSTEMS, 360 Merrimack St., Lawrence, Mass., 01842, Tel: 617-683-9501, TWX: 710-342-0765; Empl.: 300; Minimum order: \$15

Customer service: D. L. Thomas

Free literature available: Complete catalog of products

Products manufactured: Chamber, Environmental Test, Ovens, Refrigerators, Environmental Test

Local Sales Offices & Reps.

Ala	Birmingham, Dilcher Engrg. Co. Inc.	205-252-3300
-----	-------------------------------------	--------------

Ariz	Scottsdale, Sls. Engrg., Inc.	602-945-5781
Cal	Mountain View, IFM, Inc.	415-961-2828
Cal	Van Nuys, Gordon-Elliott, Inc.	213-873-6862
Conn	East Hartford, E. E. Specialists, Inc.	
		203-568-1500
Fla	St. Petersburg, Dilcher Engrg. Co. Inc.	
		813-343-1041
Ga	Atlanta, Dilcher Engrg. Co.	404-261-1678
Ill	Chicago, Midwest Elctn. Sls.	312-626-0030
Ind	Indianapolis, Midwest Elctn. Sls.	317-926-3736
Iowa	Cedar Rapids, Midwest Elctn. Sls.	
		319-362-4410
Kans	Wichita, Aero-Hill Sls.	316-943-6371
Md	Silver Spring, ARA Elctns., Inc.	301-565-2584
Mass	Acton, Edcom	617-969-9710
Mich	Detroit, Electro Entprs., Inc.	313-521-1500
Minn	Minneapolis, E. J. Doyle Co.	612-827-5847
NY	Albany, J. A. Reagan Co., Inc.	518-489-4777
NY	Binghamton, J. A. Reagan Co., Inc.	
		607-723-9661
NY	Great Neck, Trionic Assocs., Inc.	516-466-2300
NY	New Hartford, J. A. Reagan Co., Inc.	
		315-732-3775
NC	Winston Salem, Radco Co.	919-722-9671
Ohio	Cleveland, Electro Entprs., Inc.	216-261-7670
Ohio	Dayton, Electro Entprs., Inc.	513-426-6071
Pa	Glenside, ARA Elctns., Inc.	215-887-5250
Tex	Dallas, True Technology Co.	214-691-7870
Wisc	Waukesia, Midwest Elctn. Sls.	414-542-5129

ASSOCIATED RESEARCH, INC., 6125 W. Howard St., Niles, Ill., 60648, Tel: 312-647-7850; Minimum order: \$10..... p. 1607

For info on price: R. S. Barnard; Application info: M. Kaltenbach; Customer service: R. S. Barnard; Delivery info: M. Kaltenbach

Products manufactured: Cable Fault Locators, Meters, Power Supplies, Testers

Local Sales Offices & Reps.

Ariz	Scottsdale, Sls. Engrg.	602-945-5781
Ark	Little Rock, Electra-Tech Midsouth	
		501-562-4090
Cal	Paramount, Brenner-Fiedler Assoc.	
		213-531-7222
Cal	San Francisco, California Instr. Co.	
		415-863-0350
Fla	Miami, Ludlum Assocs. Co.	305-592-6523
Fla	Orlando, Ludlum Assocs. Co.	305-894-7761
Ga	Atlanta, Holman-Lobsinger Co.	404-256-9120
Ill	Chicago, Factory Office	312-647-7850
Ind	Indianapolis, C.M. Buck & Assocs.	
		317-251-1281
Md	Bethesda, Bartlett Assocs.	301-656-3061
Mass	Needham, Northeast Reps.	617-449-3034
Mich	Birmingham, Electro-Mation Assocs.	
		313-564-6517
Minn	Edina, Ainslie Co.	612-920-2996
Mo	Kansas City, Cleaves-Bessmer-Marietti	
		816-353-6011
Mo	St. Louis, Fitzgerald Sls. Co.	314-241-4066
Neb	Omaha, F.C. Clatterbaugh Co.	402-331-3950
NY	Brooklyn, Associated Research	212-451-0708
NC	Charlotte, J. Rudisill Assocs.	704-377-6901
Ohio	Brecksville, D & B Engrg. Sls.	216-526-6320
Pa	Pittsburgh, Bollinger & Bradford	412-561-2340
Pa	Wayne, Bartlett Assocs.	215-688-7325
Tex	Dallas, J.Y. Schoonmaker Co.	214-357-8481
Wash	Seattle, D.A. Olson	206-522-6594

ASSOCIATED SPECIALTIES CO., 1751 Main St., Orefield, Pa., 18069, Tel: 215-395-9172

Customer service: V. Laudenslager

Products manufactured: Power Supplies

ASSOCIATED SPRING CORP., 18 Main St., Bristol, Conn., 06010, Tel: 203-582-9581, TWX: 710-454-0592; Empl.: 6,105

For info on price: R. O. Corley; Application info: S. M. Rimmer; Customer service: R. O. Corley; Delivery info: R. O. Corley

Products manufactured: Fasteners, Forms, Wire, Services, Assembly, Production & Test, Springs (All Types)

Local Sales Offices & Reps.

Cal	Gardena	213-323-4833
Colo	Denver	303-399-2643
Conn	Bristol	203-582-9581
Ga	Atlanta	404-256-2510
Ill	Lombard	312-495-4760
Ill	Mattson	217-235-5601
Mich	Ann Arbor	313-665-8686
Mich	Plymouth	313-453-6100
NY	Syracuse	315-457-9200
NC	Arden	704-684-7836
Ohio	Dayton	513-253-4131
Pa	Corry	814-665-8241

Tenn	Memphis	901-332-4832
Tex	Dallas	214-631-3441
Wisc	Milwaukee	414-482-1600

ASSOCIATED TESTING LABS., Northwest Ind'l. Pk., Burlington, Mass., 01803, Tel: 617-272-9050; Empl.: 100

Products manufactured: Chamber, Environmental Test, Services, Assembly, Production & Test, Testers

Local Sales Offices & Reps.

Ariz	Scottsdale, Engrg. Sls. Assocs.	602-945-5781
Cal	Mt. View, IFM-North	415-961-2828
Cal	Van Nuys, Gordon-Elliott, Inc.	213-873-6862
NY	Albany, Compar Albany	518-489-7408
NC	Winston-Salem, Radco Co.	919-722-9671
Tex	Dallas, True Technology	713-649-7874
Tex	Houston, True Technology	214-239-7741

ASSOCIATED TESTING LABORATORIES, 9 Brighton Rd., Clifton, N.J., 07012, Tel: 201-473-6455; Empl.: 45

Customer service: D.W. Hanright

Free literature available: Facilities & capabilities brochures describe testing services offered.

Products manufactured: Services, Assembly, Production & Test

ASTATIC CORP., Box 120, Conneaut, Ohio, 44030; Empl.: 500

Products manufactured: Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds

Local Sales Offices & Reps.

Cal	Burlingame, W.J. Purdy Co.	415-347-7701
Cal	Sacramento, W.J. Purdy Co.	916-422-0181
Cal	Van Nuys, M. Roth Sls.	213-989-3738
Colo	Denver, Connors, Inc.	303-934-5829
Conn	Waterbury, Anderson Sls. Assocs.	
		203-753-2487
Fla	Orlando, Hollingsworth & Still, Inc.	
		305-671-4515
Ga	Atlanta, Hollingsworth & Still, Inc.	404-394-3270
Ill	Chicago, Markal Sls. Corp.	312-282-5800
Ind	Indianapolis, Sukup & Cox, Inc.	317-253-1215
Iowa	Des Moines, Kathrinus-Kelly & Co.	
		515-255-4584
Kans	Shawnee Mission, Kathrinus-Kelly & Co.	
		913-722-0000
La	Chalmette, Cartwright & Bean Inc.	
		901-276-4442
Md	Silver Spring, Lowery Assocs. Co.	
		301-439-3542
Mass	Boston, Anderson Sls. Assocs.	617-227-2980
Mich	Southfield, R. Mils Co.	313-354-3310
Miss	Jackson, Cartwright & Bean Inc.	601-354-1368
Mo	St. Louis, Kathrinus-Kelly & Co.	314-968-3800
NJ	Teaneck, S. Axelrod Assoc.	201-836-6661
NY	Lake Ronkonkoma, S. Axelrod Assoc.	
NY	Syracuse, Paston-Hunter Co., Inc.	315-437-2992
NC	Charlotte, Hollingsworth & Still Inc.	
		704-536-7047

Ohio Beachwood, Elctn. Salesmasters Inc.

		216-831-9555
Ohio	Dayton, Elctn. Salesmasters Inc.	513-837-2379
Ore	Portland, D.G. Weber Co.	503-234-0686
Pa	Broomall, Lowery Assocs. Co.	215-356-5300
Pa	Harrisburg, Lowery Assocs. Co.	215-233-0917
Tenn	Memphis, Cartwright & Bean Inc.	901-276-4442
Tex	Dallas, Maynard & Gunn Sls. Co.	214-742-2384
Tex	Houston, Maynard & Gunn Sls. Co.	
		713-497-0544

Utah Bountiful, Connors, Inc.

		801-292-4664
Va	Charlottesville, Lowery Assocs. Co.	
		703-973-6672
Wash	Seattle, D.G. Weber Co.	509-623-5990
Wash	Spokane, D.G. Weber Co.	509-624-3908
EXP	Plainview, NY, Morhan Exporting Corp.	
		516-293-5582

ASTRO ELCTRNS., INC., 2478 Fender Ave., Unit "D", Fullerton, Calif., 92631, Tel: 714-526-5581; Empl.: 14; Minimum order: \$100

For info on price: C. Jasper; Application info: G. A. Harter; Customer service: G. A. Harter; Delivery info: C. Jasper

Products manufactured: Potentiometers, Resistors

Local Sales Offices & Reps.

Cal	Los Angeles, Component Mktg. Assocs.	
		213-541-2515
Ohio	Cincinnati, B. Stephens Manufacturers' Rep.	
		513-921-0350

ASTRO-GEO-MARINE INC., Box 5526, Oxnard, Cal., 93030, Tel: 805-485-3128; FSC No: 51473; Empl.: 10

Customer service: J. E. Fenole

Products manufactured: Converters, Inverters, Power Supplies, Services, Assembly, Production & Test

ASTRO-MED, Div Atlan-Tol Inds. Inc., 639 E. Greenwich Ave., West Warwick, R.I., 02893, Tel: 401-828-4000; Empl.: 35

For info on price: D. Colinan; Application info: E. V. Pizzoti; Customer service: M. Cote; Delivery info: B. Berthume

Free literature available: (1) "Barebones" Recorders - One, two, three, and four channel low cost recorders; (2) "OEM" Recorders - One, two, three, and four channel recorders; (3) Portable Battery Powered Recorder; (4) Eight channel recorder.

Products manufactured: Paper, Graphic Recording, Recorders

ASTRO CIRCUIT CORP., 540 Main St., Tewksbury, Mass., 01876, Tel: 851-7229, Telex: 947851; Empl.: 140; Minimum order: \$100

Customer service: W. J. Galvin

Free literature available: Literature provides a photographic description of facilities as well as a description of capabilities, in design, engineering and manufacturing.

Products manufactured: Circuits, Printed, Multilayer

Local Sales Offices & Reps.

Mass	Randolph, Naton Assocs.	617-986-6417
NY	Roslyn Heights, Productronics Ltd.	
		516-484-2619

ASTRO DYNAMICS, Northwest Indl. Park, Burlington, Mass., 01803, Tel: 617-272-3900; Empl.: 50; Minimum order: \$25

Free literature available: Our literature describes our cooling devices which can help solve any cooling problems one might have, and our flowmeters and flow generators which can measure accurately.

Products manufactured: Blowers & Fans & Accessories, Chamber, Environmental Test, Containers, Controls/Control Eqp., Data Acquisition & Reduction Systems, Motors, Services, Assembly, Production & Test, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

Ariz	Scottsdale, Fryco	602-945-3281
Cal	Orange, Current Prod. Sls.	714-633-7414
Cal	Pasadena, Components Corp.	213-681-7448
Colo	Boulder, Components Prods. Sls. Co.	
		303-444-2730
Fla	Jupiter, Cherry Assocs.	305-746-4591
Ill	Hillside, TX Sales	312-499-0600
Ind	Ft. Wayne, TX Sales	219-489-4447
Md	Ellicott City, V.P.I., Inc.	301-465-4060
Mass	Reading, Champagne Assocs.	617-944-3011
Mich	Dearborn Heights, Ankofski Assocs.	
		315-565-6330
Mich	Ferndale, Tiby Co.	313-547-3550
Minn	Minneapolis, Components Group	612-824-4222
NJ	Mt. Ephraim, Burdette Co.	609-931-1300
NY	Northport, Production Sls. Assocs.	
		516-757-0336
Ohio	Cleveland, Tiby Co.	216-371-5335
Pa	North Wales, V.P.I.	215-368-4233
Tex	Grand Prairie, Howell Sls. Co.	214-262-5153
Va	Merrifield, V.P.I.	703-573-7837

ASTRODATA INC., 240 E. Palais Rd., Anaheim, Cal., 92805, Tel: 714-772-1000, TWX: 910-591-1175; Empl.: 238; Minimum order: \$75

For info on price: J. McLendon; Application info: J. McLendon; Customer service: W. J. Konvalinka; Delivery info: W. J. Konvalinka

Products manufactured: Boards, Printed Circuit, Comm. Systems, Counters, Decommutators, Telemetering

ASTRODYNE, INC., Sub. Roanwell Corp., 353 Middlesex Ave., Wilmington, Mass., 01887, Tel: 617-272-3850, TWX: 710-347-0704; Empl.: 60; Minimum order: \$25

For info on price: R. G. Vossler; Application info: E. Kuklinski; Customer service: R. Levesque; Delivery info: R. Levesque

Free literature available: Catalog NC-740 Natural Convection Heat Sinks-Outlines and performance graphs Catalog FC-730 Forced Convection Cooling Assemblies - description & performance data Catalog HP-7000 Heat Pipes-description Catalog HE-5740 Heat Exchangers-description-sizers & performance-low pressure.

Products manufactured: Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Heat Exchangers & Systems, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

Ariz	Scottsdale, Inter-Mountain Engrg. Co.	602-947-7379
Cal	Anaheim, Lodan, Inc.	714-956-1560
Cal	Redwood City, Parks & Pruitt Assoc.	415-364-1640
Cal	San Diego, Earle Assoc.	714-278-5441
Colo	Boulder, Mile High Electrs.	303-444-5615
Fla	Eau Gallie, J.J. Smith & Assoc.	305-254-4206
Ill	Chicago, Ellinger Sls. Corp.	312-763-1570
Kans	Prairie Village, Engrg. Svcs. Co.	913-649-4000
Md	Baltimore, Kaufholz Assoc.	301-488-6561
Mass	Brookline, Harman Assoc.	617-232-6687
Mich	Birmingham, Forand Sls. Co.	313-644-0087
Minn	St. Louis Park, Beta Engrg. Co.	612-925-4422
Mo	St. Louis, Engrg. Svcs. Co.	314-997-1515
NJ	Harrington Park, Metro Tech. Sls.	201-768-8495
NY	East Syracuse, Jones-Sudders Inc.	315-437-9118
NY	Jericho, Metro Tech. Sls.	516-935-3330
NC	Burlington, P.J. Nahser Co.	919-226-8053
Ohio	Cleveland, Component/Insulation Corp.	216-521-3570
Pa	Newtown Square, Kaufholz Assoc.	215-356-5000
Pa	Pittsburgh, J.W. Kight Co.	412-781-8303
Tex	Irving, Lee Sls. Corp.	214-363-3831
Wash	West Seattle, G.M. Gillett Assoc.	206-284-3344
EXP	Stamford, Conn., J.P. Int'l. Corp.	203-348-2691

ASTROLAB, INC., 1600 Essex St., Rahway, N.J., 07065, Tel: 201-382-8204, TWX: 710-996-5870; Empl.: 36

Products manufactured: Attenuators, Cable, Connector Adapters, Connectors, Dummy Loads, Jack Adapters (All Types), Tees, Terminals, Waveguides & Adapters, Wire Shielding

Local Sales Offices & Reps.

Cal	Los Angeles, Fetty/Schoenduve	213-651-4050
Cal	Palo Alto, E. Rinker	415-321-7041
Fla	Clearwater, Brennan Assocs.	813-446-5006
Wash	Renton, W. Milt Baxley	206-226-0650

ASTRO PRODUCTS CO., 1971 Spear St., S. Burlington, Vt., 05401, Tel: 802-864-7625; Empl.: 41; Minimum order: \$25

For info on price: H. Hassen; Customer service: A. Hunyadi

Products manufactured: Cable Assemblies & Harnesses, Cable, Wire

ASTROSYSTEMS, INC., 6 Nevada Dr., Lake Success, N.Y., 11040, Tel: 516-328-1600, TWX: 510-223-0411; Empl.: 150

Application info: J. O'Brien; Customer service: D. Bates; Delivery info: D. Lavaglio

Products manufactured: Amplifiers, Bridges, Calibrators, Controllers, Programmable, Controls/Control Eqpt., Converters, Data Acquisition & Reduction Systems, Decade Boxes, Dividers, Encoders, Indicators, Modules, Logic, Encapsulated, Potentiometers, Power Supplies, Repeaters, Servo, Signal Conditioners & Equipment, Standards, Switches, Synchro Transmitters, Solid-State, Testers, Transducers, Transformers

Local Sales Offices & Reps.

Ala	Huntsville, Kemp Engrg.	205-837-4304
Ariz	Scottsdale, Electronic Entrs.	602-946-9860
Cal	Huntington Beach, Wheatcroft Engrg. Co.	714-842-5569
Cal	San Francisco, Wm Benison	415-398-2211
Colo	Denver, Bond Assoc.	303-756-1234
DC	Wash., Astrosystems	202-296-4380
Fla	Orlando, Datapac, Inc.	305-843-5224
Ill	Mt. Prospect, Automation Equip.	312-398-7550
Mass	Lexington, Dimensional Systems	617-862-2700
Mass	Sturbridge, Brandford Controls	617-347-7367
Minn	Minneapolis, Engrg. Prods.	612-925-1883
NJ	West Trenton, Krieger Sales	609-882-6330
NM	Albuquerque, BFA Corp.	505-296-8303
NM	Las Cruces, Electronic Enterprises	505-524-0126
NY	Cazenovia, P. DeCew, Inc.	315-655-8602
NC	Charlotte, Beck Sls. & Engrg.	704-366-5366
Ohio	Dayton, LI/Corp.	513-434-6367
Oklahoma	Tulsa, Kemp Engr. Co.	918-299-2636
Ore	Portland, Hayes Tech.	503-238-0001
Tex	Addison, Kemp Engrg.	214-661-0040
Tex	Houston, Kemp Engrg. Co.	713-688-1431
Wash	Seattle, Hayes Technical	206-763-2210
Wisc	Wauwatosa, Larson Assoc.	414-258-0529

FOR: Can., La Salle, Quebec, Electrodesign, Ltd. 514-363-5120

FOR: Can., Ontario, Electrodesign, Ltd. 613-745-0541

FOR: Can., Toronto, Electrodesign, Ltd. 416-787-0991

ATEC, INC., Box 19426, Houston, Tex., 77024, Tel: 713-468-7971; Empl.: 48

Products manufactured: Comparators, Controls/Control Eqpt., Counters, Data Acquisition & Reduction Systems, Data Loggers, Indicators, Scanners, Test Systems, Testers, Timers, Totalizers, Digital

ATKOMATIC VALVE CO., INC., Box 11258, 141 Sherman Dr., Indianapolis, Ind., 46201, Tel: 317-357-8421; FSC No: 70642; Empl.: 38; Minimum order: \$5

For info on price: R. L. Thompson; Application info: R. B Spear; Customer service: A. E. Richardson; Delivery info: R. L. Thompson

Free literature available: General Bulletin - Brief description of solenoid valve line (enclosed). Catalog No. 68 - Quick value Selection chart, 16-page engineering section, complete description of valve line. 50 pages ring binder. Contains current prices. Free on request.

Products manufactured: Valves, Solenoid

Local Sales Offices & Reps.

Ala	Birmingham, Control Specialists	205-871-9679
Ala	Spanish Fort, Control Specialists	205-433-1453
Ariz	Phoenix, Bews & Wallace Co.	602-275-4496
Ariz	Tucson, Bews & Wallace Co.	602-297-4001
Ark	Little Rock, Murrel Haase & Co.	501-376-7227
Cal	Paramount, Brenner-Fiedler & Assoc.	213-531-7222
Cal	Richmond, Wagner-Denco Sls.	415-237-9054
Colo	Denver, Berry Co.	303-935-4587
Conn	Hamden, Pond Tech. Sls.	203-288-6278
Fla	Orlando, Control Center	305-896-6831
Ga	Atlanta, Rittelmeyer & Co.	404-688-8331
Ill	Chicago, Miller Engrg. Specialties	312-725-0221
Iowa	Cedar Rapids, Skarda Equip. Co.	319-393-3003
Kans	Prairie Village, Parker & Foster	913-381-9330
KY	Louisville, Richard Equip. Co.	502-895-8060
La	Baton Rouge, Del Rio	504-927-9167
Mass	Somerville, Peeco	617-666-4444
Mich	Warren, L.W. Jeffries Co.	313-755-6162
Minn	St. Paul, A-tu-Zee	612-646-6383
Mo	St. Louis, Tepco Ind. Sls.	314-741-1800
Neb	Omaha, Skarda Equip. Co.	402-731-7690
NJ	Rochelle Park, Gale Equip. Co.	201-843-1144
NY	Buffalo, J.W. Simpson Co.	716-634-3995
NY	Syracuse, J.R. Manier	315-446-8533
NC	Charlotte, Mec-Tric Control Co.	704-376-8551
Ohio	Cincinnati, Richard Equip. Co.	513-271-8666
Ohio	Cleveland, Commercial Elec. Prods. Corp.	216-241-2886
Ohio	Toledo, Fred H Hall Co.	419-531-4878
Oklahoma	Tulsa, Delcon	918-622-6380
Pa	Broomall, John C. Whiddett Co.	215-353-6343
Pa	Pittsburgh, Controlmatic Co.	412-563-4611
Tenn	Memphis, Murrel Hasse & Co.	901-743-4304
Tex	Dallas, Southwestern Controls	214-742-6266
Tex	Houston, Southwestern Controls	713-666-2801
Va	Richmond, Virginia Carolina Controls Co.	804-644-0361
Wash	Seattle, Greaves Co.	206-284-0660
Wisc	New Berlin, D.E. Riley Corp.	414-786-1230
FOR:	Can., Calgary, Alb., Cantech Controls Ltd.	403-252-8151

FOR: Can., Lachine, Montreal, Que., Cowper Co. Ltd.

FOR: Can., Mississauga, Ont., Dycon Ltd.

FOR: Can., No. Vancouver, BC, Greaves Ind. Sls. Ltd.

ATLANTIC LAMINATES, 174 N. Main St., Franklin, N.H., 03235, Tel: 603-934-5736, TWX: 510-298-1170; Minimum order: \$80

For info on price: E. Groehl; Application info: L. P. Blanchet; Customer service: J. Dyer; Delivery info: E. Groehl

Free literature available: Polyimide - G 10 - FR 4 - FR 5 - Teflon - Rexolite - Polyester - Plus Special Products and Mass Molding.

Products manufactured: Laminates

Local Sales Offices & Reps.

Cal	San Fernando, MacDonald & Assoc.	213-365-3616
Cal	Santa Clara, Butler Chemical	408-244-4177
Colo	Boulder, R-G Enterprises	303-447-9211
Conn	Southport, JCL Assocs.	203-255-2456
Fla	Winter Park, Young & Lawrence	305-647-6929
Ill	Chicago, Brock & Cushman, Inc.	312-622-4110
Ind	Noblesville, D-M Assocs.	317-773-3600

Minn Minneapolis, Hamlet & Smith 612-545-3666

Mo Baldwin, McQuillan Assocs. 314-391-0078

NJ Rocky Hills, Krone & Rubin Assocs. 609-924-0200

Ohio Cleveland, Insulation & Components 216-331-4434

Tex Dallas, Bunker Industries 214-630-1600

Wash Seattle, H-J Sales 206-522-6980

Wisc Milwaukee, Hamlet & Smith 414-272-2787

ATLANTIC OPTICAL MOULDING CO., Ellis St., Dudley, Mass., 01570, Tel: 617-943-1746; Empl.: 6

Customer service: J. F. Krysiak

Free literature available: Glass molding of all type of optical and technical glasses. Lens pressings and "Precision Glass Parts" for Optical, Industrial and Electronic applications.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Caps, Lenses, Indicator Light, Insulators & Insulation, Lenses, Readout & Display, Services, Assembly, Production & Test, Substrates

ATLANTIC RESEARCH COROPRATION, 5390 Cherokee Avenue, Alexandria, Va., 22314; Empl.: 831

Products manufactured: Alarms, CATV Systems & Equipment, Comm. Systems, Decoders, Detectors, Display Devices/Displays, Graphite Parts, Lasers & Laser Systems, Materials, Graphite, Meters, Power Supplies, Probes, Regulators, Rings, Retaining, Scramblers, Data, Seals, Services, Assembly, Production & Test, Television Systems & Equipment Closed-Circuit, Testers, Tracking Systems, Underwater Communication, Detection, Navigation, etc. Equipment, X-Ray Inspection Equipment

ATLAS ELECTRIC DEVICES, 4114 N. Ravenswood Ave., Chicago, Ill., 60613, Tel: 312-327-4520; Empl.: 95

Products manufactured: Chamber, Environmental Test, Lamps, Lights

ATLAS ENGRG. CORP., 26 Custer St., W. Hartford, Conn., 06110, Tel: 203-246-5651; FSC No: 07001; Empl.: 10; Minimum order: \$10

For info on price: C. Schectman; Application info: F. Sweeney; Customer service: C. Schectman; Delivery info: C. Schectman

Products manufactured: Chamber, Environmental Test, Refrigerators, Environmental Test, Services, Assembly, Production & Test

ATLAS EYELETS, Pinkham St., Fairhaven, Mass., 02719, Tel: 617-997-9491

Customer service: A. Pinkham

Products manufactured: Eyelets

Local Sales Offices & Reps.

Ill Chicago, E.C. Rowell & Co. 312-238-3401

ATLAS FIBRE CO., 6970 N. Central Park Ave., Chicago, Ill., 60645, Tel: 312-465-1234; Empl.: 3; Minimum order: \$50

For info on price: L. A. Grusin; Application info: M. L. Grusin; Customer service: R. Welch

Free literature available: Catalog includes samples of material, Prices, & Listing of Grade & Size Range.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Coils Including Assemblies & Forms, Insulators & Insulation, Services, Assembly, Production & Test

ATLAS SOUND DIV., American Trading & Production Corp., 10 Pomeroy Rd., Parsippany, N.J., 07054, Tel: 201-887-7800; Empl.: 350; Minimum order: \$35

For info on price: J. A. Palmieri; Application info: J. A. Palmieri; Customer service: J. Just; Delivery info: J. Just

Free literature available: Catalogue and Technical Data Describing: A) Microphone Stands, Accessories and Fittings, B) Environment-Protected Loudspeakers, Alarm and Signaling, Transducers, Custom Sound Drivers, Intercom and Siren Speakers, Mounting and Transformer Accessories

Products manufactured: Speakers

ATLEE CORP., 8 Gill St., Woburn, Mass., 01801, Tel: 617-933-3510, TWX: 710-393-0176; Empl.: 40

Products manufactured: Bus Bars & Systems, Clamps & Clips, Guides, Circuit Board, Holders, Circuit Board (Production Type), Holders, Crystal, Mounts

Local Sales Offices & Reps.

Cal Burlingame, J. Logan & Assocs. 415-697-6100
 Mass Woburn, Atlee Corp. 617-933-3510
 Mich Walled Lake, T. Mulligan & Assocs. 313-624-0174
 NJ Madison, Livera-Polk Assocs. 201-377-3220
 NY Roslyn Heights, Livera-Polk Assocs. 516-484-1276
 NY Syracuse, Rep Tech, Inc. 315-437-2845
 Ohio Columbus, T. Mulligan & Assocs. 614-457-2242
 FOR: Can., Richmond, B.C., Lake Engrg. Co. 604-277-0414
 FOR: Can., Scarborough, Ont., Lake Engrg. Co. 416-751-5980
 FOR: Can., St. Laurent, P.Q., Lake Engrg. Co. 514-747-2441

ATMOSPHERE CONTROLS PRDTS., 295 Polaris, Mt. View, Cal., 94043, Tel: 415-969-2690; Empl: 16

For info on price: J. P. Conroy; Delivery info: W. E. Ellis

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Cabinets & Accessories, Dehumidifiers (For Equipment), Services, Assembly, Production & Test

ATOMERGIC CHEMETALS CO., 584 Mineola Ave., Carle Place, N.Y., 11514, Tel: 516-333-5600, TWX: 510-222-5059; Empl: 30; Minimum order: \$25

For info on price: M. Altman; Application info: M. Blum; Customer service: H. J. Gary; Delivery info: E. Krings

Free literature available: 144 page General Product Brochure which lists all the different chemicals, metals, intermetallics, and semiconductor compounds we either produce or supply.

Products manufactured: Alloys, Chemicals, Crystal Blanks, Crystals, Display Devices/Displays, Ferrite Material & Parts, Graphite Parts, Lubricants, Materials, Graphite, Materials, Self-Lubricating, Metal Compounds, Foils, Powders, Sheet, Stock, Metal Oxides, Metals, Quartz, Fused, Semiconductor Wafer Fabrication, Silica, Fused, Substrates, Wire

Local Sales Offices & Reps.

Cal Los Angeles, Ron Geller 213-836-2777

ATR ELECTRONICS, INC., 300 E. 4th St., St. Paul, Minn., 55101, Tel: 612-222-3791; Minimum order: \$25 p. 1-1110,1111

Customer service: A. Goffstein

Free literature available: ATR literature covers ATR DC-AC Inverters, Battery Eliminators, Vibrators, and Standby Power Systems.

Products manufactured: Chargers, Battery, Converters, Eliminators, Battery, Inverters, Power Supplies, Relays, Transformers, Vibrators

AUBURN MFG., Pease Ave. & Stack St., Middletown, Conn., 06457, Tel: 203-346-6631; Minimum order: \$25

For info on price: D. Holmes; Application info: M. Weiner; Customer service: D. Holmes; Delivery info: D. Holmes

Free literature available: Gaskets, Shielding; Insulation Materials and Parts; Tapes, Pressure Sensitive; Spacers and Shock & Vibration Mounts as well as additional specific information regarding sealing components and/or materials.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Fasteners, Gaskets, Shielding, R-F-Also See Shields, R-F, Insulators & Insulation, Mounts, Seals, Shields, Sound Absorbing Materials, Spacers, Tapes, Films & Foils, Pressure Sensitive

Advertisement

Manufacturers of custom-made insulated parts (all materials), shielding RMI/EFI Gaskets, Shock and Vibration Mounts as well as virtually all types of sealing components. Distributor for CHR Products and Dow Corning Sealants RTVs. (CHR products include Silicone Rubber, Sponge and Coated Fabrics, Viton Rubber and Temp-R-Tape and Glas).

AUDIO-TECHNICA U.S., INC., 33 Shiawassee Ave., Fairlawn, Ohio, 44313, Tel: 216-836-0246

Products manufactured: Cleaners & Solvents, Handsets, Chestsets, Headphones, Headsets, Etc., Phonographs, Parts & Accessories

Local Sales Offices & Reps.

Cal Los Angeles Pacific Audio Sls.
 Cal Oakland, Paul Seaman Co. 415-562-9241
 Colo Arvada, C B Elctrn. Mktg. 303-422-0561
 Ga East Point, P. Hayden Assocs. 404-766-0261
 Ill Skokie, SER, Inc. 312-673-2250
 Ind Indianapolis, Kingston-Sharkey Assocs. 317-353-9406
 Md Baltimore, David Bros., Co. 301-764-7189
 Mass Wellesley Hills, B. Gedzelman Sls. 617-235-8775
 Mich Buchanan, Riley & Petchell Sls. 616-695-6356
 Mich Detroit, Riley & Petchell Sls. 313-535-7000
 Minn Minneapolis, SER, Inc. 612-894-1388
 Mo Raytown, Mid-West Mktg. 816-358-6638
 NJ Ridgefield, Bi-State Mkts. 201-943-5888
 NY Kenmore, Al Toupin Sls. 716-873-8839
 NY Spring Valley, B. Gedzelman Sls. 914-EL6-3477
 Ohio Columbus, C.L. Pugh Co. 614-486-9678
 Ohio Newtown, G. Conneen Sls. 215-353-2241
 Tex Houston, L.J. Paul Assocs. 800-231-3501
 Wash Seattle, W.K. Wood Co. 206-246-5111

AUDIO-VIDEO ENGRG. CO., 65 Nancy Blvd., Merrick, N.Y., 11566, Tel: 516-546-4239

Customer service: R. Drucker

Free literature available: Spec. sheet on video hum stop coil model HSC-1 engineering bulletin 1.1 on video hum stop coils.

Products manufactured: Filters

Local Sales Offices & Reps.

Cal Anaheim, BCD, Inc. 714-528-9505

AUDIO EQUIP. CO., INC., Div. W. Kidde & Co., Inc., 706 Forrest St., Charlottesville, Va., 22901, Tel: 804-977-8050, TWX: 510-587-5461; Empl: 50

For info on price: L. D. Armentrout; Application info: T. Reed; Customer service: E. Williams; Delivery info: E. Williams

Free literature available: 8-page illustrated catalog on electronic hand-held power megaphones and portable P.A. systems.

Products manufactured: Amplifiers, Speakers

AUDIOSEARS CORP., South St., Stamford, N.Y., 12167, Tel: 607-652-7305; FSC No: 3661; Empl: 100; Minimum order: \$20

For info on price: G. Vicary Mahler; Application info: R. Rusa; Customer service: G. Vicary Mahler; Delivery info: G. Vicary Mahler

Free literature available: Telephone; Handsets, Telephone Operators; Headsets, Miscellaneous; Headsets, Microphones, Earphones; and component parts thereof.

Products manufactured: Handsets, Chestsets, Headphones, Headsets, Etc., Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds

Local Sales Offices & Reps.

Cal Huntington Beach, H. Brunning 714-968-7724
 NJ Medford, Mech. Elec. Sls. 609-654-8209
 NY Geneva, J. Sumers Assocs. 315-789-2238

AUDIOTRONICS, 7428 Bellaire Ave., N. Hollywood, Cal., 91605, Tel: 213-765-2645, Telex: 69-1241; Empl: 277; Minimum order: \$10

For info on price: T. Severdia; Application info: T. Severdia; Customer service: D. Christenson; Delivery info: C. Morey

Products manufactured: Demodulators, Handsets, Chestsets, Headphones, Headsets, Etc., Microphones, All Kinds, Monitors, Phonographs, Parts & Accessories, Public Address Systems, Recorders, Speaker Systems, Terminals, Data Display (including Alphanumeric & Graphic)

AUGAT INC., 33 Perry Ave., Attleboro, Mass., 02703; Empl: 450; Minimum order: \$25 p. 2-632-639

For info on price: D. O'Brien; Application info: G. Howland; Customer service: C. Kiefer; Delivery info: S. Mitchell

Products manufactured: Backpanel Interconnect Systems, Boards, Plug-In, Cabinets & Accessories, Cable Assemblies & Harnesses, Cable, Clamps & Clips, Connector Adapters, Connectors, Drawers, Sliding, Frames, Cabinet & Rack, Heat Sinks, Soldering, Integrated Circuit Packaging Systems, Jacks (All Types), Jumpers, Kits, Breadboarding (For Engineers), Kits, Terminal, Pins, Plug Adapters, Plugs, Racks, Services, Assembly, Production & Test, Socket Adapters, Sockets, Terminals, Tools

Local Sales Offices & Reps.

Ariz Phoenix, Howe & Howe Sls., Inc. 602-264-7971
 Cal Los Angeles, P. F. Wiley Co. 213-663-8028
 Cal San Carlos, D. H. Ross Co. 415-591-4411
 Colo Littleton, Simpson Assocs., Inc. 303-794-8381
 Conn New Canaan, Stan Pierce, Inc. 203-966-4630
 Fla Clearwater, H.R. Gross & Co. 813-446-6649
 Ga Atlanta, Cartwright & Bean, Inc. 404-255-5262
 Ill Rolling Meadows, Sumer 312-394-4900
 Kans Shawnee Mission, Lowell-Kangas & Assocs. 913-631-3515

La Chalmette, Cartwright & Bean, Inc. 504-279-4598
 Mich Ferndale, Hilltronics, Inc. 313-398-5556
 Minn Edina, M. Foster Co. 612-835-2252
 Miss Jackson, Cartwright & Bean, Inc. 601-981-1368
 Mo St. Louis, Lowell-Kangas & Assocs. 314-821-4050

NJ Cherry Hill, Trinkle Sls., Inc. 609-795-4200
 NM Albuquerque, Piper-Goyne, Inc. 505-265-6794
 NY Mt. Vernon, D. Sonkin Assocs. 914-668-9809
 NY N. Syracuse, D. Allen, Inc. 315-458-7470
 NC Charlotte, Cartwright & Bean, Inc. 704-333-6457

NC Raleigh, Cartwright & Bean, Inc. 919-832-7128
 Ohio Brecksville, A. Nace Co. 216-526-4323
 Ohio Englewood, A. Nace Co. 513-836-7548
 Ore Portland, C.K. Shanks & Assocs. 503-292-5656
 Pa Pittsburgh, A. Nace Co. 412-922-7225
 Tenn Knoxville, Cartwright & Bean 615-693-7450
 Tenn Memphis, Cartwright & Bean, Inc. 910-276-4442

Tex Dallas, J.B. Guenther, Inc. 214-691-8500
 Tex Houston, J.B. Guenther, Inc. 713-468-0232
 Utah Salt Lake City, Simpson Assocs., Inc. 801-486-3731
 Wash Seattle, C. K. Shanks & Assoc. 206-632-4290
 FOR: Can., Montreal, Que., A. C. Simmonds & Sons Ltd. 514-352-5210
 FOR: Can., Willowdale, Ont., A. C. Simmonds & Sons Ltd. 416-491-1010

Local Distributors

Ala Birmingham, ACK Radio Supply Co., 3101 Fourth Ave. So. 205-322-0588
 Ala Huntsville, Cramer/Huntsville, 2310 Bob Wallace Ave. S.W. 205-539-5722
 Ariz Phoenix, Cramer/Ariz., 2643 East University Dr. 602-267-7321
 Ariz Phoenix, Kierulff Elctns, Inc., 2633 East Buckeye Rd. Box 20007 602-273-7331
 Ariz Phoenix, Sterling Elctns, Drawer 20867/2001 East University Dr. 602-258-4531
 Cal Agoura, Augat West Sales Office, Box 178 213-889-4567
 Cal Encino, Rush Assoc., 17025 Ventura Boulevard 213-986-8533
 Cal Irvine, Cramer/Los Angeles, 17201 Daimler St. 213-771-8300
 Cal Los Angeles, Kierulff Elctns, 2585 Commerce Way 213-685-5511
 Cal Mountain View, Elmar Elctns, 2288 Charleston Rd. 415-961-3611
 Cal San Carlos, Sterling Elctns, 1061 Industrial Rd. 415-592-2353
 Cal San Deigo, Kierulff Elctns, 8797 Balboa Ave. 714-278-2112
 Cal San Diego, Cramer/San Diego, 8913 Complex Dr. 714-565-1881
 Cal Sun Valley, Richey Elctns, Inc., 10871 La Tuna Canyon Rd. 213-875-2862
 Cal Sunnyvale, Cramer/San Francisco, 720 Palomar Ave. 408-739-3011
 Colo Commerce City, Elmar Elctns, Inc., 6777 East 50th Ave. 303-287-9611
 Colo Denver, Cramer/Denver, 5465 East Evans Place at Hudson 303-758-2100
 Colo Denver, Kierulff Elctns, Inc., 10890 East 47th Ave. 303-343-7090
 Conn Hamden, Arrow Elctns, 295 Treadwell St. 203-284-3807
 Conn North Haven, Cramer/Conn., 35 Dodge Ave. 203-239-5641
 Fla Hollywood, Cramer/Hollywood, 4035 N. 29th Ave. 305-923-8181
 Fla Orlando, Cramer/Orlando, 345 North Graham Ave. Box 20214 305-894-1511

Ga	Atlanta, Cramer/Atlanta, 3923 Oakcliff Ind'l Center.....	404-448-9050
Ill	Chicago, Semiconductor Specialists, Inc., Box 66125/O'Hare Int. Airport.....	312-279-1000
Ill	Mt. Prospect, Cramer/Chicago, 1911 South Busse Rd.....	312-593-8230
Ill	Rosemont, Kierulff Elctns, Inc., 9340 William St.....	312-678-8560
Ind	Fort Wayne, Fort Wayne Elctn. Supply, 3606 E. Maumee Ave.....	219-423-3422
Ind	Indianapolis, Graham Elctns Supply, Inc., 133 S. Penn St.....	317-634-8202
Ind	Indianapolis, Ra-Dis Company, Inc., 814 North Senate Ave./Box 1064.....	317-637-5571
Iowa	Cedar Rapids, Deeco, Inc., 2500 16th Ave. S.W.....	319-365-7551
Kans	Wichita, Radio Supply Co., 115 Laura Street.....	316-267-5214
Md	Baltimore, Hamilton/Avnet Elctns., Box 8647/Friendship Int'l Airport.....	301-796-5000
Md	Bethesda, Empire Elctn Supply, 4907 Rugby Ave.....	301-656-3300
Md	Gaithersburg, Cramer/Wash., 16021 Industrial Dr.....	301-948-0110
Md	Gaithersburg, Kierulff Elctns, Inc., 16021 Industrial Dr.....	301-948-0250
Md	Hanover, Cramer/Baltimore, 7255 Standard Dr.....	301-796-5790
Md	Hyattsville, Milgray/Wash., 5405 Lafayette Pl.....	301-864-1111
Mass	Boston, DeMambro Elctns., 1095 Commonwealth Ave.....	617-787-1200
Mass	Needham Heights, Kierulff Elctns, 14 Charles St.....	617-449-3600
Mass	Newton, Cramer Elctns, 85 Wells Ave.....	617-969-7700
Mass	Watertown, Sterling Elctns, 51 Spring St.....	617-926-9720
Mich	Ann Arbor, Wedemeyer Elctns Supply Co., 2280 S. Ind'l Highway.....	313-665-8611
Mich	Livonia, Cramer/Detroit, 13193 Wayne Rd.....	313-425-7000
Mich	Troy, Augat Mid West Sales Office, 2848 Sunridge Drive.....	313-644-0404
Minn	Edina, Cramer/Minnesota, 7275 Bush Lake Rd.....	612-835-7811
Minn	St. Paul, Gopher Elctns, 2520 West Larpenrue Ave.....	612-645-0889
Mo	Kansas City, Walters Radio Supply, Inc., 3635 Main St.....	816-531-7015
Mo	St. Charles, Lectronix, Inc., 306 McDonough St./Box 188.....	314-723-1120
NJ	Cherry Hill, Cramer/Pa., 12 Springdale Rd.....	609-424-5993
NJ	Moonachie, Cramer/NJ, 1 Barrett Ave.....	201-935-5600
NJ	Mt. Laurel, Hamilton/Avnet Elctns, 113 Gaither Dr./East Gate Ind'l Park.....	609-234-2133
NJ	Mt. Laurel, Kierulff Elctns, 109 Gaither Dr./East Gate Ind'l Park.....	609-234-2353
NJ	Pennsauken, Resco Elctns Div., Airport & Central Highways/Airport Ind'l Park.....	609-662-4000
NM	Albuquerque, Cramer/NM, 137 Vermont N.E.....	505-265-5767
NY	Binghamton, Stack Ind'l Elctns, 45-49 Wash.....	607-723-6326
NY	Bohemia, Car-Lac Elctn Ind'l Sls, 75 Orville Dr.....	516-567-4200
NY	Buffalo, Summit Dists., 916 Main St.....	716-884-3450
NY	East Syracuse, Cramer/Syracuse, 6716 Joy Rd.....	315-437-6671
NY	Endwell, Cramer/Binghamton, 3220 Watson Blvd.....	607-754-6661
NY	Freeport, Milgray Elctns, 191 Hanse Ave.....	516-546-6000
NY	Hauppauge, Cramer/L.I., 11787/29 Oser Ave.....	516-231-5600
NY	Rochester, Cramer/Rochester, 3000 South Winton Rd.....	716-275-0300
NY	Rochester, Summit Dists., 292 Commerce Dr.....	716-334-8110
NC	Winston-Salem, Cramer/E. W. Winston-Salem, 938 Burke St.....	919-725-8711
NC	Winston-Salem, Kirkman Elctns, Inc., 901 W. Second St./Drawer K-Salem Station.....	919-724-0541
Ohio	Cincinnati, Cramer/Tri States, 666 Redna Terrace.....	513-771-6441
Ohio	Cleveland, Cramer/Cleveland, 5835 Harper Rd.....	216-248-8400
Ohio	Cleveland, Milgray/Cleveland, 1821 E. Fortieth St.....	216-881-8800
Ohio	Cleveland, Pattison Supply Co., Box 6178/4550 Willow Pkwy.....	216-441-3000
Ohio	Columbus, Thompson Elctns Supplies, Inc., 182 East Long St.....	614-228-6191

Pa	Monroeville, Cramer/Pittsburgh, 616 Beatty Dr.....	412-252-7410
Pa	Pittsburgh, Cameradio Co., 2801 Liberty Ave.....	412-288-2600
Tex	Dallas, Cramer/Tex., 13740 Midway Rd.....	214-661-9300
Tex	Dallas, Sterling Elctns, 2875 Merrell Rd.....	214-357-9131
Tex	Houston, Sterling Elctns, 4201 Southwest Freeway/Box 1229.....	713-623-6600
Utah	Salt Lake City, Cramer/Utah, 391 West 2500 So.....	801-487-4131
Utah	Salt Lake City, Standard Supply Co., Box 1047/255 E. 6th South.....	801-355-2971
Wash	Seattle, Cramer/Seattle, 5602 6th Ave. So.....	206-762-5755
Wash	Seattle, Kierulff Elctns, Inc., 5940 6th Ave. So.....	206-763-1550
Wisc	Oak Creek, Cramer/Wisc., 430 West Rawson Ave.....	414-764-1700
For:	Can., Downsview, Ont., Cramer/Canada, Alness St., Unit #9.....	416-681-9222
For:	Can., Edmonton, Alberta, Cardinal Ind'l Elctns, Ltd., 14804 119th Ave.....	403-455-4122
For:	Can., Mississauga (Toronto), Ont., Hamilton-Avnet Int'l (Can.) Ltd., Dorman Rd.....	416-677-7432
For:	Can., Montreal, Que., Hamilton-Avnet Int'l (Canada) Ltd., 2670 Paulhus St.....	514-331-6443
For:	Can., Ottawa, Ont., Hamilton-Avnet Int'l (Can.) Ltd., 880 Lady Ellen Pl.....	913-725-3071
For:	Can., St. Laurent, Que., Cramer/Montreal, 1451 Begin St.....	514-331-9101
For:	Can., Vancouver, B.C., R-A-E Ind'l Elctns Ltd., 1629 Main St.....	604-687-2621

AUL INSTRS., INC., 139-30 34th Rd., Flushing, N.Y., 11354, Tel: 212-886-0600; Empl.: 40; Minimum order: \$25
For info on price: E. Saul; Application info: S. Kirdahl; Customer service: B. Grenet; Delivery info: B. Grenet

Products manufactured: Analyzers, Attenuators, Bridges, Chargers, Battery, Current Sources, Dividers, Dummy Loads, Generators, Meters, Oscilloscopes, Power Supplies, Receivers, Regulators, Standards

AURIC CORP., 470 Frelinghuysen Ave., Newark, N.J., 07114, Tel: 201-242-4100

For info on price: M. Bick; Application info: J. Lochet; Customer service: S. Siegel; Delivery info: S. Siegel

Products manufactured: Chemicals, Machines/Machinery, Production, Metals, Services, Assembly, Production & Test

AURICH F W & CO, 3601 Gilman Ave. W., Seattle, Wash., 98199, Tel: 206-284-5561, TWX: 910-444-1333; Empl.: 25; Minimum order: \$50

For info on price: C. Ernst 206-284-5561; Application info: F. Aurich 206-284-5562; Customer service: M. Weber 206-284-5565; Delivery info: R. Norton 206-284-5566

Free literature available: Fastener Handbook - 128 pages of technical data.

Products manufactured: Fasteners

Local Sales Offices & Reps.

Cal	Oakland.....	415-836-2405
Wash	Seattle.....	206-284-5561

AUSTRON, INC., 1915 Kramer, Austin, Tex., 78758, Tel: 512-836-3523, TWX: 910-874-1356; Empl.: 75; p. 1-279

Products manufactured: Calibrators, Comm. Systems, Data Acquisition & Reduction Systems, Data Loggers, Indicators, Meters, Monitors, Oscillators, Receivers, Scanners, Standards, Synthesizers

Local Sales Offices & Reps.

Cal	Calabasas, M. Shovlowsky.....	213-348-3402
Colo	Littleton, Aztec Enctrs.....	303-795-0250
Del	Newark, Brisco.....	302-731-5000
Fla	Orlando, R.J. Cheney & Assoc's.....	305-894-7371
Ill	Chicago, Megatek, Inc.....	312-889-1277
Md	Rockville, T.E. Corp.....	301-340-0303
NJ	Haddonfield, Brisco.....	215-923-1075
NM	Albuquerque, Aztec Enctrs.....	505-255-2440
NC	Matthews, W.K. Hile Co.....	704-847-9125
Tex	Houston, Dixon Engrg., Inc.....	713-644-3021
Va	Chester, W.K. Hile Co.....	804-271-0014

AUTO TROL CORP., 5650 N. Pecos St., Denver, Colo., 80221, Tel: 303-458-5900; Empl.: 100

Customer service: D. M. McNeill

Products manufactured: Digitizers, Pencil Follower (Inc. Coordinate & Graphic), Drafting Machines, Recorders

Local Sales Offices & Reps.

Cal	Orange, T. Loigu.....	714-532-1954
Colo	Denver, J. M. Mann.....	303-458-5900
Md	Lanham, D. L. Wilson.....	301-459-4448
Mich	Livonia, S. J. Hanson.....	313-478-9775
NH	Nashua, R. M. Jennings.....	603-883-9291
NJ	Fair Lawn, P. W. M. Zeman.....	201-797-8000
Tex	Dallas, G. W. Sickler.....	214-661-8027

AUTOCON INDS., INC., Sub. Control Data, 2300 Berkshire La. N., Minneapolis, Minn., 55441, Tel: 612-545-2851; Empl.: 400

For info on price: P. T. Durgin; Application info: P. T. Durgin; Customer service: B. Christensen

Free literature available: Computer directed control systems, pressure controllers, tone communications and variable motor speed controllers.

Products manufactured: Alarms, Annunciators, Comm. Systems, Controls/Control Eqpt., Data Acquisition & Reduction Systems, Display Devices/Displays, Indicators, Modulators, All Kinds, Receivers, Scanners, Terminal Equipment, Digital, Transducers, Transmission Systems, Data, Transmitters

Local Sales Offices & Reps.

Ark	Little Rock, McCallister Equip. Co.....	501-375-4474
Cal	Man. Beach, James O. Gierlich Co.....	213-772-4434
Cal	San Mateo, Ambrosini & Chalmers.....	415-341-7415

Colo	Denver, Slaybaugh-Thompson.....	303-238-4379
Fla	Orlando, V. K. Assocs.....	305-843-5294
Ga	Atlanta, R. Healey & Asso.....	404-351-1861
Ill	Tinley Pk., Ecology Control Sys.....	312-429-2338
Ind	Carmel, Wetterlin Eng. Sls.....	317-844-3371
Iowa	Ames, Automatic Sys. Co.....	515-232-4770
Kan	Shawnee Mss., Ron Heyse & Asso.....	913-262-0300

La	Metairie, Parson & Sanderson Co.....	504-834-1330
----	--------------------------------------	--------------

Md	Baltimore, Durling Elec. Co.....	301-467-5560
Mass	Sharon, Adcour.....	617-784-3996
Mich	Detroit, H. V. Burton Co.....	313-864-9490
Minn	St. Paul, Prest Co.....	612-690-1537
Miss	Jackson, Hartco Services.....	601-982-1716
Mo	St. Louis, Williams Equip. Co.....	314-997-1030
NJ	Upper Montclair, R. F. Goodwin Asso.....	201-744-8121

NM	Albuquerque, Applied Products.....	505-298-8811
NY	Orchard Pk., R. H. Perry Co.....	716-675-0796
NY	Syracuse, R. H. Perry Co.....	315-468-3507
NC	Charlotte, Interstate Utility Sls.....	704-377-2636
Ohio	Cincinnati, H. P. Thompson.....	513-891-4414
Ohio	Cleveland, J. P. Bergren Co.....	216-932-9445
Okla	Okla. City, Pumpco.....	405-235-4341
Ore	Beaverton, David Fry Co.....	503-643-5448
Pa	King of Prussia, Reinbrecht Assocs.....	215-265-6180

Pa	Pittsburgh, Electrical Engineered Products.....	412-561-7667
----	---	--------------

Tenn	Knoxville, Dickey Engrg Co.....	615-524-8841
Tenn	Memphis, Van Brocklin & Asso.....	901-683-3595
Tex	Dallas, J. F. Rasco Co.....	214-747-0108
Tex	Houston, T-Con.....	713-783-0229
Tex	San Antonio, Powell & Roberts.....	512-735-9123
Utah	Salt Lake City, Con-Tro-Flow Co.....	801-486-3555
Wash	Seattle, Clair Stebbins Co.....	206-246-1170
WVa	Charleston, Elec. Eng. Products.....	304-344-2171
Wisc	Milwaukee, Allan Engrg Co.....	414-353-5070

AUTOMATIC DIE CUTTING MCH, 149 Church, New York, N.Y., 10007, Tel: 212-962-7658; Empl.: 31

Customer service: E. E. Cosgrove

Products manufactured: Machines/Machinery, Production, Services, Assembly, Production & Test, Tapes, Electrical Insulation, Tubing

AUTOMATIC ELECTRIC, Industrial Sales Div., Northlake, Ill., 60164

AUTOMATIC COIL, Div. Designatronics Inc., 55 S. Denton Ave., New Hyde Pk., N.Y., 11040, Tel: 516-328-3300, TWX: 510-223-0642

Customer service: M. Scheck

Products manufactured: Chokes, Coils Including Assemblies & Forms, Filters, Transformers

Local Sales Offices & Reps.

Cal	San Mateo, Melvin Sls. Co.....	415-349-7444
-----	--------------------------------	--------------

AUTOMATIC CONNECTOR INC., 400 Moreland Rd., Commack, N.Y., 11735, Tel: 516-543-5000, TWX: 510-226-3744

AUTOMATIC PRODUCTION SYSTEMS INC., 1602 Hylton Rd., Pennsauken, N.J., 08011, Tel: 609-663-7812; Empl.: 25; Minimum order: \$25

For info on price: E. A. Summers; Application info: E. Cioli; Customer service: A. Spor

Free literature available: Data sheets describing specifications and features of all products - Data Sheets For DiGiprobe - AP502 Cable Tester, AP 503 Cable Tester, AP600 Cable Tester, OmniTester 1000, OmniTester 900, OmniTester 2000, OmniTester 3000.

Products manufactured: Analyzers, Test Systems, Testers

Local Sales Offices & Reps.

Cal N. Hollywood, Crown Elct. 213-877-3550
Conn Hartford, Victor Assoc. 203-246-5643
Ill Chicago, Solid State Elec. 312-889-8033
Mass Framingham, Victor Assoc. 617-879-5710
Minn Bloomington, E.C. Elctn. Sls. 612-831-0229
NJ Cherry Hill, Gordon Co. 609-667-6644
NJ Wayne, K & J Assoc. 201-694-3334
Ohio Columbus, Measurement Instrs. 614-488-9753
Tex Dallas, Data Marketing Assoc. 214-358-4643
FOR: Can., Toronto, Ont., Neece, Ind. 416-678-2890

AUTOMATIC TIMING & CONTROLS CO., King of Prussia, Pa., 19406, Tel: 215-265-0200; Empl.: 300

For info on price: J. N. Senior; Application info: W. F. Popjoy; Customer service: W. C. Hannes; Delivery info: M. Burke

Free literature available: Selection Guide; Digital Selection Guide; Photoelectric Design Guide; Complete Catalogs.

Products manufactured: Alarms, Cells, Load, Controls/Control Eqp., Counters, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Demodulators, Gages, Indicators, Printers, Programmers, Recorders, Relays, Switches, Timers, Transducers, Transformers

Local Sales Offices & Reps.

Ala Birmingham, Control Equip. Co. 205-TR9-8211
Ariz Phoenix, Portis & Assocs. 602-947-4379
Cal San Francisco, Automated Process Controls Co. 415-467-6162
Cal Van Nuys, Time Trol. 213-873-5151
Colorado Denver, D.E. Bond Assoc. 303-756-1234
Conn Middletown, Mancib Co. 203-347-5629
Fla Lakeland, A.A. Elec. Div. 813-682-6181
Ga Atlanta, Control Equip. Co. 404-237-1688
Ill Glen Ellyn, Rockford Controls Co. 312-469-6016
Ind Indianapolis, Rockwell Engrg. Co. 317-CL 1-9453
Ky Louisville, Air-Hydro Power Co. 502-451-1000
La New Orleans, Mid South Sls. Co. 504-822-3030
Md Baltimore, Jobe & Co. 301-235-3502
Mass Burlington, Mancib Co. 617-272-9450
Mich Brighton, H. H. Barnum Co. 313-229-2961
Mich Lowell, H. H. Barnum Co. 616-451-0980
Minn Minneapolis, Automated Controls, Inc. 612-377-7727
Mo Kansas City, Duncan Sales & Engrg., Inc. 816-523-2908

Mo University City, E. Mooney Co. 314-725-8875
NJ Newark, Norman Bragar Co. 201-344-1100
NY Buffalo, Niagara Electric Sls. Co. 716-886-4000
NY Rochester, Niagara Electric Sls. Co. 716-271-1223

NY Syracuse, Niagara Elec. Sls. Co. 315-422-9177
NY Yonkers, Ross Co. 212-TA4-5424
NC Charlotte, Brown & Morrison 704-333-0774
Ohio Cincinnati, Anderson-Bolds, Inc. 513-272-3351
Ohio Cleveland, Anderson-Bolds, Inc. 216-229-4700
Ohio Worthington, Anderson-Bolds, Inc. 614-885-3933

Okla Tulsa, Driscoll Automatic Control Co. 918-747-6625

Ore Eugene, J. A. Tudor & Assoc. 503-344-9212
Ore Portland, J. A. Tudor & Assoc., Inc. 503-288-5154

Pa King of Prussia, Applied Controls, Inc. 215-265-3832

Pa Pittsburgh, Gilson Engrg. Sls. Inc. 412-931-6114

Tenn Memphis, Engineered Instrs. 901-743-3402

Tex Houston, Gettys-Eads-Adair 713-781-3005

Utah Salt Lake City, Control Equip. Co. of Salt Lake 801-487-7741

Va Richmond, Jobe & Co. 804-282-6508

Wash Seattle, J. A. Tudor & Assoc. 206-MU 2-7444

Wash Spokane, J. A. Tudor & Assoc. 509-FA 7-3328

Wisc Cedarburg, Automation Engrg. Co. 414-377-7500

AUTOMATION DEVICES, INC., Box A.D., Automation Pk., Fairview, Pa., 16415, Tel: 814-474-5561; Empl.: 60

For info on price: D. Buseck; Application info: L. Kallsen

Products manufactured: Controls/Control Eqp., Indicators, Machines/Machinery, Production, Sound Absorbing Materials

Local Sales Offices & Reps.

Ariz Mesa, L.C. Brandt 602-832-0710
Cal Santa Fe Springs, Automation Devices Western 213-693-3745
Colorado Denver, R.M. Moore 303-222-4858
Conn Fairfield, W. Whitehead 203-255-4543
Fla Clearwater, Tange Drives Inc. 813-446-9871
Ill Chicago, C. Schanstra 312-344-6580
Md Riderwood, E. Miles, Jr. 301-823-1434
Mass Concord, R. Malloy 617-369-8889
Mich Detroit, J. Bishop 313-538-0595
Minn Minneapolis, H. West 612-721-6661
Miss Jackson, P. Patrick 601-982-1621
Mo St. Louis, E. Benninger 314-381-1300
NJ Chatham, G. Crawford 201-635-6868
NY Syracuse, K. Reed 315-478-2232
NY Yonkers, E. Ross 212-824-5424
NC Charlotte, J. Dixon 704-366-9661
Ohio Cleveland, J. Schiefferle 814-838-6163
Ohio Hicksville, C. Kallsen 419-542-8117
Ohio Perysburg, K. Lytle 419-475-4305
Pa Erie, W. Baker 814-459-5135
Tenn Memphis, J. Barbour, H. Lewis, C. Walker 901-362-2253

Tex Dallas, S. Lomax 214-361-1134
Wisc Milwaukee, J. O'Meara 414-353-7040
EXP: Can., Niagara Falls, Ont., S. Fisk 416-354-3881

AUTOMATION DISPLAYS INC., Box 1122, Eau Claire, Wisc., 54701, Tel: 715-834-9595; Empl.: 10; Minimum order: \$25

Customer service: J.E. Carpentier

Free literature available: The brochure contains pictures of our work to illustrate our capabilities in the information display field.

Products manufactured: Annunciators, Display Devices/Displays, Lamp Drivers, Multiplexers, Switches

Local Sales Offices & Reps.

Ariz Phoenix, Spectrum Co. 602-997-6324
Cal Santa Ana, Spectrum Assocs. Inc. 714-835-4114
Ill Chicago, Bex Data Ltd. 312-221-1411
Mass Lexington, B & B Assocs. 617-862-5054
Mich Walled Lake, Berberich Assocs. Inc. 313-624-2211
Minn Minneapolis, Bex Data Ltd. 612-835-5220
Mo St. Louis, Bex Data Ltd. 314-872-3353
NJ Cherry Hill, L.H. Walke Co. 609-424-3766
NJ Delran, T. McLaughlin Co. 609-461-5243
NM Albuquerque, Western Consultants 513-433-0342
Ohio Dayton, Berberich Assocs. Inc. 513-433-0342
Tex Dallas, T-Square Assocs. 214-369-3173
Wash Bellevue, Hudson Co. 206-455-0773



AUTOMATION DYNAMICS, INC., Div. ABC Digital, Inc., 25 Charles St., Westwood, N.J., 07675, Tel: 201-666-2458; FSC No: 53089; Empl.: 15

For info on price: B. K. Cheng 201-666-2458; Application info: C. H. Wu 201-666-2554; Customer service: D. Marchak 201-666-2554; Delivery info: R. A. Wood 201-666-2458

Products manufactured: Comparators, Data Acquisition & Reduction Systems, Testers

AUTOMATION INDS., Sperry Div, Shelter Rock Rd., Danbury, Conn., 06810, Tel: 203-748-3581, TWX: 710-456-0392; Empl.: 350; Minimum order: \$25

For info on price: B. Hodge; Application info: L. Johnson; Customer service: W. R. Kitchen; Delivery info: F. J. Lynch

Free literature available: Bulletin 105 - Nondestructive Test Equipment and Systems.

Products manufactured: Detectors, Indicators, Magnetometers, Testers, Transducers, X-Ray Inspection Equipment

Local Sales Offices & Reps.

Cal Chatsworth, Automation Industries, Inc., Sperry Div. 213-882-2600
Cal Downey, Automation Industries, Inc., Sperry Div. 213-773-6133
Cal San Jose, Automation Industries, Inc., Sperry Div. 408-244-4520
Ga Tucker, Automation Industries, Inc., Sperry Div. 404-939-8762
Ill Rosemont, Automation Industries, Inc., Sperry Div. 312-671-1670

Mich Warren, Automation Industries, Inc., Sperry Div. 313-756-5940

Ohio Dayton, Automation Industries, Inc., Sperry Div. 513-274-0892

Ohio Rocky River, Automation Industries, Inc., Sperry Div. 216-333-5575

Pa Phoenixville, Automation Industries, Inc., Sperry Div. 215-933-8961

Pa Pittsburgh, Automation Industries, Inc., Sperry Div. 412-371-3335

Pa Spring City, Automation Industries, Inc., Sperry Div. 215-948-8220

Tenn Nashville, Automation Industries, Inc., Sperry Div. 615-256-6607

Tex Dallas, Automation Industries, Inc., Sperry Div. 214-351-5381

Tex Houston, Automation Industries, Inc., Sperry Div. 713-774-9650

Va Falls Church, Automation Industries, Inc., Sperry Div. 703-536-8600

Wash Renton, Automation Industries, Inc., Sperry Div. 206-228-3170

FOR: Can., Mississauga, Ont., Automation Ind. (Can.) Ltd., Sperry Div. 416-678-9215

AUTOMATION PRDTS., 3030 Max Roy, Houston, Tex., 77008, Tel: 713-869-0361

For info on price: S. S. Turner; Application info: W. Bouldin Jr.; Customer service: B. J. Williams; Delivery info: J. Robertson

Products manufactured: Controls/Control Eqp., Densitometers, Electronic, Indicators, Switches

AUTO-SWAGE PRODUCTS INC., 726 River Rd., Shelton, Conn., 06484, Tel: 203-929-1401, Telex: 963542; Empl.: 170; Minimum order: \$50

For info on price: R. L. Mikulsky; Application info: R. L. Mikulsky; Customer service: R. L. Mikulsky; Delivery info: R. MacCormack

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Contacts, Electrical, Eyelets, Fasteners, Forms, Wire, Pins, Posts, Rivets, Services, Assembly, Production & Test, Sockets, Spacers, Springs [All Types], Terminals

Local Sales Offices & Reps.

Ariz Scottsdale, E.E. Black 602-947-2007
Cal Glendale, Haldeman & Frazier 213-247-3330
Colorado Denver, Industrial Hardware Co. 303-426-1440
Ind Greensburg, H.K. Feaster 812-663-5689
Minn Minneapolis, W.R. Maleckar Co. 612-926-7601
NY Rochester, Gislason Sls. 716-454-4741
Ohio Beachwood, Davis & Hawley Sls. Co. 216-464-9655
Pa Broomall, AM Tech. Sls. Co. 215-356-0574
Tex Richardson, C.D. Price Co. 214-231-4321
EXP: New York, N.Y., Lang & Zysk 212-227-1743

AUTOSPLICE/DV GEN STAPLE, 220 E. 23rd St., New York City, N.Y., 10010, Tel: 212-674-4369; Empl.: 40; Minimum order: \$25

For info on price: B. Glasser; Application info: J. Zahnstecher; Customer service: C. Iadanza; Delivery info: B. Glasser

Free literature available: Autosplice a new splicing system that operates from a continuous spool of spliceband material. In one simultaneous action the machine feeds a length of this spliceband, cuts it and forms it and crimps it around the items to be assembled. Insulsplice - the only machine in the world that operates from a plastic laminated metal strip, and both makes and attaches insulated splices at the same time.

Autopin - this machine operates from a continuous coil of either round or square wire and inserts pins into printed circuit boards, bobbins, etc. Autotab - production machine that inserts pre-stamped terminal directly into printed circuit boards, components, etc.

Products manufactured: Backpanel Interconnect Systems, Clamps & Clips, Connectors, Contacts, Electrical, Fasteners, Forms, Wire, Jumpers, Laminates, Machines/Machinery, Production, Pins, Services, Assembly, Production & Test, Splicers, Coaxial Cable, Splices, wire (Including, Butt & Cap Types), Terminal Blocks, Boards & Strips, Terminals, Tools, Wire, Wire & Cable Ties, Wire Nuts

AUTOTRON, INC., 3269 N. Vermilion St., Box 595, Danville, Ill., 61832, Tel: 217-446-0650

Free literature available: Catalog 76 - contains latest released information on photoelectric controls developments, application survey, 56 complete application sketches and dimensional diagrams for innumerable practical uses.

Products manufactured: Alarms, Controls/Control Eqpt., Counters, Light Sources, Photoelectric

Local Sales Offices & Reps.

Ariz	Mesa, L.C. Brandt Co.	602-832-0710
Ark	Ft. Smith, Electro-Related Prods.	501-646-7756
Cal	Los Angeles, Electro Comps. Distrib.	213-264-7100
Cal	San Francisco, J.M. Krotzyner	415-777-4636
Fla	Ft. Lauderdale, R.D. Jacobs	305-524-1932
Ill	Addison, Llectron Controls Co.	312-543-8460
Mass	Needham, White Sls. Co.	617-444-3676
Mich	Detroit, Basic Service Corp.	313-837-8820
Minn	Minneapolis, Bican Co.	612-827-4734
Mo	Kansas City, Automation Specialties, Inc.	816-421-6646
Mo	St. Louis, Kathrinus, Kelly & Co.	314-968-3800
NY	Elmont, Crane & Egert Corp.	516-488-2100
NY	Rochester, T. Ferguson Sls.	716-482-7757
NC	Charlotte, Electro-Rep Assocs.	704-527-2530
Ohio	Cincinnati, J.W. Murray & Assoc.	513-662-1616
Ohio	Cleveland, C.A. Robinson Co.	216-381-9049
Pa	Paoli, Tyler Griffin Co.	215-644-7710
Tex	Houston, RMA/Southland	713-462-4077
Utah	Salt Lake City, Control Agency	801-466-8601
Wash	Seattle, C.B. Parsons & Co.	206-762-7373
Wisc	Wauwatosa, Larsen Assocs.	414-258-0529
FOR:	Can., Burlington, Ont., Higginson Equip. Sls. Ltd.	416-634-1888

AUTOTRONICS, INC., 2700 Davis Blvd., Joplin, Mo, 64801

AUTRONICS CORP., 180 N. Vinedo Ave., Pasadena, Cal, 91107, Tel: 213-681-3545, TWX: 910-588-1977; FSC No: 03972; Empl.: 40; Minimum order: \$25

p. 1-237,1113

For info on price: D. A. McNamara; Application info: C. B. Barnes

Free literature available: Brochure showing custom design capabilities and experience, with typical product categories. Available direct or through sales representatives.

Products manufactured: Alarms, Controls/Control Eqpt., Converters, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Detectors, Flashers, Generators, Inverters, Monitors, Power Supplies, Relays, Switches, Timers

Local Sales Offices & Reps.

Ariz	Phoenix, Thorson Co.	602-956-5300
Cal	Goleta, Thorson Co.	805-964-8751
Cal	Los Angeles, Thorson Co.	213-937-0790
Cal	Mountain View, Thorson Co.	415-964-9300
Cal	San Diego, Thorson Co.	714-298-8385
Cal	Tustin, Thorson Co.	714-544-5121
Colo	Denver, Thorson Co.	303-355-3521
Kans	Olathe, B.C. Elctn. Sls.	913-782-6696
Kans	Wichita, B.C. Elctn. Sls.	316-686-3394
Md	Baltimore, R. P. Luce & Co.	301-752-8200
Mo	Hazelwood, B.C. Elctn. Sls.	314-731-1255
NJ	Berkeley Hgts., R.P. Luce & Co.	201-464-4440
NM	Albuquerque, Thorson Co.	505-265-5655
NY	New Hyde Pk., R. P. Luce & Co.	516-437-4550
Pa	Phila., R. P. Luce & Co.	215-884-8365
Tex	Dallas, Thorson Co.	214-233-5744
Tex	Houston, Thorson Co.	713-771-3504
Wash	Bellevue, Thorson Co.	206-455-9180
Wash	Seattle, Thorson Co.	206-632-0710

AVA ELCTRNS., 242 Pembroke Ave., Landsdowne, Pa, 19050, Tel: 215-284-2500; Empl.: 45; Minimum order: \$25

For info on price: Order Dept.; Application info: Mr. Pal; Customer service: Marianne; Delivery info: Marianne

Free literature available: Catalogues of Products.

Products manufactured: Amplifiers, Arresters, Electrical Surge, Lightning, Attenuators, Connector Adapters, Couplers, Panels, Tees, Television Systems & Equipment Closed-Circuit, Terminals, Transformers

Local Sales Offices & Reps.

Cal	Carlsbad, L. J. Erickson	714-726-5270
Fla	Tampa, S. K. Wallace Assoc.	305-691-1654
Ga	Atlanta, S. K. Wallace Assoc.	
Ill	Chicago, M. Gottlieb Assoc.	312-775-1151
Md	Kensington, Forti-Austin Assoc.	301-949-4149
Mass	Wellsley Hill, M. Scott Co.	617-235-0102
Mich	Southfield, Champagne Sls. Co.	313-354-0270
NJ	Fort Lee, TMC Sls. Corp.	201-944-8340
NJ	Willingboro, Forti-Austin Co.	609-871-3720
NY	Syracuse, W. Tauber Co.	315-446-7094
Ohio	Cleveland, J. O. Olsen Co.	216-752-5444
Pa	Pittsburgh, R. Tanner Co.	412-561-4687
Wash	Seattle, W. Lanphear Dist.	206-633-4900

AVANTEK, INC., 3175 Bowers Ave., Santa Clara, Cal., 95051, Tel: 408-249-0700, TWX: 910-339-9274; Empl.: 380

For info on price: B. Goff; Application info: J. Graves; Customer service: J. Dechristofaro; Delivery info: J. Dechristofaro

Free literature available: Component catalog lists the many microwave products manufactured by Avanteck. Specs, applications and case outline data are some features

Products manufactured: Amplifiers, CATV Systems & Equipment, Circuits, Hybrid, Thin-Film, Integrated Circuit Devices, Microwave Integrated Circuits (MIC's), Oscillators, Transistors

Local Sales Offices & Reps.

Ala	Huntsville, Gentry Assocs.	205-534-9771
Ariz	Phoenix, Thorson Co.	602-956-5300
Cal	Los Altos, Cain-White & Co.	415-948-6533
Cal	Los Angeles, Cain Technology	213-476-2251
Colo	Denver, Thorson Co.	303-759-0809
DC	Washington, Applied Engrg. Conslts.	301-953-2808
Fla	Orlando, Gentry Assocs.	305-894-4401
Ill	Des Plaines, Cozzens/Cudahy	312-298-3600
Ind	Indianapolis, Cozzens/Cudahy	317-244-2456
Kans	Shawnee Mission, E.I.R.	913-362-0919
Md	Ellicott City, Applied Engrg. Conslts.	301-465-1272

Mass	Burlington, Tritex, Inc.	617-272-4550
Mich	Detroit, Micro Sls. Corp.	313-482-1229
Minn	Minneapolis, Cozzens/Cudahy	612-884-4336
Mo	Hazelwood, E.I.R.	314-895-4100
Mo	St. Louis, Cozzens/Cudahy	314-423-1234
NJ	Fort Lee, Tech. Mktg. Assocs.	201-224-6911
NM	Albuquerque, Thorson Co.	505-265-5655
NY	Skaneateles, Robtrn	315-685-5731
NC	Burlington, Gentry Assocs.	919-227-3639
Ohio	Dayton, Micro Sls. Corp.	513-885-4171
Pa	Philadelphia, Eastern Instrumentation	215-927-7777
Tex	Dallas, Thorson Co.	214-233-5744
Tex	Houston, Thorson Co.	713-771-3504
Wash	Seattle, Thorson Co.	206-455-9180

AVIATECH INTL. INC., 4250 Veterans Hwy., Holbrook, N.Y., 11741, Tel: 516-981-9300, Telex: 967892; Empl.: 10

Customer service: G. H. Inhafer

Free literature available: Data sheets on closed circuit low light level TV systems, microphones, headsets and airborne antennas

Products manufactured: Antennas, Handsets, Chestsets, Headphones, Headsets, Etc., Microphones, All Kinds, Television Systems & Equipment Closed-Circuit

AVIATION ELEC. LTD., Sub. Bendix Corp., Box 2140, Station O, Montreal, H4L 4X8 Que., Can., Tel: 514-744-2811, Telex: 05-826688; Empl.: 925

Customer service: C. Watts

Products manufactured: Computers, Potentiometers, Transducers

AVIBANK MFG. INC., 210 S. Victory Blvd., Burbank, Calif., 91503, Tel: 213-843-4330, TWX: 910-498-2215; Empl.: 200; Minimum order: \$35

Customer service: L. Slocum

Free literature available: A 100 page catalog of our product in a one-inch hard cover binder.

Products manufactured: Connectors, Fasteners, Pins

Local Sales Offices & Reps.

NY Smithtown, Avibank Mfg. Inc. 516-979-8045

AVID ELECTRONICS CORP., Box 426, Baldwin, Pl., N.Y., 10505, Tel: 914-628-6952; FSC No: 08842; Empl.: 10; Minimum order: \$25

For info on price: D. McVey; Application info: J. Del; Customer service: M. McVey; Delivery info: M. McVey

Free literature available: Components catalog covers sizes, detail dimension and part numbers. Listings include spacers, terminals, plus handles screws and custom fabricated parts-metal and plastic.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Clamps & Clips, Connectors, Contacts, Electrical, Fasteners, Handles For Cabinets, Circuit Boards, Racks, etc., Insulators & Insulation, Pins, Services, Assembly, Production & Test, Shafts & Adapters, Spacers, Terminal Blocks, Boards & Strips, Terminals

AVIONIC INSTRS. INC., 943 E. Hazelwood Ave., Rahway, N.J., 07065, Tel: 201-382-7100, Telex: 844413; Empl.: 32

Free literature available: Product Manual containing a brochure, price list, specification sheets, and block diagrams upon request.

Products manufactured: Chargers, Battery, Inverters, Regulators

AVIONICS LTD., Box 200, Niagara-On-Lane, Ont., Can., Tel: 416-468-3632; Empl.: 25

Customer service: J. G. Mitchell

Products manufactured: Boards, Plug-In, Boards, Printed Circuit

AVTRON MFG., INC., 10409 Meech Ave., Cleveland, Ohio, 44105, Tel: 216-641-8310, TWX: 810-421-8435; FSC No: 01014; Empl.: 125; Minimum order: \$25

For info on price: R. D. Thomas; Application info: R. D. Thomas; Customer service: R. J. Strober; Delivery info: D. C. Garis

Free literature available: Technical Bulletins covering Avtron's complete product line of Drive Stands, Load Banks, Digital Control/Monitor, and Winding Test Equipment upon request.

Products manufactured: Controls/Control Eqpt., Converters, Counters, Dummy Loads, Generators, Heat Sinks, Soldering, Indicators, Loads, Electronic Variable, Meters, Tachometers, Test Systems, Testers

Local Sales Offices & Reps.

Wash	Bellevue, J. Findlay Co.	206-454-5200
Wisc	Appleton, J.K. Luke	414-739-3238

AVX CERAMICS, Box 867, Myrtle Beach, S.C., 29577, Tel: 803-448-3191, TWX: 810-661-2252; FSC No: 9K916; Empl.: 2387 p. 1-530,531; p. 2-2-23

For info on price: F. Fry; Customer service: J. Bodine

Free literature available: GC 74 General Catalogue, FC 74 Filter Catalogue

Products manufactured: Capacitors, Fixed, Filters

Local Sales Offices & Reps.

Ala	Huntsville, Powertronics, Inc.	205-852-6347
Ariz	Tempe, Interstate Mktg. Assoc.	602-968-7201
Cal	Mt. View, Quadrep Inc.	415-964-3532
Cal	Woodland Hills, Interstate Mktg. Assocs.	213-883-7606
Colo	Denver, Zeus	303-771-6200
Fla	Oviedo, Conley & Assocs., Inc.	305-365-3283
Ill	Chicago, T.B. Hunter Assocs.	312-777-2500
Ind	Indianapolis, F.J. Campisano Co.	317-247-8623
Iowa	Cedar Rapids, J.R. Sls. Engrg. Inc.	319-377-8211
Md	Baltimore, Burgin-Kreh Assocs.	301-788-5200
Mass	Lexington, J.E. Boeing Co.	617-862-2500
Mich	Southfield, J.L. Montgomery	313-358-2616
Minn	Minneapolis, Comstrand Inc.	612-560-5300
Mo	Grandview, Beneke & McCaul, Inc.	816-765-2998

NJ	Cherry Hill, J.N. Barrett Assocs.	609-429-1551
NM	Albuquerque, Zeus	505-256-9831
NY	Garden City, Comtronic Assocs.	516-741-8966
NY	Ithaca, B. Dean, Inc.	607-272-2187
NC	Thomasville, Powertronics, Inc.	919-476-6727
NC	Winston-Salem, Burgin-Kreh	919-768-4174
Ohio	Cincinnati, F.J. Campisano Co.	513-662-1616
Ohio	Dayton, Schmidt & Assoc.	513-293-6657
Ohio	South Euclid, F.J. Campisano Co.	216-381-4949
Okla	Oklahoma City, Ammon & Rizos	405-721-2365
Ore	Portland, Western Tech. Sls.	503-297-1711
Pa	Pittsburgh, G.S. Root & Co.	412-561-4125
Tex	Dallas, Ammon & Rizos Co.	214-233-5591
Tex	Houston, Ammon & Rizos Co.	713-729-1233
Utah	Salt Lake City, Zeus	801-486-2317
Va	Lynchburg, Burgin-Kreh Assoc.	804-845-5800
Wash	Bellevue, Western Tech. Sls.	206-641-3900
FOR:	Can., Montreal, Kaytronics Ltd.	514-487-3434

Local Distributors

Ala	Huntsville, Cramer Elctns., 2310 Bob Wallace Ave.	205-539-5722
Ariz	Phoenix, Cramer Elctns., 2643 E. University Ave.	602-267-7321
Ariz	Phoenix, R.V. Weatherford, 1917 N. 25th Dr.	602-272-7144
Cal	Anaheim, R.V. Weatherford, 1550 Babbitt Ave.	714-547-0891
Cal	Glendale, R.V. Weatherford, 6921 San Fernando Rd.	213-849-3451
Cal	Inglewood, Newark Elctns., 4747 W. Century Blvd.	213-678-0441
Cal	Irvine, Cramer, 17201 Daimler St.	714-979-3000
Cal	Los Angeles, Texas Instruments Supply, 5200 W. 104th St.	213-776-4490
Cal	Palo Alto, R.V. Weatherford, 3240 Hillview Ave.	415-493-5373
Cal	Pomona, R.V. Weatherford, 1095 E. Third St.	714-623-1621

Cal	San Diego, Cramer, 8975 Complex Dr.	714-565-1881
Cal	San Diego, R.V. Weatherford, 7872 Raytheon Rd.	714-278-7400
Cal	Sunnyvale, Cramer, 720 Palomar Ave.	408-739-3011
Cal	Woodland Hills, Jaco Elctns., 21201 Oxnard St.	213-887-6400
Colo	Denver, Cramer Elctns., E. Evans Place	303-758-2100
Colo	Denver, Newark Elctns., 2170 S. Grape St.	303-757-3351
Conn	N. Haven, Cramer Elctns., 35 Dodge Ave.	203-239-5641
Conn	Westport, Newark Elctns., 25 Sylvan Rd. S.	203-226-6921
Fla	Ft. Lauderdale, Newark Elctns., 1360 N.W. 65th Ave.	305-587-2372
Fla	Hollywood, Cramer Elec., N. 29th Ave.	305-923-8181
Fla	Orlando, Cramer, 345 N. Graham Ave.	305-894-1511
Ill	Chicago, Newark Elctns., 500 N. Pulaski Rd.	312-638-4411
Ill	Mt. Prospect, Cramer Elec., 1911 S. Busse Rd.	312-593-8230
Iowa	Cedar Rapids, Newark Elctns., 1019 First Ave. S.W.	319-362-1171
Md	Beltsville, Newark Elctns., 10440 Baltimore Ave.	301-937-5085
Md	Gaithersburg, Cramer Elec., Ind'l. Dr.	301-948-0110
Md	Hanover, Cramer Elec., 7255 Standard	301-796-5790
Mass	Newton, Cramer Elec., 85 Wells Ave.	617-969-7700
Mass	Woburn, Newark Elctr., 13A Wheeling Ave.	617-935-8350
Mich	Detroit, Newark Elctns., 20700 Hubbell Ave.	313-548-0250
Mich	Livonia, Cramer, 13193 Wayne Rd.	313-425-7000
Mich	Wyoming, Newark Elctns., 3645 Linden Ave.	616-241-6681
Minn	Edina, Cramer, 7275 Bush Lake Rd.	612-835-7811
Minn	Minneapolis, Newark Elctns., 336 Hoover St.	612-331-6350
NJ	Clark, Texas Instrument Supply, 301 Central Ave.	201-382-6400
NJ	Kenilworth, Newark Elctns., 303 Monroe Ave.	201-272-8410
NJ	Moonachie, Cramer Elec., 1 Barrett Ave.	201-935-5600
NM	Albuquerque, Cramer Elec., Vermont N.E.	505-265-5767
NM	Albuquerque, R.V. Weatherford, 6106 Marble Ave., N.E.	505-842-9868
NY	Endwell, Cramer, 3220 Watson Blvd.	607-754-6661
NY	Hauppauge, Cramer, 29 Oser Ave.	516-231-5600
NY	Hauppauge, Jaco Elctns., Engineers Rd.	516-273-5500
NY	Plainview, Newark Elctns., 80 Express St.	516-822-5000
NY	Rochester, Cramer Elec., 3000 S. Winton Rd.	716-275-0300
NY	Rochester, Newark Elctns., 3000 S. Winton Rd.	716-473-6600
NY	Syracuse, Cramer, 6716 Joy Rd.	315-437-6671
NC	Winston-Salem, Cramer, 938 Burke St.	919-725-8711
Ohio	Cincinnati, Cramer, 666 Redna Terr.	513-771-6441
Ohio	Cincinnati, Newark Elctns., 9799 G. Princeton Rd.	513-874-5115
Ohio	Cleveland, Cramer, 5835 Harper Rd.	216-248-8400
Ohio	Cleveland, Newark Elctns., 2028 E. 46th St.	216-361-4700
Pa	Cherryhill, Cramer, Springdale Rd.	609-424-5993
Pa	Monroeville, Cramer, 616 Beatty Dr.	412-252-7410
Tex	Dallas, Cramer, 13740 Midway Rd.	214-661-9300
Tex	Dallas, Newark Elctns., Box 38299	214-271-2511
Tex	Dallas, R.V. Weatherford, 10836 Grissom La.	214-243-1571
Tex	Dallas, Texas Instrument Supply, 6000 Denton Dr.	214-238-6952
Tex	Houston, R.V. Weatherford, 3500 W.T.C. Jester Blvd.	713-688-7406
Tex	Houston, Texas Instrument Supply, 3939 Ann Arbor Dr.	713-785-4800

Utah	Salt Lake City, Cramer, 391 W. 2500 South	801-487-4131
Utah	Salt Lake City, Newark Elctns., 2540 S. 300 West	801-486-1048
Wash	Seattle, Cramer, 5602 6th Ave. S.	206-762-5755
Wash	Seattle, R.V. Weatherford, 541 Industry Dr.	206-243-6340
Wisc	Brookfield, Newark Elctns., 3695 N. 126th St.	414-781-2450
Wisc	Oak Creek, Cramer, W. Rawson Ave.	414-764-1700

AXEL ELCTRNS., Unit of General Signal, 134-20 Jamaica Ave., Jamaica, N.Y., 11418, Tel: 212-291-3900, TWX: 710-582-2618; FSC No: 13058; Empl.: 180
p. 1-525; p. 2-41

Customer service: J. Alaimo

Products manufactured: Capacitors, Fixed, Filters, Networks, Power Supplies, Transformers

Local Sales Offices & Reps.

Ariz	Scottsdale, F. Board Assocs.	602-994-9388
Cal	Fremont, Spence Assocs.	415-656-9506
Fla	Miami, Repronics	303-251-5478
Ind	Auburn, Tech Line	219-925-1757
Iowa	Hiawatha, Gassner & Clark Co.	319-393-5763
Md	Baltimore, Burgin-Kreh Assocs.	301-788-5200
Mass	Medway, J. Gallagher	617-533-7292
Minn	Chanhassen, Barnes Sis. Assocs.	612-474-2907
Mo	St. Louis, Repco	314-343-9313
Ohio	Cleveland, E.E. Bock & Assocs.	216-331-5212
Ohio	Dayton, L.D. Bruno Co.	513-434-1847
Pa	Fort Washington, G.C.M.	215-646-7535
Pa	Pittsburgh, Automated Equip. & Engrg.	412-931-7616

FOR: Can., Mississauga, Ont., Rayshield
416-822-4414

AYDIN CONTROLS, 414 Commerce Dr., Ft. Washington, Pa., 19034, Tel: 215-542-7800, TWX: 510-661-1520; Empl.: 120; Minimum order: \$50

Customer service: J. E. Bauer

Free literature available: "Get the Picture" applications brochure for color graphics and high resolution graphics; Raster Scan Graphic Display Systems; High Resolution Graphics.

Products manufactured: Converters, Display Devices/Displays, Encoders, Generators, Keyboards, Alphanumeric & Decimal, Monitors

Local Sales Offices & Reps.

Cal	Palo Alto, P. Papathakis	415-493-3939
Cal	Westlake Village, C. T. Morton	213-889-1513
Fla	Fort Walton Beach, G. W. Cleveland	904-242-3414

Mass	Bedford, R. Clafin	617-275-0296
Tex	Dallas, Data Mktg. Assoc.	214-661-0300

AYDIN ENERGY SYSTEMS, 3180 Hanover St., Palo Alto, Cal., 94303, Tel: 415-493-3900, TWX: 910-373-1238; Empl.: 300

For info on price: C. V. Weden; Application info: C. V. Weden; Customer service: K. Hanabusa; Delivery info: K. Hanabusa

Products manufactured: Amplifiers, Comm. Systems, Generators, Modulators, All Kinds, Power Supplies, Reactors, Testers, Transformers, Transmitters

B & B MOTOR & CONTROL, 96 Spring St., New York, N.Y., 10012, Tel: 212-966-5777, Telex: 14-1484; Empl.: 30; Minimum order: \$15

For info on price: I. Herman; Application info: D. Shaw; Customer service: M. Penn; Delivery info: K. Palmer

Free literature available: MOTOR SPEED CONTROL CATALOG Motors and controls from 0.02 to 10,000 RPM, 1/2000 to 3/4 HP. MOTOR CATALOG AC and DC systems from 1/2000 to 1-1/8 HP. IMPULSE COUNTER GUIDE Sodeco line of electromechanical impulse counters.

Products manufactured: Controls/Control Eqpt., Counters, Motors

Local Sales Offices & Reps.

Conn	Wallingford	203-869-8494
Ind	Indianapolis	317-248-0396
NJ	Edison	201-420-1466
NY	Rochester	716-473-6640

B & F INSTRS., INC., Box 238, Corwells Hgts, Pa., 19020, Tel: 215-639-7100, TWX: 510-667-1516; Empl.: 100; Minimum order: \$50

Customer service: E. H. New, Jr.

Free literature available: Bulletins 450A, AN109 Thru AN113 Describe Our Digital Data Acquisition Systems, Bulletins MS10A, EB30, AN106 and 107 Describe Our Digital Data Loggers.

Products manufactured: Amplifiers, Bridges, Cases, Equipment, Instrument, Meter, Converters, Data Acquisition & Reduction Systems, Data Loggers, Indicators, Oscillographs, Direct Writing, Power Supplies, Process Control Systems, Scanners, Signal Conditioners & Equipment

Local Sales Offices & Reps.

Ala	Huntsville, Kemp Instrs., Inc.	205-837-4304
Ariz	Phoenix, Cleveland Ent.	602-996-6130
Cal	Anaheim, FLW	714-956-8220
Cal	Culver City, FLW	213-559-7200
Cal	North Hollywood, F.L. Wolfe Inc.	213-877-5518
Cal	San Diego, F.L. Wolfe, Inc.	714-277-0993
Cal	Walnut Creek, D. Dahl Assocs.	415-933-9595
Colo	Arvada, Cleveland Entrs., Inc.	303-423-3707
Fla	Orlando, RJC Assocs.	305-894-7371
Ill	Northfield, Torkelson Assocs.	312-446-9085
Ind	Indianapolis, Torkelson Assocs.	317-244-7867
Iowa	Cedar Rapids, Palatine Engrg. Sls.	319-365-8071

Kans	Andover, Palatine Engrg. Sls.	913-262-5643
Kans	Overland Park, Palatine Engrg. Sls.	913-262-5643

Mass	Natick, Andruss-Peskin Corp.	617-653-3919
Mich	Royal Oaks, Measurement Instrs.	313-352-2144
Minn	Minneapolis, Torkelson Assocs.	612-835-2414
Mo	St. Louis, Palatine Engrg. Sls.	314-426-7055
NJ	Stirling, NBS Assocs.	201-464-8500
NM	Albuquerque, Cleveland Entrs., Inc.	505-345-2481

NC	Winston-Salem, Radco Co.	919-722-9671
Ohio	Cincinnati, Measurement Instrs.	513-531-2729
Ohio	Columbus, Measurement Instrs.	614-488-9753
Okla	Tulsa, Palatine Sls.	918-622-0321
Ore	Portland, Applied Arts and Science	503-233-4683

Pa	Jenkintown, PDC Corp.	215-887-9610
Tex	Austin, Palatine Sls.	512-451-7463
Tex	Houston, Palatine Engrg. Sls.	713-783-1492
Tex	Richardson, Palatine Engrg. Sls.	214-231-9489

B & K DYNASCAN, See Dynascan

B & K INSTRUMENTS, INC., 5111 W. 164th St., Cleveland, Ohio, 44142, Tel: 216-267-4800, TWX: 810-421-8266; FSC No: 27591; Empl.: 65; Minimum order: \$25

For info on price: L. Stier; Application info: L. Stier; Customer service: T. Romo; Delivery info: L. Stier

Free literature available: New 1974 Short Form Catalog describes briefly the full line of precision transducers and instrumentation for sensing, measuring, and analyzing all aspects of sound and vibration.

Products manufactured: Accelerometers, Amplifiers, Analyzers, Bridges, Calibrators, Comm. Systems, Computers, Filters, Gages, Generators, Kits, Test Equipment, Meters, Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds, Oscillators, Recorders, Services, Assembly, Production & Test, Signal Conditioners & Equipment, Technical Books, Test Equipment, Testers, Transducers

Local Sales Offices & Reps.

Ala	Huntsville, Lee Assocs.	205-533-5896
Ariz	Phoenix, Barnhill Three, Inc.	602-947-7841
Cal	Anaheim, B & K Instrs., Inc.	714-778-2450
Cal	San Mateo, B & K Instrs., Inc.	415-574-8100
Colo	Denver, Barnhill Three, Inc.	303-934-5505
Conn	Hamden, Equip. Sls. Co.	203-248-5581
Fla	Winter Haven, Lee Assocs.	813-294-5815
Ill	Chicago, Carter Elctns., Inc.	312-585-5485
Ind	Indianapolis, Carter Elctns., Inc.	317-293-0696
Kans	Overland Park, Carter Elctns., Inc.	913-649-6996

Md	Rockville, Farrell Assocs.	301-424-9460
Mass	Chelmsford, Equip. Sls. Co.	617-256-8547
Mich	Detroit, B & K Instrs.	313-557-1930
Minn	Minneapolis, Carter Elctns., Inc.	612-544-9393
Mo	St. Louis, Carter Elctns., Inc.	314-731-2237
NM	Albuquerque, Barnhill Three, Inc.	505-299-7658
NY	DeWitt, DB Assocs.	315-446-0220
NY	Great Neck, Meas. Technology, Inc.	212-895-7177

NC	Raleigh, Lee Assocs., Inc.	919-787-5818
Ohio	Cincinnati, B & K Instrs.	513-874-5379
Pa	Philadelphia, Letronix, Inc.	215-242-6223
Pa	Pittsburgh, B & K Instrs.	412-276-6393
Tex	Dallas, Barnhill Two, Inc.	214-231-2573
Tex	Houston, Barnhill Two, Inc.	713-688-9971
Wash	Seattle, H. Levinson Co.	206-323-5100

Wisc Milwaukee, Carter Elctns., Inc.414-484-5555

BABCOCK ELECTRONICS, Sub Esterline Corp., Box 1499, Costa Mesa, Cal., 92626, Tel: 714-540-1234, TWX: 910-595-1517; Empl.: 500

For info on price: G. W. Henn; Application info: J. M. Brown; Customer service: J. N. Larson; Delivery info: J. N. Larson

Free literature available: Catalogs for military and commercial relays. Full, half and 1/6 size crystal can relays latching and non latching. Time delay relays, voltage sensors, reed relays, general purpose, and solid state relays.

Products manufactured: Relays

Local Sales Offices & Reps.

Ala Huntsville, Elctrn. Mktg. Assoc.205-837-6061
Ariz Phoenix, Chaparral Mfrg. Reps.602-996-9648
Cal Los Angeles, E. Landa Co.213-879-0770
Cal Redwood City, Warren & Hickey Sls. Co.415-368-3849

Colo Englewood, Checkmate Sls.303-771-4920
Conn North Haven, Kitchen & Kutchnin203-239-0212
Fla Clearwater, G.F. Bohman Assoc.813-422-5606
Fla Ft. Lauderdale, G.F. Bohman Assoc.305-564-3081

Fla Orlando, G.F. Bohman Assoc.305-855-0274
Ill Chicago, Carlson Elctrn. Sls.312-774-4812
Ind Greenwood, V. Schillinger & Assocs.317-888-2260

Ind South Bend, V. Schillinger & Assocs.219-291-6258

Kans Olathe, BC Elctrn. Sls.913-782-6696
Md Silver Springs, Rep-Tron301-593-4844

Mass Lexington, Kitchen & Kutchnin617-862-8230
Minn Minneapolis, J.J. Exon Co.612-566-5340
Mo Hazelwood, BC Elctrn. Sls.314-731-1255

NJ Haddonfield, Gray Assocs.609-429-5300
NJ Teaneck, R.T. Reid Assocs.201-692-0200
NM Albuquerque, Data Handling Co.505-268-4364

NY North Syracuse, Advanced Comps. Corp.315-699-2671

NY Scottsville, Advanced Comps. Corp.716-889-1429

NC Winston Salem, Elctrn. Mktg. Assocs.919-722-5151

Ohio Cincinnati, Giesting Assocs.513-931-0812

Ohio Dayton, Giesting Assocs.513-293-4044

Ore Beaverton, Arneson Assocs.503-643-5754

SC Greenville, Elctrn. Mktg. Assocs.803-268-1125

Tex Richardson, Barry Sls. Co.214-234-0255

Utah Salt Lake City, Checkmate Sls.206-762-7664

Wash Seattle, Arneson Assocs.206-762-7664

Wisc Milwaukee, Carlson Elctrn. Sls.414-476-2790

FOR: an., Montreal, Que., Space Elctns. Sls. Corp.514-735-1108

FOR: Can., Toronto, Ont., Space Elctrn. Sls. Corp.416-677-4205

BACHARACH INSTRUMENT CO., 625 Alpha Dr., Pittsburgh, Pa., 15238, Tel: 412-782-3500, TWX: 710-664-2085; Empl.: 500

Products manufactured: Alarms, Analyzers, Detectors, Indicators

Local Sales Offices & Reps.

Cal Canoga Park213-348-4142

Cal Mountain View415-967-7221

Ill Wheeling312-541-3293

Mich Berkley313-399-7883

NJ Little Ferry201-440-4662

Pa Philadelphia215-338-5173

Tex Houston713-688-7150

BACON INDS., 192 Pleasant St., Watertown, Mass., 02172, Tel: 617-926-2550; Empl.: 18; Minimum order: \$25

For info on price: Sales Dept.; Application info: T. Willett; Customer service: T. Willett

Free literature available: Data Sheets on our epoxy, and urthane potting compounds; Data Sheets on our molded rubber line & other services.

Products manufactured: Adhesives (All Types), Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Conductive Plastic Materials, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Rubber, Seals, Services, Assembly, Production & Test

BAFCO, INC., 717 Mearns Rd., Warminster, Pa., 18974, Tel: 215-674-1700, TWX: 510-665-6860; Empl.: 21

For info on price: R. France; Application info: A. M. Fuchs; Customer service: R. France; Delivery info: R. France

Free literature available: Catalog 7172 and Tech. Publ. 7172-1 describes the complete line of Frequency Response Analyzers and provide theoretical basis of operation for measurement of dt ratio and phase shift from 0.005 HZ thru 50,000 HZ in poor S/N conditions.

Products manufactured: Actuators, Analyzers, Controls/Control Eqpt., Filters, Meters, Servo Systems, Test Equipment, Testers

Local Sales Offices & Reps.

Cal Carson, ABCO Co.213-537-5152

Cal Santa Clara, Mauldin415-326-5291

Conn Newton, Daner-Hayes Inc.203-426-9094

Fla Orlando, Truex305-859-2160

Mass Newton Centre, Daner-Hayes Inc.617-969-4650

NY Rochester, Daner-Hayes Inc.716-467-5100

Ohio Dayton, P. Glavinios513-433-1010

Pa Melrose Park, R. Meyers Assoc.215-224-1663

BAGANOFF ASSOCS., INC., 6809 W. Florissant, St. Louis, Mo., 63136, Tel: 831-0956; Empl.: 12

Customer service: E. Brown

Products manufactured: Amplifiers, Analyzers, Comm. Systems, Computers, Converters, Data Acquisition & Reduction Systems, Delay Lines, Generators, Services, Assembly, Production & Test, Testers

BAKER CO., INC., Drawer E - Sanford Airport, Sanford, Me., 04073, Tel: 207-324-8773; Empl.: 80

Products manufactured: Benches, Consoles, Stools, Tables, Cabinets & Accessories, Ovens

Local Sales Offices & Reps.

Ariz Gilbert, R. Pressnell602-833-5387

Cal Dana Point, Dana Scientific Co.714-495-0492

Cal Richmond, Tegal Corp.415-232-1757

Fla Clearwater, Datco813-531-4255

Ga Decatur, B. H. Yates Co.404-633-6900

Ill Villa Park, Motordor312-833-2700

Ind Indianapolis, Little & Assocs.317-545-4083

Mass Cambridge, Rush Assocs.617-661-1200

Mich Dearborn, W. Mullins & Assoc.313-563-3340

Minn St. Paul, S. Clasen612-439-6347

Mo Clayton, Gateway Scientific314-725-3464

NJ Newark, Thornton Assocs.201-622-0905

NC Cary, R. Petty919-467-9663

Okla Okla. City, Oklahoma Air Filter Sls. & Svc.405-521-9918

Tenn Memphis, Dickson Instr. Co.901-452-2612

Tex Houston, Contamination Control713-943-1883

Wash Lake Stevens, Northwest Scientific Instrs.206-259-0123

FOR: Can., Oakville, Ont., Cartec416-844-4561

BAKER, J.T. CHEMICAL CO., Phillipsburg, N.J., 08865, Tel: 201-859-2151, TWX: 510-235-2924; Empl.: 750; Minimum order: \$150

For info on price: G. L. Collins; Application info: T. P. Merrick; Customer service: W. D. Alpaugh; Delivery info: W. D. Alpaugh

Free literature available: Product Information Bulletin 174 lists ULTREX(R) products for research, and reagents for the lab with application data, starting materials, purification methods, packaging and characterization. "Defined Purity Dopants" describes product features, packaging/price info and examples of actual Certificates of Analysis.

Products manufactured: Chemicals, Cleaners & Solvents, Metal Oxides

Local Sales Offices & Reps.

Cal Hayward415-471-6225

Ill Glen Ellyn312-469-4224

Ohio Hudson216-653-6635

FOR: Can., Weston, Ont., c/o Richardson-Merrell Canada Ltd.416-749-8620

BAKNOR INDUSTRIES LTD., 58 Oakwood Ave., N. Port Credit, Ont., L5g3L8, Tel: 416-274-1591, Telex: 06-961252; FSC No: WJ0905; Empl.: 6; Minimum order: \$25

For info on price: M.E. Sawicki 416-274-1592; Application info: A.R. von den Baumen 416-274-1721; Customer service: S. DeAmeral 416-274-1591; Delivery info: L. Ruddy 416-274-1591

Free literature available: Spec sheets

Products manufactured: Capacitors, Fixed, Resistors

Local Sales Offices & Reps.

FOR: Can., Oakville, Ont., Haltronics Ltd.416-844-2121

BALCO CAPACITORS, Div. Balco Elctns., Inc., 307 Washington St., Orange, N.J., 07050, Tel: 201-677-1200, TWX: 710-994-5812; FSC No: 5910; Empl.: 50; Minimum order: \$50

For info on price: R. W. Hagerty; Application info: R. W. Hagerty; Customer service: L. James; Delivery info: R. W. Hagerty

Free literature available: Precision Film Capacitors, Wrap & Fill Film Capacitors

Products manufactured: Capacitors, Fixed, Networks, Resistors

Local Sales Offices & Reps.

Ariz Scottsdale, F. Schoeffler Assocs.213-478-7733

Cal Culver City Sodaro Co.213-785-0773

Cal Van Nuys, Penwarden Entrs.203-237-9232

Conn Meriden, Abbott-Allison312-498-5444

Ill Northbrook, R.T. Howlett & Assocs.913-831-4259

Kans Overland Park, Bob Rush Assocs.213-788-8495

NY Harrington Pk., Metro Tech. Sls.516-935-3330

NY Jericho, Metro Tech. Sls.206-938-4166

Wash Seattle, J.B. Jolly414-543-8110

Wisc Milwaukee, Gentron Corp.212-944-4372

EXP: New York, Multiparts Corp.516-334-3303

EXP: Westbury, N.Y., Minthorne Int'l. Inc.514-389-5914

FOR: Can., Montreal, Que., Electro Design613-745-0541

FOR: Can., Ottawa, Ont., Electro Design416-787-0991

FOR: Can., Toronto, Ont., Electrodesign Ltd.514-363-5120

FOR: Can., Ville Lasalle, Que., Electrodesign Ltd.514-363-5120

Local Distributors

Ohio Dayton, McGuire Prod., 206 Troy St.513-222-1651

Tex Houston, Lenert Co., 1420 Hutchins713-225-1465

BALDWIN ELCTRNS., 1101 McAlmont St., Little Rock, Ark., 72203, Tel: 501-375-7351, TWX: 910-722-7384; Empl.: 435; Minimum order: \$20p. 1-144-146

Customer service: S. Berg

Free literature available: Application papers concerning operating characteristics of optical encoders.

Products manufactured: Alarms, Circuits, Hybrid, Thick Film, Controls/Control Eqpt., Converters, Counters, Encoders, Indicators, Motors, Tachometers

Local Sales Offices & Reps.

Ariz Phoenix, R.A. Mayes Co.602-279-5243

Cal Los Angeles, Baldwin Elctns., Inc.213-368-1716

Colo Denver, R.A. Mayes, Co.303-444-0782

Conn North Haven, Northeast Reps., Inc.203-239-2507

Fla Boca Raton, Conley Assocs.305-395-6108

Fla Oviedo, Conley Associates305-365-3283

Fla Tampa, Conley Assocs.813-933-3183

Ill Chicago, Carlson Elctns. Sls. Co.312-774-9022

Kans Kansas City, Carlson Elctns. Sls. Co.913-432-2144

Md Arnold, Baldwin Elctns., Inc.301-757-5904

Mass Needham Heights, Northeast Reps.617-449-3034

Minn Minneapolis, J. J. Exon Co.612-566-5340

Mo St. Louis, Carlson Elctrn. Sls. Co.314-991-0262

NJ Ridgewood, Instrumentation Sls. Co.201-445-5210

NM Albuquerque, R.A. Mayes Co.505-292-2330

NY Buffalo, H. C. Johnson Agencies716-632-7880

NY Rochester, H.C. Johnson Agencies716-482-3000

NY Syracuse, H.C. Johnson Agencies315-637-9383

Ohio Cincinnati, Baldwin Elctns., Inc.513-231-1786

Ore Portland, Brett Associates, Inc.503-232-4184

Pa Pittsburgh, H.C. Johnson Agencies412-961-0414

Tex Fort Worth/Dallas, Carey, Wolf & Associates817-738-1996

Tex Houston, Carey, Wolf & Assoc.713-643-2114

Utah Salt Lake City, R.A. Mayes Co.801-292-6781

Wash Seattle, Brett Associates, Inc.206-935-8054

Wisc Wauwatosa, Carlson Elctns. Sls. Co.414-476-2790



BALLANTINE LABORATORIES, INC., 90 Fanny Rd., Box 97, Boonton, N.J., 07005, Tel: 201-335-0900, TWX: 710-987-8380; FSC No: 50423; Empl: 65; Minimum order: \$25

For info on price: I. Bromberg; Application info: M. J. Lichtenstein; Customer service: T. Gilbert; Delivery info: N. Lauchaire

Products manufactured: Amplifiers, Calibrators, Counters, Generators, Meters, Oscilloscopes, Probes, Recorders, Services, Assembly, Production & Test, Shunts, Meter, Standards, Thermocouples, Elements & Accessories, Totalizers, Digital, Voltage Sources

Local Sales Offices & Reps.

Ala	Huntsville, Gentry Assoc. Inc.	205-534-9771
Ariz	Scottsdale, Williams Assoc.	602-947-4297
Cal	Irvine, Moxon Elctns.	714-556-6500
Cal	San Diego, Moxon Elctns.	714-292-4820
Cal	Santa Clara, Moxon Elctns.	408-249-2491
Colo	Denver, Williams Assocs.	303-343-2911
Conn	New Haven, Mc Bar Assoc.	203-865-4376
Fla	Melbourne, Gentry Assocs.	305-773-0812
Fla	Orlando, Gentry Assocs.	305-894-4401
Fla	St. Petersburg, Gentry Assocs.	813-867-7820
Ill	Chicago, Scientific Sls.	312-775-7594
Ind	Indianapolis, Scientific Sls.	317-253-4606
Kans	Shawnee Mission, Eir Co.	913-362-0919
Md	Baltimore, Dyna Rep Co.	301-256-3709
Mass	Waltham, McBar Assocs.	617-890-0233
Mich	Royal Oak, Group Ten	313-549-3910
Minn	Bloomington, Scientific Sls.	612-881-3300
Mo	Hazelwood, Eir Co.	314-895-4100
NJ	Haddonfield, Dyna Rep Co.	609-795-1700
NM	Albuquerque, Williams Assocs.	505-255-1638
NY	Mt. Vernon, Q.E.D. Elctns.	914-664-0080
NY	North Syracuse, NACO Elctns.	315-699-2651
NY	Schenectady, NACO Elctns.	518-244-4720
NY	Utica, NACO Elctns.	315-732-1801
NC	Burlington, Gentry Assocs.	919-227-3639
Ohio	Cleveland, Group Ten	216-486-2800
Ohio	Dayton, Group Ten	513-293-7061
Okl	Norman, Data Mktg. Assoc. Inc.	405-364-8320
Tex	Dallas, Data Mktg. Assocs.	214-661-0300
Tex	Houston, Data Mktg. Assocs.	713-686-9627
Tex	San Antonio, Data Mktg. Assoc. Inc.	512-828-0937
Va	Alexandria, Dyna Rep Co.	703-354-1222
Va	Newport News, Dyna Rep Co.	804-874-7729
Wash	Seattle, Rush S. Drake Assoc.	206-763-2755

BALSTON, INC., Box C, 703 Massachusetts Ave., Lexington, Mass, 02173, Tel: 617-861-7240, Telex: 92-3481

For info on price: D. Weldon; Application info: J. Alpert; Customer service: J. Alpert; Delivery info: C. Mahler

Free literature available: Technical information on the selection and use of high efficiency filters for removal of oil from compressed air. Technical information filtration of deionized water. Summary of applications for high efficiency liquid and gas filters. Quick Reference Chart on Balston High Efficiency Filters.

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded)

Local Distributors

Ala	Mobile, Alabama Controls Co., Box 7154	205-479-2345
Cal	Palo Alto, Priz-Co., 2675 Park Blvd.	415-326-9333
Cal	Paramount, Brenner-Fiedler & Assoc., 16210 Gundry Ave.	213-636-3206
Colo	Denver, Mundix Ind'l Controls, 5495 Marion St.	303-893-2390
Fla	Orlando, Control Center, 1013 E. Montana St.	305-896-6831
Ill	Chicago, A. Stanley & Co., 6059 N. Albany Ave.	312-973-7376
Md	Baltimore, Jobe & Co., 2857 Greenmount Ave.	301-235-3502
Mich	Detroit, Michigan Value & Fitting Co., 17236 E. Warren Ave.	313-884-9415
Minn	Eden Prairie, G. Speaker Co., 14760 Martin Dr.	612-941-5730
Mo	Hazelwood, E. M. Thompson Co., 400 Brooks Dr.	314-731-2688
Mo	Kansas City, E. M. Thompson Co., 208 W. 10th St.	816-471-8248

Neb	Omaha, E. M. Thompson Co., 119 S. 19th St.	402-341-4635
NJ	Moorestown, Salem Scientific, Box 354	609-235-4565
NJ	Springfield, RJM Sls., Box 82	201-467-1210
NY	Buffalo, R.L. Stone Co., 1807 Elmwood Ave.	716-873-1873

NY Rochester, R.L. Stone Co., Box 9148

NY Syracuse, R.L. Stone Co., 2023 Milton Ave.

NC Charlotte, Salem Sls. Assocs., Box 9323

Ohio Cincinnati, J.R. Douglass Co., Box 31075

Ohio Cleveland, F. W. Kirk Co., 15017 Detroit Ave.

Pa Pittsburgh, J.F. Kraus & Co., 360 Broadmoor Ave.

Tenn Memphis, Centro, Inc., Box 7311

Tex Dallas, H & D Distributors, 6211 Denton Dr.

Tex Pasadena, Tech-Quip, Inc., Box 6191

Utah Provo, Priz-Co., 17 E. 200 North

Va Richmond, Jobe & Co., 2508 Grenobler

WVa So. Charleston, Appalachian Controls Co., Box 8246

Wisc Appleton, Guy Speaker Co., 1425 N. Douglas St.

Wisc Milwaukee, Guy Speaker Co., 5706 W. Vliet St.

For: Can., Mississauga, Ont., Can-Am Instrs. Ltd., 1938 Mattawa Ave.

For: Can., Montreal, Que., Can-Am Instrs. Ltd., Box 397, Snowden Po.

BARBER-COLMAN CO., Motor Div., Dept. S, 12116 Rock St., Rockford, Ill., 61101, Tel: 815-877-0241, TWX: 815-398-0341; Empl: 5000

Products manufactured: Blowers & Fans & Accessories, Motors, Relays

Local Sales Offices & Reps.

Ala	Huntsville, Candor Co.	205-539-6575
Cal	Menlo Park, Long & Assocs., Inc.	415-327-1300
Cal	Sherman Oaks, R. Meussdorffer & Assoc.	213-788-0771
Colo	Denver, Todd & Assocs., Inc.	303-744-2313
Conn	Berlin, White Sls. Co.	203-224-0423
Ill	Chicago, D. Dolin Sls. Inc.	312-286-6200
Ind	Ft. Wayne, Menze Sls.	219-747-5616
Kans	Overland Park, Penzner-Mankus Assocs.	913-381-0004
Md	Baltimore, Machinery & Equip. Sls. Inc.	301-889-2070
Mass	Needham, White Sls. Co.	617-444-3676
Minn	St. Paul, Northport Engrg.	612-698-3841
Mo	Hazelwood, Penzner-Mankus Assocs.	314-731-4334
NJ	Mt. Laurel, Naudain Assocs.	609-235-1801
NJ	Springfield, P. H. Werner, Inc.	201-376-9440
NY	East Aurora, Harries & Hershaw	716-652-1221
NC	Winston-Salem, Candor Co.	919-924-1480
SC	Myrtle Beach, Candor Co.	803-448-5213
Va	Lynchburg, Candor Co.	703-239-5265
Wisc	Milwaukee, Barber-Colman Co.	414-464-5900
EXP	Milwaukee, Wis., Dumann World Trade Co.	414-464-0100

BARBER-COLMAN CO., Industrial Instrs. Div., 2711 Rock St., Rockford, Ill., 61101, Tel: 815-877-0241, TWX: 815-398-0341; Empl: 5000

Customer service: M. Bengston

Free literature available: Ten page brochure describes Barber-Colman's solid state, reprogrammable sequence logic control systems, designed to increase productive machine time by improving cycle time and machine sequence repeatability.

Products manufactured: Actuators, Alarms, Amplifiers, Controllers, Programmable, Controls/Control Eqpt., Converters, Indicators, Meters, Monitors, Process Control Systems, Pyrometers, Recorders, Relays, Signal Conditioners & Equipment, Testers, Thermocouples, Elements & Accessories, Transducers, Wire

Local Sales Offices & Reps.

Ala	Birmingham, Control Equip. Co.	205-879-8211
Ala	Huntsville, Control Equip. Co.	205-883-1330
Cal	Alhambra, Barber-Colman Co., Industrial Instrs. Div.	213-282-9166
Cal	Redwood City, CB Controls	415-364-2313
Cal	San Diego, R. Brainard Co.	714-274-1333

Colo Denver, Technical Engrg. Sls.-Svc. (TESSCO)

Conn Stamford, Barber-Colman Co., Industrial Instrs. Div.

Fla Miami, G. Brophy Assoc.

Fla Winter Park, Control Equip. Co.

Ga Atlanta, Barber-Colman Co., Industrial Instrs. Div.

Ill Lincolnwood, Barber-Colman Co., Industrial Instrs. Div.

Ill Loves Park, Barber-Colman Co., Industrial Instrs. Div.

Ill Rock Island, Barber-Colman Co., Industrial Instrs. Div.

Ind Indianapolis, Barber-Colman Co., Industrial Instrs. Div.

Ind Lanesville, Barber-Colman Co., Industrial Instrs. Div.

Kans Prairie Village, Parker & Foster, Inc.

La Baton Rouge, Allen Assocs.

La Shreveport, JDJ Sls. Co.

Md Laurel, Barber-Colman Co., Industrial Instrs. Div.

Mass Canton, Barber-Colman Co., Industrial Instr. Div.

Mich Grand Rapids, Barber-Colman Co., Industrial Instrs. Div.

Mich Southfield, Barber-Colman Co., Industrial Instrs. Div.

Minn Minneapolis, Pyro-Matic Industrials, Inc.

Mo St. Louis, Barber-Colman Co., Industrial Instrs. Div.

NJ Rochelle Park, Barber-Colman Co., Industrial Instrs. Div.

NY Buffalo, Barber-Colman Co., Industrial Instr. Div.

NC Charlotte, Barber-Colman Co., Industrial Instrs. Div.

Ohio Cincinnati, Barber-Colman Co., Industrial Instrs. Div.

Ohio Columbus, Industrial Data Control Co.

Ohio Highland Hgts., Barber-Colman Co., Industrial Instrs. Div.

Ohio Toledo, Barber-Colman Co., Industrial Instrs. Div.

Okl Tulsa, Electrical & Inst. Sls. Co.

Pa Frazer, Barber-Colman Co., Industrial Instrs. Div.

Pa Pittsburgh, Barber-Colman Co., Industrial Instrs. Div.

Tenn Memphis, Combustion & Controls Co.

Tex El Paso, Delta Instr. Co.

Tex Fort Worth, Barber-Colman Co., Industrial Instrs. Div.

Tex Pasadena, ASKCO Instr. Co.

Utah Salt Lake City, Control Sys., Inc.

Va Richmond, Indamacion Co.

Wash Bellevue, KAKAR Corp.

WVa Charleston, Chemac Co.

Wisc Appleton, Pyro-Matic Industrials, Inc.

Wisc Brookfield, Pyro-Matic Industrials, Inc.

FOR: Can., Dorval, Quebec, Barber-Colman of Canada, Ltd., Industrial Instrs. Div.

FOR: Can., Vancouver 10, British Columbia, Instrument Service Labs

FOR: Can., Weston, Ontario, Barber-Colman of Canada, Ltd., Industrial Instrs. Div.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

BARBER CORP., Box 271, Waynesville, Ohio, 45068, Tel: 513-897-2926; Empl: 25

For info on price: C. M. Barber; Application info: C. M. Barber; Customer service: M. S. Barber

Products manufactured: Power Supplies, Relays, Solenoids, Switches, Testers

BARDEN CORP., 200 Park Ave., Danbury, Conn., 06810, Tel: 203-744-2211, TWX: 203-744-0097; Empl: 1100

For info on price: E. V. Silver; Application info: W. W. Warner; Customer service: E. V. Silver; Delivery info: E. V. Silver

Free literature available: Selection & usage guide to precision bearings The Barden linear bearing.

Products manufactured: Bearings

BARKER ELEC. SLS., Box 405, Ship Bottom, NJ, 08008, Tel: 609-494-8209; Empl: 17

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

FOR: Can., Edmonton, Alb., Instr. Svc. Labs.

Free literature available: Catalog & Technical Data. Terminal converters vacuum types "U.H.F." & "Standard" patterns. Leaflet - Descriptive Data. New "Wilkins" multicouple with high output (up to 1.6 volts) and extreme accuracy of reversal differences & temperature coefficients.

Products manufactured: Cores, Magnetic, Magnets, Thermocouples, Elements & Accessories

Advertisement

Vacuum Thermocouples, Mfr. L.R. Graham Co. UHF and STANDARD Low Frequency styles from 1Ma up. Accurate RMS and true SQUARE LAW outputs with Low Reversal Errors and Compensated Temperature Coefficients. Wide current tracking ratios, long to fast time responses. Single units and matched parameters. Complete technical catalog available.

BARKER PRODS. CO., 344 Central St., Saugus, Mass., 01906, Tel: 617-233-9070, TWX: 617-233-6676; Empl.: 60

Customer service: W. A. Brackett

Free literature available: Catalog

Products manufactured: Connector Adapters, Connectors, Cords, Jack Adapters (All Types), Jacks (All Types), Plug Adapters, Plug & Jack Sets

Local Sales Offices & Reps.

Ariz Phoenix, R. Fissell Co. 602-264-4031
Cal Burbank, Koessler Sls. Co. 213-849-5716
Cal Lafayette, Wilkins-Mason Assocs. 415-284-9200

Colo Denver, Vines & Co. 303-832-6967
Fla Ormond Beach, J.F. Thompson Co. 904-677-2298

Ga Atlanta, Maitland K. Smith 404-939-5838
Ill Chicago, T. Pappas & Assocs. Inc. 312-685-2338

Mass Auburndale, Mktg. Elctn., Inc. 617-527-7753
Mich Detroit, Riley & Petchell Sls., Inc. 313-535-7000
Minn Minneapolis, J. E. M. Anderson Co. 612-823-6459

NJ Montclair, Component Marketers Inc. 201-746-6717

Ohio Twinsburg, F. Ohman Inc. 216-425-7455
Pa Wynnwood, Stinson Assocs. 215-896-7378
Tex Dallas, C. Lucas Sls. Co. 214-330-8181
Wash Seattle, D. Champlin Co. 206-362-0401
FOR: Can., Mississauga, Ontario, W. Farrow Assocs., Ltd. 416-625-8151

BARKER & WILLIAMSON, INC., Canal St., Bristol, Pa., 19007, Tel: 215-788-5581; Empl.: 50

Products manufactured: Amplifiers, Analyzers, Antennas, Capacitors, Variable, Chokes, Coils Including Assemblies & Forms, Counters, Couplers, Dummy Loads, Filters, Generators, Meters, Switches, Terminals, Transformers

BARNES ENGRG. CO., 30 Commerce Rd., Stamford, Conn., 06902, Tel: 203-348-5381, TWX: 710-474-3367; Empl.: 400; Minimum order: \$25

For info on price: R. Bouton; Application info: R. F. Leftwich; Customer service: R. Bouton; Delivery info: B. Manning

Free literature available: Literature for Infrared Thermometers that make non-contact temperature measurements and Infrared Microscopes and Micro Scanners for non-contact temperature measurements of micro-targets.

Products manufactured: Analyzers, Bolometers, Cameras, Controls/Control Eqpt., Detectors, Microscopes, Pyrometers, Radiometers, Scanners, Standards

Local Sales Offices & Reps.

Cal Los Altos, J. Stone Assocs. 415-948-4563
Cal Los Angeles, Basic Systems Co. 213-938-2833
Colo Evergreen, Mountaintek 303-674-5255
Fla Casselberry, GPI Instrs. 305-831-6215
Fla Orlando, E. G. Holmes & Assocs. 305-894-8901
Ga Chamblee, E. G. Holmes & Assocs. 404-451-6161

Haw Honolulu, Elctn. Measurement Corp. 808-847-1138

Ill Chicago, Carter Elctns. 312-585-5485
Ind Indianapolis, Carter Elctns. 317-293-0696
Kans Overland Park, Carter Elctns. 913-649-6996
La Baton Rouge, SESCO 504-272-3730
Md Silver Spring, Spectro Systems 301-949-8261
Mass Marblehead, Northeast Assocs. 617-631-9500

Mich Detroit, WKM Assocs. 313-892-2500
Minn Minneapolis, E. J. Doyle Co. 612-827-5847
Mo Hazelwood, Carter Elctns. 314-731-2237
NJ East Orange, Friedman Assocs. 201-673-2500
NM Albuquerque, Trembley Assocs. 505-293-4444
NY Fayetteville, M. P. Andrews 315-637-3144
Ohio Cleveland, WKM Assocs. 216-267-0445
Ohio Dayton, WKM Assocs. 513-434-7500
Pa Elkins Park, Snow Assocs. 215-379-4700
Pa Pittsburgh, WKM Assocs. 412-892-2953
Tex Houston, SESCO 713-668-7840
Tex Richardson, SESCO 214-231-9364
Utah Salt Lake City, Mountaintek 810-272-4611
Va Virginia Beach, E. G. Holmes & Assocs. 804-481-6556

Wash Seattle, Showalter-Judd 206-624-9020
Wisc Milwaukee, Carter Elctns. 414-464-5555

BARNES & REINECKE, INC., 351 E. Ohio St., Chicago, Ill., 60611, Tel: 312-321-0350; Empl.: 250

For info on price: J. E. Smart; Application info: J. E. Smart; Customer service: J. E. Smart; Delivery info: J. G. Ferkan

Products manufactured: Chargers, Battery, Meters

BARON-BLAKESLEE, INC., 1620 S. Laramie Ave., Chicago, Ill., 60650, Tel: 312-656-7300

For info on price: P. Johnson; Application info: P. Johnson; Customer service: J. C. Avery; Delivery info: J. C. Avery

Products manufactured: Cleaners & Solvents, Cleaners, Ultrasonic

Local Sales Offices & Reps.

Cal Gardena 213-532-0730
Cal Newark 415-794-6511
Cal San Diego 714-295-0041
Cal Santa Fe Springs 213-723-0971
NJ South Kearny 201-589-5933
NY Garden City 516-747-8460
Ore Portland 503-252-3468
Wisc Oak Creek 414-762-6850

BARTLETT-EMERY INSTRUMENT CORP., 14th & Ave. "M", Ft. Madison, Iowa, 52627, Tel: 319-372-8366; Empl.: 25; Minimum order: \$10

Customer service: P. R. Bartlett

Products manufactured: Meters, Shunts, Meter, Testers, Thermocouples, Elements & Accessories

Local Sales Offices & Reps.

Cal Los Altos, Schwerin Assocs. 415-941-3737
Cal Malibu, Corman Co. 213-457-7524
Mo Kansas City, Nevco, Inc. 816-421-1751
Mo St. Louis, Nevco, Inc. 314-843-7406
Pa Glenside, W.E. Girard Co. 215-887-4411

BASE TEN SYSTEMS, INC., 3828 Quakerbridge Rd., Trenton, N.J., 08619, Tel: 609-586-7010, TWX: 510-685-5692; Empl.: 100; Minimum order: \$300

For info on price: R. E. Van Doren; Application info: J. W. Pflueger, Jr.; Customer service: J. W. Pflueger, Jr.; Delivery info: R. E. Van Doren

Free literature available: 1. Bulletin 1271 - PCM Systems (Airborne Telemetry). 2. Bulletin 2000/4000 - PAM and PCM Telemetry Components. 3. Model 500-480 PCM Decommutator 4. LGK-100 Voice Scan Spectrograph 5. Voiceprint Identification.

Products manufactured: Amplifiers, Comm. Systems, Commutators, Converters, Data Acquisition & Reduction Systems, Decommutators, Telemetry, Generators, Modulators, All Kinds, Monitors, Signal Conditioners & Equipment, Switches, Testers

Local Sales Offices & Reps.

Cal Saratoga, M. Bergman Co. 408-257-5900
Conn Hamden, P. Jenks Assocs. 203-281-0810
Mass Wakefield, P. Jenks Assocs. 617-246-1590
Tex Dallas, Synthetics 214-631-1740
EXP: New York, N.Y., Technitron 212-758-2790

BASF SYSTEMS, Crosby Dr., Bedford, Mass, 01730

BASLER ELECTRIC CO., Box 269, Rte. 143, Highland, Ill., 62249, Tel: 618-654-2341, TWX: 910-996-2522; Empl.: 740

Products manufactured: Amplifiers, Chargers, Battery, Controls/Control Eqpt., Converters, Monitors, Potentiometers, Power Supplies, Reactors, Regulators, Relays, Switchboards, Transformers

Local Sales Offices & Reps.

Ariz Scottsdale, Piper-Goyne 602-946-4437
Cal LaHabra, Nolan Assocs. 213-694-2146
Cal LaMirada, Marrs & Assocs. 213-947-2095

Cal Palo Alto, Abbott Engrg. Co. 415-327-0830
Colo Littleton, Piper-Goyne 303-798-8955
Conn Thomaston, Nelson, Bennett, Skilton Assoc. 203-283-5959
Fla Jacksonville, Belcher & Assocs. 904-724-7811
Fla St. Petersburg, Orbe, Inc. 813-894-0687
Ga Atlanta, Electro Mech Sls. Engrg. Co. 404-393-0444

Ill Chicago, H. Sam Tollaksen 312-441-6644
La Chalmette, L. Elliott Co. 504-737-1895
Md Glen Burnie, Faion Lott Co. 301-744-4611
Mass Braintree, R.F. Duffy Assocs. 617-335-7724
Mich Farmington, Miltimore Sls. Inc. 313-476-2446
Minn Minneapolis, White Sls. Co. 612-929-4661
Mo North Kansas City, H.J. Weisler & Assocs. 816-421-1679

Mo St. Louis, H.J. Weisler & Assocs. 314-428-3934
NJ Cherry Hill, L.H. Walke Co. 609-424-3766
NM Albuquerque, Piper-Goyne 505-265-6794
NY Memphis, Aero Sls. Co. 313-458-4774
NY Roslyn, Seidel Assocs. 516-621-1117
NC Charlotte, J. Rudisill Assocs. 704-377-6901
NC Raleigh, Electro Mech Sales Engrg. Co. 919-782-6452

Ohio Cleveland, A.H. Baier Co., & Assocs. 216-461-6161

Oklahoma Tulsa, L. Elliott Co. 918-743-7794
Ore Portland, McLaren Inc. 503-297-2248
Pa Pittsburgh, Gormley Elec. Co. 412-371-4111
Tex Dallas, Wm. Reese Assocs. 214-638-6575
Wash Bellevue, McLaren, Inc. 206-454-3400
EXP: St. Louis, Mo., Brauner Export Co. 314-426-2600

BAUMKER MFG. CO., 5144 Enterprise, Toledo, Ohio, 43612; Empl.: 8

Products manufactured: Comm. Systems

BAUSCH & LOMB, S.O.P.D. Division, 1400 N. Goodman St., Rochester, N.Y., 14602, Tel: 716-232-6000, TWX: 716-97-8231; Empl.: 5500

Products manufactured: Analyzers, Counters, Lasers & Laser Systems, Lenses, Optical & Camera, Magnifying Glasses, Inspection, Microscopes, Recorders, Scanners

Local Sales Offices & Reps.

Cal Compton 213-636-9381
Cal San Francisco 415-863-1580
Ga Atlanta 404-873-2023
Ill Deerfield 312-948-9290
Md Sparks 301-666-2109
NJ Parsippany 201-263-3300
FOR: Can., Scarborough 708, Ont. 416-291-7911

BAY LABORATORIES, INC., 20160 Center Ridge Rd., Cleveland, Ohio, 44116, Tel: 216-333-3898; Empl.: 20; Minimum order: \$10

Customer service: G. J. Prusha

Products manufactured: Amplifiers, Converters, Data Acquisition & Reduction Systems, Data Loggers, Filters, Indicators, Memory Systems, Monitors, Multiplexers, Signal Conditioners & Equipment

Local Sales Offices & Reps.

Cal Long Beach, Saber Enptrs. 213-595-5646

BAY PRODS., Div. American Metal Works, 8701 Torresdale Ave., Phila., Pa., 19136, Tel: 215-DE8-7300; Empl.: 125

For info on price: A. Gold; Customer service: T. Ford; Delivery info: S. Segal

Free literature available: Bay catalog - #69D Contains product and eng. info.

Products manufactured: Benches, Consoles, Stools, Tables, Cabinets & Accessories, Carts & Dollies, Instrument & Equipment, Containers, Racks

Local Sales Offices & Reps.

Ala Birmingham, Southern Ind. Sls. 602-624-6656
Ariz Tucson, Industrial Tool & Supp. 602-624-6656
Cal Los Angeles, McKinley Eq. Co. 213-263-6931
Cal San Carlos, James Old & Son 415-591-8231
Del Wilmington, Bruce Ind. Supp. 302-OL 5-9617
Fla Tampa, Florida Bin & Shelving Co. 813-626-4101

Ga Atlanta, Atlanta Bin & Shelving 404-636-4393
Ill Chicago, A. H. Waprin Assoc. 312-644-7938
Ind South Bend, Balient Handling Equip. 219-291-6115

Iowa Cedar Rapids, Allen Supp. Co. 301-864-6380

Md Bladensburg, Thompson & Cooke Co. 301-866-2720
Md Cockeysville, Fabricators Inc. 301-866-2720
Mass Waltham, Alexander Steel Co. 617-891-5780
Mich Union Lake, Solve Needs Co. 313-947-2095

Minn	Minneapolis, Haldeman-Homme Co.	612-331-4880
NJ	London, Reliance Eq. Co.	201-381-0770
NY	Long Island City, A. Liss & Co.	212-392-8484
Pa	Bala-Cynwyd, Material Handling Co.	215-839-3440
RI	Central Falls, Rand Mat'l. Handling Co.	401-751-7657
Tex	Houston, Texas Mat'l Handling Co.	713-666-5851
Va	Richmond, Bates Co.	804-233-3002
Wash	Seattle, F. T. Crowe & Co.	206-284-8484
Wisc	Milwaukee, Badger-Beau Equip. Co.	414-453-5581

BAYSHORE SYSTEMS CORP., 5404-B Port Royal Rd., Springfield, Va., 22151, Tel: 703-321-9625; Empl.: 25

Products manufactured: Antennas, Decoders, Duplexers, Antenna, Hydrophones & Accessories, Receivers, Recorders, Timers, Transmitters

Local Sales Offices & Reps.

Cal	Millbrae, Ashby Assocs.	415-692-4442
Fla	Orlando, UNIREP	305-295-4817
Minn	New Brighton, Dalska Assocs.	612-631-2941
Ohio	Dayton, Ashby Assocs.	513-252-5627
Pa	Huntingdon Valley, Rabal Assocs.	215-947-4825
RI	Cumberland, Perry Assocs.	

BEAD ELCTRNS., Div. Bead Chain Mfg. Co., 110 Mountain Grove St., Bridgeport, Conn., 06605, Tel: 203-334-4124; Empl.: 150; Minimum order: \$40

For info on price: B. M. Krafcik; Application info: A. B. Mudgett; Customer service: B. M. Krafcik; Delivery info: B. M. Krafcik

Free literature available: Bead Electronics catalog listing male and female contacts, leads, connectors, terminals, square wire wrap pins, wire leads, etc.

Products manufactured: Connectors, Contacts, Electrical, Eyelets, Fasteners, Forms, Wire, Jacks (All Types), Pins, Terminals

Local Sales Offices & Reps.

Cal	Los Angeles, Yarbrough Sls. Co.	213-254-5101
Ill	Chicago, Gene F. Sls. Co.	312-545-5562
Ind	Indianapolis, Hoster & Sietloff Assocs., Inc.	317-844-9921
Mass	Needham, A. G. Anderson	617-449-1418
Mich	Orchard Lake, Fox Industries, Inc.	313-363-3105
Minn	Minneapolis, Nygaard Sls. Co.	612-881-3727
NJ	Beach Haven, Dyneers, Inc.	609-492-2869
NY	Lake Grove, Krone & Rubin Assocs.	609-924-0200
NY	Webster, Krone & Rubin Assocs., Inc.	716-671-6709
Va	Williamsburg, Dyneers, Inc.	804-229-3612
Wash	Seattle, F.W. Aurich & Co.	206-284-5561
EXP	Union City, N.J., Alton Co.	201-865-4080
FOR	Can., Thornhill, Ont., EMI Sls.	416-889-1204

BEARING INSPECTION, 10041 Shoemaker Ave., Santa Fe Springs, Cal., 90670, Tel: 213-944-6251; Empl.: 32
Customer service: D. L. Hutton

Products manufactured: Analyzers, Bearings, Tools

BECKMAN INSTRS., (AISSD), 2500 Harbor Blvd., Fullerton, Cal., 92634, Tel: 714-871-4848, TWX: 910-592-1260; Empl.: 3500

Products manufactured: Alarms, Amplifiers, Analyzers, Baths, Controlled Temperature (Air & Liquid), Computers, Data Acquisition & Reduction Systems, Densitometers, Electronic, Indicators, Interferometer Systems, Meters, Networks, Oceanographic Equip. (Electronic), Oscillographs, Direct Writing, Oscilloscopes, Paper, Graphic Recording, Probes, Radiometers, Recorders, Scales, Dial, Standards, Technical Books, Testers, Thermocouples, Elements & Accessories

Local Sales Offices & Reps.

Cal	Mountain View	415-326-1970
Colo	Denver	303-371-0950
Ga	Atlanta	404-934-3830
Haw	Honolulu	808-395-9744
Ill	Lincolnwood	312-583-1020
La	Baton Rouge	504-926-5085
Md	Silver Springs	301-622-2500
Mass	Wakefield	617-245-6800
Mich	Southfield	313-424-8800
Minn	Minneapolis	612-835-2202
Mo	Creve Coeur	314-432-5610
NJ	Mountainside	201-232-7600
NC	Durham	919-383-5593
Ohio	Cleveland	216-886-3020
Ohio	Reading	513-761-9560
Pa	Broomall	215-544-2695

Pa	Pittsburgh	412-921-1530
Tex	Dallas, 214-637-1640	
Tex	Houston	713-781-0810
Utah	Salt Lake City	801-467-5471
Wash	Bellevue	206-454-9528
FOR	Can., Edmonton, Alberta	403-482-3447
FOR	Can., Montreal 251, Que.	514-735-1376
FOR	Can., North Vancouver, B.C. 1	604-980-3471
FOR	Can., Toronto, Ont.	416-251-5251

BECKMAN INSTRS., Cedar Grove Opers., 89 Commerce Rd., Cedar Grove, N.J., 07009, Tel: 201-239-6200, TWX: 710-994-5781; Empl.: 3500

For info on price: J. Short; Application info: P. Wilson; Customer service: J. Short; Delivery info: D. Casale

Free literature available: Beckman Instruments offers Bulletin 505 which provides a capsule look at a wide array of electrical test equipment.

Products manufactured: Bridges, Controls/Control Eqp., Decade Boxes, Dividers, Indicators, Meters, Oceanographic Equip. (Electronic), Power Supplies, Recorders, Services, Assembly, Production & Test, Testers

Local Sales Offices & Reps.

Cal	Fullerton	714-521-3700
Ga	Atlanta	404-934-3830
Ill	Lincolnwood	312-583-1020
NJ	Cedar Grove	201-239-6200
Pa	Pittsburgh	412-921-1530
Tex	Houston	713-781-0810
Va	Richmond	804-282-0555

BECKMAN INSTRS., Ectrn. Instrs. Div. Ectrn. Instrumentation, 3900 N. River Rd., Schiller Park, Ill., 60176, Tel: 312-671-3300, TWX: 910-253-1820; Empl.: 3500

Products manufactured: Counters, Data Acquisition & Reduction Systems, Generators, Meters, Printers, Signal Conditioners & Equipment, Testers, Transducers

BECKMAN INSTRS., Helipot Div., 2500 Harbor Blvd., Fullerton, Cal., 92634, Tel: 714-871-4848, TWX: 910-592-1260; Empl.: 3500

p. 1-880-883; p. 2-1126, 1127, 1418, 1419, 1610-1621
Customer service: C. H. Vessey

Free literature available: Hybrid Microcircuit Technical Bulletin. Cermet Trimming Potentiometer Technical Bulletin. Precision Potentiometer Technical Bulletin. Resistor Network Technical Bulletin.

Products manufactured: Amplifiers, Circuits, Hybrid, Thick Film, Converters, Dials, Diodes, Display Devices/Displays, Dividers, Drivers & Decoders For Readouts, Filters, Hybrid Voltage Regulators, Integrated Circuit Devices, IC's, Active Filters, Lamp Drivers, Networks, Potentiometers, Protectors, Regulators, Resistors, Servo Systems, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Murcota Corp.	205-539-8476
Cal	Fullerton, Beckman	714-871-4848
Cal	Mountain View, Beckman Instrs.	415-961-6817
Cal	San Diego, Beckman	714-565-6244
Colo	Denver, Barnhill Five	303-934-5505
Fla	Clearwater, Lynch-Gentry Assocs.	813-443-2697

Fla	Ft. Lauderdale, Lynch-Gentry Assocs.	
Ill	Chicago, Carlson Ectrn. Sls. Co.	312-774-9022
Iowa	Cedar Rapids, Comstrand	319-363-4905
Kans	Overland Park, Sheridan Assocs.	913-383-1636
Md	Silver Spring, Beckman	301-622-2500
Mass	Needham Hgts., Beckman	617-444-9010
Mich	Farmington, Sheridan Assocs.	313-477-3800
Minn	Minneapolis, Comstrand	612-560-5300
Mo	Florissant, Sheridan Assocs.	314-837-5200
NJ	Clifton, Beckman	201-778-8888
NJ	Mt. Laurel, Beckman	609-235-3314
NM	Albuquerque, Barnhill Five	505-299-7658
NY	Buffalo, Ossmann Comp. Sls.	716-832-4271
NY	Kingston, Ossmann Comp. Sls.	914-338-5505
NY	Rochester, Ossmann Comp. Sls. Corp.	716-442-3290

NY	Syracuse, Ossmann Comp. Sls.	315-454-4477
NY	Vestal, Ossmann Comp. Sls.	607-785-9949
NC	Winston-Salem, Murcota Corp.	919-723-1001
Ohio	Cincinnati, Sheridan Assocs.	513-761-5432
Ohio	Cleveland, Sheridan Assocs.	216-524-8120
Ohio	Dayton, Sheridan Assocs.	513-277-8911
Okla	Tulsa, Norvell Assocs.	918-663-1247
Ore	Portland, Almac/Stroum	503-292-3534
Pa	Pittsburgh, Sheridan Assocs.	412-244-1640
Pa	Dallas, Norvell Ectrn. Sls.	214-350-6771
Tex	Houston, Norvell Assocs.	713-774-2568
Wash	Seattle, Almac/Stroum Ectrn. Sls.	206-763-2300
FOR	Can., Toronto, Ont., Beckman	416-251-5251

Local Distributors

Ala	Huntsville, M & C Sls.	205-539-8476
Ala	Huntsville, Powell Ectrn. Sls.	205-539-2731
Ariz	Phoenix, Liberty Ectrn. Sls.	602-257-1272
Ariz	Tempe, Marshall Inds.	602-968-6181
Cal	El Monte, Marshall Inds.	213-686-0141
Cal	El Segundo, Liberty Ectrn. Sls.	213-322-8100
Cal	Irvine, Marshall Inds.	714-556-6400
Cal	Mountain View, Elmar Ectrn. Sls.	415-961-3611
Cal	San Diego, Liberty Ectrn. Sls.	714-565-9171
Cal	San Diego, Marshall Inds.	714-278-6350
Cal	Sunnyvale, Marshall Inds.	408-732-1100
Colo	Arvada, Marshall Inds.	303-423-9670
Colo	Commerce City, Elmar Ectrn. Sls.	303-287-9611
Conn	Hamden, Arrow Ectrn. Sls.	203-248-3801
Conn	North Branford, Marshall Inds.	203-484-0488
Fla	Clearwater, Lynch-Gentry Assocs.	813-443-2697

Fla	Miami Springs, Powell Ectrn. Sls.	305-885-8761
Fla	Orlando, Powell Ectrn. Sls.	305-859-1450
Fla	Winter Park, Lynch-Gentry Assocs.	305-671-7649

Ill	Mount Prospect, Magnuson Ectrn. Sls.	312-956-0700
-----	--------------------------------------	--------------

Ill	Rosemont, Advent Ectrn. Sls.	312-298-4210
Md	Baltimore, Arrow Ectrn. Sls.	301-247-5200
Md	Beltsville, Powell Ectrn. Sls.	301-937-4030
Mass	Burlington, Arrow Ectrn. Sls.	617-273-0100
Mass	Lexington, Harvey/R & D Ectrn. Sls.	617-861-9200
Mass	Newton Highlands, Marshall Inds.	617-965-5115

Mich	Farmington, Sheridan Sls. Co.	313-477-3800
Minn	Bloomington, Arrow Ectrn. Sls.	612-888-5522
Minn	St. Paul, Magnuson Ectrn. Sls.	612-227-8495
Mo	Florissant, Sheridan Sls. Co.	314-837-5200
NJ	Moorestown, Arrow/Angus	609-235-1900
NJ	Rutherford, Kierulff Ectrn. Sls.	201-935-2120
NJ	Saddle Brook, Arrow Ectrn. Sls.	201-797-5800
NM	Albuquerque, Elmar Ectrn. Sls.	505-292-1111
NY	Buffalo, Ossmann Component Sls. Corp.	716-832-4271

NY	Farmingdale, Arrow Ectrn. Sls.	516-694-6800
NY	Farmingdale, Marshall Inds.	516-293-4141
NY	Hicksville, Kierulff Ectrn. Sls.	516-433-5530
NY	Kingston, Ossmann Component Sls. Corp.	914-338-5505

NY	Rochester, Ossmann Component Sls. Corp.	716-442-3290
NY	Syracuse, Ossmann Component Sls. Corp.	315-454-4477
NY	Vestal, Ossmann Component Sls. Corp.	607-785-9949

NC	Winston-Salem, M & C Sls.	919-723-1001
Ohio	Cincinnati, Sheridan Sls. Co.	513-761-5432
Ohio	Cleveland, Sheridan Sls. Co.	216-831-0130
Ohio	Dayton, Sheridan Sls. Co.	513-277-8911
Okla	Tulsa, Norvell Ectrn. Sls.	918-663-1247
Ore	Portland, Almac/Stroum Ectrn. Sls.	503-292-3534
Pa	Philadelphia, Powell Ectrn. Sls.	215-365-1900
Pa	Pittsburgh, Sheridan Sls. Co.	412-244-1640
Tex	Dallas, Norvell Ectrn. Sls.	214-350-6771
Tex	Houston, Norvell Ectrn. Sls.	713-774-2568
Wash	Seattle, Almac/Stroum Ectrn. Sls.	206-763-2300
Wash	Seattle, Liberty Ectrn. Sls.	206-763-2300
For	Can., Toronto, Ont., Semad Ectrn. Sls.	416-635-9880
For	Can., Vancouver, BC, Semad Ectrn. Sls.	604-434-2622

BECKMAN INSTRS., Information Displays Oper., Box 3579, Scottsdale, Ariz., 85257, Tel: 602-947-8371, TWX: 910-950-1293; Empl.: 150; Minimum order: \$100

p. 2-1128
For info on price: P. Cornell; Application info: J. Dorrough; Customer service: E. Wilcox; Delivery info: E. Wilcox

Free literature available: 1. Short Form Catalog - Showing photograph, specifications, and brief description of all products. 2. Technical Bulletin - VC-525 Voltage Converter. 3. Catalog Sheet - SM-800 Display Modules. 4. SP-350/330 Character Front-showing actual size & color of Beckman IDO displays. 5. OEM Price List.

Products manufactured: Converters, Display Devices/Displays, Drivers & Decoders For Readouts, Integrated Circuit Devices

Local Sales Offices & Reps.

Ala	Huntsville, Murcota Corp.	205-539-8476
Cal	Fullerton, Beckman Instrs.	714-871-4848
Cal	Mountain View, Beckman Instrs.	415-961-6817
Cal	San Diego, Beckman Instrs.	714-565-6244
Colo	Denver, Barnhill Five	303-934-5505
Fla	Clearwater, Lynch-Gentry Assocs.	813-443-2697

Fla	Ft. Lauderdale, Lynch-Gentry Assocs.	
Fla	Winter Park, Lynch-Gentry Assocs.	305-671-7649

Ill	Chicago, Carlson Elctn. Sls. Co.	312-774-9022
Iowa	Cedar Rapids, Comstrand	319-363-4905
Kans	Overland Park, Sheridan Assocs.	913-383-1636
Md	Silver Spring, Beckman Instrs.	301-622-2500
Mass	Needham Heights, Beckman Instrs.	617-444-9010
Mich	Farmington, Sheridan Assocs.	313-477-3800
Minn	Minneapolis, Comstrand	612-480-5300
Mo	Florissant, Sheridan Assocs.	314-837-5200
NJ	Clifton, Beckman Instrs.	201-778-8888
NJ	Mt. Laurel, Beckman Instrs.	609-235-3314
NY	Buffalo, Ossmann Comp. Sls.	716-832-4271
NY	Kingston, Ossmann Comp. Sls.	914-338-5505
NY	Rochester, Ossmann Comp. Sls.	716-442-3290
NY	Syracuse, Ossmann Comp. Sls.	315-454-4477
NY	Vestal, Ossmann Comp. Sls.	607-785-9949
NC	Winston-Salem, Murcota Corp.	919-723-1001
Ohio	Cincinnati, Sheridan Assocs.	513-761-5432
Ohio	Cleveland, Sheridan Assocs.	216-524-8120
Ohio	Dayton, Sheridan Assocs.	513-277-8911
Okla	Tulsa, Norvell Assocs.	918-663-1247
Ore	Portland, Almac/Stroum	503-292-3534
Pa	Pittsburgh, Sheridan Assocs.	412-244-1640
Tex	Dallas, Norvell Assocs.	214-350-6771
Tex	Houston, Norvell Assocs.	713-774-2568
Wash	Seattle, Almac/Stroum	206-763-2300
FOR:	Can., Toronto Ont., Beckman Instrs.	416-251-5251
Local Distributors		
Ala	Huntsville, M&C Sls.	
Ala	Huntsville, Powell Elctn./Huntsville, 803 Oster Dr., Box 1095	205-539-2731
Ariz	Phoenix, Liberty Elctn./Ariz.	602-257-1272
Ariz	Tempe, Marshall Inds.	602-968-6181
Cal	El Mont, Marshall Inds.	213-686-0141
Cal	El Segundo, Liberty Elctns.	213-322-8100
Cal	Fullerton, Beckman Instrs.	714-871-4848
Cal	Irvine, Marshall Inds.	714-556-6400
Cal	Mountain View, Elmar Elctns.	415-961-3611
Cal	San Diego, Liberty Elctns.	714-565-9171
Cal	San Diego, Marshall Inds.	714-278-6350
Cal	Sunnyvale, Marshall Inds.	408-732-1100
Cal	Denver, Elmar Elctns./Denver	303-287-9611
Cal	Denver, Marshall Inds.	303-423-9670
Conn	Hamden, Arrow Elctns.	203-245-3801
Conn	Hamden, Marshall Inds.	203-288-9241
Fla	Clearwater, Lynch-Gentry Assocs.	813-443-2697
Fla	Miami Springs, Powell Elctns./Fla., 1740 N. W. 69th Ave., Box 514	305-885-8761
Fla	Orlando, Powell Elctns./Florida, Oakridge Commerce Ctr., 2032 Palmridge Way	305-859-1450
Fla	Winter Park, Lynch-Gentry Assocs.	305-671-7649
Ill	Mt. Prospect, Magnuson Elctns.	312-956-0700
Ill	Rosemont, Advent Elctns., 7110 Lyndon St.	312-298-4210
Md	Baltimore, Arrow Elctns.	301-247-5200
Md	Beltsville, Powell Elctns./Wash., 10728 Hanna St.	301-937-4030
Mass	Burlington, Arrow Elctns.	617-273-0100
Mass	Lexington, Harvey/R & D Elctns.	617-861-9200
Mass	Newton Highlands, Marshall Inds.	617-965-5115
Mich	Farmington, Sheridan Sls. Co.	313-477-3800
Minn	St. Paul, Magnuson Elctns.	612-227-8495
Mo	Florissant, Sheridan Sls. Co.	314-837-5200
NJ	Mt. Laurel, Arrow/Angus	609-235-1900
NJ	Rutherford, Kierulff Elctns.	201-935-2120
NJ	Saddlebrook, Arrow Elctns.	201-797-5800
NY	Buffalo, Ossmann Comp. Sls.	716-832-4271
NY	Farmingdale, Arrow Elctns.	516-694-6800
NY	Farmingdale, Marshall Inds.	516-293-4141
NY	Hicksville, Kierulff Elctns.	516-433-5530
NY	Kingston, Ossmann Comp. Sls.	914-338-5505
NY	Rochester, Ossmann Comp. Sls.	716-442-3290
NY	Syracuse, Ossmann Comp. Sls.	315-454-4477
NY	Vestal, Ossmann Comp. Sls.	607-785-9949
NC	Winston-Salem, M & C Sls.	919-723-1001
Ohio	Cincinnati, Sheridan Sls. Co.	513-761-5432
Ohio	Cleveland, Sheridan Sls. Co.	216-524-8120
Ohio	Dayton, Sheridan Sls. Co.	513-277-8911
Okla	Tulsa, Norvell Elctns.	918-663-1247
Ore	Portland, Almac/Stroum	503-292-3534
Pa	Philadelphia, Powell Elctns./Philadelphia, South Island Rd., Box 8765	215-365-1900
Pa	Pittsburgh, Sheridan Sls. Co.	412-244-1640
Tex	Dallas, Norvell Elctns.	214-350-6771
Tex	Houston, Norvell Elctns.	713-774-2568
Wash	Seattle, Almac/Stroum	206-763-2300
Wash	Seattle, Liberty Elctns./Northwest	206-763-8200
For:	Can., Montreal, Que., Specialty Elctns.	514-336-4500
For:	Can., Toronto, Ont., Weber Semad Elctns.	416-635-9880

For:	Can., Vancouver, B.C., Weber Semad Elctns.	604-434-2622
BECO, INC., 740 Kasler Mill Rd., Salem, Va., 24153, Tel: 703-389-3053; FSC No: 06673; Empl.: 21; Minimum order: \$10		
For info on price: L. S. Ball; Application info: C. R. Ball, Jr.; Customer service: M. O. Weddle; Delivery info: L. S. Ball		
Free literature available: Power Supply Catalog - Lists current models, outlines features, contains glossary of terms & connection modes. Kit Catalog - Describes various kits, parts & plans available.		
Products manufactured: Boards, Plug-In, Boards, Printed Circuit, Counters, Kits, Power Supply, Power Supplies, Services, Assembly, Production & Test		
BECTON, DICKINSON & CO., Edmont-Wilson Div., 3157 Walnut St., Coshocton, Ohio, 43812, Tel: 614-622-4311; Minimum order: \$25		
For info on price: D. Cores; Application info: M. Sweet; Customer service: D. Cores		
Products manufactured: Calibrators, Meters		
BEECHWOOD MFG. CORP., 360 S. Downey Ave., Indianapolis, Ind., 46219, Tel: 317-356-2493; Empl.: 12; Minimum order: \$20		
Customer service: R. E. Cox		
Products manufactured: Cabinets & Accessories, Carts & Dollies, Instrument & Equipment, Cases, Equipment, Instrument, Meter, Chassis, Metal		
Local Sales Offices & Reps.		
Ala	Huntsville, F.M. Assoc.	205-536-9990
Cal	Mt. View, Connolly & Co.	415-967-6988
Fla	Orlando, F.M. Assoc.	305-851-5710
Fla	West Palm Beach, F.M. Assoc.	305-746-3126
NC	Greensboro, F.M. Associates	919-294-2754
Va	Baileys Crossroads, Q.T. Electronic Sls.	703-671-4357
BEEDE ELECTRICAL INSTR. CO., INC., S. Main St., Penacook, N.H., 00331, Tel: 603-753-6362, TWX: 710-364-6977; Empl.: 500; Minimum order: \$25		
p. 1*238,239,612,613		
Customer service: Sales Dept.		
Free literature available: Bltn. Mr-2 Meter Relays; Bltn. T-1 Pyrometer Meter relays; Bltn. T-2 Pyrometers; Bltn. PM-10 Panel Meters		
Products manufactured: Meters, Monitors, Motors, Relays, Tachometers		
Local Sales Offices & Reps.		
Ala	Huntsville, Comp. Sls. Corp.	205-883-7794
Ariz	Phoenix, MR Engineering	602-959-5150
Cal	Los Angeles, Universal Comp. Co.	213-641-4255
Cal	San Carlos, Elctn. Engrg. Assoc.	415-593-2189
Cal	Denver, Elctn. Sls. Inc.	303-771-6300
Conn	Farmington, R. Perron & Co.	203-673-4825
Conn	Trumbull, R. Perron & Co.	203-268-9631
Fla	Tor Lauderdale, Comp. Sls. Corp.	305-523-5906
Fla	Indian Harbor Beach, Comp. Sls. Corp.	305-773-0919
Fla	St. Petersburg, Comp. Sls. Corp.	813-894-4366
Fla	Terra Ceia, Comp. Sls. Corp.	813-722-6376
Ill	Skokie, Saffro & Assocs.	312-588-0905
Kans	Leawood, Thunderbird Tech. Sls. & Svc.	913-642-7220
Kans	Wichita, Thunderbird Tech. Sls. & Svc.	316-684-3941
Mass	Norwood, R. Perron & Co.	617-762-8114
Mich	Ann Arbor, O-M Sls. Co.	313-994-6073
Minn	Minneapolis, Wenco Sls.	612-866-3639
Mo	St. Louis, Thunderbird Tech. Sls. & Svc.	314-567-6488
NH	Dover, R. Perron & Co.	603-742-2321
NJ	Ridgewood, Ballou, Inc.	201-444-6990
NY	Buffalo, Ossman Comp. Sls. Corp.	716-832-4271
NY	Kingston, Ossman Comp. Sls. Corp.	914-338-5505
NY	Rochester, Ossman Comp. Sls. Corp.	716-442-3290
NY	Syracuse, Ossman Comp. Sls. Corp.	315-454-4477
NY	Vestal, Ossman Comp. Sls. Corp.	607-785-9949
NC	Raleigh, Comp. Sls. Corp.	919-832-1897
Ohio	Cleveland, D. Steffen & Assocs.	216-461-8333
Ohio	Dayton, D. Steffen & Assocs.	513-293-3146
Pa	Devon, B & A Assocs.	215-687-5173
Tex	Dallas, Southwest Elctn. Ind.	214-233-9816
Tex	Houston, Southwest Elctn. Ind.	713-729-1670

Wash	Mercer Island, J. H. Andersen Assocs.	206-232-0484
Wash	Vancouver, J. Anderson & Assoc.	206-256-1475
FOR:	Brampton, Ontario, Can., Mod-Tronic Instr. Ltd.	416-457-6322
Local Distributors		
Cal	Los Angeles, Metermaster, 5647 Jillson St.	213-685-4340
Cal	Santa Clara, Dynametron, 3343 Edwards Ave.	408-246-6535
Colo	Denver, Metermaster Inst. Corp., 1165 S. Cherokee St.	303-722-5766
Conn	Middletown, Mancib Co., Randolph & Coe Rds.	203-346-6646
Fla	Pompano Beach, A&M Instr., 6560 SW 7th Ct.	305-972-1610
Ill	Chicago, EIL Instrs., 221 W. 79th St.	312-874-8070
Ill	Oak Park, Pacific Indicator, 6603 W. North Ave.	312-261-1330
Ind	Indianapolis, EIL Instrs., 7061 Twin Oaks Dr., Ste. M	317-545-1373
Kans	Overland Pk., Brooks Elctn. Svc Co., 3761 W. 95th St.	913-648-3131
Md	Timonium, EIL Instrs., 1830 York Rd.	301-252-1260
Mass	Burlington, Mancib Co., A St. at Middlesex Tpk.	617-272-9450
Mich	Clawson, Instr. Specialties, 1024 W. 14 Mile Rd.	313-435-3311
Minn	Minneapolis, Environ Labs, 9725 Gerard Ave.	612-888-7795
Mo	St. Louis, Scherrer Instrs., 7170 Manchester Ave.	314-644-5362
NY	Rockville Centre, A&M Instr., 5 Nassau St.	516-678-6960
Ohio	Cleveland, Weschler Elec. Corp., 4250 W. 130th St.	216-251-4609
Pa	Pittsburgh, EIL Instrs., 1844 Ardmore Blvd.	412-731-5230
Tex	Houston, Electrical Inst. & Meter Co., 1424 Westheimer St.	713-526-6871
Va	Alexandria, EIL Instrs., Shirley Hwy. at Edsall Rd.	703-354-4330
Wash	Seattle, Eicher-Richards Co., 2727 NE Blakeley St.	206-523-7888
BEHLMAN DIV., CALIFORNIA INSTRS., Div. Aiken Ind., 5150 Convoy St., San Diego, Cal, 92111, Tel: 714-279-8620; FSC No: 16067; Empl.: 80; Minimum order: \$25		
For info on price: W. W. Hanford; Application info: W. W. Hanford; Customer service: D. Chilcoat; Delivery info: W. W. Hanford		
Free literature available: Cimron® digital multimeter selection guide Invertron® AC power source short form catalog.		
Products manufactured: Amplifiers, Converters, Generators, Power Supplies, Protectors, Regulators, Transformers, Voltage Sources		
Local Sales Offices & Reps.		
Ala	Huntsville, FM Assocs.	205-536-9990
Ariz	Scottsdale, Williams Assocs. Inc.	602-947-4297
Cal	Cupertino, T. L. Snitzer Co.	408-257-8333
Cal	Los Angeles, T. L. Snitzer Co.	213-636-6170
Colo	Denver, Williams Assocs. Inc.	303-343-2911
Fla	Orlando, FM Assocs.	305-851-5710
Fla	Tequesta, FM Assoc.	305-746-3128
Haw	Honolulu, Aloha Assocs.	808-941-1574
Ill	Chicago, Sea	312-282-6694
Ind	Carmel, Sea	317-846-2593
Iowa	Cedar Rapids, Palatine Engrg. Sls. Co.	319-365-8071
Kans	Andover, Palatine Engrg. Sls. Co.	316-683-7512
Kans	Overland Pk., Palatine Engrg. Sls. Co.	913-262-5643
La	Baton Rouge, SESCO	504-827-7574
Mass	Needham, Addeco Corp.	617-444-4754
Mich	Detroit, Group Ten	313-549-3910
Minn	Minneapolis, Waytek	612-933-2133
Mo	St. Louis, Palatine Engrg. Sls.	314-426-7055
NM	Albuquerque, Williams Assocs. Inc.	505-255-1638
NY	Great Neck, Eastern Instr. of N.Y.	516-466-9505
NY	North Syracuse, NACO Electronics Inc.	315-699-2651
NC	Greensboro, FM Assocs.	919-294-2754
Ohio	Cleveland, Group Ten	216-486-2800
Ohio	Dayton, Group Ten	513-277-6531
Pa	Philadelphia, Eastern Instr. of Phil.	215-927-7777
Tex	Houston, SESCO	713-668-7840
Tex	Richardson, SESCO	214-231-9364
Va	Anandale, Nine Assocs.	703-256-9105
Wash	Seattle, Datacom Assocs.	206-329-2989

BEHLMAN ENGINEERING CORP., Box 4518, 427 N. Nopal St., Santa Barbara, Cal., 93103, Tel: 805-963-9019 p. 1-1114-1119
For info on price: J. Behlman; Application info: H. L. Behlman; Customer service: H. L. Behlman; Delivery info: J. Behlman

Free literature available: Describes Line of A.C. power supplies. Includes price list.

Products manufactured: Converters, Generators, Inverters, Power Supplies, Regulators

Local Sales Offices & Reps.

Ala	Huntsville, Reynolds & Assocs.	205-536-1941
Ariz	Phoenix, R.L. Davis Co.	602-955-2266
Cal	Burbank, Instr. Specialists, Inc.	213-849-7181
Cal	San Diego, Instr. Specialists, Inc.	714-565-2555
Cal	Santa Clara, Instr. Specialists, Inc.	408-244-1505
Conn	Glastonbury, Instr. Reps., Inc.	203-633-0777
Fla	Satellite, Reynolds & Assocs.	305-773-4700
Ga	Atlanta, Reynolds & Assocs.	404-252-5360
Md	Rockville, Farrell Assocs., Inc.	301-424-9460
Mass	Lexington, Instr. Reps., Inc.	617-861-8620
NJ	Ridgefield, Haber-Ramp Corp.	201-945-5250
NM	Albuquerque, Scientific Devices	505-293-3494
Pa	King of Prussia, Letronix	215-265-1020
FOR:	Can., West Hill, Electromechanical Prods.	416-282-3870

BEL FUSE, 203 Van Vorst, Jersey City, N.J., 07302, Tel: 201-432-0463, TWX: 710-730-5301; Empl: 125 p. 1-432-442, 1966

Products manufactured: Circuit Breakers, Coils Including Assemblies & Forms, Converters, Delay Lines, Fuses, Transformers

Local Sales Offices & Reps.

Cal	Burlingame, Ledy Assoc.	415-347-5247
Cal	Escondido, Andrew Elctrn. Sls.	714-743-3015
Cal	Garden Grove, Impact Elctrns.	213-431-3581
Conn	Rowayton, Eastern Tech. Sls.	203-853-8350
Fla	Clearwater, Southeastern Comp. Sls.	813-531-8324
Ill	Chicago, Memac Sls.	312-545-1033
Ind	Indianapolis, Lat-Tronics	317-846-5788
Mass	Waban, QRC Corp.	617-332-9600
Minn	St. Louis Park, Beta Engrg.	612-925-4422
NY	Hempstead, Kahgan Sls.	516-538-2300
NY	Pompey, S.F. Foster Co.	315-677-3333
Pa	Bala Cynwyd, M. Friedman & Assoc.	215-839-3450
Tex	Addison, Parvin Sls.	214-239-9148



BELDEN CORP., Electronic Div., Box 1100, Richmond, Ind., 47374, Tel: 317-966-6661; Empl: 3783 p. 2-1882-1909

Products manufactured: Braid, Cable, Bus Bars & Systems, Cable Assemblies & Harnesses, Cable, Cords, Cutters, Wire, Hand Operated, Probes, Testers, Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices), Wire

Local Sales Offices & Reps.

Cal	Anaheim	714-991-0645
Cal	Claremont	714-624-7910
Cal	Granada Hills	213-361-7256
Cal	Pleasanton	415-846-8003
Cal	San Mateo	415-348-2060
Cal	West Covina	213-331-2592
Colo	Aurora	303-751-2870
Fla	Boca Raton	305-395-4392
Ga	Lilburn	404-921-3504
Haw	Hololulu	808-531-7548
Ill	Arlington Hts.	312-392-3849
Ill	Batavia	312-879-1625
Ill	Hinsdale	312-654-4462
Ind	Indianapolis	317-849-1945
Iowa	Des Moines	515-278-4343
La	Kenner	504-722-7223
Mass	Framingham Center	617-877-2120
Mich	Novi	313-477-9177
Minn	Burnsville	612-894-3697
Mo	Black Jack	314-355-1495
NH	Exeter	603-772-9007
NJ	Ft. Lee	212-762-8433
NY	Brookport	716-837-2869
NY	Pomona	914-354-0032
NC	Charlotte	704-535-4553
Ohio	Englewood	513-836-3805
Ohio	Medina	216-725-4285
Okla	Tulsa	918-663-5245
Pa	Pittsburgh	412-922-9056
Pa	St. Davids	215-293-0867

Tenn	Bartlett	901-388-9181
Tex	Dallas	214-823-1423
Tex	Houston	713-444-0844
Va	Fairfax	703-273-5771
Wash	Bellevue	206-885-5808
Wisc	Waukesha	414-968-2631

BELL CO., INC., 106 Morrow Ave., Box 92E, Trussville, Ala., 35173, Tel: 205-655-2135; Empl: 19
For info on price: N. H. Bell; Application info: N. H. Bell; Customer service: N. H. Bell; Delivery info: H. M. Bell

Free literature available: Information on Graphic Sign Systems, Nameplates, and Special Marking applications for all types of business.

Products manufactured: Boards, Printed Circuit, Nameplates, Services, Assembly, Production & Test, Terminal Blocks, Boards & Strips

BELL, INC., F.W., 4949 Freeway Dr. E., Columbus, Ohio, 43229, Tel: 614-888-7501, TWX: 810-337-2851; Empl: 50; Minimum order: \$25 p. 1-614,615,2338,2339

Customer service: D. L. Calvelage

Free literature available: Catalogs which describe in detail all the capabilities and specifications for each of our product lines.

Products manufactured: Analyzers, Generators, Magnetizers, Magnetometers, Meters, Multipliers, Probes, Transducers

Local Sales Offices & Reps.

Cal	Menlo Park, Straube Assocs.	415-323-2476
Cal	Pasadena, P. Nurches Co.	213-796-5844
Colo	Denver, G. Moss Elctrns	303-985-8815
Colo	Greeley, Gordon Moss Elctrns., Inc.	303-353-1452
Conn	Glastonbury, Instr. Reps.	203-633-0777
Ill	Chicago, Carter Elctrns.	312-585-5485
Ind	Indianapolis, Carter Elctrns.	317-293-0686
Kans	Overland Park, Carter Elctrns.	913-649-6996
Mass	Lexington, Instrument Reps.	617-861-8620
Mich	Detroit, WKM Assocs.	313-892-2500
Minn	Minneapolis, Carter Elctrns.	612-544-9393
Mo	Hazelwood, Carter Elctrns.	314-731-2237
NM	Albuquerque, G. Moss Elctrns.	505-821-6101
NY	Mamaroneck, Cane Tech. Sls.	914-698-4411
NY	Syracuse, Labtronics, Inc.	315-454-9314
Ohio	Cleveland, WKM Assocs.	216-267-0445
Ohio	Dayton, WKM Assocs.	513-434-7500
Ore	Portland, Brett Assocs.	503-232-4184
Pa	Paoli, T. Griffin Co.	215-644-7710
Pa	Pittsburgh, WKM Assocs.	412-892-2953
Tex	Dallas, Carey-Wolf & Assocs.	214-823-5383
Tex	Ft. Worth, Carey-Wolf & Assocs.	817-738-1996
Tex	Houston, Cary-Wolf & Assocs.	713-721-2442
Wash	Seattle, Brett Assocs.	206-935-8054
EXP:	New York, N.Y., J. Plasencia, Inc.	212-867-8084
FOR:	Can., Burnaby B.C., Megatronix Ltd.	604-526-3312
FOR:	Can., Montreal, Megatronix Ltd.	514-488-0404
FOR:	Can., Ottawa, Ont., Megatronix Ltd.	613-729-4004
FOR:	Can., Weston Ont., Megatronix	416-742-8015

BELL & HOWELL, 706 Bostwick Ave., Bridgeport, Conn., 06605, Tel: 203-367-6751, TWX: 710-453-2997; Empl: 125; Minimum order: \$25

For info on price: I. Isdale; Application info: I. Isdale; Customer service: E. Board; Delivery info: E. Board

Free literature available: Hybrid operational amplifier catalog. Electro optical detector bulletin.

Products manufactured: Amplifiers, Cells, Photoconductive, Photoemissive, Photovoltaic, Detectors, Meters

Local Sales Offices & Reps.

Ala	Huntsville, Beacon	205-881-5031
Ariz	Phoenix, Toward Engrg.	602-955-3193
Cal	Chatsworth, Boyle Assocs.	213-773-8982
Cal	Millbrae, Ashby Assocs.	415-692-4442
Fla	Ft. Lauderdale, Beacon Elctrns.	305-776-6074
Fla	Maitland, Beacon	305-647-3498
Ga	Atlanta, Beacon	404-351-3654
Ill	Elmhurst, Schuten Assocs.	312-833-0980
La	Baton Rouge, Response Instr. Serv. & Eng.	504-766-4645
Mass	Brookline, Technology Prods. Group	617-731-0858
Mich	Birmingham, J.C.H. Co.	313-643-7203
Mich	Grand Rapids, J.C.H. Co.	616-942-0650
Minn	Minneapolis, C.E. Bohlig & Co.	612-922-7011
NY	Bay Shore, Brunetta Sls.	516-586-1800
NY	Rochester, Scientific Devices	716-334-2445
Ohio	Dayton, J.C.H. Co.	513-296-1010
Ohio	Medina, J.C.H. Co.	216-241-4880
SC	Spartanburg, Beacon	803-582-4613

Tex	Dallas, Allied Comps.	214-238-0408
Tex	Houston, Allied Comps.	713-782-5406
Va	Falls Church, Beacon North, Inc.	703-534-1673
Wash	Bellevue, Scientific Devices	206-454-0900

BELL & HOWELL CO., Elctrns. & Instrs. Grp., 360 Sierra Madre Villa, Pasadena, Cal., 91109, Tel: 213-443-3211, TWX: 910-587-3440

Products manufactured: Data Acquisition & Reduction Systems, Recorders, Tape Recording Accessories

BELL INDUSTRIES, ELECTRONIC COMPONENTS DIV., 150 W. Cypress Ave., Burbank, Cal., 91502, Tel: 213-846-9302, TWX: 910-498-2207

Products manufactured: Capacitors, Fixed, Filters, Networks

BELL INDUSTRIES, J.W. Miller Div., 19070 Reyes Ave., Compton, Cal., 90221, Tel: 213-537-5200, TWX: 910-346-6740; Empl: 85; Minimum order: \$25 p. 2-370-379

For info on price: A. Bufford; Application info: F. T. Scott; Customer service: A. Bufford; Delivery info: T. Shiffer

Products manufactured: Capacitors, Fixed, Chokes, Coders, Coils Including Assemblies & Forms, Detectors, Discriminators, Filters, Relays, Transformers

Local Sales Offices & Reps.

Ariz	Phoenix, H.A. Moore Sls. Co.	602-274-4558
Ark	El Dorado, D. Bellew Sls., Inc.	501-863-8325
Cal	Gardena, Bidwell Sls. Assocs.	213-770-0300
Cal	Redwood City, Logan Sls. Co.	415-369-6726
Colo	Denver, R.G. Bowen Co., Inc.	303-722-4641
Fla	Maitland, Hutto-Hawkins-Perego, Inc.	305-831-2474
Fla	Pompano Beach, Hutto-Hawkins-Perego, Inc.	305-943-9593
Ga	Atlanta, Millar Electronics, Inc.	404-261-6160
Ill	Chicago, Markal Sls. Corp.	312-282-5800
Ind	Indianapolis, Elctrn. Reps., Inc.	317-897-9326
La	Kenner, D. Bellew Sls., Inc.	504-729-4550
Md	Baltimore, Par-Nell Sls. Co.	301-655-2944
Mass	North Scituate, W.A. Hendrickson Co.	617-545-0652
Mich	Southfield, Markal Sls. Corp.	313-355-5700
Minn	Minneapolis, C.R. Gibb Co.	612-377-1200
Mo	Raytown, Marty Taraski Sls. Co.	816-358-1442
NJ	Englewood, J.J. Bressler, Inc.	201-569-7600
NM	Albuquerque, C.T. Carlberg & Assocs.	505-265-1579
NY	Binghamton, Bucco Assocs.	607-798-7141
NY	Lancaster, Lawrence Ind'l Sls.	716-685-1993
NY	Rochester, Marsey Sls., Inc.	716-442-9700
NC	Raleigh, Millar Elctrns., Inc.	919-787-9564
Ohio	St. Marys, T. Shelby & Co.	419-394-3377
Ore	Portland, Earl & Brown, Co.	503-245-2283
Pa	Holland, Par-Nell Sls. Co.	215-355-9330
Tenn	Memphis, D. Bellew Sls., Inc.	901-365-9437
Tex	Richardson, Campion Sls. Co.	214-238-8145
Wash	Seattle, Earl & Brown Co.	206-284-1121
EXP:	New York City, N.Y., Roburn Agencies, Inc.	212-989-5939

BEMAN MFG. INC., New Cumberland, Pa., 17070, Tel: 717-938-1451, TWX: 510-650-3539; Empl: 250

Products manufactured: Cable Assemblies & Harnesses, Cable, Caps, Connector, Circuits, Flexible, Clamps & Clips, Connector Adapters, Connectors, Contact Strips, Finger, Contacts, Electrical, Cords, Eyelets, Grommets, Jacks (All Types), Jumpers, Lead Assemblies & Receptacles, Pins, Plug & Jack Sets, Plugs, Resistors, Services, Assembly, Production & Test, Terminal Blocks, Boards & Strips, Terminals, Tools

Local Sales Offices & Reps.

Fla	Fern Park, M & G Assoc.	305-841-8793
Ill	Park Ridge, Metcom Assoc.	312-696-1490
Ind	Kokomo, R. Leib	317-453-1398
Mass	Waltham, Mekkom	617-891-7520
Mich	Bloomfield Hills, Ellinger Sales	313-642-0203
Pa	Philadelphia, Newson Assoc.	215-248-3377

BEMCO, INC., 9908 San Fernando Rd., Pacoima, Cal., 91331, Tel: 213-899-5296, TWX: 910-496-1520; Empl: 53
For info on price: F. Garacci; Application info: F. Garacci; Customer service: L. Hernandez; Delivery info: F. Garacci

Products manufactured: Chamber, Environmental Test, Heat Exchangers & Systems, Ovens, Services, Assembly, Production & Test, Valves, Vacuum

THE BENDIX CORP., Flight Systems Div., Teterboro, N.J., 07608, Tel: 201-288-2000, TWX: 710-990-6136; Empl.: 2900

Products manufactured: Amplifiers, Annunciators, Controls/Control Eqpt., Gages, Indicators, Motors, Pedestals, Radar, Repeaters, Servo, Resolvers, Synchro, Services, Assembly, Production & Test, Servo Systems, Synchros, Transducers

BENDIX-GUIDANCE SYSTEMS, Teterboro, N.J., 07608, Tel: 201-288-2000, TWX: 201-990-6136; Empl.: 2500

Products manufactured: Accelerometers, Computers, Gyros (All Types), Transducers

Local Sales Offices & Reps.

Cal Lakewood, Bendix 213-595-4311
DC Washington, Bendix 202-331-8200
Ohio Dayton, Bendix 513-276-2154
Wash Tukwila, Bendix 206-246-8100
EXP: New York, N.Y., Bendix Int'l 212-262-8000
FOR: Can., Montreal, Que., Aviation Elec.

314-744-2811

THE BENDIX CORP., Test Systems Div., Teterboro, N.J., 07608, Tel: 201-288-2000, TWX: 710-990-6136; Empl.: 900

Products manufactured: Test Equipment, Test Systems, Testers

BENDIX CORP., Aerospace Sys. Div., 3300 Plymouth Rd., Ann Arbor, Mich., 48107, Tel: 313-685-7766, TWX: 810-223-6041; FSC No: 07038; Empl.: 700

For info on price: B. Maddalena; Application info: B. Maddalena; Customer service: J. O'Doherty; Delivery info: B. Maddalena

Products manufactured: Scanners, X-Ray Inspection Equipment

Local Sales Offices & Reps.

Ala Huntsville, Bendix Corp. 205-533-0180
Ohio Dayton, Bendix Corp. 513-276-2154
Va Arlington, Bendix Corp. 703-841-1200

BENDIX CORP., Avionics Div, Box 9414, Ft. Lauderdale, Fla., 33310, Tel: 305-776-4100, TWX: 510-955-9884; Empl.: 950

For info on price: A. White 316-684-0177; Customer service: E. Casey 305-776-4100; Delivery info: D. Bossle 305-776-4100

Products manufactured: Antennas, Direction Finders, Indicators, Radar Systems, Receivers, Transmitters

Local Sales Offices & Reps.

Cal Burbank 213-843-4600
Kans Wichita 316-684-0177
Md Cockeysville 301-252-7740
Ohio Dayton 513-224-9214
Tex Euless 817-267-3641

BENDIX CORP., Communications Div, East Joppa Rd., Towson, Md., 21204, Tel: 301-823-2200, TWX: 710-232-1823; Empl.: 1,000

Products manufactured: Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Coders, Comm. Systems, Microwave Integrated Circuits (MIC's), Modules, Logic, Encapsulated, Multiplexers, Radar Systems, Receivers, Transceivers, Transmitters, Transponders

BENDIX Electric & Fluid Power Div., Hwy. 35, Eatontown, N.J., 07724, Tel: 201-542-2000, TWX: 710-722-6686; FSC No: 83298; QPL No: Multiple; Empl.: 500

For info on price: G. P. Clericuzio; Application info: J. Breickner; Customer service: G. P. Clericuzio; Delivery info: K. Smith

Free literature available: Developers and manufacturers of electric power systems including rotary AC-DC generators, power conversion systems and electric power supervisory/control equipment.

Products manufactured: Inverters, Power Supplies, Regulators, Transformers

Local Sales Offices & Reps.

Ala Huntsville, Bendix Corp. 205-539-3673
Cal Los Angeles, Bendix Corp. 213-377-0170
DC Washington, Bendix Corp. 202-841-1200
Ohio Dayton, Bendix Corp. 513-276-2154
Wash Tukwila, Bendix Corp. 206-246-8107

BENDIX CORP., THE, Electrical Comp. Div., Sidney, N.Y., 13838, Tel: 607-563-9511, TWX: 510-261-7550; Empl.: 3500 p. 2-640-642

Customer service: Slis. Dept.

Free literature available: Form SL-100-4. "Electrical Connectors" illustrates and briefly describes the connector product line.

Products manufactured: Adapters, Waveguide, Cable Assemblies & Harnesses, Caps, Connector, Connector Adapters, Connectors, Packages, Integrated Circuit, Switches, Tachometers, Testers

Local Sales Offices & Reps.

Cal Lakewood 213-920-1711
Cal Palo Alto 415-494-1224
Fla Orlando 305-894-6931
Ill Des Plaines 312-296-7791
Mass Lexington 617-861-8900
NJ Teterboro 201-288-1710
NY New York, Bendix International
Ohio Dayton 513-276-2154
Tex Dallas 214-243-4394
Wash Tukwila 206-246-8100
FOR: Can., Montreal, Aviation Elec. Ltd.

BENDIX CORP., Electrodynamics Div., 11600 Sherman Way, N. Hollywood, Calif., 91605, Tel: 213-765-1010, TWX: 910-499-2151; Empl.: 1200

Products manufactured: Actuators, Comm. Systems, Controls/Control Eqpt., Data Acquisition & Reduction Systems, Hydrophones & Accessories, Radar Systems, Receivers, Servo Systems, Underwater Communication, Detection, Navigation, etc. Equipment, Valves, Solenoid

Local Sales Offices & Reps.

DC Washington, Bendix Corp., Electrodynamics Div. 202-333-8200

BENDIX CORP. ENVIRONMTL. SCI., 1400 Taylor Ave., Dept. 81, Baltimore, Md., 21204, Tel: 301-825-5200, TWX: 710-232-1805; Empl.: 350

Products manufactured: Alarms, Analyzers, Comm. Systems, Data Acquisition & Reduction Systems, Monitors, Oceanographic Equip. (Electronic), Scanners, Services, Assembly, Production & Test, Signal Conditioners & Equipment, Switches, Synchro Transmitters, Solid-State, Transducers, Transmission Systems, Data

Local Sales Offices & Reps.

EXP: New York, NY, Bendix Corp., Bendix Int'l.
FOR: Can., Montreal, Que., Aviation Elec. Ltd.

314-744-2811

BENDIX CORP., Instr. & Life Support Div., 2734 Hickory Grove Rd., Davenport, Iowa, 52808, Tel: 319-234-9101, TWX: 910-525-1197; Empl.: 750; Minimum order: \$30

Customer service: M. J. Gallagher

Free literature available: "Guidelines for Sonic Energy Cleaning", Complete System or Flexible Options Sonic Energy Cleaning", "O" How to Evaluate Sonic Energy Cleaning Equipment", "Immersible Sonic Cleaning Systems"

Products manufactured: Cleaners & Solvents, Cleaners, Ultrasonic, Generators, Transducers

Local Sales Offices & Reps.

Cal Los Angeles, Barnard & Assocs. 213-973-5050
Cal San Francisco, Avionics Liaison Inc. 415-783-1131
Ill Northfield, Marsland Distributing Co. 312-295-1616
Mass Concord, H. M. Nazor Assocs. 617-259-8784
Wash Seattle, Avionics Liaison, Inc. 206-767-3870

BENDIX, Microwave Devices Plant, Hurricane Rd., Franklin, Ind., 46131, Tel: 317-736-6136, TWX: 810-260-2600 p. 2-643, 1214, 1280

Products manufactured: Circulators, Ferrite, Connector Adapters, Connectors, Couplers, Dividers, Dummy Loads, Headers, Isolators, Jack Adapters (All Types), Jacks (All Types), Loads, Electronic Variable, Meters, Monitors, Seals, Services, Assembly, Production & Test, Shifters, Strip-Line Components, Microwave, Terminals, Waveguides & Adapters

Local Sales Offices & Reps.

Ala Huntsville, 20th Century Mktg. 205-772-9237
Ariz Phoenix, Shefler Kahn Co. 602-258-7893
Cal No. Hollywood, Jewett 213-789-8103
Colo Denver, Gossard 303-985-0602
Conn Wethersfield, Underwood Sls. 203-563-3046
Fla Ft. Lauderdale, CBC, Inc. 305-782-0804
Ill Chicago, Techrep 312-761-0548
La Metairie, McKinney Sls. 504-887-1723
Md Baltimore, Components Sls. 301-484-3647
Mass Chelmsford, Underwood Sls. 617-256-8191
Minn Minneapolis, F.B. Hill Co. 612-941-5270
Mo St. Charles, Buse Sls. Co. 314-946-6430
NJ Paramus, Astroprep, Inc.

NY E. Aurora, E.E. Harries & Co. 716-652-1221
NY Fayetteville, E.E. Harries & Co. 315-637-9871
NY Melville, Astroprep Inc. 516-432-2266
NY Webster, E.E. Harries & Co. 716-671-6365
Ohio Cleveland, Components Inc. 216-842-2737
Okla Tulsa, McKinney Sls. Co. 918-742-6791
Ore Portland, C.K. Shanks 503-292-5656
Pa Feasterville, PSA, Inc. 215-355-6244
Tex Bellaire, McKinney Sls. Co. 713-774-3232
Tex Dallas, J. McKinney Sls. 214-631-9450
EXP: N.Y., N.Y., Bendix Int'l 212-262-8000
FOR: Can., Montreal, Aviation Electric Ltd. 514-744-2811

BENDIX CORP., Motor Comps. Div., Elmira, N.Y., 14903, Tel: 607-737-8303, TWX: 510-252-1594; Empl.: 1000; Minimum order: \$50

For info on price: F. Loomis 607-737-8254; Application info: F. Loomis 607-737-8254; Customer service: T. Fice 607-737-8254; Delivery info: T. Fice 607-737-8254

Free literature available: New 27 page catalog and application guide describing a complete line of Tooth, multiple Disc and single surface Electric Clutches and brakes with application considerations.

Products manufactured: Brakes, Brushes & Brush Assemblies, Clutches, Power Supplies

Local Sales Offices & Reps.

Ala Birmingham, Wilcox & Allen 205-592-0356
Cal Bell Gardens, N. A. D'Arcy Co. 213-773-5511
Cal San Diego, N. A. D'Arcy Co. 714-274-8700
Conn Old Lyme, Aid Engrg. Sls. Co. 203-529-7946
Conn Rocky Hill, Aid Engrg. Sls. Co. 203-673-3692
Ill Chicago, Halliday-Lenhart 312-446-9320
Mass Westboro, Aid Engrg. Sls. Co. 617-890-8181
Mich Birmingham, J. C. Hofstetter Co. 313-643-7203
Mo Kansas City, Terry & Hodges 913-722-1024
Mo St. Louis, Terry & Hodges 314-965-0746
NJ Livingston, Varrelman-Gorman Co. 201-992-2505

212-463-5000

NY Elmira, Motor Components Div. 607-737-8303
NC Charlotte, M. R. Snyder Co. 704-377-6571
Ohio Cincinnati, Fremont & Lewis 513-891-3560
Ore Portland, N. Rupp Co. 503-228-4311
Pa Bridgeville, Foster-McClinton Inc. 412-941-4800
Pa Paoli, Joos Equip. Co. 215-644-5875
Tex Richardson, D. E. Horman Co. 214-234-2021
Wash Bellevue, N. Rupp Co. 206-455-2130
Wisc Wauwatosa, Gille Engrg. Sls. 414-258-4100

BENTHOS, INC., Edgerton Dr., N. Falmouth, Mass., 02556, Tel: 617-563-5917; Empl.: 33; Minimum order: \$25

Customer service: B. Eaton

Free literature available: Oceanographic Catalog - summary of equipment deep sea cameras - Edgerton camera system deep sea floats - glass floatation spheres Taptone - vacuum/pressure inspection of cans & containers

Products manufactured: Cameras, Chamber, Environmental Test, Lights, Oceanographic Equip. (Electronic)

BERG ELECTRONICS, Div. I.E. du Pont de Nemours & Co. (Inc.), York Expwy., New Cumberland, Pa., 17070, Tel: 717-938-6711, TWX: 510-650-3538; Empl.: 1200

p. 2-645-652

Products manufactured: Connectors, Contacts, Electrical, Integrated Circuit Packaging Systems, Machines/Machinery, Production, Pins, Sockets, Terminal Blocks, Boards & Strips, Terminals, Tools

Local Sales Offices & Reps.

Cal Woodland Hills 213-347-8830
Ill Lincolnwood 312-982-4280
Mass East Longmeadow 413-525-4228
Minn Minneapolis 612-835-4820
PA New Cumberland 717-232-8656

BERKELEY NUCLEONICS, 1198 Tenth St., Berkeley, Cal., 94710, Tel: 415-527-1121; Empl.: 15; Minimum order: \$20

Customer service: D. Ellis

Products manufactured: Amplifiers, Calibrators, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Generators, Power Supplies, Simulators

Local Sales Offices & Reps.

DC Washington, Scientific Sys. 202-726-4161
Ill Chicago, Corlett & Assoc. 312-626-6726
NY Syosset, Scientific Sys. 516-921-3737
Tenn Knoxville, Pulcri, Inc. 615-693-3641

BERKELEY INSTRUMENTS, INC., 1701 Reynolds Ave., Santa Ana, Cal., 92705, Tel: 714-556-0623, TWX: 800-854-3253; Empl.: 25 p. 1-616,617
 Products manufactured: Alarms, Calibrators, Counters, Generators, Meters, Printers, Testers
 Local Sales Offices & Reps.
 EXP: Can., Montreal, Que., Electrodesign, Ltd.
 514-363-5120

BERTAN ASSOCS., INC., 180 Miller Pl., Hicksville, N.Y., 11801, Tel: 516-433-3110; FSC No: 6130; Empl.: 48; Minimum order: \$50 p. 1-1120,1121
 Customer service: L. L. Bertan
 Free literature available: Short Form Catalog - describes high voltage products and capabilities including high voltage instrumentation, nuclear power supplies, CRT power supplies and other electron beam high voltage power supplies.
 Products manufactured: Converters, Meters, Power Supplies, Probes, Testers, Transformers

Local Sales Offices & Reps.
 Ariz Scottsdale, PLS Assoc. 602-957-9110
 Cal Encino, King-Way Assoc. 213-788-4124
 Cal Milbrae, Ashby Assoc. 415-692-4442
 Colo Denver, PLS Assocs. 303-771-0140
 Ill Aurora, D. Smith & Assoc. 312-896-0828
 Md Silver Springs, Spectroscopy Sys. 301-949-8261
 Mass Framingham, Victor Assocs. 617-879-5710
 Mich Farmington, Carter, McCormic & Peirce 313-477-7700
 NM Albuquerque, PLS Assocs. 505-255-2330
 Ohio Cleveland, Carter, McCormic & Peirce 216-333-5650
 Ohio Dayton, Carter, McCormic & Peirce 513-278-5873
 Pa Monroeville, Carter, McCormic & Peirce 412-372-4415
 Pa Windmoor, Spectroscopy Sys. 215-836-1545
 Tex Dallas, Dwayne Clement & Assocs. 214-239-6105



VACUUM THERMOCOUPLES

BEST ELECS. DIV., Harry Levinson Co., 1211 E. Denny Way, Seattle, Wash., 98122, Tel: 206-323-5100, TWX: 910-444-2154; Empl.: 4; Minimum order: \$15
 Customer service: H. Levinson
 Products manufactured: Thermocouples, Elements & Accessories

Local Sales Offices & Reps.
 Cal Menlo Park, Straube Assocs., Inc. 415-323-2476
 Colo Denver, Straube Assocs., Inc. 303-426-0890

Advertisement

Vacuum thermocouples for the measurement of true rms, or power. Matched pairs for Linear rms conversion. Multijunction consisting of 100 prs. in series. True differential type.

BETA TECHNOLOGY, INC., 94 Verdi St., Farmingdale, N.Y., 11735, Tel: 516-293-4313; Empl.: 6
 For info on price: E.J. Youskites; Application info: W.S. Douglas; Customer service: W.S. Douglas; Delivery info: W.S. Douglas

Free literature available: Data sheets of standard video products.

Products manufactured: Amplifiers, Comm. Systems, Data Compressors, Digital, Delay Lines, Display Devices/Displays, Dividers, Editing Equipment, Tape, Generators, Meters, Modulator/Demodulators, Modulators, All Kinds, Monitors, Multiplexers, Receivers, Switches, Television Systems & Equipment Closed-Circuit, Test Equipment, Translators, Data, Transmission Systems, Data, Transmitters

BETAMITE ELECTRONIC DEV., 6321 W. Slauson Ave., Culver City, Cal., 90230, Tel: 213-390-3401; Empl.: 12
 Products manufactured: Flashers, Relays

Local Sales Offices & Reps.
 Ariz Scottsdale, J.A. Swanson Assoc. 602-947-4379
 Cal San Diego, Andrew Elctn. Slc. 714-747-3015
 Mass Framingham, Victor Assocs. 617-879-5710
 Wash Seattle, Carlyle Tech. 206-ME2-4290

BETATRONIX, INC., 100 Ricefield La., Hauppauge, N.Y., 11787, Tel: 516-543-8780, TWX: 510-226-3748; Empl.: 35
 Customer service: H. W. Cashman
 Free literature available: Catalog describes, Quality Control System, various Models of Precision Conductive Plastic and Wire-Wound Potentiometers, Special Designs (including switches), and Packaging Capabilities.
 Products manufactured: Potentiometers, Rheostats, Switches

BEUKERS LABS., INC., 30 Orville Drive, Bohemia, N.Y., 11716, Tel: 516-567-5100, TWX: 510-288-7888; Empl.: 60; Minimum order: \$10
 For info on price: F. Fetkowitz; Application info: F. Fetkowitz; Customer service: C. B. Williams; Delivery info: F. Fetkowitz
 Products manufactured: Amplifiers, Couplers, Filters, Oscillators, Receivers, Tracking Systems, Transmitters

BF ELCTRNS., 415 S. Nardo, Solana Beach, Calif., 92075, Tel: 714-755-1881; Empl.: 7
 Customer service: W. Blair
 Free literature available: Detailed specification sheets on our line of telemetry and communication receivers, transmitters, amplifiers, filters, etc.
 Products manufactured: Amplifiers, Comm. Systems, Converters, Filters, Generators, Kits, Power Supply, Multipliers, Receivers, Transmitters

BG ELECTRONICS, INC., 9 Elm Ave., Mount Vernon, N.Y., 10550, Tel: 914-664-5591; FSC No: 33791; Empl.: 32
 For info on price: W. Bein; Application info: W. Bein; Customer service: W. Bein; Delivery info: A. J. Slasser
 Free literature available: Catalog of typical products; Flyer-telegraph tone channel filters; Flyer-speech plus filters.
 Products manufactured: Delay Lines, Equalizers, Filters, Networks, Transformers

Local Sales Offices & Reps.
 Cal San Carlos, Westronics Assocs. 415-592-1417
 Ill Arlington Heights, Hagan Slc. Co. 312-394-0617
 Md Annapolis, Hayden Assocs. 202-296-6059
 NY Huntington, Andrews & Andrews Inc. 516-692-8686
 Tex Dallas, J. A. Green Co. 214-631-7450
 Tex Houston, J. A. Green Co. 713-526-2959
 EXP: Lemoyne, PA, Elctns. Int'l. 717-737-8858

BH ELECTRONICS, 245 E. 6th St., St. Paul, Minn., 55101

B. H. INDUSTRIES, 5784 Venice Blvd., Los Angeles, Cal, 90019, Tel: 213-937-4763; Empl.: 6; Minimum order: \$38
 Customer service: R. Quiring
 Products manufactured: Chargers, Battery, Chokes, Converters, Decade Boxes, Inverters, Power Supplies, Transformers

Local Sales Offices & Reps.
 Mass Lexington, MRI 617-861-6270

BICRON ELCTRNS. CO., Box 807, Barlow St., Canaan, Conn., 06018, Tel: 203-824-5125; Empl.: 70
 For info on price: S. Kopcha; Application info: J. Wootton; Customer service: J. Casey; Delivery info: P. Kent

Free literature available: Brochures showing Electro-Mechanical, Electro-Magnetic Assemblies. Solenoid design data sheets. X-Ray, non-contact and Bicon/Vollmer contact gaging and control systems data and specification sheets.
 Products manufactured: Chokes, Coils Including Assemblies & Forms, Converters, Generators, Inverters, Reactors, Solenoids, Testers, Transducers, Transformers

Local Sales Offices & Reps.
 Va Vinton, C. Schmitt 703-890-3859

BIDDLE, JAMES G., Township Line & Jolly Rds., Plymouth Meeting, Pa., 19462, Tel: 215-646-9200; Empl.: 197

Products manufactured: Bridges, Cable Fault Locators, Controls/Control Eqpt., Counters, Decade Boxes, Detectors, Indicators, Locators, Open-Short, Meters, Oscillators, Potentiometers, Relays, Services, Assembly, Production & Test, Standards, Testers, Transmitters, X-Ray Inspection Equipment

Local Sales Offices & Reps.

Ala Huntsville, Col-Ins-Co., Inc. 205-539-1771
 Cal Mountainview, Tech-Ser., Inc. 415-969-9020
 Cal San Diego, Tech-Ser., Inc. 714-222-1121
 Cal Torrance, Tech-Ser., Inc. 213-538-2267
 Colo Denver, Tescos, Inc. 303-744-1119
 Conn Middletown, The Mancib Co. 203-346-6646
 Fla Orlando, Col-Ins-Co., Inc. 305-423-7615
 Fla St. Petersburg, Col-Ins-Co. 813-343-0978
 Ga Atlanta, Williams & Assocs. 404-261-3434
 Ill Chicago, K.W. Meyers Co. 312-774-6440
 Ind Indianapolis, K.W. Meyers Co. 317-243-6681
 La New Orleans, Butler & Land, Inc. 504-722-6363
 Md Silver Spring, Sel-Tronics, Inc. 301-589-3391
 Mass Burlington, The Mancib Co. 617-272-9450
 Mich Royal Oak, Satullo Co. 313-549-3910
 Minn Minneapolis, K.W. Meyers Co. 612-920-7080
 Mo Kansas City, C.B. Fall Co. 816-422-3912
 Mo St. Louis, C.B. Fall Co. 314-968-3850
 NJ Saddlebrook, L & M Assoc. 201-843-8700
 NM Albuquerque, Tech. Marketing Asso. 505-298-4321
 NY Brentwood, L & M Assoc. 516-231-8363
 NY Fayetteville, Savage Sales Co. 215-682-2131
 NY New York, L & M Asso. 212-675-7486
 Ohio Cincinnati, Peter Lax Co. 513-771-4411
 Ohio Cleveland, Peter Lax Co. 216-226-8815
 Okla Tulsa, Butler & Land 918-664-8633
 Ore Portland, Instr. Lab., Inc. 503-234-6683
 Pa Andalusia, L & M Assoc. 215-639-3100
 Pa Pittsburgh, Peter Lax Co. 412-833-5477
 Tex Dallas, Butler & Land, Inc. 214-363-8900
 Tex Houston, Butler & Land, Inc. 713-464-4662
 Va Richmond, Virginia Tech. Assoc. 804-266-9654
 Wash Seattle, Instr. Lab., Inc. 206-283-5850

BIKOR CORPORATION, 1228 253rd St., Harbor City, Cal., 90710, Tel: 213-325-2820 p. 1-1122,1123
 For info on price: R. Pizer; Application info: J. Zagorin

Free literature available: Summary catalog, proposal drawings per customer's specific needs.

Products manufactured: Converters, Power Supplies, Regulators, Transformers

BIOCLOGY SYS. INC., 19 Daniel Rd., Fairfield, N.J., 07006, Tel: 201-227-6188; Empl.: 26; Minimum order: \$100

For info on price: T. Greco; Application info: T. J. Ramney; Customer service: J. Cortez

Free literature available: Brochures on: White & clean rooms computer rooms laminar flow work stations clean room equipment.

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Air Conditioners (For Equipment)

BIOCOM, INC., 9522 W. Jefferson Blvd., Culver City, Cal., 90230, Tel: 213-836-7263; Empl.: 24; Minimum order: \$25

Customer service: B. Dickey

Products manufactured: Amplifiers, Bridges, Comm. Systems, Data Acquisition & Reduction Systems, Demodulators, Oscillators, Oscilloscopes, Transducers, Transmitters

BIOMATION, INC., 10411 Bubb Rd., Cupertino, Cal., 95014, Tel: 408-255-3500, TWX: 910-338-0226

For info on price: D. Blecki; Application info: R. Tottingham; Customer service: S. Austin; Delivery info: K. Scott

Free literature available: Short form catalog describes complete line of Waveform Recorders, Logic Analyzers and Logic Recorders.

Products manufactured: Analyzers, Converters, Recorders

Local Sales Offices & Reps.

Ariz Phoenix, C.W. Fowler Co. 602-274-5537
 Cal La Jolla, Ward/Davis Assoc. 714-459-3351
 Cal Lawndale, Ward/Davis Assoc. 213-542-7740
 Cal Sunnyvale, Ward/Davis Assoc. 408-245-3700
 Colo Denver, C.W. Fowler Co. 303-744-9595
 Conn Hamden, P. Jenks Assoc. 203-281-0810
 Fla Orlando, E.G. Holmes & Assoc. 305-894-8901
 Ga Chamblee, E.G. Holmes & Assoc. 404-451-6161
 Ill Chicago, Pivan Engrg. 312-539-4838
 Ind Indianapolis, Pivan Engrg. 317-253-1681
 Kans Mission, Pivan Engrg. 913-722-1030
 Md Wheaton, Sales Technology 301-340-0015
 Mass Wakefield, P. Jenks Assoc. 617-246-1590
 Mich Detroit, WKM Assoc. 313-434-7500
 Minn Minneapolis, Pivan Engrg. 612-537-4501
 Mo St. Louis, Pivan Engrg. 314-567-3636
 NM Albuquerque, C.W. Fowler Co. 505-299-7676
 NY Dewitt, D.B. Assoc. 315-446-0220
 NY Port Chester, Radiation Elctns. 914-937-2300

Ohio	Cleveland, WKM Assoc.	216-267-0445
Ohio	Dayton, WKM Assoc.	513-434-7500
Oklahoma	Norman, Data Mktg. Assoc.	405-364-8320
Pa	Norristown, Data Engrg.	215-272-1444
Pa	Pittsburgh, WKM Assoc.	412-892-2953
Texas	Dallas, Data Mktg. Assoc.	214-358-4643
Texas	Houston, Data Mktg. Assoc.	713-686-9627
Texas	San Antonio, Data Mktg. Assoc.	512-828-0937
Va	Virginia Beach, E.G. Holmes Assoc.	804-481-6556
Wash	Seattle, Showalter Instrs.	206-455-4922
Wisc	Brookfield, Pivan Engrg.	414-786-1940

BIOMETRICS INSTRUMENT CORP., Sub. Varo, Inc.,
2201 Walnut, Garland, Tex., 75040, Tel: 214-276-6141,
TWX: 910-860-5093; Empl.: 1500 p. 1-1528-1531

Products manufactured: Amplifiers, Chargers, Battery, Chokes, Coils Including Assemblies & Forms, Converters, Filters, Generators, Inverters, Power Supplies, Reactors, Rectifiers, Regulators, Testers, Transformers

Local Sales Offices & Reps.		
NJ	Eatontown, L. Donnelly	201-229-1400
Ohio	Dayton, B. Zunke	513-253-8935
Va	Arlington, A. Fiedler	703-920-4500

BIRD ELECTRONIC CORP., 30303 Aurora Rd., Solon, Ohio, 44139, Tel: 216-248-1200, TWX: 810-427-2687; FSC No: 70998; Empl.: 185; Minimum order: \$5 p. 1-618,619

For info on price: P. Cornell; Customer service: L. Kuklinski; Delivery info: T. Bonsky

Products manufactured: Alarms, Attenuators, Bridges, Calorimeters, Microwave, Connector Adapters, Connectors, Couplers, Detectors, Dummy Loads, Filters, Heat Exchangers & Systems, Meters, Monitors, Probes, Resistors, RFI Measuring Equipment, Switches, Terminals, Testers

Local Distributors		
Cal	Los Angeles, Henry Radio, 11240 W. Olympic	213-477-6701
NY	New York, Barry Elctns., 512 Broadway	212-925-7000
Pa	Trevose, Hamtronics Trevose TV & Elec., 4033 Brownsville	215-357-1400

BIRD, RICHARD H. & CO., INC., 1 Spruce St., Waltham, Mass., 02154, Tel: 617-894-0160; FSC No: 17706; Empl.: 70; Minimum order: \$50

Customer service: R. Cameron

Products manufactured: Bearings, Insulators & Insulation, Pins

BIRNBACH CO., INC., 177 Hanse Ave., Freeport, N.Y., 11520, Tel: 516-223-8400; Empl.: 20

Products manufactured: Braid, Cable, Bushings, Glass, Plastic, Metal, Rubber, Etc., Cable, Circuit Breakers, Clamps & Clips, Connectors, Cords, Couplings, Fasteners, Insulators & Insulation, Jack Adapters (All Types), Jacks (All Types), Leads, Test & Adaptors, Pads, Transistor Mounting, Panels, Plug Adapters, Plug & Jack Sets, Plugs, Pointers, Dial, Posts, Probes, Retainers, Socket Adapters, Spacers, Splices, wire (Including, Butt & Cap Types), Switches, Terminal Blocks, Boards & Strips, Terminals, Transistor, Diode, Thyristor Heat Dissipators, Tubing, Wire

Local Sales Offices & Reps.		
Fla	No. Miami, L. Haas Co.	305-949-9143

BISHOP GRAPHICS, 20450 Plummer St., Chatsworth, Cal., 91311, Tel: 213-993-1000, Telex: 66-2400; Empl.: 70; Minimum order: \$15

Customer service: D. Belanger

Free literature available: Bishop Technical Manual and General Catalog - over 84 pages packed with hundreds of time and money-saving tips, plus full details on over 15,000 printed circuit symbols and tapes, light tables, drafting film and vellum.

Products manufactured: Benches, Consoles, Stools, Tables, Boards, Printed Circuit, Drafting Symbols, Dry Transfer, Pressure Sensitive, etc. (Including Lettering), Kits, Printed Circuit, Labels, Pressure-Sensitive, Adhesive, Lenses, Optical & Camera, Tapes, Films & Foils, Pressure Sensitive

Local Sales Offices & Reps.		
Cal	Irvine, Bishop Graphics Drafting Supply Center	714-979-8952, 213-628-6161
Cal	Sunnyvale, Bishop Graphics Drafting Supply Center	408-732-9010

BIVAR, INC., 1617 E. Edinger Ave., Santa Ana, Cal., 92705, Tel: 714-547-5832; Empl.: 7 p. 2-1259,1266

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Capacitor, Hardware, Fasteners, Guides, Circuit Board, Handles For Cabinets, Circuit Boards, Racks, etc., Holder & Carriers, Holders, Circuit Board (Production Type), Integrated Circuit Packaging Systems, Pads, Transistor Mounting, Pullers, Racks, Resistor, Hardware, Socket Adapters, Sockets, Spacers, Tubing

Local Sales Offices & Reps.		
Ariz	Scottsdale, Jack Osborn	602-838-9358
Cal	San Diego, Qualtronic Co.	714-560-8955
Cal	Santa Clara, L.A. Woods	408-984-7444
Colo	Denver, W.J. Purdy Co.	303-777-1411
Fla	Winter Park, Young & Lawrence ..	305-647-6929
Ill	Chicago, Kennedy Engrg.	312-631-8283
Iowa	Marion, Thomas & Modrcin	319-377-6261
Kans	Shawnee Mission, Thomas & Modrcin ..	913-432-2131
Mass	Reading, Kanan Assocs.	617-944-8484
Mich	Detroit, Heick & Ralph Assocs.	313-538-3350
Minn	Minneapolis, Thurston Assocs.	612-929-7801
Mo	Hazelwood, Thomas & Modrcin	314-895-4700
NY	Conklin, Comerota Assocs.	607-775-4442
NY	Jericho, HRC Comp-Tech	516-832-5550
Ohio	Cincinnati, Tri-State Mktg.	513-761-7993
Pa	Elkins Park, K.B. Erdman Co.	215-224-1833
Tex	Dallas, Elcom Co.	214-352-5006
Wash	Seattle, Blum & Assocs.	206-285-2590
EXP:	Reese, Cal., Dynatronics International ..	213-881-8700

BLACK & WEBSTER, INC., 281 Winter St., Waltham, Mass., 02154, Tel: 617-890-9100, TWX: 710-324-1959; Empl.: 60

Customer service: J. Barber

Free literature available: Literature describes electric press type machines for small parts assembly-staking, marking, riveting, swaging, terminal setting, etc. Safety devices for punch presses also presented.

Products manufactured: Machines/Machinery, Production, Tools

BLACKHAWK NETWORKS CORP., 14 N. Parker Dr., Janesville, Wisc., 53545, Tel: 608-752-8701; FSC No: 12724; Empl.: 10

Products manufactured: Filters

Local Sales Offices & Reps.	
Ill	Chicago, E. Schmeichel Co. ....312-524-0307

BLH ELCTRNS., INC., 42 Fourth Ave., Waltham, Mass., 02154, Tel: 617-890-8700, TWX: 710-324-0683; FSC No: 03089; Empl.: 400; Minimum order: \$25

For info on price: J. Enman, Ext. 207; Application info: G. Welch, Ext. 388; Customer service: E. Studien, Ext. 375; Delivery info: Order Services, Ext. 207

Free literature available: General Catalog - 001 - Description and specifications of all BLH Products; including strain gauges and accessories; Load, Pressure, Torque Transducers; Instruments and Systems for stress analysis, process control, Scientific and Test, and Calibration.

Products manufactured: Amplifiers, Bridges, Cells, Load, Gages, Indicators, Recorders, Services, Assembly, Production & Test, Signal Conditioners & Equipment, Testers, Thermocouples, Elements & Accessories, Thermometers, Resistance, Transducers

BLILEY ELECTRIC CO., 2545 W. Grandview Blvd., Erie, Pa., 16512, Tel: 814-838-3571, TWX: 510-696-6886; FSC No: 71034; QPL No: 3098; Empl.: 230; Minimum order: \$50 p. 1-282,283

For info on price: H. A. Yocum; Application info: F. C. Swartz; Customer service: R. L. Samick; Delivery info: H. A. Yocum

Free literature available: Literature describes our complete product line which includes Quartz Crystals and Related Frequency Control Devices for use in electric equipment as required by various segments (Military and Commercial) of the Electronic Industry.

Products manufactured: Crystal Blanks, Crystals, Delay Lines, Filters, Holders, Crystal, Memory Systems, Mounts, Oscillators, Ovens

Local Sales Offices & Reps.		
Cal	Los Angeles, Elsner-Rambo Co.	213-664-2928-2928
Conn	Meriden, P.R. Sturgeon Co., Inc.	203-237-1112
Fla	Maitland, Hutto-Hawkins-Peregoy	305-831-2474
Fla	Pompano Beach, Hutto-Hawkins-Peregoy	305-943-9593

Mass	Babson Park, P.R. Sturgeon Co.	617-237-3506
NY	Buffalo, R.W. Mitscher Co.	716-633-7970
NY	Elmont, F. Edwin Schmitt Co.	516-437-8150
NC	Raleigh, R.W. Mitscher Co.	919-828-0575
Ore	Portland, C.K. Shanks & Assocs.	503-292-5656
Tenn	Shelbyville, R.W. Mitscher Co.	615-684-4544
Texas	Grand Prairie, Howell Sls., Inc.	214-262-5153
Va	Troutville, R.W. Mitscher Co.	804-484-4932
Va	Virginia Beach, R.W. Mitscher Co.	804-481-7200

Wash	Seattle, C.K. Shanks & Assocs.	206-632-4290
EXP:	Plainview, Telesco Int'l Corp.	516-433-6210
EXP:	Stamford, Conn., Dage Corp.	203-324-3123

BLONDER-TONGUE LABS., INC., One Jake Brown Rd., Old Bridge, N.J., 08857, Tel: 201-679-4010; Empl.: 450

For info on price: S. Stone; Application info: R. St. Louis; Customer service: S. Stone; Delivery info: S. Stone

Free literature available: Distributor products catalog MATU professional products catalog

Products manufactured: Amplifiers, Antenna Rotators, Antennas, Attenuators, Boxes, Junction, Outlets & Wall Plates, Bridges, Cabinets & Accessories, Cable, CATV Systems & Equipment, Connector Adapters, Connectors, Converters, Couplers, Detectors, Filters, Generators, Insertion Loss Measurement Systems, Jack Adapters (All Types), Meters, Modulators, All Kinds, Plugs, Power Supplies, Splicers, Coaxial Cable, Switches, Television Systems & Equipment Closed-Circuit, Terminals, Test Equipment, Tools, Transformers

Local Sales Offices & Reps.		
Alas	Anchorage, H. J. Lang & Assocs	907-279-5741
Ariz	Phoenix, Toward Engrg Assoc.	602-955-3193
Cal	Los Angeles, Southern: E. N. Strassner Co.	213-666-1511
Cal	Redwood City, Northern: Sinai-Johnson	415-365-6283
Colo	Denver, R. Bolwen Assocs.	303-744-2501
Fla	Port Charlotte, W. F. Hemminger Co.	813-625-6050
Haw	Honolulu, G. Piety Factors	808-841-0195
Ill	Oak Park, G. Pettit Co.	312-261-0342
Ind	Fort Wayne, N. Hoemig Sls Co.	219-747-0826
La	New Orleans, Texpert Co.	504-486-6073
Mass	North Scituate, W. A. Hendrickson Co.	617-545-0652

Mich	Brighton, Lector Sls Co.	313-632-7941
Minn	Edina, M. Folster Co.	612-835-2252
Mo	Kansas City, Forristal-Young Sls Co.	816-358-6771
Mo	St. Louis, Forristal-Young Sls Co.	314-645-2360
NM	Albuquerque, C. T. Carlberg & Assocs	505-265-1579
NY	Phelps, LSM Assocs Orchard Park	315-548-4891
NY	Tuckahoe, L-C-A Sls	914-961-4700
NC	Greensboro, Adams & Assocs.	919-272-6838
Ohio	Columbus, Veller Elctn Sls	614-885-7819
Tenn	Memphis, Texpert Co.	901-683-0880
Texas	Dallas, Texpert Co.	214-358-3435
Texas	Houston, Spivey-LeBoeuf Assocs.	713-649-1221

Texas	Richardson, Spivey-LeBoeuf Assocs.	214-231-3190
Utah	Salt Lake City, R. Bowen Assocs.	801-299-3920
Wash	Seattle, Pacnor Mktg	206-284-8020
EXP:	Plainview, N.Y., Morhan Exporting Corp.	516-293-5582
FOR:	Can., London, Ont., Telequipment, Ltd.	519-439-8871

BLUE M ELECTRIC CO., 138th & Chatham St., Blue Island, Ill., 60406, Tel: 312-385-9000, TWX: 910-689-3398; Empl.: 250 p. 1-468,469

For info on price: H. Mathews; Application info: W. Tranbarger; Customer service: A. Anleitner; Delivery info: H. Mathews

Free literature available: Catalog E-176-192 picturing and describing company's lines of environmental chambers, ovens furnaces and baths, includes complete specifications and performance data.

Products manufactured: Baths, Controlled Temperature (Air & Liquid), Chamber, Environmental Test, Controls/Control Eqpt., Furnaces, Heaters & Heating Elements, Ovens, Programmers, Refrigerators, Environmental Test, Testers

Local Sales Offices & Reps.		
Ariz	Scottsdale, Blue M Engrg.	602-947-7026
Cal	El Monte, Blue M Engrg.	213-442-6672
Cal	Sunnyvale, Blue M Engrg.	408-734-8734
Ga	Atlanta, Blue M Engrg.	404-237-7644
Mass	Framingham, Blue M Engrg.	617-235-8320

Mich Allen Park, Blue M Engrg. 313-381-2123
 NY Elmsford, Blue M Equip. Co. 914-592-3828
 Ohio Cincinnati, Blue M Engrg. 513-821-6278
 Pa Ardmore, Blue M Engrg. 215-649-1448
 Tex Garland, Blue M Engrg. 214-272-2509

BLUM, JULIUS & CO., INC., Box 292, Carlstadt, N.J.,
 07072, Tel: 201-438-4600, TWX: 710-989-0112; Minimum
 order: \$25

Products manufactured: Tubing

BODINE ELECTRIC CO., 2500 W. Bradley Pl., Chicago,
 Ill., 60618, Tel: 312-IR8-3515, Telex: 25-3646; Empl.:
 800; Minimum order: \$400 p. 1*938
 Customer service: M. L. Lindsten

Free literature available: Catalogs: Over 340
 stocked motors, gearmotors, and SCR
 speed/torque controls. 1/2000 thru 1/4 HP. torques
 .3 Oz-in. thru 342 Lb-in. Catalog CDC: Adjustable
 speed/torque drive systems. Chassis and encased
 controls for bodine shunt wound and permanent
 magnet D-C motors and gearmotors

Products manufactured: Controls/Control Eqpt.,
 Motors

Local Sales Offices & Reps.

Cal Los Angeles, C.E. Mello 213-626-9159
 Cal Saratoga, E.W. Duemlein 408-257-0900
 Mass Andover, L.R. Cascino 617-470-0050
 Mich Grosse Ile, P.S. Miller 313-386-0900
 Minn Minneapolis, E.R. Kaye 612-588-2821
 Mo Kansas City, Automation Specialties 816-421-6646
 NY Buffalo, H. Cardozo 716-834-3377
 NY East Syracuse, R.H. Nichols 315-437-2813
 NY Massapequa, D.V. Mayorga 516-541-1611
 NY Rochester, J.F. Serr 716-586-6226
 Ohio Chagrin Falls, D.E. DeWolf 216-543-1591
 Ore Portland, D.E. Johnson 503-246-3131
 Tex Dallas, General Power Equip. 214-368-4655
 Tex Houston, General Power Equip. 713-524-1895
 EXP: Ill., Export Dept., Bodine Elec. 312-478-3515

Local Distributors

Ala Mobile, Brownell Electro, Inc., 3450 Armour Dr.
 205-479-5405
 Cal Antioch, King Bearing, Inc., 109 "I" St.
 415-757-4680
 Cal Fremont, King Bearing, Inc., 37237 Maple St.
 415-797-8552
 Cal Fresno, King Bearing, Inc., 2452 S. East Ave.
 209-485-7660
 Cal Los Angeles, Andrews Hardware, 1610 W. 7th
 St. at Union 213-HU3-8110
 Cal Los Angeles, Minarik Electric Co., 224 East Third
 St. 213-MA4-3161
 Cal Merced, King Bearing, Inc., 847 W. 17th St.
 209-722-6218
 Cal Modesto, King Bearing, Inc., 2053 Yosemite
 Blvd. 209-529-2880
 Cal Mountain View, King Bearing, Inc., 2133 (A)
 Leghorn St. 415-968-8316
 Cal Oakland, King Bearing, Inc., 541 Julie Ann Way
 415-568-6690
 Cal Sacramento, King Bearing, Inc., 2779 Del Monte
 St. 916-372-0790
 Cal San Jose, King Bearing, Inc., 1008 S. 2nd St.
 408-294-3363
 Cal San Leandro, Republic Supply Co., 2025 Pike
 Ave. 415-EL7-2211
 Cal Stockton, King Bearing, Inc., 1350 E. Scotts Ave.
 209-464-7661
 Cal Tulare, King Bearing, Inc., 360 S. M St.
 209-686-4738
 Colo Denver, Wazee Electric Co., 2020 W. Barbary Pl.
 303-892-7003
 Fla Orlando, Brownell Electro, Inc., 307 27th St.
 305-843-6770
 Ga Hapeville, Brownell Electro, Inc., 3020
 Commerce Way 404-762-5181
 Ill Chicago, Excel Electric Service Co., 2113 S.
 Western Ave. 312-VI7-7220
 Ill Chicago, Samuel Harris & Co., 114 N. Clinton St.
 312-FR2-7272
 Ill Rockford, Samuel Harris & Co., 2526 20th St.
 815-398-0606
 Ill St. Charles, Samuel Harris & Co., 315 Industrial
 Dr. 312-584-5000
 Ill Waukegan, Samuel Harris & Co., 1720 Grand
 Ave. 312-ON2-0372
 La Baton Rouge, Louisiana Bearings, Inc., 2864
 Weller Ave. 504-357-0622
 La Lake Charles, Behring's Bearing Svc., 1233 3rd
 St. 318-HE9-9001
 Mass Medford, Empire Electrical Co., 54 Mystic Ave.
 617-395-5000
 Mass Somerville, Electro Sls Co., 100 Fellsway West
 617-666-0500

Mich Detroit, Howard Electric Co., 4801 Bellevue Ave.
 313-WA3-0430
 Minn Minneapolis, Boustead Electric & Mfg., 7135
 Madison Ave. W. 612-544-9131
 Mo Kansas City, Kronfield-Thorp Elec., 2700 McGee
 Trafficway 816-BA1-4000
 Mo St. Louis, Zeller Electric, Inc., 4250 Hoffmeister
 Ave. 314-638-9641
 NJ Cherry Hill, Motor & Control Sys. Div. of Jos. T.
 Fewkes & Co., 6 Springdale Road 609-424-5810
 NJ Edison, B & B Motor & Control, 146 U.S.
 Highway #1 201-420-1466
 NY Binghamton, Diehl Binghamton, Inc., 5 Lewis St.
 607-772-1760
 NY East Syracuse, Diehl Syracuse, Inc., 4413 James
 St. 315-437-2826
 NY N. Y., B & B Motor & Control, 96 Spring St.
 212-WO6-5777
 NY Rochester, B & B Motor & Control Corp. of
 Rochester, 3259 Winton Rd. So. 716-473-6640
 NC Charlotte, Mize Company, Inc., 513 W. 24th St.
 704-ED3-0356
 Ohio Cleveland, Reserve Electric Co., 2090 E. 19th St.
 216-PR1-5764
 Ohio Dayton, Thal Mor Assocs. Inc., 3232 Encrete La.
 513-298-9939
 Okla Oklahoma City, Dagwell Dixie Co., 816 W. Main
 St. 405-232-7671
 Okla Tulsa, Dagwell Dixie Co., 39 N. Lewis St.
 918-932-4231
 Ore Portland, Star Machinery Co., 3461 N.W. Yeon
 Ave. 503-226-3011
 Pa Pittsburgh, Braunlich-Roessele Co., 3117-3127
 Penn Ave. 412-471-6995
 Tenn Memphis, Brownell Electro Inc., 3053
 Tranquillity Dr. 901-332-9254
 Tenn Nashville, Tennessee Machinery Co., 1133 Polk
 Ave. 615-242-1742
 Tex Baytown, Behring's Bearing Svc., 3307 Market
 St. 713-583-1911
 Tex Beaumont, Behring's Incorporated, 2980 Milam
 St. 713-TE3-8675
 Tex Dallas, Bearing Chain & Supply, 1630 Prudential
 Dr. 214-ME1-8310
 Tex Fort Worth, Bearing Chain & Supply, 217 N.
 Beach St. 817-TE8-6701
 Tex Houston, Behring's Bearing Svc., 1417 Clay At
 LaBranch 713-CA4-1743
 Tex La Marque, Behring's Bearing Svc., 916 Highway
 1765 713-WE8-8156
 Tex Port Arthur, Behring's Incorporated, 1749 7th St.
 713-YU5-9333
 Tex Tyler, Bearing Chain & Supply, 2500 W. N.W.
 Loop 323 214-LY2-0873
 Va Richmond, Industrial Supply Corp., 1905
 Westwood Ave. 804-EL5-8041
 Wash Seattle, Industrial Electric, 1938 Fairview Ave., E.
 206-EA9-3909
 Wisc Milwaukee, Trester Service Elec., 3225 N. Pierce
 St. 414-264-8170
 Wisc New Berlin, Electric Sls. & Engrg., 16150 W.
 Rogers Dr. 414-782-2400
 For: Can., Brantford, ON, Renold Canada Ltd., Park
 Road No. 519-756-6118
 For: Can., Edmonton, AB, Renold Canada Ltd.,
 12253-75th St. 403-474-2431
 For: Can., Hampton, NB, Renold Canada Ltd., P.O.
 Box 180 506-832-5324
 For: Can., London, ON, Renold Canada Ltd., 28
 Firestone Blvd. 519-453-3420
 For: Can., Montreal, PQ, Renold Canada Ltd., 2333
 Masson St. 514-527-8701
 For: Can., Quebec City, PQ, Renold Canada Ltd., 210
 Rue Lee 418-522-2011
 For: Can., Rexdale, ON, Renold Canada Ltd., 110
 Skyway Ave. 416-741-5732
 For: Can., Vancouver, BC, Renold Canada Ltd., 1290
 Odium Dr. 604-255-8455
 For: Can., Winnipeg, MB, Renold Canada Ltd., 1302
 Notre Dame Ave. 204-772-9541

BODINE CO., 236 Mt. Pleasant Rd., Collierville, Tenn.,
 38017, Tel: 901-853-7211; Empl.: 30

For info on price: D. Crippen; Application info: R. H.
 Bodine, Jr.; Customer service: D. Crippen; Delivery
 info: D. Crippen

Products manufactured: Lighting Equipment,
 Emergency

Local Sales Offices & Reps.

Cal Los Angeles, E. S. Condon Co. 213-726-7926
 Cal San Francisco, Drath-Jacobs 415-467-5642
 Colo Denver, Repco-Electro Sls. 303-232-3070
 Fla Orlando, Hartman & Assocs. 305-894-4151
 Ga Atlanta, J. J. Perry, Jr. 404-237-8239
 Haw Honolulu, Pacific Electrical Sls. Agency 808-536-5145
 Ill Chicago, Electri-Agency 312-439-5030

Ind Indianapolis, C. M. Buck & Assocs. 317-251-1281
 Ky Louisville, Winn-Beck Agency 502-426-1126
 La New Orleans, General Manufacturers Agents 504-861-3656
 Md Baltimore, A. Daniels 301-752-0982
 Mich Detroit, KVA Assocs. 313-692-6000
 Minn Minneapolis, Frven & Vedders Sls. 612-922-1642
 Miss Jackson, A. Spencer 601-373-5552
 Mo Kansas City, B. Andrews Co. 816-931-7195
 Mo St. Louis, Consolidated Agencies, Inc. 314-721-1213
 NJ Somerville, D. Caughlan & Assocs. 201-725-5623
 NY Baldwinsville, R. A. Blann 315-635-6231
 NY New York, Mark Sls. Agency 516-221-2995
 NC Charlotte, C. Alley Assocs. 704-523-1532
 Ohio Cleveland, Verne LaSalle 216-241-3788
 Okla Tulsa, Tri-States Sls. Co. 918-836-5342
 Pa Pittsburgh, W. G. Cashdollar Assoc. 412-731-7915
 Tenn Nashville, Factory Sls. Agency 615-327-9051
 Tex Dallas, Lammers-Galvin 214-369-1271
 Tex Houston, Lighting & Electrical Sls. 713-923-7781
 Tex San Antonio, Hylltin-Ayres 512-828-0624
 Wisc Milwaukee, Electric Materials of Wisc. 414-383-0350

BOGEN DIV., Lear Siegler, Inc., Box 500, Paramus, N.J.,
 07652, Tel: 201-343-5700, TWX: 710-990-5047; Empl.:
 332

Free literature available: Six brochures describe
 Bogen's lines of public address intercoms,
 telephone-intercoms, school sound consoles,
 selective radio pocket paging, and pocket paging
 with voice.

Products manufactured: Amplifiers, Baffles,
 Speaker, Cases, Equipment, Instrument, Meter,
 Comm. Systems, Encoders, Microphone
 Accessories (Including Stands, Holders, Booms),
 Microphones, All Kinds, Mixers, Public Address
 Systems, Receivers, Speaker Systems, Speakers,
 Transformers, Transmitters, Tuners

Local Sales Offices & Reps.

Ala Mobile, Hollingsworth & Still 205-478-8108
 Ariz Scottsdale, Marshank Sls. Co. 602-949-9443
 Cal Culver City, Marshank Sls. Co. 213-559-2591
 Cal Redwood City, Sinai-Johnson 415-365-6263
 Cal Sacramento, Sinai-Johnson 916-428-4666
 Colo Denver, Ron Bowen & Assocs. 303-744-2501
 Fla Umatilla, Hollingsworth & Still 904-669-4738
 Ga Atlanta, Hollingsworth & Still Inc. 404-394-3270
 Haw Honolulu, Nylsen Brothers 808-538-1171
 Ill Chicago, R. R. Hutmacher Assocs. 312-631-3248
 Ind Indianapolis, Kingston-Sharkey & Assocs. 317-353-9406
 La New Orleans, The Texport Co. 504-486-6073
 Md Baltimore, D. H. Brothers Co. 301-764-7189
 Mass Wellesley Hills, M. Scott Co. 617-235-0102
 Mich Buchanan, Riley & Petchell, Inc. 616-695-6356
 Mich Detroit, Riley & Petchell, Inc. 313-535-7000
 Minn St. Paul, Skor 612-645-6461
 Mo Kansas City, Forristal-Young Sls. Co. 816-358-6771
 Mo St. Louis, Forristal-Young Sls. Co. 314-645-2360
 Neb Omaha, Forristal-Young Sls. Co. 402-333-0800
 NJ Ridgefield, Bi-State Marketers Inc. 201-943-5888
 NM Albuquerque, C.T. Carlberg & Assocs. 505-265-1579
 NY Buffalo, Waxman-Currant Sls. Co. 716-873-0442
 NC Charlotte, Hollingsworth & Still Inc. 704-536-7047
 Ohio Cincinnati, McFadden Sls. Co. 513-825-1224
 Ohio Columbus, McFadden Sls. Co. 614-221-3363
 Ohio N. Olmstead, Avcom, Inc. 216-777-2060
 Okla Tulsa, The Texport Co. 918-939-1727
 Ore Salem, Pacnor Mktg. 503-363-6445
 Pa Laverock, M. Weinberg Assocs. 215-885-1918
 Pa Pittsburgh, F. P. Yarussi Co. 412-221-4676
 Tenn Memphis, The Texport Co. 901-683-0880
 Tex Austin, Texport Co. 512-928-0096
 Tex Houston, The Texport Co. 713-464-2828
 Tex Richardson, Texport Co. 214-238-7117
 Utah Salt Lake City, R. Bowen & Assocs. 801-363-8801
 Wash Seattle, Pacnor Mktg. 206-284-8020
 EXP: New York, N.Y., Genex Corp. 212-524-2557

BOKER'S, INC., 3106 Snelling Ave. S, Minneapolis, Minn.,
 55046

BOONTON ELECTRONICS CORP., Route #287, Parsippany, N.J., 07054, Tel: 201-887-5110, TWX: 710-986-8241; FSC No: 6625; Empl.: 150; Minimum order: \$15 p. 1-620-625

For info on price: P. Farnsworth Ext. 178; Application info: L. Pokorny Ext. 174; Customer service: P. Farnsworth Ext. 178; Delivery info: P. Farnsworth Ext. 178

Products manufactured: Bridges, Generators, Meters, Semiconductor Wafer Fabrication, Test Systems

Local Sales Offices & Reps.

Ala Huntsville, J.L. Highsmith, Inc. 205-881-3294
 Ariz Phoenix, Zeus, Inc. 602-253-6104
 Cal North Hollywood, O'Halloran Assoc. 213-877-0173
 Cal Palo Alto, O'Halloran Assoc. 415-326-1493
 Cal San Diego, O'Halloran Assoc. 714-224-2824
 Colo Denver, Zeus, Inc. 303-770-4400
 Conn Hamden, Scientific Devices, Conn. 203-248-9361
 Fla Orlando, J.L. Highsmith, Inc. 305-293-5202
 Ill Chicago, K.W. Meyers Co. 312-774-6440
 Ind Indianapolis, K.W. Meyers Co. 317-243-6681
 Kans Olathe, B. Rush Assoc. 913-782-1177
 Md Silver Spring, Sal-Tronics, Inc. 301-589-3391
 Mass Burlington, R.G. Sickles Assoc. 617-272-7285
 Minn Minneapolis, K.W. Meyers Co. 612-920-7080
 NJ Palisades Park, Scientific Devices East 201-945-3962
 NM Albuquerque, Zeus Inc. 505-268-3941
 NY Rochester, Scientific Devices 716-334-2445
 NC Charlotte, J.L. Highsmith 704-333-7743
 Ohio Centerville, Micro Sales Corporation 513-433-8171
 Pa Melrose Park, R. Meyers Assoc. 215-224-1663
 Tex Dallas, Airep Elctns. Inc. 214-827-2120
 Utah Salt Lake City, Zeus, Inc. 801-466-4924
 Wash Bellevue, Scientific Devices Northwest 206-454-0900

BORG-WARNER INGERSOLL PRODS., See Ingersoll Prods Div. Borg-Warner

BORG-WARNER THERMOELECTRICS, Dept. Borg-Warner, Wolf & Algonquin Rds., Des Plaines, Ill., 60018, Tel: 312-827-3131; Empl.: 240 p. 1-488-491

Products manufactured: Cooling/Heating Modules, Thermoelectric, Heat Exchangers & Systems

Local Sales Offices & Reps.

EXP: Franklin Park, Ill., Borg-Warner Aerospace Prods. International 312-455-3120

BOSTITCH, Div. of Textron, Inc., Briggs Dr., E. Greenwich, R.I., 02818, Tel: 401-TU 4-2500; Empl.: 2500

Free literature available: Staplers, nailers and fastening systems for industrial and commercial users are described in a 16-page, illustrated BOSTITCH brochure. Specific applications for each tool and system, including Auto-Nailer fastening systems and the BOSS line of forced entry fastening tools are outlined.

Products manufactured: Fasteners, Machines/Machinery, Production

Local Sales Offices & Reps.

Cal Los Angeles 213-724-0440
 Cal San Francisco 415-648-7200
 Ga Atlanta 404-458-2324
 Ill Northbrook 312-498-6550
 Ind Indianapolis 317-353-2171
 Mass Winchester 617-729-6400
 Mich Farmington 313-477-1200
 Mo Md. Hts. 314-567-6120
 NJ Carlstadt 201-933-8660
 NC Charlotte 704-376-4402
 Ohio Middleburg Heights 216-826-0500
 Pa Montgomeryville 215-643-6200
 Tenn Memphis 901-365-7200
 Tex Dallas 214-631-7580
 Wash Seattle 206-283-6300

BOSTON INSULATED WIRE & CABLE CO., 65 Bay St., Dorchester, Mass., 02125, Tel: 617-265-2102, Telex: 94-0604; FSC No: 71102; Empl.: 200

For info on price: R. Janeway; Customer service: A. Sutkis; Delivery info: R. Janeway

Products manufactured: Cable Assemblies & Harnesses, Cable, Connector Adapters, Connectors, Cords, Wire

Local Sales Offices & Reps.

Cal Bell, Engr. Ind'l. Prod. 213-588-9161
 Cal Los Angeles, Bos. Ins. W & C Elec. Access. Div. 213-532-9064
 Cal Mill Valley, H.B. Burley III 415-388-2104
 Colo Denver, P. A. Douden Co. 303-744-1497

Conn Southbury, A. Coscina 617-265-2102
 Ga Atlanta, Hardcastle & Rhyme 404-261-4540
 Ga Tallapoosa, W. Bridges 404-574-2060
 Ill Chicago, Brisky Assocs. 312-597-7890
 Ill Hinsdale, T. Russell 312-641-1045
 Kans Shawnee Mission, Lowell-Kangas & Assocs., Inc. 913-631-3515
 La New Orleans, Case Sls. Co. 504-835-7713
 La New Orleans, Mid-South Sls. Co. 502-822-3030
 Md Columbia, W. Hill 301-752-3558
 Mass North Attleboro, W. Conroy 617-265-2102
 Mich Royal Oak, M. McAuliffe Sls. 313-545-7177
 Minn Minneapolis, C. E. Bohlig Co. 612-922-7011
 Mo St. Louis, Lowell-Kangas & Assocs., Inc. 314-821-4050
 NJ Cherry Hill, J. Schindell Assocs. 609-424-1441
 NM Albuquerque, Sealect Technology, Inc. 505-299-1137
 NY Pittsford, NoCo, Inc. 716-461-4750
 NC Charlotte, Power Engrg. Co. 705-537-8099
 Ohio Chagrin Falls, F. Gunther 216-247-5823
 Pa Ambridge, R. F. Meinert Co. 412-931-6627
 Tenn Knoxville, Engr. Prod. Co. 615-588-3312
 Tenn Memphis, Engr. Prods. Co. 901-327-6622
 Tex Houston, C. A. Richards & Assocs. 713-522-7987

Wash Seattle, Datacom Assocs. 206-285-2525
 FOR: Can., Hamilton, Ont., Boston Insulated Wire & Cable Co., Ltd. 416-529-7151
 FOR: Can., Montreal 2, Quebec, Boston Insulated Wire & Cable Co., Ltd. 514-866-7151

BOURNS, INC., Instr. Div., 6135 Magnolia, Riverside, Calif., 92506, Tel: 714-684-1700, TWX: 910-332-6103; Empl.: 250

Customer service: J. Pancake

Products manufactured: Accelerometers, Gages, Potentiometers, Resistors, Switches, Transducers, Transformers

Local Sales Offices & Reps.

Aerospace
 Ala Huntsville, Kemp Instrs., Inc. 205-837-4304
 Cal Hayward, Avionics Liaison, Inc. 415-783-1131
 Cal San Diego, L.L. Stoakes Inc. 714-274-6281
 Colo Arvada, Cleveland Enrtns. 303-423-3707
 Fla Orlando, Truex Assocs., Inc. 305-859-2160
 Iowa Cedar Rapids, Tech. Reps., Inc. 319-363-2489
 Md Gaithersburg, Wright Co. 301-948-5151
 Mass Natick, Andrus-Peskin Corp. 617-653-3919
 Mich Farmington, Carter, McCormick & Peirce 313-477-7700
 Mich Kalamazoo, Carter, McCormick & Peirce Inc. 616-349-9666
 Minn Minneapolis, Furber Sls. Co. 612-861-1518
 Mo Hazelwood, Tech. Reps., Inc. 314-731-5200
 Mo Independence, Technical Representatives 816-737-1414
 NM Albuquerque, Cleveland Enrtns. 505-345-2481
 NY Fayetteville, H. C. Johnson Agency, Inc. 315-637-9383
 NY Guilderland, H.C. Johnson Agency, Inc. 518-456-9681
 NY Melville, Astrorop, Inc. 516-423-2266
 NY Rochester, H. C. Johnson Agency, Inc. 716-482-3000
 NY Williamsville, H. C. Johnson Agency, Inc. 716-632-7880
 Ohio Cleveland, Carter McCormick & Peirce 216-333-5650
 Ohio Dayton, Carter McCormick & Peirce 513-278-5873
 Ohio Worthington, Carter McCormick & Peirce 614-888-4466
 Okla Tulsa, Kemp Engrg. Co. 918-299-2636
 Pa Glenshaw, H. C. Johnson Agency, Inc. 412-961-0414
 Pa Jenkintown, PDC Corp. 215-887-9610
 Tex Addison, Kemp Engrg. Co. 214-661-0400
 Tex Houston, Kemp Engrg. Co. 713-688-1431

Industrial

Ala Huntsville, Kemp Instrs., Inc. 205-837-4304
 Cal Foster City, Featherstone Assocs. 415-341-1617
 Cal San Diego, L.L. Stoakes Inc. 714-274-6281
 Colo Arvada, Cleveland Enrtns. 303-423-3707
 Fla Orlando, Milne Assocs. 305-855-1533
 Ill Schaumburg, Carvel Engrg. 312-882-6088
 La Harvey, Bourns, Inc. 504-362-2043
 Md Gaithersburg, Wright Co. 301-948-5151
 Mass Natick, Andrus-Peskin Corp. 617-653-3919
 Mich Farmington, Carter, McCormick & Peirce 313-477-7700
 Mich Kalamazoo, Carter, McCormick & Peirce Inc. 616-349-9666
 Mo Hazelwood, Tech. Reps., Inc. 314-731-5200
 Mo Independence, Technical Representatives 816-737-1414
 NJ Stirling, NBS Assocs. 201-464-8500

NM Albuquerque, Cleveland Enrtns. 505-298-7671
 NY Fayetteville, H. C. Johnson Agency, Inc. 315-637-9383
 NY Guilderland, H.C. Johnson Agency, Inc. 518-456-9681
 NY Rochester, H. C. Johnson Agency, Inc. 716-482-3000
 NY Williamsville, H. C. Johnson Agency, Inc. 716-632-7880
 Ohio Cleveland, Carter McCormick & Peirce 216-333-5650
 Ohio Dayton, Carter McCormick & Peirce 513-278-5873
 Ohio Worthington, Carter McCormick & Peirce 614-888-4466
 Okla Tulsa, Kemp Engrg. Co. 918-299-2636
 Ore Portland, Brett Assocs., Inc. 503-232-4184
 Pa Glenshaw, H. C. Johnson Agency, Inc. 412-961-0414
 Pa Glenside, Elcom, Inc. 215-885-1325
 Tex Addison, Kemp Engrg. Co. 214-661-0400
 Tex Houston, Kemp Engrg. Co. 713-688-1431
 Wash Seattle, Brett Assocs., Inc. 206-935-8054

BOURNS, INC., Trimpot Prods. Div., 1200 Columbia Ave., Riverside, Cal., 92507, Tel: 714-684-1700, TWX: 910-332-1252; Empl.: 4000 p. 2-1420,1623-1626

Customer service: Appl. Eng.

Free literature available: Short-Form Catalog - All Products, Panel Potentiometer Brochure, Resistor Networks Brochure, Custom Precision Potentiometer Brochure, Trimpot Digest (Application Periodical)

Products manufactured: Dials, Networks, Potentiometers, Resistors

Local Sales Offices & Reps.

Ala Huntsville, Beacon Elctns. 205-881-5031
 Ariz Phoenix, Sheffer-Kahn Co. 602-258-7893
 Cal Long Beach, Bourns, Inc. 213-774-8000
 Cal Palo Alto, Quad Rep. 415-964-3532
 Cal San Leandro, Quad Rep. 415-352-5942
 Colo Denver, Parker Webster 303-770-1972
 Fla Clearwater, Dyne-A-Mark 813-441-4702
 Fla Ft. Lauderdale, Dyne-A-Mark 305-771-6501
 Fla Orlando, Dyne-A-Mark 305-299-6303
 Ga Atlanta, Beacon Elctns. Assoc. 404-351-3654
 Ill Chicago, D. Dolin Sls. 312-286-6200
 Ill Southern, Centech 816-358-8100
 Ind Ft. Wayne, G&D Elctn. Sls. 219-432-5585
 Md Glen Burnie, Micro-Comp., Inc. 301-761-4600
 Mass Hingham, Bourns, Inc. 617-749-5800
 Mich Detroit, Rathsburg Assoc. 313-882-1717
 Minn Edina, Mel Foster Co., Inc. 612-835-2252
 Mo Hazelwood, Centech 314-731-4220
 Mo Raytown, Centech 816-358-8100
 NJ Haddonfield, Thomas Assoc. 609-854-3011
 NM Albuquerque, A.Q. Elctns. 505-255-8701
 NY Ithaca, B. Dean, Inc. 607-272-2187
 NY Melville, Bourns, Inc. 516-271-3500
 Ohio Dayton, Bear Mktg. 513-299-3566
 Ohio Richfield, Bear Mktg. 216-659-3131
 Ore Portland, J.J. Backer Co. 503-297-3776
 Ore Salem, J.J. Backer Co. 503-362-0717
 Pa Enon Valley, Nebco Assocs. 216-457-2333
 Pa Philadelphia, Thomas Assoc. 215-627-6615
 SC Spartanburg, Beacon Elctns. 803-582-4613
 Tex Dallas, Allied Comps., Inc. 214-238-0408
 Tex El Paso, A.Q. Elctns. 915-545-2363
 Tex Houston, Allied Components 713-691-3961
 Wash Seattle, J. J. Backer Co. 206-285-1300
 FOR: Can., Downsview, Ont., Kaytronics, Ltd. 416-638-5511
 FOR: Can., Montreal, Que., Kaytronics, Ltd. 514-487-3434
 FOR: Can., Vancouver, B.C., L.A. Varah, Ltd. 604-873-3211

Local Distributors

Ala Huntsville, Cramer/E.W., 2310 Bob Wallace Ave., S.W. 205-539-5722
 Ala Huntsville, Hamilton/Avnet Elctns., 805 Oster Dr., N.W. 205-533-1170
 Ariz Phoenix, Hamilton/Avnet, 2615 So. 21st St. 602-275-7851
 Ariz Phoenix, Kierulff Elctns., 2633 E. Buckeye Rd. 602-273-7331
 Cal Chatsworth, Westates Elctns. Corp., 20151 Bahama St. 213-341-4411
 Cal Culver City, Hamilton Electro Sls., 10912 W. Washington Blvd. 213-558-2121
 Cal Irvine, Cramer/Los Angeles, 17201 Daimler St. 213-771-8300
 Cal Mountain View, Hamilton/Avnet, 575 E. Middlefield Rd. 415-961-7000
 Cal Palo Alto, Kierulff Elctns., 3969 E. Bayshore Rd. 415-968-6292
 Cal Riverside, Elctn. Supp. Corp., 2486 Third St. 714-683-7300

Cal	San Diego, Cramer/San Diego, 8975 Complex Dr.	714-565-1881	NY	E. Syracuse, Hamilton/Avnet, 6500 Joy Rd.	315-437-2641	NJ	Long Branch, Bourns Pacific Magnetics Corp.	201-229-5317
Cal	San Diego, Hamilton/Avnet, 8917 Complex Dr.	714-279-2421	NY	Endwell, Cramer/Binghamton, 3220 Watson Blvd.	607-754-6661	NM	Albuquerque, Tri-Tronix 505-265-0172	
Cal	Sunnyvale, Cramer/San Francisco, 720 Palomar 408-739-3011		NY	Hauptpage, Cramer/Esco, 29 Oser Ave.	516-231-5600	NY	Huntington Station, Addem 1 516-567-5900	
Colo	Denver, Cramer/Denver, 5465 E. Evans Pl.	303-758-2100	NY	Rochester, Cramer, E.W., 3000 S. Winton Rd.	716-275-0300	NY	Syracuse, Electra Sls. Corp. 315-455-5783	
Colo	Denver, Hamilton/Avnet, 5921 N. Broadway 303-534-1212		NY	Rochester, Hamilton/Avnet Elctns., 167 Clay Rd.	716-442-7820	Ohio	Richfield, N. Bear Mktg. 216-659-3131	
Colo	Denver, Kierulff Elctns., 10890 E. 47th Ave.	303-371-6500	NY	Westbury, Hamilton/Avnet, 70 State St.	516-333-5800	Or	Beaverton, Arneson Assocs. 503-643-5754	
Conn	Georgetown, Hamilton/Avnet, 643 Danbury Rd.	203-762-0361	NY	Westbury, Schweber Elctns., Jericho Tpke.	516-334-7474	SC	Myrtle Beach, Candor Co., Inc. 803-448-5213	
Conn	Hamden, Wilshire Elctns., 2554 State St.	203-281-1166	NY	Woodbury, Harvey Elctns., 60 Crossways Pk. W.	516-921-8700	Tex	Dallas, Bourns Pacific Magnetics Corp.	214-272-1443
Conn	North Haven, Cramer Elctns., 35 Dodge Ave.	203-239-5641	NC	Winston-Salem, Cramer/E.W., 938 Burke St.	919-725-8711		Wash Seattle, Arneson Assocs.	206-762-7664
Conn	Norwalk, Harvey Elctns., 112 Main St.	203-853-1515	Ohio	Cincinnati, Hughes-Peters, 4865 Duck Creek Rd.	513-351-2000	BOW SOLDER PRODUCTS, 25 Amsterdam St., Newark, N.J., 07105, Tel: 201-589-2266; Empl.: 25; Minimum order: \$100		
Fla	Hollywood, Cramer/E.W., 4035 N. 29th Ave.	305-923-8181	Ohio	Cleveland, Hamilton/Avnet Elctns., 761 Beta Dr.	216-461-1400	For info on price: J. Buccine; Customer service: S. Turkus; Delivery info: W. Walzer		
Fla	Hollywood, Hamilton/Avnet, 4020 N. 29th Ave.	305-925-5401	Ohio	Cleveland, Pioneer Standard Elctns., 4800 E. 131 St.	216-587-3600	Free literature available: Six page catalog showing various types of solders and fluxes available. Technical data and specifications are included.		
Fla	Orlando, Cramer/E.W., 345 N. Graham Ave.	305-894-1511	Ohio	Columbus, Hughes-Peters, 481 E. 11th Ave.	614-294-5351	Products manufactured: Flux, Brazing & Soldering Materials, Solder (All Types)		
Fla	Orlando, Hammond Elctns., 911 W. Central Blvd.	305-849-6060	Ohio	Dayton, Hamilton/Avnet Elctns., 118 Westpark Rd.	513-433-0610	BOWMAN ELECTRICAL PRODS. CORP., 108 N. Jefferson St., Chicago, Ill., 60606, Tel: 312-372-8556; Empl.: 55		
Ga	Atlanta, Cramer/E.W., 3923 Oakcliff Ind'l. Ct.	404-448-9050	Ohio	Dayton, Pioneer-Dayton, 1900 Troy St.	513-236-9900	For info on price: J. Swimmer; Application info: S. Rubin; Customer service: M. Mindel; Delivery info: S. Sylan		
Ga	Norcross, Hamilton/Avnet, 6700 1-85, Suite 2B	404-448-0800	Pa	Montgomery, Pyttronic Inds., Stump Rd.	215-643-2850	Free literature available: Descriptive Literature of three models of permanent magnet synchronous timing motors showing specifications including standard speeds from 1 RPM to 60 RPM.		
Ill	Chicago, Newark Elctns. Corp., 500 N. Pulaski Rd.	312-638-4411	Pa	Pittsburgh, Cameradio Elctns., 2801 Liberty Ave.	412-288-2600	Products manufactured: Motors		
Ill	Mt. Prospect, Cramer Elctns., 1911 S. Busse Rd.	312-633-8230	Pa	Pittsburgh, Pioneer/Pittsburgh, 560 Alpha Dr.	412-782-2300	BOWMAR/ALI, INC., Sub. Bowmar Instr. Corp., 531 Main St., Acton, Mass., 01720, Tel: 617-263-8365, TWX: 710-347-1400; Empl.: 600		
Ill	Schiller Park, Hamilton/Avnet, 3901 N. 25th Ave.	312-678-6310	RI	Providence, Wm. Dandreta & Co., 28 Wolcott St.	401-861-2800	Customer service: Sls. Dept.		
Ind	Fort Wayne, Fort Wayne Elctns. Supply, 3606 Maumee Ave.	219-423-3422	Tex	Dallas, Cramer Elctns., 13740 Midway Rd.	214-350-1355	Products manufactured: Analyzers, Calculators, Electrical & Electronic, Clutches, Couplings, Drives & Drive Mechanisms (Dial), Equalizers, Filters, Generators, Limit Stops, Mechanical, Locks, Dial & Shaft, Meters, Telephone Channel Test & Simulator Equipment, Testers		
Ind	Indianapolis, Graham Elctns. Supp., 133 S. Pennsylvania St.	317-634-8486	Tex	Dallas, Hamilton/Avnet, 4445 Sigma Rd.	214-661-8661	BOWMAR INSTR. CORP., 8000 Bluffton Rd., Ft. Wayne, Ind., 46809, Tel: 219-747-3121, TWX: 810-332-1510; Empl.: 500; Minimum order: \$100		
Ind	Indianapolis, Pioneer/Indiana, 6408 Castleplace Dr.	317-849-7300	Tex	Ft. Worth, Allied Elctns., 401 E. 8th St.	817-336-5401	For info on price: E. H. Koors X 326; Application info: Prod Mgr; Customer service: Cust Svc Mgr; Delivery info: Prod Mgr		
Kans	Lenexa, Hamilton/Avnet, 37 Lenexa Ind'l. Ctr.	913-888-8900	Tex	Houston, Hamilton/Avnet, 1216 W. Clay St.	713-526-4661	Products manufactured: Actuators, Calculators, Electrical & Electronic, Computers, Controls/Control Eqpt., Counters, Display Devices/Displays, Gearheads & Speed Reducers, Gears & Gear Mechanisms (Precision), Keyboards, Alphanumeric & Decimal, Motors, Printers, Repeaters, Servo, Switches		
La	Lafayette, Ralph's of Lafayette, 3004 Cameron 318-234-4507		Tex	Houston, Harrison Equip. Co., Box 3268, 1616 McGowan St.	713-224-9131	Local Sales Offices & Reps.		
Md	Gaithersburg, Cramer/E.W., 16021 Ind'l. Dr.	301-948-0110	Utah	Salt Lake City, Cramer/Utah, 391 W. 2500 S.	801-487-4131	Ala	Huntsville, 20th Century Mktg.	205-772-9237
Md	Gaithersburg, Pioneer/Washington Elctns., 9100 Gaither Rd.	301-948-0710	Utah	Salt Lake City, Hamilton/Avnet, 647 W. Billiniss Rd.	801-262-8451	Ariz	Phoenix, Sheffler-Kahn 602-258-7893	
Md	Hanover, Cramer/Baltimore, 7255 Standard Dr.	301-796-5790	Wash	Bellevue, Hamilton/Avnet, 13407 Northrup Way 206-746-8750		Cal	Chatsworth, Nippon Miniature Bearing Corp.	213-882-4478
Md	Hanover, Hamilton/Avnet, 7255 Standard Dr.	301-796-5000	Wash	Seattle, Cramer/Seattle, 5602 Sixth Ave. S.	206-762-5755	Cal	Costa Mesa, Bowmar Instr. Corp.	714-979-7707
Mass	Burlington, Hamilton/Avnet Elctns., 185 Cambridge St.	617-273-2120	Wisc	Mequon, Taylor Elec. Co., 1000 W. Dongs Bay Rd.	414-241-4321	Cal	Dublin, Aircsupply Co.	415-829-0870
Mass	Burlington, Wilshire Elctns./New England, One Wilshire Rd.	617-272-8200	Wisc	Oak Creek, Cramer/Wisconsin, 430 W. Rawson Ave.	414-764-1700	Cal	Santa Monica, Aircsupply Co.	213-871-0520
Mass	Newton, Cramer Elctns., 85 Wells Ave.	617-969-7700	For:	Can., Downsview, Ont., Cramer Elctns. Can., Ltd., 920 Alness St., Unit 9	416-661-9222	Colo	Denver, Sheffler-Kahn 303-623-1567	
Mich	Livonia, Hamilton/Avnet, 12870 Farmington Rd.	313-522-4700	For:	Can., Mississauga, Ont., Hamilton/Avnet, 6291-19 Dorman Rd.	416-677-7432	Conn	Suffield, T.P. Dunn Assocs.	203-668-0446
Mich	Livonia, Pioneer/Michigan, 13485 Stamford 313-525-1800		For:	Can., Ottawa, Ont., Hamilton/Avnet, 680 Lady Ellen Pl.	613-725-3071	Fla	Clearwater, Saber Assoc.	813-441-1301
Minn	Edina, Cramer/Bonn Co., 7275 Bush Lake Rd.	612-835-7811	For:	Can., St. Laurent, Que., Hamilton/Avnet, 2670 Paulus 514-331-6443		Fla	Lighthouse Point, Saber Assocs.	305-943-3076
Minn	Edina, Hamilton/Avnet, 7683 Washington Ave. S.	612-941-3801	For:	Can., Toronto 19, Ont., Zentronics Ltd., 185 Bridgeland Ave.	416-789-5111	Fla	Longwood, Saber Assocs.	305-422-3686
Minn	Minneapolis, Newark Elctns., 336 Hoover St.	612-331-6350	For:	Can., Vancouver 10, B.C., L.A. Varah Ltd., 2077 Alberta St.	604-873-3211	Ga	Smyrna, Spartech, Inc.	404-432-3644
Mo	Hazelwood, Hamilton/Avnet, 364 Brookes La.	314-731-1144	BOURNS PACIFIC MAGNETIC CORP., Div. Bourns, Inc., Box 1398, Romoland, Cal., 92380, Tel: 714-657-5195, Telex: 67-6446; Empl.: 120; Minimum order: \$35 p. 1+443; p. 2+381,1732,1733			Ill	Park Ridge, Probe Elect.	312-696-2828
NJ	Cedar Grove, Hamilton/Avnet, 218 Little Falls Rd.	201-239-0800	For info on price: R.F. Miller; Application info: R.F. Miller; Customer service: L. Hall; Delivery info: L. Hall			Ind	Fort Wayne, J & B Engrg. Sls. Co.	219-483-2813
NJ	Cinnaminson, Wilshire Elctns., 855 Ind'l. Hwy., Unit 5	215-627-1920	Products manufactured: Chokes, Coils Including Assemblies & Forms, Delay Lines, Transducers, Transformers			Mass	Medway, Gallager Sls. Co.	617-533-7292
NJ	Clifton, Wilshire Elctns., 312 Clifton Ave.	201-365-2600	Local Sales Offices & Reps.			Mass	Waltham, Impact Sls. Co.	617-893-2850
NJ	Moonachie, Cramer Elctns., 1 Barrett Ave.	201-935-5600	Ala	Huntsville, Twentieth Century Mktg., Inc.	205-772-9237	Mich	Farmington Hills, H. Lowell Co.	313-851-7474
NJ	Mount Laurel, Hamilton/Avnet, 113 Gaither Dr., E. Gate Ind'l. Pk.	609-234-2133	Ariz	Scottsdale, De Angelo, Rothman & Cheever, Inc.	602-948-2240	Mo	St. Charles, Bowmar Instr. Corp.	314-724-7335
NJ	Somerset, Schweber Elctns., 43 Belmont Dr.	201-469-6008	Cal	Encino, H. Stein 213-986-2016		NJ	Livingston, Graydon-Sherman, Inc.	201-994-9055
NM	Albuquerque, Cramer/New Mexico, 137 Vermont, N.E.	505-265-5767	Cal	Mountain View, Tri-Rep 415-965-1822		NJ	Matawan, Bowmar Instr. Corp.	201-526-0400
NM	Albuquerque, Elctn. Parts Co., 2620 Rhode Island, N.E.	505-293-6161	Fla	Oviedo, Conley Assocs., Inc.	305-365-3283	NY	Clinton, Aircsupply Co.	315-735-8341
NM	Albuquerque, Hamilton/Avnet Elctns., 2450 Baylor Dr., S.E.	505-765-1500	Ind	Southbend, Valentine-Schillinger & Assocs.	219-291-6258	NY	Fayetteville, Graydon-Sherman 315-637-9861	
NY	Binghamton, Harvey Elctns., Box 1208	607-748-8211	Mass	Concord, Bourns Pacific Magnetic Corp.	617-369-6249	NY	Great Neck, ERA, Inc.	516-822-9890
NY	Buffalo, Standard Elctns., 3519 Union Rd.	716-685-4220	Mass	Reading, Kanan Assocs.	617-944-8484	NY	Pittsford, Graydon-Saerman 315-637-9861	
NY	E. Syracuse, Cramer/Eastern, 6716 Joy Rd.	315-437-6671	Minn	Edina, M. Foster Co.	612-941-7600	Ohio	Dayton, Whelen Corp.	513-434-7551

Free literature available: General precision potentiometer catalog entitled "Upgrade Your System With Our Pots".

Products manufactured: Brakes, Clutches, Potentiometers, Switches, Timers, Transducers, Tubes

Local Sales Offices & Reps.

Cal	Van Nuys, Cardinal Assoc.	213-787-5511
Conn	Suffield, Terrance Dunn & Assoc.	203-668-0446
Ga	Smyrna, Sparteck Assoc.	404-432-3644
Ill	Park Ridge, Probe Elctns.	312-696-2828
Ind	Ft. Wayne, J & B Engrg. Sls.	219-483-2813
Mass	Medway, J. Gallagher Sls.	617-533-7292
Minn	Minnetonka, T.H. Ayre Assoc.	612-474-4125
NY	Buffalo, R.A. Murray Co.	716-632-6913
NY	Plainview, ERA	516-822-9890
Tex	Dallas, Brice Co.	214-233-9808

BRADY CO., W. H., 2221 W. Camden Rd., Milwaukee, Wis., 53201, Tel: 414-332-8100; Minimum order: \$30

For info on price: J. Kaiser; Application info: K. Von Sleet; Customer service: J. Young

Products manufactured: Drafting Symbols, Dry Transfer, Pressure Sensitive, etc. (Including Lettering), Heat Guns, Production, Kits, Marking (Dial, Instrument, Equipment, etc.), Labels, Pressure-Sensitive, Adhesive, Machines/Machinery, Production, Nameplates, Switches, Tapes, Films & Foils, Pressure Sensitive, Testers, Tubing, Wire Markers

Local Sales Offices & Reps.

Cal	Redondo Beach	213-373-6869
Cal	San Francisco	415-574-5822
Cal	San Mateo	415-574-5822
Colo	Denver	303-455-6232
Conn	Hartford	203-247-1283
Fla	Tampa	404-636-5581
Ga	Atlanta	404-636-5581
Ill	Chicago	312-827-6108
Ind	Indianapolis	317-545-5500
Kans	Kansas City	816-363-4133
Mass	Waltham	617-893-8390
Mich	Birmingham	313-642-6643
Minn	Minneapolis	612-926-4666
Mo	St. Louis	314-535-3406
NJ	Maplewood	201-763-7274
NY	Huntington	516-433-6088
NY	Rochester	716-442-8857
NC	Charlotte	704-333-0928
Ohio	Chagrin Falls	216-382-5090
Pa	King of Prussia	215-337-1275
Pa	Pittsburgh	412-766-0555
Tenn	Memphis	901-452-2640
Tex	Dallas	214-363-3710
Wash	Medina	206-455-1177
Wisc	Milwaukee	414-332-8100

BRAILS FORD & CO., 670 Milton Rd., Rye, N.Y., 10580, Tel: 914-967-1820; Empl.: 20; Minimum order: \$10

For info on price: R.E. Drummond; Application info: R.E. Drummond; Customer service: R.E. Drummond; Delivery info: D.G. Kelly

Free literature available: Brushless D.C. Miniature Axial Fans: Brushless D.C. Miniature Centrifugal Blowers; Brushless D.C. Miniature Diaphragm Pumps, Vacuum or Pressure; Sequence Timers, Low Current D.C., Governed & Nongoverned.

Products manufactured: Blowers & Fans & Accessories, Motors, Pumps, Vacuum, Timers

BRAM METALLURGICAL-CHEM. CO., 245 W. Chelton Ave., Phila., Pa., 19144, Tel: 215-GE 8-4900; Empl.: 2; Minimum order: \$50

For info on price: H. H. Bram; Application info: T. G. Bram; Customer service: H. H. Bram; Delivery info: T. G. Bram

Free literature available: "High Purity Metals" card.

Products manufactured: Alloys, Bi-Metals, Thermostatic, Crystals, Foil, Metal Compounds, Foils, Powders, Sheet, Stock, Metals, Quartz, Fused, Services, Assembly, Production & Test, Silica, Fused, Tubing, Wire

BRAMCO CONTROLS DIV., Ledex, Inc., College & South Sts., Piqua, Ohio, 45356, Tel: 513-773-8271; Empl.: 75; Minimum order: \$49

For info on price: J. Market; Application info: J. Market; Customer service: A. Burnett; Delivery info: A. Burnett

Free literature available: Catalog 240, Auto-Connect, Radio-Telephone Interconnect, "Catalog 260, Control Head, Mobile Radiotelephone Control Head, Catalog 505, Selective Call, Catalog 512, Identifier System, (ANI) Automatic Number I.D., Catalog 606, 4020, AM Tone Telemetry Sys., Catalog 650, Series 5500 Digital Telemetry Sys. Catalog 750 FSK System

Products manufactured: Alarms, Annunciators, Comm. Systems, Controls/Control Eqpt., Decoders, Detectors, Encoders, Filters, Generators, Monitors, Multiplexers, Oscillators, Receivers, Relays, Standards, Transmission Systems, Data, Transmitters, Transponders

Local Sales Offices & Reps.

Cal	Burbank, RTS Comms.	213-843-3111
Cal	Santa Clara, RTS Comms.	408-247-2310
Conn	Trumbull, SIR Assocs.	203-268-2560
Fla	Orlando, Data Rep. Inc.	305-843-5224
Ill	Arlington Hts., Reshal Assocs.	312-398-7660
Ill	La Grange Park, Bierhaus Sls., Inc.	312-354-5100

Kans Shawnee Mission, Technical Sls. Assoc. 913-888-3330

Mass Lexington, SIR Assocs. 617-862-1812

Mich Lathrup Village, R.C. Nordstrom & Co. 313-559-7373

Minn Minnetonka, T.H. Ayre Assocs. 612-474-4125

NY Liverpool, Lewis & Dunnigan Co. 315-622-2133

NY Oceanside, Bittan Assocs. 516-678-6222

NC Raleigh, A.B. Andrews & Co. 919-833-5565

Ohio Dayton, Dynel Co. 513-434-6467

Pa Philadelphia, V. S. Malta 215-836-5122

Pa Pittsburgh, R.F. Clark Co. 412-242-9500

Tex Dallas, Elcom 214-352-5006

Wisc Milwaukee, Bierhaus Sls., Inc. 414-332-0900

EXP: Dayton, Ohio, Int'l. Sls. Div., Ledex, Inc. 513-224-9891

FOR: Can., Richmond, B.C., Lake Engrg. Co. Ltd. 604-277-0414

FOR: Can., Scarborough, Ont., Lake Engrg. Co. Ltd. 416-751-5980

FOR: Can., St. Laurent 381, Que., Lake Engrg. Co. Ltd. 514-747-2441

BRAND DIELECTRICS, INC., Route 203, N. Windham, Conn., 06256, Tel: 203-423-6321; Empl.: 5

Products manufactured: Compounds, Encapsulating, Insulating, Molding, Potting, Insulators & Insulation, Tapes, Electrical Insulation, Tubing

BRAND-REX CO., Box 498, Willimantic, Conn., 06226, Tel: 203-423-7771; FSC No: 71124; Empl.: 1000; Minimum order: \$100

Products manufactured: Cable, Insulators & Insulation, Tubing, Wire

Local Sales Offices & Reps.

Alas	Anchorage, Rostel Co.	907-344-9247
Cal	Santa Ana, Brand-Rex Co.	714-540-7806
Cal	Sunnyvale, Brand-Rex Co.	408-245-3564
Colo	Denver, Brand-Rex Co.	303-759-2751
Fla	Tampa, Brand-Rex Co.	813-876-4632
Ga	Atlanta, Brand-Rex Co.	404-394-9416
Ga	Roswell, E. Rushin Co.	404-993-6498
Ill	Glenview, Brand-Rex Co.	312-729-5600
Ind	Indianapolis, Brand-Rex Co.	317-844-2860
Iowa	Des Moines, KSW Assocs.	515-279-9235
La	Metairie, Aneson Assocs.	504-835-6445
Md	Baltimore, J.A. Maguire & Co.	301-377-0223
Mass	Clinton, Brand-Rex Co.	617-368-8234
Minn	Hopkins, Grayden & Flemmer	612-941-1120
Mo	Kansas City, KSW Assocs.	816-358-5240
Mo	St. Louis, KSW Assocs.	314-781-6111
NJ	Pennsauken, J.A. Maguire & Co.	609-665-5136
NJ	Plainfield, J.A. Maguire & Co.	201-754-6400
NY	Rhinebeck, Brand-Rex Co.	914-297-6296
Ohio	Aurora, Clark Sls. Co.	216-543-5656
Ore	Portland, Brand-Rex Co.	503-292-9189
Pa	Pittsburgh, Brand-Rex Co.	412-371-3290
SC	Greenwood, H. Reynolds	803-229-6801
Tex	Addison, Parvin Sls. Co.	214-239-9148
Tex	Houston, Parvin Sls. Co.	713-721-1054
Wisc	Brookfield, Brand-Rex Co.	414-392-2141

BRANSON CORP., Vanderhoff Ave., Denville, N.J., 07834, Tel: 201-625-0600, TWX: 710-987-8466; FSC No: 99928; Empl.: 40; Minimum order: \$25

Customer service: J. Witzler

Free literature available: Complete catalog with applications data & QPL listings

Products manufactured: Relays, Sockets, Switches

Local Sales Offices & Reps.

Fla	Orlando, Perrott Assoc. Inc.	305-275-1132
Kans	Prairie Village, Engrg. Svcs. Co.	913-649-4000

Mo	St. Louis, Engrg. Svcs. Co.	314-726-2233
Ohio	Columbus, T. Mulligan & Assoc.	614-457-2242

BRANSON CLEANING EQUIP. CO., Parrott Dr., Shelton, Conn., 06484, Tel: 203-929-7301, TWX: 710-474-0893; Empl.: 300; Minimum order: \$25

For info on price: R. Harvey; Application info: F. Terry; Customer service: R. Harvey; Delivery info: T. Martinez

Free literature available: Bransonic - self-contained ultrasonic cleaners; E - Module - industrial aqueous ultrasonic cleaning equipment; FD-UD Series - industrial solvent ultrasonic cleaning equipment.

Products manufactured: Cleaners, Ultrasonic, Detectors, Generators, Machines/Machinery, Production, Oscillators, Transducers

Local Sales Offices & Reps.

Ariz	Phoenix, H. C. Torrey Assocs.	602-944-0352
Cal	Fullerton, Branson Cleaning Equip.	714-870-6360

Cal Santa Clara, Branson Cleaning Equip. 408-249-2616

Colo Denver, Crump Co. 303-426-1443

Fla Clearwater, MacGregor Assocs. 813-446-7310

Fla Coral Springs, MacGregor Assocs. 305-752-1924

Ga Lilburn, MacGregor Assocs. 404-921-1300

Haw Honolulu, Thom Equip. Co. 808-847-2027

Ill Des Plaines, Branson Cleaning Equip. 312-824-7175

Kans Kansas City, Pacific Scientific Co. 913-381-2600

Mass Woburn, Branson Cleaning Equip. 617-935-8060

Mich Detroit, Gottsman Machinery Assocs. 313-838-5020

Mo Saint Louis, Pacific Scientific Co. 314-731-2440

NJ Stratford, Branson Cleaning Equip. 609-627-2888

NY Rochester, Branson Cleaning Equip. 716-288-0100

NC Charlotte, Branson Cleaning Equip. 704-394-7309

Tex Richardson, Branson Cleaning Equip. 214-234-2477

BRAUN-BUSH CO., 8833 78th St., Woodhaven, N.Y., 11421, Tel: 212-296-3332; Empl.: 26; Minimum order: \$10

For info on price: G. Dinnis; Application info: M. Cheney; Customer service: G. Aitken; Delivery info: M. Thompson

Products manufactured: Brushes & Brush Assemblies

BRAUN CO., INC., 4200 31st St. N., St. Petersburg, Fla., 33714, Tel: 813-526-9104; Empl.: 50; Minimum order: \$25

For info on price: H. Bonser; Application info: H. Bonser; Customer service: A. de Alcala; Delivery info: E. Clarke

Free literature available: 20 page catalog on standard items- finger stock - contact rings - component clips; single page flyer on welded contacts single page flyer on assemblies.

Products manufactured: Clamps & Clips, Contact Strips, Finger, Contacts, Electrical, Springs (All Types)

Local Sales Offices & Reps.

Cal	Los Angeles, El-Com Inc.	213-223-1353
Conn	Glastonbury, Barton & Caron Inc.	203-633-9417
Ill	Chicago, Brock & Cushman	312-622-4110
Mass	Auburndale, Barton & Caron Inc.	617-332-2021
Mich	Chagrin Falls, Bray Assoc. Inc.	216-247-4474
NC	Charlotte, J.C. Jackson Co.	704-536-2713
Pa	Pittsburgh, Buchanan Sls. Co.	412-782-3324

BRAXTON MFG. CO., Echo Lake Rd. N., Watertown, Conn., 06795, Tel: 203-274-6781; Empl.: 35

For info on price: A. F. Anderson; Application info: J. Triano; Customer service: C. Swanson; Delivery info: B. Lyons

Products manufactured: Eyelets, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Cal	Costa Mesa, Braxton Mfg. Co.	714-645-7363
Tex	Richardson, Burns Tech. Sls.	214-423-3379

BRELONIX, INC., 106 North 36th St., Seattle, Wash., 98103, Tel: 206-ME 3-1964; Empl.: 10

Customer service: T. A. Rommel

Free literature available: Brochure describing Model SAM-100 Aircraft SSB Transceiver and Accessories.

Products manufactured: Comm. Systems, Couplers, Receivers, Transmitters

BRINKMANN INSTRS., INC., Cantiague Rd., Westbury, N.Y., 11590, Tel: 516-334-7500, TWX: 510-222-8254; Empl.: 150; Minimum order: \$15
Customer service: K. Peters

Free literature available: Lauda Circulators, baths and accessories, Metrohm Recording Polarographic Analyzer, Wenking Electronic Potentiostats and Galvanostats

Products manufactured: Baths, Controlled Temperature (Air & Liquid), Potentiometers, Recorders

Local Sales Offices & Reps.

Cal Burlingame
Cal Los Angeles
Ill Des Plaines
Md Silver Spring
Mo St. Louis
NY Syracuse
Ohio Cincinnati
Ohio Cleveland
Pa Philadelphia
Tex Houston

BRISTOL SAYBROOK CO., 97 Coulter St., Old Saybrook, Conn., 06475, Tel: 203-388-3414; Empl.: 125
Customer service: G. S. Willis

Free literature available: Free application data and ordering information is available on a complete line of synchronous motors and timing devices. Special modifications are available on OEM quantities.

Products manufactured: Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Indicators, Motors, Relays, Switches, Timers

Local Sales Offices & Reps.

Cal Los Angeles, C.E. Mello Co. 213-626-9159
Cal Palo Alto, O'Donnell Assoc. 415-327-9260
Conn Old Saybrook, M.L. Assoc. 203-388-9718
Ill Chicago, J.C. Angel Co. 212-878-0653
Mass Marlboro, M.L. Assoc. 617-485-6190
Mich Novi, Miltimore Sls. 313-476-2446
Mo Independence, Gribble Sls. Engr. Co.

816-796-4333
NJ Nutley, Challenge Assoc. 201-667-3558
NJ Pitman, Colrud Co. 609-589-5866
NY Camillus 315-672-3988
NY Old Saybrook, Challenge Assoc. 203-388-5562
NY Pittsford 716-381-6714
NC Charlotte, R.W. Chapman Co. 704-525-2421
NC Raleigh, R.W. Chapman Co. 919-782-2624
Ore Beaverton, David Fry Co. 503-643-5448
SC Greenville, R.W. Chapman Co. 803-232-5391
Tex Arlington, Ion Assoc. 817-461-9661

BRITISH AIRCRAFT CORP. (USA INC.), Intratec Div., 399 Jefferson Davis Hwy., Arlington, Va., 22202, Tel: 703-979-1400; Empl.: 100; Minimum order: \$50
Customer service: G.J. McCallum

Products manufactured: Analyzers, Interferometer Systems, Kits, Breadboarding (For Engineers)

BROADVIEW CHEMICAL, 2910 S. 18th St., Broadview, Ill., 60153

BROMBERG ENGINEERING, 12 Simpson Rd., Wayland, Mass., 01778, Tel: 617-653-4285; Empl.: 6

For info on price: J. Swartz; Application info: N. S. Bromberg; Customer service: N. S. Bromberg; Delivery info: J. Swartz

Free literature available: Brochure describing OEM or custom dedicated instrumentation for clinical or pollution analysis employing fluorescence, scattering, polarization, optical density and electrochemistry. Using DAMS and D&SZAMS&II.

Products manufactured: Amplifiers, Interferometer Systems, Lasers & Laser Systems, Meters, Services, Assembly, Production & Test, Spectrometers

BROOKHAVEN INSTRS. CORP., Box 3136, Austin, Tex., 78764, Tel: 512-442-1216; Empl.: 8

For info on price: E. J. Rogers; Delivery info: R. L. Davis

Free literature available: Brochures giving technical specs and descriptive info. on electronic integrators & sweep generators. Price lists.

Products manufactured: Generators, Integrators, Electronic, Services, Assembly, Production & Test

Local Sales Offices & Reps.

NY Port Chester, Radiation Electrns. Inc. 914-937-2300
Tenn Knoxville, Pulcir Inc. 615-693-3461

BROOKS INSTR. DIV., Emerson Elec. Co., Hatfield, Pa., 19440, Tel: 215-368-2000; Empl.: 450
Customer service: N. Wilcox

Products manufactured: Alarms, Controls/Control Eqpt.

Local Sales Offices & Reps.

Ariz Scottsdale, Brooks Instr. Div. Emerson Elec. Co. 602-947-8073
Cal Stanton, Brooks Instr. Div. Emerson Elec. Co. 213-860-4460
Del Wilmington, Brooks Instr. Div. Emerson Elec. Co. 215-724-7373
Ill Westchester, Brooks Instr. Div. Emerson Elec. Co. 312-345-2740
NJ Teaneck, Brooks Instr. Div. Emerson Elec. Co. 212-753-4628

Ohio Cleveland, Brooks Instr. Div. Emerson Elec. Co. 216-884-7036

Pa Hatfield, Brooks Instr. Div. Emerson Elec. Co. 215-247-2366

Tex Houston, Brooks Instr. Div. Emerson Elec. Co. 713-784-4930

BROOKS CO. INC., WINFIELD, Conn. at Fowle St., Woburn, Mass., 01801, Tel: 617-933-5300

For info on price: Miss Salines; Application info: H. A. Perry, Jr.; Customer service: H. A. Perry, Jr.; Delivery info: Miss Salines

Free literature available: Form #52A-description of Tapfree and Alumtap Cutting Fluids.

Products manufactured: Lubricants

BSR (USA) LTD, Route 303, Blauvelt, NY, 10913

BUCHANAN CRIMP TOOL PRODS., Amerace Corp. Control Prods. Div., 1065 Floral Ave., Union, N.J., 07083, Tel: 201-289-2225; FSC No: 5120; OPL No: 22520; Empl.: 65; Minimum order: \$50 p. 2-653

Customer service: J. Nosti

Free literature available: Catalog (T105) 32 page catalog describing full line of manual, pneumatically-operated and automatic feed crimping tools listing Mip-specs and contact types accommodated.

Products manufactured: Tools

Local Sales Offices & Reps.

Cal Van Nuys 213-997-7243

BUCKBEE MEARS CO., 245 E. 6th St., St. Paul, Minn., 55101, Tel: 612-228-6371; Empl.: 1600

Products manufactured: Boards, Printed Circuit, Circuits, Flexible, Circuits, Printed, Multilayer, Laminations, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Cal Los Angeles 213-889-9962
Cal San Jose 408-248-2750
Colo Denver 303-237-3870
Ill Elk Grove Village 312-439-6433
Minn St. Paul 612-228-6371
NH Nashua 603-883-0316
NJ E. Windsor 609-443-3340
NY Manlius 315-469-7394
Ohio Sylvania 419-882-6918
Pa Allentown 215-398-1511
Tex Plano 214-423-3110

BUCKEYE STAMPING CO., 555 Marion Rd., Columbus, Ohio, 43207, Tel: 614-445-8433; Empl.: 75
p. 1-46-48; p. 2-1075

Customer service: J. Willcox

Free literature available: Instrument Knobs; Instrument Cases & Cabinets; Printed Circuit Board Guides & Racks.

Products manufactured: Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Chassis, Metal, Guides, Circuit Board, Knobs, Racks, Stands, Instruments

Local Sales Offices & Reps.

Cal Palo Alto, Engrg. Assocs. 415-326-7842
Cal Pasadena, P. Nurches Co. 213-MU1-8957
Colo Greeley, G. Moss Electrns., Inc. 303-353-1452
Fla St. Petersburg, S. Partak Inc. 813-393-5402
Ill Chicago, W.J. Doyle Co. 312-BR4-6685
Mass Belmont, Electrns. Comp. & Svc. 617-484-8680
Mich Lathrup Village, R.C. Nordstrom Co. 313-559-7373
Minn Minneapolis, A.J. Warner Co. 612-729-7371

Mo Raytown, Production Automation 816-737-0068
NY Lynbrook, P. Saffler Assoc. 516-593-7880
Ohio Columbus, Electrns. Mktg. 614-299-4161
Pa Paoli, T. Griffin Co. 215-647-1550
Tex Houston, Southland Engrg. & Sls. 713-462-4077
Wash Seattle, Underwood & Underwood 206-243-2133

BUD RADIO, INC., 4605 E. 355th St., Willoughby, Ohio, 44094, Tel: 216-946-3200, TWX: 810-427-2604; Empl.: 200 p. 1-54,55

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Benches, Consoles, Stools, Tables, Blowers & Fans & Accessories, Boxes, Junction, Outlets & Wall Plates, Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Chassis, Metal, Connector Boxes & Strips, Power Outlet, Drawers, Sliding, Frames, Cabinet & Rack, Handles For Cabinets, Circuit Boards, Racks, etc., Panels, Racks, Services, Assembly, Production & Test, Slides, Cabinet & Chassis

Local Sales Offices & Reps.

Ariz Scottsdale, J. Berman Co. 602-994-8081
Cal Inglewood, J. Berman Co. 213-649-6111
Cal San Carlos, D.H. Ross Co. 415-591-4411
Colo Denver, Lindberg Co. 303-758-9033
Fla Orlando, Cartwright & Bean Co. 305-422-4531
Fla Plantation, Cartwright & Bean Co. 305-791-3989

Ga Atlanta, Cartwright & Bean Co. 404-255-5262

Ill Chicago, GNB Assocs. 312-673-4050

Ind Indianapolis, Southern Sls. Corp. 317-257-7575

Iowa Cedar Rapids, Palatine Engrg. Sls. 319-365-8071

Kans Andover, Palatine Engrg. Sls. 316-683-7512

Kans Overland Park, Palatine Engrg. Sls. 913-262-5643

La Chalmette, Cartwright & Bean Co. 504-279-4598

Mass Needham, Mullin Tech. Sls. 617-444-4780

Mich St. Clair Shores, J.M. Thorpe 313-779-6363

Minn Minneapolis, C. Gibb Co. 612-377-1200

Miss Jackson, Cartwright & Bean Co. 601-981-1368

Mo St. Louis, Palatine Engrg. Sls. 314-426-7055

NJ Cherry Hill, Trinkle Sls. 609-795-4200

NY Rochester, Marsey Sls. 716-442-9700

NY Rockville Centre, Willgold 516-764-4022

NC Charlotte, Cartwright & Bean Co. 704-333-6457

NC Raleigh, Cartwright & Bean Co. 919-932-7128

NM Albuquerque, Lindberg Co. 505-345-2489

Ohio Cleveland, Marlow Assocs. 216-932-0900

Ohio Xenia, Marlow Assocs. 513-426-6270

Ore Portland, Earl & Brown Co. 503-245-2283

Tenn Knoxville, Cartwright & Bean Co. 615-693-7450

Tenn Memphis, Cartwright & Bean Co. 901-276-4442

Tex Dallas, Lund & Co. 214-358-4335

Utah Salt Lake City, Lindberg Co. 801-364-6409

Wash Seattle, Earl & Brown Co. 206-284-1121

BUDWIG MFG. CO., P.O. Box 97, Ramona, Calif., 92065, Tel: 714-789-0900; FSC No: 31827; Empl.: 50

Customer service: E. Creighton

Free literature available: Form 663-D Data-Straps, Grommets; Form 712-A Data Cabinet Feet; Form 906 Data Antenna Connectors.

Products manufactured: Bumpers, Clamps & Clips, Grommets

BULOVA WATCH CO., FREQ CONTROLS DIV., Electrns. Div., 61-20 Woodside Ave., Woodside, N.Y., 11377, Tel: 212-335-6000; Minimum order: \$100
p. 1-4,284-295,1124

For info on price: W. Carnes; Application info: M. Isola; Customer service: M. F. Casino; Delivery info: M. Isola

Products manufactured: Amplifiers, Analyzers, Bridges, Calibrators, Chargers, Battery, Chokes, Choppers, Chronometers, Cleaners, Ultrasonic, Clocks (All Types), Coders, Coils Including Assemblies & Forms, Comparators, Controls/Control Eqpt., Converters, Counters, Crystals, Decoders, Demodulators, Detectors, Dividers, Drivers, Chopper, Filter Synthesizers, Filters, Generators, Inverters, Keys, Tones, Light Choppers, Meters, Modulators, All Kinds, Monitors, Networks, Oscillators, Power Supplies, Receivers, Records, Frequency Test, Regulators, Scanners, Servo Systems, Standards, Switches, Timers, Transducers, Tuning Forks

Local Sales Offices & Reps.

Ariz Scottsdale, Carter Assocs. 602-947-4355

Cal Menlo Park, Straube Assocs. 415-323-2476

Colo Boulder, Straube Assocs. 303-443-8600

Conn Suffield, Terrance P. Dunn Co. 203-668-0446

Fla Clearwater, Purrett Assocs. 813-531-5513

Fla	Orlando, Perrott Assocs.	305-275-1132
Ill	Chicago, Techrep, Inc.	312-761-0548
Iowa	Cedar Rapids, J.R. Sls. Engrg. Inc.	319-377-8211
Kans	Prairie Village, Engrg. Svcs. Inc.	913-649-4000
Md	Baltimore, Callas Elctns. Inc.	301-744-7711
Mass	Chelmsford, Underwood Sls.	617-256-8191
Minn	Minneapolis, Tornolson Assocs.	612-835-2414
Mo	St. Louis, Engrg. Svcs. Co.	314-997-1515
NJ	Englewood Cliffs, E. Glass Assocs.	201-592-0200
NY	Buffalo, H.C. Johnson Agencies	716-632-7880
NY	Fayetteville, H.C. Johnson Agencies	315-637-9383
NY	Guiderland, H.C. Johnson Agencies	415-456-9681
NY	Rochester, H.C. Johnson Agencies	716-482-3000
Ohio	Akron, Avoy Natalino Assocs.	216-725-6087
Ohio	Dayton, Avoy Natalino Assocs.	513-223-5002
Ore	Portland, J. J. Backer	503-297-3776
Pa	Glenshaw, H.C. Johnson Agencies	412-961-0414
Pa	Philadelphia, Eastern Comps.	215-927-6262
Tex	Dallas, United Comps.	214-324-1448
Wash	Seattle, J.J. Backer	206-285-1300
EXP:	New York, N.Y., C. Tunnant & Sons	212-679-1300
EXP:	New York, N.Y., Landseas Corp.	212-265-8323

BULOVA WATCH CO., SERVO PRODS. ELCTRNS. DIV., 61-20 Woodside Ave., Woodside, N.Y., 11377, Tel: 212-335-6000, TWX: 710-582-2637; Minimum order: \$100 p. 1-1910-1913
Customer service: Ed Cohen

Products manufactured: Amplifiers, Controls/Control Eqpt., Servo Systems

BULOVA WATCH CO., Sys. & Instrs. Div., Green Acres Rd., W. Valley Stream, N.Y., 11582, Tel: 516-561-2600, TWX: 510-225-8409; Empl.: 750

Products manufactured: Switches, Testers, Timers

BULOVA WATCH CO., Timer Lab., Bulova Pk., Flushing, N.Y., 11370, Tel: 212-DE 5-6000, TWX: 212-672-0344; Minimum order: \$25
Customer service: A. Craig

Free literature available: Descriptions of applications of precision D.C. clocks and timers in a variety of scientific projects.

Products manufactured: Clocks (All Types), Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Indicators, Timers

BUNKER-RAMO CORP., Elctrn. Sys. Div., 31717 La Tienda Dr., Westlake Village, Cal, 91361, Tel: 213-889-2211, TWX: 910-494-1234

Products manufactured: Comm. Systems, Computers, Hydrophones & Accessories, Oceanographic Equip. (Electronic), Underwater Communication, Detection, Navigation, etc. Equipment

BUNTING, BRASS & BRONZE CO., Div. N.I. Inds., Inc., 715 Spencer St., Toledo, Ohio, 43609, Tel: 419-382-3451, Telex: 28-6413; Empl.: 450; Minimum order: \$25

For info on price: J. J. Doherty ext 276; Application info: R. A. Peterson ext 224; Customer service: C. Serence ext 214; Delivery info: C. Serence ext 214

Free literature available: #72 catalog - Stock listing of cast bronze and powder metal oil-filled bearings. #5 catalog - Engineering data on powder metal.

Products manufactured: Bearings, Bushings, Glass, Plastic, Metal, Rubber, Etc.

Local Sales Offices & Reps.

Cal	Los Angeles	213-747-5566
Ga	Atlanta	404-876-6316
Ill	Elk Grove Village	312-593-2750
NJ	Robbinsville	609-587-5705

BURDETTE BUSS BARS, INC., 383 Kings Hwy., Cherry Hill, N.J., 08034, Tel: 609-931-1300; Empl.: 7; Minimum order: \$50

For info on price: R. Kemper 609-931-1300; Application info: D. Kemper 609-931-1302

Products manufactured: Bus Bars & Systems, Connectors

Local Sales Offices & Reps.

Fla	Casselberry, Pubicover Assocs.	305-834-5775
Md	Timonium, Technical Mktg. Co.	301-252-4780
Mass	Westboro, Technical Mktg. Co.	617-366-8460
NJ	Mt. Ephraim, Burdette Co.	609-931-1309

BUREAU ENGRAVING, INC., Ind'l. Div., 219 N. Second St., Minneapolis, Minn., 55401, Tel: 612-339-8001, TWX: 910-576-2733; Empl.: 550; Minimum order: \$500

For info on price: J. Patterson; Application info: J. Patterson; Customer service: J. Patterson; Delivery info: B. Currie

Products manufactured: Boards, Printed Circuit, Circuits, Flexible, Circuits, Printed, Multilayer

BURGESS BATTERY, See Gould Inc., Portable Battery Div.

BURGESS SWITCH CO., 777 Warden Ave., Scarborough, Ont., Ont., Can., MIL 4C3, Tel: 416-751-8280; FSC No: 36497; Empl.: 1000; Minimum order: \$25

For info on price: Sls. Order Off.; Application info: Tech. Sls. Off.; Customer service: Cust. Svc. Dept.; Delivery info: Exped. Dept.

Free literature available: Ultraminiature micro switches.

Products manufactured: Switches

Local Sales Offices & Reps.

Fla	Clearwater, Lynch Gentry Assoc.	813-443-2697
Ga	Atlanta, Murphy & Cota	404-875-2525
Ill	Des Plaines, Lincoln Hodges	312-297-3810
Mass	Waltham, R.J.C. Assocs.	617-899-5858
Mich	Bloomfield Hills, R. C. Dakin Co.	313-647-2262
Minn	St. Paul, Kenco Co.	612-645-7717
NJ	Clifton, Faber Assocs.	201-773-8900
NY	Buffalo, Niagara Elec.	716-886-4000
NY	Rochester, Niagara Elec.	716-271-1223
NY	Syracuse, Niagra Elec.	315-437-1656
Ohio	Cleveland, Anderson-Bolds	216-229-4700
Tex	Dallas, Wm. Reese Corp.	214-638-6575
Wisc	Waukesha, Lincoln Hodges Assocs.	414-542-3087

BURLING INSTR. CO., 16 River Rd., Box 298, Chatham, N.J., 07928, Tel: 201-635-9481; Empl.: 27; Minimum order: \$10

For info on price: J. Price; Application info: T. Mick; Customer service: J. Price; Delivery info: I. Altman

Products manufactured: Controls/Control Eqpt., Monitors, Switches, Thermostats

Local Sales Offices & Reps.

Cal	Los Angeles, C. Meriam Co.	213-269-8271
Cal	Mountain View, Claypool Controls Co.	415-968-7488
Colo	Denver, Toncray Equip. Co.	303-CH4-1102
Conn	Bridgeport, M.A. Selmon Co.	203-366-3651
Fla	Cantonment, C.B. Metcalf Co.	904-476-7710
Fla	Jacksonville, Olen Sls. Corp.	904-744-3988
Fla	Miami, Henning Co.	305-NA4-5832
Ga	Atlanta, J.R. Stilwell Co.	404-237-9844
Haw	Honolulu, Berkley Engrg. & Equip. Co.	
Ill	Chicago, Kelburn Engrg. Co.	312-775-6383
La	New Orleans, Gilbert & Assocs.	504-UN6-7444
Md	Baltimore, G. Goodman Ind.	301-837-3210
Mich	Roseville, H.C. Engelman Co.	313-777-0750
Minn	Minneapolis, Industria Co.	612-929-6224
Mo	Florissant, H and R Sls. & Engrg. Co.	314-837-3966
Neb	Omaha, H.G. Klug Co.	402-553-1377
NJ	Springfield, RJM Sls.	201-467-1210
NJ	Westfield, Mechanical Specialties Co.	201-233-9188
NY	Rochester, H.C. Johnson Agencies	716-482-3000
NC	Charlotte, Brown & Morrison	704-ED3-0774
Ohio	Bay Village, C. H. Joy Co.	216-TR1-5900
Ohio	Cincinnati, BC Engrg. Co.	513-891-6122
Okla	Tulsa, Quigg Process Equip. Co.	918-587-0166
Pa	Broomall, J.C. Whiddett Co.	215-353-6343
Pa	Glenshaw, H.C. Johnson Agencies	412-961-0414
Tex	Arlington, Pan-Tech Engrg. Co.	817-261-4111
Tex	Houston, Pan-Tech Engrg. Co.	713-623-0640
Tex	Odessa, Banqo, Inc.	915-332-0293
Wash	Kirkland, Unit Process Co.	206-822-0241
EXP:	New Haven, Conn., Masten-Wright Corp.	203-288-1638
FOR:	Can., Thornhill, Ont., Baker Instrs. Ltd.	416-889-8642
FOR:	Can., Vancouver, B.C., J. Sherman Co.	604-254-3113

BURLINGTON OPERS. DIV., Electronized Chems. Corp., S. Bedford St., Burlington, Mass., 01803, Tel: 617-272-2850, TWX: 710-332-0502; FSC No: 24011; Empl.: 125; Minimum order: \$25

Customer service: W.P. Broderick

Free literature available: Short Form Catalog contains synopsis of heat shrinkable tubings, tapes, and parts available from E.C.C. Gives data relating to electrical, mechanical and chemical properties of various heat shrinkable materials.

Products manufactured: Caps, Forms & Tapes, Heat Shrinkable, Heat Guns, Production, Laminates, Services, Assembly, Production & Test, Tapes, Electrical Insulation, Tubing

BURNDY CORPORATION, Richards Ave., Norwalk, Conn., 06852, Tel: 203-838-4444, TWX: 710-468-2546; Empl.: 3500

For info on price: S. Miller; Application info: J. F. Bradley; Customer service: S. Miller; Delivery info: S. Miller

Free literature available: HYLOK&T Connectors-Multi-pin, rectangular connectors, HYPOINT&T-Leadless IC receptacles, TRIMTRIO&T-Rectangular, OIKMATE&T & Round Connectors, Power & Coax Contacts, Large HYRING&T Assemblies-for termination of multi-conductor shielded cable, Smooth BANTAM&T Connectors, Solder BANTAM Connectors, Rack and Connector, Terminals & Splices, LG107-1, Printed Circuit Connectors Rack and Panel Connectors, Terminals & Splices, LG107-1, Printed Circuit Connectors

Products manufactured: Cable, Connectors, Contacts, Electrical, Holder & Carriers, Integrated Circuit Packaging Systems, Limiters, Machines/Machinery, Production, Sockets, Splices, Coaxial Cable, Splices, wire (Including, Butt & Cap Types), Terminal Blocks, Boards & Strips, Terminals, Tools, Wire & Cable Ties, Wire Strippers

Local Sales Offices & Reps.

Ariz	Phoenix, Burndy Corp.	602-947-5715
Ark	Little Rock, C.H. Stout, Inc.	501-374-8201
Cal	El Segundo, Burndy Corp.	213-772-5401
Cal	San Diego, Burndy Corp.	714-278-7131
Cal	Santa Clara, Burndy Corp.	408-249-5353
Colo	Denver, Burndy Corp.	303-377-8859
Conn	Norwalk, Burndy Corp.	203-838-4444
Fla	Ft. Lauderdale, Burndy Corp.	305-685-6446
Fla	Winter Park, Burndy Corp.	305-851-7430
Ga	Atlanta, Burndy Corp.	404-292-1633
Ill	Schiller Park, Burndy Corp.	312-678-5211
La	New Orleans, C.H. Stout of LA, Inc.	504-486-3707
La	Shreveport, C.H. Stout of Shreveport, Inc.	318-425-5485
Md	Silver Spring, Bradley Electro Sls. Corp.	301-587-1886
Mass	Dedham, Burndy Corp.	617-326-6386
Mich	Troy, Burndy Corp.	313-557-2668
Minn	Bloomington, Burndy Corp.	612-835-2500
Miss	Jackson, C.H. Stout, of Miss. Inc.	601-354-4326
Md	St. Louis, Burndy Corp.	314-878-4294
Mo	Kansas City, Burndy Corp.	816-353-3131
NY	Pelham, Burndy Corp.	914-738-3200
NY	Rochester, Burndy Corp.	716-381-3792
NY	Syracuse, Burndy Corp.	315-422-3990
NC	Greensboro, Burndy Corp.	919-274-8441
Ohio	Cleveland, Burndy Corp.	216-749-2665
Ohio	Dayton, Burndy Corp.	513-222-7997
Ore	Portland, Burndy Corp.	503-244-8559
Pa	Philadelphia, Burndy Corp.	215-265-1615
Pa	Pittsburgh, Muller, Harper & Assoc.	412-931-6460
Tenn	Memphis, C.H. Stout of Tenn., Inc.	901-362-1616
Tex	Dallas, Burndy Corp.	214-231-1456
Tex	Houston, Burndy Corp.	214-231-1456
Va	Richmond, Bradley Electro Sls. Corp.	804-649-8787
Wash	Seattle, Burndy Corp.	206-624-5442
WVa	Charleston, Skaff Engrg. Co.	304-342-0131
EXP:	Norwalk, Conn., Burndy Corp.	203-838-4444

BURNS ENGRG., INC. cont'd

Advertisement

Platinum, Nickel & special RTD's. Interchangeability 0.1°F or 0.1% of temperature (Precision Series) or 3/4° for 1/2% of temperature (Relia Bulb Series). Also 1/4° F Interchangeability over any span of 75° F or less. Thermocouples and specialized electronics. STOCK DELIVERY ON SEVERAL MODELS

BURR-BROWN, 6730 S. Tucson Blvd., Tucson, Ariz., 85734, Tel: 602-294-1431, TWX: 910-952-1111; Empl.: 405

Products manufactured: Amplifiers, Capacitors, Fixed, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Comparators, Converters, Dividers, Filters, Generators, Integrated Circuit Devices, IC's, Active Filters, Multiplexers, Multipliers, Networks, Power Supplies, Voltage Sources

Local Sales Offices & Reps.

Ga	Atlanta, BCS Assocs.	404-874-9925
Ala	Huntsville, BCS Assocs.	205-881-6220
Ala	Mobile, BCS Assocs.	205-342-9670
Ariz	Tucson, Burr-Brown Research Corp.	602-294-1431
Cal	San Diego, Elctn. Mktg. Specialists	714-566-1000
Cal	San Jose, Burr-Brown Research Corp.	408-984-7700
Cal	Santa Ana, Burr-Brown Research Corp.	714-835-0712
Cal	Sherman Oaks, Elctn. Mktg. Specialists	213-990-4244
Cal	Sunnyvale, Elctn. Mktg. Specialists	408-245-9291
Fla	Ft. Lauderdale, BCS Assocs.	305-735-7641
Fla	Orlando, BCS Assocs.	305-896-4881
Ill	Addison, Burr-Brown Research Corp.	312-832-6520
Md	Silver Spring, QED Elctns.	301-588-8134
Mass	Wakefield, Meas. Equip. Co.	617-245-4870
Mich	Farmington, Sheridan Assocs.	313-477-3800
Minn	Minneapolis, ECR, Inc.	612-831-4547
Mo	Florissant, Sheridan Assocs.	314-837-5200
NJ	Camden, QED Elctns., Inc.	215-925-8711
NY	Clinton, Advanced Comps. Corp.	315-853-6438
NY	Endicott, Advanced Comps. Corp.	607-785-3191
NY	Mt. Vernon, QED Elctns., Inc.	914-664-0080
NY	Syracuse, Advanced Comps. Corp.	315-699-2671
NC	Greensboro, BCS Assocs.	919-273-1918
Ohio	Cincinnati, Sheridan Assocs.	513-761-5432
Ohio	Cleveland, Sheridan Assocs.	216-524-8120
Okla	Tulsa, Norvell Assocs.	918-663-1247
Pa	Pittsburgh, Sheridan Assocs.	412-244-1640
Tex	Dallas, Norvell Assocs.	214-350-6771
Tex	Houston, Norvell Assocs.	713-774-2568
Wash	Seattle, Hayes Tech.	206-763-2210
FOR:	Calgary, Alb.	403-261-0780
FOR:	Can., Longueuil, Que.	514-670-1212
FOR:	Can., Malton, Ont.	416-678-1500
FOR:	Can., Ottawa, Ont.	613-829-9651
FOR:	Can., Vancouver, B.C.	604-253-7136

BURROUGHS CORP., Electronic Components Div., Box 1226 - Mt. Bethel Rd., Plainfield, N.J., 07061, Tel: 201-757-3400, TWX: 710-997-9539; Empl.: 1100

For info on price: R. Pignatello 201-757-5000; Application info: G. Weber; Customer service: R. Pignatello; Delivery info: R. Pignatello

Products manufactured: Display Devices/Displays, Tubes

Local Sales Offices & Reps.

Cal	Palo Alto	415-321-5363
Cal	Santa Ana	714-835-7335
Ga	Atlanta	404-633-0606
Mass	Brockton	617-364-3220
Mich	Royal Oaks	313-545-3250
NY	Henrietta	716-544-8582
Ohio	Kettering	513-299-5174
Tex	Dallas	214-748-9863
Va	McLean	703-893-2950

BURROUGHS CORP., OEM Sales, 460 Sierra Madre Villa, Pasadena, Cal., 91109, Tel: 213-351-6551, TWX: 910-585-1835; Empl.: 50,000

Products manufactured: Comm. Systems, Computers, Encoders, Memory Systems, Modulator/Demodulators, Perforators, Printers, Punched Card Equipment, Readers, Recorders, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Ala	Huntsville	205-539-4433
Ariz	Phoenix	602-264-1281
Ark	Little Rock	501-FR 2-4121
Cal	Los Angeles	213-483-4520
Cal	San Diego	714-560-7222
Cal	San Francisco	415-UN 3-4062
Colo	Denver	303-861-8222
Conn	Hartford	203-AD 3-9871
Del	Wilmington	302-478-4200
DC	Washington	202-833-3280
Fla	Jacksonville	904-EX8-1551
Fla	Orlando	305-628-0999
Ga	Atlanta	404-881-8888
Haw	Honolulu	808-949-4171
Idaho	Boise	208-343-4911
Ill	Chicago	312-WA2-7600
Ill	Springfield	217-528-3455
Ind	Indianapolis	317-925-9051
Iowa	Cedar Rapids	319-393-1812
Iowa	Sioux City	712-258-7552
Kans	Wichita	316-MU2-6536
Ky	Lexington	606-253-2626
La	Baton Rouge	504-926-0012
Me	Portland	207-SP 3-8119
Md	Baltimore	301-667-9700
Mass	Lexington	617-862-9810
Mich	Detroit	313-972-7300
Mich	Lansing	517-IV 5-9401
Minn	Minneapolis	612-870-1891
Miss	Jackson	601-956-5004
Mo	Kansas City	816-421-0202
Mo	St. Louis	314-534-7510
Neb	Omaha	402-344-4105
NH	Manchester	603-NA 7-7686
NJ	Paterson	201-967-0800
NJ	Trenton	609-883-5670
NM	Albuquerque	505-247-1594
NY	Buffalo	716-877-4774
NY	New York	212-972-3000
NY	Syracuse	315-463-8651
NY	W. Hempstead	516-483-6625
NC	Raleigh	919-876-6827
ND	Fargo	701-AD 2-71: 5
Ohio	Cincinnati	513-242-3790
Ohio	Cleveland	216-398-6700
Ohio	Columbus	614-224-7248
Okla	Oklahoma City	405-843-9437
Okla	Tulsa	918-LU 7-5138
Ore	Portland	503-639-9660
Pa	Philadelphia	215-LO 8-1400
Pa	Pittsburgh	412-343-3622
RI	E. Providence	401-GE 4-1811
SC	Columbia	803-772-8274
Tenn	Knoxville	615-588-7451
Tenn	Nashville	615-385-0082
Tex	Dallas	214-R18-9861
Tex	Houston	713-688-6911
Utah	Salt Lake City	801-DA 8-8947
Vt	Burlington	802-864-6861
Va	Roanoke	703-DI 3-1537
Wash	Seattle	206-MA 3-1780
WVa	Wheeling	304-CE 2-0690
Wisc	Milwaukee	414-UP 3-8600

BURWEN LAB. INC., 209 Middlesex Tpke., Burlington, Mass., 01803, Tel: 617-273-1488; Empl.: 84

Customer service: R. Bollman

Free literature available: Specification sheets that cover bandwidths & applications on all Burwen dynamic noise filters, specs on modules, users list, application sheets.

Products manufactured: Amplifiers, Detectors, Filters, Networks

BUSSCO ENGRG., 119 Standard St., El Segundo, Cal., 90245, Tel: 213-322-6580, TWX: 910-348-6295; Empl.: 95; Minimum order: \$50

For info on price: Sls Dept; Application info: Engrg Dept; Customer service: P. Wainscott; Delivery info: P. Wainscott

Free literature available: General Catalog

Products manufactured: Backpanel Interconnect Systems, Bus Bars & Systems, Terminals

Local Sales Offices & Reps.

Cal	San Carlos, Lodan, Inc.	415-592-4600
Cal	San Diego, AAA Sls.	714-565-0122
Colo	Denver, Todd Assoc., Inc.	303-761-7801
Conn	North Haven, Forsberg Sls.	203-239-5111

Fla	Eau Gallie, J. J. Smith Manufacturers Rep.	305-727-3163
Ill	Oak Park, M. Reith	312-383-5728
Mass	Brockton, Forsberg Sls.	617-522-6300
Mich	Grand Rapids, R. P. Urban & Assoc.	616-245-0511
Minn	St. Paul, Countryman & Assoc.	612-645-9151
NJ	So. Bound Brook, Jolt Elctn. Sls.	201-469-2030
NY	Rochester, R. P. Kennedy Co.	716-271-6322
Pa	LaFayette Hill, M.C.D. Assoc.	215-828-0560
Tex	Dallas, E. B. Robertson, Inc.	214-942-2716
Tex	Houston, E. B. Robertson, Inc.	713-785-6800
Va	McLean, Carwithen Assoc.	301-589-9112
Wash	Bellevue, H. Paulman Sls.	206-455-3311

BUSSMANN MANUFACTURING, Div.
McGraw-Edison Co., University at Jefferson, St. Louis, Mo., 63107, Tel: 314-421-1740; FSC No: 5920; CPL No: Multiple; Minimum order: \$15

For info on price: N. Schmitz; Application info: W. Curtis; Customer service: N. Schmitz; Delivery info: N. Schmitz

Free literature available: BUSS Form SFB - 28 page catalog featuring the complete line of Fuses, Fuseholders, Fuse Blocks and Accessories

Products manufactured: Clamps & Clips, Fuses, Indicators

Local Sales Offices & Reps.

Ala	Montgomery, A. Ashurst	205-328-9623
Cal	Los Angeles, L. Waggoner	213-263-7105
Cal	San Francisco, R. Madden	415-282-8220
Colo	Denver, L. Hall	303-322-2189
Conn	Cheshire, J. Miller	203-624-2440
Fla	Clearwater, W. Penhalligon	813-531-5112
Ga	Chamblee, L. Acker	404-457-1356
Ill	Northlake, J. Waters	312-562-3370
Ill	Peoria Heights, V. Saporita	309-685-9897
Ind	Carmel, J. Adams	317-637-9606
Iowa	Davenport, T. Bates	319-355-5400
Kans	Overland Park, B. Favaloro	816-EM3-3700
Ky	Louisville, M. Dickson	502-451-7652
La	New Orleans, A. Richard	504-488-5333
Md	Baltimore, J. Rambo	301-243-1717
Mass	Winchester, C. Dane	617-HA6-2122
Mich	Grand Rapids, R. Berry	616-949-4660
Mich	Southfield, T. Ewald	313-961-9405
Minn	Minnetonka, R. Norris	612-935-6280
Mo	St. Louis, P. Friemel	314-421-1740
Neb	Bellevue, B. Shriver	402-341-9224
NJ	Newark, A. Cox	201-484-3500
NY	Brewerton, P. Palys	315-422-1929
NY	Fairport, G. Goyette	716-377-7591
NY	New York, T. Lawless	212-267-1466
NC	Greensboro, K. Williams	919-299-3348
Ohio	Cincinnati, J. Wulfmeyer	513-241-1740
Ohio	Orient, J. Wise	614-237-9810
Ohio	Strongsville, G. Ockuly	216-561-4875
Ohio	Toledo, J. Atkins	419-241-1141
Okla	Oklahoma City, H. Gossage	405-751-4996
Okla	Tulsa, L. Welborn	918-742-5914
Ore	Lake Oswego, S. Dyrnes	503-234-0281
Pa	Newtown Square, A. Branning	215-K16-0644
Pa	Pittsburgh, H. Slack	412-364-5230
Tenn	Memphis, R. Terry	901-397-2306
Tex	Dallas, J. Tubbesing	214-357-8357
Tex	Houston, E.H. McGowan	713-526-3101
Utah	Salt Lake City, O. Christiansen	801-363-4596
Va	Hayes, W. Kirkland	804-642-5550
Wash	Seattle, R. Shipek	206-R03-1350
Wisc	Milwaukee, W. Burbach	414-964-3185

C & A PRODUCTS, INC., 37-12 58th St., Woodside, N.Y., 11377, Tel: 212-779-4303; Empl.: 37 ... p. 1-148-151

Customer service: R. M. Bogen

Free literature available: Synchro-to-Digital Converters, Angle Position Indicators, Synchro-to-Linear DC Converters, Multiplexed Synchro-to-Digital Converters, Digital-to-Sine-Cosine DC Converters, Digital-to-Synchro Converters, Synchro-to-Sine-Cosine DC Converters, Absolute Shaft Angle Encoders.

Products manufactured: Amplifiers, Controls/Control Ept., Converters, Demodulators, Detectors, Encoders, Indicators, Meters, Programmers, Repeaters, Servo, Resolvers, Synchro, Servo Systems, Standards, Switches, Synchro Transmitters, Solid-State, Testers, Transducers.

C-COR ELCTRNS., D., 60 Decibel Rd., State College, Pa., 16801, Tel: 814-238-2461, TWX: 510-691-1933; FSC No: 12775; Empl.: 150; Minimum order: \$25

Customer service: G. H. Rachau

Free literature available: 1974-75 Industrial Short Form Catalog, Industrial Amplifier Catalog Data Sheets, Cable Television Systems and Products Catalog 1974-75, Cable Television Systems and Products Price List July 15, 1974

Products manufactured: Amplifiers, CATV Systems & Equipment, Converters, Mixers

Local Sales Offices & Reps.

Cal Canoga Park, C-COR Elctns., Western
213-887-0754
Cal Los Altos, Astroel, Inc. 415-948-3636
DC Wash., Eastern Instr. 301-839-3800
Va Richmond, Eastern Instr., Inc. 703-644-6622
EXP: NY, N.Y., S. Ginsbury 212-689-5212

C-F ELECTRONICS, INC., 14709 Keswick St., Van Nuys, Cal., 91405, Tel: 213-781-3849; FSC No: 5905; Empl.: 50; Minimum order: \$15

For info on price: K. Landers; Application info: R.G. Jordan; Customer service: K. Landers; Delivery info: K. Landers

Free literature available: Catalog Free samples when ordered on company purchase order

Products manufactured: Networks, Resistors, Shunts, Meter

Local Sales Offices & Reps.

Ariz Phoenix, Moltronics of Ariz. 602-272-7951
Ariz Phoenix, MIRCO Electronics 602-944-2281
Ariz Phoenix, Parts Electronics 602-258-6476
Cal San Diego, Ohm Spun Electronics
714-277-6230
Cal Santa Clara, Mauldin Co. 408-249-7660

C & K COMPONENTS, INC., 103 Morse St., Watertown, Mass., 02172, Tel: 617-926-0800, TWX: 710-327-0460; FSC No: 09353; Empl.: 190; Minimum order: \$1 p. 1-1968, 1969

For info on price: S. Trocki; Application info: J. Martinec; Customer service: N. Seldon; Delivery info: M. Kincaid

Products manufactured: Switch Hardware, Switches

Local Sales Offices & Reps.

Ala Huntsville, Beacon Mfg. 205-881-5031
Ariz Scottsdale, Engrg. Sls. Assoc. 602-945-5781
Cal Los Altos, Ewing-Foley Inc. 415-941-4525
Cal Los Angeles, Universal Comp. Co.
213-641-4255
Colo Arvada, Arrowhead Sls. Corp. 303-423-5556
Ga Atlanta, Beacon Mfg. 404-351-3654
Ill Des Plaines, Control Sls. 312-296-5595
Minn St. Louis Park S., Beta Engrg. Co. 612-925-4422
NJ Cherry Hill, Quality Comps. 609-428-6266
NY Elbridge, L-Tron Corp. 315-689-3787
NY Mt. Vernon, D. Sonkin Assoc. 914-668-9809
Ohio Cincinnati, F.E. Kahsar Sls. 513-471-9011
Ohio Hudson, F.E. Kahsar Sls. 216-653-6808
Tex Richardson, R.F. Kimball Co. 214-231-3447
Utah Salt Lake City, Arrowhead Sls. Corp.
801-487-0036

Local Distributors

Ala Huntsville, Cramer
Alas Anchorage, Yukon Radio Supply
Ariz Phoenix, Kierluff Elctns.
Cal Gardena, Santa Monica Bell
Cal Glendale, RCA, Cramer
Cal Los Angeles, Fisher Switches
Cal Los Angeles, Kierluff Elctns.
Cal Menlo Park, Bell Inds.
Cal Palo Alto, Kierluff Elctns.
Cal Redwood City, Cramer Elctns.
Cal San Diego, Kierluff Elctns.
Cal San Diego, R&C/Cramer
Cal Santa Clara, Fisher Switches
Cal Santa Clara, Fisher Switches
Colo Denver, Kierluff Elctns.
Conn Hamden, Wilshire Elctns.
Fla Miami, Electronics Equip.
Fla Orlando, Hallmark Elctns. Corp.
Fla Orlando, Hammond Elctns.
Fla Palm Beach Gardens, Controlled Distr.
Ga Atlanta, Cramer/Atlanta
Ill Palatine, Cramer/Chicago
Ill Rosemont, Advent Elctns.
Ill Westchester, L-Comp, Inc.
Ind Ft. Wayne, Ft. Wayne Elctns. Supply
Iowa Cedar Rapids, Deeco, Inc.
Kans Wichita, Radio Supply Elctns.
Ky Owensburg, Ohio Valley Sound
Md Baltimore, Arrow Elctns.
Mass Burlington, Arrow Elctns.
Mass Dedham, Gerber Elctns.
Mass Needham, Schley/Kierluff
Mass Newton, Cramer Elect.
Mass Watertown, D.R.W. Elec. Corp.
Mich Ann Arbor, Advent

Minn St. Louis, Park Elctns.
Mo St. Louis, L-Comp, Inc.
Neb Lincoln, Scott Elect. Supply Corp.
NJ Moorestown, Arrow-Angus
NJ Springfield, Route Elect.
NM Albuquerque, Kierluff Elctns.
NY Albany, E. E. Taylor
NY Bohemia, Car Lac Elctns.
NY Buffalo, Summit Distr.
NY Hempstead, Elctn. Equip.
NC Raleigh, Pytronics
Ohio Dayton, Esco, Inc.
Okla Oklahoma City, Hallmark Elctns. Corp.
Pa Huntington Valley, Hallmark Elctns.
Pa Montgomeryville, Pytronics Inds.
Pa Paoli, F.J.R./Kierluff-Phil.
Tex Dallas, Hallmark Elctns. Corp.
Tex Houston, Altair Co.
Utah Salt Lake City, Kimball Elctns.
Va Richmond, Meridian Elctns.
Wash Bellevue, Bell Inds.
Wash Seattle, Kierluff Elctns.
Wisc Mequon, Taylor Elect. Co.
Wyo Cheyenne, Houge Radio & Supply Co.

CABLE SYSTEMS & ASSEMBLY CO., INC., 210 Broadway, Everett, Mass., 02149, Tel: 617-387-7550; FSC No: 33426; Empl.: 65; Minimum order: \$48

For info on price: T. Armelin; Application info: E. Vecchia; Customer service: T. Armelin; Delivery info: C. Ferrando

Products manufactured: Cable Assemblies & Harnesses, Cable, Cords, Services, Assembly, Production & Test

CABLEMASTER DIV., Accurate Elctns. Corp., 7350 Atoll St., No. Hollywood, Cal., 91605, Tel: 213-875-0500

Products manufactured: Locators, Open-Short, Testers

Local Sales Offices & Reps.

Cal San Jose, White & Co. 408-292-8229
Fla Orlando, R. Attaway Co. 305-424-9983
Md Lutherville-Timonium, Naudain Assocs.
301-252-5378
Mich Detroit, Electro Enterprises, Inc. 313-886-2280
NJ Ridgewood, Hansen Assocs. 201-652-7055
NC Winston-Salem, Radco Co. 919-722-9671
Ohio Cleveland, Electro Enterprises, Inc.
216-261-7670
Ohio Dayton, Electro Enterprises, Inc. 513-426-6071
Pa Philadelphia, Naudain Assocs. 215-564-3194
Pa Pittsburgh, Electro Enterprises, Inc.
412-371-8497
Tex Houston, Brice Co. 713-526-3197
Va Lynchburg, Naudain Assocs. 703-846-8044
Wash Seattle, Paratech 206-783-3900

CABLEWAVE SYSTEMS INC., 60 Dodge Ave., North Haven, Conn., 06473, Tel: 203-239-3311, TWX: 710-465-0244; Empl.: 135; Minimum order: \$50

Customer service: S. Raucci, Jr.

Products manufactured: Antenna Feed Systems, Cable, Connector Adapters, Connectors, Dehydrators, Delay Lines, Kits, Cable-End Sealing, Plug Adapters, Socket Adapters, Splicers, Coaxial Cable, Tees, Waveguides & Adapters

Local Sales Offices & Reps.

Ala Huntsville, Technology Mktg. Assocs.
205-883-7893
Ariz Phoenix, Thorson Co. 602-956-5300
Cal Alhambra, M. W. Riedel & Co. 213-283-7694
Cal Redwood City, Woodworth Co. 415-365-0252
Fla Ormond Beach, Technology Mktg. Assocs.
904-672-2314
Fla Pompano Beach, Technology Mktg. Assocs.
305-942-0774
Ill Park Ridge, RF Specialists 312-698-2044
Ind Ft. Wayne, McDonald Sls. Co. 219-747-3650
Md New Carrollton, W. A. Brown Equip-Comp, Inc.
301-577-4527
Mass Haverhill, L-K Assocs. 617-373-1313
Mo Kansas City, Forristal-Young Sls. Co.
816-358-6771
Mo St. Louis, Forristal-Young Sls. Co. 314-645-2360
Neb Omaha, Forristal-Young Sls. Co. 402-333-0800
NJ Keasbey, Addem 2 516-567-5900
NY Huntington Station, Addem 1 516-567-5900
NY Syracuse, T2 Elctns. 315-463-8592
NC Winston-Salem, Burgin-Kreh Assocs., Inc.
919-768-4174
Pa Fort Washington, Kirk-Sandell, Inc.
215-643-2100
Tex Dallas, Hillman Entprs. 214-827-4790
Va Alexandria, W. A. Brown Equip-Comp, Inc.
703-836-1800

Va Lynchburg, Burgin-Kreh Assocs., Inc.

804-845-5600
Wash Bellevue, Thorson Co. 206-455-9180
EXP: Stamford, Conn., Dage Corp. 203-324-3123

CABTRON SYS., INC., 200 Anets Dr., Northbrook, Ill., 60062, Tel: 312-498-6090; Empl.: 30 p. 1-56, 57

Free literature available: Short form catalog 801 metal cabinets for electronic equipment featuring the exclusive filtered base construction and all modular design.

Products manufactured: Benches, Consoles, Stools, Tables, Blowers & Fans & Accessories, Cabinets & Accessories, Carts & Dollies, Instrument & Equipment, Panels, Racks

Local Sales Offices & Reps.

Ariz Scottsdale, Elctn. Enpr., Inc. 602-946-9860
Cal Santa Clara, Nova-Tronix 408-243-9530
Cal Tustin, Spaulding Sls. Co. 714-832-1384
Colo Golden, F. R. Campbell Assocs. 303-238-4174
Fla Cocoa, Orbe, Inc. 305-452-9568
Fla Fort Lauderdale, Orbe, Inc. 305-564-8571
Fla St. Petersburg, Orbe, Inc. 813-894-0687
Ill Northbrook, Cabtron Sys. 312-648-6090
Ind Fort Wayne, S & S Elctns. 219-743-4611
Md Silver Spring, Ansell Engrg. 301-949-1655
Mass Wakefield, Meas. Equip. Co. 617-245-4870
Mich Farmington Hills, H. Lowell Co. 313-851-7474
Minn St. Paul, Countryman Assocs. 612-645-9151
Mo Raytown, Prod. Automation 816-377-0066
NM Albuquerque, Elctn. Enpr., Inc. 505-256-3561
NY Port Washington, Paul D. Aaron 516-883-0600
NY Syracuse, Tesco Assocs. 315-463-4566
NC Kernersville, S. K. Wallace Assoc.
919-993-3993

Ohio Cleveland, Geotronics Mktg. Assoc.

216-526-2535

Ohio Columbus, Geotronics Mktg. Assoc.

614-457-8472

Pa Feasterville, Professional Svc. 215-355-6244

Tex Addison, Dunbar Assocs. 214-239-7151

Wash Renton, S. Wilson Co. 206-226-0650

CADDELL-BURNS MFG. CO., INC., 40 E. 2nd St., Mineola, N. Y., 11501, Tel: 516-746-2310; Empl.: 30 p. 2-382-385

Products manufactured: Chokes, Coils Including Assemblies & Forms, Cores, Magnetic, Delay Lines, Filters, Shields, Transformers, Wire

Local Sales Offices & Reps.

Ohio Dayton, C. V. Clark 513-294-7337

CADDELL COIL CORP., 35 Main St., Poultney, Vt., 05764, Tel: 802-287-4055; Empl.: 6; Minimum order: \$10

For info on price: J. Caddell; Application info: J. Caddell; Customer service: R. Caddell; Delivery info: R. Caddell

Free literature available: Catalog, catalog supplement & price list. Lists stock coil products-toroids, chokes, variable coils, pot core transformers and coil parts. Gives specifications-inductance, Q, etc.

Products manufactured: Chokes, Coils Including Assemblies & Forms, Transformers

Local Sales Offices & Reps.

Fla Sebastian, R.B. Caddell 609-492-2971
Mass West Falmouth, D.P. MacDonald 617-548-7039

Advertisement

COIL WINDING JOB SHOP-RF

coils, chokes, transformers. Coils to Print or Specification-toroids, printed circuit, pot core inductors, high current chokes, coils with ferrite or powdered iron, slug tuned, pi wound, single layer, random wound, encapsulation.

RF coils for communication, experimentation, avionics, radar, CATV, RF power, tests & measurement.

Send for catalog of stock coils.

CADDOCK ELECTRONICS, INC., 3127 Chicago Ave., Riverside, Cal., 92507, Tel: 714-683-5361, TWX: 910-332-6108; FSC No: 19647; Empl.: 80; Minimum order: \$25 p. 1-504-587; p. 2-1428-1443

For info on price: F. Grimes; Application info: R. Caddock; Customer service: L. Johnson; Delivery info: F. Grimes

Free literature available: 1. Long-term stability data (40,000 hours) on Micronox high-performance resistors. 2. Test summary compiled from two years of Reliability Testing on Caddock Micronox film resistors.

Products manufactured: Dividers, Films, Networks, Packages, Integrated Circuit, Resistors

Local Sales Offices & Reps.

Ore Portland, Almac/Strum Elctns.503-292-3534
Tex Houston, Unidyne, Inc.713-782-0218
Wash Seattle, Almac/Strum Elctns.206-763-2300

Local Distributors

Tex Houston, Lenert Co., 1420 Hutchins
713-225-1465

CADILLAC PLASTIC & CHEMICAL, Dayco Co., Box 810, Detroit, Mich., 48232, Tel: 313-869-9500; Empl.: 1000

For info on price: L. Lumberg; Application info: D. Meyer; Customer service: D. Meyer; Delivery info: D. Meyer

Free literature available: Cadillac Plastic Buyers Guide - the complete what, where and how of plastics for industry and home. Cadillac Plastic OSHA-Spec Safety Products Buyers Guide - complete Osha-Spec Safety Products line featuring brand name products in compliance with OSHA standards.

Products manufactured: Bearings, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Bushings, Glass, Plastic, Metal, Rubber, Etc., Conductive Plastic Materials, Containers, Covers, Protective (Including Dust), Laminates, Materials, Self-Lubricating, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Rubber, Seals, Services, Assembly, Production & Test, Tapes, Electrical Insulation, Tapes, Films & Foils, Pressure Sensitive, Tubing

Local Sales Offices & Reps.

Ala Birmingham205-251-8951
Ala Mobile205-456-8481
Alas Anchorage907-337-2863
Ariz Phoenix602-264-0861
Cal Anaheim714-538-0021
Cal North Hollywood213-980-0840
Cal So. San Francisco415-761-0740
Colo Denver303-287-2506
Conn Hartford203-278-6900
Del Wilmington302-655-1027
DC Washington202-638-4552
Fla Jacksonville904-724-7274
Ga Atlanta404-351-9800
Ill Chicago312-243-2500
Ill Rockford815-874-9444
Ind Indianapolis317-639-5343
Ind South Bend219-272-1200
Iowa Davenport319-391-2224
Kans Kansas City913-888-5950
Ky Louisville502-448-6444
La New Orleans504-834-6222
Md Baltimore301-485-4200
Mass Boston617-666-8840
Mich Detroit313-869-9500
Mich Flint313-238-0411
Mich Grand Rapids616-452-6926
Mich Kalamazoo616-343-1341
Minn Minneapolis612-339-7941
Mo St. Louis314-991-1790
NH Manchester603-627-3583
NJ Linden201-862-8900
NJ Pennsauken609-662-4100
NM Albuquerque505-345-2516
NY Albany518-459-3377
NY Buffalo716-684-9200
NY Long Island City212-721-8484
NY Rochester716-235-2260
NC Charlotte704-523-7880
Ohio Akron216-644-7183
Ohio Cincinnati513-271-2780
Ohio Cleveland216-441-2200
Ohio Columbus614-228-6991
Ohio Toledo419-244-6757
Okla Tulsa918-836-6556
Pa Philadelphia215-925-3473
Pa Pittsburgh412-372-2202
RI Warwick401-738-6969
Tenn Memphis901-365-6600
Tex Dallas214-631-4460
Tex Ft. Worth817-332-4421
Tex Houston713-928-2581
Va Richmond804-276-2791
Wash Seattle206-682-7252
Wisc Green Bay414-435-8811
Wisc Milwaukee414-444-7650

CAL. DIV. BOURNS INC., 550 W. Northwest Hwy., Barrington, Ill., 60010, Tel: 312-381-2400, TWX: 910-651-1904; Empl.: 600; Minimum order: \$100

For info on price: F. Consdorf x 406; Application info: K. Paap x 415; Customer service: G. Lohuis x 401; Delivery info: F. Consdorf x 406

Products manufactured: Cameras, Lenses, Optical & Camera

Local Sales Offices & Reps.

Cal Los Angeles213-670-4909
Va Arlington703-525-2590

CAIG LABS., INC., 455A Union Ave. Box 788, Westbury, N.Y., 11590, Tel: 516-334-1940; Empl.: 12; Minimum order: \$10

Customer service: J. Howard

Free literature available: Bulletin C-200-Technical Facts about Cremoline Contact cleaner as applied to electronic and electrical metal contacts.

Products manufactured: Chamber, Environmental Test, Cleaners & Solvents, Coatings, Controls/Control Eqp., Flux, Brazing & Soldering Materials, Heat Guns, Production, Lamps, Lubricants, Meters, Solder (All Types), Solder Pots & Baths, Soldering Accessories, Soldering Equipment

Local Sales Offices & Reps.

Cal Northridge, P Dooley213-360-2231
Fla Winterhaven, S & S Sls. Reps.813-293-7304
Ill Palatine, J Clark312-358-5095
Ohio Canton, G. Melbourne216-492-3333

Local Distributors

Ark Little Rock, Carlton-Bates Co., 6821 Scott Hamilton Dr.501-562-9100
Cal Los Angeles, California Elec. Sply., 1911 Armacost W.213-826-8333
Del Wilmington, Wholesale Elctn., 1402 Walnut St.302-656-9988
Ill Champaign, Klaus Radio Inc., 905 S. Neil St.217-356-1896
Ill Chicago, Complete Reading Elect., 100 So. Jefferson St.502-589-3960
Ky Louisville, Burks, P.I., 842 S. 7th502-589-3960
La Baton Rouge, R.P.S. Elctns., Inc., 1732 Plank Rd.504-344-3761
Md Bethesda, Empire Elctns., 4907 Rugby Ave.301-OL6-3300
Md Rockville, Capital Radio Wholesalers, 12270 Wilkins Ave.301-881-2270
Mich Grand Rapids, Stotts-Friedman, 2035 Eastern Ave., S.E.616-241-6731
Mo Kansas City, Walters Radio Supply Inc., 3635 Main St.816-531-7015
NC Fayetteville, Southeastern Radio, 325 Rowan St.703-855-2021
Ohio Cleveland, Complete Reading Elect., 13311 Enterprise Ave.915-533-9555
Tex El Paso, Midland Spec. Co., 2235 Wyoming Ave.915-533-9555
Tex Odessa, Midland Specialty Co., 2101 Andrew's Highway915-337-7365
Va Norfolk, Priest Elctns., 6431 Tidewater Dr.703-855-2021
Va Norfolk, Radio Parts Dist. Co., 5652 E. Virginia Bch. Blvd.703-855-8095

CAL-METEX CORP., 509 Hindry Ave., Inglewood, Cal., 90301, Tel: 213-641-8000, TWX: 910-328-6100; Empl.: 37

Products manufactured: Adhesives (All Types), Air Cleaners & Filters (Shielded & Unshielded), Bezels, Shielded & Unshielded, Braid, Cable, Conductive Plastic Materials, Contacts, Electrical, Containers, Gaskets, Shielding, R-F-Also See Shields, R-F, Honeycomb Sheets, Panels, etc., Rubber, Shields, Tubing, Wire, Wire Shielding

Local Sales Offices & Reps.

Ariz Phoenix, Intermountain Engrg.602-947-7379
Cal Los Altos, Frauman Assoc.415-941-0660
Cal Los Angeles, Universal Comps.213-474-1537
Colo Denver, Walter Assoc.303-777-5585
Wash Seattle, Jon B. Jolly, Assoc.206-938-4166
FOR: Can., Vancouver, B.C., J.B. Jolly206-938-4166

CAL-POWER CORP., 140 Kansas St., El Segundo, Calif., 90245, Tel: 213-772-2171, TWX: 910-348-6678; Empl.: 30

For info on price: L. Berggren; Application info: K. Richter

Products manufactured: Chargers, Battery, Controls/Control Eqp., Converters, Eliminators, Battery, Inverters, Monitors, Power Supplies, Regulators

CAL-R, INC., P.O. Box 1397, Santa Monica, Cal., 90406, Tel: 213-451-9761, TWX: 910-343-6966; Empl.: 130

Products manufactured: Capacitors, Fixed, Resistors, Thermistors

Local Sales Offices & Reps.

Ariz Phoenix, Toward Engrg. Assoc.602-277-1453
Cal Mountain View, Caltron/Pyle, Inc.415-964-3244
Cal San Diego, LoDan Inc.714-279-6383
Colo Boulder, Mile High Elctns.303-444-5615
Conn Woodbridge, Electronic Mktg. Co.203-397-1461
Fla Tampa, F. C. Nickerson Co.813-885-1416
Ill Northbrook, Raines-Brin Assocs.312-498-0890
Ind Greenwood, Valentine Schillinger317-888-2260

Ind South Bend, Valentine Schillinger219-291-6258

Md Baltimore, Wafer Assocs.301-744-1133

Minn St. Louis Park, Beta Engrg. Co.612-925-4422

Mo Blue Springs, Cairns & Hayes Elec. Sls.816-229-1404

Mo St. Charles, Cairns & Hayes Elec. Sls.314-946-6677

NY Bay Shore, Brunetta Sls. Co.516-586-1800

NY Dewitt, Tri-Tech Elctns.516-446-2881

Ohio Cleveland, Del Steffen & Assocs.216-461-8333

Ohio Dayton, Del Steffen & Assocs.513-293-3145

Pa Narberth, Electro-Comp Sls. Co.215-664-3576

Tex Dallas, Hillman Entrps.214-827-4790

Wash Bellevue, Ruggles Tech. Sls.206-455-2778

EXP: Cal., Santa Monica, Trans-World Trade213-472-0444

FOR: Can., Mississauga, Ont., Anbak Sls. Can., Ltd.416-625-1061

CALEX MGF. CO., INC., 3305 Vincent Rd., Pleasant Hill, Calif., 94523, Tel: 415-932-3911; FSC No: 29988; Empl.: 30; Minimum order: \$15p. 1*240, R15

For info on price: A. Dallons; Application info: A. Belford; Customer service: T. Cate; Delivery info: A. Dallons

Free literature available: Product Catalog, Individual Data Sheets, Power Supply Brochure - 12 page brochure containing modular power supplies and mounting kits.

Products manufactured: Alarms, Amplifiers, Comparators, Current Sources, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Detectors, Filters, Magnetometers, Monitors, Multipliers, Power Supplies, Regulators, Relays, Timers, Voltage Sources

Local Sales Offices & Reps.

Cal Mountain View, Gado Instr. Sls.415-961-2222
Minn Wayzata, Wm. A. Sternad612-473-4700
Wash Bellevue, Topp Engr. Sls. Co.206-747-5401

Local Distributors

Cal Santa Monica, Distr. Specialist, 1710 Santa Monica Blvd.213-829-5401

CALICO DIV., California Instrus. Co., Div. Aiken Inds., Inc., 5150 Convoy St., San Diego, Cal., 92111, Tel: 714-279-8620; FSC No: 16067; Empl.: 80; Minimum order: \$25

For info on price: W.W. Hanford; Application info: W.W. Hanford; Customer service: D. Chilcoat; Delivery info: W.W. Hanford

Free literature available: Cimron® Digital Multimeter Selection Guide Invertron® AC Power Source, Short Form Catalog

Products manufactured: Amplifiers, Converters, Counters, Meters, Oscilloscopes, Tape Recording Accessories

Local Sales Offices & Reps.

Ala Huntsville, FM Assocs.205-536-9990
Ariz Scottsdale, Williams-Assocs., Inc.602-947-4297
Cal Los Altos, Jay Stone & Assoc.415-948-4563
Cal Los Angeles, QPL Inc.213-682-3705
Cal Los Angeles, T. Louis Snitser Co.213-836-6170
Cal San Diego, QPL Inc.714-274-3722
Colo Denver, Williams-Assocs., Inc.303-373-4730
Fla Orlando, FM Assocs.305-851-5710
Fla Tequesta, FM Assoc.305-746-3128
Haw Honolulu, Aloha Assocs.808-941-1574
Ill Chicago, SEA Inc.312-282-6694
Ind Carmel, SEA Inc.317-846-2593
Kans Overland Park, Palatine Engrg.913-262-5643
Kans Shawnee Mission, EIR Co.913-362-0919
La Baton Rouge, Systems Engrg. Sls. Co., Inc.504-927-7574
Md Silver Springs, Eastern Instr.301-681-6500
Mass Needham, Addeco Corp.617-444-4754
Mich Detroit, Group Ten313-549-3910
Minn Minneapolis, Waytek612-933-2133
Mo Hazelwood, EIR Co.314-895-4100
Mo St. Louis, Palatine Engrg.314-426-7055

NM	Albuquerque, Williams-Associ., Inc.	505-255-1638
NY	Great Neck, Eastern Instr. of N.Y.	516-466-9505
NY	North Syracuse, NACO Electronics	315-699-2651
NC	Greensboro, FM Assocs.	919-294-2754
Ohio	Cleveland, Group Ten	216-486-2800
Ohio	Dayton, Group Ten	513-277-6531
Pa	Philadelphia, Eastern Instr. of Phil.	215-927-7777
Tex	Houston, Systems Engrg. Sls. Co., Inc.	713-668-7840
Tex	Richardson, Systems Engrg. Sls. Co., Inc.	214-231-9364
Wash	Seattle, Datacom Assocs.	206-285-2525

CALIFORNIA AVIONICS LABS., INC., Box 701, Palo Alto, Calif., 94302, Tel: 415-328-7999; Empl.: 5; Minimum order: \$10

Customer service: K. A. Hirschberg

Free literature available: Cable Catalog

Products manufactured: Cable Assemblies & Harnesses, Calibrators, Cords, Data Acquisition & Reduction Systems, Generators, Leads, Test & Adaptors

CALIFORNIA COMPUTER PRODS., 2411 W. La Palma Ave., Anaheim, Cal, 92801, Tel: 714-821-2011, TWX: 910-591-1154; Empl.: 4000

For info on price: Sls. Off.; Application info: J. L. Pyle; Delivery info: Sls. Off.

Free literature available: Literature on the following products: digital plotting equipment, disk and tape memory systems, COM systems, intelligent terminals, and our automated tape library.

Products manufactured: Computers, Digitizers, Pencil Follower (Inc. Coordinate & Graphic), Disc Packs, Magnetic, Drums Computer Memory, Memory Systems, Paper, Graphic Recording, Printers, Recorders

Local Sales Offices & Reps.

Ala	Huntsville	205-837-8540
Cal	El Segundo	714-523-7081
Cal	Newport Beach	714-833-0141
Cal	Sunnyvale	408-732-8421
Colo	Denver	303-433-7136
Conn	Meridian	203-634-3181
Fla	Maitland	305-645-1011
Fla	Orlando	305-851-1580
Ga	Atlanta	404-449-4610
Ill	Rosemont	312-693-6030
Kans	Shawnee Mission	913-362-0707
Md	Rockville	301-770-5274
Mass	Waltham	617-890-0484
Mich	Southfield	313-358-3130
Minn	Bloomington	612-888-0297
Minn	Minneapolis	612-888-0297
Mo	St. Louis	314-567-5215
NJ	Union	201-686-7100
NY	Fairport	716-223-2110
NY	Hicksville	516-938-7255
Ohio	Cleveland	216-243-7180
Ohio	Dayton	513-276-3915
Oklahoma	Tulsa	918-742-8039
Ore	Beaverton	503-646-3942
Pa	Bala Cynwyd	215-667-1740
Pa	Pittsburgh	412-922-3430
Pa	Wayne	215-687-2910
Tex	Dallas	214-661-2326
Tex	Houston	713-781-6133
Utah	Salt Lake City	801-355-3459
Wash	Bellevue	206-747-9321
EXP	Anaheim, Cal.	714-821-2011

CALIFORNIA INSTRS. CO., Div. Aiken Inds. Inc., 5150 Convoy St., San Diego, Cal., 92111, Tel: 714-279-8620, Telex: 695047; FSC No: 16067; Empl.: 80; Minimum order: \$25 p. 1-626-629, 1164, 1165

For info on price: W. W. Hanford; Application info: W. W. Hanford; Customer service: D. Chilcoat; Delivery info: W. W. Hanford

Free literature available: Cimron® Digital Multimeter Selection Guide Invertron® AC Power Source Short Form Catalog

Products manufactured: Amplifiers, Converters, Counters, Generators, Isolators, Meters, Oscillators, Oscilloscopes, Power Supplies, Probes, Protectors, Regulators, Shifters, Suppressors, Tape Recording Accessories, Transformers, Voltage Sources

Local Sales Offices & Reps.

Ala	Huntsville, FM Assoc.	205-536-9990
Ariz	Scottsdale, Williams Assoc.	602-947-4297
Cal	Los Altos, Jay Stone & Assoc.	415-948-4563
Cal	Los Angeles, Basic Systems	800-252-9075

Colo	Denver, Williams Assoc.	303-373-4730
Fla	Orlando, FM Assoc.	305-851-5710
Fla	Tequesta, FM Assoc.	305-746-3128
Haw	Honolulu, Aloha Assoc.	808-941-1574
Ill	Chicago, Sea Inc.	312-282-6694
Ind	Carmel, Sea	317-846-2593
Kans	Shawnee Mission, EIR Co.	913-362-0919
Md	Silver Springs, Eastern Instrumentation	301-681-6500

Mass	Needham, Addeco Corp.	617-444-4754
Mich	Detroit, Group Ten	313-549-3910
Minn	Minneapolis, Waytek Inc.	612-933-2133
Mo	Hazelwood, EIR Co.	314-895-4100
NM	Albuquerque, Williams Assoc.	505-255-1638
NY	Great Neck, Eastern Instr. of N.Y.	516-466-9505
NY	North Syracuse, NACO Elctns.	315-699-2651
NC	Greensboro, FM Assoc.	919-294-2754
Ohio	Cleveland, Group Ten	216-486-2800
Ohio	Dayton, Group Ten	513-277-6531
Pa	Philadelphia, Eastern Instr. of Phil.	215-927-7777

Tex	Houston, Systems Engrg. Sls. Co.	713-668-7840
Tex	Richardson, Systems Engrg. Sls. Co.	214-231-9364
Wash	Seattle, Datacom Assoc.	206-285-2525

CALIFORNIA MICROWAVE, INC., 455 W. Maude Ave., Sunnyvale, Cal., 94086, Tel: 408-732-4000, TWX: 910-339-9231; Empl.: 315

For info on price: Mktg. Dept.; Application info: Mktg. Dept.; Customer service: R. Parry; Delivery info: Contracts Dept.

Products manufactured: Circulators, Ferrite, Converters, Isolators, Multipliers, Oscillators, Testers

Local Sales Offices & Reps.

Cal	Los Angeles, Cain Technology	213-476-2251
Cal	Mountain View, D. Lay Assocs.	415-968-7500
Colo	Englewood, Cal. Microwave	303-770-8228
Ill	Park Ridge, R. F. Specialists	312-698-2044
Ind	Ft. Wayne, R. F. Specialists	219-485-8982
Md	Glen Burnie, Micro-Comp	301-761-4600
Mass	Lexington, Lancer Assocs.	617-861-1720
NY	Great Neck, Trionic Assocs.	516-466-2300
NY	Skaneateles, Robtron	315-685-5731
Pa	Ambler, W. M. Assocs.	215-643-4119
Tex	Arlington, N and W Sls.	817-461-4443
Va	Arlington, Cal. Microwave	703-841-1774

CALLINS CAPACITORS, Box C, Greenfield, Tenn., 38230, Tel: 901-235-2234, TWX: 810-590-3779; Empl.: 435; Minimum order: \$100

For info on price: M. O'Hara; Application info: J. Stewart; Customer service: M. R. Maness; Delivery info: J. Hamilton

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Ala	Huntsville, Comps. Sls. Corp.	205-883-7794
Ariz	Phoenix, Southwest e/m Engrg.	602-993-0250
Ariz	Phoenix, W. Bert Knight Co.	602-242-3057
Cal	Newport Beach, W.B. Knight Co.	714-833-8250
Cal	Redwood City, Parks & Pruitt Assocs.	415-364-1640
Conn	Meriden, Electro Prods. Sls.	203-235-4040
Conn	Waterbury, Selmark Assocs.	203-754-3060
Fla	Indianapolis, Comps. Sls. Corp.	305-727-2681
Fla	N. Palm Beach, Callins Ind.	305-848-3466
Fla	Terra Ceia, Comps. Sls. Corp.	813-722-6376
Ind	Columbus, A. Bolenbaugh	812-372-8666
Md	Baltimore, Stitzer Assocs.	301-823-2600
Mass	Millis, Selmark Assocs.	617-376-2914
Mass	Waltham, Electro Prods. Sls.	617-899-1570
Mich	Jackson, Norwood Scroggs Co.	517-750-1170
Minn	Minneapolis, Comstrand	612-560-5300
Minn	Minneapolis, White Sls. Co.	612-929-4661
Mo	Hazelwood, Dy-Tronix	314-731-5799
Mo	Kansas City, Dy-Tronix	816-761-6543
NY	Camillus, C.L. Avery Assocs.	315-672-3988
NY	New York City, C.L. Avery Assocs.	212-823-5224
NY	Rye, C.L. Avery Assocs.	914-967-7610
NC	Raleigh, Comps. Sls. Corp.	919-832-1897
Oklahoma	Broken Arrow, P. J. Scanlon Co.	918-251-1427
Oklahoma	Tulsa, P.J. Scanlon Co.	918-663-1427
Pa	Paoli, Stitzer Assocs.	215-644-5500
Tex	Houston, P.J. Scanlon Co.	713-497-2302
Tex	Richardson, P.J. Scanlon Co.	214-231-4661
Wisc	Milwaukee, Gentron Corp.	414-351-1660

CALMARK CORP., 408 S. Gladys Ave., San Gabriel, Cal., 91776, Tel: 213-287-0451; FSC No: 52094; Empl.: 6; Minimum order: \$10

For info on price: W. J. Jacobs; Application info: A. Weisman; Customer service: M. Kerby; Delivery info: M. Kerby

Free literature available: Technical Data and Pricing for PC Card Cages, Card Guides, Card Insertion and Extraction Devices.

Products manufactured: Chassis, Circuit Board Mounting, Chassis, Metal, Guides, Circuit Board, Pullers, Racks

Local Sales Offices & Reps.

Ala	Huntsville, Reynolds & Assocs.	205-536-1941
Ariz	Tempe, Delta Elctn. Sls. Corp.	602-966-9903
Cal	Fremont, H. K. Foraker Co.	415-657-2213
Cal	San Gabriel, Calmark Corp.	213-287-0451
Colo	Denver, West/Mark Assocs.	303-433-7181
Fla	Satellite Beach, Reynolds & Assocs. Inc.	305-773-4700
Ga	Atlanta, Reynolds & Assocs. Inc.	404-252-5360
Ill	Arlington Hgts., Martec Assocs.	312-956-8090
Md	Towson, Kraft Electronic Sls.	301-828-5838
Mass	Westboro, Technical Mktg. Svcs. Co.	617-366-8462
Minn	Minneapolis, Components Group	612-824-4222
NJ	Medford, Component Consultants	609-654-2800
NY	Cooperstown, Fizzle Assocs.	607-547-9333
NY	Northport, Production Sls. Assocs.	516-757-0336
Ohio	Cleveland, Components, Inc.	216-842-2737
Ohio	Hamilton, Components, Inc.	513-721-2997
Oklahoma	Broken Arrow, P. J. Scanlon Co.	918-251-1427
Tex	Richardson, P. J. Scanlon Co.	214-231-4661

CALTRON INDUSTRIES, 2015 Second St., Berkeley, Cal., 94710, Tel: 415-548-1966; Empl.: 18

For info on price: S. Foster; Application info: J. Chourre; Customer service: S. Foster; Delivery info: S. Foster

Free literature available: Lab products catalog-wire, cable, tubing, & cable assemblies for laboratories. Manufacturing services data sheets-wire & cable harnessing, cable assemblies.

Products manufactured: Cable Assemblies & Harnesses, Cable

CALVERT ELCTRNS., INC., 220 E. 23rd St., New York, N.Y., 10010, Tel: 212-679-1340, TWX: 710-581-4088; Empl.: 50; Minimum order: \$50

For info on price: J. McBride; Application info: I. Gips; Customer service: R. Borden; Delivery info: P. Karl

Products manufactured: Diodes, Integrated Circuit Devices, Transistor, Diode, Thyristor Heat Dissipators, Transistors, Tubes

Local Sales Offices & Reps.

Cal	San Jose, Calvert Elctns.	408-265-0521
Fla	Clearwater, Brennan Assocs.	813-448-5006
Fla	Orlando, Brennan Assocs.	305-425-4382
Ill	Chicago, R. Olson Assts.	312-545-3237
Minn	Minneapolis, J.E.M. Anderson Co.	612-823-6459
Pa	Willow Grove, R. Lewis Sales	215-659-0704

CAMBRIDGE MEMORIES, INC., 12 Crosby Dr., Bedford, Mass., 01730, Tel: 617-271-6500, Telex: 92-3336; Empl.: 500

For info on price: W. R. Nimee 271-6502; Application info: W. R. Nimee 271-6502; Customer service: D. C. Turner 271-6505; Delivery info: D. C. Turner 271-6505

Products manufactured: Memory Systems

Local Sales Offices & Reps.

Ariz	Phoenix, Mountaintek	602-242-5551
Cal	Los Altos, Casey Assocs.	415-941-8892
Cal	Torrance, Mitronics Inds.	213-323-7934
Colo	Boulder, Mountaintek	303-444-1738
Colo	Littleton, Mountaintek	303-794-1779
Fla	Orlando, Technical Assocs.	305-894-7531
Ind	Columbus, Mitronics	812-376-6321
Kans	Shawnee Mission, Inland Assocs.	913-362-2386
Mass	Framingham, Victor Assocs.	617-237-4070
Mass	Waltham, Computer Mktg. Assoc.	617-890-1776
Mo	Glencoe, Inland Assocs.	314-938-4992
NM	Albuquerque, Mountaintek	505-268-0003
NY	Great Neck, Measurement Tech.	516-482-3500
Pa	Melrose Park, R. Meyers Assocs.	215-224-1663
SC	Spartanburg, Technical Assocs.	803-579-2904
Tex	Dallas, Remtek	214-369-8146
Tex	Houston, Remtek	713-664-2113
Utah	Salt Lake City, Mountaintek	801-278-6056
Va	Annapolis, Roy Lankenau Assocs.	703-256-0800
Wash	Bellevue, L. B. Robbins Inc.	206-455-1246

CAMBRIDGE THERMIONIC CORP., 455 Concord Ave., Cambridge, Mass., 02138, Tel: 617-491-5400, TWX: 710-320-6399; FSC No: 71279; Empl.: 614; Minimum order: \$25

55

Fla	Delray Beach, J.W. Beaver	305-276-0111
Ill	Homewood, Carbone	312-798-7400
Ind	Highland, H.A. Smolen Co.	219-838-2700
Mich	Detroit, Winton Crawford Assocs.	
Mich	Owosso, Cortem Int. Div., Toledo Co.	517-725-8192
Minn	Minneapolis, W.B. Odegard	
Miss	Jackson, Lawrence Co.	601-982-9513
NJ	E. Orange, David A. Rugg Co.	201-675-4822
NJ	Toms River, Beaver Co.	201-244-6467
NY	Syracuse, B. Fleckenstein	315-488-7883
Ohio	Copley, Norco	216-666-3774
Pa	Pittsburgh, Bowman & Co.	412-781-5949
Wisc	Milwaukee, F.C. du Bois & Assocs.	
Carbolube		
Cal	San Francisco, Advance Carbon Prods.	415-431-4034
Conn	Newington, Interep Co.	203-666-4233
Fla	Boca Raton, J. Krupinski	305-395-5970
Fla	Delray Beach, J.W. Beaver	305-276-0111
Ill	Homewood, Carbone	312-SY8-7400
Ind	Highland, H.A. Smolen Co.	219-838-2700
Mich	Franklin, Schlee Sls. & Engrg. Co.	313-499-3430
Minn	Minneapolis, William Be Odegard	612-929-2226
Miss	Jackson, Lawrence Co.	601-982-9513
NJ	East Paterson, Bergen Ind. Supp.	201-796-2600
NJ	Toms River, Beaver Co.	201-244-6467
NY	Carle Place, Atomergic Chemetals Co.	212-786-0900
NY	Syracuse, B. Fleckenstein	315-488-7883
Ohio	Copley, Norco	216-666-3774
Pa	Pittsburgh, Bowman Co.	412-781-5949
Wisc	Oconomowoc, McNellis Representatives	414-567-9731
FOR:	Can., Valleyfield, P.Q., Cipel & Le Carbone	514-373-7337
Chemical Equip.		
Cal	Glendale, Horrell Co.	213-245-6452
Cal	Pinole, Cutino Co.	415-223-5555
Fla	Hastings, Paul Sleeper Assoc.	904-328-5177
Ga	Atlanta, G.H. Crossley & Assocs.	404-261-4278
Ill	Homewood, J.J. Carey	312-798-7400
La	Gonzales, Wallace Co.	504-644-2861
Md	Millersville, PSI	301-987-1343
Mass	Cambridge, Mooney New England	617-864-5630
Mich	Galesburg, Hagadone Co.	616-665-4982
Mo	St. Louis, Technical Serv. Corp.	314-647-4252
NJ	Boonton, Carbone	201-334-0700
NJ	Little Falls, Mooney Bros. Co.	201-256-6200
NY	Batavia, F.J. Guppenberger	716-343-0115
NC	Charlotte, Carotek	704-847-4406
Ohio	Cincinnati, R.A. Mueller & Assocs.	513-242-2535
Okla	Tulsa, Laster/Castor Corp.	918-663-7365
Pa	McMurray, Kenneth R. Sears	412-941-8574
Pa	Philadelphia, M & S Seitz Co.	215-563-6136
Tenn	Chattanooga, David F. Moore & Assocs.	615-622-2123
Tex	Houston, Mercer Engineers	713-529-6121
Wisc	Milwaukee, A.E. Rasmussen Co.	414-342-2065
For:	Can., Valleyfield, P.Q., Cipel & Le Carbone Ltd.	514-373-7337

CARBORUNDUM CO., Graphite Prods. Div., Box 339, Niagara Falls, N.Y., 14302, Tel: 716-278-2731, Telex: 91 555; Empl.: 250 p. 1-2309-2315; p. 2-1445-1447
 For info on price: D. L. Pietras 716-278-2521; Application info: H. R. Emes 716-278-2143; Customer service: N. L. Nadeau 716-278-2521; Delivery info: N. L. Nadeau 716-278-2521

Products manufactured: Abrasive Belts, Compounds, Cords, Powders, etc., Coatings, Dummy Loads, Heaters & Heating Elements, Insulators & Insulation, Materials, Self-Lubricating, Resistors, Suppressors, Terminals, Thermistors

Local Sales Offices & Reps.

Ala	Huntsville, Twentieth Century Mktg.	205-772-9237
Cal	El Segundo, Varigon Assocs.	213-679-0621
Cal	Palo Alto, O'Donnell Assocs. North	415-327-9260
Cal	San Diego, Varigon Assocs.	714-299-5413
Fla	Clearwater, WMM Assocs.	813-477-2533
Ill	Chicago, T.B. Hunter Assoc.	312-777-2500
Ind	Indianapolis, Electro-Rep	317-255-4147
Md	Westminster, FBD Sls.	301-876-2396
Mass	West Springfield, Carborundum	413-739-7361
Mich	Southfield, Rep. Assocs.	313-354-9066
NY	Elmont, Crane & Egert Corp.	516-488-2100
NY	Niagara Falls, Carborundum	716-278-2521
NC	Cary, F.B.D. Sls.	919-467-7595
Ohio	Dayton, Sidnell Co.	513-433-7761
Pa	Ambler, Kirk-Sandell	215-643-2100
Tex	Houston, Vista Assocs.	713-661-0119

Tex	Richardson, Vista Assocs.	214-235-4547
Va	Portsmouth, F.B.D. Sls.	804-484-3162

CARCO ELCTRNS., 1180 O'Brien Dr., Menlo Park, Calif., 94025, Tel: 415-321-8174, Telex: 348482; Empl.: 41
 For info on price: J.M. Carter; Application info: W.M. Spont; Customer service: J.M. Carter; Delivery info: W.M. Spont

Products manufactured: Actuators, Analyzers, Bearings, Bridges, Modulators, All Kinds, Simulators, Testers

CARDINAL CONTROL CO., 110 Kensington Rd., Kensington, Conn., 06037, Tel: 203-828-6379; Minimum order: \$10

Customer service: E. P. Beatman

Free literature available: Relay Catalog - Standards and specials, coils, switches assemblies, Timer Catalog - Solid State standards and specials. Autovac Literature-Press overload control. Accessories Literature-Sockets, brackets, clips.

Products manufactured: Coils Including Assemblies & Forms, Controls/Control Eqp't., Relays, Services, Assembly, Production & Test, Sockets, Switches, Timers

CARDION ELCTRNS., Unit General Signal Corp., Long Island Expwy., Woodbury, N.Y., 11797, Tel: 516-921-7300, TWX: 510-221-2179; FSC No: 12909; Empl.: 300
 Customer service: J.F. Riley Ext. 211

Products manufactured: Comm. Systems, Control Systems, Air Traffic, Converters, Data Acquisition & Reduction Systems, Decoders, Display Devices/Displays, Monitors, Radar Systems, Receivers, Transmission Systems, Data

CARLINGSWITCH INC., 505 New Park Ave., W. Hartford, Conn., 06110, Tel: 203-233-5551, TWX: 710-425-0034; Empl.: 650; Minimum order: \$25
 p. 1-1972,1973

For info on price: B. Boucher; Application info: R. Smith; Customer service: M. Miller; Delivery info: M. Miller

Free literature available: Full Line - Cat G Short Form Distributing - Cat GS

Products manufactured: Switch Handle Boots, Switches

Local Sales Offices & Reps.

Cal	Van Nuys, Pacific Switch	213-873-4802
Conn	W. Hartford, Atlantic Switch	203-523-5259
Fla	Hialeah, Switch Controls	305-822-0892
Ill	Wheaton, Conectrix	312-653-1130
Tex	Dallas, Texaswitch	214-357-1768

CAROLINA MEDICAL ELCTRNS., INC., U.S. 52 Expwy., Box 307, King, N.C., 27021, Tel: 919-983-5132; Empl.: 26; Minimum order: \$5

Customer service: C. R. Jones

Products manufactured: Meters, Recorders, Transducers

CARSON MFG. CO., 5451 N. Rural St., Indianapolis, Ind., 46220, Tel: 317-257-3191; Empl.: 125-150

Products manufactured: Controls/Control Eqp't., Switches, Transformers

CARTER MFG. CORP., Sugar Rd., Bolton, Ma., 01740, Tel: 617-779-5501; FSC No: 03929; Empl.: 25; Minimum order: \$50 p. 2-1640,1641

Customer service: L. W. Tedstone

Free literature available: Data sheets illustrating a representative cross section of our product line. All or most of our products can be modified to meet customers specific requirements.

Products manufactured: Potentiometers, Switches

Local Sales Offices & Reps.

Cal	Millbrae, Polach & Bensinger Inc.	415-697-2525
Conn	Glastonbury, C.K. Barton Assocs.	203-633-9417
Ill	Chicago, Comms. Engrs.	312-761-0548
Mass	Auburndale, Charles K. Barton Assocs.	617-332-2021
NJ	Kinnelon, Ind'l. Science Supply Corp.	201-838-8746
NY	Great Neck, Ind'l. Science Supply Corp.	516-487-1174
Ohio	Dayton, Bek Assocs.	513-278-1343
Tex	Dallas, Southern Engrg. & Sls. Co.	214-748-5760

CARTER MOTOR CO., 2707 W. George St., Chicago, Ill., 60618, Tel: 312-588-7700; Minimum order: \$5
 Customer service: E. J. Mitchell

Products manufactured: Converters, Inverters, Motors, Tachometers

Local Sales Offices & Reps.

Cal	San Jose, J.T. McFarland Assocs.	408-268-2600
Cal	Sherman Oaks, R. Meussdorffer & Assocs.	213-788-0771
Colo	Englewood, H. Kaub & Co.	303-761-5881
Conn	Old Lyme, S. Armstrong	203-673-3692
Conn	Rocky Hill, Aid Engrg. Sls.	203-673-3692
Fla	Orlando, C. Ammerman	305-894-6071
Ga	Smyrna, B-C Elctn. Sls.	404-436-5169
Ill	Oak Brook, A.G. Erickson & Assocs.	312-323-1367
Kans	Shawnee Mission, Double V Power Sls.	913-262-1345
La	New Orleans, J.B. Clements	504-282-2897
Md	Baltimore, B. Young	301-235-3726
Mass	Westborough, T. Sanden	617-890-8181
Mich	Ann Arbor, V. Miklas	313-769-5181
Mich	Marshall, R. Reed Inc.	616-781-7287
Minn	Minneapolis, A.J. Warner Co.	612-729-7371
NY	Buffalo, R.W. Mitscher Co.	716-633-7970
NY	Floral Park, Cushing Electro Sls.	516-775-7170
NC	Raleigh, J. Nagle	919-828-0575
Okla	Tulsa, R.D. Jay	918-939-5956
Pa	Philadelphia, Clisby & Assocs.	215-425-7724
Tex	Dallas, E.W. Haley	214-742-2515
Tex	Houston, M.F. Kliepera Co.	713-747-3868
Va	Troutville, R. Lawson	703-345-3283
Va	Virginia Beach, C. Bludau	804-481-7200
Wash	Seattle, R. Johnston Co.	206-524-5170
EXP:	Wheaton, Ill., CHS Int'l.	312-665-3402

CARTER SEMICONDUCTOR, 6901 Jericho Tpk., Syosset, N.Y., 11701, Tel: 516-598-0660, TWX: 510-224-6691

Products manufactured: Diodes, Rectifiers, Thyristors (Includes Silicon Controlled Rectifiers), Transistors

Local Sales Offices & Reps.

Ariz	Tempe, Saguro Tech. Svc.	602-275-0431
Cal	Cupertino, Carter Semiconductor tor	408-245-7884
Cal	San Diego, Frugaletti Assoc.	714-272-6769
Ill	Northbrook, Jassen Assoc.	312-498-4260
Ind	Indianapolis, J. L. Weber Agcy.	317-255-4117
Iowa	Cedar Rapids, Engrg. Svc.	319-366-1591
Kans	Prairie Village, Engrg. Svc.	913-649-4000
Md	Towson, C. H. Newson	
Mass	Lexington, Contact Sls.	
Mich	Detroit, S. Greiner	313-882-7570
Minn	St. Louis Pk., J. O'Brien	612-920-3643
Mo	St. Louis, Engrg. Svc.	314-726-2233
NJ	Stratford, A. E. Luba	609-784-5000
NY	Amityville, Carter Semiconductor	516-598-0660
NY	Northport, Halcon Assoc.	516-423-1818
Ohio	Dayton, E. M. A.	413-433-2800
Tex	Richardson, Thornton-Leepee Elctn. Sls.	214-231-6891

CASTLE TV TUNER SERVICE, INC., 5710 N. Western Ave., Chicago, Ill., 60645, Tel: 312-561-6354; Empl.: 17

For info on price: A. Western 312-561-6354; Application info: C. Western 312-561-6355; Customer service: C. Western 312-561-6355; Delivery info: I. Stein 312-561-6354

Free literature available: TV receiver signal circuit analyzing instruments furnishing substitute signals for all signal stages of color or B & W TV receivers. TV field strength meters.

Products manufactured: CATV Systems & Equipment, Meters, Test Equipment, Testers

Local Sales Offices & Reps.

Cal	Los Angeles, Erlanger Sls. Co.	213-731-2238
Del	Newark, Di Vincent & Legato Assoc.	
Fla	Ft. Lauderdale, Unirep, Inc.	305-527-1556
Ill	Arlington Hts., P. Dombrow Co.	312-253-3326
Iowa	Des Moines, T. L. Dowell & Assoc.	515-225-1620
Kans	Overland Pk., T. L. Dowell & Assoc.	913-236-8200
Mass	Braintree, Rudolph Mac Inn's Assoc.	617-843-0908
Minn	Minneapolis, HMR Inc.	612-920-8200
Mo	St. Louis, T. L. Dowell & Assoc.	314-968-4234
NJ	Moorestown, Di Vincent & Legato	609-235-8299
NY	N. Bellmore, W. Keller & Assoc.	516-785-2826
Ohio	St. Mary's, Repp Co.	419-394-4724
Pa	Pittsburgh, Tanner Co.	412-561-4687
Tenn	Memphis, Ranger Elctn. Co.	901-388-5410
Tex	Hurst, Ranger Elctn. Co.	817-281-2736

CATON CONNECTOR CORP., 425 Northern Blvd., Great Neck, N.Y., 11021, Tel: 516-466-9288; FSC No: 52196; Empl.: 14; Minimum order: \$50

For info on price: F. Tylinski 516-466-9288; Application info: L. Galambos 716-746-6817; Customer service: L. Tylinski 516-466-9288; Delivery info: L. Tylinski 516-466-9288

Free literature available: Brochure describes high voltage (over 1000 volts), corona free, connectors and cable assemblies, and cable assemblies, also pressurized and watertight. Typical applications are in radar systems, x-ray equipment, laser systems CRT displays, etc.

Products manufactured: Connectors

Local Sales Offices & Reps.

Cal	Garden Grove, Impact Elctns.	213-431-3581
Cal	Los Altos, Parsons & Meister	415-941-4745
Ill	Hinsdale, H. Gray Assoc.	312-325-4810
NJ	Mt. Laurel, Naudain Assoc.	609-235-1801
NY	Great Neck, F. Tylinski Co.	516-466-9070
NY	Ithaca, B. Dean	607-272-2187
NC	Raleigh, B. Dean	919-782-9226
Ore	Forest Grove, B. Doran Sls.	503-357-3333

Advertisement

Designer and manufacturer of High Voltage Connectors and Cable Assemblies.

Our specialty is Corona Free and also Watertight Connectors.

These products find applications in copying machine, CRT terminals, ion implantation equipment, Laser equipment, Power supplies, radar X-ray equipment, Xenon flashers, nuclear equipment.

Connectors are single and/or multi-pin; Coaxial, Triaxial; Molded on types;

Quick disconnects or Field assembled. We invite your inquiries.

Write for literature

CBS LABORATORIES, High Ridge Rd., Stamford, Conn., 06905, Tel: 203-327-2000, TWX: 710-474-0694

Products manufactured: Amplifiers, Equalizers, Generators, Records, Frequency Test

Local Sales Offices & Reps.

Cal	La Canada, CBS Laboratories	213-790-4393
-----	-----------------------------	--------------

CCS HATFIELD WIRE & CABLE GROUP, Continental Copper & Steel Industries, Inc., 12 Commerce Dr., Cranford, N.J., 07016, Tel: 201-272-3850; Empl: 1036; Minimum order: \$100

For info on price: G. Joyce; Application info: L. Kelly; Customer service: P. Sefranka; Delivery info: D. Christie

Products manufactured: Cable, Wire

Local Sales Offices & Reps.

Ariz	Phoenix, J. Smith Baker Agency	602-254-5189
Cal	Los Angeles, Agencies Co.	213-263-9561
Colo	Denver, Empire Elec. Sls.	303-744-1776
Ga	Atlanta, Hoppert & McCoy	404-875-5802
Ill	Chicago, J. Schonthal & Assoc.	312-828-0774
Ill	Melrose, CCS Hatfield Wire & Cable Grp.	312-379-4750

Iowa	Des Moines, Dick Bray Elec. Sls. Co.	515-225-2961
------	--------------------------------------	--------------

La	New Orleans, Redmann Sls. Co.	504-525-4103
----	-------------------------------	--------------

Md	Baltimore, Bloom Assocs.	301-233-2222
----	--------------------------	--------------

Mass	Braintree, B.N. Yanow & Co.	617-848-7300
------	-----------------------------	--------------

Mich	Detroit, Hoffman Bros.	313-873-7550
------	------------------------	--------------

Minn	Mound, Jerry Finn & Assocs.	612-472-3562
------	-----------------------------	--------------

Mo	St. Louis, CCS Hatfield Wire & Cable Grp.	314-434-1311
----	---	--------------

NJ	Cranford, CCS Hatfield Wire & Cable Grp.	201-272-3850
----	--	--------------

NJ	Linden, E.H. MacLeod & Assoc.	201-862-2233
----	-------------------------------	--------------

NJ	Pennsauken, J.B. Currell Assoc.	609-663-0888
----	---------------------------------	--------------

NM	Albuquerque, Hallek Sls. Co.	505-298-3114
----	------------------------------	--------------

NY	LeRoy, S & S Assocs.	716-967-6248
----	----------------------	--------------

NC	Greensboro, Barber-Ayers & Assoc.	919-273-3628
----	-----------------------------------	--------------

Ohio	Cincinnati, A.L. Ehlers Co.	513-242-4200
------	-----------------------------	--------------

Ohio	Cleveland, Pressler-Weissinger Co.	216-351-5841
------	------------------------------------	--------------

Pa	Pittsburgh, L & R Elec. Corp.	412-781-4811
----	-------------------------------	--------------

Tex	Dallas, Source, Inc.	214-747-3521
-----	----------------------	--------------

Tex	Houston, Brenner Elec. Sls.	713-225-0766
-----	-----------------------------	--------------

Utah	Price, Schroeder Bros. Co.	801-637-0522
------	----------------------------	--------------

Utah	Salt Lake City, Lyle W. Williams Co.	801-487-7621
------	--------------------------------------	--------------

Wash	Seattle, Shaffer & Nelson	206-523-0664
------	---------------------------	--------------

WVa	Wheeling, R.M. Wilson Co.	304-232-5860
Wisc	Butler, J.F. Nolan & Assoc.	414-781-1140

CEA, Div. Berkleonics, Inc., 1 Aerovista Pk., San Luis Obispo, Cal., 93401, Tel: 800-235-4150, 800-592-5910; Empl: 30

Products manufactured: Chargers, Battery, Converters, Cords, Current Sources, Heat Exchangers & Systems, Inverters, Isolators, Power Supplies, References, D-C Voltage, Standards, Transformers, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

Cal	San Luis Obispo, Johnson Assocs.	805-544-7770
Cal	Van Nuys, Tri-Tek	213-997-8340
Md	Bethesda, S & S Assocs.	301-654-1434
NM	Albuquerque, F. Hawken	505-292-2196
Pa	King of Prussia, S & S Assocs.	215-265-3450
Pa	Pittsburgh, R. F. Clark Co.	412-242-9500
Tex	Houston, Lear & Assocs.	713-649-7727
Tex	Richardson, Lear & Assoc.	214-231-5388
EXP:	Cal., L.A., Trans-World Tr.	213-472-0444

CELANESE CHEMICAL CO., 245 Park Ave., New York, N. Y., 10017

Products manufactured: Chemicals, Cleaners & Solvents

CELANESE PLASTICS, 550 Broad St., Newark, N.J., 07102

CELCO, Constantine Engrg. Labs., Co., 70 Constantine Dr., Mahwah, N.J., 07430, Tel: 201-327-1123, TWX: 710-988-1018; Empl: 45

For info on price: E. Ryder, 201-327-1123; Application info: M. J. Constantine, 714-986-9868

Free literature available: Product literature on: Deflection Yokes, Coils, Micropositioners, Large-Format and Micro-Scanners & Printers, CRT Displays, CRT Spot Analyzers, X-Y Deflection Amplifiers, Display Circuitry, Dual-Ramp Generators, 70mm Photo Recorders.

Products manufactured: Amplifiers, Analyzers, Cameras, Cards, Linear Function, Character Recognition Systems, Coils Including Assemblies & Forms, Comm. Systems, Data Acquisition & Reduction Systems, Display Devices/Displays, Generators, Integrated Circuit Devices, Intensifiers, Image, Microscopes, Mounts, Power Supplies, Printers, Radar Systems, Recorders, Regulators, Scanners, Services, Assembly, Production & Test, Shields, Yokes

Local Sales Offices & Reps.

Cal	Upland, Celco, Pacific	714-986-9868
Minn	Minneapolis, Loonan Assoc.	612-927-4055
Tex	Richardson, P.J. Scanlon	214-231-4661

CENTRAL PLASTICS DIST., 2701 N. Pulaski Road, Chicago, Ill., 60639, Tel: 312-235-3300; Empl: 32

For info on price: L. Longwell; Application info: H. Greenwald; Customer service: L. Longwell; Delivery info: T. Harris

Free literature available: Central Plastics General Catalog

Products manufactured: Insulators & Insulation, Nameplates, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Tubing

Local Sales Offices & Reps.

Ill	Rockford, Rockford Central Plastics	815-397-4465
-----	-------------------------------------	--------------

CENTRALAB DISTRIBUTOR PRODS., N. 93 W 16112 Megal Dr., Menomonee Falls, Wisc., 53051, Tel: 414-228-2911, TWX: 910-260-3620

For info on price: C. Zickuhr; Application info: K. Youngbeck; Customer service: S. Wilkin; Delivery info: S. Wilkin

Refer to Centralab Elctns. Div. for Sales Office Information.

CENTRALAB, Elctrs. Div. - Globe Union, 5757 N. Green Bay Ave., Milwaukee, Wisc., 53201, Tel: 414-228-1200, TWX: 414-228-2315; Empl: 5500

Products manufactured: Attenuators, Capacitors, Fixed, Capacitors, Variable, Circuits, Hybrid, Thick Film, Circuits, Printed, Multilayer, Cores, Ceramic, Dividers, Filters, Insulators & Insulation, Integrators, Electronic, Networks, Potentiometers, Resistors, Seals, Substrates, Switches, Tubing

Local Sales Offices & Reps.

Ariz	Phoenix, Clemick-Neenan & Assoc.	602-279-7649
------	----------------------------------	--------------

Cal	Los Angeles, Clemick-Neenan & Assoc.	213-476-1272
-----	--------------------------------------	--------------

Cal	Palo Alto, Brooks Technical Group	415-328-3232
-----	-----------------------------------	--------------

Colo	Denver, Electro-Rep Inc.	303-744-2821
------	--------------------------	--------------

Fia	Orlando, Cartwright & Bean, Inc.	305-422-4531
-----	----------------------------------	--------------

Fia	Plantation, Cartwright & Bean, Inc.	305-791-3989
-----	-------------------------------------	--------------

Ga	Atlanta, Cartwright & Bean, Inc.	404-255-5262
----	----------------------------------	--------------

Haw	Honolulu, Dougherty Enterprises	312-694-4870
-----	---------------------------------	--------------

Ill	Des Plaines, Centralab	317-257-1227
-----	------------------------	--------------

Ind	Indianapolis, L.M. De Voe Co.	317-257-1227
-----	-------------------------------	--------------

Iowa	Cedar Rapids, J. Vrbik Co.	319-377-8244
------	----------------------------	--------------

Kans	Shawnee Mission, Lowell-Kangas & Assoc.	913-631-3515
------	---	--------------

La	Chalmette, Cartwright & Bean, Inc.	504-279-4598
----	------------------------------------	--------------

Md	Pikesville, J. Bresson Assoc.	215-839-6770
----	-------------------------------	--------------

Mass	Needham, Centralab	617-444-4847
------	--------------------	--------------

Mich	Detroit, R.C. Merchant & Co.	313-535-6000
------	------------------------------	--------------

Mich	St. Joseph, R.C. Merchant & Co.	616-983-7378
------	---------------------------------	--------------

Minn	Minneapolis, Centralab	612-831-5212
------	------------------------	--------------

Miss	Jackson, Cartwright & Bean, Inc.	601-981-1368
------	----------------------------------	--------------

Mo	St. Louis, Lowell-Kangas & Assoc.	314-821-4050
----	-----------------------------------	--------------

NJ	Clifton, Centralab	201-778-5900
----	--------------------	--------------

NY	Albany, Reagan/Compar Albany	518-489-7408
----	------------------------------	--------------

NY	Endwell, Reagan/Compar Albany	607-723-8743
----	-------------------------------	--------------

NY	Fairport, Reagan/Compar Albany	716-271-2230
----	--------------------------------	--------------

NY	New Hartford, Reagan/Compar Albany	315-732-3775
----	------------------------------------	--------------

NC	Charlotte, Cartwright & Bean, Inc.	704-333-6457
----	------------------------------------	--------------

NC	Raleigh, Cartwright & Bean, Inc.	919-839-7178
----	----------------------------------	--------------

Ohio	Cleveland, Imtech Inc.	216-826-3400
------	------------------------	--------------

Ohio	Dayton, Imtech Inc.	513-885-4181
------	---------------------	--------------

Ohio	Fairborn, R.G. Siff & Assoc.	513-252-7785
------	------------------------------	--------------

Ore	Portland, J.J. Backer Co.	503-297-3776
-----	---------------------------	--------------

Ore	S. E. Salem, J. J. Backer Co.	503-362-0717
-----	-------------------------------	--------------

Pa	Narberth, J. Bresson Assoc.	215-839-6770
----	-----------------------------	--------------

Pa	Pittsburgh, Imtech	412-247-1050
----	--------------------	--------------

Tenn	Knoxville, Cartwright & Bean, Inc.	615-693-7450
------	------------------------------------	--------------

Tenn	Memphis, Cartwright & Bean, Inc.	901-276-4442
------	----------------------------------	--------------

Tex	Dallas, R.E. Nesbitt Co.	214-357-4601
-----	--------------------------	--------------

Tex	El Paso, Centralab	915-779-3968
-----	--------------------	--------------

Tex	Houston, R.E. Nesbitt Co.	713-224-3633
-----	---------------------------	--------------

Va	Lynchburg, J. Bresson Assoc.	215-839-6770
----	------------------------------	--------------

Wash	Seattle, J.J. Backer Co.	206-285-1300
------	--------------------------	--------------

Wisc	Milwaukee, Centralab	414-228-2122
------	----------------------	--------------

CENTRALAB SEMICONDUCTOR, Globe-Union, 4501 Arden Dr., El Monte, Cal., 91734, Tel: 213-579-0700, TWX: 910-587-3429; Empl: 300

Products manufactured: Amplifiers, Caps, Lenses, Indicator Light, Cells, Photoconductive, Photoemissive, Photovoltaic, Diodes, Lubricants, Punched Card Equipment, Racks

Local Sales Offices & Reps.

Ariz	Phoenix, Toward Engg.	602-955-3193
------	-----------------------	--------------

Cal	Los Altos, Recht	415-941-0338
-----	------------------	--------------

Cal	Los Angeles, Clemick-Neenan	213-476-1272
-----	-----------------------------	--------------

Cal	Orange, Clemick-Neenan	714-998-2525
-----	------------------------	--------------

Colo	Denver, McCloud & Raymond	303-756-1589
------	---------------------------	--------------

Fia	Orlando, Cartwright & Bean	305-425-8284
-----	----------------------------	--------------

Ga	Atlanta, Cartwright & Bean	404-237-2273
----	----------------------------	--------------

Ill	Des Plaines, Centralab	312-827-4487
-----	------------------------	--------------

Ind	Indpls, L.M. DeVoe	317-257-1227
-----	--------------------	--------------

Md	Baltimore, Component Sls.	301-484-3647
----	---------------------------	--------------

Mass	Burlington, Contact Sls.	617-273-1520
------	--------------------------	--------------

Mich	Southfield, REP Assocs.	313-354-9066
------	-------------------------	--------------

Minn	Minneapolis, Furber Sls.	612-861-1518
------	--------------------------	--------------

Mo	St. Louis, Coombs	314-542-3636
----	-------------------	--------------

NJ	Clifton, Centralab	201-778-5900
----	--------------------	--------------

NY	Rochester, W.H. Zimmerman	716-586-4450
----	---------------------------	--------------

NY	Syracuse, W.H. Zimmerman	315-474-4889
----	--------------------------	--------------

Ohio	Cleveland, Imtech	216-382-9090
------	-------------------	--------------

Pa	Glenside, Elcom Inc.	215-885-1325
----	----------------------	--------------

Tenn	Memphis, Cartwright & Bean	901-276-4442
------	----------------------------	--------------

Tex	Dallas, R.E. Nesbitt	214-357-4601
-----	----------------------	--------------

Tex	Houston, R. Nesbitt Co.	713-224-3633
-----	-------------------------	--------------

Wash	Seattle, J. Backer Co.	206-285-1300
------	------------------------	--------------

FOR:

Free literature available: Drafting Aids - complete line of printed circuit-artwork symbols, tapes, and donut pads. For making printed circuit master artworks. Available off the shelf. Available on request.

Products manufactured: Drafting Symbols, Dry Transfer, Pressure Sensitive, etc. (Including Lettering), Kits, Breadboarding (For Engineers), Kits, Printed Circuit, Tapes, Films & Foils, Pressure Sensitive

Local Sales Offices & Reps.

Ariz	Phoenix, W. Bart Knight Co.	602-242-6787
Ariz	Scottsdale, F. Board Assocs.	602-949-9561
Cal	Burlingame, W. J. Purdy Co.	415-347-7701
Cal	Newport Beach, W.B. Knight Co.	714-833-8350
Colo	Denver, W.J. Purdy Co.	303-777-1411
Fla	Orlando, Cartwright & Bean	305-422-4531
Ga	Atlanta, Cartwright & Bean	404-255-5262
Ill	Hinsdale, Hill-Gray Assoc.	312-325-4810
Ind	Mulberry, Maish Sls.	317-296-2322
Kans	Overland Pk., T.L. Dowell	913-236-8200
Mass	Babson Park, P.R. Sturgeon Co.	617-237-3506
Minn	Minneapolis, Dick Borrett Co.	612-929-0028
NJ	Teaneck, Fisher Elect. Assocs.	201-837-1200
NM	Albuquerque, C.T. Carlberg & Assocs.	505-265-1579

NY	Syracuse, Mar-Com Assocs.	315-437-2992
Ohio	St. Marys, T. Shelby & Co., Inc.	419-394-3377
Ore	Portland, Earl & Brown, Co.	206-284-1121
Tenn	Knoxville, Cartwright & Bean	615-693-7450
Tenn	Memphis, Cartwright & Bean	901-276-4442
Tex	Dallas, J.V. Schoonmaker Co.	314-357-8481

CENTRONICS, Hudson, N.H., 03051, Tel: 603-883-0111, TWX: 710-228-6505; Empl: 700; Minimum order: \$50

Free literature available: On impact printers for EDP and communications applications. Specification data sheets.

Products manufactured: Printers, Teleprinters, Terminal Equipment, Digital

Local Sales Offices & Reps.

Cal	Santa Ana	714-979-6650
Ill	Rolling Meadows	312-398-4500
Mass	Burlington	617-272-8545
NH	Hudson	603-883-0111
NJ	Mt. Holly	609-234-6111
Ohio	Kettering	513-294-0070
Tex	Arlington	817-461-5711

CERAMASEAL, INC., Sub. Interpace Corp., Box 25, New Lebanon Center, N.Y., 11216, Tel: 518-794-7800, Telex: 14-5442; FSC No: 07601; Empl: 60; Minimum order: \$25

For info on price: G. D. Sawin; Application info: H. Jennings; Customer service: P. A. Beresford; Delivery info: P. A. Beresford

Free literature available: Literature On: High Alumina Ceramic & High Temp. Porcelain-Metal Sealed Bushings. High Vacuum: Flanges and Hardware, Coaxial Connectors and Cables, & Sapphire, Quartz and Glass Windows.

Mini-Vacuum, - Mini Thermocouple Vacuum, - Rotary Motion, & High Vacuum Feedthrus.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Connectors, Deposition Equipment, Vacuum & Accessories, Feedthrus & Seals, Environmental, Headers, Lead Assemblies & Receptacles, Seals, Services, Assembly, Production & Test, Terminals

Local Sales Offices & Reps.

Ariz	Wickenburg, H. A. Omley	602-684-7201
Ark	Little Rock, C.H. Stout, Inc.	501-374-8201
Cal	Atherton, Wadsworth-Pacific Mfg. Assoc.	415-321-3619
Cal	Pacific Palisades, Wadsworth-Pacific Mfg. Assoc.	213-454-4313
Colo	Denver, Continental Divide Prods.	303-420-0130
Ill	Mt. Prosepect, Automation Equip. Co.	312-398-7550
La	New Orleans, C.H. Stout of La., Inc.	504-482-3183
La	Shreveport, C.H. Stout of La., Inc.	318-425-5485
Md	Baltimore, R. A. Wafer Assoc.	301-744-1133
Mass	Boston, P-J Engrg. Sls. Co.	617-783-0510
Miss	Jackson, C.H. Stout of Miss., Inc.	601-354-4326
NY	Binghamton, Canavan-Scanlon Assoc.	607-724-7220
NY	Buffalo, Canavan-Scanlon Assoc.	716-839-3373
NY	Rochester, Canavan-Scanlon Assoc.	716-442-0720
NY	Syracuse, Canavan-Scanlon Assoc.	315-437-1271
NC	Charlotte, J. Rudisill Assoc.	704-377-6901
Ohio	Chagrin Falls, Bray Assocs.	216-247-4474

Pa Pittsburgh, Muller-Harper & Assoc.

Tenn	Knoxville, C.E. Fox	412-931-6460
Tenn	Memphis, C.H. Stout, Inc.	901-526-7601
Tex	Dallas, E.B. Robertson, Inc.	214-942-8486
Tex	Houston, E.B. Robertson, Inc.	713-785-6800
Tex	Lubbock, E.B. Robertson, Inc.	806-746-6527
Wash	Seattle, J.B. Jolly, Inc.	206-938-4166
FOR:	Can., Islington, Toronto, D.T. Shaw Co. Ltd.	416-231-2706
FOR:	Can., Montreal 379, D.T. Shaw Co. Ltd.	514-332-1163
FOR:	Can., Delta, British Columbia, Ocean Comps. Ltd.	604-521-3419

CERAMIC MAGNETICS, INC., 87 Fairfield Rd., Fairfield, N.J., 07006, Tel: 201-227-4222; Empl: 25; Minimum order: \$85

For info on price: A. G. Lang, Jr.; Application info: A. G. Lang, Jr.; Customer service: G. Schaller; Delivery info: G. Schaller

Free literature available: A catalog which presents all the technical data on the ferrites manufactured at this facility.

Products manufactured: Cores, Ceramic, Cores, Magnetic, Ferrite Material & Parts, Heads, Recording Playback, Erase, Magnets

Local Sales Offices & Reps.

Cal	Irvine, A. C. Allen	714-552-9428
Conn	North Haven, Northeast Reprs.	203-239-2507
Ill	Park Ridge, R. McIntosh	312-825-8070
Mass	Needham Heights, Northeast Reprs.	617-449-3034
Minn	St. Paul, Knox Assocs.	612-488-5402
NY	Buffalo, H. C. Johnson Agencies	716-632-7880
NY	Fayetteville, H. C. Johnson Agencies	315-637-9383
NY	Rochester, H. C. Johnson Agencies	716-482-3000
Pa	Glenshaw, H. C. Johnson Agencies	412-961-0414
Wash	Richland, H. Svobada	509-783-6523
Wash	Seattle, J. B. Jolly	206-938-4166
FOR:	Can., B.C., H. Bourgeois	604-521-3419

CERRO COMMUNICATION PRODUCTS, Box 2026, Anniston, Ala, 36201

CERRO WIRE & CABLE CO., Div. Cerro Corp., 285 Nicoll St., New Haven, Conn., 06504, Tel: 203-772-2250, TWX: 710-465-2149; Empl: 500

Customer service: R.L. Belard Ext. 216

Products manufactured: Cable, Wire

Local Sales Offices & Reps.

Cal	Fremont	415-651-0460
Cal	Sherman Oaks	213-872-1610
Conn	Bradford	203-488-1604
Ga	Norcross	404-449-1868
Ill	Bellwood	312-379-2265
Mo	Clayton	314-721-2498
Mo	Independence	816-358-9191
NJ	Avenel	201-381-2170
NJ	Cherry Hill	609-779-7667
Ohio	Rocky River	216-333-8640
Pa	Pittsburgh	412-343-5022
Tex	Dallas	214-233-2294
Tex	Houston	713-523-6843

CHADWICK-HELMUTH CO., INC., 111 E. Railroad Ave., Monrovia, Calif., 91016, Tel: 213-358-4567; Empl: 20

Customer service: B. Minter

Products manufactured: Controls/Control Eqpt., Lights, Testers

CHALCO ENGRG. CORP., 15126 S. Broadway, Gardena, Cal., 90248, Tel: 213-FA 1-0121, TWX: 910-346-7026; Empl: 95; Minimum order: \$25

Customer service: J. Cox

Products manufactured: Converters, Duplicators, Paper-Tape Preparation Systems, Perforators, Readers, Recorders

CHANNEL INDS., 839 Ward Dr., Santa Barbara, Cal., 93105, Tel: 805-967-0171; Empl: 75

For info on price: R. F. Carlson; Application info: R. M. Callahan; Customer service: L. Barrett; Delivery info: R. M. Callahan

Products manufactured: Crystals, Hydrophones & Accessories, Oceanographic Equip. (Electronic), Transducers

Local Sales Offices & Reps.

Ohio	Newbury, Channel Prods., Inc.	216-564-2245
------	-------------------------------	--------------

CHANNEL MASTER DIV. AVNET, Rte. 209, Ellenville, N.Y., 12428, Tel: 914-647-5000; Empl: 1000

Products manufactured: Alarms, Amplifiers, Antenna Rotators, Antenna Towers & Supports, Antennas, Arresters, Electrical Surge, Lightning, Attenuators, Cable, CATV Systems & Equipment, Comm. Systems, Connectors, Converters, Couplers, Filters, Meters, Mixers, Mounts, Phonographs, Parts & Accessories, Receivers, Rivets, Rods, Ground, Tape Recording Accessories, Transformers, Tubes, Wire

CHANNELLOCK, INC., S. Main St., Meadville, Pa., 16335, Tel: 814-336-1175; Empl: 500 p. 2-1693

Customer service: W. S. DeArment

Free literature available: Complete catalog illustrating the channellock line of mechanic's hand tools: pliers, hammers, screwdrivers, adjustable wrenches, aviation and metal cutting snips.

Products manufactured: Cutters, Wire, Hand Operated, Drivers, Nut, Heat Sinks, Soldering, Knives & Knife Sets, Pliers, Screwdrivers, Tools, Wire Strippers, Wrenches

Local Sales Offices & Reps.

Cal	Alhambra, J.J. Brown Co.	213-283-1322
Cal	S. San Francisco, J.J. Brown Co.	415-589-5775
Colo	Denver, Western Ind'l. Sls. & Svcs. Co.	303-758-3972
Fla	Ft. Lauderdale, G.A. Palmer	305-764-3487
Ga	Decatur, J.C. Lyle & Assocs.	404-378-5691
Ill	Chicago, Muzzy & Peters	312-287-1360
Ind	Jeffersonville, Wixson-Clinard Co.	812-283-0955
La	Mansfield, Lynn & Hemphill, Inc.	318-872-1108
Mass	Wellesley, T. Sawyer Sls. Co.	617-235-2667
Mich	Detroit, Wixson-Nehls Co.	313-871-8815
Minn	Minneapolis, R.L. Perrin & Assocs.	612-831-1211
Mo	Kansas City, D. Schmelzinger Co.	816-444-5330
Neb	Omaha, J. Pedersen	402-571-8604
NJ	Brickstown, A.P. Henricks Co., Inc.	201-892-2894
NJ	Summit, A.P. Henricks Co., Inc.	201-273-0555
NY	Brooklyn, A.P. Henricks Co., Inc.	212-680-0045
NY	Marcellus, A.P. Henricks Co., Inc.	315-673-1340
NY	Merrick, A.P. Henricks Co., Inc.	516-379-8507
NY	New York, A.P. Henricks Co., Inc.	212-732-9630
Ohio	Cleveland, H.W. Murray Co., Inc.	216-333-2977
Okla	Oklahoma City, Lynn & Hemphill, Inc.	405-524-9807
Pa	Glenolden, A.P. Henricks Co., Inc.	215-583-3921
Pa	Pittsburgh, E.D. McGinley	412-561-7979
Tex	Dallas, Lynn & Hemphill, Inc.	214-747-4745
Va	Richmond, D. Miller & Assocs.	703-353-5324
Wash	Port Orchard, R.G. Sullivan Co.	206-871-0872
EXP:	South Bend, Ind., United Export Corp.	219-232-8286

CHASSIS-TRAK, DIV., General Devices Co., Inc., 525 S. Webster Ave., Indianapolis, Ind., 46219, Tel: 317-359-5407, Telex: 27-2169; Empl: 125; Minimum order: \$50 p. 1-63-66

For info on price: S. Gray; Application info: R. D. Lambert; Customer service: R. L. Watson; Delivery info: S. Gray

Free literature available: Catalogs covering: Chassis-Trak solid bearing slides, Chassis-Trak bottom mount slides, Chassis-Trak linear ball-bearing slides, Chassis-Trak circulating ball bearing slides Chassis-Trak handles

Products manufactured: Handles For Cabinets, Circuit Boards, Racks, etc., Slides, Cabinet & Chassis

Local Sales Offices & Reps.

Ariz	Scottsdale, Schoeffler Assoc.	602-948-3470
Cal	Los Angeles, M. A. Stolaroff Co.	213-295-7781
Cal	Mtn. View, G. Woempner Co.	415-964-5454
Cal	San Diego, M. A. Stolaroff Co.	714-234-6905
Cal	Van Nuys, J. Thomas	213-782-3820
Colo	Sedalia, Jensen Reprs.	303-688-4154
Conn	Cheshire, Coakley, Boyd & Abbott, Inc.	203-272-2261
Fla	North Miami, Winfield Elctn. Sls.	305-945-6544
Fla	Tampa, Winfield Elctn. Sls.	813-884-6500
Ill	Rolling Meadows, Lightner Assoc.	312-398-3000
Ind	Indianapolis, Mktg. Engineers, Inc.	317-546-1523
Ind	South Bend, Valentine & Schilling	219-291-6258
Kans	Shawnee Mission, Lowell, Kangas & Assoc.	913-631-3515
Md	Bethesda, G. Rosen Assocs., Inc.	301-530-8448
Mass	Needham, Coakley, Boyd & Abbott, Inc.	617-444-5470

Mich Brighton, Valentine & Schillinger313-227-7863
 Minn St. Paul, Northport Engineering612-698-3841
 Mo St. Louis, Lowell, Kangas & Assocs.314-821-4050
 NY Fayetteville, H.G. Richter Inc.315-637-6713
 NY Manhasset, Kalber & Mack516-627-6620
 NC Paw Creek, Ward Tech. Sls. Co.704-399-3481
 Ohio Cincinnati, Components, Inc.513-721-2997
 Ohio Cleveland, Components, Inc.216-842-2737
 Tex Dallas, R. Martin Assoc.214-361-8584
 Tex Houston, R. Martin Assoc.713-462-4077
 Wash Olympia, Bergford Assoc.206-866-2001
 EXP: Indianapolis, General Devices Co.317-359-5407

CHATNATH CONTROLS CORP., 33 River Rd., Chatham, N.J., 07928, Tel: 201-635-8892; FSC No: 04814; Empl.: 11; Minimum order: \$10

For info on price: D. C. Perst; Application info: J. S. Eckloff; Delivery info: J. N. Ash

Free literature available: Miniature and sub-miniature hermetically sealed thermostats.

Products manufactured: Controls/Control Eqpt., Monitors, Switches, Thermostats

Local Sales Offices & Reps.

Cal Pasadena, Components Corp.213-681-7448
 NJ Fairlawn, PAR Assocs., Inc.201-447-3722

CHATILLON JOHN & SONS, 83-30 Kew Gardens Rd., Kew Gardens, N.Y., 11415, Tel: 212-847-5000; Empl.: 135; Minimum order: \$50

Customer service: R. H. Eklund

Products manufactured: Gages, Scales, Dial, Springs (All Types), Testers

CHATSWORTH DATA CORP., 9732 Cozycroft Ave., Chatsworth, Cal., 91311, Tel: 213-341-9200; Empl.: 45

For info on price: H. G. Boehm; Application info: R. Miller; Customer service: J. O'Neil

Free literature available: Cablemaster-A compact, versatile unit for rapid and efficient testing of electrical cable assemblies, harnesses, connectors, and bulk cable.

Products manufactured: Punched Card Equipment, Testers

CHEM AERO, INC., 231 E. Lomita Blvd., Wilmington, Cal., 90744, Tel: 213-775-2581, TWX: 910-345-6267; Empl.: 100; Minimum order: \$1000

For info on price: D. Thomas; Application info: D. Thomas; Customer service: C. Hansen; Delivery info: D. Martin

Free literature available: Brochures detail bus bars, heatsinks, memory frames, multi-layer boards and assemblies, the rigid-to-flex technique, and bus bar design engineering.

Products manufactured: Boards, Printed Circuit, Bus Bars & Systems, Circuits, Flexible, Circuits, Printed, Multilayer, Heat Exchangers & Systems, Panels, Pins, Strips

Local Sales Offices & Reps.

Ariz Scottsdale, Runyon Co.602-959-6060
 Cal Anaheim, LoDan213-924-1691
 Cal Mountain View, Melchior/Wesley415-964-2321

Cal San Diego, LoDan714-279-6383
 Fla Clearwater, Reynolds & Assoc.305-773-4700
 Ga Atlanta, Reynolds & Assoc.305-773-4700
 Mass Waltham, United Engr. Sls.617-890-6680
 Mich St. Clair Shores, J. M. Thorpe Co.313-779-6363
 Minn Minneapolis, Technical Assoc.612-929-6721
 Mo Florissant, H & R Sls. & Engrg.314-921-6242
 NJ Livingston, Varrelman-Gorman201-992-2505
 Tex Dallas, Precision Sls.214-351-6964
 Wash Seattle, Todd-Brian Ind.206-827-5811

CHEMCUT CORP., 500 Science Pk., State College, Pa., 16801, Tel: 814-238-0514, Telex: 842-555; Empl.: 186

For info on price: R. Lohar; Application info: J. Infield; Customer service: I. Hoy; Delivery info: R. Lohar

Free literature available: P.C. board and chemical machining process equipment...from printing and etching to regeneration and cleaning.

Products manufactured: Machines/Machinery, Production

Local Sales Offices & Reps.

Cal Anaheim, Chemcut Corp., Western Dist. Office714-630-1700

Local Distributors

Cal Anaheim, Chemcut Corp. Western Dist. Off., Box 6376, 1509-A Kraemer Blvd.714-630-1700
 Fla Maitland, Photo Chem. Sys., Box 1475305-647-1593

Ga Roswell, Photo Chem. Sys., 900 Sun Valley Rd.404-993-1738
 Ill Chicago, John Plosfich & Assoc., 4106 N. Nashville Ave.312-286-7676
 Ill Elk Grove Village, Chemcut-Central Dist. Off., 1210 Jarvis Ave.312-956-6513
 Ind W. Lafayette, Bruce Johnson Co., 132 Tamiami Ct.317-463-4616
 Mass Waltham, Etchomatic, Inc., Box 444, 151 Newton St.617-893-2020
 Minn Minneapolis, T.K. Gray, Inc., St. Anthony Off. Pk., 2812 Anthony La., N.E.612-781-4874
 NY East Meadow, Granirer Assoc., 1359 Oak La.516-292-1627

NY Skaneateles, Spar-Kleen Prod., Box 2, Fennell St.315-685-5711
 Ohio Cleveland, L.W. Hodson Machinery Co., 9400 Midwest Ave.216-587-4500
 Okla Tulsa, Lew Wenzel & Co., 520 S. Peoria Ave.918-587-3371

Ore Portland, Vandy Corp., Box 4383503-297-1900
 Tex Dallas, Lew Wenzel & Co., 2850 Satsuma214-243-1546

TEX Houston, Lew Wenzel & Co., 1909 Scott St.713-225-2147

Va Alexandria, Chem. Etching Equip. & Supp. Co., 7629 Crawford Ct.703-971-2646
 Wash Seattle, Vandy corp., Box 70651206-789-3300

CHEMETRON CORP., Welding Prods., 111 E. Wacker St., Chicago, Ill., 60601, Tel: 312-565-5000

Free literature available: Instruction manual & catalog of our maintenance & repair alloys & fluxes.

Products manufactured: Alloys, Flux, Brazing & Soldering Materials, Solder (All Types), Soldering Accessories, Soldering Guns, Irons & Desoldering Tools, Torches, Soldering, Welding & Access., Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

CHEMICAL ELECTRONIC ENG., Amboy Rd. Box 203, Matawan, N.J., 07747

CHEMICAL ETCHING EQUIP. & SUPPLY, 7629 Crawford Ct., Alexandria, Va., 22310, Tel: 703-971-2646; Empl.: 5; Minimum order: \$25

Customer service: R. E. Hunt

Free literature available: Printed Circuit Processing Equipment

Products manufactured: Blowers & Fans & Accessories, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Cameras, Comparators, Densitometers, Electronic, Drafting Machines, Drills & Accessories, Hand & Power, Electroplating Equipment & Supplies, Furnaces, Heaters & Heating Elements, Holders, Circuit Board (Production Type), Knives & Knife Sets, Lamps, Lenses, Optical & Camera, Lights, Machines/Machinery, Production, Microcircuit Production Equip., Power Supplies, Racks, Rectifiers, Solder (All Types), Solder Pots & Baths, Soldering Equipment, Testers

CHEMPLAST, INC., 31-150 Dey Rd., Wayne, N.J., 07470, Tel: 201-696-4700, TWX: 710-988-5834; Empl.: 200; Minimum order: \$15

For info on price: H. Hill; Application info: L. Atkins; Customer service: L. Atkins; Delivery info: E. Walty

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Caps, Forms & Tapes, Heat Shrinkable, Chemicals, Coatings, Cords, Heat Guns, Production, Insulators & Insulation, Lubricants, Materials, Self-Lubricating, Services, Assembly, Production & Test, Tapes, Electrical Insulation, Tapes, Films & Foils, Pressure Sensitive, Tubing, Wire

Local Sales Offices & Reps.

Ariz Phoenix, A. W. Anderson602-277-5911
 Ark Poyen, Component Parts501-337-9580
 Cal Dana Point, J. Edwards714-493-5046
 Cal Van Nuys, Chemplast-West213-786-8866
 Colo Englewood, R-C Sls. Co.303-789-0565
 Conn Branford, W.C. Thompson203-488-8838
 Fla Vero Beach, J.D. Rule305-589-5357
 Ill Rosemont, V. Cogger312-671-0099
 Kans Wichita, Regal Plastic & Sup.316-263-1211
 Md Pasadena, P.J. Simard301-437-0855
 Mass Reverse, J.G. Ferraro617-289-6225
 Minn Minneapolis, Service Tool & Engr. Co.612-941-7151

Mo Kansas City, Regal Plastic & Sup. Co.816-471-6390
 Mo St. Louis, J.A. Crowe314-842-1353
 Neb Omaha, Regal Plastic & Sup. Co.402-344-4446
 NJ Lincoln Park, E.R. Fischer201-694-4763

NJ Mount Holly, J.T. Anderson609-267-6902
 NY New Hyde Park, J.J. Hagmaier516-742-0524
 Ohio Kettering, D. McMullian503-299-8063
 Ohio Olmsted Falls, B. Williams216-886-1050
 SC Columbia, G.E. Younginer803-772-6671
 Tex Dallas, Kolster214-233-4158
 Tex Houston, J.V. Graves713-626-4131
 Utah Salt Lake City, Ward & Assoc.801-487-0756
 Wash Seattle, D. Smith Sls. Co.206-633-3160
 EXP: Wayne, N.J., H. Hamilton201-696-4700

CHEMTRONICS, INC., 45 Hoffman Ave., Hauppauge, N.Y., 11787, Tel: 516-582-3322; Empl.: 23; Minimum order: \$50

Customer service: R. G. Russell

Free literature available: Dealer Catalog available upon request. Provides complete information on each product that is currently being manufactured.

Products manufactured: Adhesives (All Types), Cleaners & Solvents, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Coolants, Circuit & Components, Demagnetizers, Lubricants, Solder (All Types)

Local Sales Offices & Reps.

Cal Burlingame, Wm. J. Purdy Co.415-347-7701
 Cal West Covina, Dow Forth Assoc.213-967-2893
 Colo Englewood, Electronix Spec. Co.303-781-4409
 Fla Ft. Lauderdale, Jack Sproch Sls. Corp.305-886-0927

Ga Norcross, B. Cooper Co.404-448-5460
 Ill Chicago, Markal Sls. Corp.312-282-5800
 Ind Indianapolis, New/Era Sls.317-257-7333
 Mass N. Scituate, W.A. Hendrickson617-545-0652
 Minn St. Paul, Carl-M Co.612-699-8004
 Mo Raytown, Taraski Sls. Corp.816-358-4590
 NY Grand Island, L.J. McTaggart Assoc.716-773-9222

Ohio St. Mary's, Repp Co.419-394-4724
 Pa Pittsburgh, R. Tanner Co.412-561-4687
 Tex Richardson, Willoughby-Fouler Co.214-235-3664

Wash Seattle, Fleehart & Sullivan206-LA 2-1533

FOR: Can., St. Laurent, Montreal, Paco Elctns. Ltd.514-748-6787

CHERRY ELECTRICAL PRODS. CORP., 3600 Sunset Ave., Waukegan, Ill., 60085, Tel: 312-689-7700, TWX: 910-235-1572; Empl.: 1050

Free literature available: Catalog of Switches and Keyboards - 72 pages, Gas Discharge Displays - 6 pages, Keyboard Key Cap Work Book - 32 pages, Facilities Booklet (pocket) - 16 pages.

Products manufactured: Calculators, Electrical & Electronic, Delcalcomania, Display Devices/Displays, Keyboards, Alphanumeric & Decimal, Matrices, Computer, Programmers, Switches

Local Sales Offices & Reps.

Ala Huntsville, Powertronics205-852-6347
 Cal Palo Alto, Abbott Engrg.415-327-0830
 Cal Torrance, O'Donnell Assocs.213-323-9243
 Colo Arvada, Arrowhead Sls.303-422-5556
 Conn Meriden, Electro-Prod. Sls.203-235-4040
 Fla Ft. Lauderdale, CBC Elctns.305-484-7330
 Ill Waukegan, Cherry Electrical Prods.312-689-7600

Ind Fort Wayne, Menze Sls.219-747-5616
 Kans Prairie Village, Thro Indl. Sls.913-362-2533
 Mass Waltham, Electro-Prod. Sls.617-899-1570
 Mich Novi, Miltimore Sls.313-476-2446
 Mich Troy, McPahil Corp.313-689-6444
 Minn St. Paul, Cahill Assoc.612-646-7217
 Mo Florissant, Miller Assoc.314-355-1642
 NJ Fort Lee, S. Justin Assoc.201-947-4371
 NJ Pitman, Colrud Co.609-589-5866
 NY Albuquerque, IMEC505-883-9010
 NY Rochester, Andres Comp. Sls.716-244-2445
 NC Thomasville, Oren Entprs., Inc.919-476-6727
 Ore Portland, J.J. Backer Co.503-297-3776
 Tex Dallas, Ion Assocs.801-487-3716
 Utah Salt Lake City, Arrowhead Sls.801-487-1450
 Wash Seattle, J.J. Backer Co.206-285-1300
 Wisc Pewaukee, D. Herrick414-691-2770
 FOR: Can., Oakville, Ont., H. Diamond Sls. Ltd.416-844-6787

Local Distributors

Cal Chatsworth, Westates Elec. Corp., 20151 Bahama St.213-341-4411
 Cal Orange, Westates Elec. Corp., 948 Elm St.714-532-6891
 Cal Sunnyvale, Westates Elec. Co., 255 N. Mathilda Ave.408-733-8383
 Tex Richardson, Southwest Elec., 1100 Executive Dr.214-234-3050

CHERRY

MANUFACTURERS & SALES OFFICE DIRECTORY

Tex Stafford, Southwest Elec., 12725 Royal Dr.
713-494-6021

CHERRY RIVET & BOOTS NUT DIVS., Townsend Co.,
P.O. Box 2157, Santa Ana, Calif., 92707, Tel:
714-545-5511, TWX: 910-595-1500; Empl.: 817

Customer service: R. E. Herndon

Free literature available: Catalogs on Cherry MS
Rivets, Cherrylock Rivets, Boots "Banc-Lok"
Inserts, Boots Nuts.

Products manufactured: Bushings, Glass, Plastic,
Metal, Rubber, Etc., Fasteners, Rivets

Local Sales Offices & Reps.

Ga Atlanta, J.O. King 404-355-7660
Kans Wichita, Std. Parts & Equip. Corp. 316-522-1516
Tex Ft. Worth, Std. Parts & Equip. Corp. 817-336-2521

CHESTERFIELD PRODS. INC., 511A Victor St.,
Saddle Brook, N.J., 07662, Tel: 201-845-6886; Empl.:
27; Minimum order: \$25 p. 1•548

For info on price: M. Silver; Application info: A. J.
Spencer; Customer service: M. Silver; Delivery info:
M. Silver

Products manufactured: Analyzers, Attenuators,
Coils Including Assemblies & Forms, Delay Lines,
Equalizers, Filters, Generators, Meters, Monitors

Local Sales Offices & Reps.

Ill Chicago, K. W. Meyers Co. 312-774-6440
Ind Indianapolis, K. W. Meyers Co. 317-243-6681
Md Edgewater, Commart, Inc. 301-798-0607
Mass Acton, E.E. Specialists, Inc. 617-259-9200
Minn Minneapolis, K. W. Meyers Co. 612-920-7080
NJ Saddle Brook, L&M Assocs. 201-843-8700
NY Brentwood, L & M Assocs. 516-231-8363
NY New York City, L & M Assocs. 212-675-7486
Pa Andalusia, L & M Assocs. 215-639-3100
Tex Dallas, Bradenco 214-358-3278
Tex Houston, Bradenco 713-529-9881
Wisc Milwaukee, K. W. Meyers Co. 414-482-1313

CHICAGO CONDENSER CORP., 3255 W. Armitage,
Chicago, Ill., 60647, Tel: 312-227-7070; Empl.: 15;
Minimum order: \$25

For info on price: P. Phillips; Application info: K.
Peter; Customer service: P. Phillips; Delivery info: P.
Phillips

Products manufactured: Capacitors, Fixed, Power
Supplies

Local Sales Offices & Reps.

Cal Redwood City, Warren-Hickey Sls. Co. 415-368-3849

CHICAGO DYNAMIC INDUSTRIES, Precision Prods. Div.,
1725 Diversey Blvd., Chicago, Ill., 60614, Tel:
312-935-4600; Empl.: 478

For info on price: J. M. Early; Application info: S.
Heide; Customer service: J. M. Early; Delivery info: F.
E. Kucera

Free literature available: Complete catalog or
individual spec. sheets on thumbwheel, rotary,
slide, and pushbutton switches; custom
components; mechanical or pulse counters.

Products manufactured: Counters, Relays, Switches

Local Sales Offices & Reps.

Ala Huntsville, Craft Assocs. 205-837-0221
Cal Inglewood, Weightman & Assocs. 213-645-6060
Cal Menlo Park, West Engrg. Sls. 415-325-2885
Colo Denver, TESCO 303-744-1119
Fla Maitland, Craft Assocs. 305-645-2242
Ga Atlanta, Craft Assocs. 404-252-5001
Ill Rolling Meadows, Sumer, Inc. 312-394-4900
Ind Fort Wayne, Temple Engrg. 219-744-4331
Md Glen Arm, Hodgins Assocs. 301-592-7047
Mass Norwood, JMG 617-762-5333
Mich Detroit, L. H. Dickelman Co. 313-255-3303
Minn Edina, M. Foster Co. 612-835-2252
Mo Kansas City, Harris-Hanson Co. 816-H14-9494
Mo St. Louis, Harris-Hanson Co. 314-432-3611
NJ Carlin, S.A.M. Assocs. 201-727-5335
NY Jamaica, S.A.M. Assocs. 212-OL8-8881
NC Greensboro, L & D, Inc. 919-292-3201
Ohio Cleveland, L.H. Dickelman Co. 216-831-1039
Tex Dallas, Glidden Electro Equip. 214-EM3-6539
Tex Houston, Glidden Electro Equip. 713-681-1415
EXP: Westbury, N.Y., Minthorne Int'l. Co. 516-334-3303

CHICAGO LOCK CO., 4275 W. Belmont Ave., Chicago,
Ill., 60641, Tel: 312-282-7177, Telex: 25-4055; Empl.: 408
p. 1•1986,1987

Products manufactured: Switches

Local Sales Offices & Reps.

NY New Rochelle 914-636-1311

CHICAGO MINIATURE LAMP/DRAKE, 4433 N
Ravenswood Ave., Chicago, Ill., 60640, Tel:
312-784-1020, TWX: 910-221-5445; FSC No: 71744;
Minimum order: \$75

For info on price: C. Feeney 312-784-1020; Application
info: M. Kaczmarek 312-867-7227; Customer service:
C. Feeney; Delivery info: C. Feeney

Products manufactured: Caps, Lenses, Indicator
Light, Diodes, Display Devices/Displays,
Indicators, Lamps, Lights, Sockets

Local Sales Offices & Reps.

Ariz Phoenix, Howe & Howe Sls., Inc. 602-264-7971
Cal Mt. View, CMLW 415-967-2346
Cal N. Hollywood, Chicago Miniature Lamp Co. 213-877-0158
Colo Denver, Lindberg Co. 303-758-9033
Conn Newtown, Gerber Sls. Corp. 203-426-3440
Fla Hollywood, Component Engrg. Sls. Co. 305-922-5230
Ga Atlanta, Winfield Southeast Co. 404-636-3023
Ill Chicago, CMLW 312-784-1020
Ind Indianapolis, Tech. Reprs. 317-849-6454
Iowa Cedar Rapids, PMA Corp. 319-362-9177
Kans Overland Park, PMA Corp. 313-381-0004
Kans Wichita, PMA Corp. 316-264-2662
Mass East Longmeadow, Gerber Sls. Corp. 413-525-3059
Mass Waltham, Gerber Sls. Corp. 617-890-8040
Mich Detroit, Rathsburg Assoc. 313-882-1717
Minn Minneapolis, Nortec Sls. 612-835-7414
Mo Hazelwood, PMA Corp. 314-731-4334
NJ Cherry Hill, Trinkle Sls., Inc. 609-795-4200
NJ Parsippany, TMA 201-227-4073
NM Albuquerque, Lindberg Co. 505-345-2489
NY N. Syracuse, L.D. Allen, Inc. 315-458-7470
NY Port Washington, T.M.A. 516-883-2432
NY Snyder, L.D. Allen, Inc. 716-839-3300
NC Charlotte, Winfield Southeast Co. 404-636-3023
Ohio St. Marys, T. Shelby & Co. 419-394-3377
Ore Portland, J.J. Backer Co. 503-297-3776
Ore Salem, J.J. Backer Co. 503-362-0717
Tenn Hermitage, Winfield Southeast Co. 404-636-3023
Tex Dallas, Techno Assocs. 214-357-9213
Utah Salt Lake City, Lindberg Co. 801-364-6409
Wash Seattle, J.J. Backer Co. 206-285-1300
EXP: Chicago, Ill., Chicago Miniature 312-784-1020
FOR: Can., Montreal, P.Q., General Instr. Can. 514-636-9454
FOR: Can., Toronto, Ont., General Instr. Can. 416-763-4133

CHICAGO SWITCH, INC., 2035 W. Wabansia,
Chicago, Ill., 60647, Tel: 312-489-5500; Empl.: 150;
Minimum order: \$25 p. 1•1988

For info on price: E. H. Petersen; Application info: E.
H. Petersen; Customer service: M. Moore; Delivery
info: M. Moore

Free literature available: GENERAL CATALOG - An
attractive two color, 24 page catalog containing
over 250 switches, many of which are in stock for
immediate delivery. Included in this catalog are
photos, dimensional line drawings, specifications,
prices, and ordering information on our complete
line of switches-including slide, snap action,
rotary, pushbutton, rocker, paddle and leaf.

Products manufactured: Lights, Sockets, Switch
Hardware, Switches

Local Sales Offices & Reps.

Ariz Phoenix, Cleveland Entr. 602-996-6130
Cal Burlingame, J. Logan & Assoc. 415-697-6100
Cal San Gabriel, V. Gott & Assoc. 213-285-2148
Colo Denver, Omega Ltd. 303-758-1508
Conn Bethany, Reps. Corp. 203-393-0024
Fla Casselberry, E.I.R. 305-830-9600
Ga Atlanta, Winfield-Southeast Co. 404-636-3023
Ind Indianapolis, Tech. Reprs. 317-849-6454
Mass Topsfield, Reps. Corp. 617-887-5050
Mich Southfield, Kingsley Assoc. 313-424-8181
Minn Minneapolis, Stack-Johnson, Inc. 612-925-2111
NJ Mountain Lakes, Comps. Elctns. 201-334-2921
NM Albuquerque, Cleveland Entr. 505-345-2481
NY Syracuse, Nycorn, Inc. 315-437-8343
NC Charlotte, Winfield-Southeast Co. 404-636-3023
Ohio Beachwood, Elctn. Salesmasters, Inc. 216-831-9555
Ore Beaverton, N.R. Schultz Co. 503-643-1644
Pa Glenside, Elcom, Inc. 215-885-1325
Tenn Hermitage, Winfield-Southeast Co. 404-636-3023
Tex Dallas, Erickson-Vilter Sls. 214-243-6611

Utah Salt Lake City, Omega Ltd. 801-266-9617
Wash Bellevue, N.R. Schultz Co. 206-454-5224

Local Distributors

Cal Burlingame, Rose Elctns., 846 N. Stanton Rd.
415-697-0224

CHOMERICS

CHOMERICS, INC., 77 Dragon Court, Woburn, Mass.,
01801, Tel: 617-935-4850, TWX: 710-393-0173; Empl.:
90; Minimum order: \$50

For info on price: P. A. Connolly; Application info: R.
Stahl; Customer service: P. A. Connolly; Delivery info:
D. Smith

Free literature available: Technical Bulletin
41-Describes CHO-THERM, a thermally
conductive, electrically insulating silicone rubber
for insulating power semiconductors. Bulletin
967-Describes standard QUICKKEY keyboards,
featuring low profile, tactile feel.

Products manufactured: Adhesives (All Types),
Coatings, Compounds, Encapsulating, Insulating,
Molding, Potting, Conductive Plastic Materials,
Gaskets, Shielding, R-F-Also See Shields, R-F,
Keyboards, Alphanumeric & Decimal, Pads,
Transistor Mounting, Rubber, Shields, Switches,
Transistor, Diode, Thyristor Heat Dissipators,
Tubing

Local Sales Offices & Reps.

Cal Los Angeles, El-Com, Inc. 213-223-1351
Pa Glenside, C.A. Briggs Co. 215-885-2244
Tex Dallas, J. Clay Co. 214-350-1281

RFI Shielding

Cal Irvine, Chomerics/Job-Ready 714-556-4170
Cal Los Angeles, El-Com, Inc. 213-223-1351
Cal San Carlos, Lo-Dan, Inc. 415-592-4600
Fla Orlando, Data-Rep, Inc. 305-843-5224
Fla Pompano Beach, Data-Rep, Inc. 305-781-9279
Ill Skokie, Mar-Con Assoc. 312-675-6450
Md Rockville, Mechtronics Sls., Inc. 301-340-2130
Minn Minneapolis, Milt Westlund Assoc. 612-866-5002

Mo St. Louis, Chomerics/Mid-America

NY Jamaica, S-J Assocs. 314-434-3880
NY Manhasset, Win-Cor Elctn. Sls. 516-627-9474
Okla Tulsa, Blair Engrg. 918-633-9850
Ore Portland, Houston Co. 503-235-4174
Pa Philadelphia, Professional Svc. Assoc. 215-355-6244

Tex Dallas, Blair Engrg. 214-352-8411
Tex Dallas, K. A. Elctn. Sls. 214-634-7870
Tex Houston, Blair Engrg. 713-772-0677
Wash Seattle, Houston 206-622-0750

Local Distributors

Cal Los Angeles, El-Com, 5134 Valley Blvd.
213-223-1351

CHRISTIANSEN RADIO INC., 1950 San Remo, Laguna
Beach, Cal., 92651, Tel: 714-497-1506; Empl.: 9

For info on price: J. Conroy; Application info: A. D.
Christiansen; Customer service: J. Conroy; Delivery
info: J. Conroy

Free literature available: Brochures: Mini-Mount
Solid State Electronics Kits, Mini-Mounts DC/UHF
Breadboarding, Electronics in Education,
Instructor's Manual A Series.

Products manufactured: Benches, Consoles, Stools,
Tables, Boards, Plug-In, Boards, Printed Circuit,
Boards, Branded Wiring, Universal, Chassis, Circuit
Board Mounting, Integrated Circuit Packaging
Systems, Integrated Circuit Devices, Kits,
Breadboarding (For Engineers), Kits, Power
Supply, Kits, Printed Circuit, Kits, Test Equipment,
Kits, Training Aid, Pads, Transistor Mounting,
Soldering Accessories, Soldering Equipment,
Strips, Terminal Blocks, Boards & Strips

Local Sales Offices & Reps.

Cal Los Altos, Andot Tech. Sls. Co. 415-941-8858

CHRISTIE ELEC., 3404A W. 67th St., Los Angeles, Cal.,
90043, Tel: 213-750-1151, TWX: 910-321-3867; FSC No:
02294; Empl.: 120; Minimum order: \$1,095
p. 1•1180,1186

Customer service: H. Rudman

Free literature available: Bulletin AC-73 High-current
DC power supplies; regulated and non-regulated;
up to 1500 amps and 126 DC output volts.

Products manufactured: Chargers, Battery, Current Sources, Eliminators, Battery, Lamps, Lights, Power Supplies, Rectifiers, Sockets, Testers

Local Sales Offices & Reps.

Cal Santa Clara, Thomas-Hartman Assoc. 408-247-1252
 Fla Orlando, Newco & Assocs. 305-293-7700
 Md Silver Spg., L. White 301-585-3141
 NC Winston-Salem, L. White & Co. 919-725-3612
 Tex Richardson, C. Tinch 214-231-1322
 EXP: Cal., L.A., Trans-World Trade 213-472-0444

CHRONETICS, INC., 500 Nuber Ave., Mt. Vernon, N.Y., 10550, Tel: 914-699-4400, TWX: 710-560-0014; Empl.: 55 p. 1*634; p. 2*1286

For info on price: Sls. Dept.; Application info: S. Gordon; Customer service: Sls. Dept.; Delivery info: Sls. Dept.

Free literature available: Complete and detailed literature on the following items: PG-10, PG-11A, PG-12, PG-13, PG-14B, PG-16, PG-32A, 1012.

Products manufactured: Amplifiers, Analyzers, Delay Lines, Generators

Local Sales Offices & Reps.

Ariz Tempe, Trembly Assoc. 602-966-4428
 Cal Sherman Oaks, Windsor Dynamics 213-989-3631
 Cal Woodside, Windsor Dynamics 415-854-4870
 Colo Parker, Technology Mktg. Assoc. 303-841-3435
 Conn Hamden, Equip. Sls. Co., Inc. 203-248-5581
 Fla Clearwater, Brennan Assocs., Inc. 813-446-5006
 Fla Orlando, Brennan Assocs., Inc. 305-425-2161
 Ill Elk Grove Village, L.F. Green & Assocs. 312-593-0282
 Ill Mt. Prospect, Contemporary Science 312-255-3793
 Ind Indianapolis, L.F. Green & Assocs. 317-253-2087
 Kans Olathe, R. Rush Assocs. 913-782-1177
 Md Bethesda, Powell-Pendergraph, Inc. 301-656-4535
 Mass Chelmsford, Equip. Sls. Co., Inc. 617-256-8547
 Minn Minneapolis, L.F. Green & Assocs. 612-781-1611
 Mo St. Louis, R. Rush Assocs. 314-426-3656
 NM Albuquerque, Technology Mktg. Assoc. 505-298-4321
 NY Mt. Vernon, Q.E.D. Elctns., Inc. 914-664-0080
 Ohio Dayton, Rixon Assocs. 513-278-4216
 Ohio Westerville, Contemporary Science, Inc. 216-292-7533
 Pa Abington, Powell-Pendergraph, Inc. 215-657-0300
 Tex Dallas, R. Martin Assocs., Inc. 214-358-3704
 Tex Houston, R. Martin Assocs., Inc. 713-462-4077
 Va Richmond, Powell-Pendergraph, Inc. 703-264-2341
 Wash Seattle, H. Levinson Co. 206-EA 3-5100

CHRONO-LOG CORP., 2 W. Park Rd., Havertown, Pa., 19083, Tel: 215-853-1130; Empl.: 15; Minimum order: \$20 p. 1*152, 153

For info on price: D. Biberman; Application info: D. Biberman; Customer service: A. Roy

Free literature available: Condensed Catalog - Digital Clocks, Calendars, Time Code Readers, Generators, Tape Search Systems. Series 70,000 Bulletin - versatile Digital Clocks. Series 9,000 Bulletin - low cost Time Code & Generator Readers.

Application Notes - individual bulletins of Chrono-log Digital Clocks and Time Code Equipment.

Products manufactured: Chronometers, Clocks (All Types), Controllers, Programmable, Converters, Counters, Generators, Receivers, Standards, Tape Search Equipment, Timers

Local Sales Offices & Reps.

Mass Needham, J.J. Wild, Inc. 617-HI4-2366
 Va Arlington, H.J. Heffernan Co. 703-JA2-6666
 FOR: Can., Don Mills, Ont., York Instrs. 416-445-1255

CHRONOMITE LABS, 21011 S. Ligueroa St., Carson, Cal., 90745

CIMCO WIRE & CABLE, INC., 250 W. Crescent Ave., Allendale, N.J., 07401, Tel: 201-327-2522, Telex: 13-3443; Empl.: 58; Minimum order: \$50 p. 2*1910, 2023

Customer service: H. Singer

Products manufactured: Cable, Tubing, Wire

Local Sales Offices & Reps.

Cal Chatsworth, Cal-Ward Sls. Co. 213-885-1771

Fla Orlando, Royce Elctn. Sls., Inc. 305-843-6030
 Ill Chicago, Kennedy Engrg. 312-631-8283
 Ind Ft. Wayne, Component/Insulation Corp. 219-485-7114
 Kans Shawnee Mission, K & M Sls. 913-262-1444
 Mass Weston, F.C. Talbot Co. 617-893-6877
 Mich Birmingham, Forand Sls. Co. 313-644-0087
 Minn Minneapolis, Paul Ericson & Assocs. 612-884-1969

NY East Syracuse, Mac-Tron Sls. & Engrg. Co. 315-422-2425
 Ohio Cleveland, Component/Insulation Corp. 216-521-3570
 Pa Pittsburgh, J.W. Kight Co. 412-781-8303
 Pa Radnor, Cordray Sales Co. 215-687-1366
 Tenn Memphis, Wm. L. Porter Co. 901-386-7714
 Tex Dallas, R.E. Nesbitt Co. 214-357-4601
 Wash Kirkland, Lehr Assocs. 206-827-4581
 FOR: Can., Montreal, Que., Allied Elctn. Sls. 514-488-5547

CINCH, See TRW Cinch

CINCINNATI ELCTRNS. CORP., 2630 Glendale Milford Rd., Cincinnati, Ohio, 45241, Tel: 513-563-6000, TWX: 810 464-8151; FSC No: 80045; Empl.: 900

Free literature available: Radio Sets, Receivers, Transceivers, Decoders, Demodulators, Antennas, Displays, Amplifiers, IR Receiving Sets and Detectors, Radar Sets.

Products manufactured: Amplifiers, Antennas, Boards, Printed Circuit, Circuits, Hybrid, Thick Film, Coders, Comm. Systems, Couplers, Decoders, Decommutators, Telemetering, Demodulators, Detectors, Mixer-Preamplifiers, Microwave, Modulator/Demodulators, Modulators, All Kinds, Multiplexers, Packages, Integrated Circuit, Radar Systems, Receivers, Scanners, Services, Assembly, Production & Test, Transceivers, Transmitters

CINCINNATI MILACRON, Molded Plastics Division, P.O. Box 246, Blanchester, Ohio, 45107, Tel: 513-783-2464, Telex: 214472; Empl.: 10000

Products manufactured: Laminates

Local Sales Offices & Reps.

Ala Huntsville, Component Sls. 205-883-7794
 Cal Fremont, H.K. Foraker 415-657-2213
 Cal Sepulveda, R.L. Assocs. 213-782-7826
 Colo Boulder, Straube Assocs. 303-443-8600
 DC Bellevue, Ray Over Sls. 206-454-9187
 Fla Terra Ceia, Component Sls. 813-360-7460
 Ill Chicago, Electro-Comp. Sls., Inc. 312-763-3636
 Ind Ft. Wayne, P. Kilfoil 219-749-0113
 Kans Mission, Inland Assocs. 913-362-2366
 Mich Ferndale, Hilltronics, Inc. 313-398-5556
 Minn Minneapolis, M. Franklin 612-835-6422
 Mo Glencoe, Inland Assocs. 314-938-4992
 NH Spofford, Bahr Sls. 603-352-5444
 NJ Springfield, F. F. Sylvester Assoc. 201-376-3324
 NM Albuquerque, Straube Assocs. 505-294-1880
 NY Rochester, Landfeir & Brophy 716-442-0430
 NC Raleigh, Component Sls. Corp. 919-832-1897
 Ohio Cincinnati, J.F. Kilfoil Co. 513-791-6150
 Ohio Grafton, A. Risser 216-458-5091
 Pa Fairview Village, R.H. Hilderbrand Co. 215-247-6225
 Tex Garland, G.V. Peck Co. 214-341-8311
 Utah Salt Lake City, Straube Assocs. 801-328-4513
 FOR: Can., Brock Elctns. Ltd. 613-342-0152

CINCINNATI SUB-ZERO PRODUCTS, 2612 Gilbert Ave., Cincinnati, Ohio, 45206, Tel: 513-751-8810; Empl.: 40

For info on price: T. J. Frederick; Application info: T. J. Frederick; Customer service: R. E. Schroeder; Delivery info: T. E. Spicer

Products manufactured: Baths, Controlled Temperature (Air & Liquid), Chamber, Environmental Test, Testers

CIPHER DATA PRODUCTS, 7655 Convoy Ct., San Diego, Cal., 92111, Tel: 714-279-6550, TWX: 910-335-1257; Empl.: 132

Customer service: E. L. Phillips

Products manufactured: Computers, Converters, Data Acquisition & Reduction Systems, Recorders

Local Sales Offices & Reps.

Ala Huntsville, FM Assocs. 205-536-9990
 Ariz Phoenix, Thorson Co. 602-956-5300
 Cal Los Angeles, Thorson Co. 213-937-0790
 Cal Mountain View, Thorson Co. 415-964-9300
 Cal San Diego, Mesa Elctns. 714-278-8021
 Colo Boulder, Measurement Consultants 303-449-5294
 Fla Orlando, FM Assocs. 305-851-5710
 Ill Chicago, Data Elctns. 312-283-0300

Ind Columbus, Miltronics 812-376-6321
 Mass Wakefield, Instr. Dynamics 617-245-5100
 Mich Farmington, Anderson Elctns. 313-476-9161
 Minn Minneapolis, Data Elctns. 612-786-9666
 NJ Ramsey, Cipher East Regional Off. 201-825-0335

NM Las Cruces, Measurement Consultants 505-526-2491
 NY East Setauket, K & J Assocs. 516-751-8886
 NC Greensboro, FM Assocs. 919-294-2754
 Ohio Dayton, E. V. Swede Swenson 513-425-2773
 Pa Pennsauken, Megargel/Himmelsstein 609-662-3081

Tex Houston, Comspec 713-461-4487
 Tex Richardson, Comspec 214-234-4137
 Utah Murray, Measurement Consult. 801-268-3181

CIR-Q-TEL, INC., 10504 Wheatley St., Kensington, Md., 20795, Tel: 301-946-1800; Empl.: 20

Customer service: D. E. Claycomb

Free literature available: Mini Catalog - filters and other products.

Products manufactured: Attenuators, Circulators, Ferrite, Detectors, Filters, Isolators

CIRCON CORP., 749 Ward Drive, Santa Barbara, Cal., 93111, Tel: 805-967-0404; Empl.: 30; Minimum order: \$15

Customer service: Sls. Order Desk

Free literature available: MicroVideo Systems; MicroTools; MicroHardware; MicroIndicators & Lamps, MicroLuminators and MicroMagnifiers.

Products manufactured: Cameras, Caps, Lenses, Indicator Light, Eyelets, Fasteners, Kits, Breadboarding (For Engineers), Kits, Terminal, Knives & Knife Sets, Lamps, Leads, Test & Adaptors, Lenses, Optical & Camera, Lights, Microcircuit Production Equip., Microscopes, Monitors, Probes, Recorders, Rivets, Sockets, Solder (All Types), Soldering Accessories, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools, Television Systems & Equipment Closed-Circuit, Terminals, Testers, Tools, Tweezers, Hand & Vacuum

Local Sales Offices & Reps.

Ariz Phoenix, Jensen Tools & Alloys 602-959-2210
 Fla Longwood, Lenz Engrg. Co. 305-831-9791
 Fla Miami, Elctn. Equip. 305-871-3500
 Ill Chicago, Brooks Engrg. Co. 312-944-1227
 Md Rockville, Winston Sls. Co. 301-881-5780
 Mass Framingham, DLG Assocs. 617-877-7880
 Mass Sudbury, DLG Assocs. 617-877-7880
 Mich Detroit, Group Ten Tech. Sls. Corp. 313-549-3910
 NJ East Brunswick, Sigma Comms. Assocs. 201-238-3910
 NM Albuquerque 505-265-6775
 NY Binghamton, Stack Ind'l. Elctns. 607-723-6326
 NY Hempstead, Davis Elctns. 516-483-9200
 NY Merrick, Sigma Comms. Assocs. 516-623-7227
 Ohio Cleveland, Group Ten Tech. Sls. Corp. 216-488-2800
 Ohio Dayton, Group Ten Tech. Sls. Corp. 513-277-6531
 Pa Feasterville, H. Mann 215-355-7200
 Pa Plymouth Meeting, Techni-Tool 215-825-4990
 Tex Dallas, Southwestern Engrg. & Equip. Co. 214-826-6661
 Tex Spring, Southwestern Engrg. & Equip. Co. 713-353-4333
 Wash Seattle, Demarest Assocs. 206-523-0600

CIRCUIT ASSEMBLY CORP., 3169 Red Hill Ave., Costa Mesa, Ca., 92626, Tel: 714-540-5490, TWX: 910-595-1971; Empl.: 275

For info on price: T. Piatt; Application info: T. Piatt; Customer service: B. Payne; Delivery info: B. Payne

Products manufactured: Cable Assemblies & Harnesses, Cable, Connectors, Contacts, Electrical, Enclosures, Module, Plug-In, Jumpers, Pins, Plug Caps & Shells, Sockets, Wire

Local Sales Offices & Reps.

Ariz Scottsdale, Barnhill Five 602-947-5745
 Cal Los Angeles, Product Supply Co. 213-659-1858
 Cal Santa Clara, Kelley Sales 408-249-0786
 Colo Denver, Barnhill Five 303-426-0222
 Conn Wallingford, Con Sales 203-269-7964
 Fla Fort Lauderdale, Tech-Rep Assocs. 305-792-0962
 Fla Indian Rocks Beach, Tech-Rep Assocs. 813-595-2834
 Ill Wilmette, Crest-Assocs. 312-256-5202
 Mass Waltham, Con Sales 617-890-0011
 NJ Westwood, R. C. Assocs. 201-664-1241
 NM Albuquerque, Barnhill Five 505-293-5956

Tex Arlington, N. & W. Sales 817-461-4443
 Wash Bellevue, Hays Industrial 206-883-8888

CIRCUIT-STIK, INC., 24015 Garner St., Torrance, Cal., 90501, Tel: 213-530-5530, Telex: 69-8223; FSC No: 06656; Empl.: 43; Minimum order: \$25

For info on price: D. Harper; Application info: G. McCray; Customer service: D. Harper; Delivery info: Order Desk

Products manufactured: Boards, Printed Circuit, Connectors, Drafting Symbols, Dry Transfer, Pressure Sensitive, etc. (Including Lettering), Kits, Breadboarding (For Engineers), Kits, Printed Circuit, Racks, Socket Adapters, Sockets, Tapes, Films & Foils, Pressure Sensitive

Local Sales Offices & Reps.

Ariz Phoenix, W. B. Knight Co. 602-242-6787
 Ariz Scottsdale, F. Board Assocs. 602-949-9561
 Cal Burlingame, W.J. Purdy Co. 415-347-7701
 Cal Newport Beach, W. B. Knight, Inc. 714-833-8250

Colorado Denver, W.J. Purdy Co. 303-777-1411
 Fla Orlando, Cartwright & Bean, Inc. 305-422-4531
 Ga Atlanta, Cartwright & Bean 404-255-5262
 Ill Hinsdale, Hill-Gray Assoc. 312-325-4810
 Ind Mulberry, Maish Sls. 317-296-2322
 Kans Overland Pk., T.L. Dowell 913-236-8200
 Mass Babson Park, P.R. Sturgeon Co. 617-237-3506
 Minn Minneapolis, D. Borrett Co. 612-929-0028
 NJ Teaneck, Fisher Elect. Assoc. 201-837-1200
 NM Albuquerque, C.T. Carlberg & Assocs. 505-265-1579

NY Syracuse, Mar-Com Assocs. 315-437-2843
 Ohio St. Marys, Thomas Shelby & Co. 419-394-3377
 Ore Portland, Earl & Brown Co. 206-284-1121
 Tenn Knoxville, Cartwright & Bean 615-693-7450
 Tenn Memphis, Cartwright & Bean 901-276-4442
 Tex Dallas, J.Y. Schoonmaker Co. 214-357-8481

CIRCUIT STRUCTURES LAB., Div. Lincoln Instr. Co., Inc., 3200 N. San Fernando Blvd., Burbank, Calif., 91504, Tel: 213-849-6341; Empl.: 4

For info on price: G. Vogel; Application info: E.L. Deatrick; Customer service: G. Vogel; Delivery info: G. Vogel

Products manufactured: Chassis, Circuit Board Mounting, Chassis, Metal, Guides, Circuit Board, Kits, Breadboarding (For Engineers), Pads, Transistor Mounting

CIRCUIT TECHNOLOGY, 160 Smith St., Farmingdale, N.Y., 11735, Tel: 516-293-8686, TWX: 510-224-6555; Empl.: 280; Minimum order: \$1000

For info on price: M. Spitz; Application info: B. Sabatini; Customer service: J. DiPietro; Delivery info: J. DiPietro

Free literature available: Facilities & Capabilities Brochure

Products manufactured: Circuits, Hybrid, Thick Film, Converters, Drivers, Switch, Filters, Hybrid Voltage Regulators, Integrated Circuit Devices, IC's, Active Filters, Integrators, Electronic, Lamp Drivers, Networks

Local Sales Offices & Reps.

Cal Manhattan Beach 213-374-7446

CIRTECH CORP., 3802 W. 95th St., Leawood, Kans., 66206, Tel: 913-649-2800, TWX: 910-749-6806

Products manufactured: Filters

Local Sales Offices & Reps.

Ariz Phoenix, Runyon Co. 602-959-6060
 Cal Los Angeles, Westaironics, Inc. 213-466-6201
 Fla Clearwater, WMM Assoc., Inc. 813-446-0075
 Mass Braintree, Bordewick Eng. Sales 617-843-0845
 NY Buffalo, Telesco Assoc., Inc. 716-834-1026
 NY New York, F & F Assoc. 516-ED 4-1160
 Ohio Dayton, Berberich & Assoc. 513-252-9891
 Tex Dallas, Tinch Sls. Co. 214-231-1322

CLAIREX ELCTRNS. INC., 560 S. 3rd Ave., Mt. Vernon, N.Y., 10550, Tel: 914-664-6602; Empl.: 120; Minimum order: \$25 p. 1-1008, 1009

For info on price: A. Rabidoux; Application info: S. Aconsky; Customer service: A. Rabidoux; Delivery info: A. Rabidoux

Free literature available: Photocell Design Manual, Photomod Catalog, Spec Sheets

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Detectors, Isolators, Transistors

Local Sales Offices & Reps.

Cal Culver City, E.V. Roberts & Assoc. 213-870-9561
 Cal Palo Alto, E.V. Roberts & Assoc. 415-494-1671

Cal San Diego, E.V. Roberts & Assoc. 714-565-4535
 Colo Eastlake, Jensen Reps. 303-688-4151
 Fla North Miami Beach, Irby & Connolly Inc. 305-949-5197

Fla Orlando, Irby & Connolly Inc. 305-894-8471
 Ga Decatur, Electro Rep. Assoc. Inc. 312-286-1500
 Ill Chicago, L-Tec Inc. 301-296-4306
 Md Lutherville, Cunningham & Assoc. 301-296-4306

Mass Norwell, Bordewick Eng. Sls. Co. 617-659-4915

Mich Ferndale, Hilltronics Inc. 313-398-5556
 Minn Minneapolis, H.M.R. Inc. 612-920-8200
 NJ Fort Lee, Tecmat 201-461-8686
 NY Cato, Clairex Elctns. 315-626-6426
 NY Mt. Vernon, Clairex Elctns. 914-664-6602
 NY Roslyn Heights, Livera Polk Assoc. 516-484-1276

NC Charlotte, Electro Rep. Assoc. 704-527-2530
 Ohio Chardon, Clairex Elctns. 216-285-3415
 Pa Media, W. Reeves Assoc. 215-566-6709
 Tex Dallas, J.B. Guenther Inc. 214-691-8500
 Tex Houston, J.B. Guenther Inc. 713-468-0232
 Wash Seattle, H. Levinson Co. 206-323-5100

Local Distributors

Ala Birmingham, M-G Elctns & Equip., Inc., 3112 6th Ave. S. 205-328-4525
 Cal Culver City, E.V. Roberts & Assocs., Inc., 9601 W. Jefferson Blvd. 213-870-9561
 Cal Garden Grove, Allied Elctns. Corp., 12311 Ind'l. St. 714-894-7585
 Cal Palo Alto, E.V. Roberts & Assocs., Inc., 800 San Antonio Rd. 415-494-1671
 Cal San Diego, E.V. Roberts & Assocs., Inc., 8861 Balboa Ave., Suite E 714-565-4535

Fla Orlando, Hammond Elctns., Inc., 911 W. Central Blvd. 305-241-6601
 Fla Tampa, Lykes Elctns. Corp., 5426 W. Crenshaw 813-886-6621
 Ill Elgin, Allied Elctns. Corp., 1355 Sleepy Hollow Rd. 312-697-8200

Ind Indianapolis, Graham Elctns. Supp., Inc., 133 S. Pennsylvania St. 317-634-8486
 Kans Topeka, Acme Radio Supply, Box 437, 135 Kansas 913-235-1363
 Ky Louisville, P.I. Burks Co., 842 S. 7th St. 502-589-3960

La New Orleans, Southern Radio Supply Co., 1901 Tulane Ave. 504-524-2343
 Mass Newton, Cramer Elctns., Inc., 85 Wells Ave. 617-969-7700

Mass Norwell, Bordewick Sls. Co., 427 Washington St. 617-659-4915
 Mich Detroit, Michigan Lectrols Corp., 18315 W. 7 Mile Rd. 313-255-4250
 Mich Detroit, R.S. Elctns., 12775 Lyndon Ave. 313-491-1000

Minn Minneapolis, Stark Elctns., 112 3rd. Ave. N. 612-294-1325
 Mo St. Louis, Van Sickel Radio Elctns., 1915017 Washington Ave. 314-621-5000
 NJ Cherry Hill, D.F. Assocs., 135 Dumas Rd. 609-428-3455

NY Buffalo, Summit Dists., 916 Main St. 716-884-3450
 NY Farmingdale, Arrow Elctns., 900 Broad Hollow Rd. 516-694-6800
 NY New York, Blan Elctns. Corp., 56 Warren St. 212-233-6288

NY Rochester, Summit Elctns. Rochester, 292 Commerce Dr. 716-334-8110
 NC Greensboro, Hammond Elctns., Inc., 2923 Pacific Ave. 919-275-6391
 NC Raleigh, Southeastern Radio Supply Co., 414 Hillsborough St. 919-828-2311

NC Winston-Salem, Kirkman Elctns., Inc., 901 W. 2nd St. 919-724-0541
 Ohio Cincinnati, Hughes-Peters, Inc., 4865 Duck Creek Rd. 513-351-2000
 Ohio Columbus, Hughes-Peters, Inc., 418 E. 11th. Ave. 614-294-5351

Pa Pittsburgh, R.P.C. Elctns., 620 Alpha Dr. 412-782-3770
 SC Columbia, Dixie Radio Supply Co., 1900 Barnwell St. 803-253-5333
 SC Greenville, Hammond Elctns., Inc., Box 2308 803-233-4121

Tenn Memphis, Bluff City Dist. Co., 234 E. St. 901-276-4501
 Tenn Nashville, Electra Distr. Co., 1914 W. End Ave. 615-329-3971

Tex Dallas, Wholesale Elctn. Supply, Ross at Central 214-824-3001
 Tex Ft. Worth, Allied Elctns., 401 E. 8th St. 817-336-5401
 Tex Ft. Worth, Wholesale Elctn. Supply Co., 550 South Freeway 817-336-0461

Tex Richardson, Altair Co., 405 N. Plano Rd. 214-231-5166

Wash Seattle, Radar Elec. Co., 168 Western Ave. W. 206-282-2551

Wisc Mequon, Taylor Elec. Co., 1000 W. Donges Bay Rd. 414-241-4321

Wisc Milwaukee, Parts Mart Corp., 1314 N. 7th St. 414-276-4160

For: Can., Willowdale, Ont., Electro-Sonic Ind'l. Sls. Ltd., 1100 Gordon Baker Rd. 416-494-1666

CLARE & CO., C.P., 3101 Pratt Blvd., Chicago, Ill., 60645, Tel: 312-262-7700, Telex: 25-3775; Empl.: 1500 p. 1-1598-1615

For info on price: R. E. Axthelm; Application info: T. Sipp; Customer service: T. Miller; Delivery info: T. Miller

Products manufactured: Relays, Sockets, Switches

Local Sales Offices & Reps.

Ala Huntsville, C.P. Clare & Co. 205-534-5438
 Ariz Phoenix, Spectrum Assocs. 602-997-6324
 Ark Fort Smith, Electro-Related Prods. 501-783-7323

Cal Mountain View, C.P. Clare & Co. 415-968-2831
 Cal Santa Ana, Spectrum Assocs. 714-835-4114
 Colo Denver, Electrodyne, Inc. 303-757-7679

Fla Ft. Lauderdale, R.I. Smith Assocs. 305-772-5100

Ga Atlanta, A. Brown Assocs. 404-457-6381
 Ill Chicago, C.P. Clare & Co. 312-262-7700
 Ind Fort Wayne, Baehr, Greenleaf & Assoc. 219-447-1608

Kans Shawnee Mission, Lowell-Kangas & Assoc. 913-631-3515

La Harvey, Electro-Related Prods. 504-388-7487
 Md Ellicott City, Doss Elctns., Inc. 301-465-1336

Mass Needham, C.P. Clare & Co. 617-449-4780
 Mich Southfield, C.P. Clare & Co. 313-356-3988
 Minn St. Paul, Repor, Inc. 612-645-8618

Mo St. Louis, Lowell-Kangas & Assoc. 314-821-4050

NY Great Neck, C.P. Clare & Co. 516-466-2100
 NY Syracuse, C.P. Clare & Co. 315-637-3939

NC Charlotte, R.W. Chapman & Co. 704-525-2421
 NC Raleigh, R.W. Chapman & Co. 919-782-2624
 Ohio Cincinnati, Baehr, Greenleaf & Assoc. 513-891-3826

Ohio Cleveland, Baehr, Greenleaf & Assoc. 216-221-9030

Ohio Columbus, Baehr, Greenleaf & Assoc. 614-486-4046

Pa Erie, Foster-McClinton Inc. 814-455-9111
 Pa Ft. Washington, C.P. Clare & Co. 215-643-5321

Pa Pittsburgh, Foster-McClinton Inc. 412-941-4800
 SC Greenville, R.W. Chapman & Co. 803-232-5391

Tex Dallas, R.E. Nesbitt Co. 214-357-4601
 Tex Houston, Gettys-Eads-Adair Inc. 713-781-3005

Utah Salt Lake City, Electrodyne, Inc. 804-270-7182
 Va Richmond, Advance Control Equip. 206-747-5600

Wash Bellevue, C.P. Clare & Co. 206-747-5600

WVa Huntington, Foster-McClinton, Inc. 304-736-5161

Wisc Wauwatosa, Larsen Assocs. 414-258-0529

Local Distributors

Ala Birmingham, M. G. Elctns. & Equip., 3112-6th Ave. S. 205-328-4525

Ala Huntsville, Cramer/EW Inc., 2310 Bob Wallace Ave. S.W. 205-539-5722

Ala Huntsville, Powell Elctns., 803 Oster Dr. 205-539-2731

Ariz Phoenix, Kierulff Elctns., 2633 E. Buckeye Rd. 602-273-7331

Ark Fort Smith, Wise Wholesale Elctns., 1001 Towson Ave. 501-783-8925

Ark Little Rock, Carlton-Bates Co., Scott Hamilton Dr. at 69th 501-562-9100

Cal Los Angeles, Kierulff Elctns. Corp., 2585 Commerce Way 213-685-5511

Cal Los Angeles, Texas Instrs. Supply Co., 5200 W. 104th St. 213-776-4490

Cal Menlo Park, Bell Inds, Elctn. Dist. Div., 1070 O'Brien Dr. 415-323-9431

Cal Palo Alto, Kierulff Elctns., 3969 E. Bayshore Rd. 415-968-6292

Cal San Diego, Kierulff Elctns., 8797 Balboa Ave. 714-278-2112

Cal Sun Valley, Richey Elctns., 10871 La Tuna Canyon 213-983-0222

Cal Sunnyvale, Texas Instrs. Supply 776 Palomar 408-732-5555

Colo Denver, Kierulff Elctns. Corp., 10890 E. 47th Ave. 303-343-7090

Colo Denver, Texas Instrs. Supply Co., 2149 S. Holly St. 303-757-7671

Conn North Haven, Cramer/Connecticut, 35 Dodge Ave. 203-239-5648

Fla	Hollywood, Cramer/EW Inc., 4035 N. 29th Ave. 305-923-8181	Pa	Pittsburgh, Cameradio Co., 2801 Liberty Ave. 412-288-2600	Products manufactured: Amplifiers, Generators, Memory Systems, Meters, Modulators, All Kinds, Multipliers, Oscillators, Test Equipment, Test Systems, Testers
Fla	Miami Springs, Powell Elctns., 1740 N.W. 69th Ave. 305-885-8761	SC	Columbia, Dixie Radio Supply, 1900 Barnwell St. 803-253-5333	Local Sales Offices & Reps.
Fla	Orlando, Cramer/EW Inc., 345 N. Graham Ave. 305-894-1511	Tenn	Nashville, Electra Distributing Co., 1914 West End Ave. 615-329-3971	Ill Chicago, P. Lind Elctns. Co. 312-774-1246
Ga	Atlanta, Cramer/EW Atlanta, 3923 Oakcliff Industrial Ct. 404-448-9050	Tex	Austin, Texas Instrs. Supply Co., 2601 N. Lamar 512-258-1636	Ind Indianapolis, P. Lind Elctns. Co. 317-547-9178
Ga	Atlanta, Specialty Distributing, 763 Juniper St., N.E. 404-873-2521	Tex	Dallas, Cramer/Tex., 2970 Blystone La. 214-350-1355	Kans Leawood, Leemark Engrs., Inc. 313-N18-0124
Ill	Arlington Heights, Texas Instrs. Supply Co., 2420 E. Oakton 312-593-7660	Tex	Dallas, Texas Instrs. Supply Co., 6000 Denton Dr. 214-238-6853	Mass Waltham, W. M. Hague Co. 617-899-5600
Ill	Mount Prospect, Cramer/Chicago, 1911 South Busse Rd. 312-593-8230	Tex	Houston, Tex. Instrs. Supply, 3939 Ann Arbor Dr. 713-785-4800	Minn Circle Pines, P. Lind Elctns. Co. 612-786-5770
Ill	Palatine, Ohm/Elctns., 649 Vermont Ave. 312-359-5500	Utah	Salt Lake City, Alta-Land Elctns., 2280 S. Main St. 801-486-7227	Tex Richardson, Spectra Sls. 214-234-3600
Ill	Peoria, Klaus Radio & Elctns., 8400 N. Pioneer Pkwy. 309-691-4840	Va	Richmond, Meridian Elctns., 1001 W. Broad St. 804-355-0669	Va Crossroads, Q.T. Elctns. Sls. Co. 703-671-4357
Ind	Ft. Wayne, Ft. Wayne Elctns. Supply, 3606 Maumee Ave. 219-423-3422	Wash	Seattle, Almac-Stroum Elctns., 5811 Sixth Ave. S. 206-763-2300	CLAROSTAT MFG. CO., INC., Washington St., Dover, N.H., 03820, Tel: 603-742-1120, TWX: 510-297-4455; Empl.: 600 p. 2-1627
Ind	Indianapolis, Graham Elctns. Supply, 133 S. Pennsylvania St. 317-634-8486	Wash	Seattle, Kierulff Electronics, 5940 Sixth Ave. S. 206-763-1550	For info on price: D. Flanagan; Application info: J. McDevitt
Kans	Wichita, Radio Supply Co., Inc., 115 Laura 316-267-5214	Wisc	Milwaukee, Marsh Elctns., Inc., 6047 West Beloit Rd. 414-545-6500	Free literature available: 388/389 1/2" Square Modular Potentiometer, 731A - 10 turn pot, 381 - Quiet-one 1 watt 5/8" Dia. Conductance plastic variable pot, 1975 - Distributor full line catalog, Engineering catalog.
La	LaFayette, Ralph's of LaFayette, Box "R" 318-234-4507	Wisc	Oak Creek, Cramer/Wisc., 430 W. Rawson Ave. 414-764-1700	Products manufactured: Attenuators, Decade Boxes, Dials, Potentiometers, Resistors, Rheostats, Switches
Md	Beltsville, Treeko Sales, 10739 Tucker St. 301-937-8260	CLARE-PENDAR, Box 785, Post Falls, Idaho, 83854, Tel: 208-773-4541; Empl.: 500; Minimum order: \$50		Local Sales Offices & Reps.
Md	Gaithersburg, Cramer/EW Washington, 16021 Industrial Dr. 301-948-0110	For info on price: T. Drahan; Application info: D. Dillard; Customer service: T. Drahan; Delivery info: T. Drahan		Ariz Phoenix, J. Berman Co., Inc.
Md	Hanover, Cramer/EW Baltimore, 7235 Standard Dr. 301-796-5790	Free literature available: Switchlight Systems, S410 Monoform, S190 General Switchlight.		Ark Little Rock, J.Y. Schoonmaker Co.
Md	Rockville, Pioneer/Washington Elctns., 1037 Taft St. 301-424-3300	Products manufactured: Annunciators, Caps, Lenses, Indicator Light, Display Devices/Displays, Indicators, Keyboards, Alphanumeric & Decimal, Lenses, Readout & Display, Lenses, R-F, Lights, Sockets, Switchboards, Switches		Cal Inglewood, J. Berman Co. 213-776-1281
Mass	Cambridge, Wilshire Elctns./New England, 205 Alewife Brook Pkwy. 617-491-3300	Local Sales Offices & Reps.		Cal Menlo Park, Straube Assoc. 415-323-2476
Mass	Newton Centre, Cramer Elctns., 85 Wells Ave. 617-969-7700	Ala Huntsville, C.P. Clare & Co. 205-534-5438		Colo Denver, Straube Assoc./Mtn. States 303-426-0890
Mich	Detroit, RS Elctns., 12775 Lyndon Ave. 313-491-1000	Ariz Phoenix, Spectrum Assoc. 602-997-6324		Fla Bradenton, Hutto-Hawkins-Peregoy Inc. 813-755-4015
Mich	Livonia, Cramer/Detroit, 13193 Wayne Rd. 313-425-7000	Ark Ft. Smith, J.R. Masterson 501-783-7323		Fla Maitland, Hutto-Hawkins-Peregoy Inc. 305-831-2474
Minn	Edina, Cramer/Bonn, 7275 Bush Lake Rd. 612-835-7811	Cal Mt. View, C.P. Clare & Co. 415-968-2831		Fla Pompano Beach, Hutto-Hawkins-Peregoy Inc. 305-943-9593
Minn	Edina, Texas Instrs. Supply Co., 7615 Metro Bldv., Suite 202 612-941-5020	Cal Santa Ana, Spectrum Assoc. 714-835-4114		Ga Atlanta, Millar Elctrs. Inc. 404-261-6160
Minn	Minneapolis, Control Design, 3433 E. 25th St. 612-721-1628	Cal Santa Ana, Spectrum Assoc. 714-835-4114		Ill Chicago, Clarostat Mfg. Co. Inc. 312-792-3898
Mo	Kansas City, Walters Radio Supply, 3627-35 Main St. 816-531-7015	Colo Denver, Electrodyne 303-757-7679		Ind Fort Wayne, Needler Sls. Co. 219-447-2123
Mo	St. Louis, Olive Industrial Elctns., 6662 Olive Blvd. 314-863-7800	Fla Ft. Lauderdale, R.L. Smith Assoc. 305-772-5100		Ind Indianapolis, New/Era Sls. Inc. 317-257-7333
Neb	Lincoln, Scott Elctn. Supply Corp., 4040 Adams St., Box 4467 402-434-8308	Fla Largo, R.L. Smith Assoc. 813-585-2980		Iowa Cedar Rapids, Palatine Eng. Sls. Inc. 319-365-8071
NJ	Cherry Hill, Cramer/Pennsylvania, No. 12 Springdale Rd. 215-923-5950	Ga Atlanta, A. Brown & Assoc. 404-457-6381		Kans Andover, Palatine Eng. Sls. Inc. 316-683-7512
NJ	Clifton, Wilshire Elctns./N.J., 312 Clifton Ave. 201-365-2600	Ill Chicago, C.P. Clare & Co. 312-262-7700		Kans Overland Park, Palatine Eng. Sls. Inc. 913-262-5643
NJ	Moonachie, Cramer/N.J., 1 Barrett Ave. 201-935-5600	Ind Ft. Wayne, Baehr Greenleaf & Assoc. 219-447-1608		Md Lutherville, L.D. Lowery Inc. 301-VA3-2172
NJ	Moorestown, Arrow/Angus, 126 Pleasant Valley Ave. 609-235-1930	Md Ellicott City, Doss Elctns., Inc. 301-465-1336		Md Silver Spring, Lowery Assoc. 301-HE9-3542
NM	Albuquerque, Kierulff Elctns. Corp., 2524 Baylor Dr. S.E. 505-247-1055	Mass Needham, C.P. Clare & Co. 617-449-4780		Mass Concord, Clarostat Mfg. Co. Inc. 617-369-7933
NY	Buffalo, Genesee Radio & Parts Co., 2550 Delaware Ave. 716-873-9661	Mich Southfield, C.P. Clare & Co. 313-356-3988		Minn Minneapolis, A.J. Warner Co. 612-729-7371
NY	East Syracuse, Cramer/Syracuse, 6716 Joy Rd. 215-437-6671	Minn St. Paul, Repor, Inc. 612-645-8618		Mo St. Louis, Palatine Eng. Sls. Inc. 314-426-7055
NY	Endwell, Cramer/Binghamton, 3220 Watson Blvd. 607-754-6661	Mo St. Louis, Lowell-Kangas & Assoc. 314-821-4050		NM Albuquerque, Straube Assoc./Mt. States 505-292-0295
NY	Farmingdale, Wilshire Elctns./L.I., 1855 New Hwy 516-293-5775	NY Fayetteville, C.P. Clare & Co. 315-637-3939		NY Manhasset, Win-Cor Elctr. Sls. Corp. 516-627-9474
NY	Hauppauge, Cramer/L.I., 29 Oser Dr. 516-231-5600	NY Great Neck, C.P. Clare & Co. 516-466-2100		NY N. Syracuse, L.D. Allen Inc. 315-458-7470
NY	Johnson City, Wilshire Elctns., 617 Main St. 607-797-1236	NY Huntington, Caravan Sls. Corp. 516-692-2839		NY Snyder, L.D. Allen Inc. 716-839-3300
NY	Rochester, Cramer/Rochester, 3259 Winton Road So. 716-275-0300	NC Charlotte, R.W. Chapman & Co. 704-525-2421		NC Raleigh, Millar Elctrs. Inc. 919-787-9564
NY	Rochester, Simcona Elctns., 275 Mt. Read Blvd. 716-328-3230	NC Raleigh, R.W. Chapman & Co. 919-782-2624		Ohio Cleveland, K.W. Elctrs. Sls. Inc. 216-831-8292
NC	Raleigh, Cramer/EW Raleigh, 3901 Winton Rd. 919-876-2371	Ohio Cincinnati, Baehr Greenleaf & Assoc. 513-891-3826		Ohio Dayton, K.W. Elctrs. Sls. Inc. 513-890-2150
NC	Winston-Salem, Cramer/EW Inc., 938 Burke St. 919-725-8711	Ohio Cleveland, Baehr Greenleaf & Assoc. 216-221-9030		Okla Tulsa, J.Y. Schoonmaker Co. 918-936-1423
Ohio	Cincinnati, Cramer/Tri-States, 666 Redna Terr. 513-771-6441	Ohio Columbus, Baehr Greenleaf & Assoc. 614-486-4046		Ore Portland, Almac/Stroum Elctrs. 503-292-3534
Ohio	Cleveland, Cramer/Cleveland, 5835 Harper Rd. 216-248-8400	Pa Bridgeville, Foster-McClinton, Inc. 412-941-4800		Pa Allison Park, K.W. Elctrs. Sls. Inc. 412-487-4300
Ohio	Cleveland, Pioneer/Cleveland Elctns., 4800 E. 131st St. 216-587-3600	Pa Erie, Foster-McClinton, Inc. 414-455-9111		Pa Broomall, L.D. Lowery Inc. 215-356-5300
Ohio	Dayton, Pioneer/Dayton Elctns., 1900 Troy St. 513-236-9900	Pa Ft. Washington, C.P. Clare & Co. 215-643-5321		Pa Camp Hill, Beil & Whitaker Inc. 717-652-0184
Okla	Tulsa, Texas Instrs. Supply, 12151 E. Skelly Dr. 918-437-4555	SC Greenville, R.W. Chapman & Co. 803-232-5391		Pa Harrisburg, Beil & Whitaker Inc. 215-779-2610
Pa	Allentown, Federated Elctns., A Div. Federated Purchaser, 936 Union Blvd. 215-437-4431	Tex Dallas, R.E. Nesbitt Co. 214-357-4601		Tex Dallas, J.Y. Schoonmaker Co. Inc. 214-357-8481
Pa	Philadelphia, Powell Elctns., S. Island Rd. 215-365-1900	Tex Houston, Gettys-Eads-Adair, Inc. 713-781-3005		Tex Houston, J.Y. Schoonmaker Co. Inc. 713-926-9510
		Va Portsmouth, Advance Control Equip. 804-393-6642		Va Charlottesville, L.D. Lowery Inc. 703-973-6672
		Va Richmond, Advance Control Equip. 804-264-2588		Wash Seattle, Almac/Stroum Co. 206-763-2300
		Wash Bellevue, C.P. Clare & Co. 206-747-5600		EXP: New York, N.Y., M. Simons & Sons Co. Inc. 212-227-5513
		WVa Huntington, Foster-McClinton, Inc. 304-736-5161		FOR: Montreal, Quebec, Can., Superior Int'l. 514-683-6331
		Wisc Wauwatosa, Larsen Assoc. 414-258-0529		Local Distributors
		CLARKE-HESS COMM., Resch. Corp., 43 W. 16th St., New York, N.Y., 10011, Tel: 212-255-2940; FSC No: 34423 p. 1-636,637		Ariz Phoenix, Sterling Elctns., 201 E. University Dr. 602-258-4531
		Customer service: M. Jacobs		Cal Irvine, Cramer/Los Angeles, 17201 Daimler 714-979-3000
		Free literature available: Equivalent Series Resistance in Capacitors. Function Generator Synchronization Notes. Experiments with Function Generators and Multipliers		Cal Oakland, Brill Elctns., 610 E. 10th St. 415-834-5888
				Cal Riverside, Elctn. Supp., 2486 Third St. 714-787-9220
				Cal San Carlos, Sterling Elctns., 1061 Ind. Rd. 415-952-2353
				Cal Sun Valley, Richey Elctns., 10871 La Tuna Canyon Rd. 213-875-2862
				Colo Denver, Acacia Sls., 11111 W. 8th Ave., Unit B 303-232-2882

Colo Denver, Elctrn. Parts Co., 1212 S. Broadway 303-266-3755 Conn Fairfield, U-Tronics, 273 Linwood Ave. 203-255-4521 Conn North Haven, Cramer Elctrns., 35 Dodge Ave. 203-239-5641 Fla Miami, Elctrn. Equip., 2701 N.W. 42nd St. 305-635-0421 Fla Oakland Park, Peerless Radio of Fla., 1040 N.E. 43rd Ct. 305-566-5966 Ga Atlanta, Lykes Elctrns., 1135 Chattahoochee 404-355-2223 Ill Chicago, Newark Elctrns. Corp., 500 N. Pulaski Rd. 312-638-4411 Ill Elgin, Allied Radio Corp., 1355 Sleepy Hollow Rd. 312-697-8200 Ill Palatine, Ohm Elctrns., 649 Vermont Ave. 312-359-5500 Ind Indianapolis, Radisco, 814 N. Senate Ave. 317-637-5571 Iowa Cedar Rapids, Deeco, 2500 16th Ave., S.W. 319-365-7551 Kans Wichita, Radio Supp., 131 Laura 316-267-5216 Ky Louisville, P.I. Burks, 659 S. 9th St. 502-583-2871 La Lafayette, Ralph's of Lafayette, 3004 Cameron 318-369-9816 Md Baltimore, Radio Elec. Serv. Co., 1026 Cromwell Bridge Rd. 301-823-0070 Md Savage, Pytronics, 8200 Wellmoor Ct. 301-792-7000 Mass Dedham, Gerber Radio, 852 Providence Hwy., Rte. #1 617-329-2400 Mass Newton, Cramer Elctrns., 85 Wells Ave. 617-969-7700 Mass Newton, Greene-Shaw Co., Inc., 70 Bridge St. 617-969-8900 Mass Watertown, Sterling Elctrns., 51 Spring St. 617-926-9720 Mich Ann Arbor, Wedemeyer Elctrn. Supp., 2280 S. Ind. Hwy. 315-665-8611 Mich Augusta, Great Lakes Elctrns., Div. Knappen Milling Co. 616-731-4156 Minn Minneapolis, Harry Stark Elctrns. Supp., 112 3rd Ave., N. 612-332-1325 NH Concord, Evans Radio, Box 893 603-224-9961 NJ Hanover, State Elctrns., 36 Route 10 201-887-2550 NY Farmingdale, Arrow Elctrns., 900 Broad Hollow Rd. 516-694-6800 NY Lynbrook, Peerless Radio, 19 Wilbur St. 516-593-2121 NY Rochester, Simcona Elctrns., 275 Mt. Read Blvd. 716-328-3230 NC Greensboro, Hammond Elctrns. of Carolina, 4923 Pacific Ave. 919-275-6391 NC Winston-Salem, Kirkman Elctrns., 901 W. 22nd St. 919-724-0541 Ohio Akron, Akron Elctrns., 107 S. Arlington St. 216-762-8818 Ohio Cleveland, Pioneer-Cleveland, 4800 E. 131st St. 216-587-3600 Ohio Columbus, Hughes-Peters, 481 E. 11th Ave. 614-294-5351 Ohio Dayton, Stotts Friedman Co., 108-112 N. Jefferson St. 513-224-1111 Okla Tulsa, Radio, Inc., 1000 S. Main St. 918-587-9123 Ore Portland, Almac/Stroum Elctrns., 8888 S.W. Canyon Rd. 503-292-3534 Pa Philadelphia, Almo Ind. Elctrns., Roosevelt Blvd., at Blue Grass Rd., N.E. Ind. Pk. 215-676-6000 Pa Philadelphia, Philadelphia Elctrns., 112 N. 12th St. 215-568-7400 Pa Pittsburgh, Cameradio, 2801 Liberty 412-288-2600 SC Columbia, Dixie Radio Supp., 1900 Barnwell St. 803-253-5333 Tenn Memphis, Bluff City Dist., 234 East St. 901-725-9500 Tenn Nashville, Electra Dist., 1914 West End Ave. 615-329-3971 Tex Ft. Worth, Allied Elctrns., 401 E. 8th St. 817-336-8366 Tex Ft. Worth, Sweico, 1512-18 E. Lancaster 817-335-6521 Tex Houston, Sterling Elctrns., 4201 S.W. Frwy. 713-623-6600 Va Charlottesville, Virginia Radio Supp., 717 Henry Ave. 804-296-4184 Wash Seattle, Almac/Stroum Elctrns., 5811 Sixth Ave., S. 206-763-2300 Wisc Milwaukee, Elctrnc. Expeditors, 6045 N. Greenbay Ave. 414-374-6666	Products manufactured: Gyros (All Types), Printers, Recorders, Terminal Equipment, Digital CLAUSS CUTLERY CO., Box 667, Fremont, Ohio, 43420, Tel: 419-332-7344; Empl.: 175; Minimum order: \$75 For info on price: L. Beal; Application info: J. Hart; Customer service: L. Beal; Delivery info: L. Beal Free literature available: Pocket size catalog and price list Products manufactured: Scissors, Tweezers, Hand & Vacuum, Wire Strippers CLEAN ROOM PRODS., 56 W. Penataquit Ave., Bay Shore, N.Y., 11706, Tel: 516-968-8282; Empl.: 27; Minimum order: \$15 For info on price: W. Duncan; Application info: W. Duncan; Customer service: C. Coppola; Delivery info: C. Coppola Free literature available: General Catalog - Clean Room Ancillaries & Materials "Clean Rooms" Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Benches, Consoles, Stools, Tables, Carts & Dollies, Instrument & Equipment, Cleaners & Solvents, Cleaners, Ultrasonic, Counters, Indicators, Lights, Machines/Machinery, Production, Ultraviolet Inspection Lighting CLEMENS MFG. CO., 630 So. Berry Rd., St. Louis, Mo., 63122, Tel: 314-961-7228; Empl.: 3 Products manufactured: Generators CLEVELAND CRYSTALS, INC., Box 17157, Euclid, Ohio, 44117, Tel: 216-486-6100; FSC No: 8K400; Empl.: 12; Minimum order: \$50 Customer service: A. Carlson Free literature available: Basic Data Sheets: Electro-optic crystals, piezoelectric II-DI crystals Lithium iodate, piezoelectric KBS (potassium perborate) infrared polarizer Products manufactured: Crystal Blanks, Crystals, Modulators, All Kinds CLEVELAND ELECTRONICS, INC., 14500 Darley Ave., Cleveland, Ohio, 44110, Tel: 216-249-3700, TWX: 810-421-8656; Empl.: 500 Customer service: J. Riffe Products manufactured: Speakers, Yokes CLEVELAND INSTITUTE OF ELCTRNS., 1776 E. 17th St., Cleveland, Ohio, 44164, Tel: 216-781-9400 Customer service: Registrar Free literature available: CIE School Catalog: electronics homestudy courses-basic & advanced training information-benefits of CIE methods. FCC Booklet: answers popular questions about the various FCC licenses & permits- How to prepare for the government FCC exam. Products manufactured: Technical Books CLEVELAND MICA CO., 1360 Hird Ave., Lakewood, Ohio, 44107, Tel: 216-226-1360; Empl.: 50; Minimum order: \$25 For info on price: W. D. Burton; Application info: W. D. Burton; Customer service: D. Brady; Delivery info: D. Brady Free literature available: General information sheet on Mica. Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Insulators & Insulation Local Sales Offices & Reps. Ill Northfield, Special Electric Co. 800-558-0640 NY New York, United Mineral & Chemical Corp. 212-966-4330 Ohio Cleveland, C.J. Voneman Co. 216-333-5500 Tex Frankston, Cline & Son, Inc. 214-876-2223 CLIFTON PRECISION, Litton Systems, Inc., Marple at Brdway, Clifton Hgts., Pa., 19018, Tel: 215-622-1000, TWX: 510-669-9782; FSC No: 86197; Empl.: 1000 Customer service: E. Demarco Free literature available: Our general catalog is major source of information. Various products do appear in bulletin form as well; however, the data is always updated in the catalog, while bulletins become obsolete. Products manufactured: Amplifiers, Controls/Control Ept., Converters, Encoders, Indicators, Motors, Repeaters, Servo, Resolvers, Synchro, Servo Systems, Synchros, Testers, Transducers	Local Sales Offices & Reps. Ariz Phoenix, Clifton Precision 602-242-0910 Cal Norwalk, Comar Co. 213-921-8695 Cal Sunnyvale, Comar 408-245-3193 Fla Altamonte Springs, Clifton Precision 305-831-1441 III Elk Grove Village, Midwest Meridian 312-437-6531 Iowa Cedar Rapids, Midwest Meridian ... 319-365-6561 Mass W. Newton, Darbury Corp. 617-244-2053 Mich E. Grand Rapids, Midwest Meridian 616-949-7798 Mo Maryland Hgts., Midwest Meridian 314-878-4441 NY Greenlawn, Reflex Elctrn. 516-549-1888 Ohio Dayton, Midwest Meridian 513-276-4137 Tex Dallas, Midwest Meridian 214-251-3933 CLIMATRONICS CORP., 1324 Motor Pkwy., Hauppauge, N.Y., 11787, Tel: 516-234-2772; Empl.: 15 Customer service: T. Schreiber Products manufactured: Bridges, Cable Assemblies & Harnesses, Choppers, Controls/Control Ept., Data Acquisition & Reduction Systems, Detectors, Indicators, Modulator/Demodulators, Modulators, All Kinds, Monitors, Probes Local Sales Offices & Reps. Mass Bedford, Ambientmetrics 617-274-6450 CLINTON ELCTRNS. CORP., 6701 Clinton Rd., Rockford, Ill., 61111, Tel: 815-633-1444, Telex: 257-484 For info on price: C. G. Philipps; Application info: P. Knulty; Customer service: K. Pohl; Delivery info: K. Pohl Free literature available: Free brochure describing products and capabilities. Products manufactured: Tubes CML-MACARR, INC., 167 National Rd., Edison, N.J., 08817, Tel: 201-287-2810, TWX: 710-998-0560; Empl.: 100 p. 11154-1161 Products manufactured: Amplifiers, Chargers, Battery, Controls/Control Ept., Converters, Discharge Systems, Energy, Generators, Inverters, Motor Electric Generator Sets, Motors, Oscillators, Power Supplies, Testers, Transformers, Underwater Communication, Detection, Navigation, etc. Equipment Local Sales Offices & Reps. Cal Costa Mesa, Meas. Assoc. 714-540-7160 Cal Sunnyvale, RDP Instrs. 408-735-9040 Fla Orlando, Dataprep 305-843-5224 Fla Pompano Bch., Dataprep 305-781-9279 Fla St. Petersburg, Dataprep 813-345-8503 III Des Plaines, Marsland Assoc. 312-298-2620 III Elk Grove Village, L.F. Green & Assoc. 312-593-0282 Ind Indianapolis, L.F. Green 317-293-9827 Md Fulton, Gans-Fryling 301-837-6311 Mass Burlington, Tekdata 617-273-0198 Mich Detroit, H. Teplitz 313-537-9058 Minn Minneapolis, Marsland Assoc. 614-278-6949 Minn Mpls., L.F. Green 312-781-1611 Mo Florissant, Marsland Assocs. 816-765-0641 NJ Fort Lee, Tech. Mktg. Assocs. 201-224-6911 NY Fayetteville, M. P. Andrews 315-637-3144 Ohio Cleveland, H. Teplitz & Co. 216-371-2044 Ohio Dayton, H. Teplitz & Co. 315-277-6531 Pa Exton, Scientific Mktg. 215-363-7377 Tex Dallas, True Technology 214-691-7870 Va Arlington, Gans-Fryling 703-527-3262 CO-OPERATIVE INDS., INC., 100 Oakdale Rd., Chester, N.J., 07930, Tel: 201-879-5151, TWX: 510-235-1277; FSC No: 81482; Empl.: 250; Minimum order: \$25 Customer service: C. Baletti Free literature available: Waveguide Catalog; Plastic Conduit Catalog; Flex Metal Conduit/Hose Catalog; Gen'l Capability Brochure Products manufactured: Bends & Twists, Microwave, Braid, Cable, Cable, Chokes, Conduit, Electrical, Connectors, Couplers, Ducts, Wiring, Flanges, Waveguide, Lead Assemblies & Receptacles, Shields, Tubes, Tubing, Waveguides & Adapters, Wire COASTCOM, 2346 Stanwell Dr., Concord, Cal., 94520, Tel: 415-825-7500; Empl.: 25 Customer service: G.H. Vought Free literature available: Data sheets describing the operation and listing specifications of our program audio transmission equipment and other specialized multiplex equipment. Products manufactured: Comm. Systems, Filters, Multiplexers
---	--	--

CLARY CORP., Precision Instrs. Div., 320 W. Clary Ave.,
San Gabriel, Calif., 91776, Tel: 213-287-6111; Empl.: 50

Local Sales Offices & Reps.

Cal	Concord, Coastron	415-825-7500
Cal	Santa Fe Springs, Kennedy Engrg. Co.	213-868-9865
Fla	Melbourne, Repcom, Inc.	305-254-1877
Md	Edgewater, Commart	301-261-4344
NJ	Totowa, H.M. Holzberg Assocs.	201-258-0455
Tex	El Paso, H. Markowitz Co.	915-584-1795

COAX DEVICES INC., Box 234-EEM, Chelsea, Mass., 02150, Tel: 617-884-6983; Empl.: 20

Products manufactured: Adapters, Waveguide, Attenuators, Cavities, Microwave, Detectors, Dividers, Dummy Loads, Duplexers, Microwave, Horns, Microwave, Junctions, Hybrid, Microwave, Line Stretchers, Microwave, Mismatches, Microwave, Precision, Mixers, Mounts, Probes, Terminals, Waveguides & Adapters

COAXIAL DYNAMICS, INC., 13110 Enterprise, Cleveland, Ohio, 44135, Tel: 216-267-2233; Empl.: 28
Customer service: R. J. Scott

Free literature available: Catalog binder and specific flysheets on individual items: e.g. filters, watt meters, power sensors.

Products manufactured: Attenuators, Couplers, Detectors, Dummy Loads, Filters, Meters, Monitors, Probes, Strip-Line Components, Microwave, Switches, Terminals

Local Sales Offices & Reps.

Del	Newark, Tom Wright & Assoc.	301-398-3748
Ind	Nt. Wayne, Tx Sales Inc.	219-485-0805
Iowa	Cedar Rapids, S & O Sales	319-393-1845

COBEHN, INC., 226 Passaic Ave., Fairfield, N.J., 07006, Tel: 201-227-6675; Empl.: 5

For info on price: D. F. Cook; Application info: G. L. Henzel; Customer service: W. E. Bellars; Delivery info: D. F. Cook

Free literature available: High velocity spray equipment and fractionally distilled solvent for the critical cleaning of precision electronic, electro-mechanical and mechanical components.

Products manufactured: Cleaners & Solvents, Machines/Machinery, Production

Local Sales Offices & Reps.

Cal	Fullerton, John Broadbent, Jr.	714-879-4974
Cal	San Diego, J. C. Henberger Co.	714-223-7114
Ill	Des Plaines, Marsland Assocs., Inc.	312-298-2620
Ind	Indianapolis, Marsland Assocs., Inc.	317-924-3568
Md	Kensington, Aeron Assocs.	301-946-0070
Mass	Boston, R. E. Bailey	617-426-0846
Mich	Cedar, C & D Assocs.	616-334-3722
Minn	Minneapolis, Marsland Assocs., Inc.	612-545-4481
Mo	St. Peters, Marsland Assocs., Inc.	314-278-6949
NJ	Montclair, Ameresco, Inc.	201-746-5300
NY	Rochester, Rochester Ind'l. Supply Co.	716-325-2386
Pa	Reading, Chemtronics Div., Ind'l. Abrasives	215-779-3910
Tex	El Paso, Test Equip. Co.	915-755-9192
Utah	Bountiful, Bert Randall Assocs.	801-292-4965

COBER ELCTRS., INC., 7 Gleason Ave., Stamford, Conn., 06902, Tel: 203-327-0003, TWX: 710-474-3371; FSC No: 28909; Empl.: 60; Minimum order: \$50

For info on price: B. Zarkower; Application info: B. Zarkower; Customer service: A. Fairman; Delivery info: A. Fairman

Products manufactured: Amplifiers, Dielectric Heating Equipment, Generators, Machines/Machinery, Production, Modulators, All Kinds, Networks, Power Supplies, Protectors, Radar Systems, Regulators, Relays, Testers, Transformers, Transmitters

Local Sales Offices & Reps.

Ariz	Phoenix, Zeus, Inc.	602-253-6104
Cal	Los Altos, J. Stone	415-948-4563
Cal	Woodland Hills, Interstate Mktg. Assocs.	213-883-7606
Colo	Denver, Zeus, Inc.	303-770-4400
DC	Wash, Eastern Instr.	301-681-6500
Fla	Palm Bay, SparTech Assocs.	305-727-8045
Ga	Smyrna, SparTech Assocs.	404-432-3644
Mass	Waban, Instrument Conslts.	617-969-9881
Mass	Waltham, Meas. Conslts.	617-890-4400
Mich	Detroit, Micro Sls.	313-482-1229
NM	Albuquerque, Zeus, Inc.	505-268-3941
NY	E. Syracuse, Ossmann Instr.	315-437-6666
NY	Great Neck, Eastern Instr.	516-466-9505

Ohio	Dayton, Micro Sls.	513-298-3033
Pa	Phila., Eastern Instr.	215-927-7777
Tex	Fort Worth, Carey, Wolf & Assoc.	817-738-1996
Utah	Salt Lake City, Zeus, Inc.	801-466-4924
FOR:	Calgary 21, Alberta, Can., Canadian Dynamics, Ltd.	403-269-2202
FOR:	Don Mills, Ont., Can., Componetics Limited	416-445-3230
FOR:	Donauworth, Germany, Telemeter Electronic Gmoh	
FOR:	Montreal, P.Q., Can., Componetics Limited	514-342-4117

CODEX CORP., 15 Riverdale Ave., Newton, Mass., 02195, Tel: 617-969-0600, Telex: 92-2443; Empl.: 459

For info on price: R. Lowry; Application info: R. Lowry; Customer service: B. Richner; Delivery info: J. Madison

Free literature available: High speed data processing equipment. Modems and multiplexers.

Products manufactured: Comm. Systems, Modulator/Demodulators, Terminal Equipment, Digital, Transmission Systems, Data

Local Sales Offices & Reps.

Cal	Los Angeles, P. Lindberg	213-552-2558
Cal	San Francisco, C. Rose	415-329-1700
Conn	New Haven, J. Blenner	203-488-8918
DC	Washington, G. Dickey	202-223-2990
Ga	Atlanta, L. Wallace	404-944-8233
Ill	Chicago, C. Cuthforth	312-992-1136
Mass	Boston, D. Kendrick	617-336-7495
Mass	Boston, S. Puchkoff	617-444-4060
NY	New York, D. Kirshy	201-779-6500
Ohio	Cleveland, J. Reid	216-886-3330
Tex	Dallas, G. Anderson	214-661-5235
FOR:	Can., Toronto, T.E. Field Assoc. Ltd.	416-292-1475

CODI CORPORATION, Pollitt Dr., Fair Lawn, N.J., 07410, Tel: 201-797-3900, TWX: 710-988-2241; FSC No: 16352; QPL No: 19500; Empl.: 73; Minimum order: \$25

For info on price: J.S. LaBruna; Application info: W.C. Henderson; Customer service: P. Lydon; Delivery info: L. Dobson

Free literature available: Data sheets on the following products: Voltage Variable Capacitors; Zeners & Reference Diodes; High Voltage Rectifiers; Multijunction Diodes; Log Diodes; Chips; and White Noise Generator & Short Form catalog

Products manufactured: Bridges, Calibrators, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Crystals, Diodes, Generators, Power Supplies, Rectifiers, References, D-C Voltage, Regulators, Standards, Suppressors

Local Sales Offices & Reps.

Ala	Huntsville, BJR Ind's	205-881-3569
Ariz	Tempe, Gassner & Clark Co.	602-968-9037
Cal	Burlingame, Leddy	415-347-5247
Cal	Santa Ana, California Elctrn. Mktg.	714-835-2702
Colo	Littleton, B.B. Farquhar	303-795-1973
Fla	Ft. Lauderdale, CBC Elctns., Inc.	305-484-7330
Ill	Franklin Pk., Dekotech, Inc.	312-455-5100
Ind	Fort Wayne, Delesa Sls. Co.	219-483-9537
Iowa	Cedar Rapids, S & O Sls. Co.	319-393-1845
Kans	Shawnee, J.F. Guernsey	913-631-2414
Md	Hyattsville, Eastern Components	301-577-2925
Mass	Norwood, J.M.G.	617-762-5333
Mich	Ferndale, SHALCO	313-547-4771
Mo	Shawnee, J.F. Guernsey	913-631-2414
NY	Williamsville, R.A. Murray Co.	716-632-6913
Ohio	Dayton, The Whelan Corp.	513-434-7551
Ore	Portland, C.K. Shanks & Assoc.	503-292-5656
Pa	Flourtown, Eastern Comps.	215-836-1616
Tex	Dallas, J. Clay Co.	214-350-1281
Wash	Seattle, C.K. Shanks & Assoc.	206-632-4290
EXP:	N.Y., N.Y., Singer Prods.	212-432-1400

COHU ELECTRONICS, INC., San Diego Div., Box 623, San Diego, Cal., 92112, Tel: 714-277-6700, TWX: 910-335-1244; Empl.: 210

For info on price: E. V. Dempsey; Application info: D. Frost; Customer service: C. Murray; Delivery info: Area Sls. Office

Free literature available: Closed-circuit television short form catalog; Broadcast television short form catalog

Products manufactured: Television Systems & Equipment Closed-Circuit

Local Sales Offices & Reps.

Ala	Huntsville, BCS Assocs.	205-881-6220
Ariz	Scottsdale, Perspective Measurements	602-947-3860
Cal	Cerritos, Cohu	213-926-7002

Cal	San Carlos, Cohu	415-592-7851
Cal	San Diego, Cohu	714-277-6700
Cal	San Diego, Perspective Measurements	714-278-8931
Colo	Denver, Cohu	303-573-8835
Fla	Orlando, BCS Assocs.	305-896-4881
Ill	Des Plaines, Cohu	312-824-4422
Md	Bethesda, Bartlett Assocs.	301-656-3061
Mass	Bedford, Cohu	617-275-0370
Neb	Lincoln, Cohu	402-467-2900
NJ	Florham Park, Cohu	201-377-6636
NC	Greensboro, BCS Assocs.	919-273-1918
Pa	Wayne, Bartlett Assocs.	215-688-7325
Tex	Arlington, Cohu	817-461-1707

COIL-CRAFT INC., 340 Bronxville Rd., Bronxville, N.Y., 10708, Tel: 914-337-4775; Empl.: 7; Minimum order: \$15

For info on price: H. Julie; Application info: J. Julie; Customer service: J. Julie

Free literature available: Four page catalog listing technical information on tuneable, Hi Q inductors.

Products manufactured: Coils Including Assemblies & Forms, Couplers, Dividers, Filters, Transformers

Advertisement

Our line of turnable RF coils affords highest Q and stability in filter applications from audio thru VHF. Values of .027 to 100,000 uH spaced in a 10% series have overlapping tuning ranges. We also make wideband matching transformers, power splitter-combiners, Directional couplers, audio transformers, fixed and tuneable filters. We will also design and fabricate any of the above items to your specific requirements.

COILCRAFT, 1102 Siler Lake Rd., Cary, Ill., 60013, Tel: 312-639-2361, TWX: 910-651-2251; Minimum order: \$100

For info on price: R. G. Adams; Application info: J. Renskers; Customer service: R. G. Adams; Delivery info: D. Brodie

Products manufactured: Amplifiers, Chokes, Coils Including Assemblies & Forms, Filters, Heads, Recording Playback, Erase, Networks, Reactors, Transformers

COIL SPECIALTY CO., Box 120, Route 322, Boalsburg, Pa., 16827, Tel: 814-466-6244; Empl.: 25

Customer service: H. Hoffman

Free literature available: RF & IF coils and chokes manufactured to customers specifications.

Products manufactured: Chokes, Coils Including Assemblies & Forms, Filters, Resistors, Transformers

Advertisement

Coil Specialty Co. has facilities to manufacture small or large quantity requirements of IF and RF coils, chokes, transformers, hash filters, solenoid, special bobbin, reed switch or any other specialty windings to customer's specifications. Quotations and sample requirements given immediate attention.

COIL WINDING EQUIP. CO., Railroad Plaza, Oyster Bay, N.Y., 11771, Tel: 516-922-5660; Empl.: 35; Minimum order: \$10

For info on price: B. A. George; Application info: H. R. Snider; Customer service: G. Meier; Delivery info: B. A. George

Products manufactured: Machines/Machinery, Production

Local Sales Offices & Reps.

Ariz	Scottsdale, Elctrn. Entrs.	602-946-9860
NM	Albuquerque, Elctrn. Entrs.	505-256-3561
NM	Las Cruces, Elctrn. Entrs.	505-524-0126
NY	Oyster Bay, Coil Winding Equip. Co.	516-922-5660

COLE-FLEX CORP., 91 Cabot St., W. Babylon, N.Y., 11704, Tel: 516-249-6150

Products manufactured: Cable, Caps, Forms & Tapes, Heat Shrinkable, Cleaners & Solvents, Cords, Heat Guns, Production, Insulators & Insulation, Kits, Cable-End Sealing, Lubricants, Tapes, Electrical Insulation, Tapes, Films & Foils, Pressure Sensitive, Tubing

Local Sales Offices & Reps.

Cal	Glendale, Armstrong Sls. Co.	213-245-5344
Cal	Redwood City, Warren & Hickey Sls. Co.	415-368-3849
Cal	Colorado Springs, Norris & Co.	303-635-9319
Fla	Miami, World Wide Prods. Inc.	305-949-3457
Ga	Atlanta, Henry Phillips Co.	404-252-0720
Ill	Chicago, GNB Assoc.	312-673-4050
Ind	Indianapolis, Sukup & Cox	317-253-1215
Kans	Overland Park, Penzner-Mankus Assoc.	913-381-0004
La	Chalmette, Cartwright & Bean	504-279-4598
Mass	Lynn, Keene Sls. Co. Inc.	617-595-2300
Mich	Ferndale, Shalco Inc.	313-547-4771
Minn	Minneapolis, J.E.M. Anderson	612-823-6459
Miss	Jackson, Cartwright & Bean	601-354-1368
Mo	Hazelwood, Penzner-Mankus Assoc.	314-731-4334
NY	N. Syracuse, L.D. Allen Inc.	315-458-7470
NY	N.Y., I. Brown & Assoc.	212-493-1379
Ohio	Columbus, Weller Electronic Sls.	614-885-7819
Pa	Wynnewood, J. Stinson & Assoc.	215-896-7378
Tenn	Memphis, Cartwright & Bean	901-276-4442
Tex	Dallas, J. Collins Co.	214-341-7866
Wash	Seattle, W.K. Widdekind Co.	206-284-8020

COLE INSTRUMENT CORP., Div. F.H. Cole Enterprises, 2034 Placentia Ave., Costa Mesa, Cal., 92627, Tel: 714-642-8080; Empl.: 35

Customer service: P. Hunson

Products manufactured: Accelerometers, Controls/Control Eqpt., Drivers, Switch, Index Assemblies, Switch, Kits, Switch Assembling, Programmers, Shields, Switches, Testers

COLEMAN INSTR. DIV., 2000 York Road, Oak Brook, Ill., 60521, Tel: 312-887-0770; Empl.: 250; Minimum order: \$25

For info on price: R. Glos; Application info: D. Smeaton; Delivery info: R. Glos

Products manufactured: Meters, Pumps, Vacuum, Recorders, Spectrometers

COLEMAN MICROWAVE CO., Box 59, Rte. 22, Lebanon, N.J., 08833, Tel: 201-534-2480; Empl.: 8

Customer service: K.R. Coleman

Free literature available: Microwave Filter Brochure which lists various types and frequencies of tunable bandpass filters. This brochure is representative of our product line but does not include other types of filters and wavemeters which Coleman Microwave Co. also manufactures.

Products manufactured: Cavities, Microwave, Diplexers, Antenna, Discriminators, Dummy Loads, Filters, Meters, Multiplexers, Preselector-Mixers, Preselectors, Terminals

Local Sales Offices & Reps.

Ala	Huntsville, Beacon	205-881-5031
Ariz	Tempe, Jarko Assocs.	602-966-3020
Fla	Maitland, Beacon	305-647-3498
Ga	Atlanta, Beacon	404-351-3654
Miss	Hernando, Beacon	601-368-9008
Okla	Norman, Data Marketing Assocs.	405-364-8320
Pa	Lafayette Hill, M. Lader Co.	215-825-3177
SC	Spartanburg, Beacon	803-582-4613
Tex	Houston, Data Marketing Assocs. Inc.	713-686-9627
Tex	San Antonio, Data Marketing Assocs.	512-828-0937
Va	Woodbridge, M. Lader Co.	703-494-3321

COLLINS RADIO CO., 160-180, Cedar Rapids, Iowa, 52406

COLLINS RADIO, Dallas, Tex., 75207, Tel: 214-690-5000, TWX: 910-867-4709; Empl.: 16000

Customer service: L. Marx 214-690-6020

Products manufactured: Amplifiers, Analyzers, Antennas, Cable Assemblies & Harnesses, Calibrators, CATV Systems & Equipment, Cavities, Microwave, Circuits, Cordwood, Circuits, Hybrid, Thin-Film, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Circuits, Printed, Multilayer, Coils Including Assemblies & Forms, Comm. Systems, Comparators, Computers, Converters, Demodulators, Detectors, Dividers, Dummy Loads, Equalizers, Filters, Generators, Indicators, Integrators, Electronic, Leads, Test & Adaptors, Limiters, Memory Systems, Meters, Mixers, Modulators, All Kinds, Monitors, Mounts, Multipliers, Networks, Oscillators, Ovens, Preselectors, Punched Card Equipment, Racks, Radar Systems, Receivers, Regulators, Relays, RFI Measuring Equipment, Services, Assembly, Production & Test, Servo Systems, Shields, Shifters, Standards, Switches, Synthesizers, Tape Search Equipment, Television Systems & Equipment Closed-Circuit, Terminal Equipment, Digital, Terminals, Testers, Totalizers, Digital, Transformers, Transmission Systems, Data, Transmitters, Tuners, Underwater Communication, Detection, Navigation, etc. Equipment

Local Sales Offices & Reps.

Alas	Anchorage	904-337-2870
Ariz	Nogales	602-287-2101
Ariz	Sierra Vista	602-458-4491
Ark	Limestone	501-428-5257
Cal	La Habra	213-691-2304
Cal	Long Beach	213-593-8722
Cal	Los Angeles	213-647-5611
Cal	Palo Alto	415-493-9033
Cal	San Carlos	415-343-3224
Cal	San Mateo	415-342-2131
Cal	Saratoga	408-255-9399
Cal	Littleton	303-795-8784
Fla	Lighthouse Point	305-943-8371
Fla	Madeira Beach	813-391-8065
Fla	Miami Springs	305-888-0611
Fla	Tallahassee	904-877-2580
Ga	Atlanta	404-761-0607
Ga	Warner Robins	912-922-6616
Ill	Buffalo Grove	312-537-3760
Kans	Wichita	316-942-4201
La	Pineville	318-640-3412
Md	Bethesda	301-223-4222
Mass	Burlington	617-272-4050
Minn	Maple Plain	612-479-2633
Minn	Minneapolis	612-922-2876
Mo	Grandview	816-763-3928
Mo	Kansas City	816-942-4449
NJ	Red Bank	201-741-5379
NY	Guilfordland Center	518-371-6610
NY	Lake Success	212-343-1600
NY	New York City	212-661-6530
Ohio	Cincinnati	513-825-3802
Ohio	Dayton	513-276-3931
Ohio	Galion	419-468-3964
Okla	Oklahoma City	405-632-6801
Okla	Tulsa	918-836-3751
Pa	Natboro	215-672-7797
SC	Rock Hill	803-366-7322
Tenn	Rockford	615-573-9717
Va	Arlington	703-524-9503
Wash	Seattle	206-725-1000

COLLINS RADIO GROUP, Comps. Mktg., 4311 Jamboree Blvd., Newport Beach, Calif., 92663, Tel: 714-833-4661, TWX: 910-595-1705; Empl.: 800

Products manufactured: Filters, Integrated Circuit Devices

Local Sales Offices & Reps.

Cal	Burlingame, J. Logan Assocs.	415-697-6377
Cal	Garden Grove, Impact Elctns.	714-893-8551
Cal	San Jose, Collins Radio Grp.	415-961-1306
Fla	Orlando, Gentry Assocs.	305-894-4401
Ill	Buffalo Grove, Collins Radio Grp.	312-537-3760
Ind	Ft. Wayne, Bieberich, Inc.	219-432-2537
Ky	Lexington, Circuit Sls.	617-861-0567
Md	Bethesda, Collins Radio Grp.	202-223-4222
Mich	Warren, Dem Elctns. Sls.	313-755-6660
Minn	Minneapolis, Merrill Franklin Co.	612-835-6422
Mo	St. Louis, Engineering Svcs. Co.	314-977-1515
NY	Plainview, E.R.A.	516-822-9890
NY	Syracuse, T&S2 Elctns. Co.	315-463-8592
Ohio	Dayton, D. Steffen & Assocs.	513-293-3145
Tex	Dallas, Texas Microwave Elctns.	214-341-7866
Wash	Seattle, R. Johnston Co.	206-524-5170

COLORADO CRYSTAL CORP., 2303 W. 8th St., Loveland, Colo., 80537, Tel: 303-667-9248

Customer service: E. Altick

Products manufactured: Crystals

COLORADO VIDEO, INC., Box 928, Boulder, Colo., 80302, Tel: 303-444-3972, TWX: 910-940-3248; Empl.: 19

p. 1111-1118

For info on price: G. Southworth; Application info: J. Sparks; Customer service: C. Elliott; Delivery info: C. Elliott

Products manufactured: Television Systems & Equipment Closed-Circuit, Test Equipment

Local Sales Offices & Reps.

Ala	Huntsville, BCS Assocs.	205-881-6220
Cal	San Diego, Perspective Meass.	714-278-8931
Cal	Westlake Village, LD Bevan Co.	213-889-3653
Cal	Littleton, Croyplex, Inc.	303-794-4231
Fla	Orlando, BCS Assocs.	305-896-4881
NC	Greensboro, BCS Assocs.	919-273-1917
Pa	Exton, Scientific Mktg., Inc.	215-363-7377
Tex	Dallas, CVI Southwest Regional	214-233-5497
Va	Williamsburg, BCS Assocs.	703-877-4053

COLUMBIA COMPONENTS, Div. Computer Instrs., 60 Madison Ave., Hempstead, N.Y., 11550, Tel: 516-483-8200, TWX: 510-222-4189

Products manufactured: Circuits, Hybrid, Thick Film, Delay Lines, Modules, Logic, Encapsulated, Networks, Potentiometers

Local Sales Offices & Reps.

Ala	Huntsville, Int'l. Scien. Instr.	205-837-1601
Cal	Los Angeles, E. Land	213-897-0770
Cal	Menlo Park, Frauman	415-322-8641
Cal	San Diego, B. Tauber & Assoc. Inc.	714-274-7242
Fla	Orlando, F. Baetzman	305-295-4817
Ill	Chicago, Lightner Assoc.	312-SP 4-1500
Md	Pimonia, Barn Hill & Assoc.	301-252-5610
Mo	Kansas City, Automatic General Elec.	816-333-8206
NJ	Cherry Hill, Jay Assocs.	609-662-0399
NJ	Morristown, D. Snyder	201-569-8800
NY	Huntington, Andrews & Andrews	516-692-8686
NY	Rochester, Semple	716-342-1413
Ohio	Fairborn, J. C. Hofstetter Co.	216-241-4880
Utah	Salt Lake City, Cannon Eng. & Sls.	206-454-2514
Va	Lynchburg, Glen White	703-846-4624

COLUMBIA ELECTRIC MFG. CO., 4519 Hamilton Ave. N.W., Cleveland, Ohio, 44114, Tel: 216-361-8060; Empl.: 60

Products manufactured: Alternators, Generators, Meters



COLUMBIA ELCTR. CABLES, 11 Cove St., New Bedford, Mass., 02744, Tel: 617-999-4455; Empl.: 2,500; Minimum order: \$500; p. 2*1911

For info on price: L. Cohen; Application info: A. Souza; Customer service: N. Aronberg; Delivery info: A. Souza

Free literature available: Brochures on: Basket Merchandisers; Color Foam; Cross Reference Guide; Distributor Price Sheet; Dura-Color; Duraform for Color TV; Shielded Permaform TV Transmission; Super Duracolor; TV Cheater & Power Asst. Kit; and Various Ext. Cords.

Products manufactured: Braid, Cable, Cable Assemblies & Harnesses, Cable, Cords, Wire, Wire Shielding

Local Sales Offices & Reps.

Ala	Huntsville, Winfield Southeast Co.	205-533-3509
Ariz	Phoenix, J.R. Morgan Agency	602-252-3089
Cal	Gardena, Bidwell Sls. Assocs.	213-770-0300
Cal	San Francisco, Technical Sls. Assocs.	415-467-1434
Cal	Englewood, ESP Co.	303-781-4409
Fla	Miami, Winfield Electronic Sls.	305-945-6544
Ga	Atlanta, Winfield Southeast	404-636-3023
Haw	Honolulu, Gene Piety Factors	808-839-9059
Ill	Chicago, Bransky Sls.	312-433-2375
Ind	Indianapolis, Elctn. Reps.	317-897-9326
Kans	Shawnee Mission, Lowell-Kangas & Assoc.	913-631-3515
La	New Orleans, Texpot Co.	504-486-6073
Md	Silver Springs, Mid-Atlantic Sls. Co.	301-593-7749
Mass	Norwood, Rudolph & MacInnis Assoc.	617-769-5450
Mich	St. Clair Shores, J.M. Thorpe Co.	313-779-6363
Mich	St. Joseph, R. C. Merchant & Co.	616-983-7378
Minn	Minneapolis, H. M. R. Inc.	612-920-8200

Mo St. Louis, Lowell-Kangas & Assoc. 314-821-4050
 NY N. Bellmore, L.W. Keller & Assoc. 516-785-2826
 NY Port Washington, T.M.A., Inc. 516-883-2432
 NY Rochester, J. Brown Elctn. Sls. 716-266-2728
 NY Yonkers, J. Brown Elctn. Sls. 914-779-7330
 NC Charlotte, Winfield/SE Co. 704-536-2757
 Ohio Columbiana, Nebco Assocs. 216-457-2333
 Ohio Richfield, Bear Mktg. 216-659-3131
 Okla Tulsa, The Texpport Co. 918-939-1727
 Ore Salem, Pacnor Mktg. 503-363-6445
 Pa Philadelphia, S.K. MacDonald, Inc. 215-545-1205
 Pa Reading, Beil-Whitaker 215-779-2610
 Tenn Hermitage, Winfield Southeast Co. 615-889-5207
 Tenn Memphis, Texpport Co. 901-683-0880
 Tex Houston, Texpport Co. 713-464-2828
 Tex Richardson, Texpport Co. 214-238-7117
 Wash Seattle, Pacnor Mktg. Co. 206-284-8020

COLUMBIA RESCH. LABS., Macdade Blvd. & Bulls Ls.,
 Woodlyn, Pa., 19094, Tel: 215-532-9464, TWX:
 510-669-3625; Empl.: 96

For info on price: J. Sarty; Application info: T. Carey;
 Customer service: R. R. Reymos; Delivery info: R. R.
 Reymos

Products manufactured: Accelerometers, Alarms,
 Amplifiers, Analyzers, Controls/Control Eqpt.,
 Meters, Microphones, All Kinds, Recorders,
 Services, Assembly, Production & Test, Signal
 Conditioners & Equipment, Testers, Transducers,
 Transformers

Local Sales Offices & Reps.
 Ariz Phoenix, R. A. Mayes Co. 602-279-5243
 Colo Broomfield, R. A. Mayes Co. 303-466-6311
 Ill Des Plaines, Marsland Assocs., Inc. 312-298-2620
 Ind Indianapolis, Marsland Assocs., Inc. 317-924-3568
 Mich Detroit, Electro Sls. Assocs., Inc. 313-526-8801
 Minn Minneapolis, Marsland Assocs., Inc. 612-545-4881
 Mo Florissant, Marsland Assocs., Inc. 314-278-6949
 NM Albuquerque, R. A. Mayes Co. 505-265-7989
 NY Mamaroneck, Cane Tech Sls., Inc. 914-698-4411
 Ohio Cleveland, Electro Sls. Assocs., Inc. 216-261-5440
 Ohio Dayton, Electro Sls. Assocs., Inc. 513-426-5551
 Pa Pittsburgh, Electro Sls. Assocs. 412-371-9449
 Tex Richardson, R. A. Mayes Co. 214-235-3043
 Wash Bellevue, Topp Engrg. Sls., Inc. 206-747-5401

COLUMBIA TECH, See Humiseal Div. and Industrial Mica
 Div.

COLUMBUS ELECTRIC MFG. CO., Box 289A Rt #2, Piney
 Flats, Tenn., 37686, Tel: 615-538-8191; Empl.: 160;
 Minimum order: \$15

Customer service: L. Belt
 Free literature available: Switch Catalogue, Control
 Catalogue

Products manufactured: Air Cleaners & Filters
 (Shielded & Unshielded), Controls/Control Eqpt.,
 Switches

Local Sales Offices & Reps.
 Cal Los Angeles, F. Alleman 213-222-8128
 Cal Oakland, W. Nott 415-654-3747
 Conn Glastonbury, Barton-Caron Assoc. 203-633-9417
 Ill Chicago, J. Angel Co. 312-878-0653
 Mass Auburndale, B. Caron
 NY Henlett, E. Mann 516-569-5769
 Ohio Columbus, D. Davies 614-239-1158
 Tex Dallas, Blackburn Assoc. 214-351-9991

COM/TECH SYSTEMS INC., 15 William St., New York,
 N.Y., 10005, Tel: 212-425-0733; Empl.: 8; Minimum
 order: \$100

For info on price: C. M. Mengani; Application info: S.
 Sharin; Customer service: C. M. Mengani; Delivery
 info: C. M. Mengani

Free literature available: Data sheet - Secre/Data
 scrambler AN-101 Scramblers for cash dispensers
 AN-102 Scramblers for multi-drop systems
 Secre/Data operating procedures

Products manufactured: Comm. Systems,
 Scramblers, Data

COMCO PLASTICS, INC., 98-36 C. Jamaica Ave.,
 Richmond Hill, N.Y., 11418, Tel: 212-849-9000; Empl.:
 125; Minimum order: \$35

For info on price: J. Steele; Application info: J.
 Steele; Customer service: J. Steele; Delivery info: J.
 Schram

Products manufactured: Insulators & Insulation,
 Laminates, Services, Assembly, Production &
 Test, Terminal Blocks, Boards & Strips

Local Sales Offices & Reps.
 Conn Orange, Commercial Plastics & Supply Corp. 203-799-2351
 Fla Miami, Commercial Plastics & Supply Corp. 305-576-3333
 Ga Atlanta, Commercial Plastics & Supply Corp. 404-579-2600
 Ill Chicago, Commercial Plastics & Supply Corp. 312-277-4500
 Md Hyattsville, Commercial Plastics & Supply Corp. 301-864-6226
 Mass Somerville, Commercial Plastics & Supply Corp. 617-623-2100
 Mich Warren, Commercial Plastics & Supply Corp. 313-755-1700
 NJ Newark, Commercial Plastics & Supply Corp. 201-824-5400
 NJ Trenton, Commercial Plastics & Supply Corp. 609-883-5100
 NY New York, Commercial Plastics & Supply Corp. 212-477-5000
 NC Raleigh, Commercial Plastics & Supply Corp. 919-834-2511
 Pa Philadelphia, Commercial Plastics & Supply Corp. 215-331-8600
 Tex Dallas, Commercial Plastics & Supply Corp. 214-631-8170

COMMUNICATION ASSOCs., INC., 200 McKay Rd.,
 Huntington Station, N.Y., 11746, Tel: 516-271-0800,
 TWX: 510-226-6998; Empl.: 150; Minimum order: \$10

For info on price: G. W. Zachmann; Application info:
 G. W. Zachmann; Customer service: B. Hannon;
 Delivery info: B. Hannon

Free literature available: The "Mk II" brochure
 describes CAI's complete line of Marine SSB
 communications equipment and systems. The
 "Company Heard Around the World" brochure
 describes CAI facilities and outlines their HF/SSB
 communications products.

Products manufactured: Antennas, Receivers,
 Transceivers, Transmitters

COMMUNICATIONS EQUIPMENT CO., INC., 5134 East
 65th Street, Indianapolis, Ind., 46220, Tel:
 317-849-9240; Empl.: 23

For info on price: T. A. Garmhausen 616-334-3081;
 Application info: H. I. Morris 616-334-3081

Free literature available: Individual data sheets for
 each item. 3 ring binder covering all products.

Products manufactured: Amplifiers, Annunciators,
 Comm. Systems, Racks

COMMUNICATIONS TECHNOLOGY CORP., 2237 Colby
 Ave., Los Angeles, Cal., 90064, Tel: 213-478-5061,
 TWX: 910-342-6983; Empl.: 250; Minimum order: \$15

For info on price: H. Reeves; Application info: D.
 deVilleneuve; Customer service: H. Reeves; Delivery
 info: H. Reeves

Free literature available: 1975 price book - reviews
 product application, kit contents, & gives resale
 prices.

Products manufactured: Caps, Connector, CATV
 Systems & Equipment, Clamps & Clips, Cleaners
 & Solvents, Coatings, Compounds, Encapsulating,
 Insulating, Molding, Potting, Cords, Covers,
 Protective (Including Dust), Fasteners, Insulators
 & Insulation, Kits, Cable-End Sealing, Kits,
 Terminal, Knives & Knife Sets, Locators,
 Open-Short, Services, Assembly, Production &
 Test, Splicers, Coaxial Cable, Splices, wire
 (Including Butt & Cap Types), Testers, Tools,
 Tubing, Wrenches

COMMUNICATIONS TRANSISTOR CORP., 301 Industrial
 Way, San Carlos, Cal., 94070, Tel: 415-592-9390, TWX:
 910-376-4893; FSC No: 50155; Empl.: 170; Minimum
 order: \$50

For info on price: B. J. McDaniel; Application info: B.
 J. McDaniel; Customer service: S. Huebner; Delivery
 info: S. Huebner

Free literature available: Short Form Catalog.
 Products manufactured: Transistors

Local Sales Offices & Reps.
 Ariz Scottsdale, DeAngelo, Rothman & Cheever 602-948-2240
 Ariz Scottsdale, Varian Assocs. 602-947-5461

Cal Culver City, DeAngelo, Rothman & Co. 213-398-6239
 Cal Los Altos, Varian Assocs. 415-968-7630
 Cal San Diego, Trans Dynamics, Inc. 714-298-8215
 Fla Clearwater, Dyne-A-Mark Corp. 813-441-4702
 Fla Fort Lauderdale, Dyne-A-Mark Corp. 305-771-6501

Fla Orlando, Dyne-A-Mark Corp. 305-299-6303
 Ga Atlanta, Varian Assocs. 404-252-0045
 Ill Park Ridge, RF Specialists 312-698-2044
 Ind Ft. Wayne, RF Specialists 219-485-8982
 Iowa Des Moines, Beams 515-282-0292
 Kans Shawnee Mission, Beams 913-341-7744
 Md Cheverly, Varian Assocs. 301-773-7010
 Mass Waltham, Com-Sale 617-890-0011
 Minn Minneapolis, Tech. Assocs. 612-929-6721
 Mo Creve Coeur, Beams 314-569-1060
 NJ Mt. Laurel, Varian Assocs. 609-235-6800
 NJ Springfield, Varian Assocs. 201-376-6600
 NY Dix Hill, K & J Engrg. 516-242-0888
 NY Huntington, CDB Entrs., Inc. 516-692-5200
 NY Syracuse, Varian Assocs. 315-437-2568
 Ohio Chagrin Falls, Crest Comp. Sls. 216-543-9808
 Tex Richardson, Varian Assocs. 214-235-2385
 Wash Tukwila, General Elctns., Inc. 206-243-5141

COMPONENT RESCH., 1717 19th St., Santa Monica,
 Cal., 90404, Tel: 213-829-3615, TWX: 910-343-6864; FSC
 No: 12517; QPL No: Multiple; Empl.: 150; Minimum
 order: \$20 p. 242

For info on price: S. Kellerman; Application info: D.
 Kellerman; Customer service: C. Davis; Delivery info:
 C. Davis

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.
 EXP: Cal., Beverly Hills, M. Stewart & Co. 213-272-0103

COMPONENT SPECIALTIES, 9143 E. La Rosa Dr., Temple
 City, Cal., 91780, Tel: 213-283-0015; FSC No: 28984;
 Empl.: 45; Minimum order: \$75

For info on price: Office; Application info: R. C.
 Johnston; Customer service: N. Laughlin; Delivery
 info: N. Laughlin

Free literature available: Our brochure shows the
 variety of magnetic components produced. All
 products are custom designed to fit customer
 specific requirements.

Products manufactured: Clutches, Coils Including
 Assemblies & Forms, Relays, Solenoids,
 Transformers

COMPONENTS CORP., 106 Main St., Denville, N.J.,
 07834, Tel: 201-627-0290; Empl.: 11

Customer service: W. Gordon

Free literature available: Digi-Klips® - Board to
 Board Interconnect System, describes Digi-Klip
 system and gives specifications; contact facts -
 application potential of Digi-Klips and associated
 items.

Products manufactured: Connectors, Converters,
 Power Supplies, Records, Frequency Test

Local Sales Offices & Reps.
 Cal Los Angeles, E. E. Strassner Co. 213-666-1511
 Cal San Carlos, LoDan 415-592-4600
 Ga Atlanta, Electro-Components 404-451-5489
 Ill Des Plaines, Coombs Assocs. 312-298-4830
 Mass Northboro, Henik Assoc. 617-891-5660
 NJ W. Trenton, W. Hartig 609-882-2433
 Tex Garland, G. V. Peck Co. 214-341-8311
 FOR: Can., Westmount, Montreal Que., W. F. Griffith

COMPONENTS SPECIALTIES, INC., 393 So. Franklin St.,
 Hempstead, N.Y., 11550, Tel: 516-292-9500

For info on price: J. Berliant; Application info: S.
 Hulkower; Customer service: B. Zachman; Delivery
 info: B. Zachman

Products manufactured: Capacitors, Fixed, Coils
 Including Assemblies & Forms, Comm. Systems,
 Eliminators, Battery, Grilles, Jacks (All Types),
 Meters, Networks, Plug & Jack Sets,
 Potentiometers, Power Supplies, Probes, Speaker
 Systems, Speakers, Switch Handle Boots,
 Switches, Testers, Transformers

COMPONENTS SPECIALTIES, IN cont'd

Advertisement

SPECO - Complete line of automotive speakers. Auto grilles replacement speakers 1" - 15". The most complete line of miniature speakers in stock in the U.S. Miniature speakers made to your specifications. 25 to 70 volt line transformers. Miniature and sub-miniature jacks and plugs, volume controls, ear pieces and pillow speakers. A full line of electrolytic capacitors. Trumpets and intercoms.

COMPU-LITE CORP., 17795 Sky Park Cir. # C, Irvine, Cal., 92707, Tel: 714-546-9045; FSC No: 51420; Empl.: 50; Minimum order: \$25

Customer service: S. Rasmussen

Free literature available: Product Summaries & Data Sheets with Engineering Specifications, Photos, Etc.

Products manufactured: Clamps & Clips, Indicators, Sockets, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Repcom, Inc.	205-534-9959
Ariz	Phoenix, Gramer & Co.	602-279-1231
Cal	Los Angeles, Universal Components Co.	213-641-4255
Cal	San Carlos, Electronic Engineering Assoc. Ltd.	415-593-2189
Conn	Woodbridge, Electronic Marketing Co.	203-397-1461
Fla	Melbourne, Repcom Inc.	305-254-1877
Ga	Warner Robins, Repcom Inc.	912-923-1393
Ill	Oakbrook, Whitmore Associates Inc.	312-325-4727
Mich	Dearborn, Villani-Pitcher Inc.	313-271-4600
Minn	Bloomington, OEM Sales Co.	612-884-5930
NJ	Englewood Cliffs, Sprung/Nussbaum Inc.	201-947-6767
Pa	Jenkintown, Arnold Associates	215-887-7870
Wash	Bellevue, Pacific Consultants	206-454-2503
Exp:	Irvine, Cal., D. Rippin Ind'l. Exp. Mgr.	714-493-2589

COMPUMOD, INC., 306 River St., Haverhill, Mass., 01830, Tel: 617-373-9104, TWX: 710-347-0269

Products manufactured: Converters

Local Sales Offices & Reps.

Cal	Pasadena, A-F Sls. Engrg. Inc.	213-681-5631
Conn	West Hartford, Instrument Assocs	203-525-9367
Fla	Orlando, Brosey Enterprises	305-622-6045
Fla	Palm Beach Gardens, Brosey Enterprises	305-622-6045
Ill	Elk Grove, L.F. Green & Assocs.	312-593-0282
Ind	Indianapolis, L.F. Green & Assocs.	317-293-9827
Mass	Bedford, Instrument Assocs.	617-275-0700
Mich	Southfield, Data-Tron	313-354-6421
Minn	Fridley, L.F. Green & Assocs.	612-781-1611
NJ	Bogota, Neville & Vespo, Inc.	201-487-1507
NY	New Hartford, KLM Assocs.	315-735-8525
NY	North Syracuse, KLM Assocs.	315-458-6214
NY	Rochester, KLM Assocs.	716-442-0820
Ohio	Dayton, Data-Tron	513-223-8421
Ohio	Wickliffe, Data-Tron	216-585-8421
Okla	Tulsa, R. Matthews Elctns.	918-936-2562
Pa	Media, W. Reeves Assocs.	215-566-6709
Tex	Dallas, R. Matthews Elctns.	214-233-0363
Tex	Houston, R. Matthews Elctns.	713-664-7131
Va	Fairfax, Nine Assocs.	703-273-1830
Wash	Seattle, J.B. Jolly Inc.	206-938-4166

COMPUTER AUTOMATION, INC., Ind. Prods. Div., 18651 Von Karman, Irvine, Cal., 92664, Tel: 714-833-8830, TWX: 910-595-1767; Empl.: 360

Customer service: A. Armoni

Products manufactured: Test Systems, Testers

Local Sales Offices & Reps.

Cal	Costa Mesa, Measurement Assocs.	714-540-7160
Colo	Denver, Computer Automation	303-466-1749
Ill	Chicago, Computer Automation	312-956-6400
Mass	Burlington, W.M. Hague Co.	617-899-5600
NJ	Ramsey, Computer Automation, Inc.	201-825-0990
Ohio	Cleveland, Computer Automation, Inc.	716-777-8700

Tex	Houston, Computer Automation	713-626-9430
Wash	Seattle, Computer Automation	206-455-9650

COMPUTER COMPS., 88-06 Van Wyck Expwy., Jamaica, N.Y., 11418, Tel: 212-AX 1-3500; Empl.: 45
p. 1-1616, 1617

Products manufactured: Coils Including Assemblies & Forms, Relays, Sockets, Transformers

Local Sales Offices & Reps.

Cal	Santa Monica, Rep Assocs.	213-829-5401
Ill	Bellwood, Fiat Eng. Assocs.	312-547-6200
Mass	Billerica, Matrix Sls.	617-667-9268
NJ	Springfield, Svc. & Tech. Inc.	201-232-2666
NY	Commack, Svc. & Tech. Inc.	516-543-1061
NY	Rochester, L-Mar Assocs.	716-328-5240
Ohio	Chagrin Falls, Crest Component Sls.	216-543-9808

Pa King of Prussia, White-Keystone Inc.

Wash	Renton, Control Instr. Co.	206-226-7170
EXP:	N.Y., Baldwin, Milano Brothers	516-223-9000

COMPUTER CONVERSIONS CORP., 6 Dunton Ct., East Northport, N.Y., 11731, Tel: 516-261-3300; FSC No: 51086; Empl.: 100
p. 1-154, 155

Customer service: S. J. Renard

Free literature available: Complete technical and applications on data on synchro/digital or DC, digital or DC/synchro, absolute encoders, angle indicators, rectangular to polar, modulators, demodulators, and multiplexed converters.

Products manufactured: Amplifiers, Calibrators, Comm. Systems, Controls/Control Eqpt., Converters, Counters, Demodulators, Encoders, Indicators, Meters, Modulator/Demodulators, Modulators, All Kinds, Resolvers, Synchro, Scales, Binary, Decade, Standards, Synchro Transmitters, Solid-State, Synchros, Testers, Transducers

Local Sales Offices & Reps.

Cal	Burlingame, Ledy Assocs.	415-347-5247
Fla	Clearwater, Brennan Assocs.	813-446-5006
Ind	Carmel, Rich Elctn. Mktg.	317-844-8462
Mass	Brookline, Technology Prods. Grp.	617-731-0858
NM	Albuquerque, F.Y. Gates Co.	505-298-1875
NY	Liverpool, R & D Assocs.	315-622-2350
Tex	Dallas, Jacobson Co.	214-363-7584
Va	Fairfax, Nine Assocs.	703-273-1803
Wash	Redmond, Desco, Northwest	206-455-9325

Advertisement

CCC manufactures a complete line of low cost, solid state, shaft and synchro to digital or DC (\$295), and digital or DC to synchro converters for the military and commercial market. Other related products are rectangular to polar co-ordinate converters, digital phase meters (\$295), digital angle indicators (\$595), digital data converters, computer modulators and demodulators. Evaluation units supplied on request. Write for further information and free data conversion chart.

COMPUTER DEVICES CORP., 63 Austin Blvd., Commack, N.Y., 11725, Tel: 516-543-4220; Empl.: 50

Products manufactured: Coders, Decade Boxes, Delay Lines, Equalizers, Generators, Memories, Buffer, Memory Systems, Networks, Oscillators, Standards, Synthesizers

Local Sales Offices & Reps.

Cal	Arcadia, Mar-Land Entrs.	213-681-9440
Ill	Chicago, Kemp Sls. Co.	312-622-1121
Md	Baltimore, R.A. Wafer Assocs.	301-744-1133
NH	Windham, J.A. Justice Co.	603-434-4290
NJ	Cherry Hill, J.N. Barrett Assocs.	609-429-1551
NY	Tarrytown, Garretson Co.	914-631-2650
NY	Utica, B.D. Hummel Co.	315-736-7821
Tex	Dallas, Bouco Sls. Assocs.	214-247-1749
EXP:	New Rochelle, N.Y., Montclair Elctns.	914-576-1400

COMPUTER DEVICES OF CALIF., 11901 Burke St., Santa Fe Springs, Cal., 90670, Tel: 213-698-2595, Telex: 65-7478; FSC No: 32423; Empl.: 150
p. 1-940, 941

For info on price: J. Rock; Application info: W. Diston; Customer service: J. Bazinet; Delivery info: J. Bazinet

Free literature available: Bulletin 6-72 - Large Angle Step Motors, 23 - Small Angle Stepping & Synchronous Motors 34H - 1.8° & 5° Stepping & Synchronous Motors, C&D - 1.8° 40 Steppers, 23F - 50 Steppers, 20 - PS & PE Value Line Steppers & Synchronous Motors, ESM - Electronics for Stepper Motors, PC-1 Rapid-Syn Drivers 484 - Rapid Syn Drivers SFC - Short Form Catalog - Stepping Motor & Drivers.

Products manufactured: Controls/Control Eqpt., Motors

Local Sales Offices & Reps.

Cal	Redwood City, Archie Cardwell	415-364-7553
Cal	Santa Fe Springs, Computer Devices of Cal.	213-723-6593
Colo	Denver, Camel Elctns.	303-757-6191
Conn	Old Saybrook, M.L. Assocs.	203-388-9718
Fla	Orlando, MacKay, Smith & Assocs.	305-277-1513
Ill	Barrington, G.A. Cridland Co.	312-381-7044
Mass	Marlboro, M.L. Assocs.	617-485-6190
Mich	Birmingham, J.C. Hofstetter Co.	313-422-7203
Minn	St. Paul, W.E. Taubert	612-636-6414
NH	East Derry, M.L. Assocs.	603-432-5838
NJ	Cherry Hill, R.E. Winter Assocs.	609-429-0696
NJ	Tenafly, ABC Elctn. Sls. Co.	201-568-2354
NY	Cazenovia, A.E. Decew Agency	315-655-8602
NY	Sodus, A.E. Decew Agency	315-483-6561
NY	Williston Park, ABC Elctn. Sls. Co.	516-747-6610
NC	Charlotte, MacKay, Smith, & Assocs.	704-527-0240

Ohio	Dayton, Electrical Sys. Co.	513-434-9822
Tex	Houston, Oeler & Menelaides	713-772-0730
Tex	Richardson, Oeler & Menelaides	214-234-6334
Wash	Bellevue, Ruggles Tech. Sls.	206-455-2778

COMPUTER INSTRS., 92 Madison Ave., Hempstead, N.Y., 11550, Tel: 516-483-8200, TWX: 510-222-4189; Empl.: 260
p. 1-2340; p. 2-1642, 1643

Products manufactured: Circuits, Hybrid, Thick Film, Commutators, Controls/Control Eqpt., Delay Lines, Dividers, Films, Gages, Indicators, Meters, Modules, Logic, Encapsulated, Networks, Paper, Graphic Recording, Potentiometers, Recorders, Resistors, Switches, Testers, Transducers, Transmitters

Local Sales Offices & Reps.

Ala	Huntsville, Int'l. Sci. Instr.	205-837-1601
Cal	Glendale, Meko Instr.	213-240-4664
Cal	Los Altos, Servo Data	415-964-1325
Colo	Denver, Technical Engrg. Sls.-Serv.	303-744-1119

Fla Clearwater, Technical Comps. & Instr.

Ill	Lansing, North Central Engrg.	312-474-3580
Kans	Andover, Palatine Engrg.	316-683-7512
Kans	Overland Pk., Palatine Engrg.	913-262-5643
Md	Greenbelt, J.E. Cuesta	301-552-1200
Mass	Norwell, Bordewick Engrg. Sls. Co.	617-659-4915

Mich	Trenton, North Central Eng.	313-675-3157
Minn	Minneapolis, R.J. Sls.	612-922-1425
Mo	St. Louis, Palatine Engrg.	314-426-7055
NY	Westbury, Tech-Rep Engrg. Sls.	516-997-7946
Ohio	Dayton, J. Hofstetter	513-296-1010
Ohio	Medina, J. Hofstetter	216-241-4880
Okla	Tulsa, Pan Tech Engrg.	918-747-2494
Pa	Valley Forge, J.E. Cuesta & Co.	215-265-5800
Tex	Arlington, Pan Tech Engrg.	817-261-4111
Tex	Houston, Pan Tech Engrg.	713-623-0640
Wash	Seattle, Barrett Equip. Co.	206-522-8325

Potentiometer & Components

Ala	Huntsville, Int'l. Sci. Instrs.	205-837-1601
Ariz	Scottsdale, Carter Assoc.	602-947-4355
Cal	Los Altos, Servo Data	415-964-1325
Cal	Los Angeles, E. Land Co.	213-879-0770
Cal	San Diego, B. Tauber & Assoc.	714-274-7242
Colo	Denver, Camel Elctns.	303-757-6191
Ill	Chicago, Berndt Assoc.	312-283-0713
Ind	Ft. Wayne, Temple Engrg.	219-744-4331
Iowa	Cedar Rapids, Palatine Engrg.	319-365-8071
Kans	Overland Pk., Palatine Engrg.	913-262-5643
Md	Baltimore, Callas Elctns.	301-744-7711
Mass	Millis, Selmark Assocs.	617-376-2914
Mich	Birmingham, J. Hofstetter	313-642-0590
Minn	Mpls., R.J. Sls.	612-922-1425
Mo	St. Louis, Palatine Engrg.	314-426-7055
NH	Plaistow, Selmark Assocs.	617-375-0305
NJ	E. Orange, Masin-Esco	201-674-6505
NY	Jericho, Electro-Rep, Inc.	516-938-0540
NY	Massapequa Pk., Metro Tech.	516-798-1066
NY	Penfield, A & D Devices	716-586-8033
Ohio	Dayton, J. Hofstetter	513-298-0662
Ohio	Medina, J. Hofstetter	216-241-4880

Okla Tulsa, Carter Assocs. 918-936-5100
 Pa Valley Forge, J. E. Cuesta 215-265-5800
 Tex Garland, Carter Assocs. 214-276-7151
 Wash Seattle, Gillett & Assocs. 206-284-3344

COMPUTER LABS, 1109 S. Chapman St., Greensboro, N.C., 27403, Tel: 919-292-6427, TWX: 510-922-7954; FSC No: 34031; Empl.: 40; Minimum order: \$100

For info on price: D. W. Brockman; Application info: D. W. Brockman; Customer service: G. W. Perryman; Delivery info: D. W. Brockman

Free literature available: Individual data sheets, or catalog of data sheets. Also booklets containing reprints of articles and/or talks by engineers from company, useful as reference material.

Products manufactured: Amplifiers, Converters

Local Sales Offices & Reps.

Ariz Phoenix, R.A. Mayes Co. 602-279-5243
 Cal No. Hollywood, Cardinal Assocs. 213-877-6641
 Colo Denver, R.A. Mayes Co. 303-444-0782
 Conn Hamden, J & J Assocs. 203-624-7800
 Md Laytonsville, G-T Assocs. 301-949-8060
 Mass Burlington, J & J Assocs. 617-272-2806
 NJ Fairfield, KLS Assocs. 201-227-2900
 NM Albuquerque, R.A. Mayes Co. 505-292-2330
 NY Penfield, A & D Devices 716-586-8033
 Tex Dallas, R.A. Mayes Co. 214-235-3043

COMPUTER OPERATIONS, 10774 Tucker St., Beltsville, Md., 20705, Tel: 301-937-5377; Empl.: 19

Products manufactured: Memory Systems

Local Sales Offices & Reps.

Colo Boulder, Par Assocs. 303-499-4736
 Haw Honolulu, Aloha Assocs. 808-941-1574
 Ind Munster, Bexdata Ltd. 312-221-1411
 Md Rockville, MESA 301-881-8430
 Mass Wellesley, Northeast Data 617-237-1509
 Minn Edina, Bexdata Ltd. 612-941-2999
 Mo St. Louis, Bexdata Ltd. 314-872-3357
 NJ Cinnaminson, MESA 609-786-0284
 Okla Norman, Data Mktg. 405-364-8320
 Tex Houston, Data Mktg. 713-686-9627
 Wash Bellevue, Brennan Assoc. 206-454-9332

COMPUTER POWER, INC., 42 E. Park Avenue, Madison, NJ, 07940; Tel: 201-377-4003; Empl.: 50; Minimum order: \$500

For info on price: R. Love; Application info: R. Love; Customer service: P. Ahlers; Delivery info: J. Moore

Free literature available: Interruptable and non-interruptable (UPS) power systems; General facilities brochure; modular power supply.

Products manufactured: Chokes, Computers, Converters, Inverters, Power Supplies, Reactors, Transformers

Advertisement

Small special purpose computers, all types of custom multiple output computer power supplies. Low cost, high efficiency, sine wave, regulated, interruptable, and non-interruptable (U.P.S.) AC power systems which include batteries, charger and inverter up to 15 KVA for many hours. Custom magnetics up to 100 KVA for all types of applications such as inverters, converters, ferro regulators etc. We will assist in the design of the magnetic interface circuitry at no extra charge.

COMPUTER PRODUCTS, Box 23849, Ft. Lauderdale, Fla., 33307, Tel: 305-974-5500, TWX: 510-956-9895; Empl.: 150; Minimum order: \$/50

For info on price: W. Ford; Application info: W. Ford; Customer service: R. Cheek; Delivery info: R. D'Allessandro

Free literature available: Power Supply Catalog - lists 61 models of encapsulated modular power supplies - from 3.6 to 26 volts, from 65MA to 2000 MA. RTP Device Specifications - describes CPI line of computer directed measurement & control equipment. RTP Pricing & Configuration Guide - provides model no.'s and pricing info on RTP line.

Products manufactured: Multiplexers, Power Supplies, Scanners

Local Sales Offices & Reps.

Ala Huntsville, W.A. Brown Comps., Inc. 205-539-4411

Cal North Hollywood, B.J. Wolfe Entps. 213-877-5518
 Cal Sunnyvale, RDP Instrs., Inc. 408-735-9040
 Fla Fort Lauderdale, W.A. Brown Comps., Inc. 305-776-4800
 Fla Orlando, W.A. Brown Comps., Inc. 305-425-5505
 Ill Chicago, Data Elctns. 312-283-0300
 Ind Indianapolis, J. Holsapple & Assocs. 317-899-2890
 Md Ellicott, A/D Inc. 301-531-6700
 Mass Lynnfield, Andrews Airtronics, Inc. 617-245-5220
 Minn Minneapolis, Data Elctns. 312-786-9666
 NM Albuquerque, Aztec Entprs. 505-255-2440
 NY Fayetteville, M.P. Andrews 315-637-9734
 NY Roslyn Heights, Travco Assocs. 516-621-3223
 NC Raleigh, W.A. Brown Comps. 919-876-9601
 NC Winston-Salem, W.A. Brown Comps., Inc. 919-725-5384
 Ohio Cincinnati, J.O. Olsen & Co. 513-922-2176
 Ohio Cleveland, J.O. Olsen & Co. 216-752-5444
 Pa Pittsburgh, J.O. Olsen & Co. 412-279-2550
 Tex Garland, G.V. Peck Co. 214-341-8311
 Tex Houston, G.V. Peck, Co. 713-664-1435
 Wash Bellevue, Brennan Assocs. 206-454-9332

COMPUTER TALK INC., Box 145, Idlelale, Colo., 80453, Tel: 303-697-4315; Empl.: 20

Customer service: W. M. Barnes

Free literature available: Powerful - Fast - Automatic Computer; Billion Byte Disk Memories; Free - Floating Cursor Digitizers.

Products manufactured: Computers, Digitizers, Pencil Follower (Inc. Coordinate & Graphic), Memory Systems

COMPUTER TERMINAL SYS., 52 Newtown Plaza, Plainview, N.Y., 11803, Tel: 516-293-6611; FSC No: 33948; Empl.: 30; Minimum order: \$25

For info on price: J. Gross; Application info: J. Gross; Customer service: E. Mermelstein; Delivery info: J. Gross

Free literature available: Line of versatile alphanumeric printers. Printing on impact paper, pressure sensitive labels, tickets, IBM cards, tags, sales slips, bank checks and plastic stock.

Products manufactured: Controls/Control Eqpt., Data Loggers, Printers, Teleprinters

Local Sales Offices & Reps.

Cal Palo Alto, Gil Eakins 415-326-5317
 Fla Fort Lauderdale, Snow Co. 305-563-2448

COMSTRON SEG., 120-30 Jamaica Ave., Richmond Hill, N.Y., 11418, Tel: 212-441-3200, Telex: 146337; Empl.: 35 p. 1-544,545,638,639

Customer service: R. W. Tramosch

Free literature available: Brochure describing our Frequency Synthesizer

Products manufactured: Filters, Generators, Meters, Recorders, Synthesizers, Telephone Channel Test & Simulator Equipment, Testers

Local Sales Offices & Reps.

Ariz Scottsdale, Measurement Consils. 602-994-9519
 Cal Inglewood, L & M Engrg. 213-674-6850
 Cal San Jose, L & M Engrg. 408-292-3220
 Colo Boulder, Measurement Consils. 303-449-5294
 Conn Hamden, J & J Assocs. 203-624-7800
 Fla Lighthouse Point, Saber Assocs. 305-943-3076
 Fla Longwood, Saber Assocs. 305-422-3686
 Fla St. Petersburg, Saber Assocs. 813-441-1301
 Ga Woodstock, Saber Assocs. 404-432-9625
 Ill Chicago, Electronic Instr. Assoc. 312-271-3774
 Ind Indianapolis, Electronic Instrs. Assoc. 317-257-7231

Kans Wichita, Winco 316-684-8224
 Md Lanham, Brimberg Assocs. 301-552-2200
 Mass Burlington, J & J Assocs. 617-272-2606
 Mich Detroit, Comtel-Sterling Co. 313-255-1970
 NJ Hazlet, Mer Mon Electron. Instrum. 201-264-1851
 NM Las Cruces, Measurement Consils. 505-526-2491

NY Plainview, Eastern Metro Assocs. 516-WE1-1414
 NC Raleigh, Saber Assocs. 919-834-3961
 Ohio Cleveland, Comtel-Sterling Co. 216-442-8080
 Ohio Detroit, Comtel-Sterling Co. 513-298-7573
 Pa Pittsburgh, Comtel-Sterling Co. 412-922-5720
 Tex Hurst, Anderson-Wylie Assocs. 817-268-2327
 Utah Murray, Measurement Consils. 801-268-3181

COMSTRON-SEG MULTIMETRICS, 120-30 Jamaica Ave., Richmond Hill, N.Y., 11418, Tel: 212-441-4240, Telex: 146337; Empl.: 35 p. 1-544,545,638,639

Customer service: R. W. Tramosch

Free literature available: Brochures describing our Models - Series AF-100, AF-200, AF-400.

Products manufactured: Analyzers, Filters, Generators, Meters, Recorders, Signal Conditioners & Equipment, Synthesizers, Telephone Channel Test & Simulator Equipment, Testers

Local Sales Offices & Reps.

Ala Huntsville, Scientific Devices, SE, Inc. 205-536-1969
 Ariz Scottsdale, Measurement Consils. 602-994-9519
 Cal Mountain View, Gado Instr. Sls. 415-961-2222
 Cal Signal Hill, Saber Entprs. 213-595-5646
 Colo Boulder, Measurement Consils. 303-449-5294
 Conn Hamden, J & J Assocs. 203-624-7800
 Fla Lighthouse Point, Saber Assocs. 305-943-3076
 Fla Longwood, Saber Assocs. 305-422-3686
 Fla St. Petersburg, Saber Assocs. 813-441-1301
 Ga Woodstock, Saber Assocs. 404-432-9625
 Ill Chicago, Electronic Instrument Assocs., Inc. 312-271-3774
 Ind Indianapolis, Electronic Instrument Assocs., Inc. 317-257-7231
 Mass Burlington, J & J Assocs. 617-272-2606
 Mich Detroit, Comtel-Sterling Co. 313-255-1970
 NJ Hazlet, Mer-Mon Electronic Instrumentation 201-264-1851
 NM Las Cruces, Measurement Consils. 505-526-2491
 NY Plainview, Eastern Metro Assocs., Inc. 516-WE 1-1414
 NC Raleigh, Saber Assocs. 919-834-3961
 Ohio Cleveland, Comtel-Sterling Co. 216-442-8080
 Ohio Dayton, Comtel-Sterling Co. 513-298-7573
 Pa Mt. Penn, Mer-Mon Electronic Instrumentation 215-779-1640
 Pa Pittsburgh, Comtel-Sterling Co. 412-922-5720
 Utah Murray, Measurement Consils. 801-268-3181
 Va Annandale, J. Hopkins Assocs. 703-323-1641
 FOR: Can., Don Mills, Ont., Componetics, Ltd. 416-445-3230
 FOR: Can., Montreal, Que., Componetics, Ltd. 514-342-4117

CONAP, INC., 184 E. Union St., Allegany, N.Y., 14706, Tel: 716-372-9650, TWX: 510-245-2769; Empl.: 115

Products manufactured: Adhesives (All Types), Cleaners & Solvents, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Conductive Plastic Materials, Insulators & Insulation, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Cal Anaheim, Advance Electrical Sls. 714-870-0304
 Cal Belmont, Advance Electrical Sls. 415-592-4550
 Ga Macon, Stoneco Assocs. 912-745-4652
 Ill Wood Dale, Lucole Entprs. 312-595-7846
 Ind Indianapolis, Sheer Engrg. 317-852-8766
 Mass Marshfield, Conap, Inc. 617-837-1459
 Minn Burnsville, W.J. Koness 612-890-9159
 Mo St. Louis, Ensco-Rep Inc. 314-542-3935
 NJ Riverton, Given Assocs. 609-829-7249
 NY Allegany, Conap, Inc. 716-372-9650
 NY Bayside, Davis & Co. 212-229-7987
 Pa Meadville, Conap, Inc. 814-336-1996
 SC Myrtle Beach, J.D. Morrison Assocs. 803-448-2819
 Tex Garland, Cogburn & Assocs. 214-271-1147
 Wash Seattle, Advance Electrical Sls. 206-762-2262
 Wisc Brookfield, Techno-Ind'l. Sls. Co. 414-783-4385

CONCORD ELCTRNS., 37 Great Jones St., Dept. JE, New York, N.Y., 10012, Tel: 212-777-6571, TWX: 710-581-4930; Empl.: 150 p. 2-654,655

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Connectors, Contacts, Electrical, Handles For Cabinets, Circuit Boards, Racks, etc., Insulators & Insulation, Jacks (All Types), Pins, Spacers, Terminals, Tools

Local Sales Offices & Reps.

Cal Fremont, H. Foraker 415-657-2213
 Mass Woburn, Jalco Assocs. 617-227-1515
 FOR: Can., Downsview, Ont., Kaytronics Engrg. 416-638-5511
 FOR: Can., Montreal, Que., Kaytronics Engrg. 514-489-9335

CONDENSER PRODUCTS CORP., Box 997, Brooksville, Fla., 33512, Tel: 904-796-3562

Products manufactured: Capacitors, Fixed, Power Supplies

CONDOR PACIFIC INDS. CALIF., 8740 Rammet Ave., Canoga Park, Cal., 91304, Tel: 213-882-0550; Empl.: 20
Customer service: E. J. Smith
Products manufactured: Gyros (All Types)

CONFORMING MATRIX CORP., Box 5126, Pt. Pl. Sta., Toledo, Ohio, 43611, Tel: 419-729-3777; Empl.: 35;
Minimum order: \$15
Customer service: R. Sebetto
Products manufactured: Films

CONIC CORP., Terra Com Div., 9020 Balboa Ave., San Diego, Cal., 92123, Tel: 714-278-4100, TWX: 910-335-1183
Customer service: B. M. Jennings

Free literature available: Specification Sheet - Lists the product specification and discusses the Theory of Operation.
Products manufactured: Power Supplies, Receivers, Transmitters

CONNECTICUT HARD RUBBER CO., 407 East St., New Haven, Conn., 06509, Tel: 203-777-3631, TWX: 710-465-0264; Empl.: 80

Products manufactured: Gaskets, Shielding, R-F-Also See Shields, R-F, Rubber, Tapes, Electrical Insulation, Tapes, Films & Foils, Pressure Sensitive

CONNECTOR CORP., 6025 N. Keystone Ave., Chicago, Ill., 60646, Tel: 312-539-3108 p. 2-657-660

Products manufactured: Antennas, Backpanel Interconnect Systems, Cable Assemblies & Harnesses, Clamps & Clips, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Holders, Crystal, Jacks (All Types), Pins, Plug Adapters, Plug & Jack Sets, Plugs, Relays, Retainers, Services, Assembly, Production & Test, Socket Adapters, Sockets, Terminal Blocks, Boards & Strips, Terminals

Local Sales Offices & Reps.

Cal	Altadena, D. Wagner	213-681-4060
Ill	Chicago, Bauman Sls.	312-539-3108
Kans	Leawood, Vasek Sls. Co.	913-649-0679
Mass	Needham, Coakley Boyd & Abbott	617-444-5470
Mich	Jackson, E.H. Jordan	517-782-0694
Minn	Minneapolis, E. Mellus & Assoc. Inc.	612-854-4270
NY	Dewitt, A. Bowser	315-446-5920
NY	Synder, H.J. Sapcey	716-839-4170
NC	Raleigh, J. Nagle	919-782-0213
Tenn	Shelbyville, C. McLanahan	615-684-4544
Va	Virginia Beach, C. Bludau	703-464-0500

CONNECTICUT MICROWAVE CORP., Route 44, New Hartford, Conn., 06057, Tel: 203-693-4247; FSC No: 50974; Empl.: 16; Minimum order: \$25

For info on price: S. T. Urbank; Application info: M. DePalo; Customer service: R. Poppe; Delivery info: S. T. Urbank

Free literature available: Brochure which includes outline dwgs & specifications of approx 50 models of directional couplers selected from approx 400 different units produced by this firm.

Products manufactured: Couplers, Dummy Loads

Local Sales Offices & Reps.

Pa	King of Prussia, J.T. Birkhead	215-688-4021
Va	Fairfax, Schibley Assocs.	703-591-3008

Advertisement

DIRECTIONAL COUPLERS, CO-AXIAL AND WAVEGUIDE, designed to produce DC or RF outputs sensitive to forward and reflected main line RF power. Your most exacting "SPECIAL" RF power measuring requirements can, in most cases, be satisfied by but a slight modification of one of our hundreds of standard models. Meet MIL Specs.

CONNECTOR INDS. OF AMERICA, 639 N. Wayne, Cincinnati, Ohio, 45215, Tel: 513-733-3680; FSC No: 32076; Empl.: 30

For info on price: K. C. Neal; Application info: F. S. Knolik; Customer service: K. C. Neal; Delivery info: K. C. Neal

Products manufactured: Connectors, Seals, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Ariz	Phoenix, Southwest e/m Engrg., Inc.	602-944-1521
Conn	Branford, W. McCoy Co.	203-488-2012
Fla	Zephyrhills, Tool-Tronics	813-782-7177
Ill	Chicago, D. Dolin Sls. Co.	312-286-6200
Md	Baltimore, J.R. Daniel & Co.	301-825-3330
Mich	Birmingham, Forand Sls. Co.	313-644-0087
Mo	St. Louis, Boweng	314-429-7327
NJ	Newfoundland, T.A. Adamo Prod., Inc.	201-697-2450
NY	Syracuse, Canavan-Scanlon Assocs.	315-463-9161
Ohio	Cleveland, Component/Insulation Corp.	216-521-3570

CONNOR-WINFIELD CORP., 109 Turner Ct., W. Chicago, Ill., 60185, Tel: 312-231-5270; Empl.: 17
p. 1-296-299

Products manufactured: Alarms, Generators, Integrated Circuit Devices, Meters, Oscillators, Relays, Standards, Timers, Transformers

Local Sales Offices & Reps.

Cal	Encino, C.D.H. Assocs.	213-345-3111
Cal	Los Altos, Frauman Assocs.	415-941-0660

CONRAC CORP., See Cramer Div.

CONRAC CORP., Instrs/Controls Div., 1700 S. Mountain Ave., Duarte, Cal., 91010, Tel: 213-359-9141

Products manufactured: Accelerometers, Controls/Control Eqpt., Gyros (All Types), Indicators, Potentiometers, Switches, Transducers

CONRAC CORP., Machine Tool Div., 9200 Bolsa Ave., Westminster, Cal., 92683, Tel: 714-894-4711

Products manufactured: Controls/Control Eqpt., Cords, Machines/Machinery, Production

CONRAC CORP., New Jersey Div., Sherwood La., Fairfield, N.J., 07006, Tel: 201-226-7777

Products manufactured: Comm. Systems, Controls/Control Eqpt., Converters, Data Acquisition & Reduction Systems, Indicators

CONRAC DIV., Conrac Corp., 600 N. Rimsdale Ave., Covina, Calif., 91722, Tel: 213-966-3511

Products manufactured: CATV Systems & Equipment, Converters, Display Devices/Displays, Monitors, Mounts, Receivers

CONRAC CORP., Turner Div., 909 17th St. N.E., Cedar Rapids, Iowa, 52402

Products manufactured: Amplifiers, Machines/Machinery, Production, Microphones, All Kinds

CONSOLIDATED CONTROLS CORP., 12 Durant Ave., Bethel, Conn., 06801, Tel: 203-743-6721, TWX: 710-456-0446; FSC No: 02750; Empl.: 300; Minimum order: \$25

Customer service: G. L. Garavel

Products manufactured: Actuators, Comparators, Controls/Control Eqpt., Converters, Couplings, Data Acquisition & Reduction Systems, Data Loggers, Gages, Indicators, Meters, Monitors, Multiplexers, Printers, Probes, Scanners, Switches, Transducers, Valves, Solenoid, Valves, Vacuum

Local Sales Offices & Reps.

Ariz	Scottsdale, OEM Specialties	602-948-3360
Cal	Redwood City, Marchi Assocs.	415-364-3411
Colo	Denver, D. E. Bond Assocs.	303-756-1234
Conn	Meriden, Abbott-Allison Inc.	203-237-9232
Fla	Satellite Beach, Reynolds & Assocs.	305-773-4700
Haw	Honolulu, Atecs Corp.	312-482-3300
Ill	La Grange, Olson Engrg. & Sls. Co.	617-245-0250
Mass	Boston, Abbott-Allison Inc.	313-354-1190
Mich	Southfield, Automatic Controls Co.	612-454-5552
Minn	Minneapolis, JD Co.	314-429-7327
Mo	St. Louis, Boweng Representatives	505-256-3561
NM	Albuquerque, Industrial Prods. Corp.	516-798-5634
NY	Massapequa, Clime Equip. Co.	216-831-9393
Ohio	Cleveland, Jay Industrial Sls. Co.	215-224-1663
Pa	Melrose Park, R. Meyers Assocs.	412-682-0777
SC	Pittsburgh, Ener-Jet Inc.	803-288-4450
Tex	Greenville, Egan Assocs.	713-523-3764
Utah	Houston, C. M. Asfahl Agency	801-262-2979

Va Annandale, R.W. Lankenau & Assocs.

703-256-0800
Wash Bellevue, M. Poggi Co.
206-454-2026
EXP: New York, N. Y., Technitron Inc.
212-758-2790

CONSOLIDATED REFINING CO., see CRM Div
Consolidated Refining Co

CONSOLIDATED RESISTANCE CO. OF AMERICA, INC., 222 Lake Ave., Yonkers, N.Y., 10701, Tel: 914-YO3-5900 p. 2-1427

For info on price: J. J. Wilentchik; Application info: J. J. Wilentchik; Customer service: A. Powers; Delivery info: A. Powers

Products manufactured: Resistors

CONSOLIDATED WIRE & ASSOC. CORPS., 1635 S. Clinton St., Chicago, Ill., 60616, Tel: 312-421-4441; Empl.: 57; Minimum order: \$100
p. 2-1929, 1930, 1933-1968

Customer service: T. A. Mann

Products manufactured: Braid, Cable, Cable, Cords, Leads, Test & Adaptors, Wire, Wire Shielding

Local Sales Offices & Reps.

Cal	Glendale, Armstrong Sls. Co.	213-245-5344
Colo	Anvada, Arrowhead Sls. Co.	303-423-5556
Conn	West Haven, Johnson Assocs.	203-932-0162
Fla	Hollywood, S.K. Wallace Assoc.	305-961-6640
Fla	Tampa, S.K. Wallace Assoc.	813-961-1037
Ga	Jonesboro, S.K. Wallace Assoc.	404-471-6297
Ill	Chicago, R.R. Hutmacher Assoc.	312-631-3248
Ind	Indianapolis, New/ERA Sls.	317-257-7333
Kans	Overland Park, Palatine Engrg. Sls.	913-262-5643
Md	Kensington, Forti-Austin Assoc.	301-949-1706
Mass	Wellesley Hills, Johnson Assoc.	617-235-3977
Mich	Detroit, Burcaw Co. & Assoc.	313-533-7700
Minn	Minneapolis, R.W. Marshall Co.	612-929-0457
Mo	St. Louis, Palatine Engrg. Sals.	314-426-7055
NJ	Willingboro, Forti-Austin Assoc.	609-871-9290
NY	Buffalo, Maury Farber & Assoc.	716-856-3543
NY	Flushing, Bettan Sls., Inc.	212-591-7600
NC	Kernersville, S.K. Wallace Assoc.	919-993-3993
Ohio	Cleveland, J.O. Olsen Co.	216-752-5444
Pa	Pittsburgh, J.O. Olsen Co.	412-279-2550
Tenn	Memphis, S.K. Wallace Assoc.	901-682-2281
Tex	Dallas, E.L. Wilks & Co.	214-242-5321
Utah	Salt Lake City, Arrowhead Sls.	801-487-3444
Wash	Seattle, Interface Ectrns.	206-285-3500
EXP:	Plainview, N.Y., Morhan Exporting	516-293-5582

CONSTANTA CO. OF CAN., 280 Regina Ave., Montreal, Can., Tel: 514-766-8569; Empl.: 33

Products manufactured: Capacitors, Fixed, Resistors

Local Sales Offices & Reps.

Cal	Bellflower, Royer Assocs.	213-867-3638
Cal	Walnut Creek, Murray Assocs.	415-937-7577
Md	Towson, W.M. Jones Co.	301-823-5721
Mass	Newton Upper Falls, Brookdale Ectrns. Engrg. Ltd.	617-244-6969
NY	Buffalo, J.M. Glass	716-856-9272
Ohio	Dayton, LI/Corp	513-434-6367

CONTINENTAL CONNECTOR CORP., 34-63 56th St., Woodside, N.Y., 11377, Tel: 212-899-4422, TWX: 710-582-2565; FSC No: 95238; Empl.: 550 p. 2-662-665

For info on price: H. Schade; Application info: O. Chernoff; Customer service: G. Palmquist

Free literature available: CONDENSED CATALOG - 8 different series listed and highlighted with pertinent specs for each group: PRINTED CIRCUIT CATALOG - 84-page manual with specifications, illustrations, descriptions and ordering information on receptacle type pc board connectors: MICROMINIATURE CONNECTOR CATALOG.

Products manufactured: Connectors, Sockets, Terminal Blocks, Boards & Strips

Local Sales Offices & Reps.

Cal	Encino, Continental Connector Corp.	213-986-6025
Cal	Los Altos, Continental Connector Corp.	415-948-0211
Cal	San Diego, Southwest Tech. Sls.	714-565-2295
Ill	Chicago, Continental Connector Corp.	312-282-1455
Mass	Chestnut Hill, M.M. Ross	617-469-0674
NY	Woodside, Continental Connector Corp.	212-899-4422
Pa	Warminster, Continental Connector Corp.	215-441-0195
Tex	Dallas, Continental Connector Corp.	214-620-1840

FOR: Can., Scarborough, Al Attree 416-267-6567

Local Distributors

Cal Chatsworth, Westates Elctns., 20151 Bahama St. 213-341-4411
 NY W. Hempstead, March Elctns., 600 Hempstead Tpke. 516-486-6511

CONTINENTAL RENTALS DIV., Continental Leasing, 175 Middlesex Tpke., Bedford, Mass., 01730, Tel: 617-275-0850

Products manufactured: Amplifiers, Analyzers, Bridges, Cameras, Counters, Filters, Generators, Meters, Monitors, Oscillators, Oscillographs, Direct Writing, Oscilloscope Plug-Ins, Oscilloscopes, Power Supplies, Recorders, RFI Measuring Equipment, Services, Assembly, Production & Test, Synthesizers, Test Equipment

Local Sales Offices & Reps.

Ariz Mesa, Scientific Devices Albuq. 602-834-1682
 Cal Los Angeles, Continental Rentals 213-477-7521
 Cal Sunnyvale, Continental Rentals 408-735-8300
 Colo Denver, Scientific Devices 303-573-9466
 Conn Hartford, Instrument Assocs. 203-525-9367
 Ill Des Plaines, Scientific Devices 312-297-5240
 Ill Elk Grove Village, Continental Rental Div. 312-439-4700

Iowa Cedar Rapids, Techn. Rep. Inc. 319-363-2489
 Md Ellicott City, Continental Rental Div. 301-465-7880

Mass Bedford, Continental Rental Div. 617-275-0850
 Mich Detroit, Scientific Devices 313-851-5945
 Minn Minneapolis, Scientific Devices 612-544-1616
 Mo Hazelwood, Technical Rep. Inc. 314-731-5200
 Mo Independence, Technical Rep. Inc. 816-356-3010

NJ Metuchen, Continental Rental Div. 505-268-6729

NJ Albuquerque, Scientific Devices-Albuq. 505-268-6729

Ohio Cleveland, Scientific Devices 216-261-2000

Ohio Dayton, Scientific Devices 513-298-9904

Tex Dallas, Continental Rental Div. 214-357-1779

Tex Houston, Scientific Devices 713-623-4250

CONTINENTAL SPECIALTIES, 44 Kendall Street, Box 1942, New Haven, Conn., 06509, Tel: 203-624-3103; Empl.: 15; Minimum order: \$5 p. 2-348-351

For info on price: B. Bovee 203-624-3103; Application info: J. Pascoe 415-383-4207; Customer service: B. Bovee 203-624-3103; Delivery info: P. Contento 203-624-3103

Free literature available: Seasonal catalog describing breadboarding & circuit testing devices manufactured by Continental Specialties. Data sheets giving detailed description of Continental Specialties' Proto Board line and QT Socket line.

Products manufactured: Analyzers, Clamps & Clips, Connectors, Integrated Circuit Devices, Kits, Breadboarding (For Engineers), Kits, Training Aid, Sockets, Terminal Blocks, Boards & Strips, Testers

Local Sales Offices & Reps.

Cal San Francisco, Continental Specialties 415-383-4207

CONTROL DATA CORP., 2815 El Segundo Blvd., Hawthorne, Cal., 90250

CONTROL DATA CORP., Printed Circuit Operation, 3965 Meadowbrook Rd., St. Louis Park, Minn., 55426

CONTROL DATA CORP., Connector Div., 31829 W. Tienda Dr., Westlake Village, Cal., 91361, Tel: 213-889-3535, TWX: 910-494-1224; Empl.: 180; Minimum order: \$100
 Customer service: T. Mueller

Products manufactured: Connector Blocks, Mother Board, Connectors, Contacts, Electrical

Local Sales Offices & Reps.

Cal Glendale, Orion Sls. 213-240-3151
 Cal San Diego, Orion Sls. 714-566-0360
 Cal Santa Clara, Cindel Sls. 408-249-4424
 Cal Tustin, Orion Sls. 714-832-9687
 Colo Denver, Rope & Williamson 303-758-8507
 Conn Hartford, Cable Assocs. 203-525-5016
 Fla Ft. Lauderdale, Orbe Inc. 305-771-8915
 Fla St. Petersburg, Orbe Inc. 813-894-0687
 Ill Chicago, Such-Bohmer, Inc. 312-446-8934
 Md Stevenson, Tyler Griffin Co. 301-484-0251
 Mass Boston, Cable Assocs. 617-267-7322
 Mich Farmington, CMP 313-477-7700
 Mo St. Louis, Enesco-Rep 314-567-3935
 NY Mamaroneck, Cane Tech. Sls. 914-698-4411
 NY Rochester, T. Ferguson Sls. 716-482-7757
 Ohio Cleveland, CMP 216-333-5550
 Pa Pittsburgh, CMP 412-824-3760
 Tex Richardson, R.F. Kimball Co. 214-231-3447

CONTROL DATA CORP., Magnetic Components Div., 7801 Computer Ave., Minneapolis, Minn., 55435, Tel: 612-830-5800, TWX: 910-576-2978; Empl.: 500

Products manufactured: Motors, Power Supplies, Transformers

Local Sales Offices & Reps.

Ala Huntsville, W.A. Brown Comps. 205-539-4411
 Cal Yorba Linda, E. Grabowski 714-528-5555
 Colo Denver, Williams-Assocs. 303-373-4730
 Fla Ft. Lauderdale, W.A. Brown Comps. 305-776-4800
 Fla Orlando, W.A. Brown Comps. 305-425-5505
 La Metairie, McKinney Sls. Co. 504-887-1723
 Mass Framingham, F.C. Hatch 617-879-3854
 NM Albuquerque, Williams-Assocs. 505-255-1638
 NY New York, J.D. Grey 914-255-0393
 NC Winston-Salem, W.A. Brown Comps. 919-725-5384

Ohio Cleveland, Research Development Prod. Assocs. 216-526-5260

Ohio Dayton, Research Development Prod. Assocs. 513-253-6175

Tex Bellaire, McKinney Sls. Co. 713-774-3232

Tex Dallas, McKinney Sls. Co. 214-631-9450

Va Alexandria, W.A. Brown Equip-Comp 703-836-1800

Wash Seattle, Avionics Liaison, Inc. 206-767-3870

Wisc Racine, E. Wojcik 414-554-7167

EXP: New York, N.Y., Lothar-Sanford Co. 212-757-3881

CONTROL DEVICES INC., 204 New Boston St., Woburn, Mass., 01801, Tel: 617-935-1105; Empl.: 54; Minimum order: \$25

For info on price: J. F. Colligan; Application info: D. Gove; Customer service: A. Dean; Delivery info: G. Marino

Products manufactured: Keyboards, Alphanumeric & Decimal, Switches

Local Sales Offices & Reps.

Cal Torrance, Mitronics Inds. 213-323-7934

Conn Huntington, Comtronic Assoc. Inc. 203-929-4953

Fla Clearwater, WMM Assoc. 813-726-8871

Ill Chicago, Pivan Engrg. 312-539-4838

NY Garden City, Comtronic Assoc. Inc. 516-741-8966

NY Ithaca, B. Dean Inc. 607-272-2187

Ohio Cleveland, S. Sterling Co. 216-442-8080

Pa Broomall, L.D. Lowery Inc. 215-356-5300

Tex Dallas, EBR 214-942-2716

CONTROL ELCTNS. CO., INC., 153 Florida St., Farmingdale, N.Y., 11735, Tel: 516-694-0125; Empl.: 50 p. 1-110,444

Customer service: H. Goldstein

Free literature available: Supplier of all types of delay line components, including variable magneto strictive, ultrasonic dispersive, lumped constant, etc. Full military and commercial lines.

Products manufactured: Amplifiers, Delay Lines, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Filters, Memory Systems, Meters, Synthesizers

Local Sales Offices & Reps.

Cal Sherman Oaks, R.T. Assocs. 213-788-7588

Ill Chicago, LGS Elctn. 312-622-8183

Md Ellicott City, VPI 301-465-4060

Mass W. Medway, J. Gallagher 617-533-7292

Pa Montgomery, VPI 215-474-3200

EXP: Fla., Hallandale, Emec 305-925-6366

CONTROL EQUIP. CORP., 220 Tanner St., Lowell, Mass., 01851, Tel: 617-459-0573; Empl.: 10; Minimum order: \$25

For info on price: G. Stephens; Application info: G. Stephens; Customer service: L. J. Pouliot; Delivery info: O. W. Ryden

Products manufactured: Cards, Logic, Comparators, Converters, Counters, Data Acquisition & Reduction Systems, Data Loggers, Generators, Integrators, Electronic, Multiplexers, Paper-Tape Preparation Systems, Punched Card Equipment, Recorders, Scanners, Switches, Testers, Totalizers, Digital, Translators, Data

CONTROL PRODUCTS CORP., 4431 W. Division St., Chicago, Ill., 60651, Tel: 312-235-1131; Empl.: 60

Free literature available: CPC manufactures thermocouples, sheathed conductor, heaters, control panels and systems using electrical, electronic, pneumatic components custom built. We supply adjustable speed and frequency systems, using regadylene all AC control from 5 thru 1500 HP.

Products manufactured: Alarms, Cable Assemblies & Harnesses, Controls/Control Eqpt., Converters, Meters, Panels, Thermocouples, Elements & Accessories, Wire

Local Sales Offices & Reps.

Ariz Mesa, D.C. Donath Co. 602-964-2782
 Cal Irvine, C. Oestreich 714-673-1235
 Mich Detroit, K.V.A. Assocs. 313-892-6000
 Mich Grand Rapids, H.E. Frakie 616-949-4366
 Minn St. Paul, E.C. Stiedemann Co. 612-379-3775
 Ohio Cincinnati, A.H. Parker 513-563-1843
 Pa Bethayres, Control Instr. Sls. Co. 215-676-1808
 Pa Pittsburgh, Weiss Instr. 412-371-3020
 Tex El Paso, Progress Sls. Co. 915-566-2731
 Tex Houston, Houston Tech. Sls. 713-664-9891
 Wash Bellevue, Topp Engrg. Sls. Corp. 206-747-5401
 Wisc Milwaukee, E.C. Stiedemann Co. 414-332-1250

CONTROL PRODS., INC., E. Hanover, N.J., 07936, Tel: 201-887-9400; Empl.: 35; Minimum order: \$10

For info on price: M. P. Deachuck; Application info: M. P. Deachuck; Customer service: C. Artho; Delivery info: C. Artho

Free literature available: Thermal Folder and 10 Data Sheets

Products manufactured: Switches

CONTROL SCIENCES, INC., 10315 Woodley Ave., Granada Hills, Cal., 91344, Tel: 213-342-3067; FSC No: 53317; Empl.: 8

For info on price: H. C. Ericsson; Application info: M. Bushell; Customer service: M. Bushell; Delivery info: H. C. Ericsson

Products manufactured: Converters, Demodulators, Indicators, Transformers

Local Sales Offices & Reps.

Ala N. W. Huntsville, W. A. Brown Assoc. 205-539-4411

Cal Van Nuys, Cardinal Assoc. 213-787-5511

Fla Fort Lauderdale, W.A. Brown Assoc. 305-776-4800

Fla Orlando, W.A. Brown Assoc. 305-425-5505

Ga Tucker, W.A. Brown Assoc. 404-939-1674

La Gretna, W.A. Brown Assoc. 504-366-5766

NY Syracuse, Syracuse Tech. Reps. 315-488-0222

NC Winston-Salem, W.A. Brown Assoc. 919-768-3600

Ohio Cincinnati, G & H Sls. Co. 513-771-8231

Pa Hatboro, DeShawn Assoc. 215-675-9111

CONTROL SWITCH, A Cutler Hammer Co., 1420 Delmar Dr., Folcroft, Pa., 19032, Tel: 215-586-7500, Telex: 83-4216; FSC No: 81640; Empl.: 250; Minimum order: \$50

For info on price: F. Giasone; Application info: G. Maier; Customer service: J. Boyle; Delivery info: F. Giasone

Free literature available: Bulletins on: High reliability toggle, pushbutton, limit, lighted and special switches for direct PCB mounting for commercial, aircraft, industrial and military control applications

Products manufactured: Indicators, Lamps, Lights, Sockets, Switches

Local Sales Offices & Reps.

Cal Menlo Park, Control Switch Inc. 415-854-1005

Cal Sepulveda, R. L. Assocs. 213-782-7826

Fla Lighthouse Point, Saber Assocs., Inc. 305-943-3076

Ga Woodstock, Saber Assocs., Inc. 404-432-9625

Ill Chicago, Carlson Elctn. Sls. Co. 312-774-9022

Ind Indianapolis, R. O. Whitesell & Assoc., Inc. 317-359-9283

Ky Louisville, R. O. Whitesell & Assoc., Inc. 502-893-7303

Md Lanham, Eastern Comps. Inc. 301-577-2925

Mass Newton, Control Switch Inc. 617-244-7514

Mich Grand Rapids, R. O. Whitesell & Assoc., Inc. 616-451-8901

Mich Southfield, R. O. Whitesell & Assoc., Inc. 313-358-2020

Mich St. Joseph, R. O. Whitesell & Assoc., Inc. 616-983-7337

Minn Minneapolis, Control Switch Inc. 612-831-3560

Miss Corinth, Rakes Engrg & Mktg. Corp. 601-287-5369

Mo St. Louis, Carlson Elctn. Sls. Co. 314-991-0262

NY Oceanside, Bittan Assocs., Inc. 516-678-6222

NC Smithfield, Byrd & Barbour Sls. 919-934-8136

Ohio Cincinnati, R. O. Whitesell & Assoc., Inc. 513-521-2290

Ohio Columbus, R. O. Whitesell & Assoc., Inc. 614-888-9396

Ohio Dayton, R. O. Whitesell & Assoc., Inc. 513-298-9546

Directory of Local Distributors Starts on page 401

For info on price: D. Chandler; Application info: T. Glass; Customer service: T. Glass; Delivery info: T. Glass

Free literature available: 952 - alumina cermaic specification and application literature.

Products manufactured: Coatings, Packages, Integrated Circuit, Seals, Substrates, Tubing

Local Sales Offices & Reps.

Ariz Phoenix, Hecht, Henschen & Assoc. 602-275-4411
 Cal Goleta, J.N. Paxson 805-968-3632
 Cal Newport Beach, S. Whisner 714-772-9500
 Fla Melbourne, Reynolds & Assoc. 305-727-3205
 Ill Chicago, A.S. Deter, Jr. 312-541-8010
 Ind Indianapolis, D.R. Reimer 317-783-2856
 Kans Kansas City, Mid-America Elctns., Inc. 913-236-4800

Mich Southfield, Eynon-Weyand Assoc. 313-354-3430
 Minn Minneapolis, D.G. Perry & Co. 612-920-3212
 NJ Hopatcong, R.P. Collins 201-526-9050
 NY Ithaca, B. Dean, Inc. 607-272-2187
 NC Winston-Salem, Dula Assoc. 919-768-7166
 Pa West Chester, R.L. White 215-692-2674
 Tex Hurst, H.L. Moschel 817-336-4721
 Tex Richardson, P.J. Scanlon Co. 214-231-4661

COPPERWELD BIMETALLICS, Div. Copperweld Corp., Glassport, PA, 15045, Tel: 412-664-7131, TWX: 710-794-4806

Customer service: W. G. Ross

Free literature available: Literature covers properties and characteristics of copperweld® (copper-clad steel) and Alumoweld® (aluminum-clad steel) wire and strand for use in electrical and mechanical applications.

Products manufactured: Antenna Towers & Supports, Cable, CATV Systems & Equipment, Clamps & Clips, Forms, Wire, Metals, Rods, Ground, Wire, Wire & Cable Ties

CORCOM, 2635 No. Kildare Ave., Chicago, Ill., 60639, Tel: 312-384-7400, TWX: 910-221-5308; FSC No: 05245; Empl.: 275 p. 1-546,547

Customer service: Reg. Sls. Mgr.

Products manufactured: Coils Including Assemblies & Forms, Comparators, Connector Boxes & Strips, Power Outlet, Connectors, Filters

Local Sales Offices & Reps.

Ariz Scottsdale, Q.T. Wiles & Assoc. 602-948-5590
 Cal Los Angeles, Q.T. Wiles & Assoc. 213-649-1232
 Cal Menlo Park, Straube Assocs. 415-323-2476
 Cal San Diego, Q.T. Wiles & Assoc. 714-565-6893
 Cal Tustin, Q.T. Wiles & Assoc. 714-832-4952
 Colo Boulder, Straube Assocs. 303-426-0890
 Conn Milford, Conti-Younger 203-929-3294
 Fla Altamonte, W.M.M. Assocs. 305-831-4646
 Fla Clearwater, W.M.M. Assocs. 813-447-2533
 Fla Pompano, W.M.M. Associates 305-943-3091
 Ga Atlanta, G.S. O'Hara 404-237-0600
 Ill Downers Grove, Richmar Elctns. Corp. 312-968-0118

Ind Fort Wayne, Robert O. Whitesell & Assocs. 219-432-5591

Ind Indianapolis, Robert O. Whitesell & Assocs. 317-359-9283

Ind Kokomo, Robert O. Whitesell & Assocs. 317-452-6065

Iowa Cedar Rapids, Palatine Eng. Sls. 319-365-8071

Kans Andover, Palatine Eng. Sls. 316-683-7512

Kans Overland Park, Palatine Eng. Sls. 913-262-6820

Ky Louisville, Robert O. Whitesell & Assocs. 502-893-7303

Md Baltimore, D.K. Jones & Assocs. 301-752-0577

Mass Waltham, Conti-Younger Assocs. 617-890-4582

Mich Grand Rapids, Robert O. Whitesell & Assocs. 616-451-8901

Mich Southfield, Robert O. Whitesell & Assocs. 313-358-2020

Mich St. Joseph, Robert O. Whitesell & Assocs. 616-983-7337

Minn Edina, M. Foster Co. 612-835-2252

Mo St. Louis, Palatine Eng. Sls. 314-426-7055

Ohio Columbus, Robert O. Whitesell & Assocs. 614-888-9396

Ohio Dayton, Robert O. Whitesell & Assocs. 513-298-9546

Ore Portland, Earl & Brown Co. 503-245-2283

Pa Feasterville, Professional Service Assoc. 215-355-6244

Pa Pittsburgh, Robert O. Whitesell & Assocs. 412-344-7277

Tex Austin, K & H Sls. 512-836-2842

Tex Plano, K & H Sls. 214-423-6520

Utah Salt Lake City, Straube Assocs. 801-328-4513

Wash Seattle, Earl & Brown Co. 206-284-1121

Wisc Oak Creek, Richmar Elctns. Corp. 414-475-0141

FOR: Toronto, Ont., Can., Atlas Elctns., Ltd. 416-781-6174

Local Distributors
 Cal Mt. View, Terminal Elctns., 880 Maude Ave. 415-969-9240

Cal South Gate, CEC/Moltronics, 5610 E. Imperial Hwy. 213-773-6521

Cal Sunnyvale, Diplomat/Westland, 1118 Elko Dr. 408-734-1900

Colo Denver, Elctn. Parts, 1212 S. Bdwy. 303-744-1992

Fla Orlando, Hammond Elctns., 911 W. Central 305-849-6060

Ga Atlanta, Lykes Elctns., 1135 Chattahoochee Ave. N.W. 404-355-2223

Ill Chicago, Newark Elctns., 500 N. Pulaski 312-638-4411

Ill Elgin, Allied Elctns., 1355 Sleepy Hollow 312-697-8200

Ill Palatine, Ohm Elctns., 649 Palatine 312-359-5500

Md Savage, Pyttronics Ind., 8220 Wellmore Ct. 301-792-7000

Mass Dedham, Gerber Elctns., 852 Providence 617-329-2400

Mo Raytown, Advanced Elctns., 9052 B50 Hwy 816-737-1443

NJ Haddonfield, Mid Atlantic, 140 Haddon Ave. 609-428-8288

NY Mt. Vernon, QAR Ind. Elctn., 621 S. Columbus 914-699-2224

Tex Richardson, Prime Distr., 777 S. Central Expwy. 214-231-0170

Utah Salt Lake City, Diplomat/Alta Land, 2280 S. Main 801-486-7227

Wash Seattle, Interface Elctns., 300 2nd Ave. W. 206-285-3500

CORDOVER & CO., CARL, 3914 North 29th Ave., Hollywood, Fla., 33020, Tel: 305-921-6300; Empl.: 25; Minimum order: \$25

For info on price: C. Cordover; Application info: J. Cordover; Customer service: D. Abbey; Delivery info: D. Abbey

Products manufactured: Alarms, Diodes, Kits, Printed Circuit, Modules, Logic, Encapsulated, Rectifiers, Transistor, Diode, Thyristor Heat Dissipators, Transistors

CORNELL-DUBILIER ELCTRNS., 2070 Maple, Des Plaines, Ill, 60018

CORNELL-DUBILIER ELECTRONICS, 150 Avenue "L", Newark, N.J., 07105, Tel: 201-589-7500; QPL No: Multiple; Empl.: 3000; Minimum order: \$25

Customer service: H. Cerretti

Free literature available: Cornell - Dubilier Component Selector provides convenient identification of standardized products, applied by CDE Distributors, and guidance to selection of customized parts developed through engineering services.

Products manufactured: Antenna Rotators, Capacitors, Fixed, Filters, Relays, Vibrators

Local Sales Offices & Reps.

Ariz Scottsdale 602-946-4437

Cal Los Angeles 415-941-3399

Cal San Diego 714-565-9444

Cal Venice 213-821-5001

Colo Littleton 303-798-8955

Fla Maitland 305-831-1242

Ga Atlanta 404-261-6160

Ill Des Plaines 312-299-7761

Ind Indianapolis 317-545-6247

Iowa Des Moines 515-276-6387

Mass Norwood 617-762-5333

Mich Detroit 313-882-1717

Minn Minneapolis 612-546-5361

Mo Liberty 816-781-2522

Mo St. Louis 314-534-4611

NM Albuquerque 505-265-6794

NY Rochester 716-544-9580

NC Raleigh 919-787-9584

Ohio Cleveland 216-271-5429

Ohio Dayton 513-298-7224

Ore Portland 503-297-3777

Pa Norristown 215-272-0118

Pa Pittsburgh 412-563-0303

Tex Dallas 214-357-4024

Wash Seattle 206-285-1300

EXP: Des Plaines, Ill. 312-299-8171

FOR: Can., Lower Sackville, Halifax County, N.S. 902-865-8960

FOR: Can., Montreal 379, Que. 514-331-2722

FOR: Can., Scarborough 733, Ont. 416-755-9348

FOR: Can., Vancouver 9, B.C. 604-980-4346

CORNING GLASS WORKS, Electronic Prod. Div., Houghton Pk., Bldg. A-2, Corning, N.Y., 14830, Tel: 607-974-8652, TWX: 510-252-1385; Minimum order: \$45 p. 2-105,1449

Customer service: F. Quan 607-974-8679

Free literature available: Corning Electronics - Electronic Components Catalog # ECC-1

Products manufactured: Capacitors, Fixed, Delay Lines, Heaters & Heating Elements, Memory Systems, Resistors, Transducers

Local Sales Offices & Reps.

Cal Orange, Corning Glass Works 714-541-5275

Cal Sunnyvale, Corning Glass Works 408-732-5050

Colo Denver, Corning Glass Works 303-756-9457

Ill Chicago, Corning Glass Works 312-693-6830

Kans Leawood, H.C. Heyde Co. 913-649-8628

Me Kennebunk, Components, Inc. 207-282-5111

Mass Littleton, Corning Glass Works 617-486-3125

NC Raleigh, Corning Glass Works 919-876-1100

NC Wilmington, Corning Glass Works 919-791-5040

Pa Bradford, Corning Glass Works 414-382-5571

Pa Broomall, L.D. Lowery Assocs. 215-358-5300

Pa Pittsburgh, Covert & Newman Co. 412-563-0303

FOR: Can., Toronto, Ont., Corning Glass Works of Canada 416-421-1500

Local Distributors

Ala Huntsville, Cramer/EW Inc., 2310 Bob Wallace Ave., S.W. 205-539-5722

Ariz Phoenix, Liberty Elctns., 3130 N. 27th Ave. 602-257-1272

Cal El Segundo, Liberty Elctns. Inc., 124 Maryland St. 213-322-8100

Cal Gardena, Bell Industries, 306 E. Alondra Blvd. 213-321-5802

Cal Mountain View, Elmar Elctns., 2288 Charleston Rd. 415-961-3611

Cal San Diego, Liberty Elctns., 8248 Mercury Ct. 714-565-9171

Colo Commerce City, Elmar Elctns., 6777 E. 50th Ave. 303-287-9611

Colo Denver, Cramer Elctns., 5465 E. Evans Pl. 303-758-2100

Conn North Haven, Cramer Elctns. Inc., 35 Dodge Ave. 203-239-5641

Fla Hollywood, Cramer/EW Inc., 4035 N. 29th Ave. 305-923-8181

Fla Hollywood, Hamilton/Avnet Elctns., 4020 N. 29th Ave. 305-925-5401

Fla Orlando, Cramer/EW Inc., 345 N. Graham Ave. 305-894-1511

Ill Chicago, Bell Ind., 7701 N. Austin Ave. 312-282-5400

Ill Elk Grove Village, Schweber Elctns., 1380 Jarvis Ave. 312-593-2740

Ind Indianapolis, Graham Elctns. Supp., 133 S. Pennsylvania St. 317-634-8202

Kans Lenexa, Hamilton Avnet Elctns., 37 Lenexa Ind'l Center 913-888-8900

Md Baltimore, Radio Elctn. Svc. Co., 1026 Cromwell Bridge Rd. 301-823-0700

Md Hyattsville, Milgray/Washington, Inc., 5405 Lafayette Pl. 301-864-1111

Md Rockville, Cramer/EW, Inc., Box 1648 301-948-0110

Mass Newton Centre, Cramer Elctns., 85 Wells Ave. 617-969-7700

Mass Watertown, Sterling Elctns., 70 Summer St. 617-926-9720

Minn St. Paul, Ragón Elctns., 1138 W. Larpenteur Ave. 612-488-0201

NJ Cherry Hill, Cramer/Penn, 12 Springdale Rd. 609-424-5993

NJ Somerset, Schweber Elctns., 43 Belmont Dr. 201-469-6008

NM Albuquerque, Cramer Elctns., 137 Vermont N.E. 505-265-5767

NY Freeport, Milgray Elctns., 191 Hanse Ave. 516-546-6000

NY Hauppauge, Cramer/Long Island, 29 Oser Ave.
516-231-5600

NY Rochester, Cramer/Rochester, Inc., 3000 S.
Winton Rd. 716-275-0300

NY Syracuse, Cramer/Eastern, Inc., 6716 Joy Rd.
315-437-6671

NY Westbury, Schweber Elctns., Jericho Tnpk.
516-334-7474

NY Woodbury, Harvey Elctns., 60 Crossways Pk.
W. 516-921-8700

NC Raleigh, Resco, 701 Georgetown Rd.
919-832-2077

NC Winston-Salem, Cramer/EW, Inc., 938 Burke St.
919-725-8711

Ohio Cincinnati, Sheridan Assocs., Box 37826
513-761-5432

Ohio Cleveland, Schweber Elctns., 23880 Commerce
Pk. Rd. 216-464-2970

Ohio Columbus, Hughes-Peters, Inc., 481 E. 11th Ave.
614-294-5351

Pa Philadelphia, Almo Elctns., Roosevelt Blvd. at
Blue Grass Rd. 215-676-6000

Tex Dallas, Solid State Elctns., 2643 Manana St.,
Box 20299 214-352-2601

Tex Houston, Hamilton/Avnet Elctns., 1216 W. Clay
St. 713-526-4661

Utah Salt Lake City, Cramer Elctns., 391 West 2500
South 801-487-4131

Wash Seattle, Liberty Elctns./NW, 5305 Second Ave.,
S. 206-763-8200

For: Can., Downsview, Ont., Cesco Elctns., 24 Martin
Ross Ave. 416-661-0220

For: Can., Montreal, Cesco Elctns., 4050 Jean-Talon
St., W. 514-735-5511

CORNING GLASS WORKS, FLUIDIC PRODUCTS,

Corning, N.Y., 14830, Tel: 607-974-8311, TWX:
510-252-1595; Empl.: 8000; Minimum order: \$30

For info on price: S. Gunn 607-974-8467; Application
info: L. Roueche 607-974-8674; Customer service: S.
Gunn 607-974-8467; Delivery info: S. Gunn
607-974-8467

Free literature available: Complete technical
information on fluidic elements, peripheral
equipment, systems and circuits plus a wide
variety of applications information.

Products manufactured: Air Cleaners & Filters
(Shielded & Unshielded), Controls/Control Eqpt.,
Converters, Counters, Detectors, Kits,
Breadboarding (For Engineers), Kits, Training Aid,
Modules, Logic, Encapsulated, Shift Registers,
Switches, Timers, Transducers

CORNING GLASS WORKS, Memory Prods Dept., 3900 Electronic Dr., Raleigh, N.C., 27602, Tel: 919-876-1100, TWX: 510-928-1840; Empl.: 25

For info on price: H. S. Craumer; Application info: H.
S. Craumer; Customer service: W. L. Brown; Delivery
info: W. L. Brown

Free literature available: MCA 5.02 - Glass Delay
Lines for Video Processing, MCA 5.03 - Low Cost
1H Video Delay Line, MCA 5.04 - High
Performance Video Delay Line; MAN 4 -
Sharpening TV Pictures With Video Delay Lines;
1H & 2H - Video Delay Line Questionnaire For
Custom Designed Video Delay Lines.

Products manufactured: Delay Lines

CORNING GLASS WORKS, Corning Scientific Instruments, Medfield, Mass., 02052, Tel: 617-359-2341; Empl.: 8000

Products manufactured: Meters, Recorders

CORNING GLASS WORKS, Tech. Prods. Div., Corning, N.Y., 14830, Tel: 607-974-9000, TWX: 510-252-1384; Empl.: 34,000

For info on price: J. R. Dalle Pezze 607-974-7237;
Application info: N. S. Kenny 607-974-7562

Free literature available: Brochures: (1) VYCOR
BRAND GLASSES (2) DATA SHIELD PRECISION
TAPE REEL (3) MACHINABLE GLASS-CERAMIC
(4) CERCOR GLASS-CERAMIC HEAT
EXCHANGER CORES (5) FUSED SILICA (6)
MODEL CH-40 RADIANT PANEL HEATERS (7)
HEAT EXCHANGERS (8) PROPERTIES OF
GLASSES AND GLASS-CERAMICS

Products manufactured: Antennas, Bushings, Glass,
Plastic, Metal, Rubber, Etc., Coatings,
Compounds, Encapsulating, Insulating, Molding,
Potting, Heat Exchangers & Systems, Heaters &
Heating Elements, Honeycomb Sheets, Panels,
etc., Lenses, Optical & Camera, Quartz, Fused,
Seals, Silica, Fused, Substrates, Tape Recording
Accessories, Thermocouples, Elements &
Accessories, Tubing

Local Sales Offices & Reps.

Cal Orange, Corning Glass Works 714-541-5275
Cal Palo Alto, Corning Glass Works 415-328-7400
Ill Chicago, Corning Glass Works 312-337-6600
NY New York City, Corning Glass Works
212-752-1100

CORNING GLASS WORKS, TELEVISION PRODS. DIV.,

Corning, N.Y., 14830, Tel: 607-974-8600, TWX:
510-252-1595; Empl.: 8000

Products manufactured: Bushings, Glass, Plastic,
Metal, Rubber, Etc., Compounds, Encapsulating,
Insulating, Molding, Potting, Fiber Optic Bundles,
Indicators, Insulators & Insulation, Mounts,
Quartz, Fused, Seals, Silica, Fused, Spacers,
Substrates, Tubing, Waveguides & Adapters

CORTEC, INC., 890 Production Pl., Newport Beach, Cal., 92660, Tel: 714-642-1877; Empl.: 27; Minimum order: \$15

Customer service: A. Herbert

Free literature available: Cortec manufactures
powdered iron cores for R.F. applications.

Products manufactured: Bobbins, Winding, Coil &
Transformer, Coils Including Assemblies & Forms,
Cores, Magnetic

Local Sales Offices & Reps.

Cal Orange, Sls & Mktg. Assoc. 714-997-5720
Cal Santa Clara, Rodgers 408-984-8110
Minn St. Paul, Knox Assoc. 612-488-5402
NJ Old Bridge, S.E.A. Co. 201-679-8800
NY Buffalo, J.R. Henderson 716-634-8650
NC Charlotte, McLean Sls. 704-366-2675

COSAR CORP., 3121 Benton St., Garland, Tex., 75042, Tel: 214-276-9487, Telex: 730-764; Empl.: 50

For info on price: J. D. Peterson; Application info: J.
D. Peterson; Customer service: B. Milner; Delivery
info: B. Milner

Free literature available: Twenty-page ZESTRON
Reed Relay Catalog has sections on dynamic
characteristics, load considerations, contact
protection and reliability as well as detailed
product data.

Products manufactured: Densitometers, Electronic,
Relays, Testers

Local Sales Offices & Reps.

Cal Fullerton 714-992-4690
Conn Greenwich 203-661-2325
Ill Chicago 312-539-6181
Tex Dallas 214-276-9487

COSMO ELEC. LTD., 2145 Marion Pl., Baldwin, N.Y., 11510

COSMO PLASTICS CO., 3239 W. 14th St., Cleveland, Ohio, 44109, Tel: 216-861-5594, TWX: 810-421-8444; Empl.: 500

For info on price: D. Haft; Application info: R. G.
Bumm; Customer service: D. Haft; Delivery info: D.
Haft

Free literature available: Catalog/design manual
covers bobbin-terminal assemblies, material
specifications, terminal designs. Lists
specifications of over 1000 transformer, pot core,
reed relay, IF, rectangular, round bobbins.

Products manufactured: Bobbins, Winding, Coil &
Transformer, Coils Including Assemblies & Forms

Local Sales Offices & Reps.

Ariz Phoenix, Electrical Specialty Co. 602-275-5736
Cal Los Angeles, Electrical Specialty Co.
213-724-9600

Cal San Diego, Electrical Specialty Co. 714-239-1345

Cal So. San Francisco, Electrical Specialty Co.
415-589-9611

Colo Denver, Electrical Specialty Co. 303-321-0226

Conn Guilford, R.H. Whitehead Jr. & Assocs.
203-453-3762

Ill Chicago, A.J. Ellis Co. 312-262-2708

Ind Fort Wayne, Blind & Assocs. 219-748-7705

Ind Indianapolis, Blind & Assocs. 317-251-1249

Md Timonium, Heller Sls. Co. 301-252-4780

Mass Boston, Whitehead Assocs. 617-542-7676

Minn Minneapolis, Ladky Assocs. of Minn.
612-884-2125

Mo Webster Grove, Hippler Sls. Co. 314-961-8499

NJ Morristown, Andrews & Andrews, Inc.
201-569-8800

NY Huntington, Andrews & Andrews, Inc.
516-692-8686

NY Rochester, P.J. Andres 716-271-2201

Ohio North Olmsted, Plus Sls., Inc. 216-734-8989

Ore Portland, Electrical Specialty Co. 503-227-3601

Pa Ardmore, R.D. Freedman Assocs. 215-649-3679

Tenn Knoxville, T.S. Stone Co. 615-546-9282

Utah Salt Lake City, Electrical Specialty Co.
801-487-9805

Va Roanoke, A.B. Kreger, Jr. 703-989-4738

Wash Seattle, Electrical Specialty Co. 206-682-3434

COTO-COIL CO., 65 Pavilion Ave., Providence, R.I., 02905, Tel: 401-487-4777; Empl.: 110 p. 1*1618-1623

Products manufactured: Coils Including Assemblies
& Forms, Relays, Switches

Local Sales Offices & Reps.

Cal Palo Alto, Engrg. Assocs. 415-326-7842
Cal Pasadena, P. Nurches Co. 213-681-8957
Conn Plantsville, Parnetics Co. 203-628-9343
Ill Lombard, Quadtrion Assocs. 312-627-6800
NY Brooklyn, Eastern Elctn. Sls. 212-763-5180
Ohio Cleveland, J. Olsen Co. 216-752-5444
Wash Seattle, H. Levinson Co. 206-323-5100

COUCH S.H. DIV., ESB Inc., 36 River St., Boston, Mass., 02126, Tel: 617-298-4147; Empl.: 203

Products manufactured: Relays

Local Sales Offices & Reps.

Ariz Scottsdale, Mercury Engrg. Sls. 602-945-1927
Cal Burbank, TransDynamics, Inc. 213-849-6261
Cal Palo Alto, Engrg. Assocs. 415-326-7842
Cal San Diego, TransDynamics, Inc. 714-298-8215
Colo Denver, I.W. Strong & Assocs. 303-292-6900
Conn Madison, A&M Elctn. Reps. 203-245-1031
Fla Orlando, Buchanan & Abrams Assocs.
305-898-7444

Ill Wheaton, H.J. Batha Co. 312-668-4740

Iowa Cedar Rapids, Snider Sls. Co. 319-326-4410

Mass Needham, A&M Elctn. Reps. 617-444-8170

Mich Grand Rapids, Elko Sls. Corp. 616-959-1451

Mich Grosse Pointe Woods, Elko Sls. Corp.
313-884-7893

Minn Minneapolis, International Sls. Co. 612-831-8223

Mo St. Louis, Pem Sls. Co. 314-427-7400

NY Rochester, J.G. Welch 716-244-1100

NY Syracuse, H.R. Murray, Inc. 315-446-5555

NC Winston-Salem, Radco Co. 999-722-9671

Ohio Cincinnati, Pfister Equip. Co. 513-421-3850

Ohio Cleveland, Greenleaf & Assocs. 216-333-5480

Ore Portland, J.W. Eckersley Co. 503-246-3183

Pa Philadelphia, Technicraft Co. 215-483-4700

Tex Dallas, Hillman Entprs. 214-827-4790

COUNTERSCAN SYSTEMS, Box 536, Sutton, Neb., 68979, Tel: 402-773-3875; Empl.: 100

Customer service: Mktg. Mgr.

Free literature available: Literature describes
multiplexing and interconnect systems including
interface adjustments, matching, considerations.
Describes sophisticated data switching systems -
State of the Art Equip.

Products manufactured: Controllers,
Programmable, Counters, Data Acquisition &
Reduction Systems, Multiplexers, Scanners,
Switches

Advertisement

Manufacturer of sophisticated
backplane and wiring harness test
equipment. Uses a self contained
microprocessor with an internal elec-
trically reprogrammable LSI-MOS
memory and all CMOS integrated cir-
cuit construction. Complete with
printer, mating connectors - Capac-
ities to 768 K points. Modest Cost.
Call Collect for info.

COUNTIS INDS., Box 1444, San Luis Obispo, Cal., 93406, Tel: 805-544-1770; Empl.: 9

Products manufactured: Ferrite Material & Parts

COX & CO., INC., 215 Park Ave., S., New York, N.Y., 10003, Tel: 212-OR 4-4727, TWX: 710-581-2839; Empl.: 85

Products manufactured: Adhesives (All Types),
Baths, Controlled Temperature (Air & Liquid),
Bridges, Cable, Chamber, Environmental Test,
Controls/Control Eqpt., Heaters & Heating
Elements, Indicators, Laminates, Monitors, Ovens,
Probes, Relays, Resistors, Standards, Switches,
Thermistors, Thermostats, Transducers, Wire

Local Sales Offices & Reps.

Cal Palos Verdes Peninsula, J. E. Scott
213-377-9761

NY Syracuse, Lenard Co. 315-GR 9-9191
 Vt Vergennes, M. Benton 802-877-2656
 Wash Mukilteo, J. Ransom 206-775-5431

CPS INC., DISPLAY GRP., 722 E. Evelyn Ave.,
 Sunnyvale, Cal., 94086, Tel: 408-738-0530, Telex:
 357-450; FSC No: 31640; Empl: 62; Minimum order:
 \$25 p. 1-1162,1163

Customer service: J. Gwinner

Free literature available: Beam penetration CRT,
 Color Monitor Catalog.

Products manufactured: Monitors, Terminals, Data
 Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Cal Los Angeles, Basic Systems 213-938-2833
 Cal Sunnyvale, AMASCO 408-733-8690
 Fla Melbourne, REPCOM 305-254-1877
 Md Baltimore, Scientific Devices 301-788-6611
 Mass Burlington, Tekdata 617-273-0198
 Minn Minneapolis, Jaynus 612-884-1700
 NJ Palisades Park, Scientific Devices-East
 201-871-3916
 Pa Audubon, Holmes 215-666-0636
 Tex Dallas, Data Aids 214-620-1551
 Va Springfield, Scientific Devices-DC
 703-451-6500
 Wash Seattle, Underwood/Jensen 206-575-0123

CPS INC. - POWER SUPPLY GRP., 722 E. Evelyn
 Ave., Sunnyvale, Cal., 94086, Tel: 408-738-0530, Telex:
 357-450; FSC No: 31640; Empl: 62; Minimum order:
 \$25 p. 1-1162,1163

Customer service: J. Gwinner

Free literature available: High Voltage Power
 Supply Catalog to 50 kv DC.

Products manufactured: Connectors, Converters,
 Power Supplies, Probes

Local Sales Offices & Reps.

Cal Los Angeles, Basic Systems 213-938-2833
 Cal Sunnyvale, AMASCO 408-733-8690
 Fla Melbourne, Repcom 305-254-1877
 Ill Northfield, Torkelson Associates 312-446-9085
 Ind Indianapolis, Torkelson Associates
 317-244-7867
 Md Baltimore, Scientific Devices-DC 301-788-6611
 Mass Burlington, Tekdata Inc. 617-273-0198
 Mich Center Line, Dietrich 313-754-6450
 Minn Minneapolis, Torkelson Assocs. 612-835-2414
 NJ Palisades Park, Scientific Devices-East
 201-871-3916
 NY N. Syracuse, NACO 315-699-2651
 Ohio Cleveland, Dietrich & Assocs. 216-781-1855
 Pa Audubon, Holmes Assocs. 215-666-0636
 Pa Pittsburgh, Dietrich & Assocs. 412-892-2992
 Tex Irving, Space Elctns. 214-251-2266
 Va Springfield, Scientific Devices-DC
 703-451-6500
 Wash Seattle, Underwood/Jensen 206-575-0123

CRAIG SYS. CORP., 360 Merrimack St., Lawrence, Mass.,
 01842, Tel: 617-688-6961, TWX: 710-342-0765; Empl:
 200

Customer service: R. Noebel

Free literature available: Our literature describes
 general purpose mobile shelters, transporters and
 some shelter accessories used to house
 communication, radar, teletype and other systems
 requiring mobility.

Products manufactured: Antenna Towers &
 Supports, Benches, Consoles, Stools, Tables,
 Cases, Equipment, Instrument, Meter, Cases,
 Transit, Containers, Frames, Cabinet & Rack, Kits,
 Shielding, Mounts, Racks, Services, Assembly,
 Production & Test

Local Sales Offices & Reps.

Cal Fullerton, Craig Sys. Corp. 714-879-3180
 Md Rockville, W. F. Frank Assoc. 301-340-7717
 Minn St. Paul, Debeck Assoc. 612-690-1557
 Pa York, N. R. Osborne Assoc. 717-755-2114

CRAMER COIL, Box 32, Grafton, Wisc., 53024; Empl: 35;
 Minimum order: \$25

Customer service: R. Rubinstein 414-377-7040

Free literature available: R.F. Coils, power
 transformers, balun coils.

Products manufactured: Chokes, Coils Including
 Assemblies & Forms, Transformers

Local Sales Offices & Reps.

Ala Huntsville, Component Mktg.
 Colo Aurora, Robbins & Assoc.
 Ill Park Ridge, Metcom Assoc.
 Ind Greenwood, Valentine & Schillinger
 Ind South Bend, Valentine & Schillinger

Mass Brookline, Technology Prods. Group
 Minn Minneapolis, OEM Sls. Co.
 Neb Lincoln, Mktg. Assoc.
 NJ Teaneck, Abbott Gordon
 Pa Erie, Tuznik Assoc.
 Wash Seattle, F. Jackson C.
 FOR: Can., Oakville, Ont., Danowski Sls. Ltd.

CRAMER DIVISION, Conrac Corporation, Old
 Saybrook, Conn., 06475, Tel: 203-388-3574, Telex:
 966-453; Empl: 350 p. 1-143,943

Customer service: C. R. Gasparini

Products manufactured: Alarms, Monitors, Motors,
 Tape Recording Accessories, Tape Search
 Equipment, Tapes, Recording, Magnetic (All
 Types), Timers

Local Sales Offices & Reps.

Ala Huntsville, Col-Ins-Co. 205-539-1771
 Ariz Phoenix, Spectrum Assocs. 602-997-6324
 Cal Palo Alto, Held & Mollard 415-965-9321
 Cal Santa Ana, Spectrum Assocs. 714-835-4114
 Cal Santa Fe Springs, Conrac Security Detection
 213-945-2673
 Colo Denver, I.W. Strong & Assoc. 303-292-6900
 Conn Rocky Hill, Aid Engrg. Sls. Co. 203-673-3692
 Fla Orlando, Col-Ins-Co. 305-423-7615
 Ga Clarkston, Col-Ins-Co. 404-934-7280
 Ill Arlington Heights, Martec Assocs.
 312-956-8090

Ind Indianapolis, Sukup & Cox 317-253-1215
 Md Rockville, L.G. White & Co. 301-770-6556
 Mass Westboro, Aid Engrg. Sls. Co. 617-890-8181
 Mich Birmingham, J.C. Hofstetter Co. 313-643-7203
 Minn Minneapolis, Jos-Co. Sls. Engrg. 612-835-5858
 Mo St. Louis, H.J. Weisler & Assoc. 314-428-3934
 NY Elmsford, Cramer Div./Conrac Corp. 914-592-5500
 NY Rochester, Upstate Comp. Sls. 716-288-1080
 NC Raleigh, Col-Ins-Co. 919-834-6591
 Ohio Medina, J.C. Hofstetter Co. 216-241-4880
 Pa Broomall, J.C. Whiddett Co. 215-353-6343
 Tex Dallas, Glidden Electro Equip. Co. 214-363-6539

Wash Mercer Island, J.H. Andersen Assocs.
 206-232-0484

CRATEX RUBBERIZED ABRASIVES, 1600 Rollins Rd.,
 Burlingame, Cal., 94010, Tel: 415-697-1600; Empl: 19

Free literature available: Catalog/price list
 describing Cratex rubberized abrasive wheels,
 points, blocks, sticks, and cones for light
 deburring, smoothing, cleaning, and polishing.

Products manufactured: Abrasive Belts,
 Compounds, Cords, Powders, etc.

CREST INDUSTRIES, INC., Box 35, Northbrook, Ill., 60062,
 Tel: 312-272-2440; Empl: 10; Minimum order: \$35

Customer service: P. Taylor

Free literature available: Short form catalog
 available describing crest prewired power strips
 and A.C. distribution Panels. Full catalog &
 distributor or industrial price list available on
 request.

Products manufactured: Boxes, Junction, Outlets &
 Wall Plates

Local Sales Offices & Reps.

Ariz Tempe, J.F. Hurlbut Co. 602-968-5962
 Cal Carson, Bidwell Sls. Assocs. 213-770-0300
 Cal Redwood City, Warren & Hickey Sls. Co.
 415-368-3849
 Colo Golden, J.F. Hurlbut Co. 303-279-7138
 Fla St. Petersburg, C.M. Furman Co. 813-898-8864
 La New Orleans, IBL Engrg. Co. 504-895-4793
 Md Baltimore, B. White & Co., Inc. 301-484-5400
 Minn Minneapolis, A.S. Miller & Son 612-866-6677
 NY Buffalo, M. Farber Assocs., Inc. 716-856-3543
 NY Oceanside, Bittan Assocs., Inc. 516-678-6222
 NC Charlotte, C.M. Furman Co. 704-375-2332
 Okla Tulsa, IBL Engrg. Co. 918-936-6305
 Tex Dallas, IBL Engrg. & Sls., Inc. 214-363-2921
 Tex Houston, IBL Engrg. & Sls., Inc. 713-467-5115
 Wisc Milwaukee, W.M. Braun & Assts. 414-332-1040

Advertisement

Crest "Prewired" Power Strips and A.
 C. Distribution Panels are designed
 for quality installations featuring all
 UL approved components. Reduce
 Internal Wiring in your Rack Cabinet
 by installing a Crest Prewired Power
 Strip or Power Panel. Send for your
 free catalog.

CRESTRONICS INC., 23539 Crest Forest Dr., Box "S",
 Crestline, Cal., 92325, Tel: 714-338-1722; Empl: 11

Products manufactured: Converters, Power
 Supplies

CRM DIV., See Consolidated Refining Co.

CROSS ELECTRONICS INC., 100 Commonwealth Dr.,
 Warrendale, Pa., 15086, Tel: 412-776-1591; Empl: 35

For info on price: F. C. Stebbins; Application info: T.
 S. Roman; Customer service: D. Heddaeus; Delivery
 info: R. Heddaeus

Free literature available: 1 SCR proportional power
 controllers 2 Temperature controllers 3 Static
 relays 4 signal conditioners 5 static contactors 6
 magnetic amplifiers & reactors 7 systems
 8 electronic assemblies 9 electrical assemblies 10
 mechanical assemblies 11 wiring harnesses 12
 parts & subassemblies

Products manufactured: Amplifiers, Cable
 Assemblies & Harnesses, Coils Including
 Assemblies & Forms, Controllers, Programmable,
 Controls/Control Eqpt., Current Sensors, Isolators,
 Power Supplies, Reactors, Regulators, Relays,
 Transformers

Local Sales Offices & Reps.

Ala Huntsville, Newcomb Assocs. 205-852-0304
 Fla Winterpark, GPI Instrs. 305-831-6215
 Md Bethesda, S & S Assocs. 301-654-1434
 Mo St. Louis, Wm. Adler Assoc. 314-423-7200
 NY N. Syracuse, KLM Assocs. 315-458-6214
 NY New Hartford, KLM Assocs. 315-735-8525
 NY Rochester, KLM Assocs. 716-442-0820
 NY Roslyn Heights, TRAVCO Assoc. 516-621-3223
 NC Research Triangle Park, Newcomb Assocs.
 919-467-6248
 Pa King of Prussia, S & S Assocs. 215-265-3450
 Tex Richardson, Concept Sls. Inc. 214-387-1434

CROVEN, LTD., 500 Beech St., Whitby, Ont., Can., Tel:
 416-668-3324, TWX: 610-384-2750; QPL No: Multiple;
 Empl: 250 p. 1-300,301

For info on price: R. A. McCormick; Application info:
 R. A. McCormick; Customer service: J. Bates; Delivery
 info: G. Rankine

Free literature available: Quartz, Crystal Catalogue

Products manufactured: Circuit Breakers, Crystal
 Blanks, Crystals, Filters, Oscillators

Local Sales Offices & Reps.

Cal San Mateo, Melvin Sls. Co. 415-349-7444
 Cal Sepulveda, R.L. Assocs. 213-892-5386
 Cal Van Nuys, R.L. Assocs. 213-782-7826
 Mass Sherborn, Naton Assoc. 617-986-6417
 FOR: Can., Que., Montreal, Ben Manis Assocs.
 514-336-4500

CROWN INTERNATIONAL, Box 1000, Elkhart, Ind.,
 46514, Tel: 219-294-5571, TWX: 810-294-2160; Empl:
 175 p. 1-14,15

Products manufactured: Amplifiers, Analyzers,
 Controls/Control Eqpt., Dials, Duplicators,
 Recorders

Local Sales Offices & Reps.

Conn Woodbridge, Elctrn. Mktg. 203-397-1461
 Ga Atlanta, Fidelicom 404-458-3616
 Ill Chicago, P. Berndt Assocs. 312-283-0713
 Md Gaithersburg, Wright Co. 301-948-5151
 Mich Ferndale, Shalco 313-547-4771
 Minn St. Paul, Skor 612-645-6461
 NJ Parlin, JMR Sls., Inc. 201-727-5335
 NY E. Rochester, RJC Assoc. 716-385-2521
 NY Rochester, Ossmann 315-437-6666
 Ohio Dayton, Ashby Assocs. 513-252-5627

CRYDOM CONTROLS, Int'l. Rectifier, 1521 Grand Ave., El
 Segundo, Cal., 90245, Tel: 213-322-4987

For info on price: L. Bringle; Application info: J.
 Weiss; Customer service: L. Bringle; Delivery info: L.
 Bringle

Free literature available: Crydom photo-isolated
 solid-state power relays-contains technical info
 and application data for solid/state relays from
 2.5A to 40A and voltages of 120, 240 and 480 V. AC.

Products manufactured: Relays

Local Sales Offices & Reps.

Ala Birmingham, Com-Trol Corp. 205-823-0897
 Ariz Scottsdale, Williams-Assocs. 602-947-4297
 Cal San Diego, Southwest Tech. Sls. 714-565-2295
 Cal Santa Clara, T. Hartman Assoc. 408-247-1252
 Cal Tustin, Morgan Johnson Co. 714-832-7282
 Colo Denver, Williams-Assocs. 303-373-4730
 Conn Ridgefield, W. Johnson Co. 203-438-3351
 Fla Ft. Lauderdale, N. Bredesen 305-566-3289
 Kans Overland Park, Dy-Tronix 816-761-6543

Kans	Wichita, Dy-Tronix	316-943-6221
Md	Rockville, Marktron Inc.	301-762-6210
Md	Timonium, Marktron Inc.	301-252-7111
Mass	Bloomfield, JMG, Inc.	617-762-5333
Mich	Bloomfield Hills, Roth Ind'l Sls.	313-626-3171
Minn	St. Paul, Repor	612-645-8618
Mo	Hazelwood, Dy-Tronix	314-731-5799
NJ	Ridgewood, Ballou Inc.	201-444-6990
NM	Albuquerque, Williams-Asocs.	505-255-1638
NY	Buffalo, R. W. Mitscher Co.	716-633-7970
NY	New York City, Ballou Inc.	212-964-4640
NC	Raleigh, R. W. Mitscher Co.	919-828-0575
Ohio	Aurora, EMA Inc.	216-562-6104
Ohio	Centerville, EMA Inc.	513-433-2800
Okla	Tulsa, Ballou Inc.	918-663-8707
Ore	Beaverton, Vantage Corp.	503-644-6111
Pa	Bala Cynwyd, J. V. Calhoun Co.	215-839-3000
Pa	Erie, F. McClinton	814-455-9111
Pa	Pittsburgh, F. McClinton	412-561-4803
Pa	Scranton, J. V. Calhoun Co.	717-587-1164
Pa	York, J. V. Calhoun Co.	717-244-4597
Tenn	Shelbyville, R. W. Mitscher Co.	615-684-4544
Tex	Ft. Worth, W. Pat Fralia Co.	817-738-2394
Tex	Houston, W. Pat Fralia Co.	713-772-1572
Va	Charlottesville, Marktron Inc.	804-973-5874
Wash	Bellevue, Vantage Corp.	206-455-3460
WVa	Huntington, F. McClinton	304-736-5161
Wisc	Racine, KMG Sls Co.	414-639-9005

CRYSTAL NETWORK PRODS. CORP., 818 Parade St., Erie, Pa., 16503, Tel: 814-459-2351; Minimum order: \$100

For info on price: R. H. Tuznik; Application info: J. T. Tuznik; Customer service: R. K. Tuznik; Delivery info: R. K. Tuznik

Products manufactured: Crystals, Discriminators, Filters, Oscillators

CRYSTAL TECHNOLOGY, 2510 Old Middlefield Way, Mountain View, Cal, 94043, Tel: 415-961-9311; Empl.: 30; Minimum order: \$100

Customer service: R. L. Carlson

Free literature available: Growth and fabrication of single crystal oxides, including lithium niobate, lithium tantalate, tellurium dioxide, BSO, BGO, and GGG. Fabrication of transducers and surface acoustic wave delay lines.

Products manufactured: Crystals, Delay Lines, Modulators, All Kinds, Transducers

Local Sales Offices & Reps.

Ill	Chicago, Brooks Engrg. Co.	312-944-1227
Md	Silver Spring, Spectro Sys.	301-949-8261
Mass	Billerica, Drew Associates	617-667-6643
NJ	E Windsor, Cook & Weil, Inc.	609-448-7409
NY	New York, Cook & Weil	212-741-1053



CRYSTEK CRYSTALS CORPORATION
A Whitehall Company

CRYSTEK CRYSTALS CORP., 1000 Crystal Dr., Ft. Myers, Fla., 33901, Tel: 813-936-2109; Empl.: 2500

For info on price: L. Stacey; Application info: J. Case; Customer service: A. Whidden; Delivery info: L. Stacey

Free literature available: New Quartz Crystal Catalog includes application notes, definitions, specification charts, graphs and ordering information.

Products manufactured: Crystal Blanks, Crystals

Local Sales Offices & Reps.

Ala	Birmingham, H. W. Phillips Co., Inc.	205-655-8415
Ark	Little Rock, Schoonmaker	501-375-2168
Cal	Los Angeles, Crystek Crystals Sls. Office	714-936-8055
Cal	San Francisco, J.E. Stricker Co.	415-342-1425
Colo	Denver, KC Marketeers	303-733-5561
DC	Washington, Sonny Simberkoff Assocs., Inc.	703-525-5898
Fla	Ft. Lauderdale, Sprock Sls., Inc.	305-587-3792
Fla	Sarasota, Sprock Sls.	
Ga	Atlanta, H. W. Phillips Co., Inc.	404-252-0720
Ill	Chicago, Cummings & Foley Sls., Co.	312-725-8110
Ind	Indianapolis, Shamrock Elctrn. Sls.	317-251-5527
Iowa	Des Moines, Kathrinus-Kelly & Co.	515-255-4584
Kans	Kansas City, Kathrinus-Kelly & Co.	913-722-0000
Mass	Boston, Data Memory Assocs.	617-868-3120
Mich	Detroit, RC Merchant & Co.	313-535-6000
Mich	St. Joseph, RC Merchant & Co.	616-983-7378

Minn	Minneapolis, Heimann Co.	612-861-6051
Mo	St. Louis, Kathrinus-Kelly & Co.	314-968-3800
NJ	South Orange, Sonny Simberkoff Assocs., Inc.	201-763-7900
NY	Buffalo, Sonny Simberkoff Assocs., Inc.	716-834-8119
NY	New York City, Sonny Simberkoff Assocs., Inc.	212-943-7023
NC	Burlington, Sonny Simberkoff Assocs., Inc.	919-584-6450
Ohio	Akron, Shamrock Elctrn. Sls.	216-666-1400
Ohio	Dayton, Shamrock Elctrn. Sls.	513-298-3052
Okla	Tulsa, Schoonmaker Co.	918-936-1423
Ore	Portland, EBCO	503-245-2283
Pa	Philadelphia, Sonny Simberkoff Assocs., Inc.	215-455-9579
Pa	Pittsburgh, Shamrock Elctrn. Sls.	
Tex	Dallas, Schoonmaker Co.	214-357-8481
Tex	Houston, Schoonmaker Co.	713-926-9510
Va	Arlington, Sonny Simberkoff Assocs., Inc.	703-525-5898
Wash	Seattle, EBCO	206-284-1121
FOR:	Can., Toronto Ont., Fanon Elctns.	416-363-5011

CTS CORP., 905 N. West Blvd., Elkart, Ind., 46514, Tel: 219-293-7511, TWX: 810-294-2167; Empl.: 6100

Free literature available: New 12-page Short Form Catalog for Expanding CTS Industrial Distributor Product Line. The handsome two-color, 12-page catalog pictures and describes capabilities of: 53 types of CTS cermet, carbon, and wirewound trimmers and potentiometers.

36 choices of CTS 1-1/16" diameter Rotary Selector Switches and an additional 20 miniature 13/16" diameter Selector Switches. 101 values of six or 8 lead single-in-line resistor networks. 126 values of CTS 14 or 16 lead DIP resistor networks. 7 new DIP programmable switches. Distributor quantity prices are included for each product line. Write: J.C. Wells, Distributor Sales Manager, CTS Corporation, 905 North West Boulevard, Elkhart, Indiana 46514. Phone: (219) 293-7511.

Products manufactured: Circuits, Hybrid, Thick Film, Controllers, Programmable, Controls/Control Eqpt., Controls, Fader, Converters, Crystal Blanks, Crystals, Discriminators, Filters, Hybrid Voltage Regulators, Networks, Oscillators, Ovens, Potentiometers, Power Drivers, Hybrid (High Current, High Voltage), Resistors, Rheostats, Speaker Systems, Speakers, Standards, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Interop Assocs.	205-881-3677
Ariz	Phoenix, Hecht, Henschen & Assocs.	602-275-4411
Cal	Burlingame, Logan & Assocs.	415-697-6100
Cal	South Pasadena, CTS Corp.	213-682-1137
Colo	Denver, Zeus, Inc.	303-770-4400
Conn	North Haven, Comp Rep Assocs.	203-239-9762
Fla	Cocoa, Orbe, Inc.	305-452-9568
Fla	Ft. Lauderdale, Orbe, Inc.	305-564-8571
Fla	St. Petersburg, Orbe, Inc.	813-894-0687
Ga	Atlanta, Interop Assocs.	404-394-7756
Ind	Elkhart, CTS Corp.	219-293-7511
Iowa	Marion, Thomas & Modrcin Assocs.	319-377-6261
Kans	Shawnee Mission Thomas & Modrcin Assocs.	913-432-2131
Md	Baltimore, Coulbourn DeGreif, Inc.	301-247-4646
Mass	Needham, Comp Rep Assocs.	617-444-2484
Mich	Grand Rapids, J.L. Montgomery, Inc.	616-774-9308
Mich	Southfield, J.L. Montgomery, Inc.	313-358-2616
Minn	Minneapolis, R.W. Marshall Co.	612-929-0457
Mo	Hazelwood, Thomas & Modrcin Assocs.	314-838-6446
NM	Albuquerque, Zeus, Inc.	505-256-9831
NY	Jamaica, S-J Sales Assocs.	212-291-3232
NY	Syracuse, Nycorn, Inc.	315-437-8343
NC	Raleigh, Component Sls.	919-782-8433
Ohio	Cincinnati, Baehr, Greenleaf & Assocs.	513-891-3827
Ohio	Cleveland, Baehr, Greenleaf & Assocs.	216-221-9030
Ohio	Upper Arlington, Baehr, Greenleaf & Assocs.	614-486-4046
Okla	Oklahoma City, Parvin Sls. Co.	405-942-4581
Pa	Fort Washington, G.C.M. Inc.	215-646-7535
Pa	Pittsburgh, Covert & Newman Co.	412-563-0303
Tex	Addison, Parvin Sls. Co.	214-239-9148
Tex	Houston, Parvin Sls. Co.	713-721-1054
Utah	Salt Lake City, Zeus, Inc.	801-486-2317
Wash	Bellevue, SD-R2 Prods. & Sls.	206-747-9424
EXP:	Elkhart, Ind., CTS Corp.	219-293-7511

FOR: Can., Streetsville, Ont., CTS of Canada, Ltd.
416-826-1141

CTS OF BERNE, 406 Parr Rd., Berne, Ind., 46711, Tel: 219-589-3111, TWX: 810-589-1580 p. 2-1421-1426

Customer service: J. Long

Products manufactured: Resistors
Refer to CTS Corp. for sales office information

CTS KNIGHTS, INC., 400 Reimann Ave., Sandwich, Ill., 60548, Tel: 815-786-8411 p. 1-303-311

Customer service: C. Mooibroek

Products manufactured: Crystal Blanks, Crystals, Discriminators, Filters, Oscillators, Ovens
Refer to CTS Corp. for sales office information

CTS MICROELECTRONICS, INC., 1201 Cumberland Ave., W. Lafayette, Ind., 47906, Tel: 317-563-2565, TWX: 810-342-1882 p. 1-888; p. 2-1622

Customer service: F. Leingang

Products manufactured: Circuits, Hybrid, Thick Film, Potentiometers, Power Drivers, Hybrid (High Current, High Voltage)
Refer to CTS Corp. for sales office information

CTS OF PADUCAH, INC., 1565 N. 8th St., Paducah, Ky., 42001, Tel: 502-442-1641, TWX: 510-546-1152; Empl.: 1000; Minimum order: \$100

Customer service: G. Draffen

Free literature available: Catalog 50M-3-73 complete listing of all loudspeakers and do-it-yourself systems (complete with crossover networks) available for immediate shipment from CTS stock.

Products manufactured: Speaker Systems, Speakers

Local Sales Offices & Reps.

Ark	El Dorado, D. Ballew Sls.	501-863-8325
Cal	San Francisco, Meyer, Ross & Fleming	415-285-8880
Cal	Van Nuys, Markman Co.	213-787-6151
Colo	Denver, B & B Elctrn. Prods.	303-934-2123
Fla	Maitland, Hutto, Hawkins, Peregrin	305-831-2474
Ga	East Point, P. Hayden & Assocs.	404-766-0261
Ill	Oak Park, G. Pettit Co.	312-265-0342
Ky	Paducah, CTS of Paducah	502-442-1641
Md	Silver Springs, Mid Atlantic Sls.	301-593-7749
Mass	Boston, Anderson Sls. Assocs.	617-227-2980
Mich	Plymouth, J. Malcolm Flora	313-453-4296
Minn	Minneapolis, Heimann Co.	612-861-6051
Mo	St. Louis, Lowell-Kangas & Assocs.	314-821-4050
NJ	Caldwell, A. Cerf & Co.	201-226-2263
NY	Syracuse, W. Tauber Co.	315-446-7094
Ohio	Medina, T. Grant Assocs.	216-725-6528
Pa	Enon Valley, Nebco Assocs.	214-457-2333
Tex	Dallas, Collins Co.	214-341-7866
Wash	Bellevue, SDR&S2 Prods. & Sls.	206-747-9424
EXP:	Summit, N.J., N. Christensen Int'l. Mktg.	201-273-3833

CUBIC CORP., 9233 Balboa Ave., San Diego, Cal., 92123, Tel: 714-277-6780, TWX: 714-279-0267; Empl.: 2100

Customer service: T. Grady

Products manufactured: Antenna Feed Systems, Antennas, Boards, Programming, Comm. Systems, Data Acquisition & Reduction Systems, Interferometer Systems, Meters, Receivers, Simulators, Tracking Systems, Translators, Data, Transmission Systems, Data, Transmitters

CUNNINGHAM, S.B. Gleason Works, 10 Carriage St., Honeoye Falls, N.Y., 14472, Tel: 716-624-2000, TWX: 510-254-4202; Empl.: 108 p. 1-640-641, 2012, 2013

Customer service: G. Appleton

Free literature available: 8 page reprint for switching products line. Product wall chart for CCTV products line.

Products manufactured: Matrices, Computer, Monitors, Multiplexers, Scanners, Switches, Television Systems & Equipment Closed-Circuit

Local Sales Offices & Reps.

Cal	Pasadena, Luscombe Engrg. Pasadena	213-684-2000
Cal	San Mateo, Luscombe Engrg. San Francisco	415-342-7057
Colo	Parker, Technology Mktg. Assocs.	303-841-3435
Conn	Hamden, Instr. Consits.	203-288-5246
Ill	Des Plaines, Cozzens & Cudahy	312-298-3600
Ind	Indianapolis, Cozzens & Cudahy	317-244-2456
Md	Bethesda, Bartlett	301-656-3061
Mass	Waban, Instrument Consits., Inc.	617-969-9891
Minn	Minneapolis, Cozzens & Cudahy	612-884-4336

Mo	St. Louis, Cozzens & Cudahy	314-423-1234
NM	Albuquerque, Tech. Mktg. Assocs.	505-298-4321
NY	White Plains, Bartlett	914-949-6476
Pa	Wayne, Bartlett	215-688-7325
Tex	Houston, Scien. Sls.	713-666-5318
Tex	Richardson, Scien. Sls.	214-231-6541
Wash	Seattle, Delcom Sls. Co.	206-248-0090

CURTIS INDUSTRIES INC., 8000 West Tower Ave., Milwaukee, Wisc., 53223, Tel: 414-354-1500; Empl.: 160; Minimum order: \$50; p. 2-666,667

For info on price: M. Schuman; Application info: R. Van der Elsen; Customer service: M. Schuman; Delivery info: M. Schuman

Free literature available: Terminal Block Catalog - Broad Range of Terminal Blocks for High Current, Control, and Electronic Applications. Relay Socket Catalog - Complete Line Covering Octal and Rectangular Base Relays. Liquid Level Control Catalog - Complete Line Covering Sensitivity Ranges and Cost Ranges.

Products manufactured: Controls/Control Eqpt., Indicators, Sockets, Terminal Blocks, Boards & Strips, Timers

Local Sales Offices & Reps.

Ariz	Scottsdale, DeAngelo, Rothman, Cheever	602-948-2240
Cal	Los Altos, Ewing-Foley	415-941-4525
Cal	Santa Fe Springs, Sls. Engineers Ltd.	213-921-4337
Colo	Boulder, Comp. Prods. Sls.	303-444-2730
Fla	Lakeland, AA Electric Div. of AEC	813-682-6181
Ga	Atlanta, Holman-Lobsinger Co.	404-256-9120
Haw	Honolulu, Dougherty Entprs.	
Ill	Downers Grove, Richmar Elctns. Corp.	312-968-0118
Ind	Indianapolis, Val-Skol Sls.	317-926-5063
La	New Orleans, W. Case & Assocs.	504-835-7713
Md	Woodbridge, Naudain Assocs.	301-252-5378
Mass	Sturbridge, Electrical Apparatus Co.	617-347-7447
Mich	Farmington Hills, Electro-Matic	313-478-1182
Minn	St. Paul, Kenco Co.	612-645-7717
Mo	Hazelwood, Dy-Tronix	314-731-5799
Mo	Kansas City, Dy-Tronix	816-761-6543
NJ	Mount Laurel, Naudain Assocs.	609-235-1801
NY	Buffalo, Ossmann Comp. Sls.	716-832-4271
NY	Kingston, Ossmann Comp. Sls.	914-338-5505
NY	Rochester, Ossmann Comp. Sls.	716-442-3290
NY	Valley Cottage, LRC Assocs.	914-634-7973
NC	Winston-Salem, L.G. White & Co.	919-725-3612
Ohio	Cincinnati, Val-Skol Sls.	513-563-6790
Ohio	Cleveland, Val-Skol Sls.	216-526-2156
Ohio	Columbus, Val-Skol Sls.	614-291-4123
Okla	Tulsa, T.J. Ray Co.	918-627-1515
Pa	Philadelphia, Naudain Assocs.	215-564-3194
Pa	Pittsburgh, R.F. Clark Co.	412-242-9500
Tenn	Memphis, R.D. Thomas Co.	901-683-0341
Tex	Richardson, R.F. Kimball Co.	214-231-3447
Wash	Seattle, C.B. Parsons & Co.	206-762-7373
Wisc	Oak Creek, Richmar Elctns.	414-475-0141
FOR:	Willowdale, Ont., Can., A.C. Simmonds & Sons, Ltd.	416-491-1010

Local Distributors

NY	Scarsdale, Logicomp Elctns., Inc., 52 Lafayette Rd.	914-723-3334
----	---	--------------

CURTIS INSTRS., INC., 200 Kisco Ave., Mt. Kisco, N.Y., 10549, Tel: 914-666-2971, TWX: 710-571-2163; Empl.: 50; Minimum order: \$40; p. 1-642,643

For info on price: R. MacDonald, 914-666-2971; Application info: E. Sands, 914-666-2971; Customer service: R. MacDonald, 914-666-2971

Free literature available: 2 booklets describing range of analog timers and counter and comparing them with digital types. 2 booklets describing Curtis line of integrating instruments featuring the unique infinite memory integrator.

Products manufactured: Counters, Indicators, Integrators, Electronic, Meters, Testers, Timers

Local Sales Offices & Reps.

Cal	Milbrae, Polach & Bensinger, Inc.	415-697-2525
Cal	Seal Beach, Texel Engrg.	213-596-9411
Colo	Boulder, R.G. Entprs.	303-447-9211
Ill	Elmhurst, Schuten Assocs.	312-833-0980
Ind	Ft. Wayne, McDonald Sls. Co.	219-743-4611
Mass	Brookline, Harman Assocs.	617-232-6687
Mo	St. Louis, Fixman Engrg.	314-725-5219
NM	Albuquerque, Goyne, Assocs. Inc.	505-265-6794
NY	Syracuse, Rep. Tech., Inc.	315-437-2845
NC	Winston-Salem, Radco Engrg.	919-722-9671
Pa	Media, W. Reeves Assocs., Inc.	215-LO 6-6709
Va	Arlington, Gans Fryling, Inc.	703-527-3262

Wash	Seattle, Blum & Assocs.	206-782-1600
Wisc	Milwaukee, Star Engrg. Co.	414-645-3680

CUSH CRAFT CORP., 621 Hayward St., Manchester, N.H., 03103, Tel: 627-7877; Empl.: 30; Minimum order: \$50

For info on price: R. Cushman; Application info: R. Cushman; Customer service: J. C. Arsenault; Delivery info: J. C. Arsenault

Products manufactured: Antenna Feed Systems, Antennas, Arresters, Electrical Surge, Lightning

Local Sales Offices & Reps.

Alas	Anchorage, H. J. Lang & Assoc.	907-279-5741
Cal	Los Angeles, Wallace & Wallace	213-744-0401
Cal	San Francisco, Featherstone Sls. Co.	415-467-3133
Colo	Aurora, AES Sls. Co.	303-366-0208
Fla	Hollywood, E. Healy	305-961-6640
Ga	Jonesboro, E. Clanton	404-471-6297
Kans	Shawnee Mission, Lowell Kangas & Assoc.	913-631-3515
Mo	St. Louis, Lowell Kangas-Assoc.	314-821-4050
NY	Farmingdale, Chester Drexler Co.	516-249-8206
NC	Kernersville, M. F. Mottsinger Jr.	919-993-3993
Ohio	N. Jackson, Ohio Assocs.	216-538-3215
Ore	Portland, Jud LeBrun Co.	503-244-6805
Pa	Philadelphia, Herman Lewis Co.	215-567-5020
Tenn	Memphis, A. F. Howard	901-682-2281
Tex	Dallas, Collins	214-341-7866
EXP:	Chicago, E. D. Magnus Assoc.	312-334-1503

CUSTOM CABLE CO., 3325 Royal Ave., Oceanside, N.Y., 11572, Tel: 516-536-0300; Empl.: 3

Customer service: J. Michelman

Products manufactured: Braid, Cable, Cable, Wire

CUSTOM COIL & TRANSFORMER CO., Box 2624, Zanesville, Ohio, 43701, Tel: 614-452-6973; Empl.: 75

For info on price: D. Young; Application info: D. Young; Customer service: D. Young; Delivery info: R. Tilton

Products manufactured: Chokes, Coils Including Assemblies & Forms, Transformers

CUSTOM CONNECTOR CORP., 1738 E. 30th St., Cleveland, Ohio, 44114, Tel: 216-241-1679; Empl.: 36; Minimum order: \$25

For info on price: D. G. Harper; Application info: J. R. Crosby; Customer service: D. Jones; Delivery info: D. Jones

Free literature available: Relay Socket Catalog

Products manufactured: Sockets

Local Sales Offices & Reps.

Cal	Downey, Sierra-Pacific Engrg. Inc.	213-928-1815
Colo	Aurora, Comp. Specialties	303-341-0160
Ill	Chicago, Control Sls.	312-296-5595
Mass	Norwell, Bordewick Engrg. Sls. Co.	617-659-4915
Mo	St. Louis, Control Design	314-426-3150
NJ	Edison, Burgoyne Elec. Sls.	201-225-0450
NY	Mt. Laurel, J. G. Speck Assoc.	609-234-4957
NJ	Baldwinsville, Scibetta Reps.	315-622-3993
NC	Charlotte, J. Rudisill Assoc.	704-377-6901
Pa	New Kensington, J. G. Speck Assoc.	609-234-4957
Tex	Dallas, Carey & Assoc.	214-363-7813
Tex	Houston, Carey & Assoc.	713-460-1111
Wisc	Milwaukee, Control Sls.	414-354-6266

CUSTOM ELCTNS., Browne St., Oneonta, N.Y., 13820, Tel: 607-432-3880, TWX: 510-241-8292; Empl.: 60; p. 2-102,103

For info on price: D. Hathaway; Application info: J. Ahearn; Customer service: S. Vance; Delivery info: T. Piza

Free literature available: Company Brochure, Technip Data Sheets-CMR, CER, CEM Type units & mica data

Products manufactured: Capacitors, Fixed, Networks

Local Sales Offices & Reps.

Cal	Los Angeles, M.A. Stolaroff Co.	213-295-7781
Cal	Santa Clara, Richards Ass.	408-248-5860
Ill	Chicago, Rozner Sales	312-283-0022
Mass	Stow, Musello Assocs.	617-369-5900
Minn	Minneapolis, Revere Assocs.	617-781-7700
Mo	Kansas City, K & M Sls. & Assocs.	
NY	New York, Martech Assocs.	516-627-1151
Tex	Dallas, Hillman Entprs.	214-827-4790
Wash	Seattle, Underwood Inc.	206-243-2133

CUSTOM POWER, INC., 740 W. Collins Ave., Orange, Cal., 92667, Tel: 714-639-2390; Empl.: 45; Minimum order: \$25

For info on price: R. Williams; Application info: T. Mehl; Customer service: A. M. Parker; Delivery info: A. M. Parker

Free literature available: Custom Power Supplies; General Information, Pictures Units previously manufactured. Custom OEM/Standards; shows outline drawings, general specifications, pricing. Transformers; states we build custom transformers. Standard Off the shelf supplies; data sheet with pricing.

Products manufactured: Power Supplies, Transformers

CUSTOM SCIENTIFIC INSTRS., 13 Wing Dr., Box A, Whippany, N.J., 07981, Tel: 201-538-8500; Empl.: 25; Minimum order: \$25

Customer service: H. J. Bultman Jr.

Free literature available: Catalog or individual brochures of instruments.

Products manufactured: Chamber, Environmental Test, Testers

CUTLER-HAMMER, INC., 4201 N. 27th St., Milwaukee, Wisc., 53216, Tel: 414-442-7800, TWX: 910-262-3089

Free literature available: Order Log: A complete catalog of Commercial and Military Switches and Relays. Industrial Control Catalog: A complete catalog of motor starters, relays, timers and accessory devices.

Products manufactured: Arresters, Electrical Surge, Lightning, Brakes, Bus Bars & Systems, Circuit Breakers, Clutches, Controls/Control Eqpt., Drivers, Solenoid, Lights, Panels, Relays, Switchboards, Switches, Timers

Local Sales Offices & Reps.

Ala	Birmingham	205-871-1166
Ala	Mobile	205-471-5852
Ariz	Phoenix	602-957-1430
Ark	Little Rock	501-375-8355
Cal	Anaheim	714-776-1910
Cal	Concord	415-682-8800
Cal	Menlo Park	415-854-1005
Cal	San Diego	714-298-5432
Colo	Colorado Springs	303-576-1453
Colo	Denver	303-934-5408
Conn	Hartford	203-563-0104
Fla	Jacksonville	904-725-2845
Fla	Tampa	813-839-5493
Ga	Atlanta	404-399-3023
Haw	Honolulu	808-531-0596
Ill	Broadview	312-379-7565
Ill	Peoria	309-685-4031
Ill	Rockford	815-398-6585
Ind	Indianapolis	317-546-4096
Ind	South Bend	219-256-1591
Iowa	Ankeny	515-984-0258
Iowa	Davenport	319-323-8057
Kans	Mission	913-236-6313
Kans	Wichita	316-263-5216
Ky	Louisville	502-458-2639
La	New Orleans	504-366-1616
La	Shreveport	318-869-3194
Md	Rockville	301-881-8450
Md	Towson	301-825-6041
Mass	Newton	617-244-7511
Mass	Worcester	616-853-5824
Mich	Bridgeport	517-777-0880
Mich	Grand Rapids	616-243-0152
Mich	Lansing	517-482-2553
Mich	Southfield	313-444-8700
Minn	Minneapolis	612-831-3560
Mo	Joplin	417-623-6607
Mo	St. Louis	314-429-7711
Neb	Omaha	402-391-5040
NH	Dover	603-742-1687
NJ	Trenton	215-878-0820
NJ	Union	201-687-4433
NM	Albuquerque	505-266-7955
NY	Melville	516-595-4424
NY	New York	212-687-0707
NY	Rochester	716-271-5460
NY	Syracuse	315-437-7201
NC	Charlotte	704-523-3056
NC	Greensboro	919-272-4567
Ohio	Cincinnati	513-825-5252
Ohio	Dayton	513-293-2117
Okla	Oklahoma City	405-848-4807
Okla	Tulsa	918-627-3312
Ore	Eugene	502-342-8251
Pa	Pittsburgh	412-922-2707
Pa	Wayne	215-878-0820
Ri	E. Providence	401-434-8555
SC	Columbia	803-772-6531
SC	Greenville	803-232-4639
Tenn	Memphis	901-458-2631
Tenn	Nashville	615-292-5539

Tex	Dallas	214-631-3731
Tex	Houston	713-526-1205
Utah	Salt Lake City	801-487-1338
Va	Norfolk	703-499-0555
Va	Richmond	804-353-4413
Wash	Seattle	206-747-5560
Wash	Spokane	509-326-1610
WVa	Charleston	304-343-4141
Wisc	Milwaukee	414-354-6050

CUTLER-HAMMER SHALLCROSS, Preston St., Selma, N.C., 27576, Tel: 819-965-2341, TWX: 510-920-0740; FSC No: 54294; QPL No: 39007; Empl: 477; Minimum order: \$50

For info on price: J. E. Russell; Application info: C. M. Huber; Customer service: C. A. Johnson; Delivery info: C. A. Johnson

Free literature available: Stockistor Stock List - Power wirewound resistors per Mil-R-39007 (RWR 80s, 81s, & 89S) stocked (1,000 ohm values) in packages of 10 for fast delivery through Authorized Distributors.

Products manufactured: Bridges, Decade Boxes, Meters, Networks, Probes, Resistors, Switches, Testers

Local Sales Offices & Reps.		
Ariz	Phoenix, G. R. McKnight Co.	415-325-2844
Cal	Hawthorne, WCV Co.	213-772-4479
Cal	San Carlos, Wincos Sls.	415-365-6082
Cal	Denver, Camel Elctns.	303-757-6192
Fla	Oviedo, Conley Assocs.	305-365-3284
Ill	Chicago, Berndt Assocs.	312-283-0713
Kans	Olathe, T.R.I.	913-782-1177
Md	Bethesda, Warren Mount Co.	301-657-9312
Mass	Allston, Vector Sls., Inc.	617-787-2790
Mich	Farmington Hills, H. Lowell Co.	313-581-7474
NY	Plainview, ERA, Inc.	516-822-9890
NY	Rochester, Ontec	716-464-8636
NC	Smithfield, Byrd & Barbour Sls.	919-934-8136
Ohio	Cincinnati, A.C. Wahl & Assocs.	513-821-3270
Tenn	Bristol, Remco Corp.	615-968-4195
Tex	Richardson, Zonk Engrg. Co.	214-238-7651
Wash	Seattle, Underwood & Underwood	206-243-2133

Local Distributors		
Cal	Carson, Hi-Rel, 20507 S. Belshaw Ave.	213-537-6500
Cal	Hawthorne, Westec, 14125 Inglewood Ave.	213-772-4479
Cal	Sunnyvale, Diplomat/Westland, 1118 Elko Dr.	408-734-1900
Fla	Clearwater, Diplomat/Southland, 1771 N. Hercules Ave.	813-443-4514
Md	Bethesda, Wire Supply, 4924 St. Elmo Ave.	301-657-9333
Minn	Minneapolis, Diplomat/Electro Com, 3816 Chandler Dr.	612-788-8601
Mo	St. Louis, Diplomat/St. Louis, 2725 Mercantile Dr.	314-645-8550
NJ	Haddonfield, Mid-Atlantic, 140 Haddon Ave.	609-428-8288
NY	Farmingdale, Command Elctns., 114 Allen Blvd.	516-293-1212
NY	Plainview, ACI, 28 South Mall	516-293-6630
NY	Vestal, Harvey Federal, E. Vestal Pkwy.	607-748-8211
Ohio	Dayton, Diplomat/Northland, 2452 Stanley Ave.	513-228-1080

CVC PRODUCTS, INC., 525 Lee Rd., Box 1886, Rochester, N.Y., 14603, Tel: 716-458-2550, Telex: 97-8269; Empl: 160; Minimum order: \$30

For info on price: E. Chamberlain; Application info: R. Weeks; Customer service: G. Sadler; Delivery info: E. Chamberlain

Free literature available: Gauge Control Catalog, Diffusion Pump Catalog, High Vacuum Distillation Catalog, Pump Fluid Catalog

Products manufactured: Analyzers, Chamber, Environmental Test, Controllers, Programmable, Controls/Control Eqpt., Deposition Equipment, Vacuum & Accessories, Evaporation Equipment, Electron Beam, Furnaces, Gages, Lubricants, Microcircuit Production Equip., Power Supplies, Pumps, Vacuum, Services, Assembly, Production & Test, Testers, Valves, Vacuum

Local Sales Offices & Reps.		
Cal	Hayward	415-785-4440
Cal	Van Nuys	213-787-6001
Ga	Atlanta	404-233-1171
Ill	Mt. Prospect	312-394-0840
Mass	Wellesley	617-235-8273
Mich	Southfield	313-352-6367
NJ	Union	201-376-4900
Ohio	Cincinnati	513-871-6558

Tex	Richardson	214-235-2378
FOR:	Can., St. Laurent, Montreal, Canadian Vacuum Equip. Co. Ltd.	514-332-1025

CW INDUSTRIES, 550 Davisville Rd., Warminster, Pa., 18974, Tel: 215-355-7080, TWX: 510-667-1875; Empl: 500 p. 1967; p. 2-656

Customer service: H. Cohen

Products manufactured: Connectors, Potentiometers, Resistors, Switches

Local Sales Offices & Reps.		
Cal	Redwood City, W. Hickey Sls.	415-368-3849
Cal	Van Nuys, Shephard Comps.	213-787-4610
Colo	Denver, L.G. Moss	303-985-9815
Colo	Greeley, G. Moss Elctns.	303-353-1452
Ill	Chicago, G. Mc Cole	312-774-3535
Ind	Indpls., Southern Sls.	317-257-7575
Md	Pikesville, J. Nichols	301-484-6376
Mass	Needham, A & M Elctn. Reps.	617-444-8170
Mich	Detroit, Nicon Assocs.	313-341-7688
Minn	Minneapolis, E. Melius	612-854-4270
Miss	Meridian, Herron Assoc.	601-483-9306
Mo	St. Louis, E. Hill	314-621-1818
NJ	Oaklyn, A. Wetterhahn	609-858-3003
NM	Albuquerque, Staley Co.	505-294-2660
NY	Elmont, F.E. Schmitt	516-437-8150
NY	Hempstead, Kahgan Sls. Corp.	516-538-2300
NY	Syracuse, W.A. Franklin Sls. Corp.	315-474-2954

NY	Whitesboro, H. Lessman	315-736-5460
Ohio	Cincinnati, H. Behrends	513-351-4441
Ohio	Rocky River, G. Herrick	216-333-0333
Tex	Dallas, Vista Assocs.	214-235-4547
Va	Chesapeake, F.B.D. Sls.	703-484-3162
Wash	Seattle, Carlyle Tech.	206-622-4288
EXP:	N.Y., N.Y., Roburn Agencies	513-294-1648
FOR:	Can., Etobicoke, Ont., C. Pipe	416-622-3403

CYBEREX, INC., 7171 Industrial Park Blvd., Mentor, Ohio, 44060, Tel: 216-946-1783, Telex: 980644; Empl: 60

Products manufactured: Chargers, Battery, Controls/Control Eqpt., Converters, Inverters, Power Supplies, Regulators, Transformers

Local Sales Offices & Reps.		
Ala	Birmingham, Crim Sls. & Engrg. Co.	205-871-4084
Alas	Anchorage, J.P. Bagoy & Assocs.	907-274-8531
Cal	Fullerton, Western Automation/Power Sys.	714-879-0440
Cal	San Francisco, Artwel Elec., Inc.	415-467-1880
Colo	Denver, Electrical Agencies Co.	303-623-8246
Conn	Bolton, Metronics, Inc.	203-643-5358
Conn	Wilton, J.H. Burnett	203-762-8862
Fla	Brandon, J. Meeks & Assocs.	813-689-6137
Fla	Miami, A.C. Chaney & Assocs.	305-754-8857
Ga	Litburn, R.W. Dollar	404-469-6861
Haw	Honolulu, Atlas Elec. Co.	808-571-906
Ill	Chicago, Gannon Elec.	312-774-2884
Ill	Chicago, W. Lamont Assocs.	312-777-8575
Ind	Indianapolis, R.M. Price	317-255-0665
Kans	Lenexa, Matney & Co.	913-888-6900
La	Metairie, General Power & Control	504-834-1345

Md	Pikesville, A.D. Wilson Assocs.	301-252-2231
Mass	Framingham, Total Power Corp.	617-237-2024
Mich	Southfield, Engel-Klaes Co.	313-355-1610
Minn	Minneapolis, A.M. Johnson Co.	612-927-8741
Mo	St. Louis, Karraker Co.	314-231-3666
Neb	Omaha, Electric Equip. Sls. Co.	402-556-4198
NM	Albuquerque, Bowden Engrg. & Sls.	505-268-7676
NY	Buffalo, Robinson Assocs.	716-886-7350
NY	Latham, Robinson Assocs.	518-785-5844
NY	New York City, NEPA, Inc.	212-867-0340
NY	Rochester, Robinson Assocs.	716-342-3130
NY	Syracuse, Robinson Assocs.	315-478-0241
NY	White Plains, Shea Assocs.	914-949-2366
NC	Charlotte, Motion Technology, Inc.	704-525-9855

NC	Greensboro, R.W. Chapman & Co.	919-273-1809
NC	Raleigh, R.W. Chapman & Co.	919-782-2624
Ohio	Chagrin Falls, Drivex Corp.	216-247-6701
Ohio	Cincinnati, Alexander Equip. Co.	513-221-7520
Ohio	Cleveland, Collart Co.	216-333-5550
Ohio	Wadsworth, Ohio Industrial	216-334-2518
Okla	Tulsa, H. Furtney Co.	918-747-6490
Ore	Gresham, Artwel Electric/Structural Substations	503-665-5141
Pa	Concordville, Harris & Kenworthy, Inc.	215-459-5532
Pa	Philadelphia, Technicraft Co.	215-483-4700
Pa	Pittsburgh, Waggoner-Ver Hill Assocs.	412-241-5202

SC	Greenville, R.W. Chapman & Co.	803-232-5391
SC	W. Columbia, R.W. Chapman & Co.	803-796-9796

Tenn	Concord, R.W. Chapman & Co.	615-968-6120
Tex	Dallas, Carey & Assocs.	214-363-7813
Tex	Houston, Carey & Assocs.	713-460-1111
Va	Falls Church, Negley Assocs.	703-560-7920
WVa	Charleston, McJunkin Corp.	304-348-5211
Wisc	Cedarburg, W. Osborn Assocs.	414-377-2400

CYCLE-DYNE, INC., Sub. Axel Elctns., Inc., 134-20 Jamaica Ave., Jamaica, N.Y., 11418, Tel: 212-AX 1-3907, TWX: 710-582-2618; Empl: 50; Minimum order: \$15

For info on price: A. H. Fisher; Application info: N. Gagliardi; Customer service: D. Drechsel; Delivery info: W. McCook

Free literature available: Induction and Dielectric Heating Equipment, accessories, heat exchangers, work coils, fixtures, spare parts and service in the field.

Products manufactured: Converters, Dielectric Heating Equipment, Generators, Heaters & Heating Elements, Machines/Machinery, Production, Soldering Equipment

CYCLO-TRONICS, INC., 3858 N. Cicero Ave., Chicago, Ill., 60641, Tel: 312-282-6141; Empl: 10

Customer service: Dave Goldware

Products manufactured: Machines/Machinery, Production

Local Sales Offices & Reps.
EXP: Burlington, Ont., Can., Arbell Equip. Ltd.
416-632-9494

CYCON CORP., 1080 E. Duane Ave., Sunnyvale, Cal., 94086, Tel: 408-732-8311, TWX: 910-339-9216; Empl: 40

For info on price: D. Armanino; Application info: C. Cump; Customer service: D. Armanino; Delivery info: D. Armanino

Free literature available: Our literature contains specifications, pin outs, operational characteristics, and applications data for proprietary & second source A/D and D/A Converters.

Products manufactured: Amplifiers, Converters, Multiplexers, Multipliers

Local Sales Offices & Reps.		
Ala	Huntsville, South Central Mkt.	205-852-4600
Ariz	Tempe, J. F. Hurlbut & Co.	602-968-5962
Cal	Los Angeles, Basic Sys. Co.	213-938-2833
Cal	San Carlos, Electronic Engrg. Assocs.	415-593-2189

Colo	Golden, J. F. Hurlbut & Co.	303-279-7138
Conn	Hamden, Instrument Consultants, Inc.	203-288-5246
Fla	Orlando, Truex Assocs.	305-859-2160
Ill	Des Plaines, Coombs Assocs.	312-298-4830
Mass	Waban, Instrument Consultants, Inc.	617-969-9881
Minn	Minneapolis, Arjay Sls.	612-925-1833
Mo	St. Louis, Beneka & McCaul	314-567-3657
NY	Syracuse, T. Elctns.	315-463-8592
Pa	Abington, Bach Stewart Assocs.	215-885-1550
Tex	Dallas, McCoy Assocs.	214-350-9931
Tex	Houston, Carter Assocs.	713-644-1307
Wash	Seattle, R. Drake & Assocs.	206-763-2765
Wisc	Greendale, Coombs Assocs.	414-421-2300

D-CEMCO, INC., 3200 N. San Fernando Blvd., Burbank, Calif., 91504, Tel: 213-849-6341; Empl: 16; Minimum order: \$20

For info on price: G. Vogel; Application info: E. L. Deatrick; Customer service: G. Vogel; Delivery info: D. Vogel

Products manufactured: Contacts, Electrical, Frames, Cabinet & Rack, Guides, Circuit Board, Handles For Cabinets, Circuit Boards, Racks, etc., Kits, Breadboarding (For Engineers), Pads, Transistor Mounting, Spacers, Terminal Blocks, Boards & Strips, Terminals

D & L SALES CO. INC., 296 Preakness Ave., Paterson, N.J., 07502, Tel: 201-684-8223, 684-8224; Empl: 10; Minimum order: \$25

For info on price: I. Delgado; Application info: N. Bufundo; Customer service: I. Delgado; Delivery info: I. Delgado

Products manufactured: Bobbins, Winding, Coil & Transformer, Coils Including Assemblies & Forms

DABURN ELECTRONICS & CABLE CORP., 2360 Hoffman, Bronx, N.Y., 10458, Tel: 212-295-0050, TWX: 710-593-4145; FSC No: 25706; Minimum order: \$25 p. 2-1973-1992

For info on price: F. Martin; Application info: B. Danziger; Customer service: S. Goltz; Delivery info: M. Wiczorek

Free literature available: Full catalog of electronic wire, cable, tubing and sleeving, lacing cord and tape, fastening devices and hardware; includes teflon constructions, audio and communication cables, retractable cords; shrinkable PVC, polyolefin, teflon, kynar, neoprene, dual wall teflon tubing and shrinkable tape.

Products manufactured: Braid, Cable, Bushings, Glass, Plastic, Metal, Rubber, Etc., Cable, Caps, Forms & Tapes, Heat Shrinkable, Clamps & Clips, Connectors, Cords, Fasteners, Heat Guns, Production, Heat Sinks, Soldering, Insulators & Insulation, Jacks (All Types), Plugs, Posts, Switch Hardware, Switches, Terminal Blocks, Boards & Strips, Terminals, Tubing, Wire, Wire & Cable Ties, Wire Shielding

Local Sales Offices & Reps.

Ala	Gadsden, F.C. Nickerson Co.	205-547-7718
Cal	San Mateo, Carelli-EMA	415-341-6666
Conn	Waterbury, Anderson Sls. Co.	203-753-2487
Fla	Oldsmar, F.C. Nickerson Co.	813-855-4209
Fla	Seminola, F.C. Nickerson Co.	813-397-4843
Fla	Tampa, F.C. Nickerson Co.	813-885-1416
Haw	Honolulu, Hawaii Elctn. Ser.	808-848-8207
Kans	Colwich, Dy-Tronix, Inc.	316-263-6590
Md	Baltimore, Dyna Rep Co.	301-256-8300
Mass	Boston, Anderson Sls. Co.	617-227-2980
Mo	Hazelwood, Dy-Tronix, Inc.	314-731-5799
Mo	Kansas City, Dy-Tronix, Inc.	816-761-6543
NJ	Haddonfield, Dyna Rep.	609-795-1700
NY	E. Syracuse, Honsinger Assoc.	315-463-5718
NY	Liverpool, Lewis-Dunnigan Co.	315-622-2133
NY	Plainview, R. Smith Assoc.	516-681-3155
NY	Spring Valley, R. Smith Assoc.	914-354-6067
NC	Franklin, F.C. Nickerson Co.	704-524-6363
Ohio	Cleveland, Ind'l. Sls. Assoc.	216-721-7500
Tex	Garland, G.V. Peck Co.	214-341-8311
Va	Alexandria, Dyna Rep.	703-354-1222
Va	Newport News, Dyna Rep.	804-874-7729

DACO INSTR. CO., 30 Stran Rd., Milford, Conn., 06460, Tel: 203-874-2515, TWX: 710-462-1049; Empl.: 40

Products manufactured: Dehumidifiers (For Equipment), Dehydrators, Display Devices/Displays, Indicators, Solenoids

DAICO INDUSTRIES INC., Box 5225, Compton, Cal., 90220, Tel: 213-631-1143, TWX: 910-346-6741; Empl.: 35; Minimum order: \$50 p. 2-1281-1284
Customer service: P. Nooteboom

Free literature available: Cat & Chart, Low frequency (IF and RF) switches, programmable (multi-bit) attenuators and phase shifters. Combining elements include both solid state switches and RF relays.

Products manufactured: Antenna Switching Matrices, Attenuators, Couplers, Relays, Shifters, Switches

Local Sales Offices & Reps.

Ariz	Scottsdale, J. Smith & Assocs.	602-947-2495
Cal	Los Altos, Cain-White & Co.	415-948-6533
Colo	Boulder, J. Smith & Assocs.	303-442-7100
Colo	Littleton, J. Smith & Assocs.	303-794-8891
Fla	Palm Bay, Spartech Assocs.	305-727-8045
Ga	Smyrna, Spartech Assocs.	404-432-3644
Iowa	Cedar Rapids, Penzner-Mankus Assocs.	319-362-9177
Kans	Overland Park, Penzner-Mankus Assocs.	923-381-0004
Kans	Wichita, Penzner-Mankus Assocs.	316-264-2662
Mass	Cochituate, Micronic Assocs.	617-872-6561
Mo	Hazelwood, Penzner-Mankus Assocs.	314-731-4334
NM	Albuquerque, J. Smith & Assocs.	505-255-2111
NY	Huntington Station, Gray & Reed Assocs.	516-GE 3-3333
Pa	Newtown Square, SWR Assocs.	215-EL6-8550
Wash	Seattle, Datacom Assocs.	206-285-2525

DALE ELECTRONICS INC., Sub. Lionel Corp., Box 609, Columbus, Neb., 68601, Tel: 402-564-3131, TWX: 910-668-3605; Empl.: 2000; Minimum order: \$35 p. 2-1452

Customer service: N. Newman

Free literature available: Dale Full Line Catalog 232 pages of detailed catalog information on all Dale propus lines. Wirewound-film resistors, resistor networks, trimmer pots, connectors, inductors, transformers and surge arresters.

Products manufactured: Arresters, Electrical Surge, Lightning, Attenuators, Chokes, Coils Including Assemblies & Forms, Connectors, Converters, Networks, Potentiometers, Relays, Resistors, Transformers

Local Sales Offices & Reps.

Ariz	Scottsdale, Williams Assocs.	602-947-4297
Cal	Los Alamitos, J.S. Heaton Co. South	213-598-6676
Cal	Redwood City, J.S. Heaton Co. North	415-369-4671
Cal	San Diego, J.S. Heaton Co. South	714-454-1456
Colo	Denver, Williams Assocs.	303-373-4730
Fla	Palm Beach Gardens, Graham Assocs.	305-622-4049
Ill	Chicago, D.J.M. Elctn. Sls., Inc.	312-774-6525
Ind	Fort Wayne, Scott Elctns., Inc.	219-743-1586
Ind	Indianapolis, Scott Elctns., Inc.	317-897-9976
Ky	Louisville, Scott Elctns., Inc.	502-583-3220
Md	Towson, R.L. Wilkinson, Inc.	301-377-7800
Mass	Wakefield, Kaelber & Mack, Inc.	617-245-9359
Mich	Detroit, Burcaw Co. & Assocs.	313-533-7700
Mich	Kentwood, Burcaw Co. & Assocs.	616-531-1000
Minn	Minneapolis, Merrill Franklin Co.	612-835-6422
NJ	Fairlawn, Kaelber & Mack, Inc.	201-797-7782
NM	Albuquerque, Williams Assocs.	505-255-1638
NY	Buffalo, M. Farber Assocs.	716-856-3543
NY	Manhasset, Kaelber & Mack, Inc.	516-627-6620
NC	Charlotte, J. Rudisill Assocs.	704-377-6901
Ohio	Cleveland, Scott Elctns., Inc.	216-291-2600
Ohio	Columbus, Scott Elctns., Inc.	614-236-8619
Ohio	Dayton, Scott Elctns., Inc.	513-294-0539
Okla	Tulsa, E.F. Aymond Co.	918-936-2562
Ore	Beaverton, ES/Chase Co.	503-649-6177
Pa	Glenside, R. Wilkinson, Inc.	215-424-8400
Pa	Pittsburgh, Scott Elctns., Inc.	412-781-3112
Tex	Dallas, E.F. Aymond Co.	214-826-7620
Tex	Houston, E.F. Aymond Co.	713-442-5791
Wash	Edmonds, ES/Chase Co.	206-774-3586
Wisc	Cambridge, D. J. M. Elctns. Sls.	608-423-4190
FOR:	Canada, Scarborough, Ont., Dale Electronics, Canada, Ltd.	416-759-5631

Local Distributors

Ariz	Phoenix, Dalis Elctn. Supply, 917 N. 7th St.	602-258-8151
Ariz	Phoenix, Hamilton/Avnet Corp., 2615 S. 21st St.	602-275-7851
Cal	Culver City, Avnet Corp., 10916 Washington Blvd.	213-559-4111
Cal	Mountain View, Hamilton/Avnet Corp., 575 E. Middlefield Rd.	415-961-7000
Cal	Mountain View, Shelley-Rodabaugh, 2444 Old Middlefield Way	415-969-1820
Cal	San Diego, Hamilton/Avnet Corp., 8917 Complex Dr.	714-279-1550
Cal	San Diego, Shanks & Wright, 2045 Kettner Blvd.	714-239-0176
Cal	San Diego, Shelley-Neumann, Inc., 3347 Industrial Ct.	714-459-3701
Cal	Santa Monica, F. Shelley Elctns., 1040 Pico Blvd.	213-392-3913
Colo	Denver, Newark-Denver Elctns., 2170 S. Grape St.	303-757-3351
Colo	Denver, Waco Elctns., 4616 Ironton St.	303-371-4370
Conn	Stratford, Electro/Comp, 2415 Main St.	203-375-5811
Fla	Ft Lauderdale, Newark Elctns., 1360 N.W. 65th Ave.	305-587-2372
Fla	Palm Beach Gardens, G.S. Marshall Co., 10385 Riverside Dr.	305-622-8490
Ga	Atlanta, Jackson Elctns., 1135 Chattahoochee Ave., N.W.	404-355-2223
Ill	Chicago, Newark Elctns., 500 N. Pulaski Rd.	312-638-4411
Ill	Elgin, Allied Elctns., 1355 Sleepy Hollow Rd.	312-697-8200
Ill	Palatine, Ohm Elctns., 649 Vermont Ave.	312-359-5500
Ill	Schiller Park, Hamilton/Avnet Elctns., 3901 Pace Ct.	312-678-6310
Ill	Skokie, Bell Inds., 7701 N. Austin Ave.	312-282-5400
Ind	Evansville, Ohio Valley Sound, 20 E. Sycamore St.	812-425-6173
Ind	Ft. Wayne, Ft. Wayne Elctns., 3606 Maumee Ave.	219-742-4346
Ind	Indianapolis, Graham Elec. Supply, 133 S. Pennsylvania St.	317-634-8202
Ind	South Bend, Radio Distributing Co., 1212 High St.	219-287-2911
Iowa	Cedar Rapids, Deeco, Inc., 2500 16th Ave., S.W.	319-365-7551
Kans	Wichita, Radio Supply Co., 115 Laura	316-267-5216

Ky	Lexington, Radio Elctn. Equip Co., 480 Skain Ave.	606-255-6661
La	New Orleans, Southern Radio Supply Co., 1909 Tulane Ave.	504-524-2343
Md	Baltimore, Radio Elec. Svc. Co., 1026 Cromwell Bridge Rd.	301-823-0070
Mass	Watertown, Sterling Elctns., 51 Spring St.	617-926-9720
Mass	West Newton, A.W. Mayer Co., 38 Border St.	617-965-1111
Mich	Ann Arbor, Wedemeyer Elctn. Supply, 2280 S. Industrial Hwy.	313-665-8611
Mich	Detroit, R S Elctns., 12775 Lyndon St.	313-491-1000
Mich	Grand Rapids, Stotts-Friedman, 2035 Eastern, S.E.	616-241-6731
Mich	Oak Park, Newark-Detroit Elctns., 20700 Hubbell Ave.	313-548-0250
Mich	Wyoming, Newark Industrial Elec. Corp., 3645 Linden Ave., S.E.	616-241-6681
Minn	Minneapolis, Stark Elctns., 112 3rd Ave., N.	612-332-1325
Minn	St. Paul, Gopher Elctns. Co., 2520 W. Larpenteur	612-645-0241
Mo	Kansas City, Burnstein-Applebee Co., 3199 Mercier St.	816-561-5460
Mo	Kansas City, Radiolab, Inc., 3814 Main	816-561-9935
Mo	St. Charles, Lectronix, Inc., 306 McDonough St.	314-946-6424
NJ	Clifton, Wilshire Elctns., 312 Clifton Ave.	201-365-2600
NJ	Kenilworth, Newark Elctns. Ctr., 303 Monroe Ave.	201-272-8410
NJ	Rahway, Terminal Elctns., Rahway Ind'l. Ctr., 1463 Pinewood St.	201-381-5700
NJ	Roselle, Garden State Ind'l. Elctns., 407 Hope Ave.	201-241-9000
NJ	Springfield, Federated Purchaser, 155 U.S. Rte 22	201-376-8900
NJ	Springfield, Route Elctns., Echo Plaza, U.S. Rte. 22	201-379-7710
NJ	Trenton, Allen & Hurley, 23 S. Warren St.	609-393-3300
NM	Albuquerque, Kierulff Elctns. Co., 2524 Baylor Dr., S.E.	505-247-1058
NM	Albuquerque, Sterling Elctns., 3530 Pan American Fwy., N.E.	505-345-6601
NY	Binghamton, Stack Ind'l. Elctns., 45 Washington Ave.	607-723-6326
NY	Buffalo, Radio Equip. Corp., 196 Vulcan St.	716-874-2690
NY	Buffalo, Summit Dist., 916 Main	716-884-3450
NY	E. Farmingdale, Harrison Radio Corp., 20 Smith St.	516-293-7990
NY	Farmingdale, Arrow Elctns., 900 Broad Hollow Rd.	516-694-6800
NY	Farmingdale, Hallmark Elctns., 167 Marine St.	516-293-7500
NY	Johnson City, Wilshire Elctns., 617 Main St.	607-797-1236
NY	Plainview, Fairmont Elctns., 35 S. Service Rd.	516-694-8200
NY	Poughkeepsie, Higgins & Sheer, 123 Dutchess Turnpike	914-471-3510
NY	Rochester, Simcona Elctns. Corp., 275 Mt. Read Blvd.	716-328-3230
NY	Rockville Centre, Midway Ind'l. Elctns., 24 Maple Ave.	516-764-2400
NY	Rome, Rome Elctns., 216 Erie Blvd. E.	515-337-5400
NY	Yorkville, Valley Ind'l. Elctns., Commercial Dr.	315-736-3393
NC	Charlotte, Brownell-Electro, 5141 Belhaven Blvd.	704-394-4341
NC	Winston-Salem, Kirkman Elctns., 901 W. Second St.	919-724-0541
Ohio	Cincinnati, Hughes-Peters, Inc., 4865 Duck Creek Rd.	513-351-2000
Ohio	Cleveland, Pioneer Standard Elctns., 4800 E. 131st St.	216-587-3600
Ohio	Cleveland, W.M. Pattison Supply Co., 4550 Willow Pkwy.	216-441-3000
Ohio	Cleveland, Winteradio Elctns. Supply Corp., 1468 W. 25th St.	216-621-9383
Ohio	Columbus, Hughes-Peters, Inc., 481 E. 11th Ave.	614-294-5351
Ohio	Dayton, Nasco, Inc., 3201 Plainfield Rd.	513-236-9900
Ohio	Dayton, Pioneer/Dayton, 1900 Troy St.	513-253-9176
Ohio	Kettering, Plaintronics Co., Box 2265, 3100 Plainfield Rd.	419-228-1220
Okla	Tulsa, Oil Capitol Elctns., 708 S. Sheridan	918-836-2541
Okla	Tulsa, Radio, Inc., 1000 S. Main	918-587-9123

Ore Portland, Almac/Stroum Electrs., Box 25444
503-292-3534

Pa Philadelphia, Herbach & Rademan, 401 E. Erie
Ave. 215-426-1700

Pa Pittsburgh, Cameradio Co., 2801 Liberty Ave.
412-288-2600

Pa Pittsburgh, RPC Electrs., 620 Alpha Dr.
412-782-3770

Ri Providence, W. Dandreta & Co., 28 Wolcott St.
401-861-2800

Tenn Nashville, Electra Distributing Co., 1914 W. End
Ave. 615-329-3971

Tex Dallas, Sterling Electrs., 2875 Merrell Rd. Box
20129 214-357-9131

Tex El Paso, McNichols, Inc., 3012 E. Yandell Dr.
915-566-2936

Tex Fort Worth, Textronics, Inc., 1108 E. Lancaster
817-335-8111

Tex Houston, Lenet Co., Box 2184, 1420 Hutchins
713-225-1465

Tex Houston, Sterling Electrs., Box 1229
713-623-6600

Va Richmond, I.T.R., 1425 Blue Jay La.
804-288-7198

Wash Bellevue, Hamilton/Avnet Corp., 13407 Northrup
Way 206-624-5930

Wash Seattle, Almac-Stroum Electrs., 5811 Sixth Ave.
S. 206-763-2300

Wash Seattle, Radar Elec. Co., 168 Western Ave., W.
206-282-2511

WVa Charleston, McJunkin Corp., Box 513
304-348-5211

DALE ELECTRONICS, INC., Box 74, Norfolk, Nebr.,
68701, Tel: 402-371-0080, TWX: 910-623-0163; Minimum
order: \$35 p. 2-1452

Customer service: B. Means
Free literature available: Refer to Dale Electronics,
Columbus Neb. for catalog information.
Products manufactured: Attenuators, Circuits,
Hybrid, Thick Film, Filters, Networks, Resistors
Refer to Dale Electronics Columbus, Neb. for sales
office and distributor information.

DALE ELCTRS., INC., Yankton Div., E. Hwy. 50, Box
180, Yankton, S.D., 57078, Tel: 605-665-9301, TWX:
910-668-3605; Empl.: 250; Minimum order: \$35
p. 2-1452

Customer service: John Elliot
Free literature available: Refer to Dale Electronics,
Columbus Neb. for catalog information.
Products manufactured: Arresters, Electrical Surge,
Lightning, Bobbins, Winding, Coil & Transformer,
Chokes, Coils Including Assemblies & Forms,
Connectors, Controls/Control Eqpt., Drives &
Drive Mechanisms (Dial), Filters, Kits,
Potentiometer, Rheostat, Motors, Potentiometers,
Protectors, Relays, Spark Gaps, Suppressors,
Transformers
Refer to Dale Electrs., Columbus, Neb. for sales
office and distributor information.

DALE ELCTRS. CANADA, LTD., 18 Howden Rd.,
Scarborough, Ont., Can., Tel: 416-759-5631, TWX:
610-492-1381; Minimum order: \$35 p. 2-1452

Customer service: K. Beeby
Free literature available: Refer to Dale Electrs.,
Columbus, Neb. for catalog information.
Products manufactured: Resistors
Local Sales Offices & Reps.
FOR: Can., Burnaby, B.C., ES/Chase Ltd.
604-298-4515
FOR: Can., Dorval, Que., Avotroics Ltd. 514-631-9168
FOR: Can., London, Ont., Welwyn Can. Ltd.
519-451-9490
FOR: Can., Montreal, Que., Bach-Simpson Ltd.
514-731-9617
FOR: Can., Willowdale, Ont., Avotroics Ltd.
416-493-9711

DAMON CORP., Electrs. Div., 80 Wilson Way,
Westwood, Mass., 02090, Tel: 617-449-0800, TWX:
710-348-6722; Empl.: 75; Minimum order: \$50
p. 1-312,313

Customer service: Ed Doherty
Products manufactured: Delay Lines,
Discriminators, Filters, Oscillators

Local Sales Offices & Reps.
Cal No. Hollywood, Jewett Assocs. 213-789-8103
Cal Palo Alto, Waldman Assocs. 415-961-4100
Del Springfield, Scientific Devices 703-451-6500
Fla Melbourne, Repcom, Inc. 305-254-1877
Ill Northfield, Feller Assoc. 312-446-8065
Mass Cambridge, Vector Sis. 617-491-5700

NJ Cherry Hill, Stemler Assocs. 609-966-4070
NM Albuquerque, ALS Electrs. 505-298-2575
NY Tuckahoe, Spectrum Sis. 914-793-1660
Tex Addison, Southland Comp. 214-233-0603

DAN-L INC., 229 Laurel Rd., E. Northport, N.Y., 11731,
Tel: 516-757-8000; FSC No: 28327; Empl.: 22; Minimum
order: \$25

For info on price: E. P. Huber; Application info: D.
Eltermann; Customer service: J. Ciosky; Delivery info:
E. P. Huber

Products manufactured: Sockets

DANA EXACT ELECTRONICS, INC., Box 160, 455 SE
2nd Ave., Hillsboro, Ore., 97123, Tel: 503-648-6661,
TWX: 910-460-8811; Empl.: 60; Minimum order: \$5
p. 1-644,645

Customer service: J. Foster

Free literature available: Dana exact Electronics, Inc.
short form catalog listing function generators,
waveform synthesizers and frequency
synthesizers.

Products manufactured: Amplifiers, Generators,
Synthesizers

Local Sales Offices & Reps.

Ala Huntsville, BCS Assocs. 205-881-6220
Ariz Scottsdale, PLS Assocs. 602-957-9110
Cal Los Angeles, Basic Sys. Corp. 213-938-2833
Cal Palo Alto, Coherent Mktg. Assocs. 415-327-2217
Colo Denver, PLS Assocs. 303-771-0140
Fla Orlando, BCS Assocs. 305-896-4881
Ill Chicago, Pivan Engrg. Inc. 312-539-4838
Ind Indianapolis, Pivan Engrg. Inc. 317-253-1681
Kans Shawnee Mission, Pivan Engrg. Inc. 913-722-1030
Md Kensington, Electronic Mktg. Assocs. 301-744-7700
Mass Waltham, Measurement Conslts. Corp. 617-890-4400
Mich Farmington, Carter, McCormic & Peirce, Inc. 313-477-7700
Minn Minneapolis, Pivan Engrg. Inc. 612-537-4501
Mo St. Louis, Pivan Engrg. Inc. 314-567-3636
NM Albuquerque, PLS Assocs. Inc. 505-255-2330
NY Great Neck, Measurement Tech. Inc. 516-482-3500
NY Rochester, KLM Assocs. Inc. 315-735-8525
NC Greensboro, BCS Assocs. Inc. 919-273-1918
Ohio Cleveland, Carter, McCormic & Peirce, Inc. 216-333-5650
Ohio Dayton, Carter, McCormic & Peirce, Inc. 513-278-5873
Okla Tulsa, Palatine Sis. Inc. 918-622-0321
Ore Portland, Hayes Technical 503-238-0001
Pa King of Prussia, Electronic Mktg. Ass.-Carter,
McCormic/P 412-472-4415
Ri Cumberland, Measurement Consultants Corp. 410-333-6000
Tex Richardson, Palatine Sis. Inc. 214-231-9489
Wash Seattle, Hayes Technical 206-763-2210
Wisc Brookfield, Pivan Engrg. Inc. 414-786-1940
FOR: Can., Downsview, Ont., Electronic Sys. Ltd. 416-661-3673

DANA LABS., INC., 2401 Campus Dr., Irvine, Calif., 92664,
Tel: 714-833-1234, TWX: 910-595-1136; FSC No: 21793;
Empl.: 300

For info on price: C. Steinke; Application info: C.
Steinke; Customer service: B. Bishop; Delivery info:
C. Steinke

Free literature available: The package contains
information on our digital voltmeters, electronic
counters and frequency synthesizers, including
our new model 2000 Nanometer which is a
hand-held digital voltmeter that runs on a 9 volt
transistor battery. Each catalog includes general
information on the product as well as
specifications.

Products manufactured: Counters, Meters,
Synthesizers

Local Sales Offices & Reps.

Ala Huntsville, Gentry Assocs., Inc. 205-534-9771
Ariz Phoenix, PLS 602-957-9110
Cal Irvine, Dana Labs, Inc. 714-833-1234
Cal La Jolla, Ward-Davis Assocs. 714-459-3351
Cal Lawndale, Ward-Davis Assocs. 213-542-7740
Cal Sunnyvale, Ward-Davis Assocs. 408-245-3700
Colo Denver, PLS 303-771-0140
Conn Hamden, P. Jenks Assocs. 203-281-0810
DC Wheaton, Sonco, Inc. 301-942-9420
Fla Orlando, Gentry Assocs., Inc. 305-894-4401
Ill Chicago, Pivan Engrg. Co. 312-539-4838
Ind Indianapolis, Pivan Engrg. Co. 317-253-1681

Kans Shawnee Mission, Pivan Engrg. Co. 913-722-1030
Md Wheaton, Sonco, Inc. 301-942-9420
Mass Wakefield, P. Jenks Assocs. 617-246-1590
Mich Farmington, Carter, McCormic & Peirce, Inc. 313-477-7700

Mich Kalamazoo, Carter, McCormic & Peirce, Inc. 616-349-9666

Minn Minneapolis, Pivan Engrg. Co. 612-537-4501
Mo St. Louis, Pivan Engrg. Co. 314-567-3636
NJ Ft. Lee, Tech. Mktg. Assocs. 201-224-6911
NM Albuquerque, PLS 505-255-2330
NY Rochester, Ossmann Instruments, Inc. 716-328-2230

NY Syracuse, Ossmann Instruments, Inc. 315-437-6666

NY Vestal, Ossmann Instruments, Inc. 607-785-8947

NC Burlington, Gentry Assocs. Inc. 919-227-3639
Ohio Cleveland, Carter, McCormic & Peirce, Inc. 216-333-5650

Ohio Dayton, Carter, McCormic & Peirce, Inc. 513-278-5873

Okla Norman, Data Mktg. Assocs. 405-364-8320
Pa Blue Bell, Sonco, Inc. 215-542-1490
Pa Pittsburgh, Carter, McCormic & Peirce, Inc. 412-824-3760

Tex Dallas, Data Mktg. Assocs. 214-661-0300
Tex Houston, Data Mktg. Assocs. 713-686-9627
Tex San Antonio, Data Mktg. Assocs. 512-828-0937
Wash Seattle, R. Drake Assocs., Inc. 206-763-2755
Wisc Brookfield, Pivan Engrg. Co. 414-786-1940

DANIELS MFG. CORP., 2266 Franklin Rd., Bloomfield
Hills, Mich., 48013, Tel: 313-338-9611; FSC No: 5120;
QPL No: 22520; Empl.: 50; Minimum order: \$25
For info on price: W. Daniels; Application info: H.
Kemmer; Customer service: H. Kemmer; Delivery
info: H. Kemmer

Free literature available: Catalogs describing
crimping tools, contact insertion & removal tools
and tool kits. Catalog also includes cross
reference of tools and contact part numbers they
will crimp.
Products manufactured: Tools

Local Sales Offices & Reps.

Ala Madison, Southeastern Assocs. 205-772-9616
Cal Bellflower, Daniels Mfg. Corp. 714-774-6872
Fla Orlando, Balmor Ents. 305-851-4041
Md Bethesda, Sparks & Co. 301-654-1094

DANTRONICS, INC., 3175 Hafner Ct., St. Paul, Minn.,
55112, Tel: 612-484-2108; Empl.: 22

Free literature available: Dantec 100 Automatic
Transistor tester, Dantec 200 medium power diode
and SCR tester.

Products manufactured: Analyzers,
Controls/Control Eqpt., Meters, Testers

Advertisement

TESTERS FOR TRANSISTORS,
DIODES, SLR'S, FETS, TRIACS,
POTS, ETC.

EITHER ON WAFER OR FINAL
DEVICE
FOR HIGH SPEED HANDLERS
OR MANUAL INSERTION.

D.A.T.A. INC., A Cordura Co., 32 Lincoln Ave., Orange,
N.J., 07050, Tel: 201-673-8030, TWX: 710-994-5839;
Empl.: 36; Minimum order: \$9.75

For info on price: P. McGill; Application info: E. H.
Marriott; Customer service: B. Ehrlich; Delivery info:
P. McGill

Free literature available: Brochures and Price lists.

Products manufactured: Technical Books

DATA, INC., 130 S. Mason, Box 2074, Ft. Collins, Colo.,
80521, Tel: 303-493-1222; Empl.: 3

Products manufactured: Amplifiers, Recorders

DATA-CONTROL SYSTEMS, Commerce Dr., Box 584,
Danbury, Conn., 06810, Tel: 203-743-9241, TWX:
710-456-0376; FSC No: 08539; Empl.: 199; Minimum
order: \$50

Customer service: J. S. Lombardo

Free literature available: Application and
Specification Information On Analog and Digital
(PCM) Telemetry Systems.

Products manufactured: Amplifiers, Calibrators, Comm. Systems, Data Acquisition & Reduction Systems, Decommutators, Telemetering, Demodulators, Detectors, Discriminators, Filters, Generators, Modulator/Demodulators, Modulators, All Kinds, Oscillators, Signal Conditioners & Equipment, Testers, Transmission Systems, Data

Local Sales Offices & Reps.

Ala	Huntsville, Data-Control Sys.	205-536-0784
Ariz	Phoenix, BFA Corp.	602-946-4215
Cal	Westminster, Data-Control Sys.	714-894-4471
Cal	Denver, BFA Corp.	303-744-3301
Conn	Danbury, Data-Control Sys.	203-743-9241
Conn	Hamden, Pat Jenks Assoc.	203-281-0810
Fla	Orlando, Uni-Rep	305-295-4817
Mo	Laytonville, G T Assocs.	301-949-8060
Mass	Natick, Rabal Assoc.	617-655-5909
NM	Albuquerque, BFA Corp.	505-292-1212
NM	Las Cruces, BFA Corp.	505-523-0601
NY	Melville, Astrorep	516-423-2266
Ore	Norman, Data-Mktg. Assoc.	405-364-8320
Pa	Huntingdon Valley, Rabal Assoc.	215-947-4825
Tex	Dallas, Data Mktg. Assoc.	214-358-4643
Tex	Houston, Data-Mktg. Assocs.	713-686-9627
Tex	San Antonio, Data Mktg. Assocs.	512-828-0937
Utah	Salt Lake City, BFA Corp.	801-466-6522

DATA DELAY DEVICES, 253 Crooks Ave., Clifton, N.J., 07011, Tel: 201-772-1106; Empl.: 10 p. 1+445-451,552

Products manufactured: Coils Including Assemblies & Forms, Decade Boxes, Delay Lines, Equalizers, Filters, Networks, Oscillators, Synthesizers

Local Sales Offices & Reps.

Cal	Mountain View, Weseloh & Assocs.	415-961-0565
Cal	Santa Monica, Rep Assocs.	213-829-5401
Fla	Winter Haven, S & S Sls. Reps.	813-293-7304
Mass	Framingham, Victor Assocs.	617-879-5710
NY	Huntington, C. R. Mayer Co.	516-921-7876
Va	Alexandria, W. A. Brown Equip. Comp.	703-836-1800
Tex	Dallas, IBL Engrg. & Sls. Inc.	214-363-2921

Advertisement

We manufacture, Design, Develop:

- Electromagnetic Delay lines fixed; variable, lumped, distributed, electrically variable.
- Filters Passive & Active of all response types
- Inductors, Fixed, variable, toroids, electrically variable
- Oscillators, Low-Freq. modular
- Magnetostrictive Delay Lines

DATA DISC INC., 686 W. Maude Ave., Sunnyvale, Cal., 94086, Tel: 408-732-7330, TWX: 910-339-9244; Empl.: 281; Minimum order: \$25

For info on price: Sls. Dept.; Application info: Mktg. Dept.; Customer service: W. Sattler; Delivery info: Mktg. Dept.

Products manufactured: Display Devices/Displays, Memory Systems, Recorders, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Cal	Topanga, Data Disc	213-883-8413
Cal	Denver, Grifco	303-722-4674
Fla	Melbourne, Data Disc	305-724-2108
Ill	Glenview, Data Disc	312-729-8030
Kans	Shawnee Mission, Inland Assocs.	913-362-2366
Mo	Bethesda, Bartlett Assocs.	301-656-3061
Mass	Framingham, Bartlett Assocs.	617-879-7530
Mich	Center Line, Dietrich & Assocs.	313-784-6450
Minn	Hopkins, F. Peterson Co.	612-941-5400
Mo	Glencoe, Inland Assocs.	314-938-4992
NY	Elmsford, Data Disc	914-592-8658
NY	White Plains, Bartlett Assocs.	914-949-6476
NC	Charlotte, Electro-Rep Assocs.	704-527-2530
Ohio	Cleveland, Dietrich & Assocs.	216-781-1855
Ohio	Dayton, Dietrich & Assocs.	513-223-6042
Pa	Pittsburgh, Dietrich & Assocs.	412-892-2992
Pa	Wayne, Bartlett Assocs.	215-688-7325
Tex	Dallas, Thorson Co.	214-233-5744
Tex	Houston, Thorson Co.	713-771-3504

DATA DISPLAY PRODUCTS, 5428 W. 104th St., Los Angeles, Cal., 90045, Tel: 213-641-1232; FSC No: 15513; Empl.: 14; Minimum order: \$15

For info on price: P. Lodhie; Application info: Q. Lodhie; Customer service: P. Lodhie; Delivery info: P. Lodhie

Products manufactured: Diodes, Lamp Drivers, Lamps, Lights, Sockets

Local Sales Offices & Reps.

Ariz	Scottsdale, G. R. McKnight Co.	602-949-0809
Cal	Menlo Park, G. R. McKnight Co.	415-325-2844
Cal	Sun Valley, Weightman & Assocs.	213-768-5750
Ill	Glendale Heights, Trend-Tronics	312-963-2210
Mass	Sturbridge, Branford Controls	617-347-7367
Minn	Minneapolis, R. W. Marshall Co.	612-929-0457
NJ	Fair Lawn, Geo. D. Harris Assoc.	201-796-5200
NM	Albuquerque, McKnight Co.	505-266-6423
Pa	Jenkintown, Arnold Assocs.	215-742-0600

DATA GENERAL CORP., Route 9, Southboro, Mass., 01772, Tel: 617-485-9100, TWX: 710-390-0309; Empl.: 3000

Products manufactured: Computers, Converters, Memory Systems, Printers, Readers, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Ariz	Scottsdale	602-994-0351
Cal	El Segundo	213-973-0401
Cal	Palo Alto	415-965-1010
Cal	Sacramento	916-441-0167
Cal	San Diego	714-276-8450
Cal	Santa Ana	714-558-9421
Cal	Santa Barbara	
Colo	Denver	303-758-5080
Conn	North Haven	203-239-4438
Fla	Ft. Lauderdale	305-771-0784
Fla	Orlando	305-851-8230
Fla	St. Petersburg	813-576-4157
Ga	Atlanta	404-325-3181
Ill	Schaumburg	312-885-0505
Ind	Indianapolis	317-248-8306
Ky	Louisville	502-456-1490
Mass	Waltham	617-891-7000
Mich	Southfield	313-357-0006
Minn	Minneapolis	612-854-7727
Mo	Clayton	314-726-0811
Mo	Kansas City	816-531-1326
NJ	Saddlebrook	201-843-0676
NM	Albuquerque	505-266-5951
NY	Buffalo	716-674-6200
NY	Commack	516-864-2700
NY	New York City	212-867-1010
NY	Rochester	716-385-2000
NY	Schenectady	518-377-1300
NY	Syracuse	315-455-1525
NC	Greensboro	919-275-8586
Ohio	Dayton	513-435-1932
Ohio	Euclid	216-289-2660
Okla	Tulsa	918-749-5763
Ore	Portland	503-297-1756
Pa	Blue Bell	215-643-5515
Pa	Pittsburgh	412-922-7584
Tex	Austin	512-451-7487
Tex	Dallas	214-233-4496
Tex	Houston	713-688-8641
Utah	Salt Lake City	801-484-5271
Va	Falls Church	703-893-0910
Wash	Renton	206-228-5890
Wisc	Milwaukee	

DATAGRAPHICS CORP., 8402 Speedway, San Antonio, Tex., 78230, Tel: 512-342-9486; Empl.: 26; Minimum order: \$25

For info on price: S. Smith; Application info: S. Smith; Customer service: J. Kosek; Delivery info: S. Smith

Products manufactured: Converters, Data Acquisition & Reduction Systems, Data Loggers, Timers

Local Sales Offices & Reps.

Cal	Newport Beach, FLW, Inc.	714-540-4412
Cal	North Hollywood, FLW, Inc.	213-877-5518
Cal	San Diego, FLW, Inc.	714-277-0993
Conn	Hamden, Equipment Sls. Co.	203-248-5581
DC	Washington, Scientific Sys. Sls. Corp.	202-726-4161
Mass	Chelmsford, Equipment Sls. Co.	617-256-8547
Minn	Minneapolis, Kirkeby & Assoc.	612-377-3239
NM	Albuquerque, Moore-Eiler	505-344-8020
NY	Syoset, Scientific Sys. Sls.	516-921-3737
NC	Matthews, W.K. Hile Co.	704-847-9125
Ohio	Dayton, G.L. Ashby Assoc.	513-252-5627
Okla	Norman, Data Mktg. Assoc.	405-364-8320
Tex	Dallas, Data Mktg. Assoc.	214-358-4643
Tex	Houston, Data Mktg. Assoc.	713-686-9627
EXP	San Antonio, Tex., Data Graphics Corp.	512-342-9486

DATA NUMERICS, 141-A Central Ave., Farmingdale, N.Y., 11735, Tel: 516-293-6600; Empl.: 40

Customer service: A. H. Battaglia

Free literature available: Act I - Automatic continuity tester Act II - Automatic continuity tester, high voltage version Data check 200S - Cable & continuity tester, solid state version Data check 200H - Cable & continuity tester, Hi-Pot model

Products manufactured: Cards, Linear Function, Cards, Logic, Computers, Services, Assembly, Production & Test, Terminal Blocks, Boards & Strips, Test Systems, Testers

Local Sales Offices & Reps.

Cal	Encino, World Enterprises	213-342-5473
Cal	San Diego, Tauber & Assoc.	714-274-7242
Kan	Wichita, Vinco, Inc.	316-684-8224
Md	Cockeysville, Advanced Tech. Sls.	301-666-9026
Mass	Newton Centre, Daner Hayes	617-969-4650
Mich	Grand Rapids, R. P. Urban & Assoc.	616-245-0511
NY	Farmingdale, Haines Prod	516-420-1177
Pa	Erie, Tuznik Assoc.	814-459-1894
Wash	Seattle, Drake Assoc	206-763-2755

DATA PRECISION CORPORATION, Audubon Rd., Wakefield, Mass, 01880, Tel: 617-246-1600; Empl.: 100 p. 1+646,647

For info on price: R. Scheinfein; Application info: R. Scheinfein; Customer service: J. Muise; Delivery info: L. Beston

Free literature available: Catalogs of our 3 1/2, 4 1/2 & 5 1/2 digit digital multimeters, Catalog of our new 7 digit, 100 MHz frequency counter, Evaluating digital multimeters-guide to selecting the right meter for your application.

Products manufactured: Counters, Meters, Probes

Local Sales Offices & Reps.

Ala	Huntsville, Lee Assocs.	205-533-5896
Ariz	Scottsdale, Measurement Conslts.	602-944-9519
Cal	Costa Mesa, Meas. Assocs.	714-540-7160
Cal	Sunnyvale, Amasco	408-733-8690
Colo	Boulder, Meas. Conslts.	303-449-5294
Conn	E. Hartford, Tekdata, Inc.	203-525-7647
Fla	Ft. Lauderdale, Lee Assocs.	305-525-9798
Fla	Winterhaven, Lee Assocs.	813-294-5815
Ga	Atlanta, Lee Assocs.	404-457-7117
Haw	Kailua, Lanikai Elctns.	808-282-6286
Ill	Elk Grove Village, L. F. Green Assoc.	312-593-0282
Ind	Indianapolis, L. F. Green Assoc.	317-293-9827
Mo	Lanham, Brimberg Assoc.	301-552-2200
Mass	Burlington, Tekdata, Inc.	617-273-0198
Mich	Detroit, Micro Sls. Corp.	313-482-1229
Minn	Minneapolis, L. F. Green Assoc.	612-781-1611
Mo	Hazelwood, Production Automation Corp.	314-731-2331
Mo	Raytown, Production Automation Corp.	816-737-0066
NJ	Camden, QED Elctns. Inc. of PA	215-925-8711
NJ	Union City, Meas. Tech. Inc.	201-863-5660
NM	Albuquerque, Meas. Conslts.	505-265-6471
NM	Las Cruces, Meas. Conslts.	505-526-2491
NY	DeWitt, DB Assocs.	315-446-0220
NY	Great Neck, Measurement Tech. Inc.	516-482-3500
NC	Raleigh, Lee Assocs.	919-787-5818
Ohio	Cleveland, Micro Sls. Corp.	216-725-4560
Ohio	Dayton, Micro Sls. Corp.	513-433-8171
Ore	Portland, Hayes Tech.	503-238-0001
Tex	Dallas, Comspec, Inc.	214-234-4137
Tex	Houston, Comspec, Inc.	713-461-4487
Utah	Murray, Meas. Conslts.	801-268-3181
Wash	Seattle, Hayes Tech.	206-763-2210

DATAPRODUCTS CORP., 6219 DeSoto Ave., Woodland Hills, Cal., 91365, Tel: 213-887-8490; Empl.: 3500

Free literature available: OEM product catalog, Individual data sheets on all products.

Products manufactured: Comm. Systems, Computers

Local Sales Offices & Reps.

Cal	Newport Beach	714-752-7411
Cal	Sunnyvale	408-733-9890
Cal	Pompano Beach	305-942-2257
Md	Bethesda	301-652-8120
Mass	Framingham	617-620-1950
Mich	Southfield	313-355-0822
Minn	Minneapolis	612-835-2066
NJ	Cherry Hill	609-667-7555
Tex	Dallas	214-231-4771

DATA SPECIALTIES, 3455 Commercial Ave., North Brook, Ill., 60062, Tel: 312-564-1800; Empl.: 30; Minimum order: \$25

Customer service: E. Kaplan

Products manufactured: Comm. Systems, Data Acquisition & Reduction Systems, Data Loggers, Paper-Tape Preparation Systems, Perforators, Readers, Receivers, Recorders, Tape Winders

Local Sales Offices & Reps.

Ariz	Phoenix, Mountaintek	602-242-5551
Cal	San Diego, Moxon	714-292-4820
Cal	Sanita Clara, Moxon	408-249-2491
Colo	Boulder, Mountaintek	303-444-1783
Colo	Evergreen, Mountaintek	303-674-5255
Ind	Columbus, Miltronics	812-376-6321
Mass	Waltham, Digital Sys. Assoc.	617-899-4300
NM	Albuquerque, Mountaintek	505-268-0003
NY	Guiderland, Electro Modular Sys.	518-456-2665
NY	Roslyn Heights, Travco Assocs.	516-621-3223
Pa	Norristown, Denco	215-279-8146
Ri	N. Scituate, Digital Sys. Assoc.	401-647-5075
Utah	Salt Lake City, Mountaintek	801-272-4611

DATA TECHNOLOGY, 2700 S. Fairview, Santa Ana, Cal., 92704, Tel: 714-546-7160, TWX: 910-595-1570; Empl.: 150; Minimum order: \$25 p. 1-649-651-863

For info on price: S. Blakemore; Application info: W. Kennedy; Customer service: L. Lombard; Delivery info: S. Blakemore

Free literature available: Data sheets for: panel meters; multi meters; strip chart recorders.

Products manufactured: Backpanel Interconnect Systems, Converters, Meters, Recorders

Local Sales Offices & Reps.

Ariz	Phoenix, Trembley Assocs.	602-253-6104
Cal	Los Angeles, Basic Sys.	213-938-2833
Cal	Mountain View, Prod. Data of No. Calif.	415-941-4410
Cal	San Diego, Basic Sys.	714-279-9641
Colo	Broomfield, Figaro-Klebba Assocs.	303-466-8228
Fla	Orlando, E.G. Holmes	305-894-8901
Ga	Chamblee, E.G. Holmes	404-451-6161
Ill	Chicago, Sea Inc.	312-282-6694
Ind	Carmel, Sea Inc.	317-846-2593
Kans	Prairie Village, Engrg. Svcs.	913-649-4000
Md	Bel Air, Dyna Rep. Co.	703-354-1222
Mass	Braintree, Data Technology Corp.	617-843-0954
Mass	Waltham, McBar Assoc.	617-890-0233
Mich	Farmington Hills, H. Lowell Co.	313-851-7474
Minn	Minneapolis, Sea Inc.	612-425-4455
Mo	St. Louis, Engrg. Svcs.	314-997-1515
NJ	Bogota, Neville & Vespo	212-539-1515
NJ	Haddonfield, Dyna Rep.	609-795-1700
NY	New Hartford, KLM Assocs.	315-735-8525
NY	No. Syracuse, KLM Assocs.	315-458-6214
NY	Rochester, KLM Assocs.	716-442-0820
NY	Tuckahoe, Neville & Vespo	212-539-1515
Ohio	Cleveland, Data Equip. Sys. Co.	216-252-3151
Tex	Richardson, Lear Assocs.	214-231-5388
Utah	Salt Lake City, Figaro, Klebba Assoc.	303-466-8228

Va	Alexandria, Dyna Rep Co.	703-354-1222
Va	Virginia Beach, E.G. Holmes	804-481-6556
Wash	Seattle, L. Levinson Co.	206-323-5100
Wisc	Waukesha, Sea Inc.	414-547-6637
FOR:	Can., Downsview, Ont., Electronic Sys.	416-636-3673
FOR:	Can., Montreal, Que., Electronic Sys. Ltd.	514-343-4112
FOR:	Can., Ottawa, Ont., Electronic Sys. Ltd.	613-733-3781
FOR:	Can., Vancouver, BC, Electronic Sys. Ltd.	604-687-5696

DATA TECHNOLOGY INC., 65 Grove St., Watertown, Mass., 02172, Tel: 617-924-1773; Empl.: 42

Products manufactured: Computers, Controls/Control Eqp., Converters, Counters, Digitizers, Pencil Follower (Inc. Coordinate & Graphic), Encoders, Indicators, Recorders

Local Sales Offices & Reps.

Cal	San Marino, Dale-Dahl Assoc.	213-682-3417
Cal	Walnut Creek, Dale-Dahl Assoc.	415-933-9595
Ill	Deerfield, Traco Eng. Co.	312-945-3520
Md	Gaithersburg, Wright Co.	202-296-0979
Mass	Framingham, Victor Assocs.	617-879-5710
Mich	Southfield, Sterling-Howell Co.	313-352-8881
Mo	St. Louis, Coombs Assocs.	314-542-3399
NM	Albuquerque, W. Dolde Sys. Co.	505-256-0307
NY	Albany, J.A. Reagan Co.	518-489-4777
NY	Mamoronck, Neville & Vespo	212-539-1515
NY	New Hartford, J.A. Reagan Co.	315-732-3775
NY	Rochester, J.A. Reagan Co.	716-473-2115
Ohio	Cleveland, Geotronics Mktg. Assoc.	216-238-8520
Okl	Tulsa, J.W. Elder Co.	918-583-9149
Ore	Eugene, J. Tudor & Assocs.	503-344-9212
Ore	Portland, J. Tudor & Assocs.	503-288-5154

Pa	Exton, Scientific Mktg. Inc.	215-363-7377
Wash	Seattle, J. Tudor & Assocs.	206-682-7444
Wash	Spokane, J. Tudor & Assocs.	509-327-3328

DATA TEST CORP., 2450 Whitman Rd., Concord, Cal., 94518, Tel: 415-689-3583, TWX: 910-481-9973; Minimum order: \$25

Customer service: D. Greenwood

Free literature available: Family product guide.

Products manufactured: Analyzers, Test Systems, Testers

Local Sales Offices & Reps.

Ariz	Scottsdale, B F A Corp.	602-946-4215
Cal	Los Angeles, Burtis Instr. Sys.	213-887-1360
Cal	Oakland, Advanced Technology	415-452-1401
Colo	Denver, B F A Corp.	303-744-3301
Conn	Hamden, Equipment Sys. Co.	203-248-5581
Ill	Wheaton, Engrg. Prods. Assocs.	312-653-6826
Mass	Chelmsford, Equipment Sys. Co.	617-256-8547
Mich	Detroit, Electro Sys. Assocs.	313-526-8800
Minn	Minneapolis, Engrg. Prods. Assocs.	612-925-1883
NJ	Pennsauken, Megargel/Himmelstein Assoc.	609-662-3081
NM	Albuquerque, B F A Corp.	505-292-2323
NM	Las Cruces, B F A Corp.	505-523-0601
NY	Tuckahoe, Asco Elctns.	914-779-8110
Ohio	Cleveland, Electro Sys. Assocs.	216-261-5440
Ohio	Dayton, Electro Sys. Assocs.	513-426-5551
Okl	Norman, Data Mktg. Assocs.	405-364-8320
Pa	Pittsburgh, Electro Sys. Assocs.	412-371-9449
Tex	Dallas, Data Mktg. Assocs.	214-661-0300
Tex	Houston, Data Mktg. Assocs.	713-686-9627
Utah	San Antonio, Data Mktg. Assocs.	512-828-0937

DATA TRANSLATION, 109 Concord St., Framingham, Mass., 01701, Tel: 617-879-3595, Telex: 948316; Empl.: 15; Minimum order: \$38

Customer service: F. Molinari

Free literature available: DATAX Data Acquisition Module brochure; DATAX User Instruction Guide; Data Acquisition System articles; Point Plotting data sheets and application data; DC-DC Converter data sheets; Microcomputer and minicomputer interface guides.

Products manufactured: Amplifiers, Converters, Data Acquisition & Reduction Systems, Meters, Modules, Logic, Encapsulated

Local Sales Offices & Reps.

Ala	Huntsville, W.A. Brown Instrs., Inc.	205-539-4411
Ariz	Scottsdale, Barnhill Three	602-947-7841
Cal	Los Angeles, Basic Sys. Co.	213-938-2833
Cal	Mt. View, Product Data	415-941-4410
Colo	Denver, Barnhill Three	303-934-5505
Fla	Ft. Lauderdale, W.A. Brown Instrs.	305-776-4800
Fla	Ft. Walton Beach, W.A. Brown Instrs.	904-243-6424
Fla	Indianapolis, W.A. Brown Instrs.	305-723-0766
Fla	Orlando, W.A. Brown Instrs.	305-425-5505
Ga	Atlanta, W.A. Brown Instrs.	404-939-1674
Kans	Prairie Village, Engineering Svcs. Co.	913-649-4000
La	Gretna, W.A. Brown Instrs.	504-366-5766
Md	Fulton, Gans-Fryling	301-953-3724
Mo	St. Louis, Engineering Svcs. Co.	314-997-1515
NM	Albuquerque, Barnhill Three	505-299-7658
NY	Rego, Scientific Devices-New York	716-334-2445
NY	Tenafly, Budd-Tronics	201-569-2230
NC	Durham, W.A. Brown Instrs.	919-489-1546
Ohio	Wickliffe, Data-Tron	216-585-8421
Pa	Abington, Bach-Steward Assocs.	610-584-2614
Tenn	Knoxville, W.A. Brown Instrs.	615-584-2614
Tex	Houston, Barnhill Two	713-688-9971
Tex	Richardson, Barnhill Two	214-231-2573
Va	Arlington, Gans-Fryling	703-527-3262
Wash	Bellevue, Scientific Devices-Northwest	206-454-0900

DATACOM, INC., Box 278, Ft. Walton Beach, Fla., 32548, Tel: 904-244-6121, TWX: 510-730-7693; Empl.: 40; Minimum order: \$25

For info on price: T. D. Jaye; Application info: T. D. Jaye; Customer service: A. J. Williams; Delivery info: L. L. Croxton

Products manufactured: Alarms, Data Acquisition & Reduction Systems, Memory Systems, Recorders

Local Sales Offices & Reps.

Ala	Huntsville, Currie, Peak & Frazier, Inc.	205-536-5650
Fla	Orlando, Currie, Peak & Frazier, Inc.	305-855-0843
Md	Greenbelt, J.E. Cuesta & Co.	301-552-1200

Mich	Detroit, Electro Sys. Assocs.	313-526-8800
Mo	Hazelwood, Technical Reps.	314-731-5200
NC	Greensboro, Currie, Peak, & Frazier, Inc.	919-273-3040
Ohio	Dayton, Electro Sys. Assocs.	513-426-5551
Pa	Valley Forge, J.E. Cuesta & Co., Inc.	215-265-5800

DATADYNE CORP., Box 247, King of Prussia, Pa., 19406, Tel: 215-265-1793; FSC No: 53032; Empl.: 23; Minimum order: \$25

For info on price: J. Riggs; Application info: J. P. Roding; Customer service: R. D. Currie; Delivery info: L. H. Biscombe

Free literature available: 1. Application Guide for high-speed digital printer mechanisms. 2. Service and Operating instructions for high-speed digital Printer including electronics & mechanics. 3. Low-speed printer specification 4. High-speed printer specification.

Products manufactured: Printers

DATACORP., 65 Seventy-First St., Guttenberg, N.J., 07093, Tel: 201-869-2200 p. 2-354, 1079

For info on price: B. Postorino 201-869-2200; Application info: C. Pflueger 201-869-2203; Customer service: C. Pflueger 201-869-2203; Delivery info: F. Marascio 201-869-2200

Free literature available: Full Line catalog and price sheets; Reprint of article "Printed Circuit Applications of JotDraft Dry Transfers"; Reprint of article "Direct Etch Resist for Printed Circuits"; Printed Circuit Kits brochure.

Products manufactured: Capacitors, Fixed, Delcalcomania, Dials, Drafting Symbols, Dry Transfer, Pressure Sensitive, etc. (including Lettering), Kits, Marking (Dial, Instrument, Equipment, etc.), Labels, Pressure-Sensitive, Adhesive, Nameplates, Scales, Dial

Local Sales Offices & Reps.

Ariz	Phoenix, H. Premil	602-939-6787
Cal	Millbrae, Polach & Bensinger	415-697-2525
Cal	West Covina, Don Forth Assocs.	213-962-1431
Colo	Denver, W.J. Adams Co.	303-777-1411
Conn	Wallingford, Adams-McGregor	203-269-0225
Fla	Ft. Lauderdale, Unirep, Inc.	901-683-7616
Ill	River Forest, Pettit Co.	312-369-9040
Md	Kensington, Forti-Austin	301-949-1707
Mass	Scituate, K. Walsh	617-545-2213
Minn	Minneapolis, Kodo Assoc.	612-881-1255
NJ	Caldwell, BCD Sys. Co.	201-226-2263
NJ	Willingboro, Forti-Austin Assocs.	609-871-9290
NM	Albuquerque, W.J. Purdy Co.	505-266-7959
NY	Middle Village, BCD Sys. Co.	212-894-1331
Ohio	Cleveland, C.H. Dolfuss, Jr. & Co.	PR 1-1270
Ohio	Dayton, C.H. Dolfuss, Jr. & Co.	213-275-4831
Ore	Lake Oswego, McMillan Elctns.	503-636-7954
Pa	Pittsburgh, G.S. Root & Co.	412-561-5707
Ri	Lincoln, Adams-McGregor	401-726-1300
SC	Taylors, H.C. Norman	803-244-6254
Tenn	Memphis, H.C. Norman Sys. Co.	901-683-7616
Tex	Dallas, Loss & Stewart	214-691-6039

Local Distributors

Ala	Huntsville, Mock Elect. Inc., 2310 Memorial Pkwy.	
Alas	Juneau, Juneau Elctn., 241 S. Franklin	
Ariz	Tempe, Circuit Special, 1110 N. Scottsdale Rd.	
Cal	Palo Alto, Zack Elctns., 654 High St.	
Cal	San Francisco, Zack Elctns., 1444 Market St.	
Cal	W. Los Angeles, Cal. Elect. Supply, 1911 Armacost Ave.	
Colo	Colorado Springs, Walker Elect., 2838 N. Prospect St.	
Conn	Waterbury, Bond Radio Elect., 438 W. Main St.	
Del	Wilmington, RESCO, 3601 Market St.	
Fla	W. Palm Bch., Nurmi Elect., 1727 Donna Rd.	
Ga	Atlanta, Lykes Elect. Sply., 1135 Chattahoochee Ave. N.W.	
Haw	Honolulu, Precision Radio Ltd., 1160 S. King	
Ill	Peoria, Klaus Radio & Elect., 8400 N. Pioneer Pkwy.	
Ind	Indianapolis, Graham Elect., 133 Pennsylvania St.	
Ky	Louisville, P.I. Burks Co., 842 So. 7th St.	
La	N. Orleans, Radio Parts Inc., 1112 Magazine St.	
Md	Baltimore, A S I Elect., 1728-30 Whitehead Rd.	
Mass	Boston, Sager Electrical Sply., 172 High St.	
Mass	Dedham, Gerber Elect., 852 Providence Hwy.	
Mich	Muskegon, Western Elect. Sply., 1781 Fifth St.	
Minn	Minneapolis, Electronic Ctr., 107 Third Ave. N.	
Mo	Kansas City, Burstein Applebee, 3199 Mercier	
Mo	St. Louis, Gateway Elect., 8123-25 Page Blvd.	
Neb	Lincoln, Scott Elect. Sply., 4040 Adams St.	
Nev	Reno, Elect. Dist. Co., Box 2918	
NH	Concord, Evans Radio Inc., Box 893	
NJ	Spfld., Route Elect., Echo Plaza, Rt. 22	

NM Albuquerque, Elect. Parts, 222 Truman St. N.E.
 NY Buffalo, Summit Distributor, 916 Main St.
 NY L.I. City, H.L. Dalis, Inc., 35-35 24th St.
 NY Rochester, Rochester Radio Sply., 140 W. Main St.
 NY Syosset, Lafayette Radio, 111 Jericho Tpk.
 NC Raleigh, Southeastern Radio, 414 Hillsborough St.
 Ohio Akron, Akron Elect. Sply., 107 So. Arlington St.
 Ohio Columbus, Hughes-Peters, 481 E. 11th Ave.
 Okla Tulsa, Radio Inc., 1000 So. Main St.
 Ore Portland, Portland Radio Sply., 1234 S.W. Stark St.
 Pa Pittsburgh, R.P.C. Electronics, 620 Alpha Dr.
 Pa Reading, G. D. Barbey, 333 N. 4th St.
 RI Providence, W. Dandreta & Co., 28 Wolcott St.
 SC Columbia, Dixie Radio Sply., 1900 Barnwell St.
 Tenn Memphis, W & W Distributing, 641 Madison
 Tex El Paso, Midland Specialty Co., 2235 Wyoming Ave.
 Utah Provo, Central Stan Elect., Box N
 Utah Salt Lake City, Kimball Elect., 350 Pierpont Ave.
 Va Arlington, Arlington Elect. Who., 3636 Lee Hwy.
 Wash Seattle, Radar Elect. Co., 169 Western Ave. W.
 Wisc Milwaukee, Parts Mart Corp., 1314 N. Seventh St.

DATAGLO DIV., LITTON SYS., 1770 Walt Whitman Rd.,
 Melville, N. Y., 11746, Tel: 516-694-8326, TWX:
 510-224-6477; Empl.: 110; Minimum order: \$50

For info on price: Mktg. Dept. Ext. 151; Application
 info: Mktg. Dept. Ext. 151; Customer service: Prod.
 Svcs.-H. Israel Ext. 442; Delivery info: Mktg. Dept. Ext.
 151

Free literature available: Brochures - Messagefax,
 Videofax, Pressfax, Weatherfax, Policefax, Photo
 Recorder, Printers - MC1000, MC2000, MC3000,
 MC3434, MC4600, MC8800, 1100 and MC5000

Products manufactured: Comm. Systems, Printers

Local Sales Offices & Reps.

Cal Studio City 213-986-7350
 NJ Bayonne 201-823-2310
 Okla Tulsa 918-664-6170

DATAMETRICS INC., 340 Fordham Road, Wilmington,
 Mass., 01887, Tel: 617-658-5410; Empl.: 104; Minimum
 order: \$50

For info on price: S. Lucke; Application info: H. Gray;
 Customer service: A. Crampton; Delivery info: K.
 McMillan

Free literature available: Programmable Controller
 Handbook; Pressure/Vacuum Measurement
 Handbook; Time Code Generator Catalog; Flow
 Measurement Catalog; Absolute Timing
 Distribution Handbook.

Products manufactured: Amplifiers, Bridges,
 Calibrators, Controllers, Programmable,
 Converters, Data Acquisition & Reduction
 Systems, Detectors, Encoders, Gages,
 Generators, Indicators, Meters, Monitors,
 Multiplexers, Standards, Switches, Tape Search
 Equipment, Thermometers, Resistance, Timers,
 Totalizers, Digital, Transducers

Local Sales Offices & Reps.

Ala Huntsville, Lee Assocs. Inc. 205-533-5896
 Cal Campbell, Sedillo Co. 408-374-5220
 Cal Canoga Park, Boyle Assocs. 213-773-5982
 Cal Palo Alto, R. W. Thompson Assocs. 213-677-6105

Cal Studio City, Pi Instruments 213-983-0151
 Colo Littleton, RADCO Elctns. 303-794-4279
 DC Washington, Scientific Sys. Sls. Corp. 202-726-4161

Fla Winter Haven, Lee Assocs. 813-294-5815
 Ga Atlanta, W. L. Schoonover 404-255-0761
 Kans Shawnee Mission, Pivan Eng. 913-722-1030
 Md Rockville, TE Corp. 301-340-0303
 Mass Burlington, Scientific Sys. Sls. Corp. 617-273-1660

Mass Burlington, Tekdata 617-273-0198
 Mass Natick, Andrus-Peskin Corp. 617-653-3919
 Mich Detroit, S. Sterling Co. 313-255-1970
 Mo St. Louis, Pivan Eng. 314-542-3636
 NM Albuquerque, Klein Aerospace 505-344-8020
 NY Depew, Labtronics 716-685-4111
 NY Garden City, PM Elctns.
 NY Syosset, Scientific Sys. Sls. Corp. 516-921-3737

NY Syracuse, Labtronics 315-454-9314
 NC Raleigh, Lee Assocs. Inc. 919-787-5818
 NC Winston-Salem, RADCO Co. 919-722-9671
 Ohio Dayton, E. V. Swenson 513-435-2772
 Ohio Dayton, S. Sterling 513-298-7573
 Pa Melrose Park, R. Meyers Assocs. 215-224-1663
 Tex Dallas, True Tech. Co. 214-691-7870

Tex Houston, Leeco 713-649-7727
 Tex Richardson, Leeco 214-231-7696
 Wash Bellevue, Topp Engrg. Sls. Corp. 206-747-5401
 Wash Seattle, Showalter Judd 206-624-9020

DATAPROBE, INC., 290 Huyler St., So. Hackensack, N.J.,
 07606, Tel: 201-489-5588; Empl.: 10

Customer service: S. Weiss

Products manufactured: Comm. Systems,
 Controls/Control Eqpt., Display Devices/Displays,
 Generators, Multiplexers, Receivers, Testers,
 Transmitters

DATASCAN DIV., Anadex Instruments Inc., 7833 Haskell
 Ave., Van Nuys, Ca., 91406, Tel: 213-782-9527, TWX:
 910-495-1762; Empl.: 95; Minimum order: \$15

Customer service: Will Luff

Free literature available: Digital Panel Meter
 Catalog, I.C. Logic Card Handbook

Products manufactured: Cards, Logic, Comparators,
 Controls/Control Eqpt., Converters, Integrators,
 Electronic, Meters, Racks

Local Sales Offices & Reps.

Ala Huntsville, Lee Assoc. Inc. 205-533-5896
 Ariz Tempe, PLS Assocs. 602-957-9110
 Cal Los Altos, Jay Stone & Assocs. 415-948-4563
 Colo Denver, PLS Assocs. 303-771-0140
 Conn W. Hartford, Instrument Assocs. 203-525-9367
 Ill Chicago, Pivan Engrg. Co. 312-539-4838
 Ind Indianapolis, Pivan Engrg. Co. 317-253-1681
 Kans Mission, Pivan Engrg. Co. 913-722-1030
 Md Wheaton, Sonco 301-942-9420
 Mass Bedford, Instrument Assocs. 617-275-0700
 Mich Farmington, Carter, McCormick & Peirce, Inc. 313-477-7700

Mich Kalamazoo, Carter, McCormick & Peirce, Inc. 616-349-9666
 Minn Minneapolis, Pivan Engrg. Co. 612-537-4501
 Mo St. Louis, Pivan Engrg. Co. 314-567-3636
 NJ Ft. Lee, Tech. Mktg. Assoc. 201-224-6911
 NM Albuquerque, PLS Assocs. 505-255-2330
 Ohio Cleveland, Carter, McCormick & Peirce, Inc. 216-333-5650

Ohio Dayton, Carter, McCormick & Peirce, Inc. 513-278-5873
 Okla Norman, Data Mktg. Assocs. 405-364-8320
 Pa Blue Bell, Sonco 215-CH2-8460
 Pa Pittsburgh, Carter, McCormick & Peirce, Inc. 412-824-3760

Tex Dallas, Data Mktg. Assocs. 214-661-0300
 Tex Houston, Data Mktg. Assocs. 713-686-9627
 Tex San Antonio, Data Mktg. Assocs. 512-828-0937
 Wash Seattle, R. S. Drake Assocs. 206-763-2755
 Wisc Brookfield, Pivan Engrg. Co. 414-786-1940
 FOR: Can., Montreal, Que., Radionics Ltd. 514-735-4565

DATATRON, INC., Box 11427, Santa Ana, Cal., 92711, Tel:
 714-540-9330, TWX: 910-595-1589; Empl.: 300

Products manufactured: Annunciators, Display
 Devices/Displays, Editing Equipment, Tape,
 Generators, Lights, Services, Assembly,
 Production & Test, Tape Search Equipment, Test
 Systems, Testers, Translators, Data

Local Sales Offices & Reps.

Ala Huntsville, Currie Aerospace 205-536-5650
 Cal Anaheim, Broadcast Comms. Devices 714-528-9505

Cal Ben Lomond, Broadcast Comms. Devices 408-336-5437
 Cal Los Angeles, Basic Sys. 213-938-2833
 Cal Mountain View, Prod. Data Co. 415-941-4410
 Cal San Diego, Mesa Elctns. 714-278-8021

Colo Englewood, Davis Assocs. 303-761-9228
 Colo Evergreen, Didier/Denver 303-674-6000
 Fla Lighthouse Point, Saber Assocs. 305-422-3686
 Ga Atlanta, Radford Assocs. 404-237-6097
 Ill Chicago, Megatek, Inc. 312-889-1277

Md Gaithersburg, Data-Time 301-948-7666
 Mass North Billerica, Datatron East 617-667-5353
 Mich Detroit, WKM Assocs. 313-892-2500
 Mich Farmington Hills, M. Dyer 313-892-2500
 Minn Minneapolis, Megatek, Inc. 612-933-2133

Mo Raytown, Production Automation 816-737-0066
 NJ Fairfield, KLS Assocs. 201-227-2900
 NM Albuquerque, Rustco Enptrs. 505-296-6474
 NY Garden City, P.M. Elctns. 516-248-4858
 NY Kings Park, KLS Assocs. 212-233-4849

Ohio Cleveland, WKM Assocs. 216-267-0445
 Ohio Dayton, WKM Assocs. 513-434-7500
 Okla Norman, Data Mktg. Assocs. 405-364-8320
 Tex Dallas, Data Mktg. Assocs. 214-661-0300

Tex Dallas, Martin, Zienkosky, Browne & Assoc. 214-233-5535
 Tex Houston, Data Mktg. Assocs. 713-686-9627
 Tex San Antonio, Data Mktg. Assocs. 512-828-0937

Wash Seattle, Avionics Liaison 206-767-3870
 FOR: Can., Don Mills, Ont., Glentronix 416-444-8497
 FOR: Can., Montreal-Nord 462, Que., Avuinc 514-322-4564

DATWEST CORP., 7333 E. Helm Dr., Scottsdale, Ariz.,
 85260, Tel: 602-948-3280; Empl.: 14; Minimum order:
 \$150

Customer service: N. T. Holzer

Products manufactured: Controllers,
 Programmable, Converters

DATTEL SYSTEMS INC., 1020 Turnpike St., Canton,
 Mass., 02021, Tel: 617-828-8000, TWX: 710-348-0135;
 Empl.: 215; Minimum order: \$30

p. 1516-161, 241, 648, 1166, 1167

For info on price: B. Aldsworth; Application info: B.
 Salow; Customer service: S. Jackson; Delivery info:
 S. Jackson

Free literature available: 70 Pg Engineering Product
 Handbook-General catalog of A/D & D/A
 converters, multiplexers, sample/holds, DPM's,
 power supplies; 20 pg Data Acquisition Brochure;
 16 Pg Power Supply Catalog; 16 Pg Cassette Data
 Logger Brochure; 60 Individual Product Data
 Sheets.

Products manufactured: Amplifiers, Computers,
 Converters, Counters, Data Acquisition &
 Reduction Systems, Data Loggers, Filters,
 Integrated Circuit Devices, Meters, Multiplexers,
 Multipliers, Power Supplies, Printers, Recorders,
 Tapes, Recording, Magnetic (All Types), Timers,
 Totalizers, Digital

Local Sales Offices & Reps.

Ala Huntsville, Int'l. Scientific Instrs. 205-837-1601
 Ariz Phoenix, Cleveland Ent. 602-996-6130
 Cal Los Angeles, Datel Sys. 213-933-7256
 Cal Santa Ana, Datel Sys., Inc. 714-835-2751
 Cal Sunnyvale, Datel Sys. 408-733-2424
 Colo Westminster, Harvey Data Sys., Inc. 303-427-5299

Fla Lighthouse Point, Saber Assocs., Inc. 305-943-3076
 Fla Longwood, Saber Assocs., Inc. 305-422-3686
 Fla St. Petersburg, Saber Assocs., Inc. 813-441-1301

Haw Honolulu, Hawaii Data Sys. 808-946-1533
 Ill Chicago, Carter Elctns., Inc. 312-585-5485
 Ind Indianapolis, Carter Elctns., Inc. 317-293-0696
 Iowa Marion, B. Rush Assocs. 319-377-6133
 Kans Olathe, Technical Reps. 913-782-1177

Mass Canton, Datel Sys., Inc. 617-828-8000
 Mich Troy, G.R. Peters Assocs. 313-254-2920
 Minn Minneapolis, Carter Elctns., Inc. 612-544-9393
 Mo Hazelwood, Technical Reps. 314-731-5200
 NJ Fort Lee, Tech Mktg. Assoc. 201-224-6911

NM Albuquerque, Cleveland Ent. 505-345-2481
 NY Liverpool, R & D Assocs. 315-622-2350
 Ohio Cleveland, Instrumentation Sys. 216-486-0782
 Ohio Dayton, Instrumentation Sys. 513-294-2838
 Pa King of Prussia, Rivco 215-856-5211

Pa Pittsburgh, Instrumentation Sys. 412-243-1111
 Tex Dallas, Evans-McDowell 214-238-7157
 Tex Houston, Evans-McDowell 713-783-2900
 Va Arlington-H.J. Heffernan Co. 703-522-6666
 Wash Seattle, Jon B. Jolly Inc. 206-938-4166

Wisc Milwaukee, Carter Elctns. 414-464-5555
 EXP: Montreal 12, Quebec, Can., Prelco Elctns., Ltd. 514-389-8051

EXP: Ottawa, Ontario, Can., Prelco Elctns., Ltd. 613-237-6150
 EXP: Rexdale, Ontario, Can., Prelco Elctns., Ltd. 416-678-0401

DATLEX DIV., Conrac Corp., 1600 S. Mountain Ave.,
 Duarte, Cal., 91010, Tel: 213-395-9141

Products manufactured: Comm. Systems,
 Controls/Control Eqpt., Converters, Indicators

DATRON SYSTEMS, 20716 Plummer St., Chatsworth,
 Cal., 91311, Tel: 213-882-9616, TWX: 910-494-2787;
 Empl.: 165; Minimum order: \$100

For info on price: F. M. Amsberg; Application info: N.
 Hannon; Customer service: F. M. Amsberg; Delivery
 info: F. M. Amsberg

Products manufactured: Amplifiers, Antenna Feed
 Systems, Antenna Rotators, Antennas,
 Computers, Controls/Control Eqpt., Data
 Acquisition & Reduction Systems, Detectors,
 Horns, Microwave, Indicators, Integrators,
 Electronic, Limit Stops, Mechanical, Mounts,
 Networks, Pedestals, Radar, Radar Systems,
 Servo Systems, Tracking Systems

Local Sales Offices & Reps.

Ala Huntsville, P. T. Miller Assocs. 205-534-2652

Cal	Mountain View, Microwave Mktg. Assocs.	415-969-3355
Cal	Santa Barbara, Kannard Engrg., Inc.	805-682-1928
DC	Washington, ECM Assocs.	202-296-1337
Fla	Ft. Lauderdale, Snow Co.	305-563-2449
Mass	Needham Hgts., Reptron, Inc.	617-449-4142
Tex	Fort Worth, C. Wolf & Assocs.	817-738-1996

DATTILO ENTERPRISES, INC.

DATTILO ENTERPRISES, INC., 9405 Doral Ct., Louisville, Ky., 40220, Tel: 502-426-1212; Empl.: 50

Customer service: D. P. Dattilo 502-491-6282

Free literature available: Available literature includes a short form brochure describing capabilities and services offered. Application notes (with photos) are included with specific details on cost reduction re-design.

Products manufactured: Cards, Linear Function, Cards, Logic, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Ind	Indianapolis, Needler Sls. Co.	317-255-8056
Ky	Louisville, Custom Comp. Sls.	502-969-4473

Advertisement

Why do so many firms, both large and small, come to Dattilo Enterprises, Inc. for design, layout, and complete printed circuit assemblies. The answer is simple. We do more than anyone else in the industry to help you with your individual circuit needs. We provide weekly status reports to keep you up-to-date with your RFQ or Purchase order. We do not offer excuses, only fast, concise information or solutions. We have established our reputation on superior quality at reasonable prices. For complete printed circuit assemblies from design to finished product; remember our name. We would be pleased to add your company to our constantly growing list of satisfied customers. If the above sound to good to be true.....try us, you will be very pleasantly surprised.

DATUM, INC., 1363 State College Blvd., Anaheim, Calif., 92806, Tel: 714-533-6333, TWX: 910-592-1289; Empl.: 300

Products manufactured: Amplifiers, Analyzers, Clocks (All Types), Computers, Converters, Data Acquisition & Reduction Systems, Generators, Memory Systems, Multiplexers, Printers, Readers, Receivers, Recorders, Tape Recording Accessories, Tape Search Equipment, Terminal Equipment, Digital, Timers

Local Sales Offices & Reps.

Ala	Huntsville, Lee Assocs.	205-881-7629
Ala	Huntsville, Lee Assocs.	205-533-5896
Ariz	Scottsdale, BFA of Arizona, Inc.	602-946-4215
Cal	Lawndale, Ward/Davis Assoc.	213-542-7740
Cal	San Diego, Datum, Inc.	714-453-1633
Cal	Sunnyvale, Ward/Davis Assoc.	408-245-3700
Colo	Denver, BFA of Arizona, Inc.	303-744-3301
Conn	Hamden, P. Jenks Assoc.	203-281-0810
Fla	Ft. Lauderdale, Lee Assocs.	305-525-9767
Fla	Longwood, Southern Data Assocs.	305-831-3311
Fla	Winterhaven, Lee Assocs.	813-294-5815
Ill	Hoffman Estates, Datum, Inc.	312-298-1244
Kans	Wichita, Winco, Inc.	316-684-8224
Md	Silver Spring, K-G Elctns.	301-588-3000
Mass	Waltham, P. Jenks Assoc.	617-246-1590
Mass	Waltham, Datum, Inc.	617-899-7474
Mich	Detroit, Electro Sls. Assoc.	313-526-8800
NM	Albuquerque, BFA of Arizona, Inc.	505-292-1212
NM	Las Cruces, BFA of Ariz., Inc.	505-523-0601
NY	Great Neck, Krasner Assocs.	516-487-0690
NY	Melville, Astroprep	516-423-2266
NC	Raleigh, Lee Assocs.	919-787-5818
Ohio	Aurora, EMA, Engrg. Mktg. Assoc.	216-562-6104

Ohio	Centerville, EMA, Inc.	513-433-2800
Ohio	Cleveland, Electro Sls. Assoc.	216-261-5440
Ohio	Dayton, Electro Sls. Assoc.	513-426-5551
Pa	Norristown, Denco, Data Engrg. Co.	215-279-8146
Pa	Pittsburgh, Electro Sls. Assoc.	412-371-9449
Tex	Arlington, J. T. Houston Assoc.	817-265-2931
Tex	Dallas, Data Aids Assoc.	214-620-1551
Tex	Dallas, Datum, Inc.	214-352-7411
Tex	Houston, Data Aids Assoc.	713-862-6685
Utah	Salt Lake City, BFA of Ariz.	801-466-6522
Wash	Seattle, Comptronics, Inc.	206-284-4842

DAVIDSON ELCTRN. DEV. CO., 2211 Peninsula Dr., Erie, Pa., 16506, Tel: 814-833-9818

Customer service: A. R. Davidson

Products manufactured: Bridges, Meters, Test Systems

Local Sales Offices & Reps.

Mich	Detroit, WKM Assocs.	313-892-2500
Ohio	Cleveland, W.K.M. Assocs.	216-267-0445
Ohio	Dayton, W.K.M. Assocs.	513-434-7500
Pa	Pittsburgh, W.K.M. Assocs.	412-892-2953

Advertisement

Davidson designs and builds to your requirements: automatic test equipment, data acquisition systems, automatic adjust equipment, and special devices for the electrical and electronic industry.

DAVIES MOLDING CO., HARRY, 4920 Bloomingdale Ave., W., Chicago, Ill., 60639, Tel: 312-622-8966; FSC No: 5355; Empl.: 170; Minimum order: \$25

For info on price: L. A. Sera; Application info: L. A. Sera; Customer service: R. C. Appleby Jr.; Delivery info: R. C. Appleby Jr.

Free literature available: 24 page catalog of plastic knobs, handles, and cases available without tooling costs.

Products manufactured: Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Dials, Handles For Cabinets, Circuit Boards, Racks, etc., Knobs

Local Sales Offices & Reps.

Cal	Belmont, Littell Western Sls., Inc.	415-592-3346
Cal	Los Angeles, Littell Western Sls., Inc.	213-261-0164
Conn	Meriden, P.R. Sturgeon Co.	203-237-1112
Fla	Fort Lauderdale, W. Chester Smith	305-564-1477
Ill	Chicago, R. W. Kruse Co.	312-736-9546
Ind	Clermont, L.T. Clower Co.	317-293-3598
Iowa	Cedar Rapids, Clancey Co.	319-365-7141
Iowa	Des Moines, Clancey Co.	515-278-1331
Mass	Babson Park, P.R. Sturgeon Co.	617-237-3506
Mich	Bloomfield Hills, Gitre Co.	313-645-1777
Mo	Kansas City, Clancey Co.	816-931-3090
Mo	St. Louis, Clancey Co.	314-432-3633
NY	Syosset, Rywel Sls.	516-364-0888
Ohio	Westlake, Foley & Beilstein Co.	216-871-8830
Pa	Erie, M.L. Crowell Co.	814-454-0250
Pa	Paoli, W.G. Walker	215-627-8146
Tenn	Memphis, L.E. Offutt Co.	901-789-1210
Tex	Dallas, Commercial Plastics & Supply Co.	214-631-8170
Wash	Seattle, Northwest Plastics Inds.	206-763-0441
Wisc	Milwaukee, Clague Sls. Corp.	414-272-1951
FOR	Can., Toronto, Atlas Elctns., Ltd.	416-781-6174

DAVEN, See McGraw-Edison Co.

DAVIS ELEC. CO., Box 38, Cape Girardeau, Mo., 63701, Tel: 314-335-5547; Empl.: 54; Minimum order: \$100

For info on price: B. D. Davis; Application info: T. Le Grand; Customer service: B. D. Davis; Delivery info: B. D. Davis

Products manufactured: Relays

Local Sales Offices & Reps.

Cal	Costa Mesa, George Mousel Co.	714-546-8990
Cal	Los Altos, Schwerin Assocs.	415-941-3737
Cal	Santa Barbara, Schwerin Assocs.	805-967-7317
Fla	Palm Beach Gardens, W. Reasor & Assocs.	305-622-4049
Fla	Tampa, W. Reasor & Assocs.	813-877-2886
Ill	Norridge, Gianaras Sls. Co.	213-SP4-4600
Mass	Scituate, Near, Inc.	617-545-6327
Mo	Kansas City, Automatic Gen. Elctn. Sls., Co.	816-DE3-8206
Ohio	Cincinnati, Components Inc.	513-721-2997

Ohio	Cleveland, Components Inc.	216-172-2737
Pa	Radnor, W. Henry Cordray Sls. Co.	215-TR8-3737
Tex	Dallas, Stevens Sls. Co.	214-350-2478
Wisc	Cedarburg, TFL Assocs.	414-377-7030

DAVIS & CO., J.W., Box 35313, Dallas, Tex., 75235, Tel: 214-352-8405; Empl.: 42

For info on price: W. Hevron; Application info: W. N. Fango; Customer service: S. DeHay; Delivery info: W. Hevron

Products manufactured: Amplifiers, Attenuators, Cabinets & Accessories, Knobs, Mixers, Speaker Systems, Speakers, Transformers

Local Sales Offices & Reps.

Ill	Chicago, B. Burns & Assocs.	312-775-1233
Kans	Overland Park, T. Dowell & Assocs.	913-236-8200
Tex	Dallas, Crockett Sls. Co.	214-748-8209

DE COURSEY ENGRG. LAB., 11828 W. Jefferson, Culver City, Cal., 90230, Tel: 213-EX7-9668; Empl.: 7

Customer service: L. W. Howard

Free literature available: "Active Filters by DeCoursey" "DeCoursey Model 110 Electronic Dividing Network"

Products manufactured: Chargers, Battery, Coils Including Assemblies & Forms, Filters, Inverters, Networks, Transformers

DEARBORN ELCTRNS. DIV., Sprague Elec. Co., Box 1076, Longwood, Fla., 32750, Tel: 305-838-3011; FSC No: 56289; Minimum order: \$50

Customer service: J. D. Kowalski 413-664-4411 Ext. 2495

Products manufactured: Capacitors, Fixed

Refer to Sprague Electric for Sales office information

DEARBORN WIRE & CABLE CO., 8299 Evenhouse Dr., Rosemont, Ill., 60018, Tel: 312-696-1000; Empl.: 58; Minimum order: \$25 p. 2*1993

For info on price: K. Brcka; Application info: K. Brcka; Customer service: M. DePinto; Delivery info: J. Lebert

Products manufactured: Braid, Cable, Bus Bars & Systems, Cable Assemblies & Harnesses, Cable, Cable Retractors, Cords, Monitors, Shields, Tubing, Wire, Wire Shielding

Local Distributors

Cal	Burlingame, Rose Elctns., 846 Stanton	415-697-0224
Cal	Garden, Allied Elctns., 12821 Knotts Ave.	213-598-8671
Cal	Inglewood, Switch & Signal, 1009 W. Arbor	213-776-3550
Fla	Clearwater, Diplomat Southland, 1771 N. Hercules	813-443-4512
Fla	Miami, Electro-Standards Lab., 3560 N.W. 34th	305-633-6973
Ill	Chicago, Allied Elctns., 2400 W. Washington	312-421-2400
Ill	Chicago, Merrill Elctns., 3563 N. Milwaukee	312-386-2525
Ill	Chicago, Newark Elctns., 500 N. Pulaski	312-638-4411
Ill	Elk Grove, Diplomat Lakeland Elctn., 2451 Brickvale	312-595-1000
Ind	Evansville, Hutch & Sons, 300 N. Main	812-425-7201
Ind	Fort Wayne, Fort Wayne Elctns., 3606 Maume Ave.	219-423-3422
Mich	Grand Rapids, Stotts-Friedman, 2035 Eastern Ave.	616-241-6731
Minn	Minneapolis, Electro-Com, 3816 Chandler Dr.	612-788-8601
Mo	St. Louis, Diplomat St. Louis, 2725 Mercantile	314-645-8550
NY	Rochester, Simcona Elctnrcs., 275 Mt. Read Blvd.	716-328-3230
Tenn	Knoxville, Industrial Electric, Gov. J. Sevier	615-753-7135
Tex	Garland, Hisco, 3710 Marquis	214-272-5411
Tex	Houston, Altair Co., 9501 Baythorne	713-462-3029
Tex	Houston, Hisco, 1815 Dallas	713-228-6662
Tex	Richardson, Altair, Box 26	204-231-5166
Utah	Salt Lake, Diplomat Alta Elctnrcs., 2280 S. Main Str.	801-486-7227
Va	Portsmouth, Distributors Inc., 710-712 Country	703-399-2446
Va	Richmond, Avec Elctnrcs., 2002 Staples	703-359-6071
Wisc	Milwaukee, Electronic Expeditors, 6045 Green	414-228-8100

DECISION DATA COMPUTER CORP., 100 Witmar Rd.,
Horsham, Pa, 19044

DECITEK, Div. Jamesbury Corp., 250 Chandler St.,
Worcester, Mass., 01602, Tel: 617-798-8731; Empl.: 800

Free literature available: Bulletin D2 Decitek
Punched Tape Readers

Products manufactured: Readers

Local Sales Offices & Reps.

Ala Huntsville, Beacon Elctns. Assocs.
Cal Costa Mesa, Costello Little & Co.
Cal Los Altos, Casey Assoc.
Conn Southbury, J.J. Wild
Fla Ft. Lauderdale, Beacon Elctns. Assoc.
Fla Maitland, Beacon Elctns. Assoc.
Ga Atlanta, Beacon Elctns. Assoc.
Ill Rolling Meadows, Lightner Assoc.
Kans Shawnee Mission, Inland Assoc.
Mass Needham, J.J. Wild
Mich Southfield, Data-Tron
Minn Minneapolis, Looman Assoc.
Mo Glen Cove, Inland Assoc.
NJ Woodbridge, J.J. Wild
NY Jericho, J.J. Wild
Ohio Dayton, Data-tron
Ohio Wickliffe, Data-tron
Pa Monroeville, Data-tron
SC Spartanburg, Beacon Elctns. Assoc.

DEFIANCE CIRCUIT CORP., Sub. Hi-G, 12 Shepherd
St., Lawrence, Mass., 01843, Tel: 617-688-1856, TWX:
710-342-1246; Empl.: 120; Minimum order: \$100

p. 2-252,253

Customer service: Bill Imlach 617-688-1856

Products manufactured: Boards, Printed Circuit

Local Sales Offices & Reps.

Cal Downey, Trimarco 213-861-8244
Conn Middletown, John E. Boeing 203-632-1892
Ga Marietta, K & E Assocs. 404-427-0241
Ill Des Plaines, Coombs Assoc. 312-298-4830
Kans Wichita, Buse Sls. 316-685-8036
Md Timonium, Heller Sls. 301-252-4780
Mass Lexington, John E. Boeing Co. 617-862-2500
Minn Minneapolis, Nygaard Sls. 612-881-3727
Miss Corinth, K & E Assoc. 601-287-5369
Mo St. Charles, Buse Sls. Co. 314-946-6430
NY Great Neck, Pacent-DiBlasi 516-482-4678
NY Rochester, Tech-Mark 716-223-1252
Pa Glenside, Elcom, Inc. 215-885-1325
Tex Dallas, Blackburn Assoc. 214-351-9991
EXP: Can., Mississauga, Ont., Anbak Sales
416-625-1061

DEGUSSA INC., Metals Div., Two Pennsylvania Plaza,
New York, N.Y., 10001, Tel: 212-563-7100, TWX:
710-581-6320; Empl.: 30; Minimum order: \$25

Customer service: Metals Div.

Free literature available: Catalog 101 - Platinum
resistance elements for temperature sensing,
Catalog 102 - Resistance temperature detectors,
WS-81 - Platinum resistance surface temperature
sensor.

Products manufactured: Probes, Thermometers,
Resistance, Transducers, Wire

DEL ELECTRONICS CORP., 250 E. Sandford Blvd., Mt.
Vernon, N.Y., 10550, Tel: 914-699-2000, TWX:
710-562-0130; FSC No: 01378; Empl.: 100

p. 1-1168-1176; p. 2-120

For info on price: W. Young; Application info: B.
Michalako; Customer service: T. Galgano; Delivery
info: T. Galgano

Free literature available: Complete Catalogs
Available

Products manufactured: Analyzers, Capacitors,
Fixed, Capacitors, Variable, Chokes, Coils
Including Assemblies & Forms, Connectors,
Controls/Control Eqp., Converters, Counters,
Dividers, Indicators, Inverters, Modulators, All
Kinds, Monitors, Multipliers, Networks,
Oceanographic Equip. (Electronic), Power
Supplies, Reactors, Regulators, Relays, Switches,
Testers, Transducers, Transformers

Local Sales Offices & Reps.

Ala Huntsville, Lee Assocs. 205-533-5896
Cal Downey, Trimarco, Inc. 213-861-8244
Cal Palo Alto, Brooks Techn. Group 415-328-3232
Cal Pasadena, D Ellis Co. 213-681-9108
Cal San Carlos, Wincos Sls. 415-365-6082
Colo Littleton, Radco Elctns. 303-794-4279
Fla Winter Haven, Lee Assocs. 813-294-5815
Fla Winter Park, Young & Lawrence Assoc.
305-647-6929
Haw Honolulu, Aloha Assocs. 808-941-1574

Ill Elmhurst, Scott Assocs. 312-279-5681
Md Ellicott City, Whitco 301-937-1122
Mass Burlington, Tri-Tek Inc. 617-272-4550
Mich Dearborn, Pitcher-Poulin 313-582-5450
Mich Lathrup Village, R.C. Nordstrom & Co.
313-559-7373
Minn Mpls., Scott Elctn. Sls. 612-929-2985
Mo Springfield, Del-Tech Assocs. 417-881-3667
NJ Nutley, I. Brill 201-667-0653
NM Albuquerque, Trembly Assocs. 505-293-4444
NY Commack, L.K. Haner Assocs. 516-864-2220
NC Raleigh, Lee Assocs. 919-787-5618
Ohio Cincinnati, F.J. Campisano 513-662-1616
Ohio Fairborn, Tech. Assocs. 513-878-2484
Ore Portland, J.E. Edstrom 503-775-8527
Pa Ardmore, Martin Elec. Co. 215-649-6332
Tex Richardson, Athans Sls. Co. 214-235-7859
FOR: Can., Toronto, Ont., Datamex 416-787-1208
FOR: Can., Ville La Salle, Que., Electrodesign
514-363-5120

DELBERT BLINN CO., Box 2007, Pomona, Calif., 91766,
Tel: 714-623-1257

Products manufactured: Bushings, Glass, Plastic,
Metal, Rubber, Etc., Fasteners, Insulators &
Insulation, Pads, Transistor Mounting, Services,
Assembly, Production & Test, Sockets, Spacers,
Transistor, Diode, Thyristor Heat Dissipators

DELCO ELECTRONICS DIV., General Motors Corp.,
700 Firmin St., Kokomo, Ind., 46901, Tel: 317-457-8461,
TWX: 810-269-1921; Empl.: 9500 p. 1-1838-1841

Free literature available: Short Form Catalogs, Data
Sheets and Application Notes.

Products manufactured: Accelerometers, Alarms,
Cards, Logic, Computers, Controls/Control Eqp.,
Converters, Data Acquisition & Reduction
Systems, Diodes, Gyros (All Types), Heat Sinks,
Soldering, Inverters, Rectifiers, Suppressors,
Transistor, Diode, Thyristor Heat Dissipators,
Transistors

Local Sales Offices & Reps.

Cal Goleta 805-968-1011
Cal Van Nuys 213-988-7550
Ind Kokomo 317-459-2175
NJ Union 201-687-3070
Exp: NY New York, Gen. Motors Overseas Oper.,
Power & Ind'l. Prods. Dept. 212-486-3723

Local Distributors

Ala Birmingham, Forbes Distr. Co., 1416 Fourth Ave.,
S. 205-251-4104
Ala Huntsville, Powell Elctns., 803 Oster Dr.
205-539-2731
Ariz Phoenix, Sterling Elctns., 1930 N. 22nd Ave.
602-258-4531
Cal Goleta, R.P.S. Elctns., 350-E So. Kellogg Ave.
805-964-6823
Cal Los Angeles, Kierulff Elctns., 2585 Commerce
Way 213-685-5511
Cal Los Angeles, R.P.S. Elctns., 1501 S. Hill St.
213-748-1271
Cal Palo Alto, Kierulff Elctns., 3969 E. Bayshore Rd.
415-968-6292
Cal San Diego, Kierulff Elctns., 8797 Balboa Ave.
714-278-2112
Cal San Diego, R.P.S. Elctns., 7889 Clairemont
Mesa Blvd. 714-292-5611
Cal Sunnyvale, Bell Inds., 1161 N. Fair Oaks Ave.
408-734-8570
Colo Denver, Kierulff Elctns., 10890 E. 47th Ave.
303-371-6500
Conn Norwalk, Harvey Elctns., 112 Main St.
203-853-1515
Fla Miami Springs, Powell Elctns./Fla., 1744 N.W.
69th Ave. 305-592-3260
Fla Orlando, Powell Elctns./Fla., 2032 Palm Ridge
Way 305-859-1450
Ill Rosemont, Kierulff Elctns., 9340 William St.
312-678-8560
Ill Skokie, Bell Inds., 7701 N. Austin Ave.
312-282-5400
Ind Indianapolis, Graham Elctns. Supply, 133 So.
Pennsylvania St. 317-634-8202
Md Baltimore, Radio Elec. Serv. Co., 1026 Cromwell
Bridge Rd. 301-823-0070
Mass Billerica, Kierulff Elctns. 617-935-5134
Mass Newton, Greene-Shaw Co., Chapel Bridge Pk.,
70 Bridge St. 617-969-8900
Mich Farmington, Harvey-Michigan, 23461 Ind. Pk. Dr.
313-477-1650
Mich Livonia, Pioneer/Mich. 313-525-1800
Minn Minneapolis, Stark Elctns. Supply Co., 112 3rd
Ave., N. 612-332-1325
Mo Kansas City, Walters Radio Supp., 2627-3635
Main St. 816-531-7015
Mo St. Louis, LCOMP-St. Louis, 2605 S. Hanley Rd.
314-647-5505

NJ Cinnaminson, Wilshire Elctns./Philadelphia, 855
Ind. Hwy. - Unit 5 609-786-8990
NJ Clifton, Wilshire Elctns./N.J., 312 Clifton Ave.
201-365-2600
NM Albuquerque, Sterling Elctns., 3530 Pan
American Fwy. 505-345-6601
NY Binghamton, Harvey Elctns., Box 1208
607-748-8211

NY Buffalo, Summit Dist., 916 Main St.
716-884-3450

NY Farmingdale, Wilshire Elctns./L.I., 1855 New
Highway 516-293-5775

NY Woodbury, Harvey Elctns., 60 Crossways Pk.
W. 516-921-8700

Ohio Cincinnati, United Radio, 7713 Reinhold Dr.
513-761-4030

Ohio Cleveland, Pattison Supp. Co. Ind. Elctns. Div.,
4550 Willow Pkwy. 216-441-30000

Ohio Dayton, Pioneer Dayton, 1900 Troy St.
513-236-9900

Pa Philadelphia, Almo Elctns., Roosevelt Blvd. at
Blue Grass Rd. Northeast Ind. Pk. 215-698-4000

Pa Pittsburgh, Cameradio Elctns., 2801 Liberty
Ave. 412-288-2600

SC Columbia, Dixie Radio Supp. Co., 1900 Barnwell
St. 803-253-5333

Tex Dallas, Sterling Elctns., 2875 Merrell Rd.
214-263-1711

Tex Fort Worth, Adleta Elctns. Co., S. Expwy. at E.
Vickery 817-336-7446

Tex Garland, Kierulff Elctns. 214-271-2471

Tex Houston, Harrison Equip. Co., 1616 McGowan
St. 713-224-9131

Wash Seattle, Kierulff Elctns., 5940 6th Ave. S.
206-763-1550

For: Can., Scarborough, Ont., Lake Engrg. Co., Ltd.,
123 Manville Rd. 416-751-5980

DELEVAN DIV., AMERICAN PREC. INDS., Clutch &
Brake Prods., 270 Quaker Road, E. Aurora, N.Y., 14052,
Tel: 716-652-3600, Telex: 91-293; Empl.: 350 p. 1-945

Customer service: J. Holmes

Free literature available: Hysteresis Clutches &
Brakes, Model 20 Electro-Magnetic Clutches &
Brakes, Precision Electro-Mechanical Clutches &
Brakes

Products manufactured: Brakes, Clutches

Local Sales Offices & Reps.

Ariz Phoenix, Southwest e/m Engrg., Inc.
602-993-0250
Cal Los Altos, Servo-Data 415-964-1325
Cal Los Angeles, L-Tronix Assocs. 213-256-2224
Colo Denver, Walter Engrg. Assocs. 303-777-5585
Fla Boca Raton, Conley & Assocs., Inc.
305-395-6108
Fla Oviedo, Conley & Assocs., Inc. 305-365-3283
Fla Tampa, Conley & Assocs., Inc. 813-933-3183
Ill Hinsdale, Momak Sls. 312-654-4524
Kans Leawood, H.C. Heyde Co. 913-649-8628
Md Lutherville, J.A. Dougherty Sls. Co.
301-321-7890
Mass Boston, P.J. Engrg. Sls. Co. 617-924-5950
Minn Minneapolis, E.C. Elctn. Sls. 612-831-0229
NJ Parlin, Martech Assocs. 201-721-2200
NJ Woodstown, Loman Co. 609-769-0055
NY Manhasset, Martech Assocs. 516-627-1151
NY Syracuse, M.C. Antil 315-437-4851
Tex Dallas, Scott Tech. Sls. Co. 214-352-7698
EXP: Montreal, Can., J.G. Weiss Co. Ltd.
514-489-6887
EXP: North Vancouver, Can., J.G. Weiss Co. Ltd.
604-987-3833
EXP: Rexdale, Ont., Can., J.G. Weiss Co. Ltd.
416-766-0843

DELEVAN DIV., COIL PRODS., American Precision
Inds., 270 Quaker Rd., E. Aurora, N.Y., 14052, Tel:
716-652-3600, Telex: 91-293; FSC No: 95800; QPL No:
Multiple; Empl.: 350; Minimum order: \$40 p. 2-388

For info on price: F. E. Riehle; Application info: R.
Schuler; Customer service: S. Kerling; Delivery info:
S. Kerling

Products manufactured: Chokes, Coils Including
Assemblies & Forms, Transformers

Local Sales Offices & Reps.

Ariz Phoenix, Toward Engrg. 602-277-1453
Cal Los Angeles, L-Tronix Assoc. 213-256-2224
Cal Menlo Park, Long & Assoc. 415-327-1300
Colo Denver, Walter-Engrg. 303-777-5585
Fla Boca Raton, Conley & Assoc. 305-395-6108
Fla Oviedo, Conley & Assoc. 305-365-3283
Fla Tampa, Conley & Assoc. 813-933-3183
Ill Hinsdale, MO-MAK Sls. 312-654-4524
Ind Ft. Wayne, W.W. Bieberich 219-432-2537
Iowa Cedar Rapids, Lorenz Sls. 319-393-9125
Kans Leawood, H.C. Heyde Co. 913-649-8628

Md	Lutherville, J. Dougherty Sls.	301-321-7890
Mass	Boston, P.J. Engrg.	617-924-5950
NJ	Haddonfield, Thomas Assocs.	609-854-3011
NJ	Parlin, Martech Assc.	201-721-2200
NY	Endicott, Tech-Mark	607-748-7473
NY	Fairport, Tech-Mark	716-223-1252
NY	Manhasset, Martech Assc.	516-627-1151
Ohio	Cleveland, C. Robinson	216-381-9049
Ohio	Dayton, C. Robinson	513-275-2412
Okla	Broken Arrow, P.J. Scanlon Co.	918-251-1427
Ore	Portland, D.G. Weber Co.	503-234-0686
Tenn	Shelbyville, R. Mitscher	615-684-4544
Tex	Houston, P.J. Scanlon	713-466-6897
Tex	Richardson, P. Scanlon	214-231-4861
Wash	Seattle, D. G. Weber Co.	206-623-5990

Local Distributors

Cal	Glendale, R. V. Weatherford, 6921 San Fernando Rd.	213-849-3451
Cal	Mountain View, Elmar Elctns., 2288 Charleston Rd.	415-961-3611
Cal	Sunnyvale, Cramer/San Francisco, 720 Palomar Ave.	408-739-3011
Cal	Woodland Hill, Rampart Comps., 21201 Oxnard St.	213-887-7260
Conn	Fairfield, Utronics, 273 Linwood Ave.	203-255-4521
Fla	Clearwater, Diplomat/Southland, 1771 No. Hercules Ave.	813-443-4514
Ind	South Bend, Radio Distributing, 1212 High St.	219-287-2911
Md	Savage, Pytronics Ind., 8200 Wellmoor Ct.	301-792-7000
Mass	Boston, P. J. Engrg. Supply, 360 N. Beacon St.	617-783-0510
NJ	Pennsauken, Resco Elctns., Airport Industrial Pk.	215-925-6900
NY	Buffalo, Summit Distributors, 916 Main St.	716-884-3450
NY	Farmingdale, Arrow Elctns., 900 Broad Hollow Rd.	516-694-6800
NY	Freeport, Milgray/New York, 191 Hanse Ave.	516-546-6000
NY	Hauppauge, Rampart Components, Engineers Rd.	516-273-1111
Tex	Dallas, Hall-Mark Elctns., 9333 Forest La.	214-231-6111

DELAVAL ELECTRONICS, 14441 No. 73rd St., Scottsdale, Ariz., 85260, Tel: 602-948-6350; Empl.: 500; Minimum order: \$10

Customer service: J. Frantz

Products manufactured: Controls/Control Eqpt., Indicators, Switches

DELTA-BENCO-CASCADE LTD., 124 Belfield Rd., Rexdale, Ont. Can. M9W 1G1, Tel: 416-241-2651; Empl.: 500

Customer service: J. Galco 716-874-6570

Free literature available: Complete catalog on cable television products.

Products manufactured: Amplifiers, Attenuators, Calibrators, CATV Systems & Equipment, Converters, Couplers, Filters, Meters, Monitors, Transformers, Transmitters

Local Sales Offices & Reps.

NY Buffalo, Delta-Benco-Cascade 716-874-6570
FOR: Can., Don Mills, Ont., Welsh Communications
416-445-5650

DELTA DESIGN, INC., 5725 Kearny Villa Road, San Diego, Cal, 92123, Tel: 714-292-5000, TWX: 910-335-1215; Empl.: 55; Minimum order: \$50

Customer service: G. Whitlock

Free literature available: Literature on Environmental Temperature Chambers, Ambient and Environmental Semiconductor Handlers, DIP and TO-5 Carrier Loaders/Unloaders and Burn-In Systems.

Products manufactured: Chamber, Environmental Test, Controllers, Programmable, Controls/Control Eqpt., Machines/Machinery, Production, Monitors, Ovens, Testers

DELTA ELCTR. CONTROL, 1701 Pomona St., Costa Mesa, Cal., 92627, Tel: 714-646-7776; FSC No: 33434; Empl.: 40; Minimum order: \$25

For info on price: C. W. Jobbins; Application info: L. O. Hodges; Customer service: H. Bakowski; Delivery info: B. Selle

Free literature available: Catalog: Shows general line of products manufactured. Paper: "Power Amplifiers for Sonar Systems" by L.O. Hodges, C.W. Jobbins and Dr. L.R. Sylzle. This is a 20 page study of designed and applications of class B and class D amplifiers.

Products manufactured: Amplifiers, Controls/Control Eqpt., Converters, Inverters, Power Supplies, Tachometers, Transmitters

DELTA PRODUCTS, Box 1147, Grand Junction, Colo., 81501, Tel: 303-242-9000; Empl.: 140

Products manufactured: Alarms, Controls/Control Eqpt.

Local Sales Offices & Reps.

Ariz	Phoenix, McSherry & Assocs.	602-265-2803
Cal	Santa Rosa, Thomas	707-542-7380
Cal	Van Nuys, A. Szerlip Sls.	213-782-1765
Colo	Denver, McSherry & Assoc.	303-238-8361
Colo	Grand Junction, Delta Prods., Inc.	303-242-9000
Fla	Miami, Sochin Sls.	305-235-6048
Ga	Doraville, R. Alan Dist.	404-458-3195
Haw	Honolulu, A. Mosher	808-732-3636
Ind	Indianapolis, Shamrock Elctn.	317-251-5527
Md	Severna Park, Hochrein & Assoc.	301-987-4003
Mass	Northboro, W.B. Pray Sls.	617-393-3434
Mich	Brighton, Lectro Sls.	313-532-5725
Minn	Minneapolis, Heimann Co.	612-861-6051
Mo	Independence, C.W. Dreese & Assoc.	816-461-7294
NY	Utica, G.E. & C.F. Bates Assoc.	315-735-4389
Ohio	Akron, Shamrock Elctn.	216-666-1400
Tex	Houston, Ranger Elctns.	713-526-1044
Wash	Chehalis, B.E. Barkis & Assoc.	204-339-8024
EXP:	South Bend, Ind., Schwanke & Marshall Int., Inc.	219-232-5948

DELTEC CORP., 980 Buenos Ave., San Diego, Cal., 92110, Tel: 714-297-4466; Empl.: 50 p. 1-1181-1183

Customer service: R. D. Scott

Free literature available: Super-Isolation Transformers, 250VA to 500VA; A-C Line Conditioners, 1200VA to 5000VA; D-C to A-C Inverters, 300VA to 15KVA; Uninterruptible Power Systems, 700VA to 30KVA.

Products manufactured: Inverters, Isolators, Power Supplies, Protectors, Regulators, Suppressors, Transformers, Voltage Sources

Local Sales Offices & Reps.

Ala	Huntsville, F-M Assocs.	205-536-9990
Ariz	Phoenix, Zeus, Inc.	602-253-6104
Cal	Pasadena, A-F Sales Engg.	213-681-5631
Colo	Denver, Zeus, Inc.	303-770-4400
Fla	Orlando, F-M Assocs.	305-851-5710
Fla	Tequesta, F-M Assocs.	305-746-2996
Iowa	Cedar Rapids, Technical Reps.	319-363-2489
Kans	Kansas City, Technical Reps	913-782-1177
Md	Silver Springs, Sel-Tronics	301-589-3391
Mass	Waltham, McBar Assocs.	617-890-0233
Minn	Minneapolis, Electro-Service Co.	612-827-2907
Mo	Independence, Technical Reps.	816-737-1414
NJ	Pennsauken, Megargel/Himmelsstein Assoc.	609-662-2081
NJ	Ridgwood, Hansen Assoc.	201-652-7055
NM	Albuquerque, Zeus, Inc.	505-268-3941
NY	Fairport, NACO Elctns. Corp.	716-223-4490
NY	North Syracuse, NACO Elctns. Corp.	315-699-2651
NY	Utica, NACO Elctns. Corp.	315-732-1801
NC	Greensboro, F-M Assocs.	919-294-2754
Tex	Houston, Data Appls. Corp.	713-661-4501
Tex	Richardson, Data Appls. Corp.	214-231-4846
Tex	San Antonio, Data Appls. Corp.	512-732-7176
Utah	Salt Lake City, Zeus, Inc.	801-466-4924
Wash	Bellevue, TOPP Engrg. Sls. Corp.	206-747-5401

DELTROL CONTROLS, 2745 S. 19th St., Milwaukee, Wisc., 53215, Tel: 414-671-6800; Empl.: 300

Customer service: D. Uhen

Products manufactured: Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Relays, Solenoids, Timers

Local Sales Offices & Reps.

Cal	Los Angeles, Cummings & Assoc.	213-340-6035
Cal	Palos Verdes Estates, Deltrol Controls	213-377-4294
Cal	San Francisco, Cummings & Assoc.	408-247-8656
Colo	Denver, Parker-Webster	303-770-1972
Conn	Thomaston, Nelson & Schoonmaker	203-283-5959
Fla	North Miami, Winfield Electronic Sls.	305-945-6544
Ga	Atlanta, Winfield Southeast Co.	404-636-3023
Haw	Honolulu, Aloha Assocs.	808-941-1574
Ill	Chicago, Deltrol Controls	312-547-0500
Ind	Ft. Wayne, W. Bieberich Co.	219-432-2537
Ind	New Albany, W. W. Bieberich	812-945-3187
Md	Lutherville, Timonium, Naudain Assoc.	301-252-5378
Mich	Rochester, Kent & Assoc.	313-651-1890

Minn	St. Paul, Kenco Co.	612-645-7717
Mo	Hazelwood, Dy-Tronix	314-731-5799
Mo	Kansas City, Dy-Tronix	816-761-6543
NJ	Mount Laurel, Naudain Assocs.	609-235-1801
NY	Plainview, Deltrol Controls	516-931-3815
NY	Rochester, Deltrol Controls	716-473-3340
NC	Charlotte, Winfield Southeast Co.	704-536-2757

Ohio	Dayton, Deltrol Controls	513-223-3502
Ohio	Parma, Deltrol Controls	216-845-6727
Okla	Tulsa, T. J. Ray Co.	918-627-1515
Pa	Philadelphia, Naudain & Assoc.	609-235-1801
Tex	Dallas, E. F. Aymond Co.	214-826-7620
Tex	Houston, E. F. Aymond Co.	713-461-4487
Wash	Seattle, Underwood & Underwood	206-243-2133

Wisc Wauwatosa, F.C. DuBois & Assoc. 414-774-3100

EXP: Can., Ontario, Islington, Power Service Products 416-239-2977

Local Distributors

Ala	Birmingham, Forbes Distributing Co.	205-251-4104
Ala	Decatur, Forbes Distributing Co.	205-353-4546
Ala	Dothan, Hand Supply	205-792-3148
Ala	Huntsville, Hall-Mark	205-539-0691
Alas	Anchorage, Alaska Russell Elec. Co.	907-279-2150
Ariz	Phoenix, Service Supply Co.	602-264-6126
Ark	Fort Smith, Carlton-Bates Co.	501-782-7258
Ark	Little Rock, Carlton-Bates Co.	501-562-9100
Cal	Los Angeles, Electric Switches	213-664-2125
Cal	Los Angeles, Electro Components Dists.	213-264-7100
Cal	San Jose, Consolidated Parts	408-294-3202
Cal	Westminster, B. A. S. E. Electronics	714-894-1303
Cal	Woodland Hills, C & A Elctns.	213-340-6022
Colo	Denver, Fistell's Elctns. Supply Co.	303-244-4691
Colo	Denver, Intermark Elctns.	303-936-8284
Colo	Grand Junction, Radio & Elctns. Supply Co.	303-243-3346
Conn	New Haven, Hatry Elctns.	203-787-5921
Conn	Waterbury, Suburban Supply Co.	203-757-1251
Conn	West Port, Hi-Rel Inds.	203-226-4731
Fla	Miami, Electronic Equip.	305-871-3500
Fla	Tampa, Leader Elctns. Dists.	813-835-1891
Fla	Tampa, Lykes Elctns Corp.	305-633-8535
Ga	Chamblee, Lance Engrg.	404-458-6280
Haw	Honolulu, V. Kim Elctns.	808-533-7132
Ill	Chicago, G. W. Berkheimer Co.	312-468-5454
Ill	Chicago, Merrill Elctns. Inc.	312-286-2525
Ill	Chicago, Reverse Elctns. Supply	312-738-3636
Ill	Elgin, Stolz-Wickes, Inc.	312-741-4506
Ill	Elk Grove, Hall-Mark Elctns.	312-437-8800
Ill	Peoria, Warren Radio Co.	309-674-5998
Ill	Rockford, J & M Elctns., Inc.	815-963-6445
Ill	Wheeling, G. W. Berkheimer Co.	312-537-9300
Ind	Elkhart, Warren Radio Co.	219-523-2398
Ind	Fort Wayne, Fort Wayne Elctns. Supply	219-423-3422
Ind	Fort Wayne, G. W. Berkheimer Co.	219-744-4156
Ind	Fort Wayne, Warren Radio Co.	219-743-5344
Ind	Gary, G. W. Berkheimer Co.	219-887-0141
Ind	Indianapolis, G. W. Berkheimer Co.	317-787-2206
Ind	Indianapolis, Graham Elctns.	317-634-8486
Ind	Indianapolis, Warren Radio Co.	317-634-5566
Ind	South Bend, G. W. Berkheimer Co.	219-288-4741
Ind	South Bend, Radio Distributing Co.	219-287-2911
Iowa	Cedar Rapids, Iowa Radio Supply Co.	319-364-6154
Iowa	Davenport, Warren Radio	319-323-8051
Iowa	Dubuque, Miller Electric	319-588-1469
Iowa	Marshalltown, Egelston Electric	515-752-4678
Iowa	Waterloo, Farnsworth Electronics, Inc.	391-364-6154
Iowa	West Des Moines, Ramco Co.	515-274-2548
Kans	Great Bend, Cen-Kan Supply, Inc.	316-792-4362
Kans	Lenexa, Hall-Mark Electronics	913-888-4747
Ky	Ashland, Ashland Electric Co.	606-324-4107
Ky	Louisville, Peerless Electronic Equipment Co.	502-637-7677
Ky	Paducah, Warren Radio Co.	502-442-4367
La	Amelia, Bayou Bouef Elec.	504-631-2853
Md	Baltimore, Chesapeake Electronics	301-665-7595
Md	Baltimore, Hall-Mark Electronics	301-265-8500
Md	Baltimore, Temco, Inc.	301-685-4523
Md	Baltimore, United Electronics	301-732-5000
Mass	Cambridge, Interstate Electronics Equip.	617-868-7440

Mass	Fitchburg, Gettens Electric Supply Co.	617-343-3711
Mass	Waltham, QPL Electronic Distributors, Inc.	617-891-0460
Mich	Alpena, P & B Supply Inc.	517-354-5025
Mich	Ann Arbor, Gulf Electronics	313-769-8650
Mich	Battle Creek, Warren Radio Co.	616-965-3338
Mich	Detroit, Michigan Lectrol Corp.	313-255-4250
Mich	Flint, Roth Electric Supply Co.	313-234-8661
Mich	Grand Rapids, Stotts Friedman Electronics Co.	616-241-6731
Mich	Grand Rapids, Warren Radio Co.	616-456-5385
Mich	Kalamazoo, Warren Radio Co.	616-381-4203
Mich	Marquette, Warren Radio Co.	517-723-5239
Mich	Owasa, N.R.W. Electronics Corp.	906-226-7578
Mich	Port Huron, Huron Electric Supply Co.	313-985-8183
Minn	Minneapolis, Control Design, Inc.	612-721-1629
Minn	Minneapolis, Hall-Mark Electronics	612-925-2944
Mo	Kansas City, Kornfeld Thorp Electric	816-221-4000
Mo	St. Louis, Briner Electric Co.	314-321-1185
Mo	St. Louis, Control Design	314-426-3150
Mo	St. Louis, Hall-Mark Electronics	314-521-3800
Mo	St. Louis, Van Sickle Radio Electronics	314-621-5000
NJ	Belleville, Beltronics Corp.	201-751-2250
NJ	Edison, William Electronics Supply	201-985-3700
NJ	Rahway, Terminal Electronics Corp.	201-381-5700
NJ	Union City, Nidisco, Inc.	201-863-2111
NM	Albuquerque, Electronic Parts Co.	505-293-6161
NY	Brooklyn, Brooklyn Electronics, Inc.	212-748-1300
NY	Buffalo, Buffalo Electric Co.	716-854-4420
NY	East Islip, East Islip Electrical Supply	516-581-7600
NY	Farmingdale, Hall-Mark	516-293-7500
NY	Hempstead, Davis Electronics	516-483-9200
NY	Hempstead, Electronic Equipment Co.	516-895-5757
NY	New Hyde Park, Motors & Armatures, Inc.	516-437-9100
NY	Rochester, Simcona Electronics Corp.	716-328-3230
NC	Durham, Vickers Electronics Supply Co.	919-688-6311
ND	Minot, John Iverson	701-838-5466
ND	Williston, John Iverson	701-572-5126
Ohio	Akron, Sun Radio Co.	216-434-2171
Ohio	Akron, Warren Radio Co.	216-434-6668
Ohio	Cincinnati, United Radio Inc.	513-761-4030
Ohio	Cleveland, Warren Radio Co.	216-888-5225
Ohio	Cleveland, Winter-radio Electronic Supply	216-621-9383
Ohio	Columbus, McJunkin Corp.	614-294-3711
Ohio	Toledo, Warren Radio Co.	419-248-3364
Ohio	Wickliffe, Gateway Megatech	216-944-8565
Okla	Oklahoma City, Miller Jackson Co.	405-235-8426
Okla	Oklahoma City, Trice Wholesale Electronics	405-524-4411
Okla	Tulsa, Hall-Mark Electronics	918-835-8458
Ore	Albany, Portland Electric & Plumbing	503-926-7755
Ore	Eugene, Portland Electric & Plumbing	503-342-2101
Ore	Eugene, Tillman & Booth Inc.	503-343-7701
Ore	Medford, Portland Electric & Plumbing	503-779-6311
Ore	Portland, Central Distributors	503-234-0711
Ore	Portland, Portland Electric & Plumbing Co.	503-226-2531
Pa	Erie, Mace Electronics	814-838-3511
Pa	McKeesport, Barno Radio Co.	412-751-5966
Pa	Philadelphia, Simco Electronics Inc.	215-229-1880
Pa	Trevese, Hall-Mark Electronics	215-355-7300
SC	Columbia, Dixie Radio Supply	803-253-5332
SC	West Columbia, Standard Distributors	803-796-0350
Tenn	Chattanooga, Curle Electronics	615-266-4728
Tenn	Dyersburg, Warren Radio Co.	901-285-3850
Tenn	Knoxville, Bondurant Bros.	615-573-9151
Tex	Austin, Hargus-Austin, Inc.	512-478-6618
Tex	Beaumont, Marine & Industrial Electric	713-835-2517
Tex	Corpus Christi, Nunn Electric Supply Co.	512-884-0341
Tex	Dallas, Buffalo Electric Co.	214-421-7671
Tex	Dallas, Hall-Mark Electronics	214-231-5101
Tex	El Paso, McNicol Inc.	915-566-2936
Tex	El Paso, Sunland Supply Co.	915-533-5901
Tex	Houston, Buffalo Electric Co.	713-228-4431
Tex	Houston, Hall-Mark Electronics	713-781-6100

Tex	Houston, Nunn Electric Supply Corp.	713-928-5511
Tex	Lubbock, R & R Electric Co.	806-765-7727
Tex	Odessa, Midland Specialty Co.	915-337-6365
Tex	Richardson, Amtex Electric	214-637-1310
Utah	Salt Lake City, Alta Electronics	801-486-7227
Utah	Salt Lake City, Control Equipment Co.	801-487-7741
Utah	Salt Lake City, W. H. Bintz	801-363-5821
Va	Arlington, Arlington Electronic Wholesalers, Inc.	202-524-6256
Va	Charlottesville, Piedmont Electric Supply Corp.	804-977-2990
Va	Richmond, Meridian Electronics	804-353-6648
Va	Staunton, Piedmont Electric Supply Corp.	703-885-5186
Va	Staunton, Southern Electric Corp.	703-886-6218
Wash	Seattle, Almac Stroum Electronics	206-763-2300
Wash	Seattle, Interface Electronics Corp.	206-285-3500
Wash	Seattle, Pepco	206-325-2435
Wisc	Madison, Satterfield Electronics	608-257-4801
Wisc	Mequon, Taylor Electric Co.	414-241-4321
Wisc	Milwaukee, Hall-Mark Electronics	414-476-1270
Wisc	Wausau, Electronics Inc.	715-845-4671
Wisc	Wausau, Forward Electronics, Inc.	715-845-4355
For:	Can., Ont., Islington, Power Service Prods.	416-239-2977

DELTRON, INC., Wissahickon Ave., N. Wales, Pa., 19454.
Tel: 215-699-9261, TWX: 510-661-8061; Empl.: 75;
Minimum order: \$15

For info on price: P. M. Gerber; Application info: J. Phillips; Customer service: P. M. Gerber; Delivery info: J. Phillips

Free literature available: Deltron manufactures a complete line of highly regulated power supplies covering OEM applications as well as systems and laboratory requirements.

Products manufactured: Power Supplies

Local Sales Offices & Reps.

Ala	Huntsville, Incotek, Inc.	205-837-6061
Ariz	Phoenix, Arrowhead Sales Corp.	602-271-7148
Cal	Inglewood, L & M Engrg.	213-674-6850
Cal	Sunnyvale, AMASCO	408-733-8690
Colo	Arvada, Arrowhead Sls. Corp.	303-423-5556
Conn	Hamden, Pat Jenks Assocs.	203-281-0810
Fla	Orlando, Geartrner Assocs.	305-299-1000
Ill	Chicago, Berndt Assocs.	312-283-0713
Ind	Carmel, Berndt Assocs.	317-844-0114
Ind	Wheaton, Sonco	301-942-9420
Mass	Wakefield, Pat Jenks Assoc.	617-246-1590
Mich	Detroit, Micro Sls. Corp.	313-482-1229
Mo	St. Louis, Gordon Fixman	314-725-5219
NJ	Haddonfield, TAI Corp.	609-854-3011
NY	Baldwinsville, Scibetta Reps.	315-622-3993
NY	Tuckahoe, Spectrum Sls.	914-793-1660
Ohio	Centerville, Micro Sales Corp.	513-885-4171
Ohio	Cleveland, Micro Sls. Corp.	216-243-7430
Ore	Portland, McLaren, Inc.	503-297-2248
Tex	Garland, Gordon V. Peck Co.	214-341-8311
Tex	Houston, Gordon V. Peck Co.	713-664-1435
Utah	Salt Lake City, Arrowhead Sls.	801-487-4716
Wash	Bellevue, McLaren, Inc.	206-454-3400
Wisc	Brookfield, Berndt Assocs.	414-786-6950
FOR:	Can., Don Mills, Ont., Componetics Ltd.	416-445-3230
FOR:	Can., Montreal, Que., Componetics Ltd.	514-342-4117

DELTRONIC CRYSTAL INDS., INC., Box 323, Denville, N.J., 07834, Tel: 201-361-2222; Empl.: 5
Customer service: S. Samuelson

Free literature available: Product bulletins YIG-1 & GGG-1, data/spec sheets

Products manufactured: Crystals, Ferrite Material & Parts, Filters, Oscillators

DEMEK, INC., 4824 Rainbow Blvd., Shawnee-Mission, Kans., 66205, Tel: 913-384-0444; Empl.: 10

Products manufactured: Comm. Systems, Converters, Punched Card Equipment, Translators, Data, Transmission Systems, Data

DENISON, R.B., INC., 103 Broadway, Bedford, Ohio, 44146, Tel: 216-232-8200; Empl.: 40; Minimum order: \$5

For info on price: J. Basar; Application info: F. Hardcastle; Customer service: J. Basar; Delivery info: J. Basar

Free literature available: Individual Bulletins are available for Type L, Type C, Type M, Type SG and Type P limit switches. Complete catalogs are not available. Reader must specify bulletin of interest.

Products manufactured: Switches

Local Sales Offices & Reps.

Ala	Birmingham, J. Spader Co.	205-879-1366
Ark	Fort Smith, J.R. Masterson	501-646-7756
Cal	Los Angeles, R.B. Clapp Co.	213-225-2395
Cal	San Francisco, Artwell Elec. Inc.	415-467-1880
Colo	Denver, TESSCO	303-744-1119
Conn	Hartford, R. Sawtell Assoc.	413-562-6627
Fla	Indian Rocks Beach, Kirk Sls. Co.	813-595-7353
Ga	Buford, R.L. Matus	404-945-2946
Ill	Chicago, G.H. Anderson	312-728-3827
Ind	Indianapolis, L.W. Loven Co.	317-359-0311
Mass	Norwood, R.P. Hyland Co.	617-762-0345
Mass	Westfield, R. Sawtell Assoc.	413-562-6627
Mich	Farmington Hills, R. McBride Co.	313-474-2300
Minn	Minneapolis, W.A. Hallock Co.	612-920-6100
Mo	St. Louis, R. Greene Co.	816-333-7585
NY	Buffalo, A.C. Schultz Inc.	315-475-5263
NY	Flushing, Tri State Comps., Inc.	212-358-1010
NC	Charlotte, W.E. Cook & Assoc.	704-525-3384
Ohio	Cincinnati, Nelcor, Inc.	513-871-2818
Ohio	Cleveland, J.L. Finnicum & Assoc.	216-226-7078
Pa	Malvern, Miller & Dietz Co.	215-647-7373
Pa	Pittsburgh, R.F. Clark Co.	412-242-9500
Tex	Dallas, Stout Schmidt Co.	214-241-4435
Tex	Houston, Stout-Jennings-Schmidt	713-729-1994
Va	Richmond, Reynolds Cowardin Assoc.	703-266-3457
Wash	Seattle, H. Campbell Co.	206-634-1200

DENNISON MFG. CO., Marketing & Attaching Sys. Div., Framingham, Mass., 01701, Tel: 617-879-0511, Telex: 948-478; FSC No: 5975; QPL No: 2310; Empl.: 6000

Customer service: F. T. Wright

Free literature available: Product Bulletin #283 gives specifications and prices on heavy duty Bar-Lok&T cable ties. Bundle diameters 1/16" to 3". Unique manufacturing process lowers cost and reduces weight. Product Bulletin #295 gives specifications and prices on adjustable Secur-A-Tie® fasteners for lowest cost.

Light duty bundling, closing, tying or harnessing diameters from 1/16" to 1 3/8".

Products manufactured: Clamps & Clips, Fasteners, Labels, Pressure-Sensitive, Adhesive, Machines/Machinery, Production, Nameplates, Wire & Cable Ties

Local Sales Offices & Reps.

Ala	Birmingham	205-251-9558
Ariz	Phoenix	602-264-2699
Cal	Burlingame	415-347-1487
Cal	Rosemead	213-283-0214
Colo	Denver	303-388-8187
Conn	Hamden	203-528-0625
Fla	Ft. Lauderdale	305-947-3531
Fla	Tampa	813-894-0681
Ga	Atlanta	404-355-7665
Ill	Des Plaines	312-298-8870
Ind	Indianapolis	317-243-3209
Iowa	Des Moines	515-278-4276
La	New Orleans	504-947-2197
Mo	Riverdale	301-792-4474
Mass	Waltham	617-890-0027
Mich	Grand Rapids	616-455-1620
Mich	Southfield	313-354-6440
Minn	Minneapolis	612-544-7738
Mo	Independence	816-358-4488
Mo	St. Louis	314-352-4161
NY	Buffalo	716-875-3084
NY	Elnora	518-869-8406
NY	New York	212-489-9400
NY	Rochester	716-244-3250
NC	Gastonia	704-867-8315
NC	Greensboro	919-275-9915
NC	Raleigh	919-782-5969
Ohio	Cincinnati	513-621-0865
Ohio	Cleveland	216-888-0515
Ohio	Columbus	614-231-2944
Ore	Portland	503-226-3241
Pa	Pittsburgh	412-923-1620
Pa	Wayne	215-687-9110
SC	Spartanburg	803-585-7175
SC	Taylors	803-232-8033
Tenn	Nashville	615-256-8718
Tex	Dallas	214-826-3150
Tex	Houston	713-771-4940
Tex	San Antonio	512-828-6055
Va	Richmond	804-644-2841
Wash	Seattle	206-243-2740
Wisc	Wauwatosa	414-778-0560

DERINGER MFG. CO., 1250 Town Line Rd., Mundelein, Ill., 60060, Tel: 312-566-4100, TWX: 910-685-4321; Empl.: 220

Products manufactured: Contacts, Electrical

DESIGN AUTOMATION, INC., 809 Massachusetts Ave., Lexington, Mass., 02173, Tel: 617-862-8998; Empl.: 5
Customer service: N. Sokal

Free literature available: Check lists for design review of electronic and electromechanical equipment.

Products manufactured: Amplifiers, Computers, Converters, Data Acquisition & Reduction Systems, Inverters, Services, Assembly, Production & Test, Transformers, Transmitters

DESIGNATRONICS INC., 55 S. Denton Ave., New Hyde Park, NY, 11040

DESPATCH OVEN CO., P.O. Box 1320, Minneapolis, Minn., 55440, Tel: 612-331-1873; Empl.: 250

Products manufactured: Chamber, Environmental Test, Controls/Control Eqpt., Furnaces

DEST DATA CORP., 1285 Forgewood Ave., Sunnyvale, Cal., 94085, Tel: 408-734-1234; Empl.: 33; Minimum order: \$50

For info on price: A. E. Kushnick; Application info: I. Mallender; Customer service: A. E. Kushnick; Delivery info: I. Mallender

Free literature available: DSD 120/240 - Document Scanners and Digitizers OCR/Comp - OCR Equipment

Products manufactured: Cameras, Comm. Systems, Compressors, Data, Converters, Data Compressors, Digital, Digitizers, Pencil Follower (Inc. Coordinate & Graphic), Expanders, Data, Interferometer Systems, Readers, Recorders, Scanners, Servo Systems, Transmission Systems, Data

DETRONICS CORP., 10660 E. Rush St., S. El Monte, Cal., 91733, Tel: 213-579-7130, TWX: 910-587-3436; FSC No: 29867; Empl.: 45

For info on price: R. Wilson; Application info: D. Duke; Customer service: D. Baroda; Delivery info: R. Wilson

Free literature available: Illustrative brochure depicting various hermetically sealed glass to metal connectors and headers. Technical catalogs sheets available on request.

Products manufactured: Connector Adapters, Connectors, Detectors, Feedthrus & Seals, Environmental, Headers, Holder & Carriers, Packages, Integrated Circuit, Resistors, Seals, Services, Assembly, Production & Test, Terminals

DEUTSCH CO., Elec. Components Div., Municipal Airport, Banning, Cal., 92220

DEUTSCH FASTENER CORP., 7001 W. Imperial Hwy., Los Angeles, Cal., 90045, Tel: 213-649-1400, TWX: 213-673-1000; Empl.: 100; Minimum order: \$25
Customer service: E. Baumgarten

Free literature available: Folders describing specialized fastening devices such as captive screws as well as flare inserted nuts, press to open latches stress panel fasteners and related devices.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Fasteners, Handles For Cabinets, Circuit Boards, Racks, etc., Pins, Rivets

DEUTSCH RELAYS, INC., 65 Daly Rd., East Northport, N.Y., 11731, Tel: 516-864-6000, TWX: 510-226-0233; Empl.: 420

For info on price: S. Saccareccia; Application info: R. Robotti; Customer service: R. D'Ambrosio; Delivery info: R. D'Ambrosio

Free literature available: Short Form Relay Catalog - Describes the wide line of Electromechanical relays produced by Deutsch Relays. Time Controllers Catalogs - Describes the Time Delay Relays available from Deutsch Relays.

Products manufactured: Relays

Local Sales Offices & Reps.

Cal Burlingame, J. Logan & Assoc. 415-697-6100
Fla Altamonte Springs, Semtronic Assocs. 305-931-8235
Ga Atlanta, Grady Duckett 404-451-3529
Ill Chicago, Berndt Assocs. 312-283-0713
Mass Waltham, Rantek 617-890-5110
Ohio Dayton, Electro-Com 513-898-5140

Pa King of Prussia, Monteiro Assocs.

Tex Dallas, Allied Inc. 215-265-0634
Wash Bellevue, Pacific NW Consult. 206-454-2503
FOR: Can., Burlington, Ont., Neeco 416-632-1403
FOR: Can., Toronto, Ont., Neeco 416-364-0443

DEVELCO, 530 Logue Ave., Mountain View, Cal., 94043, Tel: 408-969-1600, TWX: 910-379-6588; Empl.: 75; Minimum order: \$25

For info on price: G. Patterson; Customer service: R. Rondoe

Free literature available: Product Brochures and Application Notes.

Products manufactured: Amplifiers, Display Devices/Displays, Isolators, Magnetometers, Standards, Testers

Local Sales Offices & Reps.

Md Gaithersburg, Data Time, Inc. 301-948-7666

Advertisement

Develco manufactures a broad range of high-technology products which include: (1) Fluxgate magnetometers; (2) Superconducting magnetometers, gradiometers, shields and cryostats; (3) Fiber-Optic isolated data links; (4) Geophysical instrumentation; (5) LF/VLF time and frequency instruments; (6) 3-axis displays for signal analysis; and, (7) the Alma (see separate Alma listing) line of IC testers.

DIACON, 4812 G Kearny Mesa Rd., San Diego, Cal., 92111, Tel: 714-279-6992; Empl.: 225; Minimum order: \$100

For info on price: D. Fleming; Application info: P. Scott; Customer service: B. Moran; Delivery info: D. Fleming

Free literature available: Packages - hermetic ceramic dips and flatpaks cerdip technology, low temp seal. Equipment - environment and ambient handlers for test equipment.

Products manufactured: Machines/Machinery, Production, Packages, Integrated Circuit

Local Sales Offices & Reps.

Mass Fall River, Greenlees Assoc. 617-674-9858
NY New York, Huth Sls. 212-984-1765
Tex Richardson, Marston Co. 214-235-3577
Wash Bellevue, SD-R&S2 Co. 206-747-9424

DI-ACRO, Div. Houdaille Inds., Inc., 316 8th Ave., Lake City, Minn., 55041, Tel: 612-345-4571; Empl.: 400; Minimum order: \$20

For info on price: F. W. Coyle; Application info: R. Scroggins; Customer service: T. Kruempel; Delivery info: F. W. Coyle

Products manufactured: Machines/Machinery, Production, Punches, Chassis, Services, Assembly, Production & Test

DI/AN CONTROLS, INC., 944 Dorchester Ave., Boston, Mass., 02125, Tel: 617-288-7700, TWX: 710-333-1732; Empl.: 180; Minimum order: \$25

For info on price: H. Smith; Application info: H. Smith; Customer service: E. Healey; Delivery info: H. Smith

Free literature available: Ticket Printers - describes functions and specifications, as well as applications for a variety of ticket, bag and label printers. Model 9030 teleprinter - describes features and characteristics of this wide carriage, 30 CPS impact teleprinter.

Products manufactured: Memory Systems, Printers, Teletypewriters & Equipment, Terminal Equipment, Digital, Timers

DIALIGHT, 203 Harrison Pl., Brooklyn, N.Y., 11237, Tel: 212-497-7600, TWX: 710-584-5487; Empl.: 400
p. 2-1138-1141

For info on price: C. Dombroski; Application info: C. Dombroski; Customer service: H. Goodman; Delivery info: A. Romaine

Products manufactured: Diodes, Display Devices/Displays, Drivers & Decoders For Readouts, Flashers, Lamps, Lights, Sockets, Switches

Local Sales Offices & Reps.

Ariz Phoenix, R. Stitzer Co. 602-944-6808
Cal Oakland, Moulthrop Sls. 415-261-7676

Cal Pico Rivera, Westrep 213-949-2551

Colo Denver, R.G. Bowen Co. 303-722-4641

Fla Orlando, Cartwright & Bean, Inc. 305-422-4531

Fla Plantation, Cartwright & Bean, Inc. 305-791-3989

Ga Atlanta, Cartwright & Bean, Inc. 404-255-5262

Ill Hinsdale, Hill-Gray Assocs. 312-325-4810

Ind Indianapolis, Southern Sls. Corp. 317-257-7575

Kans Shawnee Mission, K & M Sls. Co. 913-262-1444

La Chalmette, Cartwright & Bean, Inc. 504-279-4598

Mass Needham, Mullin Tech. Sls. 617-444-4780

Mich Ferndale, Hilltronics Inc. 313-398-5556

Minn St. Paul, R.G. Ragon, Inc. 612-488-0201

Mo St. Louis, K & M Sls. Co. 314-423-2420

NJ Wayne, R. Horne Assocs. 201-835-7400

NY No. Syracuse, Precision Sls. 315-458-2223

NC Charlotte, Cartwright & Bean, Inc. 704-333-6457

Ohio Cleveland, K.W. Elctrn. Sls. 216-831-8292

Ohio Dayton, K.W. Elctrn. Sls. 513-890-2150

Ore Portland, Almac/Stroum Elctrns. 503-292-3534

Pa Allison Park, K.W. Elctrn. Sls. 412-487-4300

Pa Broomall, L.D. Lowery, Inc. 215-528-5170

Tenn Memphis, Cartwright & Bean, Inc. 901-276-4442

Tex Houston, Tesco 713-464-2828

Tex Richardson, Tesco 214-690-4004

Utah Salt Lake City, R.G. Bowen Co. 801-363-8801

Wash Seattle, Almac/Stroum Elctrns. 206-763-2300

EXP: Brooklyn, N.Y., Dialight 212-497-7600

Local Distributors

Ariz Phoenix, Moltronics of Ariz, 2746 W. Palm La. 602-272-7951

Cal Chatsworth, Westates Elctrns., 20151/ Bahama St. 213-341-4411

Cal Culver City, Western Electromotive, 8467 Steller Dr. 213-870-7621

Cal Inglewood, Newark Elctrns., 4747 W. Century Blvd. 213-678-0441

Cal Sacramento, Sacramento Elctrns., 1219 S. St. 916-441-4821

Cal Santa Clara, Fisher/Brownell, 3381 Edward Ave. 408-244-6182

Cal Sun Valley, Richey Elctrns., Inc., 10871 La Tuna Canyon Rd. 213-875-2862

Cal Sunnyvale, Bell Industries, 1161 No. Fair Oak 408-734-8570

Colo Denver, Meter Master Instr., 1165 S. Cherokee St. 303-722-5766

Colo Denver, Newark-Denver Elctrns., 2170 S. Grape St. 303-757-3351

Conn Waterbury, Suburban Supply, 117 Benedict St. 203-757-1251

Fla Orlando, Hammond Elctrns., 911 W. Central Blvd. 305-849-8060

Ga Atlanta, Specialty Dist., 763 Juniper St., N.E. 404-873-2521

Ill Chicago, Elctrn. Dists., Inc., 4900 No. Elston Ave. 312-283-4800

Ill Chicago, Newark Elctrns., 500 No. Pulaski Rd. 312-638-4411

Ill Elgin, Allied Elctrns., 1355 Sleepy Hollow Rd. 312-697-8200

Ill Peoria, Klaus Radio & Elect., 8400 N. Pioneer Pkwy. 309-691-4840

Ind Ft. Wayne, Fort Wayne Elctrn. Supply, 3606 E. Maumee St. 219-423-3422

Ind Indianapolis, Graham Elctrn. Supply, 133 S. Pennsylvania St. 317-634-8202

Ind Indianapolis, Ra-Dis-Co., 814 N. Senate Ave. 317-637-5571

Ind South Bend, Radio Dist., 1212 High St. 219-287-2911

Ky Louisville, P.I. Burks Co., 842 S. 7th St. 502-583-2871

La Lafayette, Ralph's of Lafayette, 3004 Cameron St. 318-234-4507

La New Orleans, Southern Radio Supply Co., 1909 Tulane Ave. 504-524-2343

Md Baltimore, Radio Elec. Svc., 1026 Cromwell Bridge Rd. 301-823-0070

Md Gaithersburg, Cramer/EW Wash., 16021 Industrial Dr. 301-948-0110

Md Rockville, Capitol Radio Wholesalers, 12270 Wilkins Ave. 301-881-2270

Md Rockville, Pioneer Washington Elect., 1037 Taft St. 301-424-3300

Mass Boston, De Mambro Radio Supply Co., 1095 Commonwealth Ave. 617-787-1200

Mass Boston, Sager Electrical Supply, 172 High St. 617-542-2281

Mass Dedham, Gerber Elctrns., 852 Providence Hwy. 617-329-2400

Mass Newton Centre, Cramer Elctrns., 85 Wells Ave. 617-969-7700

Mass Springfield, T.F. Cushing, Inc., 1026 Bay St. 413-788-7341

Mass Wilbraham, Ind'l. Components, 2551 Boston Rd.
413-596-3854

Mich Ann Arbor, Wedemeyer Elctn. Supply, 2280 S.
Industrial Hwy. 313-665-8611

Mich Detroit, Newark-Detroit Elctn. Supply, 20700
Hubbell Ave. 313-548-0250

Mich Wyoming, Newark Elctn., 3645 Linden Ave. S.E.
616-241-6681

Minn St. Paul, Gopher Elctns., 2520 W. Larpenteur
Ave. 612-645-0241

Mo Kansas City, Walters Radio Supply, 3635 Main
St. 816-531-7015

Mo No. Kansas City, LCOMP-Kansas City, 1520
Taney 816-221-2400

Mo St. Louis, LCOMP-St. Louis, 2605 So. Hanley
314-647-5505

Neb Lincoln, Scott Elctn. Supply, 4040 Adams St.
402-434-8308

NJ Cherry Hill, Milgray/Delaware Valley, 1165
Marlkress Rd. 609-424-1300

NJ Hanover, State Elctns., 36 Rt. 10 201-887-2550

NJ Kenilworth, Newark Elctns., 303 Monroe Ave.
201-272-8410

NJ Pennsauken, Resco Elctns., Airport & Central
Hwys. 609-662-4000

NJ Rahway, Terminal Elctns. Corp., Rahway
Industrial Ctr., Pinewood St. 201-381-5700

NJ Springfield, Federated Elctns., 155 U.S. Rt. 22
201-376-8900

NY Binghamton, Stack Industrial Elctns., 45
Washington St. 607-723-6326

NY Buffalo, Summit Distributors, 916 Main St.
716-884-3450

NY E. Farmingdale, Harrison Radio, 20 Smith St.
516-293-7990

NY Elmsford, Ancar Electronics Supply, 1
Nepperhan Ave. 914-592-7100

NY Farmingdale, Arrow Elctns., 900 Broad Hollow
Rd. 516-694-6800

NY Long Island City, H.L. Dalis, 35-35 24th St.
212-361-1100

NY Lynbrook, Peerless Radio, 19 Wilbur St.
516-593-2121

NY Rochester, Summit Elctns. of Rochester, 292
Commerce Dr. 716-334-8110

NY Rome, Rome Elctns., 108 Spring St.
315-337-5400

NY Syosset, Milo Elctns., 170 Eileen Way
516-364-1111

NY Woodbury, Harvey Radio, 60 Crossways Park W.
516-921-8700

NC Greensboro, Hammond Elctns. of Carolina,
2923 Pacific Ave. 919-275-6391

NC Raleigh, Southeastern Radio Supply, 414
Hillsborough St. 919-828-2311

NC Winston-Salem, Cramer/EW, 938 Burke St.
919-725-8711

Ohio Akron, Akron Elctn. Supply, 107-117 S.
Arlington St. 216-762-8818

Ohio Akron, Sun Radio, 110 E. Market St.
216-434-2171

Ohio Cincinnati, Hughes-Peters, 4865 Duck Creek Rd.
513-351-2000

Ohio Cincinnati, Newark Cincinnati, 9799-G Princeton
Rd. 513-874-5115

Ohio Cincinnati, United Radio, Summit Rd. &
Reinhold Dr. 513-761-4030

Ohio Cleveland, Pioneer-Standard-Cleveland Div.,
4800 E. 131 St. 216-587-3600

Ohio Columbus, Hughes-Peters, 481 E. 11th St.
614-294-5351

Ohio Dayton, Pioneer/Dayton Div., Pioneer-Standard
Elctn., 1900 Troy St. 513-236-9900

Ohio Dayton, Stotts-Friedman, 108 N. Jefferson St.
513-224-1111

Ohio Highland Hgts, RPC Elctns., 749 Miner Rd.
216-461-4700

Ohio Lima, Lima Radio Parts, 150 W. Grand Ave.
419-228-1220

Ohio Solon, Radio & Elctn. Parts (Repco), 6835
Cochran Rd. 216-248-8900

Okla Tulsa, Radio, Inc., 1000 S. Main St.
918-587-9124

Ore Portland, Almac/Stroum Elctns., 4475 Scholls
Ferry Rd. 503-292-3534

Pa Erie, Seaway Elec. Supply, 142 W. 12 St.
814-456-4228

Pa Montgomeryville, Pyttronic Industries,
Montgomeryville Ind'l Pk. 215-242-6700

Pa Philadelphia, Almo Elctns., Roosevelt Blvd. at
Blue Grass Rd. 215-676-6000

Pa Philadelphia, Philadelphia Elctns., 1225 Vine St.
215-568-8288

Pa Pittsburgh, Cameradio Elctns., 2801 Liberty
Ave. 412-288-2600

Pa Reading, G. D. Barbey Co., 333 No. 4th St.
215-376-7451

RI Providence, Wm. Dandreta & Co., 28 Wolcott St.
401-861-2800

SC Greenville, Hammond Elctns. of Carolina, 100
Augusta St. 803-293-4121

Tenn Kingsport, Radio Elec. Supply, 961 E. Sullivan
St. 615-247-8111

Tenn Nashville, Electra Distributing, 1914 West End
Ave. 615-255-8444

Tex Dallas, Texas Instr. Supply, 6000 Denton Dr.
214-238-6811

Tex Ft. Worth, Allied Elctns., 401 E. 8th St.
817-336-5401

Tex Garland, Newark Elctns., 707 Easy St.
214-271-2511

Tex Houston, Harrison Equip. Co., 1616 McGowen
713-224-9131

Tex Houston, Lenert Co., 1420 Hutchins
713-225-1465

Tex Houston, Newark-Houston Elctns. Corp., 6902
Harwin Dr. 713-782-4800

Utah Salt Lake City, Standard Supply Co., 225 E. 6th
South 801-355-2971

Va Norfolk, Priest Elctns., 6431 Tidewater Dr.
703-855-0141

Va Richmond, Meridian Elctns., 1001 W. Broad St.
804-353-6648

Wash Seattle, Almac/Stroum Elctns., 5811 Sixth Ave.
So. 206-763-2300

Wisc Milwaukee, Elctn. Expeditors, 6045 N. Green
Bay Ave. 414-228-8100

Wisc Milwaukee, Parts Mart, 1314 N. 7th St.
414-276-4160

For: Can., Don Mills, Ont., Saynor Elctns. Ltd., 99
Scarsdale Rd. 416-445-2347

For: Can., Downsview, Ont., Cesco Elctns. Ltd., 24
Martin Ross Ave. 416-661-0220

For: Can., Montreal, Que., Cesco Elctns. Ltd., 4050
Jean Talon St. W. 514-735-5511

For: Can., Montreal, Que., Payette Radio Ltd., 730 St.
James St. W. 514-866-6681

For: Can., Ottawa, Ont., Wackid Radio TV Labs, Ltd.,
312 Parkdale Ave. 613-728-1821

For: Can., Ottawa, Ont., Cesco Elctns. Ltd., 1300
Carling Ave. 613-729-5118

For: Can., Toronto, Ont., Electro Sonic Supply Co.,
Ltd., 543 Yonge St. 416-924-0711

For: Can., Toronto, Ont., Zenronics, Ltd., 185
Bridgeland Ave. 416-525-1700

For: Can., Vancouver, B.C., L.A. Varah Ltd., 2077
Alberta St. 604-873-3211

For: Can., Winnipeg, Man., Cam Gard Supply, Ltd.,
1777 Ellice Ave. 204-786-8401

DIAMONITE PRODUCTS DIV., Box 581, Shreve, Ohio,
44676, Tel: 216-567-2145; Empl: 250

Customer service: P. Dunley

Free literature available: Diamonite Alumina
Electronic Ceramics-Brochure

Products manufactured: Cores, Ceramic, Insulators
& Insulation, Seals, Substrates, Tubing

Local Sales Offices & Reps.

Ala Huntsville, Techn. Sls. 205-881-1750

Cal Atherton, Wadsworth-Pacific Mfg. Assoc. 415-321-3619

Cal Pacific Palisades, Wadsworth-Pacific Mfg.
Assoc. 213-454-4313

Conn Simsbury, C.M. Billard & Co. 203-658-7200

Fla Ft. Lauderdale, G.F. Bohman Assocs. 305-564-3081

Fla Orlando, G.F. Bohman Assocs. 305-855-0274

Ind Indianapolis, H.G. Lake Co. 317-783-7254

Mich Farmington, Scanlon-Cotter Co. 313-477-9080

Mo St. Louis, A.V. Doran Co. 314-725-3377

NJ Trenton, William S. Mills 609-882-4111

NY Liverpool, Wadsworth Mfg. Assocs. 315-652-6865

NY Manlius, Wadsworth Mfg. Assocs. 315-682-5705

NC Greensboro, Manufacturers Sls. Co. 919-274-2474

Ohio Dayton, H.G. Lake Co. 513-277-8181

Ohio Richmond Heights, H.G. Lake Co. 216-486-1477

Pa Philadelphia, K.B. Erdman Co. 215-224-1833

Tex Addison, Manufacturers Mktg. Svc. 214-661-5160

Tex Kemah, Manufacturers Mktg. Svc. 713-334-4717

Wisc Elm Grove, Gibbons & Hebbe 414-782-6900

DIA-NETICS INC., 18823 Napa St., Northridge, Cal.,
91324, Tel: 213-886-2616; Empl: 35 p. 2-422,423

For info on price: M. Easton; Application info: L.
Fluey; Customer service: L. Fluey; Delivery info: E.
Wilson

Products manufactured: Bobbins, Winding, Coil &
Transformer, Coils Including Assemblies & Forms

DICEON ELECTRONICS, 18522 Von Karman Ave., Irvine,
Cal., 92664, Tel: 714-833-0870, TWX: 910-595-1794

Customer service: Area Sls. Coordinator

Products manufactured: Circuits, Flexible, Circuits,
Printed, Multilayer, Services, Assembly,
Production & Test

Local Sales Offices & Reps.

Ala Huntsville, Electronic Mktg. Assocs. 205-837-6061

Ariz Phoenix, Markets West 602-279-2378

Cal Mt. View, West/Mark Assocs. 415-969-1700

Cal Denver, Rope & Williamson 303-758-8507

Ill Barrington, L. Bacher & Assocs. 312-381-6780

Mass Wakefield, Data Engrg. Svcs. 617-234-6666

Mich Southfield, Luebbs Sls. Co. 313-357-0355

Minn Anoka, K. Haugen & Assocs. 612-421-3395

NJ Livingston, Graydon-Sherman 201-994-9055

NY Fayetteville, Graydon-Sherman 315-637-9861

NC Cary, Electronic Mktg. Assocs. 919-722-5151

Ohio Cincinnati, Luebbs Sls. Co. 513-871-4211

Pa Delmont, Luebbs Sls. Co. 412-468-4019

Pa Yeadon, Graydon-Sherman 215-664-7316

SC Greenville, Electronic Mktg. Assocs. 803-244-8120

Tex Richardson, P. J. Scanlon Co. 214-231-4661

DICKSON ELECTRONICS, See Siemens Corp, Comps
Div.

DIELECTRIC COMMS, Div. Sola Basic Inds., Raymond,
Maine, 04071, Tel: 207-655-4555, TWX: 710-229-6890;
FSC No: 08441; Empl: 165

For info on price: P. Skahan; Application info: R.
Tanczos; Customer service: P. Skahan; Delivery info:
R. Tanczos

Products manufactured: Dehydrators, Dummy
Loads, Meters

DIELECTRIC INSTR. CORP., 761 Franklin Ave., Pittsburgh,
Pa., 15221, Tel: 412-731-6566; Empl: 10

Customer service: W. M. Wyman

Products manufactured: Bridges, Meters, Services,
Assembly, Production & Test, Testers, Timers

DIELECTRIC SCIENCES, 5 South Ave., Burlington, Mass,
01803, Tel: 617-272-8960; FSC No: 50509; Empl: 6

Customer service: J. A. Goldlust

Products manufactured: Cable, Connectors, Lead
Assemblies & Receptacles, Wire

Local Sales Offices & Reps.

Cal San Diego, Encom 714-299-1616

Cal San Francisco, Encom 415-969-0330

DIETZ DESIGN, INC., 100 Electronics Pkwy., Belton, Mo.,
64012, Tel: 816-331-4911; Empl: 50

For info on price: D. Lier; Application info: V. L.
Zugenbuhler; Customer service: C. Gurnett

Free literature available: Catalog sheets on Desco
Plug-in Assemblies, Company folder describing
capabilities and showing pictures of products
manufactured, and catalog sheet designated 2700
EEM File System showing telegraph tone channel
band pass filters and there frequency.

Products manufactured: Chokes, Coils Including
Assemblies & Forms, Delay Lines, Enclosures,
Module, Plug-In, Filters, Networks, Reactors,
Standards, Transformers

DIETZ, HENRY G. CO., INC., 14-26 28th Ave., Long Island
City, N.Y., 11102, Tel: 212-RA 6-3347; Empl: 20;
Minimum order: \$10

Customer service: H. G. Dietz

Free literature available: Catalog - Title: flow
meters, low pressure switches and velocity
actuated flow switches (contents: general
description of products available).

Products manufactured: Controls/Control Eqpt.,
Switches

DIETZGEN CORP., 2425 N. Sheffield Ave., Chicago, Ill,
60613, Tel: 312-549-3300; Empl: 200

Products manufactured: Drafting Machines,
Readers

Local Sales Offices & Reps.

Cal Los Angeles 213-678-3761

Cal San Diego 714-234-8411

Cal San Francisco 408-984-2460

Cal Denver 303-399-2180

Conn North Brunswick 201-297-3500

DC Washington 202-223-8130

Fla Orlando 305-241-5671

Ga Atlanta 404-934-5240

Ill Chicago 312-549-3300

Ky	Louisville	502-584-2265
La	New Orleans	504-525-7121
Mass	Upper Newton Falls	617-965-4830
Mich	Birmingham	313-644-1900
Mo	Kansas City	816-471-3340
NJ	North Brunswick	201-297-3500
Ohio	Cincinnati	513-761-2724
Ohio	Cleveland	216-631-2660
Ohio	Columbus	614-224-5149
Okla	Oklahoma City	405-232-1147
Pa	Philadelphia	215-688-6400
Pa	Pittsburgh	412-563-6880
Tex	Arlington	214-263-3111
Wash	Seattle	206-623-1158
Wisc	Brookfield	414-671-1518
FOR:	Can., Weston, Ont.	416-749-2077

DIGIAC CORP., 175 Engineers Rd., Smithtown, N.Y., 11787, Tel: 516-273-8600; Empl.: 50; Minimum order: \$10

Customer service: G. Timmes

Free literature available: Apple Cat - Includes educational training products, in computer electronics, technology, electromechanical technology, mechanisms & linkages fluid power technology. Electrolab - Data sheets to include, introductory to electricity training systems, advanced electrical machines studies, electrical technology training systems and power supplies.

Products manufactured: Amplifiers, Benches, Consoles, Stools, Tables, Computers, Controls/Control Ept., Converters, Generators, Power Supplies, Recorders, Servo Systems

Local Sales Offices & Reps.

Ala	Birmingham, Technical Training Aids	205-822-1326
Ariz	Scottsdale, Peterson Assocs.	602-945-6605
Cal	Granada Hills, Tech. Education Svcs.	213-360-1061
Fla	Winter Pk., Tech. Training Aids	305-647-5373
Ill	Downers Grove, Aindex Corp.	312-963-4270
Iowa	Marion, Gib Klein Co.	319-393-4048
Md	Columbia, W.B. Cavanaugh Co.	301-730-6777
Mich	Plymouth, J. Close	313-453-7531
Minn	Eden Prairie, Lab Corp.	612-944-1807
NH	Windham, Helmar Assocs.	603-893-4586
NY	East Norwich, Tequipment	516-922-6590
NY	Pittsford, Vowell Assocs.	716-381-9280
NC	Sanford, A.B. Williams Jr. Assoc.	919-775-4164
Ohio	Toledo, Freeman Supply Co.	419-691-4624
Pa	Philadelphia, Delta Equip. Co.	215-236-6350
SD	Watertown, J.L.H. Assocs.	605-886-4667
Tex	Dallas, Tol-Mark Co.	214-341-6917
Tex	Temple, Digiac Corp.	817-778-5681
Wash	Edmonds, Tomahawk Corp.	206-776-4598
Wisc	Milwaukee, Lab Corp.	414-771-2946

DIGI-DATA CORP., 8580 Dorsey Rd., Jessup, Md., 20794, Tel: 301-498-0200, TWX: 710-867-9254; Empl.: 80; Minimum order: \$20

For info on price: R. Arnold; Application info: R. Pedersen; Customer service: C. Guenther; Delivery info: R. Arnold

DIGILIN INC., 3521 W. Pacific Ave., Burbank, Cal., 91505, Tel: 213-846-1800, TWX: 910-498-2758; Empl.: 50; Minimum order: \$25

For info on price: E. B. Hibbs Jr.; Application info: J. Masatsugu; Customer service: M. Lessard; Delivery info: M. Jones

Free literature available: Literature describes performance specifications for Digilins' Broad Line of Digital Panel Meters, Thermocouple indicators, and process control meters.

Products manufactured: Comparators, Counters, Meters

Local Sales Offices & Reps.

Ala	Huntsville, Int'l. Scien.	205-837-1801
Cal	Burbank, DeAngelo, Rothman & Co.	213-398-6239
Cal	San Diego, DeAngelo, Rothman & Co.	415-969-9020
Fla	Orlando, Turex Assocs.	714-560-5707
Ill	Chicago, Midwest Elctrn. Sls.	305-859-2160
Md	Rockville, Marktron	312-626-0030
Mich	Clawson, Instr. Specialties	301-762-6210
Mich	Royal Oak, Group Ten	313-435-3311
Minn	Minneapolis, E.C. Elctrons	313-549-3910
Mo	Kansas City, Harris Hanson Co.	612-831-0229
Mo	St. Louis, Harris Hanson Co.	816-444-9494
NJ	Stirling Heights, N.B.S. Assocs.	314-432-3611
NM	Albuquerque, Intermountain Engrg.	201-464-8500
NY	E. Syracuse, Ossmann Instrs.	505-883-9010
NY	Rochester, Ossmann Instrs.	315-437-6666
NY	Rochester, Ossmann Instrs.	716-328-2230

NY	Vestal, Ossmann Instrs.	607-785-9947
Ohio	Cleveland, Group Ten	216-486-2800
Ohio	Dayton, Group Ten	513-277-6531
Ore	Portland, Hayes Tech.	503-232-5343
Pa	Glenside, Elcom, Inc.	215-885-1325
Wash	Seattle, Hayes Tech.	206-763-2210
EXP:	Medway, Mass., Surel Int'l.	617-533-2041

DIGITAL COMPUTER CONTROLS, INC., 12 Industrial Rd., Fairfield, N.J., 07006; Empl.: 25; Minimum order: \$50
For info on price: B. R. Erickson; Application info: P. Goodman; Customer service: J. Laidlaw; Delivery info: V. Choffo

Free literature available: Minicomputers and associated equipment including discs, printers, card readers, tape drives, communications. Electronic cash registers.

Products manufactured: Computers

Local Sales Offices & Reps.

Ariz	Phoenix, Mountaintek	602-242-5551
Cal	Cupertino, Digital Computer Controls	408-255-6690
Cal	Irvine, Digital Computer Controls	714-556-2760
Cal	Boulder, Mountaintek	303-444-1738
Cal	Evergreen, Mountaintek	303-674-5255
Conn	Danbury, Digital Computer Controls	203-792-1230
Fla	Altamonte Springs, Digital Computer Controls	305-862-6699
Kans	Shawnee Mission, Inland Assocs.	913-362-2366
Md	Silver Spring, Digital Computer Controls	301-587-5871
Mass	Wakefield, Digital Computer Controls	617-245-6240
Mich	Southfield, Digital Computer Controls	313-559-4633
Minn	Minneapolis, Carter Elctns.	612-544-9393
Mo	Glencoe, Inland Assocs.	314-938-4992
NJ	Fairfield, Digital Computer Controls	201-575-0146
NM	Albuquerque, Mountaintek	505-268-0003
Ohio	Columbus, Meas. Instrs., Inc.	614-488-9753
Tex	Dallas, Remtek	214-369-8146
Tex	Houston, Remtek	713-664-2113
Utah	Salt Lake City, Mountaintek	801-272-4611
Wash	Seattle, Rush S. Drake Assocs.	206-763-2755
EXP:	N.J., Fairfield, Digital Computer Controls Inc.	201-575-9100
FOR:	Can., St. Laurent, Mont., Que., Digital Computer Controls	514-748-9694

DIGITAL DEV. CORP., 5575 Kearny Villa Rd., San Diego, Calif., 92123, Tel: 714-278-9920; Empl.: 375; Minimum order: \$50

For info on price: M. Mougel; Application info: M. Mougel; Customer service: T. Rodstrum; Delivery info: D. Kinzel

Products manufactured: Memory Systems

Local Sales Offices & Reps.

Cal	Sunnyvale, Digital Dev. Corp.	408-733-5622
Fla	Orlando, W.A. Brown Instr., Inc.	305-426-5505
Mass	Boston, Digital Dev. Corp.	617-965-6099
Pa	Philadelphia, Digital Dev. Corp.	609-227-4617
Tex	Richardson, Digital Dev. Corp.	214-235-3488
Wash	Seattle, Showalter-Judd, Inc.	206-762-2310

DICEON ELECTRONICS, 18522 Von Karman Ave., Irvine, Cal., 92664, Tel: 714-833-0870, TWX: 910-595-1794; Empl.: 225

Products, manufactured: Services, Assembly, Production & Test

Local Sales Offices & Reps.

Ariz	Phoenix, Markets West	602-279-2378
Cal	Mt. View, West/Mark Assocs.	415-969-1700
Cal	Denver, Rope & Williamson	303-758-8507
Ill	Barrington, L. Bacher & Assocs.	312-386-8462
Mass	Westboro, Tech. Mktg. Svcs.	617-421-3395
Minn	Anoka, K. Haugen & Assocs.	201-994-9055
NJ	Livingston, Graydon-Sherman	513-871-4211
Ohio	Cincinnati, Luebbe Sls. Co.	803-244-8120
SC	Greenville, Elctrn. Mktg. Assocs.	214-231-4661
Tex	Richardson, P.J. Scanlon Co.	214-231-4661

DIGITAL EQUIPMENT CORP., 146 Main St., Maynard, Mass., 01754, Tel: 617-897-5111; Empl.: 19000

Products manufactured: Comm. Systems, Computers, Controllers, Programmable, Converters, Data Acquisition & Reduction Systems, Data Compressors, Digital, Data Loggers, Disc Packs, Magnetic Memories, Buffer, Memory Systems, Multiplexers, Paper-Tape Preparation Systems, Printers, Punched Card Equipment, Readers, Recorders, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic), Test Systems

Local Sales Offices & Reps.

Ala	Huntsville	205-881-7730
Ariz	Phoenix	602-267-1364
Ariz	Tucson	602-795-5840
Cal	Los Angeles	213-479-3791
Cal	Mountainview	415-964-6200
Cal	Oakland	415-635-3000
Cal	San Diego	714-280-7880
Cal	Santa Ana	714-979-2460
Cal	Sunnyvale	408-735-9200
Colo	Englewood	303-770-6150
Conn	Fairfield	203-255-5991
Conn	Meriden	203-237-8441
Fla	Fort Lauderdale	305-739-0530
Fla	Orlando	305-851-4450
Ga	Atlanta	404-451-7411
Haw	Kailua, Oahu	808-261-3182
Ill	Rolling Meadows	312-640-5500
Ind	Indianapolis	317-248-9461
Iowa	Bettendorf	319-359-7581
Ky	Louisville	502-458-9561
La	Metairie	504-837-0257
Md	Lanham	301-459-7900
Mass	Maynard	617-897-5111
Mass	Waltham	617-890-0330
Mass	Westfield	413-568-9511
Mich	Farmington Hills	313-478-3000
Minn	Minneapolis	612-854-6562
Mo	Independence	816-252-2300
Mo	St. Louis	314-872-8540
NH	Manchester	603-668-5507
NJ	Fairfield	201-227-9280
NJ	Metuchen	201-549-4100
NJ	Princeton	609-452-2940
NM	Albuquerque	505-296-5411
NY	Albany	518-869-8461
NY	Huntington Station	516-694-4131
NY	New York	212-582-1300
NY	Rochester	716-461-1700
NY	Syracuse	315-437-1593
NC	Durham	919-489-3347
Ohio	Cleveland	216-289-9000
Ohio	Columbus	614-868-1900
Ohio	Dayton	513-294-3323
Ohio	Sylvania	419-882-0511
Ohio	Worthington	614-888-9572
Okla	Tulsa	918-749-4476
Ore	Portland	503-297-3761
Pa	Blue Bell	215-825-4200
Pa	Monroeville	412-243-9404
Tenn	Knoxville	615-588-6571
Tenn	Nashville	615-244-0130
Tex	Austin	512-454-3660
Tex	Dallas	214-620-2051
Tex	Houston	713-777-3471
Utah	Salt Lake City	801-487-4669
Va	Richmond	804-282-3157
Wash	Bellevue	206-641-0070
Wisc	Milwaukee	414-784-1317

DIGITAL EQUIPMENT CORP., Comps. Grp., One Iron Way, Marlborough, Mass., 01752

DIGITAL GEN'L CORP., Univ. Cir. Resch. Ctr., 11000 Cedar Ave., Cleveland, Ohio, 44106, Tel: 216-721-0440; Empl.: 15

Customer service: W. Rittman

Free literature available: DC IV Diagnostic Computer Test System - Computer controlled; functional test system for testing digital and hybrid logic cards. ELF - Portable test system for testing digital logic cards.

Products manufactured: Test Systems, Testers

Local Sales Offices & Reps.

Ariz	Scottsdale, C.T. Fink & Assocs.	602-947-7981
Cal	North Hollywood, Crown Elctns.	213-877-3550
Ill	Park Ridge, West-Tronics	312-696-3115
Mass	Framingham, Victor Assocs.	617-879-5710
Mich	Royal Oak, Meas. Instrs.	313-352-2144
Minn	Minneapolis, Bitronics Sls. Co.	201-994-9055
NJ	Livingston, Graydon-Sherman	315-622-3993
NY	Baldwinsville, Scibetta Reps.	216-333-6611
Ohio	Cleveland, Meas. Instrs.	614-488-9753
Ohio	Columbus, Meas. Instrs.	513-252-8132
Ohio	Dayton, Meas. Instrs.	412-366-1906
Pa	Monroeville, Meas. Instrs.	214-231-1322
Tex	Richardson, C. Tinch Sls. Co.	214-231-1322
Tex	Richardson, C. Tinch Sls. Co.	214-231-1322

DIGITAL SCIENTIFIC, 11455 Sorrento Valley Rd., San Diego, Cal., 92121, Tel: 714-453-6050, TWX: 910-322-1136

For info on price: P. H. Rosa; Application info: J. J. Gormley; Customer service: R. W. Sykes; Delivery info: J. J. Gormley

Free literature available: Sales/Technical Brochures - Meta 4th Computer Emulators.

Products manufactured: Computers

Local Sales Offices & Reps.

Cal	Los Angeles	213-640-1360
DC	Washington	703-620-3458
Ill	Chicago	312-449-5155
Mich	Detroit	313-642-7448
NY	New York	212-943-8777
Tex	Dallas	214-239-0170

DIGITECH DATA INDS., INC., 66 Grove St., Ridgefield, Conn., 06877, Tel: 203-438-3731; Empl.: 100

Products manufactured: Amplifiers, Analyzers, Comm. Systems, Generators, Kits, Test Equipment, Meters, Oscillators, Relays, Synthesizers, Test Equipment, Testers

DIGITECH DATA INDS., INC., 66 Grove St., Box 547, Ridgefield, Conn., 06877, Tel: 203-438-3731, Telex: 969-623; Empl.: 60; Minimum order: \$25

For info on price: D. Doherty; Application info: W. C. Andrews; Customer service: D. Doherty; Delivery info: D. Doherty

Free literature available: Short form catalog, data sheets defining our telecommunications test equipment.

Products manufactured: Amplifiers, Analyzers, Generators, Meters, Oscillators, Relays, Terminals, Data Display (including Alphanumeric & Graphic), Testers

DIGITRAN CO., 855 So. Arroyo Pkwy., Pasadena, Cal., 91105, Tel: 213-449-3110, TWX: 910-588-3794

Products manufactured: Decade Boxes, Dividers, Keyboards, Alphanumeric & Decimal, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Beacon Elctns. Assoc.	205-881-5031
Ariz	Phoenix, Howe & Howe Sls., Inc.	602-264-7971
Cal	Los Altos, Shannon Assoc.	415-941-2217
Cal	San Diego, Celtec Co. Inc.	714-279-7961
Colo	Englewood, Todd Assoc.	303-761-7801
Fla	Mitland, Beacon Elctns. Assoc.	305-647-3498
Fla	Palm Beach Gardens, Beacon Elctns. Assoc.	305-622-2770
Ga	Atlanta, Beacon Elctns. Assoc.	404-351-3654
Ill	Chicago, Scientific Sls. Corp.	312-775-7594
Ind	Ft. Wayne, R.O. Whitesell & Assoc.	219-432-5591
Ind	Indianapolis, R.O. Whitesell & Assoc.	317-359-9283
Ind	Kokomo, R.O. Whitesell & Assoc.	317-452-6065
Iowa	Des Moines, Beams	515-282-0292
Kans	Overland Park, Beams	913-341-7744
Ky	Louisville, R.O. Whitesell & Assoc.	502-893-7303
Md	Rockville, Marktron, Inc.	301-762-6210
Md	Silver Springs, Mil, Inc.	301-585-6141
Md	Timonium, Marktron, Inc.	301-252-7111
Mich	Grand Rapids, Robert O. Whitesell & Assoc.	616-451-8901
Mich	South Field, Robert O. Whitesell & Assoc.	313-358-2020
Mich	St. Joseph, Robert O. Whitesell & Assoc.	616-983-7337
Minn	Bloomington, Scientific Sls. Corp.	612-881-3300
Mo	St. Louis, Beams	314-781-6855
NJ	Cherry Hill, N. Kronstadt Assoc.	609-662-2958
NJ	Dumont, Dom Ciccone	201-273-6140
NJ	Haddonfield, Sunday-O'Brien	609-249-4013
NM	Albuquerque, Data Handling Co.	505-268-4364
NY	Buffalo, Telesco Assoc.	716-834-1026
NY	Canandaigua, Telesco Assoc.	716-872-6417
NY	Coram, B. O'Brien	201-273-6140
NY	Liverpool, Telesco Assoc.	315-451-4925
NY	Rochester, Telesco Assoc.	716-271-3780
Ohio	Cincinnati, R.O. Whitesell & Assoc.	513-521-2290
Ohio	Columbus, R.O. Whitesell & Assoc.	614-888-9396
Ohio	Dayton, Mil, Inc.	513-268-8771
Ohio	Lakewood, R.O. Whitesell & Assoc.	216-228-7525
Ore	Beaverton, Arneson Assoc.	503-643-5754
Pa	Pittsburgh, Robert O. Whitesell & Assoc.	412-344-7277
SC	Spartanburg, Beacon Elctns. Assoc.	803-582-4613
Tex	Dallas, Allied Comps., Inc.	214-238-0408
Tex	Houston, Allied Comps., Inc.	713-691-3961
Va	Charlottesville, Marktron, Inc.	703-973-5874
Wash	Seattle, Arneson Assoc.	206-762-7664
FOR:	Can. Malton, Ontario, Deskin Sls., Inc.	416-677-5517

FOR: Can. Montreal, Que., Deskin Sls., Inc.

514-384-1420

FOR: Can., Vancouver, B.C., Deskin Sls., Inc.

604-324-6331

Local Distributors

Ala	Huntsville, Powell Electrs./Huntsville, 803 Oster Dr.	205-539-2731
Cal	Los Angeles, El-Com, Inc., 5134 Valley Blvd.	213-223-1351
Cal	Mt. View, Powell Electrs., Inc., 411 Fairchild Dr.	415-964-0820
Conn	Hamden, Impact Sls. Inc., 60 Connolly Pkwy.	203-281-1331
Fla	Coral Springs, Controlled Distrs., Inc., 7857 W. Sample Rd.	305-752-4950
Fla	Miami Springs, Powell Electr./Fla., Box 514	305-592-3260
Fla	Orlando, Powell Electrs./Fla., 2049 W. Central Blvd.	305-859-1450
Ill	Mt. Prospect, Magnuson Elctns., 2420 Oakton St.	312-956-0700
Ind	Indianapolis, Pioneer Standard, 6408 Castle Pl.	317-849-7300
Md	Bettsville, Powell Electr./Wash., 10728 Hanna St.	301-937-4030
Mass	Waltham, Impact Sls. Co., 223 Crescent St.	617-893-2850
Mich	Romulus, Pioneer Standard, 6337 N. Beverly Plaza	313-729-8500
Minn	St. Paul, Magnuson Elec., Inc., 1246 W. 7th St.	612-227-8495
NY	Buffalo, Ossmann Comp. Sls. Corp., 395 Cleveland Dr.	716-832-4271
NY	Kingston, Ossmann Comp. Sls. Corp., 411 Washington Ave.	914-338-5505
NY	Lynbrook, Peerless Radio Corp., 19 Wilbur St.	516-593-2121
NY	Rochester, Ossmann Comp. Sls., 280 Metro Park	716-442-3290
NY	Syracuse, Ossmann Comp. Sls. Corp., 132 Pickard Bldg.	315-454-4477
NY	Vestal, Ossmann Comp. Sls. Corp., 1911 Vestal Pkwy. E.	607-785-9949
Ohio	Cleveland, Pioneer Standard, 4800 E. 131st St.	216-587-3600
Ohio	Columbus, Electronics Mktg. Corp., 1150 W. Third Ave.	614-200-4161
Ohio	Dayton, Pioneer Standard, 1900 Troy St.	513-236-9900
Pa	Philadelphia, Powell Electr./Philadelphia, S. Island Rd., Box 8765	215-365-1900
Pa	Pittsburgh, Pioneer Standard, 560 Alpha Dr.	412-782-2300
Tex	Dallas, Powell Electrs./Dallas, 2860 Walnut Hill Dr.	214-350-4186
Tex	Dallas, Solid State Electrs. Co. of Tex., 2643 Manana	214-352-2601
Tex	Houston, Solid State Elctns. Co. of Texas, Box 36849	713-785-5436

DIGITRONICS CORP., 1 Albertson Ave., Albertson, N.Y., 11507, Tel: 516-484-1000, TWX: 510-223-0607

Products manufactured: Comm. Systems, Converters, Integrated Circuit Packaging Systems, Perforators, Printers, Readers, Recorders, Transmission Systems, Data

DILECTRON, Div. Bestran Corp., 2669 S. Myrtle Ave., Monrovia, Cal., 91016, Tel: 213-446-6195, TWX: 910-582-3210; Empl.: 400

Customer service: R.J. Ruby

Free literature available: Catalog - Complete line of disc and monolithic ceramic capacitors

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Ariz	Phoenix, W. Bert Knight Co.	602-242-3057
Cal	Newport Beach, W. Bert Knight Co.	714-833-8250
Cal	Redwood City, Logan Sls.	415-369-6726
Colo	Denver, Piper-Goyne	303-934-6971
Conn	Vernon, G.M. Assocs.	203-646-4443
Fla	Indian Rocks Beach, Tech-Rep Assocs.	813-595-2834
Ga	Marietta, K&E Assocs.	404-427-0241
Ill	Chicago, Schumacher Elec. Co.	312-384-6060
Ind	Indianapolis, Scott Elctns.	317-897-9976
Ky	Louisville, Scott Elctns.	502-583-3220
Mass	Framingham, G.M. Assocs.	617-872-4871
Mich	Flint, Scott Elctns.	313-357-2088
Mo	Kansas City, R.R. Burton Co.	816-444-8300
NJ	Marlton, Krouse Assocs.	609-424-3543
NM	Albuquerque, Piper-Goyne	505-265-6794
NY	Fulton, C.D. Truax	315-592-7184
NY	Valley Cottage, LRC Assocs.	914-634-7973
Ohio	Cleveland, Scott Elctns.	216-291-2600
Pa	Ardmore, Wm. K. Metz	215-649-3966

Tex Richardson, Semiconductor Sls. Assocs.

214-231-6181

Wash Seattle, Ray Johnston

206-524-5170

FOR: Can., Markham, Ont., Elctn. Components Intl.

416-499-5681

DILLON, W.C. & CO., 14620-EP Keswick St., Van Nuys 340, Calif., 91407, Tel: 213-786-8812, Telex: 65-1449; Empl.: 80; Minimum order: \$15

For info on price: R. Magio; Application info: R. Magio; Customer service: J. W. Dillon; Delivery info: E. Webber

Products manufactured: Cells, Load, Controls/Control Eqpt., Gages, Indicators, Limit Stops, Mechanical, Power Supplies, Scales, Dial, Services, Assembly, Production & Test, Switches, Testers, Transducers

Local Sales Offices & Reps.

Fla	Ft. Lauderdale, R. Jacobs	305-523-8694
Haw	Milani, H.C. Burgess & Assocs.	808-623-3118
Ill	Chicago, Service Assoc.	312-568-4545
Id	Baltimore, Jobe & Co.	301-235-3503
Mass	Hathorne, Danvers, Osgood Engrg.	617-933-4744
Mich	Detroit, Basic Serv. Corp.	313-837-8820
NY	Amityville, Long Island, Testing Machines Inc.	516-598-1400
Ohio	Brecksville, M.A. Blankenburg Co.	216-526-1100
Pa	Newtown Square, C.W. Middlestead Co.	215-528-5092
Tex	Dallas, Dillon Equip. Co.	214-824-2511
Wisc	Milwaukee, C. V. Kray Co.	414-352-5194

DIMCO-GRAY COMPANY, 207 E. Sixth St., Dayton, Ohio, 45402, Tel: 513-224-1913; Empl.: 130

For info on price: R. Cramer; Application info: R. Cramer; Customer service: B. Chaney; Delivery info: R. Cramer

Free literature available: DIMCO-GRAY stock molded plastic knobs and handles, snapslide fasteners, and GraLab darkroom, sports, photographic and industrial timers.

Products manufactured: Fasteners, Knobs, Timers

Local Sales Offices & Reps.

Cal	Downey, Corbett-Smith	213-927-2677
Conn	Torrington, Manu-Rep	203-643-4485
Fla	Eustis, R.K. Welter	215-657-0100
Ga	Atlanta, Electro-Mech Sls. Engr. Co.	404-256-4414
Ill	Des Plaines, L. Hodges & Assocs.	312-297-3810
Mich	Birmingham, Barribeau-Simmons Co.	313-646-7800
Minn	Minneapolis, Christian-Richards Co.	612-929-7574
Mo	Kansas City, Automatic General Elctn. Sls.	816-333-8206
NJ	Forked River, Feralite Metals Corp.	609-693-8575
NY	Rochester, W. Stevenson	716-271-2200
NC	Raleigh, Electro-Mech Sls. Engr. Co.	919-782-6452
Ohio	Lyndhurst, A.C. Wahl & Assocs.	216-461-4930
Pa	Willow Grove, Techparts	215-659-6900
Tex	Hurst, Edmar Tech. Sls. Co.	817-282-5561
Wash	Seattle, National Co.	206-623-7060
Wisc	Waukesha, Lincoln Hodges & Assocs.	414-542-3087
FOR:	Can., Toronto, Ont., Precision Express Supply Ltd.	416-481-5211

DIMENSIONAL SYSTEMS, INC., 31 Hartwell Ave., Lexington, Mass., 02173, Tel: 617-862-2700; Empl.: 25

For info on price: M. N. Barry; Application info: J. Novosielski; Customer service: M. Wiener; Delivery info: M. N. Barry

Free literature available: DMS-15 Datafile 1510 Add-on core memory for PDP-15 computer DMS-9 Datafile 910 Add-on core memory for PDP-9 computer, DMS-10 Brochure Add-on core/semiconductor memory for PDP-10 computer, Datadraft Brochure Automated engineering drafting system.

Products manufactured: Drafting Machines, Memory Systems

DIPLOHOMATIC DIV., Harry Levinson Co., 1211 E. Denny Way, Seattle, Wash., 98122, Tel: 206-323-5100, TWX: 910-444-2154; Empl.: 4; Minimum order: \$15

Customer service: H. Levinson

Products manufactured: Potentiometers, Resistors



ROTASWITCH® Shaft Encoder

DISC INSTRUMENTS, INC., 102 E. Baker St., Costa Mesa, Ca., 92626, Tel: 714-979-5300, TWX: 910-595-1987; Empl.: 60; Minimum order: \$20

For info on price: E. L. McElroy Ext. 32; Application info: B. Wiles Ext. 45; Customer service: L. Hulbert Ext. 53; Delivery info: B. Treadway Ext. 52

Free literature available: Packages upon request for all Disc Instruments' standard products, describing both electrical and mechanical specifications of individual units.

Products manufactured: Cards, Logic, Controls/Control Eqpt., Counters, Couplings, Encoders, Generators, Indicators, Integrators, Mechanical & Electro-Mechanical, Power Supplies, Switches, Tachometers, Transducers

Local Sales Offices & Reps.

Cal	Mt. View, TRI REP	415-965-1822
Cal	Studio City, Pi Instr.	213-995-0077
Fla	Satellite Beach, Reynolds & Assocs.	305-773-4700
Mass	Lexington, SIR Assocs.	617-862-1812
Mich	Farmington, Carter, McCormic & Peirce, Inc.	313-477-7700
Minn	Minneapolis, Waytek, Inc.	612-933-2133
Mo	Raytown, Production Automation	816-737-0066
NY	Buffalo, Good Components Corp.	716-634-4400
NY	White Plains, Swedelo, Inc.	914-946-1122
Ore	Beaverton, Fry Controls, Inc.	503-643-5448
Pa	Glenside, C. A. Briggs Co.	215-885-2244

DISPLAY DEVICES, Box 667, Encinitas, Cal., 92024, Tel: 714-753-0113; FSC No: 26107; Minimum order: \$25

p. 2-1142,1143

For info on price: C. Homer; Application info: C. Ross; Customer service: C. Homer; Delivery info: C. Homer

Free literature available: Component catalog - all components we sell; backlighted panel drawings - typical applications; LED panels.

Products manufactured: Caps, Lenses, Indicator Light, Display Devices/Displays, Labels, Pressure-Sensitive, Adhesive, Lamp Adapters, Lamps, Lenses, Readout & Display, Lights, Sockets

Local Sales Offices & Reps.

Ariz	Phoenix, Thorson Co.	602-956-5300
Cal	Santa Clara, Nova-Tronix	408-243-9530
Cal	Torrance, James W. Johnson	213-371-8580
Fla	Miami, Ludlum Assocs. Co.	305-592-6523
Fla	Orlando, Ludlum Assocs. Co.	305-894-7761
Ill	Bellwood, Fiat Engrg. Assocs.	312-547-6200
Ind	Ft. Wayne, Advanced Comp. Sls.	219-432-2546
Ind	Indianapolis, Advanced Comp. Sls.	317-545-6441
Md	Towson, Kraft Elctrn. Sls., Inc.	301-828-5838
Mich	Plymouth, Romarc	313-455-0300
Minn	St. Paul, Northport Engrg.	612-698-3841
NH	Nashua, Bell Controls	603-882-6984
NJ	Wayne, GT Assoc.	201-694-6040
NY	North Salem, Lodol-Bell Controls	203-438-7808
NC	Winston-Salem, Dula Assocs.	919-768-7166
Ohio	Chagrin Falls, Crest Comp. Sls.	216-543-9808
Pa	Newton Square, Holdsworth & Co., Inc.	215-356-8550
Tex	Dallas, Thorson Co.	214-233-5744
Tex	Houston, Thorson Co.	713-771-3504
Wash	Renton, Control Inst. Co.	206-226-7170

DIT-MCO INT'L., 5612 Brighton Terr., Kansas City, Mo., 64130, Tel: 816-444-9700; Empl.: 160; Minimum order: \$25

p. 1-6660

For info on price: B. A. Claxton; Application info: B. A. Claxton; Customer service: J. Herbert; Delivery info: B. A. Claxton

Products manufactured: Test Systems, Testers

Local Sales Offices & Reps.

Cal	Corona, G. Coulter	213-772-4386
Cal	Los Angeles, A. Holtz	213-772-4386
Fla	Cocoa Beach, P. File	305-295-9780
Mass	Beverly, J. Coogan	617-734-5400
Mo	Kansas City, P. Tobin	816-363-6288
NY	N.Y., J. Fitzsimmons	212-682-5844

DIVA, INC., 607 Industrial Way West, Eatontown, N.J., 07724, Tel: 201-544-9000, TWX: 710-722-6645; Empl.: 80; Minimum order: \$one

For info on price: R. Maly; Application info: R. Maly; Customer service: S. Trudo; Delivery info: R. Maly

Free literature available: General Disc Drive Description and Controllers. Product Description and General Specs of Computrollers. Floppy Disc Systems. Magnetic Tape Systems. Cartridge Disc Systems. Controllers & Multiwire, Design & Production.

Products manufactured: Circuits, Printed, Multilayer, Memory Systems

Local Sales Offices & Reps.

Ariz	Phoenix, Thorson Co.	602-956-5300
Mass	Bedford, E. H. Gittines	617-275-1436
FOR:	Can., Ottawa, Ont., Gil York	613-225-8789

DIVERSIFIED ELECTRONICS CO., 720 E. Evelyn St., Sunnyvale, Cal., 94086, Tel: 408-738-3911; Empl.: 8

Customer service: Order desk

Products manufactured: Calculators, Electrical & Electronic, Computers

DIVERSIFIED ELECTRONICS INC., Box 6231, Sta. B, Evansville, Ind., 47712, Tel: 812-426-2806; Empl.: 35

p. 1-1624-1627

Customer service: C. L. Smith

Free literature available: Phase Monitor Catalog - contains specifications, applications and operational description. Current Monitor Catalog - contains specifications, applications and operational description. Air Conditioning/Refrigeration Controls Catalog - contains specifications, applications, check-out procedure and installation procedures.

Products manufactured: Controls/Control Eqpt., Monitors, Protectors, Relays, Sockets, Timers

Local Sales Offices & Reps.

Cal	L.A., Cutlass Elctrns.	213-324-7360
Conn	Meriden, Abbott-Allison Co.	203-237-9232
Fla	Ft. Lauderdale, Armor Investment Corp.	305-733-7767
Ill	Chicago, Lincoln Hodges Assoc.	312-297-3810
Ind	Ft. Wayne, McDonald Sls. Co.	219-747-3650
NC	Charlotte, L.P. Spoon Co.	704-372-3290
Tex	Ft. Worth, C. Yarborough Co.	817-451-8000
Wisc	Janesville, National Sls. Off.	608-752-1402
Wisc	Milwaukee, Automation Prods. Co.	414-425-2250

FOR: Can., Quebec, Electrodesign, Ltd., 514-363-5120

Local Distributors

Cal	Cathedral City, Consolidated Electrical Distr., 33-660 Cathedral Canyon Dr.	714-328-1131
Cal	San Francisco, E.B. Ward & Co., 337 Roebling Rd.	415-873-1660
Del	Wilmington, Wilmington Supply, 2000 Maryland Ave.	302-656-4421
Fla	Miami, ACR Supply Inc., Box 1	305-576-1120
Ind	Indianapolis, Ra-Dis-Co, 814 Senate Ave.	317-637-5571
Ky	Louisville, E & H Electric Supply, Box 1022	502-587-0991
Md	Rockville, Boland Trane Service Ag., 12320 Parklawn Dr.	301-881-8600
Mich	Detroit, Cochrane Supply & Eng., 19300 Beech Daly Rd.	313-255-4050
Neb	Seward, Lee's Refrigeration Co., 734 Seward	402-643-3344
Nev	Las Vegas, Desert York Co., Box 14606	702-384-3980
NJ	Fairlawn, Relay Specialties, 13-00 Plaza Rd.	201-797-3313
NY	Maspeth, Power Cooling, 59-55 60th St.	212-894-8003
Ohio	Columbus, Columbus Temperature Controls, 100 East Swan St.	614-221-7133
Tex	Ft. Worth, Air Tec Supply, Box 8446	817-732-3447
Utah	Salt Lake, Distributors Inc., 234 West 13th South	801-486-3731

DIXON AUTOMATION, 23915 Garnier, Torrance, Cal., 90509

Free literature available: Chip Assembly Robot: Automatically Places & Solderdips Chip Capacitors, IC's and Resistors onto Substrates.

Products manufactured: Machines/Machinery, Production

Local Sales Offices & Reps.

Ariz	Phoenix, K. Jahn Co.	602-956-9060
Cal	Inglewood, Weightman Assoc.	213-645-6060
Cal	Menlo Park, West Engineering Sls.	415-325-2885

DIXON CORP., Metacorn Ave., Bristol, R.I., 02809, Tel: 401-253-2000; Empl.: 210; Minimum order: \$25

For info on price: J. G. Holloway; Application info: W. A. Tucker; Customer service: F. Rounds; Delivery info: G. Beauchaine

Products manufactured: Bearings, Bushings, Glass, Plastic, Metal, Rubber, Etc., Compounds, Encapsulating, Insulating, Molding, Potting, Conductive Plastic Materials, Films, Grommets, Insulators & Insulation, Laminates, Materials, Self-Lubricating, Tapes, Electrical Insulation, Terminals

Local Sales Offices & Reps.

Ala	Birmingham, Moodie & Assoc.	205-823-0815
Cal	Glendale, Lockwood Assocs.	213-247-3330
Cal	Palo Alto, Lockwood Assoc.	415-328-3999
Conn	Plainville, N. F. Mooers	203-747-3042
Fla	Coral Spgs., D. H. Bond	305-752-0344
Ill	Arlington, A. H. Walkie	312-394-8313
Ind	Indianapolis, Hoster & Sioff	317-844-9921
Mich	Dearborn, Firth Assoc.	313-565-0615
Minn	Minneapolis, Swenson Ind. Sls.	612-544-7789
Mo	Florissant, H & R Sls. & Engrg.	314-921-6242
NY	Commack, P. Hoade	516-543-9308
NY	Penfield, CHP Sls. Corp.	716-381-2800
NC	Sanford, C.G. Simpson	919-776-8025
Ohio	N. Olmstead, G. E. Blaney	216-777-4322
Pa	Aston, J. F. Walls	215-622-2300
Tex	Dallas, Benson Engrg. Co.	214-543-7541
Utah	Salt Lake City, B. S. Anderson	801-486-6401
Wisc	Milwaukee, Fisher-Barton	414-258-1022

DIXSON, INC., Box 1449, Grand Junction, Colo., 81501, Tel: 303-242-8863, TWX: 910-929-6991; Empl.: 460

Customer service: K. Rogers

Products manufactured: Meters

Local Sales Offices & Reps.

Ariz	Phoenix, Kay Entprs.	602-242-6787
Ark	Ft. Smith, Electro-Related Products	501-783-7323
Cal	Long Beach, Emerson Kirk Engrg.	213-439-9559
Colo	Littleton, Simpson Assocs., Inc.	303-794-8381
Fla	North Miami, Winfield Elctrn. Sls. Co.	305-945-6544
Ill	Des Plaines, E. Flaxman Co.	312-298-8580
Kans	Olathe, BC Elctrn. Sls., Inc.	913-782-6696
Mich	Benton Harbor, Hampton, Askin & Assocs., Inc.	616-925-0341
Mo	Hazelwood, BC Electronic Sls., Inc.	314-731-1255
NJ	Oaklyn, A. Wetterhahn Co.	609-858-3003
NY	Mount Vernon, D. Sonkin Assocs.	914-668-9809
NY	Syracuse, Nycorn, Inc.	315-437-8343
Ohio	Cleveland, J.O. Olsen Co.	216-752-5444
Tex	Dallas, United Comps.	214-324-1448
Utah	Salt Lake City, Simpson Assocs., Inc.	801-486-3731
Wash	Bellevue, SD-R2	206-747-9424

DOERR ELECTRIC CORP., 1201 Doerr Way, Cedarburg, Wisc., 53012, Tel: 414-377-0500

Products manufactured: Motors

DOLAN-JENNER INDS., INC., 10 Ingalls Ct., Melrose, Mass., 02176, Tel: 617-662-8200; Empl.: 60; Minimum order: \$15

For info on price: F. Laudin; Application info: F. Pettis; Customer service: J. Prior; Delivery info: F. Laudin

Free literature available: Bulletin 738-Glass Fiber Optics-Custom Designed, 818-Industrial Heavy Duty-Fiber Optics, 728-Plastic Fiber Optics, 737-Glass Fiber Optics, 739-Technical Data-Fiber Optics, 746-Registration Controls

Products manufactured: Controls/Control Eqpt., Counters, Detectors, Fiber Optic Bundles, Indicators, Lights, Scanners, Switches, Transducers

DOLPH, JOHN C. CO., New Rd., Monmouth Junction, N.J., 08852, Tel: 201-DA-9-2333

Products manufactured: Adhesives (All Types), Chemicals, Cleaners & Solvents, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Insulators & Insulation, Plastic Raw Materials, Liquids, Pellets, Powders, Resins

DORAN MFG. CO., 1033 Bader St., Cincinnati, Ohio, 45225, Tel: 513-681-5424; Empl.: 25; Minimum order: \$100

For info on price: R. Demar; Application info: R. Demar; Customer service: D. A. Griffin; Delivery info: D. A. Griffin

Free literature available: Send for free designers' guide and catalog from Doran Mfg. Co., booklet includes material and terminal tab selection guide for your custom terminal board.

Products manufactured: Connectors, Terminal Blocks, Boards & Strips, Terminals

DORIC SCI. CORP., 3883 Ruffin Rd., San Diego, Calif., 92123, Tel: 714-565-4415, Telex: 69-5001; Empl.: 105; Minimum order: \$25

For info on price: F. Schulte; Application info: A. Frowiss; Customer service: G. Roberts; Delivery info: S. Shelquist

Free literature available: This new 4-page brochure provides a quick look at the highlight features of digital instruments for physical measurements. A wide range of products, from single point indicators to multipoint data loggers, are listed and described.

Products manufactured: Alarms, Amplifiers, Bridges, Calibrators, Comparators, Converters, Data Acquisition & Reduction Systems, Data Loggers, Indicators, Meters, Monitors, Multiplexers, Potentiometers, Power Supplies, Signal Conditioners & Equipment, Standards

Local Sales Offices & Reps.

Cal	Los Altos, J. Stone & Assocs.	415-948-4563
Cal	Los Angeles, Basic Sys.	213-938-2833
Cal	San Diego, Mesa Elctns.	714-278-8021
Colo	Littleton, Radco Elctns.	303-794-4279
Conn	Hamden, Applied Measurements	203-288-5288
DC	Washington, Powell-Pendergraph	301-656-4535
Ill	Chicago, Doric Scientific Corp.	312-397-8545
Ill	Chicago, SEA, Inc.	312-282-6694
Ind	Carmel, SEA, Inc.	317-846-2593
Kans	Prairie Village, Engineering Svcs. Co.	913-649-4000
La	Baton Rouge, SESCO	504-272-3730
Mass	West Acton, Applied Measurements, Inc.	617-263-2766
Mich	Farmington, Anderson Elctns.	313-476-9161
Minn	Minneapolis, SEA, Inc.	612-425-4455
Mo	St. Louis, Engineering Svcs. Co.	314-997-1515
NJ	Fairfield, KLS Assocs., Inc.	201-227-2900
NM	Albuquerque, Rustco Entrs.	505-296-6474
NY	Fairport, Naco Elctns. Corp.	716-244-4720
NY	N. Syracuse, Naco Elctns. Corp.	315-699-2651
NY	Utica, Naco Elctns. Corp.	315-732-1801
NC	Charlotte, Doric Scientific Corp.	704-536-8096
Ohio	Cleveland, Instrumentation Sys., Inc.	216-486-0782
Ohio	Dayton, Instrumentation Sys., Inc.	513-294-2838
Pa	Abington, Bach-Stewart Assocs.	215-885-1550
Pa	Pittsburgh, Instrumentation Sys., Inc.	412-243-1111
Pa	Warrington, Doric Scientific Corp.	215-343-3215
Tex	Houston, SESCO	713-668-7840
Tex	Richardson, SESCO	214-231-9364
Va	Richmond, Powell-Pendergraph, Inc.	804-264-2341
Wash	Seattle, Seatronics, Inc.	206-767-4330
Wisc	Waukesha, SEA, Inc.	414-547-6637

DORMEYER INDUSTRIES, 3418 N. Milwaukee, Chicago, Ill., 60641, Tel: 312-283-4000; Empl.: 650

Customer service: Sls. Coordinators

Free literature available: Engineering workbook for use in specifying linear solenoids as relates to work force required in application.

Products manufactured: Chargers, Battery, Coils Including Assemblies & Forms, Power Supplies, Solenoids, Transformers

DOUGLAS ELECTRONICS, 718 Marina Blvd., San Leandro, Cal., 94577, Tel: 415-483-8770; Empl.: 20; Minimum order: \$10

For info on price: L. Powell; Application info: C. Pennebaker; Customer service: N. Cain; Delivery info: L. Powell

Free literature available: 1. Catalog of Circuit Buaro Components 2. Mini Computer products

Products manufactured: Boards, Plug-In, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Chassis, Circuit Board Mounting, Connector Blocks, Mother Board, Connectors, Integrated Circuit Devices, Printers, Racks, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic)

DOUGLAS-WORKMAN ELCTRNS CORP., 4300 Peters Rd., Ft. Lauderdale, Fla., 33317, Tel: 305-791-9390

Customer service: D. Workman; Delivery info: H. Biesemeyer

Free literature available: Form D100-B Description of exact replacement television knobs, available to Electronic Parts Distributors.

Products manufactured: Knobs

DOUGLAS RANDALL DIV., Walter Kidde, 6 Pawcatuck Ave., Pawcatuck, Conn., 02891, Tel: 203-599-1750; Empl.: 125

p. 1-549, 1629-1638; p. 2-1734

For info on price: J. Barber; Application info: E. J. Goehring; Customer service: J. Barber; Delivery info: J. Barber

Free literature available: Reed Relay Catalogs-complete description & details of standard products. Solid State Relays-complete details on twenty standard models. Modular Tone Controls-technical data on oscillators and fritch including application notes.

Products manufactured: Coders, Coils Including Assemblies & Forms, Controls/Control Eqpt., Decoders, Detectors, Encoders, Monitors, Oscillators, Regulators, Relays, Switches, Transformers

Local Sales Offices & Reps.

Ala	Huntsville, Leigh Sls., Inc.	205-852-3270
Cal	Los Altos, Parsons & Meister	415-941-4745
Cal	Los Angeles, Sodaro Assocs.	213-478-7733
Cal	San Diego, Qualtronix	714-560-8955
Conn	Ridgefield, JMG, Inc.	617-762-5333
Fla	Maitland, Ellis Assoc.	305-645-1101
Ill	Chicago, R. Cahill, Inc.	312-287-7292
Mass	Norwood, JMG, Inc.	617-762-5333
Minn	St. Paul, Cahill	612-646-7217
Mo	Kansas City, R.R. Burton Sls. Co.	816-444-8300
Mo	Maryland Hgts., Delltron Co.	314-434-3804
NY	Great Neck, F. Tyliniski Co.	516-466-9070
NY	Rochester, H.R. Murray, Inc.	716-244-1100
NY	Syracuse, H.R. Murray Inc.	315-446-5555
NC	Knightdale, Leigh Sales	919-266-0105
Ohio	Berea, Geotronics Mktg. Assoc.	216-243-8520
Ohio	Columbus, Geotronics Mktg. Assoc.	614-457-8472
Pa	Glenside, Elcom, Inc.	215-885-1325
Tex	Dallas, BESCO	214-376-1929
Va	Reston, Boyle Assocs.	703-620-9558
Wash	Seattle, Carlyle Tech. Sls.	206-622-4288

Local Distributors

Mass W. Newton, A. Mayer Co., Inc., 38 Border St. 617-965-1111

DOW CHEMICAL CO., Box 2020, Midland, Mich., 48640, Tel: 517-636-1000, TWX: 810-266-9490; Empl.: 52000

Products manufactured: Chemicals, Cleaners & Solvents, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Coolants, Circuit & Components, Etchants, Printed Circuit, Insulators & Insulation, Metal Oxides, Metals, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Services, Assembly, Production & Test, Sound Absorbing Materials, Tubing

Local Sales Offices & Reps.

Cal	Pasadena	213-577-1515
Cal	Walnut Creek	415-933-3100
Conn	Stamford	203-359-3300
Ga	Atlanta	404-394-4141
Ill	Des Plaines	312-297-1000
Ind	Indianapolis	317-926-3441
Kans	Shawnee Mission	913-362-2100
La	Baton Rouge	504-937-2222
Mass	Wellesley	617-237-2070
Mich	Grand Rapids	616-949-9000
Mich	Southfield	313-358-1300
Minn	Minneapolis	612-835-4200
Mo	St. Louis	314-726-5000
NJ	Moorestown	609-234-0400
NJ	Saddle Brook	201-845-5000
NY	New York	212-757-8300
NY	Williamsville	716-631-5540
NC	Charlotte	704-525-9030
Ohio	Cincinnati	513-793-6200
Ohio	Cleveland	216-861-5825
Pa	Pittsburgh	412-281-3030
Tenn	Memphis	901-767-5000
Tex	Dallas	214-742-8691
Tex	Houston	713-626-3170
Wash	Belleue	206-455-2144

DOW CORNING, Savage Rd. Bldg., Midland, Mich., 48640, Tel: 517-636-8000, TWX: 810-266-9006

Products manufactured: Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Coolants, Circuit & Components, Crystals, Insulators & Insulation, Lubricants, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Rubber

Local Sales Offices & Reps.

Cal	Los Angeles	213-289-5186
Cal	Palo Alto	415-964-7744
Ga	Atlanta	404-934-6595
Ill	Chicago	312-671-3100

Mass	Boston	617-965-1010
Mich	Farmington	313-474-4000
NJ	Englewood Cliffs	201-567-4960
NC	Greensboro	919-275-9706
Ohio	Cleveland	216-464-2330
Tex	Dallas	214-661-0702

DRACON INDUSTRIES, 9541 Mason Ave., Chatsworth, Cal., 91311, Tel: 213-882-8595; Empl.: 150; Minimum order: \$10

For info on price: J. Mason; Application info: A. Polzer; Customer service: B. Witt; Delivery info: B. Witt

Products manufactured: Amplifiers, Baffles, Speaker, Cable, Generators, Power Supplies, Racks, Speaker Systems, Speakers, Tools

DRAKE MFG. CO., Sub. Gen. Instr. Corp., 4626 N. Olcott Ave., Harwood Heights, Ill., 60656, Tel: 312-867-7227, TWX: 910-221-0236; Empl.: 150

Products manufactured: Bezels, Shielded & Unshielded, Diodes, Holders, Circuit Board (Production Type), Lamps, Lights, Sockets

Local Sales Offices & Reps.

Ariz	Phoenix, Howe & Howe Sls.	602-264-7971
Cal	Mountainview, R.T. Pross	415-967-2346
Cal	N. Hollywood, Chicago Miniature/Drake	213-877-0158
Colo	Denver, Lindberg Co.	303-758-9033
Conn	Newtown, Gerber Sls.	203-426-3440
Fla	Hollywood, Component Eng. Sls.	305-922-5230
Ga	Atlanta, Winfield Southeast Co.	404-636-2023
Ill	Chicago, Chicago Miniature Lamp Works	312-784-1020
Ind	Indianapolis, Technical Reps.	317-849-6454
Kans	Overland Park, Penzer-Mankus Assoc.	913-381-0004
Mass	Needham, Chicago Miniature/Drake	617-449-4730
Mass	Waltham, Gerber Sls.	617-890-8040
Mich	Detroit, Rathsborg Assoc.	313-882-1717
Minn	Minneapolis, Nortec Sls.	612-835-7414
NJ	Cherry Hill, Trinkle Sls.	609-795-4200
NY	North Syracuse, L.D. Allen	315-458-7470
NY	Port Washington, TMA	516-883-2432
Ohio	St. Mary's, T. Shelby & Co.	419-394-3377
Tex	Dallas, Techno Assocs.	214-357-9213
Wash	Seattle, J.J. Backer Co.	206-285-1300

EXP: Chicago, Ill., E.D. Magnus & Assoc. 312-334-1503

DRAKE CO., R.L., 540 Richard St., Miamisburg, Ohio, 45342, Tel: 513-866-2421, Telex: 288-017

For info on price: J. H. Brunzo; Application info: J. H. Brunzo; Customer service: W. F. Frost; Delivery info: J. H. Brunzo

Free literature available: Technical brochures on any R.L. Drake Co. product upon request.

Products manufactured: Amplifiers, Couplers, Filters, Meters, Receivers, Transceivers, Transmitters

DRANETZ

DRANETZ ENGRG. LABS., 2385 S Clinton Ave., So. Plainfield, N.J., 07080, Tel: 201-755-7080, TWX: 710-997-9553; FSC No: 23207; Empl.: 50; Minimum order: \$25 p. 1-652-657

Customer service: L. Banas

Free literature available: Description, specifications and application information for time/phase/impedance/energy and line disturbances are described instruments to measure, analyze and record AC volts/amperes/frequency/ time/phase/impedance/energy and line disturbances are described in individual and general catalogs and application notes.

Products manufactured: Amplifiers, Analyzers, Bridges, Calibrators, Coders, Comm. Systems, Comparators, Controllers, Programmable, Controls/Control Eqpt., Converters, Counters, Current Sensors, Data Acquisition & Reduction Systems, Detectors, Equalizers, Filters, Generators, Indicators, Insertion Loss Measurement Systems, Meters, Monitors, Networks, Oceanographic Equip. (Electronic), Shifters, Signal Conditioners & Equipment, Standards, Telephone Channel Test & Simulator Equipment, Test Equipment, Testers, Timers, Totalizers, Digital, Transformers, Underwater Communication, Detection, Navigation, etc. Equipment

Local Sales Offices & Reps.

Cal	Los Angeles, E. Mintz	213-645-2066
Cal	Palo Alto, Coherent Mktg. Assoc.	415-327-2217
Cal	San Diego, E. Mintz	213-645-2066
Colo	Denver, Hamilton Assocs.	303-629-0901
Conn	Hamden, Scientific Devices-Conn.	203-248-9361
Fia	Orlando, Dataprep, Inc.	305-843-5224
Fia	Pompano Beach, Dataprep, Inc.	305-781-9279
Fia	St. Petersburg, Dataprep, Inc.	813-345-8503
Haw	Honolulu, Aloha Assocs.	808-941-1574
Ill	Elk Grove Village, L. F. Green & Assocs.	312-593-0282
Ind	Indianapolis, L. F. Green & Assocs.	317-293-9827
Md	Rockville, Mesa	301-881-8430
Mass	Waltham, Scientific Devices-New England	617-894-5637
Mich	Royal Oak, Group Ten	313-549-3910
Minn	Minneapolis, L. F. Green & Assoc.	612-781-1611
Mo	St. Louis, Delltron Co.	314-869-4779
NJ	Cinnaminson, Mesa	609-786-0284
NJ	Fairfield, KLS Assocs.	201-227-2900
NY	Rochester, Scientific Devices	716-334-2445
NC	Charlotte, Ranson, Wallace & Baesel, Inc.	704-334-4244
Ohio	Cleveland, Group Ten	216-486-2800
Ohio	Dayton, Group Ten	513-293-7061
Ore	Portland, Topp Eng. Sls.	503-644-3020
Tex	Austin, Martin, Zienkosky, Browne & Assco.	512-454-4371
Tex	Dallas, Martin, Zienkosky, Browne & Assco.	214-233-5535
Tex	Houston, Martin, Zienkosky, Browne & Assco.	713-523-7333
Wash	Bellevue, Topp Engrg. Sls.	206-747-5400
WVa	W. Virginia, Group Ten	513-293-7061
FOR: Can., Ottawa, Ont., Kenwood Controls		613-722-8233
FOR: Can., St. Catherines, Ont., Kenwood Controls		416-682-3286
FOR: E. Can., Montreal, Que., Kenwood Controls		514-738-4969
FOR: W. Can., Vancouver, B.C., Canadian Dynamics		604-325-3201

DRESSEN-BARNES ELCTRNS., 250 N. Vinedo Ave., Pasadena, Cal., 91107, Tel: 213-681-0643, TWX: 910-588-3780; FSC No: 94412; Empl: 85; Minimum order: \$25

For info on price: M. Foes 213-795-7731; Application info: A. Washnesky 213-795-7731; Customer service: M. Foes 213-795-7731; Delivery info: M. Foes 213-795-7731

Products manufactured: Converters, Power Supplies, Regulators, Transformers

Local Sales Offices & Reps.

Ala	Huntsville, Young & Lawrence Assoc.	205-539-6575
Cal	Mountain View, Tech-Ser.	415-969-9020
Cal	Pasadena, Dessen-Barnes	213-795-7731
Fia	Ft. Lauderdale, Young & Lawrence Assoc.	305-563-6717
Fia	St. Petersburg, Young & Lawrence Assoc.	813-894-0026
Fia	Winter Park, Young & Lawrence Assoc.	305-647-6929
Md	Simpsonville, Seirec Assoc.	301-596-5520
Mass	Needham, A. & M. Elec. Reps.	617-444-8170
Mich	Detroit, Hocker Assocs.	313-431-1403
NY	Elmira, A & D Dev.	607-733-0405
NY	Hartsdale, Comp. Sls.	914-725-1050
NY	Rochester, A & D Devices	716-586-8033
NY	Verona, A & D Devices	315-337-7321
Ohio	Dayton, Hocker Assocs.	513-298-8638
Tex	Plano, Zeus Eng.	214-423-2027
Wash	Seattle, Avionics-Liaison	206-767-3870

DUKANE CORP., 2900 Dukane Dr., St. Charles, Ill., 60174

Products manufactured: Amplifiers, Analyzers, Baffles, Speaker, Clocks (All Types), Comm. Systems, Detectors, Generators, Grilles, Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds, Mixers, Phonographs, Parts & Accessories, Public Address Systems, Speaker Systems, Speakers, Transducers, Tuners, Underwater Communication, Detection, Navigation, etc. Equipment, Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

DULLRON CO., INC., 425 N. Findlay St., Dayton, Ohio, 45401, Tel: 513-226-4000; Empl: 2100

For info on price: J. A. Welch 513-226-4056; Application info: R. J. Hinman 513-226-4249; Customer service: J. R. Adcock 513-226-4117; Delivery info: R. J. Hinman 513-226-4249

Free literature available: Complete and descriptive literature on Durcon laboratory sinks and tops made from corrosion resistant Durcon® epoxy resin.

Products manufactured: Benches, Consoles, Stools, Tables

Local Sales Offices & Reps.

Ala	Birmingham, Clary & Assocs.	205-251-2085
Ariz	Phoenix, Tyson-Feist Assocs.	602-277-4427
Ariz	Tucson, Tyson-Feist Assocs.	602-296-0349
Ark	N. Little Rock, C.A. Riner Co.	501-372-4156
Cal	Los Angeles, Scanlan & Lucas	213-266-2020
Cal	San Francisco, Specification Products	415-981-1154
Colo	Denver, Parker/Shyne Assocs.	303-893-5149
Conn	Windsor, R. Yost Assocs.	203-527-4101
Fia	Jacksonville, Tripp & Black Assocs.	904-737-7022
Fia	Miami, N. Ascher & Assocs.	305-371-3195
Fia	Orlando, Tripp & Black Assocs.	305-841-4995
Fia	Tampa, P. Pullara & Assocs.	813-872-5657
Ga	Atlanta, Clary & Assocs.	404-873-1861
Haw	Honolulu, B. Watanabe	808-845-0939
Ill	Broadview, W.R. Wallin Assocs.	312-379-2626
Ind	Indianapolis, Aspinall & Assocs.	317-926-3421
Iowa	Des Moines, M.B. Townsend Co.	515-279-1641
La	Alexandria, W.H. Grant, Jr.	318-443-4084
La	New Orleans, Grant & Assocs.	504-525-4207
Md	Bethesda, Steck Sls. Co.	301-657-2442
Md	Severna Park, Donnelly & Burns Assocs.	301-647-4100
Mich	Detroit, R.L. Deppman Co.	313-872-6304
Mich	Grand Rapids, J.R. Thomas & Assocs.	616-454-2500
Minn	Minneapolis, H.E. Agness Co.	612-339-4696
Mo	Kansas City, Hebenstreit Co.	816-561-4661
Mo	St. Louis, Brodz Sls & Engineer Co.	314-426-0335
Mont	Great Falls, D.E. Weidner Co.	406-453-2727
Neb	Omaha, Shiner Sls. Co.	402-493-6625
NJ	Walidwick, Salsbury Sls. Co.	201-652-2666
NM	Albuquerque, Mohon Sls. Co.	505-344-3449
NY	Buffalo, E.C. Oldach	716-634-0024
NY	Long Island City, Salsbury Sls. Co.	212-786-8260
NY	Syracuse, J.A. Walsh	315-474-1089
NC	Charlotte, Smith & Stevenson	704-525-3388
Ohio	Cleveland, BWA Co.	216-781-4040
Ohio	Hilliard, BWA Co.	614-876-2477
Ohio	Norwood, BWA Co.	513-631-3330
Ohio	Toledo, BWA Co.	419-472-6531
Okla	Broken Arrow, Brazeal & Dilbeck	918-251-1509
Okla	Oklahoma City, Brazeal & Dilbeck	405-232-2940
Ore	Portland, G.J. Scott Co.	503-228-8643
Pa	Philadelphia, R. Burns Assocs.	215-925-7255
Pa	Pittsburgh, R.J. Fitzgerald Assocs.	412-486-8900
Tenn	Knoxville, Corrigan Co.	615-584-8335
Tenn	Memphis, Corrigan Co.	901-274-5712
Tex	Dallas, Dillard Assocs.	214-748-7708
Tex	Houston, H.F. Wood & Assocs.	713-686-8441
Utah	Salt Lake City, Richards & Hansen	801-487-1355
Va	Richmond, Otto Sls. Co.	804-288-5648
Wash	Bellevue, J. Wm. Jones Sls. Agency	206-747-4447
Wash	Spokane, D.E. Weidner Co.	509-535-4632
Wisc	Wauwatosa, T. Tiernan & Assocs.	414-453-8838
FOR: Can., Vancouver, B.C., Scott-Peterson Agencies, Ltd.		604-685-7304

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Counters, Detectors, Diodes, Mounts, Photomultiplier Tube Housings, Tubes

DUMONT OSCILLOSCOPE LABS., INC., 40 Fairfield Pl., W. Caldwell, N.J., 07006, Tel: 201-575-8666, TWX: 710-734-4308; Empl: 125; Minimum order: \$25

Products manufactured: Cameras, Oscilloscope Plug-Ins, Oscilloscopes, Probes

DUNCAN ELECTRONICS, INC., 2865 Fairview Rd., Costa Mesa, Cal., 92626, Tel: 714-545-8261, TWX: 910-595-1128; FSC No: 5905; Empl: 170; Minimum order: \$25

For info on price: R. L. Rissler; Application info: R. L. Rissler; Customer service: R. Macke; Delivery info: R. Macke

Products manufactured: Attenuators, Controls, Fader, Dials, Potentiometers, Switches

Local Sales Offices & Reps.

Ariz	Phoenix, Southwest e/m Engrg., Inc.	602-993-0250
Cal	Costa Mesa, Duncan Elctns., Inc.	714-545-8261
Cal	El Monte, Telemat Co.	213-444-7666
Cal	Mountain View, Caltron/Pyle	415-964-3244
Colo	Denver, Zeus, Inc.	303-771-6200
Conn	Newtown, Gerber Sls. Corp.	203-426-3440
Fia	Ft. Lauderdale, Orbe, Inc.	305-564-8571
Fia	St. Petersburg, Orbe, Inc.	813-894-0687
Ga	Atlanta, G. Duckett Sls. Co.	404-451-3529
Ill	Mt. Prospect, Delta Tech. Sls.	312-437-9412
Ind	Greenwood, Valentine & Schillinger	317-888-2260
Ind	South Bend, Valentine & Schillinger	219-291-6258
Kans	Shawnee Mission, Florence & Meyer	913-722-5210
Kans	Wichita, Florence & Meyer	316-838-7226
Md	Rockville, Marktron, Inc.	301-762-6210
Md	Timonium, Marktron, Inc.	301-252-7111
Mass	East Longmeadow, Gerber Sls. Corp.	413-525-3059
Mass	Waltham, Gerber Sls. Corp.	617-890-8040
Mich	Grosse Pointe Park, Greiner Assocs.	313-499-0188
Minn	Minneapolis, J.J. Exon Co.	612-566-5340
Mo	St. Charles, Florence & Meyer	314-723-8566
NM	Albuquerque, Zeus, Inc.	505-256-9831
NY	Copague, Sencor, Inc.	516-842-7676
NY	De Ruyter, R.P. Kennedy Co.	516-682-2920
NY	Rochester, R.P. Kennedy Co.	716-271-6322
Ohio	Dayton, Rockford Controls Ohio, Inc.	513-898-5452
Ohio	Euclid, Rockford Controls Ohio, Inc.	216-731-5250
Okla	Tulsa, Kemp Engrg. Co.	918-299-2636
Ore	Portland, C. K. Shanks & Assoc.	503-292-5656
Pa	Monroeville, Rockford Controls Ohio, Inc.	412-373-2531
Pa	Philadelphia, Sencor, Inc.	215-698-9660
Tex	Addison, Kemp Engrg. Co.	214-661-0400
Tex	Houston, Kemp Engrg. Co.	713-688-1431
Utah	Salt Lake City, Zeus, Inc.	801-486-2317
Va	Charlottesville, Marktron, Inc.	703-973-5874
Wash	Seattle, C. K. Shanks & Assoc.	206-632-4290

Products manufactured: Attenuators, Controls, Fader, Dials, Potentiometers, Switches

Local Sales Offices & Reps.

Ariz	Phoenix, Southwest e/m Engrg., Inc.	602-993-0250
Cal	Costa Mesa, Duncan Elctns., Inc.	714-545-8261
Cal	El Monte, Telemat Co.	213-444-7666
Cal	Mountain View, Caltron/Pyle	415-964-3244
Colo	Denver, Zeus, Inc.	303-771-6200
Conn	Newtown, Gerber Sls. Corp.	203-426-3440
Fia	Ft. Lauderdale, Orbe, Inc.	305-564-8571
Fia	St. Petersburg, Orbe, Inc.	813-894-0687
Ga	Atlanta, G. Duckett Sls. Co.	404-451-3529
Ill	Mt. Prospect, Delta Tech. Sls.	312-437-9412
Ind	Greenwood, Valentine & Schillinger	317-888-2260
Ind	South Bend, Valentine & Schillinger	219-291-6258
Kans	Shawnee Mission, Florence & Meyer	913-722-5210
Kans	Wichita, Florence & Meyer	316-838-7226
Md	Rockville, Marktron, Inc.	301-762-6210
Md	Timonium, Marktron, Inc.	301-252-7111
Mass	East Longmeadow, Gerber Sls. Corp.	413-525-3059
Mass	Waltham, Gerber Sls. Corp.	617-890-8040
Mich	Grosse Pointe Park, Greiner Assocs.	313-499-0188
Minn	Minneapolis, J.J. Exon Co.	612-566-5340
Mo	St. Charles, Florence & Meyer	314-723-8566
NM	Albuquerque, Zeus, Inc.	505-256-9831
NY	Copague, Sencor, Inc.	516-842-7676
NY	De Ruyter, R.P. Kennedy Co.	516-682-2920
NY	Rochester, R.P. Kennedy Co.	716-271-6322
Ohio	Dayton, Rockford Controls Ohio, Inc.	513-898-5452
Ohio	Euclid, Rockford Controls Ohio, Inc.	216-731-5250
Okla	Tulsa, Kemp Engrg. Co.	918-299-2636
Ore	Portland, C. K. Shanks & Assoc.	503-292-5656
Pa	Monroeville, Rockford Controls Ohio, Inc.	412-373-2531
Pa	Philadelphia, Sencor, Inc.	215-698-9660
Tex	Addison, Kemp Engrg. Co.	214-661-0400
Tex	Houston, Kemp Engrg. Co.	713-688-1431
Utah	Salt Lake City, Zeus, Inc.	801-486-2317
Va	Charlottesville, Marktron, Inc.	703-973-5874
Wash	Seattle, C. K. Shanks & Assoc.	206-632-4290

Local Distributors

Cal	San Carlos, Sterling Elctns., 1061 Industrial Rd.	415-592-2353
Cal	Sun Valley, Richey Elctns., 10871 La Tuna Canyon Rd.	213-875-2662
Colo	Denver, Ind. Elctns., Box 22457	303-771-2636
Fia	Tampa, Lykes Elctns., 1800 N.W. 23rd	305-633-8535
Ill	Elgin, Allied Elctns., 1355 Sleepy Hollow	312-697-8200
Ill	Westmont, Bodelle Co., 47 Chestnut La.	312-323-9670
Mich	Ann Arbor, Advent Elctns., 254 S. Wagner Rd.	313-769-8650
Minn	Minneapolis, Stark Elctns., 112-3rd Ave. N.	612-332-1325
NJ	Clifton, Parts Masters, 411 Main Ave.	201-777-7706
NJ	Perth Amboy, Sterling Elctns., 774 Pfeiffer Blvd.	201-442-8000
NM	Albuquerque, Ind. Elctns., 310 Val Verde S.E.	505-266-8721
NY	NYC, Martin Audib, 320 W. 46th	212-265-6470
Ohio	Akron, Akron Elctns., 107 S. Arlington	216-762-8818
Pa	Erie, Mace Elctns., 2631 W. 8th	814-838-3544
Tex	Stafford, Southwest Elctns., 12725 Royal Dr.	713-494-6021
Wash	Seattle, Radar Electric, 168 Western Ave. W.	206-282-2511

DUNEGAN/ENDEVCO, Rancho Viejo Rd., San Juan Capistrano, Cal., 92675, Tel: 714-831-9131, TWX: 910-596-1415; Empl: 30

Customer service: B. Sonnenberg

Products manufactured: Detectors

Local Sales Offices & Reps.

Ala	Huntsville, Craft Assocs.	205-837-0221
Cal	Palo Alto, Dunegan/Endevco	415-969-3212
Cal	Rowland Heights, Dunegan/Endevco	714-493-8181
Cal	San Juan Capistrano, Dunegan/Endevco	714-493-8181
Cal	Santa Clara, Johnson Assocs.	408-984-4626
Fia	Maitland, Craft Assocs.	305-645-2242
Ga	Atlanta, Craft Assocs.	404-393-0400
Ill	Chicago, Rhodes Engineering Co.	312-478-0161
Ill	Crystal Lake, Dunegan/Endevco	815-459-7226

Md Towson, Dunegan/Endevco 301-752-0688
 Mass Bedford, Dunegan/Endevco 617-969-8063
 NJ Haddonfield, Dunegan/Endevco 609-428-5285
 Ohio Brecksville, RDP Assocs. 216-526-5260
 Ohio Dayton, RDP Assocs. 513-253-6175
 FOR: Can., Scarborough, Ont., J. DeGroot Assocs.
 416-264-2991

DUNTON, M.W. CO., 350 Kinsley Ave., Providence, R.I.,
 02903, Tel: 401-331-3600; Empl.: 14; Minimum order:
 \$8

Products manufactured: Flux, Brazing & Soldering
 Materials, Solder (All Types)

Local Sales Offices & Reps.

Ariz Phoenix, Nibco of Phoenix 602-272-6853
 Cal Los Angeles, Nanklyell/Rollins & Assoc.
 213-588-9166
 Colo Denver, Nibco of Denver 303-936-2328
 DC Wash, Barnett & Benner 301-864-5640
 Fla Pinellas Park, Distributor Sls. of Fla.
 813-527-6651
 Ga Atlanta, Cochran & Co. 404-351-7767
 Ill Addison, Preferred Dist. 312-543-4660
 Ind Indianapolis, C.T. Voyles Co. 317-359-0698
 Iowa Des Moines, Mack McClain Corp. 515-288-0184
 Md Baltimore, R.B. Fulton Co. 301-467-0750
 Mass Reading, F. Banester 617-944-3776
 Mich Birmingham, Marshall Durston Co.
 313-646-6144
 Minn Minneapolis, Nibco Midwest 612-544-3377
 Mo St. Louis, Nibco of St. Louis 314-647-2141
 NJ Woodbury, C.W. Cope Assoc. 609-845-0573
 NY Mineola, W.G. Roller 516-746-4486
 NY Rochester, Kolstad Assoc. 716-288-2086
 NC Greensboro, J.M. Pleasants Co. 919-288-1707
 Ohio Worthington, Shreiner Wright 614-846-1700
 Tenn Memphis, Cochran-Prather 901-274-4018
 Tex Dallas, H.F. Wood & Assoc. 214-631-4470
 Va Richmond, Taylor, Lipscomb & Appel
 804-648-4431
 Wash Seattle, Baxter-Rutherford 206-623-1954

DUPONT INDUSTRIAL FIBERS, Center Rd. Bldg.,
 Wilmington, Del, 19898

DURA PLASTICS N.Y., INC., 49 Richmondville Ave.,
 Westport, Conn., 06880, Tel: 203-227-9588; Empl.: 90;
 Minimum order: \$100

For info on price: J. F. Layman; Application info: J.
 Layman; Customer service: C. Halas; Delivery info: C.
 Halas

Free literature available: Catalog - Custom
 fabrication and vacuum forming of
 thermoplastics.

Products manufactured: Bezels, Shielded &
 Unshielded, Boxes, Junction, Outlets & Wall
 Plates, Bushings, Glass, Plastic, Metal, Rubber,
 Etc., Cabinets & Accessories, Cases, Equipment,
 Instrument, Meter, Dials, Plastic Raw Materials,
 Liquids, Pellets, Powders, Resins, Services,
 Assembly, Production & Test

Local Sales Offices & Reps.

Ill Downers Grove, Jon Wright Distr. Co.
 NY N.Y. C., Dura Plastics of N.Y.

DURABLE INTERNATIONAL, INC., 3-01 27th Ave., Long
 Island City, NY, 11102, Tel: 212-726-1200

DURAKOOL, 1010 N. Main St., Elkhart, Ind., 46514, Tel:
 219-264-1116, Telex: 25-8482; Empl.: 120; Minimum
 order: \$25 p. 1-1639-1643

For info on price: N. Thorn; Application info: B.
 Brewers; Customer service: B. Brewers; Delivery info:
 D. Severs

Products manufactured: Relays, Switches

Local Sales Offices & Reps.

Cal Los Angeles, Hundley Co. 213-240-3600
 Cal Los Gatos, Ind'l Mktg Assoc. 408-358-1734
 Ga Atlanta, Austin Brown Assocs. 404-457-6381
 Ill Chicago, Kelburn Engrg Co. 312-775-8383
 Ind Indianapolis, Kelburn Engrg Co. 317-257-9874
 Iowa Davenport, Volco Co. 319-326-5233
 Iowa Des Moines, Volco Co. 515-283-1650
 La Metairie, Carey & Assocs. 504-737-7614
 Md Cockeysville, N. H. Yates & Co. 301-667-6300
 Mass Waltham, DeVeer Sales Engrg Co.
 617-899-5900
 Mich Farmington, Carter, McCormick & Peirce
 313-477-7700
 Minn Minneapolis, Volco Co. 612-336-1746
 Mo Kansas City, R. Greene Co. 816-333-7585
 Mo St. Louis, R. Greene Co. 314-644-2666
 Neb Omaha, Volco Co. 402-346-2203
 NY Wantagh, DONY Tech. Sls. 516-826-5550
 NC Matthews, Carolina Tech. Reps. 704-847-4494

Ohio Akron, Sords Elec 216-644-7074
 Ohio Cincinnati, Sords Elec 513-272-3351
 Ohio Cleveland, Sords Elec 216-229-4700
 Ohio Worthington, Sords Elec 614-885-3933
 Ore Portland, Branom Instr. Co. 503-285-9861
 Pa Pittsburgh, Carter, McCormick & Pierce
 412-824-3760

Pa Willow Grove, Techparts 215-659-6900
 Tenn Nashville, Austin Brown Assocs. 615-256-3003
 Tex Dallas, Carey & Assocs. 214-363-7813
 Tex Houston, Carey & Assoc. 713-460-1111
 Utah Salt Lake City, Thermalink Intermountain
 801-466-8601

Va Richmond, Virginia Tech. Assocs. 804-266-9654
 Wash Seattle, Branom Instr. Co. 206-762-6050
 Wisc Milwaukee, Kelburn Engrg Co. 414-545-2122
 FOR: Can., Ancienne Lorette, Que., Davis Controls
 418-524-1823

FOR: Can., Edmonton So., Alb, Davis Controls
 403-439-5644

FOR: Can., Halifax S.N.S., Davis Controls
 902-429-3877

FOR: Can., Hamilton, Que., Davis Controls
 416-522-2551

FOR: Can., Islington, Ont., Davis Controls
 416-233-3211

FOR: Can., London, Ont., Davis Controls
 519-432-9341

FOR: Can., Montreal, Que., Davis Controls
 514-481-7765

FOR: Can., Ottawa, Ont., Davis Controls
 613-237-6361

FOR: Can., Richmond, BC, Davis Controls
 604-685-1942

FOR: Can., Winnipeg, Manitoba, Davis Controls
 204-589-6625

Local Distributors

Pa Narberth, Power Modules, Box 465
 215-839-1331

DURANT DIGITAL INSTRUMENTS, Cutler Hammer Co.,
 901 S. 12th St., Watertown, Wisc., 53094, Tel:
 414-261-4070, TWX: 910-260-3713; Minimum order: \$25

Customer service: E. J. Parulski

Products manufactured: Controls/Control Eqpt.,
 Counters, Machines/Machinery, Production,
 Switches

Local Sales Offices & Reps.

Ala Birmingham, Spader & Assocs. 205-879-1366
 Cal Los Angeles, Durant Digital Instrs.-Cutler
 Hammer Co. 213-876-4000
 Cal Menlo Park, Durant Digital
 Instrs.-Cutler-Hammer Co. 415-854-2178
 Colo Denver, Durant Digital Instrs.-Cutler Hammer
 303-922-3458

Conn Stamford, Durant Digital Instrs.-Cutler Hammer
 Co. 203-327-1750

Fla Clearwater, H.R. Gross & Co. 813-446-6649

Ill Chicago, Durant Digital Instrs.-Cutler-Hammer
 Co. 312-237-1222

Kans Mission, Durant Digital Instrs.-Cutler-Hammer
 Co. 913-262-2199

Md Baltimore, Durant Digital Instrs.-Cutler Hammer
 Co. 301-825-6626

Mass Wakefield, Durant Digital Instrs.-Cutler Hammer
 Co. 617-246-0024

Mich Detroit, Durant Digital Instrs.-Cutler Hammer
 Co. 313-535-3630

Minn Minneapolis, Durant Digital Instrs.-Cutler
 Hammer 612-835-5534

Mo St. Louis, Durant Digital Instrs.-Cutler Hammer
 314-423-3431

NY Rochester, Durant Digital Instrs.-Cutler Hammer
 716-328-5700

NC Charlotte, Durant Digital Instrs.-Cutler Hammer
 704-525-3149

Ohio Cincinnati, Durant Digital Instrs.-Cutler Hammer
 513-531-5073

Ohio Cleveland, Durant Digital Instrs.-Cutler Hammer
 216-464-8787

Ore Portland, Durant Digital Instrs.-Cutler Hammer
 503-297-4374

Pa Paoli, Durant Digital Instrs.-Cutler Hammer
 215-688-5055

Tex Houston, Durant Digital Instrs.-Cutler Hammer
 713-528-4183

Wash Bellevue, Durant Digital Instrs.-Cutler Hammer
 206-747-2001

DURGIN & BROWN, INC., 80 Allen Rd., Burlington, Vt.,
 05401, Tel: 802-863-6873; Empl.: 26; Minimum order:
 \$10
 For info on price: R. Martineau; Application info: R.
 Haskins; Customer service: R. Haskins; Delivery info:
 B. Hutchins

Free literature available: Digital systems products
 catalog. Complete catalog of counters, timers and
 controllers for production and process control.

Products manufactured: Counters, Display
 Devices/Displays, Indicators, Process Control
 Systems, Timers

Local Sales Offices & Reps.

Ariz Phoenix, RDX Corp. 602-267-8162
 Cal Pasadena, RDX Corp. 213-681-3451
 Cal San Diego, RDX Corp. 714-278-6863
 Cal Sunnyvale, RDX Corp. 408-734-4500
 Conn Enfield, Measurement Equip. Co.
 Ind Indianapolis, National Engrg. Co. 317-251-1132
 Mass Wakefield, Measurement Equip. Co.
 617-245-4870
 NY Sodus, AED Agency 315-483-6561
 Pa Abington, Industrial Mktg. Specialist
 215-659-0444
 Tex Dallas, Glidden Electro Equip. Co.
 214-363-6539
 Wash Bellevue, Hickey Engineering Sales
 206-454-0460

DUTREX INDS., INC., 150 Fifth Ave., New York, N.Y.,
 10011, Tel: 212-989-5000, TWX: 710-581-6234; Empl.: 20

For info on price: H. H. Friedman; Application info: H.
 H. Friedman; Customer service: P. Ortiz; Delivery info:
 P. Ortiz

Products manufactured: Diodes, Tubes

DYNACO INC., Box 88 Coles Rd., Blackwood, N.J., 08012,
 Tel: 609-228-3200, Telex: 831-493; Empl.: 100;
 Minimum order: \$500

For info on price: V. Kaplan; Application info: W.
 Phillips; Customer service: V. Kaplan; Delivery info: V.
 Kaplan

Products manufactured: Amplifiers, Speaker
 Systems, Transformers, Tuners

DYNACOR, Div. Vectrol, Inc., 1010 Westmore Ave.,
 Rockville, Md., 20850, Tel: 301-424-6900; Empl.: 48;
 Minimum order: \$25

For info on price: R. Mitchell; Application info: R.
 Vollmer; Customer service: K. Berger; Delivery info:
 K. Berger

Free literature available: Miniature tape wound
 bobbin cores

Products manufactured: Cores, Magnetic

DYNAGE, INC., 1331 Blue Hills Ave., Bloomfield, Conn.,
 06002, Tel: 203-243-0315, TWX: 710-425-6063; Empl.:
 60; Minimum order: \$25 p. 1-1178, 1179

For info on price: J. A. Pfingsten; Application info: J.
 A. Pfingsten; Customer service: L. Fedora; Delivery
 info: L. Fedora

Free literature available: Catalog 73-1 - Power
 Supplies.

Products manufactured: Cards, Logic, Controllers,
 Programmable, Controls/Control Eqpt., Power
 Supplies, References, D-C Voltage

Local Sales Offices & Reps.

Cal Palo Alto, Engrg. Assocs. 415-494-7842
 Cal San Gabriel, Van Gott & Assoc. 213-285-2148
 Fla Casselberry, EIR, Inc. 305-830-9600
 Ill Northfield, H. Sam Tollaksen Co. 312-441-6644
 Minn St. Paul, Countryman Assocs. 612-645-9151
 NM Albuquerque, Trembley Assocs. 505-293-4444
 NY Jericho, HRC Comp-Tech 516-822-5550
 NY Rochester, R.P. Kennedy Co. 716-271-6322
 Ohio Dayton, Midwest Mktg. Assoc. 513-433-2511
 Pa Paoli, Stitzer Assocs. 216-644-5500
 Tenn Bristol, Rakes Engrg. & Mktg. Corp.
 615-968-4195

Local Distributors

Cal Santa Monica, Distr. Specialist, 1710 Santa
 Monica Blvd. 213-829-5401
 Pa Trappe, Empire Intl., 106 W. 7th Ave.
 215-489-6061

DYNAIR ELCTRS. INC., 6360 Federal Blvd., San Diego,
 Calif., 92114, Tel: 714-582-9211, TWX: 910-335-2040;
 FSC No: 11650; Empl.: 150; Minimum order: \$20

For info on price: M. Hughes Ext. 69; Application info:
 D. A. Keller Ext. 61; Customer service: E. Jett Ext. 26;
 Delivery info: M. Hughes Ext. 69

Products manufactured: Amplifiers, CATV Systems &
 Equipment, Demodulators, Direction Finders,
 Modulators, All Kinds, Power Supplies, Switches,
 Television Systems & Equipment Closed-Circuit,
 Transponders

Local Sales Offices & Reps.

DC Washington, L. Darrigo 703-471-4078

DYNALAB CORP., 7808 Gloria Ave., Van Nuys, Cal., 91406, Tel: 213-781-3151; Empl.: 8

Products manufactured: Amplifiers, Analyzers, Antenna Feed Systems, Cavities, Microwave, Comm. Systems, Comparators, Converters, Couplers, Demodulators, Diplexers, Antenna, Discriminators, Duplexers, Microwave, Filters, Generators, Inverters, Limiters, Microphones, All Kinds, Mixer-Preamplifiers, Microwave, Modulators, All Kinds, Multipliers, Networks, Oscillators, Power Supplies, Prescalers, Preselectors, Probes, Receivers, Scramblers, Data, Shifters, Strip-Line Components, Microwave, Timers, Transceivers, Transformers, Transmitters, Transponders

DYNALLOY, INC., 7 Great Meadow La., Hanover, N.J., 07936, Tel: 201-887-9270; FSC No: 27908; Empl.: 19; Minimum order: \$10

For info on price: M. Bell; Application info: A. Ringel; Customer service: N. Gallop; Delivery info: M. Bell

Free literature available: Remove-A-Pads-New fast dissolving CFX1 type-under 15 seconds in chlorinated or fluorinated solvents: AWE Type under 1 minute in water-Decap & Uresolve - For dissolving most epoxies, RTV silicones, urethanes over 14 different selective solvents for failure analysis; Chemical deflashing; salvage, Conductive coatings & epoxy silver solders - air dry, silver & gold filled; unique one component silver epoxy for die attach.

Products manufactured: Adhesives (All Types), Chemicals, Cleaners & Solvents, Coatings, Conductive Plastic Materials, Pads, Transistor Mounting, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Spacers

Local Sales Offices & Reps.

Ariz Scottsdale, E. J. Foley & Assocs. 602-945-2665
Cal Westminster, Contronic Devices 714-897-2266
Ind Noblesville, G. Cardoza 317-773-6985
Minn Minneapolis, International Sales 612-831-8423
Tex Dallas, M. Daggett, Jr. & Assoc. 214-368-0135

DYNAMAGNETIC ENGRG, INC., 620 E. Dyer Rd., Santa Ana, Cal., 92705, Tel: 714-540-2081; FSC No: 52635; Empl.: 7; Minimum order: \$10

Customer service: L. J. Zynda

Free literature available: A four page brochure with drawings showing numerous packaging configurations, terminals, mounting means, performance ratings, and sizes. Various applicable mil-specs. are listed.

Products manufactured: Capacitors, Fixed, Filters, Suppressors

DYNAMIC COMMUNICATIONS, INC., 948 Ave.E, P.O. Box 10116, Riviera Beach, Fla., 33404, Tel: 305-844-1323; Empl.: 30

For info on price: R.E. Beja; Application info: J. Penny; Customer service: T. Gault; Delivery info: R.E. Beja

Free literature available: Short form catalog which gives a complete description of each product manufactured. Individual data sheets for technical info on each product.

Products manufactured: Amplifiers, Comm. Systems, Meters, Probes, Transponders

Local Sales Offices & Reps.

Cal Anaheim, Gillingham Assocs. 714-280-6050
Cal Oakland, Sinclair Elctn. Assoc. 415-451-1835
Fla Terra Ceia, Communications Supp. Corp. 813-360-7460
Ga Atlanta, J.E. Joyner Assoc. 404-691-1776
Mass Newton, Techmar 617-444-8130
Minn Minneapolis, C.K. Melby Co. 612-884-7688
Mont Billings, Duane E. Parker & Assoc. 406-245-6349

NY Greenvale, Bertram D. Aaron & Co. 516-621-0630
NY Syracuse, Tesco Mktg. Assoc. 315-463-4566
Tex Richardson, Horizon Engrg. Sls. 214-238-9121
Va Arlington, Magnum Systems & Comm. 703-524-0884
Wash Seattle, Robert R. Slater Co. 206-622-3860
Wisc Brookfield, Steffen Sls. Co. 414-781-7591
EXP: Chicago, Ill, E.D. Magnus & Assoc. 312-334-1503

DYNAMIC CONTROLS CORP., 8 Nutmeg Rd., S. Windsor, Conn., 06074, Tel: 203-289-6807, TWX: 710-425-1994; FSC No: 07148; Empl.: 200; Minimum order: \$35

For info on price: R. Kowalski ext. 68; Application info: R. Kowalski ext. 68; Customer service: R. Kowalski ext. 68; Delivery info: J. Dutton ext. 30

Products manufactured: Controls/Control Eqpt., Detectors, Flashers, Monitors, Power Supplies, Switches, Timers

Local Sales Offices & Reps.

Cal Los Angeles, Ledbetter Assocs. 213-454-2421
Tex Arlington Hgts., Aero Sls Co. 817-732-6907

DYNAMIC INSTR. CORP., 933 L.I. Motor Pkwy., Hauppauge, N.Y., 11787, Tel: 516-234-2900, TWX: 510-227-9884; Empl.: 720 p. 1-1177; p. 2-1735

Products manufactured: Chargers, Battery, Coils Including Assemblies & Forms, Converters, Eliminators, Battery, Inverters, Isolators, Plug Adapters, Power Drivers, Hybrid (High Current, High Voltage), Power Supplies, Regulators, Transformers

Local Sales Offices & Reps.

Cal Burlingame, J. Logan & Assoc. 415-697-6100
Cal Monrovia, Electro-Mechanical Instr. 213-358-1881

Colo Arvada, Arrowhead Sls. Corp. 303-423-5556
Conn Bloomfield, Zaslow Sls. Co. 203-242-7781
Fla Maitland, Hutto, Hawkins, Perego, Inc. 305-831-2474
Ga Atlanta, Millar Elctns. Inc. 404-261-6160
Ill Oakbrook, Whitmore Assoc. Inc. 312-325-4727
Mass Lowell, Zaslow Sls. Corp. 617-458-8452
Minn St. Paul, H.A. Cullen Assoc. 612-646-7371
NY Plainview, Preisick Assoc. 516-681-8444
NY Syracuse, Naylor Elec. Co. 315-GR2-9183
NC Raleigh, Millar Elctns. Inc. 919-787-9564
Ohio Englewood, Ad-El-Tek Co. 513-836-2741
Pa Devon, Kiley Elec. Co. 215-687-9340
Tex Dallas, E.B. Robertson Inc. 214-942-2716
Utah Salt Lake City, Arrowhead Sls. Corp. 801-487-3444

EXP: Downsview Ont., Can., Zaslow-Can. 416-249-1954

DYNAMIC MEASUREMENTS CORP., 6 Lowell Ave., Winchester, Mass., 01890, Tel: 617-729-7870, TWX: 710-348-6596; Empl.: 60

Customer service: R. Palmer

Free literature available: Complete specifications and applications data covering a broad range of convertor and operational amplifier products.

Products manufactured: Amplifiers, Comparators, Converters, Power Supplies

Local Sales Offices & Reps.

Ala Huntsville, Beacon Sls. 205-881-5031
Ariz Scottsdale, De Angelo, Rothman & Cheever 602-948-2240
Cal Santa Clara, Mauldin Co. 408-249-7660
Cal Santa Monica, Rep Assocs. 213-829-5401
Colo Englewood, Klein Aerospace 303-781-4967
Conn North Haven, Kitchen & Kutchen 203-239-0212
Fla Ft. Lauderdale, Beacon Elec. Assoc. 305-776-6074

Fla Maitland, Beacon Elec. Assoc. 305-647-3498
Ga Atlanta, Beacon Elec. Assoc. 404-351-3654
Md Simpsonville, A/O Elctns. 301-997-8033
Mass Lexington, Kitchen & Kutchen 617-862-8230
Mich Detroit, Burcaw Assoc. 313-533-7700
Mich Kentwood, Burcaw Assoc. 616-531-1000
Miss Hernando, Beacon Elec. Assoc. 601-368-9008
Mo St. Louis, Ozark Elec. Mktg. 314-423-7200
NJ Wallington, Comp-Tech Sls. 201-935-5454
NY Ithaca, B. Dean Inc. 607-272-2187
Ohio Cleveland, Marlow Assoc. 216-932-0900
Ohio Xenia, Marlow Assoc. 513-426-6270
Pa Horsham, CMS Mktg. 215-672-8300
SC Spartanburg, Beacon Sls. 803-582-4613
Tex Dallas, Bouco Sls. Assocs. 214-247-6708
Tex Houston, Bouco Sls. Assocs. 713-661-9640
Wash Renton, Control Instrument 206-226-7170
EXP: N.C. Greensboro, Beacon Elec. Assoc. 919-674-9432

FOR: Can., Toronto, Ont., Norgay Enterprises 416-233-2930

DYNAMIC SYSTEM ELCTRNS., 35 Anacapa St., Santa Barbara, Cal., 93101, Tel: 805-963-3479

Products manufactured: Converters, Data Acquisition & Reduction Systems, Data Loggers, Multiplexers

DYNAMICS ELCTRN. PRODS., INC., 12117 E. Slauson Ave., Santa Fe Springs, Cal., 90670, Tel: 213-723-6395; FSC No: 51209; Empl.: 35 p. 1-45

For info on price: A. L. White; Application info: J. Stephenson; Customer service: D. Cantrell; Delivery info: D. Cantrell

Free literature available: Current and Voltage Excitation of Resistance Bridges Grounding and Shielding Practices for Instrumentation Systems.

Products manufactured: Amplifiers, Filters, Meters, Power Supplies, Signal Conditioners & Equipment

Local Sales Offices & Reps.

Ala Huntsville, Currie Peak & Frazier, Inc. 205-536-5650
Ariz Scottsdale, J. Smith & Assocs. 602-947-2495
Cal Palo Alto, Egbert Engrg. Assocs. 415-326-1387
Cal Santa Fe Springs, Dynamics Elctn. Prods., Inc. 213-945-2493
Colo Littleton, J. Smith & Assocs. 303-794-8891
Conn Hamden, P. Jenks Assocs. 203-281-0810
Fla Orlando, Currie Peak & Frazier, Inc. 305-855-0843

Ill Chicago, Pivan Engrg. Co. 312-539-4838
Ill Skokie, Pivan Engrg. Co. 312-679-7870
Ind Indianapolis, Pivan Engrg. Co. 317-253-1681
Kans Shawnee Mission, Pivan Engrg. Co. 913-722-1030

Md Fulton, Gans-Fryling, Inc. 301-837-6311
Mass Wakefield, P. Jenks Assocs. 617-246-1590
Mich Detroit, S. Sterling Co. 313-255-1970
Minn Minneapolis, Pivan Engrg. Co. 612-537-4501
Mo St. Louis, Pivan Engrg. Co. 314-567-3636
NJ Cherry Hill, Williams Assocs. 609-424-4110
NM Albuquerque, J. Smith & Assocs. 505-255-2111
NY Kings Park, KLS Assocs., Inc. 516-724-1325
NY Penfield, A & D Devices, Inc. 716-586-8033
NC Greensboro, Currie Peak & Frazier, Inc. 919-273-3040

Ohio Cleveland, S. Sterling Co. 216-442-8080
Ohio Dayton, S. Sterling Co. 513-298-7573
Pa Pittsburgh, S. Sterling Co. 412-922-5720
Tex Houston, C.M. Asfahl, Inc. 713-523-3764
Va Arlington, Gans-Fryling, Inc. 703-527-3262
Wash Seattle, Comptronics 206-284-4842
Wisc Brookfield, Pivan Engrg. Co. 414-786-1940

DYNAMOD, Power Prods Corp., Box 152, Little Ferry, N.J., 07643, Tel: 201-440-9112; Empl.: 80

Products manufactured: Power Supplies

DYNAPAR CORP., 1675 Delany Rd., Gurnee, Ill., 60031, Tel: 312-662-2666, TWX: 910-235-1865; Empl.: 120; Minimum order: \$30

Customer service: R. R. Brooks Ext. 41

Free literature available: Industrial Digital Equipment (Bulletin 100) The publication describes and illustrates digital measurement and control components and provides abbreviated specifications. On systems, application descriptions are provided.

Products manufactured: Computers, Controls/Control Eqpt., Counters, Data Acquisition & Reduction Systems, Encoders, Indicators, Timers, Totalizers, Digital, Transducers

Local Sales Offices & Reps.

NJ Westfield, Dynapar Corp. 201-654-3111
Ohio Willowick, Dynapar Corp. 216-944-9616

DYNASCAN CORP., 1801 W. Belle Plaine Ave., Chicago, Ill., 60613, Tel: 312-327-7270; Empl.: 250
p. 1-608-611

Products manufactured: Comm. Systems, Counters, Generators, Meters, Oscilloscopes, Power Supplies, Probes, Testers, Transceivers

Local Sales Offices & Reps.

Ala Birmingham, Maitland K. Smith, Inc. 205-967-3080
Cal Redwood City, Sinai-Johnson, Inc. 415-365-6263

Cal Van Nuys, Mike Roth Sls. of Cal. 213-989-3738
Colo Denver, K-C Mkts., Inc. 303-733-5561
Fla Ft. Lauderdale, Sproch Sls., Inc. 305-587-3792
Fla Sarasota, Sproch Sls., Inc. 813-924-7768
Ga Marietta, Maitland K. Smith, Inc. 404-971-2831
Ill Centralia, R. Dunn 618-533-1775
Ill Mt. Prospect, Q & B, Inc. 312-392-1200
La New Orleans, Texpert Co. 504-486-6073
Mich Detroit, Burcaw Co. & Assoc. 313-533-7700
Minn Minneapolis, Kodo Assoc. 612-881-1255
Mo Crestwood, Nevco, Inc. 314-843-7406
Mo Kansas City, Nevco, Inc. 816-421-1751
NY Ballston Lake, G. Dworkin 518-877-8586
NY Grand Island, McTaggart Assoc. 716-773-9222
NY North Bellmore, L.W. Keller Assoc. 516-785-2826

NC Charlotte, Maitland K. Smith, Inc. 704-372-1026
Ohio Conneaut, T. Clements, Reg. S. Mgr. 216-593-1646

Ohio Novelty, D. Kocher, District S. Mgr. 216-338-3964

Okla Tulsa, Texport Co. 918-939-1727

Pa Jenkinton, J. Spangler 215-884-2787
 RI Glouster, A. Previte 401-949-0534
 Tenn Memphis, Texport Co. 901-683-0880
 Tex Houston, Texport Co. 713-464-2828
 Wash Seattle, Fleeheart & Sullivan 206-522-1533
 EXP: Plainville, N.Y., Empire Exporters 516-293-5582
 EXP: Toronto, Canada, Atlas Elctns., Inc. 416-781-6174

DYNATECH CORP., 1225 E. Wakenham Ave., Santa Ana, Cal., 92702, Tel: 714-558-8755, TWX: 910-595-1951; Empl.: 100; Minimum order: \$35
 Customer service: E. Krause

Products manufactured: Backpanel Interconnect Systems, Connector Blocks, Mother Board, Connectors, Panels, Sockets

Local Sales Offices & Reps.

Ala Huntsville, Technology Mktg. Assoc. 205-883-7893
 Ariz Phoenix, Hecht, Henschen & Assoc. 602-275-4411
 Cal Los Altos, Frauman Assoc. 415-941-0660
 Cal Santa Ana, Dynatech Corp. 714-558-8755
 Colo Denver, Rope & Williams 303-758-8507
 Fla Winter Park, C.B.C. Elctns. 305-644-2277
 Ill Evanston, Rendell Sis. Co. 312-866-8060
 Ind Indianapolis, J.D. Mktg. 317-849-9832
 Mass Westboro, Technical Mktg. Svc. 617-366-8462
 Mich Warren, DEM Elctn. Sis. 313-755-6660
 Minn Bloomington, S. Clothier Co. 612-888-4666
 Mo St. Charles, Buckman & Assoc. 314-724-6690
 NY Spring Valley, R. Smith Assoc. 914-354-6067
 NY Syracuse, D. Dwyre 315-472-8282
 NC Winston-Salem, Burgin-Kreh & Assoc. 919-768-4174

Ohio Canton, CSA Equip. Sis. Co. 216-456-1359
 Pa Ft. Washington, Kirk-Sandell 215-643-2100
 Tex Richardson, Zonk Engrg. Co. 214-238-7651
 Va Charlottesville, K.-Sandell 703-977-2033
 Wash Bellevue, Vantage Corp. 206-455-3460

Local Distributors

Cal Mountain View, Abacus Elctns., 1065 Terra Bella Ave. 416-961-1500
 Cal Orange, R.C. Elctns., 17885 Skypark Cir. 714-549-9822
 Cal Woodland Hills, Elcon, 6325 DeSoto, Bldg. E 213-884-4852
 NY Farmingdale, Broadline Elec. Dist., 119 Marine St. 516-420-8320
 NY New York, Hoffer Ind'l Svcs., Inc., 342 Madison Ave. 212-682-3092
 Tex Addison, Computer Comp Corp., 732 Wiley Post Rd. 214-239-0271
 Wash Seattle, Intermark Elctns., 621 S. Michigan 206-767-3160

DYNATRON CO., Box 48822, Los Angeles, Cal., 90048, Tel: 213-933-4413; Empl.: 3; Minimum order: \$25

Customer service: M. S. Robbins

Free literature available: Description of the color bar T.V. subcarrier frequency comparator system using the DyCo Model 175 and a color T.V. set for calibration against network rubidiums.

Products manufactured: Comparators, Connector Adapters, Television Systems & Equipment Closed-Circuit

DYNISCO, 20 S. West Pk., Westwood, Mass., 02090, Tel: 617-326-8210, Telex: 092-4347; Empl.: 78; Minimum order: \$50

For info on price: R. J. Van Hooft; Application info: R. J. Van Hooft; Customer service: L. Shovelton; Delivery info: L. Shovelton

Products manufactured: Controls/Control Eqpt., Gages, Power Supplies, Transducers

Local Sales Offices & Reps.

Cal Long Beach, E. Kirk Engrg. Co. 213-439-9559
 Cal San Francisco, Automated Process Controls 415-467-6162
 Conn Newtown, D. Hayes Inc. 203-426-9094
 Fla Ft. Lauderdale, Beacon Elctn. Assocs. Inc. 305-776-6074
 Ga Atlanta, Beacon Elctn. Assocs. Inc. 404-351-3654
 Ill Chicago, Thermo/Cense Inc. 312-792-2760
 Mass Newton Centre, D. Hayes Inc. 617-969-4650
 Minn Minneapolis, Automated Controls Inc. 612-377-7727
 Mo St. Louis, Ozark Elctn. Mktg. 314-423-7200
 NJ Englewood, Tridon Sis. Co. 201-569-8011
 NY Rochester, D. Hayes Inc. 216-885-1324
 Ohio Cincinnati, Schlemmer Assocs. 513-522-8340
 Ohio Cleveland, Orr Assocs. 216-885-1324
 Pa Jenkintown, PDC Corp. 215-887-9610

SC Spartanburg, Beacon Elctn. Assocs. Inc. 803-582-4613
 Tex Arlington, D. Dawson Co. 817-265-6426
 Utah Salt Lake City, Applied Engrg. Prods. Co. 801-582-4942
 Va Falls Church, Beacon North Inc. 703-534-1673

DYTRO CORP., 63 Tec St., Hicksville, N.Y., 11801, Tel: 516-822-2130, TWX: 710-593-4135; Empl.: 15; Minimum order: \$100

Products manufactured: Comparators, Converters, Data Acquisition & Reduction Systems, Data Loggers, Demagnetizers, Meters, Printers, Testers

Local Sales Offices & Reps.

Cal North Hollywood, Crown Elctns. 213-877-3550
 Mass Waltham, Instrumentation Controls & Measts. 617-891-8059
 Tex Houston, Leeco Inc. 713-487-1402

DYTRONICS CO., INC., 4800 Evanswood Dr., Columbus, Ohio, 43229, Tel: 614-885-3303; Empl.: 25

p. 1-658,659

Products manufactured: Filters, Generators, Meters, Shifters, Standards, Testers, Transducers

Local Sales Offices & Reps.

Ala Huntsville, Beacon Elctn. Assoc. 205-881-5031
 Cal San Mateo, Dayton Assocs. 415-347-9419
 Colo Wheatridge, Technology Mktg. Assoc. 303-423-6106
 Fla Ft. Lauderdale, Beacon Elctn. Assoc. 312-775-1309
 Ill Des Plaines, Marsland Assocs. 617-263-2766
 Mass Acton, Applied Meas. 612-545-4481
 Minn Minneapolis, Marsland Assoc. 214-363-5291
 Tex Dallas, Airep Elctns. 703-527-3262
 Va Arlington, Gans-Fryling, Inc. 206-938-4166
 Wash Seattle, J.B. Jolly, Inc. 212-867-8084
 EXP: New York, N.Y., Joseph Plasencia, Inc. 212-867-8084

DYTRONICS DIV., GTI Corp., Box 217, Leesburg, Ind., 46538, Tel: 219-453-3261, Telex: 023-2653; Empl.: 150

For info on price: S. E. Edwards; Application info: R. L. Gerber; Customer service: N. L. Banghart; Delivery info: N. L. Banghart

Products manufactured: Boards, Printed Circuit, Circuits, Flexible

Local Sales Offices & Reps.

Ark Hot Springs, Meredith Young Assoc. 501-262-1365
 Cal Santa Ana, Calif Elctn Mktg. 714-835-2702
 Cal Orlando, Geartner Assoc. 305-299-1000
 Ill Chicago, Midwest Elctn. Sis. 312-626-0030
 Ind Indianapolis, Electro-Reps 317-255-4147
 Kans Mission, Mid-Amer. Elctn. Mktg. 913-236-4800
 Mass Attleboro, E. J. Hughes Assoc. 617-226-0050
 Mich Rochester, Kent & Assocs. 313-651-1890
 Minn St. Paul, Kenco Co. 612-645-7717
 Miss Jackson, Meredith Young Assoc. 601-366-8185
 NJ Parsippany, Total Mktg. Approach 201-227-4073
 NY East Aurora, E. E. Harries & Co. 716-652-1221
 NY Fayetteville, E. E. Harries & Co. 315-637-9871
 Ohio Chagrin Falls, Alexander Indl. Sis. 216-247-4133
 Pa Ardmore, R. D. Freedman Assoc. 215-649-3679

DZUS FASTENER CO., INC., 425 Union Blvd., West Islip, N.Y., 11795, Tel: 516-669-0494; Empl.: 100

Products manufactured: Fasteners

Local Sales Offices & Reps.

Cal Anaheim, Dzus Fastener Co. 714-635-0830

E-H RESCH LABS., INC., Dept. A., 515 11th St., Oakland, Cal., 94604, Tel: 415-834-3030, TWX: 910-366-7256; Empl.: 175

Products manufactured: Amplifiers, Attenuators, Calibrators, Comparators, Converters, Current Sources, Generators, Integrators, Electronic, Meters, Oscilloscopes, Probes, Recorders, Testers, Transformers

Local Sales Offices & Reps.

Ala Huntsville, BCS Assocs. 205-881-6220
 Ariz Phoenix, Zeus, Inc. 602-253-6104
 Cal Lawndale, Ward/Davis Assocs. 213-542-7740
 Colo Denver, Zeus, Inc. 303-770-4400
 Conn W. Hartford, Instr. Dynamics 203-223-5503
 Fla Orlando, BCS Assocs. 305-843-1510
 Ill Chicago, Cozzens & Cudahy, Inc. 312-298-3600
 Md Baltimore, E-H Research Labs. 301-532-7400
 Mass Wakefield, Instr. Dynamics 617-245-5100
 Minn Wpls., Cozzens & Cudahy, Inc. 612-684-4336
 Mo St. Louis, Cozzens & Cudahy, Inc. 314-423-1234
 NJ Haddonfield, Dyna Rep. Co. 609-795-1700
 NJ Union, SBM Reps. 201-687-8737

NM Albuquerque, Zeus, Inc. 505-268-3941
 NY Pleasantville, SBM Reps. 914-769-1811
 NY Rochester, SBM Reps. 716-381-8330
 NC Greensboro, BCS Assocs. 919-273-1918
 Ohio Centerville, Micro Sis. 513-885-4171
 Ohio Medina, Micro Sis. Corp. 216-221-5505
 Ore Portland, McLaren, Inc. 503-297-2248
 Tex Dallas, Data Mktg. 214-661-0300
 Tex Houston, Data Mktg. 713-686-9627
 Wash Bellevue, McLaren, Inc. 206-454-3400

E & L INSTRUMENTS, INC., 61 First St., Derby, Conn., 06418, Tel: 203-735-8774, Telex: 963536; Empl.: 25

For info on price: G. LaRatta; Application info: R. Vuillequez; Customer service: D. Tomalis; Delivery info: D. Tomalis

Free literature available: 1) Circuit Design Line-catalogue on range of breadboarding instruments & accessories, 2) Innovator Series Brochure-programmed/teacher's manual, 3) Adam Brochure-Modular-breadboarding instrument, 4) Elite Brochure-range of design requirements from incoming inspection thru research lab.

Products manufactured: Analyzers, Boards, Plug-In, Boards, Printed Wiring, Universal, Boards, Programming, Cards, Linear Function, Cards, Logic, Chassis, Circuit Board Mounting, Clamps & Clips, Generators, Integrated Circuit Devices, Jumpers, Kits, Breadboarding (For Engineers), Kits, Marking (Dial, Instrument, Equipment, etc.), Kits, Power Supply, Kits, Programming Board, Kits, Test Equipment, Kits, Training Aid, Power Supplies, Probes, Sockets, Terminal Blocks, Boards & Strips, Terminals, Testers

Local Sales Offices & Reps.

Cal Mountain View, IFM Co. 415-961-2828
 Cal Palos Verdes, Edwards Assocs. 213-377-0975
 Colo Denver, R. Bowen Assoc. 303-722-4641
 Conn Woodbridge, Electronic Mktg. Co. 203-397-1461
 Fla Orlando, Nine Assocs. 305-628-1124
 Ill Arlington Heights, Martec Assocs. 312-956-8090
 Mo Kansas City, T. Dowell Co. 913-236-8200
 NJ Springfield, Shortess-Rawson & Assocs. 201-467-8585
 NY N. Syracuse, Naco Elctns. 515-699-2651
 Ohio Dayton, Rixan Assocs. 513-222-0011
 Pa Valley Forge, J. E. Cuesta & Co. 215-265-5800
 Tex Richardson, Tesco, Inc. 214-690-4004
 Va Fairfax, Nine Assocs. 703-273-1803
 Wash Seattle, J. Jolly, Inc. 206-938-4166
 FOR: Can., Vancouver, BC, RAE Industrial Electronics Ltd. 604-687-2621
 FOR: Can., Edmonton, Alb., Cardinal Ind'l. Elctns. Ltd. 403-455-4122
 FOR: Can., Winnipeg, Man., J. Fortin Co. 204-774-6286

E & M LABORATORIES, INC., 5388 Sterling Ctr. Dr., Westlake Village, Cal., 91361, Tel: 213-889-1470, TWX: 910-494-1953; FSC No: 14135; Empl.: 75

For info on price: G. M. Underberger; Application info: C. C. Carnegie; Customer service: M. McGinniss; Delivery info: W. Reed

Products manufactured: Amplifiers, Circulators, Ferrite, Drivers, Switch, Isolators, Strip-Line Components, Microwave, Switches

Local Sales Offices & Reps.

Ariz Phoenix, Thorson Co. 602-956-5300
 Cal Cupertino, Data Elec. Sis. 408-255-2084
 Cal Los Angeles, McDougall/McLaughlin Co. 213-477-8556
 Colo Parker, TMA, Inc. 303-841-3435
 Fla Lighthouse Point, Saber Assocs., Inc. 305-943-3076
 Ga Woodstock, Saber Assocs. 404-432-9625
 Ill Park Ridge, RF Specialists 312-698-2044
 Ind Ft. Wayne, TX Sis. 219-489-4447
 Mass Stoneham, REPCO 617-438-3113
 NJ Haworth, Central Assocs., Inc. 201-568-0808
 NJ Pennsauken, Megargel/Himmelstein Assoc. 609-662-3081
 NM Albuquerque, TMA, Inc. 505-298-4321
 NY No. Syracuse, Naco Elctns. 315-699-2651
 NY Plainview, Central Assocs., Inc. 516-433-0808
 NY Rochester, NACO Elctns. 716-244-4720
 NY Utica, Naco Elctns. Corp. 315-733-1801
 NC Raleigh, Candor Co. 919-876-4999
 Ohio Shaker Hts, Tels. Sis. 216-561-1900
 SC Myrtle Beach, Candor Co., Inc. 803-448-5213
 Tenn Chattanooga, Candor Co., Inc. 615-894-7454
 Tex Dallas Airep Elctns. 214-827-2120
 Utah Salt Lake City, Monarch Dist. & Representing 206-285-2525
 Wash Seattle, Datacom Assoc. 206-285-2525

FOR: Can., Vancouver, Mitec Elctns Ltd. 604-988-7317
 FOR: Can., Quebec, Mitec Elctns Ltd. 514-334-9140

E-SYSTEMS INC., Garland Div., Box 6118, Dallas, Tex., 75222, Tel: 214-272-0515, TWX: 910-860-5187; Empl.: 1700

Products manufactured: Antenna Feed Systems, Antennas, Comm. Systems, Data Acquisition & Reduction Systems, Display Devices/Displays, Receivers

Local Sales Offices & Reps.

Fla	Fort Walton Beach	904-243-0127
Mass	Lexington	617-861-9050
NJ	W. Long Branch	201-222-0565
NY	Rome	315-336-1911
Ohio	Dayton	513-254-8464
Va	Arlington	703-524-2310
Va	Hampton	703-838-2010

E-SYSTEMS, INC., Memcor Div., 1320 Flaxmill Rd., Huntington, Ind., 46750, Tel: 219-356-4300, TWX: 810-333-1530; Empl.: 1100; Minimum order: \$50
 p. 2-1484-1491, 1656-1665

For info on price: B. Broom; Application info: J. Fredricks; Customer service: B. Broom; Delivery info: J. Fredricks

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Clamps & Clips, Dials, Fasteners, Kits, Potentiometer, Rheostat, Knobs, Locks, Dial & Shaft, Resistors, Rheostats

Local Sales Offices & Reps.

Ala	Huntsville, Murcota Inc.	205-539-8476
Cal	Culver City, De Angelo, Rothman & Co.	213-398-6239
Cal	San Carlos, D.H. Ross Co.	415-591-4411
Colo	Denver, Gossard & Assoc.	303-985-0602
Fla	Boca Raton, R.K. Welter Co.	305-391-9067
Ga	Atlanta, Murcota Corp.	404-875-2525
Ill	Chicago, D. Dolin Sls. Co.	312-286-6200
Ind	Ft. Wayne, M & N Prods. Co.	219-747-2461
Iowa	Marion, Thomas & Modrcin Assocs.	319-377-6261
Kans	Shawnee Mission, Thomas & Modrcin Assocs.	913-432-2131
Md	Baltimore, D.H. Brothers Co.	301-764-7189
Mass	Boston, Anderson Sales Assoc.	617-227-2980
Mich	St. Clair Shores, J.M. Thorpe Co.	313-779-6363
Minn	St. Paul, H.A. Cullen, Assoc.	612-646-7371
Mo	Hazelwood, Thomas & Modrcin Assocs.	314-895-4700
NJ	East Orange, Masin Esco Inc.	201-674-6505
NY	E. Syracuse, Honsinger Mktg. Assocs.	315-463-5718
NY	Syosset, Masin Esco Inc.	516-364-0310
NC	Burlington, Murcota Corp.	919-585-1577
NC	Winston Salem, Murcota Corp.	919-723-1001
Ohio	Cleveland, Glover Sls. Co.	216-842-4520
Pa	Newtown Square, G.M. Conneen	215-353-2241
Tex	Dallas, Southwest Electronic Ind.	214-233-9816
Tex	Houston, Southwest Electronic Ind.	713-729-1670
Wash	Seattle, R.K. Squibb Inc.	206-632-2450

E-T-A PRODS. CO. AMERICA, 7400 N. Croname Rd., Chicago, Ill., 60648, Tel: 312-647-8303, Telex: 253780; Empl.: 13; Minimum order: \$20

For info on price: D. Schneider 312-647-8303; Application info: W. Gillich 312-647-8306; Delivery info: D. Schneider 312-647-8303

Free literature available: Condensed Catalog; individual catalog sheets; bulletin 402, thermal magnetic circuit breaker.

Products manufactured: Circuit Breakers, Relays

Local Sales Offices & Reps.

Cal	Santa Fe Springs, Sierra-Pacific Eng.	213-921-9634
Cal	Walnut Creek, P.W. Jasin Co.	415-935-6339
Colo	Denver, Vinson Assocs.	303-757-5151
Conn	Meriden, Eagle Assocs.	203-235-9036
Fla	Orlando, Buchanan & Abrams Assoc.	305-898-7444
Ill	Chicago, Midwest Elctn. Sls.	312-777-9700
Ind	Indianapolis, Garstang Engrg.	317-632-9903
Iowa	Cedar Rapids, Midwest Elctn. Sls.	319-362-4410
Kans	Wichita, Dy-Tronix Inc.	316-943-6221
La	New Orleans, M.F. Klicpera Co.	504-282-2897
Mich	Lathrup Village, R.C. Nordstrom & Co.	313-559-7373
Minn	Minneapolis, Wenco Sls.	612-866-3639
Mo	Hazelwood, Dy-Tronix Inc.	314-731-5799
Mo	Kansas City, Dy-Tronix	816-761-6543
NJ	Fort Lee, S. Justin Assoc.	201-947-4371
NY	Buffalo, Harries & Kershaw Co.	716-652-1221

NY Rochester, Harries & Kershaw Co. 716-671-6365

NY Syracuse, Harries & Kershaw Co. 315-637-9871

Ohio Cincinnati, J.O. Olsen Co. 513-922-2176

Ohio Cleveland, J.O. Olsen Co. 216-752-5444

Okla Tulsa, M.F. Klicpera Co. 918-939-5956

Pa Pittsburgh, J.O. Olsen Co. 412-279-2550

Pa Willow Grove, Techparts 215-659-6900

Tenn Nashville, Stark & Assocs. 615-352-4276

Tex Dallas, M.F. Klicpera 214-742-2515

Tex Houston, M.F. Klicpera 713-747-3868

Wash Kirkland, W.J. Stulgis Co. 206-822-3867

Wisc Waukesha, J.C. Morkin Sls. Eng. 414-542-5129

E-TRONICS, 16774 Schoenborn, Sepulveda, Cal., 91343, Tel: 213-892-7279; Empl.: 28

Products manufactured: Cabinets & Accessories, Carts & Dollies, Instrument & Equipment, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Chokes, Coils Including Assemblies & Forms, Converters, Inverters, Power Supplies, Transformers

EV-GAME INC., Box 711, Freeport, N.Y., 11520, Tel: 516-378-0440, Telex: 96-1304; Empl.: 60; Minimum order: \$20

Customer service: Sales Dept.

Products manufactured: Cable, Connector Adapters, Connectors, Cords, Crystals, Jack Adapters (All Types), Microphones, All Kinds, Motors, Phonographs, Parts & Accessories, Plug Adapters, Plug & Jack Sets, Tape Recording Accessories

Local Sales Offices & Reps.

Ariz	Phoenix, B & G Sls. Co.	602-266-5624
Ark	El Dorado, D. Bellew Sls. Co.	501-863-8325
Cal	San Francisco, Technical Sls.	415-467-1434
Cal	W. Covina, D. Forth Assocs.	213-967-2893
Colo	Colorado Springs, Norris & Co.	303-635-9319
Fla	Ormand Beach, J. F. Thompson Co.	904-677-2298

Ga	Atlanta, H. W. Phillips Co.	404-237-7564
Ill	Skokie, M. Bermann Sls. Co.	312-675-3740
Ind	Indianapolis, Mid-Central Sls.	317-283-1727
Ky	Ferncreek, Mid-Central Sls.	502-239-5614
La	Kenner, D. Bellew Sls. Co.	504-729-4550
Md	Baltimore, E-K-P Assocs.	301-788-6498
Mich	Detroit, Riley & Petchell Sls.	313-535-7000
Minn	Minneapolis, Kodo Assocs.	612-881-1255
Mo	Raytown, Midwest Mktg.	816-358-6638
NJ	Englewood, J. J. Bressler	201-569-7600
NY	Liverpool, Lewis-Dunnigan Co.	315-622-2133
NY	New York, J. J. Bressler	212-564-4105
NC	Burlington, E. P. Ester Co.	919-226-5942
Ohio	Cleveland, H. Miller Sls. Co.	216-321-3900
Pa	Easton, E-K-P Assocs.	215-258-6477
Tenn	Memphis, L. Jones	901-683-7616
Tex	Irving, Antle-Smith Sls. Co.	214-259-8707
Wash	Seattle, W. R. Lanphear Sls. Co.	206-633-4900

E-Z-HOOK, Div. of Tektest, Inc., Box 450, Arcadia, Cal., 91006, Tel: 213-446-6175, TWX: 910-582-1614 ... p. 2-671

Products manufactured: Cable Assemblies & Harnesses, Clamps & Clips, Connectors, Cords, Jumpers, Kits, Breadboarding (For Engineers), Kits, Test Equipment, Leads, Test & Adaptors, Probes, Testers

EAGLE MAGNETICS INC., Box 24283, 7421 Crawfordville Rd., Indianapolis, Ind., 46224, Tel: 317-297-1030; Empl.: 11 ... p. 2-1216, 1217

For info on price: R. Jackson; Application info: J. L. Coddington; Customer service: R. Jackson; Delivery info: R. Jackson

Free literature available: Transformer Brochure-Design & Application, Testing, Cathode-Ray-Tube Brochure-Design & Application, Testing, Magnetic Shielding Materials Brochure-Design & Application, Testing

Products manufactured: Foil, Shields

EAGLE-PICHER INDS., Commercial Prods, Dept., Box 130, Seneca, Mo., 64865, Tel: 417-776-2258; Empl.: 100 ... p. 1-1208

Customer service: H.M. York

Free literature available: Battery Application Manual.

Products manufactured: Batteries

Local Sales Offices & Reps.

Ariz	Phoenix, Spectrum Assocs.	602-997-6324
Cal	Palo Alto, Abbott Engrg. Co.	415-327-0830
Cal	Santa Ana, Spectrum Assocs.	714-835-4114
Conn	Bloomfield, Zaslow Sls. Co.	203-242-7781
Fla	Maitland, Ellis Assocs.	305-645-1101
Ill	Oak Brook, Whitmore Assocs.	312-325-4727

Mass	Northboro, Zaslow Sls. Co.	617-393-8150
Minn	Minneapolis, Jaynus Assocs.	612-884-1700
NY	Plainview, Preisick Assocs.	516-681-8444
NY	Syracuse, Naylor Elec. Co.	315-656-2251
NC	Greensboro, L & D	919-292-3201
Ohio	Dayton, Ad-El-Tek/El Compo	513-836-2741
Tex	Dallas, E. B. Robertson	214-942-2716

EAGLE-PICHER INDUSTRIES, INC., Elctns. Div., Box 47, Joplin, Mo., 64801, Tel: 417-623-8000, TWX: 910-774-4508; Empl.: 700; Minimum order: \$100

Customer service: P. E. Grayson Ext: 448

Free literature available: Special purpose batteries for military and aerospace applications.

Products manufactured: Batteries, Boards, Printed Circuit, Braid, Cable, Cable, Chargers, Battery, Crystals, Metals, Services, Assembly, Production & Test

EAGLE SIGNAL, Mfg. Div. Gulf & Western Inds., Box 3585, Davenport, Iowa, 52808, Tel: 319-326-8111; Empl.: 800

For info on price: D. J. Morse 312-326-8125; Application info: J. C. Schwartz 312-326-8143; Customer service: E. P. Doak 312-326-8127; Delivery info: E. P. Doak 312-326-8127

Free literature available: An industrial control selection guide describing everything from control relays to programmable control systems including time, count and temperature controls; control sensors; prices; sales offices.

Products manufactured: Controllers, Programmable, Controls/Control Eqpt., Counters, Indicators, Light Sources, Photoelectric, Programmers, Relays, Sensors, Light, Switches, Timers, Totalizers, Digital

Local Sales Offices & Reps.

Ala	Birmingham, McConnell Sls. & Engrg. Corp.	205-871-3501
-----	---	--------------

Ariz	Phoenix, Bews & Wallace Co., Inc.	602-275-4496
Ariz	Tucson, Bews & Wallace Co., Inc.	602-297-4001
Cal	Burlingame, Campbell & George Co.	415-697-2965

Cal	Los Angeles, Hundley Co.	213-240-3600
Calo	Denver, Empire Electrical Sls. Co.	303-744-1776
Fla	Ft. Lauderdale, Ward Engrg. Co.	305-564-4883
Fla	Jacksonville, Ward Engrg. Co.	904-388-7656
Fla	Orlando, Ward Engrg. Co.	305-851-0725
Ga	Atlanta, B. Fancher & Assocs.	404-448-7078
Idaho	Twin Falls, C.W. Silver Inc.	208-733-0460
Ill	Chicago, Kelburn Engrg. Co.	312-775-8383
Ill	Moline, J. Otis & Assocs.	309-762-9311
Ind	Indianapolis, Kelburn Engrg. Co.	317-257-9874
La	Baton Rouge, Thompson Equip. Co.	504-355-6663

La	New Orleans, Thompson Equip. Co.	504-833-6381
Md	Glen Burnie, E.J. Varholy & Sons Inc.	301-760-3344

Mass	Norwood, Gibson Engrg. Co.	617-769-3600
Mich	Detroit, R.D. Ernest Assocs.	313-861-7311
Mich	Spring Lake, Mackinaw Engrg. Co.	616-842-9170

Minn	Minneapolis, W. Hallock Co.	612-920-6100
Mo	Kansas City, R. Greene Co.	816-333-7585
Mo	St. Louis, R. Greene Co.	314-644-2666
NJ	Hackensack, C.W. Ribble Co.	201-342-2602
NY	Buffalo, Munhall Co.	716-856-1212
NC	Charlotte, B. Fancher & Assocs.	704-376-1753
Ohio	Cleveland, J.L. Finnicum & Assocs.	216-226-7076

Ohio	Dayton, Thal-Mor Assocs.	513-298-9939
Okla	Oklahoma City, L. Elliott Co.	405-842-7885
Okla	Tulsa, L. Elliott Co.	918-743-7794
Ore	Portland, Branom Instr. Co.	503-285-9861
Pa	Havertown, W. F. Keegan & Co.	215-528-6640
Pa	Monroeville, H. A. Deever & Co.	412-372-4000
Tenn	Knoxville, J. R. Stephenson Agency	615-588-7474

Tex	Addison, L. Elliott Co.	214-239-8533
Tex	Missouri City, L. Elliott Co.	713-499-1571
Utah	Salt Lake City, C. W. Silver Inc.	801-355-5377
Wash	Seattle, Branom Instr. Co.	206-762-6050
WVa	Charleston, Skaff Engrg. Co.	304-342-0131
Wisc	Milwaukee, Kelburn Engrg. Co.	414-545-2122
EXP	Davenport, Iowa, (Eagle Signal - J. Duda)	319-326-8146

EAI, See Electronic Assocs.

EASTERN AIR DEVICES MOTOR DIV., Electro Audio Dynamics, Inc., 385 Central Ave., Dover, N.H., 03820, Tel: 603-742-3330, TWX: 510-297-4454; Empl.: 325

Products manufactured: Alternators, Blowers & Fans & Accessories, Controls/Control Eqpt., Gearheads & Speed Reducers, Motors, Reducers, Tachometers

Local Sales Offices & Reps.

Ala	Huntsville, International Scientific	205-837-1601
Ariz	Tempe, Gassner & Clark	602-945-7979
Cal	Los Altos, Servo Data	415-964-1325
Cal	Los Angeles, Universal Comps.	213-641-4255
Fla	Orlando, Perrott Assoc.	305-275-1132
Ill	Westchester, Gassner & Clark	312-345-4245
Mich	Detroit, A. Blumenberg Assoc.	313-557-1934
Minn	St. Paul, R. G. Ragon	612-488-0201
NJ	Ridgefield, Haber-Ramp Corp.	201-945-5250
NY	No. Syracuse, L. D. Allen	315-458-7470
NY	Rochester, H. C. Johnson Agencies	716-482-3000
Ohio	Dayton, Midwest Mktg Assoc.	513-433-2511
Pa	Newtown Square, Hag Assoc.	215-459-0504
Tex	Houston, Carey Assoc.	713-460-1111
FOR:	Can., Montreal, Que., Compontics, Ltd.	514-342-4117

EASTERN DELTA CORP., 29-09 S. Broadway, Fair Lawn, N.J., 07410, Tel: 201-797-4200; Empl.: 31; Minimum order: \$25

For info on price: S. Carlson; Application info: I. Green; Customer service: I. Green; Delivery info: F. McKenzie

Products manufactured: Arresters, Electrical Surge, Lightning, Chargers, Battery, Chokes, Demagnetizers, Diodes, Eliminators, Battery, Limiters, Protectors, Rectifiers, Services, Assembly, Production & Test, Suppressors, Transformers, X-Ray Inspection Equipment

Local Sales Offices & Reps.

NJ	Fair Lawn, Eastern Delta Corp.	201-797-4200
----	--------------------------------	--------------

EASTMAN CHEM. PRODS., Sub. Eastman Kodak Co., Kingsport, Tenn., 37662, Tel: 800-251-0351, TWX: 810-574-5174; Empl.: 1000

Customer service: Info. Svcs.

Free literature available: Pub. No. PA-14 Describes bonding strength and fast setting properties of Eastman 910[®] brand of cyanoacrylate adhesives. Pub. No. PO-12 General information on Tenite[®] Polyallomer in wire coatings and other applications.

Products manufactured: Adhesives (All Types), Cleaners & Solvents, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Plastic Raw Materials, Liquids, Pellets, Powders, Resins

Local Sales Offices & Reps.

Conn	Hartford	
Del	Newark	
Fla	Tampa	
Ga	Atlanta	
Ga	Dalton	
Ill	Chicago	
Ky	Louisville	
La	New Orleans	
Mass	Boston	
Mich	Detroit	
Minn	Minneapolis	
Mo	Kansas City	
Mo	St. Louis	
NJ	Millburn	
NY	Buffalo	
NY	New York City	
NC	Charlotte	
NC	Greensboro	
NC	Raleigh	
Ohio	Akron	
Ohio	Cincinnati	
Ohio	Cleveland	
Ohio	Columbus	
Ohio	Toledo	
Okla	Tulsa	
Pa	Bethlehem	
Pa	Philadelphia	
Pa	Pittsburgh	
SC	Greenville	
Tenn	Memphis	
Tex	Dallas	
Tex	Houston	

EASTMAN KODAK, Bus. Sys. Mkt. Div., 343 State St., Rochester, NY, 14608

EASY-UP INC., Racine, Wisc., 53401, Tel: 414-633-6389; Empl.: 12

For info on price: T. I. Le Clear; Application info: T. I. Le Clear; Customer service: T. I. Le Clear; Delivery info: Main

Free literature available: Brochures-All products described.

Products manufactured: Benches, Consoles, Stools, Tables, Carts & Dollies, Instrument & Equipment, Mounts

Local Sales Offices & Reps.

Ga	Smyrna, B-C Elctn. Sls.	404-436-5169
Ill	Skokie, M. Bermann Sls. Co.	312-675-3740
Ind	Fort Wayne, N. Hoemig Sls. Co.	219-747-0826
Mass	Needham, Coakley, Boyd & Abbott	617-444-5470
Mich	Detroit, R. Milsk Co.	313-342-6660
Minn	Minneapolis, R. Ripley & Assocs.	612-881-8282
Mo	St. Louis, Kathrinus-Helly-Boswell Co.	314-962-5627
NY	Yonkers, J. Mesnick Elctn. Sls.	914-961-6619

EATON CORP., Ind'l. Drives Div., 9919 Clinton Rd., Cleveland, Ohio, 44111; Empl.: 1640

Products manufactured: Brakes, Controls/Control Eqpt., Gearheads & Speed Reducers, Gears & Gear Mechanisms (Precision), Motors, Reducers

Local Sales Offices & Reps.

Cal	Los Angeles	213-724-4320
Cal	San Francisco	415-588-4307
Colo	Denver	303-623-7011
Conn	Stratford	203-375-5207
Fla	Jacksonville	904-786-3254
Ga	Atlanta	404-448-6600
Ill	Elk Grove Village	312-439-6200
Iowa	Des Moines	515-278-4540
La	Metairie	504-888-9811
Md	Timonium	
Mass	Westboro	617-235-1624
Mich	Grand Rapids	616-245-8748
Mich	Southfield	313-345-5085
Minn	Minneapolis	612-835-5110
Mo	Maplewood	314-645-4732
NJ	Cherry Hill	215-563-1446
NJ	Fairfield	201-227-4111
NY	Buffalo	716-836-0850
NY	Syracuse	315-463-8202
NC	Charlotte	704-375-5659
Ohio	Cincinnati	513-874-4800
Ohio	Cleveland	216-523-5304
Okla	Tulsa	918-587-7917
Pa	Pittsburgh	412-341-6565
Tenn	Memphis	901-272-1374
Tex	Dallas	214-522-6191
Tex	Fort Worth	817-332-5351
Tex	Houston	713-623-0797
Tex	Odessa	915-366-4951
Wash	Seattle	206-624-7292
Wisc	Milwaukee	414-462-3800

EATON CORPORATION, Engineered Fasteners Division, Box 6688, Cleveland, Ohio, 44101, Tel: 216-523-5363, TWX: 810-421-8678; Empl.: 1300; Minimum order: \$100

For info on price: W. J. Febel 216-523-5325; Application info: W. J. Febel 216-523-5325; Customer service: W. H. Gibbons 216-523-5705; Delivery info: W. A. Sutton 216-523-5771

Free literature available: Bulletin 383 - high carbon spring steel fasteners, heat treated. Used throughout automotive, appliance, radio-tv industries. Also complete line of plastics fasteners. Exotic & precious metal stampings, precision, miniature & sub-miniatures for electro-mechanical components.

Catalog 034-100 - Full Line of Cold Headed Nut-Bolt-Washer Assemblies & Specialties, Railroad Washers.

Products manufactured: Clamps & Clips, Connectors, Contacts, Electrical, Fasteners, Forms, Wire, Grommets, Rings, Retaining, Rivets, Springs (All Types), Strain Reliefs, Cable & Wire, Terminals, Wire

Local Sales Offices & Reps.

Cal	Santa Ana	714-542-7295
Ill	Oak Park	312-589-0300
Mich	Southfield	313-354-2810
Minn	Richfield	612-866-3696
Mo	St. Louis	314-725-1182
NJ	Kenilworth	201-272-8780
NY	Rochester	716-654-9690
Ohio	Cincinnati	513-771-9303
Ohio	Cleveland	216-523-5363
Tenn	Chattanooga	615-892-8452
Va	Roanoke	703-343-3678

EBY CO., HUGH H., 4701 Germantown, Philadelphia, Pa., 19144, Tel: 215-842-3000, TWX: 710-670-0452; FSC No: 72825; Empl.: 150; Minimum order: \$200

For info on price: W. Telmosse; Application info: M. Sterling; Customer service: M. Costello; Delivery info: M. Costello

Products manufactured: Clamps & Clips, Connectors, Jacks (All Types), Plugs, Posts, Services, Assembly, Production & Test, Sockets

Local Sales Offices & Reps.

Cal	Norwalk, Zoolialian Inc.	213-921-9791
Ill	Des Plaines, E. Flaxman Co.	312-298-8580
Ill	Streamwood, Al Holte & Assoc.	312-837-4066
Md	Baltimore, Component Sls.	301-484-3647
Mass	Framingham, G. Rosen Co.	617-879-5505
Mich	Southfield, Bep Ents.	313-357-3330
Minn	Hopkins, Grayden & Flemmer	612-941-1120
Mo	Hazelwood, Technical Representatives	314-731-5200
NY	Huntington, Caravan Sls. Corp.	516-421-1391
NY	Jamaica, S-J Sls. Assoc.	212-291-3232
NY	Larchmont, B.C.S. Assoc.	914-834-5781
NY	Liverpool, B.C.S. Assoc.	315-458-4774
NY	New York, Eltron Export Corp.	212-944-7635
Ohio	Cleveland, Components, Inc.	216-842-2737
Pa	Glenside, Griffin Co.	215-646-8383
FOR:	Can., Quebec, Electrodesign Ltd.	514-363-5120

Local Distributors

Cal	Los Angeles, Dyna Service Co., 1020 S. Atlantic Blvd.	213-268-8531
Ill	Des Plaines, Edmar Elctns., 1305 Rand Rd.	312-298-8580
NY	Buffalo, Summit Dists., 916 Main St.	716-884-3450
NY	Jamaica, Eby Sls. Co., 148-05 Archer Ave.	212-291-3232

ECC CORP., Box 669, Euless, Tex., 76039; Empl.: 927

Products manufactured: Controls/Control Eqpt., Regulators, Relays, Switches, Thyristors (Includes Silicon Controlled Rectifiers), Timers

Local Sales Offices & Reps.

Ala	Huntsville, Interep Assocs.	205-881-3677
Ariz	Scottsdale, F. Board Assocs.	602-949-9561
Cal	Palo Alto, O'Donnell Assocs.	415-327-9260
Cal	Torrance, O'Donnell Assocs.	313-323-9243
Colo	Arvada, Arrowhead Sls.	303-423-5556
Fla	Clearwater, Perrott Assocs.	813-531-5513
Fla	Orlando, Perrott Assocs.	305-275-1132
Ill	Elk Grove Village, John G. Twist Co.	312-593-0200
Ind	Fort Wayne, R.O. Whitesell & Assocs.	219-432-5591
Ind	Indianapolis, R.O. Whitesell & Assocs.	317-359-9283
Ind	Kokomo, R.O. Whitesell & Assocs.	317-453-6868
Iowa	Cedar Rapids, John G. Twist Co.	319-393-8703
Ky	Louisville, R.O. Whitesell & Assocs.	502-893-7303
Mass	Lexington, KCA Comps., Inc.	
Mich	Grand Rapids, R.O. Whitesell & Assocs.	616-451-8901
Mich	Southfield, R.O. Whitesell & Assocs.	313-358-2020
Mich	St. Joseph, R.O. Whitesell & Assocs.	616-983-7337
Minn	Minneapolis, Elec. Comp. Sls.	612-933-2594
Mo	Hazelwood, Centech Sls.	314-731-4220
Mo	Raytown, Centech Sls.	816-358-8100
NM	Albuquerque, A.Q. Elctns.	505-255-8701
NY	Binghamton, Elcom Sls., Inc.	607-723-9270
NY	Rochester, Elcom Sls., Inc.	716-385-1400
NY	Whitesboro, Elcom Sls., Inc.	315-732-6445
NC	Charlotte, R.W. Chapman	704-525-2421
NC	Raleigh, R.W. Chapman & Co.	919-782-2624
Ohio	Cincinnati, R.O. Whitesell & Assocs.	513-521-2290

Ohio	Columbus, R.O. Whitesell & Assocs.	614-888-9396
Ohio	Dayton, R.O. Whitesell & Assocs.	513-298-9546
Ohio	Lakewood, R.O. Whitesell & Assocs.	216-228-7522

Pa	Bala Cynwyd, M. Friedman Assocs.	215-839-3450
----	----------------------------------	--------------

Pa	Pittsburgh, R.O. Whitesell & Assocs.	412-242-0100
----	--------------------------------------	--------------

SC	Greenville, R.W. Chapman & Co.	803-232-5391
Tenn	Bristol, Remco	615-968-4195
Tex	Dallas, Component Specialties, Inc.	214-357-4576

Tex	Houston, Component Specialties, Inc.	713-771-7237
-----	--------------------------------------	--------------

Tex	Richardson, Oeler & Menelaides	214-234-6334
Utah	Salt Lake City, Arrowhead Sls.	801-487-3444

Wash Bellevue, Vantage Corp. 206-455-3460
 Wisc Oak Creek, Erdman Sls. Co. 414-761-2120
 Wisc Waukesha, John G. Twist Co. 414-786-6330
 FOR: Downsville, Ont., Can., Cantronics Ltd.
 416-661-2494
 FOR: Montreal, Quebec, Can., Cantronics Ltd.
 514-733-0749

ECHO SCIENCE CORP., 485 E. Middlefield Rd., Mountain View, Cal., 94040, Tel: 415-961-7145, TWX: 910-379-6499; Empl.: 180

Customer service: R. R. Watson

Free literature available: Video Discassette Recorder, Video Tape Recorder, military and commercial, military-ruggedized. Video Disc Recorder - VDR 300, 310 & 315 & VDR-1R, Video Tape Recorder - VRR-411, WR-200 series Longitudinal Recorder, Transient Free Recorder.

Products manufactured: Memory Systems, Recorders

Local Sales Offices & Reps.

Cal San Diego, Tauber & Assoc. 714-274-7242
 Md Laytonville, G-T Assocs. 301-949-8060
 NY Huntington, Data Logic Sls. 516-421-1644
 Tex Dallas, Martin, Zienkasky, Browne & Assoc.
 214-233-5535

ECONOMY FUSE DIV., Federal Pacific Elec. Co., 2070 Maple St., Des Plaines, Ill., 60016, Tel: 312-299-2211

Products manufactured: Fuses

ECP CORP., 4726 Superior Ave., Cleveland, Ohio, 44113

ECTRON CORP., 8159 Engineer Rd., San Diego, Cal., 92111, Tel: 714-278-0600, TWX: 910-335-1259; Empl.: 30 p. 1-7, 162

Customer service: J. W. JaQuay

Free literature available: Differential DC Amplifiers and Signal Conditioners, Wide Band Differential DC Amplifiers, 500 Series DC Amplifiers, Industrial DC Amplifiers Multipurpose Signal Conditioners, Thermocouple Simulator/Calibrator

Products manufactured: Amplifiers, Calibrators, Data Acquisition & Reduction Systems, Data Loggers, Signal Conditioners & Equipment, Standards, Thermocouples, Elements & Accessories

Local Sales Offices & Reps.

Ala Huntsville, Incotech, Inc. 205-837-6061
 Cal Encino, Sci Devices 213-986-9933
 Cal Los Alamitos, Sci. Devices 213-598-7678
 Cal Mtn. View, Sci. Devices 415-964-4230
 Cal San Diego, Scientific Devices 714-279-6642
 Colo Littleton, Aztec Enter. 303-795-0250
 Conn E. Hartford, Tekdata 203-525-7647
 Fla Orlando, Datatrep 305-843-5224
 Fla Pompano Beach, Datatrep 305-781-9279
 Ill Chicago, S.E.A. Inc. 312-282-6694
 Ind Carmel, S.E.A. Inc. 317-846-2593
 Md Perry Hall, Dyna Rep. Co. 301-256-8300
 Mass Burlington, Tekdata 617-273-0198
 Mich Royal Oak, Satullo 313-549-3910
 Minn Minneapolis, S.E.A. Inc. 612-425-4455
 NJ Haddonfield, Dyna Rep Co. 609-795-1700
 NM Albuquerque, Aztec Entrs. 505-255-2440
 NY Fayetteville, Doolittle Elctns. Corp.
 315-637-3222

NY Great Neck, Eastern Instrumentation
 516-466-9505
 NC Winston-Salem, Radco Co. 919-722-9671
 Ohio Cleveland, Instrumentation Sys. Inc.
 216-486-0782

Ohio Dayton, Instrumentation Sys. Inc. 513-294-2838
 Pa Pittsburgh, Instrumentation Sys. 412-243-1111
 Va Alexandria, Dyna Rep. 703-354-1222
 Wash Seattle, R.S. Drake Assocs. 206-763-2755
 Wisc Waukesha, S.E.A. Inc. 414-547-6637
 FOR: Can., Scarborough, Ont., J. DeGrott
 416-264-2991

EDAL INDS., INC., 4 Short Beach Rd., E. Haven, Conn., 06512, Tel: 203-467-2591; Empl.: 200; Minimum order: \$50

For info on price: E. Pagano; Application info: E. Pagano; Customer service: D. Vagnini; Delivery info: D. Vagnini

Products manufactured: Arresters, Electrical Surge, Lightning, Bridges, Diodes, Limiters, Rectifiers, Spacers, Suppressors, Terminals

Local Sales Offices & Reps.

Ala Huntsville, Component Sls. 205-883-7794
 Cal Los Altos, Schwerin Assoc. 415-941-3737
 Cal Los Angeles, Current Product Sls. 714-633-7414
 Conn Madison, A&M 203-245-1031
 Fla Terra Ceia, Component 813-722-6376

Ill Chicago, Brock & Cushman 312-622-4110
 Mass Needham, A&M Sls. 617-444-8170
 Mich Ferndale, Hilltronics 313-398-5556
 Minn Minneapolis, Furber Sls. 612-861-1518
 Mo Blue Springs, Chesco 816-229-1404
 Mo St. Charles, Chesco 314-946-6677
 NJ Nutley, I. Brill 201-667-0653
 NY Brooklyn, Eastern 212-763-5180
 NY Buffalo, H.C. Johnson 716-632-7880
 NY Rochester, H.C. Johnson 716-482-3000
 Ohio Cleveland, Brauer 216-943-0601
 Ohio Vandalia, Brauer & Assoc. 513-898-1224
 Pa Pittsburgh, Brauer 412-921-3213
 Pa Radnor, Cordray Sls. 215-878-3737
 Ri Needham, A & M 617-444-8170
 Va Reston, Boyle Assoc. 703-620-9558
 Wisc West Allis, Brock & Cushman 414-933-3374

E.D.I. INC., Box 66, Cairo, Ill., 62914, Tel: 618-734-1694; Empl.: 3

Customer service: E. Badran

Products manufactured: Boards, Printed Circuit

EDISON ELECTRONICS DIV., See McGraw-Edison Co.

EDISON, INSTR. DIV., McGraw Edison Co., 2 Babcock Pl., W. Orange, N.J., 07051, Tel: 201-736-1000, TWX: 710-994-5810; Empl.: 450

Products manufactured: Alarms, Controls/Control Eqpt., Detectors, Gages, Indicators, Meters, Monitors, Probes, Pyrometers, Recorders, Relays, Switches, Transducers

EDMAC ASSOCIATES INC., 333 W. Commercial St., East Rochester, N.Y., 14445, Tel: 716-385-1440; Empl.: 70

Products manufactured: Counters, Data Acquisition & Reduction Systems, Data Loggers, Filters, Recorders, Services, Assembly, Production & Test, Testers, Underwater Communication, Detection, Navigation, etc. Equipment

EDMUND SCIENTIFIC CO., 555 Edscorp Bldg., Barrington, N.J., 08007, Tel: 609-547-3488, Telex: 831-564; Empl.: 175; Minimum order: \$5

For info on price: B. McKelevy; Application info: B. McKelevy; Customer service: D. Blackburn; Delivery info: D. Blackburn

Free literature available: Catalog 752 - More than 4,500 unusual bargains for hobbyists, schools & industry. Bulletin 9903 "Tips & Things For Beating the Energy Crisis". Consumer benefits from energy conservation. Includes solar energy devices, alternate energy devices, heat pipes.

Products manufactured: Adhesives (All Types), Alarms, Analyzers, Batteries, Calculators, Electrical & Electronic, Cameras, Cells, Photoconductive, Photoemissive, Photovoltaic, Chargers, Battery, Chemicals, Cleaners, Ultrasonic, Demagnetizers, Fiber Optic Bundles, Lamps, Lasers & Laser Systems, Lenses, Optical & Camera, Lenses, Readout & Display, Lights, Magnets, Magnifying Glasses, Inspection, Meters, Microscopes, Pyrometers, Radiometers

EDO WESTERN CORP., 2645 S. 300 West, Salt Lake City, Utah, 84115, Tel: 801-486-7481; Empl.: 225

Free literature available: Data sheets on each product and brochures on systems in the areas of oceanographic instrumentation, closed circuit TV systems for airborne and underwater applications, transducers and hydrophones, and piezoceramic crystals.

Products manufactured: Amplifiers, Cases, Equipment, Instrument, Meter, Coders, Crystals, Hydrophones & Accessories, Indicators, Monitors, Oceanographic Equip. (Electronic), Receivers, Recorders, Television Systems & Equipment Closed-Circuit, Transducers, Underwater Communication, Detection, Navigation, etc. Equipment

Local Sales Offices & Reps.

Ala Huntsville, Kemp Instr. 205-837-4304
 Ariz Scottsdale, J. Smith & Assocs. 602-947-2495
 Cal Laguna Beach, J. M. Elgar 714-494-3965
 Colo Boulder, J. Smith & Assocs. 303-442-7100
 Conn West Hartford, Instrument Assocs.
 203-525-9367
 Md Rockville, E. J. Winston 301-881-5780
 Md Silver Spring, L. G. White & Co. 301-685-1780
 Mass Bedford, Instrument Assocs. 617-275-0700
 NM Albuquerque, J. Smith & Assocs. 505-255-2111
 NY College Point, Edo Int'l. 212-445-6000
 Ohio Risingun, Mecom 419-457-3231
 Okla Tulsa, Kemp Engrg. Co. 918-299-2636
 Tex Addison, Kemp Engrg. Co. 214-661-0400
 Tex Houston, Kemp Engrg. Co. 713-688-1431

Tex Stafford, Electrosystems Engrg. 713-721-0126
 Wash Seattle, Cocolith & Co. 206-525-8952
 FOR: Can., Delta, B.C., Band Elctns. 604-581-9104

EDSYN, INC., 15958 Arminia St., Van Nuys, Cal., 91406, Tel: 213-873-5115, Telex: 65-1469; Empl.: 25 p. 2-1694, 1695

Products manufactured: Meters, Soldering Accessories, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools

Local Distributors

Ariz Phoenix, Jensen Tools & Alloys, 4117 N. 44 th St.
 Cal El Monte, Marshall Inds., 9674 Telstar Ave.
 Cal El Segundo, Alpha Comps., 115 Eucalyptus Dr.
 Cal El Segundo, Vassco, 410 Douglas St.
 Cal Glendale, MacDonald Co., 213 S. Brand Blvd.
 Cal Los Angeles, Garrett Corp., 6015 E. Randolph St.
 Cal San Jose, J. Elctn. Tool Co., 1918 Story Rd.
 Cal Santa Clara, Com Kyl, 2368 Walsh Ave.
 Cal Torrance, Erem Corp., 3740 Skypark Dr.
 Ill Chicago, EMF Co., 6135 W. Belmont
 Minn Minneapolis, H. Stark's Inc., 112 3rd Ave. N.
 NJ Saddlebrook, Tool-Tronics, 114 Route 46
 Pa Huntingdon Valley, H. Mann Inc., 3983 Mann Rd.
 Tex Fort Worth, Tandy Corp., 2615 W. 7th St.
 Wash Seattle, Seattle Tool Supply, 1161 Eleventh St.

EDWARDS HIGH VACUUM, 3279 Grand Isl. Blvd., Grand Island, N.Y., 14072, Tel: 716-773-7552, Telex: 91-536; Empl.: 40; Minimum order: \$10

For info on price: R. Niccola; Application info: H. Stry; Customer service: R. Niccola; Delivery info: R. Niccola

Products manufactured: Chamber, Environmental Test, Couplings, Deposition Equipment, Vacuum & Accessories, Detectors, Evaporation Equipment, Electron Beam, Feedthrus & Seals, Environmental, Gages, Lubricants, Pumps, Vacuum, Switches, Valves, Solenoid, Valves, Vacuum

Local Sales Offices & Reps.

Cal El Segundo, Edwards High Vacuum, Inc.
 213-322-7699
 Colo Denver, Continental Divide Prods., Inc.
 303-420-0130
 Fla Orlando, Physimetrics, Inc. 305-894-8081
 Ga Atlanta, Physimetrics, Inc. 404-261-8720
 Ill Oak Lawn, Edwards High Vacuum, Inc.
 312-423-0443
 Mass So. Weymouth, Edwards High Vacuum, Inc.
 617-337-8931
 Mich Dearborn, Anger Assocs. 313-584-9853
 NJ Sussex, Edwards High Vacuum, Inc.
 201-835-3925
 NM Albuquerque, Southwestern Engrg. & Equip. Co.
 505-265-6775
 NY Grand Island, Edwards High Vacuum, Inc.
 716-773-7552
 Tex Dallas, Southwestern Engrg. & Equip. Co.
 214-826-6661
 Tex Houston, Southwestern Engrg. & Equip. Co.
 713-353-4333

EEOCO, 1441 E. Chestnut Ave., Santa Ana, Cal., 92701, Tel: 714-835-6000, TWX: 910-595-1550; Empl.: 642 p. 1-2030-2033

Free literature available: EEOCO Switch Catalog, EEOCO Electronic Packaging Products Catalog #1002, EEOCO Guide to Punched Tape Readers/Perforators #630.

Products manufactured: Boards, Plug-In, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Cards, Logic, Chassis, Circuit Board Mounting, Dividers, Editing Equipment, Tape, Modules, Logic, Encapsulated, Packages, Integrated Circuit, Paper-Tape Preparation Systems, Perforators, Readers, Services, Assembly, Production & Test, Switch Hardware, Switches, Tape Search Equipment

Local Sales Offices & Reps.

Ala Huntsville, Col-Ins-Co 205-539-1771
 Cal Los Altos, Recht Assocs. 415-941-0336
 Cal San Diego, Mesa Engr. & Sls. Assoc.
 714-278-8021
 Conn Farmington, R. Perron & Co. 203-673-4825
 Conn Trumbull, R. Perron & Co. 203-268-9631
 Fla Orlando, Col-Ins-Co 305-423-7615
 Ga Clarkston, Col-Ins-Co 404-938-7280
 Ill Northfield, Torkelson Assocs. 312-446-9085
 Ind Indianapolis, Torkelson Assocs. 317-244-7867
 Iowa Cedar Rapids, Palatine Sls. 319-365-8071
 Kans Overland, Palatine Sls., Inc. 316-683-7512
 Kans Overland Park, Palatine Sls., Inc. 913-262-5643
 Md Kensington, EMA (Elctn. Mktg. Assts.)
 301-881-5300
 Mass Norwood, R. Perron & Co. 617-762-8114
 Mich Farmington Hills, H. Lowell Co. 313-851-7474

Minn Minneapolis, Torkelson Assocs. 612-835-2414
 Mo St. Louis, Palatine Sls., Inc. 314-426-7055
 NH Dover, R. Perron Co., Inc. 603-742-2321
 NJ Ft. Lee, Tecmat 201-461-8686
 NY Fairport, NACO Electronics Corp. 716-244-4720
 NY No. Syracuse, NACO Electronics Corp. 315-699-2651
 NY Utica, NACO Electronics Corp. 315-732-1801
 NC Raleigh, Col-Ins Co. 919-834-6591
 Ohio Aurora, EMA, Inc. 216-562-6104
 Ohio Centerville, EMA, Inc. (Engr. Mktg. Assts.) 513-433-2800
 Okla Tulsa, Palatine Sls., Inc. 918-622-0321
 Pa King of Prussia, EMA (Electron. Mktg. Assts.) 215-265-1600
 Pa Philadelphia, EMA, Inc. 215-248-5050
 Tex Austin, Palatine Sls., Inc. 512-451-7463
 Tex Houston, Palatine Sls., Inc. 713-783-1492
 Tex Richardson, Palatine Sls., Inc. 214-231-9489
 Wash Seattle, B. Hirsh Co. 206-783-3423

Local Distributors

Ala Huntsville, Hall-Mark Elect. Corp. 4739
 Commercial Dr. 205-837-8700
 Ariz Tempe, G.S. Marshall Co., 835 W. 22nd St. 602-968-6181
 Cal Costa Mesa, Schweber Elctns., 3000 Red Hill Ave. 714-556-3880
 Cal El Monte, G.S. Marshall Co., 9674 Telstar Ave. 213-688-0141
 Cal Irvine, G.S. Marshall Co., 17975 Sky Park Blvd. 714-556-6400
 Cal San Diego, G.S. Marshall Co., 8057 Raytheon Rd. 714-278-6350
 Cal Sunnyvale, G.S. Marshall Co., 788 Palomar 408-732-1100
 Colo Arvada, G.S. Marshall Co., 5633 Kendall Ct. 303-423-9670
 Conn Danbury, Schweber Elctns., Finance Dr. 203-792-5000
 Commerce Indust. Pk. 203-792-5000
 Conn N. Branford, G.S. Marshall Co., 200 Shaw Rd. 203-484-0488
 Fla Hollywood, Schweber Elctns., 2830 N. 28th Terrace 305-927-0511
 Fla Orlando, Hall-Mark Elctns., 7233 Lake Ellenor Dr., Box 13950 305-885-4020
 Fla Palm Beach Gardens, G.S. Marshall Co., 10384 Riverside Dr. 305-622-8490
 Ga Atlanta, Schweber Elctns., 4126 Pleasantdale Rd. 404-449-9170
 Ill Des Plaines, G.S. Marshall, 300 East Touhy Ave. 312-298-3700
 Ill Elk Grove Village, Schweber Electronics, 1380 Jarvis Ave. 312-593-2740
 Ill Elk Grove Village, Hall-Mark Elctns., 180 Crossen Ave. 312-437-8800
 Iowa Cedar Rapids, Schweber Elctns., 302 Executive Plaza 319-393-9125
 Kans Lenexa, Hall-Mark Elect. Corp., 9006 Rosehill Rd. 913-888-4747
 Md Baltimore, Hall-Mark Elect. Corp., 6660 Security Blvd. 301-265-8500
 Md Rockville, Schweber Elctns., 5640 Fisher La., Twinbrook Pkwy. 301-881-2970
 Mass Newton Highland, G.S. Marshall, 88 Needham St. 617-965-5115
 Mass Waltham, Schweber Elctns., 213 Third Ave. 617-890-8484
 Mich Troy, Schweber Elctns., 86 Executive Dr. 313-583-9242
 Minn Bloomington, Hall-Mark Elect. Corp., 9201 Penn Ave. So. 612-884-9056
 Minn Edina, Schweber Elctns., 7015 Washington Av. S. 612-941-5280
 Mo Earth City, Hall-Mark Elect. Corp., 13789 Rider Trails 314-291-5350
 NJ Somerset, Schweber Elctns., 43 Belmont Dr. 201-469-6008
 NY Farmingdale, G.S. Marshall Co., 230 Sherwood Ave. 516-293-4141
 NY Farmingdale, Hall-Mark Elctns., 167 Marine St. 516-293-7500
 NY Rochester, Schweber Elctns., 2 Town Line Circle 716-461-4000
 NY Westbury, Schweber Elctns., Jericho Turnpike 516-334-7474
 NC Raleigh, Hall-Mark Elctns., 3000 Industrial Dr. 919-832-4465
 NC Raleigh, Schweber Elctns., 10 Sunnybrook Rd. 919-832-8881
 Ohio Beachwood, Schweber Elctns., 23880 Commerce Pk. Rd. 216-464-2970
 Ohio Dayton, G.S. Marshall Co., 6388 No. Dixie Dr. 513-898-1105
 Okla Tulsa, Hall-Mark Elect. Corp., 4846 S. 83rd E. Ave. 918-835-8458
 Pa Trevese, Hall-Mark Elect. Corp., Box 125 215-355-7300

Tex Austin, Schweber Elctns., 2628 Longhorn Blvd. 512-837-2890
 Tex Dallas, G.S. Marshall Co., 14205 Proton Rd. 214-233-5200
 Tex Dallas, Hall-Mark Elctns., 9333 Forest La. 214-231-5101
 Tex Dallas, Schweber Elctns., 14177 Proton Rd. 214-661-5010
 Tex Houston, Hall-Mark Elctns., 8000 Westglen 713-781-6100
 Tex Houston, Schweber Elctns., 7420 Harwin Rd. 713-784-3600
 Wash Bellevue, G.S. Marshall Co., 1801 130th Ave. N.E. 206-883-1084
 Wisc Milwaukee, Hall-Mark Elect. Corp., 11925 W. Ripley Ave. 414-476-1270

EEMCO DIV., Datron Sys., 4585 Electronics Pl., Los Angeles, Cal., 90039, Tel: 213-247-7060, TWX: 910-497-2269; Empl.: 200

Products manufactured: Actuators, Cabinets & Accessories, Controls/Control Eqpt., Gears & Gear Mechanisms (Precision), Motor & Generator Armatures, Rotors, Stators, Motor Electric Generator Sets, Motors, Valves, Solenoid

Local Sales Offices & Reps.

Cal Encino, El Tec 213-981-9881
 Cal Palo Alto, Mauldin Co. 415-326-5291
 Colo Golden, J. T. Hurlbert Co. 303-279-7138
 Conn Hamden, Northeast Eng. 203-929-0981
 Conn Huntington, G.T.C. Assocs. 203-929-0981
 Fla Hialeah, Shaw Engrg. & Sls. 305-888-0835
 Fla Orlando, Dost Assoc. 305-295-4440
 Ga Atlanta, Brown Assoc. 312-725-7870
 Ill Chicago, J. Golden Co. 617-774-3010
 Mass Danvers, Northeast Eng. 617-655-1529
 Mass So. Natick, Wm. Beaver 617-459-6782
 Mass Westford, G. T. C. Assocs. 617-459-6782
 Minn St. Paul, Vikeland Sls. 612-645-4847
 NY Manhasset, Northeast Eng. 516-822-6140
 NY Plainville, L. I. R. Smith Assocs. 716-342-7664
 NY Rochester, L. G. Marchese Assoc. 914-352-1067
 NY Spring Valley, R. Smith Assocs. 216-238-8520
 Ohio Cleveland, Geotronics 503-297-3776
 Ore Portland, J. J. Backer Co. 215-688-5173
 Pa Devon, B & A Assocs. 206-454-2514
 Wash Kirkland, R. Chase 206-285-1300
 Wash Seattle, J. J. Backer Co. 206-285-1300

EFRATOM CALIFORNIA, INC., 3303 Harbor Blvd., Costa Mesa, Cal., 92626, Tel: 714-556-1620, Telex: 685-635; Empl.: 18

Customer service: H. Badura

Free literature available: Data Sheets and General Brochure describing our products, technical articles on Rubidium Frequency Standards.

Products manufactured: Receivers, Standards

Local Sales Offices & Reps.

Mass Reading, Geder-Rotondi 617-944-3105

E G & G INC., Georgetown, Mass, 01833

EG & G, INC., 35 Congress St., Salem, Mass., 01970, Tel: 617-745-3200, TWX: 710-347-6741

Products manufactured: Detectors, Diodes, Lamps, Lights, Meters, Monitors, Power Supplies, Probes, Protectors, Radiometers, Spark Gaps, Transformers, Tubes

EG&G, INC., Bedford Div., 35 Congress St., Salem, Mass., 01970, Tel: 617-745-3200, TWX: 710-347-6741; Empl.: 310

Products manufactured: Alarms, Comm. Systems, Data Compressors, Digital, Flashers, Lamps, Lights, Magnifying Glasses, Inspection, Power Supplies, Recorders, Scanners, Transmitters

EG&G, INC., Electro-Optics Div., 35 Congress St., Salem, Mass., 01970, Tel: 617-745-3200, TWX: 710-347-6741; FSC No: 25506; Empl.: 400; Minimum order: \$50 p. 1-1011-1013

For info on price: J. McClafferty; Application info: G. Riley; Customer service: J. McClafferty; Delivery info: J. McClafferty

Free literature available: Photodiode Catalog; Light Measurement Instrument Catalog; Flashtube, Transformer, High Energy Switch Catalog; Strobe and Sensitometer Catalog

Products manufactured: Amplifiers, Arresters, Electrical Surge, Lightning, Cells, Photoconductive, Photoemissive, Photovoltaic, Densitometers, Electronic, Detectors, Diodes, Generators, Lamps, Lights, Meters, Monitors, Power Supplies, Protectors, Radiometers, Spark Gaps, Switches, Transformers, Tubes

Local Sales Offices & Reps.

Cal Los Angeles, EG&G, Inc. 213-484-8780
 Md Riverdale, EG&G, Inc. 301-779-4272
 Mass Salem, E G & G Inc., Electro-Optics Div. 617-745-3200

EXP: Can., Waterloo, Ont. N2J-4C3, Optikon Corp., Ltd. 519-743-8571

E.I. DUPONT DE NEMOURS & CO., 1007 Market St., Wilmington, Del., 19898, Tel: 302-774-2421; Empl.: 110000

Products manufactured: Abrasive Belts, Compounds, Cords, Powders, etc., Adhesives (All Types), Analyzers, Chemicals, Cleaners & Solvents, Cleaners, Ultrasonic, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Coolants, Circuit & Components, Detectors, Electroplating Equipment & Supplies, Etchants, Printed Circuit, Fiber Optic Bundles, Films, Flux, Brazing & Soldering Materials, Heat Exchangers & Systems, Indicators, Inks For Thick Film Microcircuits, Insulators & Insulation, Laminates, Lubricants, Materials, Self-Lubricating, Metals, Meters, Paints, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Refrigerants, Spray, Services, Assembly, Production & Test, Solder (All Types), Sound Absorbing Materials, Spectrometers, Tapes, Recording, Magnetic (All Types)

Local Sales Offices & Reps.

Cal Los Angeles 213-843-1038
 DC Washington 202-DU7-0416
 Del Wilmington 302-774-2421
 Ill Chicago 312-222-5050
 Md Baltimore 301-PL2-2506
 NY New York 212-971-4771
 Pa Philadelphia 215-WA3-2493
 Tex Houston 713-467-4449

EICO ELECTRONIC INSTR. CO., 283 Malta St., Brooklyn, NY, 11207

EIMAC, Div. Varian Assocs., 301 Industrial Way, San Carlos, Calif., 94070, Tel: 415-592-1221, TWX: 910-376-4893

Products manufactured: Amplifiers, Diodes, Filters, Headers, Heat Exchangers & Systems, Lamps, Lights, Modulators, All Kinds, Power Supplies, Seals, Sockets, Switches, Tubes

Local Sales Offices & Reps.

Ariz Scottsdale, Varian Assocs., Eimac Div. 602-947-5461
 Cal Los Altos, Varian Assocs., Eimac Div. 415-968-7630
 Cal Santa Monica, Varian Assocs., Eimac Div. 213-828-5588
 Fla Clearwater, Varian Assocs., Eimac Div. 813-446-8513
 Fla Lighthouse Point, Varian Assocs., Eimac Div. 305-943-9495
 Ga Atlanta, Varian Assocs., Eimac Div. 404-252-0045
 Ill Park Ridge, Varian Assocs., Eimac Div. 312-825-6686
 Md Cheverly, Varian Assocs., Eimac Div. 301-773-7010
 Mass Waltham, Varian Assocs., Eimac Div. 617-890-4560
 NJ Cherry Hill, Varian Assocs., Eimac Div. 609-428-6800
 NJ Springfield, Varian Assocs., Eimac Div. 201-376-6600
 NM Albuquerque, Varian Assocs., Eimac Div. 505-345-3827
 NY Syracuse, Varian Assocs., Eimac Div. 315-437-2568
 Ohio Dayton, Varian Assocs., Eimac Div. 513-298-7318
 Tex Richardson, Varian Assocs., Eimac Div. 214-235-2385

EIP, INCORPORATED, 3230 Scott Blvd., Santa Clara, Cal., 95051, Tel: 408-244-7975, TWX: 910-338-0155; Empl.: 70
 Customer service: R. Bush

Free literature available: Literature describing automatic microwave frequency counters and their capabilities-20 Hz to 20 Ghz

Products manufactured: Counters

Local Sales Offices & Reps.

Ariz	Phoenix, Zeus, Inc.	602-253-6140
Cal	La Jolla, Ward/Davis Assocs.	714-459-3351
Cal	Lawndale, Ward/Davis Assocs.	213-542-7740
Cal	Sunnyvale, Ward/Davis Assocs.	408-245-3700
Colo	Denver, Zeus, Inc.	303-770-4400
Fla	Orlando, Gentry Assocs.	305-894-4401
Ill	Chicago, Pivan Engrg. Co.	312-539-4838
Ind	Indianapolis, Pivan Engrg. Co.	317-253-1681
Kans	Shawnee Mission, EIR Co.	913-362-0909
Md	Wheaton, Sonco Inc.	301-942-9420
Mass	Waltham, Meas. Consils. Corp.	617-890-4400
Mich	Detroit, Group Ten	313-549-3910
Minn	Minneapolis, Pivan Engrg. Co.	612-537-4501
Mo	Hazelwood, EIR Co.	314-895-4100
NJ	Fort Lee, Tech. Mktg. Assocs.	201-224-6911
NM	Albuquerque, Zeus, Inc.	505-268-3941
NY	East Syracuse, Ossmann Instrs., Inc.	315-437-6666
NY	Rochester, Ossmann Instrs., Inc.	716-328-2230
NY	Vestal, Ossmann Instrs., Inc.	607-785-9947
NC	Burlington, Gentry Assocs., Inc.	919-227-3639
Ohio	Cleveland	216-486-2800
Ohio	Dayton	513-277-6531
Okla	Norman, Data Mktg. Assocs., Inc.	405-364-8320
Pa	Blue Bell, Sonco Inc.	215-524-1490
Tex	Dallas, Data Mktg. Assocs., Inc.	214-358-4643
Tex	Houston, Data Mktg. Assocs.	713-686-9627
Tex	San Antonio, Data Mktg. Assocs.	512-828-0937
Utah	Salt Lake City, Zeus, Inc.	801-466-4922
Wash	Seattle, Arva-Hudson	206-622-0177
Wisc	Brookfield, Pivan Engrg. Co.	414-786-1940

EL-RAD MFG. CO., 4300 N. California, Chicago, Ill., 60618, Tel: 312-478-7300, TWX: 910-221-0104; FSC No: 11253; Empl.: 300 p. 2-1773, 1774

Customer service: J. Clark

Products manufactured: Antennas, Coils Including Assemblies & Forms, Delay Lines, Filters, Networks, Transformers

Local Sales Offices & Reps.

Cal	San Marino, Van Gott Assoc.	213-282-1125
Fla	Melbourne, Hanson Assocs.	305-727-7474
Ill	Palatine, Butor Sls. Co.	312-358-2988
Md	Glen Burnie, Faion Lott & Co.	301-744-4611
Mich	Jackson, E.H. Jordan & Assocs.	517-782-0694
Minn	Minneapolis, Elctn. Innovators Inc.	612-884-7471
NY	Rochester, Elcom Sls.	716-385-1400

ELASCO, Div. Buchbinder Corp., 5 Northwood Rd., Bloomfield, Conn. 06002, Tel: 203-242-0708; Empl.: 50
For info on price: S. Buchbinder; Application info: F. Wolff; Customer service: J. Lovinger; Delivery info: W. Grenen

Products manufactured: Converters, Power Supplies

Local Sales Offices & Reps.

Cal	Santa Clara, Cummings & Assoc.	408-247-8656
Cal	Woodland Hills, Cummings & Assoc.	213-340-6035
Conn	Bloomfield	203-242-0708
Mich	Plymouth, Romarc	313-455-0300
NY	Mamaroneck, Cane Technical	917-698-4411
Pa	King of Prussia, Riucco	215-265-5211

Local Distributors

Mass Dedham, Gerber Elctns., 825 Providence Hwy. 617-329-2400

ELCO, Maryland Rd. & Computer Ave., Willow Grove, Pa., 19090, Tel: 215-659-7000, TWX: 510-665-5573; Empl.: 825

Products manufactured: Bus Bars & Systems, Chassis, Circuit Board Mounting, Connectors, Contacts, Electrical, Flashers, Guides, Circuit Board, Machines/Machinery, Production, Plugs, Posts, Racks, Sockets, Terminals, Tools

Local Sales Offices & Reps.

Ala	Huntsville, EMA	205-837-6061
Ariz	Phoenix, Ralph Stitzer Co.	602-944-6808
Cal	El Segundo, Elco Pacific	213-675-3311
Cal	Oakland, Mouthrop Sls.	415-261-7676
Cal	San Diego, Celtec Co.	714-279-7961
Colo	Denver, Parker, Webster Co.	303-770-1972
Conn	Cheshire, Scientific Comps.	203-272-2160
Fla	Ft. Lauderdale, R. I. Smith Assocs.	305-772-5100
Ill	Chicago, Carlson Elctn. Sls. Co.	312-774-4812
Ind	Ft. Wayne, Baehr, Greenleaf & Assocs.	219-483-6864
Md	Rockville, Marktron Inc.	301-762-6210
Md	Timonium, Marktron Inc.	301-252-7111
Mass	Wilburn, Belmac Corp.	617-935-6810
Mich	Farmington, Sheridan Assocs.	313-476-2446

Minn	St. Paul, Cahill	612-646-7217
Mo	Crestwood, Nevco Inc.	
Mo	Kansas City, Nevco Inc.	816-421-1751
NY	Binghamton, Canavan-Scanlon Assocs.	607-724-7220
NY	Buffalo, Canavan-Scanlon Assocs.	716-839-3373
NY	Jericho, Electro Rep.	516-938-0540
NY	Rochester, Canavan-Scanlon Assocs.	716-442-0720
NY	Syracuse, Canavan-Scanlon Assocs.	315-437-1271
NC	Winston-Salem, EMA	919-722-5151
Ohio	Cincinnati, Baehr-Greenleaf	513-891-3826
Ohio	Columbus, Baehr, Greenleaf & Assocs.	614-486-4046
Ohio	Lakewood, Baehr-Greenleaf	216-221-9030
Okla	Tulsa, H. Daly	918-627-4159
Ore	Portland, Almac/Stroum	503-292-3534
Pa	Pittsburgh, Covert & Newman Co.	412-563-0303
Pa	Willow Grove, Elco Corp.	215-659-7000
SC	Greenville, EMA	803-268-1125
Tex	Houston, Aid Elctns.	713-777-3882
Tex	Irving, Aid Elctns.	214-259-4761
Utah	Salt Lake City, Parker Webster Co.	801-486-3737
Wash	Seattle, Almac/Stroum	206-763-2300
Wisc	Milwaukee, Carlson Elctn. Sls.	414-476-2790

ELCO PACIFIC, 2200 Park Pl., El Segundo, Cal., 90245, Tel: 213-675-3311, TWX: 910-325-6602

ELCOM INDUSTRIES, INC., 10277 Bach Blvd., St. Louis, Mo., 63132, Tel: 314-429-3100; Empl.: 20
Customer service: T. C. Noel, Jr.

Products manufactured: Comm. Systems, Punched Card Equipment, Readers

ELCOM SYSTEMS, INC., 127F Brook Ave., Deer Pk., N.Y., 11729, Tel: 516-667-5800; Empl.: 6
Customer service: L. Pollachek

Free literature available: Catalog #731 - complete product line

Products manufactured: Attenuators, Converters, Couplers, Mixers, Terminals, Transformers

ELCOR PRODS. NEOTEC ELCTNS. INC., Box 986, 2431 Linden La., Silver Spring, Md., 20910, Tel: 301-589-6614; Empl.: 100

For info on price: C. Guinee; Application info: K. V. Borgen; Customer service: C. Guinee; Delivery info: C. Guinee

Free literature available: ELCOR Product Catalog Including: Isolated, Transformers 4025W, Power Transformers 40 to 6000VA, Power Supplies 3% to .002% Reg., Signal Conditioners, Integrators, Electronic, Prices and Application Info.

Products manufactured: Integrators, Electronic, Meters, Power Supplies, References, D-C Voltage, Regulators, Signal Conditioners & Equipment, Transformers

Local Sales Offices & Reps.

Ariz	Scottsdale, Elctn. Ent.	602-946-9860
Cal	Acadia, William H. H. Co.	213-447-6166
Cal	San Mateo, J.E. Lape Co.	415-345-3021
Ill	Addison, R.E. Stemm, Inc.	312-279-2440
Ill	Rockford, Rockford Reps.	815-964-5806
Md	Silver Springs, ML Council Assoc.	301-587-1755
Mass	Lexington, Zieco, Inc.	617-861-8300
NJ	Hillsdale, B. Cameron Assoc.	201-461-2595
NM	Albuquerque, Elctn. Enterprises	505-256-3561
NM	Las Cruces, Elctn. Enterprises	505-524-0126
NY	Guilford, Electro Modular Sys.	518-456-2665
Okla	Oklahoma City, J. R. Lukeman & Assoc.	405-848-4791
Pa	King of Prussia, Letronix	215-265-1020
EXP:	N.Y., N.Y., Henley & Co.	212-986-5544

ELDEC CORP., Box 100, 16700 13th Ave. W., Lynnwood, Wash., 98036, Tel: 206-743-1313, TWX: 910-449-2855; Empl.: 600; Minimum order: \$25 p. 1-1193-1196

For info on price: W. W. Arnold; Application info: R. B. Banks; Customer service: R. Keating; Delivery info: B. A. Stone

Products manufactured: Chargers, Battery, Converters, Power Supplies

Local Sales Offices & Reps.

Ala	Huntsville, Astro-Tec	205-881-1861
Cal	Northridge, Tauber & Assocs.	213-368-4011
Cal	Torrance, ELDEC	213-532-8732
Conn	Madison, A & M Elctn. Reps.	203-245-1031
Ga	Atlanta, Astro-Tec	404-237-0943

Ill	Chicago, Pivan Engrg. Co.	312-539-4838
Ind	Indianapolis, Pivan Engrg. Co.	317-253-1681
Kans	Wichita, D & O Engrg. Co.	316-264-7358
La	New Orleans, Astro-Tec	504-581-2099
Mass	Needham, A & M Elctn. Reps.	617-444-8170
Mass	Stoneham, Robertson Elctn. Prods. Co.	617-438-3113
Mich	Royal Oak, Group Ten	313-549-3910
Minn	Minneapolis, Pivan Engrg. Co.	612-537-4501
Mo	Brigdeton, D & O Engrg. Co.	314-731-3800
NJ	Dover, R.L. Diamond Inc.	
NY	Bayside, R.L. Diamond, Inc.	212-423-7330
NY	Binghamton, Labtronics, Inc.	607-748-0509
NY	Depew, Labtronics, Inc.	716-685-4111
NY	Syracuse, Labtronics, Inc.	315-454-9314
NY	Ulster Park, Labtronics, Inc.	518-372-6649
Ohio	Cleveland, Group Ten	216-486-2800
Ohio	Dayton, Group Ten	513-277-6531
Tex	Arlington, D & O Engrg. Co., Inc.	817-261-2300
Tex	Bedford, Astro Tec	817-267-1361
Va	Arlington, Astro Tec	703-979-2498
Wisc	Brookfield, Pivan Engrg. Co.	414-786-1940
FOR:	Can., Toronto, Ont., Patlon Aircraft & Ind. Ltd.	416-239-7389

ELDEN MFG. CO., 2712 N. Elston Ave., Chicago, Ill., 60647; Empl.: 12

Products manufactured: Counters, Machines/Machinery, Production, Motors

ELDORADO INSTRUMENT CO., 2151 Arnold Industrial Hwy., Concord, Cal., 94520, Tel: 415-686-4200; Empl.: 20

Products manufactured: Counters, Generators, Meters, Timers, Totalizers, Digital

Local Sales Offices & Reps.

Cal	Cupertino, T. Louis Snitzer Co.	408-257-8333
Cal	Del Mar, Snitzer	714-454-2191
Cal	Los Angeles, Snitzer	213-836-6170
Colo	Littleton, Aztec Entrs.	303-795-0250
Fla	Orlando, E. Holmes	305-894-8901
Ga	Chamblee, E. Holmes	404-451-6161
Ill	Chicago, Carter Elctns.	312-585-5485
Ind	Indpls., Carter Elctns.	317-293-0696
Kans	Leawood, Leemark Engrs.	913-648-0124
Md	Lanham, Brimberg Assocs., Inc.	301-552-2200
Mass	Burlington, J & J Assocs.	617-272-2606
Mich	Farmington, Anderson Elctns.	313-476-9161
Minn	Mpls., Carter Elctns.	612-544-9393
Mo	Hazelwood, Carter Elctns.	314-731-2237
NJ	Fairfield, KLS Assocs.	201-227-2900
NM	Albuquerque, Aztec Entrs.	505-255-2440
NY	N. Syracuse, NACO Elctns.	315-699-2651
NY	NY, KLS Assocs.	212-233-4849
Pa	Ambler, W M Assocs.	215-643-4119
Tex	Austin, Crockett Southwest Co.	512-476-6801
Tex	Dallas, Crockett Southwest Co.	214-637-6120
Va	Virginia Bch., E.G. Holmes	703-340-6556
Wash	Bellevue, Brennan	206-454-9332
Wisc	Milwaukee, Carter Elctns.	414-464-5555

ELEC-TROL, INC., 26477 N. Golden Valley Rd., Saugus, Cal., 91350, Tel: 805-252-8330, TWX: 910-338-1556; FSC No: 51636; Empl.: 300; Minimum order: \$25 p. 1-1644-1647

For info on price: M. Wainess; Application info: M. Wainess; Customer service: N. Koon; Delivery info: N. Koon

Products manufactured: Relays

Local Sales Offices & Reps.

Ala	Huntsville, Beacon Elctn. Assocs.	205-881-5031
Ariz	Phoenix, Southwest Engrg. Inc.	602-993-0250
Cal	Mt. View, Gene C. Woempner Co.	415-964-5454
Cal	Pico Rivera, Westrep	213-949-2551
Cal	San Diego, Westrep	714-276-0751
Colo	Denver, Zeus, Inc.	303-770-4400
Conn	Orange, NPM Assocs.	203-878-4066
Fla	Ft. Lauderdale, Beacon Elctn. Assocs.	305-776-6074
Fla	Maitland, Beacon Elctn. Assocs.	305-647-3498
Ga	Atlanta, Beacon Elctn. Assocs.	404-351-3654
Ill	Des Plaines, Lincoln, Hodges & Assocs.	312-297-3810
Mass	Franklin, NPM Assocs.	617-528-5013
Mich	Detroit, Nicon Assocs.	313-341-7688
Mich	St. Joseph, Nicon Assocs.	616-983-4989
Minn	Minneapolis, R-J, Inc.	612-922-1425
Mo	Blue Springs, Chesco	816-229-1404
Mo	St. Charles, Chesco	314-946-6677
NM	Albuquerque, Zeus, Inc.	505-256-9831
NY	Jericho, HRC Comp-Tech, Inc.	516-822-5550
NY	New Hartford, KLM Assocs.	315-735-8525
NY	North Syracuse, KLM Assocs.	315-458-6214
NY	Rochester, KLM Assocs.	716-442-0820

Ohio	Cincinnati, G & H Sls. Co.	513-771-8231
Ohio	Grove City, G & H Sls. Co.	614-878-1128
Pa	Birchrunville, Jadelectronic Associates, Inc.	215-647-5151
SC	Spartanburg, Beacon Elctrn. Assocs.	803-582-4613
Tex	Dallas, Allied Comps., Inc.	214-238-0408
Tex	Houston, Allied Comps., Inc.	713-691-3961
Utah	Salt Lake City, Zeus, Inc.	801-486-2317
Wash	Bellevue, R. Over Sls.	206-454-4551
Wisc	Waukesha, Lincoln, Hodges & Assocs.	414-542-3087

Local Distributors

Cal	Sunnyvale, Acacia Sls., 384 San Alejo St.	408-735-0100
Cal	Van Nuys, Patane Avionics, 5937 Kester Ave.	213-988-4455
Colo	Lakewood, Acacia Sls., 11111 W. 8th Ave.	303-232-2882
Fla	Margate, C.D.I., 2922 N. State Rd. Suite 105	305-971-4950
Ill	Elk Grove Village, Diplomat/Lakeland, 2451 Brickville Dr.	312-595-1000
Tex	Dallas, Solid State Elctns. Co. of Tex, 2643 Manana	214-352-2601
Tex	Houston, Solid State Elctns. Co. of Tex, 6400 Westpark Dr., Suite 480	713-785-5436

ELECTRA/MIDLAND CORP., Box 760, Mineral Wells, Tex., 76067, Tel: 817-325-7871, TWX: 910-890-5855

Products manufactured: Circuits, Hybrid, Thick Film, Resistors

(Refer to Electra/Midland Corp., Midland Div., for sales office information.)

ELECTRAC, INC., 1614 Orangethrope Way, Anaheim, Calif., 92801, Tel: 714-879-6021; Empl.: 40

Customer service: L. Katz
Products manufactured: Analyzers, Comm. Systems, Converters, Demodulators, Detectors, Filters, Indicators, Multipliers, Receivers, Tracking Systems

ELECTRIC INDICATOR CO., INC., 272 Main Avenue, Norwalk, Conn., 06851, Tel: 203-847-5861, Telex: 96-5945; Empl.: 102

For info on price: W. L. Sly; Application info: W. L. Sly; Customer service: F. J. Drake; Delivery info: F. J. Drake

Free literature available: Catalogs on AC & DC generators; AC & DC commutator motors; AC induction & AC torque motors; AC hysteresis & salient pole synchronous motors; AC self-synchronous motors; AC induction & synchronous gear motors; and stepping motors.

Products manufactured: Alternators, Converters, Generators, Motor Electric Generator Sets, Motors, Resolvers, Synchro, Synchros, Tachometers, Transformers

ELECTRIC MACHINERY MFG. CO., 800 Central Ave., Minneapolis, Minn., 55413, Tel: 612-378-0500, TWX: 612-321-1390; Empl.: 1600

For info on price: C. M. Burns Ext. 548; Application info: C. M. Burns Ext. 548; Customer service: K. B. Green Ext. 613

Products manufactured: Controls/Control Eqp., Converters, Motor Electric Generator Sets, Motors

Local Sales Offices & Reps.

Ala	Birmingham	205-822-4474
Ariz	Phoenix	602-244-0331
Cal	Los Angeles	213-685-6444
Cal	San Francisco	415-392-8296
Colo	Denver	303-388-6322
Conn	Rocky Hill	203-563-9338
Fla	Tampa	813-872-7859
Ga	Atlanta	404-458-7971
Ill	Barrington	312-381-8091
Ill	Oak Brook	312-325-9620
Ind	Indianapolis	317-546-4053
Kans	Prairie Village	913-362-8540
La	Gretna	504-362-1074
Mass	Waltham	617-890-3792
Mich	Farmington	313-477-3774
Mich	Grand Rapids	616-459-8156
Minn	Minneapolis	612-831-2111
Mo	St. Louis	314-872-7300
Mont	Butte	406-792-5447
NM	Albuquerque	505-344-3288
NY	Buffalo	716-839-0851
NY	New York	212-697-0955
NC	Charlotte	704-332-6191
Ohio	Cincinnati	513-791-0480
Ohio	Cleveland	216-885-1254
Okla	Tulsa	918-743-9851

Ore	Portland	503-223-7349
Pa	Broomall	215-353-5040
Pa	Pittsburgh	412-563-7603
Pa	York	717-854-0217
Tenn	Knoxville	615-522-0165
Tenn	Memphis	901-767-3555
Tex	Dallas	214-748-6691
Tex	Houston	713-526-3283
Utah	Salt Lake City	801-487-5621
Va	Richmond	703-784-5293
Va	Vienna	703-790-5790
Wash	Bellevue	206-455-3655
Wash	Spokane	509-535-2931
Wisc	Milwaukee	414-332-5140
FOR: Can., Calgary, Alberta		403-265-4854
FOR: Can., North Vancouver, B.C.		604-985-7451
FOR: Can., Scarborough, Ont.		416-449-3200
FOR: Can., Winnipeg, Manitoba		204-338-5404

FIRING CIRCUITS, see Marathon Elec.

ELECTRIC SOLDERING IRON CO., Box 247, Deep River, Conn., 06417

ELECTRIC TACHOMETER CORP., 68th & Upland Sts., Philadelphia, Pa., 19142, Tel: 215-SA6-7723, Telex: 831-475; FSC No: 20049; Empl.: 50; Minimum order: \$15

For info on price: W.F. Porter; Application info: F.M. Porter; Customer service: W.F. Porter; Delivery info: W.F. Porter

Free literature available: Bulletin 740, Describes Tetco Model 120 Indicating Tachometers and drive components. Dial and digital types, portable, explosion-proof, watertight. Photos and technical data given.

Products manufactured: Counters, Indicators, Recorders, Tachometers

Local Sales Offices & Reps.

Ala	Huntsville, VESCO	205-881-8830
Cal	Berkeley, P. Rosen Co.	415-526-8286
Cal	Reseda, T.R. Slocum, Jr.	213-789-3355
Fla	Cocoa Beach, VESCO	305-784-0784
Haw	Honolulu, Berkley Engrg. & Equip. Co.	808-538-1921
Ill	Hinsdale, Johnson Engrg. & Sls. Co.	312-325-2272
Ind	Mishawaka, Law Instr. Co.	219-256-1110
Mass	Lexington, W.R. Hatfield Assoc.	617-861-0201
Mich	Lake Orion, Service Instr. Sls.	313-391-2266
Minn	St. Paul, Nelson Engineered Sls.	612-631-0646
Mo	St. Louis, C.O. Leaver Co.	314-968-1500
NJ	Fair Lawn, Bixon Assocs.	201-797-5356
NJ	Haddonfield, C.G. Thomson	609-429-5233
NY	Rochester, Holter Assocs.	716-381-7988
NY	Valley Stream, Idalee Elctns. Corp.	516-825-8955
NC	Greensboro, Associated Agents	919-292-6508
Ohio	Cincinnati, Kammerer Sls. Co.	513-321-1916
Ohio	Cleveland, Fred R. Sharp Co.	216-464-3820
Pa	Ligonier, J.K. Woodwell, Jr.	412-238-2748
Tenn	Memphis, Engineered Instrs.	901-743-3402
Tex	Stafford, Jordan Equip. Co.	713-GY8-6212
FOR: Can., Edmonton, Alb., Instr. Serv. Labs.		465-0327
FOR: Can., St. Lambert, Que., Lasanne Serv. Ltd.		514-672-6430
FOR: Can., Vancouver, B.C., Instr. Serv. Labs.		604-876-3361

ELECTRICAL INSTR. SVC., INC., 25 Dock St., Mt. Vernon, N.Y., 10550, Tel: 914-699-9717; QPL No: 16034A; Empl.: 35; Minimum order: \$25

For info on price: R. Ngelia; Application info: M. Kane; Customer service: G. D. Frank; Delivery info: R. Ngelia

Products manufactured: Baths, Controlled Temperature (Air & Liquid), Batteries, Bridges, Calibrators, Comparators, Decade Boxes, Detectors, Dividers, Indicators, Meters, Multipliers, Potentiometers, Regulators, Services, Assembly, Production & Test, Shunts, Meter, Standards, Testers, Transformers

Local Sales Offices & Reps.

Ala	Huntsville, J. L. Highsmith Co.	205-881-3294
Ariz	Scottsdale, William Assocs.	602-947-4297
Colo	Denver, Williams Assocs.	303-343-4730
DC	Washington, Whitcomb Assocs.	202-737-0763
Fla	Orlando, J. L. Highsmith Co.	305-293-5202
Ill	Skokie, Saffro & Assocs.	312-588-0905
Kans	Shawnee Mission, Pivan Engrg. Co.	913-722-1030
Md	Baltimore, Whitcomb Assocs.	301-889-1245
Mass	Waltham, Measurement Consultants Corp.	617-890-4400
Mich	Detroit, S. Sterling Co.	313-255-1970

Minn	Minneapolis, The Heimann Co.	612-861-6051
Mo	St. Louis, Pivan Engrg. Co.	314-567-3636
NM	Albuquerque, Williams Assocs.	505-255-1638
NY	Buffalo, R. F. Lamb Co.	716-874-4900
NY	Rochester, R. F. Lamb Co.	716-544-5580
NY	Schenectady, R. F. Lamb Co.	518-393-4844
NY	Syracuse, R. F. Lamb Co.	315-454-2469
NC	Charlotte, J. L. Highsmith Co.	704-333-7743
Ohio	Cleveland, S. Sterling Co.	216-442-8080
Ohio	Dayton, Comtel-Sterling Co.	513-298-7573
Okla	Norman, Data Mktg. Assocs.	405-364-8320
Pa	Jenkintown, A M T	215-L19-2080
Pa	Pittsburgh, S. Sterling Co.	412-922-5720
Tex	Dallas, Data Mktg. Assocs.	214-661-0300
Tex	Houston, Data Mktg. Assocs., Inc.	713-686-9627

Tex San Antonio, Data Mktg. Assocs. 512-828-0937
Va Richmond, J. L. Highsmith Co. 202-752-5888
Wash Seattle, R. S. Drake Assocs., Inc. 206-725-2700

ELECTRICAL PLASTICS CORP., 500 Long Branch Ave., Long Branch, N.J., 07740, Tel: 201-870-9500; Empl.: 60; Minimum order: \$35

For info on price: L. Classen; Application info: R. Brockner; Customer service: L. Classen; Delivery info: R. Kluge

Free literature available: EPC Stock Coil Forms and Bobbins Catalog #710 contains description of over 378 standard products including material selection guide, MIL specs and dimensions.

Products manufactured: Bobbins, Winding, Coil & Transformer, Cores, Magnetic, Cups, Encapsulation, Services, Assembly, Production & Test, Terminal Blocks, Boards & Strips

Local Sales Offices & Reps.

Cal	Los Angeles, E.A. Wilcox	213-723-6436
Cal	San Francisco, E.A. Wilcox	415-871-5350
Fla	Orlando, Buchanan & Abrams	305-898-7444
Ill	Chicago, J. Gotten Co.	312-725-7870
Mass	Framingham, G & M Assoc.	617-872-4871
Mich	Dearborn, Villani-Pitcher	313-271-4600
Minn	St. Paul, Knox Assocs.	612-488-5402
NJ	Livingston, H. Thaw Sls. Co.	201-992-2711
NM	Albuquerque, A.Q. Elctns.	505-255-8701
NY	Rochester, Schmitz Brothers	716-546-7628
Pa	Elkins Park, EMESCO Assoc.	215-224-3102
Pa	Haverford, D Humes Sls.	215-489-4163
Tex	Houston, Hisco	713-228-6662
Wash	Seattle, Powell & Assoc.	206-623-7060

ELECTRICAL STANDARDS DIV., E.S.R.S., Inc., 13418 Wyandotte St., N. Hollywood, Cal., 91605, Tel: 213-765-4224; Empl.: 6

For info on price: R. Stromquist; Application info: R. Wangerin; Customer service: R. Stromquist; Delivery info: E. Barnhart

Products manufactured: Dividers, Meters

Local Sales Offices & Reps.

Ariz	Scottsdale, Biedler & Assocs.	602-945-7821
Conn	Durham, Marr Elec. Co.	203-349-9691
Fla	Melbourne, Repcom Inc.	305-254-1877
NJ	Morris Plains, K. Garrison Assocs.	201-539-3142
Va	Annandale, J. Hopkins Assocs.	703-323-1641

Advertisement

Manufacturers of Taut Band design high voltage Electrostatic Voltmeters and Precision High Voltage Dividers with accuracies to the "State of the Art". Custom design dividers and instrumentation for unique application to customer specifications. Maintain standards directly traceable to the National Bureau of Standards.

ELECTRICAL TESTING LABS., INC., 2 East End Ave., New York, N.Y., 10021, Tel: 212-288-2600, TWX: 710-581-2440; Empl.: 141

Customer service: D. S. Schrum

Free literature available: CATALOG BROCHURE 200 list - lists services and facilities. Available on letterhead requests.

Products manufactured: Services, Assembly, Production & Test

Local Sales Offices & Reps.

Ga	Chamblee, ETL Georgia Div.	404-458-7763
Ind	Elkhart, Gold Seal Div. of ETL	219-294-1332
NY	Elmhurst, KAL Div. of ETL	212-446-1550

ELECTRO CORP., 1845 57th St., Sarasota, Fla. 33580, Tel: 813-355-8411, Telex: 52-683; FSC No: 81692; Empl.: 120; Minimum order: \$50

For info on price: R. Snite; Application info: R. Hollenbeck; Customer service: R. Snite; Delivery info: R. Snite

Free literature available: Magnetic Sensors - catalog contains engineering & specification data on non-contact speed sensors. Proximity Switches - catalog describes inductive proximity sensors & controls for industrial applications. Tachometers - catalog lists speed monitoring & control components & systems.

Products manufactured: Controls/Control Eqpt., Converters, Indicators, Switches, Tachometers, Transducers

Local Sales Offices & Reps.

Ariz	Phoenix, Mesa Engrg. & Sls. Assocs.	602-943-9213
Cal	Emeryville, Milligan-Spika	415-658-9044
Cal	Los Angeles, Basic Sys.	213-938-2833
Cal	Menlo Park, Long Assocs.	910-373-1170
Cal	San Diego, Mesa Elctns.	714-278-8021
Cal	Santa Ana, Electramation	714-541-8142
Colo	Denver, Bond Assocs.	303-756-1234
Conn	Cheshire, Coakley, Boyd & Abbott	203-272-2261
		305-843-5224
Fla	Orlando, Datarep	305-781-9279
Fla	Pompano BH., Datarep	813-345-8503
Fla	St. Petersburg, Datarep	312-543-5288
Ill	Addison, Electro Corp.	312-543-5288
Ill	Chicago, Electro	312-482-3300
Ill	La Grange, Olson Engrg. & Sls. Corp.	317-644-1690
Ind	Anderson, F. R. Sharp Co.	319-363-2489
Iowa	Cedar Rapids, Technical Reps.	617-444-5470
Mass	Needham, Coakley, Boyd & Abbott	313-564-6517
		612-925-1833
Minn	Minneapolis, Arjay Sls., Inc.	816-737-1414
Mo	Independence, Technical Reps.	315-437-6666
NY	E. Syracuse, Ossman Instrs., Inc.	716-328-2230
NY	Rochester, Ossman Instrs., Inc.	607-785-9947
NY	Vestal, Ossman Instrs., Inc.	914-946-1122
NC	Charlotte, Systems Service Corp.	704-377-3407
Ohio	Cleveland, F.R. Sharp Co.	216-464-3820
Ohio	Dayton, F.R. Sharp Co.	513-298-0011
Ore	Portland, Tekelectric Control Co.	503-246-5451
Pa	Erie, Ecco Elctn. Sls. Co.	814-455-8110
Pa	Glenside, C.A. Briggs	215-885-2244
Tex	Houston, Whitson Engrg. Co.	713-645-1801
Tex	Piano, Whitson Engrg. Co.	214-423-5255
Wash	Seattle, Tekelectric Control Co.	206-283-7100

ELECTRO-CRAFT CORP., 1600 2nd St. South, Hopkins, Minn., 55343, Tel: 612-935-8226, TWX: 910-576-3132; Empl.: 300; Minimum order: \$25 p. 1*946-949

For info on price: Sls. Dept.; Application info: K. P. Willasch; Customer service: D. Woodash; Delivery info: Sls. Dept.

Products manufactured: Amplifiers, Controls/Control Eqpt., Motor Electric Generator Sets, Motors, Servo Systems, Tachometers

Local Sales Offices & Reps.

Ariz	Scottsdale, Oem Specialties	602-948-3360
Cal	Los Angeles, Electrocraft Corp.	213-889-3631
Colo	Denver, Electro-Craft Corp.	303-750-4040
Fla	Altamonte Springs, WMM Assocs.	305-831-4645
		813-726-8871
Fla	Pompano Beach, WMM Assocs.	305-943-3091
Ga	Liburn, Motion Technology Inc.	404-233-4368
Ill	Chicago, Electro-Craft Corp.	312-298-0687
Mass	Boston, Electro-Craft Corp.	617-226-0206
Minn	Minneapolis, Electro-Craft Corp.	612-935-8226
NJ	Williamstown, Electro-Craft Corp.	609-728-2450
NY	Melville, Electro-Craft Corp.	516-293-2188
NY	Rochester, Ferguson Sls. Co.	716-482-7757
NC	Charlotte, Motion Technology Inc.	704-525-9855
		216-461-6161
Ohio	Cleveland, A.H. Baier Co.	513-276-4128
Ore	Dayton, A.H. Baier Co.	503-297-3862
Tex	Dallas, Electro-Craft Corp.	214-241-0680
Wash	Seattle, Todd-Brian Inds.	206-827-5811
FOR:	Can., Montreal, Que., Electrodesign Ltd.	514-363-5120
		416-787-0991
FOR:	Can., Vanier, Ont., Electrodesign Ltd.	613-745-0541

FOR: Can., Winnipeg, Man., Electrodesign Ltd. 204-338-5050

ELECTRO-DEVICES, INC., 4-6 Godwin Ave., Paterson, N.J., 07509, Tel: 201-274-8989; Empl.: 12

For info on price: O. E. Carlson; Application info: O. E. Carlson; Customer service: E. A. Fix; Delivery info: E. A. Fix

Products manufactured: Controls/Control Eqpt., Indicators

ELECTRO IMPULSE, Box 870, Red Bank, N.J., 07701, Tel: 201-741-0404; Empl.: 50; Minimum order: \$25 p. 1*492,662-666

Customer service: M. Rubin

Free literature available: Conversion Factors-Engineer's Handbook, Gen Catalog 800, Intro to cooling units-tech data on cooling systems for electronics.

Products manufactured: Air Conditioners (For Equipment), Attenuators, Bridges, Calorimeters, Microwave, Couplers, Dummy Loads, Heat Exchangers & Systems, Meters, Monitors, Resistors, Terminals, Transformers, Waveguides & Adapters

Local Sales Offices & Reps.

Cal	Hawthorne, Barnard & Assocs.	213-973-5050
Fla	Orlando, Gra-Mar, Inc.	305-894-3351
Md	Ellicott City, VPI, Inc.	301-465-4060
Mass	Reading, Geder-Rotondi Assocs.	617-944-3105
NY	Bridgeport, Lightstone Corp.	315-699-5747
NY	Greenville, B.D. Aaron & Co.	516-621-0630
Pa	Montgomeryville, VPI, Inc.	215-474-3200
Tex	Richardson, Spectra Sls. Corp.	214-234-3600
EXP:	Teaneck, N.J., Sylvan Ginsbury Ltd.	201-837-1100

ELECTRO LIFE, INC., 603 Maple La., Geneva, Ill., 60134, Tel: 312-232-0010; Empl.: 5

Customer service: J. B. White

Free literature available: Catalog sheets describing our highway traffic beacons, strobe lights for fire and security alarm systems, emergency vehicle, and warning lights for projecting loads on trucks.

Products manufactured: Lights

ELECTRO MATS. CORP. AMER., 605 Center Ave., Mamaroneck, N.Y., 10543, Tel: 914-698-8434, TWX: 710-566-1128; Minimum order: \$50

For info on price: D. Davis; Application info: T. McCurdy; Customer service: T. McCurdy; Delivery info: Stock

Products manufactured: Adhesives (All Types), Coatings, Conductive Plastic Materials, Paints, Resistors, Solder (All Types), Thermistors

Local Sales Offices & Reps.

Cal	Livermore, EMCA	415-447-8300
Fla	Longwood, Lenz Engrg. Co.	305-831-9797
Mass	Newton, Normell Assocs.	617-969-5478
Minn	Minneapolis, D.G. Perry & Co.	
NY	Buffalo, Watmet	716-285-3595
Tex	Richardson, Mero Corp.	214-234-3365

ELECTRO-MECH COMPONENTS, 1826 N. Floradale Ave., So. El Monte, Cal., 91733, Tel: 213-442-7180; FSC No: 07150; Empl.: 75; Minimum order: \$25 p. 1*2026,2027

For info on price: M. Ambrose; Application info: M. Peretik; Customer service: M. Ambrose; Delivery info: M. Ambrose

Products manufactured: Caps, Lenses, Indicator Light, Dials, Index Assemblies, Switch, Indicators, Keyboards, Alphanumeric & Decimal, Lamps, Lights, Switches

Local Sales Offices & Reps.

Ariz	Phoenix, GND Sales Co.	602-971-9758
Cal	Los Angeles, Rep Assocs.	213-829-5401
Cal	Palo Alto, Engrg. Assocs.	415-326-7842
Colo	Denver, Franklin Sls. Co.	303-922-3623
Conn	Millford, Todino Engrg.	203-TR4-6643
Fla	Casselberry, Publicover Assocs.	305-834-5775
Ill	Chicago, DJM Elctn. Sls.	312-774-6525
Ind	Fort Wayne, Scott Elctns., Inc.	219-743-1586
Ind	Indianapolis, Scott Elctns., Inc.	317-897-9976
Ky	Louisville, Scott Elctns., Inc.	502-583-3220
Md	Rockville, Quality Comps., Inc.	301-933-1623
Mass	Needham Heights, Todino Engrg. Sls.	617-444-7925
		313-455-2440
Mich	Plymouth, Scott Elctns., Inc.	612-929-0457
Minn	Minneapolis, R.W. Marshall Co.	609-428-6266
NJ	Cherry Hill, Quality Comps.	914-SC3-3334
NY	Scarsdale, Bassin Tech. Sls. Co.	216-291-2800
Ohio	Cleveland, Scott Elctns., Inc.	513-294-0539
Ohio	Dayton, Scott Elctns., Inc.	

Pa Pittsburgh, Scott Elctns., Inc. 412-781-3112
Tex Dallas, McCoy Assoc. 214-350-9931
Tex Houston, Ev. Smith Sls. Co. 713-649-5756

Advertisement

**IMMEDIATE DELIVERY
ELECTRO-MECH
COMPONENTS, INC.**
East Coast Stocking Distributor
LOGICOMP ELECTRONICS INC.
Box 37H; Scarsdale, N.Y. 10583
Phone - 914-SC3-3334
Off the shelf delivery of
**ELECTRO-MECH COMPONENTS
INC.** switches & indicators. Fast
custom engraving service for lenses.
Incandescent & neon lamps.

ELECTRO-MECHANICAL INSTR. DIV., See Sheller-Globe Corp. Electro-Mechanical Instr. Div.

ELECTRO-MECHANICS CO., Box 1546, Austin, Tex., 78767, Tel: 512-451-8273; Empl.: 14
Customer service: R. L. Waters

Products manufactured: Analyzers, Antennas, Calibrators, Ferrite Material & Parts, Filters, Horns, Microwave, Magnetometers, RFI Measuring Equipment

Local Sales Offices & Reps.

Cal	Yorba Linda, Del Black Assocs.	714-524-0141
Md	Silver Spring, Gawler-Knoop Co.	301-589-4406
NY	Guiderland, Electro-Modular Sys. Inc.	518-456-2685
Tex	El Paso, Comms. Data & Control Sys.	915-584-1795
EXP:	New York, N.Y., Ad. Auriema; Inc.	212-466-2500

ELECTRO-MECHANISMS, INC., 1163 W. Fourth St., Azusa, Cal., 91702, Tel: 213-334-4927, TWX: 910-584-4855; Empl.: 25

Products manufactured: Solenoids, Switches

Local Sales Offices & Reps.

Ariz	Scottsdale, R. Thomas Co.	602-994-0401
Cal	Redwood City, Warren & Hickey Sls.	415-368-3849
Cal	San Diego, Van Gott & Assoc.	714-272-8452
Cal	San Gabriel, Van Gott & Assoc.	213-285-2148
Colo	Denver, Cristee-Meade Co.	303-753-9471
Conn	Old Saybrook, M. L. Assoc.	203-388-9718
Ill	Mt. Prospect, Magnuson Assoc.	312-956-0700
Md	Bethesda, Warren Mount Co.	301-657-9312
Mass	Marlboro, M. L. Assoc.	617-485-6190
Mich	Detroit, Group Ten	313-549-3910
Minn	St. Paul, Magnuson Assoc.	612-227-8495
NH	East Derry, M. L. Assoc.	603-432-5838
NJ	Berkeley Heights, R. P. Luce & Co.	201-464-6440
		716-634-4400
NY	Buffalo, Good Components	516-437-4550
NY	New Hyde Pk., R. P. Luce & Co.	704-867-2101
NC	Gastonia, Warren Mount Co.	216-486-2800
Ohio	Cleveland, Group Ten	513-277-6531
Ohio	Dayton, Group Ten	215-884-8365
Pa	Philadelphia, R. P. Luce & Co.	214-233-8235
Tex	Addison, R. Thomas Co.	206-454-9187
Wash	Bellevue, Ray Over Sls.	416-751-5980
FOR:	Can., Scarborough, Ont., Lake Engrg.	
FOR:	Can., St. Laurent, Que., Lake Engrg.	

ELECTRO-METRICS, Div. Penril Corp., 100 Church St., Amsterdam, N.Y., 12010, Tel: 518-842-2600; FSC No: 8A831; Empl.: 52; Minimum order: \$25

For info on price: F.B. Powell; Application info: W.S. Lambdin; Customer service: R. Lyons; Delivery info: F. Powell

Products manufactured: Analyzers, Filters, Meters, Probes, Receivers

Local Sales Offices & Reps.

Ala	Huntsville, E.G. Holmes & Assoc.	
Cal	Yorba Linda, D. Black Assoc.	714-524-0141
Colo	Evergreen, Moutaintek, Inc.	303-674-5255
Fla	Orlando, E.G. Holmes & Assoc.	305-894-8901
Ga	Chamblee, E.G. Holmes & Assoc.	404-451-6161
Ill	Chicago, K.W. Meyers Co.	312-774-6440
Ind	Indianapolis, K.W. Meyers Co.	317-243-6681
Kans	Overland Park, Ensco-Rep Inc.	913-381-7557
Md	Silvers Spring, Gawler-Knoop Co.	301-589-4406
Minn	Minneapolis, K.W. Meyers Co.	612-920-7080
Mo	St. Louis, Ensco-Rep Inc.	314-567-3935

NJ E. Orange, Friedman Associates 201-673-2500
 NM Albuquerque, Mountaintek Inc. 505-268-0003
 NY Guindlerland, Electro-Modular Sys. 518-456-2665
 Ohio Dayton, G.L. Ashby Assocs. 513-252-5627
 Tex Richardson, Scientific Devices 214-231-8016
 Utah Salt Lake City, Mountaintek Inc. 801-278-6056
 Va Virginia Beach, E.G. Holmes & Assoc. 801-481-6556
 Wash Seattle, G.M. Gillett & Assocs. 206-284-3344
 EXP: Amsterdam, NY, Electro-Metrics 518-843-2600
 FOR: Can., Burnaby, B.C., Megatronix Ltd. 604-526-3312
 FOR: Can., Montreal, Que., Megatronix, Ltd. 514-488-0404
 FOR: Can., Ottawa, Ont., Megatronix, Ltd. 613-729-4004
 FOR: Can., Weston, Ont., Megatronix, Ltd. 416-742-8015

ELECTRO-MODULE, INC., 2655 Metropolitan Place,
 Pomona, Cal., 91767, Tel: 714-593-3565, Telex: 670339;
 FSC No: 34217; Empl.: 150; Minimum order: \$35
 Customer service: D. Glynn

Products manufactured: Current Sensors, Delays,
 Time (Excluding Delay Lines, Timers, Delay &
 Relays, Time-Delays), Detectors, Flashers,
 Inverters, Power Supplies, Regulators, Relays,
 Switches, Timers

Local Sales Offices & Reps.

Ind Indianapolis, Rockford Controls 513-898-5452
 Mass Lexington, M.R.I. 617-861-6270
 NY Commack, Lawrence K. Haner, Assoc. 516-864-2220
 Ohio Dayton, Rockford Controls-Ohio 513-898-5452
 Tex Dallas, EBR 214-942-2716

ELECTRO MOTIVE CORP., Div. of International
 Electronics Corp., 316 S. Service Road, Melville, New
 York, 11746, Tel: 516-694-7700, TWX: 510-224-6427;
 Empl.: 2100 p. 2-194,195

For info on price: Sls. Dept.; Application info: Engrg.
 Dept.; Customer service: Sls. Dept.; Delivery info: Sls.
 Dept.

Free literature available: Complete catalog all
 products. Covers dipped, molded high reliability
 mica; polyester film, mylar, ceramic, paper,
 polypropylene capacitors; variable compression
 trimmers, padders; metal clad devices;
 electrolytics, tantalums.

Products manufactured: Capacitors, Fixed,
 Capacitors, Variable, Diodes, Tubes

Local Sales Offices & Reps.

Ala Huntsville, 20th Century Mktg 205-772-9237
 Ariz Tempe, Argus Sls. 602-967-8709
 Cal Los Altos, Collins & Hyde 415-941-3355
 Cal Los Angeles, Collins & Hyde 213-666-4238
 Colo Denver, Walter Eng. 303-777-5585
 Conn Milford, Conti-Younger Assocs. 203-929-3294
 Fla Oviedo, Conley Assocs. 305-365-3283
 Ill Chicago, Electro Motive 312-237-4454
 Ill Streamwood, A. Holte & Assoc. 312-837-4066
 Ind Indianapolis, Electro Motive 317-545-4432
 Kans Prairie Village, Engrg. Svcs. 913-649-4000
 Ky Owensboro, Great Southern Elctns. 502-685-4781
 Mass Waltham, Conti-Younger Assocs. 617-890-4582
 Minn St. Louis Park, Beta Engrg. Corp. 612-925-4422
 Mo St. Louis, Engineering Svcs. Co. 314-997-1515
 NJ Harrington Park, Metro Tech. Sls. 201-768-8495
 NY Endicott, Advanced Comps. Corp. 607-785-3191
 NY Jericho, Metro Tech. Sls. 516-935-3330
 NY North Syracuse, Advanced Comps. Corp. 315-699-2671
 Ohio Cincinnati, R. Makin Assoc. 513-232-5588
 Pa Ardmore, W.K. Metz 215-649-3966
 Tex Dallas, United Comps. 214-324-1448
 Wash Seattle, R. Thorp Co. 206-763-1236
 FOR: Can., Ont., Anbak Sls. 416-625-1061
 FOR: Can., Que., Anbak Sls. 514-636-8514

ELECTRO-NUMERICS CORP., 67 East Evelyn Ave.,
 Mountain View, Cal., 94040, Tel: 415-965-8500; Empl.:
 70

Products manufactured: Cells, Load, Converters,
 Counters, Indicators, Meters, Printers, Totalizers,
 Digital, Transducers

Local Sales Offices & Reps.

Ariz Scottsdale, O.E.M. Specialties 602-948-3360
 Cal Belmont, Richards Assocs. 408-246-5860
 Cal So. Pasadena, Cameron G. Pierce Assocs. 213-682-1166
 Colo Denver, Omega Ltd. 303-758-1508
 Conn Hamden, Applied Meas., Inc. 203-288-5288

Ill Chicago, Lighner Assocs. Inc. 312-774-1500
 Mass Acton, Applied Meas., Inc. 617-263-2766
 Mich Farmington, Carter, McCormic & Peirce, Inc. 313-477-7700
 NJ Camden, QED Elctns., Inc. 215-925-8711
 NJ Fort Lee, Tecmimat 201-461-8686
 NY Liverpool, Rayelco Elctns., Inc. 315-652-5272
 Ohio Cleveland, Carter, McCormic & Peirce 216-333-5650

Ohio Dayton, Carter, McCormic & Peirce 513-278-5873
 Ore Portland, Brett & Assocs., Inc. 503-232-4184
 Pa Pittsburgh, Carter, McCormic & Peirce 412-824-3760
 Tex Dallas, R. T. Martin Assoc. 214-358-3704
 Tex Houston, R. T. Martin Assoc. 713-462-4077
 Wash Seattle, Brett & Assoc. 206-321-1240
 EXP: Palo Alto, Cal., Western Int'l. Trade Co. 415-321-1240

ELECTRO-OPTICAL INDS., INC., 839 Ward Dr., Santa
 Barbara, Cal., 93111, Tel: 805-964-6701; Empl.: 40

Customer service: A.J. Cussen

Free literature available: "Radiometric Properties of
 Isothermal, Diffuse Wall Cavity Sources"
 Description: Total radiant power emission from
 various diffuse wall cavity sources is calculated
 without approximation. Results applied to the
 practical problems of cavity design and analysis.

Products manufactured: Amplifiers, Analyzers,
 Calibrators, Choppers, Filters, Generators, Heat
 Exchangers & Systems, Integrators, Electronic,
 Light Choppers, Modulators, All Kinds, Monitors,
 Oscilloscopes, Power Supplies, Pyrometers,
 Radiometers, Slide Rules (Circuitry Computing),
 Standards

ELECTRO-PACIFIC, INC., 5782 Thornwood Dr., Goleta,
 Calif., 93017, Tel: 805-964-4878; Empl.: 41; Minimum
 order: \$25

For info on price: J.R. Lindbery; Application info: J.R.
 Lindbery; Customer service: J.R. Lindbery; Delivery
 info: P. Williams

Free literature available: Data sheets EPI Models
 1-249 & 1-250 Laser power supplies for 12UDC
 battery operation for portable laser equip. such as
 surveying equip., levels etc.

Products manufactured: Amplifiers, Coils Including
 Assemblies & Forms, Controls/Control Eqpt.,
 Converters, Generators, Inverters, Power
 Supplies, Reactors, Transformers

Local Sales Offices & Reps.

Cal Los Angeles, Halbar Assocs. 213-387-8283
 Cal San Mateo, Halbar Assocs. 415-349-4700

ELECTRO PACKAGING, INC., 176 Walker St., Lowell,
 Mass., 01854, Tel: 459-3731, Telex: 94-7490; Empl.: 350
 p. 2-672-675

Customer service: B. Rio

Free literature available: Data Sheets Cross
 Reference lists on Competitive products.

Products manufactured: Boards, Plug-In, Boards,
 Printed Circuit

Local Sales Offices & Reps.

Ala Huntsville, Technology Mktg. Assocs. 205-883-7893
 Ariz Scottsdale, S.C. Blaker Co. 602-948-3061
 Colo Englewood, Holland Co. 303-789-4149
 Conn Meriden, Com-SI 203-634-0179
 Fla Ormond Beach, Technology Mktg. Assocs. 904-672-2314
 Fla Pompano Beach, Technology Mktg. Assocs. 305-942-0774
 Ill Northbrook, R.T. Howlett & Assocs. 312-498-5444
 Mass Waltham, Com-SI 617-890-0011
 NJ North Caldwell, Masin-Esco 201-226-2550
 NY Schenectady, N. Alexander & Assocs. 518-377-0581
 NY Syosset, Masin-Esco 516-364-0310
 Pa Newton Square, Danton Assocs. 215-353-0500
 Tex Houston, Cunningham Co. 713-461-4197
 Tex Richardson, Cunningham Co. 214-231-2686
 FOR: Can. Dollard Des Ormeaux, Que., Empro Sls. Co. 514-683-3455

ELECTRO RENT, 1699 Elmhurst Rd., Elk Grove Village, Ill.,
 60007, Tel: 312-956-8380, TWX: 910-222-1847; Empl.:
 75; Minimum order: \$50

For info on price: T. Wallace; Application info: J.
 Frey; Customer service: J. Frey; Delivery info: T.
 Wallace

Free literature available: Catalog and equipment
 rental brochure.

Products manufactured: Services, Assembly,
 Production & Test

Local Sales Offices & Reps.

Cal Burbank 213-843-3131
 Cal Mountain View 415-964-5500
 Cal Santa Ana 714-979-5620
 Md Rockville 301-881-8180
 Mich Detroit 313-891-8410
 NJ Plainfield 201-561-6466
 Tex Dallas 214-691-6086

ELECTRO-RACK PRODUCTS CO., 1742 So. Clementine
 St., Anaheim, Cal., 92802, Tel: 714-776-5420; Empl.: 25

Products manufactured: Cabinets & Accessories,
 Cases, Equipment, Instrument, Meter, Chassis,
 Metal

ELECTRO-SCIENCE LABS., 1601 Sherman Ave.,
 Pennsauken, N. J., 08110, Tel: 609-663-7777, Telex:
 83-4788; Empl.: 70

For info on price: C. M. Schreiber; Application info: A.
 Rose; Customer service: A. Gelb

Free literature available: Short form catalog of thick
 film and optoelectronic materials data sheets on
 individual products thick film resistors for high
 yield processing.

Products manufactured: Adhesives (All Types),
 Boards, Printed Circuit, Capacitors, Fixed, Circuits,
 Hybrid, Thick Film, Coatings, Compounds,
 Encapsulating, Insulating, Molding, Potting, Films,
 Inks For Thick Film Microcircuits, Insulators &
 Insulation, Kits, Printed Circuit, Metals, Paints,
 Potentiometers, Resistors, Rubber, Seals,
 Services, Assembly, Production & Test, Solder (All
 Types), Substrates

Local Sales Offices & Reps.

Ariz Phoenix, Sheffer-Kahn Co. 602-258-7893
 Cal Burlingame, Hybrid Elctns. 415-347-8217
 Cal Hacienda Heights, Electro-Science Labs. 213-330-5592
 Cal Sunnyvale, Electro-Science Labs. 408-732-5161
 Colo Denver, W. J. Purdy Co. 303-777-1411
 Fla Sarasota, W. J. Irvine Co. 813-955-9656
 Kans Shawnee Mission, Mid-America Elctns. Mktg. 913-236-4800
 Mass Framingham, Microdon 617-879-3800
 Minn Minneapolis, C. E. Bohlig Co. 612-922-7011
 NJ Nutley, D/R Assocs. 201-667-5900
 NM Albuquerque, Sheffer-Kahn Co. 505-265-7077
 NY Rochester, D/R Elctns. 716-442-6980
 Ohio Dayton, Sidnell Co. 513-885-4161
 Tex Austin, Crockett Southwest Corp. 512-476-6801
 Tex Dallas, Crockett Southwest Corp. 214-251-1776
 FOR: Can., Rosemere, Que., D/R Elctns., Ltd.

ELECTRO SCI. INDS., 13902 N.W. Science Pk. Dr.,
 Portland, Ore., 97229, Tel: 503-646-4141, Telex:
 36-0273; FSC No: 11837; Empl.: 297; Minimum order:
 \$25

For info on price: S. Gressel; Application info: J.
 Currier; Customer service: S. Gressel; Delivery info:
 S. Gressel

Free literature available: ESI Condensed Catalog;
 ESI Model 1234 IC (Linear) Tester Brochure; ESI
 Model 1248 IC (Digital) Tester Brochure; ESI
 System 25 Resistance Trimming Laser System
 Brochure

Products manufactured: Bridges, Calibrators,
 Capacitors, Fixed, Clamps & Clips, Comparators,
 Decade Boxes, Detectors, Dividers, Indicators,
 Leads, Test & Adaptors, Meters, Microcircuit
 Production Equip., Networks, Potentiometers,
 Resistors, Standards, Testers, Transformers

Local Sales Offices & Reps.

Ala Huntsville, Gentry Assocs. Inc. 205-534-9771
 Cal Orange, Bill Lyon 714-633-4704
 Cal Palo Alto, T. White 415-327-1571
 Conn Seymour, B. Fobes 203-888-3258
 Fla Orlando, Gentry Assocs. Inc. 205-534-9771
 Ill Rosemont, Electro Sci. Ind. 312-696-4322
 Mass Waltham, D. Erickson 617-899-6633
 NJ Bergenfield, Electro Sci. Inds. 201-385-9493
 NY Camillus, Eric Hill 315-672-5498
 NC Burlington, Gentry Assocs. Inc. 919-227-3639
 Ohio Cleveland, Instr. Sys. 216-486-0782
 Ohio Dayton, Instr. Sys. 513-293-8095
 Pa Pittsburgh, Instrumentation Sys. Inc. 412-243-1111
 Tex Austin, Crockett Engrg. 512-476-6801
 Tex Dallas, Crockett Engrg. Co. 214-637-6120

ELECTRO STYLUS, 31 Cheyenne Blvd., Colorado Springs,
 Colo., 80906, Tel: 303-633-5969; Empl.: 10

Customer service: M. L. Murray

Products manufactured: Nameplates

ELECTRO SWITCH CORP., King Ave., Weymouth, Mass., 02188, Tel: 617-335-5200, TWX: 710-388-0377; Empl.: 200 p. 1-2028, 2029

Products manufactured: Switches

Local Sales Offices & Reps.

Ariz Scottsdale, OEM Specialties 602-948-3360
Cal Oakland, W. Nott & Co. 415-654-3747
Cal Pico Rivera, Westrep 213-949-2551
Cal San Diego, Westrep 714-279-9412
Colo Denver, Vinson Assocs. 303-757-5151
Fla Boca Raton, Floritronics Inc. 305-368-0325
Fla Winter Park, Floritronics, Inc. 305-886-4818
Ga Atlanta, Holman-Lobsinger Co. 404-256-9120
Ill Elk Grove Village, Electro Switch Corp. 312-593-2225
Md Woodbine, Naudain Assocs. 301-252-5378
Mich Ferndale, Hilltronics, Inc. 313-398-5556
Minn St. Paul, Kenco Co. 612-645-7717
Mo No. Kansas City, H.J. Weisler & Assoc., Inc. 816-421-1679
Mo St. Louis, H. J. Weisler & Assoc. 314-428-3934
NJ Mt. Laurel, Naudain Assocs. 609-235-1801
NY Melville, Electro Switch Corp. 516-249-3770
NY Rochester, T. Ferguson Sls., Inc. 716-482-7757
NC Winston-Salem, L.G. White Southern, Inc. 919-725-3612
Ohio Columbus, Rockford Controls 614-231-5890
Ohio Dayton, Rockford Controls Ohio 513-278-7362
Ohio Euclid, Rockford Controls Ohio 216-731-5250
Pa Pittsburgh, R. F. Clark 412-242-9500
Tex Bellaire, Brice Co. 713-666-1788
Tex Dallas, Brice Co. 214-233-9808
Wash Seattle, C.B. Parsons & Co. 206-762-7373
Wisc Wauwatosa, Larsen Assc. 414-258-0529
EXP: Canada, Don Mills, Ont., G.M. Fraser Ltd. 416-449-6600
EXP: Conn. Litchfield, Norcon Div. Intrade Inc. 203-567-5865

ELECTRO-TECHNIQUES, INC., 215 Via Del Norte, Oceanside, Cal., 92054, Tel: 714-757-7770, Telex: 697-932; Empl.: 38; Minimum order: \$50

For info on price: G. S. Tice; Application info: B. H. Tice

Free literature available: Short form catalog #5 = Lists all standard potentiometers built by electro-techniques; Short Form catalog #6 = Gives specs on all variations Series 850, 3/4" long multitrans, including switch-pot variations; Data sheet - Model 850 - 7/8" diameter, 3/4" long multi-turn.

Products manufactured: Potentiometers

Local Sales Offices & Reps.

Ariz Scottsdale, Piper-Goyne 602-946-4437
Cal Burlingame, Jack Logan & Assocs. 415-697-6100
Cal Los Angeles, M.W. Riedel & Co. 213-283-7694
Colo Littleton, Piper-Goyne 303-798-8955
Conn Madison, A & M Elec. Reps. 203-421-4242
Fla Palm Beach Gardens, Brosey Enterprises 305-622-6045
Ill Glenview, Crimmon Engrg. 312-724-1780
Kans Wichita, E. Carbiener Assoc. 316-682-5782
Mich Livonia, Rep-Tron 313-525-2700
NM Albuquerque, Piper-Goyne 505-265-6794
NY Conklin, Ramcom 607-775-0641
NY New York, Addem Group 516-567-5900
Ore Portland, J. W. Eckersley Co. 503-246-3183
Pa Philadelphia, W. F. Assocs. 215-224-4120
Tex Richardson, Spectra Sls. Co. 214-234-3600

ELECTRO-VOICE, INC., Sub. Gulton Inds., Inc., 600 Cecil St., Buchanan, Mich., 49107, Tel: 616-695-6831, TWX: 810-270-3135; Empl.: 1,000

Customer service: Sales Dept.

Free literature available: Complete catalog on microphones and loudspeakers for broadcast, recording, sound reinforcement, communications, and home entertainment.

Products manufactured: Attenuators, Filters, Handsets, Chestsets, Headphones, Headsets, Etc., Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds, Networks, Speaker Systems, Speakers, Tape Recording Accessories, Transducers, Transformers

Local Sales Offices & Reps.

Ala Birmingham, M. K. Smith, Inc. 205-967-3080
Alas Anchorage, H. J. Lang & Assocs. 907-279-5741
Ariz Phoenix, J. R. Morgan Agency 602-252-3089
Ark El Dorado, Dick Bellow Sls., Inc. 501-863-8325
Cal Hollywood, J. Carter Assocs. 213-980-3450
Cal San Francisco, Meyer, Ross & Fleming, Inc. 415-285-8880
Colo Denver, Lindberg Co. 303-758-9033

Fla Fort Lauderdale, Sproch Sls., Inc. 305-587-3792
Fla Sarasota, Sproch Sls., Inc. 813-924-7768
Ga Tucker, M. K. Smith, Inc. 404-938-7161
Haw Honolulu, Dougherty Entprs. Co. 808-847-4144
Ill Lincolnwood, Wm. M. Linz Assocs. 312-677-2000
Ind Mulberry, Maish Sls. 317-296-2322
Kans Olathe, B. C. Elctrn. Sls., Inc. 913-782-6696
La Kenner, Dick Bellow Sls., Inc. 504-729-4550
Md Baltimore, D. H. Brothers Co. 301-764-7189
Mass Wellesley Hills, M. Scott Co. 617-235-0102
Mich Detroit, Riley & Petchell Sls. Inc. 313-535-7000
Minn St. Paul, SKOR 612-645-6461
Miss Michigan City, J. Fisher Sls. 601-224-6470
Mo Raytown, Midwest Mktg. Co. 816-358-6638
Mo St. Louis, Midwest Mktg. Co. 314-894-1388
NJ Ridgefield, Bi-State Marketers, Inc. 201-943-5888

NY Buffalo, Waxman-Currant Sls., Inc. 716-873-0442

NC Charlotte, M. K. Smith, Inc. 704-372-1026

Ohio Columbia Station, C. L. Pugh & Assocs. 216-235-6028

Pa Columbus, C. L. Pugh & Assocs. 614-486-9678

Pa Newtown Square, G. M. Conneen Co. 215-353-2241

Pa Pittsburgh, C. L. Pugh & Assocs. 412-531-2731

Tenn Memphis, Dick Bellow Sls., Inc. 901-365-9437

Tex Dallas, Collins Co. 214-341-7866

Utah Salt Lake City, Lindberg Co. 801-364-6409

Wash Edmond, Gemini Elctrn., Inc. 206-775-1229

Exp: Chicago, Ill., Magnus Inter-America 312-334-1503

Exp: Roslyn, N.Y., Telesco Int'l. Corp. 516-484-4920

FOR: Can., Gananoque, Ont., E.V. of Canada, Ltd. 613-382-2141

FOR: Can., Mississauga, Ont., Thorvin Elctrn., Inc. 416-274-1573

FOR: Can., Montreal, H2W2J1, Audesco Elctrn., Ltd. 514-288-4122

FOR: Can., Vancouver, B.C., Electro-Tec Marketers 604-736-6377

ELECTROCOM INDS., 1105 N. Ironwood Dr., S. Bend, Ind., 46615, Tel: 219-232-2743; FSC No.: 27114; Minimum order: \$15

Customer service: B. Jaffe

Products manufactured: Amplifiers, Chokes, Coils Including Assemblies & Forms, Comm. Systems, Converters, Filters, Keys, Tone, Networks, Reactors, Receivers, Services, Assembly, Production & Test, Teletypewriters & Equipment, Terminal Equipment, Digital, Transformers

ELECTROCUBE INC., 1710 So. Del Mar Ave., San Gabriel, Cal., 91776, Tel: 213-573-3300, TWX: 910-589-1609; Empl.: 125

p. 1-553; p. 2-121-125, 1736, 1737

Products manufactured: Capacitors, Fixed, Chokes, Coils Including Assemblies & Forms, Filters, Networks, Reactors, Resistors, Transformers

Local Sales Offices & Reps.

Ariz Phoenix, Delta Elctrn. Sls. Corp. 602-966-9903

Cal Los Angeles, Ed Land Co. 213-879-0770

Cal Mountain View, West/Mark Assocs. 415-969-1700

Colo Denver, West/Mark Assocs. 303-433-7181

Fla Coca, Orbe Inc. 305-452-9568

Fla Ft. Lauderdale, Orbe, Inc. 305-564-857

Fla Winter Park, CBC, Inc. 904-383-6498

Ill Downers Grove, Richmar Elctrn. Sls. 312-968-0118

Md Stevenson, T. Griffin Co. 301-484-0251

Mass Reading, C. Godfrey Co. 617-944-2230

Mich Grosse Pointe Park, S. Greiner Assocs. 313-499-0188

Minn Minneapolis, Electro-Serv Co. 612-827-2907

Mo Hazelwood, Centech Sls. 314-731-4220

Mo Raytown, Centech Sls. 816-358-8100

NM Albuquerque, IMEC 505-883-9010

NY Floral Park, MOS Assocs. 516-694-5923

NY Rochester, Gislason Sls. 716-454-4741

Ohio Cleveland, K.W. Elctrn. Sls. 216-831-8292

Ohio Dayton, K.W. Elctrn. Sls. 513-890-2150

Pa Paoli, T. Griffin Co. 215-647-1550

Pa Waterford, K.W. Elctrn. Sls. 814-796-6714

Tex Dallas, W. Reese Assocs. 214-638-6575

Tex Houston, W. Reese Assocs. 713-621-3134

Wash Bellevue, J. Findley Co. 206-454-5200

Wash Seattle, H. Levinson Co. 206-323-5100

Wisc Oak Creek, Richmar Elctrn. Sls. 414-475-0141

EXP: N.Y., N.Y., C. Tennant, Sons & Co. 212-679-1300

Local Distributors

Cal Calson, Hi-Rel Dist. Sls., 20507 S. Belshaw 213-537-6500

Cal Sunnyvale, Acacia Sls., 384 San Aleso 408-735-0100
Ohio Englewood, Argent Inds., 477 E. Wenger Rd. 513-836-8633
Ohio Solon, REPCO, Inc., 6855 Cochran Rd. 216-248-8900
Pa Erie, Erie Corp. Contractors, 1938 Buffalo Rd. 814-452-3762
Pa Pittsburgh, Cameradio, 2801 Liberty Ave. 412-288-2600
Tex Richardson, Altair Co., 405 N. Pland Rd. 214-231-5166

ELECTRODYNE CORP., 7315 Greenbush Ave., No. Hollywood, Cal., 91605

ELECTRON, INC., 12655 Coit Rd., Bratenahl, Ohio, 44108, Tel: 216-681-4700, Telex: 980240; Empl.: 85

For info on price: J. M. Wexler; Application info: F. P. Zaffarano; Customer service: R. C. Dederson

Products manufactured: Controls/Control Eqpt., Data Acquisition & Reduction Systems, Data Compressors, Digital, Drums Computer Memory, Readers, Recorders, Test Systems, Testers

ELECTRON-MACHINE CORP., Box M, Umatilla, Fla., 32784, Tel: 904-669-3101, Telex: 56-4300; Empl.: 55

Customer service: J. Gatch

Free literature available: Milmaster, Controller, Capacitance Monitor, X-Ray Gage, Refractometer

Products manufactured: Controls/Control Eqpt.

Local Sales Offices & Reps.

Ala Anniston, Shelton Ind. Equip. 205-237-1749

Colo Denver, Equipment Specialties Co. 303-433-3371

Ill Chicago, Memeco, Inc. 312-774-0919

Mass Acton, Six States Engrg. 617-263-8989

Mich Birmingham, Brooks Equip. Co. 313-645-0950

Minn Wayzata, Wm. A. Sternad, Consulting Engr. 612-473-4700

Mo St. Louis, E.B. Miller Co. 314-966-8250

NJ Haddonfield, Brennan-Davis Instr. Sls. Co. 609-429-7687

NJ Kenilworth, Wolock & Lott 201-241-4333

NY North Syracuse, V. Luven Company 315-458-8195

NC Charlotte, MacGuire & Crawford Instr. Co. 704-366-3454

Ohio Cincinnati, Surkamp & Rowe 513-891-1838

Ohio Cleveland, Thorat & Hamner 216-333-5950

Okla Tulsa, Telstar Instr. Corp. 918-628-1011

Ore Portland, R.E. Donelson Co. 503-654-3137

Pa Pittsburgh, Bollinger & Richards 412-561-2340

Tex Bellaire, Cactus Engrg. Co. 713-665-2723

Vt Springfield, Six States Engrg. 802-885-5253

Va Richmond, Mickle-Milnor Engrg. Co. 804-266-8741

FOR: Can., Montreal, Que., Industrial Projects, Ltd. 514-489-5769

FOR: Can., Toronto, Ont., Industrial Projects, Ltd. 416-368-1923

ELECTRONAUTICS, Dept. Dielectric Comm., Newtown Rd., Littleton, Mass., 01460, Tel: 617-486-3578, TWX: 710-347-0650; Empl.: 155; Minimum order: \$10

For info on price: N. J. Diehm; Application info: N. J. Diehm; Customer service: B. Lurvey; Delivery info: B. Lurvey

Products manufactured: Attenuators, Dummy Loads, Loads, Electronic Variable

Advertisement

Designing, Engineering & Manufacturing Loads from Waveguide Sizes WR28 thru WR650 *Low Power Terminations, Tongue Loads, Step Loads Cone Loads

*Hi Pow Dummy Loads from 40 watts to 8000 watts avg. power

*Special Configurations, Stripline Load Elements Attenuators Bushings, Damping Rings

*Bar Stock Material: Round, Square & Waveguide Size

Write for new catalog and price lists

ELECTRONIC APPLICATIONS CO., 2213 Edwards Ave., So. El Monte, Cal., 91733, Tel: 213-442-3212; Empl.: 75 p. 1-1648-1659

For info on price: G. T. Stockton; Application info: A. Churik; Customer service: A. Churik; Delivery info: A. Churik

Free literature available: Catalogs

Products manufactured: Relays

Local Sales Offices & Reps.

Ala	Huntsville, Repcom	205-534-9959
Ariz	Phoenix, McKnight	602-257-8037
Cal	Los Angeles, El-Com Inc.	213-223-1351
Cal	Menlo Park, McKnight	415-325-2844
Colo	Sedalia, Jensen Reps.	303-688-4154
Conn	Trumbull, TX Sales	203-261-2088
Fla	Ft. Lauderdale, Repcom Inc.	305-564-1929
Fla	Jacksonville, Repcom Inc.	904-773-8381
Fla	Melbourne, Repcom Inc.	305-254-1877
Fla	Miami Springs, Repcom	305-887-8723
Fla	Orlando, Repcom	305-894-7217
Fla	Seminole, Repcom, Inc.	313-393-0584
Ga	Marietta, Repcom, Inc.	404-971-2831
Ga	Warner Robins, Repcom	912-923-1393
Ill	Chicago, Midwest Elctrn. Sls.	312-777-9700
Ind	Indianapolis, Midwest Elec.	317-926-3736
Ind	Cedar Rapids, Midwest Elec.	319-362-4410
lowa	Baltimore, M/E Assoc.	301-825-1130
Md	Towoon, Holden Engineering Sls. Co.	301-823-3763
Mass	Randolph, Tx Sls.	617-986-6080
Minn	Bloomington, Lady Assoc.	612-884-2125
NJ	Little Falls, Carbone Assoc.	201-256-9191
NM	Albuquerque, McKnight	505-266-6423
Pa	Elkins Pk., Arnold Assoc., Inc.	814-455-8110
Pa	Erie, Ecco Elctrn. Sls.	215-887-7870
Pa	Jenkintown, Arnold Assoc.	215-887-7870
Tex	Dallas, E-Tron Sls.	214-348-4749
Tex	Dallas, Kentron Engrg.	214-352-7535
Wash	Seattle, Underwood	206-243-2133
Wisc	Waukesha, Midwest Elec.	414-542-5129
For:	Can., Toronto, Ont.	416-294-6797

ELECTRONIC ARRAYS, 550 Middlefield Rd., Mountain View, Cal., 94043, Tel: 415-964-4321, TWX: 910-379-6985; Empl: 798

For info on price: B. Cushman; Application info: L. Hester; Customer service: H. Day

Free literature available: Short form catalog.

Products manufactured: Integrated Circuit Devices

Local Sales Offices & Reps.

Ala	Huntsville, Col-Ins Co.	205-539-1771
Ariz	Phoenix, Dorton Entprs.	602-263-0414
Cal	Huntington Beach, EA Western Region	714-968-3775
Cal	Los Angeles, Black, Ekizian & Strong	213-870-9191
Cal	Mt. View, Caltron/Pyle	408-964-3244
Cal	San Diego, Bectronics	714-278-2150
Colo	Denver, Thorson Co.	303-759-0809
Conn	Meriden, COM-SALE	203-634-0179
Conn	Wallingford, COM-SALE	203-269-7964
Fla	Largo, Col-Ins Co.	813-343-0978
Fla	Orlando, Col-Ins Co.	305-423-7615
Ga	Clarkston, Col-Ins Co.	404-934-7280
Ind	Indianapolis, Ihrig Assoc.	317-783-7630
Mass	Waltham, Com-Sale	617-890-0011
Mich	Grand Rapids, Elko Sls. Corp.	616-949-1451
Mich	Grosse Pointe Woods, Elko Sls. Corp.	313-884-1955
Minn	Minneapolis, Electronic Innovators	612-884-7471
NJ	Cherry Hill, EA Eastern Region	609-795-5066
NM	Albuquerque, Thorson Co.	505-265-5655
NY	Elmont, Crane & Egert Corp.	516-488-2100
NC	Raleigh, Col-Ins Co.	919-834-6591
Ohio	Brecksville, A. Nace Co.	216-526-4323
Ohio	Englewood, A. Nace Co.	513-836-7548
Ore	Beaverton, N.R. Schultz Co.	503-643-1844
Pa	Pittsburgh, A. Nace Co.	412-922-7225
Pa	Willow Grove, Harry Nash Assocs.	215-657-2213
Tex	Dallas, Thorson Co.	214-233-5744
Tex	Houston, Thorson Co.	713-771-3504
Va	Reston, Boyle Assocs.	703-620-9558
Wash	Bellevue, N.R. Schultz Co.	206-454-0300

ELECTRONIC COIL CORP., 347 New Britain Ave., Plainville, Conn., 06062, Tel: 203-747-1213; Empl: 75; Minimum order: \$50

For info on price: R. Gorski 203-747-1213; Application info: R. Gorski 203-747-1213; Customer service: D. Bray 203-747-1222; Delivery info: D. Bray 203-747-1222

Free literature available: Wire Stripping Ultra-fine Teflon & PV wires to AWG #36 Stranded 7/44 with final O.D. of .010", Electric Coils for relays, timing motors, solenoids, clocks, voice systems, memory drum systems, telephone systems etc.

Products manufactured: Coils Including Assemblies & Forms, Lead Assemblies & Receptacles, Services, Assembly, Production & Test

ELCTRN. COMM., INC., Sub. NCR, 1501 72nd St., N., St. Petersburg, Fla., 33733, Tel: 813-381-2000, TWX: 810-850-4127; Empl: 1500

Products manufactured: Amplifiers, Antennas, Circuits, Hybrid, Thin-Film, Comm. Systems, Data Acquisition & Reduction Systems, Keyboards, Alphanumeric & Decimal, Modulators, All Kinds, Multiplexers, Receivers, Transmitters

Local Sales Offices & Reps.

Cal	Van Nuys	213-896-9963
Mass	Lexington	617-861-1063
Va	Arlington	703-525-7070

ELCTRN. CONCEPTS, INC., Box 627, Eatontown, N.J., 07724, Tel: 201-542-7880, TWX: 710-722-6691; Empl: 80

Customer service: A. J. Muscillo

Products manufactured: Capacitors, Fixed, Films

Local Sales Offices & Reps.

Cal	Los Angeles, Corcoran Assocs.	213-823-2425
Cal	Menlo Park, G.R. McKnight Co.	415-325-2844
Fla	Maitland, Hutto-Hawkins-Perego	305-831-2474
Ill	Park Ridge, Metcom Assocs.	312-696-1490
Mass	Waltham, Impact Sls. Co.	617-893-2850
Minn	Minneapolis, Revere Assocs.	612-781-2615
NJ	Irvington, Murray Gallagher	201-399-4350
NJ	Neptune, Com-Tek Elctrn.	201-477-6992
NY	Conklin, Comerota Assocs.	607-775-0641
NY	New Rochelle, Display Comps. Sls.	914-636-2969
Ohio	Mentor, Bishop Co.	216-255-6969
Tex	Seabrook, Stolle-Hamilton Co.	713-334-1909
Va	Reston, Boyle Assocs.	703-620-9558
Wash	Seattle, Underwood & Underwood	206-243-2133

ELECTRONIC CONTROL SYSTEMS, INC., Box 1232, Fairmont, W. Va., 26554, Tel: 304-363-8690; Empl: 112; Minimum order: \$50

Customer service: J. P. O'Leary

Products manufactured: Alarms, Cabinets & Accessories, Controllers, Programmable, Controls/Control Eqpt., Indicators, Meters, Monitors, Panels, Potentiometers, Switches, Thyristors (Includes Silicon Controlled Rectifiers)

Local Sales Offices & Reps.

Cal	La Mirada, F.C. Collins Co.	213-941-8515
Cal	Sunnyvale, Wilson, Leonik & Co.	408-732-9050
Del	Claymont, Elctrn. Control Sys.	302-405-8050
Mass	Norborough, Elctrn. Control Sys.	617-366-4940
NJ	Hackensack, C.H. Ribble Co.	201-342-2602
NJ	Moorestown, J. Speck Assocs.	609-234-4957
Ohio	Cleveland, Elctrn. Control Sys.	216-235-2992
Pa	Warminster, Elctrn. Control Sys.	215-674-4777
Pa	White Oak, Elctrn. Control Sys.	412-672-8500
SC	Taylors, Elctrn. Control Sys.	803-244-6147
Wisc	Brookfield, S.F. Boyd Co.	414-781-7170

ELECTRONIC COUNTERS & CONTROLS INC., 1500 McCormick Blvd., Mundelein, Ill., 60060, Tel: 312-362-8910; Empl: 90

For info on price: F. A. Balmes; Application info: J. L. Mosak; Customer service: P. Sulek; Delivery info: P. Sulek

Free literature available: Digital, preset counters, uni or bi-directional standard or custom sequential controls digital tachometers, ratio indicators, draw-speed indicators proximity & photoelectric switches shaft encoders.

Products manufactured: Cards, Logic, Comparators, Controllers, Programmable, Controls/Control Eqpt., Counters, Encoders, Indicators, Meters, Modules, Logic, Encapsulated, Monitors, Printers, Process Control Systems, Programmers, Sensors, Light, Switches, Tachometers, Timers

Local Sales Offices & Reps.

Ala	Birmingham, Com-Trol	205-823-0897
Alas	Anchorage, J.A. Tudor & Assocs.	907-274-6350
Cal	Marina Del Rey, Components West Sls.	213-821-6522
Colo	Boulder, R. Hendrickson	303-499-5603
Conn	Rocky Hill, Aid Engrg. Sls. Co.	203-673-3692
Ga	Atlanta, Hal Homer Assocs.	404-255-8669
Ill	Deerfield, Traco Eng. Co.	312-945-3520
Iowa	Sioux City, Lakeland Eng. Equip.	712-252-3611
Mass	Westboro, Aid Engrg. Sls. Co.	617-890-8181
Mich	Kalamazoo, E.B. Dewey Co.	616-344-6163
Mich	Troy, Control Sls. Assoc.	313-391-3235
Minn	St. Paul, Power/Mation Div.	612-645-0781
Mo	St. Louis, Times Ind'l Sls.	314-638-2936

NJ	Kenilworth, Wolock & Lott	201-241-4333
NY	Henrietta, Rush Instrs.	716-334-0452
NC	Charlotte, Amtek	704-566-6898
Ohio	Cincinnati, Drivex Corp.	513-742-2000
Ohio	Dayton, Albrecht Assocs.	513-236-9333
Ohio	Euclid, Control Dynamics Corp.	216-692-2818
Ohio	Toledo, P. Girkins	419-241-2101
Ore	Eugene, J.A. Tudor & Assoc.	503-686-1252
Ore	Portland, J.A. Tudor & Assocs.	503-288-5154
Pa	King of Prussia, Reinbrecht Assocs.	215-265-6180

Pa	Pittsburgh, Weiss Instrs.	412-371-3020
Tex	Bellaire, Brice Co.	713-666-1788
Tex	Dallas, Brice Co.	214-233-9808
Va	Richmond, S.D. Harmon & Co.	804-285-3168
Wash	Seattle, J.A. Tudor & Assocs.	206-682-7444
Wash	Spokane, J.A. Tudor & Assoc.	509-327-3328

ELECTRONIC COUNTERS, INC., 240 Humphrey St., Englewood, N.J., 07631, Tel: 201-567-5300; Empl: 30

Customer service: L. Sonders

Free literature available: Technical Data Sheets for our line of Pulse Generators.

Products manufactured: Generators

Local Sales Offices & Reps.

Colo	Loveland, Kelley Entprs.	303-667-1376
DC	Washington, Eastern Instru.	301-839-3800
NY	Fayetteville, M. P. Andrews, Inc.	315-637-3144
NY	Great Neck, E. I. Inc.	516-466-9505
Pa	Philadelphia, Eastern Instru.	215-927-7777
Tex	Dallas, Airep Elctrn.	214-363-5291
Va	Richmond, Eastern Instru.	703-644-6622

ELECTRONIC DEV. CORP., 11 Hamlin St., Boston, Mass., 02127, Tel: 617-268-9696; FSC No: 12619; Minimum order: \$15

Customer service: R. Ross

Free literature available: Complete catalog containing full engineering specifications, applications, block diagrams and prices.

Products manufactured: Calibrators, Converters, Current Sources, Indicators, Meters, Power Supplies, References, D-C Voltage, Standards, Testers, Voltage Sources

Local Sales Offices & Reps.

Ala	Huntsville, Lee Assocs.	205-881-8008
Ariz	Phoenix, R.A. Mayes Co.	602-279-5243
Cal	Burbank, Basic Systems	213-938-2833
Cal	Los Altos, Wright Engrg.	415-941-4405
Colo	Boulder, R.A. Mayes Co.	303-444-0782
Conn	E. Hartford, Tekdata, Inc.	203-525-7647
Fla	Ft. Lauderdale, Lee Assocs.	305-525-9767
Fla	Winterhaven, Lee Assocs.	813-294-5815
Ill	Des Plaines, Marsland Assocs.	312-298-2620
Ind	Indpls., Marsland Assocs.	317-924-3568
Ind	Bethesda, Powell-Pendergraph Inc.	301-656-4535
Mass	Boston, Electronic Dev. Corp.	617-268-9696
Mich	Ferndale, Tiby Co.	313-547-3550
Minn	Mpls., Marsland Assocs.	612-545-4481
Mo	Florissant, Marsland Assocs.	314-278-6949
NM	Albuquerque, R.A. Mayes Co.	505-292-2330
NY	E. Syracuse, Ossmann Instrs., Inc.	315-437-6666

NY	Great Neck, Powell-Pendergraph, Inc.	914-761-7792
NY	Rochester, Ossmann Instrs.	716-328-2230
NY	Vestal, Ossmann Instrs.	607-785-9947
NC	Raleigh, Lee Assocs.	919-787-5818
Ohio	Cleveland, Tiby	216-371-5335
Ohio	Dayton, Tiby Co.	513-277-3822
Pa	Abington, Powell-Pendergraph, Inc.	215-657-0330

Tex	Dallas, R.A. Mayes Co.	214-235-3043
Tex	El Paso, R.A. Mayes Co.	Enterprise 750
Tex	Houston, R.A. Mayes Co.	713-466-8325
Utah	Salt Lake City, R.A. Mayes Co.	801-292-6781
Va	Richmond, Powell-Pendergraph, Inc.	703-264-2341

Wash	Bellevue, Topp Engrg.	206-747-5400
FOR:	Can., Mississauga, Ont., Webster Instr.	416-275-2270
FOR:	Can., Point Claire, Que., Webster Instr.	514-695-9787

ELCTRN. DEVICES, 21 Gray Oaks Ave., Yonkers, N.Y., 10710, Tel: 914-965-4400, TWX: 710-560-0021; Empl: 200; Minimum order: \$50

For info on price: D. Dean; Application info: J. D. Weiner; Customer service: M. Goldstein; Delivery info: D. Dean

Products manufactured: Bridges, Diodes, Multipliers, Rectifiers

Local Sales Offices & Reps.

Ariz	Scottsdale, Mercury Engrg. Sls.	602-945-1927
------	---------------------------------	--------------

Cal	Conojo Park, Blazer Wolf	213-888-7432
Cal	Sunnyvale, RDX	408-734-4500
Colo	Denver, Walder Engrg.	303-777-5585
Fla	Light House Point, Saber Assoc.	305-943-3076
Fla	Orlando, Saber Assoc.	305-422-3686
Fla	St. Petersburg, Saber Assoc.	813-441-1301
Ga	Woodstock, Saber Assoc.	404-926-7680
Ill	Chicago, Berndt Assocs.	312-283-0713
Ill	Chicago, Rozner Sls.	312-283-0022
Kans	Overland Pk., Penzner-Mankus	913-DU 1-0004
Ky	Liberty, Depco	513-621-0162
Mass	Waltham, Betronic Assocs.	617-894-8400
Mich	Southfield, Rep Inc.	313-354-9066
Minn	St. Paul, Cahill Assocs.	612-739-8445
Mo	Hazelwood, Penzner-Mankus	314-731-4334
NY	Rochester, Electra Sls.	716-436-4030
NY	Syracuse, Electra Sls.	315-455-5783
NC	Raleigh-Durham, Saber Assoc.	919-787-9675
Ohio	Cleveland, Depco	216-289-8188
Ohio	Wadsworth, Depco	216-336-2600
Tex	Dallas, Dunbar Assocs.	214-239-7151
Wash	Seattle, F. Jackson & Co.	206-782-2211
EXP:	N.Y., Yonkers, Elctrn. Devices, N.Y.	914-965-4400
FOR:	Can., Montreal, Allied Elctns.	514-488-5547

ELECTRONIC ENCLOSURES, Div. Wyle Labs, 225 South Aviation Blvd., El Segundo, Cal., 90245, Tel: 213-679-0181; Empl.: 150; Minimum order: \$25
 For info on price: A. Blinder; Application info: H. Sorey; Customer service: J. Gordon; Delivery info: D. Marlow

Products manufactured: Blowers & Fans & Accessories, Cabinets & Accessories, Carts & Dollies, Instrument & Equipment, Cases, Equipment, Instrument, Meter, Racks, Services, Assembly, Production & Test

Local Sales Offices & Reps.		
Cal	El Segundo, Elctrn. Enclosures	213-679-0181
Cal	San Jose, B. Belt	408-226-2611
Conn	Milford, Todino Engrg.	203-874-6643
Md	Rockville, Marktron	301-762-6210
Md	Timonium, Marktron, Inc.	301-252-7111
Mass	Needham, Todino Engrg.	617-444-7925
NJ	Pennsauken, Elctrn. Enclosures, Inc.	609-665-6810
NJ	Rockaway, D. Despina Elctrn. Enclosures	201-627-4276

ELECTRONIC ENGRG. CO. OF CAL., See EECO Elctrn. Engrg. Co. of Cal.

ELCTR. ENTERPRISES, 65 7th Ave., Newark, N.J., 07104, Tel: 201-485-8500; FSC No: 97130; Empl.: 100; Minimum order: \$25

For info on price: R. Rubin; Application info: H. C. Grunwald; Customer service: J. Torlucci; Delivery info: J. Torlucci

Products manufactured: Diodes, Heaters & Heating Elements, Modulators, All Kinds, Tubes

Local Sales Offices & Reps.		
EXP:	N.Y., Westbury, Minthorne Int'l.	516-334-3303
FOR:	Can., Montreal, Que., Future Elctns. Corp.	514-481-7701

ELECTRONIC HARDWARE CORP., Div. Hi-Tech Industries, Inc., 180-08 Liberty Ave., Jamaica, N.Y., 11433, Tel: 212-291-2710; Empl.: 100 p. 2-1081,1082
 For info on price: H. Goodman; Application info: H. Goodman; Customer service: J. Quick; Delivery info: J. Quick

Free literature available: Catalog #MS70 - MS91528
 Knobs, #68 - Knobs, #CS-1 - Knobs, #71 - Knobs.

Products manufactured: Dials, Handles For Cabinets, Circuit Boards, Racks, etc., Knobs

Local Sales Offices & Reps.		
Cal	Los Altos, Schwerin Assoc.	415-941-3737
Cal	Orange, Current Prods. Sls.	714-633-7414
Colo	Denver, Electronic Sls.	303-771-6300
Fla	Miami Beach, Geartner Assoc.	305-861-3661
Fla	Orlando, Geartner Assoc.	305-299-1000
Ill	Chicago, Allen Woods & Assoc.	312-283-7400
Kans	Overland Park, Penzner-Mankus Assoc.	913-381-0004
Md	Pikesville, A. Wetterhahn Co.	301-484-6376
Mass	Waltham, Impact Sls. Co.	617-893-2850
Minn	Minneapolis, Betronics Sls. Co.	612-866-3035
NJ	Oaklyn, A. Wetterhahn Co.	609-858-3003
NJ	River Edge, Meg Sls.	201-265-9887
NY	Buffalo, Telesco Assoc.	716-834-1026
Ohio	Cincinnati, F.E. Kahsar Sls.	513-471-9011
Ohio	Hudson, F.E. Kahsar Sls.	216-653-6808
Pa	Philadelphia, A. Wetterhahn Co.	215-627-1535
Tex	Garland, G.V. Peck Co.	214-341-8311

Tex	Houston, G.V. Peck Co.	713-664-1435
Wash	Mercer Island, J.H. Andersen Assoc.	206-232-0484

ELCTR. INSTR. & SPECIALTY, 42 Pleasant St., Stoneham, Mass., 02180, Tel: 617-438-5300; Empl.: 65; Minimum order: \$25 p. 1-1660-1667

For info on price: W. K. Crawford; Application info: R. A. Painter; Customer service: W. K. Crawford; Delivery info: E. K. Rodham

Free literature available: Eight page catalog of wide spectrum of Reed Relays and data sheets on AC Solid State Relays.

Products manufactured: Converters, Relays

Local Sales Offices & Reps.

Cal	San Jose, Grosken Inc.	408-293-3108
Md	Woodbine, Naudain Assocs.	301-442-2270
Mass	Stoneham, Electronic Instr. & Specialty Corp.	617-438-5300
Mich	Birmingham, Forand Sls. Co.	313-644-0087
NJ	Mount Laurel, Naudain Assocs.	215-564-3194
NJ	Nutley, I. Brill	201-667-0653
Ohio	Cleveland, Buckeye Comps.	216-292-2889
Ohio	Dayton, Buckeye Comps.	513-278-4279
Tex	Houston, Texas Special Elctrn. Comps.	713-666-5871

Local Distributors

NJ	Clifton, Parts Masters, 411 Main Ave.	201-777-7706
----	---------------------------------------	--------------

ELECTRONIC MEASUREMENTS, 405 Essex Rd., Neptune, N.J., 07753, Tel: 201-922-9300, Telex: 132-424; Empl.: 70 p. 1-1187-1192

Products manufactured: Power Supplies

ELECTRONIC MEMORIES & MAGNETICS CORP., 12621 Chadron Ave., Hawthorne, Cal., 90250, Tel: 213-644-9881, TWX: 910-325-6213; Empl.: 7300

Products manufactured: Cores, Magnetic, Disc Packs, Magnetic, Integrated Circuit Devices, Memory Systems

Local Sales Offices & Reps.

Cal	Burlingame, EMM Corp.	415-692-4250
Cal	Los Angeles, EMM Corp.	213-477-3911
Colo	Littleton, Croyley Inc.	303-794-4231
Conn	Rocky Hill, EMM Corp.	203-529-7775
Fla	Ft. Lauderdale, Modemsplus, Inc.	305-587-3849
Ga	Atlanta, Modemsplus, Inc.	404-633-1212
Ill	Des Plaines, EMM Corp.	312-297-3110
Mass	Lexington, EMM Corp.	617-861-9650
Mich	Southfield, EMM Corp.	313-352-1040
Minn	Minneapolis, Datasery	612-546-4422
Mo	Clatton, EMM Corp.	314-863-0015
Neb	Omaha, Dataserv	402-551-4882
NJ	Saddle Brook, EMM Corp.	201-845-0450
NC	Charlotte, Modemsplus, Inc.	704-364-5158
Ohio	Cleveland, EMM Corp.	216-884-1980
Pa	Abington, EMM Corp.	215-887-4940
Pa	Pittsburgh, EMM Corp.	412-921-1221
Tenn	Nashville, Modemsplus, Inc.	615-868-1004
Tex	Dallas, EMM Corp.	214-243-2374
Tex	Houston, EMM Corp.	713-626-3592
Tex	McDade, EMM Corp.	918-366-8491
Utah	Salt Lake City, Croyley, Inc.	801-355-8321
Va	Annandale, EMM Corp.	703-941-2100
Wash	Seattle, EMM Corp.	206-623-1477

ELECTRONIC MODULES, INC., 2500 E. Foothill Blvd., Pasadena, Cal., 91107, Tel: 213-795-4231; Empl.: 15

Products manufactured: Amplifiers, Power Supplies, Regulators, Relays, Signal Conditioners & Equipment

ELCTR. MOLDING CORP., 88 Mill St., Woonsocket, R.I., 02895, Tel: 401-769-3800, TWX: 710-387-1350; FSC No: 17117; Empl.: 100; Minimum order: \$25 p. 2-676-679

For info on price: I. Dulude 401-769-3800; Application info: E. Boonstra 401-769-3800; Customer service: J. Bourassa 401-769-3800; Delivery info: I. Dulude 401-769-3800

Products manufactured: Backpanel Interconnect Systems, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Bushings, Glass, Plastic, Metal, Rubber, Etc., Chassis, Circuit Board Mounting, Clamps & Clips, Coils Including Assemblies & Forms, Connectors, Contacts, Electrical, Cords, Enclosures, Module, Plug-In, Fasteners, Feedthrus & Seals, Environmental, Handles For Cabinets, Circuit Boards, Racks, etc., Holders, Crystal, Integrated Circuit Packaging Systems, Jacks (All Types), Jumpers, Lamp Adapters, Packages, Integrated Circuit, Pads, Transistor Mounting, Panels, Pins, Plug Adapters, Posts, Probes, Racks, Services, Assembly, Production & Test, Socket Adapters, Sockets, Spacers, Terminal Blocks, Boards & Strips, Terminals, Tools

Local Sales Offices & Reps.

Cal	San Diego, Qualtronic	714-560-8955
Cal	San Jose, K. Yerrama	408-251-6900
NY	Plainview, B. Yellin	516-433-7669



ELECTRONIC NAVIGATION INDS., INC., 3000 Vinton Rd. S., Rochester, N.Y., 14623, Tel: 716-473-6900, Telex: 97-8283; Empl.: 50 p. 1-674-676

For info on price: L. M. Salmen; Application info: L. M. Salmen; Customer service: L. M. Salmen; Delivery info: C. Cipro

Free literature available: We have an ENI catalog describing our complete line of Solid State, Broadband, Power Amplifiers & Power Multicouplers. Also includes technical data and design information on our RF Power Amplifiers and their application.

Products manufactured: Amplifiers, Attenuators, Generators, Meters, Oscillators, Transformers

Local Sales Offices & Reps.

Ala	Huntsville, Scientific Devices	205-536-1969
Ariz	Scottsdale, Williams Assocs.	602-947-4297
Cal	Los Angeles, McDougall/McLaughlin Co.	213-477-8556
Cal	Portola Valley, Kipp Assocs.	415-851-0123
Colo	Denver, Williams Assocs.	303-373-4730
Fla	Ft. Lauderdale, Scientific Devices	305-721-4260
Fla	Orlando, Scientific Devices	305-841-8180
Ill	Chicago, Carter Elctns.	312-585-5485
Ind	Indianapolis, Carter Elctns.	317-293-0696
Kans	Overland Park, Carter Elctns.	913-649-6996
Md	Silver Springs, Gowler Knoop Co.	301-589-4406
Mass	South Chelmsford, Independent Mktg. Reps.	617-256-8251
Mich	Ferndale, Tiby Co.	313-547-3550
Minn	Minneapolis, Carter Elctns.	612-544-9393
Mo	Hazelwood, Carter Elctns.	314-731-2237
NM	Albuquerque, Williams Assocs.	505-255-1638
NY	Greenvale, B.D. Aaron & Co.	516-621-0630
NY	Rochester, Elctrn. Navigation Ind's.	716-473-6900

NC	Burlington, Scientific Devices	919-228-6279
Ohio	Cleveland, Tiby Co.	216-371-5335
Ohio	Dayton, Tiby Co.	513-277-3822
Okla	Norman, Data Mktg. Assocs.	405-364-8320
Pa	Newtown Square, SWR Assocs.	215-356-8550
Tex	Austin, Data Mktg. Assocs.	512-451-5174
Tex	Dallas, Data Mktg. Assocs.	214-661-0300
Tex	Houston, Data Mktg. Assocs.	713-686-9627
Tex	San Antonio, Data Mktg. Assoc.	512-828-0937
Wash	Seattle, Underwood, Jensen & Assoc.	206-575-0123
Wisc	Milwaukee, Carter Elctns.	414-464-5555

ELCTR. PRECISION COMPS. CORP., 11 W. Sandford Blvd., Mt. Vernon, N.Y., 10550, Tel: 914-664-2333; Empl.: 8; Minimum order: \$25

For info on price: Patricia; Application info: D. Edwards; Customer service: Patricia; Delivery info: L. Brown

Free literature available: Literature on precision power resistors.

Products manufactured: Networks, Resistors, Shunts, Meter

Local Sales Offices & Reps.

NJ	Nutley, I. Brill	201-667-0653
----	------------------	--------------

ELECTRONIC RESEARCH CO., Div. Tetraxon Inc., Box 913, Shawnee Mission, Kans., 66201, Tel: 913-631-6700, TWX: 910-749-6477; Empl.: 520; Minimum order: \$35 p. 1-317,677-684

For info on price: B. Cook Ext. 46; Application info: B. Cook Ext. 46; Customer service: C. Hammond Ext. 62; Delivery info: B. Cook Ext. 46

Free literature available: Digital Instrument Product Index - Contains Abbreviated Specs, Prices, Options for 13 series of digital panel instruments including voltmeters, clocks, counters, timers, comparators, and stopwatches. Data Sheets - Complete Specs, Prices, Options on all instruments. Frequency Product Literature - Data Sheets, Design Sheets.

Products manufactured: Clocks (All Types), Comparators, Counters, Crystals, Current Sensors, Filters, Indicators, Meters, Oscillators, Preselctors, Synthesizers, Timers, Totalizers, Digital

Local Sales Offices & Reps.

Digital instrument

Ala Huntsville, Vesco 205-881-8830
Cal Cupertino, T. L. Snitzer Co. 408-257-8333
Cal Del Mar, T. L. Snitzer Co. 714-454-2191
Cal Los Angeles, T. L. Snitzer Co. 213-836-6170
Colo Littleton, Aztec Entrprs. 303-795-0250
Conn Newton, Daner-Hayes, Inc.
Fla Orlando, Datarep, Inc. 305-843-5224
Fla Pompano Beach, Datarep, Inc. 305-781-9279
Ind Indianapolis, Couchman-Conant 317-849-9890
Kans Baxter Springs, Production Automation Corp.
Md Rockville, Farrell Assoc. 301-424-9460
Mass Newton Center, Daner-Hayes, Inc.

617-969-4650
Mass Stoneham, Ken Corp. 617-438-5464
Mich Royal Oak, Dave Ray & Assocs. 313-576-4705
Minn Minneapolis, Production Automation Corp. 612-866-5700
Mo Hazelwood, Production Automation Corp. 314-731-2331
Mo Raytown, Production Automation Corp.

816-737-0066
NM Albuquerque, J.S. Heaton Co. 505-293-3900
NY Elbridge, L-Tron Corp. 516-689-3787
NY Great Neck, Meas. Technology Inc.

516-482-3500
NY Scottsville, L-Tron 716-436-4410
NY Tonawanda, L-Tron 716-691-8887
NC Winston Salem, Radco Co. 919-722-9671
Ohio Aurora, EMA, Inc. 216-562-6104
Ohio Centerville, EMA, Inc. 513-433-2800
Pa Audubon, Daner-Hayes, Inc. 215-666-5005
Wash Rush, S. Drake Assocs. 206-763-2755

Frequency product

Cal Redwood City, J. S. Heaton Co. 415-369-4671
Colo Denver, J. S. Heaton Co. 303-758-5130
Conn New Canaan, S. Pierce Inc. 203-966-4630
Fla Clearwater, Dyne-A-Mark Corp. 813-446-3229
Fla Ft. Lauderdale, Dyne-A-Mark Corp.

305-771-6501
Fla Orlando, Dyne-A-Mark Corp. 305-299-6303
Ill Oak Brook, Whitmore Assocs. 312-325-4727
Ky Ft. Mitchell, G. W. Thelen Co. 606-341-8181
Md Silver Spring, Spectro Sys. 301-949-8261
Mass Norwood, S. Pierce, Inc. 617-762-3164
Minn Minneapolis, Nortec Sys. Inc. 612-835-7414
Mo Hazelwood, Cen-Tech Sys. 314-731-4220
Mo Raytown, Cen-Tech Sys. 816-358-8100
Mo Springfield, Osborn Sys. Co. 417-887-1773
NJ Riverdale, Comp Tech Sys. 201-935-5454
NM Albuquerque, J. S. Heaton Co. 505-293-3900
NY New Hyde Park, Comp-Tech Sys. 516-893-2628
Pa Wyndmoor, Spectro Sys. Corp. 215-836-1545
Wash Seattle, Blum & Assocs. 206-285-2590

ELCTRN. SEALS, 13766 Satcoy St., Van Nuys, Cal, 91402, Tel: 213-873-4982; FSC No: 12349; Empl: 25; Minimum order: \$75

Customer service: H. Adelman

Products manufactured: Connectors, Seals, Services, Assembly, Production & Test

ELECTRONIC SPECIALTY DIV., Datron Systems Inc., 18900 N.E. Sandy Blvd., Portland, Ore., 97220, Tel: 503-665-0121, TWX: 910-469-8782; QPL No: M5757; Minimum order: \$35

For info on price: B. Sites; Application info: B. Hartman; Customer service: N. Pelham; Delivery info: N. Pelham

Products manufactured: Relays

Local Sales Offices & Reps.

Ala Madison, B-C Elctrn. Sys. 205-837-5778
Ariz Scottsdale, Goodreau Assocs. 602-994-9909
Cal Los Angeles, KCE Corp. 213-649-2622
Cal Mountain View, Westrep 415-968-5800
Cal Pico Rivera, Westrep 213-949-2551
Cal San Diego, Westrep 714-276-0751
Colo Denver, Cristee-Meade 303-753-9471
Conn North Haven, Forsberg Sys. 203-239-5111
Fla Seminole, Spartak Inc. 813-393-5402
Ga B-C Elctrn. Sys. 404-436-5169
Ill Hinsdale, J.D. Allyn Co. 312-325-0495

Ind Indianapolis, Berberich Assocs. 317-788-9221
Kans Prairie Village, Engrg. Svc. Co. 913-649-4000
Md Luthersville, L.D. Lowery 301-296-0379
Mass Brockton Mass, Forsberg Sys. 617-522-8300
Mich Walled Lake, Berberich Assoc. 313-624-2211
Minn St. Paul, Countryman Assoc. Co. 612-645-9151
Mo St. Louis, Engrg. Svcs. Co. 314-997-1515
NY Smithtown, T.X. Sys. 516-979-8750
NY Syracuse, C.V. Floring & Assoc. 315-478-2149
Ohio Dayton, Berberich Assoc. Inc. 513-433-0342
Pa Broomall, L.D. Lowery 215-356-5300
Pa Harrisburg, L.D. Lowery
Tex Addison, R.R. Thomas Co. 214-233-8235
Va Charlottesville, L.D. Lowery 804-973-6672
Va Vinton, B-C Elctrn. Sys. 703-890-1128
Wash Seattle, H.S. Thorpe 206-784-3333

ELECTRONIC SUPPORT SYSTEMS, 122 W. St. Charles Rd., Villa Park, Ill., 60181, Tel: 312-833-8277; Empl: 20
Products manufactured: Boards, Printed Circuit

ELECTRONIC SYSTEMS & PROGRAMMING INC., 3355 W. El Segundo Blvd., Hawthorne, Cal., 90250, Tel: 213-973-0262; Empl: 46; Minimum order: \$25

For info on price: R. Potampay; Application info: K. F. Zimmermann; Customer service: H. F. Gainey; Delivery info: L. E. Oliver

Products manufactured: Jigs And Fixtures, Chassis & Circuit Board, Test Systems, Testers

Local Sales Offices & Reps.

Cal Los Angeles, Burtis Instrumentation 213-887-1360
Tex Houston, Ammon & Rizes 214-233-5591

ELECTRONIC TRANSFORMER CORP., 460 Totowa Ave., Paterson, N.J., 07509, Tel: 201-279-4445; FSC No: 72149; Empl: 65

For info on price: M. Gorman; Application info: E. Bulwin; Customer service: A. Cezar; Delivery info: M. Haras

Products manufactured: Chokes, Coils Including Assemblies & Forms, Filters, Networks, Reactors, Transformers

Local Sales Offices & Reps.

NY Bellmore, J. Anapol 516-826-2310
NY Syracuse, Lenard Co. 315-479-9191
Ohio Dayton, S. Tetelbaum 513-276-5808

Advertisement

Commerical military audio, power and pulse tRansformers, toroid, inductors, LC filters designed for your application.

Specialists in Scott-T, high frequency DC to AC inverters and ferro-resonant regulating transformers.

Epoxy, silicone encapsulation, metal case hermetically sealed samples speedily furnished at no minimum charge

A phone call can start it to happen.

ELECTRONIC TRANSISTORS, 153-13 Northern Blvd., Flushing, N.Y., 11354, Tel: 212-539-6700, Telex: 960173; FSC No: 12045; Empl: 45; Minimum order: \$5

For info on price: M. Byrnes; Application info: M. Byrnes; Customer service: M. Byrnes; Delivery info: M. Lipton

Products manufactured: Diodes, Rectifiers, Thyristors (Includes Silicon Controlled Rectifiers), Transistors

Local Sales Offices & Reps.

Ill Chicago, Weisz Assocs. 312-637-9117
Ohio Dayton, L.S. Fedotin 513-275-9345
Ohio St. Marys, Repp Co. 419-394-4724
EXP: Westbury, N.Y., Minthorne Int. Co. 516-334-3303

ELECTRONICS ONE INC., 2166 Faulkner Rd. NE, Atlanta, Ga., 30324, Tel: 404-321-4960; Empl: 7
Customer service: B.A. Bond Jr.

Products manufactured: Circuits, Printed, Multilayer, Services, Assembly, Production & Test, Testers, Timers

ELECTRONS CO., Unit of General Signal Corp., 65 Passaic Ave., Fairfield, N.J., 07006, Tel: 201-227-3830; FSC No: 80098; Empl: 100

For info on price: D. J. Hall; Application info: E. Burns; Customer service: H. Benevento; Delivery info: N. Benevento

Free literature available: Industrial power tubes, Equipment Ground Fault Sensors; Telecommunications Surge Arrestors; Fire and Security Systems Thermal and Ionization detectors.

Products manufactured: Arresters, Electrical Surge, Lightning, Protectors, Spark Gaps, Tubes

Local Sales Offices & Reps.

Ala Birmingham, Whitman Assoc. 205-252-3079
Cal El Monte, Randolph Ind., Inc. 213-443-1701
Cal San Francisco, Artwel Elec., Inc. 415-467-1880
Colo Denver, Gaer Sys. 307-777-3740
Fla Coconut Grove, Whitman Assoc. 305-856-6749
Fla Gulf Breeze, Whitman Assoc. 904-932-5670
Fla Jacksonville, Whitman Assoc. 904-354-5985
Fla Tampa, Whitman Assoc. 813-877-6091
Ga Atlanta, Whitman Assocs. 404-521-0977
Ill Chicago, Weldy-Lamont Assoc., Inc.

312-777-8575
La New Orleans, Rapco Assoc. 504-283-7321
Mass Watertown, Northeast Mfrs. Assocs. 617-325-3252

Mich Royal Oak, Continental Products Co. 313-546-4520

Miss Jackson, Rapco Assoc. 601-969-3221

Mont Missoula, Pacific Western Agencies 406-543-5296

NJ Old Bridge, R. W. Duffy & Assocs. 201-251-6200

NY Old Bridge, R. W. Duffy & Assoc. 201-251-6200

NY Rochester, Canavan-Scanlon Assoc. 716-442-0720

NC Charlotte, Norman Tindel Co. 704-334-4776

Ore Portland, Pacific Western Agencies 503-228-7261

Pa Pittsburgh, Brown Elec. Equip. Co. 412-563-4444

SC Columbia, George W. Greene Agency 803-252-3032

Tenn Knoxville, Whitman Assoc. 615-687-3578

Tex Houston, J. Edwards Co. 713-223-4731

Va Richmond, Whitman Assoc. 703-266-3185

Va Roanoke, Whitman Assoc. 703-774-6029

Va Va. Beach, Whitman Assoc. 703-428-8717

Wash Seattle, Pacific Western Agencies 206-623-3483

Wash Spokane, Pacific Western Agencies 509-FA 6-4242

FOR: Can., Streetsville, Ont., L & H Ents. 416-826-3828

ELECTROSTATICS INC., 7718 Clairemont Mesa Blvd., San Diego, Cal., 92111, Tel: 714-279-1414; FSC No: 34538; Empl: 15; Minimum order: \$30 ... p. 1-1184, 1185

For info on price: Robert D. McCartney; Application info: Robert D. McCartney; Customer service: Edwin T. Foster; Delivery info: Edwin T. Foster

Free literature available: A catalog of low priced DC power supplies featuring single, dual, and triple models from 3 to 50 volts and 0.35 to 15A.

Products manufactured: Power Supplies

ELECTROTEC INC., 2837 Ladybird La., Dallas, Tex., 75220, Tel: 214-358-4221, TWX: 910-861-4123; Empl: 32; Minimum order: \$50

For info on price: W. Cloyd 214-358-4221; Application info: W. Cloyd 214-358-4221; Delivery info: D. Venable 214-358-4223

Free literature available: Microwave Integrated Circuit design parameters & assembly techniques for MIC users. Resistor Design design parameters for thin film resistor designers.

Products manufactured: Chemicals, Networks, Resistors

Local Sales Offices & Reps.

Cal Burbank, Wright Engrg. 213-843-7240
Cal Los Altos, Stout-Loeswick Inc. 415-948-3265
Mass Lowell, Russell Engrg. 617-458-7146
Minn Anoka, Magner & Assocs. 612-427-5550
NY Bridgeport, Lightstone Corp. 315-699-5747
NY Plainview, ERA 516-822-9890
Wisc Milwaukee, MW Enterprises 414-352-9150

ELECTROVERT, 86 Hartford Ave., Mt. Vernon, N.Y., 10553, Tel: 914-664-6090, Telex: 1-37483; Empl: 65; Minimum order: \$50
Customer service: M. Lanoy

Free literature available: Wire cable harnesses, markers & accessories. Terminal blocks, strips & specialty types. Automatic soldering, fusing & tinning systems.

Products manufactured: Baths, Controlled Temperature (Air & Liquid), Boards, Programming, Cable Assemblies & Harnesses, Clamps & Clips, Cleaners, Ultrasonic, Ducts, Wiring, Fasteners, Grommets, Holders, Circuit Board (Production Type), Machines/Machinery, Production, Solder Pots & Baths, Soldering Equipment, Strips, Terminal Blocks, Boards & Strips, Testers, Tubing, Wire & Cable Ties, Wire Markers

Local Sales Offices & Reps.

Ala	Huntsville, BJR Research Reps	205-881-1841
Ariz	Phoenix, Kay Ent.	602-242-6787
Ariz	Phoenix, Southwest Engrg.	602-933-0250
Cal	Burbank, Electrovert, Inc.	213-849-7833
Cal	Encino, CDH	213-345-3111
Cal	Glendale, Tooltronics, Inc.	213-240-4000
Cal	La Mirada, Dennis Don & Assoc.	714-523-5622
Cal	Santa Clara, Tooltronics	415-241-4000
Cal	Saratoga, Enterprise Engrg. Reps	408-255-7272
Colo	Boulder, Mile High Elctns.	303-444-5615
Colo	Denver, B. T. Clark Inc.	303-936-4844
Fla	Clearwater, H. R. Gross & Co.	813-446-6649
Fla	Maitland, Rowe Engrg. Sls.	305-834-2700
Ga	Atlanta, Electrovert	404-451-9366
Ill	Chicago, Cumming & Foley Sls. Co.	312-725-8110
Ill	Chicago, EMF Co.	312-889-8323
Ill	Northlake, Electrovert, Inc.	312-562-1700
Ind	Carmel, Central States Machinery Co.	317-844-0178

Ind	Indianapolis, Dick Bennet Sls.	317-786-0196
Ind	Indianapolis, Marketing Engrs.	317-546-1523
Kans	Prairie Village, Engrg. Serv. Co.	913-649-4000
Md	Silver Springs, ARA Elctns.	301-565-2444
Mass	Newtonville, Edcom, Inc.	617-969-9710
Mass	Norwood, JMG, Inc.	617-762-5333
Mich	Grosse Point Park, J. L. Miner Assoc.	313-886-5878
Mich	Southfield, M. A. Percival Co.	313-358-5710
Minn	Minneapolis, Servco	612-941-7151
Minn	St. Paul, Countryman Assoc. Co.	612-645-9151
Mo	Raytown, Marty Taraski	816-358-4590
Mo	St. Louis, Engrg. Svc. Co.	314-997-1515
NJ	Hohokus, H. M. Linter & Son	201-445-2905
NJ	Livingston, Argo Engrg. Co.	201-992-4367
NY	Guiderland, Solder Pot	518-355-1829
NY	Plainville, R. Smith Assoc.	516-681-3155
NY	Rochester, L-Mar Assocs.	716-328-5240
Ohio	Cincinnati, Luebbs Sls. Co.	513-871-4211
Ohio	Cincinnati, Nelcor	513-871-2816
Ohio	Cleveland, J. B. Clough Co.	216-431-2700
Ohio	Cleveland, K. R. Dodge	216-461-6482
Ore	Portland, Vandy Corp.	503-297-1900
Pa	Enon Valley, NEBCO Assoc.	412-457-2333
Pa	Glenside, ARA Elctns. Inc.	215-887-5250
Pa	Narberth, S. A. Jeffries, Inc.	215-664-8500
Pa	Reading, Beil & Whitaker	215-779-2610
Tenn	Memphis, Strickland Assoc.	901-332-6578
Tex	Dallas, J. Tuite Co.	214-381-2103
Tex	Irving, Electrovert, Inc.	214-255-1516
Tex	Irving, Tooltronics	214-251-2239
Tex	Richardson, P. J. Scanlon Co.	214-231-4661

Wash	Seattle, Electrical Agents NW Inc.	206-762-3314
Wash	Seattle, Vandy Corp.	206-789-3300
FOR:	Can., Montreal, Electrovert, Mfg.	514-488-2521

ELEXON POWER SYS., Div. Elpac Inc., 3131 S. Standard Ave., Santa Ana, Cal., 92705, Tel: 714-979-4440; Empl.: 160

Products manufactured: Power Supplies

Local Sales Offices & Reps.

Ala	Huntsville, BJR Mfg. Reps.	205-881-3569
Ariz	Phoenix, J.S. Heaton Co., Inc.	602-264-7887
Cal	Redwood City, J.S. Heaton Co., Inc.	415-369-4671
Colo	Denver, J.S. Heaton Co., Inc.	303-758-5130
Fla	Ft. Lauderdale, CBC Elctns.	305-484-7330
Fla	Melbourne, Reynolds & Assoc. Inc.	305-727-3205
Fla	St. Petersburg, Orbe, Inc.	813-894-0687
Ill	Chicago, Balhorn & Welch	312-889-5011
Ill	Oak Park, E. Schmeichel Co.	312-378-2070
Ind	Indianapolis, France Entprs.	317-894-0593
Iowa	Cedar Rapids, J. Vrbik Co.	319-377-8244
Kans	Shawnee Mission, K & M Sls Co.	913-262-1444
Md	Baltimore, Component Sls., Inc.	301-484-3647
Mass	Needham, Coakley, Boyd & Abbott	617-444-5470
Mass	Needham Heights, Todino Eng. Sls., Inc.	617-444-7925
Mich	Dearborn, Villani-Pitcher, Inc.	313-271-4600
Minn	St. Paul, L. Cahill & Assoc. Inc.	612-646-7217
NJ	Mt. Laurel, Naudian Assoc.	215-564-3194
NM	Albuquerque, J. S. Heaton Co.	505-293-3900
NY	New York, P. Saffler Assoc., Inc.	16-593-7880
NC	Raleigh, Component Sls., Inc.	919-782-8433

Ohio	Cincinnati, F. J. Campisano Co.	513-662-1616
Ohio	Medina, J.C. Hoffstetter Co.	216-241-4880
Okla	Tulsa, H. J. Daly Co.	918-627-4159
Pa	Doylestown, T.O.E. Sls. Inc.	215-348-2212
Tex	Dallas, Hillman Entprs.	214-827-4790
Wash	Bellevue, Testco	206-454-7422
FOR:	Can., Downsview, Ont., Cantronics Ltd.	416-661-2494

ELFAB CORP., 762 Wiley Post Rd., Addison, Tex., 75001, Tel: 214-233-3033, TWX: 910-860-5460; Empl.: 150; Minimum order: \$50 p. 2-680,681

For info on price: B. Treece; Application info: J. Scaminaci, Jr.; Customer service: B. Treece; Delivery info: B. Treece

Free literature available: Literature on: Printed circuit connector backpanel assemblies.

Products manufactured: Backpanel Interconnect Systems, Boards, Printed Circuit, Connectors, Terminals

Local Sales Offices & Reps.

Ariz	Tempe, Delta Elctns.	602-966-9903
Cal	Freemont, H.K. Foraker	415-657-2213
Cal	Woodland Hills, Elfab Corp.	213-883-7606
Colo	Boulder, Component Prods.	303-444-2730
Fla	Orlando, Geartner Assocs.	305-299-1000
Ill	Glendale Hgts., Trend-Tronics	312-963-2210
Kans	Prairie Village, R. S. Sls., Inc.	913-381-8812
Md	Rockville, Mechtronics Sls.	301-340-2130
Mich	Dearborn Hts., Ankofski Sls. Co.	313-565-6330
Minn	Minneapolis, Components Group	612-824-4222
NJ	Paramus, Win Cor Elctns. Sls.	201-967-0242
NY	Cooperstown, A. Fittelle Assocs.	607-547-9333
NY	Manhasset, Win-Cor Elctns. Sls.	516-627-9474
Ohio	Dayton, Myers Assocs.	513-435-1309
Okla	Oklahoma City, Ammon & Rizos Co.	405-373-2748
Pa	Philadelphia, R.P. Luce & Co.	215-884-8365
Tex	Dallas, Ammon & Rizos Co.	214-233-5591
Tex	Houston, Ammon & Rizos Co.	713-781-6240
Wash	Tukwila, General Elctns. Inc.	206-243-5141
FOR:	Can., Ottawa, Ont., Orion Elctns.	613-521-2739

ELGAR CORPORATION, 8225 Mercury Ct., San Diego, Cal., 92111, Tel: 714-565-1155, TWX: 910-335-1246; FSC No: 25965; Empl.: 85; Minimum order: \$25 p. 1-1197-1199

For info on price: W. E. Foy Ext. 19; Application info: W. E. Foy Ext. 19; Customer service: Samuel A. Lewis, Ext. 41; Delivery info: W. E. Foy, Ext. 19

Free literature available: General Catalog (describes AC Power Sources & AC Line Conditioners), UPS Brochure (describes UPS models through 15 KVA), Inverter Data Sheets.

Products manufactured: Amplifiers, Converters, Inverters, Isolators, Oscillators, Power Supplies, Regulators, Suppressors, Testers

Local Sales Offices & Reps.

Ala	Huntsville, BCS Assocs.	205-881-6220
Ariz	Scottsdale, Barnhill Three, Inc.	602-947-7841
Cal	La Jolla, Ward/Davis Assocs.	714-459-3351
Cal	Lawndale, Ward/Davis Assocs.	213-452-7740
Cal	Sunnyvale, Ward/Davis Assocs.	408-245-3700
Colo	Denver, Barnhill Three, Inc.	303-750-1222
Conn	Hamden, P. Jenks Assocs.	203-281-0810
Conn	New Canaan, McLellan Assocs.	203-966-2580
Fla	Orlando, BCS Assocs.	305-896-4881
Ill	Des Plaines, Cozzens & Cudahy, Inc.	312-298-3600
Ind	Indianapolis, Cozzens & Cudahy, Inc.	317-244-2456

Md	Kensington, Electronic Mktg. Assocs.	301-881-5300
Mass	Holbrook, McLellan Assocs.	617-767-4771
Mass	Wakefield, P. Jenks Assocs.	617-246-1590
Mich	Detroit, WKM Assocs.	313-892-2500
Minn	Minneapolis, Cozzens & Cudahy, Inc.	612-884-4336
Mo	Edmundson, Cozzens & Cudahy, Inc.	314-423-1234
Mo	Kansas City, Cozzens & Cudahy, Inc.	816-454-5836
NM	Albuquerque, Barnhill Three, Inc.	505-299-7658
NY	Great Neck, Measurement Tech. Inc.	516-482-3500
NY	Pleasantville, SBM Representatives	914-769-1811
NY	Rochester, SBM Representatives	716-266-1400
NC	Greensboro, BCS Assocs.	919-273-1918
Ohio	Cleveland, WKM Assocs.	216-267-0445
Ohio	Dayton, WKM Assocs.	513-434-7500
Pa	King of Prussia, Electronic Mktg. Assocs.	215-265-1600
Pa	Pittsburgh, WKM Assocs.	412-892-2953
Tex	Houston, Barnhill Two, Inc.	713-688-9971

Tex	Richardson, Barnhill Two, Inc.	214-231-2573
Wash	Seattle, SJI Corp.	206-624-9020
EXP:	San Diego, Cal., Elgar Intern'l. Corp.	714-565-1155

ELGENCO, INC., 1550 Euclid, Santa Monica, Cal., 90404, Tel: 213-451-1635; FSC No: 15455; Minimum order: \$10 p. 1-685-690

Customer service: D. Cusworth

Products manufactured: Analyzers, Cards, Linear Function, Generators, Power Supplies

Local Sales Offices & Reps.

Cal	Sherman Oaks, Windsor Dynamics, Inc.	213-989-3631
Cal	Woodside, Windsor Dynamics, Inc.	415-854-4870
Conn	Glastonbury, Instrs. Reps.	203-633-0777
Mass	Lexington, Instr. Reps., Inc.	617-861-8620
NM	Albuquerque, Technology Mktg. Assoc.	505-298-4321
NY	Great Neck, Harvey J. Krasner Assoc.	516-487-0690
Pa	Newtown Square, Holdsworth & Co.	215-EL6-8550

ELGIN ELCTRNS., INC., Sub. Basic, Inc., Walnut St., Waterford, PA., 16441, Tel: 814-796-2601, TWX: 510-699-6659; Empl.: 600; Minimum order: \$50

For info on price: G. Egelston; Application info: J. Seppala; Customer service: R. Borgia; Delivery info: R. Borgia

Products manufactured: Boards, Printed Circuit, Chargers, Battery, Eliminators, Battery, Generators, Power Supplies, Services, Assembly, Production & Test, Terminal Blocks, Boards & Strips

Local Sales Offices & Reps.

Ala	Huntsville, 20th Century Mktg., Inc.	205-772-9237
Cal	Los Alamitos, Anderson Assoc.	213-596-2313
Cal	Mountain View, Microwave Mktg. Assoc.	415-969-3355
Conn	Wilton, Elgin Electronics	203-762-7012
Fla	Eau Gallie, W. Bitter	305-254-3674
Haw	Honolulu, Communicators Inc.	
Ill	Woodridge, Elgin Electronics	312-964-4474
Mass	Concord, Elgin Electronics	617-369-3051
Mich	Rochester, K. Mor Assoc.	313-651-1890
Mont	Lakeside, W.J. McDougall	
PA	Waterford, Elgin Electronics	814-796-2601
Tex	Dallas, Utility Mktg. & Devel.	214-661-3284
Va	Fairfax, Tom Davis Mkts.	703-591-7390
Wash	Seattle, Del Com Sls. Co.	206-248-0900
EXP:	Can., Scarborough, Ont., R-O-R Assoc., Ltd.	416-291-7121

ELIN DIV., California Instrs. Co., Div. of Aiken Ind., 5150 Convoy St., San Diego, Cal., 92111, Tel: 714-279-8620; FSC No: 16067; Empl.: 80; Minimum order: \$25

For info on price: W. W. Hanford; Application info: W. W. Hanford; Customer service: D. Chilcoat; Delivery info: W. W. Hanford

Free literature available: Cimron® Digital Multimeter Selection Guide Invertron® AC power source short form catalog.

Products manufactured: Amplifiers, Converters, Generators, Isolators, Power Supplies, Protectors, Regulators, Suppressors, Transformers

Local Sales Offices & Reps.

Ala	Huntsville, FM Assocs.	205-536-9990
Ariz	Scottsdale, Williams Associates, Inc.	602-947-4297
Cal	Cupertino, T. Louis Snitzer Co.	408-257-8333
Cal	Los Angeles, T. Louis Snitzer Co.	213-836-6170
Colo	Denver, Williams Associates, Inc.	303-373-4730
Fla	Orlando, FM Assoc.	305-851-5710
Fla	Tequesta, FM Assoc.	305-746-3128
Haw	Honolulu, Aloha Associates	808-941-1574
Ill	Chicago, Sea	312-282-6694
Ind	Carmel, Sea	317-846-2593
Iowa	Cedar Rapids, Palatine Engrg. Sls. Co.	319-365-8071
Kans	Andover, Palatine Engrg. Sls. Co.	316-683-7512
Kans	Overland Pk., Palatine Engrg. Sls. Co.	913-262-5643
La	Baton Rouge, SESCO	504-927-7574
Mass	Needham, Adelco Corp.	617-444-4754
Mich	Detroit, Group Ten	313-549-3910
Minn	Minneapolis, Waytek	612-933-2133
Mo	St. Louis, Palatine Engrg. Sls. Co.	314-426-7055
NM	Albuquerque, Williams Associates, Inc.	505-255-1638
NY	Great Neck, Eastern Instr. of N.Y.	516-486-9505
NY	North Syracuse, NACO Elctns.	315-699-2651
NC	Greensboro, FM Assoc.	919-294-2754

Ohio Cleveland, Group Ten 216-486-2800
 Ohio Dayton, Group Ten 513-277-6531
 Pa Philadelphia, Eastern Instr. of Phil. 215-927-7777
 Tex Houston, SESCO 713-668-7840
 Tex Richardson, SESCO 214-231-9364
 Wash Seattle, Data Com Assoc. 206-285-2525

ELMA ENGINEERING, 1066 E. Meadow Circle, Palo Alto, Cal., 94303, Tel: 415-494-7303, Telex: 345-560; Empl.: 50; Minimum order: \$25

For info on price: J. E. Frederick; Application info: K. W. Widi; Customer service: W. Bougher; Delivery info: G. Albert

Products manufactured: Analyzers, Chokes, Coils Including Assemblies & Forms, Controls/Control Eqpt., Heaters & Heating Elements, Magnets, Power Supplies, Reactors, Transformers

Local Sales Offices & Reps.

Ariz Phoenix, Montgomery Bros. 602-253-3431
 Cal Laguna Beach, Marchi-Barus Assocs. 714-497-1815
 Cal Redwood City, Marchi Assocs. 415-364-3411
 Colo Denver, Montgomery Bros. 303-759-2749
 Conn Woodstock, Godfrey & Assocs. 203-928-0332
 Minn Minneapolis, I. T. Dahl Co. 612-926-4823
 NJ Paterson, Long, Poveromo & Assocs. 201-785-2492
 NY Rochester, H.C. Johnson Agencies 716-482-3000
 Ohio Cleveland, Allied Ents. 216-234-3838
 Pa St. Davids, R. Schadler Co. 215-687-5650
 Tenn Memphis, Engineered Instrs. 901-324-3871
 Tex Arlington, Davis-Dawson Co. 817-265-6426
 Utah Salt Lake City, Montgomery Bros. 801-363-3555

ELMAG CORP., 54 Clark St., Newark, N.J., 07104, Tel: 201-481-1600; FSC No: 23160; Empl.: 25; Minimum order: \$50

For info on price: I. Black; Application info: F. Senft; Customer service: I. Black; Delivery info: I. Black

Products manufactured: Capacitors, Fixed, Filters

Local Sales Offices & Reps.

NJ Hillsdale, Martin Klein Assoc. 201-664-8711
 NY E. Rockaway, Wm. Bellenkes Assoc. 516-887-1443
 Ohio Dayton, Irving Atkind Assoc. 513-837-4750
 Pa Narbeth, Samuel A. Jeffries 215-664-8500

EL-MENCO-, See Electro Motive Corp.

ELMWOOD SENSORS, INC., 1655 Elmwood Ave., Cranston, RI, 02907, Tel: 401-781-6500, TWX: 710-381-6413; Empl.: 400; Minimum order: \$100 p. 1•1682,2308

For info on price: S. Hecht; Application info: S. Hecht; Customer service: A. Emerson; Delivery info: A. Emerson

Products manufactured: Controls/Control Eqpt., Relays, Switches, Thermometers, Resistance

Local Sales Offices & Reps.

Ala Decatur, Tenn. Tech. Sls. 205-350-0630
 Ark Hot Springs, M. Young Assocs. 501-262-1365
 Cal Palo Alto, O'Donnell 415-327-3583
 Cal Torrance, O'Donnell 213-323-9243
 Colo Denver, P.A. Douden Co. 303-744-1497
 Conn Cheshire, G. Forman Co. 203-272-8509
 Fla Maitland, D & E Assocs. 305-644-3039
 Ga Marietta, K & E Asso. 404-427-0241
 Ill Hoffman Estates, Tech. Reps. 312-882-1414
 Ind Marion, O. Bromberg 317-664-5384
 Iowa Cedar Rapids, J.G. Twist Co. 310-393-8703
 Ky Louisville, O. Bromberg 502-245-8916
 Mich Farmington, Davis & Martensen 313-474-8300
 Minn Mpls., C. Listig Sls. 612-537-6740
 Mo St. Louis, E.J. Hill Co. 314-621-1818
 NH Durham, G. Forman 603-868-2282
 NJ Pitman, Colrud Co. 609-589-5866
 NY Binghamton, Canavan-Scanlon 607-724-7220
 NY Buffalo, Canavan-Scanlon 716-839-3373
 NY Larchmont, G.M. Moch Co. 914-834-3530
 NY Latham, L-Tron Corp. 518-785-5032
 NY Rochester, Canavan-Scanlon 716-442-0720
 NY Syracuse, Canavan-Scanlon 315-437-1271
 Ohio Cincinnati, O. Bromberg 513-771-9333
 Ohio Cleveland, Allied Entprs. 216-234-3838
 Pa Pittsburgh, Allied Entprs. 216-234-3838
 Tex Edgewood, G.H. Forman 401-781-1230
 Tex Fort Worth, T.J. Small Co. 817-332-6352
 Va Lynchburg, Royelco Sls. Assocs. 703-846-7117
 Wash Federal Way, Temco Northwest 206-838-0588
 Wisc Milwaukee, R. Zingler 414-964-8120

ELPA MARKETING IND., Thorens & Atlantic Ave., Garden City Park, NY, 11040, Tel: 516-746-3002

ELPOWER CORP., 2117 S. Anne St., Santa Ana, Cal., 92704, Tel: 714-540-6155, TWX: 910-595-1934; Empl.: 129

Customer service: J. Dunn

Free literature available: Complete catalogue with price sheet, discharge curves, other application data.

Products manufactured: Batteries, Chargers, Battery

Local Sales Offices & Reps.

Cal Inglewood, Ungar Sls. Assocs. 213-678-5371
 Cal Oakland, Moulthrop Sls., Inc. 415-261-7676
 Colo Denver, K.C. Mkts. 303-733-5561
 Fla Orlando, Cartwright & Bean Inc. 305-896-2031
 Fla Plantation, Cartwright & Bean Inc. 305-791-3989
 Ga Atlanta, Cartwright & Bean Inc. 404-237-2273
 Ill Chicago, G. McL. Cole Co. 312-774-3535
 La Chalmette, Cartwright & Bean Inc. 504-279-4598

Mass Newtonville, C. Segel Co. 617-969-6900
 Mich St. Clair Shores, J. Thorpe Co. 313-779-6363
 Minn Minneapolis, Heimann Co. 612-861-6051
 Miss Jackson, Cartwright & Bean Inc. 601-354-1368
 Mo Kansas, KSW Assocs. 816-363-5651
 NJ Cherry Hill, Trinkle Sls., Inc. 609-667-3500
 NJ East Orange, Masin-Esco, Inc. 201-674-6505
 NY Syosset, Masin-Esco, Inc. 516-364-0310
 NY Syracuse, Mar-Com Assocs. 315-437-2843
 NC Charlotte, Cartwright & Bean Inc. 704-333-6457
 NC Raleigh, Cartwright & Bean Inc. 919-832-7128
 Ohio Columbus, McFadden Sls., Inc. 614-221-3363
 Tenn Knoxville, Cartwright & Bean Inc. 615-693-7450
 Tenn Memphis, Cartwright & Bean Inc. 901-276-4442
 Tex Dallas, J.Y. Schoonmaker Co. 214-357-8481
 Wash Seattle, R. Johnston Co. 206-524-5170

ELSYTEC, INC., 212 Michael Dr., Syosset, N.Y., 11791, Tel: 516-364-0560; Empl.: 25

Products manufactured: Analyzers

ELTEC INSTRUMENTS INC., Central Ind'l. Pk., Daytona Beach, Fla., 32014, Tel: 904-252-0411

For info on price: M. A. Cleaver; Application info: F. H. Oettel; Customer service: M. A. Cleaver; Delivery info: M. A. Cleaver

Products manufactured: Feedthrus & Seals, Environmental, Impedance Converters, Microwave, Meters, Resistors

ECM MOTOR CO., 1301 E. Tower Rd., Schaumburg, Ill., 60172, Tel: 312-885-4000; Empl.: 250

Customer service: E. Spence

Free literature available: Gear motor brochure providing mechanical & electrical specifications for unidirectional & reversible AC & DC motors, plus information sheets on universal & synchronous motors.

Products manufactured: Motors

Local Sales Offices & Reps.

Ark Little Rock, Ind'l. Sls. Co. 501-562-5852
 Cal Los Angeles, Halbar Assocs. 213-387-8283
 Cal San Mateo, Halbar Assocs. 415-349-4700
 Conn Thomaston, NBC 203-283-5959
 Fla Maitland, Hutto, Hawkins, Perego, Inc. 305-831-2474
 Fla Pompano Beach, Hutto, Hawkins, Perego, Inc. 305-943-9593
 Ill Chicago, M. Gottlieb Assoc. 312-775-1151
 Ind Ft. Wayne, J & B Engvr. Sls. Co. 219-483-2813
 Ind Indianapolis, M. Gottlieb Assoc. 317-846-5788
 Ky Nicholasville, W.H. Mathews 606-885-5047
 La New Orleans, Warriner Controls 504-861-4571
 Md Silver Spring, H.R. Sieber Co. 301-589-9110
 Mass Auburn, NBS 617-757-3131
 Mich Detroit, Nicson Assoc. 313-341-7688
 Minn Minneapolis, Applied Sls. Engrg. 612-544-3308
 Mo Kansas City, L.T. Silver 816-531-1144
 Mo St. Louis, Wells-White Co. 314-726-2511
 NJ Fort Lee, Sydney-Justin Assocs. 201-947-4371
 NY Rochester, Electra Sls. Corp. 716-436-4030
 NY Syracuse, Electra Sls. Corp. 315-455-5783
 Ohio Cincinnati, J. O. Olsen Co. 513-922-2176
 Ohio Cleveland, J. O. Olsen Co. 216-752-5444
 Okla Tulsa, T.J. Ray Co. 918-627-1515
 Pa Broomall, J. C. Whiddett Co. 215-353-6343
 Pa Pittsburgh, J.O. Olsen Co. 412-279-2550
 Tenn Bristol, Remco 615-968-4195
 Tex Dallas, Titan Reps Inc. 214-661-5350
 Wash Bellevue, Hays Indl. Sls. 206-883-8888
 Wisc Wauwatosa, Larsen Assocs. 414-258-0529

EMCO HIGH VOLTAGE, 2444 Old Middlefield Way, Mt. View, Cal., 94086, Tel: 415-969-3056; Empl.: 10; Minimum order: \$100

Customer service: W. F. Doherty

Free literature available: General Catalog

Products manufactured: Converters, Power Supplies

EMCON DIV., Illinois Tool Works Inc., 11620 Sorrento Valley Rd., Box 85142, San Diego, Cal., 92138, Tel: 714-459-4355, TWX: 910-322-1130

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Cal Irvine, Emcon Regional Office 714-833-9286
 Cal Mt. View, G.C. Woempner Co. 415-964-5454
 Cal San Diego, Emcon Home Office 714-459-4355
 Colo Denver, Camel Elctns. 303-757-6191
 Fla Altomonte Springs, WMM Assocs. 305-831-4645
 Fla Clearwater, WMM Assocs. 813-447-2533
 Fla Pompano Beach, WMM Assocs. 305-943-3091
 Ill Chicago, Emcon Regional Office 312-282-7383
 Ind Indianapolis, Emcon Regional Office 317-255-9658

Mass Burlington, Emcon Regional Office 617-273-0365

Mich Benton Harbor, R.C. Nordstrom Co. 616-857-4653

Mich Lathrup Village, R.C. Nordstrom Co. 313-559-7373

Minn St. Paul, Murnco 612-484-8200

NY Elmont, F.E. Schmitt Co. 516-437-8150

NY Liverpool, L-Mar Assocs. 315-457-2329

NY Rochester, L-Mar Assocs. 716-328-5240

NY Vestal, L-Mar Assocs. 607-729-6339

Ohio Columbus, Rockford Controls 614-231-5890

Ohio Dayton, Rockford Controls 513-278-7362

Ohio Euclid, Rockford Controls 216-731-5250

Pa Erie, Ecco Elctns. 814-455-8110

Tenn Memphis, Emcon Regional Office 901-386-7252

Tex Houston, R.F. Kimball Co. 800-294-2805

Tex Richardson, R.F. Kimball Co. 214-231-3447

Utah Salt Lake City, Camel Elctns. 801-355-6181

Wash Seattle, Nemco

EXP: Chicago, Ill., Illinois Tool Works Inc. 312-693-3040

FOR: Can., Montreal, Que., H.W. Brieger Sls. 514-482-0722

Local Distributors

Cal Los Angeles, RPS Elctns., 1501 S. Hill St. 213-748-1271
 Cal Sunnyvale, Acacia Sls., 384 San Alejo Ave. 408-735-0100
 NY Elmont, F. E. Schmitt Co., 311 Meacham Ave. 516-437-8150

EMERGENCY BEACON CORP., 15 River Street, New Rochelle, N.Y., 10801, Tel: 914-235-9400; Empl.: 56

For info on price: J. DeLorenzo; Application info: R. Scappatura; Customer service: R. Scappatura; Delivery info: J. DeLorenzo

Products manufactured: Alarms, Amplifiers, Antennas, Comm. Systems, Filters, Handsets, Chestsets, Headphones, Headsets, Etc., Meters, Receivers, Transmitters

EMERSON & CUMING, INC., Dielectric Mat'ls. Div., 869 Washington St., Canton, Mass., 02021, Tel: 617-828-3300, TWX: 710-348-1324; Empl.: 252

For info on price: E. DiCastro; Application info: R. Wittemaur; Customer service: R. Wittemaur; Delivery info: E. DiCastro

Free literature available: Stycast Brochure - casting resins; Eccobond Brochure - adhesives; Eccocoat Brochure - coatings; Eccosil Brochure - silicones; Eccofaam Brochure - dielectric foams; Eccomold Brochure - transfer molding epoxies; Eccosorb Brochure - microwave absorbers; Eccoshield Brochure - microwave r.f. shielding; Eccospheres Brochure - hollow glass spheres.

Products manufactured: Adhesives (All Types), Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Conductive Plastic Materials, Containers, Gaskets, Shielding, R-F-Also See Shields, R-F, Interferometer Systems, Kits, Shielding, Loads, Electronic Variable, Rubber, Seals, Shields, Tubing

Local Sales Offices & Reps.

Cal Gardena, Emerson & Cuming, Inc. 213-321-6650
 Fla Cocoa Beach, DBM Research Corp. 305-783-2438
 Ill Northbrook, Emerson & Cuming, Inc. 312-272-6700
 Md Silver Spring, Emerson & Cuming, Inc. 301-949-2777
 NY Kings Park, Emerson & Cuming, Inc. 516-724-5216

Pa Philadelphia, Emerson & Cuming, Inc.
215-848-2040
Tex Richardson, Emerson & Cuming, Inc.
214-235-7394
Wash Seattle, Minor B. Brown & Assoc. 206-932-5855

EMERSON, INDUSTRIAL CONTROLS DIV. 3300
Standard St., Santa Ana, Cal., 92702, Tel:
714-545-5581; Empl.: 400

For info on price: L. J. Boutin; Application info: L. J. Boutin; Customer service: H. Greene; Delivery info: H. Greene

Products manufactured: Controls/Control Eqpt., Power Supplies, Recorders

EMI GENCOM INC., 80 Express St., Plainview, N.Y., 11803, Tel: 516-433-5900, TWX: 510-221-1889; Empl.: 13
Customer service: L. M. Lieberman

Free literature available: General catalog with supplement and revised data sheets. Also, new accessories catalog and reprints of published technical papers, on request.

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Detectors, Diodes, Dividers, Gages, Generators, Meters, Photomultiplier Tube Housings, Power Supplies, Sensors, Light Tubes

Local Sales Offices & Reps.

Ariz Scottsdale, PLS Assocs. 602-957-9110
Cal N. Hollywood, O'Halloran Assocs. 213-877-0173
Cal Palo Alto, O'Halloran Assocs. 415-326-1493
Colo Denver, PLS Assocs. 303-771-0140
Fla Orange Park, Pulcir 904-264-7615
Ill Chicago, Carter Elctns. 312-585-5485
Ill Chicago, Pivan Engrg. 312-539-4838
Ind Indianapolis, Carter Elctns. 317-293-0696
Kans Shawnee, Pivan Engrg. 913-722-1030
Mass Needham, Addelco Corp. 617-444-4754
Mich Farmington, Carter, McCormic & Peirce 313-477-7700
Mich Kalamazoo, Carter, McCormic & Peirce 616-349-9666
Minn Minneapolis, Carter Elctns. 612-544-8393
Mo St. Louis, Pivan Engrg. 314-567-3636
NJ East Orange, Friedman Assocs. 201-673-2500
NM Albuquerque, PLS Assocs. 505-255-2300
NY Fayetteville, M.P. Andrews 315-637-3144
Ohio Cleveland, Carter, McCormic & Peirce 216-333-5650
Ohio Dayton, Carter, McCormic & Peirce 513-278-5873
Ore Beaverton, N.R. Schultz Co. 503-643-1644
Pa Elkins Park, Snow Assocs. 215-379-4700
Pa Pittsburgh, Carter, McCormic & Peirce 412-824-3760
Tenn Knoxville, Pulcir 615-693-3641
Tex Dallas, Southwestern Eng. & Equip. Co. 214-826-6661
Tex Houston, Southwestern Eng. & Equip. Co. 713-353-4333
Wash Bellevue, N.R. Schultz Co. 206-454-0300
Wisc Milwaukee, Carter Elctns. 414-464-5555

EMPORIUM SPECIALTIES CO., INC., Box 65, Austin, Pa., 16720, Tel: 814-647-8661; Empl.: 150

For info on price: W. G. Munsell; Application info: D. English; Customer service: T. Lepold; Delivery info: W. G. Munsell

Products manufactured: Bearings, Bushings, Glass, Plastic, Metal, Rubber, Etc., Cams, Connectors, Forms, Wire, Services, Assembly, Production & Test, Terminals, Tools, Wrenches

Local Sales Offices & Reps.

Ariz Scottsdale, C.T. Fink & Assocs. 602-947-7981
Cal Burbank, H.N. Petersen Sls. Co. 213-848-7091
Cal Lynwood, D. West & Assocs. 213-636-6124
Cal Oakland, MHR Sls. Agency 415-569-1564
Conn Woodbury, Hart, Nininger & Campbell 203-263-4321
Fla Lighthouse Point, E. Whalen 305-781-6996
Ill Chicago, K.D. Engle Co. 312-539-1820
Ind Indianapolis, T. Tuohy 317-356-3001
Md Ellicott City, Special Prods. 301-465-5922
Mass Gloucester, P. Hart 617-281-0679
Mich St. Claire Shores, L. Donlon 313-775-6496
Minn Anoka, Magner & Assocs. 612-427-5550
NJ Montvale, H. Herzing 201-573-0967
NJ Riverton, Given Assocs. 609-829-7249
NY New York, A. Oppenheim 212-683-1093
NY Roslyn Heights, R. Binder 516-621-8279
NY Tonawanda, N.A. Throm & Assocs. 716-693-4468
NC Charlotte, S.M. Clarke 704-376-8262
Ohio Chagrin Falls, Bray Assocs. 216-247-4474
Ohio Cleveland, G.F. Sindelar Co. 216-333-9945

Tex Richardson, C.J. Garvey Co. 214-234-3371
Wisc Wauwatosa, C. Garry 414-475-9290

EMPRO MFG. CO., INC., Box 26064, 10920 E. 59th St., Indianapolis, Ind., 46226, Tel: 317-823-4478; Empl.: 25;
Minimum order: \$10 p. 1-692,693

Free literature available: CATALOG 72 Full line catalog of Empro standard model DC ammeter shunts. Includes photographs and drawings of ten types, with dimensions of 177 different models. Six pages. BULLETIN 72A One page bulletin on the Empro DC ammeter shunt Model LAB for laboratory use.

BULLETIN CM One page Empro bulletin showing examples of custom made DC ammeter shunts.

Products manufactured: Shunts, Meter

Local Sales Offices & Reps.

Ga Atlanta, Brownell Electro Inc. 404-762-5181
Ill Chicago, A & M Inst. Inc. 312-774-3500
Ill LaGrange, Penn Engrg. 312-352-1037
Mass Burlington, Mancib Co. 617-272-9450
NY Flushing, D.F. Tobias & Co. 212-545-9191
Ohio Cleveland, Weschler Elec. Corp. 216-251-4609
Pa Philadelphia, Sunshine Scientific Inst. 215-673-5600

EMR TELEMETRY, Weston Instrument Co., Box 3041, Sarasota, Fla., 33578, Tel: 813-371-0811, TWX: 810-864-0406; Empl.: 525; Minimum order: \$25

Free literature available: Condensed catalog plus individual spec. sheets for any product listed therein.

Products manufactured: Analyzers, Calibrators, Comm. Systems, Converters, Decommutators, Telemetering, Discriminators, Filters, Multiplexers, Oscillators, Transmitters

Local Sales Offices & Reps.

Cal Cupertino, EMR-Telemetry 408-257-1813
Cal Lancaster, EMR-Telemetry 805-948-7614
Cal Playa Del Rey, EMR-Telemetry 213-821-8084
Fla Sarasota, EMR-Telemetry 813-371-0811
Ill Chicago, Carter Elctns., Inc. 312-585-5485
Ind Indianapolis, Carter Elctns., Inc. 317-293-0696
Kans Overland Park, Carter Elctns., Inc. 913-649-6996
Md Rockville, Farrell Assocs. 301-424-9460
Md Silver Spring, EMR-Telemetry 301-588-8200
Mass Waltham, EMR-Telemetry 617-890-1183
Mich Southfield, EMR-Telemetry 313-559-2580
Minn Minneapolis, Carter Elctns., Inc. 612-544-8393
Mo Hazelwood, Carter Elctns., Inc. 314-731-2237
Tex El Paso, EMR-Telemetry 915-542-0966
Wash Seattle, EMR-Telemetry 206-243-4330
Wisc Milwaukee, Carter Elctns., Inc. 414-464-5555

ENCOM PRODS. CO., INC., Lower Hopewell Rd., Oxford, Pa., 19363, Tel: 215-932-9265; Empl.: 10

Customer service: R. P. Mallalieu

Free literature available: Data sheets describing the various intercom/paging phones manufactured by ENCOM. Data sheet describing the ENCOM Model ETA-25 Power Amplifier for voice paging applications.

Products manufactured: Amplifiers, Comm. Systems, Public Address Systems

Local Sales Offices & Reps.

Pa Pittsburgh, Control Assembly Co.

Local Distributors

Ala Birmingham, Sound Engrg. Svc., 2317-2nd Ave. S. 205-322-4408
Alas Anchorage, Electronics Alaska, 507 E. Northern Lights 907-272-5447
Ariz Phoenix, Comm. Consultants, 4111 E. McDowell 602-267-1411
Cal Los Angeles, General Intercom, 1849 Arlington 213-731-6336
Cal Oakland, Comm. Svc. Co., 600-16th St. 415-893-6970
Cal San Dimas, Pacific Intercom, 730 E. Foothill 213-963-1225
Del Wilmington, Megonigal Elex., 304 N. Maryland 302-652-3178
Fla Hollywood, Comm. Svc. Co., 1932 Tyler 305-961-1157
Fla Orlando, Dictograph/N. Fla., 1537 Smith 305-841-1360
Ga Atlanta, JWM Corp./Comm. Div., 1141 Spring, NW 404-875-8175
Ill Chicago, G & O Industries, 5752 N. Calif. 312-334-2294
Ill Chicago, Industrial Comms., 5843 W. Div. 312-626-7500
Ill Chicago, Modern Comms. Inc., 8333 Niles Ctr. 312-677-0700

Ill Springfield, Elec. Specialty Co., 135 N. Illinois 217-787-0800

Ill Elkhart, Penwood Sls. Corp., 115 N. Main St. 219-293-3615

Iowa Des Moines, Tempur, Inc., 3833 E. 27th 515-265-1586

Kans Kansas City, A. A. Richards Co., 1206 State Ave. 913-321-3977

Md Ellicott City, B. F. Whitten Co., 3702 St. Johns La. 301-465-0797

Mass Canton, Mass. Tel. Co., 11 Beaumont St. 617-828-8400

Mich Detroit, Stanley's Comms., 13507 Keystone 313-366-6344

Minn Minneapolis, Interior Comms., 7705 Morgan Ave. S. 612-866-4001

Mo St. Louis, St. Louis Comms., 7811 Carondelet 314-726-2218

NJ Beverly, Dynasonic Inc., 429 Cooper St. 609-386-6900

NJ Bloomfield, Bingham Comms., 69 E. Passaic 201-748-3575

NJ Elizabeth, Tel-A-Tune Music, 422 Trinity Pl. 201-965-1144

NJ Mahwah, N. A. Philips, 91 McKee Dr. 201-529-3800

NY Batavia, Demerly Comms., 104 Cedar St. 716-343-4946

NY Buffalo, Hunter & Bell Inc., 858 Main St. 716-882-2210

NY Marcellus, Div. Concepts, 3929 New Seneca 315-673-2088

NY Woodside, Imperial Elex., 33-44; 61st St. 212-458-7275

NC Winston-Salem, Long Engrg. Co., 961 Burke St. 919-725-2306

Ohio Akron, Elec. Engrg. Co., 362 W. Bowery 216-762-9771

Ohio Cleveland, Warwick Comms., 3125 Detroit 216-621-7127

Okla Lawton, Automatic Music, 425 Ave. F 405-355-4926

Pa Allentown, Daveland Co., 407 Linden St. 215-439-8701

Pa Pittsburgh, Gray Sound, 10 California 412-761-6130

RI Providence, Gertz Inc., 166 Broadway 401-421-5881

Tenn Chattanooga, Sound Engrg. Co., 1209 S. Watkins 615-624-3381

Tex Corpus Christi, Sound Distributors, 515 S. Water St. 512-882-2282

Va Richmond, Cottrell Elex., 408 E. Main 703-648-8338

Wash Seattle, Electronic Aids, 2642-42nd Ave. SW. 206-937-3399

WV Wheeling, H. Black Co., 123 N. 23rd St. 304-277-1651

Wisc Wauwatosa, Krueger Elex. Inc., 9021 Jack. Park 414-453-0650

ENCODER DIVISION, Litton Sys. Inc., 20745 Nordhoff St., Chatsworth, Cal., 91311, Tel: 213-341-6161, TWX: 910-494-1229; Empl.: 175

Products manufactured: Encoders

ENDEVCO, Div. Becton, Dickinson & Co., 30700 Rancho Viejo Rd., San Juan Capistrano, Cal., 92675, Tel: 714-493-8181, TWX: 910-588-3272; FSC No: 95411; Empl.: 400; Minimum order: \$25

Customer service: J. Wilson

Products manufactured: Accelerometers, Amplifiers, Analyzers, Calibrators, Detectors, Filters, Meters, Power Supplies, Recorders, Signal Conditioners & Equipment, Test Equipment, Testers, Transducers

Local Sales Offices & Reps.

Cal Palo Alto, Endevco 415-969-3212
Fla Palm Beach Gardens, Endevco 305-622-2122
Ill Crystal Lake, Endevco 815-459-7226
Md Towson, Endevco 301-752-0688
Mass Bedford, Endevco 617-969-8063
Mich Southfield, Endevco 313-557-6675
NJ Haddonfield, Endevco 609-428-5285
Ohio Akron, Endevco 216-929-3811

ENDICOTT COIL CO., 24 Charlotte St., Binghamton, N.Y., 13905, Tel: 607-797-1263; Empl.: 110

p. 1-1206; p. 2-396
For info on price: R. Beebe; Application info: R. Beebe; Customer service: R. Beebe; Delivery info: C. Biviano

Free literature available: E700 Power supply Bulletin & Specifications (DC to DC for glow discharge displays); E8600 Clicker for Audible Feedback of Completed Information Input; Linear Solenoid Data Sheet; E305 Vibrator for Shaking or Moving Small Parts; E29 & E30 Buzzers (AC only).

Products manufactured: Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Bobbins, Winding, Coil & Transformer, Coils Including Assemblies & Forms, Converters, Data Compressors, Digital, Inverters, Power Supplies, Services, Assembly, Production & Test, Solenoids, Valves, Solenoid, Vibrators

Local Sales Offices & Reps.

Cal Palo Alto, Testco Inc. 415-326-5320
Cal Panarama City, Testco Inc. 213-988-2671
Fla Orlando, M.G. Assoc. 305-841-8793
Ill Crystal Lake, Dessco 815-459-8688
Md Timonium, Heller Assoc. 301-252-4780
Mass Lexington, Sir Assoc. 617-862-1812
Mich Detroit, Blumenberg Assoc. 313-557-1934
NY Endicott, Tech-Mark Inc. 607-748-7473
NY Williamsville, H. C. Johnson 716-632-7880
Ohio Dayton, Dynel Co. 513-434-6467
Pa Ardmore, Freedman Assoc. 215-649-3679
Tex Richardson, Palatine Inc. 214-231-9489
Wash Bellevue, Testco 206-454-7422
WVa Glenshaw, H.C. Johnson 412-961-0414

ENERGY CONVERSION DEVICES, 1675 W. Maple Rd., Troy, Mich., 48084

ENERGY ELCTR. PRODUCTS CORP., 6060 Manchester Ave., Los Angeles, Cal., 90045, Tel: 213-670-7880, TWX: 910-325-6161; Empl.: 17

Products manufactured: Integrated Circuit Devices, Transistors

ENERGY TECHNOLOGY CORP., See TOR Corp.

ENGDAHL ENTERPRISES, 2850 Monterey Ave., Costa Mesa, Cal., 92626, Tel: 714-540-0398; Empl.: 5
Customer service: P. D. Engdahl

Free literature available: Peak Shock Recorder describes a response spectrum recorder. Peak Shock Annunciator describes a response spectrum annunciator. Talk to Seismological Society of America describing a response spectrum recorder and annunciator.

Products manufactured: Accelerometers, Alarms, Annunciators, Data Acquisition & Reduction Systems, Meters, Recorders, Transducers

ENGELHARD MINERALS & CHEM., Engelhard Inds. Div., 430 Mountain Ave., Murray Hill, N.J., 07974, Tel: 201-464-7000

Customer service: A. Nabor Ext. 478

Free literature available: Literature on: Brazing alloys & flux for joining metals, Precious metal refining, Thick & thin films & powders, Clad metals, Modulus alloy, Contact assemblies, Plating solutions.

Products manufactured: Alloys, Brushes & Brush Assemblies, Chemicals, Circuits, Hybrid, Thick Film, Contact Strips, Finger, Contacts, Electrical, Films, Flux, Brazing & Soldering Materials, Fuses, Inks For Thick Film Microcircuits, Laminates, Metal Compounds, Foils, Powders, Sheet, Stock, Metals, Paints, Preforms, Precious Metal, Resistors, Rivets, Slip-Rings & Assemblies, Solder (All Types), Springs (All Types), Thermocouples, Elements & Accessories, Wire

Local Sales Offices & Reps.

Ala Birmingham 205-871-3202
Cal E. Palo Alto 415-968-2613
Cal Los Angeles 213-724-1800
Ill Skokie 312-673-1900
Mich Southfield 313-557-1424
Tex Dallas 214-350-4106
FOR: Can., Toronto, Ont. 416-362-3211

ENGLMANN MICROWAVE, Skyline Dr., Montville, N.J., 07045, Tel: 201-334-5700, TWX: 710 987-8344; Empl.: 100; Minimum order: \$15

For info on price: C. Schraufnagl; Application info: H. F. Bailey; Customer service: E. Wiest; Delivery info: E. Wiest

Products manufactured: Attenuators, Comparators, Couplers, Detectors, Discriminators, Dividers, Filters, Junctions, Hybrid, Microwave, Limiters, Mixers, Modulators, All Kinds, Switches, Terminals

Local Sales Offices & Reps.

Cal Inglewood, L & M Engrg., Inc. 213-674-6850

Cal Santa Clara, L & M Engrg. Inc. 408-243-2891
Conn Stamford, Dage Corp. 203-324-3125
Fla Fort Lauderdale, Snow Co. 305-563-2448
Ga Smyrna, SparTech Assocs. 404-432-3644
Ill Highland Park, Feller Assocs. 312-433-3651
Ind Rochester, Feller Assocs. 219-223-2377
Md Columbia, Neal Deoul Assocs. 301-997-4353
Mass Lowell, Russell Engrg. 617-458-5146
NY Bridgeport, Lightstone Corp. 315-699-5747
NY Huntington, CDB Enterprises, Inc. 516-692-5200
Pa Lafayette Hill, M. Lader Co. 215-825-3177
Wash Bellevue, Ray Over Sls. 206-454-4551

ENGINEERED COMPONENTS CO., 3580 Sacramento Dr., San Luis Obispo, Cal., 93401, Tel: 805-544-3800; FSC No: 32440; Empl.: 75

For info on price: M. Clarke; Application info: B. Rorick

Free literature available: Insulator Catalog - over 100 component mounting insulators. Encapsulation Shell Catalog - more than 2,000 sizes in Round, Oblong, Square, and Module Configurations. Delay Line Brochures - description of Delay Lines. Capacitor Brochures - capacitors available TTLDM, ECLDM Brochures

Products manufactured: Capacitors, Fixed, Delay Lines, Filters, Generators, Networks, Oscillators

Local Sales Offices & Reps.

Ariz Phoenix, Gramer Co. 602-279-1231
Cal Downey, Groh Assocs. 213-923-0963
Cal Palo Alto, R. W. Thompson Assocs.
Cal San Diego, Daniels & Doty Sls. Co. 714-560-6266

Colo Boulder, R. G. Ents. 303-447-9211
Iowa Des Moines, Beams 515-282-0292
Kans Shawnee Mission, Beams 913-341-7744
Md Hyattsville, Eastern Components 301-557-2925
Mass Woburn, Jalco Assocs. 617-227-1515
Minn Hopkins, Fred Peterson Co. 612-941-5400
Mo Creve Couer, Beams 314-569-1060
NY Brentwood, Cir-Tech Assocs. 516-231-4440
NY De Ruyter, R. A. Murray Co. 315-852-9981
NY Rochester, R. A. Murray Co. 716-467-4538
Ohio Cleveland, Electro-Com 216-886-2404
Ohio Dayton, Electro-Com 513-276-3993
Pa Flortown, Eastern Components 215-836-1616
Pa York, Eastern Components 714-764-3114
Tex Houston, Aid Elctns. 713-777-3882
Tex Irving, Aid Elctns. 214-259-4761
Wash Kirkland, Freed Assocs. 206-822-8100

ENM, 5350 Northwest Hwy., Chicago, Ill., 60630, Tel: 312-775-8400; Empl.: 140

Products manufactured: Counters, Timers

ENTERPRISE DEVELOPMENT CORP, 5127 E. 65th St., Indianapolis, Ind., 46220, Tel: 317-251-1231; Empl.: 10; Minimum order: \$5

For info on price: L. Kopernak; Application info: R. Kopernak; Customer service: L. Kopernak; Delivery info: A. Kopernak

Products manufactured: Soldering Accessories, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools

Local Sales Offices & Reps.

Cal Redwood City, Sinai-Johnson, Inc. 415-365-6263
Fla Ormond Beach, J.F. Thompson Co. 904-677-2298
Ga Tucker, Elrep Sls. Co. 404-938-7108
Ill Skokie, M. Berman Sls. 312-679-2293
Ind Indianapolis, Elctrn. Rep., Inc. 317-897-9326
Mass Northboro, W.B. Pray Sls. 617-393-3434
Mich Livonia, F. Peters & Assocs. 313-425-0086
Minn Minneapolis, D. Borrett Co. 612-929-0028
Mo Ballwin, R.J. Throckmorton Sls. Co. 314-227-7222

NY Camillus, Callahan-Ferguson Co. 315-487-3870
Ohio St. Mary's, T. Shelby & Co. 419-394-3377
Pa Philadelphia, S.K. Macdonald, Inc. 315-545-1205

Tex Richardson, Campion Sls. Co. 214-238-8145
Wash Seattle, Larrabee & Assocs. 206-623-2521

ENVIRONMENTAL COMMUNICATIONS INC., 3150 Pullman St., Costa Mesa, Cal., 92627, Tel: 714-557-7800, TWX: 910-595-1781

Free literature available: Facility brochure-custom hybrid micro circuits.

Products manufactured: Alarms, Amplifiers, Attenuators, CATV Systems & Equipment, Circuits, Hybrid, Thin-Film, Comm. Systems, Comparators, Controls/Control Eqp., Converters, Couplers, Current Sensors, Decoders, Demodulators, Detectors, Diodes, Discriminators, Display Devices/Displays, Dividers, Drivers, Switch, Drivers & Decoders For Readouts, Electronic Switches (Oscilloscope), Encoders, Films, Filters, Flashers, Generators, Hybrid Voltage Regulators, Integrated Circuit Devices, Integrators, Electronic, Lamp Drivers, Limiters, Microcircuit Production Equip., Mixer-Preamplifiers, Microwave, Mixers, Modulator/Demodulators, Modulators, All Kinds, Modules, Logic, Encapsulated, Monitors, Multiplexers, Multipliers, Networks, Oscillators, Preslector-Mixers, Receivers, Rectifiers, References, D-C Voltage, Regulators, Resistors, Restorers, Pulse Form, Services, Assembly, Production & Test, Shifters, Signal Conditioners & Equipment, Strip-Line Components, Microwave, Substrates, Timers, Transmitters

ENVIRONMENTAL CONTAINER SYS., INC., 3560 Rogue River Hwy., Box 188, Grants Pass, Ore., 97526, Tel: 503-479-5388; FSC No: 24995; Empl.: 100; Minimum order: \$50 p. 160,61

For info on price: J. Innes; Application info: D. Becklin; Customer service: B. Jaeger; Delivery info: Mktg./Scheduling

Free literature available: 1. "Standard Case Catalog": Lists Approx. 1200 standard case sizes and styles available from stock tooling. Includes hardware, colors, and ordering information. 80 pages 2. "Instrumentation Operating Cases": Transportable shock mounted, rack-mount, operating enclosures. Sizes from 5 1/4" to 47 3/8" rack height. Accessory drawers and design options are described. 20 pages 3. "Tape Reel Cases": Fiberglass cases for 8 1/2" & 11" diameter tape reel. Case sizes for 2 reels, 4 reels & 6 reels. Waterproof and/or magnetically shielded. 2 pages 4. "Excalibur": Cloth laminated, fiberglass cases for camera equipment, electronic equipment, sporting rifles and shotguns, 4 pages

Products manufactured: Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Cases, Transit, Containers, Drawers, Sliding

Local Sales Offices & Reps.

Cal Newport Beach, W. Burkhart 714-673-0681
Cal Sebastopol, R. Connick 415-494-3661
Fla Orlando, Gra-Mar, Inc. 305-894-3351
NM Albuquerque, R.A. Mayes Co. 505-293-8010
Tex Dallas, E.A. Robertson, Inc. 214-942-2716

ENVIRONMENTAL RESEARCH GRP., 313 N. First St., Ann Arbor, Mich., 48103, Tel: 313-662-3104

Customer service: F. Hammer

Free literature available: Eight-page brochure discusses ERG's problem-solving capabilities in Chemical Analysis, Toxicology, and Radiation Studies, Air Pollution and Industrial Health Analysis.

Products manufactured: Services, Assembly, Production & Test

EPIC, INC., 150 Nassau St., New York, N.Y., 10038, Tel: 212-349-2470; Empl.: 8; Minimum order: \$10

For info on price: P. Letica; Application info: P. Letica; Customer service: M. Couteau; Delivery info: F. Harding

Free literature available: Hand Vibrograph, Infrared Pyrometer Kustotherm, Electrical Clip-on AC Meters, Resistance Bridges, Capacitance Bridges, Standard Compressed Gas Capacitors, Micro-Optical Pyrometer

Products manufactured: Bridges, Capacitors, Fixed, Indicators, Lamps, Meters, Pyrometers, Recorders, Testers

EPOXY TECHNOLOGY, 65 Grove St., Watertown, Mass., 02172, Tel: 617-926-0136; FSC No: 33246; Empl.: 6

For info on price: J. Toppi; Application info: F. Kulesza; Customer service: A. Delmarsh; Delivery info: J. Toppi

Free literature available: Literature for The Microelectronic Industry Include Our Conductive Silver and Gold Epoxies for Chip Attachment as well as Non-Conductive Epoxies. Literature on our New Insulating Epoxy for Lid Sealing.

Products manufactured: Adhesives (All Types), Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Conductive Plastic Materials, Inks For Thick Film Microcircuits

Local Sales Offices & Reps.

Cal	Pacific Palisades, Wadsworth-Pacific Mfg. Assoc. Inc.	213-454-4313
Fla	Longwood, Lenz Engrg. Co.	305-831-9797
Ill	Lake Villa, R.W. Venn Co.	312-395-5353
Mass	Newton, Normell Assocs.	617-969-5478
Mich	New Baltimore, Tech-Tron Engrg.	313-725-4600
NJ	Califon, C.W. Price Co.	201-638-6850
NY	Liverpool, Wadsworth Mfg. Assoc. Inc.	315-652-6865
Tex	Richardson, Oeler & Menelaides, Inc.	214-234-6334
Utah	Salt Lake City, Specialty Sls. Co.	801-262-2979
Wash	Seattle	206-938-4166
EXP:	Plainville, Mass., Teknis	617-695-3591

EPOXYCAST ELECTRONIC CASE CO., 222 Lake Ave., Yonkers, N.Y., 10701, Tel: 914-YO3-5900

For info on price: J. J. Wilentchik; Application info: J. J. Wilentchik; Customer service: A. Powers; Delivery info: A. Powers

Products manufactured: Cups, Encapsulation, Enclosures, Module, Plug-In

EPSCO, INC., 920 Westwood Dr., Addison, Ill., 60101, Tel: 312-543-0410; FSC No: 53003; Empl.: 9; Minimum order: \$10 p. 1-1200,1201

Customer service: J. W. Storch

Products manufactured: Inverters, Power Supplies

Local Sales Offices & Reps.

Ohio	Cleveland, Fred Sharp Co.	216-464-3820
------	---------------------------	--------------

Local Distributors

Ala	Birmingham, Forbes Dist. Co., 1416 4 Ave. S.	205-251-4104
Ariz	Phoenix, R.V. Weatherford Co., 1917 No. 25th Dr.	602-272-7144
Ark	Little Rock, Carlton-Bates Co., Scott Ham. at 69th	501-562-9100
Cal	Garden Grove, Allied Elctns., 12311 Ind. St.	213-598-6605
Cal	Glendale, Western Elctn. Supply, 229 S. Orange St.	213-246-4861
Colo	Denver, R. V. Weatherford Co., 3905 So. Mariposa	303-761-5432
Conn	New London, Aikins Elctn. Supply, 531 Broad St.	203-442-4406
Del	Wilmington, Almo Elctn. Corp., 1122 French St.	302-656-9467
DC	College Park, Allied Elctns., 4911 Niagara Rd.	301-345-4600
Fla	Tampa, Lykes Elctns., Box 24047	813-886-6621
Ga	Atlanta, Spec. Distr. Co., 763 Juniper St. N.E.	404-873-2521
Haw	Honolulu, Honolulu Elctn., 819 Keeaumoku	949-5564
Idaho	Twin Fall, Central Elctn., 125 Second St. W.	
Ill	Chicago, Allied Elctn., 2400 W. Washington Blvd.	312-421-2400
Ill	Chicago, Newark Elctns., 500 N. Pulaski	312-638-4411
Ind	Indianapolis, Graham Elctns. Supply, 133 S. Pa. St.	317-634-8202
Iowa	Cedar Rapids, Deeco, Inc., 2500 16th Ave., S.W.	319-365-7551
Kans	Topeka, Interstate Elctn. Supply, 2500 S. Kan. Ave.	913-235-2396
Ky	Lexington, Radio-Elctn. Equip., 480 Skain Ave.	606-255-6661
La	New Orleans, Southern Radio Supply, 1909 Tulane Ave.	504-524-2324
Me	Portland, Holmes Distr., 510 Cumberland	207-774-5901
Md	College Park, Allied Elctn., 4911 Niagara Rd.	301-345-4600
Mass	Braintree, Allied Elctn., 1 Century Cir.	617-848-4150
Mich	Ann Arbor, Wedemeyer Elctn. Supply Co., 2280 S. Ind. Hwy.	218-727-1565
Minn	Duluth, Northwest Radio of Duluth, 123 E. First St.	218-727-1565
Miss	Jackson, Ellington Elctn. Supply, 1425 Terry Rd.	601-355-0561
Mo	Kansas City, Walters Radio Sup., 3627-35 Main St.	816-531-7015
Mont	Billings, Elctn. Supply Co., 250 11 St. W.	406-252-2197
Neb	Lincoln, Scott Elctn. Supply Co., 4040 Adams St.	402-434-8308
Me	Portland, Holmes Distr., 510 Cumberland	207-774-5901
Nev	Las Vegas, Indl. Elctns., 300 W. Utah	702-384-2151
NH	Concord, Evans Radio & Elctns., Box 893	603-224-9961

NJ	Kenilworth, Newark Elctns., 303 Monroe Ave.	201-272-8410
NJ	Rahway, Quad Parts Distr., 1561 Main St.	201-381-5400
NM	Albuquerque, R. V. Weatherford Co., 6101 Marble Ave., N.E.	505-265-5671
NY	Buffalo, Summit Distr., 916 Main	716-884-3450
NY	New York, Newark Elctns., 3000 S. Winton Rd.	716-473-6800
NC	Raleigh, Southeastern Supply, 414 Hillsborough	919-828-2313
ND	Minot, J-I Co., Inc., 330 N. Bdwy.	701-838-5466
Ohio	Cleveland, RPC Elctn. of Ohio, 749 Miner Rd.	216-461-4700
Okla	Oklahoma City, Trice Wholesale Elctns., 4701 N. Stiles	405-232-2291
Ore	Portland, United Radio Supply, 123 N.E. 7th Ave.	503-233-5346
Pa	Philadelphia, Almo Elctn., 9815 Roosevelt	215-676-6000
RI	Providence, W. Candreta & Co., 28 Wolcott St.	401-861-2100
SC	Columbia, Dixie Radio Supply, 1900 Barnwell St.	803-253-5333
SD	Mitchell, Elctn. Supply Co., 119 E. 1st Ave.	605-996-4300
Tenn	Kingsport, Radio Supply Co., 961 E. Sullivan	615-247-8111
Tex	Ft. Worth, Allied Elctns., 401 E. 8th St.	817-336-5401
Utah	Provo, Central Utah Elctns., 735 S. State St.	801-373-7522
Vt	White River Jct., Elctn. Supply, S. Main	802-295-3536
Va	Richmond, AVEC Elctn. Corp., 2002 Staples Mill	800-373-7522
Wash	Seattle, Western Elctns. Co., 717 Dexter Ave., N.	206-284-0200
Wash	Seattle, Western Elctn. Co., 717 Dexter Ave. N.	206-284-0200
WVa	Charleston, McJunkin Corp., 1400 Hansford St.	304-348-4919
Wisc	Milwaukee, Elctn. Expeditors, 6045 N. Gr. Bay	414-228-8100
Wyo	Casper, Fleming Supply Co., 332 East A St.	

EPSCO, INC., 411 Providence Hwy., Westwood, Mass., 02090, Tel: 617-329-1500, TWX: 710-348-0484; FSC No: 99380; Empl.: 150; Minimum order: \$25

Customer service: H. Clark

Free literature available: Data sheets/brochures with detailed specifications of data conversion systems; ECM, radar, TACAN, altimeter, IFF simulators; high power microwave signal sources and cavity oscillators.

Products manufactured: Converters, Data Acquisition & Reduction Systems, Radar Systems, Receivers, Synthesizers, Test Systems, Transponders

Local Sales Offices & Reps.

Ariz	Tempe, PLS Assocs.	612-957-9110
Cal	Anaheim, Blair Assocs.	714-635-1350
Cal	San Jose, MCH Assocs.	408-246-7330
Colo	Denver, PLS Assocs.	303-771-0140
Fla	Ft. Lauderdale, Snow Co.	305-563-2448
Fla	Hallandale, Emec, Inc.	305-925-6366
Ill	Northfield, Feller Assocs.	312-446-8065
Mass	Waban, Bawer Assocs.	617-244-6572
NJ	Hayworth, Central Assocs.	201-568-0808
NM	Albuquerque, PLS Assocs.	505-255-2330
NY	Plainview, Central Assocs.	516-433-0808
NY	Syracuse, Syracuse Tech. Reps.	315-488-0222
Tex	Ft. Worth, C. Wolf & Assocs.	817-738-1996
Tex	Houston, C. Wolf & Assocs.	714-721-2442
Va	Annandale, J. Hopkins Assocs.	703-323-1641
Wash	Seattle, Datacom Assocs.	206-285-2525

EQUIPTO, Aurora Equipment Co., 225 So. Highland Ave., Aurora, Ill., 60507, Tel: 312-859-1000; Empl.: 300

Products manufactured: Benches, Consoles, Stools, Tables, Cabinets & Accessories, Carts & Dollies, Instrument & Equipment, Drawers, Sliding, Racks

EQUIPTO ENCLOSURE SYSTEMS, Div/Equito Elec. Corp., 435 Woodlawn Ave., Aurora, Ill., 60507, Tel: 312-897-4691; FSC No: Multiple; Empl.: 40 p. 1-58,59

Customer service: C. W. Peterson

Free literature available: Complete catalog containing technical and ordering information as well as price books Includes rack cabinets, consoles, accessories, blowers and fans.

Products manufactured: Blowers & Fans & Accessories, Cabinets & Accessories, Racks

Local Sales Offices & Reps.

Ala	Huntsville, J.L. Highsmith & Co.	205-881-3294
Ariz	Scottsdale, BFA Corp.	602-946-4215
Cal	Menlo Park, Long & Assocs.	415-327-1300

Cal	Santa Fe Springs, Sls. Engrs. Limited	213-921-4337
Colo	Denver, BFA Corp.	303-744-3301
Conn	Glastonbury, Edcom, Inc.	203-633-1380
Fla	Hollywood, W.B. Wimberly Co.	305-961-6962
Fla	Orlando, W.B. Wimberly Co.	305-423-2514
Ill	Palatine, J. Clark Co.	312-358-5095
Mass	Newtonville, Edcom, Inc.	617-969-9710
Mich	Royal Oak, Group Ten	313-549-3910
Minn	St. Paul, H.A. Cullen & Assocs.	612-646-7371
Mo	Blue Springs, Cairns & Hayes Elctn. Sls. Co.	816-229-1404
Mo	St. Charles, Cairns & Hayes Elctn. Sls. Co.	314-946-6677
NM	Albuquerque, BFA Corp.	505-296-8303
NM	Las Cruces, BFA Corp.	505-523-0601
NY	Port Chester, Radiation Elctns., Inc.	914-937-2300
NY	Syracuse, Labtronics, Inc.	315-454-9314
NC	Charlotte, J.L. Highsmith & Co.	704-333-7743
Ohio	Cleveland, Group Ten	216-486-2800
Ohio	Dayton, Group Ten	513-277-6531
Pa	Valley Forge, J.E. Cuesta & Co.	215-265-5800
Tex	Dallas, M. Kruvand Co.	214-827-8043
Tex	Houston, M. Kruvand Co.	713-661-3007
Utah	Salt Lake City, BFA Corp.	801-466-6522
Va	Richmond, J.L. Highsmith & Co.	804-272-5888
Va	Springfield, Scientific Devices/E-Tech	703-451-6500
Wash	Seattle, Seatronics	206-767-4330

ERA ACOUSTICS, 311 E. Park St., Moonachie, N.J., 07074, Tel: 201-641-3650, TWX: 710-990-5064; Empl.: 100; Minimum order: \$25

Customer service: J. Grieg

Free literature available: Poly-planar speaker product line, Poly-planar speaker application data. Products manufactured: Speaker Systems, Speakers



ERA TRANSPAC CORP., Sub. Electronic Research Assocs., 311B E. Park St., Dept. 1202, Moonachie, N.J., 07074, Tel: (201) 641-3650, TWX: 710-990-5064 p. 1-1200-1205

Products manufactured: Inverters, Power Supplies, Regulators

Local Sales Offices & Reps.

Ariz	Scottsdale, DeAngelo, Rothman & Cheever	602-948-2240
Cal	Culver City, DeAngelo, Rothman & Co.	213-398-6239
Fla	Melbourne, Repcom	305-254-1877
Ill	Park Ridge, R.F. Specialists	312-698-2044
Md	Baltimore, Stemler Assocs.	
Mass	Canton, New England Elctn. Sls. Co.	617-828-4835
NY	Fayetteville, M.P. Andrews Co.	315-637-3144
NY	Plainview, R.H. Smith Assocs.	516-681-3155
NY	Spring Valley, R. Smith Assocs.	914-354-6067
Ohio	Cincinnati, R. Makin Assocs.	513-232-5588
Tex	Dallas, E.B. Robertson	

ERASER CO., Box 1342, Syracuse, N.Y., 13201, Tel: 315-454-3237; Empl.: 25; Minimum order: \$10

Customer service: J. Nett

Free literature available: Full Line Catalog

Products manufactured: Brushes & Brush Assemblies, Burnishers, Contact, Chemicals, Cleaners & Solvents, Heat Guns, Production, Holders, Circuit Board (Production Type), Machines/Machinery, Production, Wire Strippers, Wire Twisters

Local Sales Offices & Reps.

Ark	Hot Springs, Meredith Young Assoc.	501-262-1365
Fla	Orlando, W.A. Brown Comps.	305-425-5505
Ill	Chicago, EMF Co., Inc.	312-889-8323
Mass	Stonham, Production Devices Corp.	617-438-2772
Minn	Minneapolis, Prod. Auto Corp.	612-866-5700
NY	Guilderland, The Solder Pot	518-355-1829
NC	Raleigh, W. A. Brown Comps.	919-876-9601
Ohio	Strongsville, Jim Finnegan & Co.	216-826-1033
Pa	Ft. Washington, Kirk-Sandell Inc.	215-643-2100
Tex	Richardson, Prod. Auto. Corp.	214-234-4002
Wash	Kingston, F. A. Haight Co.	206-297-3212
Wisc	Milwaukee, Wakefield-Krauthoff Co.	414-871-3381
EXP:	N.Y., New York, American Trading Co., Inc.	212-943-5100

FOR: Can., Montreal, Que., A D Tool Corp.
514-482-2548

Local Distributors

Ala Huntsville, W. A. Brown Comp., 1314 Buford St.
NW 205-539-4411

Cal El Monte, C. Michael, 9674 Telstar Ave.
..... 213-686-0141

Cal El Segundo, Wassco, 410 S. Douglas St.
..... 213-640-1060

Fla Clearwater, Prod. Cupboardi, 2060 Palmeto St.
..... 813-447-2581

Ga Atlanta, Elect. Insulating Supp., 1255 Collier Rd.
..... 404-355-1651

Ill Chicago, EMF Co., 6135 W. Belmont
..... 312-889-8323

Minn Minneapolis, Prod. Auto. Corp., 7726 Morgan
Ave. S. 812-866-5700

Miss Jackson, O. Van Horn Co., 451 No. Gallatin St.
..... 601-354-4321

NY Guilderland, Solder Pot, Box 14 118-355-1829

NY Syracuse, Jet Elctrn., Box 109 Oliva Dr.
..... 315-454-3237

NC Raleigh, W. A. Brown Co., 7204 Bolero Cir.
..... 919-876-9601

Pa Huntingdon Valley, H. Mann Inc., 3983 Mann Rd.
..... 215-355-7200

Tex Richardson, Prod. Auto. Corp., 777 S. Central
Exp. 214-234-4002

ERC, See Electronic Research Co.

ERIE FREQUENCY CONTROL, Div. Erie Technological
Prods., 453 Lincoln St., Carlisle, Pa., 17013, Tel:
717-249-2232, Telex: 84-2328; Minimum order: \$25

Products manufactured: Crystals, Filters,
Oscillators, Ovens

Local Sales Offices & Reps.

Cal Palo Alto 415-327-1520

Cal Santa Ana 714-835-4822

Fla Maitland 305-644-0954

Ill Des Plaines 312-297-5560

Ind Fort Wayne 219-484-1528

Mass Wakefield 617-245-7880

NJ Pennsauken 609-655-4787

NC Greensboro 919-299-1905

EXP: Pa 814-453-5611

ERIE TECHNOLOGICAL PRODUCTS, 644 W. 12 St.,
Erie, Pa., 16512, Tel: 814-453-5611, TWX: 510-696-6607;
FSC No: Multiple; QPL No: Multiple; Empl.: 2300;
Minimum order: \$50

p. 1*314,315,556,1207,1837; p. 2*127-129

For info on price: R. F. Smith; Application info: P. M.
Miller; Customer service: R. L. Whitney; Delivery info:
R. L. Whitney

Products manufactured: Capacitors, Fixed,
Capacitors, Variable, Crystals, Filters, Oscillators,
Ovens, Power Supplies, Rectifiers, Sockets

Local Sales Offices & Reps.

Cal Palo Alto, Erie Technological Prods., Inc.
..... 415-327-1520

Cal Santa Ana, Erie Technological Prods., Inc.
..... 714-835-4822

Fla Maitland, Erie Technological Prods., Inc.
..... 305-644-0954

Ill Des Plaines, Erie Technological Prods., Inc.
..... 312-297-5560

Ind Fort Wayne, Erie Technological Prods., Inc.
..... 219-484-1528

Mass Wakefield, Erie Technological Prods., Inc.
..... 617-245-7880

Mo North Kansas City, LCOMP, Inc./Kansas City
..... 816-221-2400

NJ Pennsauken, Erie Technological Prods., Inc.
..... 609-655-4787

NC Greensboro, Erie Technological Prods., Inc.
..... 919-299-1905

Pa Erie, Erie Technological Prods., Inc.
..... 814-453-5611

EXP: Erie, Pa., Erie Technological Prods. Export Sls.
..... 814-453-5611

FOR: Can., Trenton, Ont., Erie Technological Prod. of
Can. Ltd. 613-392-2581

ERIKSON SPECIALIZED TOOL CO., Box 424, Pico-Rivera,
Cal., 90660, Tel: 213-699-3719; Empl.: 4; Minimum
order: \$10

Customer service: J. R. Erikson

Products manufactured: Pliers, Screwdrivers,
Soldering Accessories, Tools, Wrenches

ESC ELCTRNS. CORP., 534 Bergen Blvd., Palisades
Pk., N.J., 07650, Tel: 201-947-0400, TWX: 710-991-9780;
Empl.: 120 p. 1*452,453,550,551

For info on price: B. Carr; Application info: R.
Peressini; Customer service: B. Carr; Delivery info: B.
Carr

Free literature available: 1. Delay Line Brochure LC
Delay Line information. 2. LC Filters Brochure-LC
Filters of printed circuit board mounting types and
discussions of ESC Telephone Line Simulators and
Equalizers and other LC Filters 3. Wide Band
Video Transformers Bulletin.

Products manufactured: Coils Including Assemblies
& Forms, Delay Lines, Equalizers, Filters,
Networks, Synthesizers, Telephone Channel Test
& Simulator Equipment, Transformers

Local Sales Offices & Reps.

Ariz Scottsdale, Carter Assocs. 602-947-4355

Cal Chatsworth, Westaironics Inc. 213-882-8977

Cal Los Alamitos, Westaironics Inc. 213-431-1101

Cal Los Altos, P.M. Sls. 415-941-4444

Cal Marina Del Ray, Westaironics Inc.
..... 213-821-7958

Fla Cocoa Beach, Barrett Assocs. 305-784-2758

Fla Maitland, Barrett Assocs. 305-678-0172

Fla Melbourne, Barrett Assocs. 305-727-2491

Fla N. Miami, Barrett Assocs. 305-681-4957

Fla St. Petersburg, Barrett Assocs. 813-345-3585

Ill Chicago, Carlson Elctrn. Sls. Co. 312-774-9022

Md Glen Burnie, New Era Sls. 301-768-6666

Mass Waltham, Betronic Assocs. 617-894-8400

Mich Mt. Clemens, Compass Assocs. 313-468-8830

Minn Minneapolis, J. J. Exon Inc. 612-566-5340

Mo St. Louis, Carlson Elctrn. Sls. Co. 314-991-0262

NJ Clifton, A. Clarfield Assocs. 212-757-6454

NY Buffalo, Telesco Assocs. 716-834-1026

NY Rochester, Telesco Assocs. 716-271-3780

NC Charlotte, J. Rudisill Assoc. Inc. 704-377-6901

Ohio Dayton, Compass Assocs. 513-252-9939

Pa Philadelphia, Mid-Eastern Assocs.
..... 215-842-2810

Tex Dallas, Mark Kruvand & Assoc. 214-827-8043

Tex Houston, Mark Kruvand & Assoc. 713-661-3007

FOR: Can., Downsview, Ont., Zaslow Sls. Co.
..... 416-727-1211

ESCO PRODUCTS, Oak Ridge Rd., Oak Ridge, NJ, 07438,
Tel: 201-697-3700; Empl.: 35

Products manufactured: Coatings, Lenses, Optical &
Camera, Lenses, Readout & Display, Microscopes,
Quartz, Fused, Silica, Fused, Tubing

ESICO, INC., Box 247, Deep River, Conn., 06417, Tel:
203-526-5361; Empl.: 40; Minimum order: \$15

For info on price: R. Lee; Application info: G. E.
Westerlund; Customer service: R. Lee; Delivery info:
R. Lee

Products manufactured: Solder Pots & Baths,
Soldering Accessories, Soldering Equipment,
Soldering Guns, Irons & Desoldering Tools

Local Sales Offices & Reps.

Colo Lakewood, Pathway, Inc. 303-232-7730

Ga Atlanta, Electr-Mech Sls. Engrg. Co.
..... 404-393-0444

Ill Chicago, H. Halinton Engrg. Assoc. 312-763-2131

Ohio Dayton, AMES Corp. 513-435-9730

Tex Dallas, Production Eng. Sls. Inc. 214-369-3181

ESNA DIV., Amerace Corp., 2330 Vauxhall Rd., Union,
N.J., 07083, Tel: 201-686-6000, TWX: 710-985-4677;
Empl.: 1100; Minimum order: \$50

For info on price: Sls. Dept.; Application info: G.
Dietrich; Customer service: Sls. Dept.; Delivery info:
Sls. Dept.

Free literature available: General product bulletin
No. 7014 visually identifies and describes the
three major cana lines of self-locking fasteners
and lists nation-wide sales offices.

Products manufactured: Fasteners, Pins

Local Sales Offices & Reps.

Cal San Francisco 415-349-6011

Cal Van Nuys 213-873-7420

Ill Chicago 312-777-2929

Ind Indianapolis 317-253-6526

Mass Boston 617-545-3424

Mich Southfield 313-646-6700

Minn Minneapolis 612-835-4599

Mo Kansas City 816-333-8394

Mo St. Louis 314-968-1336

NJ Union 201-686-6000

NY Rochester 716-473-5088

Ohio Cincinnati 513-825-8135

Ohio Dayton 513-298-2346

Ohio Strongsville 216-238-3351

Pa Ardmore 215-642-8667

Tex Dallas 214-231-2391

Wisc Milwaukee 414-786-4456

FOR: Can., Dorval, Que., Esna Ltd. 514-631-9013

FOR: Can., Markham, Ont. 416-499-1221

ESSEX INTERNATIONAL, INC., Essex Controls Div., 445
Park Ave., Sycamore, Ill., 60178, Tel: 815-895-4501,
TWX: 910-639-0611

Customer service: L. Bassill

Products manufactured: Cable, Cords, Wire

Local Sales Offices & Reps.

Cal Anaheim, Essex Int'l., Inc. 213-625-7516

Colo Denver, Essex Int'l., Inc. 303-399-0521

Ky Georgetown, Essex Int'l., Inc. 502-863-3321

Mich Berrien Springs, Essex Int'l., Inc. 616-473-4811

Minn Minneapolis, Essex Int'l., Inc. 612-331-6370

Mo St. Louis, Essex Int'l., Inc. 314-382-9000

Ohio Dayton, Essex Int'l., Inc. 513-277-8964

Pa Philadelphia, Essex Int'l., Inc. 215-236-7100

SC Bennettsville, Essex Int'l., Inc. 803-479-6211

Tenn Nashville, Essex Intl. 615-794-8451

Tex Dallas, Essex Intl. 214-369-6541

ESSEX INTERNATIONAL CORP., 1601 Wall St., Ft.
Wayne, Ind, 46802

ESSEX CONTROLS DIV., Essex International, Inc., 131
Godfrey St., Logansport, Ind., 46947, Tel:
219-753-7521, TWX: 810-295-0699; Minimum order: \$25
p. 1*1668-1681

Customer service: A. M. Maloy

Free literature available: Distributor Catalog SC-7
Covering General Purpose Relays, Power Relays &
Contactors, Miniature Sensitive Relays,
Solenoids, Time Delays-Complete Engineering
Data Dimensions & Prices.

Products manufactured: Relays, Switches

Local Sales Offices & Reps.

Cal Anaheim, Essex Int'l., Controls Div.
..... 213-625-7516

Cal Burlingame, Leddy Assocs. 415-347-5247

Colo Denver, R.G. Bowen Co. 303-722-4641

Conn Madison, A & M Elctrn. Reps., Inc.
..... 203-245-1031

Fla Clearwater, Reynolds & Assocs. 813-726-2373

Fla Ft. Lauderdale, Reynolds & Assocs.
..... 305-581-6611

Fla Hollywood, Reynolds & Assocs. 305-987-6720

Fla Palm Beach Gardens, Reynolds & Assocs.
..... 305-622-6850

Fla Satellite Beach, Reynolds & Assocs.
..... 305-773-4700

Fla St. Petersburg, Reynolds & Assocs.
..... 813-360-1484

Ga Atlanta, Reynolds & Assocs. 404-252-5360

Ill Chicago, Essex Intern'l. Inc. Controls Div.
..... 312-478-9151

Ind Greenwood, Valentine & Schillinger & Assoc.
..... 317-888-2260

Ind Logansport, Essex Intern'l. Inc. Controls Div.
..... 219-753-7521

Ind South Bend, Valentine & Schillinger & Assoc.
..... 219-291-6258

Iowa Cedar Rapids, Palatine Sls., Inc. 319-365-8071

Kans Andover, Palatine Sls., Inc. 316-683-7512

Kans Overland Park, Palatine Sls. Inc. 913-262-6820

Md Baltimore, W.S. Warrington & Assocs.
..... 301-823-8759

Mass Needham, A & M Elctrn. Reps. 617-444-8170

Mich Berrien Springs, Essex Intern'l., Inc. Controls
Div. 616-473-4811

Minn Minneapolis, Essex Intern'l., Inc. Controls Div.
..... 612-331-6370

Mo St. Louis, Palatine Sls., Inc. 314-426-7055

NJ South Hackensack, Essex Intern'l., Inc. Controls
Div. 201-641-4407

NY Dewitt, Essex Intern'l., Inc. Controls Div.
..... 315-446-0800

NC Charlotte, Reynolds & Assocs. 704-527-2536

Ohio Centerville, C.H. Dolfuss, Jr. & Co.
..... 513-433-6776

Ohio Rocky River, C.H. Dolfuss Jr. & Co.
..... 216-333-7504

Oklahoma Tulsa, Palatine Sales 918-622-0321

Ore Portland, C. K. Shanks & Assoc. 503-292-5656

Pa Blue Bell, Essex Intern'l., Inc. Controls Div.
..... 215-542-8476

Tex Austin, Palatine Sls. 512-451-7463

Tex Houston, Palatine Sls. 713-777-4477

Tex Richardson, Palatine Sls. 214-231-9489

Wash Seattle, C. K. Shanks & Assoc. 206-632-4290

Local Distributors

Ala Huntsville, Powell Elctrn., Inc., 803 Oster Dr.
..... 205-539-2731

Ariz Tucson, Inland Elctrn. Supply, 715 E. Bdwy.
..... 602-624-4402

Ark Fort Smith, Carlton-Bates Co., 302 North 6th St.
..... 501-782-7258

Ark Jonesboro, Bluff City Distributing Co., 324 Huntington 501-932-7811

Ark Little Rock, Carlton-Bates Co., 69th & Scott Hamilton Dr. 501-562-9100

Cal Burbank, Terminal Elctns. Corp., 2402 W. Olive 213-843-1221

Cal Fresno, Dunlap Elctns., 1750 E. McKinley Ave. 209-268-6111

Cal Hayward, Dunlap Elctns., 25354 Cypress Ave. 415-352-1933

Cal Mountain View, Terminal-Hudson Elctns., Inc., 880 Maude Ave. 415-969-9240

Cal Redwood City, Electrical Slis. Prods., 465 Convention Way 415-364-2621

Cal San Leandro, Electro Comps. Dist., 1939 Republic Ave. 415-352-5210

Cal Santa Clara, Fisher Switches, Inc., 3331 Edward Ave. 408-244-6182

Colo Denver, Dixon Elec. Supply, Inc., 4880 E. Pacific Pl. 303-757-7453

Colo Denver, Newark/Denver Elctns., 2170 S. Grape St. 303-757-3351

Conn Hamden, Wilshire Elctns./Conn., 2554 State St. 203-281-1166

Fla Daytona Beach, Hammond Elctns., Inc., 719 N. Ridgewood Ave. 904-253-0531

Fla Fort Myers, Hammond Elctns., Inc., 2563 4th St. 813-334-2277

Fla Jacksonville, Hammond Elctns., Inc., 250 East First St. 904-356-4851

Fla Lakeland, Hammond Elctns., Inc., 830 East Oak St. 813-686-4145

Fla Miami, Electro-Standards Labs, Inc., 3560 N. W. 34th St. 305-633-6973

Fla Miami, Electronic Equip. Co., 2701 N.W. 42nd Ave. 305-671-3500

Fla Orlando, Hammond Elctns., Inc., 911 West Central Blvd. 305-849-6060

Fla Tampa, Hammond Elctns., Inc., 1516 Cypress St. 813-253-0104

Ga Atlanta, Specialty Distributing Co., 763 Juniper St. N.E. 404-873-2521

Ill Chicago, Newark Elctns., 500 North Pulaski Rd. 312-638-4411

Ill Elgin, Allied Elctns., 1355 Sleepy Hollow Rd. 312-697-8200

Ill Peoria, Klaus Radio, Inc., 8400 N. Pioneer Pkwy. 309-691-4840

Ind Evansville, Hutch & Son, Inc., 300 N. Main St. 812-425-7201

Ind Fort Wayne, Fort Wayne Elctns. Supply, Inc., 3606 E. Maumee Ave. 219-423-3422

Ind Indianapolis, Graham Elctns. Supply, Inc., 133 S. Pennsylvania St. 317-634-8486

Iowa Cedar Rapids, Deeco, Inc., 2500-16th Ave. S.W. 319-365-7551

Kans Wichita, Radio Supply Co., 115 Laura 316-267-5216

La Metairie, Industrial Distributors, Inc., 710 Papworth Ave. 504-835-7281

Md Baltimore, A S I Elctns., 1728 - 30 Whitehead Rd., Meadows Industrial Pk. 301-265-5100

Md Beltsville, Powell Elctns., Inc., 10728 Hanna St. 301-474-1030

Md Gaithersburg, Pioneer/Wash., 9100 Gaither Rd. 301-948-0710

Mass Dedham, Gerber Elctns. & Radio Supply Co., 852 Providence Hwy. (U.S. Rt. 1) 617-329-2400

Mich Detroit, RS Elctns., 12775 Lyndon Ave. 313-491-1012

Mich Grand Rapids, Stotts-Friedman, 2035 Eastern Ave., S.E. 616-241-6731

Minn St. Paul, Gopher Elctns. Co., 2520 W. Larpenteur 612-645-0241

Miss Columbus, Bluff City Distributing Co., 116 S. 22nd St. 601-328-6212

Miss Greenville, Bluff City Distributing Co., Box 5606 601-334-4412

Miss Tupelo, Bluff City Distributing Co., 210 South Glaster 601-842-6832

Mo Kansas City, Burstein-Applebee, 3199 Mercier St. 816-531-5614

Mo North Kansas City, LCOMP, 1520 Taney St. 816-221-2400

Mo St. Louis, Interstate Ind'l. Elctns., 4445 Gustine Ave. 314-481-6110

Mo St. Louis, Olive Ind'l. Elctns., 6662 Olive Blvd. 314-863-7800

NJ Fairlawn, Relay Specialties, Inc., 1300 Plaza Rd. 201-797-3313

NJ South Plainfield, Brownell-Electro, 500 Hadley Rd. 201-753-4600

NY Buffalo, Summit Distributors, Inc., 916 Main St. 716-884-3450

NY Farmingdale, Arrow Elctns., Inc., 900 Broad Hollow Rd. (Rt. 110) 516-694-6800

NY New York, Brownell-Electro, 85 Tenth Ave. 212-924-6000

NY Rochester, Summit Elctns., 292 Commerce Dr. 716-334-8110

NC Charlotte, Dixie Radio Supply Co., 2220 South Tryon St. 704-377-5413

Ohio Cincinnati, Hughes-Peters, Inc., 4865 Duck Creek Rd. 513-351-2000

Ohio Cleveland, Pioneer-Standard Elctns., Inc., 4800 E. 131st St. 216-587-3600

Ohio Columbus, Hughes-Peters, Inc., 481 East 11th Ave. 614-294-5351

Ohio Dayton, J. A. Becker Co., 1341 East Fourth St. 513-226-1341

Ohio Mansfield, Hoover Instr. Service, Inc., 401 North Home Rd. 419-529-3583

Okla Tulsa, Oil Capitol Elctns. Corp., 708 South Sheridan, Box GG - Admiral Station 918-836-2541

Ore Portland, EOFF Elec. Co., 509 N.W. 10th Ave. 503-222-9411

Pa Philadelphia, Powell Elctns., Inc., S. Island Road & Enterprise Ave. 215-365-1900

Pa Pittsburgh, RPC Elctns., 620 Alpha Dr. 412-782-3770

Pa Reading, G. D. Barbey Co., 333 N. 4th St. 215-376-7451

SC Columbia, Dixie Radio Supply Co., 1900 Barnwell St. 803-253-5333

Tenn Memphis, Bluff City Distributing Co., 234 East St. 901-725-9500

Tenn Nashville, Electra Distributing Co., 1914 West End Ave. 615-329-3971

Tex Dallas, Texas Instr. Supply Co., 8000 Denton Dr. 214-238-2011

Tex Denison, Denison Radio Supply, 426 West Woodard St. 214-465-2336

Tex Ft. Worth, Allied Elctns., 401 East 8th St. 817-336-5401

Tex Houston, Solid State Elctns. Co. of Texas, 6400 Westpark Dr. 713-785-5205

Tex Houston, Texas Instrs. Supply Co., 3939 Ann Arbor Dr. 713-785-4800

Va Charlottesville, Piedmont Elec. Supply Corp., 1150 Rose Hill Dr. 703-296-6167

Wash Seattle, Sterling Elctns., 5608 6th Avenue So. 206-762-9100

Wisc Milwaukee, Marsh Elctns., Inc., 6047 W. Beloit Rd. 414-545-6500

Wisc Milwaukee, Parts Mart Corp., 1314 N. 7th St. 414-276-4160

Exp: New York, N.Y., Roburn Agencies, Inc., 349 West 14th St. 212-989-5939

ESSEX WIRE, 6235 S. Harlem Ave., Chicago, Ill., 60638

ESTERLINE ANGUS, 1201 Main St., Indianapolis, Ind., 46224, Tel: 317-244-7611; FSC No: 72264; Empl.: 300; Minimum order: \$20 p. 1-864-867

For info on price: M. Vian; Application info: M. Vian; Customer service: B. Kiser; Delivery info: M. Vian

Free literature available: Keyboard programmable data acquisition systems, ammeters, voltmeters, milliammeters, inless multipoint, PIP, XY and impact chart recorders. Also: event, frequency and temperature recorders; Servo recorders.

Products manufactured: Amplifiers, Cleaners, Ultrasonic, Data Acquisition & Reduction Systems, Data Loggers, Indicators, Integrators, Electronic, Meters, Monitors, Recorders, Tachometers, Transformers

Local Sales Offices & Reps.

Ala Birmingham, Spader & Assocs. 205-879-1366

Ariz Scottsdale, BFA Corp. of Ariz. 602-946-4215

Ark Little Rock, Electra-Tech Midlands, Inc. 501-562-4090

Cal City of Industry, Esterline Angus Branch Off. 213-330-1621

Cal Hayward, Esterline Angus Branch Off. 415-785-8232

Colo Denver, Cliff Beabot Co. 303-831-7259

Fla Orlando, Datatemp, Inc. 305-843-5224

Fla Pompano Beach, Datatemp, Inc. 305-781-9279

Ga Decatur, Spader & Assocs. 404-296-3024

Haw Honolulu, Berkley Engrg. & Equip. Co. 808-538-1921

Ill Elmhurst, Esterline Angus Branch Off. 312-833-4410

Ind Indianapolis, C.D. Arnold Co. 317-546-4053

Iowa Cedar Rapids, H.E. Ferris Co. 319-362-9156

Iowa Des Moines, H.E. Ferris Co. 515-255-5008

La New Orleans, Mid-South Slis. Co. 504-822-3030

Mass Holliston, Esterline Angus Branch Off. 617-235-5343

Mich Marquette, NWR Elctns. Corp. 906-228-9660

Mich Troy, G. R. Peters Assocs. 313-524-2920

Minn Minneapolis, Electrical Jobbers Equip. Inc. 612-721-4815

Minn Virginia, NWR Elctns. Corp. 218-741-5080

Mo Crestwood, C.B. Fall Co. 314-968-3850

Mo Kansas City, C.B. Fall Co. 816-942-3912

NJ Lodi, Esterline Angus Branch Off. 201-471-0084

NM Albuquerque, BFA Corporation 505-292-1212

NM Las Cruces, BFA Corporation 505-523-0601

NY Buffalo, Robt F. Lamb Co. 716-874-4900

NY Rochester, Robt F. Lamb Co. 716-544-5580

NY Schenectady, Robt F. Lamb Co. 518-393-4844

NY Syracuse, Robt F. Lamb Co. 315-454-2469

NC Charlotte, Ranson, Wallace & Baesel, Inc. 704-334-4244

Ohio Cincinnati, Beedle Equip. Co. 513-793-0140

Ohio Cleveland, M.A. Blankenburg & Co. 216-251-7010

Okla Oklahoma City, Kennedy Engrg. Co. 405-524-6048

Okla Tulsa, Kennedy Engrg. Co. 918-835-9975

Ore Portland, McLaren, Inc. 503-297-2248

Pa Oreland, Esterline Angus Branch Off. 215-887-2268

Pa Pittsburgh, Bollinger & Richards 412-561-2340

Tenn Knoxville, G.W. Massey Co. 615-577-9553

Tex Borger, Kennedy Engrg. Co. 806-273-2871

Tex Dallas, Data Aids Assocs. 214-620-1551

Tex Houston, Data Aids Assocs. 713-862-6685

Utah Salt Lake City, Instrumentation Slis. 801-272-3793

Va Fairfax, Hildenbrand Co. 703-280-2330

Wash Bellevue, McLaren, Inc. 206-454-3400

WVa Charleston, Vynock Engrg. Co. 304-722-4221

Wisc Milwaukee, T.R. Bickler Assocs. 414-453-3772

Local Distributors

Ala Birmingham, MG Elect. & Equip., 3112 Sixth Ave., S. 205-328-4525

Cal Burlingame, Metric Resources, 822 Airport Blvd. 415-347-3067

Cal City of Industry, Hamilton Instrumentation Inc., 137 A N. Puente Ave. 213-330-3380

Ill Niles, Cole-Parmer Instr. Co., 7425 N. Oak Park Ave. 312-647-0272

La New Orleans, New Orleans Instr. Works, 3821 Magazine St. 504-897-0561

Md Timonium, E.I.L. Instrmts., 1830 York Rd. 301-252-1260

Mich Troy, G. R. Peters Assoc., 1944 Crooks Rd. 313-524-2920

Neb Omaha, Schneider Elect., 1102-08 Farnham 402-346-5550

NJ Park Ridge, Gibbs & Stone, 116 Glendale Rd. 201-391-1255

NY Buffalo, KOM Lamb, 1865 Kenmore Ave. 716-874-3530

Ohio Cleveland, Marlin Mfg., 12404 Triskett Rd. 216-941-6200

Pa Philadelphia, Aquatronics, 4th & Cumberland 215-739-0695

Tex Fort Worth, Allied Elctns., 401 E. 8th St. 817-336-5401

Wash Seattle, Eicher-Richards, 2727 N.E. Blakely 206-523-7888

Wisc Milwaukee, Taylor Elec., Drawer 11 414-241-4321

ESTES ENGRG. CO., 930 Marine Dr., Port Angeles, Wash., 98362, Tel: 206-457-0904; FSC No: 22590; Empl.: 28

Customer service: S. E. Estes

Free literature available: Ignition shielding specifications & application listings for automotive engines (for use by 2-way radio communications systems).

Products manufactured: Braid, Cable, Cable, Capacitors, Fixed, Containers, Filters, Jumpers, Kits, Shielding, Lead Assemblies & Receptacles, Resistors, Services, Assembly, Production & Test, Shields, Suppressors, Wire, Wire Shielding

ETC TERMINAL PRODUCTS, Unit of ITT Cannon Elec., 29000 Aurora Rd., Solon, Ohio, 44139, Tel: 216-248-8800; Empl.: 380; Minimum order: \$50 p. 2-695-706

Customer service: D. Dunn

Free literature available: OEM-6T - Electric Terminals & Splices for the OEM, PDQ-1 - Quick Connect Terminals AMC-5 - Terminals & Splices, FIG-4 - Electrical Pigtales, lamp socket assemblies & connectors, TB-2 - Terminal Blocks, Open & Closed Backs, CT-3 - Crimping Tools.

Products manufactured: Connectors, Cutters, Wire, Hand Operated, Splices, wire (Including, Butt & Cap Types), Strips, Terminal Blocks, Boards & Strips, Terminals, Tools, Wire & Cable Ties

Local Sales Offices & Reps.

Ala Huntsville, ITT Cannon Elec. 205-881-6653

Ariz Phoenix, ITT Cannon Elec. 602-273-0755

Cal Los Altos, Recht Assocs. 415-941-0336

Cal	San Carlos, LoDan, Inc.	415-592-4600
Cal	San Marcos, ITT Cannon Elec.	714-743-4554
Cal	Santa Ana, ETC Terminal Products	714-557-4700
Colo	Denver, Camel Elctns., Inc.	303-757-6191
Colo	Englewood, ITT Cannon Elec.	303-770-1631
Conn	Tolland, ITT Cannon Elec.	203-872-2119
Fla	Deerfield Beach, Brandel-Stephens & Co.	305-427-8558
Fla	Orlando, Brandel-Stephens & Co.	305-425-3202
Ga	Atlanta, Brandel-Stephens & Co.	404-261-7579
Ill	Des Plaines, ITT Cannon Elec.	312-297-3150
Ind	Muncie, ITT Cannon Elec.	317-257-7879
Kans	Leawood, Thunderbird Tech. Sls. & Svcs.	913-642-7220
Kans	Wichita, Thunderbird Tech. Sls. & Svcs.	316-684-3941
Mass	Swampscott, ITT Cannon Elec.	617-729-8950
Mich	Detroit, ITT Cannon Elec.	313-543-0360
Minn	Minneapolis, ITT Cannon Elec.	612-854-1973
Mo	St. Louis, Thunderbird Tech. Sls. & Svcs.	314-567-6488
NY	Dewitt, Tri Tech Elctns.	315-446-2881
NY	E. Rochester, Tri Tech Elctns.	716-381-2722
NY	Elmsford, ITT Cannon Elec.	914-834-4423
NY	Larchmont, Tri Tech Elctns.	216-248-8800
Ohio	Bedford, ITT Cannon Elec.	513-434-8181
Ohio	Kettering, ITT Cannon Elec.	513-434-8181
Pa	Feasterville, Professional Svc. Assocs.	215-355-6244
Pa	Fort Washington, ETC Terminal Products	215-646-2801
Tex	Dallas, ITT Cannon Elec.	214-661-0302
Tex	Houston, ITT Cannon Elec.	713-721-3999
Tex	Irving, Aid Elctns., Inc.	214-259-4761
Va	Alexandria, ITT Cannon Elec.	703-370-5733
Va	Roanoke, ITT Cannon Elec.	703-362-0749
Wash	Bellevue, ITT Cannon Elec.	206-454-3903
Wisc	Milwaukee, DeVos-Prinz Sls. Corp.	414-272-0356
EXP	Santa Ana, Cal., ETC Terminal Products	714-557-4700
FOR	Can., Montreal, Que., ITT Cannon Elec. Can.	514-336-7660
FOR	Can., North Vancouver, B.C., Arwin Tech. Sls.	604-980-4346
FOR	Can., Whitby, Ont., ITT Cannon Elec. Can.	416-668-8881
ETCHIT, INC.	643 13th Ave. S., Hopkins, Minn., 55343, Tel: 612-935-5507; Empl.: 20; Minimum order: \$40 For info on price: F. Bergland; Application info: R. H. Dunn; Customer service: F. Bergland; Delivery info: R. H. Dunn	
Free literature available: Brochure		
Products manufactured: Services, Assembly, Production & Test		
Local Sales Offices & Reps.		
Ind	Columbus, Ritter	812-372-1534
NJ	Caldwell, A.M. Bakken	201-349-4655
Tex	Houston, Manco Metals	713-664-8084
EUBANKS ENGRG.	225 W. Duarte Rd., Monrovia, Calif., 91016, Tel: 213-358-4531, Telex: 675403; Empl.: 75; Minimum order: \$25 For info on price: J. Reed; Application info: J. Reed; Customer service: J. Menart; Delivery info: S. Kirkland	
Free literature available: Quick-Reference Catalogue; Eubanks; Automatic Wire Strippers.		
Products manufactured: Machines/Machinery, Production, Wire Strippers		
Local Sales Offices & Reps.		
Ala	Huntsville, Powertronics, Inc.	205-852-6347
Cal	Glendale, Tool Tronics, Inc.	415-968-7722
Cal	Mountain View, Charles Morse	415-968-7722
Cal	Pasadena, O.E.M. Sls. Co.	213-796-9937
Cal	Santa Clara, Tool Tronics, Inc.	408-241-4000
Colo	Boulder, Mile High Elctns.	303-444-5615
Conn	Bridgeport, Technical Instrs., Inc.	203-368-4582
Fla	Titusville, Powertronics, Inc.	305-267-5699
Ill	Lake Forest, Marsland Distributing Corp.	312-295-1616
Md	Silver Springs, Ara Elctns. Inc.	301-565-2584
Mass	Wilmington, Technical Instrs., Inc.	617-944-3930
Mich	Detroit, Electro Entprs., Inc.	313-521-1500*2
Minn	Minneapolis, Production Automation Corp.	612-866-5700
Mo	Hazelwood, Production Automation Corp.	314-731-2331
Mo	Raytown, Production Automation Corp.	816-737-0066
NJ	Livingston, Argo Engrg. Co.	201-992-4367
NY	Spring Valley, Salit Assocs.	914-352-4443
NY	Syracuse, Maloney Sls. Co.	315-488-3440

NC	Raleigh, Powertronics, Inc.	919-787-9090
NC	Thomasville, Powertronics, Inc.	919-476-6727
Ohio	Cleveland, Electro Entprs., Inc.	216-261-7670
Ohio	Dayton, Electro Entprs., Inc.	513-426-6071
Ore	Portland, Vandy, Inc.	503-292-8633
Pa	Glenside, Ara Elctns. Inc.	215-887-5250
Pa	Pittsburgh, Electro Entprs., Inc.	412-371-8497
Tex	Dallas, Sivright Co.	214-357-6681
Wash	Seattle, Vandy, Inc.	206-789-3300
FOR	Can., Thornhill, Ontario, Robert Neill Co.	416-889-9971
EVANS ASSOCS., Box 5055, Berkeley, Cal., 94705, Tel: 415-848-6839 Customer service: Sls. Dept. Products manufactured: Amplifiers Local Sales Offices & Reps. Va Annandale, J. Hopkins Assoc. 703-323-1641		
EVANS CORP., GEORGE 121 37th St., Moline, Ill., 61265, Tel: 309-762-9456; Empl.: 180 p. 1-493 Products manufactured: Air Cleaners & Filters (Shielded & Unshielded)		
EVAPORATED COATINGS, INC., 798 Welsh Rd., Huntingdon Valley, Pa., 19006, Tel: 215-WI 7-1465; Empl.: 17; Minimum order: \$30 For info on price: R. W. Schaffer; Application info: C. H. Barto Free literature available: General literature as well as data sheets on several specialized coatings such as RFI shielding anti-static films, reflecting and low reflecting coatings. Products manufactured: Coatings, Filters, Lenses, R-F, Services, Assembly, Production & Test, Shields		
EVERETT/CHARLES, INC., 2806 Metropolitan Pl., Pomona, Cal., 91767, Tel: 714-593-2541; Empl.: 90 Application info: J. Ireland; Customer service: W. Frey Products manufactured: Cable Assemblies & Harnesses, Cable Fault Locators, Probes, Testers, Valves, Solenoid, Valves, Vacuum Local Sales Offices & Reps. Cal Pleasanton, Everett/Charles 415-462-4772 Fla Winter Park, Everett/Charles 305-671-1246 Ill Aurora, Everett/Charles, Inc. 312-859-2636 Ill Chicago, K.W. Meyers 312-774-6440 NH Merrimack, Everett/Charles 603-424-4466 Tex Dallas, Bradenco 214-358-3278		
EWALD INSTRS. CORP., Rte. 7R, Kent, Conn., 06757, Tel: 203-927-3278 Customer service: Sls. Dept. Free literature available: SS - welding eq't for small parts; HWT hand welding tools; DB die bonders; SS shielding strippers. Products manufactured: Machines/Machinery, Production, Soldering Equipment, Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices), Wire Strippers		
EWC, INC., 725 Federal Ave., Kenilworth, N.J., 07033, Tel: 201-245-3200, TWX: 710 996 5993; FSC No: 15387; Empl.: 90 For info on price: C. G. Hiotis; Application info: S. Plepis; Customer service: W. J. Cyra; Delivery info: W. J. Cyra Free literature available: Audio, Power and Inverter Transformers for Military and Commercial Applications. Products manufactured: Amplifiers, Chokes, Coils Including Assemblies & Forms, Converters, Filters, Power Supplies, Transducers, Transformers Local Sales Offices & Reps. Cal Santa Clara, Cummings & Assocs. 408-247-8656 Cal Woodland Hills, Cummings & Assocs. 213-340-6035 Conn Marion, Sands S Company, Inc. 203-628-4363 Fla Orlando, Duay Enterprises 305-277-3296 Fla Palm Beach Gardens, Bill Brozey 305-622-6045 NY Fairport, D. Kirby Co. 516-326-5740 NC Swansboro, William Eschwei 919-326-5740 Ohio Vandalia, W. Williams 513-898-1224 Ohio Wickliffe, Walter J. Brauer & Assocs. 216-943-0601 Pa Pittsburgh, Hal B. Allison 412-921-3213		
EXACT ELECTRONICS, Box 160, Hillsboro, Ore., 97123, Tel: 503-648-6661, TWX: 910-460-1188; Empl.: 60; Minimum order: \$5 Customer service: P. V. Pryor		

Free literature available: SHORT FORM CATALOG describes and illustrates 31 different items including function generators, phase generators, frequency synthesizers, and complex waveform synthesizers. The catalog also contains a model capability cross-reference chart and prices. Products manufactured: Amplifiers, Generators, Synthesizers Local Sales Offices & Reps. Ala Huntsville, BCS Assocs. 205-881-6220 Ariz Tempe, PLS Assocs. 602-957-9110 Cal Culver City, Feeger, Lucas, Wolfe 213-559-7220 Cal Los Altos, J. Stone & Assocs. 415-948-4563 Cal Los Angeles, Basic Systems 213-938-2833 Cal Palo Alto, Coherent Mktg. Assoc. 415-327-2217 Cal San Diego, Feeger, Lucas, Wolfe, Inc. 714-277-0993 Colo Denver, PLS Assocs. 303-771-0140 Fla Orlando, BCS Assocs. 305-896-4881 Ill Chicago, Pivan Engrg., Inc. 312-539-4838 Ind Indianapolis, Pivan Engrg., Inc. 317-253-1681 Kans Shawnee Mission, Pivan Engrg., Inc. 913-722-1030 Md Kensington, Electronic Mktg. Assocs., Inc. 301-744-7700 Mass Waltham, Measurement Consultants Corp. 617-890-4400 Mich Farmington, Carter, McCormic & Peirce, Inc. 313-477-7700 Mich Kalamazoo, Carter, McCormic & Peirce, Inc. 616-349-9666 Minn Minneapolis, Pivan Engrg., Inc. 612-537-4501 Mo St. Louis, Pivan Engrg., Inc. 314-567-3636 NM Albuquerque, PLS Assocs. 505-255-2330 NY Great Neck, Measurement Tech., Inc. 516-482-3500 NC Greensboro, BCS Assocs. 919-273-1918 Ohio Cleveland, Carter, McCormic & Peirce, Inc. 216-333-5650 Ohio Dayton, Carter, McCormic & Peirce, Inc. 513-278-5873 Okla Tulsa, Palatine Sls., Inc. 918-622-0321 Pa King of Prussia, Electronic Mktg. Assoc. 215-248-5050 Pa Pittsburgh, Carter, McCormic & Peirce, Inc. 412-824-3760 RI Cumberland, Measurement Consultants Corp. 410-333-6000 Tex Austin, Palatine Sls., Inc. 512-451-7463 Tex Houston, Palatine Sls., Inc. 713-777-4477 Tex Richardson, Palatine Sls., Inc. 214-231-9489 Wash Seattle, Hayes Tech. 206-763-2210 Wisc Brookfield, Pivan Engrg., Inc. 414-786-1940 FOR Can., Downsview, Ont., Electronic Systems 416-661-3673 FOR Can., Montreal, Que., Electronic Systems 514-342-4112 FOR Can., Ottawa, Ont., Electronic Systems 613-733-3781 FOR Can., Vancouver, B.C., Electronic Systems 604-687-5696		
EXAR, 750 Palomar Ave., Sunnyvale, Cal., 94088, Tel: 408-733-7700, TWX: 910-339-9233; Empl.: 50 Customer service: K. Davis Products manufactured: Integrated Circuit Devices, Transistors Local Sales Offices & Reps. Ariz Scottsdale, Barnhill Five 602-947-5745 Cal Culver City, DeAngelo, Rothman & Co. 213-398-6239 Cal Redwood City, Logan Sls. 415-369-6726 Cal San Diego, DeAngelo, Rothman & Co. 714-560-5707 Cal Santa Ana, DeAngelo, Rothman & Co. 714-549-8092 Cal Sunnyvale, Exar Integrated Sys. 408-733-7700 Colo Denver, Barnhill Five 303-426-0222 Conn Wallingford, Com-Sale 203-289-7964 Fla Miami, Reptronics 305-251-5478 Fla St. Petersburg, Reptronics 813-522-8220 Ga Atlanta, Electro-Mech 404-393-0444 Ill Chicago, M&S Sls. 312-992-1053 Kans Wichita, Dy-Tronix 316-943-6221 Md Baltimore, Component Sls. 301-484-3647 Md Severna Park, Exar Integrated Sys. 301-647-6775 Mass Waltham, Com-Sale 617-890-0011 Mich Warren, DEM Elctn. Sls. 313-755-6660 Minn Minneapolis, Electronic Innovators 612-884-7471 Minn St. Petersburg, Reptronics 813-522-8220 Mo Hazelwood, Dy-Tronix 314-731-5799 Mo Kansas City, Dy-Tronix 816-761-6543 NY Buffalo, J. McDonough Assoc. 716-839-2044 NY Manlius, J. McDonough Assoc. 716-889-1919 NY Rochester, J. McDonough Assoc. 716-889-1919		

NY Williston Park, ABC Elctn. Sls. 516-747-6610
 NC Raleigh, Component Sls. 919-782-8433
 Ohio Columbus, McFadden Sls. 614-221-3363
 Pa Willow Grove, H. Nash Assoc. 215-657-2213
 Tenn Nashville, Electro-Mech. 615-883-1490
 Wash Bellevue, SD-R2 Products & Sls. 206-747-9424
 FOR: Can., Dollard Des Ormeaux, Que., R.F.Q. Ltd.
 FOR: Can., Downsview Ont., R. Ohm Elctns. Can.
 416-661-2084
 FOR: Can., Mississauga, Ont., R.F.Q. Ltd.
 416-625-8874

EXCEL PRODUCTS CO., INC., 700 Joyce Kilmer Ave.,
 New Brunswick, N.J., 08903, Tel: 201-249-6600; Empl.:
 360; Minimum order: \$25
 For info on price: L. Eige Ext. 212; Customer service:
 R. Louth Ext. 221; Delivery info: R. Louth Ext. 221

Free literature available: Contained in Excel
 Literature Along With Complete, Illustrated
 Descriptions of Products are the 'Products'
 Outstanding Features, Drawings, and Specs of All
 Items and Material Used in Their Manufacture.

Products manufactured: Boards, Plug-In, Boards,
 Printed Circuit, Boards, Printed Wiring, Universal,
 Boards, Programming, Cabinets & Accessories,
 Cams, Cards, Logic, Chassis, Circuit Board
 Mounting, Connector Adapters, Connector Blocks,
 Mother Board, Connector Boxes & Strips, Power
 Outlet, Connectors, Contact Strips, Finger,
 Contacts, Electrical, Guides, Circuit Board, Holder
 & Carriers, Holders, Circuit Board (Production
 Type), Integrated Circuit Packaging Systems,
 Racks, Screens, Printed Circuit, Services,
 Assembly, Production & Test, Sockets, Solder (All
 Types), Splicers, Coaxial Cable, Splices, wire
 (Including, Butt & Cap Types), Terminal Blocks,
 Boards & Strips, Terminals

EXCEL SPECIALTY CORP., 6335 N. Broadway, Chicago,
 Ill., 60660, Tel: 312-262-4781; Empl.: 25

For info on price: M. Bank; Application info: M. Bank;
 Customer service: M. H. Gawron; Delivery info: B.
 King

Products manufactured: Cords, Jumpers, Lead
 Assemblies & Receptacles, Leads, Test &
 Adaptors, Services, Assembly, Production & Test

EXCELLON AUTOMATION, Div. Excellon Inds., 23915
 Garner St., Torrance, Cal., 90509

EXCELLON INDUSTRIES, 9522 W. Jefferson, Culver City,
 Cal., 94525

EXECUTONE, PRINTACT RELAY DIV., 29-10
 Thomson Ave., Long Island City, N.Y., 11101, Tel:
 212-EX2-4800, TWX: 710-582-2610; Empl.: 500;
 Minimum order: \$25 p. 1-1683

For info on price: J. A. Richards; Application info: R.
 Terry; Customer service: R. Terry; Delivery info: R.
 Terry

Free literature available: PR-100 Catalog describes
 PC board relay which plugs directly into board
 without sockets or soldering. PR-102A - Relay BCD
 decoder with memory, PR-262D Technical note on
 P-C board preparation to accommodate the printout
 relay.

Products manufactured: Drivers & Decoders For
 Readouts, Relays

Local Sales Offices & Reps.
 Cal Orange, Sls. & Mktg. Assoc. 714-997-5720
 Cal San Francisco, R.R. Slater 415-392-9154
 Cal Tarzana, R. Capell Co. 213-987-2233
 Colo Colorado Springs, Elctns. Mfg. Consult.
 303-244-3217

DC Wash, H. Wise Co. 202-363-9417
 Fla Palm Beach Gardens, Graham Assocs. 305-622-4049
 Ill Chicago, Allen Wood & Assocs. 312-283-7400
 Ind Indianapolis, Marketing Engineers 317-546-1523

Mass Wakefield, Measurement Equip. Co. 617-245-4870
 Mich Dearborn Hgts., Ankofski Assocs. 313-565-6330
 Minn Anoka, K. Haugen & Assocs. 612-421-3395
 NM Albuquerque, IMEC 505-883-9010
 NY Jamaica, S. A. M. Assoc. 212-658-8881
 Ohio Englewood, Ad-El-Tek 513-836-2741
 Pa Philadelphia, H.A. Goodman 215-247-7116
 Tex Dallas, Caton Sls. Co. 214-661-5792
 Wash Seattle, R.R. Slater 206-622-3860

EXETRON CORP., 2390 Walsh St., Santa Clara, Cal.,
 95050, Tel: 408-247-7660, Telex: 357424; Empl.: 215;
 Minimum order: \$25

For info on price: B. Dresser; Application info: D.
 Apte; Customer service: S. Koch; Delivery info: S.
 Koch

Products manufactured: Circuits, Integrated, Silicon
 Monolithic, Unpackaged Chips, Circuits, Printed,
 Multilayer, Integrated Circuit Devices,
 Semiconductor Wafer Fabrication, Services,
 Assembly, Production & Test

Local Sales Offices & Reps.
 Ariz Tempe, Delta Elctn. Sls. 602-966-9903
 Cal Mountain View, Nor-Cal 451-961-8121
 Cal San Diego, J.T.L. Assoc. 714-277-8044
 Cal Woodland Hills, Elctn. Comp. Mktg.
 213-340-1745

Colo Denver, Straube Assoc. 303-426-0890
 Fla Casselberry, E.I.R. 305-830-6900
 Ill Palatine, Choisser & Clanfield Elctn. Sls.
 312-358-8900

Mass Burlington, Contact Sls. 617-273-1520
 Mich Grosse Pointe Woods, Elko Sls. 313-884-1955
 Mo St. Louis, Bencke & McCaul 314-434-6242
 NJ Cherry Hill, Barrett Assoc. 609-429-1551
 NJ Irvington, M.G.I. 201-399-4350
 Ohio Cleveland, D. Steffen & Assoc. 216-461-8333
 Tenn Bristol, Rakes Engrg. & Mktg. 615-968-4195
 Tex Dallas, Merino Sls. 214-239-9719
 Wash Bellevue, Western Tech. Sls. 206-641-3900
 Wisc Elm Grove, Choisser & Clanfield Elctn. Sls.
 414-476-0484

EXIDE POWER SYS. DIV., ESB, Inc., Box 5723,
 Philadelphia, Pa., 19120, Tel: 215-FI2-8000, TWX:
 215-725-7397; Empl.: 2200

Products manufactured: Batteries, Oceanographic
 Equip. (Electronic), Power Supplies, Switches,
 Testers

Local Sales Offices & Reps.

Ala Birmingham 205-879-5321
 Ariz Phoenix 602-279-6680
 Cal San Francisco 415-589-9005
 Cal San Francisco 415-761-1080
 Cal Santa Fe Springs 213-698-9981
 Colo Denver 303-623-7793
 Conn Hamden 203-288-6389
 Del Wilmington 302-994-1970

DC Wash 202-362-5700
 Fla Jacksonville 904-356-7506
 Fla Miami 305-885-5709
 Fla Tampa 813-248-2173
 Ga Atlanta 404-351-2722
 Haw Honolulu 808-847-0623
 Ill Benton 618-439-6194
 Ill Countryside 312-352-3665
 Ill Peoria 309-685-7684

Ind Fort Wayne 219-743-0020
 Ind Indianapolis 317-787-3434
 Ind South Bend 219-233-7823
 Ky Louisville 502-585-4500
 La Metairie 504-837-3504

Md Towson 301-825-2611
 Mass Medford 617-395-7979
 Mass Springfield 413-785-1034
 Mich Dearborn 313-581-0400

Mich E. Grand Rapids 616-456-7487
 Mich Flint 313-238-6811
 Minn Roseville 612-631-2150

Mo Kansas City 816-842-7274
 Mo St. Louis 314-773-1644
 Neb Omaha 402-342-6528

NJ Newark 201-642-0005
 NY Albany 518-869-6907
 NY Buffalo 716-854-1278

NY East Syracuse 315-437-8481
 NY Rochester 716-865-3800
 NY Woodside 212-457-4700

NC Charlotte 704-375-7966
 NC Greensboro 919-274-2222
 Ohio Cincinnati 513-851-3838

Ohio Cleveland 216-241-6231
 Ohio Columbus 614-846-0224
 Okla Tulsa 918-932-2878

Ore Portland 503-284-6710
 Pa Bethel Park 412-833-6500
 Pa King of Prussia 215-265-6060

Tenn Chattanooga 615-267-5850
 Tenn Memphis 901-327-6236
 Tenn Nashville 615-262-9285

Tex Dallas 214-243-5531
 Tex Houston 713-524-2033
 Utah Salt Lake City 801-359-5766

Va Ashland 804-798-4511
 Va Roanoke 703-342-0763
 Wash Seattle 206-623-1377
 WVa Bluefield 304-327-5859

WVa Charleston 304-346-5363
 Wisc New Berlin 414-544-5428

F-DYNE ELCTRNS., 449 Howard Ave., Bridgeport,
 Conn., 06605, Tel: 203-367-6431; Empl.: 310; Minimum
 order: \$15 p. 2-130-133

For info on price: M. Koenigsberg; Application info: A.
 Horne; Customer service: M. Koenigsberg; Delivery
 info: R. Furst

Products manufactured: Capacitors, Fixed,
 Capacitors, Variable, Filters, Networks

Local Sales Offices & Reps.

Ala Huntsville, Beacon Elctns. 205-881-5031
 Cal Fremont, Spence Assocs. 415-656-9506
 Cal Van Nuys, Myco Sls. 213-988-2288
 Colo Denver, Walter Engrg. 303-777-5585
 Conn Wethersfield, Con/Pak 203-563-4784
 Del Wilmington, Dyna-Rep. 301-256-8300
 Fla Ft. Lauderdale, Beacon Elctns. 305-622-2770
 Fla Maitland, Beacon Elctns. 305-647-3498
 Ga Atlanta, Beacon Elctns. 404-351-3654

Ill Elk Grove Village, Loren Green Assocs. 312-593-0282

Ind Indianapolis, Loren Green Assoc. 317-293-9827
 Kans Shawnee, J. Guernsey Co. 913-631-2414
 Mass Needham, Com/Pak 617-444-1259

Mich St. Clair Shores, J. M. Thorpe Co. 313-779-6363
 Minn Minneapolis, Loren Green Assoc. 612-781-1611
 NJ Haddonfield, Dyna-Rep. 609-795-1700

NY Hempstead, Kahgan Sls. 516-538-2300
 NY Syracuse, Naylor Elec. 315-472-9183
 NC Greensboro, L & D, Inc. 919-292-3201

Ohio Cleveland, Orr Assoc. 216-885-1324
 Tex Dallas, Cunningham Co. 214-231-2686
 Tex Houston, Cunningham Co. 713-461-4197

Va Alexandria, Dyna-Rep. 703-354-1222
 Va Newport News, Dyna-Rep. 804-874-7729
 FOR: Can., Don Mills, Ont., B. D. Vallillee Elctns.
 416-447-8482

FABRI-TEK, INC., 5901 S County Rd. #18, Minneapolis,
 Minn., 55436, Tel: 612-935-8811, TWX: 910-576-2913

Products manufactured: Memory Systems

FABRI-TEK, INC., Computer Systems Div., 5901 S. County
 Rd. 18, Minneapolis, Minn., 55436, Tel: 612-935-8811,
 TWX: 910-576-2913; FSC No: 21542; Empl.: 2322;
 Minimum order: \$75

For info on price: J. Erickson; Application info: J.
 Erickson; Customer service: G. Nelson; Delivery info:
 G. Nelson

Free literature available: Data sheets on all products
 - lists features & specifications Data sheets &
 reference manual on MP12 digital computer -
 contains all info. on operation & descriptions of
 standard MP12 software.

Products manufactured: Cores, Magnetic,
 Memories, Buffer, Memory Systems

Local Sales Offices & Reps.

Cal Long Beach 213-420-2493
 Cal San Jose 408-246-8391

Colo Denver 303-753-0631
 Fla Orlando 305-857-1050
 Ill Elk Grove Village 312-437-4116

Mass Auburndale 617-969-5077
 Mich Northville 313-348-2161
 NJ Union 201-964-4770

Tex Dallas 214-661-3155

FABRICAST, INC., 2517 Seaman Ave., So. El Monte,
 Cal., 91733, Tel: 213-443-3247; FSC No: 13345; Empl.:
 8; Minimum order: \$25 p. 1-950-955

Customer service: T. Elam

Free literature available: Catalogue

Products manufactured: Brushes & Brush
 Assemblies, Motor & Generator Armatures,
 Rotors, Stators, Slip-Rings & Assemblies

FACIT-ADDO, INC., 501 Winsor Dr., Secaucus, N.J.,
 07094, Tel: 201-866-5111, TWX: 710-992-8927; Empl.:
 125

Customer service: O. Bjerkmann

Products manufactured: Calculators, Electrical &
 Electronic, Display Devices/Displays, Perforators,
 Printers, Readers, Recorders, Typewriters,
 Input-Output (All Types)

Local Sales Offices & Reps.

Cal Los Altos, Cain-White, Co. 415-950-4161
 Cal Los Angeles, Facit-Ado, Inc. 213-385-4161
 Cal Sherman Oaks, Elctn. Mktg. Specialists
 213-990-4244
 Colo Denver, Rocky Mountain Office Machines
 303-238-1381
 Colo Evergreen, Mountaintek 303-674-5255

Fla	Orlando, Gra-Mar, Inc.	305-894-3351
Ill	Chicago, Data Elctns. Co.	312-283-0300
Md	Wheaton, K-G Elctns.	301-946-4055
Mass	Wakefield, Instr. Dynamics	617-245-5100
Mo	Florissant, Midwest Mktg. Assocs.	314-831-0342
		516-448-2100
NY	Elmont, Crane & Egert	716-586-8033
NY	Penfield, A & D Devices	216-585-8421
Ohio	Wickliffe, Data-tron	215-265-5211
Pa	King of Prussia, Riv. Co.	817-738-1996
Tex	Fort Worth, Carey Wolf & Assocs.	206-762-2310
		206-762-2310

FAIR-RITE PRODS. CORP., Wallkill, N.Y., 12589, Tel: 914-895-2055, TWX: 510-249-4819; Empl.: 210

p. 2-1215

For info on price: B. Tolen; Application info: W. Martin; Customer service: B. Tolen; Delivery info: B. Tolen

Free literature available: Catalog of Fair-Rite®

Cores, Application Note: Use of Ferrites For Wide Band Transformers, Application Note: DC to AC Inverter Design, Fair-Rite® Shield Beads

Products manufactured: Cores, Magnetic, Ferrite Material & Parts, Shielding Beads, Ferrite

Local Sales Offices & Reps.

Cal	City of Industry, Micrometals	213-968-4718
Colo	Denver, Electronic Sales, Inc.	303-771-6300
Conn	W Hartford, R. S. Pettigrew & Assoc.	203-233-8533

Fla	Maitland, Barrett Assocs.	305-678-0172
Ill	Palestine, Fair-Rite Prod.	618-586-2556
Mass	W. Newton, R. S. Pettigrew & Co.	617-969-5770
Ohio	Cincinnati, F. J. Campisano & Assoc.	513-662-1616

Pa	Philadelphia, Mid-Eastern Assoc.	215-842-2810
Tex	Dallas, Stasco	214-239-5054
Va	Roanoke, A. B. Kreger & Co.	703-989-4738
Wash	Seattle, J. Bergford & Assoc.	206-866-0201

FAIRCHILD SEMICONDUCTOR, 464 Ellis St., Mountain View, Cal., 94040, Tel: 415-962-5011

Products manufactured: Amplifiers, Circuits, Hybrid, Thin-Film, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Diodes, Display Devices/Displays, Integrated Circuit Devices, Lamp Drivers, Lamps, Memory Systems, Microwave Integrated Circuits (MIC's), Multiplexers, Multipliers, Rectifiers, Regulators, Sensors, Light, Shift Registers, Switches, Transducers, Transistors

Local Sales Offices & Reps.

Ala	Huntsville	205-883-7020
Ariz	Phoenix	602-264-4948
Cal	Los Angeles	213-466-8393
Cal	San Diego	714-279-6021
Cal	Santa Ana	714-558-1881
Cal	Santa Clara	408-244-1400
Colo	Lakewood	303-234-9292
Conn	Stamford	203-348-7701
Fla	Altamonte Springs	305-834-7000
Fla	Ft. Lauderdale	305-566-7414
Fla	Largo	813-585-3892
Ill	Schiller Park	312-671-4660
Ind	Fort Wayne	219-483-6453
Ind	Indianapolis	312-849-5412
Kans	Mission	913-432-7878
Md	Bladensburg	301-779-0954
Mass	Wellesley Hills	617-237-3400
Mich	Westland	313-425-3250
Minn	Edina	612-835-3322
NJ	Wayne	201-696-7070
NM	Albuquerque	505-285-5601
NY	Endwell	607-754-1094
NY	Melville	516-293-2900
NY	Poughkeepsie	914-452-4200
NY	Rochester	716-385-1130
NY	Syracuse	315-471-3391
NC	Raleigh	919-781-1000
Ohio	Dayton	513-278-8278
Ohio	Highland Hgts.	216-461-8288
Okla	Tulsa	918-663-7131
Pa	Fort Washington	215-886-6623
Tex	Dallas	214-234-3391
Tex	Houston	713-771-3547
Wash	Bellevue	206-454-4946
Wisc	Milwaukee	414-282-5260
FOR	Can., Mississauga, Ont.	416-625-7070

FAIRCHILD SOUND EQUIP., Sub. Robins Inds., 75 Austin Blvd., Commack, N.Y., 11725, Tel: 516-543-5200; Empl.: 35; Minimum order: \$25
Customer service: R. Belmont

Free literature available: Engineering data sheets covering our broad line of solid state audio components, including amplifiers, compressors, mixing consoles and specialized audio control devices.

Products manufactured: Amplifiers, Attenuators, Equalizers, Generators, Mixers, Monitors, Oscillators, Power Supplies, Public Address Systems

Local Sales Offices & Reps.

Ala	Birmingham, Adams & Assocs., Inc.	205-822-8109
Cal	Oakland, Hank Gabriel	415-465-5361
Colo	Westminster, Electro-Tek Sls., Inc.	303-255-4566
		813-227-5051
Fla	Tampa, Repelect	404-981-2207
Ga	Decatur, Adams & Assocs., Inc.	808-839-9059
Haw	Honolulu, Gene Piety Factors, Inc.	312-763-6785
		515-279-9235
Ill	Chicago, Gordon Duvall Co.	313-354-3310
Iowa	Des Moines, KSW Assocs.	816-363-5651
Mich	Southfield, Robert Milk Co.	609-424-4660
Mo	Kansas City, KSW Assocs.	315-548-4891
Neb	Omaha, KSW Assocs.	516-883-1829
NJ	Cherry Hill, Landy Assocs.	919-272-6838
NY	Phelps, LSM Assocs.	614-235-0265
NY	Port Washington, Joseph Assocs.	713-772-0961
		516-484-4920
NC	Greensboro, Adams & Assocs., Inc.	
Ohio	Columbus, Mandabach Assocs.	
Tex	Houston, Wyborny Sls. Co.	
EXP	N.Y., Roslyn, Telesco Internat'l Corp.	

FAIRCHILD SPACE & DEFENSE SYS. DIV., Fairchild Camera & Instr., 300 Robbins La., Syosset, N.Y., 11791, Tel: 516-931-4500, TWX: 510-221-1836; Empl.: 800

Products manufactured: Cameras, Comm. Systems, Computers, Converters, Data Acquisition & Reduction Systems, Lenses, Optical & Camera, Services, Assembly, Production & Test, Standards, Television Systems & Equipment Closed-Circuit

FAIRCHILD SYS. TECHNOLOGY, 1725 Technology Dr., San Jose, Cal., 95110, Tel: 408-998-0123, TWX: 910-338-0558; Empl.: 600

For info on price: L. Thompson; Application info: J. Campbell; Customer service: V. Klein; Delivery info: B. Davi

Free literature available: Catalogs: Qualifier 901 - Digital IC benchtop tester; Sentry 610 - Computer controlled 10 MHz LSI, memory tester; Sentry 1200 - Computer controlled memory and microprocessor tester.

Products manufactured: Testers

Local Sales Offices & Reps.

Ariz	Tempe, FST	602-966-7297
Cal	Los Angeles, Fairchild Sys. Tech.	213-678-3166
Cal	Sunnyvale, Fairchild Sys. Tech.	408-998-0123
Fla	Altamonte Springs, Fairchild Sys. Tech.	305-834-7070
		312-671-4480
Ill	Chicago, Fairchild Sys. Tech.	617-237-4787
Mass	Wellesley, FST	612-835-3322
Minn	Minneapolis, Fairchild Sys. Tech.	602-242-3100
NJ	Cherry Hill, FST	201-696-7070
NJ	Wayne, FST	

FALSTROM CO., 174 Falstrom Ct., Passaic, N.J., 07055, Tel: 201-777-0013; Empl.: 250

Customer service: R. E. Hill

Free literature available: Falstrom Metal Fabricated Products - shows variety of weldments, enclosures, chassis, racks, made for dozens of industries.

Products manufactured: Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chassis, Metal, Frames, Cabinet & Rack, Racks, Services, Assembly, Production & Test, Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

FANON/COURIER CORP., SUBS., Resdel Engineering, 990 S. Fair Oaks, Pasadena, Cal., 91105, Tel: 213-799-9164

For info on price: M. Trotiner; Application info: M. Trotiner; Customer service: R. Dashner

Free literature available: Fanon short form catalog with complete product line of sound and communications products. Individual Courier data sheets on citizen band radios and monitor scanners.

Products manufactured: Amplifiers, Antennas, Baffles, Speaker, Comm. Systems, Drivers, Speaker, Handsets, Chestsets, Headphones, Headsets, Etc., Microphones, All Kinds, Public Address Systems, Receivers, Speaker Systems, Speakers, Transmitters

Local Sales Offices & Reps.

Cal	Burlingame, Elvey Proctor Co.	415-347-2994
Cal	Sunnyvale, Elvey Proctor Co.	
Cal	Van Nuys, C.H. Mitchell Co.	213-994-9466
Colo	Littleton, Kenealey Assocs.	303-771-8140
Conn	Wallingford, Adam-McGregor	203-269-5816
Ga	Savannah, L. Sherman Assocs.	912-925-3660
Ill	Skokie, M. Bermann Sls.	312-675-3740
Ind	Indianapolis, Dewey Powers Sls.	317-846-0790
Kans	Shawnee Mission, M. Bettis Co.	913-362-0772
Kans	Wichita, M. Bettis Co.	316-685-7441
Mass	Scituate, Adams-McGregor	617-545-2213
Minn	St. Paul, Carl-M Co.	612-699-8004
Mo	St. Louis, M. Bettis Co.	314-429-2099
NJ	Fair Lawn, Moses & Kline	201-791-8538
NY	Ballston Spa, Al Toupin Sls.	518-587-3956
NY	Kenmore, Al Toupin Sls.	716-873-8839
NY	Merrick, Moses & Kline	516-378-1804
NY	North Pelham, Moses & Kline	914-738-1163
Ohio	Youngstown, Repcom	216-788-9693
Ore	Portland, Ron Meritt Co.	503-292-8762
Pa	Willowgrove, R. Lewis Sls.	215-659-0704
Ri	Lincoln, Adams-McGregor	401-726-1300
Tex	Dallas, Loss Co.	214-691-6039
Utah	Murray, Kenealey Assocs.	801-268-3111
Va	Falls Church, R. Lewis Sales	703-534-7732
Wash	Seattle, Ron Meritt Co.	206-682-7337
Ariz	Phoenix, Sal Bova Sls. Co.	602-266-1137
Cal	Foster City, Olson Sls. Co.	415-573-1600
Cal	Los Angeles, L.J. Ross Sls.	213-476-1601
Cal	No. Hollywood, M. Stobin Co.	213-983-1555
Cal	San Diego, Doyle & Assocs.	714-461-1926
Colo	Englewood, H.P. Mktg.	303-770-1158
Conn	Waterbury, Anderson Sls. Assocs.	203-753-2487

Fla	Atlantic Beach, Global Military Sls.	904-246-1400
		305-945-6544
Fla	North Miami, Winfield Elctn. Sls.	813-884-6500
Fla	Tampa, Winfield Elctn. Sls.	404-448-5460
Ga	Norcross, D. Cooper Co.	312-282-5800
Ill	Chicago, Markal Sls. Co.	312-273-2600
Ill	Evanston, David-Martin Corp.	
Ind	Indianapolis, Shamrock Elctn. Sls.	317-547-0080

Mass	Boston, Anderson Sls. Assocs.	617-227-2980
Minn	St. Paul, Carl-M Co.	612-699-8004
Mo	Raytown, Midwest Mktg.	816-358-6638
Mo	St. Louis, Midwest Mktg.	314-894-1388
NJ	Fair Lawn, Moses & Kline	201-791-8538
NJ	South Orange, S. Simberkoff Sls. Assocs.	201-763-7900

NY	Lockport, S. Simberkoff Sls. Assocs.	716-434-4426
NY	Merrick, Moses & Kline	516-378-1804
NY	North Pelham, Moses & Kline	914-738-1163
NY	North Syracuse, S. Simberkoff Sls. Assocs.	315-458-5469

Ohio	Akron, Shamrock Elctn. Sls.	216-666-3796
Ohio	Beachwood, Kam Mktg.	216-464-7717
Pa	Cambridge Springs, Shamrock Elctn. Sls.	814-398-8348
Pa	Philadelphia, S. Simberkoff Sls. Assocs.	215-743-2512

Tex	Dallas, Maynard-Gunn Sls.	214-528-9090
Tex	Dallas, Ram Mktg.	214-744-4881
Tex	El Paso, Sal Bova Sls.	915-591-6242
Tex	Houston, Maynard-Gunn Sls.	713-497-0544
Utah	Salt Lake City, H & P Mktg. of Colo.	801-466-6105

Va	Arlington, Howard Golenpaul & Assocs.	703-525-5898
----	---------------------------------------	--------------

Wash	Seattle, W.R. Lanphear & Co.	206-633-4900
Wisc	Colgate, Markal Sls. Co.	414-628-2801

EXP: N.Y., New York, Roburn Agencies
212-989-5939

FANSTEEL INC., One Tantalum Pl., N Chicago, Ill., 60064, Tel: 312-689-4900, TWX: 910-235-1577; Empl.: 3000

Products manufactured: Contacts, Electrical, Diodes, Foil, Heat Sinks, Soldering, Metal Compounds, Foils, Powders, Sheet, Stock, Metals, Seals, Services, Assembly, Production & Test, Transistor, Diode, Thyristor Heat Dissipators, Wire

FARATRON CORP., 280 Green St., S. Hackensack, N.J., 07606, Tel: 201-488-1440, TWX: 710-990-5022; Empl.: 60

For info on price: A. Sanford; Application info: H. Auffero; Customer service: B. Crawford; Delivery info: B. Crawford

Free literature available: Product sheets on our Present Standard Line of Power Supplies listing description, specifications, available options and pricing. Greibach product literature analoge instruments.

Products manufactured: Meters, Power Supplies

Local Sales Offices & Reps.

Cal Torrance, Mitronics Ind.
Conn Manchester, Addelco Corp.
Mass Needham, Addelco Corp.
NY Elbridge, L-Tron Corp.
NY Great Neck, EAC Assocs.
NY Syracuse, Nycorn Corp.
Pa Doylestown, Camco
Pa Pittsburgh, Automated Equip. & Engrg.
Tex Dallas, Thorson Co.
Tex Houston, Thorson Co.

Advertisement

SINGLE AND MULTIPLE OUTPUT POWER SUPPLIES DESIGNED ESPECIALLY FOR THE OEM MARKET AND COVERING A WIDE RANGE OF REQUIREMENTS. ULTIMATE IN RELIABILITY AND RUGGEDNESS WITH UNIQUE SELF COOLING DESIGN.

FARATRON STOCKS AN EXTENSIVE STANDARD LINE TO SATISFY YOUR IMMEDIATE NEEDS AND SPECIFICATIONS. INFORMATIVE LITERATURE AVAILABLE ON REQUEST.

FARIA METER CORP., 19 Faria Lane, Uncasville, Conn., 06382, Tel: 203-848-9271; Empl.: 150 p. 1-694

For info on price: J. C. Halbrooks; Application info: J. C. Halbrooks; Customer service: K. Willey; Delivery info: K. Willey

Free literature available: Catalog sheet on each type of product manufactured. Gives technical data, physical dimensions and options available.

Products manufactured: Meters, Switches, Tachometers

FARINON ELECTRIC, 935 Washington St., San Carlos, Calif., 94070, Tel: 415-593-8491, Telex: 34-8491; Empl.: 1000; Minimum order: \$25

Customer service: K. O'Neil

Products manufactured: Amplifiers, Comm. Systems, Receivers, Transmitters

Local Sales Offices & Reps.

Cal San Carlos 415-593-8491
Ga Atlanta 404-451-1982
NJ Somerville 201-526-2669
Tex Houston 713-688-5569
FOR: Can., Calgary, Alberta
FOR: Can., Dorval, Que. 514-636-0974
FOR: Can., Edmonton, Alberta 403-422-0566

FARRAND CONTROLS, INC., 99 Wall St., Valhalla, N.Y., 10595, Tel: 914-RO 1-2600; Empl.: 75

For info on price: G. A. Quinn; Application info: W. Grace; Customer service: R. McCusker

Free literature available: Farrand Integrated Circuit Digital Readout Brochure, Farrand Step-by-Step Way to Grinder Automation

Products manufactured: Amplifiers, Controls/Control Ept., Couplings, Indicators, Recorders, Resolvers, Synchro, Servo Systems

Local Sales Offices & Reps.

Cal Gardena, Meas. Dev. 213-321-2504
Cal Hayward, Harron-Rickard Dist. 415-786-1300
Conn No. Haven, Machining Sys. Inc. 203-288-7433
Ga Atlanta, Scott Mach. Tool Co. 404-522-8311
Haw Honolulu, H. S. Gray Co., Ltd. 808-839-2747
Ill Elmhurst, Federal-Bryant Mach. 312-833-4800
La Shreveport, Richards Mach. & Sup. 314-567-3131

Mass E. Boston, Wigglesworth Mach. 617-567-7210
Mich Troy, Applied Mfg. Sys. 313-689-8600
Mo Springfield, Crossland Mach. Co. 402-571-2288
Neb Omaha, Crossland Mach. Co. 402-571-2288
NJ Morristown, Leon Assocs. 201-540-0209
NY Pittsford, R/F Allen Mach. 716-385-2730
Ohio Cincinnati, Tech. Equip. S. 513-771-3630
Ore Portland, Star Machinery 503-226-3011
Pa Media, G.S. Maier Co. 215-565-2010
SC Mt. Pleasant, Smith-Courtney Co. 802-884-5689

Tex Dallas, C. J. Harter & Son Mach. 214-FL7-1501
Va Richmond, Smith-Courtney Co. 804-232-4581

FEDERAL PACKAGE CORP., 34016 Nevada Ave. N., Minneapolis, Minn., 55427

FEDERAL SCIENTIFIC CORP., See Nicolet Scientific Corp.

FEEDBACK, INC., 438 Springfield Ave., Berkeley Hgts., N.J., 07922, Tel: 201-464-5181; Empl.: 5

Customer service: M. A. Hewett

Free literature available: Electronic Test Equipment Catalog - Gives detailed specifications of products we offer. Includes application notes & explains principles of operation.

Products manufactured: Analyzers, Demodulators, Generators, Meters, Modulators, All Kinds

Local Sales Offices & Reps.

Fla Lighthouse Point 305-946-0381
Ind Indianapolis 317-926-6327

FENWAL ELCTRNS., 63 Fountain St., Framingham, Mass., 01701, Tel: 617-872-8841, TWX: 710-346-0678; Empl.: 250 p. 1-2316

For info on price: W. M. Minnucci; Application info: W. M. Minnucci; Customer service: N. Brien; Delivery info: W. M. Minnucci

Free literature available: ISO - CURVE & UNI-CURVE, RT, curve-matched interchangeable thermistors (L-2A & L-6A), thermistor capsule course cL-3A); E-I, curve-matched thermistors (L-7); hi-temp thermistors (L-8), thermistor housing manual (L-5A); thermistor manual

Products manufactured: Mounts, Probes, Resistors, Slide Rules (Circuitry Computing), Thermistors, Transducers

Local Sales Offices & Reps.

Ala Huntsville, Col Ins Co. 205-539-1771
Ariz Phoenix, Dorton Enterprises, Inc. 602-263-0414
Cal Los Angeles, E. Landa Co. 213-879-0770
Cal Menlo Park, G.R. McKnight Co. 415-325-2844
Colo Denver, Zeus, Inc. 303-770-4400
Conn Suffield, Andrews Airtronics, Inc. 203-668-0446
Fla Orlando, Col Ins Co. 305-423-7615
Ill Chicago, Midwest Elctn. Sls. 312-777-9700
Ind Indianapolis, Midwest Elctn. Sls. 317-926-3736
Iowa Marion, Thomas & Modrcin Assocs. 319-377-6261

Kans Shawnee Mission, Thomas & Modrcin Assocs. 913-432-2131

Md Baltimore, B. White & Co. 301-484-5400
Mass Lynfield, Andrews Airtronics, Inc. 617-245-5220
Mich Ferndale, Hilltronics, Inc. 313-398-5556
Minn St. Paul, Northport Engr., Inc. 612-698-3841
Mo Hazelwood, Thomas & Modrcin Assocs. 314-895-4700

NM Albuquerque, Zeus, Inc. 505-256-9831
NY De Ruyter, R.P. Kennedy Co. 315-682-2920
NY Huntington, CDB Enterprises, Inc. 516-692-5200
NY Red Hook, R.P. Kennedy Co. 914-876-2700
NY Rochester, R.P. Kennedy Co. 716-271-6322
NC Raleigh, Col Ins Co. 919-834-6591
Ohio Cleveland, A.H. Baier Co. & Assocs. 216-461-6161

Ohio Dayton, A.H. Baier Co. & Assocs. 513-276-4128
Okla Tulsa, W.P. Fralia Co. 918-663-8707
Ore Beaverton, Arneson Assocs. 503-643-5754
Pa Ardmore, W.K. Metz, Inc. 215-649-3966
Pa Pittsburgh, Covert & Newman Co. 412-563-0303

Tex Fort Worth, W.P. Fralia Co. 817-738-2394
Tex Houston, W.P. Fralia Co. 713-772-1572
Utah Salt Lake City, Zeus, Inc. 801-486-2317
Wash Seattle, Arneson Assocs., Inc. 206-762-7664
Wisc Waukesha, Midwest Elctn. Sls. 414-542-5129
EXP: Framingham, Mass., Fenwal Electronics 617-872-8841

Local Distributors

Ala Huntsville, Thermal Corp., Box 5327 205-837-1122
Cal Burlingame, Rose Elctn. Distributing Co., 846 Stanton Rd. 415-697-0224
Cal Los Angeles, Mil-Comm Distrs., 1616 Cotner Ave. 213-478-0525
Colo Aurora, Jet Elctns. Supply Co., 1455 Florence St. 303-364-7000
Colo Denver, Indl. Elctns. Corp., Box 22457 303-771-2636
Colo Denver, Newark-Denver Elctn. Supply, 2170 S. Grape St. 303-757-3351
Ill Chicago, Newark Elctns. Corp., 500 N. Pulaski Rd. 312-638-4411
Ill Elgin, Allied Elctns., 1355 Sleepy Hollow Rd. 312-697-8200

Ind Indianapolis, Graham Elctn Supply, 133 South Pennsylvania St. 317-634-8486

Mass Boston, DeMambro Elctns., 1095 Commonwealth Ave. 617-787-1200
Mass Newton, A. W. Mayer Co., 38 Border St. 617-965-1111

Minn Minneapolis, Harry Stark, Inc., 112 Third Ave. N. 612-332-1325

Mo Kansas City, Burstein-Applebee Co., 3199 Mercier St. 816-531-5614
Mo St. Louis, Olive Indl. Elec., 6662 Olive St. Rd. 314-863-4051

NH Manchester, DeMambro Elctns., 1308 Elm St. 516-433-1700

NM Albuquerque, Industrial Elctns., 310 Valverde S.E. 505-256-9831
NY Buffalo, Summit Distributors, 916 Main St. 716-884-3450

NY Rochester, Summit Elctns. of Rochester, 292 Commerce Dr. 716-334-8110
NC Winston-Salem, Kirkman Elctns., Inc., 901 W. Second St. 919-724-0541

Ohio Cincinnati, United Radio, Summit Road & Rheinhold Dr. 513-761-4030
Okla Tulsa, Radio, Inc., 1000 S. Main St. 918-587-9123

Pa Philadelphia, Philadelphia Elctns., 112 N. 12th St. 215-568-7444
RI Providence, Wm. Dandreta & Co., 28 Wolcott St. 401-861-2800

Tex Fort Worth, Patco Supply, 6100 Camp Bowie Blvd. 817-738-2394
Utah Salt Lake City, Standard Supply Co., 225 E. 6th So. 801-355-2971

For: Can., Edmonton, Alb., Cardinal Indl. Elctns. Ltd., 14804-119th Ave. 403-455-4122
For: Can., Montreal West, Que., S. C. Hooker (Cda) Ltd., 144 Ronald Dr. 514-487-5151

For: Can., Montreal, Que., D. Randall Div. of Neeco Inds. Ltd. Zenith39420
For: Can., Rexdale, Ont., D. Randall-Div. of Neeco Inds. Ltd., 80 Galaxy Blvd. 416-678-2890

For: Can., Vancouver 2, BC, RAE Indl. Elctns. Ltd., 1629 Main St. 604-687-2621

FENWAL, INC., Div. W. Kidde & Co., Inc., Main St., Ashland, Mass., 01721, Tel: 617-881-2000, TWX: 617-881-1609; FSC No: 73168; Empl.: 700; Minimum order: \$25

For info on price: J. W. Rice; Application info: J. W. Rice; Customer service: E. Murphy; Delivery info: J. W. Rice

Products manufactured: Adhesives (All Types), Alarms, Comparators, Controls/Control Ept., Monitors, Probes, Pyrometers, Switches, Thermistors, Thermocouples, Elements & Accessories, Thermostats, Transducers

Local Sales Offices & Reps.

Cal Oakland, Belllove Co., Engrs. 415-658-9011
Cal Sherman Oaks, Pacific Thermal Sls., Inc. 213-986-6036
Colo Denver, E & M Sls., Inc. 303-244-4291
Conn Middletown, Dittman & Greer, Inc. 203-347-4655

Fla Miami, Ludlum Assocs. Co. 305-592-6523
Ga Atlanta, Applebee-Church, Inc. 404-451-2747
Ill River Forest, F. I. Tourtelot Co. 312-771-6300
Ind Indianapolis, Couchman-Conant, Inc. 317-849-9890

Iowa Davenport, Volco Co. 319-326-5233
La Baton Rouge, Ross & Pethtel, Inc. 504-293-0520

Md Ellicott City, McCourt Co., Inc. 301-465-4515
Mich Warren, Smith Instrument & Equip. Co. 313-755-3110

Minn Minneapolis, Volco Co. 612-336-6631
Mo Kansas City, R. Greene Co. 816-333-7586
Mo St. Louis, R. Greene Co. 314-644-2666

NJ Clifton, R.L. Faber & Assocs., Inc. 201-773-8900
NY Buffalo, R. F. Lamb Co., Inc. 716-874-4900
NY New York, R.L. Faber & Assocs., Inc. 212-947-4100

NC Matthews, W.K. Hile Co., Inc. 704-847-9125
Ohio Cincinnati, Arnold & Assocs. 513-851-7200

Ohio Cleveland, Anderson-Bolds, Inc. 216-229-4700
Okla Tulsa, Driscoll Automatic Control Co. 918-747-6625

Pa Narberth, C. B. Ives & Co., Inc. 215-839-6850
Pa Pittsburgh, Gilson Engrg. Sls. 412-931-6114
Tenn Memphis, R. M. Jordan & Assocs. 901-452-7441

Tex Dallas, D. Shuhart Co., Inc. 214-239-0185
Tex Houston, Southwestern Controls 713-666-2801
Wash Seattle, Seatronics, Inc. 206-767-4330

Wisc Milwaukee, G. Hatch Co., Inc. 414-671-6550

FERRA, FLUX CORP., 1801 Newport Circle, Santa Ana, Cal., 92705, Tel: 714-979-0225; Empl.: 50

Customer service: J. Erdag
Free literature available: Data sheets are available on both Audio, Digital and Instrumentation Head Assemblies and on Memory Drum Systems.

Products manufactured: Drums Computer Memory, Heads, Recording Playback, Erase, Memory Systems

FERRANTI ELEC., East Bethpage Rd., Plainview, N.Y., 11803, Tel: 516-293-8383; Empl.: 15

For info on price: M. Canellos; Application info: S. J. Gladys; Customer service: S. J. Gladys; Delivery info: G. Glavin

Products manufactured: Display Devices/Displays, Erasers, Magnetic Tape (Bulk), Meters, Shields, Transistors, Tubes, Yokes

FERRANTI-PACKARD, LTD. ELEC. DIV., 121 Industry St., Toronto, Can.M6M 4M3, Tel: 416-762-3661, Telex: 06-22007; Empl.: 140; Minimum order: \$75

For info on price: D. W. Smart; Application info: D. W. Smart; Customer service: J. D. Greenwood; Delivery info: B. Ashton

Free literature available: Brochures on: Electromagnetic display systems and components. Fully automatic or semi-automatic sortation control systems.

Products manufactured: Controls/Control Eqpt., Display Devices/Displays, Indicators

FERRODYNE CORP., 4240 Glencoe Ave., Venice, Calif., 90291, Tel: 213-821-7933, TWX: 910-588-3780; Empl.: 80; Minimum order: \$25

For info on price: R. Warmington; Application info: H. Kumano; Customer service: R. Warmington; Delivery info: R. Warmington

Products manufactured: Chokes, Coils Including Assemblies & Forms, Reactors, Transformers

Local Sales Offices & Reps.

Cal	Pasadena, Dressen-Barnes	213-795-7731
Md	Simpsonville, Seltic Assoc.	301-596-5520
Mass	Needham, A & M Elec. Reps.	617-444-8170
NY	Elmira, A & D Devices	607-733-0405
NY	Hartsdale, Comp. Sls.	914-725-1050
NY	Rochester, A & D Devices	716-586-8033
NY	Verona, A & D Devices	315-337-7321
Tex	Plano, Zeus Eng.	214-423-7027
Wash	Seattle, Avionics-Liaison	206-767-3870

FERRONICS, INC., 60 N. Lincoln Rd., East Rochester, N.Y., 14445, Tel: 716-377-6820; Empl.: 60; Minimum order: \$20

For info on price: M. J. Breiland; Application info: W. Lee Vroom; Customer service: E. Kolls; Delivery info: E. Kolls

Free literature available: Ferronics "Short Form" Catalog, Data Materials Div. Bulletin 501, Ferrite Beads, Bulletin 203, Wide Band Ferrite Cores, Bulletin 401

Products manufactured: Cores, Magnetic, Ferrite Material & Parts, Heads, Recording Playback, Erase, Kits, Shielding, Magnets, Shielding Beads, Ferrite

Local Sales Offices & Reps.

Ala	Huntsville, Comp. Sls.	
Ariz	Phoenix, J.A. Swanson Assocs.	602-949-1536
Cal	Santa Clara, Rodgers Assocs.	408-984-8110
Cal	Seal Beach, TEXEL	213-596-9411
Fla	Tera Ceia, Comp. Sls.	813-894-4366
Ill	Chicago, Kennedy Engrg.	312-631-8283
Ind	Fort Wayne, Component Insulation Corp.	219-485-7114
Md	Baltimore, Bernard White	301-484-5400
Mass	Newton Lower Falls, New England Comp. Sls.	617-969-9523

Mich	Birmingham, Comp. Insulation	313-644-0087
Minn	Minnetonka, P.J. Codute Co.	612-933-2281
NJ	Ft. Lee, B. Cameron	201-461-2595
NY	Syracuse, N. J. Matchuk	315-488-3251
NC	Charlotte, McLean Sls. Co.	704-366-2675
Ohio	Cleveland, Comp. Insulation	216-521-3570
Ore	Portland, D. G. Weber	503-234-7671
Pa	Ardmore, Wm. K. Metz, Inc.	215-649-3966
Tex	Dallas, Gordon V. Peltz Co.	214-341-8311
Wash	Seattle, D. G. Weber	
WVa	Spokane, D. G. Weber	

FERRO-TECH CORP., 6 Northwood Rd., Bloomfield, Conn., 06002, Tel: 203-242-0708; Empl.: 12; Minimum order: \$100

For info on price: S. Buchbinder; Application info: R. Wolff; Customer service: J. Zavac; Delivery info: J. Zavac

Products manufactured: Transformers

FERROTRAN ELCTR., 683 Broadway, New York, N.Y., 10012, Tel: 212-AL4-5810

p. 1•1209-1213; p. 2•1751

Customer service: E. Abbot

Free literature available: Company Catalog

Products manufactured: Power Supplies, Transformers

FERROXCUBE CORP., Mt. Marion Rd., Box 359, Saugerties, N.Y., 12477, Tel: 914-246-2811, TWX: 510-247-5410; Empl.: 300; Minimum order: \$100

p. 2•1218-1225

For info on price: G. Ljutic; Application info: J. VanderPoec; Customer service: G. Ljutic; Delivery info: G. Ljutic

Products manufactured: Bobbins, Winding, Coil & Transformer, Chokes, Cores, Magnetic, Ferrite Material & Parts, Magnets, Memories, Buffer, Memory Systems, Shielding Beads, Ferrite, Suppressors

Local Sales Offices & Reps.

Ala	Huntsville, NAPECC	205-534-7351
Cal	North Hollywood, NAPECC	213-762-2118
Cal	San Diego, NAPECC	714-453-5440
Cal	Santa Clara, NAPECC	408-249-1134
Colo	Denver, NAPECC	303-922-8434
Conn	Shelton, Comark Assoc.	203-929-4884
Fla	Fort Lauderdale, NAPECC	305-772-2840
Ill	Elk Grove Village, NAPECC	312-593-8220
Ind	Indianapolis, NAPECC	317-257-6547
Kans	Olathe, B. C. Electronics Sls.	913-782-6696
Mass	Waltham, NAPECC	617-899-7100
Mich	Southfield, NAPECC	313-357-4288
Minn	Minneapolis, Siedera Assoc.	612-533-2294
Mo	St. Louis, B.C. Electronic Sls.	314-731-1255
NJ	Rochelle Park, NAPECC	201-843-4810
NY	Endicott, Tech-Mark Inc.	607-748-7473
NY	Fairport, Tech-Mark Inc.	716-223-1252
NY	Hempstead, Kahgan Sls. Co.	516-538-2300
NY	Hicksville, NAPECC	516-931-6200
NY	Liverpool, Tech-Mark Inc.	315-652-6229
NY	Pleasant Valley, Tech Mark, Inc.	914-635-3436
NC	Raleigh, Candor Co.	919-787-2652
Pa	King of Prussia, NAPECC	215-265-4240
SC	Myrtle Beach, Candor Co.	803-448-5213
Tex	Dallas, NAPECC	214-691-2141
Va	Richmond, NAPECC	804-282-6515
Wash	Bellevue, Ferroxcube Corp.	206-746-3600

Local Distributors

Cal	San Diego, NAPECC, 11568 Sorrento Valley Rd.	714-453-5440
Ill	Elk Grove Village, NAPECC, 175 Scott St.	312-593-8220
Mass	Waltham, NAPECC, 1393 Main St.	617-899-7103
NY	Hempstead, Kahgan Sales, 556 Peninsula Blvd.	516-538-2300
NY	Woodstock, Elna Ferrite, Box 395	914-246-5861
Pa	Flourtown, Eastern Comps., 1407 Bethlehem Pk.	215-836-1616

FERWALT INC. W. H., Hwy. 95 & Webb Rd., Lapwai, Idaho, 83540, Tel: 208-843-2281; Empl.: 15

p. 1•318,319

For info on price: R. J. Brant; Application info: R. J. Brant; Customer service: R. J. Brant; Delivery info: S. Pinson

Free literature available: Crystal oscillator catalog sheets, Temperature compensated crystal oscillator catalog sheets, Voltage controlled crystal and non-crystal catalog sheets, LC & RC oscillator catalog sheets, Oven regulated oscillator specifications

Products manufactured: Clocks (All Types), Oscillators, Standards, Timers

Local Sales Offices & Reps.

Pa	Philadelphia, W.F. Assocs.	215-CA4-4120
Wash	Seattle, IMI Corp.	206-244-8233

FIBERFIL DIV. DART IND., 1701 N. Heidelberg, Evansville, Ind., 47717, Tel: 812-424-3831, TWX: 810-353-0506

For info on price: Cust. Svc.; Application info: W. Lachowecki; Customer service: J. Kissinger; Delivery info: Cust. Svc.

Free literature available: 36 page engineering manual with charts and physical property comparison, test and application data.

Products manufactured: Plastic Raw Materials, Liquids, Pellets, Powders, Resins

Local Sales Offices & Reps.

Cal	Encino	213-783-3235
Ga	Atlanta	404-525-7184
Ill	Chicago	312-332-6242

Mass	Boston	617-742-1049
Mich	Detroit	313-961-9696
Minn	Minneapolis	612-335-0186
NY	New York	212-765-3690
Ohio	Cincinnati	513-721-3810
Ohio	Cleveland	216-771-7107
Okla	Oklahoma City	405-235-2001
Pa	Philadelphia	215-567-2450

FIBRA-SONICS, INC., 4626 N. Lamont Ave., Chicago, Ill., 60630, Tel: 312-286-7377; Empl.: 20; Minimum order: \$25

For info on price: A. R. Watson; Application info: A. R. Watson; Customer service: J. Kirchsclager; Delivery info: J. Kirchsclager

Free literature available: "Facts About Ultrasonic Soldering"

Products manufactured: Generators, Soldering Equipment

Local Sales Offices & Reps.

Cal	Gardena, Instrument Labs	213-770-0650
Colo	Denver, Electronic Sls.	303-771-6300
Ga	Atlanta, D. G. Machinery & Gage Co.	404-633-6201
Mass	Boston, P.J. Engrg. Sls. Co.	617-783-0510
Mich	Dearborn, Pitcher-Poulin	313-582-5420
Minn	Minneapolis, E. J. Doyle Co.	612-827-5847
NY	Great Neck, F. Tylinski Co.	516-466-9070
NY	Scaneateles, Tech-Sonics Assocs.	315-685-6144
Ohio	Dayton, Rixan Assocs.	513-222-0001
Ore	Portland, Vandy	503-297-1900
Pa	Paoli, Stitzer Assocs.	215-644-5500
Tex	Dallas, Teamwork Inc.	214-243-5881

FIDELITY CHEM. PRODS. CORP., 472 Frelinghuysen Ave., Newark, N.J., 07114, Tel: 201-242-4110; Empl.: 10; Minimum order: \$20

For info on price: S. Siegel; Application info: M. Bick; Customer service: S. Siegel; Delivery info: S. Siegel

Products manufactured: Chemicals, Cleaners & Solvents, Cleaners, Ultrasonic, Coatings, Electroplating Equipment & Supplies

FIFTH DIMENSION, Box 483, Princeton, N.J., 08540, Tel: 609-924-5990, TWX: 510-685-9294; Empl.: 100; Minimum order: \$45

For info on price: W. Kinney 669-452-1200; Application info: W. Kinney 669-452-1200; Customer service: A. Dubs 669-452-1200; Delivery info: A. Dubs 669-452-1200

Free literature available: Applications Booklet & Catalog on Mercury Film Switching describes methods of using non position sensitive mercury relays and switches. Test Data provided.

Products manufactured: Comm. Systems, Converters, Data Acquisition & Reduction Systems, Relays, Scanners, Signal Conditioners & Equipment, Switches

Local Sales Offices & Reps.

Ariz	Phoenix, Portis & Assocs.	602-947-4379
Cal	Encino, Porter Co.	213-788-2350
Cal	Menlo Pk., G.R. McKnight Co.	415-325-2844
Colo	Denver, A-G Elctns.	303-759-4790
Fla	Orlando, Gra-Mar	305-841-2330
Mass	Burlington, Tritex Inc.	617-272-4550
Mich	Detroit, Nicon Assocs.	313-341-7688
Minn	Minneapolis, G.E. Arneson & Co.	612-920-2086
Mo	Kansas City, Harris Hanson Co.	816-444-9494
Mo	St. Louis, Harris-Hanson Co.	314-432-3611
NY	Staten Island, F.T. Battista Co.	212-979-4020
Pa	Berwyn, Tucker Assocs.	215-644-0142
Va	Alexandria, Vanguard Engrg. Sls.	703-768-1660
Wash	Seattle, H. Levinson Co.	206-323-5100

FIGARO ENGRG. INC., 3-7-3 Higashitoyonaka, Toyonaka City, Osaka, Japan, Tel: 06-849-2156; Empl.: 64; Minimum order: \$32

Customer service: K. Tsukada

Free literature available: Catalog: TGS High Sensitive Gas-Electric Transducer for Combustible gases.

Products manufactured: Detectors

FILM CAPACITORS, INC., 100 8th St., Passaic, N.J., 07055, Tel: 201-779-2240; Minimum order: \$25

For info on price: S. Lipmsn; Application info: S. Saposnik; Customer service: Margaret; Delivery info: Margaret

Free literature available: 1 - Application Chart 2 - High Voltage Capacitors 3 - High Voltage AC Capacitors 4 - Metallized Mylar High Voltage Capacitors 5 - Metallized Capacitors, (Mylar) 6 - Polystyrene Capacitors Hermetic Mylar Capacitors

8 - Teflon capacitors 9 - Polycarbonate capacitors
10 - Polypropylene capacitors

Products manufactured: Capacitors, Fixed, Capacitors, Variable

Local Sales Offices & Reps.

Ala Gadsden, F. C. Nickerson & Co. 205-547-7718
Cal Mountain View, G. C. Woempner Co. 415-964-5454

Cal Santa Monica, Rep Associates 213-829-5401
Fla Oldsmar, F. C. Nickerson Co. 813-855-4209
Ga Decatur, F. C. Nickerson Co. 404-321-4678
Ill Chicago, Berndt Assocs. 312-283-0713
Md Lutherville, Cunningham & Assocs. 301-296-4306

Mass Chelmsford, Northeast Comps. 603-668-1372
Mich Warren, DEM Elctn. Labs 313-755-6660
NJ Leonia, Kohl-Camber 201-944-6488
NY Pittsford, D Hurley Sls. 716-586-6159
NC Kannapolis, F. C. Nickerson & Co. 704-932-6772
Ohio Akron, Augue Natalino Assoc. 216-725-6087
Tex Dallas, G. Weinreich & Assocs. 214-DA 1-2800
Wash Seattle, R Johnston Co. 206-524-5170

FILM MICROELECTRONICS, INC., 17 A St., Burlington, Mass, 01803, Tel: 617-272-5650; Empl.: 75; Minimum order: \$10

For info on price: M. Lioz; Application info: M. Lioz; Customer service: M. Lioz; Delivery info: J. Gordon

Free literature available: Literature is available on our chip resistors chemical etchants, metallized substrates, pin diode drivers and hybrid circuit capabilities.

Products manufactured: Circuits, Hybrid, Thin-Film, Resistors, Substrates

FILTECH CORP., 10103 W. Pacific, Franklin Park, Ill., 60131, Tel: 312-678-8900, TWX: 910-227-4637; Empl.: 75
Customer service: J. A. Victor

Free literature available: Brochures: Quartz crystal filters, LC filters and monolithic crystal filters

Products manufactured: Filters

FILTRON COMPANY, INC., 200 Shames Drive, Westbury, N.Y., 11590, Tel: 516-997-3500; FSC No: 51932; Empl.: 50; Minimum order: \$100

For info on price: E. Greenwood 516-997-3500; Application info: E. Greenwood 516-997-3500; Customer service: G. Barry 516-997-3500; Delivery info: G. Barry 516-997-3500

Products manufactured: Capacitors, Fixed, Coils Including Assemblies & Forms, Delay Lines, Films, Filters

Local Sales Offices & Reps.

Ariz Scottsdale, Inter-Mountain Engrg. 602-947-7379

Cal Culver City, DeAngelo, Rothman 213-398-6239
Cal Mt. View, Nor-Cal Assoc. 415-961-8121
DC Wash, Arco 202-393-5991
Mass Newton Upper Falls, Brookdale Elec. 617-244-6969

Mich Farmington, Carter, McCormick & Peirce 313-477-7700

NJ Huntingdon Valley, ABC Sls. 215-464-2275
NJ Tenafly, Garrettsen Co. 201-568-2354
NM Albuquerque, IMEC 505-883-9010
NY Williston Pk., Garrettsen Co., Inc. 516-747-6610
Tex Dallas, Texas Microwave 214-231-5381
FOR: Can., Ottawa, Ont., Aircraft Appliances & Equip., Ltd. 613-233-1852

FINNEY CO., 34 W. Interstate St., Bedford, Ohio, 44014, Tel: 216-232-6161; Empl.: 200; Minimum order: \$25

For info on price: R. O. Phillips; Application info: R. O. Phillips; Customer service: R. O. Phillips; Delivery info: N. Harris

Products manufactured: Amplifiers, Antenna Feed Systems, Antenna Rotators, Antennas, Arresters, Electrical Surge, Lightning, Attenuators, Cable, Connectors, Converters, Couplers, Dividers, Filters, Meters, Mounts, Probes, Splicers, Coaxial Cable, Tools, Transformers

Local Sales Offices & Reps.

Cal Fullerton, H. Hawthorne 714-528-4551
Colo Colorado Springs, Norris & Co. 303-635-9319
Fla Maitland, Hutto-Hawkins-Peregoy 305-831-2474

Fla Pompano Beach, Hutto-Hawkins-Peregoy 305-943-9593
Ga Atlanta, Millar Electronics 404-261-6160
Ill Chicago, Markal Sls. 312-282-5800
Ind Indianapolis, Elctn. Representatives, Inc. 317-897-9326
Kans Shawnee Mission, Lowell, Kangas & Assocs. 913-631-3515

Md Baltimore, E.K.P. Assocs. 301-944-6677
Md Baltimore, E.K.P. Assocs. 301-788-6498
Mass W. Springfield, L.B. Cole & Co. 413-781-3040
Mass Wellesley Hills, L.B. Cole & Co. 617-237-1260
Miss Clinton, J. Fisher Sls. Co. 601-924-7348
Miss Michigan City, J. Fisher Sls. Co. 601-224-6470
Mo St. Louis, Lowell, Kangas & Assocs. 314-821-4050

NJ Edison, L.W. Keller & Assocs. 201-287-5476
NJ Moorestown, Victor Piper 609-235-8006
NY North Bellmore, L.W. Keller & Assocs. 516-785-2826

NY North Syracuse, L.D. Allen, Inc. 315-458-7470
NY Snyder, L.D. Allen 716-839-3300
NC Raleigh, Millar Electronics 919-787-9564
Ohio Westlake, T.G. Corpus 216-871-8832
Pa Easton, E.K.P. Assocs. 215-258-6477
Tex Ft. Worth, L. Smith 817-332-1909
Wash Seattle, D. Miller Sls. 206-784-6800
Wisc Colgate, Markal Sls. 414-628-2801

FIRING CIRCUITS INC., Muller Ave./Box 2007, Norwalk, Conn., 06852, Tel: 203-846-1633; Empl.: 110

Products manufactured: Controls/Control Eqpt., Power Supplies

FISHER SCI. CO., 711 Forbes Ave., Pittsburgh, Pa., 15219, Tel: 412-562-8300; Empl.: 2500

For info on price: W. Lorenz; Application info: K. Doverspike

Products manufactured: Analyzers, Baths, Controlled Temperature (Air & Liquid), Benches, Consoles, Stools, Tables, Cabinets & Accessories

Local Sales Offices & Reps.

Cal Santa Clara 408-249-0660
Fla Orlando 305-857-3600
Ga Atlanta 404-261-4120
Ill Chicago 312-379-9300
Md Silver Spring 301-587-7000
Mass Medford 617-391-6110
Mich Livonia 313-261-3320
Mo St. Louis 314-991-2400
NJ Springfield 201-379-1400
NY Rochester 716-464-8900
NC Raleigh 919-876-2351
Ohio Cincinnati 513-793-5100
Ohio Cleveland 216-292-7900
Pa King of Prussia 215-265-0300
Pa Pittsburgh 412-781-3400
Tex Houston 713-521-9351

FITCHBURG COATED PRODUCTS, Div. Litton Inds., P. O. Box 1106, Scranton, Pa., 18501, Tel: 717-347-2035; Empl.: 250

Customer service: R. Malloy

Free literature available: A free technical manual on the "Dry Electro-sensitive Recording Process" on request.

Products manufactured: Paper, Graphic Recording, Tapes, Films & Foils, Pressure Sensitive

FJW INDUSTRIES, 215 E. Prospect Ave., Mt. Prospect, Ill., 60056

FLEXPRINT DIV., Sanders Assocs., Inc., Grenier Field, Manchester, N. H. 03060, Tel: 603-669-4615, TWX: 710-220-1845; Empl.: 700

Products manufactured: Boards, Printed Circuit, Circuits, Flexible, Circuits, Printed, Multilayer

FLIGHT SYS., INC., Box 25, Mechanicsburg, Pa., 17055, Tel: 717-697-0333; Empl.: 30

Products manufactured: Controls/Control Eqpt.

Local Sales Offices & Reps.

Pa Paoli, T. Griffin Co. 215-647-1550

FLITE-TRONICS CO., INC., 3314 Burton Ave., Burbank, Cal., 91504, Tel: 213-849-1483; Empl.: 50
p. 1*1214,1215

Customer service: W. V. Viscarra

Products manufactured: Inverters, Power Supplies

FLUKE MFG. CO., INC. JOHN, Box 7428, Seattle, Wash., 98133, Tel: 206-774-2211, TWX: 910-449-2850; FSC No: 89536
p. 1*695

For info on price: J. Welte 206-774-2481; Application info: D. Buell 206-774-2473; Customer service: T. Brumfield 206-774-2323; Delivery info: J. Welte 206-774-2481

Free literature available: 1974-75 Test and Measurement Instruments Catalog general catalog covering all Fluke products. Digital Multimeter Brochure - One or more brochures covering latest digital voltmeter products in Fluke line. Automatic Calibration Systems Brochure - Covers Fluke's terminal/10 line of automatic calibration systems.

Products manufactured: Amplifiers, Attenuators, Bridges, Calibrators, Comparators, Converters, Counters, Dividers, Generators, Meters, Power Supplies, Printers, Probes, Receivers, Services, Assembly, Production & Test, Standards, Synthesizers, Test Systems

Local Sales Offices & Reps.

Ala Huntsville, BCS Assocs. 205-881-6220
Alas Anchorage, Harry Lang Assocs. 907-279-5741
Ariz Scottsdale, Barnhill Assoc. Inc. 602-947-7841
Cal Burbank, Instr. Specialists Inc. 213-849-7181
Cal San Diego, Instr. Specialists Inc. 714-752-6200
Cal Santa Clara, Instr. Specialists Inc. 408-244-1505
Colo Denver, Barnhill Assoc. 303-750-1222
Conn Glastonbury, Instr. Reps. Inc. 203-633-0777
Fla Orlando, BCS Assoc. Inc. 305-896-4881
Ga Atlanta, BCS Assoc., Inc. 804-321-0980
Haw Honolulu, Ind'l. Elctns., Inc. 808-533-6095
Ill Des Plaines, Cozzens & Cudahy, Inc. 312-298-3600

Ind Indianapolis, Cozzens & Cudahy, Inc. 317-244-2456

Ky Louisville, BCS Assocs. 502-935-9634
Md Kensington, Elctn. Mktg. Assoc. 301-881-5300
Mass Lexington, Instr. Reps. Inc. 617-861-8620
Mich Detroit, WKM Assoc. 313-892-2500
Minn Minneapolis, Cozzens & Cudahy, Inc. 612-884-4336

Mo St. Louis, Cozzens & Cudahy, Inc. 314-423-1234
Mo. Kansas City, Cozzens & Cudahy, Inc. 816-454-5836

NJ Union, SBM Reps., Inc. 201-687-8737
NM Albuquerque, Barnhill Assoc. 505-299-7658
NY Pleasantville, SBM Reps., Inc. 914-769-1811
NY Rochester, SBM Reps., Inc. 716-266-1400
NC Greensboro, BCS Assoc. 919-273-1918
Ohio Cleveland, WKM Assoc. 216-267-0445
Ohio Dayton, WKM Assoc. 513-434-7500
Ore Beaverton, Showalter Instrs. 503-646-3004
Pa King of Prussia, Elctn. Mktg. Assoc. 215-248-5050

Pa Pittsburgh, WKM Assoc. 412-892-2953
Tex Houston, Barnhill Assoc. 713-688-9971
Tex Richardson, Barnhill Assoc. 214-231-2573
Va Williamsburg, BCS Assoc. 804-877-4053
Wash Seattle, Showalter Instrs. 206-455-4922

FLUKE TRENDAR CORP., 500 Clyde Ave., Mountain View, Cal., 94043, Tel: 415-965-0350, TWX: 910-379-6573; Empl.: 40

Customer service: N.P. Lyons

Free literature available: TESTCLIP sales brochure and How to Use Manual, T1000, T1010, and T2000 sales brochures, Questions and Answers, and Preparing to Test Manuals.

Products manufactured: Analyzers, Comparators, Probes, Test Systems, Testers

Local Sales Offices & Reps.

Ala Huntsville, BCS Assocs. 205-881-6220
Alas Anchorage, H. J. Lang & Assocs. 907-279-5741
Ariz Scottsdale, Barnhill Three, Inc. 602-947-7841
Cal Burbank, Instr. Specialists, Inc. 213-849-7181
Cal Glendale, Instr. Specialists, Inc. 213-243-9404
Cal San Diego, Instr. Specialists, Inc. 714-565-2555
Cal Santa Clara, Instr. Specialists, Inc. 408-244-1505

Colo Denver, Barnhill Three, Inc. 303-934-5505
Conn Glastonbury, Instr. Reps. 203-633-0777
Fla Orlando, BCS Assocs. 305-896-4881
Ill Des Plaines, Cozzens & Cudahy, Inc. 312-298-3600

Ind Indianapolis, Cozzens & Cudahy, Inc. 317-244-2456

Md Kensington, Elctn. Mktg. Assocs. 301-881-5300
Mass Lexington, Instr. Reps. 617-861-8620
Mich Detroit, W K M Assocs. 313-892-2500
Minn Minneapolis, Cozzens & Cudahy, Inc. 612-884-4336

Mo St. Louis, Cozzens & Cudahy, Inc. 314-423-1234
NJ Union, S B M Reps., Inc. 201-687-8737
NM Albuquerque, Barnhill Three, Inc. 505-299-7658
NY Pleasantville, S B M Reps., Inc. 914-769-1811
NY Rochester, S B M Reps., Inc. 716-266-1400
NC Greensboro, BCS Assocs. 919-273-1918
Ohio Cleveland, W K M Assocs. 216-267-0445
Ohio Dayton, W K M Assocs. 513-434-7500
Ore Beaverton, Showalter-Judd, Inc. 503-646-3004

Pa King of Prussia, Elctn. Mktg. Assocs. 215-265-1600
 Pa Pittsburgh, WKM Assocs. 412-892-2953
 Tex Houston, Barnhill Two, Inc. 713-621-0040
 Tex Richardson, Barnhill Two, Inc. 214-231-2573
 Wash Bell, Showalter-Judd, Inc. 206-455-4922

FMC CORP., Organic Chems. Div., 633 Third Ave., New York, N.Y., 10017, Tel: 212-MU 7-7400; Empl.: 300
 Products manufactured: Plastic Raw Materials, Liquids, Pellets, Powders, Resins

FMC CORPORATION, Semiconductor Products Operation, 264 Lexington, Homer City, Pa., 15748, Tel: 412-479-8011, TWX: 510-468-9220
 Customer service: H. D. Wood

Free literature available: Syntron Silicon Rectifiers - #310072; Syntron Selenium Surge Suppressors - #301172; Silicon Controlled Rectifier Data - #323173; Syntron Selenium Rectifiers - #300D71; A complete line of Syntron Selenium, Silicon, and Silicon Controlled Power Rectifiers.

Products manufactured: Diodes, Rectifiers, Suppressors, Thyristors (Includes Silicon Controlled Rectifiers)

Local Sales Offices & Reps.

Ariz Scottsdale, Fryco, Engrg. Reps. 602-945-3281
 Cal Los Angeles, C. E. Holmes Co. 213-256-2255
 Colo Denver, Gossard & Assocs. 303-985-0602
 Fla N. Miami Beach, L. Haas Co., Inc. 305-949-9143
 Ill Hinsdale, FMC Corp. Material Handling Equip. Div. 312-325-3250
 Ind Montgomery, Seawood 513-793-6702
 Md Baltimore, Callas Elctnrs. 301-744-7711
 Mass Needham, Garrettson Co. 617-449-2640
 Mich Detroit, L.H. Dickelman 313-255-3300
 Minn St. Paul, Northport Engrg. 612-698-3841
 Mo St. Louis, H.J. Weisler & Assocs. 314-428-3934
 NJ Hasbrouck Heights, FMC Corp. Material Handling Equip. Div. 201-288-1845
 NY Penfield, J. Lazor Assocs. 716-385-3300
 NC Charlotte, J. Rudisill Assocs. 704-377-6901
 Ohio Brecksville, A. Nace Co. 216-526-4323
 Pa Media, W. Reeves Assocs. 215-566-6709
 Tex Richardson, Palatine Sls. 214-231-9489
 Wash Olympia, Bergford & Assocs. 206-866-2001
 Wisc Milwaukee, Syntron Semiconductor Sls. 414-273-6773

FOGG SYSTEM CO., 2101 So. Leyden, Box 22226, Denver, Col., 80222, Tel: 303-758-2979; Empl.: 7

Customer service: H. Fogg
 Products manufactured: Amplifiers, Bridges, Calibrators, Filters, Integrators, Electronic

FORK STANDARDS, INC., 211 Main St., West Chicago, Ill., 60185, Tel: 312-231-3511; Empl.: 27
 p. 1-320,321

Customer service: A. E. Toht

Free literature available: Catalog 72C and Mailer - contains broad looks at fork standards product line of tuning fork and crystal oscillators. Specialized units such as oven controlled crystal oscillators and oscillators with output regulation are included.

Products manufactured: Calibrators, Coders, Decoders, Generators, Modulator/Demodulators, Modules, Logic, Encapsulated, Oceanographic Equip. (Electronic), Oscillators, Power Supplies, Relays, Standards, Tuning Forks

Local Sales Offices & Reps.

Ala Huntsville, Reynolds & Assoc. 205-536-1941
 Cal Sherman Oaks, Windsor Dynamics 213-989-3631
 Cal Woodside, Windsor Dynamics 415-854-4870
 Fla Satellite Beach, Reynolds & Assoc. 305-773-4700
 Ga Atlanta, Reynolds & Assoc. 404-252-5360
 Mass Salem, Forbes Engrg. 617-744-1693
 NC Greensboro, Reynolds & Assoc. 919-275-3725
 Ohio Cleveland, Harvey Teplitz & Co. 216-371-2044
 Ohio Dayton, Harvey Teplitz & Co. 513-277-6531
 Pa Paoli, Tyler Griffin Co. 215-647-1550
 EXP: Westbury, N.Y., Minthorne Intl. Co. 516-334-3303

FORM-IT PRODUCTS INC., 1621 W Walnut St., Chicago, Ill., 60612, Tel: 312-421-7337; Empl.: 21; Minimum order: \$10

Customer service: R. St. John

Free literature available: A catalog of our products and an inquiry sheet.

Products manufactured: Bobbins, Winding, Coil & Transformer, Coils Including Assemblies & Forms, Insulators & Insulation, Services, Assembly, Production & Test

FORMICA METAL PRODS. CO., INC., Corporation Way, Dept. M, Medford, Mass., 02155, Tel: 617-395-5656; Empl.: 35 p. 1-62,1540

Products manufactured: Benches, Consoles, Stools, Tables, Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Racks

FORMULATED RESINS INC., Box 508, Greenville, R.I., 02828, Tel: 401-949-2060; Empl.: 15

For info on price: J. Leone; Application info: N. G. Harrington; Customer service: H. R. Oldham; Delivery info: C. Ridge

Free literature available: Dielectric Materials Selector Chart, News Release.

Products manufactured: Adhesives (All Types), Chemicals, Cleaners & Solvents, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Conductive Plastic Materials, Insulators & Insulation, Lubricants, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Rubber

FOSTER TRANSFORMER CO., 3820 Colerain Ave., Cincinnati, Ohio, 45223, Tel: 513-681-2420, TWX: 810-461-2584; Empl.: 250; Minimum order: \$2000
 Customer service: A. W. Reynolds

Products manufactured: Transformers

Local Sales Offices & Reps.

Cal Encino, V & L Assocs. 213-986-9703
 Cal San Carlos, Component Assocs. 415-591-9656
 Cal Santa Clara, Nova-Tronix Elctn. Sls. 408-243-9530
 Colo Wheatridge, Waugaman Assocs. Inc. 303-423-1020
 Fla Melbourne, Hanson Assocs. 305-727-7474
 Ill Evanston, W.F. Swinke & Assocs. 312-869-3577
 Ky Ft. Mitchell, G. Thelen Co. 606-341-8181
 Md Towson, Kraft Elctn. Sls. 301-828-5838
 Mass Brockton, Forsberg Sls. 207-522-6302
 Mich Farmington, Davis-Martensen Co. 313-474-8300
 Minn Minneapolis, R.W. Marshall Co. 612-929-0457
 NJ Ho-Ho-Kus, Alto Assoc. 201-447-1770
 NJ Moorestown, Maple Assocs. 609-234-0382
 NY Brooklyn, Alto Elctnrs. 212-253-3904
 NY Pittsford, D. Hurley Sls. 716-586-6159
 NC Charlotte, B. Jackson Co. 704-366-6678
 Ohio Cleveland, Martin-Rettger 216-791-8787
 Pa Pittsburgh, R.F. Clark Co. 412-242-9500
 Tex Dallas, Tesco 214-631-6270
 Wisc Milwaukee, W.M. Braun & Assoc. 414-332-1040

FOUR-PHASE SYSTEMS, 19333 Vallico Pkwy., Cupertino, Cal, 95014, Tel: 408-255-0900, TWX: 910-338-0250

Products manufactured: Computers, Data Loggers, Display Devices/Displays, Recorders, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Cal Los Angeles 213-640-1438
 Cal San Francisco 415-692-4360
 Conn Hartford 203-549-0054
 Conn Stamford 203-357-1860
 DC Washington 202-785-9222
 Fla Miami 305-592-3620
 Ga Atlanta 404-351-0070
 Ill Chicago 312-694-3250
 Ind Indianapolis 317-923-1341
 Kans Kansas City 913-384-0080
 Mass Boston 617-245-9600
 Mich Detroit 313-557-8844
 Minn Minneapolis 612-854-4461
 Mo St. Louis 314-862-3030
 NJ Rochelle Park 201-845-0252
 NY New York 212-575-5656
 Ohio Cincinnati 513-771-0670
 Ohio Cleveland 216-661-0720
 Ohio Columbus 614-459-0414
 Pa Philadelphia 609-234-0200
 Tex Dallas 214-634-2240

FOURJAY INDUSTRIES, Box 1465 Northridge Br., Dayton, Ohio, 45414, Tel: 513-278-9417

Products manufactured: Baffles, Speaker, Grilles, Speakers

FOXBORO CO., 38 Neponset Avenue, Foxboro, Mass., 02035, Tel: 617-543-8750, Telex: 927-602; Empl.: 8500; Minimum order: \$25

Free literature available: Brochures for different types of products, e.g., temperature, flow level, pH etc., and indicators, recorders or controllers, pneumatic and electronic. A general catalog for large users.

Products manufactured: Alarms, Amplifiers, Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Computers, Controllers, Programmable, Controls/Control Eqp., Converters, Counters, Current Sources, Dividers, Gages, Indicators, Integrators, Electronic, Meters, Monitors, Paper, Graphic Recording, Probes, Programmers, Receivers, Recorders, Services, Assembly, Production & Test, Signal Conditioners & Equipment, Thermocouples, Elements & Accessories, Totalizers, Digital, Transducers, Valves, Solenoid, Valves, Vacuum

Local Sales Offices & Reps.

Ala Birmingham 205-871-0319
 Ala Mobile 205-471-4487
 Cal El Monte 213-443-4191
 Cal San Leandro 415-357-7520
 Cal Valencia 805-259-8080
 Colo Denver 303-757-6105
 Conn West Hartford 203-236-6121
 Fla Jacksonville 904-398-1545
 Ga Chamblee 404-458-2381
 Haw Honolulu 808-538-1921
 Ill Lansing 312-474-8822
 Ill Mt. Prospect 312-625-8430
 Kans Mission 913-262-1262
 Kans Wichita 316-682-9061
 La Baton Rouge 504-937-3955
 La Metairie 504-887-9450
 La Shreveport 318-865-6522
 Me Augusta 207-622-0601
 Md Baltimore 301-377-9000
 Mass Walpole 617-762-9350
 Mich Farmington Hills 313-851-8900
 Minn Minneapolis 612-835-2191
 Mo St. Louis 314-567-4377
 NJ Springfield 201-379-4000
 NY East Greenbush 518-477-9397
 NY New York 212-532-4682
 NY Rochester 716-244-4590
 NY Tonawanda 716-693-8455
 NC Charlotte 704-535-1111
 Ohio Cincinnati 513-851-1220
 Ohio Middleberg Hts. 216-842-9300
 Okla Tulsa 918-743-4096
 Ore Portland 503-282-4545
 Pa Media 215-565-4100
 Pa Pittsburgh 412-922-3000
 SC Greenville 803-233-4184
 Tenn Knoxville 615-588-9601
 Tenn Memphis 901-452-4427
 Tex Amarillo 806-374-8823
 Tex Beaumont 713-832-9949
 Tex Corpus Christi 512-854-4856
 Tex Dallas 214-238-8207
 Tex Houston 713-783-5400
 Tex Odessa 915-333-2791
 Utah Salt Lake City 801-486-0133
 Va Richmond 804-359-2479
 Wash Seattle 206-633-3660
 WV South Charleston 304-744-5321
 Wisc Appleton 414-739-1153
 FOR: Can., Calgary 2, Alberta, Foxboro Co., Ltd. 403-264-0891
 FOR: Can., Edmonton, Alberta, Foxboro Co., Ltd. 403-469-2374
 FOR: Can., La Salle 650, Quebec, Foxboro Co., Ltd. 514-366-4210
 FOR: Can., Mississauga, Ontario, Foxboro Co., Ltd. 416-625-4111
 FOR: Can., Moncton, New Brunswick, Foxboro Co., Ltd. 506-855-5174
 FOR: Can., Montreal 201, Quebec, Foxboro Co., Ltd. 514-761-4534
 FOR: Can., Vancouver 6, British Columbia, Foxboro Co., Ltd. 604-291-7248
 FOR: Can., Winnipeg 21, Manitoba, Foxboro Co., Ltd. 204-775-1577

FRAZIER, INC., 1930 Valley View La., Dallas, Tex., 75234, Tel: 214-241-3441; Empl.: 30

Products manufactured: Amplifiers, Baffles, Speaker, Drivers, Speaker, Equalizers, Filters, Mixers, Networks, Speaker Systems, Speakers, Transformers

Local Sales Offices & Reps.

Cal Los Angeles, Pacific Audio Sls. Inc. 213-747-7314
 Cal San Francisco, Equinox Sls. Co. 415-468-3000
 Colo Arvada, CB Elctn. Mktg. 303-422-0581
 Conn W. Hartford, Robert Smith Co. 203-523-0512
 Ga Atlanta, Secom 404-261-8935

Haw Honolulu, J.C. Elctns. 808-537-6787
 Ill Chicago, R.R. Hutmacher Assoc. 312-631-3248
 Mich Ferndale, Shalco Inc. 313-547-4771
 Minn Moorhead, Northland Assocs. 218-233-4616
 NJ Greenbrook, Idiser Co. 201-968-0344
 Ohio Dayton, N. Browning Co. Ltd. 513-298-5973
 Tex Dallas, B. Amos & Assocs. 214-741-3674
 Wash Seattle, D. Smith Sls. Co. 206-633-3160

FREDERICK ELECTRONICS CORP., Hayward Rd. P.O. Box 502, Frederick, Md., 21701, Tel: 301-662-5901, Telex: 893438; Empl.: 215; Minimum order: \$25

For info on price: B. Fogle; Application info: E. Russell; Customer service: B. Payton; Delivery info: D. Baker

Free literature available: Data brochures on all products; complete catalog of all products.

Products manufactured: Comm. Systems, Converters, Generators, Keyers, Tone, Memory Systems, Modulator/Demodulators, Oscillators, Receivers, Synthesizers

Local Sales Offices & Reps.

Cal Santa Clara, Plantronics 408-249-1160
 Cal Valencia, Plantronics 805-255-7997
 Conn Trumbull, Plantronics 203-261-5642
 Fla Brandon, Plantronics 813-689-0220
 Ill Chicago, Plantronics 312-991-1120
 Md Bethesda, Warner Assocs. 202-469-8904
 Mo Ballwin, Plantronics 314-391-0209
 NY New York, Frederick Elctns. Corp. 212-422-2449
 Ohio Cincinnati, Plantronics 513-232-7870
 Pa Shippensburg, Plantronics 717-532-4425
 Tex Dallas, Plantronics 214-341-9500
 Wash Seattle, Plantronics 206-624-8861
 FOR: Can., Montreal, Fred. Elctns. 541-871-9652

FREDERICKS CO., Televac Div., Philmont & Anne Sts., Huntingdon Valley, Pa., 19006, Tel: 215-947-2500; Empl.: 75; Minimum order: \$15

For info on price: J. Boerick; Application info: P. McReynolds; Customer service: H. Q. Simons; Delivery info: H. Q. Simons

Products manufactured: Gages, Seals, Services, Assembly, Production & Test, Switches, Thermocouples, Elements & Accessories, Timers

FREED TRANSFORMER CO., INC., 1718 Weirfield St., Brooklyn, N.Y., 11227; Empl.: 200
 p. 1-716,717; p. 2-1738-1747

Products manufactured: Amplifiers, Bridges, Capacitors, Fixed, Chokes, Coils Including Assemblies & Forms, Compounds, Encapsulating, Insulating, Molding, Potting, Converters, Current Sources, Decade Boxes, Filters, Indicators, Inverters, Meters, Power Supplies, Reactors, Regulators, Testers, Transformers, Voltage Sources

FREQUENCY DEVICES, INC., 25 Locust St., Haverhill, Mass., 01830, Tel: 617-374-0761, TWX: 710-347-0314; Empl.: 25
 p. 1-554,555
 Customer service: S. M. Ruscio

Free literature available: Data Sheets 300 Series Voltage Tuneable Filters, 700 Series Fixed Frequency Filters, 730-760 Series Tuneable Filters, 744 Series Programmable Filters, 400 Series Quadrature Oscillators, 440 Series Tuneable Oscillators, 450 Series Amplitude Regulated Oscillators, 510 Series Tone Encoders, 540-550 Series Tone Decoders, Application Briefs #1-30.

Products manufactured: Decoders, Encoders, Filters, Generators, Oscillators, Power Supplies, Testers

Local Sales Offices & Reps.

Ala Huntsville, Tech. Sls. 205-881-1750
 Cal Mountain View, Tech-Ser 415-969-9020
 Cal Woodland Hills, Elctn. Comp. Mktg. 213-340-1745
 Colo Englewood, Klein Aerospace Assocs. 303-781-4967
 Fla Clearwater, Brennan Assocs. 813-446-2670
 Ill Northfield, Torkelson Assoc. 612-835-2414
 Ind Indianapolis, Torkelson Assocs. 317-244-7867
 Kans Shawnee Mission, Tech. Sls. Assocs. 913-888-3330
 Md Silver Spring, Rep-Tron, Inc. 301-593-4844
 Mich Detroit, Electro Sls. Assocs. 313-526-8800
 Minn Minneapolis, Torkelson Assocs. 612-835-2414
 Mo Ferguson, Technical Sls. 314-725-5361
 NJ Fort Lee, Technimat 201-461-8686
 NM Albuquerque, Klein Aerospace Assocs. 505-344-8020
 NY Guilderland, Electro-Moduler Sys. 516-456-2665

Ohio Cleveland, Electro Sls. Assocs. 216-261-5440
 Pa Pittsburgh, Electro Sls. Assocs. 412-371-9449
 Pa Willow Grove, H. Nash Assocs. 215-657-2213
 Tex Richardson, Scientific Sls. Co. 214-231-6541
 Wash Seattle, Avionics Liaison, Inc. 206-767-3870

FREQUENCY ELCTRNS., 3 Delaware Dr., New Hyde Pk., N.Y., 11040, Tel: 516-328-0100, TWX: 510-223-0418; Empl.: 185
 p. 1-323-326

Products manufactured: Amplifiers, Calibrators, Clocks (All Types), Comparators, Connectors, Controls/Control Eqpt., Converters, Detectors, Discriminators, Dividers, Filters, Generators, Meters, Microwave Integrated Circuits (MIC's), Multipliers, Oscillators, Ovens, Receivers, Standards, Switches, Synthesizers

Local Sales Offices & Reps.

Ala Huntsville, Int'l. Scien. 205-837-1601
 Cal Sherman Oaks, Windsor Dynamics 213-989-3631
 Cal Woodside, Windsor Dynamics 415-854-4870
 Fla Orlando, Truex Assoc. 305-859-2160
 Ill Chicago, Pivan Engrg. 312-539-4838
 Md Rockville, Marktron Inc. 301-762-6210
 Mass Reading, Kanan Assocs. 617-944-8484
 Mich Ferndale, Tiby Co. 313-547-3550
 Mo St. Louis, Pivan Engrg. 314-567-3636
 NJ Englewood, Scien. Devices-East 201-871-3916
 NY Rochester, Ossmann Comps. 716-442-3290
 NC Winston Salem, Int'l. Scien. 919-722-1783
 Ohio Cleveland, Tiby Co. 216-371-5335
 Pa Glenside, Elcom Inc. 215-885-1325
 Tex Houston, R. Martin Assocs. 713-462-4077
 Va Charlottesville, Marktron, Inc. 703-973-5874
 Wash Renton, S. Wilson Co. 206-226-0650
 EXP: New York City, N.Y., Henley Elctns. 212-986-5544

FREQUENCY ENGRG. LABS., Div. Harvard Inds., Inc., Box 527, Farmingdale, N.J., 07727, Tel: 201-938-9221, TWX: 201-938-2456; Empl.: 620; Minimum order: \$125

Customer service: R. Peterson

Free literature available: Passive microwave components, sub-assemblies & instruments, including fixed & variable filters, phase shifters, high power filter-combiners, wavemeters, cavities, multiplexers, frequency synchronizers & phase noise analyzers.

Products manufactured: Amplifiers, Analyzers, Antennas, Calibrators, Cavities, Microwave, Comm. Systems, Comparators, Converters, Filters, Junctions, Hybrid, Microwave, Meters, Mixers, Monitors, Multipliers, Preselector-Mixers, Preselectors, Radar Systems, Receivers, Shifters, Synchronizers, Klystron & BWO, Synthesizers, Testers, Tuners

Local Sales Offices & Reps.

Cal Sherman Oaks, Windsor Dynamics 213-989-3631
 Cal Woodside, Windsor Dynamics 415-854-4870
 Md Glen Burnie, Micro-Comp 301-761-4600
 NY Tuckahoe, ASCO Elctns. 914-779-8110
 Tex Ft. Worth, C. Wolf Co. 817-738-1996
 Tex Houston, C. Wolf Co. 713-721-2442
 Tex Universal City, C. Wolf 512-658-6672

FREQUENCY WEST, INC., 3140 Alfred St., Santa Clara, Cal., 95050, Tel: 408-249-2850, TWX: 910-338-0163; FSC No: 8F150; Empl.: 60; Minimum order: \$50

Free literature available: Complete specifications for fundamental oscillators, microwave sources and synthesizers. Linear transistorized power amplifiers specifications are included. Application notes on phase-locked signal source design and phase-locked oscillator tune-up procedure.

Products manufactured: Amplifiers, Generators, Oscillators

Local Sales Offices & Reps.

Ala Huntsville, FM Assocs. 205-536-9990
 Ariz Phoenix, Thorson Co. 602-956-5300
 Cal Los Angeles, Thorson Co. 213-937-0790
 Cal Palo Alto, Waldman Assocs. 415-961-4100
 Colo Denver, Thorson Co. 303-759-0809
 Fla Orlando, Currie, Peak & Frazier 305-855-0843
 Ill Chicago, Tech. Sls. 312-237-7210
 Ind Ft. Wayne, TX Sls. 219-489-4447
 Kans Shawnee, J. F. Guernsey Co. 913-631-2414
 Md Ellicott City, VPI 301-465-4060
 Mass Needham Hts., REPTRON 617-449-4141
 Mo St. Louis, HIT Assocs. 314-426-2322
 NM Albuquerque, Thorson Co. 505-265-5655
 NY N. Syracuse, NACO ELCTRNS. 315-699-2651
 NY Tuckahoe, Spectrum Sls. 914-793-1660
 NC Greensboro, FM Assocs. 919-294-2754
 Ohio Shaker Heights, TX Sls. 216-561-1900

Pa Montgomeryville, VPI Assocs. 215-474-3200
 Tex Dallas, Thorson Co. 214-233-5744
 Wash Bellevue, Thorson Co. 206-455-9180

FREUDENBERG, INC. B., 50 Rockefeller Plaza, New York, N.Y., 10020, Tel: 212-757-9130; Empl.: 8

Customer service: W. J. Leonhardt

Products manufactured: Bridges, Machines/Machinery, Production, Testers, Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

FRIEND'S MFG., Rd. 5, Box 74, Williamstown, N.J., 08094, Tel: 609-629-7919; Empl.: 2; Minimum order: \$32

Customer service: H. Friend

Products manufactured: Cleaners & Solvents

FUJITSU LTD., 2-chone 6-1, Marunochi, Chiyoda-ku, Japan, 100, Tel: 03-216-3211; Empl.: 32380

FUJI ELECTROCHEMICAL CO., Hamagomu Bld. 5 36-11 Shinbashi, Minato-ku, Tokyo, Japan; Empl.: 3000

Products manufactured: Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Circulators, Ferrite, Coils Including Assemblies & Forms, Converters, Cores, Magnetic, Delay Lines, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Heads, Recording Playback, Erase, Inverters, Isolators, Memory Systems, Microwave Integrated Circuits (MIC's), Power Supplies, Transformers

FUNCTION MODULES, INC., Box 856, 711 W. 17th St., Costa Mesa, Cal., 92627, Tel: 714-645-6001, TWX: 910-596-1384; FSC No: 52467; Empl.: 50; Minimum order: \$25

For info on price: S. Banis; Application info: S. Osgood; Customer service: S. Banis; Delivery info: S. Banis

Products manufactured: Amplifiers, Converters, Dividers, Multiplexers, Multipliers, Power Supplies

Local Sales Offices & Reps.

Ariz Phoenix, Mesa Engrg. & Sls. Assocs. 602-224-1995
 Cal Pasadena, A-F Sales. 213-681-5631
 Cal San Diego, Mesa Engrg. 714-278-8021
 Cal Sunnyvale, RDP Instr., Inc. 408-735-9040
 Colo Denver, Lindberg Co. 303-758-9033
 Fla Altamonte Springs, Wmm Assocs. Inc. 305-831-4645
 Fla Clearwater, Wmm Assocs. Inc. 813-726-8871
 Fla Pompano Beach, Wmm Assocs. Inc. 305-943-3091
 Ill Hinsdale, Momak Sls. 312-654-4524
 Iowa Cedar Rapids, Palatine Engrg. Sls. 319-365-8071
 Kans Andover, Palatine Engrg. Sls. 316-683-7512
 Kans Overland Park, Palatine Engrg. Sls. 913-262-5643
 Md Baltimore, J.R. Daniel & Co. 301-825-3330
 Mass Needham, Massa & Maquire 617-329-0354
 Mich Farmington, Rep-Tron 313-478-1024
 Minn Minneapolis, Nortec Inc. 612-920-9526
 Mo St. Louis, Palatine Engrg. Sls. 314-426-7055
 NM Albuquerque, Lindberg Co. 505-345-2489
 NY Kingston, Ossmann Component Sales 914-338-5505
 NY Manhasset, Win-Cor Elctn. Sls. 516-627-9474
 NY Rochester, Ossmann Component Sales 716-442-3290
 NY Syracuse, Ossmann Component Sales 315-454-4477
 NY Vestal, Ossman Component Sales 607-785-9949
 NC Greensboro, J.R. Daniel & Co. 919-294-1065
 Ohio Dayton, Neal Bear Corp. 513-299-3556
 Ohio West Richfield, Bear Mktg. 216-659-3331
 Ore Portland, Western Tech. Sls. 503-297-1711
 Pa Ambler, Wm Assocs. 215-643-4119
 Pa Delmont, T.F. Laslo & Assocs. 412-468-5045
 Tex Dallas, Comspec, Inc. 214-234-4137
 Tex Houston, Comspec, Inc. 713-461-4487
 Tex Houston, Palatine Engrg. Sls. 713-747-6537
 Tex Richardson, Palatine Engrg. Sls. 214-231-9489
 Utah Salt Lake City, Lindberg Co. 801-364-6409
 Wash Bellevue, Western Tech. Sls. 206-454-3906

FURNAS ELEC. CO., 1197 McKee St., Batavia, Ill., 60510, Tel: 312-879-3410; Empl.: 1100; Minimum order: \$10

For info on price: Sls. Dept.; Application info: Appl. Eng.; Customer service: J. B. Blass; Delivery info: Sls. Dept.

Products manufactured: Controls/Control Eqpt., Nameplates, Relays, Switches, Timers

Sales Offices & Reps.			FUSITE DIV./EMERSON ELEC., 6000 Fernview Ave., Cincinnati, Ohio, 45122, Tel: 513-731-2020, TWX: 810-461-2810; Minimum order: \$75			GAMBLE, CHARLES T. INDS., New Jersey Ave. & Fairview St., Riverside, N.J., 08075, Tel: 609-461-1900, TWX: 510-682-3243; Empl.: 150; Minimum order: \$25 p. 2-1492-1495		
Ark	Little Rock, Ransom Sls. Co.	501-225-7332	For info on price: J. Marsh; Application info: J. Bentley; Customer service: W. Grothaus; Delivery info: J. Marsh			Customer service: E.P. McCabe		
Cal	Los Angeles, Calhoun & Poxon Co.	213-225-2328	Free literature available: Bulletin 421: Overview of products & specs.			Free literature available: Precision Resistor Catalogue; Power "Vitreous Enamel" Wirewound Resistors; Precision Power Wirewounds; Resistor Engineering Data Book.		
Cal	Sacramento, R.G. Mitchell Co.	916-444-3789	Products manufactured: Connectors, Feedthrus & Seals, Environmental, Seals, Services, Assembly, Production & Test, Terminals, Wire			Products manufactured: Dividers, Networks, Resistors		
Cal	San Francisco, Furnas Elec. Co.	415-692-5656	Local Sales Offices & Reps.			Local Sales Offices & Reps.		
Colo	Lakewood, Western Reps.	303-986-6025	Conn Old Saybrook, E.J. Hughes Assoc.			Cal	Menlo Park, G.R. McKnight Co.	415-325-2844
Conn	North Haven, Furnas Elec. Co.	203-239-7185	Mass Attleboro, E.J. Hughes Assoc.			Cal	San Diego, Miracle Assoc.	714-276-8619
Fla	Jupiter, J.C. Turner Assoc.	305-746-1487	Mass Beverly, E.J. Hughes Assoc.			Fla	Fort Lauderdale, G. Bohman Assoc.	
Fla	Miami, J.C. Turner Assoc.	305-625-6556	GABRIEL ELCTRS. INC., Box 626, Scarborough Ind'l Pk., Scarborough, Me., 04074, Tel: 207-883-5161; Empl.: 80; Minimum order: \$35			Fla	Orlando, G. Bohman Assoc.	305-855-0274
Fla	Orlando, J.C. Turner Assoc.	305-859-4705	For info on price: D. B. Crisman; Application info: D. B. Crisman; Customer service: M. Curry; Delivery info: M. Curry			Ill	Glenview, Crimmon Eng.	312-724-1780
Ga	Atlanta, A. Brown Assoc.	404-457-6381	Free literature available: Short form catalog on request. Information on standard parabolic antennas, high performance antennas (including ultra type) and horn reflectors. Details on mounts, elliptical waveguide, networks, circular waveguide, radomes and pressurizer.			NY	Hempstead, Kahgan Sls. Corp.	516-538-2300
Ill	Chicago, Furnas Elec. Co.	312-521-7450	Products manufactured: Antenna Feed Systems, Antennas, Couplers, Dehydrators, Flanges, Waveguide, Horns, Microwave, Mounts, Waveguides & Adapters			NY	Liverpool, WEI Inc.	315-652-8111
Ind	Fort Wayne, Neal Eng. Co.	219-484-5090	GAERTNER SCIENTIFIC CORP., 1261 Wrightwood Ave., Chicago, Ill., 60614, Tel: 312-281-5335; Empl.: 80; Minimum order: \$15			Pa	Erie, ECCO Elctn. Sls.	814-452-3762
Ind	Indianapolis, Neal Eng. Co.	317-849-4201	For info on price: R. Kutko; Application info: E. G. Watson; Customer service: K. Kutko; Delivery info: J. Stozek			Tex	Richardson, Vista Assoc.	214-235-4547
Iowa	Davenport, R.L. Wildauer Co.	319-355-3121	Products manufactured: Densitometers, Electronic, Gages, Interferometer Systems, Lamps, Lenses, Optical & Camera, Microscopes, Testers			GAMMA SCIENTIFIC INC., 3777 Ruffin Rd., San Diego, Cal., 92123, Tel: 714-279-8034, Telex: 697938; Empl.: 50; Minimum order: \$25		
Kans	Kansas City, R.E. Gooley	913-831-0200	GAGNE ASSOCS., INC., 1080 Chenago St., Dept. 3EE-27, Binghamton, N.Y., 13901, Tel: 607-723-9556; Empl.: 45; Minimum order: \$10			For info on price: P. Householder; Application info: G. Unangst; Customer service: G. Unangst; Delivery info: P. Householder		
Ky	Louisville, Neal Eng. Co.	502-267-8337	For info on price: S. Morrissey; Application info: W. W. Schoch; Customer service: J. Edwards; Delivery info: S. Morrissey			Products manufactured: Densitometers, Electronic, Detectors, Lamps, Meters, Microscopes, Monitors, Photomultiplier Tube Housings, Radiometers, Recorders, Tubes		
La	New Orleans, MacKenroth-Robbins & Assocs.	504-524-7662	Free literature available: Literature on 1-"Shield-Stripp", "P-F" Dust Bellows2-"Porta-Flex", 3-"Sensiflex", 4-"Porta-Flex".			Local Sales Offices & Reps.		
Md	Baltimore, McCourt Co.	301-465-4515	Products manufactured: Controls/Control Eqpt., Covers, Protective (Including Dust), Machines/Machinery, Production, Switches, Wire Strippers, X-Ray Inspection Equipment			Ariz	Phoenix, Griot Assocs.	602-275-4991
Mass	Boston, Electrical Comp.	617-655-2225	GALILEO ELECTRO-OPTICS CORP., Galileo Pk., Sturbridge, Mass., 01518, Tel: 617-347-9191, TWX: 710-347-1190; Empl.: 200			Cal	El Segundo, Griot Assocs.	213-322-8383
Mass	Longmeadow, Electrical Comp.	617-655-2225	For info on price: J. M. O'Neil; Application info: L. Owen; Customer service: J. M. O'Neil; Delivery info: J. M. O'Neil			Cal	Los Altos, Griot Assocs.	415-941-2533
Mich	Detroit, W. C. Fay & Assoc.	313-851-4750	Products manufactured: Comm. Systems, Converters, Detectors, Fiber Optic Bundles, Intensifiers, Image, Power Supplies, Substrates, Transmission Systems, Data, Tubes			Cal	Tustin, Griot Assocs.	714-838-2330
Mich	Grand Rapids, J.M. Perry Co.	616-949-0271	Local Sales Offices & Reps.			Fla	Winter Park, McMahan Assocs.	305-645-0463
Minn	Minneapolis, H. Mercer Co.	612-933-7111	Cal El Segundo, Griot Assocs., Inc.			Ill	Chicago, Brooks Engrg.	312-944-1227
Miss	Jackson, MacKenroth-Robbins & Assoc.	601-355-3946	Cal Los Altos, Griot Assocs., Inc.			Md	Kensington, C.W. Hench Assocs.	301-946-7822
Mo	St. Louis, Kattelmann & Co.	314-434-6875	Colo Arvada, Cleveland Entrps., Inc.			Mass	Sudbury, DLG Assocs.	617-877-7880
Neb	Omaha, Orlin I. Wahl	402-451-4276	Conn Sherman, R. P. Mahan Co.			Pa	Elkins Park, Snow Assocs.	215-379-4700
NJ	Fairfield, Furnas Elec. Co.	201-227-5122	Fla Winter Park, McMahan Assocs.			Tex	Plano, Optical Services Co.	214-442-2011
NM	Albuquerque, Elec. Locator & Sls. Co.	505-867-5340	Ill Chicago, Brooks Engrg.			Wash	Bellevue, Griot Assocs.	206-454-8592
NY	Buffalo, H.H. Cardozo	716-834-3377	Md Beltsville, Kelly Scientific Instr.			GAP INSTR. CORP., 110 Marcus Blvd., Hauppauge, N.Y., 11787, Tel: 516-273-0909, TWX: 510-227-6237; FSC No: 00607; Empl.: 50; Minimum order: \$100		
NY	New York City, Furnas Elec. Co.	212-285-9732	Mass Wellesley, R. P. Mahan Co. (Fiber optics)			Customer service: W. P. Soboleski		
NY	Rochester, F. Serr	716-586-6226	Mich Farmington, Sheridan Assocs., Inc.			Free literature available: Short Form Catalog Demonstrating Full Capability And/Or Individual Technical Data Sheets on Certain Equipments With Technical Specifications.		
NY	Syracuse, R.H. Nichols	315-437-2813	Minn St. Paul, Northport Engrg., Inc.			Products manufactured: Actuators, Amplifiers, Comparators, Computers, Controls/Control Eqpt., Converters, Display Devices/Displays, Indicators, Motors, Multipliers, Power Supplies, Repeaters, Servo, Servo Systems, Simulators		
NC	Charlotte, R.W. Chapman & Co.	704-525-2421	Mo Florissant, Sheridan Assocs., Inc.			Local Sales Offices & Reps.		
NC	Greensboro, R.W. Chapman & Co.	919-275-6323	NJ Tenafly, Budd-Tronics (Fiber Optics)			Cal	Long Beach, Maintronics Div. of Pac Ord	213-426-9486
NC	Raleigh, R.W. Chapman & Co.	919-782-2624	NM Albuquerque, Cleveland Entrps., Inc.			Cal	Monrovia, E. M. I.	213-358-1881
Ohio	Akron, R.R. Smith	216-334-2518	NY Rochester, Irondequoit Inds.			Fla	Orlando, Brennan Assocs.	305-425-4382
Ohio	Cincinnati, Fallon & Sterling Assoc.	513-232-7733	Ohio Cincinnati, Sheridan Assocs., Inc.			Md	Simpsonville, A/O Elctns.	301-531-6700
Ohio	Cleveland, M.M. Haley Co.	216-238-3650	Ore Beaverton, ES/Chase Co.			Mass	Attleboro, Elctn. Sls. of New England	617-222-4078
Ohio	Dayton, W. Hammer & Assoc.	513-294-4531	Pa Pittsburgh, Sheridan Assocs., Inc.			Minn	Anoka, A & R Assocs.	612-421-0751
Okla	Tulsa, Industrial Sls. & Engr. Co.	918-743-3610	Tex Garland, R. S. Marston Co.			EXP	N.Y.C., N.Y., Frathom Co., Div. of Henley Overseas Sls.	212-687-9390
Ore	Portland, Donal Co.	503-246-3131	Wash Edmonds, ES/Chase Co.			GAR ENTERPRISES, 2031 N. Lincoln Ave., Pasadena, Cal., 91103, Tel: 213-798-0785; Empl.: 25		
Pa	Erie, Foster-McClinton Inc.	814-455-9111	EXP: Plainville, Mass., Teknis, Inc.			Customer service: G. Sugimoto		
Pa	Philadelphia, H.B. Stallings & Assoc.	215-566-4100	GARDNER SOLDER CO., Div. of Gardiner Metal Co., 4820 S. Campbell Ave., Chicago, Ill, 60632			Products manufactured: Regulators, Testers		
Pa	Pittsburgh, Foster-McClinton Inc.	412-561-4803	Free literature available: Bulletin 14-1, Portable Wire-Wrap® Tools - A complete line of portable air, electric, battery powered and manual tools for making solder-less wrapped electrical connections.			Products manufactured: Backpanel Interconnect Systems, Cutters, Wire, Hand Operated, Machines/Machinery, Production, Pumps, Vacuum, Screwdrivers, Tools, Wire Strippers, Wire Twisters, Wrenches		
SC	Greenville, R.W. Chapman & Co.	803-232-5391	FUSION SYSTEMS CORP., 11810 Parklawn Dr., Rockville, Md., 20852, Tel: 301-881-5934; Empl.: 19					
SC	W. Columbia, R.W. Chapman & Co.	803-796-9796	Customer service: M. Greenblatt					
Tenn	Memphis, Ransom Sls. Co.	901-332-0036	Free literature available: An electrodeless high intensity ultraviolet lamp system with instant on-off, 3000 hour bulb lifetime, low heat, high curing speed. Non mercury bulbs available.					
Tenn	Nashville, A. Brown Assoc.	615-256-3003	Products manufactured: Lamps					
Tex	Dallas, Titan Reps Inc.	214-661-5350						
Tex	Houston, Beeco Corp.	713-661-3192						
Tex	San Antonio, Dudley Co.	512-337-4804						
Utah	Salt Lake City, Electrical Sls. Co.	801-486-1367						
Va	Richmond, Marchant Electrical Sls. Co.	804-262-7333						
Wash	Seattle, M. Richards Co.	206-323-2127						
Wash	Spokane, Electro-Power Corp.	509-535-2931						
WV	Huntington, Foster-McClinton Inc.	304-736-5161						
Wisc	Appleton, H. Mercer Co.	414-739-6223						
Wisc	Milwaukee, H. Mercer Co.	414-786-6431						
FOR	Can., Calgary, Alb., Elec. Contr. Mach. Ltd.	403-244-0771						
FOR	Can., Halifax, NS, MarLite Co. Ltd.	902-429-5200						
FOR	Can., Moncton, NB, MarLite Co., Ltd.	506-382-8469						
FOR	Can., Montreal, Que, PD Assoc.	514-695-6369						
FOR	Can., St. Johns, New Found, MarLite Co. Ltd.	709-726-4500						
FOR	Can., Toronto, Ont., Furnas Elec. Can. Ltd.	416-759-6743						
FOR	Can., Vancouver, BC, Cansco Agencies Ltd.	604-291-7251						
FOR	Can., Winnipeg, Manitoba, Smith-Paterson & Assoc.	204-774-1855						

Local Sales Offices & Reps.

Ala	Birmingham, Gardner-Denver Co.	205-871-3543
Ariz	Phoenix, Gardner-Denver Co.	602-272-0451
Cal	Bakersfield, Gardner-Denver Co.	805-327-5713
Cal	San Diego, San Diego Egypt. & Supply	714-278-6000
Cal	San Francisco, Gardner-Denver Co.	415-589-3305
Cal	Whittier, Gardner-Denver Co.	213-692-1258
Colo	Denver, Gardner-Denver Co.	303-399-1321
Colo	Grand Junction, Gardner-Denver Co.	303-242-4157
Conn	Bloomfield, Gardner-Denver Co.	203-243-0311
Fla	Hialeah, Pan American Equip. Co.	305-691-4631
Ga	Atlanta, Gardner-Denver Co.	404-938-6633
Idaho	Wallace, Gardner-Denver Co.	208-752-6291
Ill	Broadview, Gardner-Denver Co.	312-681-2210
Ill	Quincy, Gardner-Denver Co.	217-223-8282
Ind	Indianapolis, Gardner-Denver Co.	317-634-2167
Kans	Shawnee Mission, Gardner-Denver Co.	913-888-1040
Ky	Louisville, Gardner-Denver Co.	502-363-2679
La	Lafayette, Gardner-Denver Co.	318-232-3190
La	New Orleans, Gardner-Denver Co.	504-347-1451
La	Shreveport, Gardner-Denver Co.	318-424-4446
Md	Elicott City, Gardner-Denver Co.	301-465-1155
Mass	Hopkinton, Gardner-Denver Co.	617-435-6311
Mich	Livonia, Gardner-Denver Co.	313-525-9110
Minn	Duluth, Gardner-Denver Co.	218-729-9290
Minn	Minneapolis, Gardner-Denver Co.	612-888-4647
Mo	Bridgeton, Gardner-Denver Co.	314-291-2800
NJ	Mahwah, Gardner-Denver Co.	201-529-4760
NY	Buffalo, Gardner-Denver Co.	716-836-8300
NY	Rochester, Gardner-Denver Co.	716-254-1260
NC	Charlotte, Gardner-Denver Co.	704-366-8532
Ohio	Cleveland, Gardner-Denver Co.	216-524-1856
Ohio	Springdale, Gardner-Denver Co.	513-671-7270
Okla	Oklahoma City, Gardner-Denver Co.	405-677-5737
Okla	Tulsa, Gardner-Denver Co.	918-622-2800
Pa	Horsham, Gardner-Denver Co.	215-672-3003
Pa	Pittsburgh, Gardner-Denver Co.	412-923-1511
Tenn	Knoxville, Gardner-Denver Co.	615-523-6195
Tex	Corpus Christi, Gardner-Denver Co.	512-882-6155
Tex	Dallas, Gardner-Denver Co.	214-233-0100
Tex	Houston, Gardner-Denver Co.	713-626-2220
Tex	Odessa, Gardner-Denver Co.	915-563-1350
Utah	Salt Lake City, Gardner-Denver Co.	801-466-8610
Wash	Seattle, Gardner-Denver Co.	206-624-1115
Wisc	Milwaukee, Gardner-Denver Co.	414-774-2210
Wyo	Casper, Gardner-Denver Co.	307-235-5794
EXP:	Dallas, Tex., Gardner-Denver Int'l.	214-634-8491

GARDNER-DENVER CO., Box 47114, Dallas, Tex, 75247

GARY MFG., INC., 1010 Jersey Ave., New Brunswick, N.J., 08902, Tel: 201-545-2424; Empl: 250

Products manufactured: Boards, Plug-In, Boards, Printed Wiring, Universal, Connectors, Contacts, Electrical, Integrated Circuit Packaging Systems, Packages, Integrated Circuit, Pins, Racks, Services, Assembly, Production & Test, Socket Adapters, Sockets, Terminals

Local Sales Offices & Reps.

Ariz	Phoenix, Mirco Elctns.	602-944-2281
Cal	Mountainview, Westmark Assocs.	415-969-1700
Cal	Santa Ana, Spectrum Assocs.	714-835-4114
Colo	Denver, Westmark Assocs.	303-433-7181
Conn	Stratford, G. Rosen Co.	203-375-5456
Fla	Pompano Beach, V. G. Sls.	305-941-5544
Ill	Downers Grove, Richmar Elctns.	312-968-0118
Ind	Indianapolis, J. Ithrig	317-783-7630
Iowa	Des Moines, BEAMS	515-282-0292
Kans	Overland Park, BEAMS	913-341-7744
Md	Baltimore, J. R. Daniels & Co.	301-825-3330
Mass	Framingham, G. Rosen Co.	617-879-5505
Mich	Detroit, Nicon Assocs.	313-341-7688
Mo	Creve Couer, BEAMS	314-569-1060
NJ	Cherry Hill, J. N. Barrett Assocs.	609-429-1551
NY	Mount Vernon, Friedman Smith Elec. Sls.	914-664-4866
NY	Syracuse, I. A. Hotze	315-479-6641
NC	Greensboro, J. R. Daniels & Co.	919-294-1965
Ohio	Medina, J. C. Hofstetter	216-725-4477
Tex	Dallas, R. Matthews Co.	214-233-0363
Wash	Kirkland, Freed Assocs.	206-822-8100

GATES ELCTRN. CO., 526 Van Nest Ave., Bronx, N.Y., 10460 p. 1-1216-1221

Products manufactured: Chargers, Battery, Eliminators, Battery, Power Supplies

GATES ENERGY PRODS., INC., 1050 S. Broadway, Denver, Colo., 80217, Tel: 303-744-4806, TWX: 910-931-2658; Empl.: 100

Products manufactured: Batteries, Power Supplies

Local Sales Offices & Reps.

Ariz	Scottsdale, FRYCO, Inc.	602-945-3281
Cal	Los Angeles, M. Geery	213-641-2325
Colo	Denver, Gates Energy Prods., Inc.	303-744-4806
Fla	Hollywood, Reynolds & Assocs.	305-987-6720
Fla	Melbourne, Reynolds & Assocs.	305-727-3205
Ga	Atlanta, Reynolds & Assocs.	404-252-5360
Minn	Minneapolis, HMR, Inc.	612-920-8200
Mo	Kansas City, H. Hanson Co.	816-444-9494
Mo	St. Louis, H. Hanson Co.	314-432-3611
Okla	Tulsa, Ammon & Rizo	918-633-8518
Ore	Portland, Almac Stroum Elect.	503-292-3534
Tex	Dallas, Ammon & Rizo	214-233-5591
Tex	Houston, Ammon & Rizo	713-729-1233
Wash	Seattle, Almac Stroum Elec.	206-763-2300

GATES, GEO. W. & CO., INC., Hempstead Tpke. & Lucille Ave., Franklin Sq., N.Y., 11010, Tel: 212-347-0787; Empl.: 8

Customer service: T. E. Schulz, Sr.

Products manufactured: Chemicals, Lamps, Lights, Power Supplies, Ultraviolet Inspection Lighting

G B INSTRUMENTS INC., 2030 Coolidge St., Hollywood, Fla., 33020, Tel: 305-920-0225, TWX: 510-954-9813; FSC No: 31601; Minimum order: \$50

For info on price: B. Weiss; Application info: B. Weiss; Customer service: R. Richard; Delivery info: B. Weiss

Free literature available: X-Y Recorder Specs; Polar to cartesian converters (coordinate converters); Buffers; Meteorological transmission system; commercial computer systems.

Products manufactured: Computers, Converters, Multiplexers, Process Control Systems, Receivers, Recorders, Services, Assembly, Production & Test, Transmission Systems, Data

Local Sales Offices & Reps.

NM	Las Cruces, BFA Assoc.	505-523-0601
----	------------------------	--------------

GBC - CLOSED CIRCUIT TV, 74 Fifth Ave., New York, N.Y., 10011; Empl.: 85; Minimum order: \$10

For info on price: B. Clarke; Application info: S. Lefkowitz; Customer service: M. Dunn; Delivery info: Z. Richards

Free literature available: List Price Catalog; Executive Guide to CCTV; Distributor Price Schedule.

Products manufactured: Alarms, Amplifiers, Cable, CATV Systems & Equipment, Lenses, Optical & Camera, Monitors, Oceanographic Equip. (Electronic), Racks, Recorders, Tapes, Recording, Magnetic (All Types), Television Systems & Equipment Closed-Circuit, Tubes

Local Sales Offices & Reps.

Cal	Oakland, F.W. Moulthrop & Assoc.	415-261-7676
DC	Wash., GBC/CCTV Wash. Corp.	202-785-8182
Ill.	Chicago, GBC/CCTV Ill. Corp.	312-956-1286
Ind	Indianapolis, GBC/CCTV Ind. Corp.	317-257-1337
Mass	Boston, GBC/CCTV New England Corp.	617-261-2360
Mich	Detroit, GBC/CCTV Mich. Corp.	313-398-1630
Mo	St. Louis, GBC/CCTV Mo. Corp.	314-994-3211
NY	Buffalo, Waxman-Currant Sls.	716-873-0442
EXP:	New York, N.Y., GBC Export Corp.	212-989-4433

GC ELECTRONICS, Div. Hydrometals, 400 So. Wyman St., Rockford, Ill., 61101, Tel: 815-968-9661; Empl.: 550 p. 2-341,1696

Customer service: R. Keas

Free literature available: GC Electronics Catalog-tools, chemicals, service aids. Walsco Catalog-tape-phono drives & belts. Telco Catalog-antennas & installation accessories. Audiotex Catalog-home entertainment accessories. Calctro Handbook experimenter hobbyist items. Electrocraft Switch Catalog-switches & accessories. CB Catalog-CB & ham accessories.

Products manufactured: Adhesives (All Types), Alarms, Amplifiers, Antenna Rotators, Antenna Towers & Supports, Antennas, Arresters, Electrical Surge, Lightning, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Benches, Consoles, Stools, Tables, Boards, Printed Circuit, Burnishers, Contact, Bus Bars & Systems, Cable Assemblies & Harnesses, Cable, Cans, Capacitor, Relay, Semiconductor, Transformer, etc. Capacitors, Fixed, Capacitors, Variable, Chargers, Battery, Chemicals, Chokes, Circuit Breakers, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Clamps & Clips, Cleaners & Solvents, Coatings, Coils Including Assemblies & Forms, Compounds, Encapsulating, Insulating, Molding, Potting, Connector Adapters, Connectors, Cords, Couplers, Cutters, Wire, Hand Operated, Demagnetizers, Diodes, Display Devices/Displays, Drafting Symbols, Dry Transfer, Pressure Sensitive, etc. (Including Lettering), Drivers, Nut, Dummy Loads, Eliminators, Battery, Etchants, Printed Circuit, Fasteners, Filters, Flux, Brazing & Soldering Materials, Fuses, Grilles, Grommets, Heat Sinks, Soldering, Integrated Circuit Devices, Inverters, Jack Adapters (All Types), Jacks (All Types), Jumpers, Kits, Breadboarding (For Engineers), Kits, Printed Circuit, Knobs, Lamps, Leads, Test & Adaptors, Lubricants, Meters, Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds, Mounts, Photographs, Parts & Accessories, Pickups, Telephone (For Recording), Pin Straighteners, Tube, Pliers, Plug & Jack Sets, Posts, Potentiometers, Power Supplies, Probes, Punches, Chassis, Rectifiers, Relays, Resistors, Rheostats, Rings, Retaining, Rods, Ground, Seizers, Semiconductor Wafer Fabrication, Sockets, Solder (All Types), Soldering Accessories, Soldering Guns, Irons & Desoldering Tools, Spacers, Speaker Systems, Speakers, Splicing Equipment, Magnetic Tape, Springs (All Types), Strain Reliefs, Cable & Wire, Suppressors, Switches, Tape Recording Accessories, Tape Winders, Terminals, Thermistors, Tools, Transducers, Transformers, Tubing, Tweezers, Hand & Vacuum, Wire, Wire & Cable Ties, Wire Strippers

GCA/DAVID W. MANN, 174 Middlesex Tpke., Burlington, Mass., 01803, Tel: 617-272-5600, Telex: 94-9352; Minimum order: \$25

Customer service: A. C. Tobey

Products manufactured: Data Acquisition & Reduction Systems, Data Loggers, Encoders, Machines/Machinery, Production, Microcircuit Production Equip.

GCA/PRECISION SCIENTIFIC, 3737 W. Cortland St., Chicago, Ill., 60647, Tel: 312-227-2660, TWX: 910-221-3122; Empl.: 325; Minimum order: \$10

For info on price: D. Bloss Ext. 322; Application info: R. DeSilva Ext.353; Customer service: D. Bloss Ext. 322; Delivery info: D. Bloss Ext.322

Free literature available: Telco Bulletin (320A) covers varied line of ovens, incubators, dryers, vacuum ovens, low temperature incubators, CO&I2 incubators, and similar constant temperature cabinets for research and production control.

Products manufactured: Baths, Controlled Temperature (Air & Liquid), Chamber, Environmental Test, Controls/Control Eqpt., Dehydrators, Gages, Ovens, Pumps, Vacuum, Refrigerators, Environmental Test, Timers, Vibrators

Local Sales Offices & Reps.

Cal	Los Angeles	213-283-7815
Cal	San Francisco	415-391-1883
Del	Wilmington	302-995-1753
Ga	Marietta	404-432-8737
Mass	Boston	617-227-1515
NJ	Milford	201-686-9392
NY	Buffalo	716-856-4141
NC	Charlotte	704-332-4850
Ohio	Columbus	614-457-1807

GCA/SUNNYVALE DIV., 1050 Kifer Rd., Sunnyvale, Cal., 94086

GEMS SENSORS DIV., Delaval, Spring La., Farmington, Conn., 06032, Tel: 203-677-1311; Empl.: 160

For info on price: M. Wright; Application info: M. Wright; Customer service: R. Thibodeau; Delivery info: M. Wright

Free literature available: Complete technical information is supplied relative to level switches, flow switches, solid state relays and continuous readout-tank level indicating systems. Comprehensive educational material is also offered on the subject of "Intrinsic Safety".

Products manufactured: Controls/Control Eqpt., Indicators, Relays, Switches

Local Sales Offices & Reps.

Ala	Homewood, Activation	205-871-0353
Ala	Mobile, Activation	
Alas	Anchorage, C. V. Reser Co.	907-279-3911
Ariz	Phoenix, Bews & Wallace	602-275-4496
Ariz	Tucson, Bews & Wallace	602-795-4837
Cal	Burlingame, Delaval	415-342-3350
Cal	Downey, Delaval	213-923-7281
Colo	Arvada, Petromotive Co.	303-422-0990
Conn	Wethersfield, Delaval	203-563-3737
Fla	Tampa, State Instrs.	813-251-3991
Ga	Atlanta, Activation of Georgia	404-755-6691
Haw	Honolulu, Berkley Eng. & Equip. Co.	

III	Moline, R. R. Floody Co.	808-538-1921
III	Rockford, R. R. Floody Co.	309-755-2483
III	Westchester, Delaval	815-399-1931
Kans	Kansas City, E. A. Akin Engrg. Co.	312-681-4806
La	Metairie, Aries Marine & Ind. Sls.	913-831-3733
La	Metairie, Aries Marine & Ind. Sls.	504-889-0520
Mo	St. Michael's, Ray Cantwell	301-745-9010
Mich	Madison Hts., Delaval	313-585-8200
Mich	Royal Oak, R. H. Jackson Co.	313-542-5059
Minn	Minneapolis, W. F. Hartfield Co.	612-929-1631
Mo	St. Louis, Neff Power	314-647-3002
NM	Albuquerque, Lietz Equip. Co.	505-266-5821
NY	Manhasset, Northeast Engrg.	516-365-9633
NY	Rochester, Delaval	716-328-4760
NC	Charlotte, R. W. Chapman & Co.	704-525-2421
Ohio	Cincinnati, Gallagher Co.	513-761-1288
Ohio	Cleveland, Delaval	216-333-1805
Okla	Tulsa, Tulsa Gauge & Instr.	918-622-5061
Pa	Horsham, Delaval	215-674-1697
Pa	Pittsburgh, Delaval	412-343-5666
SC	Greenville, R. W. Chapman Co.	803-233-0053
Tenn	Antioch, Activation	615-889-6524
Tenn	Knoxville, Activation of Georgia	615-584-2771
Tenn	Memphis, Centro	901-526-0518
Tex	Dallas, Delaval	214-638-1712
Tex	Houston, Delaval	713-697-2897
Wash	Seattle, Fairman B. Lee Co.	206-244-7262
Wisc	Milwaukee, Delaval	414-342-1500

GENERAL AUTOMATIC CORP., 235 W. First St., Bayonne, N.J., 07002, Tel: 201-437-7500

Products manufactured: Relays, Switches

GENERAL AUTOMATION, 1055 South East St., Box 4883, Anaheim, Cal., 92803, Tel: 714-778-4800, TWX: 910-591-1695; Empl.: 1430; Minimum order: \$50

Application info: D. Stoner Ext. 240; Customer service: J. Appel Ext. 515

Free literature available: Wide range of data sheets and technical brochures that describe all standard minicomputer products and systems presently available; two comprehensive texts on how to select both minicomputers and microprocessors for specific applications.

Products manufactured: Comm. Systems, Compressors, Data, Computers, Controls/Control Eqpt., Data Acquisition & Reduction Systems, Data Compressors, Digital, Data Loggers, Process Control Systems

Local Sales Offices & Reps.

Ala	Huntsville	205-833-9620
Ariz	Tempe	602-967-7885
Cal	Sunnyvale	408-734-4840
Colo	Denver	303-758-7323
Conn	Stanford	203-327-6000
Fla	Altamonte Springs	305-831-5603
Ga	Atlanta	404-261-6203
Ill	Des Plaines	312-298-1830
Ill	Rockford	815-962-8000
Ind	Indianapolis	317-248-0377
La	Metairie	504-837-7071
Mo	Silver Springs	301-587-7090
Mass	Waltham	617-899-8600
Mich	Farmington Hills	313-478-2640
Minn	Minneapolis	612-331-9060
Mo	St. Louis	314-997-1830
NJ	Cherry Hill	609-655-5112
NJ	Livingston	201-994-2750
NY	New York	212-682-7015
NY	Rochester	716-442-0780
NC	Greensboro	919-274-3134
Ohio	Cincinnati	513-563-0860
Ohio	Dayton	513-253-2195
Ohio	Rocky River	216-333-3544
Pa	Pittsburgh	412-922-3331

Tex	Dallas	214-661-5370
Tex	Houston	713-464-2815
Wash	Bellevue	206-747-0720
Wisc	Brown Deer	414-355-1220

GENERAL CONTROL CO., 1196 Soldiers Field Rd, Boston, Mass., 02134, Tel: 617-782-7440; Empl.: 25; Minimum order: \$10

Customer service: M. Stone

Products manufactured: Switches

Local Sales Offices & Reps.

Mass Boston, EACO Engrg. Corp. 617-782-7440

GENERAL DEVICES, INC., P.O. Box 253, Princeton, N.J., 08540, Tel: 609-924-2500, Telex: 84-6473; FSC No: 05285; Empl.: 32; Minimum order: \$50

For info on price: M. Medvin; Application info: M. Kirzecky; Customer service: M. Medvin; Delivery info: M. Medvin

Products manufactured: Amplifiers, Brushes & Brush Assemblies, Calibrators, Comm. Systems, Commutators, Controls/Control Eqpt., Converters, Data Acquisition & Reduction Systems, Data Loggers, Multiplexers, Oscillators, Scanners, Signal Conditioners & Equipment, Slip-Rings & Assemblies, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Reynolds & Assoc.	205-536-1941
Conn	New Canaan, Nerem, Inc.	203-966-2580
Fla	Ft. Lauderdale, Reynolds & Assoc.	
Fla	Satellite Beach, Reynolds & Assoc.	305-581-6611
Fla	St. Petersburg, Reynolds & Assoc.	305-773-4700
Ga	Atlanta, Reynolds & Assoc.	813-360-1484
Mass	Wakefield, Nerem, Inc.	617-245-4426
NJ	Mountainside, Service & Technology Inc.	201-232-2666
NY	Farmingdale, Service & Technology Inc.	516-694-7330
NY	Pompey, S. F. Foster Co., Inc.	315-677-3333
NY	Webster, S. F. Foster Co.	716-872-5220
NC	Greensboro, Reynolds & Assoc.	919-275-3725
Wash	Seattle, Comptronics	206-284-4842
EXP:	Bala Cynwyd, Tech Impex, Inc.	215-667-3155

GENERAL DEVICES CO., INC., 525 S. Webster Ave., Indianapolis, Ind., 46219, Tel: 317-359-5407, Telex: 27-2169; Empl.: 125; Minimum order: \$50 p. 1-63-70

For info on price: S. Gray; Application info: R. D. Lambert; Customer service: R. L. Watson; Delivery info: S. Gray

Free literature available: Complete Catalog covering: chassis-trak solid-bearing, bottom mount and ball-bearing slides; chassis-trak handles; vent-rak cabinets, consoles, instrument cases, chassis and accessories; poxylube dry-film lubricants.

Products manufactured: Benches, Consoles, Stools, Tables, Cabinets & Accessories, Cable Retractors, Cases, Equipment, Instrument, Meter, Chassis, Metal, Containers, Drawers, Sliding, Handles For Cabinets, Circuit Boards, Racks, etc., Lubricants, Racks, Slides, Cabinet & Chassis

Local Sales Offices & Reps.

Ariz	Scottsdale, F. Schoeffler Assocs.	602-959-3011
Cal	Los Angeles, M.A. Stolaroff Co. Inc.	
Cal	Mountain View, G. Woempner Co.	213-295-7781
Cal	San Diego, M.A. Stolaroff Co., Inc.	415-964-5454
Cal	Van Nuys, J.R. Thomas	714-234-6905
Cal	Van Nuys, J.R. Thomas	213-782-3820
Colo	Sedalia, Jensen Representatives	303-688-4154
Conn	Cheshire, Coakley, Boyd & Abbett, Inc.	203-272-2261
Fla	North Miami, Winfield Elctn. Sales	305-945-6544
Fla	Tampa, Winfield Elctn. Sales	813-884-6500
Ill	Rolling-Meadows, Lightner Assocs.	312-398-3000
Ind	Indianapolis, General Devices Co.	317-359-5407
Ind	Indianapolis, Mktg. Engrs., Inc.	317-546-1523
Ind	South Bend, Valentine Schillinger & Assocs.	219-291-6258
Kans	Shawnee Mission, Lowell & Kangas Assocs.	913-631-3515
Mo	Bethesda, G. Rosen & Assocs.	301-530-8448
Mass	Needham, Coakley, Boyd & Abbett, Inc.	617-444-5470
Minn	St. Paul, Northport Engrg., Inc.	612-698-3841
Mo	St. Louis, Lowell & Kangas Assocs.	314-821-4050

NY	Fayetteville, H.G. Richter, Inc.	315-637-6713
NY	Manhasset, Kaebler & Mack	516-627-6620
NC	Paw Creek, Ward Techn. Sls. Co.	704-399-3481
Ohio	Cleveland, Components, Inc.	216-842-2737
Ohio	Hamilton, Components, Inc.	513-721-2997
Tex	Dallas, R. Martin Assocs.	214-361-8584
Tex	Houston, R. Martin Assocs.	713-462-4077
Wash	Olympia, Bergford & Assocs.	206-866-2001
EXP:	Indianapolis, Ind., General Devices Co.	317-359-5407

GENERAL ELECTRIC, Battery Prods. Sect., Box 114, Gainesville, Fla., 32602, Tel: 904-462-3911; Empl.: 71500

Products manufactured: Batteries

GENERAL ELEC. CO., Communication Systems Div., Box 4197, Lynchburg, Va., 24502, Tel: 804-846-7311; Empl.: 4000

Customer service: R. A. Page

Products manufactured: Bridges, Comm. Systems, Controls/Control Eqpt., Printers, Terminal Equipment, Digital, Transceivers

GENERAL ELEC. CO., Elctn. Comps. Sls. Dept., Sect. 998-2, 1 River Rd., Schenectady, N.Y., 12345

p. 1-958,959,1684,1685; p. 2-134-137,1698,1699

Products manufactured: Amplifiers, Arresters, Electrical Surge, Lightning, Cameras, Capacitors, Fixed, Cells, Photoconductive, Photoemissive, Photovoltaic, Chargers, Battery, Circuit Breakers, Clamps & Clips, Controls/Control Eqpt., Converters, Diodes, Display Devices/Displays, Encoders, Generators, Indicators, Intensifiers, Image, Isolators, Lamps, Lights, Meters, Mixer-Preamplifiers, Microwave, Mixers, Motor Electric Generator Sets, Motors, Oscillators, Power Supplies, Pyrometers, Reactors, Recorders, Rectifiers, Regulators, Relays, Seals, Shunts, Meter, Soldering Accessories, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools, Solenoids, Spark Gaps, Substrates, Suppressors, Switches, Tachometers, Technical Books, Terminal Blocks, Boards & Strips, Thyristors (Includes Silicon Controlled Rectifiers), Timers, Transformers, Transistor, Diode, Thyristor Heat Dissipators, Transistors, Tubes

Local Sales Offices & Reps.

Ala	Huntsville	205-883-3151
Ariz	Phoenix	602-264-1751
Cal	Los Angeles	213-479-7763
Cal	Palo Alto	415-493-2600
Cal	San Diego	714-236-1266
Colo	Denver	303-388-5771
Conn	Bridgeport	203-334-1012
Fla	No. Palm Beach	305-844-5202
Ill	Chicago	312-777-1600
Ind	Fort Wayne	219-482-4557
Iowa	Cedar Rapids	319-364-9149
Mass	Wellesley	617-237-2050
Mich	Southfield	313-355-3552
Minn	Minneapolis	612-835-2550
Mo	Kansas City	816-221-4033
Mo	St. Louis	314-429-6941
NJ	Clifton	201-472-8100
NY	Albany	518-458-7755
NY	Great Neck	516-466-8800
NY	Rochester	716-461-5400
NY	Syracuse	315-456-3108
NC	Greensboro	919-273-6981
Ohio	Cleveland	216-266-2900
Ohio	Dayton	513-298-0311
Okla	Oklahoma City	405-943-9015
Pa	Erie	814-455-5466
Pa	Pittsburgh	412-921-9917
Pa	Wayne	215-962-1500
Tex	Dallas	214-661-8582
Tex	Houston	713-783-8170
Va	Falls Church	703-790-1700
Va	Waynesboro	703-943-1151
Wash	Seattle	206-575-2866
Wisc	Milwaukee	414-271-5000

GENERAL ELECTRIC, Ind'l Heating Business Dept., 1 Progress Rd, Shelbyville, Ind., 46176, Tel: 317-398-4411

Free literature available: GEP 1005 Electric heaters & components such as tubular, strip, cartridge and immersion heaters. Als duct, air and flanged and circulation heaters. GEP 1545 Soldering irons (electric) including ratings from 12 watts to 1250 watts-and-temperature controlled soldering irons.

Products manufactured: Heaters & Heating Elements, Soldering Equipment

Local Sales Offices & Reps.

Cal	Burlingame	415-697-6500
Cal	Los Angeles	213-589-6321
Cal	San Diego	714-224-1212
Colo	Denver	303-759-2749
Conn	Hamden	203-281-1795
Conn	Woodstock	203-928-0332
Fla	Miami	305-592-6523
Fla	Orlando	305-894-7761
Ill	Glen Ellyn	312-858-6320
Ind	Shelbyville	317-398-4411
La	Baton Rouge	504-275-5480
La	Lake Charles	318-439-8173
La	Monroe	318-323-3671
La	New Orleans	504-737-4181
Mich	Detroit	313-835-5100
Minn	Minneapolis	612-789-2535
Miss	Pascagoula	601-475-1248
Mo	Kansas City	816-561-4050
Mo	St. Louis	314-993-5810
Neb	Omaha	402-342-7044
NJ	Caldwell	201-228-2220
NY	Buffalo	716-634-8873
NC	Charlotte	704-523-2122
Ohio	Cincinnati	513-574-0800
Ohio	Hudson	216-467-3377
Ore	Portland	503-223-4197
Pa	Pittsburgh	412-795-4130
Pa	St. Davids	215-687-5650
Tenn	Chattanooga	615-821-0235
Tex	Dallas	214-826-6350
Utah	Salt Lake City	801-363-3555
Va	Richmond	804-359-6051
Wash	Seattle	206-762-4100
FOR	Can., Toronto, Ont.	614-534-6511

GENERAL ELECTRIC CO., Instrument Prods. Dept., 40 Federal St., West Lynn, Mass., 01905, Tel: 617-594-7049; Empl.: 800; Minimum order: \$100

For info on price: L. Atkins 617-594-7274; Application info: B. Kieser 617-594-7273; Customer service: L. Atkins; Delivery info: B. Kieser

Free literature available: GEP-307 Panel Meters Catalog; GEP-302 Switchboard Instruments Catalog; GEA-8619A Recorder Bulletin; GEA-9798 Transducer Bulletin; GEA-9729 Halogen Leak Detector Bulletin. The Ferret & T

Products manufactured: Controls/Control Eqpt., Current Sensors, Indicators, Meters, Probes, Recorders, Relays, Scales, Dial, Shunts, Meter, Thermometers, Resistance, Transducers

Refer to GE Electr. Comps. Sls. Dept. for sales office information

GENERAL ELEC., Insulating Mat's., 1 Campbell Rd., Schenectady, N.Y., 12306, Tel: 518-374-2211, TWX: 518-556-2290; Empl.: 500

For info on price: R. J. Wachalec Ext. 55249; Application info: H. C. Lauroesch Ext. 55239; Customer service: A. R. Lacasse Ext. 54773; Delivery info: A. R. Lacasse Ext. 54773

Products manufactured: Adhesives (All Types), Compounds, Encapsulating, Insulating, Molding, Potting, Films, Paints, Tapes, Electrical Insulation

GENERAL ELEC. CO., Laminated & Insulating Matls. Bus. Dep., Coshocton, Ohio, 43812, Tel: 614-622-5310, TWX: 810-255-2921; Empl.: 1100; Minimum order: \$50

For info on price: Sls. Off.; Application info: H. A. Schudel; Customer service: F. B. Simmons; Delivery info: F. B. Simmons

Free literature available: Industrial Laminates Brochure IL-401 Grades and Properties of Industrial Laminates.

Products manufactured: Laminates

Local Sales Offices & Reps.

Cal	Burlingame, Insullectro	415-692-2010
Cal	El Segundo, Insullectro	213-640-1470
Fla	Tampa, General Elec. Co.	813-251-1033
Ill	Elk Grove Village, Gen. Elec. Co.	312-439-9080
Ind	Indianapolis, General Elec. Co.	317-253-7592
Mass	Wellesley Hills, General Elec. Co.	617-235-9290
NY	Liverpool, General Elec. Co.	315-456-2144
NC	Greensboro, General Elec. Co.	919-288-0153
Ohio	Elyria, General Elec. Co.	216-322-3749
Pa	King of Prussia, General Elec. Co.	215-962-3685
Tex	Dallas, Bunker Inds.	214-630-1600

GENERAL ELEC. LAMP GLASS, See General Elec. Lamp Parts & Equip. Sales Oper.

GENERAL ELECTRIC CO., Battery Business Dept., Box 861, Gainesville, Fla., 32602, Tel: 904-377-6960

Products manufactured: Batteries, Chargers, Battery

Refer to Gen. Elec. Electr. Comps. Sls. Dept. for sales office information.

GENERAL ELECTRIC CO., Lamp Parts & Equip. Sls. Oper., 21800 Tungsten Rd., Cleveland, Ohio, 44117, Tel: 216-266-2451

Free literature available: Literature and technical data on lamps leads, bases, chemicals, tungsten, molybdenum, glass and fused quartz.

Products manufactured: Headers, Metal Compounds, Foils, Powders, Sheet, Stock, Metals, Quartz, Fused, Shields, Silica, Fused, Tubes, Tubing, Wire

Local Sales Offices & Reps.

Cal	Los Angeles	213-723-2541
Cal	San Jose	408-298-4126
Mass	Newton Upper Falls	617-332-6200
Mo	Lee's Summit	816-524-5300
NJ	West Orange	201-736-5305
Ohio	Cleveland	216-266-3788
Pa	Pittsburgh	412-531-5700

GENERAL ELECTRIC CO., Miniature Lamp Dept., Nela Park, Cleveland, Ohio, 44112, Tel: 216-266-2121 p. 2-1144,1145

Products manufactured: Lamps, Lights

Local Sales Offices & Reps.

Alas	Achorange	907-333-7835
Cal	Los Angeles	213-723-2541
Cal	Oakland	415-569-3422
Cal	Portola Valley	415-854-4010
Colo	Denver	303-388-4611
Fla	Miami	305-693-3811
Ga	Atlanta	404-875-0921
Haw	Honolulu	808-537-3280
Ill	Chicago	312-332-4712
Ind	Indianapolis	317-547-5511
La	New Orleans	504-835-6421
Md	Baltimore	301-242-5700
Mass	Newton Upper Falls	617-332-6200
Mich	Detroit	313-883-0200
Minn	Minneapolis	612-331-4050
Mo	North Kansas City	816-471-0123
Mo	St. Louis	314-429-6930
NY	Newark	201-622-8000
NY	New York	212-750-2000
NY	Rochester	716-461-5900
NY	Utica	315-733-0922
NC	Charlotte	704-376-6585
Ohio	Cincinnati	513-559-3607
Ohio	Cleveland	216-266-4337
Ohio	Columbus	614-294-4115
Okla	Oklahoma City	405-842-4028
Ore	Portland	503-221-5120
Pa	King of Prussia	215-688-5900
Pa	Pittsburgh	412-471-9050
Tenn	Memphis	901-948-2642
Tex	Dallas	214-358-5321
Tex	Houston	713-644-3264
Va	Richmond	703-355-3289
Wisc	Milwaukee	414-462-3860

GENERAL ELEC., Noryl Prods. Sect., Noryl Ave., Selkirk, N.Y., 12158, Tel: 518-439-9371

Free literature available: Noryl Engineering Plastics-describes property profiles and application areas of the three standard, four glass reinforced, one platable and three extrudable grades of Noryl thermoplastic resin. Processing, design and comparative data are described in depth.

Products manufactured: Plastic Raw Materials, Liquids, Pellets, Powders, Resins

Local Sales Offices & Reps.

Cal	Industry	213-965-4973
Cal	Oakland	415-535-2015
Ga	Atlanta	404-897-6245
Ill	Oakbrook	312-325-8090
Ind	Indianapolis	317-923-7221
Kans	Shawnee Mission	913-432-5851
Ky	Louisville	502-452-3701
Md	Baltimore	301-296-1010
Mass	Pittsfield	413-494-1110
Mass	Wellesley Hills	617-237-9125
Mich	Southfield	313-355-4460
Minn	Minneapolis	612-928-3111
Mo	St. Louis	314-429-7002
NJ	Cranford	201-276-8472
NY	East Rochester	716-381-8500
Ohio	Cleveland	216-523-6336
Ohio	Dayton	513-298-0311
Tex	Dallas	214-233-5683
FOR	Can., Toronto 4, Ont.	416-534-6511

GENERAL ELEC., Plastics, 1 Plastic Ave., Pittsfield, Mass., 01201

Customer service: Sls. Off.

Free literature available: 1. General GE Plastics Brochure - CDP-74; 2. Lexan - CDC-570; 3. Noryl - CDX-80 4. Valov - VAL-5A; 5. Gen. Product Brochure 474; 6. Engineering Structural Foam - SFR-1

Products manufactured: Plastic Raw Materials, Liquids, Pellets, Powders, Resins

Local Sales Offices & Reps.

Cal	City of Industry	213-965-4973
Ga	Atlanta	404-897-6245
Ill	Oakbrook	312-325-8090
Ind	Indianapolis	317-923-7221
Kans	Shawnee Mission	913-432-5851
Ky	Louisville	502-454-5458
Md	Baltimore	301-944-7676
Mass	Pittsfield	413-494-1110
Mass	Wellesley Hills	617-237-9125
Mich	Southfield	313-355-4400
Minn	Minneapolis	612-835-3111
Mo	St. Louis	314-429-7002
NJ	Cranford	201-276-8472
NY	East Rochester	716-381-8500
Ohio	Cleveland	216-523-6336
Ohio	Dayton	513-298-0311
Tex	Dallas	214-233-5683

GENERAL ELEC., Semiconductor Prods., Electronics Pk., Box 1122, Syracuse, NY, 13201, Tel: 315-456-2798, TWX: 710-541-0498; Empl.: 400000

Free literature available: Short Form Catalog 451.119

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Diodes, Isolators, Rectifiers, Relays, Resistors, Thyristors (Includes Silicon Controlled Rectifiers), Transistor, Diode, Thyristor Heat Dissipators, Transistors

Refer to Gen. Elec. Electr. Comps Dept. for Sales office information

Local Distributors

Ala	Birmingham, Forbes Dist Co., 1416 Fourth Ave.	205-251-4107
	Huntsville, Cramer Elctns. Inc., 2310 Bob Wallace Ave.	205-539-5722
Ala	Huntsville, Hamilton Electro Corp., 805 Oster Dr. N.W.	205-533-1170
Ariz	Phoenix, Hamilton Electro Corp., 2615 So. 21st St.	602-275-7851
Ariz	Phoenix, Kierulff Elctns. Inc., 2633 E. Buckeye Rd.	602-273-7331
Ark	Little Rock, Carlton-Bates Co., 6821 Scott Hamilton Dr.	501-562-9100
Cal	Culver City, Hamilton Electro Corp., 10912 W. Washington Blvd.	213-870-7171
Cal	El Monte, G. S. Marshall Co., 9674 Telstar Ave.	213-686-0141
Cal	Irvine, Cramer Elctns. Inc., 17201 Daimler St.	213-771-8300
Cal	Los Angeles, Kierulff Elctns. Inc., 2585 Commerce Way	213-685-5511
Cal	Mountain View, Elmar Elctns., 2288 Charleston Rd.	415-961-3611
Cal	Mountain View, Hamilton/Avnet, 575 E. Middlefield Rd.	415-961-7000
Cal	Oakland, Brill Elctns., 610 E. 10th St.	442-834-5888
Cal	Palo Alto, Kierulff Elctns. Inc., 3969 E Bayshore Rd.	415-968-6292
Cal	Riverside, Electronic Supply, 2486 Third St.	714-626-6796
Cal	San Diego, Hamilton Electro Corp., 8917 Complex Dr.	714-279-2421
Cal	San Diego, Kierulff Elctns., Inc., 8797 Balboa	714-278-2112
Cal	Sunnyvale, Cramer Elctns., 695 Veterans Blvd.	408-739-3011
Colo	Denver, Electronics Parts Co., 1212 So. Broadway	303-744-1992
Colo	Denver, Hamilton Electro Corp., 5921 N. Broadway	303-534-1212
Conn	Danbury, Schweber Elctns., Finance Dr., Commerce Ind. Pk.	203-792-3500
Conn	Georgetown, Hamilton Electro Corp., 643 Danbury Rd.	203-762-0361
Conn	No. Haven, Cramer Elctns. Inc., 35 Dodge Ave.	203-239-5641
Conn	Waterbury, Bond Radio Supp, 639 WMain St.	203-757-0546
Fla	Hollywood, Cramer Elctns. Inc., 4035 N. 29th Ave.	305-923-8181
Fla	Hollywood, Hamilton Electro Corp., 4020 N. 29th Ave.	305-925-5401
Fla	Hollywood, Schweber Elctns., 2830 N. 28th Terrace	305-827-0511

Fla	Orlando, Cramer Elctns. Inc., Box 20214 305-894-1511	NJ	Moonachie, Cramer Elctns. Inc., 1 Barrett Ave. 201-935-5600	Tex	Houston, Hamilton Electro. Corp., 1216 West Clay 713-526-4661
Fla	Orlando, Hammond Elctns. Inc., 911 W. Central Ave. 305-241-6601	NJ	Mt. Laurel, Hamilton Electro. Corp., E. Gate Ind. Pk. 609-234-2123	Tex	Houston, Sterling Elctns. Inc., 4201 SW Freeway 713-627-9800
Ga	Atlanta, Cramer Elctns. Inc., 3923 Oakliff Ind. Ct. 404-448-9050	NJ	Somerset, Schweber Elctns., 43 Belmont Dr. 201-469-6008	Utah	Salt Lake City, Ballard Supp., 44 E. Sixth South St. 801-394-5544
Ga	Atlanta, Lykes Elctns., 1135 Chattahoochee Ave. NW 404-355-2223	NM	Albuquerque, Cramer Elctns. Inc., 137 Vermont NE 505-265-5767	Utah	Salt Lake City, Hamilton Electro Corp., 647 W. Billinis Rd. 801-262-8451
Ga	Atlanta, Schweber Elctns., 4126 Pleasantdale Rd. 404-449-9170	NM	Albuquerque, Hamilton Electro Corp., 2450 Baylor Drive SE 505-765-1500	Utah	Salt Lake City, Newark Elctns. Inc., 259 Crossroads Sq. 801-486-1048
Ga	Norcross, Hamilton Electro, 6700-1-85 Suite 2B 404-448-0800	NM	Albuquerque, Kierulff Elctns. Inc., 2524 Baylor Dr. SE 505-247-1055	Va	Charlottesville, Virginia Radio Supp., 715 Henry St. 804-828-2311
Ill	Chicago, Elctn. Dists. Co., 4900 N. Elston Ave. 312-283-4800	NY	Cheetowaga, Standard Elctns. Inc., 3523 Union Rd. 716-685-4220	Va	Roanoke, Peoples Radio TV Supp., 1015 Moorman Rd. 703-342-8933
Ill	Chicago, Newark Elctns Corp., 500 N. Pulaski Rd. 312-638-4411	NY	E. Syracuse, Cramer Elctns. Inc., 6716 Joy Rd. 315-437-6671	Wash	Bellevue, Hamilton Electro Corp., 13407 Northrop Way 206-746-8750
Ill	Chicago, Semiconductor Specs Inc., Ohare Int. Airport Box 66125	NY	E. Syracuse, Hamilton Electro Corp., 6500 Joy Rd. 315-437-2642	Wash	Seattle, Almac/Stroom Elctns., 5811 6th Ave. S. 206-763-2300
Ill	Elk Grove, Schweber Elctns., 1380 Jarvis 412-593-2740	NY	Endwell, Cramer Elctns. Inc., 3220 Watson Blvd. 607-754-6661	Wash	Tacoma, C&G Elctns., 2502 Jefferson Ave. 206-272-3185
Ill	Mount Prospect, Cramer Elctns., 1911 S. Busse Rd. 312-593-8230	NY	Farmingdale, Arrow Elctns. Inc., 900 Broad Hollow Rd. 516-694-6800	WVa	Charleston, Charleston Electrical Div., 1400 Hamsford Street 304-348-5211
Ill	Schiller Park, Hamilton/Avnet Elctn., 3901 No. 25th Ave. 312-678-6310	NY	Hauppauge, Cramer Elctns. Inc., 29 Oser Ave. 516-231-5600	Wisc	Milwaukee, Electronics Expeditors, 6045 N. Greenbay Ave. 414-228-8100
Ind	Castleton, Pioneer Standard, 82nd Street 317-849-7300	NY	Rochester, Cramer Elctns. Inc., 3000 S. Winton Rd. 716-275-0330	Wisc	West Allis, Marsh Radio Inc., 6047 W. Beloit Rd. 414-545-6500
Ind	Evansville, Hutch & Son Inc., 300 N. Main 812-425-7201	NY	Rochester, Hamilton Electro Corp., 167 Clay Rd. 716-442-7820	GENERAL ELEC. CO., Silicone Prods. Dept., Waterford, N.Y., 12188, Tel: 518-237-3330; Empl.: 1300; Minimum order: \$200	
Ind	Ft. Wayne, Ft. Wayne Elctns. Supp., 3606 Maumee Ave. 219-423-3422	NY	Rochester, Rochester Radio Supp., 140 W. Main St. 716-454-7800	For info on price: H. Laumeister; Application info: R. Mahar; Customer service: W. Schultz; Delivery info: W. Schultz	
Ind	Indianapolis, Graham Elctns. Supp., 133 S. Pennsylvania St. 317-634-8202	NY	Rochester, Schweber Elctns., 999 Buffalo Rd. 716-328-4180	Free literature available: Technical Data Book S-35 describes the many uses of RTV silicone rubber adhesive/sealants. Contains a selector guide giving uses and properties; application procedures and curing agent selection sections also included.	
Ind	Indianapolis, Semiconductor Spec. Inc., 1885 Banner Ave. 317-243-8271	NY	Rome, Rome Elctns., 108 Spring St. 315-476-2033	Products manufactured: Adhesives (All Types), Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Coolants, Circuit & Components, Insulators & Insulation, Lubricants, Rubber, Seals	
Iowa	Cedar Rapids, DEECO Inc., 2500 16th Avenue SW 319-365-7551	NY	Westbury, Hamilton Electro Corp., 70 State St. 516-333-5800	Local Sales Offices & Reps.	
Kans	Lenexa, Hamilton Electro Corp., 37 Lenexa Ind. Center 9900 Pflumm Rd. 913-888-8900	NY	Westbury, Schweber Elctns., Jericho Tnkp. 516-334-7474	Cal	City of Industry 213-965-3301
Ky	Louisville, Burks P I Co., 842 S 7th St. 502-589-3960	NC	Charlotte, Dixie Radio Supply, 2220 S. Tryon St. 704-377-5413	Cal	Oakland 415-535-2014
La	New Orleans, Lykes Elctns. Corp. Epcor Div., 3308 Orleans Ave. 504-486-7441	NC	Raleigh, Southeastern Radio Supp., 414 Hillsboro St. 919-828-2311	Fla	Orlando 305-855-5904
Md	Baltimore, Cramer/Baltimore Inc., 922-24 W Patasco Ave. 301-796-5790	NC	Winston-Salem, Cramer Elctns., 938 Burke St. 919-725-8711	Ga	Atlanta 404-897-6280
Md	Gaithersburg, Cramer-Washington Inc., 16021 Ind Dr. 301-948-0110	Ohio	Akron, Sun Radio, 110 East Market St. 216-434-2171	Ill	Oak Brook 312-654-4570
Md	Hanover, Hamilton Electro Corp., 7255 Standard Dr. 301-796-5000	Ohio	Beachwood, Schweber Elctns., 23880 Commerce Pk. Rd. 216-464-2970	Ind	Indianapolis 317-923-7221
Md	Rockville, Pioneer-Washington Elctns. Inc., 1037 Taft St. 301-424-3300	Ohio	Cincinnati, Hughes Peters Inc., 4865 Duck Creek Rd. 513-351-2000	Kans	Shawnee Mission 816-842-9745
Md	Rockville, Schweber Elctns., 6540 Fisher La. 301-881-2970	Ohio	Cleveland, Pioneer Standard Elctns. Inc., 4800 E. 131 St. 216-587-3600	Md	Gaithersburg 301-948-7170
Mass	Burlington, Hamilton Electro Corp., 185 Cambridge St. 617-273-2120	Ohio	Columbus, Elctns. Marketing Corp., 1150 W. 3rd Ave. 614-299-4161	Mass	Framingham 617-879-2985
Mass	Dedham, Gerber Elctns., 852 Providence Hwy. Rte. 1 617-329-2400	Ohio	Columbus, Hughes Peters Inc., 481 E. 11th Ave. 614-294-5351	Mich	Southfield 313-355-4400
Mass	Newton, Cramer Elctns. Inc., 85 Wells Ave. 617-969-7700	Ohio	Dayton, Pioneer Standard Elctns. Inc., 1900 Troy St. 513-236-9900	Minn	Minneapolis 612-926-0026
Mass	Springfield, T.F. Cushing Inc., 1026 Bay St. 413-788-7341	Ohio	Dayton, Warren Radio Co., 1002 Adams St. 419-248-3364	Mo	St. Louis 314-429-6941
Mass	Waltham, Schweber Elctns., 213 3rd Ave. 617-890-8484	Ohio	Toledo, Warren Radio Co., 1002 Adams St. 216-399-2777	NJ	Cranford 201-276-5110
Mich	Detroit, RS Elctns., 12775 Lyndon 313-491-1000	Okla	Tulsa, Oil Capitol Elctns. Corp., 708 S. Sheridan 918-836-2541	NY	Schenectady 518-346-2059
Mich	Detroit, Semiconductor Specs., 25127 W. Six Mile Rd. 313-255-0300	Pa	Allentown, Resco of Lehigh Valley, 425 Hanover St. 215-435-6743	NY	Waterford 518-237-3330
Mich	Grand Rapids, Newark Industrial, 2114 S. Division 616-331-6350	Pa	Philadelphia, Almo Elctns. Corp., Roosevelt of Bluegrass 215-676-6000	NC	Greensboro 919-288-7906
Mich	Livonia, Hamilton Elctns., 12870 Farmington Rd. 313-522-4700	Pa	Pittsburgh, RPC Elctns., 620 Alpha Dr. 412-782-3770	Ohio	Dayton 513-298-0311
Mich	Troy, Schweber Elctns., 86 Executive Dr. 313-583-9242	Pa	Pittsburgh, Semiconductor Specs. Inc., 538 Alpha Dr. 412-781-8120	Ohio	Parma Heights 216-842-6776
Minn	Edina, Cramer Elctns. Inc. Cramer/Bonn Div., 7275 Bush Lake Rd. 612-835-7811	Pa	York, Rosen Elctns., 215 S. George St. 717-843-3875	Pa	Media 215-106-3841
Minn	Minneapolis, Semiconductor Specs. Inc., 8030 Cedar Ave. S. 612-854-8841	RI	Warwick, Edwards Co. WH, 55 Electronics Dr. 617-329-2400	Pa	W. Mifflin 412-466-6700
Minn	St. Paul, Gopher Elctns., 2520 W. Carpenter Ave. 612-645-0889	SC	Columbia, Dixie Radio Supp., 1900 Barnwell St. 803-253-5333	SC	Greenville 803-288-4453
Miss	Jackson, Ellington Elctns. Sply Co., 1425 Terry Rd. 601-355-0561	SC	Greenville, Dixie Radio Supp., 500 Pendleton St. 803-253-5357	Tenn	Memphis 901-774-3481
Mo	Hazelwood, Hamilton Electro Corp., 364 Brookes La. 314-731-1144	Tenn	Chattanooga, Harpe Elctns., 1845 Central Ave. 615-267-2381	Tex	Dallas 214-EM9-2357
Mo	Joplin, Norman Elctns. Supp., 402 Wall St. 417-624-0388	Tenn	Kingsport, Radio Electric Supp., 961 E. Sullivan St. 615-247-8111	Tex	Houston 713-688-2593
Mo	North Kansas City, L-Comp-Kansas City Inc., 1520 Tany St. 816-221-2400	Tenn	Knoxville, Ind. Elctns. Inc., Box 9125 615-573-7135	Wash	Seattle 206-575-2920
Mo	University City, Olive Ind. Elctns., 6662 Olive St. Rd. 314-873-7800	Tenn	Memphis, Bluff City Dist., 234 East St. 901-725-9500	EXP:	Export Operations, Waterford, N.Y. 518-237-3330
Neb	Lincoln, Scott Elctns., 4040 Adams St. 402-464-8308	Tenn	Nashville, Electra Distr., 1914 W. End Ave. 615-329-3971	GENERAL ELEC., Valley Forge Space Tech. Ctr., Box 8555, Phila., Pa., 19101, Tel: 215-962-5474, TWX: 510-660-2034; Empl.: 2100	
Neb	Omaha, Radio Equip. Co., 625 N. 18th St. 402-341-7700	Tex	Dallas, Cramer Elctns. Inc., 2970 Blystone 214-661-9300	For info on price: T. Hontz 215-962-1033; Application info: T. Hontz 215-962-1033; Customer service: M. D. Fasano 215-962-3987; Delivery info: M. D. Fasano 215-962-3987	
NJ	Camden, General Radio Supp., 600 Penn St. 609-964-8560	Tex	Dallas, Hamilton/Avnet Elctns., 4445 Sigma Rd. 214-661-8661	Products manufactured: Circuits, Hybrid, Thick Film, Services, Assembly, Production & Test	
NJ	Cedar Grove, Hamilton Electro Corp., 218 Little Falls Rd. 201-239-0800	Tex	Dallas, Norvell Elctns. Inc., 10210 Monroe 214-350-6771	GENERAL ELEC., Wire & Cable, 1285 Boston Ave., Bridgeport, Conn., 06602, Tel: 203-334-1012, Telex: 964209	
NJ	Cherry Hill, Cramer Elctns. Inc., 7300 Rte. 130 N. 609-424-5993	Tex	Dallas, Sterling Elctns. Inc., 2875 Merrall Rd. 214-357-9131	Free literature available: WC-3311 & WC-3119 wires and cables.	
				Products manufactured: Cable, Wire	
				Local Sales Offices & Reps.	
				Cal	Los Angeles 213-572-5330
				Cal	Oakland 415-638-0725
				Conn	Meriden 203-235-3264
				Fla	Jacksonville 904-396-3896
				Ga	Atlanta 404-633-4522
				Ill	Chicago 312-496-3232
				Ind	Indianapolis 317-923-7221

Ky	Louisville	502-452-3191
La	New Orleans	504-486-7267
Md	Baltimore	301-944-7676
Mass	Boston	617-969-8200
Mich	Detroit	313-355-4400
Mich	Grand Rapids	616-451-2094
Minn	Minneapolis	612-544-6699
Mo	Kansas City	816-842-9745
Mo	St. Louis	314-342-7794
NY	Albany	518-458-7243
NY	New York	212-683-6104
NY	Syracuse	315-456-7568
NC	Charlotte	704-372-8541
NC	Greensboro	919-288-0153
Ohio	Cincinnati	513-871-6300
Ohio	Cleveland	216-267-6300
Ore	Portland	503-221-5023
Pa	Philadelphia	215-289-6310
Pa	Pittsburgh	412-921-5150
Tenn	Nashville	615-329-3535
Tex	Dallas	214-350-4609
Tex	Houston	713-675-6681
Utah	Salt Lake City	801-364-1894
Wash	Seattle	206-575-2940
Wisc	Milwaukee	414-271-5000

GENERAL-ELECTRO MECHANICAL, 787 Hertel Ave., Buffalo, N.Y., 14207, Tel: 716-876-9685; Empl.: 121; Minimum order: \$25 p. 1-956,957
Customer service: D. Stuhlmiller
Products manufactured: Brakes, Clutches

GENERAL ELECTRODYNAMICS CORP., 4430 Forest La., Garland, Tex., 75040, Tel: 214-276-1161, TWX: 910-860-5193; Empl.: 113
For info on price: T. Anderson Ext. 264; Application info: E. Olszewski Ext. 289; Customer service: J. Cox Ext. 272; Delivery info: T. Anderson Ext. 264
Free literature available: GEC will send out any of the enclosed brochures free when they are requested.
Products manufactured: Boards, Printed Circuit, Cable, CATV Systems & Equipment, Converters, Lenses, Optical & Camera, Monitors, Television Systems & Equipment Closed-Circuit, Tubes, X-Ray Inspection Equipment

GEN'L. ENVIRONMENTS CORP., Chicago Labs. Div., 7845 Nagle Ave., Morton Grove, Ill., 60053, Tel: 312-966-0770; Empl.: 12
Customer service: B. F. Loveless
Free literature available: Facility Books Upon Request
Products manufactured: Services, Assembly, Production & Test
Local Sales Offices & Reps.
Va Springfield, General Environments Corp. 703-354-2000

GENERAL ILLUMINATION, INC., 2958 North Cleveland Ave., Roseville, Minn., 55113, Tel: 612-633-1388; FSC No: 18788; Empl.: 20; Minimum order: \$25
Customer service: D. Van Loh
Free literature available: Catalog, Product Information Sheets on new products.
Products manufactured: Diodes, Lamps, Lights, Pins, Sockets
Local Sales Offices & Reps.
Ariz Scottsdale, DeAngelo, Rothman & Cheever 602-948-2240
Cal Culver City, National Electro Sls. Co. 213-391-6294
Conn Woodbridge, Elctn. Mktg. Co. 203-397-1461
Md Baltimore, Stitzer Assocs. 301-823-2600
NY Buffalo, Telesco Assocs. 716-834-1026
NY New York, F. Tylinski Co. 516-466-9070
NY Rochester, Telesco Assocs. 716-271-3780
NY Utica, Telesco Assocs. 315-733-3183
Ohio Cleveland, Goory Sls. Co. 216-331-2055
Ohio Dayton, Goory Sls. Co. 513-294-3747
Ore Portland, Earl & Brown Co., Inc. 503-292-9145
Pa Paoli, Stitzer Associates 215-644-5500
Wash Seattle, Earl & Brown Co. 206-284-1121

GENERAL INSTR. CORP., AUTOMATIC MFG. DIV., Box 517, Chicopee, Mass. 01021, Tel: 413-594-4781, TWX: 710-353-6854; Empl.: 84
For info on price: A. A. Adessa; Application info: V. Friberg; Customer service: C. A. MacMaster; Delivery info: H. Moffatt
Products manufactured: Coils Including Assemblies & Forms, Filters, Transformers
Local Sales Offices & Reps.
Ala Huntsville, 20th Century Mktg. Inc.

Cal	Placentia, Starr Sls. Co.	
Conn	Newtown, Gerber Sls. Corp.	
Fla	Hollywood, Component Engrg. Sls. Co.	
Ill	Chicago, General Instr. Corp.	
Ind	Indianapolis, Morris, Cunningham & Assocs.	
Mass	Waltham, Gerber Sls. Corp.	
Minn	St. Paul, R. G. Ragon, Inc.	
NY	Buffalo, J. McDonough Assocs.	
NY	DeWitt, R. H. Hovey	
NY	Manlius, Quality Comps., Inc.	
Ohio	Cincinnati, G & H Sls. Co.	
Pa	Glenside, C. A. Beeson	
Tex	Dallas, Dunbar Assocs.	

GENERAL INSTR. CORP., SEMICONDUCTOR PRODS GRP., Capacitor Prods., 600 W. John St., Hicksville, N.Y., 11802, Tel: 516-733-3000, TWX: 510-221-1866; Empl.: 1200; Minimum order: \$50 p. 2-169

Customer service: M. Hollander
Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.		
Ariz	Scottsdale, Mercury Eng. Sls.	602-275-8579
Cal	Los Angeles, Clemick Neenan	213-476-1272
Cal	Palo Alto, Brooks Tech. Grp.	415-328-3232
Colo	Denver, Zeus/Elcom	303-771-6200
Fla	Hollywood, Component Engrng	305-922-8917
Ga	Atlanta, Cartwright & Bean	404-255-5262
Ind	Indianapolis, Needler Sls.	317-255-8056
Md	Towson, J. Bresson Assoc.	301-484-4457
Mich	Detroit, A. Blumenberg	313-557-1934
Minn	Minneapolis, NORTEC Sls.	612-835-7414
Miss	Jackson, Cartwright & Bean	601-981-1368
NJ	Leonia, Kohl-Camber	201-944-6488
NM	Albuquerque, Zeus, Inc.	505-256-9831
NY	Buffalo, R.W. Mitscher	716-633-7970
NY	New York, Kohl-Camber	212-369-4222
NC	Charlotte, Cartwright & Bean	704-333-6457
Ohio	Cincinnati, Giesting Assocs.	513-931-0812
Pa	Narberth, J. Bresson Assoc.	215-839-6770
Tenn	Memphis, Cartwright & Bean	901-276-4442
Tex	Dallas, J. B. Guenther	214-691-8500
Utah	Salt Lake City, Zeus, Inc.	801-486-2317
Va	Lynchburg, J. Bresson Assoc.	804-237-1304
Wash	Redmond, Desco N.W.	203-455-9325

Local Distributors		
Ala	Huntsville, Hallmark Elctns. Corp., 2010 Bob Wallace Ave.	205-837-8700
Ariz	Phoenix, Kierulff Elctns., 2633 E. Buckeye Rd.	602-968-6292
Ariz	Phoenix, Mirco Elctns., 2005 W. Peoria Ave.	602-944-2281
Ariz	Phoenix, Sterling Elctns., 1930 No. 22nd Ave.	602-258-4536
Cal	Carson, Hi-Rel Distrs., 20507 S. Belshaw	213-537-6500
Cal	Chatsworth, Westates Elctns. Corp., 20151 Bahama St.	213-241-4411
Cal	Glendale, R. V. Weatherford Co., 6921 San Fernando Rd.	213-849-3451
Cal	Melo Park, Bell Inds., 1070 O'Brien Dr.	415-323-9431
Cal	San Diego, Sterling Elctns., 7405 Convoy Ct.	714-565-2441
Cal	Sun Valley, Sterling Elctns., 11614 Pendleton St.	213-767-5030
Cal	Sunnyvale, Diplomat/Westland, 1118 Elko Dr.	408-734-1900
Cal	Woodland Hills, Jaco Elctns., 21201 Oxnard St.	213-887-6400
Colo	Denver, Ind'l. Elctns.	303-770-4400
Conn	Fairfield, U-tronics, Inc., 273 Linwood Ave.	203-255-2451
Conn	Hamden, Wilshire Elctns., 2554 State St.	203-281-1166
Conn	Norwalk, Harvey/Conn., 112 Main St.	203-853-1515
DC	Washington, Pytronics Inds., Inc.	301-953-3000
Fla	Orlando, Hallmark Elctns. Corp., 7233 Lake Elenor Dr.	305-855-4020
Ill	Elk Grove, Diplomat/Lakeland, 2451 Brickvale Dr.	312-595-1000
Ill	Palatine, Ohm/Elctns., 649 Vermont	312-359-5500
Ill	Skokie, Bell Ind's., 7701 N. Austin Ave.	312-282-5400
Iowa	Cedar Rapids, Deeco, Inc., 2500 16th Ave. S.W.	319-365-7551
Kans	Kansas City, Hallmark Elctns. Corp., 9006 Rosehill Rd.	913-888-4747
Md	Baltimore, A. S. I. Elctns., 1728 Whitehead Rd.	301-265-5100
Md	Baltimore, Hallmark Elctns. Corp., 6660 Security Blvd.	301-265-8500
Md	Gaithersburg, Kierulff Elctns., 16021 Ind'l. Dr.	301-948-0250

Md	Hyattsville, Milgray Elctns., 5405 Lafayette Pl.	301-864-1111
Mass	Lynn, Land Elctns., 9R Franklin St.	617-592-2220
Mass	Newton, Greene-Shaw Co., 70 Bridge St.	617-969-8900
Mass	Waltham, QPL Elctn. Dist., 75 N. Beacon St.	617-891-0460
Mass	Watertown, Sterling Elctns., 51 Spring St.	617-926-9720
Mich	Farmington, Diplomat/Northland	313-477-3200
Mich	Farmington, Harvey/Mich., 23461 Ind'l Park Dr.	313-477-1650
Minn	Edina, Harvey/Minnesota, 6969 Washington Ave. So.	612-941-6060
Minn	Minneapolis, Electro-Com Corp., 3816 Chandler Dr.	612-788-8801
Minn	Minneapolis, Industrial Comps.	612-831-2666
NJ	Bergenfield, Tech. Elctn. Dist.	201-384-3643
NJ	Cherry Hill, Milgray/Delaware, 1165 Markkress Rd.	609-424-1300
NJ	Clifton, Wilshire Elctns., 312 Clifton Ave.	201-365-2600
NJ	Iselin, Brothers Elctns.	201-388-7676
NJ	Parsippany, Tonar Elctns., 1220 US Hwy 46	201-335-9400
NJ	Perth Amboy, Sterling Elctns., 774 Pfeiffer Blvd.	201-442-8000
NJ	Rahway, Terminal Elctns. Corp., 1463 Pinewood St.	201-381-5700
NJ	Trenton, Allen & Hurley Co., 23 S. Warren St.	609-393-3300
NM	Albuquerque, Industrial Elctns., 310 Vale Verde S.E.	505-266-8721
NM	Albuquerque, Sterling Elctns.	505-247-2426
NY	Binghamton, Harvey/Federal Elctns., Box 1208	607-748-8211
NY	Buffalo, Summit Elctns., 916 Main St.	716-884-3450
NY	Farmingdale, Arrow Elctns., 900 Broadhollow Rd.	516-694-6800
NY	Farmingdale, Bart Elctns., 195 Central Ave.	516-293-3144
NY	Farmingdale, Command Elctns. Corp.	516-293-1212
NY	Farmingdale, Hallmark Elctns. Corp., 167 Marine St.	516-293-7500
NY	Farmingdale, Pride Elctns.	516-293-4020
NY	Farmingdale, Wilshire Elctns., 1855 New Hwy. Unit B	516-293-5775
NY	Freeport, Mil Spec Wire & Cable Corp.	516-546-5454
NY	Freeport, Milgray Elctns., 191 Hanse Ave.	516-546-6000
NY	Hauppauge, Jaco Elctns., 195 Engineers Rd.	516-273-5500
NY	Johnson City, Wilshire Elctns., 617 Main St.	607-791-1236
NY	Mount Vernon, QAR Industrial Elctn. Sls., 621 S. Columbus Ave.	914-694-2224
NY	Ontario Center, Kehoe Comp Sls.	315-524-2491
NY	Plainview, Fairmont Elctn. Sls. Corp., 35 S. Service Rd.	516-694-8200
NY	Rochester, Simcona Elctns. Corp., 275 Mt. Road Blvd.	716-328-3230
NY	Rochester, Summit Elctns., 292 Commerce Dr.	716-334-8110
NY	West Babylon, Delmar Elctns., 101 Eads St.	516-420-1234
NY	Woodbury, Diplomat Elctns.	516-921-9373
NC	Raleigh, Pytronics Inds., 4509 Creedmoor Rd.	919-782-6370
Ohio	Cleveland, Milgray Elctns., 1821 E. 40th St.	216-481-8800
Pa	Harrisburg, Pytronics Inds., 2325 No. 7th St.	717-233-6591
Pa	Huntingdon Valley, Hallmark Elctn. Corp., 458 Pike Rd.	215-355-2335
Pa	Huntingdon Valley, Shap Elctns., 421 Pike Rd.	215-698-9550
Pa	Montgomeryville, Pytronics Inds., Stump Rd., Box 433	215-242-6700
Pa	Philadelphia, Philadelphia Elctns., 1225 Vine St.	215-568-7444
Pa	Pittsburgh, Pytronics Inds.	412-276-6722
Tex	Dallas, Hallmark Elctns. Corp., 9333 Forrest La.	214-231-5101
Tex	Dallas, K.A. Elctns.	214-634-7870
Tex	Ft. Worth, Textronics Co.	817-731-8701
Tex	Houston, Sterling Elctns., 4201 S.W. Freeway	713-623-6600
Tex	Richardson, Altair Co., 405 N. Plano Rd.	214-263-8783
Tex	San Antonio, Sterling Elctns.	212-735-9173
Utah	Salt Lake City, Cramer Elctns., 391 W. 2500 South	801-487-4131
Wash	Bellevue, Bell Inds., 12410 S.E. 32nd	206-747-1515

Wash Seattle, Sterling Elctns., 5608 6th Ave. So.
206-762-9100
Wash Seattle, Zepher Elctns. 206-242-2517
For: Can., Montreal, Electronic Wholesalers Co., Ltd.
514-769-8861
For: Can., Ottawa, Wackid Radio 613-728-1821
For: Can., Scarborough, Carsten Elctns., Ltd., 52
Howden Rd. 416-951-2371
For: Can., Toronto, Electrosonic Ind'l. Sls., Ltd., 543
Yonge St. 416-924-9301

GENERAL INSTRUMENT CORP., 600 W. John St.,
Hicksville, NY, 11802, Tel: 516-733-3333

GENERAL INSTR. CORP., Entertainment Elctns. Prods.
Grp., F.W. Sickles Div., 165 Front St., Chicopee,
Mass., 01013, Tel: 413-594-4781, TWX: 710-353-1301;
Empl.: 800

Products manufactured: Transformers, Yokes

GENERAL INSTR. CORP., Microelectronics Div., 600 W.
John St., Hicksville, N.Y., 11802, Tel: 516-733-3107,
TWX: 510-221-1866

GENERAL INSTRUMENT CORP., Hybrid Div., 600 W.
John St., Hicksville, N.Y., 11802, Tel: 516-733-3000

Products manufactured: Amplifiers, Choppers,
Circuits, Hybrid, Thick Film, Circuits, Hybrid,
Thin-Film, Circuits, Integrated, Silicon Monolithic,
Unpackaged Chips, Converters, Drivers, Switch,
Drivers & Decoders For Readouts, Filters,
Generators, Hybrid Voltage Regulators,
Integrated Circuit Packaging Systems, Integrated
Circuit Devices, IC's, Active Filters, Integrators,
Electronic, Lamp Drivers, Memory Systems,
Modulator/Demodulators, Multiplexers,
Multipliers, Networks, Power Supplies,
Regulators, Relays

Refer to General Instr. Corp. Semiconductor
Comps. Div for sales office information

GENERAL INSTR. CORP., Microelectronics Div., 600 W.
John St., Hicksville, N.Y., 11802, Tel: 516-733-3107,
TWX: 510-221-1866

Products manufactured: Circuits, Hybrid, Thick Film,
Integrated Circuit Devices

Refer to Geneneal Instr. Semiconductor Comps.
Div. for sls. off. Information

GENERAL INSTRUMENTS CORP., Semiconductor
Comps. Div., 600 W. John St., Hicksville, N.Y., 11802,
Tel: 516-733-3333, TWX: 510-221-1866; Empl.: 2000
p. 1-1844

Customer service: A. Abeles

Free literature available: General Catalog (36 pages)
lists lead-mounted rectifiers, bridges, multipliers
and other high-voltage rectifiers. Also lists
Mosfets. Bridge Reference Guide-cross index
showing comparison between GI's and
competitors' bridges.
Silicon Rectifier cross reference guide. Lists over
1000 JEDEC and competitors' lead-mounted
rectifiers replaceable with reduced number of GI
units.

Products manufactured: Amplifiers, Circuits, Hybrid,
Thick Film, Circuits, Hybrid, Thin-Film, Circuits,
Integrated, Silicon Monolithic, Unpackaged Chips,
Comparators, Converters, Current Sources,
Decoders, Decommunators, Telemetering,
Detectors, Diodes, Drivers, Solenoid, Drivers &
Decoders For Readouts, Equalizers, Filters, Hybrid
Voltage Regulators, Integrated Circuit Packaging
Systems, Integrated Circuit Devices, IC's, Active
Filters, Integrators, Electronic, Inverters, Memory
Systems, Mixers, Modulators, All Kinds, Modules,
Logic, Encapsulated, Monitors, Multiplexers,
Multipliers, Oscillators, Power Drivers, Hybrid
(High Current, High Voltage), Power Supplies,
Rectifiers, References, D-C Voltage, Regulators,
Relays, Shifters, Switches, Synchro Transmitters,
Solid-State, Timers, Transistors

Local Sales Offices & Reps.

Ala Huntsville, 20th Century Mktg. 205-772-9237
Ariz Scottsdale, Mercury Engrg. Sls., Inc. 602-275-8579
Cal El Segundo, Varigon Assocs. 213-679-0621
Cal Los Altos, P.M. Sls., Inc. 415-941-4444
Cal San Diego, Varigon Assocs. 714-290-5413
Colo Wheatridge, Waugaman Assoc. 303-423-1020
Conn Stratford, G. Rosen 203-375-5456
Fla Hollywood, Comp. Engrg. Sls. Co. 305-922-8917
Ill Park Ridge, Metcom 312-696-1490
Ind Greenwood, V.S. & Assocs. 317-888-2260
Ind Southbend, V.S. & Assocs. 219-291-6258

Iowa Cedar Rapids, J.R. Sls. 319-377-8211
Kans Wichita, Dy-Tronix 316-943-6221
Md Baltimore, Comp. Sls. 301-484-3647
Mass Framingham, G. Rosen 617-879-5505
Mich Kentwood, Burcaw Co. & Assoc. 616-531-1000
Minn Hopkins, Grayden & Flemmer 612-941-1120
Mo Hazelwood, Dy Tronix 314-731-5799
Mo Kansas City, Dy Tronix 816-761-6543
NJ Teaneck, R.T. Reid 201-692-0200
NY Manlius, Quality Comps. 513-682-8885
NY Snyder, Quality Comps. 716-839-4170
NC Raleigh, Comp. Sls., Inc. 919-782-8433
Ohio Cincinnati, G & H Sls. Co. 513-771-8231
Ohio Grove City, G & H Sls. Co. 614-878-1128
Okla Oklahoma City, Ammon & Rizos 405-373-2748
Ore Portland, J.J. Backer Co. 503-297-3776
Pa Narberth, J. Bresson Assocs. 215-839-6770
Tex Dallas, Ammon & Rizos Co. 214-233-5591
Tex Houston, Ammon & Rizos 713-781-6240
Wash Seattle, J.J. Backer Co. 206-285-1300
FOR: Can., Montreal, Que., General Instr. of Canada
514-636-9454
FOR: Can., Toronto, Ont., General Instr. of Canada
416-763-4133

Local Distributors

Ala Huntsville, Cramer Elctns., 2005 Bob Wallace
S.W. 205-539-5722
Ariz Phoenix, Mirco Elctn. Dist., 2104 W. Peoria Ave.
602-944-2281
Cal Newport Beach, Semicomp Sls., 4100 Birch St.
714-833-3070
Cal San Diego, Intermark Elctns., 7354 Convo St.
714-279-5200
Cal Santa Ana, Intermark Elctns., 2920 W. Warner
714-540-1322
Cal Sunnyvale, Intermark Elctns., 1020 Stewart Dr.
408-738-1111
Cal Woodland Hills, Semiconductor Concepts,
21201 Oxnard St. 213-884-4560
Colo Denver, Intermark Elctns., 2600 W. Second Ave.
303-936-8284
Conn Norwalk, Harvey Conn, 112 Main St.
203-853-1515
Fla Hollywood, Cramer Elctns., 4035 N. 29th Ave.,
Box WW 305-923-8181
Fla Orlando, Cramer Elctns., 345 Graham Ave., Box
20214 305-894-1511
Ill Broadview, LCOMP-Chicago Inc., 2030 W. 16th
St. 312-569-2340
Ill Chicago, Newark Elctns., 500 N. Pulaski Rd.
312-638-4411
Ill Elmhurst, Semiconductor Specialists, 195
Spangler Ave., Elmhurst Industrial Pk.
312-279-1000
Ill Rosemont, Advent Elctns., Inc., 7110 N. Lyndon
St. 312-298-4210
Ind Indianapolis, Semiconductor Specialists, Box
41645, Weir Cook Airport 317-243-8271
Iowa Cedar Rapids, Deeco, Inc., 2500 16th Ave., S.W.
319-365-7551
Kans Lenexa, Hall-Mark Elctns., 9006 Rosehill Rd.
913-888-4747
Md Gaithersburgh, Cramer Elctns., 16021 Industrial
Rd. 301-948-0110
Md Savage, Pyttronic Inds., 8220 Wellmoor Ct.
301-792-7000
Mass Newton, Greene-Shaw Co., 70 Bridge St.
617-969-8900
Mich Farmington, Semiconductor Specialists, 33505
State 313-255-0300
Mich Grand Rapids, Stotts Friedman Co., 2035
Eastern Ave., S.E. 616-241-6731
Minn Minneapolis, Bergquist Co., 4350 W. 78th St.
612-835-2322
Minn Minneapolis, Hall-Mark Elctns., 9201 Penn Ave.
S. 612-884-9056
Minn Minneapolis, Semiconductor Specialists, 8030
Cedar Ave., S. 612-854-8841
Minn St. Louis Park, Park Elctns., 2206 Edgewood
Ave. 612-925-3118
Mo North Kansas City, LCOMP-Kansas City, 1520
Taney St. 816-221-2400
Mo St. Louis, LCOMP-St. Louis, 2605 S. Hanley Rd.
314-647-5505
Mo St. Louis, Semiconductor Specialists, 10062
Natural Bridge 314-428-6100
Neb Lincoln, Scott Elec. Supply, 4040 Adams St.
402-464-8308
NJ Linden, Kevtron, 1306 E. Elizabeth Ave.
201-925-5000
NM Albuquerque, Century Elctns., 121 Elizabeth
N.E. 505-292-2700
NY Buffalo, Summit Distrs., 916 Main St.
716-884-3450
NY Commack, Connecting Comps., 61 Mall Dr.
516-543-8300
NY Elmsford, Zeus Comps., 175 Clear Brook Rd.
914-592-4120

NY Farmingdale, Bart Elctns., 195 Q. Central Ave.
516-293-3144
NY Forest Hills, Nasco, 99-08 Metropolitan Ave.
212-793-6500
NY Hauppauge, Semiconductor Concepts, 195
Engineers Rd. 516-273-1234
NY Johnson City, Wilshire Elctns., 617 Main St.
607-797-1236
NY New Hyde Park, Lafayette, 1327 Second Ave.
516-488-6600
NC Raleigh, Pyttronic Inds., 4509 Creedmoor Rd.
919-782-6370
NC Winston-Salem, Cramer Elctns., 938 Burke St.
919-725-8711
Ohio Cincinnati, Newark Elctns., 9799G Princeton Rd.
513-874-5115
Ohio Dayton, Semiconductor Specialists, 4500
Wadsworth Rd. 513-278-9455
Ohio Dayton, Stotts-Friedman Co., 108-112 N.
Jefferson St. 513-224-1111
Ohio Solon, Reppo, 6835 Cochran Rd. 216-248-8900
Pa Erie, Erie Corporate, 1938 Buffalo Rd.
814-455-8110
Pa Harrisburg, Pyttronic Inds., 2525 N. 7th St.
717-233-6591
Pa Huntingdon Valley, Hallmark, 458 Pike Rd.
215-355-7300
Pa Montgomeryville, Pyttronic Inds., 2 Stump Rd.
215-643-2850
Pa Philadelphia, Philadelphia Elctns., 112 N. 12th
St. 215-568-7400
Pa Pittsburgh, Semiconductor Specialists, 538
Alpha Dr. 412-781-8120
Tex Dallas, Component Specialties, 2560 Electronics
La. 214-357-4576
Tex Dallas, K.A. Elctns. Sls., 1220 Majesty
214-634-7870
Tex Dallas, Semiconductor Specialists, Suite 112,
9990 Monroe Dr. 214-358-5211
Tex Houston, Component Specialties, Suite 202,
7313 Ashcroft 713-771-7237
Tex Houston, Lenert Co., 1420 Hutchins St.
713-225-1465
Utah Salt Lake City, Alta Elctns., 2280 S. Main St.
801-486-7227
Utah Salt Lake City, Intermark Elctns., 83 E. Stratford
Ave. 801-486-3411
Wash Seattle, Intermark Elctns., 621 S. Michigan
206-767-3160
Wisc Mequon, Taylor Elec., 1000 W. Donges Bay Rd.
414-241-4321

GENERAL MAGNETIC CO., 10001 Erwin Ave., Detroit,
Mich., 48234, Tel: 313-921-7558; Empl.: 130; Minimum
order: \$500

For info on price: R. H. Campbell; Application info: C.
Hohmann; Customer service: R. Miller; Delivery info:
R. H. Campbell

Free literature available: We have a catalog listing
the various sizes we mfg.

Products manufactured: Magnets

Local Sales Offices & Reps.

Cal Los Angeles, G.B. Leland 213-851-5821
Ill Chicago, H.J. Corey & Assoc. 312-539-6310
Ill Chicago, R.T. Thompson 312-359-0159
Mass Beverly, Gysan Assoc. 617-774-2012
NY Wellsville, Walpole Assoc. 716-593-1941
Ohio Euclid, Rockford Controls 216-731-5250

GENERAL MAGNETICS, 135 Bloomfield Ave.,
Bloomfield, N.J., 07003, Tel: 201-743-2700; FSC No:
99165; Empl.: 60 p. 1-242-251

Free literature available: Data sheets on various
products detailing capabilities, specifications,
size, weight and in most cases a photograph

Products manufactured: Amplifiers, Coils Including
Assemblies & Forms, Computers, Converters,
Demodulators, Detectors, Dividers, Generators,
Modulator/Demodulators, Modulators, All Kinds,
Multipliers, Oscillators, Regulators, Switches,
Transformers

Local Sales Offices & Reps.

Cal Lynwood, Dick West & Assoc. 213-636-6124

GENERAL MFG. CO., 724 Ruberta Ave., Glendale, Calif.,
91201, Tel: 213-243-2069; FSC No: 10454; Minimum
order: \$20

For info on price: E. Galle; Application info: E. Galle;
Customer service: V. Galle

Free literature available: Catalog

Products manufactured: Eyelets, Spacers, Terminals

Local Sales Offices & Reps.

Ill Chicago, G.F. Sls. Co. 312-545-5562

GENERAL MICROWAVE CORP., 155 Marine St., Farmingdale, NY, 11735, Tel: 516-MY4-3600, TWX: 510-224-6406; FSC No: 11332; Empl.: 120; Minimum order: \$25 p. 1-718

Customer service: Sls. Dept.

Free literature available: Switch brochure; Attenuator brochure; power meter brochure; radiation hazard monitor brochure

Products manufactured: Amplifiers, Analyzers, Attenuators, Bolometers, Bridges, Calorimeters, Microwave, Cameras, CATV Systems & Equipment, Comparators, Converters, Detectors, Dividers, Electronic Switches (Oscilloscope), Generators, Insertion Loss Measurement Systems, Junctions, Hybrid, Microwave, Limiters, Meters, Modulator/Demodulators, Modulators, All Kinds, Monitors, Mounts, Probes, Shifters, Slotted Lines, Microwave, Switches, Testers, Thermistors, Tubes, Tuners

Local Sales Offices & Reps.

Ga Woodstock, Saber Assocs.404-432-9625
Ill Mt. Prospect, Cain & Co.312-253-3578
Kans Andover, Palatine Sls., Inc.316-683-7512
Kans Overland Park, Palatine Sls., Inc.913-262-5643
Md Bethesda, S & S Assocs., Inc.301-654-1434
Mass Stoneham, REPCO617-438-3113
Mo St. Louis, Palatine Sls., Inc.314-426-7055
NJ West Orange, EF Technical Sls., Inc.201-731-7203

NY Huntington, EF Technical Sls., Inc.516-368-5841
NY Liverpool, R & D Assocs., Inc.315-622-2350
NC Raleigh, Saber Assocs.919-834-3961
Ohio Lancaster, Cain & Co.614-654-4800
Pa King of Prussia, S & S Assocs., Inc.215-265-3450
Tex Dallas, Cain & Co.214-233-6809
FOR: Can., Montreal H3P 1Y9 Quebec, Canadian Marconi Co.514-343-3695
FOR: Can., Ottawa K1P 5L6, Canadian Marconi Co.613-235-5121

GENERAL MONITORS, INC., 3019 Enterprise St., Costa Mesa, Calif., 92626, Tel: 714-540-4895, Telex: 678-372; Empl.: 90

Products manufactured: Detectors

Local Sales Offices & Reps.

Ala Huntsville, Instruments & Computer Tech., Inc.205-837-6060
Alas Anchorage, Alaska Controls, Inc.907-272-3629
Ariz Phoenix, R. A. Mayes Co.602-279-5243
Cal Costa Mesa, Technical Prods.714-646-8585
Cal Sacramento, E. Freitag916-489-8831
Col Broadfield, R. A. Mayes Co.303-466-6311
Ga Atlanta, Measure-Trol Co.404-255-7249
Ill Chicago, Nomad Engrg.312-764-0403
Iowa Des Moines, Deco Engrg. Prods., Inc.515-288-5721
La Baton Rouge, C. Doyle Co.504-921-5386
Mass Randolph, Power Specialties617-963-8910
Mich Royal Oak, The Satullo Co.313-549-3910
Minn Minneapolis, E.R. Berg & Assoc.612-890-1221
Mo St. Louis, Fisk Process Equip.314-426-1410
Neb Omaha, Deco Engrg. Prods., Inc.402-341-4836
NJ East Orange, Industrial Flow Control, Inc.201-672-5220
NM Albuquerque, R. A. Mayes Co.505-265-7989
NY Elbridge, L-Tron Corp.315-689-3787
NC Charlotte, A. D. Penn Co.704-847-4426
Ohio Cincinnati, Surkamp & Rowe513-891-1833
Ohio Cleveland, Loesch Assocs., Inc.216-241-4581
Okla Tulsa, J. Schoeffler Co.918-742-5331
Ore Portland, Set-Point Control Inc.503-233-5108
Pa Philadelphia, Y. Wayne Miller, Inc.215-247-9602
Tex Houston, Groth Equip. Corp.713-675-6151
Va Richmond, Virginia Tech Assocs.703-266-9654
Wash Bellevue, Set-Point Control Inc.206-454-0155
WVa So. Charleston, Allied Controls Co.304-768-7313

GENERAL RADIO CO., 300 Baker Ave., Concord, Mass., 01742, Tel: 617-369-8770, TWX: 710-347-1051; FSC No: 24655; Minimum order: \$25 p. 2-1748-1750
Customer service: R. W. Ingram Ext. 134

Products manufactured: Accelerometers, Amplifiers, Analyzers, Attenuators, Bridges, Cable, Calibrators, Capacitors, Fixed, Capacitors, Variable, CATV Systems & Equipment, Comparators, Connector Adapters, Connectors, Controls/Control Eqpt., Cords, Counters, Couplers, Data Acquisition & Reduction Systems, Decade Boxes, Detectors, Dividers, Filters, Generators, Indicators, Insertion Loss Measurement Systems, Jacks (All Types), Lamps, Leads, Test & Adaptors, Lights, Line Stretchers, Microwave, Meters, Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds, Mixers, Oscillators, Paper, Graphic Recording, Plug Adapters, Plug & Jack Sets, Plugs, Posts, Potentiometers, Printers, Probes, Recorders, Regulators, Resistors, RFI Measuring Equipment, Scanners, Signal Conditioners & Equipment, Slotted Lines, Microwave, Smith Chart Impedance Plotters, Automatic, Sockets, Standards, Synthesizers, Tachometers, Tees, Terminals, Test Equipment, Test Systems, Testers, Transducers, Transformers, Tubes

Local Sales Offices & Reps.

Cal Irvine714-540-9830
Cal Palo Alto415-948-8233
Ga Atlanta404-394-5380
Ill Chicago312-992-0800
Md Gaithersburg301-948-7071
Mass Bolton617-646-0550
NJ Saddle Brook212-964-2722
Ohio Dayton513-294-1500
Tex Richardson214-234-3357

GENERAL RAND CORP., 100 Menlo Park, Edison, N.J., 08817, Tel: 201-548-1591; Empl.: 12; Minimum order: \$15

For info on price: C. Morton; Application info: F. Weber; Customer service: O. Yovanovits; Delivery info: O. Yovanovits

Products manufactured: Amplifiers, Bridges, Calibrators, Meters, Printers, Pumps, Vacuum, Recorders, Standards

GENERAL RELAY CORP., 20 Mercer St., Dover, N.J., 07801, Tel: 201-361-1400, TWX: 710-987-7929; Empl.: 90

Products manufactured: Relays, Solenoids

GENERAL RESISTANCE, INC., 75 Haven Ave., Mt. Vernon, N.Y., 10553, Tel: 914-699-8010, TWX: 710-562-0199; Empl.: 50; Minimum order: \$50

For info on price: L. Batard; Application info: J. Jamieson; Customer service: L. Batard; Delivery info: L. Batard

Free literature available: Econistor brochure, Sequaristor brochure, Miniohm brochure, Instrument Catalogue Digest-440-3

Products manufactured: Attenuators, Bridges, Calibrators, Converters, Current Sources, Decade Boxes, Demodulators, Dividers, Filters, Networks, Power Supplies, References, D-C Voltage, Resistors, Standards, Testers

Local Sales Offices & Reps.

Ala Huntsville, Kemp Instrs., Inc.205-837-4304
Ariz Phoenix, Zeus, Inc.602-253-6104
Cal El Monte, Telemart415-948-4563
Cal Los Altos, J. Stone & Assoc.213-682-3706
Cal South Pasadena, QPL, Inc.303-770-4400
Colo Denver, Zeus, Inc.203-237-1112
Conn Meriden, P.R. Sturgeon Co.305-830-9600
Fla Casselberry, EIR, Inc.305-894-7371
Fla Orlando, R.J. Cheney & Assoc.404-451-3529
Ga Atlanta, Grady Duckett Sls. Co.312-622-4110
Ill Chicago, Brock & Cushman312-653-6826
Ill Wheaton, Engrg. Prods. Assoc.504-927-7574
La Baton Rouge, SESCO Corp.617-237-3506
Mass Babson Park, P.R. Sturgeon Co.617-873-8893
Mass Framingham, J.M. Lancaster Co.313-476-9161
Mich Farmington, Anderson Elctns.313-474-0661
Mich Farmington, R. Hummon Assoc.612-925-1883
Minn Minneapolis, Engrg. Prods. Assoc.505-268-3941

NM Albuquerque, Zeus, Inc.315-437-8343
NY Syracuse, Nycorn, Inc.404-451-3529
NC Charlotte, G. Duckett Sls. Co.704-847-3125
NC Matthews, W.K. Hile & Assoc.513-278-4216
Ohio Dayton, Rixan Assocs.412-468-5045
Pa Delmont, T.F. Laslo & Assoc.515-566-6709
Tex Houston, SESCO Corp.213-668-7840
Tex Richardson, SESCO Corp.214-231-9364
Utah Salt Lake City, Zeus, Inc.801-466-4924
Va Falls Church, Beacon North, Inc.703-534-1673
Wash Seattle, Seatronics, Inc.206-767-4330
EXP: Mt. Vernon, N.Y., General Resistance, Inc.914-699-8010

Local Distributors

Ill Dayton, Rixan Assoc., 5062 Wadsworth513-278-4216

GENERAL SCANNING, 80 Coolidge Hill Rd., Watertown, Mass., 02172, Tel: 617-924-1010; Empl.: 60
Customer service: R. L. Hubbell

Free literature available: OEM recorder modules for instrumentation optical scanning components & systems.

Products manufactured: Actuators, Controls/Control Eqpt., Light Choppers, Motors, Recorders, Scanners

GENERAL SEMICONDUCTOR INDUSTRIES, INC., 2001 W. 10 Pl., Box 3078, Tempe, Ariz., 85281, Tel: 602-968-3101, TWX: 910-950-1942; FSC No: 24444; QPL No: 19500; Empl.: 175; Minimum order: \$100

For info on price: E. Stumbaugh Ext. 18; Application info: D.W. Hutchins Ext. 21; Delivery info: E. Stumbaugh Ext. 18

Free literature available: TransZorb - Silicone transient voltage suppressors; Transistors - NPN silicon power switch; Zeners - Regulator and reference diodes.

Products manufactured: Arresters, Electrical Surge, Lightning, Diodes, Filters, Limiters, Protectors, Regulators, Suppressors, Transistors

Local Sales Offices & Reps.

Ariz Tempe, Argus Sls.602-967-8709
Cal San Carlos, Kottmeier Assocs.415-592-8333
Cal Woodland Hills, Electronic Comp. Mktg.213-340-1745
Colo Denver, Camel Electronics303-757-6191
Conn Milford, Sales Engrg. Co.203-877-2001
Conn New Fairfield, Sales Engrg. Co.203-746-9516
Fla Orlando, Buchanan & Abrams Assocs.305-898-7444

Ill Chicago, Balhorn & Welch, Inc.312-889-5011
Iowa Cedar Rapids, Snider Sls. Co.319-362-4410
Kans Shawnee Mission, Technical Sls. Assoc.913-888-3330

Md Baltimore, Stemler Assocs., Inc.301-944-8262
Mass Andover, Sales Engrg. Co.617-470-0800
Mich Southfield, Representatives Elctrn. Prods., Inc.313-354-9066

Minn Minneapolis, Professional Sls. Ind.612-835-1777
Mo Ferguson, Technical Sls. Assocs.314-725-5361
NJ Barrington, Stemler Assocs.215-644-3477
NJ Cherry Hill, Stemler Assocs.609-966-4070
NM Albuquerque, EMI505-292-2700
NY Endicott, Advanced Comps. Corp.914-471-1623

NY Hempstead, Kahgan Sls. Corp.516-538-2300
NY N. Syracuse, Advanced Comps. Corp.315-853-6438
NY Scottsville, Advanced Comps. Corp.716-889-1429

Ohio Columbus, McFadden Sls. Co.614-221-3363
Tex Houston, Oeler & Menelaides713-772-0730
Tex Richardson, Oeler & Menelaides214-234-6334
Va Alexandria, Stemler Assocs.703-548-7818
Wash Redmond, Desco-Northwest206-455-9325

GENERAL TV NETWORK, 520 W. Eight Mile Rd., Ferndale, Mich., 48220, Tel: 313-548-2500; Empl.: 25

Products manufactured: Television Systems & Equipment Closed-Circuit

GENERAL TIME CORP., Industrial Controls Div., 135 S Main St., Thomaston, Conn., 06787, Tel: 203-283-5881; Empl.: 350

Products manufactured: Brakes, Clutches, Controls/Control Eqpt., Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Indicators, Motors, Relays, Timers

Local Sales Offices & Reps.

Cal Pasadena, C.A. Williams213-793-1161
Cal San Francisco, C. Myers415-825-4770
Colo Denver, R.L. Palmer Co.303-771-6827
Conn Thomaston, P. Allison203-283-5881
Ga Atlanta, Motion Technology404-233-4368
Ill Des Plaines, T. Sauer312-296-7751
Kans Shawnee Mission, E.L. Martin Co.913-648-4746
Mass Boston, T. Weafer617-762-1466
Minn Mpls, General Time612-333-2815
Mo St. Louis, Automation Components314-872-7111

NY New York City, General Time201-289-5959
NY Rochester, R. King716-546-4766
NC Charlotte, Motion Technology704-525-9855
Ohio Cincinnati, W. Tomlinson513-421-3366
Ohio Cleveland, A.F. Blaine216-752-2083
Ore Portland, C. Myers415-825-4770

Pa Philadelphia, General Time215-696-3443
 Tex Dallas, Titan Reps.214-661-5350
 Wisc Milwaukee, W. Ferguson414-353-5422
 FOR: Can., Peterborough, Ont., Gen'l Time Can.

GENERAL VALVE CORP., 110 Rte. 10 Box 222, E. Hanover,
 N.J., 07936, Tel: 201-887-9460, Telex: 136411
 Customer service: G. E. Toohay

Products manufactured: Connectors,
 Controls/Control Eqpt., Valves, Solenoid, Valves,
 Vacuum

Local Sales Offices & Reps.

Cal Los Angeles, Fluid Tech Sls. So.714-530-8111
 Cal San Francisco, Valin Corp.408-734-2590
 Mo St. Louis, Hitt Assocs.314-HA 6-2322
 NJ East Hanover, General Valve Corp.201-887-9460
 NY Rochester, Lloyd Hart Assocs.716-244-3253
 Ohio Cincinnati, W. Watkins Assocs.513-891-0313
 Wisc Elm Grove, Fluid Power Consultants414-782-5508

GENISCO TECH. CORP., Special Products Div., 18435
 Susana Rd., Compton, Cal., 90221, Tel: 213-537-4750,
 TWX: 910-346-6773; Empl.: 350; Minimum order: \$100
 Customer service: K. Williamson

Free literature available: Instrumentation magnetic
 tape-Model 10-286; Model 10-276 Instrumentation
 Recorder high environment airborne or-tape
 recorders preliminary product bulletin digital
 magnetic tape cartridge.

Products manufactured: Recorders

Local Sales Offices & Reps.

Ala Huntsville, Kemp Instrs.205-837-4304
 Ariz Phoenix, Thorson Co.602-956-5300
 Cal Encino, Scientific Devices213-872-1951
 Cal Los Alamitos, Scientific Devices415-964-4230
 Cal Mountain View, Scientific Devices714-279-6642
 Colo Denver, C.W. Fowler Co.303-744-9595
 DC Wash, Mr. R. Kent White301-839-5858
 Ill Chicago, Carter Elctns.312-585-5485
 Ind Indianapolis, Carter Elctns.317-293-0696
 Kans Overland Park, Carter Elctns.913-649-6996
 Md Baltimore, Scientific Devices301-788-6611
 Mass Newton Centre, Daner-Hayes617-969-4650
 Mich Detroit, Electro Sls. Assoc.313-526-8800
 Minn Minneapolis, Carter Elctns.612-544-9393
 Mo Hazelwood, Carter Elctns.314-731-2237
 NM Albuquerque, Thorson Co.505-265-5657
 Ohio Cleveland, Electro Sls. Assoc.216-261-5440
 Ohio Dayton, Electro Sls. Assoc.513-426-5551
 Pa Bethayres, Control Instrs. Sls. Co.215-676-1808
 Pa Pittsburgh, Electro Sls. Assoc.412-371-9449
 Tex Dallas, Thorson Co.214-233-5744
 Tex Houston, Thorson Co.713-771-3504
 Va Norfolk, Scientific Devices804-499-8133
 Va Springfield, Scientific Devices703-451-6500
 Wash Seattle, R.S. Drake Assoc.206-763-2755
 Wisc Milwaukee, Carter Elctns.414-464-5555

GENISCO TECHNOLOGY CORP., Eldema Div., 18435
 Susana Rd., Compton, Cal., 90221, Tel: 213-537-4750,
 TWX: 910-346-6773; Empl.: 350; Minimum order: \$50
 Customer service: R. L. Chase

Free literature available: Eldema Condensed
 General Catalog +GTC-E200C; Eldema C-Series
 Solder-Pin Lamps #C500; Eldema C-Lites,
 D-Holders #CD 100 C; Sockets/Mountings for Led
 Lamps #Q 200A.

Products manufactured: Caps, Lenses, Indicator
 Light, Diodes, Display Devices/Displays, Lamps,
 Sockets, Switches

Local Sales Offices & Reps.

Ariz Tempe, W. Bert Knight Co.602-946-1088
 Ark El Dorado, D. Bellow Sls. Inc.501-863-8325
 Cal Los Altos, E. Foley, Inc.415-941-4525
 Cal Newport Beach, W.B. Knight Co.714-833-8250
 Colo Denver, W.J. Purdy Co.303-777-1411
 Conn Meriden, P.R. Sturgeon Co.203-237-1112
 Wash D.C., S.K. MacDonald202-265-3938
 Fla Miami Beach, Gartner Assocs.305-861-3661
 Fla Orlando, Gartner Assocs.305-299-1000
 Ill Wilmette, Crest Assocs.312-256-5202
 Ind Indianapolis, Mktg. Engrs. Inc.317-546-1523
 Iowa Cedar Rapids, Palatine Sls. Inc.319-365-8071
 Kans Andover, Palatine Sls. Inc.316-683-7512
 Kans Overland Park, Palatine Sls. Inc.913-262-5643
 La Kenner, D. Bellow Sls. Inc.504-729-4550
 Md Baltimore, S.K. MacDonald Inc.301-254-3380
 Mass Babson Park, P.R. Sturgeon Co.617-237-3506
 Minn Minneapolis, F.B. Hill Co.612-941-5270
 Mo St. Louis, Palatine Sls. Inc.314-426-7055

NJ Englewood Cliffs, Sprung-Nussbaum Inc.201-947-6767
 NM Albuquerque, C.T. Carlberg & Assocs.505-265-1579
 NY Buffalo, R.W. Mitscher Co.716-633-7970
 NY E. Aurora, Harries & Kershaw716-652-1221
 NC Raleigh, R.W. Mitscher Co.919-828-0575
 Ohio Columbus, T. Mulligan & Assocs.614-457-2242
 Pa Philadelphia, S.K. MacDonald Inc.215-545-1205
 Pa Pittsburgh, S.K. MacDonald Inc.412-366-2643
 Tenn Memphis, D. Bellow Sls. Inc.901-365-9437
 Tenn Shelbyville, R.W. Mitscher Co.615-684-4544
 Tex Dallas, R.E. Nesbitt Co.214-357-4601
 Tex Houston, R.E. Nesbitt Co.713-224-3633
 Va Virginia Beach, R.W. Mitscher Co.804-464-0500
 Wash Seattle, Underwood & Underwood Inc.206-243-3133

Local Distributors

Ark Little Rk., Carlton-Bates, Box 3155501-375-5375
 Cal Burlingame, Rose Elctns., 846 Stanton Rd.415-697-0224
 Cal Hollywood, Yale Radio, 6662 Sunset Blvd.213-465-3186
 Cal Inglewood, Cal. Switch & Signal, 1009 Arbor
 Vitae213-776-3550
 Cal Los Angeles, Cal. Elect. Supply, 1911 Armacost
 St.213-879-0760
 Cal Los Angeles, Radio Prod. Sls., 1501 So. Hill
 St.213-748-1271
 Cal Mt. View, Ratel Elctns., 815 Maude Ave.415-965-2010
 Cal Oakland, Brill Elctns., 610 E. 10th St.415-834-5888
 Cal Palo Alto, Zack Elctns., 654 High St.415-326-5432
 Cal Riverside, MacRudie Group, 3627 Merrill Ave.714-683-7711
 Cal San Diego, Radio Prod. Sls., 7889 Claremont
 Mesa303-266-3755
 Cal San Francisco, Zack Elctns., 1444 Market St.415-626-1444
 Colo Denver, Electronic Parts, 1277 Broadway
 St.303-232-2832
 Conn Hartford, R & S Elctns., 95 Leggett St.203-528-6581
 Fla Miami, Elect. Equip., 2701 N.W. 42nd Ave.305-635-0421
 Fla Pensacola, Grice Elctns., Box 1911904-434-4281
 Ind Indianapolis, Graham Elctns., 133 S. Penn St.317-635-5453
 Iowa Cedar Rap., Iowa Radio Supply, 710 Centerpoint
 Rd.319-364-6154
 Kans Wichita, Radio Supply Co., 115 Laura St.316-267-5214
 La Baton Rouge, Ralphs, 1732 Plank Rd.504-344-3761
 La Lafayette, Ralphs, Drawer R318-234-4507
 La New Orleans, Radio Parts, 1112 Magazine St.504-581-5959
 La Shreveport, Industrial Elctns., Box 4067615-573-7135
 Md Baltimore, ASI, 1728 Whitehead Ave.301-265-5100
 Md Bethesda, Empire Elctns., 4907 Rugby Ave.301-656-3300
 Md Rockville, Pioneer/Wash., 1037 Taft St.301-427-3300
 Md Savage, Pytronics, 8220 Wellmore Rd.301-792-7000
 Mass Lynn, Land Elctns., 9 Rear Franklin St.617-592-2220
 Mass Newton, Greene Shaw, 70 Bridge St.617-969-8900
 Mass W. Newton, A.W. Mayer, 38 Border St.617-267-5530
 Mich Muskegon, Fitzpatrick Elect., 444 Irwin Ave.616-722-6621
 Mich Wyoming, Newark Ind. Elect., 3645 Linden S.E.616-241-6681
 Minn Minneapolis, Electronics Center, 107 3rd Ave.312-338-5881
 Mo St. Louis, Olive Ind. Elect., 6662 Olive St.314-863-7800
 NJ Camden, General Radio Supply, 600 Penn St.,
 N.J.909-964-8560
 NJ Cinnaminson, Wilshire Elctns., 8555 Indl. Hwy.609-786-8990
 NJ Little Falls, Ind'l. Prods., Cardinal Dr.201-785-1830
 NY Babylon, Delmar Elctns., 101 Eads St.516-420-1234

NY Buffalo, Summit Distrs., 916 Main St.716-884-3450
 NY Carle Place, Electronic Precepts, 288 Westbury
 Ave.516-997-5380
 NY Mt. Vernon, QAR Elctns., 621 S. Columbus
 St.914-699-2224
 NY Plainview, ACL, 28 S. Mall St.516-293-6630
 NY Rochester, Rochester Radio, 140 W. Main St.
 N.Y.716-454-7800
 NY Rochester, Summit Dist., 292 Commerce
 St.716-334-8810
 NY Rome, Rome Elctns., 108 Spring St.315-337-5400
 Ohio Columbus, Hughes-Peters, 481 E. 11th Ave.614-294-5351
 Okla Oklahoma City, Trice Whsle Elctns., 4701 N.
 Stiles405-524-4415
 Pa Allentown, A.A. Peters, 404 Union Blvd.215-434-5237
 Pa Allentown, Valley Elctns., 101 N. 7th St.215-435-9696
 Pa Altoona, Allegheny, 1720 Union Ave.814-946-0871
 Pa Erie, J.V. Duncombe, 721 Parade St.717-233-6591
 Pa Harrisburg, Pytronics, Box 1967412-751-5966
 Pa McKeesport, Barno Radio, 5403 W. Smithfield
 St.401-781-8000
 RI Warwick, W.H. Edwards, 55 Electronic
 Dr.214-824-3001
 SC Columbia, Dixie Radio, Box 408915-533-9555
 Tex Dallas, Whsle. Elect. Supply, Ross at Central
 Express713-783-9805
 Tex El Paso, Midland Specialty, 2235 Wyoming Ave.713-785-5436
 Tex Houston, Kent Elctns., 5626 Bonhomme
 St.801-328-2075
 Tex Houston, Solid State Elect., 6400 Westpark
 Dr.703-524-2412
 Utah Salt Lake, Kimball Elctns., 360 Pierpoint Ave.804-296-4186
 Va Arlington, Arlington Elctns., 3636 Lee Hwy.206-285-3500
 Va Charlottesville, Virginia Radio, 715 Henry St.206-762-9100
 Wash Seattle, Interface, 300 2nd Ave.206-762-9100
 Wash Seattle, Sterling Elect., 5608 6th St.

GENISCO TECHNOLOGY CORP., Filter Div., 18435
 Susana Rd., Compton, Cal., 90221, Tel: 213-537-4750,
 TWX: 910-346-6773; Empl.: 350; Minimum order: \$100
 For info on price: D. Pizzo; Application info: C. Kelley;
 Customer service: C. Kelley; Delivery info: C. Kelley

Free literature available: EMI/RFI Mini Filters;
 Shielded Enclosure and Ground Support
 Equipment Radio Interference Filters; R.F.I. Filters
 R.F. Filtered Power Line Assemblies

Products manufactured: Amplifiers, Capacitors,
 Fixed, Coils Including Assemblies & Forms, Filters,
 Transformers

Local Sales Offices & Reps.

Cal Los Altos, Ewing-Foley, Inc.415-941-4525
 Cal San Diego, F. Nagel Co.714-298-4850
 Md Severna Park, D. Hughes301-647-6327
 Minn St. Paul, Countryman Assocs.612-645-9151

GENISCO TECH. CORP., Genistron Div., 18435 Susana
 Rd., Compton, Cal., 90221, Tel: 213-537-4750, TWX:
 910-346-6773; Empl.: 350; Minimum order: \$400
 Customer service: D. Pizzo

Free literature available: EMI/RFI Mini-Filters
 #F102; Shielded Enclosure and, - etc. #103C; RFI
 Filters #F101C; Current Probes #F150; Genistron
 RFI/EMI Analysis, - etc.

Products manufactured: Bobbins, Winding, Coil &
 Transformer, Coils Including Assemblies & Forms,
 Current Sensors, Filters, Networks, Probes,
 Reactors, Relays, Services, Assembly, Production
 & Test, Suppressors, Switches

Local Sales Offices & Reps.

Cal Los Altos, Ewing-Foley415-941-4525
 Cal San Diego, F. Nagel714-298-4850
 Colo Denver, I. Strong303-292-6900
 Md Severna Pk., D. Hughes301-647-6327
 Minn St. Paul, Countryman612-645-9151

GENISCO TECH. CORP., Tape Div., 18435 Susana Rd.,
 Compton, Cal., 90221, Tel: 213-537-4750, TWX:
 910-347-6773; Empl.: 450; Minimum order: \$100

For info on price: K. Williamson; Application info: L.
 Turner; Customer service: L. Turner; Delivery info: L.
 Turner

Free literature available: Model 10-286 Brochure and specifications Model 10-276 Brochure and specifications Model ECR-10 Brochure and specifications Models 10-110 and 10-236 Brochure and specifications Model AU/ASH-27 Brochure

Products manufactured: Recorders, Tape Recording Accessories

Local Sales Offices & Reps.

Ala	Huntsville, Kemp Instrs.	205-837-4304
Ariz	Phoenix, Thorson Co.	602-956-5300
Cal	Encino, Scientific Devices	213-872-1951
Cal	Los Alamitos, Scientific Devices	213-598-7678
Cal	Mt. View, Scientific Devices	415-964-4230
Cal	San Diego, Scientific Devices	714-279-6642
Colo	Denver, C. Fowler	303-744-9595
Conn	Newtown, Daner-Hayes	203-426-9094
Fla	Orlando, Scientific Devices	305-424-7932
Ill	Chicago, Carter Elctns.	312-585-5485
Ind	Indianapolis, Carter Elctns.	317-293-0696
Kans	Overland Park, Carter Elctns.	913-649-6996
Md	Baltimore, Scientific Devices	301-788-6611
Mass	Newton Centre, Daner-Hayes	617-969-4650
Mich	Detroit, Electro-Sls. Assoc.	313-526-8800
Minn	Minneapolis, Carter Elctns.	612-544-8393
Mo	Hazelwood, Carter Elctns.	314-731-2237
NM	Albuquerque, Thorson Co.	505-265-5657
NY	Rochester, Daner-Hayes	716-467-5100
Ohio	Cleveland, Electro-Sls. Assoc.	216-261-5440
Ohio	Dayton, Electro Sls. Assoc.	513-426-5551
Pa	Bethayres, Control Instr. Sls. Co.	215-676-1808
Pa	Pittsburgh, Electro Sls. Assoc.	412-371-9449
Tex	Dallas, Thorson Co.	214-233-5744
Tex	Houston, Thorson Co.	713-771-3504
Va	Norfolk, Scientific Devices	804-499-8133
Va	Springfield, Scientific Devices	703-451-6500
Wash	Seattle, R. S. Drake Assoc.	206-763-2755
Wisc	Milwaukee, Carter Elctns.	414-464-5555

GENISCO TECH. CORP., Rotating Test Div., 18435 Susana Rd., Compton, Cal., 90221, Tel: 213-537-4750, TWX: 910-346-6773; Empl.: 350; Minimum order: \$100

Customer service: F. Schodlbauer

Free literature available: Series 1100 Rate of Turn Table No. 1-RT; Genisco Centrifuge Model 1068; Genisco Rate Tables; Centrifuge Composite Catalog.

Products manufactured: Calibrators, Simulators

Local Sales Offices & Reps.

Ala	Huntsville, Scientific Devices	205-536-1969
Ariz	Phoenix, Thorson Co.	602-956-5300
Cal	Carson, Abco Co.	213-537-5152
Colo	Denver, C.W. Fowler Co.	303-744-9595
Conn	Newtown, Daner-Hayes	203-426-9044
Fla	Fort Lauderdale, Scientific Devices	305-721-4260
Fla	Orlando, Scientific Devices	305-424-7932
Ind	Indianapolis, M & L Assocs.	317-545-0643
Iowa	Cedar Rapids, Palatine Engrg.	319-365-8071
Kans	Andover, Palatine Engrg.	316-683-7512
Kans	Overland Park, Palatine Engrg.	913-262-5643
Mass	Newton Center, Daner-Hayes	617-969-4650
Mich	Plymouth, Meas. Instr., Inc.	313-352-2144
Minn	Eden Prairie, F. Peterson Co.	612-941-5400
Mo	St. Louis, Palatine Engrg.	314-426-7055
NM	Albuquerque, Thorson Co.	505-265-5655
NC	Burlington, Scientific Devices	919-228-6279
Ohio	Cincinnati, Meas. Instr., Inc.	513-531-2729
Ohio	Cleveland, Meas. Instr., Inc.	216-333-6611
Okla	Tulsa, Palatine Engrg.	918-622-0321
Ore	Portland, McLaren, Inc.	503-297-2248
Pa	Bethayres, Control Instr. Sls.	215-676-1808
Pa	Monroeville, Meas. Instr., Inc.	412-366-1906
Tex	Houston, Palatine Engrg.	713-777-4477
Tex	Richardson, Palatine Engrg.	214-231-9489
Wash	Bellevue, McLaren, Inc.	206-454-3400

GENISCO TECH. CORP., TRANSDUCERS, 18435 Susana Rd., Compton, Cal., 90221, Tel: 213-537-4750, TWX: 910-346-6773; Empl.: 350; Minimum order: \$100

Customer service: R. DeSomer

Free literature available: Acceleration Switches and Accelerometers Selector Guide #200; Genisco/Data Sensors Pressure Transducers and Readouts Selector Guide #400.

Products manufactured: Accelerometers, Amplifiers, Transducers

Local Sales Offices & Reps.

Ala	Huntsville, Incotech	205-837-6061
Cal	Long Beach, Saber Enptrs.	213-595-5646
Colo	Denver, C.W. Fowler	303-744-9595
Conn	Marion, Sands Co.	203-628-4363
Fla	Ft. Lauderdale, Scientific Devices	305-721-4260
Fla	Orlando, Scientific Devices	305-424-7932
Ill	Skokie, Mauer Co.	312-677-4771
Ind	Indianapolis, M & L Assocs.	317-545-0643

Iowa	Cedar Rapids, Palatine Engrg.	319-365-8071
Kans	Andover, Palatine Engrg.	316-683-7512
Kans	Overland Park, Palatine Engrg.	913-262-5643
Md	Baltimore, Scientific Devices	301-788-6611
Mich	Royal Oak, Meas. Instr.	313-352-2144
Minn	Hopkins, F. Peterson	612-941-5400
Mo	St. Louis, Palatine Engrg.	314-426-7055
NC	Burlington, Scientific Devices	919-228-6279
Ohio	Cincinnati, Meas. Instr., Inc.	513-531-2729
Ohio	Cleveland, Meas. Instr., Inc.	216-333-6611
Okla	Tulsa, Palatine Engrg.	918-622-0321
Pa	Bethayres, Control Instr. Sls.	215-676-1808
Pa	Monroeville, Meas. Instr., Inc.	412-366-1906
Tex	Houston, Palatine Engrg.	713-777-4477
Tex	Richardson, Palatine Engrg.	214-231-9489
Va	Norfolk, Scientific Devices	804-499-8133
Va	Springfield, Scientific Devices	703-451-6500
Wash	Seattle, R.S. Drake	206-763-2755

GENTRON CORP., 6667 N. Sydney Pl., Milwaukee, Wisc., 53209, Tel: 414-351-1660; Empl.: 10; Minimum order: \$100

Customer service: Factory

Free literature available: Micro Power Circuits, SCR Bridge Rectifiers & Assemblies, Motor Controls, Hybrid Circuits, Resistor Networks, Oscillators, Relays Solid State & Thermal.

Products manufactured: Bridges, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Controls/Control Eqpt., Flashers, Motors, Networks, Oscillators, Relays, Resistors, Suppressors, Switches, Thyristors (Includes Silicon Controlled Rectifiers)

GEORGE INSTRUMENT CO., GIC Thermodynamics Div., 4949 Delemere, Royal Oak, Mich., 48073, Tel: 313-576-4700, Telex: 23-5714; Empl.: 10; Minimum order: \$25

For info on price: F. Leslie; Application info: F. Leslie; Customer service: J. Smith; Delivery info: J. Smith

Free literature available: GIC Thermodynamics Master Catalog (42 pages) showing all material required for sensing, reading, & controlling temperature (# GIC-574-5/M) GIC Thermodynamics Short Form Catalog (12 pages) showing most commonly used thermocouples and accessories. (# GIC-774-50/M)

Products manufactured: Connectors, Plug & Jack Sets, Probes, Thermocouples, Elements & Accessories, Wire

Local Sales Offices & Reps.

Ala	Huntsville, 20th Century Mktg.	205-772-9237
Conn	Durham, Marr Elec. Co.	203-349-9691
Ill	Northfield, Ensign Co.	312-446-7147
La	Baton Rouge, Ross & Pethel	504-293-0520
Mich	Royal Oak, D. Ray & Assocs.	313-576-4705
Minn	Minneapolis, Control Assemblies	612-544-3364
NJ	Clifton, Long, Poveromo & Assocs.	201-785-2492
NJ	W. Patterson, Long, Poveromo & Assocs.	201-785-2492
NY	Brooklyn, Long, Poveromo & Assocs.	212-449-5281
NY	Buffalo, Trott Elctns.	716-876-0880
Ohio	Cleveland, Scott Elctns.	216-291-2600
Pa	Media, W. Reeves Assocs.	215-566-6709
Tex	Houston, Gaumer Co.	713-686-3483
Wisc	Milwaukee, C.D. Controls Div. of Gordon Hatch	414-671-6550

GEORATOR CORPORATION, Box 70, Manassas, Va., 22110, Tel: 703-368-2101; Minimum order: \$25

p. 11222-1229

For info on price: C. E. Trefzger; Application info: J. Rahaw; Customer service: S. Vick; Delivery info: S. Vick

Free literature available: Data Sheets, Summary Data Sheet, Converters, 60 to 60 Hz Line Isolator Motor Generators, Permanent Magnet Alternators, Complete Box Catalog: Describes Full line of, 50, 60, 120, 180, 360, 420, 840 Hz Outputs.

Products manufactured: Alternators, Converters, Generators, Isolators, Motor & Generator Armatures, Rotors, Stators, Motor Electric Generator Sets, Power Supplies, Regulators, Stabilizers, Line Impedance, Tachometers

GEORATOR CORPORATION cont'd

Advertisement

Georator Corporation

Manufacturer of NOBRUSH Permanent Magnet Generators, frequency Converters, Alternators, Isolator-Stabilizer Motor Generators, and separate rotors and stators. In frequencies of 25, 50, 60, 120, 180, 360, 400, 420, 800 and 840 Hz. In ratings from 0.5 KVA to 25 KVA.

GEOTECH, See Teledyne Geotech.

GERBER SCIENTIFIC INSTR. CO., Box 305, Hartford, Conn., 06601, Tel: 203-644-1551, TWX: 710-427-2218; Empl.: 350

Products manufactured: Digitizers, Pencil Follower (Inc. Coordinate & Graphic), Drafting Machines, Recorders, Simulators

Local Sales Offices & Reps.

Cal	Encino
Fla	Jacksonville
Ill	Skokie
Mich	Lathrup Village
NJ	Paramus
Tex	Arlington
Va	Arlington

GERMANIUM POWER DEVICES, Box 65, Shawshen Village Sta., Andover, Mass., 01810, Tel: 617-475-5982, Telex: 94-7150; Empl.: 42; Minimum order: \$100

For info on price: L. LeBow; Application info: D. Frost; Customer service: L. LeBow; Delivery info: L. LeBow

Free literature available: Short form catalogue Listing complex Germanium power devices

Products manufactured: Transistors

Local Sales Offices & Reps.

Ariz	Scottsdale, Piper-Goyne, Inc.	602-946-4437
Cal	Canoga Park, TKO Elctns.	213-883-3822
Cal	Mt. View, Nor-Cal Assocs.	415-961-8121
Cal	San Diego, Col-Rob Elctns.	714-565-6814
Colo	Littleton, Piper-Goyne, Inc.	303-798-8955
Colo	Wheatridge, Waugaman Assocs.	303-423-1020
Fla	North Miami, Winfield Elctn. Sls. Co.	305-945-6544
Ga	Atlanta, Winfield Southeast Co.	404-636-3023
Ill	Addison, H. Grubb & Co.	312-543-8525
Iowa	Cedar Rapids, F. Snyder	
Kans	Shawnee Mission, Florence & Meyer	913-722-5210
Kans	Wichita, Florence & Meyer	316-838-7226
Minn	Hopkins, Grayden & Flemmer, Inc.	612-941-1120
Mo	St. Charles, Florence & Meyer	314-724-6690
NJ	Cherry Hill, Danco Elctn. Sls. Corp.	710-896-2218
NM	Albuquerque, Piper-Goyne, Inc.	505-265-6794
NY	Larchmont, Hindston Walsh Assoc.	914-834-5781
NY	Syracuse, Nycom, Inc.	315-437-8343
Ohio	Cleveland, KW Elctns.	216-831-8292
Ohio	Dayton, KW Elctns.	513-890-2150
Okla	Broken Arrow, P. J. Scanlon Co.	918-251-5728
Ore	Portland, C. K. Shanks & Assoc.	503-292-5656
Pa	Allison Park, KW Elctns.	412-487-4300
Tex	Houston, P. J. Scanlon Co.	
Tex	Richardson, P. J. Scanlon Co.	214-231-4661
Wash	Seattle, C. K. Shanks & Assoc.	206-632-4290
Wisc	Milwaukee, H. Grubb & Co.	414-545-7810
FOR:	Can., Scarborough, Ont., International Rectifier Canada, Ltd.	416-755-7793

GHZ DEVICES, INC., 16 Maple Road, So. Chelmsford, Mass., 01824, Tel: 617-256-8101, TWX: 710-343-0404; Empl.: 66; Minimum order: \$25

For info on price: R. Tremblay; Application info: C. Newton; Customer service: C. Eliason; Delivery info: C. Eliason

Free literature available: GHZ devices offers 2 short form catalogs: to cover complete microwave diode product line and the GHZ line of microwave control devices.

Products manufactured: Attenuators, Diodes, Limiters, Modulators, All Kinds, Shifters, Switches

Local Sales Offices & Reps.

Ala	Huntsville, F.M. Assocs., Ltd.	205-536-9990
Ariz	Scottsdale, Piper Goyne	602-946-4437
Cal	Los Angeles, Thorson Co.	213-937-0790

Cal Palo Alto, Waldman Assocs.415-961-4100
 Cal San Diego, Thorson Co.714-298-8385
 Cal Tustin, Thorson Co.714-544-5121
 Colo Denver, Thorson Co.303-355-3521
 Fla Orlando, Currie, Peak & Frazier Inc.305-855-0843
 Fla Orlando, F.M. Assocs., Ltd.305-851-5716
 Ill Chicago, Techrep, Inc.212-761-0548
 Ind Ft. Wayne, TX Sls. Inc.219-485-0805
 Ind Indianapolis, TX Sls. Inc.317-253-1966
 Kans Shawnee, F. Guernsey Co.913-631-2414
 Md Ellicott City, Applied Engrg. Conslts.301-465-1272
 Mass Needham Hts., O'Sullivan & Murphy at Repton617-449-4141
 NY Tuckahoe, Spectrum Sls. Inc.914-793-1660
 NC Greensboro, F.M. Assocs. Ltd.919-294-2754
 Ohio Dayton, K.W. Elctrn. Sls., Inc.513-890-2150
 Ohio Shaker Heights, TX Sls., Inc.216-561-1900
 Tex Dallas, Thorson Co.214-233-5744
 Tex Houston, Thorson Co.713-771-3504
 Wash Seattle, Thorson Co.206-632-0710
 FOR: Can. Villa LaSalle 650, Que., Electrodesign, Ltd.514-363-5120
 FOR: Can., Toronto, Ont., Electrodesign, Ltd.416-787-0991
 FOR: Can., Vanier, Ont., Electrodesign, Ltd.613-745-0541

GIBSON/EGAN CO., 21 Flower St., Arcadia, Calif., 91006,
 Tel: 213-446-5259; Empl.: 40; Minimum order: \$15

For info on price: D. Clark; Application info: K. Kanbera; Customer service: G. Egan; Delivery info: G. Egan

Free literature available: Timing Belt Pulleys - stock list of thermoplastic pulleys; IC Carriers - wide assortment of IC carriers for flatpack, to's, and dip devices; Dip Strips - description of various sizes of dual in line sockets; P.C. Card Guides - instant pc card rack for holding p.c. cards.

Products manufactured: Cups, Encapsulation, Gears & Gear Mechanisms (Precision), Guides, Circuit Board, Holder & Carriers, Holders, Circuit Board (Production Type), Pullers, Racks, Retainers, Sockets

Local Sales Offices & Reps.

Cal San Jose, Smolen Assocs.408-252-7358
 Pa Devon, B & A Assocs.215-688-5173
 Tex Dallas, Scott Tech. Sls. Co.214-352-7698

GILWAY SALES COMPANY, 29B Cummings Pk., Woburn, Mass., 01801, Tel: 617-935-4442; Empl.: 3; Minimum order: \$25

For info on price: B. Murphy; Application info: G. Wade; Customer service: D. Volner; Delivery info: G. Wade

Free literature available: Catalog #152 list our complete line of T-3/4, T-1, and T-4 precision wound filament lamps. Filaments are straight, rugged, and centered. Lamps offer lens end and special bases.

Products manufactured: Lamps

GLASTIC CORP., 4321 Glenridge Rd., Cleveland, Ohio, 44121, Tel: 216-486-0100, TWX: 810-421-8827; Empl.: 375; Minimum order: \$50

Customer service: Cust. Svc. Dept.

Free literature available: Laminate Catalog; Insulator and Channel Catalog; Pultruded Rod Catalog.

Products manufactured: Compounds, Encapsulating, Insulating, Molding, Potting, Laminates

GLATZER INDUSTRY CORP., 286 Huguenot St., New Rochelle, NY, 10801, Tel: 914-576-2700

GLENAIR, INC., 1211 Air Way, Glendale, Cal., 91201, Tel: 213-247-6000, TWX: 910-497-2066; FSC No: 06324; Empl.: 325

Customer service: R. Platz

Products manufactured: Braid, Cable, Cable Assemblies & Harnesses, Cable, Caps, Connector, Connector Adapters, Connectors, Testers, Tools

Local Sales Offices & Reps.

Ala Huntsville, Brandel-Stephens Co.205-883-0445
 Ariz Scottsdale, Runyon Co.602-959-6060
 Cal Downey, Buffa Co.213-923-4618
 Cal Glendale, Electro-Mech Prods.213-848-0922
 Cal San Diego, Earle Assocs.714-278-5441
 Cal Santa Clara, Nova-Tronix Elec. Sls.408-243-9530
 Colo Englewood, Todd Assocs.303-761-7801
 Conn Branford, W. McCoy Co.203-488-2012
 Fla Orlando, Brandel-Stephens Co.305-425-3202

Ga Atlanta, Brandel-Stephens Co.404-261-7579
 Haw Honolulu, Aloha Assocs.808-941-1574
 Ill Chicago, Marsten Sls. Co.312-775-6611
 Ind Greenwood, Valentine-Schillinger Assoc.317-888-2260
 Ind South Bend, Valentine-Schillinger Assoc.219-291-6258
 Md Silver Spring, Carwithen Assocs.301-589-9112
 Mich Plymouth, Romarc313-455-0300
 Minn Minneapolis, Nygaard Sls.612-881-3727
 Mo Kansas City, Harris-Hanson Co.816-444-9494
 Mo St. Louis, Harris-Hanson Co.314-432-3611
 NJ Haddonfield, T. Mills Co.609-429-1005
 NJ Wayne, GT Assocs.201-694-6040
 NM Scottsdale, Goodreau Assocs.602-994-9909
 NY Buffalo, Telesco Assocs.716-834-1026
 NY Levittown, GT Assoc.516-731-3449
 NY Liverpool, Telesco Assocs.716-872-6417
 NY Rochester, Telesco Assocs.716-271-3780
 Ohio Cleveland, D. Steffen & Assocs.216-461-8333
 Ohio Dayton, A.D. Dirksen & Assoc.513-256-0351
 Ohio Dayton, D. Steffen & Assocs.513-293-3145
 Tex Houston, AID Elctrns.713-777-3882
 Tex Irving, AID Electronics, Inc.214-259-4761
 Wash Redmond, Barrett Sls. Northwest Ltd.206-885-6991

GLENMARC MFG. INC., 330 Melvin Dr., Northbrook, Ill., 60062, Tel: 312-272-9030; Empl.: 10

Customer service: D. Greenwood

Free literature available: Portionator brochure - epoxy metering & dispensing equip.

Products manufactured: Solder (All Types)

GLENTEK, INC., 1557 7th St., Santa Monica, Calif., 90401, Tel: 213-451-4511; FSC No: 26415; Empl.: 15

Customer service: R. C. Vasak

Products manufactured: Actuators, Amplifiers, Controls/Control Eqpt., Converters, Demodulators, Modulators, All Kinds, Multipliers, Power Supplies

GLIDDON METALS, Glidden-Durkee Div. SCM Corp., 900 Union Commerce Bldg., Cleveland, Ohio, 44115, Tel: 216-771-5121; Minimum order: \$30

For info on price: J. F. Jasper 216-771-5121; Application info: H. D. Ambros 814-535-2571; Customer service: H. D. Ambros 814-535-2571; Delivery info: J. F. Jasper 216-771-5121

Products manufactured: Alloys, Metal Compounds, Foils, Powders, Sheet, Stock, Metal Oxides, Metals

GLOBE PLASTICS, 1342 S. Signal Dr., Pomona, Cal., 91766, Tel: 714-NA3-2747; Empl.: 15; Minimum order: \$10

Products manufactured: Clamps & Clips, Cups, Encapsulation, Fasteners, Handles For Cabinets, Circuit Boards, Racks, etc., Kits, Marking (Dial, Instrument, Equipment, etc.), Pads, Transistor Mounting, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Ill Chicago, H. Halinton Engrg. Assocs., Inc.312-763-2131
 NY Brooklyn, Verter Sls.212-HI 4-3880

Advertisement

Injection & Transfer Molding - Custom Molding
 Complete Mold-Making Facilities
 Quality Control/Mil Q9858
 Mfg. Code No. 21071

Specialize in transistor pads, washers, header boards, frames, funnels, clips. Send for complete brochure. Let us quote on your plastic part requirements.

GLOBE UNION, INC., Globe Battery Div., 5757 N. Green Bay Ave., Milwaukee, Wisc., 53201, Tel: 414-228-1200, TWX: 910-262-3084; Empl.: 9957

For info on price: T. Ruhlmann 414-228-2396; Application info: D. Scarvaci 414-228-2394; Customer service: T. Ruhlmann 414-228-2396; Delivery info: T. Ruhlmann 414-228-2396

Products manufactured: Batteries, Chargers, Battery

Local Distributors

Ariz Phoenix, Micro-Components, Box 15268 Arcadia Sta.602-955-3193

Cal Los Angeles, Mil-Com Dist., 1609 Pontius Ave.213-477-2068
 Cal Los Angeles, Radio Prod Sls Inc., 1501 S. Hill St.213-748-1271
 Cal Mountain View, Abacus Elctrns., 1065 Terra Bella Ave.415-961-1500
 Cal Mountain View, Energy Sls., 2271 Nora Dr.415-969-0800
 Fla Miami, Pro Can Inc., 2013 N.E. 160th St.305-945-4253
 Ill Skokie, Bell Ind., 7701 N. Austin Ave.312-965-7500
 Ind Indianapolis, Ra-Dis-Co., 814 N. Senate Ave.317-637-5571
 Iowa Mason City, Alexander Dist., Box 381
 Mass Burlington, Arrow Elctrn., 15 "A" St.617-273-0100
 Minn Bloomington, Arrow Elctrns. Inc., 9700 Newton Ave. S.612-888-5522
 Mo Kansas City, Burnstein-Applebee Co., 3199 Mercier816-531-5614
 Mo St. Louis, Olive Ind. Elctrns., 6662 Olive Blvd.314-863-7800
 NJ Hanover, State Elctrns. Parts Corp., 36 Route 10201-887-2550
 NY Plainview, Fairmont Elec. Sls. Corp., 35 S. Service Rd.516-694-8200
 NY Syracuse, Stewart N. Smith, 325 E. Water St.315-422-0323
 Pa Hatboro, Henwarr Inc., 218 Tanner Ave.215-675-4104
 Tex Dallas, Mauratron Inc., 13333 Central Expwy713-225-1465
 Tex Dallas, Solid State Elec. Co. of Tex., 2643 Manana Dr.214-352-2601
 Tex Houston, Lenert Co., 420 Hutchins Dr.713-225-1465
 Tex San Antonio, Sherman Elec. Supp., 702 San Pedro Ave.512-226-0247
 Va Arlington, Perrott Engrg. Labs, 1020 N. Fillmore703-528-5861
 Wash Seattle, James J. Backer Co., 221 W. Galer St.206-285-1300

GLOWLITE CORP., Sub. ELT, Inc., Pauls Valley, Okla., 73075, Tel: 405-238-5541, TWX: 910-830-6590; Empl.: 300; Minimum order: \$35

For info on price: J. Phillips; Application info: J. Phillips; Customer service: J. Abney; Delivery info: J. Abney

Free literature available: ELT, Inc. Glow Lite Div. Catalog informative description of neon lamp characteristics and terms, as well as a convenient, compact list of glow-lite products.

Products manufactured: Lamps, Lights

Local Sales Offices & Reps.

Ill Chicago, ELT, Inc.312-441-6650

GLUCO, INC., Box 336, Monroeville, Pa., 15146, Tel: 412-327-7575; FSC No: 83508; Empl.: 20

Customer service: Wm. Gluck

Free literature available: Molding presses for encapsulation of electronic components. Automatic assembly machines.

Products manufactured: Machines/Machinery, Production

GOE ENGRG. CO., Box 3485, City of Industry, Calif., 91746, Tel: 213-330-7401; FSC No: 00866; Empl.: 40; Minimum order: \$15

Customer service: G. H. Reynolds

Products manufactured: Handles For Cabinets, Circuit Boards, Racks, etc., Terminals

Local Sales Offices & Reps.

Cal Palo Alto, W. W. Tompkins & Co.415-DA6-7940
 Colo Denver, T. Crump Co.303-428-1443
 Ill Chicago, Ellinger Sls. Corp.312-763-1570
 NJ S. Orange, S. Simberloff Assocs.201-763-7900
 Tex Arlington, D/FW Sls. Co.817-461-0681

GEO SPACE, See Trak Systems

GOODRICH CHEM. CO., B.F., 6100 Oak Tree Blvd., Cleveland, Ohio, 44131, Tel: 216-524-0200

Customer service: D. G. Kuharik

Products manufactured: Compounds, Encapsulating, Insulating, Molding, Potting, Plastic Raw Materials, Liquids, Pellets, Powders, Resins

Local Sales Offices & Reps.

Cal Los Angeles213-386-7436
 Ga Atlanta404-355-2555
 Ill Oak Brook212-654-4700
 Mass Wellesley Hills617-235-8700

Mich Southfield 313-357-3939
 Mo Kansas City 816-353-6440
 NJ Englewood Cliffs 201-461-5100
 Pa Fort Washington 215-643-8805
 FOR: Can., Kitchener, Ont. 519-742-3641

GOODRICH DIV., Conrac Corp., 3560 Chicago Dr.,
 Hudsonville, Mich., 49426, Tel: 616-669-1000

Products manufactured: Machines/Machinery,
 Production

GOODYEAR AEROSPACE CORP., 1210 Massillon Road,
 Akron, Ohio, 44315, Tel: 216-794-3631, TWX:
 810-431-2080; Empl.: 4000

Products manufactured: Computers

Local Sales Offices & Reps.

Cal Los Angeles, Goodyear Tire & Rubber Co. 213-776-5577

DC Washington, Goodyear Tire & Rubber Co. 202-331-9500

Fla Ft. Walton Beach, Goodyear Tire & Rubber Co. 904-242-4231

Fla Orlando, Goodyear Tire & Rubber Co. 305-894-2751

Mo St. Louis, Goodyear Tire & Rubber Co. 314-731-1986

NY Rome, Goodyear Tire & Rubber Co. 315-336-7020

Ohio Dayton, Goodyear Aerospace Corp. 513-224-8301

GORDON, CLAUD S. CO., Sub. Pneumo Corp., 5710
 Kenosha St., Richmond, Ill., 60071, Tel: 815-678-2211,
 Telex: 72-2427; Empl.: 200

Products manufactured: Cable, Connectors,
 Controls/Control Eqpt., Crayons, Coatings, Pellets,
 etc., Temperature Indicating, Furnaces, Labels,
 Temperature Indicating, Monitors, Probes,
 Pyrometers, Thermocouples, Elements &
 Accessories, Thermometers, Resistance, Wire

Local Sales Offices & Reps.

Cal San Carlos, C. S. Gordon Co. 415-591-7070

Cal Torrance, C. S. Gordon Co. 213-775-8688

Colo Denver, J.M.C. Instr. 303-744-7035

Conn Manchester, C. S. Gordon Co. 203-633-6887

Fla Boca Raton, L. E. Rogers Co. 305-395-7922

Fla Ruskin, L. E. Rogers Co. 813-645-1453

Ga Atlanta, R. Freeman Assocs. 404-261-9065

Ind Indianapolis, C. S. Gordon Co. 317-547-1057

Kans Wichita, B. J. Alberts Co. 316-263-4941

La Baton Rouge, Hahn Sls. Co. 504-356-2596

Mich Milford, C.S. Gordon Co. 313-872-1837

NJ Scotch Plains, Buck Sls. 201-322-8747

NM Farmington, J. Neff Co. 505-325-6449

NY Buffalo, G. E. Bowker 716-876-8387

NC Charlotte, A. D. Penn Co. 704-847-4425

Ohio Cleveland, C. S. Gordon Co. 216-321-7777

Pa Norristown, C. S. Gordon Co. 215-546-7255

Pa West Mifflin, C. S. Gordon Co. 412-371-2600

Tex Houston, C. S. Gordon Co. 713-224-2964

Utah Salt Lake City, Wiscomb-Weidner Co. 801-328-3205

Va Richmond, D.W. Larcen & Co., Inc. 804-288-4061

Wash Seattle, Eustis Co., Inc. 206-623-7060

Wisc Milwaukee, C. S. Gordon Co. 414-645-2380

EXP: Westbury, N.Y., C. S. Gordon Export Dept. 516-334-3303

GORDON ENGINEERING CORP., Del Mar Dr., Brookfield,
 Conn., 06804, Tel: 203-775-1895; Empl.: 12

Customer service: L. Najman 203-775-0990

Products manufactured: Controls/Control Eqpt.,
 Indicators, Switches

Local Sales Offices & Reps.

Ala Huntsville, B J R Reps. 205-881-3569

Cal San Francisco, Steven Engrg. 415-626-7979

Cal Whittier, Marcott Ind. 213-723-0866

Colo Denver, H. Kaub & Co. 303-399-1520

Conn Derfield, Technical Mgr. Co. 203-438-2740

Ind Wabash, Richard Scales Assocs. 219-563-4886

Mich Troy, Morco Corp. 313-585-3910

Mo St. Louis, Best Equip. Co. 314-991-3434

NY White Plains, Swedelo, Inc. 914-946-1122

NC Charlotte, Power Components 704-537-8099

Ohio Cincinnati, H. C. Jahn 513-521-0172

Ohio Twinsburg, J. Hubbard & Assoc. 717-533-3679

Pa Hershey, Niets Assocs. 717-533-3679

Wash Airway Hgts., Calvert Controls Inc. 414-543-3469

Wisc Milwaukee, Star Engrg. Sls. 414-543-3469

FOR: Can., North Vancouver, B.C., Southwell
 Controls, Ltd. 604-930-3688

FOR: Can., Windsor, Ont., Canadian Border City

GORDOS CORP., 250 Glenwood Ave., Bloomfield, N.J.,
 07003, Tel: 201-743-6800, Telex: 13-8209; Empl.: 600
 p. 1-1700-1706, 2053-2057

Products manufactured: Relays, Switches

Local Sales Offices & Reps.

Cal Palo Alto, Engrg. Assocs. 415-326-7842

Colo Wheatridge, Waugaman Assocs. 303-423-1020

Conn Cheshire, R.F. Duffy Assocs. 203-272-7789

Fla Maitland, Barrett Assocs. 305-678-0172

Ga Atlanta, Millar Elctns., Inc. 617-335-7724

Mass Braintree, R.F. Duffy Assocs. 313-255-3300

Mass Detroit, L.H. Dickelman Co. 609-667-6644

Minn St. Paul, Kenco Co. 216-461-6161

NJ Cherry Hill, Gordon Co. 513-276-4128

NJ Mountainside, Henry G. Richter Inc. 214-238-7651

NM Albuquerque, Waugaman Assocs., Inc. 206-323-5100

NY Fayetteville, Henry G. Richter Inc. 513-276-4128

NC Raleigh, Millar Elctns., Inc. 214-238-7651

Ohio Cleveland, A.H. Baier Co. & Assoc. 206-323-5100

Ohio Dayton, A.H. Baier Co. & Assoc. 513-276-4128

Tex Richardson, Zonk Engrg. 214-238-7651

Wash Seattle, H. Levinson Co. 206-323-5100

GORDOS/GRISBY-BARTON, 3800 Industrial Dr.,
 Rolling Meadows, Ill., 60008, Tel: 312-392-5900, TWX:
 910-687-3789; Empl.: 150 p. 1-1700-1706

For info on price: Sls. Dept.; Application info: Tech.
 Sls. Dept.; Customer service: Cust. Svs. Dept.;
 Delivery info: Cust. Svs. Dept.

Free literature available: Technical data sheets for
 dip reed relays, molded reed relays, Hybrid relays,
 solid state relays.

Products manufactured: Controls/Control Eqpt.,
 Relays

Local Sales Offices & Reps.

Cal Pasadena, Luscombe Eng. 213-684-2000

Cal San Mateo, Luscombe Eng. 415-342-7057

Colo Denver, Goynes Assoc. 303-722-4674

Fla Ft. Lauderdale, Orbe, Inc. 305-771-8915

Fla St. Petersburg, Orbe, Inc. 813-894-0687

Mass Andover, R. Purinton, Inc. 617-475-7055

Minn St. Paul, Kenco Co. 612-645-7717

NJ Mountainside, H.G. Richter Co. 201-233-4615

NM Albuquerque, Goynes Assoc., Inc. 505-265-6794

NY Fayetteville, H.G. Richter Co. 315-637-6713

NY Mountainside, H.G. Richter Co. 212-962-5820

Ohio Chagrin Falls, Pine Sls. & Eng. Co. 216-247-6198

Ore Beaverton, N.R. Schultz Co. 503-643-1644

Tex Garland, Whiteside Sls. 214-231-9771

Wash Bellevue, N.R. Schultz Co. 206-454-0300

Local Distributors

Cal Inglewood, Newark Elctns., 4747 W. Century
 213-678-0441

Cal Inglewood, Time Elec-West, 900 W. Olive St.
 213-649-6900

Colo Denver, Newark Electronics, 2170 S. Grape St.
 303-757-3351

Conn Westport, Newark Elctns., 25 Sylvan Rd.
 203-226-6921

DC Washington, Newark Elctns., 10440 Baltimore
 Rd. 301-937-5085

Fla Ft. Lauderdale, Newark Elctns., 1360 N.W. 65th
 St. 305-587-2372

Ill Chicago, Newark Elctns., 500 N. Pulaski Rd.
 313-638-4411

Iowa Cedar Rapids, Newark Elctns., 1019 First Ave.
 S.W. 319-362-1171

Mass Boston, Time Elctns.-N.E., Woburn
 617-935-8080

Mich Detroit, Newark Elctns., 20700 Hubbell
 313-548-0250

Minn Minneapolis, Control Design, 3433 E. 25th St.
 612-721-1628

NJ Kenilworth, Newark Elctns., 303 Monroe Ave.
 201-272-8410

NJ Pennsauken, Resco, Apt. Hwy & Cen. Hwy
 609-662-4000

NY Plainview, Newark Elctns., 80 Express St.
 516-822-5000

NY Rochester, Newark Elctns., 3000 S. Winston Rd.
 716-743-6600

NC Greensboro, Hammond Elctns., 2923 Pacific
 Ave. 919-275-6391

Ohio Cleveland, Spec. Comp. Sls. Co., 23366
 Commercial Pk. Rd. 216-464-0405

Pa Philadelphia, Resco 215-925-6900

Tex Dallas, Newark Elctns., Box 38299
 214-271-2511

Utah Salt Lake, Newark Electronics, 2540 S. 300 W.
 801-486-1048

Wisc Milwaukee, Newark Elctns., 3695 N. 126 St.
 414-781-2450

GORMAN-REDLICH MFG. CO., 6 Curtis St., Athens, Ohio,
 45701, Tel: 614-593-3150; Empl.: 4; Minimum order:
 \$50

Customer service: J. T. Gorman

Products manufactured: Oscillators

Advertisement

Manufacturers of broad band crystal
 oscillators modules (± 5 PPM) over
 the temp. range -10°C to $+60^{\circ}\text{C}$.
 Products cover 9 MHZ to 100 MHZ
 with bandwidths of 15% to 50%.

Applications: Frequency source for
 counters, communication, navigation
 transmitters and receivers. Input 10V
 to 30V at 10MA to 50MA, output up
 to 10 VRMS. Freq. set to within 1
 PPM with trimmer capacitor.

GOTHAM AUDIO CORP., 741 Washington St., New York,
 N.Y., 10014, Tel: 212-741-7411; Empl.: 14

For info on price: E. Passin; Application info: S.
 Temmer; Customer service: P. Golstein; Delivery info:
 P. Golstein

Products manufactured: Attenuators, Cable,
 Equalizers, Meters, Microphones, All Kinds,
 Mixers, Phonographs, Parts & Accessories,
 Recorders, Timers, Transformers

Local Sales Offices & Reps.

Cal Hollywood, Gotham Audio Corp. 213-874-4444

GOULD INC., Allied Control Div., 100 Relay Rd.,
 Plantsville, Conn., 06479, Tel: 203-628-9654, TWX:
 710-473-0079; Empl.: 450 p. 1-1686

Customer service: R. E. Delaney

Free literature available: Relays & Sockets Catalog,
 Solenoid Valves Catalog

Products manufactured: Controls/Control Eqpt.,
 Process Control Systems, Relays, Sockets,
 Timers, Valves, Solenoid

Local Sales Offices & Reps.

Ariz Tempe, Delta Elctns. Sls. 602-966-9903

Cal Los Angeles, El-Com Sls. 213-223-2435

Cal Menlo Park, Straube Assocs. 415-323-2476

Colo Denver, Elctn. Sls. 303-771-6300

Fla Orlando, Geartner Assocs. 305-299-1000

Ga Atlanta, O'Hara Assocs. 404-237-0600

Ill Chicago, D. Dolin Sls. 312-286-6200

Kans Olathe, Bob Rush Assocs. 913-782-1177

Md Baltimore, J.R. Daniel & Co. 301-825-3330

Mass Millis, Selmark Assocs. 617-376-2914

Mich Dearborn, VPI, Inc. 313-271-4600

Minn Minneapolis, Industrial Comps. 612-831-4547

NJ Cherry Hill, J.N. Barrett Assoc. 215-627-0149

NJ Pompton Lakes, R. Horne Assocs. 201-835-7400

NY E. Syracuse, Honsinger Mktg. Assoc. 315-463-5718

NC Burlington, P.J. Nahser Co. 919-226-8053

Ohio Aurora, E.M.A., Inc. 216-562-6104

Ohio Centerville, E.M.A., Inc. 513-433-2800

Okla Oklahoma City, Ammon & Rizos Co. 405-373-2748

Pa Pittsburgh, G.S. Root Co. 412-561-4125

Tex Dallas, Ammon & Rizos Co. 214-233-5591

Tex Houston, Ammon & Rizos Co. 713-729-1233

Wash Seattle, F. Jackson Co. 206-782-2211

FOR: Can., Montreal, Que., H.W. Brieger Sls. 514-482-0722

Local Distributors

Ala Huntsville, Cramer/EW, 2310 Bob Wallace Ave.
 205-539-5722

Ariz Phoenix, Cramer/Ariz., 2816 N. 18th St.
 602-263-1112

Cal Los Angeles, El-Com, Inc., 5134 Valley Blvd.
 213-223-1351

Cal Sunnyvale, Cramer/San Francisco, 720 Palomar
 Ave. 408-739-3011

Colo Denver, Newark-Denver Elect., 2170 S. Grape
 St. 303-757-3351

Conn Waterbury, Bond Radio, 439 W. Main St.
 203-757-0546

Fla Ft. Lauderdale, Peerless Radio, 1040 N.E. 43rd
 St. 305-566-5966

Ga Atlanta, Lykes Elctns., 1135 Chattahoochee
 404-355-2223

Ill Chicago, Newark Elct

Md	Baltimore, Allied Control Sls. Corp., 1404 Bare Hills A.	301-828-6416
Mass	Newton, Cramer Elctns., 85 Wells Ave.	617-969-7700
Mich	Oak Park, Newark Detroit Elect., 20700 Hubbell Ave.	313-548-0250
Minn	Minneapolis, Industrial Comps., 5280 W. 74th St.	612-831-2666
Mo	Kansas City, LCOMP-Kansas City, 1520 Taney St.	816-221-2400
NJ	Moonachie, Cramer/N.J., 1 Barrett Ave.	201-935-5600
NJ	Wayne, Gordon/Horne, 2282 Hamburg Tpke.	201-835-7400
NM	Albuquerque, Cramer/N.M., 137 Vermont N. E.	505-265-5767
NY	Hauppauge, Cramer, 29 Oser Ave.	516-231-5600
NY	Rome, Rome Elctn., 108 Spring St.	315-337-5400
NC	Winston-Salem, Kirkman Elect., 901 W. 2nd St.	919-724-0541
Ohio	Akron, Akron Elctns., 107 S. Arlington St.	216-762-8818
Okla	Tulsa, Cramer/Tulsa, 6336 E. 13 St.	918-836-3371
Ore	Portland, Eoff Elctns., 509 N. W. Tenth Ave.	503-222-9411
Pa	Philadelphia, Philadelphia Elctns., 1225 Vine St.	215-568-8288
Tenn	Nashville, Electra Distributing, 1914 West End Ave.	615-329-3971
Tex	Dallas, Sterling Elctns., 2875 Merrell Rd.	214-357-9131
Utah	Salt Lake City, Alta-Land Elctns., 2280 S. Main St.	801-486-7227
Va	Arlington, Republic Elctns., 3004 Lee Hwy.	703-528-3973
Wash	Seattle, Western Elctns., 717 Dexter Ave. N.	206-284-0200
Wisc	Milwaukee, Cramer/Wisc., 5626 N. 91st St.	414-462-8300

GOULD, INC., Portable Battery Div., 931 Vandalia, St. Paul, Minn., 55114, Tel: 612-452-1500; Minimum order: \$150

Customer service: Zigmund

Free literature available: Complete line of seal-nickel cadmium and gilled electrolyte lead oxide rechargeable batteries.

Products manufactured: Batteries

Local Sales Offices & Reps.

Cal	Fountain Valley	714-531-1793
Cal	San Jose	408-238-3620
Ill	Rosemont	312-671-0671
Md	Towson	301-296-0825
Mass	Maynard	617-369-5651
Mass	Quincy	617-773-7980
Minn	St. Paul	612-452-1500
NY	Brooklyn	212-332-8641
Ohio	Cleveland	216-861-1877
Pa	Philadelphia	215-831-9520
Wisc	Schofield	715-359-3531

GOULD, INC., Instr. Sys. Div., 3631 Perkins, Cleveland, Ohio, 44114, Tel: 216-361-3315 p. 1-2341

Products manufactured: Amplifiers, Analyzers, Bridges, Data Acquisition & Reduction Systems, Data Loggers, Detectors, Display Devices/Displays, Indicators, Integrators, Electronic Memory Systems, Monitors, Multiplexers, Oscilloscopes, Direct Writing, Oscilloscopes, Paper, Graphic Recording, Printers, Recorders, Signal Conditioners & Equipment, Terminals, Data Display (including Alphanumeric & Graphic), Transducers

Local Sales Offices & Reps.

Ala	Huntsville, W.A. Brown Instr., Inc.	205-539-4411
Cal	Burlingame, Gould Inc., Instr. Sys. Inc.	415-697-9345
Cal	Los Angeles, Gould Inc., Instr. Sys. Div.	213-685-7476
Colo	Denver, Gould Inc., Instr. Sys. Div.	303-758-4922
Conn	Stratford, Gould Inc., Instr. Sys. Div.	203-377-1332
Fla	Ft. Lauderdale, W.A. Brown Instrs.	305-776-4800
Fla	Ft. Walton Beach, W.A. Brown Instrs.	904-243-6424
Fla	Orlando, W.A. Brown Instrs.	305-425-5505
Ga	Atlanta, W.A. Brown Instrs.	404-939-1674
Ill	Rosemont, Gould Inc., Instr. Sys. Div.	312-671-5620
La	Gretna, W.A. Brown Instrs.	504-366-5766

Md	Lanham, Gould Inc., Instr. Sys. Div.	301-459-7350
Mass	Burlington, Gould Inc., Instr. Sys. Div.	617-272-0750
Mich	Southfield, Gould Inc., Instr. Sys. Div.	313-356-6600
Minn	Minneapolis, Gould Inc., Instr. Sys. Div.	612-546-7336
Mo	St. Louis, Gould Inc., Instr. Sys. Div.	314-878-6110
NJ	Fairfield, KLS Assocs., Inc.	212-233-4849
NJ	Saddle Brook, Gould Inc., Instr. Sys. Div.	201-845-0220
NY	East Rochester, Gould Inc., Instr. Sys. Div.	716-381-4095
NY	Schenectady, Gould Inc., Instr. Sys. Div.	518-370-1404
NC	Research Triangle Park, W.A. Brown Instrs.	919-489-1546
Ohio	Cleveland, Gould Inc., Instr. Sys. Div.	216-481-7221
Ohio	Dayton, Gould Inc., Instr. Sys. Div.	513-433-9586
Pa	Bala Cynwyd, Gould Inc., Instr. Sys. Div.	215-839-7066
Pa	Pittsburgh, Gould Inc., Instr. Sys. Div.	412-931-3660
Tenn	Knoxville, W.A. Brown Instrs.	615-584-2614
Tex	Dallas, Gould Inc., Instr. Sys. Div.	214-241-5131
Tex	Houston, Gould Inc., Instr. Sys. Div.	713-644-3671
Va	Richmond, Gould Inc., Instr. Sys. Div.	604-288-2888
Wash	Renton, Gould Inc., Instr. Sys. Div.	206-271-1100
FOR:	Can., Calgary, Alberta, Allan Crawford Assocs., Ltd.	403-276-9658
FOR:	Can., Dartmouth, Nova Scotia, Allan Crawford Assocs., Ltd.	902-469-7865
FOR:	Can., Montreal, Que., Allan Crawford Assocs., Ltd.	514-670-1212
FOR:	Can., Ottawa, Ont., Allan Crawford Assocs., Ltd.	613-829-9651
FOR:	Can., Toronto, Ont., Allan Crawford Assocs., Ltd.	416-678-1500
FOR:	Can., Vancouver, B.C., Allan Crawford Assocs., Ltd.	604-980-4831

GOULD INC., Ind'l. Battery Div., 467 Calhoun St., Trenton, N.J., 08607, Tel: 609-392-3111, TWX: 510-681-8489

Products manufactured: Batteries, Chargers, Battery, Eliminators, Battery, Inverters, Rectifiers, Transformers

GOW-MAC INSTR. CO., 100 Kings Rd., Madison, N.J., 07940, Tel: 201-377-3450, Tel: 136-331; Empl.: 45

Customer service: R. J. Mathieu

Products manufactured: Analyzers, Detectors, Probes

GOWANDA ELECTRONICS CORP., 179 Broadway Rd., Gowanda, N.Y., 14070, Tel: 716-532-2236, TWX: 710-529-1211; FSC No: 24226; QPL No: 15305D; Minimum order: \$20

For info on price: G. Drake; Application info: K. Strohmeyer; Customer service: D. McLaughlin; Delivery info: D. McLaughlin

Products manufactured: Chokes, Coils Including Assemblies & Forms, Transformers

Local Sales Offices & Reps.

Cal	Redwood City, Parks & Pruitt Assocs.	315-364-1640
Cal	Van Nuys, W.J. Barron Co.	213-780-0509
Colo	Golden, J.F. Hurlbut Co.	303-279-7138
Conn	Stamford, R.B. Scanlon Co.	203-325-2718
Ill	Chicago, W.F. Hamilton Co.	312-545-7576
Iowa	Cedar Rapids, Snider Sls. Co.	319-362-4410
Mass	Reading, Lincoln Assocs.	617-944-9020
Minn	Minneapolis, Saturn Co.	612-881-0091
Mo	St. Louis, Beneke & McCaul	314-434-6242
NJ	Medford, Mech Elec Sls. Co.	609-654-8209
NY	Syracuse, Naylor Elec. Co.	315-472-9138
NC	Greensboro, L & D	919-292-3201
Ohio	Cleveland, Geotronics Mktg. Assocs.	216-238-8520
Tex	Dallas, R. E. Nesbitt Co.	214-357-4601
Wash	Olympia, Bergford and Assocs.	206-943-6664

GRADO LABS., INC., 4614 Seventh Ave., Brooklyn, N.Y., 11220, Tel: 212-435-5340

For info on price: R. Krieger; Application info: J. Chaipis; Customer service: M. Wildes; Delivery info: R. Krieger

Free literature available: Brochures Grado FT Series CD-4 Pickups in three categories: Professional Series, Flux-Bridger Series & Super Flux-Bridger Series. All contain "diamond" needles in either spherical elliptical or twin-tip.

Products manufactured: Transducers

Local Sales Offices & Reps.

Cal	San Francisco, Meyer, Ross & Fleming	415-285-8880
Cal	Van Nuys, Markman Co.	213-787-6151
Fla	Miami, World Wide Prods., Inc.	305-754-5475
Ga	Atlanta, Igou-Turner & Assocs.	404-451-7616
Ill	Chicago, T. Pappas & Assocs.	312-685-2338
Mass	Waltham, F. Barmakian	617-894-4849
Minn	Willmar, More Sls., Inc.	612-235-0034
Neb	Omaha, Tobias Co.	402-342-4028
NY	New York City, Somerset Assocs. Inc.	212-929-1824
Ohio	Cleveland, Schroeder Sls. Co.	216-268-3638
Pa	Willow Grove, Estersohn Assocs.	215-657-1414
Tex	Irving, Dobbs-Stanford Corp.	214-252-5502
Wash	Bellevue, Pacific Northwest Marketing	206-455-2300

GRALEX INDS., Div. Gen. Microwave, 155 Marine St., Framingdale, N.Y., 11735, Tel: 516-694-3600, TWX: 510-224-6406; FSC No: 11332; Empl.: 25; Minimum order: \$25 p. 1-718,719

For info on price: H. Steinberg 516-694-3607; Application info: H. Steinberg 516-694-3607; Customer service: D. Yulke 516-694-3600; Delivery info: H. Steinberg 516-694-3607

Free literature available: Data Sheets and Application Notes available for Series 36, Series 37, Series 45 Digital Panel Meters.

Products manufactured: Counters, Meters

Local Sales Offices & Reps.

Cal	Burlingame, Leddy Assoc.	415-347-5247
Cal	El Monte, Telemart Co.	213-444-7666
Colo	Littleton, Barron Farquhar Co.	303-794-3918
Conn	E. Hartford, Tekdata	203-525-7647
DC	Washington, H. Wise Co.	202-363-9417
Haw	Honolulu, Aloha Assocs.	
Ill	Lombard, Quadtron Assoc. Inc.	312-627-6800
Ky	Louisville, Scott Elctns.	502-583-3220
Mass	Burlington, Tekdata	617-273-0198
Mass	Newton Centre, Daner-Hayes, Inc.	
Mich	Plymouth, Scott Elctns.	313-455-2440
Minn	Minneapolis, L.F. Green & Assoc.	612-781-1611
Mo	Kansas City, R.R. Burton Sls. Co.	816-444-8300
NJ	Hackensack, C.R. Mayer Assoc.	201-487-3113
NY	Huntington, C.R. Mayer Assoc.	516-921-7878
NY	Rochester, H.C. Johnson Agencies	716-482-3000
Ohio	Cleveland, Scott Elctns. Inc.	216-291-2600
Pa	Audubon, Daner-Hayes	215-666-5005
Pa	Pittsburgh, Scott Elctns.	412-781-3112
Tex	Dallas, Cain & Co.	214-233-6809

GRAND TRANSFORMERS, Box 188, Grand Haven, Mich., 49417, Tel: 616-842-5430; Empl.: 175; Minimum order: \$30

For info on price: G. G. Anderson; Application info: K. Williams; Customer service: F. Beradis; Delivery info: F. Beradis

Products manufactured: Services, Assembly, Production & Test, Transformers

Local Sales Offices & Reps.

Cal	San Gabriel, Van Gott & Assocs.	
Fla	Orlando, Buchanan & Abrams Assocs.	
Ill	Streamwood, A Holte & Assocs.	312-837-4066
Mass	Newtonville, C. Segel Co.	617-969-6900
Mich	Grand Rapids, R. Van Riper Sls.	616-452-0464
NY	Floral Park, MOS Assocs.	516-694-5923
Ohio	Cleveland, D. Steffen & Assocs.	216-281-5055
Pa	Ardmore, Rothenheber & Wurts, Inc.	215-642-6911
Tex	Dallas, W.T. Blackburn Assocs.	214-351-9991

GRANT HARDWARE CO., Div. Buildex Inc., 525 High St., W. Nyack, N.Y., 10994, Tel: 914-EL8-4400, TWX: 914-358-3541; FSC No: 83508; Empl.: 300

Customer service: J. Bross 914-429-5367

Free literature available: An illustrated 28 page handbook: "Slides, What They Are. When They Are Used. Where They Are Used" explains factors related to the selection and use of industrial slides.

Products manufactured: Cabinets & Accessories, Cable Retractors, Mounts, Slides, Cabinet & Chassis

Local Sales Offices & Reps.

Ariz	Phoenix, G.R. McKnight Co.	602-949-0809
Cal	Menlo Park, The McKnight Co.	415-325-2844

Cal	So El Monte, Grant Hardware Co.	213-686-2110
Colo	Denver, R.G. Bowen Co. Inc.	303-722-4641
Fla	Orlando, B. Wimberly Co.	305-423-2514
Ill	Des Plaines, Lincoln, Hodges & Associates	312-297-3810
		913-381-3684
Kans	Overland Park, J. Singer	913-381-3684
Mass	Lexington, E.F. Del Fino Co.	313-477-7700
Mich	Farmington, Carter, McCormic & Peirce	612-488-0201
		201-334-2921
NJ	Ridgefield, M. D Industries	201-941-3113
NY	Liverpool, Vertex Corp.	315-622-3060
NY	Syracuse, Vertex Corp.	315-458-2223
NC	Charlotte, Bill Henry Associates	704-375-8958
Ohio	Cincinnati, Tri State Mktg. Inc.	513-761-7993
Ohio	Cleveland, Carter McCormic & Peirce	216-333-5650
Pa	Pittsburgh, Carter McCormic & Peirce	412-824-3760
Tex	Dallas, Blackburn Associates	214-FL 1-9991
Wash	Bellevue, Rowe Northwest	206-455-1755

GRAPHIC CONTROLS CORP., Recording Chart Div., 189 Van Rensselaer St., Buffalo, N.Y., 14210, Tel: 716-853-7500; Empl.: 390

Products manufactured: Paper, Graphic Recording

Local Sales Offices & Reps.

Cal	Canoga Park	213-347-8621
Cal	Santa Clara	408-241-9960
Colo	Lakewood	303-238-5239
Conn	Windsor	203-688-8501
Ga	Atlanta	404-451-4738
Ill	Barrington	312-381-6540
La	Metairie	504-885-1226
Mass	Farmington	313-851-6340
Minn	Minneapolis	612-335-2341
Ohio	Cincinnati	513-522-5476
Ohio	Cleveland	216-241-2217
Okla	Tulsa	918-936-5246
Pa	Philadelphia	215-436-6100
Tex	Houston	713-781-9870
Wash	Bellevue	206-455-1755

GRAPHIC SYSTEMS, 925 Danville Rd., DL-10, Yanceyville, N.C., 27379

GRAPHITE METALLIZING CORP., 1036 Nepperhan Ave., Yonkers, N.Y., 10702, Tel: 914-968-8400, Telex: 13-1571; Empl.: 165

Products manufactured: Bearings, Brushes & Brush Assemblies, Bushings, Glass, Plastic, Metal, Rubber, Etc., Clutches, Contacts, Electrical, Graphalloy Products, Graphite Parts, Joints, Rotary, Microwave, Posts, Slip-Rings & Assemblies

GRAYHILL INC., 569 Hillgrove Ave., LaGrange, Ill., 60525, Tel: 312-354-1040, TWX: 910-683-1850; FSC No: 5930; Empl.: 250; Minimum order: \$25

p. 1•1696-1698, 2034-2052; p. 2•1261, 2021

Free literature available: G-374 General Catalog-Switches, Relays, Wire Ties, Termination Hardware, #238-Rocker DIP Switches, #231-Solid State Relays, #228-Wire Ties & Cable Clamps.

Products manufactured: Clamps & Clips, Fasteners, Insulators & Insulation, Kits, Switch Assembling, Lights, Posts, Relays, Services, Assembly, Production & Test, Sockets, Switch Hardware, Switches, Terminals, Wire & Cable Ties

Local Sales Offices & Reps.

Ala	Huntsville, Rep. Inc.	205-881-9270
Cal	Garden Grove, Impact Elctns.	213-431-3581
Cal	Los Altos, Nickerson-Gray Assoc.	415-941-5777
Colo	Denver, Lindberg Co.	303-758-9033
Fla	Orlando, Geartner Assoc.	305-299-1000
Ga	Atlanta, Rep. Inc.	404-938-4358
Ill	Hinsdale, Hill-Gray Assoc.	312-325-4810
Ind	Ft. Wayne, Menze Sls.	219-747-5616
Iowa	Cedar Rapids, Reid Assoc.	319-362-6302
Kans	Overland Park, Penzner-Mankus Assoc.	913-DU1-0004
		301-252-5378
Md	Woodbine, Naudain Assoc.	410-252-5378
Mass	Wellesley Hills, M. Scott Co.	617-235-0102
Mich	Troy, C.B. Jensen & Assoc.	313-643-0506
Minn	St. Paul, Northport Engrg. Inc.	612-698-3841
Mo	Hazelwood, Penzner-Mankus Assoc.	314-731-4334
		215-564-3194
NJ	Mount Laurel, Naudain Assoc.	609-272-2187
NM	Albuquerque, Lindberg Co.	505-345-2489
NY	Great Neck, F. Tyllinski Co.	516-466-9070
NY	Ithaca, B. Dean Inc.	607-272-2187
NC	Charlotte, R.W. Chapman & Co.	704-525-2421

Ohio	Cleveland, A.H. Baier Co. & Assoc.	216-461-6161
Ohio	Dayton, A.H. Baier Co. & Assoc.	513-276-4128
Okla	Tulsa, W.P. Fralia Co.	918-663-8707
Pa	Pittsburgh, Covert & Newman Co.	412-563-0303
SC	Greenville, R.W. Chapman & Co.	803-232-5391
Tex	Ft. Worth, W.P. Fralia Co.	817-738-2394
Tex	Houston, W.P. Fralia Co.	713-772-1572
Utah	Salt Lake City, Lindberg Co.	801-364-6409
Wash	Seattle, Seatronics, Inc.	206-767-4330

GREAT WESTERN AVIATION, Box 20396, Denver, Colo., 80220, Tel: 303-355-4468; Empl.: 2

Customer service: T. O. Markel

Products manufactured: Antennas, Cable Assemblies & Harnesses, Cable, Connectors, Couplers, Lights, Transformers, Tubes

Local Sales Offices & Reps.

Cal	San Rafael, Levin-Schwartz	415-454-1940
Cal	Van Nuys, Szerlip Sls. Co.	213-782-1765
Colo	Denver, C. B. Elctn. Mktg.	303-422-0561
Fla	Margate, Florida Elctn. Sls.	305-972-0800
Ga	Norcross, Dean Cooper Sls. Co.	404-448-5460
Ill	Chicago, Q & B Inc.	312-725-4999
Iowa	Atlantic, Kimian Sls. Co.	712-243-1626
Mass	Northboro, W.B. Pray Sls.	617-393-3434
Mich	Grand Rapids, L. Drieberg	616-953-1242
Minn	Minneapolis, J. E. M. Anderson	612-823-6459
Mo	Independence, Kimian Sls.	816-796-4026
NJ	Moorestown, DiVincent & Legato	609-235-8299
NY	Jericho, Gim Sls. Corp.	516-433-4080
Ohio	Columbus, Mandabach & Assoc.	614-235-0265
Pa	Pittsburgh, Mandabach & Assoc.	412-279-2264
Tex	Houston, M. R. Summers Assoc.	713-524-7800

GREENLEE TOOL CO., 2136-12th St., Rockford, Ill., 61101, Tel: 815-963-4881

Products manufactured: Punches, Chassis

Local Sales Offices & Reps.

Cal	Monterey Park	213-268-9307
Ga	Atlanta	404-448-6121
NY	Long Island City	212-392-3414
Wisc	Milwaukee	414-481-5768
EXP	Coral Gables, Fla.	305-443-7922

GREENRAY INDS., INC., 840 W. Church Rd., Mechanicsburg, Pa., 17055, Tel: 717-766-0223, TWX: 510-650-4939; Empl.: 60

Products manufactured: Amplifiers, Clocks (All Types), Converters, Filters, Generators, Impedance Converters, Microwave, Multipliers, Oscillators, Standards, Transmitters

Local Sales Offices & Reps.

Ala	Huntsville, Beacon Electronics Associates, Inc.	205-881-5031
Ariz	Tempe, Sedco Sales	602-968-7791
Cal	Burlingame, Westronics Assoc.	415-342-1425
Cal	Los Angeles, Cain Technology	213-476-2251
Colo	Boulder, H. Bass Assocs.	303-499-7509
DC	Washington, Hayden Assocs.	202-296-6059
Fla	Fort Lauderdale, Beacon Elctns.	305-776-6074
Ga	Atlanta, Beacon Elctns.	404-351-3654
Ill	Mt. Prospect, Cain & Co.	312-253-3578
Mass	Reading, Geder-Rotondi Assoc.	617-944-3105
Mich	Grand Rapids, Thies & Assocs.	616-245-0319
Mo	Florissant, KM & B Tech. Sls.	314-831-0015
NM	Albuquerque, Trembly Assocs.	505-293-4444
NY	Huntington, Andrews & Andrews, Inc.	516-692-8686
Ohio	Dayton, F. Ohmer Assoc.	513-434-1454
Okla	Tulsa, J.A. Green Co.	918-742-4657
Pa	Ambler, Wm. Assocs.	215-643-4119
SC	Spartanburg, Beacon Elctns. Assocs.	803-582-4613
Tex	Dallas, J.A. Green Co.	214-631-7450
Tex	Houston, J.A. Green Co.	713-526-2959
Wash	Redmond, Barrett Sls. Northwest, Ltd.	206-885-6991
EXP	Lemoyne, Pa., Elctns. Int'l.	717-737-8858
FOR	Can., St. Laurent, Que., Rutherford Agencies	514-744-4121

GREGG ELECTRIC INC., Electronics Div., 608 W. Emporia, Ontario, Cal., 91761, Tel: 714-983-1794; Empl.: 5

Customer service: R. Fehlmann

Free literature available: Illustrated Bulletins Describing our low cost line of Integrated Circuit Digital Clocks, Calendars, Timing Instruments, and their Accessories.

Products manufactured: Chronometers, Clocks (All Types), Counters, Timers

GREGG ELECTRIC INC. cont'd

Advertisement

Manufacturers of low cost integrated circuit digital electronic clocks, calendars, and timing instruments. Options include xtal time base, BCD or ASCII outputs, battery back-up, relay contact outputs, etc. We will customize to your requirements. Contact our factory for quotations and further information.

GRIES REPRODUCER CO., Div. Coats & Clark Inc., 162 Beechwood Ave., New Rochelle, N.Y., 10801, Tel: 914-633-8600, TWX: 914-235-2188; Empl.: 600

For info on price: S. R. Dube; Application info: S. R. Dube; Customer service: J. Gadin; Delivery info: J. Gadin

Products manufactured: Bobbins, Winding, Coil & Transformer, Bushings, Glass, Plastic, Metal, Rubber, Etc., Clamps & Clips, Coils Including Assemblies & Forms, Fasteners, Rivets, Services, Assembly, Production & Test, Slides, Cabinet & Chassis, Tubing

GRISBY-BARTON, INC., See Gordos/Grisby-Barton

GRM CORP., Box 337, Medford, N.J., 08055, Tel: 609-267-7950; Empl.: 100; Minimum order: \$25

p. 1•120, 121

Customer service: T. A. McGarrity

Products manufactured: Alarms, Amplifiers, Attenuators, Chargers, Battery, Coders, Comm. Systems, Control Systems, Air Traffic, Controls/Control Eqp., Couplers, Dummy Loads, Generators, Magnetizers, Monitors, Networks, Panels, Power Supplies, Services, Assembly, Production & Test

GROOV-PIN CORP., 1125 Hendricks Causeway, Ridgefield, N.J., 07657, Tel: 201-945-6780, TWX: 710-992-8963; FSC No: 73957; Empl.: 100; Minimum order: \$25

For info on price: R. F. Reis; Application info: J. Pagliuca; Customer service: R. F. Reis

Free literature available: "Design Tips for Togetherness" 26-page brochure illustrates how Groov-Pin® press fit fasteners, Tap-Lok® self-tapping, self-locking inserts, and grooved Drive Studs are used in a variety of applications.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Fasteners, Pins

Local Sales Offices & Reps.

Ariz	Phoenix, Kennedy Sls.	602-275-7501
Cal	Hayward, D. Lewis Assocs.	415-785-9650
Cal	Woodland Hills, R.R. Sweet & Son	213-883-8651
Colo	Englewood, Todd Assocs.	303-761-7801
Conn	Stratford, P.E. Wolfe & Assocs.	203-377-4343
Fla	Orlando, A-Gen-Teers Entprs.	305-293-6269
Ga	Atlanta, R.R. Miller	404-993-2150
Ill	Wheaton, W.L. Barth, Jr.	312-653-4970
Iowa	Bettendorf, R.L. Burchett	319-355-6332
Mass	Southboro, T.P. Wolfe	617-481-1769
Mich	Detroit, H.B. Schweppe	313-872-8149
Minn	Minneapolis, Nelson & Son	612-920-3414
Miss	Jackson, Lawrence & Co.	601-982-9513
Mo	St. Louis, Smith-Bollinger & Co.	314-351-1177
NY	Oakdale, R.V. Davison	516-589-6388
NY	Rochester, Select Comps.	716-381-2620
NC	High Point, L.J. Mortimer & Assocs.	919-882-9015
Ohio	Dayton, Stork-Kelch & Assocs.	513-222-3232
Pa	Paoli, A. Buchanan	215-696-8323
SC	Columbia, L.J. Mortimer & Assocs.	803-254-2228
Tex	Dallas, Tech Sls. Co.	214-631-8820
Va	Roanoke, A.B. Kreger	703-989-4738
Wash	Seattle, F.W. Aurich & Co.	206-284-5561

GTE AUTOMATIC ELECTRIC INC., 400 N. Wolf Rd., Northlake, Ill., 60164, Tel: 312-562-7100, TWX: 910-226-1975; FSC No: Multiple; Empl.: 12,000; Minimum order: \$50

Customer service: J. D. Ashby

Free literature available: "Selection Guide to AE Relays and Switches" (C-4071) A convenient aid to specifying the correct types and sizes of components, plus a considerable amount of reference data.

Products manufactured: Cable, Comm. Systems, Connector Blocks, Mother Board, Dials, Encoders, Handsets, Chestsets, Headphones, Headsets, Etc., Keyboards, Alphanumeric & Decimal, Receivers, Relays, Switches, Terminal Blocks, Boards & Strips

Local Sales Offices & Reps.

Cal	Burlingame	415-697-6400
Cal	North Hollywood	213-766-5203
Cal	San Diego	714-283-2095
Conn	Stamford	203-329-0981
Ga	Atlanta	404-261-7441
Mass	Newton	617-965-3770
Mich	Detroit	313-538-6040
Minn	Minneapolis	612-835-4222
Mo	Kansas City	816-241-4760
NY	Albany	518-438-3511
Ohio	Cleveland	216-267-6288
Ohio	Dayton	513-299-6481
Pa	Haverford	215-525-7575
Va	Falls Church	703-533-0636

GTE LENKURT INC., 1105 County Rd., San Carlos, Calif., 94070, Tel: 415-591-8461, TWX: 910-376-4396; Empl.: 4000

Products manufactured: Alarms, Antenna Feed Systems, Comm. Systems, Cords, Demodulators, Equalizers, Modulator/Demodulators, Modulators, All Kinds, Multiplexers, Receivers, Testers, Transmission Systems, Data, Transmitters

Local Sales Offices & Reps.

Ga	Atlanta	404-261-8282
Ill	Arlington Hgts.	312-398-6700
Tex	Dallas	214-363-0286
Va	Falls Church	703-533-3344

GTE SYLVANIA, INC., W.M. Chace Co., 1600 Beard Ave., Detroit, Mich., 48209, Tel: 313-842-7400; Empl.: 260

Products manufactured: Bi-Metals, Thermostatic

GTE SYLVANIA, INC., Chem. & Metallurgical Div., Towanda, Pa., 18848, Tel: 717-265-2121; Empl.: 1400

Products manufactured: Alloys, Crystals, Metal Oxides, Metals, Wire

Local Sales Offices & Reps.

Cal	Burlingame	415-697-3500
Conn	Hartford	203-246-0608
Ill	Melrose Park	312-345-0100
Mass	Danvers	617-777-1900
Mich	Dearborn	313-582-8754
NJ	Teterboro	201-288-9484
NY	Camillus	315-672-3111
NC	Charlotte	704-334-4671
Ohio	Dayton	513-223-6227
Pa	Philadelphia	215-477-5000
Pa	Pittsburgh	412-531-4975
Tex	Dallas	214-239-8171

GTE SYLVANIA, Circuit Module Oper., Elctn. Comps. Grp., Box 360, Muncy, Pa., 17756, Tel: 717-546-3191; Empl.: 463

Products manufactured: Boards, Printed Circuit, Cards, Linear Function, Cards, Logic, Circuits, Printed, Multilayer, Modules, Logic, Encapsulated, Services, Assembly, Production & Test

GTE SYLVANIA INC., Consumer Prods. - Lighting Prods., 100 Endicott St., Danvers, Mass., 01923, Tel: 617-777-1900; Empl.: 8200

Products manufactured: Lamps

Local Sales Offices & Reps.

Cal	Burlingame	415-697-3500
Cal	Los Angeles	213-726-1666
Colo	Denver	303-399-1760
Conn	Hartford	203-249-7611
Fla	Orlando	305-859-6220
Ga	Atlanta	404-762-1781
Ill	Chicago	312-345-0100
Kans	Kansas City	913-371-3773
La	New Orleans	504-733-6970
Mich	Dearborn	313-582-8754
Mich	Southfield	313-559-5872
Minn	Minneapolis	612-331-9363
Mo	St. Louis	314-664-8975
NJ	Teterboro	201-288-9484
NY	Buffalo	716-668-0500
NY	New York City	212-486-3995
NC	Charlotte	704-334-4671
Ohio	Cincinnati	513-793-6440
Ohio	Cleveland	216-267-6800
Pa	Philadelphia	215-477-5000
Pa	Pittsburgh	412-781-4533
Tex	Dallas	214-239-8171
Tex	Houston	713-869-8671
Va	Springfield	703-354-3100

Wash Seattle 206-763-2660

GTE SYLVANIA INC., Wilbur B. Driver Sub., 1875 McCarter Hwy., Newark, N.J., 07104, Tel: 201-481-3110; Empl.: 749

Products manufactured: Alloys, Cable, Foil, Metals, Substrates, Wire

Local Sales Offices & Reps.

Cal	Los Angeles	213-478-4021
Conn	West Hartford	203-233-4047
Ill	Melrose Park	312-344-4155
NJ	Teterboro	201-288-9484
NC	Charlotte	704-375-8568
SC	Orangeburg	803-534-6910

GTE SYLVANIA INC., Electrical Equip. Grp., 100 First Ave., Waltham, Mass., 02154, Tel: 617-890-9200; Empl.: 3500

Products manufactured: Boxes, Junction, Outlets & Wall Plates, Bus Bars & Systems, Circuit Breakers, Controls/Control Eqp., Limit Stops, Mechanical, Motors, Relays, Switchboards, Switches, Transformers

Local Sales Offices & Reps.

Clark	Control	
Ala	Birmingham	205-879-3457
Cal	Los Angeles	213-685-6770
Cal	San Francisco	415-479-7770
Ga	Atlanta	404-261-5970
Ga	Atlanta	404-762-1781
Ill	Chicago	312-767-5123
Ill	Elk Grove Village	312-439-8748
Ind	Gary	219-887-5645
Mass	Waltham	617-890-9200
Mich	Detroit	313-255-0660
Mich	Flint	313-688-2270
Minn	Minneapolis	612-331-9363
Mo	St. Louis	314-872-8240
NJ	Union	201-686-9000
NY	Buffalo	716-668-0500
NY	Syracuse	315-437-1431
Ohio	Akron	216-923-5274
Ohio	Cincinnati	513-272-0633
Ohio	Cleveland	216-851-2200
Ohio	Cleveland	216-851-2000
Ohio	Columbus	614-888-3428
Ohio	Youngstown	216-757-1516
Pa	Philadelphia	215-649-6511
Pa	Pittsburgh	412-341-5777
Tex	Houston	713-869-8671
Va	Hampton	804-838-8080
Va	Hampton	804-838-8080
Wisc	Milwaukee	
Union	Insulating Co.	
Ga	Decatur	404-389-4761
Md	Reisterstown	301-833-1662
Minn	Hastings	612-437-5763
Tenn	Nashville	615-242-3942
WVa	Davis	304-866-4166
WVa	Parkersburg	304-422-4571

Zinsco Electrical Prods.

Ariz	Phoenix	602-277-2649
Cal	Fresno	209-266-6669
Cal	Los Angeles	213-625-8971
Cal	Sacramento	916-452-7621
Cal	San Diego	714-283-6361
Cal	San Leandro	415-352-3450
Colo	Denver	303-892-9468
Fla	Orlando	305-859-6220
Fla	Pompano Beach	305-946-0772
Ga	Atlanta	404-762-1781
Md	Columbia	301-465-5878
Mo	Creve Coeur	314-872-8240
Mo	St. Louis	314-289-9500
Ore	Portland	503-222-1063
Pa	Folcroft	215-532-9300
Tenn	Memphis	901-276-5536
Tenn	Nashville	615-255-8084

GTE SYLVANIA INC., Elctn. Comps. Grp., 100 First Ave., Waltham, Mass., 02154, Tel: 617-890-9200; Empl.: 4726

Products manufactured: Boards, Printed Circuit, CATV Systems & Equipment, Circuits, Printed, Multilayer, Test Equipment, Tubes, Yokes

Local Sales Offices & Reps.

Cal	Burlingame	415-697-3500
Cal	Los Angeles	213-726-1666
Ga	Atlanta	404-762-1781
Ill	Melrose Park	312-345-0100
Mass	Danvers	617-777-1900
NJ	Teterboro	201-288-9484
Ohio	Cleveland	216-267-6800
Tex	Dallas	214-239-8171

GTE SYLVANIA INC., Elctn. Sys. Gp., 1800 N. Kent St., Washington, D.C., 22209, Tel: 703-841-9020; Empl.: 4200

Products manufactured: Alarms, Amplifiers, Analyzers, Antenna Feed Systems, Antenna Rotators, Antenna Switching Matrices, Antennas, Coders, Comm. Systems, Computers, Control Systems, Air Traffic, Couplers, Data Acquisition & Reduction Systems, Decoders, Detectors, Display Devices/Displays, Horns, Microwave, Lasers & Laser Systems, Modulator/Demodulators, Modulators, All Kinds, Radar Systems, Receivers, Simulators, Switchboards, Switches, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic), Tracking Systems, Transceivers, Transmission Systems, Data, Transmitters, Underwater Communication, Detection, Navigation, etc. Equipment

GTE SYLVANIA INC., Elctn. Tube Div., Seneca Falls, N.Y., 13148, Tel: 315-568-5881; Empl.: 1092

Products manufactured: CATV Systems & Equipment, Testers, Tubes

Local Sales Offices & Reps.

Cal	Burlingame	415-697-3500
Cal	Los Angeles	213-726-1666
Ga	Atlanta	404-762-1781
Ill	Melrose Park	312-345-0100
Mass	Danvers	617-777-1900
NJ	Teterboro	201-288-9484
Ohio	Cleveland	216-267-6800
Tex	Dallas	214-239-8171

GTE SYLVANIA INC., Gibson Electric Subsidiary, Delmont, Pa., 15626, Tel: 412-468-4121; Empl.: 250

Products manufactured: Contacts, Electrical

Local Sales Offices & Reps.

NC	Charlotte	704-334-8940
Pa	Philadelphia	215-477-5000
FOR:	Can., Toronto, Ont.	416-364-5660

GTE SYLVANIA INC., Lighting Prods. Grp., Danvers, Mass., 01923, Tel: 617-777-1900; Empl.: 8200

Products manufactured: Caps, Lenses, Indicator Light, Circuit Breakers, Coils Including Assemblies & Forms, Deposition Equipment, Vacuum & Accessories, Flashers, Lamp Adapters, Lamps, Lights, Regulators, Relays, Sockets, Switches, Ultraviolet Inspection Lighting

Local Sales Offices & Reps.

Cal	Burlingame	415-697-3500
Cal	Los Angeles	213-726-1666
Colo	Denver	303-399-1760
Conn	Hartford	203-249-7611
Fla	Orlando	305-859-6220
Ga	Atlanta	404-762-1781
Ill	Chicago, (Melrose Park)	312-345-0100
Kans	Kansas City	913-371-3773
La	New Orleans	504-733-6970
Mich	Dearborn	313-582-8754
Mich	Southfield	313-559-5872
Minn	Minneapolis	612-331-9363
Mo	St. Louis	314-664-8975
NJ	Teterboro	201-288-9484
NY	Buffalo	716-675-0500
NY	New York	212-244-8820
NC	Charlotte	704-334-4671
Ohio	Cincinnati	513-793-6440
Ohio	Cleveland	216-267-6800
Pa	Philadelphia	215-477-5000
Pa	Pittsburgh	412-781-4533
Tex	Dallas	214-239-8171
Tex	Houston	713-869-8671
Va	Springfield	703-354-3100
Wash	Seattle	206-763-2660

GTE SYLVANIA INC., Miniature Lamp Div., 528 Elm St., Kearny, N.J., 07032, Tel: 201-997-1850

Products manufactured: Lamps

Local Sales Offices & Reps.

Cal	No. Hollywood, Bassett & Moore, Inc.	
Colo	Arvada, Arrowhead Sls. Corp.	
Conn	Waterbury, Coakley, Boyd, & Abbott, Inc.	
Fla	Bradenton, Hutto, Hawkins, Perego, Inc.	
Fla	Maitland, Hutto, Hawkins, Perego, Inc.	
Fla	Pompano Beach, Hutto, Hawkins, Perego, Inc.	
Ga	Atlanta, Millar Elctns., Inc.	
Ill	Oak Park, G. E. Finnegan	
Ind	Indianapolis, R. O. Whitesell & Assoc.	
Ind	Indianapolis, Southern Sls. Corp.	
Iowa	Atlantic, Kimian Sls., Inc.	
Mass	Needham, Coakley, Boyd, & Abbott, Inc.	
Mich	Grand Rapids, R. O. Whitesell & Assoc.	
Mich	Southfield, R. O. Whitesell & Assoc.	
Mich	St. Joseph, R. O. Whitesell & Assoc.	

Minn Minneapolis, Stoss Assocs.
 Mo Independence, Kimian Sls., Inc.
 Mo Maryland Hgts., Kimian Sls., Inc.
 NJ Long Valley, P. A. Sweeney
 NY Camillus, Callahan & Ferguson Co.
 NY Rochester, Fowler Beach Corp.
 NY Tuckahoe, LCA Sls., Co.
 NC Raleigh, Millar Elctns., Inc.
 Ohio Cincinnati, R. O. Whitesell & Assoc.
 Ohio Columbus, R. O. Whitesell & Assoc.
 Ohio Dayton, R. O. Whitesell & Assoc.
 Ohio Lakewood, R. O. Whitesell & Assoc.
 Pa Glenside, Shelmar Elctns. Corp.
 Pa Pittsburgh, R. O. Whitesell & Assoc.
 Tenn Bristol, R. O. Whitesell & Assoc.
 Tex Dallas, Dunbar Assocs.
 Utah Salt Lake City, Arrowhead Sls. Corp.
 Wash Seattle, Blum & Assocs.
 Wisc Milwaukee, F. C. DuBois & Assoc.
 FOR: Can., Mississauga, Ont. L4T 1G3, Munro Elctn. Comps.

GTE SYLVANIA INC., Miniature Lighting Prods., W. Main St., Hillsboro, N.H., 03244, Tel: 603-464-5533, TWX: 710-366-0387; Empl.: 700 p. 2-1147

Products manufactured: Caps, Lenses, Indicator Light, Lamps, Lights, Sockets

Local Sales Offices & Reps.
 Cal Los Altos, W.W. Posey Co. 415-948-7771
 Cal N. Hollywood, Bassett & Moore 213-766-2117
 Colo Arvada, Arrowhead Sls. 303-423-5556
 Conn Cheshire, Coakley, Boyd & Abbett 203-272-2262
 Fla Maitland, Hutto, Hawkins, Peregoy 305-831-2474
 Fla Pompano Beach, Hutto, Hawkins, Peregoy 305-943-9593
 Ga Atlanta, GTE Sylvania 404-762-1781
 Ill Oak Park, G. E. Finnegan 312-383-9098
 Ind Indianapolis, Southern Sls. 317-257-7575
 Iowa Atlantic, Kimian Sls. 712-243-1626
 Mass Needham, Coakley, Boyd & Abbett 617-444-5470
 Mich Grand Rapids, R.O. Whitesell & Assoc. 616-451-8901
 Mich Southfield, R.O. Whitesell & Assoc. 313-358-2020
 Mich St. Joseph, R.O. Whitesell & Assoc. 616-983-7337

Minn Minneapolis, Stoss Assocs. 612-925-2757
 Mo Independence, Kimian Sls. 816-796-4026
 Mo Maryland Heights, Kimian Sls. 314-739-1655
 NJ Kearny, GTE Sylvania 201-997-1850
 NY Rochester, Fowler Beach Corp. 716-586-0468
 NC Raleigh, Millar Elctns. 919-787-9564
 Ohio Cincinnati, R.O. Whitesell & Assoc. 513-521-2290

Ohio Columbus, R. O. Whitesell 614-888-9396
 Ohio Dayton, R.O. Whitesell & Assoc. 513-298-9546
 Ohio Lakewood, R.O. Whitesell & Assoc. 216-228-7525

Pa Glenside, Shelmar Elctns. 215-885-0800
 Pa Pittsburgh, R.O. Whitesell & Assoc. 412-344-7277

Tenn Memphis, Cartwright & Bean 901-276-4442
 Tex Dallas, Dunbar Assoc. 214-239-7151
 Utah Salt Lake City, Arrowhead Sls. 801-487-3444
 Wash Seattle, Blum & Assocs. 206-285-2590
 Wisc Milwaukee, F. C. Du Bois & Assoc. 414-774-3100

GTE SYLVANIA INC., Parts Div., 816 Lexington Ave., Warren, Pa, 16365

GTE SYLVANIA, INC., Western Gold & Platinum Sub., 555 Harbor Blvd., Belmont, Cal., 94002, Tel: 415-593-3121; Empl.: 320

Products manufactured: Flux, Brazing & Soldering Materials, Insulators & Insulation, Metals, Tubing, Wire

Local Sales Offices & Reps.
 Cal Torrance, Western Gold & Platinum Co. 213-375-6191
 Ill Lake Zurich, Western Gold & Platinum Co. 312-438-4488
 Mass Salem, Western Gold & Platinum Co. 617-745-1826
 Minn Minneapolis, Western Gold & Platinum Co. 612-920-3288
 Pa Drexel Hill, Western Gold & Platinum Co. 201-483-7467

GTI CORPORATION, 480 Manor Oak Two, 1910 Cochran Rd., Pittsburgh, Pa., 15220, Tel: 412-343-4070, Telex: 866-483; Empl.: 800

Products manufactured: Boards, Printed Circuit, Bus Bars & Systems, Caps, Connector, Caps, Lenses, Indicator Light, Circuits, Flexible, Covers, Protective (Including Dust), Eyelets, Feedthrus & Seals, Environmental, Forms, Wire, Headers, Holder & Carriers, Lenses, Readout & Display, Machines/Machinery, Production, Pins, Seals, Services, Assembly, Production & Test, Tubing

Local Sales Offices & Reps.
 Cal Santa Clara 408-244-2938
 NJ Red Bank 201-842-6682
 Ohio Centerville 513-433-7913

GTJ/TENSOR ELECTRONICS, 11558 Sorrento Valley Rd., San Diego, Cal., 92121, Tel: 714-453-7262, Telex: 69-5056; Empl.: 55

For info on price: W. Devine; Application info: J. Sayre; Customer service: D. Spurrier; Delivery info: D. Spurrier

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.
 Ala Birmingham, Electro-Rep Assocs. 205-822-4484
 Ala Huntsville, Electro-Rep Assocs. 205-881-8315
 Ariz Scottsdale, BFA Corp. of Ariz. 602-946-4215
 Cal Downey, Trimarco, Inc. 213-861-8244
 Cal Redwood City, Parks & Pruitt Assocs. 415-364-1640
 Conn Brookfield, E. J. Hughes Assocs. 203-775-4541
 Conn Old Saybrook, E. J. Hughes Assocs. 203-339-7636

Fla Clearwater, CBC Elctns. 813-447-3375
 Fla Ft. Lauderdale, CBC Elctns. 305-484-7330
 Fla Winter Park, CBC Elctns. 305-644-2277
 Ga Decatur, Electro-Rep Assocs. 404-365-6349
 Ill Des Plaines, Butor Sls. Co. 312-298-0555
 Ind Indianapolis, Technical Representatives, Inc. 317-849-6454
 Kans Shawnee Mission, Mid-America Elctn. Mktg. 913-236-4800
 Md Lutherville, Cunningham & Assocs. 301-296-4306

Mass Attleboro, E. J. Hughes & Assocs. 617-226-0050
 Mass Beverly, E. J. Hughes & Assocs. 617-927-7171
 Mich Rochester, Kent Assocs. 313-651-1890
 Minn Minneapolis, D. G. Perry & Co. 612-920-3212
 NJ Clifton, A. Clarfied 212-757-6454
 NJ Haddonfield, Keefe Elctn. Sls. Co. 609-429-4650

NY Syracuse, T-Squared-L Elctns. 315-463-8592
 NC Charlotte, Electro-Rep Assocs. 704-527-2530
 NC Raleigh, Electro-Rep Assocs. 919-828-8133
 Ohio Dayton, Sidnell Co. 513-433-7761
 Tex Richardson, Campion Sls. Co. 214-238-8145
 Wash Seattle, R. K. Squibb, Inc. 206-632-2450

GUARDIAN CALIFORNIA, 4030 W. Spencer St., Torrance, Cal., 90503, Tel: 213-772-8511, TWX: 910-344-7381; Empl.: 48

Products manufactured: Alarms, Coils Including Assemblies & Forms, Controls/Control Eqpt., Converters, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Detectors, Drivers, Solenoid, Flashers, Relays, Timers

Local Sales Offices & Reps.
 Ala Birmingham, Imcco Inc. 205-879-0739
 Cal Palo Alto, O'Donnell Assocs. 415-327-9260
 Cal Torrance, O'Donnell Assocs. 213-323-9243
 Colo Denver, Arrowhead Sls. 303-222-5645
 Fla Winter Park, Floritronics 305-424-5070
 Ga Marietta, Imcco Inc. 404-435-0079
 Haw Honolulu, G. Piety Factors 808-841-0185
 Ill Chicago, Guardian Elec. Mfg. 312-243-1100
 Ind Fort Wayne, Needler Sls. Co. 219-447-2123
 Md Ellicott City, Mc Court Co. 301-465-4515
 Mass Concord, Sales Engrg. Co. 617-369-3943
 Mich Westland, Miltimore Sls. 313-349-5820
 Mo Kansas City, H.J. Weisler & Assocs.
 Mo St. Louis, H.J. Weisler & Assocs.
 NM Albuquerque, Arrowhead Sls. 505-247-0287
 NY Massapequa, Coughlin Assocs. 516-799-7743
 NY Rochester, Elcom Sales 716-385-1400
 Ohio Miamisburg, W. C. Schmidt 513-866-3640
 Ohio Richmond Heights, W. A. Rowell, Jr. 216-291-0647

Pa Delmont, T.F. Laslo & Assocs. 215-348-5333
 Pa Doylestown, T.O.E. Sls. 214-638-6575
 Tex Dallas, W. Reese Assocs. 214-638-6575
 Utah Salt Lake City, Arrowhead Sls. 801-487-3444
 Wash Seattle, R. K. Squibb 206-632-2450
 FOR: Can., Willowdale, Ont., A.C. Simmonds & Sons

GUARDIAN ELECTRIC CO. OF CAL., 4030 W. Spencer St., Torrance, Cal., 90503, Tel: 213-542-8651; Empl.: 50

Products manufactured: Cards, Linear Function, Controls/Control Eqpt., Counters, Current Sensors, Drivers, Solenoid, Insertion Loss Measurement Systems, Monitors, Relays, Timers
 Refer to Guardian Elec. Co. for Sales Offices

GUARDIAN ELECTRIC CO., 1550 W. Carroll Ave., Chicago, Ill., 60607

Products manufactured: Relays, Sockets, Solenoids, Switches, Timers

Local Sales Offices & Reps.
 Cal Palo Alto, O'Donnell Assocs. 415-327-9260
 Cal Torrance, O'Donnell Assocs. 213-323-9243
 Colo Arvada, Arrowhead Sls. Corp. 303-423-5556
 Fla Winter Park, Floritronics 305-886-4818
 Ga Atlanta, Electro-Mech. Eng. Sls. 404-256-4414
 Haw Honolulu, G. Piety Factors Inc. 808-841-0185
 Ill Chicago, F. Nitti 312-243-1100
 Ind Ft. Wayne, Needler Sls. Co. 219-447-2123
 Ind Indianapolis, Needler Sls. Co. 317-255-8056
 Mass West Concord, Sls. Eng. Co. 617-369-3943
 Mich Novi, Miltimore Sls. 313-476-2446
 Minn St. Paul, R.A. Karr 612-335-8552
 Mo Kansas City, H.J. Weisler & Assoc. 816-421-1679

Mo St. Louis, H.J. Weisler & Assoc. 314-428-3934
 NY Binghamton, Elcom Sls. 607-723-9270
 NY Massapequa, Coughlan Assocs. 516-799-7743
 NY Rochester, Elcom Sls. 716-385-1400
 NY Whitesboro, Electro-Mech Sls. Eng. Co. 919-782-6452

Ohio Cleveland, Depco 216-289-8188
 Ohio Miamisburg, W. Schmidt 513-298-4451
 Pa Doylestown, T.O.E. Sls. Inc. 215-348-2212
 Tex Dallas, Wm. Reese Assoc. 214-638-6575
 Utah Salt Lake City, Arrowhead Sls. Corp. 801-485-3362
 Wash Seattle, R.K. Squibb, Inc. 206-632-2450

GUDEBROD BROS. SILK CO., INC., Electronics Div., 12 South 12th St., Philadelphia, Pa., 19107, Tel: 215-WA2-1122

Products manufactured: Cords, Pads, Transistor Mounting, Retainers

Local Sales Offices & Reps.
 Cal Burbank 213-848-3962
 Ill Chicago 312-DE7-3025
 Mass Boston 617-HA6-5347
 NY New York 212-LA4-5858
 NC Charlotte 704-333-9591

GUDEMAN CORP., 340 W. Huron St., Chicago, Ill., 60610, Tel: 312-337-7400, TWX: 910-221-3863; Empl.: 180; Minimum order: \$30 p. 2-138

For info on price: P. LoVecchio; Application info: T. Banach; Customer service: E. Kacheris; Delivery info: E. Kacheris

Products manufactured: Capacitors, Fixed, Filters

Local Sales Offices & Reps.
 Ariz Scottsdale, Piper-Goyne Co. 602-946-4437
 Cal Monrovia, Caltronic Sls. 213-359-2626
 Cal Mt. View, Melchior Assocs. 415-964-2321
 Colo Denver, Walker Assocs. 303-623-8713
 Fla Ft. Lauderdale, R.I. Smith Assocs. 305-772-5100
 Ill Hinsdale, Momak Sls. 312-654-4524
 Ind Ft. Wayne, R. G. Frederick 219-745-2461
 Ind Indianapolis, Electro Reps
 Mass Chelmsford, Underwood Sls. 617-256-8191
 Minn St. Paul, Cullen & Assocs. 612-646-7371
 Mo Kansas City, R.R. Burton Sls. 816-644-8300
 NJ Englewood Cliffs, E. Glass Assocs. 201-592-0200
 NY Liverpool, George Corp. 315-652-8317
 NY Rochester, J. Sempie Co. 716-342-1413
 NC Winston-Salem, C. Dula Assocs. 919-768-7166
 Ohio Cincinnati, A.C. Wahl Assocs. 513-821-3270
 Ohio Fairborn, R.G. Siff 513-252-7785
 Pa King of Prussia, Monteiro Assocs. 215-265-0634
 Tex Dallas, Evans & McDowell 214-238-7157
 Wash Olympia, Bergford Assocs. 206-866-2001

GUILDLINE INSTRS., INC., 1997 Palmer Ave., Larchmont, N.Y., 10538, Tel: 914-834-8100; Empl.: 85; Minimum order: \$25

For info on price: V. Stein; Application info: E. Nemeroff; Customer service: V. Stein; Delivery info: B. Wright

Free literature available: Condensed Catalog - detailing precision electrical measuring instruments for temperature and voltage calibration.

Products manufactured: Amplifiers, Baths, Controlled Temperature (Air & Liquid), Batteries, Bridges, Calibrators, Chamber, Environmental Test, Choppers, Comparators, Controls/Control Eqpt., Dividers, Indicators, Meters, Oceanographic Equip. (Electronic), Potentiometers, Resistors, Standards, Testers, Transformers

GULTON INDS., INC., Elctn. Comps. Div., Metuchen, N.J., 08840, Tel: 201-548-2800, TWX: 710-998-0592; Empl.: 125; Minimum order: \$35

For info on price: V. Braza; Application info: E. Price; Customer service: V. Braza; Delivery info: V. Braza

Free literature available: Thermistor Catalog; EMI Filter Catalog; Piezoelectric Catalog; Thermal Printhead Catalog & Application Data.

Products manufactured: Circuits, Hybrid, Thick Film, Filters, Printers, Probes, Thermistors, Transducers

Local Sales Offices & Reps.

Cal Los Angeles, Cal. Cem. Inc. 714-835-2702
Cal Los Angeles, California-Caltronic Sales 213-359-2626
Cal Monrovia, California-Caltronic Sales 213-359-2626
Cal Mountain View, Tri-Rep 415-965-1822
Cal San Diego, California - Cem, Inc. 714-835-2702
Cal Santa Ana, California - Cem, Inc. 714-835-2702
Colo Denver, Comtech 303-756-6815
Fla Palm Beach Gardens, Florida-Service Representative Assoc. 305-622-4049
Ill Westchester, Wasson-Gallagher 312-261-7517
Iowa Cedar Rapids, J.R. Sls. Engrg. 319-377-8211
Md Hyattsville, Eastern Components 301-577-2925
Mass Chelmsford, Underwood Sls. 617-256-8191
Mich Grand Rapids, Elko Sls. 616-949-1451
Minn St. Paul, H.A. Cullen 612-646-7371
NJ Oakland, W. E. Venator Assoc. 201-337-5387
NM Albuquerque, Elctn. Mktg. 505-265-7837
NY Rochester, J.L. Semple 716-342-1413
NC Winston-Salem, Dula Assocs. 919-768-7166
Ohio Cincinnati, A.C. Wahl 513-821-3270
Ohio Fairborn, R.G. Siff & Assocs. 513-252-7785
Ohio Lyndhurst, A.C. Wahl 513-821-3270
Okla Tulsa, Allied Comps. 918-939-2848
Tex Dallas, Allied Comps. 214-238-0408

GULTON INDS., Connector Div., 6400 Roland St., Buena Park, Cal., 90621, Tel: 714-523-3480, TWX: 910-596-1489; Empl.: 90

Customer service: Sales Dept.

Products manufactured: Braid, Cable, Cable Assemblies & Harnesses, Cable, Connectors, Detectors, Feedthrus & Seals, Environmental, Headers, Lead Assemblies & Receptacles, Plugs, Seals, Services, Assembly, Production & Test, Terminals, Thermocouples, Elements & Accessories, Wire

Local Sales Offices & Reps.

Ariz Scottsdale, Pete Murphy Assocs. 602-946-2457
Cal Los Altos, P.M. Sls. 408-255-1771
Conn W. Simsbury, Anchor Engrg. 203-658-6261
Md Ellicott City, J. Winkler & Assocs. 301-465-8630
Mass Wellesley Hills, Anchor Engrg. 617-235-6330
Minn Minneapolis, Milt Westland Assocs. 612-884-4567
NM Albuquerque, C. T. Carlberg Assocs. 505-265-1579
NY Massapequa, Coughlin Assocs. 516-799-7743
Ohio Dayton, A. D. Dirksen & Assocs. 513-256-0351
Tex Irvine, Gordon V. Peck Co. 713-664-1435

GULTON INDS., INC., Measurement & Control Systems Div., Gulton Ind'l. Pk., E. Greenwich, R.I., 02818, Tel: 401-884-6800, TWX: 710-387-1500; Minimum order: \$25 p. 1-868,869

Free literature available: Condensed Catalog of Instrumentation. Shows complete product line of Technirite analog and event recorders, Gulton printers, recorder building blocks, Rustrack miniature recorders, West controllers and Thermocouples.

Products manufactured: Amplifiers, Controls/Control Eqpt., Oscillographs, Direct Writing, Printers, Pyrometers, Recorders, Thermocouples, Elements & Accessories

Local Sales Offices & Reps.

Ala Huntsville, Beacon Elctns. Assoc. 205-881-5031
Ariz Scottsdale, Williams Assoc. 602-947-4297
Cal Costa Mesa, Gulton M.C.S. Div. 714-646-4424
Cal Palo Alto, E.V. Roberts & Assoc. 415-494-1671
Cal San Diego, Lodan 714-279-6383
Colo Denver, Williams Assoc. Inc. 303-373-4730
Conn Glastonbury, Instr. Reps. Inc. 203-633-0777

Fla Fort Lauderdale, Beacon Elctn. Assoc. 305-622-2770
Fla Jacksonville Beach, Lewis M. Crowe Co. 904-249-8888
Fla Maitland, Beacon Elctns. Assoc. 305-622-2770
Fla Orlando, W.A. Brown Comp. Inc. 305-425-5505
Fla St. Petersburg, Lewis M. Crowe Co. 813-894-0249

Ga Atlanta, Beacon Elctn. Assoc. 404-351-3654
Haw Honolulu, Yett Co. Inc. 808-847-2521
Ill Chicago, Pivan Engrg. Co. 312-539-4838
Ind Ft. Wayne, Scott Elctns. 219-743-1586
Ind Hammond, B & B Instrs. 312-731-0878
Ind Indianapolis, Pivan Engrg. 317-253-1681
Iowa Des Moines, Harry E. Ferris Co. 515-255-5008
Kans Olathe, Tech Reps 913-782-1177
La New Orleans, Gilbert & Assocs. 504-866-7444
Md Glen Burnie, Faber-Renoff 301-768-4554
Md New Carrollton, W.A. Brown Equip. Comp. Inc. 301-577-4527
Mass Lexington, Instr. Reps. Inc. 617-861-8620
Mass Norwood, Gibson Engrg. Co. 617-769-3600
Mich Detroit, S. Sterling Co. 313-255-1970
Mich Farmington, Applied Instrs. Co. 313-476-9060
Minn Minneapolis, Heimann Co. 612-861-6051
Minn Minneapolis, Automated Controls, 612-377-7727

Mo Hazelwood, Tech. Reps. Inc. 314-731-5200
Mo Kansas City, Boschert Equip. Co. 816-561-4050
Mo University City, E. Mooney Co. 314-725-8875
Ohio Cincinnati, Scott Elctns. 513-791-2513
Mo Kansas City, Boschert Equip. Co. 861-561-4050
NJ Metuchen, Gulton M.C.S. Div. 201-548-2800
NJ Newark, Norman Brager Co. 201-344-1100
NM Albuquerque, Williams Assoc. Inc. 505-255-1638
NY Buffalo, Niagara Elec. Sls. Co. 716-886-4000
NY E. Syracuse, Niagara Elec. Sls. Co. 315-437-1656
NY Rochester, Niagara Elec. Sls. Co. 716-271-1223
NY Syracuse, Labtronics Inc. 315-454-9314
NC Charlotte, James L. Highsmith & Co. 704-333-7743
NC Raleigh, W. A. Brown Comp. 919-876-9601
NC Winston-Salem, W.A. Brown Comp. Inc. 919-725-5384

Ohio Cincinnati, Schlemmer Assocs. 513-522-8340
Ohio Cleveland, Comtel-Sterling Co. 216-442-8080
Ohio Columbus, Scott Elctns. 614-236-8619
Ohio Dayton, Comtel-Sterling Co. 513-298-7573
Okla Tulsa, Kemp Engrg. 918-299-2636
Ore Portland, Branom Instr. Co. 503-285-9861
Pa King of Prussia, Applied Controls 215-265-3832
Pa Murrysville, Bock Engrg. Co. 412-327-3700
Pa Pittsburgh, Comtel Sterling 412-922-5720
SC Spartanburg, Beacon Elctn. Assoc. 803-582-4613
Tenn Memphis, Gilber & Assocs. 901-767-7894
Tex Addison, Kemp Engrg. Co. 214-661-0400
Tex Arlington, Pan Tech. Engrg. Co. 817-261-4111
Tex Houston, Kemp Engrg. Co. 713-688-1431
Va Alexandria, W.A. Brown Equip. Comp. Inc. 703-836-1800
Va Richmond, James L. Highsmith & Co. 804-272-5888
Wash Seattle, Arva-Hudson 206-622-0177
Wisc Brookfield, Pivan Engrg. Co. 414-786-1940
Wisc Menomonee Falls, Fritz Engrg. Sls. Co. 414-251-6590

Local Distributors

Alas Anchorage, Denali Services Co., POB 4895 907-277-5594
Ariz Phoenix, Metermaster, 2633 E. Backeye Rd. 602-273-7331
Ariz Phoenix, R.V. Weatherford, 1917 N. 25th Dr. 602-272-7144
Ark El Dorado, Indl. Elctns. Supp., 413 W. Main St. 501-862-4901
Ark Little Rock, Carlont-Bates Co., 6821 Scott Hamilton Dr. 501-375-2383
Cal Culver City, E.V. Roberts, 9601 W. Jefferson Blvd. 213-870-9561
Cal Gardena, Instr. Labs, 1323 W. 130th St. 213-770-0650
Cal Glendale, R. V. Weatherford Co., 6921 San Fernando Rd. 213-849-3451
Cal Inglewood, Newark Elctns. Corp., 4747 W. Century Blvd. 213-678-0441
Cal Los Angeles, Fisher/Brownell, 13936 S. Broadway 213-532-2170
Cal Los Angeles, Metermaster, 5646 Jilison St. 213-685-4340
Cal Palo Alto, Metermaster, 3969 E. Bayshore Rd. 415-968-0313
Cal Palo Alto, R.V. Weatherford Co., 3240 Hillview Rd. 415-321-5373
Cal San Diego, R.V. Weatherford Co., 7872 Raytheon Rd. 714-278-7400

Cal Santa Clara, Fisher/Brownell, 3381 Edward Ave. 408-244-6182
Colo Denver, Newark Elctns. Corp., 2170 S. Grape St. 303-757-3351
Colo Denver, Waco, 4616 Ironton St. 303-371-4370
Conn Middletown, Mancib Co., POB 781 203-347-5629
Fla Lakeland, A.A. Elctns. Div. of Auto. Engrg. Co., 2112 S. Combee Rd. 813-682-6181
Fla Orlando, Brownell Electro, 307 27th St. 305-843-6770
Ga Atlanta, Brownell Electro, 3020 Commerce Way 404-762-5181
Haw Honolulu, Yett Co., 429 Waiakamilo Rd. 808-847-2521
Ill Chicago, Allied Elctns., 2400 W. Washington Blvd. 312-421-2400
Ill Chicago, Newark Elctns. Corp., 550 N. Pulaski Rd. 312-638-4411
Ill Elk Grove Village, Metermaster, 121 Gordon St. 312-593-8650
Ill Oak Park, Pacific Indicator Co., 6603 W. North Ave. 312-383-0220
Ill Worth, Premium Instrs. Co., 5821 W. 117th Pl. 312-371-0500
Ind Chesterton, Instr. Sys., POB 13 219-926-3078
Ind Ft. Wayne, Ft. Wayne Elctns. Supp., 3606 Maumee Ave. 219-742-4346
Ind Indianapolis, Pioneer/Indiana, 6408 Castleplace Dr. 317-849-7300
Ind South Bend, Radio Dist. Co., 1212 High St. 219-288-4666
Iowa Ames, Skarshaug Engrg. & Testing Lab, 4803 W. Lincoln Way 515-292-1422
Kans Wichita, Main Elctns., 225 Ida St. 316-267-3581
La Lafayette, Ralph's, 3004 Cameron St. 318-234-4507
La Shreveport, Analytical Logging, 1610 Well Island Rd. 318-424-8126
La Shreveport, Indl. Elctn. Supp., 2424 Greenwood Rd. 318-222-9459
Md Elkridge, Sunshine Scientific Instrs., 5800 Main St. 301-796-5600
Mass Burlington, Mancib Co., Middlesex Tnpk. at A St. 617-272-9450
Mass Norwood, Timer Srv., 90 Broadway 617-769-3600
Ill Worth, Premium Instrs. Co., 5821 W. 117th Pl. 312-371-0500
Minn Minneapolis, Instr. Control Co., 2401 E. Franklin Ave. 612-336-7744
Minn Virginia, NWR Elctns., POB 118 218-741-5080
Miss Jackson, Ellington Elctns. Supp., 1425 Terry Rd. 601-335-0561
Mo St. Louis, Indl. Svc. Labs, 4354 Olive St. 314-535-5760
Mo St. Louis, Olive Indl. Elctns., 6662 Olive Blvd. 314-863-7800
NJ Newark, Norman Brager Prods Co., 350 Lafayette St. 201-344-1101
NJ Princeton, Science Assocs., 230 Nassau St. 609-924-4470
NM Albuquerque, WACO, 420 Washington SE 505-255-1638
NY Albany, Edwin E. Taylor Co., 465 Central Ave. 518-489-5600
NY Buffalo, Summit Dists., 916 Main St. 716-884-3450
NY Long Island City, Metermod Instr. Corp., 48-15 31st Ave. 212-726-4850
NC Charlotte, Brownell Electro, 5141 Bellhaven Blvd. 704-393-4341
NC Charlotte, Sys. Svc. Corp., POB 17525 704-377-3407
NC Matthews, W.K. Hile, POB 1015 704-847-9125
NC Winston-Salem, Kirkman Elctns., Drawer K Salem Sta. 919-724-0541
Ohio Cincinnati, Hughes Peters, 4865 Duck Creek Rd. 513-351-2000
Ohio Cleveland, Pioneer Standard Elctns., Pioneer Elect-Instrs. Lab., 4800 E. 131 St. 216-587-3600
Ohio Columbus, Hughes Peters, 481 E. 11th Ave. 614-294-5351
Ohio Dayton, Pioneer/Dayton, Div. of Pioneer-Standard Elctns., 1900 Troy St. 513-224-0971
Okla Tulsa, Oil Capitol Elctns. Corp., Admiral Sta. Box GG 918-836-2451
Pa Philadelphia, Sunshine Scientific Instrs., 1810 Grant Ave. 215-673-5600
Pa Pittsburgh, Air Serco, 3875 Bigelow Blvd. 412-621-6980
Pa Pittsburgh, Cameradio, 2810 Liberty Ave. 412-288-2600
Pa Pittsburgh, T.F. Campbell Co., 1521 Saw Mill Run Blvd. 412-881-8006
Tenn Memphis, Bluff City Distr. Co., 234 East St. 901-725-9500

Tenn Memphis, Brownell Electro., 217 Cumberland St.
901-452-2181

Tenn Nashville, Brownell Electro., 1050 Acorn Dr.
615-889-8230

Tex Beaumont, Ralph Indl. Elctns., 1203 Broadway
713-833-9443

Tex Dallas, Dallas Instrs., 10205 Plano Rd.
214-341-0504

Tex Dallas, Economy Gauge, Div. of McGatlin, 11035
Harry Hines Blvd. 214-358-5381

Tex Houston, American Analog, 11207 Sagehaven
Dr. 713-481-6520

Tex Houston, Van London Co., 2422 Robin Hood
713-526-1567

Tex Stafford, Southwest Elctns., 12725 Royal Dr.
713-494-6021

Utah Salt Lake City, Control Equip. Co., 2255 S. 2nd
W. 801-487-7741

Va Richmond, Meridan Elctrs., Div. of Sterling Elec.,
1001 W. Broad St. 804-355-6521

Wash Seattle, Arva-Hudson, 1320 Prospect St.
206-622-0177

WVa Charleston, Williams & Co., 1010 F. St.
304-744-5365

Wisc Cedarburg, Automation Engrg. Co., 1200
Highway 143, 414-377-7500

Wisc Milwaukee, Electro-Mechano Co., 241 Erie St.
414-272-4050

GULTON INDS., INC., Servonic/Instrumentation Div.,
1844 Whittier Ave., Costa Mesa, Cal., 92627, Tel:
714-642-2400, TWX: 910-596-1352; Empl.: 225;
Minimum order: \$50

For info on price: J. W. Strosnider; Application info: J.
C. Pennock; Customer service: L. McKnight; Delivery
info: Contracts

Free literature available: Will be supplied on request
for any specific product.

Products manufactured: Accelerometers,
Amplifiers, Gages, Microphones, All Kinds,
Switches, Thermocouples, Elements &
Accessories, Transducers

Local Sales Offices & Reps.

Cal Burlingame, Banner Aircraft Int'l 415-697-8310

Cal Los Altos, Jay Stone & Assocs. 415-948-4563

Cal Los Angeles, Thorson Co. 213-481-6520

Cal Mission Viejo, Miracle & Assocs. 714-586-5510

Cal San Diego, Miracle & Assocs. 714-276-8619

Colo Littleton, Pond Assocs., Inc. 303-798-2904

Conn No. Haven, Kitchen & Kutchin, Inc. 203-239-0212

Fla Clearwater, Reynolds & Assocs. 813-726-2373

Fla Ft. Lauderdale, Reynolds & Assocs. 305-581-6611

Fla Hollywood, Reynolds & Assocs. 305-987-6720

Fla Palm Beach Gardens, Reynolds & Assocs. 305-622-6850

Fla Satellite, Reynolds & Assocs. 305-773-4700

Fla St. Petersburg, Reynolds & Assocs. 813-360-1484

Ga Atlanta, Reynolds & Assocs. 404-252-5360

Ill La Grange, Olson Engrg. & Sls. 312-482-3300

Ind Anderson, Olson Engrg. & Sls. Corp. 317-644-1690

Kans Leawood, Thunderbird Tech. Sls. & Svcs. 913-642-7220

Kans Wichita, Thunderbird Tech. Sls. & Svcs. 316-684-3941

Md Baltimore, Stemler Assocs., Inc. 301-944-8262

Mass Lexington, Kitchen & Kutchin, Inc. 617-862-8230

Mich Detroit, K.V.A. Assocs. 313-892-6000

Minn Minneapolis, Westlund Assocs. 612-886-5002

Mo St. Louis, Thunderbird Tech Sls. & Svcs. 314-567-6488

NJ Cherry Hill, Stemler Assocs. 609-966-4070

NJ Laurel Springs, Stemler Assocs. 215-644-3477

NJ Springfield, SM Service & Tech., Inc. 201-232-2666

NY Chappaqua, R. M. Glueck & Assoc. 914-238-3233

NC Charlotte, Reynolds & Assocs. 216-486-0782

Ohio Cleveland, Instrumentation Sys. 216-486-0782

Ohio Dayton, Instrumentation Sys. Inc. 513-294-2838

Pa Pittsburgh, Instrumentation Sys., Inc. 412-243-1111

Tex Garland, Gordon V. Peck Co. 214-341-8311

Tex Houston, Gordon V. Peck Co. 713-664-1435

Utah Salt Lake City, Applied Engrg. Prods. Co. 801-582-4942

Va Alexandria, Stemler Assocs. 703-548-7818

Wash Bellevue, Thorson Co. 206-455-9880

Wisc Milwaukee, Olson Engrg. & Sls. Corp. 414-873-7330

GULTON INDS., Piezo Prods. Div., Box 4300, Fullerton,
Cal., 92634, Tel: 714-871-2150, TWX: 910-592-1247;
Empl.: 100; Minimum order: \$150

For info on price: H. Kelly; Application info: C.
Edmiston; Customer service: C. Edmiston; Delivery
info: R. Johnson

Free literature available: Gulton Glennite
Piezoceramics catalog, H-700, contains the
specifications of our materials, describes some
standard shapes and sizes and provides basic
engineering application notes.

Products manufactured: Ceramic Resonators,
Crystals, Transducers

G.V. CONTROLS, INC., 80 Okner Parkway, Livingston,
N.J., 07039

H-B INSTR. CO., 4315 N. American St., Phila., Pa., 19140,
Tel: 215-329-9125; Empl.: 45; Minimum order: \$20

For info on price: E. D. Hiergesell; Application info: C.
G. Roveran; Customer service: C. G. Roveran;
Delivery info: F. J. Freitag

Free literature available: The new H-B
Relay/Thermostat Catalog features precision
thermostats, solid state relays, and mercury
plunger relays with capacities up through 100
amps for all applications.

Products manufactured: Controls/Control Eqpt.,
Indicators, Meters, Relays, Services, Assembly,
Production & Test, Standards, Switches,
Thermostats

HACKENSACK CABLE CORP., 3275 Sunset Blvd., West
Columbia, S.C., 29169, Tel: 803-796-3070; Empl.: 115;
Minimum order: \$25

Customer service: J. Floyd

Free literature available: Cable Catalog - wire ropes
and cables made of stainless steel, galvanized
steel, bronze, monel bare and coated with nylon
and vinyl.

Products manufactured: Cords, Wire

Local Sales Offices & Reps.

Cal Long Beach, Hackensack Cable Corp. 213-424-1659

Fla Miami, J.M. Keely Sls. 305-634-8526

NJ South Hackensack, Hackensack Cable Corp. 201-487-1036

Ohio North Olmsted, Hackensack Cable Corp. 216-734-6190

Tex Houston, R.D. Chapman 713-681-6221

HACKER INSTRS., INC., Box 646, Fairfield, N.J., 07006,
Tel: 201-226-8450; Empl.: 10; Minimum order: \$5

For info on price: K. S. Lany; Application info: I. E.
Hills; Customer service: I. E. Hills; Delivery info: K. S.
Lany

Products manufactured: Meters, Microscopes,
Testers

HADLEY COMPONENTS DIV., GTI Corp., R.D. #2, Box
77, Hadley, Pa., 16130, Tel: 412-253-3161, Telex:
914-545

Customer service: R. C. Kaufman

Free literature available: Brochure outlining Hadley
Components capabilities and current product
lines.

Products manufactured: Capacitor, Hardware,
Forms, Wire, Lead Assemblies & Receptacles,
Resistor, Hardware, Services, Assembly,
Production & Test, Wire

Local Sales Offices & Reps.

Ala Huntsville, 20th Century Mktg. 205-772-9237

Ariz Tempe, Gassner & Clark Co. 602-968-9037

Cal Canoga Park, California Elctrn. Mktg. 213-884-7867

Cal San Mateo, California Elctrn. Mktg. 415-574-1113

Cal Santa Ana, California Elctrn. Mktg. 714-835-2702

Cal Santa Clara, GTI Corp. 408-244-2938

Colo Boulder, Mile High Elctns. 303-444-5615

Conn Brookfield, E.J. Hughes Assocs. 203-775-4541

Conn Old Saybrook, E.J. Hughes Assocs. 203-399-7636

Fla Longwood, Lenz Engrg. 305-831-9797

Ill Westchester, Gassner & Clark Co. 312-345-4245

Ind Indianapolis, Electronic Sls. & Engrg. Co. 317-849-4260

Mass Attleboro, E.J. Hughes Assocs. 617-226-0050

Mass Beverly, E.J. Hughes Assocs. 617-927-7171

Mich Southfield, Eynon-Weyand Assocs. 313-354-3430

Minn Minneapolis, D.G. Perry & Co. 612-920-3212

NJ Brielle, Semi-Mat Co. 201-528-7439

NJ Shrewsbury, GTI Corp. 201-842-6682

NY Skaneateles, MCK Assocs. 315-685-7122

NC Charlotte, B. Henry Assocs. 704-375-8958

Ohio Dayton, Sidnell Co. 513-885-4161

Ohio Mentor, Bishop Co. 216-255-6969

Tex Richardson, R.S. Marston Co. 214-235-3577

HALEX, INC., Box 2940, Torrance, Cal., 90509, Tel:
213-772-4461; Minimum order: \$1000

For info on price: M. J. Bergquist Ext. 26; Application
info: Y. Tonai Ext. 34; Customer service: R. C. Sivas
Ext. 28; Delivery info: R. C. Sivas Ext. 28

Products manufactured: Amplifiers, Circuits, Hybrid,
Thin-Film, Networks, Resistors

Local Sales Offices & Reps.

Ariz Phoenix, W. W. Posey Co. 602-949-9395

Cal Los Altos, W. W. Posey Co. 415-948-7771

Colo Eastlake, Jensen Reps. 303-452-1609

Fla Atamonte Springs, WMM Assocs. 305-831-4645

Fla Clearwater, WMM Assocs. 813-726-8871

Fla Pompano Beach, WMM Assocs. 305-943-3091

Ill Northbrook, Raines-Brin Assocs. 312-498-0890

Mass Norwood, R. Perron & Co. 617-762-8114

Minn Hopkins, Grayden & Flemmer 612-941-1120

Mo Grand View, Beneke & McCaul 816-765-2998

NJ Cranford, Idalee Elctrn. Corp. 914-229-2269

NY Hyde Park, R.P. Kennedy Co., Inc. 914-229-2269

NY Rochester, R. P. Kennedy Co. 716-271-6322

NY Valley Stream, Idalee Elctrn. Corp. 516-825-8955

Wash Seattle, Underwood & Underwood
206-243-2133

HAMMAR ELECTRONICS, INC., 1544 W. Mound St.,
Columbus, Ohio, 43223, Tel: 614-276-0131, TWX:
810-482-1654; Empl.: 70; Minimum order: \$20

For info on price: Sls. Dept.; Application info: Sls.
Dept.; Customer service: T. Koerber; Delivery info:
Sls. Dept.

Products manufactured: Controls/Control Eqpt.,
Current Sensors, Integrators, Electronic, Meters,
Monitors, Power Supplies, Regulators, Relays,
Switches, Totalizers, Digital, Transducers,
Transformers

HAMAMATSU CORP., 120 Wood Ave., Middlesex, N.
J., 08846, Tel: 201-469-6640, Telex: 83-3403; Empl.: 450
p. 1-2354,2355

Customer service: R. Eno

Products manufactured: Amplifiers, Cameras, Cells,
Photoconductive, Photoemissive, Photovoltaic,
Detectors, Diodes, Lamps, Light Sources,
Photoelectric, Lights, Photomultiplier Tube
Housings, Power Supplies, Television Systems &
Equipment Closed-Circuit, Tubes

Local Sales Offices & Reps.

Cal Burlingame, California Eastern Labs
415-342-7744

HAMAMATSU TV CO., LTD., 1126 Ichino-Cho,
Hamamatsu City, Shizuoka Pref., Japan, Tel:
0534-34-3311; Empl.: 530

For info on price: R. Eno 201-469-6640; Application
info: R. Eno 201-469-6640; Customer service: C. Simola
201-469-6641; Delivery info: C. Simola 201-469-6641

Products manufactured: Analyzers, Bolometers,
Cameras, Cells, Photoconductive, Photoemissive,
Photovoltaic, Coils Including Assemblies & Forms,
Detectors, Diodes, Lamps, Light Sources,
Photoelectric, Monitors, Photomultiplier Tube
Housings, Power Supplies, Sensors, Light
Shields, Television Systems & Equipment
Closed-Circuit, Tracking Systems, Tubes

Local Sales Offices & Reps.

NJ Middlesex, Hamamatsu Corp. 201-469-6640

HAMILTON STANDARD, Div. United Aircraft Corp.,
Windsor Locks, Conn., 06096, Tel: 203-623-1621, TWX:
710-420-0584

HAMILTON TECHNOLOGY, INC., a Sub. of HMW
Industries Inc., Box 1609, Lancaster, Pa., 17604, Tel:
717-299-2581; Empl.: 1000

For info on price: S. L. Snyder; Application info: S. L.
Snyder; Customer service: T. Murray; Delivery info: S.
L. Snyder

Free literature available: Ultra-Thin metal strip and
foil; Precision parts and assembly. New facilities
brochure provides complete properties of
proprietary metals, commercial alloys, pure
metals, precisin piece-parts and assembly.

Products manufactured: Alternators, Foil, Gears & Gear Mechanisms (Precision), Heads, Recording Playback, Erase, Laminations, Magnets, Metal Compounds, Foils, Powders, Sheet, Stock, Services, Assembly, Production & Test, Wire

Local Sales Offices & Reps.

Cal	Costa Mesa, Hamilton Tech., Inc.	714-546-0780
Cal	Los Angeles, E. A. Wilcox Co.	213-723-6436
Cal	Denver, Electro-Rep, Inc.	303-744-2655
Conn	W. Hartford, R. S. Pettigrew & Co.	203-233-8533
Ill	Chicago, Electro-Comp Sls., Inc.	312-763-3636
Mass	W. Newton, R. S. Pettigrew & Co.	617-969-5770
Minn	Navarre, MagCo, Inc.	612-471-8538
Mo	St. Louis, Holtgrieve & Co.	314-725-6602
NJ	Asbury Park, Lancaster Ind'l. Sls., Inc.	201-988-5401
NM	Albuquerque, Electro-Rep, Inc.	505-256-1749
Ohio	Grafton, A. W. Risser Co.	216-458-5091
Pa	Lancaster, Lancaster Ind'l. Sls., Inc.	717-397-2942
Wash	Seattle, E. A. Wilcox Co.	206-243-5450

HAMLIN INC., Lake & Grove Sts., Lake Mills, Wisc., 53551, Tel: 414-648-2361, TWX: 910-260-3740; Empl.: 800; Minimum order: \$100

p. 1•1707,2058-2060; p. 2•1148,1149

For info on price: Cust. Serv. Desk; Customer service: Cust. Svc. Desk; Delivery info: Cust Svc Desk

Free literature available: Free descriptive literature with application help and specifications covering: Reed switches, dry and mercury-wetted; Sensors, temperature and proximity; Relays, opto-isolated solid state and hybrid; Liquid displays, dynamic scattering and field effect, for watches, clocks and instrumentation.

Products manufactured: Display Devices/Displays, Relays, Switches, Transducers

Local Sales Offices & Reps.

Ariz	Phoenix, Zeus, Inc.	602-258-7519
Cal	El Toro, Electronic Component Mktg.	714-830-3939
Cal	Palo Alto, Testco Inc.	415-494-2011
Cal	Pico Rivera, Westrep	213-949-2551
Cal	San Diego, Elctn. Comp.	714-273-1346
Cal	Woodland Hills, Elctn. Comps. Mktg.	213-340-1745
Cal	Denver, Zeus, Inc.	303-770-4400
Conn	Berlin, White Sls. Co.	203-224-0423
Fla	Hollywood, Wallace Elctn. Sls.	305-961-6640
Fla	Tampa, Wallace Elctn. Sls.	813-961-1037
Ga	Jonesboro, Wallace Elctn. Sls.	404-471-6297
Ill	Des Plaines, Lincoln, Hodges	312-297-3810
Ill	Palatine, CC Elctns. Sls.	312-358-8900
Ind	Indianapolis, R.H. Newsom Assoc.	317-849-4442
Iowa	Marion, Thomas & Modrcin	319-377-6261
Kans	Shawnee Mission, Thomas & Modrcin	913-432-2131
Md	Woodbine, Naudain Assoc.	301-422-2270
Mass	Needham, White Sls. Co.	617-444-3676
Mich	Dearborn, V.P.I. Inc.	313-271-4600
Minn	Minneapolis, R-J, Inc.	612-922-1425
Mo	Hazelwood, Thomas & Modrcin	314-895-4700
NJ	Mount Laurel, Naudain Assoc.	609-235-1801
NM	Albuquerque, Zeus, Inc.	505-256-9831
NY	DeRuyter, R.P. Kennedy Co., Inc.	315-662-3996
NY	Manhasset, Win-Cor Elctn.	516-627-9474
NY	Red Hook, R.P. Kennedy Co., Inc.	914-876-2700
NY	Rochester, R. Kennedy	716-271-6322
NC	Greensboro, Wallace Elctn. Sls.	919-292-0487
NC	Kernersville, Wallace Elctn. Sls.	919-993-3993
Ohio	Cincinnati, G & H Sales Co.	513-771-8231
Ohio	Grove City, G & H Sales Co.	614-878-1128
Tenn	Memphis, Wallace Elctn. Sls.	901-682-2281
Tex	Dallas, Allied Comp., Inc.	214-238-0408
Tex	Houston, Allied Comp., Inc.	713-691-3961
Utah	Salt Lake City, Zeus, Inc.	801-486-2317
Wash	Bellevue, Testco, Inc.	206-454-7422
Wisc	Waukesha, Lincoln Hodges	414-542-3087

Local Distributors

Ala	Huntsville, Mock Elctns., 2310 Memorial Pkwy. S.	205-539-2401
Cal	Palo Alto, Testco, 941 Charleston Rd.	415-326-5320
Cal	Van Nuys, Patane Avionics, 5937 Kester Ave.	213-988-4455
Cal	New Haven, Hatry Ectns., 610 Blvd.	303-771-2636
Fla	Miami, ESL, 3560 N.W., 34th St.	305-633-6975
Ga	Augusta, Dixie Radio Supp., 1234 Gordon Pk. Rd.	404-722-2055
Ill	Chicago, Newark Elctns., 500 N. Pulaski Rd.	312-638-4411
Ill	Westmont, Bodelle Co., 47 Chestnut La.	312-323-9670

Ind	Indianapolis, Graham Elctns., 133 S. Pennsylvania	317-634-8486
Md	Gaithersburg, Pioneer/Washington, 9100 Gaither Rd.	301-948-0710
Mass	Dedham, Gerber Elctns., 852 Providence Hwy.	617-329-2400
Mich	Ann Arbor, Wedemeyer Elctn. Supp., 2280 S. Ind. Hwy.	313-665-8611
Mich	Farmington, Harvey-Michigan, Inc., 23461 Ind. Pk. Dr.	313-477-1650
Minn	Edina, Harvey-Minnesota, Inc., 6969 Washington Ave. S.	612-941-6060
Miss	Pascego, May Elctns., 2514 Market St.	601-762-1900
NJ	Pennsauken, Resco Elctns., Airport Indl. Pk.	609-662-4000
NM	Buffalo, Summit Dist., 916 Main St.	716-884-3450
NY	Farmingdale, Norelcom Elctns., 200 Allen Blvd.	516-249-7245
NY	Lynbrook, Peerless Radio Corp., 19 Wilbur St.	516-593-2121
NC	Greensboro, Hammond Elctns., 2923 Pacific Ave.	919-275-6391
NC	Winston-Salem, Kirkman Elctns., Drawer "K", Salem Sta.	919-724-0541
Ohio	Solon, Repco, 6835 Cochran Rd.	216-248-8900
Okla	Tulsa, Radio, Inc., 1000 S. Main St.	918-587-9124
Pa	Pittsburgh, RPC Elctns., 620 Alpha Dr.	412-782-3770
RI	Providence, Wm. Dandreta & Co., 38 Wolcott St.	401-861-2800
SC	Columbia, Dixie Radio Supp. Co., 1900 Barnwell	803-253-5333
Tenn	Fort Worth, Allied Elctns., 401 E. 8th St.	817-336-5401
Tex	Dallas, KA Elctn. Sls., 1220 Majesty Dr.	214-634-7870
Va	Richmond, Meridian Elctns., 1001 W. Broad St.	206-282-2511
Wash	Seattle, Radar Elec. Co., 168 Western Ave. W.	206-282-2511

HANDY & HARMAN, 850 Third Ave., New York, N.Y., 10022, Tel: 212-752-3400; Empl.: 800

Customer service: T. M. Hansen

Free literature available: Bulletin 202A: 12 page booklet on alloys and fluxes. Advantages of silver alloy brazing; "The Logic of Precious Metal Cladding." How to gain properties of a precious metal while conserving use of costly material explained.

Products manufactured: Alloys, Flux, Brazing & Soldering Materials, Metal Compounds, Foils, Powders, Sheet, Stock, Metal Oxides, Metals, Preforms, Precious Metal, Wire

Local Sales Offices & Reps.

Cal	El Monte	213-283-8181
Ill	Elk Grove Village	312-437-3883
Mass	Atleboro	617-226-1000
Mich	Southfield	313-356-5390
NY	New York	212-752-3400
Ohio	Cleveland	216-333-2166
Tex	Dallas	214-351-5890

HANKSCRAFT CO., Motor Div., PO Box 120, Reedsburg, Wisc., 53959, Tel: 608-524-4341; Empl.: 400

Customer service: E. F. Gesteland

Free literature available: Catalog Sheet - Series 3440 D.C. Gearhead Motor - Gives dimensions, characteristics and voltages and speeds available.

Products manufactured: Motors

Local Sales Offices & Reps.

Cal	Mountain View, Catron-Pyle	415-964-3244
Cal	Westminster, Electric Motor Specialists	213-564-7323
Ga	Atlanta, V. Avis McCorvey Co.	404-636-2502
Ill	Libertyville, Matthews-Midwest Co.	312-362-8200
Ind	Indianapolis, W.F. Sondermann	317-849-2769
Md	Bethesda, Mount & Co.	301-530-9303
Mass	Salem, Forbes Engrg.	617-744-1693
Mich	Jackson, N. Scroggs Co.	517-782-5211
Minn	St. Paul, W.E. Taubert	612-776-1285
NJ	Mahwah, Kent Assocs.	201-327-7878
NY	Skaneateles, Henkel Mktg. Co.	315-685-6945
Ohio	Fairborn, Technical Assocs.	513-878-2484
Tex	Bellaire, Dynamic Comp. Sls., Inc.	713-668-7729
Wash	Seattle, R.K. Squibb, Inc.	206-632-2450

HANSEN MFG. CO., Div. P.R. Mallory & Co. Inc., Box 23, Princeton, Ind., 47670, Tel: 812-385-3415; Empl.: 350

Products manufactured: Motors, Slip-Rings & Assemblies

Local Sales Offices & Reps.

Cal	Fremont, H.K.F. Inc.	415-863-2200
Cal	Sherman Oaks, R.S. Hopkins Co.	213-788-5501
Conn	Essex, Winslow Elec. Co.	203-767-8229
Ill	River Forest, Fromm Co.	312-771-6000
Mich	Grand Rapids, J. Orr Assocs.	616-534-4029
NJ	Teaneck, H. Rude Assocs.	201-836-6778
NY	Rochester, H.C. Johnson Agency, Inc.	716-482-3000
Pa	Devon, Kiley Elec. Co.	215-687-9340
Tex	Dallas, Carey & Assocs.	214-363-7813
Tex	Houston, Carey & Assocs.	713-460-1111
Wash	Vancouver, H.K.F. Inc.	503-228-1683

HAPCO, Box 1205, Boulder, Colo., 80302, Tel: 303-447-0441; Empl.: 4

For info on price: P. Wojtisek; Application info: P. Wojtisek; Customer service: J. Snyder; Delivery info: P. Wojtisek

Products manufactured: Drafting Machines, Drafting Symbols, Dry Transfer, Pressure Sensitive, etc. (Including Lettering), Drills & Accessories, Hand & Power, Eyelets, Templates, Printed Circuit Design

HARBISON IND'L. PRODS., INC., 7205 Hibbs La., Levittown, Pa., 19057, Tel: 215-943-9000; Empl.: 115

p. 1•1544; p. 2•397

Products manufactured: Bobbins, Winding, Coil & Transformer, Coils Including Assemblies & Forms, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Tex	Richardson, Corvin Assocs.	214-424-8333
-----	----------------------------	--------------

HARDMAN INC., Belleville, N.J., 07109, Tel: 201-751-3000; Empl.: 85; Minimum order: \$25

Customer service: T. M. Stefanelli

Free literature available: Double/Bubble: 2-part epoxy adhesive job-sized packet DPR Compounds: Pourable elastomers for mold-making Epoweld: Two-part, non-sag epoxy adhesive

Products manufactured: Adhesives (All Types), Chemicals, Cleaners & Solvents, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Insulators & Insulation, Kits, Cable-End Sealing, Meters, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Rubber, Seals, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Cal	Los Altos, Astroel, Inc.	415-948-3636
Conn	Hartford, C. Segal Co.	203-236-2027
Fla	Maitland, D & E Assocs.	305-644-3039
Ill	Chicago, Techrep Inc.	312-761-0548
Mass	Newtonville, C. Segal Co.	617-969-6900
Mich	Ferndale, Tiby Co.	313-547-3550
NJ	Flemington, Eric Sheard	201-782-6492
NJ	Old Bridge, Seaco	201-679-8800
NY	Copake Falls, A.L. Perkins Co.	518-329-1428
NY	New York City, Henley & Co.	212-986-5544
Ohio	Cleveland, Tiby Co.	216-371-5325
Ohio	Dayton, Tiby Co.	513-277-3832
SC	Myrtle Beach, Candor Co.	803-448-8361
Tex	Dallas, Apogee Engrg. Svcs.	214-352-2083
Wash	Seattle, Atlas Packing & Rubber Co.	206-623-4697

Wash Seattle, Houston Co. 206-622-0750

FOR: Can., Toronto, Ont., Ware Chemical of Can. Ltd.

416-233-1234

HAROWE SERVO CONTROLS, 48 Westtown Rd., W. Chester, Pa., 19380, Tel: 215-692-2700, TWX: 510-663-0335; Empl.: 350; Minimum order: \$100

For info on price: B. Schmitt; Application info: H. Smith; Customer service: B. Schmitt; Delivery info: B. Schmitt

Free literature available: Precision synchros, resolvers, brushless synchros, stepper motors and controllers, motor generators, integrating tachometers, precision speed reducers and counters for Servo Systems and Components.

Products manufactured: Controls/Control Eqpt., Encoders, Motors, Resolvers, Synchro, Synchros, Tachometers

Local Sales Offices & Reps.

Ariz	Scottsdale, Fred Schoeffler Assoc. Inc.	602-948-3470
Cal	Hollywood, Westaironics	213-466-6201
Cal	Denver, Franklin Sls.	303-922-3623
Conn	Bloomfield, Zaslow Sls.	203-242-7781
Fla	Ormond Beach, Technology Mktg. Assoc.	904-672-2314
Ill	Chicago, Carlson Elctn.	312-594-4812
Ind	Ft. Wayne, McDonald Sls.	219-745-9214
Mass	Lowell, Zaslow Sls. Co.	617-458-8452

Minn Minneapolis, Nortec Sls. Inc. 612-926-2855
 Mo St. Louis, Carlson Electrn. Sls. 314-991-0262
 NJ Fairfield, R.C. Assocs. 201-664-1241
 NY Jericho, Electro Rep. 516-938-0540
 Ohio Cleveland, Rockford Controls 216-731-5250
 Ohio Dayton, Rockford Controls 513-274-1931
 Tex Addison, Parvin Sls. Co. 214-239-9148
 Tex Dallas, Kukla Electrn. 214-661-3257
 FOR: Can., Pierrefonds, Que., Avotronics Ltd. 514-626-6511
 FOR: Can., Willowdale, Ont., Avotronics Ltd. 416-491-7941

HARREL, INC., 16 Fitch St., E. Norwalk, Conn., 06855, Tel: 203-866-2573

Customer service: W.J. Becker

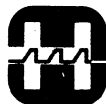
Free literature available: General bulletin-single sheet summary of available products.

Products manufactured: Alarms, Bridges, Controllers, Programmable, Controls/Control Eqpt., Counters, Data Acquisition & Reduction Systems, Data Loggers, Dials, Gages, Meters, Monitors, Probes, Process Control Systems, Programmers, Pyrometers, Recorders, Standards, Thermistors, Timers, Transducers

Local Sales Offices & Reps.

Ala Birmingham, McConnel Sls. 205-871-3501
 Cal Sherman Oaks, Windsor Dynamics, Inc. 213-989-3631
 Cal Walnut Creek, Viking Instr. 415-933-1221
 Colo Denver, Electro-Rep. 303-744-2821
 Fla Hialeah, Shaw Engrg. & Sls. 312-668-6622
 Ill Glen Ellyn 608-823-6451
 Ky Williamstown, C. Burnett Agency 314-731-2237
 Mo Hazelwood, Carter Electrn. 505-256-1749
 NM Albuquerque, Electro-Rep. 315-065-8602
 NY Cazenovia, P.M. Decew, Inc. 704-847-4464
 NC Matthews, Datatech 216-942-0920
 Ohio Willoughby 713-468-1703
 Tex Houston, Hatfield & Co. 713-468-1703

HARRINGTON & KING & PERFRTING CO., 5655 Fillmore St., Chicago, Ill., 60644



HARRIS
 COMMUNICATIONS AND
 INFORMATION HANDLING

HARRIS CORP., Computer Systems Div., 1200 Gateway Dr., Fort Lauderdale, Fla., 33309, Tel: 305-974-1700, TWX: 510-956-3096; FSC No: 29436; Empl.: 600

For info on price: A. S. Walder; Application info: J. D. Jones; Customer service: R. S. Patten; Delivery info: P. Stratford

Free literature available: Slash 4 Computer Systems; Slash 5 Computer Systems; DC-38-D Memory Systems; Vulcan (Virtual Core Manager) Operating Systems; Slash 4VMS (Virtual Memory Systems) Computer; Slash 4 Real Time Computer System; Disc Monitor System (DMS) Operating System.

Products manufactured: Computers, Memory Systems

Local Sales Offices & Reps.

Cal Newport Beach 714-752-0910
 Cal Santa Clara 408-984-2811
 Ill Oak Brook 312-323-3437
 Md Rockville 301-762-5600
 Mass Waltham 617-890-5410
 Mo St. Louis 314-961-9927
 NY Huntington 516-549-8787
 Ohio Cleveland 216-461-1510
 Pa King of Prussia 215-337-2180
 Tex Dallas 214-243-3478

HARRIS SEMICONDUCTOR, Box 883, Melbourne, Fla., 32901, Tel: 305-727-5430, TWX: 510-959-6259; Empl.: 1265; Minimum order: \$250

For info on price: Cust. Svcs.; Application info: E. Fernandez 305-727-5824; Customer service: B. DeGiovanni 305-727-5412; Delivery info: Cust. Svcs.

Products manufactured: Integrated Circuit Devices

Local Sales Offices & Reps.

Ariz Scottsdale, Harris Semiconductor 602-946-3556
 Cal Long Beach, Harris Semiconductor 213-426-7687
 Cal Palo Alto, Harris Semiconductor 415-964-6443
 Cal San Diego, Celtec 714-279-7961
 Colo Denver, Checkmate Sls. Inc. 303-771-4920
 DC Washington, Harris Semiconductor 202-337-3170
 Ill Schaumburg, Harris Semiconductor 312-894-8824

Kans Olathe, B. Rush Assocs. 913-782-1177
 Md Randallstown, Beacon North, Inc. 301-922-1248
 Mass Boston, Harris Semiconductor 617-237-5430
 Minn Deep Haven, Harris Semiconductor 612-473-4936
 NY Melville, Harris Semiconductor 516-249-4500
 NC Raleigh, R.W. Mitscher 919-828-0575
 Ohio Dayton, Harris Semiconductor 513-226-0636
 Ore Beaverton, N.R. Schultz Co. 503-643-1644
 Pa Philadelphia, Harris Semiconductor 215-687-6680

Tenn Shelbyville, R.W. Mitscher 615-684-4544
 Tex Richardson, Harris Semiconductor 214-231-9031

Utah Salt Lake City, Checkmate Sls., Inc. 801-268-3533
 Va Falls Church, Beacon North, Inc. 703-534-1673
 Va Troutville, R.W. Mitscher Co. 703-345-3283
 Va Virginia Beach, R.W. Mitscher Co. 804-481-7200

Wash Bellevue, N.R. Schultz Co. 206-454-0300
 FOR: Can., Mississauga, Ont., Munro Electric Component, Ltd. 416-676-1042

Local Distributors

Ala Huntsville, Hamilton/Avnet, 805 Oster Dr. NW 205-533-1170
 Ariz Phoenix, Hamilton/Avnet, 2615 S 21st St. 602-275-7851
 Ariz Phoenix, Liberty Electrn., 3130 N 27th Ave. 602-257-1272
 Ariz Phoenix, R.V. Weatherford, 1917 N 25th Dr. 602-272-7144
 Cal Anaheim, R.V. Weatherford, 1550 Babbitt Ave. 714-633-9633
 Cal Culver City, Avnet Electro Sls., 10916 W Washington Blvd. 213-558-2345
 Cal Culver City, Hamilton Electro Sls., 10912 W Washington Blvd. 213-558-2121
 Cal El Segundo, Liberty Electrn., 124 Maryland St. 213-322-8100
 Cal Glendale, R.V. Weatherford, 6921 San Fernando Rd. 213-849-3451
 Cal Mountain View, Elmar Electrn., 2288 Charleston Rd. 415-961-3611
 Cal Mountain View, Hamilton/Avnet, 340 E. Middlefield Rd. 415-961-7000
 Cal Palo Alto, R.V. Weatherford, 3240 Hillview Ave. 415-493-5373
 Cal Pomona, R.V. Weatherford, 1095 E Third St. 714-623-1261
 Cal San Diego, Hamilton/Avnet, 8917 Complex Dr. 714-279-2421
 Cal San Diego, Liberty Elec., 8248 Mercury Ct. 714-555-9171
 Cal San Diego, R.V. Weatherford, 7872 Raytheon Rd. 714-278-7400
 Colo Denver, Elmar Electronics, 6777 E 50th Ave. 303-287-9611
 Colo Denver, Hamilton/Avnet, 5921 N Broadway 303-534-1212
 Colo Englewood, R.V. Weatherford, 3905 S Mariposa 303-761-5432
 Conn Danbury, Schweber, Commerce Industrial Park 800-645-7381
 Conn Georgetown, Hamilton/Avnet, 643 Danbury Rd. 203-762-0361
 Conn Norwalk, Harvey Electrn., 112 Main St. 203-853-1515
 Fla Hollywood, Hamilton/Avnet, 4020 N 29th Ave. 305-925-5401
 Fla Hollywood, Schweber, 2830 N 28th Terr. 305-927-0511
 Ga Norcross, Hamilton/Avnet, 6700 I-85, Suite 2B 404-448-0800

Ill Elk Grove, Schweber, 1380 Jarvis Ave. 312-593-2740
 Ill Schiller Park, Hamilton/Avnet, 3901 N 25th Ave. 312-678-6310
 Kans Lenexa, Hamilton/Avnet, 37 Lenexa Indl. Ctr. 913-888-8900

Md Hanover, Hamilton/Avnet, 7255 Standard Dr. 301-796-5000
 Md Rockville, Schweber, 5640 Fisher La. 301-881-2970

Mass Burlington, Hamilton/Avnet, 185 Cambridge St. 617-273-2120
 Mass Lexington, Harvey, 44 Hartwell Ave. 617-861-9200

Mich Livonia, Hamilton/Avnet, 12870 Farmington Rd. 313-522-4700
 Mich Troy, Schweber, 86 Executive Dr. 313-583-9242

Minn Edina, Hamilton/Avnet, 7683 Washington Ave. S. 612-941-3801
 Minn Edina, Schweber, 7015 Washington Ave. S. 612-941-5280

Mo Hazelwood, Hamilton/Avnet, 392 Brookes Dr. 314-731-1144
 NJ Cedar Grove, Hamilton/Avnet, 218 Little Falls Rd. 201-239-0800
 NJ Mt. Laurel, Hamilton/Avnet, 113 Gaither Dr. E. Gate Indust. Pk. 609-234-2133
 NJ Somerset, Schweber, 43 Belmont Dr. 201-469-6008

NM Albuquerque, Hamilton/Avnet, 2450 Baylor Dr. S.E. 505-765-1500
 NM Albuquerque, R.V. Weatherford, 6101 Marble N.E. Marberry Plaza # 11 505-265-5671

NY E. Syracuse, Hamilton/Avnet, 6500 Joy Rd. 315-437-2642
 NY Rochester, Hamilton/Avnet, 167 Clay Rd. 716-442-7820

NY Rochester, Schweber, 2 Townline Cr. 716-461-4000
 NY Westbury, Hamilton/Avnet, 70 State St. 516-333-5800

NY Westbury Schweber, Jericho Tpk. 516-334-7474
 NY Woodbury, Harvey, 60 Crossways Pk. W. 516-921-8700

Ohio Beachwood, Schweber, 23880 Commerce Pk. Rd. 216-464-2970
 Ohio Cleveland, Hamilton/Avnet, 761 Beta Dr. 216-461-1400

Ohio Dayton, Hamilton/Avnet, 118 Westpark Rd. 513-433-0610
 Tex Dallas, Hamilton/Avnet, 4445 Sigma Rd. 214-661-8661

Tex Dallas, R.V. Weatherford, 10836 Grissom La. 214-243-1571
 Tex Houston, Hamilton/Avnet, 1216 W. Clay 713-526-4661

Tex Houston, R.V. Weatherford, 3500 WTC Jester Blvd. 713-688-7406
 Utah Salt Lake City, Hamilton/Avnet, 647 W. Billinis Rd. 801-262-8451

Wash Bellevue, Hamilton/Avnet, 13407 Northrup Way 206-746-8750
 Wash Seattle, Liberty Electrn., 5305 Second Ave. S. 206-763-8200

Wash Seattle, R.V. Weatherford, 541 Industrial Dr. 206-243-6340
 For: Can., Mississauga, Ont., Hamilton/Avnet 416-677-7432

For: Can., Montreal, Que. 514-331-6443
 For: Can., Ottawa, Ont., Hamilton/Avnet 613-725-3071

HARSHAW CHEMICAL CO., Div./Kewanee Oil Co., 1945 E. 9th St., Cleveland, Ohio, 44106, Tel: 216-248-7400, TWX: 216-248-7400

Customer service: R. Eaton

Free literature available: Data sheets describing complete line of synthetic optical crystals, IR and UV detectors, nuclear instrument modules, radiation detectors and dosimetry materials and systems.

Products manufactured: Amplifiers, Analyzers, Counters, Crystal Blanks, Crystals, Detectors, Generators, Lenses, Optical & Camera, Modules, Logic, Encapsulated, Scalars, Binary, Decade, Timers

Local Sales Offices & Reps.

Cal Los Angeles, C. D. Wright Optical Products 714-838-6340
 Cal Los Angeles, V. Overby 714-838-6340
 Cal San Francisco, R. Lowe 415-968-2171
 DC Washington, W. Todd Nuclear Products 703-356-9570
 Ga Atlanta, A. Barber 404-255-4616
 Ill Chicago, N. Pawluk 312-325-4179
 Mass Norwood, K. Babeux 617-769-5065
 NJ Ramsey, M. Aguinas 201-327-8850
 Ohio Cleveland, T. Stack Nuclear Prods. 216-248-7400

Ohio Solon, R. Kasulones Optical Prods. 216-248-7400
 Tex Houston, J. Owens 713-522-8377
 Wash Seattle, Showalter Instruments 206-624-9020

HARTMAN ELECTRICAL MFG., Div. A-T-O Inc., 175 N. Diamond St., Mansfield, Ohio, 44902, Tel: 419-524-1411, TWX: 810-448-2814

For info on price: D. Vogel; Application info: G. Danas; Customer service: G. Beck; Delivery info: G. Beck

Products manufactured: Actuators, Controls/Control Eqpt., Monitors, Motors, Relays, Solenoids, Switches, Timers

Local Sales Offices & Reps.

Ariz Phoenix, Airsupply Co. 606-267-3916
 Cal Dublin, Airsupply Co. 415-829-0870

Cal San Diego, Airsupply Co. 714-298-1121
 Cal San Monica, Airsupply Co. 213-829-1781
 Ga Marietta, Airsupply Co. 404-422-8242
 Ill Berkeley, Airsupply Co. 312-544-7400
 Ind Indianapolis, Airsupply Co. 317-248-8391
 Kans Wichita, Airsupply Co. 316-683-7518
 Mass Boston, Airsupply Co. 617-232-5020
 Minn Bloomington, Airsupply Co. 612-884-8950
 Mo Bridgeton, Airsupply Co. 314-731-3011
 NY Clinton, Airsupply Co. 315-735-8341
 NY Huntington Station, Airsupply Co. 516-249-1410
 Ohio Columbus, Airsupply Co. 614-861-1129
 Ohio Dayton, Airsupply Co. 513-224-0728
 Pa Valley Forge, Airsupply Co. 215-933-8924
 Tex Fort Worth, Airsupply Co. 817-335-4541
 Va Arlington, Airsupply Co. 703-525-1191
 Wash Bellevue, Airsupply Co. 206-454-7922
 EXP: Rye, N.Y., American Avitron 914-937-5300

HARWIL CO., 903 Colorado Ave., Santa Monica, Calif., 90401, Tel: 213-394-4710; Empl.: 5; Minimum order: \$5

Customer service: H. Hutchinson

Free literature available: 1) Coolant fluid flow switches for the electronic industry. Interlock & monitor coolant flow to ensure against very expensive overheating & failure. 2) Component Lead Bender - Eliminates trial and error lead bending. Fast, exact, thumbwheel adjusted spacing between beads.

Products manufactured: Controls/Control Eqp., Machines/Machinery, Production, Switches, Tools

HATHAWAY INDUSTRIES INC., 11616 51st St., Tulsa, Okla., 74145, Tel: 918-663-0110, TWX: 910-845-2129; Empl.: 450; Minimum order: \$25
 Customer service: F. D. Leynaert

Free literature available: Brochures on: terminal blocks- mosaic displays - PMDC motors.

Products manufactured: Amplifiers, Connectors, Meters, Motors, Oscillographs, Direct Writing, Paper, Graphic Recording, Recorders, Signal Conditioners & Equipment, Strips, Tachometers, Terminal Blocks, Boards & Strips, Terminals

Local Sales Offices & Reps.

Terminals

Ariz Phoenix, Airsupply Co. 602-267-3916
 Cal Dublin, Airsupply Co. 910-343-6861
 Cal Santa Monica, Airsupply Co. 213-670-6722
 Ga Marietta, Airsupply Co. 404-422-8242
 Ill Berkeley, Airsupply Co. 312-544-7400
 Ind Indianapolis, Airsupply Co. 317-248-8391
 Kans Wichita, Airsupply Co. 316-683-7518
 Mass Boston, Airsupply Co. 617-232-5020
 Minn Bloomington, Airsupply Co. 612-884-8950
 Mo Bridgeton, Airsupply Co. 314-731-3011
 NY Clinton, Airsupply Co. 315-735-8341
 NY Huntington, Airsupply Co. 516-249-1410
 Ohio Columbus, Airsupply Co. 614-861-1129
 Ohio Dayton, Airsupply Co. 513-224-0728
 Pa Valley Forge, Airsupply Co. 215-933-8924
 Tex Fort Worth, Airsupply Co. 817-335-4541
 Va Arlington, Airsupply Co. 703-525-1191
 Wash Bellevue, Airsupply Co. 206-454-7922

Motors

Ariz Phoenix, Airsupply Co. 602-267-3916
 Cal Dublin, Airsupply Co. 415-829-0870
 Cal Santa Monica, Airsupply Co. 213-670-6722
 Fla Orlando, Von Kamecke Assoc. 305-843-5294
 Ga Marietta, Airsupply Co. 404-422-8242
 Ill Berkeley, Airsupply Co. 312-544-7400
 Ind Indianapolis, Airsupply Co. 317-248-8391
 Kans Wichita, Airsupply Co. 316-683-7518
 Mass Boston, Airsupply Co. 617-232-5020
 Minn Bloomington, Airsupply Co. 612-884-8950
 Mo Bridgeton, Airsupply Co. 314-731-3011
 NY Clinton, Airsupply Co. 315-735-8341
 NY Huntington Sta., Airsupply Co. 516-249-1410
 Ohio Columbus, Airsupply Co. 614-861-1129
 Ohio Dayton, Airsupply Co. 513-224-0728
 Pa Valley Forge, Airsupply Co. 215-933-8924
 Tex Fort Worth, Airsupply Co. 817-335-4541
 Va Arlington, Airsupply Co. 703-525-1191
 Wash Bellevue, Airsupply Co. 206-454-7922
 FOR: Can., Rexdale, Ont., Frank Eakin Ltd. 416-245-3600

HATHAWAY INSTRUMENTS, INC., 5250 E. Evans Ave., Denver, Colo., 80222, Tel: 303-756-8301, TWX: 910-931-0568; Empl.: 150

For info on price: Sls. Dept.; Application info: L. G. Zacherl; Customer service: L. E. Carter; Delivery info: E. E. Poe

Free literature available: Power System Instrumentation, full line catalog

Products manufactured: Alarms, Annunciators, Comm. Systems, Data Loggers, Generators, Meters, Oscillographs, Direct Writing, Receivers, Recorders, Standards, Transmission Systems, Data, Transmitters

Local Sales Offices & Reps.

Cal El Monte, Randolph Inds. 213-283-7901
 Ga Atlanta, M.J. Fein & Co. 404-938-0190
 Ill Wilmette, M.J. Fein & Co. 312-256-5828
 Mass Holliston, M.J. Fein & Co. 617-236-2546
 NJ Livingston, M.J. Fein & Co. 201-994-3575
 NY Scarsdale, M.J. Fein & Co. 914-472-1100
 Wash Seattle, Sperry Co. 206-932-1101

HAWKEYE INSTRUS., INC., 3545 Third Ave., Marion, Iowa, 52302, Tel: 319-377-8241; Empl.: 18; Minimum order: \$25

Customer service: D. Meuler

Free literature available: Model 1800 bridge conditioner/amplifier bulletin; System 1830 dynamic recording system bulletin; System 910, digital data acquisition system bulletin; Frictional Strain Gage Bulletin; Concrete Strain Gage Bulletin.

Products manufactured: Amplifiers, Bridges, Data Acquisition & Reduction Systems, Data Loggers, Indicators, Meters, Oscillographs, Direct Writing, Power Supplies, Signal Conditioners & Equipment, Transducers

HAYDON SWITCH & INSTR., INC., 1500 Meriden Rd., Waterbury, Conn., 06705, Tel: 203-756-7441, TWX: 710-477-2580; FSC No: 02005; QPL No: Multiple; Empl.: 96

Free literature available: CAT72-2 - Resilient & Hermetically Sealed Basic Switches & Switch Assemblies. CAT306A - Digital Timers, Stop Clocks, Pulse Counters. CAT102A - Big Inch, Open Frame & Brushless DC Crystal Chronetic Controlled Motors.

Products manufactured: Clocks (All Types), Counters, Indicators, Meters, Motors, Process Control Systems, Relays, Switches, Timers

Local Sales Offices & Reps.

Ala Huntsville, Intecoth, Inc. 205-837-6061
 Cal Los Angeles, Fetty/Schoenduve, Inc. 213-651-4050
 Cal Palo Alto, Fetty/Schoenduve, Inc. 415-321-7041
 Colo Denver, A. G. Electronics 303-722-5814
 Fla Fern Park, M. G. Assocs. 305-841-8793
 Ill Des Plaines, Coombs Assoc. 312-298-4830
 Ind Fort Wayne, Coombs Assoc. 219-743-4611
 Md Baltimore, R.P. Luce & Co. 301-752-8200
 Minn Minneapolis, Revere Assocs. 612-781-2615
 Mo Kansas City, Automatic General Electr. Sls. Co. 816-333-8206
 Mo St. Louis, Coombs Assoc. 314-567-3657
 NY Mineola, Transaero, Inc. 516-248-0400
 NY Syracuse, J. V. Costello 315-472-0322
 Ohio Cleveland, A. H. Baier Co. 216-461-6161
 Ohio Dayton, A. H. Baier Co. 513-276-4128
 Pa Philadelphia, R.P. Luce & Co. 215-884-8365
 Wash Bellevue, Willis Sls. Co. 206-454-3029
 Wisc Greendale, Coombs Assocs. 414-421-2300
 EXP: N.Y., Mineola, Transaero 516-248-0400

HBS EQUIPMENT DIV., 3543 East 16th St., Los Angeles, Calif., 90023, Tel: 213-262-1151

HEADWAY RESEARCH, INC., 3713 Forest La., Garland, Tex., 75042, Tel: 214-272-5431
 Customer service: Sls. Dept.

Free literature available: Catalog - Complete information on Photo Resist Spinners and Wafer Cleaner/Dryers.

Products manufactured: Machines/Machinery, Production, Microcircuit Production Equip.

Local Sales Offices & Reps.

Cal Santa Ana, Nelson Engrg. 714-545-2550
 Cal Sunnyvale, Wilson Entprs. 408-732-9050

HEATH CO., Dept. 180, Benton Harbor, Mich., 49022, Tel: 616-983-3961; Empl.: 1500 p. 1720, 721, 874, 1232

For info on price: Cust Relations; Application info: Tech Correspondence; Customer service: Cust Svc Dept

Free literature available: 1975 Heathkit Catalog Describes over 350 easy-to-assemble electronic kits including color TVs, audio equipment, ham radio gear, test instruments, marine electronics and many more. Heath/Schlumberger Assembled Instruments Catalog Describes a complete line of laboratory and test instruments for research and educational applications.

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Alarms, Amplifiers, Analyzers, Antenna Rotators, Antennas, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Bridges, Cable, Calculators, Electrical & Electronic, Calibrators, Cleaners, Ultrasonic, Comm. Systems, Counters, Couplers, Decade Boxes, Dummy Loads, Electronic Switches (Oscilloscope), Eliminators, Battery, Generators, Inverters, Kits, Power Supply, Kits, Test Equipment, Meters, Microphones, All Kinds, Monitors, Oscilloscopes, Power Supplies, Probes, Receivers, Recorders, References, D-C Voltage, Soldering Guns, Irons & Desoldering Tools, Speaker Systems, Speakers, Technical Books, Test Equipment, Testers, Timers, Tools, Tracers, Curve, Transceivers, Tuners

Local Sales Offices & Reps.

Ariz Phoenix, Heathkit Electr. Center 602-279-6247
 Cal Anaheim, Heathkit Electr. Center 714-776-9420
 Cal El Cerrito, Heathkit Electr. Center 415-236-8870
 Cal La Mesa, Heathkit Electr. Center 714-461-0110
 Cal Los Angeles, Heathkit Electr. Center 213-749-0261
 Cal Pomona, Heathkit Electr. Center 714-623-3543
 Cal Redwood City, Heathkit Electr. Center 415-365-8155
 Cal Woodland Hills, Heathkit Electr. Center 213-883-0531
 Colo Denver, Heathkit Electr. Center 303-422-3408
 Conn Avon, Heathkit Electr. Center 203-678-0323
 Fla Hialeah, Heathkit Electr. Center 305-823-2280
 Fla Tampa, Heathkit Electr. Center 813-884-3102
 Ga Atlanta, Heathkit Electr. Center 404-252-4341
 Ill Chicago, Heathkit Electr. Center 312-583-3920
 Ill Downers Grove, Heathkit Electr. Center 312-852-1304
 Ind Indianapolis, Heathkit Electr. Center 317-257-4321
 Kans Mission, Heathkit Electr. Center 913-362-4486
 Ky Louisville, Heathkit Electr. Center 502-245-7811
 La Kenner, Heathkit Electr. Center 504-722-6321
 Md Baltimore, Heathkit Electr. Center 301-661-4446
 Md Rockville, Heathkit Electr. Center 301-881-5420
 Mass Wellesley, Heathkit Electr. Center 617-237-1510
 Mich Detroit, Heathkit Electr. Center 313-535-6480
 Mich E. Detroit, Heathkit Electr. Center 313-772-0416
 Minn Hopkins, Heathkit Electr. Center 612-938-6371
 Mo St. Louis, Heathkit Electr. Center 314-291-1850
 Neb Omaha, Heathkit Electr. Center 402-391-2071
 NJ Fair Lawn, Heathkit Electr. Center 201-791-6935
 NY Amherst, Heathkit Electr. Center 716-835-3090
 NY Jericho, Heathkit Electr. Center 516-334-8181
 NY New York, Heathkit Electr. Center 212-765-4590
 NY No. White Plains, Heathkit Electr. Center 914-761-7690
 NY Rochester, Heathkit Electr. Center 716-227-4750
 Ohio Cleveland, Heathkit Electr. Center 216-886-2590
 Ohio Columbus, Heathkit Electr. Center 614-475-7200
 Ohio Toledo, Heathkit Electr. Ctr. 419-537-1887
 Ohio Woodlawn, Heathkit Electr. Center 513-771-8850
 Pa Frazer, Heathkit Electr. Center 215-647-5555
 Pa Philadelphia, Heathkit Electr. Center 215-288-0180
 Pa Pittsburgh, Heathkit Electr. Center 412-824-3564
 RI Warwick, Heathkit Electr. Center 401-738-5150
 Tex Dallas, Heathkit Electr. Center 214-826-4053
 Tex Houston, Heathkit Electr. Center 713-623-2090
 Va Norfolk, Heathkit Electr. Ctr. 804-460-0997
 Wash Seattle, Heathkit Electr. Center 206-682-2172
 Wisc Milwaukee, Heathkit Electr. Center 414-873-8250

HECON CORP., 31 Park Rd., New Shrewsbury, N.J., 07724, Tel: 201-542-9200; Empl.: 200; Minimum order: \$20

For info on price: W. Goodman Ext. 263; Application info: J. Becker Ext. 233; Customer service: G. Leininger Ext. 283

Free literature available: Catalogs: Electromechanical totalizing & controlling counters, Digital tape & ticket printers, print decades & printing mechanisms, Pneumatic/fluidic counters. Brochures: Digital cassette recorder reproducers, Electronic industrial controllers (counters). Application Notes: Electromechanical counters.

Products manufactured: Counters, Printers, Recorders, Totalizers, Digital

Local Sales Offices & Reps.

Cal	Marina Del Rey, Hecon Western Corp.	213-823-5386
Cal	Mountain View, Hecon Western Corp., Recording Instrs. Div.	415-961-6015
Conn	Stratford, Hecon Corp.	203-375-2836
Fla	Bradenton, Hutto-Hawkins-Perego, Inc.	813-755-4015
Fla	Maitland, Hutto-Hawkins-Perego, Inc.	305-831-2474
Fla	Pompano Beach, Hutto-Hawkins-Perego, Inc.	305-943-9593
Ill	Hanover Park, Hecon Corp.	312-289-2859
Kans	Prairie Village, Engrg. Svcs. Co.	913-649-4000
Mass	Boston, Hecon Corp.	617-262-5043
Minn	St. Paul, Howard A. Cullen & Assoc.	612-646-7371
Mo	St. Louis, Engrg. Svcs. Co.	314-997-1515
NJ	Laurel Springs, Hecon Corp.	609-784-2334
NJ	Wayne, Hecon Corp.	201-839-5454
Ohio	Port Clinton, Hecon Corp.	419-734-4556
Okla	Tulsa, Hecon Corp.	918-627-2774
Ore	Beaverton, Fry Controls, Inc.	503-643-5448
EXP:	Can., Rexdale, Ont., Hecon of Can., Ltd.	416-678-2441

Local Distributors

Cal	Burlingame, Control Devices Pacific, Box 1584, Station A, 400 Burlingame Ave.	415-343-2773
Cal	Los Angeles, California Wholesale Elec. Co., Box 3581 Terminal Annex	213-723-6711
Cal	Los Angeles, Pacific Electrc. Sls., 1628 Silverlake Blvd.	213-663-8060
Cal	San Francisco, Master Dists., 364 Eleventh St.	415-626-0807
Cal	Santa Monica, Master Dists., 1553 17th St.	213-395-2637
Conn	Middletown, Mancib Co., Randolph & Coe Rds.	203-346-6646
Conn	Stratford, State Elctns. Parts Corp., 1269 Barnum Ave.	203-375-5961
Fla	Miami, Electro Standards Labs, 3560 N.W. 34th St.	305-633-6973
Ill	Addison, Lectron Controls Co., 524 S. Westgate St., Unit-C	312-543-8460
Ill	Chicago, D. Johns, Inc., 1320 West Lake St.	312-666-2210
Ill	Elgin, Allied Elctns. Corp., 1355 Sleepy Hollow Rd.	312-697-8200
Ill	Mount Prospect, Automation Equip. Co., 1301 Greenwood Ave.	312-398-7550
Ill	Park Ridge, Automation Comp Sls., 1731 Evergreen La.	312-823-8075
Ind	Indianapolis, Graham Elctns. Sup., 133 S. Pennsylvania	317-634-8202
Kans	Prairie Village, Parker & Foster, Inc., 7930 State Line	913-381-9330
Ky	Louisville, D. Johns of Kentucky, 1835 Cargo Ct.	502-491-3495
La	Kenner, Automation Specialists, 1939 3rd St. Box 790	504-721-3497
Md	Baltimore, E.I.L. Instrs., 1830 York Rd.	301-252-1260
Mass	Burlington, Mancib Co., "A" Street & Middlesex Turnpike	617-272-9450
Mass	Worcester, F. X. Bonneau Assocs., Box 163, West Side Station, #8 Suburban Rd.	617-754-7655
Mich	Detroit, E & E Engrg., Inc., 11941 Harper Ave.	313-371-2000
Minn	St. Paul, Power/Mation Div., 1441 Iglehart Ave.	612-645-0781
Minn	St. Paul, United Elec. Corp., 512 Sibley St.	612-333-1111
Mo	University City, E. W. Mooney Co., 7505 Delmar Blvd.	314-725-8875
NJ	Hanover, State Elctns. Parts Corp., 36 Route 10	201-887-2550
NJ	Piscataway, Fromm Electric Supply Co., 50 Seelye Ave.	201-981-0400
NY	Albany, Edwin E. Taylor Co., 465 Central Ave.	518-489-5601
NY	Buffalo, KOM Lamb, Inc., 1865 Kenmore Ave.	716-874-3530
NY	Scarsdale, Logicomp Elctns., 52 Fayette Rd.	914-723-3334
NC	Winston-Salem, Kirkman Elctns., 901 W. 2nd St., Drawer K Salem Sta.	919-724-0541
Ohio	Cincinnati, United Radio, Inc., Summit Road & Reinhold Dr.	513-761-4030
Ohio	Dayton, Summit Inds., Inc., 4545 Gateway Circle	513-434-8192
Ohio	Highland Heights, R/D Elctns. Div., Radio Distr. Co., 653 Alpha Dr. #67	216-461-9090
Ohio	Richfield, Capwell Dists., 3031 Cleveland-Massillon Rd.	216-659-4158

Ohio	Toledo, Toldedo Ind'l. Repair Svc., 2388 Airport Hwy.	419-382-2261
Ohio	Warren, Rem Electronics Supply Co., 525 S. Park Ave.	216-399-2777
Okla	Tulsa, Radio, Inc., 1000 S. Main St.	918-587-9123
Ore	Portland, Platt Electric Supply, 1305 N.W. Davis Box 3167	503-228-6121
Pa	Philadelphia, Royal Electric Supply Co., 3233 Hunting Park Ave.	215-221-1200
Pa	Philadelphia, Royal Electric Supply Co., 3300 W. Clearfield St.	215-221-1200
Pa	Reading, Barbey Elctns., G. D. Barbey Co., 333 N. Fourth St.	215-376-6116
Pa	Wilkesburg, Fuller Instr. Svc., Inc., 1125 North Ave.	412-241-6789
SC	Greenville, Barker Controls, Box 3884 Park Pl.	803-244-6495
Tex	Beaumont, Ralph's Ind'l. Elctns., Box 3631, 1293 Broadway	713-833-9443
Tex	Dallas, Dallas Instrs., 10205 Plano Rd.	214-341-0504
Tex	Dallas, Wholesale Elctn. Co., 2809 Ross Ave.	214-824-3001
Tex	Houston, Ralph's Ind'l. Elctns., 4400 Wayside Dr., Suite 102	713-641-0267
Tex	Houston, T & J Instrs., 6316 Alder	713-666-2308
Tex	Odessa, Automation Engrg., A Div. Kobe, Inc., 2310 Steven Rd.	915-363-7391
Va	Alexandria, E.I.L. Instrs., 5390 Cherokee Ave.	703-354-4330
Va	Richmond, Avec Elctns. Corp., 2002 Staples Mill Rd.	804-359-6071
Wash	Seattle, Platt Elec. Supply, 2767 6th St. So.	206-624-4083
Wisc	Cedarburg, Automation Engrg. Co., Box 322, 1220 Hwy. 143	414-377-7500

Advertisement

**IMMEDIATE DELIVERY
IMMEDIATE DELIVERY
HECON Stocking Distributor
LOGICOMP ELECTRONICS INC.**
Box 37H, Scarsdale, N. Y. 10583
Phone - 914 SC3-3334
Off the shelf delivery of HECON
totalizing, predetermining,
bi-directional and electronic counters.
automatic recycling units, reset units
and accessories.

HEEGER INC., 720 Ceres Ave., Los Angeles, Cal., 90021,
Tel: 213-627-9310

Products manufactured: Boxes, Junction, Outlets & Wall Plates, Cabinets & Accessories, Cans, Capacitor, Relay, Semiconductor, Transformer, etc., Cases, Equipment, Instrument, Meter, Chassis, Metal, Cleaners & Solvents, Containers, Coolants, Circuit & Components, Flux, Brazing & Soldering Materials, Grilles, Handles For Cabinets, Circuit Boards, Racks, etc., Panels, Racks, Refrigerants, Spray

Local Sales Offices & Reps.

Ala	Birmingham, J.F. Russel Co.	205-879-1366
Ariz	Phoenix, B.G. Sls. Co.	602-266-5624
Cal	Burlingame, Carelli EMA	415-697-8862
Cal	Aurora, A.E.S.	303-366-0208
Fla	Ft. Lauderdale, Unirep	
Ill	Skokie, M. Fields Co.	312-OR4-3018
Ind	Mulberry, Maish Sls.	
Mass	Farmington, Northeastern Rep	617-877-4850
Mich	Bloomfield Hills, S.F. McMedhan	313-852-4308
Minn	Minneapolis, A.J. Warner	
Mo	St. Louis, K. Kelly & Co.	
NY	Camillus, W.M. Ferguson	914-779-7330
NY	Yonkers, J. Bron Elctn.	914-779-7330
NC	Charlotte, De Witt-Austin Co.	704-366-4643
Ohio	Columbus, J.A. Mandabach	614-235-0265
Ore	Portland, J.W. Eckersley	503-246-3183
Pa	Holland, Parnell Sls. Co.	215-355-9330
Tex	Houston, B. Wylds Co.	

HEI, INC., Jonathan Ind'l. Ctr., Chaska, Minn., 55318, Tel: 612-448-3510, TWX: 910-578-0832; Empl: 175

Products manufactured: Alarms, Circuits, Hybrid, Thick Film, Controls/Control Eqp., Counters, Detectors, Diodes, Encoders, Kits, Training Aid, Punched Card Equipment, Readers, Transistors

Local Sales Offices & Reps.

Cal	Burlingame, Leddy Assocs.	415-347-5247
Cal	Carmichael, Leddy Assocs.	916-944-1694
Cal	Torrance, O'Donnell Assocs.	213-323-9243
Fla	Clearwater, WMM Assocs.	813-726-8871

Ill	Chicago, G. MCL Cole Co.	312-774-3535
Md	Baltimore, Stitzer Assocs.	301-823-2600
Mass	West Concord, Sls. Engrg.	617-369-3943
Mich	Novi, Multimore Sls.	313-762-2446
Mo	Florissant, Miller Assocs.	314-355-1642
NJ	Dover, Diamond Inc.	201-366-7518
NY	Bayside, Diamond Inc.	212-423-7330
NY	Fairport, Franklin Sls.	716-377-6584
NY	Syracuse, Franklin Sls.	315-472-5273
NY	Whitesboro, Franklin Sls.	315-736-5460
Ohio	Cleveland, A.H. Baier Co.	216-461-6161
Ohio	Dayton, A.H. Baier Co.	513-276-4128
Pa	Paoli, Stitzer Assocs.	215-644-5500
Tex	Dallas, W. Reese Assocs.	214-638-6575
Tex	Houston, W. Reese Assocs.	713-621-3134
Wash	Bellevue, Hays Ind'l.	206-455-3908
Wisc	Milwaukee, G. Mcl. Cole Co.	414-545-6083

HEINEMANN ELEC. CO., 2636 Brunswick Pike, Trenton, N.J., 08602, Tel: 609-882-4800; FSC No: 74193; Empl: 624; Minimum order: \$35 p. 1-1730,2061

For info on price: D. Vertuca Ext. 272; Application info: C. Littlewood Ext. 274; Customer service: R. Warner Ext. 270; Delivery info: G. Rosinski Ext. 265

Free literature available: Bulletin 303 Short Form Catalog

Products manufactured: Circuit Breakers, Motors, Protectors, Relays

Local Sales Offices & Reps.

Ala	Birmingham, J. Spader Co.	205-879-1366
Ariz	Phoenix, Martin & Assocs.	602-277-5421
Cal	Burlingame, Campbell & George	415-697-2965
Cal	Encino, Porter Co.	213-768-2350
Cal	Denver, P.A. Douden	303-744-1497
Fla	Boca Raton, Conley & Assoc. Inc.	305-305-6108
Fla	Oviedo, Conley & Assocs., Inc.	305-365-3283
Fla	Tampa, Conley	813-933-3183
Ga	Decatur, Spader & Associates	404-296-3024
Ill	Chicago, D. Dolin Sls.	312-286-6200
Ind	Marion, O. Bromberg	317-664-5384
Ky	Louisville, O. Bromberg	502-245-8916
Md	Ellicott City, McCourt	301-465-4515
Mass	Sturbridge, Branford Controls Co.	617-347-7367

Mich	Detroit, L. H. Dickelman Co.	313-255-3300
Minn	Minneapolis, H. Smith	612-881-3620
Mo	St. Louis, Hill & Co.	314-621-1818
NJ	Ridgewood, Ballou, Inc.	201-444-6990
NJ	Trenton, Krieger Sls.	609-882-6330
NY	Binghamton, Canavan Scanlon	607-724-7220
NY	Rochester, Canavan-Scanlon	716-442-0720
NY	Syracuse, Canavan-Scanlon	315-437-1271
NC	Charlotte, J. Rudisill Assocs., Inc.	704-377-6901
Ohio	Cincinnati, O. Bromberg	513-771-9333
Ohio	Cleveland, Brown Elect. Prod.	216-861-0114
Okla	Tulsa, Comps. Inc.	918-583-9149
Pa	Pittsburgh, Brown Elec. Equip.	412-563-4444
Tex	Dallas, Glidden Electro Equip.	214-363-6539
Tex	Houston, Glidden Electro Equip.	713-681-1415
Wash	Mercer Island, J. Andersen	206-232-0484
Wisc	Milwaukee, Control Sales	414-964-3322

HEITZ, INC., KARL, 979 Third Ave., New York, N.Y., 10022, Tel: 212-421-5220

Customer service: M. Schlappfer

Free literature available: Pricelists and brochures on all our products.

Products manufactured: Cameras, Controls/Control Eqp., Lenses, Optical & Camera, Magnifying Glasses, Inspection, Recorders

HELI-COIL PRODS., Div. Mite Corp., Shelter Rock La., Danbury, Conn., 06810, Tel: 203-743-7651, TWX: 710-456-0336; FSC No: 01556; Empl: 300; Minimum order: \$15

For info on price: D. Lxall; Application info: A. Mussnug; Customer service: D. Lxall; Delivery info: D. Lxall

Products manufactured: Fasteners

Local Sales Offices & Reps.

Cal	El Monte, Western Regional Office	213-579-0181
Ga	Atlanta, J. O. King, Inc.	404-355-7660
Ill	Downers Grove, S. W. Anderson Co.	312-964-2600
Mich	Detroit, A. A. Geisler Co.	313-255-1450
Tex	Arlington, Burgess Power Equip.	817-261-8241
EXP:	New York, N.Y., Resources & Facilities	212-687-4741

HELICAL PRODS. CO., INC., Box 2296, Santa Maria, Cal., 93454, Tel: 805-925-8651; FSC No: 13201; Empl: 15

For info on price: D. Merrell; Application info: G. Boehm; Customer service: D. Merrell

Free literature available: Question and answers about flexible shaft couplings - the who, what and how of flexible couplings and how we approach the solution. MC series - motor couplings "A" series - aluminum commercial couplings Precision & Instrument - precise and under Mil Spec.

Products manufactured: Couplings, Springs (All Types)

Local Sales Offices & Reps.

Conn	Bloomfield, Zaslow Sls. Co.	203-242-7781
Conn	Milford, Zaslow Sls. Co.	203-878-1094
Ill	Chicago, Engineered Sls.	312-867-8434
Md	Baltimore, R. P. Luce Co.	301-752-8200
Mass	Lowell, Zaslow Sls. Co.	617-458-8452
Mass	Northboro, Zaslow Sls. Co.	617-393-8150
Minn	St. Paul, W. Taubert	612-636-6414
NJ	Berkeley Hts., R. P. Luce & Co.	201-464-6440
NY	DeRuyter, R. P. Kennedy Co.	315-682-2920
NY	New Hook, R. P. Kennedy Co.	914-758-8229
NY	New Hyde Park, R. P. Luce & Co.	516-437-4550
NY	Rochester, R. P. Kennedy Co.	716-271-6322
Ohio	Fairburn, Tech. Assocs.	513-878-2484
Pa	Philadelphia, R. P. Luce & Co.	215-884-8365

HELIX SPRING CORP., 35-10 10th St., Long Island City, N.Y., 11106, Tel: 212-YE2-0303; Empl.: 25; Minimum order: \$50

Customer service: J. Freudenberger

Products manufactured: Coils Including Assemblies & Forms, Forms, Wire, Springs (All Types)

HELM INSTR. CO., 4511 South Ave., Toledo, Ohio, 43615, Tel: 419-531-0146; Empl.: 14

Products manufactured: Accelerometers, Alarms, Amplifiers, Analyzers, Calibrators, Cells, Load, Controls/Control Eqpt., Counters, Indicators, Monitors, Testers, Transducers

Local Sales Offices & Reps.

Ark	Little Rock, M. Robinson Co.	501-666-2170
Cal	La Jolla, R.S. Purinton	714-459-9185
Ill	Lagrange, Olson Eng.	312-482-3300
Ind	Fort Wayne, G.A. Stacy & Asc.	219-483-8331
Mo	St. Louis, Woodsons Machinery Co.	314-822-8836
NJ	Wyckoff, Vard-Smith Assocs.	
Pa	Oreland, N.H. Rogers & Co.	
Pa	Pittsburgh, WKM Asc. Inc.	412-892-2953
Tex	Houston, Mepeco	713-941-6969

HENES MFG. CO., 4301 E. Madison St., Phoenix, Ariz., 85034, Tel: 602-275-4126; Empl.: 25

Products manufactured: Heat Guns, Production, Tools, Torches, Soldering, Welding & Access., Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

Local Sales Offices & Reps.

Ariz	Scottsdale, Allen Assocs.	602-994-1305
Cal	Costa Mesa, Scrantom Engrg. Inc.	714-979-6373
Cal	Los Altos, C.D. Buerki Co.	415-941-3343
Conn	Bridgeport, Tech. Instrs., Inc.	203-368-4582
Ill	Roselle, Automated Process, Inc.	312-885-1095
Ind	Cumberland, Automated Process, Inc.	317-251-0708
Mass	Wilmington, Tech. Instrs., Inc.	617-944-3930
Minn	Minneapolis, Automated Process, Inc.	612-545-4481
Mo	Hazelwood, Production Automation Corp.	314-731-2331
Mo	Raytown, Production Automation Corp.	816-737-0066
NJ	Saddle Brook, L & M Assocs.	201-843-8700
NY	Brentwood, L & M Assocs.	516-231-8363
NY	New York, L & M Assocs.	212-675-7486
NC	Raleigh, F.G. Speidel	919-787-4521
Ohio	Dayton, H. Noyes & Assocs.	513-274-2871
Ore	Yamhill, Walsh-Ehlers, Inc.	503-662-3207
Pa	Andalusia, L & M Assocs.	215-639-3100
Tex	Dallas, R.W. Mureen Co.	214-369-7561
Wash	Bellevue, Walsh-Ehlers, Inc.	206-454-2211
Wisc	Milwaukee, Automated Process, Inc.	414-354-4370
EXP:	New York, N.Y., E.D. Allmendinger, Inc.	212-269-0090

HENSCHEL CORP., 14 Cedar St., Amesbury, Mass., 01913, Tel: 617-388-1103, Telex: 94-7444; FSC No: 28199; QPL No: Multiple; Empl.: 120; Minimum order: \$35

For info on price: F. L. Clark; Application info: F. L. Clark; Customer service: W. A. Ross; Delivery info: W. A. Ross

Free literature available: Catalog sheets enclosed are used to respond to technical inquiries.

Products manufactured: Alarms, Amplifiers, Annunciators, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Comm. Systems, Data Loggers, Indicators, Synchros

Local Sales Offices & Reps.

Cal	Los Angeles, Allied Ind.	213-685-4460
Cal	San Francisco, Dahl Beck Etc. Co.	415-392-5214
La	New Orleans, Carstone Corp.	504-525-2231
NJ	Jersey City, Henschel Corp.	201-434-1113
NJ	Morristown, C. Giffillan	609-235-3376
Ohio	Cleveland, Electro-Marine Corp.	216-631-3082
Wash	Bellevue, Ralston Cunningham Assocs.	206-455-0316
Wisc	Superior, Benson Elec. Co.	715-394-5548
FOR:	Can., Montreal, J.E. Fouchaux (Can) Ltd.	514-844-7569

HERALD ELECTRONICS, 6611 N. Lincoln Ave., Chicago, Ill., 60645, Tel: 312-675-1100; Empl.: 13

For info on price: H. Katz; Customer service: C. Ward

Products manufactured: Amplifiers, Cable, Meters, Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds, Mixers, Phonographs, Parts & Accessories, Speaker Systems, Speakers, Transformers

Local Sales Offices & Reps.

Cal	Foster City, Olson Sls.	415-573-1600
Fla	Pembroke Pines, Joe Wanger Sls.	305-987-8766
Ga	Norcross, Dean Cooper Co.	404-448-5460
Ind	Indianapolis, Ronald Munn Co.	317-897-9326
Mich	Detroit, Markal Sls.	312-282-5800
NY	Middle Village, BCD Sls.	212-894-1331
Ohio	Medina, Tom Grant & Assoc.	216-725-6528
Tex	Houston, Buck Rogers Co.	713-626-5370
EXP:	Chicago, Ill., Magno's & Assoc.	312-334-1503

HERMES ELECTRONICS LTD., Suite 315, 2020 F. Street N.W., Washington, D.C., 20006

HERMETIC SEAL CORP., 4232 Temple City Blvd., Rosemead, Cal., 91770, Tel: 213-283-0411, TWX: 910-587-3352; Empl.: 100

Products manufactured: Connectors, Feedthrus & Seals, Environmental, Headers, Lead Assemblies & Receptacles, Packages, Integrated Circuit, Seals, Services, Assembly, Production & Test, Terminals

HERTZ FILTER, 3 Aerial Way, Syosset, N.Y., 11791, Tel: 516-822-4770; Empl.: 22 p. 1-562,563

For info on price: B. Dworkin; Application info: R. Friedman; Delivery info: B. Dworkin

Products manufactured: Filters

HEWLETT PACKARD, 974 E. Arques Ave., Sunnyvale, Cal, 94086

HEWLETT-PACKARD CO., 1501 Page Mill Rd., Palo Alto, Cal., 94304, Tel: 415-493-1501, TWX: 910-373-1267; Empl.: 28000

Products manufactured: Amplifiers, Analyzers, Arresters, Electrical Surge, Lightning, Attenuators, Bolometers, Bridges, Cabinets & Accessories, Cable Fault Locators, Calculators, Electrical & Electronic, Calibrators, Cameras, Carriages, Probe, Carts & Dollies, Instrument & Equipment, Cases, Equipment, Instrument, Meter, Circuits, Hybrid, Thin-Film, Clamps & Clips, Comparators, Computers, Controls/Control Eqpt., Converters, Counters, Couplers, Current Sources, Data Acquisition & Reduction Systems, Data Loggers, Delay Lines, Detectors, Digitizers, Pencil Follower (Inc. Coordinate & Graphic), Diodes, Display Devices/Displays, Drivers & Decoders For Readouts, Gages, Generators, Holders, Crystal, Insertion Loss Measurement Systems, Integrators, Electronic, Interferometer Systems, Isolators, Kits, Training Aid, Lamps, Leads, Test & Adaptors, Lights, Locators, Open-Short, Memory Systems, Meters, Mounts, Oscillators, Oscillographs, Direct Writing, Oscilloscope Plug-Ins, Oscilloscopes, Paper, Graphic Recording, Power Supplies, Printers, Probes, Punched Card Equipment, Racks, Readers, Receivers, Recorders, RFI Measuring Equipment, Services, Assembly, Production & Test, Shifters, Signal Averagers, Signal Conditioners & Equipment, Slotted Lines, Microwave, Smith Chart Impedance Plotters, Automatic, Spectrometers, Standards, Switches, Synthesizers, Tape Recording Accessories, Tape Winders, Tees, Telephone Channel Test & Simulator Equipment, Teletypewriters & Equipment, Terminals, Test Equipment, Test Systems, Testers, Thermometers, Resistance, Timers, Totalizers, Digital, Tracers, Curve, Transducers, Transistors, Viewing Hoods, Cathode Ray Tube, Waveguides & Adaptors, X-Ray Inspection Equipment

Local Sales Offices & Reps.

Ala	Huntsville	205-881-4591
Ariz	Phoenix	602-244-1361
Ariz	Tucson	602-889-4661
Cal	Fullerton	714-870-1000
Cal	Los Angeles	213-776-7500
Cal	North Hollywood	213-877-1282
Cal	Sacramento	916-482-1463
Cal	San Diego	714-279-3200
Cal	Santa Clara	408-249-7000
Colo	Englewood	303-771-3455
Conn	New Haven	203-389-6551
Fla	Ft. Lauderdale	305-731-2020
Fla	Orlando	305-859-2900
Ga	Atlanta	404-434-4000
Haw	Honolulu	808-955-4455
Ill	Skokie	312-677-0400
Ind	Indianapolis	317-546-4891
Iowa	Iowa City	319-338-9466
La	Kenner	504-721-6201
Md	Baltimore	301-944-5400
Md	Rockville	301-948-6370
Mass	Lexington	617-861-8960
Mich	Farmington	313-476-6400
Minn	St. Paul	612-645-9461
Mo	Kansas City	816-763-8000
Mo	Maryland Hgts.	314-567-1455
NJ	Cherry Hill	609-667-4000
NJ	Paramus	201-265-5000
NM	Albuquerque	505-265-3713
NM	Las Cruces	505-526-2485
NY	Albany	518-458-1550
NY	Endicott	607-754-0050
NY	New York	201-265-5000
NY	Poughkeepsie	914-454-7330
NY	Rochester	716-473-9500
NY	Syracuse	315-454-2486
NY	Woodbury	516-921-0300
NC	High Point	919-885-8101
Ohio	Cleveland	216-243-7300
Ohio	Columbus	614-436-1041
Ohio	Dayton	513-859-8202
Okl	Oklahoma City	405-721-0200
Ore	Tualatin	503-620-3350
Pa	King of Prussia	215-265-7000
Pa	Pittsburgh	412-782-0400
SC	Columbia	803-782-6493
Tex	Houston	713-781-6000
Tex	Richardson	214-231-6101
Tex	San Antonio	512-434-8241
Utah	Salt Lake City	801-487-0715
Va	Richmond	803-285-3431
Wash	Bellevue	206-454-3971
Wisc	Milwaukee	414-541-0550
FOR:	Can., Calgary, Alb.	403-287-1672
FOR:	Can., Dartmouth, N.S.	902-459-7820
FOR:	Can., Edmonton, Alb.	403-452-3670
FOR:	Can., Mississauga, Ont.	416-678-9430
FOR:	Can., Ottawa, Ont.	613-255-6530
FOR:	Can., Pointe Claire, Que.	514-697-4232

FOR: Can., St-Foy, Que.418-688-8710
 FOR: Can., Vancouver, B.C.604-254-0531
 FOR: Can., Winnipeg, Man.204-786-7581

HEWLETT PACKARD, 5301 Stevens Creek Blvd, Santa Clara, Cal., 95050

HEWLETT-PACKARD CO., Calculator Prods. Div., Box 301, Loveland, Colo., 80537, Tel: 303-667-5000, TWX: 910-930-9020

Free literature available: "HP Calculator-Aided Design: Computing Power For Engineers In Electronics" provides an overview of HP calculators in such design areas as: Analog Networks, Logic Designs, Microwave circuits, and Transformer design.

Products manufactured: Calculators, Electrical & Electronic, Computers

Local Sales Offices & Reps.

Ala	Huntsville	205-881-4591
Ariz	Phoenix	602-244-1361
Ariz	Tucson	602-889-4661
Cal	Fullerton	714-870-1000
Cal	Los Angeles	213-776-7500
Cal	North Hollywood	213-877-1282
Cal	Palo Alto	415-327-6500
Cal	Sacramento	916-482-1463
Cal	San Diego	714-279-3200
Conn	New Haven	203-389-6551
Fla	Ft. Lauderdale	305-731-2020
Fla	Orlando	305-859-2900
Ga	Atlanta	404-436-6181
Haw	Honolulu	808-955-4455
Ill	Skokie	312-677-0400
Ind	Indianapolis	317-546-4891
La	Kenner	504-721-6201
Md	Baltimore	301-944-5400
Md	Rockville	301-948-6370
Mass	Lexington	617-861-8960
Mich	Farmington	313-476-6400
Minn	St. Paul	612-645-9461
Mo	Kansas City	816-763-8000
Mo	Maryland Heights	314-567-1455
Nev	Las Vegas	702-382-5777
NJ	Englewood	303-771-3455
NJ	Paramus	201-265-5000
NM	Albuquerque	505-265-3713
NM	Las Cruces	505-526-2485
NY	Albany	518-458-1550
NY	Endicott	607-754-0050
NY	Poughkeepsie	914-454-7330
NY	Rochester	716-473-9500
NY	Syracuse	315-454-2486
NY	Woodbury	516-921-0300
NC	High Point	919-885-8101
Ohio	Cleveland	216-243-7300
Ohio	Columbus	614-846-1300
Ohio	Dayton	513-859-8202
Okl	Oklahoma City	405-721-0200
Ore	Tualatin	503-620-3350
Pa	East Providence	401-434-5535
Pa	King of Prussia	215-265-7000
Tenn	Memphis	901-274-7472
Tex	Houston	713-781-6000
Tex	Richardson	214-231-6101
Tex	San Antonio	512-434-4171
Utah	Salt Lake City	801-487-0715
Va	Richmond	804-285-3431
Wash	Bellevue	206-454-3971
WVa	Charleston	304-345-1640
Wisc	Milwaukee	414-541-0550

HEWLETT-PACKARD CORP., Colorado Springs Div., 1900 Garden of the Gods Rd., Colorado Springs, Colo., 80907

Products manufactured: Analyzers, Cameras, Display Devices/Displays, Generators, Oscilloscope Plug-Ins, Oscilloscopes, Probes, Pulsers, Logic Test, Testers

H-PACKARD, 19310 Pruneridge Ave., Cupertino, Cal., 95014

HEWLETT-PACKARD, HPA Div., 640 Page Mill Rd., Palo Alto, Cal., 94304, Tel: 415-493-1212, TWX: 910-373-1247p. 1-1014,1015; p. 2-1150-1153
 Customer service: G.Spear

Products manufactured: Diodes, Display Devices/Displays, Isolators, Lamps, Lights

Refer to Hewlett-Packard Co., Palo Alto, Cal. for sales office information.

Local Distributors

Ala	Huntsville, Hall-Mark Electronics,	4739
	Commercial Dr.	205-837-8700
Ariz	Phoenix, Liberty Electronics, 3130 N. 27th Ave.	602-257-1272

Cal	Costa Mesa, Schweber Electronics, 3000 Redhill Ave.	714-556-3880
Cal	El Segundo, Liberty Electronics, 124 Maryland St.	213-322-8100
Cal	Mt. View, Elmar Electronics, 2288 Charleston Rd.	415-961-3611
Cal	San Diego, Liberty Electronics, 8248 Mercury Ct.	714-565-9171
Colo	Denver, Elmar Electronics, 6777 E. 50th Ave.	303-287-9611
Conn	Danbury, Schweber Electronics, Finance Dr., Commerce Ind'l Park	203-792-3500
Conn	Hamden, Wilshire Electronics, 2554 State St.	203-281-1166
Fla	Ft. Lauderdale, Hall-Mark Electronics, 1302 W. McNab Rd.	305-971-9280
Fla	Hollywood, Schweber Electronics, 2830 No. 29th Terrace	305-927-0511
Fla	Orlando, Hall-Mark Electronics, 7233 Lake Ellenor Dr.	305-855-4020
Ga	Atlanta, Schweber Electronics,	4126
	Pleasantdale Rd.	404-449-9170
Ill	Elk Grove Village, Hall-Mark Electronics, 180 Crossen	312-437-8800
Ill	Elk Grove Village, Schweber Electronics, 1380 Jarvis Ave.	312-593-2740
Iowa	Cedar Rapids, Hall-Mark Electronics, Executive Plaza, Suite 401, First Ave., S.E.	319-393-3556
Iowa	Cedar Rapids, Schweber Electronics, 4403 - 1st Ave., SE, Suite 302	319-393-0100
Kans	Lenexa, Hall-Mark Electronics, 9006 Rosehill Rd.	913-888-4747
Md	Rockville, Schweber Electronics, 5640 Fisher La.	301-881-3300
Mass	Burlington, Wilshire Electronics, One Wilshire Rd.	617-272-8200
Mass	Waltham, Schweber Electronics, 213 Third Ave.	617-890-8484
Mich	Troy, Schweber Electronics, 86 Executive Dr.	313-583-9242
Minn	Edina, Schweber Electronics, 7015 Washington Ave., So.	612-941-5280
Minn	Bloomington, Hall-Mark Electronics, 9201 Penn Avenue, So., Suite 10	612-884-9056
Mo	Earth City, Hall-Mark Electronics, 13789 Rider Trail	314-291-5350
NJ	Clifton, Wilshire Electronics, 312 Clifton Ave.	201-365-2600
NJ	Somerset, Schweber Electronics, 43 Belmont Dr.	201-469-6008
NY	Farmingdale, Wilshire Electronics, 1855 New Hwy. (Unit B)	516-293-5775
NY	Johnson City, Wilshire Electronics, 617 Main St.	607-797-1236
NY	Rochester, Schweber Electronics, 2 Townline Circle	716-461-4000
NY	Westbury, Schweber Electronics, Jericho Tpke.	516-334-7474
NC	Raleigh, Hall-Mark Electronics, 3000 Industrial Dr.	919-832-4465
Ohio	Beachwood, Schweber Electronics, 23880 Commerce Pk. Rd.	216-464-2970
Okl	Tulsa, Hall-Mark Electronics, 4846 So. 83rd E. Ave.	918-835-8458
Pa	Huntingdon Valley, Hall-Mark Electronics, 458 Pike Rd.	215-355-7300
Tex	Austin, Hall-Mark Electronics, 3100-A Ind'l Terrace	512-837-2814
Tex	Austin, Schweber Electronics, 2628 Longhorn Blvd.	512-837-2890
Tex	Dallas, Hall-Mark Electronics, 9333 Forest La.	214-231-5101
Tex	Dallas, Schweber Electronics, 14177 Proton Rd.	214-661-5010
Tex	Houston, Hall-Mark Electronics, 8000 Westglen, Box 36739	713-781-6100
Tex	Houston, Schweber Electronics, 7420 Harwin Dr.	713-784-3600
Wash	Seattle, Liberty Electronics, 5305 Second Ave. So.	206-763-8200
Wisc	West Allis, Hall-Mark Electronics, 237 S. Curtis	414-476-1270

HEWLETT-PACKARD, Green Pond Rd., Rockaway, N.J., 07204

HEWLETT PACKARD CORP., Microwave, Santa Rosa Div., 3273 Airway Dr., Santa Rosa, Cal., 95401

HEWLETT-PACKARD, San Diego Div., 16399 W. Bernardo Dr., San Diego, Cal., 92127, Tel: 714-487-4100

Free literature available: Recording instruments, including strip chart, x-y oscillographic, graphic, and magnetic tape recorders.

Products manufactured: Oscillographs, Direct Writing, Recorders

Refer to Hewlett-Packard, Palo Alto, Cal. for sales office information.

HEXACON ELEC. CO., 621 W. Clay Ave., Roselle Park, N.J., 07204, Tel: 201-CH5-6200; Empl.: 150

p. 2-1700-1705

Products manufactured: Controls/Control Eqpt., Solder Pots & Baths, Soldering Accessories, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools

Local Sales Offices & Reps.

Ariz	Tucson, Ross Ribauda	602-299-1425
Cal	Burlingame, Dillon Stevens	415-697-3022
Cal	L.A., Dillon Stevens Co.	213-747-9221
Conn	Woodstock, HDQ & HV Neff	203-974-1281
Fla	Merritt Island, J.A. Kennedy Co.	305-452-9821
Ga	Morrow, R. Hartmann	404-366-5799
Ill	Chicago, EMF Co.	312-889-8323
Kans	Kansas City, L.E. Bruns	913-287-5242
Md	Phoenix, REBCO Sis.	301-592-8907
NJ	Edgewater Park, REBCO Sis.	609-386-7116
NY	New Hartford, V. Clair	315-735-8122
NY	New York, W.D. Blood & Co.	212-344-0210
NY	New York City, Dunn & Bryan	212-964-8091
Ohio	Strongsville, J. Finnegan & Co.	216-826-1033
Ore	Milwaukie, Northcoast Mfrs. Agency Inc.	503-659-3811
SC	Greenville, J.B. Jackson	803-244-2508
Tenn	Memphis, H. Carson	901-398-6194
Tex	Richardson, P.J. Scanlon	214-AD 1-4661
Wash	Seattle, Northcoast Mfrs. Agency, Inc.	206-284-5024
Wisc	Milwaukee, Process Tech	414-464-6620-6621
EXP	Hato Rey, P.R., M. Anderson	809-722-1654
FOR	Can., Montreal, W. P. Q. Adtool	514-482-2548

HEYMAN MFG. CO., N. Michigan Ave., Kenilworth, N.J., 07033, Tel: 201-245-2345, TWX: 710-996-5986; Empl.: 86; Minimum order: \$20

For info on price: R. Zednick; Application info: R. Zednick; Customer service: R. Zednick; Delivery info: M. Lauxman

Free literature available: Catalog 175 20 pages describing strain relief bushings, insulating bushings, hole plugs, cable clamps, wire ties. Provides dimensions and application data.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Clamps & Clips, Grommets, Plug Buttons, Strain Reliefs, Cable & Wire, Terminals, Wire & Cable Ties

Local Sales Offices & Reps.

Wisc Waukesha, Heyman Mfg. Co.

HGA ELCTRNS., INC., 519 S. Fifth Ave., Mt. Vernon, N.Y., 10550, Tel: 914-664-5393; Empl.: 3

For info on price: L. Grossman; Application info: E. Valentine; Customer service: L. Grossman; Delivery info: L. Grossman

Products manufactured: Amplifiers, Chargers, Battery, Clocks (All Types)

H H CONTROLS CO., INC., 16 Frost St., Arlington, Mass., 02174, Tel: 617-646-2626; Empl.: 22

For info on price: W. Edins; Application info: W. Edins; Customer service: D. H. Smith; Delivery info: G. Davis

Products manufactured: Encoders, Indicators, Servo Systems, Transducers

Local Sales Offices & Reps.

Cal	Montebello, TUCUL Engrg. Co.	213-728-7397
Ill	Park Ridge, Electrical Materials & Equip.	312-696-1540
Mass	Stoneham, K & D Elctrns.	617-438-3002
Ohio	Cleveland, Adcon Engrg. Co.	216-238-3916
Ore	Portland, A.L. Polich	503-246-5451
Tex	Houston, C. Butt Co.	713-526-3101
Va	Roanoke, Johnson Custom Controls	703-774-5550



HI-G INC., Spring St. & Rte. 75, Windsor Locks, Conn., 06096, Tel: 203-623-2481, TWX: 710-420-0592; FSC No: 02289; QPL No: M5757; Empl.: 490; Minimum order: \$75p. 1-1714-1729
 Customer service: Sis. Dept

FOR: Can., Port Credit, Ont.; Baknor Industries Ltd.
416-274-1591

S. HIMMELSTEIN & CO., 2500 Estes Ave., Elk Grove Village, Ill., 60007; Tel: 312-439-8181; Empl.: 40; Minimum order: \$25

For info on price: J. Hall; Application info: J. Hall; Customer service: R. Kuentler; Delivery info: R. Kuentler

Free literature available: Literature on: MCRT Torquemeters & Rotary Transformers, TVS Torque Verification System, Torque-Rite Air Tool Torque Control & Verification System, Precision Load Cell Specifications.

Battery Operated, Digital Transducer Readout, Digital Torque Display, & Precision Pressure Transducer Specifications.

Products manufactured: Amplifiers, Cells, Load, Controls/Control Eqpt., Indicators, Signal Conditioners & Equipment, Testers, Transducers, Transformers

Local Sales Offices & Reps.

Mass Needham, Addeco Corp. 617-444-4754
Mich Livonia, S. Himmelstein & Co. 313-427-2066
NJ Cherry Hill, Markey Instrumentation
609-667-3809
NY Eldridge, L-Tron Corp. 315-689-3787
NY Latham, L-Tron Corp. 518-785-5032
NY Rochester, L-Tron Corp. 716-436-4410
Wash Bellevue, Topp Engrg. Sls. Corp. 206-747-5401

HIPOTRONICS, INC., Brewster, N.Y., 10509, Tel: 914-279-8091, TWX: 710-574-2420; Empl.: 155; Minimum order: \$50 p. 1-722,723,1230,1231
For info on price: J. Robertson; Application info: J. Robertson; Customer service: L. Lambert; Delivery info: W. N. Boyer

Products manufactured: Cable Fault Locators, Capacitors, Fixed, Detectors, Dividers, Locators, Open-Short, Meters, Power Supplies, Probes, Reactors, Regulators, Services, Assembly, Production & Test, Shields, Test Systems, Testers, Transformers, Voltage Sources

Local Sales Offices & Reps.

Cal Concord, J. Marinar 415-688-4382
Cal Pasadena, RDX Corp. 213-681-3452
Cal San Diego, RDX Corp. 714-278-6863
Cal Sunnyvale, RDX Corp. 408-734-4500
Colo Littleton, ADX Entrs. 303-798-4573
Ga Atlanta, J.P. Smith 404-233-1009
Haw Honolulu, Aloha Assocs. 941-1574
Ill Decatur, J. Connelly 217-865-2188
Ind Ossian, V. Schumacher 219-622-4346
Mass Bellingham, J. Kirkup 617-966-2121
NJ Riverville, J. Lebert 201-391-9400
NM Albuquerque, Aztec Entrs. 505-255-2440
NY Cazenovia, Peter De Cow Agency
315-HT 3-3261
Pa Downingtown, Kenn Ebert-Hipotonics, Inc.
215-269-5898
Tex Fort Worth, D. Wells 817-244-2204
Wash Seattle, RDX Corp. 206-682-6750

HISONIC, INC., 249 N. Troost, Olathe, Kan., 66061, Tel: 913-782-0012; FSC No: 11402; Empl.: 80; Minimum order: \$35 p. 1-564,565,1233; p. 2-1755

For info on price: W. S. Bonebright; Application info: D. H. Hersh; Customer service: W. S. Bonebright; Delivery info: W. S. Bonebright

Free literature available: Brochure-Facilities information and general product line description.

Products manufactured: Chokes, Coils Including Assemblies & Forms, Converters, Delay Lines, Discriminators, Equalizers, Filters, Inverters, Networks, Reactors, Transformers

Local Sales Offices & Reps.

Ariz Scottsdale, Piper-Goyne 602-946-4437
Cal Mountain View, Caltron/Pyle 415-964-3244
Cal No. Hollywood, Crown Elctns. 213-877-3550
Colo Littleton, Piper-Goyne 303-798-8955
Kans Shawnee, J.F. Guernsey Co. 913-631-2414
NJ Haddonfield, Gray Assocs. 609-429-5300
NY Conklin, Ramcom, Inc. 607-775-0641
NY E. Rockaway, W. Bellenkes Assocs.
516-599-8260
Tex Irving, AID Elctns., Inc. 214-259-4761

HISONIC, INC. cont'd

Advertisement

Hisonic has an established reputation of unexcelled competence in the design and quality manufacture of complex filter network as well as specialized inductors and transformers. Our staff is experienced and equipped to apply unique modern synthesis techniques to your requirements. Do not accept an answer of "impossible" unless you have consulted Hisonic.

HI-TEK CORP., 3115 W. Warner, Santa Ana, Cal., 92704, Tel: 714-540-3520, TWX: 910-595-1758; Empl.: 150

For info on price: D. Dickerman; Application info: S. Laxineta; Customer service: R. Williams; Delivery info: R. Williams

Products manufactured: Keyboards, Alphanumeric & Decimal, Switches

H.J.J. CO., Box 905, Los Gatos, Cal., 95030, Tel: 408-356-4040; Empl.: 4

Customer service: D. P. Cavallaro

Free literature available: Brochure On Screwholding Drivers.

Products manufactured: Screwdrivers

Local Sales Offices & Reps.

Cal San Mateo, J. Hand 415-341-5516
Pa Pittsburgh, A. Kostman 412-823-3430

HM ELECTRONICS, INC., 6151 Fairmount Ave., San Diego, Cal., 92120, Tel: 714-280-6050; Empl.: 12

For info on price: G. Johnson; Application info: H. Miyahira; Customer service: B. Tateyama; Delivery info: B. Tateyama

Products manufactured: Amplifiers, Oscillators, Oscilloscopes, Receivers, Synthesizers, Transceivers, Transmitters

Local Sales Offices & Reps.

Cal Los Angeles, RF Assocs. 213-478-1586
Cal Palo Alto, Coherent Mktg. Assocs. 415-327-2217
Minn Minneapolis, Scientific Devices 612-544-3725
NC Greensboro, FM Assocs. 919-294-2754

HOAGLAND INSTR., Box 550, Dayton, N.J., 08810, Tel: 201-329-4681, TWX: 710-480-5674; Empl.: 30 p. 1-1731

Products manufactured: Controls/Control Eqpt., Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Flashers, Relays, Services, Assembly, Production & Test, Switches, Timers

Local Sales Offices & Reps.

Mich Detroit, L. H. Dickelman Co. 313-255-3300
Minn St. Paul, Howard A. Cullen & Assocs. 612-646-7371
NJ Cranford, Martech Assocs. 201-272-5510
NY Manhasset, Martech Assocs. 516-627-1151
NC Charlotte, F. Nickerson 919-527-4911
Ohio Cincinnati, L.H. Dickelman Co. 513-671-6176
Ohio Cleveland, L.H. Dickelman Co. 216-292-5643
Ore Portland, Carmody Co., Inc. 206-682-2330
Wash Seattle, Carmody 206-682-2330

HOBBS, Div. of Steward Warner, Ash at Yale Blvd., Springfield, Ill, 62705, Tel: 217-525-0330

HOBSON BROS., INC., 4940 W. Lawrence Ave., Chicago, Ill., 60630, Tel: 312-283-3600; Empl.: 90

For info on price: H.L. Behm; Application info: W.J. Leitmann; Customer service: H.L. Behm; Delivery info: J. Whalen

Products manufactured: Clamps & Clips, Connectors, Services, Assembly, Production & Test, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

Ind Indianapolis, Specialty Mfrs. 317-635-2723
NY Buffalo, R. W. Mitscher Co. 716-633-7970
Va Virginia Beach, R. W. Mitscher Co. 804-481-7200

HOFFMAN ENGINEERING CO., Div. Federal Cartridge Corp., 9th & Tyler Sts., Anoka, Minn., 55303, Tel: 612-421-2240, TWX: 910-578-2211

For info on price: H. Maenke; Application info: R. Burley; Customer service: P. Pipenhagen; Delivery info: P. Pipenhagen

Products manufactured: Boxes, Junction, Outlets & Wall Plates, Cabinets & Accessories, Ducts, Wiring

Local Sales Offices & Reps.

Ala Birmingham, C.W. Ashby Co. 205-879-1651
Ariz Scottsdale, N.F. Ross 602-945-7262
Cal Los Angeles, W.J. Trenbeth Engrg. Co.
213-645-4377
Cal Walnut Creek, W.A. Borden Co. 415-937-5196
Colo Denver, Gaer Sls. 303-777-3740
Conn West Hartford, L. Bell 203-236-0395
Fla Longwood, Shannon Assocs. 305-831-2245
Fla St. Petersburg, Shannon Assocs. 813-822-3146
Ga Atlanta, Holman-Lobsinger Co. 404-256-9120
Haw Honolulu, Specialty Prods. Co. 808-531-0596
Ill Chicago, KGA Engrg. Co. 312-889-2060
Ind Indianapolis, Lester Sls. Co. 317-783-9251
Ky Louisville, R & R Inc. 502-893-2571
La Metairie, Schell-Ranna Co. 504-837-7837
Md Baltimore, O.T. Hall & Son 301-467-5359
Mass Framingham, H. Standish 617-879-1220
Mich Farmington, W.L. Trombley & Son
313-477-5800
Mich Grand Rapids, J.M. Perry Co. 616-949-0271
Minn Minneapolis, R.D. Schwen Engrg. Inc.
612-854-4304
Mo Kirkwood, Martin Electrical Sls. Inc.
314-966-8659
Mo Raytown, Arehart-Barnds Sls. Co. 816-356-3488
Neb Omaha, Electrical Prods. Co. 402-393-7350
NJ Edison, Burgoyne Elec. Sls. Inc. 201-225-0450
NJ Morristown, W.J. Waldron Assocs.
201-538-5607
NY Camillus, J.C. Fox & T.R. Fox 315-488-0200
NC Charlotte, R.W. Chapman & Co. 704-525-2421
NC Raleigh, R.W. Chapman & Co. 919-782-2824
Ohio Cleveland, M.M. Haley Co. 216-238-3650
Ohio Dayton, W.W. Baerbaeck & Assocs.
513-278-4217
Ohio Jenks, W.G. Parker Co. 513-299-5449
Ore Beaverton, D. Fry Co. 503-643-5448
Pa Oreland, Cusick Electrical Sls. Inc.
215-886-2100
Pa Pittsburgh, M.F. Smith & Assocs. 412-276-5363
SC Greenville, R.W. Chapman & Co. 803-232-5391
SC West Columbia, R.W. Chapman & Co.
803-256-2984
Tex Dallas, Electrical Agencies Co. 214-747-0108
Tex Houston, J. Edwards Co. 713-223-4731
Utah Salt Lake City, J.H. Jones Co. 801-485-9372
Va Richmond, J.H. Thrower 804-794-6819
Wash Seattle, Muth-Richards Co. 206-323-2127
Wisc Milwaukee, KGA Engrg. Co. 414-354-5900

HOFFMAN INDUSTRIAL PRODS., 170 Allen Blvd., Farmingdale, N.Y., 11735, Tel: 516-293-5244; Empl.: 30

Products manufactured: Connectors, Splices, wire (Including, Butt & Cap Types), Terminals, Tools, Wire & Cable Ties, Wire Strippers

Local Sales Offices & Reps.

DC Washington, Selinger Assoc. 202-529-2044
Fla Brandon, R. Herig 813-689-1573
Fla Winter Park, Steele Tech. Sls. 305-644-6641
Ga Atlanta, C. Roach 404-261-7184
Ill Chicago, A. J. Ellis Co. 312-262-2708
Ill Glynn Ellen, Anderson Elec.
800-645-2014
Ind Indianapolis, OEM Sls. Co. 317-545-1267
Kans Wichita, B. Penn 316-682-9433
La New Orleans, G. Bonurant Co. 504-833-6347
Mass Springfield, W. Smith 800-645-2014
Mich Detroit, Hoffman Bros. 313-873-7550
Mich Lansing, Mktg. Professionals 517-484-0828
Minn Mound, Moeller Sls. 612-472-1526
Mo Chesterfield, H. Allensworth 314-469-3281
Mo Fenton, R. Uthoff 314-343-4059
Mo St. Louis, Midwestern Sls. Co. 314-961-0766
NJ East Brunswick, I. Weschler 201-257-3951
NY Farmingdale, Haines Products 516-420-1177
NY Flushing, J. V. Marcus 212-463-0754
NY Merrick, D. Obstgarten 212-682-0276
NY New Rochelle, C. Erickson 914-636-8477
NC Charlotte, J. Fairbanks 704-537-2753
NC Statesville, J. Fowler 704-872-5117
Ohio Chagrin Falls, American Traders 216-543-8155
Ohio Shaker Heights, Martin-Rettger 216-283-5600
Pa Cornwells Heights, D. Glick 215-757-9046
Pa Phoenixville, J. Ludwick 800-645-2014
Pa Pittsburgh, Karthaus Co. 412-931-5252
Tenn Memphis, Hicks Sls. Agency 901-396-5725
Tenn Memphis, S. F. Hiller 901-525-8463
Tex Dallas, J. E. Bill Morton 214-341-1414
Tex Garland, D. Reed 800-645-2014
Tex Houston, C & C Sls. Co. 713-465-6856
Tex Houston, D. Schick 800-645-2014
Wisc Waukesha, J. C. Morkin 414-542-5129

P. R. HOFFMAN CO., Div. of Aiken Inds., Inc., 321 Cherry St., Carlisle, Pa., 17013, Tel: 717-243-2011; Empl.: 275

Customer service: J. W. Mountz

Free literature available: Literature on Cultured Quartz crystals, Literature on precision grinding, polishing, and measurement equipment and accessories for the processing of quartz, semiconductor, and optical materials.

Products manufactured: Abrasive Belts, Compounds, Cords, Powders, etc., Crystal Blanks, Crystals, Machines/Machinery, Production

HOLLINGSWORTH SOLDERLESS TERMINAL, Box 430, Phoenixville, Pa., 19460, Tel: 215-933-8947; Empl.: 300

Products manufactured: Connectors, Kits, Terminal, Machines/Machinery, Production, Terminals, Tools

HOLLIS ENGRG., INC., Charron Ave., Box 1189, Nashua, N.H., 03060, Tel: 603-889-1121, TWX: 710-228-1881; Empl.: 105

For info on price: R. T. Kosten; Application info: R. T. Kosten; Customer service: T. Diggins; Delivery info: R. T. Kosten

Free literature available: Hollis catalog 174 provides brief descriptions of the Hollis line of assembly, soldering, cleaning, lead-cutting and lead stabilizing systems.

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Cleaners & Solvents, Machines/Machinery, Production, Solder Pots & Baths, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools

Local Sales Offices & Reps.

Ariz	Phoenix, L. C. Palmer	602-955-9390
Cal	Mountain View, Morse Assocs.	415-968-7722
Cal	Denver, West/Mark Assoc.	303-433-7181
Fla	Ft. Lauderdale, B. Melvin Prods. Equip.	305-566-8195
Ga	Atlanta, DG Machinery & Gage Co.	404-633-6201
Ill	Chicago, Solid State Elctns.	312-889-8033
Md	Baltimore, D.K. Jones & Assocs.	301-752-0577
Mass	Hudson, E.P.E. Corp.	617-562-9123
Minn	Minneapolis, M. Westlund Assoc.	612-866-5002
NJ	Princeton, Krone & Rubin Assoc.	609-924-0200
NY	Webster, Krone & Rubin Assoc.	716-671-6709
Ohio	Dayton, A.M.E.S. Corp.	513-435-9730
Pa	Norristown, Glove Engrg. Co.	215-275-9875
Tex	Austin, Crockett Engrg.	512-451-8269
Tex	Dallas, Crockett Engrg.	214-251-1776
Wash	Seattle, R. Johnston Co.	206-524-5170

HAMMOND MANUFACTURING COMPANY (U.S.) INC., 1051 Clinton St., Buffalo, N.Y., 14240, Tel: 716-852-0010; Empl.: 600

For info on price: L. Sillery 519-822-2960; Application info: B. Reardon; Customer service: R. Hammond

Free literature available: Catalogue 84: Electronic Transformers and Housings; Catalogue 75: Electrical Transformers and Housings.

Products manufactured: Boxes, Junction, Outlets & Wall Plates, Cabinets & Accessories, Chassis, Metal, Transformers

HONEYWELL, Aerospace & Def., Honeywell Plaza, Minneapolis, Minn., 55408, Tel: 612-870-5200, TWX: 910-576-2692

Products manufactured: Accelerometers, Alarms, Batteries, Computers, Controls/Control Eqpt., Cores, Ceramic, Crystals, Detectors, Direction Finders, Display Devices/Displays, Gyros (All Types), Hydrophones & Accessories, Indicators, Lasers & Laser Systems, Magnetometers, Memory Systems, Modulator/Demodulators, Oceanographic Equip. (Electronic), Power Supplies, Radar Systems, Radiometers, Scanners, Services, Assembly, Production & Test, Substrates, Tracking Systems, Transducers

Local Sales Offices & Reps.

Cal	Fullerton	714-870-0120
Cal	Los Angeles	213-670-7500
Cal	San Diego	714-565-6000
Cal	Sherman Oaks	213-986-6310
Cal	Sunnyvale	408-732-0120
Fla	Orlando	305-894-3131
Fla	Shalimar	904-651-0310
Ga	Atlanta	404-321-2028
Iowa	Davenport	319-355-6456
Mass	Boston	617-782-3100
Mo	Creve Coeur	314-991-4100
NJ	Westfield	201-233-9200
NY	Elmsford	914-592-3200
NY	Liverpool	315-451-4000
NY	Plainview	516-931-1500

Ohio	Dayton	513-461-4480
Pa	Bala Cynwyd	215-835-2500
Tex	Dallas	214-661-5459
Tex	Houston	713-333-3622
Va	Arlington	703-524-8200
Wash	Merced Island	206-232-5030

HONEYWELL INFORMATION SYSTEMS, 60 Walnut St., Waltham, Mass., 02181, Tel: 617-237-4100

Customer service: Prod. Mktg.

Products manufactured: Comm. Systems, Computers, Data Acquisition & Reduction Systems, Printers, Terminals, Data Display (including Alphanumeric & Graphic)

HONEYWELL INC., Commercial Div., 200 Bond St., Wabash, Ind., 46992, Tel: 219-563-2161, TWX: 810-290-2725; Empl.: 350

Products manufactured: Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Racks

Local Sales Offices & Reps.

Colo	Denver, E. W. Johnson Co.	303-985-4810
Fla	Maitland, Beacon Elctns.	305-647-3498
Fla	Palm Beach Gardens, Beacon Elctns.	305-622-2770
Ga	Atlanta, Beacon Elctns.	404-351-3654
Ind	Ft. Wayne, R. O. Whitesell & Assoc.	219-432-5591
Ind	Indianapolis, R. O. Whitesell & Assoc.	317-359-9283
Ky	Louisville, R. O. Whitesell & Assoc.	502-893-7303
Md	Lanham, Eastern Compts.	301-794-8610
Mass	Burlington, Schaal Assocs.	617-272-7940
Mich	Grand Rapids, R. O. Whitesell & Assoc.	616-451-8901
Mich	Southfield, R. O. Whitesell & Assoc.	313-358-2020
Mich	St. Joseph, R. O. Whitesell & Assoc.	616-983-7337
Minn	St. Paul, Northport Engrg.	612-698-3841
Ohio	Dayton, R. O. Whitesell & Assoc.	513-298-9546
Pa	Flowerstown, Eastern Compts.	215-836-1616
Pa	Pittsburgh, R. O. Whitesell & Assoc.	412-242-0100
SC	Spartanburg, Beacon Elctns.	803-582-4613
Tex	Dallas, Blair Engrg. Sls.	214-352-8411
Tex	Houston, Blair Engrg.	713-772-0677

HONEYWELL INFORMATION SYSTEMS, 200 Smith St., MS061, Waltham, Mass., 02154, Tel: 617-237-4100; Empl.: 40000

Products manufactured: Comm. Systems, Computers, Disc Packs, Magnetic, Drums, Computer Memory, Printers, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Ala	Birmingham	205-323-2431
Ala	Mobile	205-479-8572
Ala	Montgomery	205-262-1127
Ariz	Phoenix	602-263-2240
Ark	Little Rock	501-376-2620
Cal	Fresno	209-486-4780
Cal	Long Beach	213-435-6578
Cal	Los Angeles	213-625-1271
Cal	Oakland	415-839-1300
Cal	Sacramento	916-927-2221
Cal	San Diego	714-565-6000
Cal	San Francisco	415-957-2500
Cal	Sunnyvale	408-732-0120
Colo	Englewood	303-771-2340
Conn	Westport	203-226-1051
Fla	Jacksonville	904-396-6971
Fla	Miami	305-592-5293
Fla	Orlando	305-894-3131
Fla	Tampa	813-870-0200
Ga	Atlanta	404-321-3231
Ga	Columbus	404-322-1625
Ga	Savannah	912-234-2283
Haw	Honolulu	808-537-5514
Ill	Chicago	312-454-1300
Ill	Chicago	312-671-1800
Ill	Lansing	312-568-4200
Ill	Oakbrook	312-325-7950
Ill	Peoria	309-692-0610
Ill	Rockford	815-965-3757
Ill	Springfield	217-529-0100
Ind	Evansville	812-477-9255
Ind	Fort Wayne	219-482-4567
Ind	Indianapolis	317-243-0831
Ind	Midway (So. Bend)	219-259-8561
Iowa	Cedar Rapids	319-393-9200
Iowa	Des Moines	515-288-3601
Kans	Wichita	316-686-2348
Ky	Louisville	502-456-1220
La	Baton Rouge	504-348-0075

La	Bettendorf	319-355-6456
La	New Orleans	504-833-7241
La	Shreveport	318-425-4288
Me	Augusta	207-622-4701
Me	Portland	207-774-5811
Md	Lutherville	301-828-0900
Mass	Burlington	617-272-8115
Mass	Springfield	413-781-0132
Mass	Waltham	617-890-0400
Mass	Worcester	617-799-4132
Mich	Detroit	313-424-3500
Mich	Grand Rapids	616-451-0621
Mich	Lansing	517-694-3361
Minn	Edina	612-830-3500
Miss	Jackson	601-982-2090
Mo	Creve Coeur	314-991-4100
Mo	Kansas City	816-358-4200
Neb	Omaha	402-393-8300
NH	Manchester	603-625-9772
NJ	Mountainside	201-233-9200
NM	Albuquerque	505-345-1656
NY	Albany	518-456-7000
NY	Amherst	716-835-2770
NY	Elmsford	914-592-3200
NY	Manhasset	516-869-8200
NY	N.Y.	212-557-1200
NY	New York	212-555-1271
NY	Rochester	716-461-1600
NY	Syracuse	315-451-4000
NC	Charlotte	704-364-4770
NC	Charlotte	704-525-4485
NC	Greensboro	919-272-2162
NC	Raleigh	919-787-0170
Ohio	Akron	216-733-2244
Ohio	Cincinnati	513-771-8730
Ohio	Cleveland	276-881-0300
Ohio	Columbus	614-486-5971
Ohio	Dayton	513-461-4480
Ohio	Lima	419-222-5010
Ohio	Toledo	419-473-9721
Okla	Oklahoma City	405-947-1516
Okla	Tulsa	918-437-5934
Ore	Portland	503-233-8581
Ore	Salem	503-585-7197
Pa	Allentown	215-434-4244
Pa	Bala Cynwyd	215-835-2500
Pa	Harrisburg	717-564-8000
Pa	Pittsburgh	412-922-4422
Ri	Providence	401-438-6000
SC	Charleston	803-722-8381
SC	Columbia	803-779-3240
SC	Greenville	803-232-3854
Tenn	Chattanooga	615-892-4242
Tenn	Johnson City	615-929-2195
Tenn	Knoxville	615-525-7396
Tenn	Memphis	901-396-6222
Tenn	Nashville	615-385-3400
Tex	Dallas	214-634-8880
Tex	Ft. Worth	817-336-5479
Tex	Houston	713-785-3200
Tex	San Antonio	512-341-4691
Utah	Salt Lake City	801-487-0681
Va	McLean	703-790-3000
Va	Norfolk	804-497-1067
Va	Richmond	804-285-8211
Va	Roanoke	703-344-3218
Wash	Merced Island	206-232-5030
Wash	Tacoma	206-475-5393
WVa	Charleston	304-744-5341
Wisc	Appleton	414-733-4491
Wisc	Madison	608-238-9344
Wisc	Milwaukee	414-771-6300
FOR	Can., Willowdale, Ont.	416-491-0660

HONEYWELL, Process Control Div./Ft. Wash., 1100 Virginia Dr., Ft. Washington, Pa., 19034, Tel: 215-643-1300, TWX: 510-661-0328

Products manufactured: Actuators, Alarms, Amplifiers, Computers, Connectors, Controls/Control Eqpt., Data Acquisition & Reduction Systems, Detectors, Gages, Indicators, Meters, Motors, Mounts, Panels, Paper, Graphic Recording, Plug & Jack Sets, Potentiometers, Probes, Pyrometers, Racks, Recorders, Regulators, Relays, Switches, Thermistors, Thermocouples, Elements & Accessories, Transducers, Transmission Systems, Data, Transmitters, Valves, Solenoid, Wire

Local Sales Offices & Reps.

Ala	Birmingham	205-323-2431
Alas	Anchorage	907-344-0522
Ariz	Phoenix	602-263-2222
Ark	Little Rock	501-372-0166
Cal	Los Angeles	213-724-3500
Cal	San Francisco	415-826-9100
Colo	Englewood	303-771-2340
Conn	Hartford	203-549-3800
Fla	Orlando	305-894-3131

Ga	Atlanta	404-875-9561
Ill	Chicago	312-478-9266
Ill	Lansing	312-474-9300
Ind	Indianapolis	317-243-0831
Iowa	Davenport	319-355-6456
Kans	Wichita	316-522-3431
Ky	Louisville	502-459-5970
La	Baton Rouge	504-924-4236
Me	Portland	207-773-4751
Md	Lutherville	301-828-0900
Mass	Boston	617-787-5305
Mich	Farmington Hills	313-478-1300
Mich	Grand Rapids	616-451-0621
Minn	Minneapolis	612-835-5400
Miss	Jackson	601-366-6461
Mo	St. Louis	314-647-6100
Mont	Billings	406-252-5646
Neb	Omaha	402-393-8300
NJ	Westfield	201-233-9200
NM	Albuquerque	505-345-1656
NY	Long Island City	212-392-4300
NY	Syracuse (Liverpool)	315-451-4000
NC	Charlotte	704-364-4770
ND	Fargo	701-235-4221
Ohio	Cleveland	216-881-0300
Okla	Oklahoma City	405-848-2811
Ore	Portland	503-235-8411
Pa	Philadelphia	215-226-2400
SC	Columbia	803-779-3240
Tenn	Memphis	901-458-8511
Tex	Houston	713-785-3200
Utah	Salt Lake City	801-487-0681
Va	Richmond	804-285-8211
Wash	Seattle	206-232-5030
WVa	Charleston	304-744-5341
Wisc	Milwaukee	414-771-6300

HONEYWELL MICRO SWITCH DIV., See Micro Switch, Div. Honeywell

HONEYWELL, Residential Div., 2701 4th Ave., S., Mpls., Minn., 55408, Tel: 612-332-5222

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Controls/Control Eqpt., Detectors, Indicators, Relays, Switches, Thermostats, Transducers, Valves, Solenoid

Local Sales Offices & Reps.

Cal	Los Angeles	213-724-3500
Cal	San Francisco	415-826-9100
Colo	Englewood	303-771-2340
Ga	Atlanta	404-875-9561
Ill	Chicago	312-478-9266
Ill	Lansing	312-474-9300
Ind	Indianapolis	317-243-0831
Iowa	Des Moines	515-288-3601
Mass	Boston	617-787-5300
Mich	Southfield	313-352-1900
Minn	Edina	612-941-5430
Mo	Kansas City	816-358-4200
Mo	St. Louis	314-647-6100
NJ	Westfield	201-233-9200
NY	Long Island City	212-392-4300
NY	Syracuse	315-437-8493
NC	Charlotte	704-364-4770
Ohio	Cleveland	216-881-0300
Ohio	Columbus	614-486-5971
Pa	Blue Bell	215-643-5990
Pa	Pittsburgh	412-922-4422
Tenn	Nashville	615-297-0992
Tex	Dallas	214-363-5441
Va	McLean	703-893-4660
Wash	Merger Island	206-232-5030
Wisc	Milwaukee	414-771-6300

HONEYWELL, INC., Test Instrs. Div., 4800 E. Dry Creek Rd., Box 5227, Denver, Colo., 80217, Tel: 303-771-4700; Empl.: 750 p. 1-724,725

Products manufactured: Amplifiers, Analyzers, Data Acquisition & Reduction Systems, Memory Systems, Oscillographs, Direct Writing, Power Supplies, Recorders, Signal Conditioners & Equipment

Local Sales Offices & Reps.

Cal	Los Angeles	213-724-3500
Cal	Sunnyvale	408-998-3131
Colo	Denver	303-771-2340
Fla	Orlando	305-894-3131
Ga	Atlanta	404-321-2524
Haw	Honolulu	808-841-6644
Ill	Lansing	312-474-9300
Ill	Skokie	312-674-9770
Md	Lutherville	301-828-0900
Mass	Bedford	617-275-2630
Mich	Southfield	313-478-1600
Minn	Minneapolis	612-830-3500
Mo	Creve Coeur	314-991-4100
NJ	Westfield	201-233-9200

NM	Albuquerque	505-345-1656
NC	Greensboro	919-292-1556
Ohio	Cleveland	216-881-0300
Ohio	Dayton	513-461-4480
Pa	Bala Cynwyd	215-835-2500
Pa	Pittsburgh	412-922-4422
Tex	Dallas	214-661-5459
Wash	Merger Island	206-232-5030

HOPE ELCTRNS., Box 773, Clifton, N.J., 07013, Tel: 201-777-3522; Empl.: 20; Minimum order: \$25 p. 1-1234; p. 2-1287

Customer service: Randolph Mossige

Products manufactured: Amplifiers, Attenuators, Controls/Control Eqpt., Detectors, Filters, Generators, Oscillators, Ovens, Power Supplies, Relays

Local Distributors

NJ Clifton, Parts Masters, 411 Main Ave. 201-777-7706

HOPKINS ENGRG., 12900 Foothill Blvd., San Fernando, Cal., 91342, Tel: 213-361-8691, TWX: 910-496-1531; Empl.: 65 p. 1-566,567

Products manufactured: Filters, Services, Assembly, Production & Test, Suppressors

Local Sales Offices & Reps:

Ariz	Scottsdale, Runyon Co.	602-959-6060
Cal	Glendale, G R U Assocs.	213-245-5586
Cal	San Carlos, Kottmeier Assocs., Inc.	415-592-8333

Colo	Wheatridge, Waugaman Assocs., Inc.	303-423-1020
Conn	Glastonbury, Barton-Caron Assocs.	203-633-9417

Kans	Olathe, B. Rush Assocs.	913-782-1177
Md	Lanham, Eastern Comps.	301-794-8610

Mass	Auburndale, Barton-Caron Assocs.	617-332-2021
Mich	Jackson, Norwood Scroggs Co.	517-750-1170

Minn	St. Paul, H. Cullen & Assoc.	612-646-7371
NJ	Wayne, Unicom	201-696-2888

NY	Syracuse, H. R. Murray, Inc.	315-446-5555
Ohio	Dayton, Berberich Assocs., Inc.	513-252-9881

Pa	Flourtown, Eastern Comps.	215-836-1616
Tex	Dallas, Stevens Sls.	214-350-2476

Wash	Seattle, Blum & Assoc.	206-782-1600
------	------------------------	--------------

HORIZONS INTERNATIONAL, INC., 716 Willow Rd., Menlo Park, Cal., 94025, Tel: 415-328-1111, TWX: 910-373-1170; Empl.: 150; Minimum order: \$25 p. 1-962,963

For info on price: S. Robinson; Application info: C. Long; Customer service: J. Raynal; Delivery info: E. Warren

Free literature available: General Brochure Super "26" Information Sheet Super "32" Information Sheet Fan Information Sheet/Fan Price Sheet Computer Run Out On All Motors On Request

Products manufactured: Blowers & Fans & Accessories, Motors, Servo Systems, Tachometers

Local Sales Offices & Reps.

Ariz	Scottsdale, Williams & Assocs.	602-947-4297
Cal	Menlo Park, Long & Assocs.	415-327-1300
Cal	Sherman Oaks, R. Meussdorfer & Assocs.	213-788-0771

Colo	Denver, Williams & Assocs.	303-373-4730
Conn	Milford, Todino Engrg. Sls.	203-874-6643

Fla	Ft. Lauderdale, Orbe, Inc.	305-564-8571
Ill	Chicago, Engineered Sls. Co.	312-867-8434

Md	Baltimore, R.L. Wilkinson	301-377-7800
Mass	Needham Heights, Todino Engrg. Sls.	617-444-7925

Mich	St. Claire Shores, J. M. Thorpe	313-779-6363
Mo	Kansas City, Harris-Hanson Co.	816-444-9494

Mo	St. Louis, Harris-Hanson Co.	314-432-3611
NJ	Ridgefield, Haber-Ramp Corp.	201-945-5250

NM	Albuquerque, Williams & Assocs.	505-255-1638
NY	Buffalo, H.C. Johnson Agencies	716-632-7880

NY	Fayetteville, H.C. Johnson Agencies	315-637-9383
NY	Rochester, H.C. Johnson Agencies	716-482-3000

Ohio	Chagrin Falls, Drivex Corp.	216-247-6701
Pa	Glenside, R.L. Wilkinson	215-424-8400

Tenn	Bristol, R. Rakes	615-968-4195
Tex	Dallas, M. Kruvand Co.	214-827-8043

Tex	Houston, M. Kruvand Co.	206-767-4330
Wash	Seattle, Seatonics	206-767-4330

FOR:	Can., Rexdale, Ont. M9W 5A3, Eakin Ltd.	416-245-3600
------	---	--------------

HOSKINS MFG. CO., 4445 Lawton Ave., Detroit, Mich., 48208, Tel: 313-895-2860, TWX: 810-221-1409; Empl.: 400

Customer service: Sls. Serv. Sec.

Free literature available: Catalogs available include nickel-chromium resistance alloys, Iron-chromium-aluminum resistance alloys, Hoskins; chromel-alumel¹ thermocouple alloys, and high temperature tungsten-rhenium thermocouple alloys. *Chromel-Alumel are registered trademarks.

Products manufactured: Magnets, Wire

Local Sales Offices & Reps.

Cal	Los Angeles, Hoskins Mfg. Co.	213-685-5550
Conn	Stamford, Hoskins Mfg. Co.	203-348-4442
Ill	Chicago, Hoskins Mfg. Co.	312-724-6880
Mich	Detroit, Hoskins Mfg. Co.	313-895-2860
Ohio	Cleveland, Hoskins Mfg. Co.	216-371-9529

HOTPACK CORP., 5148 Cottman Ave., Phila., Pa., 19135, Tel: 215-333-1700, TWX: 710-670-1694; Empl.: 130

Customer service: Sales Office

Free literature available: Short form catalog shows Hotpack's line of water jacketed incubators, fraction collector bio-refrigerators, portable refrigerated bath/circulators, steady state test chambers. The 8-page brochure also describes and illustrates the company's full line of equipment.

Products manufactured: Baths, Controlled Temperature (Air & Liquid), Chamber, Environmental Test, Controls/Control Eqpt., Dehumidifiers (For Equipment), Furnaces, Ovens

Local Sales Offices & Reps.

NY	New York, Hotpack Corp.	212-247-5554
----	-------------------------	--------------

Local Distributors

Cal	Los Altos, Herb Waldeck Assoc., 12054 Brookmill Rd.	415-964-4699
Cal	Reseda, Bob Milner & Assoc., 7219 Canby Ave.	213-877-1444

Colo	Denver, PLS Assoc., Inc., 7418 E. Princeton Ave.	303-771-0141
Fla	Ft. Lauderdale, Hays Enterprises, 2120 N.E. 45th St.	305-772-4982

Ga	Atlanta, J. L. Morris Assoc., 3224 Peachtree Rd.	404-233-5118
----	--	--------------

Ill	Chicago, A. Stanley Co., 6059 N. Albany Ave.	312-973-7376
-----	--	--------------

Iowa	Des Moines, H. E. Ferris Co., 4005 Plainview Dr.	515-255-5008
------	--	--------------

Md	Rockville, Guerra Technical Sls., Box 286	301-929-1444
----	---	--------------

Minn	Minneapolis, Gibbco Scientific Co., 1311 W. 25th St.	612-377-1200
Mo	St. Louis, Herdlein Scientific, 2050 Woodson Rd.	314-423-4834

NJ	Cherry Hill, F. Lucchesi, 224 Heritage Rd.	609-428-3537
----	--	--------------

NY	New York, G. Kobin, Box 776, Nad Sq. Sta.	212-247-5554
NY	No. Tonawanda, Harvey Instr., 1121 Oliver St.	716-694-9500

NC	Raleigh, G. W. Mitchell, Box 25129	919-833-8655
----	------------------------------------	--------------

Ohio	Cincinnati, Witt Sales Co., Box 37294	513-761-5602
------	---------------------------------------	--------------

Pa	Pittsburgh, Giangarolo Scientific, 3237 Dawson St.	412-687-6415
----	--	--------------

Tenn	Germanatown, John Sellers, 3267 Hicory Creek	901-362-8651
------	--	--------------

Tex	Dallas, Southwestern Engrg. & Equip., 6260 E. Mockingbird La.	214-826-6661
-----	---	--------------

HOUSTON INSTRUMENT, Div. Bausch & Lomb, 8500 Cameron Rd., Austin, Tex., 78753, Tel: 512-837-2820, TWX: 910-881-5782; Empl.: 10,000 p. 1-870-873

For info on price: J. Bell; Application info: W. Krieger; Customer service: R. Stevens; Delivery info: S. Haskell

Products manufactured: Recorders

Local Sales Offices & Reps.

Ala	Huntsville, J.L. Highsmith & Co.	205-881-3294
Ariz	Phoenix, Moxon, Inc.	602-273-7363

Cal	Culver City, Feeger Lucas Wolfe	213-559-7200
Cal	Long Beach, CTI Data Sys.	213-426-7375

Cal	San Mateo, Dayton Assocs.	415-347-9419
Colo	Englewood, Davis Assocs.	303-761-9228

Colo	Littleton, Aztec Entprs.	303-795-0250
Fla	Orlando, J.L. Highsmith & Co.	305-293-5202

Haw	Honolulu, Aloha Assocs.	808-941-1574
Ill	Downers Grove, Data Dev.	312-887-8480

Mass	Framingham, J.M. Lancaster Co.	617-873-8893
Mich	Detroit, Ridgway East, Inc.	313-538-3940

Minn	Minneapolis, Instrumentation Svcs., Inc.	612-544-8916
Mo	Hazelwood, Technical Reps.	314-731-5200
NJ	Palisades Park, Scientific Dev.-East	201-871-3916
NJ	Woodbridge, J.J. Wild, Inc.	201-636-7780
NM	Albuquerque, Aztec Enptrs.	505-255-2440
NY	Fayetteville, Doolittle Elctns.	315-637-3222
NY	Jericho, J.J. Wild, Inc.	516-935-6600
NC	Charlotte, J.L. Highsmith & Co.	704-333-7743
Ohio	Chagrin Falls, Ridgway East, Inc.	216-247-4845
Ohio	Loveland, Ridgway East, Inc.	513-683-4350
Pa	King of Prussia, S & S Assocs.	215-265-3450
Tex	Houston, Comspec, Inc.	713-461-4487
Tex	Richardson, Comspec, Inc.	214-234-4137
Va	Fairfax, Nine Assocs.	703-273-1803
Va	Richmond, J.L. Highsmith & Co.	703-272-5888
Wash	Bellevue, Showalter Instrs.	206-455-4922
Wisc	Hales Corners, Arthur Engrg. Sls. Co.	414-425-5919

HOWARD INDUSTRIES, Div. of MSL, Box 287, Milford, Ill., 60953; Empl.: 500

Products manufactured: Blowers & Fans & Accessories, Motor & Generator Armatures, Rotors, Stators, Motors

Local Sales Offices & Reps.

Cal	Los Angeles, Techrep Assocs.	213-641-5830
Cal	Santa Clara, Richards & Assocs.	408-246-5860
Cal	Denver, Williams & Assocs.	303-373-4730
Conn	Torrington, Motoreps of New England	203-482-3193
Ga	Atlanta, W.E. Moran, Inc.	404-451-3000
Ill	Chicago, K.M.G. Sls. Co.	312-437-5815
Minn	Minnetonka, T.H. Ayre Assocs.	612-474-4125
Mo	St. Ann, Lawton Sls. Co.	314-725-1330
NJ	Red Bank, Motoreps of New York	201-741-3356
Ohio	Dayton, Electrical Sys. Co.	513-434-9822
Tex	Dallas, Evans & McDowell Assocs.	214-238-7157
Wash	Bellevue, Pacific Conslts.	206-454-2503
Wisc	Racine, K.M.G. Sls. Co.	414-639-9005

HOWE RICHARDSON SCALE CO., 680 Van Houten Ave., Clifton, N.J., 07015, Tel: 201-GR1-3400; Empl.: 1150

Free literature available: Catalog - showing full line of industrial weighing equipment including bench, floor scales, truck and track scales, automatic packaging equipment.

Products manufactured: Scales, Dial

Local Sales Offices & Reps.

Ala	Birmingham	205-595-0587
Cal	Anaheim	714-630-6230
Cal	Hayward	415-782-5040
Cal	San Francisco	303-934-5616
Conn	Hartford	203-246-8576
Fla	Tampa	813-877-3082
Ga	Atlanta	404-355-2464
Ill	Bradview	312-345-7605
Iowa	Des Moines	515-244-2231
La	Jefferson	504-834-0082
Md	Baltimore	301-282-2600
Mass	Avon	617-588-3770
Mich	Troy	313-585-7070
Minn	Minneapolis	612-925-2995
Mo	Kansas City	816-221-0437
Mo	Maryland Heights	314-432-8300
Neb	Omaha	402-333-8754
NJ	Fairfield	201-227-1030
NY	Albany	518-459-2410
NY	Buffalo	716-684-5700
NY	Richmond Hill	212-847-7995
NC	Charlotte	704-394-1392
Ohio	Cincinnati	513-271-6640
Ohio	Cleveland	216-781-7300
Ore	Portland	503-224-3147
Pa	Philadelphia	215-744-6200
Pa	Pittsburgh	412-782-0611
Tenn	Memphis	901-743-3133
Tex	Garland	214-341-1727
Tex	Houston	713-782-1315
Va	Richmond	703-644-8774
Wash	Seattle	206-624-8646
Wash	Spokane	509-535-4295
Wisc	Milwaukee	414-453-1111

HOWELL INST. INC., 3479 W. Vickery Blvd., Ft. Worth, Tex., 76107, Tel: 817-336-7411; FSC No: 98869; Empl.: 150

Free literature available: Catalogs in the following categories: digital indicators, data acquisition systems, totalizers and batch counters, and turbine engine monitoring and test equipment.

Products manufactured: Analyzers, Controls/Control Eqpt., Counters, Data Acquisition & Reduction Systems, Data Loggers, Indicators, Meters, Monitors, Recorders, Tachometers

HOYT ELEC. INSTR. WORKS, Burton-Rogers Co., Sls.

Div., 556 Trapelo Rd., Belmont, Mass., 02179, Tel: 800-225-1375; Empl.: 200 p. 1-726,727
Customer service: W. Burton 800-225-1375

Products manufactured: Meters

Local Sales Offices & Reps.

Cal	Hollywood, Duncan Engrg. Sls. Co.	213-462-5880
Cal	St. Petersburg, W. Palmer Lanagan	303-377-4740
Ill	Chicago, Ringland M. Krueger Co.	813-822-1192
Ind	Fort Wayne, Val-Skol Sls.	312-282-8444
Ind	Indianapolis, Val-Skol Sls.	219-742-9122
Md	Baltimore, R.L. Wilkinson, Inc.	317-926-5063
Mass	Belmont, Burton-Rogers Co.	301-377-7800
Minn	Minneapolis, R.J. Siedare & Assoc.	617-489-1520
Mo	St. Louis, Ensco-Rep Inc.	612-533-2294
NJ	West Caldwell, Peterson-Rudnick Assocs.	314-542-3935
NY	Bronx, Peterson-Rudnick Assocs.	201-226-4363
NY	Rochester, Up State Comps.	212-671-1923
NC	Charlotte, K-I Assocs.	716-288-5670
Ohio	Cincinnati, Val-Skol Sls.	404-523-0324
Ohio	Cleveland, Val-Skol Sls.	513-563-6790
Pa	Glenside, R.L. Wilkinson	216-229-2822
Tex	Dallas, Stevens Sls.	215-424-8400
Wash	Bellevue, Elden Bowden Co.	214-350-2476
EXP:	Belmont, Burton-Rogers Co.	206-822-5608
		617-489-1520

Local Distributors

Ariz	Phoenix, Metermaster, Inc., 2633 E. Buckeye Rd.	602-273-7331
Cal	Los Angeles, Metermaster/LA, 5646 Jillson St.	213-685-4340
Cal	Palo Alto, Metermaster, Inc., 3995 Bayshore Rd.	415-968-0313
NJ	Little Falls, Hosica Labs, 715 Main St.	201-256-7724
Tex	Garland, Metermaster, 2809 National Dr.	214-271-2471

H.P.M. DIV., Koehring Co., Marion Rd., Mt. Gilead, Ohio, 43338, Tel: 419-946-0222; Empl.: 1200

Products manufactured: Machines/Machinery, Production

HRB-SINGER, INC., Science Park, Box 60, State College, Pa., 16801, Tel: 814-238-4311, TWX: 510-691-2610; Empl.: 575

Free literature available: Electromagnetic surveillance systems, interactive processing, environmental & behavioral sciences, airborne infrared surveillance systems & services.

Products manufactured: Amplifiers, Antennas, Converters, Couplers, Demodulators, Display Devices/Displays, Dividers, Duplexers, Microwave, Filters, Integrated Circuit Devices, Microwave Integrated Circuits (MIC's), Mixers, Multipliers, Oscillators, Receivers, Services, Assembly, Production & Test, Strip-Line Components, Microwave, Synthesizers, Tuners

Local Sales Offices & Reps.

DC	Wash, K.E. O'Neil	202-223-4100
FOR:	Can., Ottawa, Ont., J.R. Douglas	613-235-2812

HUGHES AIRCRAFT CO, Aerospace Grps., Centinela Ave & Teale St, Culver City, Cal., 90230

Products manufactured: Antenna Feed Systems, Antennas, Attenuators, Boards, Plug-In, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Boards, Programming, Cable Assemblies & Harnesses, Cable, Capacitors, Fixed, Cavities, Microwave, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Circuits, Printed, Multilayer, Circulators, Ferrite, Coatings, Coils Including Assemblies & Forms, Comm. Systems, Computers, Containers, Controllers, Programmable, Control Systems, Air Traffic, Controls/Control Eqpt., Converters, Couplers, Data Acquisition & Reduction Systems, Data Compressors, Digital, Decoders, Delay Lines, Demodulators, Detectors, Diplexers, Antenna, Direction Finders, Discriminators, Display Devices/Displays, Dividers, Drums Computer Memory, Duplexers, Microwave, Ferrite Material & Parts, Filters, Generators, Honeycomb Sheets, Panels, etc., Horns, Microwave, Impedance Converters, Microwave, Indicators, Integrated Circuit Packaging Systems, Integrated Circuit Devices, Intensifiers, Image, Inverters, Isolators, Junctions, Hybrid, Microwave, Laminates, Lasers & Laser Systems, Limiters, Lubricants, Masers, Materials, Self-Lubricating, Memory Systems, Mixers, Modulator/Demodulators, Modules, Logic, Encapsulated, Monitors, Mounts, Multiplexers, Multipliers, Networks, Packages, Integrated Circuit, Paints, Pedestals, Radar, Power Supplies, Radar Systems, Receivers, Recorders, Relays, Resistors, Scramblers, Data, Screens, Printed Circuit, Sensors, Light, Services, Assembly, Production & Test, Shifters, Shutters, Microwave, Signal Conditioners & Equipment, Simulators, Sliding Loads, Microwave, Slotted Lines, Microwave, Strip-Line Components, Microwave, Terminal Blocks, Boards & Strips, Terminal Equipment, Digital, Terminals, Terminals, Data Display (including Alphanumeric & Graphic), Test Systems, Tracking Systems, Transceivers, Transformers, Translators, Data, Transmission Systems, Data, Transmitters, Transponders, Waveguides & Adapters

HUGHES AIRCRAFT CO., Communication Prods. Dept., Microelectronic Prods. Div., 500 Superior Ave., Newport Beach, Cal., 92663, Tel: 714-548-0671, TWX: 910-596-1374 p. 1-361

Products manufactured: Crystals, Discriminators, Filters

Local Sales Offices & Reps.

Ala	Gadsden, F.C. Nickerson Co.	205-547-7718
Ariz	Phoenix, Toward Engrg. Assocs.	602-277-1453
Cal	Mountain View, Caltron Pyle	415-964-3244
Cal	Newport Beach, Hughes Aircraft Co.	714-548-0671
Cal	Van Nuys, Wes-K Assocs.	213-989-3070
Cal	Denver, Electronic Sls.	303-771-6300
Conn	No. Haven, Kitchen & Kutchin	203-239-0212
Fla	Oldsmar, F.C. Nickerson Co.	813-855-4209
Fla	Tampa, F.C. Nickerson Co.	813-885-1416
Ga	Decatur, F.C. Nickerson Co.	404-321-4678
Ill	Des Plaines, Coombs Assocs.	312-298-4830
Md	Baltimore, R.L. Wilkinson, Inc.	301-377-7800
Mass	Lexington, Kitchen & Kutchin	617-862-8230
Minn	Minneapolis, Stach-Johnson, Inc.	612-925-2111
Mo	St. Louis, Beneke & McCaul, Inc.	314-567-3399
NY	Dewitt, Tri Tech Elctns.	315-446-2881
NY	East Rochester, Tri Tech Elctns.	716-381-2722
NY	Great Neck, Cooper-Simon & Co.	516-487-1142
NY	Larchmont, Tri Tech Elctns.	914-834-4423
NC	Kannapolis, F.C. Nickerson Co.	704-932-6772
Ohio	Dayton, R.G. Sidnell Co.	513-885-4161
Ore	Beaverton, N.R. Schultz Co.	503-643-1644
Pa	Narberth, Electro-Comp Sls.	215-664-3576
Tex	Dallas, R. Mathews Elctns.	214-233-0363
Tex	Houston, R. Mathews Elctns.	713-664-7131
Wash	Bellevue, N.R. Schultz Co.	206-454-0300
Wisc	Greendale, Coombs Assocs.	414-421-2300
EXP:	Newport Beach, Cal., Hughes Aircraft Co.	714-548-0671

HUGHES AIRCRAFT CO., CONNECTING DEVICES, 17150 Von Karman Ave., Irvine, Cal., 92705, Tel: 714-549-5701 p. 2-888,2022

Products manufactured: Cable Assemblies & Harnesses, Cable, Circuits, Flexible, Connectors, Contacts, Electrical, Tools

Local Sales Offices & Reps.

Cal	Newport Bch., W. E. S. T., Inc.	714-540-9040
Ill	Park Ridge, Probe Elctns	312-696-2828
Kans	Overland Pk, Ensco-Rep	913-381-7557
Md	Towson, Kraft Elctns. Sls.	301-828-5838
Mass	Stonham, REPCO, Inc.	617-438-3113

Mich Southfield, Luebbs Sls. 313-357-0355
 Minn Mpls., Siedare Assocs. 612-533-2294
 Mo St. Louis, Ensco-Rep. 314-567-3935
 NJ Newfoundland, Adamo Prod. Divl. 201-697-2450
 NY Syracuse, T-Squared Elctns. Co. 315-463-8592
 Ohio Cincinnati, Luebbs Sls. 513-871-4211
 Ohio Cleveland, Luebbs Sls. 216-333-0425
 Ohio Dayton, Luebbs Sls. 513-294-0426
 Pa Delmont, Luebbs Sls. Co. 412-468-4019
 Tex Irving, Space Elctns. 214-251-2261
 EXP: Los Angeles, Cal., Hughes Int'l 213-534-2121

HUGHES AIRCRAFT CO., Electron Dynamics Div., 3100 W. Lomita Blvd., Torrance, Cal., 90509, Tel: 213-534-2121, TWX: 910-347-6238; Empl.: 1200

Products manufactured: Amplifiers, Bands & Twists, Microwave, Detectors, Diodes, Generators, Heat Exchangers & Systems, Heaters & Heating Elements, Isolators, Lasers & Laser Systems, Mixer-Preamplifiers, Microwave, Mixers, Modulators, All Kinds, Power Supplies, Tubes

Local Sales Offices & Reps.

Ariz Phoenix, Griot Assocs. 602-275-4991
 Ariz Scottsdale, Fryco 602-945-3281
 Cal Anaheim, Blair Assocs. 714-635-1350
 Cal El Segundo, Griot Assocs. 213-322-8383
 Cal Los Altos, Griot Assocs. 415-941-2533
 Cal San Jose, MCH Assocs. 408-246-7330
 Cal Tustin, Griot Assocs. 714-838-2330
 Colo Denver, Grifco 303-722-4674
 Fla Orlando, E. G. Holmes & Assocs. 305-894-8901
 Ga Chamblee, E. G. Holmes & Assocs. 404-451-6161

Ill Chicago, Brooks Engrg. Co. 312-944-1227
 Ill Northfield, Feller Assocs. 312-446-8065
 Ind Rochester, Feller Assocs. 219-223-2377
 Md Wheaton, Sonco 301-942-9420
 Mass Chelmsford, Independent Mktg. Reps. 617-256-8251

Mich Southfield, Air Design 313-353-3440
 NH Nashua, Independent Mktg. Reps. 603-888-3630

NJ E. Orange, Friedman Assocs. 201-673-2500
 NM Albuquerque, Fry-Gates Co. 505-298-1875
 NY Fayetteville, Graydon-Sherman 315-637-9861
 NY Pittsford, Graydon-Sherman 716-381-8838
 NY Tuckahoe, Asco Elctns. 914-779-8110
 Pa Blue Bell, Sonco 215-542-1490
 Pa Lafayette Hill, M. Lader Co. 215-825-3177
 Tex Houston, Barnhill Two 713-688-9971
 Tex Richardson, Barnhill Two 214-231-2573
 Utah Salt Lake City, Grifco 804-481-6556

Wash Bellevue, Griot Assocs. 206-454-8592
 Wash Seattle, Datacom Assocs. 206-285-2525
 FOR: Can., Manotick, Ont., Giga-Tron Assocs. 613-692-4829

HUGHES AIRCRAFT CO, Ground Sys. Grp., 1901 Malvern St., Box 3310, Fullerton, Cal., 92634, Tel: 714-871-3232; Empl.: 5000

Products manufactured: Antenna Feed Systems, Antenna Rotators, Antenna Switching Matrices, Antenna Towers & Supports, Antennas, Boards, Printed Circuit, Boards, Programming, Cabinets & Accessories, Circuits, Printed, Multilayer, Circulators, Ferrite, Comm. Systems, Computers, Control Systems, Air Traffic, Converters, Data Acquisition & Reduction Systems, Data Compressors, Digital, Decoders, Decommunators, Telemetry, Delay Lines, Demodulators, Digitizers, Pencil Follower (Inc. Coordinate & Graphic), Diodes, Display Devices/Displays, Drums Computer Memory, Duplexers, Microwave, Integrators, Electronic, Intensifiers, Image, Isolators, Junctions, Hybrid, Microwave, Masers, Modulator/Demodulators, Modulators, All Kinds, Modules, Logic, Encapsulated, Multiplexers, Multipliers, Networks, Oceanographic Equip. (Electronic), Oscillators, Pedestals, Radar, Power Supplies, Radar Systems, Receivers, Recorders, Services, Assembly, Production & Test, Shift Registers, Shifters, Shutters, Microwave, Signal Conditioners & Equipment, Simulators, Slotted Lines, Microwave, Strip-Line Components, Microwave, Technical Books, Terminal Blocks, Boards & Strips, Terminal Equipment, Digital, Terminals, Terminals, Data Display (including Alphanumeric & Graphic), Test Systems, Tracking Systems, Transistor, Diode, Thyristor Heat Dissipators, Transmitters, Transponders, Underwater Communication, Detection, Navigation, etc. Equipment, Waveguides & Adapters

HUGHES AIRCRAFT CO., Hybrid Microelectronic Circuits Dept., Microelectronic Prods. Div., 500 Superior Ave., (E 4/5), Newport Bch., Cal., 92663, Tel: 714-548-0671, TWX: 910-596-1374 p. 1-889

Products manufactured: Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film

Refer to Communications Prods Dept., Microelectronic Products Div. for sales office information.

HUGHES AIRCRAFT CO., Image Devices Ind'l. Prods. Div., 6855 El Camino Real, Carlsbad, Cal., 92008, Tel: 714-729-9191, TWX: 910-322-1393; Empl.: 500

Products manufactured: Converters, Intensifiers, Image, Terminals, Data Display (including Alphanumeric & Graphic), Tubes

HUGHES AIRCRAFT CO., Ind'l. Prods. Div. Display Sys., 2020 Oceanside Blvd., Oceanside, Calif., 92054, Tel: 714-757-1200, TWX: 910-322-1380

Products manufactured: Converters, Terminal Equipment, Digital

HUGHES AIRCRAFT CO., Ind'l. Prods. Div. FACT Sys., Box 92904, Los Angeles, Cal., 90009, Tel: 213-670-9040, TWX: 213-653-582

Products manufactured: Testers

Local Sales Offices & Reps.

Ill Park Ridge, Hughes Aircraft Co. 312-823-5126
 Tex Dallas, Bradenco 214-358-3278

Advertisement

FACT System offers a total systems approach to wiring verification by providing high speed random access circuit analyzers with a total complement of optional accessories. Includes rapid access fixturing, such as, LIFT (Low Insertion Force Technique), QUIC (Quick Universal Interface Connector), FACT-AID (Automatic Interconnection Devices) and Spring Probe Fixtures to meet the specific needs of each individual customer.

HUGHES AIRCRAFT CO., Ind'l. Prods. Div./Ind'l. Auto, 2020 Oceanside Blvd., Oceanside, Cal., 92054, Tel: 714-757-1200, TWX: 910-322-1380; Empl.: 600

Products manufactured: Controls/Control Equip., Indicators, Machines/Machinery, Production, Simulators, Testers

HUGHES AIRCRAFT CO., Ind'l. Prods. Div., Prod. Equip. Dept., 2020 Oceanside Blvd., Oceanside, Cal., 92054, Tel: 714-729-9191, TWX: 910-322-1380; Empl.: 500; Minimum order: \$15

For info on price: C. A. Rollins Ext. 258; Application info: C. A. Rollins Ext. 258; Customer service: C. A. Rollins Ext. 258; Delivery info: J. C. Brown Ext. 265

Products manufactured: Alarms, Comm. Systems, Comparators, Controllers, Programmable, Controls/Control Equip., Converters, Indicators, Machines/Machinery, Production, Microcircuit Production Equip., Power Supplies, Process Control Systems, Simulators, Soldering Equipment, Terminal Equipment, Digital, Test Systems, Testers, Tubes, Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

Local Sales Offices & Reps.

Ariz Scottsdale, Allen Assocs. 602-994-1305
 Cal Los Altos, C. D. Buerki Co. 415-941-3343
 Cal Los Angeles, International Sls. 213-670-1515
 Fla Clearwater, MacGregor Assocs. 813-446-7310
 Fla Coral Springs, MacGregor Assocs. 305-752-1924

Ga Lilburn, MacGregor Assocs. 404-921-1300
 Ill Chicago, J. C. Angel Co. 312-878-0653
 Kans Kansas City, Ransom Assocs. 913-299-2789
 Md Baltimore, A. L. Myers Co. 301-426-5583
 Mass Acton, E. E. Specialists 617-259-9200
 NJ Saddle Brook, L & M Assocs. 201-843-8700
 NY Brentwood, L & M Assocs. 516-231-8363
 NY New York, L & M Assocs. 212-675-7486
 NY Penfield, Upstate Tech. Equip. 716-381-0930
 NY Solvay, Upstate Tech. Equip. 315-488-3101
 NC Charlotte, MacGregor Assocs. 704-375-1562
 Ohio Dayton, R. G. Sidnell & Co. 215-639-3100
 Pa Andalusia, L & M Assocs. 215-639-3100
 Tex Dallas, Bradenco 214-358-3278
 Wash Seattle, Penryn Sls. & Engrg. 206-634-0240

FOR: Can., Manotick, Ont., Giga-Tron Assoc.

613-692-4829

HUGHES AIRCRAFT CO., MOS Dept. (E 3/5) Microelectronic Prods. Div., 500 Superior Ave., Newport Beach, Cal., 92663, Tel: 714-548-0671, TWX: 910-596-1374 p. 1-889

Products manufactured: Integrated Circuit Devices

Refer to Communications Prods Dept., Microelectronic Products Div. for sales office information.

HUGHEY & PHILLIPS, INC., 3050 N. California St., Burbank, Cal., 91505, Tel: 213-849-1104, TWX: 910-498-2252; FSC No: 94295; Empl.: 38; Minimum order: \$15

For info on price: C. E. Stephens; Application info: C. E. Stephens; Customer service: C. L. Phillis; Delivery info: C. L. Phillis

Products manufactured: Controls/Control Equip., Flashers, Transformers

HULL CORP., Davisville Rd., Hatboro, Pa., 19040, Tel: 215-672-7800, TWX: 510-665-6822; Empl.: 275

Customer service: S. H. Bauer

Free literature available: Brochures describing presses and molds for encapsulating electrical and electronic components by transfer molding in thermosetting resins.

Products manufactured: Chamber, Environmental Test, Furnaces, Machines/Machinery, Production, Microcircuit Production Equip., Ovens, Pumps, Vacuum

Local Sales Offices & Reps.

Cal Burlingame 415-692-4477
 Ill Elmhurst 312-279-8900
 NC Brevard 704-883-3061
 Ohio Cleveland 216-228-1318
 Pa Hatboro 215-672-7800
 Tex Dallas

HUMISEAL DIV., Columbia Tech. Dept. 77, 26-60 Bklyn-Queens Expwy., Woodside, N.Y., 11377, Tel: 212-932-0800; QPL No: 46058; Empl.: 150; Minimum order: \$20 p. 2-338,339,1270,1271

For info on price: Sls. Dept.; Application info: J. Waryold; Customer service: Sls. Dept.; Delivery info: Sls. Dept.

Free literature available: HumiSeal Protective Coating, How To Select a Conformal Coating for P.C. Boards, Materials, Methods & Equipment for Cleaning Assemblies, Causes & Prevention of Blisters

Products manufactured: Coatings, Insulators & Insulation

Local Sales Offices & Reps.

Cal Alhambra, M.W. Riedel Co. 213-283-7694
 Cal Mountain View, Weseloh & Assocs. 415-961-0565

Fla Maitland, Barrett Assocs. 305-678-0172
 Ill Northbrook, R. T. Howlett & Assoc. 312-498-5444

Mass Waltham, Betronic Assocs. 617-894-8400
 NJ Livingston, H. Thaw Sls. 201-992-2711
 NY Rochester, Gislason Sls. 716-454-4741
 Ohio Cleveland, Marlow Assocs. 216-932-0900
 Tex Dallas, R. D. Spooner 214-357-6636
 Wash Kirkland, R.R. Chase & Assoc. 206-454-2514
 FOR: Can., Montreal, Que., D/R Elctns. 514-622-7381

HUMPHREY, INC., 9212 Balboa Ave., San Diego, Calif., 92123, Tel: 714-565-6631, TWX: 910-335-2001; Empl.: 96

Customer service: H. H. Kries

Free literature available: Brochures on: Rate transducers, solid state, electro-fluidic; single and three-axis models.

Products manufactured: Accelerometers, Blowers & Fans & Accessories, Gyros (All Types), Indicators, Potentiometers, Switches, Transducers

Local Sales Offices & Reps.

Cal Burbank, TransDynamics 213-849-6262
 Cal San Diego, TransDynamics 714-298-8215
 Conn Bloomfield, Zaslow Sls. Co. 203-242-7781
 Conn Milford, Zaslow Sls. Co. 203-878-1094
 Fla Orlando, Gra-Mar, Inc. 305-894-3351
 Kans Wichita, Humphrey, Inc. 316-685-7563
 Mass Lowell, Zaslow Sls. Co. 617-458-8452
 Mass Northboro, Zaslow Sls. Co. 617-393-8150
 Mich Farmington, Carter, McCormick & Peirce 313-477-7700
 NY Holbrook, Aviatech Int'l 516-981-9300

Ohio Cleveland, Carter, McCormick & Peirce
216-333-5650

Ohio Dayton, Carter, McCormick & Peirce
513-278-5873

Pa Philadelphia, Humphrey, Inc., Eastern Div.
215-542-9150

Pa Pittsburgh, Carter, McCormick & Peirce
412-824-3760

Tex Dallas, W.N. Rider Co.
214-357-2246

Wash Seattle, TransDynamics
206-782-0064

Advertisement

Humphrey, Inc. designs and manufactures electro-mechanical and inertial reference instruments, including electro-fluidic angular rate sensors, gyroscopes (free, rate, directional, vertical); all-electric attitude and directional gyros and repeaters for general aviation and avionics OEMs; bore hole survey systems for offshore and inland drilling; angular and rectilinear displacement transducers; accelerometers and acceleration switches; planar accelerometers (Accelograph); pendulums; inertial reference systems for automotive, aircraft, and oceanographic performance testing. Proven and qualified as required for military and industrial applications.

HUNTER TOOLS, See Marshall Inds.

HURST MFG. CORP., Box 326, Princeton, Ind., 47670, Tel: 812-385-2564, TWX: 810-350-2341; Empl.: 140
Customer service: M. Meuser

Free literature available: General catalog No. 700

Products manufactured: Motors

Local Sales Offices & Reps.

Ariz Phoenix, Sheffer-Kahn Co.
602-258-7893

Cal Los Angeles, Minarik Electric Co.
213-485-1391

Cal Menlo Park, Long & Assoc.
415-327-1300

Colo Denver, Sheffer-Kahn Co.
303-232-0873

Fla Orlando, Cartwright & Bean, Inc.
305-422-4531

Fla Plantation, Cartwright & Bean, Inc.
305-791-3989

Ga Atlanta, Cartwright & Bean, Inc.
404-237-2273

Ill Chicago, D. Dolin Co.
312-286-6200

Ind Princeton, W.S. Burton
812-385-2564

La Chalmette, Cartwright & Bean, Inc.
504-279-4598

Md Glen Arm, Hodgins Assoc.
301-592-7047

Mass Millis, Selmark Assoc.
617-376-2914

Mich Grand Rapids, R. Van Riper Sls.
616-452-0464

Minn Minneapolis, White Sls. Co.
312-929-4661

Miss Jackson, Cartwright & Bean, Inc.
601-354-1368

NH Plaistow, Selmark Assoc.
617-375-0305

NJ Little Falls, D. Carbone
201-256-9191

NM Albuquerque, Sheffer-Kahn Co., Inc.
505-265-7077

NY Newburgh, W. H. Zimmerman Co.
914-562-7330

NY Rochester, W.H. Zimmerman Co.
716-586-4450

NY Syracuse, W.H. Zimmerman Co.
15-474-4889

NC Charlotte, Cartwright & Bean, Inc.
704-333-6457

NC Raleigh, Cartwright & Bean, Inc.
919-832-7128

Ohio Chagrin Falls, Kilroy Sls. Co.
216-247-8997

Pa Pittsburgh, G.S. Root Co.
412-561-4125

Tenn Knoxville, Cartwright & Bean, Inc.
615-693-7450

Tenn Memphis, Cartwright & Bean, Inc.
901-276-4442

Tex Dallas, John B. Guenther, Inc.
214-691-8500

Tex Houston, John B. Guenther, Inc.
713-468-0232

Wash Kingston, F.H. Haight Co.
206-297-3212

EXP: Westbury, New York, Minthorne International
516-334-3303

HUTCHINSON INDUSTRIAL CORP., 44 W. Highland Park, Hutchinson, Minn., 55350, Tel: 612-879-2371; Empl.: 115
p. 11542,1543

Customer service: J. Green

Free literature available: Brochure and Data Sheets

Products manufactured: Boards, Printed Circuit, Circuits, Flexible, Circuits, Printed, Multilayer, Cores, Magnetic, Delay Lines, Dials, Encoders, Heaters & Heating Elements, Light Choppers, Plates, Core Loading (Memory), Scales, Dial, Services, Assembly, Production & Test, Thermometers, Resistance, Transducers

Local Sales Offices & Reps.

Cal Santa Clara, King Assocs.
408-249-1022

HUTSON INDUSTRIES, 2019 W. Valley View, Dallas, Tex., 75234, Tel: 214-241-3511, TWX: 910-860-5537; Empl.: 200

Local Sales Offices & Reps.

Ariz Scottsdale, Gassner & Clark
602-945-7979

Cal Arcadia, Orion Sls.
213-355-6638

Cal Northridge, Orion Sls.
213-886-4761

Cal Tustin, Orion Sls.
714-832-9687

Colo Denver, Electrodyne
303-757-7679

Conn New Haven, Gerber Sls.
203-777-6279

Fla Belleair Beach, Consultants for Industry
813-595-1486

Ga Kennesaw, K&E Assocs.
404-974-4264

Ill Chicago, L-TEC, Inc.
312-286-1500

Ind Greenwood, Valentine/Schillinger & Assoc.
317-888-2260

Ind South Bend, Valentine/Schillinger & Assoc.
219-291-6258

Md Baltimore, Stemler Assoc.
301-944-8262

Mass East Longmeadow, Gerber Sls.
413-525-3059

Mass Waltham, Gerber Sls.
617-890-8040

Mich Grosse Point Park, S. Greiner Assoc.
312-499-0188

Minn Minneapolis, Bitronics Sls.
612-866-3035

Mo Grandview, Beneke & McCaul, Inc.
816-765-2998

Mo St. Louis, Beneke & McCaul, Inc.
314-231-1677

NJ Cherry Hill, Stemler Assoc.
609-966-4070

NJ Nutley, Falk-Baker Assoc.
201-661-2430

NJ Turnersville, Stemler Assoc.
215-644-3477

NY No. Syracuse, Advanced Comps.
315-699-2671

Ohio Dayton, Midwest Mktg. Assoc.
513-433-2511

Ore Beaverton, N.R. Schultz Co.
503-646-1345

Tex Garland, Whiteside Sls. Co.
214-231-9771

Tex Houston, Whiteside Sls.
713-498-2551

Va Alexandria, Stemler Assoc.
703-548-7818

Wash Bellevue, N.R. Schultz Co.
206-454-0300

HY-CAL ENGINEERING, 12105 Los Nietos Rd., Santa Fe Springs, Cal, 90607, Tel: 213-698-7785; Empl.: 50

Customer service: A. E. Bowman, Mktg Mgr

Free literature available: Bulletin A-10 describes resistance temperature sensors, indicating systems, reference temperature systems, thermocouples, calorimeters, radiometers, pyrheliometers. Includes data on equations for thermocouples, resistance temperature detectors, and heat flux instrumentation.

Products manufactured: Amplifiers, Bridges, Controls/Control Eqpt., Detectors, Indicators, Meters, Monitors, Networks, Probes, Radiometers, Scanners, Standards, Thermocouples, Elements & Accessories, Transducers, Transmission Systems, Data

HY-GAIN ELECTRONICS CORP., 8601 N.E. Highway 6, Lincoln, Neb., 68507, Tel: 402-464-9151, Telex: 48-6424; Empl.: 540; Minimum order: \$50

For info on price: K. Simmons Ext. 222; Application info: K. Simmons Ext. 222; Customer service: J. Magnuson Ext. 260; Delivery info: C. Hoppe Ext. 270

Products manufactured: Antenna Rotators, Antenna Switching Matrices, Antenna Towers & Supports, Antennas, Arresters, Electrical Surge, Lightning, CATV Systems & Equipment, Coils Including Assemblies & Forms, Comm. Systems, Dummy Loads, Mounts, Receivers, Transceivers, Transmitters

Local Sales Offices & Reps.

Cal Van Nuys, Hy-Gain Elctns. Corp.
213-785-4532

Colo Denver, G. Moss Elctns., Inc.
303-985-8815

Fla Miami, B-C Elctn. Sls., Inc.
305-894-6071

Ga Smyrna, B-C Elctn. Sls., Inc.
404-436-5169

Ind Indianapolis, Mid-Central Sls.
317-283-1727

Kans Overland Park, H. Curry
913-888-6484

Md Olney, A B & T Sls. Corp.
301-924-4976

Mass Wellesley, Johnson Assocs.
617-235-3977

Mich Ferndale, Shalco, Inc.
313-547-4771

Miss Michigan City, J. Fisher Sls. Co.
601-224-6470

NJ Fair Lawn, Moses & Kline
201-791-8538

NY Rochester, Johnson Assocs.
716-473-6030

NY Schenectady, Johnson Assocs.
518-393-3939

Ohio Cleveland, H. Miller Sls. Co.
216-321-3900

Pa King of Prussia, A B & T Sls. Corp.
215-265-1028

Tex Dallas, Loss & Stewart Assocs.
214-691-6039

Va Vinton, B-C Elctn. Sls., Inc.
703-890-1128

Wash Seattle, W.R. Lanphear Co.
206-633-4900

Wisc Brookfield, Steffen Sls. Co.
414-781-7596

EXP: Peterborough, Ont., Cah., Lectron Radio Sls.
705-745-3231

HYCOMP INC., Box 250, Maynard, Mass., 01754, Tel: 617-897-4578; Empl.: 54

For info on price: N. S. Palazzini; Application info: J. J. Madden; Customer service: N. D. Oelschlegel; Delivery info: N. D. Oelschlegel

Products manufactured: Circuits, Hybrid, Thin-Film, Converters, Films, Networks, Resistors

Local Sales Offices & Reps.

Cal Pasadena, Mar-Land Entprs.
213-681-9440

Md Ellicott City, J. Winkler Assoc.
301-465-8630

Mass Billerica, Matrix Sls.
617-667-9268

Mass Burlington, Contact Sls.
617-273-1520

NJ Ridgefield, Haber-Ramp Corp.
201-945-5250

NY Rochester, W.H. Zimmerman, Inc.
716-586-4450

NY Syracuse, W.H. Zimmerman, Inc.
315-474-4889

HYBEX, 6730 S. Tucson Blvd., Tucson, Ariz., 85734

Customer service: Sls. Dept. 602-294-1431

Products manufactured: Capacitors, Fixed, Resistors

Local Sales Offices & Reps.

Ala Huntsville, W.A. Brown Comps., Inc.
205-539-4411

Ariz Tempe, J.F. Hurlbut Co.
602-968-5962

Cal Glendale, Orion Sls.
213-240-3151

Cal Palo Alto, Andot Tech Sls.
415-941-8858

Cal San Diego, Orion Sls.
714-566-0360

Cal Tustin, Orion Sls.
714-832-9687

Colo Golden, J.F. Hurlbut Co.
303-279-7138

Conn Guilford, Whitehead Assocs.
203-453-3762

Fla Ft. Lauderdale, W.A. Brown Comps.
305-564-8000

Fla Orlando, W.A. Brown Comps.
305-425-5505

Mass Boston, Whitehead Assocs.
617-542-7676

Mich Farmington, Sheridan Assocs.
313-477-3800

Mo Florissant, Sheridan Assocs.
314-837-5200

NJ Union, J. Onore
201-355-0474

NY Clinton, Advanced Comps.
315-853-6438

NY Endicott, Advanced Comps.
607-785-3191

NY Mt. Vernon, QED Elctns.
914-664-0080

NY North Syracuse, Advanced Comps.
315-699-2671

NY Scottsville, Advanced Comps.
716-889-1429

NC Winston-Salem, W.A. Brown Comps., Inc.
919-725-5384

Ohio Cincinnati, Sheridan Assocs.
513-761-5432

Ohio Cleveland, Sheridan Assocs.
216-524-8120

Ohio Dayton, Sheridan Assocs.
513-277-8911

Pa Pittsburgh, Sheridan Assocs.
412-244-1640

HYBRID SYSTEMS CORP., 87 Second Ave., Burlington NV Ind'l Pk., Burlington, Mass., 01803, Tel: 617-272-1522, TWX: 710-332-7584; Empl.: 250
p. 1164-170,890; p. 21496,1497

For info on price: R. Cummings; Application info: W. Miller; Customer service: R. Cummings; Delivery info: R. Cummings

Free literature available: Data Conversion Module Catalog; Chip Resistor Catalog; Deltaverta Catalog

Products manufactured: Amplifiers, Cards, Linear Function, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Converters, Data Acquisition & Reduction Systems, Detectors, Dividers, Drivers, Switch, Enclosures, Module, Plug-In, Generators, Integrated Circuit Packaging Systems, Integrated Circuit Devices, IC's, Active Filters, Lamp Drivers, Modulator/Demodulators, Multiplexers, Multipliers, Networks, Power Supplies, Resistors, Signal Conditioners & Equipment, Transistors

Local Sales Offices & Reps.

Ariz Phoenix, R.A. Mayes Co.
602-279-5243

Cal Los Altos, Hoeke-Reeser Assocs.
415-941-4080

Cal Los Angeles, Cain Technology
213-476-2251

Cal Norwalk, Bertrand-Zoolalian
213-921-9791

Cal Orange, Cain Technology
714-997-7311

Colo Boulder, R.A. Mayes Co.
303-444-0782

Conn Washington Depot, Kanan Assocs.
203-868-0513

Fla Ormond Beach, Technology Mktg. Assocs.
904-672-2314

Fla Pompano Beach, Technology Mktg. Assocs.
305-942-0774

Ill Hinsdale, Momak Sales
312-654-4524

Md Randallstown, Beacon North Inc.
301-922-1248

Mass Holbrook, McLeelan Assocs.
617-767-4771

Mass Reading, Kanan Assocs.
617-944-8484

Mich Birmingham, J.C. Hofstetter Co.
313-643-7203

NJ Haddonfield, Thomas Assocs.
609-854-3011

NM Albuquerque, R.A. Mayes Co.
505-292-2330

NY Buffalo, H.C. Johnson Agencies
716-632-7880

NY Fayetteville, H.C. Johnson Agencies
315-637-9383

NY	Rochester, H.C. Johnson Agencies	716-482-3000
NY	Tuckahoe, Spectrum Sls.	914-793-1660
NC	Winston-Salem, RADCO Co.	919-722-9671
Ohio	Dayton, J.C. Hofstetter Co.	513-296-1010
Ohio	Medina, J.C. Hofstetter Co.	216-241-4880
Ore	Portland, Jas. J. Backer	503-297-3776
Pa	Glenshaw, H.C. Johnson Agencies	412-961-0414
Tex	Houston, R.A. Mayes Co.	713-461-5385
Tex	Richardson, R.A. Mayes Co.	214-235-3043
Utah	Centerville, R.A. Mayes Co.	801-292-6781
Va	Falls Church, Beacon Inc.	703-534-1673
Wash	Seattle, Jas. J. Backer	206-285-1300

HYCOM, 16841 Armstrong Ave., Irvine, Cal., 92705

HYKON MFG. CO., 163 E. State St., Box 923, Alliance, Ohio, 44601, Tel: 216-821-2320
Customer service: A. Duchon

Free literature available: A 10 page catalog featuring payout & take up wire and cable reels. Wire and cable length measuring meters. Portable live extension cord reels.

Products manufactured: Machines/Machinery, Production, Reels, Cord & Cable

HYPERTRONICS CORP., 154 Great Rd., Stow, Mass., 01775, Tel: 617-897-3236, Telex: 94-8338; FSC No: 50541; Empl: 16; Minimum order: \$25

For info on price: J. Kelley; Application info: D. Downey; Customer service: J. Kelley; Delivery info: J. Kelley

Free literature available: General Brochure (6 pages) - sampling of product line. Printed Circuit Connectors (24 pages) - K series, Modular Connectors (16 pages) - L series, Circular Connectors (Aval. Feb. 75) - C & D series.

Products manufactured: Connector Adapters, Connector Blocks, Mother Board, Connectors, Jacks (All Types), Plug & Jack Sets, Plugs, Sockets

Local Sales Offices & Reps.		
Cal	Belmont, Ciance Assocs.	415-593-2000
Cal	N. Hollywood, Jewett Co.	213-789-8103
Conn	Bethany, Representatives Corp.	203-393-0024
DC	Wash, Tyler Griffin Co.	EN1-4821
Fla	Orlando, Gra-Mar, Inc.	305-894-3351
Ill	Oak Park, Joe Popp Sls. Co.	312-626-3711
Md	Baltimore, Tyler Griffin Co.	EN9-4821
Mass	Topsfield, Representatives Corp.	617-887-5050
Minn	Minneapolis, Electronic Innovators	612-884-7471
NJ	Fairlawn, C.R. Mayer Co.	201-791-8989
NY	Huntington, C.R. Mayer Co.	516-421-4322
Ohio	Medina, McShane, Inc.	216-725-4568
Pa	Paoli, Tyler Griffin Co.	215-647-1550

HYTRONICS CORP., 6231 72nd Ave. N., Pinellas Park, Fla., 33565, Tel: 813-546-2421; FSC No: 29525; Empl: 50; Minimum order: \$35

For info on price: G. J. Wilson; Application info: C. Clark; Customer service: P. Hall; Delivery info: M. Petrucci

Free literature available: Hytronics literature illustrates the broad category of small coils and transformers that are custom-made to the design requirements of their customers.

Products manufactured: Chokes, Coils Including Assemblies & Forms, Transformers

Local Sales Offices & Reps.		
Ariz	Scottsdale, J. B. Hower & Co.	602-948-0430
Cal	Mountain View, Weseloh & Assocs.	415-961-0565
Cal	Santa Ana, Cal. Elctns. Mktg.	714-835-2702
Colo	Denver, Omega Ltd.	303-758-1508
Fla	Madeira Beach, Harvey Pipe	813-391-3057
Mass	Canton, New England Elctn. Sls. Corp.	617-828-4835
Mich	Grosse Pointe Park, Greiner Assocs.	313-499-0188
Minn	Minneapolis, Scott Elctns.	612-929-2985
Ohio	Dayton, F. L. Ohmer	513-434-1454
Pa	Furlong, Avenir	215-348-8290
Tex	Richardson, Vista Engrg.	214-235-4547

I-T-E ELECTRICAL COMPONENTS GRP., 123 Smith St., E. Farmingdale, N.Y., 11735, Tel: 516-694-5400; Empl: 400
For info on price: M. Robinson; Application info: T. Mooney; Customer service: M. Robinson; Delivery info: M. Robinson

Free literature available: EF 274 - EFCOR Products Catalog; CF 19 - Electrical Connector & Components Catalog; LT 42 - Industrial Electrical Fittings Bulletin; Shawmut Fuse Catalog & Applications Brochure.

Products manufactured: Conduit, Electrical, Connectors, Fuses, Splices, wire (Including, Butt & Cap Types), Strain Reliefs, Cable & Wire, Terminals, Tools, Wire & Cable Ties, Wire Nuts

Local Sales Offices & Reps.		
Ala	Birmingham, W. F. Bishop Co.	205-822-4524
Alas	Anchorage, Rostel Corp.	
Ariz	Phoenix, T. Geiss & Assoc.	602-252-7694
Ark	Little Rock, Percy Williams & Co.	501-663-8069
Cal	Los Angeles, I-T-E Electrical Comps.	213-266-3364
Cal	Sacramento, I-T-E Electrical Comps.	916-371-6953
Colo	Denver, Stemco Sls. Co.	303-355-3573
DC	Washington, D.T. Ewing Assoc.	202-292-4777
Fla	Tampa, I-T-E Electrical Comps.	813-621-4773
Ga	Atlanta, W. F. Bishop Co.	404-522-8124
Ill	Bellwood, I-T-E Electrical Comps.	312-547-5900
Ind	Indianapolis, Pfeiffer-Boyle Sls. Co.	317-255-2553
Iowa	Cedar Rapids, A. Sell & Assoc.	319-393-4225
Kans	Kansas City, D. Hatfield Sls. Co.	913-281-0533
Ky	Louisville, Pfeiffer-Boyle Sls. Co.	502-896-9876
La	Metairie, I-T-E Electrical Comps.	504-455-2350
Md	Baltimore, D.T. Ewing Assoc.	301-823-2306
Mass	Braintree, B.N. Yanow & Co.	617-848-7300
Mich	Detroit, Popkin Bros.	313-832-1700
Minn	Minneapolis, Lawless Electrical Sls.	612-925-3663
Mo	St. Louis, Cooper Elec. Sls.	314-638-3434
NY	Brooklyn, B. Cooper, Inc.	212-383-1900
NY	Jamaica, Warshaw Elec. Co.	212-525-8150
NY	Syracuse, Elec. Sls. Agents, Inc.	315-437-1676
NC	Charlotte, E.F. Lombardi Co.	704-334-1637
Ohio	Cleveland, J. Natt & Assoc.	216-526-4200
Ore	Portland, Carlson, Ziegler & Assoc.	503-227-1181
Pa	Philadelphia, I-T-E Electrical Comps. Grp.	215-426-1500
Pa	Pittsburgh, I-T-E Electrical Comps. Grp.	412-922-5114
Tenn	Nashville, Matthews & Park, Inc.	615-242-3309
Tex	Dallas, I-T-E Electrical Comps. Grp.	214-638-8550
Utah	Salt Lake City, L. Vordos Agency	801-521-2111
Wash	Seattle, Valliant Sales Corp.	206-762-8780
Wisc	Milwaukee, Lawless Elect. Sls.	414-352-4850

ICI/MIDWEC, See Midwec Div. Independent Cable.

ICO/RALLY CORP., 2575 E. Bayshore Rd., Palo Alto, Cal., 94303, Tel: 415-324-0970, Telex: 348-335; FSC No: 51705; Empl: 25; Minimum order: \$25

For info on price: J. Triplett; Application info: W. H. Clark, Sls. Admin.; Customer service: J. Triplett; Delivery info: J. Triplett

Free literature available: 1974 Catalog "Wiring Accessories & Plastic Insulation Materials" Indexed by product - Heat Shrinkable Tubing, Wire Harnessing Devices, Sleeving & Tuling and Solderless Terminals..Catalog #0874-MC

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Cable Assemblies & Harnesses, Clamps & Clips, Connectors, Cords, Grommets, Heat Guns, Production, Insulators & Insulation, Spacers, Strain Reliefs, Cable & Wire, Tapes, Electrical Insulation, Terminals, Tools, Tubing, Wire & Cable Ties

Local Sales Offices & Reps.		
Cal	Palo Alto	415-324-0970
NJ	Deptford	609-228-4600

ICON CORP., Sub. of U.S.M. Corp., 156 Sixth St., Cambridge, Mass., 02142, Tel: 617-868-5400, TWX: 710-321-1883; Empl: 100; Minimum order: \$25

For info on price: L. Smith; Application info: D. Jackson; Customer service: L. Smith; Delivery info: L. Smith

Free literature available: 1) Stepping Motor Technical Manual - Application guide, for design engineers, in the use of stepping motor positioning systems. 2) 1 Con Numerical Controls - Application guide, for design engineers, in the selection automatic digital positioning systems.

Products manufactured: Actuators, Controls/Control Eqpt., Motors

Local Sales Offices & Reps.		
Cal	Los Angeles, Icon Corp.	714-556-7711
Cal	San Francisco, McFarland Assoc.	408-286-9333
Fla	Orlando, McMahon Assoc.	305-645-0463
Ill	Chicago, Icon Corp.	312-259-3778
Mich	Detroit, Xanthus	313-391-3235
Minn	Minneapolis, Applied Sls. Engrg.	612-544-3308
NY	North Port, Icon	516-271-1110

NY	Rochester, H. C. Johnson Agencies	716-482-3000
Ohio	Cincinnati, J. Murray Assoc.	513-662-1616
Ohio	Cleveland, Del Steffen Assoc.	216-461-8333

ICORE INT'L, INC., 180 N. Wolfe Rd., Sunnyvale, Cal., 94086, Tel: 408-732-5400, TWX: 910-339-9269; Minimum order: \$125

Customer service: T. Green

Free literature available: Icore Conflex Systems - Harness Systems EMC Shielding - EMI Capabilities Thermoplastics Brochure - Plastic's Capabilities Conflex Wire - General Wire Data Elcon Universal Power Disconnects - General Brochure

Products manufactured: Backpanel Interconnect Systems, Braid, Cable, Cable Assemblies & Harnesses, Cable, Coils Including Assemblies & Forms, Conduit, Electrical, Connectors, Services, Assembly, Production & Test, Shields, Tubing, Wire, Wire Shielding

Local Sales Offices & Reps.		
Ala	Huntsville, E. Finn	205-859-1750
Ariz	Scottsdale, Mercury Engrg. Sls.	602-275-8579
Cal	Sunnyvale, J. Marquez	408-732-5400
Fla	Casselberry, Publicover Assocs.	305-834-5775
Ill	Chicago, Drager Co.	312-478-5022
Iowa	Cedar Rapids, Palatine	
Kans	Wichita, Dytronix	316-943-6221
Md	Towson, Kraft Elctn. Sls.	301-828-5838
Mass	Reading, Champagne Assocs.	617-944-3011
Mich	Southfield, Luebbs Sls. Co.	313-357-0355
Mo	Hazelwood, Dy-tronix	314-731-5799
NY	Commack, PMR	516-543-8300
NY	Fayetteville, F. Darcy Assocs.	315-637-6587
NY	Williston Park, ABC Elctns. Sls. Co.	

Ohio	Cincinnati, Luebbs Sls. Co.	513-871-4211
Pa	Delmont, Luebbs Sls. Co.	412-468-4019
Pa	Huntingdon Valley, ABC Elctn. Sls. Co.	215-464-2275
Tex	Richardson, Barry Sls.	214-234-0255
Wash	Seattle, Norwest Co.	206-282-3707

IDEAL INDUSTRIES INC., 4450 Becker Pl., Sycamore, Ill., 60178, Tel: 815-895-5181, TWX: 910-639-0613; Empl: 650

For info on price: K. Doubler; Application info: N. R. Griffin; Customer service: D. Woodin; Delivery info: D. Woodin

Products manufactured: Blowers & Fans & Accessories, Caps, Connector, Clamps & Clips, Connectors, Cutters, Wire, Hand Operated, Demagnetizers, Soldering Equipment, Splices, wire (Including, Butt & Cap Types), Terminals, Testers, Tools, Wire & Cable Ties, Wire Markers, Wire Nuts, Wire Strippers

Local Sales Offices & Reps.		
Ala	Birmingham, Ideal Industries, Inc.	205-822-4782
Ala	Mobile, Zeller & Constantine Inc.	205-471-1724
Ariz	Phoenix, Maddox Sls. Co.	602-274-3807
Cal	Los Angeles, Ideal Electrical Ind. Inc.	213-269-2141
Cal	Pico Rivera, Maddox Sls. Co.	213-949-5433
Cal	San Francisco, Maddox Sls. Co.	415-431-2953
Colo	Denver, E-O Sls. Co.	303-744-7031
Conn	Avon, Electrical Agencies, Inc.	203-673-9296
Conn	West Haven, Electrical Agencies, Inc.	203-WE3-2985
Fla	Miami, Curly Gross & Assoc.	305-666-7778
Fla	Temple Terrace, Ideal Ind. Inc.	813-872-2651
Ga	Atlanta, Ideal Industries Inc.	404-351-4256
Haw	Honolulu, H.H. Sawyer Co.	808-847-1411
Ill	Chicago, Ideal Industries Inc.	312-775-4343
Ill	Peoria, Ideal Industries Inc.	309-265-9631
Ind	Ft. Wayne, Ideal Industries Inc.	219-485-3625
Ind	Indianapolis, Ideal Industries Inc.	317-881-9994
Iowa	Cedar Rapids, F.C. Clatterbaugh Co.	319-364-5557
Iowa	Des Moines, F.C. Clatterbaugh Co.	515-282-3213
Kans	Leawood, Walker-Loudermilk Co.	913-648-7223
Kans	Prairie Village, Walker-Loudermilk Co.	918-362-4889
La	Metairie, Zeller & Constantine, Inc.	504-889-1995
Me	S. Berwick, Electrical Agencies, Inc.	207-384-5321
Md	Baltimore, O.T. Hall & Son Inc.	301-467-5359
Mass	Boston, Electrical Agencies Inc.	617-268-9300
Mich	Birmingham, Ideal Industries Inc.	313-341-6426
Mich	Royal Oak, Associated Elec. Sls. Co.	313-541-0248

Mich	Troyfield, Associated Elec. Sls. Co.	313-354-1177
Mich	Troy, Associated Elec. Sls. Co.	313-646-0745
Minn	Minneapolis, Elstad Sls. Co.	612-533-3033
Miss	Jackson, Zeller & Constantine, Inc.	601-982-2745
Mo	Webster Groves, Ideal Industries, Inc.	314-968-1832
Neb	Lincoln, F.C. Clatterbaugh Co.	402-489-5912
Neb	Omaha, F.C. Clatterbaugh Co.	402-391-2905
NJ	Beverly, Ideal Industries Inc.	609-871-6735
NJ	Hackensack, Ideal Industries Inc.	201-342-5813
NJ	Linden, Ideal Industries Inc.	201-925-0575
NM	Albuquerque, Maddox Sls. Co.	505-298-2422
NY	Canandaigua, Ideal Industries Inc.	315-394-3411
NY	East Williston, Ideal Industries Inc.	516-741-5989
NY	Elmira, Ideal Industries Inc.	518-371-5129
NY	Oceanside, Ideal Industries Inc.	516-764-6118
NC	Charlotte, Ideal Industries Inc.	704-536-5794
NC	Greensboro, Ideal Industries Inc.	919-288-7121
Ohio	Cincinnati, Ideal Industries Inc.	513-471-0446
Ohio	Cleveland, Ideal Industries Inc.	216-831-1600
Okla	Oklahoma City, Hamco Sls.	405-946-6503
Okla	Tulsa, Hamco Sls.	918-627-2262
Ore	Portland, Northwest Agencies Inc.	503-227-5004
Pa	Philadelphia, Ideal Industries Inc.	215-VIA-6300
Pa	Philaburgh, Ideal Industries Inc.	412-561-8335
SC	Columbia, Ideal Industries Inc.	803-722-1629
Tenn	Memphis, Ideal Industries Inc.	901-323-9162
Tenn	Nashville, Ideal Industries Inc.	615-356-2511
Tex	Dallas, Galvin Sls. Co.	214-692-1557
Tex	Houston, Galvin Sls. Co.	713-774-1141
Utah	Murray, Wright, Williams & Roup, Inc.	801-262-6132
Utah	Salt Lake City, Wright, Williams & Roup, Inc.	801-487-7821
Va	Richmond, Ideal Industries Inc.	804-262-5311
Wash	Kent, Northwest Agencies Inc.	206-UL2-8198
Wash	Seattle, Northwest Agencies Inc.	206-MA3-8882
Wisc	Pewaukee, Ideal Industries Inc.	414-464-3230

IDEAL PRECISION METER CO., 214 Franklin St., Brooklyn, N. Y., 11222, Tel: 212-383-6904; FSC No: 6625; QPL No: 10304-41; Empl.: 150; Minimum order: \$50

Customer service: R. Friedman
Free literature available: Commercial Panel Meters, Military Ruggedized Meters & Instruments, Avionic Mechanisms and Instruments

Products manufactured: Indicators, Meters

Local Sales Offices & Reps.		
Cal	San Francisco, Artwel Electric Inc.	415-467-1880
Cal	Van Nuys, Cardinal Assoc. Inc.	213-787-5511
Conn	Bloomfield, Zaslow Sls. Co.	203-242-7781
Ill	Chicago, Ropak-Cahill Inc.	312-287-7292
Iowa	Cedar Rapids, H. R. Brown Sls. Co.	319-366-0635
Md	Baltimore, M E & Assoc. Inc.	301-825-1130
Mich	Benton Harbor, Mc Nabb & Sasoc.	616-925-2166
Minn	Minneapolis, Furber Sls.	612-861-1518
NJ	Cherry Hill, M E & Assoc.	609-667-6110
NY	Liverpool, L.P. Garner	315-451-1323
Ohio	Cincinnati, F. E. Kahsar Sls.	216-653-6808
Tex	Dallas, Blackburn Assocs.	214-FL1-9991
Wash	Seattle, Seatronics, Inc.	206-767-4330
FOR:	Can. Scarborough, Ontario, Lake Engineering Co. Ltd.	416-751-5980

IEC CORPORATION, 3100 Longhorn Blvd., Austin, Tex, 78758, Tel: 512-836-0547; Empl.: 35

Customer service: J. B. McQueen

Free literature available: Catalog #2 (Illustrates our standard stocked slip ring assemblies, complete with descriptions and dimensions)

Products manufactured: Slip-Rings & Assemblies

IEC ELECTRONICS CORP., 319 E. Chestnut St., E. Rochester, N.Y., 14445, Tel: 716-586-7850; Empl.: 190

For info on price: R. Vogler; Application info: R. Vogler; Customer service: R. Vogler; Delivery info: L. Scheafer

Free literature available: Data Sheets and Accessories brochure describing the communications equipment line manufactured and marketed by IEC electronics. Equipment is VHF and UHF ultra high bands.

Products manufactured: Comm. Systems, Receivers, Services, Assembly, Production & Test, Transmitters

Local Sales Offices & Reps.
NY Syracuse, C.W. Floring & Assoc. Inc.

NY Syracuse, Canavan-Scanlon 315-437-1271

IEE/SCHADOW, INC., 8081 Wallace Rd., Eden Prairie, Minn., 55343, Tel: 612-944-1820, Telex: 29-0556; Empl.: 75; Minimum order: \$25. p. 1-2066-2073
For info on price: C. Pilon; Application info: H. Sinn; Customer service: L. Hanna; Delivery info: H. Sinn

Free literature available: Switch selection guide, incorporating our basic modular push button switches as well as our unique line of mechanical reflecting indicator buttons. Special sheets are also enclosed for customer convenience.

Products manufactured: Caps, Lenses, Indicator Light, Display Devices/Displays, Indicators, Lamps, Sockets, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Beacon	205-881-5031
Ariz	Phoenix, GND Sls. Co.	602-971-9758
Cal	Los Angeles, M.A. Stolaroff Co.	213-295-7781
Cal	Mt. View, Weseloh & Assocs.	415-961-0565
Cal	San Diego, M.A. Stolaroff Co.	714-234-6905
Conn	Farmington, R. Perron & Co.	203-673-4825
Conn	Trumbull, R. Perron & Co.	203-688-9631
Fla	Ft. Lauderdale, Beacon	305-776-6074
Fla	Maitland, Beacon	305-647-3498
Ga	Atlanta, Beacon	404-351-3654
Ill	Chicago, ILIS, Inc.	312-631-1124
Ind	Carmel, Giesting & Assocs.	317-844-8171
Md	Randallstown, Beacon	301-922-1248
Mass	Norwood, R. Perron & Co.	617-762-8114
Mich	Benton Harbor, R. C. Nordstrom	616-857-4653
Mich	Lathrop Village, R.C. Nordstrom Co.	313-559-7373

Minn	Minneapolis, Elctn. Innovators, Inc.	612-884-7471
Mo	Kansas City, Nevco	816-421-1751
Mo	St. Louis, Nevco	314-843-7406
NH	Dover, R. Perron & Co.	603-742-2321
NY	Buffalo, R.W. Mitscher Co.	716-633-7970
NY	Manlius, R.W. Mitscher Co.	315-637-3777
NY	Pittsfield, R.W. Mitscher Co.	716-381-9115
NY	Valley Cottage, LRC Assocs.	914-634-7973
NY	W. Hurley, R.W. Mitscher Co.	914-679-6151
NC	Greensboro, Beacon	312-631-1124
Ohio	Cincinnati, Giesting & Assocs.	513-931-0812
Ohio	Dayton, Giesting & Assocs.	513-293-4044
Ore	Portland, C. K. Shanks & Assocs.	503-292-5656
SC	Spartanburg, Beacon	803-582-6133
Va	Falls Church, Beacon	703-534-1673
Wash	Seattle, C. K. Shanks & Assocs.	206-632-4290

Local Distributors

Cal	Inglewood, Time Elctns. Wese, 900 W. Olive St.	213-649-6900
Cal	Mt. View, Target Elctns., Box 4189	415-961-0565
NJ	Little Falls, IPC, Box 204	201-785-1830
NY	Hempstead, Elctn. Equip. Co., 741 Peninsula Blvd.	516-538-5510
Wash	Seattle, Zepher Elctn. Sls. Corp., 647 Industry Dr.	206-242-2517

IFE DIV., Plastic Mold & Eng. Co., 66 Taylor Dr., Rumford, R.I., 02916, Tel: 401-438-3315; Empl.: 175

For info on price: D. G. Barrett; Application info: J. J. Doherty; Customer service: D. Andrews; Delivery info: D. Andrews

Free literature available: Complete brochure describing wire-wrap packaging panels, plug in cards, card cages and racks, DIP sockets, off-the shelf racks and drawers.

Products manufactured: Boards, Plug-In, Boards, Printed Wiring, Universal, Boards, Programming, Chassis, Circuit Board Mounting, Chassis, Metal, Connectors, Integrated Circuit Packaging Systems, Racks, Services, Assembly, Production & Test, Socket Adapters, Sockets, Terminals

Local Sales Offices & Reps.

Cal	Santa Clara, Ruby Sls. Co.	408-739-5333
Conn	Cheshire, Lane Assocs.	203-272-6081
Fla	Melbourne, REPCOM	305-254-1877
Ill	Chicago, Gassner & Clark Co.	312-764-6121
Ind	Fort Wayne, Gassner & Clark Co.	219-456-1675
Mass	Waltham, Digital Sls. Assoc.	617-899-4300
Mich	Grand Rapids, R.P. Urban & Assocs.	616-245-0511
Minn	Eden Prairie, F. Peterson Co.	612-941-5400
NJ	Flanders, Spectrum Sls.	201-584-8944
NJ	Mt. Ephraim, Burdette Co.	609-931-1300
NY	Fairport, TAC Assocs.	716-377-1742
NY	Tuckahoe, Spectrum Sls., Inc.	914-793-1660
Ore	Hillsboro, Elmer Panko Co.	503-222-9595
Tex	Richardson, ZONK Engrg. Co.	214-238-7651

Va Reston, Boyle Assocs. 703-620-9558
Wisc Wauwatosa, Larsen Assocs. 414-258-0529

ILC DATA DEVICE CORP., Airport Int'l. Plaza, Bohemia, N.Y., 11716, Tel: 516-567-5600, TWX: 510-228-7324; FSC No: 19645; Empl.: 320; Minimum order: \$100 p. 1-171

For info on price: F. Johnson; Application info: J. Sheahan; Customer service: G. Cregan; Delivery info: F. Johnson

Free literature available: Short Form Brochure - Brief description of most products produced. Hybrid Technology Brochure - Description of hybrid capabilities.

Products manufactured: Amplifiers, Cards, Linear Function, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Comparators, Computers, Converters, Drivers & Decoders For Readouts, Filters, Generators, Indicators, Integrated Circuit Devices, IC's, Active Filters, Lamp Drivers, Modules, Logic, Encapsulated, Multiplexers, Networks, Relays, Signal Conditioners & Equipment, Synchro Transmitters, Solid-State, Testers

Local Sales Offices & Reps.

Ala	Huntsville, Rep Inc.	205-881-9270
Ariz	Scottsdale, OEM Specialties	602-948-3360
Cal	Culver City, DeAngelo, Rothman & Co.	213-398-6239
Cal	Long Beach, Data Device	213-597-5744
Cal	Palo Alto, Coherent Mktg. Assocs.	415-327-2217

Cal	San Diego, DeAngelo, Rothman & Co.	714-560-4707
Cal	Santa Ana, DeAngelo, Rothman & Co.	714-549-8092

Colo	Boulder, Hrb Bass Assocs.	303-499-7509
Conn	Glastonbury, Instr. Reps.	203-633-0777

Fla	Casselberry, EIR, Inc.	305-830-9600
Ill	Des Plaines, Cozzens/Cudahy Inc.	312-298-3600

Ind	Indianapolis, Cozzens/Cudahy Inc.	317-244-2456
Md	Bethesda, Powell Pendergraph	301-656-4535

Md	Reisterstown, Powell-Pendergraph	410-861-8620
Mass	Lexington, Instr. Reps.	617-861-8620

Minn	Mpls., Cozzens/Cudahy Inc.	612-884-4336
Mo	Kansas City, Cozzens/Cudahy Inc.	816-454-5836

Mo	St. Louis, Cozzens/Cudahy Inc.	314-423-1234
NM	Albuquerque, Trembly Assocs.	505-293-4444

NY	Great Neck, Meas. Technology, Inc.	516-482-3500
NY	Syracuse, Nycorn, Inc.	315-437-8343

Ohio	Dayton, McShane	513-433-8173
Ohio	Medina, McShane	216-725-4568

Ore	Beaverton, Arneson Assoc.	503-643-5743
Pa	Abington, Powell-Pendergraph	215-657-0330

Tex	Austin, MZB Co.	512-454-4371
Tex	Dallas, MZB Co.	214-235-5535

Tex	Houston, MZB Co.	713-523-7333
Va	Falls Church, Data Device	703-536-2212

Va	Richmond, Powell-Pendergraph Inc.	804-264-2341
Wash	Seattle, Arneson Assocs.	206-762-7664

For:	Can., Hamilton, Ont., Kenwood Controls & Equip.	416-544-0596
For:	Can., Montreal, Que., Kenwood Controls & Equip.	514-738-4969

For:	Can., Ottawa, Ont., Kenwood Controls & Equip.	613-722-8233
------	---	--------------

ILLINOIS CAPACITOR SLS. CO., 6284 W. Oakton, Morton Grove, Ill., 60053, Tel: 312-967-6270, Telex: 72-4361; Empl.: 10 p. 2-191

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Cal	Mountain View, Weseloh & Assocs.	415-961-0565
Cal	Orange, Sales & Mktg. Assocs.	714-997-5720
Cal	Van Nuys, Myco Sls.	213-988-2827
Colo	Denver, Nelson Co.	303-573-1516
DC	Wash, H. Wise & Co.	202-363-9417
Fla	Lake Park, Graham Assocs.	305-622-4049
Ga	Marietta, K & E Assocs.	404-427-0241
Ill	Morton Grove, T-Squared Assocs.	312-965-1515

Ind	Carmel, Rich Elctn. Mktg.	317-844-8462
Iowa	Des Moines, Kathrinus-Kelly & Co.	319-722-0000

Kans	Shawnee Mission, Kathrinus-Kelly & Co.	913-722-0000
Mass	Brookline, Technology Prods. Grp.	617-731-0858

Mich	Warren, Dem Elctns. Sls.	313-755-6660
Minn	Minneapolis, Thomas Mktg.	612-823-4880

Miss	Corinth, K & E Assocs.	601-287-5369
NJ	Randolph, MOS Assocs.	201-361-5773

NY	DeRuyter, R. A. Murray Co.	
NY	Fairport, R. A. Murray Co.	716-254-2070
NY	Floral Park, MOS Assocs.	516-694-5923
NY	Rochester, R. A. Murray Co.	716-467-4538
Ohio	Cleveland, Depco	216-289-8188
Ore	Forest Grove, Bern Doran Sls.	503-357-3333
Pa	King of Prussia, Monteiro Assocs.	215-265-0634
Pa	Newtown Square, Danton Assocs.	215-353-0500
Tex	Dallas, J. Clay Co.	214-350-1281
Wisc	Oak Creek, Erdman Sls. Co.	414-643-0506

Local Distributors

Cal	Mountain View, Weseloh Distrs., Box 4189	415-961-0565
Wisc	Oak Creek, Badger Capacitor Sales, 6312 S. 27th St.	414-761-2120

ILLUMINATED PRODUCTS INC., 207 S. Helena St., Box 4011, Anaheim, Cal., 92803, Tel: 714-535-6037, TWX: 910-591-1185; FSC No: 87034; QPL No: Multiple; Empl.: 150; Minimum order: \$50
p. 1•2062-2065; p. 2•1154-1158

Customer service: B. Selvey

Free literature available: SL-72A Catalog - Illuminated pushbutton switches and indicators, SC/973 Catalog - Miniature and Subminiature lamps

Products manufactured: Caps, Lenses, Indicator Light, Diodes, Lamps, Lights, Switches

Local Sales Offices & Reps.

Lamps		
Ariz	Tempe, Argus Sls.	602-967-8709
Cal	Inglewood, Oak Inds.	213-678-4108
Cal	Los Altos, Oak Inds.	415-941-1237
Colo	Denver, I.W. Strong & Assocs.	303-292-6900
Conn	Old Greenwich, Hoffman Engrg.	203-637-1719
Fla	Orlando, Oak Inds.	305-671-4111
Ill	Chicago, Engineered Sls.	312-867-8434
Kans	Wichita, Dy-Tronix	316-943-6221
La	Metairie, McKinney Sls.	504-887-1723
Md	Baltimore, Callas Elctns.	301-744-7771
Mass	Reading, Oak Industries Inc.	617-944-0094
Mich	Farmington Hills, H. Lowell Co.	313-851-7474
Minn	Minneapolis, G. E. Arneson & Co.	612-835-2177
Mo	Hazelwood, Dy-Tronix	314-731-5799
Mo	Kansas City, Dy-Tronix	816-761-6543
NJ	Haddonfield, Gray Assocs.	609-429-5300
NY	Rochester, Irondequoit Ind.	716-544-6251
NC	Raleigh, Oak Industries Inc.	919-876-7591
Ohio	Cincinnati, Oak Industries Inc.	513-851-4411
Okla	Tulsa, McKinney Sls.	918-742-6791
Ore	Beaverton, Arneson Assocs.	503-643-6754
Tex	Bellaire, McKinney Sls.	713-655-3653
Tex	Dallas, McKinney Sales Co.	214-631-9450
Wash	Seattle, Arneson Assocs.	206-762-7664
EXP:	Cal., Anaheim, Illuminated Prods. Inc.	714-535-6037

Switches & Indicators

Ariz	Tempe, Argus Sales	602-967-8709
Cal	Inglewood, Oak Inds.	213-678-4108
Cal	Los Altos, Oak Inds.	415-941-1237
Colo	Denver, I.W. Strong & Assoc.	303-292-6900
Fla	Orlando, Oak Inds.	305-671-4111
Ill	Northfield, Torkelson Assoc.	312-446-9085
Kans	Wichita, Dy-Tronix	316-943-6221
La	Metairie, McKinney Sls.	504-887-1723
Md	Rockville, Marktron	301-762-6210
Md	Timonium, Marktron	301-252-7111
Mass	Reading, Oak Inds.	617-944-0094
Mich	Farmington Hills, H. Lowell Co.	313-851-7474
Minn	Minneapolis, Torkelson Assoc.	612-835-2414
Mo	Hazelwood, Dy-Tronix Inc.	314-731-5799
Mo	Kansas City, Dy-Tronix, Inc.	816-761-6543
NJ	Bergenfield, H. Gray Assocs.	201-384-3643
NJ	Haddonfield, Gray Assocs.	609-429-5300
NY	Rochester, Irondequoit Ind.	716-544-6251
NC	Raleigh, Oak Inds.	919-876-7591
Ohio	Cincinnati, Oak Inds.	513-851-4411
Okla	Tulsa, McKinney Sales	918-742-6791
Ore	Portland, Oak Inds.	503-292-0878
Tex	Dallas, McKinney Sales	214-631-9450
Tex	Houston, McKinney Sls.	713-665-3653

Local Distributors

Ala	Huntsville, Hall-Mark Elect., 4739 Commercial	205-837-8700
Ariz	Tempe, G. S. Marshall Co., 835 W. 22nd St.	602-968-6181
Cal	El Monte, G. S. Marshall Co., 9674 Telstar Ave.	213-686-1500
Cal	Irvine, G. S. Marshall Co., 17975 Sky Park Blvd.	714-664-2125
Cal	San Diego, G. S. Marshall Co., 8057 Raytheon Rd., Suite 1	714-278-6350

Cal	Sunnyvale, G. S. Marshall Co., 788 Palomar	408-732-1100
Colo	Arvada, G. S. Marshall Co., 5633 Kendall Ct.	303-423-9670
Conn	Hamden, Wilshire Elctns./Conn., 2554 State St.	203-281-1166
Conn	North Branford, G. S. Marshall Co., 200 Shaw Rd.	203-484-0488
Fla	Ft. Lauderdale, Hall-Mark Elctns., 1302 West McNab	305-971-9280
Fla	Orlando, Hall-Mark Elctns., Box 13950	
Fla	Palm Beach Gardens, G. S. Marshall Co., 10384 Riverside Dr.	305-622-8490
Ga	Lawrenceville, Hall-Mark Elctns., Rte. #1, Cedar Dr.	800-633-2918
Ill	Des Plaines, G. S. Marshall Co., 300 E. Touhy Ave.	312-298-3700
Ill	Elk Grove Village, Hall-Mark Elctns., 180 Crossen Ave.	312-437-8800
Ill	Rosemont, Advent Elctns., 7110 Lyndon St.	312-298-4210
Kans	Lenexa, Hall-Mark Elctns., 9006 Rosehill Rd.	913-888-4747
Kans	Wichita, Hall-Mark Elctns., 7327 E. Indianapolis	
Md	Baltimore, Hall-Mark Elctns., 6660 Security Blvd.	301-265-8500
Mass	Burlington, Wilshire Elctns./N.E., One Wilshire Rd.	617-272-8200
Mass	Newton Highlands, G. S. Marshall Co., 88 Needham St.	617-965-5115
Mich	Ann Arbor, Advent Elctns., 254 S. Wagner Rd.	313-769-8650
Minn	Bloomington, Hall-Mark Elctns., 9201 Penn Ave. So., Suite 10	612-884-9056
Minn	Minneapolis, G. S. Marshall Co., 4900 Viking Drive, Rm. 114	612-831-4904
Minn	Minneapolis, Industrial Comps., Inc., 5280 W. 74th St.	612-831-2666
Mo	St. Louis, Hall-Mark Elctns. Corp., 6100 Madison Ave.	314-521-3800
Mo	St. Louis, Olive Industrial Elctns., 6662 Olive Blvd.	314-863-7800
NJ	Cinnaminson, Wilshire Elctns., 855 Industrial Hwy.	215-627-1920
NJ	Clifton, Wilshire Elctns., 312 Clifton Ave.	201-365-2600
NY	Farmingdale, G. S. Marshall Co., 230 Sherwood Ave.	516-293-4141
NY	Farmingdale, Hall-Mark Elctns. Corp., 167 Marine St.	516-293-7500
NY	Farmingdale, Wilshire Elctns./L.I., 1855 New Highway, Unite B	516-293-5775
NY	Johnson City, Wilshire Elctns./N.Y. State, 617 Main St., (Westover Plaza)	607-797-1236
NC	Raleigh, Hall-Mark Elctns., 300 Industrial Dr.	919-832-4465
Ohio	Dayton, G. S. Marshall Co., 6388 N. Dixie Dr.	513-898-1100
Ohio	Dayton, Hall-Mark Elctns., 2775 Shelburne La.	513-294-0437
Ohio	Wickliffe, Gateway Megatech, Inc., 30214 Lakeland Blvd.	216-944-8565
Okla	Tulsa, Hall-Mark Elctns., 4846 S. E. 83rd Ave.	918-835-8458
Pa	Huntingdon Valley, Hall-Mark Elctns., 458 Pike Rd.	215-355-7300
Tex	Austin, Hall-Mark Elctns., 3100-A Industrial Terrace	512-837-2814
Tex	Dallas, G. S. Marshall Co., 14205 Proton	214-233-5200
Tex	Dallas, Hall-Mark Elctns. Corp., 9333 Forest La.	214-231-6111
Tex	Dallas, Sterling Elctns., 2875 Merrell Rd.	214-357-9131
Tex	El Paso, Hall-Mark Elctns., 2211 E. Missouri St.	915-421-9000
Tex	Houston, Hall-Mark Elctns. Corp., Box 42190	713-781-6100
Wash	Bellevue, G. S. Marshall, 1801 130th Ave. N.E.	206-883-1084
Wisc	Mequon, Taylor Elec. Co., 1000 W. Donges Bay Rd.	414-241-4321
Wisc	Milwaukee, Hall-Mark Elctns. Corp., 11925 W. Ripley Ave.	414-476-1270

ILLUMINATION INDUSTRIES, 825 E. Evelyn Ave., Sunnyvale, Cal., 94086, Tel: 408-738-2744; Empl.: 165; Minimum order: \$25

Customer service: Customer Service 408-245-4111 Ext. 74-79

Free literature available: Mercury and Xenon Lamps, Medium Pressure Ultra Violet Curing Lamps and Systems, Capillary Lamps. Power Supplies and Lamp Housings. Exposure Equipment.

Products manufactured: Lamps, Lights, Power Supplies, Semiconductor Wafer Fabrication, Sockets

Local Sales Offices & Reps.

Ariz	Scottsdale, Allen Assocs.	602-994-1305
Cal	Mountain View, R. Muenzer	415-964-0390
Cal	Torrance, Mitronics Industries	213-323-7934
Colo	Denver, Camel Elect.	303-757-6191
Fla	Ft. Lauderdale, Semquip	305-772-3002
Kans	Shawnee Mission, Mid America Mktg.	913-238-4800
NH	Amherst, Martek Inds.	617-245-0940
NJ	Nutley, D/R Assocs.	201-667-5900
NM	Albuquerque, Thorson Co.	505-265-5655
Tex	Dallas, Airep Elctns.	214-363-5291
Wash	Tukwila, General Elctns.	206-243-5141

I M C MAGNETICS, Eastern Div., 570 Main St., Westbury, N.Y., 11590, Tel: 516-334-7070, TWX: 510-222-4469; Empl.: 175; Minimum order: \$50
p. 1•494-497, 964, 965

Customer service: G. Egan

Free literature available: The Motor Catalog-EMistr, The Fan Catalog-EF1, Centrifugal Blowers Catalog-EB1, Vaneaxial Catalog- EV1R, Brushless DC Motor Broadside-Edcor-1

Products manufactured: Actuators, Alternators, Blowers & Fans & Accessories, Controls/Control Eqpt., Encoders, Gearheads & Speed Reducers, Gears & Gear Mechanisms (Precision), Motor & Generator Armatures, Rotors, Stators, Motors, Tachometers

Local Sales Offices & Reps.

Cal	Los Altos, Recht Assocs.	415-941-0336
Cal	Los Angeles, Elcom Sls. Co.	213-223-1351
Colo	Denver, Linberg Co.	303-758-9033
Conn	Newtown, Gerber Sls. Co.	203-426-3440
Fla	Lighthouse Point, Saber Assocs.	305-943-3076
Ill	Chicago, Berndt Assocs.	312-283-0713
Ind	Ft. Wayne, Waid & Assocs.	219-422-4344
Md	Baltimore, D.K. Jones & Assoc.	301-752-0577
Mass	E. Longmeadow, Gerber Sls. Co.	413-525-3059
Mass	Waltham, Gerber Sls. Co.	617-890-8040
Mich	Dearborn, V.P.I., Inc.	313-271-4600
Minn	Minneapolis, Stack Johnson	612-925-2111
Mo	Kansas City, Harris-Hanson Co.	816-444-9494
Mo	St. Louis, Harris-Hanson Co.	314-432-3811
NJ	Haddonfield, Mesa Tech. Assoc.	609-429-9531
NY	Great Neck, Trionics Assocs.	516-466-2300
NY	Rochester, Fowler-Beach Corp.	716-586-0468
Ohio	Dayton, BEK Assocs.	513-278-1343
Ore	Portland, Brett-Ross	503-232-4184
Tex	Dallas, Electra III Co.	214-243-5969
Utah	Salt Lake City, Lindberg Co.	801-364-6409
Wash	Seattle, Brett-Ross	206-935-8054
FOR:	Can., Montreal, Que., Vitel Elctns.	514-331-7393

IMC MAGNETICS CORP., New Hampshire Div., Rte. 16B, Rochester, N.H., 03867, Tel: 603-332-5300, TWX: 510-297-4466; Empl.: 200
p. 1•496, 497

Customer service: F. C. Taylor

Free literature available: AIRMOVERS CATALOGUE

Products manufactured: Blowers & Fans & Accessories

Local Sales Offices & Reps.

Cal	Los Altos, Recht Assocs.	415-941-0336
Cal	Los Angeles, Elcom Sls. Co.	213-223-1351
Colo	Denver, Lindberg Co.	303-758-9033
Conn	Newtown, Gerber Sls. Co.	203-426-3440
Fla	Ft. Lauderdale, Saber Elctns.	305-943-3076
Ill	Rolling Meadows, Sumer Inc.	312-394-4900
Md	Baltimore, D.K. Jones & Assoc.	301-752-0577
Mass	E. Longmeadow, Gerber Sls. Co.	413-525-3059
Mass	Waltham, Gerber Sls. Co.	617-890-8040
Mich	Dearborn, Villani-Pitcher, Inc.	313-271-4600
Minn	Minneapolis, Nortec	612-835-4447
Mo	Kansas City, Harris-Hanson Co.	816-444-9494
Mo	St. Louis, Harris-Hanson Co.	314-432-3811
NJ	Haddonfield, Mesa Technical Assocs.	609-429-9531
NM	Albuquerque, Lindberg Co.	505-345-2489
NY	Great Neck, Trionics Assocs.	516-466-2300
NY	Rochester, Fowler-Beach	716-586-0468
Ohio	Dayton, Bek Assocs.	513-278-1343
Ore	Portland, Brett Assoc.	503-232-4184
Pa	Pittsburgh, G. S. Root & Co.	412-561-4125
Tex	Dallas, Electra III	214-243-5969
Utah	Salt Lake City, Lindberg Co.	801-364-6409
Wash	Seattle, Brett Assoc.	206-935-8054
For:	Can., Montreal, Que., Vitel Elctns.	514-331-6393
For:	Can., Toronto, Ont., Vitel Elctns.	416-622-6300

IMC MAGNETICS CORP., Western Div., 6058 Walker Ave., Maywood, Cal., 90270, Tel: 213-584-4785, TWX: 910-321-3089; FSC No: 99743; Empl.: 110

Customer service: M. Kloetzel

Free literature available: Stepper Motor Catalog and Application Notes; Solenoid Selector; Synchro Data Sheets; Flag Indicator Data Sheets; Remote Indicator Data Sheets.

Products manufactured: Actuators, Controls/Control Eqpt., Indicators, Motors, Resolvers, Synchro, Solenoids, Synchros

Local Sales Offices & Reps.

Cal Los Altos, Recht Assocs.415-941-0336
Cal Los Angeles, El Com Sls.213-223-1351
Colo Denver, Lindberg Co.303-758-9033
Conn New Haven, Gerber Sls.203-777-6279
Fla Orlando, Duay Entprs.305-277-3296
Ill Chicago, Electro-Tech Mktg. Assoc.312-588-4535

Mass Waltham, Gerber Sls.617-891-8040
Minn Minneapolis, Stack-Johnson612-925-2111
Mo Kansas City, Harris-Hanson816-444-9494
Mo St. Louis, Harris-Hanson314-962-0111
NJ Haddonfield, Mesa Tech. Assoc.609-429-9531
NY E. Aurora, Harries & Kershaw716-652-1221
NY Great Neck, Trionic Assocs.516-466-2300
Ohio Dayton, Bek Assocs.513-278-6851
Ore Portland, Brett Assoc.503-232-4184
Tex Dallas, M. Kruvand Co. Inc.214-827-8043
Utah Salt Lake City, Lindberg Co.801-364-6409
Wash Seattle, Brett Assoc.514-681-1400

INCOR INSTRUMENTATION, INC., 144 Lamar St., West Babylon, N.Y., 11704, Tel: 516-643-7070/3rum132; FSC No: 23132; Empl.: 25

Products manufactured: Amplifiers, Attenuators, Converters, Data Acquisition & Reduction Systems, Filters, Integrators, Electronic Inverters, Isolators, Oscillographs, Direct Writing, Power Supplies, Racks, Recorders, Signal Conditioners & Equipment, Thermocouples, Elements & Accessories, Voltage Sources

Local Sales Offices & Reps.

Conn Newton, Daner-Hayes203-426-9094
DC Washington, Powell Pendergraph301-656-4535
Ill Des Plaines, Marsland Assocs.312-775-1309
Ind Indianapolis, Marsland Assoc.317-924-3568
Mass Newton Centre, Daner-Hayes617-969-4650
Mich Ann Arbor, H. C. Heym, Assoc.313-971-6552
Mich Saginaw, H. C. Heym, Assoc.517-792-7928
Minn Minneapolis, Marsland Assoc.612-545-4481
MO Kansas City, Marsland Assoc.816-765-0641
NJ Bonton, Eastern Metro Assoc.201-335-7633
NY Plainview, Eastern Metro Assoc.516-931-1414
NY Rochester, Daner-Hayes315-986-3548
Ohio Cleveland, Geotronics Mktg. Assoc.216-526-2535

Ohio Columbus, Geotronics Mktg. Assoc.614-457-8472
PA Audobon, Daner-Hayes215-666-5005
PA Glenshaw, Wainwright Tech.412-487-3358
VA Richmond, Powell-Pendergraph804-264-2341
Wash Seattle, Avionics Liaison206-767-3870

INDIANA GEN'L DIV., Electro-Mechanical Prods., 517 W. Walnut St., Oglesby, Ill., 61348, Tel: 815-883-8453, TWX: 910-642-2370; Empl.: 1,200

Products manufactured: Motors, Tachometers

INDIANA GENERAL, Elctn. Prods., Crows Mill Rd., Keasbey, N.J., 08832, Tel: 201-826-5100, TWX: 710-998-0877; Empl.: 1,200

For info on price: H. Landsberger; Application info: M. Distefano; Customer service: H. Landsberger; Delivery info: M. Maurath.

Free literature available: Ferramic Components - ferrites and associated hardware, Inverter-Rated Ferramics - inverter transformer design info with nomographs for core and wire selection, Broad Band-Rated Ferramics (16,000 perm) - with guaranteed electrical specifications, Attenuator-Rated Ferramics - for impedance modulus and DB charts for bead selection, Pulse-Rated Toroids with guaranteed electrical characteristics

Products manufactured: Cores, Magnetic, Ferrite Material & Parts

INDIANA GENERAL/DIV. EMM CORP., Magnet Prods., 405 Elm St., Valparaiso, Ind., 46383, Tel: 219-462-3131, TWX: 910-690-4891; Empl.: 1,200

Products manufactured: Magnetizers, Magnets

Local Sales Offices & Reps.

Cal Cupertino408-996-2811
Ill Villa Park312-833-5698
Mass Hingham617-749-2003
NJ Haddonfield609-428-2706
NJ Hillsdale201-666-8668

Ohio Cleveland216-289-4600

INDIVIDUALIZED INSTRUCT. INC., Div. Economy Co., 1901 N. Walnut, Oklahoma City, Okla., 73105, Tel: 405-528-8444; Empl.: 250

Customer service: A. Kuebler

Free literature available: Phi-Deck Brochure; Phi-Deck Application Notes; Phi-Deck Price Schedule & Demonstrator Offer.

Products manufactured: Tape Recording Accessories

Local Sales Offices & Reps.

Cal Culver City, Feeger Lucas Wolfe, Inc.213-559-7200
Cal Sunnyvale, AMASCO408-733-8690
Colo Littleton, Radco Elctns.303-794-4279
Ill Chicago, J. Golden Co.312-725-7570
Ohio Akron, Shamrock Elctn. Sls., Inc.216-666-3796
Tex Addison, Kemp Engrg. Co.214-661-0400
Va Arlington, Gans-Fryling, Inc.703-527-3262

INDUSTRIAL CONDENSER CORP., 3243 N. California Ave., Chicago, Ill., 60618, Tel: 312-463-2200; FSC No: 74861; Empl.: 200; Minimum order: \$25

For info on price: J. Ostrowski; Application info: M. Forester; Customer service: M. Forester; Delivery info: J. Ostrowski

Free literature available: Capacitor Catalogs-1180-B Oil Filled; 1117-D Stabelex; 1134-A G & H Type Oil Filled; 1195-A Silverfilm; 1212-A Synthar; 1255-A Viscofilm; 1273-B Miniature Metalized; 1291 Metalized Polycarbonate; 1298 Metalized Polyester

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Cal Los Angeles, W.S. Harmon Co.213-937-1460
Conn Farmington, R. Perron & Co.203-673-4825
Conn Trumbull, R. Perron & Co.203-268-9631
Md Lutherville, L.D. Lowery, Inc.301-296-0379
Mass Norwood, R. Perron Co.617-762-8114
NH Dover, R. Perron & Co.603-742-2321
NJ South Orange, S. Simberkoff Assocs.201-763-7900

Ohio Cleveland, A.H. Baier Co. & Assoc.216-461-6161

Ohio Dayton, A.H. Baier Co. & Assocs.513-276-4128
Pa Broomall, L.D. Lowery, Inc.215-528-5170
Va Charlottesville, L.D. Lowery, Inc.804-973-6672

INDUSTRIAL BLADES, Box 500, Staunton, Va., 24401

INDUSTRIAL CONTROL CO., Central Ave. at Pinelawn, Farmingdale, N.Y., 11735, Tel: 516-694-3000; Empl.: 20p. 1-1916,1917

For info on price: G. Attura; Application info: G. Attura; Customer service: E. Kirtis; Delivery info: E. Kirtis

Products manufactured: Actuators, Amplifiers, Analyzers, Coils Including Assemblies & Forms, Computers, Controllers, Programmable, Controls/Control Eqpt., Converters, Dampers, Servo, Demodulators, Detectors, Generators, Indicators, Integrators, Mechanical & Electro-Mechanical, Reactors, Repeaters, Servo, Servo Systems, Testers

INDUSTRIAL DEVICES, Edgewater, N.J., 07020, Tel: 201-224-4700, Telex: 12-7459; Empl.: 200; Minimum order: \$50p. 2-1168-1171

For info on price: M. Diceglie; Application info: M. Diceglie; Customer service: M. Diceglie; Delivery info: E. Rupert

Free literature available: Form FDC - Pilot and indicator lights and accessories available off-the-shelf. Form PLF - Pilot Light Selection Guide covering unit-construction lights. Form QCA - Covering replaceable lamp incandescent pilot lights. Form MCG - Covering bi-pin cartridge lights. Form MSF - Covering T-2 Slide Base Lamps, Sockets, Pilot Light Assemblies.

Products manufactured: Caps, Lenses, Indicator Light, Clamps & Clips, Diodes, Knobs, Lamp Drivers, Lamps, Lenses, Readout & Display, Lights, Sockets, Testers

Local Sales Offices & Reps.

Ala Huntsville, Comp. Sls.205-883-7794
Ariz Phoenix, Shepherd Comps.602-934-0425
Cal Los Altos, Frauman Assocs.415-941-0660
Cal Van Nuys, Shepherd Comps.213-787-4610
Colo Denver, Connors Inc.303-934-5829
Conn W. Simsbury, Anchor Engrg. Corp.203-658-6261
Fla Indian Harbor Beach, Comps. Sls. Corp.305-773-0919

Fla St. Petersburg, Comps. Sls.813-894-4366
Ill Chicago, K.D. Engle312-539-1820
Kans Overland Pk., Fixman Eng.913-648-7748
Kans Wichita, G. Fixman Engrg. Co.316-MU 2-9433
Md Baltimore, ME & Assocs.301-825-1130
Mass Newton Upper Falls, Anchor Engrg.617-964-6205

Mich Oak Pk., W. Spenser313-398-8005
Minn Wayzata, G.A. Kelly612-473-0251
Mo St. Louis, Fixman Engrg.314-PA 5-5219
NJ Cherry Hill, ME & Assocs.609-667-6110
NY Albany, Niagara Electric Sls.518-869-0130
NY Buffalo, Niagara Elec. Sls.716-886-4000
NY E. Syracuse, Niagara Electric Sls.315-437-1656
NY Manhasset, Kaelber & Mack, Inc.516-MA 7-6620

NY Rochester, Niagara Elec. Sls. Co.716-BR 1-1223

NC Raleigh, Comps Sls. Corp.919-832-1897

Tenn Chattanooga, Ind'l. Hardgoods Co.615-267-0907

Tex Dallas, Blackburn Assocs.214-692-8885

Wash Seattle, Fleehart & Sullivan206-522-1533
EXP: NJ Ft. Lee, J.A. Gross201-944-3609
FOR: Can., Windsor, Ont., W. Spenser Co.519-969-1332

Local Distributors

Ala Huntsville, Cramer EW/Huntsville, Inc., 2310 Bob Wallace Ave. S.W.205-539-5722
Ariz Phoenix, Cramer/Ariz., 2643 E. University Dr.602-263-1112

Ariz Tucson, Inland Elctn. Supply, 715 E. Broadway602-624-4402

Cal Buena Park, Dow Radio Inc., 6001 Beach Blvd.714-521-1906

Cal Costa Mesa, Marvac Elctns., 1870 Harbor Blvd.714-642-0952

Cal Fullerton, Orvac Elctns., 1645 E. Orangethorpe Ave.714-871-1020

Cal Irvine, Cramer/Los Angeles, 17201 Daimler St.714-979-3000

Cal Los Angeles, Electric Switches, Box 3085, Term. Annex213-664-1141

Cal Oxnard, Dow Radio Inc., 921 S. Oxnard Blvd.805-486-6353

Cal Palo Alto, Zack Elctns., 654 High St.415-326-5432

Cal Pasadena, Dow Radio Inc., 1759 E. Colorado Blvd.213-681-34163376770730/A3/

Cal Pasadena, Empire Elctns., 37 E. Union213-681-2711

Cal San Diego, Cramer/San Diego, 8975 Complex Dr.714-565-1881

Cal San Diego, Shanks & Wright, 2045 Kettner Blvd.714-239-0176

Cal San Francisco, Zack Elctns., 1444 Market St.415-626-1444

Cal San Jose, Quement Elctns., 1000 S. Bascom Ave.408-294-0464

Cal Sunnyvale, Cramer/San Francisco, 720 Palomar Ave.408-739-3011

Cal W. Los Angeles, California Elctn. Supply, 1911 Armacost Ave.213-477-8561

Colo Colorado Springs, D. Walker Elctns., 9 E. Vermijo Ave.303-758-2100

Colo Denver, Cramer/Denver, 5465 E. Evans Pl. at Hudson303-935-2406

Colo Denver, D. Walker Elctns., 300 Bryant St.1129 Main Ave.

Colo Durango, D. Walker Elctns., 537 N. 1st St.Greely, D. Walker Elctns., 1525 8th Ave.

Colo Pueblo, D. Walker Elctns., 100 N. Victoria Ave.North Haven, Cramer/Conn., 35 Dodge Ave.

Conn North Haven, Cramer/Conn., 35 Dodge Ave.203-239-5641

Conn Norwalk, Arrow Elctns., 18 Isaac St.203-838-4851

Conn Stratford, State Elctns. Parts, 1269 Barnum Ave.203-375-5961

Conn Waterbury, Bond Radio Elctns., 439 W. Main St.203-735-1184

Fla Hollywood, Cramer EW/Hollywood, 4035 N. 29th Ave.305-923-8181

Fla Miami, ESL Elctn. Dist. Div., 3560 N.W. 34th St.Orlando, Cramer EW/Orlando, 345 N. Graham Ave. Box 20214305-894-1511

Ga Atlanta, Cramer/Atlanta, 3923 Oakcliff Ind'l. Ct.404-448-9050

Ga Augusta, Dixie Radio Supply Co., 1234 Gordon Park Rd.404-722-2055

Idaho Boise, Kimball Elctns., 418 N. Orchard208-342-3559

Ill Chicago, Electro-Kinetics, 4114 N. Nashville Ave.312-286-4200

Ill Mt. Prospect, Cramer/Chicago, 1911 South Busse Rd.312-593-8230

Ill Peoria, Warren Radio Co., 800 S.W. Jefferson309-674-5998

Why share your EEM?

The 1975-76 edition of EEM contains more than 4,400 pages of detailed product data from over 700 manufacturers of electronic products. A proven valuable catalog/directory for the working engineer, EEM also contains:

- ☐ a product index listing of more than 3,000 product headings
- ☐ an alphabetical listing of manufacturers, listing their mailing address, key sales personnel and sales offices, representatives and distributors
- ☐ a trade mark directory matching the company name with the trade mark and a description of the product
- ☐ a distributor directory of all the leading electronic distributors listed geographically.

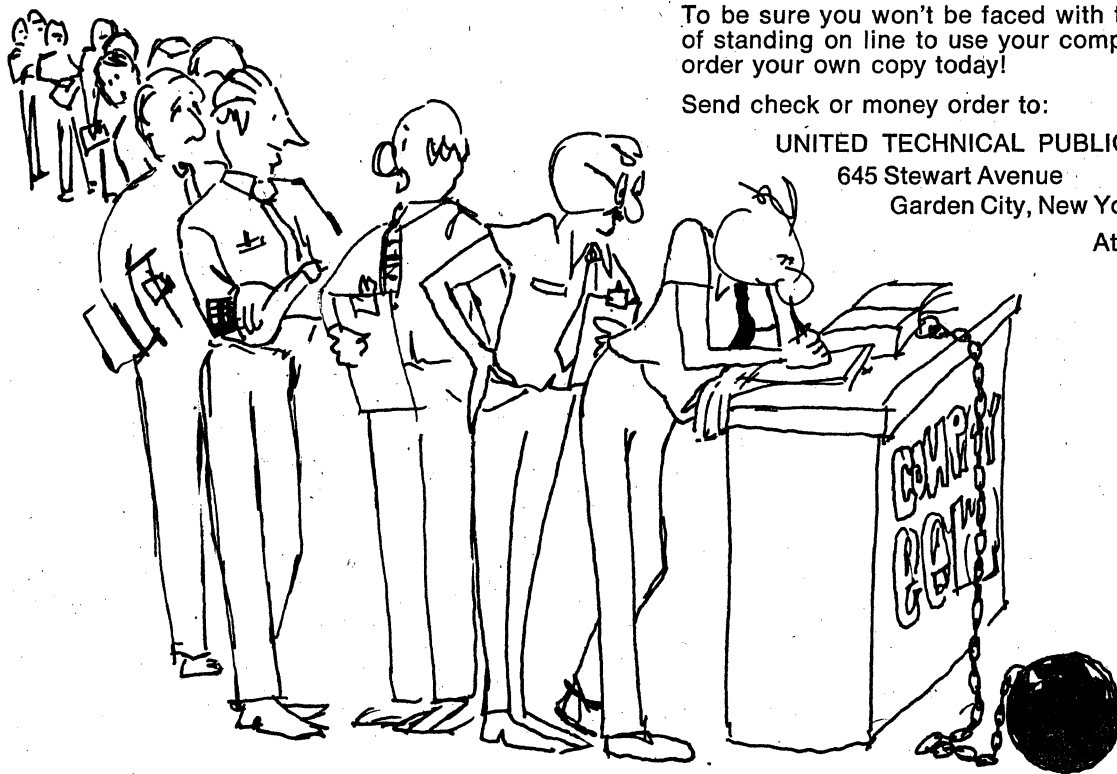
To be sure you won't be faced with the problem of standing on line to use your company's EEM, order your own copy today!

Send check or money order to:

UNITED TECHNICAL PUBLICATIONS

645 Stewart Avenue
Garden City, New York 11530

Att: Patti Foley



electronic engineers master

United Technical Publications, Inc., Div. of Cox Broadcasting Corp. 645 Stewart Avenue, Garden City, New York 11530 / 516 248-9700

INDUSTRIAL ELCTRN. ENGRS., 7740 Lemona Ave.,
Van Nuys, Cal., 91405, Tel: 213-787-0311, TWX:
910-495-1707; Empl.: 250; Minimum order: \$25
p. 2-1160-1167

For info on price: B. Weir Ext. 341; Application info: P.
McEvoy Ext. 273; Customer service: B. Brandt Ext. 287;
Delivery info: J. Ritacco Ext. 278

Free literature available: IEE PRODUCT SELECTOR -
capsule descriptions of complete product line of
digital readouts and display components and
systems. PRODUCT PROFILES - complete
technical description on each product series -
mechanical, electrical, and performance data,
with ordering specifying data.

SHORT FORM CATALOGS - technical, short form
descriptions on each series or family of display
products.

Products manufactured: Annunciators, Bezels,
Shielded & Unshielded, Converters, Diodes,
Display Devices/Displays, Drivers & Decoders For
Readouts, Integrated Circuit Devices, Keyboards,
Alphanumeric & Decimal, Lamp Drivers, Lamps,
Lenses, Readout & Display, Lights, Monitors,
Power Supplies, Services, Assembly, Production
& Test, Sockets, Switches, Tachometers,
Terminals, Data Display (including Alphanumeric
& Graphic), Tubes

Local Sales Offices & Reps.

Ariz	Phoenix, Gramer	602-279-1221
Cal	Palo Alto, Brooks Technical Grp.	415-328-3232
Cal	San Diego, L.L. Stoakes	714-274-6281
Cal	Van Nuys, IEE Factory Sls.	213-787-0311
Colo	Denver, Checkmate	303-771-4920
Conn	North Haven, Kitchen & Kutchin	203-239-0212
DC	Wash, L. L. Paxson, Sys. Support	202-544-4257
Fla	Clearwater, Reynolds & Assocs., Inc.	813-726-2373
Fla	Fort Lauderdale, Reynolds & Assocs., Inc.	305-581-6611
Fla	Hollywood, Reynolds & Assocs., Inc.	305-987-6720
Fla	Palm Beach, Reynolds & Assocs., Inc.	305-622-6850
Fla	Satellite Beach, Reynolds & Assocs.	305-773-4700
Ga	Atlanta, Reynolds & Assoc.	404-252-5360
Ill	Highland Park, Bransky Sls.	312-433-2375
Ind	Carmel, Rich Elctrn. Mktg.	317-844-8462
Kans	Overland Park, Enesco/Rep.	913-381-7557
Md	Rockville, Marktron	301-762-6210
Md	Timonium, Marktron	301-825-8222
Mass	Lexington, Kitchen & Kutchin	617-862-8230
Mich	Detroit, L. H. Dickelman	313-255-3300
Mo	St. Louis, Enesco/Rep.	314-567-3935
NJ	Haddonfield, TAI Sales	215-627-6615
NM	Albuquerque, Data Handling	505-268-4364
NY	Albany, Reagan/Compar Albany Inc.	518-489-7408
NY	Endwell, Reagan/Compar Albany Inc.	607-732-8743
NY	Fairport, Reagan/Compar Albany Inc.	716-271-2230
NY	New Hartford, Reagan/Compar Albany	315-732-3775
NY	Plainview, E.R.A.	516-522-9890
NC	Charlotte, Reynolds & Assocs.	704-527-2536
Ohio	Cleveland, Geotronics Mktg. Assocs.	216-526-2535
Ohio	Columbus, Geotronics Mktg. Assocs.	614-457-8472
Pa	Philadelphia, Tai Sales	215-627-6613
Pa	Pittsburgh, Russell F. Clark	412-242-9500
Tex	Dallas, E. B. Robertson, Inc.	214-942-2716
Utah	Salt Lake City, Checkmate Sls.	801-268-3533
Va	Charlottesville, Marktron, Inc.	301-762-6210
Wash	Mercer Island, J. H. Anderson Assocs.	206-232-0484
For:	Can., Delta, B.C. V4C 3T3, Kaytronics West	416-638-5511
For:	Can., Downsview, Kaytronics, Ltd.	514-487-3434
For:	Can., Montreal, Kaytronics, Ltd.	514-487-3434

INDUSTRIAL ELCTRN. ENGRS. cont'd

Advertisement

IMMEDIATE DELIVERY!
I.E.E. Stocking Distributor
LOGICOMP ELECTRONICS, INC.
Box 37H Scarsdale, N.Y. 10583
Phone - 914 SC3-3334
Off the shelf delivery of IEE Lamps,
Neon Tube Displays, Incandescent
Flatpacks, LED Displays, LED
Mounting Hardware & LED
Indicator Lamps.

INDUSTRIAL ELECTRONIC HARDWARE, 109 Prince St.,
New York, N.Y., 10012, Tel: 212-677-1881, TWX:
710-581-4338; Empl.: 350; Minimum order: \$50

For info on price: L. Roberts; Application info: W.
Kirschner; Customer service: L. Roberts; Delivery
info: J. Schmidt

Free literature available: 1974/5 issue of connector
catalog including PC types, rack & panel, IC
receptacles, display connectors transistor &
power transistor sockets, CRT assemblies.

Products manufactured: Connector Adapters,
Connector Blocks, Mother Board, Connector
Boxes & Strips, Power Outlet, Connectors,
Contacts, Electrical, Sockets, Terminal Blocks,
Boards & Strips

Local Sales Offices & Reps.

Ala	Huntsville, Beacon Elctns.	205-881-5031
Ariz	Scottsdale, J. Berman Co.	602-994-8081
Cal	Santa Clara, Nova-Tronix	408-243-9530
Conn	Milford, Conti-Younger Assocs.	203-929-3294
Fla	St. Lauderdale, Beacon Elctns.	305-776-6074
Fla	Maitland, Beacon Elctns.	305-647-3498
Ga	Atlanta, Beacon Elctns.	404-351-3654
Ill	Chicago, B. Burns & Assocs.	312-775-1233
Ill	Chicago, M. Gottlieb Assocs.	312-775-1151
Ind	Indianapolis, Lat-Tronics	312-846-5788
Iowa	Cedar Rapids, Reid Assocs.	319-362-6302
Kans	Leawood, Vasek Sls. Corp.	913-649-0679
Md	Westminster, F.B.D. Sls. Corp.	301-876-2398
Mass	Waltham, Conti-Younger Assocs.	617-890-4582
Mich	St. Clare Shores, J.M. Thorpe Co.	313-779-6363
Minn	Anoka, K. Haugen Assocs.	612-421-3359
NJ	Haworth, Kay Sls.	201-384-3261
NY	Buffalo, W.A. Franklin Sls.	716-223-5102
NY	Syracuse, W.A. Franklin Sls.	315-472-5273
NY	Whitesboro, W.A. Franklin Sls.	315-736-5460
Ohio	Cleveland, Marlow Assoc.	216-932-0900
Ore	Portland, C.K. Shanks Assoc.	503-292-5656
Pa	Bala Cynwyd, M. Friedman Assoc.	215-839-3450
Tex	Dallas, E.B.R. Inc.	214-942-2716
Va	Portsmouth, F.B.D. Sls.	804-484-3162
Wash	Seattle, C.K. Shanks	206-632-4290
FOR:	Can., Mississauga, Ont., Specialty Elec. Ltd.	416-678-2104
FOR:	Can., Montreal, Que., Specialty Elec. Ltd.	514-336-4500

INDUSTRIAL MICA DIV., Columbia Tech. Corp., 223
S. Van Brunt St., Englewood, N.J., 07631, Tel:
201-568-7200; Empl.: 150 p. 1-1268,1269
Customer service: J. Maione

Products manufactured: Insulators & Insulation,
Pads, Transistor Mounting, Spacers

INDUSTRIAL PRODUCTS DIV., Int'l Laser Systems, Inc.,
2111 W. Central Blvd., Orlando, Fla., 32805, Tel:
305-843-4731, TWX: 810-850-0195; Empl.: 9

Customer service: D. O. Tate

Free literature available: Industrial Optical Data
Communications Systems - both analog and
digital GaAs laser transmitters and receivers

Products manufactured: Comm. Systems,
Detectors, Lasers & Laser Systems,
Modulator/Demodulators, Transmission Systems,
Data

INDUSTRIAL TEST EQUIP., 21 Yennicock Ave., Port
Washington, N.Y., 11050, Tel: 516-883-1700; FSC No:
90074; Minimum order: \$10 p. 1-729,1235
Customer service: M. Schreibman

Free literature available: Catalog No. PH-71 - 4 page
catalog describing line of phase meters and vector
voltmeters. Catalog No. 969 - 8 page catalog
describing line of AC power converters. Brochures
- describing line of impedance comparators.

Products manufactured: Amplifiers, Bridges,
Calibrators, Comparators, Converters, Detectors,
Generators, Inverters, Meters, Modulators, All
Kinds, Multipliers, Oscillators, Power Supplies,
Regulators, Shifters, Standards, Testers

Local Sales Offices & Reps.

Ala	Huntsville, Intern'l. Scientific Instru.	205-837-1601
Ariz	Phoenix, Luscombe Engrg., Co.	602-274-8128
Cal	Pasadena, Luscombe Engrg., Co.	213-684-2000
Conn	Hartford, MRI	203-527-1245
Ill	Chicago, Midwest Elctrn.	312-626-0030
Ind	Indianapolis, Midwest Elctrn. Sls.	317-926-3736
Mass	Lexington, MRI	617-861-6270
NY	Great Neck, Industron Assocs., Inc.	516-HU 7-2620
NC	Winston Salem, Int'l. Sci. Instrs.	919-722-1783
Ohio	Dayton, Gemini Inc.	513-890-5394
Wisc	Waukesha, Midwest Elctrn. Sls.	414-542-5129
EXP:	N.Y., N.Y., Ad. Auriema	212-466-2500
FOR:	Can., Ont., Giga-Tron Assoc.	613-892-4829

INDUSTRIAL TIMER CORP., Unit of Esterline Corp., U.S.
Hwy 287, Parsippany, N.J., 07054, Tel: 201-867-2200;
Empl.: 175; Minimum order: \$10

For info on price: F. Bailey; Application info: F. Bailey;
Customer service: S. Stewart; Delivery info: S.
Stewart

Free literature available: Timing control condensed
catalog Direct Reading Tape Programmers &
Control Systems catalog.

Products manufactured: Programmers, Timers

Local Sales Offices & Reps.

Ark	El Dorado, D. Bellow Sls. Co.	501-863-8325
Cal	Oakland, Sierra-Pacific Engrg.	415-635-6909
Cal	Santa Fe Springs, Sierra-Pacific Engrg.	213-921-9634
Fla	Orlando, Buchanan & Abrams Assocs.	305-423-8995
Ill	Hinsdale, Hill-Gray Assocs.	312-325-4810
Ind	Indianapolis, Val-Skol Sls.	317-926-5063
La	Kenner, D. Bellow Sls.	504-729-4550
Mass	Waltham, RJC Assocs.	617-899-5858
NJ	Leonia, Associated Controls & Equip.	201-944-9218
NY	Rochester, Ontec	716-464-8636
NC	Charlotte, Barker Instr. & Mach. Co.	704-334-1222
Ohio	Cincinnati, Val-Skol Sls.	513-563-6790
Ore	Forest Grove, Bern Doran Sls.	503-357-3333
Pa	Abington, Ind'l. Mktg. Specialists	215-659-0444
SC	Greenville, Barker Instr. & Mach. Co.	803-235-5022
Tex	Dallas, Lund & Co.	214-358-4335
EXP:	Bloomfield, New Jersey, Buck International, Inc.	201-743-8110

INERTIAL MOTORS CORP., 280 N. Broad St.,
Doylestown, Pa., 18901, Tel: 215-345-1010; Empl.: 41

For info on price: E. S. Mihalko; Application info: T. D.
Schmalbruch; Customer service: L. Rouleau; Delivery
info: L. Rouleau

Free literature available: Position control catalogue
describing the performance characteristics of low
inertia shell motors, and application formulas.

Products manufactured: Motors

Local Sales Offices & Reps.

Cal	Santa Fe Springs, Sales Engineers Ltd.	213-921-4337
Conn	E. Hartford, Meas. Equip. Co.	203-745-9050
Fla	Pompano Beach, G. Morris	305-943-8715
Ill	Chicago, Engineered Sls. Co.	312-867-8434
Mass	Wakefield, Meas. Equip. Co.	617-245-4870
NJ	Camden, J.E.D. Elctns.	601-357-7389
NY	Mt. Vernon, Q.E.D. Elctns.	914-864-0080
NY	Pittsford, Magna Sls. Corp.	716-586-8748

INFO-LITE CORP., 46-10 104 St., Corona, N.Y., 11368,
Tel: 212-476-1287; Empl.: 13 p. 1-2076; p. 2-1159

Products manufactured: Annunciators, Boards,
Plug-In, Boards, Programming, Connectors,
Controllers, Programmable, Cords, Counters,
Display Devices/Displays, Flashers, Kits,
Programming Board, Lamps, Lights, Matrices,
Computer, Panels, Power Supplies, Process
Control Systems, Programmers, Sockets,
Switchboards, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Repcom	205-534-9959
Cal	Redwood City, Caltronic Assocs.	415-365-2545
Fla	Melbourne, Repcom	305-254-1877
Ga	Marietta, Repcom	404-971-2831
Mass	Needham, A & M Elctrn. Reps.	617-444-8170
Mich	Southfield, H. Lowell Co.	313-851-7474
Minn	St. Paul, Kenco Co.	612-645-7717

NJ Long Valley, Rovine Assocs. 201-876-4140
 NY Syracuse, Lenard Co. 315-479-9191
 Tex Dallas, Glidden Electro Equip. 214-363-6539
 Tex Houston, Glidden Electro Equip. 713-681-1415

INFODEX, INC., 7 Cherry Ave., Waterbury, Conn.,
 06702, Tel: 203-757-9291; FSC No: 09087; Empl.: 25
 p. 1-730-733

Customer service: E. H. Ulm
 Free literature available: Phosphor Selection
 Guide-describes briefly the most popular
 phosphors in general purpose monitors
 & discusses suitability.

Products manufactured: Amplifiers, Display
 Devices/Displays, Monitors, Oscilloscopes,
 Scanners, Tapes, Recording, Magnetic (All Types),
 Tubes

Local Sales Offices & Reps.

Cal Pasadena, A-F Sales Engrg. 213-681-5631
 Cal Sunnyvale, Amasco 408-733-8690
 Mass Concord, Nortech Engrg. Sls. 617-259-0032
 NJ Tenafly, Budd-Tronics, Inc. 201-569-2230
 NY Schenectady, N.W. Alexander & Assocs.
 518-377-0581
 Tex Dallas, Mft. Mktg. Svc. Corp. 214-357-6893
 Tex Houston, Mft. Mktg. Svc. Corp. 713-645-3581

INFORMATION DISPLAYS, INC., 333 N. Bedford Rd., Mt.
 Kisco, N.Y., 10549, Tel: 914-241-1000, TWX:
 710-571-2179; Empl.: 19

For info on price: C. Machover; Application info: C.
 Machover; Customer service: F. Lombardi; Delivery
 info: C. Machover

Products manufactured: Amplifiers, Converters,
 Display Devices/Displays, Drafting Machines,
 Generators, Recorders, Terminal Equipment,
 Digital

Local Sales Offices & Reps.

Ariz Scottsdale, Williams-Assocs. 602-947-4297
 Ariz Tempe, Williams-Assocs. 602-838-2631
 Cal Mission Hills, J. Long 213-365-9754
 Colo Denver, Williams-Assocs. 303-373-4730
 Colo Lakewood, Williams-Assocs. 303-233-9067
 Colo Littleton, Williams-Assocs. 303-798-6738
 Md Baltimore, S & S Assocs. 301-661-8979
 Md Bethesda, S & S Assocs. 301-654-1434
 Mass Chelmsford, S & S Elctns. 617-256-8731
 Mich Southfield, Data-Tron 313-354-6421
 Mich St. Clair Shores, Data-Tron 313-776-3685
 Minn Minneapolis, DeBeck Assocs. 612-822-4265
 Minn St. Paul, DeBeck Assocs. 612-690-1557
 Mo Ballwin, Automated Graphics 314-391-0461
 Mo St. Louis, Automated Graphics 314-535-2978
 NM Albuquerque, Williams-Assocs. 505-255-1638
 Ohio Dayton, Data-Tron 513-223-8421
 Ohio Wickliffe, Data-Tron 216-858-8421
 Okla Norman, Data Mktg. Assocs. 405-364-8320
 Pa King of Prussia, S & S Assocs. 215-265-3450
 Pa Monroeville, Data-Tron 412-243-8421
 Pa Swarthmore, S & S Assocs. 215-328-0580
 Tex Dallas, Data Mktg. Assocs. 214-661-0300
 Tex Houston, Data Mktg. Assocs. 713-686-9627
 Tex Richardson, Data Mktg. Assocs. 214-231-6932
 Tex San Antonio, Data Mktg. Assocs. 512-828-0937
 Va Catlett, S & S Assocs. 703-347-7304
 FOR: Can., Montreal, Que., Datanetics Ltd.
 514-342-4210

INFORMATION HANDLING SERVICES, 5500 S. Valencia
 Way, Englewood, Colo., 80110, Tel: 303-771-2600;
 Empl.: 350

For info on price: Mktg. Dept.; Application info: Mktg.
 Dept.; Customer service: Cust. Svc.; Delivery info:
 Cust. Svc.

Free literature available: "Brochures" of general
 nature for specific applications/markets "Teck
 Data Sheets" detailing each of our 25 services.

Products manufactured: Technical Books

INFORMATION TERMINALS, 323 Soquel Way,
 Sunnyvale, Cal., 94086, Tel: 408-245-4400, TWX:
 910-339-9381; Empl.: 250; Minimum order: \$50

For info on price: J. E. Neal; Application info: S.
 Ferketich; Customer service: C. Hentis; Delivery info:
 S. Rawlings

Products manufactured: Disc Packs, Magnetic,
 Tapes, Recording, Magnetic (All Types), Testers

Local Sales Offices & Reps.

Cal Newport Beach, N. D. Roche
 Conn Newton, Gerber Sls. Corp. 203-426-3440
 Kans Lenexa, W. N. Adel 913-888-2128
 Mass Waltham, Gerber Sls. Corp. 617-890-8040
 Pa East Pittsburgh, W. Pogachnick 412-563-6655
 FOR: Can., DASCO Data Prods., Ltd. 416-677-9373

Local Distributors

Cal Los Altos, Systems Mktg. Conslts., Box 1376
 415-941-7122
 Cal Los Angeles, Consolidated Trading Company,
 12609 Venice Blvd. 213-397-6231
 Cal Los Angeles, FSI, 7407 Melrose Ave.
 213-651-4411
 Cal San Carlos, Herrmann & Assocs., 727 Industrial
 Rd. 415-592-2757
 Cal San Francisco, Kanematsu-Gosho (U.S.A.) Inc.,
 425 California Street, 4th Floor 415-788-3800
 Cal San Gabriel, Data Accessory Co., 313 W. Valley
 Blvd. 213-283-7616
 Cal Santa Clara, Logic Sys., 3520 Victor Ave.
 408-244-2412
 Colo Denver, Tab Prods. of Colo., 1390 W. Evans
 303-922-8355
 Conn Hamden, Wilshire Elctns./Conn., 2554 State St.
 203-281-1166
 Conn Newton, Gerber Sls. Corp., Whipperwill Hill Rd.
 203-426-3440
 Fla Indian Rocks Beach, Tech-Rep Assocs., Box 508
 813-595-2834
 Fla Miami, American Comp. Supply, 4141 N. Miami
 Ave. 305-576-1607
 Fla Miami, Lykes Elctns. Corp., 1800 N.W. 23rd St.
 305-638-3300
 Fla Tampa, Lykes Elctns. Corp., 5426 W. Crenshaw
 813-886-6621
 Ga Atlanta, Hackett Corp., 1311 Logan Circle, N.W.
 404-351-2364
 Ga Atlanta, Lykes Elctns. Corp., Jackson Div.
 404-355-2223
 Haw Honolulu, Hole Enterprises, 1451 S. King St.
 808-946-3185
 Ill Chicago, Hackett Corp., 2100 W. Fullerton Ave.
 312-227-7714
 Ill Downers Grove, Remote Computing Supplies,
 3415 Hickory 312-964-7800
 Ill Northfield, American Data Processing Supplies,
 229 Northfield Rd. 206-623-2413
 Md Baltimore, R. L. Wilkinson, 707 Stevenson La.
 301-377-7800
 MD Baltimore, Data Processor Supplies, 4319
 Harford Rd. 301-254-4321
 Mass Chelmsford, Scopus Corp., 286 Chelmsford St.
 617-454-4267
 Mass East Longmeadow, Gerber Sls. Corp., 44
 Baldwin St. 413-525-3059
 Mass W. Newton, A. W. Mayer Co., 38 Border St.
 617-965-1111
 Mass Waltham, Gerber Sls. Corp., 176 Second Ave.
 617-890-8040
 Mich Howell, Hackett Corp., 1800 S. Burkhardt Rd.
 517-546-6530
 Mich West Bloomfield, Robert Fairbank Assocs., 6118
 Palomino Ct. 313-851-9546
 Mo Kansas City, Alexander Elctns., 1820
 Wyandotte St. 816-474-6656
 Neb Lincoln, Data Source Business Forms, Box 5573
 402-464-0432
 NH Portsmouth, Morley Co., 909 Islington St.
 603-436-5430
 NJ Bergenfield, Technical Elctn. Distrs., 20 Foster
 St. 201-384-3643
 NJ Ho-Ho-Kus, Progressive Sys., 212 First St.
 201-652-0909
 NY New York, Super Business Machines, 19 Rector
 St. 212-943-4130
 NY Rochester, Elcom Sls., Box 9112 716-385-1400
 NC Greensboro, Carolina Ribbon & Carbon Sls., 400
 Prescott St. 919-274-2468
 Ohio Cincinnati, Hackett Corp., 811 Ridgeway Ave.
 513-961-5335
 Ohio Cincinnati, Sheridan Assocs., Box 37826
 513-761-5432
 Ohio Cleveland, Hackett Corp., 6530 Juniata Ave.
 216-391-2700
 Okla Tulsa, Indel-Davis, Box 6248 918-587-2151
 Ore Portland, Century Business Systems, Box 1268,
 Cascade Plaza Bldg. - No. 208 503-227-3815
 Pa Pittsburgh, Keystone Forms & Supply Co., 666
 Washington Rd. 412-341-2001
 SC Charleston, Wholesale Radio Supply Co., 515 E.
 Bay St. 803-722-2634
 Tex Dallas, Indel-Davis, 2991 Laydbird La.
 214-358-5481
 Tex Houston, Kent Computer, 9219 Katy Frwy.
 713-467-0077
 Wash Seattle, Almac/Stroum Elctns., 5811 Sixth Ave.
 S. 206-763-2300
 Wash Seattle, Data Card, 3625 Interlake Ave. N.
 206-633-4346
 Exp: New York, NY, B. Freudenberg, 50 Rockefeller
 Plaza 212-677-9130
 For: Bromma, Sweden, Esselte System AB, Box 140
 Stockholm 25-27-80

For: Can., Don Mills, Ont., DKW Computer Prods. &
 Svcs., 801 Yorkmills Rd. 416-447-0301
 For: Can., Rexdale, Ont., DASCO Data Prods., Ltd.,
 421 Carlingview Dr. 416-677-9373
 For: England, London W. 13, BFI Elctns. Ltd., Sinclair
 House, The Avenue 01-998-2113
 For: Finland, Helsinki, KONTVA, Runeberginkatu 56
 90-440371
 For: France, Paris, BFI Electronique S.A.R.L., 52,
 Avenue de New York KLE 6969
 For: Germany, Frankfurt am Main, BFI Elektronik,
 GmbH, 26-28 Hainerweg 617099
 For: Israel, Tel Aviv, TALVITON Elctns. Ltd., 9,
 Biltmor St. 444572
 For: Italy, Milano, BFI Elettronica SPA, Via Massena,
 18 316716
 For: Japan, Tokyo, Kanematsu-Gosho Ltd., 2-5
 Takaracho, 2-Chome, Chuo-Ku 03-562-8111
 For: Puerto Rico, Santurce, Info-Teknica, Inc., Box
 6823 809-722-4339

INFORMATION TRANSFER INDUSTRIAL, INC., Box 357,
 Holcomb, N.Y., 14469, Tel: 315-657-7074; Empl.: 10

For info on price: J. E. Wiseman; Application info: M.
 P. Tubinis; Customer service: J. E. Wiseman; Delivery
 info: J. E. Wiseman

Free literature available: Bulletin OLR-001 Magnetic
 Latching Relays; Bulletin 7100 Scanners and
 Accessories.

Products manufactured: Data Acquisition &
 Reduction Systems, Data Loggers, Filters, Relays,
 Scanners, Switches

Local Sales Offices & Reps.

Conn Madison, A & M Elctn. Reps. 203-245-1031
 Md Greenbelt, Riffe Assocs. 301-474-8600
 Mass Needham, A & M Elctn. Reps. 617-444-8170
 NJ Ridgewood, Ballou Inc. 212-964-464
 NY Buffalo, R. F. Lamb Co. 716-874-4900
 NY Rochester, R. F. Lamb Co. 716-544-5580
 NY Schenectady, R. F. Lamb Co. 518-393-4844
 NY Syracuse, R. F. Lamb Co. 315-454-2469
 Pa Norristown, Glove Engrg. Co. 215-275-9875
 Tex Dallas, V. J. Sykes Assocs. 214-243-2221
 EXP: NY, Schenectady, EMB Tech. Corp.
 518-372-5841

Advertisement

- Multipole Latching Reed Relays
- Reed Switching Matrices
- Scanners With Controls
- Scanners for Computer Control
- Data Acquisition Systems
- True RMS Voltmeters & Amme-
- ters
- Thermistor Temperature Indica-
- tors
- Thermocouple Data Systems
- LC & Quartz Crystal Filters
- Catalogs Available

INFRARED INDUSTRIES, INC., 62 Fourth Ave., Waltham,
 Mass., 02154, Tel: 617-890-5400, TWX: 710-324-1199

Customer service: J. W. Meehan

Free literature available: Optical Filter, Designers
 Guide and Catalog Interference Filters from the
 Ultraviolet to the Infrared are fully described with
 tips to the designer. Detector Specification
 Sheets, complete description of Silicon, Lead
 Sulfide, Lead Selenide, and Indium Antimonide
 Photodetectors.

Products manufactured: Cells, Photoconductive,
 Photoemissive, Photovoltaic, Detectors, Diodes,
 Light Choppers

Local Sales Offices & Reps.

Cal Santa Barbara 805-684-4181

INGERSOLL PRODS., Div. Borg-Warner Corp., 1000 W.
 120th St., Chicago, Ill., 60643, Tel: 312-264-7800, TWX:
 910-221-5081; Empl.: 750; Minimum order: \$15
 p. 1-72,73

Customer service: EmCor Sales

Products manufactured: Cabinets & Accessories,
 Cases, Equipment, Instrument, Meter, Drawers,
 Sliding, Frames, Cabinet & Rack, Panels, Racks,
 Slides, Cabinet & Chassis

Local Sales Offices & Reps:

Ala Huntsville, W.A. Brown Instrs. 205-539-4411
 Cal Cupertino, T. Louis Snitzer Co. 408-257-8333
 Cal Del Mar, T. Louis Snitzer Co. 714-454-2191
 Cal Los Angeles, T. Louis Snitzer Co. 213-836-6170
 Colo Denver, Rope & Williamson 303-758-8507

Conn	Bridgeport, Tech. Instrs.	203-368-4582
Fla	Fort Lauderdale, W.A. Brown Instrs.	305-776-4800
Fla	Fort Walton Beach, W. A. Brown Instrs.	904-243-6424
Fla	Indianapolis, W. A. Brown Instrs.	305-723-0766
Fla	Orlando, W.A. Brown Instrs.	305-425-5505
Ga	Atlanta, W.A. Brown Instrs.	404-939-1674
Ill	Des Plaines, Marsland Assocs.	312-775-1309
Ind	Indianapolis, Marsland Assocs.	317-924-3568
La	Gretna, W.A. Brown Instrs.	504-366-5766
Mass	Wilmington, Technical Instrs.	617-944-3930
Mich	Detroit, Comtel-Sterling Co.	313-255-1970
Minn	Minneapolis, Marsland Assocs.	612-545-4481
Mo	Kansas City, Harris-Hanson Co.	816-444-9494
Mo	St. Louis, Harris-Hanson Co.	314-432-3611
NJ	Fort Lee, K.E. Hughes Co.	201-944-1600
NJ	Haddonfield, Dyna Rep. Co.	215-627-2212
NY	Albany, Reagan Compar Albany Co.	518-489-4777
NY	Endwell, Reagan Compar Albany Co.	607-723-9661
NY	Fairport, Reagan Compar Albany Co.	716-721-2230
NY	New Hartford, Reagan Compar Albany Co.	315-732-3775
NY	New York, K. E. Hughes Co.	212-695-0082
NC	Research Triangle Park, W.A. Brown Instrs.	919-489-1546
Ohio	Cleveland, Comtel-Sterling Co.	216-442-8080
Ohio	Dayton, Comtel-Sterling Co.	513-298-7573
Ore	Beaverton, N.R. Schultz	503-643-1644
Pa	Pittsburgh, Comtel-Sterling Co.	412-922-5720
Tenn	Knoxville, W. A. Brown Instrs.	615-584-2614
Tex	Dallas, J.A. Green Co.	214-631-7450
Tex	Houston, J.A. Green Co.	713-526-2959
Va	Alexandria, Dyna Rep. Co.	703-354-1222
Va	Newport News, Dyna Rep. Co.	804-874-7729
Wash	Bellevue, N.R. Schultz Co.	206-454-0300
FOR	Can., Downsview, Ont., Tracan Elctrs.	416-628-0052
FOR	Can., Montreal, Que., Tracan Elctrs.	514-341-4163
FOR	Can., Ottawa, Ont., Tracan Elctrs.	613-820-0269
FOR	Can., West Vancouver, B.C., Tracan Electronics Western	604-926-3411
INGRAHAM DIV., McGraw Edison Co., 210 Redstone Hill Rd., Bristol, Conn., 06010, Tel: 203-582-6321, TWX: 710-454-1024; Empl.: 250		
Customer service: W. A. Hinman		
Products manufactured: Motors, Solenoids, Timers		
INLAND ELCTRN. PRODS. CORP., 35 E. Glenarm, Pasadena, Cal., 91105, Tel: 213-682-1521; FSC No: 14953; Empl.: 10; Minimum order: \$25		
For info on price: A. Raines; Application info: William August; Customer service: A. Raines; Delivery info: D. Umland		
Free literature available: Bulletin 201B - TR Series Transistor Radiators		
Products manufactured: Transistor, Diode, Thyristor Heat Dissipators		
INLAND MFG. CO., 1108 Jackson St., Omaha, Neb., 68102, Tel: 402-342-1108; Empl.: 175		
Customer service: T. R. Gomez		
Free literature available: 24-page brochure describing Inland Glass Bead cleaning systems for removing solder from transistors, etc.		
Products manufactured: Cabinets & Accessories, Machines/Machinery, Production		
INLAND MOTOR DIV. KOLLMORGAN, 501 First St., Rockford, Va., 24141, Tel: 703-639-3973, TWX: 710-875-3740; FSC No: 11384; Empl.: 472; Minimum order: \$25		
For info on price: B. Webb; Application info: C. Hayes; Customer service: J. Davis; Delivery info: J. Davis		
Products manufactured: Actuators, Amplifiers, Controls/Control Eqpt., Motor Electric Generator Sets, Motors, Tachometers		
Local Sales Offices & Reps.		
Ariz	Phoenix, Thorson Co.	602-956-0800
Cal	Los Angeles, Thorson Co.	213-937-0790
Cal	Palo Alto, Thorson Co.	415-321-2414
Cal	San Diego, Thorson Co.	714-298-8385
Cal	Tustin, Thorson Co.	714-544-5121
Colo	Denver, Thorson Co.	303-355-3521
Conn	Guilford, R H Whitehead Jr. Assoc.	203-453-3762
Fla	Ormond Beach, Technology Mktg. Assoc.	904-672-2314
Ill	Chicago, Carlson Elctrn. Sls.	312-774-4812

Md	Silver Spring, Rep-Tron	301-593-4844
Mass	Boston, R H Whitehead Jr. Assoc.	617-542-7676
Mich	Bloomfield Hills, Roth Industrial Sls.	313-626-3171
Minn	Hopkins, Fred Peterson Co.	612-941-5400
Mo	St. Louis, Carlson Elctn. Sls.	314-991-0262
NJ	Haddonfield, Thomas Assocs. (TAI)	609-854-3011
NM	Albuquerque, Thorson Co.	505-265-5655
NY	New York, Bradley Assoc.	212-549-8500
NY	Penfield, A & D Devices	716-586-8033
NC	Winston-Salem, Burgin-Kreh Assoc.	919-768-4174
Ohio	Chagrin Falls, Jerry Kilroy Corp.	216-247-8997
Tex	Dallas, Thorson Co.	214-233-5744
Va	Lynchburg, Burgin-Kreh Assoc.	703-845-5600
Wash	Bellevue, Thorson Co.	206-455-9180
INNOVATION INDUSTRIES INC., 5012 S. Main St., Roswell, N.M., 88201, Tel: 505-622-4072; Empl.: 10; Minimum order: \$25		
For info on price: R. Primm; Application info: J. Copeland		
Free literature available: Complete Catalog		
Products manufactured: Alarms, Controls/Control Eqpt., Counters, Scanners		
Local Sales Offices & Reps.		
Cal	San Rafael, H. Wells Assocs.	415-454-5730
Cal	Santa Ana, H. Wells Assocs.	714-547-4455
INRECO, 8940 Ellis Ave., Los Angeles, Cal., 90034, Tel: 213-870-6664; Empl.: 30; Minimum order: \$25		
For info on price: H. S. Potter; Application info: H. S. Potter; Customer service: J. A. Wasson; Delivery info: J. A. Wasson		
Free literature available: General catalog describing environmental simulation equipment including temperature, humidity, vibration & altitude chambers, along with temperature & humidity conditioning units.		
Products manufactured: Chamber, Environmental Test, Refrigerators, Environmental Test		
INSELEK, Dept. 6 University Park, 743 Alexander Rd., Princeton, N.J., 08540, Tel: 609-452-2222		
INSTANT INSTRUMENTS INC., 306 River St., Haverhill, Mass., 01830, Tel: 617-373-9260; Empl.: 14; Minimum order: \$25		
For info on price: J. Bonfiglio; Application info: J. Bonfiglio; Customer service: N. Blye; Delivery info: N. Blye		
Free literature available: Literature on low cost laboratory & modular regulated power supplies, keyboard, sloped & vertical panel enclosures, and instant breadboarding systems.		
Products manufactured: Boards, Printed Circuit, Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Chassis, Metal, Converters, Diodes, Display Devices/Displays, Kits, Breadboarding (For Engineers), Kits, Power Supply, Kits, Printed Circuit, Power Supplies		
Local Sales Offices & Reps.		
Cal	Pasadena, Advanced Techniques	213-681-1093
Mass	Andover, Mech-Tron Co.	617-475-3531
NJ	Hazlet, MerMon Elctrn. Instrumentation	201-264-1851
Pa	Hatboro, MerMon Elctrn. Instrumentation	215-672-5565
FOR: Can., Toronto, Ont., Canadian Instr.		

Advertisement

INSTANT INSTRUMENTS INC.

manufactures:

INSTRUMENT CASES

- Keyboard, Sloped & Vertical panel Low cost off-the-shelf brushed alum.

• MINI-LAB POWER SUPPLIES

- Logic & Linear outputs, variable & preset from 50 to 1000 mA

• MODULAR POWER SUPPLIES

- single & dual from 25 to 3000 mA

• INSTANT BREADBOARD new method to mount.

INSTRU-LEC CORP., 520 Homestead Ave., Mt. Vernon, N.Y., 10550, Tel: 914-668-3754; FSC No: 13782; Empl.: 45; Minimum order: \$20

For info on price: R. Hobert; Application info: R. Hobert; Customer service: N. L. Eckles; Delivery info: N. L. Eckles

Free literature available: Gear and Differential Brochures illustrating the various types of precision instrument components manufactured on premises.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Couplings, Gears & Gear Mechanisms (Precision), Reducers

INSTRUMENTS COMPONENTS CO., 7239 Industrial Park Blvd., Montor, Ohio, 44060, Tel: 951-3030; Empl.: 15

Customer service: J. Werab

Free literature available: Constant Current Power Supplies - Applications & Specifications.

Products manufactured: Controls/Control Eqpt., Converters, Power Supplies

INSTRUMENT RESEARCH CO., Box 231, Lincoln, Mass., 01773, Tel: 617-897-7647; Empl.: 6

Customer service: E. Withay

Products manufactured: Amplifiers, Generators, Modulators, All Kinds, Power Supplies

Local Sales Offices & Reps.

Cal	Los Angeles, Sodaro Co.	213-876-6001
Colo	Evergreen, Fahnstock Assoc.	303-674-5255
NM	Albuquerque, Mountaintek	505-268-0003
EXP	Fla., Hallandale, EMEC	305-925-6366

INSTRUMENT SPECIALTIES, 276 Bergen Blvd., Little Falls, N.J., 07424, Tel: 201-256-3500, TWX: 710-988-5732; Empl.: 170

Free literature available: Catalog 14C Precision Springs, RF1-EM1 Shielding, Contact Strips and Rings, All From Beryllium Copper.

Products manufactured: Contact Strips, Finger, Contacts, Electrical, Gaskets, Shielding, R-F-Also See Shields, R-F, Shields, Springs (All Types)

Local Sales Offices & Reps.

Ariz	Phoenix, O'Donnell Assoc.	602-993-9740
Cal	Palo Alto, O'Donnell Assocs.	415-327-9260
Cal	Torrance, O'Donnell Assocs.	213-323-9243
Ill	Arlington Heights, Instrument Specialties Co.	312-392-0292
NC	Charlotte, McLean Sls. Co.	704-366-2675
Ohio	Cincinnati, J.G. McLaughlin & Assoc.	513-561-2285
Tex	Irving, Lee Sls. Co.	214-363-3831

INSTR. & CONTROL SYS., INC., 129 W. Laura, Addison, Ill., 60101, Tel: 312-543-6200; Empl.: 35

Customer service: H. Washington

Free literature available: Sheets on all Industrial Control Components and Electro-Pac UPS Systems and Inverters.

Products manufactured: Controls/Control Eqpt., Current Sensors, Electroplating Equipment & Supplies, Inverters, Motors, Power Supplies, Process Control Systems, Relays, Timers

Local Sales Offices & Reps.

Cal	Sunnyvale, RDP Instrs.	408-735-9040
Cal	Woodland Hills, Cummings & Co.	213-340-6035
Fla	Orlando, McKay, Smith & Assoc.	305-277-1513
Fla	Satellite Beach, Reynolds & Assoc.	305-773-4700
Ill	Lombard, Quadtron Assoc.	312-627-6800
Ill	Northfield, Sam Tallaksen Co.	312-441-6644
Ind	Indianapolis, Garstang Engrg. Co.	317-832-9903
Ind	Indianapolis, J. Mahaney	317-925-2090
Md	Rockville, Marktron, Inc.	301-762-6210
Mass	Needham Heights, Geo. Danek & Co.	617-444-8838

Mich Saginaw, R. Von Berg

Mich Southfield, Static Controls

Minn Minneapolis, HMR

Mo Kansas City, Harris-Hanson Co.

Mo St. Louis, Harris-Hanson Co.

NJ East Orange, Friedman & Assoc.

NJ Old Bridge, Ross Co.

NY Utica, KLM Assoc.

NC Charlotte, McKay, Smith & Assoc.

Ohio Chagun Falls, Pine Sls. & Engrg.

Tex Dallas, G. Weinreich & Assoc.

Tex Dallas, Glidden Electro Equip. Co.

Tex Houston, Glidden Electro Equip. Co.

Utah Salt Lake City, Stuart & Co.

Va Charlottesville, Marktron, Inc.

INSTRUMENTATION ENGRG., 769A Susquehanna Ave., Franklin Lakes, N.J., 07417, Tel: 201-891-9300; Empl.: 197

For info on price: J. Gregory; Application info: T. Aufferi; Customer service: F. Borkowski; Delivery info: J. Gregory

Free literature available: The SYSTEM 390 Computerized Test Systems Catalog describes performance capabilities of delivered configurations satisfying analog/digital/hybrid requirements in production, service repair, and refurbishment environments.

Products manufactured: Test Systems, Testers

Local Sales Offices & Reps.

Cal El Segundo, Instrumentation Engrg. 213-973-6611

Ill Chicago, Solid State Elctns. of Ill. 312-889-8033

Mass Waltham, McBar Assocs. 617-890-0233

NJ Palisades Park, Scientific Devices - East 201-871-3916

NY Rochester, Ossman Instrs. 716-328-2230

NC Charlotte, J. L. Highsmith Co. 704-333-7743

Pa Glenside, ARA Elctns. 215-887-5250

Tex Arlington, CTR, Inc. 817-277-6001

Va Springfield, Instrumentation Engrg. 703-451-1422

INSTRUMENTATION TECH. CORP., 18811 Napa St., Northridge, Cal., 91324, Tel: 213-886-2034; FSC No: 34090; Empl.: 30

For info on price: J. Ahlstrom; Application info: J. Ahlstrom; Customer service: J. Ahlstrom; Delivery info: D. Benson

Products manufactured: Calibrators, Comm. Systems, Comparators, Computers, Controls/Control Eqp., Converters, Data Acquisition & Reduction Systems, Data Loggers, Generators, Multiplexers, Simulators, Terminal Equipment, Digital, Verification Systems, Tape

INSTRUMENTS FOR INDUSTRY, INC., 151 Toledo St., Farmingdale, N.Y., 11735, Tel: 516-694-1414; Empl.: 25

Products manufactured: Amplifiers, Antennas, Generators, Meters

Local Sales Offices & Reps.

Cal Yorbalinda, Del Black Assocs. 714-524-0141

Colo Evergreen, Mountaintek, Inc. 303-674-5255

Kans Shawnee Mission, EIR Co. 913-362-0919

Mich Detroit, Harvey Teplitz & Co. 313-537-9058

Mo Leasburg, EIR Co. 314-245-6477

NJ No. Plainfield, Brady Co. 201-753-7988

NM Albuquerque, Mountaintek Inc. 505-268-0003

NY Guilderland, Electro Modular Sys. 518-456-2665

Ohio Cleveland, Harvey Teplitz & Co. 216-371-2044

Ohio Dayton, Harvey Teplitz & Co. 513-277-6531

EXP: Hollandale, Fla., Emec Inc. 305-925-6366

FOR: Can., Mississauga, Ont., D.R. Beattie Ltd. 416-274-3000

FOR: Can., Port Credit, Ont., D.R. Beattie Ltd. 416-278-7401

FOR: Can., St. Eustache, Que., D.R. Beattie Ltd. 514-473-5744

INSTRUMENTS, INC., 3432 Midway Dr., San Diego, Cal., 92110, Tel: 714-223-7156; Empl.: 22

Customer service: D. K. Kalbfell

Products manufactured: Amplifiers

Local Sales Offices & Reps.

Wash Seattle, Datacom Assocs. 206-285-2525

INTECH, INC., 1220 Coleman Ave., Santa Clara, Cal., 95050, Tel: 408-244-0500, TWX: 910-338-0254; FSC No: 33967; Empl.: 165

For info on price: M. Schall; Application info: R. L. Burkett; Customer service: M. Schall; Delivery info: M. Schall

Free literature available: Short Form Catalog (Modular Products) or individual data sheets Individual data sheets (Communications products)

Products manufactured: Amplifiers, Cards, Linear Function, Comm. Systems, Commutators, Converters, Integrated Circuit Devices, Modules, Logic, Encapsulated

Local Sales Offices & Reps.

Ariz Scottsdale, Barnhill Five, Inc. 602-947-7841

06/ Fla Clearwater, Brennan Assocs. 813-446-5006

Ill Elk Grove Village, L.F. Green & Assocs. 312-593-0282

Ind Indianapolis, L.F. Green & Assocs. 317-293-9827

Md Fulton, Gans-Fryling, Inc. 301-953-3724

Mass Peabody, Intech Inc. 617-535-3058

Mich Detroit, WKM Assocs. 313-892-2500

Minn Minneapolis, L.F. Green & Assocs. 612-781-1611

Mo St. Louis, Beneke & McCaul 314-567-3399

NJ Clifton, Compas N.Y. 201-546-3660

Ohio Dayton, WKM Assocs. 513-434-7500

Tex Houston, Semiconductor Sls. Assocs. 713-461-4197

Tex Richardson, Semiconductor Sls. Assocs. 214-231-6181

Va Arlington, Gans-Fryling, Inc. 703-527-3262

Wash Bellevue, NEMCO 206-747-6863

EXP: New York, N.Y., Multiparts Corp. 212-944-4370

INTEGRATED CIRCUITS, INC., 13256 Northrup Way, Bellevue, Wash., 98005, Tel: 206-747-8556, TWX: 910-443-2302; Empl.: 45

Customer service: G. H. Kestner

Free literature available: Hybrid Capabilities Brochure - describing facilities, equipment and general specifications. Product Data Sheets on DC-DC Converters. Product Data Sheets on Filters.

Products manufactured: Amplifiers, Circuits, Hybrid, Thick Film, Converters, Filters, Hybrid Voltage Regulators, Power Supplies, Signal Conditioners & Equipment

Local Sales Offices & Reps.

Ala Huntsville, Technical Sls. 205-881-1750

Cal El Toro, Electronic Component Mktg. 714-830-3939

Cal Menlo Park, Straube Assocs. 415-323-2476

Cal San Diego, Electronic Component Mktg. 714-295-6122

Cal San Diego, Tech-Ser Inc. 714-222-1121

Cal Woodland Hills, Electronic Component Mktg. 213-340-1745

Colo Denver, Straube Assocs./Mtn. States 303-426-0890

Ind Fort Wayne, W. W. Bieberich 219-432-2537

Mich Detroit, R.P. Urban & Assocs. 313-535-2355

Mich Grand Rapids, R.P. Urban & Assocs. 616-245-0511

NM Albuquerque, Straube Assoc./Mtn. States 505-294-1880

Pa King of Prussia, Shibley Assocs. 215-688-4021

Utah Salt Lake City, Straube Assoc./Mtn. States 801-328-4513

Va Fairfax, Shibley Assocs. 703-591-3008

Wash Seattle, Integrated Circuits 206-747-8556

Advertisement

CUSTOM HYBRID MICROCIRCUITS Broad capability in military and commercial application. Specialists in custom design services and rapid response to customer needs.

DC-DC CONVERTERS High efficiency, low cost converters with input voltages in the range of 5V to 50V and any output voltages from 5V to 21 V. Standard models available.

ACTIVE FILTERS Total capability in custom and standard hybrid filters.

INTERGRATED MICROSYSTEMS INC., 1215 Terra Bella Ave., Mountain View, Cal., 94043, Tel: 415-965-3900; Empl.: 75

For info on price: A. Nusbaum; Application info: A. Nusbaum; Customer service: J. Laurence

Products manufactured: Cards, Linear Function, Cards, Logic, Circuits, Hybrid, Thick Film, Filters, Integrated Circuit Devices, IC's, Active Filters, Resistors

Local Sales Offices & Reps.

Ariz Phoenix, Bestronics 602-248-7020

Cal Los Angeles, Black, Ekizian, Strong Inc. 213-870-9191

Cal Mountain View, Melchior/Wesley Assoc. 415-964-2321

Cal San Diego, Bestronics 714-278-2150

Ill Park Ridge, R.F. Specialists 312-698-2044

Ind Indianapolis, R.F. Specialists 617-667-9268

Mass Billerica, Matrix Sls. 313-643-7203

Mich Birmingham, J.C. Hofstetter Co. 616-942-0650

Mich Grand Rapids, J.C. Hofstetter Co. 616-942-0650

Minn Minneapolis, Elctrn. Innovators, Inc. 612-884-7471

NY Camillus, ONTEC 315-488-2203

NY Fayetteville, ONTEC 315-446-2580

NY Grand Island, ONTEC 716-773-9319

NY Northport, F. F. Marin Co. 516-261-5585

NY Rochester, ONTEC 716-464-8636

Ohio Dayton, J.C. Hofstetter Co. 513-296-1010

Ohio Medina, J.C. Hofstetter Co. 216-241-4880

Tex Houston, Semiconductor Sls. Assoc. 713-461-4197

Tex Richardson, Semiconductor Sls. Assoc. 214-231-6181

Wash Tukwila, General Elctns. Inc. 206-243-5141

INTEGRATED PHOTOMATRIX, 1101 Bristol Rd., Mountainside, N.J., 07092, Tel: 201-233-7200; Empl.: 60

Products manufactured: Cameras, Cells, Photoconductive, Photoemissive, Photovoltaic, Circuits, Hybrid, Thick Film, Diodes, Integrated Circuit Devices, Switches

Local Sales Offices & Reps.

Cal Pasadena, A F Sales Engrg. 213-681-5631

Cal San Diego, Tauber & Assocs. 714-274-7242

Cal Sunnyvale, Dynetics International 408-257-7776

Ill Hinsdale, Hill-Gray Assocs. 312-325-4810

Mass Amesbury, ATM World Trade 603-394-7874

Minn Minneapolis, International Sls. Co. 612-831-8423

Mo Kansas City, R. R. Burton Sls. Co. 816-471-2850

NH So. Hampton, ATM World Trade 603-394-7874

NY New York City, ATM World Trade 212-687-5244

Ohio Cleveland, Ad-El-Tek 216-252-0488

Ohio Englewood, Ad-El-Tek 513-836-2741

Tex Plano, Whitson Engrg. Co. 214-423-5255

Wash Seattle, J. B. Jolly Co. 206-938-4166

INTEL CORP., 3065 Bowers Ave., Santa Clara, Cal., 95051, Tel: 408-246-7501, TWX: 910-338-0026; Empl.: 2000

Products manufactured: Computers, Integrated Circuit Devices, Memory Systems

Local Sales Offices & Reps.

Cal Irvine, Intel Corp. 714-838-1126

Mass Lexington, Intel Corp. 617-861-1136

Minn Bloomington, Intel Corp. 612-835-6722

Pa Bala Cynwyd, Intel Corp. 215-664-6636

INTER-COMPUTER ELECTRONICS., Div. American Electronics Laboratories, Inc., Box 507, Lansdale, Pa., 19446, Tel: 215-855-0922, TWX: 510-661-4976; Empl.: 1228; Minimum order: \$25

Customer service: H. W. Anderson

Free literature available: Literature covering A/D converters, D/A converters, Sample and Hold modules and Pulse and Transient Recorders.

Products manufactured: Amplifiers, Analyzers, Converters, Data Acquisition & Reduction Systems, Data Loggers, Decoders, Encoders, Generators, Multiplexers, Process Control Systems, Recorders

Local Sales Offices & Reps.

Ariz Phoenix, Sheffer-Kahn Co. 602-258-7893

Cal Mountain View, IFM 415-961-2828

Cal San Pedro, IFM 213-547-0829

Colo Denver, Sheffer-Kahn Co. 303-631-9087

Flo Satellite Beach, Reynolds & Assocs. 305-773-4700

Mass Burlington, Scientific Sys. Sls. Corp. 617-273-1660

Mich Detroit, Comtel-Sterling Co. 313-255-1970

Minn Minneapolis, SEA, Inc. 612-425-4455

Mo St. Louis, Kemco, Inc. 505-265-7077

NM Albuquerque, Sheffer-Kahn Co. 516-921-3737

NY Syosett, Scientific Sys. Sls. Corp. 516-442-8080

Ohio Cleveland, Comtel-Sterling Co. 513-298-7573

Ohio Dayton, Comtel-Sterling Co. 412-922-5720

Pa Pittsburgh, Comtel-Sterling Co. 713-467-1061

Tex Houston, Kemco Inc. 214-255-0537

Wash Seattle, R. S. Drake Assocs. 206-RO 3-2755

Wisc Waukesha, SEA, Inc. 414-547-6637

FOR: Can., Ottawa, Ont., Louis Albert Assoc., Inc. 610-562-8918

INTER-MARKET, INC., 1946 Lehigh Ave., Glenview, Ill., 60025, Tel: 312-729-5330, TWX: 910-651-1997; Empl.: 10; Minimum order: \$15

For info on price: R. M. Scott; Application info: K. Freed; Customer service: R. M. Scott; Delivery info: R. M. Scott

Free literature available: Subminiature miniature, bi-pin/neon/green neon lamps; indicator lights - incandescent and neon; Thumbwheel switches; lighted displays; industrial C.C.T.V.

Products manufactured: Display Devices/Displays, Lamps, Lights; Sockets, Switches, Television Systems & Equipment Closed-Circuit

Local Sales Offices & Reps.

Ariz	Phoenix, Spectrum Assoc.	602-997-6324
Cal	San Carlos, Kottmeier Assoc.	415-592-8333
Cal	Santa Ana, Spectrum Assoc.	714-835-4114
Conn	Berlin, White Sls.	203-224-0423
Ill	Downers Grove, Richmar Elctns	312-968-0118
Md	Glen Wood, Naudain Assoc.	301-442-2270
Mass	Needham, White Sls.	617-444-3676
Mich	Birmingham, J.C. Hofstetter Co.	313-643-7203
Mich	Grand Rapids, J.C. Hofstetter Co.	616-942-0650
Minn	St. Paul, Kenco Co.	612-645-7717
NJ	Harrington Pk., Metro Tech. Sls.	201-768-8495
NJ	Mt. Laurel, Naudain Assoc.	609-235-1801
NY	Jericho, Metro Tech. Sls.	516-935-3330
Ohio	Dayton, J.C. Hofstetter Co.	513-296-1010
Ohio	Medina, J.C. Hofstetter Co.	216-725-4477
Tex	Dallas, Erickson-Ulter Sls.	214-243-6611
Wash	Seattle, C.K. Shanks & Assoc.	206-632-4290
Wisc	Oak Creek, Richmar Elctns	414-475-0141
FOR:	Can., Montreal, Que., Braydon Electro Ltd.	514-341-3330

INTER-TECH. GRP., INC., Box 23,
Irvington-on-Hudson, N.Y., 10533, Tel: 914-LY 1-8822,
TWX: 710-564-0802; Empl: 8

p. 1•19,2356,2357; p. 2•1230

Products manufactured: Alloys, Bi-Metals,
Thermostatic, Capacitors, Fixed, Cores, Magnetic,
Foils, Heads, Recording Playback, Erase,
Laminations, Shields, Tubes

Local Sales Offices & Reps.

Ariz	Phoenix, Palmer Assoc.	602-996-9077
Cal	San Carlos, Winco Sls.	415-365-6082
Cal	San Gabriel, R. G. Moye	213-283-1669
Colo	Denver, Palmer Assoc.	303-255-9961
Fla	Maitland, H. Sarkis	305-647-3671
Fla	Melbourne, Repcom	305-254-1877
Ill	Chicago, J. Goltion Co.	312-725-7870
Md	Timonium, Heller	301-252-4780
Mass	Newton, Normell Assoc.	617-969-5478
Minn	Minneapolis, Int'l. Sls.	612-831-8423
NY	Lynbrook, H.B. Heft	516-19-9-3351
NY	Syracuse, Naylor Elec.	315-GR 2-9183
Ohio	Dayton, BEK Assoc., Inc.	513-278-1343
Pa	Ardmore, Freedman Assoc.	215-649-3679
Tex	Dallas, J. Clay Co.	214-350-1281
Wash	Seattle, H. Levinson	206-323-5100

INTERDATA, 2 Crescent Pl., Oceanport, N.J., 07757, Tel:

201-229-4040, TWX: 710-722-6512; Empl: 1100

For info on price: D. Von Donop; Application info: J. Gould; Customer service: J. Rechner; Delivery info: D. Von Donop

Products manufactured: Comm. Systems,
Computers, Recorders

Local Sales Offices & Reps.

Ariz	Phoenix	602-968-2477
Cal	Los Angeles	213-640-0451
Cal	San Diego	714-565-0602
Cal	San Francisco	415-969-1180
Colo	Denver	303-758-0474
DC	Washington	703-525-4806
Fla	Orlando	305-851-6962
Ill	Chicago	312-437-5120
Mass	Boston	617-890-0557
Mich	Detroit	313-356-5515
Mo	Kansas City, 913-384-1606	
Ohio	Dayton	513-434-4193
Pa	Philadelphia	215-436-5579
Tex	Dallas	214-238-9656
Tex	Houston	713-783-3060
Wash	Bellevue	206-455-0680
Wash	Seattle	206-455-0680
FOR:	Can., Toronto	416-677-8990

INTERDESIGN INC., 1255 Reamwood Ave., Sunnyvale, Cal., 94086, Tel: 408-734-8666, TWX: 910-339-9374; Empl: 50; Minimum order: \$10

Customer service: G. Kurtz

Free literature available: Monochip Brochure;
Technical Monochip Journal-Quarterly (1 through 6); Pulse Generator Brochure-Model 1101;
Thermocouple amplifier Data Sheet-Model 1201.

Products manufactured: Amplifiers, Circuits,
Integrated, Silicon Monolithic, Unpackaged Chips,
Generators, Indicators, Integrated Circuit Devices

INTERDYNE

INTERDYNE, Intercette Div., 14761 Califa St., Van Nuys, Cal., 91401, Tel: 213-787-6800, TWX: 910-495-1754; FSC No: 31598; Empl: 80; Minimum order: \$25

For info on price: W. Geist; Application info: R. Lewis

Free literature available: Digital Cassette Tape Drives, D.C. servo capstan drive system, ANSY ECMA compatible with cast frame. Interfaced cassette systems with RS 232 and machine interfaces, 1, 2, or 3 drives.

Products manufactured: Boards, Plug-In, Boards, Printed Circuit, Cable, Connectors

Local Sales Offices & Reps.

Ariz	Phoenix, Vari-Tron Sls.	602-997-0774
Cal	La Jolla, REP Sls.	714-454-1500
Cal	Los Altos, Parsons & Meister	415-941-4745
Colo	Boulder, Component Prod. Sls.	303-444-2730
Ill	Chicago, J.C. Angel & Co.	312-878-0653
Ind	Ft. Wayne, Temple Engrg.	219-743-0362
Md	Baltimore, B. White & Assocs.	301-484-5400
Mass	Stoneham, REPCO	617-438-3113
Minn	Minneapolis, Stoss Assocs.	612-925-2757
NJ	Wayne, K & J Assocs.	201-694-3334
NY	E. Setauket, K & J Assocs.	516-751-8686
NY	Rochester, R.P. Kennedy Co.	716-271-6322
Ohio	Wickliffe, W.J. Brauer	216-943-0601
Pa	King of Prussia, Monteiro Assocs.	215-265-0634

Tex Richardson, P.J. Scanlon Co. 214-231-4661
Wash Bellevue, Ruggles Tech. Sls. 206-455-2778

INTERELECTRONICS CORP., 550 U.S. Rte. 303, Congers, N.Y., 10920, Tel: 914-EL8-8000; p. 1•1237

Products manufactured: Capacitors, Fixed, Capacitors, Variable, Converters, Cords, Intensifiers, Image, Inverters, Power Supplies, Thermistors

INTERFACE, INC., 7401 Butherford Dr., Scottsdale, Ariz., 85260, Tel: 602-948-5555; FSC No: 32311; Empl: 35; Minimum order: \$50

For info on price: T. Johnson; Application info: T. Johnson; Customer service: B. P. Moran; Delivery info: B. P. Moran

Free literature available: Catalog 300-A offers concise Models & specification chart & price list. Data sheets for Low Range Minibeam & Sealed Super-Mini give same for new products. Ranges from 5 lbs to 200,000 lbs are included in the literature describing Interface load cells.

Products manufactured: Cells, Load, Transducers

Local Sales Offices & Reps.

Ala	Huntsville, Col-Ins Co.	205-539-1771
Ariz	Scottsdale, Electronic Entrs.	602-946-9860
Cal	Long Beach, Saber Ent.	213-595-5646
Cal	Mountain View, Gado Instr. Sls.	415-933-5566
Conn	Hamden, Northeast Engrg.	203-248-4481
Fla	Largo, Col-Ins Co.	813-343-0978
Fla	Orlando, Col-Ins Co.	305-423-7615
Ga	Clarkston, Col-Ins Co.	404-934-7280
Ill	Des Plaines, Marsland Assoc.	312-298-2620
Ind	Indianapolis, Marsland Assoc.	317-924-3568
Md	Randletown, Beacon North	703-534-1868
Mass	Danvers, Northeast Engrg.	617-774-3010
Mich	Farmington, Anderson Elctns.	313-476-9161
Minn	Minneapolis, Marsland Assoc.	612-545-4481
Mo	Florissant, Marsland Assoc.	314-728-6949
NM	Albuquerque, Electronic Entrs.	505-256-3561
NY	Elbridge, L-Tron	315-689-3787
NY	Manhasset, Northeast Engineer	516-365-9633
NC	Raleigh, Col-Ins Co.	919-834-6591
Ohio	Cleveland, Instrumentation Systems	216-486-0782

Ohio	Dayton, Instrumentation Systems	513-294-2838
Ore	Portland, McLaren	503-297-2248
Pa	Jenkintown, PDC Corp.	215-887-9610
Pa	Pittsburgh, Instrumentation Syst.	412-243-1111
Tex	Fort Worth, Carey Wolf & Assoc.	817-738-1996
Tex	Houston, Carey Wolf & Assoc.	713-721-2442
Va	Falls Church, Beacon North	703-534-1868
Wash	Bellevue, McLaren	206-454-3400

INTERFACE ENGINEERING INC., 386 Lindelof Ave., Stoughton, Mass., 02072, Tel: 617-344-7383; FSC No: 14352; Empl: 18; p. 1•174, 175

For info on price: T. Scanlon; Application info: T. Scanlon; Customer service: J. Judd; Delivery info: J. Judd

Free literature available: "Angle Translators"-Summary of digital and analog angle translation modules and their key performance characteristics. The modules encompass all functions required in the development of medium to high performance control systems.

Products manufactured: Alarms, Amplifiers, Bridges, Comm. Systems, Comparators, Computers, Controls/Control Eqp., Converters, Data Acquisition & Reduction Systems, Decommunators, Telemetering, Indicators, Monitors, Multiplexers, Signal Conditioners & Equipment, Simulators, Synchro Transmitters, Solid-State, Testers

Local Sales Offices & Reps.

Ariz	Phoenix, RDX Corp.	
Cal	Pasadena, RDX Corp.	
Cal	San Diego, RDX Corp.	
Cal	Sunnyvale, RDX Corp.	
Va	Arlington, Gans-Frying	

Advertisement

INTERFACE ENGINEERING

manufactures analog, synchro, and digital code converters, analog and digital function generators, digital angle operators, coordinate converters, digital couplers, and accessory power supplies and displays for the measurement, control, simulation, and display of shaft position.

INTERFACE TECHNOLOGY INC., 10500 Kahlmeyer Dr., St. Louis, Mo., 63132, Tel: 314-426-6880; Empl: 30; Minimum order: \$75

For info on price: M. E. Smith; Application info: M. E. Smith; Customer service: K. Zienta; Delivery info: K. Zienta

Free literature available: Touch-Tone User's Guide. This small booklet describes the touch-tone transmission technique and the terminal products available from Interface Technology, Inc. to support this growing application area.

Products manufactured: Display Devices/Displays, Encoders, Keys, Tone, Keyboards, Alphanumeric & Decimal, Terminals, Data Display (including Alphanumeric & Graphic), Typewriters, Input-Output (All Types)

Local Sales Offices & Reps.

NY	Great Neck, H. J. Krasner & Assocs.	516-487-0690
Ohio	Akron, System Mktg. Corp.	216-666-5411

INTERLOK, 770 Airport Blvd., Burlingame, Cal., 94010, Tel: 415-347-7701; Empl: 30; Minimum order: \$50; p. 1•74-77; p. 2•1084-1086

For info on price: R. Vorce 348-5625; Application info: R. Vorce 348-5625; Customer service: A. Fluter 347-7701; Delivery info: R. Vorce 348-5625

Free literature available: Short Form Product Catalog Model 12 Card Frame Model 15 Card Frames Model 30 Enclosures Model 34 Consoles Model 36 Enclosures Model 1500 Cabinets Model 1520 Cabinets The Collet Knob Catalog

Products manufactured: Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Knobs, Racks

Local Sales Offices & Reps.

Ariz	Phoenix, Bestronics	602-248-7020
Ark	Little Rock, J.Y. Schoonmaker Co.	501-375-2168
Cal	Burlingame, W.J. Purdy Co.	415-347-7701
Cal	Los Angeles, Black, Ekizan, Strong, Inc.	213-870-9191
Cal	San Diego, Bestronics	714-278-2150
Colo	Denver, W.J. Purdy Co.	303-777-1411
Conn	Meriden, P.R. Sturgeon Co.	203-237-1112
Ill	Hinsdale, Hill-Gray Assoc.	312-325-4810
Ind	Indianapolis, Sukup & Cox	317-253-5501
Mass	Babson Park, P.R. Sturgeon Co.	617-237-3506
Mich	Ferdale, Hilltronics, Inc.	313-398-5556
Minn	Minneapolis, HMR	612-920-8200
NJ	Bergenfield, Harold Gray Assocs.	201-384-3643
NM	Albuquerque, W.J. Purdy Co.	505-266-7959
NY	Syracuse, Mar-Com Assocs.	315-437-2843
Okla	Tulsa, J.Y. Schoonmaker Co.	918-936-1423
Pa	Enon Valley, Nebco Assoc.	216-457-2333
Pa	Havertown, Liberi Sls.	215-789-8150
Tex	Dallas, J.Y. Schoonmaker Co.	214-357-8481
Tex	Houston, J.Y. Schoonmaker Co.	713-926-9510
FOR:	Can., Willowdale, Ont., A.C. Simmonds & Sons	416-491-1010

INTERMATIC, INC., Intermatic Plaza, Spring Grove, Ill., 60081, Tel: 815-675-2321, Telex: 25-265; Empl: 700; Minimum order: \$50

For info on price: J. Sechrist; Application info: J. Sechrist; Customer service: A. Dunn; Delivery info: A. Dunn

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Timers

Local Sales Offices & Reps.

Ariz Phoenix, T. Geis & Assocs. 602-252-7694
Cal Los Angeles, Intermatic, Inc. 213-627-1506
Cal San Francisco, Keeler, White Co. 415-431-2900
Colo Denver, E.O. Sales 303-744-7081
Fla Coral Gables, J.H. Akerman 305-667-3864
Ga Atlanta, C. Powell, Inc. 404-875-0755
Haw Honolulu, H.H. Sawyer Co. 808-847-1411
Ind Indianapolis, C.K. Warble Assocs. 317-632-1465

Iowa Cedar Rapids, A. Sell & Assocs. 319-393-4225
Kans Shawnee Mission, Stover & Assocs. 913-649-6600

Ky Covington, Hackman Electrical Sls. 606-291-3800

La New Orleans, W. Case & Assocs. 504-835-7713
Mass Woburn, Yusen Assocs. 617-935-8500
Mich Southfield, Linder Assocs. 313-353-4334
Minn Golden Valley, Elstad Sales Co. 612-533-3033
Mo Kirkwood, Martin Electrical Sls. 314-966-8659
Neb Omaha, Midwest Equip. Co. 402-734-1020
NJ Rahway, Nash & Cornell 201-381-2400
NM Albuquerque, T. Deskin & Assocs. 505-242-3581

NY New Hartford, F.W. Laver & Son 315-724-2304
NC Charlotte, E.F. Lombardi 704-334-1637
Ohio Bedford Heights, Riffle & Assocs. 216-439-5500

Okla Jenks, W.G. Parker 918-299-5449
Ore Portland, M.H. Gerrard 503-224-0864

Pa Philadelphia, W.C. Welde & Sons 215-243-1120
Pa Pittsburgh, H.W. Grotzinger Co. 412-322-6280
Tex Dallas, T.C. Kissel Co. 214-742-2349
Tex Houston, Kopinitz Co. 713-692-0022
Utah Salt Lake City, J.R. Christensen & Assocs. 801-486-0031

Wash Seattle, Tai Agencies 206-624-3355
Wisc Wauwatosa, G.R. Adams & Assocs. 414-453-7130

INTERNATIONAL COMMUNICATIONS, A Milgo Co., 8600 NW 41st St., Miami, Fla., 33166, Tel: 305-592-7654, TWX: 810-848-6588; Empl.: 1400

Free literature available: Data communications products catalog.

Products manufactured: Comm. Systems, Modulator/Demodulators, Terminals, Data Display (including Alphanumeric & Graphic), Testers

Local Sales Offices & Reps.

Cal Los Angeles, Intl. Comm. Corp. 213-641-3961
Cal Oakland, Persons & Assocs. 415-569-6461
Cal Sunnyvale, CSS Telecommunications Specialists 408-739-8366
Cal Torrance, CSS Telecommunications Specialists 213-372-9360

Colo Littleton, Copley, Inc. 303-794-4231
Conn Westport, T.H. Maguire & Assocs. 203-227-1976

DC Washington, Intl. Comm. Corp. 202-296-4940
Fla Ft. Lauderdale, Modemsplus 305-587-3849
Fla Tampa, Modemsplus 813-223-7932

Ga Atlanta, Intl. Comm. Corp. 404-996-6327
Ill Alton, Information Prods. 314-355-4340
Ill Chicago, HH Sls. 312-337-4478

Kan Prairie Village, Giddings Co. 913-831-0727
Ky Louisville, Data Processing Sciences 502-459-1206

Md Silver Springs, Computer Complements Inc. 301-593-1559
Mass Danvers, John Melanson & Assocs. 617-774-1220

Mich Southfield, Data Processing Sciences 313-557-3164
Minn Minneapolis, Delta Comms. Sys. 612-884-0202
Mo Independence, Information Prods. Inc. 816-252-3700

NY Great Neck, Harvey J. Krasner Assocs. Inc. 516-487-0690
NY Herkimer, Gall & Annesse Assocs. 315-458-7189
NY Massapequa, L.E. Walz & Assocs. 516-798-3119

NY New York, Int'l. Comm. Corp. 212-687-5040
Ohio Cincinnati, Data Processing Sciences Corp. 513-961-0776

Ohio Cleveland, Data Processing Sciences Corp. 216-886-2090
Ohio Toledo, Data Processing Sciences Corp. 419-472-0111

Ohio Vandalia, Data Processing Sciences Corp. 513-275-6781

Ohio Worthington, Data Processing Sciences Corp. 614-224-4081
Ore Beaverton, SJI 503-646-3004
Pa Bala-Cynwyd, Applied Energy Systems Inc. 215-667-1010

Tenn Nashville, Modemsplus, Inc. 615-868-1004
Tex Richardson, Computer Mktg. Corp. 214-231-1426

Wash Seattle, SJI Inc. 206-624-9020
Wisc Milwaukee, Delta Commus. Sys. 414-774-1989
FOR: Can., Montreal 252, Que., Electronetic Supt. Ltd. 514-342-4112

FOR: Downsview, Ont., Can., Electronetic Supt. Ltd. 416-661-3673
FOR: Ottawa 8, Ont., Can., Electronetic Supt. Ltd. 613-733-3781

FOR: Vancouver, B.C., Can., Western Electronic Supt. Ltd. 604-687-5696

INTERNATIONAL COMPS CORP., 105 Maxess Rd, Melville, N.Y., 11746, Tel: 516-293-1500, TWX: 510-224-6409; Empl.: 100; Minimum order: \$50

p. 2-192, 193
For info on price: M. Karasik; Application info: I. Greenburg; Customer service: R. Schuster; Delivery info: R. Rubenstein

Free literature available: Aluminum Electrolytic Capacitors; Tantalum Capacitors; Film Capacitors; Metallized Film Capacitors; Ceramic Disc Capacitors; Carbon Film Resistors; Carbon Composition Resistors.

Products manufactured: Capacitors, Fixed, Diodes, Meters, Potentiometers, Resistors, Tubes

Advertisement

INTEROHM RESISTORS - including carbon composition, and carbon film. INTERCAP CAPACITORS - miniature electrolytics, dipped tantalums, and miniature film. INTERNATIONAL SERVICEMASTER & 10M RECEIVING TUBES - all domestic & foreign types. ALL PRODUCTS ARE STOCKED IN DEPTH. LARGE QUANTITIES OF STANDARD VALUES AVAILABLE.

INTERN'L. COMPUTER PRODS., INC., 2925 Merrell Rd., Dallas, Tex., 75229, Tel: 214-350-6951; Empl.: 102

Customer service: G. Rocky

Free literature available: A 16 page brochure on the most versatile digital cassette family with descriptions, specifications and photographs.

Products manufactured: Recorders, Tape Recording Accessories, Tapes, Recording, Magnetic (All Types)

Local Sales Offices & Reps.

Ariz Phoenix, Southwest Peripherals 602-995-1508
Cal Sherman Oaks, Electronic Mktg Specialists 213-990-4244

Conn Stamford, ICP East Coast Regional Off. 203-327-6263
Fla Orlando, Technical Assocs. 305-894-7531

Minn Minneapolis, Loonam Assocs. 612-831-1616
FOR: Can., Ottawa, Ont., L. Albert Assocs. 613-737-5941

INTERNATIONAL CRYSTAL MFG., 10 N. Lee St., Oklahoma City, Okla., 73102, Tel: 405-CE 6-3741, TWX: 910-831-3177 p. 1-362-366,738

Products manufactured: Crystal Blanks, Crystals, Oscillators

INTERNATIONAL DATA SCIENCES, 100 Nashua St., Providence, R.I., 02904, Tel: 401-274-5100, TWX: 710-381-0285; Empl.: 35

Customer service: Sls. Dept.

Free literature available: Specification sheets describing various products. Short form catalog and technical article reprints also available. Telephone line matrix switches and special systems quoted on request.

Products manufactured: Cable Assemblies & Harnesses, Generators, Panels, Printers, Testers

Local Sales Offices & Reps.

Ala Huntsville, FM Assocs. 205-536-9990
Alas Anchorage, Consolidated Comm. 907-272-3591
Ariz Scottsdale, Barnhill Three 602-947-7841
Cal N. Hollywood, O'Halloran Assoc. 213-877-0173
Colo Denver, Barnhill Three 303-934-5505

Conn Wallingford, Instrument Assoc. 203-525-9367
Ill Elk Grove Village, L.F. Green & Assoc. 312-593-0282

Ind Indianapolis, L.F. Green Assoc. 317-293-9827
Kans Shawnee Mission, Inland Assoc. 913-362-2366

Md Gaithersburg, Wright Co. 301-948-5151
Mass Bedford, Instr. Assoc. 617-275-0700
Minn Minneapolis, L.F. Green & Assoc. 612-781-1611

Mo Glencoe, Inland Assocs. 314-938-4992
NJ Pennsauken, Megargel/Himmelstein Assoc. 609-622-3081

NJ Ridgewood, Instrumentation Sls. Co. 201-445-5210
NM Albuquerque, Barnhill Three 505-299-7658

NY E. Syracuse, Ossmann Instr. 315-437-6666
NC Greensboro, FM Assocs. 919-294-2754
Ohio Dayton, Ashby Assocs. 513-252-5627

RI Providence, Int. Data Sciences 401-274-5100
Tex Richardson, Barnhill Two 214-231-2573
Wash Seattle, Delcom Sls. Co. 206-248-0090

INTERNATIONAL ELECTRO EXCH. CORP., See IEE/Schadow, Inc.

INTERNATIONAL ELECTRO-MAGNETICS, Eric Dr. & Cornell Ave., Palatine, Ill., 60067, Tel: 312-358-4622; Empl.: 30 p. 1-16,17

Products manufactured: Cameras, Controls/Control Eqpt., Heads, Recording Playback, Erase, Mounts, Recorders, Tape Recording Accessories, Transducers

INT'L. ELCTRN. RESCH., 135 W. Magnolia Blvd., Burbank, Cal., 91508, Tel: 213-849-2481, TWX: 910-498-2206; FSC No.: 98978; Empl.: 110; Minimum order: \$25

Customer service: Order Desk

Free literature available: Product Technical Bulletins (individual) Short Form Catalog 1974/1975 General Catalog 1974/1975 22 Pg. Article "Semiconductor Thermal Mgmt." 17 Pg. Article "U.S. Navy SHP - Standard Packaging"

Products manufactured: Boards, Printed Circuit, Chassis, Circuit Board Mounting, Circuits, Printed, Multilayer, Coatings, Guides, Circuit Board, Heat Exchangers & Systems, Metal Oxides, Racks, Retainers, Shields, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

Ala Huntsville, Murcota Corp. 205-539-8476
Ariz Phoenix, Piper Sales Co. 602-946-4436
Cal Burlingame, J. Logan 415-697-6100
Cal Los Angeles, Ed Landa Co. 213-879-0770
Colo Denver, Vinson Assocs. 303-757-5151
Conn Canaan, Hathaway Elctns. 800-225-1293
Fla Clearwater, Lynch-Gentry Assocs. 813-443-2697

Ill Mt. Prospect, Magnuson 312-956-0700
Kans Leawood, Thunderbird Tech. 913-642-7220
Kans Wichita, Thunderbird Tech. Sls. 316-684-3941

Mass Lexington, Hathaway Elct. 617-861-7010
Mich Utica, N. Case Assocs. 313-781-3900
Minn St. Paul, Magnuson 612-227-8495

Mo St. Louis, Thunderbird Tech. 314-567-6488
NJ Clifton, Compar N.Y. 201-546-3660
NY Buffalo, Ossmann Component Sls. Corp. 716-832-4271

NY Kingston, Ossmann Component Sls. Corp. 914-338-5505
NY Rochester, Ossmann Component Sls. Corp. 716-442-3290

NY Syracuse, Ossmann Component Sls. Corp. 315-454-4477
NY Vestal, Ossmann Component Sls. Corp. 607-785-9949

NC Winston-Salem, Murcota Corp. 919-723-1001
Ohio Centerville, N. Case Assocs. 513-435-1301
Ohio Rocky River, N. Case Assocs. 216-333-4120

Pa Philadelphia, Kenneth B. Erdman Co. 215-224-1833
Pa Pittsburgh, R. F. Clark Co. 412-242-9502

Tex Dallas, Blair Engrg. 214-352-8411
Wash Seattle, F. Jackson Co. 206-782-2211
FOR: Can., Burlington, Ont., White Radio 416-634-1845

FOR: Can., Montreal, Que., White Radio 514-482-8091

INTERNATIONAL ELECTRONICS CORP., I.E.C./El-Menco Capacitors, 316 S. Service Rd., Melville, N.Y., 11746, Tel: 516-694-7700, TWX: 510-224-6427; Empl.: 3000 p. 2-194, 195

Products manufactured: Capacitors, Fixed, Capacitors, Variable, Diodes, Tubes

Local Sales Offices & Reps.

Conn Milford, Conti-Younger 203-929-3294
Ill Chicago, S. DiMarco 312-237-4454

Ill	Des Plaines, E. Flaxman Co.	312-298-8580
Mass	Waltham, Conti-Younger Assocs.	617-890-4582
Minn	St. Louis Park, Beta Engrg.	612-925-4422
NJ	Harrington Park, Metro Tech. Sls.	201-768-8495
NY	Endicott, Advanced Comps.	607-785-3191
NY	Jericho, Metro Tech. Sls.	516-935-3330
NY	No. Syracuse, Advanced Comps.	315-699-2671
Pa	Ardmore, V.K. Metz	215-M19-3966
Tex	Dallas, United Comps.	214-324-1448
Wash	Seattle, R. Thorp Co.	206-763-1236

INTERNATIONAL IDENTIFICATIONS, 1917 Green Spring Dr., Timonium, Md., 21903, Tel: 301-252-1768; Empl.: 15

Customer service: W. B. Yahn

Products manufactured: Braid, Cable, Cable Assemblies & Harnesses, Cable, Kits, Marking (Dial, Instrument, Equipment, etc.), Lead Assemblies & Receptacles, Leads, Test & Adaptors, Machines/Machinery, Production, Services, Assembly, Production & Test, Strips, Tubing, Wire, Wire Shielding

Advertisement

Flat woven cable, harness and cable assembly, wire and cable markers, lead assembly braided cable, hot stamping, cutting and stripping wire, back panel wiring, circumferential color coding of wire. Engineering and design assistance on all phases of interconnections and wire and cable marking.

INTERNATIONAL IMPORTERS, 2244 S. Western Ave., Chicago, Ill., 60608, Tel: 312-847-6363, TWX: 910-221-1394; Empl.: 35

Customer service: B.A. Moll Ext. 226

Products manufactured: Capacitors, Fixed, Diodes, Jacks (All Types), Microphones, All Kinds; Resistors, Speakers, Transistors, Tubes

Local Sales Offices & Reps.

Ala	Huntsville, 20th Century Mktg.	205-772-9237
Cal	Marina Del Ray, Intervend	213-821-7936
Colo	Denver, Franklin Sls.	303-922-3623
Ill	Chicago, Minitron	312-774-6815
Ind	Indianapolis, W. Deem & Assoc.	317-844-2993
Iowa	Des Moines, Beams	515-282-0292
Kans	Shawnee Mission, Beams	913-888-6110
Mass	Waltham, MSN Assoc. Inc.	617-893-6211
Mich	Ferndale, Shalco	313-547-4771
Minn	St. Paul, D. Countryman & Assoc.	612-645-9151
Mo	St. Louis, Beams	314-781-8855
NY	NYC, C. Avery & Assoc.	212-823-5224
NY	Rye, C. Avery & Assoc.	914-967-7610
Pa	Philadelphia, Danton Assoc.	215-353-0500
Tex	Dallas, Techno Assoc.	214-357-9213

INT'L INSTRS., Div. Sigma Instrs., 88 Marsh Hill Rd., Orange, Conn., 06477, Tel: 203-795-4711, TWX: 710-465-2897; Empl.: 275; Minimum order: \$50

For info on price: J. Connolly; Application info: J. Connolly; Customer service: M. Schultz; Delivery info: M. Schultz

Free literature available: Catalog - individual data sheets

Products manufactured: Alarms, Controls/Control Eqpt., Indicators, Meters, Monitors; Relays

Local Sales Offices & Reps.

Ala	Huntsville, Brandel-Stephens & Co. Inc.	205-883-0445
Ariz	Phoenix, J. S. Heaton Co.	602-264-7887
Cal	Burlingame, Engineering Rep. Co.	415-692-2581
Cal	Los Angeles, Barnard & Assocs.	213-973-5050
Cal	San Diego, Engineering Rep. Co.	714-565-6366
Colo	Englewood, Tech Sls.	303-789-2864
Fla	Orlando, Brandel-Stephens & Co.	305-425-3202
Ga	Atlanta, Brandel-Stephens & Co.	404-261-7579
Ill	Westchester, Gassner & Clark Co.	312-345-4245
Kans	Shawnee Mission, Technical Sls. Assoc.	913-888-3330
La	Harahan, Williams Equipment Co.	504-737-4082
Md	Baltimore, J.R. Daniel & Co.	301-825-3330
Mass	Needham Heights, Northeast Reps.	617-449-3093
Mich	Detroit, Stress Analysis Services	313-535-1120
Minn	Minneapolis, Pilot Industrial Controls	612-941-7400
Mo	Ferguson, Technical Sls. Assocs.	314-725-5361

NJ	Stirling, NBS Assocs.	201-464-8500
NY	Buffalo, H.C. Johnson Agencies	716-632-7880
NY	Fayetteville, H.C. Johnson Agencies	315-637-9383
NY	Rochester, H.C. Johnson Agencies	716-482-3000
NC	Charlotte, D.G.W., Inc.	704-334-7090
NC	Winston Salem, D.G.W., Inc.	919-768-7166
Ohio	Medina, Stress Analysis Services	216-725-7733
Okla	Tulsa, Telstar Instrument Corp.	918-628-1011
Pa	Glenshaw, H.C. Johnson Agencies	412-961-0414

Pa	Paoli, Stitzer Assocs.	215-644-5500
Tex	Dallas, J.B. Guenther, Inc.	214-691-8500
Tex	Houston, Instrumentics, Inc.	713-225-6626
Wash	Bellevue, General Elctns., Inc.	106-885-4148

Local Distributors

Ariz	Phoenix, Metermaster, 2633 E. Buckeye Rd.	602-273-7331
Cal	Los Angeles, Metermaster, 5646 Jilison St.	213-685-4340
Cal	Palo Alto, Metermaster, 3995 E. Bayshore	415-968-0313
Colo	Denver, Metermaster Instr. Corp., 1165 So. Cherokee	303-722-5766
Conn	Middletown, Mancib Co., Box 467	203-346-6646
Fla	Ft. Lauderdale, A & M Instrs., 4257 N.E. 6th Ave.	305-565-2579

Ill	Chicago, E.I.L. Instrs., 221 W. 79th St.	312-874-8070
-----	--	--------------

La	New Orleans, Ind. Instr. Works, 3305 Tchoupitoulas	504-895-5621
----	--	--------------

Md	Timonium, E.I.L. Instrs., 1830 York Rd.	301-252-1260
----	---	--------------

Mass	Burlington, Mancib Co., Middlesex Tpk.	617-272-9450
------	--	--------------

Mich	Royal Oak, Stillings Instr., 4850 Leafdale Rd.	313-549-6030
------	--	--------------

Minn	Minneapolis, Control Assemblies Co., 5735 Lindsey St.	612-544-3364
------	---	--------------

NY	Buffalo, Trott Elctns., 932 Hertel Ave.	716-876-0880
----	---	--------------

NY	Rockville Center, A & M Instrs., 5 Nassau St.	516-678-6960
----	---	--------------

Ohio	Cleveland, Weschler Electric, 4250 W. 130th St.	216-251-4609
------	---	--------------

Pa	Pittsburgh, Cameradio Co., 2801 Liberty Ave.	412-288-2600
----	--	--------------

Ri	E. Greenwich, E.I.L. Instrs., 99 French Town Rd.	401-885-1773
----	--	--------------

Tex	Houston, Meters & Instr., 6502 Gulf Frwy.	713-644-1631
-----	---	--------------

Wash	Seattle, Eicher Richards, 2727 N.E. Blakeley	206-523-7888
------	--	--------------

INTERNATIONAL NICKEL CO., Huntington Alloy Prods. Div., Huntington, W.Va., 25720

INTERNATIONAL POWER MACHINES CORP., 3328 Executive Blvd., Box 724, Mesquite, Tex., 75149, Tel: 214-288-7501, Telex: 73-0992; Empl.: 140

For info on price: F. Perkins; Application info: F. Perkins; Customer service: J. Herr; Delivery info: L. Parks

Products manufactured: Converters, Inverters, Power Supplies

Local Sales Offices & Reps.

Ark	North Little Rock, Kennedy Engrg. Co.	501-753-6306
Cal	Emeryville, Independent Engrg., Inc.	714-995-5959
Cal	San Diego, Independent Engrg.	714-995-5959
Colo	Denver, Benchmark Sys., Inc.	303-399-1062
DC	Washington, Instrucom, Inc.	202-223-1759
Fla	Orlando, R.J.C. Assocs.	305-894-7371
Ga	Atlanta, Forward Prods. Co.	404-255-1016
Haw	Honolulu, Island Rep., Inc.	808-531-4011
Ill	Schaumburg, Tech-Sys.	312-894-0015
NJ	Upper Montclair, D. Cunningham	201-783-4647
NY	Rochester, PCI Assocs.	716-334-6793
Ohio	Cleveland, P.E. Lax Co.	216-226-8815
Okla	Oklahoma City, Kennedy Engrg. Co.	405-524-6048
Okla	Tulsa, Kennedy Engrg. Co.	918-835-9975
Ore	Portland, Ingalls Engrg. Co.	503-232-7487
Pa	Croydon, J. LeSaint	215-788-8212
Pa	Pittsburgh, P.E. Lax Co.	412-833-5477
Tex	Houston, L.P. Spencer & Assocs.	713-337-2751
Utah	Salt Lake City, Benchmark Sys.	801-487-4955
Va	Danville, Instrucom, Inc.	804-799-1661

INTERNATIONAL POWER MACHIN cont'd

Advertisement

Manufacturer of 'Computer Grade' Uninterruptible Power Systems (UPS) providing 50 Hz, 60 Hz, & 415 Hz power in the range from 10 KVA to 300 KVA. Equipment is compatible with IBM system/370 computers.

INT'L PRODS. INC., Box 405, Atchison, Kans., 66002, Tel: 913-EM 7-1934; Empl.: 3; Minimum order: \$25

For info on price: L. Poos; Application info: T. Moorhead; Customer service: L. Poos; Delivery info: L. Poos

Products manufactured: Lamp Adapters, Lamps, Lights

Local Sales Offices & Reps.

Ariz	Phoenix, Toward Engrg. Assocs.	602-955-3193
Cal	Mountain View, Connolly & Co.	415-967-6988
Cal	Van Nuys, C.H. Mitchell Co.	213-994-9466
Colo	Greeley, Moss Elctns.	303-353-1452
Fla	Melbourne, REPCOM Inc.	305-254-1877
Mass	Belmont, Elctn. Comps. & Svc.	617-484-6680
Mich	Jackson, Norwood Scroggs Co.	517-782-5211
NJ	West Caldwell, Peterson-Rudnick Assocs.	201-CA6-4363
NY	Rochester, Ossmann Comp. Sls. Corp.	716-442-3290
NC	Charlotte, Power Engrg. Co.	704-537-8099
Ohio	Cleveland, Brownie & Assocs.	216-795-7472
Ore	Portland, J. E. Edstrom	503-775-8527
Tex	Houston, M. R. Summers Assocs.	713-524-7800
Wash	Seattle, W.J. Stulgis	206-AT2-7870

INTERNATIONAL RECTIFIER CORP., Semiconductor Div., 233 Kansas St., El Segundo, Cal., 90245, Tel: 213-678-6281, TWX: 910-348-6291; Empl.: 1200 p. 1-1842, 1843

For info on price: F. Angier; Application info: B. Bixby; Customer service: F. Angier; Delivery info: F. Angier

Free literature available: A complete selection of cross references to IR product lines. Also an increasing number of application notes. Write for index.

Products manufactured: Arresters, Electrical Surge, Lightning, Bridges, Cells, Photoconductive, Photoemissive, Photovoltaic, Chargers, Battery, Circuits, Hybrid, Thick Film, Controls/Control Eqpt., Converters, Diodes, Eliminators, Battery, Fuses, Heat Exchangers & Systems, Inverters, Power Drivers, Hybrid (High Current, High Voltage), Power Supplies, Protectors, Readers, Rectifiers, References, D-C Voltage, Regulators, Relays, Sensors, Light, Suppressors, Switches, Thyristors (Includes Silicon Controlled Rectifiers), Transistors, Tubes

Local Sales Offices & Reps.

Alas	Anchorage, H.J. Lang & Assoc.	907-279-5741
Ariz	Phoenix, Sheffer-Kahn Co.	602-258-7893
Cal	El Segundo, Int'l. Rectifier	213-678-2181
Cal	San Diego, Harvey King	714-276-7541
Cal	San Francisco, Thomas-Hartman Assocs.	415-969-0660
Cal	Santa Clara, Thomas-Hartman Assocs.	408-247-1252
Colo	Denver, Parker-Webster	303-770-1972
DC	Washington, Int'l. Rectifier	301-821-0292
Fla	Ft. Lauderdale, Dyne-A-Mark Corp.	305-771-6501
Ill	Des Plaines, Int'l. Rectifier	312-299-7181
Iowa	Cedar Rapids, Seltce Sls. Corp.	319-362-8155
md	Baltimore, Int'l. Rectifier	301-821-0292
Mass	Lexington, Int'l. Rectifier	617-861-1820
Mich	Livonia, Int'l. Rectifier	313-477-3131
Minn	Minneapolis, Int'l. Rectifier	612-920-1200
Mo	Hazelwood, Int'l. Rectifier	314-895-3400
NJ	Palisades Park, Int'l. Rectifier	201-943-4554
NM	Albuquerque, Sheffer-Kahn Co.	505-265-7077
NY	Buffalo, R.W. Mitscher Co.	716-633-7970
NY	New York, Int'l. Rectifier	212-565-0882
NC	Charlotte, Int'l. Rectifier	704-372-9190
Ohio	Cleveland, Int'l. Rectifier	216-261-2135
Ohio	Kettering, Int'l. Rectifier	513-299-2635
Okla	Tulsa, W. Pat Fralia Co.	918-663-8707
Pa	Abington, Int'l. Rectifier	215-886-0130
Tenn	Shelbyville, R.W. Mitscher Co.	615-684-4549
Tex	Fort Worth, W. Pat Fralia Co.	817-738-2394
Tex	Houston, W. Pat Fralia Co.	713-772-1572
Wash	Bellevue, Vantage Corp.	206-455-3460
Wisc	Brookfield, Int'l. Rectifier	414-784-2480
FOR:	Can., Dorval, Que., Int'l. Rectifier Can. Ltd.	514-631-4969

FOR: Can., Scarborough, Ont., Int'l. Rectifier Can. Ltd.
416-755-7793

Local Distributors

Ala Huntsville, Hall-Mark Elctns., 4739 Commercial Dr. 205-837-8700

Ala Huntsville, Powell/Gulf Elctns., 803 Aster Dr. 205-539-2731

Ariz Phoenix, Kierulff Elctns., 2633 E. Buckeye Rd. 602-273-7331

Cal Costa Mesa, Schweber Elctns., 3000 Red Hill Ave. 714-556-3880

Cal Inglewood, Newark Elctns., 4747 Century Blvd. 213-678-0441

Cal Los Angeles, Kierulff Elctns., 2585 Commerce Way 213-685-5511

Cal Los Angeles, RPS Elctns., 1501 S. Hill St. 213-748-1271

Cal Mountain View, Abacus, 1065 Terra Bella Ave. 415-961-1500

Cal Oakland, Brill Elctns., 610 E. 10th St. 415-834-5888

Cal Palo Alto, Kierulff Elctns., 3969 E. Bayshore Rd. 415-968-6292

Cal San Diego, Intermark Elctns., 7354 Convoy Court 714-279-5200

Cal San Diego, Kierulff Elctns., 8797 Balboa Ave. 714-278-2112

Cal San Diego, Liberty Elctns., 8248 Mercury Ct. 714-565-9171

Cal Santa Ana, Intermark Elctns., 2920 W. Warner 714-540-1322

Cal Sunnyvale, Intermark Elctns., 1020 Stewart Dr. 408-738-1111

Colo Denver, Intermark Elctns., 2600 W. Second Ave. 303-936-8284

Colo Denver, Kierulff Elctns., 10890 E. 47th Ave. 303-371-6500

Conn Danbury, Schweber Elctns., Finance Dr., Commerce Ind'l. Pk. 203-792-3500

Fla Ft. Lauderdale, Hall-Mark Elctns., 1302 W. McNab 305-971-9280

Fla Hollywood, Schweber Elctns., 284 N. 28th Terrace 305-927-0511

Fla Miami, Powell Elctns., 1740 N.W. 69th Ave. 305-887-8761

Fla Orlando, Hall-Mark Elctns., 7233 Lake Ellenor Dr. 305-855-4020

Fla Orlando, Powell Elctns., 2032 Tomridge Way 305-859-1450

Ga Atlanta, Schweber Elctns., 4126 Pleasantdale Rd. 404-449-9170

Ill Chicago, Allied Elctns., 2400 W. Lake St. 312-829-9100

Ill Chicago, Newark Elctns., 500 N. Pulaski Rd. 312-638-4411

Ill Elk Grove Village, Hall-Mark Elctns., 180 Crossen St. 312-437-8800

Ill Elk Grove Village, Schweber Elctns., 1380 Jarvis Ave. 312-593-2740

Ill Skokie, Bell Inds., 7701 North Austin Ave. 312-965-7500

Ind Fort Wayne, Fort Wayne Elctns., 3606 Maumee Ave. 219-423-3422

Ind Indianapolis, Graham Elctns., 133 S. Pennsylvania 317-634-8202

Iowa Cedar Rapids, Schweber Elctns., Executive Plaza, Suite 302, 4403 First Ave., S.E. 319-319-366-0774

Kans Lenexa, Hall-Mark Elctns., 9006 Rosehill Rd. 913-888-4747

Md Baltimore, Hall-Mark Elctns., 6660 Security Blvd. 301-265-8500

Md Gaithersburg, Kierulff Elctns., 16021 Industrial Dr. 301-948-0250

Md Rockville, Schweber Elctns., 5640 Fisher Ave. 301-881-2970

Mass Waltham, Schweber Elctns., 213 Third Ave. 617-890-8484

Mass Watertown, Sterling Elctns., 51 Spring St. 617-926-9720

Mich Troy, Schweber Elctns., 86 Executive Dr. 313-583-9242

Minn Edina, Schweber Elctns., 7015 Washington Ave. 612-941-5280

Minn Minneapolis, Hall-Mark Elctns., 4555 West 77th St. 612-925-2944

Minn Minneapolis, Stark Elctns., 112 Third Ave. N. 612-333-3361

Mo Earth City, Hall-Mark Elctns., 13789 Rider Trail 314-291-5350

Mo Saint Louis, Olive Ind'l. Elctns., 6662 Olive Blvd. 314-863-7800

NJ Clifton, Wilshire Elctns. (N.J.), 312 Clifton Ave. 201-365-2600

NJ Somerset, Schweber Elctns., 43 Belmont Dr. 201-469-8008

NY Buffalo, Summit Dists., 916 Main St. 716-884-3450

NY Farmingdale, Arrow Elctns., 900 Broadhollow Rd., Route 110 516-694-6800

NY Farmingdale, Hall-Mark Elctns., 167 Marine St. 516-293-7500

NY Freeport, Milgray/N.Y., 191 Hanse Ave. 516-546-6000

NY Hicksville, L.I., Kierulff Elctns., 49 Bethpage Rd. 516-433-5530

NY Rochester, Rochester Radio Supply, 140 W. Main St. 716-454-6300

NY Rochester, Schweber Elctns., 2 Town Line Cir. 716-328-4180

NY Westbury, Schweber Elctns., Jericho Turnpike 516-334-7474

NC Raleigh, Hall-Mark Elctns., 3000 Industrial Dr. 919-832-4465

NC Raleigh, Schweber Elctns., 10 Sunnybrook Rd. 919-832-8881

Ohio Beachwood, Schweber Elctns., 23880 Commerce Park Rd. 216-464-2970

Ohio Cleveland, Arrow Elctns., 23500 Mercantile Rd. 216-464-2000

Ohio Dayton, Esco Elctns., 221 Crane St. 513-226-1133

Okla Tulsa, Hall-Mark Elctns., 4846 S. 83rd E. Ave. 918-835-8458

Okla Tulsa, T.I. Supply, Box T, Admiral Station 918-437-4555

Ore Portland, United Radio Supply, 123 N.E. 7th 503-233-7151

Pa Erie, Mace Elctns., 2631 W. 8th St. 814-838-3511

Pa Huntington Valley, Hall-Mark Elctns., 458 Pike Rd. 215-355-7300

Pa Philadelphia, Almo Elctns., Roosevelt Blvd. at Blue Grass Rd. 215-676-6000

Pa Philadelphia, Powell Elctns., South Island Rd. 215-365-1900

Pa Pittsburgh, Cameradio Co., 2801 Liberty Ave. 412-288-2606

Tenn Knoxville, Industrial Elctns., Box 9120 615-573-7135

Tex Austin, Schweber Elctns., 2628 Longhorn Blvd. 512-837-2890

Tex Dallas, Hall-Mark Elctns., 9333 Forest 214-231-6111

Tex Dallas, Kierulff Elctns., 2750 Northaven 214-243-4521

Tex Dallas, Schweber Elctns., 14177 Proton Rd. 214-233-5866

Tex Dallas, T.I. Supply, 6000 Denton Dr. 214-238-6974

Tex Houston, Hall-Mark Elctns., 8000 West Glen 713-781-6100

Tex Houston, Harrison Equip., 1616 McGowen 713-224-9131

Tex Houston, Schweber Elctns., 7420 Harwin Dr. 713-784-3600

Tex Houston, T.I. Supply, 3939 Ann Arbor Dr. 713-785-4800

Utah Salt Lake City, Intermark Elctns., 63 E. Stratford 801-486-3411

Wash Seattle, Almac-Stroum Elec., 5811 6th Ave. S. 206-763-2300

Wash Seattle, Intermark Elctns., 621 S. Michigan St. 206-767-3160

WVa Charleston, McJunkin Corp., 312 Mac Corkle Ave., S.E. 304-348-4930

wisc Milwaukee, Marsh Elctns., 6047 W. Beloit Rd. 414-545-6500

wisc Milwaukee, Hall-Mark Elctns., 11925 W. Ripley Ave. 414-476-1270

INTERNATIONAL SENSOR SYSTEMS, INC., Aurora Industrial Pk., Box 345, Aurora, Neb., 68818, Tel: 402-694-6111; Empl.: 18; Minimum order: \$100

Customer service: Sls. Dept.

Free literature available: Facilities and Capabilities brochure, Descriptions of facilities with photographs and a flow chart of typical Hybrid thick film system.

Products manufactured: Circuits, Hybrid, Thick Film, Networks, Resistor, Hardware

Local Sales Offices & Reps.

Cal Millbrae, Ashby Assocs. of N. Cal. 415-692-4442

Cal Studio City, Shortronics 213-789-0418

Kans Mission, Mid America Elctns. 913-236-4800

NY Endicott, Tech-Mark Inc. 607-748-7473

Ohio Dayton, Ashby Assocs. 513-252-5627

INTERSIL, INC., 10900 N. Tantau Ave., Cupertino, Cal., 95014, Tel: 408-996-5000, TWX: 910-338-0228; FSC No: 32293; Empl.: 750; Minimum order: \$50

Customer service: Customer Service 408-996-5257

Free literature available: Information on Low Power CMOS Monolithic Watch and Clock circuits. Devices Available for both Analog and Digital Application.

Products manufactured: Amplifiers, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Integrated Circuit Devices, Transistors

Local Sales Offices & Reps.

Ariz Phoenix, Shefler-Kahn Co. 602-258-7893

Cal Carson, Intersil Inc. 213-532-3544

Cal Cupertino, Intersil, Inc. 408-257-5450

Cal San Diego, Intersil Inc. 714-278-6053

Colo Littleton, Simpson Assocs. 303-794-8381

Fla Casselberry, E.I.R. Inc. 305-830-9600

Ill Franklin Park, Dekotech, Inc. 312-455-5100

Ill Palos Heights, Intersil, Inc. 312-371-1440

Ind Ft. Wayne, Delesa Sls. 219-483-9537

Ind Indianapolis, Delesa Sls. 317-257-4683

Iowa Cedar Rapids, Elctn. Sls. 319-364-4342

Kans Shawnee, J.F. Guernsey 913-631-2414

Md Glen Bernie, New Era Sls. Inc. 301-761-0085

Mass Burlington, Intersil, Inc. 617-273-2055

Mich Grand Rapids, J.L. Montgomery Assoc., Ltd. 616-774-9308

Mich Southfield, J.L. Montgomery Assoc. Ltd. 313-358-2616

Minn Minneapolis, Intersil, Inc. 612-925-1844

Mo St. Louis, Enso-Rep Sls. 314-567-3935

NJ Cherry Hill, Barrett Assocs. 609-429-1551

NJ Englewood Cliffs, Intersil, Inc. 201-567-5585

NJ Irvington, MGI 201-399-4350

NM Albuquerque, Shefler-Kahn Co. 505-265-7077

NY Ithaca, Bob Dean, Inc. 607-272-2187

NY Syracuse, Intersil, Inc. 315-463-3368

Ohio Cleveland, K.W. Elctns. Sls. 216-831-8292

Ohio Dayton, K.W. Elctns. Sls. 513-890-2150

Ore Beaverton, ES/Chase Co. 503-649-6177

Pa Allison Park, K.W. Elctns. Sls. 412-487-4300

Tex Dallas, Intersil Inc. 214-233-0611

Tex Houston, Vista Engr. Assocs. 713-661-0119

Tex Richardson, Vista Engr. Assocs. 214-235-4547

Utah Salt Lake City, Simpson Assocs. 801-486-3731

Va Falls Church, Beacon North, Inc. 703-534-1673

Wash Edmonds, ES/Chase Co. 206-774-3586

INTERSTATE ELECTRONICS, Box 1117, Anaheim, Cal., 92803, Tel: 714-772-2811, TWX: 910-591-1197; Empl.: 1000

Customer service: J. Norburg

Free literature available: Interstate Shortform Catalog, 20 MHz Pulse Generators and 3MHz, 11MHz, and 20 MHz function generators Pulse Generator Catalog, 8-page catalog illustrates how applications requirements are matched with series 20 Performance Capabilities.

Products manufactured: Generators

Local Sales Offices & Reps.

Ariz Scottsdale, Meas. Conslts. 602-994-9519

Cal Costa Mesa, Meas. Assocs. 714-540-7160

Cal Palo Alto, General Radio Co. 415-948-8233

Colo Boulder, Meas. Conslts. 303-449-5294

Conn Hamden, J & J Assoc. 203-624-7800

Ga Atlanta, General Radio Co. 404-394-5380

Ill Elk Grove Village, L.F. Green & Assocs. 312-593-0282

Ind Indianapolis, L.F. Green & Assocs. 317-293-9827

Kans Olathe, Tech. Reps. Inc. 913-782-1177

Md Silver Spring, Sel-Tronics, Inc. 301-589-3391

Mass Burlington, J & J Assocs. 617-272-2606

Mich Royal Oak, Group 10 313-549-3910

Minn Minneapolis, L.F. Green Assocs. 612-781-1661

Mo Hazelwood, Tech. Reps., Inc. 314-731-5200

NJ Fairfield, KLS Assocs., Inc. 201-227-2900

NM Albuquerque, Meas. Conslts. 505-265-6471

NM Las Cruces, Meas. Conslts. 505-526-2491

NY Syracuse, Labtronics, Inc. 315-454-9314

Ohio Cleveland, Group Ten 216-486-2800

Ohio Dayton, Group 10 513-277-6531

Pa Melrose Park, R. Meyers Assoc. 215-224-1663

Tex Houston, Scientific Sls. Co. 713-666-5318

Tex Richardson, Scientific Sls. Co. 214-231-6541

Utah Murray, Meas. Conslts. 801-268-3181

INTERSWITCH, 770 Airport Blvd., Burlingame, Cal., 94010, Tel: 415-347-8217, TWX: 910-374-2353; Empl.: 30; Minimum order: \$50

Free literature available: Brochures On: Thumbwheel Switches Program Matrix Boards Program Data Modules

Products manufactured: Boards, Programming, Connectors, Matrices, Computer, Modules, Logic, Encapsulated, Pins, Readers, Switches

Local Sales Offices & Reps.

Ariz Phoenix, Bestronics 602-248-7020

Ark Little Rock, J.Y. Schoonmaker 501-375-2168
 Cal Burlingame, W.J. Purdy Co. 415-347-7701
 Cal Los Angeles, Black Ekizian Strong, Inc. 213-870-9191
 Cal San Diego, Bestronics 714-278-2150
 Colo Denver, W.J. Purdy Co. 303-777-1411
 Conn Meriden, P.R. Sturgeon Co. 203-237-1112
 Fla Orlando, Cartwright & Bean 305-422-4531
 Fla Plantation, Cartwright & Bean 305-791-3989
 Ga Atlanta, Cartwright & Bean 404-255-5262
 Ill Hinsdale, Hill-Gray 312-325-4810
 Ind Indianapolis, Sukup & Cox 317-253-5501
 Mass Babson Park, P. Sturgeon Co. 617-237-3506
 Mich Ferndale, Hilltronics Inc. 313-398-5556
 Minn Minneapolis, HMR, Inc. 612-920-8200
 Miss Jackson, Cartwright & Bean 601-981-1368
 NJ Bergenfield, H. Gray Assoc. 201-384-3643
 NM Albuquerque, W. J. Purdy Co. 505-266-7959
 NY Syracuse, Mar-Conn Assocs. 315-437-2843
 NC Charlotte, Cartwright & Bean 704-333-6457
 NC Raleigh, Cartwright & Bean Co. 919-832-7128
 Ohio Dayton, Bear Mktg. 513-299-3566
 Ohio Richfield, Bear Mktg. 216-659-3131
 Okla Tulsa, J.Y. Schoonmaker Co. 918-936-1423
 Pa Enon Valley, NEBCO Assoc. 216-457-2333
 Pa Havertown, Liberi Sls. 215-789-8150
 Tenn Knoxville, Cartwright & Bean 615-693-7450
 Tenn Memphis, Cartwright & Bean 901-276-4442
 Tex Dallas, J. Schoonmaker 214-357-8481
 Tex Houston, J.Y. Schoonmaker 713-926-9510
 FOR Can., Willowdale, Ont., A. C. Simmonds & Sons 416-491-1010

INTRONICS INC., 57 Chapel St., Newton, Mass., 02158, Tel: 617-332-7350, TWX: 710-335-6835; Empl: 50
 Products manufactured: Amplifiers, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Converters, Demodulators, Dividers, Integrated Circuit Devices, Multipliers, Power Supplies, Yokes
 Local Sales Offices & Reps.
 Cal Chatsworth, Boyle Assocs. 213-861-9223
 Cal San Carlos, Courier Data 213-277-8884
 Conn Hamden, Scientific Devs.-Conn., Inc. 203-248-9361
 Fla Clearwater, Southeastern Comp. Sls. 703-522-6666
 Mich Dearborn Heights, Mitronics Sls. Co. 313-565-6330
 Mo St. Louis, Enscop-Rep., Inc. 314-567-3935
 NJ Fort Lee, Tecnimat 201-461-8666
 NY Rochester, Scientific Devs.-N.Y. Inc. 716-334-2445
 Ohio Wickliffe, Walter J. Brauer & Assocs. 216-943-0601
 Pa Berwyn, Tucker Assocs. 215-644-0142
 Tex Richardson, Scientific Sls. Co. 214-231-6541
 Va Arlington, H.J. Hefferman Co. 703-522-6666

INVINCIBLE GEAR CO., 14938 Telegraph Rd., Detroit, Mich., 48239, Tel: 313-533-7524; Empl: 25
 Customer service: L. J. Smith
 Free literature available: Description of gear types & size capacity & explanation of method employed for producing precision gears.
 Products manufactured: Gears & Gear Mechanisms (Precision)

IPT CORP., 1140 W. Evelyn Ave., Sunnyvale, Cal., 94086, Tel: 408-732-7550, TWX: 910-379-6472; Empl: 35
 Products manufactured: Machines/Machinery, Production, Microcircuit Production Equip., Testers
 Local Sales Offices & Reps.
 Colo Boulder, Mile High Elctns. 303-444-5615
 Fla Pompano Beach, Semquip 305-772-3002
 Ill Chicago, L.F. Green & Assocs. 312-593-0282
 Ind Indianapolis, L.F. Green Assocs. 317-293-9827
 Md Gaithersburg, Wright Co. 301-948-5151
 Minn Minneapolis, L.F. Green & Assocs. 612-781-1611
 NJ Wayne, K & J Assocs. 201-694-3334
 NY E. Setauket, K & J Assocs. 516-751-8686
 NY Rochester, K & J Assocs. 716-334-9487

IRCON INC., 7555 N. Linder Ave., Skokie, Ill., 60076, Tel: 312-967-5151, Telex: 72-4412; Empl: 60
 Products manufactured: Bridges, Controls/Control Eqpt., Indicators, Meters, Pyrometers
 Local Sales Offices & Reps.
 Ala Birmingham, Spader & Assoc. 205-879-1366
 Ariz Scottsdale, J.T. Aldrich Co. 602-945-8598
 Ark Little Rock, Electra-Tech Midsouth 501-562-4090
 Cal Costa Mesa, Robinson Tech. Assoc. 714-557-1622

Cal San Diego, R. Brainard Co. 714-274-1333
 Cal San Mateo, Ircon, Inc. 415-348-0122
 Colo Lakewood, Intermountain Instrs. 303-237-0444
 Ga Woodstock, Spader & Assoc. 404-428-0366
 Ill Libertyville, J. Miller Co. 312-362-0038
 Ind Indianapolis, Electro Engrg. & Sls. 317-547-5273
 La New Orleans, Mid-South Sls. 504-822-3030
 La Shreveport, DDJ Sls. 318-865-2393
 Mass Framingham, J.M. Lancaster Co. 617-873-8893
 Mass Pittsfield, Ircon, Inc. 413-445-4016
 Mich Berkley, G. Peters Assoc. 313-564-6325
 Minn Minneapolis, Arjay Sls. 612-925-1833
 Mo St. Louis, Arentsen Elctns. 314-434-3605
 NJ Palisades Park, Scientific Devices-East 201-871-3916
 NY Baldwinville, Alpha Co. 315-622-3993
 NY Williamsburg, Alpha Co. 716-633-1342
 NC Matthews, Datatech, Inc. 704-847-4464
 Ohio Cincinnati, Schlumberger Assoc. 513-522-8340
 Ohio Grafton, A. Risser Co. 216-458-5091
 Okla Tulsa, P. King 918-836-2501
 Pa King of Prussia, Reinbrecht Assoc. 215-265-6180
 Pa Pittsburgh, Weiss Instrs. 412-371-3020
 Tex Houston, JD Inds. 713-468-8087
 Wash Bellevue, Kakar Corp. 206-454-1318
 Wisc Milwaukee, T.R. Bickler 414-453-3772

IRD MECHANALYSIS, INC., 6150 Huntley Rd., Columbus, Ohio, 43229, Tel: 614-885-5376, Telex: 24-5318; Empl: 250
 Customer service: E. Raub
 Products manufactured: Accelerometers, Analyzers, Calibrators, Meters, Services, Assembly, Production & Test, Shields, Testers, Transducers
 Local Sales Offices & Reps.
 Cal Industry 213-968-3219
 Cal Lafayette 415-781-5529
 Conn Fairfield 203-255-0893
 Ga Atlanta 404-237-4875
 Ill Chicago 312-726-2969
 La Baton Rouge 504-272-0355
 Mich Farmington 313-477-2066
 Mo St. Louis 314-644-4691
 NJ Springfield 201-379-1132
 NY New York City 212-687-6754
 NY Williamsburg 716-632-6699
 Pa Rosemont 215-477-0922
 Pa Verona 412-795-1606
 Tex Houston 713-645-1846
 Tex Richardson 214-352-8312
 FOR: Can., Calgary, Alberta 403-264-2568
 FOR: Can., Montreal, Que. 514-697-9992
 FOR: Can., Stoney Creek, Ontario 416-662-7577

IRISH MAGNETIC RECORDING TAPE, 270-78 Newtown Rd., Plainview, N.Y., 11803, Tel: 516-293-5582, Telex: 96-7880; Empl: 17; Minimum order: \$50
 Customer service: G. Krug
 Products manufactured: Tapes, Recording, Magnetic (All Types)
 Local Sales Offices & Reps.
 Cal San Francisco, Meyer, Ross & Fleming 415-285-8880
 Cal Van Nuys, Mike Roth Sls. of Cal. 213-989-3738
 Colo Aurora, A-E-S 303-366-0208
 Fla Longwood, Riddle-Williams Sls. & Mktg. Co. 305-862-8722
 Ga Jonesboro, Stanley K. Wallace Assoc. 407-471-6297
 Ill La Grange, Ed Severson & Assoc. 312-246-4883
 Ind Indianapolis, C. Scheffler 317-253-6337
 La Metairie, Jack F. McKinney Sls. Co. 504-887-1723
 Mass N. Scituate, W. A. Hendrickson Co. 617-545-0652
 Mich Southfield, Robert Milsk Co. 313-354-3310
 Minn St. Paul, Skor 612-645-6461
 NY Flushing, Bettan Sls. 212-591-7600
 NY Liverpool, Lewis & Dunnigan Co. 315-622-2133
 Ohio Cleveland, Spectra Sls. Co. 216-561-8900
 Okla Tulsa, Jack F. McKinney Sls. Co. 918-742-6791
 Tex Dallas, Jack F. McKinney Sls. Co. 214-631-9450
 EXP: Plainview, N.Y., Morhan Exporting Corp. 516-293-5582

ISC MAGNETICS DIV., Instr. Sys. Corp., 35 S. Service Rd., Plainview, N.Y., 11803, Tel: 516-293-0115, TWX: 510-226-6983; Empl: 6
 Customer service: M. Schwartz
 Products manufactured: Calibrators, Dividers, Generators, Indicators, Magnetizers, Magnetometers, Magnetoresistors, Hall, Magnets, Meters, Monitors, Multipliers, Probes, Resistors, Switches, Thermistors, Transducers

TELEPHONICS, DIV., Instr. Sys. Corp., 770 Park Ave., Huntington, N.Y., 11743, Tel: 516-549-6000, TWX: 510-226-6983; Empl: 525
 For info on price: C. Hamilton 516-549-6240; Application info: C. Hamilton 516-549-6240; Customer service: T. Reith 516-549-6038; Delivery info: T. Reith 516-549-6038
 Products manufactured: Comm. Systems, Handsets, Chestsets, Headphones, Headsets, Etc., Microphones, All Kinds

ISOCHEM RESINS CO., 99 Cook St., Lincoln, R.I., 02865
 Products manufactured: Adhesives (All Types), Chemicals, Cleaners & Solvents, Cleaners, Ultrasonic, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Insulators & Insulation, Materials, Self-Lubricating, Paints, Plastic Raw Materials, Liquids, Pellets, Powders, Resins

ITE IMPERIAL, Rte. 309, Norristown Rd., Springhouse, Pa., 19477

ITEK CORP. MEAS. SYS. DIV., Christina St., Newton, Mass., 02161, Tel: 617-969-7300, TWX: 710-335-6783; Empl: 100; Minimum order: \$100
 Customer service: L. J. Kelly

Products manufactured: Counters, Encoders, Indicators

Local Sales Offices & Reps.
 Cal Los Altos, Wright Engrg. 415-941-4405
 Cal Los Angeles, Measurement Sys. Div. 213-641-8251
 Fla Orlando, Measurement Sys. Div. 305-896-1455
 Ill Des Plaines, Marsland Assocs. Inc. 312-298-2620
 Ind Indianapolis, Marsland Assocs. Inc. 317-924-3568
 Mich Detroit, Electro Sls. Assocs. 313-521-1500
 Minn Minneapolis, Marsland Assocs. Inc. 612-545-4481
 Mo Florissant, Marsland Assocs. Inc. 314-278-6949
 NJ Union, Measurement Sys. Div. 201-964-3000
 Ohio Cleveland, Electro Sls. Assocs. Inc. 216-261-7670
 Pa Pittsburgh, Electro Sls. Assocs. Inc. 412-371-8497
 Tex Grand Prairie, Telemetry Sls. Corp. 214-262-2649

ITHACO, INC., 735 W. Clinton St., Ithaca, N.Y., 14850, Tel: 607-272-7640, TWX: 510-255-9307; Empl: 120; Minimum order: \$200 p. 1+8,9,568,739
 For info on price: M. Jolly; Application info: J. Hanson; Customer service: T. Hoff; Delivery info: M. Jolly

Free literature available: Preamp Specification Brochures: Discussion of Amplifier Noise, Filters Discussion of Filters and Noise, Model 3170 Applications Information, 430/450 Amplifiers Plus Discussion of Noise Application Notes:
 Heterodyning Lock-In Amplifier Variable Electronic Filters Use of Filters to Measure Noise

Products manufactured: Amplifiers, Attenuators, Choppers, Data Acquisition & Reduction Systems, Filters, Hydrophones & Accessories, Light Choppers, Meters, Oceanographic Equip. (Electronic), Signal Conditioners & Equipment

Local Sales Offices & Reps.
 Ala Huntsville, W.A. Brown Instr., Inc. 205-539-4411
 Cal Cupertino, T. Louis Snitzer Co. 408-257-8333
 Cal Del Mar, T. Louis Snitzer Co. 714-454-2191
 Cal Los Angeles, T. Louis Snitzer Co. 213-836-6170
 Conn Easton, Jarrold Corp. 203-255-4133
 Fla Fort Lauderdale, W.A. Brown Instrs., Inc. 305-776-4800
 Fla Orlando, W.A. Brown Instrs., Inc. 305-425-5505
 Ga Atlanta, W.A. Brown Instrs., Inc. 404-939-1674
 Ill Skokie, Maurer Co. 312-677-4771
 La Gretna, W.A. Brown Instrs., Inc. 504-366-5766
 Mass Waltham, Jarrold Corp. 617-891-8045
 Mich Royal Oak, Meas. Instrs., Inc. 313-352-2144
 Minn Minneapolis, Heimann Co. 612-861-6051
 NM Albuquerque, Grady Moore Assocs. 505-292-3322
 NY Northport, Lindgren Assocs. 516-261-7937
 NC Research Triangle Park, W.A. Brown Instrs., Inc. 919-489-1546
 Ohio Columbus, Measurement Instrs., Inc. 614-488-9751
 Tenn Knoxville, W.A. Brown Instr. 615-584-2614
 Tex Dallas, Southwestern Eng. & Equip. Co. 214-692-8097

Va Norfolk, Scientific Devices-D.C., Inc. 804-499-8133
 Va Springfield, Scientific Devices-D.C., Inc. 703-451-6500
 Wash Bellevue, Scientific Devices-N.W. 206-454-0900

ITI ELECTRONICS, INC., 369 Lexington Ave., Clifton, N.J., 07015, Tel: 201-546-3900; Empl.: 50; Minimum order: \$10

For info on price: E. G. Nichols; Application info: E. G. Nichols; Customer service: M. DeBlik; Delivery info: M. DeBlik

Products manufactured: Amplifiers, Attenuators, Bridges, Cable Assemblies & Harnesses, Coils Including Assemblies & Forms, Comm. Systems, Converters, Detectors, Equalizers, Filters, Panels, Power Supplies, Services, Assembly, Production & Test, Transformers

C. ITOH ELECTRONICS, INC., 280 Park Ave., New York, N.Y., 10017, Tel: 212-953-5452; Empl.: 100; Minimum order: \$100 p. 1-176
 Customer service: H. Weck

Free literature available: We have digital printers, alpha numeric, segment impact types.

Products manufactured: Printers

Local Sales Offices & Reps.

Ala	Huntsville, Technical Assocs.	205-881-8494
Ariz	Scottsdale, BFA Corp.	602-946-4215
Cal	Marina Del Rey, Delta Mutual Sls.	213-823-0643
Cal	Denver, BFA Corp.	303-744-3301
Fla	Orlando, Technical Assocs.	305-894-7531
Ill	Des Plaines, Coombs Assocs.	312-298-4830
Iowa	Cedar Rapids, Tech. Reps.	319-363-2489
Kans	Olathe, Tech. Reps.	913-782-1177
La	Shreveport, IBL Engrg. & Sls.	617-256-8731
Mass	Chelmsford, S & S elctms.	612-941-1120
Minn	Hopkins, Grayden & Flemmer	314-731-5200
Mo	Hazelwood, Technical Reps.	505-523-0601
NM	Las Cruces, BFA Corp.	914-698-4411
NY	Mamaroneck, Cane Tech. Sls.	716-328-5240
NY	Rochester, L-Mar Assocs.	216-842-2737
Ohio	Cleveland, Components Inc.	405-843-9434
Okla	Oklahoma City, IBL Engrg. & Sls.	215-279-8146
Pa	Norristown, Data Engrg. Co.	803-579-2904
SC	Spartanburg, Technical Assocs.	214-363-2921
Tex	Dallas, IBL Engrg. & Sls.	801-466-6522
Utah	Salt Lake City, BFA Corp.	206-763-2755
Wash	Seattle, R. S. Drake Assocs.	

Local Distributors

Cal Burlingame, Itronics Lab, 381 Beach Rd.

ITT CANNON ELECTRIC, 666 E. Dyer Rd., Santa Ana, Cal., 92702, Tel: 714-557-4700, TWX: 910-595-1131; FSC No: 71468; QPL No: Multiple; Empl.: 1700; Minimum order: \$50 p. 2-687-693

Customer service: J. Tison

Free literature available: Connector Selection Guide.

Products manufactured: Cable Assemblies & Harnesses, Cable, CATV Systems & Equipment, Connectors, Sockets, Tools, Wire Strippers

Local Sales Offices & Reps.

Ala	Huntsville, Brandel-Stephens & Co.	205-883-0445
Ariz	Phoenix, ITT Cannon Elec.	602-273-0755
Cal	Los Altos, Recht Assocs.	415-941-0336
Cal	San Marcos, ITT Cannon Elec.	714-743-4554
Cal	Santa Ana, ITT Cannon Elec.	714-557-4700
Colo	Englewood, ITT Cannon Elec.	303-770-1631
Conn	Tolland, ITT Cannon Elec.	203-872-2119
Fla	Deerfield Beach, Brandel-Stephens & Co.	305-427-8558
Fla	Orlando, Brandel-Stephens & Co.	305-425-3202
Ga	Atlanta, Brandel-Stephens & Co.	404-261-7579
Ill	Des Plaines, ITT Cannon Elec.	312-297-3150
Ind	Muncie, ITT Cannon Elec.	317-257-7879
Kans	Leawood, Thunderbird Tech. Sls. & Svcs., Inc.	913-642-7220
Kans	Wichita, Thunderbird Tech. Sls. & Svcs.	316-684-3941
Mass	Swampscott, ITT Cannon Elec.	617-729-8950
Mich	Detroit, ITT Cannon Elec.	313-534-0360
Minn	Minneapolis, ITT Cannon Elec.	612-854-1973
Mo	St. Louis, Thunderbird Tech. Sls. & Svcs., Inc.	314-567-6488
NY	Dewitt, Tri-Tech Elctms., Inc.	315-446-2881
NY	E. Rochester, Tri Tech Elctms.	716-381-2722
NY	Elmsford, ITT Cannon Elec.	
NY	Larchmont, Tri Tech Elctms.	914-834-4423
Ohio	Bedford, ITT Cannon Elec.	216-248-8800
Ohio	Kettering, ITT Cannon Elec.	513-434-8181

Pa	Feasterville, Professional Svc. Assocs.	215-355-6244
Pa	Fort Washington, ITT Cannon Elec.	215-646-2801
Tex	Dallas, ITT Cannon Elec.	214-661-0302
Tex	Houston, ITT Cannon Elec.	713-721-3999
Va	Alexandria, ITT Cannon Elec.	703-370-5733
Va	Roanoke, ITT Cannon Elec.	703-362-0749
Wash	Bellevue, ITT Cannon Elec.	206-454-3903
EXP	Santa Ana, Cal., ITT Cannon Elec.	714-557-4700
FOR	Can., Montreal, Que., ITT Cannon Elec. Can.	514-336-7660
FOR	Can., North Vancouver, B.C., Arwin Tech. Sls.	604-980-4346
FOR	Can., Whitby, Ont., ITT Cannon Elec.	416-668-8881

ITT COMPS. GRP., Electro Mechanical Comps., 1551 Osgood St., N. Andover, Mass., 01845, Tel: 617-688-1881

Products manufactured: Motors, Relays, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Rep. Inc.	205-881-9270
Cal	Mountain View, Nor-Cal	415-961-8121
Colo	Lakewood, Tri-Tronix	303-237-0774
Conn	Hamden, Impact Sales	203-281-1331
Fla	Indian Rock Beach, Tech-Rep Assocs.	813-595-2834
Ga	Tucker, Rep. Inc.	404-938-4358
Ill	Hinsdale, Hill-Gray Assocs.	312-325-4810
Iowa	Cedar Rapids, Reid Assocs.	319-362-6302
Kans	Wichita, M.E. Bettis Co.	316-685-7441
Mass	Waltham, Impact Sales	617-893-2850
Mich	Warren, DEM Elctms.	313-755-6660
Minn	Minneapolis, S* Comps. Sls.	612-544-3022
NM	Albuquerque, Tri-Tronix	505-265-0172
NY	Syracuse, NYCOM	315-437-8343
NY	Valley Cottage, LRC Assocs.	914-634-7973
NC	Raleigh, Candor Co.	919-876-4999
Ohio	Cincinnati, Giesting Assocs.	513-931-0812
SC	Myrtle Beach, Candor Co.	803-448-8361
Tenn	Chattanooga, Candor Co.	615-894-7454
Tex	Dallas, W. Reese Assocs.	214-638-6575
Va	Lynchburg, Candor Co.	804-846-6579
Wash	Bellevue, Vantage Corp.	206-455-3460

ITT ELECTRON TUBE, Box 100, Easton, Pa., 18042, Tel: 215-252-7331; Empl.: 550; Minimum order: \$50

Customer service: W. Jakimer

Products manufactured: Lamps, Tubes

Local Sales Offices & Reps.

Cal	Los Angeles	213-367-5988
Ill	Chicago	312-782-4359
Md	Baltimore	301-467-5733
Mass	Waltham	617-893-5579
NJ	Nutley	201-284-2762

ITT GENERAL CONTROLS, 801 Allen Ave., Glendale, Cal., 91201, Tel: 213-842-6131, TWX: 910-498-2225; Empl.: 1892

For info on price: Prod. Mgr.; Application info: Application Engineer; Customer service: S. Garner; Delivery info: S. Garner

Free literature available: All products are supported by Technical Data sheet and catalog.

Products manufactured: Controls/Control Eqpt., Counters, Printers, Valves, Solenoid

Local Sales Offices & Reps.

Cal	Burlingame	415-342-8391
Cal	Glendale	213-842-6131
Colo	Denver	303-572-8494
Ga	Atlanta	404-451-5895
Ill	Des Plaines	312-299-2237
Kans	Shawnee Mission	913-631-1188
Mich	Birmingham	313-642-1847
Minn	Minneapolis	612-929-6772
Mo	Manchester	314-391-8456
NJ	Teaneck	201-836-2444
NC	Charlotte	704-334-6511
Ohio	Dayton	513-298-8771
Ohio	Fairview Park	216-333-2306
Ohio	Troy	513-335-3583
Okla	Tulsa	918-627-9145
Pa	Folcroft	215-534-2800
Ri	Warwick	401-739-6336
Tenn	Hendersonville	615-824-6838
Tex	Dallas	214-358-2555
Tex	Houston	713-666-4261

ITT GILFILLAN DIV. OF ITT, 7821 Orion Ave., Van Nuys, Calif., 91409, Tel: 213-988-2600, TWX: 910-495-1787; FSC No: 24930; Empl.: 1500; Minimum order: \$100

Customer service: F. J. Brennan

Free literature available: The near and far reaches of space - ITT Gilfillan capabilities brochure, Quadradar - the world's most versatile air traffic control radar, Series 32 - the world's most advanced family of 3D surveillance radars.

Products manufactured: Antennas, Radar Systems, Receivers

ITT HARPER, 8200 Lehigh Ave., Morton Grove, ILL., 60053, Tel: 312-966-6000; Empl.: 875; Minimum order: \$20

Customer service: R. Gilbert

Free literature available: Bulletin # 114 - Checklist of stock corrosion resistant fasteners.

Products manufactured: Fasteners, Rivets

Local Sales Offices & Reps.

Ala	Birmingham	205-324-5678
Cal	Berkeley	415-357-2655
Cal	Monterey Park	213-268-1345
Colo	Denver	303-433-7397
Fla	Hialeah	305-887-8151
Ga	Atlanta	404-355-0330
Ill	Elk Grove Village	312-595-7220
Ind	Indianapolis	317-244-7888
La	New Orleans	504-246-0000
Md	Baltimore	301-866-1600
Mass	Winchester	617-729-8700
Mich	Troy	313-585-7510
Mo	St. Louis	314-781-9906
NY	Castleton-on-Hudson	518-732-7711
NY	Mt. Vernon	914-664-7555
NY	Rochester	813-877-9193
NC	Charlotte	704-376-1854
Ohio	Cincinnati	513-733-4411
Ohio	Cleveland	216-781-4411
Pa	Philadelphia	215-329-8900
Pa	Pittsburgh	412-242-8901
Tex	Dallas	214-241-2353
Tex	Houston	713-223-4204
Wash	Seattle	206-783-9200
Wisc	Milwaukee	414-272-3565

ITT-HIGBIE MFG. CO., Wagner Rd., Rochester, Mich., 48063, Tel: 313-651-5300, TWX: 810-232-1592; Empl.: 1500

Customer service: D. J. Campbell

Products manufactured: Tubing

Local Sales Offices & Reps.

Cal	Los Angeles, E.J. Brookes Co.	213-723-8431
Ill	Lombard, A.G. Pinder	312-627-4678
Mich	Rochester, ITT Higbie Mfg. Co.	313-651-5300
Mich	Tecumseh, M.G. Coulter	313-423-4300
NJ	Rumson, Phillips Tube Co.	201-842-5168
Tenn	Hermitage, Cap-I-Tol Sls.	615-254-8295
Tex	Dallas, W.P. Schoenfeld	214-352-6200

ITT HOLUB INDUSTRIES, 413 West Elm, Sycamore, Ill., 60178, Tel: 815-895-6501; Empl.: 110; Minimum order: \$50

For info on price: J. W. Hope; Application info: T. McNieve; Customer service: T. McNieve; Delivery info: R. Parsons

Free literature available: OSHA - 972 - Product des. by family.

Products manufactured: Clamps & Clips, Connectors, Cutters, Wire, Hand Operated, Meters, Wire & Cable Ties, Wire Nuts, Wire Strippers, Wrenches

ITT INDUSTRIAL & AUTOMATION SYSTEMS, 41225 Plymouth Rd., Plymouth, Mich., 48170, Tel: 313-427-9300, Telex: 23-5816; Empl.: 200

For info on price: G. McAlpine; Application info: W. Ferris; Customer service: M. Wylie; Delivery info: G. McAlpine

Free literature available: Soldering Systems: Brochure describes system modules and applications of typical systems.

Products manufactured: Detectors, Soldering Equipment

Local Sales Offices & Reps.

Ala	Birmingham, E. Pickett Co.	205-879-4726
Ariz	Phoenix, Bews & Wallace Co.	602-424-2771
Cal	Alhambra, H.E. Wales & Assocs.	213-576-0953
Cal	San Francisco, Process Equip. Co.	415-397-1496
Colo	Englewood, G.M. Wallace & Assocs.	303-771-5960
Conn	Bloomfield, Wetzel Tool Corp.	203-242-8535
Fla	Orlando, B. Woodruff, Inc.	305-424-2771
Ga	Atlanta, Crigler Engrg.	404-351-3733
Ill	Chicago, Mills-Winfield Engrg. Sls.	312-648-1373

Ind	Kokomo & Indianapolis, Stout, Loman & Thompson	317-459-8236
Ky	Louisville, Miller-Harrington Ind'l. Sls.	502-893-5859
La	New Orleans, Betz Engrg. Sls. Co.	504-486-5452
Mass	Boston, Harris & Underhill	617-426-3544
Mich	Farmington, Garrett-Burgess	313-477-7440
Mich	Lansing, A.D. Schneider & Co.	517-482-1337
Minn	Minneapolis, Mills-Winfield	612-920-1199
Minn	Minneapolis, W.H. Schulz Co.	612-544-0133
Mo	St. Louis, Ind'l. Process Equip.	314-534-3100
Mo	St. Louis, Process & Chemical Equip. Co.	314-771-4741
NJ	Mountain Lakes, Dearie & Farrell Co.	201-334-4848
NY	Rochester, Brook-Anco Corp.	716-271-4100
NC	Charlotte, F.D. Hurka Co.	704-366-0209
NC	High Point, Hersey-Thomas	919-882-1132
Ohio	Cuyahoga Falls, W.T. Kendall Co.	216-928-3636
Ohio	Dayton, Production Engrg. Sls.	513-278-4741
Okla	Oklahoma City, Southwestern Gage & Sls.	405-787-1734
Ore	Portland, N. Rupp Co.	503-228-4311
Pa	Bethel Park, D.A. Roberts & Sons	412-561-6404
Pa	Newtown Squares, Holco, Inc.	215-353-2060
SC	Greenville, Hersey-Thomas	803-232-5261
Tenn	Memphis, M-P Sls. Co.	901-274-6933
Tex	Dallas, Southwestern Gage & Sls.	214-358-5151
Tex	Houston, Southwestern Gage & Sls.	713-523-4606
Utah	Salt Lake City, Pelton Equip. Co.	801-484-3522
Va	Alexandria, Chemical Etching Equip. & Supply	703-971-2646
Wash	Bellevue, H.F. Soderling	206-885-2535
Wisc	Elm Grove, Mills-Winfield Engrg. Sls.	414-782-5372

ITT JENNINGS, INSTRUS. & SYSTEMS, Div. Int'l.
Telephone & Telegraph Corp., 970 Mc Laughlin Ave.,
San Jose, Cal., 95116, Tel: 408-292-4025, TWX:
910-338-0159 p. 1-740,741

Products manufactured: Dividers, Meters, Power
Supplies, Probes, Testers

Local Sales Offices & Reps.

Ala	Huntsville, Lee Assocs., Inc.	205-533-5896
Ariz	Scottsdale, BFA Corp.	602-946-4215
Cal	Calabasas, Shovlowsky	213-348-3402
Cal	Palo Alto, Held & Mollard	415-965-9321
Colo	Denver, BFA Corp.	303-744-3301
Conn	Hartford, Newmar Assocs.	203-523-0402
Fla	Winterhaven, Lee Assocs.	813-294-5815
Ga	Chamblee, Lee Assoc.	404-457-7117
Ill	Northbrook, Electronic Instrument Assocs.	312-498-4500
Ind	Indianapolis, Electronic Instrument Assocs.	317-257-7231
Mass	Lynnfield, Newmar Assocs.	617-245-7960
Mo	St. Louis, Scherrer Inst.	314-644-5362
NM	Albuquerque, BFA Corp.	505-296-8303
NM	Las Cruces, BFA Corp.	505-523-0601
NY	Binghamton, Ossman Instrs.	607-785-9947
NY	East Syracuse, Ossman Instr.	315-437-6666
NY	Great Neck, Eastern Instrumentation	516-466-9505
NY	Rochester, Ossman Instr.	716-328-2230
NC	Raleigh, Lee Assocs.	919-787-5818
Ohio	Dayton, Whelan Corp.	513-434-7551
Okla	Norman, Data Mktg. Assocs., Inc.	405-364-8320
Tex	Dallas, Data Mktg. Assocs.	214-661-0300
Tex	Houston, Data Mktg. Assocs.	713-686-9627
Tex	San Antonio, Data Mktg. Assocs.	512-828-0937
Wash	Bellevue, Conrad-Carlson	206-455-1336
EXP:	Downsview, Ontario, Can., Meter Master	416-661-3190

ITT JENNINGS, Monrovia Plant, 1960 Walker Ave.,
Monrovia, Cal., 91016, Tel: 213-359-8281, TWX:
910-585-1830; Empl.: 160

Products manufactured: Capacitors, Fixed,
Capacitors, Variable, Films, Filters, Foil, Forms,
Wire

Local Sales Offices & Reps.

Ariz	Scottsdale, R. R. Thomas Co.	602-994-0401
Cal	Los Altos, Horne Associates	415-948-5823
Cal	Monrovia, ITT Jennings Monrovia Plant	213-357-1185
Cal	San Diego, Bestronics, Inc.	714-278-2150
Fla	Palm Beach Gardens, Beacon Assoc.	305-622-2770
Ga	Atlanta, Beacon Assoc.	404-351-3654
Ill	Elmhurst, Schuten Assoc.	312-833-0980
Ind	Ft. Wayne, Delesa	219-483-7486
Iowa	Cedar Rapids, Reid Assoc.	319-362-6302
Md	Timonium, Marktron Inc.	301-762-6210
Mass	Lexington, Kitchen & Kutchin	617-862-8230

Minn	St. Paul, R. G. Ragon Inc.	612-488-0201
NJ	Dunellen, ITT Jennings	201-968-6556
NJ	Tenafly, ABC Elctrn. Sls.	201-568-2354
NY	New Rochelle, Montclair Electronics	914-576-1400
NY	Syracuse, Nycom	315-437-8343
NY	Williston Park, ABC Elctrn. Sls.	516-747-6610
Ohio	Dayton, Whelan Corp.	513-434-7551
Pa	Bethayres, ABL Electronic Sales Co.	215-464-2275
SC	Spartanburg, Beacon Assoc.	803-576-7462
Tex	Dallas, R. R. Thomas Co.	214-363-8591
Wash	Bellevue, Ray Over Sls.	206-454-4551

ITT JENNINGS, VACUUM ELCTRN. PRODS., Div.
Int'l. Telephone & Telegraph Corp., 970 McLaughlin
Ave., San Jose, Cal., 95116, Tel: 408-292-4025, TWX:
910-338-0159; Empl.: 350
p. 1-1733-1738, 2077-2079; p. 2-198-200

Products manufactured: Capacitors, Fixed,
Capacitors, Variable, Relays, Services, Assembly,
Production & Test, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Brandel-Stephens	205-883-0445
Ariz	Scottsdale, BFA Corp.	602-946-4215
Cal	Palo Alto, Engineering Assocs.	415-494-7842
Colo	Denver, BFA Corp.	303-744-3301
Fla	Deerfield Beach, Brandel-Stephens	305-427-8558
Fla	Orlando, Brandel-Stephens	305-425-3202
Ga	Atlanta, Brandel-Stephens	404-261-7579
Ill	Chicago, Berndt Assocs.	312-283-0713
Kans	Shawnee Mission, Lowell-Kangas & Assoc.	913-631-3515
Md	Rockville, Marktron, Inc.	301-762-6210
Md	Timonium, Marktron, Inc.	301-252-7111
Mich	Troy, Peters Assoc.	313-524-2920
Mo	St. Louis, Lowell-Kangas & Assoc.	314-821-4050

NJ	Tenafly, ABC Elctrn. Sls.	201-568-2354
NM	Albuquerque, BFA Corp.	505-292-1212
NM	Las Cruces, BFA Corp.	505-523-0601
NY	N. Tarrytown, ABC Elctrn. Sls.	914-631-2650
NY	Syracuse, Nycom Inc.	315-437-8343
NY	Williston Pk., ABC Elctrn. Sls.	516-747-6610
Ohio	Dayton, Whelan Corp.	513-434-7551
Pa	Huntington Valley, ABC Elctrn. Sls.	215-464-2275
Tex	Richardson, P.J. Scanlon	214-231-4661
Va	Charlottesville, Marktron	301-762-6210

ITT MACKAY MARINE, 2912 Wake Forest Rd., Raleigh,
N.C., 27611, Tel: 919-828-4441; Empl.: 525

Products manufactured: Alarms, Amplifiers,
Antennas, Comm. Systems, Direction Finders,
Generators, Indicators, Inverters, Radar Systems,
Receivers, Synthesizers, Teletypewriters,
Teletypewriters & Equipment, Transceivers,
Transmitters, Underwater Communication,
Detection, Navigation, etc. Equipment

Local Sales Offices & Reps.

La	Metairie	504-887-4200
NJ	Elizabeth	201-527-0300
Wash	Seattle	206-283-4204

Advertisement

ITT Mackay Marine designs and
manufactures a complete line of com-
munications and navigational equip-
ment systems, includes Synthesized
Receivers (15 kHz to 30 MHz), Syn-
thesized Transmitters 2-30 MHz Solid
State Transmitters and Receivers,
Auto alarms, Keyers, Radio Direc-
tion Finders, Lorans, Omega Recei-
vers, Antenna systems and Survival
equipment.

ITT POMONA ELECTRONICS DIV., 1500 E. 9th St.,
Box 2767, Pomona, Cal., 91766, Tel: 714-623-3463,
TWX: 910-581-3822; FSC No: 05276; Empl.: 100;
Minimum order: \$25 p. 2-727-787

For info on price: Sls. Dept.; Application info: J. J.
Musarra; Customer service: Sls. Dept.; Delivery info:
Sls. Dept.

Free literature available: Electronic Test Accessory
Catalog

Products manufactured: Bars, Shorting, Boards,
Printed Circuit, Cable Assemblies & Harnesses,
Clamps & Clips, Connector Adapters, Connectors,
Containers, Cords, Enclosures, Module, Plug-In,
Jack Adapters (All Types), Jacks (All Types),
Jumpers, Leads, Test & Adaptors, Meters, Plug
Adapters, Plug & Jack Sets, Posts, Probes,
Sockets, Terminals

Local Sales Offices & Reps.

Ala	Madison, South Eastern Assoc.	205-722-9616
Ariz	Phoenix, H.A. Moore Sls. Co.	602-274-4558
Ariz	Scottsdale, DeAngelo, Rothman & Cheever, Inc.	602-947-8626
Cal	Beverly Hills, Intercontinental Aviation	213-274-7578
Cal	Culver City, DeAngelo, Rothman	213-398-6239
Cal	La Selva Bch., Belchamber & French	408-722-0444
Cal	Palo Alto, Engineering Assoc.	415-494-7842
Cal	Pasadena, P. Nurches	213-881-8957
Colo	Aurora, AES, Inc.	303-EM 6-0208
Fla	No. Miami, L. Haas	305-949-9143
Ill	Lincolnwood, W.M. Linz	312-677-2000
Ind	Indianapolis, Blind & Assoc., Inc.	317-251-1249
Mass	Sharon, A Appell Assoc.	617-SU 4-3439
Mich	Kentwood, C. Geer	616-534-9449
Minn	Mpls., Northern States	612-888-3300
Mo	Crestwood, NEVCO	314-843-7406
Mo	Kansas City, NEVCO, Inc.	816-421-1751
NY	Long Island City, Tobias	212-545-9191
Ohio	Cleveland, P. Lohse	216-381-4424
Pa	Philadelphia, D.S. Linz	215-ES 9-0734
SC	Greenville, H. C. Norman	803-244-6254
Tex	Dallas, Techno Assocs.	214-FL 7-9213
Wash	Seattle, R.K. Squibb	206-632-2450
FOR:	Can., Whitby, Ont., ITT Cannon Electric	416-688-8881

ITT SEMICONDUCTOR, 3301 Electronics Way, West Palm
Beach, Fla., 33407, Tel: 305-842-2411, TWX:
510-952-7605; Empl.: 1350

Products manufactured: Amplifiers, Capacitors,
Fixed, Circuits, Integrated, Silicon Monolithic,
Unpackaged Chips, Converters, Counters, Diodes,
Dividers, Drivers & Decoders For Readouts,
Integrated Circuit Devices, Multiplexers,
Rectifiers, Semiconductor Wafer Fabrication,
Shift Registers, Timers, Transistors

Local Sales Offices & Reps.

Ala	Huntsville, Rep. Inc.	205-881-9270
Ariz	Tempe, ITT Semiconductors	602-277-8166
Cal	Inglewood, ITT Semiconductors	213-649-4644
Cal	Mountain View, Nor-Cal Assocs.	415-961-8121
Cal	Palo Alto, ITT Semiconductors	415-961-5265
Cal	San Diego, JTL Assocs.	714-277-8044
Cal	Woodland Hills, Interstate Mktg.	213-883-7606
Colo	Denver, Checkmate Sls.	303-771-4920
Fla	Palm Beach Gardens, Trainor Sls.	305-622-1383
Fla	West Palm Beach, ITT Semiconductors	305-842-2411
Ill	Chicago, ITT Semiconductors	312-693-7070
Ill	Rolling Meadows, Sumer, Inc.	312-394-4900
Iowa	Cedar Rapids, S & O Sls. Co.	319-393-1845
Md	Baltimore, Coulbourn-DeGreif, Inc.	301-247-4646
Mass	Lexington, ITT Semiconductors	617-861-0880
Mich	Farmington, ITT Semiconductors	313-477-6060
Mich	Livonia, Rep-Tron	313-261-7446
Minn	Minneapolis, ITT Semiconductors	612-920-2943

Mo	Grandview, Beneke & McCaul, Inc.	816-765-2998
NY	Fayetteville, ITT Semiconductors	315-445-0560
NY	Huntington, Caravan Sls.	516-692-2839
NY	Jericho, ITT Semiconductors	516-938-1191
NY	Syracuse, Precision Power	315-477-3200
NY	Valley Cottage, LRC Assocs.	914-634-7973
Ohio	Cincinnati, Giesting Assocs.	513-931-0812
Pa	Wayne, ITT Semiconductors	215-688-6990
Tex	Dallas, ITT Semiconductors	214-242-8164
Wash	Tukwila, General Elctns.	206-243-5141
EXP:	Mississauga, Ont., Can., ITT Semiconductors	416-625-9022
EXP:	Montreal, Que., Can., Vitel Elctns.	514-331-7393

ITT SEMICONDUCTORS-CAPACITORS, 1551 Osgood St.,
No. Andover, Mass., 01845, Tel: 617-688-1881, TWX:
710-344-0718; Empl.: 30

Products manufactured: Capacitors, Fixed, Motors,
Rectifiers, Relays, Sockets, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Rep. Inc.	205-881-9270
Ariz	Scottsdale, R.R. Thomas Co.	602-994-0401
Cal	Mt. View, Nor Cal Assoc.	415-961-8121

Cal	San Jose, ITT	408-247-6400
Colo	Lakewood, Tri Tronix	303-237-0774
Conn	Hamden, Impact Sls.	
Fla	Indian Rocks Beach, Tech. Rep.	813-595-2834
Iowa	Cedar Rapids, Reid & Assoc.	319-362-6302
Mass	Waltham, Impact Sls.	617-893-2850
Mich	Warren, DEM Elct. Sls.	313-755-6660
Minn	Minneapolis, S & R Comp. Sls.	612-544-3022
NM	Albuquerque, Tri-Tronix	505-265-0172
NY	Syracuse, Nycorn Inc.	315-437-8343
NY	Valley Cottage, LRC Assocs.	914-634-7973
NC	Raleigh, Candor Co.	919-787-2652
Ohio	Cincinnati, Giesting Assocs.	513-931-0812
SC	Myrtle Beach, Candor Co.	803-448-5213
Tenn	Chattanooga, Candor Co.	615-894-7454
Tex	Dallas, R.R. Thomas Co.	214-363-8591
Va	Lynchburg, Candor Co.	703-946-6579
Wash	Bellevue, Vantage Corp.	206-455-3460

ITT SEMICONDUCTORS DISCRETE DEVICES, 500 Broadway, Lawrence, Mass., 01841

ITT SEMICONDUCTORS PASSIVE COMPONENTS, 1551 Osgood St., No. Andover, Mass., 01845

ITT SEMICONDUCTORS RECTIFIERS, 1551 Osgood St., No. Andover, Mass., 01845

ITT TELECOMMUNICATIONS, Apparatus Dept., Fulton Dr., Corinth, Miss., 38834, Tel: 601-287-3771, TWX: 510-984-0211; Empl.: 1100

Application info: M. Ayer; Customer service: J. Livingston; Delivery info: J. Livingston

Products manufactured: Comm. Systems, Dials

ITT THERMOTEC, Div. Int'l. Telephone & Telegraph Corp., 1202 S. 5th St., Hopkins, Minn., 55343, Tel: 612-938-7671; Empl.: 515

Products manufactured: Bobbins, Winding, Coil & Transformer, Coils Including Assemblies & Forms, Covers, Protective (Including Dust), Keyboards, Alphanumeric & Decimal, Services, Assembly, Production & Test, Terminals

Local Sales Offices & Reps.

Ariz	Phoenix, Toward Engrg. Assoc., Inc.	602-277-1453
Cal	Belmont, C. Crisler	415-591-5363
Cal	Glendale, Secana Co.	213-240-7570
Colo	Denver, T. Mc Sherry	303-238-8361
Conn	W. Hartford, D. Kelley	203-233-0870
Conn	West Simsbury, R. Russ	203-658-6261
Fla	St. Petersburg, Florida Div.	813-347-2191
Ill	Chicago, J. Robinson	312-777-6200
Ill	Norridge, B. Reynolds	312-824-4129
Ind	Ft. Wayne, R. McCampbell	219-747-9697
Iowa	Des Moines, F. F. Wilcox	515-255-8416
Kans	Mission, Inland Assocs.	913-362-2366
Ky	Mt. Sterling, M.F. Eubanks	606-498-5955
Mass	Newton Upper Falls, Anchor Engrg.	

Mich	Detroit, G. Hall	313-864-1368
Mich	Farmington, L. George	313-477-5833
Minn	Minneapolis, W. J. Houlihan	612-544-3023
Mo	Glenco, R.L. Omer	314-938-4992
Mo	St. Louis, E. Monnig	314-991-2512
NJ	Union, Plastech	201-687-4810
NY	Fairport, P. B. Schumacher	716-223-2488
NY	Manhasset, Kaelber & Mack	516-627-6620
NC	Charlotte, Spartan Assoc.	704-523-8419
NC	Greensboro, Mfrs. Sls.	919-274-2474
Ohio	Cleveland, G. Richards	216-221-3634
Okla	Tulsa, T. J. Ray Co.	918-627-1515
Ore	Portland, C. E. Riggs	503-226-3286
Pa	Ardmore, Midlantic Plastic Sls.	215-649-2436
Tex	Dallas, Ammon & Rizzo	214-233-5591
Tex	Houston, G. Knower	713-781-6240
Wash	Seattle, J. Perkins	206-623-5707
Wisc	Menomonee, D. Jensen	414-251-9230



J-B-T INSTRS., INC., Box 1818, New Haven, Conn., 06508, Tel: 203-772-2220, TWX: 710-465-3165; Empl.: 300

Free literature available: TS-7-various types of MIL and commercial toggle switches. MT-40-types of sub-miniature toggle, rocker and paddle lever switches. 1172A-frequency and elapsed time meters, 12, 14 and 20 position rotary switches and other J-B-T products.

Products manufactured: Indicators, Meters, Switches

Local Sales Offices & Reps.

Cal	Inglewood, J. Berman Co.	213-678-1281
Cal	La Mesa, J. Berman Co.	714-583-6457

Cal	Oakland, Moulthrop Sls.	415-261-7676
Colo	Denver, Nelson Co.	303-573-1516
Conn	Wallingford, Adams-McGregor, Inc.	203-269-5816
Fla	Maitland, Hutto-Hawkins-Perego	305-831-2474
Fla	Pompano Beach, Hutto-Hawkins-Perego	305-943-9593
Ga	Atlanta, Millar Elctns.	404-261-6160
Ill	Oak Park, G. Pettit Co.	312-369-8940
Ind	Fort Wayne, W.V. Bieberich	219-432-2537
Kans	Overland Park, T.L. Dowell & Assocs.	913-236-8200
Md	Reisterstown, Massey Assocs.	301-833-2039
Mass	Scituate, Adams-McGregor, Inc.	617-542-3773
Mich	St. Clair Shores, J.M. Thorpe Co.	313-779-6363
Minn	Minneapolis, Heimann Co.	612-861-6051
NY	Long Island City, D.F. Tobias & Co.	212-545-9191

NY	Syracuse, H.R. Murray, Inc.	315-446-5555
NC	Raleigh, Millar Elctns., Inc.	919-787-9564
Ohio	Dayton, C.H. Dolfuss, Jr. & Co.	513-275-4831
Ohio	Rocky River, C.H. Dolfuss, Jr. & Co.	

Pa	Media, Snyder & Massey Assocs.	215-566-5400
Pa	Pittsburgh, G.S. Root & Co.	412-561-4125
RI	Lincoln, Adams-McGregor, Inc.	401-726-1300
Tex	Dallas, Lund & Co.	214-358-4335
Wash	Seattle, J.J. Backer Co.	206-285-1300

JACKSON BROS., (LONDON) LTD., 258 Bway., New York, N.Y., 10007, Tel: 212-WO 2-5485; Minimum order: \$10

Customer service: Swedgal Elctns.

Products manufactured: Capacitors, Fixed, Capacitors, Variable, Couplings, Dials, Drives & Drive Mechanisms (Dial), Encoders, Gears & Gear Mechanisms (Precision), Locks, Dial & Shaft, Terminal Blocks, Boards & Strips, Terminals, Transducers

Local Sales Offices & Reps.

Cal	Encino, V & L Assocs., Inc.	213-986-9703
Ill	Westchester, W.G. Brouillette	312-345-6500

JAESIC INDUSTRIES CO., 29830 Beck, Wixom, Mich., 48096, Tel: 313-624-6411; Empl.: 18; Minimum order: \$250

For info on price: J. J. Tomecek; Application info: K. J. Sekenski; Customer service: J. W. Tomecek; Delivery info: F. Tomecek

Free literature available: Brochures

Products manufactured: Amplifiers, Cards, Linear Function, Cards, Logic, Chargers, Battery, Coders, Controls/Control Eqpt., Converters, Generators

Local Sales Offices & Reps.

Fla	Hollywood, R. L. Tomecek Co.	305-752-0226
Ill	Lombard, A. Bolin	312-627-6802
Mich	Ann Arbor, Lama Enterprises	313-761-4323
Mich	Detroit, Professional Med. Dist.	313-624-6413

JAIDINGER MFG. CO., INC., 1921 W. Hubbard St., Chicago, Ill., 60622, Tel: 312-421-1090; Empl.: 35; Minimum order: \$10

Customer service: F. M. Smith

Free literature available: Brochure RS-65 describes and illustrates typical relays and switches we can produce, to customer's specifications, from modular components.

Products manufactured: Relays, Switches

JAMESBURY CORP., 640 Lincoln St., Worcester, Mass., 01605, Tel: 617-852-0200, TWX: 710-340-1268; Empl.: 800

Free literature available: Bulletin #233 Ball Valves for Vacuum Service 247 Butterfly Valves for Vacuum Service 213 Style B 3-piece Valves P137 Wafer-Sphere Butterfly Valves 251 Pneumatic piston actuators 252 Quadra-Powr spring-diaphragm actuators 215 Clincher Ball Valves

Products manufactured: Actuators, Valves, Vacuum

Local Sales Offices & Reps.

Ala	Pleasant Grove, Jamesbury Corp.	205-787-1429
Cal	Mill Valley, Jamesbury Corp.	415-982-0606
Cal	Westlake Village, Jamesbury Corp.	
Fla	Jacksonville, Jamesbury Corp.	213-264-7508
Ill	Prestbury, Jamesbury Corp.	904-768-0411
La	Baton Rouge, Jamesbury Corp.	504-344-1933
Mich	Milford, Jamesbury Corp.	313-547-5070
Mo	Kansas City, Jamesbury Corp.	816-531-2700
NY	New York, Jamesbury Corp.	212-964-8852
NY	Pittsford, Jamesbury Corp.	716-381-2282
NC	Charlotte, Jamesbury Corp.	704-376-6393

Ohio	Chagrin Falls, Jamesbury Corp.	216-543-4202
Ohio	Dayton, Jamesbury Corp.	513-579-3447
Pa	Newtown Square, Jamesbury Corp.	
Pa	Pittsburgh, Jamesbury Corp.	215-353-4670
Tex	Houston, Jamesbury Corp.	713-622-1671
Tex	Irving, Jamesbury Corp.	214-259-8460
Wash	Mercer Island, Jamesbury Corp.	206-682-6997
EXP:	Tenn., Murfreesboro, Jamesbury Corp.	
FOR:	Can., Ottawa 15, Ont., Jamesbury Canada Ltd.	615-256-0643
		613-746-2211

JAN HARDWARE MFG. CO., 47-27 36th St., Long Island City, N.Y., 11101, Tel: 212-361-0800; FSC No: 99813; QPL No: 3926; Empl.: 60; Minimum order: \$25

p. 2-1088-1103

For info on price: I. Wasserman; Application info: R. Oddo; Customer service: J. Ray; Delivery info: L. Marra

Free literature available: Catalog including products listed in EEM.

Products manufactured: Alarms, Bezels, Shielded & Unshielded, Brakes, Bumpers, Bushings, Glass, Plastic, Metal, Rubber, Etc., Cabinets & Accessories, Chassis, Metal, Clutches, Controls/Control Eqpt., Cords, Counters, Couplings, Dials, Display Devices/Displays, Drives & Drive Mechanisms (Dial), Encoders, Escutcheons, Foil, Gearheads & Speed Reducers, Gears & Gear Mechanisms (Precision), Handles For Cabinets, Circuit Boards, Racks, etc., Heat Exchangers & Systems, Heat Sinks, Soldering, Jack Covers, Jacks (All Types), Jigs And Fixtures, Chassis & Circuit Board, Knobs, Limit Stops, Mechanical, Locks, Dial & Shaft, Mounts, Panels, Plug & Jack Sets, Pointers, Dial, Potentiometers, Racks, Reducers, Scales, Dial, Shafts & Adapters, Shields, Sockets, Spacers, Terminal Blocks, Boards & Strips, Terminals, Testers

Local Sales Offices & Reps.

Cal	Carte Madera, P. O'Neal Assoc.	415-924-1691
Cal	Los Angeles, J.C. Simon Co.	213-939-2366
Fla	Clearwater, CBC Elctns.	813-447-3375
Fla	Ft. Lauderdale, CBC Elctns.	305-484-7330
Fla	Winter Park, CBC Elctns.	305-644-2277
Ga	Avondale Estates, Candor Co.	404-458-6713
Haw	Honolulu, Aloha Assoc.	808-922-3810
Ill	Chicago, Croydon Elect.	312-237-4343
Ind	Huntington, Croydon Elect.	219-422-2311
Md	Woodbine, Naudain Assoc.	301-442-2270
Mass	Newton Lower Falls, New England Comp. Sls.	617-969-9523
Mo	Crestwood, Nevco	314-843-7406
Mo	Kansas City, Nevco	816-421-1751
NJ	Bergenfield, H. Gray Assoc.	201-384-3643
NY	Rochester, Lloyd Hart Assoc.	716-244-3253
NC	Raleigh, Candor Co.	919-876-4999
Ohio	Cleveland, Goory Sls.	216-331-2055
Ohio	Dayton, Goory Sls.	513-294-3747
Pa	Mount Laurel, Naudain Assoc.	215-554-3194
SC	Myrtle Beach, Candor Co.	803-448-8391
Tenn	Chattanooga, Candor Co.	615-894-7454
Tex	Dallas, Loss & Stewart Assoc.	214-691-6039
Va	Lynchburg, Candor Co.	804-846-6579
EXP:	Can., Scarborough, Ont., Banke Elctns., Ltd.	416-291-7529

JANCO CORP., Box 3038-Glenoaks Sta., Burbank, Cal., 91504, Tel: 213-845-7473, TWX: 910-498-2701; FSC No: 91812; Empl.: 150

p. 1-2088-2091

For info on price: S. Kay, Jr.; Application info: L. Smart

Products manufactured: Bus Bars & Systems, Jumpers, Shunts, Meter, Switches, Timers

Local Sales Offices & Reps.

Ala	Knoxville, J.R. Stephenson Agency	
Ariz	Scottsdale, J.B. Hower & Co.	615-588-7474
Ark	Dallas, M. Kravand Co.	602-948-0430
Cal	Menlo Park, McKnight Co.	415-325-2844
Colo	Denver, Brown Tech., Inc.	303-233-0863
Conn	Glastonbury, Barton-Caron Assocs.	
Fla	Orlando, MacKay, Smith & Assocs.	203-633-0417
Ga	Atlanta, N.D. Russell	305-277-1513
Ill	Chicago, Engineered Sls. Co.	404-255-2918
Kans	Wichita, T-Bird Tech. Sls. & Svc.	312-867-8434
Md	Silver Spring, H.R. Sieber Co.	316-684-2941
Mass	Auburndale, Barton-Caron Assocs.	301-589-9110
Minn	Minneapolis, Electro-Serv Co.	617-332-0342
Mo	St. Louis, T-Bird Sls. & Svc.	612-827-2907
NJ	Cherry Hill, Quality Comps. Co.	314-567-6488
NY	Albertson, C.F. Ward	609-428-6266
		516-742-5561

NC Charlotte, MacKay, Smith & Assoc. 704-527-0240
 Ohio Cleveland, Comps., Inc. 216-842-2737
 Tenn Knoxville, J.R. Stephenson Agency 615-588-7474
 Tex Dallas, Mark Kruvand Co. 214-827-8043
 Wash Seattle, Norwest Co. 206-282-3707

JANEL, INC., 1320 Valley Rd., Stirling, N.J., 07980, Tel: 201-647-5600; Empl.: 16

For info on price: M. Marcasciano; Application info: B. Hurlock; Customer service: D. Stelle; Delivery info: C. Giacomo

Products manufactured: Cleaners, Ultrasonic, Gages, Heat Sinks, Soldering, Knives & Knife Sets, Lamps, Pliers, Screwdrivers, Soldering Accessories, Soldering Equipment, Tools, Tweezers, Hand & Vacuum, Wire Twisters, Wrenches

JAPANESE PRODS. CORP., 7 Westchester Plaza, Elmsford, N.Y., 10523, Tel: 914-592-8880; Empl.: 6

For info on price: S. Lane; Application info: S. Lane; Customer service: E. W. Brown; Delivery info: E. W. Brown

Products manufactured: Motors, Testers

JAVELIN DIV., Apollo Lasers, Inc., 6357 Arizona Circle, Los Angeles, Cal., 90045, Tel: 213-641-4490, Telex: 69-8204; Empl.: 65

For info on price: T. Miller; Application info: T. Miller; Customer service: M. Rice; Delivery info: R. Perry

Free literature available: Javelin Catalog - literature on CCTV security equipment: cameras, monitors VTR's, video signal equipment, housings, pan/tits, scanners, switchers, night vision equipment.

Products manufactured: Amplifiers, Lasers & Laser Systems, Lenses, Optical & Camera, Monitors, Recorders, Tapes, Recording, Magnetic (All Types), Television Systems & Equipment Closed-Circuit

Local Sales Offices & Reps.

Cal Los Angeles, R. S. Milecki 213-641-4490
 Colo Aurora, A. E. S. 303-366-0208
 Fla Port Charlotte, W. F. Hemminger 813-625-6050
 Ga Atlanta, C. Harrison Assocs. 404-633-3230
 Ill Chicago, Ellinger Sls. Corp. 312-763-1570
 Ind Indianapolis, C. Scheffer Co. 317-253-6337
 Mass Newton Upper Falls, M. P. Video 617-965-5405
 Minn Minneapolis, Kodo Assoc. 612-881-1255
 Mo Kansas City, Nevco 816-421-1751
 NY Binghamton, Rayber Sls. Co. 607-724-1734
 NY Port Chester, Reich & Bernstein 914-939-5408
 Ohio Cleveland, Imtech Equip. Div. 216-825-3400
 Pa Newton Square, G. M. Coneen Co. 215-353-2241
 Tex Dallas, B. S. Amos & Assoc. 214-823-7820
 Va Anandale, Javelin Electrs. 703-978-7558
 Wash Seattle, Pacnor Mktg. 206-284-8020

JAVEX ELCTRNS., 9509 Oak Glen Rd., Cherry Valley, Cal., 92223, Tel: 714-845-3986; Empl.: 60

Customer service: C. J. Reimuller

Products manufactured: Attenuators, Boxes, Junction, Outlets & Wall Plates, Caps, Connector, Connectors, Couplers, Jacks (All Types), Plug Adapters, Plug & Jack Sets, Plug Caps & Shells, Plugs, Potentiometers, Sockets, Splicers, Coaxial Cable, Switches, Terminals

JAY-EL PRODS., 1859 W. 169th St., Gardena, Calif., 90247, Tel: 213-321-3260, TWX: 910-346-7633; FSC No: 08719; QPL No: Multiple; Empl.: 65; Minimum order: \$25

For info on price: K. Woods; Application info: L. Miller; Customer service: K. Woods; Delivery info: K. Woods

Free literature available: Basic concepts of our switches and indicators plus ordering information and general outline dimensions.

Products manufactured: Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Indicators, Relays, Switches

Local Sales Offices & Reps.

Cal Gardena, Jay-El Prods., Inc. 213-323-7130
 Cal Santa Clara, Nova Tronix, Representative 408-243-9530
 Mass Chelmsford, North East Components 603-668-1372
 Pa Lafayette Hill, R. Tschopp (Direct Sls.) 215-825-3666
 Tex Dallas, Allied Comp. 214-238-0408
 Wash Seattle, Norwest Co. 206-AT 2-3707

JB ELCTRN, TRANSFORMERS, INC., 2300 W. Armitage Ave., Chicago, Ill., 60647, Tel: 312-342-0080, TWX: 910-221-1283; Empl.: 150

Products manufactured: Coils Including Assemblies & Forms, Transformers

JDN ELECTRONICS, INC., 239 Morristown Rd., Gillette, N.J., 07933, Tel: 201-647-2400; Empl.: 5; Minimum order: \$15

For info on price: M. Fussell; Application info: D. Bock; Customer service: D. Bock

Free literature available: JDN-Series A .1000DX .250 Long, JDN Series B .1250DX .335 Long, JDN Series C .1570DX .450 Long, JDN Series D .1570DX .415 Long, Data sheets describe components and list mechanical and electrical parameters for each series.

Products manufactured: Chokes, Coils Including Assemblies & Forms

Local Sales Offices & Reps.

Ala Huntsville, Incotech 205-837-6061
 Cal Sunnyvale, Amasco 408-733-8690
 Ill Chicago, Chant-Aslan Assocs. 312-235-8443
 Mass Waltham, Betronic Assocs. 617-894-8400
 NJ Kenilworth, Ventronics 201-272-9262
 Ohio Chagrin Falls, Pine Sls. & Engrg. Co. 216-247-6198

Va Fairfax, Schibley Assocs. 703-591-3008
 Wash Seattle, W. Spaulding Co. 206-282-9173

JEFFERSON ELEC., Div. Litton Inds., 840 S. 25th Ave., Bellwood, Ill., 60104, Tel: 312-626-7700; Empl.: 1200

Customer service: J. Mocko

Free literature available: Published as application guides, Jefferson Electric's comprehensive product catalogs offer the latest electrical data for transformers, ballasts and lighting equipment.

Products manufactured: Transformers

Local Sales Offices & Reps.

Ariz Scottsdale, J. Bannan Sls. Co. 602-945-2394
 Ark Little Rock, Southland Sls. Inc. 501-753-4013
 Cal Los Angeles, J.G. Pomeroy Co. 213-263-9381
 Cal San Francisco, Black & Egbert 415-282-0840
 Colo Denver, E-O Sls. Co. 303-744-7081
 Fla Orlando, O.C. Puckett Co. 305-422-7197
 Fla Temple Terrace, O.C. Puckett Co. 813-988-7077
 Ga Atlanta, Chastain-Powell, Inc. 404-875-0755
 Haw Honolulu, R.J. Austin & Assoc. 808-395-4011
 Ill Westchester, EMC, Electrical Mktg. Corp. 312-681-1180

Ind Indianapolis, C. Warblee & Assoc. 317-632-1465

Kans Kansas City, D. Hatfield Sls. Co. 913-281-0533
 Ky Covington, Hackman Electrical Sls. 606-291-3800

La New Orleans, Corrigan Mktg. Agency 504-865-7301

Mass Canton, North Coast Sls. Co. 617-828-4006
 Mich Dearborn, Electrical Materials 313-541-1650
 Mo St. Louis, Electrical Mktg. Inc. 314-726-2920

Neb Omaha, W.J. Fritsch, Electric Equip. Sls. Co. 402-556-4998

NY Hartford, F.W. Laver & Son 315-724-2304
 NY Jamaica, Vawshaw Electric Co. 212-525-8150

NC Charlotte, W.H. Lassiter, Sls. Co. 704-523-2736

Ohio Bedford Heights, Rifle & Assoc. 216-439-5500
 Pa Philadelphia, Electrical Sls. Assoc. 609-541-7452

Pa Pittsburgh, Squire & Main Assoc. 412-364-3700

Tenn Memphis, Southland Sls. Agents 901-525-0142
 Tenn Nashville, Southland Sls. Agents 615-889-4738

Tex Dallas, Rich Co. 214-742-1758
 Tex Houston, McIver & Slavin Co. 713-861-3888

Utah Salt Lake City, J.D. Stephens Co. 801-355-3540
 Wash Seattle, Bangs Assoc. 206-762-0262

Wisc Milwaukee, J. F. Nolan & Assoc. 414-781-1140

JENSEN SOUND LABS., Div. Pemcor, Inc., 4310 Trans World Rd., Schiller Park, Ill., 60176, Tel: 312-671-5680, TWX: 910-227-3728; Empl.: 42; Minimum order: \$100

For info on price: R. Gold; Application info: R. Engelmann; Customer service: R. Gold; Delivery info: R. Gold

Free literature available: New 4/Color Catalogs, for high fidelity speaker systems and automotive speaker systems.

Products manufactured: Speaker Systems, Speakers

Local Sales Offices & Reps.

Ariz Phoenix, Sal Bova Sls. 602-266-1137
 Cal Culver City, Marshank Sls. 213-559-2591
 Cal Redwood City, Sinai-Johnson, Inc. 415-365-6263
 Colo Aurora, Snowcroft & Assoc. 303-755-2422

Ga Atlanta, B. M. Tyler & Assoc. 404-634-6121
 Haw Honolulu, G. Piety Factors 808-839-9059
 Ill LaGrange, E.N. Severson & Assoc. 312-352-2055

Ind Carmel, Alpha Sls. Corp. 317-846-7735
 Kans Overland Park, Nackman-Brod-Vann & Co. 913-381-6560

Md Silver Springs, M.F. Taylor 301-589-4002

Mass Norwood, Market Reps., Inc. 617-762-0155
 Mich Lake Orion, T.A. Firaneck Sls. 313-391-1177

Minn Minneapolis, G & C Assocs. 612-927-5633
 Mo St. Louis, Nackman-Brod-Vann & Co. 314-991-2424

Neb Omaha, Nackman-Brod-Vann 402-333-4346
 NY Phelps, LSM Assocs. 315-548-4891

NY Yonkers, Adelman-Pinz Sls. Corp. 914-423-4747
 Ohio Cleveland, MS Sls. Corp. 216-382-2060

Okla Oklahoma City, T. Wachendorfer Assoc. 405-721-9170

Ore Portland, Fleehart & Sullivan 503-297-1033
 Tex Houston, T. Wachendorfer Assoc. 713-465-3092

Wash Seattle, Fleehart & Sullivan 206-522-1533
 EXP: Chicago, Ill., J. D. Marshall Int'l. 312-583-6060

JENSEN TOOLS & ALLOYS, 4117 N. 44th St., Phoenix, Ariz., 85018, Tel: 602-959-2210, TWX: 910-950-1154; Empl.: 35

Customer service: J. Hogg

Products manufactured: Drills & Accessories, Hand & Power, Heat Guns, Production, Heat Sinks, Soldering, Knives & Knife Sets, Pliers, Screwdrivers, Solder (All Types), Soldering Accessories, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools, Tools, Torches, Soldering, Welding & Access., Wire Strippers, Wrenches

JERMYN, 712 Montgomery St., San Francisco, Cal., 94111, Tel: 415-362-7431; Empl.: 6

Customer service: G. Hall

Free literature available: 80 page full color catalog and complete price list including sockets logic checkers, heat sinks, heat pipes, heat transfer isolators, transistor and I. C. spacers, cooling modules and D. I. L. headers for discrete construction of small plug in units.

Products manufactured: Cable, Clamps & Clips, Coatings, Connectors, Cooling/Heating Modules, Thermoelectric, Heaters & Heating Elements, Kits, Breadboarding (For Engineers), Ovens, Pads, Transistor Mounting, Probes, Retainers, Sockets, Testers, Wire

Local Sales Offices & Reps.

Ariz Tempe, J. F. Hurlbut Co. 602-968-5962
 Cal Garden Grove, Impact Electrs. 213-431-3581
 Colo Denver, Cristee-Meade Co. 303-753-9471
 Fla Casselberry, E. I. R. 305-830-9600
 Ill Northbrook, R. T. Howlett 312-498-5444
 Mass Waltham, Impact Sls. 617-893-2850
 NY Huntington Station, Addem Group 516-567-5900

Pa Birchrunville, Jadelectronics Assoc. 215-647-5151

Wash Seattle, Fleehart & Sullivan 206-522-1533

JEROME INDUSTRIES CORP., 391 Lakeside Ave., Orange, N.J., 07050, Tel: 201-678-9595; Empl.: 75

For info on price: J. Digirolamo; Application info: J. Digirolamo; Customer service: C. Montagna; Delivery info: J. D. Trollo

Free literature available: Catalogue-shows plug-in adaptors and complete product line. Flyer-shows transformers manufactured.

Products manufactured: Chargers, Battery, Motors, Plug Adapters, Potentiometers, Power Supplies, Transformers

Local Sales Offices & Reps.

Cal Santa Monica, REP Assocs. 213-829-5401
 Fla Oldsmar, L.A. Assocs. 813-855-4209
 Ill Downers Grove, Ed Joyner & Co. 312-968-8383
 Md Glen Arm, Hodgins Assoc. 301-592-7047
 Mass Framingham, Gerald Foxen Co. 617-879-5505
 Mo St. Louis, Gordon Fisman Engrg. Co. 314-725-5219

NY Floral Park, M.O.S. Assoc. 516-694-5923

NY Pompey, Stuart Foster Co. 315-677-3333

Tenn Bristol, Rakes Engrg. & Mktg. Corp. 615-968-4195

Tex Dallas, Precision Sls. 214-351-6964

Wash Bellevue, Vantage Corp. 206-455-3460

JERROLD ELECTRONICS CORP., Distributor Sales Div., 200 Witmer Rd., Horsham, Pa., 19044, Tel: 215-674-4800, TWX: 510-665-6880

Products manufactured: Amplifiers, Antenna Feed Systems, Antennas, Attenuators, Bridges, Cable, CATV Systems & Equipment, Comparators, Converters, Couplers, Demodulators, Detectors, Filters, Generators, Insertion Loss, Measurement Systems, Jacks (All Types), Meters, Modulators, All Kinds, Mounts, Networks, Switches, Television Systems & Equipment Closed-Circuit, Terminals, Test Equipment, Testers, Transformers

Local Sales Offices & Reps.

Cal Redwood City, R. Snider415-365-5050
Ga Atlanta, O. Cavendish404-432-3102
Mo No. Kansas City, W. Woody816-842-1555

JERSEY SPECIALTY CO., Box 248, Burgess Pl., Wayne, N.J., 07470, Tel: 201-694-8200; Empl.: 40; Minimum order: \$50

Customer service: R. D. Foster

Free literature available: Catalog and Wire Sample Board.

Products manufactured: Cable, Wire

Local Sales Offices & Reps.

Cal Los Angeles, Erlanger Sls. Co.213-731-2238
Del Newark, F. S. Carmine Co.302-738-5966
Fla Miami, Raulson & Co.305-226-6013
Ga Atlanta, H. W. Phillips Co.404-237-7564
Ill Chicago, Lassars & Co.312-539-0170
Ind Indianapolis, D. Powers Sls., Inc.317-846-0790
Mass Lynn, Keene Sls. Co.617-595-2300
Mich Brighton, Lector Sls. Co.313-632-7941
Minn St. Louis Park, Smith Sls. Co.613-377-3187
Mo Raytown, M. Taraski Sls. Co.816-358-1442
NJ Teaneck, Fisher Elctn. Assocs.201-837-1200
NY Liverpool, Lewis-Dunnigan Co.315-622-2133
NC Charlotte, D. Austin Co.704-366-4643
Ohio Medina, T. Grant Assocs.216-692-3050
Ore Portland, R. M. Minthorne503-246-4556
Tex Dallas, Crockett Sls. Co.214-748-8209
EXP: New York, N.Y., Roburn Agencies212-989-5939

JETTRON PRODS., 58 Rte. 10, Box 7, Hanover, N.J., 07936, Tel: 201-887-0571; FSC No: 04435; Empl.: 30; Minimum order: \$20

For info on price: R. Jannacelli; Application info: E. Dietz; Customer service: J.M. Schill; Delivery info: D. Lanata

Free literature available: Magnetron Connectors, 50 Types Plus Input Terminal Outlines; Molded H.V. Cabel Assembly Outlines And Anode Terminal Types; Magnetron Connectors, 5 Types, Magnetron Tube Type Listing; Jettron Thermal Time Delay Relays, 45 P/N's.

Products manufactured: Cable Assemblies & Harnesses, Caps, Connector, Clamps & Clips, Connector Adapters, Connectors, Holder & Carriers, Holders, Crystal, Jigs And Fixtures, Chassis & Circuit Board, Lead Assemblies & Receptacles, Relays, Retainers, Services, Assembly, Production & Test, Sockets, Strips, Testers

Local Sales Offices & Reps.

Cal El Monte, Western Controls213-443-9376
Ill Chicago, William F. Hamilton Co.312-545-7676
Mass Natick, Wayland Engrg. Sls.617-655-6080
NY New York, Eltron Export Co.212-944-7635
FOR: Can., Willowdale, Ont., Avotronics Ltd.

JEWELL ELECTRICAL INSTRUMENTS, INC., Grenier Field, Manchester, N.H., 03105, Tel: 603-669-8400; Empl.: 500

Products manufactured: Controls/Control Eqpt., Indicators, Meters

Local Sales Offices & Reps.

Ariz Scottsdale, E.V. Roberts & Assocs.205-881-1213
Ark Magnolia, J.Y. Schoonmaker Co.501-234-3778
Cal Culver City, E.V. Roberts & Assocs.213-870-9561
Colo Denver, R.G. Bowen Co.303-722-4641
Conn New Haven, Gerber Sls. Corp.203-767-6279
Fla Orlando, Cartwright & Bean Inc.305-422-4531
Fla Plantation, Cartwright & Bean Inc.305-791-3989
Ga Atlanta, Cartwright & Bean, Inc.404-237-2273
Ill Barrington, F.J. Peck Co.312-381-3388
Ind Indianapolis, L.M. DeVoe Co.317-257-1227
Kans Shawnee Mission, Kathrinus, Kelly & Co.913-722-0000
La Chalmette, Cartwright & Bean, Inc.504-279-4598
Mass East Longmeadow, Gerber Sls. Corp.413-525-3059
Mass Waltham, Gerber Sls. Corp.617-890-8040
Mich Dearborn, Villani-Pitcher313-271-4600

Minn Edina, M. Foster Co.612-941-7600
Mo St. Louis, Kathrinus & Kelly314-968-3800
NJ Cherry Hill, Trinkle Sls., Inc.609-667-3500
NM Albuquerque, C.T. Carlberg & Assocs.505-265-1579
NY Garden City, Comtronics Assocs.516-741-8966
NY N. Syracuse, L.D. Allen, Inc.315-458-7470
NC Charlotte, Cartwright & Bean, Inc.704-333-6457

Ohio Beachwood, Elctns. Salesmaster, Inc.216-831-2900
Okla Tulsa, J.Y. Schoonmaker501-234-3778
Tenn Memphis, Cartwright & Bean, Inc.901-276-4442

Tex Dallas, J.Y. Schoonmaker Co.214-357-8481
Tex Houston, J.Y. Schoonmaker Co.713-926-9510
Utah Salt Lake City, R.G. Bowen Co.801-364-4632
Wash Seattle, F. Jackson Co.206-363-3931

JFD ELECTRONICS COMPONENTS CORP., 15th Ave. at 62nd St., Bklyn., N.Y., 11219, Tel: 212-331-1000, TWX: 710-584-2462; Empl.: 325; Minimum order: \$50

For info on price: L. Semmel; Application info: F. Caserta; Customer service: M. Miller; Delivery info: M. Miller

Free literature available: Microceram Porcelain Ceramic Multilayer Capacitors; Piston Timmer Capacitors; Air Variable Capacitors; Subminiature Ceramic Disc Capacitors; Fixed and Variable Metalized Indicators, LC tuners; Modutrim Microminiature Ceramic Variable Capacitors.

Products manufactured: Capacitors, Fixed, Capacitors, Variable, Coils Including Assemblies & Forms

Local Sales Offices & Reps.

Ala Huntsville, 20th Century Mktg.205-772-9237
Ariz Tempe, Argus Sls.602-967-8709
Cal Los Altos, Recht Assocs.415-941-0336
Cal Van Nuys, MCA So. Cal.213-785-0487
Colo Denver, Omega Ltd.303-758-1508
Fla Altamonte Springs, SemTronic Assocs.305-831-8233
Fla Ft. Lauderdale, SemTronic Assocs.305-771-0010
Ga Atlanta, G. Duckett Sls. Co.404-451-3529
Ill Chicago, MCA Chicago312-992-2090
Ill Hinsdale, Momak Sls.312-654-4524
Ind Indianapolis, Electro-Reps Inc.317-255-4147
Kans Prairie Village, Engrg. Svcs. Co.914-649-4000
Md Ellicott City, Doss Elctns.301-465-1336
Mass Framingham, MCA Boston617-872-4843
Mich Southfield, Luebke Sls. Co.313-357-0355
Minn St. Louis Park, Beta Engrg. Corp.612-925-4422
Mo St. Louis, Engrg. Svcs. Co.314-997-1515
NY Jericho, HRC Comp-Tech, Inc.516-822-5550
NY New Hartford, MCA Upstate N.Y.315-732-3507
NC Charlotte, L.P. Spoon, Inc.704-372-3290
Ohio Cincinnati, Luebke Sls.513-871-4211
Ohio Cleveland, Luebke Sls.216-333-0425
Ohio Dayton, Luebke Sls.513-294-0426
Pa King of Prussia, Monteiro Assocs., Inc.215-265-0634

Tex Dallas, United Comps.214-861-4306
Wash Seattle, H. Levinson Co.206-EA-3-5100
Wisc Milwaukee, Star Engrg. Sls.414-543-3469
FOR: Can., Toronto, Ont., Kaytronics Ltd.416-638-5511

FOR: Can., Montreal, Quebec, Kaytronics Ltd.514-487-3434
FOR: Can., Vancouver, B.C., Harry Levinson206-EA-3-5100

J.D.N. ELECTRONICS INC., Box 156, 239 Morristown Rd., Gillette, N.J., 07933, Tel: 201-647-2400; Empl.: 5; Minimum order: \$15

For info on price: M. Fussell; Application info: D. Bock; Customer service: D. Bock; Delivery info: M. Fussell

Free literature available: JDN Series A - 0.10 uh to 1000 uh shielded inductor, JDN Series B - 0.10 uh to 10000 uh shielded inductor, JDN Series C - 0.10 uh to 100000 uh shielded inductor, JDN Series D - 0.10 uh to 100000 uh shielded inductor, Mechanical dimensions on products plus, complete listing of electrical parameters and, applicable Mil specifications.

Products manufactured: Chokes, Coils Including Assemblies & Forms

Local Sales Offices & Reps.

Ala Huntsville, Inctech Inc.205-837-6061
Cal Sunnyvale, Amasco408-733-8690
Ill Chicago, Chant-Asian Association312-235-8443
Mass Waltham, Betronic Assocs.617-894-8400
NJ Kenilworth, Ventronics, Inc.201-272-9262

Ohio Chagrin Falls, Pine Sls. & Engrg. Co.216-247-6198

Pa King of Prussia, Schibley Assocs.703-591-3008
Va Fairfax, Schibley Assocs.703-591-3008
Wash Seattle, Walt Spaulding Co.206-282-9173

JPI, INC., 1507 San Vicente Blvd., Santa Monica, Cal., 90402, Tel: 213-395-2018; Empl.: 3

Customer service: S. Kondo

Products manufactured: Boards, Printed Circuit, Boards, Printed Wiring, Universal, Coils Including Assemblies & Forms, Counters, Heads, Recording Playback, Erase, Indicators, Inverters, Lamps, Meters, Power Supplies, Readers, Speaker Systems, Tachometers, Testers

JOHANSON MFG. CORP., Box 329, Boonton, N.J., 07005, Tel: 201-334-2676, TWX: 710-987-8367; Empl.: 160; Minimum order: \$35p. 2*204

Customer service: P. Smeeton

Products manufactured: Capacitors, Fixed, Capacitors, Variable, Tuners

Local Sales Offices & Reps.

Ariz Scottsdale, Q.T. Wiles & Assocs.602-948-5590
Cal Menlo Pk., Straube Assocs.415-323-2476
Cal Studio City, Shortronics, Inc.213-789-0418
Colo Denver, Straube Assoc.-Mountain States, Inc.303-426-0890
Conn Meriden, J. Murphy Assocs.203-269-1812
Fla Clearwater, Perrott Assocs.813-726-1549
Fla Orlando, Perrott Assocs., Inc.305-275-1132
Ill Rolling Meadows, Sumer, Inc.312-394-4900
Ind Greenwood, Valentine & Schillinger317-888-2260

Ind South Bend, Valentine & Schillinger219-291-6258
Md Silver Springs, Rep-Tron, Inc.301-593-4844
Mass Seekonk, J. Murphy Assocs.617-761-7153
Minn Minneapolis, Stoss Assocs.612-925-2757
NM Albuquerque, Straube Assoc.-Mountain States, Inc.505-292-0295
NY Fayetteville, Graydon-Sherman315-637-9861
NY Mt. Vernon, Friedman-Smith Elctn. Sls.914-644-4866

Ohio Cleveland, Electro-Com216-886-2404
Ohio Dayton, Electro-Com513-276-3993
Pa Feasterville, Professional Svc. Assocs.215-355-6244

Tex Ft. Worth, W. Pat Fralia Co.214-264-3491
Utah Salt Lake City, Straube Assoc.-Mountain States, Inc.801-328-4513
Wash Seattle, R. Johnston Co.206-524-5170

Local Distributors

Cal Oxnard, JACO Elctns., Willard Hills Rd.213-887-6400
Cal Sunnyvale, Diplomat/Westland, 1118 Elko Dr.408-734-1900
Fla Orlando, Pelcor Co., 1607 Forsyth Rd.305-275-1132
Ill Chicago, Newark Elctns., 500 N. Pulaski312-638-4411
Md Baltimore, Radio Elec. Ser., 1026 Cromwell Bridge Rd.301-823-0700
Mass Medford, Blake Assocs., 74 Lawrence Rd.617-391-7890
NY Hauppauge, JACO Elect., 195 Engineer Rd.516-273-5500
Pa Philadelphia, Philadelphia El., 112 N. 12th St.215-568-8288
Tex Ft. Worth, PATCO Co., 6100 Camp Bowie Blvd.214-264-3491

JOHANSON/MONOLITHIC DIELECTRICS DIV., Box 6456, Burbank, Cal., 91505, Tel: 213-848-4465, TWX: 910-498-2735; Empl.: 75; Minimum order: \$25p. 2*205

Customer service: H. Huber

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Ariz Scottsdale, Q.T. Wiles602-948-5590
Cal Menlo Park, Straube Assocs.415-323-2476
Cal Sherman Oaks, J.B. Microelctns.213-789-0418
Colo Boulder, Straube/Mountain States, Inc.303-443-8600
Conn Durham, J. W. Murphy Assocs.203-269-1812
Fla Orlando, Pelcor305-275-1132
Ill Sumer Inc.312-394-4900
Ind South Bend, Valentine & Schillinger219-291-6258
Md Silver Springs, Rep-Tron, Inc.301-593-4844
Mass Seekonk, J. W. Murphy Assoc.617-761-7153
Minn Minneapolis, Stoss Assocs.612-925-2757
NJ Mt. Vernon, Friedman-Smith Elect. Sls.914-664-4866

NY	Fayetteville, Graydon-Sherman, Inc.	315-637-9861	Cal	Los Angeles, RPS Elctns., 1501 S. Hill St.	213-748-1271	Minn	Minneapolis, Newark-Minneapolis Elects. Corp., 336 Hoover St., N.E.	612-331-6350
Ohio	Cleveland, Electro-Com	216-886-2404	Cal	Mt. View, Elmar Elctns., 2288 Charleston Rd.	415-961-3611	Minn	Minneapolis, Stark Elctns., 112 3rd Ave. N.	612-332-1325
Okla	Tulsa, W. P. Fralia Co., Inc.	918-663-8707	Cal	Oakland, Brill Elctns., 610 E. 10th	415-834-5888	Minn	St. Paul, Gopher Elctns., 2520 W. Larpenteur Ave.	612-645-0889
Pa	Philadelphia, Professional Service Assoc.	215-722-8222	Cal	Palo Alto, 415-326-5432, 654 High St.	415-3256-5432	Mo	Kansas City, Burstein Applebee Co., 3199 Mercier St.	816-531-5614
Pa	Pittsburgh, Electro-Com	216-886-2404	Cal	Riverside, Electronic Supply, 2486 3rd St.	714-787-9220	Mo	Kansas City, Walters Radio Supply, 3635 Main St.	816-531-7015
Tex	Fort Worth, W. Pat Fralia Co.	214-264-3491	Cal	San Diego, Mock III Sls., 5150 Convoy St.	714-560-0515	Mo	St. Louis, Olive Indl. Elctns., 6662 Olive Blvd.	314-863-7800
Wash	Seattle, R. Johnson Co.	206-524-5170	Cal	San Diego, Shank & Wright, 2045 Kettner Blvd.	714-239-0176	NH	Concord, Evans Radio, Inc., Rt. 3 at Bow Junction	609-964-8560
FOR:	Can., Que., Braydon Electro, Ltd.	514-341-3330	Cal	San Diego, Sterling Elctns., 6158 Mission Gorge Rd.	714-283-6575	NJ	Camden, General Radio Supply, 600 Penn St.	201-887-2550
JOHNATHAN MFG., 1101 South Acacia Ave., Fullerton, Calif.			Cal	San Francisco, Zack Elctns., 1444 Market St.	415-626-1444	NJ	Green Brook, Green Brook Elec., 269 U.S. Highway 22 East	201-376-8900
JOHNSON CO., E.F., 299 10th Ave., Waseca, Minn., 56093, Tel: 507-835-2050; Empl.: 1400			Cal	San Jose, Quement Elctns., 1000 So. Bascom Ave.	408-998-5900	NJ	Hanover, State Elctn. Parts, 36 Rt. #10	201-785-1830
For info on price: Mktg.; Application info: Mktg.; Customer service: Cust. Svc. Dept.; Delivery info: Mktg.			Cal	Santa Barbara, Channel Radio Supply Co., 18 E. Ortega St.	805-965-8551	NJ	Little Falls, IPC Corp., Cardinal Dr.	201-376-8900
Free literature available: Capacitors Catalog, JCM Miniature Coaxial Connectors Catalog, Electrical Hardware Catalog.			Cal	Woodland Hills, Jaco Elctns., 21201 Oxnard	213-887-6400	NJ	Pennsauken, Radio Elec. Svc., Airport Industrial Pk.	609-662-4000
Products manufactured: Capacitors, Variable, Comm. Systems, Connectors, Jacks (All Types), Plugs, Posts, Terminals, Transceivers, Transmitters			Cal	Denver, Electronic Parts, 1212 So. Bdwy.	303-744-1992	NJ	Rahway, Terminal Elects. Corp., Pinewood St.	201-381-5700
Local Sales Offices & Reps.			Cal	Denver, Elmar Elctns., 5701 E. Evans Ave.	303-758-5711	NJ	Springfield, Federated Purchaser, 155 U.S. Rt. #22	201-376-8900
Ariz	Phoenix, Clemick-Neenan & Assoc.	602-254-2327	Cal	Denver, Newark/Denver, 2170 S. Grape St.	303-757-3351	NJ	Springfield, Route Elctns., U.S. Rt. #22	201-376-8900
Cal	Los Angeles, Clemick-Neenan & Assocs.	213-476-1272	Cal	Lakewood, Acacia Sls., 11111 W. 8th Ave., Unit B	303-232-2882	NM	Albuquerque, Electronic Parts Co., 2620 Rhode Island St., N.E.	505-293-6161
Cal	Redwood City, Logan Sls. Co.	415-369-6726	Cal	Miami, Electronic Equip., 2701 N.W. 42nd Ave.	305-871-3500	NY	Binghamton, Stack Ind. Elects., 45-49 Washington St.	607-723-6371
Cal	Denver, McLeod & Raymond Co.	303-756-1589	Cal	Orlando, Hammond Elctns., 911 W. Central Ave.	305-241-6601	NY	Buffalo, Genesee Radio, 2550 Delaware	716-873-9661
Conn	Meriden, P.R. Sturgeon Co.	203-237-1112	Fla	Tampa, Lykes Elctns., Box 24047		NY	Buffalo, Standard Elect., 3519 Union Rd.	716-685-4220
Fla	Bradenton, Hutto-Hawkins-Perego, Inc.	813-755-4015	Ga	Atlanta, Ack Radio Supply, 554 Deering N.W.	404-351-6340	NY	Buffalo, Summit Distrs., 916 Main St.	716-884-3450
Fla	Maitland, Hutto-Hawkins-Perego, Inc.	305-831-2474	Ga	Atlanta, Lykes Elctns. Corp., 1135 Chattahoochee Ave.	404-355-2223	NY	Farmingdale, Arrow Elctns., 900 Broadhollow Rd.	516-694-6800
Fla	Pompano Beach, Hutto-Hawkins-Perego, Inc.	305-943-9593	Ill	Chicago, Allied Elctns., 2400 W. Lake St.	312-421-2400	NY	Farmingdale, Broadline Elctns. Distributors, 119 Marine St.	516-420-8320
Ga	Atlanta, Millar Elctns. Inc.	404-261-6160	Ill	Chicago, Electronic Distributing, 4900 N. Elston Ave.	312-283-4800	NY	Farmingdale, Harrison Radio Co., 20 Smith St.	516-293-7990
Ill	Chicago, Ellinger Sls. Corp.	312-763-1570	Ill	Chicago, Newark Elctns., 500 N. Pulaski Rd.	312-638-4411	NY	Freeport, Milgray Elctns., 191 Hanse Ave.	516-546-6000
Iowa	Cedar Rapids, J. Vrbik Co.	319-377-8244	Ill	Geneva, Melvin Elctns., 825 W. State St.	312-232-8050	NY	Hauppauge, Jaco Elctns., 195 Engineers Rd.	516-273-5981
Kans	Overland Park, T.L. Dowell & Assocs.	913-238-8200	Ill	Palatine, OHM/Elect., 649 Vermont Ave.	312-359-5500	NY	Long Island City, Dalis, H.L., 35-24th St.	212-361-1100
La	Chalmette, McFadden Sls. Inc.	614-221-3363	Ill	Peoria, Klaus Radio & Elec. Co., 8400 N. Pioneer Parkway	309-691-4840	NY	Lynbrook, Peerless Radio Corp., 19 Wilbur St.	212-523-3456
Md	Baltimore, J. Bresson Assocs.	215-839-6770	Ind	Fort Wayne, Ft. Wayne Elctn. Supply, 3606 Maumee Ave.	219-423-3422	NY	New York, Barry Elctns. Corp., 512 Broadway	212-925-7000
Mass	Babson Park, P.R. Sturgeon Co.	617-237-3506	Ind	Indianapolis, Graham Elctns., 133 S. Pennsylvania St.	317-634-8486	NY	Port Washington, Restart Elctns., 820 Port Washington Blvd.	516-883-3500
Minn	Minneapolis, S. Clothier Co.	612-888-4666	Ind	Indianapolis, RadisCo, Inc., 814 N. Senate Ave.	317-637-5571	NY	Rochester, Rochester Radio Supply, 140 W. Main St.	716-454-7800
Miss	Jackson, Cartwright & Bean	504-354-1368	Ind	South Bend, Radio Distributing, 1212 High St.	219-288-4666	NY	Rochester, Simcona Elctns., 275 Mt. Read Blvd.	716-328-3230
Mo	Shrewsbury, T.L. Dowell & Assocs.	314-647-7067	Iowa	Cedar Rapids, DEECO, Inc., 2500 16th Ave., S.W.	319-365-7551	NY	Rochester, Summit Elctns., 292 Commerce Dr.	716-334-8110
NY	Palisades Park, E.F. Johnson Co.	201-461-6463	Kans	Wichita, Interstate Elctns. Supply, 1330 E. 1st St.		NY	Rome, Rome Elctns., 216 Erie Blvd. E.	315-337-5400
NJ	Elmont, F.E. Schmitt Co.	516-437-8150	Kans	Wichita, Radio Supply Co., 115 Laura		NY	White Plains, Westchester Elctns., 602 Mamaroneck Ave.	914-949-2400
NY	Syracuse, Mor-Com Assocs.	315-437-2843	Ky	Louisville, Burks, P.I., 842 S. 7th	502-589-3960	NY	Woodbury, Harvey Radio Co., 60 Crossway Park W.	516-921-8700
NC	Raleigh, Millar Elctns., Inc.	404-261-6160	La	New Orleans, Southern Radio Supply, 1909 Tulane Ave.	504-524-2343	NY	Rochester, Rochester Radio Supply, 140 W. Main St.	716-454-7800
Ohio	Columbus, McFadden Sls., Inc.	614-221-3363	Md	Baltimore, Radio Elec. Svc., 1026 Cromwell Bridge Rd.	301-823-0070	NC	Raleigh, Southeastern Radio Supply Co., 414 Hillsborough St.	919-724-0541
Ore	Portland, J.J. Backer Co.	503-297-3776	Md	Bethesda, Empire Elctn. Supply, 4907 Rugby Ave.	301-656-3300	NC	Winston-Salem, Kirkman Elctns., 901 W. 2nd St.	919-724-0541
Ore	Salem, J.J. Backer Co.	503-362-0717	Md	Rockville, Capitol Radio Wholesalers, 12270 Wilkins Ave.	301-881-2270	Ohio	Akron, Akron Elect. Supply, 107 S. Arlington	216-762-8818
Pa	Narberth, J. Bresson Assocs.	215-839-6770	Mass	Boston, Demambo Elctns., 1095 Commonwealth Ave.	617-787-1200	Ohio	Cincinnati, Hughes-Peters, Inc., 4865 Duck Creek Rd.	513-351-2000
Pa	Pittsburgh, Covert & Newman Co.	412-563-0303	Mass	Boston, Sager Electrical Supply, 172 High St.	617-542-2281	Ohio	Cleveland, Pioneer Cleveland Elctns., 4800 E. 131st St.	216-587-3600
Tenn	Memphis, Cartwright & Bean Inc.	901-276-4442	Mass	Cambridge, Wilshire Elctns./New Eng., 205 Alewife Brook Pkwy	617-491-3300	Ohio	Cleveland, R.P.C. Elctns., 749 Miner Rd.	216-587-3600
Tex	Dallas, R.E. Nesbitt Co.	214-357-4601	Mass	Dedham, Gerber Elctns., 852 Providence Hwy.	617-329-2400	Ohio	Columbus, Hughes-Peters, 481 E. 11th Ave.	614-294-5351
Tex	Houston, R.E. Nesbitt Co.	713-224-3633	Mass	Newton, Cramer Elctns., 85 Wells Ave.	617-969-7700	Ohio	Dayton, Esco, Inc., 221 Crane St.	513-224-9192
Va	Lynchburg, J. Bresson Assocs.	215-839-6770	Mass	Newton, Greene-Shaw Co., 70 Bridge St.	617-969-8900	Ohio	Dayton, Pioneer/Dayton, 1900 Troy St.	513-236-9900
Wash	Seattle, J.J. Backer Co.	206-285-1300	Mass	Springfield, Cushing, T. F., 1026 Bay St.	413-788-7341	Ohio	Dayton, Stotts Friedman Co., 108 N. Jefferson St.	513-224-1111
EXP:	New York, Roburn Agencies	212-989-5939	Mass	W. Newton, A. W. Mayer, 38 Border St.	617-965-1111	Okla	Okklahoma City, Trice Wholesale Elctns., 4701 N. Stiles	405-524-4411
FOR:	Can., Calgary, Alb., A.C. Simmonds & Sons	403-242-3207	Mass	Watertown, Sterling Elctns., 51 Spring St.		Okla	Portland, United Radio Supply, 123 N.E. 7th Ave.	503-233-7151
FOR:	Can., Montreal, Que., A.C. Simmonds & Sons	514-352-5250	Mich	Ann Arbor, Wedemeyer Elctn. Supply, 2280 S. Industrial Hwy.	313-665-8611	Okla	Tulsa, Capitol Elctns., 708 S. Sheridan	918-836-2541
FOR:	Can., Smith Falls, Ont., A.C. Simmonds & Sons	613-283-2727	Mich	Detroit, R. S. Elctns., 12775 Lyndon	313-491-1000	Okla	Tulsa, Radio, Inc., 1000 S. Main St.	918-587-9123
FOR:	Can., Vancouver, B.C., A.C. Simmonds & Sons	604-324-3921	Minn	Minneapolis, Electronic Center, 127 3rd Ave., N.	612-338-5881	Ore	Portland, Portland Radio Supply, 1234 S.W. Stark St.	503-228-8647
FOR:	Can., Willowdale, Ont., A.C. Simmonds & Sons	416-491-1010						
FOR:	Can., Winnipeg, Man., A.C. Simmonds & Sons	204-489-2086						
Local Distributors								
Ala	Huntsville, Mock Elctns., 2310 Memorial Pkwy.	205-539-2401						
Ariz	Phoenix, Dalis Radio & TV Supply, 917 North 7th St.	602-258-4531						
Ariz	Phoenix, Sterling Elctns., 2001 East University	602-624-4402						
Ariz	Tucson, Inland Elctns. Supply, 715 E. Broadway	602-624-4402						
Cal	Irvine, Terminal Elctns., 1791 Reynolds Ave.	714-549-8611						
Cal	Los Angeles, California Elctns. Supply, 1911 Armacost Ave.	213-826-8333						
Cal	Los Angeles, Henry Radio, 11240 Olympic Blvd.	213-272-1440						

Pa	Braddock, M. Leff Radio Parts, 225 Braddock Ave.	412-271-2800
Pa	Montgomery, Pytronics Inds., Montgomeryville Ind. Bldg.	215-643-2850
Pa	Philadelphia, Almo Elctns. Corp., 9815 Roosevelt Blvd.	215-676-6000
Pa	Philadelphia, Herbach & Rademan, 401 E. Erie Ave.	215-426-1700
Pa	Philadelphia, Philadelphia Elctns., 112 N. 12th St.	215-568-8288
Pa	Pittsburgh, Cameradio Co., 2801 Liberty Ave.	412-288-2600
Pa	Pittsburgh, RPC Elctns., 620 Alpha Dr.	412-782-3770
RI	Providence, Dandretta, Wm., Co., 28 Wolcott St.	401-861-2800
Tenn	Knoxville, Industrial Elctns., Gov. John Sevier Hwy.	713-224-9131
Tenn	Nashville, Electra Distributing Co., 1914 West End Ave.	615-329-3971
Tex	Dallas, All State Elctns., 516 S. Good-Latimer	
Tex	Dallas, Sterling Elctns., 2875 Merrell Rd.	817-336-5401
Tex	Dallas, Wholesale Elctns. Supply, 2809 Ross Ave.	214-824-3001
Tex	Ft. Worth, Allied Elctns., 401 East 8th St.	817-336-5401
Tex	Ft. Worth, Swieco, Inc., 1512 E. Lancaster	817-335-6521
Tex	Garland, Newark Dallas, 707 Easy St.	214-271-2511
Tex	Houston, Geophysical Supply Co., 1500 Crawford St.	713-224-0621
Tex	Houston, Harrison Equip., 1616 McGowen	713-224-9131
Tex	Houston, Wofford Elctns. Co., 7537 Edna St.	713-644-1838
Utah	Salt Lake City, Kimball Elctns., 350 Pierpont Ave.	801-328-2075
Utah	Salt Lake City, Standard Supply Co., 225 E. 6th St.	801-355-2971
Va	Charlottesville, Virginia Radio Supply, 715 Henry Ave.	703-296-4184
Va	Roanoke, Peoples Radio & TV, 1015 Moorman Rd., N.W.	703-342-8933
Wash	Seattle, ALMAC/Stroum Elctns., 5811 6th Ave. S.	206-763-2300
Wash	Seattle, Interface Elctns. Corp., 300 2nd Ave. W.	206-285-3500
Wash	Seattle, Radar Elec. Co., 168 Western Ave. W.	206-282-2511
Wash	Seattle, Sterling Elctns., 5608 6th Ave. S.	206-284-0200
Wash	Seattle, Western Elctns., 717 Dexter Ave. N.	206-284-0200
WVA	Breckley, Halley Elctns. Co., 713 S. Oakwood Ave.	206-284-0200
Wisc	Madison, Satterfield Elctns., 1900 S. Park St.	608-257-4801
Wisc	Milwaukee, Electronic Expeditors, 6045 N. Green Bay Ave.	414-276-4160
Wisc	Milwaukee, Parts Mart, Inc., 1314 N. 7th St.	414-545-6500
Wisc	West Allis, Marsh Radio Supply, 6047 W. Beloit Rd.	414-545-6500
For:	Can., Montreal 427, Que., A.C. Simmonds & Sons, Ltd., Place Versailles, Suite 315, 7275 est rue Sherbrooke	514-352-5250
For:	Can., South Burnaby, B.C., A.C. Simmonds & Sons, Ltd., 7010 Sussex Ave.	604-434-9002
For:	Can., Vancouver, B.C., A.C. Simmonds & Sons, Ltd., 8175 Main St.	604-324-3921
For:	Can., Willowdale, Ont., A.C. Simmonds & Sons, Ltd., 285 Yorkland Blvd.	416-491-1010
For:	Can., Winnipeg, Manitoba, A.C. Simmonds & Sons, Ltd., 109 Ruby St.	204-489-2086

JOLO INDUSTRIES, INC., 11861 Cardinal Circle, Garden Grove, Cal., 92643, Tel: 714-636-4940; Empl.: 10; Minimum order: \$15

For info on price: T. Giampiccolo; Delivery info: J. Baval

Free literature available: Product data sheets to all letter head requests.

Products manufactured: Connectors, Guides, Circuit Board, Jacks (All Types), Plug Adapters, Sockets

Local Sales Offices & Reps.

Cal	Burlingame, Leddy Assocs.	415-347-5247
Fla	N. Miami, Irby & Connolly	305-949-5197
Fla	Orlando, Irby & Connolly	305-894-8471
Id	Riverdale, Riggs Assocs.	301-927-3380
Mass	Brookline, Harman Assocs.	617-232-6687
NJ	Riverton, Given Assocs.	609-829-7249
NY	Manhasset, Everett Mktg. Corp.	516-627-7750
NY	Vestal, Systems Hardware Reps.	607-729-6339
Ohio	Cleveland, Geotronics Mktg. Assocs.	216-526-2535
Ohio	Columbus, Geotronics Mktg. Assocs.	614-457-8472

SC Greenville, Egan Assocs.803-288-4450
Wash Kirkland, Lehr Assocs.206-827-4581
FOR: Can., Scarborough, Ont., Lake Engrg. Co.416-751-5980

Advertisement

Manufacture Quality Electronic Components Dual in-Line IC Sockets, Dual in-Line Headers, Connectors, Strip Sockets, P.C. Test Jacks, P.C. Card Ejector, P.C. Card Guide, P.C. Card Edge Connectors and Custom Connectors. All JOLO Sockets Feature Closed-Entry Insulators, Excellent Lead Retention Characteristics, Pedestal Design For Flux Removal and Anti-Wicking Capability.



JONARD INDUSTRIES CORP., 134 Marbledale Rd., Tuckahoe, N.Y., 10707, Tel: 914-793-0700, TWX: 710-562-0107; Empl.: 65; Minimum order: \$25 p. 2*1706-1709

For info on price: M. Zyzzyk; Application info: J. Roman; Customer service: S. J. McKinnon

Products manufactured: Brushes & Brush Assemblies, Burnishers, Contact, Calibrators, Cases, Equipment, Instrument, Meter, Cleaners & Solvents, Connectors, Drivers, Nut, Gages, Heat Guns, Production, Heat Sinks, Soldering, Holder & Carriers, Holders, Circuit Board (Production Type), Kits, Breadboarding (For Engineers), Kits, Switch Assembling, Kits, Test Equipment, Leads, Test & Adaptors, Lubricants, Meters, Microscopes, Pliers, Probes, Pullers, Scissors, Screwdrivers, Scribes, Seizers, Services, Assembly, Production & Test, Soldering Accessories, Soldering Guns, Irons & Desoldering Tools, Splicers, Coaxial Cable, Splices, wire (Including, Butt & Cap Types), Testers, Tools, Torches, Soldering, Welding & Access., Tweezers, Hand & Vacuum, Wire, Wire Strippers, Wire Twisters, Wrenches

Local Distributors

Cal	Garden Grove, Allied Elctns., 12311 Industry St.	213-598-6605
Cal	Inglewood, Newark Elctns., 4747 W. Century Blvd.	213-678-0441
Colo	Englewood, National Camera, 2000 W. Union Ave.	303-789-1893
Fla	Miami, Electro-Standards Labs., 35-60 NW 34th St.	305-633-6975
Ill	Chicago, Newark Elctns., 500 N. Pulaski Rd.	312-638-4411
Ill	Elgin, Allied Elctns., 1355 Sleepy Hollow Rd.	312-697-8200
La	Lafayette, Ralph's of Lafayette, 3004 Cameron St.	318-234-4507
NY	Mount Vernon, Elctn. Tool, 15 Bertel Ave.	914-664-0088
NY	New York, Graybar Elec., 420 Lexington Ave.	212-532-4000
Okla	Tulsa, S & S Radio Sup., 537 S. Kenosha	918-582-8242
Pa	Plymouth Meeting, Techni-Tool, Apollo Rd.	215-825-4990
Tex	Dallas, Specialized Prods., 2324 Shorecrest Dr.	214-358-4663

Advertisement

MANUFACTURERS OF PRECISION HAND TOOLS FOR THE ELECTRONIC, TELECOMMUNICATION AND AEROSPACE INDUSTRIES SUCH AS WRAPPING TOOLS, CONNECTOR TOOLS, GAUGES, BURNISHERS, ADJUSTERS, CONNECTOR INSERTION AND REMOVAL TOOLS, ETC.

JONES ELCTNS., HIRAM, 11607 Vanowen St., No. Hollywood, Cal., 91605, Tel: 213-875-0213; FSC No: 04867; Empl.: 8; Minimum order: \$20p. 2*682-685
Customer service: E. W. Reed

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Contacts, Electrical, Jacks (All Types), Terminals

Local Sales Offices & Reps.

Tex	Dallas, Packard Assocs.	214-357-5713
Tex	Houston, Lenert Co.	713-225-1465
Tex	Paris, Amrad Corp.	214-785-4544
EXP:	N.Y., New York, C. Tennant	212-679-1300

JONESVILLE PAPER TUBE CORP., 474 Beck Rd., Jonesville, Mich., 49250, Tel: 517-849-9963; Empl.: 40
Products manufactured: Tubing

JORDAN CONTROLS, 5607 W. Douglas Ave., Milwaukee, Wisc., 53218, Tel: 414-461-9200; Empl.: 55-60; Minimum order: \$25

For info on price: R. Hall; Application info: D. Minue; Customer service: R. Hall; Delivery info: R. Hall

Free literature available: "Remote Positioning Controls for Industry" - catalog describing products, applications & theory.

Products manufactured: Actuators, Amplifiers, Controls/Control Eqpt., Servo Systems

Local Sales Offices & Reps.

Cal	Santa Ana, Electramation	714-541-4434
Cal	Santa Clara, Johnson Assocs.	408-984-4626
Colo	Denver, D.E. Bond Assocs.	303-756-1234
Conn	Simsbury, Canner Assocs.	203-658-5074
Ga	Atlanta, F.B. Culwell & Assocs.	404-939-1860
Ill	Chicago, Clarkson Engrg. Co.	312-286-2314
Ind	Indianapolis, Garstang Engrg. Co.	317-632-9903
Kans	Shawnee Mission, W. Hickman Co.	913-362-8066
Mass	Lynn, Canner Assocs.	617-589-4740
Mich	Birmingham, Electro-Mation Assoc.	313-564-6517
Minn	St. Paul, Kenco Co.	612-645-7717
Mo	St. Louis, Ray Co.	314-241-5376
Neb	Omaha, W. Hickman Co.	402-334-0861
NJ	Newark, N. Brager Co., Inc.	201-344-1100
NY	Buffalo, J.W. Simpson Co.	716-634-3995
NY	New York, N. Brager Co. Inc.	212-697-1050
NC	Charlotte, Beck Sls. & Engrg. Co.	704-366-5366
Ohio	Chagrin Falls, J. Kilroy Corp.	216-247-8997
Pa	Bala Cynwyd, Jackson-Bowden Automation	215-664-9611
Pa	Erie, Foster-McClinton Inc.	814-453-5786
Pa	Pittsburgh, Foster-McClinton Inc.	412-561-4803
Tex	Dallas, Peco-Production Engrg.	214-369-3181
Va	Roanoke, Johnson Custom Control 703-774-5550	
Wash	Bellevue, Southwell Controls Ltd.	206-454-1140
WVa	Huntington, Foster-McClinton Inc.	304-736-5161
EXP:	New Haven, Conn., Master-Wright	203-288-1638

JORDAN ELECTRIC CO., 14707 Keswick St., Van Nuys, Cal., 91405, Tel: 213-781-3849; FSC No: 5905; Empl.: 50; Minimum order: \$25

For info on price: K. Landers; Application info: R. Jordan; Customer service: K. Landers

Free literature available: Catalog; samples when ordered on company purchase order

Products manufactured: Resistors, Shunts, Meter

Local Sales Offices & Reps.

Ariz	Phoenix, Micro Elctns. Dist.	602-944-2281
Ariz	Phoenix, Moltronics of Ariz.	602-272-7951
Ariz	Phoenix, Parts Elctns.	601-258-6476
Cal	San Diego, Ohm Spun Elctns.	714-277-6230
Cal	Santa Clara, Mauldin Co.	408-249-7660

JOSLYN ELCTRN. SYS., Div. Joslyn Mfg. & Supply Co., 6868 Cortona Dr., Box 817, Goleta, Cal., 93017, Tel: 805-968-3551; FSC No: 23663; Empl.: 100; Minimum order: \$30

For info on price: W. O. Hecht; Application info: J. J. Gilmour; Customer service: W. O. Hecht; Delivery info: W. O. Hecht

Products manufactured: Arresters, Electrical Surge, Lightning, Counters, Limiters, Protectors, Spark Gaps, Suppressors



JSH ELECTRONICS, INC., 8549 Higuera St., Culver City, Cal., 90230, Tel: 213-559-6900, TWX: 910-340-6356; FSC No: 28436; Empl.: 127; Minimum order: \$25

For info on price: L. W. Novin; Application info: B. Segal; Customer service: A. de Villeneuve; Delivery info: A. de Villeneuve

Free literature available: 64 page price list covering almost 30,000 types of Electron Tubes and Semiconductors

Products manufactured: Tubes

Local Sales Offices & Reps.

Mass Belmont, Cunningham Sales Co. 617-489-2180
Mich Birmingham, Forand Sales Co. 303-644-0087

JUDSON RESCH. & MFG. CO., Conshohocken, Pa., 19428, Tel: 215-828-3011; Empl.: 30; Minimum order: \$20

Customer service: R. Gibson 215-828-0433

Products manufactured: Detectors

JUDD WIRE DIV., Electronized Chems. Corp., S Bedford St., Burlington, Mass., 01803, Tel: 413-863-4357, TWX: 510-290-2147; Empl.: 70

Customer service: M. Walker

Products manufactured: Cable, Wire

Local Sales Offices & Reps.

Ariz Scottsdale, Carter Assocs. 602-947-4355
Cal Los Altos, Ewing-Foley 415-941-4525
Cal Woodland Hills, Cal-Ward Sls. 213-883-2202
Fla Pompano Beach, Technology Mktg. 305-942-0774

Md Baltimore, Burgin-Kreh Assoc. 710-862-1450
Mass Marlborough, O.K. Engrg. 617-481-6400
Mass Sturges, Kesler Assoc. 616-651-7619
Minn Edina, W.L. Ruth & Assoc. 612-941-6350
NJ Hackensack, TRAK Sls. 201-487-5075
NY Syracuse, D. Dwyre 315-472-8282
Ohio Dayton, Whelan Corp. 513-434-7551
Pa Haddonfield, Mesa Tech. Assoc. 609-429-9531
Tex Dallas, Stevens Sls. Co. 214-350-2476
Va Lynchburg, Burgin-Kreh Assoc. 804-845-5600
Wash Olympia, Bergford Assoc. 206-866-2001

JULIE RESEARCH LAB., 211 West 61st St., New York, N.Y., 10023, Tel: 212-245-2727; Empl.: 40; Minimum order: \$50

For info on price: Sls. Dept.; Application info: Sls. Dept./Engrg.; Customer service: Prod. Dept.; Delivery info: Sls. Dept.

Free literature available: General Catalogue (in preparation), CC-11 Short Form-categorical listing/description, LOCOST Portfolio-complete packet on Julie Ate. Resistor Bulletins-specifications on resistors, Instrument Data Sheets.

Products manufactured: Amplifiers, Bridges, Crystals, Current Sources, Data Acquisition & Reduction Systems, Decade Boxes, Dividers, Indicators, Meters, Networks, Power Supplies, References, D-C Voltage, Resistors, Scanners, Shunts, Meter, Standards, Test Systems, Testers, Voltage Sources

Local Sales Offices & Reps.

Cal Pasadena, Luscombe Engineer 213-684-2000
Cal San Mateo, Luscombe Engineer 415-342-7057
Mass E. Pepperill, Legor Labs. 617-433-6940
Tex San Antonio, Teletronics Labs., Inc. 512-735-6179

K & S ENGINEERING, 6917 W. 59th St., Chicago, ILL., 60638

Products manufactured: Services, Assembly, Production & Test, Tubing

K-W ENGINEERING WORKS, N50 W16328 Pin Oak Ct., Menomonee Falls, Wisc., 53051, Tel: 414-781-8616; Empl.: 37

Customer service: H. Kaetel

Products manufactured: Antennas, Coils Including Assemblies & Forms, Mounts

KAHAN ELECTRONICS CORP., 556 Peninsula Blvd., Hempstead, NY, 11550, Tel: 516-538-2300; Empl.: 12

For info on price: B. Stapler; Application info: B. Stapler; Customer service: B. Quisenberry; Delivery info: B. Quisenberry

Free literature available: Mica capacitors, low cost and subminiature. Low cost, low voltage, standardized ceramic capacitors; Aluminum Electrolytic Capacitors-Single Ended (Radial Leads); Solid, Dipped Tantalum Capacitors-Single Ended (Radial Leads); Metal Oxide Film Resistors (1/2 to 5 watts)-Flame-proof Coating.

Products manufactured: Capacitors, Fixed, Resistors

Local Sales Offices & Reps.

Ariz Phoenix, G. R. McKnight Co. 602-257-8037
Cal City of Industry, Micrometals 213-968-4718
Cal Menlo Park, G. R. McKnight Co. 415-325-2844

Conn West Simsbury, Anchor Engrg. Corp. 203-658-6261

Fla Altamonte Springs, Semtronics Assocs. 305-831-8233

Fla Ft. Lauderdale, Semtronics Assocs. 305-771-0010

Ill Des Plaines, E. Flaxman Co. 312-298-8580

Kans Shawnee, J. F. Guernsey Co. 913-631-2414

Mass Wellesley Hills, Anchor Engrg. Corp. 617-235-6330

Mich Detroit, Nicor Assocs. 313-341-7688

Minn Minneapolis, Thomas Mktg. 612-823-4880

NM Albuquerque, G. R. McKnight Co. 505-266-6423

Pa Reading, Beil-Whitaker 215-779-2610

Tex Addison, Southland Comps. 214-231-2008

Va Alexandria, Potomac Electrn. 703-836-1630

Wash Redmond, Desco Northwest 206-455-9325

KAHLE ENGRG. CO., 3344 Hudson Ave., Union City, N.J., 07087, Tel: 201-867-6500; Empl.: 50

For info on price: C. A. Napor; Application info: C. A. Napor; Customer service: E. Stiefel; Delivery info: C. A. Napor

Free literature available: Our literature covers CRT production; mercury switch manufacture; lamps and component manufacture; hermetically sealed capacitors, diodes; exhaust machines; capacitor testing; brazing, soldering and welding systems.

Products manufactured: Cams, Furnaces, Machines/Machinery, Production, Ovens, Soldering Accessories, Soldering Equipment, Testers

Advertisement

KAHLE Automatic Production Machines and Machine Systems are custom engineered for precision, high speed processing or assembling of lamps, tubes, semi-conductors, diodes, transistors, electrical sub-assemblies, switches, vacuum bottles, etc. Hermetic seal and exhaust machines include those for most vacuum and gasfilled devices; two or three piece lead-and-cap, lead-slug butt welding by resistance or capacitor discharge welding machines with 100-200 per minute capacity; cat-whisker or current carrying element welding. Glass machinery of all types.

KALART VICTOR CORP., Hultenius St., Plainville, Conn., 06062, Tel: 203-747-1663

For info on price: H. Nettleton; Application info: H. Nettleton; Customer service: J. J. Costag; Delivery info: J. J. Costag

Free literature available: Form #TB55-TeleBeam II new solid state large screen television projector.

Products manufactured: CATV Systems & Equipment

KAMAN SCIENCES CORP., 1500 Garden of the Gods Rd., Colorado Springs, Colo., 80907, Tel: 303-599-1500; Empl.: 450; Minimum order: \$50

For info on price: G. Cooper 303-599-1891; Application info: S. Smith 303-599-1892; Customer service: H. Ramey 303-599-1864; Delivery info: G. Cooper 303-599-1891

Products manufactured: Accelerometers, Cable, Transducers

Local Sales Offices & Reps.

Cal Temple City, Kaman Sciences 213-579-4867
Conn Simsbury, Kaman Sciences 203-821-6989
Pa Bethayres, Control Instr. Sls. Co. 215-676-1808

KANDU CORPORATION, 5635 Kendall Ct., Arvada, Colo., 80002, Tel: 303-421-8031; Empl.: 19; Minimum order: \$5

Customer service: K. Norris

Free literature available: E-3 Lists prototype P.C. supplies and accessories Etching and plating supplies. 4C Describes custom metal products

Products manufactured: Chemicals, Cleaners & Solvents, Drills & Accessories, Hand & Power, Electroplating Equipment & Supplies, Etchants, Printed Circuit, Kits, Printed Circuit, Laminates, Nameplates, Services, Assembly, Production & Test, Templates, Printed Circuit Design

KAPPA NETWORKS, 165 Roosevelt Ave., Carteret, N.J., 07008, Tel: 800-631-5653; Empl.: 40 p. 1461-464

Products manufactured: Coils Including Assemblies & Forms, Delay Lines, Equalizers, Synthesizers, Transformers

Local Sales Offices & Reps.

Ariz Scottsdale, R.R. Thomas Co. 602-994-0401
Cal Alhambra, M.W. Ridel Co. 213-283-7694
Ill Chicago, Electro Tech. Assoc. 617-272-7655
Mass Burlington, Burlington Sls. 612-861-6051
Minn Minneapolis, Heimann Co. 201-541-1600
NJ Carteret, Kappa Networks 609-779-9282
NY Cherry Hill, Benco Sales 516-484-1276
Roslyn Heights, Livera-Polk Assoc. 513-761-7993

Ohio Cincinnati, Tri State Mktg. 214-363-8591
Tex Dallas, R.R. Thomas Co. 801-266-9617
Utah Salt Lake City, Monarch Distributing & Representing 206-248-0090
Wash Seattle, Delcom Sls. Co. 206-248-0090

KAPPA SCIENTIFIC CORP., Box 30585, Santa Barbara, Cal., 93105, Tel: 805-967-2396; Empl.: 4

Customer service: F. R. Marshall

Free literature available: Send for: Data sheets describing Kerr cells for Photography. Q-switching and light modulation, also High Voltage Pulse Generators, with nanosecond speed and very low jitter.

Products manufactured: Generators, Modulator/Demodulators, Networks

Advertisement

Kerr cells featuring picosecond response and apertures to 25mm for photography, Q-switching, and light modulation. Specialists in fast, high amplitude pulse generators with outputs to 30 Kilovolts or more, sub-nanosecond speed and very low jitter. Applications to electro optical modulators, spark gap triggering, laser excitation. Custom requirements are invited.

KATES SCIENTIFIC INSTRS., INC., 23 Converse Ave., Newton, Mass., 02158, Tel: 617-527-2711; Empl.: 18

For info on price: M. Kates; Application info: M. Kates; Customer service: D. Kates

Products manufactured: Braid, Cable, Cards, Logic, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Coils Including Assemblies & Forms, Controls/Control Eqpt., Integrated Circuit Packaging Systems, Modules, Logic, Encapsulated, Services, Assembly, Production & Test, Wire

KATO ENGINEERING CO., 1415 1st Ave., Mankato, Minn., 56001, Tel: 507-387-4011; Empl.: 450

For info on price: M. C. Madsen; Application info: F. Batemon; Customer service: J. Findblom; Delivery info: G. Cliff

Free literature available: Numerous brochures describing KATO generators, motors, power conversion motor - generator sets and complete engine-generator control systems are available from KATO Engineering Company.

Products manufactured: Controls/Control Eqpt., Generators, Motor & Generator Armatures, Rotors, Stators, Motor Electric Generator Sets, Motors, Power Supplies, Regulators, Transformers

Local Sales Offices & Reps.

Cal San Rafael, H. Wells Assocs. 415-454-5730
Conn Trumble, Roswell Engrg. 203-268-4382
Ill Deerfield, Electrocon Inc. 312-948-0320
La Metarie, General Power & Control Corp. 504-834-1345

Minn St. Paul, DeBeck Assocs. 612-690-1557
NH Ashland, Roswell Engrg. 603-968-7022
NY Seaford, Greer Tech. Sls., Inc. 516-785-6919
Ore Portland, W. Haynes Assoc. 503-236-2744
Tex Dallas, General Power Equip. Co. 214-368-4655
Houston, General Power Equip. Co. 713-524-1895

Va Virginia Beach, R.H. Graham 804-425-1388
FOR: Can., Chomeday, Laval, Que., T. G. McDougall 514-332-0712

FOR: Can., North Vancouver, B.C., C. L. Thompson, Ltd. 604-987-9388

FOR: Can., Winnipeg, Man., C. L. Thompson, Ltd.
204-783-0848

KAWECKI BERYCO INDS., INC., 220 East 42nd St., New York, NY, 10017, Tel: 212-682-7143, TWX: 710-581-5199; Empl.: 1925

For info on price: R. McLaughlin Ext. 217; Application info: C. B. Harlan; Customer service: R. McLaughlin; Delivery info: R. McLaughlin

Products manufactured: Alloys, Cores, Ceramic, Eyelets, Foil, Jigs And Fixtures, Chassis & Circuit Board, Metal Compounds, Foils, Powders, Sheet, Stock, Metal Oxides, Metals, Pliers, Screwdrivers, Services, Assembly, Production & Test, Tools, Tubing, Wrenches

Local Sales Offices & Reps.

Cal Long Beach, Kaweck Beryco Ind., Inc. 213-595-4525
Cal Palo Alto, Kaweck Beryco Ind., Inc. 415-323-9625
Conn Thomaston, Eyelets for Industry, Inc. 203-283-8213
Conn Thomaston, Summit Finishing Div.
Ga Atlanta, Kaweck Beryco Inds., Inc. 404-458-7824
Ill Des Plaines, Kaweck Beryco Inds., Inc. 312-824-6133
Mass Boston, Metalonics Div. 617-268-4450
Mass Waltham, Kaweck Beryco Inds., Inc. 617-890-8270
Mich Dearborn, Kaweck Beryco Inds., Inc. 313-292-0300
NJ Palisades Park, Duramic Prods. 201-947-8313
NY New York, Kaweck Beryco Inds., Inc. 212-697-4360
Ohio Cleveland, Kaweck Beryco Inds., Inc. 216-464-8860
Ohio Dayton, Kaweck Beryco Inds., Inc. 513-298-1433
Ore Springfield, National Metallurgical Div. 503-746-7670
Pa Reading, Kaweck Beryco Inds., Inc. 215-929-0781
Pa Revere, Penn Rare Metals Div. 215-847-5121
Wash Wenatchee, Wenatchee Works 509-663-2165

KAY ELEMETRICS CORP., 12 Maple Ave., Pine Brook, N.J., 07058, Tel: 201-227-2000, TWX: 710-734-4347; Empl.: 86 p. 1-746-749

Customer service: J. Connors

Free literature available: GENERAL R.F. TEST EQUIPMENT equipment for tests in the audio thru microwave range. PRECISION, STEPPED ATTENUATOR attenuators for the Audio thru Microwave frequency ranges. CATV TEST EQUIPMENT-Video thru UHF Test equipment for CATV.

Products manufactured: Amplifiers, Analyzers, Attenuators, Bridges, CATV Systems & Equipment, Detectors, Electronic Switches (Oscilloscope), Generators, Insertion Loss Measurement Systems, Meters, Switches, Testers

Local Sales Offices & Reps.

Ariz Scottsdale, Barnhill Assocs. 602-947-7841
Cal Canoga Park, Kay Elemetrics Corp. 213-883-4610
Cal Canoga Park, Kay Elemetrics Corp. 303-934-5505
Conn Hamden, J & J Assocs. 203-624-7800
Ill Northfield, Feller Assocs. 312-446-8065
Mass Burlington, J & J Assocs. 617-272-2606
NM Albuquerque, Barnhill Assocs. 505-299-7658
Tex Houston, Barnhill Assocs. 713-688-9971
Tex Richardson, Barnhill Assocs. 214-231-2573

KD COMPONENTS, INC., 3016 S. Orange Ave., Santa Ana, Cal., 92707, Tel: 714-545-7108; Minimum order: \$25

Customer service: M. Day

Free literature available: Technical and ordering information on single layer and multilayer ceramic capacitors for 125°C and 200°C temperatures. Voltage ranges from 25 to 1500V.

Products manufactured: Capacitors, Fixed

Local Distributors

Tex Houston, Lenert Co., 1420 Hutchins 713-225-1465

KEDMAN CO., Box 267, Salt Lake City, Utah, 84110

KEITHLEY INSTRUMENTS INC., 28775 Aurora Rd., Cleveland, Ohio, 44139, Tel: 216-248-0400; Empl.: 200; Minimum order: \$15

For info on price: V. Disantis Ext. 261; Application info: C. Garfinkel Ext. 286; Customer service: V. Disantis Ext. 261; Delivery info: V. Disantis Ext. 261

Free literature available: Full-Line Catalog (All products except below), Keithley Engineering Notes (Models 164, 165, 168, 171, 180, 190, 227, 244), Product Information Bulletins (Models 103A, 160, 160B, 163, 167, 225, 427, 616, 616/6169, 840, 26000, 35020, 35050)

Products manufactured: Amplifiers, Bridges, Calibrators, Detectors, Indicators, Meters, Monitors, Power Supplies, Testers, Voltage Sources

Local Sales Offices & Reps.

Cal Cupertino, T.L. Snitzer Co. 408-257-8333
Cal Del Mar, T.L. Snitzer Co. 714-454-2191
Cal Los Angeles, T.L. Snitzer Co. 213-836-6170
Colo Littleton, Aztec Entrs., Inc. 303-795-0250
Ill Chicago, Carter Elctns., Inc. 312-585-5485
Ind Indianapolis, Carter Elctns., Inc. 317-293-0696
Minn Minneapolis, Carter Elctns., Inc. 612-544-9393
Mo Hazelwood, Tech. Reps., Inc. 314-731-5200
Mo Independence, Tech. Reps., Inc. 816-737-1414
NJ Flemington, Keithley Instrs., Inc. 201-782-5555
NM Albuquerque, Aztec Entrs., Inc. 505-265-2440
Ore Portland, McLaren, Inc. 503-297-2248
Tex Austin, Palatine Sls. 512-451-7463
Tex Houston, Palatine Sls. 713-777-4477
Tex Richardson, Palatine Sls., Inc. 214-231-9489
Tex Tulsa, Palatine Sls. 918-622-0321
Wash Bellevue, McLaren, Inc. 206-454-3400
Wisc Milwaukee, Carter Elctns., Inc. 414-464-5555
EXP: Cleveland, Ohio, Keithley Int'l. Sls. Corp. 216-248-0400

KELK, GEORGE LTD., 48 Lesmill Rd., Don Mills, Ont., Canada, Tel: 416-445-5850; Empl.: 60; Minimum order: \$10

For info on price: P. R. Wharton; Application info: C. H. Draper; Customer service: J. Mitchell; Delivery info: J. Mitchell

Products manufactured: Amplifiers, Cells, Load, Dividers, Inverters, Regulators, Tachometers

KELTEC FLORIDA, A Division of Aiken Industries, Inc., Box 1348, Fort Walton Beach, Fla., 32548, Tel: 904-651-1210, TWX: 510-730-7775; FSC No: 09062; Empl.: 197; Minimum order: \$100

Customer service: Mktg. Dept.

Products manufactured: Amplifiers, Power Supplies

Local Sales Offices & Reps.

Ala Huntsville, Gentry Assocs. 205-534-9771
Ariz Tempe, PLS Assocs. 602-957-9110
Cal Los Altos, Stout-Loeswick 415-948-3265
Cal Los Angeles, Cain Technology 213-476-2251
Colo Denver, PLS Assocs. 303-771-0140
Fla Orlando, Gentry Assocs. 305-894-4401
Ill Park Ridge, RF Specialists 312-698-2044
Ind Fort Wayne, RF Specialists 219-485-8982
Iowa Cedar Rapids, Palatine Sls. 319-365-8071
Kans Overland Park, Palatine Sls. 913-262-5643
Md Ellicott City, VPI 301-465-4060
Mass Needham Heights, Repton 617-449-4141
Mich Detroit, Micro Sls. Corp. 313-482-1229
Mo St. Louis, Palatine Sls. 314-426-7055
NJ Rockaway Borough, Gray & Reed Assocs. 201-625-0223
NM Albuquerque, PLS Assocs. 505-255-2330
NY Huntington Station, Gray & Reed Assocs. 516-433-3333
NY Syracuse, Labtronics 315-454-9314
NC Burlington, Gentry Assocs. 919-227-3639
Ohio Dayton, Micro Sls. Corp. 513-885-4171
Pa Montgomeryville, VPI 215-474-3200
Tex Richardson, Lear Assoc. 214-231-5388
Utah Salt Lake City, PLS Assocs. 801-272-3681
Va Merrifield, VPI 703-573-7837
Wash Seattle, Delcom Sls. Co. 206-248-0090

KELTRON, 223 Crescent St., Waltham, Mass., 02154, Tel: 617-894-0525; Empl.: 100

Products manufactured: Counters, Drivers & Decoders For Readouts, Power Supplies, Printers, Timers

Local Sales Offices & Reps.

Cal Mountain View, Tri-Rep 415-965-1882
Cal Santa Fe Springs, Sls. Engrs., Ltd. 213-921-4337
Fla Orlando, Gra-Mar, Inc. 305-894-3351
Ill Chicago, Scientific Sls. 312-775-7594
Ind Indianapolis, Scientific Sls. 317-253-4806
Mich Detroit, Ridgway-East 313-538-3940
Minn Bloomington, Scientific Sls. 612-881-3300
NJ Harrington Park, Metro Tech. Sls. 201-768-8495
NY Jericho, Metro Tech. Sls. 516-935-3330
Ohio Chagrin Falls, Ridgway-East 216-247-4485
Ohio Loveland, Ridgway-East 513-683-4350
Pa Abington, Bach-Stewart 215-885-1550

Wash Bellevue, A. Smith Co. 206-746-6670

KELVIN, 5919 Noble Avenue, Van Nuys, Cal., 91411, Tel: 213-782-6662, Telex: 651417; FSC No: 07088; Empl.: 250; Minimum order: \$35

Customer service: Sls. Dept.

Products manufactured: Networks, Resistors

Local Sales Offices & Reps.

Ariz Scottsdale, Piper-Goyne 602-946-4437
Cal Mountain View, G.C. Woempner Co. 415-964-5454
Cal San Diego, Harvey King 714-276-7541
Colo Boulder, R-G Entrs. 303-447-9211
Conn Milford, Todino Engrg. Sls. 203-874-6643
Fla Fort Lauderdale, Orbe 305-564-8571
Ga Smyrna, B-C Elctns. 404-436-5169
Ill Des Plaines, Coombs Assoc. 312-298-4830
Iowa Des Moines, Beams 515-282-0292
Kans Overland Park, Beams 913-341-7744
Md Baltimore, Callas Elctns. 301-744-7711
Mass Needham Hgts., Todino Engrg. 617-444-7925
Mich Grosse Pointe Park, S. Greiner 313-499-0188
Minn St. Paul, Cahill Assocs. 612-646-7217
Mo Creve Couer, Beams 314-569-1080
NJ Haddonfield, Gray Assoc. 609-429-5300
NM Albuquerque, Piper-Goyne 505-265-6794
NY Great Neck, Trionic 516-466-2300
NY Pompey, S.F. Foster 315-677-3333
NY Webster, S.F. Foster 716-872-5220
Ohio Akron, Augnat Assoc. 216-725-6087
Ohio Dayton, Augnat Assoc. 513-223-5002
Pa Pittsburgh, Augnat Assoc. 412-281-8283
Tex Dallas, Reese Assoc. 214-638-6575
Wash Seattle, H. Levinson 206-323-5100

KEMLITE LABS., INC., 1819 W. Grand Ave., Chicago, Ill., 60622, Tel: 312-829-6050; Empl.: 65; Minimum order: \$10

For info on price: P. Hamlin; Application info: H. W. Klauer; Customer service: J. Daniels, Jr.; Delivery info: J. Daniels, Jr.

Free literature available: Brochure Lists Many Of Our Standard Photographic Flashtubes and Reflector Flashtubes.

Products manufactured: Lamps

KEMTRON ELECTRON PRODS., INC., 14 Prince Pl., Newburyport, Mass., 01950, Tel: 617-462-4464

Products manufactured: Diodes

KENCO ALLOY & CHEMICAL CO., INC., 418 W. Belden Ave., Addison, Ill., 60101, Tel: 312-543-6060; Empl.: 12

For info on price: M. Bush; Application info: K. Barry; Customer service: E. Wolfgram; Delivery info: T. Whalen

Free literature available: General Catalog of solders, fluxes, cleaners, coatings & PCB processing chemicals.

Products manufactured: Chemicals, Cleaners & Solvents, Coatings, Flux, Brazing & Soldering Materials, Solder (All Types), Soldering Accessories

Local Sales Offices & Reps.

Ariz Phoenix, K. Jahn Co. 602-956-9060
Cal Mountain View, Morse Assocs. 415-968-7722
Fla Largo, Doug Shower Assocs. 813-446-6505
Mass Hudson, E.P.E. Corp. 617-562-9123
Minn St. Paul, Nordic Elctns. 612-226-2210
Mo Springfield, Del-Tech Assocs. 417-881-3667
NJ Princeton, Krone & Rubin Assocs. 609-924-0200
NY Webster, Krone & Rubin Assocs. 716-671-6709
Ohio Dayton, Buckeye Comps. 513-278-4279
Tex Dallas, Atlan Inds. 214-243-6216
Wash Seattle, F. Jackson Co. 206-782-2211
EXP: Ill., Addison, Kenco Alloy & Chemical Co. 312-543-6060

KENTON ENGRG. CORP., 8232 Christiana Ave., Skokie, Ill., 60076, Tel: 312-677-8280; FSC No: 18308; Empl.: 18

For info on price: A. R. Friesel; Application info: R. E. Zenner; Customer service: E. A. Roberts

Products manufactured: Memory Systems, Meters, Tape Recording Accessories

KENTUCKY ELECTRONICS, INC., 1204 Industrial Dr., Box 507, Owensboro, Ky., 42301, Tel: 502-684-0431; Empl.: 300; Minimum order: \$100

For info on price: R. Soblosky; Application info: E. E. Yorns; Customer service: T. Payne; Delivery info: T. Payne

Free literature available: Facilities Brochure - Outlines general capabilities.

Products manufactured: Cans, Capacitor, Relay, Semiconductor, Transformer, etc., Caps, Connector, Clamps & Clips, Connectors, Eyelets, Fasteners, Forms, Wire, Pins, Services, Assembly, Production & Test, Wire

Local Sales Offices & Reps.

Ariz	Phoenix, Southwest Engrg.	602-993-0250
Cal	Atherton, Wadsworth-Pacific Mfg. Assocs.	415-321-3619
	Pacific Palisades, Wadsworth-Pacific Mfg. Assocs.	213-454-4313
Conn	Madison, A & M Electronic Reps.	203-245-1031
Ill	Park Ridge, R. McIntosh	312-825-8070
Mass	Needham, A & M Electronic Reps.	617-444-8170
NJ	Haddenfield, Keefe Electronic Sls.	609-429-4650
NY	Williamsville, Henderson Assocs.	716-634-8650
Tex	Dallas, Waddle Sls. Co.	214-638-2860

Advertisement

Deep-drawn and stamped metal parts, wire forms, and fine wire. KE specializes in close-tolerance, precision parts and close-tolerance, critical-surface wire. Main plant has low-tonnage presses (to 35-ton) and low-to-medium tonnage eyelet machines (to No. 20). Subsidiary does contract tool and die work and medium-tonnage stamping (to 100-ton). Custom assembly services available at both plants.

KEPCO, INC., 131-38 Sanford Ave., Flushing, N.Y., 11352, Tel: 212-461-7000, TWX: 710-582-2631; Empl.: 200 p. 1-239-1301

For info on price: C. Parrish; Application info: P. Birman; Customer service: E. Becker; Delivery info: B. Ruppert

Free literature available: "Using Operational Power Supplies" "Kepco power supply catalog & handbook" Kepco international catalog (in French & German)

Products manufactured: Generators, Power Supplies, Regulators

Local Sales Offices & Reps.

Ala	Huntsville, J.L. Highsmith Co.	205-881-3294
Ariz	Tempe, J.F. Hurlbut Co.	602-968-5962
Cal	Los Angeles, Windsor Dynamics	213-989-3631
Cal	S. Francisco, Windsor Dynamics	415-854-4870
Colo	Denver, J.F. Hurlbut Co.	303-279-7796
Conn	Farmington, R. Perron Co.	203-673-4825
Conn	Trumbull, R. Perron Co.	203-268-9631
Fla	Orlando, J.L. Highsmith Co.	305-293-5202
Ill	Chicago, Midwest Elctn. Sls.	312-777-9700
Iowa	Cedar Rapids, Midwest Elctn. Sls.	319-362-4410
Kans	Shawnee Mission, K. Kelly & Co.	913-722-0000
Md	Baltimore, Eastern Instrumentation	301-744-3675
Md	Silver Spring, Eastern Instrumentation	301-681-6500
Mass	Boston, R. Perron Co.	617-762-8114
Mich	Detroit, Carter McCormick & Peirce Inc.	313-477-7700
Minn	Minneapolis, E.C. Elctn. Sls.	612-927-7777
Mo	St. Louis, Kathrinus, Kelly & Co.	314-968-3800
NH	Dover, R. Perron & Co.	603-742-2321
NM	Albuquerque, Technology Mktg. Assoc.	505-298-4321
NY	New York, Eastern Instrumentation	516-466-9505
NY	Rochester, NACO Elctns. Corp.	716-223-1156
NY	Syracuse, NACO Elctns. Corp.	315-699-2651
NY	Utica, NACO Elctns. Corp.	315-732-1801
NC	Charlotte, J.L. Highsmith Co.	704-333-7743
Ohio	Cleveland, Carter McCormick & Peirce Inc.	216-333-5650
Ohio	Dayton, Carter McCormick & Peirce Inc.	513-278-5873
Pa	Philadelphia, Eastern Instrumentation	215-927-7777
Pa	Pittsburgh, Carter McCormick & Peirce	412-472-4415
Tex	Dallas, Airep Elctns. Inc.	214-827-2120
Va	Norfolk, Eastern Instrumentation	804-497-0001
Va	Richmond, J.L. Highsmith Co.	703-272-5888
Wash	Seattle, H. Levinson Co.	206-323-5100
Wisc	Milwaukee, Midwest Elctn. Sls.	414-542-5129
For:	Can., Halifax, N.S., Radionics Ltd.	902-455-0670

For: Can., Montreal, Que., Radionics Ltd. 514-735-4565

For: Can., Ottawa, Ont., Radionics Ltd. 613-521-8251

For: Can., Vancouver, B. C., Radionics Ltd. 604-732-7317

For: Can., Winnipeg, Radionics Ltd. 204-475-1732

For: Can., Toronto, Ont., Radionics 416-638-0218

KERTRON, INC., 7516 Central Ind'l. Dr., Riviera Beach, Fla., 33404, Tel: 305-848-9606, TWX: 510-952-7611; Empl.: 160

Products manufactured: Transistors

Local Sales Offices & Reps.

Ariz	Tempe, Sedco Inc.	602-950-1149
Cal	Palos Verdes Peninsular, B. Gray & Assocs.	213-373-1820
Cal	Redwood City, Parks & Pruitt	415-364-1640
Colo	Denver, Camel Elctns.	303-757-6192
Ill	Chicago, Derndt Assoc.	312-283-0713
Kans	Overland Park, Palatine Engrg. Sls.	913-262-5643
Md	Silver Spring, Rep-Tron	301-593-4844
Mass	Framingham, G. Rosen Co.	617-879-5505
Mich	Southfield, Reps. Elctn. Prods.	313-354-9066
Mo	St. Louis, Engrg. Svcs.	314-997-1515
NY	East Rockaway, W. Bellenkes & Assoc.	516-887-1443
Ohio	Cincinnati, Giesting Assocs.	513-931-0812
Okla	Tulsa, Palatine Engrg. Sls.	918-622-0321
Pa	Amblor, WM Assocs.	215-643-4119
Tenn	Bristol, Rakes Engrg. & Mktg. Co.	615-968-4195
Tex	Richardson, Palatine Engrg. Sls.	214-231-9489



KESSLER-ELLIS PRODS., 120 1st Ave., Atlantic Highlands, N.J., 07716, Tel: 201-291-0500, Telex: 13-2496; FSC No: 28222; Empl.: 30; Minimum order: \$15 p. 1-254-259

For info on price: L. Gleeson; Application info: R. Laird; Customer service: L. Gleeson; Delivery info: L. Gleeson

Free literature available: Bulletin #1200 General Catalog, Bulletin #12 ER type of counters, Bulletin #20 Elapsed time indicators, Bulletin #21 Electronic line-both totalizing & predetermining, Bulletin #14 Pneumatic Predetermining & Totalizing counters.

Products manufactured: Controls/Control Eqpt., Counters, Indicators, Switches, Timers, Totalizers, Digital

Local Sales Offices & Reps.

Ala	Atlanta, Electro Mech. Inc.	404-393-0444
Ariz	Phoenix, Palmer Assocs.	602-996-9077
Cal	San Gabriel, Van Gott Assocs.	213-285-2148
Colo	Denver, Palmer Assocs.	303-255-9961
Fla	Clearwater, WMM Assoc.	813-447-2533
Ill	Des Plaines, Lincoln Hodges	312-297-3810
Ind	Indianapolis, F. Sedlack	317-545-1141
Md	Silver Springs, H.R. Siebar	301-589-9110
Mass	Woburn, Gilway Sls. Co.	617-935-4442
Mich	Dearborn, Pitcher-Paulin	313-582-5450
Minn	Minneapolis, R.J. Sls.	612-922-1425
NJ	Atlantic Highlands, R. L. Dalton	201-291-0500
NY	Rochester, L. Marchese	716-544-4300
Ohio	Cleveland, E. Bock & Assocs.	216-331-5212
Pa	Media, W. Reeves	215-566-6709
Tex	Houston, W. Carey Assocs.	713-460-1111
Wash	Seattle, C. Parsons	206-762-7373
Wisc	Waukesha, Rockwell, Brown, Lincoln, Hodges	414-542-3087

KESTER SOLDER DIV., Litton Systems Inc., 4201 Wrightwood Ave., Chicago, Ill., 60639, Tel: 312-235-1600; Empl.: 350

Customer service: B. Mullins

Free literature available: Distributor Catalog; OEM Catalog

Products manufactured: Cleaners & Solvents, Flux, Brazing & Soldering Materials, Solder (All Types), Soldering Equipment

Local Sales Offices & Reps.

Cal	Anaheim	714-871-0280
NJ	Newark	201-589-0246

KEUFFEL & ESSER CO., 20 Whippany Rd., Morristown, N.J., 07960, Tel: 201-285-5181; Empl.: 2200

For info on price: J. Montesi 201-285-5358; Application info: R. Wayne 201-285-5181; Customer service: J. Montesi 201-285-5358

Products manufactured: Cleaners, Ultrasonic, Drafting Machines, Drafting Symbols, Dry Transfer, Pressure Sensitive, etc. (Including Lettering), Films, Paper, Graphic Recording

Local Sales Offices & Reps.

Alas	Anchorage	907-277-2506
Cal	Los Angeles	213-747-7601
Cal	S. San Francisco	415-873-6850
Colo	Denver	303-733-2451
Fla	Jacksonville	904-398-6471
Fla	Orlando	305-423-1641
Ga	Norcross	404-448-6352
Ill	Northbrook	312-564-0880
Kans	Wichita	316-265-8505
Md	Baltimore	301-727-5290
Mich	Troy	313-549-9100
Mo	Kansas City	816-842-9077
Mo	St. Louis	314-773-8500
NJ	Teterboro	201-288-3900
NJ	Trenton	609-882-8000
NY	E. Syracuse	315-437-1417
NY	Long Island City	212-361-2190
NY	New York	212-687-6510
Ohio	Cleveland	216-241-7807
Ohio	Cuyahoga Falls	216-929-8371
Ohio	Toledo	419-475-3427
Pa	Ft. Washington	215-643-2570
Tex	Dallas	214-742-8084
Tex	Houston	713-227-6231
Tex	San Antonio	512-223-3811
Va	Arlington	703-524-9000
Va	Norfolk	703-625-2591
Wash	Seattle	206-623-5535
Wisc	Milwaukee	414-444-1890
FOR:	Can., Montreal 376, P.Q.	514-735-4171
FOR:	Can., Ottawa 13, Ont.	613-725-2048
FOR:	Can., Ste. Foy, Que.	418-688-9049
FOR:	Scarborough, Ont.	416-751-5600

KEWAUNEE SCIEN. EQUIP. CORP., 4012 Logan St., Adrian, Mich., 49221, Tel: 313-263-5731; Empl.: 750

For info on price: C. A. Schindler; Application info: D. Richards; Customer service: J. McElfresh; Delivery info: J. McElfresh

Products manufactured: Benches, Consoles, Stools, Tables, Blowers & Fans & Accessories, Chamber, Environmental Test

KEY TRONIC CORP., Bldg. 14, Spokane Ind'l. Pk., Spokane, Wash., 99216, Tel: 509-928-8000, TWX: 510-773-1885; Empl.: 350

Customer service: Mktg. Dept.

Products manufactured: Encoders, Keyboards, Alphanumeric & Decimal, Kits, Switch Assembling, Lights, Switchboards, Switches

KEYSTONE CARBON CO., Thermistor Div., St. Marys, Pa., 15857, Tel: 814-781-1591; Empl.: 1100

p. 1-2317, 2318

Products manufactured: Bearings, Brushes & Brush Assemblies, Controls/Control Eqpt., Indicators, Limiters, Monitors, Networks, Probes, Resistors, Thermistors

Local Sales Offices & Reps.

Cal	San Carlos, Electro Pacific	415-593-1334
Cal	San Gabriel, Van Gott & Assoc.	213-285-2148
Fla	Orlando, Cartwright & Bean	305-422-4531
Fla	Plantation, Cartwright & Bean	305-791-3989
Ga	Atlanta, Cartwright & Bean	404-255-5262
Ill	Elk Grove Village, Knoblock & Assoc.	312-593-5940
Ind	Fort Wayne, R.O. Whitesell & Assoc.	219-432-5591
Ind	Indianapolis, R.O. Whitesell & Assoc.	317-359-9283
Ind	Kokomo, R.O. Whitesell & Assoc.	317-452-6065
Ky	Louisville, R.O. Whitesell & Assoc.	502-893-7303
La	Chalmette, Cartwright & Bean	504-279-4598
Md	Baltimore, Coulbourn DeGreif	301-247-4646
Mass	Reading, C.E. Godfrey Co.	617-944-2230
Mich	Grand Rapids, J.L. Montgomery Co.	616-774-9308
Mich	Southfield, J.L. Montgomery Assoc.	313-358-2616
Minn	Minneapolis, Stoss Assocs.	612-925-2757
Miss	Jackson, Cartwright & Bean	601-981-1368
NJ	Ridgefield, Haber-Ramp Corp.	201-945-5250
NY	Pompey, S.F. Foster Co.	315-677-3333
NY	Webster, S.F. Foster Co.	716-265-2072
NC	Charlotte, Cartwright & Bean	704-333-6457
NC	Raleigh, Cartwright & Bean	919-832-7128
Ohio	Cincinnati, R.O. Whitesell & Assoc.	513-521-2290
Ohio	Columbus, R.O. Whitesell & Assoc.	614-888-9396

Ohio Dayton, R.O. Whitesell & Assoc. 513-298-9546
 Ohio Lakewood, R.O. Whitesell & Assoc.
 216-228-7525
 Pa Fort Washington, GCM, Inc. 215-646-7535
 Pa Pittsburgh, R.O. Whitesell & Assoc.
 412-344-7277
 Tenn Knoxville, Cartwright & Bean 615-693-7450
 Tenn Memphis, Cartwright & Bean 901-276-4442
 EXP: Westbury, N.Y., Minthorne Int'l. 516-334-3303
 For: Can., Markham, Ont., Tel-Mar Elctn. Sls., Ltd.
 416-887-5612

KEYSTONE ELCTRNS. CORP., 49 Bleeker St., New York, N.Y., 10012, Tel: 212-475-4600; FSC No: 91833; Empl.: 50; Minimum order: \$20 p. 2-713-715
 For info on price: B. Luque; Application info: A. Arons; Customer service: D. Rosenberg; Delivery info: L. Schwaid

Free literature available: Standardized Electronic Components catalog includes: Battery Holders and Connectors, Clips, Terminal Boards, Perforated Boards, Plug-In Housings, Spacers and Standoffs, Transistor Sockets and Associated Hardware.

Products manufactured: Boards, Plug-In, Boards, Printed Circuit, Bushings, Glass, Plastic, Metal, Rubber, Etc., Cabinets & Accessories, Cans, Capacitor, Relay, Semiconductor, Transformer, etc, Cases, Equipment, Instrument, Meter, Clamps & Clips, Connectors, Contact Strips, Finger, Contacts, Electrical, Containers, Couplings, Cups, Encapsulation, Enclosures, Module, Plug-In, Eyelets, Fasteners, Headers, Holders, Crystal, Insulators & Insulation, Jack Covers, Jacks (All Types), Jumpers, Kits, Breadboarding (For Engineers), Kits, Printed Circuit, Kits, Terminal, Kits, Test Equipment, Laminates, Locks, Dial & Shaft, Pads, Transistor Mounting, Pins, Plug Adapters, Plug & Jack Sets, Plugs, Probes, Retainers, Services, Assembly, Production & Test, Sockets, Spacers, Terminal Blocks, Boards & Strips, Terminals, Tools

Local Sales Offices & Reps.

Cal Culver City, H. Feldman Co. 213-870-5973
 Cal Daly City, R. Del Bucchia Assocs. 415-756-1664
 Colo Arvada, Arrowhead Sls. 801-487-3444
 Fla N. Miami, Len Hass Co. 305-949-9143
 Ill Chicago, Memac Sls. 312-545-1033
 Kans Overland Park, Penzner Assocs. 913-381-0004
 Md Lutherville, Cunningham & Assocs.
 301-296-4306
 Mass Waltham, Conti-Younger Assocs. 617-890-4582
 NJ Moorestown, L.E. Brown Assocs. 609-234-0382
 NJ Murray Hill, Cambridge-Allen Assocs.
 201-464-7987
 NJ Riveredge, Cambridge Assocs. 201-MU2-5844
 NY Fayetteville, Martin P. Andrews Inc.
 315-637-3144
 NC Charlotte, Maitland K. Smith 704-372-1026
 Ohio Cleveland, Del Steffen & Assocs. 216-461-8333
 Tex Dallas, Texas Sls.
 Tex Garland, Texas Sales Co. 214-270-5451
 Wash Seattle, R. K. Squibb, Inc. 206-632-2450

K.G.S. ELCTRNS., 2029 N. Lincoln Ave., Pasadena, Cal., 91103, Tel: 213-798-0786; Empl.: 25
 p. 1-1238, 1752; p. 2-1752-1754

Customer service: G. Sugimoto

Products manufactured: Amplifiers, Chargers, Battery, Chokes, Coils Including Assemblies & Forms, Controls/Control Eqpt., Inverters, Power Supplies, Transformers

KIDDE, WALTER & CO., Belleville Div., 675 Main St., Belleville, N.J., 07109, Tel: 201-759-5000, TWX: 710-995-4925; Empl.: 1266; Minimum order: \$100
 Customer service: Sales Off.

Free literature available: Kidde's Fire & Intrusion Alarm Systems & Components brochure illustrates and describes intrusion systems and components and fire alarm systems and components.

Products manufactured: Alarms, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Transducers

Local Sales Offices & Reps.

Cal San Francisco 415-863-8858
 Cal Signal Hill 213-595-5488
 Ga Atlanta 404-451-6122
 Ill LaGrange 312-352-1910
 Md Baltimore 301-247-4545
 NJ Totowa 201-785-4224
 Tex Irving 214-259-3756
 Wash Seattle 206-283-1616

FOR: Can., Pointe Claire, Quebec, Walter Kidde & Co. of Can., Ltd. 514-695-8230

KILOVAC CORP., Box 4422, Santa Barbara, Cal., 93103, Tel: 805-684-4560, TWX: 910-336-1141; FSC No: 18741; Empl.: 100; Minimum order: \$50 p. 1-1740-1748

For info on price: J. L. Dysart; Application info: R. Masada; Customer service: M. Casten; Delivery info: M. Casten

Free literature available: Kilovac Vacuum Relays - General Catalogue - 18 pages, Kilovac Vacuum Relays - 4 page summary, Dow-Key Coaxial Relays - 12 page General Catalog, 1 Page Dow-Key Summary and Prices.

Products manufactured: Antenna Switching Matrices, Attenuators, Coils Including Assemblies & Forms, Relays, Switches

Local Sales Offices & Reps.

Ariz Tempe, Gassner & Clark (Arizona) 602-968-9037
 Cal Los Angeles, Rep. Assocs. 213-829-5401
 Cal San Carlos, Electro Pacific 415-593-1334
 Conn Washington Depot, Kanan Assocs.
 203-868-0513
 Fla Madeira Beach 813-391-3057
 Ill Westchester, Gassner & Clark 312-345-4245
 Iowa Cedar Rapids, H.R. Brown Sls. Co. 319-366-0635
 Kans Leawood, Vaseen Sls. 913-649-0679
 Kans Shawnee Mission, M. Bettis 913-362-0772
 Kans Wichita, M.E. Bettis Co. 316-685-7441
 Md Baltimore, Burgin-Kreh 301-788-5200
 Mass Reading, Kanan Assocs. 617-944-8484
 Minn St. Paul, De Beck 612-690-1557
 Mo St. Louis, M. Bettis 314-429-2099
 NJ Riverton, Given 609-829-7249
 NM Albuquerque, Data Handling 505-268-4364
 NY Buffalo, Lamb 716-874-4900
 NY Great Neck, Trionic 516-466-2300
 NY Rochester, Lamb 716-544-5580
 NY Schenectady, Lamb 518-393-4844
 NY Syracuse, Lamb 315-454-2469
 NC Charlotte, DGW, Inc. 704-334-7090
 NC Winston-Salem, DGW, Inc. 919-768-7166
 Ohio Cleveland, Components 216-842-2737
 Ohio Hamilton, Components 513-721-2997
 Okla Tulsa, Norvell Assocs., Inc. 918-663-1247
 Tex Dallas, Norvell Assocs. 214-350-6771
 Tex Houston, Norvell 713-774-2568
 Va Lynchburg, Burgin-Kreh 804-845-5600

KILOVOLT CORP., 238 High St., Hackensack, N.J., 07602, Tel: 201-488-7373; Empl.: 22; Minimum order: \$25 p. 1-1302-1305

For info on price: S. Rothman; Application info: W. Haschec; Customer service: E. Brown; Delivery info: A. Baratta

Free literature available: General Catalog-High voltage power supplies & insulator testers

Products manufactured: Capacitors, Fixed, Connectors, Diodes, Dividers, Electrodes, High-Voltage, Meters, Power Supplies, Probes, Relays, Resistors, Spark Gaps, Switches, Testers, Transformers

Local Sales Offices & Reps.

Cal Sherman Oaks, Windsor Dynamics, Inc. 213-989-3631
 Cal Woodside, Windsor Dynamics 415-854-4870
 Conn Meriden, Abbott-Allison Co., Inc. 203-237-9232
 Ill Chicago, P. Lind Elctns. Co. 312-774-1246
 Mich Farmington, Carter, McCormic & Peirce 313-477-7700
 Mich Kalamazoo, Carter, McCormic & Peirce
 616-349-9666
 Minn Circle Pines, Lind Elctns. 612-786-5770
 Ohio Cleveland, Carter McCormic & Peirce
 216-333-5650
 Ohio Dayton, Carter, McCormic & Peirce
 513-278-5873
 Pa Pittsburgh, Carter, McCormic & Peirce
 412-824-3760
 Tex Dallas, J.A. Green Co. 214-631-7450
 Tex Houston, J.A. Green Co. 713-526-2959

KINEMATRICS, INC., 336 Agostino Rd., San Gabriel, Cal., 91776, Tel: 213-287-9731; Empl.: 44

For info on price: H. T. Halverson; Application info: H. T. Halverson; Customer service: K. L. Benuska; Delivery info: H. T. Halverson

Free literature available: 1. "Kinematrics Short Form Catalog", Gives technical descriptions for Kinematrics instruments for geophysics, seismology, and structural dynamics. 2. "Specific Products Division Short Form Catalog", Gives technical descriptions for Specific Products standard time and frequency receivers.

Products manufactured: Accelerometers, Antennas, Comparators, Data Acquisition & Reduction Systems, Receivers, Recorders, Services, Assembly, Production & Test, Signal Conditioners & Equipment, Testers, Transducers

Local Sales Offices & Reps.

NJ Berkeley Heights, Kinematrics, Inc. 201-464-3933
 FOR: Can., Toronto 269, Ont., B. H. McGregor 416-699-5521

KINETIC SYSTEMS CORP., Maryknoll Dr., Lockport, Ill., 60411, Tel: 815-838-0005; Empl.: 32

For info on price: Laurie; Application info: L. A. Klaisner; Customer service: W. C. Martin; Delivery info: Laurie

Free literature available: KineticSystems' catalog describes a complete line of computer interface modules manufactured to the CAMAC standard. Application information and an introduction to the standard is included.

Products manufactured: Converters, Counters, Data Acquisition & Reduction Systems, Process Control Systems, Scalars, Binary, Decade, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Cal LaCanada, Spectrum Sciences 213-790-1181
 Mass Burlington, Scientific Sys. Sls. Corp.
 617-273-1660
 Wash Seattle, Spectrum Sciences 206-624-2373

KINETIC TECH., INC., 3393 De La Cruz Blvd., Santa Clara, Cal., 95050, Tel: 408-296-9305, TWX: 910-338-0122; Empl.: 13

For info on price: G. Williams; Application info: G. Williams; Customer service: S. Odell; Delivery info: S. Odell

Free literature available: Standard Product Brochure; Special Product Brochure; Touch Tone Receiver System Description data sheet; C-Message Filters Specifications Brochure; Standard Product Data Sheets; Application Notes.

Products manufactured: Amplifiers, Analyzers, Filter Synthesizers, Filters

Local Sales Offices & Reps.

Cal Altadena, Trimarco, Inc. 213-681-7760
 Cal San Francisco, F. Glynn Mktg. Research
 415-563-3982
 Colo Denver, Omega Ltd. 303-758-1508
 Md Baltimore, Compar Chesapeake 301-484-5400
 Mich Utica, Norm Case Assoc. 313-781-3900
 Minn Minneapolis, Electro-Serv. 612-827-2907
 Ohio Dayton, Norm Case Assocs. 513-435-1301
 Ohio Fairview Park, Norm Case Assocs.
 216-333-4120
 Pa Ambler, Wyncote Instr. Co. 215-643-2440
 Tex Richardson, Campion Sls. 214-238-8145

KINETRON CORP., 1416 Roller Rd, Asbury Park, N.J., 07712, Tel: 201-776-9595; Empl.: 12; Minimum order: \$25

Customer service: V. H. Triwedi

Free literature available: General catalog-All types of custom sheet metal fabrication including cans, covers, chassis, brackets etc. Also stock drawn & fabricated cans & covers, weld studs & inserts. Brochure-Stock Transformer Mounting Brackets.

Products manufactured: Cabinets & Accessories, Cans, Capacitor, Relay, Semiconductor, Transformer, etc, Cases, Equipment, Instrument, Meter, Chassis, Metal, Containers, Fasteners, Services, Assembly, Production & Test, Shields

KING-SEELEY THERMOS CO., Box 423, Kendallville, Ind., 46755, Tel: 219-347-1000; Empl.: 450

Products manufactured: Controls/Control Eqpt., Relays, Thermostats

KINGS ELECTRONICS, 40 Mabledale Rd., Tuckahoe, N.Y., 10707, Tel: 914-793-5000, TWX: 710-562-0110; FSC No: 91836; Empl.: 360; Minimum order: \$25

For info on price: E. Corcorin; Application info: F. Pack; Customer service: Sls. Dept; Delivery info: Sls. Dept.

Free literature available: Catalogs for all types of coaxial connectors and flat cable connectors.

Products manufactured: Attenuators, Cable Assemblies & Harnesses, Connectors, Relays, Switches, Terminals

Local Sales Offices & Reps.

Ala Huntsville, Interop Assocs. 205-881-3677
 Alas Anchorage, H. Lang Assocs. 907-279-5741

Cal Daly City, R. Del Bucchia & Assoc. 415-756-1664
 Cal Westminster, A. A. Dowers Co. 714-894-1123
 Colo Denver, Camel Elctns. 303-757-6191
 Fla St. Petersburg, Kirkwood Assocs.
 Ill Chicago, D. Dolin Sls. Co. 312-286-6200
 Iowa Marion, Thomas & Modrcin Assocs. 319-377-6261
 Md Lutherville, Dougherty Sls. Co. 301-823-0431
 Mass Wellesley Hills, M. Scott Co. 617-235-0102
 Mo St. Louis, Boweng Co. 314-429-7327
 NJ Haddonfield, Gray Assocs. 609-429-5300
 NY E. Syracuse, Fountain, Young & Co. 315-437-7733
 NY Massapequa, Coughlin Assocs. 516-799-7743
 Ohio Dayton, F. L. Ohmer & Assoc. 513-434-1454
 Tex Dallas, Bradenco 214-358-3278
 Wash Seattle, R. K. Squibb 206-632-2450
 FOR: Can., Malton, S. C. Hooker Ltd.
 FOR: Can., Montreal W., Que., Kings Canada 514-487-5151

KINGSLEY MACH. CO., Aero-Space Div., 850 Cahuenga Blvd., EEM, Hollywood, Calif., 90038, Tel: 213-469-7243
 Customer service: J. M. Butler
 Products manufactured: Machines/Machinery, Production

KINSEKISHA LAB. LTD., 23-17 2-chome Miyasaka, Setagaya-ku Tokyo, Japan, Tel: 429-2111, Telex: J24-22659; Empl.: 735
 Products manufactured: Counters, Crystal Blanks, Crystals, Delay Lines, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Oscillators, Thermostats

KISTLER INSTR. CO., see Sunstrand Data Control, Inc.

KLEIN, MATHIAS & SONS, INC., 7200 McCormick Rd., Chicago, Ill., 60645, Tel: 312-588-6820, Telex: 72-4431
 For info on price: R. Franklin; Application info: M. Kelly; Customer service: R. Franklin; Delivery info: R. Franklin
 Free literature available: Catalog 117 - General Tool & Safety, 117 PTG - Pocket Version of Catalog 117, KT2 - Envelope Size Tool Guide, CW1 - Construction Workers Bulletin, Consumer Price List, RM Bulletin - Roll N Measure Bulletin.

Products manufactured: Cases, Equipment, Instrument, Meter, Clamps & Clips, Cutters, Wire, Hand Operated, Drills & Accessories, Hand & Power, Drivers, Nut, Knives & Knife Sets, Scissors, Screwdrivers, Tools, Wire Strippers, Wrenches

KLIPSCH & ASSOCS. INC., Box 688, Hope, Ark, 71801, Tel: 501-777-6751; Empl.: 43
 For info on price: B. Moers; Application info: Eng. Dept.; Customer service: B. Moers; Delivery info: L. McClellan
 Free literature available: Catalog, price list, dealer list, Pocket Size Mailers, Spec Sheets.
 Products manufactured: Speaker Systems

Local Sales Offices & Reps.
 Ariz Phoenix, R. Fissell Co. 602-264-4031
 Cal Burbank, Mike Ross & Assoc. 213-842-2104
 Cal Palo Alto, J. Thornton Co. 415-327-8960
 Colo Denver, Justiss, Wilson, & Co. 303-934-3741
 Fla Tampa, Repelect 813-227-5051
 Md Gaithersburg, Electronic Marketers 301-948-5623
 Mass Holliston, W. H. Bell 617-429-2424
 Mich Livonia, F. Peters & Assoc. 313-425-0086
 Mo Springfield, J. C. Fricks 417-831-3674
 NY Gloversville, D. Croucher 212-799-7118
 NY New York, RMS Marketing 212-799-7118
 Wash Seattle, R. Johnston Co. 206-524-5171

KNOL ENTERPRISE, 200 Suburban Rd., San Luis Obispo, Cal., 93401, Tel: 805-544-4881; Empl.: 4
 Customer service: P. Knol
 Products manufactured: Attenuators, Circuits, Printed, Multilayer, Timers

KNOWLES ELCTRNS., INC., 3100 N. Mannheim Rd., Franklin Park, Ill., 60131, Tel: 312-455-3600, Telex: 72-8397
 Free literature available: Sub-miniature microphones, receivers, and speakers.
 Products manufactured: Annunciators, Microphones, All Kinds, Transducers

KOLLSMAN INSTR. CO., 575 Underhill Blvd., Syosset, N.Y., 11791, Tel: 516-921-4300, TWX: 510-221-2191; Empl.: 1600

Products manufactured: Display Devices/Displays, Gages, Indicators, Lenses, Optical & Camera, Lenses, Readout & Display, Motors, Pyrometers, Scanners, Servo Systems, Tachometers, Tracking Systems, Transducers, Underwater Communication, Detection, Navigation, etc. Equipment

Local Sales Offices & Reps.
 Cal Long Beach 213-595-5441
 DC Arlington 703-979-1200
 Tex Dallas 214-350-1396

KOOLTRONICS INC., Box 504, Princeton, N.J., 08540, Tel: 609-799-1466, Telex: 843345; Empl.: 100

For info on price: R. Armbruster; Application info: W. G. Stewart; Customer service: R. Armbruster; Delivery info: C. Weil

Products manufactured: Air Conditioners (For Equipment), Blowers & Fans & Accessories, Heat Exchangers & Systems

Local Sales Offices & Reps.
 Ala Huntsville, Beacon Elctns 205-881-5031
 Ariz Tempe, Jarko Assocs. 602-966-3020
 Cal Canoga Pk., Ebert Entprs. 213-887-7578
 Cal San Mateo, Halbar Assoc.
 Colo Denver, McCloud & Raymond 303-756-1589
 Fla Maitland, Beacon Elctns 305-647-3498
 Ga Atlanta, Beacon Elctns 404-351-2654
 Ill Palatine, J. Clark Co. 312-358-5095
 Kan Shawnee Mission, Inland Assoc. 913-362-2366
 Md Randallstown, Beacon North Inc. 301-922-1248
 Minn Minneapolis, C. R. Gibb Co. 612-377-1200
 Mo Glencoe, Inland Assoc. 314-938-4992
 NY Syracuse, Naylor Elec. Co. 315-472-9183
 Ohio Sylvania, Deo-Volente & Assoc. 419-882-2830
 Pa Bala Cynwyd, Elec-Tech Inc. 215-687-5305
 SC Spartanburg, Beacon Elctns 803-582-4613
 Tex Dallas, Blackburn Assoc. 214-351-9991
 Va Falls Church, Beacon North Inc. 703-534-1673

KORRY MFG. CO., 223 8th Ave. N., Seattle, Wash., 98109, Tel: 206-624-4066, TWX: 910-444-2295; Empl.: 156; Minimum order: \$30
 Customer service: J. A. Hevly

Free literature available: Short Form Catalog; Facilities Brochure; Brochure Catalog.

Products manufactured: Diodes, Display Devices/Displays, Indicators, Lights, Sockets, Switches

Local Sales Offices & Reps.
 Ala Huntsville, Craft Assoc. Co. 205-837-0221
 Cal Mountain View, Westrep 415-968-5800
 Cal Pico Rivera, Westrep 213-949-2551
 Cal San Diego, Westrep 714-276-0751
 Conn New Canaan, S. Pierce, Inc. 203-966-4639
 Fla Maitland, Craft Assoc. Co. 305-645-2242
 Ga Atlanta, Craft Assoc. Co. 404-393-0400
 Haw Pico Rivera, Westrep 213-949-2551
 Ill Chicago, Engineered Sls. Co. 312-867-8434
 Ind Fort Wayne, McDonald Sls. Co. 219-747-3650
 Kans Overland Park, Ensco-Rep 913-381-7557
 Md Glen Arm, Hodgins Assoc. 301-592-7047
 Mass Norwood, S. Pierce, Inc. 617-762-3164
 Mo St. Louis, Ensco-Rep 314-542-3935
 NY New Rochelle, Display Comps. Sls. Co. 914-636-4664
 Ohio Dayton, Whelan Corp. 513-434-7551
 Tex Fort Worth, W.P. Fralia Co. 817-738-2394

K R ELECTRONICS, INC., 91 Avenel St., Avenel, N.J., 07001, Tel: 201-636-1900
 Products manufactured: Filters

KRATOS, 403 S. Raymond Ave., Bin 45, Pasadena, Cal, 91109, Tel: 213-449-3090, TWX: 910-588-3288; FSC No: 34830; Empl.: 340; Minimum order: \$50
 p. 1-177,253,750,751

For info on price: F. LaChapelle; Application info: D. Risk; Customer service: F. LaChapelle; Delivery info: F. LaChapelle

Free literature available: Catalog - Switchboard Instruments, Catalog - Panel Meters, Catalog - Pressure Gauges, Catalog - Aircraft Instruments, Brochures - Computer Graphics, Brochures - Batching/Weighing

Products manufactured: Alarms, Comparators, Controllers, Programmable, Controls/Control Eqpt., Converters, Current Sensors, Detectors, Display Devices/Displays, Gages, Indicators, Meters, Monitors, Process Control Systems, Relays, Switches, Terminals, Data Display (including Alphanumeric & Graphic), Timers, Transducers, Transmitters

Local Sales Offices & Reps.
 Cal San Carlos, Electro-Pacific 415-593-1334
 Conn Bethel, Kratos Eastern Sls. Off. 203-792-9302
 Fla Miami, Ludlum Assoc. 305-592-6523
 Fla Orlando, Ludlum Assoc. 305-894-7761
 Ga Atlanta, Electro-Mech Sls. Engrg. Co. 404-256-4414

Ill Addison, R. Edward Stemm, Inc. 312-279-2440
 Md Glen Arm, Hodgins Assocs. 301-592-7047
 Mass Peabody, JSR Assocs. 617-532-0348
 Minn St. Paul, Cullen & Assocs. 612-646-7371
 Mo St. Louis, PEM Sales Co. 314-427-7200
 NY Great Neck, F. Tyllinski Co. 516-466-9070
 NY N. Massapequa, C. B. Hopkins Co. 516-796-0066

NY Syracuse, Labtronics, Inc. 315-454-9314
 Ohio Cleveland, Imtech Corp. 216-826-3400
 Okla Tulsa, Knight Engineering Company, Inc. 918-749-7785
 Tex Hurst, Kratos Dallas Sls. Off. 817-268-4165
 Wash Bellevue, Doland Co. 206-454-4952
 Wisc West Allis, Electric Power & Light Equipment Co. 414-258-8488

KRECKMAN, HERB CO., Cresco, Pa., 18326, Tel: 717-595-2212; Empl.: 4

Customer service: H. Kreckman
 Free literature available: Catalog - Showing Communications Antennas in various forms from 25 to 470 MHZ.

Products manufactured: Antennas

KRIS INC., 1026 S. Washington, Cedarburg, Wisc., 53012, Tel: 414-377-5700, Telex: 2-6886

Products manufactured: Amplifiers, Comm. Systems

Local Sales Offices & Reps.
 Cal Glendale, Richard Armstrong Sls. 213-245-5344
 Ga East Point, Paul Hayden Assoc. 404-766-0281
 Mass Boston, Sam Adelman Assocs. 617-443-9260
 Minn Burnsville, Chip Carlson Sls. 612-890-7893
 Pa Pittsburgh, Don Small Assoc. 412-561-6432
 Utah Murray, Kennealey Assocs. 801-268-3111
 Wash Seattle, DMS/VANTAGE 206-784-6800

KRL ELECTRONICS, 28 Bridge St., Manchester, N.H., 03101, Tel: 603-668-3210; Empl.: 25; p. 2-1498,1499
 Products manufactured: Networks, Resistors, Thermistors, Thermometers, Resistance, Thermostats

Local Sales Offices & Reps.
 Cal Mt. View, Shaw-Tech, Inc. 415-961-4775
 Colo Denver, Omega Ltd. 303-758-1508
 Ill Palatine, C & C Elctn. Sls. 312-358-8900
 Ind Indianapolis, Sheridan Assocs. 317-547-7777
 Kans Overland Park, Sheridan Assocs. 913-383-1636
 Mass Burlington, Contact Sls. 617-273-1520
 Mich Farmington, Sheridan Assocs. 313-477-3800
 Mo Florissant, Sheridan Assocs. 314-837-5200
 NY Port Washington, R.E. Breuer Co. 516-883-7810
 NC Raleigh, Candor Co., Inc. 919-876-4999
 Ohio Beachwood, Sheridan Assocs. 216-831-0130
 Ohio Cincinnati, Sheridan Assocs. 513-761-5432
 Ohio Dayton, Sheridan Assocs. 513-277-8911
 Okla Tulsa, Norvell Assocs. 918-663-1247
 Pa Pittsburgh, Sheridan Assocs. 412-244-1640
 SC Myrtle Beach, Candor Co., Inc. 803-448-8361
 Tenn Chattanooga, Candor Company, Inc. 615-894-7454

Tex Dallas, Norvell Assocs. 214-350-6771
 Tex Houston, Norvell Assocs. 713-774-2568
 Va Lynchburg, Candor Company, Inc. 804-846-6579

Wash Bellevue, J. Wandell Co. 206-454-4648

Local Distributors
 SC Myrtle Bch., Candor Co., Box 2220 803-448-5213
 Tex Dallas, Norvell Assocs., 10210 Monroe Dr. 214-350-6771
 Tex Houston, Norvell Assocs., 6640 Hillcroft Ave. 713-774-2568
 Tex Tulsa, Norvell Assocs., 3340 Memorial Blvd. 918-663-1247
 Wash Seattle, Earl & Brown Co., Box 9285 206-284-1121

KROHN-HITE CORP., 580 Massachusetts Ave., Cambridge, Mass., 02139, Tel: 617-580-1660, TWX: 710-320-6583; Empl.: 120; Minimum order: \$10 p. 1569,753-755

For info on price: E. C. Luffy; Application info: S. L. Guinta; Customer service: E. C. Luffy; Delivery info: E. C. Luffy

Products manufactured: Amplifiers, Filters, Generators, Meters

Local Sales Offices & Reps.

Ala Huntsville, Gentry Assocs. 205-534-9771
Ariz Scottsdale, Barnhill Three Inc. 602-947-7841
Cal Inglewood, L&M South, Inc. 213-674-6850
Cal San Jose, L&M Engrg., Inc. 408-292-3220
Colo Denver, Barnhill Three, Inc. 303-750-1222
Conn Glastonbury, Instrument Reps., Inc. 203-633-0777

Fla Orlando, Gentry Assocs. 305-894-4401
Haw Honolulu, Aloha Assocs. 808-941-1574
Ill Des Plaines, Cozzens & Cudahy Inc. 312-298-3600

Ind Indianapolis, Cozzens & Cudahy Inc. 317-244-2456
Mass Lexington, Instrument Reps., Inc. 617-861-8620
Mich Detroit, Electro Sls. Assocs. 313-526-8800

Mo St. Louis, Cozzens & Cudahy Inc. 314-423-1234
NJ Haddonfield, Dyna Rep Co. 609-795-1700
NM Albuquerque, Barnhill Three, Inc. 505-299-7658
NY Elmort, Crane & Egert Corp. 516-488-2100

NY Syracuse, Ossman Instr. 315-437-6666
NC Burlington, Gentry Assocs. 919-227-3639
Ohio Cleveland, Electro Sls. Assocs. 216-261-5440
Pa Pittsburgh, Electro Sls. Assocs. 412-371-9449

Tex Houston, Barnhill Two Inc. 713-688-9971
Tex Richardson, Barnhill Two Inc. 214-231-2573
Va Alexandria, Dyna Rep Co. 703-354-1222
Wash Bellevue, Showalter Instruments, Inc. 206-624-4035

KRYLON, Div. Borden, Box 390, Norristown, Pa., 19404, Tel: 215-279-1950, TWX: 510-660-0335; Empl.: 200
Customer service: F. Adams

Products manufactured: Cleaners & Solvents, Coatings

Local Sales Offices & Reps.

Ala Atlanta, Cartwright & Bean 404-255-5262
Cal Los Angeles, G.B. White & Assoc. 213-749-4168

Cal Millbrae, G.B. White & Assoc. 415-EM 6-8234
Colo Denver, Western Indus. Sls. & Svcs. 303-758-3972

Ill Chicago, Q & B Inc. 312-725-4999
Ind Mktg. Engineers 317-545-1523

Kans Shawnee Mission, Thomas & Modrcin Assoc. 913-HE 2-2131

Mass Ellingwood 617-423-4075
Mich Detroit, Riley & Petchell Sls. 313-838-9100

Minn Minneapolis, Godden-Olson 612-927-4434
NY New York, Newhope Corp. 212-LE 2-7372

NY Syracuse, Paston-Hunter Co. 315-437-2992
Ohio Cleveland, J. O. Olsen Co. 216-752-5444

Pa Philadelphia, K. B. Erdman 215-CA 4-1833
Tenn Memphis, Cartwright & Bean 901-276-4442

Tex Dallas, H. Frazier 214-824-0117
Tex Houston, H. Frazier 713-461-2866

Wash Seattle, R. Merritt Co. 206-682-7337

KRYSTINEL CORP., Fox Island Rd., Port Chester, N.Y., 10573, Tel: 914-937-5252, TWX: 914-937-5370; Empl.: 135 p. 2*1234,1235

Customer service: S. Snead

Free literature available: Complete catalog: Lists Ferrite, Slugs, Coil Forms, Insert Tuning Cores, Threaded Cores, Cap Cores, Balun Cores, Bobbins, Toroids, Washers, Shield Beads, Sleeves.

Products manufactured: Bobbins, Winding, Coil & Transformer, Coils Including Assemblies & Forms, Cores, Magnetic, Ferrite Material & Parts, Shields

Local Sales Offices & Reps.

Cal LaHabra, Magnetic Materials 213-694-2063
Cal Los Altos, Horne Assocs. 415-948-0788

Cal Golden, B. Callister & Assocs. 303-761-0992
Fla Orlando, Geartner Assocs. 305-299-1000

Ill Chicago, C & A Assocs. 312-235-8443
Mo Blue Springs, Cairns & Hayes Elctns. Sls. Co. 816-229-1404

Mo St. Charles, Cairns & Hayes Elctns. Sls. Co. 314-946-6617
NJ Kenilworth, Ventronics Inc. 201-272-9262

NJ South Orange, S. Simberkoff Assocs. 201-763-7900
NY Buffalo, J. R. Henderson & Assocs. 716-634-8650

Tex Houston, Cunningham Co. 713-461-4197

Wash Bellevue, Rep. Tronix 206-454-5190

KULITE SEMICONDUCTOR PROD., 1030 Hoyt Ave., Ridgefield, N.J., 07657, Tel: 201-945-3000, Telex: 135458; Empl.: 140; Minimum order: \$25

Customer service: J. W. G. Budd

Free literature available: Literature describing complete line of products including semiconductor strain gages, pressure transducers, accelerometers, load cells, and temperature sensors.

Products manufactured: Accelerometers, Amplifiers, Cells, Load, Gages, Microphones, All Kinds, Transducers, Transmitters

Local Sales Offices & Reps.

Ala Huntsville, Col-Ins-Co. 205-539-1771
Cal Hollywood, B. J. Wolfe Entprs. 213-877-5518

Cal Walnut Crk., Dale-Dahl Assocs. 415-933-9595
Colo Littleton, Aztec Entprs. 303-795-0250

Conn Hamden, Northeast Engrg. 203-248-4481
Fla Orlando, Col-Ins-Co. 305-423-7615

Ga Clarkston, Col-Ins-Co. 404-934-7280
Ill Northfield, Torkelson Assocs. 312-446-9085

Ind Indianapolis, Torkelson Assocs. 317-244-7867
Md Kensington, Kinney Tech Prod. 301-727-2122

Mass Danvers, Northeast Engrg. 617-774-3010
Mich Detroit, WKM Assoc. 313-892-2500

Minn Minneapolis, Torkelson Assocs. 612-835-2414
Mo St. Louis, Ozark Elctrn Mktg. 314-423-7200

NM Albuquerque, Aztec Entprs. 505-255-2440
NY Manhasset, Northeast Engrg. 516-365-9633

NY Melville, Astorrep Inc. 516-423-2266
NC Raleigh, Col-Ins-Co. 919-834-6591

Ohio Cleveland, WKM Assocs. 216-267-0445
Ore Portland, Brett-Ross 503-232-4184

Pa Jenkintown, PDC Corp. 215-887-9610
Tex Arlington, Pan/Tech Engrg. 817-261-4111

Wash Seattle, Brett-Ross 206-935-8054

KULKA ELEC. CORP., 520 S. Fulton Ave., Mt. Vernon, N.Y., 10551, Tel: 914-664-4024, TWX: 710-562-0104; Empl.: 500

Customer service: P. Lauria

Free literature available: 17B Catalog - Terminal Boards & Toggle Switches Individual. Catalog Sheets - Spec Sheets: Standards Printed Circuit Mount Insulated Feed-Thru Marker & Insulated Strips Military Kiplites Pressure-Contact Stud & Turret Snapblocks Wire Wrap Thermoplastic Printed Circuit Mount Thermoplastic Insulated Feed-Thru Thermoplastic High Barrier

Products manufactured: Connectors, Sockets, Strips, Terminal Blocks, Boards & Strips, Terminals

Local Sales Offices & Reps.

Ariz Phoenix, Sheffer-Kahn Co. 602-258-7893
Cal Los Angeles, E E Strassner 213-666-1511

Cal Redwood City, Warren-Hickey Sls. 415-368-3849
Colo Denver, Koether-Cox 303-733-5561

Conn Cheshire, Coakley, Boyd & Abbott 203-272-2261

Fla North Miami, Winfield Elctns. Sls. 305-945-6544
Ga Atlanta, Winfield Southeast 404-636-3023

Ill Chicago, Hanke Co. 312-593-8500
Ind Fort Wayne, New Era Sls. 219-743-5371

Kan Shawnee Mission, Lowell-Kangas & Assocs. 913-631-3515
La Metairie, J. F. McKinney Sls. 504-887-1723

Md Bromall, L.D. Lowery 215-356-5300
Mass Needham, Coakley, Boyd & Abbott 617-444-5470

Mich Ferndale, Shalco 313-547-4771
Mo St. Louis, Lowell-Kangas & Assocs. 314-821-4050

NJ South Orange, Simberkoff Sls. 201-763-7900
NM Albuquerque, Sheffer-Kahn 505-265-7077

NY Buffalo, Telesco Assocs. 716-834-1026
NY New York, Simberkoff Sls. 212-943-7023

NY Rochester, Telesco Assocs. 716-271-3780
NY Utica, Telesco Assocs. 315-733-3183

Ohio Dayton, Neal Bear 513-299-3566
Ohio Richfield, Bear Mktg. 216-659-3131

Okla Tulsa, J. F. McKinney Sls. 918-742-6791
Ore Portland, Earl & Brown 503-245-2283

Pa Broomall, L.D. Lowery 215-356-5300
Pa Pittsburgh, Trymac Co. 412-823-8400

Tex Bellaire, J. F. McKinney Sls. 713-774-3232
Tex Dallas, J. F. McKinney Sls. 214-631-9450

Wash Seattle, Earl & Brown 206-274-1121
FOR: Can., Ajax, Ont., Munro Elctrn. Comps. 416-676-1042

KURZ-KASCH, INC., Electronics Div., 2876 Culver Ave., Dayton, Ohio, 45429, Tel: 513-296-0330; Empl.: 70

Customer service: J. Keller

Free literature available: Kurz-Kasch will supply upon request catalogs or data sheets of any product shown in EEM. All literature is self-descriptive.

Local Sales Offices & Reps.

Cal Los Angeles, W.S. Harmon Co. 213-937-1460
Colo Denver, Walter Engineering 303-777-5585

Conn Wallingford, Adams-McGregor, Inc. 203-269-5816
Ill Libertyville, R. Klipp Assoc. 312-362-4676

Iowa Des Moines, KSW Associates 515-279-9235
Mass Scituate, Adams-McGregor, Inc. 617-545-2213

Mich Farmington, Carter, McCormic & Peirce 313-477-7700
Minn St. Paul, Skor 612-645-6461

Mo Kansas City, KSW Assocs. 816-358-5240
Mo St. Louis, KSW Associates 314-328-5111

NY Great Neck, F. Tylini Co. 516-466-9070
NY Rochester, Marsey Sls., Inc. 716-442-9700

NC Charlotte, M. F. Taylor Co. 704-537-4878
Ohio Cleveland, Carter, McCormic & Pierce 512-278-5873

Ohio Dayton, Carter, McCormic & Pierce 503-234-7671
Ore Portland, D.G. Weber Co. 404-726-1300

RI Lincoln, Adams-McGregor, Inc. 401-726-1300
Tex Dallas, G. V. Peck Co. 214-328-3511

Tex Houston, The Gordon V. Peck Co. 713-664-1435
EXP: New York, N.Y., Singer Products Co.

KURZ-KASCH, INC., Knob Div., 711 Hunter Rd., Wilmington, Ohio, 45177, Tel: 513-382-0966 p. 2*1104

Customer service: A.L. King

Free literature available: Kurz-Kasch will supply upon request catalogs or data sheets of any product shown in EEM. All literature is self-descriptive.

Products manufactured: Knobs, Services, Assembly, Production & Test

Refer to Kurz-Kasch Electronics Div. for sales office information.

KYROS CORP., Box 406, Madison, Wisc., 53701, Tel: 608-238-3587; Empl.: 4

Customer service: R. Cox

Products manufactured: Tape Search Equipment

L & L SPECIAL FURNACE CO., 166 Conchester Rd., Twin Oaks, Pa., 19016, Tel: 215-HU5-6334; Empl.: 32

Customer service: G. Lewicki

Free literature available: Econo Master Furnaces. Unique new Modular furnaces. Available with tubes, conveyor belts, alloy muffles, recirculation. Temperatures to 2350°F. Dyna-Trol Furnaces. Unique box furnaces for temperatures to 2300°F. Available with fans, various controls. Elements located on multi-walls.

Products manufactured: Furnaces

L & R MFG., 577 Elm St., Kearny, N.J., 07032

LABELON CORP., 10 Chapin St., Canandaigua, N.Y., 14424, Tel: 315-394-6220, TWX: 510-254-7147; Empl.: 160

Customer service: H. J. Kratoville

Products manufactured: Labels, Pressure-Sensitive, Adhesive, Tapes, Films & Foils, Pressure Sensitive

Local Sales Offices & Reps.

Cal Los Angeles, R. L. Smith Co. 213-746-1710
Ill Chicago, P. Coridon & Assoc. 312-286-5144

NY New York, Labelon Corp. 212-947-4049

LABORATORY DATA CONTROL, Div. M. Roy Corp., Box 10235, Riviera Beach, Fla., 33404, Tel: 305-844-5241; Empl.: 52

For info on price: J. Wagner; Delivery info: J. Wagner

Products manufactured: Integrators, Electronic, Paper, Graphic Recording, Recorders

Local Sales Offices & Reps.

Ala Huntsville, Newcomb, Assoc. 205-852-0304
Del Newark, Benchmark 302-366-8797

Ill Joliet, Utopia Instr. 815-727-5431
Iowa Ames, Midwest Instr. 515-292-5413

Mass Boston, Richman Assoc. 617-879-5011
Minn Minneapolis, Midwest Inst. 612-333-0319

Mo St. Louis, Gateway Scientific 314-725-3464
NJ South Amboy, Laboratory Data Control 201-721-9331

NM Albuquerque, Air Row Inc. 505-268-1733
NC Raleigh, Newcomb Assoc. 919-893-5721

Tex Houston, Antek Instr. 713-691-2265
Wash Seattle, VWR Scientific 206-682-3460

LAKE CHEMICAL CO., 250 N. Washtenaw Ave., Chicago, Ill., 60612, Tel: 312-826-1700; Empl.: 65

Free literature available: #74-0 Catalog, Covering Our Full Line of Fluxes and Sealants.

Products manufactured: Flux, Brazing & Soldering Materials

LAKESHORE ELECTRIC CORP., 205 Willis, Bedford, Ohio, 44146, Tel: 216-232-0200, Telex: 980-253; Empl.: 40

Products manufactured: Cabinets & Accessories, Chargers, Battery, Controls/Control Eqpt., Panels, Switchboards, Switches

Local Sales Offices & Reps.

Cal	Redondo Beach, Control Switches, Inc.	213-772-1582
Cal	San Francisco, Artwel Elec., Inc.	415-467-1880
Cal	Commerce City, Elec. Power Equip. Co.	303-288-0753
Fla	Jacksonville, R.J. Hines	904-641-9503
Fla	Miami, A.C. Chaney & Assoc.	305-633-1651
Ga	Atlanta, R.W. Allen	404-725-5561
Haw	Honolulu, Pacific Energy Equip.	808-373-1039
Ill	Chicago, Weldy-Lamont Assoc.	312-777-8575
Iowa	Des Moines, I.L. Davidson Co.	515-288-0958
Md	Lutherville, M.P. West, Inc.	301-252-7080
Mass	Sharon, Adcour	617-784-3996
Mich	Detroit, Webco, Inc.	313-862-4673
Minn	Minneapolis, Pinkney & Assocs.	612-786-9270
Mont	Billings, Holuman GM Diesel, Inc.	406-252-4191
NY	Buffalo, H.C. Zang	716-877-3677
NY	Greenvale, O. Smith-Johannsen & Co.	516-484-5630
NC	Charlotte, C. Alley Assocs.	704-523-1532
Ohio	Cincinnati, Alexander Equip. Co.	513-221-7520
Ohio	Shaker Heights, R.F. Reske & Assoc.	216-932-5293
Pa	Croyden, R. Cunningham & Assoc.	215-677-8559
Pa	Pittsburgh, Waggoner-Ver Hill Assoc.	412-241-5203
Tenn	Knoxville, Tubbs Agency	615-577-0689
Tenn	Memphis, Underwood Sls. Co.	901-527-0333
Tex	Garland, Stout-Jennings-Schmidt Co.	214-272-5585
Tex	Houston, Stout-Jennings-Schmidt Co.	713-729-1994
Va	Richmond, T.L. Haynes & Co.	804-285-9326
Wisc	Cedarburg, Weldy-Osborn Assoc.	414-377-2400
FOR:	Can., Montreal 460, Que., Syntrolec Controls, Ltd.	514-324-8991

LA MARCHE MFG. CO., 106 Bradrock Drive, Des Plaines, Ill., 60018, Tel: 312-299-1188, Telex: 282-524; QPL No: 15736; Empl.: 225 p. 1-1308,1309

Customer service: A. Rotschild

Free literature available: Complete float battery charger and D.C. to A.C. Inverter catalog.

Products manufactured: Chargers, Battery, Converters, Eliminators, Battery, Inverters, Power Supplies, Relays

Local Sales Offices & Reps.

Alas	Anchorage, J.P. Bagoy	907-274-8531
Ariz	Phoenix, W.C. Osborn	602-279-5556
Ark	El Dorado, L. Byrne	501-UN3-9435
Cal	El Cerrito, B. Saletta	415-236-9191
Cal	Encino, D. Meyers	213-981-6552
Cal	Denver, W. Pape	303-455-3643
Fla	Jupiter, J. Marsh	305-746-4911
Ga	Atlanta, J. H. Chambers	404-875-8086
Ill	Deerfield, T. Waters	312-948-0320
Ind	Ft. Wayne, J. McDonald	219-747-3650
Iowa	Eldridge, L. Garrett	319-391-5211
La	New Orleans, H. Chambers	504-525-6677
Md	Annapolis, P. Martini	301-267-7462
Mass	Sharon, R. Jacobs	617-784-3996
Mich	Detroit, B. Schafer	313-862-4673
Mich	Grand Rapids, J. Perry	616-949-0271
Minn	Minneapolis, W. Ruva	612-721-7444
Mo	Kansas City, H. Burton	816-531-1077
Mo	St. Louis, R. Link	314-966-3506
Mont	Billings, D. Parker	406-245-6349
NJ	Collingswood, C.W. Wright	609-858-4887
NY	Syracuse, A. Komar	315-437-2845
NY	Uniondale, A. Crowe	516-485-2622
NC	Charlotte, H.E. Gray Jr.	704-375-3249
Ohio	Columbus, A. Ulrich	614-253-2705
Okla	Tulsa, L.W. Hubbell	918-R13-9851
Ore	Portland, W. Haynes	503-236-2744
Tenn	Jackson, D. Hallman	901-423-1366
Tex	Dallas, D. Cooper	214-271-6494
Tex	Houston, E. Meyer	713-928-8131
Tex	Odessa, B. McEntyre	915-332-1429
FOR:	Can., Springhill Nova Scotia, D. Surrette	902-597-3767
FOR:	Can., Vancouver B.C., Simson-Maxwell Co.	604-736-5431

FOR: Can., Ville St. Laurent Que., D. Surrette 514-336-4192

LAMBDA ELCTRNS., 515 Brd. Hollow Rd., Melville, N.Y., 11746, Tel: 516-694-4200, TWX: 510-224-6484; Empl.: 500 p. 1-1310,1311,1846

Products manufactured: Chokes, Circuits, Hybrid, Thick Film, Hybrid Voltage Regulators, Limiters, Locks, Dial & Shaft, Meters, Power Supplies, Protectors, Racks, Reels, Cord & Cable, Regulators, Slides, Cabinet & Chassis, Transformers

Local Sales Offices & Reps.

Ariz	Phoenix	602-996-1010
Cal	No. Hollywood	213-875-2744
Cal	Sunnyvale	408-738-2541
Fla	Altamonte Springs	305-831-8010
Ill	Arlington Heights	312-593-2550
Md	Baltimore	301-465-1133
Mass	Lexington	617-861-8585
Minn	Minneapolis	612-935-6194
NJ	Cherry Hill	609-424-2170
NY	Melville	516-694-4200
NY	Poughkeepsie	914-297-4800
NY	Rochester	716-454-6770
Ohio	Cleveland	216-585-7808
Pa	Norristown	215-279-5644
Texas	Dallas	214-341-5130
Tex	Houston	713-464-6554
Va	McLean	703-356-0141
EXP:	N.Y., Melville	516-694-4200
FOR:	Can., Pointe Claire, Que.	514-697-6520
FOR:	Can., Toronto, Ont.	416-486-0794

LAMINATED FABRICATORS, 1145 San Mateo Ave., San Bruno, Calif., 94066, Tel: 415-583-5092; Minimum order: \$5

Customer service: H. L. Jacobs

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Insulators & Insulation, Laminates, Nameplates, Services, Assembly, Production & Test, Terminal Blocks, Boards & Strips

LAMPS, INC., see Illuminated Products, Inc.

LANGEVIN, 2030 Placentia Ave., Costa Mesa, Cal., 92627, Tel: 714-642-8083; FSC No: 11135; Empl.: 12

Customer service: P. Hanson

Products manufactured: Programmers, Switches

LANSDALE TRANSISTOR & ELCTRNS., Bldg. 4, Shetland Ind'l. Pk., Andover, Mass., 01810, Tel: 617-933-3500; Empl.: 10

Products manufactured: Integrated Circuit Devices

LAPP INSULATOR DIV., INTERPACE CORP., Radio Specialties, 350 Summer St., LeRoy, N.Y., 14482, Tel: 716-967-6221, TWX: 716-967-2511; Empl.: 1310

For info on price: S. P. Lapp, Ext. 403; Application info: G. Bolin, Ext. 409; Customer service: R. Bullock, Ext. 244

Free literature available: Catalog No. 590 contains description, ratings and specifications on antenna tower insulators, standoff insulators, entrance insulator and special radio insulators.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Capacitors, Fixed, Capacitors, Variable, Insulators & Insulation, Seals

Local Sales Offices & Reps.

Ala	Birmingham, C.W. Ashby Co.	205-879-1651
Ark	Little Rock, C. H. Stout	501-372-2555
Fla	Jacksonville, Belcher & Assocs.	904-724-7811
Ga	Atlanta, E. A. Thornwell	404-351-6535
Kans	Kansas City, Power Equip. Sls.	913-384-3898
Ky	Lexington, Dyer-Pederson Agency	606-266-7412
La	Shreveport, C. H. Stout	318-221-5555
Md	Annapolis, Rumsey Elec. Co.	301-268-9644
Miss	Jackson, C. H. Stout of Miss.	601-354-4326
NC	Charlotte, J. Rudisill Assocs.	704-377-6901
Okla	Tulsa, C. B. Anderson Elec. Co.	918-836-4661
Pa	Pittsburgh, Muller, Harper & Assocs.	412-931-6460
Tenn	Memphis, C. H. Stout of Tenn	901-362-1616
Tex	Dallas, E. B. Robertson	214-942-2711
Va	Richmond, Rumsey Elec. Co.	804-335-4379

LARSON AERO DEV., Box 135, Concord, Calif., 94522, Tel: 415-228-7870; Empl.: 15

Products manufactured: Accelerometers, Gyros (All Types), Indicators, Meters, Potentiometers, Recorders, Relays, Testers, Transducers

Local Sales Offices & Reps.

Fla	Maitland, D & E Assoc.	305-644-3039
Mich	Detroit (Ferndale), TIBY Co.	313-547-3550
Ohio	Cleveland, TIBY Co.	216-371-5335
Ohio	Dayton, TIBY Co.	513-277-3822

LARSON INSTR. CO., INC., Greenbush Rd., Orangeburg, N.Y., 10962, Tel: 914-359-3800; Empl.: 14 p. 1-756,757

Products manufactured: Amplifiers, Bridges, Controls/Control Eqpt., Meters, Probes, Pyrometers, Recorders, Relays, Shunts, Meter, Transducers, Transformers

Local Sales Offices & Reps.

Cal	Los Angeles, L-Tronix Assoc.	213-256-2224
Cal	Palo Alto, Mauldin Co.	415-326-5291
Ind	Richmond, Kennedy Sls.	317-966-1933
Pa	Ingomar, R. W. Moulton Assocs.	412-366-3333
Wash	Seattle, Instr. Engrg.	206-682-1123

FOR: Can., Montreal, Que., Brian Engrg.

514-735-1671

LASER INC., Laser Lane, Box 537, Sturbridge, Mass., 01566, Tel: 617-347-7314; Empl.: 12

For info on price: A.D. Battista; Application info: W.H. Shiner; Customer service: W.H. Shiner; Delivery info: A.D. Battista

Free literature available: Complete catalog of our products. This 24 page catalog contains 8 pages of general information and many descriptions, with photos, of industrial welding & drilling with laser equipment.

Products manufactured: Fiber Optic Bundles, Lasers & Laser Systems, Lenses; Optical & Camera, Machines/Machinery, Production, Microscopes, Monitors, Power Supplies, Services, Assembly, Production & Test, Television Systems & Equipment Closed-Circuit, Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

Local Sales Offices & Reps.

Cal	Sherman Oaks, Windsor Dynamics	213-989-3631
Cal	Woodside, Windsor Dynamics	415-854-4870
Fla	Satellite Beach, Reynolds & Assocs.	305-773-4700
Ill	Chicago, Victor Welding	
Ind	Indianapolis, Tech Sls. & Mktg.	317-356-3658
Md	Silver Spring, Spectroscopy Sys.	301-949-8261
Mass	Waltham, Betronic Assocs.	617-894-8400
NY	Mineola, J.B. Lilly Co.	516-746-2226
NY	Syracuse, Labtronics	315-454-9314
Ohio	Dayton, H. Teplitz & Co.	513-277-6531
Pa	Wyndmoor, Spectroscopy Sys.	215-836-1545
Tex	Houston, Optics & Elctns.	713-666-8622
Wisc	Milwaukee, Bentley Welding Supply Co.	414-476-1222
EXP:	Weston, Mass., Maridyne Int'l Corp.	617-899-3510

LASER SYSTEMS CORP., 117 N. First St., Ann Arbor, Mich., 48108, Tel: 313-761-7150; Empl.: 6

Customer service: R. E. Miller

Products manufactured: Alarms

LASER TECHNOLOGY, INC., 10624 Ventura Blvd., N. Hollywood, Calif., 91604, Tel: 213-763-7091; Empl.: 24

Customer service: H. B. McLaughlin

Products manufactured: Honeycomb Sheets, Panels, etc., Scribes, Semiconductor Wafer Fabrication

LATTIN RADIO LABS., 1431 Sweeney, Box 44, Owensboro, Ky., 42301, Tel: 502-683-2868; Empl.: 3; Minimum order: \$55

Customer service: W. J. Lattin

Products manufactured: Coils Including Assemblies & Forms

LDJ ELECTRONICS, 1064 Naughton Ave., Troy, Mich., 48064, Tel: 313-689-3623; Empl.: 12

For info on price: I. Bergel; Application info: L. Jackson; Customer service: I. Bergel; Delivery info: L. Jackson

Products manufactured: Analyzers, Calibrators, Coils Including Assemblies & Forms, Generators, Indicators, Integrators, Electronic, Magnetizers, Magnetometers, Magnetoresistors, Hall, Magnets, Meters, Probes, Testers, Transducers

LDJ ELECTRONICS cont'd

Advertisement

LDJ magnetizing and magnetic test equipment is designed for the production and quality control testing of magnetic materials and assemblies. Standard products include: magnetizers, demagnetizers, calibrators, gaussmeters, fluxmeters, coercimeters, and BH Meters, including tooling and fixtures to be used with the above. Features include digital readouts, hard-copy print-outs, automation and measurements that can be obtained with the push of a single button, and special designs for customers' particular application.

LEACH CORP., 5915 Avalon Blvd, Los Angeles, Cal., 90003, Tel: 213-232-8221, TWX: 910-321-2303; FSC No: 5945; QPL No: 6106; Empl.: 500; Minimum order: \$100 p. 1-1749-1755

For info on price: J. Weaver; Application info: E. Combs; Customer service: J. Weaver; Delivery info: J. Weaver

Free literature available: 8 page short form catalog covering all product lines, plus various technical reprints. 12 part "How-To-Pick-A-Relay" advertising insert series.

Products manufactured: Circuits, Hybrid, Thick Film, Controls/Control Eqpt., Monitors, Relays, Sockets, Switches, Timers

Local Sales Offices & Reps.

Ala	Huntsville, Craft Assocs.	205-837-0221
Cal	San Mateo, Halbar Assocs.	415-349-4700
Colo	Denver, Brown Technical	303-233-0863
Conn	Trumbull, Blake Assocs.	617-391-7890
Fla	Maitland, Craft Assocs.	305-645-2242
Ga	Atlanta, Craft Assocs.	404-393-0400
Md	Rockville, Markton, Inc.	301-762-6210
Mass	Medford, Blake Assocs.	617-391-7890
Mo	Ferguson, Leach Corp.	314-524-2880
NJ	Fort Lee, Leach Corp.	201-461-6550
NY	Fayetteville, Graydon-Sherman	315-637-9861
NY	Pittsford, Graydon-Sherman	315-637-9861
Ohio	Dayton, Leach Corp.	513-434-8151
Pa	Feasterville, PSA, Inc.	215-355-6244
Tex	Dallas, Caton Sales	214-661-5792
Va	Charlottesville, Marktron, Inc.	301-762-6210
Wash	Bellevue, Leach Corp.	206-822-9247

Local Distributors

Cal	El Segundo, Liberty Elctns., 124 Maryland St.	213-322-8100
Cal	Inglewood, Time Elctns. West, 900 W. Olive St.	213-649-6900
Ga	Atlanta, Electro Air Corp., 2270 Marietta Blvd.	404-351-3545
Mass	Woburn, Time Elctns./New England, 116 Cummings Pk.	617-935-8080
NY	Hauppauge, Time Elctns. Sls., 70 Marcus Blvd.	516-273-0100
Pa	Clifton Hgts., Time/Mid-Atlantic, 359 E. Madison Ave.	215-622-2500
Tex	Dallas, Assoc. Aircraft Supply, 5021 W. Jefferson Blvd.	214-331-4381
Wash	Seattle, Liberty Elctns./Northwest, 5305 2nd Ave. S.	206-763-8200

LEADER INSTRUMENTS CORP., 151 DyPont St, Plainview, N.Y., 11803, Tel: 516-822-9300; Empl.: 15; Minimum order: \$50

For info on price: S. Eisonborg; Application info: P. Redko; Customer service: M. Ambrico; Delivery info: D. Myers

Free literature available: 1) Complete full line catalog describing entire line of equipment-specifications applications and pricing; 2) full line short form catalog essentially same as above, but in condensed form.

Products manufactured: Calibrators, Generators, Meters, Oscilloscope Plug-Ins, Oscilloscopes, Power Supplies, Probes

LEAR SIEGLER, INC., 3171 S. Bundy Dr., Santa Monica, Calif., 90406, Tel: 213-391-7211, TWX: 910-343-8463; Empl.: 21000

Customer service: G. A. Moak

Products manufactured: Actuators, Air Conditioners (For Equipment), Amplifiers, Analyzers, Bearings, Bins, Part Storage, Brakes, Bus Bars & Systems, Bushings, Glass, Plastic, Metal, Rubber, Etc., Cabinets & Accessories, Chargers, Battery, Clutches, Comm. Systems, Controls/Control Eqpt., Couplings, Dehumidifiers (For Equipment), Dehydrators, Drills & Accessories, Hand & Power, Encoders, Equalizers, Gears & Gear Mechanisms (Precision), Generators, Grilles, Gyros (All Types), Indicators, Knobs, Motor Electric Generator Sets, Motors, Oceanographic Equip. (Electronic), Power Supplies, Public Address Systems, Pumps, Vacuum, Regulators, Relays, Repeaters, Servo, Services, Assembly, Production & Test, Servo Systems, Speaker Systems, Speakers, Switches, Telephone Channel Test & Simulator Equipment, Television Systems & Equipment Closed-Circuit, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic), Testers, Transducers, Transmission Systems, Data, Tubing, Underwater Communication, Detection, Navigation, etc. Equipment

Local Sales Offices & Reps.

Cal	Anaheim, Lear Siegler, Inc., Elctn. Instr. Div.	714-774-1010
Cal	Burbank, Lear Siegler, Inc., Bogen Div.	213-843-3111
Colo	Englewood, LSI Environmental Technology Div.	303-770-3300
Mass	Burlington, LSI Instrument Div.	617-273-0058
Mich	Grand Rapids, LSI Instrument Div.	616-241-7000
Mich	Southfield, Acts Computing Corp.	313-557-6800
NJ	Paramus, LSI Bogen Div.	201-343-5700
NY	Rye, American Avitron, Inc.	914-937-5300
Ohio	Maple Heights, LSI Power Equip. Div.	216-662-1000
Okla	Oklahoma City, LSI Telecomms.	405-525-2171
Tex	Dallas, LSI Power Equip. Div.	214-247-1212
Va	Arlington, Div. Sls. Off.	703-521-1010
Wash	Seattle, LSI Instr. Div.	206-725-6077
EXP	Rye, New York, American Avitron, Inc.	914-937-5300

LEAR SIEGLER, Elctn. Instr. Div., 714 N. Brookhurst St., Anaheim, Cal., 92803, Tel: 714-774-1010, TWX: 910-591-1157; Empl.: 600; Minimum order: \$50 p. 2-716,717

Free literature available: Pin Bar Product Brochure-Giving performance, mechanical and plating specifications for the entire line of solderless bus bars including two free sample bars.

Products manufactured: Bus Bars & Systems

Local Sales Offices & Reps.

Cal	San Francisco, Shannon Assoc.	415-941-2217
Colo	Denver, Moss Elec.	303-353-1452
Ga	Atlanta, Grady Duckett	404-451-3529
Ill	Chicago, Mauer Co.	312-677-4771
Mass	Boston, ABC Elec.	617-542-9162
Mich	Detroit, Hummon Assoc.	313-474-0661
Minn	Minneapolis, Macnamara Assoc.	612-472-4919
NJ	Haddonfield, Mid-Atlantic Elec.	609-428-8288
NJ	Tenafly, ABC Elec.	201-568-2354
NM	Albuquerque, Moss Elec.	505-821-6101
NY	Tarrytown, ABC Elec.	914-631-2650
NY	Williston Park, ABC Elec.	516-747-6610
NC	Charlotte, Grady Duckett	404-451-3529
Ohio	Cleveland, Geotronics	216-526-2535
Ohio	Columbus, Geotronics	614-457-8472
FOR	Can., Toronto, Ont., LSI/AA&E	416-459-0920

Local Distributors

Cal	Los Altos, Shannon Assocs., One First St.	415-941-2217
Colo	Greeley, G. Moss Elect., Drawer "J"	303-353-1452
Ga	Atlanta, Grady Duckett Sls., Box 29067	404-451-3529
Ill	Skokie, Mauer Co., Suite 29, 9701 Kenton	312-677-4771
Mass	Needham, ABC Elctn. Sls., 50 Kearney Rd.	617-449-2640
Mich	Farmington Hills, W.R. Hummon & Assoc., 23414 Industrial Pk.	313-474-0661
Minn	Mound, Macnamara Assoc., Box 38	612-472-4919
NJ	Haddonfield, Mid Atlantic Corp., 140 Haddon Ave.	609-428-8288
NJ	Tenafly, ABC Elect. Sls., 121 Oak St.	201-568-2354
NM	Albuquerque, G. Moss Elect., Box 708	505-821-6101
NY	N. Tarrytown, ABC Elect. Sls., 2 Willard Ave.	914-631-2650

NY Williston Pk., ABC Elect. Sls., 99 Hillside Ave. 516-747-6610
Ohio Cleveland, Geotronics Mktg., Box 41068 216-526-2535
Ohio Columbus, Geotronics Mktg., Box 20313 614-457-8472

LEAR SIEGLER, INC., Transportation Support Div., 11135 Condor Avenue, Fountain Valley, Cal., 92708, Tel: 714-546-3060, Telex: 678454; Empl.: 200

Products manufactured: Air Conditioners (For Equipment)

LEAR SIEGLER, INC., Romec Div., 241 S. Abbe Rd., Elyria, Ohio, 44035, Tel: 216-323-3211, TWX: 216-322-7265; Empl.: 230

For info on price: Mktg. Dept.; Application info: Engrg. Dept.; Customer service: Svc. Dept.; Delivery info: Mktg. Dept.

Products manufactured: Controls/Control Eqpt., Couplings, Dehumidifiers (For Equipment), Dehydrators, Heat Exchangers & Systems, Motors, Pumps, Vacuum, Services, Assembly, Production & Test, Switches, Valves, Vacuum

Local Sales Offices & Reps.

Cal	Los Angeles
Cal	Santa Monica
Ga	Atlanta
Ga	Marietta
Mass	Waltham
NJ	Palisades Park
Tex	Dallas
Tex	Fort Worth
Exp	Rye N.Y., American Avitron
FOR	Can., Rexdale, Ont., A.A.E. Aerospace Prods.

LEBOW ASSOCIATES, INC., 1728 Mapleawn Rd., Troy, Mich., 48064, Tel: 313-643-0220, TWX: 810-232-4818; Empl.: 80; Minimum order: \$20

For info on price: R. Haggerson; Application info: R. Phillips; Customer service: R. Martin; Delivery info: P. Rice

Products manufactured: Amplifiers, Cells, Load, Indicators, Slip-Rings & Assemblies, Testers, Transducers

Local Sales Offices & Reps.

Ala	Huntsville, Vaughn Electrosources	205-881-8830
Ariz	Phoenix, RDX Corp.	602-267-8162
Cal	Pasadena, RDX Corp.	213-681-3451
Cal	San Diego, RDX Corp.	714-278-6863
Cal	Sunnyvale, RDX Corp.	408-734-4500
Colo	Denver, PLS Assocs.	303-771-0140
Conn	W. Hartford, Instrument Assocs.	203-525-9367
Fla	Cocoa Beach, Vaughn Electrosources	303-784-0784
Ill	Chicago, Pivan Engrg.	312-539-4838
Ind	Indianapolis, Pivan Engrg.	317-253-1681
Kans	Mission, Pivan Engrg.	913-722-1030
Mass	Bedford, Instrument Assocs.	617-275-0700
Mich	Detroit, S. Sterling Co.	313-255-1970
Minn	Minneapolis, Pivan Engrg.	612-537-4501
Mo	St. Louis, Pivan Engrg.	314-567-3636
NJ	Bogota, Neville & Vespo Inc.	201-487-1505
NM	Albuquerque, PLS Assocs.	505-355-0120
NY	Williamsville, Maxwell Bennett Co.	716-634-2107
Ohio	Cleveland, S. Sterling	216-442-8080
Ohio	Dayton, S. Sterling	513-298-7573
Ore	Portland, ARVA, Inc.	503-292-8762
Pa	Pittsburgh, S. Sterling	412-922-5720
Tex	Dallas, Tech. Prods.	214-357-9603
Tex	Houston, Tech. Prods.	713-777-7360
Wash	Seattle, ARVA, Inc.	206-622-0177
Wisc	Brookfield, Pivan Engrg.	414-786-1940

LECTROETCH, 14925 Elderwood Ave., E. Cleveland, Ohio, 44112, Tel: 216-451-8080; Empl.: 20; Minimum order: \$7

For info on price: E. A. Badt; Application info: E. A. Badt; Customer service: J.F. Zentner; Delivery info: J.F. Zentner

Free literature available: Electrochemical marking manual complete catalog of all products illustrated price list.

Products manufactured: Kits, Marking (Dial, Instrument, Equipment, etc.), Machines/Machinery, Production

Local Sales Offices & Reps.

Ala	Birmingham, Porter Landrum Assoc.	205-967-2095
Cal	El Segundo, Applied Prods. Co.	213-678-6441
Conn	So. Glastonbury, E.D. Geiger	203-633-7646
Fla	Boca Raton, Aeromark Corp.	305-395-3320
Ill	Chicago, W.C. Kamin Co.	312-371-2870

Mass	Belmont, A.D. Geiger Co.	617-489-3322
Mich	Grosse Ile, C.H. Webster	313-676-6510
Mo	Kansas City, Liepsner & Co.	816-421-2511
Mo	St. Louis, Wagner Engraving Co.	314-535-3393
NY	Rochester, R.A. Haehl	716-467-6074
Ohio	Mayfield Heights, J.G. Seifert	216-442-0380
Pa	Feasterville, J.C. Moore	215-357-6086
Pa	Pittsburgh, E.A. McKinney	412-281-3138

LECTROHM DIV. OF CAPCO, INC., Box 1028, Grand Junction, Colo., 81501, Tel: 303-243-8480, TWX: 910-896-4346; Empl.: 200; Minimum order: \$35

For info on price: M. Klinect; Application info: J. Younker

Products manufactured: Resistors

Local Sales Offices & Reps.

Cal	Encino, V & L Assocs.	213-986-9703
Cal	Los Altos, Frauman Assocs.	415-941-0660
Colo	Littleton, Goyne Assocs.	303-298-8955
Ill	Chicago, Rinaldi Sls. Co.	312-763-4848
Kans	Prairie Village, Engrg. Svs. Co.	913-649-4000
Mass	Babson Park, P.R. Sturgeon Co.	617-237-3506
Minn	St. Paul, Countryman Assocs.	612-645-1951
Mo	St. Louis, Engrg. Svs. Co.	314-997-1515
NM	Albuquerque, Goyne Assocs.	505-265-6794
NY	Buffalo, R.W. Mitscher Co.	716-633-7970
NY	Manlius, R.W. Mitscher Co.	315-637-3771
NC	Raleigh, R. W. Mitscher Co.	919-828-0575
Ohio	Cleveland, D. Steffen & Assocs.	216-641-8333
Ohio	Dayton, D. Steffen & Assocs.	513-293-3145
Pa	Birchrunville, Jalelectronic	215-647-5151
Tenn	Shelbyville, R. W. Mitscher Co.	615-684-4544
Va	Virginia Beach, R. W. Mitscher Co.	804-481-7200
Wisc	Milwaukee, Star Engrg.	414-543-3469

LECTRO MAGNETICS, INC., 6056 W. Jefferson Blvd., Los Angeles, Cal., 90016, Tel: 213-870-9383; FSC No: 29098; Empl.: 45; Minimum order: \$25

For info on price: F.J. Nichols; Application info: J.C. Senn; Customer service: F.J. Nichols; Delivery info: G. Muir

Free literature available: Catalogs: RF Shielded Rooms: Prefabricated & all welded types 2. RFI/EMC Power Line Filters per MIL-STD-220A & MIL-F-15733

Products manufactured: Capacitors, Fixed, Chamber, Environmental Test, Chokes, Containers, Filters, Honeycomb Sheets, Panels, etc., Kits, Shielding, Shields

Local Sales Offices & Reps.

Ala	Huntsville, J.L. Highsmith & Co.	205-881-3294
Ariz	Phoenix, J.S. Heaton Co.	602-264-7887
Cal	Los Altos, Frauman Assoc.	415-941-0660
Cal	Santa Monica, McDonald Assoc.	213-393-7195
Colo	Denver, Scientific Devices, S.W.	303-573-9466
Fla	Orlando, J.L. Highsmith & Co.	305-293-5202
Ill	Belleville, E.E. Pauley Co.	618-233-3524
Ill	Chicago, Tolkaksen & Assoc.	312-441-6644
Md	Wheaton, Magyar & Assoc.	301-871-8833
Mass	Waltham, Meas. Conslts. Corp.	617-890-4400
NM	Albuquerque, Scientific Devices, S.W.	505-268-6729
NY	East Syracuse, Ossmann Instrs.	315-437-6666
NC	Charlotte, J.L. Highsmith & Co.	704-333-7743
Ohio	Dayton, Ashby Assoc.	513-252-5627
Pa	Philadelphia, Magyar & Assoc.	215-763-5044
Tex	Dallas, Scientific Devices, S.W.	214-231-8106
Tex	Houston, Scientific Devices, S.W.	713-623-4250
Tex	San Antonio, Scientific Devices, S.W.	512-694-6251
Wash	Seattle, Rush S. Drake Assoc.	206-763-2755

FOR: Can., Mississauga, Ont., RFQ LTD.

Advertisement

LectroMagnetics(LMI) is a leading supplier in all types of shielded enclosures of the modular and all welded types. Complete turn key facilities are designed and installed by licensed engineers and contractors.

LMI's Filter Division manufactures a wide range of RFI/EMI power line Filters to Government, U/L, FCC and to customer specifications.

LECTROTECH, INC., 5810 N. Western Ave., Chicago, Ill., 60659, Tel: 312-769-6262

Products manufactured: Generators, Oscilloscopes, Power Supplies, Probes, Test Equipment, Testers

Local Sales Offices & Reps.

Ariz	Phoenix, P.Z. Ray Assocs.	602-942-2502
Cal	Culver City, H. Feldman Co.	213-397-4471
Cal	San Francisco, Tech. Sls. Assocs.	415-467-1434
Fla	Ormond Beach, J.F. Thompson Co.	904-677-2298
Ga	Atlanta, Murphy & Cota	404-875-2525
Ill	Skokie, M. Berman Sls.	312-OR5-3740
Kans	Shawnee Mission, Maury Bettis Co.	913-382-0772
Md	Silver Springs, Mid-Atlantic Sls.	215-657-2815
Mich	Detroit, R. Mils Co.	313-354-3310
Minn	St. Paul, C.M. Sales Co.	612-699-8004
NY	East Northport, F. Tabman Sls	212-263-4646
NY	Syracuse, W. Tauber Co.	315-446-7094
Ohio	Cleveland, H. Miller Sls.	216-321-3900
Tex	Dallas, Loss & Stewart Assocs.	214-691-6039
Wash	Seattle, D.G. Weber Co.	503-254-0686
EXP	Westbury, N. Y., Minthorne Intl Co.	516-334-3303

LEDEX INC., 123 Webster St., Dayton, Ohio, 45402, Tel:

513-224-9891, TWX: 810-459-1646; FSC No: 81840; Empl.: 515; Minimum order: \$25

p. 1-262,263,970,1756-1759,2092-2096

Customer service: Cust. Supv.

Free literature available: Solenoids, switches, stepping motors and interface circuits are shown in the General Catalog, A-9500. Detailed catalogs on each product are also available upon request.

Products manufactured: Actuators, Comm. Systems, Controls/Control Eqpt., Lamps, Lights, Motors, Rectifiers, Relays, Solenoids, Suppressors, Switches, Timers

Local Sales Offices & Reps.

Ariz	Scottsdale, B-5 Inc.	602-947-5745
Cal	Palo Alto, Testco	415-326-5320
Cal	Woodland Hills, Interstate Mktg. Assocs.	213-883-7606
Colo	Denver, B-5 Inc.	303-426-0222
Conn	Trumbull, SIR Assocs.	203-268-2560
Fla	Hollywood, W.B. Wimberly Co.	305-961-6962
Fla	Orlando, W.B. Wimberly Co.	305-423-2514
Ill	La Grange Park, Bierhaus Sls., Inc.	312-354-5100
Kans	Leawood, Thunderbird Tech. Sls. & Svcs.	913-642-7220
Kans	Wichita, Thunderbird Tech. Sls. & Services	316-684-3941
Mass	Lexington, SIR Assocs.	617-862-1812
Mich	Benton Harbor, R.C. Nordstrom & Co.	616-857-4653
Mich	Lathrup Village, R.C. Nordstrom & Co.	313-559-7373
Minn	Minnetonka, T.H. Ayre Assocs.	612-474-4125
Mo	St. Louis, Thunderbird Tech. Sls. & Svcs.	314-567-6488
NY	Liverpool, L.P. Garner Assocs.	315-451-1323
NY	Oceanside, Bittan Assocs.	516-678-6222
NC	Raleigh, A.B. Andrews & Co.	919-833-5565
Ohio	Dayton, Dynel Co.	513-434-6467
Pa	Philadelphia, V.S. Malta	215-836-5122
Pa	Pittsburgh, R.F. Clark Co.	412-242-9500
Tex	Richardson, Thunderbird Tech. Sls. & Svcs. Inc.	214-690-0763
Wash	Bellevue, Testco	206-454-7422
Wisc	Milwaukee, Bierhaus Sls. Inc.	414-332-0900

LEECRAFT MFG. CO., INC., 21-16 44th Rd., Long Island City, N.Y., 11101, Tel: 212-392-8800; Empl.: 250

p. 2-1182,1183

Customer service: T. Marine

Free literature available: Specification Sheets: 1) Solid State L-E-D Indicators, 2) Lampholder (subminiature) 3) Trim-Line Indicator Lights, 4) Tineon Pilot Lights Product Lighting Guide No.1-73 4 Pages, Product Lighting Guide No.1-70-C 12 Pages; Indicator Lights, Product Lighting Guide No. LG-970/1 20 Pages; Lampholders, Indicator Lights, Electrical Assemblies.

Products manufactured: Diodes, Lamps, Lights, Services, Assembly, Production & Test, Sockets, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Murcota	205-536-9121
Ark	Hot Springs, Meredith Young & Assocs.	501-262-1365
Cal	Chatsworth, Hansen	213-882-8181
Colo	Arvada, Arrowhead Sls. Co.	303-423-5556
Conn	Bloomfield, Zaslow Sls.	203-242-7781
Fla	No. Miami, Winfield Elctns.	305-945-6544
Ga	Atlanta, Murcota	919-723-1001
Ill	Hinsdale, Hill & Gray	312-325-4810
Ind	Indianapolis, Southern Sls.	317-257-7575
Iowa	Des Moines, K-S-W	515-279-9235
Ky	Louisville, Southern Sls. Co.	919-723-1001

Md	Lutherville, L. Lowery	301-823-2172
Mass	Lowell, Zaslow Sls.	617-458-8452
Mich	Troy, C. Jensen	313-643-0506
Minn	St. Paul, R. Ragon	612-488-0201
Miss	Jackson, Meredith Young Assoc.	601-366-8185
Mo	Kansas City, K-S-W	816-358-5240
Mo	St. Louis, K-S-W	314-781-6111
NJ	Parlin, Cooper Simon & Co. Inc.	516-487-1142
NY	Cazenovia, B. H. Tollefson Assoc., Inc.	716-271-4141
NY	Great Neck, C. Simon & Co.	516-487-1142
NC	Winston Salem, Murcota	919-723-1001
Ohio	Cleveland, Anderson-Bolds	216-229-4700
Okla	Tulsa, Erickson-Viliter Sls.	214-243-6611
Ore	Portland, A. Stroum	503-292-3534
Pa	Broomall, L. D. Lowery	215-356-5300
Pa	Pittsburgh, R. W. Moulton Assoc.	412-366-3333
Tenn	Chattanooga, Knox Talley	615-266-3611
Tex	Dallas, Erickson-Viliter Sls.	214-243-6611
Utah	Salt Lake City, Arrowhead Sls.	801-487-3444
Va	Charlottesville, L.D. Lowery Inc.	804-973-6672
Wash	Seattle, Almac Stroum	206-763-2300

EXP: Long Island City, NY, Leecraft Intl Corp.

FOR: Can., Richmond, Ontario, Leecraft Industries, Ltd.

FOR: Can., Scarborough, Ont., Lake Engrg.

416-751-5980

Local Distributors

Cal	Culver City, Western Electromotive, 8467 Steller Dr.	213-870-7621
Cal	El Monte, Kimball Stark, 3035 N. Tyler Ave.	213-283-7979
Cal	Garden Grove, Allied Elctns, 12311 Industry St.	714-894-7581
Cal	Inglewood, Newark Electronics, 4747 W. Century Blvd.	213-678-0441
Cal	Los Angeles, Fisher/Brownell, 13936 S. Broadway	213-532-2170
Cal	Sacramento, Sacramento Elctns.	916-441-4821
Cal	Santa Clara, Fisher/Brownell, 3381 Edward Ave.	408-244-6182
Colo	Denver, Newark Denver Supply, 2170 S. Grape St.	303-757-3351
Conn	WWaterbury, Suburban Supply Corp., 117 Benedict St.	203-757-1251
Fla	Orlando, E. W. Cramer, 345 N. Graham Ave.	305-894-1511
Fla	Orlando, Hammond Elctns., 911 W. Central Ave.	305-241-6601
Ill	Chicago, Newark Elctns. Corp., 500 N. Pulaski Rd.	312-638-4411
Ill	Elgin, Allied Elctns. Corp., 1355 Sleepy Hollow	312-421-2400
Ill	Peoria, Klaus Radio, 8400 N. Pioneer Pkwy.	309-691-4840
Ill	Western Springs, Industribution Inc., Box 228	312-325-0296
Ind	Evansville, Hutch & Son, Inc., 300 N. Main St.	812-425-7155
Ind	Indianapolis, Ra-Dis-Co., 814 N. Senate Ave.	317-637-5571
Ind	Indianapolis, Graham Elctns. Supply, 133 S. Pennsylvania St.	317-634-8486
Ky	Louisville, P. I. Burks Co., 659 S. Ninth St.	502-583-2871
La	New Orleans, Southern Radio Supply Co., 1909 Tulane Ave.	504-524-2345
Md	Baltimore, Radio Elec. Sve. Co., 1026 Cromwell Bridge Rd.	301-823-0071
Md	Rockville, Capitol Radio Wholesalers, 12270 Wilkens Ave.	301-881-2270
Md	Rockville, Cramer E. W. Inc., 16021 Industrial Dr.	301-948-0110
Mass	Boston, Sager Electrical Supply, 172 High St.	617-542-2281
Mass	Newton, Cramer Elctns, Inc., 85 Wells Ave.	617-969-7700
Mich	Ann Arbor, Wedemeyer Elec. Supply, 2280 S. Industrial Hwy.	313-665-8611
Mich	Detroit, Newark Elctns. Corp., 20700 Hubbell Ave.	313-548-0250
Mich	Detroit, RS Elctns., 12775 Lyndon Ave.	616-241-3483
Mich	Wyoming, Newark Ind. Elect., 3645 Linden Ave. S. E.	616-241-6681
Minn	St. Paul, Gopher Elctns., 2520 W. Larpenteur Ave.	612-645-0241
Mo	St. Louis, LCOMP St. Louis, Inc., 2605 S. Hanley Rd.	314-647-5505
NJ	Cherry Hill, Milgray/Delaware Valley, 1165 Markkress Rd.	609-424-1300
NJ	Hanover, State Elctns., Inc., 36 Route #10	201-887-2550
NJ	Kenilworth, Newark Elctns., 303 Monroe Ave.	201-272-8410
NJ	Pennsauken, Resco Elctns, Airport Industrial Pk	609-662-4000

NJ	Springfield, Federated Purchasers, Inc., 155 U.S. Route #22	201-376-8900
NY	Binghamton, Stack Indl. Elctns., 10 Susquehanna St.	607-723-6326
NY	Buffalo, Summit Distrs., 916 Main St.	716-884-3450
NY	Elmsford, Ancar/Elctns., One Nepperhan Ave.	914-592-7100
NY	Farmingdale, Arrow Elctns., 900 Broadhollow Rd.	516-694-6800
NY	Rochester, Summit Distrs., Inc., 292 Commerce Dr.	716-334-8110
NC	Greensboro, Hammond Elctns., 2923 Pacific Ave.	919-275-6319
Ohio	Akron, Sun Radio Co., 110 E. Market St.	216-434-2171
Ohio	Cincinnati, Hughes Peters, Inc., 4865 Duck Creek Rd.	513-351-2000
Ohio	Cincinnati, Newark Elctns., 9799G Princeton Rd.	513-874-5115
Ohio	Cleveland, Pioneer Standard Elect., 4800 E. 131 St.	216-587-3600
Ohio	Dayton, Pioneer Standard, 314 Leo St.	513-224-0871
Ohio	Dayton, S. Friedman, 108-112 N. Jefferson	513-224-1111
Ore	Portland, Almas Almac Stroum Elctns., Box 25444, 4475 S. W. Scholls Ferry Rd.	503-292-3534
Pa	Philadelphia, Almo Indl. Elctns., Roosevelt Blvd. & Blue Grass Rd.	215-676-6000
Pa	Philadelphia, Herbach Rademan, Inc., 401 E. Erie Ave.	215-426-1700
Pa	Philadelphia, Philadelphia Elctns., Inc., 112 N. 12th St.	215-568-7400
Pa	Pittsburgh, Cameradio, Inc., 2801 Liberty Ave.	412-288-2988
Pa	Reading, G. D. Barbey Co., 333 N. 4th St.	215-376-7451
RI	Providence, W. Dandretta & Co., 28 Wolcott St.	401-861-2800
Tenn	Kingsport, Radio Elec. Supply Corp., 961 E. Sullivan St.	615-247-8111
Tenn	Nashville, Electra Distributing Corp., 1914 West End Ave.	615-329-3971
Tex	Fort Worth, Allied Elctns., 401 E. 8th St.	817-336-5401
Tex	Garland, Newark Elctns., 707 Easy St.	214-271-2511
Va	Richmond, Sterling/Meridian Elctns., 1001 W. Broad St.	804-353-0040
Wash	Seattle, Almac Stroum Elctns., 5811 6th Ave., S.	206-763-2300
Wisc	Milwaukee, Parts Mart Corp., 1314 N. 7th St.	414-276-4160
Exp:	Can., Richmond Hills, Ont., Leecraft Inds. Ltd., 382 Enford Rd.	416-869-2744
Exp:	Long Island City, N.Y., Leecraft Int. Corp., 21-16 44th Rd.	212-392-8800
For:	Can., Don Mills, Ont., Saynor Elctns., Ltd., 99 Scarsdale Rd.	416-445-2340
For:	Can., Montreal, Que., Payette Radio, 730 St. James St.	514-878-4771
For:	Can., Montreal, Que., Cesco Elctns., Ltd., 4050 Jean Talon St.	514-735-5511
For:	Can., Toronto, Ont., Electro Sonic, Inc., 543 Yonge St.	416-494-1555
For:	Can., Toronto, Ont., Zentronics, Ltd., 185 Bridgeland Ave.	416-789-5111
For:	Can., Vancouver, B.C., L.A. Varah, Ltd., 1250 W. 6th St.	604-873-3211
For:	Can., Winnipeg, Man., Cam Gard Supply Co., Ltd., 1777 Ellis Ave.	204-786-8401

LEEDS & NORTHRUP CO., Sunnyside Pike, North Wales, Pa., 19454, Tel: 215-643-2000; Empl.: 4800

Products manufactured: Amplifiers, Analyzers, Baths, Controlled Temperature (Air & Liquid), Bridges, Calibrators, Capacitors, Fixed, Capacitors, Variable, Clocks (All Types), Comm. Systems, Comparators, Computers, Controllers, Programmable, Controls/Control Eqpt., Converters, Current Sensors, Data Acquisition & Reduction Systems, Data Loggers, Decade Boxes, Display Devices/Displays, Dividers, Drives & Drive Mechanisms (Dial), Furnaces, Indicators, Integrated Circuit Devices, Meters, Monitors, Paper, Graphic Recording, Potentiometers, Power Supplies, Printers, Probes, Pyrometers, Recorders, References, D-C Voltage, Scanners, Services, Assembly, Production & Test, Standards, Switches, Testers, Thermocouples, Elements & Accessories, Thermometers, Resistance, Totalizers, Digital, Transducers, Transmission Systems, Data, Transmitters, Voltage Sources, Wire

Local Sales Offices & Reps.
Ala Birmingham 205-870-5310

Ala	Mobile	205-342-8929
Ariz	Phoenix	602-966-3870
Cal	Anaheim	714-635-6040
Cal	San Mateo	415-349-6656
Colo	Denver	303-759-2701
Conn	West Hartford	203-232-4474
Del	Wilmington	302-478-6970
DC	Washington	301-621-1353
Fla	Miami	305-428-2861
Fla	Orlando	305-851-3911
Ga	Atlanta	404-938-8946
Ill	Chicago	312-775-4141
Ill	Lansing	312-474-7070
Ind	Indianapolis	317-545-4364
Iowa	Davenport	319-355-6481
Kans	Mission	913-432-3727
Ky	Louisville	502-426-2985
La	Baton Rouge	504-921-5487
La	Shreveport	318-861-1861
Md	Baltimore	301-465-9494
Mass	Boston	617-326-8816
Mich	Detroit	313-398-3035
Mich	Grand Rapids	616-458-3691
Minn	Minneapolis	612-835-7722
Mo	Kansas City	913-432-3727
Mo	St. Louis	314-726-0853
Neb	Omaha	402-895-0886
NJ	Union	201-686-5200
NY	Albany	518-785-1354
NY	Buffalo	716-836-5900
NY	New York	212-687-4133
NY	Rochester	716-235-1700
NY	Syracuse	315-446-8446
NC	Winston-Salem	919-723-1087
Ohio	Akron	216-253-9086
Ohio	Canton	216-492-7400
Ohio	Cincinnati	513-791-2274
Ohio	Cleveland	216-291-2100
Ohio	Columbus	614-891-1615
Ohio	Toledo	419-531-4489
Okla	Tulsa	918-622-4515
Ore	Portland	503-292-8945
Pa	Allentown	215-434-4417
Pa	Erie	814-838-7708
Pa	Harrisburg	717-737-8628
Pa	Philadelphia	215-646-5500
Pa	Pittsburgh	412-561-7808
Pa	Sharon	412-346-3585
SC	Columbia	803-256-1495
Tenn	Knoxville	615-693-1838
Tenn	Memphis	901-365-9026
Tex	Beaumont	713-838-6848
Tex	Dallas	214-234-3363
Tex	Houston	713-784-2720
Utah	Salt Lake City	801-266-6931
Va	Richmond	804-272-7573
Va	Roanoke	703-345-9532
Wash	Seattle	206-455-4450
WVa	Charleston	304-342-6678
Wisc	Milwaukee	414-774-6000

LEEPOXY PLASTICS, 3324 Ferguson Rd., Ft. Wayne, Ind., 46809, Tel: 219-747-7411; Empl.: 15
Customer service: S. H. Christie

Free literature available: Selector Guide - Adhesives
Products manufactured: Adhesives (All Types), Compounds, Encapsulating, Insulating, Molding, Potting

Local Distributors
Cal Paramount, J. S. Switzer, 15116 Downey Ave.
213-634-6363

LEIGHTON ELECTRONICS, INC., RD1 4Mi. West on Rt. 443, Leighton, Pa, 18235, Tel: 717-386-4156; Empl.: 40;
Minimum order: \$25

For info on price: L. Miller; Application info: A. R. Blew; Customer service: L. Miller; Delivery info: L. Miller

Free literature available: IC & transistor carrier board-device trays, digital controller P.C. Boards, control panels, electronic ass'ys to equip., switchgear, elevated temp. aging rack (diodes) ambient transistor aging rack.

Products manufactured: Alarms, Boards, Plug-In, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Boards, Programming, Cable Assemblies & Harnesses, Cards, Linear Function, Cards, Logic, Controllers, Programmable, Kits, Printed Circuit, Power Supplies, Services, Assembly, Production & Test, Testers, Timers

Local Sales Offices & Reps.
DC Washington, Arco Engrg. Inc. 202-393-5991
NJ Haddonfield, Sunday-O'Brien 609-429-4013

LEIGHTON ELECTRONICS, INC. cont'd

Advertisement

Let Leighton Electronics, Inc. be your one stop high quality fast delivery source for artwork, printed circuit boards and assemblies, special and catalog test, production and automation equipment and switchgear. Please send your specifications and drawings for fast competitive pricing.

LEICO INDS., INC., 250 West 57th St., New York, N.Y., 10019, Tel: 212-765-5290; Minimum order: \$30

For info on price: L. L. Eisenmann; Application info: L. L. Eisenmann; Customer service: E. Buchsbaum; Delivery info: P. Kasner

Products manufactured: Alloys, Connectors, Crystals, Diodes, Metal Compounds, Foils, Powders, Sheet, Stock, Metal Oxides, Metals, Plug Adapters, Plug & Jack Sets, Thermocouples, Elements & Accessories, Tubing, Wire

LEKTRA LABS., INC., 129-07 18th Ave., College Point, N.Y., 11356, Tel: 212-939-7171; Empl.: 60

For info on price: F. L. Chilton; Application info: C. Sershen; Customer service: C. Sershen; Delivery info: L. Nappi

Products manufactured: Controls/Control Eqpt., Switches, Timers



LEMO USA, 2015 Second St., Berkeley, Cal., 94710, Tel: 415-548-1966, Telex: 33-5393

For info on price: D. Winocour; Application info: B. Wersen; Customer service: D. Winocour; Delivery info: D. Winocour

Products manufactured: Connector Adapters, Connectors

Local Sales Offices & Reps.

Cal Berkeley, Caltron Industries 415-548-1966
Cal Los Angeles, Ezra Mintz Assocs. 213-645-2066
Ill Parkridge, Central States Assocs. 312-692-2101
Mass Lexington, Zieco 617-861-8300

Advertisement

Quick Connect/Dis-connect cylindrical connectors for round cables. Coaxial, multi-contact, and high voltage types. All metal shells are satin-chrome plated and complement other high quality front panel components.

LENK MFG. CO., INC., See Wall-Lenk Mfg. Co.

LENOX-FUGLE ELCTNS., INC., 100 Sylvania Pl., S. Plainfield, N.J., 07080, Tel: 201-756-1164; Empl.: 18

Products manufactured: Coils Including Assemblies & Forms

LENOX INSTR. CO., 121 E. Luray St., Philadelphia, Pa., 19120, Tel: 215-DA 4-4543; Empl.: 40

Products manufactured: Fiber Optic Bundles, Lenses, Optical & Camera, Lenses, Readout & Display, Microscopes, Television Systems & Equipment Closed-Circuit

LENZ ELECTRIC MFG. CO., 1751 N. Western Ave., Chicago, Ill., 60647, Tel: 312-276-4454

Products manufactured: Cable, Wire, Wire Shielding

LEPEL HIGH FREQUENCY LABS., 59-21 Queens-Midtown Expwy., Maspeth, N.Y., 11378, Tel: 212-HA 6-4580; Empl.: 200; Minimum order: \$25

For info on price: J. Chiuflfi; Application info: P. Capolongo; Customer service: R. Rosenberg; Delivery info: J. Chiuflfi

Products manufactured: Heaters & Heating Elements, Machines/Machinery, Production

Local Sales Offices & Reps.
Ala South Birmingham, Dilcher Engrg. Co. 205-252-3300

Ariz	Scottsdale, Mercury Engrg. Sls., Inc.	602-945-1927
Cal	Irvine, Lepel High Frequency Labs., Inc.	714-540-1650
Conn	Simsbury, T. V. Evans	203-658-5579
Fla	St. Petersburg, Dilcher Engrg. Co.	813-343-1041
Ga	Atlanta, Dilcher Engrg. Co.	404-261-1678
Ill	Chicago, Lepel High Frequency Labs., Inc.	312-637-7244
Mass	Wakefield, Eastern Appliance Co.	617-245-8530
Mich	Mount Clemens, E. L. Kemper & Assocs.	313-468-9797
Minn	Minneapolis, C. W. Stone Co.	612-FE 9-0611
Mo	St. Louis, Brandwine Equip. Co.	314-993-5810
NC	Charlotte, Dilcher Engrg. Co.	704-364-9272
Ohio	North Canton, H. D. Denton	216-499-3091
Pa	Havertown, E. G. Murphy	215-446-4414
Tenn	Chattanooga, Young Equip. Sls.	615-265-3862
Tex	Houston, Selle Alloys & Equip. Co.	713-524-3013
Wash	Seattle, Eustis Co., Inc.	206-623-7060

LEVITON MFG. CO., INC., 59-25 Little Neck Pkwy., Little Neck, N.Y., 11362, Tel: 212-229-4040, TWX: 710-582-2632

Products manufactured: Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Boxes, Junction, Outlets & Wall Plates, Cable, Caps, Connector, Clamps & Clips, Controls/Control Eqpt., Cords, Fuses, Lamp Adapters, Plug Caps & Shells, Plugs, Socket Adapters, Sockets, Switch Mounting Plates, Switches, Wire

LFE CONTROL SYSTEM INDUSTRIES, 2920 Sand Ysidro Way, Santa Clara, Cal., 95051, Tel: 408-732-9400, TWX: 910-339-9282; Empl.: 100

For info on price: D. G. Ridgeway 408-732-9400; Application info: D. J. Gausshell 408-732-9400; Customer service: W. J. Robertson 408-732-9591; Delivery info: D. G. Ridgeway 408-732-9400

Free literature available: Modscan Systems-Modular computer-driven data acquisition & control systems 2. Series 400 Trend Displays. Supplies simultaneous viewing of any two process variables. CSI 7000 Remote Terminal-Supplies remote acquisition of data and transmission to a central Minicomputer.

Products manufactured: Data Acquisition & Reduction Systems, Multiplexers, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.		
Cal	Santa Clara	408-732-9400
Ill	Arlington Heights	312-956-0930
Tex	Houston	713-661-5390

LFE CORPORATION, Process Control Div., 1601 Trapelo Rd., Waltham, Mass., 02154, Tel: 617-890-2000, TWX: 710-324-0681; Empl.: 490

For info on price: R. Gubisch; Application info: R. Gubisch; Customer service: J. Incatasciato; Delivery info: G. Holderer

Free literature available: New catalog describes (API) analog panel meters, meter-relays, digital panel meters, temperature indicators, temperature controllers, and other display and control instruments.

Products manufactured: Comparators, Controls/Control Eqpt., Counters, Detectors, Dials, Display Devices/Displays, Meters, Monitors, Pyrometers, Recorders, Relays, Semiconductor Wafer Fabrication, Thermocouples, Elements & Accessories, Transducers

Local Sales Offices & Reps.		
Ala	Huntsville, 20th Century Mktg.	205-772-9237
Ariz	Phoenix, Zeus Inc./Elcom Div.	602-253-6104
Cal	Irvine, LFE Corp./Process Control Div.	714-979-8472
Cal	Santa Clara, LFE Corp./Process Control Div.	408-732-9611
Cal	San Jose, Zeus Inc./Elcom Div.	303-770-4400
Fla	Boca Raton, Conley Assocs.	305-395-6108
Fla	Oviedo, Conley Assocs.	305-365-3283
Fla	Tampa, Conley Assocs.	813-933-3183
Ga	Douglasville, 20th Century Mktg.	404-942-6483
Ill	Arlington Heights, LFE Corp./Process Control Div.	312-593-5551
Kans	Prairie Village, LFE Corp./Process Control Div.	913-649-0121
Mass	Waltham, LFE Corp./Process Control Div.	617-890-2000
Mich	Royal Oak, George Instr. Co.	303-576-4700
Minn	Minneapolis, CMI	612-757-5090

NJ	Oakland, LFE Corp./Process Control Div.	201-337-6163
NM	Albuquerque, Zeus Inc./Elcom Div.	505-268-3941
NY	New Hartford, KLM Assocs.	515-735-8525
NY	North Syracuse, KLM Assocs.	315-458-6214
NY	Rochester, KLM Assocs.	716-442-0820
Ohio	Chesterland, LFE Corp./Process Control Div.	216-423-3131
Ohio	Dayton, LFE Corp./Process Control Div.	513-434-8873
Pa	Newtown Square, LFE Corp./Process Control Div.	215-353-0772
Tex	Houston, Carey-Wolf & Assocs.	713-721-2442
Utah	Salt Lake City, Zeus Inc./Elcom Div.	801-486-2317
Wash	Seattle, Comptronics	206-284-4842

For info on price: J. C. Graham; Application info: J. C. Graham; Customer service: L. Reeve; Delivery info: L. Reeve

Products manufactured: Power Supplies

Local Sales Offices & Reps.

Ariz	Scottsdale, DeAngelo, Rothman & Cheever	602-948-2240
Cal	Los Altos, Parsons & Meister	415-941-4745
Cal	Pasadena, A-F Sls. Engrg.	213-795-7081
Fla	Winter Park, Young & Lawrence Assoc.	305-647-6929
Md	Laytonsville, G-T Assocs.	301-949-8060
Minn	Minneapolis, Electro-Serv.	612-827-2907
NH	Nashua, Bell Controls	603-882-6984
NY	Endicott, Tech-Mark Assoc.	607-748-7473
NY	Great Neck, Tronic Assoc.	516-466-2300
Ohio	Cleveland, Goetronix Mktg. Assocs.	216-526-2535
Pa	Ambler, Denco-Data Engrg.	215-542-9876
Tex	Irving, Space Electrs.	214-251-2261
Wash	Seattle, C.K. Shank & Assocs.	206-632-4290

LIBBEY OWENS-FORD CO., Liberty Mirror Div., 811 Madison Ave., Toledo, Ohio, 43695, Tel: 419-247-4797

For info on price: Ms. M. Gillespie 412-224-1800; Application info: D. W. Barkley 412-224-1800; Customer service: D. R. Grove 419-247-4797; Delivery info: T. Conroy 412-224-1800

Products manufactured: Coatings

Local Sales Offices & Reps.		
Cal	Los Angeles	213-388-0641
Ill	Chicago	312-236-2490
NJ	Fort Lee	201-947-8000
Ohio	Cincinnati	513-563-8920
Ohio	Toledo	419-247-4797
Tex	Dallas	214-521-3782

LIBERTY CONTROLS, INC., 500 Brookforest Ave., Shorewood, Ill., 60431, Tel: 815-725-2241; Empl.: 60; Minimum order: \$50

For info on price: R. J. Rudisill; Application info: R. J. Rudisill; Customer service: R. A. Bauer; Delivery info: R. A. Bauer

Products manufactured: Coils Including Assemblies & Forms, Panels, Racks, Relays, Solenoids

Local Sales Offices & Reps.		
Cal	Santa Monica, REP Assoc.	213-829-5401
Fla	Sarasota, R.F. Carlson	813-388-3086
Ill	Chicago, Schuten Assoc.	312-833-0980
Mass	Braintree, Systems Comps.	617-275-2890
Mich	Grand Rapids, R. P. Urban & Assocs.	616-245-0511
Minn	St. Paul, Countryman Assocs.	612-645-9151
Mo	St. Louis, R. Carlson	314-961-4485
NJ	Fort Lee, Necco	201-461-2789
NY	Buffalo, Niagara Elec. Sls.	716-886-4000
NY	Rochester, Niagara Elec.	716-271-1223
Ohio	Cleveland, E. Bock	216-331-5212
Pa	Bryn Mawr, Vantage Sls.	215-525-0304
Tex	Dallas, D. Shuhart Co.	214-239-0185

LICON DIV., Illinois Tool Works, 6615 W. Irving Park Rd., Chicago, Ill., 60634, Tel: 312-282-4040, TWX: 910-221-0275; Empl.: 450; Minimum order: \$50

For info on price: R. Schmidt; Application info: R. Schmidt; Customer service: A. Strassenberg; Delivery info: A. Strassenberg

Free literature available: Designers Keyboard Brochure with designers work sheet, A colorful 24-page lighted switch guide, and a general 40 page condensed catalog covering all Licon products.

Products manufactured: Caps, Lenses, Indicator Light, Controls/Control Eqpt., Diodes, Keyboards, Alphanumeric & Decimal, Lamps, Switches

Local Sales Offices & Reps.		
Cal	Los Angeles, Licon	213-723-1181
Cal	Menlo Pk., McKnight Co.	415-325-2844
Colo	Lakewood, Licon	303-232-9588
Conn	Meriden, R. Stornello	203-237-6361
Fla	Clearwater, Perrott Assoc.	813-726-1549
Fla	Orlando, Perrott Assoc.	305-275-1132
Ga	Atlanta, Electro Mech.	404-393-0444
Kans	Overland Pk., Penzner-Mankus	913-381-0004
Kans	Wichita, Penzner-Mankus	316-264-2662
Md	Baltimore, Coulbourn DeGreif Inc.	

Mass	Burlington, J. Griffin	617-273-0365
Mich	Birmingham, Licon	313-642-9876
Minn	Minneapolis, Comstrand Inc.	612-560-5300
Mo	Hazelwood, Penzner-Mankus	314-731-4334
Neb	Lincoln, Mktg. Assoc.	402-464-5244
NJ	Haddonfield, TAI Corp.	609-854-3011
NY	Buffalo, Telesco Assoc.	716-834-1026
NY	Massapequa, J.F. Coughlin	516-799-7773
NY	Rochester, Telesco Assoc.	716-271-3780
NY	Utica, Telesco Assoc.	315-733-3183
NC	Raleigh, Electro Mech.	919-782-6452
Ohio	Columbus, Rockford Controls	614-231-5890
Ohio	Dayton, Rockford Controls	513-278-7362
Ohio	Euclid, Rockford Controls	216-731-5250
Pa	Monroeville, Rockford Controls	412-373-2531
Tex	Dallas, Evans-McDowell	214-238-5177
Tex	Houston, Evans-McDowell	713-783-2900
Wash	Bellevue, Barrett Sls.	206-885-6991
FOR	Can., Don Mills, Ont., Illinois Tools	

LINDEN LABS., INC., Box 920, State College, Pa., 16801, Tel: 814-355-5491; FSC No: 20872; Empl.: 50; Minimum order: \$50

For info on price: D. A. Beisswanger; Application info: P. A. Rishel; Customer service: D. A. Beisswanger; Delivery info: D. A. Beisswanger

Free literature available: Technical data on complete line of piezoelectric materials and transducers. Short form catalog.

Products manufactured: Ceramic Resonators, Crystals, Detectors, Hydrophones & Accessories, Microphones, All Kinds, Transducers

LINE ELECTRIC CO. UNIT ESTERLINE CORP., U.S. Hwy. 287, Parsippany, N.J., 07054, Tel: 201-887-8200; Empl.: 175; Minimum order: \$5

For info on price: I. Kasper; Application info: I. Kasper; Customer service: I. Kasper; Delivery info: I. Kasper

Free literature available: Line Relay Catalog

Products manufactured: Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Relays, Switches

Local Sales Offices & Reps.		
Ala	Huntsville, Murcota Corp.	205-539-8476
Cal	Oakland, Sierra-Pacific Engrg. Inc.	415-635-6909
Cal	Santa Fe Springs, Sierra Pacific Engrg.	213-921-9634
Conn	Berlin, White Sls. Co.	203-224-0423
Fla	Clearwater, Lynch Gentry Assocs.	813-443-2697

Ind	Indianapolis, Val-Skol Sls., Inc.	317-926-5063
Mass	Needham, White Sls. Co.	617-444-3676
NJ	Leonia, Associated Controls & Equip.	201-944-9218
NY	Rochester, ONTEC	716-464-8636
NC	Winston-Salem, Murcota Corp.	919-723-1001
Ore	Forest Grove, Bern Doran Sls.	503-357-3333
Pa	Abington, Industrial Mktg. Specialists	215-659-0444
Tex	Dallas, Techno Assocs.	214-357-9213
EXP	Bloomfield, N.J., Buck International Co.	201-743-8110

LINEAC CORP., 222 Lake Ave., Yonkers, N.Y., 10701, Tel: 914-YO3-5900

For info on price: J. Wilentchik; Application info: J. Wilentchik; Customer service: A. Powers; Delivery info: A. Powers

Free literature available: Bulletin #P502 - Program Dip Switches From 1 to 32 positions; single or multi throw; 1 to 8 poles; Mount on Board, Panel or in standard DIP receptacles.

Products manufactured: Switches

LINEAR INSTRS. CORP., 17282 Eastman St., Irvine, Cal., 92705, Tel: 714-546-6776, Telex: 68-5613; Empl.: 50; Minimum order: \$25

LINEAR

For info on price: J. Mixon; Application info: J. Mixon; Customer service: C. Hamilton; Delivery info: N. Loran

Free literature available: Laboratory Recorders; Log/Linear Recorders; Integrating Recorders; Recorder Buyer's Guide.

Products manufactured: Amplifiers, Paper, Graphic Recording, Recorders

LINEAR NETWORKS CO., Box 775, Westminster, Cal., 92683, Tel: 213-430-9342; FSC No: 5915; Empl.: 7
Customer service: J. L. Hugin

Products manufactured: Filters

LINEAR SYSTEMS, INC., 220 Airport Blvd., Watsonville, Cal., 95076, Tel: 408-722-4177, TWX: 910-330-6371; Empl.: 70

For info on price: P. F. Zimmer; Application info: P. F. Zimmer; Customer service: J. L. Peloso; Delivery info: J. L. Peloso

Free literature available: Full line catalogue 16 page, full color product data sheets by model Misc. product information fliers and brochures

Products manufactured: Comm. Systems, Microphones, All Kinds, Power Supplies, Receivers, Transceivers, Transmitters

Local Sales Offices & Reps.

Cal Culver City, W. Alderson Co. 213-870-9286
Cal S. Lake Tahoe, L. & H. Mktg. Co. 916-544-5053
Cal San Jose, L. & H. Mktg. Co. 408-268-8629
Cal Arvada, CB Elctn. Mktg. 303-422-0561
Conn Hartford, S. Cohn Assocs. 203-522-0596
Fla Orlando, Cartwright & Bean 305-422-4531
Fla Plantation, Cartwright & Bean 305-791-3989
Ga Norcross, D. Cooper Co. 404-448-5460
Ill Chicago, R.R. Hutmacher Assocs. 312-631-3248
Ind Fort Wayne, New/Era Sls. 219-423-1164
Ind Indianapolis, New/Era Sls. 317-257-7333
Iowa Atlantic, Kimian Sls. 712-243-1626
Md Baltimore, Par-Nell Sls. 301-655-2944
Mich Oak Park, Wolverine Elctn. Sls. 313-547-4089
Minn Minneapolis, Jensen & Olsen Sls. 612-941-7181
Mo Independence, Kimian Sls. 816-796-4026
Mo Maryland Heights, Kimian Sls. 314-739-1655
NY North Syracuse, L.D. Allen 315-458-7470
NY Valley Cottage, S. Cohn Assocs. 914-268-9216
Ohio Cleveland, Eastern Regional Sls Off. 216-235-6865

Ohio Dayton, Bear Mktg. 513-299-3566
Ohio Richfield, Bear Mktg. 216-659-3131
Ore Portland, Earl & Brown Co. 503-245-2283
Pa Enon Valley, NEBCo Assocs. 216-457-2333
Pa Holland, Par-Nell Sls. 215-355-9330
Tex Dallas, Collins Co. 214-341-7866
Wash Seattle, Earl & Brown Co. 206-284-1121
WVa Princeton, NEBCO Assocs. 606-284-1121
FOR: Can., Montreal, Que., E.S. Gould Mktg. 514-342-4441

LINEMASTER SWITCH CORP., Box 52, Woodstock, Conn., 06281, Tel: 203-974-1000; FSC No: 97918; Empl.: 100; Minimum order: \$10/

For info on price: Sls. Dept.; Application info: A. Munroe; Customer service: Sls. Dept.; Delivery info: Sls. Dept.

Free literature available: Catalog 74 (16 pages) Electric foot switches, anti-trip controls, foot operated Air Valves, special OEM foot controls, stock and custom cordsets OTS Reprint 1975 edition. Over 150 standard foot control in 17 basic families, with brief description including operation, circuitry and electrical ratings.

Products manufactured: Cable Assemblies & Harnesses, Cable, Switches

Local Sales Offices & Reps.

Ill Addison, Line Master Switch Corp. 312-543-4550

LION PRECISION CORP., 60 Bridge St., Newton, Mass., 02195, Tel: 617-969-4710; FSC No: 25404; Empl.: 30; Minimum order: \$20

For info on price: P. S. Vail; Application info: L. Michelson; Customer service: A. Pearle; Delivery info: J. Carsow

Free literature available: Literature contains specifications, features, applications, drawings, photos, etc. of spring, displacement, bow, diameter, thickness, tension, force, semiconductor thickness, ribbon, caliper, taper, pressure, flow, emissivity and reflectivity gages.

Products manufactured: Analyzers, Controls/Control Eqpt., Detectors, Gages, Indicators, Meters, Process Control Systems, Transducers

MANUFACTURERS & SALES OFFICE DIRECTORY

LIPPS, INC., 1630 Euclid St., Santa Monica, Cal., 90404, Tel: 213-393-0449; Empl.: 100 p. 1-20-23

Products manufactured: Heads, Recording Playback, Erase

Local Sales Offices & Reps.

Ala Huntsville, Kemp Instrs. Inc. 205-837-4304
Conn Guilford, Whitehead Assocs. 203-453-3762
Mass Boston, Whitehead Assocs. 617-542-7676
Mo St. Louis, Kemp Engr. Corp. 314-821-0587
Okla Tulsa, Kemp Engr. Corp. 918-299-2636
Tex Dallas, Kemp Engrg. Corp. 214-661-0400

LISK, G.W. CO., 2 South St., Clifton Springs, N.Y., 14432, Tel: 315-462-2611, Telex: 97-8395; Empl.: 125; Minimum order: \$30

For info on price: R. A. Nelson; Application info: M. D. Walborn; Customer service: A. Landschoot; Delivery info: A. Landschoot

Free literature available: Cat 8 Special Design to Order Military-Aerospace Linear DC Solenoid; Cat 9 Standard Industrial Linear DC Solenoids; Standard Industrial Rotary Solenoids (DC).

Products manufactured: Actuators, Air Cleaners & Filters (Shielded & Unshielded), Coils Including Assemblies & Forms, Solenoids

Local Sales Offices & Reps.

Ariz Phoenix, Palmer Assocs. 602-996-9077
Cal Whittier, J.J. Crowley 213-943-4115
Colo Denver, Palmer Assocs. 303-255-9961
Ga Roswell, Wyco 404-428-2576
Ill Chicago, K-W Assocs. 312-792-2618
Md Baltimore, W.V. Fox Assocs. 301-323-9544
Mich Farmington Hills, W.R. Hummon & Assocs. 313-474-0661
Minn Minneapolis, Murphy Assocs. 612-884-9701
Ohio Cincinnati, Tri-State Mktg. 513-761-7993
Okla Tulsa, Blair Engrg. 918-663-9850
Tex Dallas, Blair Engrg. 214-352-8411
Tex Houston, Blair Engrg. 713-667-9864
Wisc Wauwatosa, Larsen Assocs. 414-258-0529
FOR: Can., Stoney Creek, Ont., Simmonds Aerocessories of Can. Ltd. 416-664-6203

LITHIC SYSTEMS, INC., Box 478, Saratoga, Cal., 95070, Tel: 408-867-5600; FSC No: 51083; Empl.: 6; Minimum order: \$25

Customer service: R. A. Hirschfeld

Free literature available: Short-Form Brochure "Integrated Circuits for the Communications Industry"

Products manufactured: Amplifiers, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Detectors, Dividers, Flashers, Integrated Circuit Devices, IC's, Active Filters, Lamp Drivers, Mixers, Modulators, All Kinds, Semiconductor Wafer Fabrication

Local Sales Offices & Reps.

Cal Mt. View, Norcal Assocs. 415-961-8121
Cal Tustin, Orion Sls. 714-832-9687
Ill Rolling Meadows, Lightner Assocs. 312-398-3000

LITRONIX, 19000 Homestead Rd., Cupertino, Cal., 95014, Tel: 408-257-7910, TWX: 910-338-0022; FSC No: 50579; Empl.: 5000; Minimum order: \$150 p. 2-1174-1179

For info on price: D. Fraser; Application info: D. Fraser; Customer service: L. Golden; Delivery info: L. Golden

Free literature available: Our line short form catalog lists all standard products: Led Lamps, Opto Isolators, Photo Transistors, Numeric Displays, Alpha Numeric Displays.

Products manufactured: Calculators, Electrical & Electronic, Crystals, Diodes, Display Devices/Displays, Integrated Circuit Devices, Isolators, Lamps, Lights, Sensors, Light, Timers, Transistors

Local Sales Offices & Reps.

Ala Huntsville, Rep. Inc. 205-881-9270
Ariz Scottsdale, Q.T. Wiles & Assoc. 602-947-5791
Cal Los Angeles, Q.T. Wiles & Assoc. 213-478-0183
Cal Mountain View, Trident Assoc. 415-967-7031
Cal Tustin, Q.T. Wiles 714-832-4952
Colo Denver, Parker-Webster Co. 303-770-1972
Conn Meriden, New England Tech. Sls. 203-634-0298
Fla Altamonte Springs, Semtronics Assoc. 305-831-8233
Fla Ft. Lauderdale, Semtronics Assoc. Inc. 305-771-0010
Fla Plantation, Cartwright & Bean 305-791-3989
Ga Atlanta, Cartwright & Bean 404-255-5262
Ga Tucker, Rep Inc. 404-338-4358
Ill Elk Grove Village, J. G. Twist Co. 312-593-0200

Ind Fort Wayne, R.O. Whitesell 219-432-5591
Ind Indianapolis, R.O. Whitesell 317-359-9283
Ind Kokomo, R.O. Whitesell 317-452-6065
Iowa Cedar Rapids, J. G. Twist Co. 319-933-8703
Kans Prairie Village, J. G. Twist Co. 913-236-4646
Kans Wichita, J. G. Twist Co. 316-686-6685
Ky Louisville, R.O. Whitesell 502-893-7303
Md Baltimore, Component Sls. 301-484-3647
Mass Burlington, New England Tech. Sls. 617-272-0434

Mich Grand Rapids, R.O. Whitesell 616-451-8901
Mich Southfield, R.O. Whitesell 313-358-2020
Mich St. Joseph, R.O. Whitesell 616-983-7337
Minn Edina, M. Foster Tech. Sls. 612-835-2252
Mo St. Louis, J. G. Twist Co. 314-432-2830
NM Albuquerque, Tri-Tronix Inc. 505-265-8409
NY DeWitt, Tritech 315-446-2881
NY E. Rochester, Tritech 716-381-2722
NY Larchmont, Tritech 914-834-4423
NY Manhasset, Win-Cor 516-627-9474
NC Raleigh, Component Sls. 919-782-8433
Ohio Cincinnati, R.O. Whitesell 513-521-2290
Ohio Cleveland, R.O. Whitesell 216-228-7525
Ohio Columbus, R.O. Whitesell 614-888-9396
Ohio Dayton, R.O. Whitesell 513-298-9546
Pa Ft. Washington, G.C.M. 215-646-7535
Pa Pittsburgh, R.O. Whitesell 412-344-7277
Tex Houston, Semi Conductor Sls. 713-464-4197
Tex Richardson, Semi Conductor Sls. 214-231-6181
Utah Salt Lake City, Parker-Webster 801-486-3737
Wash Bellevue, Tri-Tronix 206-454-0940
Wisc Wauwatosa, J. G. Twist Co. 414-475-7755
For: Can., Montreal, Que., Vitel Elctns. 514-331-7393
For: Can., Toronto, Ont., Vitel Elctns. 416-622-6300

Local Distributors

Ala Huntsville, Hamilton-Avnet 205-533-1170
Ariz Phoenix, Hamilton-Avnet, 2615 So. 21st St. 602-275-7851
Ariz Phoenix, Moltronics, Inc., 2746 W. Palm La. 602-272-7951
Ariz Phoenix, R.V. Weatherford, 1917 N. 25th Dr. 602-272-7144
Cal Anaheim, R.V. Weatherford, 1550 Babbitt Ave. 714-633-9633
Cal Culver City, Hamilton Electro Sls., 10912 W. Washington Blvd. 213-558-2121
Cal Glendale, R.V. Weatherford, 6921 San Fernando Rd. 213-849-3451
Cal Mt. View, Hamilton-Avnet, 575 E. Middlefield Rd. 415-961-7000
Cal Palo Alto, R.V. Weatherford, 3240 Hillview Ave. 415-493-5373
Cal Pamona, R.V. Weatherford, 1095 E. 3rd St. 714-623-1261
Cal San Diego, Hamilton-Avnet, 8917 Complex Dr. 714-279-2421
Cal San Diego, Moltronics, Inc. 714-278-5020
Cal San Diego, R.V. Weatherford, 7872 Raytheon Rd. 714-278-7400
Cal Southgate, Moltronics, Inc., 5610 E. Imperial Hwy. 213-773-6521
Colo Denver, Hamilton-Avnet, 5921 N. Broadway 303-534-1212
Colo Englewood, R.V. Weatherford, 3905 S. Mariposa 303-761-5432
Conn Georgetown, Hamilton-Avnet, 643 Danbury Rd. 203-762-0361
Conn Hamden, Arrow Elctns., 295 Treadwell 203-248-3801
Fla Hollywood, Hamilton-Avnet, 4020 N. 29th Ave. 305-925-5401
Ga Norcross, Hamilton-Avnet, 6700 I-85, Suite 2B 404-448-0800
Ill Rosemont, Advent Elctns., 7110-16 N. Lyndon St. 312-298-4210
Ill Schiller Park, Hamilton-Avnet, 3901 N. 25th Ave. 312-678-6310
Ind Indianapolis, Pioneer-Standard, 6408 Castle Place Dr. 317-849-7300
Kans Lenexa, Hamilton-Avnet, 37 Lenexa Industrial Cir. 913-888-8900
Md Gaithersburg, Pioneer-Wash. Elctns., 9100 Gaither Rd. 301-948-0710
Md Hanover, Hamilton-Avnet, 7255 Standard Dr. 301-796-5000
Mass Burlington, Hamilton-Avnet, 185 Cambridge St. 617-273-2120
Mass Dedham, Gerber Elctns., 852 Providence Hwy. 617-329-2400
Mich Livonia, Hamilton-Avnet, 12870 Farmington Rd. 313-522-4700
Mich Livonia, Pioneer-Mich. 313-525-1800
Minn Minneapolis, Hamilton-Avnet, 7683 Washington Ave. 612-941-3801
Mo Hazlewood, Hamilton-Avnet, 364 Brookles La. 314-731-1144

NJ Cedar Grove, Hamilton-Avnet, 218 Little Falls Rd. 201-239-0800

NJ Moorestown, Arrow Elctns., Pleasant Valley Ave. 609-235-1900

NJ Mt. Laurel, Hamilton-Avnet, 113 Gaither Dr., E. Gate Ind'l. Pk. 609-234-2133

NM Albuquerque, Century Elctns., 129 Vermont St., N.E. 505-292-2700

NM Albuquerque, Hamilton-Avnet, 2450 Baylor Dr., S.E. 505-765-1500

NM Albuquerque, R.V. Weatherford, 6101 Marble Ave., N.E. 505-265-5671

NY Buffalo, Summit Dists., 916 Main St. 716-884-3450

NY E. Syracuse, Hamilton-Avnet, 6500 Joy Rd. 315-437-2642

NY Farmingdale, Arrow Elctns., 900 Broad Hollow Rd. 516-694-6800

NY Freeport, Milgray Elctns., 191 Hanse Ave. 516-546-6000

NY Hauppauge, Semiconductor Concepts, 175 Engineers Rd. 516-273-1234

NY Rochester, Hamilton-Avnet 716-442-7820

NY Rochester, Summit Dists., 292 Commerce Dr. 716-334-8110

NY Westbury, Hamilton-Avnet, 70 State St. 516-333-5800

NC Greensboro, Pioneer-STD Elctns., 2906 Baltic Ave. 919-273-4441

NC Winston-Salem, Kirkman Elctns., 910 W. Second St. 919-724-0541

Ohio Cleveland, Hamilton-Avnet, 761 Beta Dr. 216-461-1400

Ohio Cleveland, Pioneer-Standard, 4800 E. 131st St. 216-587-3600

Ohio Dayton, Arrow elctns., 3100 Plainfield Rd. 513-253-9176

Ohio Dayton, Hamilton-Avnet, 118 Westpark Rd. 513-433-0610

Ohio Dayton, Pioneer-Standard, 1900 Troy St. 513-236-9900

Pa Pittsburgh, Pioneer-Standard, 560 Alpha Dr. 412-782-2300

Tex Dallas, Component Specialties 214-357-4576

Tex Dallas, Hamilton-Avnet, 4445 Sigma Rd. 214-661-8661

Tex Dallas, R.V. Weatherford, 10836 Grissom La. 214-243-1571

Tex Houston, Component Specialties, 7313 Ashcroft 713-771-7237

Tex Houston, Hamilton-Avnet, 1216 W. Clay St. 713-526-4661

Tex Houston, R.V. Weatherford, 3500 W. T.C. Jester Blvd. 713-688-7406

Utah Salt Lake City, Hamilton-Avnet, 647 W. Billins Rd. 801-262-8451

Wash Bellevue, Hamilton-Avnet, 13407 Northrup Way 206-746-8750

Wash Seattle, R.V. Weatherford, 541 Industry Dr. 206-243-6340

For: Can., Mississauga, Tor., Hamilton-Avnet, 6291-19 Dorman Rd. 416-677-7432

For: Can., Montreal, Que., Hamilton-Avnet, 935 Montee de Liesse St. Laurant 514-331-6443

For: Can., Montreal, Que., Prelco Elctns., 480 Port Royal St. W. 514-389-8051

For: Can., Montreal, Que., Future Elctns., 5647 Ferrier St. 514-735-5775

For: Can., Ottawa, Ont., Prelco Elctns. Ltd. 613-237-6150

For: Can., Ottawa, Ont., Future Elctns. 613-232-7757

For: Can., Vancouver, B.C., L.A. Varah's Ltd., 2077 Alberta St. 604-873-3211

For: Can., Willowdale, Ont., Electro Sonic, 1100 Gordon Baker Rd. 416-494-1666

LITTELFUSE, INC., 800 E. Northwest Hwy., Des Plaines, Ill., 60016, Tel: 312-824-1198
p. 1*2098, 2099; p. 2*1180, 1181

Customer service: B. Cotter

Free literature available: Catalog #18: Technical information on fuses, fuseholders, clips and blocks, circuit breakers. Littelfuses Product Guide: Guide to selecting correct indicator lights; cartridge lamps; subminiature, miniature lampholders; snap-mount plastic lites.

Products manufactured: Circuit Breakers, Clamps & Clips, Fuses, Lights, Panels, Relays, Sockets, Switches

Local Sales Offices & Reps.

Ala Gadsden, F.C. Nickerson Co. 205-547-7718

Ariz Phoenix, H. Moore Sls. Co. 602-257-8007

Cal Burlingame, W.J. Purdy Co. 415-347-7701

Cal Inglewood, J. Berman Co. 213-766-1281

Colo Denver, McCloud & Raymond Co. 303-756-1589

Conn West Hartford, C. Segel Co. 203-236-2027

Fla Oldsmar, F.C. Nickerson Co. 813-855-4209

Ga Atlanta, F.C. Nickerson Co. 404-321-4678

Ill Arlington Heights, C.P. Dombrow Co. 312-253-3326

Ind Indianapolis, L.M. DeVoe Co. 317-257-1227

Iowa West Des Moines, T.L. Dowell & Assocs. 515-225-1620

Kans Overland Park, T.L. Dowell & Assocs. 913-236-8200

Md Silver Spring, Ansell Engrg. Co. 301-949-1655

Mass Newtonville, C. Segel Co. 617-969-6900

Mich Detroit, R.C. Merchant & Co. 313-535-6000

Minn Edina, M. Foster Tech. Sls. 612-835-2252

Mo St. Louis, T.L. Dowell & Assocs. 314-968-4234

NJ Englewood, Bressler & Baum Assocs. 201-569-7600

NJ N. Caldwell, Masin Esco, Inc. 201-226-2550

NM Albuquerque, W.J. Purdy Co. 505-266-7959

NY Buffalo, R.V. Mitscher 716-633-7970

NY Syosset, Masin Esco, Inc. 516-364-0310

NC Kannapolis, F.C. Nickerson Co. 704-932-6772

Ohio Richfield, Bear Mktg. 216-659-3131

Ore Portland, J.V. Belusko Co. 503-222-4279

Pa Enon Valley, Nebco Assocs. 216-457-2333

Pa Narbeth, S.A. Jeffries, Inc. 215-664-8500

Pa Reading, Beil & Whitaker 215-779-2610

Tenn Memphis, A. Engelman 901-458-6233

Tex Dallas, Lund & Co. 214-358-4335

Va Virginia Beach, R.V. Mitscher Co. 804-481-7200

Wash Seattle, Earl & Brown Co. 206-284-1121

Exp: Chicago, Ill. 312-824-1188

FOR: Can., Willowdale, Ont., A.C. Simmonds & Sons, Ltd. 416-491-1010

LITTON ABS/OEM PRODS DIV., 34 Maple Ave., Pine Brook, N.J., 07058

LITTON INDS., Electron Tube Div., 960 Industrial Rd., San Carlos, Calif., 94070, Tel: 415-591-8411, TWX: 910-376-4900; FSC No: 80080; Empl.: 950

Customer service: E. D. Taylor

Free literature available: Product Summary, This brochure describes most of the unclassified microwave tubes, solid-state microwave devices, and cathode ray tubes available from Litton Industries Electron Tube Division.

Products manufactured: Amplifiers, Coils Including Assemblies & Forms, Couplers, Diodes, Generators, Intensifiers, Image, Modulators, All Kinds, Oscillators, Power Supplies, Shields, Tubes

Local Sales Offices & Reps.

DC Washington 202-554-2570

Ga Warner Robins 912-923-3397

NJ West Long Branch 201-542-7101

Ohio Dayton 513-258-1243

Pa Williamsport 717-326-3561

Tex Dallas 214-369-2184

LITTON SYSTEMS, INC., Potentiometer Div., 226 E. Third St., Mt. Vernon, N.Y., 10550, Tel: 914-664-7733, TWX: 710-562-0129; QPL No: Multiple; Empl.: 300

For info on price: E. Cubbin

Free literature available: Precision potentiometer catalog illustrating complete line of conductive plastic, wire wond and slidewire single and multiturn potentiometer elements, wipers and speed controls.

Products manufactured: Alarms, Brushes & Brush Assemblies, Controls/Control Eqp., Dividers, Generators, Potentiometers, Resistors, Testers, Transducers

Local Sales Offices & Reps.

Ala Huntsville, Technology Instr. Assocs. 205-883-7893

Cal Norwalk, Comar Co. 213-921-8695

Cal Sunnyvale, Comar Co. 408-245-3193

Fla Ormond Beach, Technology Mktg. Assocs. 904-672-2314

Fla Pompano Beach, Technology Mktg. Assocs. 305-942-0774

Ill Chicago, Rokep-Cahill 312-287-7292

Iowa Cedar Rapids, Midwest Meridian Corp. 319-365-6561

Md Baltimore, R.A. Wafer Assocs. 301-744-1133

Mass Allston, Vector Sls. 617-787-2790

Mich Lakeview, Midwest Meridian Corp. 517-352-7775

Mo St. Louis, B & H Assocs. 314-427-7200

Mo St. Louis, Mid West Meridian Corp. 314-878-4441

NY New York, Trionic Assocs., Inc. 516-466-2300

NY Syracuse, C. W. Floring Assocs. 315-478-2149

Ohio Dayton, Rixan Assocs., Inc. 513-278-4216

Pa Newton Square, Quarracino & Hunter 215-353-4300

Tex Saginaw, Midwest Meridian Corp. 214-251-3933

FOR: Can., Ottawa, Wilson Entprs. 613-224-9878

FOR: Can., Toronto, Wilson Entprs. 416-766-0510

LITTON SYS., INC., Guidance & Control Sys. Div., 5500 Canoga Ave., Woodland Hills, Calif., 91346; Empl.: 3000

Products manufactured: Computers, Memory Systems

LIVERMORE DATA SYSTEMS, INC., 2050 Research Dr., Livermore, Cal., 94550, Tel: 415-447-2252, TWX: 910-386-8343; Empl.: 110; Minimum order: \$15

For info on price: J. G. Nugen; Application info: J. G. Nugen; Customer service: J. E. Bannister; Delivery info: B. H. Shore

Products manufactured: Comm. Systems, Couplers, Modulator/Demodulators, Multiplexers

Local Sales Offices & Reps.

Ariz Phoenix, Thorson Co. 602-956-0653

Cal Palo Alto, Digicom 415-327-9081

Colo Denver, Thorson Co. 303-759-0809

Ill Des Plaines, Cozzens & Cudahy 312-298-3600

Ind Indianapolis, Cozzens & Cudahy 317-244-2458

Mass Framingham, Victor Assoc. 617-879-5710

Mich Southfield, Nation Wide Communications 313-627-9310

Minn Minneapolis, Cozzens & Cudahy 612-884-4336

Mo Kansas City, Cozzens & Cudahy 816-454-5836

Mo St. Louis, Cozzens & Cudahy 314-423-1234

NY Roslyn Hts., Travco Assoc. 516-621-3223

Ore Beaverton, Tarbell Communications 503-643-1631

Ore Lake Oswego, Cartel 503-636-5226

Va Fairfax, Nine Assocs. 703-273-1803

FOR: Can., Thornhill, Manitoba, Harding Corp. 416-881-0707

LMB HEEGER, INC., 729 Ceres Ave., Los Angeles, Cal., 90021, Tel: 213-627-9310; Empl.: 11

For info on price: O. Heeger 213-627-9319; Application info: O. Heeger 213-627-9319; Customer service: R. Heeger 213-627-9310; Delivery info: R. Heeger 213-627-9310

Products manufactured: Boxes, Junction, Outlets & Wall Plates, Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Chassis, Metal, Cleaners & Solvents, Coolants, Circuit & Components, Enclosures, Module, Plug-In, Flux, Brazing & Soldering Materials, Panels

Local Sales Offices & Reps.

Ala Birmingham, J. F. Russell Sls. 205-266-5624

Ariz Phoenix, B.G. Sls. 602-266-5624

Cal Burlingame, Carelli-EMA 415-697-8862

Cal Los Angeles, Heeger 213-627-9319

Colo Aurora, A.E.S. Inc. 303-366-0208

Fla Fort Lauderdale, Unirep Inc. 305-527-1556

Ill Skokie, Mort Fields Co. 312-0R4-3018

Ind Mulberry, Marsh Sls. 617-877-8850

Mass Framingham Center, Northeastern Rep. 617-877-8850

Mich Bloomfield Hills, S.F. McMechan 313-852-4308

Minn Minneapolis, A.J. Warner Co. 612-729-7371

Mo St. Louis, Kathrinus-Kelly & Co. 314-235-0265

NY Yonkers, J. Brown Ele. Reps. 914-779-7330

Ohio Columbus, J.A. Mandabach 614-235-0265

Ore Portland, J.W. Eckersley 503-246-3183

Pa Holland, Parnell-Sls. Co. 215-355-9330

Tex Houston, W. Wylids 713-467-0072

LOCKHEED AIRCRAFT SVC., Ont. Intl. Airport, P.O. Box 33, Ont., Cal., 91761, Tel: 714-984-1234, TWX: 714-556-9517

Products manufactured: Antennas, Converters, Data Acquisition & Reduction Systems, Decommunators, Telemetering, Racks, Recorders, Services, Assembly, Production & Test

LOCKHEED ELCTNS. CO., Rte. #22, Watchung, N.J., 07060, Tel: 201-757-1600, TWX: 710-997-9541; Empl.: 1600

Products manufactured: Boards, Printed Circuit, Circuits, Flexible, Circuits, Printed, Multilayer, Computers, Control Systems, Air Traffic, Cores, Ceramic, Cores, Magnetic, Memory Systems, Radar Systems, Recorders, Services, Assembly, Production & Test, Technical Books, Underwater Communication, Detection, Navigation, etc. Equipment

Local Sales Offices & Reps.

Cal Cupertino, Lockheed Elctn. Co. 408-257-3357

Cal Downey, Lockheed Elctn. Co. 213-869-1187

Cal Atlanta, Lockheed Elctns. Co. 404-266-0730

Ill Elmhurst, Lockheed Elctns. Co. 312-833-4600

Mass Lexington, Lockheed Elctns. Co.617-861-1880
 Mich Southfield, Lockheed Elctns. Co.313-557-5037
 Minn Bloomington, Lockheed Elctns. Co.612-888-6080
 NJ Fort Lee, Lockheed Elctns. Co.201-947-8107
 Pa West Conshohocken, Lockheed Elctns. Co.215-825-2880
 Tex Richardson, Lockheed Elctns. Co.214-231-6163
 Va Arlington, Lockheed Elctns. Co.703-525-3600

LOGICPULSE, 18758 Bryant St., Northridge, Cal., 91324,
 Tel: 213-993-0225; Empl.: 3

Customer service: W.W. Fisher
 Free literature available: Bulletin/Specification
 Products manufactured: Generators

LOGIMETRICS INC., 121-03 Dupont Street, Plainville,
 NY, 11803, Tel: 516-681-4700, TWX: 510-221-1833; FSC
 No: 6625; Empl.: 35; Minimum order: \$50

p. 1-758,759,909
 For info on price: M. H. Feigenbaum; Application info:
 M. H. Feigenbaum; Customer service: M. H.
 Feigenbaum; Delivery info: B. Divack
 Products manufactured: Amplifiers, Generators,
 Power Supplies, Synthesizers

Local Sales Offices & Reps.

Ala Huntsville, Scientific Devices S.E.205-536-1969
 Ariz Phoenix, R.L. Davis Co.602-955-2266
 Cal Los Angeles, L & M Engrg.213-674-6850
 Cal Palo Alto, R.F. Assocs.415-327-5531
 Colo Denver, Scientific Devices Intermountain
303-573-9466
 Conn Hamden, Instrument Consultants, Inc.
203-288-5246
 Fla Ft. Lauderdale, Scientific Devices S.E.
305-721-4260
 Fla Orlando, Scientific Devices S.E.305-841-8180
 Ill Northfield, Torkelson Assocs.312-446-9085
 Ind Indianapolis, Torkelson Assocs.317-244-7867
 Kans Shawnee Mission, Pivan Engrg., Inc.
913-722-1030

Md Lanham, Brimberg Assocs.301-552-2200
 Mass Waban, Instrument Consultants, Inc.
617-969-9881
 Mich Detroit, S. Sterling313-255-1970
 Minn Minneapolis, Torkelson Assocs.612-835-2414
 Mo St. Louis, Pivan Engrg., Inc.314-567-3636
 NJ Hazlet, Mer Mon Elctn. Instrumentation
201-264-1851
 NM Albuquerque, I.M.E.C.505-883-9010
 NY Binghamton, Labtronics, Inc.607-748-0509
 NY Jericho, Dal-Tech Devices, Inc.516-433-7448
 NY Syracuse, Labtronics, Inc.315-454-9314
 NY Ulster Park, Labtronics, Inc.518-372-6649
 NC Burlington, Scientific Devices S.E.
919-228-6279

ND Minneapolis, Torkelson Assocs.612-835-2414
 Ohio Cleveland, S. Sterling216-442-8080
 Ohio Dayton, S. Sterling Co.513-298-7573
 Tex Houston, Scientific Devices S.W.713-623-4250
 Tex Richardson, Scientific Devices S.W.
214-231-8106

Wash Bellevue, Brennan Assocs.206-454-9332

LOGITEK, INC., 42 Central Dr., Farmingdale, N.Y., 11735,
 Tel: 516-694-3080; Empl.: 25

Products manufactured: Controls/Control Eqpt.,
 Detectors, Flashers, Monitors, Relays, Timers

Local Sales Offices & Reps.

Cal Palo Alto, Adtek Assocs.415-323-5414
 Cal Sun Valley, Weightman & Assocs.
213-768-5750
 Fla Orlando, Dost Assocs.305-831-1118
 Iowa Cedar Rapids, Palatine Engrg. Sls., Inc.
319-365-8071
 Kans Andover, Palatine Engrg. Sls., Inc.
316-683-7512
 Kans Overland Park, Palatine Engrg. Sls., Inc.
913-262-5643
 Md Baltimore, Coulbourn DeGreif, Inc.
301-247-4646
 Mass Needham Heights, Northeast Reps., Inc.
617-449-3034
 Mo St. Louis, Palatine Engrg. Sls., Inc.
314-426-7055
 NJ Clifton, Compar Corp.201-546-3660
 Ohio Cleveland, Ad-El-Tek Co.216-252-0488
 Ohio Englewood, Ad-El-Tek Co.513-836-2741
 Okla Tulsa, Palatine Engrg. Sls., Inc.918-622-0321
 Pa Philadelphia, Technicraft Co.215-IV 3-4700
 Tex Houston, Palatine Engrg. Sls., Inc.
713-777-4477
 Tex Richardson, Palatine Engrg. Sls., Inc.
214-231-9489

LONDON CHEMICAL CO., 240 Foster Ave., Bensenville,
 Ill., 60106; Empl.: 25

Products manufactured: Chemicals, Cleaners &
 Solvents, Cleaners, Ultrasonic, Coatings, Flux,
 Brazing & Soldering Materials,
 Machines/Machinery, Production

Local Sales Offices & Reps.

Cal Burbank, London Chemical West, Inc.
213-846-8666
 Fla Miami, Norm Black, Assoc.305-651-4132
 Md Baltimore, D.K. Jones301-752-0577
 Mass Waltham, Etchomatic, Inc.617-893-2020
 Minn Minn., Servco, Inc.612-941-7151
 NY Skaneateles, Spar-Kleen Prods.315-685-5711
 Ohio Cleveland, Hodson Co.216-587-4500
 Pa Montgomeryville, Burger Co.215-699-7591
 Tex Dallas, Steven-Daniels Corp.214-241-2333
 EXP: Rensenville, Ill., London Chemical Co. Inc.
 International Dept.312-287-9477

LONDON CO., 811 Sharon Dr., Westlake, Ohio, 44145,
 Tel: 216-871-8900; Empl.: 35

For info on price: R. Specht; Application info: J. Bush;
 Customer service: R. Specht; Delivery info: R. Specht
 Free literature available: Test equipment for the
 audio, mid frequency and component market.

Products manufactured: Analyzers, Bridges,
 Generators, Meters, Switches, Testers

Local Sales Offices & Reps.

Cal Burbank, Wright Engrg.213-843-7240
 Cal Los Altos, Wright Engrg.415-941-4405
 Conn Glastonbury, Instr. Reps., Inc.203-633-0777
 Ill Chicago, Bernot Assoc.312-283-0713
 Mass Lexington, Instr. Reps., Inc.617-861-8620
 Mich Royal Oak, Group Ten313-549-3910
 Ohio Cleveland, Group Ten216-486-2800
 Ohio Dayton, Satullo Co.513-277-6531
 Pa Audubon, Holmes Assoc.215-666-0636

LORANGER MFG. CORP., Box 948, Warren, Pa., 16365,
 Tel: 814-723-2250; Empl.: 350; Minimum order: \$50

For info on price: R. Ehrman; Application info: A.
 Loranger Jr.; Customer service: P. Seber; Delivery
 info: R. Ehrman

Free literature available: Literature on: The LMC
 #2910-300-4050 tool.

Products manufactured: Sockets

Local Sales Offices & Reps.

Ariz Scottsdale, C.T. Fink & Assocs.602-992-9884
 Cal Los Angeles, Elmo Engrg. Assocs.
213-461-4871
 Cal Sunnyvale, B. Oppenheim, Inc.408-733-9000
 Conn New Haven, McBar Assocs.203-865-4376
 Fla Longwood, Lenz Engrg. Co.305-831-9797
 Ill Northfield, Torkelson Assocs.312-446-9085
 Ind Indianapolis, Torkelson Assocs.317-244-7867
 Mass Waltham, McBar Assoc.617-890-0233
 Minn Minneapolis, Torkelson Assocs.612-835-2414
 NJ Flinders, D. Zingone201-584-7845
 NY Rochester, Upstate Comp. Sls.716-288-1080
 Tex Richardson, C.J. Garvey Co.214-234-3371
 Wash Seattle, H.S. Thorpe Co.206-784-3333
 FOR: Can., Toronto, Ont., C. Edwards416-921-6986

LORCH ELCTRS. CORP., 105 Cedar La., Englewood,
 N.J., 07631, Tel: 201-569-8282, TWX: 710-991-9718

For info on price: A. E. Steinhauer; Application info: J.
 Lorch; Customer service: A. Remes; Delivery info: A.
 Remes

Products manufactured: Amplifiers, Antenna Feed
 Systems, Attenuators, Cavities, Microwave,
 Comparators, Converters, Couplers, Duplexers,
 Demodulators, Detectors, Dividers, Duplexers,
 Microwave, Filters, Impedance Converters,
 Microwave, Junctions, Hybrid, Microwave, Line
 Stretchers, Microwave, Mixer-Preamplifiers,
 Microwave, Mixers, Modulators, All Kinds,
 Multipliers, Preselector-Mixers, Receivers,
 Shifters, Strip-Line Components, Microwave,
 Switches, Transformers

Local Sales Offices & Reps.

Ala Huntsville, Scientific Devices S.E.205-536-1969
 Ariz Phoenix, Williams Assocs.602-947-4297
 Cal Inglewood, L & M Engrg. South213-674-6850
 Cal San Jose, L & M Engrg. Inc.408-292-3220
 Colo Denver, Williams Assocs.303-373-4730
 Fla Fort Lauderdale, Scientific Devices-Southeast
305-721-4260
 Fla Orlando, Scientific Devices S.E.305-841-8180
 Fla St. Petersburg, Scientific Devices-Southeast
813-576-5194
 Ill Chicago, Pivan Engrg., Inc.312-539-4838
 Ind Indianapolis, Pivan Engrg., Inc.317-253-1681

Kans Shawnee Mission, Pivan Engrg., Inc.
913-722-1030

Md Silver Spring, Eastern Instrumentation
301-744-3675
 Mass Reading, Geder-Rotondi Assocs.617-944-3105
 Mich Detroit, Comtel-Sterling Co.313-255-1970
 Minn Minneapolis, Pivan Engrg., Inc.612-537-4501
 Mo St. Louis, Pivan Engrg., Inc.314-567-3636
 NJ W. Orange, R. Felsenheld, Jr.201-731-7203
 NM Albuquerque, Williams Assocs.505-255-1638
 NY Liverpool, R & D Assocs.315-622-2350
 Ohio Cleveland, Comtel-Sterling Co.216-442-8080
 Ohio Dayton, Comtel-Sterling513-298-7573
 Pa Jenkintown, AMT215-549-2080
 Pa Pittsburgh, Comtel-Sterling Co.412-922-5720
 Tex Houston, Scientific Devices S.W.713-623-4250
 Tex Richardson, Scientific Devices S.W.
214-231-8106

Tex San Antonio, Ashcraft512-824-7267
 Va Suffolk, Eastern Instrumentation804-497-0001
 Wash Seattle, G.M. Gillett & Assocs.206-284-3344
 Wisc Brookfield, Pivan Engrg., Inc.414-786-1940
 EXP: New York, N.Y., Ad. Auriema Inc.212-466-2500

FOR: Can., Ottawa K1G 3N4, Ont., L. Albert Assocs.
613-737-5941

LORCH DEVICES INC., 105 Cedar Lane, Englewood, N.J.,
 07631, Tel: 201-569-8282, TWX: 710-991-9718

For info on price: J. Lorch; Application info: A. E.
 Steinhauer; Customer service: A. Remes; Delivery
 info: A. Remes

Products manufactured: Amplifiers, Antenna Feed
 Systems, Attenuators, Cavities, Microwave,
 Circuits, Printed, Multilayer, Comparators,
 Converters, Couplers, Delay Lines, Demodulators,
 Detectors, Duplexers, Antenna, Dividers, Drivers,
 Switch, Dummy Loads, Duplexers, Microwave,
 Filters, Generators, Impedance Converters,
 Microwave, Isolators, Junctions, Hybrid,
 Microwave, Line Stretchers, Microwave,
 Mismatches, Microwave, Precision,
 Mixer-Preamplifiers, Microwave, Mixers,
 Modulators, All Kinds, Monitors, Multipliers,
 Preselector-Mixers, Preselectors, Receivers,
 Shifters, Strip-Line Components, Microwave,
 Switches, Transformers

Local Sales Offices & Reps.

Ala Huntsville, Scientific Devices205-536-1969
 Ariz Phoenix, Williams Assocs.602-947-4297
 Cal Canoga Pk., Microwave Mktg.213-883-6181
 Colo Denver, Williams Assoc.303-373-4730
 Fla Fort Lauderdale, Scientific Devices - Southeast
305-721-4260
 Fla Orlando, Scientific Devices - Southeast
305-843-1826
 Fla St. Petersburg, Scientific Devices-Southeast
813-576-5194
 Ill Chicago, Pivan Engrg., Inc.312-539-4838
 Ind Indianapolis, Pivan Engrg.317-253-1681
 Kan Shawnee Mission, Pivan Engrg.913-722-1030
 Md Silver Spring, Eastern Instrumentation
301-744-3675

Mass Andover, Bee Assoc.617-475-2124
 Mich Detroit, Comtel-Sterling Co.313-255-1970
 Minn Minneapolis, Pivan Engrg.612-537-4501
 Mo St. Louis, Pivan Engrg.314-567-3636
 NJ West Orange, R. Felsenheld, Jr.201-731-7203
 NM Albuquerque, Williams-Assocs.505-255-1638
 NY Utica, B.D. Hummel Co.315-736-7821
 Ohio Cleveland, Comtel-Sterling Co.216-442-8080
 Ohio Dayton, Comtel-Sterling513-298-7573
 Pa Jenkintown, AMT215-549-2080
 Pa Pittsburgh, Comtel-Sterling Co.412-922-5720
 Tex Houston, Scientific Devices-SW713-623-4250
 Tex Richardson, Scientific Devices-SW
214-231-8106

Tex San Antonio, Scientific Devices-SW
512-736-3164

Va Suffolk, Eastern Instrumentation804-497-0001
 Wash Seattle, G.M. Gillett & Assocs.206-284-3344
 Wisc Brookfield, Pivan Engrg.414-786-1940
 EXP: New York, N.Y., Ad. Auriema Inc.212-466-2500
 FOR: Can., Ottawa, Ont., L. Albert Assocs.
613-737-5941

LPS RESEARCH LABS, 2050 Cotner Ave., Los Angeles,
 Cal., 90025, Tel: 213-478-0095, TWX: 910-342-7557;
 Empl.: 61; Minimum order: \$250

For info on price: L. Erdman; Application info: B.
 Eison; Customer service: L. Erdman; Delivery info: R.
 Dube

Free literature available: Catalogs explain what the
 product is and how to use it. Explains testimonials
 Products manufactured: Cleaners & Solvents,
 Cleaners, Ultrasonic, Coatings, Lubricants

Local Sales Offices & Reps.

Cal	San Francisco, D. C. Dostal	415-584-2159
Fla	Miami, M. Kelly	305-253-1294
Ga	Stone Mountain, E. R. Eigen	404-469-2698
Ill	Hanover Park, J. A. McArdle	312-685-7612
Ill	Woodridge, R. Parker	312-685-7612
Mass	Walpole, A. Hession	617-668-0201
Minn	Edina, R. D. O'Bryan	612-993-0344
NJ	Barnegat, J. L. Markley	201-544-1170
Ohio	Vermillion, J. Lacinak	215-234-7400
Tex	Arlington, A. V. Heavin	817-265-9067
Va	Midlothian, F. T. Mayo	804-355-3392
Wash	Bellevue, D. Pearce	206-682-6860

LRC INC., 101 Digital Dr., Hudson, N.H., 03051, Tel: 603-883-9351, TWX: 710-228-1377; Empl.: 50; Minimum order: \$20

For info on price: J. Susi; Application info: F. Solla; Customer service: R. Woodman; Delivery info: J. Susi

Free literature available: Solid State Switch Drivers, Resistor Ladder Networks, Chip Resistors, Custom Hybrid Ckts. Metallized Substrates

Products manufactured: Attenuators, Circuits, Hybrid, Thin-Film, Converters, Drivers, Switch, Networks, Resistors, Switches

Local Sales Offices & Reps.

Ariz	Phoenix, Thorson Co.	602-956-5300
Cal	San Diego, KCE Corp.	714-278-7640
Cal	San Francisco, Jack Logan & Assoc.	415-697-6100
Cal	Tustin, Thorson Co.	714-455-5121
Colo	Denver, Thorson Co.	303-355-3521
Conn	Hamden, Impact Sls.	203-281-1331
Fla	Orlando, Gra-Mar Inc.	305-894-3351
Ill	Palatine, CC Electronics	312-358-8900
Mass	Waltham, Impact Sls.	617-893-2850
Mich	Detroit, R.C. Merchant & Co.	313-535-6000
NH	Hudson, LRC Inc.	603-883-9351
NJ	Clifton, Compar Inc.	201-546-3660
NM	Albuquerque, IMEC	505-344-2212
NY	Rochester, Schomburg & Burke Grp.	716-244-0920
Ohio	Dayton, Berberich Assoc.	513-433-0342
Pa	Jenkintown, AMT	215-549-2080
Va	Baileys Crossroads, QT Elctn. Sls.	703-671-4357
Wash	Seattle, Thorson Co.	206-632-0710
FOR:	Can., Don Mills, Ont., J-Tronics	416-429-6324

LSI COMPUTER SYSTEMS, INC., 22 Cain Dr., Plainview, N.Y., 11803, Tel: 516-293-3850; Empl.: 20; Minimum order: \$50

Free literature available: Capabilities Brochure; D Series Dividers; Red Series Dividers; C1200 Clock Circuit.

Products manufactured: Clocks (All Types), Converters, Dividers, Integrated Circuit Devices, Memory Systems, Multiplexers, Packages, Integrated Circuit, Scales, Binary, Decade, Services, Assembly, Production & Test

LUFT INSTRS., INC., Old Winter St., Lincoln, Mass., 01773, Tel: 617-259-9215; Empl.: 25; Minimum order: \$100

Customer service: L. Luff

Products manufactured: Alarms, Comparators, Controllers, Programmable, Controls/Control Eqpt., Electroplating Equipment & Supplies, Servo Systems, Testers

GULTON INDUSTRIES, Luminator Div., 1200 E. Dallas N. Pkwy., Plano, Tex, 75074, Tel: 214-424-6511, Telex: 073-2373; Empl.: 300; Minimum order: \$25

For info on price: R. P. Winks; Application info: R. P. Winks; Customer service: J. Pavlik; Delivery info: J. Pavlik

Products manufactured: Inverters, Sockets, Switches

Local Sales Offices & Reps.

Cal	Pacific Palisades, Ledbetter Assocs.	213-454-2421
Ill	Chicago, Terhune-Van Effen	312-346-0053
Md	Wheaton, W. Jordan Co.	202-949-1962
Mass	Boston, Sands-Barnard Assocs.	617-631-7533
Tex	Dallas, Blair Engr. Sls. Co.	214-352-8411
Wash	Kirkland, R.R. Chase & Assocs.	206-454-2514

LUNDY ELCTRNS. & SYS., INC., Robert La., Glen Head, N.Y., 11545, Tel: 516-671-9000, TWX: 510-223-0605; Empl.: 707

For info on price: J. Guy; Application info: B. Stein; Customer service: D. Casadonte; Delivery info: D. Casadonte

Products manufactured: Actuators, Cable, Character Recognition Systems, Converters, Display Devices/Displays, Filters, Gaskets, Shielding, R-F-Also See Shields, R-F, Motors, Printers, Punched Card Equipment, Readers, Scanners, Shields, Testers, Transceivers, Transmitters

Local Sales Offices & Reps.

Cal	Los Angeles	213-487-4040
Colo	Boulder	303-443-2606
Fla	Pompano Beach	305-943-1500
Ga	Atlanta	404-458-7339
Ill	Chicago	312-726-3103
Mass	Ipswich	617-356-5761
NJ	Moorestown	201-434-1533
NC	Charlotte	704-394-1161
Tex	Houston	713-521-0818
Va	Annandale	703-941-1900

LUXO LAMP CORP., Monument Park, Port Chester, N.Y., 10573, Tel: 914-937-4433, Telex: 137-336; Empl.: 100

Customer service: R. Newton

Free literature available: Price lists; Brochures; Flyers.

Products manufactured: Lamps, Magnifying Glasses, Inspection

Local Sales Offices & Reps.

Cal	Corte Madera, E. Myer	415-924-4680
Cal	Hollywood, J. Barnett	213-462-4576
Conn	Norwalk, N. Tarrant	203-866-2420
Fla	Port Charlotte, W. Hemminger Co.	813-625-6050
Ga	Atlanta, Dotson & Co.	404-325-9173
Ill	Evanson, J.S. Sprenger	312-475-0848
Md	Baltimore, H. Abrams	301-486-3040
Mich	Plymouth, W. Ryan	313-779-5760
Minn	St. Louis Park, J. Lee Co.	612-920-1525
Mo	Kansas City, Nevco	816-421-1751
NY	Port Chester, Luxo Lamp Corp.	914-937-4433
NY	Whitesboro, A. Coletti	315-736-6989
NC	Charlotte, Coleman Co.	704-525-2046
Ore	Portland, T.E. Ferris	503-646-8659
Tex	Conroe, T. O'Neill	713-273-1215

LVC INDS. INC., Co-Ord Switch Bloc-Lite Divs., 135-25 37th Ave., Flushing, N.Y., 11354, Tel: 212-939-9777; FSC No: 32759; Empl.: 29; Minimum order: \$25
p. 1•2010,2011,2100; p. 2•1137

For info on price: L. Cartelli; Application info: J. Muller; Customer service: N. Pennetti; Delivery info: T. Rade

Products manufactured: Annunciators, Antenna Switching Matrices, Boards, Plug-In, Boards, Programming, Caps, Lenses, Indicator Light, Connectors, Controls/Control Eqpt., Cords, Counters, Display Devices/Displays, Dividers, Generators, Kits, Breadboarding (For Engineers), Kits, Programming Board, Lamp Adapters, Lamps, Lights, Matrices, Computer, Monitors, Panels, Pins, Receivers, Services, Assembly, Production & Test, Sockets, Switchboards, Switches, Timers

Local Sales Offices & Reps.

Cal	Los Angeles, Dyna Sls. Co.	213-268-1175
Colo	Denver, Franklin Sls. Co.	303-922-3623
Kans	Prairie Village, Engrg. Svcs. Co.	913-649-4000
Mo	St. Louis, Engrg. Svcs. Co.	314-997-1515
NJ	Springfield, Service & Technology	201-232-2666
NY	Farmingdale, Service & Technology	516-694-7330
Pa	Phila., V.S. Malta	215-836-5122
Wash	Seattle, W. Spaulding Co.	206-282-9173

LYON METAL PRODUCTS, INC., 47 Railroad Ave., Aurora, Ill., 60507, Tel: 312-892-8941; Empl.: 1200

For info on price: J. Jurgelonis; Application info: M. Miller; Customer service: S. Thompson; Delivery info: G. Anderson

Free literature available: Catalog 100-B - illustrates and describes the entire Lyon steel equipment line Catalog 200-A - pictures and descriptions of Lyon office furniture.

Products manufactured: Benches, Consoles, Stools, Tables, Cabinets & Accessories, Carts & Dollies, Instrument & Equipment, Racks

Local Sales Offices & Reps.

Cal	Los Angeles	213-330-2261
Cal	San Francisco	415-347-7067
DC	Washington	703-683-2755
Ga	Atlanta	404-237-9205
Ill	Chicago	312-263-4255
Mass	Boston	617-825-0100
Mich	Detroit	313-352-5860
Minn	Minneapolis	612-927-5695
Mo	Kansas City	816-363-6801

NY	New York City	212-695-5441
NY	Syracuse	315-478-0947
NC	Charlotte	704-527-0410
Ohio	Cincinnati	513-221-4688
Ohio	Cleveland	216-241-3535
Pa	Philadelphia	215-687-6232
Pa	Pittsburgh	412-344-5577
Tenn	Memphis	901-682-9664
Tex	Dallas	214-691-7341

3M CO., See Listing Under Letter "T"

M-TRON INDUSTRIES, Box 630, 100 Douglas St., Yankton, S.D., 57078, Tel: 605-665-9321, TWX: 910-668-3603; Empl.: 500; Minimum order: \$15
p. 1•383

Customer service: Sales Dept.

Free literature available: A guide and catalogue to specify M-Tron crystals.

Products manufactured: Crystal Blanks, Crystals, Holders, Crystal

Local Sales Offices & Reps.

Cal	Los Alamitos, Anderson Assocs.	213-596-2313
Cal	Los Angeles, Wallace & Wallace	213-747-0401
Cal	Redwood City, Logan Sls.	415-369-6726
Cal	San Diego, Celtec Co.	714-279-7961
Colo	Denver, McCloud & Raymond	303-756-1589
Conn	Meriden, P.R. Sturgeon Co.	203-237-1112
Fla	Indian Rocks Beach, Tech-Rep Assocs.	813-595-2834
Fla	Maitland, Hutto-Hawkins-Peregoy	305-831-2474
Fla	Pompano Beach, Hutto-Hawkins-Peregoy	305-943-9593
Fla	Tampa, Hutto-Hawkins-Peregoy	813-837-2512
Ga	Atlanta, Millar Elctnrs.	404-261-6160
Ill	Chicago, Ellinger Sls. Corp.	312-763-1570
Ind	Fort Wayne, Given Corp.	219-432-5585
Ind	Indianapolis, Kingston Sharkey & Assoc.	317-353-9406
Iowa	W. Des Moines, T.L. Dowell & Assoc.	515-255-6583
Kans	Overland Park, T.L. Dowell & Assoc.	913-649-6069
La	Chalmette, Cartwright & Bean	504-279-4598
Md	Silver Spring, Mid-Atlantic Sls.	301-593-7749
Mass	Babson Park, P.R. Sturgeon Co.	617-237-3506
Mass	Lexington, J.E. Boeing Co.	617-237-3506
Mich	Benton Harbor, McNabb & Assoc.	616-925-2166
Miss	Jackson, Cartwright & Bean	601-981-1368
Mo	Shrewsbury, T.L. Dowell & Assoc.	314-647-7067

NY	Elmont, F.E. Schmitt Co.	516-437-8150
NY	Huntington Station, Addem I.	516-567-5900
NC	Raleigh, Millar Elctnrs., Inc.	919-787-9564
Ohio	Columbus, Weller Elctnrc. Sls.	614-885-7819
Ohio	Dayton, BEK Assoc.	513-278-1343
Ore	Salem, M.K. Widdekind Co.	503-363-6445
Pa	Glenside, Elcom, Inc.	215-885-1325
Pa	Laverock, M. Weinberg Assoc.	215-549-1122
Tenn	Memphis, Cartwright & Bean	901-276-4442
Tex	Dallas, R.E. Nesbitt Co.	214-357-4601
Tex	Houston, R.E. Nesbitt Co.	713-224-3633
Wash	Seattle, M. Stobin Co.	206-772-2121
Wash	Seattle, Pacnor Mktg.	206-284-8020

MAC PANEL CO., Box 5027, 215 Church Ave., High Pt., N.C., 27622, Tel: 919-882-8138; Empl.: 20

Products manufactured: Boards, Plug-In, Boards, Programming, Connectors, Cords, Matrices, Computer, Panels, Services, Assembly, Production & Test, Tape Recording Accessories, Tapes, Recording, Magnetic (All Types), Tools

Local Sales Offices & Reps.

Ala	Huntsville, Reynolds & Assocs., Inc.	205-536-1941
Ariz	Phoenix, Zeus, Inc.	602-258-7519
Cal	Los Altos, Casey Associates	415-941-6892
Cal	Los Angeles, Costello, Little & Co.	213-870-5951
Colo	Denver, Zeus, Inc.	303-771-6200
Fla	Bradenton, Reynolds & Assocs., Inc.	813-778-5219
Fla	Ft. Lauderdale, Reynolds & Assoc., Inc.	305-581-6611
Fla	Melbourne, Reynolds & Assocs., Inc.	305-727-3205
Ga	Atlanta, Reynolds & Assocs., Inc.	404-252-5360
Ill	Chicago, Megatek, Inc.	312-889-1277
Md	Rockville, J.J. Wild	301-424-8490
Mass	Needham, J.J. Wild, Inc.	617-444-2366
Mich	Detroit, B. Hocker & Assocs.	313-531-1403
Minn	St. Paul, Bonament Heyda Co.	612-484-8531
NJ	Mendham, J.J. Wild	201-643-4782
NM	Albuquerque, Zeus, Inc.	505-256-9831

NY	Hastings on Hudson, J.J. Wild, Inc.	914-963-3803
NY	Jericho, J.J. Wild, Inc.	516-935-6600
NC	High Point, Mac Panel Co.	919-882-8138
Ohio	Cleveland Heights, B Nocker & Assocs.	216-932-0984
Ohio	Dayton, B. Hocker & Assocs.	513-298-8638
Ore	Portland, J.J. Backer Co.	503-297-3776
Pa	Southampton, J.J. Wild, Inc.	215-357-6645
Tex	Dallas, K.O. Brown & Co.	214-357-3996
Utah	Salt Lake City, Zeus, Inc.	801-486-2317
Wash	Seattle, J.J. Backer Co.	206-285-1300

MACDONALD & CO., 213 S. Brand Blvd., Glendale, Calif., 91204, Tel: 213-241-1101, TWX: 910-497-4782; Empl.: 18
Customer service: D. W. MacDonald

Free literature available: Production tools for electronic assembly

Products manufactured: Adhesives (All Types), Chemicals, Clamps & Clips, Cleaners, Ultrasonic, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Drivers, Nut, Heat Guns, Production, Heat Sinks, Soldering, Holders, Circuit Board (Production Type), Jigs And Fixtures, Chassis & Circuit Board, Knives & Knife Sets, Lamps, Lubricants, Pliers, Scissors, Screwdrivers, Solder (All Types), Solder Pots & Baths, Soldering Accessories, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools, Testers, Tools, Tweezers, Hand & Vacuum, Wire Twisters, Wrenches

Local Sales Offices & Reps.

Cal	Sunnyvale, Wyman Engrg. Sls.	408-735-0598
Colo	Denver, Soldering Supply Specialists	303-455-0104
Ill	Chicago, EMF Co.	312-889-8323
Ind	Indianapolis, Blind & Assoc.	317-251-1249
Md	Baltimore, D. K. Jones & Assoc.	301-752-0577
Mich	Grand Rapids, C. A. Geer Co.	616-534-9449
Minn	St. Paul, Ragon Elctns.	612-488-0201
Mo	Kansas City, Burke Sls. Co.	816-842-5511
NJ	Haddonfield, Mills Equip. Co.	609-429-1005
NY	New York, Van Valkenburg Assoc.	212-254-3722

NC	Winston-Salem, Kirkman Elctns.	216-381-4424
Ohio	Cleveland, P. Lohse Co.	216-381-4424
FOR:	Can., Brossard, P.Q., Gammon Ind'l	819-861-6177

FOR:	Can., Vancouver 2, B.C., RAE Industrial Electronics	
------	---	--

MACHINE COMPONENTS CORP., 70 Newtown Rd., Plainview, N.Y., 11803, Tel: 516-694-7222; FSC No: 15531; Empl.: 20

For info on price: D. L. Dubov; Application info: D. L. Dubov; Customer service: R. Kanter; Delivery info: R. Kanter

Free literature available: Catalog #18 - Describes standard stock clutches brakes, couplings - torques to 20 in. lb. Catalog #19 - Intermittent motion devices, electromechanical. Catalog #20 - X and XY axis joy stick toggle switches

Products manufactured: Brakes, Clutches, Counters, Couplings, Drives & Drive Mechanisms (Dial), Electronic Switches (Oscilloscope), Gears & Gear Mechanisms (Precision), Index Assemblies, Switch, Shafts & Adapters, Switches

Local Sales Offices & Reps.

Cal	San Jose, McFarland Assoc.	408-286-9333
Ind	Indianapolis, Pacer Sls. & Eng'g Co.	317-849-1481
Mass	Woburn, Stockwell Technical Sls. Co.	617-935-5770
Wash	Mercer Island, J. H. Andersen Assoc.	206-232-0484

MACRODATA, 6203 Variel Avenue, Woodland Hills, Cal., 91364, Tel: 213-887-5550; Empl.: 125

Products manufactured: Semiconductor Wafer Fabrication, Testers

MACRODYNE INC., 1900 Maxon Rd., Box 1079, Schenectady, N.Y., 12301, Tel: 518-372-5619; Empl.: 16; Minimum order: \$25

Customer service: D.J. Antos

Free literature available: ERDAC III Brochure 2 MACHINE MINDER Transducer Brochure-monitoring the power spectrum to control process variables. 3 Laser Doppler Velocimeter Brochure-precise, non-contact measurement techniques for high speed fluid flow applications in wind tunnel & turbine research.

Products manufactured: Analyzers, Converters, Counters, Current Sensors, Data Acquisition & Reduction Systems, Lasers & Laser Systems, Memories, Buffer, Memory Systems, Meters, Oscilloscopes, Process Control Systems, Records, Services, Assembly, Production & Test, Testers, Transducers

MADISON LABORATORIES, Box 608, Madison, Conn, 06443; Tel: 203-245-4280; Empl.: 8; Minimum order: \$15

For info on price: M.S. MacDonald; Application info: D. H. MacDonald; Customer service: D.H. MacDonald; Delivery info: M. S. MacDonald

Free literature available: Product Reference Guide - small brochure listing our level switches and solid state controls

Products manufactured: Controls/Control Eqpt., Relays, Switches

Local Sales Offices & Reps.

Cal	Glendale, James L. McCoy Co.	213-246-2134
NY	New York City, Mc Intosh Equip. Corp.	212-349-3288
Pa	Philadelphia, Technicraft Co.	215-182-2323
Tenn	Memphis, Engineered Instr.	901-743-3402

MAG-CON, INC., 85-2nd Ave. S.E., New Brighton, Minn., 55112, Tel: 612-633-8820, TWX: 910-576-3116; Empl.: 150; Minimum order: \$15

Customer service: M. Lorge 612-633-5892

Free literature available: Bulletins on: Temp. monitoring equipment; Resistance temp. detectors for above; Resistance sensing power relays; Rotary speed sensors & monitors; Portable, hand-held temp. meter; Facilities & service related to manufacture of custom magnetics.

Products manufactured: Alarms, Amplifiers, Chargers, Battery, Chokes, Coils Including Assemblies & Forms, Controls/Control Eqpt., Current Sensors, Demagnetizers, Detectors, Eliminators, Battery, Inverters, Magnetizers, Meters, Monitors, Power Supplies, Probes, Reactors, Regulators, Relays, Services, Assembly, Production & Test, Switches, Tachometers, Transducers, Transformers

Local Sales Offices & Reps.

Ariz	Tucson, Gar Kachel Co.	602-795-5202
Cal	Altadena, D. Murray Entprs.	213-681-5031
Cal	San Francisco, Tech. Sls. Dev. Co.	415-346-1655
Fla	Orlando, Fluid Scientific, Inc.	305-851-5310
Md	Wheaton, Magyar & Assocs.	301-871-8833
Mass	Allston, Magyar & Assocs.	617-566-9759
NJ	Middlesex, Magyar & Associates	201-752-4848
Ohio	Brecksville, A. Nace Co.	216-526-4323
Pa	Philadelphia, Magyar & Assocs.	215-763-5044
Pa	Pittsburgh, A. Nace Co.	412-922-7225
Tex	Houston, R & K Engrg. & Sls., Inc.	713-465-8367
Wisc	Cedarburg, T.F.L. Assocs.	414-377-7030

MAGIC DOT, 3361 Republic Ave., Minneapolis, Minn., 55426, Tel: 612-925-4410, TWX: 910-576-3477; Empl.: 18

Products manufactured: Keyboards, Alphanumeric & Decimal, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Murcota	205-539-8476
Ariz	Phoenix, Thorson Co.	602-956-5300
Cal	Burlingame, Brooks Tech. Group	415-374-5411
Cal	Downey, Trimarco	213-861-8244
Cal	San Diego, W. Hadden Assocs.	714-585-9444
Colo	Denver, Thorson Co.	303-355-3521
Conn	Hamden, Kanan Assocs.	203-288-9276
Fla	Clearwater, Lynch-Gentry	813-443-2697
Fla	Winter Park, Lynch-Gentry	305-671-7649
Ill	Chicago, Cryodon Elctn. Inc.	312-781-3900
Ind	Fort Wayne, S & S Elctns. Inc.	219-743-4611
Iowa	Cedar Rapids, Technical Reps. Inc.	319-363-2489

Md	Baltimore, Compar Chesapeake, Inc.	301-484-5400
----	------------------------------------	--------------

Mass	Reading, Kanan Assocs.	617-944-8484
Mich	Utica, N. Case Assocs.	313-781-3900
Minn	Minneapolis, C. Bohlig Co.	612-922-7011
Mo	Hazelwood, Technical Reps.	314-731-5200
Mo	Independence, Technical Reps.	816-737-1414
NJ	Clifton, Compar N. Y., Inc.	201-546-3660
NJ	Haddonfield, S. O'Brien	609-429-1526
NY	Albany, Compar Albany	518-489-7408
NY	Endwell, Compar Albany	607-723-8743
NY	Fairport, Compar Albany	716-271-2230
NY	Liverpool, Compar Albany	315-471-3356
NC	Winston-Salem, Murcota	919-723-1002
Ohio	Centerville, N. Case Assocs.	513-435-1301
Ohio	Fairview Park, N. Case Assocs.	216-333-4120

Tex	Dallas, Allied Comp.	214-238-0408
Tex	Houston, Allied Comp.	713-782-5406
Wash	Bellevue, SDR2 Prods. & Sls.	206-747-9424

MAGITRAN CO., 311 E. Park St., Moonachie, N.J., 07074, Tel: 201-641-3650, TWX: 710-990-5064; Empl.: 100; Minimum order: \$25

For info on price: J. Grieg; Application info: J. Crompton

Free literature available: Poly-Planar Speaker Products, Poly-Planar Speaker Application Data

Products manufactured: Speaker Systems, Speakers

Local Sales Offices & Reps.

Ala	Birmingham, Maitland Smith	205-967-3080
Cal	No. Hollywood, M. Stobin Co.	213-983-1555
Cal	San Mateo, Olson Sls.	415-347-7071
Conn	Waterbury, J. Sequenzia	203-753-2487
Fla	Miami, Raulson & Co.	305-264-6003
Ga	Marietta, Maitland Smith	404-971-2831
Ill	Chicago, Lassers & Co.	312-539-0170
Kans	Prairie Village, N. Spencer Assoc.	913-432-3700
Ky	Campbellsville, R. B. Herron Assoc.	502-465-5631
Md	Kensington, Forti-Austin Assoc.	301-949-1706
Mo	St. Louis, N. Spencer Assoc.	314-994-1916
Neb	Omaha, N. Spencer Assoc.	402-393-6574
NJ	Englewood, J. Bressler Co.	201-569-7600
NJ	Willingboro, Forti-Austin Assoc.	609-871-9290
NY	New York, J. Bressler Co.	212-564-4105
NY	Yonkers, J. Brown Sls.	914-779-7330
NC	Charlotte, Maitland Smith	704-372-1026
Ohio	Dayton, S. McWilliams	513-277-9245
Pa	Meadville, D. Hilliard Assoc.	814-336-3443
Tex	Houston, Ranger Elctns.	713-626-1432
Wash	Seattle, K. Bolster Sls.	206-772-2121
Exp.	N.Y., N.Y., Auriema Inc.	212-466-2500

MAGNECRAFT ELEC. CO., 5575 N. Lynch Ave., Chicago, Ill., 60630, Tel: 312-282-5500, TWX: 910-221-5221; Empl.: 400; Minimum order: \$50

p. 1-1766-1798

For info on price: D. Didricksen; Application info: W. Greenwood; Customer service: W. Greenwood; Delivery info: D. Nordquist

Free literature available: Over 1060 stock relays for custom application. This 36 page, 2 color catalog includes photos, prices, ordering information, drawings, and specifications.

Products manufactured: Relays, Sockets

Local Sales Offices & Reps.

Ala	Huntsville, BJR Research & Mfg.	205-881-3569
Ariz	Phoenix, Gramer & Co.	602-279-1231
Cal	Los Angeles, Universal Comp. Corp.	213-641-4255
Cal	San Carlos, Kottmeier Assoc.	415-592-8333
Colo	Denver, Camel Elctn. Inc.	303-757-6191
Conn	Farmington, R. Perron & Co.	203-673-4825
Conn	Trumbull, R. Perron & Co.	203-268-9631
Fla	Altamonte Springs, WMM Assocs.	305-831-4645
Fla	Clearwater, WMM Assoc.	813-447-2538
Fla	Pompano Beach, WMM Assoc.	305-943-3091
Ga	Duluth, BJR Research & Mfg	404-476-1453
Ill	Hinsdale, Momak Sls.	312-654-4524
Ind	FT. Wayne, Menze Sls. Inc.	219-747-5616
Mass	Norwood, R. Perron & Co.	617-762-8114
Mich	Detroit, R.P. Urban & Assoc.	313-535-2355
Mich	Grand Rapids, R.P. Urban & Assoc.	616-245-0511
Minn	Minneapolis, S. Johnson Inc.	612-925-2111
Mo	Kansas City, K & M Sales	816-471-1355
Mo	St. Louis, K & M Sales	314-423-2420
NH	Dover, R. Perron & Co.	603-742-2321
NJ	South Orange, S. Simberkoff & Assoc.	201-763-7900

NY	New York, S. Simberkoff & Assoc.	212-943-7023
----	----------------------------------	--------------

NY	Syracuse, W. A. Franklin Sls	315-472-5273
NC	Burlington, S. Simberkoff & Assoc.	919-584-6450

Ohio	Cleveland, Weschler Electric Corp.	216-251-4609
------	------------------------------------	--------------

Ohio	Dayton, Weschler Electric Corp.	513-274-6972
------	---------------------------------	--------------

Okla	Tulsa, H.J. Daly Co.	918-627-4159
------	----------------------	--------------

Ore	Portland, Earl & Brown Co.	503-245-2283
-----	----------------------------	--------------

Pa	Bristol, S. Simberkoff & Assoc.	215-785-1132
----	---------------------------------	--------------

Tex	Dallas, Evans-McDowell Assocs.	214-238-7157
Tex	Dallas, McKinney Sls.	214-631-9450
Wash	Seattle, Earl & Brown Co.	206-284-1121

Exp:	Chicago, Ill., Magnecraft Int'l	312-282-5500
For:	Can., EtoBicoke, Ont., C.A. Pipe & Assocs.	416-622-3403
For:	Can., Montreal, Que., Vitel Elctns.	514-331-7393

Local Distributors			Tex		
Ala	Andalusia, Wholesale Elctn Supply Co., Box 1437	205-222-5100	Tex	Houston, Hall-Mark Elctns, Box 42190	713-781-6100
Ala	Birmingham, M G. Elctn & Equip Co., 3112 6th Ave. S.	205-328-4525	Tex	Houston, Newark Elctns, 6902 Harwin Dr.	713-782-4800
Ala	Huntsville, Hall-Mark Elctns, Box 1133	205-539-0691	Tex	Odessa, Automation Eng. Suc., Inc., 2310 Steven Rd.	915-382-7391
Ariz	Phoenix, Dalis Elctns Supply Inc., 917 N. 7th St.	602-258-8151	Tex	Richardson, Altair Co., Box 26, 405 N. Plano Rd.	214-231-5166
Ariz	Phoenix, Kierulff Elctns, 2633 E. Buckeye Rd	602-273-7331	Tex	Stafford, Southwest Elctns, Inc., 12725 Royal Dr., Box 848	713-494-8021
Ariz	Phoenix, Parts Elctns., 1310 7th St.	602-258-6476	Tex	Waco, Hargis Co., 1205 Washington Ave.	817-754-5667
Cal	Burlingame, Rose Elctns, 846 Stanton Rd.	415-697-0224	Utah	Salt Lake City, Stuart Electric Supply Co., 2999 S. 300 West	801-466-8605
Cal	Emeryville, B & B Distributors, 1400 62nd St.	415-843-3254	Utah	Salt Lake City, W.H. Bintz, 433 W. 3rd South	801-363-5821
Cal	Garden Grove, Allied Elctns of Cal. Inc., 12821 Knott Ave.	714-894-7581	Va	Arlington, Arlington Elctns Wholesalers, Inc., 3636 Lee Hwy.	703-524-2412
Cal	Hollywood, Hollywood Radio & Elctns, 5250 Hollywood Blvd.	213-466-3181	Va	Richmond, Meridian Electric, 1001 W. Broad St.	703-355-6521
Cal	Inglewood, Newark Elctns, 4747 W. Century Blvd.	213-678-0441	Wash	Seattle, Almac/Stroum Elctns, 5811 Sixth Ave. S.	206-763-2300
Cal	Los Angeles, Kierulff Elctns, 2585 Commerce Way	213-685-5511	Wash	Tacoma, Consolidated Electrical Distributors (Love Electric Co.), 1914 Market St.	206-383-5961
Cal	Palo Alto, Kierulff Elctns, 3969 E. Bayshore Rd.	415-968-6292	Wisc	Appleton, Electronic Expeditors, 1037 W. Wisconsin Ave.	414-731-4187
Cal	Sacramento, Sacramento Elec., 1219 South St.	916-441-4821	Wisc	Mequon, Taylor Electric Co., 1000 W. Donges Bay Rd.	414-241-4321
Cal	San Diego, Kierulff Elctns, 8797 Balboa	714-278-2112	Wisc	Milwaukee, Hall-Mark Elctns, 11925 W. Ripley Ave.	414-478-1270
Cal	Sun Valley, Q.C. Components, Inc., 8913 Lankershim Blvd.	213-768-6111	MAGNET WIRE INC., 25 Walker St., New York, NY, 10013, Tel: 212-228-0900; Empl.: 6; Minimum order: \$15		
Cal	Sunnyvale, Bell Industries, 1161 N. Fair Oaks, Box 8050	408-734-8570	Customer service: J. Wasserman		
Colo	Aurora, Jet Elctns, 1447 Florence St.	303-364-1000	Products manufactured: Cable		
Colo	Denver, Fistells Elctns Supply Co., 1001 Bannock	303-244-4691	MAGNETEC CORP., A Hi-G Subsidiary, 96 Granby St., Bloomfield, Conn., 06002, Tel: 203-243-8941, TWX: 710-420-0592; Empl.: 55 p. 1708-1713		
Conn	East Hartford, R & S Electronics, 95 Leggett St.	203-528-6581	Products manufactured: Solenoids		
Conn	Stratford, State Elctns Parts Corp., 1269 Barnum Ave.	203-375-5961	Local Sales Offices & Reps.		
Fla	Miami, Electronic Equip Co., Inc., 2701 N.W. 42nd Ave.	305-871-3500	Ala	Huntsville, Interep Assoc.	205-881-3677
Fla	Orlando, Hall-Mark Elctns, 7233 Lake Ellenor Dr.	305-855-4020	Ariz	Scottsdale, Fryco	602-945-3281
Fla	Tampa, Lykes Elctns, 5426 W. Crenshaw, P.O. Box 24047	813-886-6621	Cal	Mountain View, G. C. Woempner Co.	415-964-5454
Ga	Atlanta, Ack Radio Supply Co., 554 Deering Rd., N.W.	404-351-6340	Cal	Woodland Hills, Interstate Mktg. Assoc.	213-883-7606
Ga	Chamblee, Lance Engrg Inc., 2080 Peachtree Ind. Ct.	404-458-6286	Colo	Denver, Omega Ltd.	303-758-1508
Haw	Honolulu, Electrical Equip. Co., 656 Queen St.	808-533-3884	Conn	Fairfield, C. Weber	203-259-5386
Ill	Alton, Ebinger Radio Inc., 1155 Broadway, Rear Ct.	217-462-9783	Fla	Coral Springs, Shaw Engrg. & Sls.	305-752-7596
Ill	Chicago, Allied Elctns Corp., 2400 W. Washington Blvd.	312-421-2400	Ga	Atlanta, Interep Assocs.	404-394-7756
Ill	Chicago, Newark Elctns Corp., 500 N. Pulaski Rd.	312-638-4411	Ill	Chicago, Engineered Sls. Co.	312-867-8434
Ill	Decatur, York Radio & TV Corp., 590 N. Broadway	217-423-3484	Ind	Ft. Wayne, Given Corp.	219-432-5585
Ill	Elk Grove Village, Hall-Mark Elctns, 180 Crossen Ave.	312-437-8800	Kans	Overland Park, Reese & Assocs.	913-648-7748
Ill	Mt. Prospect, Cramer Elctns, 1911 Busse Rd.	312-593-8230	Kans	Wichita, Buse Sls. Co.	316-685-8036
Ill	Peoria, Klaus Radio & Elec. Co., 8400 N. Pioneer Pkwy.	309-691-4840	Mass	Lexington, J. E. Boeig Co.	617-862-2500
Ind	Evansville, Hutch & Son, 300 N. Main St.	812-425-7201	Mich	Grand Rapids, Representatives Elctn. Prod.	616-942-1320
Ind	Fort Wayne, Fort Wayne Elctns, 3606 E. Maumee Ave.	219-423-3422	Mich	Southfield, Representatives Elctn. Prod.	313-354-9066
Ind	Indianapolis, Graham Elctns Supply, Inc., 133 S. Pennsylvania St.	317-634-8202	Minn	St. Paul, R. G. Ragon, Inc.	612-488-0201
Iowa	Cedar Rapids, Deeco Inc., 2500 16th Ave. S.W.	319-365-7551	Mo	St. Charles, Buse Sls. Co.	314-946-6430
Iowa	Cedar Rapids, Iowa Radio Supply Co., 719 Center Pt. Rd. N.E.	319-364-6154	NY	Binghamton, Canavan-Scanlon Assoc.	607-724-7220
Kan	Lenexa, Hall-Mark Elctns, 9006 Rosehill Rd.	913-888-4747	NY	Jericho, HRC Comp-Tech, Inc.	516-822-5550
Kan	Wichita, Radio Supply Co., 115 Laura	316-267-5216	NY	Rochester, Canavan-Scanlon Assoc.	716-442-0720
La	Baton Rouge, Davis Wholesale Elctn Supply Co., 3575 Choctaw Dr.	504-357-8427	NY	Syracuse, Canavan-Scanlon Assoc.	315-437-1271
La	LaFayette, Ralph's of LaFayette, Inc., 3004 Cameron St.	513-234-4507	Ohio	Cincinnati, Components, Inc.	513-721-2997
La	New Orleans, Lykes Elctns, 3308 Orleans Ave.	504-486-7441	Ohio	Cleveland, Components, Inc.	216-842-2737
Md	Baltimore, Hall-Mark Elctns, 6660 Security Blvd.	301-285-8500	Ohio	Dayton, P. E. Montplaisir	513-434-4316
Md	Baltimore, Radio Electric Service Co. of Baltimore, Inc., 1026 Cromwell Bridge Rd.	301-823-0070	Pa	Ardmore, Rothenheber & Wurts, Inc.	215-649-6300
Md	Rockville, Pioneer Washington Elctns, 1037 Taft St.	301-424-3300	Tex	Dallas, United Comps.	214-324-1448
Mass	Boston, DeMambro Elctns, 1095 Commonwealth Ave.	617-7876-1200	Utah	St. Lake City, Omega Ltd.	801-266-9617
Mass	Needham Hts., Kierulff Elctns, 14 Charles St.	617-449-3800	Wash	Bellevue, Ruggles Tech. Sls.	206-455-2778
Mass	Newton, Cramer Elctns, Inc., 85 Wells Ave.	617-969-7700	FOR	Can., Dorval, Que., Anbak Sls. Can., Ltd.	514-635-8514
Mass	Woburn, Newark Elctns, 13A Wheeling Ave.	617-935-8350	FOR	Can., Mississauga, Ont., Anbak Sls. Can., Ltd.	416-625-1061
Mich	Ann Arbor, Wedemeyer Electric Supply Co., 2280 S. Industrial Hwy.	313-665-8611	MAGNETIC CIRCUIT ELEMENTS, 2455A Garden Rd., Monterey, Cal., 93940, Tel: 408-373-0456, TWX: 910-360-7088; FSC No: 09349; Empl.: 24; Minimum order: \$15		
Mich	Romulus, Pioneer/Mich, 6337 N. Beverly Plaza	313-729-8500	For info on price: K. Dethlefsen; Application info: J. Conklin; Customer service: K. Dethlefsen; Delivery info: K. Dethlefsen		
Minn	Minneapolis, Hall-Mark Elctns, 4555 W. 77th St.	612-925-2944	Free literature available: Complete catalogue of standard parts.		
Mo	St. Louis, Hall-Mark Elctns, 6100 Madison Ave.	314-521-3800			
Mo	St. Louis, Olive Ind. Elctns, Inc., 6662 Olive Blvd.	314-863-7800			
Mo	St. Louis, Vansickle Radio Elec., 1915-17 Washington	314-821-5000			
Mont	Billings, Electronic Supply, 250 Eleventh St.	406-252-2197			
Neb	Lincoln, Scott Elctn Supply Corp., 4040 Adams St.	402-434-8308			
NJ	Rutherford, Kierulff Elctns, 5 Industrial Dr.	201-935-2120			
NM	Albuquerque, Kierulff Elctns, 2524 Baylor Dr. S.E.	505-247-1055			
NY	Albany, E.E. Taylor Co., 465 Central Ave.	518-438-4461			
NY	Buffalo, Standard Elctns, Inc., 3519 Union Rd.	716-685-4220			
NY	Buffalo, Summit Distributors, 916 Main St.	716-884-3450			
NY	E. Farmingdale, Harrison Elctns Corp., 20 Smith St.	516-293-7990			
NY	Farmingdale, Hall-Mark Elctns, 167 Marine St.	516-293-7500			
NY	Lynbrook, Peerless Radio Corp., 19 Wilbur St.	516-593-2121			
NY	Mt. Vernon, QAR Industrial Elctns Sls, Inc., 621 S. Columbus Ave.	914-699-2224			
NY	Rochester, Rochester Radio Supply Co., 140 W. Main St.	716-454-6300			
NY	Rochester, Simcona Elctns Corp., 275 Mt. Read Blvd.	716-328-3230			
NY	Syosset, Lafayette Radio, 111 Jericho Tpk	516-921-7700			
NC	Concord, MacVictor Elctn Supply, Box 3236, Hwy. 29 & Florence Ave.	704-786-4175			
NC	Gastonia, United Electronic Supply Co. of Gastonia, Inc., 805 W. Airline Ave.	704-867-4401			
NC	Raleigh, Hall-Mark Elctns, 3000 Industrial Dr.	919-832-4465			
NC	Winston-Salem, Kirkman Elctns, Inc., 901 W. 2nd St.	919-724-0541			
Ohio	Cleveland, W. Pattison Supply Co. 4550 Willow Pkwy. (Cuyahoga Heights)	216-441-3000			
Ohio	Columbus, Hughes-Peters Inc., 481 E. 11th Ave.	614-294-5351			
Ohio	Dayton, ESCO Inc., Crane St.	513-224-9192			
Okla	Oklahoma City, Electronic Supply Co., 212 N.W. 10th St.	405-232-5215			
Okla	Tulsa, Hall-Mark Elctns, 4846 S. 83rd E. Ave.	918-835-8458			
Okla	Tulsa, S & S Radio Supply, 537 S. Kenosha	918-582-8242			
Ore	Portland, Almac/Stroum, 8888 S.W. Canyon Rd.	503-292-3534			
Ore	Portland, North Coast Electric Co., 625 N.W. Evert St.	503-228-5111			
Pa	Huntingdon Valley, Hall-Mark Elctns, Box 125	215-355-7300			
Pa	Philadelphia, Simco Elctns, Inc., 3907-11 N. Broad St.	215-229-1880			
Pa	Pittsburgh, Cameradio Co., 2801 Liberty Ave.	412-288-2600			
RI	Providence, W. Dandrea & Co., 28 Wolcott St.	401-861-2800			
RI	Warwick, W.H. Edwards, Inc., 55 Electronic Dr.	401-781-8000			
SC	Charleston, Wholesale Radio Supply Co. 515 E. Bay St.	803-722-2634			
SC	Greenville, Sawyer Elctns, 1210 Poinsett Hwy	803-235-0438			
Tenn	Chattanooga, Curle Elctns, 1813 S. Market St.	615-266-4728			
Tenn	Kingsport, Radio Electric Supply Co., 961 E. Sullivan St. Box 827	615-247-8111			
Tenn	Nashville, Electra Distributing Co., 1914 W. End Ave.	615-329-3971			
Tex	Dallas, Hall-Mark Elctns, 9333 Forest La.	214-231-6111			
Tex	Fort Worth, Allied Elctns, 401 E. 8th St.	817-336-5401			
Tex	Garland, Newark Elctns, 707 Easy St.	214-271-2511			
Tex	Houston, Altair Co., 9501 Baythorne Dr.	713-462-3029			

Products manufactured: Chokes, Coils Including Assemblies & Forms, Converters, Inverters, Transformers

Advertisement

MCE offers an extensive line of standard inductors and transformers with package options. These include 60 and 400 Hz transformers, lamination type or toroidal chokes, and precision inductors. Miniature high frequency, high temperature and high voltage units for power supplies are our specialty. Complete catalogue including engineering data and prices on request.

MAGNETIC METALS CO., Hayes Ave. at 21st St., Camden, N.J., 08105, Tel: 609-964-7842, TWX: 710-891-7054; Empl.: 500; Minimum order: \$35

For info on price: J. Roche; Application info: G. B. Finke; Customer service: R. L. Breen; Delivery info: R. L. Breen

Free literature available: Transformer lamination catalog; cut core catalog; tape core design manual; ferrite core catalog.

Products manufactured: Cores, Magnetic, Foil, Laminations, Motor & Generator Armatures, Rotors, Stators, Testers

Local Sales Offices & Reps.

Cal Westminster, Magnetic Metals Co. 714-892-6627
Ill Chicago, Magnetic Metals Co. 312-437-7440
Minn Minneapolis, D. G. Perry & Co. 612-920-3212
NC Bethania, Candor Co. 919-924-1480
EXP: Philadelphia, Pa., Ballagh & Thrall, Inc. 215-564-4020

MAGNETIC TECHNOLOGY, Vernitron Corp., 21001 Kittridge St., Canoga Pk., Cal., 91303, Tel: 213-887-7700, TWX: 910-494-1217; Empl.: 125

p. 1-971-974

Products manufactured: Actuators, Motors, Tachometers

Local Sales Offices & Reps.

Cal Los Altos, Servo Data 415-964-1325
Cal Los Angeles, Halbar 213-387-8283
Conn Hartford, Aid Engr. Sls. Co. 203-673-3692
Fla Cocoa, Orbe Inc. 305-452-9568
Fla St. Petersburg, Orbe 813-894-0687
Ill Chicago, Engr. Sls. 312-867-8434
Md Baltimore, Wilkinson Inc. 301-377-7800
Mass Westboro, Aid Engr. Sls. Co. 617-890-8181
Mich Detroit, A. Blumenberg Assoc. 313-557-1934
Minn Minneapolis, Revere Assoc. 612-781-2615
Mo Florissant, Sheridan Assoc. 314-837-5200
NJ Harrington Pk., Metro Tech. 201-768-8495
NY Jericho, Metro Tech. 516-935-3330
NY Pittsford, Magna Sales Corp. 716-586-8748
Ohio Beachwood, Sheridan Assoc. 216-831-0130
Ohio Cincinnati, Sheridan Assocs. 513-761-5432
Ohio Dayton, Sheridan Assoc. 513-277-8911
Pa Glenside, R.L. Wilkinson, Inc. 215-424-8400
Pa Pittsburgh, Sheridan Assoc. 412-244-1640

MAGNETICO, INC., 182 Morris Ave., Holtsville, N.Y., 11742, Tel: 516-654-1166; Empl.: 45 p. 2-1770

For info on price: H. Eicher; Application info: Ch. Engr.; Customer service: T. Sullivan

Products manufactured: Amplifiers, Bobbins, Winding, Coil & Transformer, Chokes, Coils Including Assemblies & Forms, Converters, Decade Boxes, Filters, Inverters, Networks, Power Supplies, Regulators, Transformers

Local Sales Offices & Reps.

Mass Brookline, Technology Prods. Group

MAGNETICO, INC. cont'd

Advertisement

Magnetico Manufactures a complete line of laminated and toroidal transformers. A complete line of precision Scott "T" and reference transformers for use in solid state synchro to digital and digital to synchro converters. Other standard products include power transformers, inductors, inverter transformers, DC to DC converter transformers, ratio transformers, pulse, wide band and hybrid transformers.

MAGNETICS, Div/Spang Industries, Inc., Box 391, Butler, Pa., 16001, Tel: 412-285-4711, TWX: 710-373-3821; Empl.: 650

For info on price: E. J. McClellan; Application info: R. G. Noah; Customer service: E. J. McClellan; Delivery info: E. J. McClellan

Products manufactured: Alloys, Cores, Magnetic, Ferrite Material & Parts, Foil, Laminations, Metal Compounds, Foils, Powders, Sheet, Stock, Seals, Shields, Wire

Local Sales Offices & Reps.

Cal S. El Monte, J. A. McMillin 213-686-0920
Cal San Jose, L. J. Anglin 408-253-0591
Colo Arvada, B. P. Brenner 303-420-3927
Fla St. Petersburg, D.A. King 813-896-4420
Ill Chicago, H.G. Pretat 312-255-6011
Mass South Deerfield, B.E. Gray 413-665-2225
Minn Hopkins, F. Peterson Co. 612-941-5400
NY Rochester, Fowler-Beach Corp. 716-586-0468
NC Greensboro, E.A. Siebenaler 919-288-0053
Ohio Findlay, H.A. Beck 419-424-0592
Pa Doylestown, F.A. Sank 215-794-7312
RI Westerly, T. G. Fitch 401-322-8844
Tex Garland, F.H. Hall 214-272-5697
EXP: New York, N.Y., B. Freudenberg, Inc. 212-757-9130

FOR: Can., Agincourt, Ont., F. P. Taylor, Ltd. 416-291-6538

MAGNETICS, DIV. OF SPANG INDUSTRIES, INC., Ind'l. Control Div., Sandy Lake, Pa., 16145, Tel: 412-376-7515, TWX: 510-461-3334; Empl.: 150

Application info: S. Barretta; Delivery info: L. Hughes

Products manufactured: Amplifiers, Controls/Control Eqpt., Power Supplies, Reactors, Regulators, Transformers

MAGNOS, INCORPORATED, Old School House Rd., Harvard, Mass., 01451, Tel: 617-456-8880; Empl.: 4

For info on price: S. Cohen 617-484-8680; Application info: S. Cohen 617-484-8680; Customer service: A. H. Fredrick 617-456-8880; Delivery info: A. H. Fredrick 617-456-8880

Free literature available: GAUSSMETERS - Solid State Hall effect magnetic field strength meters; HALL PROBES - Transverse, Axial and special probes; FLUXMETERS - Discrete scale and digital scale instruments for general purpose or laboratory measurement. Electrical output on all models; SPECIAL COILS - For determination of intrinsic or extrinsic material properties. Field generating coils, Helmholtz or simple solenoids; MATERIAL TEST SYSTEMS - Hysteresisographs for BH loop tracing of hard and soft materials. Thin film BH loopers; QUALITY CONTROL EQUIPMENT - Coercivity and Remanence systems for hard or soft materials. Production oriented with digital readout and printout option; DEMAGNETIZERS and MAGNETIZERS - Tool and material demagnetizers and electro-magnetic magnet chargers.

Products manufactured: Coils Including Assemblies & Forms, Demagnetizers, Indicators, Magnetizers, Magnets, Meters, Power Supplies, Testers

Local Sales Offices & Reps.

Cal San Carlos, Electronic Engrg Assocs. 415-593-2189
Mass Belmont, Electronic Comps. & Svcs. 617-484-8680

MAGNOS, INCORPORATED cont'd

Advertisement

Specialists in instrumentation for; Magnetic Measurement, Magnetic Material Tests, Quality Control Systems. Manufacturer of Fluxmeters, Hall Gaussmeters, Coercivity Meters, Electromagnets and associated Power Supplies. Solenoids, Helmholtz Coils and Material Test Coil Sets to specifications.

MAGNUM ELEC. CORP., Drawer 247, 6385 Dixie Hwy., Erie, Mich., 48133, Tel: 313-848-2555; Empl.: 75; Minimum order: \$25

For info on price: A. Gonzales; Application info: F. Wojcik; Customer service: A. Gonzales; Delivery info: A. Gonzales

Free literature available: Magstrip catalog - barrier strips - how to order - suggested applications - options optional hardware, quick connects, marking, mounts, colors, jumpers, screws, new products

Products manufactured: Connectors, Terminal Blocks, Boards & Strips, Terminals

Local Sales Offices & Reps.

Cal Fremont, H.K. Foraker Co. 415-657-2213
Cal Lynwood, D. West & Assocs. 213-636-6124
Conn East Haven, Eagle Assocs. 203-235-9036
Fla Ft. Lauderdale, R.I. Smith Assocs. 305-772-5100
Fla Largo, R.I. Smith Assocs. 813-585-2980
Ill Des Plaines, Control Sls. 312-296-5595
Ind Ft. Wayne, Baehr, Greenleaf & Assocs. 219-447-1608
Mich Utica, E.H. Hufferd Co. 313-731-6003
Minn Minneapolis, E. Melius Assocs. 612-854-4270
NJ Haddonfield, TAI Corp. 215-627-6615
NY Great Neck, Frank Tylnski Co. 516-466-9070
NY Rochester, E.J. Schomburg Co. 716-244-0920
Ohio Cincinnati, Baehr, Greenleaf & Assocs. 513-891-3826
Ohio Cleveland, Baehr, Greenleaf & Assocs. 216-221-9030
Ohio Columbus, Baehr, Greenleaf & Assocs. 614-486-4046
Tenn Greenvale, ACM Southeast 615-639-9141
Wisc Milwaukee, Control Sls. 414-964-3322 53/

Local Distributors

Cal Fremont, Terminal Sales, 40970 Fremont 415-656-7722
Minn Minneapolis, Control Design, 3433 E. 25th St. 612-721-1629

MAGNUSONIC DEVICES, INC., 290 Duffy Ave., Hicksville, N.Y., 11801, Tel: 516-938-4700, TWX: 510-221-1850; Empl.: 200

For info on price: K. A. Both; Application info: A. Garamy; Customer service: K. A. Both; Delivery info: K. A. Both

Free literature available: 7 and 9 track IBM compatible head (all speeds), flying heads, floppy disc and cassette/cartridge heads.

Products manufactured: Heads, Recording Playback, Erase

Local Sales Offices & Reps.

Cal Covina, DCM Assocs. 213-331-7114
Mass Burlington, New England Tech. Sls. Co. 617-272-0434
Tex Dallas, Evans & McDowell Assocs. 214-238-7157

MAIN ELECTRNS, INC., 225 Ida, Wichita, Kan., 67211, Tel: 316-267-3581; Empl.: 10

Products manufactured: Dials, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Kans Shawnee Mission, Main Elctns. 913-362-2121

MAJOR DATA CORP., 1796 Monrovia Ave., Costa Mesa, Cal., 92627, Tel: 714-646-2455; Empl.: 10

Customer service: B. Sears

Products manufactured: Annunciators, Computers, Display Devices/Displays, Tubes

Local Sales Offices & Reps.

Cal Montebello, Tucul Engrg. Co. 213-728-7397
Cal Santa Anna, Shelly Assocs. 714-540-9330
D.C. Wash, Arco Engrg. 202-393-5991

III Chicago, Engineered Sls. Co. 312-867-8434
 La New Orleans, I B L Engrg. & Sls., Inc.
 504-895-4793
 Mass Newton Upper Falls, Brookdale/Electrns. Engrg.
 617-244-6969
 NJ Haddonfield, Gray Assocs. 609-429-5300
 NY Fayetteville, M. P. Andrews, Inc. 315-637-5291
 NY Scarsdale, Bassin Tech. Sls. Co. 914-723-3334
 Ohio Dayton, Ashby Assocs., Inc. 513-252-5627
 Tex Dallas, I B L Engrg. & Sls., Inc. 214-363-2921
 Tex Houston, I B L Engrg. & Sls., Inc. 713-781-5171
 FOR: Can., Montreal, Que., Electrodesign, Ltd.
 514-363-5120

MALCO, A MICRODOT CO., 5150 W. Roosevelt Rd.,
 Chicago, Ill., 60650, Tel: 312-287-6700, TWX:
 910-221-1296; Empl.: 400

Free literature available: Coaxial Connectors-
 Catalog #100-1 Multi-Pin Connectors- Catalog
 #200-1 Rack & Panel Connectors- Catalog #300-1
 Wire Terminals- Catalog #400-1 Printed Circuit
 Terminals- Catalog #500-1 Back Plane
 Assemblies- Catalog #600-1 Cardedge
 Connectors- Catalog #700-1
 Electronic Hardware- Catalog #800-1 Wire and
 Cable- Catalog #900-1

Products manufactured: Cable Assemblies &
 Harnesses, Cable, Connector Adapters,
 Connectors, Contacts, Electrical, Cords,
 Machines/Machinery, Production, Sockets,
 Terminal Blocks, Boards & Strips, Terminals

MALLINCKRODT, INC., 2nd & Mallinckrodt Sts., St.
 Louis, Mo., 63147, Tel: 314-731-4141, TWX:
 910-761-0443; Empl.: 2500; Minimum order: \$100

For info on price: C. S. Kettler; Application info: C. S.
 Kettler; Customer service: B. D. Williams; Delivery
 info: B. D. Williams

Free literature available: Product brochure including
 specifications on Transist AK® line of electronic
 grade chemicals.

Products manufactured: Chemicals, Cleaners &
 Solvents, Metal Oxides

P.R. MALLORY & CO., 3029 East Washington St.,
 Indianapolis, Ind., 46201; Empl.: 7500

Local Sales Offices & Reps.

Cal Los Angeles 213-921-7939
 Cal San Francisco 415-348-2081
 Fla Orlando 305-855-6353
 Ill Chicago 312-775-9455
 Mass Watertown 617-924-2214
 Mich Detroit 313-645-4490
 NJ Cinnaminson 609-829-7902
 NJ Hillsdale 201-666-3600
 Ohio Dayton 513-299-5505

MALLORY BATTERY, P.R. Mallory, S. Broadway,
 Tarrytown, N.Y., 10591, Tel: 914-591-7000

Products manufactured: Batteries

(Refer to Mallory, P.R. & Co. Inc. for sales office
 information.)

MALLORY CAPACITOR CO., Div. P.R. Mallory, 3029 E.
 Washington, Box 372, Indianapolis, Ind., 46201, Tel:
 317-636-5353 p. 1-26, 27; p. 2-206-209

Products manufactured: Alarms, Capacitors, Fixed

Local Sales Offices & Reps.

Ala Huntsville, P.R. Mallory 205-539-1751
 Ariz Scottsdale, P.R. Mallory 602-947-0241
 Cal Los Angeles, P.R. Mallory 714-523-7992
 Cal San Francisco, P.R. Mallory 415-348-2081
 Colo Denver, P.R. Mallory 303-758-7788
 Fla Orlando, P.R. Mallory 305-855-6353
 Ill Chicago, P.R. Mallory 312-775-9455
 Ind Indianapolis, P.R. Mallory 317-636-5353
 Mass Boston, P.R. Mallory 617-924-2214
 Minn Minneapolis, P.R. Mallory 612-944-2870
 Mo St. Louis, P.R. Mallory 314-727-8695
 NJ Hillsdale, P.R. Mallory 201-666-3600
 NY Plandome, Fred Spellman Co. 516-627-3399
 NY Rochester, P.R. Mallory 716-647-3410
 NC Statesville, P.R. Mallory 704-872-0586
 Ohio Dayton, P.R. Mallory 513-299-5505
 Ore Portland, Earl & Brown Co. 503-292-9145
 Pa Philadelphia, P.R. Mallory 215-844-8891
 Tex Dallas, P.R. Mallory 214-324-2448
 Wash Seattle, Earl & Brown Co. 206-284-1121

MALLORY CONTROLS, P.R. Mallory, Box 327, Frankfurt,
 Ind., 46041, Tel: 317-654-5501, TWX: 317-634-4214

Products manufactured: Plug & Jack Sets,
 Potentiometers, Resistors, Switches

(Refer to Mallory, P.R. & Co. Inc. for sales office
 information.)

MALLORY DISTRIBUTOR PRODS. CO., P.R. Mallory &
 Co., Box 1558, Indianapolis, Ind., 46201

MALLORY TIMERS, P.R. Mallory, 3029 E. Washington St.,
 Indpls., Ind., 46201, Tel: 317-636-5353, TWX:
 317-634-4214; Empl.: 2,000

Products manufactured: Bells, Buzzers, Gongs,
 Sirens & Aural Warning Devices, Indicators,
 Motors, Timers

(Refer to Mallory, P.R. & Co. Inc. for sales office
 information.)

MANGER ELEC. CO., INC., W. Henry St., Stamford,
 Conn., 06902, Tel: 203-348-7761; Minimum order: \$50

For info on price: J. A. Markus; Application info: J. V.
 Judge; Customer service: J. V. Judge; Delivery info:
 B. Lusita

Free literature available: Summary sheet giving
 history of our company; catalog which details the
 scope of wire processing at Manger.

Products manufactured: Braid, Cable, Cable
 Assemblies & Harnesses, Cords, Jumpers, Labels,
 Pressure-Sensitive, Adhesive, Lead Assemblies &
 Receptacles, Services, Assembly, Production &
 Test, Terminals, Wire & Cable Ties, Wire Markers,
 Wire Shielding

Local Sales Offices & Reps.

Cal Palos Verdes Estates, Sid Schulman & Assoc.
 213-373-6564
 Md Baltimore, Fian Lott Co. 301-744-4611
 Mich Rochester, Keu-Mor Assoc. 313-651-1890

MANHATTAN ELEC. CABLE CORP., 1 Station Plaza, Rye,
 N.Y., 10580, Tel: 212-875-7130, Telex: 12-6141; Empl.:
 75; Minimum order: \$50

For info on price: F. Mindek; Application info: T. Blick;
 Customer service: K. Berg

Free literature available: Electronic wire & cable
 catalog containing complete data & information
 on the wide range of electronic & electrical types
 of wire & cable marketed by Manhattan Cable

Products manufactured: Braid, Cable, Cable, Cords,
 Wire

Local Sales Offices & Reps.

Cal Burlingame, Manhattan Elec. Cable
 415-697-7016
 Cal Los Angeles, Bassett & Moore Inc.
 213-766-2117
 Cal San Francisco, Logan Sales Co. 415-369-6726
 Colo Denver, K.C. Marketes Inc. 303-733-5561
 Ga Atlanta, Hollingsworth & Still Inc. 404-394-3270
 Ill Chicago, Manhattan Elec. Cable 312-344-5040
 Ill Melrose Park, Manhattan Elec. Cable
 312-344-5040
 Mass Boston, Keene Sales Co. Inc. 617-595-2300
 Mich Detroit, Shalco Inc. 313-547-4771
 Mo St. Louis, Midwestern-Manhattan Elec. Cable
 314-865-5050
 NY Brooklyn, Manhattan Elec. Cable 212-875-7130
 NY Camillus, Callahan-Ferguson Co. 315-487-3870
 NY New York, Bressler & Baum Assoc.
 212-564-4105
 NY Rye, Manhattan Elec. Cable 914-967-4080
 Ohio Cleveland, Electronic Sales Masters
 216-831-9555
 Ohio Independence, Manhattan Elec. Cable
 216-749-7500
 Pa Philadelphia, Stinson Assoc. Inc. 215-896-7378
 Tex Dallas, Lund & Co. Inc. 214-358-4335
 Tex Houston, Texas-Manhattan Elect. Insulated
 Cable 713-227-5228
 Wash Seattle, R.K. Squibb Inc. 206-ME2-2450

MANN, HENRY INC., Mann Rd., Box 496, Huntingdon
 Valley, Pa., 19006, Tel: 215-355-7200, TWX:
 800-523-1960; Empl.: 50; Minimum order: \$20

For info on price: B. Schick; Application info: J.
 Massi; Customer service: L. Suder; Delivery info: L.
 Suder

Free literature available: Literature on all Printed
 Circuit Board processing equipment, component
 lead forming, cut and layover tools, holding
 fixtures, assembly tools and equipment, etc.

Products manufactured: Adhesives (All Types),
 Benches, Consoles, Stools, Tables, Cabinets &
 Accessories, Calculators, Electrical & Electronic,
 Carts & Dollies, Instrument & Equipment,
 Chemicals, Cleaners & Solvents, Cleaners,
 Ultrasonic, Coatings, Containers, Cords, Cutters,
 Wire, Hand Operated, Demagnetizers, Drills &
 Accessories, Hand & Power, Drivers, Nut, Heat
 Guns, Production, Heat Sinks, Soldering, Holders,
 Circuit Board (Production Type), Jigs And Fixtures,
 Chassis & Circuit Board, Kits, Connector, Knives &
 Knife Sets, Lamps, Machines/Machinery,
 Production, Magnifying Glasses, Inspection,
 Meters, Pads, Transistor Mounting, Pliers, Pumps,
 Vacuum, Racks, Scissors, Screwdrivers, Scribes,
 Seizers, Solder (All Types), Solder Pots & Baths,
 Soldering Accessories, Soldering Equipment,
 Soldering Guns, Irons & Desoldering Tools,
 Testers, Tools, Torches, Soldering, Welding &
 Access., Tweezers, Hand & Vacuum, Wire
 Strippers, Wire Twisters, Wrenches

MARATHON BATTERY CO., c/o Marathon Manufacturing
 Co., 1900 Marathon Bldg., 600 Jefferson Box 61589,
 Houston, Tex., 77002, Tel: 817-776-0550, TWX:
 910-894-5203; Empl.: 400; Minimum order: \$1000

Customer service: R. Tarpey

Products manufactured: Batteries, Chargers,
 Battery, Eliminators, Battery, Motor Electric
 Generator Sets, Motors

Local Sales Offices & Reps.

Cal San Carlos, R. DelBucchia & Assoc.
 415-756-1664
 Cal Westminster, A.A. Dowers, Inc. 213-596-4485
 Colo Denver, Brown Tech. 303-233-0863
 Fla Winter Pk., Young & Lawrence 305-647-6929
 Ill Chicago, Gassner & Clark Co. 312-345-4245
 Ind Indianapolis, Southern Sls. 317-257-7575
 Iowa Hiawatha, Gassner & Clark Co. 319-393-5763
 Mich Farmington Hills, H. Lowell Co. 313-851-7474
 Minn St. Paul, Howard Cullen Assocs. 612-646-7371
 NM Albuquerque, Bowden Assoc. 505-268-7676
 NY Buffalo, R. Mitscher 716-633-7970
 Ohio Cleveland, Components, Inc. 216-842-2737
 Pa Phila., C. Newson 215-248-3377
 Wash Seattle, R. Squibb 206-632-2450
 Wisc Oak Creek, Erdman Sls. 414-761-2120

MARCONI INSTRS., Div. Marconi Electrns. Inc., 100
 Stonehurst Ct., Northvale, N.J., 07647, Tel:
 201-767-7250, TWX: 710-991-9752; Empl.: 19

p. 1-766-771

Products manufactured: Analyzers, Attenuators,
 Bridges, Counters, Filters, Generators, Meters,
 Monitors, Oscillators, Receivers, Telephone
 Channel Test & Simulator Equipment, Television
 Systems & Equipment Closed-Circuit, Test
 Equipment, Testers

Local Sales Offices & Reps.

Ala Huntsville, Lee 205-533-5896
 Ariz Phoenix, Moxon Electrns. 602-273-7363
 Cal Irvine, Moxon Electrns. 714-556-6500
 Cal San Diego, Moxon Electrns. 714-292-4820
 Cal Santa Clara, Moxon Elct. 408-249-2491
 Colo Denver, PLS Assoc. 303-771-0140
 Fla Winter Haven, Lee Assocs. 813-294-5815
 Ga Chamblee, Lee Assocs., Inc. 404-457-7117
 Ill Chicago, K.W. Meyers 312-774-6440
 Ind Indpls., K. Meyers 317-243-6681
 Md Bethesda, S & S 301-654-1434
 Mass Stoneham, Ken Corp. 617-438-5464
 Minn Mpls., K.W. Meyers 612-920-7080
 Mo Raytown, P. A. C. 816-737-0068
 NJ Saddle Brook, L & M Assocs. 201-843-8700
 NM Albuquerque, PLS Assoc. 505-255-2330
 NY Brentwood, L & M Assocs. 516-231-8363
 NY Fayetteville, Savage Sales Co. 315-682-2131
 NY New York City, L & M Assocs. 212-675-7486
 NC Raleigh, Lee Assocs., Inc. 919-787-5818
 Ohio Waldo, Ohio Instr. 614-726-4242
 Pa Andalusia, L & M 215-639-3100
 Tex Dallas, Bradenco 214-358-3278
 Utah Salt Lake City, PLS Assoc. 801-272-3681
 Wash Seattle, R.S. Drake Assoc. 206-763-2755

MARK EYELET & STAMPING, 185 Wakelee Rd., Wolcott,
 Conn., 06716, Tel: 203-758-8847; Empl.: 50

For info on price: G. Hunting; Delivery info: C. Rinaldi

Products manufactured: Connectors, Eyelets,
 Fasteners, Grommets, Rivets, Terminals

Local Sales Offices & Reps.

Cal Glendale, Bruce Entprs. 213-245-6538
 Ill Chicago, Weber Assocs. 312-943-5225
 Iowa Cedar Rapids, Snider Sls.
 Mich Detroit, W. L. Crawford 313-836-8121
 Minn St. Paul, C. Vandervort 612-489-5222

Pa Wayne, Miller & Smith Co. 215-687-0750
 Tex Richardson, P.J. Scanlon Co. 214-231-4661

MARK SPECIALTIES, 1780 Monrovia, Costa Mesa, Cal.,
 92627, Tel: 714-642-7757; Empl.: 4; Minimum order:
 \$25

Customer service: R. Hackstock

Products manufactured: Bobbins, Winding, Coil &
 Transformer, Coils Including Assemblies & Forms,
 Solenoids

MARKAL CO., 250 N. Washtenaw Ave., Chicago, Ill.,
 60612, Tel: 312-826-1700; Empl.: 65; Minimum order:
 \$25

For info on price: J. Laicour; Application info: D.
 Lytton; Customer service: E. G. Carlsen; Delivery info:
 M. Kaplan

Free literature available: We have Markal Paint
 Eight Page Catalog, Ball Paint Marker Catalog &
 Protective Coating Catalog

Products manufactured: Coatings, Crayons,
 Coatings, Pellets, etc., Temperature Indicating

MARKEL, L. FRANK & SONS, School La., Norristown,
 Pa., 19404, Tel: 215-272-8960, TWX: 510-660-0190; FSC:
 No: 03890; Empl.: 395; Minimum order: \$25
 p. 2-1272,1273,2024,2025

For info on price: J. F. Carpenter, Jr.; Customer
 service: E. Pascal; Delivery info: H. Doerner

Products manufactured: Cable, Tapes, Electrical
 Insulation, Tubing, Wire

Local Sales Offices & Reps.

Ariz Phoenix, K. Jahn Co. 602-956-9060
 Ark Hot Springs, Meredith Young Assocs.
 501-262-1365
 Cal L.A., National Wire & Cable 213-225-5611
 Cal Los Angeles, C.D. LaMoree 213-225-5631
 Cal Torrance, Insulation Supply 213-320-9400
 Colo Denver, Ward Elec. Supply 303-222-3541
 Conn Sherman, R.P. Mahan Co. 203-355-0231
 Fla Clearwater, WMM Assocs. 813-447-2533
 Ill Chicago, J. Glenn 312-847-6400
 Kans Overland Park, Mathews & Co. 913-642-9063
 Mass Wellesley, R. Mahan 617-237-1040
 Mich Farmington, L. George Agency 313-474-1055
 Minn Eden Prairie, F. Peterson 612-941-5400
 Mo Webster Groves, Hippler 314-961-8499
 NJ Colonia, H.B. Heft Assocs. 201-381-5389
 NY Lynbrook, H.B. Heft 516-599-3351
 NY Rochester, Gislason 716-454-4741
 NC Charlotte, H.T. Altman Co. 704-399-8926
 Ohio Chagrin Falls, Electrolock 216-543-5125
 Okla Oklahoma City, J. Cole 405-235-2447
 Ore Portland, C. Riggs 503-226-3286
 Pa Munnhall, PEI Sis. Corp. 412-462-6300
 Pa Phila., C. Newton 215-248-3377
 Tenn Chattanooga, Jackson 615-267-4260
 Tex Tyler, Cline & Son, Inc. 214-595-1038
 Wash Seattle, C. Riggs 206-623-5707
 Wisc Elm Grove, J.J. Glenn & Co. 414-352-7262
 FOR: Can., Burlington, Ont., Neeco Inds.
 416-632-1403

MARKEM CORP., 1000 Congress St., Keene, NH, 03431,
 Tel: 603-352-1130, TWX: 710-366-1800; Empl.: 775

Customer service: T. Pallarino

Free literature available: Capabilities Brochure
 describing in-plant marking systems available for
 Electronics Industry - component marking,
 pressure sensitive labels including rating plate
 labels.

Products manufactured: Labels, Pressure-Sensitive,
 Adhesive, Machines/Machinery, Production,
 Nameplates, Wire Markers

Local Sales Offices & Reps.

Cal Industry, Markem Corp. 213-965-3345
 Ill Elk Grove Village, Markem Corp. 312-625-2866
 Mo St. Louis, Mft. Supplies Co. 314-231-7866
 NH Keene, Markem Corp. 603-352-1130
 NJ Springfield, Markem Corp. 201-467-0870
 NC Charlotte, Markem Corp. 704-525-1445
 Ohio Cincinnati, L. G. Freeman Co. 513-721-1080
 Ohio Medina, Markem Corp. 216-238-5125
 Tex Richardson, Markem Corp. 214-231-8297

MARLIN MANUFACTURING CORP., 12404 Triskett Rd.,
 Cleveland, Ohio, 44111, Tel: 216-941-6200; Empl.: 55;
 Minimum order: \$25

For info on price: P. Hrubby; Application info: D. Park;
 Customer service: P. Hrubby; Delivery info: P. Hrubby

Products manufactured: Connectors, Panels, Plug
 Adapters, Plug & Jack Sets, Probes,
 Thermocouples, Elements & Accessories, Wire

Local Sales Offices & Reps.

Mass Norwell, Bordewick Engrg. & Sls.
 617-659-4915
 NY Troy, HJM Sis. Co. 518-283-5599
 NC Charlotte, Sloan Assocs. 704-523-2133
 Ohio Cincinnati, Seawood Sis. Co. 513-793-6702
 Pa Broomall, AM Tech. Sis. Co. 215-356-0574
 Pa Pittsburgh, AM Tech. Sis. Co. 412-885-3363
 Tenn Chattanooga, Coleman Assocs. 615-821-0235
 Va Richmond, Sloan Assocs. 804-359-6051

MARLOW INDUSTRIES, INC., 3640 A Marquis Dr.,
 Garland, Tex., 75402, Tel: 214-494-2521, TWX:
 910-860-5161; Empl.: 10; Minimum order: \$50

Customer service: R. L. Smythe

Products manufactured: Baths, Controlled
 Temperature (Air & Liquid), Controls/Control
 Eqpt., Cooling/Heating Modules, Thermoelectric,
 Feedthrus & Seals, Environmental,
 Photomultiplier Tube Housings, Substrates

Local Sales Offices & Reps.

Ariz Phoenix, Griot Assocs. 602-275-4991
 Cal El Segundo, Griot Assocs. 213-322-8383
 Cal Los Altos, Griot Assocs. 415-941-2533
 Cal Tustin, Griot Assocs. 714-838-2330
 Tex Dallas, W.P. Fralia Co. 214-264-3491
 Tex Houston, W.P. Fralia Co. 713-772-1572
 Wash Bellevue, Griot Assocs. 206-454-8592

MAROTTA SCI. CONTROLS, INC., Boonton Ave.,
 Boonton, N.J., 07005, Tel: 201-334-7800, TWX:
 710-987-8358; FSC No: 99657; Empl.: 165; Minimum
 order: \$30

For info on price: P. Johnson; Application info: T.
 Havness; Customer service: T. Rogers; Delivery info:
 B. Stritch

Products manufactured: Controllers,
 Programmable, Controls/Control Eqpt., Valves,
 Solenoid

Local Sales Offices & Reps.

Ala Huntsville, General Hydraulics Corp.
 205-536-6341
 Cal Tustin, Marotta Scientific Controls
 714-544-2160

HUNTER TOOLS, Marshall Industries, 9674 Telstar Ave.,
 El Monte, Calif, 91731, Tel: 213-686-0141, TWX:
 910-587-1565; Empl.: 75

For info on price: J. Spiri; Application info: J. Spiri;
 Customer service: D. Hunter; Delivery info: D. Hunter

Products manufactured: Drivers, Nut, Heat Sinks,
 Soldering, Pliers, Pullers, Screwdrivers, Soldering
 Accessories, Soldering Guns, Irons & Desoldering
 Tools, Testers, Tools, Transistor, Diode, Thyristor
 Heat Dissipators, Wrenches

Local Sales Offices & Reps.

Cal Los Angeles, Gignac, Oldfield & Weaver
 213-747-9544
 Cal San Francisco, Meyer, Ross & Fleming
 415-285-8880
 Colo Arvada, Arrowhead Sis. Corp. 303-423-5556
 Fla Ft. Lauderdale, Unirep Inc.
 Ga Atlanta, Murphy & Cota 404-875-2525
 Ill Chicago, J. J. McBride Sis., Inc. 312-775-1080
 Ind Indianapolis, Elctrn. Reps. 317-897-9326
 Kans Leawood, J. D. How Assoc. 913-649-0542
 Md Phoenix, Rebco Sis. 301-592-8907
 Mass Lynn, J. Grant 617-595-6411
 Mich Detroit, Burcaw Co. & Assoc. 313-533-7700
 Minn Minneapolis, Jensen & Olsen Sis. 612-941-7181
 Mo Liberty, Lectro-Reps. 816-781-2522
 NY Elmhurst, Wilson Assoc. 212-899-0929
 NY Rochester, Marsey Sis. 716-442-9700
 Ohio Cincinnati, Paten Sis. Co. 513-574-0813
 Ohio St. Marys, Shelby & Co. 419-394-3377
 Ore Portland, J. V. Belusko Co. 503-222-4279
 Pa Willow Grove, Dick Lewis 215-659-0704
 Tex Dallas, Techno Assoc. 214-357-9213
 Utah Salt Lake City, Arrowhead Sis. Corp.
 801-487-3444
 Va Richmond, Taylor Bros., Inc. 804-644-2391

MARSHALL INDUSTRIES, Kinatech Sys., 9674 Telstar
 Ave., El Monte, Cal., 91731, Tel: 213-686-0141, TWX:
 910-587-1565; Empl.: 500

For info on price: R. Frost; Application info: R. Merrill;
 Customer service: R. Frost; Delivery info: R. Frost

Free literature available: Complete 94 page catalog
 covering all aspects of facilities layout, assembly
 station specifications, industrial seating and
 material handling.

Products manufactured: Benches, Consoles, Stools,
 Tables, Cleaners, Ultrasonic,
 Machines/Machinery, Production

Local Sales Offices & Reps.

Ariz Tempe 602-968-6181
 Cal Sunnyvale 408-739-8720
 Colo Arvada 303-423-9670
 Conn N. Branford 203-288-9241
 Fla Palm Beach Gardens 305-622-8590
 Ill Des Plaines 312-298-0440
 Mass Newton Highland 617-965-5310
 NY Farmingdale 516-293-4120
 Ohio Dayton 513-898-1100
 Tex Dallas 214-233-7650
 Wash Bellevue 206-883-1084

MARSTAN RESISTOR, Balco- Elctrns., Inc., 307
 Washington St., Orange, N.J., 07050, Tel:
 201-677-1200, TWX: 710-994-5812; FSC No: 5905; QPL
 No: Multiple; Empl.: 50; Minimum order: \$50

For info on price: R. W. Hagerty; Application info: R.
 W. Hagerty; Customer service: L. James; Delivery
 info: R. W. Hagerty

Free literature available: Precision wirewound
 resistors.

Products manufactured: Dividers, Networks,
 Resistors

Local Sales Offices & Reps.

Ariz Scottsdale, F. Schoeffler Assocs.
 Cal Culver City, Sodaro Co. 213-870-6001
 Conn Meriden, Abbott-Allison 203-237-9232
 Ill Northbrook, R.T. Howlett & Assocs.
 312-498-5444
 Kans Overland Park, B. Rush Assocs. 913-831-4259
 Mich Northbrook, R.T. Howlett & Assocs.
 312-498-5444

NJ Harrington Pk, Metro Tech Sis. 201-768-8495
 NY Jericho, Metro Tech Sis. 516-935-3330
 Wash Seattle, J. B. Jolly 206-938-4166
 Wisc Milwaukee, Gentron Co. 414-543-8110
 EXP: New York, N.Y., Multiparts Corp. 212-944-4372
 EXP: Westbury, N.Y., Minthorne International Inc.
 516-334-3303

FOR: Can., Montreal, Quebec, Electrodesign, Ltd.
 514-389-5914

FOR: Can., Ottawa, Ont., Electrodesign, Ltd.
 613-745-0541

FOR: Can., Quebec, Electrodesign 514-363-5120
 FOR: Can., Toronto, Ont., Electrodesign
 416-787-0991

MASTECH, INC., 478 E. Brighton Ave., Syracuse, N.Y.,
 13210, Tel: 315-478-3133, TWX: 710-541-1546; Empl.:
 20; Minimum order: \$100

Customer service: R. F. Merrithew

Free literature available: 2610-202-216,
 Semiconductor Device Test Sets, (Short Form
 Catalog)

Products manufactured: Testers

Local Sales Offices & Reps.

Cal Los Angeles, Dyna Sis. Co. 213-268-1175
 Mass Chelmsford, Equipment Sis. Co. 617-256-8547
 Wash Bellevue, Scientific Devices - Northwest
 206-454-0900

MASTER APPLIANCE CORP., 2420 18th St., Racine,
 Wisc., 53403, Tel: 414-633-7791; Empl.: 80
 p. 2-1710-1713

Customer service: S. Radwill

Free literature available: Full Line Catalog & Price
 List Single Page Full Line Sheet Master-Mite Page
 Parts Price Lists Air Cleaner Catalog Pages

Products manufactured: Air Cleaners & Filters
 (Shielded & Unshielded), Blowers & Fans &
 Accessories, Heat Guns, Production, Tools,
 Torches, Soldering, Welding & Access., Welding
 Equipment & Access. (Excluding Equip. for
 Semiconductor Devices)

Local Sales Offices & Reps.

NJ Cherry Hill, M/E & Assocs. 609-667-6110
 NY Great Neck, Harris & Aldrich Sis. Inc.
 516-466-4122
 EXP: Mt. Prospect, Ill., Master Appliance
 Corp.-Overseas Div. 312-358-8677

MASTER ELCTRN. CONTROLS, 1553 17th St., Santa
 Monica, Cal., 90404, Tel: 213-393-3177; Empl.: 27;
 Minimum order: \$15

For info on price: K.A. Holladay; Application info: I.
 Nizam; Customer service: D. Colmenero; Delivery
 info: K.A. Holladay

Products manufactured: Controls/Control Eqpt.,
 Relays, Sockets, Timers

Local Sales Offices & Reps.

Cal Los Angeles, Master Distributors 213-395-2637
 Cal San Francisco, Master Dist. 415-626-0807
 Ill Park Ridge, G. E. Collins Sis. 312-823-8075

NY Scarsdale, Bassin Tech. Sls. Co. 914-SC 3-3334
Ohio Columbus, Ind'l. Comp. Sls. 614-486-3045

MASTER SPECIALTIES CO., 1640 Monrovia St., Costa Mesa, Cal., 92627, Tel: 714-642-2427; Empl.: 350

Products manufactured: Display Devices/Displays, Lamps, Lights, Switches

Local Sales Offices & Reps.

Cal Costa Mesa 714-642-2427
Cal Mountain View 415-961-3640
Cal San Diego 714-279-4812
Colo Denver 303-758-7741
Fla Titusville 305-269-3040
Ga Morrow 404-363-9947
Ill Schiller Park 312-671-4586
Mass Lynn 617-599-0566
Minn St. Paul 612-854-7535
NJ Barrington 609-546-9044
NY Avon 716-342-3630
NY Valley Stream 516-561-2334
Ohio Wickliffe 216-946-5552
Tex Dallas 214-357-9459
Wash Bellevue 206-746-4440

MASTERITE CORPORATION, 2841 Lomita Blvd., Torrance, Cal., 90505, Tel: 213-775-3471, TWX: 910-347-6237; FSC No: 05041; Empl.: 380; Minimum order: \$50

For info on price: C. J. Huebert; Application info: C. J. Huebert; Customer service: R. C. Reese; Delivery info: R. C. Reese

Free literature available: Masterite brochures include P.C.B. Connectors which are available in several sizes with a choice of contact centers; .050, .100, .125, .156 Also available are brochures "Plates and Connecting Devices for Wire Wrap" and "Flexible Interconnects"

Products manufactured: Boards, Printed Wiring, Universal, Boards, Programming, Cable Assemblies & Harnesses, Cable, Connectors

Local Sales Offices & Reps.

Ariz Phoenix, S.O. Rush 602-959-3594
Cal Mountain View, West/Mark Assoc. 415-969-1700
Colo Denver, West/Mark Assoc. 303-433-7181
Fla St. Petersburg, Russell Assoc. 813-526-2939
Ga Atlanta, Russell Assoc. 404-255-8422
Ill Wood Dale, L. Bacher Assoc. 312-766-1922
Kans Overland Park, Penzner-Mankus Assoc. 913-381-0004
Mass Waltham, UNESCO 617-890-6680
Mich Grand Rapids, R.P. Urban Assoc. 616-245-0511
Minn St. Paul, Countryman Assoc. 612-645-9151
Mo Hazelwood, Penzner-Mankus Assoc. 314-731-4334
NJ Livingston, Varrelman-Gorman Co. 201-992-2505
NM Albuquerque, Thorson Co. 505-265-5655
NY Camillus, Varrelman-Gorman Co. 315-458-4774
NY Centerport, Varrelman-Gorman Co. 212-463-5000
Ohio Tipp City, Tech. Comps. 513-667-1216
Okla Broken Arrow, P.J. Scanlon Co. 918-251-1427
Pa Newtown Square, Hagy Assoc. 215-459-0504
Tex Richardson, P.J. Scanlon Co. 214-231-4661

MATERIALS FOR ELCTRNS., INC., 149-32 132nd St., Jamaica, N.Y., 11430, Tel: 212-322-9400

Products manufactured: Antennas, Capacitors, Fixed, Coatings, Metals, Seals, Thermocouples, Elements & Accessories

MATERIALS RESCH. CORP., Route 303, Orangeburg, N.Y., 10962, Tel: 914-359-4200, TWX: 710-576-2656; Empl.: 300

Products manufactured: Alloys, Chamber, Environmental Test, Coatings, Crystals, Deposition Equipment, Vacuum & Accessories, Detectors, Evaporation Equipment, Electron Beam, Feedthrus & Seals, Environmental, Forms, Wire, Furnaces, Gages, Materials, Self-Lubricating, Metal Compounds, Foils, Powders, Sheet, Stock, Metal Oxides, Metals, Microcircuit Production Equip., Networks, Ovens, Pumps, Vacuum, Quartz, Fused, Scribes, Semiconductor Wafer Fabrication, Services, Assembly, Production & Test, Substrates, Valves, Vacuum, Wire

Local Sales Offices & Reps.

Ariz Tempe, Materials Research Corp. 602-949-5862
Cal Mountain View, Materials Research Corp. 415-964-7272
Mass Allston, J. W. Fox 617-429-1300
Mo Maryland Heights, J. True 314-739-3326
Tex Dallas, S. Smith 214-235-9008

Tex Richardson, Materials Research Corp. 214-235-9008

MATHESON GAS PRODUCTS, Box 85, East Rutherford, N.J., 07073, Tel: 201-933-2400, TWX: 710-989-0173;

Empl.: 500; Minimum order: \$10

Customer service: T. Swanson 415-793-2559

Free literature available: Matheson General Gas Catalog: Separate section devoted to electronic gases and gas mixtures for use in the semiconductor industry. Equipment section for high purity regulators and handling equipment.

Products manufactured: Chemicals, Controls/Control Eqpt., Couplings, Dials, Gages, Regulators, Technical Books, Testers, Valves, Vacuum

Local Sales Offices & Reps.

Cal Cucamonga 714-987-4611
Cal Newark 415-793-2559
Fla Morrow 404-478-7274
Ill Joliet 815-727-4848
Mass Gloucester 617-283-7700
Tex La Porte 713-471-2544
FOR: Can., Edmonton, Alberta 403-476-6214
FOR: Can., Whitby, Ontario 416-668-3397

MATRIX CORP., 520 N. 11th Ave., Beech Grove, Ind., 46107, Tel: 317-786-4601; Empl.: 10 p. 1•178,266

Customer service: K. D. Bantlett

Products manufactured: Boards, Programming, Controllers, Programmable, Controls/Control Eqpt., Process Control Systems, Programmers, Scanners, Timers

Local Sales Offices & Reps.

Ill Chicago, SEA Inc. 312-282-6694
Ind Carmel, Sea Inc. 317-846-2593
Minn Mpls., SEA Inc. 612-425-4455
Tex Dallas, Sys. Engrg. Sls. 214-231-9364
Tex Houston, System Engrg. 713-668-7840
Wisc Waukesha, SEA Inc. 414-547-6637

MATRIX ENGINEERING CORP., 17000 S. Western Ave., 19, Gardena, Cal., 90247, Tel: 213-770-0521; Empl.: 9; Minimum order: \$10

Customer service: G. Austin

Free literature available: MATRIX ENGINEERING CORPORATION presents work positioners and fixtures for: Assembly, Inspection, Testing, Servicing.

Products manufactured: Benches, Consoles, Stools, Tables, Holders, Circuit Board (Production Type), Jigs And Fixtures, Chassis & Circuit Board, Panels, Pullers, Racks, Services, Assembly, Production & Test, Soldering Accessories, Soldering Equipment, Tools

Local Sales Offices & Reps.

Ariz Phoenix, Davis Co. 602-955-2266
Cal Anaheim, Production Sys. Inc. 714-533-1120
Cal Ontario, West Coast Ents. 714-903-3914
Cal San Jose, Hefte Industries 408-264-8319
Colo Denver, Soldering Supply Specialists 303-455-1352
Ill Chicago, EMF Co. Inc. 312-889-8323
Mass Burlington, Contact East Inc. 617-272-5051
Ore Portland, Murphy Ind. Supply Co. 503-226-6081
Pa Feasterville, H. Mann Inc. 215-355-7200
Tex Dallas, Atlan Inds. 214-243-6216
Utah Salt Lake City, Technical Devices Co. 801-277-1029
FOR: Can., Burlington, Ont., Arbell Equipment Ltd. 416-632-9494

Local Distributors

Ala Huntsville, Mock Ents., 2310 Memorial Pkwy 205-539-2401
Cal Anaheim, Production Sys., 2021 Via Burton 213-533-1120
Cal Inglewood, N66 Inc., 3819 W. Imperial Hwy 213-671-5455
Ill Chicago, E.M.F. Co., 6135 W. Belmont 312-889-8323
Mass Burlington, Contact East, 7 Cypress Dr. 617-272-5051
Ore Portland, Murphy Indus. Supply, 3057 N.W. Yeon Ave. 503-226-6081
Pa Huntingdon Val., Henry Mann, Box 496, Mann Rd. 215-355-7200
Pa Plymouth Meeting, Techni-Tool, Apollo Rd. 215-825-4990

MATRIX SYSTEMS CORP., 9411 Lurline Ave., Chatsworth, Cal., 91311, Tel: 213-882-2008; Empl.: 10 p. 1•1800-1802

Customer service: J. Singleton

Products manufactured: Attenuators, Converters, Modules, Logic, Encapsulated, Relays, Scanners, Switches

Local Sales Offices & Reps.

Cal Los Angeles, Dynasales Co. 213-268-1175
Cal Mountain View, IFM, Inc. 415-961-2828
Conn Hamden, Instrument Consultants, Inc. 203-288-5246
Fla Satellite Beach, Reynolds & Assocs. 305-727-3205
Ga Atlanta, Reynolds & Assocs. 404-252-5360
Ill Chicago, Pivan Engrg., Inc. 312-539-4838
Ind Indianapolis, Pivan Engrg., Inc. 317-253-1681
Kans Shawnee Mission, Pivan Engrg. 913-722-1030
Mass Waban, Instrument Consultants, Inc. 617-969-9881
Mich Detroit, Comtel-Sterling Assocs. 313-255-1970
Minn Minneapolis, Pivan Engrg., Inc. 612-537-4501
Mo St. Louis, Pivan Engrg., Inc. 314-542-3636
NY Cortland, RJC Assocs. 607-753-3909
NY Scarsdale, Bassin Tech. Sls. Co. 914-723-3334
Ohio Cleveland, Comtel-Sterling Assocs. 216-442-8080
Ohio Dayton, Comtel-Sterling Assocs. 513-298-7573
Okla Tulsa, Carter Assocs. 918-749-3311
Pa Pittsburgh, Comtel-Sterling Assocs. 412-922-5720
Tex Garland, Carter Assocs. 214-276-7151
Tex Houston, Carter Assocs. 713-644-1307
Va Fairfax, Schibley Assocs. 703-591-3008
Wisc Brookfield, Pivan Engrg., Inc. 414-786-1940
Exp: NY, NY, May Lee Inds. 212-532-9200
FOR: Downsview, Ontario, Can., Can-Tech Elctns. Co. 416-661-9797

MATTHEWS & CO., JAS. H., Marking Systems Div., 6619 Penn. Ave., Pittsburgh, Pa., 15206, Tel: 412-362-6500, Telex: 86-6215; Empl.: 250; Minimum order: \$15

Customer service: J. R. Ash

Products manufactured: Kits, Marking (Dial, Instrument, Equipment, etc.), Machines/Machinery, Production, Nameplates, Wire Markers

Local Sales Offices & Reps.

Cal Bell Gardens, J.E. Hinshaw 213-927-3495
Cal San Francisco, T.E. Graves 415-474-8300
Ga Atlanta, C.W. Powell 404-233-8426
Ill Chicago, S.C. Gurner 312-263-6573
NJ Clifton, S. Zeeble 201-643-4377
NY Buffalo, J.V. Mason 716-856-7812
Ohio Cincinnati, H.C. Bathe 513-631-0133
Ohio Cleveland, G.H. Shumaker 216-696-6676
Pa Philadelphia, S. Zeeble 215-563-2243
Pa Pittsburgh, J.R. Ash 412-362-6500
Pa Pittsburgh, R.F. Abbs 412-362-6500
Tenn Memphis, J.J. Ford 901-525-0316
Tex Dallas, L.S. Maguire 214-742-1760
Wash Seattle, L.E. Kasper 206-624-0265
EXP: Pittsburgh, Pa., C.A. Prezikowski 412-362-6500

MAURATRON, INC., 2741 Satsuma, Dallas, Tex., 75229, Tel: 214-243-3329; Empl.: 7; Minimum order: \$10 p. 1•1312,1313

For info on price: A. Deasey; Application info: J. E. Sykes; Customer service: A. Deasey; Delivery info: C. Hunter

Products manufactured: Batteries, Blowers & Fans & Accessories, Chargers, Battery, Diodes, Power Supplies, Resistors, Retainers, Timers, Transistor, Diode, Thyristor Heat Dissipators, Tubing

Local Sales Offices & Reps.

Cal San Diego, Tauber & Assocs. 714-274-7242
Md Lutherville, Cunningham & Assoc. 301-296-4306
Mass Northboro, Henik Assocs. 617-891-5660
Tex Dallas, V.J. Sykes Assocs. 214-243-2221

Local Distributors

Cal W. Los Angeles, Mil-Comm Distributor, 1616 Cotner 213-478-0525

MAUREY INSTRUMENT CORP., 555 W. 60th St., Chicago, Ill., 60629, Tel: 312-581-4555; FSC No: 03942; Empl.: 75; Minimum order: \$25

For info on price: E. Maurey; Application info: E. Maurey; Customer service: T. Podge; Delivery info: T. Podge

Free literature available: Literature is available describing full lines of single turn and linear motion wirewound and conductive plastic potentiometers as well as wirewound trimmers.

Products manufactured: Potentiometers, Resistors, Slip-Rings & Assemblies, Switches

Local Sales Offices & Reps.

Ariz Tempe, Whitronics, Inc. 602-966-4417

Fla Shaw Engrg. & Sls. 305-752-7596
Ill Glenview, Crimson Engrg. Co. 312-724-1780
NM Albuquerque, A.L.S. Elctns. 505-294-8555
NY Jamestown, W.R. Arnold, Inc. 716-664-5402
Wisc Glenview, Crimson Engrg. Co. 312-724-1780

MAURY MICROWAVE CORP., 8610 Helms Ave., Cucamonga, Calif., 91730, Tel: 714-987-4715; FSC No: 13047; Empl.: 26; Minimum order: \$40

For info on price: S. Shirley Ext. 31; Application info: B. Wambach Ext. 26; Customer service: A. Lopez Ext. 20; Delivery info: A. Lopez Ext. 20

Free literature available: A short form catalog and one page product summary of Maury Microwave's product line of precision coaxial, waveguide and microwave instrumentation is available.

Products manufactured: Adapters, Waveguide, Antenna Feed Systems, Antennas, Attenuators, Bends & Twists, Microwave, Bolometers, Calibrators, Cavities, Microwave, Comparators, Connector Adapters, Connectors, Couplers, Delay Lines, Detectors, Dividers, Dummy Loads, Filters, Flanges, Waveguide, Holders, Crystal, Horns, Microwave, Insertion Loss Measurement Systems, Junctions, Hybrid, Microwave, Line Stretchers, Microwave, Meters, Mismatches, Microwave, Precision, Monitors, Mounts, Oscillators, Preselctors, Probes, Receivers, Services, Assembly, Production & Test, Shifters, Sliding Loads, Microwave, Slotted Lines, Microwave, Standards, Suppressors, Switches, Tees, Terminals, Tubing, Tuners, Waveguides & Adapters

Local Sales Offices & Reps.

Ariz Tempe, Jarko Assoc. 602-966-3020
Cal Cupertino, Dura Elctn. Sls. 408-255-2084
Colo Parker, TMA, Inc. 303-841-3435
Fla Satellite Beach, Reynolds Assoc. 305-773-4700
Ga Atlanta, Reynolds Assoc. 404-252-5360
Md Greenbelt, Riffe Assoc., Inc. 301-474-8600
Mass Lexington, Zieco, Inc. 617-861-8300
NJ Moorestown, Stern Assocs., Inc. 609-234-0661
NM Albuquerque, TMA, Inc. 505-298-4321
NY East Rockaway, Long Island, W. Bellenkes Assoc. Inc. 516-887-1443
Ohio Dayton, F. L. Ohmer & Assoc. 513-434-1454

MAXI-SWITCH CO., 9697 East River Road, Minneapolis, Minn., 55433, Tel: 612-755-7660; Empl.: 100 p.1-2262-2265

Products manufactured: Keyboards, Alphanumeric & Decimal, Relays, Switches

Local Sales Offices & Reps.

Ala Huntsville, Young & Lawrence 205-539-6575
Ariz Scottsdale, Williams Assocs. 602-947-4297
Cal Canoga Park, R. Kruse 213-341-3020
Colo Denver, Williams Assocs. 303-373-4730
Fla Ft. Lauderdale, Young & Lawrence 305-563-6717
Fla St. Petersburg, Young & Lawrence 813-894-0026
Fla Winter Park, Young & Lawrence 305-647-6929
Ill Crystal Lake, Mesa Inc. 312-639-3359
Md Towson, H. White Co. 609-667-3202
Mass Chelmsford, M. Flynn 617-256-6229
Mich Grand Rapids, R.P. Urban & Assocs. 616-245-0511

Minn St. Paul, Quantum Sls. 612-831-8583
NJ Cherry Hill, H. White Co. 609-428-4544
NJ East Orange, D. A. Rugg Co. 201-675-4822
NM Albuquerque, Williams Assocs. 505-255-1638
NY Penfield, J.E. Blair 716-586-1419
NC Raleigh, Candor 919-828-5716
Ohio Cincinnati, Tri-State Mktg 513-761-7993
SC Myrtle Beach, Candor Co. 803-448-5213
Tex Dallas, J. A. Green Co. 214-631-7450
Tex Houston, J. A. Green Co. 713-526-2959
Va Lynchburg, Candor 703-846-6579

MAXWELL LABS., INC., 9244 Balboa Ave., San Diego, Calif., 92123, Tel: 714-279-5100, TWX: 910-335-2063; Empl.: 300

For info on price: Sls. Dept.; Application info: Sls. Dept.; Customer service: V. Tallarida; Delivery info: V. Tallarida

Free literature available: Capacitors 303R/401R/760 (Haefely); Generators 513; Switches 807/808/812; Questionnaires: capacitors/switches/supplies/; Reprints; Magneform 1201R; Magneform machines 1202; Application 1501 & 1502A.

Products manufactured: Capacitors, Fixed, Diodes, Discharge Systems, Energy, Generators, Lasers & Laser Systems, Modulators, All Kinds, Networks, Power Supplies, Spark Gaps, Switches, Transformers

Local Sales Offices & Reps.

Cal Los Angeles, Halbar Assoc. 213-387-8283
Ill Chicago, Berndt Assoc. 312-283-0713

MBC ENGINEERING INC., 2501 Walsh Ave., Santa Clara, Cal., 95050, Tel: 408-244-9242; Empl.: 25; Minimum order: \$100

For info on price: D. Munson; Application info: D. Munson; Customer service: L. Romelfanger; Delivery info: L. Romelfanger

Free literature available: Brochure describing facility and equipment.

Products manufactured: Circuits, Printed, Multilayer

MCCOY ELECTRONICS, Sub Oak Inds. Inc., Chestnut & Watts, Mount Holly Springs, Pa., 17065, Tel: 717-486-3411, TWX: 510-650-3548; Empl.: 457

p.1-367-381

Products manufactured: Crystal Blanks, Crystals, Filters, Oscillators

Local Sales Offices & Reps.

Ariz Tempe, Argus Sls. 602-967-8709
Cal Inglewood, O. Foyer-McCoy Elctns. Co. 213-678-4108
Cal Los Altos, OAK Inds. Inc. 415-941-1237
Colo Denver, I.W. Strong & Assocs. 303-292-6900
Fla Altamonte Springs, Oak Inds., Inc. 305-735-4495
Ill Chicago, Brock & Cushman 312-622-4110
Ind Fort Wayne, Menze Sls. 219-747-5616
Iowa Cedar Rapids, Lorenz Sls. 319-393-9125
Md Silver Springs, Eastern Instrumentation 301-681-6500

Mass Norwood, JMG, Inc. 617-762-5333
Mich Jackson, Norwood Scroggs Co. 517-750-1170
Minn Edina, Wagner Conslts. Corp. 612-941-6310
Mo Kansas City, Automatic Gen. Elctn. Sls. 816-333-8206

NJ Clifton, Albert Clarfield 212-757-6454
NJ Haddonfield, Gray Assocs. 609-429-5300
NY Pompey, S.F. Foster Co. 315-677-3333
NY Webster, S.F. Foster Co. 716-872-5220
NC Raleigh, OAK Inds. Inc. 919-876-7591
Ohio Cincinnati, OAK Inds. Inc. 513-851-4411
Ore Salem, Pacnor Mktg., Inc. 503-636-6445
Tex Richardson, R.F. Kimball Co. 214-231-3447
Wash Seattle, Pacnor Mktg. 206-284-8020
EXP: Teaneck, N.J., Sylvan Ginsbury Ltd. 201-837-1100

MCFADDEN ELCTNS. CO., 8953 S. Atlantic Blvd., South Gate, Calif., 90281, Tel: 213-564-5958; FSC No: 25750; Empl.: 11

For info on price: B. W. McFadden; Application info: B. W. McFadden; Customer service: S. McFadden; Delivery info: B. W. McFadden

Free literature available: Cockpit Simulation Control Loaders and Instruments Catalog, Low Torque Dynamometers, DC Power Amplifiers, Motion Simulation Tables.

Products manufactured: Amplifiers, Controls/Control Eqpt., Servo Systems, Simulators, Testers

Local Sales Offices & Reps.

Ala Huntsville, Incotec 205-837-6061
Ind Indianapolis, Tri-State Tech. Sls. 317-924-3568
Mass Salem, Forbes Engrg. 617-744-1693
FOR: Can., Ville LaSalle, Que., Electrodesign Ltd. 514-363-5120

MCG ELECTRONICS INC., 279 Skidmore Rd., Deer Park, N.Y., 11729

Products manufactured: Arresters, Electrical Surge, Lightning, Protectors, Suppressors

Local Sales Offices & Reps.

Cal Los Angeles, Dyna Sls. 213-268-1175
Fla Maitland, Beacon 305-647-3498
Ga Atlanta, Beacon 404-351-3654
Mass Framingham, Victor Assoc. 617-879-5710
Mich Utica, N. Case Assoc. 313-731-6003
NJ Mt. Vernon, Sonkin Assocs. 914-668-9809
NY Conklin, Ramcom 716-632-6913
Pa Newtown Square, Holdsworth & Co. 717-632-6913
Va Falls Church, D. Snow-Beacon 703-534-1673
Wisc Germantown, Germantown 414-255-2120

MCGILL MFG. CO. INC., Electrical Div., 909 Lafayette St., Valparaiso, Ind., 46383, Tel: 219-464-4911, TWX: 910-690-4892; Empl.: 395

Customer service: P. Bain VP Sls. Ext. 376

Free literature available: Catalog #89 illustrates and describes McGill precision switches including snap action, (standard, miniature and sub-miniature), toggle, rocker, push button types and specials. 1 to 20 Amp.

Products manufactured: Switches

Local Sales Offices & Reps.

Ark Hot Springs, M. Young Assocs. 501-262-1365
Cal Los Angeles, Clemick-Neenan & Assocs. 213-476-1272
Cal San Francisco, Maddox Sls. Co. 415-431-2953
Fla Orlando, Geartner Assocs. 305-299-1000
Ill R. J. Eckert 312-297-3233
Ind Arcadia, D. Rickards 317-253-8689
Ind Dyer, A. Knezevich 312-297-3233
Mass Norwood, R. Perron & Co. 617-782-8114
Mich Benton Harbor, Ken-Mor Assocs. 616-927-3134
Minn Minneapolis, Elec. Comp. Sls. 612-933-2594
Mo St. Louis, Larco Sls., Inc. 314-863-1242
NJ Mount Laurel, Naudain Assocs. 609-235-1801
NY Baldwin, C. Glianna 516-378-2700
NY Pompey, S.F. Foster Co. 315-677-3333
Ohio Cleveland, G. Stofor & Bro. Co. 216-333-0733
Ohio Tipp City, W. Lenz 513-277-5509
SC Columbia, H. Heaton 803-779-4016
Tex Dallas, Raley Sls. Co. 214-368-1783
Tex Houston, Carey & Assocs. 713-460-1111
Wash Seattle, Stroheker, Inc. 206-623-0357

MCGRAW-EDISON CO., Edison Electronics Div., Grenier Field, Manchester, N.H., 03103, Tel: 603-669-0940, TWX: 710-220-1747; Empl.: 450 p.1-661

For info on price: W. Manson; Application info: D. Cox; Customer service: D. Cox; Delivery info: D. Cox

Products manufactured: Attenuators, Cable, Calibrators, CATV Systems & Equipment, Coils Including Assemblies & Forms, Connectors, Delay Lines, Detectors, Gages, Generators, Indicators, Meters, Monitors, Networks, Oscillators, Resistors, Switches, Telephone Channel Test & Simulator Equipment, Terminals, Testers, Transducers, Transformers, Transmitters

Local Sales Offices & Reps.

Ala Huntsville, P.J. Nahser 205-881-5590
Ariz Scottsdale, Williams Assocs. 602-947-4297
Cal Encino, Eltec Sys. 213-981-9881
Colo Denver, Williams Assocs. 303-343-2911
Conn Wallingford, Adams-McGregor, Inc. 203-269-5816
Fla Lighthouse Point, Saber Assocs. 305-943-3076
Fla Longwood, Saber Assocs. 305-422-3686
Fla St. Petersburg, Saber Assocs. 813-441-1301
Ga Kennesaw, P.J. Nahser 404-422-8053
Ga Woodstock, Saber 404-432-9625
Idaho Boise, Tarbell Comms. 208-343-0285
Ill Chicago, Midwest Elctns. Sls. 12-777-9700
Ind Indianapolis, Midwest Elctns. Sls. 312-926-3736

Iowa Cedar Rapids, S & O Sls. 319-393-1845
Kans Swanee Mission, Tech. Sls. Assocs. 913-888-3330

Md Silver Spring, Gawler Knoop Co. 301-598-4406
Mass Scituate, Adams-McGregor, Inc. 617-545-2213
Mich Ferndale, Tiby Co. 313-547-3550
Mo Ferguson, Tech. Sls. 314-725-5361
NJ Boonton, Eastern Metro Assocs. 201-335-7881
NM Albuquerque, Williams Assocs. 505-255-1638
NY Gunderland, Electro-Modular Sys. Inc. 518-456-2665

NY Plainview, Eastern Metro Assocs. 516-931-1414
NC Burlington, P. J. Nahser Co. Inc. 919-226-8053
NC Raleigh, Saber Assocs. 919-834-3961
Ohio Cleveland, Tiby Co. 216-371-5335
Ohio Dayton, Tiby Co. 513-277-3822
Ore Beaverton, Tarbell Comms. 503-643-1631
RI Lincoln, Adams-McGregor 401-726-1300
Tex Dallas, Diversity Comms. Co. 713-772-0730
Wash Bellevue, Tarbell Comms. 206-454-9716
Wisc Waukesha, Midwest elctns. Sls. 414-542-5129

MCKAY DYMEK CO., 675 N. Park Ave., Box 2100, Pomona, Cal., 91766, Tel: 800-854-7769, TWX: 800-472-7782; Empl.: 15; Minimum order: \$155

For info on price: L. Engard 714-623-1581; Application info: L. Engard 714-623-1581; Customer service: F. Coker 714-623-1581; Delivery info: L. Engard 714-623-1581

Free literature available: #1 - Sheet on Shielded Ferrite Rod Antenna for AM broadcast band 540 - 1600 khz. #2 - Sheet on Hi Fi AM Tuner as used in broadcast Stations all over the U.S.A.

Products manufactured: Antennas, Receivers

MCKEE-PEDERSEN INSTRS., P.O. Box 322, Danville, Calif., 94526, Tel: 415-937-3630; Empl.: 8

Customer service: R. G. McKee

Free literature available: An 8-page brochure describes all the MP-System electronic modules and housings. A 4-page brochure describes MPI graphic recorders. A 4-page brochure describes electro-optical instruments.

Products manufactured: Amplifiers, Bridges, Current Sources, Meters, Potentiometers, Power Supplies, Recorders, Voltage Sources

MCL, INC., 10 North Beach Ave., LaGrange, Ill., 60525, Tel: 312-354-4350, TWX: 910-683-1899; Empl.: 80
p. 1-910-915,917-925

Products manufactured: Amplifiers, Cavities, Microwave, Filters, Generators, Modulators, All Kinds, Multipliers, Oscillators, Preselctors, Transmitters

Local Sales Offices & Reps.

Cal	Cupertino, Allis Assocs.	408-379-2883
Cal	Orange, Pacific Microwave, Inc.	714-633-7991
Fla	Orlando, Gra-Mar, Inc.	305-894-3351
Haw	Honolulu, Aloha Assocs.	808-941-1574
Ill	Mt. Prospect, Cain & Co.	312-253-3578
Md	Baltimore, Stemler Assocs.	310-944-8262
Mass	Reading, Geder-Rotondi Assocs.	617-944-3105
NM	Albuquerque, J. Smith & Assocs.	505-255-2111
NY	Plainview, Eastern Metro Assocs.	516-931-1414
Ohio	Dayton, Cain & Co.	513-254-6521
Ohio	Reynoldsburg, Cain & Co.	614-861-2119
Tex	Dallas, Texas Avionics Co.	214-363-6324
Va	Alexandria, Stemler Assocs.	703-548-7818

MCLEAN ENGRG. LABS., 70 Washington Rd., Princeton Jctn., N.J., 08550, Tel: 609-799-0100; Empl.: 74; Minimum order: \$25
p. 1-499-503,975

For info on price: P. Blakely; Application info: P. M. Stewart; Customer service: P. Blakely; Delivery info: P. Blakely

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Blowers & Fans & Accessories, Controls/Control Eqpt., Gaskets, Shielding, R-F-Also See Shields, R-F, Grilles, Heat Exchangers & Systems, Honeycomb Sheets, Panels, etc., Motors, Shields

Local Sales Offices & Reps.

Ala	Huntsville, W. Brown	205-539-4411
Ariz	Phoenix, PLS Assocs.	602-957-9110
Cal	Cupertino, T. Snitzer	408-257-8333
Cal	Del Mar, T. Snitzer	714-454-2191
Cal	L.A., T. Snitzer	213-836-6170
Colo	Denver, PLS Assoc.	303-771-0140
Conn	Bridgeport, Technical Instrs.	203-FO 8-4582
Fla	Ft. Lauderdale, W. Brown	305-776-4800
Fla	Orlando, W. Brown	305-425-5505
Ga	Tucker, W. Brown	404-939-1674
Ill	Elmhurst, Scott Assocs.	312-279-5681
Kans	Kansas City, Harris-Hanson	816-HI 4-9494
La	Gretna, W.A. Brown Inst. Co.	504-366-5766
Mass	Wilmington, Tech. Instrs.	617-944-3930
Mich	St. Clair Shores, J. Thorpe	313-779-6363
Minn	Mpls., Scott Elctn.	612-929-2985
Mo	St. Louis, Harris-Hanson	314-432-3611
NJ	Ft. Lee, K. Hughes	201-944-1600
NM	Albuquerque, PLS Assocs.	505-255-2330
NY	Albany, J. Reagan	518-489-4777
NY	New Hartford, J. Reagan	315-732-3775
NY	Rochester, J. Reagan	716-473-2115
NC	Winston-Salem, W. Brown	919-768-3600
Ohio	Cleveland, Marlow Assocs.	216-932-0900
Tex	Dallas, J.A. Green Co.	214-ME 1-7450
Tex	Houston, J.A. Green Co.	713-JA 6-2959
Va	Alexandria, Dyna Rep. Co.	703-354-1222

FOR: Can., Montreal, Que., Brian Engrg. 514-735-1671
FOR: Can., Rexdale, Ont., Brian Engrg. 416-248-0226

MEASUREMENT SYS., INC., 523 West Ave., Norwalk, Conn., 06850, Tel: 203-838-5561; Empl.: 14

For info on price: F. J. Stevens; Application info: M. H. Mehr; Customer service: F. J. Stevens; Delivery info: F. J. Stevens

Free literature available: C-3 "Tracking control products for the Human Operator" 8 page condensed catalog providing brief description of over 40 products. G174 "Control Grips" 8 page brochure describing standard products and custom configurations providing an almost limitless number of control options.

Products manufactured: Bridges, Controls/Control Eqpt., Converters, Switches, Tracking Systems, Transducers

Local Sales Offices & Reps.

Cal	Encino, Kingway & Assocs.	213-788-4124
Cal	Fullerton, Kingway & Assocs.	213-788-4124
Iowa	Cedar Rapids, S & O Sls. Inc.	319-393-1845
Mass	Burlington, Tekdata Inc.	617-273-0198

Pa Melrose Park, R. Meyers Assocs.215-224-1663
Tex Richardson, P.J. Scanlon Co.214-231-4661

MECHANICAL ENGRAVING CO., INC., 10 Van Cortlandt Ave., E. Bronx, N.Y., 10468, Tel: 212-LU 4-8600; FSC No: 99040; Empl.: 35; Minimum order: \$15

For info on price: B.W. Mandel; Customer service: J.T. Mandel; Delivery info: J.T. Mandel

Products manufactured: Cams, Chassis, Metal, Dials, Indicators, Nameplates, Panels, Scales, Dial, Services, Assembly, Production & Test, Strips, Terminal Blocks, Boards & Strips

MECHANICAL ENTERPRISES, 601 Dale Dr., Silver Spring, Md., 20910, Tel: 703-321-8282, TWX: 710-832-0942

For info on price: R. H. Twyford; Application info: R. H. Twyford; Customer service: G. Russell; Delivery info: G. Russell

Free literature available: Keyboard designer's kit including data on all mercutron and gold v-bar switches, keytops, and keyboard accessories.

Products manufactured: Keyboards, Alphanumeric & Decimal, Switch Hardware, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Beacon Reps	205-861-5031
Ariz	Phoenix, KCE Corp.	602-955-5250
Cal	Burlingame, J. Logan & Assoc.	415-697-6100
Cal	Los Angeles, KCE Corp.	213-649-2622
Colo	Denver, Franklin Sls. Co.	303-922-3623
Fla	Palm Beach Gardens, Beacon Reps	305-622-2770

Ga	Atlanta, Beacon Reps	404-351-3654
Ill	Des Plaines, Coombs Assocs.	312-298-4830
Ind	Fort Wayne, Coombs Assocs.	219-747-0402
Md	Glen Arm, Hodgins Assocs.	301-592-7047
Mass	Lexington, Circuit Sls. Co.	617-861-0567
Mich	Jackson, Norwood Scroggs	517-750-1170
Mo	St. Louis, Beneke & McCaul, Inc.	314-567-3399
NY	Mt. Vernon, D. Sonkin Assocs.	914-668-9809
NY	Rochester, L. Hart	716-244-3253
Ohio	Dayton, Bear Mktg.	513-299-3566
SC	Spartanburg, Beacon Reps	803-582-4613
Tex	Dallas, I.B.L. Engrg. & Sls.	214-363-2921
Wisc	Greendale, Coombs Assoc.	414-421-2300

MECHANICAL ENTERPRISES, INC., 8000 Forbes Pl., Springfield, Va., 22151, Tel: 703-321-8282, TWX: 710-832-0942; Empl.: 25

For info on price: R. Twyford; Application info: R. Twyford; Customer service: G. Russell; Delivery info: G. Russell

Free literature available: Complete catalog & list containing specifications on 3 basic keyboard switches, including lighted and alternate action, 6 varieties of double-shot molded keytops & 44 small keyboard arrays.

Products manufactured: Keyboards, Alphanumeric & Decimal, Switches

MECHANICAL ENTERPRISES, INC., 8000 Forbes Pl., Springfield, Va., 22151, Tel: 703-321-8282, TWX: 710-832-0942; Empl.: 25

For info on price: R. Twyford; Application info: R. Twyford; Customer service: G. Russell; Delivery info: G. Russell

Free literature available: Complete catalog & list containing specifications on 3 basic keyboard switches, including lighted and alternate action, 6 varieties of double-shot molded keytops & 44 small keyboard arrays.

Products manufactured: Keyboards, Alphanumeric & Decimal, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Beacon Elctnrs	205-881-5031
Ariz	Phoenix, KCE Corp.	602-258-7519
Cal	Burlingame, J. Logan	415-697-6100
Cal	Los Angeles, KCE Corp.	213-649-2622
Cal	San Diego, KCE Corp.	714-278-7640
Colo	Denver, Franklin Sls.	303-922-3623
Fla	Ft. Lauderdale, Beacon Elctnrs	305-776-6074
Fla	Maitland, Beacon Elctnrs	305-647-3498
Ga	Atlanta, Beacon Elctnrs	404-351-3654
Ill	Chicago, Coombs Assoc. Inc.	312-298-4830
Ind	Fort Wayne, Coombs Assocs., Inc.	219-747-0402
Md	Glen Arm, Hodgins Assocs.	301-592-7047
Mass	Lexington, Circuit Sls. Co.	617-861-0567
Mich	Jackson, Norwood Scroggs & Co.	517-750-1170

Miss	Hernando, Beacon Elctnrs	601-368-9008
Mo	St. Louis, Beneke & McCaul	314-434-6242
NY	Mt. Vernon, D. Sonkin Assocs.	914-668-9809
NY	Rochester, Lloyd Hart	716-244-3253
NC	Greensboro, Beacon Elctnrs	919-674-9432
Ohio	Dayton, Neal Bear Corporation	513-299-3566
Ohio	Richfield, Neal Bear Corporation	216-659-3131
SC	Spartanburg, Beacon Elctnrs	803-576-4613
Tex	Dallas, IBL Engrg. & Sls.	214-363-2921
Wisc	Greendale, Coombs Assocs.	414-421-2300

MECHANICAL PROD., Div. Aiken Ind., 1824 River St., Jackson, Mich., 49204, Tel: 517-782-0391, TWX: 810-253-0827; Empl.: 200; Minimum order: \$50

Customer service: R. Reed

Products manufactured: Circuit Breakers

Local Sales Offices & Reps.

Cal	Panorama City, Mechanical Prods.	213-781-8966
-----	----------------------------------	--------------

MEGATEK CORP., 1055 Shafter St., San Diego, Cal., 92106, Tel: 714-224-2721; Empl.: 25; Minimum order: \$25

For info on price: C. Foley; Application info: W. Foley; Customer service: W. Foley; Delivery info: C. Foley

Free literature available: "7 Economical ways to solve your computer graphics problems." A collection of data sheets and application notes on inexpensive approaches to computer graphics.

Products manufactured: Display Devices/Displays

Local Sales Offices & Reps.

Ala	Birmingham, Technical Assocs.	205-854-0616
Ariz	Phoenix, Data Sys. Mktg.	602-277-4732
Cal	La Mesa, Data Sys. Mktg.	714-447-5411
Cal	Newport Beach, Data Sys. Mktg.	714-540-2312
Cal	Poway, Data Sys. Mktg.	714-466-2172
Cal	San Francisco, Data Sys. Mktg.	415-391-1111
Colo	Littleton, Data Sys. Mktg.	303-795-1960
Fla	Orlando, Technical Assocs.	305-894-7531
Haw	Honolulu, Aloha Assocs.	808-941-1574
Kans	Prairie Village, Engineering Svcs. Co.	913-649-4000

Mass	Cambridge, Techexpert	617-661-9424
Mich	Centerline, Dietrich & Assocs.	313-754-6450
Mo	St. Louis, Engineering Svcs.	314-997-1515
NJ	Tenafly, Budd-Tronics	201-569-2230
Ohio	Cleveland, Dietrich & Assocs.	216-781-1855
Ohio	Dayton, Dietrich & Assocs.	513-223-6042
Pa	Pittsburgh, Dietrich & Assocs.	412-892-2992
SC	Spartanburg, Technical Assocs.	803-579-2904
Utah	Bountiful, Data Sys. Mktg.	801-295-3457
Wash	Bellvue, Data Sys. Mktg.	206-455-2999

FOR: Can., Rexdale, Ont., Ahearn & Soper, Ltd. 416-247-7141

MEGAVOLT, INC., Sub. Julie Research Labs., 211 W. 61st St., New York, N.Y., 10023, Tel: 212-245-2727; Empl.: 8

Customer service: H. Tekel

Free literature available: Manufacture of high voltage power supplies, insulation testers, and dividers.

Products manufactured: Cable, Dividers, Drivers, Nut, Meters, Modulators, All Kinds, Power Supplies, Regulators, Relays, Spark Gaps, Standards, Switches, Testers, Transformers

Advertisement

Specialists in the design, manufacture and testing of High Voltage Power Supplies and insulation testers.

Custom units at standard prices are our specialty.

Voltage rating range from 1 KV to 1000 KV and powers up to 1 Megawatt. Our dividers have accuracies to 0.001% and are certified traceable to NBS.

Contact Harry Tekel for immediate quotations. 212-245-2727

MEGURO ELECTRONIC INSTR. CO., 5-1 2-Chome Chu-Cho Meguro-ku, Tokyo, Japan, Tel: Tokyo 715-1211, TWX: 2468208 MEGURO J; Empl.: 230

Products manufactured: Calibrators, Generators, Meters, Oscillators, Oscilloscopes

MEKO INSTRUMENT CO., 1311 Air Way, Glendale, Cal., 91201, Tel: 213-240-4664; Empl.: 10

Customer service: M. F. Gonsalves

Free literature available: Electrical and mechanical specification catalogue.

Products manufactured: Counters, Meters, Relays

Local Sales Offices & Reps.

Cal	Encino, Porter Co.	213-788-2350
Cal	Mountain View, Weseloh & Assoc.	415-961-0565
Cal	Palos Verdes Peninsula, R. Carretta Co.	213-375-6648
Colo	Denver, Parker-Webster Co.	303-770-1972
Fla	Orlando, Geartner Assocs.	813-393-2974
Ga	Marietta, K & E Assocs.	404-427-0241
Haw	Honolulu, Aloha Assocs.	808-941-1574
Md	New Carrollton, W. A. Brown	703-836-1800
Mass	Millis, Selmark Assoc. Inc.	617-376-2914
NJ	Fort Lee, B. Cameron Assocs.	201-461-2595
NY	Burnt Hills, K. D. Corsetti	518-399-9200
Ohio	Cleveland, E. E. Bock & Assocs.	216-331-5212
Ohio	Dayton, BEK Assocs.	513-278-1343
Tex	Garland, G. V. Peck Co.	214-341-8311
Tex	Houston, G. V. Peck Co.	713-664-1435
Va	Alexandria, W. A. Brown	703-836-1800

Wash Seattle, W. Spaulding Co.206-282-9173
 WVa Charleston, W. A. Brown304-342-2700
 FOR: Can., H8R 3H9, Quebec, Electrodesign Ltd.
 514-363-5120

MELCOR/MATERIALS ELCTRN. PRODS., 990 Spruce St.,
 Trenton, N.J., 08638, Tel: 609-393-4178, Telex: 84-3314;
 FSC No: 32333; Empl: 36; Minimum order: \$25
 Customer service: M. A. Levine

Free literature available: 1. General catalog
 containing specifications, ratings and prices of all
 standard single stage heat pumps 2. Folder
 containing specifications and ratings of frigichip
 miniaturized heat pumps.

Products manufactured: Cooling/Heating Modules,
 Thermoelectric

Local Sales Offices & Reps.
 Ill Skokie, Spartan Engrg. Co.312-674-2950

Advertisement

Creators of the Solderable Ceramic
 Thermoelectric Cooling Module and
 the "Frigichip" Miniaturized Module.
 Applications in Electro-optical Systems
 (Infrared Detectors, Photomultiplier
 Tube Housings), Medical and
 Biomedical Apparatus and Instru-
 ments, Institutional Refrigeration,
 etc. Highest reliability and efficiency.
 Modules and Assemblies supplied in
 OEM quantities and prices.

MELLOY LABORATORIES INC., Instrus. & Sys. Div., 6715
 Electronic Dr., Springfield, Va., 22151, Tel:
 703-354-2600, Telex: 899-440; Empl: 475; Minimum
 order: \$10

Customer service: Mktg. Ext. 311-313

Products manufactured: Alarms, Analyzers,
 Calibrators, Controls/Control Eqpt., Converters,
 Counters, Generators, Multipliers, Oscillators,
 Sensors, Light, Standards, Timers, Tuning Forks

Local Sales Offices & Reps.
 Cal Los Altos, Collins & Hyde415-941-3355
 Mass Hingham, Meloy Labs Inc.617-749-4842
 Mo Kansas City, Nevco, Inc.816-421-1751
 NC Wake Forest, Meloy Labs919-556-1345

MELTRONICS INC., Route #3 Box 225, Leeds, Ala.,
 35094, Tel: 205-699-2186; Empl: 20

Customer service: J. Miele

Products manufactured: Actuators, Antenna
 Rotators, Brakes, Clutches, Controls/Control
 Eqpt., Gears & Gear Mechanisms (Precision),
 Motors, Reducers, Solenoids

MEMCOR DIV. E-SYSTEMS, See E-Systems, Memcor
 Div.

MEMODYNE CORP., 369 Elliot St., Newton Upper Falls,
 Ma., 02164, Tel: 617-527-6600, Telex: 922537; Empl: 14;
 Minimum order: \$25

For info on price: K. Corbett; Application info: J.
 Pastoriza; Customer service: M. Furey; Delivery info:
 K. Corbett

Free literature available: Incremental Recorder
 Handbook; Data Sheets on all products; Short
 Form Catalog.

Products manufactured: Data Loggers, Recorders,
 Terminal Equipment, Digital

Local Sales Offices & Reps.
 Ala Huntsville, Currie, Peak & Frazier205-536-5650
 Ariz Glendale, ED Assocs.602-247-5818
 Cal Los Altos, H-R Assocs.415-941-4080
 Cal Los Angeles, Cain Technology213-476-2251
 Colo Westminster, Harvey Data Sys303-427-5299
 Fla Orlando, Currie, Peak & Frazier305-855-0843
 Haw Honolulu, Hawaii Data Sys808-946-1533
 Ill Chicago, Elctrn. Instr. Assoc.312-271-3774
 Ind Indianapolis, Elctrn. Instr. Assoc.317-257-7231
 Mass Holbrook, McLellan Assocs.617-767-4771
 Mich Detroit, Electro Sls. Assocs.313-526-8900
 NJ Wayne, G. & A. Sls.201-256-8500
 NM Albuquerque, J. & D Assocs.505-255-2377
 NY Binghamton, Labtronics607-748-0509
 NY Depew, Labtronics716-685-4111
 NY Syracuse, Labtronics315-454-9314
 NY Ulster Park, Labtronics914-471-2806
 NC Greensboro, Currie, Peak & Frazier919-273-3040
 Ohio Cleveland, Electro Sls. Assoc.216-261-5440

Ohio Dayton, Electro Sls. Assoc.513-426-5551
 Pa Ambler, Wyncote Instrumentation215-643-2440
 Pa Pittsburgh, Electro Sls. Assoc.412-371-9449
 Tex Dallas, Bouco Sls. Assocs.214-247-6708
 Tex Houston, Bouco Sls. Assocs.713-661-9640
 Va Arlington, H. J. Heffernan Co.703-522-6666
 Wash Seattle, Datacom Assocs.206-285-2525
 EXP: Can., Laval, Que., Harvard Elctrn. Sls. Co.
 514-681-1400

MEMOREX CORP., San Thomas at Central Expwy., Santa
 Clara, Cal., 95052, Tel: 408-987-1000; Empl: 5300
 Customer service: J. Pingree 408-987-3578

Free literature available: Brochures on: Computer
 peripheral equipment and media, audio/video
 tape for consumer & professional use, and word
 processing supplies.

Products manufactured: Comm. Systems, Disc
 Packs, Magnetic, Tapes, Recording, Magnetic (All
 Types)

Local Sales Offices & Reps.
 Ala Birmingham205-870-4240
 Cal Los Angeles213-380-4790
 Colo Denver303-399-1943
 Conn Hartford203-568-1370
 Ga Atlanta404-321-0200
 Ill Oak Brook312-325-8420
 Mass Waltham617-890-0700
 Mich Southfield313-354-0240
 Minn Minneapolis612-835-6635
 Mo St. Louis314-725-9687
 NY Buffalo716-631-5410
 NY Long Island212-541-7780
 Ohio Cincinnati513-721-7120
 Ore Portland503-228-9341
 Pa Bala Cynwyd215-835-2190
 Tex Dallas214-233-1031
 Va Richmond804-288-3116
 Wash McLean703-821-3300

MEPCO/ELECTRA, SUBSTRATE DIV., 10439 Roselle St.,
 San Diego, Cal., 92121, Tel: 714-453-4733, TWX:
 910-322-1134; Empl: 50

Products manufactured: Substrates

Local Sales Offices & Reps.
 Ala Huntsville205-534-7351
 Cal Los Angeles, N.A.P. Elctrn. Comps.213-762-2118
 Cal North Hollywood213-762-2118
 Cal San Diego714-453-9250
 Cal Santa Clara, N.A.P. Elctrn. Comps.408-249-1134
 Colo Denver303-922-8434
 Conn Shelton, Comark Assocs.203-929-4884
 Fla Fort Lauderdale305-772-2840
 Fla Winter Park305-678-2522
 Ill Elk Grove Village312-593-8220
 Ind Indianapolis317-257-6547
 Kans Olatha, BC Elctrn.913-782-6696
 Mass Waltham617-899-7100
 Mich Southfield313-357-4288
 Minn Minneapolis, Siedera Assoc., Inc.612-533-2294
 Mo Hazelwood, BC Elctrn.314-731-1255
 NJ Montvale201-391-3511
 NY Endicott, Tech-Mark, Inc.607-748-7473
 NY Fairport, Tech-Mark, Inc.716-223-1252
 NY Hempstead, Kahgan Sls. Corp.516-538-2300
 NY Hicksville516-931-6200
 NY Liverpool, Tech-Mark, Inc.315-652-6229
 NC Raleigh, Candor Co., Inc.919-787-2652
 Pa King of Prussia215-265-4240
 SC Myrtle Beach, Candor Co., Inc.803-448-5213
 Tex Dallas, N.A.P. Elctrn. Comps.214-691-2141
 Va Richmond703-282-6515
 Wash Bellevue, Western Tech. Sls.206-454-3906

MEPCO/ELECTRA, INC., Columbia Rd., Morristown, N.J.,
 07960, Tel: 201-539-2000, TWX: 710-986-7473

Free literature available: MEPCO/ELECTRA
 PRODUCT GUIDE - illustrates and briefly
 describes our entire product line which includes:
 capacitors, electrolytic; film; ceramic and
 trimmers. Fixed Resistors, carbon film; metal film.
 Variable Resistors, cermet; carbon; wirewound.

Products manufactured: Capacitors, Fixed,
 Capacitors, Variable, Circuits, Hybrid, Thick Film,
 Cores, Ceramic, Networks, Potentiometers,
 Resistors, Substrates, Thermistors

Local Sales Offices & Reps.
 Ala Huntsville, North American Philips Elctrn. Comp.
 Corp.205-534-7351
 Ariz Phoenix, N.A.P.E.C.C.602-279-9588
 Cal North Hollywood, N.A.P.E.C.C.213-762-2118
 Cal San Diego, N.A.P.E.C.C.714-453-5440

Cal Santa Clara, N.A.P.E.C.C.408-249-1134
 Colo Denver, N.A.P.E.C.C.303-922-8434
 Conn Shelton, Comark Assocs.203-929-4884
 Fla Fort Lauderdale, N.A.P.E.C.C.305-772-2840
 Ill Elk Grove Village, N.A.P.E.C.C.312-593-8220
 Ind Indianapolis, N.A.P.E.C.C.317-257-6547
 Kans Olatha, BC Elctrn. Sls.913-782-6696
 Mass Waltham, N.A.P.E.C.C.617-899-7100
 Mich Southfield, N.A.P.E.C.C.313-357-4288
 Minn Minneapolis, Siedera Assocs.612-533-2294
 Mo Hazelwood, BC Elctrn. Sls.314-731-1255
 NY Endicott, Tech-Mark, Inc.607-748-7473
 NY Fairport, Tech-Mark, Inc.716-223-1252
 NY Hicksville, N.A.P.E.C.C.516-931-6200
 NY Liverpool, Tech-Mark, Inc.315-652-6229
 NC Raleigh, Candor Co.919-787-2652
 Ohio Dayton, N.A.P.E.C.C.513-278-7351
 Pa King of Prussia, N.A.P.E.C.C.215-265-4240
 SC Myrtle Beach, Candor Co.803-448-5213
 Tenn Chattanooga, Candor Co.615-894-7454
 Tex Dallas, N.A.P.E.C.C.214-691-2141
 Va Lynchburg, Candor Co.804-846-6579
 Va Richmond, N.A.P.E.C.C.804-282-6515
 Wash Bellevue, N.A.P.E.C.C.206-746-3600

MERCER CONTROLS CORP., 96 Mercer St., New York,
 N.Y., 10012, Tel: 212-966-5815, Telex: 14-1484; Empl:
 15; Minimum order: \$20

For info on price: D. Shaw; Application info: D. Shaw;
 Customer service: B. Kulack; Delivery info: Stock

Free literature available: Variable speed controls for
 permanent split capacitor, single phase AC
 induction motors to 1/4 HP. Speed range 20:1.
 Regulation - 1% load, 1% line.

Products manufactured: Controls/Control Eqpt.

Local Sales Offices & Reps.
 Conn Torrington, Motoreps of New England203-482-3193
 Ill River Forest, Allen/Sizer Assoc.312-366-3324
 Mich Detroit, C.H. Alexander Assocs.313-535-4714
 Minn Minnetonka, T. H. Ayres Assoc. Inc.612-474-4125

Miss St. Louis, Delltron Co.314-434-3804
 NJ Red Bank, Motoreps of New York201-741-3356
 NY New York, Mercer Controls122-966-5815
 Ohio Dayton, Electrical Syst. Co.513-434-9822
 Tex Houston, Southland Engrg. & Sls.713-782-4575
 Va Bellevue, Pacific Consultants206-454-2503
 Wisc Wauwatosa, Larson Assocs.414-258-0529

MERCURY ELECTRONICS CORP., 339 E Cottage Place,
 York, Pa., 17403, Tel: 717-854-9557; Empl: 35

Customer service: C. R. Bruns 717-854-9557

Free literature available: Brochure

Products manufactured: Cable Assemblies &
 Harnesses

Local Sales Offices & Reps.
 Pa West Chester, S. E. Balint

MERET INC., 1815 24th St., Santa Monica, Cal., 90404, Tel:
 213-828-7496, Telex: 65-2468; Empl: 12; Minimum
 order: \$50

For info on price: M. B. Prince; Application info: D. B.
 Medued; Customer service: M. B. Prince; Delivery
 info: M. B. Prince

Free literature available: Hybrid Optoelectronic
 Modules - includes light sources with driving
 circuitry, deflector packages with amplifiers, and
 total systems including fiber optic cables.

Products manufactured: Amplifiers, Circuits, Hybrid,
 Thin-Film, Comm. Systems, Detectors, Diodes,
 Lasers & Laser Systems, Sensors, Light,
 Transceivers, Transmission Systems, Data

MERIAM INC., Box 2134, Hammond, Ind., 46323, Tel:
 219-980-1909, Telex: 72-5449; Empl: 4; Minimum
 order: \$100

For info on price: A. Jones 219-980-1909; Application
 info: E. Cronch 219-980-1909; Customer service: Miss
 Marlini; Delivery info: Miss Marlini 219-980-3566

Products manufactured: Punched Card Equipment

MERIX CHEM. CO., 2234 East 75th St., Chicago, Ill., 60649,
 Tel: 312-221-8242; Empl: 15; Minimum order: \$25

For info on price: J. Parus; Application info: E. O.
 Sonneman; Customer service: R. Newman; Delivery
 info: R. Newman

Products manufactured: Cleaners & Solvents,
 Coatings, Conductive Plastic Materials, Fabrics,
 Conductive, Lubricants, Phonographs, Parts &
 Accessories, Plastic Raw Materials, Liquids,
 Pellets, Powders, Resins

MERRIMAC INDS., INC., 41 Fairfield Pl., West Caldwell, N.J., 07006, Tel: 201-228-3890, TWX: 710-734-4314; Empl.: 110

Customer service: F. J. Weber

Products manufactured: Attenuators, Circulators, Ferrites, Comparators, Couplers, Dividers, Isolators, Junctions, Hybrid, Microwave, Limiters, Mismatches, Microwave, Precision, Mixer-Preamplifiers, Microwave, Mixers, Modulators, All Kinds, Networks, Shifters, Strip-Line Components, Microwave, Terminals

Local Sales Offices & Reps.

Ala Huntsville, Beacon Elctns. 205-881-5031
Cal Orange, J.E. Hachten Co. 714-998-6020
Cal Palo Alto, J.E. Hachten Co. 415-326-1252
Colo Boulder, Herb Bass Assoc. 303-499-7509
Va Alexandria, Vanguard Engrg. 703-768-1860
Wash Seattle, Jon B. Jolly 206-938-4166

MERRIMACK MAGNETICS, 361 Aiken St., Lowell, Mass., 01850, Tel: 617-458-1487; Empl.: 200

Customer service: R. Ross

Products manufactured: Transformers

Local Sales Offices & Reps.

Ariz Phoenix, J.S. Heaton Co. 602-264-7887
Cal Menlo Pk., J.S. Heaton Co., Inc. 415-369-4671
Conn Nor. Haven, Comp. Rep. 203-239-9762
FOR: Can., Cooksville, Ont., Anbak Sls., Ltd. 416-625-1061

MET-L-WOOD CORP., 6755 65th St., Chicago, Ill., 60638, Tel: 312-585-7575, Telex: 25-6106; Empl.: 110

For info on price: C. B. Correnti; Application info: C. B. Correnti; Customer service: V. Lutze; Delivery info: V. Lutze

Free literature available: General Brochure - general product info; Bulletin 661 - Cabinetry panels.

Products manufactured: Cabinets & Accessories, Honeycomb Sheets, Panels, etc., Laminates

Local Sales Offices & Reps.

Cal San Jose, H.J. Carlson 408-226-9049
Fla Largo, Dow Assocs. 813-595-9195
Ill Chicago, R.R. Clemens 312-585-7575
Ill Chicago, T.J. Neirinxck 312-585-7575
NJ No. Haledon, J.P. Gagliano 201-427-5133
Ohio Columbus, G.V. Pagorek 614-891-6856
Pa Media, V.J. Higgins 215-566-9188

METAL BELLOWS CORP., 1075 Providence Hwy., Sharon, Mass., 02067, Tel: 617-668-3050; Empl.: 300

For info on price: S. Jackson; Application info: S. Jackson; Customer service: E. Mendeloff; Delivery info: S. Jackson

Products manufactured: Actuators, Braid, Cable, Couplings, Feedthrus & Seals, Environmental, Pumps, Vacuum, Seals, Shields

Local Sales Offices & Reps.

Cal Chatsworth, Metal Bellows Co. 213-341-4900
Mo Hazelwood, Strother & Assoc. 314-521-5100
NJ Col't's Neck, J. L. Reddan 201-462-4824
Ohio Port Clinton, W. C. Johnson 419-625-0943
Tex Duncanville, J. Stephens 214-298-6994
FOR: Can., Burnaby, B.C., Philip French Sls. 604-437-0312

FOR: Can., Mississauga, Ont., Philip French Sls. 416-678-9261

FOR: Can., Dorval 760, Que., Philip French Sls. Ltd. 514-636-1484

METALIZED CERAMICS, Huntington Industrial Pk., Providence, R.I., 02907, Tel: 401-943-2200; Empl.: 600

For info on price: J. T. Feeley; Application info: F. C. Rydwanaky, Jr.; Customer service: R. Halpert; Delivery info: J. T. Feeley

Free literature available: Tech Data Sheets - Packages; Tech Data Sheets - Microwave & Opto Diode Housings; Design Guidelines - Multilayer Ceramics; Design Guidelines - Screened Dielectrics; Hybrid Package Design & Applications.

Products manufactured: Packages, Integrated Circuit, Services, Assembly, Production & Test, Substrates

Local Sales Offices & Reps.

Cal Cupertino, Metalized Ceramics Corp. 408-996-1350
Tex Richardson, Metalized Ceramics Corp. 214-238-0505

METALPHOTO CORP., 18531 South Miles Rd., Cleveland, Ohio, 44128, Tel: 216-475-0555; Empl.: 50

Customer service: M. Hizak

Free literature available: Metalphoto&R products, processes and applications.

Products manufactured: Labels, Pressure-Sensitive, Adhesive, Machines/Machinery, Production, Nameplates

METAVAC, INC., 45-68 162nd St., Flushing, N.Y., 11358, Tel: 212-HIS-0400; Empl.: 40; Minimum order: \$100

Customer service: S.D. Feiman

Free literature available: O-1 list capabilities to supply thin film coatings and components for optical applications. E-1 catalog list resistors, attenuators and conductive coatings.

Products manufactured: Attenuators, Coatings, Films, Filters, Lenses, Optical & Camera, Lenses, Readout & Display, Resistors, Services, Assembly, Production & Test, Strip-Line Components, Microwave, Terminals

METEX CORP., 970 New Durham Rd., Edison, N.J., 08817, Tel: 201-287-0800, TWX: 710-998-0578; Empl.: 240

Products manufactured: Adhesives (All Types), Air Cleaners & Filters (Shielded & Unshielded), Bezels, Shielded & Unshielded, Braid, Cable, Coatings, Conductive Plastic Materials, Contact Strips, Finger, Contacts, Electrical, Gaskets, Shielding, R-F-Also See Shields, R-F, Honeycomb Sheets, Panels, etc., Kits, Shielding, Rubber, Shields, Wire, Wire Shielding

Local Sales Offices & Reps.

Ariz Scottsdale, Inter-Mountain Engr. 602-947-7379
Cal Los Altos, Frauman Assocs. 415-941-0660
Cal Los Angeles, Universal Comps. 213-641-4225
Colo Denver, Walter Engrg. 303-777-5585
Conn Connors & Mann 617-769-2570
Fla Semtronic Assoc. Inc. 305-831-8233
Ga Smyrna, B.C. Elctn. Sls. Co. 404-436-5169
Ill Chicago, R.M. Krueger Co. 312-282-8444
Mass Westwood, Connors & Mann 617-769-2570
Minn St. Paul, R.G. Ragon, Inc. 612-488-0201
Mo St. Charles, Cairns & Hayes Elctn. Sls. 314-946-6677
NY Great Neck, Trionic Assocs. 212-762-4320
NY Syracuse, C.W. Floring & Assocs. 315-478-2149
Ohio Dayton, Jay Engrg. Co. 513-253-2151
Pa Media, Snyder & Massey Assocs. 215-566-5400
Tex Richardson, P.J. Scanlon Co. 214-231-4661
Va Fairfax, Snyder & Massey Assocs. 703-273-1413
Wash Seattle, Jon B. Jolly, Inc. 206-938-4166

METHODE ELCTRNS., INC., 7447 W. Wilson Ave., Chicago, Ill., 60656, Tel: 312-867-9600, TWX: 910-221-2468; Empl.: 900

For info on price: D. Mason; Application info: J. Klimek; Customer service: I. Lubor; Delivery info: I. Lubor

Products manufactured: Backpanel Interconnect Systems, Bars, Shorting, Boards, Plug-In, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Bus Bars & Systems, Cable Assemblies & Harnesses, Cable, Chemicals, Circuits, Flexible, Circuits, Printed, Multilayer, Connector Blocks, Mother Board, Connectors, Contact Strips, Finger, Contacts, Electrical, Guides, Circuit Board, Headers, Inks For Thick Film Microcircuits, Jack Adapters (All Types), Jacks (All Types), Panels, Plugs, Services, Assembly, Production & Test, Shields, Socket Adapters, Sockets, Switches, Terminal Blocks, Boards & Strips, Terminals

Local Sales Offices & Reps.

Ariz Scottsdale, F. Board Assocs. 602-994-9388
Cal Burlingame, W. J. Purdy Co. 415-347-7701
Cal El Segundo, Varigon Assocs. 313-679-0621
Fla Winter Pk., Young & Lawrence 305-647-6929
Ill Chicago, J. Howe 312-867-9600
Ind Indianapolis, Schroeder & Loomis 317-251-4571
Ky Fort Mitchell, G. W. Thelen Co. 606-341-8181
Mass Needham, Massa & Maguire 617-329-0354
Mich Dearborn, VPI 313-271-4600
Minn St. Paul, R. G. Ragon 612-488-0201
Mo Hazelwood, Dy-Tronix 314-731-5799
NJ Haddonfield, T. A. I. 609-854-3011
NJ Mountain Lakes, Components for Elctns. 201-334-2921
NY Pompey, S. F. Foster Co. 315-677-3333
SC Myrtle Beach, Candor Co. 803-448-5213
Tex Dallas, McKinney Sls. Co. 214-631-9450
Wash Bellevue, Ray Over Sls. Co. 206-454-9187

METHODS RESEARCH CORP., 34 Asbury Ave., Farmingdale, N.J., 07727

METRA INSTRUMENTS, INC., 1161 San Antonio Rd., Mt. View, Cal., 94043, Tel: 415-961-7249; Empl.: 22

For info on price: F. Fitting; Application info: F. Fitting; Customer service: D. Marquez; Delivery info: P. Andrews

Products manufactured: Alarms, Annunciators, Data Acquisition & Reduction Systems, Display Devices/Displays, Monitors, Multiplexers, Printers, Scanners

Local Sales Offices & Reps.

Cal San Francisco, Technical Sls. Dev. 415-346-1655
Cal Sante Fe Springs, D.A. Matthews/Assocs. 213-693-5432
Fla Port St. Lucie, Tech. Svcs. Assocs. 305-334-5266
Ill Chicago, Liz Indl. Sls. Co. 312-943-5122
Md Fulton, Gans-Fryling 301-837-6311
Mass Newton Centre, Daner-Hayes 716-969-4650
Mass Peabody, JSR Assocs. 617-532-0348
Mich Detroit, Electro Sls. Assocs. 313-528-8800
NJ S. Orange, Daner-Hayes 201-783-1771
NY Port Washington, Daner-Hayes 516-883-4576
NY Rochester, Daner-Hayes 716-467-5100
NC Matthews, W.K. Hile Co. 704-847-9125
Ohio Cincinnati, A. Parker, Jr. 513-563-1843
Ohio Cleveland, Electro Sls. Assocs. 216-261-5440
Okla Tulsa, Pan Tech. Engrg. Co. 918-747-2494
Ore Portland, Brett Assocs. 503-232-4184
Pa Audubon, Daner-Hayes 215-666-5755
Pa Pittsburgh, Electro Sls. Assocs. 412-371-9449
Tenn Knoxville, W.K. Hile 615-690-1061
Tex Arlington, Pan Tech Engrg. 817-261-4111
Tex Houston, Pan Tech Engrg. 713-623-0640
Va Arlington, Gans-Fryling 703-527-3262
Wash Seattle, Brett Assocs. 206-935-8054
FOR: Can., Calgary, Alberta, Cantech Controls, Ltd. 403-252-8151
FOR: Can., Edmonton, Alberta, Cantech Controls, Ltd. 403-252-9810
FOR: Can., Halifax, Nova Scotia, Cantech Controls, Ltd. 902-429-9103
FOR: Can., St. Laurent, Que., Cantech Controls, Ltd. 514-636-8364
FOR: Can., Vancouver, B. C., Cantech Controls, Ltd. 604-736-2851
FOR: Can., Scarborough, Ont., Cantech Controls, Ltd. 416-438-6907

METRIC ENGRG., Div. Oven Ind's., Box 290, Mechanicsburg, Pa., 17055, Tel: 717-766-0741; Empl.: 30; Minimum order: \$20

For info on price: T. M. Nolan; Application info: R. E. Eckert; Customer service: T. M. Nolan; Delivery info: T. M. Nolan

Products manufactured: Regulators

Local Sales Offices & Reps.

Ala Huntsville, Reynolds & Assocs. 205-536-1941
Ariz Scottsdale, S.C. Blaker Co. 602-948-3061
Cal Encino, El-Tec, Inc. 213-981-9881
Cal San Carlos, Westronics Assoc. 415-592-1417
Fla Melbourne, Reynolds & Assocs. 305-727-3205
Ga Atlanta, Reynolds & Assocs. 404-252-5360
Ill Skokie, Saffro & Assocs. 312-588-0905
La Baton Rouge, Covington Instr. Co. 504-924-1784
Mass Reading, Geder & Rotundi 617-944-3105
Minn Minneapolis, C. E. Bohlig Co. 612-922-7011
Mo St. Peters, K.M. & B. Tech. Sls. 314-278-3159
NY Huntington, Andrews & Andrews, Inc. 516-692-8686
NY Syracuse, Mike Antil 315-463-0266
NC Greensboro, Reynolds & Assocs. 919-275-3725
Ohio Medina, McShane 216-725-4568
Pa Ambler, W&M Assocs. 215-643-4119
Tex Dallas, Bouco Sales Assocs. 214-247-6708
Va Falls Church, Beacon Elctn. Assoc. 703-534-1673
EXP: Lemoyne, Pa., Elctn. International 717-737-8858
FOR: Can., Ajax, Ont., R. D. Assocs. 416-294-6796

METRIC SYSTEMS CORP., 736 N. Beal St., Ft. Walton Beach, Fla., 32548, Tel: 904-242-2111; Empl.: 135; Minimum order: \$50

For info on price: Mktg. Dept.; Application info: Mr. Henne; Customer service: D. Evans

Products manufactured: Analyzers, Annunciators, Antenna Towers & Supports, Boards, Printed Circuit, Calibrators, Cards, Linear Function, Cards, Logic, Comm. Systems, Computers, Converters, Data Acquisition & Reduction Systems, Flashers, Generators, Indicators, Monitors, Receivers, Recorders, Simulators, Tape Search Equipment, Terminal Equipment, Digital, Timers, Tracking Systems, Translators, Data

Local Sales Offices & Reps.

Fla Orlando, Datarep Inc. 305-843-5224

METRIX INSTRUMENT CO., Box 36501, Houston, Tex., 77036, Tel: 713-668-2386; Empl.: 26

Customer service: H. W. Kinne

Free literature available: 1975 Vibration Catalog - Vibration Inst'n. Bulletin DW-103 - DATAWATCH® Alarm Monitors and Signal Transmitters.

Products manufactured: Accelerometers, Alarms, Amplifiers, Analyzers, Converters, Indicators, Meters, Monitors, Switches, Testers, Transducers

Local Sales Offices & Reps.

Ala Birmingham, Lewis M. Crowe Co. 205-629-5475

Ariz Phoenix, Roy E. Coulson Co. 602-947-8331

Cal Encino, Arens Inds. 212-986-5560

Cal San Francisco, Technical Sls. Div. 415-346-1655

Conn Newton, Daner-Hayes 203-426-9094

DC Washington, Wright Co. 202-296-0979

Fla St. Petersburg, Lewis M. Crowe Co. 813-894-0249

Ill Chicago, Martec Assocs. 312-956-8090

La Baton Rouge, Carter Elctns. 504-272-3175

Md Gaithersburg, Wright Co. 202-296-0979

Mass Newton Centre, Daner-Hayes 617-969-4650

Mich Detroit, Basic Service Corp. 313-837-8820

NJ Englewood, Tridon Sls. Co. 201-569-8011

NY NYC, Tridon Sls Co. 201-569-8011

Ohio Englewood, Gemini, Inc. 513-890-5394

Ohio N. Canton, M. S. Jacobs 216-494-5480

Okla Tulsa, Quigg Equip. 918-587-0166

Pa Philadelphia, Control Equip. 215-676-1460

Pa Pittsburgh, M.S. Jacobs & Assoc. 412-923-2090

Tenn Knoxville, Lewis M. Crowe Co. 615-693-4226

Tex Lubbock, Killian Inds. 806-792-8768

WVa Charleston, M. S. Jacobs & Assoc. 304-343-8906

METROLOGIC INSTRUMENTS, INC., 143 Harding Ave., Bellmawr, N.J., 08030, Tel: 609-933-0100; Empl.: 51

For info on price: S. Decicco; Application info: G. Punis; Delivery info: S. Decicco

Free literature available: Catalog describes the company's line of HE-NE lasers, education laboratories, holography systems, optical benches and accessories.

Products manufactured: Lasers & Laser Systems, Meters, Monitors, Power Supplies, Radiometers, Substrates, Tubes

METROPOLITAN CIRCUITS INC., 1261 Logan, Costa Mesa, Cal, 92626, Tel: 714-549-2204; Empl.: 400

Customer service: R. Florez

Products manufactured: Boards, Printed Circuit, Circuits, Printed, Multilayer

METROPOLITAN WIRE CORP., Industrial Div., Washington & George, Wilkes-Barre, Pa., 18705, Tel: 717-825-2741

Customer service: Cust. Svc.

Free literature available: 1M175 Applications brochure - Super Erecta shelf mobile & stationary materials handling equipment PCB-773 Data Sheet - printed circuit board baskets MC-873 Data Sheet - meter carriers.

Products manufactured: Carts & Dollies, Instrument & Equipment, Containers, Holder & Carriers, Holders, Circuit Board (Production Type), Racks

METROSONICS, INC., Box 18090, Rochester, N.Y., 14618, Tel: 716-442-0760; Empl.: 20

Free literature available: db-201 General Purpose Sound Level Meters db-400 Sound Level Recorders db-501 Octane Band Analyzers db-600 Sound Level Analyzers

Products manufactured: Analyzers, Calibrators, Meters, Microphones, All Kinds, Recorders

Local Sales Offices & Reps.

Ala Huntsville, BCS Assocs. 205-881-6220

Conn Hamden, Northeast Engr. 203-248-4481

Fla Orlando, BCS Assocs. 305-896-4881

Ind Indianapolis, Tri-State Tech. Sls. 317-924-3568

Mass Danvers, Northeast Engr. 617-774-3010

Mich Detroit, Electro Sls. Assocs. 313-526-8800

Mo St. Louis, Adelphi Inc. 314-821-1232

NY Dewitt, db Assocs. 315-446-0220

NC Greensboro, BCS Assocs. 919-273-1918

Ohio Cleveland, Electro Sls. Assocs. 216-261-5440

Ohio Dayton, Electro Sales Assocs. 513-426-5551

Pa King of Prussia, Valley Instr. 215-265-1020

Pa Pittsburgh, Electro Sls. Assocs. 412-371-9449

METROSONICS, INC. cont'd

Advertisement

Specialists in sound measurement instrumentation. Designers and manufacturers of acoustical equipment including miniature general purpose sound level meters and sophisticated recording and analysis products. Complete system design capability for industrial and environmental applications including interfacing transducers, computers, etc.

MEYERCORD CO., 365 E. North Ave., Carol Stream, Wheaton, Ill., 60187, Tel: 312-682-6200, Telex: 72-2449; Empl.: 683; Minimum order: \$25

For info on price: A.M. Batchen 312-682-6226; Application info: R.A. Jando 312-682-6228; Customer service: R.G. Kline 312-682-6351; Delivery info: E. Prochaska 312-682-6316

Products manufactured: Delcalcomania, Labels, Pressure-Sensitive, Adhesive, Nameplates

Local Sales Offices & Reps.

Cal Fremont 415-794-6522

Cal Los Angeles 213-723-8661

Ga Atlanta 404-237-3422

Kans Leawood 913-648-3480

Mass Fayville 617-879-0447

Mich Detroit 313-538-5819

Mich Grand Rapids 616-451-3773

Minn Brooklyn Center 612-566-3380

Mo St. Louis 314-965-0857

NY Mamaroneck 914-698-0710

Ohio Chesterland 216-729-4644

Ore Portland 503-244-3144

Pa Abington 215-885-2820

Tex Houston 713-528-0962

Tex Wynnboro 214-342-6307

Wisc Milwaukee 414-272-8294

MFE CORPORATION, Keewaydin Dr., Salem, N.H., 03079, Tel: 603-893-1921, TWX: 710-366-1887; Empl.: 224

Products manufactured: Heads, Recording Playback, Erase, Monitors, Motors, Paper, Graphic Recording, Printers, Recorders, Scanners, Tapes, Recording, Magnetic (All Types)

Local Sales Offices & Reps.

Ala Huntsville, Lee Assocs. 205-533-5896

Ariz Phoenix, Moxon Elctns. 602-273-7363

Cal Goleta, Thorson Co. 805-964-8751

Cal Irvine, Moxon Elctns. 714-556-6500

Cal Los Angeles, Thorson Co. 213-937-0790

Cal Mt. View, Thorson Co. 415-964-9300

Cal San Diego, Moxon Elctns. 714-292-4820

Cal Santa Clara, Moxon Elctns. 408-249-2491

Cal Tustin, Thorson Co. 714-544-5121

Colo Denver, Thorson Co. 303-759-0809

Fla Ft. Lauderdale, Lee Assocs. 305-525-9767

Fla Winter Haven, Lee Assocs. 813-294-5815

Ga Chamblee, Lee Assocs. 404-457-7117

Haw Honolulu, Industrial Elctns., Inc. 808-533-6095

Ill Elk Grove Village, L.F. Green Assocs. 312-593-0282

Ind Indianapolis, L.F. Green Assocs. 317-293-9827

Md Annapolis, Bartek 301-261-2987

Md Silver Spring, Gawler Knoop Co. 301-589-4406

Mass Natick, Andrus-Peskin Co. 617-653-3919

Mich Royal Oak, Group Ten 313-549-3910

Minn Minneapolis, L.F. Green & Assocs. 612-781-1611

NJ Kinnelon, Science Supply Corp. 201-838-8746

NJ N. Plainfield, Brady Co. 201-753-7988

NM Albuquerque, Shefler-Kahn Co. 505-265-7077

NY Buffalo, H.C. Johnson Agencies, Inc. 716-632-7880

NY Fayetteville, H.C. Johnson Agencies, Inc. 315-637-9383

NY Great Neck, Science Supply Corp. 516-487-1173

NY Rochester, H.C. Johnson Agencies, Inc. 716-482-3000

NC Raleigh, Lee Assocs. 919-787-5818

Ohio Cleveland, Group Ten 216-486-2800

Ohio Dayton, Group Ten 513-277-6531

Pa Greshaw, H.C. Johnson Agencies, Inc. 412-961-0414

Pa Philadelphia, V.S. Malta Co. 215-386-5122

Tex Dallas, Thorson Co. 214-233-5744

Tex Houston, Thorson Co. 713-771-3504

Va Norfolk, Scientific Devices/E-Tech

Wash Bellevue, Thorson Co. 804-499-8133

206-455-9180

MF ELECTRONICS CORP., 118 E. 25th St., New York, N.Y., 10010, Tel: 212-674-5360, TWX: 710-581-4109

p. 1-384-387

Products manufactured: Oscillators

Local Sales Offices & Reps.

Cal North Hollywood, B.J. Wolfe Entrs. 213-877-5518

Conn Meriden, Abbott-Allison Co. 203-237-9232

NY Huntington, C.R. Mayer Co. 516-921-7876

M.I.A.L. U.S.A., INC., 165 Franklin Ave., Nutley, N.J., 07110, Tel: 201-667-1600, TWX: 710-989-1443; Empl.: 10; Minimum order: \$35

For info on price: J. W. Yuhas; Application info: J. W. Yuhas; Customer service: R. Birtwistle; Delivery info: R. Birtwistle

Free literature available: MIAL U.S.A. offers Ceramic disc capacitors, all styles of Polystyrene capacitors both general purpose and professional, solid Tantalum capacitors (dipped style) and Metal Film resistors.

Products manufactured: Capacitors, Fixed, Resistors

Local Sales Offices & Reps.

Cal Walnut Creek, MacPherson Sls. 415-937-1482

Cal Woodland Hills, Interstate Mktg. Assocs. 213-883-7606

Colo Golden, J.F. Hurlbut 303-279-7138

Ill Rolling Meadows, Lightner 312-398-3000

Mich Detroit, R.S. Lohmann Co. 313-474-6144

Minn Minneapolis, C.R. Gibb Co. 612-377-1200

NJ Nutley, Falk-Baker Assocs. 201-661-2431

NY Pompey, S.F. Foster 315-667-3333

NC Raleigh, A.B. Andrews & Co. 919-833-5565

Pa Oreland, Brown-Oberlies 215-887-1325

Tex Addison, Parvin Sls. Co. 214-239-9148

M12 DATA SYSTEMS INC., Design Elements Div., 930 Kinneard Rd., Columbus, Ohio, 43212, Tel: 614-481-8881; Empl.: 110

For info on price: G. Gerhard; Application info: G. Gerhard; Customer service: D. Buelow; Delivery info: G. Gerhard

Free literature available: Product Data Sheets on acoustic couplers, direct access data sets, and other data transmission equipment cover features and specifications of each device. Product catalog giving a capsule review of all M12 data systems products.

Products manufactured: Comm. Systems, Converters, Couplers, Data Compressors, Digital, Modulator/Demodulators, Multiplexers, Printers, Recorders, Teleprinters, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Ga Atlanta, R. Geiger 404-455-1830

Ohio Cincinnati, L. Sherman 513-531-2729

Pa Berwyn, L. Phelan 215-647-0797

MICA CORPORATION, 10900 Washington Blvd., Culver City, Calif., 90230, Tel: 213-559-4223, TWX: 910-340-6365; FSC No: 06216; QPL No: Multiple; Empl.: 300; Minimum order: \$100

For info on price: W. Kennedy; Application info: P. Benke; Customer service: G. Rogers; Delivery info: G. Rogers

Free literature available: Epoxy Glass and Polyimide Glass Laminates, Ohmega Resistor-Conductor Laminate, Conductor Metalized Substrates for Hybrid Circuitry, Micapak Lamination Service, Hybrid Circuitry and Thin Copper Claddings.

Products manufactured: Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Circuits, Printed, Multilayer, Laminates

Local Sales Offices & Reps.

Cal Mountain View, West Mark Assocs. 415-969-1700

Fla Orlando, R. F. Carlson Co. 305-422-3996

Md Lutherville, Nationwide Circuit Prods. 301-296-0009

NH Amherst, Nationwide Circuit Prods. 603-889-2122

NJ Cedar Grove, Nationwide Circuit Prods. 201-857-1333

NY Utica, Nationwide Circuit Prods. 315-735-7686

Tex Dallas, Stevens Sls. 214-350-2476

Wash Seattle, R. Johnston Co. 206-524-5170

MICHIGAN MAGNETICS, 203 W. Third St., Vermontville, Mich. 49096, Tel: 517-726-0590; Empl.: 95; Minimum order: \$15

For info on price: B. L. Killinger; Application info: M. Fox; Customer service: B. Killinger; Delivery info: B. Killinger

Products manufactured: Heads, Recording Playback, Erase

Local Sales Offices & Reps.

Cal Burlingame, J. Logan Assoc. 415-697-6100
Cal Los Angeles, C. L. Repp Co. 213-820-1715
Conn Kensington, N. Stachelek 203-223-6423
Ill Chicago, J. Twist
Minn St. Paul, Countryman 612-645-9151
NY Great Neck, R. Breuer 516-466-3030
EXP: New York, Singer Products 212-432-1400

MICONICS INDUSTRIES INC., 135 Ailene Way, Syosset, N.Y., 11701

MICRITE METAL MFG., INC., 21531 Strathern St., Canoga Park, Cal. 91304, Tel: 213-348-1610; Empl.: 16 p. 2-1236-1239

Products manufactured: Boxes, Junction, Outlets & Wall Plates, Cabinets & Accessories, Cans, Capacitor, Relay, Semiconductor, Transformer, etc., Cases, Equipment, Instrument, Meter, Chassis, Metal, Containers, Cups, Encapsulation, Horns, Microwave, Metal Oxides, Services, Assembly, Production & Test, Shields

Local Sales Offices & Reps.

Ariz Phoenix, Dorton Entprs. 602-263-0414
Cal Fountain Valley, Stangenberg & Assoc. 714-968-5049
Cal Santa Clara, King & Assocs. 408-240-1022
Ill Parkridge, Central States Assocs. 312-692-2101
Mass Woburn, Jalco Assocs. 617-227-1515
Mo Kansas City, Burke Sls. Co. 816-842-5511

MICRO-CIRCUITS CO., INC., Dept EEM I, New Buffalo, Mich., 49117, Tel: 616-469-2727 p. 2-342,343

Free literature available: Catalog-Descriptions of our line of electrically conductive coatings. Ten basic ways to use electrically conductive coatings.

Products manufactured: Coatings, Inks For Thick Film Microcircuits, Paints, Shields

MICRO COMPONENTS CORP., 99 Bald Hill Rd., Cranston, RI, 02920, Tel: 401-737-3200, TWX: 710-381-1757; Empl.: 120

Customer service: E. Rasmanis

Products manufactured: Alarms, Amplifiers, Choppers, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Converters, Diodes, Integrated Circuit Devices, Semiconductor Wafer Fabrication, Transistors

Local Sales Offices & Reps.

Cal San Jose, Allgood-North 408-288-6731
Colo Denver, Omega Ltd. 303-758-1508
Ill Chicago, M & S Sls. Co. 312-992-1053
Mass Westboro, Tech Mktg. Serv. Co. 617-366-8462
Minn Minneapolis, Siedera Assocs. 910-576-3171
Mo Webster Groves, Boyce Assocs. 341-961-8235
NY Plainview, Erde Assocs. 516-822-5357
Ohio Cincinnati, R. Makin Assocs. 513-232-5588
Wash Seattle, Blair-Hirsh Co. 206-783-3423

MICRO DEVICES CORP., Box 501 - Far Hill Sta., Dayton, Ohio, 45419; Empl.: 450

Products manufactured: Circuit Breakers, Controls/Control Eqp., Current Sensors, Fuses, Indicators, Limiters, Monitors, Protectors, Thermocouples, Elements & Accessories, Thermostats

Local Sales Offices & Reps.

Ala Decatur, Tenn-Tech Sls. 205-350-0630
Cal Fremont, Hartfield, Kennan & Freytag 415-863-2200
Cal Los Angeles, Hartfield, Kennan & Freytag 213-225-1318
Colo Denver, Thorson Co. 303-759-0809
Conn Madison, L.J. Carr, Inc. 203-245-4890
Fla Maitland, D & E Assocs. 305-644-3039
Ill Arlington Heights, W.J. Davis 312-545-0166
Ind Marion, O.H. Bromberg & Assocs. 317-664-5384
Ky Louisville, O.H. Bromberg & Assocs. 502-245-8916
Mich Rochester, R. Shurte 313-375-0888
Minn Minneapolis, C. Listug 612-537-6740
Mo Raytown, G.F. Beckett & Co. 816-358-0404
Mo Saint Louis, Thunderbird 314-567-6488
NJ Denville, Grimm, Siegel Assocs. 201-877-2154
NY Binghamton, Elcom Sls. 607-723-9270

NY East Northport, Grimm, Siegel Assocs. 516-757-7642

NY Plainview, Grimm, Siegel Assocs. 516-938-9721
NY Rochester, Elcom Sls. 716-385-1400
NY Whitesboro, Elcom Sls. 315-732-6445
NC Charlotte, R.W. Chapman & Co. 704-525-2421
NC Raleigh, R.W. Chapman & Co. 919-782-2624
Ohio Cincinnati, O.H. Bromberg & Assocs. 513-381-5728

Ohio Cleveland, Allied Entprs. 216-234-3838
Ohio Dayton, O.H. Bromberg & Assocs. 513-434-8788

Pa Devon, Kiley Elec. Co. 215-687-9340
SC Greenville, R.W. Chapman & Co. 803-232-5391
Tex Fort Worth, T.J. Small Co. 817-332-6353
Wash Vancouver, Hartfield, Kennan & Freytag 503-228-1683
Wisc Milwaukee, R.C. Zingler Co. 414-964-8120

MICRO INSTRUMENT CO., Marine & Power Instr. Div., Box 1565, Escondido, Cal., 92025, Tel: 714-746-2010, TWX: 910-322-1156; Empl.: 20; Minimum order: \$10
Customer service: C. L. Marks

Free literature available: "M.I.C. Live Wires" - new power monitoring techniques and applications. Distributed to qualified power engineers. "M.I.C. Navigation News" - information on the latest changes in the Omega system and new navigation products.

Products manufactured: Alarms, Detectors, Meters, Monitors, Oscillographs, Direct Writing, Oscilloscope Plug-Ins, Probes, Recorders, Testers

Local Sales Offices & Reps.

Ala Birmingham, Spader & Assocs. 205-879-1366
Cal Emeryville, Independent Engrg. Assoc. 415-658-4476
Cal Santa Fe Springs, Underground Svc. & Supply Co. 213-941-7833
Colo Denver, Utility Prods., Inc. 303-758-3103
Conn East Hartford, Tekdata, Inc. 203-525-7647
Fla Orlando, Datarep, Inc. 305-843-5224
Ga Decatur, Spader & Assocs. 404-296-3024
Ill Chicago, Electronic Instr. Assocs. 312-271-3774
Ind Indianapolis, M & L Assocs. 317-546-1155
Md Silver Springs, Rep-Tron, Inc. 301-593-4844
Mass Burlington, Tekdata, Inc. 617-273-0198
Mich Detroit, Electro Entprs. Inc. 313-521-1500
NJ Cherry Hill, L. H. Walke Co. 609-424-3766
NJ East Orange, Friedman Assocs. 201-673-2500
Ohio Dayton, Electro Entprs., Inc. 513-420-6071
Ore Portland, Arnett Sls. 503-292-9746
Pa Pittsburgh, Electro Entprs., Inc. 412-371-8497

MICRO LINE DIV. BAUSCH & LOMB, 2 Girts Rd., Jamestown, N.Y., 14701, Tel: 716-488-1958, Telex: 91-547; Empl.: 50

Products manufactured: Coatings, Counters, Disc Packs, Magnetic, Encoders, Services, Assembly, Production & Test

MICRO MASK, INC., 716 N. Pastoria Ave., Sunnyvale, Cal., 94086

MICRO-MEASUREMENTS DIV., Vishay Intertechnology, Inc., Box 306, Romulus, Mich., 48174, Tel: 313-941-3900, Telex: 23-0328; Empl.: 235

For info on price: G. J. Guminski; Application info: L. B. Sayles; Customer service: G. J. Guminski; Delivery info: G. J. Guminski

Free literature available: Short Form Catalog 95 describes M-M Strain Gages, Temperature Sensors, Fatigue Life Gages, Crack Propagation Gages, Manganin Gages, Bondable Resistors, and related accessories (adhesives, protective coatings, wires, solders, surface preparation supplies, installation tools, etc.)

Products manufactured: Gages, Transducers

Local Sales Offices & Reps.

Cal Santa Clara, Johnson Assoc. 408-984-4626
Cal Wilmington, Premtronics Inc. 213-830-5871
Colo Denver, Davis Assoc. 303-744-6644
Ga Atlanta, Craft Assocs. 404-393-0400
Ill Glen Ellyn, G.B. Hall Co. 312-858-1700
Mass Natick, Andruss-Peskin Corp. 617-653-3919
NM Albuquerque, Rustco Entprs. 505-296-6474
Ohio Medina, Stress Analysis Svcs. 216-725-7733
Pa Chadds Ford, Stress & Test Sls. 215-793-1008
Pa Frazer, Measurement Sls. 215-644-7142
Tex Dallas, Tech. Prods. 214-357-9603
Wash Seattle, Brett Assocs. 206-935-8054

MICRO-MO ELECTRONICS INC., 3691 Lee Rd., Cleveland, Ohio, 44120, Tel: 216-921-1131, Telex: 98-0650; Empl.: 50

For info on price: S. Frakes 216-921-1131; Application info: J. W. Linko 617-453-1719; Customer service: S. Frakes 216-921-1131; Delivery info: S. Frakes 216-921-1131

Free literature available: Short form catalog - Contains all electrical, thermal, and mechanical specifications.

Products manufactured: Amplifiers, Controls/Control Eqp., Gearheads & Speed Reducers, Gears & Gear Mechanisms (Precision), Motors, Tachometers

MICRO NETWORKS, 324 Clark St., Worcester, Mass., 01606, Tel: 617-852-5400, TWX: 710-340-0067; Empl.: 160

For info on price: B. Smith; Application info: D. Pouliot; Customer service: A. Peterson; Delivery info: D. Pouliot

Free literature available: Short Form Catalog - data sheets application notes

Products manufactured: Amplifiers, Circuits, Hybrid, Thin-Film, Converters, Data Acquisition & Reduction Systems, Hybrid Voltage Regulators, Integrated Circuit Devices

Local Sales Offices & Reps.

Ariz Tempe, Argus Sls. 602-967-8709
Cal Burlingame, Liddy Assocs. 415-347-5247
Cal Santa Ana, Calif. Elctns. Mktg., Inc. 714-835-2702
Fla Winter Park, Young & Lawrence Assoc. 305-647-6929
Haw Honolulu, Aloha Assocs. 808-941-1575
Ill Chicago, Communication Engrs. 312-761-0548
Mass Lexington, J.E. Boeing, Inc. 617-862-2500
Mich Detroit, Rathsborg Assoc., Inc. 313-882-1717
Minn St. Louis Park, Beta Engrg. Corp. 612-925-4422
Mo St. Louis, Benek & McCaul, Inc. 314-434-6242
NY Jamaica, S-J Sales Assoc. 212-291-3232
NY Syracuse, Nycorn, Inc. 315-437-8343
Ohio Dayton, Midwest Mktg. Assoc. 513-433-2511
Pa Berwyn, Tucker Assoc. 215-644-0142
Tex Dallas, J. Clay Co. 214-350-1281
Wash Seattle, J.B. Jolly, Inc. 206-938-4166

MICRO-NOW INSTR. CO., 6104 N. Pulaski Rd., Chicago, Ill., 60646, Tel: 312-478-1151; Empl.: 15; Minimum order: \$25

For info on price: G. Zielinski; Application info: R. Houget; Customer service: G. Zielinski

Free literature available: Catalog of products, and current engineering bulletins.

Products manufactured: Amplifiers, Generators, Mixers, Multipliers, Power Supplies, Receivers, Spectrometers, Synchronizers, Klystron & BWO

Local Sales Offices & Reps.

Cal Los Angeles, Mc Dougall/Mc Laughlin Co. 213-477-8556
Colo Boulder, H. Bass Assocs. 303-499-7509
NJ Westfield, Gray & Reed 201-AD3-6116
NM Albuquerque, IMEC 505-344-2212
NY Huntington Station, Gray & Reed Assocs. 516-GE3-3333
Tex Dallas, Texas Avionics Co. 214-368-3566

MICRO-OHM CORP., Box 287, South Laguna, Cal., 92677, Tel: 213-442-3310; FSC No: 20940; Empl.: 109; Minimum order: \$25

Customer service: C. A. Schwab

Free literature available: Quality Precision - Precision Wirewound, Commercial Power, Film and Carbon Film Resistors.

Products manufactured: Resistors

Local Sales Offices & Reps.

Ariz Scottsdale, Gassner & Clarke 602-945-7979
Cal Orange, Sls. & Mktg. Assocs. 714-997-5720
Cal Redwood City, Siani Johnson, Inc. 415-365-6263
Cal San Diego, B. Tauber 714-274-7242
Colo Denver, Electrodyne 303-757-7679

MICRO POWER SYSTEMS INC., 3100 Alfred St., Santa Clara, Cal., 95050

MICRO SWITCH, Div. Honeywell Inc., 11 W. Spring St., Freeport, Ill., 61032, Tel: 815-232-1122, TWX: 910-642-0922; Empl.: 3000 p. 1-2101

Free literature available: Catalogs 50, 51, 52 - Switches, Various Types, Catalog NTC - "No Touch" Photoelectric controls and proximity controls. Product Brochure SN - solid state pushbutton switches. Product Brochure SD - Solid state keyboards. DC Motors Brochure - Low inertia high performance DC motors with fast acceleration and deceleration.

Products manufactured: Alarms, Caps, Lenses, Indicator Light, Controls/Control Expt., Indicators, Keyboards, Alphanumeric & Decimal, Light Sources, Photoelectric, Motors, Relays, Switch Handle Boots, Switches

Local Sales Offices & Reps.

Cal	Los Angeles	213-723-6611
Cal	San Jose	408-732-0120
Colo	Englewood	303-771-2340
Conn	Hartford	203-549-3800
Ga	Atlanta	404-321-2565
Ill	Skokie	312-478-9266
Iowa	Davenport	319-355-6456
Mass	Bedford	617-275-2440
Mich	Southfield	313-424-3569
Minn	Minneapolis	612-835-5400
Mo	Creve Coeur	314-991-4100
NJ	Westfield	201-233-9200
NY	Elmsford	914-592-3200
NY	Rochester	716-461-1600
NY	Syracuse (Liverpool)	315-451-4000
Ohio	Cleveland	216-881-0300
Ohio	Dayton	513-461-4480
Pa	Blue Bell, Merion-Towle House	215-643-5820
Tenn	Memphis	901-396-6222
Tex	Dallas	214-661-5459
Va	McLean	703-790-3525
Wash	Merger Island	206-233-2010
Wisc	Milwaukee	414-771-6300

MICRO SYSTEMS, INC., 2106 W. Peoria, Phoenix, Ariz., 85029, Tel: 602-997-5931; Empl.: 30
Customer service: Sls. Dept.

Free literature available: Brochure (20-page) describing Micro 500-series logic-circuit testers; Booklet containing technical reprints and descriptions of company products and services.

Products manufactured: Analyzers, Test Systems, Testers

MICRO SYSTEMS INT'L., Box 3529, Sta. C, Ottawa, Can.

MICRO-TEL CORP., 6310 Blair Hill La., Baltimore, Md., 21209, Tel: 301-823-6227; Empl.: 50

Customer service: Sls. Dept.

Free literature available: Data Sheets containing technical specifications on all products manufactured.

Products manufactured: Calibrators, Comm. Systems, Converters, Counters, Generators, Receivers, Testers

Local Sales Offices & Reps.

Ala	Huntsville, Gentry Assocs.	205-534-9771
Ariz	Scottsdale, J. Smith & Assocs.	602-947-2495
Cal	Cupertino, T. Louis Snitzer Co.	408-257-8333
Cal	Los Angeles, T. Louis Snitzer Co.	213-836-6170
Colo	Boulder, J. Smith & Assoc.	602-947-2495
Fla	Orlando, Gentry Assocs.	305-894-4401
NJ	Hazlet, Mer Mon.	201-264-1851
NM	Albuquerque, J. Smith & Assocs.	505-255-2111
NY	Huntington, N. Ellen	516-368-5841
NC	Burlington, Gentry Assocs.	919-227-3639

MICRODATA CORP., 17481 Red Hill Ave., Irvine, Cal., 92705, Tel: 714-540-6730, TWX: 910-595-1764; Empl.: 375

Products manufactured: Comm. Systems, Computers, Memory Systems

Local Sales Offices & Reps.

Cal	Los Angeles, Microdata Corp.	213-596-5404
Cal	San Jose, Microdata Corp.	408-225-3235
Ill	Deerfield, Microdata Corp.	312-948-9440
Md	Rockville, Microdata	301-881-6282
Mass	Foxboro, Microdata	617-543-6306
Mich	Farmington, Microdata Corp.	313-477-8686
NY	Hempstead, Microdata Corp.	516-724-4807
Pa	King of Prussia, Microdata	215-337-1839
Tex	Dallas, Microdata Corp.	214-239-8186

MICRODOT, See Ailtech, Western Opers.

MICRODYNAMICS, 9855 Dupree, So. El Monte, Cal., 91733, Tel: 213-579-1166; Empl.: 40

Customer service: J. Foster

Free literature available: Automated Omega Probe Station Probe Card Manufacturing Station Fixed Array Probe Card for testing & laser trimming Multiprobe cards - IC/TF Movable Magnetic Probe Card

Products manufactured: Calculators, Electrical & Electronic, Clocks (All Types), Probes, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Cal	Mountain View, Karl Suss KG	415-961-1720
-----	-----------------------------	--------------

Cal Santa Ana, Schlines-Richardson 714-832-1949
Fla Sarasota, W. J. Irvine Co. 813-955-9656
Kans Prairie Village, Dougherty & Assocs.

Mass	Needham Heights, COM/PAK	617-444-1259
Minn	St. Paul, MURNCO	612-484-8200
Mo	St. Louis, J. E. Metz Co.	314-993-1979
NJ	Sparta, Production Technology	201-729-7159
NY	Niagara Falls, Watmet	716-285-3595
Ohio	Dayton, Sidnell Co.	513-885-4161
Tex	Dallas, Crockett Southwest Co.	214-251-1776
Wisc	Milwaukee, Process Technology	414-464-6620

MICROFLECT CO., 3575 25th S.E., Salem, Ore., 97302, Tel: 503-363-9267, TWX: 510-599-0107; Empl.: 85

For info on price: G. Kreitzberg; Application info: J. Kreitzberg; Customer service: R. Kreitzberg; Delivery info: R. Kreitzberg

Products manufactured: Antenna Towers & Supports, Mounts

MICROLAB/FXR, 10 Microlab Rd., Livingston, N.J., 07039, Tel: 201-992-7700, TWX: 710-994-4850; FSC No: 00929; Empl.: 185; Minimum order: \$25

Customer service: M. J. DiPrimo

Products manufactured: Adapters, Waveguide, Amplifiers; Antennas, Attenuators, Bends & Twists, Microwave, Bolometers, Calorimeters, Microwave, Cavities, Microwave, Chokes, Circulators, Ferrite, Connector Adapters, Converters, Couplers, Detectors, Diodes, Dividers, Dummy Loads, Filters, Flanges, Waveguide, Horns, Microwave, Isolators, Joints, Rotary, Microwave, Junctions, Hybrid, Microwave, Kits, Test Equipment, Kits, Training Aid, Limiters, Line Stretchers, Microwave, Meters, Mismatches, Microwave, Precision, Mixer-Preamplifiers, Microwave, Mixers, Modulators, All Kinds, Monitors, Mounts, Multipliers, Preselector-Mixers, Preselctors, Probes, Receivers, Shifters, Sliding Loads, Microwave, Slotted Lines, Microwave, Standards, Strip-Line Components, Microwave, Switches, Tees, Terminals, Testers, Transmitters, Tuners, Waveguides & Adapters

Local Sales Offices & Reps.

Cal	Los Angeles, McDougall/McLaughlin Co.	213-477-8556
Cal	San Jose, M.C.H. Assoc.	408-246-7330
Fla	Clearwater, R.F. Brennan, Inc.	813-446-5006
Ill	Park Ridge, R.F. Specialists, Inc.	312-698-2045
Ind	Indianapolis, R.F. Specialists, Inc.	317-783-7630
Md	Ellicott City, V P I Inc.	301-465-4060
Mass	Stoneham, Robertson Electr. Prods. Co.	617-438-3113
NY	Great Neck, Robert L. Diamond, Inc.	516-482-8387
NC	Winston-Salem, The Candor Co., Inc.	919-924-1480
Pa	Montgomeryville, V P I, Inc.	215-474-3200
Wash	Seattle, Datacom Assocs.	206-329-2989

MICROMETALS, 228 N. Sunset, City of Industry, Cal., 91744, Tel: 213-968-4718, TWX: 910-584-1878; FSC No: 12856; Empl.: 30; Minimum order: \$20

For info on price: K. Baker; Application info: J. Cox; Customer service: L. Raymond; Delivery info: L. Raymond

Free literature available: Complete catalog of Iron Powder Cores Q. Curves for Iron Powder Toroidal Cores

Local Sales Offices & Reps.

Cal	Santa Clara, King Assocs.	408-249-1022
Fla	Dunedin, W. J. Irvine Co.	813-733-5382
Mass	Wellesley Hills, Anchor Engrg.	617-235-6330
Minn	Hopkins, F. Peterson Co.	612-941-5400
NY	Hempstead, Kahgan Sls.	516-538-2300
NY	Rochester, L. Hart Assocs.	716-244-3253

MICRON INDUSTRIES CORP., Constant Voltage Div., 1830 N. 32nd Ave., Stone Park, Ill., 60165, Tel: 312-345-0788; Empl.: 54; Minimum order: \$25

For info on price: J. Topel; Application info: D. Davenport; Customer service: J. Topel; Delivery info: J. Topel

Free literature available: Impervitran Bulletin showing line of standard machine tool transformers and molded transformers. OEM Bulletin showing OEM capabilities for regulated DC power supplies and AC voltage regulators.

Products manufactured: Power Supplies, Regulators, Transformers

MICROPAC INDUSTRIES, INC., 905 E. Walnut St., Garland, Tex., 75040, Tel: 214-272-3571, TWX: 910-860-5186; Empl.: 200

Products manufactured: Circuits, Hybrid, Thick Film, Hybrid Voltage Regulators

Local Sales Offices & Reps.

Ala	Huntsville, Burgin-Kreh	205-883-7893
Ariz	Tempe, Argus Sls.	602-948-1499
Cal	Los Altos, Cain, White & Co.	415-948-6533
Fla	Orlando, G. F. Bohman	305-855-0274
Ill	Des Plaines, Coombs Assoc.	312-298-4830
Md	Baltimore, Burgin-Kreh Assoc.	301-788-5200
Mich	Southfield, Reps. Assoc.	313-354-9066
Minn	Minneapolis, Bitronics Sls. Co.	612-835-7744
NJ	Ridgewood, Instrumentation Sls. Co.	201-445-5210
NY	Syracuse, T2 Elctns.	315-463-8592
NC	Winston Salem, Burgin Kreh	919-768-4174
Ohio	Cleveland, D. Steffen & Assoc.	216-461-8333
Ohio	Dayton, D. Steffen & Assoc.	513-293-3146
Ore	Beaverton, ES/Chase Co.	503-649-6177
Va	Lynchburg, Burgin-Kreh Assoc.	703-845-5600
Wash	Edmonds, ES/Chase Co.	206-774-3586
Wisc	Greendale, Coombs Assoc.	414-421-2300

MICROPHASE CORP., 35 River Rd., Cos Cob, Conn., 06807, Tel: 203-661-6200, TWX: 710-579-2926; Empl.: 105

Customer service: R. J. Crocco

Free literature available: Catalog Pages On: LTM series low-pass filters, HI series interdigital band-pass filters, CDL series limiter detectors, contiguous band multiplexers, detector mounts, amplifiers, detector/video log amps, detecting multi-plexers, mixers, front ends & receivers.

Products manufactured: Amplifiers, Cavities, Microwave, Converters, Couplers, Detectors, Diodes, Dividers, Duplexers, Microwave, Filters, Holders, Crystal, Junctions, Hybrid, Microwave, Limiters, Mixer-Preamplifiers, Microwave, Mixers, Modulators, All Kinds, Modules, Logic, Encapsulated, Monitors, Mounts, Multiplexers, Oscillators, Preselector-Mixers, Preselctors, Receivers, Switches, Tuners

Local Sales Offices & Reps.

Mo	Glen Burnie, R. L. Engrg.	301-760-5533
NY	Syracuse, Ossmann Instruments Inc.	315-437-6666

MICROSONICS, INC., Div. Sangamo Elec. Co., 60 Winter St., Weymouth, Mass., 02188, Tel: 617-337-4200, TWX: 710-388-6833; Empl.: 125; Minimum order: \$100
Customer service: J. Klayman

Products manufactured: Amplifiers, Delay Lines, Filters, Memory Systems, Oscillators

Local Sales Offices & Reps.

Cal	Los Angeles, Tauber Assocs.	213-368-4011
Cal	San Carlos, Kottmeier Assocs.	415-592-8333
Cal	San Diego, Tauber Assocs.	714-274-7242
Fla	Ormond Beach, Technology Mktg. Assoc.	904-672-2314

Fla Pompano Bch., Technology Mktg. Assoc. 305-942-0774

Ind Ft. Wayne, G & D Electr. Sls., Inc. 219-432-5585

Md Baltimore, Burgin-Kreh Assocs. 301-788-5200

Mass Weymouth, Reptron 617-449-4141

NJ Cherry Hill, Danco 609-424-5590

NY Rochester, Ontec 716-464-8636

NC Winston-Salem, Burgin-Kreh Assoc. 919-768-4174

Ohio Cleveland, Whelan Corp. 216-692-1266

Ohio Dayton, Whelan Corp. 513-434-7551

Pa Fairview Vill., Danco 215-627-2218

Tex Richardson, Lear Assocs. 214-231-5388

Va Lynchburg, Burgin-Kreh 703-845-5600

MICROTRAN CO., INC., 145 E. Mineola Ave., Valley Stream, N.Y., 11580, Tel: 516-561-6050, TWX: 510-225-8412; FSC No: 50; Empl.: 100; Minimum order: \$50
For info on price: B. Tanner; Application info: W. Benschner; Customer service: B. Tanner; Delivery info: B. Ciancia
Free literature available: Transformer Catalog: Highlights new P.C. Powers, Telephone Coupling, Studio-Broadcast, DC-DC Converter - F237: P.C. Power Supply Xfmr. for +5V & ±15V supplies - F158: Lists schematics and components for DC-DC Converters - F243: Magnetically Shielded Studio-Grade Mike Input Xfmr. F185: Magnetically Shielded Low-Level Chopper Input Xfmr. - Nomograph: Transistor Xfmr. Load Impedances determination - F139: Professional Bulk Tape Erasers, Demagnetizers, Audio Accessories.

Products manufactured: Chokes, Coils Including Assemblies & Forms, Controls/Control Eqpt., Converters, Decade Boxes, Demagnetizers, Demodulators, Editing Equipment, Tape, Eliminators, Battery, Erasers, Magnetic Tape (Bulk), Filters, Hybrid Voltage Regulators, Inverters, Kits, Power Supply, Microphone Accessories (Including Stands, Holders, Booms), Networks, Pickups, Telephone (For Recording), Power Supplies, Reactors, Regulators, Transducers, Transformers

Local Sales Offices & Reps.

Ala Gadsden, F. Nickerson 205-547-7718
 Ariz Scottsdale, F. Schoeffler 602-959-3011
 Cal Los Altos, Westec Elctns. 415-948-8880
 Cal Norwalk, Bertrand-Zoolalian 213-921-9791
 Cal San Diego, Bertrand-Zoolalian 714-560-5832
 Colo Denver, Gossard & Assocs. 303-985-0602
 Fla Miami Beach, Gartner Assocs. 305-861-3661
 Fla Orlando, Gartner Assocs. 305-299-1000
 Ga Decatur, F. Nickerson 404-321-4678
 Ill Highland Park, Bransky Sls. Co. 312-433-2375
 Kans Shawnee, J. Guernsey Co. 913-631-2414
 Md Baltimore, J. R. Daniel 301-825-3330
 Mass Wakefield, Meas. Equip. Co. 617-245-4870
 NJ Englewood Cliffs, E. Glass Assocs. 212-586-8440

NC Kannapolis, F. Nickerson Co. 704-832-6772
 Ohio Cincinnati, J. Olsen 513-922-2176
 Ohio Cleveland, J.O. Olsen 216-752-5444
 Pa Jenkintown, Arnold Assocs. 215-887-7870
 Pa Pittsburgh, J.O. Olsen Co. 412-279-2550
 Tex Grand Prairie, Howell Sls., Inc. 214-AN2-5153
 Wash Seattle, Westec Elctns., Inc. 206-CH3-7070
 EXP: N.Y., Valley Stream, Microtran Co. 516-561-6050

Local Distributors

Ala Birmingham, MG Elctns. & Equip., 3112 6th Ave. S. 205-328-4525
 Ariz Phoenix, Moltrons, Inc., 2746 W. Palm La. 910-951-1512
 Cal San Diego, Moltrons, Inc., 7960 Convoy Ct. 714-278-5020
 Cal Santa Clara, Moltrons, Inc., 337 Matthew St. 408-244-7600
 Cal South Gate, Moltrons, Inc., 5610 E. Imperial Hwy. 213-773-6521
 Colo Denver, Electronic Parts Co., 1212 S. Broadway 303-744-1992
 Conn Hamden, Arrow Elctns., 295 Treadwell St. 203-248-3801
 Fla Orlando, Hall-Mark Elctns., 7233 Lake Ellenor Dr. 810-850-0183
 Ga Atlanta, Lykes Elctns. Corp., 1135 Chattahoochee 810-751-3501
 Ill Chicago, Newark Elctns., 500 N. Pulaski Rd. 910-221-0268
 Ind Indianapolis, Graham Elctns., 133 S. Penn St. 317-634-8486
 Iowa Cedar Rapids, Deeco, Inc., 2500 16th Ave. S.W. 319-365-7551
 Kans Wichita, Radio Supply Co., 115 Laura St. 316-267-5216
 Md Savage, Pyyttronic Inds., Inc., 8200 Wellmoor Ct. 301-792-7000
 Mass Waltham, QPL Elctn. Distr., Inc., 47 Calvary St. 617-891-0460
 Mich Oak Park, Newark-Detroit, 20700 Hubbell Ave. 313-548-0250
 Minn Minneapolis, Newark Elctns., 336 Hoover St. N.E. 612-331-6350
 Mo Berkeley, Hall-Mark Elctns., 6100 Madison Ave. 910-760-1630
 NJ Moorestown, Arrow/Angus, Pleasant Valley Ave. 710-897-0829
 NJ Springfield, Federated Purchaser, Inc., 155 U.S. Rte. 22 201-376-8900
 NM Albuquerque, Electronics Parts Co., 2620 Rhode Island N.E. 505-293-6161
 NY Binghamton, Federal Elctns., Box 1208 510-252-0893
 NY Buffalo, Summit Dists., Inc., 916 Main St. 710-522-1692
 NY Farmingdale, Arrow Elctns., 900 Broad Hollow Rd. 516-694-6800
 NC Raleigh, Hall-Mark Elctns., 3000 Industrial Dr. 510-928-1831
 Ohio Cleveland, Pattison Supply Co., 4550 Willow Pkwy. 216-441-3000
 Pa McKeesport, Barno Radio Co., 5403 W. Smithfield St. 412-751-5971
 Tenn Nashville, Electra Distributing Co., 1914 W. End Ave. 615-255-8444
 Tex Dallas, Hall-Mark Elctns., 9333 Forest La. 910-867-4721
 Tex Houston, Lenert Co., 1420 Hutchins 713-225-1465

Wash Seattle, Sterling Elctns., 5608 6th Ave. S. 206-762-9100

MICROWAVE ASSOCS., Northwest Industrial Pk., Burlington, Mass., 01803, Tel: 617-272-3000, TWX: 710-332-6789

Products manufactured: Adapters, Waveguide, Alarms, Amplifiers, Analyzers, Attenuators, Bends & Twists, Microwave, CATV Systems & Equipment, Cavities, Microwave, Chokes, Circulators, Ferrite, Comm. Systems, Couplers, Detectors, Diodes, Dividers, Duplexers, Microwave, Filters, Integrated Circuit Packaging Systems, Interferometer Systems, Isolators, Limiters, Microwave Integrated Circuits (MIC's), Mixer-Preamplifiers, Microwave, Mixers, Modulators, All Kinds, Mounts, Multipliers, Receivers, Shifters, Shutters, Microwave, Strip-Line Components, Microwave, Switches, Tees, Terminals, Transmitters, Tubes, Waveguides & Adapters

Local Sales Offices & Reps.

Ala Huntsville, Tech. Mktg. Assocs. 205-883-7893
 Ariz Scottsdale, Microwave Assocs. 602-947-5431
 Cal Long Beach, Microwave Assocs. 213-426-9531
 Cal Sunnyvale, Microwave Assocs. 408-733-0330
 Fla Ormond Beach, Tech. Mktg. Assocs. 904-672-2314
 Fla Pompano Beach, Tech. Mktg. Assocs. 305-942-0774
 Fla Seminole, Tech. Mktg. Assocs. 813-393-3214
 Ill Franklin Park, Dekotech, Inc. 312-455-5100
 Ind Fort Wayne, Delesa Sls. 219-483-9537
 Ind Indianapolis, Delesa Sls. 317-257-4683
 Iowa Cedar Rapids, Seltco Sls. Corp. 319-362-8155
 Md Baltimore, Burgin-Kreh Assocs. 301-788-5200
 Mass Burlington, Burlington Sls., Inc. 617-272-7655
 Mich Ann Arbor, IM Tech, Inc. 313-663-0230
 NY Great Neck, ERA, Inc. 516-482-9320
 NY Syracuse, T2 Elctns. 315-463-8592
 NC Winston-Salem, Burgin-Kreh Assocs. 919-768-4174
 Ohio Cleveland, IM Tech, Inc. 216-826-3400
 Ohio Dayton, IM Tech, Inc. 513-837-5610
 Pa Fort Washington, G.C.M., Inc. 215-646-7535
 Tex Richardson, Microwave Assocs. 214-234-2463

MICROWAVE DEVELOPMENT LABS., INC., 87 Cresent Rd., Needham Hgts., Mass., 02194, Tel: 617-449-0700, TWX: 710-325-1739; Empl: 180; Minimum order: \$25

For info on price: R. Tucker; Application info: R. Tucker; Customer service: W. Berry; Delivery info: M. Hale

Free literature available: Three ring binder with individual catalogs & data sheets- Individual bulletins & catalogs can be mailed separately for many of our products.

Products manufactured: Adapters, Waveguide, Attenuators, Bends & Twists, Microwave, Cavities, Dividers, Dummy Loads, Duplexers, Microwave, Filters, Flanges, Waveguide, Generators, Holders, Crystal, Horns, Microwave, Impedance Converters, Microwave, Joints, Rotary, Microwave, Junctions, Hybrid, Microwave, Mixers, Seals, Shifters, Shutters, Microwave, Switches, Tees, Terminals, Tubing, Waveguides & Adapters

Local Sales Offices & Reps.

Cal Orange, J. E. Hachten Co. 714-998-6020
 Cal Palo Alto, J. E. Hachten Co. 415-326-1252
 Fla Orlando, Hi Co Assocs., Inc. 305-273-0571
 Md Lanham, Brimberg Assoc. 301-552-2200
 Mass Wayland, Wayland Engrg. Sls. 617-655-6080
 NY DeWitt (Syracuse), D.B. Assocs., Inc. 315-446-0220
 NY Great Neck, Trionic Assocs., Inc. 516-466-2300
 Pa Lafayette Hill, M. Lader Co. 215-825-3177
 Tex Dallas, Texas Microwave 214-231-5381
 Wash Seattle, Jon B. Jolly 206-938-4166
 EXP: Stamford, Conn., Dage Corp. 203-324-3123
 FOR: Can., Don Mills, Ontario, Tacan Assocs., Inc. 416-445-7490

MICROWAVE DIODE CORP., 13 Pleasant St., Colebrook, N.H., 03576, Tel: 603-237-4822; Empl: 15; Minimum order: \$35

For info on price: D. E. Shea; Application info: D. E. Shea; Customer service: G. P. Jacques; Delivery info: D. Hamel

Free literature available: Catalog and Specification Sheets

Products manufactured: Converters

Local Sales Offices & Reps.

Cal Santa Ana, Rical Assocs. 714-557-6543

Md Towson, L. H. Kolman & Co. 301-752-8756
 Mass Waltham, Betronic Assocs. 617-894-8400

MICROWAVE POWER DEVICES, Adams Ct., Plainview, N.Y., 11803, Tel: 516-433-1400, TWX: 510-221-1862; Empl: 53

Customer service: R. J. Sheloff

Free literature available: Solid state CW power amplifiers, solid state linear amplifiers, low noise solid state amplifiers, solid state IF amplifiers, solid state AM Modulators, solid state pulse amplifiers, and lab amplifiers.

Products manufactured: Amplifiers, Converters, Modulators, All Kinds, Transmitters

Local Sales Offices & Reps.

Ala Huntsville, Gentry Assocs. 204-534-9771
 Ariz Phoenix, R. A. Mayes Co. 602-279-5243
 Cal Inglewood, L & M Engrg. S. 213-674-6850
 Cal San Jose, L & M Engrg. 408-292-3220
 Colo Boulder, R.A. Mayes Co. 303-444-0782
 Fla Orlando, Gentry Assocs. 305-894-4401
 Fla St. Petersburg, Gentry Assocs. 813-867-7820
 Ill Mt. Prospect, Cain & Co. 312-253-3578
 Kans Prairie Village, Engrg. Servs. Co. 913-649-4000
 Md Silver Springs, Eastern Instrumentation Corp. 301-681-6500
 Mass Needham, Addelco Corp. 617-444-4754
 Mo St. Louis, Engrg. Serv. Co. 314-997-1515
 NJ Palisades Park, Scientific Devices - East 201-871-3916
 NM Albuquerque, R.A. Mayes Co. 505-292-2330
 NY N. Syracuse, Naco Elctns. Corp. 315-699-2651
 NY Rochester, Naco Elctns. Corp. 716-244-4720
 NC Burlington, Gentry Assocs. 919-227-3639
 Ohio Dayton, Cain & Co. 513-253-8144
 Ohio Lancaster, Cain & Co. 614-654-4800
 Pa Philadelphia, Eastern Instrumentation of Philadelphia 215-927-7777
 Tex Houston, R.A. Mayes Co. 713-461-5385
 Tex Richardson, R.A. Mayes Co. 214-235-3043
 Utah Centerville, R.A. Mayes Co. 801-292-6781
 EXP: Fla., Hallandale, Emec Inc. 305-925-6366
 FOR: Can., Montreal, Que., Electrodesign Ltd. 514-363-5120
 FOR: Can., Toronto, Ont., Electrodesign Ltd. 416-787-0991
 FOR: Can., Vanier, Ottawa, Electrodesign Ltd. 613-745-0541
 FOR: Can., Winnipeg, Manitoba, Electrodesign Ltd. 204-338-5050

MICROWAVE SEMICONDUCTOR CORP., 100 School House Rd., Somerset, N.J., 08873, Tel: 201-469-3311, TWX: 710-480-4730; Empl: 190

Products manufactured: Amplifiers, Generators, Transistors

MICROWAVE PRODS., INC., 9533 Irondale Ave., Chatsworth, Cal., 91311, Tel: 213-882-3434; Empl: 70

For info on price: C. T. Troesken; Application info: W. Perry; Customer service: W. Perry; Delivery info: C. T. Troesken

Products manufactured: Antennas, Circulators, Ferrite, Couplers, Filters, Isolators, Mixers, Strip-Line Components, Microwave

MICROWAVE/SYS, INC., 1 Adler Dr., E. Syracuse, N.Y., 13057, Tel: 315-437-9951, TWX: 710-541-0406; Empl: 50

Customer service: D. L. Bush

Products manufactured: Amplifiers, Analyzers, Calibrators, Couplers, Detectors, Discriminators, Dividers, Generators, Meters, Mixers, Monitors, Radar Systems, Receivers, Synchronizers, Klystron & BWO

Local Sales Offices & Reps.

Cal Anaheim, Blair Assocs. 714-635-1350
 Cal Portola Valley, Kipp Assocs. 415-851-0123
 Colo Denver, PLS Assocs. 303-771-0110
 DC Washington, SONCO 301-942-9420
 Fla Orlando, E.G. Holmes & Assocs. 305-894-8901
 Ga Chamblee, E.G. Holmes & Assocs. 404-451-6161
 Ill Chicago, Pivan Eng. 312-539-4838
 Kans Shawnee Mission, Pivan Eng. 913-722-1030
 Mass Waltham, Meas. Conslts. Corp. 617-890-4400
 Mich Detroit, S. Sterling Co. 313-255-1970
 Mo St. Louis, Pivan Eng. 314-567-3636
 NJ Englewood, Scientific Devices E 201-871-3916
 NM Albuquerque, PLS Assocs. 505-255-2330
 NY Syracuse, Ossmann Instrs. 315-437-6666
 Ohio Cleveland, S. Sterling Co. 216-442-8080
 Ohio Dayton, S. Sterling Co. 513-298-7573
 Pa Blue Bell, SONCO 215-242-8460
 Pa Pittsburgh, S. Sterling Co. 412-922-5726
 Tex Richardson, Lear Assocs. 214-231-5388

Wash Bellevue, Scientific Devices N.W.206-454-0900

MID-EASTERN INDS., Div. of Enanco, Inc., 660 Jerusalem Rd., Scotch Plains, N.J., 07076, Tel: 201-233-5900, TWX: 510-665-6752; FSC No: 06179; Empl.: 30; Minimum order: \$25 p. 1-1315-1318
For info on price: D. R. Ellenback; Application info: R. Huseur or D. Ellenback; Customer service: R. Daisey; Delivery info: M. Fullman

Free literature available: Catalog arranged so that you can quickly find the power supply that has the features and voltage current output you want.

Products manufactured: Chargers, Battery, Converters, Eliminators, Battery, Inverters, Power Supplies, Regulators

Local Sales Offices & Reps.

Cal Los Angeles, Dyna Sls.213-268-1175
Colo Denver, D. E. Bond Assocs.203-756-1234
Conn Guilford, R. H. Sturdy Co.203-966-2580
Conn New Canaan, R. H. Sturdy Co.203-966-2580
Fla Alamonte Spg., WMM Assocs.305-862-4700
Fla Clearwater, WMM Assocs., Inc.813-446-0075
Fla No. Palm Beach, WMM Assoc. Inc.305-848-9042

Fla Pompano Bch., WMM Assocs., Inc.305-943-3091
Ill Evanston, Mauer & Co.312-869-1644
Ill Skokie, Mauer & Co.312-677-4771
Ind Indianapolis, Mauer & Co.317-547-3259
Iowa Ft. Dodge, Heimann515-576-2374
Md Baltimore, J. R. Daniel & Co.301-825-3330
Mass Wellesley Hls., R. Sturdy617-235-2330
Mich Brighton, Dietrich & Assoc.313-961-4540
Mich Centerline, Dietrich & Assoc.313-754-6450
Minn Mpls., Heimann Co.612-861-6051
NJ Hazlet, Mer Mon Elec. Inst.201-264-1851
NJ Sussex, Enanco201-875-3860
NM Albuquerque, D. E. Bond Assoc.505-296-9111
NY Huntington, C.R. Mayer Co.516-WA 1-7876
Ohio Cleveland, Dietrich & Assoc.216-781-1855
Ohio Dayton, Dietrich & Assoc.513-223-6042
Pa Mt. Penn, Mer Mon Elctrn. Instrumentation215-779-1640
Pa Pittsburgh, Dietrich & Assoc.412-892-2992
Pa Willow Grove, J. R. Daniel Co.215-674-3880
Wash Seattle, Eicher-Richards Co.206-LA 3-7888

MID-WEST METAL PRODS., INC., 456 E. Donovan Rd., Kansas City, Kans., 66115, Tel: 913-342-8171; Empl.: 200

Products manufactured: Benches, Consoles, Stools, Tables, Boards, Plug-In, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Cabinets & Accessories, Cable Assemblies & Harnesses, Carts & Dollies, Instrument & Equipment, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Chassis, Metal, Circuits, Flexible, Frames, Cabinet & Rack, Jack Covers, Jigs And Fixtures, Chassis & Circuit Board, Panels, Racks, Services, Assembly, Production & Test

MIDGET LOUVER CO., 800 Main Ave., Norwalk, Conn., 06852, Tel: 203-866-2342; Empl.: 10

Free literature available: Circular 10-A and price list; also additional stuffers.

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Cabinets & Accessories

MIDLAND INTERNATIONAL CORP., 1909 Vernon St., No. Kansas City, Mo., 64116, Tel: 816-474-5080, Telex: 42-6344; Empl.: 200; Minimum order: \$1000

For info on price: J. Hart; Application info: D. Saxon; Customer service: J. Hart; Delivery info: J. Hart

Products manufactured: Antennas, Batteries, Comm. Systems, Converters, Crystals, Cutters, Wire, Hand Operated, Filters, Flashlights & Lanterns, Meters, Microphones, All Kinds, Pickups, Telephone (For Recording), Power Supplies, Public Address Systems, Receivers, Recorders, Speaker Systems, Speakers, Testers, Transceivers

Local Sales Offices & Reps.

Ala Birmingham, Adams & Assocs.205-822-8109
Alas Anchorage, C. E. Garrett907-279-7585
Ark El Dorado, D. Bellew Sls.501-863-8325
Cal Emoryville, Assc. Rep & Whse.415-653-3838
Cal Torrance, Barston & Doran213-325-4140
Colo Englewood, E.S.P. Co.303-781-4409
Ind Indianapolis, Kingston - Sharkey Assocs.317-353-9406
Iowa Des Moines, Beams515-282-0292
La Kenner, D. Bellen Sls.504-729-4550
Md Seabrook, Taylor Mktg.301-864-4011
Mass Lynne, Keene Sls. Co.617-595-2300
Mich Brighton, Leetro Sls. Co.313-632-7941

Minn Minneapolis, H.M.R.612-920-8200
NJ Teaneck, S. Axelrod Assocs.201-836-6661
NY Syracuse, W. Tauber Co.315-446-7094
NC Greensboro, Adams & Assocs.919-272-6838
Ohio Columbus Station, C.L. Pugh & Assocs.216-235-6028
Pa Laverock, M. Weinberg Assocs.215-549-1122
Tenn Memphis, G. Venable901-365-9437
Tex Dallas, Roman Sls. Co.214-358-2152
Wash Seattle, James J. Backer Co.206-285-1300
EXP: Mo Kansas City, R. B. Thetford816-842-0511

MIDWEC DIV., Independent Cable, Box 417 G, Scottsbluff, Neb., 69361, Tel: 308-632-4127, TWX: 910-627-0061; Empl.: 300; Minimum order: \$50 p. 2-187-190

For info on price: D. Williamson; Application info: J. Tierney; Customer service: J. Tierney; Delivery info: D. Williamson

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Ariz Phoenix, Toward Engr. Assoc.602-955-3193
Cal Long Beach, Emerson Kirk Engr.213-439-9559
Cal Mountain View, Catron/Pyle Inc.415-964-3244
Colo Denver, Checkmate Sls.303-771-4920
Conn Washington Depot, Kanan Assocs.203-868-0513
Ga Atlanta, G. Duckett Sls.404-451-3529
Ill Northbrook, Raines Brin Assoc.312-498-0890
Md Baltimore, Kaufholz Assoc.301-488-6561
Mass Reading, Kanan Assocs.617-944-8484
Mich Plymouth, Romarc313-455-0300
Minn St. Paul, Knox Assoc.612-488-5402
Neb Lincoln, Mktg. Assoc.402-464-5244
NY Port Washington, P.D. Aaron516-883-0600
NY Syracuse, L.D. Allen Inc.315-458-7470
NC Charlotte, G. Duckett Sls.404-451-3529
Ohio Cincinnati, J. Olsen Co.513-922-2176
Ohio Cleveland, J. Olsen Co.216-752-5444
Ore Portland, C.K. Shanks Assoc.503-292-5656
Pa Newton Square, Kaufholz Assoc.215-356-5000
Pa Pittsburgh, J. Olsen Co.412-279-2550
Tex Dallas, United Comps.214-324-1448
FOR: Can., Montreal, Que., Vitel Elctns.514-331-7393
FOR: Can., Toronto, Ont., Vitel Elctns.416-622-6300

Local Distributors

Cal Belmont, Eric Electronics, 111 Glenn Way415-593-8284
Mass Newton, Greene-Shaw, 70 Bridge St.617-969-8900
NY Buffalo, Summit Dr.516-883-0600
NY Port Washington, Connector Concepts, Box 511516-883-0600
Ohio Cleveland, Gateway, 30214 Lakeland Blvd.216-944-8565
Pa Huntingdon Valley, Hallmark, 458 Pike Rd.215-355-7300

MIDWEST ELECTRONIC INDUSTRIES, 4945 W. Belmont Ave., Chicago, Ill., 60641, Tel: 312-626-0030, TWX: 910-221-5247; Empl.: 64

For info on price: E. Taylor; Application info: E. Chapman; Customer service: C. Sweeney; Delivery info: K. Kramer

Products manufactured: Amplifiers, Microphones, All Kinds, Speakers

Local Sales Offices & Reps.

Ind Indianapolis317-426-3736
Iowa Cedar Rapids319-362-4410
Wisc Waukesha414-542-5129

MIIDA ELECTRNS., 14 Henderson Dr., W. Caldwell, NJ, 07006

MIKRON INSTR. CO., Box 211, Ridgewood, N.J., 07451, Tel: 201-891-7330; Empl.: 15

For info on price: J. E. Galbraith; Application info: J. E. Galbraith; Customer service: K. B. Davis; Delivery info: K. B. Davis

Free literature available: Sales brochures for each model.

Products manufactured: Bolometers, Controls/Control Eqpt., Detectors, Pyrometers, Radiometers

Local Sales Offices & Reps.

Ariz Tempe, Lietz Equip. Co.602-968-4991
Cal Gardena, Instr. Lab.213-770-0650
Cal Palo Alto, Instr. Lab.415-328-1040
Colo Denver, TESCO Co.303-744-1119
Conn Westport, A. J. Abrams Co.203-226-3010
Fla Winter Haven, Engineered Equip. Co.813-294-6520
Haw Mililani Town, H. C. Burgess & Assocs.808-623-3118

Ill Westchester, Murphy & Dickey312-344-5660
Iowa Cedar Rapids, H. E. Ferris319-362-9156
Iowa Des Moines, H. E. Ferris515-255-5008
La Baton Rouge, Alford, Woods & Childs504-275-5480
Mass Lowell, Moisan Assocs.617-452-5003
Mich Dearborn, Ind. Temperature Control313-278-2210
Minn Minneapolis, G. J. Winikates & Co.612-546-5770

Mo St. Louis, EV Miller Co.314-821-2610
NJ Brielle, H. V. Good Co.201-528-5251
NJ Riverdale, B. Most Assocs.201-839-4333
NM Albuquerque, Lietz Equip. Co.505-266-5821
NY E. Rochester, Thermal Systems716-377-1970
NY N. Syracuse, Thermal Systems315-458-5202
NY Orchard Park, Thermal Systems716-662-5560
NC Charlotte, J. L. Highsmith & Co.704-333-7743
Ohio Brecksville, D & B Engrg. Sls.216-526-6320
Ohio Cincinnati, G. H. Drysdale & Assocs.513-752-2069

Okla Tulsa, Wallace Equip. Co.918-747-6749
Ore Portland, Branom Instr. Co.503-285-9861
Pa Bridgeville, Instr. Servs.412-221-3600
Tenn Oak Ridge, Tech. Equip. Supp.615-483-4285
Tex Houston, Alford, Woods & Childs713-488-2730
Va Richmond, Advance Control Equip.804-270-6180

Wash Seattle, Branom Instr. Co.206-762-7052
WVa St. Albans, Instr. Servs.304-722-2953
Wisc Menomonee Falls, Fritz Engrg. Sls. Co.414-251-6590

FOR: Calgary, 27, Alberta, Can., Lee Instr. & Supp.403-252-4222

FOR: Downs View, Ont., Can., Tubefit Ltd.416-743-1661

FOR: Lachine, Que., Can., Instron-Test Ltd.514-637-1231

FOR: Sarnia, Ont., Can., Tubefit Ltd.519-344-5271

FOR: Vancouver 9, B.C., Can., Branom Instr. Co.604-736-7794

MIL ELECTRONICS, 176 Walker St., Lowell, Mass., 01854, Tel: 617-453-4142, Telex: 94-7490; Empl.: 35

p. 1-1319-1324

For info on price: B. W. Eldridge; Application info: B. W. Eldridge; Customer service: M. Gaudette; Delivery info: M. Gaudette

Free literature available: Catalog 7406-dc-dc encapsulated power converters. Catalog 735-ac-dc encapsulated power supplies.

Products manufactured: Converters, Power Supplies

Local Sales Offices & Reps.

Ala Huntsville, Scientific Dev.205-536-1969
Ala Huntsville, Scientific Dev SE303-789-4149
Ariz Tempe, Hall Co.213-636-6124
Cal Lynwood, Dick West & Assocs.415-365-6082
Cal San Carlos, Winco Sls.303-789-4149
Colo Englewood, Hall Co.203-239-2507
Conn North Haven, Northeast Reps.305-841-8180
Fla Fort Lauderdale, Scientific Devs S.E.312-256-5205
Fla Orlando, Scientific Dev - Southeast617-533-2041

Ill Wilmette, Crest Assocs.617-449-3034
Ind Indianapolis, Crest Assocs.313-642-0203

Mass Medway, Sural Int'l612-922-1425
Mass Needham, Northeast Reps.214-351-6964
Mass Needham Heights, Northeast Reps.703-280-2086
Mich Bloomfield Hills, Ellinger Sls.-Mich.313-642-0203

Minn Minneapolis, R-J Inc.612-922-1425
NJ Marmora, Holdsworth & Co.518-377-0581
NY Schenectady, N. W. Alexander & Assocs.914-793-1660

NY Tuckahoe, Spectrum Sls.215-356-8550
NC Burlington, Scientific Devs., S.E.214-351-6964
Ohio Chagrin Falls, Crest Comp Sls.216-543-9808
Pa Newton Square, Holdsworth & Co.703-280-2086

Tex Dallas, Precision Sls.215-356-8550
Va Annandale, J. Hopkins Assocs.214-351-6964
Wash Bellevue, A. Smith Co.703-280-2086

FOR: Can., Don Mills, Ont., G. M. Fraser Ltd.

MIL SPEC WIRE & CABLE CORP., 404 N. Main St., Freeport, N.Y., 11520, Tel: 516-546-5454

Products manufactured: Cable, Cable Retractors, Tubing, Wire, Wire Shielding

MILERTRONICS, 525-A Airport Rd., Greenville, S.C., 29607, Tel: 803-242-9232; Empl.: 8

For info on price: G. G. Miller, Jr.; Application info: M. D. Webb; Customer service: P. G. Arms; Delivery info: M. D. Webb

Free literature available: Application Notes 101
READ ONLY MEMORIES and 201 DESIGN AND PROGRAMMING OF PROGRAMMABLE ROM MEMORY BOARDS. Brochures: ROM Programmers. DM-2000 Diode Matrix Programmer (Universal).

Products manufactured: Boards, Programming, Integrated Circuit Devices, Programmers

Local Sales Offices & Reps.

Ala Huntsville, F.M. Assocs. 205-536-9990
 Conn Ellington, Daner-Hayes 203-875-5157
 Fla Orlando, F. M. Assocs. 305-851-5710
 Ga Atlanta, F. M. Assocs. 305-851-5710
 Mass Newton Centre, Daner-Hayes 617-969-4650
 NJ Port Washington, Daner-Hayes 516-883-4576
 NC Greensboro, F. M. Assocs. 919-294-2754
 Pa Erie, Ecco Elctn. Sls. 814-452-3762
 Va Fairfax, Nine Assocs. 703-273-1803

Advertisement

MilerTronics div. of George Miler Inc. designs and manufactures IC test equipment. Product line includes ROM programmers and accessories and diode matrix programmers. The MilerTronics ROM programmers include a remote socket. These programmers will operate fully automatically using the MilerTronics duplicator or tape cassette accessories and can be interfaced with computers. MilerTronics also designs and builds custom microprocessor systems.

MILGO ELECTRONIC CORP., 8600 N.W. 41st Street, Miami, Fla., 33166, Tel: 305-592-8600, TWX: 810-848-6588; Empl.: 1485

Products manufactured: Comm. Systems, Modulator/Demodulators, Terminals, Data Display (including Alphanumeric & Graphic), Testers

MILLEN MFG. CO. INC., JAMES, 150 Exchange St., Malden, Mass., 02148, Tel: 617-324-4108; FSC No: 76487; Empl.: 500; Minimum order: \$25

p. 2*1240-1253

For info on price: A. B. Caputo; Application info: O. I. Haszard; Customer service: A. B. Caputo; Delivery info: A. B. Caputo

Free literature available: General Catalog- 12 pages. Condensed Listing; Price List- 2 pages - Items in General Catalog; Shaft Hardware Bulletin- 8 pages. Dials-Couplings-Drives-Shaft Hardware; Oscilloscope/Magnetic Shield Bulletin- 24 pages; Selecting Magnetic Materials; Use of Magnetic Foil.

Products manufactured: Amplifiers, Antenna Feed Systems, Bezels, Shielded & Unshielded, Boards, Plug-In, Bridges, Capacitors, Variable, Caps, Connector, Chamber, Environmental Test, Chokes, Clamps & Clips, Coatings, Coils Including Assemblies & Forms, Connectors, Containers, Counters, Couplers, Couplings, Delay Lines, Detectors, Dials, Discriminators, Display Devices/Displays, Drives & Drive Mechanisms (Dial), Jacks (All Types), Knobs, Locks, Dial & Shaft, Meters, Modulators, All Kinds, Monitors, Networks, Oscilloscope Plug-Ins, Oscilloscopes, Plug & Jack Sets, Plugs, Pointers, Dial, Posts, Power Supplies, Probes, RFI Measuring Equipment, Scales, Dial, Shields, Shifters, Sockets, Standards, Switches, Terminal Blocks, Boards & Strips, Terminals, Transformers

Local Sales Offices & Reps.

Cal Los Angeles, W.S. Harmon Co. 213-937-1460
 Cal Millbrae, Polach & Bensinger, Inc. 415-697-2525
 Cal Pasadena, D. Ellis Co. 213-681-9108
 Conn Newtown, Gerber Sls. Corp. 203-426-3440
 Ill Streamwood, Al Holte & Assoc. 312-837-4066
 Mass Waltham, Gerber Sls. Corp. 617-890-8040
 NY Great Neck, J. DiBlasi Assoc. 516-482-4040
 NY Pittsford, D. Hurley Sls., Inc. 716-586-6159
 Pa Havertown, Liberi Sls. 215-789-8150
 Tex Richardson, Air Quip Sls. Co. 214-234-3285
 EXP: Lakehurst, N.J., Tech. Equip. Co. 201-349-1716

Local Distributors

Cal Palo Alto, Zack Elctns., 654 High St. 415-326-5432

Fla Miami, Elctn. Equip. Co., 2701 N.W. 42nd Ave. 305-871-3500

MILLER, J.W. CO., See Bell Inds.

MILLER, L.C. CO., 717 Monterey Pass Rd., Monterey Park, Calif., 91754, Tel: 213-268-3611; Empl.: 49
 Customer service: R. D. Kelly

Products manufactured: Heaters & Heating Elements, Soldering Accessories, Soldering Equipment

MILLER, SANFORD CORP., See Sanford-Miller Corp.

MILLER-STEPHENSON CHEM. CO., INC., Box 628, Danbury, Conn., 06810, Tel: 203-743-4447; Empl.: 500

For info on price: F. H. Bodnar; Application info: J. R. Laverdure; Customer service: F. H. Bodnar; Delivery info: F. H. Bodnar

Products manufactured: Adhesives (All Types), Chemicals, Cleaners & Solvents, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Coolants, Circuit & Components, Lubricants

Local Sales Offices & Reps.

Ariz Phoenix, H.C. Torrey Assoc. 602-944-0352
 Cal Los Angeles, Miller-Stephenson Chem. 213-624-3887
 Colo Denver, Ind. Hardware Co. 303-426-1443
 Fla Merritt Isle, J. A. Kennedy 305-452-9821
 Ill Chicago, Miller-Stephenson Chem. 312-761-4272

FOR: Can., Toronto, Miller-Stephenson Chem. 416-364-0111

Local Distributors

For: Fr., Montgeron, POLYTRONIX S.A. 903-22-50
 For: G. B., Scotland, D. Fraser & Co. Uddington 3476

For: Ger., Hamburg, Detakta 0411/513051
 For: It., Milano, Aldo Garzanti S.A.S. 654-621
 For: Lebanon, Beirut, Freon* Products Middle East 20845LE

For: Neth., Amsterdam, G. L. Loos & Co.'s. 020-822851

For: Spain, Valencia, JASO 23 70 90
 For: Swit., Basle, Matera AG Basle 061 06 30

Advertisement

Aerosol Products for electronics, computers/communications/maintenance

MS-122 Fluorocarbon Release Agent
 MS-150 En-Rust Rust Inhibitor
 MS-160 Freon T-P 35 Solvent
 MS-166 En-Stat Static Eliminator
 MS-170 I, I, I-Trichloroethane
 MS-180 Freon TF Solvent
 MS-185 Freon TA Solvent
 MS-190/MS-190HD Flux Removers
 MS-200 Magnetic Tape Head Cleaner
 MS-220 Aero-Duster
 MS-226 Cobra Extension Brush Kit
 MS-230 Contact Re-Nu
 MS-238 "Clean 'n Lube" Contact Cleaner
 MS-240 Quik-Freeze
 MS-260 Cleaner Plastic/Glass/Metal
 MS-400 Strippable Masking Film
 MS-450 Protective Varnish
 MS-111 Epoxy Stripper, Resins, Curing Agents

MILLER, W. A. CO., Mingo Loop, Oquossoc, Me., 04964, Tel: 207-864-3343; Empl.: 32

Customer service: R. Wentzell

Free literature available: Upon request literature with approximate pricing describing our custom-built Ruggedized Formica Cases, cabinets, and enclosures

Products manufactured: Cabinets & Accessories, Cases, Equipment, Instrument, Meter

MILLS RESISTOR CO., 10810 Kaylor St., Los Alamitos, Cal., 90720, Tel: 213-598-2454; FSC No: 34238; Empl.: 22

For info on price: M. Gough; Application info: T. Mills; Customer service: T. Mills; Delivery info: M. Gough

Free literature available: General Catalog; Metric Catalog; Precision Power Resistor Release; Miniature (MR 510) Resistor Page; Dual Miniature Resistor Specification.

Products manufactured: Networks, Resistors

Local Sales Offices & Reps.

Cal Clairemont, Nelgo Assocs. 714-621-1224
 Cal Los Altos, Frauman Assocs. 415-941-0660
 Fla Belleair Beach, Consultants for Industry 813-595-1486
 Ind Carmel, Rich Elctns. Mktg. 317-844-8462
 Mo Kansas City, Nevco 816-421-1751
 NY Valley Stream, Levison Sls. Co. 516-561-9696
 Tex Houston, Ev Smith Sls. 713-649-5756
 Va Lynchburg, J. A. Griffin 804-384-5236
 Wash Bellevue, Rowe/Northwest 206-455-2686

MILWAUKEE RESISTOR CORP., 700 W. Virginia St., Milwaukee, Wisc., 53204, Tel: 414-271-9900; FSC No: 82807; QPL No: 15109; Empl.: 90; Minimum order: \$25 p. 2*1500, 1501

For info on price: C. Gormanson; Application info: R. Amacher; Customer service: C. Gormanson; Delivery info: C. Gormanson

Free literature available: Product Bulletins Covering Our Line of Wire-Wound Power Resistors in the Range of 3-2000 Watts, and Grid Resistors 2000 Watts and Above.

Products manufactured: Alarms, Resistor, Hardware, Resistors

Local Sales Offices & Reps.

Ala Gadsden, F.C. Nickerson Co. 205-547-7718
 Cal Mountain View, Wes-K Assocs. 415-964-5454
 Cal San Diego, Wes-K Assocs. 714-276-7541
 Cal Van Nuys, Wes-K Assocs. 213-989-3070
 Colo Denver, Nelson Co. 303-733-5528
 Conn West Haven, Johnson Assocs. 203-932-0162
 Fla Oldsmar, F.C. Nickerson Co. 813-855-4209
 Fla Tampa, F.C. Nickerson Co. 813-885-1416
 Ga Atlanta, F.C. Nickerson Co. 404-321-4678
 Ill Evanston, W.F. Swinke & Assocs. 312-248-4343
 Ind Ft. Wayne, W.W. Bieberich 219-432-2537
 Ind New Albany, W.W. Bieberich 812-945-3187
 Iowa Cedar Rapids, Technical Reps. 319-363-2409
 Kans Olathe, Technical Reps. 913-782-1177
 Mass Wellesley, Johnson Assocs. 617-235-3977
 Minn Minneapolis, C.R. Gibb Co. 612-377-1200
 Mo Maryland Heights, Kattelmann & Co. 314-434-6875

NH E. Wakefield, Johnson Assoc. 603-522-8512
 NJ Haddonfield, Braddock Assocs. 609-429-0087
 NY Forest Hills, Miller Co. 212-263-4446
 NY Rochester, Gislaon Sls. 716-454-4741
 NC Kannapolis, F.C. Nickerson Co. 704-932-6772
 Ohio Cincinnati, Val-Skol Sls. 513-563-6790
 Ore Portland, R.M. Minthorne Co. 503-246-4556
 Tex Dallas, R.E. Nesbitt Co. 214-357-4601
 Tex Houston, R.E. Nesbitt Co. 713-224-3633
 Exp: Teaneck, N.J., S. Ginsbury, Ltd. 201-837-1100
 EXP: Downsview, Ont., Can., F. Eakin Ltd. 416-638-0451

MINCO PRODUCTS INC., 7300 Commerce Lane, Minneapolis, Minn., 55432, Tel: 612-786-3121, TWX: 910-576-2848; Empl.: 200; Minimum order: \$20

Customer service: L. Hanson

Free literature available: 1) Bulletin TS-100 - Temperature sensors for general purpose, industrial, and laboratory applications. 2) Bulletin HE-100 - Heating elements and assemblies. Thin flexible patch, strip and spot heaters.

Products manufactured: Circuits, Flexible, Heaters & Heating Elements, Thermocouples, Elements & Accessories, Thermometers, Resistance

Local Sales Offices & Reps.

Ala Huntsville, Technical Sls. 205-881-1750
 Cal Los Gatos, Industrial Mktg. Assocs. 408-358-1734
 Cal South Pasadena, Pentagon Co. 213-799-7141
 Ill Chicago, Thermo/Cense 312-792-2760
 Md Wheaton, Magyar & Assocs. 301-871-8833
 Mass Allston, Magyar & Assocs. 617-566-9759
 NJ Livingston, A.A. Budde & Assoc. 201-994-1210
 NJ Middlesex, Magyar & Assocs. 201-752-4848
 Ohio Brecksville, A. Nace Co. 216-526-4323
 Ore Portland, McLaren, Inc. 503-297-2248
 Pa Philadelphia, Magyar & Assocs. 215-763-5044
 Tex Richardson, Air Quip Sls. Co. 214-234-3285
 Wash Bellevue, McLaren, Inc. 206-454-3400
 WV Charleston, Scaff Engrg. Co. 304-342-0131

MINE SAFETY APPLIANCES CO., 400 Penn Center Blvd., Pittsburgh, Pa, 15235, Tel: 412-241-5900, TWX: 710-797-3895; Empl.: 2000; Minimum order: \$10

Free literature available: Data Sheets on all products including Description, Application, Specifications and ordering information

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Alarms, Analyzers, Batteries, Blowers & Fans & Accessories, Calibrators, Chargers, Battery, Coatings, Comm. Systems, Counters, Detectors, Meters

Local Sales Offices & Reps.

Ala	Birmingham	205-592-2077
Ariz	Tucson	602-623-1814
Cal	Los Angeles	213-875-2905
Cal	San Diego	714-26-5720
Cal	San Francisco	415-871-6700
Conn	Bridgeport	203-335-9639
DC	Washington	202-621-1221
Ill	Chicago	312-921-7474
Ind	Indianapolis	317-547-4407
Kans	Lenexa	913-888-2628
La	New Orleans	504-486-5368
Md	Baltimore	301-828-6363
Mass	Boston	617-364-2828
Mich	Detroit	313-272-7717
Mo	St. Louis	314-533-2550
NJ	Mountainside	201-232-3490
NY	New York	212-697-1350
NY	Tonawanda	716-694-2737
Ohio	Cleveland	216-461-6300
Ore	Portland	503-CO 9922
Pa	Philadelphia	215-622-2121
Pa	Pittsburgh	412-241-6332
RI	Esmond	401-231-6900
Tex	Dallas	214-631-2670
Tex	Houston	713-785-4040
Utah	Salt Lake City	801-355-7517
Wash	Seattle	206-763-9666
WVa	Bluefield	304-327-5171

MINELCO, DIV. GENERAL TIME CORP., 135 S. Main St., Thomaston, Conn., 06787, Tel: 203-283-8261, TWX: 710-475-1091; FSC No: 07479; Empl: 66

For info on price: M. Tanski Ext. 270; Application info: W. Gillis; Customer service: M. Tanski; Delivery info: M. Tanski

Free literature available: Short Form Catalog (SFC-1) includes brief description of all products on four pages. Data sheets on each product also available.

Products manufactured: Indicators, Potentiometers, Switches

Local Sales Offices & Reps.

Ariz	Phoenix, Thorson Co.	602-956-5300
Cal	Alhambra, M.W. Riedel & Co.	213-283-7694
Cal	Daly City, R Del Buchia & Assoc.	415-756-1664
Ga	Atlanta, Beacon Elec. Assoc.	404-351-3654
Ill	Wilmette, Crest Assoc.	312-256-5202
Iowa	Cedar Rapids, Jr Sls. Eng.	319-377-8211
Kans	Overland Park, Penzner-Mankus Assoc.	913-381-0004
Mass	Waltham, Conti-Younger Assoc.	617-890-4582
Mich	Oak Park, Willard Spenser Co.	313-398-8005
Minn	St. Paul, Northport Eng.	612-698-3841
NY	Huntington Station, Addem Group	516-567-5900
NY	Syracuse, Rep Tech	315-437-2845
Ohio	Cleveland, Geotronix Mktg. Assoc.	216-243-8520
Tex	Dallas, Bradenco Corp.	214-358-3278
Wash	Seattle, RK Squibb	206-632-2450
EXP:	Huntington Station, N.Y., Airsupply Intl.	212-291-8885

MINI-CIRCUITS LAB., Div. Scientific Comps. Corp., 2913 Quentin Rd., Brooklyn, N.Y., 11229, Tel: 212-252-5252; Empl: 15

Products manufactured: Attenuators, Detectors, Dividers, Indicators, Mixers, Modulators, All Kinds, Multipliers, Transformers

Local Sales Offices & Reps.

Cal	Los Altos, Cain-White & Co.	415-948-6533
Cal	N. Hollywood, Crown Elctns.	213-877-3550
Ill	Mount Prospect, Cain & Co.	312-253-3578
Mass	So. Chelmsford, IMR	617-256-8251
NY	East Rockaway, W Bellenkes Assoc.	516-LY 9-8260
Ohio	Dayton, Cain & Co.	219-482-4411
Ohio	Reynoldsburg, Cain & Co.	614-861-2119
Pa	Lafayette Hill, M. Lader & Co.	215-825-3177
Tex	Dallas, Cain & Co.	214-233-6809
Va	Woodbridge, M. Lader & Co.	703-494-4731

MINI-SYSTEMS, INC., 20 David Rd., North Attleboro, Mass., 02761, Tel: 617-695-0206, TWX: 710-348-0564; FSC No: 50316; Empl: 58; Minimum order: \$10

p. 2-1502, 1503

For info on price: D. Rice; Application info: P. Boivin; Customer service: G. Robertson; Delivery info: J. Sweeney

Free literature available: Precision Thick Film Chip Resistors (MIL-Spec. Hi Rel applications); Miniature Single, Dual, Triple Op Amps; FET Input Op Amps; Chip Attenuators; Hybrid Jumpers and padders.

Products manufactured: Amplifiers, Attenuators, Capacitors, Fixed, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Diodes, Jumpers, Packages, Integrated Circuit, Pads, Transistor Mounting, Resistors, Seals, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Ariz	Phoenix, J.S. Heaton Co.	602-264-7887
Colo	Denver, J.S. Heaton Co.	303-758-5130

MINNEAPOLIS SPEAKER CO., 3806 Grand Ave. S., Minneapolis, Minn., 55409, Tel: 612-825-1010;

Minimum order: \$10

Customer service: Sls. Off.

Free literature available: Form C74 Full Line Descriptive Catalog; Form MB474 Mini-Speaker Brochure; Form 671 Descriptive Brochure Describing Loudspeaker Construction, "All About Speakers"

Products manufactured: Speaker Systems, Speakers

Local Sales Offices & Reps.

Ala	Birmingham, J.F. Russell Sls. Co.	205-822-2196
Cal	Gardena, Bidwell Sls. Assocs.	213-770-0300
Cal	Oakland, Sinclair Elctns. Assoc.	415-451-7485
Fla	Pembroke Pines, J. Wanger Sls. Co.	305-987-8766
Ill	Chicago, T. Pappas & Assoc.	312-685-2338
Iowa	Marion, Thomas & Modrcin Assoc.	319-377-6261
Kans	Shawnee Mission, Thomas & Modrcin Assoc.	913-432-2131
Md	Baltimore, Par-Nell Sls. Co.	301-655-2944
Mass	Bedford, Chamberlin & Murray	617-274-0044
Mich	Bloomfield Hills, Central Elctns. Sls. Co.	313-852-4308
Mo	Hazelwood, Thomas & Modrcin Assoc.	314-838-6446
NY	Roslyn Heights, S.I.R. Sls., Inc.	516-621-7485
NY	Syracuse, Wm. Tauber Co.	315-446-7094
Ohio	Cincinnati, J.O. Olsen Co.	513-825-0678
Ohio	Cleveland, J.O. Olsen Co.	216-752-5444
Ore	Portland, J. LeBrun Co.	503-244-6805
Pa	Holland, Par-Nell Sls. Co.	215-355-9330
Pa	Pittsburgh, J.O. Olsen Co.	412-341-8391
SC	Greenville, H.C. Norman Sls. Co.	802-244-6254
Tex	Dallas, Techno Assocs.	214-357-9213

MINNESOTA RUBBER CO., 3630 Wooddale Ave., Minneapolis, Minn., 55416, Tel: 612-929-6781; Empl: 800; Minimum order: \$10

Customer service: R. K. Matlocks

Products manufactured: Feedthrus & Seals, Environmental, Rubber, Seals, Services, Assembly, Production & Test

MITEG INC., 100 Ricefield La., Hauppauge, N.Y., 11787, Tel: 516-543-8873, TWX: 510-226-3781; Empl: 25

For info on price: A. Kiiss; Application info: A. Kiiss; Customer service: A. Faverio; Delivery info: A. Faverio

Products manufactured: Amplifiers, Converters, Mixer-Preamplifiers, Microwave, Mixers, Multipliers, Oscillators

Local Sales Offices & Reps.

Ariz	Scottsdale, Fryco Inc.	602-945-3281
Cal	Mountain View, Microwave Mktg. Assocs.	415-969-3355
Cal	North Hollywood, Crown Elctns.	213-877-3550
Fla	Orlando, Gra-Mar	
Mass	Natick, Spectrum Energy	617-237-4030
Minn	Minneapolis, Saturn Co.	
NJ	Haworth, Central Assocs.	201-568-0808
NJ	Moorestown, N. Stern	609-234-0661
NY	Plainview, Central Assocs.	516-433-0808
Ohio	Dayton, Ashby Assocs.	513-252-5627
Va	Alexandria, Dyna Rep Co.	703-354-1222
FOR	Can., Don Mills, Ont., B. D. Vallilille Elctns Ltd.	416-447-8482

MITSUBISHI INT'L CORP., MGA Div., 7045 N. Ridgeway Ave., Lincolnwood, Ill., 60465

MKC ELECTRONICS, 454 E. Donovan Rd., Kansas City, Kans., 66115, Tel: 913-371-1351; Empl: 26

Customer service: V. M. Mathews

Products manufactured: Controls/Control Eqpt., Counters, Drivers, Solenoid, Relays, Timers

MKS INSTRS., INC., 25 Adams Street, Burlington, Mass., 01803, Tel: 617-272-9255; Empl: 50; Minimum order: \$25

Customer service: E. Mortberg

Products manufactured: Controls/Control Eqpt., Detectors, Gages, Transducers

M M ELCTRN. ENCLOSURES, 111 Bloomingdale Rd., Hicksville, N.Y., 11801, Tel: 516-935-9400, TWX: 510-221-1857

Products manufactured: Cases, Equipment, Instrument, Meter, Cases, Transit, Containers

Local Sales Offices & Reps.

Ala	Huntsville, BJR Inds.	205-881-3569
Ariz	Scottsdale, Vinson	602-947-7371
Cal	Los Angeles, Daton Engrg. Co.	213-479-4211
Cal	Santa Clara, Vico Sls. Co.	408-298-5944
Colo	Denver, Vinson Assocs.	303-757-5151
Conn	Kensington, N.S. Stachalek	203-VA 8-4587
Fla	Indian Rocks Bch., Tech. Rep.	813-595-2834
Fla	Melbourne, Tech. Rep. Assocs.	305-723-9140
Ga	Jonesboro, Tech. Rep. Assocs.	404-753-0111
Ill	Northfield, Adcon Assocs.	312-446-6486
Kans	Mission, Tech. Sls. Assocs.	913-831-2888
Mass	W. Acton, K.B. Reidy	617-CO 3-7146
Mich	Farmington, Carter, McCormic & Peirce, Inc.	313-477-7700
Minn	Mpls., Hasse & Assocs.	612-588-0551
Mo	St. Louis, Tech-Sls.	314-725-5361
NJ	Haddonfield, M & S Assocs.	609-HA 9-7055
NJ	Raritan, J & L Assocs.	201-722-0682
NM	Albuquerque, Vinson Assocs.	505-298-7442
NY	Utica, R. J. Davis Assoc.	315-724-5773
Ohio	Cleveland, Carter, McCormic & Peirce	216-333-5650
Ohio	Dayton, Carter, McCormic & Peirce	513-278-5873
Pa	Pittsburgh, Carter, McCormic & Peirce, Inc.	412-824-3760
Tex	Dallas, Blair Engrg. Sls.	214-352-8411

MOBAY CHEM. CORPORATION, Pittsburgh, Pa., 15205, Tel: 412-923-2700

Products manufactured: Coatings, Insulators & Insulation, Plastic Raw Materials, Liquids, Pellets, Powders, Resins

MOBIL ELECTRONICS, INC., Box 1132, Anderson, Ind., 46015, Tel: 317-642-7976; Empl: 6-9; Minimum order: \$10

For info on price: H. P. Hart; Application info: J. M. Hart; Customer service: H. Z. Hart; Delivery info: H. Z. Hart

Free literature available: on all products

Products manufactured: Amplifiers, Baffles, Speaker, Boards, Printed Circuit, Boxes, Junction, Outlets & Wall Plates, Cabinets & Accessories, Carts & Dollies, Instrument & Equipment, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Chassis, Metal, Comm. Systems, Converters, Couplers, Decoders, Encoders, Generators, Grilles, Handles For Cabinets, Circuit Boards, Racks, etc., Meters, Panels, Racks, Receivers, Services, Assembly, Production & Test, Speaker Systems, Switches, Transceivers, Transmitters

MOBIL-TRONICS, Box 1022, Tustin, Cal., 92680, Tel: 714-832-6744; Empl: 2

Customer service: B. Somodi

Free literature available: Mobil-Tronics' catalog presents over 100 instrument and utility carts, scope carts, stainless steel carts, lab carts, and test equipment carts for use in all industries.

Products manufactured: Carts & Dollies, Instrument & Equipment

MODPAK, 31 A Green St., Waltham, Mass., 02154, Tel: 617-891-7048, TWX: 710-324-6484; Empl: 4

For info on price: C. Lindbohm; Application info: A. Cerullo; Customer service: A. Cerullo; Delivery info: C. Lindbohm

Free literature available: Literature & information describing MODPAK's electronic packaging devices and MODPAK'S new circuit boxes and prototype engineering kit

Products manufactured: Boxes, Junction, Outlets & Wall Plates, Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Connectors, Containers, Frames, Cabinet & Rack, Holders, Circuit Board (Production Type), Integrated Circuit Packaging Systems, Kits, Breadboarding (For Engineers), Kits, Shielding, Kits, Test Equipment, Packages, Integrated Circuit, Racks, Services, Assembly, Production & Test, Shields, Strip-Line Components, Microwave

Local Sales Offices & Reps.

Ala	Huntsville, Reynolds & Assocs.	205-536-1941
Ariz	Phoenix, Thorson Co.	602-956-5300
Cal	Burbank, Wright Omnia	213-843-7240
Cal	Los Altos, Wright Eng.	415-941-4405
Cal	San Diego, Wright Omnia	213-843-7240
Colo	Denver, Thorson Co.	303-355-3521
Fla	Palm Beach, Reynolds & Assoc.	305-622-4336
Fla	Satellite Beach, Reynolds & Assoc.	305-773-4700
Ga	Atlanta, Reynolds & Assoc.	404-252-5360
Mass	Waltham, Russell Engrg. Sls.	617-458-7146
NY	Buffalo, Harries & Kershaw	716-652-1221
NY	Mt. Vernon, Friedman-Smith	914-664-4866
NY	Rochester, Harries & Kershaw	716-671-6365
NY	Syracuse, Harries & Kershaw	315-637-9871
Pa	Plymouth Meeting, Ron-Mar Co.	215-825-2841
Tx	Dallas, Stevens Sls.	214-350-2476
Va	Alexandria, Vanguard	703-768-1660

MODULAR AUDIO PRODUCTS, INC., 1385 Lakeland Ave., Bohemia, N.Y., 11716, Tel: 516-567-9620; FSC No: 52202; Empl.: 5; Minimum order: \$35

For info on price: J. Brick; Application info: M. Gittleman; Customer service: K. Zajick; Delivery info: K. Zajick

Free literature available: Audio Products Catalog - Complete line of amplifier and special effects devices for audio console and system construction.

Products manufactured: Amplifiers, Integrated Circuit Devices, Power Supplies

Local Sales Offices & Reps.

Ill	Hinsdale, J. D. Allyn Co.	312-325-0495
Ohio	Dayton, Rixan Assoc.	513-278-4216
EXP:	Cal., San Diego, Total Electronics Int'l.	714-224-3291

MODULAR DEVICES, INC., 1385 Lakeland Ave., Airport International Plaza, Bohemia, N.Y., 11716, Tel: 516-567-9620; FSC No: 52202; Empl.: 20; Minimum order: \$35

For info on price: J. Brick; Application info: M. Gittleman; Customer service: J. Brick; Delivery info: K. Zajick

Free literature available: SP-100 servo amplifier condensed catalog SP-200 operational amplifier catalog

Products manufactured: Amplifiers, Equalizers, Integrated Circuit Devices, Inverters

Local Sales Offices & Reps.

Cal	San Diego, Total Electronics Int'l.	714-224-3291
Ill	Hinsdale, J.D. Allyn Co.	312-325-0495
Ohio	Dayton, Rixan Assocs.	513-278-4216

Advertisement

Off the shelf and custom designed amplifiers, specializing in AC servo amplifiers and related modules: DC operational amplifiers and power amplifiers; professional quality audio amplifiers and special effects devices; military quality intercom equipment. If you have an amplifier requirement, check with MDI first! We probably have it on the shelf now, and if not, we're still able to reduce your engineering costs in designing it.

MODULAR POWER, 7364 Convoy Ct., San Diego, Cal., 92111, Tel: 714-279-1641; Empl.: 20

Products manufactured: Converters, Power Supplies

Local Sales Offices & Reps.

Ala	Huntsville, FM Assocs., Ltd.	205-536-9990
Ariz	Phoenix, Mesa Engrg.	602-943-9213
Cal	Costa Mesa, Robinson Tech. Assocs.	714-557-1622
Cal	San Diego, Mesa Engrg.	714-278-8021

Cal	San Jose, MCH Assocs.	408-246-7330
Cal	Westlake Village, Edwards Assocs.	213-889-1057
Colo	Littleton, Eissler Sls. & Service	303-794-1779
Conn	Newton, C. Lueders & Co.	203-426-3339
Fla	Orlando, FM Assocs., Ltd.	305-851-5710
Fla	Tequesta, FM Assocs., Ltd.	305-746-3126
Ill	Palatine, C & C Electr. Sls.	312-358-8900
Kans	Shawnee Mission, Tech. Sls. Assocs.	913-888-3330
Mass	Needham, C.J. Lueders	617-449-0345
Minn	Minneapolis, Bitronics Sls. Co.	612-866-3035
Mo	Ferguson, Tech. Sls. Assocs.	910-761-0565
NJ	Moorestown, Comp. Conslts.	609-234-3666
NJ	Palisades Park, Scientific Devices-East	201-871-3916
NM	Albuquerque, Electr. Entrps.	505-256-3561
NM	Las Cruces, Electr. Entrps.	505-524-0126
NC	Greensboro, FM Assocs., Ltd.	919-294-2754
Ohio	Worthington, Ohio Instr. Co.	614-885-0743
Tx	Dallas, REMTEK	214-369-8146
Tx	Houston, Remtek	713-664-2113
Wash	Seattle, Blum & Assocs.	206-782-1600

MODUTEC, INC., 18 Marshall St., Norwalk, Conn., 06854, Tel: 203-853-3636, TWX: 710-468-2039; Empl.: 300

For info on price: R. A. Eck; Application info: L. A. Velez; Customer service: W. J. Beke; Delivery info: B. Kunkel

Free literature available: Catalog #622 - Panel Meters, Control Meter Catalog #CM-1011, Pyrometer Catalog #PYR-1104

Products manufactured: Indicators, Meters, Pyrometers, Thermocouples, Elements & Accessories

Local Sales Offices & Reps.

Ala	Huntsville, Beacon Electrns. Assocs.	205-881-5031
Cal	Los Gatos, Luscombe Engrg. Co.	408-354-6496
Cal	Pasadena, Luscombe Engrg. Co.	213-684-2000
Colo	Arvada, Arrowhead Sls. Co.	303-423-5556
Fla	Fort Lauderdale, Beacon Electronic Assoc.	305-776-6074
Fla	Maitland, Beacon Electrns. Assocs.	305-647-3498
Ga	Atlanta, Beacon Electrns. Assocs.	404-351-3654
Ill	Wilmette, Crest Assocs.	312-256-5202
Ind	Indianapolis, Crest Assocs.	317-844-2800
Kans	Prairie Village, Engrg. Service Co.	913-649-4000
Md	Randallstown, Beacon Elec. Inc.	301-922-1248
Mass	Canton, New England Electronic Sls. Corp.	617-828-4835
Mich	Farmington, Carter, McCormic & Peirce, Inc.	313-477-7700
Minn	Minneapolis, R.J. Inc.	612-922-1425
Mo	St. Louis, Engrg. Svcs. Co.	314-997-1515
NJ	Englewood Cliffs, Sprung/Nussbaum, Inc.	201-947-6767
NJ	Marmora, Holdsworth & Co.	609-398-4340
NM	Albuquerque, Aztec Enterprises, Inc.	505-255-2440
NY	DeRuyter, R.P. Kennedy Co.	515-682-2299
NY	Red Hook, R.P. Kennedy Co.	914-876-2700
NY	Rochester, R.P. Kennedy Co.	716-271-6322
Ohio	Cleveland, Carter, McCormic & Peirce	216-333-5650
Ohio	Dayton, Carter, McCormic & Peirce	513-278-5873
Pa	Monroeville, Carter, McCormic & Peirce	412-372-4415
Pa	Newtown Square, Holdsworth & Co.-SWR	215-356-8550
SC	Spartanburg, Beacon Electrns. Assocs.	803-582-4613
Tx	Houston, Scientific Sls. Co.	713-666-5318
Tx	Richardson, Scientific Sls. Co.	214-231-6541
Utah	Salt Lake City, Arrowhead Sls. Co.	801-487-4716
Va	Falls Church, Beacon Electrns.	703-534-1673
Wash	Seattle, R.K. Squibb, Inc.	206-632-2450
EXP:	New York, Frathorn Co.	212-687-9390
FOR:	Can., Burlington, Ont., Motion Control Devices	416-637-9369

MOHAWK DATA SCIENCES CORP., Corporate Headquarters, Utica, N.Y., 13503, Tel: 315-792-2002; Empl.: 5000

Customer service: S. J. Keane, V.P. Direct Sls 315-792-2022

Free literature available: Card equip. Tape equip.

Products manufactured: Perforators, Printers, Punched Card Equipment, Readers, Recorders, Transmission Systems, Data

Local Sales Offices & Reps.

Cal	Anaheim	714-772-0803
Cal	San Mateo	415-573-6400

Fla	Orlando	305-841-3091
Mass	Waltham	617-890-5870
Mich	Southfield	313-352-9160
Pa	King of Prussia	215-337-1910

MOHAWK OEM SALES, 1008 West 8th Ave., King of Prussia, Pa., 19406, Tel: 215-337-1910, Telex: 84-6453; Empl.: 5400; Minimum order: \$100

For info on price: F. Graziano 315-792-2183; Application info: J. Rodenhausen 215-337-1910; Customer service: C. Randall 315-792-2234; Delivery info: F. Graziano 315-792-2183

Free literature available: 34-page catalog describing and picturing complete MDS OEM product line: printers tape drives, card readers, disk drives, keyboards, and paper tape equipment.

Products manufactured: Comm. Systems, Computers, Controllers, Programmable, Converters, Data Loggers, Encoders, Keyboards, Alphanumeric & Decimal, Modulator/Demodulators, Perforators, Printers, Punched Card Equipment, Readers, Recorders, Teleprinters, Terminal Equipment, Digital, Translators, Data, Transmission Systems, Data

Local Sales Offices & Reps.

Cal	Anaheim	714-772-0803
Cal	Los Angeles	213-933-5571
Cal	San Mateo	415-573-6400
Fla	Orlando	305-841-3091
Ill	Oak Brook	312-654-8630
Ind	Indianapolis	317-243-7547
Mass	Waltham	617-890-5870
Mich	Southfield	313-352-9160
Mo	Clayton	314-727-0175
NY	Liverpool	315-457-3248
NY	Utica	315-792-2022
Ohio	Independence	216-398-4700
Pa	Wayne	215-687-8452
Tenn	Nashville	615-383-1393
Tx	Houston	713-681-6601
Va	Richmond	804-359-9283
Wisc	Wauwatosa	414-771-7830
EXP:	Utica, N.Y.	315-792-2045

MOLDING TECHNOLOGY INC., Ivyland, Pa., 18974, Tel: 215-355-3110; Empl.: 80

Customer service: D. C. Campbell

Free literature available: Four page brochure from Molding Technology Incorporated, Ivyland, Pa. 18974, describing their "Total Concept Service" for Molds, Trim and Forming Systems used by the Electronics and Electrical Industries.

Products manufactured: Services, Assembly, Production & Test

Local Sales Offices & Reps.

Cal	Alta Loma, Metro-Line Western	714-987-4112
Cal	Westminster, Metro-Line Western	714-839-8880
Fla	Ft. Lauderdale, E & E Engrg. Svc.	305-791-0754
NY	Niagara Falls, Waters Metal Prods. Ltd.	716-285-3595
NC	Charlotte, E & E Engrg. Svc.	704-333-9790

MOLDTRONICS, INC., 707 Roger St., Downers Grove, Ill., 60515, Tel: 312-968-7000; Empl.: 170; Minimum order: \$25

For info on price: B. Qualizza; Application info: J. Collins; Customer service: B. Qualizza; Delivery info: B. Qualizza

Free literature available: PLASTIC MODULE CASES - DIP HEADERS - COIL FORMS/24 page illustrated brochure describing an assortment of miniature plastic cases for potting electronic components, many with metal inserts.

Products manufactured: Bobbins, Winding, Coil & Transformer, Bushings, Glass, Plastic, Metal, Rubber, Etc., Cups, Encapsulation, Headers, Lenses, Readout & Display, Pads, Transistor Mounting, Services, Assembly, Production & Test, Sockets

Local Sales Offices & Reps.

Ariz	Phoenix, Thorson Co.	602-956-5300
Cal	Canoga Park, Snively Assocs.	213-348-5258
Cal	San Diego, Miracle & Assocs.	714-276-8619
Cal	San Jose, United Sls. Co.	408-379-0800
Colo	Denver, Thorson Co.	303-759-0809
Fla	Orlando, Hi-Co Assocs.	305-273-0571
Ga	Atlanta, Davidson Co.	404-993-4570
Ill	Hinsdale, Hill-Gray Assocs.	312-325-4810
Ind	Indianapolis, Stollenberg Sls. Co.	317-547-1169
Iowa	Marion, Thomas & Modrcin Assocs.	319-377-6261
Kan	Shawnee Mission, Thomas & Modrcin Assocs.	913-432-2131
Md	Woodbine, Naudain Assocs.	301-252-5378

Mass	Wellesley Hills, Michael Scott Co.	617-235-0102
Minn	St. Paul, Northport Engrg.	612-698-3841
Mo	Hazelwood, Thomas & Modrcin Assocs.	314-895-4700
NJ	Mount Laurel, Naudain Assocs.	609-235-1801
NY	Rochester, Fowler Beach Corp.	716-586-0468
Ohio	Dayton, Harry G. Lake Co.	513-277-8181
SC	Columbia, Davidson Co.	803-788-3538
Tenn	Nashville, Davidson Co.	615-356-2905
Tex	Garland, Gordon V. Peck Co.	214-341-8311
Wash	Bellevue, Henry Paulman Sls.	206-455-3311

MOLECU-WIRE CORP., P.O. Box 495, Farmingdale, N.J., 07727, Tel: 201-922-9400, TWX: 710-723-6943; Empl.: 150

Products manufactured: Wire

Local Sales Offices & Reps.

Cal	La Canada, R. D. Dahl Co.	213-790-6111
Ill	Chicago, Kennedy Engrg.	312-631-8283
Minn	Wayzata, Schlenker & Assoc.	612-473-5417
Mo	St. Louis, Renner & Co.	314-434-3623
NJ	N. Plainfield, Tri-J Corp.	201-469-9300
Ohio	Cleveland, Qualiform Insul.	216-671-8300
Ohio	Oregon, Meej Sls.	419-698-1026
Pa	Pittsburgh, Patterson Elec. Co.	412-244-1818
Wash	Seattle, Comptronics	206-284-4842

MOLEX INC., 2222 Wellington Ct., Lisle, Ill., 60532, Tel: 312-969-4550, p. 2*1068, 1069

Customer service: Cust. Svc.

Free literature available: M-100 Catalog (General Product Catalog) M-200 Catalog - specific terminal and connector housing information. M-300 Catalog - switch product catalog. M-400 Catalog - printed circuit board interconnection systems and devices.

Products manufactured: Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Sockets, Switches, Terminals, Tools

Local Sales Offices & Reps.

Cal	Encino, R.H. McDonald & Assocs.	213-986-5832
Cal	Mt. View, Cindel Sls.	415-965-2630
Colo	Denver, Thorson Co.	303-759-0809
Fla	Altamonte Springs, WMM Assocs.	815-459-4386

Fla	Clearwater, WMM Assocs.	813-447-2533
Fla	Pompano Beach, WMM Assocs.	305-943-3091
Ill	Crystal Lake, E.S. Healy & Assocs.	815-459-4386
Ind	Crawfordsville, D. Miller & Assocs.	317-362-6348

Kans	Overland Park, Palatine Engrg. Sls.	913-262-5643
Mass	Andover, Sales Engrg. Co.	617-470-0800
Mich	Benton Harbor, Hampton Askin & Assocs.	616-925-0341
Mich	Southfield, D.D. Douglas & Assocs.	313-352-7180

Minn	Minneapolis, C. Diehl	612-854-4448
Mo	St. Louis, P. Still & Assocs.	314-993-2077
NM	Albuquerque, Cleveland Ents.	505-345-2481
NY	Lynbrook, P. Saffler & Assocs.	516-593-7880
NY	Rochester, L-Mar Assocs.	716-328-5240
Ohio	Mansfield, R. Meckling Assocs.	419-526-1250
Pa	Pittsburgh, Sheridan Assocs.	412-244-1640
Tenn	Chattanooga, Peirson, Deakins & McGinness	615-821-4501

Tex	Richardson, Palatine Sls. Inc.	214-231-9489
Va	Lynchburg, Barnhill & Assocs.	804-846-4624
Wash	Bellevue, H. Paulman Sls.	206-455-3311

MOLEX PRODUCTS, INC., 5224 Katrine, Downers Grove, Ill., 60515, Tel: 312-969-4550, TWX: 910-695-3229

Customer service: Cust. Svc. Personnel

Free literature available: M100 Catalog - General Product Line; M200 Catalog - Connectors and Terminals; M300 Catalog - Molex Switches; M400 Catalog - Printed Circuit Interconnections.

Products manufactured: Connector Blocks, Mother Board, Connectors, Machines/Machinery, Production, Sockets, Switches, Terminal Blocks, Boards & Strips, Terminals, Tools

Local Sales Offices & Reps.

Cal	Encino, R. H. McDonald & Assocs.	213-986-5832
Cal	Mountain View, Cindel Sales, Inc.	415-965-2630
Colo	Denver, Thorson Co.	303-759-0809
Fla	Clearwater, WMM Assocs.	813-447-2533
Ill	Crystal Lake, E.S. Healy & Assocs.	815-459-4386
Ind	Crawfordsville, Dale A. Miller & Assocs.	317-362-6348

Kans	Overland Park, Palatine Engrg. Sls.	913-262-5643
Mass	Andover, Sls. Engrg. Co.	617-470-0800
Mich	Benton Harbor, Hampton, Askin & Assocs.	616-925-0341
Mich	Southfield, D.D. Douglass & Assocs.	313-352-7180

Minn	Bloomington, Chuck Diehl	612-854-4448
Mo	St. Louis, Palmer Still & Assocs.	314-993-2077
NJ	Riverton, Valley Sls.	609-829-2882
NM	Albuquerque, Cleveland Enterprises, Inc.	505-345-2481

NY	Lynbrook, P. Saffler & Assocs.	516-593-7880
NY	Rochester, L-Mar Assocs.	716-328-5240
Ohio	Mansfield, Ralph Meckling & Assocs.	419-526-1250
Pa	Pittsburgh, Sheridan Assocs., Inc.	412-244-1640

Tenn	Chattanooga, Peirson, Deakins & McGinness	615-821-4501
Tex	Richardson, Palatine Sls., Inc.	214-231-9489
Va	Lynchburg, Barnhill & Assocs.	804-846-4624

MOLOM MOTORS & COIL CORP., 3737 Industrial Ave., Rolling Meadows, Ill., 60008, Tel: 312-259-3750; Empl.: 300

Customer service: L. Breden 312-259-8700

Free literature available: 1. Brochure describing Molon's product line of custom designed open frame motors and gear motors. 2. Literature describing Molon's permanent magnet synchronous motors and 7 1/2" stepper motors.

Products manufactured: Blowers & Fans & Accessories, Motors, Pumps, Vacuum

Local Sales Offices & Reps.

Cal	Sunnyvale, RDX Corp.	408-734-4500
Cal	Woodland Hills, G.M. Stevenson	213-348-5506
Colo	Denver, Parker Webster	303-770-1972
Conn	Bloomfield, Zaslow Sls. Co.	203-242-7781
Minn	St. Paul, Dale Merrick Co.	612-636-0444
NJ	Cranford, Hy Rel Assocs.	201-276-5677
NY	Buffalo, R.W. Mitscher Co.	716-633-7970
Ohio	Cleveland, E.B. Kaercher	216-761-8098
Pa	Cornwall Hgts., W.D. Staats	215-ME9-5231
Tex	Dallas, W. Reese Assoc.	214-638-6575

MONA INDS., INC., Box 397, River Street Station, Paterson, N.J., 07524, Tel: 201-274-8220; Empl.: 60

Products manufactured: Chemicals, Cleaners & Solvents

MONITOR LABS, INC., 4202 Sorrento Vly. Blvd., San Diego, Cal., 92121, Tel: 714-453-6260, TWX: 910-337-1278; Empl.: 75; Minimum order: \$25

For info on price: Prod. Line Mgr.; Application info: Prod. Line Mgr.; Customer service: Cust. Svc. Mgr.; Delivery info: Prod. Line Mgr.

Products manufactured: Analyzers, Clocks (All Types), Data Acquisition & Reduction Systems, Data Loggers, Scanners, Switches

Local Sales Offices & Reps.

Ala	Huntsville, F.M. Assocs.	205-536-9990
Ariz	Scottsdale, Measurement Conslts.	602-994-9519
Cal	Lawndale, Ward/Davis Assocs.	213-542-7740
Cal	San Diego, Ward/Davis Assocs.	714-459-3351
Cal	Sunnyvale, Ward/Davis Assocs.	408-245-3700
Colo	Boulder, Measurement Conslts.	303-449-5294
Fla	Orlando, F.M. Assocs.	305-851-5710
Fla	Tequesta, F.M. Assocs.	305-746-3126
Ill	Chicago, Dalec	312-283-0300
Ind	Indianapolis, Dalec	317-784-6360

Md	Rockville, MESA, Inc.	301-881-8430
Mass	Nonantum, ETA Assocs.	617-527-4544
Mich	Southfield, Data-Tron	313-354-6421
Minn	Minneapolis, Dalec	612-786-9666
Mo	Hazelwood, Technical Reps.	314-731-5200
NJ	Union, SBM Assocs.	201-687-8737
NM	Albuquerque, Measurement Conslts.	505-265-6471

NY	Pleasantville, SBM Assocs.	914-769-1811
NY	Rochester, SBM Assocs.	716-266-1400
NC	Greensboro, F.M. Assocs.	919-294-2754
Ohio	Dayton, Data-Tron	513-223-8421
Ohio	Wickliffe, Data-Tron	216-585-8421
Pa	Pittsburgh, K. J. Lesker Co.	412-892-2996
Tex	Houston, Harvey Assoc.	713-464-7641
Tex	San Antonio, Data Applications Corp.	512-732-7176

Wash	Seattle, Showalter/Instruments	206-455-4922
FOR:	Can., Calgary, Alb., Canadian Dynamics	403-269-2202
FOR:	Can., Downsview, Ont., Datamex, Ltd.	416-661-1404
FOR:	Can., Montreal, Datamex, Ltd.	514-731-9328

FOR: Can., Ottawa, Ont., Datamex, Ltd.

813-625-4255
FOR: Can., Vancouver, B.C., Canadian Dynamics
604-325-3201

MONITOR PRODS., Box 1966, 3018 San Luis Rey Rd., Oceanside, Cal., 92054, Tel: 714-433-4510, TWX: 910-322-1381; Empl.: 60; Minimum order: \$50

p. 1-388-397

Customer service: Sls. Order Desk

Free literature available: Oven Oscillator Data Sheet, General Catalog, 74 EEM Reprint, Digital Oscillators & Logic Clocks, TCXO's, Filters, Crystals, Comm'l. Crystals, Military

Products manufactured: Clocks (All Types), Crystals, Filters, Integrated Circuit Devices, Oscillators, Ovens, Standards, Terminal Equipment, Digital

Local Sales Offices & Reps.

Cal	W. Covina, Groh Assocs.	213-923-0963
Colo	Denver, Electrodyn, Inc.	303-757-7679
Fla	Ft. Lauderdale, Tech. Rep. Assocs.	305-792-0962
Fla	Indian Rock Bch., Tech. Rep. Assocs., Inc.	813-595-2834
Iowa	Cedar Rapids, H. R. Brown Assoc.	319-366-0635
NY	Great Neck, Trionic Assoc.	516-466-2300
Ohio	Dayton, Berberich Assocs.	513-252-9981
Tex	Dallas, Tesco	214-358-3521

MONOLITHIC MEMORIES INC., 1165 E. Arques Ave., Sunnyvale, Cal., 94086

MONROE, THE CALCULATOR CO., Div. Litton Inds., 550 Central Ave., Orange, N.J., 07050, Tel: 201-673-6600, TWX: 710-994-5840; Empl.: 3000; Minimum order: \$50

Products manufactured: Analyzers, Calculators, Electrical & Electronic, Comm. Systems, Computers, Data Acquisition & Reduction Systems, Integrated Circuit Devices, Recorders, Terminal Equipment, Digital, Transmission Systems, Data

MONSANTO, Box 8, St. Peters, Mo., 63376, Tel: 314-272-6281, TWX: 910-760-1591; Empl.: 1000

Products manufactured: Crystals

Local Sales Offices & Reps.

Cal	Santa Clara, Monsanto Co.	408-243-0414
Mass	Westwood, Monsanto Co.	617-329-2530
Mo	St. Peters, Monsanto Co.	314-272-6281
Tex	Garland, Monsanto Co.	214-272-6974

MONSANTO-ELCTR. SPEC. PRODS., 3400 Hillview Ave., Palo Alto, Cal., 94304, Tel: 415-493-3300, TWX: 910-373-1767; Empl.: 500; Minimum order: \$250

For info on price: W. Reed; Application info: M. Bottini; Customer service: F. August; Delivery info: F. August

Free literature available: Short form catalog of optoelectronic devices

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Detectors, Diodes, Display Devices/Displays, Isolators, Lamps, Lights, Relays, Switches

MONTEVIDEO TECHNOLOGY INC., 4716 Wilford Way, Edina, Minn., 55435, Tel: 612-920-1050; Empl.: 160; Minimum order: \$50

For info on price: W.L. Nees; Application info: W.L. Nees; Customer service: W.C. Knutsen; Delivery info: W.C. Knutsen

Free literature available: Catalog Describing Aircraft Grade Servo Motors, Motor Tachometers, Digital Indicators and Related Mechanisms That Are Used in Military & Commercial Aircraft and Other Airborne Equipment. The Product Line Has Its Origin in 1962 And Has Been Marketed Under Trade Names "Cedar Engineering", "Cedar" and "Cedar Avionics."

Products manufactured: Coils Including Assemblies & Forms, Controls/Control Eqpt., Counters, Display Devices/Displays, Gearheads & Speed Reducers, Gears & Gear Mechanisms (Precision), Generators, Indicators, Motors, Tachometers, Transducers

MOODY TOOLS, INC., 42 - 46 Dudley St., Providence, R.I., 02905, Tel: 401-421-5032; Empl.: 11; Minimum order: \$60

Customer service: J. H. Moody

Free literature available: Catalog of present line, a sheet announcing 41 New Tools plus distributor and dealer price lists.

Products manufactured: Drills & Accessories, Hand & Power, Drivers, Nut, Magnets, Screwdrivers, Scribes, Tools, Wrenches

Local Sales Offices & Reps.

Cal	Long Beach, L. P. Feeley & Assocs.	213-595-5421
Cal	San Carlos, A. Williams	415-591-7043
Cal	San Carlos, A. Williams	303-934-5829
Fla	Riviera Beach, C.M. Allen	305-844-2593
Ga	Atlanta, R.B. Allen	404-255-8267
Ill	Chicago, Witz-Knight, Inc.	312-685-3181
Kans	Overland Park, D.H. Donegan	913-384-0460
NY	Manlius, W. Ferguson	315-682-9301
NY	New York, A. Mizner Assocs., Inc.	212-683-4948
NC	Charlotte, T.T. Patterson	704-366-4174
Ore	Portland, R. Minthorne Co.	503-246-4556
Pa	King of Prussia, L. Spangenberg	215-265-2130
Pa	Pittsburgh, A. Kostman	412-421-9204
RI	East Providence, G. Goddard Assocs.	401-434-3824
Tenn	Nashville, M.M. Hnatio	615-834-4225

MOREY CORP., 2659 Wisconsin Ave., Downers Grove, Ill., 60515, Tel: 312-964-2300; FSC No: 04377; Empl.: 150; Minimum order: \$25

For info on price: E. J. Cunningham; Application info: E. J. Hollowed; Customer service: E. J. Cunningham; Delivery info: R. R. Morey

Free literature available: Product & general facility brochure.

Products manufactured: Cable Assemblies & Harnesses, Cable Retractors, Capacitors, Fixed, Capacitors, Variable, Chokes, Coils Including Assemblies & Forms, Comm. Systems, Cords, Couplers, Filters, Jack Covers, Lead Assemblies & Receptacles, Oscillators, Reels, Cord & Cable, Screens, Printed Circuit, Terminal Blocks, Boards & Strips, Transformers

MORIRICA ELCTRNS. LTD., 205 Tozuka-machi, Tozuka-ku, Yokohama, Japan, Tel: 045-881-2331; Empl.: 350

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic

Local Sales Offices & Reps.

Ill Skokie, Solar Systems Inc.

MORRIS, J.I. CO., 372 Elm St., Southbridge, Mass., 01550, Tel: 617-764-4394; Empl.: 45

For info on price: J. B. Diriam; Application info: J. B. Diriam; Customer service: T. Holden; Delivery info: T. Holden

Products manufactured: Fasteners

MOS TECHNOLOGY, INC., Valley Forge Corp. Ctr., 950 Rittenhouse Rd., Norristown, Pa., 19401, Tel: 215-666-7950, TWX: 510-660-4033; Empl.: 350; Minimum order: \$250

Customer service: J. C. Hertsch

Free literature available: Mos LSI, application notes and specifications/data sheets available on complete product line.

Products manufactured: Encoders, Integrated Circuit Devices, Shift Registers

MOSTEK CORP., 1215 W. Crosby Rd., Carrollton, Tex., 75006, Tel: 214-242-0444; Empl.: 1800

For info on price: J. Garrett Ext. 357; Application info: K. Daugherty Ext. 432; Customer service: C. Crutcher Ext. 359; Delivery info: J. Tadlock Ext. 359

Free literature available: Literature on complete line of RAMs, ROMs, shift registers, timing and display circuits, calculator circuits, CMOS, and special products.

Products manufactured: Integrated Circuit Devices

Local Sales Offices & Reps.

Ala	Huntsville, Component Mktg.	205-881-5333
Ariz	Phoenix, Howe & Howe Sls.	602-264-7971
Cal	Fountain Valley, Mostek Corp.	714-554-1611
Cal	Los Altos, Mostek Corp.	415-941-3030
Cal	Redwood City, J. Heaton Co.	415-369-4671
Cal	San Diego, H. King	714-276-7541
Cal	Santa Ana, Rical Assoc.	714-557-6543
Cal	Wheatridge, Waugaman Assocs.	303-423-1020
Fla	Clearwater, CBC	813-447-3375
Fla	Coral Springs, Mostek Corp.	305-752-8140
Fla	Ft. Lauderdale, CBC	305-484-7330
Fla	Winter Park, CBC	305-644-2277
Ill	Elk Grove Village, J. G. Twist Co.	312-593-0200
Ill	Wheaton, Mostek	312-682-9505
Ind	Fort Wayne, R. O. Whitesell & Assocs.	219-432-5591
Ind	Indianapolis, R. O. Whitesell & Assocs.	317-359-9283

Ind Kokomo, R. O. Whitesell & Assocs.

Kans	Prairie Village, J. G. Twist Co.	913-236-4646
Ky	Louisville, R. O. Whitesell & Assocs.	502-893-7303
Md	Baltimore, J. R. Daniel & Co.	301-825-3330
Mass	Burlington, New England Tech. Sls.	617-272-0434
Mass	Waltham, Mostek Corp.	617-899-9107
Mich	Grosse Point Park, Greiner Assocs.	313-499-0188
Minn	Minneapolis, HMR	612-920-8200
Mo	St. Louis, J. G. Twist Co.	314-432-2830
NJ	East Hanover, HLM Assocs.	201-386-0794
NY	Liverpool, J. Sempale Assocs.	315-458-4775
NY	Northport, HLM Assocs.	516-757-1606
NY	Rochester, J. Sempale Assocs.	716-544-8582
NC	Greensboro, J. R. Daniel & Co.	919-885-4634
NC	Raleigh, A. B. Andrews Co.	919-833-5565
Ohio	Brecksville, Mostek Corp.	216-526-6747
Ohio	Cincinnati, R. O. Whitesell & Assocs.	513-521-2290

Ohio Cleveland, R. O. Whitesell & Assocs.

Ohio	Columbus, R. O. Whitesell & Assocs.	614-888-9396
Ohio	Dayton, R. O. Whitesell & Assocs.	513-298-9546
Okla	Tulsa, W. Pat Fralia Co.	918-663-8707
Pa	Ft. Washington, Mostek Corp.	215-628-9050
Pa	Horsham, CMS Mktg.	215-672-8300
Pa	Pittsburgh, R. O. Whitesell & Assocs.	412-344-7277

Tex Ft. Worth, W. Pat Fralia Co.

Tex	Houston, W. Pat Fralia Co.	713-772-1572
Wash	Seattle, General Elctns.	206-243-5141
Wisc	Wauwatosa, J. G. Twist Co.	414-475-7755
FOR:	Can., Downsview 475, Ont., Cantronics Ltd.	416-661-2494
FOR:	Can., Montreal, Que., Cantronics Ltd.	514-341-5207

MOTOROLA COMMS. DIV., Parts Dept., 1313 E. Algonquin Rd., Schaumburg, Ill., 60172, Tel: 312-397-3500, TWX: 910-693-1592

Customer service: J. Willson 312-397-1000 Ex. 3204

Products manufactured: Antenna Towers & Supports, Antennas, Arresters, Electrical Surge, Lightning, Attenuators, Batteries, Benches, Consoles, Stools, Tables, Cabinets & Accessories, Cable, Calibrators, Capacitors, Fixed, Capacitors, Variable, Carts & Dollies, Instrument & Equipment, Cases, Equipment, Instrument, Meter, Chargers, Battery, Comm. Systems, Comparators, Connectors, Counters, Cutters, Wire, Hand Operated, Diodes, Dummy Loads, Eliminators, Battery, Filters, Fuses, Generators, Handsets, Chestsets, Headphones, Headsets, Etc., Heat Sinks, Soldering, Inverters, Kits, Marking (Dial, Instrument, Equipment, etc.), Lamps, Meters, Microphones, All Kinds, Monitors, Oscillators, Pliers, Plug Buttons, Potentiometers, Power Supplies, Probes, Public Address Systems, Receivers, Resistors, Soldering Accessories, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools, Speakers, Synthesizers, Tubes, Wire

Local Sales Offices & Reps.

Cal	El Segundo	213-644-1101
Cal	Foster City	415-349-3111
Ga	Forest Park	404-762-6183
NJ	Glen Rock	201-447-4000
Ohio	Parma	216-267-2210
Tex	Dallas	214-241-2151

MOTOROLA INC., Component Prods. Dept., 2553 N. Edgington, Franklin Park, Ill., 60131, Tel: 312-451-1000, TWX: 910-227-0799 p. 1-398

Customer service: C. Chopp

Free literature available: K1100A - Crystal Clock Oscillator, K1114A - K1115A - K1116A Economy Class Crystal Clock Oscillator, K1117A - K1123A Clock Generator for INTEL 8080 Microprocessor, K1112A - K1122A - Clock Generator for Motorola M6800 Microprocessor, Preliminary Data Sheets

Products manufactured: Integrated Circuit Devices, Oscillators

Local Sales Offices & Reps.

Ala	Huntsville, Barnhill Assocs.	205-883-9394
Ariz	Scottsdale, F. Board Assocs.	602-994-9388
Cal	Inglewood, J. Berman Co.	213-776-1281
Cal	San Carlos, Kottmeier Assocs.	415-592-8333
Fla	Altamonte Springs, Semtronic Assocs.	305-831-8233
Fla	Fort Lauderdale, Semtronic Assocs.	305-771-0010

Ill	Franklin Park, Component Prods. Dept. Motorola Inc.	312-451-1000
Ill	Skokie, Mar-Con Assocs.	312-675-6450
Ind	Indianapolis, Sheridan Assocs.	317-547-7777
Md	Timonium, Barnhill Assocs.	301-252-5610
Mass	Natick, Wayland Engrg. Sls.	617-655-6080
Mich	Farmington, Sheridan Assocs.	313-477-3800
Mo	Florissant, Sheridan Assocs.	314-837-5200
NJ	Keasby, Addem 3	516-567-5900
NY	Buffalo, Ossmann Comp. Sls.	716-832-4271
NY	Deer Park, Addem 12	516-567-5900
NY	Huntington Station, Addem 1	516-567-5900
NY	Kingston, Ossmann Comp. Sls.	914-338-5505
NY	Massapequa Park, Addem 4	516-567-5900
NY	Rochester, Ossmann Comp. Sls.	716-442-3290
NY	Syracuse, Ossmann Comp. Sls.	315-454-4477
NY	Vestal, Ossmann Comp. Sls.	607-785-9949
NC	Raleigh, Barnhill Assocs.	919-876-5617
Ohio	Beachwood, Sheridan Assocs.	216-831-0130
Ohio	Cincinnati, Sheridan Assocs.	513-761-5432
Ohio	Dayton, Sheridan Assocs.	513-277-8911
Okla	Tulsa, H.J. Daly Co.	918-627-4159
Ore	Portland, Almac/Stroum Electronics	503-292-3534

Pa	Bala Cynwyd, Vantage Sls. Co.	215-667-0990
Pa	Pittsburgh, Sheridan Assocs.	412-242-1640
Tenn	Johnson City, Barnhill Assocs.	615-928-0184
Tex	Dallas, R.M. Electronics	214-233-0363
Tex	Houston, R.M. Electronics	713-664-7131
Va	Lynchburg, Barnhill Assocs.	804-846-4624
Wash	Seattle, Almac/Stroum Electronics	206-763-2300

MOTOROLA SEMICONDUCTOR PRODS., Tech. Info. Ctr. T902, 5005 E. McDowell Rd., Phoenix, Ariz., 85008, Tel: 602-244-3464, TWX: 910-951-1334; Empl.: 10000

Products manufactured: Capacitors, Fixed, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Controls/Control Eqpt., Diodes, Integrated Circuit Devices, Isolators, Multipliers, Rectifiers, References, D-C Voltage, Regulators, Resistors, Suppressors, Technical Books, Thyristors (Includes Silicon Controlled Rectifiers), Transistors

Local Sales Offices & Reps.

Ala	Huntsville	205-533-1650
Ariz	Phoenix	602-244-6364
Cal	Encino	213-986-6850
Cal	Menlo Park	415-854-1910
Cal	San Diego	714-560-4644
Cal	Santa Ana	714-558-2601
Cal	San Diego	303-770-2122
Conn	Hamden	203-281-0771
Fla	Maitland	305-644-3422
Fla	Palm Beach Gardens	305-622-2700
Fla	Pompano Beach	305-782-4444
Fla	St. Petersburg	813-576-6030
Ga	Atlanta	404-255-2043
Ill	Chicago	312-992-2320
Ill	Schiller Park	312-678-7205
Ind	Ft. Wayne	219-485-1691
Ind	Indianapolis	317-849-7060
Iowa	Cedar Rapids	319-393-8632
Kans	Mission	913-384-3050
Md	Hyattsville	301-779-1100
Mass	Lexington	617-861-1350
Mich	Garden City	313-261-6200
Mich	Saugatuck	616-857-2159
Minn	Minneapolis	612-545-0251
Mo	St. Louis	314-872-7681
NJ	Cherry Hill	609-665-3783
NJ	River Edge	201-488-1200
NM	Albuquerque	505-266-5763
NY	Fishkill	914-896-8970
NY	Hauapauge	516-231-9000
NY	Rochester	716-381-7220
NY	Syracuse	315-454-9373
NC	Raleigh	919-782-7604
Ohio	Cleveland	216-461-3160
Ohio	Dayton	513-294-2231
Ohio	Worthington	614-846-9460
Okla	Tulsa	918-664-5227
Ore	Portland	503-297-2235
Pa	Ft. Washington	215-643-4500
SC	Columbia	803-788-0585
Tex	Dallas	214-661-9829
Tex	Houston	713-668-4583
Wash	Bellevue	206-455-3700
Wisc	Wauwatosa	414-476-5554

Local Distributors

Ala	Huntsville, Hall-Mark Elctns.	205-539-0691
Ariz	Phoenix, Hamilton/Avnet Elctns.	602-275-7851
Ariz	Phoenix, Liberty Elctns./Arizona	602-257-1272
Cal	El Segundo, Liberty Elctns. Corp.	213-322-8100
Cal	Irvine, Cramer/Los Angeles	213-771-8300

Cal	Los Angeles, Hamilton Electro Sls.	213-870-7171
Cal	Mountain View, Elmar Elctns.	415-961-3611
Cal	Mountain View, Hamilton/Avnet Elctns.	415-961-7000
Cal	San Diego, Hamilton/Avnet Elctns.	714-279-2421
Cal	San Diego, Liberty Elctns./San Diego	714-565-9171
Cal	Sunnyvale, Cramer/San Francisco	408-739-3011
Cal	Commerce City, Elmar Elctns.	303-287-9611
Cal	Denver, Hamilton/Avnet Elctns.	303-534-1212
Conn	Danbury, Schweber Elctns.	203-792-3500
Conn	North Haven, Cramer Elctns.	203-239-5641
Fla	Hollywood, Cramer Elctns.	305-923-8181
Fla	Hollywood, Hamilton/Avnet	305-925-5401
Fla	Hollywood, Schweber Elctns.	305-927-0511
Fla	Orlando, Cramer Elctns.	305-894-1511
Ga	Norcross, Hamilton/Avnet Elctns.	404-448-0800
Ill	Chicago, Newark Elctns. Corp.	312-638-4411
Ill	Chicago, Semiconductor Specialists	312-279-1000
Ill	Schiller Park, Hamilton/Avnet Elctns.	312-678-6310
Ind	Indianapolis, Graham Elctns. Supply	317-634-8202
Kans	Lenexa, Hamilton/Avnet Elctns.	913-888-8900
Mid	Rockville, Cramer Elctns.	301-948-0110
Mid	Rockville, Pioneer/Washington Elctns.	301-424-3300
Mid	Rockville, Schweber Elctns.	301-881-2970
Mid	Savage, Pytronic Inds.	301-792-7000
Mass	Burlington, Hamilton/Avnet Elctns.	617-273-2120
Mass	Lexington, Harvey Elctns.	617-861-9200
Mass	Newton Centre, Cramer Elctns.	617-969-7700
Mich	Detroit, RS Elctns.	313-491-1012
Mich	Livonia, Hamilton/Avnet Elctns.	313-522-4700
Minn	Edina, Cramer/Minneapolis	612-835-7811
Minn	Edina, Hamilton/Avnet Elctns.	612-941-3801
Mo	Hazelwood, Hamilton/Avnet Elctns.	314-731-1144
NJ	Cedar Grove, Hamilton/Avnet Elctns.	201-239-0800
NJ	Moorestown, Arrow Elctns.	609-235-1900
NJ	Mt. Laurel, Hamilton/Avnet Elctns.	609-234-2133
NJ	Pennsauken, Radio Elect. Svc. Co.	609-662-4000
NJ	Somerset, Schweber Elctns.	201-469-6008
NM	Albuquerque, Hamilton/Avnet Elctns.	505-765-1500
NY	East Syracuse, Cramer/Syracuse	315-437-6671
NY	Hauppauge, Cramer Elctns.	516-231-5600
NY	Rochester, Cramer Elctns.	716-275-0300
NY	Westbury, Schweber Elctns.	516-334-7474
NY	Woodbury, Harvey Elctns.	516-921-8700
NC	Winston-Salem, Cramer Elctns.	919-725-8711
Ohio	Cleveland, Pioneer-Standard Elctns.	216-587-3600
Ohio	Dayton, Hamilton/Avnet Elctns.	513-433-0610
Ohio	Dayton, Pioneer/Dayton	513-236-9900
Ohio	Solon, Cramer/Cleveland	216-248-8400
Pa	Pittsburgh, Cameradio	412-288-2600
SC	Columbia, Dixie Radio Supply Co.	803-253-5333
Tex	Dallas, Hall-Mark Elctns.	214-231-6111
Tex	Dallas, Hamilton/Avnet Elctns.	214-661-8661
Tex	Dallas, Sterling Elctns.	214-357-9131
Tex	El Paso, Midland Specialty Co.	915-533-9555
Tex	Houston, Hamilton/Avnet Elctns.	713-526-4661
Tex	Houston, Sterling Elctns.	713-623-6600
Utah	Salt Lake City, Cramer Elctns.	801-487-4131
Wash	Bellevue, Hamilton/Avnet Elctns.	206-746-6720
Wash	Seattle, Liberty Elctns.	206-763-8200
For:	Can., London, Ont., CM Peterson Co.	519-434-3204
For:	Can., Mississauga, Ont., Hamilton/Avnet	416-677-7432
For:	Can., Montreal, P.Q., Electronic Wholesalers Co.	514-769-8851
For:	Can., Montreal, P.Q., Hamilton/Avnet	514-735-6393
For:	Can., Ottawa, Ont., Electronic Wholesalers Co.	613-237-4703
For:	Can., Ottawa, Ont., Hamilton/Avnet	613-725-3071
For:	Can., Toronto, Ont., Zenronics, Ltd.	416-787-1271
For:	Can., Vancouver, B.C., L. A. Varah	604-873-3211
For:	Can., Vancouver, B.C., Bowtek Elec. Co.	604-736-7677
For:	Can., Winnipeg, Man., Jang Elctns.	204-786-7521

MPB CORP., Precision Park, Keene, N.H., 03431, Tel: 603-352-0310, TWX: 710-366-1801; Empl.: 1600

Products manufactured: Bearings, Bushings, Glass, Plastic, Metal, Rubber, Etc.

Local Sales Offices & Reps.

Cal	Glendale	213-245-6413
Conn	Milford	203-877-3208
Ill	Rolling Meadows	312-259-7800

MOXON INC., 2222 Michelson Dr., Irvine, Cal., 92664, Tel: 714-833-2000, TWX: 910-596-1362; FSC No: 22623; Empl.: 85; Minimum order: \$50 p. 1752,2343

Free literature available: Sales brochures describing in detail Timing Systems, Digital Data Generators, LVDT and Torque Transducers, Power Supplies, Signal Conditioning Equipment and CATV Equipment. Products produced to Mil and Commercial Specifications.

Products manufactured: Amplifiers, Calibrators, CATV Systems & Equipment, Converters, Encoders, Gages, Generators, Indicators, Power Supplies, Signal Conditioners & Equipment, Television Systems & Equipment Closed-Circuit, Testers, Transducers

Local Sales Offices & Reps.

Ala	Huntsville, Int'l. Scientific Instrs.	205-837-1601
Ariz	Phoenix, Moxon Elctns.	602-945-3737
Cal	Irvine, Moxon Elctns.	714-556-6500
Cal	San Diego, Moxon Elctns.	714-292-4820
Cal	Santa Clara, Moxon Elctns.	408-249-2491
Fla	Orlando, Truex Assocs.	305-859-2160
Mid	Rockville, Farrell Assocs.	301-424-9460
Mass	Stoneham, Ken Corp.	617-438-5464
Mich	Farmington, Carter McCormick & Peirce	313-477-7700

Mich Kalamazoo, Carter McCormick & Peirce

NJ	Union, S B M Reps Inc.	201-687-8737
NY	Pleasantville, S B M Reps. Inc.	914-769-1811
NY	Rochester, S B M Reps. Inc.	716-266-1400
NC	Winston Salem, Int'l. Scientific Instrs.	919-722-1783

Ohio Cleveland, Carter McCormick & Peirce

Ohio Dayton, Carter McCormick & Peirce

Pa Pittsburgh, Carter McCormick & Peirce

Tex Dallas, Martin, Zienkosky, Browne & Assocs.

Tex Houston, Martin, Zienkosky, Browne & Assocs.

Wash Seattle, R. Drake Assocs.

MPC PRODS. CORP., 4200 W. Victoria Ave., Chicago, Ill., 60646, Tel: 312-583-5100, TWX: 910-221-2576; FSC No: 019710; Empl.: 115

Customer service: Sls. Dept.

Products manufactured: Actuators, Amplifiers, Controls/Control Eqpt., Drives & Drive

Mechanisms (Dial), Gearheads & Speed Reducers, Gears & Gear Mechanisms (Precision), Motors, Potentiometers, Servo Systems, Tachometers

MRC ALARM SYSTEMS & DEVICES CO., 700 W. Virginia St., Milwaukee, Wisc., 53204, Tel: 414-271-4343 p. 1-1017

Products manufactured: Alarms

Local Sales Offices & Reps.

Cal Pinole, Bryce Bogue

Cal Westlake Village, K. Jensen

Ga Chamblee, R. J. Shafer

Haw Honolulu, J. J. Harding Co., Ltd.

Pa Bala-Cynwyd, M. Friedman Assocs.

Wash Seattle, D. Smith Sls. Co.

FOR: Can., Kitchener, Ont., Poetker Comms., Ltd.

MU-DEL ELCTRNS., 2426 Linden La., Silver Spring, Md., 20910, Tel: 301-587-6087; Empl.: 14; Minimum order: \$50

For info on price: I. Kuzminsky; Application info: I. Kuzminsky; Customer service: I. Kuzminsky; Delivery info: H. E. Blum

Free literature available: Catalog Sheets

Products manufactured: Amplifiers, Attenuators, Comm. Systems, Converters, Couplers, Diplexers, Antenna, Dividers, Filters, Mixer-Preamplifiers, Microwave, Mixers, Multiplexers, Multipliers, Networks, Oscillators, Preselctors, Receivers

Local Sales Offices & Reps.

Ala Huntsville, Anderson Assocs.

Fla Orlando, Unirep

Mid Greenbelt, Riffe Assocs.

Mass Reading, L. DeBrigard

NM Albuquerque, Moore-Eiler Assocs.

NY Greenvale, B. D. Aaron & Co.

Pa Huntingdon Valley, Rabal Assocs.

Tex Arlington, J. T. Houston Assoc.

MU-DEL ELCTRNS., 2426 Linden La., Silver Spring, Md., 20910, Tel: 301-587-6087; Empl.: 14; Minimum order: \$50

For info on price: E. Olson; Application info: B. Leary; Customer service: E. Olson; Delivery info: E. Olson

Free literature available: Sixteen page catalog listing hardware in a wirewrap mode to package micro electronic systems.

Products manufactured: Boards, Plug-In, Boards, Printed Wiring, Universal, Cable, Chassis, Circuit Board Mounting, Chassis, Metal, Connectors, Drawers, Sliding, Jack Covers, Jumpers, Panels, Racks, Sockets, Terminals, Tools

Local Sales Offices & Reps.

Cal Anaheim, Loran, Inc.

Cal San Carlos, Loran, Inc.

Cal Littleton, Eissler Sls. & Svcs.

Cal Anaheim, Loran, Inc.

Cal San Carlos, Loran, Inc.

Cal Littleton, Eissler Sls. & Svcs.

Cal Anaheim, Loran, Inc.

Cal San Carlos, Loran, Inc.

Cal Littleton, Eissler Sls. & Svcs.

Cal Anaheim, Loran, Inc.

Cal San Carlos, Loran, Inc.

Cal Littleton, Eissler Sls. & Svcs.

Fla	Orlando, Unirep	305-295-4817
Mid	Greenbelt, Riffe Assocs.	301-474-8600
Mass	Reading, L. DeBrigard	617-944-5661
NM	Albuquerque, Moore-Eiler Assocs.	505-292-3322
NY	Greenvale, B. D. Aaron & Co.	516-621-0630
Pa	Huntingdon Valley, Rabal Assocs.	215-947-4825
Tex	Arlington, J. T. Houston Assoc.	817-265-2931

MUELLER ELECTRIC CO., 1589 H East 31st St., Cleveland, Ohio, 44114, Tel: 216-771-5225; FSC No: 5999; Empl.: 156; Minimum order: \$3 p. 2-718,719

Customer service: Sls. Dept.

Free literature available: 8-page general catalog G1 illustrates and describes complete line of electric test and battery clips and clip insulators.

Products manufactured: Cable, Clamps & Clips, Insulators & Insulation

Local Sales Offices & Reps.

Ariz	Phoenix, Maddox Sls. Co.	602-274-3807
Cal	Pico Rivera, Maddox Sls. Co.	213-949-5433
Cal	San Francisco, Maddox Sls. Co.	415-431-2953
Cal	Denver, L B Putnam Co.	303-825-5066
Fla	Orlando, Cartwright & Bean	305-422-4531
Fla	Plantation, Cartwright & Bean	305-791-3989
Ga	Atlanta, Cartwright & Bean	404-255-5262
Ill	Libertyville, R. Klipp Assocs.	312-362-4676
Ind	Indianapolis, Sukup & Cox Inc.	317-253-5501
Kans	Shawnee Mission, K & M Sls. Co.	913-262-1444
La	Chalmette, Cartwright & Bean	504-279-4598

Conn	North Haven, Forsberg Sls.	203-239-5111
Fla	Lighthouse Point, Saber Assocs.	305-943-3076
Fla	Orlando, Saber Assocs.	305-422-3686
Ga	Woodstock, Saber Assocs.	404-432-9625
Ill	Morton Grove, T-Squared Assocs.	312-965-1515
Md	Silver Springs, Rep-Tron, Inc.	301-593-4844
Mass	Brockton, Forsberg Sls.	617-522-6300
Minn	Minneapolis, C.E. Bohlig Co.	612-922-7011
Mo	Blue Springs, Chesco	816-222-1404
Mo	St. Charles, Chesco	314-946-6677
NJ	Flanders, K & R Engrg Sls Co.	201-584-5235
NY	Bayside, K & R Engrg Sls Co.	212-225-8879
NY	Syracuse, Marcom Assocs.	315-437-2845
Ohio	Chagrin Falls, Midwest Mktg. Assocs.	216-247-6655
Ohio	Dayton, Midwest Mktg. Assocs.	513-433-2511
Pa	Harleysville, T. Jackson Assocs.	215-643-5560
Tex	Dallas, EBR, Inc.	214-942-2716

MURA CORP., 50 S. Service Rd., Jericho, N.Y., 11753, Tel: 516-334-2700; Empl.: 25

For info on price: J. Gaffney; Application info: B. Lipsky; Customer service: B. Lipsky; Delivery info: B. Lipsky

Products manufactured: Display Devices/Displays, Indicators, Lamps, Lights, Meters, Microphones, All Kinds, Probes, Rectifiers

MURATA CORPORATION OF AMERICA, 2 Westchester Plaza, Elmsford, N.Y., 10523, Tel: 914-592-9180, Telex: 13-7332; Empl.: 12

Customer service: Cust. Svc.

Products manufactured: Filters, Heaters & Heating Elements, Resistors, Thermistors, Transducers, Tuning Forks

Refer to Murata Corp. of America, Capacitor Div. for sales office information.

MURATA CORP. OF AMERICA, Capacitor Div., Rockmart Ind'l. Pk., Rockmart, Ga., 30153, Tel: 404-684-7143, Telex: 54-2999; Empl.: p. 2+211

Customer service: G. Beylouny

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Ala	Huntsville, 20TH Century Mktg.	205-772-9237
Ariz	Tempe, Argus Sls.	602-967-8709
Cal	Inglewood, J. Berman	213-649-6111
Cal	Mountain View, Cindel	415-965-2630
Cal	Van Nuys, MCA Southern California	213-785-0487
Cal	Fort Lauderdale, Semtronic Assocs.	303-758-1508

Ga	Atlanta, Grady Duckett Sls. Co.	404-451-3529
Ill	Hinsdale, Momak Sls.	312-654-4524
Ind	Indianapolis, Electro-Reps	317-255-4147
Kans	Prairie Village, Engrg. Svcs. Co.	914-649-4000
Md	Ellicott City, Doss Elctns.	301-465-1336
Mass	Framingham, MCA Boston	617-872-4843
Mich	Southfield, Luebbe Sls. Co.	313-357-0355
Minn	St. Louis Park, Beta Engrg.	612-925-4422
Mo	St. Louis, Engrg. Svcs. Co.	314-997-1515
NY	Jericho, HRC Comp-Tech	516-822-5550
NY	New Hartford, MCA Upper N.Y. State	315-732-3507

Ohio	Cincinnati, Luebbe Sls. Co.	513-871-4211
Ohio	Cleveland, Luebbe Sls. Co.	216-333-0425
Pa	Philadelphia, S.K. MacDonald	215-545-1205
Tex	Dallas, Blackburn Assocs.	214-692-8885
Wash	Seattle, Harry Levinson Co.	206-EA3-5100

MURATA MFG. CO. LTD., Nagaoka-Shi, Kyoto, Japan, Tel: 075-921-9111; Empl.: 1800

Products manufactured: Amplifiers, Capacitors, Fixed, Capacitors, Variable, Chamber, Environmental Test, Circuits, Hybrid, Thick Film, Coatings, Coders, Cores, Magnetic, Ferrite Material & Parts, Filters, Heaters & Heating Elements, Insulators & Insulation, Magnets, Networks, Oscillators, Ovens, Paints, Potentiometers, Resistors, Spark Gaps, Switches, Thermistors, Transducers, Tubes, Tuning Forks

Local Sales Offices & Reps.

Ga	Rockmart, Murata Corp. of America	404-684-7143
NY	Elmsford, Murata Corp. of America	914-592-9180

MYLEE DIGITAL SCIENCES, 155 Weldon Pkwy., Maryland Heights, Mo., 63043, Tel: 314-567-3420; Empl.: 80

For info on price: C. Bogner; Application info: G. Graves; Customer service: J. Acup; Delivery info: G. Graves

Free literature available: IMS - General product features; A-L6 - Small systems; A-18 - General system; Plan 3 - Multistore.

Products manufactured: Comm. Systems, Computers

Local Sales Offices & Reps.

Ala	Birmingham, Automation Inc.	205-595-7787
Alas	Anchorage, Alaska Digital	907-272-4414
Cal	Los Angeles, Franken Computer Sys.	213-483-4711
Cal	Mountain View, Mylee Digital Sciences	415-965-2227
Cal	San Diego, Saber Sys.	714-296-2162
Colo	Denver, Total Business Sys.	303-333-4256
Fla	Longboat Key, Inventrol Sys., Inc.	813-383-1424

Ga	Atlanta, H & B Office Machines	404-872-4236
Haw	Honolulu, Automated Data Sys.	808-536-8556
Ill	Northfield, Mylee Digital Sciences	312-446-3002

Ind	Indianapolis, Indianapolis Office Machines	317-353-9336
-----	--	--------------

Iowa	West Des Moines, Electronic Business Sys., Inc.	515-225-2489
------	---	--------------

Kans	Kansas City, Midwest Data Sys.	816-363-0470
------	--------------------------------	--------------

Ky	Louisville, Accounting Machines Sls. & Service	502-583-4417
----	--	--------------

La	Metairie, Delta Business Machines, Inc.	504-368-3402
----	---	--------------

Md	Towson, Natl. Business & Security Sys.	301-296-0600
----	--	--------------

Mass	Boston, Systems Automation, Inc.	617-246-1620
------	----------------------------------	--------------

Mich	Ann Arbor, Data Machines Corp.	313-761-0450
------	--------------------------------	--------------

Minn	Minneapolis, Information Products, Inc.	612-721-6391
------	---	--------------

Miss	Clinton, Regional Sls. Corp.	601-924-5696
------	------------------------------	--------------

NJ	Cinnaminson, Mylee Digital Sciences	716-271-2010
----	-------------------------------------	--------------

NY	Rochester, Business Machines of NYS	704-366-5721
----	-------------------------------------	--------------

NC	Charlotte, Auto Data Corp.	704-366-5721
----	----------------------------	--------------

Ohio	Northfield, B. Prescott	216-467-4727
------	-------------------------	--------------

Ore	Portland, Abbott & Lind	503-282-3245
-----	-------------------------	--------------

Pa	Horsham, Mylee Digital Sciences	215-674-4517
----	---------------------------------	--------------

Tenn	Memphis, Automation Inc.	901-396-7248
------	--------------------------	--------------

Tex	Dallas, Selectronic Business Mach.	214-363-2531
-----	------------------------------------	--------------

Utah	Salt Lake City, Herrscher & Co.	801-363-4551
------	---------------------------------	--------------

Va	Richmond, American Business Mach.	804-499-9856
----	-----------------------------------	--------------

Wash	Spokane, Murphy's Business Equip.	509-325-2551
------	-----------------------------------	--------------

NAMCO CONTROLS, Acme-Cleveland Co., 170 E. 131st St., Cleveland, Ohio, 44108, Tel: 216-268-4200; Empl.: 220; Minimum order: \$17

For info on price: Mrs. Cerino; Application info: R. H. Kantner; Customer service: R. Passow; Delivery info: W. Kocianic

Free literature available: "Namco" and "Snap-Lock" Limit Switches miniature to hazardous locations; Proximity Switches - "rf" and magnetic sensing; Pushbutton Control Stations - butt & reed type contacts; Solid State Relays; Reed Switches; Solenoids - miniature to heavy-duty & Coils for A.C.-D.C. applications.

Products manufactured: Coils Including Assemblies & Forms, Controls/Control Eqpt., Drivers, Solenoid, Modules, Logic, Encapsulated, Solenoids, Switches

Local Sales Offices & Reps.

Cal	Thousands Oaks	805-495-4070
Fla	Pompano Beach	305-942-9880
Ga	Marietta	404-427-0241
Ill	Chicago	312-427-0496
La	Kenner	504-722-6363
Mass	Danvers	617-777-0450
Mich	Detroit	313-851-6614
Mo	Kansas City	816-781-3770
Mo	St. Louis	314-965-5880
NJ	Montclair	201-744-6222
NC	Charlotte	704-392-2155
Ohio	Cincinnati	513-271-1530
Ohio	Cleveland	216-942-1496
Ohio	Jefferson	216-576-4074
Ohio	Tiffin	419-447-1291
Ore	Portland	503-760-3400
Pa	Willow Grove	215-659-6900
Tex	Dallas	214-363-8900
Tex	Houston	713-464-4662
Wisc	Walworth	414-275-2771
FOR	Can., North Burnaby, B.C.	604-291-2361
FOR	Can., Toronto	416-787-0687

NANO PULSE INDUSTRIES, INC., 249-D E. Emerson Ave., Orange, Cal., 92665, Tel: 714-998-2360, TWX: 910-593-1617; Empl.: 165; Minimum order: \$1

p. 2+1773,1774

For info on price: J. Rogers; Application info: B. Grissom; Customer service: J. Rogers; Delivery info: J. Ito

Free literature available: Pulse Transformer Brochure, Memory Design Info Reprints.

Products manufactured: Coils Including Assemblies & Forms, Transformers

Local Sales Offices & Reps.

Ariz	Phoenix, Dorton Ent.	602-263-0414
Cal	San Gabriel, Van Gott & Assocs.	213-285-2148
Cal	Santa Barbara, Astralronics	805-498-2183
Fla	Maitland, Ellis & Assoc.	305-645-1101
Ill	Chicago, El-Rad Mfg. Co.	312-478-7300
Mass	Burlington, J & J Assocs.	617-272-2606
Minn	Minneapolis, Elctn. Innovators	612-884-7471
NC	Greensboro, L & D Inc.	919-292-3201
Tex	Dallas, Merino Sls. Co.	214-239-9719

NARDA MICROWAVE CORP., Plainville, N.Y., 11803, Tel: 516-433-9000, TWX: 510-221-1867; FSC No: 99899; Empl.: 335; Minimum order: \$30

For info on price: R. Nopper Ext. 720; Application info: J. J. Lautermilch Ext. 723; Customer service: D. Marlowe Ext. 227; Delivery info: R. Nopper Ext. 720

Free literature available: Technical notes on microwave measurements, complete catalog of products, various short form catalogs on directional couplers, coaxial attenuators and terminations - technical note on broadband swept oscillators and signal generators.

Products manufactured: Adapters, Waveguide, Amplifiers, Analyzers, Antennas, Attenuators, Bends & Twists, Microwave, Bolometers, Bridges, Cable, Calibrators, Calorimeters, Microwave, Comm. Systems, Comparators, Connector

Adapters, Connectors, Converters, Couplers, Demodulators, Detectors, Diplexers, Antenna, Discriminators, Dividers, Drivers, Switch, Dummy Loads, Duplexers, Microwave, Filters, Flanges, Waveguide, Generators, Horns, Microwave, Insertion Loss Measurement Systems, Junctions, Hybrid, Microwave, Line Stretchers, Microwave, Meters, Microwave Integrated Circuits (MIC's), Mixers, Modulators, All Kinds, Monitors, Mounts, Oscillators, Probes, Receivers, Semiconductor Wafer Fabrication, Shifters, Slotted Lines, Microwave, Strip-Line Components, Microwave, Suppressors, Switches, Terminals, Thermistors, Transmitters, Tuners, Waveguides & Adapters

Local Sales Offices & Reps.

Ariz	Scottsdale, BFA Corp.	602-946-4215
Cal	Menlo Pk., Straube Assocs.	415-323-2476

NATIONWIDE ELCTRN. SYS., See NES

NATEL ENGINEERING CO., 8954 Mason Ave., Canoga Park, Cal., 91306, Tel: 213-882-9620, TWX: 910-494-1959; Empl.: 35 p. 1-184-187

Products manufactured: Amplifiers, Converters, Data Acquisition & Reduction Systems, Demodulators, Detectors, Indicators, Modulator/Demodulators, Signal Conditioners & Equipment, Synchro Transmitters, Solid-State

NATIONAL BERYLLIA CORP., Greenwood Ave, Haskell, N.J., 07420, Tel: 201-839-1600, TWX: 710-988-5363; Empl.: 300

Products manufactured: Alloys, Circuits, Printed, Multilayer, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Cores, Ceramic, Couplers, Crystals, Graphite Parts, Headers, Insulators & Insulation, Integrated Circuit Packaging Systems, Packages, Integrated Circuit, Pads, Transistor Mounting, Seals, Semiconductor Wafer Fabrication, Services, Assembly, Production & Test, Substrates, Thermocouples, Elements & Accessories, Transistor, Diode, Thyristor Heat Dissipators, Tubing

NATIONAL CAMERA INC., 2000 W. Union Ave., Englewood, Colo., 80110, Tel: 303-789-1893; Empl.: 56; Minimum order: \$5

For info on price: E. Kuhlman; Application info: E. Kuhlman; Customer service: H. Love; Delivery info: E. Kuhlman

Free literature available: FLASHER catalog of unique or hard-to-find tools, test instruments, technical supplies. Instruction manuals and specifications for photographic equipment test instruments. Sample copy of magazine for photo equipment technicians. Sheet describing technical literature on photographic equipment.

Products manufactured: Batteries, Cabinets & Accessories, Calculators, Electrical & Electronic, Cleaners & Solvents, Cleaners, Ultrasonic, Drills & Accessories, Hand & Power, Gages, Magnifying Glasses, Inspection, Meters, Microscopes, Pliers, Rings, Retaining, Rivets, Screwdrivers, Services, Assembly, Production & Test, Solder (All Types), Soldering Accessories, Soldering Guns, Irons & Desoldering Tools, Tachometers, Testers, Tools, Torches, Soldering, Welding & Access., Tweezers, Hand & Vacuum, Wire Strippers, Wire Twisters

NAT'L CERAMIC CO., 500 Southard St., Trenton, N.J., 08602, Tel: 609-394-5373; Empl.: 50; Minimum order: \$33

For info on price: E. A. Domber; Application info: J. M. Welke; Customer service: E. A. Domber; Delivery info: A. B. Hunt

Free literature available: Ceramic insulators and/or metal part assemblies using ceramic insulators. All insulators JAN-I-8, MIL-I-10-A and MIL-I-23264

Products manufactured: Insulators & Insulation, Tubing

Local Sales Offices & Reps.

Iowa Cedar Rapids, J. R. Sls. Engr. 319-377-8211
NY Liverpool, Wadsworth Mfg. Assocs. 315-652-6885

NATIONAL CONNECTOR, Div of Fabri Tek, Inc., 9210 Science Center Dr., Minneapolis, Minn., 55428, Tel: 612-533-3533, TWX: 910-576-2717; Empl.: 250

Customer service: P. Van Wyngaeren

Free literature available: Connector Design Guide - Plate & Molded Types Telephone Connectors Printed Circuit Board Headers High Reliability PC Connectors

Products manufactured: Connector Adapters, Connectors, Contact Strips, Finger, Contacts, Electrical, Sockets, Terminals

Local Sales Offices & Reps.

Ala Huntsville, 20th Century Mktg. 205-772-2194
Ariz Phoenix, M R Engrg. Sls. Co. 602-959-5150
Cal Burlingame, Jack Logan & Assocs. 415-697-6100

Cal Escondido, Cirolia Elctrn. Sls. 714-743-3015
Cal Woodland Hills, Elcon Elctrn. 213-884-4852

Conn North Haven, Kitchen & Kutchin 203-239-0212
Fla Indianantic, J. Talbot 305-724-2386
Fla Lighthouse Point, Saber Assocs. 305-943-3076
Fla Longwood, D. Mitro 305-422-3886
Ill Oak Brook, Whitmore & Assoc. 312-325-4727
Ill Fort Wayne, Delesa Sls. 219-483-9537
Ind Indianapolis, F. Thomas 317-257-4683

Md Baltimore, Burgin-Kreh Assocs. 301-788-5200
Mass Lexington, Kitchen & Kutchin 617-862-8230
Mass N. Andover, R. Hicks 617-686-6975

Mass Westwood, B. Reinherz 617-762-9272
Minn Minneapolis, S & R Sls. 612-544-3022
Mo Kansas City, Thro Ind. Sls. Co. 913-362-2533
NJ Springfield, F.F. Sylvester Assoc. 201-944-6964
NY Fayetteville, Martin P. Andrews 315-637-3144
NC Winston-Salem, L. G. White Southern 919-725-3612
Ohio Richfield, Bear Mktg. 216-659-3131
Pa Narberth, Jerry Bresson Assocs. 215-839-6770
Tex Richardson, Concept Sls. 214-387-1434
Va Lynchburg, Burgin-Kreh Assocs. 804-845-5600
FOR: Can., Thornhill, Ont., Elctrn. Components Int. 416-889-0212

NATIONAL ELECTRONIC SUPPLY, INC., 7231-B Garden Grove Blvd., Garden Grove, Cal., 92641, Tel: 213-430-7525, TWX: 910-596-1316; Empl.: 32; Minimum order: \$10

Customer service: M. Hartstein

Free literature available: Capacitor catalog and mil-spec capacitor directory. Complete pricing and manufacturer's information displayed in easy-to-understand language.

Products manufactured: Capacitor, Hardware, Capacitors, Fixed

Local Sales Offices & Reps.

Minn Minneapolis, Components Group 612-824-4222

NATIONAL ELECTRONICS, Varian Div., Box 269, Geneva, Ill., 60134, Tel: 312-232-4300, TWX: 910-237-1685; Empl.: 400

Products manufactured: Display Devices/Displays, Drivers & Decoders For Readouts, Integrators, Electronic, Semiconductor Wafer Fabrication, Tubes

Local Sales Offices & Reps.

Cal Los Altos 415-868-7633
Ill Geneva 312-232-4300

NATIONAL SEMICONDUCTOR CORP., 2900

Semiconductor Dr., Santa Clara, Cal., 95051, Tel: 408-732-5000, TWX: 910-339-9240; Empl.: 15000

Customer service: R. Weaver

Products manufactured: Amplifiers, Calculators, Electrical & Electronic, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Clocks (All Types), Comparators, Computers, Controllers, Programmable, Converters, Counters, Data Acquisition & Reduction Systems, Decoders, Diodes, Display Devices/Displays, Drivers, Solenoid, Drivers & Decoders For Readouts, Encoders, Integrated Circuit Devices, Isolators, Keyboards, Alphanumeric & Decimal, Lamp Drivers, Memories, Buffer, Memory Systems, Modulator/Demodulators, Modulators, All Kinds, Multiplexers, Multipliers, Power Supplies, References, D-C Voltage, Regulators, Shift Registers, Timers, Transducers, Transistors

Local Sales Offices & Reps.

Ala Huntsville, Inter Rep. Assocs., Inc. 205-881-3677
Ala Huntsville, National Semiconductor 205-881-0622

Ariz Scottsdale, Fred Board Assocs. 602-994-9388
Ariz Scottsdale, National Semiconductor 602-945-8473

Cal Buena Park, P. H. Wastal & Assoc. 714-826-7434
Cal Mountain View, National Semiconductor 415-961-4740

Cal Palo Alto, Quad Rep, Inc. 415-984-3532
Cal San Diego, S.R. Electronics 714-565-8411
Cal San Leandro, Quad Rep, Inc. 415-352-5942
Cal Sherman Oaks, National Semiconductor 213-783-8272

Cal Tustin, National Semiconductor 714-832-8113
Colo Denver, Electrodyne Inc. 303-757-7679
Conn Danbury, National Semiconductor 203-744-2350

Conn Westport, National Semiconductor 203-226-6833
Conn Westport, P.A.L. Comps. Inc. 203-226-6835

Fla Clearwater, Dyne A Mark 813-441-4072
Fla Ft. Lauderdale, Dyne A Mark 305-771-6501

Fla Miami, National Semiconductor 305-446-8309
Fla Orlando, Dyne A Mark 305-299-6303
Ga Atlanta, Inter Rep. Assoc. 404-394-7756
Ill Chicago, Gassner & Clark Co. 312-764-6121
Ill Mt. Prospect, Delta Tech. Sls. 312-437-9412
Ill Mt. Prospect, National Semiconductor 312-394-2030

Ind Ft. Wayne, Advanced Comp. Sls. 219-432-2546
Ind Indianapolis, Advanced Comp. Sls. 317-545-6441

Ind Indianapolis, National Semiconductor 317-255-5822

Iowa Cedar Rapids, Gassner & Clark Co. 319-393-5763

Md Glen Burnie, Micro Comp. Inc. 301-761-4600
Md Glen Burnie, National Semiconductor 301-760-5220

Mass Lexington, KCA Components 617-861-9024
Mass Lexington, National Semiconductor 617-861-6090

Mich Farmington, National Semiconductor 313-477-0400
Mich Grand Rapids, Representative Elctrn. Prod. 616-942-1320

Mich Southfield, Representative Elctrn. Prod. 313-354-9066

Minn Minneapolis, National Semiconductor 612-888-3060
Minn Minneapolis, Stan Clothier Co. 612-888-4666

Mo Hazelwood, Cen Tech 314-731-4220
Mo Raytown, Cen Tech 816-358-8100

NJ Cranford, National Semiconductor 201-272-3344
NJ Englewood Cliffs, National Semiconductor 201-461-5959

NJ Englewood Cliffs, P.A.L. Comps. Inc. 201-461-3410
NJ Haddonfield, Thomas Assocs. Inc. 609-854-3011

NM Albuquerque, A.Q. Elctrn. 505-255-8701
NY Greenvale, P.A.L. Comps. Inc. 516-484-4900

NY Rochester, Electra Sls. Corp. 716-436-4030
NY Syracuse, Electra Sls. Corp. 315-455-5783

NY Syracuse, National Semiconductor 315-455-5858
NC Raleigh, Inter Rep. Assoc. 919-781-2370

Ohio Chagrin Falls, Micro Tec. 216-247-5481
Ohio Dayton, National Semiconductor 513-434-0097

Okla Tulsa, Carter Assocs. Inc. 918-749-3311
Ore Beaverton, Vantage Corp. 503-644-6111

Tex Dallas, National Semiconductor 214-233-6801
Tex El Paso, Carter Assocs. 915-533-2681

Tex Garland, Carter Assocs. 214-276-7151
Tex Houston, Carter Assocs. 713-621-6930

Wash Bellevue, National Semiconductor 206-454-4600
Wash Bellevue, Vantage Corp. 206-455-3460

FOR: Can., Downsview, National Semiconductor 416-630-5751
FOR: Can., Montreal, Weber Electronic Ltd. 514-738-9415

Local Distributors

Ala Huntsville, Hall-Mark Elctrn., 2010 Bob Wallace Ave., S.W. 205-539-0691

Ala Huntsville, Hamilton/Avnet Elctrn., 805 Oster Drive N.W. 205-533-1170

Ariz Phoenix, Hamilton/Avnet Elctrn., 2615 S. 21st St. 602-269-1391

Ariz Phoenix, Liberty Elctrn., 3130 North 27th Ave. 602-257-1272

Ark Little Rock, Carlton Bates, Scott Hamilton at 69th St. 501-562-9100

Cal Culver City, Avnet Elctrn., 10916 Washington Blvd. 213-558-2345

Cal Culver City, Hamilton Electro Sales, 10912 W. Washington Blvd. 213-558-2121

Cal El Segundo, Liberty Elctrn., 124 Maryland St. 213-322-8100

Cal Mountain View, Elmar Elctrn., 2288 Charleston Rd. 415-961-3611

Cal Mountain View, Hamilton/Avnet Elctrn., 340 Middlefield Rd. 415-961-7000

Cal San Diego, Hamilton/Avnet Elctrn., 8917 Complex Dr. 715-279-2421

Cal San Diego, Liberty Electronics/San Diego, 8248 Mercury Ct. 714-565-9171

Cal Sunnyvale, Bell Inds., 1161 N. Fair Oaks 408-734-8570

Colo Commerce City, Elmar Elctrn./Denver, 6777 East 50th Ave. 303-287-9611

Colo Denver, Hamilton/Avnet Elctrn., 5921 North Bdw. 303-534-1212

Conn Georgetown, Hamilton/Avnet Elctrn., 643 Danbury Rd. 203-762-0361

Conn Hamden, Wilshire Elctrn./Conn., 2554 State St. 203-281-1166

Conn Norwalk, Harvey/Elctrn., 112 Main St. 203-853-1515

Fla Hollywood, Hamilton/Avnet Elctrn., 4020 North

III Elk Grove Village, Hall-Mark Elctns. Corp., 180 Crossen Ave. 312-437-8800

III Rosemont, Advent Elctns., 7110 Lyndon Ave. 312-298-4210

III Rosemont, Kierulff Elctns., 9340 William St. 312-678-8560

III Schiller Park, Hamilton/Avnet Elctns., 3901 North 25th Ave. 312-678-6310

Ind Indianapolis, Harvey-Indiana, Inc., 8557 Zionsville Rd. 317-297-4910

Ind Indianapolis, Pioneer Indiana Elctns., Inc., 6408 Castleplace Dr. 317-849-7300

Iowa Cedar Rapids, Advent Elctns., 1834 Blairs Ferry Rd., N.E. 319-393-8811

Kans Lenexa, Hall-Mark Elctns. Corp., 9000 Rosehill Rd. 913-888-4747

Kans Lenexa, Hamilton/Avnet Elctns., 37 Lenexa Industrial Center 913-888-8900

Md Gaithersburg, Kierulff Elctns., 16021 Industrial Dr. 301-948-0250

Md Gaithersburg, Pioneer Washington Elctns., 9100 Gaither Rd. 301-948-0710

Md Hanover, Hamilton/Avnet Elctns., 7255 Standard Dr. 301-796-5000

Mass Burlington, Hamilton/Avnet Elctns., 185 Cambridge 617-273-2120

Mass Burlington, Wilshire Elctns., One Wilshire Rd. 617-272-8200

Mass Lexington, Harvey-Elctns., 44 Hartwell 617-861-9200

Mass Needham Heights, Kierulff Elctns., 14 Charles St. 617-449-3600

Mich Farmington, Harvey Michigan Inc., 23461 Industrial Parkway Dr. 313-477-1650

Mich Kentwood, Harvey Michigan Inc., 4860 South Division Rd. 313-525-1800

Mich Livonia, Hamilton/Avnet Elctns., 12670 Farmington Rd. 313-522-4700

Mich Livonia, Pioneer/Michigan, 13485 Stamford 313-525-1800

Minn Bloomington, Hall-Mark Elctns., 9201 Penn Ave. So., Suite 10 612-884-9056

Minn Edina, Hamilton/Avnet Elctns., 7683 Washington Ave. So. 612-941-3801

Mo Earth City, Hall-Mark Elctns. Corp., 13789 Rider Trail 314-291-5350

Mo Hazelwood, Hamilton/Avnet Elctns., 382 Brooks La. 314-731-1144

NJ Cedar Grove, Hamilton/Avnet Elctns., 218 Little Falls Rd. 201-239-0800

NJ Cinnaminson, Wilshire Elctns., 855 Industrial Highway 609-786-8990

NJ Mount Laurel, Hamilton/Avnet Elctns., 113 Gaither Dr., East Gate Industrial Pk. 609-234-2133

NJ Rutherford, Kierulff Elctns., Industrial Dr. 201-935-2120

NM Albuquerque, Century Elctns., Inc., 129 Vermont Avenue, N.E. 505-265-7839

NM Albuquerque, Hamilton/Avnet Elctns., 2450 Baylor Dr. S.E. 505-765-1500

NY Binghamton, Harvey/Federal Elctns., Box 1208 607-748-8211

NY Buffalo, Summit Dist., 916 Main St. 716-884-3450

NY East Syracuse, Hamilton/Avnet Elctns., 6500 Jay Road 315-437-2642

NY Hauppauge, Semiconductor Concepts, 195 Engineers Road 516-273-1234

NY Rochester, Hamilton/Avnet Elctns., 167 Clay Rd. 716-442-7820

NY Rochester, Summit Elctns. of Rochester Inc., 292 Commerce Dr. 716-334-8110

NY Westbury, Hamilton/Avnet Elctns., 70 State Street 516-333-5800

NY Woodbury, Harvey Elctns., 60 Cross Ways Park West 516-921-8700

NC Greensboro, Hammond Elctns. of Carolina, Inc., 2923 Pacific Ave. 919-275-6391

NC Greensboro, Pioneer/Carolina Elctns., 2906 Baltic Avenue 919-273-4441

NC Raleigh, Hall-Mark Elctns., 3000 Industrial Dr. 919-832-4465

Ohio Cleveland, Hamilton/Avnet Elctns., 761 Beta Dr., Suite E 216-461-1400

Ohio Cleveland, Pioneer Standard, 4800 East 131 St. 216-587-3600

Ohio Dayton, Hamilton/Avnet Elctns., 118 Westpark Rd. 513-433-4055

Ohio Dayton, Pioneer Standard, 1900 Troy St. 513-236-9900

Okla Oklahoma City, Radio, Inc., 903 North Hudson 405-CE-1561

Okla Tulsa, Hall-Mark Electronics Corp., 4846 South 83rd East Ave. 913-835-8458

Okla Tulsa, Radio Inc., Ind'l. Elctns., 1000 South Main 918-587-9124

Ore Portland, Almac/Stroum Elctns., 4475 School Ferry Rd. 503-292-3534

Pa Erie, Mace Elctns., 2631 West 8th St. 814-838-3511

Pa Huntingdon Valley, Hall-Mark Elctns. Corp., 458 Pike Rd., Pike Ind'l. Pk. 215-355-7300

Pa Pittsburgh, Cameradio, 2801 Liberty Ave. 412-288-2600

Pa Pittsburgh, Pioneer/Pittsburgh, 560 Alpha Dr. 412-782-2300

SC Greenville, Hammond Elctns. of Carolina, 100 Augusta Street 803-233-4121

Tex Austin, Hall-Mark Elctns. Corp., 3100-A Industrial Terr. 512-837-2814

Tex Dallas, Hall-Mark Elctns. Corp., 9333 Forest La. 214-231-6111

Tex Dallas, Hamilton/Avnet Elctns., 4445 Sigma Rd. 214-661-8661

Tex Houston, Hall-Mark Elctns. Corp., 8000 Westglenn 713-781-6100

Tex Houston, Hamilton/Avnet Elctns., 1216 West Clay 713-526-4661

Utah Salt Lake City, Century Elctns., Inc., 2150 South 300 W., Suite J-1 801-466-6000

Utah Salt Lake City, Hamilton/Avnet Elctns., 647 Billinis Road W. 801-262-8451

Wash Bellevue, Hamilton/Avnet Elctns., 13407 Northrup Way 206-746-8750

Wash Seattle, Almac/Stroum Elctns., 5811 Sixth Ave., So. 206-763-2300

Wash Seattle, Liberty Elctns. Northwest, 5305 - 2nd Ave., S. 206-803-8200

Wisc Milwaukee, Taylor Electric Co., Drawer 11N 414-241-4321

For: Can., Downsview, Ont., Semad Elctns., Ltd., 1111 Finch Ave. W. 416-635-9880

For: Can., Mississauga, Ont., Hamilton/Avnet Elctns., Ltd., 6291 - 9 Dorman Rd. 416-677-7432

For: Can., Montreal 12, Que., Preico Elctns., Ltd., 480 Port Royal St., W. 514-389-8051

For: Can., Ottawa, Ont., Hamilton/Avnet Elctns., 880 Lady Ellen Pl. 613-725-3071

For: Can., St. Laurent, Que., Hamilton/Avnet Elctns., Ltd., 2670 Paulus 514-331-6443

For: Can., Vancouver 15, B.C., Intek Elctns. Ltd., 7212 Main St. 604-324-6831

For: Can., Willowdale, Ont., Electro Sonic Ind'l Sls., 100 Gordan Baker Rd. 416-494-1666

NATIONAL SEMICONDUCTORS, 331 Cornelia St., Plattsburgh, N.Y., 12901, Tel: 518-561-3160, TWX: 610-421-3362; Empl.: 150; Minimum order: \$25

p. 1-1018,1019

Customer service: Duncan F. Clifton 518-561-3170

Free literature available: Literature On: CdS, CdSe and Si Photo detectors, photocouplers, phototransistors. Light emitting diodes.

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Diodes, Isolators, Transistors

Local Sales Offices & Reps.

Ala Huntsville, BJR Research 205-881-3569

Ariz Phoenix, KCE Corp. 203-527-1881

Cal Los Altos, Shannon Assocs. 415-941-2217

Cal Varigon, El Segundo 213-679-0621

Conn Farmington, Keyco Assocs. 203-677-1771

Fla Ft. Lauderdale, Tech-Rep Assocs. 305-792-0962

Fla Indian Rocks Beach, Tech-Rep Assocs. 813-595-2834

Ill Glenview, Nero Elctn. 312-729-5075

Kans Shawnee Mission, Florence & Meyer Inc. 913-722-5210

Mass Needham, Keyco Assocs. 617-449-2600

Mich Farmington, Davis-Martensen Co. 313-474-8300

Minn St. Paul, Northport Engrg. 612-698-3841

NJ Nutley, D/R Assoc. of N.J. 201-667-5900

NY Huntington, Andrews & Andrews, Inc. 516-692-8686

NY Rochester, D/R Elctns. 716-442-6980

NC Greensboro, L & D Inc. 919-292-3201

Ohio Cleveland, D. Steffen 216-461-8333

Ohio Columbus, T. Mulligan & Assocs. 614-457-2242

Ohio Dayton, D. Steffen 513-293-3145

Ore Beaverton, Arneson Assocs. 503-643-5754

Pa Phila., H.A. Goodman 215-247-7116

Tex Dallas, J. Clay Co. 214-350-1281

Wash Seattle, Arneson Assocs. 206-762-7664

FOR: Rosemere, Que., Can., D/R Elctn. Ltd. 514-622-7381

NATIONAL SONICS, Div. Envirotech Corp., 120 Milbar Blvd., Farmingdale, N.Y., 11735, Tel: 516-694-5110, Telex: 14-4545; Empl.: 65

Customer service: J. Kristoffersen

Free literature available: Dry Product Control - Control dry product in bins, silos etc. Conveyor line counting and sorting. Liquid Level Control - Level control of any kind of liquid. Interface detection of two liquids. Sludge Density Control - Monitoring and controlling density of municipal and industrial sludges and slurries

Products manufactured: Controls/Control Eqpt., Indicators, Switches, Transducers

NAT'L-STANDARD CO., Niles, Mich., 49120, Tel: 616-683-8100, TWX: 810-270-3153; Empl.: 1000

Customer service: J. L. Dayton

Products manufactured: Wire

NATIONAL TEL-TRONICS, Div. Electro Audio Dynamics, Inc., State Road Hill, Meadville, Pa., 16335, Tel: 814-724-6440, Telex: 91-4405; Empl.: 200; Minimum order: \$35 p. 2-720-723

For info on price: M. Keller; Customer service: J. George; Delivery info: S. Rynd

Free literature available: Product Catalogs

Products manufactured: Cable Assemblies & Harnesses, Cable, Circuits, Printed, Multilayer, Clamps & Clips, Connectors, Insulators & Insulation, Jack Adapters (All Types), Jacks (All Types), Leads, Test & Adaptors, Panels, Plug Adapters, Plug & Jack Sets, Plugs, Posts, Probes, Terminal Blocks, Boards & Strips, Terminals, Tools

Local Sales Offices & Reps.

Ala Huntsville, J. Eberle & Assocs. 205-881-8315

Cal Burlingame, Carelli-EMA 415-697-6286

Cal Van Nuys, Shepherd Comps. 213-787-4610

Fla Ft. Lauderdale, Sprock Sls., Inc. 305-587-3792

Ill Chicago, Rozner Sls. Co. 312-283-0022

Ind Indianapolis, Tech. Reps. Inc. 317-849-6454

Mass Framingham, G-M Assocs. 617-872-0333

Minn Minneapolis, Heimann Co. 612-861-6051

Mo St. Louis, J. J. Mueller 314-353-3656

NJ Marlton, N. Krouse Assoc. 609-424-3543

NJ Nutley, Falk-Baker Assoc. 201-661-2436

NY Pompey, S.F. Foster Co. 315-677-3333

Ohio Chagrin Falls, D.C. Prior Co. 216-247-7999

Ohio Cincinnati, R. Makin Assocs. 513-232-5588

Pa Philadelphia, R. Cooper Sls. 215-624-5486

Tex Dallas, Allied Comps. 214-348-6660

Wash Seattle, Pacnor Mktg., Inc. 206-284-8020

EXP: Plainview, N.Y., Empire Exporters Inc. 516-293-5582

FOR: Can., Hamilton, Ont., Cartwright Southall Assoc. 416-528-0294

Local Distributors

Ariz Phoenix, Parts Elctns., 1310 North 7th 602-258-6476

Cal N. Redondo Beach, Mark Elec., 2315 1/2 Artesia Blvd. 213-772-2141

Cal San Jose, Peninsula Elec., 980 S. First St. 408-294-3594

Colo Denver, Electronic Parts, 1277 Broadway 303-893-3050

Conn Bridgeport, Hatry Elctns., 2465 Main St. 203-335-3124

Conn Hartford, Hatry Electronics, 500 Ledyard St. 203-527-1881

Fla Tampa, Lykes Elctns., 121 S. Ashley 813-229-1885

Md Bethesda, Empire Elec. Supply, 4907 Rugby Ave. 301-656-3300

Mass Lynn, Land Elctns., 9 Franklin St. 617-592-2220

NY N.Y. City, Center Ind. Elec., 15 East 16th St. 212-989-6363

NY Rochester, Simcona Elec., Box 1903 716-328-3230

Okla Tulsa, Radio, Inc., 1000 S. Main St. 717-233-6591

Pa Harrisburg, Pyttronics Ind., 2525 N. 7th St. 615-255-8444

Tenn Nashville, Electra Dist., 19-14 W. End 817-335-6521

Tex Ft. Worth, Swieco, Inc., 1512-18 E. Lancaster 817-335-6521

NATIONAL WIRE & CABLE CORP., Dept EEM, Service Div., 136 San Fernando Rd., Los Angeles, Cal., 90031, Tel: 213-225-5611, TWX: 910-321-4155; FSC No: 04569; Empl.: 114; Minimum order: \$50

p. 2-2028-2047

For info on price: H.F. Korte; Application info: F. Motley; Customer service: J.B. Wiley; Delivery info: H.F. Korte

Free literature available: Complete catalog.

Products manufactured: Cable Assemblies & Harnesses, Cable, Services, Assembly, Production & Test, Shields, Tubing, Wire

Local Sales Offices & Reps.

Ariz Phoenix, K. Jahn Co. 602-956-9060

Ark	Fort Smith, Electro-Related Products	501-783-7323
Cal	La Jolla, Rep. Sls. Co.	714-454-1500
Cal	Los Angeles, National Wire & Cable Corp.	213-225-5811
Cal	San Mateo, National Wire & Cable Corp.	415-344-3066
Colo	Arvada, Arrowhead Sls. Co.	303-423-5556
Conn	Wethersfield, Com/Pak Ltd., Inc.	203-563-4784
Fla	Maitland, J.W. Barrett Assocs.	305-678-0172
Fla	North Miami, J.W. Barrett Assocs.	305-681-4957
Fla	Orlando, National Wire & Cable Corp.	305-898-3801
Ill	Northfield, H.S. Tollaksen Co.	312-441-6644
Md	Glen Burnie, Faion Lott Co.	301-744-4611
Mass	Needham Heights, Com/Pak Ltd.	617-444-1259
Mich	Southfield, Luebke Sls. Co.	313-357-0355
Minn	Minneapolis, Tech. Assocs.	612-929-6721
Mo	Hazelwood, Production Automation	314-731-2331
Mo	Raytown, Production Automation	816-737-0066
NY	Huntington, National Wire & Cable Corp., Int'l.	516-757-6549
NY	Ontario Center, Kehoe Comp. Sls.	315-524-2491
NC	Charlotte, J. Rudisill Assocs.	704-377-6901
Ohio	Cincinnati, Luebke Sls. Co.	513-871-4211
Ohio	Cleveland, Luebke Sls. Co.	216-333-0425
Ohio	Dayton, Luebke Sls. Co.	513-294-0428
Pa	Delmont, Luebke Sls. Co.	412-468-4019
Pa	Wynnewood, H.J. Fairbanks Co.	215-642-5816
Tex	Fort Worth, J.H. Gibbs Assocs.	817-237-1455
Utah	Salt Lake City, Arrowhead Sls. Co.	801-487-4716
Wash	Olympia, Bergford Assocs.	206-866-2001
FOR:	Can., Downsview, Ontario, Cantronics, Ltd.	412-661-2494

NAUGLER ENGRG., INC., Off Dunham Rd., Beverly, Mass., 01915, Tel: 617-922-5634; FSC No: 05222; Empl.: 5; Minimum order: \$8
For info on price: C. A. Osborn; Application info: C. A. Osborn; Customer service: C. A. Osborn; Delivery info: T. Johnson

Free literature available: Catalog #700 Describes line of flexible couplings with unique leaf design for shafts up to 1/2" dia. with both set screw and clamp type hubs available.

Products manufactured: Couplings

NCI, INC., 5900 Australian Ave., W. Palm Beach, Fla., 33407, Tel: 305-842-3201, TWX: 510-952-7618; FSC No: 26769; Empl.: 460; Minimum order: \$100
Customer service: C. C. Johnson
Free literature available: NCI tantalum capacitor catalog listing each product and specification thereof as manufactured by NCI.

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.		
Ala	Huntsville, 20th Century Mktg.	205-772-9237
Ariz	Tempe, Sedco Sls.	602-968-7791
Cal	Los Alamitos, J.S. Heaton Co.	213-598-6676
Cal	Mountain View, Caltron-Pyle	415-964-3244
Cal	San Diego, J.S. Heaton Co.	714-452-1456
Colo	Denver, J.S. Heaton Co.	303-758-5130
Fla	Fort Lauderdale, CBC	305-484-7330
Fla	Winter Park, CBC, Inc.	305-644-2277
Ill	Chicago, Brock & Cushman, Inc.	312-622-4110
Iowa	Cedar Rapids, J. Vrbik Co.	319-377-8244
Kans	Shawnee Mission, K & M Sls & Assocs.	913-262-1444
Mass	Burlington, New England Tech. Sls.	617-272-0434
Mich	Detroit, R.C. Merchant & Co.	313-535-6000
Minn	St. Paul, R.G. Ragon, Inc.	612-488-0201
NJ	Englewood Cliffs, E. Glass Assocs.	212-586-8440
NY	Ontario Center, Kehoe Comps.	315-524-2491
Ohio	Medina, J.C. Hofstetter	216-241-4880
Pa	Fort Washington, GCM Assocs.	215-646-7535
Tex	Garland, Carter Assocs.	214-276-7151
Va	Lynchburg, Barnhill & Assocs.	804-846-4624
Wash	Seattle, Blum & Assocs.	206-782-1600
EXP:	Montreal, Que., Can., Cantronics, Ltd.	514-733-0749

NCR, S. Main & K Sts., Dayton, Ohio, 45409

NCR MICROELECTRONICS DIV., 8181 Byers Rd., Miamisburg, Ohio, 45342

NEC, see Nippon Electric

NEC AMERICA INC., See Nippon Elec./NEC America

NEC AMERICA, INC., 277 Park Ave., New York, N.Y., 10017, Tel: 212-758-1666, TWX: 710-581-3376; Empl.: 200 p. 1-2261; p. 2-1184
Products manufactured: Capacitors, Fixed, Diodes, Display Devices/Displays, Fiber Optic Bundles, Integrated Circuit Devices, Lasers & Laser Systems, Potentiometers, Relays, Switches, Thyristors (Includes Silicon Controlled Rectifiers), Transistors, Tubes

Local Sales Offices & Reps.

Cal	Los Angeles	213-973-2071
Del	Newark	302-738-0150
Ill	Chicago	312-828-9494
Va	Falls Church	703-560-2010

Local Distributors

Cal	Burlingame, California Eastern Lab., 1 Edwards Ct.	415-342-7744
Cal	Canoga Park, Nucleonic Prods. Co., 6660 Taniel Ave.	213-887-1010
Mich	Farmington, Harvey Michigan, 23461 Industrial Pk. Dr.	313-477-1650
Minn	Minneapolis, World Products, 5100 Edina Industrial Blvd., Box 35263	612-835-2117

NEC MICROSYSTEMS, Div. of North Electric Co., 1150 NW 70th St., Ft. Lauderdale, Fla., 33309, Tel: 305-974-5400, TWX: 510-956-9897; Empl.: 75; Minimum order: \$50 p. 1-892

For info on price: L. Brande; Application info: E. Lane; Customer service: L. Brande; Delivery info: L. Brande

Free literature available: Capabilities brochure - custom hybrid microcircuits

Products manufactured: Circuits, Hybrid, Thick Film, Drivers & Decoders For Readouts, Filters, Hybrid Voltage Regulators, Integrated Circuit Devices, IC's, Active Filters

Local Sales Offices & Reps.

Cal	Laguna Beach, W.D. Bird	714-494-5800
Cal	Los Altos, W. W. Posey Co.	415-948-7771
Conn	North Haven, Kitchen & Kutchin	203-239-0212
Ill	Northfield, Such & Assocs.	312-446-8934
Md	Silver Spring, Spectro Sys.	301-494-8261
Mass	Lexington, Kitchen & Kutchin	617-862-8230
Mich	Ferndale, Shalco	313-547-4771
Mo	Grandview, Bencke & McCaul	816-765-2998
Mo	St. Louis, Bencke & McCaul	314-434-6242
NJ	E. Hanover, HLM Assoc.	201-386-0794
NY	Northport, HLM Assoc.	516-423-1818
NY	Syracuse, Lenard Co.	315-479-9191
Ohio	Chagrin Falls, Midwest Mktg. Assoc.	216-247-6655
Ohio	Dayton, Midwest Mktg. Assoc.	513-433-2511
Pa	Wyndmoor, Spectro Sys.	215-836-1545
Tex	Garland, R. Forsyth	214-243-0140

NEFF INSTRUMENT CORP., 1088 E. Hamilton Rd., Duarte, Cal., 91010, Tel: 213-357-2281, TWX: 910-585-1833; Empl.: 55; Minimum order: \$10
Customer service: Sls. Dept.

Free literature available: Amplifiers: Instrumentation Amplifier products and accessories, System 620: amplifier-per-channel data acquisition system. Input Connection Practices for Differential Amplifiers: discussion of correct input techniques necessary to achieve high accuracy performance of instrumentation amplifiers.

Products manufactured: Amplifiers, Data Acquisition & Reduction Systems, Data Compressors, Digital, Multiplexers

Local Sales Offices & Reps.

Ala	Huntsville, BCS Assocs.	205-881-6220
Ariz	Phoenix, Zeus, Inc.	602-253-6104
Cal	Glendale, Instrument Specialists, Inc.	213-849-7181
Cal	San Diego, Instrument Specialists, Inc.	714-565-2555
Cal	Santa Clara, Instrument Specialists, Inc.	408-244-1505
Colo	Englewood, Zeus, Inc.	303-770-4400
Conn	Glastonbury, Instrument Reps., Inc.	203-633-0777
Fla	Orlando, BCS Assocs.	305-896-4881
Ill	Chicago, Carter Elctns., Inc.	312-585-5485
Ind	Indianapolis, Carter Elctns., Inc.	317-293-0696
Iowa	Cedar Rapids, Technical Reps., Inc.	319-363-2489
Mass	Lexington, Instrument Reps., Inc.	617-861-8620
Mich	Detroit, Electro Sls. Assocs.	313-526-8800
Minn	Minneapolis, Carter Elctns., Inc.	612-544-9393
Mo	Hazelwood, Technical Reps., Inc.	314-731-5200
Mo	Independence, Technical Reps., Inc.	816-737-1414
NJ	Union, SBM Reps., Inc.	201-687-8737
NM	Albuquerque, Zeus, Inc.	505-268-3941

NY	Pleasantville, SBM Reps., Inc.	914-769-1811
NY	Rochester, SBM Reps., Inc.	716-266-1400
NC	Greensboro, BCS Assocs.	919-273-1918
Ohio	Cleveland, Electro Sls. Assocs.	216-261-5440
Ohio	Dayton, Electro Sls. Assocs.	513-426-5551
Ore	Beaverton, Showalter Instr.	503-646-3004
Pa	Jenkintown, PDC Corp.	215-887-9610
Pa	Pittsburgh, Electro Sls. Assocs.	412-371-9449
Tex	Houston, Barnhill Two, Inc.	713-621-0040
Tex	Richardson, Barnhill Two, Inc.	214-231-2573
Utah	Salt Lake City, Zeus Inc.	801-486-3217
Wash	Seattle, Showalter Instr.	206-624-7020
Wisc	Milwaukee, Carter Elctns., Inc.	414-464-5555
FOR:	Can., Calgary, Alb., A. Crawford Assocs. Ltd.	403-261-0780

FOR: Can., Longueville, Que., A. Crawford Assocs. Ltd. 514-670-1212

FOR: Can., Mississauga, Ont., A. Crawford Assoc., Ltd. 416-678-1500

FOR: Can., North Vancouver, A. Crawford Assocs. Ltd. 604-980-4831

FOR: Can., Ottawa, Ont., A. Crawford Assocs. Ltd. 613-829-9651

NELSON ROSS ELCTRNS., 5 Delaware, Lake Success, N.Y., 11040, Tel: 516-328-1100, TWX: 510-223-0414; FSC No: 82199; Empl.: 150; Minimum order: \$25 p. 1-784,785

For info on price: E. F. Feldman; Application info: E. F. Feldman; Customer service: V. Roebbeck; Delivery info: E. F. Feldman

Free literature available: Spectrum Analyzer Catalog 0.5Hz - 25 MHz, Plug-In Spectrum Analyzers 0.5 Hz - 25 MHz, Synchro Sweep Generators 10 Hz - 500 kHz, Communications Spectrum Analyzers 10 Hz to 400 MHz, Microwave Spectrum Analyzers 10 MHz - 6.5 GHz, Low Frequency Spectrum Analyzers 0.5 Hz - 25 MHz, Broad Band Spectrum Analyzers 100 Hz - 25 MHz, RF - VHF - TV Spectrum Analyzers 1 to 300 MHz

Products manufactured: Analyzers, Detectors, Generators, Monitors, Receivers

Local Sales Offices & Reps.

Ala	Huntsville, J. L. Highsmith	205-881-3294
Alas	Anchorage, Arva-Hudson, Inc.	907-272-5231
Ariz	Scottsdale, BFA Corp. of Ariz.	602-946-4215
Cal	Cupertino, T. Snitzer	408-257-8333
Cal	Del Mar, T. Snitzer	714-454-2191
Cal	Los Angeles, T. Snitzer	213-836-6170
Colo	Boulder, H. Bass Assocs.	303-499-7509
Conn	Hamden, P. Jenks Assocs.	203-281-0810
Fla	Orlando, J. Highsmith	305-293-5202
Ill	Elk Grove Village, L. Green	312-593-0282
Ind	Indianapolis, L. Green	317-293-9827
Kans	Prairie Vlg., Engrg. Svcs.	913-649-4000
Md	Bethesda, S & S Assocs.	301-654-1434
Mass	Wakefield, P. Jenks Assocs.	617-246-1590
Mich	Detroit, Group Ten, Inc.	

Fla	Jacksonville	904-786-6734
Ga	Atlanta	404-261-3479
Ind	Ft. Wayne	219-484-5356
Iowa	Davenport	319-323-2139
Kans	Overland Park	913-381-3060
La	Metairie	504-737-1082
Md	Rockville	301-762-9511
Md	Towson	301-821-6862
Mass	Needham Heights	617-449-0131
Mich	Grand Rapids	616-455-9020
Mich	Southfield	313-357-3700
Minn	Minneapolis	612-884-4108
Mo	St. Louis	314-567-5320
Neb	Omaha	402-341-5272
NJ	Palisades Park	201-947-2291
NY	New York	212-565-1585
NY	Tonawanda	716-694-6535
NC	Winston-Salem	919-724-2262
Ohio	Cincinnati	513-771-1581
Ohio	Cleveland	216-524-5470
Ohio	Columbus	614-258-6705
Okla	Tulsa	918-627-3487
Ore	Portland	503-281-7693
Pa	Pittsburgh	412-922-2515
Pa	York	717-843-5585
SC	Columbia	803-798-0415
Tenn	Memphis	901-452-6770
Tenn	Nashville	615-256-1739
Tex	Dallas	214-358-1588
Tex	Houston	713-524-7429
Utah	Salt Lake City	801-322-4122
Va	Richmond	804-233-5520
Wisc	Milwaukee	414-351-0705
FOR: Can.,	Calgary 24, Alberta	403-287-1243
FOR: Can.,	Dorval 730, Quebec	514-636-8170

NERA, INC., 133 The Great Rd., Bedford, Mass., 01730,
Tel: 617-275-2500; Empl.: 20; Minimum order: \$25

Customer service: D. Kuyamjian

Free literature available: Brochures Data Sheets
application notes describing applications Water
Quality System Brochure: describing system for
automatic water quality data acquisition Model 4
Series Specifications - Interface specifications for
environmental data acquisition system
Application Note: Data display formats
Environmental data reduction system

Products manufactured: Comm. Systems, Data
Acquisition & Reduction Systems, Data Loggers

Local Sales Offices & Reps.

Cal	Port Hueneme, Whitney Assocs.	805-488-4434
Cal	San Diego, Whitney Assocs.	714-453-1181
Fla	Sarasota, Continental Shelf Assocs.	813-349-7182
La	Gretna, Continental Shelf Assocs.	504-340-3502
Md	Fulton, Gans - Fryling, Inc.	301-837-6311
Mass	Cohasset, E-M Assocs.	617-383-6133
NC	Charlotte, S. J. Perkinson Co.	704-366-1892
Va	Arlington, Gans - Fryling, Inc.	703-527-3262
Wash	Edmunds, Ocean Research Instrs.	206-774-6824

NES, INC., 1536 Brandy Pkwy., Streamwood, Ill., 60103,
Tel: 312-289-8820; Empl.: 145 p. 1-182, 183

For info on price: R. Lounsbury; Application info: R.
Lounsbury; Customer service: C. Manning; Delivery
info: R. Casperson

Free literature available: CATALOGS & DATA
SHEETS ON: DIGITAL PANEL METERS DATA
LOGGING, ACQUISITION, & REDUCTION
SYSTEM CIRCUIT CARDS COMMUNICATION
EQUIPMENT DIGITAL CLOCKS APPLICATION
NOTE INDEX

Products manufactured: Accelerometers, Alarms,
Amplifiers, Analyzers, Bi-Metals, Thermostatic,
Boards, Plug-In, Boards, Printed Circuit, Boards,
Printed Wiring, Universal; Boards, Programming,
Bolometers, Bridges, Cabinets & Accessories,
Calculators, Electrical & Electronic, Calibrators,
Cameras, Cards, Linear Function, Cards, Logic,
Cells, Load, Chamber, Environmental Test,
Chassis, Circuit Board Mounting, Clocks (All
Types), Coders, Comm. Systems, Comparators,
Compressors, Data, Computers, Controls/Control
Eqpt., Converters, Counters, Couplers, Current
Sensors, Data Acquisition & Reduction Systems,
Data Compressors, Digital, Data Loggers,
Decoders, Decommutators, Telemetering,
Deposition Equipment, Vacuum & Accessories,
Detectors, Display Devices/Displays, Drivers &
Decoders For Readouts, Duplicators, Enclosures,
Module, Plug-In, Encoders, Expanders, Data,
Filters, Gages, Generators, Indicators, Integrators,
Electronic, Kits, Breadboarding (For Engineers),
Magnetometers, Magneto-resistors, Hall,
Memories, Buffer, Memory Systems, Meters,
Modulator/Demodulators, Modules, Logic,
Encapsulated, Monitors, Motors, Multiplexers,
Multipliers, Oceanographic Equip. (Electronic),
Oscillators, Paper-Tape Preparation Systems,
Perforators, Pickups, Telephone (For Recording),
Potentiometers, Power Supplies, Prescalers,
Preselectors, Printers, Process Control Systems,
Programmers, Pulsers, Logic Test, Pyrometers,
Racks, Readers, Receivers, Recorders, Relays,
Scanners, Scramblers, Data, Sensors, Light,
Services, Assembly, Production & Test, Shunts,
Meter, Signal Conditioners & Equipment,
Switches, Tachometers, Teleprinters,
Teletypewriters & Equipment, Terminal
Equipment, Digital, Test Systems, Testers,
Thermistors, Thermocouples, Elements &
Accessories, Thermometers, Resistance,
Thermostats, Timers, Totalizers, Digital, Tracking
Systems, Transducers, Translators, Data,
Transmission Systems, Data, Transmitters,
Transponders, Typewriters, Input-Output (All
Types), Underwater Communication, Detection,
Navigation, etc. Equipment, Verification Systems,
Tape

Local Sales Offices & Reps.

Fla	St. Petersburg, Comtech Assocs.	813-527-3281
Md	Bethesda, S & S Assocs.	301-654-1434
Mass	Waltham, McBar Assocs.	617-890-0233
Minn	Minneapolis, R-J Inc.	612-922-1425
NY	DeWitt, DB Assocs.	315-446-0220
NY	Great Neck, Industro Assoc.	516-487-2620
Pa	King of Prussia, S & S Assocs.	215-265-3450

NESHAMINY TRANSFORMER, Div. Neshaminy
Electrn., Edison-Furlong Rd., Furlong, Pa., 18925, Tel:
215-794-7411; Empl.: 130; Minimum order: \$150
p. 2-1775, 1776

For info on price: F. Klein; Application info: W. Smith;
Customer service: F. Klein; Delivery info: F. Klein

Products manufactured: Chokes, Coils Including
Assemblies & Forms, Converters, Filters, Power
Supplies, Transformers

Local Sales Offices & Reps.

Cal	Altadena, D. Wagner Assoc.	213-MU 1-4060
Fla	Maitland, Peregov, Inc.	305-831-2474
Ill	Chicago, Ever-Flo Sls. Corp.	312-775-1418
NH	Nashua, Bell Controls	603-882-6984
NJ	Haddonfield, Thomas	609-UL 4-3011
NY	Rockville Centre, Magneco Inds.	516-764-4000
NY	Syracuse, W. Zimmerman	315-GR 4-4889
Pa	Philadelphia, Thomas Assocs.	215-627-6615

NESOR ALLOY CORP., 666 Passaic Ave., W. Caldwell,
N.J., 07006, Tel: 201-575-0400; Empl.: 230; Minimum
order: \$100

For info on price: M. Feldman; Customer service: B.
Rosen; Delivery info: M. Jacobsen

Products manufactured: Wire

NEUSES, INC. P.K.I., 1401 Rohlwing Rd., Rolling
Meadows, Ill., 60008, Tel: 312-253-6555; Empl.: 8
Customer service: V. Pelletier

Free literature available: Literature on all items
listed in EEM.

Products manufactured: Burnishers, Contact,
Gages, Kits, Marking (Dial, Instrument,
Equipment, etc.), Screwdrivers, Services,
Assembly, Production & Test, Testers, Tools,
Wrenches

NEW ENGLAND INSTR., 14 Kendal Lane, Natick,
Mass., 01760, Tel: 617-873-9711, TWX: 710-346-0398;
Empl.: 250; Minimum order: \$25 p. 2-1666-1671

For info on price: E. Burroughs; Application info: D.
Hoos; Customer service: E. Burroughs; Delivery info:
E. Burroughs

Free literature available: 12-page Condensed
Catalog of Precision Potentiometers Featuring
Single-Turn & Linear Motion Models in
Wirewound, Conductive Plastic, Conductive
Plastic Film, & Hybrid Designs.

Products manufactured: Potentiometers, Resistors,
Rheostats, Switches

Local Sales Offices & Reps.

Ariz	Scottsdale, E.J. Foley & Assoc.	602-945-2665
Cal	Palo Alto, O'Donnell Assocs.	415-327-9260
Cal	Torrance, O'Donnell Assocs.	213-323-9243
Colo	Denver, Electrodyne	303-757-7679
Conn	Wethersfield, Underwood Sls.	203-563-3046
Fla	Fort Lauderdale, R.I. Smith Assocs.	305-772-5100

Ga	Atlanta, Electro-Mech Sls. Eng. Co.	404-256-4414
Ill	Oak Park, J. Popp Sls. Co.	312-626-3711

Kans	Overland Park, Penzner-Mankus Assoc.	913-381-0004
Kans	Wichita, Penzner-Mankus Assoc.	316-264-2662
Md	Silver Spring, Rep-Tron, Inc.	301-593-4844

Mass	Chelmsford, Underwood Sls.	617-256-8191
Mich	Farmington, W.R. Hummon & Assoc.	313-474-0661
Minn	Minneapolis, R.W. Marshall Co.	612-929-0457

Mo	Hazelwood, Penzner-Mankus Assoc.	314-731-4334
NJ	Newfoundland, T.A. Adamo Prod. Dev. Inc.	201-697-2450

NY	Kingspark, T.A. Adamo Prod. Dev. Inc.	603-474-9112
NY	New Hartford, KLM Assocs.	315-735-8525

NY	No. Syracuse, KLM Assocs.	315-458-6214
NY	Rochester, KLM Assocs.	716-442-0820

NC	Raleigh, Electro-Mech Sls. Eng. Co.	919-782-6452
Ohio	Cincinnati, Tri-State Mktg.	513-761-7993

Pa	King of Prussia, Monteiro Assocs.	215-265-0634
Tex	Dallas, Evans & McDowell Assoc.	214-238-7157

Wash	Renton, S. Wilson Co.	206-226-0650
------	-----------------------	--------------

NEW ERA PRODS., 4480 Broadway Rd., Cleveland, Ohio,
44109, Tel: 216-351-1097; Empl.: 25; Minimum order:
\$5

Customer service: M. Zehner

Products manufactured: Alarms, Calibrators,
Inverters, Leads, Test & Adaptors, Lighting
Equipment, Emergency, Reels, Cord & Cable,
Services, Assembly, Production & Test,
Tachometers, Test Equipment, Testers

NEW HAMPSHIRE BALL BEARINGS, INC., Peterborough,
N.H., 03458, Tel: 603-924-3311, TWX: 710-364-1805;
Empl.: 750; Minimum order: \$200

For info on price: Sls. Dept.; Application info: Engrg.
Dept.; Customer service: Sls. Dept.; Delivery info: Sls.
Dept.

Free literature available: Miniature and Instrument
Bearings, Precision Bearing Assemblies, Precision
Steel Balls, Rod End and Spherical Bearings.

Products manufactured: Bearings

Local Sales Offices & Reps.

Cal	Los Angeles	213-776-5330
Ill	Des Plaines	312-827-6646
NY	Plainview	516-938-2011
Tex	Dallas	817-268-3141
Tex	Ft. Worth	817-284-1451

Local Distributors

Cal	Los Angeles, Jamaica Bearings, 8621 Bellanca Ave.	213-649-0480
Fla	Miami, Florida Bearings, 3164 N. Miami Ave.	305-573-8424
Ga	Atlanta, Dixie Bearings, 276 Memorial Dr.	404-522-7620
Iowa	Cedar Rapids, Iowa Midland Supply, 708 Third St. SE	319-366-3555
Minn	Minneapolis, Arrowhead Bearings, 1609 Hennepin Ave.	612-335-1111
Mo	Kansas City, Bearing Distrs., 1919 Baltimore St.	816-471-0666
NY	Jamaica, Jamaica Bearings, 138-72 Queens Blvd.	212-526-1350
Okla	Tulsa, Allied Brg. Supply, Box 3263	918-583-0164
Pa	Pittsburg, Bearings, Inc., 5536 Baum Blvd.	
Tex	Dallas, Bearing Chain & Supply, 1630 Prudential Dr.	214-631-8310
Wash	Bellevue, J.E. Phillips Co., Box 764	206-747-6538

NEWMAN CORP., M. M., Marblehead, Mass., 01945, Tel: 617-631-7100; Empl.: 8; Minimum order: \$10

For info on price: F. McCarron; Application info: P. Cohen; Customer service: F. McCarron; Delivery info: P. Cohen

Free literature available: Descriptive Bulletin on Spiral Wrap Tubing; Descriptive Bulletin on Antex Solder Irons.

Products manufactured: Caps, Forms & Tapes, Heat Shrinkable, Cords, Heat Guns, Production, Insulators & Insulation, Kits, Cable-End Sealing, Soldering Guns, Irons & Desoldering Tools, Spacers, Strain Reliefs, Cable & Wire, Tubing, Wire Markers

NEW-TRONICS CORP., 15800 Commerce Park Dr., Brookpark, Ohio, 44142, Tel: 216-267-3150; Empl.: 200; Minimum order: \$100

For info on price: P. Fritz; Application info: W. C. McNeil; Customer service: R. Chakerian; Delivery info: P. Fritz

Free literature available: Citizens-band and monitor antenna catalog, UHF amateur antennas & accessories, VHF amateur antennas & accessories

Products manufactured: Antennas, Cable

Local Sales Offices & Reps.

Cal	Foster City, Olson Sls.	415-573-1600
Cal	Woodland Hills, Chick Ryel & Co.	213-883-8118
Cal	Colorado Springs, Norris & Co.	303-635-9319
Cal	Denver, Norris & Co.	303-988-6430
Fla	Pembroke Pines, J. Wanger Sls.	305-987-8766
Ga	Atlanta, Murphy & Cota Co.	404-875-2525
Ill	Skokie, M. Bermann Sls.	312-675-3740
Ind	Indianapolis, Sukup & Cox Inc.	317-253-1215
Iowa	West Des Moines, Irvine Assocs.	515-225-7900
Mich	Bloomfield Hills, S. McMechan	313-852-4308
Mo	Liberty, Lector Reps	816-781-2522
NY	Flushing, Bettan Sls. Inc.	212-591-7600
NC	Burlington, Murphy & Cota Co.	919-584-1577
Ohio	Brookpark, W. J. Corrigan	216-267-3150
Ohio	Twinsburg, F. Ohman Inc.	216-425-7445
Pa	Levittown, Sher Sls. Inc.	215-946-6200
Tex	Dallas, I. Harrison	214-239-2479
Wash	Seattle, Fleehart & Sullivan Inc.	206-522-1533
EXP:	New York, N.Y., Roburn Agencies Inc.	212-989-5939
FOR:	Can., Dorval, Que., Superior Int'l. Elctns.	514-683-6331

N.Y. TESTING LABS., INC., 81 Urban Ave., Westbury, N.Y., 11590, Tel: 516-334-7770, TWX: 212-297-1449; Empl.: 50; Minimum order: \$50

Customer service: J. Gaspari

Products manufactured: Furnaces, Gages, Ovens, Services, Assembly, Production & Test, Testers

NEWCOMB AUDIO PRODUCTS CO., 12881 Bradley Ave., Sylmar, Cal., 91342, Tel: 213-367-1921

Products manufactured: Amplifiers, Phonographs, Parts & Accessories, Public Address Systems, Receivers, Recorders

Local Sales Offices & Reps.

Ala	Birmingham, M.F. Taylor Co.	205-853-3673
Cal	Burlingame, W.J. Purdy Co.	415-347-7701
Cal	Colorado Springs, Norris & Co.	303-635-9319
Fla	Winter Haven, M.F. Taylor Co.	813-294-2941
Iowa	Des Moines, K.S.W. Assocs.	515-279-9235
La	New Orleans, Crockett Sls. Co.	504-486-4590
Md	Silver Spring, M.F. Taylor Co.	301-589-4002
Mass	Belmont, A. Reinherz	617-484-7784
Mich	Ferndale, Shalco, Inc.	313-547-4771
Minn	Minneapolis, Jensen-Olsen Sls.	612-941-7181
Mo	Kansas City, K.S.W. Assocs.	816-363-5651
NJ	Teaneck, Fisher Elctns. Assocs.	201-836-6661
NY	Grand Island, L.J. McTaggart	716-773-9222
NC	Charlotte, M.F. Taylor	704-537-4878
Ohio	Mansfield, K. White	419-756-3363
Pa	Pittsburgh, M.F. Taylor	412-823-8400
Tenn	Memphis, Crockett Sls. Co.	901-388-5410
Tex	Dallas, Crockett Sls. Co.	214-748-8209
Wash	Seattle, Vantage Corp.	206-784-6800

NEWPORT LABS., INC., 630 E. Young St., Santa Ana, Cal., 92705, Tel: 714-540-4914, TWX: 910-595-1787; Empl.: 175; Minimum order: \$25

Free literature available: Sales catalog includes information on complete line of panel mounted digital instrumentation for voltage, current, frequency, time and temperature.

Products manufactured: Amplifiers, Comparators, Converters, Counters, Data Loggers, Indicators, Meters, Tachometers, Thermometers, Resistance, Timers, Totalizers, Digital

Local Sales Offices & Reps.

Ala	Huntsville, W.A. Brown	205-539-4411
Ariz	Scottsdale, Measurement Conslts.	602-994-9519
Cal	Pasadena, A&F Sls.	213-681-5631
Cal	Sunnyvale, RPD Instrs.	408-735-9040
Cal	Boulder, Meas. Conslts.	303-449-5294
Conn	Hartford, Victor Assocs.	203-246-5643
Fla	Ft. Lauderdale, W.A. Brown	305-776-4800
Fla	Orlando, W.A. Brown	305-425-5505
Ga	Atlanta, W.A. Brown	404-939-1674
Ill	Chicago, Data Elctns.	312-283-0300
Ind	Indianapolis, Data Elctns.	317-784-6360
La	Gretna, W.A. Brown	504-366-5766
Md	Rockville, Mesa, Inc.	301-881-8430
Mass	Frammingham, Victor Assocs.	617-879-5710
Mich	Southfield, Data-Tron	313-354-6421
Minn	Minneapolis, Data Elctns.	612-786-9666
Mo	Crestwood, C.B. Fall	314-968-3850
Mo	Kansas City, C.B. Fall	816-942-3912
NJ	Pennsauken, Megargel & Himmelstein	609-662-3081
NM	Albuquerque, Meas. Conslts.	505-265-6471
NY	Buffalo, R.F. Lamb	716-874-4900
NY	Elmont, Crane & Egert	516-488-2100
NY	Rochester, R.F. Lamb	716-544-5580
NC	Research Triangle Park, W.A. Brown	919-489-1546
Ohio	Dayton, Data-Tron	513-223-8421
Ohio	Wickliffe, Data-Tron	216-585-8421
Tex	Dallas, Martin, Zienkowsky, Browne, & Assoc.	214-233-5535
Tex	Houston, Martin, Zienkowsky, Browne, & Assoc.	713-523-7333
Utah	Murray, Meas. Conslts.	801-268-3181
Wash	Seattle, Underwood, Jensen & Assoc.	206-575-0123

NEY, CO. J.W., Maplewood Ave., Bloomfield, Conn., 06002

NH RESEARCH, INC., 1510 S. Lyon St., Santa Ana, Calif., 92705, Tel: 714-835-1616, Telex: 67-8377; FSC No: 24862; Empl.: 20; Minimum order: \$50

Customer service: N. Paik

Free literature available: Short-form catalog or specific data sheets of the NH Research product line.

Products manufactured: Amplifiers, Analyzers, Calibrators, Controls/Control Eqpt., Converters, Current Sensors, Current Sources, Dividers, Filters, Generators, Isolators, Meters, Monitors, Oscillators, Power Supplies, Regulators, Shifters, Stabilizers, Line Impedance, Standards, Synthesizers, Testers

Local Sales Offices & Reps.

Ala	Huntsville, Gentry Assocs.	205-534-9771
Ariz	Scottsdale, Measurement Conslts. Ltd.	602-948-8410
Cal	Santa Ana, Schlimes-Richardson	714-832-1949
Cal	Boulder, Measurement Conslts. Ltd.	303-449-5294
Fla	Gulfport, Greenstein Assocs.	813-381-6490
Ill	Chicago, Pat Lind Elctns. Co.	312-774-1246
Ind	Indianapolis, Pat Lind Elctns. Co.	317-547-9178
Mass	Waltham, W.M. Hague Co.	617-899-5600
Mich	Detroit, Electro Sales Assocs.	313-526-8800
Minn	Circle Pines, Pat Lind Elctns. Co.	612-786-5770
NJ	Haddonfield, Dyna Rep Co.	609-795-1700
NJ	Ridgewood, Hansen Assocs.	201-652-7055
NM	Albuquerque, Measurement Conslts., Ltd.	505-265-6471
NY	Huntington, Hansen Assocs.	212-947-0379
NC	Burlington, Gentry Assocs.	919-227-3639
Ohio	Cleveland, Electro Sales Assocs.	216-261-5440
Ohio	Dayton, Electro Sales Assocs.	513-426-5551
Pa	Pittsburgh, Electro Sales Assocs.	412-371-9449
Tex	El Paso, LH Industries	915-544-5124
Utah	Murray, Measurement Conslts. Ltd.	801-268-3181
Va	Alexandria, Dyna Rep Co.	703-354-1222
Wash	Bellevue, Shallowater Instr.	206-624-9020
FOR:	Can., Mississauga, Ont., Allan Crawford Assocs.	416-678-1500

NICHICON AMERICA CORP., 6435 N. Proesel Ave., Chicago, Ill., 60645, Tel: 312-679-6530

Products manufactured: Capacitors, Fixed

NICOLET INSTRUMENTS CORP., 5225 Verona Rd., Madison, Wisc., 53711, Tel: 608-271-3333, TWX: 910-286-1713; Empl.: 201

Customer service: B. Hervey

Free literature available: 1090 Brochure. A description of the operation and display capability of the Digital Oscilloscope. Specifications of the mainframe and various plug-ins are included.

Products manufactured: Oscilloscopes

Local Sales Offices & Reps.

Cal	Encino, Scientific Devices	213-872-1951
Cal	Los Alamitos, Scientific Devices	213-588-7678
Cal	Mountainview, Scientific Devices	415-964-4230
Cal	San Diego, Scientific Devices	714-279-6642
Cal	Littleton, Nicolet Instr.	303-798-3561
Ga	Decatur, Nicolet Instr.	404-243-1219
Ill	Des Plaines, Scientific Devices-Midwest	312-297-5240
Kans	Lenexa, Scientific Devices-Midwest	913-631-3818
La	Baton Rouge, Systems Engrg. Sls. Co.	504-272-3730
Md	Silver Spring, Sel-Tronics, Inc.	301-589-3391
Mass	Auburndale, Nicolet Instr.	617-969-7420
Minn	Minneapolis, Scientific Devices-Midwest	612-544-1616
Mo	St. Louis, Scientific Devices-Midwest	314-842-2535
NJ	Fairfield, KLS Assocs., Inc.	201-227-2900
NY	Liverpool, Rayelco Elctns., Inc.	315-652-5272
Ohio	Cleveland, Data Equip. Sls. Co.	216-252-3151
Pa	Melrose Park, R. Meyers Assocs.	215-224-1663
Tex	Houston, Systems Engrg. Sls. Co.	713-668-7840
Tex	Richardson, Systems Engrg. Sls. Co.	214-231-9364
Wash	Bellevue, Scientific Devices-Northwest	206-454-0900
FOR:	Can., Mississauga, Ont., Allan Crawford Assocs.	416-678-1500

NICOLET SCIENTIFIC CORP., 245 Livingston St., Northvale, N.J., 07647, Tel: 201-767-7100, TWX: 710-991-9619; Empl.: 85; Minimum order: \$50

For info on price: R. S. Rothschild; Application info: R. S. Rothschild; Customer service: A. Pini; Delivery info: R. S. Rothschild

Products manufactured: Analyzers

Local Sales Offices & Reps.

Cal	Irvine, Nicolet Scientific	714-549-1199
Cal	Littleton, Nicolet Instrument	303-798-3561
Ga	Decatur, Nicolet Instrument	404-243-1219
Ill	Palatine, Nicolet Scientific	312-358-6520
Mass	Auburndale, Nicolet Instrument	617-969-7420
NJ	Medford, Nicolet Scientific	215-467-7070
NY	Liverpool, Rayelco Elctns.	315-652-5272
Ohio	Dayton, LI/CORP	513-434-6367
Pa	West Chester, Nicolet Scientific	301-942-2020
Tex	Plano, Nicolet Instrument	214-424-8611
Wash	Bellevue, Scientific Devices/Northwest	206-454-0900

NIHON DEMPA KOGYO CO., LTD., 1-21-2 Nishihara, Shibuya-Ku, Tokyo, Japan, Tel: 03-460-2111; Empl.: 800

Products manufactured: Crystal Blanks, Filters, Oscillators

NIPPERT CO., 825 Pittsburgh Dr., Delaware, Ohio, 43015, Tel: 614-363-1981; Empl.: 350; Minimum order: \$100

For info on price: D. E. Breese; Application info: D. E. Breese; Customer service: D. Heinlein; Delivery info: D. Heinlein

Free literature available: Bulletin N-101: Cold-Formed Components, Bulletin N-102: Cold-Formed Heat Sinks with Integral Weld Rings, Bulletin N-104: Custom Drawn Shapes.

Products manufactured: Commutators, Crystals, Headers, Services, Assembly, Production & Test, Slip-Rings & Assemblies

NIPPON-DENSA CORP., 1821 University Ave., St. Paul, Minn., 55104

NITRON DIV., McDonnell Douglas Corp., 10420 Bubb Rd., Cupertino, Cal., 95014

NJE CORP., Box 50, Culver Rd., Dayton, N.J., 08810, Tel: 201-329-4616, TWX: 710-480-5674; Empl.: 125

p. 1-1326-1331

Products manufactured: Power Supplies

Local Sales Offices & Reps.

Ala	Huntsville, Col-Ins-Co.	205-539-1771
Ariz	Phoenix, BFA Corp.	213-990-4244
Cal	Sherman Oak, Electronic Mktg. Specialists	408-245-9291
Cal	Sunnyvale, Electronic Mktg. Specialists	303-744-3301
Cal	San Jose, BFA Corp.	408-245-9291
Conn	Hamden, Instrument Consultants	203-288-5246

Fla	Orlando, Col-Ins-Co.	305-423-7615
Ind	Ft. Wayne, R.O. Whitesell & Assocs.	219-432-5591
Ind	Indianapolis, R.O. Whitesell & Assocs.	317-359-9283
Ind	Kokomo, R.O. Whitesell & Assocs.	317-452-6065
Iowa	Marion, B. Rush Assoc.	319-377-0551
Kans	Olathe, B. Rush Assoc.	913-782-1177
Md	Silver Spring, Reptron Inc.	301-593-4844
Mass	Waban, Instr. Consultants	617-969-9881
Mo	St. Louis, B. Rush Assoc.	314-426-3656
NM	Albuquerque, BFA Corp.	505-292-1212
NM	Las Cruces, BFA Corp.	505-523-0601
NY	Manhasset, Win-Cor Elctn. Sls. Corp.	516-627-9474
NY	Pittsford, T-Squared Elctns. Co.	716-381-2551
NY	Syracuse, T-Squared Elctns. Co.	315-463-8592
NC	Raleigh, Col-Ins-Co.	919-834-6591
Okla	Tulsa, Kemp Engrg.	918-299-2636
Pa	Pennsauken, Megargel-Himmelstein Assoc.	215-629-1072
Tex	Addison, Kemp Engrg.	214-661-0400
Tex	Houston, Kemp Engrg.	713-688-1431
Wash	Bellevue, Brennan Assoc.	206-454-9332

NL INDS., INC., Elctns. Dept., Box 726-1981 Port City Blvd., Muskegon, Mich., 49445, Tel: 616-777-2602, TWX: 510-394-4130; Empl.: 60 p.1-2320-2323

Products manufactured: Arresters, Electrical Surge, Lightning, Current Sensors, Discharge Systems, Energy, Fuses, Heaters & Heating Elements, Indicators, Limiters, Meters, Ovens, Probes, Protectors, Regulators, Resistors, Suppressors, Switches, Thermistors, Thermometers, Resistance, Transducers

Local Sales Offices & Reps.

Ala	Huntsville, Murphy & Cota	205-529-8476
Cal	Inglewood, Tracker	213-645-6060
Cal	Palo Alto, Testco	415-326-5320
Colo	Wheat Ridge, RMS Sls.	303-423-6693
Ill	Chicago, D. Dolin Sls. Co.	312-286-6200
Ind	Greenwood, V. Schillinger & Assocs.	317-888-2260
Ind	South Bend, V. Schillinger & Assocs.	219-291-6258
Md	Baltimore, R. A. Wafer Assocs.	301-744-1133
Mass	Newton, Norwell Assocs.	617-969-5478
Mich	Detroit, Burcaw Co. & Assocs.	313-533-7700
Minn	St. Paul, R.G. Ragon, Inc.	612-488-0201
Mo	Kansas City, Nevco, Inc.	816-421-1751
NJ	Fairlawn, G. Harris & Assocs.	201-796-5200
NJ	Haddonfield, Thomas Assocs., Inc.	609-854-3011
NY	Syracuse, W.A. Franklin Sls. Corp.	315-474-2954
NY	Whitesboro, W.A. Franklin Sls. Corp.	315-736-5460
NC	Winston-Salem, Murphy & Cota	919-723-1001
Ohio	Cleveland, Jay Engrg. Co.	216-252-0486
Ohio	Dayton, Jay Engrg. Co.	513-253-2151
Okla	Tulsa, Norvell Assocs., Inc.	918-663-1247
Tex	Dallas, Norvell Assocs., Inc.	214-350-6771
Tex	Houston, Norvell Assocs.	713-774-2568
Wash	Seattle, D. Smith Sls. Co.	206-633-3160

NL INDUSTRIES, INC., Metal Div., 111 Broadway, New York, N.Y., 10006, Tel: 212-732-9400

Products manufactured: Flux, Brazing & Soldering Materials, Metal Compounds, Foils, Powders, Sheet, Stock, Metals, Solder (All Types), Tubing

N L INDS., INC., Paint Div., 111 Broadway, New York, N.Y., 10006, Tel: 212-732-9400

Products manufactured: Coatings, Paints

N L INDS., INC., Steel Package Div., 15th & State Sts., Granite City, Ill., 62040, Tel: 618-451-9760

Products manufactured: Containers



NOBEX DIV., Griffith Plastics Corp., 1027 California Dr., Box 4365, Burlingame, Cal., 94010, Tel: 415-342-8170, TWX: 910-374-2840; FSC No: 32767; Empl.: 35; Minimum order: \$10

For info on price: P. Long; Application info: J. A. Griffith; Customer service: P. Meyers; Delivery info: P. Long

Free literature available: Instrument Knob Catalog #300, Clear Dial Skirted Knob Catalog #361, DIGIBEZEL Catalog #351, Instrument Case Catalog #371, Binding Post Catalog #381.

Products manufactured: Bezels, Shielded & Unshielded, Caps, Lenses, Indicator Light, Cases, Equipment, Instrument, Meter, Dials, Knobs, Lenses, Readout & Display, Meters, Posts, Testers

Local Sales Offices & Reps.

Cal	Burlingame, J. Logan & Assocs.	415-697-6100
Cal	Inglewood, V & L Assocs.	213-671-7688
Fla	Delray Beach, F. A. Cullman Co.	305-276-5071
Ill	Chicago, Comm. Engrs.	312-761-0548
Ind	Ft. Wayne, McDonald Sls. Co.	219-745-9214
La	Metairie, McKinney Sls. Co.	504-887-1723
Md	Baltimore, M/E Assocs.	301-825-1130
Mass	N. Scituate, W.A. Hendrickson Co.	617-545-0652
Minn	Minneapolis, Wenco Sls.	612-866-3639
NJ	Cherry Hill, M/E Assocs.	609-667-6110
NY	Bayside, W. Jay Assocs.	212-762-4238
Okla	Tulsa, McKinney Sls. Co.	918-742-6791
Tex	Bellaire, McKinney Sls. Co.	713-665-3653
Tex	Dallas, McKinney Sls. Co.	214-631-9450
Va	Richmond, M/E Assocs.	703-266-3457
Wash	Seattle, C.K. Shanks & Assoc.	206-632-4290

Local Distributors

Cal	Burlingame, Rose Elctns., Inc., 846 Stanton Rd.	415-697-0224
Cal	Los Angeles, Electric Switches, Inc., 2478 Fletcher Dr.	213-664-1141
Mass	Newton, Greene-Shaw Co., 70 Bridge St.	617-969-8900
NY	Bohemia, Car-Lac Elctns., 75 Orville Dr.	516-567-4200
NY	Buffalo, Summit Distributors, 916 Main St.	716-884-3450
Okla	Tulsa, Oil Capitol Elctns., 708 S. Sheridan	918-836-2541
Tex	Dallas, K-A Electronic Sls., 1220 Majesty	214-634-7870
Wisc	Mequon, Taylor Electric Co., 1000 W. Dones Bay	414-241-4321

SELF-ORGANIZING SYS., See Cosar Corp.

NON LINEAR FILTERS, Box 338, Trumbull, Conn., 06611, Tel: 203-268-6309; Empl.: 12

Free literature available: IPI low pass and IPV-1 voltage controlled (over a 500:1 frequency range) low pass non-linear filters.

Products manufactured: Amplifiers, Filters, IC's, Active Filters

NON-LINEAR SYS., INC., Box N, Del Mar, Cal., 92014, Tel: 714-755-1134, TWX: 910-322-1132; Empl.: 76

For info on price: H. P. Heising; Application info: P. Akin

Products manufactured: Clocks (All Types), Comparators, Controllers, Programmable, Controls/Control Eqpt., Converters, Counters, Data Acquisition & Reduction Systems, Data Compressors, Digital, Data Loggers, Detectors, Gages, Generators, Meters, Monitors, Multiplexers, Printers, Recorders, Scanners, Signal Conditioners & Equipment, Test Systems, Testers, Totalizers, Digital

NORELCO ELECTRONICS, 200 Allen Blvd., Farmingdale, N.Y., 11735, Tel: 516-249-7262, TWX: 510-224-6519; Empl.: 40; Minimum order: \$10

For info on price: A. Baldon; Application info: A. Rogers; Customer service: L. Frodell; Delivery info: L. Frodell

Free literature available: Electronic Hardware Catalog #173A; GE RTV Silicone Catalog; Raychem Heat Shrinkable Tubing Catalog; Thermalloy Heat Sink & Mfg. Pad Catalog.

Products manufactured: Cable, Capacitors, Fixed, Chokes, Coils Including Assemblies & Forms, Compounds, Encapsulating, Insulating, Molding, Potting, Connectors, Cords, Diodes, Fuses, Insulators & Insulation, Knobs, Lamps, Lubricants, Pads, Transistor Mounting, Rectifiers, Rubber, Tapes, Electrical Insulation, Tapes, Films & Foils, Pressure Sensitive, Transistor, Diode, Thyristor Heat Dissipators, Transistors, Tubing, Wire, Wire & Cable Ties

Local Sales Offices & Reps.

NJ Livingston, H. Thaw Sls. Co.

NORPLEX DIV., Universal Oil Products, Norplex Dr., LaCrosse, Wisc., 54601, Tel: 608-784-6070, Telex: 29-3422; Empl.: 850

Products manufactured: Laminates

Local Sales Offices & Reps.

Ariz	Phoenix, Karl Jahn Co.	602-956-9060
Cal	Alhambra, Ralph Little & Assocs.	213-282-2114

Cal	Santa Clara, Ralph Little & Assocs.	408-247-7750
Colo	Sedalia, Jensen Reps. Co.	303-466-6061
Conn	West Hartford, R.S. Pettigrew & Co.	203-233-8533
Fla	Largo, Almac Assocs.	813-581-0444
Ga	Tucker, Cartier & Wilson Co.	404-939-2547
Ill	Wheaton, Norplex Div, UOP	312-653-1283
Ind	Indianapolis, Norplex Division, UOP	317-788-1998
Iowa	Cedar Rapids, J. Vrbik Co.	319-377-8244
Mass	West Newton, R.S. Pettigrew & Co.	617-969-5770
Mich	Detroit, Hohlfeldt Engrg., Inc.	313-839-4592
Minn	Minneapolis, Norplex Div., UOP	612-835-5530
Mo	St. Louis, Phelan-Tramelli Sls. Agency	314-727-3400
NJ	Union, Plastech, Inc.	201-687-4810
NY	East Rochester, J.N. Powderly Co.	716-381-2540
Ohio	Cleveland, R.A. Paisley	216-333-0569
Ohio	Dayton, Wm. S. McClellan Assocs.	513-299-5161
Okla	Tulsa, T.J. Ray Co.	918-627-1515
Pa	Ardmore, Midlantic Plastics Sls. Co.	215-649-2436
Tex	Arlington, N & W Sls., Inc.	817-461-4443
Wash	Olympia, Bergford & Assocs.	206-866-2001
Wisc	Menomonee Falls, Ind'l Sls. Tech., Inc.	414-781-7232
FOR	Can., Agincourt, Ont., J. Best	416-690-3254

NORSAL INDUSTRIES, INC., 34 Grand Blvd., Brentwood, N.Y., 11717, Tel: 516-231-4040, TWX: 510-227-9865; FSC No: 19136; Empl.: 15; Minimum order: \$25

For info on price: C. Feldman; Application info: N. Spector; Customer service: C. Feldman; Delivery info: R. Feldman

Products manufactured: Adapters, Waveguide, Attenuators, Boards, Programming, Cavities, Microwave, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film; Circuits, Printed, Multilayer, Circulators, Ferrite, Connectors, Couplers, Demodulators, Detectors, Dividers, Dummy Loads, Duplexers, Microwave, Films, Filters, Isolators, Junctions, Hybrid, Microwave, Limiters, Line Stretchers, Microwave, Mismatches, Microwave, Precision, Mixers, Modulators, All Kinds, Monitors, Multiplexers, Probes, Resistors, Shifters, Strip-Line Components, Microwave, Switches, Tees

Local Sales Offices & Reps.

Cal	Los Angeles, E. Mintz Assoc.	213-645-2066
Cal	Mt. View, Don Jay Assoc.	415-968-7500
Fla	Clearwater, Brennan Assoc.	813-446-5006
Ill	Chicago, Communication Engineers	312-761-0548
Mo	Kansas City, R. R. Burton Sls.	816-444-8300
Mo	Maryland Hgts., Delltron Co.	314-434-3804
NY	Melville, Astrorep	516-423-2266
Ohio	Dayton, F. L. Ohmer, Assoc.	513-434-1454
Pa	Lafayette Hill, M. Lader Co.	215-825-3177
Tex	Addison, RMC & Assoc.	214-363-0166
Wisc	Milwaukee, Star Engrg.	414-543-3469

NORTH AMERICAN PHILIPS CONTROLS CORP., Cheshire Industrial Park Box E, Cheshire, Conn., 06410, Tel: 203-272-0301, TWX: 710-455-4048; Empl.: 650

For info on price: L. Connor; Application info: F. Vitone; Customer service: R. Wozniak; Delivery info: R. Wozniak

Free literature available: 4-page "Permanent Magnet Synchronous Motor Selection Guide" lists in chart form comparative electrical, physical and operating characteristics of 13 models of synchronous motors.

Products manufactured: Controls/Control Eqpt., Counters, Detectors, Display Devices/Displays, Flashers, Indicators, Motors, Relays, Switches, Timers, Totalizers, Digital

Local Sales Offices & Reps.

Ala	Huntsville, W.A. Brown Components	205-539-4411
Cal	North Hollywood, No. Amer. Philips Controls	213-877-0536
Cal	Palo Alto, Harris Engrg.	415-328-3370
Colo	Littleton, Simpson Assocs.	303-794-8381
Fla	Ft. Lauderdale, W.A. Brown Comps.	305-776-4800
Fla	Orlando, W.A. Brown Comps.	305-425-5505
Ill	Rolling Meadows, Sumer	312-394-4900
Ind	Ft. Wayne, Temple Engrg.	219-744-4331
Kans	Wichita, Dy-Tronix, Inc.	316-943-6221
Md	Lutherville, L.D. Lowery	301-823-2172

Mass	Braintree, No. Amer. Philips Controls	617-648-2576
Mich	Dearborn Heights, Temple Engrg.	313-565-6330
Minn	Mpls., Nortec Sls.	612-835-7414
Mo	Hazelwood, Dy-Tronix Inc.	314-731-5799
Mo	Kansas City, Dy-Tronix Inc.	816-761-6543
NJ	Livingston, A.A. Budde	201-994-1210
NJ	Union City, Malin Assocs. Co.	201-348-3770
NY	Rochester, Woodams-Montbach	716-544-8721
NC	Raleigh, W.A. Brown Comps.	919-876-9601
NC	Winston-Salem, W.A. Brown Comps.	919-725-5384
Ohio	Cleveland, C. Robinson Co.	216-381-9049
Ohio	Dayton, C. Robinson Co.	513-275-2412
Pa	Broomall, L.D. Lowery	215-528-5170
Tex	Dallas, R. Kimball Co.	214-231-3447
Utah	Salt Lake City, Simpson Assocs., Inc.	801-486-3731
Va	Charlottesville, L.D. Lowery	703-973-6672
Wash	Bellevue, W.M. Buehler Co.	206-455-5512
FOR:	Can., Toronto, Ont., Philips Elctns. Inds., Ltd.	416-425-5161

Local Distributors

Cal	Sun Valley, Sterling Elctns., 11614 Pendleton St.	213-767-5030
Fla	Ft. Lauderdale, Peerless Radio Corp., 1040 N.E. 43rd Ct.	305-566-5966
Pa	Horsham, Pioneer/Pennsylvania, 205 Witmer Rd.	215-674-5710
Tex	Houston, Altair Co., 9501 Baythorne Dr.	713-462-3029
Tex	Richardson, Altair Co., 405 N. Plano Rd.	214-231-5166

NORTH AMERICAN PHILIPS CONTROLS, Husky Park, Frederick, Md., 21701, Tel: 301-663-5141, TWX: 710-862-0901; Empl.: 310; Minimum order: \$40

For info on price: B. L. Reeder; Application info: G. Borke; Customer service: P. Longo; Delivery info: M. Gieroux

Free literature available: 4-page guide to general purpose relays, displayed are operating, electrical and mechanical characteristics as well as dimensional data.

Products manufactured: Relays, Solenoids, Switches

Local Sales Offices & Reps.

Ala	Huntsville, W. Brown	205-539-4411
Cal	No. Hollywood, North Amer. Philips Controls Corp.	213-877-0536
Cal	Palo Alto, Harris Engrg.	415-328-3370
Colo	Denver, Williams-Asocs.	303-343-2911
Conn	Cheshire, North Amer. Philips Controls Corp.	203-272-0301
Fla	Ft. Lauderdale, W. Brown	305-776-4800
Fla	Orlando, W. Brown	305-425-5505
Ill	Rolling Meadows	312-394-4900
Ind	Ft. Wayne, Temple Engrg.	219-744-4331
Kans	Wichita, Dy-Tronix, Inc.	316-943-6221
Md	Towson, J-H Elctn. Sls. Co.	301-825-4440
Mass	Braintree, North Amer. Philips Controls Corp.	617-848-2576
Mich	Dearborn Heights, Temple Engineering	313-565-6330
Minn	Mpls., Nortec Sls.	612-920-9526
Mo	Hazelwood, Dy-Tronix	314-731-4677
Mo	Kansas City, Dy-Tronix	816-761-6543
NJ	Dumont, Wilson Assoc.	201-385-7447
NM	Albuquerque, Williams Assocs.	505-255-1638
NY	New York, Wilson Assoc.	212-889-0929
NY	Rochester, Woodams-Montbach	716-544-8721
NC	Raleigh, W.A. Brown	919-876-9601
NC	Winston-Salem, W. Brown	919-725-5384
Ohio	Cleveland, C. Robinson	216-381-9049
Ohio	Dayton, C. Robinson	513-275-2412
Pa	Fort Washington, G. C. M. Assocs.	215-646-7535
Tex	Richardson, R.F. Kimball Inc.	214-231-3447
Wash	Bellevue, W.M. Buehler Co.	206-455-5512
EXP:	NY, N.Y., Frathom Co.	212-687-9390
FOR:	Can., Toronto, Ont., Pye-Tmc	416-249-7044

Local Distributors

Cal	Sun Valley, Sterling Elctns., 11614 Pendleton St.	213-767-5030
Fla	Ft. Lauderdale, Peerless Radio Corp., 1040 NE 43rd Ct.	305-566-5966
Pa	Horsham, Pioneer/Penn., 205 Witmer Rd.	215-674-5710
Tex	Houston, Altair Co., 9501 Baythorne Dr.	713-462-3029
Tex	Richardson, Altair Co., 405 N. Plano Rd.	214-231-5166

NORTH AMERICAN PRINTED CIRCUIT DIV., Tyco Labs., Inc., Box 145, Stafford, Conn., 06075, Tel: 203-684-2703; Empl.: 140

Products manufactured: Boards, Printed Circuit, Circuits, Printed, Multilayer

NORTH ATLANTIC INDS., 200 Terminal Dr., Plainview, N.Y., 11803, Tel: 516-681-8600, TWX: 510-221-1879; FSC No: 07342; Empl.: 175; Minimum order: \$25

p. 1-188,772

For info on price: P. G. Wittenberg; Application info: P. G. Wittenberg; Customer service: W. Cullum; Delivery info: B. Carolyn

Free literature available: Condensed catalog, individual data sheets & application notes on AC instrumentation & resolver/synchro/digital conversion

Products manufactured: Analyzers, Bridges, Calibrators, Comparators, Converters, Decade Boxes, Demodulators, Detectors, Dividers, Indicators, Meters, Repeaters, Servo, Resolvers, Synchro, Servo Systems, Shifters, Simulators, Standards, Synchro Transmitters, Solid-State, Testers, Transformers

Local Sales Offices & Reps.

Ala	Huntsville, BCS Assocs.	205-881-6220
Ala	Mobile, BCS Assoc.	205-666-2796
Cal	Encino, Scientific Devices	213-872-1951
Cal	Los Alamitos, Scientific Devices	213-598-7678
Cal	Mountain View, Scientific Devices-CA	415-964-4230
Cal	North Hollywood, Elect. Standards Repair Svc.	213-765-4224
Cal	North Hollywood, North Atlantic Dist. Off.	213-982-0442
Cal	San Diego, Scientific Devices-CA	714-279-6642
Conn	Hamden, J & J Assocs.	203-624-7800
Fla	Orlando, BCS Assocs.	305-896-4881
Ga	Decatur, BCS Assocs.	404-321-0980
Ill	Chicago, P. Lind	312-774-1246
Ind	Indianapolis, P. Lind	317-547-9178
Iowa	Cedar Rapids, Tech Reps	319-363-2489
Ky	Valley Station, BCS Assoc.	502-935-9634
Md	Lanham, Brimberg Sls. Co.	301-552-2200
Mass	Burlington, J & J Assocs.	617-272-2606
Mich	Troy, G. R. Peters Assocs.	313-524-2920
Minn	Circle Pines, P. Lind	612-786-5770
Mo	Hazelwood, Tech. Reps.	314-731-5200
Mo	Independence, Tech Reps.	816-737-1414
NC	Greensboro, BCS Assocs.	919-273-1918
Ohio	Cleveland, Dynatron	216-835-2270
Pa	Exton, Scientific Mktg.	215-363-7377
Tex	El Paso, System Design Conslts.	915-544-5124
Tex	Houston, Scien. Sls.	713-666-5318
Tex	Richardson, Sci. Sls.	214-231-6541
Va	Williamsburg, BCS Assocs.	703-245-1786
Wash	Bellevue, Sci. Devices N.W.	206-454-0900
EXP:	N.Y., Plainview, North Atlantic	516-681-8600

Advertisement

Modular Synchro Conversion

If you are using ILC/DDC or Analog Devices, North Atlantic Industries has the second source and also state-of-the-art S/D-D/S.

Test Equipment

Digital Phase Angle Voltmeters, Synchro/Resolver Bridges, Simulators Angle Position Indicators 0.1° to .001°

NORTH ELECTRIC CO., Electronics Div., Portland Way N., Gallion, Ohio, 44833, Tel: 419-468-8100, TWX: 810-248-2907; Empl.: 1000

Free literature available: "NEC TODAY" Brochure - Overview of all of North's divisions with descriptions of each division's product line. "QUALITY ENGINEERED POWER SUPPLIES" Brochure - Photos & descriptions of the facilities and product capabilities of North's Electronics Division, including ordering information for power supplies.

Products manufactured: Chargers, Battery, Chokes, Coils Including Assemblies & Forms, Converters, Inverters, Power Supplies, Switches, Transformers

Local Sales Offices & Reps.

Cal	Laguna Beach, North Elec. Co.	714-494-5800
Ill.	Des Plaines, Marsland Assoc.	312-775-1309
NJ	Cherry Hill, Benco Sls.	609-779-9282
NJ	Fair Lawn, Bixon Assoc.	201-797-5356
NJ	Livingston, G & A Elctns., Inc.	201-992-3087
Ohio	Canton, CSA Equip. Sls.	216-456-1359

Va Oakton, Product Management Corp. 703-385-9306

NORTH HILLS ELCTRNS., Alexander Pl., Glen Cove, N.Y., 11542, Tel: 516-671-5700; FSC No: 98821; Empl.: 45; Minimum order: \$25

p. 1-189,264,265,1332,1333; p. 2-399,1388,1771

Free literature available: Summary Product Sheets on All Products.

Products manufactured: Alarms, Boards, Programming, Calibrators, Coils Including Assemblies & Forms, Comm. Systems, Comparators, Converters, Couplers, Current Sources, Display Devices/Displays, Dividers, Integrators, Electronic, Power Supplies, References, D-C Voltage, Scanners, Switches, Transducers, Transformers, Transmission Systems, Data, Voltage Sources

Local Sales Offices & Reps.

Ala	Huntsville, Scientific Devices-Southeast	205-536-1969
Cal	Los Angeles, Sodaro Co.	213-478-7733
Fla	Ft. Lauderdale, Scientific Southeast	305-721-4260
Fla	Orlando, Scientific Devices-Southeast	305-841-8180
Fla	St. Petersburg, Scientific Devices-Southeast	813-521-1720
Minn	Minneapolis, Heimann Co., Inc.	612-861-6051
NY	Great Neck, Industrian Assocs., Inc.	516-487-2620
NC	Burlington, Scientific Devices-Southeast	919-228-6279

NORTHEAST SCIENTIFIC CORP., 30 Wetherbee St., Acton, Mass., 01720, Tel: 617-263-2711; Empl.: 10; Minimum order: \$100

Customer service: C. Moritz

Free literature available: Catalog

Products manufactured: Power Supplies

Local Sales Offices & Reps.

Cal	Santa Clara, Ray Marg	408-248-5199
DC	Washington, Whitcomb Assocs.	202-737-0763
Ill	Des Plaines, Marsland Assocs., Inc.	312-775-1309
Ind	Indianapolis, Marsland Assocs., Inc.	317-924-3568
Md	Baltimore, Whitcomb Assocs.	301-889-1245
Minn	Minneapolis, Marsland Assocs.	612-455-4481
Mo	St. Peters, Marsland Assocs.	314-278-6949
NH	Salem, Bilowich Enterprises	603-898-5408
Pa	Audubon, Holmes Assocs.	215-666-0636

NORTHERN ENGINEERING LABS., 357 Beloit St., Burlington, Wisc., 53105, Tel: 414-763-3591; FSC No: 00815; Empl.: 200; Minimum order: \$25 p. 1-399

Customer service: D. Griebel

Free literature available: Twenty page technical brochure on frequency control devices (catalog #373) and pamphlet on "Writing Crystal Specifications."

Products manufactured: Crystal Blanks, Crystals, Oscillators, Ovens

Local Sales Offices & Reps.

Cal	Palo Alto, R.W. Thompson Assocs.	415-494-7516
Cal	Pasadena, P. Nurches Co.	213-796-5844
Colo	Aurora, Robbins & Assocs.	303-399-6618
Ill	Oak Park, E. Schmeichel Co.	312-524-0307
Kans	Olathe, Tech. Reps. Inc.	913-782-1177
Mass	Needham, Hatch Assocs.	617-444-3310
Minn	Chanhassen, Barnes Sls Assocs.	612-474-2907
NJ	Bergenfield, H. Gray Assocs.	201-384-3643
NY	Syracuse, Naylor Elctns. Co.	315-656-2251
Ohio	Wickliffe, W.J. Brauer & Assocs.	216-943-0601
Tex	Addison, Southland Comps., Inc.	214-233-0603

NORTHFIELD PRECISION INSTR. CORP., 4400 Austin Blvd., Island Park, N.Y., 11558, Tel: 516-431-1112; FSC No: 12639

Customer service: M. Farber

Products manufactured: Clutches, Couplings

NORTON ASSOCS., INC., 10 Di Tomas Ct., Copiague, N.Y., 11726, Tel: 516-842-4666; FSC No: 08739

Customer service: R. Norton

Free literature available: Specification sheets on Norton magnetic heads for tape & film.

Products manufactured: Heads, Recording Playback, Erase

NORTONICS CO., INC., 8101 Tenth Ave., N., Minneapolis, Minn., 55427, Tel: 612-545-0401; Empl.: 600; Minimum order: \$35

For info on price: E. Bedell; Application info: J. Dundovic; Customer service: P. Lund; Delivery info: P. Lund

Free literature available: Design digest for audio recording; design digest for mini-digital recording design digest for digital recording; recorder care maintenance manual; nortronics head replacement guide; - application oriented literature & catalogues for the user.

Products manufactured: Demagnetizers, Editing Equipment, Tape, Erasers, Magnetic Tape (Bulk), Heads, Recording Playback, Erase, Tape Recording Accessories

NOTHELTER WINDING LABS, See NWL Transformer

NOVA ELECTRIC MFG. CO., 263 Hillside Ave., Nutley, N.J., 07110, Tel: 201-661-3434; Empl.: 50

p. 1-1334-1337

Products manufactured: Converters, Inverters, Power Supplies, Regulators

Local Sales Offices & Reps.

Cal	Los Angeles, Basic Sys.	213-938-2833
Cal	Mountain View, Gado Instr.	415-961-2222
Cal	Boulder, A.L.S. Elctns.	303-447-2436
Conn	Hamden, Victor Assoc.	203-646-6448
Fla	Maitland, Rowe Engrg. Sls.	305-834-2700
Ill	Chicago, Ampol Svcs. & Engrg.	312-545-4600
Ind	Carmel, Rich Elctn. Mktg.	317-844-8462
Md	Bethesda, Powell-Pendergraph	301-656-4535
Mass	Framingham, Victor Assoc.	617-879-5710
Mich	Farmington, Anderson Elctns.	313-476-9161
Minn	Minneapolis, R-J Inc.	612-922-1425
NM	Albuquerque, A.L.S. Elctns.	505-294-8555
NY	Elmont, Crane & Ept Corp.	516-488-2100
NY	Fayetteville, M.P. Andrews Mfrs. Rep.	315-637-5291
NC	Charlotte, J. Rudisill Assoc.	704-377-6901
Ohio	Aurora, EMA Inc.	216-562-8516
Ohio	Centerville, EMA Inc.	513-433-2800
Ore	Portland, Richard Legg Co.	503-792-8824
Pa	Philadelphia, Powell-Pendergraph	215-657-0330
Pa	Pittsburgh, Wainwright Tech. Sls.	412-487-5055
Tex	Dallas, R. Martin Assoc.	214-358-3704
Tex	Houston, R. Martin Assoc.	713-462-4077
Va	Richmond, Powell-Pendergraph	804-264-2341
EXP:	N.Y., N.Y., Henley & Co.	212-986-5544
FOR:	Can., Calgary, Alberta, Canadian Dynamics	403-243-2018
FOR:	Can., Lachine, Que., Electrodesign Ltd	514-363-5120
FOR:	Can., Toronto, Ont., Electrodesign Ltd	416-787-0991
FOR:	Can., Vancouver, B.C., Canadian Dynamics	604-325-3201
FOR:	Can., Vanier, Ont., Electrodesign Ltd	613-745-0541

NSI, INSTRUMENT DIV., 2613 Industrial La., Garland, Tex., 75041, Tel: 214-278-3545; Empl.: 38; Minimum order: \$25

Customer service: D. Hoppens

Free literature available: Solid State Cooling: Guide to Solid State Cooling: photos, performance curves, size and application data

Products manufactured: Controls/Control Eqpt., Cooling/Heating Modules, Thermoelectric, Power Supplies

Advertisement

Standard and custom solid state thermoelectric coolers and associated temperature controls/power supplies. Specialists in coolers for industrial use and high reliability space or military applications. Temperatures to -110°C. Capabilities include complete thermal systems design and fabrication including heat exchangers, fans, and vacuum chambers.

N T-T/PEERLESS, 40 Jytek Dr., Leominster, Mass., 01453, Tel: 617-537-6001, TWX: 710-347-0326; Minimum order: \$25

Customer service: W. E. Schwartz

Products manufactured: Cable Assemblies & Harnesses, Cable, Clamps & Clips, Cleaners, Ultrasonic, Connectors, Cords, Insulators & Insulation, Jack Adapters (All Types), Jacks (All Types), Lead Assemblies & Receptacles, Microphone Accessories (Including Stands, Holders, Booms), Networks, Plug Adapters, Plug & Jack Sets, Posts, Probes, Sockets, Spacers, Speaker Systems, Speakers, Terminal Blocks, Boards & Strips, Terminals, Tools

Local Sales Offices & Reps.

Cal	Burlingame, Carelli-EMA	415-697-6286
Cal	Van Nuys, Markman Co.	213-787-6151
Fla	Fort Lauderdale, Sproch Sls.	305-587-3792
Ga	Atlanta, Hollingsworth & Still	404-394-3270
Ill	Hoffman Estates, G. Sangwin Co.	312-884-0186
Mass	Wellesley, L. Cole	617-237-1260
Mich	Milford, Polyphase Sls.	313-685-3003
Minn	Minneapolis, Heimann Co.	612-861-6051
NY	New York, Newhope Co.	212-532-7372
NY	Rochester, Marsey Sls.	716-442-9700
Ohio	Columbus, Mandabach & Assoc.	614-235-0265
Ore	Salem, Pacnor Mktg.	503-363-6445
Pa	Willow Grove, R. Lewis Sls.	215-659-0704
Tex	Dallas, Berthold Sls.	214-526-8329
Wash	Seattle, Pacnor Mktg.	206-284-8020
Wisc	Brookfield, G. Sangwin Co.	414-782-3240

NU-CONCEPT COMPUTER SYSTEMS, INC., Route 309 and Advance Lane, Colmar, Pa., 18915, Tel: 215-822-8400

For info on price: T. Dvorak; Application info: J. Moretz; Customer service: T. Dvorak; Delivery info: T. Dvorak

Free literature available: Dy-Nos-Stick Digital Test Probe Brochure - Specifications & description, Digital Diagnostics leaflet - Digital trouble-shooting requisites, PAK-X-TRAC brochure - Specifications & description

Products manufactured: Probes, Soldering Guns, Irons & Desoldering Tools

NU-METRICS, RD 1 Box 489, Vanderbilt, Pa., 15486, Tel: 412-628-0400; Empl.: 23

For info on price: R. T. Semsey; Application info: R. T. Semsey; Customer service: J. D. Bowman; Delivery info: J. D. Bowman

Products manufactured: Counters

NUCLEAR MEAS. CORP., 2460 N. Arlington Ave., Indianapolis, Ind., 46218, Tel: 317-546-2415, TWX: 810-341-3137; Empl.: 46; Minimum order: \$10

For info on price: L. G. Vaughn; Application info: L. G. Vaughn; Customer service: M. Hansen; Delivery info: M. Hansen

Free literature available: Bulletin AM-4 Continuous Air Monitors - Nuclear Bulletin GA-270-Gamma Alarms-Nuclear Bulletin PC-4-Laboratory Counting System1-Nuclear

Products manufactured: Detectors, Scalers, Binary, Decade

Local Sales Offices & Reps.

Cal	Menlo Park, Robt. W. Healy Co.	415-828-6044
Colo	Denver, T. Buirley	303-841-2754
DC	Washington, Hildenbrand Co., Inc.	703-280-2330
Fla	Jacksonville, Pulcir, Inc.	904-743-5700
Ill	Chicago, Memeco, Inc.	312-774-0919
Mass	Marblehead, Nucleonic Div. M.M. Newman Corp.	617-631-7100
NY	Syosset, Scientific Sys. Sls. Corp.	516-921-3737
NC	Charlotte, MacGuire & Crawford, Inc.	704-366-3454
Pa	Pittsburgh, Scientific-Pittsburgh	412-655-2800
Tex	Houston, R. Martin Assocs.	713-462-4077
Wash	Bellevue, Showalter Elctns.	206-455-4922

NUCLEAR RESCH. CORP., Street Rd. & 2nd St. Pike, Southampton, Pa., 18966, Tel: 215-357-5015; FSC No: 96696; Empl.: 25

For info on price: E. M. Pollock; Application info: A. J. Cassell; Customer service: A. J. Cassell; Delivery info: A. J. Cassell

Products manufactured: Amplifiers, Controls/Control Eqpt., Counters, Gages, Indicators, Meters, Scalers, Binary, Decade, Test Equipment, X-Ray Inspection Equipment

NUCLEONIC PRODS., Box 1454, 6660 Variel Ave., Canoga Pk., Cal., 91303, Tel: 213-887-1010, TWX: 910-494-1954; Empl.: 101; Minimum order: \$35

For info on price: H. Nierenberg; Application info: H. Nierenberg; Customer service: A. Blakemore; Delivery info: A. Blakemore

Products manufactured: Capacitors, Fixed, Crystals, Diodes, Integrated Circuit Devices, Inverters, Magnets, Metals, Power Supplies, Rectifiers, Transistors

NUCLEUS CORP., 25131 Dequindre, Madison Hgts., Mich., 48071, Tel: 313-399-3610; Empl.: 37

For info on price: L. Zeleny; Application info: L. Zeleny; Customer service: L. Adami; Delivery info: L. Adami

Free literature available: Fifth wheel instrumentation; vehicle performance test electronics.

Products manufactured: Boards, Printed Circuit, Controls/Control Eqpt., Converters, Counters, Decoders, Dials, Display Devices/Displays, Indicators, Integrated Circuit Packaging Systems, Kits, Power Supply, Kits, Test Equipment, Machines/Machinery, Production, Meters, Packages, Integrated Circuit, Screens, Printed Circuit, Services, Assembly, Production & Test, Solder (All Types), Stands, Instruments, Test Systems

NUCOR CORP., Power Supply Div., 2 Richwood Pl., Denville, N.J., 07834, Tel: 201-627-4200, TWX: 710-987-8487; Empl.: 115

Products manufactured: Chamber, Environmental Test, Meters, Power Supplies

Local Sales Offices & Reps.

Cal	Long Beach, Cairns Engrg. Sls.	213-432-7444
Fla	Clearwater, Brennan Assocs.	305-466-5006
Ill	Chicago, Electro-Tech Mktg. Assoc.	312-588-4535
Iowa	Cedar Rapids, Palatine Sales	319-365-8071
Kans	Overland Park, Palatine Sls.	913-262-5643
Md	Timonium, DeShawn Assocs.	301-252-4878
Mass	Burlington, R.J. Sickles Assoc.	617-272-7285
Mich	Warren, DEM Elctn. Sls.	313-755-6660
Mo	St. Louis, Palatine Sls.	314-426-7055
NY	Cortland, R.J.C. Associates	607-753-3909
NY	Huntington Station, Addem Group	516-567-5900
Okla	Tulsa, Vista Engrg.	918-627-7557
Tex	Richardson, Vista Engrg.	214-235-4547

NURAD, INC., 2165 Druid Pk. Dr., Baltimore, Md., 21211, Tel: 301-462-1700; Empl.: 40

Free literature available: "Airborne ECM Horn Antennas" A brochure on the use of airborne horn antennas for Electronic Warfare. Omni Directional Quad Polarized antenna system for remote TV broadcasts.

Products manufactured: Antenna Feed Systems, Antennas, Attenuators, CATV Systems & Equipment, Honeycomb Sheets, Panels, etc., Horns, Microwave, Mounts, Switches, Waveguides & Adapters

NUSONICS, INC., Box 248, Paramus, N.J., 07652, Tel: 201-265-2400; Empl.: 30

Products manufactured: Analyzers, Meters, Oceanographic Equip. (Electronic)

NVF CO., Box 68, Yorklyn, Del., 19736, Tel: 302-239-5281; Empl.: 1500

Products manufactured: Cases, Equipment, Instrument, Meter, Containers, Insulators & Insulation, Laminates, Services, Assembly, Production & Test, Tubing

NWL TRANSFORMERS, Nothelfer Winding Labs., Box 455, Trenton, N.J., 08603, Tel: 609-298-7300; Empl.: 100; Minimum order: \$100; p. 1-1325; p. 2-1325, 1772

For info on price: R. Graham; Application info: D. Singh; Customer service: C. Zigrand; Delivery info: C. Wszolek

Free literature available: Our transformer reactor information booklet describes NWL design and manufacture of custom electrical equipment. It is directed to those with special design requirements not met by standard "off the shelf" catalog units. The following information is available in this literature: transformer, reactor, power supply and application information.

Products manufactured: Chokes, Coils Including Assemblies & Forms, Controls/Control Eqpt., Filters, Power Supplies, Reactors, Transformers

Local Sales Offices & Reps.

Mass	Randolph, Naton Assoc.	617-986-6417
NY	Elmira Hgts., REECO	607-733-1387
Tex	Dallas, Titan Hgts.	214-357-8266

NYE, WILLIAM F., INC., P.O. Box G-927, New Bedford, Mass., 02742, Tel: 617-996-6721; Empl.: 10; Minimum order: \$6
Customer service: G. B. Mock
Free literature available: Summary catalog on synthetic lubricants for wide temperatures, high lubricity, chemical resistance, oil creep control, motion damping, plastic and elastomer compatibility and electric contacts.
Products manufactured: Lubricants

NYTRONICS COMPS. GROUP INC., Sub Nytronics, Orange St., Darlington, S.C., 29532, Tel: 803-393-5421; FSC No: 83125; Empl.: 500; Minimum order: \$50
p. 2-212-229,400-421,1504-1507
For info on price: M. W. Windham Ext. 320;
Application info: W. Early Ext. 325; Customer service: M. Parnell Ext. 217; Delivery info: M. Parnell Ext. 217
Products manufactured: Capacitors, Fixed, Coils Including Assemblies & Forms, Delay Lines, Resistors

Local Sales Offices & Reps.

Ala Huntsville, W.A. Brown Inc.205-539-4411
Ariz Phoenix, Clemick & Neenan & Assocs.602-279-7649
Cal Los Altos, W.W. Posey415-948-7771
Cal Los Angeles; Clemick & Neenan & Assoc.213-476-1272
Colo Denver, P. Webster303-770-1972
Fla Fort Lauderdale, W.A. Brown Comp. Inc.305-776-4800
Fla Orlando, W.A. Brown Comp. Inc.305-425-5505
Ga Atlanta, W.A. Brown Comp. Inc.404-457-4069
Ill Chicago, Balhorn & Welch Inc.312-889-5011
Ind Indianapolis, Southern Sls. Corp.317-257-7575
Md Bethesda, Warren Mount Comp.301-657-9312
Mass Bedford, F.R. Lesser617-275-7558
Mich Ann Arbor, H.C. Heym Assoc.313-971-6552
Mich Saginaw, H.C. Neym Assoc.617-799-0873
Minn Edina, Wagner Conslts.512-941-6310
NY Fairport, W.A. Franklin Sls. Corp.716-377-6584
NY Syracuse, W.A. Franklin Sls. Corp.315-472-5273
NY Valley Cottage, LRC Assocs.914-634-7973
NY Whitesboro, W.A. Franklin Sls. Corp.315-736-5460
NC Gastonia, W.A. Brown Comp. Inc.704-867-2101
NC Winston Salem, W.A. Brown Comp. Inc.919-725-5384
Ohio Cleveland, Imtech Inc.216-826-3400
Ohio Dayton, Imtech Inc.918-622-0321
Okla Tulsa, Palatine Sls., Inc.215-839-6770
Pa Narbeth, J. Bresson Assoc.215-839-6770
Pa Pittsburgh, Imtech, Inc.512-451-7463
Tex Austin, Palatine Sls., Inc.713-777-4477
Tex Houston, Palatine Sls., Inc.214-231-9489
Utah Salt Lake City, P. Webster206-767-4330
Wash Seattle, Seatronics, Inc.206-767-4330

Local Distributors

Ala Huntsville, Cramer Elect., 2310 Bob Wallace Ave. S.W.205-539-5722
Cal Carson, Hi Rel, 20507 S. Belshaw Ave.213-537-6500
Cal Sunnyvale, Bell Industries, Box 8050408-734-8570
Colo Denver, Newark Elect., 2170 S. Grape St.303-757-3351
DC Beltsville, Newark Elec., 10440 Baltimore301-937-5085
Fla Ft. Lauderdale, Newark Elect., 1360 N.W. 65th Ave.305-587-2372
Ga Atlanta, Cramer Elect., 3923 Oak Cliff404-448-9050
Ill Chicago, Newark Elect., 500 N. Pulaski Rd.312-638-4411
Ind Ft. Wayne, Ft. Wayne Elect., 3606 E. Maumee219-742-4346
Iowa Cedar Rapids, Newark Elect., 1019 First Ave. S.W.312-362-1171
Md Baltimore, Radio Elect., 1026 Cromwell Bridge Rd.301-823-0070
Mass Newton, Cramer Elect., 85 Wells Ave.617-969-7700
Minn Minneapolis, Newark Elect., 2028 E. 46th St.216-361-4700
NJ Kenilworth, Newark Elect., 303 Monroe Ave.201-272-8410
NJ Rahway, Terminal Elect., 1463 Pinewood St.201-381-5700
NY Hauppauge, Jaco Elect., 195 Engineers Rd.516-273-5981
NY Plainview, ACI Elect., 28 South Mall St.516-293-6630
NC Winston Salem, Cramer Elect., 938 Burke St.919-725-8711

Ohio Cleveland, Newark Elect., 2028 E. 46th St.216-361-4700
Pa Philadelphia, Philadelphia, 1225 Vine St.215-568-8288
Tex Dallas, Wholesale Elect., Ross at Central214-824-3001
Utah Salt Lake City, Newark Elect., 2540 S. 300 W.801-486-1048
Wash Bellevue, Bell Industries, 12410 S.E. 32nd St.206-747-1515
Wisc Brookfield, Newark Elect., 3695 No. 126th St.414-781-2450

OAK INDS. INC., Switch Div., Dept. EL, Crystal Lake, Ill., 60014, Tel: 815-459-5000, TWX: 910-634-3353; FSC No: 76854; QPL No: 3786; Empl.: 2000; Minimum order: \$100
Customer service: Mktg. Dept.

Products manufactured: Controls/Control Eqpt., Relays, Solenoids, Switches

Local Sales Offices & Reps.

Ariz Phoenix, Sheffer-kahn602-258-7893
Cal Inglewood, J. Kent213-678-4108
Cal Los Altos, D. Jacoby415-941-1237
Colo Denver, I.W. Strong303-292-6900
Fla Orlando, Dan Green305-671-4111
Haw Honolulu, Pegart Int'l. Hawaii808-839-6574
Ill Crystal Lake, Oak Inds. Inc.815-459-5000
La Metairie, J. McKinney Sls.504-887-1723
Mass Reading, R. Kolarik617-944-0094
Mich St. Joseph, J. Carlson616-983-3032
Minn Edina, Wagner Conslts. Corp.612-941-6310
Mo Raytown, Cotech Corp.816-358-8100
NJ Haddonfield, Gray Assocs.609-429-5300
NJ Mountainside, H. Richter201-233-4615
NJ Nutley, Falk-Baker Assoc.201-661-2430
NM Albuquerque, Sheffer-Kahn Co.505-265-7077
NY Fayetteville, H. G. Richter, Inc.315-637-6713
NY New York, H. G. Richter, Inc.212-962-5820
NC Raleigh, R. Burns919-876-7591
Ohio Cincinnati, C. Preston513-851-4411
Okla Tulsa, J.F. McKinney Sls. Co.918-742-6791
Ore Portland, B. Bartos503-292-0878
Tex Dallas, J. McKinney Sls.214-631-9450
Tex Houston, J.F. McKinney Sls. Co.713-774-3232
EXP: Ill., Crystal Lake, Oak Industries Inc.815-459-5000
FOR: Can., Aurora, Ont., Harper-Oak, Ltd.416-727-3191

Local Distributors

Ala Huntsville, Hall Mark Elctns., 4739 Commercial Dr.205-837-8700
Ariz Phoenix, Parts Elect. of Ariz., 1310 N. 7th St.602-258-6476
Ariz Tempe, G.S. Marshall Co., 835 W. 22nd St.602-968-6181
Cal El Monte, G.S. Marshall Co., 9674 Telstar Ave.213-686-1500
Cal Irvine, G.S. Marshall Co., 17975 Sky Park Blvd.714-556-6400
Cal San Diego, G.S. Marshall Co., 8057 Raytheon Rd.414-278-6350
Cal Sunnyvale, G.S. Marshall Co., 788 Palomar Ave.408-732-1100
Colo Arvada, G.S. Marshall Co., 5633 Kendall Ct.303-423-9670
Conn No. Branford, G.S. Marshall Co., 200 Shaw Rd.203-484-0480
Fla Ft. Lauderdale, Hall Mark Elctns., 1302 W. McNab305-971-9280
Fla Orlando, Hall Mark Elctns., 7233 Lake Ellenor Dr.305-855-4020
Fla Palm Beach Gardens, G.S. Marshall Co., 10384 Riverside Dr.305-622-8490
Ill Chicago, Newark Elctns., 500 N. Pulaski Rd.312-638-4411
Ill Des Plaines, Edmar Elctns., 1275 Rand Rd.312-298-8580
Ill Des Plaines, G.S. Marshall Co., 300 E. Touhy Ave.312-298-3700
Ill Elk Grove Village, Hall Mark Elctns., 180 Crossen Ave.312-437-8800
Ill Peoria, Klaus Radio, 8400 N. Pioneer Pkwy.309-691-4840
ILL Palatine, Ohm/Elctns., 649 Vermont Ave.312-359-5500
Ind Indianapolis, Graham Elctns., 133 S. Pa.317-634-8486
Kans Lenexa, Hall Mark Elctns., 9006 Rosehill Rd.913-888-4747
Md Baltimore, Hall Mark Elctns., 6660 Security Blvd.301-265-8500
Md Hyattsville, Milgray/Washington, 5405 Lafayette Pl.301-864-1111
Mass N. Wilbraham, Industrial Comps., 2551 Boston Rd.413-596-3854

Mass Newton Highland, G.S. Marshall Co., 88 Needham St.617-965-5115
Mass Watertown, DRW Elctns., 600 Pleasant St.617-923-1900
Minn Bloomington, Hall Mark Elctns., 9201 Penn Ave., S., Ste. 10612-884-9056
Minn Minneapolis, Industrial Comps., 5280 W. 74th St.612-831-2666
Mo Earth City, Hall Mark Elctns., 13789 Rider Trail314-291-5350
NJ Springfield, Federated Purchaser, 155 U.S. Rte. 22201-376-8900
NY Binghamton, Harvey/Federal Elctns., Box 1208 Vestal Pkwy.607-748-8211
NY Farmingdale, DRW Elctns., 100 Milbar Blvd.516-249-2660
NY Farmingdale, G.S. Marshall Co., 230 Sherwood Ave.516-293-4141
NY Farmingdale, Hall Mark Elctns., 167 Marine St.516-293-7500
NC Raleigh, Hall Mark Elctns., 3000 Industrial Dr.919-832-4465
Ohio Dayton, G.S. Marshall Co., 6388 N. Dixie Dr.513-898-1105
Ohio Medina, DRW Elctns., 7409 Spencer Lake Rd.216-225-0020
Okla Tulsa, Hall Mark Elctns., 4846 S. 83rd East Ave.918-835-8458
Okla Tulsa, S & S Radio Supply, 537 S. Kenosha918-582-8242
Pa Huntingdon Valley, Hall Mark Elctns., 458 Pike Rd.215-355-7300
Pa Philadelphia, Herbach & Rademan, 401 E. Erie Ave.215-426-1700
Tex Austin, Hall Mark Elctns., 3100-A Industrial Terr.512-837-2814
Tex Dallas, G.S. Marshall Co., 14205 Proton214-233-5200
Tex Dallas, Hall Mark Elctns., 9333 Forest La.214-231-6111
Tex Dallas, Solid State Elect. Co. of Tex., 2643 Manana214-352-2601
Tex Houston, Hall Mark Elctns., 8000 Westglenn713-781-6100
Tex Houston, Solid State Elect. Co. of Tex., 6400 Westpark Dr., Ste. 295713-585-5205
Tex El Paso, Hall Mark Elctns., 2211 E. Missouri St.915-545-1763
Wash Bellevue, G.S. Marshall Co., 1801 130th Ave., N.E.206-883-1084
Wash Seattle, Radar Electric Co., 168 Western Ave., W.206-282-2511
Wisc Milwaukee, Hall Mark Elctns., 11925 W. Ripley Ave.414-476-1270

OKTRON INDS., INC., Monroe, Wisconsin, 53566, Tel: 608-325-2121; Empl.: 250p. 1-26,27
For info on price: J. Disch; Application info: J. Disch; Customer service: J. Disch; Delivery info: M. West

Free literature available: C-75 Home & Industry Catalog; A-75 Automotive Catalog Sound Engineering Data Sheets

Products manufactured: Alarms, Baffles, Speaker, Controls, Fader, Drivers, Speaker, Grilles, Speaker Systems, Speakers, Transducers, Transformers, Underwater Communication, Detection, Navigation, etc. Equipment

Local Sales Offices & Reps.

Ariz Phoenix, R. Fissell Co.602-264-4031
Cal Los Altos, Ewing-Foley, Inc.415-941-4525
Cal No. Hollywood, J. Carter Assoc.213-980-3450
Colo Arvada, C B Elctn. Mktg.303-422-0561
DC Washington, Lienau Assoc.301-770-6800
Fla No. Miami, Winfield Elect. Sls.305-945-6544
Fla Tampa, Winfield Elect. Sales813-884-6500
Ga Atlanta, Millar Elect.404-261-6160
Ill Chicago, Markal Sls.312-282-5800
Ind Indianapolis, Shamrock Elect.317-547-0080
Md Rockville, Lienau Assoc.301-770-6800
Mass Braintree, Rudolph & MacInnis617-843-0908
Mass Norwood, Rudolph & MacInnis617-769-5450
Mich Ferndale, Shalco Inc.313-547-4771
Minn St. Paul, Carl-M Co.612-699-8004
Mo Kansas City, Nevco, Inc.816-421-1751
Mo St. Louis, Nevco, Inc.314-843-7406
NY Rochester, J. Brown Elect. Sls.716-266-2728
NY Yonkers, J. Brown Elect. Sls.914-779-7330
NC Raleigh, Millar Elect.919-787-9564
Ohio Akron, Shamrock Elect.216-666-3796
Ohio Dayton, Shamrock Elect.513-298-3052
Ore Salem, Pacnor Mktg.503-363-6445
Pa Philadelphia, Lienau Assoc.215-464-9444
Pa Pittsburgh, Tanner Co.412-561-4687
Tenn Memphis, Al. Engleman Co.901-458-6263
Tex Irving, Antle Smith Sls.214-259-8707
Wash Seattle, Pacnor Mktg.206-284-8020
EXP: Chicago, Ill., E.D. Magnus Assoc.312-334-1503

OAL ASSOCS., INC., Box 788, Westbury, N.Y., 11590, Tel: 516-334-1940; Empl.: 10

Customer service: O. Lohkemper

Free literature available: Bulletin 1R-100D - Infra Red Radiation Heating

Products manufactured: Chamber, Environmental Test, Controls/Control Eqpt., Furnaces, Heaters & Heating Elements, Lamps, Lights, Soldering Equipment

Local Sales Offices & Reps.

Cal Northridge, Pat Dooley Co. 213-360-2231
Fla Winter Haven, S & S Sls. Reps. 813-293-7304
Ill Palatine, Jos. Clark Co. 312-358-5095
Mass Chelmsford, Equipment Sls. Co. 617-256-8547
Mich Southfield, S.L. Sellers & Assocs. 313-444-1070

M. P. ODELL CO., 26612 Center Ridge Rd., Cleveland, Ohio, 44145, Tel: 216-871-8000; Empl.: 7; Minimum order: \$5

For info on price: N. Odell; Application info: M. P. Odell; Customer service: M. S. Harmon; Delivery info: N. Odell

Products manufactured: Cleaners & Solvents, Machines/Machinery, Production, Ovens

OGALLALA ELCTRS., Div. Arnold Engrg. Co., Box 59, Ogallala, Neb., 69153, Tel: 308-284-4093; Empl.: 30; Minimum order: \$25

Customer service: H. L. Harrington

Free literature available: "Electromagnet Brochure" A 12 page illustrated "Quick Facts" booklet looks at special purpose electromagnets, permanent-magnet assemblies and related magnetic products for high precision applications.

Products manufactured: Coils Including Assemblies & Forms, Magnets

Local Sales Offices & Reps.

Mass Belmont, Electronic Comps. & Svcs. 617-484-8680

OHIO CARBON CO., 12508 Berea Rd., Cleveland, Ohio, 44111, Tel: 216-252-6100; FSC No: 76868; Minimum order: \$250

For info on price: D. Marquard; Application info: J. Kupets; Customer service: D. Marquard; Delivery info: D. Marquard

Free literature available: Brush Grade Selector Form 1250, Karak Brochure carbon-graphite applications, material specifications.

Products manufactured: Bearings, Brushes & Brush Assemblies, Bushings, Glass, Plastic, Metal, Rubber, Etc., Contacts, Electrical, Graphite Parts, Materials, Graphite, Materials, Self-Lubricating, Resistors

Local Sales Offices & Reps.

Cal Los Angeles, Marwood Ltd. 213-628-3241
Cal San Francisco, Marwood Ltd. 415-431-7893
Ga Atlanta, W. Gilbert 404-255-8152
Ill Arlington Hgts., Eschner & Keranen 312-259-8184

Ill Chicago, M. Smith 312-787-3371
Kans Shawnee Mission, K&M Sls. 913-262-1444
Mass Sharon, Adco Engrg. Reps. 617-784-3996

Mich Bay City, Allsopp Assoc. 517-684-6120
Mo St. Louis, K&M Sls. 314-423-2420

NJ Andover, W. Proshok 201-347-6205
Ohio Cleveland, Greenleaf Assoc. 216-333-5480

Ore Portland, Marwood Ltd. 503-223-5130
Pa Sewickley, R. Clark 412-923-1980

Wash Seattle, Marwood Ltd. 206-623-4747

OHIO SEMITRONICS, INC., 1205 Chesapeake Ave., Columbus, Ohio, 43212, Tel: 614-486-9561; FSC No: 12066; Empl.: 30 p. 1-782, 783, 1848, 1849, 2344-2346

For info on price: A. Leatherman; Application info: A. Leatherman; Customer service: J. Gillard

Free literature available: HE7-2A, Halltron Hall Effect Probes; CT4-1, Current Transducers DC to KHz; HE-7-4, Wideband Current XDCRS AC to MHz; HE-7-6, Watt Transducers; HE-7-10, Watt Meter; WH74-1, Watt Hour Meter; HE7-3A, Hall Multipliers; ME8-2, Magnetic Antenna.

Products manufactured: Controls/Control Eqpt., Cooling/Heating Modules, Thermoelectric, Crystals, Current Sensors, Detectors, Generators, Integrators, Electronic, Meters, Monitors, Multipliers, Probes, Signal Conditioners & Equipment, Transducers

OHMITE MFG. CO., 3601 W. Howard St., Skokie, Ill., 60076, Tel: 312-675-2600, TVX: 910-223-0805
p. 1-1799, 2266; p. 2-1508-1515, 1673-1675, 1777

Products manufactured: Attenuators, Chokes, Coils Including Assemblies & Forms, Controls/Control Eqpt., Decade Boxes, Dividers, Dummy Loads, Potentiometers, Regulators, Relays, Resistors, Rheostats, Switches, Timers, Transformers

Local Sales Offices & Reps.

Alas Anchorage, H.J. Lang & Assocs. 907-279-5741
Ariz Phoenix, Darci Sales 602-948-2240
Cal Garden Grove, Impact Elctns., Inc. 213-431-3581

Cal Palo Alto, Ohmite Mfg. Co. 415-494-6953
Colo Denver, I.W. Strong & Assocs. 303-292-6900
Conn Waterbury, Coakley, Boyd & Abbott, Inc. 203-756-8766

Fla Orlando, Cartwright & Bean 305-896-2031
Iowa W. Des Moines, T.L. Dowell & Assocs. 515-225-1620

Kans Kansas City, T.L. Dowell & Assocs. 913-649-6069

La Chalmette, Cartwright & Bean 504-279-4598
Mass Needham, Coakley, Boyd & Abbott, Inc. 617-444-5470

Mich Birmingham, Ohmite Mfg. Co. 313-642-6040
Minn St. Paul, Cahill Assocs. 612-646-7217

Mo St. Louis, T.L. Dowell & Assocs. 314-647-7067
NJ Pennsauken, Ohmite Mfg. Co. 609-663-1703

NY Buffalo, Telesco Assocs. 716-834-1026
NY Great Neck, L.I., Cooper-Simon & Co. 516-487-1142

NC Charlotte, Polytec Svs. 704-332-6191
Ohio Birmingham, Ohmite Mfg. Co. 216-261-6000

Ohio Dayton, Ohmite Mfg. Co. 513-277-6543
Tenn Memphis, Cartwright & Bean 901-276-4442

Tex Dallas, Erickson & Vilter Sls. 214-243-6611
Wash Western Tech. Sls., Western Tech. Sls. 206-641-3900

EXP: Canada, Ontario, A.C. Simmonds & Sons Ltd. 416-491-1010

O. K. MACHINE & TOOL CORP., 3455 Conner St., Bronx, N.Y., 10475, Tel: 212-994-6600, Telex: 12-5091; Empl.: 100; Minimum order: \$25

For info on price: J. Camen; Application info: J. Camen; Customer service: J. Camen; Delivery info: G. Polanco

Free literature available: Catalog 36A includes technology of wire-wrapping, tool specifications, terminal spacing charts, illustrations and charts for bits and sleeves. Aimed at telecommunications and electronics fields.

Products manufactured: Connectors, Cutters, Wire, Hand Operated, Machines/Machinery, Production, Pliers, Soldering Guns, Irons & Desoldering Tools, Terminals, Tools, Wire Strippers

OKONITE CO., Box 340, Ramsey, N.J., 07446, Tel: 201-825-0300; Empl.: 1800

For info on price: H. A. Penhale; Application info: J. R. Hogan; Customer service: H. N. Bush; Delivery info: H. N. Bush

Products manufactured: Cable, Tapes, Electrical Insulation, Tubing, Wire

Local Sales Offices & Reps.

Ala Birmingham 205-592-8968
Cal Los Angeles 213-685-7610

Cal S. San Francisco 415-589-2362
Colo Denver 303-759-2776/7

Fla Jacksonville 904-721-2800
GA Smyrna 404-434-3388

Ill LaGrange 312-352-7200
La New Orleans 504-944-0259

Mass Hingham 617-749-3374/5
Mich Royal Oak 313-588-3525

Minn Minneapolis 612-888-7925
Mo Frontenac 314-997-2320

Mo Kansas City 816-471-6991
NJ Cherry Hill 215-567-5739

NY Syracuse 315-479-8313
NC Charlotte 704-535-6535

Ohio Cincinnati 513-761-1333
Ohio Cleveland 216-661-2550

Okla Tulsa 918-743-2543
Ore Portland 503-228-3172

Pa Pittsburgh 412-344-8181
Tex Dallas 214-243-3318

Tex Houston 713-691-3716
Utah Salt Lake City 801-484-7642

Va Vienna 703-938-4770
Wisc Milwaukee 414-476-4550

OLYMPUS CORP. AMERICA, Two Nevada Dr., New Hyde Park, N.Y., 11040, Tel: 516-488-3880; Empl.: 120

For info on price: J. Jurek; Application info: W. J. Seidl; Customer service: R. Kester; Delivery info: R. Kester

Products manufactured: Fiber Optic Bundles, Lenses, Optical & Camera, Microscopes

OMEGA ENGRG., INC., Box 4047, Stamford, Conn., 06907, Tel: 203-359-1660; Empl.: 75; Minimum order: \$10 p. 1-2324-2327

For info on price: M. Cardillo; Application info: D. Babbitt; Customer service: S. Bartosik; Delivery info: M. Cardillo

Free literature available: 1975 Omega Temperature Measurement Handbook, Bulletin A 674 - Color Coded Thermocouple Connectors & Jack Panels, Bulletin C 765 - Thermocouple Readout Meters, Bulletin 474 - Melting Point Standards

Products manufactured: Amplifiers, Bolometers, Bridges, Connectors, Controls/Control Eqpt., Crayons, Coatings, Pellets, etc., Temperature Indicating, Current Sensors, Detectors, Indicators, Labels, Temperature Indicating, Meters, Mounts, Panels, Potentiometers, Probes, Pyrometers, Switches, Thermistors, Thermocouples, Elements & Accessories, Thermometers, Resistance, Transducers, Tubing, Wire



OMNETICS, INC., Box 113, Syracuse, N.Y., 13211, Tel: 315-699-5262; FSC No: 52516; Empl.: 65; Minimum order: \$25

Customer service: J. F. Cleary

Free literature available: Specification sheets on all products. Price lists on all products. Complete binder catalog upon request. Short form catalog mailer. Application notes.

Products manufactured: Controls/Control Eqpt., Timers

Local Sales Offices & Reps.

Ark Fort Smith, Electro-Related Products 501-646-7756

Cal La Habra, Nolan Assocs. 213-694-2145
Cal Oakland, Powermatics 415-635-6826

Colo Denver, TESSCO 303-744-1119
Conn Trumbull, SIR Assocs. 203-268-2560

Fla North Miami, L. Haas Co. 305-949-9143
Ill Des Plaines, Control Sls. 312-774-1674

Kans Shawnee Mission, Technical Sls. Assocs. 913-888-3330

La Metairie, Electro Related Products 504-888-2908

Mass Lexington, SIR Assocs. 617-862-1812
Mich Troy, Control Sls. Assocs. 313-391-3236

Mo St. Louis, Technical Sls. Assocs. 314-725-5361
NJ Pitman, Colrud Co. 609-589-5866

NJ Ridgewood, Bailou 212-964-4640
NM Albuquerque, TESSCO 505-298-2415

NY Skaneateles, MCK Assocs. 315-685-7122
NY Syracuse, Omnetics, Inc. 315-699-5262

NC Charlotte, W. E. MacDonald Co. 704-372-7012
Ohio Cleveland, E. E. Bock & Assocs. 216-331-5212

Ohio Dayton, W. Hammer & Assocs. 513-294-4531
Ore Beaverton, D. Fry Co. 504-643-5448

Pa Erie, ECCO Elctn. Sls. 814-455-8110
Tex Houston, M. R. Summers Assocs. 713-524-7800

Va Richmond, Marchant-Field Sls. Co. 804-262-7333
Va Vienna, W. E. MacDonald Co. 703-938-4242

Wash Seattle, D. Fry Co. 503-643-2391
WVa Charleston, W. E. MacDonald Co. 304-342-8557

Wisc Cedarburg, TFL Assocs. 414-377-7030

Local Distributors

Ark Crossett, Lanus Elctns., 118 Main St. 501-364-3015

Ark Ft. Smith, Wise Whsl. Elec., 1001 Towson Ave. 501-783-8925

Cal El Segundo, Alpha Components Corp., 115 Eucalyptus Dr. 213-322-7780

Cal Redwood City, Electrical Sls. Prod., 465 Convention Way 415-364-2621

Colo Denver, TESSCO, 1340 S. Sherman 303-744-1119

Fla Miami, Electro-Standards Labs, 3560 NW 34th St. 305-633-6975

Fla Tampa, Leader Elec. Dist., 3411 S. Dale Mabry 813-835-1891

Ill Chicago, Fluid-Tek, 6348 S. Central 312-582-2872

Ill Franklin Park, Lumenite Elec. Co., 2331 N. 17th Ave. 312-455-1450

Mass Cambridge, H. Young Jr., 45 Landsdowne St.
617-547-3873
Mass West Springfield, Control Eng'g Inc., 1702
Riverdale St. 413-739-5134
NJ Fairlawn, Relay Specialties, 1300 Plaza Rd.
201-797-3313
NY Rochester, K.M.V.G., 315 Mt. Read Blvd.
716-328-2800
NY Rochester, Simcona Elec. Corp., 275 Mt. Read
Blvd. 716-328-3230
NY Woodside, Switches Unlimited, 49-11 43rd Ave.
212-651-0945
Ohio Columbus, Columbus Elec. Works, 767-783 N.
4th St. 614-294-4651
Ohio Dayton, Duellman Elec., 131 Wayne Ave.
513-461-5010
Ore Portland, Platt Elec. Supply, 1305 NW Davis
503-228-6121
Pa Braddock, M. Leff Radio Parts, 225 Braddock
Ave. 412-271-2800
Pa Erie, Erie Corporate Cont., 1938 Buffalo Rd.
814-455-8110
Wash Seattle, Radar Elec. Co., 168 Western Ave. W.
206-282-2511
Wisc Mequon, Taylor Elec. Co., 1000 W. Donges Bay
Rd. 414-241-4321

Advertisement

SOLID STATE TIMERS by Omne-tics...

Plain, quiet, priced to save you money. All Solid State Circuitry gives you silently smooth system operation, superior performance and dependability. Example: The NEW M-Liners are 100% solid state, are high-temp. compression molded to withstand extreme environmental abuses, and are available in AC or DC from 24 to 240 volts. Time delays start at 0.6 second and can be had out to 8 minutes in fixed times or in adjustable ranges by adding a potentiometer control. A single mounting screw and some Quick-Connects make M-Liners easy to use. Cost is easy too.

- Repeat accuracy = 2%
- Operate resistive or inductive loads
- Stable with temp/voltage
- Built-in transient protection
- Rating: 1 ampere steady state (10 amps inrush)
- Low cost

Write now for FREE Catalog or call 315-699-5262 for information.

OMNI SPECTRA, 24600 Hallwood Ct., Farmington, Mich., 48024, Tel: 312-477-1234; Empl: 250
p. 2724, 725

Products manufactured: Attenuators, Connector Adapters, Connectors, Couplers, Detectors, Dividers, Integrated Circuit Packaging Systems, Line Stretchers, Microwave, Microwave Integrated Circuits (MIC's), Sockets, Tees, Tools, Tuners

Local Sales Offices & Reps.

Ala Huntsville, Gentry Assocs. 205-536-5306
Ariz Phoenix, Zeus, Inc. 602-253-6104
Cal Culver City, DeAngelo, Rothman & Co. 213-398-6239
Cal Los Altos, Cain-White & Co. 415-948-6533
Cal San Carlos, LoDan, Inc. 415-592-4600
Colorado Denver, Zeus, Inc. 303-770-4400
Fla Orlando, Gentry Assocs. 305-894-4401
Ill Chicago, Gassner & Clark Co. 312-345-4245
Iowa Hiawatha, Gassner & Clark Co. 319-393-5763
Md Randallstown, C.L. Malinow & Co., Inc. 301-922-2092
Mass Brockton, Forsberg sls. 617-522-6300
Minn Minneapolis, C.E. Bohlig Co. 612-922-7011
NM Albuquerque, Zeus, Inc. 505-268-3941
NY Bayside, R. Diamond Inc. 212-423-7330
NY Fayetteville, Graydon-Sherman, Inc. 315-637-9861
NC Burlington, Gentry Assocs. 919-227-3630
Ohio Cincinnati, Comps., Inc. 513-721-2997
Ohio Cleveland, Comps., Inc. 216-842-2737
Pa Media, Snyder & Massey Assocs. 215-566-5400
Tex Dallas, Texas Microwave 214-231-5381
Utah Salt Lake City, Zeus, Inc. 801-466-4924
Wash Seattle, H. Levinson Co. 206-323-5100

OMNI-SPECTRA, Arizona Div., 1040 W. Alameda Dr., Tempe, Ariz., 85282, Tel: 602-966-1471, TWX: 910-950-1296; Empl: 165

Customer service: F. S. Parin

Free literature available: Voltage controlled and mechanically tuned oscillators for ECM, radar and communication applications. Low noise, broad band and minimum post tuning drift characterize voltage controlled oscillators.

Products manufactured: Alarms, Detectors, Oscillators

Local Sales Offices & Reps.

Cal Van Nuys, C.W. Swift & Assocs. 213-989-1133
Md Randallstown, C.L. Malinow & Co. 301-922-2092
Mass Medford, Blake Assocs., Inc. 617-391-7890
NY Fayetteville, Graydon-Sherman, Inc. 315-637-9861
Tex Dallas, Texas Microwave Elctn. 214-358-1172

OMNITEC CORPORATION, 2405 S. 20th St., Phoenix, Ariz., 85034, Tel: 602-258-8246, TWX: 910-951-4247; FSC No: 09376; Empl: 50

For info on price: F. Willes; Application info: F. Willes; Customer service: J. Ingram; Delivery info: J. Ingram

Products manufactured: Couplers, Modulator/Demodulators, Printers, Telephone Channel Test & Simulator Equipment, Teletypewriters & Equipment, Terminal Equipment, Digital

Local Sales Offices & Reps.

Ala Huntsville, W. A. Brown Instr. 205-539-4411
Ariz Scottsdale, BFA Corp. 602-946-4215
Cal Sherman Oaks, Elctn. Mktg. Spec. 213-990-4244
Cal Sunnyvale, Elctn. Mktg. Spec. 408-245-9291
Colorado Denver, BFA Corp. 303-744-3301
Conn Hamden, J & J Assocs. 617-272-2606
Fla Ft. Lauderdale, W. A. Brown Instr. 305-776-4800
Fla Indialantic, W. A. Brown Instr. 305-723-0766
Fla Orlando, W. A. Brown Instr. 305-425-5505
Ga Atlanta, W. A. Brown Instr. 404-939-1674
Ill Des Plaines, Lincoln, Hodges & Assoc. 312-297-3810
La Gretna, W. A. Brown Instr. 504-366-5766
Md Bethesda, S & S Assocs. 301-654-1434
Mass Burlington, J & J Assocs. 617-272-2606
NJ Ft. Lee, Tech. Mktg. Assoc. 201-224-6911
NM Albuquerque, BFA Corp. 505-292-1212
NM Las Cruces, BFA Corp. 505-523-0601
NY E. Syracuse, Ossmann Instrs. 315-437-6666
NY Rochester, Ossmann Instrs. 716-328-2230
NY Vestal, Ossmann Instrs. 607-785-9947
NY Wappingers Falls, Ossmann Instrs. 914-297-7777
NC Durham, W. A. Brown Instr. 919-489-1546
Okla Norman, Data Mktg. Assocs. 405-364-8320
Pa King of Prussia, S & S Assocs. 215-265-3450
Tenn Knoxville, W. A. Brown Instr. 615-584-2614
Tex Dallas, Data Mktg. Assocs. 214-661-0300
Tex Houston, Data Mktg. Assocs. 713-686-9627
Tex San Antonio, Data Mktg. Assocs. 512-828-0937
Utah Salt Lake City, BFA Corp. 801-466-6522
Wisc Waukesa, Lincoln, Hodges & Assoc. 414-542-3087

OMTRONICS MFTG., INC., 2406 Leavenworth, Omaha, Neb., 68105, Tel: 402-348-9500, TWX: 910-622-8220; Empl: 125; Minimum order: \$10
p. 21516-1525

For info on price: B. Matejka; Application info: J. Matejka, Sr.; Delivery info: B. Matejka

Products manufactured: Resistors

Local Sales Offices & Reps.

Ariz Phoenix, Dorton Entprs., Inc. 602-263-0414
Cal Redwood City, Woodworth Co. 415-365-0252
Cal Santa Ana, RMS Assocs. 714-556-4155
Colorado Arvada, Arrowhead Slis. 303-423-5556
Ill LaGrange Park, Bierhaus Slis. 312-354-5100
Iowa Cedar Rapids, J. Vrbik Co. 319-377-8244
Kans Overland Park, Penzner Assocs. 913-381-0004
Kans Wichita, Penzner-Mankus Assocs. 316-264-2662
Md Towson, Habco Elctnrs., Inc. 301-825-9637
Mass Canton, New England Elctn. Slis. 617-828-4835
Minn Minneapolis, Hasse & Assocs. 612-535-2671
Mo Hazelwood, J.C. Mankus Assocs. 314-731-4334
NJ Kenilworth, Ventronics, Inc. 201-272-9262
NY Rochester, L.G. Marchese Assocs. 716-544-4300
Ohio Cincinnati, Comps., Inc. 513-863-0526
Ohio Cleveland, Comps., Inc. 216-842-2737
Tex Fort Worth, W. Pat Fralia Co. 817-738-2394
Utah Salt Lake City, Arrowhead Slis. 801-485-3362

Wash Seattle, Carlyle Tech. Slis. 206-622-4288
EXP: Stamford, Ct., Dage Corp. 203-324-3123

Local Distributors

Ala Birmingham, ACK Radio Supply, 3101 4th Ave. So. 205-322-0588
Ariz Phoenix, Mirco Elctnrc., 2005 W. Peoria Ave. 602-944-2281
Cal Chatsworth, Westates Elctnrs., 20151 Bahama St. 213-341-4411
Cal Costa Mesa, Comps. Center, 1240 Logan Ave. 714-979-0433
Colorado Denver, Elctn. Parts, 1212 So. Bdwy. 303-744-1992
Fla Miami, Elctn. Equip., 2201 N.W. 42nd Ave. 305-871-3500
Ill Rosemont, Advent Elctnrs., 7110 No. Lyndon 312-297-6200
Mass Newton, Greene-Shaw Co., 70 Bridge St. 617-969-8900
Mo St. Louis, L/Comp St. Louis, 2605 So. Hanley Rd. 314-647-5505
Neb Omaha, Radio Equip., 625 No. 18th St. 402-341-7700
NY Farmingdale, Arrow Elctnrs., 900 Broadhollow Rd. 516-694-6800
Ohio Cleveland, Hamilton Avnet, 26111 Brush Ave. 216-289-0550
Okla Tulsa, Hall Mark Elctnrs., 4846 So. 83 Ave. E. 918-835-8458
Pa Huntingdon Valley, Hall Mark Elctnrs., 458 Pike Rd. 215-355-7300
SC Greenville, Hammond Elctnrs., 100 Augusta St. 803-233-4121
Tex Houston, Hall Mark Elctnrs., 8000 Westglenn 713-781-6100
Wash Seattle, R. E. Priebe Co., 2211 Fifth Ave. 206-682-8242

ON-GUARD CORP. OF AMERICA, 350 Gotham Pkwy., Carlstadt, NJ, 07072, Tel: 201-939-5822, TWX: 710-989-0282; Minimum order: \$50

Free literature available: Catalog #972-Alarms and Accessories Catalog #727-Home Security Systems and back up Catalog Sheet #2016-alarms & forged wheel locks Catalog Sheet #2017-Smoke & heat detectors Catalog Sheet #2018-splash guards

Products manufactured: Alarms, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Switches, Thermostats, Wire

Local Sales Offices & Reps.

Ala Birmingham, Morris F. Taylor Co. 205-853-3181
Cal Emeryville, Assoc. Rep. Warehouse C. 415-653-3838
Cal Van Nuys, Art Szerlip Slis. 213-782-1765
Colorado Englewood, ESP Co. 303-781-4409
Fla Miami, Seaman Slis. Inc. 305-271-5728
Ga Decatur, Morris F. Taylor Co. 404-243-8591
Ill Chicago, D. Dolinn Slis. Co. 312-286-6200
Iowa Des Moines, B.E.A.M.S. 515-282-0292
Kans Shawnee, B.E.A.M.S. 913-341-7744
Md Silver Spring, Morris F. Taylor Co. 301-589-4002
MD Silver Spring, Morris F. Taylor Co. 301-946-3569
Mass Northboro, W. B. Pray Slis. 617-393-3434
Mich Ferndale, Irving J. Flanders Assoc. 313-545-4633
Minn St. Louis Park, Smith Slis. Co. 612-377-3187
Mo Creve Couer, B.E.A.M.S. 314-569-1060
NY Roslyn Heights, Sir Slis. 516-621-7485
NY State Grand Island, McTaggart Assoc. 716-634-2030
NC Charlotte, Morris F. Taylor Co. 704-523-7832
Ohio Akron, Shamrock Elctn. Slis. 216-666-3796
Ohio Cincinnati, Kirschner Slis. 513-891-5602
Pa Philadelphia, Morris F. Taylor Co. 215-698-9757
Pa Pittsburgh, Morris F. Taylor Co. 412-823-8337
Tex Houston, Sidney Katzoff Assoc. 713-666-1636
EXP: NY Westbury, Minthorne International 516-334-3303

ONAN DIV-ONAN CORP., 1400 73rd Ave. N.E., Minneapolis, Minn., 55432, Tel: 612-786-6322
Customer service: R.L. Westrum

Free literature available: Standby Folder (F-322-D) "A Guide to the Selection & Installation of Onan Standby Electric Generating Systems".

Products manufactured: Annunciators, Chargers, Battery, Generators, Power Supplies

ONEIDA ELECTRONICS MFG., 843 N. Cottage St., Meadville, Pa., 16335, Tel: 814-336-2125; Empl: 25; Minimum order: \$25
Customer service: D. L. Smith

Free literature available: Complete Oneida Electronic Mfg., Inc. Product-Parts Catalog available upon request.

Products manufactured: Adhesives (All Types), Clamps & Clips, Lamps, Resistors, Sockets

Local Sales Offices & Reps.

Cal Los Altos, W.W. Poseys Co. 415-948-7771
Cal Sacramento, W.W. Posey Co. 916-428-5768
Cal Van Nuys, A. Szerlip Sls. Co. 213-782-1765
Colo Westminster, Electro-Tex Sls. 303-255-4566
Fla Ormond Beach, J. F. Thompson Sls. Co. 904-677-2298

Haw Mililani, C&L Distrs. 808-949-1087
Ill Chicago, Lassers & Co. 312-539-0170
Kans Shawnee Mission, K&M Sls. Co. 913-262-1444
Md Silver Springs, Mid-Atlantic Sls. Co. 301-593-7749

Mass North Boro, W.B. Pray Sls. Co. 617-393-3434
Mich Milford, Polyphase Sls. Co. 313-685-3003
Minn St. Louis Park, Smith Sls. Co. 612-377-3187
NJ Princeton, S. Enright Sls. Co. 914-779-7330
NY Yonkers, J. Brown Sls. Co. 704-372-1026
NC Charlotte, M.K. Smith 216-666-3796
Ohio Akron, Shamrock Elctrn. Sls. 215-865-3014
Pa Bethlehem, L.T. Benner 412-561-4687
Pa Pittsburgh, Tanner Co. 817-281-2736
Tex Hurst, Ranger Elctrn. Co. 206-522-1533
Wash Seattle, Fleehart & Sullivan
EXP: Chicago, Ill., E.D. Magnus & Assocs. 312-334-1502

OPAD ELEC. CO., INC., 43-12 Walker St., New York, N.Y., 10013, Tel: 212-WO 6-0380; FSC No: 94940

For info on price: H. L. Opad; Customer service: G. Cohen

Products manufactured: Chargers, Battery, Controls/Control Eqp., Detectors, Electroplating Equipment & Supplies, Eliminators, Battery, Kits, Power Supply, Machines/Machinery, Production, Monitors, Power Supplies, Rectifiers, Regulators, Testers

OPAMP LABS, INC., 1033 N. Sycamore Ave, Los Angeles, Cal., 90038, Tel: 213-934-3566; FSC No: 24699; Empl.: 18 p. 1*10,11

Customer service: B. J. Losmandy

Free literature available: Free 30 page Catalog and Audio Applications. Contains Audio Consoles (Kits and Wired), Amplifiers-Mic. Eq. ACN. Line. Tape. Disc. Power. Oscillators-Audio, Tape Bias, Power Supplies.

Products manufactured: Amplifiers, Integrated Circuit Devices, Power Supplies

OPCOA, INC., 330 Talmadge Rd., Edison, N.J., 08817, Tel: 201-287-0355, TWX: 710-998-0555; Empl.: 150

Products manufactured: Display Devices/Displays, Indicators, Lights

Local Sales Offices & Reps.

Ariz Scottsdale, Carter Assocs. 602-947-4355
Cal Menlo Park, Straube Assocs., Inc. 415-323-2476
Cal Woodland Hills, Interstate Mktg. Assoc. 213-883-7606

Colo Englewood, W. J. Purdy Co. 303-770-5311
Conn North Haven, Comp. Rep. Assocs., Inc. 203-239-9762

Fla Bradenton, Reynolds & Assocs. 813-778-5219
Ga Atlanta, Reynolds & Assocs. 404-422-2114
Ill Chicago, Delta Tech. Sls. 312-693-3380
Ind Greenwood, Valentine-Schillinger 317-888-2260

Md Elkridge, J. Bresson Assocs. 301-796-5220
Mass Needham, Comp. Rep. Assocs., Inc. 617-444-2484

Mich Southfield, R. O. Whitesell & Assocs. 313-358-2020

Minn Hopkins, Grayden & Flemmer 612-941-1120
Mo Hazelwood, Technical Reps, Inc. 314-524-6900
Mo Peculiar, Technical Reps, Inc. 816-331-7744
NM Albuquerque, Straube Assocs., Inc. 505-294-1880

NY Dewitt, Bowser & Sapecky Assocs. 315-446-5920

NY Jamaica, S-J Sls. 212-291-3232
Ohio Cincinnati, G & H Sales Co. 513-771-8231
Ore Beaverton, N. R. Schultz Co. 503-646-1345

Pa Narberth, J. Bresson Assocs. 215-839-6770
Tex Ft. Worth, W. P. Fralia Co. 817-738-2394
Tex Houston, W. P. Fralia Co. 713-772-1572

Va Lynchburg, J. Bresson Assocs. 215-839-6770
Wash Bellevue, N. R. Schultz Co. 206-GL 4-0300
EXP: Edison, N. J., Opcoa, Inc. 201-287-0355

OPT INDS, INC., Data Products Div., 300 Red School Lane, Phillipsburg, N.J., 08865, Tel: 201-454-2600; Empl.: 160; Minimum order: \$500

For info on price: J. Smith; Application info: B. Slack; Customer service: P. Jones; Delivery info: P. Jones

Products manufactured: Chokes, Coils Including Assemblies & Forms, Equalizers, Filters, Modulator/Demodulators, Networks, Power Supplies, Transformers

Local Sales Offices & Reps.

Cal Encino, El/Tec
Fla St. Petersburg, Kirkwood Assoc.
Ill Chicago, Croymel Elctrn.
Md Bethesda, Warren Mount Assoc.
Mass Needham Heights, Com/Pak
NJ Union, J. Onore
NY Hempstead, Kahgan Sls.
NY Syracuse, Franklin Sls.

OPTEL CORP., Box 2215, Princeton, N.J., 08540

OPTICAL ELECTRONICS, INC., Box 11140, Tucson, Ariz., 85734, Tel: 602-624-8358, TWX: 910-952-1283; FSC No: 5962; Empl.: 26; Minimum order: \$15

For info on price: Mrs. Mac; Application info: R. Gerdes; Customer service: S. E. Day; Delivery info: Mrs. Mac

Free literature available: Analog modules including operational amplifiers and analog function modules.

Products manufactured: Amplifiers, Circuits, Hybrid, Thick Film, Comparators, Converters, Dividers, Filters, Generators, Integrated Circuit Devices, Integrators, Electronic, Multipliers, Oscillators, Power Supplies, Timers

Local Sales Offices & Reps.

Ariz Tempe, J.F. Hurlbut Co. 602-968-5962
Colo Golden, J.F. Hurlbut Co. 303-279-7796
Pa Abington, Bach-Stewart Assocs. 215-885-1550
Tex Richardson, Applied Science Accounts 214-231-6958
Va Annandale, J. Hopkins Assocs. 703-323-1641

OPTICS INTERNATIONAL, Box 101, Tenafly, N.J., 07670, Tel: 201-567-4799; Empl.: 10; Minimum order: \$50

For info on price: R. J. Schmitt; Application info: R. Cole; Customer service: J. Johnson; Delivery info: M. Ryan

Free literature available: Custom optics brewster angle prisms, corner cube reflectors, plane and spherical mirrors, polarizing prisms, retardation plates, narrow band interference filters, neutral density filters, front surface mirrors, high precision optical coatings.

Products manufactured: Coatings, Crystals, Filters, Lenses, Optical & Camera, Quartz, Fused, Silica, Fused

OPTIMA ENCLOSURES, Div. Scientific Atlanta, 2166 Mountain Ind'l Blvd., Tucker, Ga., 30084, Tel: 404-939-6340, TWX: 810-766-3967; Empl.: 70; Minimum order: \$50 p. 1*78,79

For info on price: B. Holman; Application info: R. Dawsey; Customer service: B. Holman; Delivery info: B. Holman

Free literature available: Short form Catalog Describes general line of products with photos and brief technical descriptions.

Products manufactured: Benches, Consoles, Stools, Tables, Blowers & Fans & Accessories, Cabinets & Accessories, Carts & Dollies, Instrument & Equipment, Cases, Equipment, Instrument, Meter, Chassis, Metal, Drawers, Sliding, Frames, Cabinet & Rack, Grilles, Handles For Cabinets, Circuit Boards, Racks, etc., Racks, Slides, Cabinet & Chassis

Local Sales Offices & Reps.

Ala Huntsville, Gentry Assocs. 205-536-5306
Ariz Scottsdale, Barnhill Five 602-947-5745
Cal Los Altos, Frauman Assocs. 415-941-0660
Cal Palos Verdes, Edwards Assocs. 213-377-0975
Colo Denver, Barnhill Five 303-426-0222
Fla Orlando, Gentry Assocs. 305-894-4401
Fla St. Petersburg, Gentry Assocs. 813-867-7820
Ga Tucker, Scien.-Atlanta 404-939-6340
Ill Des Plaines, Cozzens & Cudahy 312-298-3600
Ind Indianapolis, Cozzens & Cudahy 317-244-2456
Md Bladensburg, Scien.-Atlanta 301-779-1515
Mass Lexington, Zieco 617-861-8300
Mich Grand Rapids, Representatives Elec. Prod. 616-942-1320

Mich Southfield, Representative Elec. Prod. 313-354-9066

Minn Minneapolis, Cozzens and Cudahy, Inc. 612-884-4336
Mo St. Louis, Cozzens & Cudahy 314-423-1234
NJ Leonia, Scien.-Atlanta 201-461-3650

NC Burlington, Gentry Assocs. 919-227-3639
Ohio Cleveland, C.A. Robinson Co. 216-381-9049
Ohio Dayton, C.A. Robinson Co. 513-275-2412
Tex Ft. Worth, Carey-Wolf 817-738-1996
Tex Garland, Carey-Wolf 214-494-1212
Tex Houston, Carey-Wolf 713-721-2442
Wash Seattle, S.J.I. Corp. 206-624-9020

OPTIMATION, INC., Sub. Julie Research Labs., Inc., 9259 Independence Ave., Chatsworth, Cal., 91311, Tel: 213-882-6490, TWX: 910-494-1219; Empl.: 26

Products manufactured: Amplifiers, Calibrators, Current Sources, Display Devices/Displays, Generators, Oscillators, Standards, Testers, Voltage Sources

Local Sales Offices & Reps.

Ala Huntsville, BCS Assocs., Inc. 205-881-6220
Cal Newport Beach, Feeger, Lucas, Wolfe, Inc. 714-540-4412

Cal North Hollywood, Feeger, Lucas, Wolfe, Inc. 213-877-5518
Cal Palo Alto, Coherent Mktg. 415-327-2217
Cal San Diego, Feeger, Lucas, Wolfe, Inc. 714-277-0993

Conn Hamden, Applied Measurements, Inc. 203-288-5288

Fla Orlando, BCS Assocs., Inc. 305-896-4881
Ga Atlanta, BCS Assocs., Inc. 404-874-9925
Ill Chicago, Pivan Engrg. Co. 312-539-4838

Ind Indianapolis, Pivan Engrg. Co. 317-253-1681
Md Beltsville, R. Davies Assocs. 301-937-2215
Mass West Acton, Applied Measurements, Inc. 617-263-2766

Mich Detroit, S. Sterling Co. 313-255-1970
Minn Minneapolis, Pivan Engrg. Co. 612-537-4501
Mo Hazelwood, Technical Representatives, Inc. 314-731-5200

Mo Peculiar, Technical Representatives, Inc. 816-737-1414

NY Mount Vernon, Q.E.D. Elctrn., Inc. 914-664-0080

NY Rochester, SBM Reps., Inc. 716-266-1400
NC Greensboro, BCS Assocs., Inc. 919-273-1918
Ohio Cleveland, S. Sterling Co. 216-442-8080

Ohio Dayton, S. Sterling Co. 513-298-7573
Pa Melrose Park, R. Meyers Assoc. 215-224-1663
Pa Pittsburgh, S. Sterling Co. 412-922-5720

Wash Bellevue, Scientific Devices-Northwest 206-454-0900
Wise Brookfield, Pivan Engrg. Co. 414-786-1940

OPTIMAX, INC., Box 105, Advance Lane, Colmar, Pa., 18975, Tel: 215-822-1311, TWX: 510-661-3730; Empl.: 30; Minimum order: \$50

For info on price: R. Barry; Application info: D. Gardner; Customer service: R. West; Delivery info: R. Barry

Free literature available: Optimax catalog

Products manufactured: Amplifiers

Local Sales Offices & Reps.

Cal Los Angeles, Hoeke and Reeser Assoc. 415-941-4080
Cal Los Angeles, McDougall/McLaughlin 213-477-8556

Fla Palm Bay, Spar Tech Assocs. 305-727-8045
Ga Smyrna, Spar Tech Assocs. 404-432-3644
Ill Park Ridge, RF Specialists 312-698-2044

Ind Ft. Wayne, RF Specialists 219-485-8982
Md Silver Spring, Spectroscopy Sys. 301-949-8261
Mass Lexington, Lancer Assocs. 617-861-1720

Mich Warren, DEM Elctn. Sls. 313-755-6660
Mo St. Louis, Boweng Reps. 314-429-7327
NJ Palisades Park, Scientific Devices 201-945-3962

NY E. Syracuse, Ossmann Instrs. 315-437-6666
Pa Wyndmoor, Spectroscopy Sys. VEE-1545
Tex Dallas, Texas Microwave/Elec. 214-231-7281

OPTIMIZED DEVICES, INC., 220 Marble Ave., Pleasantville, N.Y., 10570, Tel: 914-769-6100; Empl.: 22

For info on price: A. Zuch; Application info: A. Zuch; Customer service: J. ODonnel; Delivery info: J. Murtha

Free literature available: Model 6000 Computer Operated Test System, Model Computer Operated Screwdriver, Series 19 Capacitor Test Bridges, Model 3000 Automatic Relay Test System, Model CH-1 Component Handler, Model 1900 Capacitance Test System.

Products manufactured: Analyzers, Bridges, Generators, Screwdrivers, Test Systems, Testers

Local Sales Offices & Reps.

Cal Los Angeles, DynaSales Co.
NM Albuquerque, Electronic Enterprises
NM Las Cruces, Elctn. Enterprises

NY New York City, Hy Lewis Assoc.
Wash Seattle, Datacom Assocs.

Advertisement

Automatic and computer operated testing systems for circuits, boards and components. Specialists in custom designs and unusual applications. Call us for a free price estimate and proposal.

OPTO-METRIC TOOLS, Sub/E. Leitz, Link Crescent, Rockleigh, N.J., 07647, Tel: 201-767-1320; Empl.: 200

Products manufactured: Comparators, Fiber Optic Bundles, Gages, Interferometer Systems, Lamps, Lenses, Optical & Camera, Magnifying Glasses, Inspection, Microscopes, Simulators, Television Systems & Equipment Closed-Circuit, Testers

Local Sales Offices & Reps.

Cal Burlingame, E. Leitz, Inc. 415-697-9182

OPTRON, INC., 1201 Tappan Cir., Carrollton, Tex., 75006, Tel: 214-242-6571, TWX: 910-860-5958; FSC No: 32694; Empl.: 230; Minimum order: \$25

For info on price: Mktg.; Application info: Mktg.; Customer service: Cust. Svc.; Delivery info: Cust. Svc.

Free literature available: Shortform Catalog-Individual Data Sheets

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Detectors, Diodes, Encoders, Isolators, Lamps, Light Sources, Photoelectric, Lights, Punched Card Equipment, Readers, Sensors, Light, Transistors

Local Sales Offices & Reps.

Ala Huntsville, Murcota Corp. 205-539-8376
Ariz Phoenix, T. Goodreau & Assocs. 602-243-5141
Cal Glendale, Orion Sls. 213-240-3151
Cal San Carlos, Kottmeier Assocs. 415-592-8333
Cal San Diego, Orion Sls. 714-299-8322
Cal Tustin, Orion Sls. 714-832-9687
Colo Wheat Ridge, Waugaman Assocs. 303-423-1020

Fla Clearwater, Lynch-Gentry Assocs. 813-443-2697

Ill Chicago, Carlson Elctrn. Sls. 312-774-9022
Md Baltimore, Stemlen Assocs. 301-944-8262
Mass Haverhill, L-K Assocs. 617-373-1313
Mass Sudbury, Heinecke Corp. 617-443-3200
Mich Detroit, R.P. Urban Assocs. 313-535-2355
Mich Grand Rapids, R.P. Urban Assocs. 616-245-0511

Minn Minneapolis, ECR, Inc. 612-831-4547
Mo St. Louis, Carlson Elctrn. Sls. 314-991-0262
NJ Cherry Hill, Stemlen Assocs. 609-966-4070
NJ Fort Lee, Necco 201-461-2789
NJ Freehold, Necco 201-462-1361
NJ Laurel Springs, Stemlen Assocs. 215-644-3477
NM Albuquerque, Electronic Mktg., Inc. 505-265-7837

NY Endicot, Advanced Comps. Corp. 607-785-3191
NY N. Syracuse, Advanced Comps. Corp. 315-699-2671

NY Scottsville, Advanced Comps. Corp. 716-889-1429

NC Winston Salem, Murcota Corp. 919-723-1001
Ohio Cleveland, D. Steffen & Assocs. 216-461-8333
Ohio Dayton, D. Steffen & Assocs. 513-293-3145
Tex Dallas, M. Kruvand Co. 214-827-8043
Tex Houston, M. Kruvand Co. 713-661-3007
Va Alexandria, Stemlen Assocs. 703-548-7818
Va Reston, Boyle Assocs. 703-620-9558
Wash Tukwila, General Elctns., Inc. 206-243-5141
Wisc Wauwatosa, Carlson Elctrn. Sls. 414-476-2790

Local Distributors

Cal Sunnyvale, Diplomat/Westland, 1118 Elko Dr. 408-734-1900
Ill Westmont, Bodelle Co., 47 Chestnut La. 312-323-9670
Tex Dallas, Component Specialties, 2560 Electronic Ln. 214-357-4576
Tex Houston, Component Specialties, 7313 Ashcroft 713-771-7237
Utah Salt Lake City, Diplomat/Altland, 2280 S. Main St. 801-486-7227

ORBIT INDS., Div. Countis Inds., Box 1444, San Luis Obispo, Calif., 93401, Tel: 805-544-1770; Empl.: 10

Products manufactured: Tools, Tweezers, Hand & Vacuum

ORBIT INSTR. CORP., 131 Eileen Way, Syosset, N.Y., 11791, Tel: 516-WA 1-6310, TWX: 510-221-2122; FSC No: 11263; Empl.: 65

For info on price: P. Sherman; Application info: M. Gersten; Customer service: P. Sherman; Delivery info: P. Sherman

Products manufactured: Amplifiers, Analyzers, Brakes, Clutches, Controls/Control Eqpt., Counters, Gears & Gear Mechanisms (Precision), Indicators, Reducers, Repeaters, Servo, Servo Systems, Switches, Tracking Systems, Transducers

Local Sales Offices & Reps.

Cal San Diego, W. Gorman Co. 714-222-9424
Tex Dallas, R. O. Spooner Co. 214-357-6636

ORIEL CORP. OF AMERICA, 15 Market St., Stamford, Conn., 06902, Tel: 203-357-1600, TWX: 710-474-3563; Empl.: 49; Minimum order: \$50

Customer service: A. Smith

Free literature available: Instruments and components for UV, visible and IR research including optical bench and table equipment, lasers and accessories, light sources and monochromators, light detection equipment, optical filters and optical components.

Products manufactured: Coatings, Converters, Filters, Lamps, Lasers & Laser Systems, Lenses, Optical & Camera, Lights, Machines/Machinery, Production, Power Supplies, Radiometers, Services, Assembly, Production & Test, Ultraviolet Inspection Lighting

Local Sales Offices & Reps.

Cal Newport Beach 714-546-5871

ORMOND INC., 11969 E. Rivera Rd., Santa Fe Springs, Cal., 90670, Tel: 213-698-0641, TWX: 910-586-1635; Empl.: 40; Minimum order: \$85

Customer service: A. Denny Ext. 26

Free literature available: Literature on: load cells, digital displays, digital printers, aircraft weighing systems, & scales.

Products manufactured: Cells, Load

OSBORNE TRANSFORMER CORP., 3834 Mitchell Jen Ave., Detroit, Mich., 48207, Tel: 313-579-0700; Empl.: 30

Products manufactured: Coils Including Assemblies & Forms, Reactors, Transformers

OSHINO ELECTRIC LAMP WORKS, LTD., 2-5-2, Minami-Shinagawa, Shinagawa-ku, Tokyo, Japan, Tel: 03-471-8548; Empl.: 250

Products manufactured: Diodes, Lamps, Sockets, Switches

Local Sales Offices & Reps.

Cal Costa Mesa, WAMCO Tech. Sls., Inc. 714-833-9361
Ill Chicago, Cimco Int'l. Inc. 312-782-5621

OSTBY & BARTON CO., Box 6267, Providence, R.I., 02904, Tel: 401-739-7310; Empl.: 175; Minimum order: \$25

For info on price: G. J. Cavanaugh; Application info: E. Jackson; Customer service: R. L. Porter; Delivery info: J. Burns

Free literature available: Spring-loaded test probes; custom designed & manufactured test fixtures; wire wrapping equipment.

Products manufactured: Brushes & Brush Assemblies, Contacts, Electrical, Probes, Testers, Tools

Local Sales Offices & Reps.

Ill Glen Ellyn, H.F. Wilson Engrg. Co. 312-469-8473
Nev Reno, Standard Pneumatic Motor Co. 702-329-6311
RI Warwick, Market Development 401-739-7610

OTTO ENGRG., INC., Otto Controls Div., 36 Main St., Carpentersville, Ill., 60110, Tel: 312-428-7171; FSC No: 21649; Empl.: 42; Minimum order: \$15. p. 1-1545,2267

For info on price: R. E. Sparks; Application info: R. E. Sparks; Customer service: J. Graves; Delivery info: J. Graves

Products manufactured: Switches

Local Sales Offices & Reps.

Cal Alhambra, M.W. Riedel & Co. 213-283-7694
Cal Redwood City, Woodworth Co. 415-365-0252
Ill Glen Ellyn, Rockford Controls Co. 312-469-6016
Mass Chelmsford, Northeast Comps. 617-256-8758
Mo Kansas City, Harris-Hanson Co. 816-444-9494
Mo St. Louis, Harris-Hanson Co. 314-432-3611

NY Great Neck, F. Tylinski Co. 516-466-9070
Ohio Cleveland, A.H. Baier Co. 216-461-6161
Ohio Dayton, A.H. Baier Co. 513-276-4128
Wash Bellevue, J. Findlay Co. 206-454-5200

OVEN INDUSTRIES, INC., Box 229, Silver Spring Indl. Pk., Mechanicsburg, Pa., 17055, Tel: 717-766-0721; Empl.: 30; Minimum order: \$20

For info on price: T. M. Nolan; Application info: R. E. Eckert; Customer service: T. M. Nolan; Delivery info: T. M. Nolan

Products manufactured: Controls/Control Eqpt., Heaters & Heating Elements, Ovens, Regulators, Standards

Local Sales Offices & Reps.

Ala Huntsville, Reynolds & Assocs. 205-536-1941
Ariz Scottsdale, S.C. Blaker Co. 602-948-3061
Cal Encino, El-Tec, Inc. 213-981-9881
Cal San Carlos, Westronics Assoc. 415-592-1417
Fla Melbourne, Reynolds & Assocs. 305-727-3205
Ga Atlanta, Reynolds & Assocs. 404-252-5360
Ill Skokie, Saffro & Assocs. 312-588-0905
La Baton Rouge, Covington Instr. Co. 504-924-1784

Mass Reading, Geder & Rotundi Assocs. 617-944-3105

Minn Minneapolis, C.E. Bohlig Co. 612-922-7011
Mo St. Peters, K.M. & B. Tech. Sls. 314-278-3159
NY Huntington, Andrews & Andrews 516-692-8686
NY Syracuse, Mike Antil 315-463-0266
NC Greensboro, Reynolds & Assocs. 919-275-3725
Ohio Medina, McShane, Inc. 216-725-4568
Pa Ambler, W & M Assocs. 215-643-4119
Tex Dallas, Bouch Sls. Assocs. 214-247-6708
Va Falls Church, Beacon Elctrn. Assoc. 703-534-1673

EXP: Ajax, Ont., Can., R.D. Assocs. 416-294-6796
EXP: Pa., Lemoyne, Elctns. Int'l. 717-737-8858

OVENAIRE, Div. Walter Kidde & Co., 706 Forrest St., Charlottesville, Va., 22901, Tel: 804-977-8050, TWX: 510-587-5461; Empl.: 125 p. 1400-403

Customer service: Norman Broadbent

Free literature available: Ovens-16 page catalog illustrating crystal ovens and component ovens, proportional control and thermostat control. Oscillators-4 page short form catalog illustrating packaged high stability crystal oscillators

Products manufactured: Oscillators, Ovens, Standards

Local Sales Offices & Reps.

Ala Huntsville, L & D, Inc. 205-881-7760
Ariz Phoenix, J. S. Heaton Co. Inc. 602-264-7887
Ark El Dorado, D. Bellow Sls. 501-863-8325
Cal San Mateo, Melvin Sl. 415-349-7445
Cal Van Nuys, R.L. Assocs. 213-780-1666
Fla Maitland, Ellis & Assocs. 305-645-1101
Ill Chicago, TX Sls., Inc. 312-455-6199
Ind Fort Wayne, TX Sls., Inc. 219-489-4447
Ind Indpls., TX Sls., Inc. 317-253-1966
La Kenner, D. Bellow Sls. 504-729-4550
Md Luthersville, L. E. Brown Assoc. 301-296-4306
Mass Randolph, Naton Assocs., Inc. 617-986-6417
Minn St. Paul, Countryman 612-645-9151
Mo Blue Springs, Chesco 816-229-1404
Mo St. Charles, Chesco 314-946-6677
NJ Moorestown, L. E. Brown Assoc. 609-234-0382
NY Buffalo, Quality Comps. 716-839-4170
NY Smithtown, TX Sls., Inc. 516-979-8750
NC Greensboro, L & D, Inc. 919-292-3201
Ohio Cleveland, TX Sls., Inc. 216-561-1900
Tenn Memphis, D. Bellow Sls. 901-365-9437
Tex Dallas, Stevens Sls. 214-350-2476
Wash Seattle, Carlyle Tech. Sls. 206-622-4288

OVERLY-HAUTZ CO., 8617 Clinton Rd., Cleveland, Ohio, 44144, Tel: 216-281-1500; Empl.: 100; Minimum order: \$25

Customer service: P. Siliko

Free literature available: MB-400 Motor Base Brochure, Shorewall Brochure, Facilities Brochure

Products manufactured: Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Chassis, Metal, Enclosures, Module, Plug-In, Frames, Cabinet & Rack, Racks, Services, Assembly, Production & Test, Stands, Instruments

OWATONNA TOOL CO., 395 Eisenhower Dr., Owatonna, Minn., 55060, Tel: 507-451-5310; Empl.: 1035

For info on price: L. Wavrin Ext. 225; Customer service: T. Nutting Ext. 409

Free literature available: Catalog No. G-71, includes complete OTC line of maintenance tools and equipment; Catalog No. H-72, power work holding systems.

Products manufactured: Couplings, Gages, Testers, Wrenches

Local Sales Offices & Reps.

Ala	Birmingham, J.R. Kuehn	205-853-0980
Cal	Arcadia, R. Long	213-447-0081
Cal	La Habra, R. Fitzgerald	213-697-8626
Cal	San Jose, G. Packer	408-378-1853
Cal	Santa Ana, G. Weers	213-283-2933
Colo	Aurora, K. Buerk	303-751-9369
Conn	Killingworth, W. Buckingham	203-663-2271
Fla	Tampa, L. Rickett, Jr.	813-884-1046
Ga	Riverdale, C. Crews	404-471-8046
Idaho	Pocatello, W. Noesen	208-232-2045
Ill	Chicago, G.J. Reilly	312-274-6993
Ind	Lebanon, T. Payne	317-482-1376
Iowa	Des Moines, D. Vandermeulin	515-276-2290
Iowa	Des Moines, M. Seskis	515-265-0843
Md	Derwood, G. Miller, Jr.	301-948-2892
Mass	Concord, B. L. Boyd	617-369-9338
Mich	Madison Heights, R. Lock	313-645-2120
Mich	Troy, D.V. Johnson	313-889-5413
Minn	Minneapolis, C. Johnson	612-888-4957
Mo	Florissant, P. Stumpe	314-741-4444
NJ	Convent Station, C. Krill	201-538-3846
NJ	Middletown, D.A. Peterson	201-671-4395
NJ	Parlin, J. Stowers	201-727-6020
NJ	Willingboro, C.V. Bareikis	609-871-0399
NY	Rochester, J. Jenkinson	716-385-3217
NC	Charlotte, R.J. Ludes, Sr.	704-366-4963
Ohio	Columbus, J. Moeller	614-885-1478
Ohio	Conneaut, D. Dye	216-593-1226
Ohio	Lakewood, D. Brown	216-228-9563
Ohio	Westlake, D.O. Schneider	216-871-8820
Ore	Tigard, J. Davenport	503-639-6644
Tenn	Memphis, R. Ludes	901-396-7469
Tex	Euless, L. Johnson	817-267-4828
Tex	Houston, W. Parker	713-468-6157
Tex	Richardson, J.W. Cissne	214-235-6127
Wisc	Kenosha, E.T. Beckman	414-654-1778

OWENS-ILLINOIS, INC., Box 1035, Toledo, Ohio, 43666, Tel: 419-242-6543, TWX: 810-442-1812; Empl.: 56000

OXFORD INSTR. CORP., Box 1829, 48 Maryland Ave., Annapolis, Md., 21404, Tel: 301-268-2350; Empl.: 3
Customer service: J. E. Templeton

Products manufactured: Controls/Control Eqpt., Generators, Indicators, Magnets, Recorders

OXFORD SPEAKER CO., 4647 W. 47th St., Chicago, Ill., 60632, Tel: 312-585-4491, TWX: 910-221-5029; Empl.: 300

Products manufactured: Speaker Systems, Speakers

Local Sales Offices & Reps.

Ala	Gadsden, F.C. Nickerson	205-547-7718
Alas	Anchorage, R. Merritt Co.	
Ariz	Culver City, H. Feldman Co.	213-870-5973
Cal	Culver City, H. Feldman Co.	213-870-5973
Cal	San Francisco, Tech. Sls. Assoc.	414-467-1434
Colo	Denver, Nelson Co.	303-733-5528
Fla	Ormond Beach, J.F. Thompson	904-677-2298
Ga	Decatur, F.C. Nickerson	404-631-4481
Ill	Chicago, G. MCL Cole Co.	312-774-3535
Ind	Indianapolis, D. Powers Sls. Inc.	317-848-0790
Mass	N. Scituate, W.A. Hendrickson Co.	617-545-0652
Mich	Oak Park, J. Shay Assocs.	313-546-0194
Minn	Minneapolis, J.E.M. Anderson	
Mo	Kansas City, Forristal-Young Sls. Co.	816-358-6771
Neb	Omaha, Forristal-Young Sls. Co.	402-333-0800
NY	Liverpool, Lewis & Dunnigan Co.	315-622-2133
NY	Tuckahoe, L-C-A Sls. Co.	
NC	Kannapolis	
Ohio	Columbus, Mandabach & Assocs.	614-235-0265
Ore	Portland, R. Merritt Co.	
Pa	Philadelphia, L-C-A Sls. Co.	215-GR7-3298
Tex	Dallas, Wyborny Sls. Co.	
Wash	Seattle, R. Merritt Co.	206-682-7337
Wisc	Milwaukee, G. MCL Cole Co.	414-545-6083
EXP:	New York, N.Y., Roburn Agencies, Inc.	219-989-5939

PACE INC., 9337 Fraser Ave., Silver Spring, Md., 20910, Tel: 301-587-1696, Telex: 89-8476; Empl.: 35; Minimum order: \$40

For info on price: R. Deblinger; Application info: R. Deblinger; Customer service: R. Deblinger; Delivery info: Sls. Off.

Free literature available: PACE Catalog - Detailed descriptions of PACE Equipment and Services; PACE All Products Flyer - "Yours" Brief desc. of PACE Products; PACE Desoldering for any Budget - Ped-A-Vac descriptive brochure.

Products manufactured: Soldering Guns, Irons & Desoldering Tools

Local Sales Offices & Reps.

Ala	Madison, South Eastern Assoc.	205-772-9616
Ariz	Phoenix, Tooltronics	602-257-0768
Cal	Glendale, Tooltronics	213-240-4000
Cal	Santa Clara, Tooltronics	408-241-4000
Colo	Lakewood, Pathway	303-232-7730
Fla	Miami, N. Black Assoc.	305-651-4132
Haw	Honolulu, Pacific Instrumentation	808-373-1287
Ill	Mt. Prospect, E.T. Champion & Assoc.	312-593-1150
Kans	Baxter Springs, Production Automation Corp.	316-856-3600
Md	Baltimore, A.L. Myers Co.	301-426-5583
Mass	Woburn, MacHugh Assoc.	617-935-4650
Minn	Minneapolis, Production Automation Corp.	612-866-5700
Mo	Raytown, Production Automation Corp.	816-737-0066
Ohio	Cleveland, Data Equip. Sls.	216-252-3151
Okla	Tulsa, Production Automation Corp.	918-932-1051
Tex	Richardson, Production Automation Corp.	214-234-4002
Wash	Bellevue, Doland Co.	206-454-4952

PACE WIRE & CABLE CORP., 3590 Oceanside Rd., Oceanside, N.Y., 11572, Tel: 516-678-2275; Empl.: 35

Products manufactured: Braid, Cable, Cable, Wire

PACIFIC COMMUNICATIONS, 2126 So. Lyon St., Santa Ana, Cal., 92705, Tel: 714-546-0147; Empl.: 26

For info on price: G. Grunewald; Application info: G. Grunewald; Customer service: G. Grunewald; Delivery info: J. Day

Products manufactured: Comm. Systems, Receivers, Transmitters

PACIFIC ELECTRICORD CO., 747 W. Redondo Beach Blvd., Box 10, Gardena, Cal., 90247, Tel: 213-532-6600, TWX: 910-346-7619; Empl.: 350; Minimum order: \$250

For info on price: P. Liput; Customer service: A. McLeod; Delivery info: A. McLeod

Free literature available: Catalog #1073 describes stock and custom power supply cords and cord sets.

Products manufactured: Braid, Cable, Cable, Cords, Plug Caps & Shells, Plugs, Switches, Wire

PACIFIC TECHNOLOGY, 235 Airport Way, Renton, Wash., 98055, Tel: 206-623-9080; Empl.: 60
Customer service: L. C. Rama

Products manufactured: Controls/Control Eqpt., Memory Systems, Monitors, Shift Registers

Local Sales Offices & Reps.

Ala	Huntsville, Vesco	205-881-8830
Ariz	Scottsdale, Utility Prods.	602-947-9326
Cal	El Monte, Randolph Industries, Inc.	213-283-7901
Cal	Palo Alto, Coherent Mktg. Assocs.	415-327-2217
Colo	Englewood, Utility Prods., Inc.	303-771-9080
Conn	Glastonbury, Instrument Reps., Inc.	203-633-0777
Ill	Chicago, Scientific Sls. Corp.	312-775-7594
Ind	Indianapolis, Scientific Sls. Corp.	317-253-4606
Md	Baltimore, Electrn. Mktg. Assoc.	301-744-7700
Mass	Lexington, Instrument Reps., Inc.	617-861-8620
Minn	Bloomington, Scientific Sls. Corp.	612-881-3300
Mo	St. Louis, Floyd Gilliam Assoc.	314-961-5555
NY	Buffalo, Robinson Assoc.	716-886-7350
NC	Charlotte, J. Rudisill Assocs., Inc.	704-377-6901
Ohio	Cleveland, Peter Lax Co.	216-226-8815
Okla	Tulsa, Telstar Instrument Corp.	918-628-1011
Pa	Pittsburgh, Peter Lax Co.	412-833-5477
Tex	Houston, W. W. Schenwitz Co.	713-527-8866
Wash	Bellevue, Topp Engrg. Sls.	206-747-5400
FOR:	Can., Toronto, Ont., Nortech Control Equip. Co.	416-622-7820
FOR:	Can., Montreal 355, Quebec, Associated Instrumentation & Controls	514-384-7211
FOR:	Can., Vancouver, British Columbia, T. W. MacKay & Son, Ltd.	604-731-6561

PACKAGED RESINS DIV., Bacon Inds., Inc., 192 Pleasant St., Watertown, Mass., 02172, Tel: 617-926-2550; Empl.: 18; Minimum order: \$25

For info on price: Order Desk; Application info: T. Willett; Customer service: T. Willett

Products manufactured: Adhesives (All Types), Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Conductive Plastic Materials, Plastic Raw Materials, Liquids, Pellets, Powders, Resins

PAGEANT/M.A. MILLER CO., 605 Northern Blvd., Chinchilla, Pa., 18501, Tel: 717-587-4771; Empl.: 14; Minimum order: \$25

For info on price: R. Gardner; Application info: A. Wormser; Customer service: R. Gardner; Delivery info: Stock

Products manufactured: Bearings, Phonographs, Parts & Accessories

Local Sales Offices & Reps.

Ark	Jonesboro, B. McCaughan Sls.	402-346-5330
Cal	San Rafael, Sid Levin Sls.	415-454-1940
Cal	Van Nuys, A. Szerlip Sls. Co.	213-782-1765
Fla	Longwood, Williams Sls. & Mktg.	305-862-8722
Ga	Atlanta, Murphy & Cota	404-875-2525
Ill	Skokie, 2M Sls. Co.	312-674-3018
Md	Baltimore, Associated Sls. Reps.	301-661-2888
Mich	Lake Orion, T. Franek Sls.	313-391-1177
Minn	Minneapolis, H.M.R.	612-920-8200
Neb	Omaha, Mag Co. Sls.	402-346-5330
NY	Camillus, Callahan-Ferguson Co.	315-487-3870
NY	Wantagh, Audio Plus	516-781-2223
Ohio	Akron, Audio Mktg. Assocs.	216-864-8988
Ore	Portland, J. V. Be Lusk Co.	503-222-4279
Pa	Elkins Pk., I. Perlman Co.	615-523-7482
Tenn	Knoxville, R. K. Swan & Assocs.	214-742-7541
Tex	Dallas, Poole Inds.	214-742-7541
Tex	Houston, Ranger Elctns. Co.	713-529-2811

PAKTRON DIV., Illinois Tool Works, Inc., 900 Follin Lane, S.E., Vienna, Va., 22180, Tel: 703-281-2810, TWX: 710-833-0682; FSC No: 19396; Minimum order: \$1000

For info on price: C. Miller; Application info: K. Christensen; Customer service: C. Miller; Delivery info: C. Miller

Free literature available: Standard Catalog; Micromatic Catalog; Filmatic Catalog; Application Note Series; Facilities Brochure.

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Cal	Mountain View, G. Woempner Co.	415-964-5454
Cal	Newport Beach, Paktron Regional Sls. Off.	714-833-9286
Cal	San Diego, Emcon	714-459-4355
Colo	Denver, Camel Elctns., Inc.	303-757-6191
Fla	Altamonte Springs, W M M Assocs.	305-831-4645
Fla	Clearwater, W M M Assocs.	813-447-2533
Fla	Pompano, W M M Assocs.	305-943-3091
Ill	Chicago, Elctrn. Div., Illinois Tool Works, Inc.	312-693-3040
Ind	Indianapolis, Paktron Regional Sls. Off.	317-255-9658
Mass	Burlington, Paktron Regional Sls. Off.	617-273-0365
Mich	Benton Harbor, R.C. Nordstrom & Co.	616-857-4653
Mich	Lathrup Village, R.C. Nordstrom & Co.	313-559-7373
Minn	St. Paul, Murnco	612-484-8200
Mo	North Kansas City, H. J. Weisler & Assocs.	816-421-1679
Mo	St. Louis, H. J. Weisler & Assocs.	314-HA 8-3934
NY	Elmont, F.E. Schmitt Co.	516-437-8150
NY	New York, Landseas Corp.	212-265-8323
NY	Rochester, L-Mar Assocs.	716-328-5240
NY	Vestal, L-Mar Assocs.	607-729-6339
NC	Smithfield, Byrd & Barbour Sls.	919-934-8136
Ohio	Columbus, Rockford Controls, Inc.	614-231-5890
Ohio	Dayton, Rockford Controls, Inc.	513-278-7362
Ohio	Euclid, Rockford Controls, Inc.	216-731-5250
Pa	Erie, ECCO Electronic Sls.	814-452-3762
Tenn	Memphis, Paktron Regional Sls. Off.	901-386-7252
Tex	Houston, R.F. Kimball & Co.	800-294-2805
Tex	Richardson, R.F. Kimball & Co.	214-231-3447
Wash	Seattle, Nemco	206-322-6200
FOR:	Can., Toronto 20, Ont., P. J. Heenan Ltd.	416-223-3619

Local Distributors

Ala	Huntsville, Hall-Mark, 4739 Commercial Dr.	205-837-8700
Cal	Goleta, Radio Prod. Sls., 350 E. South Kellogg	805-964-6823

Cal	Los Angeles, Radio Product Sls., 1501 S. Hill St. 213-748-1271
Cal	San Diego, Radio Prod. Sls., 7889 Clairemont Mesa Blvd. 714-292-5611
Conn	Stratford, Stepcos, 1269 Barnum Ave. 203-375-5961
Fla	Ft. Lauderdale, Hall-Mark, 1302 West McNab Rd. 305-971-9280
Fla	Orlando, 7233 Lake Ellenor Dr., 305-855-4020
Ga	Lawrenceville, Hall-Mark, Route 1 404-963-9728
Ill	Skokie, Bell Inds., 7701 N. Austin Ave. 312-965-7500
Ind	Ft. Wayne, Harvey-Ind., 2226 Abbey Dr. 800-382-4517
Ind	Indianapolis, Harvey-Indiana, 8505 Zionsville Rd. 317-297-4910
Mich	Farmington, Harvey-Mich, 23461 Industrial Pk. Rd. 313-477-1650
Mich	Kentwood, Harvey-Mich, 4860 S. Div. 616-531-9300
Minn	Edina, Harvey-Minn, 6969 Washington Ave. S. 612-941-6060
NJ	Hanover, State Elctns., 36 Route 10 201-887-2550
NM	Albuquerque, Century Elec., 121 Elizabeth N.E. 505-292-2700
NY	Farmingdale, Iris Elctns., 91 Milbar Blvd. 516-420-8400
NY	Rochester, Simcona Elec., 275 Mt. Read Blvd. 716-328-3230
NC	Raleigh, Hall-Mark, 3000 Ind'l Dr. 919-832-4465
Ohio	Dayton, Sunray Elec., 3191 Plainfield Rd. 513-253-4114
Pa	Erie, Erie Corporate Cont., 1938 Buffalo Rd. 814-455-8110
Tex	Dallas, Component Specialties, 2560 Elctns. La. 214-357-4576
Tex	Houston, Component Specialties, 7315 Ashcroft 713-771-7237
Utah	Salt Lake City, Century Elec., 2150 South 300 W. 801-466-6000
Utah	Salt Lake City, W.H. Bintz, 433 West Third St. 801-363-5821

PALL CORP., 30 Sea Cliff Ave., Glen Cove, N.Y., 11542,
Tel: 516-671-4000, TWX: 510-223-0606; Empl.: 1300

Products manufactured: Air Cleaners & Filters
(Shielded & Unshielded), Dehumidifiers (For
Equipment), Filters, Switches

Local Sales Offices & Reps.

Cal	Pasadena 213-684-2131
NJ	Pall Trincor Corp. 201-245-8400

PALL TRINITY MICRO CORP., Rte. 281, Cortland, N.Y.,
13045, Tel: 607-756-7535, TWX: 510-252-0791; Empl.:
300; Minimum order: \$25

For info on price: D. J. Taylor; Application info: D. J.
Taylor; Customer service: D. J. Taylor; Delivery info:
R. Chierchio

Products manufactured: Air Cleaners & Filters
(Shielded & Unshielded), Dehumidifiers (For
Equipment), Dehydrators, Filters

Local Sales Offices & Reps.

Ala	Birmingham, Brownlee-Morrow Engrg. 205-967-2873
Ala	Mobile, F. A. Thomas Co. 205-471-1593
Ala	Pelham, G. S. Edwards Co. 205-663-0707
Cal	S. El Monte, Pall Western Corp. 213-686-2786
Cal	Sunnyvale, Menasco 408-739-8690
Colo	Denver, Ross Equip. Co. 303-759-4215
Conn	Hamden, Pond Tech. Sls. 203-288-6278
Fla	Tampa, J. M. Clontz Assocs. 813-935-1988
Ga	Atlanta, Thomas Engrg. Co. 404-261-5070
Haw	Honolulu, Berkley Engrg. 808-538-1921
Ill	Villa Park, Enpro Inc. 312-279-2525
Iowa	Clinton, H. G. Klug Co. 319-243-3642
Ky	Paducah, LECO Inc. 502-554-9653
La	Baton Rouge, AWC Inc. 504-275-5480
Mass	North Reading, J. R. Chisholm Corp. 617-664-5711
Mich	Kalamazoo, Hose & Seals Inc. 616-375-1290
Mich	Trenton, North Central Engrg. 313-675-3157
Minn	Minneapolis, Industra Co. 612-929-6224
Mo	Kansas City, Condit Co. 816-561-4660
Mo	St. Louis, Durkin Equip. Co. 314-542-1444
Mo	St. Louis, Process & Chemical Equip. 314-771-3741
Neb	Omaha, H. G. Klug Co. 402-553-1377
NJ	Vauxhall, Pall Trincor Corp. 201-245-8400
NY	Cortland, B.E.S. Corp. 607-753-9308
NY	Malone, Benteck Inc. 518-483-4654
NY	New York City, Pall Trincor Corp. 212-269-4779
Ohio	Cleveland, Lester Johnson Co. 216-751-7040
Okla	Tulsa, Condit Co. 918-743-6651
Ore	Portland, Set Point Control 503-288-8868
Pa	Pittsburgh, Biltmore Products Co. 412-563-0808

SC	Greenville, Abernathy-Thomas Engrg. 803-288-2833
Tenn	Kingsport, Abernathy-Thomas Engrg. 615-245-6151
Tenn	Memphis, LECO Inc. 901-754-4800
Tex	El Paso, Engineered Equip. 915-533-4221
Tex	Houston, AWC Inc. 713-488-2730
Utah	Salt Lake City, T. R. Brown & Assoc. 801-486-7241
Va	Richmond, Dymation Inc. 804-649-7666
Wash	Bellevue, Set Point Control 206-454-0155
Wisc	Milwaukee, Chiple & Zeman Inc. 414-228-1300
FOR:	Can., Montreal, Que., Pall Canada Ltd. 514-735-5311

PALOMAR ENGRS., Box 455, Escondido, Cal., 92025, Tel:
714-747-3343; Empl.: 6

Customer service: J. Althouse

Free literature available: A brochure for each of our
seven products on request.

Products manufactured: Bridges, Decoders,
Generators, Keys, Tone, Modulators, All Kinds,
Standards, Transformers

PAMOTOR, INC., 770 Airport Blvd., Burlingame, Cal.,
94010, Tel: 415-347-1203, TWX: 910-374-2353; Empl.: 30
p. 1-504-507

Free literature available: Brochures: "Fans Blowers
& Accessories" & "Pentaflo Premium Fans"

Products manufactured: Blowers & Fans &
Accessories

Local Sales Offices & Reps.

Ariz	Phoenix, Bestronics 602-248-7020
Ark	Little Rock, J.Y. Schoonmaker Co. 501-375-2168
Cal	Burlingame, W. J. Purdy Co. 415-347-7701
Cal	Los Angeles, Black, Ekizian, Strong, Inc. 213-870-9191
Cal	San Diego, Bestronics 714-278-2150
Colo	Denver, W. J. Purdy Co. 303-777-1411
Conn	Meriden, P. R. Sturgeon 203-237-1112
Fla	Orlando, Cartwright & Bean 305-422-4531
Fla	Plantation, Cartwright & Bean, Inc. 305-791-3989
Ga	Atlanta, Cartwright & Bean 404-255-5262
Ill	Hinsdale, Hill-Gray 312-325-4810
Ind	Indianapolis, Sukup & Cox 317-253-5501
Mass	Babson Park, P. R. Sturgeon Co. 617-237-3506
Mass	Fendale, Hilltronics, Inc. 313-398-5556
Minn	Edina, M. Foster 612-835-2252
Miss	Jackson, Cartwright & Bean 601-981-1368
NJ	Bergenfield, H. Gray Assoc. 201-384-3643
NM	Albuquerque, W. J. Purdy Co. 505-266-7959
NY	Syracuse, Mar-Com Assocs. 315-437-2843
NC	Charlotte, Cartwright & Bean 704-333-6457
NC	Raleigh, Cartwright & Bean Co. 919-832-7128
Ohio	Dayton, Bear Mktg. 513-299-3566
Ohio	Richfield, Bear Mktg. 216-659-3131
Okla	Tulsa, J.Y. Schoonmaker Co. 918-936-1423
Pa	Enon Valley, Nebco Assoc. 216-457-2333
Pa	Havertown, Liberi Sls. 215-789-8150
Tenn	Knoxville, Cartwright & Bean 615-693-7450
Tenn	Memphis, Cartwright & Bean 901-276-4422
Tex	Dallas, J. Schoonmaker Co. 214-357-8481
Tex	Houston, J.Y. Schoonmaker Co. 713-926-9510
FOR:	Can., Willowdale, Ont., A. C. Simmonds & Sons 416-491-1010

PAN-L-FAST, 13205 Sherman Way, N. Hollywood, Cal.,
91605, Tel: 213-875-0831; Empl.: 5

Products manufactured: Fasteners

PANAMETRICS INC., 221 Cresent St., Waltham, Mass.,
02154, Tel: 617-899-2719, Telex: 92-3406; Empl.: 60;
Minimum order: \$25

For info on price: D. F. Garland; Application info: K. A.
Fowler; Customer service: D. F. Garland; Delivery
info: D. F. Garland

Products manufactured: Amplifiers, Analyzers,
Generators, Indicators, Testers, Timers,
Transducers, X-Ray Inspection Equipment

Local Sales Offices & Reps.

Cal	Downey, Uresco Co. 213-773-3828
Conn	Gailes Ferry, NDT Engrg. 203-464-7636
Mich	Chelsea, Michigan Nondestructive Gage Co. 313-994-5117
Pa	Downingtown, Testech 215-269-2705
Pa	Pittsburgh, American NDT 412-536-2345
Tex	Dallas, NDE-Aids 214-363-3217

PANASONIC, IND'L ELCTRN. COMPS., Matsushita Elec.
Corp. Amer., 200 Park Ave., New York, N.Y., 10017,
Tel: 212-973-8427

Products manufactured: Capacitors, Fixed,
Capacitors, Variable, Circuits, Hybrid, Thick Film,
Circuits, Hybrid, Thin-Film, Controls/Control Eqpt.,
Delay Lines, Diodes, Display Devices/Displays,
Drivers, Speaker, Films, Filters, Foil, Handsets,
Chestsets, Headphones, Headsets, Etc., Heads,
Recording Playback, Erase, Integrated Circuit
Devices, Isolators, Limiters, Microphones, All
Kinds, Networks, Oscillators, Phonographs, Parts
& Accessories, Potentiometers, Power Supplies,
Protectors, Rectifiers, Relays, Resistors, Speaker
Systems, Speakers, Substrates, Switches,
Thermistors, Thyristors (Includes Silicon
Controlled Rectifiers), Transducers, Transformers,
Transistors, Tubes, Tuners, Yokes

Local Sales Offices & Reps.

Ala	Huntsville, Rep. Inc. 205-881-9270
Cal	Los Angeles, Elctns. for Industry 213-641-3277
Cal	San Jose, Allgood-North 408-288-6731
Colo	Arvada, Arrowhead Sls. Corp. 303-423-5556
Fla	Casselberry, EIR, Inc. 305-380-9600
Fla	Palm Beach, EIR, Inc. 305-585-6689
Ga	Atlanta, Rep. Inc. 404-876-1591
Ill	Chicago, Brock & Cushman 312-622-4110
Ill	Franklin Park, Matsushita Elec. Corp. Amer. Elctn. Comps. Dept. 312-455-3105
Iowa	Des Moines, B.E.A.M.S., Inc. 515-282-0292
Kans	Shawnee Mission, B.E.A.M.S., Inc. 913-888-6110

Mass	Cambridge, Vector Sls., Inc. 617-491-5700
Mich	Detroit, NICON Assocs. 313-341-7688
Mich	Farmington, Panasonic Distr. Ctr. Automotive Comps. 313-477-1107
Minn	St. Paul, Skor 612-645-6461
Mo	St. Louis, B.E.A.M.S., Inc. 314-781-6855
NJ	River Edge, Meg Elctn. Sls. 201-265-9887
NY	Buffalo, Kehoe Comp. Sls. 716-856-9272
NY	Ontario Center, Kehoe Comp. Sls. 315-524-2491

NC	Charlotte, Anthom, Inc. 704-527-1515
Ohio	Columbus, T. Mulligan & Assocs. 614-457-2242
Ore	Portland, Almac/Strom Elctns. 503-292-3534
Pa	King of Prussia, Monteiro Associates, Inc. 215-265-0634
Tex	Addison, Dunbar Assocs. 214-239-7151
Utah	Salt Lake City, Arrowhead Sls. Corp. 801-485-3362

Va	Fairfax, T. Davis Marketers 703-591-7390
Wash	Seattle, Almac/Strom Elctns. 206-763-2300
EXP:	Toronto 150, Ont., Can., Canadian Gen. Elec. 416-537-4481

PANASONIC SPD DIV., OEM Ind'l. Battery Dept., Box
3980, Grand Central Sta., New York, N.Y., 10017, Tel:
212-973-8054

Customer service: K. Love

Free literature available: General Battery Catalog
Ni-Cad Battery Catalog sealed lead acid (gel cells)
Lithium batteries Silicone Photo Detectors
Panaquick battery chargers.

Products manufactured: Batteries, Cells,
Photoconductive, Photoemissive, Photovoltaic,
Chargers, Battery, Meters

PANDUIT CORP., 17301 Ridgeland Ave., Tinley Park,
Ill., 60477, Tel: 312-532-1800, Telex: 25-4560; QPL No:
06383 p. 2-2048-2051

For info on price: B. Kenny; Application info: B.
Kenny; Customer service: H. Kunce; Delivery info: H.
Kunce

Free literature available: Bulletin CC-2, an eight
page condensed catalog covering the complete
line of Panduit® wiring components. It contains
concise data to aid in selection of component to
meet the application.

Products manufactured: Clamps & Clips,
Connectors, Cutters, Wire, Hand Operated, Ducts,
Wiring, Fasteners, Kits, Terminal, Splices, wire
(Including, Butt & Cap Types), Strain Reliefs,
Cable & Wire, Strips, Terminals, Tools, Tubing,
Wire, Wire & Cable Ties, Wire Markers, Wire
Nuts, Wire Strippers

Local Sales Offices & Reps.

Ala	Birmingham, James E. Heusser Agency 205-836-3896
Alas	Anchorage, H.J. Lang & Assocs. 907-279-5741
Ariz	Phoenix, Panduit Corp. 602-252-4515
Ark	Little Rock, Byron Carson Co. 501-568-3342
Cal	Los Altos, Ewing-Foley, Inc. 415-941-4525
Cal	San Diego, Panduit Corp. 714-270-2827
Cal	Westminster, Panduit Corp. 714-554-2300
Colo	Denver, Panduit Corp. 303-756-7747
Conn	Glastonbury, Barton-Caron Assocs. 203-633-9417
Fla	Boca Raton, Floritronics 305-368-0325
Fla	Winter Park, Floritronics 305-886-4818

Ga	Atlanta, Panduit Corp.	404-252-6483
Haw	Honolulu, A. J. Vivas Co.	808-946-6233
Ill	Tinley Park, Panduit Corp.	312-532-1800
Ind	Fort Wayne, Val-Skol Sls., Inc.	219-742-9122
Ind	Indianapolis, Val-Skol Sls., Inc.	317-926-5063
Iowa	Marion, Thomas & Modrcin Assoc.	319-377-6261
Kans	Shawnee Mission, Thomas & Modrcin Assoc.	913-432-2131
Ky	Jeffersontown, A.L. Pickens Co.	502-491-4215
La	Gretna, Panduit	504-366-1022
Md	Rockville, L.G. White & Co.	301-792-0660
Mass	Auburndale, Barton-Caron Assoc.	617-332-2021
Mich	Flint, Panduit Corp.	313-233-0501
Mich	Jenison, Panduit Corp.	616-942-0420
Mich	Southfield, Panduit Corp.	313-354-1830
Minn	Minneapolis, Electric Comp. Sls.	612-933-2594
Mo	Hazelwood, Thomas & Modrcin Assoc.	314-895-4700
NJ	Leonia, Panduit Corp.	201-461-7790
NY	Albany, Panduit Corp.	518-869-6913
NY	Kenmore, Panduit Corp.	716-834-8119
NY	Rochester, Panduit Corp.	716-244-9480
NY	Syracuse, Panduit Corp.	315-476-6161
NC	Winston-Salem, L.G. White Southern, Inc.	919-725-3612
Ohio	Cincinnati, Val-Skol Sls., Inc.	513-563-6790
Ohio	Cleveland, Val-Skol Sls., Inc.	216-526-2156
Ohio	Columbus, Val-Skol Sls., Inc.	614-291-4123
Okl	Oklahoma City, Panduit Corp.	405-848-6916
Ore	Portland, Panduit Corp.	503-248-1971
Pa	King of Prussia, L.G. White-Keystone, Inc.	215-265-1817
Pa	Pittsburgh, Myles F. Smith & Assoc.	412-276-5363
Tenn	Cookeville, A.L. Pickens Co.	615-528-1047
Tenn	Memphis, Byron Carson Co.	901-396-4553
Tex	Dallas, Panduit Corp.	214-638-7280
Tex	Houston, Panduit Corp.	713-784-1680
Wash	Bellevue, Panduit Corp.	206-454-7267
Wisc	Appleton, H. Mercer Co.	414-739-6223
Wisc	Brookfield, H. Mercer Co.	414-786-6431

PANEL CONTROLS CORP., 1000 Mt. Elliott Ave., Detroit, Mich., 48207, Tel: 313-568-2400; Empl.: 22
Customer service: P. Van Osdol

Products manufactured: Cases, Equipment, Instrument, Meter, Containers, Racks

Local Sales Offices & Reps.		
Ala	Chattanooga, Jackson & Assocs.	615-267-4260
Ariz	Phoenix, Davia Pkg. Supplies	602-942-5484
Cal	Westminster, Contronic Devices	714-897-2266
Ill	Glenview, F.W. Castle Co.	312-724-3075
Mass	Burlington, Contract East	617-272-5051
Mich	Dearborn, F.B. Wright Co.	313-843-8250
Minn	Anoka, A. & R. Assocs.	612-421-0751
Mo	Maryland Heights, Allied Assocs.	314-291-1120
NJ	Mountain Lakes, J.P. Dearie Co.	201-334-4848
NC	Durham, R.H. Davis Co.	919-596-8472
Ohio	Dayton, Dynel Co.	513-434-6467
Ore	Portland, Commercial Products Co.	503-286-4040
Tex	Dallas, W.W. Cannon Co.	214-357-2846
Utah	Salt Lake City, American Handling & Packaging	801-487-4673
Wash	Seattle, Commercial Products Co.	206-767-5313

PANELGRAPHIC CORP., Box 254, Caldwell, N.J., 07006, Tel: 201-227-1500, TWX: 710-734-4367; Empl.: 100; Minimum order: \$95
For info on price: D. Appel; Application info: E. Greason; Customer service: W. Perra; Delivery info: W. Perra

Products manufactured: Cabinets & Accessories, Dials, Display Devices/Displays, Filters, Nameplates, Scales, Dial, Services, Assembly, Production & Test

Local Sales Offices & Reps.		
Ala	Huntsville, W.A. Brown Comps.	205-539-4411
Ariz	Phoenix, C. P. McKnight Co.	602-257-8037
Cal	Canoga Park, M.J. Murphy	213-341-1472
Cal	Menlo Park, G.R. McKnight	415-325-2844
Colo	Denver, Goynne Assoc.	303-798-8955
Fla	Ft. Lauderdale, W.A. Brown Comps.	305-776-4800
Fla	Orlando, W.A. Brown Comps.	305-425-5505
Ill	Elmhurst, Panelgraphic	312-834-4849
Ill	Rolling Meadows, Sumer, Inc.	312-394-4900
Mass	Lexington, Measurements Equip.	617-245-4870
Mich	Southfield, J. L. Montgomery Assoc.	313-358-2616
Minn	Minneapolis, TWC Sales	612-636-1770
NJ	Mt. Lakes, Comp. for Electronics	201-334-2921
NM	Albuquerque, G. R. McKnight	505-266-6423

NY	Rochester, L. Hart	716-244-3253
NC	Raleigh, W. A. Brown	919-725-5384
NC	Winston Salem, W.A. Brown Comp.	919-725-5384
Ohio	Cincinnati, Components	513-721-2997
Ohio	Cleveland, Components Inc.	216-842-2737
Pa	Media, Snyder & Massey	215-566-5400
Tex	Dallas, McCoy Assoc.	214-350-9931
Tex	Houston, McCoy	713-649-5756
Va	Fairfax, Snyder & Massey	703-273-1413
Wash	Bellevue, Hickey Eng. Sales	206-454-0460

PANELOC CORP., Front & Main Sts., Collinsville, Conn., 06022, Tel: 203-693-8363; FSC No: 23893; Empl.: 24; Minimum order: \$25

For info on price: B. Ehrhardt; Application info: G. M. Williams, Jr.; Customer service: B. Ehrhardt; Delivery info: B. Ehrhardt

Free literature available: Quick Operating Fasteners Self locking fasteners

Products manufactured: Fasteners

PAR-METAL PRODS. DIV., Eon Corp., 1260 Atlantic Ave., Brooklyn, N.Y., 11216, Tel: 212-772-5800; Empl.: 75; Minimum order: \$50

For info on price: H. L. Miller; Application info: H. L. Miller; Customer service: W. Jones; Delivery info: W. Jones

Products manufactured: Benches, Consoles, Stools, Tables, Cabinets & Accessories, Chassis, Circuit Board Mounting, Panels, Racks, Slides, Cabinet & Chassis

Local Sales Offices & Reps.		
Ill	Skokie, Saffro & Assoc.	312-588-0905
Md	Baltimore, ME & Assoc.	301-825-1130
Mass	Lynnfield, New Mar Assoc.	617-245-7960
NY	New York, Miller Co.	212-263-4446
Tex	Dallas, Techno Assoc.	214-357-9213

Local Distributors

Rockville, Capital Radio, 12270 Wilkins Ave.		
Cal	Oakland, Brill Ectrns., 610 E. 10th St.	834-5888
Md	Bethesda, Empire Ectrn. Sup., 4907 Rugby Ave.	301-OL6-3300
NJ	Greenbrook, Greenbrook Elec., 269 U.S. Hwy. 22	201-968-3500
NJ	Hanover, State Ectrns., 36 Rte. 10.	201-887-2550
NY	Buffalo, Summit Dist., 916 Main St.	716-884-3450
NY	L.I.C., H.L. Dalis, 35-35 24th St.	212-361-1100
Tex	Houston, Geophysical Sup. Co., 1500 Crawford	713-224-0621

PARA-KOTE, INC., Box 516, Marshall, Minn., 56258, Tel: 507-532-3789, TWX: 910-565-1330; Empl.: 35 p. 2-1773,1774

Products manufactured: Coatings, Services, Assembly, Production & Test, Transformers

PARABAM, INC., 3017 E. Las Hermanas St., Compton, Cal., 90221, Tel: 213-537-1771; Empl.: 22; Minimum order: \$25

Customer service: J. N. Day

Free literature available: Custom manufacturing of fiberglass products; prototype production or quantity production; Astrodome and Observatory Shelters; Containers; Auto Bodies; Panels; Trailer Structures; Hoods; Concrete Forms; Custom Molded Shapes and Fiberglass Tooling.

Products manufactured: Containers, Services, Assembly, Production & Test, Servo Systems, Tracking Systems

PARAMETRIC INDS., INC., 742 Main St., Winchester, Mass., 01890, Tel: 617-729-7333; FSC No: 21455; Empl.: 50; Minimum order: \$25

For info on price: J. D. Haskins; Application info: G. R. Stotiropoulos; Delivery info: J. D. Haskins

Products manufactured: Detectors, Diodes, Oscillators

Local Sales Offices & Reps.		
Cal	Campbell, Allis Assocs.	408-379-2883
Colo	Boulder, H. Bass Assocs.	303-449-7509
Kans	Wichita, E. Carbiener Assocs.	316-682-5782
NJ	Leonia, Sprung/Nussbaum	201-947-6767
Pa	Glenside, Lewis Slubin & Co.	215-886-9291
Tex	Dallas, Stevens Sls. Co.	214-350-2476
Wash	Seattle, Datacom Assocs.	206-285-2525

PARAMOUNT INDUSTRIES, INC., 1430 Progress Rd., Ft. Wayne, Ind., 46808, Tel: 219-484-4111; Empl.: 44

Free literature available: Arbor list of square, rectangular and round sizes available.

Products manufactured: Tubing

Local Sales Offices & Reps.
FOR: Can., Scarborough, Ont., Lake Engrg. Co. Ltd.
416-751-5880

PARAPLEGICS MFG., 304 N. York Rd., Bensenville, Ill., 60106, Tel: 312-625-7740; Empl.: 65; Minimum order: \$25

For info on price: V. Caricato; Customer service: V. Caricato; Delivery info: I. Pryble

Free literature available: Job Shop - Sub-Contract of electro-mechanical & electronics assembly - cable & harness fabrication - circuit board assembly (wave & hand solder), wire wrapping, control panel asbly. Encapsulation of components & circuit boards coaxial cable assembly.

Products manufactured: Cable Assemblies & Harnesses, Cards, Linear Function, Cards, Logic, Services, Assembly, Production & Test

PASO SOUND PRODUCTS INC., 251 Park Ave. S., New York, N.Y., 10010, Tel: 212-254-2282; Empl.: 50; Minimum order: \$25

For info on price: S. Goldberl; Application info: P. Mastrangelo; Customer service: A. Sgueglia; Delivery info: A. Sgueglia

Free literature available: Three Catalogs: General Line #33, Intercommunication Equipment #66, and Packaged Sound Systems #55 With Application Data 47, 48, 50, 51, 53, 54.

Products manufactured: Amplifiers, Comm. Systems, Horns, Microwave, Microphones, All Kinds, Mixers, Speaker Systems, Speakers, Transformers

Local Sales Offices & Reps.		
Fia	North Miami Beach, L. Haas Co.	305-949-9143
Ga	East Point, P. Hayden Assocs.	404-766-0261
Ill	La Grange, E. N. Severson & Assocs.	312-352-2055

Ind	Indianapolis, C. Scheffler Co.	317-253-6337
Mich	Brighton, Lectro Sls. Co.	313-632-7941
Minn	Minneapolis, A. J. Warner Co.	612-729-7371
Mo	Raytown, M. Taraski Sls. Co.	816-358-1442
NY	Jericho, Gim Sls. Corp.	516-433-4080
NY	Yonkers, J. Brown Electronic Sls. Reps.	914-779-7330

Ohio	Medina, J. H. Podolny Co.	216-725-8814
Tex	Houston, B. Rogers & Co.	713-626-5370
FOR:	Can., St. Laurent, Montreal, Que., PACO Electronics Ltd.	514-748-6787

PASTERNAK ENTERPRISES, 8538 Hamilton Ave., Huntington Beach, Cal., 92646, Tel: 714-536-7511; FSC No: 7F118; Empl.: 7; Minimum order: \$35

Customer service: M. Pasternack

Free literature available: Data Sheet Package Describing All Products

Products manufactured: Amplifiers, Cable, Connectors, Demodulators

Local Sales Offices & Reps.		
Cal	Los Angeles, RF Assocs.	213-478-1586
Cal	Palo Alto, RF Assocs.	415-327-5531
Colo	Boulder, A.L.S. Ectrns.	303-447-2436
Mass	Andover, Bee Assocs.	617-475-2124
Mich	Detroit, Comtel-Sterling Co.	313-255-1970
NM	Albuquerque, A.L.S. Ectrns.	505-294-8555
NY	Huntington Station, Gray & Reed Assocs.	516-GE3-3333

NY	Syracuse, Syracuse Tech. Reps.	315-488-0222
Ohio	Cleveland, Comtel Sterling Co.	216-442-8080
Pa	Newton Square, SWR Assocs.	215-356-8550
Tex	Dallas, Southern Engrg. Co.	214-357-0669
Va	Bailey's Crossroads, Q.T. Ectrns. Sls.	703-671-4357

EXP: Stamford, Conn., J.P. Int'l. Corp.203-348-2691

PAYNE ENGRG. CO., Box 70, Scott Depot, W. Va., 25560, Tel: 304-755-4353, Telex: 88-5452; Empl.: 16; Minimum order: \$10

For info on price: F. M. Griffin; Application info: F. M. Griffin; Customer service: I. Endicott; Delivery info: L. McElwee

Products manufactured: Controls/Control Eqpt., Fuses, Inverters, Limiters, Power Supplies, Rectifiers, Relays, Switches

Local Sales Offices & Reps.		
Cal	Santa Fe Springs, Sierra-Pacific Eng.	
Conn	Ridgefield, Himes Co.	
Ga	Atlanta, H. Homer & Assoc.	
Ill	Chicago, Ash Equip. Co.	
Mass	Worcester, F. X. Bonneau Assoc.	
Mich	St. Clair Shores, T. E. Redmond	
Minn	St. Paul, Power/Mation Div.	
Mo	St. Louis, Times Ind. Sls.	
NJ	Kenilworth, Wolock & Lott	

NY Oriskany, Knightsbridge Ind.
 NY White Plains, Swedeco
 Ohio Cincinnati, J. W. Murray & Assoc.
 Ohio Cleveland, Collart Co.
 Okla Tulsa, Components
 Pa Frazer, Engineered Specialty Prods.
 Pa Pittsburgh, Process Engrg. Co.
 Tex Houston, Cordel Corp.
 Va Richmond, Frazier & Co.
 Wisc Oconomowoc, Power/Motion Division
 FOR: Can., Toronto, Sigma Instrs. Can. Ltd.

PCA ELCTRNS., INC., 16799 Schoenborn St., Sepulveda, Cal., 91343, Tel: 213-892-0761, TWX: 910-496-1525; Empl.: 35; Minimum order: \$25

For info on price: Sls. Desk; Application info: Engrg. Dept.; Customer service: Sls. Desk; Delivery info: Sls. Desk

Products manufactured: Delay Lines, Transformers

Local Sales Offices & Reps.

Ariz Phoenix, Toward Engrg. Assocs., Inc.
 602-277-1453
 Cal Mountain View, Caltron/Pyle 415-964-3244
 Cal San Diego, J.T.L. Assocs. 714-277-8044
 Fla Altamonte Springs, WMM Assocs.
 305-831-4645
 Fla Clearwater, WMM Assocs. 813-447-2533
 Fla Pompano Beach, WMM Assocs. 305-943-3091
 Ill Westchester, W. G. Brouillette & Assocs., Inc.
 312-345-6500
 Iowa Marion, Thomas & Modrcin Assocs., Inc.
 319-377-6261
 Kans Shawnee Mission, Thomas & Modrcin Assocs., Inc.
 913-432-2131
 Md Baltimore, R. P. Luce & Co., Inc. 301-752-8200
 Mass Stoneham, REPCO 617-438-3113
 Minn Hopkins, Grayden & Flemmer 612-941-1120
 Mo Hazelwood, Thomas & Modrcin Assocs., Inc.
 314-838-6446
 NJ Berkeley Heights, R. P. Luce & Co., Inc.
 201-464-6440
 NY Fayetteville, H. C. Johnson Agencies
 315-637-9383
 NY Guilderland, H. C. Johnson Agencies
 518-465-9681
 NY New Hyde Park, R. P. Luce & Co., Inc.
 516-437-4550
 NY Rochester, H. C. Johnson Agencies, Inc.
 716-482-3000
 Ohio Cleveland, Weschler Elec. Co. 216-251-4609
 Ohio Dayton, Weschler Elec. Corp. 513-274-6972
 Pa Glenshaw, H. C. Johnson Agencies
 412-961-0414
 Pa Philadelphia, R. P. Luce & Co., Inc.
 215-884-8365
 Tex Dallas, Blackburn Assocs. 214-351-9992

PCB PIEZOTRONICS, INC., 5800 Transit Rd., Depew, N.Y., 14043, Tel: 716-684-0001, TWX: 710-263-1371; Empl.: 35

Products manufactured: Accelerometers, Amplifiers, Analyzers, Cells, Load, Signal Conditioners & Equipment, Transducers

Local Sales Offices & Reps.

Cal Long Beach, Saber Entprs. 213-595-5646
 Cal Santa Clara, Richards Assocs. 408-246-5860
 Conn Hamden, Northeast Engrg., Inc. 203-248-4481
 Fla Orlando, Physimetrix, Inc. 305-894-8081
 Ga Atlanta, Physimetrix, Inc. 404-261-8720
 Ill Northfield, Torkelson Assocs. 312-446-9085
 Ind Indianapolis, Torkelson Assocs. 317-244-7867
 Md Fulton, Gans-Fryling, Inc. 301-837-6311
 Mass Danvers, Northeast Engrg., Inc. 617-774-3010
 Mich Farmington, Carter, McCormick & Peirce, Inc.
 313-477-7700
 Mich Kalamazoo, Carter, McCormick & Peirce, Inc.
 612-835-2414
 Minn Minneapolis, Torkelson Assocs. 314-821-1232
 Mo St. Louis, Adelphi, Inc. 505-296-6474
 NM Albuquerque, Rustco Entprs. 513-652-5272
 NY Liverpool, Rayelco Elctns., Inc. 516-365-9633
 NY Manhasset, Northeast Engrg., Inc.
 Ohio Cleveland, Carter, McCormick & Peirce, Inc.
 216-333-5650
 Ohio Dayton, Carter, McCormick & Peirce, Inc.
 513-278-5873
 Ore Portland, Brett Assocs. 503-232-4184
 Pa Jenkintown, AMT 215-549-2080
 Pa Pittsburgh, Carter, McCormick & Peirce, Inc.
 412-824-3760
 Tex Dallas, Tech. Prods., Inc. 214-357-9603
 Va Arlington, Gans-Fryling, Inc. 703-527-3262
 Wash Seattle, Brett Assocs. 206-935-8054

PCS., INC., 5467 Hill 23 Dr., Flint, Mich., 48507, Tel: 313-744-0225, TWX: 810-235-8667; Empl.: 90; Minimum order: \$25

For info on price: A. D. Harmala; Application info: A. D. Harmala; Customer service: T. Wadsworth; Delivery info: A. D. Harmala

Free literature available: Micropac 80 - stand alone microcomputer development system. Has a full line of digital, analog & communications I/O. Micropac OEM - microcomputer system tailored to the OEM's application. Micropac RT - remote I/O for computers using a microcomputer at the process interface.

Products manufactured: Computers, Controllers, Programmable, Controls/Control Eqpt., Converters, Counters, Multiplexers

Local Sales Offices & Reps.

Cal Culver City, Feeeger Lucas & Wolfe
 213-559-7200
 Cal Fullerton, PCS 714-992-4311
 Cal Los Altos, J. Stone & Assocs. 415-948-4563
 Cal Newport Beach, Feeeger Lucas & Wolfe
 Cal San Diego, Feeeger Lucas & Wolfe
 714-277-0993
 Conn Glastonbury, Lincoln Tech. Sls. 203-633-1380
 Ill Chicago, Solid State Elctns. Ill. 312-889-8033
 Kans Shawnee Mission, Inland Assocs. 913-362-2366
 Md Bethesda, S & S Assocs. 301-654-1434
 Mass Reading, Lincoln Tech. Sls. 617-944-9594
 Mich Grand Rapids, Reps. Elctns. Prods.
 616-942-1320
 Mich Southfield, Reps. Elctns. Prods. 313-354-9066
 Minn St. Paul, Cullen & Assocs. 612-646-7371
 Mo Glencoe, Inland Assocs. 314-938-4992
 NJ Bricktown, PCS 201-477-8080
 NY Mamaroneck, Cane Tech. Sls. 914-698-4411
 Ohio Cleveland, Instrumentation Sys. 216-486-0782
 Ohio Dayton, Instrumentation Sys. 513-294-2838
 Pa of Prussia, S & S Assocs. 215-265-3450
 Pa Pittsburgh, Instrumentation Sys. 412-243-1111
 Tex Dallas, Evans & Mc Dowell Assocs.
 214-238-7157
 Tex Houston, Evans & Mc Dowell Assocs.
 713-772-1257
 Wash Bellevue, Topp Engrg. Sls. Corp. 206-747-5400
 Wisc Wauwatosa, Larsen Assocs. 414-258-0529

PEARCE-SIMPSON, INC., Div/Gladding Corp., 4701 N.W. 77th Ave., Miami, Fla., 33166, Tel: 305-592-5550; Empl.: 200

For info on price: D. Henry; Application info: D. Henry; Customer service: M. Goldblatt; Delivery info: P. Zazzali

Products manufactured: Antennas, Comm. Systems, Direction Finders, Receivers, Transceivers

PEARSON ELCTRNS. INC., 4007 Transport St., Palo Alto, Cal., 94303, Tel: 415-326-7285; FSC No: 05280; Empl.: 20; Minimum order: \$236

For info on price: C. Porter; Application info: D. Everton; Customer service: C. Porter; Delivery info: C. Porter

Products manufactured: Current Sensors, Dividers, Transformers

PECO CORP., 450-9 Landress Ave., Milpitas, Cal., 95035, Tel: 408-262-4050, Telex: 346-347; Empl.: 70; Minimum order: \$10

For info on price: R. Jensen; Application info: J. Bellamy; Customer service: J. Bellamy

Free literature available: Catalogs upon request.

Products manufactured: Cards, Logic, Controls/Control Eqpt., Counters, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Detectors, Modules, Logic, Encapsulated, Monitors, Racks, Relays, Switches, Transducers

Local Sales Offices & Reps.

Cal Huntington Beach, W. Spell 714-963-6444
 Cal Milpitas, A. Khan 408-262-4050
 Ga Atlanta, J. Luttrell & Assocs. 404-237-4551
 Ill Chicago, F. M. Smith 312-763-3656
 Mass Cohasset, W. F. Humphrey Co. 617-653-7918
 Mo Creve Coeur, Williams Equipment Co.
 314-997-1030
 NJ Bogota, Neville & Vespo 201-487-1505
 NJ Mine Hill, T. Regenczuk 201-366-5977
 NJ Willingboro, J. D. Miller 609-877-2031
 NY Rochester, H. M. Cross & Sons 716-442-6200
 Ohio Toledo, P. Hensing 419-478-4506
 Tex Dallas, Production Engrg. Sls. Org.
 214-369-3181

PEERLESS RADIO CORP., 19 Wilbur St., Lynbrook, N.Y., 11563, Tel: 516-593-2121, TWX: 510-225-8422; Empl.: 40; Minimum order: \$10

For info on price: Sls. Dept.; Application info: Sls. Dept.; Customer service: T. Corozzo; Delivery info: P. Hartill

Free literature available: Literature is available for all custom switch products Toggle, Pushbutton, Indicators, Manual Control, Reed, Magnetic etc.

Products manufactured: Services, Assembly, Production & Test

Local Sales Offices & Reps.

Fla Oakland Park 305-566-5966

PENN AIRBORNE PRODS., Industrial Hwy., Southampton, Pa., 18966, Tel: 215-355-3400; FSC No: 25805; Empl.: 33; Minimum order: \$25

Customer service: F. Pito

Free literature available: Bulletin 201
 Potentiometers-Portable; Bulletin 301
 Bridges-Portable.

Products manufactured: Bridges, Indicators, Meters, Modules, Logic, Encapsulated, Potentiometers, Resistors, Standards, Testers

Local Sales Offices & Reps.

Cal Palo Alto, Mauldin Co. 415-326-5291
 Haw Honolulu, Atecs Corp. 808-841-6694
 Iowa Des Moines, H.E. Ferris 515-255-1757
 Mich Royal Oak, Stillings Instr. Sys. 412-439-6030
 Neb Omaha, Interstate Ind'l. Inst. 402-331-3535
 Ohio Dublin, Analytco 614-889-1224
 Ohio W. Carrollton, Analytco 513-434-8940
 Pa Downingtown, Reinbrecht 215-265-6180
 Pa Pittsburgh, W. Wells 412-833-1632
 Tex Houston, Wilson-Mohr Inc. 713-781-2768
 Va Richmond, Instrument Technical Representatives 703-288-7198

PENN ENGRG. & MFG. CORP., Doylestown, Pa., 18901, Tel: 215-766-8853, TWX: 510-665-9338; FSC No: 46384; Empl.: 130; Minimum order: \$10

For info on price: Sls. Dept.; Application info: J. Guba; Customer service: J. Guba; Delivery info: Sls. Dept.

Products manufactured: Fasteners, Machines/Machinery, Production, Terminals

PENN FIBRE & SPECIALTY, 2020 E. Westmoreland St., Phila., Pa., 19134, Tel: 215-RE 9-4862; Empl.: 40; Minimum order: \$15

For info on price: W. H. Frey; Application info: W. K. Davis; Customer service: R. Wagner; Delivery info: E. Timms

Free literature available: Comparative Sample Chart of plastics and non-metallics showing typical properties and costs of materials most commonly used for electrical insulation in fabricated parts.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Fasteners, Gaskets, Shielding, R-F-Also See Shields, R-F, Insulators & Insulation; Laminates, Tubing, Wire Markers

Local Sales Offices & Reps.

Ill Chicago, B. Finder & Assocs. Inc. 312-262-2020

PENN KEYSTONE CORP., Division St., Ansonia, Conn., 06401, Tel: 203-734-3301, Telex: 96-3554; FSC No: 03034; Empl.: 65; Minimum order: \$25

For info on price: E. M. Parker; Application info: John Babina; Customer service: John Babina; Delivery info: E. M. Parker

Free literature available: Peaklite Indicator Lights - Series 7500 etal. An illustrated bulletin with fly sheets, describing a unique family of products for front-of-panel and rear-of-panel lighting. Message display is emphasized.

Products manufactured: Annunciators, Caps, Lenses, Indicator Light, Display Devices/Displays, Indicators, Lamps, Lights

Local Sales Offices & Reps.

Cal Huntington Beach, ASC Sls. Co. 714-847-7515
 Ind Fort Wayne, Ryan Sls. Co., Inc. 219-483-9567
 NJ Pitman, Colrud Co. 609-589-5866
 NY Rochester, L. Hart Assoc., Inc. 716-244-3253
 Ohio Cincinnati, Tri-State Mktg., Inc. 513-761-7993
 Tex Arlington, Ion Associates, Inc. 817-461-9661

PENNTUBE PLASTICS, Madison Ave. & Holly St., Clifton Heights, Pa., 19018, Tel: 215-622-2300; Empl.: 145

Products manufactured: Tubing

Local Sales Offices & Reps.

Cal Burlingame, Quintec Inds. 415-692-2010
 Cal El Segundo, Quintec Inds. 231-640-1400
 Cal San Diego, Quintec Inds. 714-276-6604
 Colo Denver, Industrial Elctns., Inc. 303-771-2636

Conn Woodbury, Hart, Nininger & Campbell Assocs. 203-263-4321
 Fla Largo, Almac Assocs. 813-581-0444
 Ga Atlanta, D. Wix 404-361-2550
 Ill Arlington Hgts., A. H. Walkie 312-394-8313
 Ind Indianapolis, Hoster & Sietloff Assocs. 317-844-9921
 Kans Overland Park, ENSCO-Rep, Inc. 913-381-7557
 Mich Birmingham, Carmco, Inc. 313-642-2068
 Minn Minneapolis, D. A. Schultz Co. 612-FE9-7701
 Mo St. Louis, ENSCO-Rep, Inc. 314-567-3935
 NY Mineola, R. A. Colucci Co. 516-746-0397
 NY Rochester, Potter Assocs. 716-288-3750
 NC Sanford, G. Simpson 919-776-3701
 Ohio North Olmsted, G. Blaney 216-777-4322
 Pa Aston, J. F. Walls 215-459-8377
 Tex Richardson, C. J. Garvey Co. 214-234-3371
 Wash Kirkland, Lehr Assocs. 206-827-4581
 FOR: Can., Montreal, Que., A. Gilchrist, Ltd. 514-735-3603
 FOR: Can., Rexdale, Ont., A. Gilchrist Ltd. 416-749-8755

PENTRONIX, 1735 Cicotte, Lincoln Park, Mich., 48146, Tel: 313-388-3100, Telex: 23-0398; Empl.: 12; Minimum order: \$25
 For info on price: A. Bazner; Application info: J. Schultz; Customer service: F. Wheeler; Delivery info: A. Bazner

Free literature available: Multipak Powder Compacting Press Brochure featuring three mode presses and anvil type presses.

Products manufactured: Machines/Machinery, Production

PERFECT GEAR & INSTR. DIV., Div. Designatronics, 18141 Napa, Northridge, Calif., 91324, Tel: 213-885-1781, TWX: 910-493-1241
 Customer service: A. Cazier

Products manufactured: Brakes, Clutches, Couplings, Dials, Drives & Drive Mechanisms (Dial), Encoders, Gears & Gear Mechanisms (Precision), Limit Stops, Mechanical, Servo Systems

PERFECTION MICA CO., Magnetic Shield Div., 740 Thomas Dr., Bensenville, Ill., 60106, Tel: 312-766-7800, TWX: 910-256-4815; Empl.: 43; p. 2+1255-1257, 2055

Products manufactured: Cable, Chamber, Environmental Test, Containers, Indicators, Insulators & Insulation, Kits, Shielding, Photomultiplier Tube Housings, Shields, Wire, Wire Shielding

Local Sales Offices & Reps.

Ala Huntsville, Murcotta Corp. 205-539-8476
 Cal San Carlos, Kottmeier Assoc. 415-592-8333
 Cal Woodland Hills, Cal-Ward Sls. Co. 213-833-2202
 Colo Denver, E. Johnson 303-985-4810
 Conn Wethersfield, Com/Pak 203-563-4784
 Fla Clearwater, L. Gentry Assoc. 813-443-2697
 Ill Hinsdale, Momak Sls. 312-654-4524
 Kans Shawnee Mission, Midwestern Sls. Co. 913-648-6414
 Md Bethesda, Mount & Co. 301-530-0012
 Mass Needham Heights, Com/Pak 617-444-1259
 Minn Minneapolis, E. Mellus & Assoc. 612-854-4270
 Mo St. Louis, Midwestern Sls. Co. 314-961-6880
 NJ Moorestown, Electrical Comps., Inc. 609-235-3012
 NJ Mountain Lakes, Comps. for Elctns. 201-334-2921
 NM Albuquerque, IMEC 505-883-9010
 NY Buffalo, Telesco Assoc. 716-834-1026
 NY Rochester, Telesco Assoc. 716-271-3780
 NY Utica, Telesco Assoc. 919-723-1001
 NC Winston-Salem, Murcotta Corp. 513-434-1454
 Ohio Dayton, F. Ohmer Assoc. 214-234-3285
 Tex Richardson, Air Quip Sls. Co. 801-521-9677
 Utah Salt Lake City, P. Bowthorpe Agency 206-938-4166
 Wash Seattle, J.B. Jolly

PERKIN-ELMER CORP., Electr. Prods. Dept., Main Ave., Norwalk, Conn., 06856, Tel: 203-762-4786, TWX: 710-468-3213; Empl.: 40

For info on price: J. Sonntag 203-762-6574; Application info: W. Woschetzky 203-762-6574; Delivery info: J. Sonntag 203-762-6574

Free literature available: Short form catalog of Vernistat (A. C. Potentiometer) Function Generator, Transformer and Digital Converter Product Lines

Products manufactured: Converters, Generators, Potentiometers, Transformers

Local Sales Offices & Reps.

Ariz Scottsdale, Mercury Engrg. Co. 602-945-1927
 Cal San Diego, Qualtronic Corp. 714-224-6555
 Colo Denver, Electrodyne Inc. 303-757-7679
 Fla Ft. Lauderdale, Snow Co. 305-563-2448
 Ind Greenwood, Valentine-Schillinger & Assoc. 317-888-2260
 Ind South Bend, Valentine-Schillinger & Assoc. 219-291-6258
 Kans Overland Park, ENSCO-Rep, Inc. 913-381-7557
 Md Temple Hills, Wyncote Instrumentation Co. 301-423-8523
 Mich Grand Rapids, Thies & Assocs. 616-457-2052
 Minn Eden Prairie, F. Peterson Co. 612-941-5400
 Mo St. Louis, ENSCO-Rep Inc. 314-567-3935
 NY Syracuse, C.W. Floring & Assoc. 315-478-2149
 Pa Ambler, Wyncote Instrumentation Co. 215-643-2440
 Tex Dallas, Southern Engrg. Co. 214-357-0669
 Wash Bellevue, Conrard-Carlson Engrg. Co. 206-455-1336

PERKIN-ELMER CORP., Instr. Div., Main Ave., Norwalk, Conn., 06856, Tel: 203-762-1000, TWX: 710-468-3213; Empl.: 7300

Products manufactured: Amplifiers, Converters, Generators, Lenses, Optical & Camera, Potentiometers, Transformers

PERKIN-ELMER ULTEK INC., Box 10920, Palo Alto, Cal., 94303, Tel: 415-967-2100, TWX: 910-379-6442; Empl.: 180

Customer service: J. A. Leever Ext. 282

Free literature available: High vacuum equipment and Randex sputtering deposition equipment

Products manufactured: Chamber, Environmental Test, Deposition Equipment, Vacuum & Accessories, Detectors, Evaporation Equipment, Electron Beam, Feedthrus & Seals, Environmental, Furnaces, Gages, Ovens, Pumps, Vacuum, Services, Assembly, Production & Test, Valves, Vacuum

Local Sales Offices & Reps.

Cal Huntington Beach, Perkin-Elmer Ultek 714-968-1030
 Cal San Jose, Perkin-Elmer Ultek 408-292-7044
 Ill Wilmette, Perkin-Elmer Ultek 312-256-2688
 Md Gaithersburg, Perkin-Elmer Ultek 301-926-3200
 Mass Stoneham, H. W. Gath Assoc. 617-438-5428
 NJ Mountainside, Perkin-Elmer Ultek 201-232-1750
 Ohio N. Olmsted, Perkin-Elmer Ultek 216-331-4798
 Tex Richardson, Yardrough Southwest 214-690-0800

PERMA POWER DIV., Chamberlain Mfg. Corp., 845 Larch Ave., Elmhurst, Ill., 60126, Tel: 312-279-3600; Empl.: 1500

For info on price: N. Ackerman; Customer service: E. Michna; Delivery info: M. Shatz

Free literature available: Radio Control Catalog, describes available systems; Ampli-Vox Sound Systems Catalog, public address systems; Ladder Catalog, aluminum ladders; Perma Power Complete Line catalog, product groups.

Products manufactured: Amplifiers, Controls/Control Eqpt., Public Address Systems, Regulators, Speaker Systems, Speakers, Transformers

Local Sales Offices & Reps.

Ark El Dorado, D. Bellew Sls. 505-883-9010
 Cal San Francisco, Technical Sls. Assocs. 415-592-8333
 Cal Van Nuys, Oberman-Renner Sls. Co. 818-271-3780
 Colo Aurora, A. E. S. 303-985-4810
 Conn West Hartford, R. Smith Co. 203-563-4784
 Ill Lincolnwood, W. Linz & Assoc. 312-256-2688
 Ind Ft. Wayne, N. Hoemig Sls. Co. 317-438-5428
 Mich Plymouth, J. Malcolm Flora 313-443-2697
 Minn St. Paul, W. Engelbreton Co. 612-941-5400
 Mo Jefferson City, C. A. Vignola Assoc. 816-234-3285
 NJ Cherry Hill, Trinkle Sls. 201-334-2921
 NY Manhasset, Landau & Mack 516-434-1454
 NY Phelps, L. S. M. Assocs. 212-234-3285
 NC Greensboro, Adams & Assocs. 919-723-1001
 Ohio Columbus, J. W. Lehner Co. 614-234-3285
 Tex Dallas, Berthold Sls. Co. 214-357-0669
 Wash Seattle, Fleehart & Sullivan 206-938-4166

PERMAG CORP., 88-06 Van Wyck Expwy., Jamaica, N.Y., 11418, Tel: 212-657-1818; Empl.: 50

Customer service: C. Hemming

Free literature available: Literature on Magnetic Assemblies, Ferramics, ALNICO and Ceramics, Berlox and Heat Sinks.

Products manufactured: Cores, Ceramic, Cores, Magnetic, Demagnetizers, Ferrite Material & Parts, Magnetizers, Magnets

Local Sales Offices & Reps.

Cal Los Angeles, Permag Pacific Corp. 213-776-5656
 Cal Menlo Park, Permag Sierra Corp. 415-369-0303
 Ga Atlanta, Permag Dixie Corp. 404-351-0994
 Ill Elk Grove Village, Permag Central Corp. 312-956-1140
 Mass Billerica, Permag Northeast Corp. 617-273-2890
 Ohio Toledo, Permag Magnetics Corp. 419-385-4621
 Dallas, Permag Southwest Corp. 214-748-6909

PERMALUSTER, INC., 1844 N. Keystone St., Burbank, Calif., 91504, Tel: 213-849-4543; Empl.: 9

For info on price: H. D. Walker; Application info: H. D. Walker; Customer service: J. Ross

Free literature available: Technical catalog describing Permaluster process, properties of thin film insulation, thermal and mechanical properties, working techniques and applications.

Products manufactured: Coatings, Coils Including Assemblies & Forms, Films, Shields, Wire

PERMANENT MAGNET CO., 4437 Bragdon St., Indianapolis, Ind., 46226, Tel: 317-547-1336; Empl.: 150; Minimum order: \$35

Customer service: J. M. Amigh

Products manufactured: Magnets

Local Sales Offices & Reps.

Cal Pasadena, T.W. Yeakle 213-684-2275
 Ill Hillside, L.M. Holt, Permanent Magnet Co. 312-449-7660
 Ind Indianapolis, Hoster & Sietloff Assocs. 317-884-9921
 Mass Wakefield, Denning Assocs. 617-334-4099
 Minn Minneapolis, Peterson Entrs. 612-784-6628
 NY Manhasset, Kaelber & Mack, Inc. 516-627-6620

PERRY AMPLIFIER, 138 Fuller St., Brookline, Mass., 02146, Tel: 617-734-0844; Empl.: 18

For info on price: H. Rodman; Application info: G. Perry; Customer service: H. Rodman; Delivery info: P. Turcotte

Free literature available: Amplifier Catalog

Products manufactured: Amplifiers, Power Supplies

Advertisement

Ultra low noise (10B typical) transistor amplifiers for use with infrared detectors and electrical transducers; voltage mode, current mode and automatic bias control. Standard models are available to match all infrared detectors and transducers produced in the U.S. and Europe. Multi-Element amplifier arrays are available in all operating modes with hybrid modules containing up to 100 signal channels. Standard secondary function amplifiers such as; logarithmic, AGC, video, RF, etc., are also available from stock.

PERTEC, Peripheral Equip. Div., 9600 Irondale Ave., Chatsworth, Cal., 91311, Tel: 213-882-0030, TWX: 910-494-2093; Empl.: 523

For info on price: R. Gabai Ext. 485; Application info: R. Gabai Ext. 485; Customer service: J. Zedalis Ext. 561; Delivery info: L. Hemmerich Ext. 564

Free literature available: Data Sheets and Brochures Describing Technical Specifications, Applications, and Interface Requirements for Tape Transports, Disk Drives for Minicomputer Peripherals.

Products manufactured: Memory Systems, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Ala Birmingham, T.A. Instrs. 205-881-8494
 Ariz Scottsdale, BFA Corp. 602-946-4215
 Cal Encino, Pertec PED 213-996-1333
 Cal Los Altos, Pertec PED 415-964-9966
 Cal Santa Ana, Pertec PED 714-542-2348
 Colo Denver, BFA Corp. 303-744-3301
 Conn Stamford, Pertec PED 203-327-2260
 Fla Orlando, T.A. Instrs. 305-894-7531
 Ill Rosemont, Pertec PED 312-696-2460

Kans	Shawnee Mission, EIR Co.	913-362-0919
Mass	Waltham, Pertec PED	617-890-6230
Minn	Minnetonka, Pertec PED	612-933-1030
Mo	Hazelwood, EIR Co.	314-895-4100
NM	Albuquerque, BFA Corp.	505-296-8303
NM	Las Cruces, BFA of Arizona	505-523-0601
Ohio	Vandalia, Pertec PED	513-898-3150
Pa	Malvern, Pertec PED	915-644-4910
SC	Spartanburg, T.A. Instrs.	803-579-2904
Tex	Dallas, Pertec PED	214-692-0052
Tex	Dallas, Remtek	214-369-8146
Tex	Houston, Remtek	713-664-2113
Utah	Salt Lake City, BFA Corp.	801-466-6522
Wash	Seattle, Rush Drake Assocs.	206-763-2755

PERTEC CORP., 101 Continental Blvd., Ste. 435, El Segundo, Cal., 90245, Tel: 213-640-1540, TWX: 910-494-2093; Empl.: 1000

For info on price: W. T. Chambers 882-0030; Application info: J. Lembas 882-0030; Customer service: J. Zedalis 882-0030; Delivery info: T. Boren 882-0030

Free literature available: Sales Brochures/Data Sheets on the Following: (1) Tape Drives 15000 Series; T6000 Series; T7000 Series; T8000A Series; T9000 Series, (2) Memory Drives D3000 Series Disk, (3) FD400 Flexible Disk, (4) 7100 CRT Terminal.

Products manufactured: Drives & Drive Mechanisms (Dial), Terminals, Data Display (including Alphanumeric & Graphic), Transports, Tape (all kinds)

Local Sales Offices & Reps.

Ariz	Scottsdale, BFA Corp.	602-946-4215
Cal	Encino, Pertec	213-996-1333
Cal	Los Altos, Pertec	415-964-9966
Cal	Santa Ana, Pertec	714-542-2348
Colo	Denver, BFA Corp.	303-744-3301
Conn	Stamford, Pertec	203-327-2260
Fla	Orlando, T.A. Instrs.	305-894-7531
Ill	Rosemont, Pertec	312-696-2460
Kans	Mission, E.I.R. Co.	
Kans	Shawnee, E.I.R. Co.	913-362-0919
Mass	Waltham, Pertec	617-890-6230
Minn	Minnetonka, Pertec	612-933-1030
Mo	Hazelwood, E.I.R. Co.	314-895-4100
NM	Albuquerque, BFA Corp.	505-296-8303
Ohio	Vandalia, Pertec	513-898-3150
Pa	Malvern, Pertec	215-644-4910
SC	Spartanburg, T.A. Instrs.	803-579-2904
Tex	Dallas, Pertec	214-387-2817
Tex	Dallas, Remtek	214-387-2817
Tex	Houston, Remtek	713-664-2113
Utah	Salt Lake City, BFA Corp.	801-466-6522
Wash	Seattle, Rush Drake Assoc.	206-763-2755

PESCHEL INSTRS., INC., 1412 Viscaya Pkwy., Cape Coral, Fla., 33904, Tel: 813-542-3164; FSC No: 92656; Empl.: 13; Minimum order: \$15

For info on price: M. S. Maily; Application info: F. Peschel; Customer service: W. J. Strobel; Delivery info: M. S. Maily

Free literature available: Peschel Instruments' 25 page catalog of high voltage power supplies and test equipment, provides full specifications and prices on their line of standard units.

Products manufactured: Cable Fault Locators, Chokes, Converters, Current Sources, Detectors, Power Supplies, Probes, Reactors, Testers, Transformers

Local Sales Offices & Reps.

Fla	Orlando, Boynton & Assocs.	305-423-0555
Mass	Boston, Sandman Elec. Co.	617-442-7600
NC	Charlotte, R.W. Chapman & Co.	704-525-2421
SC	West Columbia, R.W. Chapman & Co.	
		803-796-9796
Tenn	Concord, R.W. Chapman & Co.	615-966-6120

Advertisement

We manufacture a broad line of high voltage test equipment, power supplies and magnetic components as a standard line and built to order. Our 28 yrs. in business covers broad experience in DC-DC to 500 watts and 100KV; Regulated power supplies to 100KV at 0.01%; transformers and AC test sets to 300KV RMS & DC units to 400KV. Specials built to order.

PFC MANUFACTURING DIV., Community Dr., Great Neck, N.Y., 11022, Tel: 516-487-0500, TWX: 510-223-0888

PHAOSTRON INSTRUMENT, 151 Pasadena Ave., So. Pasadena, Cal., 91030, Tel: 213-255-1471, TWX: 910-321-4134; FSC No: 77221; Empl.: 250; Minimum order: \$50

For info on price: B. Alexander; Application info: B. Alexander; Customer service: B. Alexander; Delivery info: b. Cox

Free literature available: Panel Meters (Analog) and Avionic Mechanisms.

Products manufactured: Meters

Local Sales Offices & Reps.

Ariz	Phoenix, Southwest Engrg.	602-993-0250
Cal	Redwood City, Parks & Pruitt	415-364-1640
Cal	So. Pasadena, Phaostrom	213-255-1471
Colo	Denver, Omega Ltd.	303-758-1508
Conn	Thomaston, N. Bennett Assoc.	203-283-5959
Ill	Hinsdale, Hill-Gray Assocs	312-325-4810
Iowa	Cedar Rapids, J. R. Sales Co.	319-377-8211
Kans	Overland Park, Penzner Mankus Assoc.	
		913-381-0004
Mass	Auburn, N. Bennett Assoc.	617-757-3131
Mich	Detroit, Burcaw Co.	313-533-7700
Minn	Minneapolis, L. F. Green Assoc.	612-781-1611
Mo	Hazelwood, Penzner Mankus Assoc.	
		314-731-4334
NJ	Haddonfield, Thomas Assocs.	609-854-3011
NY	Great Neck, Trionic Assocs.	516-466-2300
NY	Syracuse, Lenard Co.	315-479-9191
Ohio	Cleveland, H. Baier Corp.	216-461-6161
Rl	Thomaston, N. Bennett Assoc.	203-283-5959
Tex	Dallas, McCoy Assocs.	214-350-9931
Tex	Houston, E. Smith Sls. Co.	713-649-5756
Utah	Salt Lake City, Omega Ltd.	801-266-9617

PHILADELPHIA QUARTZ CO., Box 840, Valley Forge, Pa., 19482, Tel: 215-687-8400, TWX: 510-668-3432; Empl.: 600

Customer service: R. Attig

Free literature available: (PO Bulletin #18-25) Describes the functions of and techniques for using QUISO microfine silica suspensions for polishing silicon wafers.

Products manufactured: Adhesives (All Types), Cleaners & Solvents, Metal Oxides, Semiconductor Wafer Fabrication

PHILAMON, INC., 33 Dubon Ct., Farmingdale, N.Y., 11735, Tel: 516-249-2700, TWX: 510-224-6512; Empl.: 27 p. 1-405,1020

Products manufactured: Choppers, Filters, Light Choppers, Oscillators, Tuning Forks

PHILIPS ELMET CORP., 1560 Lisbon Rd., Lewiston, Me., 04240, Tel: 207-784-3591; Empl.: 200; Minimum order: \$100

Customer service: R. J. Boutin

Products manufactured: Contacts, Electrical, Metal Compounds, Foils, Powders, Sheet, Stock, Metals, Wire

Local Sales Offices & Reps.

NJ	Ramsey, R. A. Vachon	201-825-4070
----	----------------------	--------------

PHILIPS TEST & MEASURING INSTRS., INC., 400 Crossways Pk. Dr., Woodbury, N.Y., 11797, Tel: 516-921-8880, TWX: 510-221-2120; Empl.: 25; Minimum order: \$10

For info on price: E. Chwalisz; Application info: S. Rauch; Customer service: E. Chwalisz; Delivery info: E. Chwalisz

Products manufactured: Analyzers, Cameras, Counters, Generators, Kits, Training Aid, Meters, Oscilloscopes, Printers, Probes, Receivers, Recorders, Scanners

Local Sales Offices & Reps.

Ala	Huntsville, Lee Assocs.	205-533-5896
Ariz	Phoenix, Cleveland Ent.	602-996-6130
Cal	N. Hollywood, Philips Test & Measuring Inst.	
		213-762-2997
Cal	Santa Clara, Philips Test & Measuring Instrs.	
		408-243-7363
Colo	Arvada, Cleveland Entprs., Inc.	303-423-3707
Conn	Hartford, Victor Assocs.	203-246-5643
Del	Delaware, Wright Co.	301-948-5151
DC	Washington, D.C., Wright Co.	301-948-5151
Fla	Ft. Lauderdale, Lee Assocs.	305-525-9796
Fla	Winterhaven, Lee Assocs.	813-294-5815
Haw	Honolulu, J.B. Jolly, Inc.	206-938-4166
Ill	Northfield, Torkelson Assocs.	312-446-9085
Ind	Indianapolis, Torkelson Assocs.	317-244-7867
Iowa	Cedar Rapids, Palatine Sls.	319-365-8071

Kans	Andover, Palatine Sls.	316-683-7512
Kans	Overland Park, Palatine Sls.	913-262-5643
Md	Gathersburg, Wright Co.	301-948-5151
Mass	Framingham, Victor Assocs.	617-879-5710
Mich	Centerline, Dietrich & Assocs.	313-754-8450
Minn	Minneapolis, Torkelson Assocs.	612-835-2414
Mo	St. Louis, Palatine Sls.	314-426-7055
NJ	Willingboro, Philips Test & Measuring Instr.	
		609-877-2293

NM Albuquerque, Cleveland Entprs., Inc.

		505-345-2481
NY	Syracuse, Tesco Mktg. Assocs.	315-463-4566
NY	Woodbury, Philips Test & Measuring, Inst.	
		516-921-8880

NC	Raleigh, Lee Associates, Inc.	919-787-5818
Ohio	Cleveland, Dietrich & Assocs.	216-781-1855
Ohio	Dayton, Dietrich & Assocs.	513-223-6042

Okla	Tulsa, Palatine Sls., Inc.	918-622-0321
Pa	Philadelphia, Philips Test & Measuring Inst.	
		215-677-5770

Pa	Pittsburgh, Dietrich & Assocs.	412-892-2992
Tex	Austin, Palatine Sls., Inc.	512-451-7463
Tex	Houston, Palatine Sls., Inc.	713-777-4477
Tex	Richardson, Palatine Sls., Inc.	214-231-9489
Va	Virginia, Wright Co.	301-948-5151
Wash	Richland, Jon B. Jolly	509-783-6523
Wash	Seattle, J.B. Jolly, Inc.	206-938-4166

PHILLIPS MFG. CO., National Ultrasonic Div., 7334 N. Clark St., Chicago, Ill., 60626, Tel: 312-338-6200, Telex: 25-4507; Empl.: 75

Products manufactured: Cabinets & Accessories, Chamber, Environmental Test, Cleaners & Solvents, Cleaners, Ultrasonic, Generators, Machines/Machinery, Production, Racks, Transducers

Local Sales Offices & Reps.

Ariz	Phoenix, Arizona Abrasive & Supply Co.	
		602-244-9357
Cal	Pico Rivera, Acto-Kleen Co.	213-723-8505
Cal	San Mateo, Batina Machinery Co.	415-342-9554
Colo	Englewood, Todd Assocs.	303-761-7801
Conn	Ansonia, Foy Electro Chemical Co.	
		203-735-3331
Fla	Clearwater, Datco Inc.	813-531-4255
Haw	EWA Beach, Panther Chemical Co.	
		312-338-6200
Ill	Chicago, A. Wudi	312-338-6200
Ill	Chicago, W. Blomberg	312-338-6200
Ill	Rockford, R.R. Floody Co.	815-399-1931
La	New Orleans, Hester Engrg. Co.	504-866-2998
Md	Baltimore, W.L. Lawrence	301-235-4161
Mich	Detroit, J. Matteson	313-341-4030
Mich	Kalamazoo, L. Riege	616-342-6437
Minn	Minneapolis, Minnesota Ind'l. Tool Co.	
		612-333-8281

Mo Kansas City, Ellfeldt Machinery Co.

		816-842-5494
NJ	Teaneck, J. Dempsey	212-685-9137
NM	Albuquerque, R. Berg & Sons	505-299-8173
NY	Great Neck, W & A Holland, Inc.	516-487-8877
NY	New York, R. Balton	212-685-9137
NY	Skaneateles, R.M. Krause	315-685-5196
NY	Stow, K. Merrill	716-789-2645
NC	Charlotte, J. & P. Assocs.	704-525-5331
Ohio	Cincinnati, B. Bruns & Assoc.	513-931-4425
Ohio	Toledo, R. Deckelman	419-243-7161
Pa	Lancaster, Lightner Ind'l. Finishings	
		717-393-5541

Pa	Pittsburgh, L. Nourie, Inc.	412-561-1628
Rl	North Scituate, R. Poyton	401-521-3522
Tex	Arlington, JMC Sls. Co.	817-261-1621
Wash	Seattle, Process Systems, Inc.	206-246-0224
WVa	Charleston, Preiser Scientific	304-343-5515
Wisc	Milwaukee, Industrial Abrasives Co.	
		414-383-5700

PHILMORE MFG. CO. INC., 40 Inip Dr., Inwood, N.Y., 11696, Tel: 516-239-6161; Empl.: 25; Minimum order: \$25

For info on price: M. Greenker; Application info: E.M. Rothenstein; Customer service: M. Greenker; Delivery info: I. Koff

Free literature available: Philmore Master Catalog #745 Philmore Industrial Catalog #M16 Philmore Consumer Mini-Catalog #100

Products manufactured: Amplifiers, Cable, Capacitors, Fixed, Capacitors, Variable, Clamps & Clips, Connectors, Cords, Grilles, Jacks (All Types), Knobs, Leads, Test & Adaptors, Lights, Meters, Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds, Mixers, Networks, Pickups, Telephone (For Recording), Plug Adapters, Plug & Jack Sets, Posts, Potentiometers, Power Supplies, Sockets, Soldering Guns, Irons & Desoldering Tools, Speakers, Switches, Testers, Tools, Transformers

PHIPPS & BIRD, P.O. Box 2V, Richmond, Va., 23205

PHOENIX DATA INC., 3384 W. Osborn Rd., Phoenix, Ariz., 85017, Tel: 602-278-8528, TWX: 910-951-1364; Empl.: 57 p. 1-190-193
Customer service: R. D. Brunnermer

Products manufactured: Amplifiers, Comm. Systems, Commutators, Converters, Data Acquisition & Reduction Systems, Data Loggers, Meters, Multiplexers

Local Sales Offices & Reps.

Ariz Tempe, J. Cain Assocs. 602-838-3404
Cal Burbank, EM Southwest 213-846-9373
Cal San Diego, Dorado Sls. 714-487-1974
Cal Sunnyvale, RDP Instrs., Inc. 408-735-9040
Fla Orlando, Datarep 305-843-5224
Haw Honolulu, Aloha Assocs. 808-941-1574
Ill Chicago, Electronic Instrs. Assocs. 312-271-3774
Ind Indianapolis, Electronic Instrs. Assocs. 317-257-7231
Kans Shawnee Mission, Inland Assocs. 913-362-2366
Md Ellicott City, Whitco 301-366-1216
Mass Norwood, Forster Assocs. 617-543-5041
Mo Glencoe, Inland Assocs. 314-938-4992
NJ Fort Lee, Tecnimat 201-461-8868
NJ Pennsauken, Megargel/Himmelstein 215-629-1072
NY Schenectady, Alexander Assocs. 518-377-0581
Tex Richardson, Barry Sls. 214-234-0255
Wash Bellevue, Topp Engrg. Sls. Corp. 206-747-5401

PHOENIX TRANSFORMER CO., 1818 E. Madison, Phoenix, Ariz., 85034, Tel: 602-254-9747, TWX: 910-951-0631; Empl.: 50

Products manufactured: Chokes, Coils Including Assemblies & Forms, Filters, Regulators, Transformers

Advertisement

A complete facility for engineering and production of military and industrial transformers designed for your exact application. Stock and facility for volume production. We specialize in constant voltage units. Call or write for prompt quotations.

PHOENIX WIRE, INC., 100 Teflon Ave., S. Hero, Vt., 05486, Tel: 802-372-4561; Empl.: 25

Customer service: A. Legge

Free literature available: Folder describing specail subminiature & microminiature hook-up wires & cables especially valuable in miniaturization applications.

Products manufactured: Cable, Services, Assembly, Production & Test, Tubing, Wire

Advertisement

Micro-Miniature High-Reliability Wires. Phoenix Wire specializes in the custom application of Teflon to fine wires. Guages 14 to 60 of any composition can be insulated with less than .000025 to over .006 inches of Teflon. Custom cut & strip service for all types of insulated wires also available. Call us for all types of Teflon Hook-up Wires-Teflon Tubing, and Teflon Magnet Wire.

PHONE-AID CO., Sub. of Wells-Gardner Elctns., 2701 N. Kildare, Chicago, Ill., 60639, Tel: 312-252-4610; Empl.: 25; Minimum order: \$100

For info on price: J. Remec; Application info: Dr. Matthew; Customer service: J. Remec; Delivery info: Dr. Matthew

Products manufactured: Cable, Comm. Systems

PHOTO CHEMICAL PRODS. CAL., 1715 Berkeley, Santa Monica, Cal., 90404, Tel: 213-828-9561; Empl.: 60

For info on price: J. T. Cain; Application info: J. T. Cain; Customer service: R. Taylor; Delivery info: S. Jocsing

Products manufactured: Cabinets & Accessories, Caps, Lenses, Indicator Light, Coatings, Delcalcomania, Dials, Display Devices/Displays, Escutcheons, Kits, Marking (Dial, Instrument, Equipment, etc.), Labels, Pressure-Sensitive, Adhesive, Laminates, Lenses, Readout & Display, Lights, Nameplates, Scales, Dial, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Ariz Tempe, N. A. Page 602-838-1128
Cal Burlingame, W. J. Purdy Co. 415-347-7701
Colo Denver, W. J. Purdy Co. 303-777-1411
Ill La Grange, Bierhaus Sls. 312-345-5100
Md Bethesda, W. Mount Co. 301-657-9312
Mass Needham, W. Mahoney 617-444-3372
Mich Lathrup Village, R. C. Nordstrom & Co. 313-333-4417
Minn Minnetonka, T. H. Ayre Assocs. 612-474-4125
Mo Kansas City, L. F. Florence Co. 816-561-7222
NJ Nutley, Falk-Baker Assocs. 201-661-2430
NM Albuquerque, W. J. Purdy Co. 505-266-7959
NY N. Syracuse, H. R. Murray 315-446-5555
Ohio Dayton, Dynel Co. 513-789-8150
Pa Haverton, Liberi Sls. 215-789-8150
Tex Dallas, W. Reese Assocs. 214-638-6575
Wisc Milwaukee, Bierhaus Sls. 414-332-0900

PHOTO RESEARCH CORP., Division Kollmorgen Corp., 3000 N. Hollywood Way, Burbank, Cal., 91505, Tel: 213-849-6017; Empl.: 40; Minimum order: \$10

Customer service: F. Grover

Free literature available: A wide variety of product bulletins describing complete photometer/radiometer light measuring instrumentation line. Also technical reprints on many of the products.

Products manufactured: Light Sources, Photoelectric, Meters, Radiometers, Test Equipment

Local Sales Offices & Reps.

Ala Huntsville, Beacon Elctns 205-881-5031
Cal N. Hollywood, O'Halloran Assoc. 213-877-0173
Cal Palo Alto, O'Halloran Assoc. 415-326-1493
Cal San Diego, O'Halloran Assoc. 714-224-2824
Fla Ft. Lauderdale, Beacon Elctns 305-776-6074
Fla Maitland, Beacon Elctns 305-647-3498
Ga Atlanta, Beacon Elctns 404-351-3654
Haw Honolulu, Pacific Instrumentation 808-373-1287
Ill Hoffman Estate, Mist Engrg 312-885-3432
Md Silver Spring, Spectroscopy Sys. 301-949-8261
Mass Billerica, Drew Assocs. 617-667-6643
Mo St. Louis, G. Fixman Engrg. Co. 314-725-5219
NJ East Orange, Friedman Assocs. 201-673-2500
NM Albuquerque, Southwestern Engrg. & Equip. 505-265-6775
NC Greensboro, Beacon Elctns 919-457-3231
Ohio Rising Sun, Mecom, Inc. 803-582-4613
SC Spartanburg, Beacon Elctns 214-826-6661
Tex Dallas, Southwestern Engrg. & Equip. Co. 713-353-4333
Tex Houston, Southwestern Engrg. & Equip. Co. 206-454-8600
Wash Bellevue, C.W. Fowler Co. 206-454-8600

PHOTOBELL CO., INC., 12M East 22nd St., New York, N.Y., 10010, Tel: 212-674-2121; Empl.: 30; Minimum order: \$10

Customer service: A. Edelman

Free literature available: Photoheads and Prices, Bulletin RP, Reflex photohead applications RPX, 115V Reflex photorelays, RPXLA, Drop through count sensors, CPDTR1 Photoelectric burglar alarms, BP Safety light curtain for machy SAO, Conveyorized Inspections 3535IT
Daylight control of lamps, etc. Capacitance proximity units, RCA

Products manufactured: Alarms, Character Recognition Systems, Controls/Control Eqt., Counters, Detectors, Indicators, Services, Assembly, Production & Test, Switches

Advertisement

Photoelectric and capacitive devices, methods, ideas for machines, instruments, production lines; to trigger, control, sort, alarm, count, inspect, reject, measure, sense. Low prices, custom designs for infrared and visible light projectors, receivers, reflex photoheads, solid-state logic circuits to fit need. Intrusion alarms, smoke sensors, safety guards.

PHOTOCIRCUITS DIV., KOLLMORGEN CORP., 31 Sea Cliff Ave., Glen Cove, N.Y., 11542, Tel: 516-448-1000, TWX: 516-671-3155; Empl.: 850

Customer service: J. Tabak

Products manufactured: Boards, Printed Circuit, Chemicals, Circuits, Printed, Multilayer, Coatings, Motors

PHOTOMATION, INC., Box 460, Mountain View, Cal., 94041, Tel: 415-967-8992; Empl.: 12; Minimum order: \$10

For info on price: S. Pedersen; Application info: R. Heinsoth

Free literature available: Catalog #731 Photoelectric Controls as used in automation.

Products manufactured: Controls/Control. Eqt., Counters, Scanners

Local Sales Offices & Reps.

Cal Millbrae, Call Assoc.
Fla Orlando, B. Woodruff, Inc.
Haw Honolulu, Amfac Distribution Co.
Ill Glen Ellyn, Control Dynamics
Ind Indianapolis, Sukup & Cox, Inc.
Kans Kansas City, Process Svce. & Equip. Co.
Mass Sturbridge, Electrical Apparatus Co.
Mich Detroit, R.D. Ernest & Assoc.
Minn Minneapolis, Pilot Industries Corp.
Mo St. Louis, Schwaig Engrg. Co.
NY Brooklyn, Eastern Elctn. Sls.
NY Syracuse, Thomas J. McGough
Ohio Cincinnati, Jeffrey Equip Co.
Ohio Cleveland, Adcon Eng. Co.
Ore Portland, Dynatech
Pa Narberth, Clayton A. Denault
Tenn Chattanooga, C.H. Cloer & Assoc.
Tex Houston, Electrical Instr & Meter Co.
Utah Salt Lake City, E. C. Coffin Co.
Va Richmond, Martin's Control & Equip. Co.
Wash Airway Heights, Calvert Controls
Wash Medical Lake, Calvert Controls Inc.
Wash Seattle, C. Stebbins
WVa Charleston, Engrg. Prods. Co.
Wisc Milwaukee, G.H. Fredericks & Co.

PHOTRON INSTRUMENT CO., 6516 Detroit Ave., Cleveland, Ohio, 44102, Tel: 216-281-7020; Empl.: 10

Products manufactured: Meters, Oscillographs, Direct Writing, Recorders

Advertisement

GALVANOMETERS: Low cost, for OEM applications; miniaturized and conventional types. A wide range of coil impedance and torque is offered and may be tailored to customer requirement. Frequency response available from d.c. to 75 Hz. Suitable for solid state or high resistance circuitry.
OSCILLOGRAPHS: Custom engineered for OEM, complete or sub-assemblies.

PHYSICAL DATA, INC., 5160 N. Lagoon Ave., Portland, Ore., 97217, Tel: 503-283-5116; Empl.: 12; Minimum order: \$25

For info on price: B. Gibbons; Application info: G. Caspell; Customer service: B. Gibbons; Delivery info: B. Gibbons

Products manufactured: Analyzers, Recorders

Local Sales Offices & Reps.

Ala Huntsville, Lee Assocs. 205-533-5896
Ariz Scottsdale, Measurement Consultants 602-944-9519
Cal Inglewood, C. Fowler Co. 213-678-5211
Cal Menlo Park, C. Fowler Co. 415-322-5374
Colo Boulder, Measurement Consultants 303-449-5294
Conn Hamden, Equipment Sls. 203-248-5581
Fla Miami, Lee Assocs. 305-525-9796
Fla Winter Haven, Lee Assocs. 313-294-5815
Ga Chamblee, Lee Assocs. 404-457-7117
Ill Chicago, Carter Elctns. 312-585-5485
Ind Indianapolis, C. Elctns. 317-293-0696
Kans Overland Park, Carter Elctns. 913-649-6996
Md Rockville, Farrell Assocs. 301-424-9460
Mass Chelmsford, Equipment Sls. 617-256-8547
Mich Detroit, Comtel-Sterling 313-255-1970
Minn Minneapolis, Carter Elctns. 612-544-9393
Mo Hazelwood, Carter Elctns. 314-731-2237
NM Albuquerque, Measurement Consultants 505-265-6471

NY Williamsville, M. Bennett Assocs. 716-634-2107
 NC Raleigh, Lee Assocs. 919-787-5818
 Ohio Cleveland, Comtel-Sterling 216-442-8080
 Ohio Dayton, Comtel-Sterling 513-298-7573
 Pa Pittsburgh, Comtel-Sterling 412-922-5720
 Utah Murray, Measurement Consultants 801-268-3181
 Wash Bellevue, C. Fowler Co. 206-454-8600
 Wisc Milwaukee, Carter Elctns. 414-464-5555

PHYSICAL ELECTRONICS LABS., 1185 O'Brien Dr., Menlo Park, Cal., 94025, Tel: 415-323-9092; Empl.: 25
 Customer service: R. A. Craig

Products manufactured: Discriminators, Filters, Generators, Limiters, Oscillators, Tuners

Local Sales Offices & Reps.

Cal Los Altos, Cain-White Co. 415-948-6533
 Cal Los Angeles, Cain Tech. Inc. 213-476-2251
 Fla Clearwater, Brennan Assocs., Inc. 813-446-5006
 Ill Mt. Prospect, R. Forlaw dba Cain & Co. 312-253-3578
 Md Lanham, Brimberg Assocs., Inc. 301-552-2200
 Mass Reading, Geder-Rotundi Assocs. 617-944-3105
 NJ Livingston, G & A Sls. 201-992-3087
 NY North Syracuse, NACO Elctns. Corp. 315-699-2651

Ohio Dayton, J. Tension dba Cain & Co. 513-254-6521
 Ohio Reynoldsburg, R. Hansel, dba Cain & Co. 614-861-2119
 Tex Dallas, Cain & Co. 214-233-6809
 Wash Seattle, Datacom Assocs. 206-325-5193

PHYSICAL ELECTRONICS INDUSTRIES, 6509 Flying Cloud Dr., Eden Prairie, Minn., 55343, Tel: 612-941-5540, Telex: 29-0407; Empl.: 90

For info on price: M. Gorder; Application info: M. Gorder; Customer service: L. Yarger; Delivery info: M. Gorder

Free literature available: Auger Electron Spectrometers; Thin Film Analyzer for an elemental analysis of thin films; Scanning Auger Microprobe for comprehensive surface elemental analysis; Condensed product catalogue; ESCA/Auger Electron Spectrometer for surface elemental analysis with ESCA or Auger Electron Spectroscopy.

Products manufactured: Spectrometers

Local Sales Offices & Reps.

Cal San Jose 408-247-7767
 Ill Park Ridge 312-297-7730
 Mass North Attleboro 617-695-7504
 NJ Springfield 201-376-3650
 Tex Richardson 214-231-8661

PIC DESIGN DIVISION, Benrus Corp., Box 335, Benrus Ctr., Ridgefield, Conn., 06877, Tel: 203-431-1500, TWX: 710-467-0666; Empl.: 150; Minimum order: \$10

For info on price: Sls. Dept. 203-431-1500; Application info: E. Hansen 203-431-1517; Customer service: J. Able 203-431-1506; Delivery info: Expediting Dept. 203-431-1521

Free literature available: PIC Catalog #37 explicitly defines over 35,000 precision mechanical components and assemblies supplied from stock.

Products manufactured: Bearings, Brakes, Cams, Clutches, Counters, Couplings, Dials, Drives & Drive Mechanisms (Dial), Fasteners, Gearheads & Speed Reducers, Gears & Gear Mechanisms (Precision), Handles For Cabinets, Circuit Boards, Racks, etc., Jigs And Fixtures, Chassis & Circuit Board, Kits, Breadboarding (For Engineers), Kits, Training Aid, Knobs, Limit Stops, Mechanical, Locks, Dial & Shaft, Nameplates, Pins, Pointers, Dial, Potentiometers, Power Supplies, Reducers, Rings, Retaining, Spacers, Springs (All Types)

Local Sales Offices & Reps.

Ill Chicago, F. Tye Sls. Co. 312-283-1227
 Ind Fort Wayne, Hoernig Sls. Co. 219-483-6913
 Ohio Cleveland, J. O. Olsen Co. 216-752-5444
 Pa Philadelphia, K. B. Erdman Co. 215-224-1833
 Tex Dallas, Robco Inc. 214-631-7191

PICKERING & CO., Meas. & Controls Div., 101 Sunnyside Blvd., Plainview, N.Y., 11803, Tel: 516-681-0200; Empl.: 300

For info on price: A. Eidmann; Application info: R. P. Zupa; Customer service: A. Eidmann; Delivery info: A. Eidmann

Products manufactured: Indicators, Transducers

Local Sales Offices & Reps.

Cal Los Angeles, Fetty/Schoenduve, Inc. 213-651-4050

Colo Denver, Walter Engrg. Assoc. 303-777-5585
 Ill Lombard, Quadtron Assoc. Inc. 312-627-6800
 Mass Norwell, Bordewieck Engrg. Sls. Co. 617-659-4915
 Mich Ferndale, Tiby Co. 313-547-3550
 NJ North Caldwell, Masin, Esco, Inc. 201-226-2550
 NY Liverpool, Rayelco Elect. Inc. 315-652-5272
 NY Syosset, Masin Esco, Inc. 516-364-0310
 Ohio Cleveland, Tiby Co. 216-371-5335
 Pa Bethayres, Control Instr. Sls. Co. 215-OR 6-1808

Tex Dallas, G. Weinreich & Assoc. 214-321-2800
 Wash Seattle, G. M. Gillett 206-284-5324

PICO CRIMPING TOOLS CO., 9832 Jersey Ave., Santa Fe Springs, Calif., 90670, Tel: 213-723-2150; Empl.: 12

Products manufactured: Tools

PICO ELCTRNS. INC., 50 S. Macquesten Pkwy., Mount Vernon, N.Y., 10551, Tel: 914-699-5514 p. 2 • 1778-1783
 Customer service: J. Sweeney

Free literature available: Catalog 2002, Ultra-Miniature Transformers

Products manufactured: Chokes, Coils Including Assemblies & Forms, Reactors, Transformers

Local Sales Offices & Reps.

Ariz Scottsdale, Piper-Goyne 602-946-4437
 Cal Orange, Sls. & Mktg. Assocs. 714-997-5720
 Cal Santa Clara, Fisher Assocs. 408-733-7350
 Colo Littleton, Piper-Goyne 303-798-8955
 Conn Waterbury, Selmark Assocs. 203-754-3060
 Ga Atlanta, Grady Duckett Sls. Co. 404-451-3529
 Mass Millis, Selmark Assocs. Inc. 617-376-2914
 Minn Minneapolis, F. B. Hill & Co. 612-941-5270
 Mo St. Charles, Buckman & Assocs. 314-724-6690
 NH Plaistow, Selmark Associates Inc. 603-382-4796

NM Albuquerque, Piper-Goyne 505-294-1436
 Ohio Dayton, BEK Assocs. Inc. 513-278-1343
 Tex Houston, Vista Engrg. 713-661-0119
 Tex Richardson, Vista Engrg. 214-235-4547
 Wash Seattle, W. Spaulding Co. 206-282-9173

PICONICS INC., Cummings Rd., Tyngsboro, Mass., 01879, Tel: 617-649-7501, TWX: 710-347-6663; Empl.: 48

Products manufactured: Coils Including Assemblies & Forms, Transformers

Local Sales Offices & Reps.

Cal No. Hollywood, Jewett Co. 213-789-8103
 Cal Palo Alto, J/M Assocs. 415-327-1261
 Fla Woodland, Lenz Engrg. 305-831-9797
 Mass Wayland, Wayland Engrg. Sls. Co. 617-655-6080
 Mo Kansas City, Harris-Hanson Co. 816-444-9494
 Mo St. Louis, Harris-Hanson Co. 314-432-3611
 NY Huntington, Regulis Ind'l. Sls. Co. 516-271-7966

NY Utica, Micro Comp. Sls. 315-733-2460
 Pa Lansdowne, W. F. Satterthwaite & Co. 215-623-5100

Tex Addison, Southland Comps. 214-233-0603
 EXP: Huntington, N.Y., Regulis Ind'l. Sls. Co. 516-271-7966
 FOR: Can., Waters Metal Prods. 716-285-3595

PIEZO CRYSTAL CO., 100 "K" St., Carlisle, Pa., 17013, Tel: 717-249-2151; Empl.: 250

Customer service: S. Stone

Free literature available: General product catalog giving major performance characteristics and popular closure configurations.

Products manufactured: Crystal Blanks, Crystals, Discriminators, Filters

PIEZO TECHNOLOGY INC., Box 7877, 2400 Diversified Way, Orlando, Fla., 32804, Tel: 305-425-1574, TWX: 810-850-4136; FSC No: 25120; Empl.: 320 p. 1 • 406,407

For info on price: H. C. Schinaman; Application info: H. C. Schinaman; Customer service: D. Worrell; Delivery info: D. Worrell

Free literature available: Data Sheets: Stock Monolithic Crystal Filters, 5 to 180 MHz, Reprint: "Communications Systems Benefit from Monolithic Crystal Filters"

Products manufactured: Crystals, Filters

Local Sales Offices & Reps.

Cal San Mateo, Melvin Sls. Co. 415-349-7444
 Cal Van Nuys, R.L. Assocs. 213-780-1666
 Colo Denver, Walter Engrg. Assoc. 303-777-5585
 Fla Maitland, Ellis & Assocs. 305-645-1101
 Ill Chicago, T.B. Hunter Assocs. 312-777-2500
 Ind Greenwood, V. Schillinger & Assocs. 317-888-2260
 Md Baltimore, C.O. Emrich 301-747-8348

Mass Randolph, TX Sls., Inc. 617-986-6080
 Mich Brighton, V. Schillinger & Assocs. 612-474-2907
 Minn St. Paul, Barnes Sls. Assocs. 609-429-9531
 NJ Haddonfield, Mesa Tech. Assocs. 716-839-2044
 NY Buffalo, Quality Comps., Inc. 516-979-8750
 NY Smithtown, TX Sls. Inc. 919-292-3201
 NC Greensboro, L&D, Inc. 214-350-2476
 Tex Dallas, Stevens Sls. 617-986-6080

PIHER INT'L. CORP., 1239 Rand Rd., Des Plaines, Ill., 60016, Tel: 312-297-1560, Telex: 28-2514; Empl.: 3000

Products manufactured: Potentiometers, Resistors

Local Sales Offices & Reps.

Ala Huntsville, 20th Century Mktg. 205-772-9237
 Cal Pico Rivera, Westrep 213-949-2251
 Ill Mt. Prospect, Delta Tech. Sls. 312-437-9412
 Kans Shawnee Mission, Admck Sls. 913-432-5550
 Minn St. Louis Park, Beta Engrg. 612-925-4422
 Mo Kansas City, T. Mac Colloough 816-561-5758
 NJ Cherry Hill, Trinkle Sls. 609-429-9531
 NM Albuquerque, Cleveland Enitrs 505-345-2481
 NY Garden City, Comtronic Assoc. 516-442-3290
 NY Rochester, Ossmann Component Sls. Corp. 214-350-6771

Ohio Cincinnati, Sheridan Assoc. 206-632-4290
 Tex Dallas, Norvell Assocs. 416-638-1322
 Wash Seattle, C.K. Shanks & Assoc. 206-632-4290
 FOR: Can., Downsview, Ont., Weber Elctns.

PINLITES, See Refac/Pinlites

PIONEER ELEC. & RESCH. CO., 743 Circle Dr., Forest Park, Ill., 60130, Tel: 312-771-8242

Customer service: J. W. Bullock

Products manufactured: Lights, Tachometers

PIONEER INSTRUMENTATION, 4800 E. 131st St., Cleveland, Ohio, 44105, Tel: 216-587-3600; Empl.: 10

Customer service: L. Sullin

Products manufactured: Calibrators, Comparators, Meters, Standards

Local Sales Offices & Reps.

Ill Chicago, Pen-Vel Assocs. 312-248-4343
 NY Mamaronek, Cane Tech. Sls. 914-698-4411
 Ohio Cleveland, Pioneer/Instrumentation 216-587-3600
 Pa Media, W. Reeves Assocs. 215-566-6709

PIONEER MAGNETICS, 1745 Berkeley St., Santa Monica, Cal., 90404, Tel: 213-829-3305, TWX: 910-343-6249; FSC No: 08676

For info on price: A. Hagiwara; Application info: G. Held; Customer service: G. Held; Delivery info: A. Hagiwara

Products manufactured: Converters, Current Sensors, Power Supplies, Testers, Wire Strippers

PITTMAN CORP., Sellersville, Pa., 18960, Tel: 215-257-5117, TWX: 510-661-5086; Empl.: 92; Minimum order: \$40 p. 1 • 976,977

For info on price: C. Pittman; Application info: C. Pittman; Customer service: C. Pittman; Delivery info: J. Parker

Free literature available: Data sheets descriptive of miniature low voltage; DC servo motors, gearmotors, and motor-tachometers commercial.

Products manufactured: Motors, Tachometers

Local Sales Offices & Reps.

Ariz Scottsdale, Williams-Assocs. 602-947-4297
 Cal Los Angeles, Halbar Assocs. 213-387-8283
 Cal San Mateo, Halbar Assocs. 415-349-4700
 Colo Denver, Williams-Assocs. 303-373-4730
 Fla Ft. Lauderdale, Tropi-Tec Co. 305-523-4988
 Ill Chicago, K-W Assocs. 312-792-2618
 Ind Fort Wayne, Neal Engrg. Co. 219-484-5090
 Ind Indianapolis, Neal Engrg. Company 317-849-4201

Mass Salem, Forbes Engrg. 617-744-1693
 Mich Birmingham, J.C. Hofstetter Co. 313-643-7203
 Mich Grand Rapids, J.C. Hofstetter Co. 616-942-0650

Mo St. Louis, Gordon Fixman Engrg. 314-725-5219
 NJ Summit, R.A. Potter Assocs. 201-277-0220
 NM Albuquerque, Williams-Assocs. 505-255-1638
 NY Buffalo, Application Specialists 716-834-3377
 NY East Syracuse, Application Specialists 315-437-2813

NY Rochester, Application Specialists 716-586-6226

NC Charlotte, Electro-Rep Assocs., Inc. 704-527-2530
 Ohio Dayton, J.C. Hofstetter Co. 513-296-1010

Ohio Medina, J.C. Hofstetter Co. 216-241-4880
Okla Tulsa, Blair Engrg. Sls. Co. 918-663-9850
Ore Portland, Donal Co. 503-246-3131
Tex Dallas, Blair Engrg. Sls. Co. 214-352-8411
Tex Houston, Blair Engrg. Sls. Co. 713-667-9864

PLASTIC CAPACITORS, INC., 2620 N. Clvbourne Ave., Chicago, Ill., 60614, Tel: 312-348-3735, TWX: 910-221-1354; FSC No: 99120; Empl.: 125

For info on price: D. Powalish; Application info: Sls. Dept.; Customer service: S. Ludwig; Delivery info: S. Ludwig

Free literature available: Engineering oriented booklet of conversion factors and electronic formulae. Ideal for use with a pocket calculator. Booklet will fit in most calculator pouches.

Products manufactured: Capacitors, Fixed, Capacitors, Variable, Networks, Power Supplies

Local Sales Offices & Reps.

Ala Huntsville, B.J.R., Inc. 205-881-3569
Cal Los Altos, Parsons & Meister, Inc. 415-941-4745
Cal Los Angeles, E.E. Strassner Co. 213-666-1511
Conn Meriden, Eagle Assocs. 203-235-9036
Ill Chicago, Carlson Elctn. Sls. Co. 312-774-4812
Ind Fort Wayne, W.W. Bieberich, Inc. 219-432-2537
Ind New Albany, W.W. Bieberich, Inc. 812-945-3187

Kans Shawnee Mission, Carlson Elctn. Sls. Co. 913-432-2144
Md Hyattsville, Eastern Comps. 301-577-2925
Mass Boston, Eagle Assocs. 617-444-3446
Minn Minneapolis, J. J. Exon Co. 612-566-5340
Mo St. Louis, Carlson Elctn. Sls. Co. 314-991-0262
NJ Springfield, F.F. Sylvester Assoc. 201-376-3324
NY Baldwinsville, E. Scovel Co. 315-652-9798
NY Rushville, E. Scovel Co. 315-584-6522
Ohio Cleveland, Electro-Com 216-886-2404
Ohio Dayton, Electro-Com 513-276-3993
Pa Flourtown, Eastern Comps., Inc. 215-836-1616
Pa York, Eastern Comps., Inc. 717-764-3114
Tex Dallas, Packard Assocs. 214-357-5713
Wisc Milwaukee, Carlson Elctn. Sls. Co. 414-476-2790
EXP: New York, N.Y., B. Freudenberg 212-757-9130

PLASTICS ENGRG. CO., 3518 Lakeshore Rd., Sheboygan, Wisc., 53081, Tel: 414-458-2121, TWX: 910-264-3873; Empl.: 475

For info on price: L. L. Korb Ext. 323; Application info: L. L. Korb Ext. 323; Customer service: J. D. Ellis Ext. 331; Delivery info: J. Potochnik Ext. 244

Free literature available: Brochure "PLENCO" Gives descriptions, applications, typical values for PLENCO molding compounds (phenolics; melamine-phenolics and alkyds) and PLENCO phenolic resins. Also describes molding processes and PLENCO facilities.

Products manufactured: Compounds, Encapsulating, Insulating, Molding, Potting, Plastic Raw Materials, Liquids, Pellets, Powders, Resins

Local Sales Offices & Reps.

Ill Arlington Heights, H. Sanders 312-437-6930
Ill La Grange Park, O. B. Buss 311-354-4285
Ill Schaumburg, J. Wood 312-894-7038
Mich Marshall, B. L. Young 616-781-5415
Mo Manchester, K. A. Pickell 314-527-0476
NJ North Plainfield, S. C. Dusza 201-757-2059
Ohio Grafton, E. D. Larrick 216-458-4570
Pa Doylestown, R. P. Draper 215-348-3666
Pa Erie, N. B. Duffett 814-833-4386
Wisc Plymouth, R. T. Johnson 414-892-8556
Wisc Sheboygan, F. Shaw 414-452-7849

PLATT LUGGAGE, 2301 S. Prairie, Chicago, Ill., 60616, Tel: 312-225-6670; Empl.: 75

For info on price: M. Platt; Application info: M. Platt; Customer service: J. Persons; Delivery info: J. Persons

Free literature available: 4-page product sheet and pricing on complete line of tool cases for servicemen and technicians.

Products manufactured: Cases, Equipment, Instrument, Meter

P. L. C. ELECTRONICS INC., 39-50 Crescent St., Long Island City, NY, 11101, Tel: 212-937-2605; Empl.: 25; Minimum order: \$10

For info on price: Sls. Dept.; Customer service: Svc. Dept.

Free literature available: Full description 32 page catalog details 17 different professional security systems that are prepackaged for distributor sales to electronic technicians and service dealers.

Products manufactured: Alarms, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices

Local Sales Offices & Reps.

Ala Mobile, Hollingsworth & Still 205-478-8108
Colo Denver, R. Bowen & Assocs. 303-744-2501
Fla Orlando, Hollingsworth & Still 904-669-4738
Ga Atlanta, Hollingsworth & Still 404-394-3270
Ill Chicago, Cumming & Foley Sls. Co. 312-725-8110

Ind Indianapolis, Charles Scheffler Co. 317-253-6337
Iowa Des Moines, B.E.A.M.S. 515-282-0292
Kans Lenexa, B.E.A.M.S. 913-888-6110
La Monroe, Dixie Elctn. Assocs. 318-387-8893
Mich Lake Orion, Ted Firaneck Sls. 313-391-1177
Minn Minneapolis, Dick Borrett Co. 612-929-0028
Mo Creve Cover, B.E.A.M.S. 314-569-1060
NC Charlotte, Hollingsworth & Still 704-536-7047
Ohio Medina, T. Grant Assocs. 216-725-6528
Ore Salem, Pacnor Mktg. 503-363-6445
Pa Newtown Square, G. M. Conneen Co. 215-353-2241
Tenn Gallatin, Dixie Elctn. Assocs. 615-452-1744
Tex Dallas, R. E. Nesbitt Co. 214-357-4601
Wash Seattle, Pacnor Mktg. 206-284-8020

PLESSEY INC., Materials Div., 320 Long Island Expwy. S., Melville, N.Y., 11746, Tel: 516-694-7900, TWX: 510-224-6411; Empl.: 700

Free literature available: Five facility brochures as follows: Plessey Melville, Plessey EMD, Plessey Frenchtown, Plessey Montvale, Plessey Micro Science, Each describes products and capabilities. Plus, Plessey Materials brochure which gives brief overview of products and capabilities of entire Division.

Products manufactured: Alloys, Contact Strips, Finger, Contacts, Electrical, Films, Inks For Thick Film Microcircuits, Laminates, Laminations, Metal Oxides, Metals, Motors, Pads, Transistor Mounting, Paints, Preforms, Precious Metal, Rivets, Seals, Services, Assembly, Production & Test, Solder (All Types), Substrates, Thermistors, Wire

Local Sales Offices & Reps.

Ariz Mesa, Plessey Inc. 602-969-7281
Cal Los Angeles, Plessey Inc. 213-390-7844
Cal Mt. View, Plessey Inc. 415-965-1400
Cal San Diego, Plessey Inc. 714-560-8433
Colo Boulder, Mile High Elctns. 303-444-5615
Ill Schiller Park, Plessey Inc. 312-671-2686
Md Rockville, Plessey Inc. 301-340-3220
Mass Reading, Plessey Inc. 617-944-7000
NJ Bernardsville, Plessey Inc. 201-766-2200
NY Melville, Plessey Inc. 516-694-7900
Ohio Akron, Plessey Inc. 216-644-7643
Tex Dallas, Plessey Inc. 214-235-2307

PLESSEY CERAMIC DIV., Plessey N.J. Inc., 8th & Harrison Sts., Frenchtown, N.J., 08825, Tel: 201-996-2121, TWX: 510-235-3399; Empl.: 198

For info on price: W. Weaver; Application info: B. Spillman

Products manufactured: Alloys, Circuits, Hybrid, Thick Film, Coils Including Assemblies & Forms, Cores, Ceramic, Networks, Packages, Integrated Circuit, Seals, Spacers, Transistor, Diode, Thyristor Heat Dissipators, Tubes, Tubing

Local Sales Offices & Reps.

Ariz Mesa, Plessey Materials 602-969-7281
Cal Los Angeles, Plessey Materials 213-390-7844
Cal Mountain View, Plessey Materials 415-965-1400
Cla San Diego, Plessey Materials 714-560-8433
Colo Boulder, Mile High Electronics 303-444-5615
Ill Schiller Park, Plessey Materials 312-671-2686
Md Rockville, Plessey Materials 301-340-3220
Mass Reading, Plessey Materials 617-944-7000
NJ Bernardsville, Plessey Materials 201-766-2200
NY Melville, Plessey Materials 516-694-7900
Ohio Akron, Plessey Materials 216-644-7643
Tex Dallas, Plessey Materials 214-235-2307

PLESSEY ELECTRO-PRODUCTS, 3860 Centinela Ave., Los Angeles, Cal., 90066, Tel: 213-390-3585, TWX: 910-343-6483; Minimum order: \$25; p. 1-267

For info on price: P. H. Dalton; Application info: R. Coulter; Customer service: P. Dalton; Delivery info: P. Dalton

Free literature available: Bulletin 500 Applications brochure

Products manufactured: Indicators, Integrators, Electronic, Timers

PLESSEY ENVIROMENTAL SYS., 3939 Ruffin Rd., San Diego, Cal., 92123, Tel: 714-278-6500, Telex: 695053; Empl.: 75

For info on price: S. Liflander; Application info: G. N. Clausen; Customer service: J. Delozier; Delivery info: S. Liflander

Free literature available: A product catalog that describes and illustrates the instruments and equipment manufactured by the company.

Products manufactured: Baths, Controlled Temperature (Air & Liquid), Counters, Data Loggers, Dummy Loads, Gages, Indicators, Oceanographic Equip. (Electronic), Recorders, Transducers, Underwater Communication, Detection, Navigation, etc. Equipment

Local Sales Offices & Reps.

Md Rockville, C. Blakely 301-946-0082

PLESSEY SEMICONDUCTORS, 1674 McGaw Ave., Santa Ana, Cal., 92705, Tel: 714-540-9979, TWX: 910-595-1930; FSC No: 52648; Empl.: 9

For info on price: D. Clark X35; Application info: W. B. Boris X49; Customer service: D. Chant X27; Delivery info: D. Clark X35

Free literature available: Applications; data sheets; short form catalog; price list; data book

Products manufactured: Amplifiers, Cells, Photoconductive, Photoemissive, Photovoltaic, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Counters, Demodulators, Detectors, Diodes, Dividers, Drivers, Switch, Generators, Integrated Circuit Devices, Microwave Integrated Circuits (MIC's), Mixers, Modulators, All Kinds, Transistors

Local Sales Offices & Reps.

Ariz Phoenix, Thorson Co. 602-956-5300
Cal Los Altos, Hoeke-Reeser Assocs. 415-941-4080
Cal Los Angeles, Thorson Co. 213-937-0790
Cal San Diego, Thorson Co. 714-298-8385
Cal Tustin, Thorson Co. 714-544-8121
Colo N. Denver, West/Mark Assoc. 303-433-7181
Fla St. Petersburg, Kirkwood Assocs. 813-894-8240
Ill Park Ridge, R.F. Specialists 312-698-2044
Ind Fort Wayne, R. F. Specialists 219-485-8982
Kans Prairie Village, Engr. Services Co. 913-649-4000
Mass Wayland, Wayland Engrg. Sls. 617-655-6080
Mo St. Louis, Engr. Services Co. 314-997-1515
NM Albuquerque, Thorson Co. 505-265-5655
NY Plainville, B. Erde 516-822-5357
Ohio Cincinnati, Luebbs Sls Co. 513-871-4211
Pa Easton, Mid Eastern Assocs. 215-253-3100
Pa Philadelphia, Mid Eastern Assocs. 215-842-2810
Tex Dallas, Thorson Co. 602-956-5300
Tex Houston, Thorson Co. 713-771-3504
Wash Olympia, Bergford & Assoc. 206-866-2001

PLEXUS, INC., 7345 E. Evans Rd., Scottsdale, Ariz., 85260

P M C ELECTRONICS CO., INC., 1120 Industrial Hwy., Southampton, Pa, 18966, Tel: 215-322-2925; Empl.: 100; Minimum order: \$100

For info on price: J. Horan; Application info: J. Becker; Customer service: B. Petherbridge; Delivery info: B. Petherbridge

Products manufactured: Boards, Printed Circuit, Boards, Printed Wiring, Universal, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Fla Orlando, Gra-Mar 305-894-3351
NJ Haddon Field, Mesa Tech. Assocs. 609-Ha 9-9531
NY Port Washington, Total Mktg. Action 516-883-2432
NY Syracuse, D. H. Dwyer 315-472-8282

POLARAD ELCTRN. INSTRS., 5 Delaware Dr., Lake Success, N.Y., 11040, Tel: 516-328-1100, TWX: 510-223-0414; FSC No: 82199; Empl.: 150; Minimum order: \$25; p. 1-784,785

For info on price: E. F. Feldman; Application info: E. F. Feldman; Customer service: S. Lim; Delivery info: E. F. Feldman

Free literature available: Polarad Microwave Instrumentation Catalog, Microwave Signal Generators & Sources 800 MHz - 21 GHz, Microwave Receivers & Field Intensity Meters 1-21 GHz, Microwave Antennas, Retrofit Data for older Polarad Signal Generators & Sources Application Data re Microwave Signal Generators

Products manufactured: Analyzers, Antennas, Generators, Meters, Modulators, All Kinds, Monitors, Multipliers, Oscillators, Receivers, Synchronizers, Klystron & BWO, Testers

Local Sales Offices & Reps.

Alas	Anchorage, Arva-Hudson, Inc.	907-272-5231
Ariz	Scottsdale, BFA Corp. of Ariz.	602-946-4215
Cal	Cupertino, T. Snitzer	408-257-8333
Cal	Del Mar, T. Snitzer	714-454-2191
Cal	Los Angeles, T. Snitzer	213-836-6170
Colo	Boulder, H. Bass Assocs.	303-499-7509
Conn	Hamden, P. Jenks Assocs.	203-281-0810
Fla	Orlando, J. Highsmith	305-293-5202
Ill	Elk Grove Village, L. Green	312-593-0282
Ind	Indpls., L. Green	317-293-9827
Kans	Prairie Vlg., Engrg. Svcs.	913-649-4000
Md	Lanham, Brimberg Assocs., Inc.	301-552-2200
Md	Silver Spring, Eastern Instrumentation Corp.	301-681-6500
Mass	Wakefield, P. Jenks Assoc.	617-246-1590
Mich	Detroit, Group Ten, Inc.	313-549-3910
Minn	Mpls., L. F. Green	612-781-1611
Mo	St. Louis, Engrg. Svcs.	314-997-1515
NM	Albuquerque, IMEC	505-883-9010
NY	Great Neck, Meas. Tech.	516-482-3500
NY	Liverpool, R&D Assocs.	315-622-2350
Ohio	Cleveland, Group Ten, Inc.	216-486-2800
Ohio	Dayton, Group Ten, Inc.	513-277-6531
Ore	Lake Oswego, Arva-Hudson, Inc.	503-227-4916
Pa	Phila., East Instrumentation Phila., Inc.	215-927-7777
Tex	Richardson, Lear Assoc.	214-231-5388
Tex	San Antonio, Data Applications	512-732-7176
Wash	Seattle, Arva-Hudson, Inc.	206-622-0177
FOR:	Can., Downsview, Ont., Electronic Sys. Ltd.	416-661-3673
FOR:	Can., Montreal, Que., Electronic Sys. Ltd.	514-342-4112
FOR:	Can., Ottawa, Ont., Electronic Sys. Ltd.	613-733-3781
FOR:	Vancouver, B.C., Electronic Sys. Ltd.	604-687-5696

POLYFLON CORP., 35 River St., New Rochelle, N.Y., 10801, Tel: 914-636-7222, TWX: 710-563-0619; Empl.: 60; Minimum order: \$25

For info on price: R. McLaughlin; Application info: P. Russo; Customer service: R. McLaughlin; Delivery info: R. McLaughlin

Free literature available: Products & Services-Condensed catalogue; Individual Data Sheets: fixed RF capacitors, trimmer capacitors, microwave components, UHF cavities, DC Blocking Capacitors, Mylar Capacitors.

Products manufactured: Antennas, Boards, Printed Circuit, Capacitors, Fixed, Capacitors, Variable, Filters, Foil, Laminates, Seals, Services, Assembly, Production & Test, Shields, Slotted Lines, Microwave, Tees, Terminal Blocks, Boards & Strips, Terminals, Waveguides & Adapters

Local Sales Offices & Reps.

Fla	Lighthouse Point, Ed Whalen Assocs.	305-781-6996
Ill	Arlington Heights, Bunting & Assocs.	312-392-3370
EXP:	New Rochelle, N.Y., Polyflon Corp.	914-636-7222

POLYPHASE INSTR. CO., 126 E. Fourth St., Bridgeport, Pa., 19405, Tel: 215-279-4660; Empl.: 150

For info on price: R. H. Simmons; Application info: R. H. Simmons; Customer service: R. H. Simmons; Delivery info: P. Benedetti

Products manufactured: Amplifiers, Chokes, Coils Including Assemblies & Forms, Controls/Control Eqpt., Converters, Equalizers, Filters, Networks, Panels, Reactors, Transformers

Local Sales Offices & Reps.

DC	Wash, Arco Eng. Co.	202-393-5991
Fla	Seminole, Massey Assoc.	813-393-3206
Ill	Chicago, Berndt Assoc.	312-283-4900
Ind	Carmel, J. Riley	317-844-0114
Mass	Raddolph, Naton Assoc.	617-986-6417
NJ	Plainfield, Glassman Assoc.	201-561-3866
NY	Glen Cove, Glassman Assoc.	516-676-1039
NY	Utica, B. D. Hummel Co.	315-736-7821
Pa	Ft. Washington, GCM Assoc.	215-646-7535

PORTER, H.K., INC., 74 Foley St., Somerville, Mass., 02143, Tel: 617-776-8200, Telex: 92-1420; Empl.: 250

Customer service: A. L. Holmes

Free literature available: Hand & Power Operated Cutters A200B

Products manufactured: Cutters, Wire, Hand Operated, Drivers, Nut, Jacks (All Types), Tools

PORTESCAP US, 730 Fifth Ave., New York, N.Y., 10019

POSITRONIC INDS., 1906 S. Stewart, Springfield, Mo., 65804, Tel: 417-883-3434, Telex: 43-6445; Empl.: 90

For info on price: M. Dock; Application info: J. Gentry; Customer service: W. Gilbert; Delivery info: W. Gilbert

Products manufactured: Connectors, Contacts, Electrical, Fasteners, Handles For Cabinets, Circuit Boards, Racks, etc., Pins, Sockets, Spacers, Terminals, Tools

Local Sales Offices & Reps.

Ariz	Scottsdale, Schoeffler Assoc.	602-948-3470
Cal	Canoga Park, Balzer-Wolf Assocs.	213-888-7432
Cal	Mountain View, G. Woempner	415-964-5454
Colo	Littleton, Lange Sis.	303-798-1397
Conn	Field, Schumacher & Yarrington	203-259-0772
Fla	Ft. Lauderdale, CBC Electronics	305-484-7330
Ga	Norcross, Compton	404-921-6929
Ill	Des Plaines, Control Sis.	312-296-5595
Kans	Shawnee Mission, Florence & Meyer	913-722-5210
Kans	Wichita, M. Meyer	316-838-7226
Mich	Dearborn Hts., Ankofski Assoc.	313-565-6330
Minn	Minneapolis, Components Group	612-824-4222
Mo	Springfield, Positronic Inds.	417-883-3434
Mo	St. Charles, Buckman Assocs.	314-724-6690
NJ	Moorestown, Comp. Consils.	609-234-3666
NY	Cooperstown, Fittelle Assoc.	607-547-9333
NY	Farmingdale, Haines Products	516-420-1177
Ohio	Dayton, Myers Assocs.	513-435-1309
RI	Rhode Island, Schumacher & Yarrington	401-884-5671
Tex	Richardson, Zonk Engrg. Co.	214-238-7651

Local Distributors

Cal	Gardena, Bell Inds., 306 E. Alondra	213-321-5802
Cal	Inglewood, Times West, 900 W. Olive	213-673-5900
Cal	Sunnyvale, Acacia Sis., 384 San Aeso	408-735-0100
Colo	Denver, Acacia Sis., 758 S. Jason	303-232-2882
Mass	Waltham, Impact Elctns., 223 Crescent St.	617-893-2850
Tex	Dallas, Computer Comps., 732 Wiley Post Rd.	214-239-0271

POTTER & BRUMFIELD, Div of AMF, 1200 E. Broadway, Princeton, Ind., 47671, Tel: 812-385-5251, TWX: 810-350-2343; Empl.: 3500

Free literature available: Catalog 100 lists over 1000 standard relays, stocked and sold by leading electronic parts distributors. Models include electromechanical, dry reed, mercury-wetted, hybrid, solid state and time delay relays.

Products manufactured: Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Circuit Breakers, Covers, Protective (Including Dust), Relays, Sockets, Switches, Timers

Local Sales Offices & Reps.

Ariz	Phoenix, Howe & Howe Sis.	602-264-7971
Cal	Los Altos, E. Recht Assocs.	415-941-0336
Cal	Los Angeles, Black, Ekizian & Strong, Inc.	213-870-9191
Cal	San Diego, Bestronics	714-278-2150
Cal	San Juan Capistrano, Potter & Brumfield	714-493-4503
Colo	Littleton, Simpson Assocs.	303-794-8381
Conn	Canaan, Hathaway Elctns., Inc.	800-225-1293
Fla	N. Miami Beach, Irby & Connolly, Inc.	305-949-5197
Fla	Orlando, Irby & Connolly, Inc.	305-894-8471
Ga	Atlanta, Cartwright & Bean, Inc.	404-255-5262
Ill	Chicago, Balhorn & Welch, Inc.	312-889-5011
Ill	LaGrange Park, Bierhaus Sis., Inc.	312-354-5100
Ind	Fort Wayne, R.O. Whitesell & Assocs.	219-432-5591
Ind	Indianapolis, R.O. Whitesell & Associates, Inc.	317-359-9283
Ind	Kokomo, R.O. Whitesell & Assocs.	317-452-6065
Kans	Overland Park, P-M-A Corp.	913-381-0004
Kans	Wichita, P-M-A Corp.	316-264-2662
Ky	Louisville, R.O. Whitesell & Assocs.	502-893-7303
La	Chalmette, Cartwright & Bean, Inc.	504-279-4598
Md	Glen Burnie, Micro-Comp, Inc.	301-761-4600
Mass	Braintree, Potter & Brumfield	617-848-6550
Mass	Lexington, Hathaway Elctns., Inc.	617-861-7010
Mich	Ferndale, Hilltronics, Inc.	313-398-5556
Mich	St. Joseph, R.O. Whitesell & Assocs.	616-983-7337

Minn	Edina, M. Foster Co.	612-835-2252
Miss	Jackson, Cartwright & Bean, Inc.	601-981-1368
Mo	Hazelwood, P-M-A Corp.	314-731-4334
NJ	Cherry Hill, J. McCoy, Inc.	609-428-3444
NM	Albuquerque, C.T. Cardberg & Assocs.	505-265-1579

NY	Buffalo, Ossmann Comp. Sis. Corp.	716-832-4271
NY	Garden City, Comtronic Assocs.	516-741-8966
NY	Kingston, Ossmann Comp. Sis. Corp.	914-338-5505

NY	Rochester, Ossmann Comp. Sis. Corp.	716-442-3290
NY	Syracuse, Ossmann Component Sales Corp.	315-454-4477
NY	Vestal, Ossmann Component Sales Corp.	607-785-9949

NC	Charlotte, Cartwright & Bean, Inc.	704-333-6457
NC	Raleigh, Cartwright & Bean, Inc.	919-832-7128
Ohio	Cincinnati, R.O. Whitesell & Assocs.	513-521-2290

Ohio	Cleveland, Scott Elctns., Inc.	216-291-2600
Ohio	Columbus, Scott Electronics, Inc.	614-236-8619
Ohio	Dayton, R.O. Whitesell & Associates, Inc.	513-298-9546
Okla	Tulsa, Comps., Inc.	918-583-9149

Pa	Camp Hill, Beil & Whitaker, Inc.	717-233-1254
Pa	Harrisburg, Beil & Whitaker, Inc.	717-652-0184
Pa	Orefield, Beil & Whitaker, Inc.	215-395-0150
Pa	Philadelphia, Jack McCoy, Inc.	215-922-7333
Pa	Pittsburgh, Scott Electronics, Inc.	412-781-3112
Pa	Reading, Beil & Whitaker, Inc.	215-779-2610
Tenn	Knoxville, Cartwright & Bean, Inc.	615-693-7450
Tenn	Memphis, Cartwright & Bean, Inc.	901-276-4442

Tex	Dallas, J.B. Guenther, Inc.	214-691-8500
Tex	Houston, J.B. Guenther, Inc.	713-468-0232
Utah	Salt Lake City, Simpson Assocs.	801-486-3731
Wash	Seattle, R. Johnston Co.	206-524-5170
Wisc	Milwaukee, E.A. Dickinson & Assocs.	414-264-1080

POTTER CO., Box 337 North Hwy 51, Wesson, Miss., 39191, Tel: 601-643-2216, TWX: 510-981-4072; FSC No: 13050; Empl.: 200; Minimum order: \$25

For info on price: W. Murray; Application info: H. Mutz; Customer service: W. Murray; Delivery info: W. Murray

Free literature available: UL Recognized EMI Filters, High Voltage Bluseal Film Capacitors, Maxi-Brute Low Pass EMI Filters, Bluseal Film Capacitors

Products manufactured: Capacitors, Fixed, Chokes, Filters

Local Sales Offices & Reps.

Ariz	Phoenix, Chaparral	602-996-9648
Cal	Los Angeles, Products Supply Co.	213-659-1858
Cal	Malibu, Potter Co.	213-457-7835
Cal	Redwood City, Parks & Pruitt Assoc.	415-364-1640
Cal	Woodland Hills, Interstate Mktg. Assocs.	213-883-7606

Colo	Denver, Omega Limited	303-758-1508
Fla	Ft. Lauderdale, G.F. Bohman Assocs.	305-564-3081

Fla	Orlando, G.F. Bohman Assocs.	305-855-0274
Ill	Park Ridge, R.F. Specialists	312-698-2044
Ind	Ft. Wayne, R.F. Specialists	219-485-8982
Mass	Pittsfield, Potter Co.	413-499-2677
Mich	Grand Rapids, Thies & Assocs.	616-245-0319
Minn	Minneapolis, Stack-Johnson	612-925-2111
Miss	Wesson, Potter Co.	601-643-2216
NJ	Haddonfield, Gray Assocs.	609-429-5300
NY	Binghamton, El-Com Sis., Inc.	607-723-9270
NY	Mineola, R.A. Colucci Co.	516-746-0397
NY	Rochester, El-Com Sis., Inc.	716-385-1400
NY	Whitesboro, El-Com Sis., Inc.	315-736-2421
NC	Charlotte, R.W. Chapman & Co.	704-525-2421
Ohio	Brecksville, A. Nace Co.	216-526-4323
Ohio	St. Marys, Potter Co.	513-278-5030
Okla	Tulsa, W. Pat Fralia Co.	918-663-8707
Pa	Pittsburgh, Allen Nace Co.	412-922-7225
Tex	Fort Worth, W.P. Fralia Co.	214-264-3491
Tex	Houston, W.P. Fralia Co.	817-738-2394
Utah	Salt Lake City, Omega Limited	801-226-9617
Wash	Kirkland, Lehr Assocs.	206-827-4581
FOR:	Can., Toronto, Ont., Connector Sts. Ltd.	610-492-1398

Fla	Orlando, G.F. Bohman Assocs.	305-564-3081
Ill	Park Ridge, R.F. Specialists	312-698-2044
Ind	Ft. Wayne, R.F. Specialists	219-485-8982
Mass	Pittsfield, Potter Co.	413-499-2677
Mich	Grand Rapids, Thies & Assocs.	616-245-0319
Minn	Minneapolis, Stack-Johnson	612-925-2111
Miss	Wesson, Potter Co.	601-643-2216
NJ	Haddonfield, Gray Assocs.	609-429-5300
NY	Binghamton, El-Com Sis., Inc.	607-723-9270
NY	Mineola, R.A. Colucci Co.	516-746-0397
NY	Rochester, El-Com Sis., Inc.	716-385-1400
NY	Whitesboro, El-Com Sis., Inc.	315-736-2421
NC	Charlotte, R.W. Chapman & Co.	704-525-2421
Ohio	Brecksville, A. Nace Co.	216-526-4323
Ohio	St. Marys, Potter Co.	513-278-5030
Okla	Tulsa, W. Pat Fralia Co.	918-663-8707
Pa	Pittsburgh, Allen Nace Co.	412-922-7225
Tex	Fort Worth, W.P. Fralia Co.	214-264-3491
Tex	Houston, W.P. Fralia Co.	817-738-2394
Utah	Salt Lake City, Omega Limited	801-226-9617
Wash	Kirkland, Lehr Assocs.	206-827-4581
FOR:	Can., Toronto, Ont., Connector Sts. Ltd.	610-492-1398

Fla	Orlando, G.F. Bohman Assocs.	305-564-3081
Ill	Park Ridge, R.F. Specialists	312-698-2044
Ind	Ft. Wayne, R.F. Specialists	219-485-8982
Mass	Pittsfield, Potter Co.	413-499-2677
Mich	Grand Rapids, Thies & Assocs.	616-245-0319
Minn	Minneapolis, Stack-Johnson	612-925-2111
Miss	Wesson, Potter Co.	601-643-2216
NJ	Haddonfield, Gray Assocs.	609-429-5300
NY	Binghamton, El-Com Sis., Inc.	607-723-9270
NY	Mineola, R.A. Colucci Co.	516-746-0397
NY	Rochester, El-Com Sis., Inc.	716-385-1400
NY	Whitesboro, El-Com Sis., Inc.	315-736-2421
NC	Charlotte, R.W. Chapman & Co.	704-525-2421
Ohio	Brecksville, A. Nace Co.	216-526-4323
Ohio	St. Marys, Potter Co.	513-278-5030
Okla	Tulsa, W. Pat Fralia Co.	918-663-8707
Pa	Pittsburgh, Allen Nace Co.	412-922-7225
Tex	Fort Worth, W.P. Fralia Co.	214-264-3491
Tex	Houston, W.P. Fralia Co.	817-738-2394
Utah	Salt Lake City, Omega Limited	801-226-9617
Wash	Kirkland, Lehr Assocs.	206-827-4581
FOR:	Can., Toronto, Ont., Connector Sts. Ltd.	610-492-1398

Fla	Orlando, G.F. Bohman Assocs.	305-564-3081
Ill	Park Ridge, R.F. Specialists	312-698-2044
Ind	Ft. Wayne, R.F. Specialists	219-485-8982
Mass	Pittsfield, Potter Co.	413-499-2677
Mich	Grand Rapids, Thies & Assocs.	616-245-0319
Minn	Minneapolis, Stack-Johnson	612-925-2111
Miss	Wesson, Potter Co.	601-643-2216
NJ	Haddonfield, Gray Assocs.	609-429-5300
NY	Binghamton, El-Com Sis., Inc.	607-723-9270
NY	Mineola, R.A. Colucci Co.	516-746-0397
NY	Rochester, El-Com Sis., Inc.	716-385-1400
NY	Whitesboro, El-Com Sis., Inc.	315-736-2421
NC	Charlotte, R.W. Chapman & Co.	704-525-2421
Ohio	Brecksville, A. Nace Co.	216-526-4323
Ohio	St. Marys, Potter Co.	513-278-5030
Okla	Tulsa, W. Pat Fralia Co.	918-663-8707
Pa	Pittsburgh, Allen Nace Co.	412-922-7225
Tex	Fort Worth, W.P. Fralia Co.	214-264-3491
Tex	Houston, W.P. Fralia Co.	817-738-2394
Utah	Salt Lake City, Omega Limited	801-226-9617
Wash	Kirkland, Lehr Assocs.	206-827-4581
FOR:	Can., Toronto, Ont., Connector Sts. Ltd.	610-492-1398

Tex	Fort Worth, W.P. Fralia Co.	214-264-349
Tex	Houston, W.P. Fralia Co.	817-738-239
Utah	Salt Lake City, Omega Limited	801-226-961

Products manufactured: Comm. Systems, Computers, Data Acquisition & Reduction Systems, Heads, Recording Playback, Erase, Memory Systems, Perforators, Printers, Readers, Recorders, Tape Recording Accessories, Terminal Equipment, Digital, Transmission Systems, Data

POWER CONTROL CORP., Box 11432, Pittsburgh, Pa., 15238, Tel: 412-782-3120; Empl.: 65; Minimum order: \$15

For info on price: W. J. Happel; Application info: W. J. Happel; Delivery info: H. Baird

Products manufactured: Amplifiers, Boards, Printed Circuit, Chargers, Battery, Controls/Control Eqpt., Converters, Inverters, Monitors, Power Supplies, Relays, Testers, Thyristors (Includes Silicon Controlled Rectifiers)

Local Sales Offices & Reps.

Mass Boston, Ecco Engrg. Corp. 617-782-7440
Mich Saginaw, Von Berg & Assocs. 517-799-0873
NJ Plainfield, Brady Co. 201-753-7988
NY Rochester, H.C. Johnson Agency 716-482-3000
Ohio Cleveland, Whitehill Industrial 216-464-0298
Pa Philadelphia, Rothenheber & Wurts 215-649-6300

POWER CONVERSION INC., 70 MacQuesten Pkwy. S., Mt. Vernon, N.Y., 10550, Tel: 914-699-7333; Empl.: 60; Minimum order: \$50

Customer service: S. Chodosh

Free literature available: A brochure presenting voltage - time characteristics at room temperature and -20°F of Eternacell® Lithium organic electrolyte batteries ranging in capacity from 0.5 to 10 ampere-hours.

Products manufactured: Batteries

POWER DESIGNS, INC., 1700 Shames Dr., Westbury, N.Y., 11590, Tel: 516-333-6200, TWX: 510-222-6561; Empl.: 200 p. 1-1418-1425

For info on price: R. Roth; Application info: M. Waimberg; Customer service: M. Conklin; Delivery info: R. Roth

Free literature available: General Catalogue; Data sheet on stock models; stock models; instruction manual excerpts on non-standard & custom models including outline dwgs; short form catalogues.

Products manufactured: Calibrators, CATV Systems & Equipment, Chargers, Battery, Converters, Current Sources, Dividers, Eliminators, Battery, Loads, Electronic Variable, Power Supplies, References, D-C Voltage, Regulators, Stabilizers, Line Impedance, Transformers, Voltage Sources

Local Sales Offices & Reps.

Ariz Phoenix, Zeus Inc. (Hytronic Meas.) 602-253-6104
Cal North Hollywood, O'Halloran Assocs. 213-877-0173
Cal Palo Alto, O'Halloran Assocs. 415-326-1493
Cal San Diego, O'Halloran Assocs. 714-224-2824
Colo Denver, Zeus Inc. (Hytronic Meas.) 303-770-4400
Fla Casselberry, EIR, Inc. 305-830-9600
Ill Elk Grove Village, L.F. Green & Assocs. 312-593-0282
Ind Indianapolis, L.F. Green & Assocs. 317-293-9827
Mass Waltham, Mc Bar Assocs. 617-890-0233
Mich Detroit, H. Teplitz & Co. 313-537-9058
Minn Minneapolis, L.F. Green & Assocs. 612-781-1611
Nev Clark County, Zeus Inc. (Hytronic Meas.) 602-253-6104
NM Albuquerque, Zeus, Inc. 505-268-3941
NY East Syracuse, Ossmann Instrs. 315-437-6666
NY Mt. Vernon, OED Elctns. 914-664-0080
NY Rochester, Ossmann Instrs. 716-328-2230
NY Vestal, Ossmann Instrs. 607-785-9947
Ohio Cleveland, H. Teplitz & Co. 216-371-2044
Ohio Dayton, H. Teplitz & Co. 513-277-6531
Pa Abington, Powell-Pendergraph 215-657-0330
Utah Salt Lake City, Zeus, Inc. 801-466-4924
Va Richmond, Powell-Pendergraph 703-264-2341
Wash Bellevue, Topp Engrg. 206-747-5401
FOR: Can, Montreal, Que., Datamex 514-731-9328

POWER, INC., Marketing Div., 12809 Eagle Ridge Dr., Burnsville, Minn., 55378, Tel: 612-890-1360; Empl.: 500; Minimum order: \$15 p. 1-1339,1340

Customer service: D. Carlson

Free literature available: Custom Battery Packs with Chargers

Products manufactured: Batteries, Chargers, Battery

POWER INSTRS., INC., 7352 N. Lawndale Ave., Skokie, Ill., 60076; Empl.: 20; Minimum order: \$20

For info on price: N. Cohen 312-676-2300; Application info: R. H. Redfield 312-676-2301; Customer service: R. Lee 312-274-9110; Delivery info: N. Cohen 312-676-2300

Products manufactured: Controls/Control Eqpt., Converters, Counters, Indicators, Light Sources, Photoelectric, Lights, Tachometers, Testers

Local Sales Offices & Reps.

Ala Huntsville, Vaughn Electrosources Co. 205-881-8830
Cal Santa Monica, Davidson Assocs. 213-829-1731
Fla Cocoa Beach, Vaughn Electrosources Co. 305-784-0784
Kans Lenexa, S. Sterling Co. 913-888-2995
Mich Detroit, S. Sterling Co. 313-255-1970
Mo St. Louis, S. Sterling Co. 314-567-3636
Tex Dallas, Teamwork, Inc. 214-243-5881
Wisc Milwaukee, W. Klinger & Son 414-351-1775



POWER/MATE CORP., 514 S. River St., Hackensack, N.J., 07601, Tel: 201-343-6294, TWX: 710-990-5023; Empl.: 280 p. 1-1341

For info on price: R. Allison; Application info: D. Skulnik; Customer service: D. West; Delivery info: M. Hochaupt

Products manufactured: Converters, Power Supplies

Local Sales Offices & Reps.

Ariz Phoenix, Thorson Co. 602-956-5300
Cal Los Angeles, Thorson Co. 213-937-0790
Cal Mountain View, Thorson Co. 415-964-9300
Cal San Diego, Thorson Co. 714-298-8385
Cal Tustin, Thorson Co. 714-544-5121
Colo Denver, Thorson Co. 303-759-0809
Conn Hartford, Victor Assocs. 203-246-5643
Fla Ft. Lauderdale, W. A. Brown Instr. 305-776-4800
Ga Atlanta, W. A. Brown Instr. 404-939-1674
Ill Chicago, K.W. Meyers Co. 312-774-6440
Ind Indianapolis, K.W. Meyers Co. 317-243-6681
Md Rockville, Marktron 301-762-6210
Md Timonium, Marktron 301-252-7111
Mass Framingham, Victor Assocs. 617-879-5710
Mich Detroit, R.P. Urban & Assocs. 313-535-2355
Mich Grand Rapids, R.P. Urban & Assocs. 616-245-0511
Minn Minneapolis, K.W. Meyers Co. 612-920-7080
Mo Grandview, Benek & McCaul 816-765-2998
Mo St. Louis, Benek & McCaul 314-567-3399
NJ Hackensack, PMC 201-343-6294
NM Albuquerque, Rustco 505-296-6474
NY Elmont, Crane & Egert Corp. 516-488-2100
Ohio Aurora, EMA Inc. 216-562-6104
Ohio Centerville, EMA Inc. 513-433-2800
Pa Philadelphia, QED Elctns. 215-925-8711
Tex Dallas, R. Martin Assoc. 214-361-8584
Tex Houston, R. Martin Assoc. 713-462-4077
Vt Burlington, Victor Assoc. 802-862-2172
Wash Seattle, Thorson Co. 206-455-9180
EXP: Hackensack, N.J., Power/Mate 201-343-6294
FOR: Can: Mississauga, Ont., Webster Instrs. 416-275-2270

POWER MONOLITHICS INC., 121 International Dr., Corpus Christi, Tex., 78410, Tel: 512-883-6251; Minimum order: \$75 p. 1-1845

For info on price: R. Whalen; Application info: L. Ferguson; Customer service: R. Whalen; Delivery info: R. Whalen

Free literature available: Power Hybrid Voltage Regulators 4 and 14 terminal 3.3A & 5A Pos or Neg Regulators 5 and 9 terminal 10A & 15A Pos & Neg Regulators 20 and 25 Amp Pos Regulators

Products manufactured: Hybrid Voltage Regulators, Integrated Circuit Devices, Transistors

Local Distributors

Cal Burlingame, Logan Assocs. 415-697-6100
Cal Los Angeles, Black, C. Kizian & Strong, 1728 So. La., Cienega Blvd. 213-870-9191
Fla Clearwater, Lynch-Gentry, 1932 Drew St. 813-443-2697
Ill Rolling Meadows, Sumer Inc. 312-394-4900
Mass Lexington, Kitchen & Kutchin, Inc., 177 Bedford St. 617-862-8230

Minn Minneapolis, Nortec Sls., 4530 W. 77th Ave. 612-835-7414
NJ Haddonfield, Sunday & Obrien, 15 Potter St. 609-429-4013
NY Hempstead, Kahgan Sales Corp., 556 Peninsula Blvd. 516-538-2300
NY Rochester, Ossman Comp. Sls., 280 Metro Park 716-442-3290
NC Winston-Salem, Murcota, Inc., 1106 Burke St. 919-723-1001
Ohio Cincinnati, Sheridan Assocs., Box 37826 513-761-5432

POWER ONE, 531 Dawson Dr., Camarillo, Cal., 93010, Tel: 805-484-2806, TWX: 910-336-1297; Empl.: 35 p. 1-1414-1417

For info on price: D. Weisse; Application info: L. Wallace; Customer service: L. Wallace; Delivery info: D. Weisse

Free literature available: 16 page catalog listing 52 models of open frame power supplies from 5 to 200 VDC at 15 to 300 watts. Manual of each power supply.

Products manufactured: Power Supplies

Local Sales Offices & Reps.

Cal San Diego, Col-Rob Elect. 714-565-6814
Cal Santa Clara, Richards Assocs. 408-246-5860
Cal Woodland Hills, Burtis Instrs. 213-887-1360
Fla Miami, Reprtronics, Inc. 305-251-5478
Fla St. Petersburg, Reprtronics, Inc. 813-522-8220
Ill Wheaton, Engineering Products Assoc. 312-665-0061
Ind Indianapolis, Holsapple Assocs. 317-899-2890
Mass Waltham, Digital Sls. Assoc. 617-899-4300
Minn Minneapolis, Engrg. Prods. Assoc. 612-925-1883
NJ Madison, Livera-Polk Assoc. 201-377-3220
NY Burnt Hills, Mktg. Rep. 518-399-9200
NY Roslyn Heights, Livera-Polk Assoc. 516-484-1276
Pa Norristown, Denco-Data Engrg. 215-279-8146
RI N. Scituate, Digital Sls. Assoc. 401-647-2675
Tex Dallas, Reese Assoc. 214-638-6575
Tex Houston, Reese Assoc. 713-621-3134
Wash Richland, J. B. Jolly 509-783-6523
Wash Seattle, J. B. Jolly 206-938-4166
FOR: Can. Weston, Ont., Duncan Instrs. LTD. 416-742-4448

Local Distributors

Cal Santa Clara, Richards Assocs., 1659 Scott Blvd. 408-246-5860
Cal Woodland Hills, Burtis Power Dist., 6324 Variel Ave. 213-887-1360
Ind Indianapolis, Holsapple & Assocs., 8640 E. Washington 317-899-2890
Mass Waltham, Digital Sls. Assoc., 9 Spring St. 617-899-4300
NY Roslyn Hts., Livera-Polk Assoc., 275 Warner Ave. 201-377-3220
Tex Dallas, W. Reese Assocs., 3131 Stemmons Frwy. 214-638-6575
Tex Houston, W. Reese Assocs., 4151 Southwest Frwy. 713-621-3134
For: Can., Weston, Ont. M9L 1Y4, Duncan Instr. Ltd., 65 Millwick Dr., Unit 6 416-742-4448

POWER PAC, INC., 18 Marshall St., South Norwalk, Conn., 06854, Tel: 203-866-4484; FSC No: 53998; Empl.: 45; Minimum order: \$25

For info on price: C. Mittel; Application info: W. Andres; Customer service: C. Mittel; Delivery info: C. Bubba

Free literature available: Econopac, Power Card, Modules, Dual Output Modules System Pac

Products manufactured: Power Supplies

Local Sales Offices & Reps.

Ariz Phoenix, RDX Corp. 602-267-8162
Cal Pasadena, RDX Corp. 213-681-3451
Cal Sunnyvale, RDX Corp. 408-734-4500
Fla Orlando, Faussett of Fla. 305-894-6071
Ill Wilmette, Crest Assocs. 312-286-5202
Ind Indianapolis, Crest Assocs. 317-844-2800
Md New Carrollton, W. A. Brown-Equip. Co. 301-577-4527
Mass Burlington, TEKDATA 617-273-0198
Mich Farmington Hills, Lowell Co. 313-851-7474
NY Mt. Vernon, D. Sonkin Assocs. 914-668-9809
Pa Jenkintown, AMT 215-549-2080
Va Alexandria, W. A. Brown-Equip. Co. 703-836-1800
WVa Charleston, W. A. Brown-Equip. Co. 304-342-2700

POWER-PACK, INC., 1 St. John St., Dover, NH, 03820, Tel: 603-749-2929

POWER PHYSICS CORP., Box 626, Eatontown, N.J., 07724, Tel: 201-542-1393, TWX: 710-722-6646; Empl.: 110; Minimum order: \$25

For info on price: C. Dee; Application info: M. Baker; Customer service: C. Dee; Delivery info: C. Dee

Free literature available: General catalog

Products manufactured: Circuits, Hybrid, Thick Film, Diodes, Hybrid Voltage Regulators, Rectifiers, Transistors

Local Sales Offices & Reps.

Ala Huntsville, Incotech 205-837-6061
 Ariz Phoenix, Shefler-Kahn Co. 602-258-7894
 Cal Los Alamitos, J. S. Heaton Co. 714-821-9600
 Cal Menlo Park, J. S. Heaton Co. 415-369-4671
 Cal San Diego, Cel-Tec 714-279-7961
 Colo Denver, Shefler-Kahn Co. 303-831-9087
 Conn North Haven, Kitchen & Kutchen 203-239-0212
 Fla Clearwater, Bohman Assocs. 813-442-5606
 Fla Ft. Lauderdale, Bohman Assocs. 305-855-0274
 Fla Orlando, Bohman Assocs. 919-722-5151
 Ga Atlanta, EMA 312-774-1500
 Ill Chicago, Lightner Assocs. 301-825-9637
 Md Towson, Habco Elec. 617-862-8230
 Mass Lexington, Kitchen & Kutchen 313-444-4417
 Mich Lathrup, R.C. Nordstrom & Co. 612-929-6721
 Minn Minneapolis, Technical Assocs. Inc. 914-634-7973
 NY LRC Assoc. 315-685-7122
 NY MCK Assoc. 919-722-5151
 NC Winston-Salem, Elctn. Mktg. Assoc., Inc. 614-457-2242
 Ohio Columbus, T. Mulligan & Assoc. 503-245-2342
 Ore Portland, Underwood & Underwood

Pa King of Prussia, Monteiro Assocs. 215-265-0634
 Tex Dallas, Merino Sls. Co. 214-239-9719
 Va Lynchburg, Habco Elec. 804-384-5236
 Wash Seattle, Underwood & Underwood 206-243-2133

POWER-SONIC CORP., Box 5242, 3106 Spring St., Redwood City, Cal., 94063, Tel: 415-364-5001; Empl.: 4
 For info on price: B. A. Ender; Application info: G. C. Clum; Customer service: B. Ender; Delivery info: G. C. Clum

Free literature available: Specification sheet listing all models, voltage, capacity, dimensions, discharge characteristics, terminal configuration, as well as general characteristics of power-sonic batteries. Technical brochure: characteristics, curves, application notes, charging.

Products manufactured: Batteries, Chargers, Battery

Local Sales Offices & Reps.

Cal Marina Del Rey, Intervend Inds., Ltd. 213-821-7936
 Cal San Diego, Qualtronics 714-560-8955
 Ill Chicago, Roepk-Cahill 312-287-7292
 Mass Reading, Kanan Assocs. 617-944-8484
 Mich Orchard Lake, Ellinger Sls. 313-626-1170
 Minn Minneapolis, Jos-Co Sls. Engrg. 612-927-5858
 NY Wantagh, Dony Tech Sls. 516-826-5550

Advertisement

We specialize exclusively in gelled electrolyte lead-acid batteries and chargers. Our batteries are sealed, maintenance free, may be discharged and charged in any position. Cycle or standby (float) applications.

Full product line— 6, 12, 18 volts; capacities ranging from 1 to 15 ampere-hours. Minimum lead time.

POWER SYSTEMS & CONTROLS, INC., 3206 Lanvale Ave., Richmond, Va., 23230, Tel: 804-355-2803; Empl.: 40

For info on price: R. A. Amos; Application info: C. Gregory; Customer service: A. Moore; Delivery info: S. Frazier

Free literature available: 1) Series 700C Uninterruptible Computer Power Supply, 40KW through 720KW 2) Model 1200 Voltage Band Monitor, 3) Series RF Computer Power Filter

Products manufactured: Monitors, Motor Electric Generator Sets, Power Supplies

Local Sales Offices & Reps.

Cal LaCrescenta, Power Systems & Controls 213-248-9018

Iowa Des Moines, Beckley Electric Co. 515-288-3201
 Mass Framingham, C. Pappas Assocs. 617-877-2984
 Mo Florissant, C. Mark Corp. 314-921-4444
 NJ Old Bridge, Media Prods. 201-257-8076
 NY Great Neck, H.J. Krasner Assocs. 516-487-0690
 Ohio Cincinnati, Data Processing Sciences Corp. 513-961-0776
 Okla Tulsa, Data Processing Svcs. 918-582-2114
 Tex Richardson, Computer Mktg. Corp. 214-231-1426

POWER TECHNOLOGY, INC., Box 4403, 7925 Mablewave Cutoff, Little Rock, Ark., 72204, Tel: 501-568-1995; Empl.: 17
 Customer service: T. H. Burgess

Free literature available: Power Supply Catalogs; IL & ILC Series laser Diode Pulsers; DC Motor Speed Controls; 117 or 230 V AC to 12V DC Converter.

Products manufactured: Comm. Systems, Controls/Control Eqpt., Converters, Lasers & Laser Systems, Power Supplies

POWER WAVES INC., Box 1353, Asbury Park, N.J., 07712, Tel: 201-774-8322; Empl.: 6; Minimum order: \$100
 Customer service: I. Ulman

Products manufactured: Counters, Dielectric Heating Equipment, Filters, Furnaces, Meters

Local Sales Offices & Reps.

Cal San Francisco, Microwave of Cal. 415-467-1071
 NJ Middletown, Juno-Mutz 201-774-8322

POWERCUBE CORP., 214 Calvary St., Waltham, Mass., 02154, Tel: 617-891-1830, TWX: 710-324-0300; FSC No: 31557; Empl.: 70

For info on price: Sls. Department; Application info: J. Prestidge; Customer service: L. Sampson; Delivery info: L. Sampson

Products manufactured: Converters, Inverters, Power Supplies

Local Sales Offices & Reps.

Cal Palo Alto, Brooks Tech. Grp. 415-328-3232
 Cal Woodland Hills, Interstate Mktg. 213-883-7606
 Colo Littleton, Simpson Assocs. 303-794-8381
 Conn East Hartford, Tekdata 203-525-7647
 Fla Boca Raton, Conley & Assocs. 305-395-6108
 Fla Oviedo, Conley & Assocs. 305-365-3283
 Fla Tampa, Conley & Assocs. 813-933-8183
 Ill Park Ridge, R F Specialists 312-698-2044
 Ind Fort Wayne, R F Specialists 219-485-8982
 Iowa Cedar Rapids, Technical Reps. 319-363-2489
 Kans Olathe, Technical Reps. 913-782-1177
 Md Baltimore, J. R. Daniel & Co. 301-825-3330
 Mass Burlington, Tekdata 617-273-0198
 Minn Minneapolis, Bitronics Sls. Co. 612-835-7744
 Mo Hazelwood, Technical Reps. 314-731-5200
 NJ Clifton, Compar New York 201-546-3660
 NY Albany, Reagan/Compar Albany 518-489-7408
 NY Endwell, Reagan/Compar Albany 607-723-8743
 NY Fairport, Reagan/Compar Albany 716-271-2230
 NY New Hartford, Reagan/Compar Albany 315-732-3775

Ohio Milford, Knight Tech. Sls. 513-248-0193
 Ore Portland, Almac/Stroum Elctns. 503-292-3534
 Tenn Bristol, Remco 615-968-4195
 Tex Dallas, Electra III Co. 214-243-5969
 Utah Salt Lake City, Simpson Assocs. 801-486-3731
 Wash Seattle, Almac/Stroum Elctns. 206-763-2300
 FOR: Can., Toronto, Ont., Norgay Entprs. 416-233-2930

POWERTEC, INC., 9168 DeSoto Ave., Chatsworth, Cal., 91311, Tel: 213-882-0004, TWX: 910-494-2092; Empl.: 300
 Customer service: J. Poturny; Application info: S. Cole; Customer service: B. Turkish; Delivery info: M. Watson

Free literature available: OEM D.C. Power Supplies, Sub-Modular D.C. Power Supplies, High Frequency Switching Power Supplies, D.C. Power Supplies Short Form Catalog.

Products manufactured: Inverters, Power Supplies

Local Sales Offices & Reps.

Ariz Scottsdale, J. Smith Assocs. 602-947-2495
 Cal Los Altos, Powertec, Inc. 415-941-6200
 Colo Boulder, J. Smith Assocs. 303-442-7100
 Fla Orlando, Powertec, Inc. 305-277-2458
 Ill Chicago, D. Dolin Sls. 312-286-6200
 Iowa Cedar Rapids, Comstrand 319-363-7495
 Kans Overland Pk., Sheridan Assoc. 913-383-1836
 Md Silver Spring, QED Elctns. Inc. 301-588-8134
 Mich Farmington, Sheridan Assocs. 313-477-3800
 Minn Minneapolis, Comstrand Inc. 612-560-5300
 Mo Florissant, Sheridan Assocs. 314-837-5200
 NH Goffstown, Powertec, Inc. 603-497-4004

NJ Tenafly, ABC/Garrettson Sls. 201-568-2354
 NM Albuquerque, J. Smith Assocs. 505-255-2111
 NY Melville, Powertec 516-549-0790
 NY Tarrytown, ABC/Garrettson Sls. 914-631-2650
 NY Williston Park, ABC/Electronic Sls. 516-747-6610
 Ohio Cincinnati, Sheridan Assocs. 513-761-5432
 Ohio Cleveland, Sheridan Assocs. 216-831-0130
 Pa Bethayers, ABC/Electronic Sls. 215-464-2275
 Pa Pittsburgh, Sheridan Assocs. 412-244-1640
 Tex Dallas, Powertec 214-387-0529
 Wash Bellevue, A. Smith Co. 206-746-6770
 FOR: Can., Montreal, Que., John Weiss Co., Ltd. 514-489-6887

POWERTECH, INC., 9 Baker Ct., Clifton, N.J., 07011, Tel: 201-478-6205; FSC No: 32953; Empl.: 25

Customer service: A. M. Polner

Free literature available: POWER TRANSISTORS..Wall Chart describes a complete range of High-Current High-Voltage Silicon Power Transistors. Major specifications of each type are included for device selection. Each chart includes a postage-paid reply card enabling you to receive a complete catalogue with detailed specifications and price lists.

Products manufactured: Transistors

PPM, INC., 32 West Monroe St., Bedford, Ohio, 44146, Tel: 216-232-1880; Empl.: 10
 Customer service: J. J. Wild

Free literature available: Thermal Digital Printers, Data Loggers & Strain, Gage Conditioners Described in Series of PPM Data Sheets

Products manufactured: Alarms, Amplifiers, Bridges, Calibrators, Clocks (All Types), Data Acquisition & Reduction Systems, Data Loggers, Generators, Indicators, Monitors, Power Supplies, Printers, Recorders, Scanners, Signal Conditioners & Equipment, Standards, Thermocouples, Elements & Accessories

Local Sales Offices & Reps.

Ariz Glendale, Ed. Assocs. 602-247-5818
 Cal Long Beach, Saber Entprs. 213-595-5646
 Colo Westminster, Harvey Data Sys. 303-427-5299
 Conn Hamden, J. & J. Assocs. 203-624-7800
 Md Rockville, E. Winston & Co. 301-881-5780
 Mass Burlington, J. & J. Assocs. 617-272-2606
 Mich Ferndale, Tiby Co. 313-547-3550
 NM Albuquerque, J. & D. Assocs. 505-255-2377
 NY Syracuse, J.D. Birchard 315-469-4689
 NY Westbury, OAL Assocs. 516-334-1940
 NC Charlotte, Bimco 704-366-5092
 Ohio Cleveland, Tiby Co. 216-371-5335
 Ohio Dayton, Tiby Co. 513-277-3822

PRACTICAL AUTOMATION, INC., Trap Falls Rd., Shelton, Conn., 06484, Tel: 203-929-5381; Empl.: 150; Minimum order: \$15

For info on price: R. Banzaca X29; Application info: E. Bokina X27; Customer service: J. Ives X31; Delivery info: B. Tobin X30

Free literature available: Digital printers, numeric and alphanumeric for data and terminal applications. Printing digital voltmeters and thermometers pulse printers & counters.

Products manufactured: Counters, Meters, Printers, Recorders

Local Sales Offices & Reps.

Cal Montebello, Tucul Engrg. 213-728-7397
 Cal San Carlos, Electro Pacific 415-593-1334
 Colo Denver, Tescos 303-744-1119
 Conn Southbury, J. J. Wild 203-264-9494
 Fla Hialeah, Shaw Engrg. & Sls. 305-822-6141
 Ill Arlington Heights, Martec Assocs., Inc. 312-296-3331
 Md Towson, Kraft Elctn. Sls. 301-828-5838
 Mass Needham, J. J. Wild 617-444-2366
 Mich Grand Rapids, R. P. Urban & Assocs. 616-245-0511
 Minn Mpls., Wenco Sls. 612-866-3639
 NJ Woodbridge, J. J. Wild 201-636-7780
 NY Jericho, J. J. Wild 516-935-6800
 NY New Hartford, KLM Assocs. 315-735-8525
 NY Rochester, KLM Assocs. 716-442-0821
 NY Syracuse, KLM Assocs. 315-458-2199
 NC McLeansville, Ron Ingle Assocs. 919-697-0787
 Ohio Chagrin Falls, J. Kilroy 216-247-8997
 Pa Newtown Sq., Holdsworth 215-356-8550
 Tex Dallas, Glidden Engrg. & Elctn. Eqpt. 214-363-6539
 Tex Houston, Glidden Engrg. & Elctn. Eqpt. 713-681-1415
 Wash Seattle, R. Johnston Co. 206-524-5170

PRD ELCTRS., INC., Sub. of Harris Corp., 6801 Jericho Tpke., Syosset, N.Y., 11791, Tel: 516-334-7810, TWX: 510-222-4494; FSC No: 77327; Empl.: 1450; Minimum order: \$25

For info on price: C. Calabrese; Application info: R. A. Lebowitz; Customer service: D. Palmer; Delivery info: R. Lebowitz

Free literature available: Application Note #22. Vector Voltmeter Measurement Techniques; Quick Guide to the RF and Microwave Instruments and Components from PRD Electronics, Inc.; VAST Operational.

Products manufactured: Adapters, Waveguide, Amplifiers, Analyzers, Attenuators, Bolometers, Bridges, Calibrators, Calorimeters, Microwave, Carriages, Probe, CATV Systems & Equipment, Cavities, Microwave, Couplers, Detectors, Dividers, Generators, Isolators, Kits, Training Aid, Meters, Mismatches, Microwave, Precision, Mixers, Monitors, Mounts, Multipliers, Oscillators, Power Supplies, Probes, Receivers, Slotted Lines, Microwave, Switches, Synthesizers, Terminals, Test Systems, Testers, Thermistors, Tuners, Waveguides & Adapters

Local Sales Offices & Reps.

Ala	Huntsville, Gentry Assocs.	205-534-9771
Cal	Burbank, PRD Elctns.	213-842-9566
Cal	Cupertino, T. Louis Snitzer Co.	408-257-8333
Cal	Del Mar, T. Louis Snitzer Co.	714-454-2191
Cal	Los Angeles, T. Louis Snitzer Co.	213-836-6170
Colo	Littleton, Aztec Entrs.	303-795-0250
Fla	Orlando, Gentry Assocs.	305-894-4401
Ill	Chicago, Pivan Engrg.	312-539-4838
Ind	Indianapolis, Pivan Engrg.	317-253-1681
Kans	Shawnee Mission, Pivan Engrg.	913-722-1030
Md	Silver Spring, Eastern-Instrumentation	301-681-6500
Mass	Waltham, Measurement Conslts.	617-890-4400
Mich	Detroit, S. Sterling Co.	313-255-1970
Minn	Minneapolis, Pivan Engrg.	612-537-4501
Mo	St. Louis, Pivan Engrg.	314-567-3636
NM	Albuquerque, Aztec Entrs.	505-255-2440
NY	Plainville, Eastern-Metro Assoc.	516-931-1414
NC	Burlington, Gentry Assocs.	19-227-3639
Ohio	Cleveland, S. Sterling Co.	216-442-8080
Ohio	Dayton, PRD c/o Marcus/Gordon	513-256-9984
Ohio	Dayton, S. Sterling Co.	513-298-7573
Pa	Philadelphia, Eastern Instru.	215-927-7777
Pa	Pittsburgh, S. Sterling Co.	412-922-5720
Tex	Houston, Data Appls. Corp.	713-661-4501
Tex	Richardson, Data Appls. Corp.	214-231-4846
Tex	San Antonio, Data Applications Corp.	512-732-7176
Wash	Seattle, Arva, Inc.	206-622-0177
Wisc	Brookfield, Pivan Engrg.	414-786-1940

PRECISION DIPBRAZE/TOR, see Energy Technology Corp.

PRECISION DYNAMICS CORP., Elctns. Div., 3031 Thornton, Burbank, Cal., 91504, Tel: 213-845-7606, Telex: 65-1386; Empl.: 60; Minimum order: \$100

For info on price: S. Charles; Application info: A. Schimmelman; Customer service: S. Charles; Delivery info: S. Charles

Free literature available: Catalogs with application's information and pricing data on request. These include information on standard PDC modules as well as PDC dual-in-line sockets.

Products manufactured: Converters, Counters, Display Devices/Displays, Drivers & Decoders For Readouts, Integrated Circuit Devices, Lamps, Sockets, Timers, Totalizers, Digital

Local Sales Offices & Reps.

Cal	San Diego, Ohm Spun Sls.	714-277-6230
Cal	Sunnyvale, Cutlass Elctns.	408-733-5885
Cal	Torrance, Cutlass Elctns.	213-324-7360
Ill	Arlington Heights, Hagan Sls. Co.	312-394-0617
Mass	Newton Upper Falls, Brookdale Elctns.	617-244-6969
Minn	Minneapolis, Electronic Innovators	612-884-7471
NJ	Pennsauken, Megargel/Himmelstein Assoc.	609-662-3081
NY	Kew Garden Hills, Jacques Edeline	212-861-6387

PRECISION DYNAMICS CORP. cont'd

Advertisement

When your lead time is short, our off-the-shelf PDC series display modules can save you time and money on moderate volume or prototype applications. We have modules in a wide range of digit sizes. They include LED, incandescent and seven-segment numeric as well as dot-matrix alphanumeric. They're pre-wired for BCD logic and are ready to mount to your panel with just two screws. Ask for our catalog.

PRECISION ELECTRONICS, INC., 0101 King Ave., Franklin Park, Ill, 60131, Tel: 312-678-5350; Empl.: 75

For info on price: W. Stow; Application info: A. A. Hart; Customer service: J. Nielsen; Delivery info: C. R. Franzen

Free literature available: Cat. # 1274 P.A.- Sound; Cat 2972-5034 Hi-Fi; Cat 2272-600 Hi-Fi; "G" Series Booklet-Commercial Sound.

Products manufactured: Amplifiers, Attenuators, Microphone Accessories (Including Stands, Holders, Booms), Receivers, Speaker Systems, Speakers, Tuners

Local Sales Offices & Reps.

Ala	Birmingham, M. K. Smith	205-967-3080
Cal	Los Angeles, E. E. Strassner Co.	213-666-1511
Cal	San Francisco, Meyer, Ross & Fleming	415-285-8880
DC	Washington, H. Wise & Co.	202-363-9417
Ga	Marietta, M. K. Smith	404-971-2831
Haw	Honolulu, Gene Piety Factors	
Ill	Franklin Park, Precision Elctns	312-678-5350
La	Metairie, J. F. McKinney Sls.	504-887-1723
Minn	Minneapolis, J. E. Anderson	612-823-6459
NH	Londonberry, Associated Sys.	603-434-0731
NC	Charlotte, M. K. Smith	704-372-1026
Ohio	Columbus, Weller Elctns. Sls.	614-885-7819
Okla	Tulsa, J. F. McKinney Sls.	918-742-6791
Tex	Dallas, J. F. McKinney Sls.	214-631-9450
EXP:	Plainville, N.Y., Morhan Exporting Corp.	516-293-5582

FOR: Can., Dorval 740 Quebec, Superior Intl. Elctns.

PRECISION ELEC. CO., Federal Rd., Kezar Falls, Me., 04047, Tel: 207-625-3243, TWX: 710-990-7506; Empl.: 25

For info on price: R. Magline 201-666-3200; Application info: R. A. Kidder 207-625-3243; Customer service: R. O'Neill 207-625-3243; Delivery info: S. Aspinall 207-625-3243

Free literature available: Full Line Catalog; Mini Catalog; Soldering Iron Tip Brochure.

Products manufactured: Solder Pots & Baths, Soldering Accessories, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools, Tweezers, Hand & Vacuum

Local Sales Offices & Reps.

Cal	El Monte, Federated Sls. Co.	213-283-8374
Cal	Mill Valley, Roy Cohen Sls. Co.	415-383-3555
Ill	Westchester, W. Gallagher Inc.	312-344-0690
La	New Orleans, Crockett Sls. Co.	504-486-4590
Md	Baltimore, E-K-P Assocs.	301-788-6498
Mass	Nahant (Boston), F. H. Hart Co.	617-581-0381
Mich	Farmington, Carter, McCormick & Pierce	313-477-7700
Mo	Raytown, Marty Taraski Sls. Co.	816-358-1442
NY	Liverpool (Rochester), W. T. Elliott	315-652-3690
NY	New York (Jackson Hts.), C. Landis Sls. Co.	212-458-7900
Ohio	Columbus, Mandabach Assocs.	614-235-0265
Ohio	Dayton, Carter McCormick & Pierce	513-278-5873
Pa	Aston, E-K-P Assocs.	215-459-4517
Pa	Easton, E-K-P Assocs.	215-691-5250
Pa	Pittsburgh, Mandabach Assocs.	412-279-2264
Tenn	Memphis, Crockett Sls. Co.	901-388-5410
Tex	Dallas, Crockett Sls. Co.	214-748-8209
Wash	Seattle, Don Smith Sls. Co.	206-633-3160
EXP:	Westwood, N.J., Loner Sls. Intern'l. Ltd.	201-666-3200

PRECISION LAMP, INC., 950 N. Rengstorff Ave., Mountain View, Cal., 94043, Tel: 415-965-1333, Telex: 348498; Empl.: 25; Minimum order: \$25

For info on price: M. Lawrence; Application info: G. Verwer; Customer service: M. Lawrence; Delivery info: M. Lawrence

Products manufactured: Lamps, Lights

Local Sales Offices & Reps.

Ariz	Phoenix, Controlyne, Inc.	602-254-9565
Cal	Anaheim, LoDan, Inc.	714-956-1560
Cal	Menlo Park, Straube Assocs.	415-323-2476
Colo	Denver, Straube Assocs.	303-426-0890
Conn	North Haven, Comp Rep Dist.	203-239-9762
Fla	Miami, Winfield Elctn. Sls. Co.	305-945-6544
Ill	Chicago, G. McL. Cole Co.	312-774-3535
Ind	Fort Wayne, W.W. Bieberich Co.	219-432-2537
Ind	New Albany, W.W. Bieberich Co.	812-945-3187
Iowa	Des Moines, KSW Assocs.	513-279-9235
Md	Baltimore, Kaufholz Assocs.	301-488-6561
Mass	Needham, Comp. Rep. Distrs.	617-444-2484
Mich	Grand Rapids, J.L. Montgomery Assocs.	616-774-9308
Mich	Southfield, J.L. Montgomery Assocs.	313-358-2616
Minn	Minneapolis, R-J Inc.	612-922-1425
Mo	Kansas City, KSW Assocs.	816-358-5240
Mo	St. Louis, KSW Assocs.	314-781-6111
NJ	Upper Montclair, Controlyne, Inc.	201-746-8900
NM	Albuquerque, Straube Assocs.	505-292-0295
NY	Massapequa, R.D. McGrath	516-798-0400
Ohio	Cleveland, Goory Sales Co.	216-331-2055
Pa	Newtown Square, Kaufholz Assocs.	215-356-5000
Tex	Dallas, Scott Tech. Sls.	214-352-7698
Utah	Salt Lake City, Straube Assocs.	801-328-4513
Wash	Bellevue, W.M. Buehler Co.	206-455-5512
Wisc	Milwaukee, G. McL. Cole Co.	414-545-6083

PRECISION MECHANISMS CORP., 44 Brooklyn Ave., Westbury, N.Y., 11590, Tel: 516-ED 3-5955; FSC No: 08127; Empl.: 24 p. 1*1200, 1919

For info on price: M. Gagnon; Application info: L. N. Canick; Customer service: M. Kornhauser; Delivery info: M. Gagnon

Free literature available: Bulletins 102, 103, 104, 106, 108, 109, 110 Designer's manual for assembly large variety geared mechanisms from stocked components. Self contained infinitely adjustable cam switches, limit stops. Slip clutches and antibacklash gears. Bulletin III tape perforator.

Products manufactured: Actuators, Clutches, Controls/Control Eqp., Couplings, Drives & Drive Mechanisms (Dial), Gears & Gear Mechanisms (Precision), Indicators, Kits, Breadboards (For Engineers), Limit Stops, Mechanical, Perforators, Reducers, Servo Systems, Switches, Timers

Local Sales Offices & Reps.

Cal	Cupertino, Eakins ASSOC.	408-255-6494
NY	Rochester, A & D Devices	716-586-8033

PRECISION METAL PRODS. CO., 41 Elm St., Stoneham, Mass., 02180, Tel: 617-438-3650, TWX: 710-393-0113; FSC No: 86577; Empl.: 54; Minimum order: \$10

For info on price: R. A. Waite; Application info: C. F. Gerry; Customer service: R. D. Weadick; Delivery info: R. D. Weadick

Free literature available: PRESSSETS-CAPTIVE HARDWARE: 24-page catalog describing inserts and studs for thin metal and thread strength. No special tools required. TERMINALS-MINI-PINS: Complete 40-page booklet describing contact pins and soldering terminals for printed circuits and module applications.

Products manufactured: Fasteners, Pins, Spacers, Terminal Blocks, Boards & Strips, Terminals

Local Sales Offices & Reps.

Ariz	Phoenix, J. Osborn Assocs.	602-996-1291
Cal	Corte Madera, P. Oneal & Assocs.	415-924-1691
Cal	Garden Grove, Impact Elctns., Inc.	213-431-3581
Colo	Denver, McLoud & Raymond Co.	303-756-1589
Fla	Winter Park, Steele Tech. Sls.	305-644-6641
Ga	Atlanta, Mr. G. O'Hara	404-237-0600
Ill	Chicago, Rusz Sls. Co.	312-631-7322
Ind	Fort Wayne, New/Era Sls., Inc.	219-432-1164
Ind	Indianapolis, New/Era Sls., Inc.	317-257-7333
Md	Baltimore, M/E Assocs.	301-825-1130
Mass	Andover, Sls. Engrg. Co.	617-470-0800
Mich	Lathrup Village, R.C. Nordstrom & Co.	313-559-7373
Minn	Hopkins, F. Peterson Co.	612-941-5400
NJ	Cherry Hill, M/E & Assocs.	609-667-6110
NY	Mount Vernon, Zauderer Assocs., Ins.	914-664-7385
NY	Syracuse, C.W. Floring & Assocs.	315-478-2149
Ohio	Cleveland, Electro-Com	216-886-2404
Ohio	Dayton, Electro-Com	513-276-3993

PRECIS

MANUFACTURERS & SALES OFFICE DIRECTORY

Tex Arlington, Chaparral Inds.817-265-2418
 Wash Kirkland, W.J. Stulgis Co.204-822-3867
 FOR: Can., Ville St. Laurent, P.Q., A. Deskin Sls. Corp.
 514-331-2860

PRECISION MONOLITHICS INC., 1500 Space Dr.,
 Santa Clara, Cal., 95050, Tel: 408-246-9222, TWX:
 910-338-0528; Empl.: 250 p. 1-893

Products manufactured: Amplifiers, Converters,
 Drivers & Decoders For Readouts, Integrated
 Circuit Devices, Transistors

Local Sales Offices & Reps.

Ala Huntsville, W.A. Brown Comps.205-539-4411
 Ariz Tempe, Argus Sales, Inc.602-967-8709
 Cal El Toro, Elctn. Comp. Mktg.714-830-3939
 Cal Newport Beach, R. Debowey714-752-1760
 Cal San Diego, Elctn. Comp. Mktg.714-295-6122
 Cal Woodland Hills, Elctn. Comp. Mktg.213-340-1745

Colo Englewood, Checkmate Sls.303-771-4920
 Conn Wallingford, Com-Sale203-269-7964
 Fla Ft. Lauderdale, W.A. Brown Comps.305-776-4800

Fla Orlando, W.A. Brown Comps.305-425-5505
 Ga Atlanta, W.A. Brown Comps.404-457-4069
 Ill Arlington Heights, J. Kennaugh312-437-6697
 Ill Chicago, G. McL. Cole Co.312-774-3535
 Ind Indianapolis, Jerry Ihrig Assoc., Inc.317-783-7630

Md Baltimore, Stemler Assocs.301-944-8262

Mass Waltham, Com-Sale617-890-0011

Mich Detroit, A. Blumenberg Assocs.313-557-1934

Minn St. Paul, Cahill Assocs.612-646-7217

Mo Hazelwood, Dytronix, Inc.314-731-5799

Mo Kansas City, Dytronix, Inc.816-761-6543

NJ Cherry Hill, Stemler Assocs.609-966-4070

NJ Keesbey, Addem II516-567-5900

NJ Laurel Springs, Stemler Assocs.215-644-3477

NM Albuquerque, Thorson Co.505-265-5655

NY Huntington Station, Addem516-567-5900

NY Rochester, Ontec Assocs.716-464-8636

NY Smithtown, Sales Office (Mr. Mike Neidich)516-785-3331

NC Raleigh, W.A. Brown Comps.919-876-9061

NC Winston-Salem, W.A. Brown Comps.919-725-5384

Ohio Cleveland, D. Steffen & Assocs.216-461-8333

Ore Portland, S.J. Corp.713-772-0730

Tex Houston, Oeler & Menelaides, Inc.214-234-6334

Utah Salt Lake City, Checkmate Sales801-268-3533

Va Alexandria, Stemler Assocs.703-548-7818

Wash Seattle, Showalter-Judd, Inc.206-624-9020

Wisc Milwaukee, G. McL. Cole Co.414-545-6083

PRECISION PAPER TUBE CO., 1049 S. Noel Ave.,
 Wheeling, Ill., 60090, Tel: 312-537-4250; Empl.: 185;
 Minimum order: \$35

Customer service: D. Speer

Products manufactured: Bobbins, Winding, Coil &
 Transformer, Bumpers, Bushings, Glass, Plastic,
 Metal, Rubber, Etc., Caps, Forms & Tapes, Heat
 Shrinkable, Caps, Lenses, Indicator Light, Coils
 Including Assemblies & Forms, Connectors,
 Containers, Covers, Protective (Including Dust),
 Cups, Encapsulation, Grommets, Insulators &
 Insulation, Laminates, Machines/Machinery,
 Production, Shafts & Adapters, Shields, Spacers,
 Tubing

Local Sales Offices & Reps.

Ariz Phoenix, Tanler & Co.602-279-1252

Cal Los Angeles, C.E. Riggs, Inc./C.D. Lamoree Co.213-225-5631

Conn West Hartford, R.S. Pettigrew & Co.203-233-8533

Mich Grand Junction, Goodell Sls. Co.616-434-6757

Mo St. Louis, Tanler & Co.314-645-0590

NJ Rocky Hill, Krone & Rubin Assoc.609-924-0200

NY Webster, J. Giovenco716-671-6709

Ohio Cincinnati, I.W. Grothouse Assoc.513-385-6562

Ohio Westlake, Buckeye Bobbin & Mfg. Div.216-871-9020

Ore Portland, C.E. Riggs Inc./C.D. Lamoree Co.503-226-3286

Wash Seattle, C.E. Riggs Inc./C.D. Lamoree Co.206-623-5707

EXP: Can., Mississauga, Ont., Anbak Sls., Can., Ltd.416-625-1061

PRECISION RESISTOR CO., INC., 109 U.S. Hwy. 22,
 Hillside, N.J., 07205, Tel: 201-926-3036; FSC No: 48615;
 Empl.: 40; Minimum order: \$25

For info on price: W. F. Kirgan; Application info: R. L.
 Wright; Customer service: W. F. Kirgan; Delivery info:
 W. F. Kirgan

Products manufactured: Resistors, Shunts, Meter,
 Standards

PRECISION STANDARDS CORP., 1701 Reynolds, Santa
 Ana, Cal., 92705, Tel: 714-546-0431, 800-854-3253,
 TWX: 800-854-3253; Empl.: 25; Minimum order: \$25

For info on price: M. Hill; Application info: S. Eitel;
 Customer service: T. Smith; Delivery info: M. Hill

Products manufactured: Bridges, Calibrators,
 Meters, Standards, Testers

Local Sales Offices & Reps.

FOR: Can., Montreal, Que., Electro-design514-363-5120

FOR: Can., Toronto, Ont., Electro-design416-787-0991

FOR: Can., Vanier-Ottawa, Ont., Electro-design613-745-0541

PRECISION TIMER CO., 13 Westbrook Ind'l. Park,
 Westbrook, Conn., 06498, Tel: 203-399-6253; Empl.: 25
 p. 1-268,269

Products manufactured: Clocks (All Types),
 Controllers, Programmable, Controls/Control
 Ept., Converters, Counters, Data Acquisition &
 Reduction Systems, Data Loggers, Delays, Time
 (Excluding Delay Lines, Timers, Delay & Relays,
 Time-Delays), Display Devices/Displays, Dividers,
 Electroplating Equipment & Supplies, Encoders,
 Flashers, Generators, Indicators, Integrated
 Circuit Devices, Meters, Motors, Power Drivers,
 Hybrid (High Current, High Voltage), Process
 Control Systems, Programmers, Recorders,
 Relays, Services, Assembly, Production & Test,
 Standards, Switches, Testers, Timers, Totalizers,
 Digital, Transmitters, Welding Equipment &
 Access. (Excluding Equip. for Semiconductor
 Devices)

Local Sales Offices & Reps.

Conn Westbrook, Precision Timer Co.203-399-6253

Ill Lombard, Quadron Assocs.312-627-6800

Mass Millis, Selmak Assoc.617-376-2914

NH Plaiston, Selmak Assocs., Inc.603-382-4796

PRECISION TUBE, Church Rd. & Wissahickon, No.
 Wales, Pa., 19454, Tel: 215-699-5801, Telex: 84-6439;
 FSC No: 82413; Empl.: 170; Minimum order: \$25

For info on price: M. F. Balch; Application info: A. J.
 West; Customer service: B. Dudinetz; Delivery info: B.
 Dudinetz

Free literature available: Catalog; Semi-rigid coaxial
 cable, cable assemblies, and delay lines made to
 customer's exact specifications.

Products manufactured: Cable, Delay Lines

Local Sales Offices & Reps.

Ariz Scottsdale, Carter Assocs.602-947-4355

Cal Mt. View, Walter Assoc., Inc.415-965-4131

Cal Santa Ana, RMS Assocs.714-556-4155

Fla Melbourne, Hanson Assocs.305-727-7474

Ga Alpharetta, K. Ekmak404-475-4872

Ill Crystal Lake, MESA, Inc.312-639-3359

Ind Indianapolis, Sukup & Cox, Inc.317-253-1215

Iowa Cedar Rapids, Snider Sls. Co.319-362-4410

Mass Burlington, Tri Tek, Inc.617-272-4550

Minn St. Louis Park, Xylem Co.612-920-9626

Mo St. Charles, Buse Sls. Co.314-946-6430

NJ Haddonfield, Sunday-O'Brien609-429-4013

NY Huntington, CDB Enterprises, Inc.516-692-5200

NY Utica, B. D. Hummel Co.315-736-7821

NC Charlotte, McLean Sls. Co.704-366-2675

Tex Richardson, Lawrence Sls.214-235-5504

Va Fairfax, Schibley Assocs.703-591-3008

Wash Seattle, Blum & Assocs.206-285-2590

PREFORMED LINE PRODUCTS CO., Box 91129,
 Cleveland, Ohio, 44101, Tel: 216-461-5200; Empl.: 450;
 Minimum order: \$50

Customer service: W. J. Voelker

Products manufactured: Connectors, Services,
 Assembly, Production & Test, Spacers, Splices,
 wire (including Butt & Cap Types), Wire & Cable
 Ties

Local Sales Offices & Reps.

Ala Birmingham, Belcher & Assocs.205-322-1733

Ala Birmingham, Glenn, Hirshman & Mills205-591-6520

Ark Little Rock, C.H. Stout, Inc.501-374-8201

Ark Rogers, Preformed Line Prods. Co.501-636-7600

Cal Palo Alto, Preformed Line Prods. Co.415-493-0170

Cal San Francisco, K.M. Ryals Co.415-495-7090

Cal Woodland Hills, Smith Co. Div.213-887-8600
 Colo Denver, Peterson Co.303-388-6322
 Colo Littleton, R.J. Hodona303-798-6729
 Fla Jacksonville, Belcher & Assocs.904-724-7811
 Fla Long Wood, Belcher & Assocs.305-830-7327
 Fla Miami, Belcher & Assocs.305-371-1700
 Fla St. Petersburg, Belcher & Assocs.813-822-3531

Ga Atlanta, Belcher & Assocs.404-255-5481

Ga Decatur, Glenn, Huhman & Mills, Inc.404-284-4431

Ga Tucker, Preformed Line Prods. Co.404-938-6820

Haw Honolulu, J.W. Smith808-988-3079

Ill Schiller Park, JSG Elec. Co.312-678-5990

Ind Indianapolis, Cory, Crum & English, Inc.317-545-8593

Iowa Cedar Rapids, F.C. Clatterbaugh Co.319-364-5557

Iowa Des Moines, F.C. Clatterbaugh Co.515-282-3213

Ky Bowling Green, Dyer-Pederson Agency502-842-9346

Ky Lexington, Dyer-Pederson Agency606-266-7412

Ky Morganfield, Dyer-Pederson Agency502-389-1744

La Baton Rouge, C.H. Stout of La. Inc.504-927-8097

La New Orleans, C.H. Stout of La. Inc.504-486-3707

La Shreveport, C.H. Stout of Shreveport, Inc.318-425-5485

Md Annapolis, P.J. Martini & Assocs.301-267-7462

Md Reisterstown, Electrical Distributors Co.301-833-4604

Mass Framingham, E.L. Flowers & Sons617-879-4250

Mich Dearborn, G.R. Horne & Co.313-561-1360

Mich Jackson, G.R. Horne & Co.517-536-4387

Minn Faribault, Dale E. Putrah & Assoc.507-334-4431

Minn Minneapolis, Bergstrom-Verberg Co.612-FE9-0028

Miss Jackson, C.H. Stout of MS, Inc.601-354-4326

Mo Kansas City, Cleaves-Bessmer, Inc.816-353-6011

Mo St. Louis, Ken Way Co.314-961-3062

Neb Lincoln, F.C. Clatterbaugh Co.402-489-5912

Neb Omaha, Preformed Line Prods.402-391-6570

NM Albuquerque, McKinley Sls. Co.505-294-7349

NY Eastchester, M.N. Snyder & Sons, Inc.914-337-6000

NY Horseheads, Canavan-Scanlon Assoc.607-739-0810

NY Rochester, Canavan-Scanlon Assoc.716-442-0720

NY Syracuse, Canavan-Scanlon Assoc.315-437-1271

Ohio Vermilion, R.S. Howley Co.216-967-7000

Okla Oklahoma City, C.B. Anderson Elec. Co.405-751-2771

Okla Tulsa, C.B. Anderson Elec. Co.918-TE6-4661

Ore Portland, Shaffer & Nelson, Inc.503-234-7437

Pa Conshohocken, Electrical Distributions Co.215-825-1305

Pa Pittsburgh, Burns Elec. Co.412-823-5874

SC Columbia, Engr. Sls. Co. of Carculina, Inc.803-253-4004

Tenn Memphis, C.H. Slout of TN, Inc.901-362-1616

Tenn Nashville, J.S. Baron Assocs.615-883-4748

Tex Dallas, E.B. Robertson, Inc.214-942-2711

Tex Houston, E.B. Robertson, Inc.713-785-6800

Tex Lubbock, E.B. Robertson, Inc.806-746-6527

Tex Rio Hondo, B.J. Kohler Assocs.512-226-5184

Tex San Antonio, E.B. Robertson, Inc.512-824-0597

Utah Salt Lake City, Shaffer & Nelson, Inc.206-523-0664

Wash Seattle, Shaffer & Nelson, Inc.206-523-0664

Wash Spokane, Shaffer & Nelson, Inc.509-624-1339

PREMAX PRODS. DIV., Chisholm-Ryder Co., Highland &
 College Aves., Niagara Falls, N.Y., 14305, Tel:
 716-285-9186; FSC No: 74183; Empl.: 350; Minimum
 order: \$15

For info on price: M. A. Finley; Application info: J.
 Maglio; Customer service: M. A. Finley; Delivery info:
 M. A. Finley

Products manufactured: Antennas, Mounts, Rods,
 Ground

Local Sales Offices & Reps.

Ariz Phoenix, Sheffer-Kahn Co.602-258-7893

Cal Culver City, DeAngelo, Rotham & Co.213-398-6239

Cal La Selva Beach, Belchamber & French408-722-0444

Colo Denver, G. Moss Elctnrs., Inc.303-985-8815

Colo Greeley, G. Moss Elctnrs., Inc.303-353-1452

DC	Washington, S.K. Macdonald, Inc.	202-265-3938
Kans	Shawnee Mission, K & M Sls. Co.	913-262-2444
La	La Combe, Scott Ormsby & Assocs.	504-882-7248
Md	Baltimore, S.K. Macdonald, Inc.	302-254-3380
Mass	Northboro, W.B. Pray Sls., Inc.	617-393-3434
NY	Rockville Centre, L.L. Willgold Elctn. Sls. Corp.	516-764-4022
Ohio	Cincinnati, J.O. Olsen Co.	513-825-0678
Ohio	Cleveland, J.O. Olsen Co.	216-752-5444
Ore	Portland, R.M. Minthorne Co.	503-246-4556
Pa	Philadelphia, S.K. Macdonald, Inc.	215-545-1205
Pa	Pittsburgh, S.K. Macdonald, Inc.	412-366-2643
Tex	Carrollton, E. L. Wilks Co.	214-242-5321
EXP:	New York City, N.Y., M. Simons & Son Co.	212-227-5513

PREMIER METAL PRODS. CO., Div. Sunshine Mining Co., 337 Manida St., Bronx, N.Y., 10474, Tel: 212-991-6600; Empl.: 70; Minimum order: \$25
p. 1-80-91

Free literature available: Cabinets and Enclosures Catalog: 16 pages in full color (Trimline Series); 30 pages Illustrated General Lines and Accessories; 24 pages of technical drawings.

Products manufactured: Blowers & Fans & Accessories, Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chassis, Metal, Drawers, Sliding, Frames, Cabinet & Rack, Grilles, Guides, Circuit Board, Handles For Cabinets, Circuit Boards, Racks, etc., Panels, Racks, Slides, Cabinet & Chassis

Local Sales Offices & Reps.

Ala	Birmingham, Adams & Assocs.	205-822-8109
Ariz	Scottsdale, G. DARCI	602-948-2240
Cal	Culver City, DeAngelo, Rothman & Co.	213-398-6239
Cal	Menlo Park, G.R. McKnight Co.	415-325-2844
Conn	Meriden, Eagle Assocs.	203-467-6542
Fla	Orlando, Adams & Assocs.	305-894-7185
Ga	Decatur, Adams & Assocs.	404-981-2207
Ill	Chicago, Ellinger Sls.	312-763-1570
Md	Towson, Habco Elctnrs.	301-825-9637
Mass	Needham, Eagle Assocs.	617-444-3446
Minn	Minneapolis, J.E.M. Anderson Co.	612-823-6459
Mo	Kansas City, R.R. Burton Sls. Co.	816-444-8300
Mo	St. Louis, Delltron Co.	314-869-1351
NY	Liverpool, Lewis-Dunnigan Co.	315-622-2133
NY	Mt. Vernon, Sonkin Assocs.	914-668-9809
NY	New Hyde Park, Harris & Aldrich Sls.	516-488-2622
NC	Greenboro, Adams & Assocs.	919-272-6838
Ohio	Cleveland, ImTech Inc.	216-826-3400
Pa	Easton, E-K-P Assocs.	215-258-6477
Pa	Philadelphia, Eastern Instrumentation	215-927-7777
Tenn	Knoxville, Adams & Assocs.	615-577-4241
Tex	Garland, G.V. Peck	214-341-8311
Tex	Houston, G.V. Peck	713-MO4-1435
EXP:	Hallandale, Fla., Emec, Inc.	305-925-6366

Local Distributors

Ala	Opelika, Southern Elctnrs., 309 S. 10th St.	205-745-6478
Cal	Burlingame, Rose Elec. Dists., 846 Stanton Rd.	415-697-0224
Cal	San Jose, Quement Elctnrs., Box 6000, 1000 S. Bascom Ave.	408-998-5900
Conn	Bridgeport, Westconn Elctnrs. Inc., 195 Colorado Ave.	203-367-7747
Conn	E. Hartford, R & S Elctn. Dist., 95 Leggett St.	203-528-9901
Conn	Waterbury, Bond Radio Elec. Co., 439 W. Main St.	203-757-0546
Fla	Miami, Electronic Equip. Co., 2701 N.W. 42nd Ave.	305-871-3500
Ind	Ft. Wayne, Ft. Wayne Ele. Supply, 3606 E. Maumee Ave.	219-423-8422
Ind	Indianapolis, Graham Elctnrs., 133 S. Pennsylvania St.	317-634-8486
La	Lafayette, Ralph's Elctnrs., 1732 Plank Rd.	504-344-3761
Md	Bethesda, Empire Elctn. Supply, 4907 Rugby Ave.	301-OL-6-3300
Mass	Boston, Sager Elctn. Corp., 172 High St.	617-542-2281
Mass	Newton, Greene Shaw Co., Chapel Bridge Pk., 70 Bridge St.	617-WO-9-8900
Mich	Ann Arbor, Purchase Radio Supply, 327 E. Hoover Ave.	313-668-8696
NJ	Edison, William Elctnrs., 1863 Woodbridge Ave.	201-985-3700
NJ	Hanover, State Elctnrs. Pts., 36 Route # 10	201-887-2550

NJ	Springfield, Federated Purchasers, 155 U.S. Rte. #22	212-DI-9-3050
NJ	Springfield, Route Elctnrs., Echo Plaza Rte. 22	201-467-0166
NJ	Union City, Nidisco Inc., 2812 Kennedy Blvd.	201-863-2111
NY	Albany, E. E. Taylor Co., 465 Central Ave.	518-438-4461
NY	Buffalo, Summit Dists., 916 Main St.	716-884-3450
NY	Elmsford, Ancar Elctnrs. Supply, One Nepperhan Ave.	914-LY-2-7100
NY	Farmingdale, Arrow Elctnrs. Inc., 900 Broad Hollow Rd.	212-995-2100
NY	Farmingdale, Broadline Elec. Dist., 119 Marine St.	516-420-8320
NY	Hempstead, Electronics Equip. Co., 741 Peninsula Blvd.	212-895-5757
NY	L.I.C., H.L. Dalis, Inc., 35-35 24th St.	212-361-1100
NY	Lynbrook, Peerless Radio Dist. Corp., 19 Wilbur St.	212-523-3456
NY	New York, Martin Audio Corp., 320 W. 46 St.	212-541-5900
NY	Poughkeepsie, Chief Elctnrs., 14 N. Bridge St.	914-471-1300
NY	Rochester, Summit Dists., 292 Commerce Dr.	716-334-8110
NY	Rockville Ctr., Midway Indl., 24 Maple Ave.	516-764-2400
NY	Syosset, Lafayette Radio Corp., 111 Jericho Tpke.	516-921-7700
NY	White Plains, Westchester Elctnrs., 602-610 Mamaroneck Ave.	914-965-1063
NY	Woodbury, Harvey Radio Corp., 60 Crossways Pk. W.	516-895-9260
Ohio	Dayton, ESCO Inc., 221 Crane St.	513-226-1133
Pa	Allentown, A. A. Peters, 404 Union Blvd.	215-434-5237
Pa	Altoona, Allegheny Elctnrs., 800 Chestnut Ave.	814-946-0871
Pa	Philadelphia, Herbach & Rademan, 401 E. Erie Ave.	215-426-1700
Pa	Philadelphia, Philadelphia Elctnrs., 112 N. 12th St.	215-568-7400
Pa	Philadelphia, Simco Inc., 3907-11 N. Broad St.	215-BA9-1880
Pa	Reading, Barbey Elctnrs., Inc., 333 N. 4th St.	215-376-6116
Pa	West Chester, West Chester Elec. Supply, 716 E. Market St.	215-696-7500
RI	Providence, Wm. Dandreta Co., 28 Wolcott St.	401-861-2800
RI	Warwick, W.H. Edwards Inc., 55 Electric Dr.	401-781-8000
Tex	Dallas, All State O.E.M. Div., Summer Elec. Co., 510 S. Good Latimer Expwy.	214-651-0242
Tex	Ft. Worth, Swico Inc., 1512-18 E. Lancaster	817-335-6521
Tex	Houston, Lenet Co., 1420 Hutchins	713-225-1465
Va	Arlington, Arlington Elctnrs., 3636 Lee Hwy.	703-524-2412
Wash	Seattle, Radar Elec. Co., 168 Western Ave. W.	206-282-2511

PREMIER MICROWAVE, 35 New Broad St., Port Chester, N.Y., 10573, Tel: 914-939-8900; FSC No: 15870; Empl.: 60; Minimum order: \$100
Customer service: J. Simmonds

Free literature available: Brochures illustrating "Rotary Joints," "MICROWAVE FILTERS" "MICROWAVE FRONT ENDS" and "MICROWAVE FERRITE DEVICES."

Products manufactured: Adapters, Waveguide, Amplifiers, Antenna Feed Systems, Antennas, Attenuators, Bends & Twists, Microwave, Cavities, Microwave, Chokes, Circulators, Ferrite, Converters, Couplers, Couplings, Delay Lines, Detectors, Discriminators, Dividers, Dummy Loads, Duplexers, Microwave, Filters, Flanges, Waveguide, Gaskets, Shielding, R-F-Also See Shields, R-F, Generators, Horns, Microwave, Impedance Converters, Microwave, Isolators, Joints, Rotary, Microwave, Junctions, Hybrid, Microwave, Line Stretchers, Microwave, Meters, Mismatches, Microwave, Precision, Mixers, Modulators, All Kinds, Mounts, Networks, Preslector-Mixers, Preslectors, Probes, Receivers, Shifters, Shutters, Microwave, Slotted Lines, Microwave, Strip-Line Components, Microwave, Switches, Tees, Terminals, Transformers, Transmitters, Tubing, Tuners, Waveguides & Adapters

Local Sales Offices & Reps.

Ariz	Scottsdale, O.E.M. Specialties	602-948-3360
Cal	No. Hollywood, Crown Elctn.	213-877-3550

Cal	San Mateo, Melvin Sls. Co.	415-349-7444
Fla	Orlando, BC Elctnrs. Sls. Corp.	305-894-6071
Ga	Smyrna, BC Elctnrc. Sls. Corp.	404-436-5169
La	Metairie, J. F. McKinney Sls. Co.	504-887-1723
Md	Catonsville, Callas Elctnrs. Dist.	301-744-7711
Mass	Natick, Gerald-Rosen Co.	617-879-5505
Mo	St. Louis, G Fixman Engrg.	314-725-5219
NY	Huntington, C.D.B. Entrps.	516-692-5220
Ohio	Dayton, BEK Assocs.	513-278-1343
Okla	Tulsa, J. F. McKinney Sls.	918-742-6791
Tex	Bellaire, J. F. McKinney Sls. Co.	713-665-3653
Tex	Dallas, J. F. McKinney Sls.	214-631-9450
Va	Vinton, BC Elctnrc. Sls. Corp.	703-890-1128
EXP:	Cal., No. Hollywood, Air Frame Mfg. & Supply	213-765-2600
EXP:	New York, N.Y., Singer World Prods. Inc.	212-432-1400
FOR:	Can., Ville Lasalle 650, Que., Electrodesign Ltd.	514-363-5120

PRESS-ON PRODS., 39 Factory Rd., Addison, Ill., 60101, Tel: 312-543-9466; Empl.: 40

For info on price: T. Cummins; Application info: T. Cummins; Customer service: J. Tonne; Delivery info: J. Tonne

Free literature available: Catalog with samples attached of various Type gasketing tapes (pressure sensitive adhesive backed).

Products manufactured: Services, Assembly, Production & Test, Tapes, Electrical Insulation, Tapes, Films & Foils, Pressure Sensitive

PRESIN CO., INC., Trap Falls Rd., Shelton, Conn., 06484, Tel: 203-929-5381; Empl.: 150

Customer service: Sls. Desk

Products manufactured: Capacitors, Fixed, Controls/Control Eqpt., Counters, Networks, Printers, Protectors, Recorders, Suppressors, Timers, Totalizers, Digital

Local Sales Offices & Reps.

Cal	Montebello, Tucul Engrg.	213-728-7397
Cal	San Carlos, Electro Pacific	415-593-1334
Colo	Denver, Tessco	303-744-1119
Fla	Hialeah, Shaw Engrg. & Sls.	305-822-6141
Ill	Arlington Heights, Martec Assocs.	312-956-8090
Md	Towson, Kraft Elctn.	301-828-5838
Mich	Detroit, R.P. Urban & Associates	313-535-2355
Mich	Grand Rapids, R.P. Urban & Associates	616-245-0511
Minn	Mpls., Wenco Sls.	612-866-3639
NJ	Ridgewood, Ballou, Inc.	201-444-6990
NY	New Hartford, KLM Associates Inc.	315-735-8525
NY	Rochester, KLM Associates Inc.	716-442-0821
NY	Syracuse, KLM Associates Inc.	315-458-2199
NY	McLeansville, Ron Ingle Assoc.	919-697-0787
Ohio	Chagrin Falls, J. Kilroy	216-247-8997
Pa	Newtown Sq., Holdsworth	215-356-8550
Tex	Dallas, Glidden Engrg. & Elctn. Equip. Corp.	214-363-6539
Tex	Houston, Glidden Engrg. & Elctn. Equip. Corp.	713-681-1415
Wash	Seattle, R. Johnston Co.	206-524-5170

PRESTOLITE WIRE DIVISION, An Eltra Co., Box 649, Port Huron, Mich., Tel: 313-985-6131

Products manufactured: Cable, Wire

PRESTON SCIENTIFIC INC., 805 E. Cerritos Ave., Anaheim, Cal., 92805, Tel: 714-776-6400, Telex: 66-5432; Empl.: 85; Minimum order: \$25

p. 1-12, 13, 194-199

For info on price: N. Hummel, 714-776-6400; Application info: N. Hummel, 714-776-6400; Customer service: C. Currier, 714-776-6400; Delivery info: M. Montooth, 714-776-6403

Free literature available: Amplifier (DC) Technical Data Sheets: 8300XWB Series, XWBRC Series, Amplifier User Survey Report, Balanced Precision-Technical Discussion of CMV/CMRR, Bias Current Drift, 10 New Options Brochure, A/D Conversion Technical Data Sheets: GMAD1, 2 & 3 ADC Systems, GMAD-01 Ultra East (1 to 10 MHz) ADC, GMAD4 ADC Systems, Data Acquisition Systems & Components.

Products manufactured: Amplifiers, Converters, Data Acquisition & Reduction Systems, Multiplexers

Local Sales Offices & Reps.

Ala	Huntsville, Int'l. Scientific Instrs.	205-837-1601
Ariz	Scottsdale, Williams Assocs.	602-947-4297
Cal	Anaheim, Preston-Ana	714-776-6400
Cal	San Jose, MCH Assocs.	408-246-7330
Colo	Denver, Williams Assocs.	303-373-4730

Conn	Avon, Inst. Dynamics Inc.	203-678-1088
Fla	Orlando, Truex Assocs.	305-859-2160
Ind	Indianapolis, Holsapple & Assocs.	317-899-2890
Kans	Shawnee Mission, Techn. Sls. Assocs.	913-888-3330
Md	Greenbelt, Riffe Assocs.	301-474-8600
Mass	Wakefield, Instr. Dynamics Inc.	617-245-5100
Mich	Royal Oak, Hocker Assocs.	313-549-3910
Mo	Ferguson, Techn. Sls. Assocs.	314-725-5361
NM	Albuquerque, Williams Assocs.	505-255-1638
NY	Pittsford, Ossmann Instruments	716-385-2770
NY	Westbury, Tech-Rep Engrg. Sls.	516-997-7946
NC	Winston-Salem, Radco	919-722-9671
Ohio	Dayton, Hocker Assocs.	513-298-8638
Ohio	N. Olmsted, Hocker Assocs.	216-734-4433
Pa	Jenkintown, Stein Instrumentation Corp.	215-885-2370
Tex	Dallas, R. Martin Assocs.	214-361-8584
Tex	Houston, R. Martin Assocs.	713-462-4077
Wash	Bellevue, Brennan Assocs.	206-454-9332

PRIME COMPUTER INC., 145 Pennsylvania Ave., Framingham, Mass., 01701

PRIMO COMPANY LTD., 25-1, 6-Chome, Mure, Mitakashi, Tokyo, Japan, Tel: 0422-43-3121, Telex: 2822-326J; Empl.: 400 p. 1-30

Products manufactured: Comm. Systems, Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds

Local Sales Offices & Reps.

Ill Chicago, Primo Microphone Inc. 312-595-1022

PRIMO MICROPHONE INC., 2468 Delta La., Elk Grove Village, Ill., 60007, Tel: 312-595-1022, Telex: 28-3474; Empl.: 6

Products manufactured: Handsets, Chestsets, Headphones, Headsets, Etc., Meters, Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds, Mixers, Transformers

Local Sales Offices & Reps.

Ind Fort Wayne, Morris-Cunningham Assoc. 219-485-3612

Ind Indianapolis, Morris-Cunningham Assoc. 317-255-2548

Tex Addison, Parvin Sls. 214-661-5374

Tex Houston, Parvin Sls. 713-784-9900

PRINCETON APPLIED RESCH. CORP., Box 2565, Princeton, N.J., 08540, Tel: 609-452-2111, Telex: 84-3409; Empl.: 225; Minimum order: \$50

For info on price: S. Elkins; Application info: S. Letzter; Customer service: S. Elkins; Delivery info: S. Elkins

Free literature available: Photon Counting Catalog #T-335, contains complete specifications on Princeton Applied Research Corporation ratemeters, digital counters, amplifier discriminators, quantum photometers and photon counting accessories. Signal Averager Catalog #T-220B, contains complete specifications of our Model 162 Dual Channel Boxcar, Model 160 Single Channel Boxcar, Model TDH-9 100 Point Averager and Model CW-1 Single Channel Boxcar. Preamplifier specifications and accessories as well as several application summaries are included.

Lock-In Amplifiers Catalog #T218B contains complete specifications of all Princeton Applied Research Lock-ins, light choppers, ratemeters, low noise preamplifiers and current sensitive preamps. This Lock-In catalog also contains short section on How Lock-ins work, where to use them, how to choose one, a section on noise and 9 typical applications. Optical Multichannel Analyzer Catalog #T-336 describes Princeton Applied Research's 500 channel OMA. Complete specs on our Model 1205B Detector assembly. Model 1205D Intensified Detector Head and Model 1205E IR Enhanced Vidicon Detector Head. Cooled Detector Heads are also described as well as several application summaries.

Products manufactured: Amplifiers, Analyzers, Cases, Equipment, Instrument, Meter, Controls/Control Eqpt., Converters, Data Acquisition & Reduction Systems, Detectors, Indicators, Integrators, Electronic, Magnetometers, Meters, Monitors, Multipliers, Signal Averagers, Signal Conditioners & Equipment, Transducers, Transformers

Local Sales Offices & Reps.

Cal Anaheim, Princeton Applied Resch. Corp. 714-635-6710

Cal Burlingame, Princeton Applied Resch. Corp. 415-347-0786

Colo	Denver, GRIFCO	303-722-4674
Fla	Orlando, E. G. Holmes & Assoc.	305-894-8901
Ga	Chamblee, H. G. Holmes & Assoc.	404-451-6161
Ill	Deerfield, Princeton Applied Resrch. Corp.	312-498-5858
Kans	Shawnee Mission, EIR Co.	913-362-0919
Md	Rockville, Princeton Applied Resch. Corp.	301-881-3120
Mass	Bedford, Princeton Applied Resch. Corp.	617-275-2100
Mo	Hazelwood, EIR Co.	314-895-4100
NM	Albuquerque, Fry Gates Co.	505-298-1875
Ohio	Cleveland, Princeton Applied Resrch. Corp.	216-333-1244
Tex	Dallas, Southwestern Engrg. & Equip. Co.	214-826-6661
Tex	Houston, Southwestern Engrg. & Equip. Co.	713-623-2580
Va	Virginia Beach, E. G. Holmes & Assoc.	804-481-6556

FOR: Can., Longueuil, Quebec, Allan Crawford Assoc. 514-670-1212

FOR: Can., Mississauga, Ont., Allan Crawford Assoc. 416-678-1500

FOR: Can., Ottawa, Ont., Allan Crawford Assoc. 613-829-9651

FOR: Can., Vancouver, B.C., Allan Crawford Assoc. 604-253-7136

PRINCETON ELCTR. PRODS., Box 101, New Brunswick, N.J., 08902, Tel: 201-297-4448; Empl.: 70

For info on price: W. M. Herbener; Application info: R. Lenskold; Customer service: R. Lenskold; Delivery info: R. Lenskold

Products manufactured: Comm. Systems, Converters, Counters, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Detectors, Display Devices/Displays, Integrators, Electronic, Memories, Buffer, Scanners, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic), Tubes

Local Sales Offices & Reps.

Ariz Phoenix, Moxon Elctns. 602-273-7363

Cal Irvine, Moxox Elctns. 714-556-6500

Cal San Diego, Moxon Elctns. 714-292-4820

Cal Sunnyvale, Moxox Elctns. 408-249-2491

DC Washington, QED Elctns. 301-588-8134

Ind Fort Wayne, R. O. Whitesell & Assoc. 219-432-5591

Ind Indianapolis, R. O. Whitesell & Assoc. 317-359-9283

Ky Louisville, R. O. Whitesell & Assoc. 502-893-7303

Md Rockville, Wiltronix 301-460-1454

Mass Cambridge, Media Systems 617-876-0164

Mich Farmington, George Tallman 313-557-0974

Mich Southfield, R. O. Whitesell & Assoc. 313-358-2020

Mich St. Joseph, R. O. Whitesell & Assoc. 616-983-7337

Ohio Columbus, R. O. Whitesell & Assoc. 614-888-9396

Ohio Lakewood, R. O. Whitesell & Assoc. 216-228-7525

Okla Norman, Data Marketing Assoc. Inc. 405-364-8320

Pa Norristown, Data Engrg. Co. 215-272-1444

Pa Pittsburgh, R. O. Whitesell & Assoc. 412-344-7277

Tex Dallas, Data Marketing Assoc. Inc. 214-661-0300

Tex Houston, Data Marketing Assoc. Inc. 713-686-9627

PRINTACT RELAY DIV., Executone Inc., Box 1430EM, Long Island City, N.Y., 11101, Tel: 212-EX2-4800; Empl.: 500 p. 1-1683

Products manufactured: Relays

Local Sales Offices & Reps.

Cal Orange, Sales & Mktg. Assoc. 714-997-5720

Cal San Francisco, R. Slater 415-392-9154

Cal Tarzana, R. Capell Co. 213-987-2233

Colo Colorado Springs, E.M.C./P. Hale 303-244-3217

DC Washington, H. Wise 202-363-9417

Ill Chicago, A. Woods & Assoc. 312-283-7400

Ind Indianapolis, Marketing Engineers 317-546-1523

Mass Wakefield, Measurement Equip. Co. 617-245-4870

Mich Dearborn Hgts., Ankofski Assoc. 313-565-6330

Minn Anoka, K. Haugen & Assoc. 612-421-3395

Mo Grandview, K-MAR Engrg. & Sls. 816-763-3466

NM Albuquerque, IMEC 505-883-9010

NY Jamaica, S.A.M. Assocs. 212-658-8881

Ohio Englewood, AD-EL-TEK 513-836-2741

Pa Phila., H. Goodman 215-CH 7-7116

Wash	Seattle, R. R. Slater	206-622-3860
FOR:	Can., Toronto, Ont., ANRO Electronic Ltd.	416-661-2607

PROCESS & INSTRS. CORP., 1943 Broadway, Brooklyn, N.Y., 11207, Tel: 212-452-8380; Empl.: 28

For info on price: E. Greenspan; Application info: J. Greenspan

Free literature available: Our firm designs and manufactures scientific instruments as per enclosed circular.

Products manufactured: Services, Assembly, Production & Test

PRODUCTION DEVICES, 7857 Raytheon Rd., San Diego, Cal, 92111, Tel: 714-278-1141

Customer service: D. Press

Free literature available: Brochures on all products-8 1/2 x 11.

Products manufactured: Generators, Machines/Machinery, Production, Probes, Testers

Local Sales Offices & Reps.

Ala Huntsville, Elmar Assocs. 205-881-0274

Ariz Phoenix, B. G. Sls. Co. 602-266-7252

Cal Encino, Wayne Dinsmore 213-622-2849

Cal San Francisco, Technical Sls. Assocs. 415-467-1434

Cal Simi, Wayne Dinsmore 805-527-1097

Colo Colorado Springs, Norris & Co. 303-635-9319

Colo Denver, Norris & Co. 303-988-6430

Ga Atlantic, Elmar Assocs. 404-261-4345

Ill Chicago, Markal Sls. Corp. 312-282-5800

Ind Indianapolis, Mid-Central Sls. Co. 317-283-1727

Ky Louisville, Mid-Central Sls. Co. 502-239-5614

Md Silver Springs, Sherr Assocs. 301-593-2477

Mass Lynn, Keene Sls. Co. 617-595-2300

Minn Minneapolis, John E. M. Anderson Co. 612-823-6459

Mo St. Louis, Baumhauer & Assocs. 314-843-4123

NY Massapequa Park, Brown Elctn. Sls. 914-779-7330

NY Rochester, Brown Elctn. Sls. 716-266-2728

NY Yonkers, Brown Elctn. Sls. 914-779-7330

NC Burlington, E. P. Ester Co. 919-584-1568

Ohio Cleveland, H. Miller Sls. Co. 216-321-3900

Ohio Jamestown, Hank Miller Sls. 513-675-2059

Ore Portland, R. M. Minthorne Co. 503-246-4556

Pa Pittsburgh, R. Miller Sls. 412-782-1882

Tex Dallas, Berthold Sls. Co. 214-526-8329

PRODUCTS FOR RESEARCH, INC., 78 Holten St., Danvers, Mass., 01923, Tel: 617-774-3250, Telex: 94-0287; Empl.: 26

Customer service: H. Martin

Free literature available: Catalogue No. 103 gives complete performance and general spec's on our entire line of photomultiplier housing and support equipment.

Products manufactured: Chamber, Environmental Test, Oceanographic Equip. (Electronic), Photomultiplier Tube Housings, Power Supplies

Local Sales Offices & Reps.

Cal North Hollywood, O'Halloran Assocs. 213-877-0173

Cal Palo Alto, O'Halloran Assocs. 415-326-1493

Cal San Diego, O'Halloran Assocs. 614-779-2824

Ill Aurora, Dwight Smith & Assoc. 312-896-0828

Md Wheaton, Applied Science Mktg. 301-933-2566

NM Albuquerque, Thorson Co. 505-265-5655

Va Vienna, Applied Science Mktg. 703-281-3638

PROGRAM DATA CO., 739 E. 223 St., Carson, Cal., 90745, Tel: 213-830-3016; Empl.: 20; Minimum order: \$25

For info on price: R. Russo 213-830-3016; Application info: R. Russo 213-830-3016; Customer service: R. Russo 213-830-3016; Delivery info: J. Hatfield 213-830-3049

Free literature available: Probing Fixtures, PC Board Test, Probe Contacts, Pneumatic Connectors, Probe Heads, Boards, Programming.

Products manufactured: Boards, Programming, Connectors, Jigs And Fixtures, Chassis & Circuit Board, Probes, Test Systems, Testers

PROGRAMMED POWER, INC., 141 Jefferson Dr., Menlo Park, Cal., 94025, Tel: 415-323-8454, Telex: 34-8323; Empl.: 15; Minimum order: \$20

For info on price: N. Funnell; Application info: R. L. Cooper; Customer service: N. Funnell; Delivery info: N. Funnell

Free literature available: Data sheets and pricing information on our complete family of power line disturbance monitors and frequency converters, including article reprints of interest.

Products manufactured: Converters, Detectors, Inverters, Monitors, Power Supplies, Recorders

Local Sales Offices & Reps.

Ariz	Phoenix, R. A. Mayes Co.	602-279-5243
Cal	Oakland, Advanced Technology	415-452-1401
Cal	Van Nuys, Gordon-Elliott	213-873-6862
Colo	Boulder, R. A. Mayes Co.	303-444-0782
Conn	Hamden, P. Jenks Assocs.	203-281-0810
Fla	Orlando, E. G. Holmes & Assocs.	305-894-8901
Ga	Chamblee, E. G. Holmes & Assocs.	404-451-6161
Haw	Honolulu, Aloha Assocs.	808-941-1574
Ill	Glen Ellyn, J.T. Becker Assocs.	312-858-1911
Ind	Indianapolis, Holsapple Assocs.	317-899-2890
Kans	Olathe, Technical Reps.	913-782-1177
Md	Silver Spring, Tri-Tech Engrg.	301-585-8280
Mass	Wakefield, P. Jenks Assocs.	617-246-1590
Mich	Detroit, Group Ten	313-549-3910
Minn	Minneapolis, Waytek	612-933-2133
Mo	Hazelwood, Technical Reps.	314-731-5200
NM	Albuquerque, R.A. Mayes Co.	505-292-2330
NY	DeWitt, db Assocs.	315-446-0220
NY	Great Neck, Meas. Technology Inc.	516-482-3500

Ohio	Cleveland, Group Ten	216-486-2800
Ohio	Dayton, Group Ten	513-277-6531
Pa	Norristown, Data Engrg. Co.	215-279-8146
Tex	Houston, R.A. Mayes Co.	713-461-5385
Tex	Richardson, R.A. Mayes Co.	214-235-3043
Utah	Centerville, R.A. Mayes Co.	801-292-6781
Wash	Seattle, Dayne Hansen & Assocs.	206-248-1884

PROJECTS UNLIMITED, INC., 3680 Wyse Rd., Dayton, Ohio, 45414, Tel: 513-890-1918, TWX: 810-450-2523; Empl.: 49; Minimum order: \$15

p. 1-270,271

For info on price: D. L. Wyse; Application info: G. Stephens; Customer service: D. L. Wyse; Delivery info: C. Chambers

Products manufactured: Alarms, Amplifiers, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Connectors, Flashers, Generators, Networks, Posts, Probes, Relays, Services, Assembly, Production & Test, Testers

Local Sales Offices & Reps.

Ariz	Scottsdale, Williams Assocs.	602-947-4297
Cal	Anaheim, L & M Sls.	714-774-0492
Cal	Menlo Park, Long & Assocs.	415-327-1300
Colo	Denver, Williams Assocs.	303-373-4730
Ill	Addison, R. Stemm, Inc.	312-279-2440
Ind	Fort Wayne, R.O. Whitesell	219-432-5591
Ind	Indianapolis, R.O. Whitesell Co.	317-359-9283
Ind	Kokomo, R.O. Whitesell Co.	317-452-6065
Iowa	Cedar Rapids, Palatine Sls. Co.	319-365-8071
Kans	Andover, Palatine Sls. Co.	316-683-7512
Kans	Overland Park, Palatine Sls. Co.	913-262-5643
Ky	Louisville, R.O. Whitesell	502-893-7303
Mass	Sharon, Adcour	617-784-3396
Mich	Grand Rapids, R.O. Whitesell Co.	616-451-8901
Mich	Southfield, R.O. Whitesell Co.	313-358-2020
Mich	St. Joseph, R.O. Whitesell Co.	616-983-7337
Mo	St. Louis, Palatine Sls. Co.	314-428-7055
NM	Albuquerque, Williams Assoc.	505-255-1638
NY	Glen Head, J.A. Keeneth Co.	516-676-1355
Ohio	Cincinnati, R.O. Whitesell & Assocs.	513-521-2290

Ohio	Cleveland, R.O. Whitesell	216-228-7525
Ohio	Columbus, R.O. Whitesell & Assocs.	613-298-9546
Ohio	Dayton, R.O. Whitesell	918-622-0321
Okla	Tulsa, Palatine Sls. Co.	215-459-4276
Pa	Concordville, J. Hanlon Jr.	412-244-7277
Pa	Pittsburgh, R.O. Whitesell	412-244-7277
Tenn	Bristol, Rakes Engrg. & Mktg. Corp.	615-968-4195

Tex	Austin, Palatine Sls. Co.	512-451-7463
Tex	Dallas, Palatine Sls. Co.	214-231-9489
Tex	Houston, Palatine Sls. Co.	713-777-4477
Wash	Seattle, F. Jackson Co.	206-782-2211

PRO-LOG CORP., 825 Airport Rd., Monterey, Cal., 93940

PROMEMCO, INC., 181 Bridge Rd., Hauppauge, N.Y., 11787, Tel: 516-582-9388; Empl.: 22

p. 1-1847; p. 2-1784

Products manufactured: Amplifiers, Capacitors, Fixed, Computers, Converters, Drivers & Decoders For Readouts, Integrated Circuit Devices, Kits, Breadboarding (For Engineers), Memory Systems, Services, Assembly, Production & Test, Transformers, Transistors

Local Sales Offices & Reps.

NJ	Tenafly, ABC Elctrn. Sls. Co.	201-568-2354
NY	Tarrytown, ABC Elctrn. Sls. Co.	914-631-2650

NY Williston Park, ABC Elctrn. Sls. Co.

516-747-6610

Pa Bethayres, ABC Elctrn. Sls. Co. 215-464-2275

PROTECTOWIRE CO., Hanover, Mass., 02339, Tel: 617-826-2626; Empl.: 17; Minimum order: \$15

For info on price: C. J. Lane; Application info: J. T. King; Customer service: C. M. Sullivan; Delivery info: C. J. Lane

Free literature available: Brochures describe protectowire's line of UL and FM approved fire detection products and alarm systems. Featuring unique line type heat sensitive cables for fire detection in a wide variety of applications.

Products manufactured: Alarms, Annunciators, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Cable, Cable Fault Locators

PROTO MATIC CO., 11699 Chesterdale Rd., Cincinnati, Ohio, 45246, Tel: 513-771-1780; Empl.: 30; Minimum order: \$25

For info on price: R. Carver; Application info: R. Carver; Customer service: V. Dahl; Delivery info: V. Dahl

Free literature available: Facilities Brochure - Describes electronic mfg. service capability. Stepping Motor Controller Brochure - Describes controller used for cross-slide compensation and diamond truing on centerless grinders. May be used whenever precision motion control is required.

Products manufactured: Cards, Logic, Controls/Control Eqp., Deposition Equipment, Vacuum & Accessories, Integrated Circuit Devices, Services, Assembly, Production & Test, Testers

PSC TECHNOLOGY INC., 1200 Grand Central Ave., Glendale, Cal., 91201, Tel: 213-245-8424; Empl.: 65; Minimum order: \$25

For info on price: D. E. Stults; Application info: R. Christopherson; Customer service: S. Hatounian; Delivery info: D. E. Stults

Free literature available: Gamma 70 - 70 mm data recording and/or oscilloscope camera. UV-3850 - High speed lead pattern printer for IC's. Contact prints onto Super 8mm, 35 mm, 32mm, 70mm copper coated polyimide base film.

Products manufactured: Cameras, Machines/Machinery, Production

PSG INDUSTRIES INC., 1225 Tunnel Road, Perkaspie, Pa., 18944, Tel: 212-257-3621; Empl.: 74; Minimum order: \$50

For info on price: R. Whitekettle; Application info: R. Whitekettle; Customer service: L. Solliday; Delivery info: Cust. Svc.

Free literature available: HY-Switch Thermostat - High accuracy, low cost Thermostats, Sub Miniature Thermostats - High accuracy ultra-small Thermostats (.625" long X .093" wide) SSTC Series Solid State Thermostats - High accuracy Thermostats that will handle load to 5 amps.

Products manufactured: Alarms, Bi-Metals, Thermostatic, Controls/Control Eqp., Relays, Services, Assembly, Production & Test, Sockets, Switches, Thermistors, Thermocouples, Elements & Accessories, Thermometers, Resistance, Thermostats

PTS ELECTRONICS INC., Box 272, Bloomington, Ind., 47401, Tel: 812-824-9331; Empl.: 170

Customer service: J. D. Craig

Products manufactured: Cleaners & Solvents, Services, Assembly, Production & Test, Testers, Tools, Tuners

Local Sales Offices & Reps.

Ala	Birmingham	205-323-2657
Cal	Sacramento	916-482-6220
Cal	San Diego	714-280-7070
Colo	Arvada	303-423-7080
Fla	Jacksonville	904-389-9952
Fla	Miami	305-685-9811
Ind	Bloomington	812-824-9331
Kans	Kansas City	913-831-1222
La	Metairie	504-885-2349
Md	Silver Spring	301-565-0025
Mass	Springfield	413-734-2737
Mich	Detroit	313-862-1783
Minn	Minneapolis	612-824-2333
Mo	St. Louis	314-428-1299
NJ	E. Paterson	201-791-6380
NY	Buffalo	716-891-4935
NC	Charlotte	704-332-8007
Ohio	Cincinnati	513-821-2298

Ohio	Cleveland	216-845-4480
Okla	Oklahoma City	405-947-2013
Ore	Portland	503-282-9636
Pa	Philadelphia	215-724-0999
Pa	Pittsburgh	412-761-7648
Tenn	Memphis	901-365-1918
Tex	Houston	713-644-6795
Tex	Longview	214-753-4334

PULSE ENGRG., INC., Box 12235, San Diego, Cal, 92112, Tel: 714-279-5900, TWX: 910-335-1527; Empl.: 300; Minimum order: \$250

For info on price: J. Collins; Application info: B. McColey; Customer service: J. Collins; Delivery info: J. Collins

Products manufactured: Circuits, Hybrid, Thick Film, Coils Including Assemblies & Forms, Delay Lines, Networks, Reactors, Resistors, Transformers

Local Sales Offices & Reps.

Cal	San Diego	714-279-5900
Cal	Santa Clara	408-248-6040
Cal	Studio City	213-872-0735
Fla	Boca Raton	305-391-3803
Ill	Chicago	312-992-3720
Mass	Waltham	617-894-0950
Pa	Abington	215-887-4343

PULSE TECHNIQUES, INC., 1411 Palisade Ave., Teaneck, N.J., 07666, Tel: 201-837-2575

Customer service: E. R. Shenk

Free literature available: Catalog describing audio program equalizers & program and sound effects filters.

Products manufactured: Amplifiers, Equalizers, Filters

PURE CARBON CO., INC., 441 Hall Ave., St. Marys, Pa., 15857; Empl.: 750

Products manufactured: Bearings, Brushes & Brush Assemblies, Bushings, Glass, Plastic, Metal, Rubber, Etc., Graphalloy Products, Graphite Parts, Materials, Self-Lubricating

Local Sales Offices & Reps.

Cal	LaCanada, Pure Carbon Co.	213-790-1830
Conn	Bristol, Pure Carbon Co.	203-247-5019
Ga	Marietta, Pure Carbon Co.	404-436-9067
Ill	East Peoria, Pure Carbon Co.	309-699-1935
Ill	Park Ridge, Pure Carbon Co.	312-825-7686
Ind	Hammond, W.C. Boldt	219-931-7091
Mich	Plymouth, Pure Carbon Co.	313-453-7310
NJ	Carlstadt, Hoyt Sls. Co.	201-935-0044
NY	Camillus, Pure Carbon Co.	315-487-1439
Ohio	Centerville, Pure Carbon Co.	513-433-1314
Ohio	Chagrin Falls, Pure Carbon Co.	216-338-3900
Tex	Fort Worth, R.E. Porter	817-281-1415
Wash	Seattle, Pure Carbon Co.	206-542-1844
Wisc	Lake Mills, Pure Carbon Co.	414-648-8205

PYLON CO., INC., 51 Newcomb St., Attleboro, Mass., 02703, Tel: 617-222-3726; Empl.: 30; Minimum order: \$25

Free literature available: Pogo® Catalog 102 Contains various types of spring-loaded test probes for making temporary electrical connection for the purpose of testing. For testing p.c. boards, back-planes, microcircuits, etc.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Clamps & Clips, Connectors, Contacts, Electrical, Eyelets, Fasteners, Holder & Carriers, Jigs And Fixtures, Chassis & Circuit Board, Leads, Test & Adaptors, Pins, Probes, Rivets, Sockets, Terminals, Testers

Local Sales Offices & Reps.

Cal	Fremont, Hartfield, Kennan & Freytag Co.	415-863-2200
Cal	Los Angeles, Hartfield, Kennan & Freytag Co.	213-225-1318
ILL	Elk Grove Village, Somers-Reagan	312-593-2713
Mass	Plainville, Teknis	617-695-3591
NJ	Summit, R. Potter	201-277-0220
Pa	Lafayette Hill, MCD Assocs.	215-828-0560
Tex	Dallas, Sivright Co.	214-357-6681
VA	Lynchburg, Royelec Sls. Assocs.	703-846-7117
Wash	Vancouver, Hartfield, Kennan & Freytag Co.	503-228-1683

FOR: Can., Scarborough 707, Ont., Finnan Engineered Prod. Co. 416-438-6070

PYROFERRIC - N. Y., INC., Bronx Blvd. at 216th St., Bronx, N.Y., 10467, Tel: 212-654-3930; Empl.: 35

Customer service: J. A. Roberts

Free literature available: Data Packet

Products manufactured: Bobbins, Winding, Coil & Transformer, Coils Including Assemblies & Forms, Cores, Magnetic

Local Sales Offices & Reps.

Cal Los Angeles, Yarbrough Sls. Co.213-254-5101

PYROFILM RESISTOR CO., INC., 60 S. Jefferson Rd., Whippany, N.J., 07981, Tel: 201-887-8100, TWX: 710-726-8220; Empl.: 200 p. 2-1526-1528

Products manufactured: Attenuators, Dividers, Networks, Resistors, Terminals

Local Sales Offices & Reps.

Ala Huntsville, Holcombe Sls. Agency, Inc.205-534-1035
Cal Los Angeles, E. Landa Co.213-879-0770
Cal Mountain View, Don Lay Assocs.415-968-7500
Cal San Carlos, Winco415-365-6082
Colo Denver, R. Smith Assoc.303-399-1132
Fla Orlando, Irby & Connolly, Inc.305-894-8471
Ga Atlanta, Holcombe Sls. Agency, Inc.404-233-2837

Ill Chicago, Berndt Assocs.312-283-0713
Ind Carmel, Berndt Assocs.317-844-0114
Md Columbia, Neal Deoul Assocs.301-997-4353
Mass Lowell, Russell Engrg. Svc. Co.617-458-7146
Mich Royal Oak, Satullo Co.313-549-3910
Minn St. Paul, Northport Engineering612-698-3841
NJ Madison, Livera-Polk Assocs.201-377-3220
NM Albuquerque, IMEC505-344-2212
NY Camillus, Ontec315-487-0596
NY Fayetteville, Ontec315-446-2587
NY Grand Island, Ontec716-773-9319
NY Huntington, CDB Entrs.516-692-5200
NY Rochester, Ontec716-464-8636
NY Roslyn Heights, Livera-Polk Assocs.516-484-1276

NC Burlington, P. J. Nahser, Co.919-226-8053
Ohio Cleveland, Satullo Co.216-486-2800
Ohio Dayton, Satullo Co.513-277-6531
Tex Dallas, Hillman Enterprises214-827-4790
Wash Bellevue, Ray Over Sls.206-454-4551
EXP: Stamford, Conn., Dage Corp.203-324-3123

Local Distributors

Cal Los Angeles, Mil-Comm, 1618 Cotner Ave.213-879-0770
NY Yonkers, Legri S. Resistor, 389-393 Riverdale Ave.914-969-6000
Tex Houston, Lenert Co., Box 2184, 1420 Hutchins713-225-1465

Q-TECH CORP., 11529 W. Pico Blvd., Los Angeles, Cal., 90064, Tel: 213-473-1105 p. 1-408-409

Products manufactured: Crystals, Filters, Oscillators

Local Sales Offices & Reps.

Cal San Diego, Tauber Assocs.714-274-7242
Ind Auburn, D. Flanagan219-925-1757
Md College Park, J. & B. Elctns.301-864-4011
Mass Burlington, Burlington Sls., Inc.617-272-7655
NY New York, AstroRep Inc.516-423-2266
NY Rochester, R.P. Kennedy Co.716-271-6322
Tex Houston, TCI Elctns.713-774-5019
Wash Seattle, W. Spaulding Co.206-282-9173

QANTEX, the peripherals division of North Atlantic Inds., 200 Terminal Dr., Plainview, N.Y., 11803, Tel: 516-681-8350, TWX: 510-221-1879; Empl.: 175; Minimum order: \$25

For info on price: L. Malmad; Application info: L. Malmad; Customer service: L. Malmad; Delivery info: B. Carolyn

Free literature available: Catalogs, interface manuals, & application notes on digital tape drives & tape storage systems.

Local Sales Offices & Reps.

Cal Burbank, E-M Southwest213-845-4400
Cal San Leandro, IMS Assocs.415-483-2093
Colo Littleton, Cropley Inc.303-794-4231
Ill Chicago, Data Elctns. Co.312-283-0300
Ind Indianapolis, Data Elctns. Co.317-784-6360
Mass Wellesley Hills, Datamart617-235-5520
Minn Minneapolis, Data Elctns. Co.612-786-9666
Tex Dallas, Evans-McDowell214-238-7157
Tex Houston, Evans-McDowell713-772-1257
Utah Salt Lake City, Cropley Inc.801-355-8321
Wash Bellevue, Scientific Devices NW206-454-0900

QTRON CORP., 1320 E. St. Gertrude Pl., Santa Ana, Cal., 92705, Tel: 714-556-1184; FSC No: 75-2848591; Empl.: 20; Minimum order: \$25

For info on price: W. Sliff; Application info: C. Knox; Customer service: D. Franck; Delivery info: D. Franck

Free literature available: Upon Request A 12 Page Catalog On Reed Relays Including Price Sheets and Valuable Engineering Information

Products manufactured: Coils Including Assemblies & Forms, Relays

Local Sales Offices & Reps.

Cal Los Angeles, Dorr Wagner Assoc.213-681-4060
Colo Denver, Comtech303-756-6815
Ill Arlington Heights, Hagan Sls.312-394-0617
Ind Indianapolis, Marketing Engineers317-546-1523
Ky Liberty, Depco513-621-0162
Minn Minneapolis, Components Group612-824-4222
NY Commack, L.K. Haner516-864-2220
Ohio Cleveland, Depco216-289-8188
Ore Portland, Wes-Tek503-297-1711
Tex Houston, E. Smith Sls.713-649-5756
Wash Bellevue, Wes-Tek206-641-3900

Q.V.S., INC., 20 North 15th St., East Orange, N.J., 07017, Tel: 201-673-3996; FSC No: 89820; Empl.: 45

Customer service: F. D. Fogle

Products manufactured: Meters, Relays, Services, Assembly, Production & Test, Testers

QUADRATAT CONTROLS CORP., 4429 San Fernando Rd., Glendale, Cal., 91204, Tel: 213-245-1098, TWX: 910-497-4783; Empl.: 15; Minimum order: \$25

For info on price: A. Chadney; Application info: P. D. Adams; Customer service: A. Chadney; Delivery info: A. Chadney

Free literature available: Brochures show the complete "QUADCO" line of self-locking and gate-type Control Heads, as used by Heavy Equipment OEM's to mechanically control a power source.

Products manufactured: Controls/Control Eqpt.

QUALCO, One First St., Los Altos, Cal., 94022, Tel: 415-964-7666; Empl.: 11 p. 2-790,791

Customer service: J. C. Meyer

Products manufactured: Machines/Machinery, Production, Microcircuit Production Equip., Socket Adapters, Sockets, Testers

QUAM-NICHOLS CO., 234 E. Marquette Rd., Chicago, Ill., 60637, Tel: 312-488-5800; Empl.: 200; Minimum order: \$15

For info on price: G. Johns; Application info: W. G. Little; Customer service: G. Johns; Delivery info: G. Johns

Free literature available: Catalog #74 - General line loudspeakers

Products manufactured: Speakers

Local Sales Offices & Reps.

Cal Inglewood, Ungar Sls. Assocs.213-649-6238
Cal Oakland, Mouthrop Sls.415-261-7676
Fla Orlando, Cartwright & Bean305-422-4531
Ga Atlanta, Cartwright & Bean404-255-5262
Ill Chicago, R. R. Huttmacher Assoc.312-631-3248
Ind Indianapolis, R. Misk Co.317-546-5468
Kans Overland Park, T. L. Dowell913-236-8200
Mass Needham, Coakley, Boyd & Abbott617-444-5470

Mich Southfield, R. Misk Co.313-354-3310
Minn Edina, M. Foster Co.612-835-2252
NJ Cherry Hill, Trinkle Sls.609-795-4200
NY Camillus, Callahan-Ferguson315-487-3870
NY Flushing, Bettan Sls.212-591-7670
Ohio Beachwood, Electronic Salesmasters216-831-9555

Ore Portland, J. V. BeLusko Co.503-222-4279
Tenn Memphis, Cartwright & Bean901-276-4442
Tex Dallas, El Wilco Inc.214-242-5329

QUAN-TECH, Div. Scientific-Atlanta, Inc., Randolph Park W., Rte. #10, Randolph Township, N.J., 07801, Tel: 201-361-3100, TWX: 710-987-7946; Empl.: 50; Minimum order: \$25 p. 1-787-790

Customer service: G. M. Carney

Free literature available: Wave & Spectrum Catalog-Product Data Sheets plus some technical literature. Noise File-Product data sheets plus technical literature. Application note on flutter measurement in magnetic tape recorders. Data sheets on all instruments in our product line.

Products manufactured: Amplifiers, Analyzers, Filters, Generators, Meters, Standards, Test Equipment, Testers, Tracking Systems

Local Sales Offices & Reps.

Ala Huntsville, J. L. Highsmith & Co.205-881-3284
Cal Palo Alto, Coherent Mktg. Assoc.415-327-2217
Cal Pasadena, A-F Sls. Engrg.213-681-5631
Colo Golden, J. Hurlbut303-279-7138
Fla Orlando, J. L. Highsmith & Co.305-293-5202
Ill Chicago, K. Meyers312-774-6440

Ind Indianapolis, K. Meyers317-243-6681
Mass Stoneham, Ken Corp.617-438-5464
Minn Mpls., K. Meyers612-920-7080
NY Liverpool, Rayelco315-652-5272
NY Plainview, Eastern Metro Assocs.516-931-1414
NC Charlotte, J. L. Highsmith & Co.704-333-7743
Ohio Dayton, Micro Sls. Corp.513-433-8171
Tex Dallas, Airep Elctns.214-827-2120
Wash Seattle, Datacom Assocs.206-285-2525
EXP: NJ, Teaneck, Sylvan Ginsbury201-837-1100
FOR: Can., Calgary, Alberta, Can. Marconi403-243-7751

FOR: Can., Don Mills, Ont., Can. Marconi416-445-9900

FOR: Can., Edmonton, Alberta, Can. Marconi403-429-3387

FOR: Can., Halifax, N.S., Can. Marconi902-454-8321

FOR: Can., Montreal, Que., Can. Marconi514-341-7630

FOR: Can., Ottawa, Ont., Can. Marconi613-232-1672

FOR: Can., St. John's, N.F., Canadian Marconi709-726-2422

FOR: Can., Vancouver, B. C., Can. Marconi604-291-2331

FOR: Can., Winnipeg, Man., Can. Marconi204-775-0348

QUANTALOG, INC., 42 Enterprise Drive, Ann Arbor, Mich, 48103, Tel: 313-769-4936; Empl.: 16

For info on price: J. Dute; Application info: J. Dute; Customer service: E. Therkelsen; Delivery info: J. Dute

Free literature available: Transient Recorders: Model 1720 QuantaLatch featuring 1k memory; 50k samples/sec 4000 Series QuantaLatch with 4k memory, 10k samples/sec. Remote Data Acquisition & Logging: Model 1740 System featuring central control and recording station plus one or more 16-channel data stations.

Products manufactured: Data Acquisition & Reduction Systems, Data Loggers, Recorders

Local Sales Offices & Reps.

Alas Anchorage, H. J. Lang & Assocs.907-279-5741
Cal North Hollywood, O'Halloran Assocs.213-877-0173

Cal Palo Alto, O'Halloran Assoc.415-326-1493

Cal San Diego, O'Halloran Assocs.714-224-2824

Fla Clearwater, Reynolds & Assocs.813-726-2373

Fla Ft. Lauderdale, Reynolds & Assocs.305-581-6611

Fla Hollywood, Reynolds & Assocs.305-987-6720

Fla Palm Beach, Reynolds & Assocs.305-622-6850

Fla Satellite Beach, Reynolds & Assocs.305-773-4700

Fla St. Petersburg, Reynolds & Assocs.813-360-1484

Ga Atlanta, Reynolds & Assocs.404-252-5360

Ill Northbrook, Electronic Instr. Assocs.312-498-4500

Ind Indianapolis, Electronic Instr. Assocs.317-257-7231

Md Silver Springs, Eastern Instrumentation301-681-6500

Mich Farmington, Anderson Elctns.313-476-9161

NY Great Neck, Eastern Instrumentation516-466-4500

NY Syracuse, Tesco Mktg Assocs.315-463-4566

NC Raleigh, Eastern Instrumentation919-876-7600

Ohio Dayton, Hocker Assocs.513-298-8638

Ohio North Olmsted, Hocker Assocs.216-734-4433

Pa Abington, Bach-Stewart Assocs.215-885-1550

Tex Houston, Scientific Sls. Co.713-666-5318

Tex Richardson, Scientific Sls. Co.214-231-6541

Wash Bellevue, Brennan Assocs.206-454-9332

QUANTRAD CORPORATION, 139 Illinois St., El Segundo, Cal., 90245, Tel: 213-535-0854, TWX: 910-348-6676; Empl.: 40; Minimum order: \$25

For info on price: H. Long 213-322-2086; Application info: R. Fox 213-322-2086; Customer service: H. Holdaway 213-322-2460; Delivery info: C. Strobe 213-322-1452

Free literature available: Brochures on: Laser resistor trimmers, pulsed Argon, Krypton, Xenon and Ion Lasers, Image Converter Cameras, Photodiodes, Electro Optical Systems and Long Coherence Holographic Systems.

Products manufactured: Cameras, Cells, Photoconductive, Photoemissive, Photovoltaic, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Generators, Intensifiers, Image, Lasers & Laser Systems, Lights, Microcircuit Production Equip., Monitors, Perforators

Local Sales Offices & Reps.
 DC Washington, Scientific Sys. Sls. Corp. 202-726-4161
 Fla Winter Haven, S & S Sls. Reps. 813-293-7304
 Mass Burlington, Scientific Sys. Sls. Corp. 617-273-1660
 NM Albuquerque, Trembly Assocs. 505-293-4444
 NY Syosset, Scientific Sys. Sls. Corp. 516-921-3737

QUANTROL ELECT. INC., 1820 Mills Ave., El Paso, Tex., 79901, Tel: 915-532-4651; Empl.: 20; Minimum order: \$20

For info on price: E. K. Chamberlin; Application info: R. R. Chamberlin; Customer service: E. K. Chamberlin; Delivery info: M. J. Jaurez

Free literature available: Electrical and physical specifications on available photoconductors and opto isolators.

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Diodes, Sensors, Light

Local Sales Offices & Reps.
 Fla Melbourne, Reynolds & Assocs. 305-727-3205
 Minn Minneapolis, Heimann Co. 612-861-6051
 Ohio Cincinnati, Sheridan Assocs. 513-761-5432

QUANTRONIX CORP., 225 Engineers Rd., Smithtown, N.Y., 11787, Tel: 516-273-6900, Telex: 96-7782; Empl.: 70; Minimum order: \$25

For info on price: P. Riscucci; Application info: R. J. Bruno; Customer service: S. Taylor

Free literature available: Laserscribe®, functional specifications for wafer scribing; Series 114 Nd:Yag laser systems; Series 300 Acousto Optic Devices; Series 500 energy/power measuring instruments; Series 700 Laser Micromachining Systems.

Products manufactured: Lasers & Laser Systems, Machines/Machinery, Production, Modulator/Demodulators, Monitors, Scribes, Semiconductor Wafer Fabrication

Local Sales Offices & Reps.
 Ariz Phoenix, Trembly Assocs.
 Cal Palo Alto, Quantronix Corp. 415-327-6381
 Colo Broomfield, Figaro, Klebba Assocs.
 Fla Ft. Lauderdale, Semquip
 NM Albuquerque, Trembly Assocs.
 Tex Dallas, Quantronix

QUARTZITE PROCESSING, INC., 6 Holyoke St., Malden, Mass., 02148, Tel: 617-322-1380; Empl.: 11

For info on price: J. H. Westerman 617-322-1380; Customer service: P. S. Yanofsky 617-322-1380; Delivery info: P. S. Yanofsky 617-322-1380

Free literature available: Man Made Materials Which Require Diamond Tooling

Products manufactured: Cores, Ceramic, Ferrite Material & Parts, Insulators & Insulation, Quartz, Fused, Services, Assembly, Production & Test, Tubing

QUIETROLE CO., 395 St. John, Spartanburg, S.C., 29302, Tel: 803-583-1451; Minimum order: \$5

Customer service: R. O. Monk

Products manufactured: Cleaners & Solvents, Lubricants

Local Sales Offices & Reps.
 Mo St. Louis, B & C Sls. Co.
 Ohio Euclid, W. Peters Co. 216-261-2330
 Tex Dallas, E.L. Wilks Co. 214-242-5321
 FOR: Can., Downsview, Ont., L. Finkler Ltd.

R-COLUMBIA PRODUCTS, INC., 2008 St. John's Ave., Highland Park, Ill., 60035, Tel: 312-432-7915; Empl.: 6

Products manufactured: Cleaners & Solvents, Comm. Systems, Handsets, Chestsets, Headphones, Headsets, Etc., Magnets, Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds

RAACO CORP., 372 Ely Ave., So. Norwalk, Conn, 06854

RADATRON CORP., 2424 Niagara Falls Blvd., N. Tonawanda, NY, 14120, Tel: 716-731-4171; Empl.: 85

For info on price: J. Howells; Application info: J. Howells; Customer service: L. Pauly; Delivery info: L. Pauly

Products manufactured: Antennas, Lamps, Lights, Power Supplies, Receivers

Local Sales Offices & Reps.
 Cal San Rafael, E. W. Brandt Co. 415-454-0840
 Cal W. Covina, Don Forth 213-967-2893

Ga Savannah, Len Sherman Assoc. 912-925-3660
 Ill Skokie, Mike Bermann Sls. 312-675-3740
 Ind Indianapolis, Dewey Power Sls. 317-846-0790
 Md Olney, A B & T Sls. 301-924-4376
 Mich Grand Rapids, Cecil Geer Co. 616-534-9449
 Minn Burnsville, C. Carlson 612-890-7893
 Mo Raytown, Marty Taraski Sls. 816-358-1442
 NY Farmingdale, Chester Drexler Sls. 516-249-8206

NC Charlotte, Electro Rep Assoc. 704-527-2530
 Ohio Columbus, J. Lehner 614-268-5260
 Tenn Memphis, L. Jones 901-683-7616
 Tex Dallas, Collins Co. 214-341-7866
 Wash Seattle, DMS/Vantage 206-784-6800

RADIAL CONTROLS, 2555 E. 55th Place, Indianapolis, Ind., 46220, Tel: 317-255-2796; Empl.: 25; Minimum order: \$10

Customer service: R. Newsom

Free literature available: 16 page catalog on plastic knobs, 4 page catalog on aluminum knobs.

Products manufactured: Knobs

RADIATION DEVICES CO., Box 8450, Baltimore, Md., 21234, Tel: 301-665-2764; Empl.: 6; Minimum order: \$5

Customer service: F. M. Rybak

Free literature available: Broad line of RF and microwave amplifiers, multiconplers, filters described in data sheets and application notes. Receivers for ATC, ELT and monitoring featuring battery operation.

Products manufactured: Amplifiers, Antennas, Bridges, Calibrators, Couplers, Demodulators, Detectors, Dividers, Dummy Loads, Filters, Limiters, Meters, Modulator/Demodulators, Receivers, Terminals

Local Sales Offices & Reps.

Ariz Phoenix, Kay Ents. 602-242-6787
 Cal Encino, CDH Assocs. 213-345-3111
 Cal Yucca Valley, CDH Assocs. 213-345-3111
 Colo Lakewood, Harvey Data Sys. 303-427-5299
 Fla Orlando, Gra-Mar 305-894-3351
 NM Albuquerque, J & D Assocs. 505-255-2377

RADIATION DYNAMICS, INC., 1800 Shames Dr., Westbury, N.Y., 11590, Tel: 516-334-3990; Empl.: 180

For info on price: R. L. Malnati; Application info: J. H. Bly; Customer service: R. G. Burgess

Products manufactured: X-Ray Inspection Equipment

RADIO DEVELOPMENT LAB., 121 Brook Ave, Deer Park, NY, 11729, Tel: 516-242-0999; Empl.: 6; Minimum order: \$10

For info on price: F. Goldstein; Application info: S. Russo; Customer service: S. Russo; Delivery info: S. Russo

Free literature available: Data Sheets, New Product releases.

Products manufactured: Amplifiers, Converters, Filters, Integrated Circuit Devices, Preselector-Mixers, Receivers

RADIO MATERIALS CO., Div. P.R. Mallory, 4242 W. Bryn Mawr Ave., Chicago, Ill., 60646, Tel: 312-478-3600, TWX: 910-221-2915; FSC No: 91418; Empl.: 500; Minimum order: \$25

For info on price: J. Kirschner; Application info: J. Kirschner; Customer service: B. Merritt; Delivery info: Sls.Svc.

Free literature available: 28 Page General Catalog; Ceramic Resonator application notes describing typical applications and characteristics.

Products manufactured: Capacitors, Fixed, Ceramic Resonators, Circuits, Hybrid, Thick Film, Crystals, Spark Gaps, Substrates

Local Sales Offices & Reps.

Ariz Phoenix, R. Stitzer 602-944-6808
 Cal Burlingame, RMC Div. of P.R. Mallory 415-348-2081

Cal La Mirada, RMC Div. of P.R. Mallory 213-921-7939
 Conn Meriden, Eagle Assocs. 203-235-9036
 Ill Chicago, RMC Div. of P.R. Mallory 312-478-3600

Mass Needham, Eagle Assocs. 617-444-3446
 NY Plandome, F. Spellman Co. 516-627-3399
 NY Syracuse, N.J. Matchuk Co. 315-488-3251

Ore Portland, Earl & Brown Co. 503-245-2283
 Pa Philadelphia, R. Cooper 215-624-5486
 Wash Seattle, Earl & Brown Co. 206-284-1121

EXP: Indianapolis, Ind., Mallory Int'l. Co. 317-636-5353

EXP: Toronto, Ontario, Canada, P.J. Heenan Ltd. 416-223-3619

RADIO SWITCH, State Hwy. 79, Marlboro, N.J., 07746, Tel: 201-462-6100; Minimum order: \$15

Customer service: W. Schwarz

Products manufactured: Switches

RAGEN DATA SYSTEMS, INC., 125 Schmitt Blvd., Farmingdale, N.Y., 11735, Tel: 516-293-1333, TWX: 510-224-6405; Empl.: 52

Products manufactured: Amplifiers, Controllers, Programmable, Controls/Control Eqp., Converters, Counters, Dials, Indicators, Power Supplies, Servo Systems, Timers

Local Sales Offices & Reps.

Cal Los Angeles, Western Aircraft, Inc. 213-477-1548
 Cal San Diego, Temp Tech 714-560-0545
 Iowa Cedar Rapids, Palatine 319-365-8071
 Kans Andover, Palatine 316-683-7512
 Mass Stoneham, Data Engrg. Svcs. 617-245-6666
 Minn Minneapolis, Bitronics Sls. Co. 612-866-3035
 Mo St. Louis, Palatine 314-426-7055
 NY Great Neck, EAC Assocs. 516-466-9798
 Tex Dallas, Barry Sls. Co. 214-234-0255
 Va Alexandria, Vanguard Engrg. 703-768-1660
 Wash Thorson Co. 206-455-9180

RAGEN PRECISION INDS., INC., 9 Porete Ave., N. Arlington, N.J., 07032; Empl.: 250

Products manufactured: Boards, Printed Circuit, Circuits, Printed, Multilayer, Display Devices/Displays, Integrated Circuit Devices, Lamps, Machines/Machinery, Production, Memory Systems, Soldering Equipment

RAGEN SEMICONDUCTOR, 50 S. Jefferson Rd., Whippany, N.J., 07981

RAILWAY COMM., Rycom Instrs., 9351 E. 59th St., Raytown, Mo., 64133, Tel: 816-353-2100; Empl.: 37; Minimum order: \$10

For info on price: E. E. Tuel; Application info: E. E. Tuel; Customer service: G. Craven; Delivery info: H. D. Aggeler

Free literature available: "T" Carrier Test Equipment; Buried, Cable Fault Locators; Levelmeters/Voltmeters.

Products manufactured: Analyzers, Counters, Locators, Open-Short, Meters, Receivers, Testers, Totalizers, Digital

Local Sales Offices & Reps.

Cal Oakland, Dolphin Engrg. Co. 415-451-8262
 Cal Santa Fe Springs, Kennedy Engrg. Co. 213-868-9965
 Colo Denver, Claredon Co. 303-238-4462
 DC Washington, InstruCom 202-223-1759
 Fla St. Petersburg, Comtech Assocs. 813-527-3281
 Ill Schaumburg, Kay Sls. 312-397-1215
 Kans Prairie Village, Giddings Co. 913-831-0727
 MO Cameron, Communication Sys. Assocs. 816-632-7616

Tex Richardson, Horizon Engrg. Sls. Co. 214-238-9121

Wash Seattle, Reeves Supp. Co. 206-789-1234
 FOR: Can., Toronto, Ont., Tele-Radio Sys. Ltd. 416-661-3221

RAM CHEMS., Div. Whittaker Corp., 210 E. Alondra Blvd., Gardena, Calif., 90248, Tel: 213-FA 1-0710; Empl.: 65; Minimum order: \$25

For info on price: D. Saylor; Application info: M. E. Gould; Customer service: D. Saylor; Delivery info: D. Saylor

Products manufactured: Chemicals, Cleaners & Solvents, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Lubricants, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Rubber

RAMSEY ENGINEERING, 1853 W. County Rd. C, St. Paul, Minn., 55113, Tel: 612-633-5150, Telex: 29-7001; Empl.: 160; Minimum order: \$25

Customer service: J. Miller

Free literature available: RH-202: Manually operated integrated circuit handler, RH-903: Automatic three (3) category sort integrated circuit handler., RH-905: Automatic five (5) category sort integrated circuit handler. RS-5618: Automatic integrated circuit lead straightener.

Products manufactured: Machines/Machinery, Production

Local Sales Offices & Reps.

Ala	Huntsville, Scientific Devices-Southeast	205-232-8317
Cal	Encino, Scientific Devices-California	213-872-1951
Cal	Los Alamitos, Scientific Devices-California	213-598-7678
Cal	Mountain View, Scientific Devices-California	415-964-4230
Cal	San Diego, Scientific Devices-California	714-279-6642
Conn	Hamden, Scientific Devices-Connecticut	203-248-9361
Fla	Ft. Lauderdale, Scientific Devices-Southeast	305-721-4260
Fla	Orlando, Scientific Devices-Southeast	305-424-7932
Fla	St. Petersburg, Scientific Devices-Southeast	813-521-1720
Ill	Des Plaines, Scientific Devices-Midwest	312-297-5230
Ind	Indianapolis, Scientific Devices-Midwest	317-783-2111
Kans	Lenexa, Scientific Devices-Midwest	913-631-3818
Mass	Waltham, Scientific Devices-New England	617-894-5637
Mich	Milford, Scientific Devices-Midwest	313-363-2282
Minn	Minneapolis, Scientific Devices-Midwest	612-544-1616
Mo	St. Louis, Scientific Devices-Midwest	314-842-2535
NJ	Palisades Park, Scientific Devices-East	201-871-3916
NY	Rochester, Scientific Devices-New York	716-334-2445
NC	Burlington, Scientific Devices-Southeast	919-584-8311
Ohio	Cleveland, Scientific Devices-Midwest	216-261-2000
Ohio	Dayton, Scientific Devices-Midwest	513-298-9904
Okl	Norman, Data Mktg. Assoc.	405-364-8320
Tex	Dallas, Data Mktg. Assoc.	214-661-0300
Tex	Houston, Data Mktg. Assoc.	713-686-9627
Tex	San Antonio, Data Mktg. Assoc.	512-828-0937
Va	Norfolk, Scientific Devices-E/Tech	703-499-8133
Va	Springfield, Scientific Devices-E/Tech	703-451-6500
Wash	Seattle, Avionics Liaison	206-767-3870

RAMTEK CORP., 292 Commercial St., Sunnyvale, Cal., 94086, Tel: 408-735-8400, TWX: 910-339-9379; Empl.: 130

For info on price: C. W. Nordby Ext. 280; Application info: G. S. Brink Ext. 205; Customer service: H. P. Kulp Ext. 270; Delivery info: A. A. Middlebrook Ext. 215

Free literature available: GX-100 brochure and FS-2000 brochure. Describes the features and functions of the GX-100 and FS-2000 series of raster scan graphic displays.

Products manufactured: Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Ala	Huntsville, W. A. Brown Instrs.	205-539-4411
Ariz	Phoenix, Data Systems Mktg.	602-277-4732
Cal	Newport Beach, Data Systems Mktg.	714-540-2312
Cal	Littleton, Data Systems Mktg.	303-795-1960
Fla	Orlando, W. A. Brown Instrs.	305-425-5505
Ga	Atlanta, W. A. Brown Instrs.	404-939-1674
Ind	Munster, Bexdata, Ltd.	312-221-1411
La	Gretna, W. A. Brown Instrs.	504-368-5766
Md	Beltsville, Ron Davies Assocs.	301-937-2215
Mass	Chelmsford, S & S Elctns.	617-256-8731
Mich	Southfield, Tallman Assocs.	313-557-0974
Minn	Edina, Bexdata Ltd.	612-835-5220
NJ	Ridgewood, Hansen Assocs.	201-652-7055
NM	Albuquerque, Data Systems Mktg.	505-299-6027
NY	Syracuse, Naco Elctns.	315-699-2651
NC	Research Tri. Park, W. A. Brown Instrs.	919-489-1546
Pa	Bryn Mawr, Hopkins Assocs.	215-527-2252
Pa	Pittsburgh, Compu Graph	412-366-5056
Tex	Dallas, Remtek	214-369-8146
Tex	Houston, Remtek	713-664-2113
Utah	Bountiful, Data Systems Mktg.	801-295-3457
Wash	Bellevue, Data Systems Mktg.	206-454-1676

RANDOLPH PRODS. CO., 12th St., Carlstadt, N.J., 07072, Tel: 201-438-3700; Empl.: 60

Customer service: H. Randolph

Products manufactured: Adhesives (All Types), Cleaners & Solvents, Coatings, Paints

RANTEC DIV., Emerson Elec. Co., 24003 Ventura Blvd., Calabasas, Calif., 91302, Tel: 213-347-5446, TWX: 910-494-1218; Empl.: 265; Minimum order: \$100

Customer service: V. S. Kerness Ext. 254

Free literature available: Catalogs on: antennas; Cassegrain Feeds/Flat Plate Arrays/ TACAN - Electronic Instrumentation; Time/Group Test Sets Anechoic Systems; Absorber-Turnkey Chambers Power Supplies; MIL SPEC'D, Modular.

Products manufactured: Analyzers, Antenna Feed Systems, Antennas, Chamber, Environmental Test, Converters, Generators, Modulators, All Kinds, Power Supplies, Testers, Timers, Tracking Systems

RATELCO, INC., 610 Pontius Ave. N., Dept. EEM, Seattle, Wash., 98109, Tel: 206-624-7770; Empl.: 50; Minimum order: \$5

For info on price: N. Kun; Application info: B. Linco; Customer service: D. Terpstra; Delivery info: N. Kun

Products manufactured: Amplifiers, Antennas, Chargers, Battery, Comm. Systems, Converters, Eliminators, Battery, Inverters, Panels, Power Supplies, Racks, Regulators, Testers, Timers, Transformers

Local Sales Offices & Reps.

Ariz	Scottsdale, Weldy Assocs., Inc.	602-947-1263
Ark	Little Rock, M. Robinson Co., Inc.	501-663-1830
Cal	Los Angeles, Matzingher Assocs.	213-624-8001
Cal	Redwood City, Howe-Stephens Co.	415-366-9592
Cal	Denver, Hamilton Assocs., Inc.	303-770-2345
Ga	Atlanta, A. P. Beamish	404-252-5567
Haw	Kailua, R. A. Kemp Co.	808-839-5593
Ill	Chicago, Electrical Materials & Equip. Co.	312-696-1540
La	Metairie, J. J. Aertker Jr. Co.	504-888-0677
Mass	Framingham, E. L. Flowers & Sons	617-879-4250
Minn	Minneapolis, Klass Co., Inc.	612-338-8427
Mo	St. Louis, Petefish Engrg. Co.	314-821-0587
NM	Albuquerque, Bryant Co.	505-296-5158
NY	Bay Shore, F. E. Klaus	516-665-3504
NY	Massapequa, Crest Assocs.	516-799-8053
Pa	Ingomar, R. W. Moulton & Assocs.	412-366-3333
Pa	Radnor, J. Claffin Co.	215-MU8-1990
Tenn	Chattanooga, J.R. Murray Co.	615-267-3889

Advertisement

Designers and manufacturers of Constant Voltage Battery Chargers and Eliminators, Ringing Generators, Dry CEMF Cells, DC-DC Converters, DC-AC Inverters, Communications Power Distribution Boards, Uninterruptible Power Systems (U.P.S.), AC-DC Test Bench Power Supply Units (Battery Eliminators), Alternator Power Converters, Mobile 2-Way Truck Intercoms.

RAULAND, Div. Zenith Radio Corp., 2407 W. North Ave., Melrose Pk., Ill., 60160, Tel: 312-345-4700

Customer service: Sis. Dept.

Products manufactured: Tubes

RAWAY BEARING CORP., 8 Melnick Rd., Monsey, N.Y., 10952, Tel: 914-352-4944; FSC No: 3110; Empl.: 5

For info on price: A. Baskin; Delivery info: H. Grossman

Free literature available: Catalogue

Products manufactured: Bearings

RAY-O-VAC DIV., ESB Inc., 101 E. Washington Ave., Madison, Wis., 53703, Tel: 608-252-7400; Empl.: 2931; Minimum order: \$100

For info on price: H. Coakley 608-252-7483; Application info: D. Wilberg 608-252-7725; Customer service: E. Peterson 608-252-7722; Delivery info: E. Peterson 608-252-7722

Products manufactured: Batteries, Flashlights & Lanterns

Local Sales Offices & Reps.

Cal	North Hollywood, Bassett & Moore	213-877-7129
Cal	Oakland, Moulthrop Sis.	415-261-7676
Cal	Pacifica, Bassett & Moore	213-877-7129
Cal	Denver, W. J. Purdy Co.	303-777-1411
Fla	Orlando, Cartwright & Bean	305-422-4531

Fla	Plantation, Cartwright & Bean	305-791-3989
Ga	Atlanta, Cartwright & Bean	404-255-5262
Ill	Chicago, G. McL. Cole Co.	312-774-3535
Ind	Indianapolis, Sukup & Cox	317-253-1215
Mass	Needham, Mullin Tech. Sis.	617-444-4780
Mich	Detroit, R.C. Merchant Co.	313-535-6000
Mich	St. Joseph, R.C. Merchant Co.	616-983-7378
Minn	Minneapolis, Jensen-Olsen Sis.	612-941-7181
Mo	Kansas City, Forristal-Young Sis.	816-358-6771
Mo	St. Louis, Forristal-Young Sis.	314-645-2360
Neb	Omaha, Forristal-Young Sis.	402-333-0800
NJ	Cherry Hill, Trinkle Sis.	609-795-4200
NJ	Teaneck, Fisher Elctn. Assocs.	201-837-1200
NM	Albuquerque, W. J. Purdy Co.	505-266-7959
NY	Camillus, Trademark Elctns.	315-487-3870
NY	Port Washington, Fisher Elctn. Assocs.	516-883-0600

NC	Charlotte, Cartwright & Bean	704-333-6457
NC	Raleigh, Cartwright & Bean	919-832-7128
Ohio	Dayton, Bear Mktg.	513-299-3566
Ohio	Richfield, Bear Mktg.	216-659-3131
Tenn	Memphis, Cartwright & Bean	901-276-4442
Tex	Dallas, Tesco/Texpot	214-690-4004
Wash	Seattle, Fleehart & Sullivan	206-522-1533
Wisc	Milwaukee, G. McL. Cole	414-545-6083

RAYCHEM CORP., 300 Constitution Dr., Menlo Park, Cal., 94025, Tel: 415-329-3333, TWX: 910-373-1728; Empl.: 3160

Products manufactured: Cable, Caps, Forms & Tapes, Heat Shrinkable, Cups, Encapsulation, Insulators & Insulation, Solder Pots & Baths, Terminals, Tubing, Wire, Wire Markers

Local Sales Offices & Reps.

Cal	Irvine, Raychem Corp.	714-833-3630
Cal	San Diego, Raychem Corp.	714-280-5990
Cal	Sherman Oaks, Raychem Corp.	213-788-9872
Cal	Denver, Raychem Corp.	303-758-1936
Conn	Norwalk, Raychem Corp.	203-853-2700
Fla	Orlando, Raychem Corp.	305-855-4214
Ga	Atlanta, Raychem Corp.	404-261-3657
Ill	Des Plaines, Raychem Corp.	312-298-1100
Kans	Overland Park, Raychem Corp.	913-649-6930
Md	Bethesda, Raychem Corp.	301-652-9057
Mass	Hingham, Raychem Corp.	617-749-6850
Minn	Minneapolis, Raychem Corp.	612-529-9114
Mo	Berkeley, Raychem Corp.	314-521-5111
NJ	Bloomfield, Raychem Corp.	201-744-6261
NJ	Maple Shade, Raychem Corp.	609-667-4280
NY	Dix Hills, Raychem Corp.	516-864-4400
Ohio	Cleveland, Raychem Corp.	216-692-2141
Ohio	Warren, Raychem Corp.	216-856-4979
Pa	Johnstown, Raychem Corp.	814-255-1142
Pa	West Chester, Raychem Corp.	215-692-8660
Tenn	Knoxville, Raychem Corp.	615-667-3027
Tex	Dallas, Raychem Corp.	214-350-8871
Wash	Bellevue, Raychem Corp.	206-455-0903
EXP:	Dorval 760, Quebec Can., Raychem Canada Ltd.	514-636-1680
EXP:	Toronto 19, Ont, Can., Raychem Canada Ltd.	416-789-7425

RAYMOND ENGRG. INC., 217 Smith St., Middletown, Conn., 06457, Tel: 203-347-5611, TWX: 710-428-7944; FSC No: 92059; Empl.: 625

Customer service: J. S. Hinchliffe 203-632-1000

Free literature available: Raycorder Digital Cassette Recorder; Magnetic Tape Memory, Model 6401; Military Magnetic Tape Products; Positive Torque Control With Power-Dyne

Products manufactured: Accelerometers, Actuators, Fuses, Memory Systems, Recorders, Switches, Timers, Wrenches

RAYTEK, INC., 1277 Terra Bella Ave., Mountain View, Cal., 94043, Tel: 415-961-1650, Telex: 348351; Empl.: 35; Minimum order: \$50

Customer service: M. R. Wank

Free literature available: Description and application of portable and fixed IR thermometers for non-contact temperature measurement and control.

Products manufactured: Bolometers, Probes, Pyrometers, Radiometers, Transducers

Local Sales Offices & Reps.

Cal	Los Angeles, McCamey-Jones, Inc.	213-263-9812
Cal	San Francisco, Priz Co.	415-326-9333
Fla	Clearwater, J. Barber Co.	813-442-8713
Ga	Jonesboro, W.L. Anderson Co.	404-478-9648
Ill	Park Ridge, L.R. Fitz Co.	312-631-5488
Ind	Indianapolis, Couchman-Conant, Inc.	317-849-9890
La	Baton Rouge, R.S. & P. Sis.	504-937-4828
Mass	Acton, Abbott Assocs.	617-263-5047
Mich	Orchard Lake, W.C. Fay Co.	313-851-4750

Minn	Minneapolis, Bican Co.	612-827-4734
Mo	St. Louis, R. Greene Co.	314-644-2666
Neb	Omaha, H.G. Klug Co.	402-553-1377
NJ	Fair Lawn, Par Assocs.	201-447-3722
NM	Albuquerque, A.L.S. Elctns.	505-298-2575
NC	Charlotte, Sloan Assocs.	704-523-2122
Ohio	Cincinnati, A.H. Parker, Jr.	513-563-1843
Ore	Portland, McLaren, Inc.	503-297-2248
Pa	Mt. Lebanon, Advance Instrs., Inc.	412-341-3252
Pa	Wayne, R. Schadler Co.	215-687-0969
Tenn	Chattanooga, Coleman Assocs.	615-821-0235
Tex	Dallas, Dixon Engrg.	214-321-0240
Tex	Houston, Dixon Engrg.	713-644-8052
Va	Richmond, Sloan Assocs.	804-359-6051
Wash	Bellevue, McLaren, Inc.	206-454-3400
Wisc	Brookfield, S.F. Boyd Co.	414-781-7170

RAYTHEON CO., Distributor Prods. Oper., Fourth Ave., Burlington, Mass., 01803, Tel: 617-272-6400, TWX: 710-332-7641 p. 1-2283-2285; p. 2-1105-1113

For info on price: B. Knight; Application info: J. Hickey; Customer service: B. Knight; Delivery info: B. Knight

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Isolators, Jacks (All Types), Knobs, Lights, Locks, Dial & Shaft, Posts, Switches, Tubes

Local Sales Offices & Reps.

Cal	El Monte, Cook Enptrs.	213-686-2120
Cal	Oakland, Moulthrop Slis.	415-261-7676
Colo	Denver, Connors, Inc.	303-934-5829
Fla	N. Miami, L. Haas Co.	305-949-9143
Ga	Atlanta, Hollingsworth & Still	404-394-3270
Haw	Honolulu, G. Piety Factors	
Ill	Chicago, GNB Assocs.	312-673-4050
Ind	Indianapolis, Cardinal Slis. Co.	317-253-1513
Minn	Edina, Mel Foster Co.	612-835-2252
Mo	Kansas City, Forristal & Young Slis.	816-358-6771
Mo	St. Louis, Forristal & Young Slis.	314-645-2360
Neb	Omaha, Forristal & Young Slis.	402-333-0800
NJ	Cherry Hill, Trinkle Slis.	609-795-4200
NJ	Teaneck, Fisher Elctn. Assoc.	201-837-1200
NY	Rochester, Marsey Slis. Co.	716-442-9700
Ohio	Beachwood, Electronic Salesmasters	
Ohio	Cleveland, Intech	216-831-9555
Ohio	Dayton, Intech	513-837-5610
Ore	Portland, D.G. Weber Co.	503-234-0686
Tenn	Memphis, Crockett Slis. Co.	901-388-5410
Tex	Dallas, Crockett Slis. Co.	214-748-8209

RAYTHEON CO., Indl. Comps. Oper., 465 Centre St., Quincy, Mass., 02169, Tel: 617-479-5300, TWX: 710-337-6879

Customer service: R. Punchard

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Circuits, Hybrid, Thick Film, Hybrid Voltage Regulators, Isolators, Knobs, Modules, Logic, Encapsulated, Regulators, Tubes

Local Sales Offices & Reps.

Cal	Los Angeles	213-641-3103
Cal	Mountain View	415-964-4754
Fla	Longwood	305-830-6670
Ill	Elmhurst	312-833-6760
Mass	Waltham	617-899-8080
NY	Great Neck	516-482-8480
NY	Rome	315-337-2500
Ohio	Dayton	513-254-3571
Tex	Dallas	214-233-2939
Va	Arlington	703-979-6100
EXP:	Lexington, Mass.	617-862-6600
FOR:	Can., Waterloo, Ont.	519-745-6831

RAYTHEON CO., Spec. Microwave & Device Oper., 130 Second Ave., Waltham, Mass., 02154, Tel: 617-890-8080, TWX: 710-324-6568

Customer service: D. Bauks

Products manufactured: Lasers & Laser Systems, Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

RAYTHEON CO., Microwave & Power Tube Div., 190 Willow St., Waltham, Mass. 02154

RAYTHEON SEMICONDUCTOR, 350 Ellis St., Mountain View, Cal., 94042, Tel: 415-968-9211, TWX: 910-379-6481; FSC No: 07933; Empl.: 950; Minimum order: \$500

Customer service: B. O'Connell Ext 280

Products manufactured: Integrated Circuit Devices, Transistors

Local Sales Offices & Reps.

Ariz	Phoenix, Chaparral	602-996-9648
Ariz	Scottsdale, Raytheon Semiconductor	
Cal	Irvine, Raytheon Semiconductor	602-947-6621
Cal	Mountain View, Raytheon Semiconductor	415-964-4754
Cal	San Diego, Daniels & Doty Slis. Co.	714-560-6266
Colo	Boulder, Straube Assoc.	303-443-8600
Colo	Denver, Straube Assocs.	303-426-0890
Fla	Clearwater, Perrott Assocs.	813-726-1549
Fla	Fort Lauderdale, Raytheon Semiconductor	305-792-8400
Fla	Orlando, Perrott Assocs.	305-275-1132
Ill	Chicago, Carlson Elctn. Slis.	312-774-9022
Ill	Des Plaines, Raytheon Semiconductor	312-297-5540
Kans	Shawnee Mission, Carlson Elctn. Slis.	913-432-2144
Md	Glen Burnie, Raytheon Semiconductor	301-760-3917
Mass	Burlington, Raytheon Semiconductor	617-272-8500
Mich	Birmingham, J. C. Hofstetter Co.	313-643-7203
Mich	Grand Rapids, J. C. Hofstetter Co.	616-942-0650
Minn	Minneapolis, Raytheon Semiconductor	612-920-8710
Minn	New Brighton, Raytheon Semiconductor	612-636-7696
Mo	St. Louis, Carlson Elctn.	314-991-0262
NJ	Englewood, Raytheon Semiconductor	201-567-4911
NJ	Pennsauken, Raytheon Semiconductor	609-663-4066
NM	Albuquerque, Straube Assoc.	505-294-1800
NY	Melville, Raytheon Semiconductor	516-420-0700
Ohio	Dayton, J. C. Hofstetter Co.	513-296-1010
Ohio	Medina, J. C. Hofstetter Co.	216-241-4880
Ore	Beaverton, E. S. Chase Co.	503-649-6177
Tex	Dallas, Mark Kravand Co.	214-827-8043
Tex	Houston, Mark Kravand Co.	713-661-3007
Utah	Salt Lake City, Straube Assocs.	801-328-4513
Wash	Edmonds, E. S. Chase Co.	206-774-3586
Wisc	Milwaukee, Carlson Elctn. Slis.	414-476-2790
Wisc	Wauwatosa, Carlson Elctns.	414-476-2790
EXP:	Lexington, Mass., Raytheon Overseas Ltd.	617-862-6600
FOR:	Can., Scarborough, Ont., Lake Engrg. Co.	416-751-5980
FOR:	Can., St. Laurent 381, Que., Lake Engrg. Co.	514-747-2441

RBM CONTROLS, See Essex Controls Div.

RCA CORP., Commercial Communications Systems Div., Front & Cooper, Camden, N.J., 08102, Tel: 609-963-8000, TWX: 710-892-0905

Customer service: G. M. Lewis

Free literature available: Broadcast Audio Equipment, Catalog AU.742000 TR-600 advanced technology quadruplex VTR, catalog TA.3400 TKP-45A portable broadcast/teleproduction camera, catalog CA.1410

Products manufactured: Amplifiers, Erasers, Magnetic Tape (Bulk), Microphones, All Kinds, Recorders, Television Systems & Equipment Closed-Circuit

Local Sales Offices & Reps.

Ala	Birmingham, RCA Broadcast Sys.	205-871-1155
Cal	Hollywood, RCA Broadcast Sys.	213-461-9171
Cal	San Francisco, RCA Broadcast Sys.	415-343-2741
Colo	Denver, RCA Broadcast Sys.	303-433-8484
DC	Washington, RCA Broadcast Sys.	703-558-4212
Fla	Jacksonville, RCA Broadcast Sys.	904-398-4588
Fla	West Palm Beach, RCA Broadcast Sys.	305-622-1100
Ga	Atlanta, RCA Broadcast Sys.	404-634-6131
Ill	Chicago, RCA Broadcast Sys.	312-782-0700
Ind	Indianapolis, RCA Broadcast Sys.	317-546-4001
Kans	Kansas City: Overland Park, RCA Broadcast Sys.	913-642-3185
Mass	Boston: Wellesley, RCA Broadcast Sys.	617-237-6050
Mich	Detroit: Southfield, RCA Broadcast Sys.	313-357-0080
Minn	Minneapolis, RCA Broadcast Sys.	612-920-6395
Mo	St. Louis, RCA Broadcast Sys.	314-862-3660
NJ	Camden, RCA Broadcast Sys.	609-963-8000
NY	New York, RCA Broadcast Sys.	212-586-3000
NC	Charlotte, RCA Broadcast Sys.	704-366-0626
Ohio	Cincinnati, RCA Broadcast Sys.	513-825-1550
Pa	McMurray, RCA Broadcast Sys.	412-941-5570
Tex	Austin, RCA Broadcast Sys.	512-345-2224

Tex	Dallas, RCA Broadcast Sys.	214-638-6200
Wash	Seattle, RCA Broadcast Sys.	206-285-2375

RCA ELECTRONIC COMPS., 415 S. Fifth St., Harrison, N.J., 07029, Tel: 201-485-3900

Customer service: R. B. Means 201-485-3900

Products manufactured: Amplifiers, Batteries, Capacitors, Fixed, Chargers, Battery, Decade Boxes, Diodes, Display Devices/Displays, Gages, Generators, Isolators, Lasers & Laser Systems, Leads, Test & Adaptors, Meters, Oscilloscopes, Power Supplies, Probes, Resistors, Sockets, Tape Recording Accessories, Tapes, Recording, Magnetic (All Types), Television Systems & Equipment Closed-Circuit, Transformers, Transmitters, Tubes

Local Sales Offices & Reps.

Cal	Hollywood	213-461-9171
Cal	Los Altos	415-948-8961
Fla	Riviera Beach	305-842-0141
Ga	Atlanta	404-634-6131
Ill	Des Plaines	312-827-0033
Ind	Ft. Wayne	219-432-9461
Ind	Indianapolis	317-546-4001
Kans	Overland Park	913-642-7656
Mass	Needham Heights	617-444-7200
NJ	Cherry Hill	609-424-4773
NJ	Edison	201-485-3900
NY	Syracuse	315-474-8221
Pa	Lancaster	717-397-7661
Va	Arlington	703-558-4286

RCA, IND'L TUBE DIV., New Holland Ave., Lancaster, Pa., 17604, Tel: 717-397-7661

Free literature available: Literature on tubes and devices for broadcasting, communications, microwaves, electro optics, image projection, radiation detection, and image display.

Products manufactured: Diodes, Lasers & Laser Systems, Oscillators, Television Systems & Equipment Closed-Circuit, Tubes

Local Sales Offices & Reps.

Cal	Hollywood	213-461-9171
Cal	Los Altos	415-948-8996
Fla	Riviera Beach	305-842-0141
Ill	Des Plaines	312-827-0033
Kans	Overland Park	913-642-7656
Mass	Needham	617-444-7200
NJ	Cherry Hill	609-424-4773
NJ	Edison	201-485-3900
NY	Syracuse	315-474-8221
Va	Arlington	703-558-4286

RCA PARTS & ACCESSORIES, 2000 Clements Bridge Rd., Deptford, N.J., 08096, Tel: 609-963-8000

Products manufactured: Amplifiers, Antennas, Cleaners & Solvents, Couplers, Resistors

RCA SERVICE CO., Div. RCA Corp., Govt. Svcs. 202-1, Camden, N.J., 08101, Tel: 609-779-5176, TWX: 710-892-0905; Empl.: 6000

Customer service: J. J. Connors

Products manufactured: Services, Assembly, Production & Test

Local Sales Offices & Reps.

Colo	Colorado Springs	303-475-8810
Fla	Indianapolis	305-727-7120
Va	Arlington	703-558-4441

RCA SOLID STATE DIV., Route 202, Somerville, N.J., 08876, Tel: 201-722-3200, TWX: 710-480-9333; Minimum order: \$100

Customer service: P. R. Thomas X5177

Products manufactured: Amplifiers, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Diodes, Display Devices/Displays, Drivers & Decoders For Readouts, Integrated Circuit Devices, Rectifiers, Thyristors (Includes Silicon Controlled Rectifiers), Transistors

Local Sales Offices & Reps.

Ala	Huntsville	205-881-4100
Ariz	Scottsdale	602-947-7235
Cal	Hollywood	213-461-9171
Cal	Los Altos	415-948-8996
Cal	San Diego	714-279-0420
Cal	Tustin	714-832-5302
Colo	Denver	303-433-8841
Conn	Stamford	203-329-2041
Fla	Riviera Beach	305-842-1577
Ga	Atlanta	404-634-6131
Ill	Des Plaines	312-827-0033
Ind	Fort Wayne	219-432-9461
Ind	Indianapolis	317-546-4001
Kans	Overland Park	913-642-7656

Mass	Needham Heights	617-444-7200
Mich	Birmingham	313-644-1151
Minn	Minneapolis	612-929-0676
NJ	Cherry Hill	609-424-3650
NJ	Edison	201-485-3900
NY	Huntington Station	516-293-0180
NY	Syracuse	315-474-8221
Ohio	Pepper Pike	216-831-0030
Tex	Dallas	214-638-6200
Va	Arlington	703-558-4161
Wash	Bellevue	206-747-8534

RCA SOLID STATE DIV., COS/MOS IC Mktg., Rte. 202, Somerville, N. J., 08876, Tel: 201-722-3200, TWX: 710-480-9333; Minimum order: \$100

For info on price: Mktg.; Application info: Engineering HOT LINE; Customer service: P. R. Thomas; Delivery info: Mktg.

Free literature available: COS/MOS product brochure, COS-278C

Products manufactured: Integrated Circuit Devices
See RCA Solid State Div. for Sls. Reps.

RCA SOLID STATE DIV., Linear Integrated Circuits, Rte. 202, Somerville, N. J., 08876, Tel: 201-722-3200, TWX: 710-480-9333; Minimum order: \$100

For info on price: G. M. O'Neal; Application info: M. V. Hoover; Customer service: P. R. Thomas; Delivery info: G. M. O'Neal

Free literature available: Linear Integrated Circuits catalog, 6D6-820F

Products manufactured: Amplifiers, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Integrated Circuit Devices
See RCA Solid State Div. for Sls. Reps.

RCA SOLID STATE DIV., Liquid Crystal Products, Route 202, Somerville, N.J., 08876, Tel: 201-722-3200, TWX: 710-480-9333

For info on price: P.L. Farina, Ext. 5401; Application info: G.J. Granieri, Ext. 5408; Delivery info: P.L. Farina, Ext. 5401

Products manufactured: Display Devices/Displays

RCA SOLID STATE DIV., Micro Processors, Route 202, Somerville, N.J., 08876, Tel: 201-722-3200, TWX: 710-480-9333

For info on price: V. E. Hills, Ext. 2072; Application info: V. E. Hills, Ext. 2072; Customer service: P. R. Thomas, Ext. 5177; Delivery info: V. E. Hills, Ext. 2072

Products manufactured: Integrated Circuit Devices

RCA SOLID STATE DIV., MOS IC Products, Route 202, Somerville, N.J., 08876

For info on price: M. Ciampaglia, Ext. 2158; Application info: T. G. Athanas, Ext. 3741; Customer service: P. R. Thomas, Ext. 5177; Delivery info: M. Ciampaglia, Ext. 2158

Products manufactured: Integrated Circuit Devices, Metal Oxides

RCA SOLID STATE DIV., RF & Microwave Devices, Rte. 202, Somerville, N. J., 08876, Tel: 201-722-3200, TWX: 710-480-9333; Minimum order: \$100

For info on price: F. J. Rohr X3435; Application info: B. Maximow X2485; Customer service: P. R. Thomas X5177; Delivery info: F. J. Rohr X3435

Products manufactured: Transistors
See RCA Solid State Div. for Sls. Reps

RCA SOLID STATE DIV., Thyristors & Rectifiers, Rte. 202, Somerville, N.J., 08876, Tel: 201-722-3200, TWX: 710-480-9333; Minimum order: \$100

For info on price: L. H. Gibbons; Application info: T. C. McNulty; Customer service: P. R. Thomas; Delivery info: L. H. Gibbons

Free literature available: Thyristors/Rectifiers catalog, THC-500D

Products manufactured: Diodes, Rectifiers, Thyristors (Includes Silicon Controlled Rectifiers)
See RCA Solid State Div. for Sls. Reps.

RCA SOLID STATE DIV., Transistors, Rte. 202, Somerville, N.J., 08876, Tel: 201-722-3200, TWX: 710-480-9333; Minimum order: \$100

For info on price: Power Mktg. Mgr.; Application info: D. E. Burke; Customer service: P. R. Thomas; Delivery info: Power Mktg. Mgr.

Free literature available: Power Transistor Directory, PTD-187D

Products manufactured: Transistors
See RCA Solid State Div. for Sls. Reps.

RCA SERVICE CO., Tech. Prods. Svc. Div. RCA Corp., Bldg. 204-2, Cherry Hill, Camden, N.J., 08101, Tel: 609-779-4129, TWX: 710-892-0905; Empl.: 6000

For info on price: B. L. Grossman; Application info: V. A. Littlefield; Customer service: B. L. Grossman; Delivery info: V. A. Littlefield

Free literature available: 33ASR Teletype equipped for Alternate TWX/Dataphone use; 38ASR Teletype used for Dataphone; Extel with standard print, 5 and 8 level.

Products manufactured: Comm. Systems, Radar Systems, Receivers, Teleprinters, Teletypewriters & Equipment, Television Systems & Equipment Closed-Circuit, Transmission Systems, Data

Local Sales Offices & Reps.

Cal	Montebello, RCA Service Co.	213-685-3069
Ga	Atlanta, RCA Service Co.	404-355-6110
Ill	Skokie, RCA Service Co.	312-965-7550
NJ	Jersey City, RCA Service Co.	201-451-2222
Ohio	Strongsville, RCA Service Co.	216-238-9555
Pa	Philadelphia, RCA Service Co.	215-467-3300
Tex	Dallas, RCA Service Co.	214-631-8770

RCL ELECTRONICS DIV., AMF Inc., 700 S. 21st St., Irvington, N.J., 07111, Tel: 201-374-3311, TWX: 710-999-5511; Empl.: 750

p. 1454-460, 2286-2295; p. 21530-1542

Customer service: C. Smith 603-627-3831

Free literature available: Resistor Engineering Handbook. Precision/Power Wire Wound Resistors. Switch Engineering Handbook. Complete information on miniature rotary switches. Delay Line Engineering Handbook. Electromagnetic Delay Lines Including Complete Information on DIP Configurations.

Products manufactured: Delay Lines, Networks, Resistors, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Interop	205-881-3677
Ariz	Mesa, Toribre Ent.	602-832-1134
Cal	(No.) Los Altos, Held & Mollard, Inc.	415-941-6041
Cal	So. Woodland Hills, Interstate Mktg.	213-883-7606

		213-883-7606
Colo	Wheatridge, Waugaman	303-423-1020
Conn	No. Haven, Kitchen & Kutchin	203-239-0212
Fla	Altamonte Springs, Semtronic Assoc.	

Fla	St. Petersburg, Semtronic Assoc.	813-867-6835
Ga	Marietta, K&E Assoc.	404-427-0241
Ill	Chicago, Gassner & Clark	312-764-6121
Ind	Indianapolis, L. DeVoe	317-257-1227

Iowa	Cedar Rapids, Palatine Sls.	319-365-8071
Kans	Andover, Palatine Sls.	316-683-7512
Kans	Overland Park, Palatine Sls.	913-262-5643
Md	Baltimore, Burgin-Kreh	301-788-5200

Mass	Lexington, Kitchen & Kutchin	617-862-8230
Mich	Farmington, Davis-Martenson	313-474-8300
Minn	Minnetonka, T. Ayre	612-474-4125
Mo	St. Louis, Palatine Sls.	314-426-7055

NJ	(So.) Haddonfield, T.A.I.	609-854-3011
NJ	Irvington, MGI	201-399-4350
NY	Rochester, W. Zimmerman	716-586-4450
NY	Syracuse, W.H. Zimmerman	315-474-4889

NC	Winston Salem, Burgin-Kreh	919-768-4174
Ohio	Cleveland, KW Elctn. Sls.	216-831-8292
Ohio	Dayton, KW Elctn. Sls.	513-890-2150
Okla	Oklahoma City, Ammon & Rizos	405-947-1051

Ore	Portland, Almac/Stroum	503-292-3534
Pa	Waterford, KW Elctn. Sls.	412-487-4300
Tex	Dallas, Ammon & Rizos	214-233-5591
Tex	Houston, Ammon & Rizos	713-729-1233

Va	Lynchburg, Burgin-Kreh	703-845-5600
Wash	Seattle, Almac/Stroum	206-763-2300
FOR	Alaska, Almac Stroum	206-232-8228
FOR	Can., Brit. Ca., Almac/Stroum (Portland)	503-292-3534

FOR	Can., Malton, Ont., S. Hooker	416-677-3554
FOR	Can., Montreal, Que., S. Hooker	514-487-5151

Local Distributors

Cal	Sunnyvale, Bell Ind., 1161 N. Fair Oaks Ave.	408-734-8570
Cal	Woodland Hills, Rampart Components, 21201 Oxnard St.	213-887-7260
Colo	Lakewood, Acacia Sls., 11111 W. 8th Ave.	303-232-2882

Ill	Elk Grove Village, GBL, 75 Gaylord St.	312-569-2730
Ill	Rosemont, Advent Elctn., 7110 N. Lycon Ave.	312-298-4210

Iowa	Cedar Rapids, Advent Elctn., 1834 Blairs Ferry Rd. N.E.	319-393-8811
Md	Baltimore, Arrow Elctn., 4801 Benson Ave.	301-247-5200

Md	Baltimore, Radio Elec., 1026 Cromwell Bridge Rd.	301-823-0070
----	--	--------------

Mass	Burlington, Arrow Elctn., 15 A St.	617-273-0100
------	------------------------------------	--------------

NY	Hauppauge, Rampart Components, 195 Engineers Rd.	516-273-1111
NY	Rochester, Simcona, 275 Mt. Read Blvd.	716-328-3230

Ohio	Solon, Repco, 6835 Cochran Rd.	216-248-8900
------	--------------------------------	--------------

Pa	Erie, Erie Corp. Contractor, 1938 Buffalo Rd.	814-455-8110
----	---	--------------

Pa	Philadelphia, Almo, Roosevelt Blvd. at Blue Grass Rd.	215-676-6000
----	---	--------------

Utah	Salt Lake City, Diplomat/Alta, 2280 S. Main St.	801-486-7220
------	---	--------------

Vt	Richmond, Hooker Vt., Bridge St.	514-487-5151
----	----------------------------------	--------------

Wash	Seattle, Almas Stroum/Seattle, 5811 6th Ave. S.	206-763-2300
------	---	--------------

Wisc	Mequon, Taylor Elec. Co., 1000 W. Donges Bay Rd.	414-241-4321
------	--	--------------

RDI/REED DEVICES, INC., 21 W. 183 Hill Ave., Glen Ellyn, Ill., 60137, Tel: 312-858-2050, Telex: 72-1527; FSC No: 53337; Minimum order: \$50 p. 2792-795

For info on price: B. Wolber; Application info: H. Roeser; Customer service: B. Wolber; Delivery info: B. Wolber

Free literature available: Cat. #100: Complete description of 43 Snaptrack T.M. relay & timer sockets, edge connector assemblies, Power Supplies for IC's; Bulletin 102: 4 sizes Snaptrack T.M. channel for mounting pcb's; Bulletin 103: Molded octal socket assembly for single or gang mounting. Cat. #200: Barrier Terminal Strips for PCB's. 3 sizes, 6 styles including right angle mount.

Products manufactured: Boards, Printed Wiring, Universal, Connectors, Power Supplies, Sockets, Switches, Terminal Blocks, Boards & Strips, Terminals

Local Sales Offices & Reps.

Ariz	Phoenix, G. R. McKnight Co.	602-257-8037
Ark	Eldorado, D. Bellew Sls.	501-863-8325
Cal	Menlo Park, G. R. McKnight Co.	415-325-2844
Cal	Woodland Hills, Cummings & Assocs.	213-340-6035

Colo	Denver, Mundix Co.	303-893-2390
Fla	Miami, S.K. Wallace Assoc.	305-961-6640
Fla	Tampa, S. K. Wallace Assoc.	813-961-1037

Ga	Atlanta, A. Brown Assoc.	404-457-6381
Ill	Glen Ellyn, Rockford Controls	312-469-6016
Kans	Wichita, Avionics	316-264-6201

La	Kenner, D. Bellew Sls.	504-729-4550
Mass	Waltham, Betronic Assocs.	617-894-8400
Mich	Brighton, H. H. Barnum Co.	313-229-2961

Mich	Lowell, H. H. Barnum Co.	616-451-0980
Minn	Minneapolis, HMR	612-920-8200
Mo	Florissant, Miller Assocs.	314-355-1642

NY	Buffalo, H.C. Johnson Ags.	716-632-7880
NY	Fayetteville, H.C. Johnson Ags.	315-637-9383
NY	Great Neck, Cooper-Simon & Co., Inc.	516-487-1142
NY	Rochester, H.C. Johnson Ags.	716-482-3000

NC	Greensboro, S. K. Wallace Assoc.	919-292-0487
----	----------------------------------	--------------

Ohio	Columbus, Rockford Controls Ohio	614-231-5890
------	----------------------------------	--------------

Ohio	Dayton, Rockford Controls Ohio	513-898-5452
Ohio	Euclid, Rockford Controls Ohio	216-731-5250
Pa	Elkins Park, K. B. Erdman Co.	215-224-1833

Tenn	Memphis, D. Bellew Sls.	901-365-9437
Tenn	Nashville, A. Brown Assoc.	615-256-3003
Tex	Dallas, R.E. Nesbitt Co.	214-357-4601
Tex	Houston, R.E. Nesbitt Co.	713-224-3633

Utah	Salt Lake City, Control Agency, Inc.	801-466-8601
Wash	Seattle, R. Johnston & Co.	206-524-5170

Local Distributors

Ark	Little Rock, Carlton-Bates Co., 6821 Scott Hamilton	501-562-9100
Cal	Burlingame, Rose Elex, 846 Stanton Rd.	415-697-0224
Cal	Los Angeles, Electro Comps., 122 So. Mission	213-264-7100

Colo	Aurora, Component Specialties, 3178 Noma St.	303-341-0160
------	--	--------------

Conn	Hartford, Hartford Elec. Supp., Box 748	203-233-3694
------	---	--------------

Fla	Miami, Electro Standard Labs, 3560 Northwest 34 St.	305-633-6973
-----	---	--------------

Ga	Atlanta, Electrical Control Prods., 3762 N.W. Freeway Access	404-455-1216
----	--	--------------

Haw	Honolulu, Electrical Equip., 656 S. Queen St.	808-533-3884
Ill	Arlington Hts., S & R Corp., 2420 E. Oakton	312-593-2545

Ill	Chicago, Newark Elec., 500 N. Pulaski	312-638-4411
Ill	Moline, Jim Otis & Assoc., 4520 River Dr.	309-762-9311
Ind	Indianapolis, Ra-Dis-Co, 814 N. Senate	317-637-5571
Kans	Wichita, Interstate Elec. Supply, 1330 E. 1st St.	316-264-6316
Ky	Louisville, P.I. Burks Co., 842 S. 7th St.	502-589-3960
La	New Orleans, Southern Radio, 1909 Tulane	504-524-2343
Mass	Cambridge, Apollo Elec., 101 Binney St.	617-868-3120
Mich	Detroit, La Salle Elec. Supply, 470 Brainard	313-831-0470
Minn	Minneapolis, Control Design, 3433 E. 25th	612-721-1629
Mo	St. Louis, LComp, 2605 S. Hanley	314-647-5505
Neb	Lincoln, Scott Elec., 4040 Adams	402-434-8308
NJ	Jersey City, Cuny & Guerber, 3468 Kennedy	201-653-0222
NJ	So. Plainfield, Brownell Electro., 500 Hadley	201-753-4600
NY	Buffalo, Summit, 916 Main St.	716-884-3450
NY	Lynbrook, Peerless Radio, 19 Wilbur St.	516-593-2121
NC	Winston-Salem, Kirkman Elec., Drawer K	919-724-0541
Ohio	Dayton, ESCO Inc., 221 Crane	513-224-9192
Okla	Tulsa, Radio Inc., 1000 S. Main	918-587-9123
Ore	Eugene, Vitus Elec., 140 E. 5th Ave.	503-345-4377
Pa	Philadelphia, Philadelphia Elec., 112 N. 12th St.	215-568-7400
SC	Greenville, Black Elec., 203 Westfield	803-233-4142
Tenn	Memphis, Brownell Electro, 3053 Tranquility	901-332-9254
Tex	Stafford, Southwest Elec., 12725 Royal Dr.	713-494-6021
Utah	Salt Lake City, Standard Supply, 225 E. 6th	801-355-2971
Va	Lynchburg, Midstate Elec., 1217 Church	804-846-6555
Wash	Seattle, Radar Elec., 168 Western	206-282-2511
Wisc	Milwaukee, Marsh Elec., 6047 W. Beloit	414-545-6500
RE-EL CIRCUITS, INC. , 520 Victor Street, Saddle Brook, N.J., 07662, Tel: 201-843-3738; Empl.: 15		
p. 1-123, 204		
Products manufactured: Alarms, Amplifiers, Annunciators, Attenuators, Boards, Printed Circuit, Chassis, Circuit Board Mounting, Comm. Systems, Controls/Control Eqpt., Converters, Decoders, Encoders, Modulator/Demodulators, Multiplexers, Receivers, Switches, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic), Testers, Transmitters		
Local Sales Offices & Reps.		
Mass	Needham, White Sls. Co.	617-444-3676
NY	E. Northport, Jarms Assoc.	516-368-4096
NY	Fayetteville, M. P. Andrews Mfrs. Rep.	315-637-5291
RECORDER SYS DIV. , See Gulton Inds, Meas. & Control Sys. Div.		
RECOTON CORP. , 46-23 Crane St., Long Island City, N.Y., 11101, Tel: 212-392-6442		
For info on price: P. Wish; Application info: P. Wish; Customer service: R. Diaz; Delivery info: R. Diaz		
Free literature available: 3 complete product catalogs for audio, diamond needle and record, tape and music accessory products.		
Products manufactured: Cable, Connector Adapters, Demagnetizers, Microphones, All Kinds, Phonographs, Parts & Accessories, Tape Recording Accessories		
Local Sales Offices & Reps.		
Ala	Birmingham, Morris Taylor Co.	205-853-3181
Ariz	Phoenix, SWM Sls. Corp.	602-258-6868
Cal	Culver City, Marshank Sls. Corp.	213-559-2591
Cal	Walnut Creek, Mac Pherson Sls. Co.	415-937-1482
Cal	Aurora, SPS Assocs.	303-341-1776
Fla	Casselberry, Morris Taylor Co.	305-838-0821
Haw	Mililani, C & L Dists.	808-623-2762
Ill	Chicago, W. Doyle Co.	312-274-6685
Kans	Leawood, W. Menezes & Assocs.	913-649-2680
La	Metairie, Tape City U.S.A.	504-888-2505
Md	Silver Spring, Morris Taylor Co.	301-946-3569
Mass	Lynn, Keene Sls. Co.	617-595-2300
Mich	Southfield, Aztec Sls. Corp.	313-642-0777

Minn	Maple Grove, R. C. Sls. Co.	612-425-5543
NJ	Lake Pine, Morris Taylor	609-983-1712
NM	Albuquerque, SWM Sls. Corp.	505-296-2620
NY	New York, Newhope Corp.	212-532-7372
NY	Yonkers, J. Brown Electr. Sls. Reps.	914-779-7330
NC	Charlotte, Morris Taylor Co.	704-523-7932
Ohio	Cleveland, M.S. Sls. Co.	216-382-2060
Pa	Philadelphia, Morris Taylor Co.	215-698-9757
Tex	Houston, Spivey-LeBoeuf Assocs.	713-649-1221
Utah	Salt Lake City, SPS Assocs.	801-485-1294
Wash	Yakima, Barnsley-Weis Assocs.	509-453-5537
RECTIFIER COMPONENTS CORP. , 1112 Lousons Rd., Union, N.J., 07083, Tel: 201-687-5410; Empl.: 75; Minimum order: \$50 p. 1-1850, 1851		
For info on price: D. L. Mohn; Application info: D. L. Mohn; Customer service: J. Hambor; Delivery info: B. Murphy		
Products manufactured: Bridges, Diodes, Multipliers, Rectifiers		
Local Sales Offices & Reps.		
Ill	Chicago, M & S Sls. Co.	312-992-1053
Md	Towson, Habco Elctns.	301-825-9637
Mass	Needham Hts., Todino Engrg. Sls. Co.	617-444-7925
Mich	Detroit, A. Blumenberg Assoc.	313-557-1934
NY	Glen Cove, S. Glassman Assocs.	516-676-1039
Pa	Willow Grove, H. Nash Assocs.	215-657-2213
Wash	Seattle, Underwood & Underwood	206-243-2133
FOR: Can., Hamilton, Ont., Cartwright-Southall Assocs., Inc.		
416-528-0294		
RED POINT CORP. , 105 W. Spazier, Burbank, Calif., 91503, Tel: 213-842-4895; Empl.: 12; Minimum order: \$15		
Customer service: R. P. Craig		
Free literature available: Bulletins 9-70 and 10-67		
Products manufactured: Chamber, Environmental Test, Machines/Machinery, Production, Ovens, Pumps, Vacuum		
REDACTRON CORP. , 100 Parkway Dr. S., Hauppauge, N.Y., 11787, Tel: 516-543-8700; Empl.: 475		
Customer service: T. Reantillo		
Free literature available: Description & Interface Information on: Magnetic Tape Cassette Transport, Magnetic Card Transport, Cartridge Transport, 1,000 Line Resolution CRT Monitor.		
Products manufactured: Monitors, Recorders		
Local Sales Offices & Reps.		
Cal	Cupertino, Eakins Assocs.	408-255-6494
Cal	Palo Alto, Eakins Assocs. Inc.	415-328-7871
Cal	Pasadena, Advanced Techniques	213-681-1093
Colo	Englewood, Davis Assocs.	303-761-9228
Conn	Hartford, Newmar Assocs.	203-523-0402
Fla	Orlando, Gra-Mar Inc.	305-894-3351
Kans	Shawnee Mission, IBL Engrg. & Sls., Inc.	913-262-1374
Md	Silver Springs, QED Elctns.	301-588-8134
Mass	Lynnfield, Newmar Assocs.	617-245-7960
Mich	Detroit, Hocker Assocs.	313-531-1403
NM	Albuquerque, Tremblay Assocs.	505-293-4444
NY	Mamaroneck, Cane Tech. Sls., Inc.	914-698-4411
Ohio	Cleveland, Hocker Assocs.	216-734-4433
Ohio	Dayton, Hocker Assocs.	513-298-8638
Ohio	N. Olmstead, Hocker Assocs.	216-734-4433
Okla	Oklahoma City, IBL Engrg. & Sls., Inc.	405-843-9434
Pa	King of Prussia, White-Keystone, Inc.	215-265-1817
Tex	Bellair, IBL Engrg. & Sls.	713-661-2511
Tex	Dallas, IBL Engrg. & Sls., Inc.	214-EM3-2921
Tex	Houston, IBL Engrg. & Sls., Inc.	713-781-5171
Wash	Bellevue, Conrad-Carlson Assocs.	206-455-1336
REDINGTON COUNTERS, INC. , 130 Addison Rd., Windsor, Conn., 06095, Tel: 203-688-6207		
Customer service: T. Nelson		
Free literature available: RCI Full Catalog RCI #35, RCI Condensed Catalog RCI #36, RCI Model 300 Blue Line Electrical Counters RCI #38, RCI Model 500 Predetermining Counters RCI #39		
Products manufactured: Controls/Control Eqpt., Counters		
Local Sales Offices & Reps.		
Ala	Birmingham, McConnell Sls. & Engrg. Corp.	205-871-3501
Ark	Fort Smith, Electro-Related Prods.	501-783-7323

Cal	Los Angeles, R.B. Clapp Co. Inc.	213-225-2395
Cal	San Francisco, Automated Process Controls Co.	415-467-6162
Cal	Loveland, Kelley Entrs.	303-667-1376
Fla	Winter Park, Steele Tech. Sls.	305-644-6641
Ga	Atlanta, B. Fancher Assocs.	404-448-7078
Ind	Ft. Wayne, Neal Engrg. Co.	219-484-5090
Ind	Indianapolis, Neal Engrg. Co.	317-849-4201
Ky	Louisville, Neal Engrg. Co.	502-267-8337
Mass	Wellesley, Staley-Dautel Assocs.	617-235-1643
Mich	Detroit, Basic Service Corp.	313-837-8820
Minn	St. Paul, J.D. Co.	612-454-5552
NY	Buffalo, Good Comps. Corp.	716-634-4400
NY	Manhasset, R. Fara Assocs.	516-627-1151
NC	Matthews, W.K. Hile Co.	704-847-9125
Ohio	Cleveland, Jay Industrial Sls. Co.	216-831-9393
Ohio	Dayton, Neal Engrg.	513-299-6448
Okla	Tulsa, Summit Sls. Inc.	918-743-7794
Ore	Wilsonville, J.L. Kearns Co.	503-236-1165
Pa	Pittsburgh, R.W. Moulton & Assocs.	412-366-3333
Tenn	Knoxville, W.K. Hile Co.	615-588-1061
Tex	Addison, L. Elliott Co.	214-239-8533
Tex	Missouri City, L. Elliott Co.	713-499-1571
Va	Chester, W. K. Hile Co.	804-271-0014
EXP	Cheshire, Conn., Techmark Corp.	203-272-7131
FOR:	Can., Markham, Ont., Scott Controls	416-499-0932
REED SWITCH DEV. CO. , 34 Lincoln Ave., Greenwich, Conn., 06830, Tel: 203-661-9410; Empl.: 2; Minimum order: \$10		
Customer service: J. S. Hammond		
Products manufactured: Controls/Control Eqpt., Magnets, Switches		
REEVE ELECTRONICS, INC. , 601 EEM W. Lake St., Chicago, Ill., 60606, Tel: 312-726-9755; Empl.: 40		
Products manufactured: Adapters, Waveguide, Attenuators, Bends & Twists, Microwave, Calorimeters, Microwave, Cavities, Microwave, Chokes, Controls/Control Eqpt., Couplers, Dielectric Heating Equipment, Dividers, Dummy Loads, Generators, Heaters & Heating Elements, Junctions, Hybrid, Microwave, Loads, Electronic Variable, Machines/Machinery, Production, Meters, Oscillators, Shifters, Soldering Equipment, Switches, Tees, Waveguides & Adapters		
Local Sales Offices & Reps.		
Ala	Huntsville, Powertronics, Inc.	205-852-6347
Ariz	Phoenix, Montgomery Bros.	602-253-3431
Cal	Burlingame, Montgomery Bros.	415-697-6500
Colo	Denver, Montgomery Bros.	303-759-2749
Fla	Titusville, Powertronics, Inc.	305-267-5699
Ill	St. Charles, R.B. Engrg. Co.	312-584-8245
Kans	Baxter Springs, Production Automation Corp.	316-856-3600
Md	Silver Spring, ARA Elctns.	301-565-2584
Mass	Wilmington, Technical Instrs.	617-944-3930
Mich	Troy, C. H. Armstrong Co.	313-524-1414
Minn	Minneapolis, Production Automation Corp.	612-866-5700
Mo	Hazelwood, Production Automation Corp.	314-731-2331
Mo	Raytown, Production Automation Corp.	816-737-0066
NC	Raleigh, Powertronics, Inc.	919-787-9090
NC	Thomasville, Powertronics, Inc.	919-476-6727
Okla	Tulsa, Production Automation Corp.	918-932-1051
Ore	Portland, Montgomery Bros.	503-223-4197
Tex	Richardson, Production Automation Corp.	214-234-4002
Utah	Salt Lake City, Montgomery Bros., Inc.	801-363-3555
Wash	Seattle, Montgomery Bros.	206-762-4100
Wisc	Milwaukee, W. M. Braun & Assoc.	414-332-1040
FOR: Can., Thornhill, Ont., R. Neill Co.		
416-889-9971		
REEVES-HOFFMAN DIV. , Dynamics Corp. of Amer., 400 W. North St., Carlisle, Pa., 17013, Tel: 717-243-5929, TWX: 510-650-3510; Empl.: 718; Minimum order: \$25 p. 1-410, 411		
For info on price: D. Kingery; Application info: D. Kingery; Customer service: R. Stone; Delivery info: R. Stone		
Products manufactured: Crystal Blanks, Crystals, Filters, Holders, Crystal, Mounts, Oscillators		
Local Sales Offices & Reps.		
Cal	Hollywood, Westaironics	714-831-2369
Cal	Marino Del Rey	213-821-7950
Cal	Santa Clara, L & M Assocs.	408-243-2891
Ill	Deerfield, Hutchinson Assocs.	312-945-6882
Iowa	Cedar Rapids, Seltco Sls.	319-362-8155

Md	Baltimore, R. F. Assocs.	301-465-5944
Mass	Wakefield, H. Jappe Co.	617-245-9359
Mich	Farmington, W. R. Hummon & Assoc.	313-474-0661
Mo	St. Louis, Engrg. Svcs. Co.	
NJ	Ridgefield, G. M. Moch Co.	
NY	E Aurora, E.A. Kershaw & Co.	716-652-1221
NY	Larchmont, G.M. Moch Co.	914-834-3530
Ohio	Cincinnati, Tri-State Mktg.	513-761-7993
Pa	Philadelphia, C.H. Newson & Assoc.	
SC	Myrtle Beach, Candor Co.	803-448-5213
Tex	Richardson, Semi Conductor Sls.	214-231-6181

REFAC ELCTRNS./PINLITES, 1275 Bloomfield Ave., Fairfield, N.J., 07006, Tel: 201-575-8820, TWX: 710-734-4348; Empl.: 50 p. 2-1185

Products manufactured: Converters, Counters, Display Devices/Displays, Drivers & Decoders For Readouts, Enclosures, Module, Plug-In, Lamps, Terminal Equipment, Digital, Totalizers, Digital, Tubes

Local Sales Offices & Reps.

Ala	Huntsville, Elmar Assocs.	
Ariz	Scottsdale, E. J. Foley & Assocs.	602-945-2665
Cal	Burlingame, J. Logan & Assocs.	415-697-6100
Cal	Pasadena, Components Corp.	213-681-7448
Colo	Denver, I. W. Strong & Assoc.	303-292-6900
Conn	Stratford, G. Rosen Co.	203-375-5456
Fla	Pompano Beach, Technology Mktg. Assocs.	305-942-0774
Ga	Atlanta, Elmar Assocs.	404-938-2821
Ill	Westchester, Gassner & Clark Co.	
Md	Towson, L. H. Kolman & Co.	312-345-4245
Mass	Framingham, G. Rosen Co.	301-752-8756
Mich	Grand Rapids, Representatives Elctrn. Prod.	617-879-5505
Minn	St. Paul, Northport Eng., Inc.	616-942-1320
Mo	Kansas City, L. F. Florence Co.	612-698-3841
NY	New York, Contact Refac Elctrns.	816-561-7222
NC	Raleigh, Elmar Assocs.	201-575-8820
Ohio	Dayton, J. C. Hofstetter Co.	919-787-2841
Tex	Dallas, Glidden Electro Equip. Co.	513-298-0662
Wash	Seattle, R. Johnston Co.	214-363-6539
Exp:	New York, N.Y., Refac Export Corp.	206-524-5171
For:	Can., Pointe Claire, Que., Avotronics, Ltd.	212-687-4741
For:	Can., Willowdale, Ont., Avotronics, Ltd.	514-697-2135
For:	Can., Willowdale, Ont., Avotronics, Ltd.	416-499-3164

REFAC ELCTRNS/WILD ROVER, 1275 Bloomfield Ave., Fairfield, N.J., 07006, Tel: 201-227-9195, TWX: 710-991-9615; Empl.: 50 p. 1-2268

Products manufactured: Keyboards, Alphanumeric & Decimal, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Elmar Assocs.	
Ariz	Scottsdale, E. J. Foley & Assocs.	602-945-2665
Cal	Los Gatos, Luscombe Engrg. Co.	408-354-6496
Cal	Pasadena, Luscombe Engrg. Co.	213-684-2000
Colo	Denver, I.W. Strong & Assocs.	303-292-6900
Conn	Stratford, G. Rosen Co.	203-375-5456
Fla	Pompano Beach, Technology Mktg. Assocs.	305-942-0774
Ga	Atlanta, Elmar Assocs.	404-938-2821
Ill	Chicago, Carlson Elctrn. Sls.	312-774-4812
Md	Towson, L.H. Kolman & Co.	301-752-8756
Mass	Framingham, G. Rosen Co.	617-879-5505
Mich	Grand Rapids, Representatives Elctrn. Prod.	616-942-1320
Minn	St. Paul, Northport Engrg.	612-698-3841
Mo	Kansas City, L.F. Florence Co.	816-561-7222
NC	Raleigh, Elmar Assocs.	919-787-2841
Ohio	Dayton, J.C. Hofstetter Co.	513-298-0662
Tex	Dallas, Glidden Electro Equip. Co.	214-363-6539
Wash	Seattle, R. Johnston Co.	206-524-5171
Wisc	Milwaukee, Carlson Elctrn. Sls. Co.	414-476-2790
Exp:	New York, NY, Refac Export Corp.	
For:	Can., Pointe Claire, Que., Avotronics, Ltd.	514-697-2135
For:	Can., Willowdale, Ont., Avotronics, Ltd.	416-499-3164

REGENCY ELECTRONICS, INC., 7707 Records St., Indianapolis, Ind., 46226, Tel: 317-547-3581; Empl.: 450
For info on price: W. Ayres; Application info: W. Ayres; Customer service: A. Culpepper

Free literature available: Catalogues for: Comm. Systems, FM; Comm. Systems, Radiotelephone: Counters, frequency; Crystals, Quartz; Receivers, Monitoring, Communications; Transmitters, Tone; Comm. Systems, Carrier Current; Comm. Systems, Frequency Shift; Comm. Systems, Selective Paging; Crystals, Frequency Control; Receivers, Fixed Frequency; Receivers, Tone; Transmitters, UHF/VHF.

Products manufactured: Attenuators, Comm. Systems, Counters, Crystals, Receivers, Transmitters

Local Sales Offices & Reps.

Ariz	Phoenix, L. McMillan	602-949-9437
Cal	Foster City, Olson Sls.	415-573-1600
Cal	Orange, I. Greene	714-637-1356
Cal	Woodland Hills, C. Ryel Co.	213-883-8118
Fla	Miami, L.P. Hensch Co.	305-251-4343
Ga	Atlanta, B. Bowlin	404-948-6604
Iowa	Des Moines, J.D. Irvine Assoc.	515-225-7900
Md	Timonium, Tesco, Inc.	301-252-5610
Mass	Cohasset, Montague Assocs., Inc.	617-383-0634
Mich	Southfield, R. Misk Co.	313-354-3310
NY	Buffalo, M. Farber, Assoc.	716-856-3543
NY	Long Island, Willgold Sls. Corp.	516-764-4022
Ohio	Canton, L. Pilcher	216-494-2148
Okla	Tulsa, B. Favors	918-938-9291
Ore	Portland, J. LeBrun Co.	503-244-6805

REGDON CORP., 3715 Grand Blvd., Brookfield, Ill., 60513, Tel: 312-485-5152; FSC No: 27190; Empl.: 50; Minimum order: \$15 p. 1-1804,1805

For info on price: D. Siemeck; Application info: N. Krasowsky; Customer service: D. Siemeck; Delivery info: D. Siemeck

Products manufactured: Coils Including Assemblies & Forms, Solenoids

Local Sales Offices & Reps.

Ariz	Phoenix, Spectrum & Assoc.	602-997-6324
Cal	San Francisco, Shonin, Inc.	415-467-8701
Cal	Santa Ana, Spectrum & Assoc.	714-835-4114
Conn	Madison, United Components	203-562-4002
Ga	Atlanta, Mr. George O'hara	404-237-0600
Ill	Downers Grove, Richmar Elect. Corp.	312-968-0118
Mich	Walled Lake, T. Mulligan & Assoc.	313-624-0174
Minn	Minneapolis, R.J. Inc.	612-922-1425
NY	New York, LRC Assocs.	
NY	Pittsford, NoCo Inc.	716-461-4750
NY	Valley Cottage, LRC Assocs.	914-634-7973
Ohio	Columbus, T. Mulligan & Assoc.	614-457-2242
Pa	Birchrunville, Jadelectronics	215-647-5151
Ri	Saunderstown, United Components	617-226-0556
Tex	Dallas, W. Reese & Assoc.	214-638-6575
Tex	Houston, W. Reese & Assoc.	713-621-3134

REGMO DATA CORP., 6992 Oxford St., Minneapolis, Minn., 55426, Tel: 612-925-3800; Minimum order: \$25 p. 1-272; p. 2-344

For info on price: R. Otterlei; Application info: R. M. Plaisted; Delivery info: R. Otterlei

Products manufactured: Cleaners & Solvents, Coatings, Process Control Systems, Switches, Timers

REI SALES CO., 120 Cambridge St., Burlington, Mass., 01803, Tel: 617-273-2777 p. 1-796,797

Products manufactured: Computers, Meters, Oscillators, Oscilloscopes, Recorders

REICH ASSOCIATES INC., PO Box 73, Plano, Tex, 75074, Tel: 214-424-7904; Empl.: 10; Minimum order: \$25
Customer service: E. Reich

Free literature available: Application notes on nitrogen and dye lasers and information on families of high voltage power supplies.

Products manufactured: Converters, Detectors, Lasers & Laser Systems, Power Supplies

Local Sales Offices & Reps.

Ga	Atlanta, Physimetrics	404-261-8720
NM	Albuquerque, Southwestern Eng. & Equip. Co.	505-265-6775
NY	Mineola, J. B. Lilly Co.	516-746-2226
Tex	Dallas, Southwestern Eng. & Equip.	214-826-6661
Tex	Houston, TCI Elctrns.	713-774-5019

RELAY SERVICE CO., 1310 N. Pulaski Rd., Chicago, Ill., 60651, Tel: 312-AL 2-2700; Empl.: 40; Minimum order: \$7

For info on price: C. H. Badger; Application info: F. Vivacue

Products manufactured: Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Coils Including Assemblies & Forms, Relays, Switches

Local Sales Offices & Reps.

Kans	Mission, Midland Sls. Engrg. Assocs.	913-CO2-6565
Mich	Farmington, Lloyd George Assocs.	313-474-1505
NJ	Cranford, Hy-Rel Assocs.	201-276-2677

RELAY SPECIALTIES INC., 1300 Plaza Rd., Fair Lawn, N.J., 07410, Tel: 201-797-3313; Empl.: 57; Minimum order: \$15

For info on price: B. Albanese; Application info: S. Gershberg; Customer service: B. Sauer; Delivery info: J. Abrams

Free literature available: Catalog on electronic control components. Relays-Timers-Counters-Switches-Sockets-Temperature controls-Photo Electric Controls-Buzzers and cabinets.

Products manufactured: Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Counters, Relays, Switches, Timers

RELCO PRODS., 5594 E. Jefferson Ave., Denver, Colo., 80237, Tel: 303-756-1143; FSC No: 14454; Empl.: 7; Minimum order: \$50

Customer service: R. Ruehle

Products manufactured: Meters, Probes, Thermometers, Resistance, Transducers

RELIABILITY INC., 5325 Glenmont, Dept. A, Houston, Tex., 77036, Tel: 713-666-3261, TWX: 910-881-1739 p. 1-1428,1429

Customer service: B. Miller

Free literature available: Catalog which describes all products completely.

Products manufactured: Chamber, Environmental Test, Ovens, Power Supplies

Local Sales Offices & Reps.

Ala	Huntsville, EMA, Inc.	405-837-6061
Ariz	Scottsdale, Electronic Entrps.	602-946-9860
Cal	Glendale, Orion Sales	213-240-3151
Cal	San Diego, Orion Sales	714-566-0095
Cal	Sunnyvale, Amasco	408-733-8690
Cal	Tustin, Orion Sales	714-832-9687
Conn	Washington Depot, Kanan Assoc.	203-868-0513
Ind	Indianapolis, Sheridan Sales	317-547-7777
Mass	Reading, Kanan Assoc.	617-944-8484
Mass	Waltham, W. M. Hague Co.	617-899-5600
Mich	Farmington, Sheridan Sales	313-477-3800
Mo	Floissant, Sheridan Sales	314-837-5200
NJ	Berkely Heights, AMC	201-464-5100
NM	Albuquerque, Electronic Entrps.	505-256-3561
NM	Albuquerque, Piper-Goyne Inc.	505-294-1436
NY	Syracuse, T-Squared Elctrns.	315-463-8592
NC	Winston Salem, EMA, Inc.	919-722-5151
Ohio	Beachwood, Sheridan Sales	216-831-0130
Ohio	Dayton, Sheridan Sales	513-277-8911
Ohio	Reading, Sheridan Sales	513-761-5432
Pa	Pittsburgh, Sheridan Sales	412-244-1140
SC	Albany, EMA, Inc.	803-268-1125
Tex	Richardson, Semiconductor Sls. Assoc.	214-231-6181
Wash	Tukwila, General Elctrns.	206-243-5141
Wash	Vancouver, General Elctrns.	206-693-0025

Local Distributors

Cal	El Segundo, Tex. Instr. Sup. Co., 831 Douglas St.	213-776-4490
Cal	Los Angeles, Tex. Instr. Sup. Co.	213-776-4490
Cal	Sunnyvale, Tex. Instr. Sup. Co., 776 Palomar	408-732-5555
Colo	Denver, Tex. Instr. Sup. Co., 9725 E. Hampden	303-751-1780
Colo	Denver, Tex. Instr. Sup. Co.	203-757-7671
Ill	Arlington Hts., Tex. Instr. Sup. Co., 2420 E. Oakton Rd.	312-593-7660
Mass	Waltham, Tex. Instr. Sup. Co., 404 Toten Pond Rd.	617-890-0510
Minn	Edina, Tex. Instr. Sup. Co., 7615 Metro Blvd.	612-835-5353
NJ	Clark, Tex. Instr. Sup. Co., 301 Central Ave.	201-382-6400
NM	Albuquerque, Goyne Assocs.	505-265-6794
NY	Huntington Sta., Tex. Instr. Sup. Co., 2 Huntington Quadrangle	516-293-2660
NY	Syracuse, T Squared Elctrns.	315-463-8592
Ohio	Cincinnati, Sheridan Sls.	513-761-5432
Okla	Tulsa, Tex. Instr. Sup. Co., Box Drawer T	918-437-4555
SC	Greenville, Egan Assocs.	803-228-4450

Tex Austin, Tex. Instr. Supp. Co. 512-258-1636
 Tex Dallas, Tex. Instr. Supp. Co., 6000 Denton
 214-238-6821
 Tex Houston, Tex. Instr. Supp. Co., 3939 Ann Arbor
 713-785-4800
 Tex Richardson, Semiconductor Sls. Assocs.
 214-231-6181
 Va Arlington, Tex. Instr. Supp. Co., 1500 Wilson
 Blvd. 703-524-5885
 Wash Bellevue, SD.R2 Prods. & Sls. 207-747-9424

RELIANE ELECTRIC CO., 24701 Euclid Ave., Cleveland,
 Ohio, 44117, Tel: 216-266-7000; Empl.: 20000

Products manufactured: Analyzers, Boards, Printed
 Circuit, Boards, Printed Wiring, Universal,
 Controls/Control Eqp., Gearheads & Speed
 Reducers, Indicators, Inverters, Meters, Motor &
 Generator Armatures, Rotors, Stators, Motor
 Electric Generator Sets, Motors, Racks, Reducers,
 Relays, Services, Assembly, Production & Test

RENBRANDT, INC., 6 Parmelee St., Boston, Mass., 02118,
 Tel: 617-445-8910; Empl.: 25

Products manufactured: Couplings

RENCO CORP., 26 Coromar Dr., Goleta, Cal., 93017, Tel:
 805-968-1525; Empl.: 75 p. 1*202,203

Products manufactured: Encoders, Tachometers

Local Sales Offices & Reps.

Cal Santa Fe Springs, Sales Engrs. Ltd.
 213-921-4337
 Fla Orlando, MacKay, Smith & Assocs.
 305-277-1513
 Ill Chicago, Electro Tech. Mktg. 312-588-4535
 Iowa Cedar Rapids, Palatine Sls. 319-385-8071
 Kans Andover, Palatine Sls. 316-683-7512
 Kans Overland Park, Palatine Sls. 913-262-5643
 Mass Andover, Mech-Tron Co. 617-475-3531
 Mich Detroit, Ridgway East 313-538-3940
 Mo St. Louis, Palatine Sls. 314-428-7055
 NY Roslyn Heights, Travco Assocs. 516-621-3223
 NC Charlotte, MacKay, Smith & Assocs.
 704-527-0240
 Ohio Chagrin Falls, Ridgway East 216-247-4845
 Ohio Loveland, Ridgway East 513-683-4350
 Okla Tulsa, Palatine Sls. 918-622-0321
 Tex Austin, Palatine Sls. 512-451-7463
 Tex Richardson, Palatine Sls. 214-231-9489
 Wash Seattle, Thorson Co. 206-632-0710

RENTAL ELECTRONICS, 99 Hartwell Ave., Lexington,
 Mass., 02173, Tel: 617-862-6905, Telex: 92-3494; Empl.:
 70 p. 1*792-795

Free literature available: INSTRUMENT RENTAL
 CATALOG - Complete listing and description of
 rental equipment. Includes the advantages of
 renting equipment; information on rental,
 rental/purchase and leasing services available;
 and prices.

TEST EQUIPMENT CATALOG - Complete listing
 and description of slightly used electronic test
 equipment available for sale. Discount prices
 included.

Products manufactured: Amplifiers, Analyzers,
 Attenuators, Bridges, Calculators, Electrical &
 Electronic, Calibrators, Cameras, Chamber,
 Environmental Test, Computers, Converters,
 Counters, Couplers, Decade Boxes, Detectors,
 Filters, Generators, Inverters, Meters, Oscillators,
 Oscillographs, Direct Writing, Oscilloscope
 Plug-Ins, Oscilloscopes, Power Supplies,
 Recorders, Resistors, RFI Measuring Equipment,
 Scanners, Services, Assembly, Production & Test,
 Shifters, Standards, Synthesizers, Testers,
 Tracers, Curve, Voltage Sources, Waveguides &
 Adapters

Local Sales Offices & Reps.

Ala Huntsville, General Radio Corp. 205-883-7538
 Ariz Scottsdale, BFA Corp. 602-946-4215
 Cal Anaheim, Rental Elctns., Inc. 714-879-0561
 Cal Lawndale, Ward/Davis Assoc. 213-542-7740
 Cal Mountain View, Rental Elctns., Inc.
 415-968-8845
 Cal Sunnyvale, Ward/Davis Assoc. 408-245-3700
 Colo Denver, BFA Corp. 303-744-3301
 Conn Glastonbury, Instr. Rep. 203-633-0777
 Fla Ft. Lauderdale, Rental Elctns., Inc.
 305-771-3500
 Fla Lighthouse Pt., Saber Assoc. 305-943-3076
 Ga Atlanta, General Radio Corp. 404-457-2485
 Ill Des Plaines, Cozens & Cudahy 312-298-3600
 Ill Des Plaines, Rental Elctns., Inc. 312-827-6670
 Ind Indianapolis, Cozens & Cudahy 317-244-2456
 Md Gaithersburg, Rental Elctns., Inc. 301-948-0620
 Mass Burlington, Rental Elctns., Inc. 617-273-7270
 Mass Burlington, REI Sls. 617-273-2777
 Mass Lexington, Instr. Rep. 617-861-8620

Mich Detroit, S. Sterling 313-255-1970
 Minn Minneapolis, Cozens & Cudahy 612-844-4336
 Mo Edmondson, Cozens & Cudahy 314-423-1234
 NJ Oakland, Rental Elctns., Inc. 201-337-3757
 NM Las Cruces, BFA Corp. 505-523-0601
 NY E. Syracuse, Ossman Instrs. 315-437-6666
 NY Great Neck, Eastern Instr. 516-466-9505
 NC Winston-Salem, General Radio
 Cleveland, S. Sterling 216-422-8080
 Okla Norman, Data Mktg. 405-364-8320
 Pa Pittsburgh, S. Sterling 412-922-5720
 Tex Dallas, Rental Elctns., Inc. 214-661-8082
 Tex Houston, Data Mktg. Assoc. 713-686-9627
 Va Alexandria, Dyna Rep Co. 703-354-1222
 Wash Seattle, R.S. Drake Assoc. 206-763-2755
 FOR: Can., Rexdale, Ont., Rental Elctns., Inc.
 416-677-7513

REO INDS, INC., 633 3rd St., N.W., Massillon, Ohio,
 44646, Tel: 216-833-9951; Empl.: 150

Customer service: T. J. Albert

Free literature available: Brochure describes
 product applications and services available.

Products manufactured: Cabinets & Accessories

REPCO INC., Special Product Dept., Box 7065, Orlando,
 Fla., 32804, Tel: 305-843-8484, TWX: 810-850-0120;
 Empl.: 350

For info on price: J. Dirmann 305-843-8498;
 Application info: B. Schermerhorn 305-843-8498;
 Customer service: W. Nelson 305-843-8484; Delivery
 info: B. Schermerhorn 305-843-8498.

Free literature available: Brochures, R.F. links, 10-8
 hand held portable radio, 10-2 hand held portable
 radio, m/p mobile portable radio.

Products manufactured: Comm. Systems,
 Receivers, Recorders, Transceivers, Transmitters

Local Sales Offices & Reps.

Advertisement

VHF/UHF portable hand-held trans-
 ceivers, mobile/portable radios-low
 and high band. RF communications
 links. Transmitters and receiver units.
 Power outputs from .5 to 50 watts.
 Solid state throughout. Modular plug-
 in-block circuits, small size, FCC type
 accepted easy maintenance, high re-
 liability.

REPUBLIC ELCTRNS. CORP., 176 E. 7th St., Paterson,
 NJ, 07524, Tel: 201-279-0300, TWX: 710-988-5908;
 Empl.: 125; Minimum order: \$15 p. 2*232,233

For info on price: G. Wolter; Application info: G.
 Wolter; Customer service: C. Taylor; Delivery info: C.
 Taylor

Free literature available: Bulletin KI describes a
 complete line of subminiature general purpose
 and temperature compensating ceramic
 capacitors. Included are tight tolerance NPO units.

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Ariz Phoenix, MR Sales 602-959-5150
 Cal Los Angeles, Corcoran Assoc. 213-823-2425
 Cal Ramona, Advanced Tech. Sls. 714-789-1676
 Fla Miami Beach, Gartner 305-861-3661
 Fla Orlando, Gartner 305-299-1000
 Ill Chicago, Ropek & Cahill 312-287-7292
 Cedar Rapids, J.R. Sales Engrg. 319-377-8211
 Kans Overland Park, Reese Assoc. 913-648-7748
 Md Bethesda, W. Mount Co. 301-657-9312
 Mass Allston, Vector Sls. 617-787-2790
 Minn Hopkins, Grayden & Flemmer 612-941-1120
 NJ Paterson, Mucon Corp. 201-279-0300
 NJ Wallington, Comp-Tech Sls. 201-935-5454
 NY Liverpool, J.L. Semple Assoc. 315-458-4775
 NY New Hyde Park, Comp-Tech. Sls. 516-593-2628
 NY Rochester, J.L. Semple Assoc. 716-342-1413
 NC Charlotte, J. Rudisill Assocs. 704-377-6901
 Ohio Columbus, T. Mulligan & Assoc. 614-457-2242
 Okla Tulsa, H.J. Daly Co. 918-627-4159
 Pa Ardmore, Rothenheber & Wurts 215-649-6300
 Wash Seattle, Blum & Assoc. 206-285-2590

REQUIRED PRODUCTS, Box 3083, Stanford, Cal., 94305,
 Tel: 408-738-4329; Empl.: 4; Minimum order: \$25

Customer service: C. E. Merkel

Free literature available: Data sheets

Products manufactured: Amplifiers, Power Supplies

RESEDL CORP., Bldg. #22-County Airport, Rio Grande,
 N.J., 08242, Tel: 609-886-1111; Empl.: 12; Minimum
 order: \$35

For info on price: W. O. Taylor; Application info: W. A.
 Taylor; Customer service: W. O. Taylor; Delivery info:
 W. O. Taylor

Products manufactured: Bobbins, Winding, Coil &
 Transformer, Bushings, Glass, Plastic, Metal,
 Rubber, Etc., Coils Including Assemblies & Forms,
 Cups, Encapsulation, Spacers, Tubing

Advertisement

Centrifugally cast epoxy tubing, with
 or without fillers, for electrical and
 mechanical applications. Cast in
 lengths of 57 inches with no taper in-
 side or outside. Some of the present
 applications are encapsulating and
 potting forms, stand-offs, connecting
 links, spacers, insulators, bolt and
 cooling holes in castings.

RESEDL ENGRG. CORP., 300 E. Live Oak Ave., Arcadia,
 Cal., 91006, Tel: 213-684-2600, TWX: 910-582-3219;
 Empl.: 170

Customer service: R. Bennett 213-445-5955 Ext. 302

Products manufactured: Amplifiers, Comm.
 Systems, Couplers, Receivers, Recorders,
 Synthesizers, Transmission Systems, Data,
 Transmitters

RESEARCH DEVICES, 616 Springfield Ave., Berkeley
 Heights, N.J., 07922, Tel: 201-464-0668; Empl.: 6

For info on price: B. G. Cohen; Customer service: M.
 W. Focht; Delivery info: V. R. Saba

Free literature available: 1-Data Sheets on Infrared
 Microscopes; 2-Application notes on uses of IR
 Microscopy in solid state device manufacture.

Products manufactured: Cameras,
 Machines/Machinery, Production, Microscopes,
 Semiconductor Wafer Fabrication

Advertisement

Research Devices Model D infrared
 microscope. Direct observation and
 photography of defects in integrated
 circuits, transistors, LED's and other
 solid state devices. Problems such as
 faulty metallizations, internal precipi-
 tates, die attach and bonding non-
 uniformities, may be detected on slices
 and chips. Call for applications in-
 formation, or for a free demonstra-
 tion.

RESEARCH, INC., Box 24064, Minneapolis, Minn., 55424,
 Tel: 612-941-3300, TWX: 612-292-4066; Empl.: 160

For info on price: H. Atkins; Application info: G.
 Gauvin; Customer service: W. Baer; Delivery info: H.
 Atkins

Free literature available: INFRARED RADIANT
 HEATING: Basic radiant heating and control
 concepts, including focussed and area heating
 patterns. PYROMATION HEATING SYSTEMS: A
 series of short application articles concerning
 infrared process heating in the electronics
 industry.

Products manufactured: Chamber, Environmental
 Test, Computers, Controls/Control Eqp., Power
 Supplies, Programmers, Transducers

RESEARCH INSTRUMENT CO., 643 Stewart Ave., Garden
 City, N. Y., 11530, Tel: 516-248-1001; Empl.: 12;
 Minimum order: \$25

Customer service: M. Stoll

Free literature available: "The Pluses of Hermetic
 Sealing", "Universal Multi-Station GRADIENT Flat
 Pack Sealer", "Pressurized Sealer", "Crystal
 Grower", "Boat Puller", "CCTV Microscope",
 "Solvent Lap"

Products manufactured: Controls/Control Eqpt., Furnaces, Machines/Machinery, Production, Meters, Microcircuit Production Equip., Microscopes, Ovens, Seals, Semiconductor Wafer Fabrication, Services, Assembly, Production & Test, Soldering Equipment, Television Systems & Equipment Closed-Circuit, Test Equipment

Local Sales Offices & Reps.

Cal Santa Barbara, F. Pennucci 805-967-4116
 NY Ossining, Int'l. Scientific Sls. 914-762-0685
 NY Rochester, Upstate Tech. Equip. 716-377-8058
 NY Solvay, Upstate Tech. Equip. 315-458-5573
 Tex Houston, R.L. Stoll Assocs. 713-772-8282

RESEARCH PRODS. CORP., 1015 E Washington Ave., Madison, Wisc, 53701, Tel: 608-257-8801

Customer service: T. Alery

Free literature available: Aluminum, washable air filters.

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Filters

RESISTANCE PRODS., 914 S. 13th St., Harrisburg, Pa., 17104, Tel: 717-236-5081, TWX: 510-650-4920; Empl.: 87

Products manufactured: Networks, Resistors

Local Sales Offices & Reps.

Ariz Scottsdale, Fred Board Assocs. 602-944-9388
 Cal Mountain View, G.C. Woempner 415-964-5454
 Cal San Marino, Van Gott & Assoc. 213-285-2148
 Colo Denver, Walter Engrg. Assoc. 303-777-5585
 Fla Winter Park, Steele Technical Sls. 305-644-6641

Ga Atlanta, G.S. O'Hara 404-237-0600
 Ill Bellwood, Fiat Engrg. Assoc. 312-547-6200
 Ind So Bend, Valentine-Schillinger Co. 219-291-6258

Kans Leawood, Vaseen Sls. Co. 913-649-0679
 Mass Canton, New England Elec. Sls. Co. 617-828-4835

Minn St. Paul, Furber Sales 612-861-1518
 Mo St. Louis, Vaseen Sls. Co. 314-725-5219
 NY Floral Park, Mos Assocs. 516-694-5923
 NY Syracuse, C. W. Floring & Assoc., Inc. 315-478-2149

Ohio Cleveland, D. Steffen Assocs. 216-461-8333
 Ohio Dayton, Del Steffen Assoc. 513-293-3145

Pa Flourtown, Avenir 215-348-8290
 Tex Addison, MMS Comps. 214-661-5160

Wash Seattle, D. Smith Sls. Co. 206-633-3160
 EXP: N.Y., Westbury, Minthorne Int'l. Co., Inc. 516-334-3303

FOR: Can., Ottawa, Ont., Wilson Ent. 416-224-9878
 FOR: Can., Toronto, Ont., Wilson Enterprises 416-766-0510

RESISTORS, INC., 5226 W. 26th St., Chicago, Ill., 60650, Tel: 312-812-1540; Empl.: 50 p. 2-1544,1545

Products manufactured: Resistors

Local Sales Offices & Reps.

Cal Los Angeles, W.S. Harmon Co. 213-937-1460
 Cal Palo Alto, W.W. Tompkins & Co. 415-326-7940
 Ill Chicago, L-Tec, Inc. 312-286-1500
 Iowa Cedar Rapids, J.R. Sls. Engrg. 319-377-8211
 Mass Needham, White Sls. Co. 617-444-3676
 Mich Lathrup Village, R.C. Nordstrom & Co. 313-353-0210

NJ Moorestown, A.A. Foley Assocs. 609-235-2390
 NY New York City, Symon Assocs. 212-757-3638

Ohio Wickliffe, W.J. Brauer & Assocs. 216-943-0601
 Pa Pittsburgh, W.J. Brauer & Assocs. 412-921-3213

Tex Garland, Whiteside Sls. Co. 214-231-9771
 Wisc Milwaukee, Honkamp Sls. Co. 414-463-2530

MOXON, INC., see SRC Div. Moxon, Inc.

REYNOLDS INDS., INC., Box 1170, Marina Del Rey, Cal., 90291, Tel: 213-823-5491; FSC No: 99747; Empl.: 150; Minimum order: \$50

For info on price: J. Korbel; Application info: R. Craig; Customer service: J. Korbel; Delivery info: J. Korbel

Products manufactured: Connector Adapters, Connectors, Lead Assemblies & Receptacles, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Mass Stow, Musello Assocs. 617-369-5900
 NJ Moorestown, Reynolds Inds. 609-234-0613
 Tex Irvine, A.D. Elctns. 214-259-4761
 Wash Seattle, S. Wilson Co. 206-226-0650

REYNOLDS METALS CO., Box 27003, Richmond, VA., 23261, Tel: 804-282-2311, TWX: 710-956-0112

Products manufactured: Alloys, Bus Bars & Systems, Cable, Foil, Metal Compounds, Foils, Powders, Sheet, Stock, Metals, Tubing, Wire

Local Sales Offices & Reps.

Ala Birmingham 205-592-4994
 Ariz Phoenix 602-272-7961
 Ark Little Rock 501-374-6472
 Cal Los Angeles 213-937-3680
 Cal San Francisco 415-692-3011
 Colo Denver 303-756-1591
 Conn Hartford 203-278-1760
 DC Washington 202-833-3760
 Fla Coral Gables 305-666-1866
 Fla Tampa 813-877-8057
 Ga Atlanta 404-393-1000
 Ill Galesburg 309-342-6204
 Ill Park Ridge 312-696-1400
 Ind Fort Wayne 219-637-5177
 Ind Indianapolis 317-247-6246
 Kans Kansas City 913-262-2121
 Kans Wichita 316-265-7245
 Ky Louisville 502-897-7101
 La New Orleans 504-833-3713
 Md Towson 301-823-4141
 Mass Chestnut Hill 617-734-3770
 Mich Detroit 313-354-4111
 Mich Grand Rapids 616-241-4677
 Minn Minneapolis 612-927-4424
 Mo St. Louis 314-726-5700
 NJ South Plainfield 201-561-0500
 NY New York 212-355-7700
 NY Buffalo 716-877-2565
 NY Rochester 716-271-5060
 NY Syracuse 315-437-2947
 NC Charlotte 704-536-0494
 Ohio Cincinnati 513-771-8640
 Ohio Cleveland 216-845-5000
 Ohio Columbus 614-228-2092
 Ohio Toledo 419-729-1681
 Ohio Youngstown 216-757-3163
 Ore Portland 503-666-3841
 Pa Bala-Cynwyd 215-839-4820
 Pa Pittsburgh 412-563-0030
 Tenn Memphis 901-396-3435
 Tenn Nashville 615-254-7597
 Tex Dallas 214-661-1120
 Tex Houston 713-622-7810
 Utah Salt Lake City 801-328-8138
 Wash Seattle 206-623-2503
 Wisc Milwaukee 414-475-1051

RF INTERONICS, 100 Pine Air Dr., Bay Shore, N.Y., 11706, Tel: 516-231-6400, TWX: 510-227-6233; FSC No: 13619; QPL No: 15733; Empl.: 150; Minimum order: \$25 p. 1-572,573

For info on price: Sls. Dept.; Application info: Engrg. Dept.; Customer service: Sls. Dept.; Delivery info: Sls. Dept.

Free literature available: Filter catalog

Products manufactured: Attenuators, Capacitors, Fixed, Coils Including Assemblies & Forms, Filters

Local Sales Offices & Reps.

Ariz Scottsdale, Williams-Assocs. 602-947-4297
 Cal Alhambra, M.W. Riedel Co. 213-283-7694
 Cal San Jose, United Sales Co. 408-379-0800
 Colo Denver, Williams-Assocs. 303-373-4730
 Fla Ft. Lauderdale, Tech-Rep Assocs. 305-792-0962
 Fla Indian Rocks Beach, Tech-Rep Assocs. 813-595-2834

Ill Oak Park, J. Popp Sls. 312-626-3711
 Kans Overland park, Enesco-Rep. Inc. 913-381-7557

Md Bethesda, Mechtronics Sls. 301-340-2130
 Mass Wakefield, Meas. Equip. Co. 617-245-4870

Mich Detroit, A. Blumenberg Assocs. 313-557-1934
 Minn Minnetonka, P.J. Codute & Co. 612-933-2281

Mo St. Louis, Enesco-Rep. Inc. 314-542-3935
 NJ Cherry Hill, H.J. White Co. 609-428-4544

NM Albuquerque, Williams-Assocs. 505-255-1638
 NY Fairport, W.A. Franklin Sls. 716-377-6584

NY Great Neck, Trionic Assocs. 516-466-2300
 NY Syracuse, W.A. Franklin Sls. 315-474-5273

NY Whitesboro, W.A. Franklin Sls. 315-736-5460
 Ohio Cincinnati, Tri-State Mktg. 513-761-7993

Tex Richardson, Campion Sales 214-238-8135
 EXP: New York, N.Y., Ad. Auriema, Inc. 212-466-2516

FOR: Can., Don Mills, Ont., Bruce Vallilile Elec. 416-447-8482

R F D, INC., 5024 Nassau St., Tampa, Fla., 33607, Tel: 813-872-1502; FSC No: 21992; Empl.: 32; Minimum order: \$50

For info on price: S. Bailey; Application info: C. Beaty; Customer service: T. Facer; Delivery info: T. Facer

Free literature available: Microwave products catalog.

Products manufactured: Amplifiers, Oscillators, Preslector-Mixers, Preselctors, Receivers, Transmitters

Local Sales Offices & Reps.

Cal Los Altos, Stout/Loeswick Assoc. 415-948-3265
 Cal Woodland Hills, Interstate Mktg. Assoc. 213-883-7606

Colo Boulder, H. Bass Assoc. 303-499-7509
 Fla Clearwater, Southeastern Comp. Sls. 813-531-8324

Ill Chicago, RF Specialists 312-698-2044
 Md Baltimore, Applied Engrg. Conslts. 301-465-1272

Mass Burlington, Tritex, Inc. 617-272-4550
 NJ Clemerton, Applied Engrg. Conslts. 609-783-5121

NJ Westfield, Gray & Reed Assoc. 201-233-6116
 NY Huntington Station, Gray & Reed Assoc. 516-433-3333

RFL INDS., Comms. Div., Powerville Rd., Boonton, N.J., 07005, Tel: 201-334-3100, TWX: 710-987-8352; Empl.: 250; Minimum order: \$10 p. 1-122

For info on price: W. Estler Ext. 213; Application info: R. Gilman Ext. 276; Customer service: W. Fettes Ext. 246; Delivery info: W. Estler Ext. 213

Free literature available: Voice Frequency Carrier Equipment may be used for transmission of data signals derived from nearly any source. Typical are telemetry, supervisory control, telegraph and data applications.

Products manufactured: Amplifiers, Bridges, Coders, Comm. Systems, Converters, Data Acquisition & Reduction Systems, Equalizers, Limiters, Modulator/Demodulators, Multipliers, Networks, Oscillators, Receivers, Transducers, Transformers, Transmission Systems, Data, Transmitters

Local Sales Offices & Reps.

Alas Anchorage, H Lang & Assoc. 907-279-5741
 Ariz Phoenix, Portis & Assocs. 602-947-4379
 Cal Los Gatos, Luscombe Engrg. Co. 408-354-6496
 Cal Pasadena, Luscombe Engrg. Co. 213-684-2000
 Colo Lakewood, Claredon Co. 303-238-4462
 DC Wash, Instrucom, Inc. 202-223-1759
 Fla St. Petersburg, Comtech Assoc. Inc. 813-527-3281

Haw Honolulu, Aloha Assoc. 808-941-1574
 Idaho Boise, Tarbell Communications 208-343-0285

Ill Schaumburg, Kay Sls. 312-397-1215
 La New Orleans, Mid South Sls. 504-822-3030

Minn Minneapolis, R.W. Marshall Co. 612-929-0457
 Mo Cameron, Comm. Systems 816-632-7616

NH Nashua, Bell Controls 603-882-6984
 Ohio Columbus, RFL Industries 614-888-7255

Ore Portland, Tarbell Com. 503-643-1631
 Tex Houston, Control Interface, Inc. 713-464-6571

Tex Richardson, Horizon Engrg. Sls. Co. 214-238-9121

Utah Salt Lake City, Cannon Engrg. & Sls. Co. 801-328-9404

Wash Bellevue, Tarbell Communications 206-454-9716

RFL INDS., Instr. Div., Powerville Rd., Boonton, N.J., 07005, Tel: 201-334-3100, TWX: 710-987-8352; Empl.: 250; Minimum order: \$10 p. 1-791

For info on price: F. Price Ext. 202; Application info: R. Schmehl Ext. 235; Customer service: W. Fettes Ext. 246; Delivery info: F. Price Ext. 202

Free literature available: How to Magnetize, Measure and Stabilize Permanent Magnets, describes, Magnetic Instrumentation ranging from simplified operator controlled apparatus to complete automated processing systems.

Products manufactured: Analyzers, Calibrators, Demagnetizers, Dividers, Indicators, Magnetizers, Magnetometers, Magnets, Meters, Power Supplies, Probes, Standards, Testers, Transducers

Local Sales Offices & Reps.

Ala Huntsville, Lee Assocs. 205-533-5896
 Ariz Scottsdale, Williams Assocs. 602-947-4297

Cal Glendale, IFM Inc. 213-246-7261
 Cal Mountain View, IFM, Inc. 415-961-2828

Colo Denver, Williams Assocs. 303-373-4730
 Conn Middletown, The Mancib Co. 203-347-5629

Fla Ft. Lauderdale, Lee Assocs. 305-525-9767
 Fla Winter Haven, Lee Assocs. 813-294-5815

Haw Honolulu, Aloha Assocs. 808-941-1574
 Idaho Boise, Tarbell Comm., Inc. 208-343-0285

Ill Des Plaines, Marsland 312-298-0260
 Ind Indpls, Marsland 317-924-3568
 Mass Burlington, Mancib Co. 617-272-9450

Mich	Farmington, Carter, McCormic & Pierce, Inc.	313-477-7700
Minn	Mpls, Marsland Assocs., Inc.	612-545-4481
Mo	Kansas City, Marsland	314-278-6949
NJ	Haddonfield, Dyna Rep Co.	609-795-1700
NM	Albuquerque, Williams Assocs.	505-255-1638
NY	Elbridge, L-Tron Corp.	315-689-3787
NY	Latham, L-Tron Corp.	518-785-5023
NY	Tonawanda, L-Tron	716-691-8887
NC	Raleigh, Lee Assocs.	919-787-5818
Ohio	Cleveland, Carter, McCormic & Pierce	216-333-5650
Ohio	Dayton, Carter, McCormic & Pierce	513-278-5873
Ore	Beaverton, Tarbell Comm., Inc.	503-643-1631
Pa	Monroeville, Carter, McCormic & Pierce	412-372-4415
Tex	Houston, Scientific Sls.	713-666-5318
Tex	Richardson, Scientific Sls. Co.	214-231-6541
Va	Alexandria, Dyna Rep. Tech. Svcs.	703-354-1222

RFL INDS., Thermocontrol Div., Boonton, N.J., 07005, Tel: 201-334-3100, TWX: 710-987-8352; Empl.: 250; Minimum order: \$10 p. 1-2328, 2329
For info on price: B. Kendall Ext. 237; Application info: J. Simon Ext. 282; Customer service: W. Fettes Ext. 246; Delivery info: B. Kendall Ext. 237

Free literature available: A Guide for selection and installation of RFL Electronic controllers, where precise process temperature control is required for industrial applications.

Products manufactured: Controls/Control Eqpt., Meters, Monitors, Mounts, Probes, Thermistors, Transducers

Local Sales Offices & Reps.

Ala	Huntsville, W.A. Brown Comps., Inc.	205-539-4411
Ariz	Scottsdale, Williams	602-947-4297
Cal	Glendale, IFM Inc.	213-246-7261
Cal	Mountain View, IFM, Inc.	415-961-2828
Colo	Denver, Williams Assocs.	303-373-4730
Conn	Wallingford, Adams-McGregor	203-269-5816
Fla	Ft. Lauderdale, W.A. Brown Comps.	305-776-4800
Fla	Orlando, W.A. Brown Comps., Inc.	305-425-5505
Ga	Atlanta, W.A. Brown Comps.	404-457-4069
Haw	Honolulu, Aloha Assocs.	808-941-1574
Idaho	Boise, Tarbell Comms., Inc.	208-343-0285
Ill	Palatine, J.E. Zenner Assoc.	312-358-6520
Md	Kensington, Elctrn. Mktg. Assoc. Inc.	301-881-5300
Mass	Scituate, Adams-McGregor	617-545-2213
Mich	Farmington, Carter, McCormic & Peirce	313-477-7700
Minn	Minneapolis, Waytek Co.	612-933-2133
NJ	Boonton, RFL Inds., Inc.	201-334-3100
NJ	Union, Garwood Assocs.	201-964-8366
NM	Albuquerque, Williams	505-255-1638
NY	Elbridge, L-Tron Corp.	315-689-3787
NY	Latham, L-Tron Corp.	518-785-5032
NY	Tonawanda, L-Tron	716-691-8887
NC	Raleigh, W.A. Brown Comps.	919-876-9601
NC	Winston-Salem, W.A. Brown Comps., Inc.	919-725-5384
Ohio	Cleveland, Carter, McCormic & Peirce	216-333-5650
Ohio	Dayton, Carter, McCormic & Peirce	513-278-5873
Ore	Beaverton, Tarbell Comms. Inc.	503-643-1631
Pa	King of Prussia, Elctrn. Mktg. Assoc.	215-265-1600
Pa	Monroeville, Carter, McCormic & Peirce	412-372-4415
RI	Lincoln, Adams-McGregor	401-726-1300
Tex	Dallas, McGatlin Instr. Co.	214-243-6061
Wash	Bellevue, Tarbell Comms.	206-454-9716

Local Distributors

Ala	Mobile, Brownell Electro, 3450 Armour Dr.	205-479-5405
Cal	Burlingame, Rose Elctns., 846 Stanton Rd.	415-697-0224
Cal	Los Angeles, Fisher-Brownell, 13936 S. Broadway	213-532-2170
Cal	Mid View, IFM, Inc., 80 W. El Camino Real	415-961-2828
Cal	San Pedro, IFM, Inc., 1300 S. Beacon St.	213-547-0829
Cal	Santa Clara, Fisher-Brownell, 3381 Edward Ave.	408-244-6182
Conn	Waterbury, Suburban Supply, 117 Benedict St.	203-757-1251
Fla	Orlando, Brownell Electro, 307 27th St.	305-843-6770
Ga	Atlanta, Brownell Electro, 3026 Commerce	404-762-5181

Ind	Indianapolis, Rockwell Engrg., 2121 E. 45th St.	417-251-9453
Mass	Boston, Sager Electrical, 172 High St.	617-542-2281
Mass	Burlington, Instrs./Div of Mancib, A Street	617-272-9450
Mass	Cambridge, Brownell Electro, 271 Vassar St.	617-864-7500
Mich	Farmington, C.M.&P Dists., 23995 Freeway Pk.	313-477-7700
Minn	Minneapolis, Waytek, Inc., 5656 Lincoln Dr.	612-933-2133
NJ	S. Plainfield, Brownell Electro, 500 Hadley Rd.	201-753-4600
NJ	Springfield, Federated Purchaser, 155 Rte. 22	201-376-8900
NY	Buffalo, Trott Elctns., 932 Hertel Ave.	716-876-0880
NY	New York, Brownell Electro, 85 10th Ave.	212-924-6000
NC	Charlotte, Brownell Electro, 5141 Belhaven	704-394-4341
Pa	Philadelphia, Brownell Electro, 10980 Dutton	215-632-3030
Tenn	Memphis, Brownell Electro, 3053 Tranquility	901-332-9254
Tenn	Nashville, Brownell Electro, 1050 Acorn Dr.	615-889-8230

RG ENTERPRISES INC., Box 667, Scottsdale, Ariz., 85252, Tel: 602-948-9888; Empl.: 2
Customer service: R. C. Granite

Free literature available: A data sheet describing spec's, usage & pricing on a line tools for manual lead forming. Five models are available from 1/8W to 2W.

Products manufactured: Machines/Machinery, Production

Local Distributors

Cal	El Monte, Marshall Industries, 9674 Telstar Ave.	213-686-0141
Cal	El Segundo, Wassco, 410 S. Douglas St.	213-772-8171
Cal	Glendale, Macdonald & Co., 213 S. Brand Blvd.	213-241-1101
Cal	Los Angeles, Engineering & Elctrn. Devices, Inc., 1024 N. McCadden Pl.	213-463-4175
Cal	Torrance, Unitool Div. of Erem Corp., 3740 Skypark Dr.	213-772-0751
Conn	Madison, A & M Electronic Rep's, Aileen Dr.	202-245-1031
Ind	Huntington, Triad-Utrad, 305 N. Briant St.	
Pa	Huntingdon Valley, H. Mann, Inc., 3983 Mann Rd.	215-355-7200
Tex	Dallas, Specialized Prods. Co., 2324 Short Crest Dr.	214-358-4663
Wyo	Cheyenne, Houge Radio & Supply Co., 1102 Logan Ave.	307-632-6474

RHG ELCTRS. LAB., 161 E. Ind. Ct., Deer Park, N.Y., 11729, Tel: 516-242-1100, TWX: 510-227-6083; Empl.: 65 p. 2-1389

Customer service: S. Wolin

Products manufactured: Amplifiers, Comm. Systems, Converters, Couplers, Demodulators, Discriminators, Dividers, Integrated Circuit Devices, Microwave Integrated Circuits (MIC's), Mixer-Preamplifiers, Microwave Mixers, Modulators, All Kinds, Preselector-Mixers, Receivers, Transmission Systems, Data, Transmitters, Tuners

Local Sales Offices & Reps.

Ala	Huntsville, Gentry Assocs.	205-534-9771
Ariz	Phoenix, Thorson Co.	602-956-5300
Cal	Los Altos, Cain-White & Co.	415-948-6533
Cal	Los Angeles, Thorson Co.	213-937-0790
Cal	San Diego, Thorson Co.	714-298-8385
Cal	Tustin, Thorson Co.	714-544-5121
Fla	Orlando, Gentry Assocs.	305-894-4401
Md	Annapolis, Hayden Assocs.	202-296-6059
Mass	Reading, Geder-Rotundi Assocs.	617-944-3105
NJ	W. Orange, E F Tech. Sls.	201-731-7203
NM	Albuquerque, IMEC Co.	505-883-9010
NY	Huntington, E F Tech. Sls.	516-368-5841
NY	N. Syracuse, KLM Assocs.	315-458-6214
NY	New Hartford, KLM Assocs.	315-736-5466
NY	Rochester, KLM Assocs.	716-442-0820
NC	Burlington, Gentry Assocs.	919-227-3639
Pa	Lafayette Hill, M. Lader	215-825-3177
Tex	Dallas, Cain & Co., Inc.	214-233-6809
Wash	Seattle, Thorson Co.	206-632-0710

RHOMBUS INDS., INC., 22119 Vermont Ave., Torrance, Cal., 90502, Tel: 213-325-7440, TWX: 910-349-7512; Empl.: 30

Products manufactured: Delay Lines

Local Sales Offices & Reps.

Ariz	Scottsdale, S. C. Blaker Co.	602-948-3061
Mass	Waltham, Impact Sls. Co.	617-893-2850
Minn	Minneapolis, Merrill Franklin Co.	612-835-6422
Tex	Irving, Space Elctns.	214-251-2266
EXP:	Cal, Los Angeles, Product Supply Co.	213-659-1858

RICHARD-LEE CO., Box 724, New Providence, N.J., 07974, Tel: 201-665-1333; Empl.: 6
Customer service: H. Kundra

Products manufactured: Amplifiers, Comparators, Controls/Control Eqpt., Converters, Counters, Integrators, Electronic Meters, Monitors, Oscillators, Tachometers, Totalizers, Digital, Transducers

RICHLOK CORP., 5825 N. Tripp Ave., Chicago, Ill., 60646

RIESTER & THESMACHER CO., 6880 Lake Abrams Dr., Cleveland, Ohio, 44130, Tel: 216-243-5550; Empl.: 80
Customer service: T. D. Burt

Free literature available: Descriptive Brochure, Facilities List

Products manufactured: Cabinets & Accessories, Carts & Dollies, Instrument & Equipment, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Chassis, Metal, Frames, Cabinet & Rack, Racks, Services, Assembly, Production & Test

RIL ELCTRS., INC., Street Rd. at 2nd St. Pike, Southampton, Pa., 18966, Tel: 215-EL 5-1361; Empl.: 25

For info on price: D. G. Shylan; Application info: J. R. Brochon; Customer service: D. G. Shylan; Delivery info: D. G. Shylan

Products manufactured: Amplifiers, Chargers, Battery, Controls/Control Eqpt., Gages, Meters, Recorders, Test Equipment, Testers

RIPLEY CO., INC., 1 Factory St., Middletown, Conn., 06457, Tel: 203-346-6677; Empl.: 120; Minimum order: \$10

Customer service: R. S. Clark

Free literature available: Blower catalog showing line of small blowers for electronic cooling. Timer catalog showing timers for many types of application. Cable preparation tools - CATV & Coaxial

Products manufactured: Blowers & Fans & Accessories, Controls/Control Eqpt., Services, Assembly, Production & Test, Timers

Local Sales Offices & Reps.

Ariz	Scottsdale, S.C. Blaker Co.	602-948-3061
Cal	Downey, Sierra Pacific Engrg. Co.	
Cal	Mountain View, Connolly & Co.	415-967-6988
Conn	Cheshire, Techmark Corp.	203-272-7131
Fla	Hialeah, Shaw Engrg. & Sls.	305-822-6141
Ill	Elmhurst, Schuten Assocs.	312-833-0980
Ill	Park Ridge, G. Collins Sls. Co.	312-823-8075
Kans	Shawnee Mission, M.E. Bettis Co.	913-362-0772

Mass	Wellesley Hills, M. Scott Co.	617-235-0102
Minn	New Brighton, T W C Sls. Co.	612-636-1770
NY	Great Neck, F. Tyllinski Co.	516-466-9070
NY	Rochester, Application Specialists, Inc.	716-586-8226

NY	Skaneateles, Henkell Mktg. Co.	315-685-6945
Ohio	Cincinnati, G & H Sls. Co.	513-771-8231
Ohio	Cleveland, Scott Electronics, Inc.	216-291-2600
Tex	Dallas, E.F. Aymond Co.	214-826-7620
Tex	Dallas, J.C. Sauls Co.	214-742-9419

RISK INDS., INC., GEORGE, GRI Plaza, Kimball, Neb., 69145, Tel: 308-235-4645, TWX: 910-620-9040; Empl.: 80; Minimum order: \$15

For info on price: T. Onigkeit; Application info: R. Nickels; Customer service: T. Onigkeit; Delivery info: T. Onigkeit

Free literature available: Bulletin No. S-12 - Pushbutton Switch Catalog, Bulletin No. KB-10 - Keyboard Catalog, Bulletin No. BA-1 - Burglar Alarm Catalog

Products manufactured: Keyboards, Alphanumeric & Decimal, Switches

Local Sales Offices & Reps.

Ariz	Phoenix, MR Engrg. Sls. Co.	602-959-5150
Cal	Redwood City, Woodworth Co.	415-365-0252
Cal	Van Nuys, C.T.S. Sls.	213-786-4661
Ind	Greenwood, Valentine & Schillinger	317-888-2260
Ind	South Bend, Valentine & Schillinger	219-291-6258
Iowa	Cedar Rapids, VRBIK Co.	319-377-8244

Mich	Ferndale, Shalco, Inc.	313-547-4771
Minn	Minneapolis, Merrill Franklin Co.	612-835-6422
Mo	Florissant, Nevco	314-843-7406
Mo	Kansas City, Nevco Inc.	816-421-1751
Mo	St. Louis, Nevco	314-843-7406
NJ	Springfield, Shortess, Rawson & Assocs.	201-467-8585
NY	Syracuse, I. A. Hotze Co.	315-479-6641
Ohio	Cleveland, Del Steffen & Assocs.	216-461-8333
Ohio	Dayton, Del Steffen & Assocs.	513-293-3145
Pa	Paoli, Tyler Griffin	215-647-1550
Tex	Dallas, McCoy Assocs.	214-350-9931
Tex	Houston, E. V. Smith Sls.	713-649-5756
Tex	Houston, McCoy Assocs.	
EXP:	Laguna Niguel, Cal., Ind. Export Management	714-493-2589
EXP:	Philadelphia, Pa., ALM Elctns. Inds., Ltd.	215-877-3105

R L C ELCTRNS., INC., 83 Radio Cir., Mt. Kisco, N.Y., 10549, Tel: 914-241-1334; FSC No: 12598; Empl.: 45

Customer service: Sls. Dept.
Free literature available: Catalog describes in 80 pages all information concerning switches, filters, attenuators, terminations, detectors, line stretchers, etc.

Products manufactured: Adapters, Waveguide, Attenuators, Couplers, Detectors, Dividers, Dummy Loads, Filters, Junctions, Hybrid, Microwave, Line Stretchers, Microwave, Mixers, Switches, Terminals, Tuners, Waveguides & Adapters

Local Sales Offices & Reps.		
Cal	Cupertino, Dura Elctn. Sls.	408-255-2084
Cal	Los Angeles, Thorson Co.	213-937-0790
Mass	S. Chelmsford, I M R	617-256-8251
Mo	St. Peters, Marsland Assoc.	314-278-6949
NY	Plainville, Central Assoc.	516-433-0808
Pa	Elkins Park, Snow Assocs.	215-379-4700
Tex	Dallas, Texas Microwave	214-231-5381
Va	Woodbridge, M. Lader Company	703-494-4731
EXP:	Yonkers, New York, R. I. Mendels Co.	914-965-4210

RO ASSOCS., INC., 3705 Haven Ave., Menlo Park, Cal., 94025, Tel: 415-322-5321, TWX: 910-378-5929; Empl.: 60
p. 1-1430, 1431

For info on price: F. Kamp; Application info: F. Kamp; Customer service: S. Vavro; Delivery info: S. Vavro

Free literature available: Catalog-Complete technical description of standard products plus article "The Principles and Facts About Switching Power Supplies"

Products manufactured: Converters, Power Supplies

Local Sales Offices & Reps.		
Ala	Huntsville, Lee Assocs.	205-533-5896
Cal	Los Angeles, Halbar Assocs.	213-387-8283
Cal	Santa Clara, Richards Assocs.	408-246-5860
Colo	Boulder, H. Bass Assocs.	303-499-7509
Fla	Miami, Lee Assocs.	305-525-9767
Fla	Winter Haven, Lee Assocs.	813-294-5815
Ill	Rolling Meadows, Lightner Assocs.	312-398-3000
Md	Fulton, Gans-Frying Inc.	301-837-6311
Mass	Lynnfield, Research Instrs.	617-245-9530
Mass	Newton, Techmar Inc.	617-444-8130
Mich	Holsapple & Assoc.	317-899-2890
Minn	Minneapolis, Data Electronics Co.	612-786-9666
NJ	Ft. Lee, Technimat	201-461-8686
NM	Albuquerque, Fry-Gates Co.	505-298-1875
NY	Ithaca, B. Dean Inc.	607-272-2187
NC	Raleigh, Lee Assocs.	919-787-5818
Tex	Dallas, McCoy Assoc. Co.	214-350-9931
Tex	Houston, Ev Smith Sls. Co.	713-649-5756
Va	Arlington, Gans-Frying Inc.	703-527-3262
FOR:	Can., Toronto, Ont., B.H. Mc Gregor	416-699-5521

ROBERTSHAW CONTROLS CO., Box 449, Columbus, Ohio, 43216, Tel: 614-875-2351, TWX: 810-335-2560; Empl.: 500; Minimum order: \$25

For info on price: J. Putsock; Application info: R. A. Heber; Customer service: J. Putsock; Delivery info: R. A. Heber

Free literature available: General Catalog D-73, Robertshaw "Command Series" Oil-Tight Pushbutton Switches - Switch and Component Ordering Information.

Products manufactured: Switches

Local Sales Offices & Reps.		
Ga	Atlanta, B. Fancher & Assoc.	404-448-7078
Minn	Minneapolis, Stack-Johnson, Inc.	612-925-2111
NY	Rochester, Upstate Comp. Sls.	716-288-1080

NC	Charlotte, B. Fancher & Assocs.	704-376-1753
Va	Richmond, Advance Control Equip. Co.	703-288-0124

ROBERTSHAW CONTROLS CO., Ind'l. Instr. Div., 1701 Byrd Ave., Box 26544, Richmond, Va., 23261, Tel: 804-282-9561, TWX: 710-956-0121; Minimum order: \$20

Customer service: L. E. Huff

Products manufactured: Computers, Controls/Control Eqpt., Gages, Indicators, Integrators, Electronic, Meters, Monitors, Recorders, Switches, Transducers, Transmitters

Local Sales Offices & Reps.		
Ala	Birmingham, J.W. Eshelman	205-879-3462
Ariz	Phoenix, Special Sys. Co.	602-964-5807
Cal	Anaheim, Robertshaw Controls	213-860-2491
Cal	San Diego, G. L. Parkhurst Co.	714-232-0721
Cal	So. San Francisco, Robertshaw Controls	415-871-7767
Cal	Taft, Oilfield Controls, Inc.	805-763-1561
Colo	Denver, Peterson Co.	303-388-6322
Conn	Hamden, Pond Tech.	203-288-6278
DC	Washington, Caton, Waller & Assocs., Inc.	301-269-0304
Fla	Lakeland, Curry Controls	813-646-4832
Ga	Atlanta, L. Rawson Co.	404-228-2351
Haw	Kailua, Oahu, CBC, Inc.	808-262-6561
Ill	Elk Grove Village, Robertshaw	312-437-6060
Ind	Indianapolis, Electro Engrg. & Sls., Inc.	317-547-5273
Iowa	Clinton, H. G. Klug, Inc.	319-243-3642
Ky	Louisville, Control Prods. Co.	502-367-6421
La	Baton Rouge, Allen Assocs.	504-926-4687
La	New Orleans, Turner & Co.	504-834-3848
La	Shreveport, Deeco Co.	318-742-0856
Md	Baltimore, Reco Inc.	301-647-0926
Mass	Boston, Stickney Engrg. Assoc.	617-449-3733
Mich	Detroit, G. R. Peters Assoc.	313-546-1166
Mich	Portage, G. R. Peters Assoc.	616-327-8390
Minn	Minneapolis, Northwest Power Equip.	612-646-7904
Mo	Kansas City, Power Specialties	816-531-6550
Mo	St. Louis, C. F. Gast Co.	314-993-2870
Mont	Billings, Industrial Sys.	406-252-6671
Neb	Omaha, H. G. Klug Co.	402-553-1377
NJ	Beverly, T. R. Van Ornam Co.	609-387-1964
NJ	Morrestown, D. J. Hettich	609-235-3411
NY	Albany, S. F. Sheldon Co.	518-684-2356
NY	Buffalo, Nickles Engrg. Co.	716-773-5399
NY	Liverpool, Nickles Engrg. Co.	315-457-8224
NY	New York, Buck Sls.	201-322-8747
NY	Rensselaer, Ashley Engrg. Co.	518-436-9151
NY	Rochester, Nickles Engrg. Co.	716-586-4988
NC	Charlotte, G. M. Johnston	704-364-0722
NC	Charlotte, Robertshaw Controls	704-376-7495
Ohio	Cincinnati, Rawdon Myers, Inc.	513-791-4224
Ohio	Cleveland, E. J. Hodan & Assoc.	216-331-9344
Okla	Tulsa, Myers-Aubrey Co.	918-622-3500
Ore	Portland, Arthur Forsythe	503-297-3121
Pa	Ft. Washington, Robertshaw Controls	215-646-8031
Pa	Pittsburgh, Gilson Engr.	412-931-6114
SC	Greenville, Robertshaw Controls Co.	803-233-2787
Tenn	Knoxville, Robertshaw Controls	615-546-0550
Tenn	Memphis, Huckabee Industrial Sls., Inc.	901-388-4110
Tex	Corpus Christi, Duke Lane Co.	512-888-5222
Tex	Dallas, Controls Intl. Co.	214-233-9397
Tex	Houston, Robertshaw Controls	713-498-0500
Tex	Odessa, The Baranco Co.	915-332-0293
Utah	Salt Lake City, Peterson Co.	801-487-5621
Wash	Richmond, Advance Control Equip. Co.	703-288-0124
Wash	Seattle, A. Forsyth Co.	206-283-5716
Wash	Spokane, A. Forsyth	509-326-2700
Wisc	Milwaukee, Allen Engrg.	414-353-5070
Wisc	Milwaukee, Robertshaw Controls	414-464-6446
Wyo	Casper, Moltec	307-234-5309
EXP:	Richmond, Va., Robertshaw Controls Intl. Mktg.	804-282-9561
FOR:	Can., Ontario, Robertshaw Controls	416-255-3451

ROBICON CORP., Plus Ind'l. Pk., Pittsburgh, Pa., 15239, Tel: 412-327-7000, Telex: 812-441; Empl.: 175; Minimum order: \$50

For info on price: R. Sheppard; Application info: G. Lacki; Customer service: D. Lorenzi; Delivery info: S. Lagerbauer

Products manufactured: Controls/Control Eqpt.

Local Sales Offices & Reps.		
Ala	Decatur, Pace	205-353-8067
Cal	Costa Mesa, Robinson Tech. Assocs.	714-557-1622

Cal	San Francisco, Automated Process Controls Co.	415-467-6162
Ga	Atlanta, Pace	404-458-7225
Ill	Park Ridge, Thermo/Cense	312-792-2760
Kans	Shawnee Mission, W. Hickman Co.	913-362-8066
Mass	Framingham, J.M. Lancaster Co.	617-873-8893
Mich	Southfield, Harris-Blancett & Assoc.	313-352-9505
Mo	St. Louis, F. Gilliam Assoc.	314-961-5555
Neb	Omaha, W. Hickman Co.	402-895-0262
NJ	S. Orange, Smith Co.	201-763-1770
NY	Buffalo, Robinson Assocs.	716-886-7350
NY	Latham, Robinson Assocs.	518-785-5844
NY	Rochester, Robinson Assocs.	716-342-3130
NY	Syracuse, Robinson Assocs.	315-478-0241
NC	Charlotte, R. Chapman Co.	704-525-2421
NC	Raleigh, R. Chapman Co.	919-782-2624
Ohio	Cincinnati, Cetco	513-671-6871
Ohio	Cleveland, A.W. Risser Co.	216-458-5091
Ohio	Toledo, Cubbedge Controls	419-535-5530
Okla	Tulsa, Terry Co.	918-743-3249
Pa	King of Prussia, Reinbrecht Assoc.	215-265-6180
Pa	Pittsburgh, Weiss Instrs.	412-371-3020
Tex	Houston, R & K Engineering	713-465-8367
Wash	Bellevue, A. Smith Co.	206-746-6770
WVa	Charleston, Hedrick Engineering	304-925-7655

Advertisement

SCR thyristor power control and conversion equipment. Robicon supplies standard SCR devices and custom packaged systems in fields of temperature control for process and comfort industries; speed/position control for motor drives to 2000 HP, both unidirectional and static reversing; and materials melting systems to 10,000 KVA.

ROBINSON-NUGENT, INC., 802 East 8th St., New Albany, Ind., 47150, Tel: 812-945-0211, TWX: 810-540-4082; Empl.: 250; Minimum order: \$100

For info on price: S. M. Shine; Application info: M. Amster; Customer service: L. Winn; Delivery info: B. Hubler

Products manufactured: Boards, Plug-In, Chassis, Metal, Connectors, Integrated Circuit Packaging Systems, Plugs, Services, Assembly, Production & Test, Socket Adapters, Sockets, Terminals, Tools

Local Sales Offices & Reps.		
Ariz	Phoenix, GND Sls.	602-971-9758
Cal	El Monte, Cook Ent.	213-686-2120
Cal	Redwood City, Logan Sls. Co.	415-369-6726
Cal	San Diego, Celtec Co.	714-279-7961
Colo	Englewood, W.J. Purdy Co.	303-777-1411
Fla	Oviedo, Conley & Assoc.	305-365-3283
Ill	Park Ridge, Metcom Assoc.	312-696-1490
Ind	Indianapolis, Technical Reps.	317-546-4967
Ky	Mt. Sterling, M.F. Eubank Sls. Co.	606-498-5955
Mass	Clinton, F.J. Coleman Co.	617-894-1855
Mich	Sturgis, Kesler & Assoc.	616-651-7819
Minn	Minneapolis, Stan Clothier Co.	612-888-4666
NM	Albuquerque, W.J. Purdy Co.	505-266-7959
NY	Huntington, C.R. Mayer Co.	516-921-7876
NY	Syracuse, Canavan-Scanlon Assoc.	315-437-1271
Ohio	Cincinnati, Tri-State Mktg.	513-761-7993
Ore	Portland, J.V. BeLusko Co.	503-222-4279
Pa	Broomall, L.D. Lowery, Inc.	215-356-5300
SC	Greenville, Elect. Mktg. Assoc.	803-268-1125
Tex	Irving, Space Elect. Corp.	214-251-2261

Local Distributors		
Ala	Birmingham, M-G Elctns., 3112 6th Ave.	205-328-4525
Ariz	Phoenix, Moltronics, 3617 N. 35th Ave.	602-272-7951
Cal	Los Angeles, RPS, 1501 S. Hill	213-748-1271
Cal	Riverside, Elec. Supp., 2486 3rd St.	714-787-9220
Cal	Sunnyvale, Intermark Elec., 1020 Stewart Dr.	408-738-1111
Colo	Denver, Intermark, 2600 W. 2nd Ave.	303-936-8284
Fla	Orlando, Hammond Elec., 911 W. Central Blvd.	305-849-6060
Ill	Westmont, Bodelle Co., 47 Chestnut	312-323-9670
Ind	Indianapolis, Harvey-Ind., 8505 Zionsville	317-297-4910
Ky	Louisville, Peerless Elec., 1815 S. 7th	502-636-3336

Md	Baltimore, Radio Elec. Svc., 1026 Cromwell Bridge Rd.	301-823-0070
Mass	Burlington, B & W Assoc., "B" St.	617-272-4420
Mich	Farmington, Harvey-Michigan, 23461 Ind. Pk. Dr.	313-477-1650
Minn	Minneapolis, Electro-Com, 3816 Chandler 612-788-8601	
Mo	St. Louis, L-Comp St. Louis, 2605 S. Hanley 314-647-5505	
Neb	Lincoln, Scott Elec., 4040 Adams St.	402-464-8308
NY	Bohemia, Carlac, 75 Orville Dr.	516-567-4200
NY	Buffalo, Summit Dist., 916 Main St.	716-884-3450
NC	Greensboro, Hammond Elec., 838 Huffman St.	919-275-6391
Ohio	Dayton, Esco, 221 Crane St.	513-226-1133
Pa	Philadelphia, Almo, Roosevelt Blvd. & Blue Grass Rd.	215-676-6000
SC	Greenville, Hammond Elec., 100 Augusta St.	803-233-4121
Tex	Dallas, Component Spec., 2560 Elec. La.	214-357-4576
Tex	Houston, Geophysical Supp., Box 52230 713-224-0621	
Va	Charlottesville, Virginia Radio, 715 Henry Ave.	804-296-4184
Wash	Seattle, Radar Elec. Co., 168 Western Ave.	206-282-2511

ROBISON ELCTRNS., 3580 Sacramento Dr., San Luis Obispo, Cal., 93401, Tel: 805-544-8000; Empl: 70

Products manufactured: Cups, Encapsulation, Pads, Transistor Mounting

Local Sales Offices & Reps.		
Ariz	Phoenix, Gramer & Co.	602-279-1231
Cal	Downey, Groh Assocs.	213-923-0963
Cal	Palo Alto, R.W. Thompson Assocs.	
Cal	San Diego, Daniels & Doty Sls.	714-560-6266
Colo	Boulder, R.G. Enterprises	303-447-9211
Iowa	Des Moines, Beams, Inc.	515-282-0290
Kans	Shawnee Mission, Beams Inc.	913-341-7744
Md	Hyattsville, Eastern Comps.	301-557-2925
Mass	Woburn, Jalco Assocs.	617-227-1515
Minn	Hopkins, F. Peterson Co.	612-941-5400
Mo	Creve Coeur, Beams, Inc.	314-569-1060
NY	Brentwood, Cir-Tech Assocs.	516-231-4440
NY	De Ruyter, R.A. Murray Co.	315-852-9981
NY	Rochester, R.A. Murray Co.	716-467-4538
Ohio	Cleveland, Electro-Com	216-886-2404
Ohio	Dayton, Electro-Com	513-276-3993
Pa	Flourtown, Eastern Comps.	215-836-1616
Pa	York, Eastern Comps.	714-764-3114
Tex	Houston, Aid Elctns.	713-777-3882
Tex	Irvine, Aid Elctns.	214-259-4761
Wash	Kirkland, Freed Assocs.	206-822-8100

ROCKLAND INSULATED WIRE & CABLE, 87 Broadway, Haverstraw, N.Y., 10927, Tel: 914-429-3103; FSC No: 12111; Minimum order: \$25

Free literature available: Catalog #471 contains a listing of miniature and sub-miniature PVC insulated wires & cables indicating items available from stock & special order.

Products manufactured: Cable, Wire

ROCKLAND SYS. CORP., 230 W. Nyack Rd., W. Nyack, N.Y., 10994, Tel: 914-623-6666, TWX: 710-575-2631; Empl: 55; Minimum order: \$50

For info on price: D. Kohn; Application info: D. Kohn; Customer service: J. P. Marcella; Delivery info: J. P. Marcella

Free literature available: 1974 Short Form Catalog, Technical Data Sheets, Application Bulletins, Electronic Products Reprint "Frequency Synthesizers", 1973 IEEE Intercon Technical Papers "New Developments in Signal Generators"

Products manufactured: Analyzers, Equalizers, Filter Synthesizers, Filters, Generators, Signal Conditioners & Equipment, Synthesizers

Local Sales Offices & Reps.		
Ala	Huntsville, Lee Assocs., Inc.	205-533-5896
Ariz	Phoenix, Cleveland Entprs.	602-996-8130
Cal	Mountain View, IFM	415-961-2828
Cal	San Pedro, IFM	213-547-0829
Colo	Arvada, Cleveland Entprs.	303-423-3707
Conn	Hamden, Instrument Consultants	203-288-5246
Fla	Ft. Lauderdale, Lee Assocs.	305-525-9796
Fla	Winter Haven, Lee Assocs., Inc.	813-294-5815
Ill	Chicago, Carter Elctns.	312-585-5485
Ind	Indianapolis, Carter Elctns.	317-293-0696
Kans	Overland Park, Carter Elctns.	913-649-6996
Md	Rockville, Mesa, Inc.	301-881-8430
Mass	Newton, Instrument Conslts.	617-969-9881

Mich	Detroit, LI/Corp.	513-434-6367
Minn	Minneapolis, Carter Elctns.	612-544-9393
Mo	Hazelwood, Carter Elctns.	314-731-2237
NJ	Riverton, Mesa	609-786-0284
NM	Albuquerque, Cleveland Enterprises	505-345-2481
NY	Port Chester, Radiation Electronics	914-937-2300
NY	Rochester, Scientific Devices	716-334-2445
NC	Raleigh, Lee Assocs., Inc.	919-787-5818
Okla	Norman, Data Mktg. Assocs.	405-364-8320
Tex	Dallas, Data Mktg. Assoc.	214-661-0300
Tex	Houston, Data Mktg.	713-686-9627
Tex	San Antonio, Data Mktg. Assocs.	512-828-0937
Wash	Seattle, Delcom Sls. Co.	206-248-0090
Wisc	Milwaukee, Carter Elctns.	414-464-5555
FOR	Can., Downsview 463, Ont., Radionics Ltd.	416-638-0218

FOR: Can., Montreal 376, Que., Radionics Ltd. 514-735-4565

FOR: Can., Ottawa, Ont., Radionics Ltd. 613-521-8251

FOR: Can., Vancouver, B.C., Radionics Ltd. 604-732-7317

FOR: Can., Winnipeg, Man. 204-475-1732

ROCKWELL INT'L, Microelectronics Device Div., Box 3669, 3430 Miraloma Ave., Anaheim, Cal., 92803, Tel: 714-632-3729, TWX: 910-591-1179; FSC No: 34576

For info on price: W. A. Treleven 714-632-3698; Application info: J. E. Bass 714-632-3860; Customer service: R. F. Voigt 714-632-3729; Delivery info: C. D. Bopf 714-632-0624

Free literature available: Product Descriptions & Application Notes.

Products manufactured: Integrated Circuit Devices, Modulator/Demodulators

Local Sales Offices & Reps.

NY Smithtown 516-979-0183

RODAN IND'S., 2905 Blue Star St., Anaheim, Cal., 92806, Tel: 714-630-0081, TWX: 910-591-1684; FSC No: 15454; Empl: 48; Minimum order: \$15

For info on price: R. W. Dankert; Application info: A. Storamski; Customer service: J. H. Burns; Delivery info: J. H. Burns

Free literature available: Thermistor Manual enclosed

Products manufactured: Networks, Probes, Resistors, Thermistors, Transducers

Local Sales Offices & Reps.

Ariz Scottsdale, De Angelo, Rothman & Cheever 602-948-2240

Cal Los Altos, Stout-Loeswick 415-948-3265

Fla Boca Raton, Southeastern Component Sls. 305-391-9067

Fla Clearwater, Southeastern Component Sls. 813-531-8324

Ill Chicago, J. Popp Sls. Co. 312-626-3711

Ind Ft. Wayne, Menze Sls. Co. 219-747-5616

Iowa Cedar Rapids, Snider Sls. 319-362-4410

Kans Leawood, H.C. Heyde Co. 913-649-8628

Md Baltimore, Burgin-Kreh Assoc. 301-788-5200

Mass Andover, Sals Engng. 617-470-0800

Mich Troy, C. B. Jensen Assocs. 313-643-0506

Minn Minneapolis, E.C. Elctn. Sls. 612-831-0229

NY Great Neck, F. Tylnski Co. 516-466-9070

NC Winston-Salem, Burgin-Kreh Assoc. 919-768-4174

Pa Ardmore, R. Freedman Assoc. 215-649-3679

Tex Addison, Southland Components 214-233-0603

Va Lynchburg, Burgin-Kreh Assoc. 703-845-5600

Wash Seattle, R.K. Squibb Co. 206-632-2450

EXP: New York City, N.Y., Singer Prod. Inc. 212-432-1400

RODELCO, 356A Commack Rd., Deer Park, N.Y., 11729, Tel: 516-643-5110; Empl: 9; Minimum order: \$500

Customer service: A. Dahliher

Products manufactured: Amplifiers, Transmitters

ROGAN CORP., 3455 Woodhead Dr., Northbrook, Ill., 60062, Tel: 312-498-2300, TWX: 910-686-0008

Products manufactured: Dials, Knobs

Local Sales Offices & Reps.

Cal Palo Alto, O'Donnell Assocs. 415-327-9260

Cal Torrance, O'Donnell Assocs. 213-323-9243

Colo Arvada, Arrowhead Sls. 303-423-5556

Conn North Haven, Comp Rep Assocs. 203-239-9762

Haw Hanalei, TJR Sls. Co.

Mass Needham, Comp Rep Assocs. 617-444-2484

Mich Grand Rapids, Montgomery Assocs. 616-774-9308

Mich Southfield, Montgomery Assocs. 313-358-2616

Minn Minneapolis, R.W. Marshall Co. 612-929-0457

NJ	Pitman, Colrud Co.	609-589-5866
Ohio	Dayton, J.C. Hofstetter Co.	513-298-0662
Ohio	Medina, J.C. Hofstetter Co.	216-241-4880
Tex	Dallas, W. Reese Assocs.	214-638-6575
Tex	Houston, W. Reese Assocs.	713-621-3134
Utah	Salt Lake City, Arrowhead Sls.	801-487-3444
Va	Lynchburg, Royelec	703-846-7117
Wash	Bellevue, SD-R2 Sls.	206-747-9424

ROGERS CORP., Rogers, Conn., 06263, Tel: 203-774-9605, TWX: 710-448-0047; Empl: 1500

Products manufactured: Bars, Shorting, Bearings, Boards, Printed Circuit, Bus Bars & Systems, Cable, Circuits, Flexible, Circuits, Printed, Multilayer, Insulators & Insulation, Laminates, Materials, Self-Lubricating, Services, Assembly, Production & Test, Switchboards

Local Sales Offices & Reps.

Ariz	Phoenix, J. Opel	602-996-4850
Cal	Altadena, Space Engrg.	213-681-4421
Cal	Orange, F. R. Fahland	714-998-2580
Cal	Woodland Hills, A. W. Riel	213-347-7435
Colo	Littleton, G. B. Lange	303-798-1397
Conn	Essex, D. Dewey, Jr.	203-767-1118
Conn	Willimantic, G. D. Smith	203-774-9605
Fla	Jupiter, Cherry Assocs.	305-746-4591
Ga	Atlanta, Beacon Elctns.	404-351-3654
Ill	Hazel Crest, J. R. Menees	312-798-5800
Md	Simpsonville, R. J. Stout	301-997-9199
Mass	Waltham, DeVeer Sls. Engrg.	617-899-5900
Mich	Belleville, J. E. Ellward	313-845-0433
Mich	Bloomfield Hills, T. G. Erickson	313-645-0433
Mich	Onsted, B. Widegren	313-535-4926
Mich	Westland, J. Dyer	313-645-0433
Minn	Fridley, H. R. Crowder	612-560-1340
Mo	Hazelwood, Production Automation Corp.	314-731-2331

Mo Raytown, Production Automation Corp. 816-737-0066

NJ Mount Laurel, P. Tapauskas 609-235-4747

NY Pittsford, P. R. Pratt 716-661-1167

NY Roslyn, D. R. Dunay 516-621-8723

Ohio Xenia, J. Link Forte 513-428-8993

Pa Newtown Square, Hagy Assocs. 215-459-0504

Pa Sharon, H. A. Harriman 412-347-3129

Ri Slattersville, D. A. Belden 617-332-1285

Tex Richardson, Air-Quip Sales 214-234-3285

Va Boones Mill, J. L. Settles 703-342-3120

Wash Seattle, Arneson Assocs. 206-762-7664

ROGERS CORP., Box 700, Chandler, Ariz., 85224

RHODE & SCHWARZ SLS., 14 Gloria La., Fairfield, N.J., 07006, Tel: 201-575-0750, Telex: 133310; Empl: 15

Products manufactured: Accelerometers, Amplifiers, Analyzers, Antennas, Attenuators, Bridges, Calibrators, Capacitors, Fixed, Carts & Dollies, Instrument & Equipment, CATV Systems & Equipment, Clocks (All Types), Coders, Comparators, Connector Adapters, Converters, Couplers, Data Acquisition & Reduction Systems, Decade Boxes, Delay Lines, Demodulators, Detectors, Direction Finders, Dividers, Dummy Loads, Filters, Generators, Indicators, Insertion Loss Measurement Systems, Line Stretchers, Microwave, Meters, Mismatches, Microwave, Precision, Modulators, All Kinds, Monitors, Multipliers, Networks, Probes, Receivers, Recorders, Relays, Resistors, Slotted Lines, Microwave, Smith Chart Impedance Plotters, Automatic, Standards, Switches, Synchronizers, Klystron & BWO, Synthesizers, Tees, Terminals, Test Equipment, Testers, Transformers, Transmitters

Local Sales Offices & Reps.

Ala Huntsville, Scientific Devices SE 205-536-1969

Fla Orlando, Scientific Devices SE 305-841-8180

Ind Indianapolis, L.F. Green Assocs. 317-293-9827

Mass Waltham, Scientific Devices NE 617-894-5637

NC Burlington, Scientific Devices SE 919-222-6279

Ohio Dayton, LI Corp. 513-434-6367

Pa Abington, Bach-Stewart Assocs. 215-885-1550

Va Bailey's Crossroads, Q. T. Elctns. Sls. Inc. 703-671-4357

Wash Bellevue, Scientific Devices NW 206-454-9000

ROHN MFG., Div. Unarco Inds., Box 2000, Peoria, Ill., 61601, Tel: 309-697-4400, TWX: 910-652-0646; Empl: 290

Products manufactured: Antenna Towers & Supports, Antennas, Benches, Consoles, Stools, Tables, Insulators & Insulation, Mounts, Tubing, Wire

Local Sales Offices & Reps.

Cal Burlingame, Wm. J. Purdy Co. 415-347-7701

Cal Woodland Hills, Chick Ryel & Co. 213-883-8118

Colo	Denver, R.G. Bowen Co.	303-722-4641
Fla	Coral Gables, Mart Haller	305-444-4617
Fla	Lakeland, Dixie Elctn. Assoc.	813-682-6624
Iowa	Des Moines, B.E.A.M.S.	515-282-0292
Mass	N. Scituate, W.A. Hendrickson Co.	617-545-0652
Minn	Minneapolis, Jensen & Olsen Sls.	612-941-7181
NJ	Teaneck, S. Fisher Elctn. Assoc.	201-837-1200
NM	Albuquerque, C.T. Carlberg & Assoc.	505-265-1579
NY	Liverpool, Lewis-Dunnigan Co.	315-622-2133
NY	Tuckahoe, L.C.A. Sls. Co.	914-961-4700
Ohio	St. Marys, T. Shelby & Co.	419-394-3377
Tex	Dallas, B. Townsend	214-241-6703
Wash	Seattle, DMS/Vantage	206-784-6800

ROL-A-CHART DIV., Wm. A. Steward Co., Box 367, Diamond Springs, Cal., 95619, Tel: 916-622-2437; Empl.: 8

Customer service: A. Steward
Free literature available: Guide to visual control magnet catalog

Products manufactured: Magnets

ROLM CORP., 18922 Forge Dr., Cupertino, Cal., 95014, Tel: 408-257-6440, TWX: 910-338-0247; Empl.: 126

Products manufactured: Cards, Logic, Comm. Systems, Computers, Converters, Memory Systems

Local Sales Offices & Reps.

Cal	La Habra, Rolm Corp.	213-784-8500
Cal	Palo Alto, Rolm Corp.	415-965-2224
Colo	Denver, Thorson Co.	303-355-3533
DC	Washington, Rolm Corp.	703-893-2696
Kans	Shawnee Mission, EIR Co.	913-362-0919
Mass	Boston, Rolm Corp.	617-237-5752
Mo	Hazelwood, EIR Co.	314-895-4100
NY	New York, Rolm Corp.	914-297-9533
Ohio	Dayton, Rolm Corp.	513-874-5406
Tex	Dallas, Rolm Corp.	214-661-8905
Va	McLean, Rolm Corp.	703-893-2696
Wash	Seattle, Showalter-Judd, Inc.	206-762-2310

ROMARNETICS, INC., 18728 Bryant St., Northridge, Cal., 91324, Tel: 213-886-1812; Empl.: 15 p. 2-1785

Customer service: R. Easton
Free literature available: Catalog of our Printed Circuit Type Power Transformers, Standard Line

Products manufactured: Transformers

RONOR SYSTEMS, 321 Sandbank Rd., Cheshire, Conn., 06410, Tel: 203-272-6847; Empl.: 12

Customer service: N. D. Ostrowski
Products manufactured: Cable Assemblies & Harnesses, Connectors, Services, Assembly, Production & Test

ROSEMOUNT INC., Box 35129, Minneapolis, Minn., 55435, Tel: 612-941-5560; Empl.: 1200

Products manufactured: Alarms, Baths, Controlled Temperature (Air & Liquid), Controls/Control Eqp., Gages, Indicators, Monitors, Process Control Systems, Standards, Suppressors, Thermometers, Resistance, Transducers, Transmitters

Local Sales Offices & Reps.

Cal	Bellflower, Rosemount Inc.	213-866-8224
Cal	Chatsworth, Rosemount Inc.	213-341-3944
Cal	San Diego, Rosemount Inc.	714-565-9133
Cal	San Jose, Rosemount Inc.	408-269-7550
Colo	Boulder, Rosemount Inc.	303-447-9231
Ga	Atlanta, Rosemount Inc.	404-256-4800
Ill	Chicago, Rosemount Inc.	312-963-0756
La	Baton Rouge, Rosemount Inc.	504-926-8916
Mass	Boston, Rosemount Inc.	617-861-0750
Mich	Detroit, Rosemount Inc.	313-626-0900
Minn	Minneapolis, Arjay Sls. Inc.	612-925-1833
Mo	St. Louis, Rosemount Inc.	314-731-6881
NJ	Englewood, Rosemount Inc.	201-568-6366
NC	Charlotte, Rosemount Inc.	704-333-1271
Ohio	Cleveland, Rosemount Inc.	216-777-3961
Ohio	Dayton, Rosemount Inc.	513-433-6383
Pa	Philadelphia, Rosemount Inc.	215-353-3343
Tex	Dallas, Rosemount Inc.	817-267-3514
Tex	Houston, Rosemount Inc.	713-664-8891
Va	Richmond, Rosemount Inc.	804-285-3424
Wash	Seattle, Rosemount Inc.	206-747-4900

ROSS CONTROLS CORP., 381 Elliot St., Newton, Mass., 02164, Tel: 617-891-9600; Empl.: 6

Products manufactured: Recorders, Tape Recording Accessories

Local Sales Offices & Reps.

Cal	Corona Del Mar, Williams Assoc.	714-675-8161
-----	---------------------------------	--------------

Cal Sunnyvale, Pacific Entprs. 408-245-3517

ROSS ENGINEERING CORP., 559 Westchester Dr., Campbell, Cal., 95008, Tel: 408-377-4621; FSC No: 23598; Empl.: 27 p. 1-1806,1807

Customer service: H. C. Ross

Free literature available: Brochures on High Voltage: Devices, relays, switches contactors, digital multimeters, dividers, voltmeter, probes, solenoid, drivers, spark gaps, toroids, spheres & corona shields, safety accessories, resistors & capacitors, etc.

Products manufactured: Antenna Switching Matrices, Arresters, Electrical Surge, Lightning, Calibrators, Capacitors, Fixed, Chargers, Battery, Circuit Breakers, Detectors, Dividers, Drivers, Solenoid, Meters, Multipliers, Power Supplies, Probes, Protectors, Relays, Resistors, Services, Assembly, Production & Test, Spark Gaps, Switches, Testers

Local Sales Offices & Reps.

Cal	Mt. View, ENCOM	415-969-0330
Cal	San Diego, ENCOM	714-299-0993
Mich	Dearborn, D. Seyfried Co.	313-274-4900
Mo	St. Louis, G. DuBois Co.	314-961-0632
NJ	Haddonfield, M & S Assocs.	609-429-7055
NY	Cazenovia, P. DeCew Agency	315-655-8602
ND	Fargo, Dakota Elec. Supply	701-327-9440
Ohio	Cleveland, K.R. Dodge Co.	216-461-6482
Pa	Philadelphia, M & S Assocs.	215-229-7575
EXP:	N.Y., New York, Ardry Trading Co.	212-582-5058

FOR: Can., Toronto, Ontario, Electro Design Ltd. 416-787-0991

FOR: Can., Ville La Salle, Ore., Electro Design, Ltd. 514-363-5120

ROSTONE CORP., 2781 S. Concord Rd., Lafayette, Ind., 47902, Tel: 317-474-2421; Empl.: 600

For info on price: T. E. Deller; Application info: T. E. Deller; Customer service: T. E. Deller; Delivery info: F. L. Cason

Free literature available: ROSITE material data sheets and 8 page brochure explains services, facilities, and capabilities of Rostone Corporation's custom molding, compounding, and engineering operation.

Products manufactured: Insulators & Insulation, Services, Assembly, Production & Test

ROTATING COMPONENTS DIV., Aeroflex Labs. Inc., South Service Rd., Plainview, N.Y., 11803, Tel: 516-694-6700, TWX: 510-324-6417; Empl.: 50 p. 1-979

Free literature available: 1. MIL SPEC Fans. 2. MIL SPEC Blowers 3. AC Synchronous Motors 4. Tachometer Generators Part Nos. Tech Data, Dimensions and How to Order for above.

Products manufactured: Blowers & Fans & Accessories, Motor & Generator Armatures, Rotors, Stators, Motors, Tachometers

Local Sales Offices & Reps.

Cal	Aptos, Allen & Sweeney Assoc.	408-688-7114
Cal	Torrance, Allen & Sweeney Assoc.	213-373-3318
Conn	Thomaston, Tygren Co.	203-264-6880
Ill	Lombard, Quadtron Assocs.	312-627-6800
Kans	Wichita, D & O Engrg Co.	316-264-7358
Mo	Lutherville, P. Knox & Co.	301-252-1288
Mass	Stoneham, K & D Assoc.	617-438-3121
Mich	Farmington Hills, H. Lowell Co.	313-851-7474
Minn	St. Paul, Vikeland Sls.	612-645-4647
Ohio	Fairborne, Tech. Assoc.	513-878-2484
Pa	Jenkintown, Stein Instrumentation	215-885-2370
Tex	Houston, AID Elctnrs.	713-777-3882
Tex	Irving, AID Elctnrs.	214-259-4761
Wash	Seattle, G. M. Gillett & Assoc.	206-284-3344
EXP:	New York City, New York, Frathorn Co.	212-687-9390

ROTRON, INC., Hasbrouck La., Woodstock, N.Y., 12498, Tel: 914-679-2401, TWX: 510-247-9033; Empl.: 950 p. 1-516-524

Customer service: T. McCanna
Free literature available: Quick reference catalog-brief description of performance, dimensions, materials of complete product line.

Products manufactured: Blowers & Fans & Accessories, Heat Exchangers & Systems, Inverters, Switches

Local Sales Offices & Reps.

Ariz	Phoenix, Sheffer-Kahn	602-258-7893
Cal	Burbank, Rotron/Pacific	213-849-7871
Cal	Mt. View, Nor-Cal Assocs.	415-961-8121

Colo Denver, F. Gossard Associates 303-985-0602

Fla Orlando, G. Bohman 305-855-0274

Ga Atlanta, Electro-Mech Engrg. Sls. 404-393-0444

Haw Honolulu, R. Clark 808-531-5897

Ill Chicago, Mid West Elctn. Sls. 312-777-5970

Ind Indianapolis, MidWest Elctn. Sls. 317-926-3736

Iowa Cedar Rapids, Midwest Elctn. Sls. 319-393-1845

Kans , CenTech Inc. 816-358-8100

Mich Lexington, Circuit Sls. 617-861-0567

Mich Farmington, W.R. Hummon & Assoc. 313-474-0661

Minn Mpls, E.C. Elctn. Sls. 612-831-0229

Mo Hazelwood, CenTech, Inc. 314-838-6446

NJ Springfield, F. Sylvester 201-376-3324

NM Albuquerque, Sheffer-Kahn 505-265-7077

NY Woodstock, Rotron Inc. 914-OR 9-2401

NC Charlotte, Over & Over 704-527-3070

Ohio Cincinnati, F. J. Campisano 513-662-1616

Ohio Cleveland, Comp., Inc. 216-842-2737

Okla Okla Cy, Ammon & Rizos 405-373-2748

Pa Ardmore, B. R. Roome 215-649-4101

Tenn Nashville, Electro-Mech Engrg. Sls. 615-883-1490

Tex Dallas, Ammon & Rizos 214-233-5591

Tex Houston, Ammon & Rizos 713-781-6240

Wash Seattle, Blum & Assocs. 206-285-2590

EXP: N.Y., NY, A. Auriema 212-466-2500

FOR: Can., Hamilton, Ont., Cartwright Southall Assoc. 416-528-0294

FOR: Can., Montreal, Que., McIntyre Agencies 514-731-9617

Local Distributors

Ala	Huntsville, Cramer/Ew Huntsville, 2310 Bob Wallace Ave., S.W.	205-539-5722
Ala	Huntsville, Hall-Mark Elctnrs.,	4739
	Commonwealth Ave.	205-837-8700
Ariz	Phoenix, Cramer/Arizona, 2816 No. 16th St.	602-263-1112
Ariz	Phoenix, Kierulff Elctnrs., 2633 E. Buckeye Rd.	602-273-7331
Ariz	Phoenix, R.V. Weatherford, 1917 North 25th Dr.	602-272-7144
Cal	Anaheim, R.V. Weatherford, 1550 Babbitt	714-547-0891
Cal	Glendale, R.V. Weatherford, 6921 San Fernando Rd.	213-849-3451
Cal	Irvine, Cramer/Los Angeles, 17201 Daimler St.	213-771-8300
Cal	Los Angeles, Kierulff Elctnrs., 2585 Commerce Way	213-685-5511
Cal	Palo Alto, Kierulff Elctnrs., 3969 E. Bayshore Rd.	415-968-6292
Cal	Palo Alto, R.V. Weatherford, 3240 Hillview Ave.	415-321-5373
Cal	Pomona, R.V. Weatherford, 1095 E. Third St.	714-623-1261
Cal	San Diego, Cramer/San Diego, 8975 Complex Dr.	714-565-1881
Cal	San Diego, Kierulff Elctnrs., 8797 Balboa Blvd.	714-278-2112
Cal	San Diego, R.V. Weatherford, 7842 Raytheon Rd.	714-278-7400
Cal	Sunnyvale, Cramer/San Francisco, 720 Palomar Ave.	408-739-3011
Colo	Denver, Cramer/Denver, 5465 E. Evans Pl.	303-758-2100
Colo	Denver, Kierulff Elctnrs., 10980 E. 47th Ave.	303-343-7090
Colo	Englewood, R.V. Weatherford, 3905 So. Mariposa	303-761-5432
Conn	North Haven, Cramer/Connecticut, 35 Dodge Ave.	203-239-5641
Fla	Hollywood, Cramer/Ew Hollywood, 4035 No. 29th Ave.	305-923-8181
Fla	Orlando, Cramer/Ew Orlando, 345 N. Graham Ave.	305-894-1511
Fla	Orlando, Hall-Mark Elctnrs., 7233 Lake Ellenor Dr.	305-855-4020
Ga	Atlanta, Cramer/Ew Atlanta, 3923 Oakcliff Industrial Ct.	404-448-9050
Ill	Mt. Prospect, Cramer/Chicago, 1911 So. Busse Rd.	312-593-8230
Kans	Lenexa, Hall-Mark Elctnrs., 9006 Rose Hill Rd.	913-888-4747
Md	Gaithersburg, Cramer/Ew Washington, 16021 Industrial Dr.	301-948-0110
Md	Gaithersburg, Kierulff Elctnrs., 16021 Industrial Dr.	301-948-0250
Md	Hanover, Cramer/Ew Baltimore, 7255 Standard Dr.	301-796-5790
Mass	Needham Heights, Kierulff Elctnrs., 14 Charles St.	617-449-3600
Mass	Newton, Cramer Elctnrs., 85 Wells Ave.	617-969-7700
Mich	Farmington, Harvey-Michigan, 23461 Industrial Park Dr.	313-477-1650

Mich Livonia, Cramer/Detroit, 13193 Wayne Rd.
313-425-7000

Minn Edina, Cramer/Minnesota, 7275 Bush Lake Rd.
612-835-7811

Mo Earth City, Hall-Mark Elctns., 13789 Rider Trail
314-291-5350

For: Can., Willowdale, Ont. M2H3B3, Electro Sonic
Industrial Sales, 1110 Gordon Baker Rd.
416-494-1660

NJ Cherry Hill, Cramer/Pennsylvania, Cherry Hill
Ind'l. Site, Springdale Rd. 609-424-5993

NJ Cherry Hill, Cramer/Pennsylvania, Springdale
Rd., Cherry Hill Ind'l. Site 609-424-5993

NJ Moonachie, Cramer/New Jersey, 1 Barrett Rd.
201-935-5600

NJ Pennsauken, Resco Elctns., Airport Ind'l. Pk.,
Airport & Central Highways 609-662-4000

NJ Rutherford, Kierulff Elctns., Industrial Dr.
201-935-2120

NJ Saddlebrook, Arrow Elctns., 285 Midland Ave.
201-797-5800

NM Albuquerque, Cramer/New Mexico, 137
Vermont N.E. 505-265-5767

NM Albuquerque, R.V. Weatherford, 6101 Marble,
N.E. 505-265-5671

NY East Syracuse, Cramer/Syracuse, 6716 Joy Rd.
315-437-6671

NY Endwell, Cramer/Binghamton, 322 Watson Blvd.
607-754-6661

NY Farmingdale, Arrow Elctns., 900 Broad Hollow
Rd. 516-694-6800

NY Hauppauge, Cramer/Long Island, 29 Oser Ave.
516-231-5600

NY Hicksville, Kierulff Elctns., 49 Bethpage Rd.
516-433-5530

NY Rochester, Cramer/Rochester, 3000 Winton Rd.
South 716-275-0300

NC Raleigh, Hall-Mark Elctns., 3000 Industrial Dr.
919-832-4465

NC Winston-Salem, Cramer/Ew., Winston-Salem,
938 Burke St. 919-725-8711

Ohio Cincinnati, Cramer/Tri-State, 666 Redna Ter.
513-771-6441

Ohio Cleveland, Cramer/Cleveland, 5835 Harper Rd.
216-248-8400

Okla Tulsa, Hall-Mark Elctns., 7489 E. 46th Pl. So. Box
45 918-835-8458

Tex Dallas, Cramer/Dallas, 13740 Midway Rd.
214-350-1355

Tex Dallas, Hall-Mark Elctns., 9333 Forrest La.
214-231-6111

Tex Dallas, R.V. Weatherford, 10836 Grissom La.
214-243-1571

Tex Houston, Hall-Mark Elctns., 8000 Westglen
713-781-6100

Tex Houston, R.V. Weatherford, 3500 West T.C.
Jester Blvd. 713-688-7406

Utah Salt Lake City, Cramer/Utah, 391 W. 2500 S.
801-487-3681

Wash Seattle, Cramer/Seattle, 5602 6th Ave. S.
206-762-5755

Wash Seattle, Kierulff Elctns., 5940 Sixth Ave. So.
206-763-1593

Wash Seattle, R.V. Weatherford, 541 Industry Dr.
206-762-4200

Wisc Oak Creek, Cramer/Wisconsin, 430 W. Rawson
Ave. 414-764-1700

For: Can., Montreal 357, P.Q., Prelco Elctns., Ltd.,
480 Port Royal St., W. 514-389-8051

For: Can., Montreal, Que., Payette Radio, 730 St.
James West 514-866-6681

For: Can., Scarborough MIR3C 3C8, Carsten Elctns.
Ltd., Unit 5-25 Howden Rd. 416-751-5002

For: Can., Vancouver 10, B.C., L.A. Varah, 2077
Alberta St. 604-873-3211

ROWE INDUSTRIES, INC., 6225 Benore Rd., Toledo,
Ohio, 43612, Tel: 419-729-9761, TWX: 810-442-1734;
Empl.: 100; Minimum order: \$25

p. 2-796-798, 2052-2054

For info on price: K. Robinson; Application info: D. C.
Richard; Customer service: D. L. Mang; Delivery info:
J. Netry

Products manufactured: Antennas, Braid, Cable,
Bus Bars & Systems, Cable Assemblies &
Harnesses, Cable, Caps, Connector, Chamber,
Environmental Test, Chargers, Battery, Circuits,
Flexible, Clamps & Clips, Coils Including
Assemblies & Forms, Conduit, Electrical,
Connector Adapters, Connector Blocks, Mother
Board, Connector Boxes & Strips, Power Outlet,
Connectors, Contacts, Electrical, Cords, Couplers,
Detectors, Electrodes, High-Voltage, Feedthrus &
Seals, Environmental, Gaskets, Shielding,
R-F-Also See Shields, R-F, Isolators, Jack
Adapters (All Types), Jacks (All Types), Kits,
Connector, Lead Assemblies & Receptacles,
Leads, Test & Adaptors, Plug Adapters, Plug &
Jack Sets, Plug Caps & Shells, Plugs, Probes,
Services, Assembly, Production & Test, Shields,
Socket Adapters, Sockets, Splicers, Coaxial
Cable, Splices, wire (Including, Butt & Cap Types),
Strain Reliefs, Cable & Wire, Tees, Terminals, Test
Equipment, Wire, Wire & Cable Ties, Wire
Shielding

Local Sales Offices & Reps.

Ala Huntsville, Rowe Enterprize 205-837-3643

Ariz Scottsdale, Biedler & Assocs. 602-275-5505

Cal Newbury Park, Val C. Robinson 805-529-1331

Cal San Carlos, Westronics 415-592-1417

Cal Thousand Oaks, V. C. Robinson 805-529-1331

Colo Arvada, Winn & Assocs. 303-421-9466

Fla North Palm Beach, E. Furey & Assocs.
305-848-2037

Ill Greenville, Tri "J" Power, Inc. 818-664-1698

Ill Riverside, Mannella & Assocs. 312-447-7724

Md Baltimore, R.A. Wafer Assocs. 301-744-1133

Mass Shrewsbury, Ashworth & Cullen, Inc.
617-844-9688

Mo St. Louis, Repco, Inc. 314-343-9313

NY Binghamton, Canavan-Scanlon Assocs.
607-724-7220

NY Rochester, Canavan-Scanlon Assocs.
716-442-0720

NY Syracuse, Canavan-Scanlon Assocs.
315-437-1271

NC Charlotte, Dula Assocs. 704-334-7090

NC Winston-Salem, Dula Assocs. 919-768-7166

Ohio Beachwood, Richardson-Champ Assocs.
216-292-4954

Ohio Cincinnati, Coin-Tek 513-793-3611

Pa Plymouth Meeting, R. Mar Co. 215-825-2841

Tex Dallas, United Comps. 214-324-1448

Wash Seattle, Underwood & Underwood
206-243-2133

FOR: Can., Oakville, Ont., Haltronics, Ltd.
416-844-2121

ROYCE ELECTRONICS CORP., 1142 Clay St., No. Kansas
City, Mo., 64116, Tel: 816-842-0252

Customer service: A. Rudsell; Delivery info: P.
Kennedy

Products manufactured: Antennas, Batteries,
Comm. Systems, Power Supplies, Speakers

Local Sales Offices & Reps.

Cal Los Angeles, Cavanah & Fier 213-483-9760

Cal San Francisco, ARWC 415-653-3838

Colo Denver, Ron Bowen & Assoc. 303-744-2501

Del Chesnut Hills, Divincent & Legato .. 302-731-1475

Fla Pembroke Pines, Joe Wanger Sls. Co.
305-987-8766

Ga Atlanta, Ross & Assoc. 404-548-5568

Ill Chicago, CEMS 312-685-9500

Ind Indianapolis, Lyons & Assoc. 317-352-0475

Mich Detroit, Rod Butchart & Assoc. 313-773-7870

Minn Minneapolis, Terry Ripley & Assoc.
612-881-8282

Mo Kansas City, Vern Kingkade & Assoc.
816-474-5230

Neb Elkhorn, Vern Kingkade & Assoc. 402-289-2909

NJ Moorestown, Divincent & Legato Assoc.
609-235-8299

NM Albuquerque, C.T. Carlsburg & Assoc.
505-265-1579

NY N.Y.C., Fisher Sls. 201-837-1200

Ohio Akron, D.F.H. 614-876-7823

Pa Oak Grove, J.B. Sls. Co. 503-654-8617

Pa Pittsburgh, F.P. Yarrusi 412-221-4676

Tex Houston, Buck Rodgers & Assoc. 713-626-5370

Utah Salt Lake, Rasmussen & Cavanah .. 801-467-6615

**RSM SENSITRON SEMICONDUCTOR, DIV. RSM
ELECTRON POWER, INC.,** 221 W. Industry Ct.,
Deer Park, N.Y., 11729, Tel: 516-586-7600; Empl.: 180;

Minimum order: \$100 p. 1-1852-1855
For info on price: M. M. Dietz; Application info: C.
Fischer; Customer service: M. Leischner; Delivery
info: M. M. Dietz

Products manufactured: Bridges, Diodes, Rectifiers,
Transistors

Local Sales Offices & Reps.

Ariz Scottsdale, Deangelo Rothman Cheever Co.
602-948-2240

Cal Culver City, DeAngelo, Rothman Co.
213-398-6239

Cal Lafayette, Phillips Assocs. 415-284-2579

Fla Casseleberry, EIR Inc. 305-830-9600

Ill Chicago, Brock & Cushman Inc. 312-622-4110

Ind Carmel, Rich Elctn. Mktg. 317-844-8462

Md Baltimore, Stemler Assocs. 301-944-8262

Mass Waltham, Datcom Inc. 617-891-4600

Minn Minneapolis, S & R Sls. 612-544-3022

NM Albuquerque, A.Q. Elctns. 505-255-8701

NY Burnt Hills, K. Corsetti Sls. 518-399-9200

NY Hempstead, Kahgan Sls. 516-538-2300

Ohio Dayton, Buckeye Comps. 513-278-4279

Tex El Paso, A.G. Elctns. 915-545-2363

Wash Tukwila, General Elctns. 206-243-5141

EXP: Can., Montreal, Que., Elpro Elctns. Ltd.
514-389-8051

FOR: Can., Mississauga, Ont., Elpro Elctns. Ltd.
416-678-0401

FOR: Can., Ottawa, Ont.
FOR: Can., Ottawa, Ont., Elpro Elctns. Ltd.

Local Distributors

Ariz Ariz, Sterling Elctns., Box 20867 602-258-4531

Ariz Scottsdale, Vanguard Supply, 10333 N.
Scottsdale Rd. 602-948-2240

Cal Gardena, Bell Inds., 306 E. Alondra
213-321-5802

Cal Sepulveda, Milgray Elctns., 8718 Woodley Ave.
213-894-4011

Cal Sunnyvale, Bell Inds., 1161 North Fair Oaks Ave.
408-734-8570

Cal Sunnyvale, Intermark Elctns., 1020 Stewart Dr.
408-738-1111

Cal Sunnyvale, Westland Elctns., 1118 Elko Dr.
408-734-1900

Cal Woodland Hills, Semiconductor Concepts,
21201 Oxnard St. 213-884-4560

Fla Miami, All American Transistor, 120 N.E. 79th St.
305-754-5531

Fla Pompano Beach, Zeus Comps., 1470 S.W. 12th
Ave. 305-942-4312

Md Baltimore, Technico Inc., 1404 Bare Hills Ave.
301-828-6416

Mass Burlington, Zeus Comps., 32 Winn St.
617-273-0750

Mass Framingham, Future Elctns., 225 Worcester Rd.
800-225-0380

Mass Natick, Lafayette Industrial Elctns., 1400
Worcester 617-879-6300

Mich Farmington, Diplomat Northland Elctns.,
32708 W. Eight Mile Rd. 313-477-3200

Minn Minneapolis, Diplomat/Electro Com Corp., 3816
Chandler Drive 612-788-8601

NM Albuquerque, Sterling Elctns., 3530 Pan
American Fwy. N.E. 505-345-6601

NY Buffalo, Summit Dists., 96 Main St.
716-884-3450

NY Elmsford, Zeus Comps., 175 Clearbrook Co.
914-592-4120

NY Farmingdale, Arrow Elctns., 900 Broad Hollow
Rd. 516-694-6800

NY Forest Hills, Nasco, 9908 Metropolitan Ave.
212-793-6500

NY Freeport, Milgray Elctns., 191 Hanse Ave.
516-546-6000

NY Hauppauge, Semiconductor Concepts,
Engineers Rd. 516-273-1234

NY Hauppauge, Time Elctns., 70 Marcus Blvd.
516-273-0100

NY New Hyde Park, Lafayette Ind'l. Elctns., 1327 -
2nd Ave. 516-488-6600

NY Plainview, A.C.I. Elctns. Corp., 28 South Mall
516-293-6630

NY Rochester, Summit Dists., 292 Commerce Dr.
716-334-8110

Ohio Dayton, Esco, Inc., 221 Crane st. 513-226-1133

Ore Eugene, United Radio Supply, 974 W. Sixth Ave.
503-342-3381

Ore Portland, United Radio Supply, 123 N.E. Seventh
Ave. 503-233-7151

Pa Philadelphia, Almo Elctns., Roosevelt Blvd. &
Blue Grass Rd. 215-676-6000

Tex Dallas, Component Specialties, 2560 Electronic
La. 214-357-4576

Tex Houston, Component Specialties, 7315 Ashcroft
713-771-7237

Tex Houston, Sterling Elctns., Box 1229

Wash Seattle, Radar Elec., 168 Western Ave. W.
206-282-2511

Wash Seattle, Zepher Elctns., 647 Industry Ave.
206-242-2517

RTRON CORP., 7324 Lawndale, Skokie, Ill., 60076, Tel: 312-679-7180; FSC No: 19130; Minimum order: \$25

Customer service: N. Williams

Free literature available: Catalogs on RFI Filters, U.L. Recognized for Data Processing, and MIL Spec. Types.

Products manufactured: Capacitors, Fixed, Coils Including Assemblies & Forms, Filters, Networks, Suppressors

Local Sales Offices & Reps.

Cal	Costa Mesa, Component Sls.	714-557-3040
Cal	Los Altos, Horne Assoc.	415-948-0788
Cal	San Diego, SR Elctns.	714-565-8411
Fla	Lighthouse Point, Saber Assoc.	305-943-3076
Ill	Chicago, Rinaldi Inc.	312-763-4848
Mass	Dover, Charles Ferris Co.	617-785-1771
Minn	St. Paul, Cahill Assoc.	612-739-8445
NJ	Plainfield, S. Glassman Assoc.	201-561-3866
NY	E. Rochester, Douglas Taylor	716-385-1630
NY	Glen Cove, S. Glassman Assoc.	516-676-1039
Ohio	Cleveland, Component/Insulation Corp.	216-521-3570
Pa	Jenkintown, Arnold Assoc.	215-PI 2-0600
Tex	Garland, Whiteside Sls.	214-231-9771
Va	Annapdale, J. Hopkins Assoc.	703-323-1641

RUSSCO ELECTRONICS MFG. INC., 1070 Brookhaven Dr., Clovis, Cal., 93612, Tel: 209-299-2167

For info on price: S. Watts; Application info: R. Friend; Customer service: S. Watts; Delivery info: R. Najarian or Russ Friend

Free literature available: Studio Pro or Cuemaste Broadcast Turntables Model 505 Monaural Console Model 505-S Stereo Console Model MM-260 - Stereo 60 Watt Amplifier Model MA-225 - Stereo 25 Watt Amplifier

Products manufactured: Amplifiers, Mixers, Phonographs, Parts & Accessories, Speaker Systems

RUSSELL INDS., INC., 96 Station Plaza, Lynbrook, N.Y., 11563, Tel: 516-887-9000

Products manufactured: Foil, Kits, Shielding, Shields, Tapes, Electrical Insulation

RUSTRAK INSTR. DIV., See Gulton Inds., M.C.S. Div.

RUTHERFORD RESEARCH PRODS. CO., Box 162, Rutherford, N.J., 07070, Tel: 201-933-2091; Empl.: 25

Customer service: Dr. A. Blanck

Free literature available: Catalogs: Technology of Rutherford Research Plastics & Electrical Insulation Failure Analysis - Product Evaluation - Redesign.

Products manufactured: Bridges, Calibrators, Capacitors, Fixed, Coils Including Assemblies & Forms, Meters, Probes, Services, Assembly, Production & Test, Testers, Wire Twisters

RYCOM INSTRUMENTS, 9351 E. 59th St., Raytown, Mo., 64133, Tel: 816-353-2100; FSC No: 14410; Empl.: 40; Minimum order: \$10

For info on price: H. Aggeler; Application info: R. Cooper; Customer service: G. Craven; Delivery info: K. Boone

Free literature available: Complete product line of test instruments for telephone, power, utilities and communications users, carrier (FDM) "T"-carrier, transmission and line analyzers, cable fault locators.

Products manufactured: Analyzers, Cable Fault Locators, Counters, Meters; Testers, Totalizers, Digital, Transmission Systems, Data

Local Sales Offices & Reps.

Cal	Oakland, Dolphin Engrg.	415-451-8262
Cal	Santa Fe Sprgs., Kennedy Engrg.	213-868-9965
Colo	Lakewood, Claredon	303-238-4462
DC	Washington, Instrucom	202-223-1759
Fla	St. Petersburg, Souder (Comtech)	813-527-3281
Ill	Chicago, Kay Sls.	312-397-1200
Mo	Cameron, Comm Sys. Assoc.	816-632-7616
Tex	Richardson, Horizon Engr.	214-238-9121
Wash	Seattle, Reeves Supply	206-769-1234

RYE INDS., INC., 125 Spencer Pl., Mamaroneck, N.Y., 10543, Tel: 914-698-0080; Empl.: 50

Products manufactured: Boxes, Junction, Outlets & Wall Plates, Cable, Caps, Connector, Clamps & Clips, Connector Adapters, Connectors, Cords, Couplers, Handsets, Chestsets, Headphones, Headsets, Etc., Jack Adapters (All Types), Jacks (All Types), Microphones, All Kinds, Pickups, Telephone (For Recording), Plug Adapters, Plug & Jack Sets, Plug Caps & Shells, Plugs, Posts, Probes, Services, Assembly, Production & Test, Socket Adapters, Sockets, Switches, Tape Recording Accessories, Tapes, Electrical Insulation, Transducers, Transformers, Tubing, Wire

Local Sales Offices & Reps.

Cal	Los Angeles, Marshank	213-938-2591
Colo	Colorado Springs, Norris	303-685-9319
Ga	Marietta, Clymer Entprs.	404-971-2831
Haw	Honolulu, Av-Tronic Sls.	
Ill	Chicago, W.J. Doyle	
Kans	Overland Pk., Penzner	913-DU 1-0004
Mass	Cohasset, Montague	617-383-0634
Ore	Portland, Van Voorhees	503-287-6633
Pa	Havertown, J. Mustico	215-HI 6-1961
Tex	Addison, Campion Sls.	214-239-9196

S & A ELECTRONICS, Div. Scott & Fetzer Co., 202 W. Florence, Toledo, Ohio, 43605, Tel: 419-693-0528; Empl.: 100

For info on price: M. Gregg; Application info: M. Gregg; Customer service: M. Gregg; Delivery info: Order Desk

Free literature available: General Line Catalogue on request.

Products manufactured: Antenna Towers & Supports, Antennas, Arresters, Electrical Surge, Lightning, Couplers, Insulators & Insulation, Transformers

S & EI MFG., Box 832, Northridge, Cal., 91324, Tel: 213-349-4111, TWX: 910-493-1252; Empl.: 85

p 2*234,235

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Ariz	Phoenix, MR Engrg. Sls. Co.	602-959-5150
Cal	San Diego, Circula Elctn. Sls.	714-747-3015
Ill	Chicago, Ropex-Cahill Inc.	312-287-7292
Mass	Needham, Hatch Assocs.	617-444-3310
Minn	Minneapolis, Technical Assocs.	612-929-6721
NJ	Cherry Hill, Danco Corp.	609-627-2218
NY	Hempstead, Kahgan Sls.	516-538-2300
Ohio	Dayton, Berberich & Assocs.	513-252-9981
FOR:	Can., Montreal, Que., Speciality Elctns. Ltd.	514-336-4500

SAFEWAY PRODUCTS, 440 Middlefield St., Middlefield, Conn., 06455, Tel: 203-346-6601; Empl.: 130

For info on price: C. M. Slade; Application info: C. M. Slade; Customer service: H. Groepper; Delivery info: C. M. Slade

Free literature available: "SAFEWAY HEAT ELEMENTS"-16 page illustrated brochure provides guidelines for designing heat elements into your OEM product; reference data on materials available and their thermal conductivity. "ETCHED FOIL ELEMENTS"-8 page illustrated brochure describes resistive and conductive circuitry, examples, design considerations, and engineering data and specifications.

Products manufactured: Heaters & Heating Elements

SAFT AMERICA INC., 212 Durham Ave., Metuchen, N.J., 08840, Tel: 201-548-2800, TWX: 710-998-0528; Empl.: 270; Minimum order: \$100

For info on price: P. L. Mendelsohn; Application info: C. E. Hopper; Customer service: S. Greco; Delivery info: S. Greco

Free literature available: Brochure "Sealed Rechargeable Nickel-Cadmium Cells VR Series" - Describes the sealed cylindrical type cells including performance and standard battery assembly manufactured by SAFT.

Products manufactured: Batteries

Local Sales Offices & Reps.

Cal	Torrance, T. Pierce	213-378-3623
Tex	Fort Worth, J. B. Schuster	817-237-4620

SAMARIUS, INC., 300 Seymour Ave., Derby, Conn., 06418, Tel: 203-735-7405, TWX: 710-451-2495; FSC No: 5905; Empl.: 50

Customer service: R. C. Heitz

Products manufactured: Potentiometers, Resistors

Local Sales Offices & Reps.

Cal	Los Angeles, Halbar Assocs.	213-387-8283
Cal	San Mateo, Halbar Assocs.	415-349-4700
Md	Silver Spring, Globe	301-587-0060
Mo	St. Louis, Boweng	314-429-7327
Pa	Media, W. Reeves	215-566-6709

SAMS, HOWARD W. & CO., 4300 W. 62nd St., Indianapolis, Ind., 46268, Tel: 317-291-3100

Products manufactured: Technical Books

Local Sales Offices & Reps.

Cal	Burlingame, Elvey-Proctor Co.	415-347-2994
Cal	Gardena, Bidwell Sls. Assocs.	213-770-0300
Colo	Denver, Bowen & Assocs.	303-744-2501
Fla	Orlando, Cartwright & Bean	305-422-4531
Fla	Plantation, Cartwright & Bean	404-237-2273
Ga	Atlanta, Cartwright & Bean	404-237-2273
Ill	Chicago, B. Burns & Assocs.	312-775-1233
Ind	Indianapolis, R. Milk Co.	317-546-5468
Kans	Overland Park, T. L. Dowell & Assocs.	913-649-6069
La	Chalmette, Cartwright & Bean	504-279-4598
Md	Silver Springs, Lowery Assocs.	301-439-3542
Mass	Needham, Mullin Techn. Sls.	617-444-4780
Mich	Southfield, R. Milk Co.	313-354-3310
Minn	Minneapolis, D. Borrett & Co.	612-929-0028
Miss	Jackson, Cartwright & Bean	601-981-1368
Mo	St. Louis, Kathrinus, Kelly, & Co.	314-968-3800
NJ	South Orange, S. Simberkoff Assoc.	201-763-7900

NM	Albuquerque, C.T. Carlberg & Assoc.	505-265-1579
NY	Lockport, Simberkoff Sls., Inc.	716-434-4426
NC	Charlotte, Cartwright & Bean	704-537-7965
NC	Raleigh, Cartwright & Bean	919-832-7128
Ohio	Columbus, C. L. Pugh Co.	614-486-9678
Ore	Portland, J.V. Belusko Co.	503-222-4279
Pa	Broomall, Lowery Assocs.	215-528-5170
Pa	Harrisburg, Lowery Assocs.	717-233-0917
Tenn	Memphis, Cartwright & Bean	901-276-4442
Tex	Dallas, Lund & Co.	214-358-4335

SAN FERNANDO ELEC. MFG., 1501 1st St., San Fernando, Cal., 91341, Tel: 213-365-9411, TWX: 910-496-1535; Empl.: 1000; Minimum order: \$25

Products manufactured: Capacitors, Fixed, Coils Including Assemblies & Forms, Filters

Local Sales Offices & Reps.

Ariz	Tucson, West-Cap Arizona	602-294-2646
Cal	Sunnyvale, Ruby Sales Co. II	408-739-5333
Conn	Stratford, G. Rosen Co.	203-375-5456
Fla	Clearwater, Perrott Assocs.	813-531-7483
Fla	Orlando, Perrott Assocs.	305-275-1132
Ill	Chicago, Ellinger Sls. Corp.	312-763-1570
Md	Glen Burnie, Micro-Comp	301-761-4600
Mass	Framingham, G. Rosen Co.	617-879-5505
Mich	Orchard Lake, Ellinger Sls. Corp.	313-626-1170
Minn	St. Paul, Smith Engrg. Assoc.	612-646-4851
NJ	Haddonfield, TAI Assocs.	609-854-3011
NY	Chester, San Fernando Elec. Mfg.	914-469-9620
Tex	Dallas, San Fernando Elec. Mfg.	214-521-3662
Wash	Seattle, Blair Hirsch Co.	206-783-3423
FOR:	Can., Toronto, Ont., Karl Atkinson - San Fernando Elec. Mfg.	416-364-3644

SANDERS ASSOCS. INC., Corp. Hdqts., Daniel Webster Hwy., Nashua, NH, 03060, Tel: 603-885-4321

SANDERS ASSOCIATES, Defensive Systems Div., 95 Chanel St., Nashua, N.H., 03060, Tel: 603-885-3010

Customer service: P. F. Murphy

Free literature available: Sanders manufacturers LEAD SULFIDE (PbS) and SILICON (Si) photoconductive DETECTORS for optical radiation from the infrared to visible to ultraviolet region. These detectors are tailored to the customers specifications, including MIL specs. Sanders also offers custom, high performance, special wavelength lasers.

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Detectors, Lasers & Laser Systems

SANDERS ASSOCIATES, Federal Systems Grp., 95 Canal St., Nashua, N.H., 03060, Tel: 603-885-6660, TWX: 710-228-1894; FSC No: 94117; Empl.: 6000

Customer service: Mktg. Dept.

Products manufactured: Analyzers, Antenna Feed Systems, Antenna Switching Matrices, Antennas, Computers, Detectors, Filters, Lasers & Laser Systems, Modulator/Demodulators, Radar Systems, Receivers, Services, Assembly, Production & Test, Underwater Communication, Detection, Navigation, etc. Equipment

Local Sales Offices & Reps.

Ala	Huntsville, Sanders Assoc.	205-881-1940
Cal	Los Angeles, Sanders Assoc.	213-641-2251
NY	Rome, Sanders Assoc.	315-337-6660
Ohio	Dayton, Sanders Assoc.	513-254-6289
Va	Crystal City, Sanders Assoc.	703-920-5204

SANDERS ASSOCIATES, Instrument & Hydraulics Div.,
Grenier Field, Manchester, N.H., 03103, Tel:
603-669-4615, TWX: 710-220-1845; Empl.: 200
Customer service: G. Shomphe Ext. 424

Products manufactured: Accelerometers, Blowers &
Fans & Accessories, Comparators, Gyros (All
Types)

SANDERS ASSOCIATES, Microwave Div., Grenier Field,
Manchester, N.H., 03103, Tel: 603-669-4615, TWX:
710-220-1845

SANDERS ASSOCIATES, Products Div.-Modems, 95
Canal St., Nashua, N.H., 03060, Tel: 603-885-2744,
TWX: 710-228-1894; Empl.: 6000
Customer service: James J. Shea

Free literature available: BROCHURES - Modem
Cards, Modem Packs, Modem 101 Tester Modem
Card Literature & Various Types of Full Duplexes.

Products manufactured: Modulator/Demodulators

Local Sales Offices & Reps.

Ala	Huntsville, W.A. Brown	205-539-4411
Cal	Los Alamitos, Scientific Devices	213-598-7678
Fla	Orlando, W.A. Brown	305-425-5505
Ga	Atlanta, W.A. Brown	404-939-1674
Ill	Elk Grove Village, L. Green Assoc.	312-593-0282
Ind	Indianapolis, L. Green Assoc.	317-293-9827
Kans	Prairie Village, Engineering Serv.	913-649-4000
La	Gretna, W.A. Brown	504-366-5766
Mo	St. Louis, Eng. Services	314-997-1515
NY	Elmont, Crane & Egert	516-488-2100
NY	Syracuse, Labtronics, Inc.	315-454-9314
NC	Res. Tri. Park, W.A. Brown	919-489-1546
Ohio	Dayton, LI/Corp	513-434-6367
Pa	King of Prussia, RivCo	215-265-5211
Tenn	Knoxville, W.A. Brown	615-584-2614
Tex	Richardson, Data Applns	214-231-4846
Va	Springfield, Sci. Devices	703-451-6500
Wash	Bellevue, Sci. Devices	206-454-0900

SANDERS ASSOCIATES, Products Div. - Spectrum,
Analyzer, 95 Canal St., Nashua, NH, 03060, Tel:
603-885-5400, TWX: 710-228-1894; Empl.: 6000
Customer service: F. A. Bellucci

Free literature available: Brochure - Sanders Model
SA-240, Real-Time Digital Spectrum Analy.
Options - 2401: Computer Output; 2402: Computer
Input; 2403: Averaging; 2404: 12-bit Input; 2405:
Dual Memory/I&Q; 2407: Phase/I&Q.

Products manufactured: Analyzers

Local Sales Offices & Reps.

Ala	Huntsville, W. A. Brown Inc.	205-539-4411
Cal	Los Alamitos, Scien. Device	213-598-7678
Conn	Hamden, Pat Jenks	203-281-0810
Fla	Orlando, W. A. Brown Inc.	305-425-5505
Ga	Atlanta, W. A. Brown Inc.	404-939-1674
Ill	Elk Grove Village, Loren Green Assoc.	312-593-0282
Ind	Indianapolis, Loren Green Assoc.	317-293-9827
La	Gretna, W. A. Brown Inc.	504-366-5766
Md	Rockville, Mesa	301-881-8430
Mass	Wakefield, Pat Jenks Assoc.	617-246-1590
Minn	Minneapolis, Loren Green Assoc.	612-781-1611
Mo	St. Louis, Eng. Serv. Comp.	314-997-1515
NJ	Cinnaminson, Mesa Inc.	609-786-0284
NY	Syracuse, Labtronics	315-454-9314
NC	Res. Tri. Park, W. A. Brown Inc.	919-489-1546
Ohio	Cleveland, Electro	
Okl	Norman, Data Mktg. Assoc.	405-364-8320
Tenn	Knoxville, W. A. Brown Inc.	615-584-2614
Tex	Dallas, Data Mktg. Assoc.	214-661-0300

SANDERS DATA SYSTEMS, Daniel Webster Hwy.,
Nashua, N.H., 03060, Tel: 603-885-2222; Empl.: 5500

Products manufactured: Computers, Control
Systems, Air Traffic, Converters, Data Acquisition
& Reduction Systems, Data Compressors, Digital,
Digitizers, Pencil Follower (Inc. Coordinate &
Graphic), Disc Packs, Magnetic, Display
Devices/Displays, Recorders, Yokes

SANFORD-MILLER CORP., 89 Throop Ave., Brooklyn,
N.Y., 11206, Tel: 212-EV7-0600; Empl.: 10; Minimum
order: \$15 p. 1-1863

For info on price: A. Scheer; Application info: E.
Rodd; Customer service: M. Nemeth; Delivery info:
M. Nemeth

Free literature available: Catalog and Price List,
Elevator Control Rectifier List, Catalog
encompasses selenium & silicon rectifiers,
transformers, chokes, power supplies and
inverters.

Products manufactured: Bridges, Capacitors, Fixed,
Chargers, Battery, Chokes, Converters, Diodes,
Electroplating Equipment & Supplies, Eliminators,
Battery, Kits, Power Supply, Power Drivers,
Hybrid (High Current, High Voltage), Power
Supplies, Protectors, Rectifiers, Suppressors,
Transformers

Local Sales Offices & Reps.

Cal	Lynwood, Dick West & Assoc.	213-636-6124
-----	-----------------------------	--------------

Local Distributors

Ala	Huntsville, Mock Elctns., 2310 Memorial Pkwy. S.	
Ark	Little Rock, Carlton-Bates Co., 69 & Scott Hamilton Dr.	501-375-2383
Cal	San Francisco, Dahl-Beck Elctns., 580 Howard St.	
Conn	Waterbury, Bond Radio Elctns., 439 W. Main St.	203-753-1184
Fla	Orlando, Hammond Elctns., 911 W. Central Ave.	
Ga	Atlanta, Specialty Dist. Co., 764 Jumper St., N.E.	
Ind	So. Bend, Radio Dist. Co., 1212 High St.	219-287-2911
Ky	Louisville, P.I. Burks Co., 842 So. 7 St.	502-589-3960
La	New Orleans, Southern Radio Supply, 1909 Tulane Ave.	301-881-2270
Md	Rockville, Capital Radio Wholesalers, 12227 Wilkins Ave.	301-881-2270
Mass	Worcester, Radio Maintenance, 80 Thomas St.	
Mich	Benton Harbor, Benton Harbor Elctns., 922 Woodward Ave. S.	616-WA5-0069
Minn	Duluth, Northwest Radio, 123 E. 1 St.	218-727-1565
Miss	Jackson, Ellington Elctn. Supply, 1425 Terry Rd.	601-355-0561
Mo	Joplin, Four State Radio, 402 Wall St.	
Neb	Omaha, Radio Equip. Co., 625 N. 18 St.	
NC	Greenboro, Hammond Elctns., 2923 Pacific Ave.	919-275-6391
Ohio	Lima, Lima Radio Parts, 600 N. Main St.	419-223-5075
Okl	Tulsa, Radio Inc., 1000 S. Main St.	215-376-7451
Pa	Reading, Barbey Elctns., 333 N. 4 St.	215-376-7451
Pa	West Chester, West Chester Elctns., 716 E. Market St.	215-923-1520
SC	Greenville, Sawyer Elctns., 1210 Poinsett Hwy.	803-CE5-0438
Tenn	Nashville, Electra Distrib. Co., 1914 West End Ave.	
Tex	El Paso, Medland Specialty Co., 2235 Wyoming Ave.	915-533-3555
Va	Richmond, Meridian Elctns., 1001 W. Broad St.	703-355-0669

SANGAMO ELEC. CO., Capacitor Div., Box 128,
Pickens, S.C., 29671, Tel: 803-878-6311, TWX:
810-397-2496 p. 2-236,237

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Ariz	Scottsdale, P. Murphy & Assoc.	602-946-2457
Cal	Newberry Park, Astralronics	805-498-2183
Cal	Placentia, El-Kap	714-528-3750
Cal	Redwood City, Sangamo	415-364-5066
Cal	San Diego, Celtec Co.	714-279-7961
Cal	San Leandro, Quadrep East	415-352-5942
Cal	Summerland, Astralronics	805-969-1711
Colo	Denver, Parker-Webster	303-770-1972
Fla	Clearwater, Dyne-A-Mark	813-441-4702
Fla	Ft. Lauderdale, Dyne-A-Mark Corp.	
Fla	Orlando, Dyne-A-Mark	305-771-6501
Ill	Palatine, Sangamo	312-359-6080
Kans	Shawnee Mission, K & M Slis. & AAssoc.	913-262-1444
Md	Randallstown, Beacon North	301-922-1248
Mass	Braintree, Sangamo	617-848-0532
Mich	Farmington, W.R. Hummon & Assoc.	313-474-0661
Minn	Mpls., S. Clothier	612-888-4666
Mo	St. Louis, K & M Slis. & Assoc.	314-423-2420
NM	Albuquerque, A-Q Elctns.	505-255-8701
NY	DeWitt, Sangamo Elec. Co.	315-446-2299
NY	Elmont, F. E. Schmitt	516-437-8150
NY	Ontario Center, Kehoe Comp. Slis.	315-524-2491
Ohio	Rocky River, Sangamo	216-331-5222
Okl	Tulsa, T.J. Ray Co.	918-627-1515
Ore	Portland, C.K. Shanks & Assocs.	503-292-5656
Pa	Ft. Washington, G. C. M., Inc.	215-646-7535
SC	Pickens, Sangamo Elec. Co.	803-878-6311

Tex	Dallas, Ammon & Rizo Co.	214-233-5391
Tex	El Paso, A-Q Elctns.	915-545-2363
Tex	Houston, Ammon & Rizo Co.	713-781-6240
Utah	Salt Lake City, Parker-Webster Co.	801-486-3737

Va	Falls Church, Beacon North	703-534-1673
Wisc	Wauwatosa, Larsen Assoc.	414-258-0529
FOR	Can., Hamilton, Ont., Cartwright Southall Assoc.	416-528-0294

SANGAMO ELECTRIC CO., Box 3347, Springfield, Ill.,
62714, Tel: 217-544-6411, TWX: 910-242-0533; Empl.:
1600 p. 1-800,801

Customer service: C. Castle

Products manufactured: Comm. Systems,
Recorders

Local Sales Offices & Reps.

Cal	El Segundo	213-640-0847
Cal	San Jose	408-371-3110
Conn	Watertown	203-274-8900
DC	Washington	301-652-9272
Ga	Atlanta	404-252-1255
Ill	Springfield	217-544-6411
Md	Suitland	301-839-3117
Mass	Burlington	617-272-2729
Mich	Dearborn	313-562-9100
NM	Albuquerque	505-898-9053
Ohio	Columbus	614-451-5461
Pa	Cornwells Heights	215-757-6100
Tex	Dallas	214-239-6465

SANKEN ELEC. CO., 1-22-8 Nishi-Ikebukuro, Toshima-Ku,
Tokyo, Japan

SANTA BARBARA RESCH. CTR., 75 Coromar Dr., Goleta,
Cal., 93017, Tel: 805-968-3511, TWX: 213-871-5210;
Empl.: 710; Minimum order: \$50

Customer service: E. Dawson

Free literature available: SBRC Brochure &
Technical Bulletins

Products manufactured: Amplifiers, Cells,
Photoconductive, Photoemissive, Photovoltaic,
Detectors, Diodes, Heat Exchangers & Systems,
Lenses, Optical & Camera, Radiometers, Scanners

SANTA CRUZ ENGRG. INC., 300 Harvey Blvd. W., Santa
Cruz, Cal., 95060, Tel: 408-427-3131; Empl.: 10

Customer service: A. Marez

Free literature available: Price List - 1-2 pages of
price & del. Tech. Bulletin - SCE 221-I signal
generator, 4 pages on Desc. of item

Products manufactured: Amplifiers, Generators,
Receivers, Signal Averagers, Testers

SARA SCIENTIFIC CO., P.O. Box 321, San Francisco,
Calif., 94101, Tel: 415-421-3172; Empl.: 3; Minimum
order: \$25

Customer service: S. Fishman

Products manufactured: Cleaners & Solvents,
Cleaners, Ultrasonic, Generators, Heat Guns,
Production, Lights, Machines/Machinery,
Production

SARGENT WELCH SCI. CO., Vacuum Prods. Div., 7300 N.
Linder Ave., Skokie, Ill., 60076, Tel: 312-677-0600,
TWX: 910-223-4541

Free literature available: Vacuum Products Catalog.

Products manufactured: Analyzers, Baths,
Controlled Temperature (Air & Liquid), Carts &
Dollies, Instrument & Equipment, Chamber,
Environmental Test, Furnaces, Gages, Meters,
Ovens, Potentiometers, Pumps, Vacuum,
Recorders, Thermistors, Timers, Tubing

Local Sales Offices & Reps.

Ala	Birmingham	205-251-5125
Cal	Anaheim	714-772-3550
Colo	Denver	303-399-8220
Mich	Detroit	313-931-0337
NJ	Springfield	201-376-7050
Ohio	Cincinnati	513-771-3850
Ohio	Cleveland	216-587-3300
Tex	Dallas	214-357-9381

SARKES TARZIAN, INC., Semiconductor Div., 415 No.
College Ave., Bloomington, Ind., 47401, Tel:
812-332-1435; Empl.: 500

For info on price: F. Lucas; Application info: R.
Muldoon; Customer service: C. Sundt; Delivery info:
C. Sundt

Free literature available: Power Semiconductor
Devices, 16 page catalog of rectifiers, Diodes,
SCRs, rectifier assemblies, up to 250 amp, and
50,000 PIV

Products manufactured: Diodes, Rectifiers, Thyristors (Includes Silicon Controlled Rectifiers)

Local Sales Offices & Reps.

Ala	Huntsville, Murcota	205-539-8476
Ark	El Dorado, D. Bellew Sls. Co.	501-863-8325
Cal	Redwood City, Parks & Pruitt Assocs.	415-364-1640
Cal	San Gabriel, Van Gott & Assocs.	213-285-2148
Colo	Denver, Nelson Co.	303-733-5528
Fla	North Miami, Winfield Elctn. Sls.	305-945-6544
Ga	Atlanta, Murcota	404-875-2525
Ill	Chicago, Saffro & Assocs.	312-588-0905
Ind	Indianapolis, Marketing Engrs.	317-546-1523
Kans	Leawood, Thunderbird Sls. Co.	913-642-7220
Kans	Wichita, Thunderbird Sls. Co.	316-684-3941
La	Kenner, D. Bellew Sls. Co.	504-729-4550
Mass	Reading, C.E. Godfrey Co.	617-944-2230
Mich	Warren, Dem Elctn. Sls.	313-755-6660
Minn	Minneapolis, Scott Elctn. Sls.	612-929-2985
Mo	St. Louis, Thunderbird Sls.	314-567-6488
NJ	S. Orange, S. Simberkoff Sls.	201-763-7900
NY	New York City, S. Simberkoff Sls.	212-943-7023
NC	Burlington, Murcota	919-584-1577
NC	Winston Salem, 919-723-1001	
Ohio	Cleveland, Del Steffen & Assocs.	216-461-8333
Ohio	Dayton, D. Steffen & Assocs.	513-293-3145
Pa	Philadelphia, Professional Svcs. Assocs.	215-722-8222
Tex	Dallas, RM Elctn. Sls.	214-233-0363
Wash	Bellevue, SD-R2 Prods. & Sls.	206-747-9424
FOR:	Can., Downsview, Ont., F. Eakin Ltd.	416-638-0451

SAWYER INDS., 5649 Peck Rd., Arcadia, Cal., 91006, Tel: 213-442-5981, TWX: 910-587-3534; FSC No: 18098; Empl.: 140; Minimum order: \$50
Customer service: G. J. Graydon

Products manufactured: Actuators, Chargers, Battery, Controls/Control Eqp., Converters, Current Sources, Inverters, Motors, Ovens, Power Supplies, Regulators, Standards, Transformers

Local Sales Offices & Reps.

Mass	Newton, Omni-Sys. Sls. Inc.	617-527-3169
NJ	Tenafly, Budd-Tronics, Inc.	201-569-2230
EXP:	Montreal 101, Quebec, Can., Canadian Advanced Production Consults. Ltd.	

SAXTON PRODS., 215 N. Rte. 303, Congers, N.Y., 10920, Tel: 914-268-6848; Empl.: 230; Minimum order: \$100
Customer service: R. Hibshman

Products manufactured: Antennas, Cable, CATV Systems & Equipment, Clamps & Clips, Connectors, Cords, Handsets, Chestsets, Headphones, Headsets, Etc., Jack Adapters (All Types), Jacks (All Types), Lead Assemblies & Receptacles, Microphones, All Aids, Pickups, Telephone (For Recording), Plug Adapters, Plug & Jack Sets, Speakers, Tees, Wire

Local Sales Offices & Reps.

Cal	Canoga Park, L. Gould	213-463-3123
Cal	Cerritos, Saxton Prod.	213-342-9847
Cal	Millbrae, P. Rush	415-697-4995
Cal	Sherman Oaks, Vantage Sls.	213-789-4921
Cal	Topanga, D. Epstein	213-346-9631
Conn	Hartford, J. Colavecchio	203-522-0596
Ga	Stone Mountain, A. Stayton	404-469-2779
Ill	Chicago, D. Abo	312-327-9642
Ill	Des Plaines, R. Davis	312-298-7689
Ind	Greenbelt, M. Needle	301-345-8026
Pa	Philadelphia, L. Feinstein	215-677-6497
Pa	Pittsburgh, S. Schindel	412-366-1481
Tenn	Knoxville, J. Dickens	615-947-8068
Tex	Dallas, D. McMonigle	817-457-2476

SCANBE CANOGA INDUSTRIES, 3445 Fletcher Ave., El Monte, Cal., 91731, Tel: 213-579-2300, TWX: 910-587-3437; Empl.: 200
Customer service: L. Cooper

Free literature available: SHORT FORM CATALOG: General description of product lines indicating overall views and data. DISTRIBUTOR CATALOG: Products sold through national distributor outlets.

Products manufactured: Boards, Plug-In, Boards, Printed Wiring, Universal, Drawers, Sliding, Guides, Circuit Board, Integrated Circuit Packaging Systems, Kits, Printed Circuit, Pullers, Racks, Sockets

Local Sales Offices & Reps.

Ala	Huntsville, 20th Century Mktg.	205-772-9237
Ariz	Phoenix, G.R. McKnight Co.	602-257-8037
Cal	Costa Mesa, Cen-Tec Sls.	714-645-9157
Cal	Menlo Park, G.R. McKnight Co.	415-325-2844
Cal	San Diego, Earl Assocs.	714-278-5441
Colo	Sedalia, Jensen Reps. Co.	303-688-4154

Conn Cheshire, Coakley, Boyd & Abbott

Fla	Clearwater, WMM Assocs.	203-272-2261
Ill	Chicago, L-Tec, Inc.	813-447-2533
Kans	Mission, Inland Assocs.	312-286-1500
Md	Ellicott City, Doss Elctn. Sls.	913-382-2366
Mass	Needham, Coakley, Boyd & Abbott	301-465-1336
Mich	St. Clair Shores, J. M. Thorpe	617-444-5470
Minn	Minneapolis, Electro-Serv. Co.	313-779-6363
Mo	Glencoe, Inland Assocs.	612-827-2907
NM	Albuquerque, G.R. McKnight Co.	314-938-4992
NY	DeWitt, Tri-Tech Elctn. Sls.	505-266-6423
NY	Great Neck, H. J. Krasner	315-446-2881
NC	Winston-Salem, W.A. Brown Comps.	516-487-0690
Ohio	Akron, A. Natalino	919-725-5384
Pa	Feasterville, Professional Svc. Assocs.	216-725-6087
Tex	Dallas, E-Tron Sls.	15-355-6244
Wash	Bellevue, SD-R2 Products & Sls.	214-348-4749
FOR:	Can., Montreal, J. G. Weiss Co., Ltd.	206-747-9424
		514-489-6887

Local Distributors

Ala	Huntsville, Powell Elctn. Sls., 803 Oster Dr.	205-539-2731
Ariz	Phoenix, Moltronics, 3617 N. 35th St.	602-272-7951
Cal	Burlingame, Rose Elctn. Sls., 846 Stanton Rd.	415-697-0224
Cal	Santa Clara, Moltronics, 337 Mathew	408-244-7600
Cal	So. Gate, Moltronics, 5610 E. Imperial	213-773-6521
Colo	Denver, Elctn. Parts, 1212 S. Broadway	303-744-1992
Fla	Orlando, Hall-Mark Elctn. Sls., 7233 Lake Elnor	305-855-4020
Ill	Elk Grove Village, Hall-Mark Elctn. Sls., 180 Crossen	312-437-8800
Md	Beltsville, Treko Sales, 10739 Tucker St.	301-937-8260
	Woburn, Time Elctn. Sls., 116 Cummings Pk.	617-935-8080
Mass	Waltham, QPL Elctn. Sls., 47 Calvary St.	617-891-0460
Mich	Livonia, Pioneer Std., 13485 Stamford	313-525-1800
Minn	Minneapolis, Ind'l. Comp., 5280 W. 74th St.	612-831-2666
Mo	St. Louis, Olive Elctn. Sls., 6667 Olive St.	314-863-7800
NJ	Roselle, Garden State, 407 Hope	201-241-9000
NY	Bohemia, Car-Lac, 75 Orville Dr.	516-567-4200
NY	Buffalo, Summit Distr., 919 Main St.	716-884-3450
NY	Rochester, Summit Elctn. Sls., 292 Commerce	716-334-8110
Ohio	Cincinnati, Hughes-Peters, 4865 Duck Creek	513-351-2000
Ohio	Columbus, Hughes-Peters, 481 E. 11th Ave.	614-294-5351
Ore	Portland, Almac/Stroum, 8888 SW Canyon	503-292-3534
Pa	Montgomeryville, Pyttronics, Box 433 Stump	215-643-2850
Tex	Dallas, Specialized Prod., 2324 Shore Crest	214-358-4663
Tex	Houston, Hall-Mark Elect., 8000 Westglen	713-781-6100
Wisc	W Allis, Marsh Radio Supply, 6047 W. Beloit	414-545-6500

SCHAEVITZ ENGRG., U.S. 130, Union Ave., Pennsauken, N.J., 08110, Tel: 609-662-8000, TWX: 710-892-0714; Empl.: 190; Minimum order: \$25

For info on price: J. Lynch; Application info: R. Anderson; Customer service: R. Gorczyca; Delivery info: J. Lynch

Free literature available: Literature giving performance data, dimensions and application information on transducers (lvd't's) to measure displacement, dimension, pressure, force, acceleration, level and on lvd't signal conditioning.

Products manufactured: Accelerometers, Amplifiers, Calibrators, Cells, Load, Controls/Control Eqp., Data Acquisition & Reduction Systems, Gages, Indicators, Meters, Signal Conditioners & Equipment, Testers, Transducers

Local Sales Offices & Reps.

Ala	Huntsville, INCOTECH	205-837-6061
Ariz	Phoenix, Measurement Consultants	602-948-8410
Cal	Huntington Beach, S. Kennon Sls.	714-838-1888
Cal	San Carlos, Elctn. Engrg.	415-593-2189

Colo	Boulder, Meas. Conslt.	303-449-5294
Fla	Orlando, Dataprep	305-843-5224
Ill	Northfield, Torkelson Assoc.	312-446-9085
Ind	Indianapolis, Torkelson Assoc.	317-244-7867
La	Metairie, MG Elctn. Sls. & Equip.	504-834-6002
Mass	Needham, Addeco Corp.	617-444-4754
Mich	Farmington, Anderson Elctn. Sls.	313-476-9161
Minn	Mpls., Industria	612-929-6224
Mo	St. Louis, Ozark Elctn. Sls.	314-423-7200
NJ	Cherry Hill, Markey Engrg.	609-667-3809
NM	Albuquerque, Meas. Conslts.	505-265-6471
NY	Rochester, Schuler Engrg.	716-328-2347
NC	Winston-Salem, Radco Co.	919-722-9671
Ohio	Columbus, Meas. Instrs.	614-488-9753
Tenn	Knoxville, Tool Crib, Inc.	615-525-6195
Tex	Dallas, Concept Sales	214-387-1434
Utah	Murray, Meas. Conslt.	801-268-3181
Wash	Bellevue, A. Smith	206-746-6770
FOR:	Can., Weston, Ont., Megatronix Ltd.	416-742-8015

SCHAUER MFG. CORP., 4500 Alpine Ave., Cincinnati, Ohio, 45242, Tel: 513-791-3030, Telex: 21-4576; Empl.: 254; Minimum order: \$10

For info on price: R. C. Parsons; Application info: R. C. Parsons; Customer service: C. Waddell; Delivery info: C. Waddell

Free literature available: Catalog #670 concerning Zener Diodes and Silicon Varistors with inserts on application data. Catalogs on our automotive products are form numbers: #2560, 2561, 2563 and 2564.

Products manufactured: Chargers, Battery, Diodes, Gages, Meters, Power Supplies, Resistors, Testers

Local Sales Offices & Reps.

Cal	Burbank, Lingronics	213-848-8372
Cal	Palo Alto, Ellis Enterprises	415-328-5151
Conn	Meriden, Eagle Assocs.	203-377-1200
Ga	B-C Elctn. Sls.	404-436-5169
Ill	Chicago, Ellinger Sls. Corp.	312-763-1570
Mich	Detroit, Rathsborg Assocs.	313-882-1717
Minn	Minneapolis, C.R. Gibb Co.	612-377-1200
Mo	Kansas City, Nevco, Inc.	816-421-1751
NY	Long Island City, D.F. Tobias Co.	212-549-9191
Ohio	Cleveland, John O. Olsen Co.	216-752-5444
Pa	Philadelphia, Kenneth B. Erdman Co.	215-224-1833
Tex	Dallas, J.Y. Schoonmaker Co.	214-357-8481
Wash	Seattle, D. Miller Sls. Co.	206-784-6800

SCHLUMBERGER, See Heath Co.

SCHNEIDER ELECTRONICS, INC., 11 Riverside Ave., Medford, Mass., 02155; Empl.: 3

Products manufactured: Comparators, Counters, Gages, Generators, Meters, Synthesizers

SCHNEIDER INSTR. CO., 8115 Camargo Rd., Cincinnati, Ohio, 45243, Tel: 513-561-6803; Empl.: 17

For info on price: C.A. Schneider; Application info: C.A. Schneider; Customer service: W.C. Tharp; Delivery info: C.A. Schneider

Free literature available: Brochure describing automatic water quality monitors and related telemetering and data logging equipment.

Products manufactured: Comm. Systems, Data Acquisition & Reduction Systems, Data Loggers

Local Sales Offices & Reps.

Ala	Birmingham, Spader & Assocs.	205-879-1366
Ga	Atlanta, Spader & Assocs.	404-296-3024

SCHOTT CORP., 3140 Harbor Lane N., Minneapolis, Minn., 55441, Tel: 612-544-2751, TWX: 910-576-2984; FSC No: 80023; Empl.: 150; Minimum order: \$75

For info on price: O. W. Schott; Application info: O. W. Schott; Customer service: P. O. Berendes; Delivery info: P. O. Berendes

Free literature available: Brochure describing types available and capacity to produce custom-made units.

Products manufactured: Chokes, Coils Including Assemblies & Forms, Reactors, Transformers

Local Sales Offices & Reps.

Cal	Bellflower, Royer Assocs.	213-869-2517
Cal	Walnut Creek, Murray Assocs.	415-937-7577
Mass	Needham, Hatch Assocs.	617-444-3310
Minn	Minneapolis, S & R Sls.	612-544-3022
NJ	Springfield, F.F. Sylvester Assocs.	201-376-3324

SCHRACK ELECTRICAL SALES CORP., 1140 Broadway, New York, N.Y., 10001, Tel: 212-683-0790; Empl.: 3; Minimum order: \$10 p. 1-1808-1813

For info on price: E. Sobin; Application info: H. Siegel; Customer service: P. DeBiasi; Delivery info: H. Siegel

Free literature available: On all products advertised in EEM.

Products manufactured: Covers, Protective (Including Dust), Plugs, Relays, Sockets

Local Sales Offices & Reps.

Cal	Palo Alto, Engrg. Assocs.	415-326-7842
Cal	Sherman Oaks, R.S. Hopkins Co.	213-788-5501
Colo	Littleton, Lange Sls. Co.	303-798-1297
Conn	Old Saybrook, M.L. Assocs.	203-388-9718
Fla	Miami, E. Healy	305-961-6640
Ill	Chicago, R.M. Krueger Co.	312-282-8444
Md	Baltimore, D.K. Jones & Assoc.	301-752-0577
Mass	Marlboro, M.L. Assocs.	617-485-6190
Mich	Dearborn, Pitcher Inc.	313-582-5450
Minn	Minneapolis, A.J. Warner Inc.	612-729-7371
NH	East Derry, M.L. Assoc.	603-432-5050
NJ	S. Plainfield, S. Glassman Assocs.	201-561-3866

NY	Glen Cove, S. Glassman Assocs.	516-676-1039
NY	Syracuse, Lenard Co.	315-479-9191
Ohio	Englewood, Ad-El-Tek, Inc.	513-836-8471
Ohio	North Royalton, Ad-El-Tek, Inc.	216-237-4472
Ore	Portland, Pacific Elec. Sls.	503-235-3456
Pa	Ardmore, R.D. Freedman Assocs.	215-649-3679
Tex	Houston, Spectra Sls. Corp.	713-524-7800
Tex	Richardson, Spectra Sls. Corp.	214-234-3600
FOR:	Can., Toronto, Ont., Canector Sls. Ltd.	416-752-1800

SCHURMAN PRODUCTS INC., Weymouth Ind'l Pk., E. Weymouth, Mass., 02189, Tel: 617-337-8701; Empl.: 6

For info on price: G. Holsapple 617-337-8701; Application info: G. Holsapple 617-337-8701; Customer service: R. Cardinal 617-331-3601; Delivery info: R. Cardinal 617-331-3601

Products manufactured: Soldering Accessories

Local Sales Offices & Reps.

Colo	Denver, Connors	303-934-5829
Minn	Minneapolis, D. Swanson & Co.	612-789-5636
NJ	Caldwell, A. Cerf & Co.	201-226-2263
Ohio	Strongsville, J. Finnegan & Co.	216-826-1033
Pa	Warminster, A. Cerf & Co.	215-343-1339
Tex	Arlington, C.W. Cortez & Co.	817-469-8499

SCHWEITZER, PETER J. DIV., Kimberly Clark Corp., Lee, Mass., 01238, Tel: 413-243-1000, TWX: 413-243-2121; Empl.: 750

For info on price: T. W. Steiner; Application info: T. W. Steiner; Customer service: A. Baruzzi; Delivery info: A. Baruzzi

Products manufactured: Films, Foil, Insulators & Insulation, Tapes, Films & Foils, Pressure Sensitive

SCIENTIFIC-ATLANTA, Optima Div., 2166 Mountain Ind'l Blvd., Tucker, Ga., 30084, Tel: 404-939-6340, TWX: 810-766-3967; Empl.: 100

Customer service: B. Holman

Free literature available: Color brochures and a catalog which includes outline drawings, prices, and complete model information.

Products manufactured: Benches, Consoles, Stools, Tables, Blowers & Fans & Accessories, Cabinets & Accessories, Carts & Dollies, Instrument & Equipment, Cases, Equipment, Instrument, Meter, Chassis, Metal, Covers, Protective (Including Dust), Drawers, Sliding, Enclosures, Module, Plug-In, Frames, Cabinet & Rack, Grilles, Handles For Cabinets, Circuit Boards, Racks, etc., Panels, Racks, Slides, Cabinet & Chassis, Stands, Instruments

Local Sales Offices & Reps.

Ala	Huntsville, Gentry Assocs.	205-536-5306
Ariz	Scottsdale, Barnhill Five	602-947-5745
Cal	Los Altos, Frauman Assocs.	415-941-0680
Cal	Palos Verdes, Edwards Assocs.	213-377-0975
Colo	Denver, Barnhill Five	303-426-0222
Fla	Orlando, Gentry Assocs.	305-894-4401
Ill	Des Plaines, Cozzens & Cudahy	312-298-3600
Ind	Indianapolis, Cozzens & Cudahy	317-244-2456
Md	Bladensburg, Scientific-Atlanta	301-779-1515
Mass	Lexington, Zieco	617-861-8300
Mich	Southfield, Representatives Elctn. Products	313-354-9066
Minn	Minneapolis, Cozzens & Cudahy	612-884-4336
Mo	St. Louis, Cozzens & Cudahy	314-423-1234
NJ	Leonia, Scientific-Atlanta	201-461-3650
NM	Albuquerque, Barnhill Five	505-293-5956
NC	Burlington, Gentry Assocs.	919-227-3639
Ohio	Cleveland, C.A. Robinson Co.	216-381-9049
Tex	Fort Worth, Carey-Wolf and Assocs.	817-738-1996
Wash	Seattle, S.J.I. Corp.	206-624-9020

FOR: Can., Burlington, Ont., White Radio Ltd. 416-634-1845

SCIENTIFIC COLUMBUS, 1035 W. 3rd Ave., Columbus, Ohio, 43212, Tel: 614-294-5671; Empl.: 75; Minimum order: \$15 p. 1-2348,2349

For info on price: W. H. Traetow; Application info: T. Haenszel; Customer service: T. Bowen; Delivery info: T. Bowen

Free literature available: Power transducers-watts, vars, volts, amps, power factor, frequency, isolation, temperature watt-hour; demand controllers; powertest consoles; calibrators

Products manufactured: Alarms, Amplifiers, Controls/Control Eqpt., Converters, Meters, Monitors, Signal Conditioners & Equipment, Testers, Transducers

Local Sales Offices & Reps.

Ala	Birmingham, Spader & Assocs.	205-879-1366
Ariz	Scottsdale, BFA Corp.	602-946-4215
Cal	Glendale, R.A. Young & Co.	213-242-2171
Colo	Denver, Cliff Beabout Co., Inc.	303-831-7259
DC	Fairfax, Va., Hildenbrand Co.	703-280-2330
Fla	Orlando, RJC Assocs.	305-894-7371
Ga	Decatur, Spader & Assocs.	404-296-3024
Haw	Honolulu, Berkley Engrg. & Equip. Co.	808-538-1921
Ill	Park Forest, J.M. Livingston	312-481-9700
Ind	Indianapolis, C.D. Arnold Co.	317-546-4053
Iowa	Cedar Rapids, H.E. Ferris Co.	319-362-9155
Iowa	Des Moines, H.E. Ferris Co.	515-255-5008
La	New Orleans, Mid-South Sls. Co.	504-822-3030
Mass	Needham Heights, G.W. Danek Co.	617-444-8838

Mich	Marquette, NWR Elctns. Corp.	906-226-7578
Mich	Troy, G.R. Peter Assocs.	313-524-2920
Minn	Edina, NWR Inc.	612-831-6240
Minn	Virginia, NWR Elctns. Corp.	218-741-5080
Mo	Crestwood, C.B. Fall Co.	314-968-3850
Mo	Kansas City, C.B. Fall Co.	816-942-3912
NJ	Wanamassa, Bradley Corp.	201-922-9111
NM	Albuquerque, BFA Corp.	505-296-8303
NM	Las Cruces, BFA Corp.	505-523-0601
NY	Buffalo, Robert F. Lamb Co.	716-874-4900
NY	Lynbrook, R.A. Keeler	212-895-6890
NY	Rochester, Robert F. Lamb Co.	716-544-5580
NY	Schenectady, R. F. Lamb Co.	518-393-4844
NY	Syracuse, Robert F. Lamb Co.	315-454-2469
NC	Charlotte, R.W. Chapman & Co.	704-525-2421
NC	Raleigh, R.W. Chapman & Co.	919-782-2624
Ohio	Cincinnati, Beedle Equip. Co.	513-793-0140
Ohio	Cleveland, M.A. Blankenburg & Co.	216-526-1100

Ore	Portland, McLaren Inc.	503-297-2248
Pa	Broomall, Bradley Corp.	215-544-8800
Pa	Pittsburgh, R.F. Clark Co.	412-242-9500
SC	W. Columbia, R.W. Chapman & Co.	803-796-9796

Tenn	Knoxville, G.W. Massey Co.	615-577-9553
Tenn	Memphis, R.M. Archibald Co.	901-685-1722
Tex	Dallas, McCoy Assocs.	214-350-9931
Tex	Houston, E. Smith Sls. Co.	713-649-5756
Utah	Salt Lake City, Instrumentation Sls.	801-272-3793

Wash	Bellevue, McLaren, Inc.	206-454-3400
Wisc	Milwaukee, T.R. Bickler Assocs.	414-453-3772
FOR:	Calgary, Alberta, Can., Showalter Agencies, Ltd.	403-268-6411

Cal	San Francisco, Wrathall & Krusi	415-397-3593
FOR:	Don Mills, Ont., Can., R.G. Shelley, Ltd.	416-447-6471
FOR:	New Westminster, B.C., Can., Showalter Agencies, Ltd.	604-524-1434

SCIENTIFIC COMMUNICATIONS, 3425 Kingsley, Garland, Tex., 75041, Tel: 214-271-3685, TWX: 910-860-5172; Empl.: 100 p. 1-926,927; p. 2-1391

Products manufactured: Amplifiers, Computers, Generators, Mixer-Preamplifiers, Microwave, Radiometers, Receivers, Switches

Local Sales Offices & Reps.

Cal	Anaheim, Blair Assocs.	714-635-1350
Cal	Los Altos, Stout-Loeswick	415-948-3265
DC	Washington, R. May - Scientific Comms.	301-887-7387
Fla	Ft. Lauderdale, Snow Co.	305-563-2448
Mass	Needham Heights, O'Sullivan & Murphy/Repton	617-449-4141
Tex	Dallas, Texas Microwave & Elctns.	214-231-5381
Va	Arlington, Ray May	703-841-0807
Exp:	Rockville, Md., R. F. Int'l.	301-340-1175

SCIENTIFIC MEASUREMENTS, 1319 Dobson, Evanston, Ill., 60022, Tel: 312-864-9295

Customer service: G. F. Comiskey

Products manufactured: Amplifiers, Boards, Printed Wiring, Universal, Cards, Logic, Clocks (All Types), Comparators, Computers, Converters, Cords, Display Devices/Displays, Generators, Kits, Training Aid

SCIENTIFIC MICRO SYS., 520 Clyde St., Mountain View, Cal., 94043, Tel: 415-964-5700, TWX: 910-379-6577; Empl.: 58; Minimum order: \$50

For info on price: R. Lanford Ext. 65; Application info: M. Liccaro Ext. 66; Customer service: J. Berndt Ext. 68; Delivery info: J. Berndt Ext. 68

Free literature available: SMS offers system descriptions, reference manuals, maintenance manuals and application notes on all products.

Products manufactured: Integrated Circuit Devices, Memory Systems

Local Sales Offices & Reps.

Cal	Mountain View	415-964-5200
Ill	Chicago	312-298-0388
Mass	Boston	617-246-2540
Pa	Philadelphia	215-664-5511

SCIENTIFIC RESEARCH CORP., Sub. TRAK Microwave Corp., 4726 E. Eisenhower Blvd., Tampa, Fla., 33614, Tel: 813-884-1411, Telex: 52827; Empl.: 115; Minimum order: \$50

Customer service: T. G. Toth

Free literature available: A brochure describing IF amplifiers, crystal controlled oscillators, comb generators, Bite modules, IF amplifier assemblies and special purpose thin-film hybrid circuits.

Products manufactured: Amplifiers, Circuits, Hybrid, Thin-Film, Microwave Integrated Circuits (MIC's), Multipliers, Oscillators

Local Sales Offices & Reps.

Ala	Huntsville, Scientific-Devices Southeast, Inc.	205-536-1969
Cal	Orange, J. E. Hachten Co.	213-860-1317
Cal	Palo Alto, J. E. Hachten Co.	415-326-5594
Colo	Denver, Omega Ltd.	303-758-1508
Fla	Ft. Lauderdale, Scientific Devices Southeast, Inc.	305-721-4260
Fla	Orlando, Scientific Devices Southeast, Inc.	305-841-8180
Mass	Natick, Wayland Engrg. Sls.	617-655-6080
NM	Albuquerque, Premmco, Inc.	505-265-0115
NY	Skaneateles, Robtrn	315-685-5731
NY	Tuckahoe, ASCO Elctns., Inc.	914-779-8110
NC	Burlington, Scientific Devices Southeast, Inc.	919-228-6279
Ohio	Dayton, F. L. Ohmer & Assocs.	513-434-1454
Pa	Lafayette Hill, M. Lader Co.	215-825-3177
Tex	Dallas, Cain & Co.	214-233-6809
Utah	Salt Lake City, Monarch Distributing & Representing Co.	801-226-9617
Va	Woodbridge, M. Lader Co.	703-494-4731
Wash	Seattle, J. B. Jolly, Inc.	206-938-4166
EXP:	Conn., Stamford, Dage Corp.	203-324-3123

SCIENTIFIC TECHNOLOGY, 1201 San Antonio Rd., Mountain View, Cal., 94043, Tel: 415-965-0910, Telex: 34-5506; Empl.: 50; Minimum order: \$25

Customer service: D. Persen

Products manufactured: Alarms, Amplifiers, Controls/Control Eqpt., Counters, Detectors, Diodes, Display Devices/Displays, Indicators, Lamps, Lights, Modulators, All Kinds, Scanners, Switches, Transducers

SCIENTIFICO SCIENTIFIC COMPONENTS CO., 350 Vista Baya, Newport Beach, Cal., 92660, Tel: 714-642-2543; Empl.: 5

Products manufactured: Boards, Printed Circuit, Calibrators, Counters, Detectors, Diodes, Flashers, Flashlights & Lanterns, Labels, Pressure-Sensitive, Adhesive, Lamps, Lights, Meters, Power Supplies, References, D-C Voltage, Sockets, Testers, Transformers

SCOTT ELECTRONICS CORP., 2525 Shader Rd., Orlando, Fla., 32804, Tel: 305-295-5850, TWX: 810-850-4127; Empl.: 874; Minimum order: \$50

For info on price: A. Egan ext. 153; Application info: A. Renkes ext. 322; Customer service: T. Mowell ext. 132; Delivery info: T. Mowell ext. 132

Products manufactured: Power Supplies

Local Sales Offices & Reps.

Ariz	Scottsdale, Runyon Co.	602-959-6060
Cal	Cupertino, Allis Assocs.	408-379-2883
Cal	Orange, Pacific Microwave, Inc.	714-633-7991
Fla	Seminole, Spartak, Inc.	813-393-5402
Ill	Chicago, Electronic Instr. Assoc.	312-271-3774

Ind	Indianapolis, Electronic Instr. Assoc.	317-257-7231
Md	Towson, J-H Electronic Sls. Co.	301-825-4440
Mass	Stow, Associates, Inc.	617-897-2737
Mich	Ann Arbor, ImTech, Inc.	313-663-0230
Minn	Minneapolis, Scott Electronics Sls., Inc.	612-929-2985
NJ	Irvington, M. Gallagher, Inc.	201-399-4350
NY	Fairport, P. B. Schumacher Assoc.	716-235-6843
Ohio	Cleveland, ImTech, Inc.	216-826-3400
Pa	Berwyn, Tucker Assocs.	215-644-0142
Tex	Dallas, Bouillon Engrg. Sls. Co.	214-376-1929

Advertisement

We design and build GOOD power supplies. We don't overstate our capabilities, or understate our prices. Scott Electronics just does the job as quickly as possible, and at the lowest cost to you. Military or Commercial - High or Low Voltage - Small quantity or by the thousands - Scott Electronics is anxious to assist you. When you need a quality regulated power supply, that not only meets your written spec., but performs in the field, contact Scott Electronics.

SCS CORP., See NEC Micro Systems

SEACOR, INC., 598 Broadway, Norwood, N.J., 07648,
Tel: 201-768-6070, Telex: 135-354; Empl.: 20
p. 1-2270,2271; p. 2-238,239

Products manufactured: Capacitors, Fixed, Capacitors, Variable, Circuits, Hybrid, Thick Film, Crystals, Kits, Switch Assembling, Knobs, Switches

Local Sales Offices & Reps.

Ala	Huntsville, BJR	205-881-3569
Cal	Glendale, Orion Sls.	213-240-3151
Cal	Santa Clara, Roger Assocs.	408-984-8110
Colo	Denver, Williams Assocs.	303-343-2911
Conn	Madison, A & M Elctn. Reps.	203-421-4242
Fla	Ft. Lauderdale, B. Baker Assocs.	305-484-6500
Ill	Skokie, Mar-Con	312-675-6450
Kans	Shawnee Mission, TSA Tech. Sls.	913-831-2888
Mass	Needham, A & M Elctn. Reps.	617-444-8170
Mich	Grosse Pointe Park, Greiner Assocs.	313-499-0188
Minn	Mpls., Heimann Co.	612-861-6051
NJ	Nutley, Falk-Baker	201-661-2430
NY	East Rockaway, W. Bellenkes Assocs.	516-887-1443
NY	Ontario Center, Gehrs & Kehoe	315-524-2491
NY	Rochester, E. J. Schomburg Co.	716-244-0920
Ohio	Cincinnati, W. Geisting Assocs.	513-931-0812
Ohio	Columbus, T. Mulligan & Assocs.	614-457-2242
Pa	Ardmore, R.D. Freedman Assocs.	215-643-3679
Tex	Addison, Southland Comps	214-233-0603
Va	Lynchburg, G. White Assocs.	804-846-4624

SEAL-PEEL, INC., Box 250, Troy, Mich., 48084, Tel: 313-588-1055; Empl.: 10

Free literature available: Brochures on reusable hot melt plastic strippable coating to protect parts from rust and abrasion-specialty applications such as electroplating stopoff-potting and encapsulating.

Products manufactured: Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Films

Local Sales Offices & Reps.

Cal	San Gabriel, Seal-Peel	213-284-9330
Conn	Farmington, R.M. Jones & Co.	203-677-2654
Ohio	Cleveland, Reserve Ind. Supply	216-381-4746
Okla	Tulsa, Marsoco	918-LU4-5273
Tex	Fort Worth, O.H. Van Horn Co.	817-335-4484

SEAELECTRO CORP., 225 Hoyt St., Mamaroneck, N.Y., 10543, Tel: 914-698-5600, TWX: 710-566-1110; Empl.: 1100; Minimum order: \$75

p. 1-206,207,2269; p. 2-800-811

Customer service: R. O. Walcovy

Products manufactured: Antenna Feed Systems, Attenuators, Boards, Programming, Bushings, Glass, Plastic, Metal, Rubber, Etc., Cable Assemblies & Harnesses, Connector Adapters, Connectors, Contacts, Electrical, Controllers, Programmable, Controls/Control Eqpt., Controls, Fader, Filters, Grommets, Jacks (All Types), Matrices, Computer, Pads, Transistor Mounting, Plug & Jack Sets, Plugs, Probes, Programmers, Punched Card Equipment, Readers, Sockets, Switchboards, Switches, Tees, Terminal Blocks, Boards & Strips, Terminals, Timers

Local Sales Offices & Reps.

Ariz	Scottsdale, Barnhill Five, Inc.	602-947-5745
Cal	Los Angeles, Sealectro West	213-666-4040
Cal	Mt. View, Sealectro West	415-965-1212
Colo	Denver, Barnhill Five, Inc.	303-426-0222
Conn	Andover, Sls. Engrg. Co.	617-470-0800
Conn	Southbury, J.J. Wild Co.	203-264-9494
Fla	Orlando, Gartner Assocs.	305-299-1000
Fla	Winter Park, Young & Lawrence Assocs.	305-647-6929
Ill	Arlington Heights, R. Diethert Co.	312-593-7600
Iowa	Des Moines, Beams	515-282-0292
Kans	Overland Park, Beams	913-341-7744
Md	Rockville, Mechtronics Sls., Inc.	301-340-2130
Mass	Needham, J.J. Wild Co.	617-444-2366
Mich	Farmington, Carter, McCormic & Peirce Inc.	313-477-7700
Mich	Farmington Hills, W.R. Hummon & Assocs.	313-474-0661
Minn	Minneapolis, ECR, Inc.	612-831-4547
Mo	Creve Coeur, Beams	314-569-1080
NJ	Woodbridge, J.J. Wild Co.	201-636-7780
NM	Albuquerque, Barnhill Five, Inc.	505-293-5955
NY	Jericho, J.J. Wild Co.	516-935-6600
NY	Mt. Vernon, Friedman-Smith Co.	914-664-4866
NY	Syracuse, I.A. Hotze Co.	315-479-6641
NC	Burlington, P.J. Nahser Co.	919-226-8053
Ohio	Cleveland, Carter, McCormic & Peirce, Inc.	216-333-5650
Ohio	Columbus, McFadden Sls. Co.	614-221-3363
Ohio	Dayton, Carter, McCormic & Peirce, Inc.	513-278-5873
Ore	Beaverton, N.R. Schultz Co.	503-643-1644
Pa	Delmont, T.F. Laslo & Assocs.	412-468-5045
Pa	Glenside, Griffin Co.	215-M16-8383
Pa	Monroeville, Carter, McCormic & Peirce	412-372-4415
Pa	Narberth, S.A. Jeffries Co.	215-664-8500
Pa	Pittsburgh, Carter, McCormic & Peirce	412-824-3760
Pa	Southampton, J.J. Wild Co.	215-357-6645
Tex	Dallas, Allied Comps., Inc.	214-238-0408
Wash	Bellevue, N.R. Schultz Co.	206-454-0300
Wisc	Waukesha, R. Diethert Co.	414-547-6575
FOR:	Can., Pointe Claire, Que., Avotronics Ltd.	514-697-2135
FOR:	Can., Toronto, Ont., Avotronics Ltd.	416-493-9711

Local Distributors

Ala	Huntsville, Powell Elctnrs.	803 Oster Dr. 205-539-2731
Ariz	Phoenix, Micro Elctnrs.	2104 W. Peoria Ave. 602-944-2281
Ariz	Phoenix, R.V. Weatherford Co.	1917 N. 25th Dr. 602-272-7144
Cal	Glendale, R.V. Weatherford Co.	6921 San Fernando Rd. 213-843-3451
Cal	Los Angeles, Radio Prod. Sls.	1501 S. Hill St. 213-748-1271
Cal	Mt. View, Elmar	2288 Charleston Rd. 415-961-3611
Cal	Palo Alto, R.V. Weatherford Co.	3240 Hillview Ave. 415-321-5373
Cal	San Diego, Radio Prod. Sls.	7889 Clairmont Mesa 714-292-5611
Colo	Denver, Cramer	5465 E. Evans Pl. 303-758-2100
Colo	Denver, Elctn. Parts Co.	1212 S. Broadway 303-744-1992
Fla	Hollywood, Cramer	4035 N. 29th Ave. 305-923-8181
Fla	Miami Springs, Powell Elctnrs.	1740 N.W. 69th Ave. 305-885-8761
Fla	Orlando, Hall-Mark Elctn.	7233 Lake Elinor 305-855-4020
Fla	Orlando, Powell Elctn.	2032 Palmridge Way 305-859-1450
Ill	Chicago, Elctn. Dists.	4900 N. Elston 312-283-4800
Ill	Mt. Prospect, Cramer	1911 S. Busse Rd. 312-593-8230
Ind	Indianapolis, Graham Elctn.	133 S. Pennsylvania St. 317-634-8486
Ind	South Bend, Radio Distr.	1212 High St. 219-287-2911

Iowa	Cedar Rapids, Deeco Inc.	2500 16th Ave. SW 319-365-7551
Kans	Lenexa, Hall-Mark	9006 Rosehill Rd. 913-888-4747
Kans	Wichita, Radio Supp. Co.	115 Laura 316-267-5214
Md	Beltsville, Powell Elctn.	10728 Hanna St. 301-937-4030
Mass	Boston, DeMambro	1095 Commonwealth Ave. 617-787-1200
Mass	Newton Center, Cramer	85 Wells Ave. 617-969-7700
Mich	Augusta, Great Lakes Elctn.	390 E. Michigan Ave. 616-731-4156
Minn	Minneapolis, Ind. Comps.	5280 W. 4th St. 612-831-2666
Mo	St. Louis, L-Comp.	2605 S. Hanley Rd. 314-647-5505
NJ	Springfield, Federated Elctn.	155 US Rte 22 203-376-8900
NM	Albuquerque, Cramer	137 Vermont N.E. 505-265-5767
NY	Bohemia, Car-Lac	75 Orville Dr. 516-567-4200
NY	Buffalo, Summit	916 Main St. 716-884-3450
NY	E. Syracuse, Cramer	6716 Joy Rd. 315-437-6671
NY	Endwell, Cramer	3220 Watson Blvd. 607-754-6661
NY	Farmingdale, DRW	100 Milbar Ave. 516-249-2660
NY	Rochester, Cramer	3529 Winton Rd. S. 716-275-0300
NC	Winston-Salem, Kirkman Elctn.	901 W 2nd St. 919-724-0541
Ohio	Cincinnati, Cramer	666 Redna Terr. 513-771-6441
Ohio	Cleveland, Cramer	5835 Harper Rd. 216-248-8400
Ohio	Solon, Radio & Elctn. Parts	6835 Cochran 216-248-8900
Ore	Portland, Almac/Stroum	8888 SW Canyon Rd. 503-292-3534
Pa	Philadelphia, Powell	S. Island Rd & Enterprise 215-365-1900
Tex	Dallas, Tex Instr. Supp.	6000 Denton 214-238-6821
Tex	Dallas, Wholesale Elctn.	2809 Ross Ave. 214-824-3001
Wash	Seattle, Almac/Stroum	5811 6th Ave. S. 206-763-2300
Wash	Seattle, R.V. Weatherford	541 Industry Dr. 206-243-6340
Wisc	Oak Creek, Cramer	430 W. Rawson Ave. 414-764-1700

SEALED AIR CORP., 19-01 State Hwy. 208, Fair Lawn, N.J., 07410

SEASTROM MFG. CO. INC., 701 Sonora Ave., Glendale, Cal., 91201, Tel: 213-245-9121, TWX: 910-497-2271; FSC No: 86928; Empl.: 50; Minimum order: \$20

Customer service: Order Desk

Free literature available: Electrical/electronic hardware spring clips, washers-metallic, non-metallic all configurations military standards.

Products manufactured: Bus Bars & Systems, Bushings, Glass, Plastic, Metal, Rubber, Etc., Clamps & Clips, Fasteners, Terminals

Local Sales Offices & Reps.

Ariz	Phoenix, Hecht Henschen & Assoc.	602-275-4411
Cal	San Diego, Hampton-Donley Co.	714-276-1934
Cal	San Jose, A. J. Mollica Co.	408-578-6221
Colo	Denver, Industrial Hardware Co.	303-426-1440
Fla	Sarasota, RF Carlson Co.	813-388-3086
Ga	Atlanta, Electro Mech Sls. Engrg.	404-393-0444
Ill	Hinsdale, Hill-Gray Assoc.	312-325-4810
Mich	Stockbridge, Erhart Engrg.	313-229-6958
Minn	Minneapolis, Giefer Sls. Co.	612-884-2395
NH	Spofford, Bahr Sls. Co.	603-352-5444
NY	Lindenhurst, Long Island Mach'y Sls. Corp.	516-226-2400
NY	Syracuse, T Squared Elctnrs.	315-463-8592
NC	Raleigh, Electro Mech. Sls.	919-782-6452
Pa	Narberth, Samuel A. Jeffriet	215-664-8500
Tenn	Nashville, Electro Mech. Sls. Engrg.	615-883-1490
Tex	Dallas, Blair Engrg. Sls. Co.	214-352-2556
Wash	Seattle, F. W. Aurich & Co.	206-284-5561

SEG SUBSIDIARY, Comstron Seg, 120-30 Jamaica Ave., Richmond Hill, N.Y., 11418, Tel: 212-441-3200; Empl.: 35

Customer service: R.W. Tramposch

Free literature available: Brochures describing our product line.

Local Sales Offices & Reps.

Pa	Pittsburgh, Comtel-Sterling Co.	215-779-1640
Tex	Hurst, Anderson Wylie Assocs.	817-268-2327
Utah	Murray, Meas. Conslts.	801-268-3181
Va	Annapdale, J. Hopkins Assocs.	703-323-1641
FOR:	Can.-Vancouver, B.C., Electronics Sys., Ltd.	604-687-5696
FOR:	Can., Downsview, Ont., Electronics Sys., Ltd.	416-661-3673
FOR:	Can., Montreal, Que., Electronics Sys., Ltd.	514-342-4112
FOR:	Can., Ottawa, Ont., Electronics Sys., Ltd.	613-733-3781

Filters : Equalizers

Whatever your needs – from spectral shaping and phase correction to time-domain synthesis-you can rely on the filter experts at SEG. Computer aided custom designs; DC to 120 MHz; sharp rolloffs; phase corrected; narrow bandwidths, production quantities and competitive pricing. NAME IT AND SEG WILL DELIVER IT ON SCHEDULE.

The SEG SIMULINE System offers the datacomm user and designer complete telephone channel simulation capability including all impairments such as phase jitter, phase hits, impulse hits, broadband noise, harmonic distortion, dropout, frequency translation, amplitude and delay distortion, echo, SFI, crosstalk, etc. These impairments are totally adjustable and repeatable for simulating foreign as well as domestic telephone channels.

Free literature available: **SEL-REX STRIP-PLATING MACHINES** - Brochure describes several plating systems engineered for a variety of individual production requirements whether for plating selectively or over-all.

Local Sales Offices & Reps.

Cal Burlingame, Oxy Metal Inds. Corp. 415-697-7123

Mich	Madison Heights, Parker Co.	313-583-9300
Mo	Warren, Oxy Metal Inds. Corp.	313-539-3400
Mich	St. Louis, Oxy Metal Inds. Corp.	314-993-2602
NJ	Mt. Laurel, Oxy Metal Inds. Corp.	609-234-2331
NJ	Nutley, Oxy Metal Inds. Corp.	201-667-5200
Ohio	Cincinnati, Oxy Metal Inds. Corp.	513-793-6690
Ohio	Cleveland, Oxy Metal Inds. Corp.	216-267-6360
Ore	Portland, Oxy Metal Inds. Corp.	503-288-5134
RI	Warwick, Sel-Rex Co.	401-781-0700
Wash	Seattle, Oxy Metal Inds. Corp.	206-767-5924
Wisc	Brookfield, Oxy Metal Inds. Corp.	414-781-5962

Free literature available: Short form transistor catalog, Short form chip catalog, Detailed specification sheets, High power, high voltage devices. RF devices

Products manufactured: Diodes, Thyristors
(Includes Silicon Controlled Rectifiers),
Transistors

Local Sales Offices & Reps.

Ariz	Scottsdale, EST-Tronics	602-948-8444
Cal	Los Angeles, Trimarco	213-861-8244
Cal	San Diego, Trimarco	213-861-8244
Cal	Santa Clara, Caltron-Pyle	415-964-3244
Fla	Casselberry, EIR	305-830-9600
Ill	Chicago, Metcom Assoc.	312-696-1490
Mass	Burlington, Contact Sls., Inc.	617-273-1520
Minn	Minneapolis, Furber Sls. Co.	612-861-1518
Mo	Kansas City, L.F. Florence Co.	816-561-7222
NJ	South Orange, Simberloff Assocs.	

NY	Buffalo, Simberkoff Assocs.	716-434-4426
NC	Burlington, Simberkoff Assocs.	919-584-6450
Ohio	Dayton, Crest Component Sls.	216-543-9808
Pa	Narbeth, Electro-Comp.	215-664-3576
Tex	Dallas, Evans-McDowell Assoc.	214-238-5171
Wash	Seattle, Arneson Assocs.	206-762-7664

SEMICON ASSOC., INC., Box 832, Lexington, Ky., 40501,
Tel: 606-255-2446; Empl: 35

Products manufactured: Services, Assembly,
Production & Test

SEMICONDUCTOR CIRCUITS, INC., 306 River St.,
Haverhill, Mass., 01830, Tel: 617-373-9104, TWX:
710-347-0269; Empl.: 130; Minimum order: \$30

Products manufactured: Converters, Kits, Power Supply, Power Supplies

Local Sales Offices & Reps.

Ariz	Scottsdale, BFA Corp.	602-946-4215
Cal	Pasadena, A-F Sls. Engrg. Inc.	213-681-5631
Cal	Sunnyvale, Lee/Allan Assocs.	408-732-2030
Colo	Denver, BFA Corp.	303-744-3301
Conn	Middletown, McBar Assocs.	203-865-4376
Fla	Casselberry, EIR	305-830-9600
Haw	Honolulu, Aloha Assocs.	
Ill	Elk Grove Village, L.F. Green & Assocs.	

Ind Indianapolis, L.F. Green & Assocs. 317-293-9827

Mich	Farmington Hills, H. Lowell Co.	313-851-7474
Minn	Fridley, L.F. Green & Assocs.	612-781-1611
Mo	Grandview, K-Mar Engrg. & Sls.	816-763-3466
NJ	Bogota, Neville & Vespo, Inc.	201-487-1507
NM	Albuquerque, BFA Corp.	505-292-1122
NM	Las Cruces, BFA Corp.	505-523-0601
NY	North Syracuse, KLM Assocs.	315-458-6214
NY	Rochester, KLM Assocs.	716-288-9490
NY	Utica, KLM Assocs.	315-735-8525
Ohio	Cleveland, Geotronics Mkts. Assoc.	

Ohio Columbus, Geotronics Mktg. Assoc. 614-457-8472

Pa	Ambler, Data Engrg. Co.	215-542-9876
Tex	Dallas, Ralph Matthews Electrns.	214-233-0363

Tex Houston, Ralph Matthews Elctns. 713-664-7131

Utah	Salt Lake City, BFA Corp.	801-466-6522
Va	Fairfax, Nine Assocs.	703-273-1803

SEMICONDUCTOR TECHNOLOGY, INC., 124-14 22nd Ave., College Point, N.Y., 11356, Tel: 212-445-4466, TWX: 710-582-2571; Empl.: 45; Minimum order: \$25

For info on price: F. G. Seigel; Application info: F. G. Seigel; Customer service: J. Barilla; Delivery info: J. Hika

Free literature available: Short Form Catalogue with Application Notes.

Products manufactured: Diodes, Rectifiers, Transistors

Local Sales Offices & Reps.

Cal	Los Angeles, Relcom	213-595-9388
Cal	San Carlos, Lo Dan	415-592-4600
Cal	San Diego, Southwest Tech. Sls.	714-565-2295
Ill	Chicago, Rinaldi	312-763-4848
Md	Hyattsville, Eastern Comps.	301-577-2925
Mass	Waltham, Tech Sls.	617-890-1002
Mich	Utica, Norm Case Assocs.	313-731-6003
Minn	Minneapolis, C.E. Bohlig Assocs.	612-922-7011
Mo	Grandview, Beneke & Mc. Caul	316-765-2998
Mo	St. Louis, Beneke & Mc. Caul	314-434-6242
NY	Great Neck, Cooper Simon & Co.	516-487-1142
NY	Syracuse, Electra Sls. Corp.	315-455-5783
Ohio	Centerville, Norm Case Assocs.	513-435-1301
Ohio	Fairview Park, Norm Case Assocs.	

Ore Portland, Underwood & Underwood
Pa Flourtown, Eastern Comps.215-836-1616
Wash Seattle, Underwood & Underwood
206-243-2133

SEMTECH CORP., 652 Mitchell Rd., Newbury Park, Cal., 91320, Tel: 213-628-5392, TWX: 910-336-1264; FSC No: 14099; QPL No: Multiple; Empl.: 598

Free literature available: Semtech Condensed Catalog

Products manufactured: Bridges, Capacitors, Fixed, Diodes, Multipliers, Rectifiers, Regulators, Suppressors

Local Sales Offices & Reps

Ala	Huntsville, Southeastern Assoc.	205-772-9616
Ariz	Scottsdale, Sls. Engr., Inc.	602-945-5781
Cal	Palo Alto, Semtech Northwestern Sls. Off.	415-944-3113
Cal	San Diego, F. Nagel Co.	714-298-4850
Colo	Denver, Electrodyne	303-467-7067
Fla	Winter Park, Semtech Southeastern Dist. Sls. Off.	305-644-5404
Ill	La Grange, Semtech Central Regional Sls. Off.	

Ind	Ft. Wayne, G & D Elctrn. Sls.	312-332-5227
		219-422-5585
Md	Baltimore, Burgin-Kreh Assoc.	301-788-5200
Md	Rockville, Semtech	301-424-6663
Mass	Weston, Ebbo, Inc.	617-891-8670
Minn	Minneapolis, S. Clothier Co.	612-888-4666
Mo	Hazelwood, Centech, Inc.	314-731-4220
Mo	Raytown, Centech, Inc.	816-358-8100
NJ	Clifton, Compar NY	201-546-3660
NJ	Springfield, Semtech Eastern Regional Sls. Off.	301-654-4884
NM	Albuquerque, Rustco Entprns.	505-296-6474
NC	Winston-Salem, Burgin-Kreh Assoc.	

Ohio	Cincinnati, Scott Elctns.	513-791-2513
Ohio	Cleveland, Scott Elctns.	216-291-2600
Ohio	Columbus, Scott Elctns.	614-236-8619
Ohio	Dayton, Scott Elctns.	513-223-2652
Ore	Portland, Western Techn. Sls.	503-297-1711
Pa	Pittsburgh, Scott Elctns.	214-387-3551
Tex	Dallas, Semtech	214-387-3551
Utah	Salt Lake City, Electrodyne	801-467-7067
Va	Lynchburg, Burgin-Kreh Assoc.	703-845-5600
Wash	Bellevue, Western Tech. Sls.	206-641-3900
FOR:	Can. Ont. B. D. Valliile Elec. Ltd.	416-447-8482

**SENCORE, INC., 3200 Sencore Dr., Sioux Falls, S.D.,
57107, Tel: 605-339-0100, TWX: 910-660-0300; Empl.:
250**

Customer service: R. Bowden

Free literature available: Update 4 color catalog of entire Sencore line of test instruments and accessories, including oscilloscopes, tube testers, transistor testers, color generators, multimeters, sound analyzers and others.

Products manufactured: Generators, Meters,
Oscilloscopes, Power Supplies, Test Equipment,
Testers

Local Sales Offices & Reps

Cal	Burlingame	415-697-5854
Ga	College Park	404-768-0606
Ill	Downers Grove	312-852-6800

NY Albany 518-869-0996
 Va Alexandria 703-751-3556

SENNHEISER ELCTR. CORP., 10 W. 37th St., New York, N.Y., 10018, Tel: 212-239-0190; Empl.: 28

For info on price: C. Hofmann; Application info: H. A. Ankermann; Customer service: U. Sattler; Delivery info: E. Kruse

Free literature available: Complete 108 page catalog describing in detail all Sennheiser products will be sent free of charge upon request.

Products manufactured: Meters, Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds, Speakers, Transformers

Local Sales Offices & Reps.

Cal Los Angeles, Morris Tait Assocs. 213-877-4424

SENSITIVE RESEARCH INSTRS., 25 Dock St., Mt. Vernon, N. Y., 10550, Tel: 914-699-9717; FSC No: 32590; QPL No: 16034A; Empl.: 35; Minimum order: \$25

For info on price: R. Neglia; Application info: M. Kane; Customer service: G. D. Frank; Delivery info: R. Neglia

Free literature available: "SENSITIVE RESEARCH" AC/DC Electrostatic Voltmeters - Data Bulletin SRT-100 covers features, applications and characteristics of Electrostatic Voltmeters with a range span of from 120 V to 140 KV. Sensitive Research AC/DC Wattmeters and Volt Amp Wattmeters New Catalog Section 5 is an eight page catalog section providing specifications and general information on usage of AC/DC Wattmeters and Volt-Amp-Wattmeters.

Products manufactured: Calibrators, Dividers, Indicators, Magnets, Meters, Multipliers, References, D-C Voltage, Resistors, Services, Assembly, Production & Test, Shunts, Meter, Standards, Transducers, Transformers, Voltage Sources

Local Sales Offices & Reps.

Ala Huntsville, J. L. Highsmith & Co. 205-881-3294
 DC Washington, Whitcomb Assocs. 202-737-0763
 Fla Orlando, J. L. Highsmith & Co. 305-293-5202
 Ill Skokie, Saffro & Assocs. 312-588-0905
 Kans Shawnee Mission, Pivan Engrg. Co. 913-722-1030

Md Baltimore, Whitcomb Assocs. 301-889-1245

Mass Waltham, Measurement Conslts. Corp. 617-890-4400

Mich Detroit, S. Sterling Co. 313-255-1970

Minn Minneapolis, Heilmann Co. 612-861-6051

Mo St. Louis, Pivan Engrg. Co. 314-567-3636

NY Buffalo, R. F. Lamb Co. 716-874-4900

NY Rochester, R. F. Lamb Co. 716-544-5580

NY Schenectady, R. F. Lamb Co. 518-393-4844

NY Syracuse, R. F. Lamb Co. 315-454-2469

NC Charlotte, J. L. Highsmith & Co. 704-333-7743

Ohio Cleveland, S. Sterling Co. 216-442-8080

Ohio Dayton, S. Sterling Co. 513-298-7573

Okla Norman, Data Mktg. Assocs., Inc. 405-364-8320

Pa Jenkintown, AMT 215-119-2080

Pa Pittsburgh, S. Sterling Co. 412-922-5720

Tex Dallas, Data Mktg. Assocs., Inc. 214-661-0300

Tex Houston, Data Mktg. Assocs., Inc. 713-686-9627

Tex San Antonio, Data Mktg. Assoc. 512-828-0937

Va Richmond, J. L. Highsmith & Co. 804-272-5888

Wash Seattle, R. S. Drake Assocs., Inc. 206-725-2700

Advertisement

SENSITIVE RESEARCH INSTRS.

Manufacturers of Polyranagers, Electrostatic Voltmeters, Wattmeters, AC & DC Voltmeters and Ammeters, all offered in both portable and panel mountings in ranges from microvolts to 140,000 volts, and microamperes to 1000 amps.

Typical Models:

ESH & ESD Electrostatic Voltmeters

VAW Volt Amp Wattmeters

100 KV NBS Design Park Divider

Custom Designs available. Write for a SENSITIVE RESEARCH catalog.

SENSITROL, INC., 200 S. 4th St., P.O. Box 150, Albion, Ill., 62806, Tel: 618-445-2323; Empl.: 19; Minimum order: \$35

For info on price: S. Seitz Ext. 56; Application info: E. M. Pelter, Jr. Ext. 53; Customer service: S. Seitz Ext. 56; Delivery info: S. Seitz Ext. 56

Products manufactured: Controls/Control Eqpt., Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Detectors, Monitors, Protectors, Relays, Timers

Local Sales Offices & Reps.

Ariz Scottsdale, Electronic Entrys 602-266-9841

Cal LaJolla, Rep. Sls Co. 714-271-1426

Cal Long Beach, Emerson Kirk Engrg. 213-439-9559

Fla North Miami, Mark Elctrn Sls Co. 305-947-5080

NJ Fairlawn, C. R. Mayer Co. 516-921-7876

NJ Hackensack, C. R. Mayer Co. 201-487-3113

NM Albuquerque, Electronics Entrys. 505-256-3561

NM Las Cruces, Electronics Entrys 505-524-0126

NY Huntington, C. R. Mayer Co. 516-921-7876

Va Reston, Boyle Assocs. 703-620-9558

FOR: Can., Downsview Ont., Anro Elctrn Inds 416-661-2607

FOR: Can., Montreal Que., B. R. Connectron 514-332-0220

SENSOR CORP., Box 140, Scottsdale, Pa., 15683, Tel: 412-887-4080; Empl.: 12

Products manufactured: Alarms, Amplifiers, Analyzers, Boards, Plug-In, Boards, Programming, Cards, Linear Function, Cards, Logic, Coils Including Assemblies & Forms, Comparators, Computers, Controls/Control Eqpt., Converters, Counters, Current Sensors, Detectors, Diodes, Display Devices/Displays, Dividers, Drivers, Solenoid, Electroplating Equipment & Supplies, Encoders, Gages, Generators, Heads, Reflective, Indicators, Integrated Circuit Devices, Light Sources, Photoelectric, Machines/Machinery, Production, Meters, Monitors, Oscillators, Power Supplies, Programmers, Relays, Scanners, Sensors, Light, Services, Assembly, Production & Test, Shift Registers, Switches, Tachometers, Test Systems, Testers, Timers, Totalizers, Digital, Transducers

Local Sales Offices & Reps.

Conn Durham, Marr Electric Co. 203-349-9691

Fla Oldsmar, L & A Assocs. 813-855-4209

Mich Detroit, Owen Engrg. 313-538-5515

Mo St. Louis, W. Adler 314-423-7200

SENSOR TECHNOLOGY, 21012 Lassen St., Chatsworth, Cal., 91311, Tel: 213-882-4100, TWX: 910-494-4776; Empl.: 175; Minimum order: \$35

For info on price: I. Rubin; Application info: J. Cotter; Customer service: B. Hanson; Delivery info: I. Rubin

Free literature available: Complete Catalog, "Sensor Tech Opto Electronic Components & Systems"

Products manufactured: Amplifiers, Cells, Photoconductive, Photoemissive, Photovoltaic, Circuits, Hybrid, Thin-Film, Controls/Control Eqpt., Detectors, Diodes, Display Devices/Displays, Fiber Optic Bundles, Isolators, Lamps, Lights, Punched Card Equipment, Readers, Resistors, Transistors

Local Sales Offices & Reps.

Cal Redwood City, Logan Sales 415-369-6726

Colo Denver, Omega Ltd. 303-758-1508

Fla Lighthouse Pt., Saber Assocs. 305-943-3076

Ill Chicago, Balhorn & Welch 312-889-5011

Mass Worcester, W. Porter Sls. 617-852-4396

Mich Detroit, A. Blumenberg Assocs. 313-557-1934

Minn Minnetonka, T.H. Ayre Assocs. Inc. 612-474-4125

NJ Cherry Hill, Bi-Tech, Inc. 609-667-7374

NM Albuquerque, The Thorson Co. 505-265-5655

NY Dewitt, Bowser & Sapecky, Assoc. 315-446-5920

NY Great Neck, Cooper-Simon & Co. 516-487-1142

Ohio Cincinnati, Giesting Assocs. 513-931-0812

Ohio Dayton, Giesting Assocs. 513-931-0812

Tex Dallas, Erickson-Viliter Sls. 214-243-6611

Va Fairfax, Sohibley Assocs., Inc. 703-591-3008

SENSORS, INC., 3908 Varsity Dr., Ann Arbor, Mich., 48104, Tel: 313-973-1400

Customer service: D. Giles

Free literature available: Brochures describing C1, L22, L66 & S15 thermopile detectors...complete electrical/mechanical specifications, performance charts, applications, ordering information. Average Temperature Radiometer brochure gives description, complete specifications, applications information.

Products manufactured: Detectors, Pyrometers, Radiometers

Local Sales Offices & Reps.

Ariz Scottsdale, Electr. Entrys. 602-946-3802

Cal S. Pasadena, Deniston/JDA 213-254-7755

Cal San Carlos, Electr. Engrg. Assocs. 415-593-2189

Mich Chelsea, Michigan Nondestructive Gage Co. 313-685-2960

Minn Minneapolis, Automated Controls 612-377-7727

NJ Medford, Walter Lanchak Co. 215-923-5050

NM Albuquerque, Electr. Ents. 505-256-3561

NC Charlotte, J.L. Highsmith & Co. 704-333-7743

Tex Stafford, Jordan Equipment Co. 713-498-6033

SENSOTEC, INC., 1400 Holly Ave., Columbus, Ohio, 43212, Tel: 614-294-5436; Empl.: 55

Customer service: J. Feil

Free literature available: Strain Gage Transducers & Instruments: Pressure, 0.5 to 30,000 psi, gage, absolute, differential; Load Cells, 0.1 to 200,000 pounds; Signal Conditioners And Digital Readout.

Products manufactured: Amplifiers, Bridges, Cells, Load, Controllers, Programmable, Controls/Control Eqpt., Filters, Gages, Indicators, Power Supplies, Recorders, Signal Conditioners & Equipment, Transducers

Local Sales Offices & Reps.

Ariz Phoenix, Thorson Co. 602-956-5300

Cal Pasadena, RDX Corp. 213-681-3451

Cal San Diego, RDX Corp. 714-278-6863

Cal Sunnyvale, RDX Corp. 408-734-4500

Colo Denver, Thorson Co. 303-759-0809

Conn Milford, Todino Engrg. Sls. 203-874-6643

Ill Chicago, Pivan Engrg. Inc. 312-539-4838

Ind Indianapolis, Pivan Engrg. Inc. 317-253-1681

Kans Shawnee Mission, Pivan Engrg. Inc. 913-722-1030

La Baton Rouge, SESCO, Inc. 504-927-7574

Md Rockville, Farrell Assocs. Inc. 301-424-9460

Mass Needham Hgts., Todino Engrg. Sls. 617-444-7925

Mich Detroit, S. Sterling 313-255-1970

Minn Minneapolis, Pivan Engrg. Inc. 612-537-4501

Mo St. Louis, S. Sterling 314-567-3636

NJ Paramus, Tower Sls. Eng. Corp. 201-265-2878

NM Albuquerque, Thorson Co. 505-265-5655

NY New Hartford, KLM Assocs. 315-735-8525

NY North Syracuse, KLM Associates 315-458-6214

NY Rochester, KLM Associates 716-442-0820

Ohio Cleveland, S. Sterling 216-442-8080

Ohio Dayton, S. Sterling 513-298-7573

Pa Philadelphia, Scientific Dev. 215-825-9515

Pa Pittsburgh, Process Engrg. 412-561-2242

Pa Pittsburgh/S. Sterling 412-922-5720

Tex Houston, SESCO, Inc. 713-668-7840

Tex Richardson, SESCO, Inc. 214-231-9364

Wash Seattle, RDX Corp. 206-682-6750

Wisc Brookfield, Pivan Engrg. Inc. 414-786-1940

FOR: Can., Quebec, Electrodesign 514-363-5120

FOR: Can., Toronto, Electrodesign 416-787-0991

FOR: Can., Vanier, Electrodesign 613-745-0541

SEQUENTIAL INFORMATION SYSTEMS, 249 N. Saw Mill River Rd., Elmsford, N.Y., 10523, Tel: 914-592-5930, TWX: 710-567-1212; Empl.: 60; Minimum order: \$100

Customer service: F. Gordon

Free literature available: General Motor Catalog - Motorspecs on 13 different motors; General Encoder Catalog - Incremental & absolute encoders up to 21 bits; Industrial Encoders - Incremental & absolute to 14 bits and 20,000 pulses; Display Systems - Incremental, speed, ratio position and absolute readouts.

Products manufactured: Controls/Control Eqpt., Encoders, Meters, Motor & Generator Armatures, Rotors, Stators, Motors, Switches, Tachometers, Timers

Local Sales Offices & Reps.

Ariz Scottsdale, BFA Corp. 602-946-4215

Cal Campbell, Sedillo Co. 408-374-5220

Cal Santa Barbara, Kannard Assocs. 805-682-1928

Colo Denver, BFA Corp. 303-744-3301

Conn Old Lyme, Aid Engrg. Sls. Co. 203-673-3692

Conn Rocky Hill, Aid Engrg. Sls. Co. 203-673-3692

Ill Chicago, Pivan Engrg., Inc. 312-539-4838

Ind Indianapolis, Pivan Engrg., Inc. 317-253-1681

Kans Shawnee Mission, Pivan Engrg., Inc. 913-722-1030

Md Silver Spring, Spectroscopy Sys 301-949-8261

Mass Westboro, Aid Engrg. Sls. Co. 617-890-8181

Mich Detroit, S. Sterling Co. 313-255-1970

Minn Minneapolis, Pivan Engrg., Inc. 612-537-4501

Mo St. Louis, Pivan Engrg., Inc. 314-567-3636

NJ Ridgefield, Haber-Ramp Corp. 201-945-5250

NM Las Cruces, BFA Corp. 505-523-0601

NY Upper Williamsville, Maxwell Bennett Assocs. 716-634-2107

Ohio Cleveland, S. Sterling Co. 216-442-8080
 Ohio Dayton, S. Sterling Co. 513-298-7573
 Pa Western Pittsburgh, S. Sterling Company
 412-922-5720
 Pa Wyndmoor, Spectroscopy Sys. 215-VE6-1545
 Tex Dallas, Data Aids 214-620-1551
 Tex Houston, Data Aids 713-862-6685
 Utah Salt Lake City, BFA Corp. 801-466-6522
 Wash Seattle, Penryn Sls. & Engrg. Co. 206-634-0240
 Wisc Brookfield, Pivan Engrg., Inc. 414-786-1940

SERMETEL TELEFLEX INC., 155 Limerick Rd., Limerick,
 Pa, 19468, Tel: 215-948-5100, TWX: 710-637-1263;
 Empl.: 150

Customer service: E. A. Wykstra X18

Products manufactured: Adhesives (All Types),
 Boards, Printed Circuit, Coatings, Compounds,
 Encapsulating, Insulating, Molding, Potting,
 Lubricants, Paints, Seals, Services, Assembly,
 Production & Test, Wire

Local Sales Offices & Reps.

Cal Lawndale 213-973-1142
 Okla Midwest City 405-732-1392

SERVO-TEK PRODS. CO., 1086 Goffle Rd.,
 Hawthorne, N.J., 07506, Tel: 201-427-3100; Empl.: 86
 p. 1-980,981

Products manufactured: Controls/Control Eqpt.,
 Drives & Drive Mechanisms (Dial), Indicators,
 Motors, Tachometers

Local Sales Offices & Reps.

Cal Van Nuys, Servo-Tek Calif. 213-786-0690
 Fla Ft. Lauderdale, P.N. Bredeben 305-587-0117
 Mass Salem, Forbes Engrg. Co. 617-744-1693
 Ohio Dayton, Albrecht & Assocs. Inc. 513-885-3888

SERVOMETER CORP., 501 Little Falls Rd., Cedar Grove,
 N.J., 07009, Tel: 201-785-4630; FSC No: 18469; Empl.:
 65; Minimum order: \$25

For info on price: E. Toth 201-785-4633; Application
 info: F. Duggan 201-785-4637; Customer service: D.
 Walker 201-785-4634; Delivery info: B. Murawski
 201-785-4636

Free literature available: Bellows Contact
 Springs-describes line of stocked contact springs
 Flexible Shaft Couplings - Describes line of
 precision electrodeposited nickel bellows type
 shaft couplings. Electroforms - describes
 servometers unique capabilities in the field of
 electroforming

Products manufactured: Contacts, Electrical,
 Couplings, Feedthrus & Seals, Environmental,
 Services, Assembly, Production & Test,
 Waveguides & Adapters

Local Sales Offices & Reps.

Cal Cerritos, Bearings, Seals & Gears (Memtech
 Div.) 213-860-2422
 Cal Redwood City, Bearings, Seals & Gears
 415-365-5444
 Ind Indianapolis, H. G. Lake Co. 317-783-7254
 Mass Salem, J.M. Assocs. 617-745-1826
 NY East Aurora, Clarke Thrasher 716-652-0423
 Ohio Dayton, H. G. Lake Co. 513-277-8181
 Ohio Richmond Heights, H. G. Lake Co.
 216-486-1477

Ore Gresham, Bearings, Seals & Gears
 503-665-5434
 Pa Ambler, L. J. McCormick Jr. 215-643-7899

SERVOTRON CORP., See National Power Prods.

SERVOTRONICS, INC., 3901 Union Rd., Buffalo, N.Y.,
 14225, Tel: 716-633-5990, TWX: 710-523-1855; Empl.: 81
 For info on price: R. Dabinski; Application info: P. R.
 Bauer; Customer service: P. A. Bauer; Delivery info: R.
 Dabinski

Free literature available: Torque Motors-"How to
 design advantage of High force
 Linear-Displacement Torque Motors" describes
 design principles, what they do, how they work and
 where their used. Metallic Seals-Apex or
 Omega type explains design features and
 advantage of each type lists standard sizes and
 options available.

Products manufactured: Actuators, Motors,
 Services, Assembly, Production & Test, Solenoids,
 Valves, Solenoid

SESCOM, INC., Box 590, Gardena, Cal., 90247, Tel:
 213-770-3510, TWX: 910-346-7023; Empl.: 21

Products manufactured: Microphone Accessories
 (Including Stands, Holders, Booms), Microphones,
 All Kinds, Transformers

Local Sales Offices & Reps.

Ariz Phoenix, B. Fissell Co. 602-264-4031
 Cal Oakland, H. Gabriel 415-485-5361
 Ill Chicago, T. Pappas & Assoc. 312-685-2338
 Kans Overland Park, W. Menzes & Assocs.
 913-649-2680
 Md Rockville, Lienau Assocs., Inc. 301-770-6800
 Mass Framingham, VF Sls. Inc. 617-237-6544
 NY Brooklyn, I. Brown Co. Inc. 212-493-1379
 Pa Philadelphia, Lienau Assocs., Inc.
 215-H04-9444

Tex Dallas, Wyborny Sls. Co.
 Tex Houston, Wyborny Sls. Co. 713-772-0961
 EXP: Inglewood, Sescum, Inc. 213-770-3510
 EXP: Los Angeles, Calif., E.E. Strassner Sls. Inc.
 213-666-1511

SETRA SYSTEMS INC., 12 Huron Dr., Natick, Mass.,
 01760, Tel: 617-655-4645; Empl.: 25

Customer service: W. Stern

Free literature available: Catalogs

Products manufactured: Accelerometers,
 Transducers

Local Sales Offices & Reps.

Ala Huntsville, Craft Associated 205-837-0221
 Cal Los Angeles, DynaSls. Co. 213-268-1175
 Colo Wheat Ridge, RMS Sls. 303-423-6693
 Fla Maitland, Craft Assocs. 305-645-2242
 Ga Atlanta, Craft Assocs. 404-393-0400
 Ill Arlington Heights, Martec Assocs.
 312-956-8090

Kans Leawood, Leemark Engrs. 913-648-0124
 Mass Framingham, J.M. Lancaster Co. 617-873-8893
 Mich Ferndale, Tiby Co. 313-547-3550
 NJ Ridgewood, Hansen Assocs. 201-652-7055
 NY Huntington, Hansen Assocs. 212-947-0379
 NY Penfield, A&D Devices 716-586-8033
 Ohio Cleveland, Tiby Co. 216-371-5335
 Ore Portland, McLaren, Inc. 503-297-2248
 Pa Jenkintown, Stein Instrumentation
 215-885-2370

Tex Dallas, McGatlin Instr. Co. 214-243-6061
 Wash Bellevue, McLaren 206-535-3401

SEVEN SCIENCES, INC., 1405 Civic Center Drive, Santa
 Clara, Cal., 95050, Tel: 408-249-8400; Empl.: 10;
 Minimum order: \$59

For info on price: D. Linker 408-249-8400; Application
 info: L. Azar 408-249-8401; Customer service: A.
 Howard 408-249-8400; Delivery, info: D. Linker
 408-249-8400

Free literature available: Brochures: 1000 Series;
 battery power supplies, 2000 Series; battery
 chargers, 3000 Series; battery chargers, Model
 '100; DC-DC converter.

Products manufactured: Chargers, Battery,
 Converters, Power Supplies

Local Sales Offices & Reps.

Cal Los Angeles, V & L Assocs. 213-986-9703
 Cal Palo Alto, Microwave Mktg. Assocs.
 415-969-3355
 Colo Denver, K. C. Marketers 303-733-5561
 NM Albuquerque, A. L. S. Elctns. 505-298-2575
 FOR: Can., Mississauga, Ont., Munro Elctn.
 Components Ltd. 416-676-1042

S G C INC., 13737 SE 26th St., Bellevue, Wash., 98005,
 Tel: 206-746-6310, Telex: 3288311; Empl.: 18; Minimum
 order: \$25

For info on price: D. L. Stoner, 206-746-6310;
 Application info: D. L. Stoner, 206-746-6310; Customer
 service: G. Thompson, 206-746-6311; Delivery info: T.
 Rockney, 206-746-6311

Free literature available: Complete descriptive
 literature and price lists of entire line of SSB
 equipment.

Products manufactured: Antennas, Comm. Systems,
 Crystals, Receivers, Transmitters

Local Sales Offices & Reps.

Cal Benica, Mar-Pac 707-745-4068
 Fla Pompano Beach, Comark 305-785-2000
 La New Orleans, R. Daigle Assoc. 504-367-5309
 Mass Sudbury, Commercial Mktg. Assoc.
 617-443-9442
 Wash Bellevue, S G C Int'l 206-746-6310

SGL ABRASIVES, North Pitt St. Ext., Carlisle, Pa., 17013,
 Tel: 717-243-3471, TWX: 510-560-3513; Empl.: 200

Products manufactured: Abrasive Belts,
 Compounds, Cords, Powders, etc.

Local Sales Offices & Reps.

Ala Birmingham, P. Bancroft 205-823-0557
 Cal Maywood, J. Mullaney 213-585-5697
 Ill Northfield, B. Boak 312-446-3374

NC Charlotte, T. Arnold 704-535-4279
 Pa Allentown, Coleman Assoc. 215-797-0401
 Pa Hazleton, Barrett Haentjens Co. 717-455-7711
 Pa New Cumberland, J. Tio 717-774-2351
 Pa Newtown Square, E. Parkin 215-644-5849
 Tex Houston, T. Dolan 713-667-8812
 Wisc Racine, Webster Weiss 414-639-3634
 Wisc West Bend, T. Sullivan 414-334-4385

SGL BATTERIES MANUFACTURING CO., A Subsidiary of
 SGL Industries, Inc., 14650 Dequindre, Detroit, Mich.,
 48212, Tel: 313-868-6410; Empl.: 60

Customer service: R. J. Höllander

Free literature available: Brochure on Batteries.

Products manufactured: Batteries

SGL ELECTRONICS, 300 Harvard Avenue, Westville,
 N.J., 08093, Tel: 609-456-7300, TWX: 710-944-0758;
 Empl.: 60; Minimum order: \$25 p. 2-1254

For info on price: R. P. Pagliaro; Application info: J. E.
 Graham; Customer service: D. Seitzinger; Delivery
 info: D. Seitzinger

Free literature available: SGL electronics condensed
 catalog describes technical data on its line of
 magnetic laminations "C" cores tape wound and
 ring cores, and magnetic shielding.

Products manufactured: Connectors, Cores,
 Magnetic, Foil, Laminations, Services, Assembly,
 Production & Test, Shields

Local Sales Offices & Reps.

Cal La Habra, Magnetic Materials 213-694-2063
 Fla Orlando, Buchanan & Abrams Assoc.
 305-898-7444

Ill Chicago, P.K. Pitt 312-478-3124
 Mich Farmington, W.R. Hummon 313-474-0661
 Minn St. Paul, R.G. Ragon 612-488-0201
 NJ Murray Hill, Cambridge Allen 212-682-5844
 NY DeRuyter, R. P. Kennedy Co. 315-682-2299
 NY Red Hook, R. P. Kennedy Co. 914-876-2700
 NY Rochester, R. P. Kennedy Co. 716-271-6322
 Ohio Columbus, T. Mulligan & Assoc. 614-457-2242
 Tex Dallas, Southwest Elctn. Inds. 214-233-9816
 Tex Houston, Dunkel Elctns Assoc. 713-729-1670
 Wash Kirkland, Freed Assoc. 206-822-8100
 FOR: Can., Dorval, Que., Anbak Sls. 514-636-8514
 FOR: Can., Mississauga, Ont., Anbak Sls.
 416-625-1061

SGL GRAPHICS, Div. of SGL Inds., Inc., John Fitch
 Industrial Park, Warminster, Pa., 18974, Tel:
 215-672-3600; Empl.: 45

Customer service: T. Wallis

Free literature available: Product and application
 information; specifications.

Products manufactured: Nameplates, Services,
 Assembly, Production & Test, Tubing

SGL HOMALITE, Div. of SGL Inds., Inc., 11 Brookside
 Dr., Wilmington, Del., 19804, Tel: 302-652-3686; Empl.:
 30; Minimum order: \$35 p. 2-1254

For info on price: B. Eastman; Application info: B.
 Eastman; Customer service: L. Rose; Delivery info: L.
 Rose

Free literature available: Specifications,
 applications data, and typical uses.

Products manufactured: Adhesives (All Types),
 Bezels, Shielded & Unshielded, Coatings,
 Compounds, Encapsulating, Insulating, Molding,
 Potting, Dials, Display Devices/Displays,
 Nameplates, Plastic Raw Materials, Liquids,
 Pellets, Powders, Resins, Scales, Dial, Services,
 Assembly, Production & Test, Shields, Tubing

Local Sales Offices & Reps.

Cal Los Gatos, Luscombe Engrg. 408-354-6496
 Cal Pasadena, Luscombe Engrg. 213-684-2000
 Mass Newton, Normell Assocs. 617-969-5478
 Mich Farmington Hills, H. Lowell Co. 313-851-7474
 Minn Minneapolis, Int'l. Sls. Co. 612-831-8423
 NJ Cherry Hill, B & G Assocs. 609-235-4878
 NY Lynbrook, H.B. Heft Assocs. 516-599-3351
 Wash Seattle, J.B. Jolly 206-838-4166

SGL PLASTICS, Route 248, Nazareth, Pa., 18064, Tel:
 215-759-0280; Empl.: 50

Customer service: J. D. Guiducci

Free literature available: A new six page brochure
 describes SGL Plastics plant and equipment
 capability together with illustrations of products
 currently in production.

Products manufactured: Services, Assembly,
 Production & Test

SGL PRINTED CIRCUITS, Div. SGL Inds., Inc., 827 Black Oak Ridge Rd., Wayne, N.J., 07470, Tel: 201-835-2765; Empl.: 29 p. 2-356
Customer service: P. Codella
Free literature available: Service brochure available.
Products manufactured: Boards, Printed Circuit, Boards, Printed Wiring, Universal, Circuits, Flexible, Circuits, Printed, Multilayer, Kits, Printed Circuit, Screens, Printed Circuit, Services, Assembly, Production & Test
Local Sales Offices & Reps.
Fla Orlando, Buchanan & Abrams 305-899-7622
Mo Springfield, Osborn Sales Co. 417-881-0142
NJ Fairfield, Glad Assocs. 201-227-5555

SGL WABER ELECTRIC, 300 Harvard Avenue, Westville, NJ, 08093, Tel: 609-456-5400, TWX: 710-944-0758; Empl.: 50; Minimum order: \$35 p. 2-356

Customer service: A. Andrews
Free literature available: New 16 page, three color catalog including illustrations and descriptions of over 250 different pre-wired (ready to plug in) electrical power outlet strips and wheeled mobile utility and instrument carts.
Products manufactured: Benches, Consoles, Stools, Tables, Boxes, Junction, Outlets & Wall Plates, Bus Bars & Systems, Carts & Dollies, Instrument & Equipment, Circuit Breakers, Conduit, Electrical, Connector Boxes & Strips, Power Outlet, Controls/Control Eqpt., Cords, Ducts, Wiring, Indicators, Plugs, Services, Assembly, Production & Test, Switches

Local Sales Offices & Reps.
Ala Mobile, Hollingsworth & Still 205-478-8108
Cal Hollywood, Lewis Assocs. 213-877-0461
Cal San Rafael, G. E. Johnson 415-456-1196
Colo Denver, Walter Eng. Assoc. 303-777-5585
Conn Wallingford, Adams-McGregor 203-369-5816
Fla Orlando, Hollingsworth & Still 305-671-4515
Ga Atlanta, Hollingsworth & Still 404-394-3270
Haw Honolulu, Gene Piety Factors 808-841-0185
Ind Indianapolis, R. Milsik Co. 317-546-5468
Iowa Des Moines, Kathrinus-Kelly & Co. 515-255-4584

Iowa Fort Dodge, Heimann Co. 515-576-2375
Kans Shawnee Mission, Kathrinus-Kelly & Co. 913-722-0000
Md Silver Springs, Sherr Assocs. 301-593-2477
Mass Scituate, Adams-McGregor 617-545-2213
Mich Southfield, R. Milsik Co. 313-354-3310
Minn Minneapolis, Heimann Co. 612-861-6051
Mo St. Louis, Kathrinus-Kelly 314-968-3800
NM Albuquerque, C. T. Carlberg & Assoc. 505-265-1579

NY Liverpool, J. Brown Elctn. Sls. 315-451-1471
NY New Hyde Park, Harris & Aldrich Sls. 516-488-2622

NY Rochester, J. Brown Elctn Sls. 716-266-2728
NY Yonkers, J. Brown Elctn. Sls. 914-779-7330
NC Charlotte, Hollingsworth & Still 704-536-7047
Ohio Dayton, Elctn. Salesmasters 513-837-2379
Ore Salem, Pacnor Mktg. 503-363-6445
Pa Philadelphia, D. S. Linz Co. 215-379-0734
Pa Pittsburgh, Tanner Co. 412-561-4687
RI Lincoln, Adams-McGregor 401-726-1300
Tex Dallas, Lund & Co. 214-358-4335
Wash Seattle, Pacnor Mktg. 206-284-8020



SGS-ATES SEMICONDUCTOR, 435 Newtonville Ave., Newtonville, Mass., 02160, Tel: 617-969-1610; Empl.: 7000

For info on price: T. Hastings; Application info: U. Broggi; Customer service: T. Hastings; Delivery info: T. Hastings

Free literature available: Short form catalog; Audio Circuit Brochure; Individual Device Data Sheet

Products manufactured: Amplifiers, Integrated Circuit Devices, Multipliers, Semiconductor Wafer Fabrication, Transistors

Local Sales Offices & Reps.
Ala Huntsville, Comp. Mktg. 205-881-5333
Ariz Tempe, J.F. Hurlbut Co. 602-968-5962
Cal Mountain View, Caltron/Pyle Inc. 415-964-3244
Cal Santa Ana, Rical Assocs. 714-557-6543
Colo Golden, J.F. Hurlbut Co. 303-279-7138
Fla Pompano Beach, V.G. Sales Co. 305-941-5544
Fla Winter Park, V.G. Sales Co. 305-831-8699
Ill Bellwood, Fiat Engrg. 312-547-6200

Ind Indianapolis, Latronics Mfg. 317-846-5788
Mass Waltham, Conti-Younger Assocs. 617-890-4582
Mich Grosse Pointe Park, Greiner Assocs. 313-499-0188
Minn Minneapolis, L. F. Green Assocs. 612-781-1611
NJ Cherry Hill, J.N. Barrett Assocs. 609-429-1551
NJ Fort Lee, Northern Elctn. Comps. 201-461-2789
NY Pompey, S.F. Foster Co. 315-677-3333
NY Webster, S.F. Foster Co. 716-872-5220
Ohio Cleveland, Imtech Inc. 216-826-3400
Ohio Dayton, Imtech Inc. 513-837-5610
Tex Dallas, Blackburn Assocs. 214-351-9991
Va Reston, Boyle Assocs. 703-620-9558
Wash Seattle, R. Johnston Co. 206-524-5170

Local Distributors
Cal Los Angeles, Energy Elctns. Prods., 6060 Manchester Ave. 213-641-9020
Mass Burlington, Wilshire Elctns., 1 Wilshire Rd. 617-272-8200
Tex Dallas, KA Elctns. Sls., 1220 Majesty Dr. 214-634-7870
Wash Seattle, Radar Elec. Co., 168 Western Ave. W. 206-282-2511

SHAFFSTALL EQUIPMENT INC., 5149 E. 65th St., Indianapolis, Ind., 46220, Tel: 317-251-1476; Empl.: 13
For info on price: E.L. Shaffstall; Customer service: J. Ashby
Products manufactured: Readers, Recorders

SHAKESPEARE, Box 246, Columbia, S.C., 29202, Tel: 803-779-5800; Empl.: 288; Minimum order: \$225
For info on price: R. Bedenbaugh; Application info: T. Bryant; Customer service: R. Scott; Delivery info: R. Scott

Free literature available: Full antenna Line Catalog; Royal Line Catalog-insert catalog, with full line of antennas and accessories; Marine Antenna Catalog-Full color catalog.

Products manufactured: Antennas, Tubing

Local Sales Offices & Reps.
Cal Los Angeles, Wallace & Wallace 213-747-0401
Cal Sausalito, B.H. Ballard Co. 415-332-0105
Colo Aurora, A.E.S. Sls. 303-366-0208
Fla Ft. Lauderdale, Sprock Sls. 305-587-3792
Ga Savannah, Len Sherman Assocs. 912-925-3660
Ill Chicago, Lassers & Co. 312-539-0170
Ind Indianapolis, Kingston-Sharkey Assoc. 317-353-9406

Mich Grand Rapids, L. Drieberg Co. 616-453-1242
Minn St. Paul, Carl M. Co. 612-699-8004
Neb Lincoln, Marketing Assocs. 402-464-5244
NY S. Farmingdale, C. Drexler Co. 516-249-8206
Ohio Youngstown, Repcom of Ohio 216-788-9404
Tex Houston, B. Wylds Co. 713-467-0072
Utah Murray, Kenealey Assocs. 801-268-3111
Va Gwynn, L.H. Arnold Co. 804-725-7111

SHALLCO, INC., Box 1089, Smithfield, N.C., 27577, Tel: 919-934-3135, TWX: 510-939-1455; Empl.: 25; Minimum order: \$20 p. 1-28, 29, 2272-2275; p. 2-1543

For info on price: M. Sutton; Application info: M. Sutton; Customer service: E. Lee; Delivery info: E. Lee

Free literature available: Catalog 101-attenuators, audio & RF, Catalog 102-rotary switches, Catalog 300-precision wirewound resistors

Products manufactured: Attenuators, Demagnetizers, Equalizers, Networks, Resistors, Standards, Switches

Local Sales Offices & Reps.
Cal Los Angeles, WCV Co. 213-772-4479
Cal Mountain View, WCV Co. 415-961-5096
Colo Denver, Vinson Assocs. 303-757-5152
Fla Winter Park, Ridge Instr. Co. 305-293-4711
NJ So. Orange, SSAI 201-763-7900
NY Rochester, D. Hurley Sls. 716-586-6159
NC Smithfield, Byrd & Barbour Sls., Inc. 919-934-8136

Tex Dallas, Unidyne, Inc. 214-234-3281
Wash Seattle, Underwood & Underwood, Inc. 206-243-2133

SHALLCROSS, See Cutler Hammer Shallcross.

SHANNON LUMINOUS MAT'L'S., Div. Shannon-Glow Inc., 7356 Santa Monica Blvd., Hollywood, Cal., 90046, Tel: 213-876-2660; Empl.: 10; Minimum order: \$10

Free literature available: 1-Black Light & Luminous Products; 2-Fluorescent Tracer Products.

Products manufactured: Detectors, Kits, Test Equipment, Lamps, Lights, Lubricants, Ultraviolet Inspection Lighting

Local Sales Offices & Reps.
Cal Downey, Uresco 213-773-3828

SHAPIRO SCIENTIFIC INST., 3500 E. Coast Hwy., Corona del Mar, Cal., 92625, Tel: 714-675-1024; Empl.: 5

For info on price: B. Kilpatrick

Free literature available: Condensed Specifications on: Transient Waveform Generator Model 1001, Specification, Paper Tape Program Reader Model 1101 & Waveform Conditioner Model 21. Operating Instructions, Model 1001 System.

Products manufactured: Generators

SHARP ELECTRONICS CORP., 10 Keystone Pl., Paramus, N.J., 07652, Tel: 201-265-5600, Telex: 134-327

Free literature available: Descriptive brochures - Specification sheets - for Calculator Models EL-8106/8107, PC-1002, CS-365P, CS-364P and CS-2153.

Products manufactured: Calculators, Electrical & Electronic

Local Sales Offices & Reps.

Cal Long Beach
Ill La Grange

SHELDahl, INC., Electrical Prods. Div., Box 170, Northfield, Minn., 55057, Tel: 507-645-5633, TWX: 910-565-2180; Empl.: 219; Minimum order: \$300 p. 2-355

Application info: J. McKee; Customer service: J. Mazzitelli

Free literature available: Brochures describing flexible printed circuit manufacture. Literature describing flexible circuit applications with samples attached. Engineering brochure with design guidelines and circuit calculator available upon letterhead request.

Products manufactured: Circuits, Flexible, Laminates, Tapes, Films & Foils, Pressure Sensitive

Local Sales Offices & Reps.

Cal Encino, R.H. McDonald & Assocs. 213-986-5832
Cal Fremont, H.K. Foraker Co. 415-657-2213
Colo Boulder, Component Prods. Sls. Co. 303-444-2730

Fla Cocoa, Orbe, Inc. 305-452-9568
Fla Ft. Lauderdale, Orbe, Inc. 305-564-8571
Fla Orlando, MacKay, Smith, & Assocs. 305-277-1513

Ill Arlington Hts., R. Diethert Co. 312-593-7600
Iowa Des Moines, B.E.A.M.S. 515-282-0292

Kans Shawnee Mission B.E.A.M.S. 913-341-7744

Mass Norwood, Sheldahl 617-762-5703
Mich Benton Harbor, Hampton, Askin & Assocs. 616-925-0341

Mich Troy, McPhail Corp. 313-689-6444
Mo St. Louis B.E.A.M.S. 314-569-1060

NY Buffalo, R.W. Mitscher Co. 716-633-7970
NY Jamaica, S-J Sls. Assocs. 212-291-3332
NC Raleigh, R.W. Mitscher Co. 919-828-0575

Ohio Columbus, McFadden Sls., Inc. 614-221-3363
Tenn Shelbyville, R.W. Mitscher Co. 615-664-4544

Tex Houston, Aid Elctns., Inc. 713-777-3882
Tex Irving, Aid Elctns., Inc. 214-259-4761

Va Troutville, R.W. Mitscher Co. 703-345-3283
Va Virginia Beach, R.W. Mitscher Co. 804-481-7200

Wisc Waukesha, R. Diethert Co. 414-547-6575

FOR: Don Mills, Can. Ont., B.D. Vallillee Elctns. Ltd. 416-447-8482

SHELLER-GLOBE CORP., Electro-Mechanical Instr. Div., Box 216, Perkasee, Pa., 18944, Tel: 215-249-9330, TWX: 510-665-9583; Empl.: 130 p. 1-668, 669

Products manufactured: Indicators, Meters, Testers

Local Sales Offices & Reps.

Cal Los Angeles, El-Com, Inc. 213-223-1351
Cal San Carlos, D.H. Ross Co. 415-591-4411
Colo Denver, K-C Marketers, Inc. 303-PE3-5561

Fla Tampa, Nickerson Co. 813-885-1416
Ill Chicago, Ropek & Cahill, Inc. 312-287-7292
Ind Carmel, Rich Elctn. Mktg. 317-844-8462

Kans Shawnee Mission, Robinson & Assocs. 913-262-1374

Mass Silvest Spring, H.R. Sieber Co. 301-589-9110
Mass Boston, Anderson Sls. Co. 617-CA7-2980
Minn Minneapolis, H.M.R., Inc. 612-920-8200

NJ Haddonfield, T.A.I. 609-UL4-3011
NY Mt. Vernon, D. Sonkin Assocs. 914-MO8-9809
NY Syracuse, Nycorn, Inc. 315-437-8343

NC Charlotte, Electro-Rep. Assocs., Inc. 704-527-2530
Ohio Cleveland, Loesch Assocs., Inc. 216-241-4581

Pa Philadelphia, Repco215-722-3622
 Tex Richardson, Campion Sls. Co.214-238-8145
 Wash Seattle, Underwood & Underwood
 206-243-2133
 FOR: Can., Toronto, Ont., Wilson Enterprises
 416-766-0510

SHELLY ASSOCS., Sub. of Datatron Inc., Box 11427,
 Santa Ana, Cal., 92711, Tel: 714-540-9330, TWX:
 910-595-1589; Empl.: 45 p. 2-1186-1189
 For info on price: G. Madole; Application info: D.
 Bloom; Customer service: L. Zahuranec; Delivery info:
 L. Zahuranec

Products manufactured: Annunciators, Bezels,
 Shielded & Unshielded, Display Devices/Displays,
 Indicators, Lamps, Lenses, Readout & Display,
 Lights

Local Sales Offices & Reps.

Ala Huntsville, Tech. Reps.205-881-5925
 Ariz Scottsdale, Williams Assoc.602-947-4297
 Cal Anaheim, LoDan Inc.714-956-1560
 Cal Beverly Hills, I.A.S.213-274-7578
 Cal San Carlos, LoDan Inc.415-592-4800
 Cal San Diego, LoDan Inc.714-279-6383
 Colo Denver, Williams Assoc.303-373-4730
 Conn Farmington, R. Perron & Co.203-673-4825
 Conn Trumbull, R. Perron & Co.203-268-9631
 Fla Ft. Lauderdale, Tech. Reps.305-792-0962
 Fla Indian Rocks Beach, Tech. Reps.813-595-2834
 Ill Broadview, L-Comp312-865-7600
 Ill Chicago, G. Mcl. Cole Co.312-774-3535
 Md Baltimore, Callas Elctns.301-744-7711
 Mass Norwood, R. Perron & Co.617-762-8114
 Mich Walld Lake, Berberich Assoc.313-624-2211
 Minn Minneapolis, G.E. Arneson & Co.612-835-2177
 Mo N. Kansas City, L-Comp816-221-2400
 Mo St. Louis, L-Comp314-647-5505
 NH Dover, R. Perron & Co.603-742-2321
 NJ Harrington Park, Metro Tech. Sls.201-768-8495
 NM Albuquerque, Williams Assoc.505-255-1638
 NY Fayetteville, Marty Andrews315-637-3144
 NY Jamaica, Material for Electronics212-322-9400
 NY Jericho, Metro Tech. Sls.516-935-3330
 Ohio Dayton, Berberich Assoc.513-433-0342
 Pa King of Prussia, White-Keystone215-265-1817
 Tex Ft. Worth, Dyna Reps.817-451-1392
 Wash Seattle, R. Thorpe & Co.206-763-0545
 FOR: Can., Downsview, Ont., Tracan416-638-0052
 FOR: Can., Montreal, Que., Tracan514-341-4163
 FOR: Can., W. Vancouver B.C., Tracan604-926-3411

Local Distributors

Cal Alhambra, Ultex Corp., 2215 W. Valley Blvd.
 213-289-9115
 Cal Mountain View, Ratel Elctns., 815 Maude Ave.
 415-965-2010
 Fla Indian Rocks Beach, Tech Rep., Box 508
 813-595-2834
 Ill Broadview, LComp Chicago Inc., 2030 W. 16th
 St.312-865-7600
 Md Baltimore, Callas Elctns., 6409 Frederick
 301-744-7711
 Mass Norwood, Value-Added Elctns., 159 Morse St.
 617-762-8114
 Minn Minneapolis, G.E. Arneson & Co., 4900 Viking Dr.
 612-835-2177
 Mo St. Louis, LComp St. Louis Inc., 2605 S. Hanley
 Rd.314-647-5505
 NJ Harrington Park, Metro Tech., 39 Blue Field Ave.
 201-768-8495
 NY Jericho, Metro Tech., 333 N. Broadway
 516-935-3330
 Ohio Dayton, Empire Systems, 94 Compark Dr.
 513-433-0342
 Tex Ft. Worth, Dynareps, P.O. Box 8446
 814-451-1392
 Wash Seattle, Vannon Ltd., 655 S Orcas
 206-763-0545

SHESTER ENGINEERING CO., 8530 W. Washington Blvd.,
 Culver City, Cal., 90230, Tel: 213-837-3332; Empl.: 9;
 Minimum order: \$20

For info on price: J. M. Bingen; Application info: G.
 Shester; Customer service: J. M. Bingen; Delivery
 info: G. Shester

Products manufactured: Demagnetizers, Diodes,
 Magnetizers, Magnets, Power Supplies,
 Transformers

SHIGOTO INDS., LTD., 350 Fifth Ave., New York, N.Y.,
 10001, Tel: 212-695-0200; Empl.: 362

p. 1-2276; p. 2-2060

For info on price: M. Rubin; Application info: I.
 Weinstein; Customer service: E. Kramer; Delivery
 info: R. Evans

Free literature available: Catalogs Available- 1.
 Speakers, 2. Electronic Parts, 3. Resistors, 4.
 Reflex Horn Speakers, 5. Electronic Alarm Sirens,
 6. Miniature and Subminiature Lamps, 7. Sharp
 Photo Optics, 8. Bolts/Screws/Nuts-Fasteners, 9.
 Capacitors, 10. Motors, 11. Closed Circuit TV
 Systems, 12. Microphones & Headphones

Products manufactured: Alarms, Amplifiers,
 Antennas, Arresters, Electrical Surge, Lightning,
 Batteries, Bearings, Bells, Buzzers, Gongs, Sirens
 & Aural Warning Devices, Boards, Printed Circuit,
 Bobbins, Winding, Coil & Transformer, Bridges,
 Cable, Capacitors, Fixed, Capacitors, Variable,
 CATV Systems & Equipment, Cells,
 Photoconductive, Photoemissive, Photovoltaic,
 Chargers, Battery, Chokes, Clamps & Clips, Coils
 Including Assemblies & Forms, Comm. Systems,
 Connector Adapters, Connectors, Contact Strips,
 Finger, Cords, Counters, Couplers,
 Demagnetizers, Dials, Diodes, Display
 Devices/Displays, Drivers, Speaker, Eliminators,
 Battery, Fasteners, Flashers, Fuses, Grilles,
 Handsets, Chestsets, Headphones, Headsets,
 Etc., Heads, Recording Playback, Erase,
 Indicators, Insulators & Insulation, Integrated
 Circuit Devices, Inverters, Isolators, Jack Adapters
 (All Types), Jacks (All Types), Kits, Training Aid,
 Knives & Knife Sets, Knobs, Labels,
 Pressure-Sensitive, Adhesive, Laminations,
 Lamps, Lead Assemblies & Receptacles, Leads,
 Test & Adaptors, Lenses, Optical & Camera,
 Lights, Magnets, Meters, Microphones, All Kinds,
 Motor & Generator Armatures, Rotors, Stators,
 Motors, Nameplates, Networks, Phonographs,
 Parts & Accessories, Pickups, Telephone (For
 Recording), Plug Adapters, Plug & Jack Sets,
 Plugs, Posts, Potentiometers, Power Supplies,
 Public Address Systems, Rectifiers, Regulators,
 Relays, Resistors, Rheostats, Scissors,
 Screwdrivers, Sensors, Light, Services, Assembly,
 Production & Test, Shunts, Meter, Socket
 Adapters, Sockets, Solenoids, Speaker Systems,
 Speakers, Springs (All Types), Switches,
 Television Systems & Equipment Closed-Circuit,
 Terminal Blocks, Boards & Strips, Terminals,
 Testers, Thermistors, Thermostats, Timers, Tools,
 Transformers, Transistors, Tubes, Tuners, Wire,
 Wire Nuts

Local Sales Offices & Reps.

Ill Park Ridge, Metcom Assocs. Corp.312-696-1490
 Md Towson, Wyncote Instrumentation Co.301-821-5422
 Mich Farmington, Miltmore Sls. Inc.313-476-2446
 Ohio Chagrin Falls, Pine Sls. & Engrg. Co.216-247-6198
 Pa Ambler, Wyncote Instrumentation Co.215-643-2440

SHOWA MUSEN KOGYO CO., LTD., 5-5 6-Chome
 Togashi, Shinagawa-Ku Tokyo, Japan, Tel: 785-1111;
 Empl.: 1300

Products manufactured: Clamps & Clips, Connector
 Adapters, Connector Boxes & Strips, Power
 Outlet, Connectors, Insulators & Insulation, Jack
 Adapters (All Types), Jacks (All Types),
 Keyboards, Alphanumeric & Decimal, Panels, Plug
 Adapters, Plugs, Posts, Sockets, Switches,
 Terminal Blocks, Boards & Strips, Terminals

Local Sales Offices & Reps.

Cal Gardena, SMK Elctns. Corp. of America
 213-770-8915

SHURE BROTHERS, INC., 222 Hartrey Ave., Evanston, Ill.,
 60204, Tel: 312-DA8-9000, TWX: 910-231-0048

Customer service: 679-5830

Free literature available: Vocal Master Sound
 System Catalog - AL335; SR Professional Sound
 Reinforcement Equipment Catalog - AL470; High
 Fidelity Products Catalog - AL210; Microphones &
 Circuitry for Public Address, Tape Recording &
 Communications Catalog - AL 314; Professional
 Microphone Products Catalog - AL312.

Products manufactured: Accelerometers,
 Amplifiers, Attenuators, Cases, Equipment,
 Instrument, Meter, Equalizers, Filters, Generators,
 Handsets, Chestsets, Headphones, Headsets,
 Etc., Microphone Accessories (Including Stands,
 Holders, Booms), Microphones, All Kinds, Mixers,
 Networks, Phonographs, Parts & Accessories,
 Public Address Systems, Slide Rules (Circuitry
 Computing), Speaker Systems, Speakers,
 Transformers

SHURITE METERS, 428 Chapel St., New Haven, Conn.,
 06508, Tel: 203-787-5824, TWX: 710-465-3165; Minimum
 order: \$25

Customer service: W. Fitzgerald 203-772-2220

Free literature available: Catalog 100B - Describes
 and illustrates various case styles and ranges
 available in inexpensive AC and DC Panel Meters.

Products manufactured: Meters

Local Sales Offices & Reps.

Cal Ingleswood, J. Berman Co.213-678-1281
 Cal La Mesa, J. Berman Co.714-583-6457
 Cal Oakland, Moulthrop Sls.415-261-7676
 Colo Denver, Nelson Co.303-573-1516
 Conn Wallingford, Adams-McGregor203-269-5816
 Fla Maitland, Hutto-Hawkins-Peregoy
 305-831-2474
 Fla Pompano Beach, Hutto-Hawkins-Peregoy
 305-943-9593
 Ga Atlanta, Millar Elctns.404-261-6160
 Ill Oak Park, G. Pettit Co.312-369-8940
 Ind Fort Wayne, W.W. Bieberich219-432-2537
 Kans Overland Park, T.L. Dowell & Assocs.
 913-236-8200
 Md Reisterstown, Massey Assocs.301-833-2039
 Mass Scituate, Adams-McGregor617-542-3773
 Mich St. Clair Shores, J.M. Thorpe Co.313-779-6363
 Minn Minneapolis, Heiman Co.612-861-6051
 NY Long Island City, D.F. Tobias & Co.
 212-545-9191
 NY Syracuse, H.R. Murray315-446-5555
 NC Raleigh, Millar Elctns.919-787-9564
 Ohio Dayton, C.H. Dolfuss, Jr. & Co.513-275-4831
 Ohio Rocky River, C.H. Dolfuss, Jr. & Co.
 216-333-7504
 Pa Media, Snyder & Massey Assocs.215-566-5400
 Pa Pittsburgh, G.S. Root & Co.412-561-4125
 RI Lincoln, Adams-McGregor401-726-1300
 Tex Dallas, Lund & Co.214-358-4335
 Wash Seattle, J.J. Backer Co.206-285-1300

SIEMENS CORP., Comps Div., Box 1390, Scottsdale,
 Ariz., 85252 p. 1-1858-1862

Products manufactured: Diodes

SIEMENS CORP., 186 Wood Ave., S., Iselin, N.J., 08830,
 Tel: 201-494-1000; Empl.: 800

Products manufactured: Amplifiers, Arresters,
 Electrical Surge, Lightning, Capacitors, Fixed,
 Cells, Photoconductive, Photoemissive,
 Photovoltaic, Chokes, Cores, Magnetic, Crystals,
 Diodes, Display Devices/Displays, Ferrite Material
 & Parts, Filters, Integrated Circuit Devices,
 Intensifiers, Image, Isolators, Lamps, Lasers &
 Laser Systems, Lights, Magnetoresistors, Hall,
 Power Supplies, Protectors, Recorders, Rectifiers,
 Relays, Resistors, Suppressors, Switches,
 Thyristors (Includes Silicon Controlled Rectifiers),
 Transistors, Tubes

Local Sales Offices & Reps.

Ala Huntsville, Interep Assocs.205-881-3677
 Ariz Scottsdale, Siemens602-947-2231
 Cal Burlingame, Siemens415-697-6851
 Cal El Segundo, Varigon Assocs.213-679-0621
 Cal San Diego, S. R. Elctns.714-565-8411
 Cal San Leandro, Quadrep415-352-5942
 Cal Sunnyvale, Quadrep408-733-7300
 Cal Torrance, Siemens213-370-3611
 Colo Denver, Omega Limited303-758-1508
 Conn West Simsbury, Anchor Engrg. Corp.
 203-658-6261
 Fla Clearwater, Perrott Assocs.813-726-1529
 Fla Orlando, Perrott Assocs.305-275-1132
 Ga Atlanta, Interep Assocs.404-394-7756
 Ill Chicago, Siemens Corp.312-671-2810
 Iowa Cedar Rapids, Gassner & Clark319-393-5763
 Md Baltimore, J.A. Maguire Co.301-377-0223
 Mass Newton Upper Falls, Anchor Engrg. Corp.
 617-964-6205
 Minn St. Paul, Cahill Assocs.612-646-7217
 Mo Hazelwood, Dy-Tronix314-731-5799
 NJ Pennsauken, J.A. Maguire & Co.609-665-5136
 NM Albuquerque, A. Q. Elctns.505-255-8701
 NY Plainview, E.R.A., Inc.516-822-9890
 NY Rochester, Electra Sls.716-436-4030
 NY Syracuse, Electra Sales315-455-5783
 NY Syracuse, T-Squared315-463-8592
 NC Winston-Salem, J. A. Maguire919-723-5980
 Ohio Cleveland, C. Dolfuss Co.216-333-7504
 Tex Dallas, Siemens214-424-8333
 Utah Salt Lake City, Omega, Ltd.801-266-9617
 Wash Bellevue, R. Over Sales206-454-4551

SIEMENS CORP.-COMPUTEST PRODUCTS, Power
 Engrg. Div., 3 Computer Dr., Cherry Hill, N.J., 08002,
 Tel: 609-424-2400; Empl.: 225

Products manufactured: Test Systems, Testers

Local Sales Offices & Reps.

Ariz	Scottsdale, PLS Inc.	602-957-9110
Cal	Los Gatos, Yoshikawa Assocs.	408-374-3086
Cal	North Hollywood, E. Momjian Assocs.	213-764-4891
Cal	Sunnyvale, Siemens Corp.	408-734-8484
Colo	Denver, PLS Inc.	303-771-10599
Conn	Avon, Instrument Dynamics Inc.	203-678-1088
Fla	Orlando, Gentry Assocs.	305-894-4401
Kans	Prairie Village, Engineering Svcs.	913-649-4000
Md	Bethesda, Powell-Pendergraph Inc.	301-656-4535
Mass	Wakefield, Instrument Dynamics Inc.	617-245-5100
Mich	Royal Oak, Hocker Assocs.	313-549-3910
Minn	Minneapolis, Engineering Prods Assoc.	612-925-1883
Mo	St. Louis, Engineering Svcs.	314-997-1515
NJ	Berkley, AMC, Inc.	201-464-5100
NY	Liverpool, R & D Assocs.	315-622-2350
NC	Burlington, Gentry Assocs.	919-227-3639
NM	Albuquerque, PLS Inc.	505-255-2330
Ohio	Dayton, Hocker Assocs.	513-298-8638
Ohio	N. Olmstead, Hocker Assocs.	216-734-4433
Pa	Abington, Powell-Pendergraph Inc.	215-657-0330
Tex	Dallas, Data Aids Assocs.	214-620-1551
Tex	Houston, Data Aids Assocs.	713-862-6685
Va	Richmond, Powell-Pendergraph Inc.	804-264-2341
Wash	Seattle, Datacom	206-285-2525

SIERRA ELECT., Div. Sola Basic Inds., 15100 S. Figueroa St., Gardena, Calif., 90248, Tel: 213-321-1000; Empl.: 500; Minimum order: \$25

For info on price: C. L. Keeshen; Application info: C. L. Keeshen; Customer service: D. Kaufman; Delivery info: D. Kaufman

Products manufactured: Antenna Feed Systems, Connector Boxes & Strips, Power Outlet, Indicators, Jack Adapters (All Types), Jack Covers, Jacks (All Types), Plug & Jack Sets, Relays, Sockets, Switch Mounting Plates, Switches

SIERRA SCIENTIFIC CORP., 2189 Leghorn St., Mountain View, Cal., 94043, Tel: 415-969-9315; Empl.: 35

Customer service: D. Gilblom

Free literature available: Technical descriptions and specification of television cameras and displays for medical, industrial, scientific, and OEM applications.

Products manufactured: Cameras, Monitors, Television Systems & Equipment Closed-Circuit

Local Sales Offices & Reps.

Cal	Millbrae, Ashby Assocs. of No. Cal.	415-692-4442
Cal	Pasadena, A-F Sls. Engrg.	213-681-5631
Fla	Orlando, Dataprep	305-843-5224
Fla	Pompano Beach, Dataprep	305-781-9279
Mass	Attleboro, Elctrn. Sls. of New England	617-222-4078
Mass	Cambridge, Media Systems	617-876-0164
NJ	Totowa, H.M. Holzberg Assocs.	201-256-0455
Ohio	Dayton, Genelco	513-299-1819
Okla	Norman, Data Mktg Assocs.	405-364-8320
Tex	Dallas, Data Mktg. Assocs.	214-661-0300
Tex	Houston, Data Mktg. Assocs.	713-686-9627
Tex	San Antonio, Data Mktg. Assocs.	512-828-0937
Va	Vienna, Sutter & Co.	703-938-0505

SIERRACIN/MAGNEDYNE INC., 5580 El Camino Real, Box 458, Carlsbad, Calif., 92008, Tel: 714-729-7191, TWX: 910 322-1391; Empl.: 55

p. 1-982,983

Customer service: C. McElhiney

Free literature available: Data sheets and reduced drawings.

Products manufactured: Actuators, Motors, Tachometers

Local Sales Offices & Reps.

Ariz	Scottsdale, Kachina Assocs.	602-947-4472
Cal	Manhattan Beach, Tri-Tek	213-545-4649
Cal	Palo Alto, Harris Engrg. Assocs.	415-328-3370
Colo	Denver, Rope & Williamson	303-758-8507
Fla	St. Petersburg, Russell Assocs.	813-526-1134
Ill	Chicago, J. Popp Sls.	312-626-3711
Mich	Detroit, B E S C O	313-559-0444
Mich	Grand Rapids, B E S C O	616-942-1190
NJ	Wayne, SHL & Assocs.	201-523-1714
Ohio	Cleveland, D. Steffen & Assoc.	216-461-8333
Ohio	Dayton, D. Steffen & Assoc.	513-293-3145
Pa	Valley Forge, Gil-Tronics, Inc.	215-933-8525

SIERRACIN/THERMAL SYS., 13920 S. Broadway, Los Angeles, Cal., 90061, Tel: 213-FA1-4350, TWX: 910-346-6774; FSC No: 11416; Empl.: 110; Minimum order: \$25

For info on price: E. W. Swanson; Application info: E. W. Swanson; Customer service: D. Jensen; Delivery info: D. Jensen

Free literature available: General Capabilities and Facility Brochure describing our ability to produce flexible electrical heating elements, temperature sensors and solid state electronic controllers and signal conditioning.

Products manufactured: Controls/Control Eqpt., Heaters & Heating Elements, Monitors, Ovens, Probes, Standards, Thermocouples, Elements & Accessories, Transducers

Local Sales Offices & Reps.

Ala	Huntsville, Kemp Instrs.	205-837-4304
Ariz	Phoenix, R.A. Mayes Co.	602-279-5243
Cal	Costa Mesa, Scrantom Engr.	714-979-6373
Cal	Palo Alto, Harris Engr. Assoc.	415-328-3370
Colo	Boulder, R.A. Mayes Co.	303-444-0772
Conn	Gulford, R.H. Whitehead Assoc.	203-453-3762
Fla	Ft. Lauderdale, Orbe	305-564-8571
Ill	Oak Park, J. Popp Sls. Co.	312-626-3711
Kans	Overland Park, Penzner-Mankus Assocs.	913-381-0004
Md	Rockville, Farrell Assocs.	301-424-9460
Mass	Boston, R.H. Whitehead Assocs.	617-542-7676
Mich	Plymouth, ROMARC	313-455-0300
Mo	Hazelwood, Penzner-Mankus Assoc.	314-731-4334
NJ	East Orange, Friedman Assoc.	201-673-2500
NM	Albuquerque, R.A. Mayes Co.	505-292-2330
NY	Buffalo, H.C. Johnson Agen.	716-632-7880
NY	Rochester, H.C. Johnson Agen.	716-482-3000
NC	Winston-Salem, Electronic Mktg. Assoc.	919-722-5151
Ohio	Cincinnati, Giesting & Assocs.	513-931-0812
Pa	Glenside, Elcom	215-885-1325
SC	Greenville, Electronic Mktg. Assoc.	803-268-1125
Tex	Dallas, Apogee Engr. Svcs.	214-352-2083
Wash	Renton, D & D Sls	206-226-4120

SIFCO METACHEMICAL, Div. Steel Improv. & Forging, 5708 Schaaf Rd., Independence, Ohio, 44131, Tel: 216-881-8600; Empl.: 25; Minimum order: \$25

For info on price: J. White X345; Application info: J. Norris X348; Customer service: R. Jarnigan X346; Delivery info: V. Ehrenscheider X347

Free literature available: General and technical data on DALIC brush plating deposits and applications.

Products manufactured: Chemicals, Electroplating Equipment & Supplies, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Cal	Pasadena, Piddington Assoc.	213-795-8029
-----	-----------------------------	--------------

SIGMA INSTRUMENTS, INC., 170 Pearl St., Braintree, Mass., 02184, Tel: 617-843-5000, TWX: 710-348-1161; Empl.: 1050; Minimum order: \$30

Customer service: Cust. Svc. Dept.

Free literature available: Relay Stock Catalog; Stepping Motor Catalog; Panel Meter Catalog.

Products manufactured: Alarms, Amplifiers, Controllers, Programmable, Controls/Control Eqpt., Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Drivers, Chopper, Drives & Drive Mechanisms (Dial), Encoders, Indicators, Isolators, Meters, Monitors, Motors, Power Drivers, Hybrid (High Current, High Voltage), Reactors, Relays, Sockets, Switches, Testers, Timers

Local Sales Offices & Reps.

Ala	Huntsville, Brandel-Stephens & Co.	205-883-0445
Ariz	Phoenix, J S Heaton Co.	602-264-7887
Cal	Burlingame, Engrg. Reps. Co.	415-692-2481
Cal	Hawthorne, Barnard & Assocs.	213-973-5050
Cal	San Diego, Engrg. Reps. Co.	714-296-2925
Colo	Englewood, Tech Sls.	303-789-2864
Conn	Middletown, Roy Dennis Co.	203-344-3273
Fla	Deerfield Beach, Brandel-Stephens & Co.	305-399-8558
Fla	Orlando, Brandel-Stephens & Co.	305-425-3202
Ga	Atlanta, Brandel-Stephens & Co.	404-261-7579
Ill	Chicago, Gassner & Clark Co.	312-764-6121
Kans	Kansas City, Technical Sls. Assocs.	913-888-3330
La	Harahan, Williams Equip. Co.	504-737-4082
Md	Baltimore, J.R. Daniel Co.	301-825-3330
Mass	Needham, Northeast Reps.	617-449-3034
Mich	Detroit, Stress Analysis Svcs.	313-535-1120

Minn	Minneapolis, Pilot Sls. & Engrg.	612-546-4328
Mo	Ferguson, Technical Sls. Assocs.	314-725-5361
NJ	Stirling, NBS Assocs.	201-464-8500
NM	Albuquerque, J.S. Heaton Co.	505-293-3900
NY	Albany, H.C. Johnson Agencies	518-456-9881
NY	Binghamton, H.C. Johnson Agencies	607-723-6500

NY	Buffalo, H.C. Johnson Agencies	716-632-7880
NY	Rochester, H.C. Johnson Agencies	716-482-3000

NY	Syracuse, H.C. Johnson Agencies	315-637-9383
----	---------------------------------	--------------

NC	Charlotte, D.G.W., Inc.	704-334-7090
NC	Winston-Salem, D.G.W., Inc.	919-788-7166

Ohio	Medina, Stress Analysis Svcs.	216-725-7733
Okla	Tulsa, Telstar Inst. Corp.	918-628-1011

Pa	Glenshaw, H.C. Johnson Agencies	412-961-0414
----	---------------------------------	--------------

Pa	Philadelphia, Stitzer Assocs.	215-644-5500
Tex	Dallas, J.B. Guenther	214-528-6286

Tex	Houston, J.B. Guenther	713-468-0232
Wash	Tukwila, General Elctrn.	206-243-5141

Ariz	Phoenix, J S Heaton Co.	602-264-7887
Cal	Los Angeles, Halbar Assocs.	213-387-8283

Cal	San Jose, J. T. McFarland Assocs.	408-268-2600
-----	-----------------------------------	--------------

Colo	Denver, Thorson Co.	303-759-0809
Conn	Torrington, Motoreps of New England	203-482-3193

Ga	Lilburn, Motion Technology	404-233-4368
Ill	Des Plaines, Control Sls.	312-774-1674

Ind	Indianapolis, L.M. DeVoe Co.	317-257-1227
Kans	Kansas City, Technical Sls. Assocs.	913-888-3330

Md	New Carrollton, W.A. Brown Equip-Comp	301-577-4527
----	---------------------------------------	--------------

Mich	Troy, Control Sls. Assocs.	313-391-3235
Minn	Minnetonka, T.H. Ayre, Assoc.	612-474-4125

Mo	Ferguson, Technical Sls. Assocs.	314-725-5361
NJ	Camden, QED Elctrn.	215-925-8711

NJ	Red Bank, Motoreps of N.Y.	201-741-3356
NM	Albuquerque, J.S. Heaton Co.	505-293-3900

NY	Buffalo, H.C. Johnson Agencies	716-632-7880
NY	Rochester, H.C. Johnson Agencies	716-482-3000

NC	Charlotte, Motion Technology	704-525-9855
Ohio	Chagrin Falls, Drivex Corp.	216-247-6701

Ohio	Cincinnati, Drivex Corp.	513-825-3583
Okla	Broken Arrow, P.J. Scanlon Co.	918-251-1427

Pa	Glenshaw, H.C. Johnson Agencies	412-961-0414
----	---------------------------------	--------------

Tex	Dallas, P.J. Scanlon Co.	214-231-4661
Va	Alexandria, W.A. Brown Equip-Comp	703-360-5375

Wash	Tukwila, General Elctrn.	206-243-5141
Wisc	Milwaukee, Control Sls.	414-964-3322

Relays		
Ala	Huntsville, Brandel-Stephens & Co.	205-883-0445

Ariz	Phoenix, J S Heaton Co.	602-264-7887
Cal	El Segundo, Varig Assocs.	213-679-0621

Cal	Los Altos, Ewing-Foley, Inc.	415-941-4525
Cal	San Diego, Daniels & Doty Sls. Co.	714-560-6266

Conn	North Haven, Northeast Reps.	203-239-2507
Fla	Deerfield Beach, Brandel-Stephens & Co.	305-399-8558

Ga	Orlando, Brandel-Stephens & Co.	305-425-3202
Ga	Atlanta, Brandel-Stephens & Co.	404-261-7579

Ill	Des Plaines, 312-774-1674	
Ind	Indianapolis, L.M. DeVoe Co.	317-257-1227

Kans	Kansas City, Technical Sls. Assocs.	913-888-3330
------	-------------------------------------	--------------

Md	Baltimore, Coulbourn DeGrief, Inc.	301-247-4646
----	------------------------------------	--------------

Mass	Needham, Northeast Reps.	617-449-3034
Mich	Southfield, R.C. Nordstrom & Co.	313-559-7373

Minn	Edina, Wagner Consig. Corp.	612-941-6310
Mo	Ferguson, Technical Sls. Assocs.	314-725-5361

NJ	Irvington, M. Gallagher, Inc.	201-399-4350
NM	Albuquerque, J.S. Heaton Co.	505-293-3900

NY	Binghamton, H.C. Johnson Agencies	607-723-6500
NY	Buffalo, H.C. Johnson Agencies	716-632-7880

NY	Rochester, H.C. Johnson Agencies	716-482-3000
----	----------------------------------	--------------

NY	Syracuse, H.C. Johnson Agencies	315-637-9383
----	---------------------------------	--------------

NC	Charlotte, D.G.W., Inc.	704-334-7090
NC	Winston-Salem, D.G.W., Inc.	919-788-7166

Ohio	Dayton, Bear Mktg.	513-299-3566
Ohio	Richfield, Bear Mktg.	216-659-3131

Pa	Glenshaw, H.C. Johnson Agencies	412-961-0414
----	---------------------------------	--------------

Pa	Media, W. Reeves Assocs.	215-566-6709
Tex	Dallas, P.J. Scanlon Co.	214-231-4661

Wash	Tukwila, General Elctrn.	206-243-5141
------	--------------------------	--------------

Wisc Milwaukee, Control Sls. 414-964-3322

SIGMA SYS. CORP., 3163 Adams Ave., San Diego, Calif., 92116, Tel: 714-283-3193; Empl.: 8; Minimum order: \$15

Customer service: T. Stewart

Free literature available: Heat Gun - temperature controlled: brochure describes features (some patented), applications, economic factors of use. Model C precision temperature chamber controller for upgrade/retrofit on old and modern chambers. Gives specs, instructions & function connections. Liquid carbon dioxide conditioners: for temperature chamber users. Brochure describes cleaning (by distillation), drying and prechilling liquid Co2 plus method of distribution in vapor stage thru uninsulated lines. Precision temperature chambers. Brochure gives features & specs on line of std. chambers, sizes from 25 to 150 liters.

Products manufactured: Chamber, Environmental Test, Controls/Control Eqpt., Heat Guns, Production

Advertisement

Liquid carbon dioxide conditioners for temperature chamber users. Sigma's model CDC-12 cleans (by distillation), dries and precools liquid Carbon Dioxide and permits its distribution in vapor stage through uninsulated lines. Also standard & custom chambers plus retrofit three mode controllers.

SIGNAL TRANSFORMER CO., 1 Junius St., Brooklyn, N.Y., 11212, Tel: 212-498-5111, Telex: 12-5709; Empl.: 90

For info on price: A. Leibowitz; Application info: J. Millman; Customer service: A. Skurnick; Delivery info: S. Jaffee

Products manufactured: Chokes, Transformers

SIGNALITE DIV., Gen. Instr., 1933 Heck Ave., Neptune, N.J., 07753, Tel: 201-775-2490, TWX: 201-775-2255; Empl.: 300; Minimum order: \$30

For info on price: N. Fraser; Application info: T. Wolstencroft; Customer service: B. Bry; Delivery info: B. Bry

Free literature available: Neon glow lamps - definition & specs; Comm gaps, Spark gap, Regulators - brief tech bulletins; Noise source catalogue - definition & specs.

Products manufactured: Arresters, Electrical Surge, Lightning, Diodes, Display Devices/Displays, Lamps, Regulators

Local Sales Offices & Reps.

Cal Los Altos, W.W. Posey Co. 415-948-7771
Cal N. Hollywood, Chicago Miniature ... 213-777-0887
Colo Denver, Lindberg Co. 303-758-9033
Conn Newton, Gerber Sls. Corp. 203-426-3440
Fla Hollywood, Component Engr. Sls. 305-922-5230
Ill Elk Grove Village, J.G. Twist Co. 312-593-0200
Ind Fort Wayne, R.O. Whitesell & Assocs. 219-432-5591
Ind Indianapolis, R.O. Whitesell & Assocs. 317-359-9283
Ind Kokomo, R.O. Whitesell Assocs. 317-452-6065
Iowa Cedar Rapids, J.G. Twist Co. 319-393-8703
Kans Prairie Village, J.G. Twist Co. 913-236-4646
Ky Louisville, R.O. Whitesell & Assocs. 502-893-7303
Mass East Longmeadow, Gerber Sls. Corp. 413-525-3059
Mass Waltham, Gerber Sls. Corp. 617-890-8040
Mich Grand Rapids, R.O. Whitesell & Assocs. 616-451-8901
Mich Southfield, R.O. Whitesell & Assocs. 313-358-2020
Mich St. Joseph, R.O. Whitesell & Assocs. 616-983-7337
Minn Minneapolis, Nortec Sls. Inc. 612-835-7414
Miss Corinth, Rakes Engr. & Mkt. Corp. 601-287-2055
Mo St. Louis, J.G. Twist Co. 314-432-2830
NJ Neptune, Signalite 201-775-2490
NY Syracuse, Nycom Inc. 315-437-8343
NC Charlotte, B. Henry Assocs. 704-375-8958
Ohio Cincinnati, R.O. Whitesell & Assocs. 513-521-2290
Ohio Columbus, R.O. Whitesell & Assocs. 614-888-9396

Ohio Dayton, R.O. Whitesell & Assocs. 513-298-9546
Ohio Lakewood, R.O. Whitesell & Assocs. 216-228-7525

Pa Lafayette Hill, M. Lader Co. 215-825-3177
Pa Pittsburgh, R.O. Whitesell & Assocs. 412-344-7277

Tenn Bristol, Rakes Engr. & Mkt. Corp. 615-968-4195
Tex Dallas, J.B. Guenther 214-691-8500
Tex Houston, J.B. Guenther 713-468-0232
Utah Salt Lake City, Lindberg Co. 801-364-6409
Va Woodbridge, M. Lader Co. 202-296-2497
Wash Seattle, Blum & Assocs. 206-285-2590
Wisc Wauwatosa, J.G. Twist Co. 414-475-7755
FOR: Can., Montreal, Gen. Instr. Can. 514-636-9454
FOR: Can., Toronto 338, Ont., Gen. Instr. Can. 416-763-4133

SIGNET SCIENTIFIC CO., Box 6489, Burbank, Cal., 91510, Tel: 213-849-6071, TWX: 910-498-2212; Empl.: 35; Minimum order: \$25

Customer service: D. Salisbury

Products manufactured: Controls/Control Eqpt., Heaters & Heating Elements, Lights, Monitors, Oceanographic Equip. (Electronic), Ovens, Switches, Transducers

SIGNETICS CORP., 811 E. Arques Ave., Sunnyvale, Cal., 94086, Tel: 408-739-7700, TWX: 910-339-9220; Minimum order: \$250

Products manufactured: Integrated Circuit Devices, Transistors

Local Sales Offices & Reps.

Ala Huntsville, 20th Century Mktg. 205-772-9237
Ariz Phoenix, Signetics Corp. 602-971-2517
Cal Encino, Signetics Corp. 213-990-2610
Cal Irvine, Signetics Corp. 714-833-8980
Cal San Diego, Signetics Corp. 714-560-0242
Cal Sunnyvale, Signetics Corp. 408-736-7565
Colo Denver, Parker/Webster Co. 303-770-1972
Conn Hamden, Kanan Assocs. 203-288-9276
Fla Altamonte Springs, Wmm Assocs. 305-831-4645
Fla Clearwater, Signetics Corp. 813-531-3359
Fla Pompano Beach, Signetics Corp. 305-782-8225
Ga Douglasville, 20th Century Mktg. 404-942-6483
Ill Rolling Meadows, Signetics Corp. 312-259-8300
Ind Indianapolis, Signetics Corp. 317-545-3232
Kans Olathe, B.C. Electr. Sls. 913-782-6696
Md Rockville, Signetics Corp. 301-881-5710
Mass Lexington, Signetics Corp. 617-861-0840
Mass Reading, Kanan Assocs. 617-944-8484
Mich Detroit, Rathsborg Assocs. 313-882-1717
Minn Minneapolis, Signetics Corp. 612-884-7451
Mo Hazelwood, B.C. Electr. Sls. 314-731-1255
NJ Medford, Signetics Corp. 609-665-5071
NJ Piscataway, Signetics Corp. 201-981-0123
NM Albuquerque, Staley Co. 505-294-2660
NY Dewitt, Tri Tech Elctns. 315-446-2881
NY E. Rochester, Tri Tech Elctns. 916-381-2722
NY Larchmont, Tri Tech Elctns. 914-834-4423
NY Wappingers Falls, Signetics Corp. 914-297-4074
NY Woodbury, Signetics Corp. 516-364-9100
Ohio Centerville, N. Case Assocs. 513-433-0966
Ohio Fairview Park, N. Case Assocs. 216-333-4120
Ore Portland, Western Tech. Sls. 503-297-1711
Tex Dallas, Signetics Corp. 214-661-1296
Tex Houston, Signetics Corp. 713-771-9265
Utah Salt Lake City, Parker/Webster 801-486-3737
Wash Bellevue, Western Tech. Sls. 206-641-3900
Local Distributors
Ariz Phoenix, Hamilton/Avnet Elctns., 2615 S. 21st St. 602-275-7851
Ariz Phoenix, Kierulff Elctns., 2633 E. Buckeye Rd. 602-273-7331
Cal Culver City, Hamilton Electro Sls., 10912 W. Washington 213-870-7171
Cal El Segundo, Liberty Elctns., 124 Maryland St. 213-322-8100
Cal Los Angeles, Kierulff Elctns., 2585 Commerce Way 213-685-5511
Cal Mountain View, Hamilton/Avnet Elctns., 575 East Middlefield Rd. 415-961-7000
Cal Palo Alto, Kierulff Elctns., 3969 E. Bayshore Rd. 415-968-6292
Cal San Diego, Cramer Elctns., 8913 Complex Dr., Suite E. 714-565-1881
Cal San Diego, Hamilton/Avnet Elctns., 8917 Complex Dr. 714-279-2421
Cal San Diego, Kierulff Elctns., 8797 Balboa Ave. 714-278-2112
Cal Sunnyvale, Cramer Elctns., 720 Palomar 408-739-3011
Colo Denver, Cramer Elctns., 5465 Evans Pl. at Hudson 303-758-2100

Colo Denver, Hamilton/Avnet Elctns., 5921 N. Broadway 303-534-1212
Conn Georgetown, Hamilton/Avnet Elctns., 643 Danbury Rd. 203-762-0361
Conn Hamden, Arrow Elctns., 295 Treadwell St. 203-248-3801
Conn North Haven, Cramer Elctns., 35 Dodge Ave. 203-239-5641
Fla Hollywood, Hamilton/Avnet Elctns., 4020 No. 29th Ave. 305-925-5401
Fla Hollywood, Schweber Elctns., 2830 N. 28th Terrace 305-927-0511
Fla Orlando, Hammond Elctns., 911 W. Central Blvd. 305-241-6601
Ga Atlanta, Schweber Elctns., 4126 Pleasantdale Rd., Suite 14 404-449-9170
Ga Norcross, Hamilton/Avnet Elctns., 6700 Interstate 85 Access Rd. 404-448-0800
Ill Elk Grove, Schweber Elctns., 1380 Javis Ave. 312-593-2740
Ill Elmhurst, Semiconductor Specialists, 195 Spangler Ave. 312-279-1000
Ill Schiller Park, Hamilton/Avnet Elctns., 3901 No. 25th Ave. 312-678-6310
Ind Indianapolis, Semiconductor Specialists, Box 41630 317-243-8271
Kans Lenexa, Hall-Mark Elctns., 9006 Rosehill Rd. 913-888-4747
Kans Lenexa, Hamilton/Avnet Elctns., 37 Lenexa Ind'l. Center, 9900 Pflumm Rd. 913-888-8900
Md Hanover, Hamilton/Avnet Elctns., 7255 Standard Dr. 301-796-5000
Md Rockville, Pioneer Washington Elctns., 1037 Taft St. 301-424-3300
Md Rockville, Schweber Elctns., 5640 Fisher La. 301-881-2970
Mass Burlington, Hamilton/Avnet Elctns., 185 Cambridge St. 617-273-2120
Mass Newton, Cramer, 85 Wells Ave. 617-969-7700
Mass Waltham, Schweber Elctns., 213 Third Ave. 617-890-8484
Mich Farmington, Semiconductor Specialists, 33505 State St. 313-478-2700
Mich Livonia, Hamilton/Avnet Elctns., 12870 Farmington Rd. 313-522-4700
Mich Troy, Schweber Elctns., 86 Executive Drive 313-583-9242
Minn Edina, Hamilton/Avnet Elctns., 7683 Washington Ave. S. 612-941-3801
Minn Edina, Schweber Elctns., 7015 Washington Ave. S. 612-944-5280
Minn Minneapolis, Semiconductor Specialists, 8330 Cedar Ave. S. 612-845-8844
Mo Hazelwood, Hamilton/Avnet Elctns., 364 Brookess La. 314-731-1144
Mo St. Louis, Hall-Mark Elctns., 6100 Madison Ave. 314-521-3800
NJ Cedar Grove, Hamilton/Avnet Elctns., 218 Little Falls Rd. 201-239-0800
NJ Cherry Hill, Milgray-Delaware Valley, 1165 Marikress Rd. 609-424-1300
NJ Moorestown, Arrow/Angus Elctns., Pleasant Valley Rd. 609-235-1900
NJ Mt. Laurel, Hamilton/Avnet Elctns., 113 Gaither Dr., E. Gate Ind'l. Pk. 609-234-2133
NJ Saddlebrook, Arrow Elctns., 285 Midland Ave. 201-797-5800
NJ Somerset, Schweber Elctns., 43 Belmont Dr. 201-469-6008
NM Albuquerque, Cramer Elctns., 137 Vermont, N.E. 505-265-5767
NM Albuquerque, Hamilton/Avnet Elctns., 2450 Baylor Dr. S.E. 505-765-1500
NY Buffalo, Summit Dist., 916 Main St. 716-884-3450
NY Farmingdale, Arrow Elctns., 900 Broad Hollow Rd. 516-694-6800
NY Rochester, Schweber Elctns., 2 Townline Circle 716-461-4000
NY Syracuse, Hamilton/Avnet Elctns., 6500 Joy Rd. 315-437-2642
NY Westbury, Hamilton/Avnet Elctns., 70 State St. 516-333-5800
NY Westbury, Schweber Elctns., Jericho Tpk. 516-334-7474
NC Greensboro, Hammond Elctns., Box 21728 919-275-6391
Ohio Beechwood, Schweber Elctns., 23880 Commerce Pk Rd. 216-464-2970
Ohio Cleveland, Arrow Elctns., 23500 Mercantile Rd. 216-464-2000
Ohio Cleveland, Pioneer Standard Elctns., 4800 E. 131st St. 216-587-3600
Ohio Kettering, Arrow Elctns., 3100 Plainfield Rd. 513-253-9176
OHio Dayton, Hamilton/Avnet Elctns., 118 W. Park Rd. 513-433-0610

Tex	Austin, Schweber Elctns., 2628 Longhorn B	512-837-2890
Tex	Dallas, Cramer Elctns., 13740 Midway Rd.	214-661-9300
Tex	Dallas, Hamilton/Avnet Elctns., 4445 Sigma Rd.	214-661-8661
Tex	Dallas, Schweber Elctns., 14177 Proton	214-661-5010
Tex	Houston, Component Specialties, 7313 Ashcroft, Suite 202	713-771-7237
Tex	Houston, Hamilton/Avnet Elctns., 1216 W. Clay St.	713-526-4661
Tex	Houston, Schweber Elctns., 7420 Harwin Dr.	713-784-3600
Utah	Salt Lake City, Alta Elctns., 2280 S. Main St.	801-486-7227
Utah	Salt Lake City, Hamilton/Avnet Elctns., 647 West Billins Rd.	801-262-8451
Wash	Bellevue, Hamilton/Avnet Elctns., 13407 Northrup Way	206-746-8750
Wash	Seattle, Cramer Elctns., 5602 6th Ave. S.	206-762-5722

SILICON GENERAL INC., 7382 Bolsa Avenue, Westminster, Cal., 92683

SILICON GENERAL INC., 2712 McGaw Ave., Irvine, Cal., 92705

SILICON SYSTEMS INC., 2913 Daimler St., Santa Ana, Cal., 92705, Tel: 714-979-0941; Empl.: 11; Minimum order: \$100

Customer service: E. F. Klein

Products manufactured: Integrated Circuit Devices, Semiconductor Wafer Fabrication, Services, Assembly, Production & Test

SILICON TRANSISTOR CORP., Katrina Rd., Chelmsford, Mass., 01824

SILICONIX, INC., 2201 Laurelwood Rd., Santa Clara, Cal., 95054, Tel: 408-246-8000; FSC No: 17856; Empl.: 1000; Minimum order: \$250

For info on price: R. Landon Ext. 121; Application info: R. Landon Ext. 121; Customer service: S. Buckwald Ext. 210; Delivery info: S. Buckwald Ext. 210

Free literature available: Applications literature on discrete FETs, current limiters, voltage-controlled resistors, plus ICs for analog switching, A/D conversion, micropower multiple op amps.

Products manufactured: Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Comparators, Converters, Diodes, Drivers, Switch, Integrated Circuit Devices, Multiplexers, Resistors, Switches, Transistors

Local Sales Offices & Reps.

Ala	Huntsville, Rep., Inc.	205-881-9270
Ariz	Phoenix, Siliconix, Inc.	602-264-3330
Cal	Long Beach, Siliconix, Inc.	213-420-1307
Cal	Santa Clara, Siliconix, Inc.	408-246-8000
Colo	Denver, Parker Webster Co.	303-770-1972
Colo	Denver, Siliconix, Inc.	303-778-1918
Fla	Clearwater, Perrott Assocs.	813-531-5513
Fla	Orlando, Perrott Assocs.	305-275-1132
Ga	Atlanta, Rep.	404-876-1591
Ill	Wheeling, Siliconix, Inc.	312-541-0131
Iowa	Cedar Rapids, Comstrand	319-363-7495
Md	Camp Springs, Siliconix, Inc.	301-899-3110
Mass	Waltham, Siliconix, Inc.	617-890-7181
Minn	Minneapolis, Comstrand	612-560-5300
Minn	Minneapolis, Siliconix, Inc.	612-838-2515
NY	Baldwin, R.O.M.E.	516-589-8285
NY	Bethpage, Siliconix, Inc.	516-796-4680
NY	Pittsford, T2 Elctns.	716-381-2551
NY	Syracuse, T2 Elctns.	315-463-8592
Pa	Erie, Ecco Sls. Co.	814-455-8110
Pa	Ft. Washington, GCM Assoc.	215-646-7535
SC	Spartanburg, Beacon Assocs.	803-582-4613
Tex	Houston, Semiconductor Sls. Assoc.	713-461-4197
Tex	Richardson, Semiconductor Sls. Assoc.	214-231-8151
Wash	Seattle, B. Hirsh Co.	206-783-3423
Wisc	Greendale, J.M. Sls. Co.	414-421-6890

SILTEC CORP., 3717 Haven Ave., Menlo Park, Cal., 94025, Tel: 415-365-8600, Telex: 34-5503; Empl.: 250; Minimum order: \$50

For info on price: W. D. Jordan; Application info: G. R. Duncan; Customer service: G. D. Duncan; Delivery info: J. Gontang

Free literature available: Crystal Growing Furnace - Model 860C, resistance heated, production furnace for growing silicon crystals by Czochralski technique. Diameters over 4 inches and charge weight up to 12 kg. Crystal Slicing Machine - Model NAV 701B, uses I.D. diamond wheels for precision wafering of brittle materials. Polishing Machine - Model 320A, high capacity high quality and automatic polishing of silicon wafers. Uses 1 step, no damage, polishing process. Dielectric Defect Detector - Model 201, uses Electrolytic/Electrophoretic Decoration process to detect pinhole defects in dielectric layers. Wire Bond Pull Tester - Model 220, permits non-destructive screening and testing of fine wires and bonds in semiconductors.

Products manufactured: Crystals, Detectors, Machines/Machinery, Production, Ovens, Semiconductor Wafer Fabrication

Local Sales Offices & Reps.

Ariz	Phoenix, Sterns and Assocs.	602-996-9077
Cal	Menlo Park, Siltec Corp.	415-365-8600
NJ	Belleville, RHB Sls. Co.	201-687-6220
Pa	Franconia, RHB Sls. Co.	215-368-2017
RI	Woonsocket, TEC Sls. of New England	401-766-3531
Tex	Dallas, Metron-Central	214-234-1411

SIMMONDS PRECISION, Engine Systems Div., Norwich, N.Y., 13815, Tel: 607-334-3264, TWX: 510-261-7776; Empl.: 390

For info on price: L. S. Colwell; Application info: L. S. Colwell; Customer service: R. Figary

Free literature available: High temp cable assemblies; Mica paper capacitors; Cables & connectors; High temp sensing systems (2).

Products manufactured: Cable, Capacitors, Fixed, Connectors, Discharge Systems, Energy, Feedthrus & Seals, Environmental, Filters, Lead Assemblies & Receptacles, Networks, Probes, Seals, Spark Gaps, Thermocouples, Elements & Accessories, Tubes

SIMMONS FASTENER CORP., 1745 North Broadway, Albany, N.Y., 12201, Tel: 518-463-4234, TWX: 710-441-8284; Empl.: 250; Minimum order: \$25

For info on price: H. H. Rose; Application info: H. H. Rose; Customer service: F. J. Pufpaff; Delivery info: F. J. Pufpaff

Free literature available: 36-page catalog presents features, photos, illustrations, engineering drawings and application information on company's full line of quick-operating fasteners for electronics and other industrial uses.

Products manufactured: Clamps & Clips, Fasteners, Services, Assembly, Production & Test, Wire & Cable Ties

Local Sales Offices & Reps.

Cal	Los Angeles, El-Com Sls. Co.	213-223-1351
Cal	Mountain View, Hylad Entprs.	415-961-1250
Fla	Orlando, Triflex	305-841-1632
Ill	Crystal Lake, E. S. Healy & Assocs.	815-459-4386
Iowa	Cedar Rapids, F. A. Noll	319-364-3271
Mass	Needham, White Sls. Co.	617-444-3676
Mich	Warren, W. T. Peterson Co.	313-754-8600
Minn	Minneapolis, R. E. Kenney Co.	612-929-6222
NY	Pelham, Facilities Unlimited	914-946-3416
Ohio	Cincinnati, A. C. Wahl & Assocs.	513-821-3270
Pa	Philadelphia, C. H. Stratton Co.	215-247-7869
Pa	Pittsburgh, Dietrich & Assocs.	412-892-2292
Tex	Dallas, Tech Sls. Co.	214-631-8820
Wash	Seattle, G. M. Gillett & Assocs.	206-284-3344

SIMPSON ELECTRIC CO., 853 Dundee Rd., Elgin, Ill., 60120, Tel: 312-697-2260; Empl.: 1000; p. 1-802-805

For info on price: Sls. Off.; Application info: J. Petroselli; Customer service: G. Olofson; Delivery info: Sls. Off.

Free literature available: 4400 General Catalog contains all products and pricing (Free).

Products manufactured: Bridges, Calibrators, Cases, Equipment, Instrument, Meter, Controls/Control Eqpt., Counters, Indicators, Meters, Monitors, Oscilloscopes, Probes, Pyrometers, Recorders, Relays, Sensors, Light, Shunts, Meter, Standards, Tachometers, Testers, Thermocouples, Elements & Accessories, Thermometers, Resistance

Local Sales Offices & Reps.

Alas	Anchorage, H.J. Lang	279-5741
Cal	Burlingame, W.J. Purdy Assoc.	415-347-7701
Cal	Monrovia, Simpson Sls.	213-359-8132
Cal	Sacramento, W.J. Purdy Assoc.	916-422-0128
Colo	Denver, R.G. Bowen Co.	303-722-4641

Conn	Meriden, P.R. Sturgeon	203-237-1112
DC	Washington, S.K. MacDonald	202-265-3938
Fla	Orlando, Cartwright & Bean	305-422-4531
Ga	Atlanta, Cartwright & Bean	404-255-5262
Ill	Elgin, T. Franks	312-697-2260
Ind	Indianapolis, L.M. De Voe Co.	617-257-1227
Iowa	Des Moines, K. Kelly	515-255-4584
Kans	Shawnee Mission, K. Kelly	913-722-0000
La	Chalmette, C. Bean	504-279-4598
Md	Baltimore, S.K. MacDonald, Inc.	301-254-3381
Mass	Babson Park, P.R. Sturgeon Co.	617-237-3506
Mich	Detroit, R.C. Merchant Co.	313-535-6000
Mich	St. Joseph, R.C. Merchant Co.	616-983-7378
Minn	Edina, M. Foster & Co.	612-835-2252
Miss	Jackson, Cartwright & Bean Co.	601-981-1368
Mo	St. Louis, Kelly	314-968-3800
NM	Albuquerque, C.T. Carlberg	505-265-1579
NY	Great Neck, Simpson N.Y.	212-683-0674
NY	North Syracuse, L.D. Allen Inc.	315-458-7470
Ohio	Cleveland, Baehr-Greenleaf & Assoc.	216-221-9030

Okla	Tulsa, J.Y. Schoonmaker Co.	918-936-1423
Ore	Portland, Earl & Brown	503-245-2283
Pa	Pittsburgh, S.K. MacDonald Inc.	412-366-2643
Tenn	Memphis, Cartwright & Bean Co.	901-276-4442
Tex	Dallas, J.Y. Schoonmaker Co.	214-357-8481
Wash	Seattle, Earl & Brown	206-284-1121
Wisc	Milwaukee, E. Dickinson	414-264-1080
EXP	Elgin, Simpson Electric	312-697-2260

SINCLAIR RADIO LABS., 122 Rayette Road, Concord, Ontario, Can. L4K 1B6, Tel: 416-669-1244; Empl.: 100; Minimum order: \$50

For info on price: J. Morrison; Application info: J. Morrison; Customer service: M. Peace; Delivery info: M. Peace

Products manufactured: Amplifiers, Antennas, Attenuators, Filters, Mounts, Tees, Transformers

Local Sales Offices & Reps.

NY	Tonawanda
FOR	Can., Dorval, Que.
FOR	Can., N. Burnaby, B.C.

SINCLAIR RADIONICS, INC., 375 Park Ave., New York, N.Y., 10022, Tel: 212-688-6623

For info on price: D. Presser; Application info: D. Presser; Customer service: M. Wilkes; Delivery info: H. Smith

Products manufactured: Calculators, Electrical & Electronic

SINGER CO., 1150 McBride Rd., Little Falls, N.J., 07424

SINGER CO., American Meter Div., 13500 Philmont Ave., Philadelphia, Pa., 19116, Tel: 215-673-2100, TWX: 710-670-0965

Customer service: Ind'l. Sls. Off.

Free literature available: Bulletin 350-Gas Metering Instrumentation, Bulletin 351-Environmental Control, GC-100-Pneumatic/Electric Mechanical Instrumentation

Products manufactured: Controls/Control Eqpt., Filters, Meters, Transmitters

Local Sales Offices & Reps.

Ala	Birmingham
Ariz	Phoenix
Cal	Burlingame
Cal	Fullerton
Colo	Denver
Ga	Atlanta
Ill	Hinsdale
Mass	Waltham
Mich	Chelsea
Minn	Minneapolis
Mo	Kansas City
Neb	Omaha
NY	New York
Okla	Tulsa
Ore	Lake Oswego
Pa	Pittsburgh
Pa	Wynnewood
Tex	Garland
Tex	Houston
Wash	Seattle
Wisc	Beaver Dam

SINGER CO., Controls Co. of Amer., 9655 W. Soreng Ave., Schiller Park, Ill., 60176, Tel: 312-678-4150; Empl.: 1500

Products manufactured: Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Coils Including Assemblies & Forms, Controls/Control Eqpt., Motors, Solenoids, Switches, Valves, Solenoid

Local Sales Offices & Reps.

Ill	Schiller Park	312-678-4150
-----	---------------	--------------

SINGER CO., HRB - Singer, Inc., Box 60, Science Park, State College, Pa., 16801, Tel: 814-238-4311

Products manufactured: Amplifiers, Antennas, Converters, Detectors, Modulators, All Kinds, Receivers

SINGER, IND'L. TELEPRINTER CORP., 286 Eldridge Rd., Fairfield, N.J., 07006

SINGER CO., Kearfott Div., 1150 McBride Ave., Little Falls, N.J., 07424, Tel: 201-256-4000, TWX: 710-988-5700; Empl.: 6000

Customer service: D.B. Katz

Free literature available: Brochures/data sheets about gyros, accelerometers, digital computers, a/d-d/a and s/d-d/s converters, test equipment, motors, motor generators, synchros/resolvers, servos.

Products manufactured: Accelerometers, Amplifiers, Analyzers, Blowers & Fans & Accessories, Bridges, Choppers, Comm. Systems, Computers, Connectors, Controls/Control Eqpt., Converters, Dampers, Servo, Demodulators, Display Devices/Displays, Gearheads & Speed Reducers, Gyros (All Types), Indicators, Motors, Potentiometers, Radar Systems, Reducers, Repeaters, Servo, Resolvers, Synchro, Seals, Servo Systems, Shifters, Standards, Synchro Transmitters, Solid-State, Synchros, Tachometers, Testers, Transformers

Local Sales Offices & Reps.

Ariz Phoenix, Southwest e/m Engrg., Inc. 602-944-1521
Cal Glendale, Singer Co., Kearfott Div. 213-247-8076
Cal Santa Clara, Richards Assocs. 408-246-5860
Fla Melbourne, Tech-Rep Assocs., Inc. 305-723-9140
Ga Atlanta, Tech-Rep Assocs., Inc. 404-939-8339
Ill Oakbrook, Singer Co., Kearfott Div. 312-654-0800
Mo St. Louis, Singer Co., Kearfott Div. 314-521-0100
NJ Clifton, Singer Co., Kearfott Div. 201-256-4000
NJ Little Falls, Singer Co., Kearfott Div. 201-256-4000
NC Raleigh, Candor Co., Inc. 919-787-2652
Ohio Dayton, Singer Co., Kearfott Div. 513-222-8942
Ore Portland, J.J. Backer Co. 503-297-3776
SC Myrtle Beach, Candor Co., Inc. 803-448-5213
Tenn Chattanooga, Candor Co., Inc. 615-894-7454
Tex Irving, Singer Co., Kearfott Div. 214-352-1764
Va Lynchburg, Candor Co., Inc. 703-846-6579
Wash Renton, Singer Co., Kearfott Div. 206-228-4356

SINGER CO., Librascope Div., 833 Sonora Ave., Glendale, Cal., 91201, Tel: 213-245-8711, TWX: 910-497-2266; Empl.: 1600

Customer service: R. O. Vaughan

Free literature available: Data sheets for all Librascope Products listed in EEM describe special features; list operational, engineering and environmental specifications and applications data.

Products manufactured: Computers, Controls/Control Eqpt., Display Devices/Displays, Encoders, Lenses, Optical & Camera, Memory Systems, Oceanographic Equip. (Electronic)

SINGER INSTRUMENTATION, Los Angeles Oper., 5340 Alla Rd., Los Angeles, Cal., 90066, Tel: 213-822-3061, TWX: 910-343-6969; Empl.: 260

For info on price: G. Rothhammer; Application info: D. Reed; Customer service: B. Ecker; Delivery info: B. Ecker

Free literature available: Short Form Catalog covers: RFL Test Equipment, Two-Way Radio Communications Test Equipment, Synchro Resonator Test Equipment.

Products manufactured: Amplifiers, Analyzers, Bridges, Generators, Meters, RFI Measuring Equipment, Standards

Local Sales Offices & Reps.

Ariz Tucson, Ross Comms. 602-885-5368
Cal Covina, Ross Comms. 213-966-9121
Cal Cupertino, Ross Comms. 408-257-1411
Colo Denver, KC Mkts. 303-733-5561
Ga Atlanta, Secom Sys. 404-261-8935
Ill Evanston, Electronic Prods. 312-869-7038
Kans Shawnee Mission, EIR Co. 913-362-0919
Md Kensington, Electronic Mktg. Assocs. 301-881-5300
Mass Bedford, Chamberlin & Murray 617-274-0044
Mich Rochester, Webster Comms. 313-375-0420
Minn Minneapolis, Carter Elctns. 612-544-9393

Mo Hazelwood, EIR Co. 314-895-4100
NJ Englewood, Bressler & Baum Assocs. 201-569-7600
NJ Union, SBM Reps. 201-687-8737
NY Rochester, SBM Reps. 716-266-1400
Ohio Cincinnati, Cartwright Comms. 513-825-4202
Ore Beaverton, Tarbell Comms. 503-643-1631
Pa King of Prussia, Electronic Mktg. Assocs. 215-248-5050

Tex Richardson, Horizon Engrg. Sls. Co. 214-238-9121

Va Madison Heights, Electronic Mktg. Assocs. 804-847-6335

Wash Bellevue, Tarbell Comms. 206-454-9716
Wisc Milwaukee, Electronic Prods. 414-962-4818
Wisc Shiocton, Electronic Prods. 414-986-3839

SINGER CO., Palo Alto Oper., 3176 Porter Dr., Palo Alto, Cal., 94304, Tel: 415-493-3231, TWX: 910-373-1765; Empl.: 170; Minimum order: \$10

For info on price: S. Davis; Application info: B. Scarr; Customer service: J. Kadack

Free literature available: Singer Instrumentation Catalog, Singer Review "Design of a Broadband RF and M/W Sweep Generator", Singer Review "A System for the Precise Calibration of Air Navigational Receivers".

Products manufactured: Amplifiers, Analyzers, Attenuators, Cable Fault Locators, Couplers, Detectors, Generators, Insertion Loss Measurement Systems, Oscillators, Testers

Local Sales Offices & Reps.

Ala Huntsville, Gentry Assocs. 205-534-9711
Ariz Scottsdale, Williams Assocs. 602-947-4297
Cal Lawndale, Ward-Davis Assocs. 213-542-7740
Cal LaJolla, Ward-Davis Assocs. 714-459-3351
Cal Sunnyvale, Ward-Davis Assocs. 408-245-3700
Colo Denver, Williams Assocs. 303-373-4730
Fla Orlando, Gentry Assocs. 305-894-4401
Ill Chicago, Carter Elctns. 312-585-5485
Ind Indianapolis, Carter Elctns. 317-293-0696
Kans Overland Park, Carter Elctns. 913-649-6996
Kans Shawnee Mission, EIR Co. 913-362-0919
Md Kensington, Elctn. Mktg. Assocs. 301-881-5300
Mass Waltham, Meas. Conslts. 617-890-4400
Mich Detroit, WKM Assocs. 313-892-2500
Minn Minneapolis, Carter Elctns. 612-544-9393
Mo Hazelwood, EIR Co. 314-895-4100
NJ Union, SBM Reps. 201-687-8737
NM Albuquerque, Williams Assocs. 505-255-1638
NY Pleasantville, SBM Reps. 914-769-1811
NY Rochester, SBM Reps. 716-266-1400
NC Burlington, Gentry Assocs. 919-277-3639
Ohio Cleveland, WKM Assocs. 216-267-0445
Ohio Dayton, WKM Assocs. 513-434-7500
Ohio Norman, Data Mktg. Assocs. 405-364-8320
Ore Beaverton, Showalter-Judd 503-646-3004
Pa King of Prussia, Elctn. Mktg. Assocs. 215-265-1600

Pa Pittsburgh, WKM Assocs. 412-892-2953
Tex Dallas, Data Mktg. Assocs. 214-661-0300
Tex Houston, Data Mktg. Assocs. 713-686-9627
Tex San Antonio, Data Mktg. Assocs. 512-828-0937
Wash Seattle, Showalter-Judd 206-624-9020
Wisc Milwaukee, Carter Elctns. 414-464-5555

SINGER - TELE-SIGNAL, 250 Crossways Pk. Dr., Woodbury, N.Y., 11797, Tel: 516-921-9400, TWX: 510-221-2121; FSC No: 10241; Empl.: 400; Minimum order: \$50

For info on price: C. Egan; Application info: F. Wagner; Customer service: L. Della Rocca; Delivery info: C. Egan

Free literature available: System & module data sheets on request (618C 2206CS) 150 different sheets

Products manufactured: Amplifiers, Comm. Systems, Comparators, Converters, Demodulators, Generators, Integrated Circuit Devices, Modulator/Demodulators, Panels, Receivers, Signal Conditioners & Equipment, Terminal Equipment, Digital, Translators, Data, Transmitters

Local Sales Offices & Reps.

Cal Los Angeles, H. Lucas 213-483-4800
Cal Sacramento, R. Hutter 916-488-8145
DC Wash, M. Walker 202-223-4100
Fla Orlando, Singer Tele-Signal 305-851-4420
NY Webster, Singer/Tele-Signal 716-872-4839
Pa Philadelphia, Singer Tele-Signal 215-568-1165
Tex Plano, Singer Tele-Signal 214-424-8615

SITCO ANTENNAS, 10330 N.E. Marx St., Portland, Ore., 97220, Tel: 503-253-2000; Empl.: 18

Products manufactured: Amplifiers, Antenna Towers & Supports, Antennas, CATV Systems & Equipment, Connectors, Mounts, Transformers, Wire

SITEK, INC., 1078 W. Evelyn, Sunnyvale, Cal., 94086, Tel: 408-735-9800, TWX: 910-339-9253; Empl.: 35; Minimum order: \$50

For info on price: M. Andrews; Application info: R. Bernekie; Customer service: R. Bernekie; Delivery info: B. Shoemaker

Free literature available: 1420 linear tester brochure; 3200A digital test brochure.

Products manufactured: Testers

Local Sales Offices & Reps.

Cal Encino, Scientific Devices 213-872-1951
Cal Los Angeles, Scientific Devices 213-641-4800
Cal Mt. View, Scientific Devices 415-964-4230
Cal San Diego, Scientific Devices 714-279-6642
Colo Denver, Parker Webster Co. 303-770-1972
Conn Hamden, Scientific Devices 203-248-9361
Fla Casselberry, E.I.R., Inc. 305-830-9600
Haw Honolulu, Aloha Assocs. 808-941-1574
Ill Chicago, Carter Elctns., Inc. 312-585-5485
Ind Indianapolis, Carter Elctns., Inc. 317-293-0696
Kans Overland Park, Carter Elctns., Inc. 913-649-6996

Md Baltimore, Scientific Devices/E-Tech. 301-788-6611

Mass Waltham, McBar Assocs. 617-890-0233

Mich Detroit, Micro Sls. Corp. 313-366-6084

Minn Minneapolis, Carter Elctns., Inc. 612-544-9393

Mo Hazelwood, Carter Elctns., Inc. 314-731-2237

NJ Palisades Park, Scientific Devices-E. 201-871-3916

NM Albuquerque, Scientific Devices-Albuquerque 505-268-6729

NY Rochester, Scientific Devices-NY 716-334-2445

Ohio Cleveland, Micro Sls. Corp. 216-243-7430

Ohio Dayton, Micro Sls. Corp. 513-298-3033

Okla Norman, Data Mktg. Assocs. 405-364-8320

Ore Portland, Western Tech. Sls., Inc. 503-297-1711

Pa Plymouth Meeting, Scientific Devices 215-825-9515

Tex Dallas, Data Mktg. Assocs. 214-358-4643

Tex Houston, Data Mktg. Assocs. 713-686-9627

Tex San Antonio, Data Mktg. Assocs. 512-828-0937

Va Norfolk, Scientific Devices/E-Tech. 703-499-8133

Va Springfield, Scientific Devices/E-Tech. 703-451-6500

Wash Bellevue, Western Tech. Sls., Inc. 206-454-3906

Wisc Milwaukee, Carter Elctns., Inc. 414-464-5555

SIVERS LAB, Box 747, Corona del Mar, Cal., 92625, Tel: 714-673-3787; Empl.: 200

Customer service: E. M. Cleland

Free literature available: General Catalog (printed bi-annually - current 1973-74) Switches-74 Brochures & application notes on specific products per "Economic Mini-Sweeper" enclosed.

Products manufactured: Adapters, Waveguide, Attenuators, Bends & Twists, Microwave, Circulators, Ferrite, Counters, Couplers, Detectors, Dummy Loads, Filters, Generators, Horns, Microwave, Isolators, Joints, Rotary, Microwave, Junctions, Hybrid, Microwave, Meters, Modulators, All Kinds, Oscillators, Receivers, Shifters, Slotted Lines, Microwave, Switches, Tees, Terminals, Tuners, Waveguides & Adapters

Local Sales Offices & Reps.

Cal Corona del Mar, Cleland & Co. 213-673-3787
Cal Mountain View, Walter Assocs. 415-965-4136
Tex Arlington, J.T. Houston Assocs. 817-265-2931

SJOBERG, C. & SON, INC., 415 Station St., Cranston, R.I., 02910, Tel: 401-461-8220; Empl.: 20; Minimum order: \$20

Customer service: C. Sjoberg Jr.

Free literature available: Catalog sections on flat clips, "U" shaped clips, terminals, strain reliefs, specialty hardware, applying tools, and textile hardware

Products manufactured: Boxes, Junction, Outlets & Wall Plates, Clamps & Clips, Connectors, Contacts, Electrical, Eyelets, Fasteners, Grommets, Insulators & Insulation, Machines/Machinery, Production, Pliers, Services, Assembly, Production & Test, Splices, wire (Including, Butt & Cap Types), Strain Reliefs, Cable & Wire, Strips, Switch Hardware, Terminal Blocks, Boards & Strips, Terminals, Tools

Local Sales Offices & Reps.

NY Mattydale, W.M. Onyx Co. 315-446-7930

Advertisement

We specialize in the development and manufacture of terminals, "Little Gem" connector clips, strain reliefs, etc. together with the machines and dies for applying. Special terminals and related hardware will be developed to your specifications if our stock items do not meet your requirements. Requests for samples, catalogs, and quotations are invited.

SKAN-A-MATIC CORP., Box 5, Elbridge, N.Y., 13060, Tel: 315-689-3961, TWX: 710-545-0220; Empl.: 50; Minimum order: \$18

For info on price: B. J. Cottrell ext. 30; Application info: D. E. Kopp, Appl. Engr. ext. 35; Customer service: B. J. Cottrell ext. 30; Delivery info: B. J. Cottrell ext. 30

Free literature available: Complete catalog of subminiature photoelectric detectors and controls. Control Module Catalog - A building block approach to specialized electronic control systems.

Products manufactured: Alarms, Amplifiers, Cells, Photoconductive, Photoemissive, Photovoltaic, Controls/Control, Eqpt., Detectors, Diodes, Indicators, Lamps, Scanners, Switches

Local Sales Offices & Reps.

Ariz Phoenix, Luscombe Engrg. Co. 602-274-8128
Cal Pasadena, Luscombe Engrg. Co. 213-684-2000
Cal San Mateo, Luscombe Engrg. Co. 415-342-7057
Colo Lakewood, Intermountain Instrs. 303-237-0443
Conn Meriden, Abbott-Allison Co. 203-237-9232
Fla Orlando, Datarep, Inc. 305-843-5224
Ill La Grange, Olson Engrg. & Sls. Corp. 312-482-3300
Ind Anderson, K. E. Schneider 317-644-1690
Md Rockville, Farrell Assocs. 301-424-9460
Mass E. Bridgewater, Abbott-Allison Co. 617-245-0250
Mich Birmingham, Electro-Mation Assocs. 313-564-6517
Minn Minneapolis, Loren Green Assocs. 612-781-1611
Mo St. Louis, J. Durbin Co. 314-966-6500
NJ Bogota, Neville & Vespo Corp. 201-487-1505
NY Elbridge, L-Tron Corp. 315-689-3787
NC Charlotte, Systems Service Corp. 704-377-3407
Ohio Cleveland, Fred R. Sharp Co. 216-464-3820
Pa Glenside, C.A. Briggs Co. 215-885-2244
Pa Pittsburgh, R.W. Moulton & Assocs. 412-366-3333
Tex Houston, Scientific Sls. Co. 713-666-5318
Tex Richardson, Scientific Sls. Co. 214-231-6541
Wisc Milwaukee, Olson Engrg. & Sls. Corp. 414-873-7330

SKINNER POLYNOID DIV., Skinner Precision Inds., Inc., 95 Edgewood Ave., New Britain, Conn., 06050, Tel: 203-225-6421, TWX: 203-225-2591; Empl.: 500; Minimum order: \$25

For info on price: N. O'Neil; Application info: W. J. Adams; Customer service: A. Patti; Delivery info: A. Patti

Free literature available: Design Bulletin #1 & #2; Price List; Discount Schedule; Applications; Specification Form; Technical Paper.

Products manufactured: Actuators, Motors

Local Sales Offices & Reps.

Ill Oak Brook, Skinner Prec. Ind. Inc. 312-654-1886
NY Brooklyn, Eastern Elctn. Sls. Co. 212-763-5180
Pa Ardmore, Rothenheber & Wurts, Inc. 215-649-6300

SKYDYNE A BROOKS & PERKINS CO., River Rd., Port Jervis, N.Y., 12771, Tel: 914-856-6655, TWX: 510-260-1249; Empl.: 130; Minimum order: \$25

Customer service: L. W. Morris

Products manufactured: Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Cases, Transit, Containers, Covers, Protective (Including Dust), Laminates, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Ala Huntsville, Ridge Instr. 205-837-3211
Ariz Scottsdale, Runyon Co. 602-959-6060
Cal Hawthorne, WCV Co., Inc. 213-772-4479

Cal Los Altos, Weslab 415-948-8885
Colo Denver, Crump Co. 303-426-1443
Ill Chicago, Berndt Assocs. 312-283-0713
Ind Carmel, Berndt Indiana Br. 317-844-0114
Kans Leawood, Thunderbird Tech. Sls. 913-642-7220
Kans Wichita, Thunderbird Tech. Sls. 316-684-3941
Md Baltimore, M/E Assocs. 301-825-1130
Mass Lexington, J.E. Boeing 617-862-2500
Mich Royal Oak, Group Ten 313-549-3910
Mo St. Louis, Thunderbird Tech. Sls. 314-567-6488
NJ Cherry Hill, M/E Assoc. 609-667-6110
NJ Florham Pk., L. McFadden 201-377-6014
NY Fayetteville, M. P. Andrews, Inc. 315-637-3144
Ohio Cleveland, Group Ten 216-482-2800
Ohio Dayton, Group Ten 513-277-6531
Tex Ft. Worth, Dyna Reps. 817-451-1392
Wash Seattle, WesLab Sls. Corp. 206-243-7070
Wisc Brookfield, Berndt (Mil. Br.) 414-786-6950
EXP: N.Y., New York, W.D. Blood Co. 212-344-0210
FOR: Can., Stoney Creek, Ont., Simmonds Aerocessories of Canada 416-664-6203

SLAUGHTER CO., Moore & Hailey Sts., Ardmore, Okla., 73401, Tel: 405-223-4773, TWX: 910-830-6972; FSC No: 05611 p. 1-806-809

For info on price: Sls.; Application info: Application Eng.; Customer service: Sls.; Delivery info: Sls.

Free literature available: Handbook of Automatic Testing, Armature & Stator Testing Notes, Basic Facts About High Voltage Testing, Condensed Catalog/Price List - Test Equipment, Catalog Stroboscopes

Products manufactured: Bridges, Comparators, Controllers, Programmable, Lights, Locators, Open-Short, Meters, Probes, Tachometers, Testers

SLOAN COMPANY, 7704 San Fernando Rd., Sun Valley, Cal., 91352, Tel: 213-875-1123, TWX: 910-498-2250; Empl.: 21 p. 2-1190-1197

For info on price: S. Daniel, 213-875-1124; Application info: J. Bailey, 213-875-1124; Customer service: S. Daniel; Delivery info: S. Daniel, 213-875-1125

Free literature available: Brochures: Panel Mount Fixed LED Indicator Light; LED Relampable Indicator Light; Sloan Cartridge Indicators; Panel Mount Fixed Lamp; Panel Mount Front Relampable Indicator Lights; Front Relampable Indicator Lights; Two terminal front relampable indicator lights; P175 Design Kit.

Products manufactured: Caps, Lenses, Indicator Light, Diodes, Lamps, Lights, Sockets

Local Sales Offices & Reps.

Ala Huntsville, 20th Century Mktg., Inc. 205-772-9237
Ariz Scottsdale, E.J. Foley & Assocs. 602-945-2665
Cal Los Angeles, P. Wiley Co. 213-663-8028
Cal San Carlos, D.H. Ross Co. 415-591-4411
Colo Denver, Comtech, Inc. 303-756-6815
Conn Meriden, Eagle Assocs. 203-235-9036
Ga Douglasville, 20th Century Mktg. Inc. 404-942-6483
Ill Des Plaines, E. Flaxman Co. 312-298-8580
Ind Carmel, Berndt Assocs., Inc. 317-844-0114
Kans Wichita, L.F. Florence Co. 316-838-7226
Md Bethesda, W. Mount Co. 301-657-9312
Mass Pinehurst, Eagle Assocs. 617-444-3446
Mich Jackson, N. Scroggs Co. 517-750-1170
Minn Minneapolis, Electro-Serv Co. 612-827-2907
Mo Kansas City, L.F. Florence Co. 816-561-7222
Mo St. Louis, L.F. Florence Co. 314-227-5897
NJ Cherry Hill, Quality Components 609-428-6266
NJ Englewood Cliffs, E. Glass Assocs. 212-586-8440
NM Albuquerque, F.R.Y.-Gates Co. 505-298-1875
NY Rochester, H.R. Murray, Inc. 716-244-1100
NY Syracuse, H.R. Murray, Inc. 315-446-5555
NC Gastonia, Warren Mount Co. 704-867-2101
Ohio Dayton, N. Case Assocs. 513-433-0966
Ohio Rocky River, N. Case Assocs. 216-333-4120
Tex Dallas, W. Reese Assocs. 214-638-6575
Tex Houston, W. Reese Assocs. 713-621-3134
Wash Seattle, D. Smith Sls. Co. 206-633-3160
FOR: Can., Ottawa, Ont., Wilson Entprs. 514-224-9878
FOR: Can., Toronto, Ont., Wilson Entprs. 416-766-0510

SLOAN TECHNOLOGY CORP., 535 E. Montecito St., Santa Barbara, Cal., 93103, Tel: 805-963-4431, TWX: 910-334-4901; Empl.: 130; Minimum order: \$20

For info on price: B. Moore; Application info: S. Maxman; Customer service: J. Wafer; Delivery info: B. Moore

Free literature available: 1974-75 Sloan Product Catalog - Technical Description, Specifications and application on Vacuum Deposited Thin Film Deposition and Sputtering Equipment.

Products manufactured: Chamber, Environmental Test, Crystals, Deposition Equipment, Vacuum & Accessories, Evaporation Equipment, Electron Beam, Feedthrus & Seals, Environmental, Interferometer Systems, Monitors, Recorders, Testers, Transformers

Local Sales Offices & Reps.

Colo Denver, G. O'Brien Sls. Agency 303-477-4713
Ga Atlanta, G.H. Crossley Assocs. 404-261-4278
Ill Park Ridge, B. Ellis & Assocs. 212-298-7626
Mass Boston, Industrial Equip. & Sls. 617-227-8112
NY Clifton Park, Empire Technology, Inc. 518-371-2480
NY Rochester, Empire Technology, Inc. 716-225-5820
Ore Yamhill, Walsh-Ehlers Co. 503-662-3207
Pa Pittsburgh, Kurt J. Lesker Co. 412-892-2996
Tex Richardson, Yarbrough Southwest Co. 214-690-0800
Wash Bellevue, Walsh-Ehlers Co. 206-454-2211

SMITH INC., HERMAN H., 812 Snediker Ave., Brooklyn, N.Y., 11207, Tel: 212-272-9400, TWX: 710-584-2363; Empl.: 200; Minimum order: \$100 p. 2-813-893

For info on price: C. Gold; Application info: F. Kaufman; Customer service: S. Latner; Delivery info: B. Knittel

Products manufactured: Bearings, Boards, Plug-In, Boards, Printed Circuit, Bumpers, Cabinets & Accessories, Cable Assemblies & Harnesses, Cable, Cases, Equipment, Instrument, Meter, Clamps & Clips, Connector Blocks, Mother Board, Connector Boxes & Strips, Power Outlet, Connectors, Cords, Couplings, Etchants, Printed Circuit, Fasteners, Feedthrus & Seals, Environmental, Grommets, Handles For Cabinets, Circuit Boards, Racks, etc., Heat Sinks, Soldering, Holders, Test Lead, Insulators & Insulation, Jack Adapters (All Types), Jacks (All Types), Jumpers, Kits, Connector, Kits, Terminal, Knobs, Leads, Test & Adaptors, Lights, Locks, Dial & Shaft, Pads, Transistor Mounting, Plug Adapters, Plug & Jack Sets, Plug Buttons, Plug Caps & Shells, Plugs, Posts, Probes, Punches, Chassis, Racks, Shafts & Adapters, Socket Adapters, Sockets, Spacers, Strain Reliefs, Cable & Wire, Suppressors, Switch Hardware, Switch Mounting Plates, Switches, Terminal Blocks, Boards & Strips, Terminals, Tools, Transistor, Diode, Thyristor Heat Dissipators, Tubing, Wire, Wire & Cable Ties

Local Sales Offices & Reps.

Ariz Phoenix, Sheffer-Kahn 602-258-7893
Cal Los Angeles, E.E. Strassner Co. 213-666-1511
Cal Redwood City, Warren-Hickey Sls. 415-368-3849
Colo Denver, Sheffer-Kahn 303-831-9087
Conn Waterbury, Coakley, Boyd & Abbott 203-272-2261
Fla Bradenton, Hutto Hawkins Perego 813-755-4015
Fla Maitland, Hutto Hawkins Perego 305-831-2474
Fla Pompano Beach, Hutto Hawkins Perego 305-943-9593
Ga Atlanta, Millar Elctms. 404-261-6160
Ill Chicago, J.J. McBride Sls. 312-775-1080
Ind Indianapolis, Schroeder & Loomis 317-251-4571
Kans Overland Park, Lowell Kangas & Assoc. 913-631-3515
La Metairie, J.F. McKinney Sls. 504-887-1723
Md Lutherville, L.D. Lowery 301-823-2172
Md Silver Spring, L.D. Lowery 301-439-3542
Mass Needham, Coakley, Boyd & Abbott 617-444-5470
Mich Ferndale, Shalco 313-547-4771
Minn Minneapolis, C.R. Gibb 612-377-1200
Mo St. Louis, Lowell Kangas & Assoc. 314-821-4050
NM Albuquerque, Sheffer-Kahn 505-265-7077
NY North Syracuse, L.D. Allen 315-458-7470
NY Snyder, L.D. Allen 716-839-3300
NY Yonker, J. Brown Elctr. 914-779-7330
Ohio Dayton, Bear Mktg. 513-299-3566
Ohio Richfield, Bear Mktg. 216-659-3331
Okla Tulsa, J.F. McKinney Sls. 918-742-6791
Ore Portland, Dale Weber 503-234-7671
Pa Broomall, L.D. Lowery 215-356-5300
Pa Pittsburgh, Trymax Co. 412-823-8400
RI Harrisburg, L.D. Lowery 717-233-0917
Tex Bellaire, J.F. McKinney Sls. 713-774-3232
Tex Dallas, J.F. McKinney Sls. 214-631-9450

Va Charlottesville, L.D. Lowery804-973-6672
 Va Fredricksburg, L.D. Lowery703-371-5099
 Wash Seattle, D. Weber Co.206-623-5990
 Wash Spokane, D. Weber Co.509-624-3908
 FOR: Toronto 19, Atlas Radio Corp.416-781-6174

SNAP-ON-TOOLS, 8192-A 28th Ave., Kenosha, Wisc.,
 53140, Tel: 414-654-8681; Empl.: 2500

Customer service: D. Sorbie
 Products manufactured: Alternators, Analyzers,
 Benches, Consoles, Stools, Tables, Chargers,
 Battery, Couplings, Cutters, Wire, Hand Operated,
 Detectors, Drills & Accessories, Hand & Power,
 Drivers, Nut, Flashlights & Lanterns, Gages,
 Machines/Machinery, Production, Meters,
 Oscilloscopes, Pliers, Pumps, Vacuum,
 Screwdrivers, Soldering Guns, Irons &
 Desoldering Tools, Stands, Instruments, Testers,
 Tools, Welding Equipment & Access. (Excluding
 Equip. for Semiconductor Devices), Wire
 Twisters, Wrenches

SODECO DIV., Landis & Gyr, Inc., 4 Westchester Plaza,
 Elmsford, N.Y., 10523, Tel: 914-592-4400, TWX:
 710-567-1219; Empl.: 65; Minimum order: \$25

p. 1•260,261

Products manufactured: Bearings, Controls/Control
 Eqpt., Counters, Indicators, Motors, Printers,
 Switches, Timers, Totalizers, Digital

Local Sales Offices & Reps.

Ala Huntsville, Beacon Electronic Assos., Inc.
 205-881-5031
 Ariz Tempe, Trembley Assos.602-966-4468
 Cal Los Altos, Recht415-941-0336
 Cal Los Angeles, Universal Comps.213-641-4255
 Colo Denver, Thorson Co.303-759-0809
 Conn Old Lyme, Aid Engrg.203-673-3692
 Conn Rocky Hill, Aid Engrg.203-673-3692
 Fla Ft. Lauderdale, Beacon Elctns.305-776-6074
 Fla Maitland, Beacon Elctns.305-647-3498
 Ga Atlanta, Beacon Elctns.404-351-3654
 Haw Honolulu, Berkley Engrg.808-538-1921
 Ill Rolling Meadows, Sumer312-394-4900
 Md Glen Arm, Hodgins Assos.301-592-7047
 Md Towson, Hodgins Assos.301-296-0414
 Mass Westboro, Aid Engrg.617-890-8181
 Mich Detroit, L. Dickelman313-255-3300
 Minn New Brighton, TWC Sls.612-636-1770
 Miss Hernando, Beacon Elctns.601-368-9008
 Mo Kansas City, R.R. Burton Sls. Co.816-444-8300
 Mo St. Louis, Delltron Co.314-869-1351
 NM Albuquerque, Trembley Assos.505-293-4444
 NY Buffalo, Application Specialists716-834-3377
 NY East Syracuse, Application Specialists315-437-2813
 NY Mt. Vernon, D. Sonkin914-668-9809
 NY Rochester, Application Specialists716-586-6226
 NC Greensboro, Beacon Elctns.919-674-9432
 SC Spartanburg, Beacon Elctns.803-582-4613
 Tex Dallas, RMA/Southland214-361-8584
 Tex Houston, RMA/Southland713-462-4077
 Wash Mercer Island, J. Andersen206-232-0484

Local Distributors

Ind Indianapolis, B & B Motor & Controls, 3512
 Rockville Rd.317-248-0396
 NY New York, B & B Motor & Controls, 96 Spring St.
 212-966-5777
 NY Rochester, B & B Motor & Controls, 3259 Winton
 Rd. S.716-473-6640

SOLA ELECTRIC, 1717 Busse Rd., Elk Grove Village, Ill.,
 60007, Tel: 312-439-2800, Telex: 28-3451; Empl.: 450;
 Minimum order: \$500

Customer service: AC Prods. Grp.

Free literature available: Catalog + 630-Voltage
 Regulators Sizes, description, electrical
 characteristics of constant voltage transformers,
 line regulators and computer line regulators.
 Catalog + 624-Theory, Design and
 Operation-design criteria for Ferro-Resonance
 Transformers, Line Voltage Regulators.

Products manufactured: Connector Adapters,
 Power Supplies, Reactors, Regulators, Stabilizers,
 Line Impedance, Transformers

Local Sales Offices & Reps.

Ariz Phoenix, Hytronic Div. of Zeus, Inc.
 602-253-6104
 Cal Inglewood, J. Berman Co.213-678-1281
 Cal Oakland, Moulthrop Sls. Inc.415-261-7676
 Colo Denver, Hytronic Div. of Zeus, Inc.
 303-388-4081
 Fla Orlando, Cartwright & Bean, Inc.305-896-2031
 Fla Plantation, Cartwright & Bean, Inc.
 305-791-3989

Ga Atlanta, Cartwright & Bean, Inc.404-237-2273
 Ill Chicago, GNB Assocs., Inc.312-673-4050
 Ind Fort Wayne, Baehr, Greenleaf & Assoc., Inc.
 219-483-6864
 La Chalmette, Cartwright & Bean, Inc.
 504-279-4598

Mass Norwood, JMG, Inc.617-762-5333
 Mich Detroit, R.C. Merchant & Co.313-535-6000
 Mich St. Joseph, R.C. Merchant & Co.616-983-7378
 Minn Minneapolis, Stack-Johnson, Inc.612-925-2111
 Miss Jackson, Cartwright & Bean, Inc.601-354-1368
 Mo Kansas City, Forristal-Young Sls. Co.
 816-358-6771

Mo St. Louis, Forristal-Young Sls. Co.314-645-2360
 Neb Omaha, Forristal-Young Sls. Co.402-393-6191
 NJ Cherry Hill, Trinkle Sls., Inc.609-667-3500
 NM Albuquerque, Hytronic Div. of Zeus, Inc.
 505-268-3941

NY Mineola, Wilco Sls.516-294-9840
 NY Rochester, L-Mar Assocs.716-328-5240
 NY Syracuse, L-Mar Assocs.315-446-2135
 NC Charlotte, Cartwright & Bean, Inc.
 704-333-6457

NC Raleigh, Cartwright & Bean, Inc.919-832-7128
 Ohio Cincinnati, Baehr, Greenleaf & Assoc.
 513-891-3826
 Ohio Columbus, Baehr, Greenleaf & Assoc.
 614-486-4046

Ohio Lakewood, Baehr, Greenleaf & Assoc.
 513-221-9030
 Ore Portland, Earl & Brown Co.503-292-9145
 Tenn Memphis, Cartwright & Bean, Inc.
 901-276-4442

Tex Dallas, Robert E. Nesbitt Co.214-357-4601
 Tex Houston, Robert E. Nesbitt Co.713-224-3633
 Utah Salt Lake City, Hytronic Div. of Zeus, Inc.
 801-466-4924

Wash Seattle, Earl & Brown Co.206-284-1121
 Local Distributors

Ala Birmingham, J. W. Clary Co., 1713 Second Ave.
 S.205-322-2488
 Ala Birmingham, M. G. Electronic & Equip., 3112-6th
 Ave. S.205-328-4525

Alas Anchorage, Yukon Radio Supply, 3222
 Commercial Dr.
 Ariz Little Rock, D. White Elctns., 1222 Main St.
 501-376-1391

Ariz Phoenix, Cramer Elctns., 2643 E. University Dr.
 602-263-1112
 Ariz Phoenix, Kierulff Elctns., 2633 E. Buckeye Rd.
 Phoenix, Mirco Elctn. Dists., 2104 W. Peoria
 Ave.

Ariz Phoenix, Kierulff Elctns., 2633 E. Buckeye Rd.
 Phoenix, Mirco Elctn. Dists., 2104 W. Peoria
 Ave.
 Cal Garden Grove, Allied Elctns., 12311 Industry St.
 714-894-7581

Cal Glendale, Western Elctn. Supply, 229 S. Orange
 213-246-4861
 Cal Inglewood, Newark Elctns., 4747 W. Century
 Blvd.213-678-0441

Cal Los Angeles, Kierulff Elctns., 2585 Commerce
 Way213-685-5511
 Cal Mountain View, Abacus Elctns., 1065 Terra
 Bella Ave. Box B415-961-1500

Cal Oakland, Brill Elctns., 610 East 10th St.
 415-834-5888
 Cal Palo Alto, Kierulff Elctns., 3969 E. Bayshore Rd.
 714-683-5591

Cal Riverside, Electronic Supply, 2486 Third St.
 714-683-5591
 Cal Sacramento, Dunlap Elctns., 1800 18th St.
 916-444-4444

Cal Denver, Cramer/Denver Elctns., 5465 E. Evans
 Pl. at Hudson303-758-2100
 Colo Denver, Industrial Elctns., Box 22457
 Denver, Newark-Denver Elctn. Supply, 2170 S.
 Grape St.303-757-3351

Conn Hamden, Wilshire Elctns./Conn., 2554 State St.
 203-281-1166
 Conn Hartford, Electrical Supplies, 3466 Main St.
 203-527-7111

Conn Waterbury, Bond Radio Elctns., 439 West Main
 St.203-753-1184
 Fla Hollywood, Cramer/EW, 4035 N. 29th Ave.
 305-923-8181

Fla Jacksonville, Southeast Elctns., 1125 Rosselle
 St.904-356-3007
 Fla Miami, Electro Standards Lab., 3560 N. W. 34th
 St.305-633-6975

Fla Miami, Electronic Equip., 2701 N.W. 42nd Ave.
 305-635-0421
 Fla Orlando, Brownell Electro, 307 27th St.
 305-843-6770

Fla Orlando, Hammond Elctns., 911 W. Central
 Blvd.305-241-6601
 Fla Pensacola, Grice Elctns., 320 E. Gregory
 904-433-4616

Fla Tampa, Lykes Elctns., 5426 W. Crenshaw
 813-886-6621
 Ga Atlanta, Brownell Electro, 3020 Commerce Way
 404-767-8761

Ga Atlanta, Lykes Elctns., 1135 Chattahoochee,
 NW404-355-2223
 Ga Atlanta, Specialty Dist., 763 Juniper St. N. E.
 404-873-2521

Haw Honolulu, Nylan Bros. & Co., 820 S. Beretania
 ST. Box 2958208-343-7937
 Haw Honolulu, Victor Kim Elctns., 625 South St.
 Idaho Boise, Oakley Wholesale, 7605 Idaho St.

Ill Broadview, LComp-Chicago, 2030 W. 16th St.
 312-865-7600
 Ill Chicago, Electronic Dists., 4900 N. Elston Ave.
 312-283-4800

Ill Chicago, Newark Elctns., 500 N. Pulaski Rd.
 312-638-4411
 Ill Elgin, Allied Elctns., 1355 Sleepy Hollow Rd.
 312-697-8200

Ill Mt. Prospect, Cramer-Chicago, 1911 S. Busse
 Rd.312-593-8230
 Ill Palatine, OHM/Electronics, 649 Vermont Ave.
 312-359-5500

Ill Peoria, Klaus Radio, 8400 N. Pioneer Pkwy.
 309-691-4840
 Ill Rockford, J & M Electronics, 2001-9th St.
 815-963-6445

Ill Rockford, Mid-West Assoc., 225 S. 6th St.
 815-962-8036
 Ill Schaumburg, Motorola, 1301 E. Algonquin
 Ill Skokie, Sargent-Welsh Scientific, 7300 N.
 Linder Ave.312-267-5300

Ind Evansville, Ohio Valley Sound, 20 E. Sycamore
 St.812-425-6173
 Ind Fort Wayne, Fort Wayne Electronics Supply,
 3606 Maumee Ave.219-742-4346

Ind Indianapolis, Graham Elctns. Sply., 133 S.
 Pennsylvania317-634-8486
 Ind Indianapolis, RA-DIS-CO, 814 N. Senate Ave.
 317-637-5571

Ind* South Bend, Radio Distributing, 1212 S. High St.
 219-288-4666
 Iowa Cedar Rapids, Deeco, Inc., 2500 16th Ave. SW
 319-365-7551

Kans Wichita, Radio Supply, 115 Laura
 316-AM7-5216
 Ky Lexington, Radio Elctns. Equip., 480 Skain St.
 606-255-6661

Ky Louisville, E. & H. Elec. Supply, 804 S. 5th St.
 502-587-0991
 Ky Louisville, P. I. Burks Co., 842 South Seventh St.
 502-583-2871

La Lafayette, Ralphs of Lafayette, 3004 Cameron
 St.318-234-4507
 La New Orleans, Lykes Elctns., 3308 Orleans Ave.
 504-486-7441

La New Orleans, Radio Parts, 1331 Pryntania St.
 504-581-5959
 La New Orleans, Southern Radio Supply, 1909
 Tulane Ave.504-524-2345

La Shreveport, Industrial Elctn. Supply, 2422
 Southern Ave.318-422-9459
 Md Baltimore, A S I Elctns., 1728-30 Whitehead Rd.
 301-265-5100

Md Baltimore, Radio Elec. Svc., 1026 Cromwell
 Bridge Rd.301-823-0070
 Md Gaithersburg, Cramer/EW, 16021 Industrial Dr.
 301-948-0110

Md Rockville, Capitol Radio Wholesalers, 12270
 Wilkins Ave.301-881-2270
 Md Rockville, Pioneer-Washington Elctns., 1037
 Taft St.301-424-3300

Mass Cambridge, H. Young Jr., 72 Rogers St.
 Mass Cambridge, Wilshire Elctns./New England, 205
 Alewife Brook Pkwy617-491-3300

Mass Newton Center, Cramer Elctns., 85 Wells Ave.
 617-969-7700
 Mass North Wilbraham, Industrial Comps., 2551
 Boston Rd.413-596-3854

Mass Watertown, Sterling Elctns., 51 Spring St.
 617-926-9720
 Mass Worcester, R M Elctns., 80 Thomas St.
 617-756-8311

Mich Ann Arbor, Wedemeyer Elctn. Supply, 2280 S.
 Industrial Hwy313-665-8611
 Mich Detroit, Fife Elctn. Supply, 1211 Trumbull
 Mich Detroit, Newark/Detroit Elctns., 20700 Hubbell
 313-548-0250

Mich Detroit, R. S. Elctns., 12775 Lyndon Ave.
 313-491-1000
 Mich Flint, Shand Electronics, 2401 S. Dort Hwy.
 313-743-8940

Mich Grand Rapids, R. S. Elctns., 300 36th St. S. E.
 616-459-4611
 Mich Jackson, Fulton Radio Supply, 1208 Greenwood
 Ave.517-784-6107

Mich Kalamazoo, All-Phase Electric Sply., 710 Gibson
 St.616-381-1114
 Mich Lansing, Fulton Radio Supply, 2707 Alpha St.
 517-489-6519

Mich Madison Heights, Lysinger Photo Supply, 30391
Stephenson Hwy. 313-583-1070

Mich Marquette, NWR Elctns., 1010 W. Washington
St. 906-226-7578

Mich Muskegon, Western Elctn. Supply, 1781 Fifth
St. 616-722-7628

Mich Oak Park, Cadillac Electric Supply, 20700
Hubbell Ave. 313-548-0260

Mich Wyoming, Newark Ind'l. Elctns., 3645 Linden
Ave. 616-241-6681

Minn Edina, Cramer/Bonn, 7275 Bush Lake Rd.
612-941-4860

Minn St. Paul, Gopher Elctns., 2520 W. Larpentour
Ave. 612-645-0889

Miss Jackson, Ellington Elctn. Supply, 1425 Terry Rd.
601-355-0561

Mo Kansas City, Burstein-Applebee, 3190 Mercier
St. 816-531-5614

Mo Kansas City, Walters Radio Supply, 3627 35
Main St. 816-531-7015

Mo No. Kansas City, LComp-Kansas City, 1520
Taney St. 816-221-2400

Mo St. Louis, LComp-St. Louis, 2605 S. Hanley Rd.
314-647-5505

Mo St. Louis, Melvill B. Hall, 3001 Spruce St.
314-371-7000

Mont Great Falls, Holm James Distrs., 320 6th St. So.
406-761-2420

Neb Lincoln, Scott Elctn. Sy, 4040 Adams St.
402-434-8308

Neb Omaha, Omaha Radio Equip., 625 N. 18th St.
402-341-7700

NJ Moonachie, Cramer, 1 Barratt Ave.
201-687-7870

NJ Springfield, Federated Elctns. Div., 155 U.S.
Rte. 22 201-376-8900

NM Albuquerque, Hyer-Cramer Elctns., 137
Vermont, N.E. 505-265-5767

NY Albany, E. E. Taylor Co., 465 Central Ave.
518-489-5600

NY Binghamton, Harvey Federal Elctns., Box 1208 -
Vestal Pkwy. 607-748-8211

NY Buffalo, Summit Distrs., 916 Main St.
716-884-3450

NY Farmingdale, Arrow Elctns., 900 Broad Hollow
Rd. 516-694-6800

NY Huntington Station, Texas Instr. Supply, #2
Huntington Quad

NY Long Island City, H. L. Dalis, 35-35 24th St.
212-361-1100

NY Lynbrook, Peerless Radio, 19 Wilbur St.
516-593-2121

NY Plainview, Texas Instr. Supply, 245 Newton Rd.
516-293-2660

NY Rochester, Requa Electrical Supply, 2005
Brghn-Hentta, Town Line Rd. 716-442-2020

NY Rochester, Simcona Elctns., 275 Mt. Read Blvd.
716-328-3230

NC Asheville, Southeastern Radio Supply, 1065
Patton Ave. 704-253-1146

NC Charlotte, Brownell Electro, 5141 Belhaven Blvd.
704-392-7451

NC Greensboro, Hammond Electronics, 2923 Pacific
Ave. 919-275-6391

NC Raleigh, Southeastern Radio Supply, 414
Hillsboro St. 919-828-2311

NC Winston-Salem, Cramer/EW, 938 Burke St.
919-725-8711

NC Winston-Salem, Kirkman Elctns., 901 W.
Second Ave. 919-724-0541

Ohio Akron, Akron Elctns., 107 S. Arlington St.
216-762-8818

Ohio Akron, Sun Radio Co., 110 E. Market St.
216-434-2171

Ohio Cincinnati, Hughes-Peters, 4865 Duck Creek Rd.
513-381-7625

Ohio Cincinnati, Newark-Herrlinger Elec., 9799
Princeton 513-241-5282

Ohio Cleveland, Pioneer-Cleveland, 4800 E. 131st St.
216-587-3600

Ohio Columbus, Hughes-Peters, 481 E. 11th Ave.
614-294-5351

Ohio Dayton, J. A. Becker Co., 1341 E. 4th St.
513-226-1341

Ohio Dayton, Pioneer/Dayton, 1900 Troy St.
513-236-9900

Ohio Dayton, Stotts-Friedman, 108 N. Jefferson St.
513-224-1111

Ohio Lima, Lima Radio Parts Co., 150 W. Grand Ave.
419-225-1220

Ohio Solon, Radio & Elctn. Parts, 6835 Cochran Rd.
216-248-8900

Ohio Toledo, Warren Radio, 1002 Adams St.
419-248-3364

Ohio Warren, REM Elctns. Supply, 264 W. Market St.
216-399-2777

Ohio Youngstown, Ross Radio, 325 W. Federal St.
216-746-8881

Okla Tulsa, Radio, Inc., 1000 S. Main St.
918-587-9123

Okla Tulsa, S & S Radio Supply, 537 S. Kenosha St.
918-582-8242

Ore Portland, Eoff Electric, 509 N.W. 10th St.
503-222-9411

Ore Portland, Platt Elec. Supply, 1305 N. W. Davis
503-228-6121

Ore Portland, United Radio Supply, 123 N. E. 7th
Ave. 503-233-7151

Pa Altoona, Allegheny Elctns., 800 Chestnut Ave.
Braddock, Leff Radio Parts Co., 225 Braddock
Ave.

Pa Drexel Hill, Kass Elctns., 2502 Township Line
Rd. 215-568-3500

Pa Erie, Warren Radio, 1315 Peach St.
814-454-5285

Pa Harrisburg, Pyttronic Inds., Box 1967 Balto,
Wabash Ind'l. Ctr. 717-233-6591

Pa Philadelphia, Herbach & Rademan, 401 E. Erie
Ave. 215-426-1700

Pa Pittsburgh, Cameradio Co., Inc., 2801 Liberty
Ave. 412-288-2600

Pa Pittsburgh, Fisher-Scientific, 711 Forbes Ave.
412-391-1330

Pa Pittsburgh, McCollough Elec., 419 Fort Pitt Blvd.
412-261-2420

Pa Pittsburgh, R. P. C. Elctns., 620 Alpha Dr.
412-782-3770

Pa Reading, Barbey Elctns., 333 N. 4th St.
215-376-7451

Pa Westchester, Westchester Elec. Supply, 716 E.
Market St. 215-696-7500

RI Providence, Wm. Dandretta & Co., 28 Wolcott
St. 401-861-2800

SC Charleston, Wholesale Radio Supply, 515 E. Bay
St. 803-722-2634

SC Columbia, Dixie Radio Sply., 1900 Barnwell St.
803-253-5333

SC Greenville, Hammond Electronics, 100 Augusta
St. 803-233-4121

Tenn Kingsport, Radio Elec. Supply, 961 E. Sullivan
St. 615-247-8111

Tenn Knoxville, Roden Electrical Supply, 124-144
Oklahoma 615-524-9851

Tenn Memphis, Bluff City Dist., 234 East St.
901-725-9500

Tenn Memphis, Brownell Electro, 3053 Tranquillity Dr.
901-323-7693

Tenn Nashville, Electra Distributing, 1914 West End
Ave. 615-255-8444

Tex Corpus Christi, Wicks Radio Equip., 513 S.
Staples 512-884-8285

Tex Dallas, Texas Instr. Supply, 6000 Denton Dr.
214-238-3333

Tex Dallas, Wholesale Elctn. Supply, 2809 Ross
Ave. 214-824-3001

Tex El Paso, Midland Specialty, 2235 Wyoming Ave.
915-533-9555

Tex Fort Worth, Allied Elctns., 401 E. 8th St.
Houston, Curtin/Matheson Scien., 4220
Jefferson St. 713-923-1661

Tex Houston, Harrison Equip. Co., 1616 McGowen
713-224-9131

Tex Houston, Sterling Elctns., 4201 Southwest
Fwy. 713-623-6600

Tex McAllen, McAllen Radio Elctns., 413-415 S.
Bdwy. 512-682-2361

Tex Port Arthur, J & M Industrial Supply, 700
Seventh St. 713-883-2055

Tex Stafford, Southwest Elctns., 12725 Royal Dr.
Texarkana, McCollough Electric, 1222 Main St.
214-792-6923

Utah Salt Lake City, Standard Supply, 225 E. Sixth St.
801-355-2971

Va Charlottesville, Virginia Radio Supply, 715 Henry
Ave. 703-296-4184

Va Norfolk, Priest Elctns., 6431 Tidewater Dr.
703-855-3017

Va Richmond, Meridan Elctns., 1001 W. Broad St.
703-355-6521

Wash Seattle, Almac/Stroum Elctns., 5811 Sixth Ave.
So. 206-763-2300

Wash Seattle, Cramer/Seattle, 5602 Sixth Ave. S.
206-762-5755

Wash Seattle, Radar Elec., 168 Western Ave. W.
Wash Seattle, Seattle Radio Supply, 2117 Second Ave.
206-624-2341

Wash Seattle, Western Elctns., 717 Dexter Ave. No.
206-284-0200

Wash Spokane, Northwest Elctns., 730 E. First Ave.
509-534-2644

Wisc Milwaukee, Marsh Elctns., 6047 W. Beloit Rd.
414-545-6500

Wisc Milwaukee, Parts Mart, 1314 N. 7th St.
414-276-4160

SOLAR ELCTNS. CO., 901 N. Highland, Hollywood, Cal.,
90038, Tel: 213-462-0806; FSC No: 13222; Empl.: 10;
Minimum order: \$1
Customer service: A. T. Parker
Free literature available: Catalog shows complete
line of instruments, components and accessories
essential for EMI testing.
Products manufactured: Amplifiers, Antennas,
Filters, Generators, Insertion Loss Measurement
Systems, Meters, Probes

Advertisement

A UNIQUE LINE OF INSTRUMENTS, COMPONENTS AND ACCESSORIES TO ASSIST THE RFI/EMC ENGINEER IN COMPLYING WITH MIL-STD-461 AND OTHER EMI SPECS. TRANSIENT GENERATORS, AUDIO POWER SWEEP GENERATORS, LISNS, CURRENT PROBES, ISOLATION TRANSFORMERS, EMI POWER METERS, FEED-THRU CAPACITORS, EMI FILTERS AND WAVE FILTERS.

SOLATRON ENTERPRISES, 421 E. Beach Ave.,
Inglewood, Calif., 90302, Tel: 213-678-4981; Empl.: 20;
Minimum order: \$25
Customer service: D. S. Rathje
Products manufactured: Bridges, Machines/Machinery, Production, Meters, Sockets, Testers
SOLDER REMOVAL CO., 1077 E. Edna Pl., Covina, Cal.,
91722, Tel: 213-331-0985, TWX: 910-584-1820; Empl.: 30
Customer service: T. H. Naylor 213-966-8321
Products manufactured: Coatings, Soldering Accessories, Soldering Guns, Irons & Desoldering Tools, Tools

Local Sales Offices & Reps.
Ala Huntsville, South Eastern Assocs., Inc.
205-539-9816
Ariz Phoenix, Maddox Sls. Co. 602-274-3807
Cal Los Angeles, Maddox Sls. Co. 213-949-5433
Cal San Francisco, Maddox Sls. Co. 415-431-2953
Ill Joliet, Hanat & Hall, Inc. 815-722-0436
Kans Shawnee Mission, M. E. Bettis Co. 913-362-0772
Md Phoenix, REBCO Sls. 301-592-8907
Mass Wayland, Ellingwood, Inc. 617-265-6400
NJ Wayne, G.T. Assocs. 201-694-6040
NM Albuquerque, Maddox Sls. Co. 505-298-2422
NY Syracuse, M.C. Antil, Inc. 315-468-2370
Ohio Cleveland, Buckeye Components 216-292-2889
Ohio Dayton, Buckeye Components 513-278-4279
Tex Dallas, E. Tron Sls. 214-348-4749

SOLID STATE INC., 46 Farrand St., Bloomfield, N.J.,
07003, Tel: 201-429-8700, TWX: 710-994-4780; Empl.:
60; Minimum order: \$25
For info on price: Sls.; Application info: A. Citro;
Customer service: Jayne; Delivery info: Mary
Free literature available: RF applications (micro
wave); PUT applications.
Products manufactured: Amplifiers, Diodes, Hybrid
Voltage Regulators, Integrated Circuit Devices,
Rectifiers, Thyristors (Includes Silicon Controlled
Rectifiers), Transistors

Local Sales Offices & Reps.
Ariz Tempe, J. Cain Assoc. 602-838-3404
Cal Seal Beach, Texel Sls. 213-596-9411
Fla Casselberry, E. I. R. 305-426-0606
Ill Chicago, C.L. Greenslade Sls. 312-561-0156
Mich Farmington, Repton 313-478-1024
NY New York, Solid State Inc. 212-964-5682

SOLID STATE DEVICES, INC., 14830 Valley View
Ave., LaMirada, Cal., 90638, Tel: 213-921-9660, TWX:
910-583-4807; Empl.: 100 p. 1-1864,1865
Products manufactured: Diodes, Rectifiers,
Transistors

Local Sales Offices & Reps.
Cal Escondido, Cirolia Elctn. Sls. 714-743-3015
Cal Los Altos, Stout-Loeswick Elect. Mktg. 415-948-3265
Fla Kissimmee, Nickerson Co. 305-846-6755
Fla Oldsmar, Nickerson Co. 813-855-4209
Fla Tampa, Nickerson Co. 813-885-1416
Ga Decatur, Nickerson Co. 404-631-4481

Mass	Brookline, Technology Prods.	617-731-0858
Mich	Warren, DEM Elctns.	313-755-6660
Minn	Minneapolis, Bitronics Sls.	612-835-7744
NJ	Wallington, Com-Tech Sls.	201-935-5454
NM	Albuquerque, J. Smith & Assocs.	505-255-2111
NY	Rochester, Ontec	813-885-8633
Ohio	Englewood, Daytech Sls.	513-836-8633
Tex	Dallas, J. Clay Co.	214-350-1281
Va	Fairfax, Shibley Assocs.	703-591-3008
Wash	Seattle, Underwood & Underwood	206-243-2133
Wisc	Brookfield, Berndt Assocs.	414-786-6950

SOLID STATE ELECTRONICS CORP., 15321 Rayen St., Sepulveda, Cal., 91343, Tel: 213-894-2271; Empl.: 15. p. 1-126, 1816

Products manufactured: Amplifiers, Analyzers, Choppers, Coders, Coils Including Assemblies & Forms, Comm. Systems, Comparators, Controls/Control Eqpt., Converters, Decade Boxes, Decoders, Demodulators, Detectors, Discriminators, Drivers, Chopper, Filters, Generators, Indicators, Keyers, Tone, Meters, Mixers, Modulator/Demodulators, Modulators, All Kinds, Monitors, Multiplexers, Oscillators, Power Supplies, Receivers, Relays, Tachometers, Transducers, Transformers

SOLID STATE SCIENTIFIC, Montgomeryville Ind'l. Pk., Montgomeryville, Pa., 18936, Tel: 215-855-8400, TWX: 510-661-7267; Empl.: 400

Products manufactured: Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Integrated Circuit Devices, Transistors

Local Sales Offices & Reps.

Cal	Newport Beach	714-546-9621
Ill	Arlington Heights	312-437-8373
Pa	Norristown	215-279-8424

SOLIDSTATE CONTROLS, INC., 600 Oakland Park Ave., Columbus, Ohio, 43214, Tel: 614-263-1886, Telex: 245-338; Empl.: 70

For info on price: J. N. Holscher; Application info: H. W. Bates; Customer service: J. VanSkoy; Delivery info: T. A. Curran

Free literature available: Static inverters - Transfer switches for use with static inverters - Battery chargers - Complete static uninterruptible power systems.

Products manufactured: Chargers, Battery, Inverters, Switches

Local Sales Offices & Reps.

Ala	Birmingham, Spader & Assocs.	205-879-1366
Cal	San Francisco, Garland Affolter Engrg. Corp.	415-397-1800
Cal	San Gabriel, Garland Affolter Engrg. Corp.	213-287-1149
Colo	Denver, Peterson Co.	303-388-6322
Fla	Lake Wales, Carter-Watsey & Assocs.	813-676-1474
Fla	Miami Shores, Carter-Watsey & Assocs.	305-635-5361
Ga	Atlanta, M.J. Fein & Co./C.A. Legg	404-938-0190
Ga	Decatur, Spader & Assocs.	404-296-3024
Ill	Glen Ellyn, J.T. Becker Assocs.	312-858-1910
Ind	Indianapolis, Utility & Ind'l. Prods., Inc.	317-924-3607
Iowa	Bettendorf, Deco Engrg. Prods., Inc.	319-355-2679
Iowa	Des Moines, Deco Engrg. Prods., Inc.	515-274-9356
La	New Orleans, Gregory-Salisbury & Co.	504-524-5207
Mass	Holliston, M.J. Fein & Co.	617-429-4008
Mich	Royal Oak, C.H. Armstrong Co.	313-544-1305
Minn	Minneapolis, Electrical Jobbers Equip., Inc.	612-721-4815
Miss	Jackson, Gregory-Salisbury & Co.	601-362-1761
Mo	Crestwood, C.B. Fall Co.	314-968-3850
Neb	Omaha, Deco Engrg. Prods., Inc.	402-341-4836
NJ	Livingston, M.J. Fein & Co.	201-994-3575
NY	Scarsdale, M.J. Fein & Co.	914-472-1100
Ohio	Columbus, Meas. Instrs., Inc.	614-488-9753
Okla	Tulsa, D. Allert Co.	918-743-7705
Ore	Portland, Garland Affolter Engrg. Corp.	503-223-7349
Pa	Media, Sys. Control Assocs.	215-565-2077
Tenn	Memphis, Gregory-Salisbury & Co.	901-365-6660
Tex	Arlington, Pan Tech. Engrg.	817-261-4111
Tex	Houston, Pan Tech. Engrg.	713-623-0600
Utah	Salt Lake City, Peterson Co.	801-487-5621
Wash	Bellevue, Garland Affolter Engrg. Corp.	206-454-2485

SOLITRON DEVICES, 8808 Balboa Ave., San Diego, Cal., 92123, Tel: 714-278-8780, TWX: 910-335-1221; Empl.: 900

Products manufactured: Amplifiers, Calculators, Electrical & Electronic, Diodes, Integrated Circuit Devices, Rectifiers, Transistors

SOLITRON DEVICES, Transistor Div., 1177 Blue Heron Rd., Riviera Beach, Fla., 33404, Tel: 305-848-4311, TWX: 510-952-7610; FSC No: 21845; Empl.: 417; Minimum order: \$100

For info on price: J. J. Bilger; Application info: J. Lamm; Customer service: M. Giraud; Delivery info: D. Harrison

Free literature available: Solitron Short Form Catalog On Power Transistors, Hybrids Etc. Transistor Chip Catalog.

Products manufactured: Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Crystals, Diodes, Hybrid Voltage Regulators, Rectifiers, Regulators, Relays, Semiconductor Wafer Fabrication, Transistors

Local Sales Offices & Reps.

Ala	Huntsville, Owen Rowe Ents.	205-837-3643
Ariz	Scottsdale, Piper-Goyne	602-946-4437
Cal	Canoga Park, TKO	213-883-3822
Cal	San Diego, Col-Rob	714-565-6814
Cal	San Jose, Com-Cal	408-268-7337
Colo	Denver, Piper-Goyne, Inc.	303-934-6971
Conn	Wallingford, Com-Sale	203-269-7964
Fla	Orlando, Cartwright & Bean	305-422-4531
Fla	Plantation, Cartwright & Bean	305-791-3989
Ga	Atlanta, Cartwright & Bean	404-255-5262
Haw	Honolulu, Aloha Assocs.	808-941-1574
Ill	Hinsdale, Momak Sls.	312-654-4524
Ind	Indianapolis, Electro Reps.	317-255-4147
La	Chalmette, Cartwright & Bean	504-279-4598
Mass	Waltham, Com-Sale	617-890-0011
Mich	Southfield, Luebbe Sls. Co.	313-357-0355
Minn	Edina, Wagner Consultants	612-941-6310
Miss	Jackson, Cartwright & Bean	601-981-1368
Mo	Saint Charles, Buckman & Assocs.	314-724-6690
NJ	Haddonfield, M & S Assocs., Inc.	609-429-7055
NM	Albuquerque, Piper-Goyne	505-265-6794
NY	Jamaica, S-J Sls. Assocs.	212-291-3232
NY	Syracuse, Nycorn	315-463-1665
NY	Tappan, Solitron Devices	914-359-5050
NY	West Nyack, Rubin Sales & Assocs.	914-623-9237
NC	Charlotte, Cartwright & Bean	704-333-6457
NC	Raleigh, Cartwright & Bean	919-832-7128
Ohio	Cincinnati, Luebbe Sls. Co.	513-871-4211
Ohio	Cleveland, Luebbe Sls. Co.	216-333-0425
Ohio	Dayton, Luebbe Sls. Co.	513-294-0427
Ore	Portland, C. K. Shanks & Assocs.	503-292-5656
Pa	Delmont, Luebbe Sls. Co.	412-468-4019
Tenn	Knoxville, Cartwright & Bean	615-693-7450
Tenn	Memphis, Cartwright & Bean	901-276-4442
Tex	Richardson, P. J. Scanlon Co.	214-231-4661
Wash	Seattle, C. K. Shanks & Assocs.	206-ME2-4290
EXP	Riviera Beach, Solitron Devices	305-848-4311

SOLITRON DEVICES, INC., 256 Oak Tree Rd., Tappan, N.Y., 10983, Tel: 914-359-5050, TWX: 710-576-2654

SOLITRON/MICROWAVE, Box 278, Port Salerno, Fla., 33492, Tel: 305-287-5000, TWX: 510-953-7500; FSC No: 95077; Empl.: 125

For info on price: D. Kiplinger; Application info: R. Sulzer; Customer service: F. Tiemeyer; Delivery info: R. Sulzer

Products manufactured: Connector Adapters, Connectors, Delay Lines, Resistors, Strip-Line Components, Microwave, Terminals

Local Sales Offices & Reps.

Ala	Huntsville, Beacon Elctns. Assoc.	205-881-5031
Ariz	Scottsdale, Piper-Goyne	602-946-4437
Cal	Los Angeles, RF Assocs.	213-478-1586
Cal	Mountain View, Westrep	415-968-5800
Cal	Palo Alto, RF Assocs.	415-494-3331
Cal	Pico Rivera, Westrep	213-949-2551
Cal	San Diego, Westrep	714-276-0751
Colo	Littleton, Piper-Goyne	303-798-9855
Fla	Fort Lauderdale, Beacon Elctns.	305-776-6074
Fla	Maitland, Beacon Elctns.	305-647-3498
Ga	Atlanta, Beacon Elctns.	404-351-3654
Ill	Hinsdale, Momak Sales	312-654-4524
Ind	Indianapolis, Sukup & Cox	317-253-1215
Kans	Shawnee-Mission, Florence & Meyer	913-722-5210
Kans	Wichita, Florence & Meyer	316-838-7226
Md	Ellicott City, Doss Elctns.	301-465-1336
Mass	Wakefield, Nerem	617-245-4426

Mich	Southfield, Luebbe Sales	313-357-0355
Minn	Edina, Wagner Consultants	612-941-6310
Mo	St. Charles, Florence & Meyer	314-724-6690
NJ	Haddonfield, M & S Assocs.	609-429-7055
NM	Albuquerque, Piper-Goyne	505-265-6794
NY	Bayside, R. Diamond	212-423-7330
NY	Syracuse, Nycorn, Inc.	315-437-8343
NY	West Nyack, B. Rubin Assocs.	609-429-7055
Ohio	Cincinnati, Luebbe Sales	513-871-4211
Ohio	Cleveland, Luebbe Sales	216-333-0425
Ohio	Dayton, Luebbe Sales	513-294-0426
Pa	Delmont, Luebbe Sales	412-468-4019
SC	Spartanburg, Beacon Elctns.	803-582-4613
Tex	Piano, Zeus Engrg.	214-231-4661
Wash	Seattle, Blum & Assocs.	206-285-2590

SOMERSET RADIATION LAB., Box 946, Arlington, Va., 22216

Products manufactured: Attenuators, Modulators, All Kinds, Multipliers, Oscillators, Switches

SONIC INTERNATIONAL CORP., 10330 NE Marx, Portland, Ore., 97220, Tel: 503-665-0187; Empl.: 30; Minimum order: \$100

For info on price: M. L. Roth; Application info: M. L. Roth; Customer service: M. L. Roth; Delivery info: K. Miles

Products manufactured: Handsets, Chestsets, Headphones, Headsets, Etc., Speaker Systems, Speakers

Local Sales Offices & Reps.

Ariz	Phoenix, S. Bova Sls.	602-266-1137
Cal	Brisbane, Metropolitan Sls.	415-467-9100
Cal	N. Hollywood, M. Stobin	213-983-1555
Cal	Northridge, Products West	213-993-0283
Colo	Inglewood, J. Hanf	303-761-9421
Fla	Jacksonville Beach, Vantage Sls.	904-246-6756
Fla	Miami Beach, E & J Assoc.	305-531-4260
Ga	E. Point, P. Hayden Co.	404-766-0261
Ill	Chicago, Hirsh Sls.	312-583-8877
Ind	Indianapolis, B. Richey & Assocs.	317-542-0605
Kans	Overland Park, Nackman-Brod-Vann	913-381-6560

Md	Baltimore, Bernie Smith Assoc.	301-247-0033
Md	Joppa, J. Merican Co.	301-679-6969
Mass	Newtonville, Arbetter Sls.	617-969-4128
Mich	Southfield, P. Entin Assoc.	313-557-4897
Minn	Minneapolis, Felson & Moscoe Co.	612-831-1897

Mo	St. Louis, Nackman-Brod-Vann Co.	314-991-2424
----	----------------------------------	--------------

Neb	Omaha, Nackman-Brod-Vann Co.	402-333-4346
NY	N.Y., B & S Sls.	212-736-3035
NY	New York, J. Kaufman	
NY	Rochester, V. Lulla Assoc.	716-244-7772
NC	Greensboro, P. Hayden Co.	919-288-6754
Ohio	Cleveland, KAM Mktg.	216-464-7717
Pa	Pittsburgh, F. Fleischmann	412-681-4888
Pa	Trevose, E. & J. Sls.	215-355-7847
SC	Columbia, Carolina Mktg.	803-794-7359
Tex	Dallas, Ram Mktg.	214-744-4881
Tex	El Paso, S. Bova Sls.	915-591-6242
Utah	S.L.C., Austin Riggs	801-363-4408
Va	Richmond, Robco Entrps.	804-264-2901
Wash	Vancouver, J. Wasson & Assocs.	206-694-6728

SONY CORP. OF AMERICA, 47-47 Van Dam St., Long Island City, N.Y., 11101

SORENSEN CO., 676 Island Pond Rd., Manchester, N.H., 03103, Tel: 603-688-4500, TWX: 710-220-1339; Empl.: 600; Minimum order: \$25. p. 1-1433-1442

For info on price: B. McCue; Application info: H. Termin; Customer service: R. E. Maitland; Delivery info: R. E. Maitland

Free literature available: Sorensen 1974/75 Catalog

Products manufactured: Power Supplies, Regulators

Local Sales Offices & Reps.

Ala	Huntsville, BCS Assocs. Inc.	205-881-6220
Ariz	Scottsdale, Barnhill Three	602-947-7841
Cal	Burbank, Instrument Specialists, Inc.	213-849-7181
Cal	San Diego, Instrument Specialists, Inc.	714-232-2017
Cal	Santa Clara, Instrument Specialists, Inc.	408-244-1505
Colo	Denver, Barnhill Three	303-750-1222
Fla	Orlando, BCS Assocs.	305-896-4881
Ill	Chicago, Pivan Engrg. Co.	312-539-4838
Ind	Indianapolis, Pivan Engrg. Co.	317-253-1681
Kans	Shawnee Mission, Pivan Engrg. Co.	913-722-1030
Md	Belair, Dyna Rep. Co.	703-354-1222
Mich	Detroit, Comtel-Sterling Co.	313-255-1970
Minn	Minneapolis, Pivan Engrg. Co.	612-537-4501

Mo	St. Louis, Pivan Engrg. Co.	314-567-3636
NJ	Haddonfield, Dyna Rep Co.	609-795-1700
NM	Albuquerque, Barnhill Three	505-299-7658
NY	Great Neck, Meas. Technology Inc.	516-482-3500
NY	Pleasantville, SBM Assocs.	914-769-1811
NY	Rochester, SBM Assocs.	716-266-1400
NC	Greensboro, BCS Assocs.	919-273-1918
Ohio	Cleveland, Comtel-Sterling Co.	216-442-8080
Ohio	Dayton, Comtel-Sterling Co.	513-298-7573
Pa	Pittsburgh, Comtel-Sterling Co.	412-922-5720
Tex	Houston, Barnhill Two	713-688-9771
Tex	Richardson, Barnhill Two	214-231-2573
Va	Alexandria, Dyna Rep Co.	703-354-1222
Wash	Seattle, R.S. Drake Assocs., Inc.	206-963-2755
Wisc	Brookfield, Pivan Engrg. Co.	414-786-1940

SORENSEN LIGHTED CONTROLS, 505 New Park Ave., W. Hartford, Conn., 06110 p. 2-1188, 1199
Products manufactured: Lamps, Lights

SOSHIN ELEC. CO., 1-18-18 Nakamogome, Ota-Ku, Tokyo, Japan, Tel: (03) 775-2111, Telex: 246-6377; Empl.: 1100
Products manufactured: Capacitors, Fixed, Filters

SOTCHER MEASUREMENT, Box 857, Cupertino, Cal., 95014, Tel: 408-732-9171; Empl.: 6; Minimum order: \$12
Customer service: F. Sotcher

Free literature available: Model 101, The Fault Finder, Leakage Current Detector Model 301, The Short Stop, Leakage Current Tester Model 401, Outlet Tester Model 510, The Power Monitor Model 620, Generator Test Set Model 714, Low Voltage Alarm

Products manufactured: Alarms, Detectors, Loads, Electronic Variable, Meters, Monitors, Testers

Local Sales Offices & Reps.
Fla Tampa, E. L. Ebert Sls. Agency 813-837-2867
Tenn Knoxville, Electronic Sls. 615-577-0689

Local Distributors
Haw Wahiawa, Wahiawa Rentals, 825 C Olive Ave. 808-621-6084
Ill Elk Grove Village, IMI Equip. & Supp., 130 Crossen Ave. 312-593-7606
NJ Moorestown Rental Serv. Supp., Route 73 609-235-6100

SOUND TECHNOLOGY, 10601 S. Saratoga-Sunnyvale Rd., Cupertino, Cal., 95014, Tel: 408-257-9171; Empl.: 11
Products manufactured: Analyzers, Generators, Oscillators, Transformers

SOUTH SHORE METAL PRODS., INC., 88 E Allen Blvd., Farmingdale, N.Y., 11735, Tel: 516-249-3322; Empl.: 26; Minimum order: \$25

For info on price: A. G. Bauer; Application info: A. G. Bauer; Customer service: C. Bianco; Delivery info: T. Farkas

Free literature available: Catalog on standard drawn cans

Products manufactured: Bezels, Shielded & Unshielded, Cans, Capacitor, Relay, Semiconductor, Transformer, etc., Cases, Equipment, Instrument, Meter, Containers, Escutcheons, Heat Sinks, Soldering, Services, Assembly, Production & Test

Advertisement

S.S. offers a stock size line of deep drawn cans trimmed to customer's length requirement at no extra cost. Will also produce special sizes and shapes complete with mounting brackets, studs, etc. - mumetal and other shielding type enclosures are regularly shipped. Tape control drilling and machining available for panel boards, plug in strips, etc. Quality control program to MIL-I-45208.

SOUTHERN ELCTRNS CORP., see F-Dyne Electronics Co.

SOUTHERN ELECTRONICS CO., 726 So. Flower St., Burbank, Cal., 91502, Tel: 213-845-2458; Empl.: 310
p. 2-240, 241

Products manufactured: Capacitors, Fixed, Capacitors, Variable, Filters, Networks

Local Sales Offices & Reps.	
Ala	Huntsville, Beacon Electronics 205-881-5031
Cal	Fremont, Spence Assocs. 415-656-9506
Cal	Van Nuys, Myco Sls. 213-988-2288
Colo	Denver, Walter Engrg. 303-777-5585
Conn	Wethersfield, Com/Pak 203-563-4784
Del	Wilmington, Dyna-Rep 301-250-8300
Fla	Ft. Lauderdale, Beacon Electronics 305-622-2770
Fla	Maitland, Beacon Electronics 305-647-3498
Ga	Atlanta, Beacon Electronics 404-351-3654
Ill	Elk Grove Village, Loren Green Assocs. 312-593-0282
Ind	Indianapolis, Loren Green Assoc. 317-293-9827
Kans	Shawnee, J. Guernsey Co. 913-631-2414
Mass	Needham, Com/Pak 617-444-1259
Mich	St. Clair Shores, J. M. Thorpe Co. 313-779-6363
Minn	Minneapolis, Loren Green Assoc. 612-781-1611
NJ	Haddonfield, Dyna Rep 609-795-1700
NY	Hempstead, Kahan Sls. 516-538-2300
NY	Syracuse, Naylor Elec. 315-472-9183
NC	Greensboro, L & D, Inc. 919-292-3201
Ohio	Cleveland, Orr Assoc. 216-885-1324
Tex	Dallas, Cunningham Co. 214-231-2686
Tex	Houston, Cunningham Co. 713-461-4197
Va	Alexandria, Dyna Rep 703-354-1222
Va	Newport News, Dyna Rep 804-874-7729
FOR:	Can., Don Mills, Ont., B. D. Vallillie Elctns. 416-447-8482

SPACE POWER ELCTRNS, Jeffrey Lane, RD 1, Glen Gardner, N.J., 08826

SPACETAC, INC., Sub. Corning Glass Works, Crosby Dr., Bedford, Mass., 01730, Tel: 617-275-1710, TWX: 710-326-7567; Empl.: 185
Customer service: Sls. Off.

Free literature available: Flyer on modular memory controlled pcm encoders; A complete company capabilities brochure.

Products manufactured: Amplifiers, Analyzers, Comm. Systems, Converters, Decommunators, Telemetering, Encoders, Memory Systems, Power Supplies, Substrates

Local Sales Offices & Reps.
Cal Orange 714-541-5275
Md Columbia 301-953-3360

SPEC PLASTICS INC., 7224 Atoll Ave., No. Hollywood, Cal., 91605, Tel: 213-982-0300; Empl.: 43; Minimum order: \$25

For info on price: T. Reid; Application info: T. Reid; Customer service: R. Fuller; Delivery info: R. Fuller

Products manufactured: Bobbins, Winding, Coil & Transformer, Coils Including Assemblies & Forms, Connectors, Cups, Encapsulation, Enclosures, Module, Plug-In, Holder & Carriers, Integrated Circuit Packaging Systems, Packages, Integrated Circuit, Pads, Transistor Mounting, Racks

SPECIAL MICROWAVE DEVICES OPER., Raytheon Co., 130 Second Ave., Waltham, Mass., 02154, Tel: 617-890-8080, TWX: 710-324-6568
Customer service: W. C. Jones

Products manufactured: Amplifiers, Attenuators, Circulators, Ferrite, Converters, Detectors, Diodes, Filters, Generators, Isolators, Limiters, Modulators, All Kinds, Multipliers, Oscillators, Shifters, Switches, Terminals, Transistors

Local Sales Offices & Reps.	
Cal	Los Angeles 213-641-3103
Cal	Mountain View 415-964-4754
Fla	Longwood 305-830-6670
Ill	Elmhurst 312-833-6760
Mass	Waltham 617-890-8080
NY	Great Neck 516-482-8480
NY	Rome 315-337-2500
Ohio	Dayton 513-254-3571
Tex	Dallas 214-233-2939
Va	Arlington 703-979-6100

SPECIALTIES MFG. CO., INC., 23425 Harper, St. Clair Shores, Mich., 48080, Tel: 313-771-2700; Empl.: 6
p. 1-2277

Customer service: C. Novikoff
Products manufactured: Plugs, Switch Handle Boots, Switch Mounting Plates, Switches

Local Sales Offices & Reps.	
Ark	El Dorado, D. Bellew Sls. 501-863-8325
Ga	Atlanta, Hollingsworth & Still 404-255-8200
Ill	Chicago, B. Burns & Assoc. 312-775-1233
Ind	Indianapolis, Sukup & Cox 317-253-5501
La	Kenner, D. Bellew Sls. 504-729-4550
Mo	St. Louis, Kathrinus Kelly-Boswell Co. 314-962-5627

NJ	Caldwell, Art Cerf & Co. 201-226-2263
NY	Bronx, Peterson-Rudnick Assoc. 212-671-1923
NC	Charlotte, Hollingsworth & Still 704-536-7047
Ohio	Cleveland, Marlow Assocs. 216-381-4500
Ohio	Xenia, Marlow Assocs. 513-426-6270
Ore	Portland, Pacific Elec. Sls. 503-235-4137
Tex	Dallas, Collins Co. 214-341-7866

SPECIALTY CONNECTOR CORP., 3560 Madison Ave., Indianapolis, Ind., 46227, Tel: 317-787-6368; Empl.: 100; Minimum order: \$30

For info on price: W. Foltz; Application info: M. H. Burdett; Customer service: W. Foltz; Delivery info: W. Foltz

Products manufactured: Connector Adapters, Connectors

Local Sales Offices & Reps.	
Cal	Los Angeles, M.A. Stolaroff 213-295-7781
Cal	Palo Alto, W.W. Tompkins & Co. 415-326-7940
Colo	Denver, McCloud & Raymond Co. 303-756-1589
Conn	Meriden, Eagle Assocs. 203-235-9036
Ga	Atlanta, Grady Duckett Sls. Corp. 404-451-3529
Ill	Oak Park, W. Gallagher 312-261-7517
Ill	Westchester, W. Gallagher 312-344-0690
Ind	Fort Wayne, S & S Elctns. 219-743-4611
NJ	Bergenfield, H. Gray Assocs. 201-384-3643
NJ	Mount Laurel, Naudain Assocs. 609-235-3861
NJ	Syracuse, Naylor Electric Co. 315-472-9183
Ohio	Akron, A. Natalino Assocs. 216-725-6087
Tex	Richardson, Oeler & Menelaides, Inc. 214-234-6334
Wash	Seattle, H.S. Thorpe & Co. 206-784-3333

SPECTRA-PHYSICS, INC., 1250 W. Middlefield Rd., Mountain View, Calif., 94040, Tel: 415-961-2550, TWX: 910-379-6941; Empl.: 1000; Minimum order: \$100

For info on price: J. Calvert; Application info: C. Schulthess; Customer service: J. Cole; Delivery info: J. Calvert

Products manufactured: Lasers & Laser Systems, Monitors, Power Supplies, Tubes

Local Sales Offices & Reps.	
Cal	Los Angeles 714-496-6886
Ill	Chicago 312-386-5104
Mass	Boston 617-734-4661
NJ	Avenel 201-381-1552
NM	Albuquerque 505-881-7577
Tex	Dallas 214-528-5142

SPECTRA SONICS, 770 Wall Ave., Ogden, Utah, 84404, Tel: 801-392-7531; Empl.: 25

For info on price: R. Welch; Application info: W. G. Dille; Customer service: J. Dille; Delivery info: J. Dille

Products manufactured: Amplifiers, Equalizers, Filters, Mixer-Preamplifiers, Microwave, Mixers, Networks, Power Supplies, Testers, Tracers, Curve

SPECTRA-STRIP CORP., 7100 Lampson Ave., Garden Grove, Cal., 92642, Tel: 714-892-3361, TWX: 910-596-1314; Empl.: 200 p. 2-2056, 2057

Products manufactured: Adhesives (All Types), Cable Assemblies & Harnesses, Cable, Circuits, Flexible, Circuits, Printed, Multilayer, Connectors, Jumpers, Sockets, Wire

Local Sales Offices & Reps.	
Ala	Huntsville, W.A. Brown Comps. Inc. 205-539-4411
Ariz	Phoenix, G.R. McKnight Co. 602-257-8037
Cal	Menlo Park, G.R. McKnight Co. 415-325-2844
Cal	Newport Beach, Mission Mktg. Group 714-833-1802
Cal	San Diego, Hadden Assocs. 714-565-9444
Colo	Denver, Thorson Co. 303-759-0809
Conn	Wethersfield, Com/Pak Inc. 203-563-4784
Fla	Ft. Lauderdale, W.A. Brown Comps. 305-776-4800
Fla	Orlando, W.A. Brown Comps. 305-425-5505
Fla	Satellite Beach, Reynolds & Assocs. 305-773-4700
Ga	Atlanta, W.A. Brown Comps. 404-457-4069
Ill	Chicago, GNB Assocs. 312-673-4050
Ind	Indianapolis, R.H. Newsom Assoc. 317-849-4442
Mass	Needham Heights, Com/Pak Inc. 617-444-1259
Mich	Wyoming, N. Case Assocs. 616-531-2729
Minn	Minneapolis, PSI 612-835-1777
Mo	Kansas City, Nevco 816-421-1751
Mo	St. Louis, Nevco 314-843-7406
NJ	Clifton, Compar N.Y. Inc. 201-546-3660
NY	East Syracuse, Fountain Young & Co. 315-437-7733
NC	Raleigh, W.A. Brown Comps. 919-976-9601

NC Winston-Salem, W.A. Brown Comps. 919-725-5384
 Ohio Centerville, N. Case Assocs. 513-433-0965
 Ohio Fairview Park, N. Case Assocs. 216-333-4120
 Ore Aloha, E.S. Chase Co. 503-649-6177
 Pa Ft. Washington, Kirk-Sandell Inc. 215-643-2100
 Tex Dallas, McCoy Assocs. 214-350-9931
 Tex Houston, Ev. Smith Sls. Co. 713-649-5756
 Utah Bountiful, Logistic Specialties 801-292-3030
 Va Charlottesville, Kirk-Sandell 804-977-2033
 Wash Edmond, E.S. Chase Co. 206-774-3586

Local Distributors

Cal Garden Grove, Allied Elctns., 12311 Industry St. 714-894-7581
 Cal Irvine, Terminal Elec., 1791 Reynolds 714-549-8611
 Cal Mountain View, Terminal Elctns., 880 Maude Ave. 415-969-9240
 Cal Palo Alto, Storm Prod., 4039 Transport 415-326-2913
 Ill Chicago, Allied Elec., 2400 Washington 312-421-2400
 Mass Burlington, C. E. Scrymegeour Co., 13 Grant Ave. 617-272-0060
 Minn Minneapolis, Ind. Components, 5280 W. 74th St. 612-831-2666
 NH Londonderry, Yankee Elec. Supp., Grenier Ind. Pk. 603-625-9746
 NJ Rahway, Terminal Elctns., 1421 Pinewood St. 201-381-5700
 NY Buffalo, Summitt Elec., 916 Main St. 716-884-3450
 NY Farmingdale, Vertex Elec., 91 Milbar Blvd. 516-239-9880
 NY Tuckahoe, Bi-Tronics, Inc., 76 Main St. 914-961-4700
 Ohio Dayton, Astro Ind., 3189 Plainfield Rd. 513-253-5118
 Pa Harrisburg, Pyttronic Ind., Box 1967 717-233-6591
 Tex Dallas, Solid State Elec., Box 20299 214-352-2601
 Tex Ft. Worth, Allied Elec., 401 E. 8th St. 817-336-5401
 Tex Houston, Solid State Elctns., Box 36849 713-785-5436
 Utah Salt Lake City, Standard Supp., 225 E. 6th St. 801-355-2971
 Wash Seattle, Interface Elec., 300 W. 2nd 206-285-3500

SPECTROL ELECTRONICS CORP., 17070 East Gale Ave., City of Industry, Cal., 91745, Tel: 213-964-6565, TWX: 910-584-1314; Empl.: 600; Minimum order: \$50 p. 2-1676-1681

Customer service: Dist. Sls. Dept.

Products manufactured: Dials, Potentiometers, Switches

Local Sales Offices & Reps.

Ala Huntsville, Rep. Inc. 205-881-9270
 Ariz Phoenix, Howe & Howe Sls. 602-264-7971
 Cal Mountain View, Factory Sls. Off. 415-964-3260
 Cal San Diego, Daniels & Doty Sls. 714-560-6266
 Colo Denver, Lindberg Co. 303-758-9033
 Conn North Haven, Kitchen & Kutchin 203-239-0212
 Fla Altamonte Springs, Semtronic Assocs. 305-831-8233
 Fla Ft. Lauderdale, Semtronic Assocs. 305-771-0010
 Ill Hinsdale, Momak Sls. 312-654-4524
 Iowa Hiawatha, Gassner & Clark 319-393-5763
 Md Baltimore, Gould Inc.-Daniel Div. 301-825-3330
 Mass Lexington, Kitchen & Kutchin 617-862-8230
 Mich Dearborn, V.P.I., Inc. 313-271-4600
 Minn St. Paul, Murnco 612-484-8200
 Mo St. Louis, Harris-Hanson Co. 314-432-3611
 NJ Haddonfield, Sunday-O'Brien 609-429-4013
 NM Albuquerque, Lindberg Co. 505-345-2489
 NY Oceanside, Bittan Assocs. 516-678-6222
 NY Syracuse, Tri-Tech Elctns. 315-446-2881
 NC Charlotte, R.W. Chapman Co. 704-525-2421
 NC Raleigh, R.W. Chapman Co. 919-782-2624
 Ohio Cincinnati, Luebbe Sls. Co. 513-871-4211
 Ohio Cleveland, Luebbe Sls. Co. 216-333-0425
 Ohio Dayton, Luebbe Sls. Co. 513-294-0426
 Okla Oklahoma City, Ammon & Rizos Co. 405-947-1051
 Ore Beaverton, Vantage Corp. 503-644-6111
 Pa Pittsburgh, R.F. Clark Co. 412-242-9500
 SC Greenville, R.W. Chapman Co. 803-232-5392
 Tex Dallas, Ammon & Rizos Co. 214-233-5591
 Tex Houston, Ammon & Rizos Co. 713-781-6240
 Utah Salt Lake City, Lindberg Co. 801-364-6409
 Wash Bellevue, Vantage Corp. 206-455-3460
 FOR: Can., Malton, Deskin Sls. 416-677-5517
 FOR: Can., Vancouver, Deskin Sls. 604-324-6331

FOR: Can., Ville St. Laurent, Deskin Sls. 514-331-2860

Local Distributors

Ala Huntsville, Powell Elec., 803 Oster Dr. 205-539-2731
 Ariz Phoenix, R.V. Weatherford, 1917 N. 25th 602-272-7144
 Ariz Phoenix, Sterling Elec., 2001 E. University 602-258-4531
 Cal Anaheim, Weatherford Co., 1550 Babbitt Ave. 714-633-9633
 Cal Glendale, Weatherford Co., 6921 San Fernando 213-849-3451
 Cal Inglewood, Newark Elec., 4747 W. Century 213-678-0441
 Cal Los Angeles, Kierulff, 2585 Commerce Way 213-685-5511
 Cal Mt. View, Abacus, 1065 Terra Bella 415-961-1500
 Cal Palo Alto, Kierulff, 3973 E. Bayshore 415-968-6292
 Cal Palo Alto, Weatherford Co., 3240 Hillview Ave. 415-493-5373
 Cal Pomona, Weatherford Co., 1095 E. 3rd St. 714-623-1261
 Cal San Carlos, Sterling Elec., 1061 Industrial 415-592-2353
 Cal San Diego, Kierulff, 8797 Balboa Ave. 714-278-2112
 Cal San Diego, Weatherford Co., 7878 Raytheon Rd. 714-278-7400
 Cal Sun Valley, Sterling Elec., 11614 Pendleton St. 213-767-5030
 Colo Denver, Newark/Denver El., 2170 S. Grape 303-757-3351
 Colo Englewood, R.V. Weatherford, 390 S. Mariposa 303-761-5432
 Conn Fairfield, U Tronics, 272 Linwood Ave. 203-255-4521
 Conn N. Haven, Cramer Elec., 35 Dodge Ave. 203-239-5641
 Fla Ft. Lauderdale, Newark Elec., 1360 N.W. 65th 305-587-2372
 Ga Atlanta, Cramer/Atlanta, 3923 Oakcliff In. 404-448-9050
 Ill Arlington Hts., T.I. Supp., 2420 E. Oakton 312-593-7660
 Ill Rosemont, Kierulff, 9340 William 312-678-8560
 Ill Rosemont, Newark, 500 N. Pulaski 312-638-4411
 Ind Indianapolis, Graham, 133 S. Pennsylvania 317-634-8486
 Iowa Grand Rapids, Deeco, Inc., 2500 16th, S.W. 319-365-7551
 La Lafayette, Ralph's, 3004 Cameron St. 318-234-4507
 La Metairie, Sterling Elec., 4613 Fairchild 504-887-7610
 Md Baltimore, Technico, Inc., 1404 Bare Hills 301-828-6416
 Md Gaithersburg, Kierulff El., 16021 Ind. 301-948-0250
 Mass Dedham, Gerber Elec., 852 Providence Hwy. 617-329-2400
 Mass Needham, Kierulff, 14 Charles St. 617-449-3600
 Mass Newton, Cramer, 85 Wells Ave. 617-969-7700
 Mass Newton, Greene-Shaw, 70 Bridge St. 617-969-8900
 Mich Detroit, Newark Elec., 20700 Hubbell Ave. 313-548-0250
 Mich Farmington, Northland, 32708 W. Eight Mile 313-477-3200
 Mich Wyoming, Newark Elec., 3645 Linden, S.E. 616-241-6651
 Minn Minneapolis, Stark's, Inc., 112 3rd Ave. N. 612-332-1325
 Minn St. Paul, Gopher Elec., 2520 W. Larpenteur 612-645-0241
 Mo N. Kansas, LCOMP Kansas City, 1520 Taney St. 816-221-2400
 Mo St. Louis, LCOMP St. Louis, 2605 S. Hanley 314-647-5505
 NJ Camden, General Radio, 600 Penn St. 609-964-8560
 NJ Kenilworth, Newark Elec., 303 Monroe Ave. 201-272-8410
 NJ Moorestown, Arrow/Angus, Pleasant Valley 215-235-1900
 NJ Rutherford, Kierulff Elec., 5 Ind. Dr. 201-935-2120
 NM Albuquerque, Weatherford Co., Marberry Plaza 505-265-5671
 NY Buffalo, Summit Dist., 916 Main St. 716-884-3450
 NY Farmingdale, Arrow Elec., 900 Broad Hollow Rd. 516-694-6800
 NY Hicksville, Kierulff, 49 Bethpage Rd. 516-433-5530

NY Johnson City, Wilshire Elec., 617 Main St. 607-797-1236
 NY Rome, Rome Elec., 216 Erie Blvd. E. 315-337-5400
 NC Greensboro, Hammond Elec., 2923 Pacific 919-275-6391
 Ohio Cincinnati, Newark Elec., 9799 G. Princeton 513-874-5115
 Ohio Cleveland, Arrow Elec., 23945 Merchantile 216-464-2000
 Ohio Cleveland, Newark Elec., 2028 E. 46th Ave. 216-361-4700
 Ohio Cleveland, RPC Elec., 749 Miner Rd. 216-461-2700
 Ohio Dayton, Arrow Elec., 3100 Plainfield Rd. 513-253-9176
 Ohio Dayton, Kierulff, 2030 Drill Ave. 513-278-9411
 Okla Tulsa, T.I. Supp., 12151 E. Skelly 918-437-4555
 Pa Philadelphia, Kierulff Elec., 109 Gaither Dr. 215-922-0810
 Pa Pittsburgh, Barno Radio, 5403 W. Smithfield 412-462-7575
 Pa Pittsburgh, RPC Elec., 620 Alpha Dr. 412-782-3770
 SC Greenville, Hammond Elec., 100 Augusta St. 803-233-4121
 Tex Dallas, R.V. Weatherford, 10836 Grissom La 214-243-1571
 Tex Dallas, T.I. Supp., 6000 Denton Dr. 214-238-3011
 Tex Garland, Newark Elec., 707 Easy St. 214-271-2511
 Tex Houston, Newark Elec., 6902 Harwin Dr. 713-782-4800
 Tex Houston, Sterling Elec., 4201 Southwest Fwy. 713-623-6600
 Tex Houston, T.I. Supp., 3939 Ann Arbor Dr. 713-785-4800
 Utah Salt Lake City, Newark Elec., 2540 S. 300 W. 801-486-1048
 Wash Seattle, Kierulff Elec., 5640 Sixth Ave. S. 206-763-1550
 Wash Seattle, Weatherford Co., 541 Industry Dr. 206-243-6340
 Wisc Oak Creek, Cramer Elec., 430 W. Rawson 414-764-1700

SPECTRONICS, INC., 830 E. Arapaho Dr., Richardson, Tex., 75080, Tel: 214-234-4271, Telex: 73-0890; Empl.: 300; Minimum order: \$25 p. 1-1021
 Customer service: Central Mktg.

Free literature available: Optoelectronic Components Book - Complete electrical and electro-optic characteristics on all standard components. Infrared Products Book - Complete description of all standard and custom capability of Infrared Detectors and special emitters. Optical Switches & Reflective Sensor Assemblies - Summary of standard products.

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Controls/Control Eqpt., Detectors, Diodes, Encoders, Isolators, Lamps, Sensors, Light, Transistors

Local Sales Offices & Reps.

Cal Diamond Bar 714-598-2297
 Mass Methuen, Spectronics 617-687-0714

SPECTRUM CONTROL, INC., 152 E. Main St., Fairview, Pa., 16415, Tel: 814-474-5593, TWX: 510-669-6848; Empl.: 200 p. 1-575-583

Products manufactured: Capacitors, Fixed, Filters, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Cal Fullerton, M.A. Stolaroff Co. 714-879-5998
 Cal Los Angeles, M.A. Stolaroff Co. 213-295-7781
 Cal San Diego, M.A. Stolaroff Co. 714-234-6905
 Ill Chicago, Gassner & Clark Co. 312-345-4245
 Iowa Hiawatha, Gassner & Clark Co. 319-393-5763
 Minn Minneapolis, Barnes Sls. Assoc. 612-474-2907
 NJ Martinsville, Spectrum Control Inc. 201-469-6056

FOR: Can., Montreal, Que., Space Elctn. Sls. Corp. 514-735-5775

SPECTRUM DYNAMICS, 11 B North Ave., Burlington, Mass., 01803, Tel: 617-273-1850, TWX: 710-332-6878; Empl.: 62; Minimum order: \$25

Customer service: C. McNamara

Products manufactured: Boards, Programming

Local Sales Offices & Reps.

Ala Huntsville, Beacon 205-881-5031
 Cal Los Angeles, Dyna Sls. 213-268-1175
 Colo Denver, W. J. Purdy 303-777-1411
 Fla Ft. Lauderdale, Beacon 305-776-6074
 Ga Atlanta, Beacon 404-351-3654

Haw	Honolulu, Aloha Assoc.	808-941-1574
Ill	Chicago, Kennedy Engr.	312-631-8283
Kans	Wichita, G. Fixman Engr.	316-682-9433
Mass	Burlington, Spectrum Dym.	617-273-1850
Minn	Minneapolis, Milt Westlund Assoc.	
		652-866-5002
Mo	St. Louis, G. Fixman Engr.	314-725-5219
NM	Albuquerque, W. J. Purdy	505-266-7959
NY	Fayetteville, M. P. Andrews Mfg.	315-637-3144
NY	Port Chester, Radiation Elctns.	914-937-2300
PA	Bala Cynwyd, Electech	215-687-5305
SC	Spartanburg, Beacon	803-582-4613
Tex	Richardson, Carl Tinch Sls. Co.	214-231-1322

SPECTRUM TECHNOLOGY INC., 300 Frederic Lopez Rd., Goleta, Cal., 93017, Tel: 805-964-7791; Empl.: 75
Customer service: B. Bertrando

Free literature available: Complete line of logic clocks, crystal oscillators, TCXO's and frequency modules for commercial and government applications.

Products manufactured: Integrated Circuit Devices, Modulators, All Kinds, Oscillators, Standards

Local Sales Offices & Reps.

Ariz	Scottsdale, I.M.E.C.	602-947-7379
Cal	Encino, EL/TEC, Inc.	213-981-9881
Cal	Mountain View, West/Mark Assocs.	
		415-969-1700
Colo	Littlton, Lange Sls.	303-798-1397
Conn	Milford, Todino Engr. Sls.	203-847-6643
Fla	Lighthouse Point, Saber Assocs.	305-943-3076
Fla	Longwood, Saber Assocs.	305-422-3686
Fla	Temple Terrace, Saber Assocs.	813-988-8686
Ill	Westchester, W.G. Brouillette & Assoc.	
		312-345-6500

Mass	Needham, Todino Engr. Sls.	617-444-7925
Mich	Southfield, Luebbs Sls. Co.	313-357-0355
Minn	Minneapolis, Tech. Assocs.	612-929-6721
Mo	Grandview, Bencke & McCaul, Inc.	
		816-765-2998
Mo	St. Louis, Beneke & McCaul, Inc.	314-231-1677
NJ	Haddonfield, Mesa Tech. Assocs.	609-429-9531
NJ	Springfield, F.F. Sylvester Assocs.	
		201-376-3324

NM	Albuquerque, I.M.E.C.	505-883-9010
NY	Camillus, ONTEC	716-464-8636
NY	Grand Island, ONTEC	716-464-8636
NY	Rochester, ONTEC	716-464-8636
Ohio	Cincinnati, Luebbs Sls. Co.	513-871-4211
Ohio	Cleveland, Luebbs Sls. Co.	216-333-0425
Ohio	Dayton, Luebbs Sls. Co.	513-294-0426
Pa	Delmont, Luebbs Sls. Co.	412-468-4019
SC	Greenville, J. Egan Assocs.	803-288-4450
Va	Fairfax, Schibley Assocs.	703-591-3008
Wash	Mercer Island, Northwest Manufacturers Agents	
		206-284-7002
FOR:	Montreal 260, Que., Can., Solid State Engrg.	
		514-481-3313

SPEED DETECTORS, INC., 32 W. Monroe St., Bedford, Ohio, 44146, Tel: 216-232-1880; Empl.: 60

Products manufactured: Controls/Control Eqp., Counters, Indicators, Meters, Tachometers, Timers, Totalizers, Digital

Local Sales Offices & Reps.

Ariz	Glendale, Harvey Data Systems	602-247-5818
Cal	Long Beach, Saber Entprs.	213-595-5646
Colo	Westminster, Harvey Data Systems	
		303-427-5299
Conn	Hamden, J & J Assocs.	203-624-7800
MD	Rockville, E. Winston & Co.	301-881-5780
Mass	Burlington, J & J Assocs.	617-272-2606
Mich	Ferndale, Tiby Co.	313-547-3550
NY	Syracuse, J.D. Birchard	315-469-4689
NY	Westbury, OAL Assocs.	516-334-1940
NC	Charlotte, Bimco	704-366-5092
Ohio	Cleveland, Tiby Co.	216-371-5335
Ohio	Dayton, Tiby Co.	513-277-3822

SPELLMAN HIGH VOLTAGE ELCTNS. CORP., 1930 Adee Ave., Bronx, N.Y., 10469, Tel: 212-671-0300, TWX: 710-593-4135; Empl.: 40; Minimum order: \$100
p. 1-1460-1471

For info on price: H. Moresco; Application info: M. Civin; Customer service: H. Moresco; Delivery info: S. Hoffman

Free literature available: Short form catalog #7400 - General products, Application notes #7210 - RF high voltage technology, Application notes #7220 - RF high voltage versatility, High voltage testing - STP-473 - How to test a H.V. power supply

Products manufactured: Converters, Power Supplies, Transformers

Local Sales Offices & Reps.

Cal	Pasadena, A-F Sls.	213-681-5631
-----	--------------------	--------------

Colo	Arvada, Cleveland Entprs.	303-423-3707
Fla	Satellite Beach, Reynolds Assocs.	
		305-773-4700
Ill	Chicago, Ropek-Cahill	312-287-7292
MD	Hyattsville, Eastern Components	301-577-2925
Mass	Concord, Nortech Engrg. Sls.	617-259-0032
NJ	Tenafly, Budd-Tronics	201-569-2230
NM	Albuquerque, Cleveland Enterprises	
		505-345-2481
NY	Schenectady, N.W. Alexander & Assoc.	
		518-377-0581
Pa	Flourtown, Eastern Components	215-836-1616
Tex	Dallas, R. Martin Assoc.	214-361-8584
Tex	Houston, R. Martin Assoc.	713-462-4077
FOR:	Can., Vancouver 9 B.C., Broman Engrg.	
		604-731-6222

SPEMCO SWITCHES, See Specialties Mfg. Co.

SPERRY MICROWAVE COMPONENTS, Gainesville, Fla., 32601, Tel: 904-372-0411; Empl.: 375

Products manufactured: Amplifiers, Diodes, Integrated Circuit Devices, Oscillators, Power Supplies, Tubes

Local Sales Offices & Reps.

Cal	Los Angeles	213-670-4882
NY	Great Neck	516-574-1435
Ohio	Dayton	513-433-9451

SPRAGUE ELEC. CO., 481 Marshall St., No. Adams, Mass., 01247, Tel: 413-664-4411, TWX: 710-369-1360; Empl.: 9600

Products manufactured: Amplifiers, Analyzers, Bridges, Capacitor, Hardware, Capacitors, Fixed, Capacitors, Variable, Circuits, Hybrid, Thick Film, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Decade Boxes, Diodes, Filters, Integrated Circuit Devices, Machines/Machinery, Production, Meters, Networks, Receivers, Resistors, RFI Measuring Equipment, Scribes, Standards, Suppressors, Switches, Testers, Thermistors, Thyristors (Includes Silicon Controlled Rectifiers), Timers, Tracers, Curve, Transformers, Transistors

Local Sales Offices & Reps.

Ala	Huntsville, Sprague Elec. Co.	205-883-0520
Ariz	Tempe, Sprague Elec. Co.	602-279-5435
Cal	Burlingame, W. J. Purdy Co.	415-347-7701
Cal	Ingewood, Sprague Elec. Co.	213-649-2600
Cal	Los Angeles, KCE Corp.	213-649-2622
Cal	San Diego, KCE Corp.	714-278-7640
Colo	Denver, Sprague Elec. Co.	303-756-3611
Conn	Trumbull, Sprague Elec. Co.	203-261-2551
DC	Washington, Sprague Elec. Co.	202-244-6006
Fla	Longwood, Sprague Elec. Co.	305-831-3636
Ill	Schiller Park, Sprague Elec. Co.	312-678-2262
Ill	St. Ann, Sprague Elec. Co.	314-291-2500
Ind	Indianapolis, Sprague Elec. Co.	317-253-4247
Mass	Waltham, Sprague Elec. Co.	617-899-9100
Mich	Jackson, Sprague Elec. Co.	517-787-3934
Minn	Minneapolis, HMR, Inc.	612-920-8200
Mo	St. Ann, Sprague Elec. Co.	314-291-2500
NJ	Cherry Hill, Sprague Elec. Co.	609-795-2299
NJ	Wayne, Sprague Elec. Co.	201-696-8200
NM	Albuquerque, W. J. Purdy Co.	505-266-7959
NY	Mamaroneck, Wm. Rutt, Inc.	914-698-8600
NY	Melville, Sprague Elec. Co.	516-549-4141
NY	Syracuse, Mar-Com Assocs.	315-437-2843
NC	Winston-Salem, Electronic Mktg. Assocs.	
		919-722-5151
Ohio	Chagrin Falls, Sprague Elec. Co.	216-247-6488
Ohio	Dayton, Sprague Elec. Co.	513-278-0781
Tex	Richardson, Sprague Elec. Co.	214-235-1256
Va	Lexington, Sprague Elec. Co.	703-463-9161
Wash	Seattle, Sprague Elec. Co.	206-632-7761
FOR:	Can., Toronto 15, Ont., Sprague Elec. of Can., Ltd.	
		416-766-6123
FOR:	Can., Ville St. Laurent 9, P.Q., Sprague Elec. of Can., Ltd.	
		514-747-7811

SPRAGUE PRODUCTS CO., 481 Marshall St., No. Adams, Mass., 01247, Tel: 413-664-4481, TWX: 710-369-1363; FSC No: 58289
p. 1-585-587, 810, 811, 1866-1872, 2282; p. 2-242-301, 1546, 1547, 1790

For info on price: A. Lopresto 413-664-4471; Application info: K. Blanchard 413-664-4481; Customer service: R. Lemere 413-664-4481; Delivery info: A. Lopresto 413-664-4471

Free literature available: Catalog C-563 - Components for industrial, military, commercial electronics. 96 pages of capacitors, semiconductors, resistors, interference filters, L.E.D. devices, pulse transformers, switches, test instruments.

Products manufactured: Amplifiers, Analyzers, Bridges, Capacitor, Hardware, Capacitors, Fixed, Capacitors, Variable, Caps, Connector, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Clamps & Clips, Converters, Decade Boxes, Diodes, Display Devices/Displays, Films, Filter Synthesizers, Filters, Generators, Integrated Circuit Devices, IC's, Active Filters, Integrators, Electronic, Machines/Machinery, Production, Meters, Networks, Power Drivers, Hybrid (High Current, High Voltage), Receivers, Resistors, RFI Measuring Equipment, Scribes, Standards, Suppressors, Switches, Testers, Thermistors, Thyristors (Includes Silicon Controlled Rectifiers), Timers, Tracers, Curve, Transformers, Transistors

Local Sales Offices & Reps.

Ariz	Phoenix, KCE Corp.	602-258-7519
Cal	Burlingame, W. J. Purdy Co.	415-347-7701
Cal	Los Angeles, KCE Corp.	213-649-2622
Cal	Sacramento, W. J. Purdy Co.	916-422-0128
Cal	San Diego, KCE Corp.	714-278-7640
Cal	Denver, W. J. Purdy Co.	303-777-1411
Fla	Fort Lauderdale, UniRep, Inc.	305-527-1556
Haw	Honolulu, Hawaii Elctns. Sls.	808-845-8207
Ill	Chicago, D. Dolin Sls. Co.	312-286-6200
Ind	Mulberry, Maish Sls.	317-638-8484
Mass	Waltham, Sprague Prods. Co.	617-899-9840
Minn	Minneapolis, HMR, Inc.	612-920-8200
Mo	Kansas City, Nevco, Inc.	816-421-1751
Mo	St. Louis, Nevco, Inc.	314-843-7406
NJ	Cherry Hill, Trinkle Sls. Inc.	609-795-4200
NJ	Cranford, G. G. Burnett	201-276-2149
NM	Albuquerque, W. J. Purdy Co.	505-266-7959
NY	Mamaroneck, W. Rutt, Inc.	914-698-8600
NY	Syracuse, Paston-Hunter Co.	315-437-2992
NC	Winston-Salem, Elctns. Mktg. Assocs.	
		919-722-5151

Ohio	Beachwood, Elctn. Salesmasters	216-831-9555
SC	Greenville, Elctn. Mktg. Assoc.	803-268-1125
Tex	Dallas, Lund & Co.	214-358-4335
Wash	Seattle, Fleehart & Sullivan, Inc.	206-522-1533

SPRAGUE-GOODMAN ELECTRONICS, INC., 371 Willis Ave., Mineola, N.Y., 11501, Tel: 516-746-1385; Empl.: 25

Customer service: J. Goodman

Free literature available: Catalogs covering Pistoncap® glass & quartz trimmers, ceramic trimmers, & ptfte trimmers.

Products manufactured: Capacitors, Variable

Local Sales Offices & Reps.

Ala	Huntsville, Sprague Elec. Co.	205-883-0520
Ariz	Tempe, Sprague Elec. Co.	602-279-5435
Cal	Burlingame, W. J. Purdy Co.	415-347-7701
Cal	Ingewood, Sprague Elec. Co.	213-649-2600
Cal	Los Angeles, KCE Corp.	213-649-2622
Cal	San Diego, KCE Corp.	714-278-7640
Colo	Denver, Sprague Elec. Co.	303-753-1136
Colo	Denver, W. J. Purdy Co.	303-777-1411
Conn	Trumbull, Sprague Elec. Co.	203-261-2551
Fla	Melbourne, J. J. Smith Assocs.	305-727-3163
Ill	Schiller Park, Sprague Elec. Co.	312-678-2262
Ind	Indianapolis, Sprague Elec. Co.	317-253-4247
MD	Pikesville, A. Wetterhahn Co.	301-484-8376
Mass	Norwood, R. Perron & Co.	617-762-8114
Mich	Jackson, Sprague Elec. Co.	517-787-3934
Minn	Minneapolis, HMR	612-920-8200
Mo	St. Ann, Sprague Elec. Co.	314-291-2500
NH	Dover, R. Perron & Co.	603-742-2321
NJ	Oaklyn, A. Wetterhahn Co.	609-858-3003
NM	Albuquerque, W. J. Purdy Co.	505-266-7959
NY	East Rockaway, W. Bellenkas Assoc.	
		516-887-1443
NY	Pittsford, T-Squared Elctns. Co.	716-381-2551
NY	Syracuse, T-Squared Elctns. Co.	315-463-8592
NC	Winston-Salem, Electronic Mktg. Assoc.	
		919-722-5151

Ohio	Beachwood, Electronic Salesmasters	216-831-9555
Ohio	Dayton, Sprague Elec. Co.	513-278-0781
Tenn	Huntsville, Sprague Elec. Co.	205-883-0502
Tex	Dallas, E. F. Aymond Co.	214-826-7620
Vt	Dover, R. Perron & Co.	603-742-2321
Wash	Seattle, Sprague Elec. Co.	206-632-7761
FOR:	Can., Don Mills, Ont., B. D. Vallillee Elctns., Ltd.	
		416-447-8482

SPRENGNETHER INSTR. CO., W.F., 4567 Swan St., St. Louis, Mo., 63110, Tel: 314-535-1682; Empl.: 25

Free literature available: Catalog pages & prices.

Products manufactured: Amplifiers, Clocks, (All Types), Comm. Systems, Meters, Recorders, Transducers

SQUARE D CO., 4041 N. Richards, Dept. SA-711 Box 472, Milwaukee, Wisc., 53201, Tel: 414-332-2000, Telex: 2-6647; Empl.: 15000 p. 1-273,1814,1815

Products manufactured: Alternators, Boxes, Junction, Outlets & Wall Plates, Brakes, Cards, Logic, Circuit Breakers, Clamps & Clips, Connectors, Controllers, Programmable, Controls/Control Eqp't., Counters, Ducts, Wiring, Indicators, Limit Stops, Mechanical, Modules, Logic, Encapsulated, Process Control Systems, Relays, Resistors, Switchboards, Switches, Terminal Blocks, Boards & Strips, Terminals, Timers, Transformers, Valves, Solenoid

SRC DIV., MOXON INC., See Moxon Inc.

S S A C PRECISION PRODUCTS INC., Box 395, Liverpool, N.Y., 13088, Tel: 315-457-9610

For info on price: R. Shutt; Application info: R. Shutt; Customer service: D. Reynolds; Delivery info: D. Reynolds

Free literature available: Solid state flashers, timers and relays for industrial and commercial applications. Voltages from 12 to 230 AC/DC. Load rating to 12 amperes/180 amperes surge.

Products manufactured: Controls/Control Eqp't., Flashers, Lamp Drivers, Lights, Relays, Switches, Timers

Local Sales Offices & Reps.

Cal N. Hollywood, Crown Elctns. 213-877-3550
Cal San Francisco, Artwel Elec. 415-467-1880
Conn Old Lyme, Conn. Valley Ent. 203-434-5844
Mich Troy, Xanthus 313-391-3235
Minn St. Paul, Steve Foster 612-454-5552
Mo St. Louis, Richter Assocs. 314-567-1829
NY Rochester, Upstate Component Sls. 716-288-1080
NY Rye, Charles Aulery Assoc. 914-967-7610
Pa Jenkintown, Arnold Assocs. 215-742-0600
Tenn Chattanooga, Hayden Roberts 615-267-5922

Local Distributors

Cal Los Angeles, Master Distr., Box 25662 213-395-2637
Fla Winter Pk., Sta-Con, 680 Clay St. 305-645-2215
NJ Fairlawn, Relay Specialties, Box 223-1300 Plaza Rd. 201-797-3313
NC Shelby, Dixie Ind'l Supp., Box 127, Hwy. 74E 704-482-5641

STACKPOLE CARBON CO., Carbon Div., St. Marys, Pa., 15857, Tel: 814-781-1234, TWX: 510-693-4511; FSC No: 78488

Products manufactured: Brushes & Brush Assemblies, Contacts, Electrical, Graphite Parts, Materials, Graphite

STACKPOLE CARBON CO., Electronic Comps. Div./Soft Fernites/Fixed Comp. Resistors, St. Marys, Pa., 15857, Tel: 814-781-1234, TWX: 510-693-4511

Products manufactured: Cores, Magnetic, Ferrite Material & Parts, Resistors, Yokes

Refer To: SCC/Electrn. Comps. Div. - Fixed Comp. Resistors For Sales Office Information

STACKPOLE CARBON CO., Electrn. Comps. Div.-Fixed Comp. Resistors, Kane, Pa., 16735, Tel: 814-837-7000, TWX: 510-695-8404; FSC No: 78488

Products manufactured: Resistors

Local Sales Offices & Reps.

Ariz Phoenix, Bestronics 602-248-7020
Cal Los Angeles, Black, Ekizian & Strong Inc. 213-870-9191
Cal Millbrae, F. Auman 415-445-2250
Cal San Diego, Bestronics 714-278-2150
Colo Denver, Check Mate Sls. 303-771-4920
Conn Plantsville, R. J. Pisaneschi 203-628-9505
Fla N. Palm Beach, Lectro Mech. 305-842-2458
Ga Peachtree City, J.A. Creighton 404-461-9836
Ill Arlington Heights, J. L. Clingsmith 312-392-1639
Ill Chicago, Stackpole Carbon Co. 312-297-0270
Ill Kankakee, R. Burgess 815-939-7385
Ind Bloomington, R.E. Riggs 812-339-6166
Kans Overland, Enesco-Rep 913-381-7557
La Baton Rouge, R.F. Gallagher 504-924-4995
Md Baltimore, Stemler Assoc., Inc. 301-944-8262
Mass Boxford, E.F. Delaney, Jr. 617-887-2090
Mich Birmingham, J.E. Vollmer Jr. 313-644-3571
Minn Minneapolis, Bitronics Sls. Co. 612-835-7744
Minn Minneapolis, HMR Inc. 612-920-8200
Mo St. Louis, Enesco-Rep. Inc. 314-567-3935
NJ Englewood Cliffs, Sprung/Nussbaum 201-947-6767
NY Buffalo, R.W. Mitscher 716-633-7970
NY Fayetteville, R.W. Mitscher 315-637-9575

NC Raleigh, R.W. Mitscher 919-828-0575
Ohio Hudson, D. J. Mohr 216-653-2255
Pa Oreland, Brown-Oberlies Inc. 215-887-1325
Pa Pittsburgh, H.S. Swoyer 412-256-2538
Tenn Shelbyville, R. W. Mitscher 615-684-4544
Tex Dallas, M.N. Herbst 214-239-2497
Va Virginia Bch., R.W. Mitscher 804-481-7200
Wash Bellevue, Vantage 206-455-3460

STACKPOLE CARBON COMPANY, Magnet Div., Kane, Pa., 16735, Tel: 814-837-7000, TWX: 510-695-8360

Products manufactured: Magnets

STACKPOLE COMPONENTS CO., Box 14466, Raleigh, N.C., 27610, Tel: 919-828-6201, TWX: 510-928-0520; FSC No: 78488 p. 1-2278-2281

Products manufactured: Keyboards, Alphanumeric & Decimal, Potentiometers, Switches

Local Sales Offices & Reps.

Ariz Phoenix, Bestronics 602-248-7020
Cal Los Angeles, Black, Ekizian, Strong 213-870-9191
Cal Millbrae, F.A. Auman 415-445-2250
Cal San Diego, Bestronics 714-278-2150
Colo Denver, Checkmate Sls. Inc. 303-771-4920
Conn Plantsville, R.J. Pisaneschi 203-628-9505
Fla N. Palm Beach, Lectro Mech. 305-842-2458
Ga Peachtree City, J.A. Creighton 404-461-9836
Ill Arlington Heights, J.L. Clingsmith 312-392-1639
Ill Chicago, Stackpole Carbon Co. 312-297-0270
Ill Kankakee, R. Burgess 815-939-7385
Ind Bloomington, R.E. Riggs 812-339-6166
Kans Overland Park, Enesco-Rep 913-381-7557
La Baton Rouge, R.F. Gallagher 504-924-4995
Md Baltimore, Stemler Assoc. 301-944-8262
Mass Boxford, E.F. Delaney, Jr. 617-887-2090
Mich Birmingham, J.E. Vollmer, Jr. 313-644-3571
Minn Minneapolis, Bitronics Sls. Co. 612-835-7744
Mo St. Louis, Enesco-Rep 314-567-3935
NJ Englewood Cliffs, Sprung/Nussbaum 201-947-6767

NY Buffalo, R.W. Mitscher 716-633-7970
NC Raleigh, R.W. Mitscher 919-828-0575
Ohio Hudson, D.J. Mohr 216-653-2255
Pa Oreland, Brown Oberlies 215-887-1325
Pa Pittsburgh, H.S. Swoyer 412-256-2538
Tenn Shelbyville, R.W. Mitscher 615-684-4544
Tex Dallas, M.N. Herbst 214-239-2497
Va Virginia Beach, R.W. Mitscher 804-481-7200
Wash Bellevue, Vantage Corp. 206-455-3460

STACO, INC., 2240 E. 3rd St., Dayton, Ohio, 45403, Tel: 513-253-1191, TWX: 810-459-1798; FSC No: 83008; Empl.: 125; Minimum order: \$50 p. 2-1808,1809

For info on price: M. R. Marshall; Application info: D. James; Customer service: M. R. Marshall; Delivery info: M. R. Marshall

Free literature available: A new 60 page Variable Transformer Catalog, including a complete product line from 0-8 amps to 450 amps, 120 Volt to 560 Volt Types.

Products manufactured: Power Supplies, Transformers

Local Sales Offices & Reps.

Cal Los Angeles, E.E. Strassner Co. 213-666-1511
Cal Santa Clara, Thomas-Hartman Assocs. 408-247-1252
Colo Denver, R.G. Bowen Co. 303-722-4641
Conn Canaan, Hathaway Elctns., Inc. 203-824-7215
Fla North Miami, Winfield Electronic Sls. Co. 305-945-6544
Ga Atlanta, Millar Elctrn. Sls. 404-261-6160
Haw Honolulu, Aloha Assocs. 808-941-1574
Ill Skokie, Saffro & Assocs. 312-588-0905
Ind Indianapolis, Southern Sls. Co. 317-257-7575
Kans Shawnee Mission, Kathrinus-Kelly 913-722-0000
La Metairie, McKinney Sls. Co. 504-887-1723
Md Hyattsville, Eastern Comps. 301-577-2925
Mass Lexington, Hathaway Elctns., Inc. 617-861-7010
Mich Ferndale, Shalco, Inc. 313-547-4771
Minn Minneapolis, C. Gibb Co. 612-377-1200
Mo St. Louis, Kathrinus-Kelly Co. 314-968-3800
NJ Wayne, Howard Kagan Assocs. 201-684-7682
NM Albuquerque, C.T. Carlberg & Assocs. 505-265-1579
NY Buffalo, R.F. Lamb Co. 716-874-4900
NY Rochester, R.F. Lamb Co. 716-544-5580
NY Syracuse, R.F. Lamb Co. 315-454-2469
NY Valley Stream, Levison Sls. Co. 516-561-9696
NC Raleigh, Miller Elctns., Inc. 919-787-9564
Ohio Cleveland, Marlow Assocs. 216-932-0900
Ohio Dayton, Marlow Assocs. 513-426-6270
Okla Tulsa, McKinney Sls. Co. 918-742-6791

Pa Flourtown, Eastern Comps. 215-836-1616
Pa York, Eastern Comps. 717-764-3114
Tex Dallas, McKinney Sls. Co. 214-631-9450
Wash Seattle, R.K. Squibb Co. 206-632-2450

STACOSWITCH, INC., 1139 Baker St., Costa Mesa, Cal., 92626, Tel: 714-549-3041, TWX: 910-595-1507; CPL No: Multiple; Empl.: 100; Minimum order: \$25 p. 2-1114,1115

For info on price: J. Shafer; Application info: K. Johnson; Customer service: J. Shafer; Delivery info: J. Shafer

Free literature available: Lighted and Unlighted Pushbutton Switches - 48 page catalog. Light Isolator Cells (for backlighted displays) - 12 page catalog.

Products manufactured: Annunciators, Index Assemblies, Switch, Lights, Services, Assembly, Production & Test, Sockets, Switchboards, Switches

Local Sales Offices & Reps.

Cal Newark, Snyder Sls. 415-792-8323
Conn Marion, Sands Co. 203-628-4363
Fla Lighthouse Pt., Saber Assocs. 305-943-3076
Ill Glendale Hts., Trend-Tronics 312-963-2210
Ind Fort Wayne, J. B. Engrg. Sls. 219-483-2813
Md Rockville, Marktron 301-762-6210
Mich Grand Rapids, R.P. Urban & Assocs. 616-245-0511
NJ Wayne, G.T. Assocs. 201-694-6040
NY Syracuse, Lenard Co. 315-379-9191
Pa Media, W. Reeves Assocs. 215-566-6709
Tex Addison, R. R. Thomas Co. 214-233-8235
Wash Seattle, Arneson Assocs. 206-762-7664

STANCOR/ESSEX INTERNATIONAL, INC., 3501 W. Addison, Chicago, Ill., 60618, Tel: 312-463-7400, TWX: 910-221-5466; FSC No: 80089

For info on price: J. Farr; Application info: E. P. Kelly; Customer service: J. Farr; Delivery info: J. Farr

Free literature available: Catalog #407 - detailed specifications of 1,300 stock transformers for industrial applications. Catalog #721-74 - lists 800 flybacks, yokes and transformers for television replacement. Bulletin V-2000 - Describes the stancor voltage corrector.

Products manufactured: Chokes, Coils Including Assemblies & Forms, Isolators, Reactors, Regulators, Transformers

Local Sales Offices & Reps.

Ariz Tempe, W.B. Knight Co. 602-946-1088
Cal Millbrae, Polach & Bensinger Inc. 415-697-2525
Cal Newport Beach, W. Bert Knight Co. 714-833-8250
Colo Denver, R.G. Bowen Co. 303-722-4641
Fla Orlando, Hollingsworth & Still, Inc. 305-671-4515
Ga Atlanta, Hollingsworth & Still, Inc. 404-394-3270
Ill Oak Park, G. Pettit Co. 312-261-0342
Ill Peoria, G. Pettit Co. 309-699-3301
Kans Shawnee Mission, Lowell-Kangas & Assocs. 913-631-3515
La Chalmette, Cartwright & Bean, Inc. 504-279-4598
Md Rockville, Lienau Assocs. 301-770-8800
Mass Wellesley Hills, M. Scott Co. 617-235-1020
Mich Detroit, R.C. Merchant Co. 313-535-6000
Mich St. Joseph, R.C. Merchant & Co. 616-983-7378
Minn Minneapolis, R. Ripley & Assocs. 612-881-8282
Mo St. Louis, Lowell-Kangas Assocs. 314-821-4050
NM Albuquerque, C.T. Carlberg & Assocs. 505-265-1579
NY Buffalo, R.W. Mitscher Co. 716-633-7970
NY Elmont, F.E. Schmitt Co. 516-437-8150
NC Charlotte, Hollingsworth & Still, Inc. 704-536-7047

Ohio Columbus, McFadden Sls. Co. 614-221-3363
Ore Portland, Earl & Brown Co. 503-292-9145
Pa Cornwall Hts., Lienau Assocs. 215-757-8819
Pa Pittsburgh, Covert & Newman Co. 412-563-0303

Tenn Memphis, Cartwright & Bean of Tenn., Inc. 901-276-4442

Tex Dallas, R.E. Nesbitt Co. 214-357-4601

Tex Houston, R.E. Nesbitt Co. 713-224-3633

Wash Seattle, Earl & Brown Co., Inc. 206-284-1121

EXP: New York, N.Y., Roburn Agencies, Inc. 212-989-5939

STANDARD CONDENSER CORP., 1065 W. Addison St., Chicago, Ill., 60613, Tel: 312-327-5440; Minimum order: \$25

For info on price: R. T. McLean; Application info: A. Batal; Delivery info: D. Peters

Products manufactured: Capacitors, Fixed, Resistors, Suppressors

Local Sales Offices & Reps.

Ill Chicago, Rinaldi Inc. 312-763-4848
Mich Farmington, Davis-Martensen Co. 313-474-8300
Minn St. Paul, Cahill & Assoc. 612-646-7217
NY Syracuse, J.V. Costello 315-472-0322
Pa Jenkintown, Arnold & Assoc. 215-PI2-0600

STANDARD CONTROLS, 2401 S. Bayview St., Seattle, Wash., 98144, Tel: 800-426-0366, TWX: 910-444-2164; FSC No: 13624; Empl.: 45 p. 1-2347

For info on price: R. Schnoberger; Application info: T.A. Notman; Customer service: R. Schnoberger; Delivery info: R. Schnoberger

Free literature available: 24 Page Product Brochure

Products manufactured: Amplifiers, Cells, Load, Transducers

Local Sales Offices & Reps.

Ala Huntsville, Tech. Sls. 205-881-1750
Cal Costa Mesa, Scrantom Engrg., Inc. 714-979-6373
Cal Los Altos, J.C. Meyer & Assocs. 415-964-8844
Colo Denver, Grifco 303-722-4674
Ill Des Plaines, Marsland Assocs. 312-775-1309
Ind Indianapolis, Marsland Assocs. 317-924-3568
Md Kensington, Electronic Mktg. Assoc. 301-744-7700
Mass Peabody, JSR Assoc. 617-532-0348
Mich Farmington, W. R. Hummon & Assocs., Inc. 313-474-0661
Minn Minneapolis, Stack-Johnson, Inc. 612-925-2111
Mo St. Peters, Marsland Assocs., Inc. 314-278-6949
NJ Palisades Park, Tech-Rep Engr. Sls. 201-945-7669
NY Fairport, Naco Elctns. Corp. 716-244-4720
NY Nesconset, Tech-Rep Engr. Sls. 516-724-3564
NY North Syracuse, NACO Electronics Corp. 315-699-2651
NY Rochester, NACO Elctns. Corp. 716-244-4720
NY Utica, NACO Elctns. Corp. 315-732-1801
NC Charlotte, Ranson, Wallace & Beesel, Inc. 704-334-4244
Ohio Cleveland, Del Steffen & Assoc. 216-461-8333
Ohio Dayton, Del Steffen & Assoc. 513-293-3146
Pa King of Prussia, Electronic Mktg. Assoc. 215-265-1600
Tex Houston, Scientific Sls. Co. 713-666-5723
Tex Richardson, Scientific Sls. Co. 214-231-6541
Wash Seattle, Standard Controls 206-723-1705
FOR: Can., Willowdale, Ont., ASW Controls & Instrs., Ltd. 416-494-1541

STANDARD CRYSTAL CORP., 1 Cupania Circle, Monterey Park, Cal., 91754, Tel: 213-724-5004; Minimum order: \$25

Customer service: J. B. Fisher

Products manufactured: Controls/Control Eqpt., Crystal Blanks, Crystals

Local Sales Offices & Reps.

Cal Costa Mesa, E. Murray Assoc. 714-642-3282
Mich Grand Rapids, R. P. Urban Assoc. 616-245-0511

STANDARD ENVIRONMENTAL SYSTEMS, INC., 392 Minnissink Rd., Totowa, N.J., 07512, Tel: 201-256-2200, TWX: 710-988-5722; Empl.: 30

For info on price: D.E. Wilson, Jr.; Application info: K.A. Ladzinski; Customer service: L. Miller; Delivery info: J.F. Wroblewski

Free literature available: "Simulators of Geophysical Environments," including law & high temp, humidity, altitude, corrosive atmosphere, erosive atmosphere, pressure, explosion, thermal shock.

Products manufactured: Air Conditioners (For Equipment), Baths, Controlled Temperature (Air & Liquid), Cabinets & Accessories, Chamber, Environmental Test, Heat Exchangers & Systems, Ovens

Local Sales Offices & Reps.

Ga Tucker, Ridge Instrument
Mass Wilmington, Tech. Instrs.
NM Albuquerque, J. Smith & Assocs.
NY Syracuse, Tesco Assocs.
Tex Dallas, Merit Co.

STANDARD GRIGSBY INC., 920 Rathbone Ave., Aurora, Ill., 60507, Tel: 312-897-8417, TWX: 910-232-3138; Empl.: 350; Minimum order: \$50

For info on price: R. Riemland; Application info: B. Sefton; Customer service: R. Riemland; Delivery info: R. Riemland

Free literature available: Rotary and Lever Switch, 32 page catalog Rotary Printed Circuit Board Assemblies-2 pg. Brochure Linear Slide Switch, 4 page catalog Printed Circuit and Solderless Terminals-2 page Brochure PB 400 Pushbutton Switches (miniature & modular) 12 page Brochure

Products manufactured: Switches

Local Sales Offices & Reps.

Ala Huntsville, Elctrn. Mktg. Assoc. 205-837-6061
Ariz Tempe, Argus Sls. 602-966-7442
Cal Culver City, DeAngelo Rothman & Co. 213-398-6239
Cal Redwood City, Parks & Pruitt Assocs. 415-364-1640
Cal San Diego, DeAngelo Rothman & Co. 714-560-5707
Colo Wheatridge, Waugaman Assocs. 303-423-1020
Conn Milford, Conti-Younger Assoc. 203-929-3294
Fla Altamonte Springs, WMM Assoc. 305-831-4645
Fla Clearwater, WMM Assoc. 813-447-2533
Fla Pompano Beach, WMM Assoc. 305-943-3091
Ill Hinsdale, Momak Sls. 312-654-4524
Ind Indianapolis, Southern Sls. Corp. 317-257-7575
Iowa Cedar Rapids, Elctrn. Sls. Co. 319-364-4342
Md Rockville, Mechtronics Sls. 301-340-2130
Mass Waltham, Conti-Younger Assoc. 617-890-4582
Mich Benton Harbor, McNabb & Assoc. 616-925-2166
Minn Minneapolis, Stack-Johnson 612-925-2111
NJ Mountain Lakes, Comps. For Elctns. 201-334-2921
NY Buffalo, J. McDonough Assocs. 716-839-2044
NY Manlius, Bowser & Sapecky Assoc. 716-839-4170
NY Rochester, Quality Comps. 919-467-6319
NC Cary, Electronic Mktg. Assoc. 919-722-5151
NC Winston Salem, Electronic Mktg. Assoc. 513-662-1616
Ohio Cincinnati, F. J. Campisano Co. 216-381-4949
Ore Beaverton, ES/Chase Co. 503-649-6177
SC Greenville, Elctrn. Mktg. Assoc. 803-268-1125
Tex Dallas, McCoy Assoc. Co. 214-350-9931
Tex Houston, Ev Smith Sls Co. 713-649-5756
Wash Edmonds, ES/Chase Co. 206-774-3586
FOR: Can., Downsview, Ont., Kaytronics, Ltd. 416-638-5511
FOR: Can., Montreal267, Que., Kaytronics, Ltd. 514-487-3434

STANDARD LOGIC INC., 2215 S. Standard Ave., Santa Ana, Cal., 92707, Tel: 714-979-4770, TWX: 910-595-1707; Empl.: 130; Minimum order: \$25

For info on price: J. Machicek; Application info: H. Welsh; Customer service: J. Machicek; Delivery info: J. Machicek

Free literature available: DIP/Logic Packaging Handbook; Semi Automatic Wire-Wrapping Machines; Floppy Disks; Fixed Head Disks; ECL C-A-S-H Cards; A Disc Memory Buyer's Guide; Electronic Wire Stripper.

Products manufactured: Backpanel Interconnect Systems, Boards, Plug-In, Bus Bars & Systems, Cable Assemblies & Harnesses, Cards, Logic, Chassis, Circuit Board Mounting, Controllers, Programmable, Converters, Crystals, Enclosures, Module, Plug-In, Frames, Cabinet & Rack, Kits, Breadboarding (For Engineers), Machines/Machinery, Production, Memory Systems, Oscillators, Racks, Wire Strippers

STANDARD MEMORIES, INC., 2801 E. Oakland Park Blvd., Ft. Lauderdale, Fla., 33306, Tel: 305-566-7611, TWX: 510-955-9828; Empl.: 150

For info on price: D. Chandler; Application info: J. A. Deving; Customer service: D. Chandler

Products manufactured: Memory Systems

Local Sales Offices & Reps.

Cal Santa Ana, Western Regional Office 714-540-3605
NJ Fair Haven, Eastern Regional Office 201-842-3160
Tex Dallas, Midwestern Regional Office 214-369-4528

STANDARD POWER, INC., 1400 S. Village Way, Santa Ana, Cal., 92705, Tel: 714-558-8512, TWX: 910-595-1760; Empl.: 95 p. 1-1472-1475

Products manufactured: Power Supplies

Local Sales Offices & Reps.

Ariz Scottsdale, R.R. Thomas Co. 602-994-0401
Cal Palo Alto, O'Donnell Assoc. 415-327-9260
Cal Torrance, O'Donnell Assoc. 213-323-9243
Colo Denver, Parker-Webster Co. 303-770-1972
Fla Ft. Lauderdale, Tech Rep Assocs. 305-792-0962

Fla Indian Rocks Beach, Tech Rep Assocs. 813-595-2834

Ga Atlanta, Tech Rep Assocs. 404-252-9288
Ill Mt. Prospect, Delta Tech. Sls. Corp. 312-437-9412
Kans Olathe, BC Elctrn. Sls. 913-782-6696
Md Glen Arm, Barnhill & Assocs. 301-252-5610
Mass West Concord, Sls. Engrg. 617-369-3943
Mich Sterling Heights, Compass Assocs. 313-979-3690

Minn Minneapolis, Arneson & Co. 612-835-2177
Mo Hazelwood, BC Elctrn. Sls. 314-731-1255
NJ Ridgefield, Haber Ramp Corp. 201-945-5250
NY Buffalo, Precision Sls. 716-856-5974
NY N. Syracuse, Precision Sls. 315-458-2223
NC Raleigh, Barnhill & Assoc. 919-787-5774
Ohio Dayton, Compass Assoc. 513-252-9939
Pa Norristown, Data Engrg. 215-272-1444
Pa Pittsburgh, Bishop Co. 216-255-6969
Tenn Johnson City, Barnhill & Assoc. 615-928-0184
Tex Dallas, R.R. Thomas Co. 214-363-8591
Va Lynchburg, Barnhill & Assoc. 703-846-4624
Wash Bellevue, W.M. Buehler 206-243-6340
EXP: Los Angeles, Cal., Constantex 213-838-6950

STANDARD WIRE & CABLE CO., 3440 Overland Ave., Los Angeles, Cal., 90034, Tel: 213-870-9231, TWX: 910-340-6758; Empl.: 105 p. 2-2058,2059

Products manufactured: Cable Assemblies & Harnesses, Cable, Cords, Wire, Wire Shielding

Local Sales Offices & Reps.

Ariz Phoenix, Standard Wire & Cable Co. 602-269-2501
Cal Palo Alto, Standard Wire & Cable Co. 415-328-3082
Fla Orlando, Buchanan & Abrams Assoc. 305-898-7444
Ga Atlanta, Electro-Mech, Inc. 404-393-0444
Ill Hinsdale, Momak Sls. 312-654-4524
Ind Fort Wayne, R. G. Frederick Inc. 219-745-4621
Md Towson, L.H. Kolman & Co. 301-752-8756
Mass Attleboro, Standard Wire & Cable Co. 617-226-1500
Minn Minneapolis, E.C. Electronic Sls. 612-831-0229
NJ Cinnaminson, Scott Sls. 609-829-2991
NY DeWitt, Tri-Tech Elctns. 315-446-2881
Ohio Cleveland, O'Neill - Ruffing & Co. 216-331-4273
Pa Pittsburgh, Covert & Newman Co. 412-563-0303
Wash Vancouver, Standard Wire & Cable Co. 206-696-4645

STANFORD APPLIED ENGINEERING, 340 Martin Ave., Santa Clara, Cal., 95050, Tel: 408-243-9200, TWX: 910-338-0132; Empl.: 600

For info on price: J. Pollock; Application info: L. Vermont

Products manufactured: Boards, Printed Circuit, Boards, Printed Wiring, Universal, Cards, Logic, Chassis, Circuit Board Mounting, Circuits, Flexible, Circuits, Printed, Multilayer, Coils Including Assemblies & Forms, Connectors, Delay Lines, Filters, Holder & Carriers, Integrated Circuit Packaging Systems, Pullers, Racks, Services, Assembly, Production & Test, Sockets, Switches, Transformers

Local Sales Offices & Reps.

Ariz Scottsdale, BFA CORP. 602-946-4215
Cal Costa Mesa, Stanford Applied Engrg. 714-540-9256
Cal Newport Beach, Mission Mktg. 714-833-1802
Cal Palo Alto, Brooks Tech. Group 415-328-3232
Cal San Diego, Harvey King 619-776-7541
Cal Santa Clara, Stanford Applied Engrg. 408-243-9200
Colo Boulder, Stanford Applied Engrg. 303-449-9100
Colo Denver, Electrodyne 303-757-7679
Colo Denver, Integrated Elctns. 303-534-6121
Conn Cheshire, Coakley, Boyd & Abbott, Inc. 203-272-2261
Fla Casselberry, EIR, Inc. 305-830-9600
Fla Palm Beach, EIR 305-585-6689
Fla Plantation, EIR 305-791-6390
Ga Atlanta, Electro-Mech 404-393-0444
Haw Honolulu, Adtech, Inc. 808-941-0708
Ill Addison, Stanford Applied Engrg. 312-620-8820
Ill Rosemont, Advent Elctns. 312-298-4210
Md Baltimore, Stemler Assocs. 301-944-8262
Mass N. Billerica, Stanford Applied Engrg., Connector Tech. Oper. 617-667-3806
Mass Needham, Coakley, Boyd & Abbott, Inc. 617-444-5470
Mass Newton, Greene-Shaw Co. 617-969-8900
Mich Farmington, Sheridan Assocs. 313-477-3800
Minn Minneapolis, M. Westlund Assocs. 612-884-5022

Mo	Kansas City, Harris-Hanson Co.	816-444-9494
Mo	St. Louis, Harris-Hanson Co.	314-432-3611
NJ	Cherry Hill, Stemler Assoc.	609-966-4070
NJ	Laurel Springs, Stemler Assoc.	215-644-3477
NJ	Ridgefield, Haber-Ramp Corp.	201-945-5250
NM	Albuquerque, BFA Corp.	505-292-1212
NM	Las Cruces, BFA Corp.	505-523-0601
NY	Buffalo, Summit Dists.	716-494-3450
NY	Laurel Springs, Stemler Assoc.	215-644-3477
NY	Marlton, Stemler Assoc.	609-966-4070
NY	N. Syracuse, Precision Power Devices	315-458-2223
NY	Rochester, Telesco Assoc.	716-271-3780
NY	Utica, Telesco Assoc.	315-733-3183
NY	West Babylon, Stanford Applied Engrg.	516-420-8111
NC	Raleigh, Electro-Mech	
Ohio	Beachwood, Sheridan Assocs.	216-831-0130
Ohio	Cincinnati, Sheridan Assocs.	513-761-5432
Ohio	Dayton, Sheridan Assocs.	513-277-8911
Ohio	Reading, Sheridan Assocs.	513-761-5432
Okla	Tulsa, Kemp Engrg. Co.	918-299-2636
Pa	Pittsburgh, Sheridan Assocs.	412-244-1640
Tenn	Nashville, Electro-Mech	615-883-1490
Tex	Dallas, M. Kruvand Co.	214-827-8043
Tex	Houston, M. Kruvand Co.	713-661-3007
Utah	Salt Lake City, Alta Elctns.	801-486-7227
Va	Alexandria, Stemler Assoc.	703-548-7818
Wash	Redmond, Barrett Sls. Northwest	206-885-6991
FOR:	Can., Rexdale, Ont., Frank Eakin, Ltd.	416-638-0451
FOR:	Can., Toronto, Ont., Zentronics, Ltd.	416-789-5111

STANFORD APPLIED ENGRG., INC., Advanced Packaging Div., 2165 S. Grand Ave., Santa Ana, Cal., 92705, Tel: 714-540-9256, TWX: 910-595-1122; Empl.: 150

Products manufactured: Boards, Printed Circuit, Bus Bars & Systems, Connector Adapters, Connectors, Contacts, Electrical, Drawers, Sliding, Racks, Sockets, Terminals

Local Sales Offices & Reps.

Cal	San Diego, Mesa Elctns.	714-278-8021
Cal	Santa Ana, SAE	714-540-9256
Cal	Santa Clara, SAE Sls.	408-243-9200
Colo	Boulder, Rocky Mtn. Regional Sls.	
Conn	New Haven, Gerber Sls. Co.	303-449-9100
Fla	Miami, S. K. Wallace Assocs.	305-691-1654
Fla	Tampa, S. K. Wallace Assoc.	813-932-3568
Ga	Jonesboro, S. K. Wallace Assocs.	404-471-6297
Ill	River Grove, SAE	312-453-9337
Md	Silver Springs, QED Elctns.	301-588-8134
Mass	Springfield, Gerber Sls. Corp.	413-525-3059
Mass	Waltham, Gerber Sls. Co.	617-890-8040
Mich	Farmington, Carter, McCormick & Peirce	313-477-7700
Minn	Minneapolis, M. Westlund Assoc.	612-884-4567
Mo	Kansas City, Harris Hanson Co.	816-444-9494
Mo	St. Louis, Harris Hanson	314-432-3611
NJ	Camden, Q E D Elctns.	215-925-8711
NJ	Morristown, Graydon-Sherman	201-538-9246
NY	Fayetteville, R. Sherman	315-637-9863
NY	New York, East Regional Sls.	212-687-1220
NC	Greensboro, S. K. Wallace Assocs.	
Okla	Tulsa, Kemp Engrg. Co.	918-292-0487
Tenn	Memphis, S. K. Wallace Assocs.	901-682-2281
Tex	Dallas, SAE	214-661-9112
Wash	Bellevue, Rowe/Northwest	206-455-2686

STANTON MAGNETICS, INC., Terminal Dr., Plainview, N.Y., 11803, Tel: 516-OVI-0200; Empl.: 300
Customer service: Sales Dept.

Products manufactured: Handsets, Chestsets, Headphones, Headsets, Etc., Phonographs, Parts & Accessories

Local Sales Offices & Reps.

Cal	Beverly Hills, Trego Sls. Co.	213-274-8351
Cal	Redwood City, H & K Sls.	415-369-6244
Colo	Aurora, Scowcroft & Assocs.	303-755-2422
Conn	Stamford, John B. Anthony Co.	203-322-9202
Conn	West Haven, Robert S. Reiss Assocs.	
Fla	Ft. Lauderdale, Unirep	305-527-1556
Ill	Skokie, Irving W. Rose Assocs.	312-674-6790
Kans	Overland Park, William Menezes & Assoc.	913-649-2680
Md	Bethesda, Gene Rosen & Assocs.	301-530-8448
Mass	Marblehead, Willson Sls. Co.	617-631-4016
Mich	St. Clair Shores, Rod Butchart & Assocs.	313-773-7870
Minn	St. Paul, Smith Engrg. Assocs.	612-646-4851
NC	Charlotte, L. D. Roddey Sls.	704-375-5712
Ohio	Cleveland, F. A. Daugherty Co.	216-H19-1122
Ohio	Lakewood, Maybern Co.	216-333-2531

Pa	McMurray, C. S. Cooper & Assocs.	
Tex	Dallas, Charles Lucas Sls. Co.	412-941-6473
Wash	Seattle, Henry Joncas Co.	214-330-8181
		206-364-8609

STANTRON DIV., Wyco Metal Products, 6914 Beck Ave., North Hollywood, Cal., 91605, Tel: 213-875-0800, TWX: 910-499-2177; Empl.: 55 p. 1-92-95

Products manufactured: Blowers & Fans & Accessories, Cabinets & Accessories, Panels, Racks, Slides, Cabinet & Chassis

Local Sales Offices & Reps.

Ariz	Phoenix, Sheffer-Kahn Co.	602-258-7893
Cal	Los Angeles, Ed Landa Co.	213-879-0770
Cal	Oakland, Moulthrop Sls. Inc.	415-261-7676
Colo	Aurora, Robbins & Assocs.	303-399-6618
Conn	Hamden, P. Jenks Assocs. Inc.	203-281-0810
Ill	Chicago, Berndt Assocs.	312-283-0713
Md	Silver Springs, Ara Elctns., Inc.	301-565-2444
Mass	Wakefield, P. Jenks Assocs.	617-246-1590
Mo	Florissant, Nevco, Inc.	314-838-4898
Mo	Kansas City, Nevco, Inc.	816-421-1751
NJ	Wayne, G.T. Assocs.	201-694-6040
NM	Albuquerque, Sheffer-Kahn Co.	505-265-7077
Ohio	Cincinnati, J.O. Olsen Co.	513-922-2176
Ohio	Cleveland, J.O. Olsen Co.	216-752-5444
Pa	Glenside, Ara Elctns., Inc.	215-887-5250
Pa	Pittsburgh, J.O. Olsen Co.	412-279-2550
Tex	Irving, Lee Sls. Co.	214-363-3831
Wash	Seattle, D. Smith Sls.	206-633-3160

STAR PORCELAIN CO., 71 Muirhead Ave., Box 1267, Trenton, N.J., 08638, Tel: 609-392-3154; Empl.: 180; Minimum order: \$200

For info on price: R. J. Schmidt; Application info: R. J. Schmidt; Customer service: R. J. Schmidt; Delivery info: H. Everett

Free literature available: Bulletin #6266-Engineering Properties of Star Ceramics Together With Ceramic Design Information.

Products manufactured: Cores, Ceramic, Filters, Insulators & Insulation, Tubing

STAR TRON CORP., 58 Curtis St., Providence, R.I., 02909, Tel: 401-274-5090; FSC No: 32494; Empl.: 30

For info on price: Sls. Off. 401-274-5091; Application info: D. D'Amico 401-274-5092; Customer service: A. Colafrancesco 401-274-5090; Delivery info: A. Colafrancesco 401-274-5090

Products manufactured: Bolometers, Connectors, Resistors

Local Sales Offices & Reps.

Cal	Encino, El/Tec	213-981-9881
-----	----------------	--------------

STARTRONICS, INC., Moulton St., Georgetown, Mass., 01833, Tel: 617-352-6200, TWX: 710-347-0310

STATEK CORP., 1233 Alvarez Ave., Orange, Cal., 92668, Tel: 714-639-7810, Telex: 65-5430; FSC No: 51791; Empl.: 80; Minimum order: \$30 p. 1-412-415

For info on price: Sales; Application info: R. Nelson; Customer service: R. Nelson; Delivery info: B. McIntire

Free literature available: Specification sheets: crystals, oscillators, oscillator kits; Application Notes: Transistor - series resonant circuits; CMOS - parallel resonant circuits Various technical notes

Products manufactured: Circuits, Hybrid, Thin-Film, Clocks (All Types), Crystals, Filters, Lenses, Optical & Camera, Oscillators, Standards, Timers

STATHAM INSTRUMENTS, INC., 2230 Statham Blvd., Oxnard, Cal., 93030, Tel: 805-487-8511; Empl.: 660

Products manufactured: Amplifiers, Analyzers, Carts & Dollies, Instrument & Equipment, Cells, Load, Chamber, Environmental Test, Connectors, Detectors, Display Devices/Displays, Gages, Ovens, Refrigerators, Environmental Test, Seals, Services, Assembly, Production & Test, Spectrometers, Transducers

Local Sales Offices & Reps.

Ariz	Scottsdale, Hagestad & Co.	602-945-0902
Cal	Los Angeles, Burtis Instrumentation Sls.	
Cal	Santa Clara, Statham Instrs., Inc.	408-246-2277
Cal	Van Nuys, Stratham Instrs., Inc.	213-873-4636
Cal	Woodland Hills, Statham Instrs., Inc.	
Colo	Denver, Telemetry Sls. Corp.	303-424-5574
Fla	Longwood, Lenz Engrg. Co.	305-831-9797
Fla	Winter Park, Statham Instrs., Inc.	305-644-0632
Ind	Ellettsville, R. Graham, B.S. Mareachen	812-876-5382
La	Baton Rouge, Alford, Woods, Childs Engrg. Inc.	504-275-5480

La	Harvey, Strander Corp.	504-367-4389
Md	Bethesda, S & S Assocs.	301-654-1434
Mass	Peabody, JSR Assocs.	617-532-0348
Mass	Waltham, McBar Assocs.	617-890-0233
Mich	Detroit, WKM Assocs., Inc.	313-892-2500
Minn	Minneapolis, Heimann Co.	612-861-6051
Mo	Hazelwood, Statham Instrs., Inc.	314-895-7777
Mo	St. Louis, Engrg. Svcs. Co.	314-997-1515
NJ	Englewood Cliffs, Statham Instrs., Inc.	

NJ	Teaneck, R.T. Reid Assoc., Inc.	201-569-5588
NM	Albuquerque, C.T. Carlberg & Assoc.	201-692-0200

505-265-1579		
NY	Binghamton, Bucci Assocs.	607-798-7141
NY	Lancaster, Lawrence Ind'l Sls.	716-685-1993
NY	Rochester, G.P. Troy	716-586-4845
Ohio	Cleveland, WKM Assocs., Inc.	216-725-4467
Ohio	Medina, McShane Inc.	216-725-4568
Okla	Broken Arrow, P.J. Scanlon Co.	918-251-5728
Pa	King of Prussia, S & S Assocs.	215-265-3450
Pa	Pittsburgh, WKM Assocs.	412-892-2953
Tex	Dallas, Statham Instrs., Inc.	214-358-4871
Tex	Houston, AWC	713-488-2730
Tex	Richardson, P.J. Scanlon Co.	214-231-4661

STAVER CO., INC., 41 N. Saxon Ave., Bay Shore, N.Y., 11706, Tel: 516-666-8000, TWX: 510-227-6142; Empl.: 90; Minimum order: \$50 p. 2-1200

For info on price: M. Girard; Application info: A. Skrobisch; Customer service: M. Girard; Delivery info: P. Sito

Free literature available: General Catalog on Staver Electronic Hardware, Heat Sink Catalog-Staver Thermoflag & Thermovane Heat Sinks, Data Sheets on Signalex Readouts

Products manufactured: Annunciators, Bezels, Shielded & Unshielded, Caps, Lenses, Indicator Light, Display Devices/Displays, Drivers & Decoders For Readouts, Eyelets, Holders, Crystal, Indicators, Pads, Transistor Mounting, Plug Caps & Shells, Services, Assembly, Production & Test, Shields, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

Ariz	Scottsdale, E.E. Black & Assocs.	602-947-2007
Cal	Encino, R.H. McDonald & Assocs.	213-986-5832
Cal	Santa Clara, Shiell Assocs.	408-732-6280
Conn	Greenwich, Eisenbeis Sls. Co.	203-869-2008
Fla	Eustis, R.K. Welter Co.	904-357-7796
Ga	Lithonia, Erickson Prods.	404-482-8858
Ill	Chicago, McBride Sls.	312-775-1080
Ind	Indianapolis, Lat-Tronics	317-846-5788
Mich	Grand Rapids, Elko Sls.	616-949-1451
NJ	Collingswood, Kaygar Assocs.	609-398-5229
NY	Manlius, Bowser & Sapecy Assocs.	
315-682-8885		
NY	Valley Stream, Levison Sls. Co.	516-L01-9696
Ore	Portland, J.J. Backer Co.	503-297-3776
Tex	Garland, G.V. Peck Co.	214-341-8311
Va	Portsmouth, F.B.D. Sls.	804-484-3162
Wash	Seattle, J.J. Backer Co.	206-285-1300

STELLEX INDUSTRIES, 33 Canal St., Rochester, N. Y., 14608, Tel: 716-235-7070; Empl.: 35; Minimum order: \$25

Customer service: J. Durham

Products manufactured: Relays, Services, Assembly, Production & Test, Terminal Blocks, Boards & Strips, Timers

STERLING INSTR., Div. Designatronics, Inc., 55 S. Denton Ave., New Hyde Pk., N.Y., 11040, Tel: 516-328-3300, TWX: 510-223-0642; Empl.: 150

Customer service: M. Ruggiero

Products manufactured: Bearings, Brakes, Bushings, Glass, Plastic, Metal, Rubber, Etc., Cams, Clutches, Counters, Couplings, Dials, Drives & Drive Mechanisms (Dial), Fasteners, Gears & Gear Mechanisms (Precision), Handles For Cabinets, Circuit Boards, Racks, etc., Indicators, Kits, Breadboarding (For Engineers), Knobs, Limit Stops, Mechanical, Nameplates, Pins, Reducers, Rings, Retaining, Servo Systems, Spacers, Switches, Terminals

Local Sales Offices & Reps.

Ariz	Phoenix, Tri Fab Sls. Rep. Co.	602-265-3341
Cal	Burlingame, J. Logan & Assocs.	415-697-6100
Cal	Chatsworth, Sterling W. Coast	213-822-6226
Colo	Denver, McSherry	303-238-8361
Fla	Orlando, Irby & Connolly, Inc.	305-894-8471
Ga	Atlanta, Electro-Mech. Sales Eng. Co.	
404-393-0444		
Ill	Chicago, A. Woods & Assoc.	312-283-7400
Mass	Woburn, R.W. Hatfield	617-933-2324
Mich	Lathrup Village, R.C. Nordstrom	313-559-7373
NJ	So. Amboy, Addeem I.	201-721-6449

NY Clarence, Rep-Tech. 716-684-6250
 NY Syracuse, Rep. Tech. 315-454-2445
 NC Charlotte, Reynolds Cowardin Assoc. 704-523-0324
 Ohio Columbus, Rockford Controls Ohio Inc. 614-231-5890
 Ohio Dayton, Rockford Controls 513-278-7362
 Ohio Euclid, Rockford Controls 216-731-5250
 Pa Glenolden, McDermott Assoc. 215-328-9180
 Tex Richardson, Zonk Eng. Co. 214-238-9651
 Va Richmond, Reynolds Cowardin Assoc. 703-266-3457
 Va Roanoke, Reynolds Cowardin Assoc.
 Wash Seattle, Ray Johnston Co. Inc. 205-524-5170
 FOR: Can., Pierre Fonds, Que., Avotronics, Ltd. 514-697-2135
 FOR: Can., Willowdale, Ont., Avotronics, Ltd. 705-493-9711

STERLING MFG. CO., 1845 E. 30th St., Cleveland, Ohio, 44114, Tel: 216-781-7136; Empl: 175; Minimum order: \$50

For info on price: J. L. Fine; Application info: W. Cizek; Customer service: M. Cooper; Delivery info: M. Cooper

Free literature available: Auto Antenna Catalogue Form # AC 1172, Panel Meter Catalogue Form # 1906, Pocket Meter Catalogue.

Products manufactured: Antennas, Meters, Testers

Local Sales Offices & Reps.

Cal Sales Engineers Ltd. 213-921-4337
 Mass Waltham, Devereux Sls. & Engr. 617-889-5900
 Mich Edwardsburg, Dash Sls. 616-689-5820
 NY Wantagh, Arnold Schuman Co. 516-826-5550
 NC Raleigh, Leigh Sls. 919-787-9090

STERLING TRANSFORMER CORP., 510 Driggs Ave., Brooklyn, N.Y., 11211, Tel: 212-782-4200; Empl: 55; Minimum order: \$25 p. 2-1803-1807

For info on price: A. Gartner; Application info: W. Winchell; Customer service: A. Gartner; Delivery info: A. Gartner

Free literature available: Catalog Transformers & Chokes.

Products manufactured: Coils Including Assemblies & Forms, Filters, Reactors, Transformers

Local Sales Offices & Reps.

Cal Palo Alto, Mauldin Co. 415-326-5291
 Cal Van Nuys, Timco Sls. 213-781-7370
 Conn Southington, Rantec, Inc. 203-621-5941
 Mass Waltham, Rantec, Inc. 617-890-5110
 NY Rockville Centre, Willgold Elec. Sls. 516-RO 4-4022

STERLING, Div. Reichhold Chems., Inc., Sewickley, Pa., 15143, Tel: 412-766-7600, TWX: 710-668-3877; Empl: 96

Products manufactured: Coatings, Compounds, Encapsulating, Insulating, Molding, Potting

Local Sales Offices & Reps.

Conn Northford, D.H. Rausch 203-484-0094
 Ill Oak Brook, Sterling Div. 312-887-0315
 Minn Minneapolis, Bergquist Co. 615-925-2322
 NC Charlotte, R.W. Chapman & Co. 704-525-2421
 Ohio Chagrin Falls, Electrolock, Inc. 216-247-4245
 Pa Sewickley, R.P. Heinick 412-766-7600
 Wisc Oconomowoc, D.R. Stackowicz 414-871-7525

STETTNER-TRUSH INC., 67 Albany St., Cazenovia, N.Y., 13035, Tel: 315-655-8141, TWX: 710-541-1530; Empl: 20

For info on price: G. Trush; Application info: G. Trush; Delivery info: V. Harmon

Products manufactured: Attenuators, Capacitors, Fixed, Capacitors, Variable, Filters, Motors, Networks, Resistors, Suppressors, Switches

Local Sales Offices & Reps.

Cal San Mateo, Melvin Sls. Co. 415-349-7444
 Cal Santa Fe Springs, Comp. Svcs., Inc. 213-664-8445
 Colo Arvada, Arrowhead Sls. Corp. 303-423-5556
 Conn North Haven, Kitchen & Kutchin, Inc. 203-239-0212
 Fla Orlando, Geartrac Assocs. 305-299-1000
 Ill Rosemont, STC, Inc. 312-671-4208
 Ind Bloomington, J. Hersham 812-339-9563
 Mass Lexington, Kitchen & Kutchin, Inc. 617-862-8230
 Minn Minneapolis, Technical Assocs., Inc. 612-929-7274
 Mo St. Louis, Beneke & McCanl 314-434-6242
 NJ Fort Lee, R. Cameron Assocs. 201-461-2595
 NC Raleigh, A.B. Andrews & Co. 919-833-5565
 Utah Salt Lake City, Arrowhead Sls. 801-487-4716
 FOR: Can., Concord, Ont., C & R Devices, Ltd. 416-669-9870

STEVENS-ARNOLD, INC., 7 Elkins St., So. Boston, Mass., 02127, Tel: 617-268-1170; Empl: 100; Minimum order: \$25 p. 1-1476, 1477

For info on price: M.J. Ross; Application info: G.M. Karon; Customer service: M.J. Ross; Delivery info: M.J. Ross

Free literature available: Catalog 602 Ultra-Miniature DC/DC Converter Module Power Supplies. Catalog 604/605 Triple Output Modular DC/DC Converter Transformer.

Products manufactured: Choppers, Converters, Power Supplies, Transformers

Advertisement

Stevens-Arnold has Sales Engineering Representatives in principal cities of the United States and Canada. To obtain the name of your nearest representative, call 617-268-1170 collect and ask for Customer Service.

Foreign Representatives in Australia, Belgium, France, India, Israel, Netherlands, Sweden, Switzerland, and West Germany.

STEVENS, GEO. MFG. CO., 6001 N. Keystone Ave., Lincolnwood, Ill., 60466, Tel: 312-588-1300, TWX: 910-221-5139; Minimum order: \$25

For info on price: E. Sterner; Application info: J. Stevens; Customer service: F. Franke; Delivery info: A. Ericson

Free literature available: We manufacture the most complete line of Coil Winding Equipment in the country. We produce standard type machines, adaptations and complete engineered equipment to customer and product specification.

Products manufactured: Machines/Machinery, Production

Local Sales Offices & Reps.

Ariz Phoenix, Electrical Specialty Co. 602-275-5739
 Cal Los Angeles, Electrical Specialty Co. 213-724-9600
 Colo Denver, Electrical Specialty Co. 303-321-0226
 Ind Indianapolis, Blind & Assocs. 317-251-1249
 Mass Stoneham, Production Devices Corp. 617-438-2772
 Mich Fort Wayne, Blind & Assocs. 219-748-7705
 NJ Montclair, M. H. Tardif 201-744-5884
 Ore Portland, Electrical Specialty Co. 503-227-3601
 Tex Richardson, P. J. Scanlon 214-231-4661
 Wash Seattle, Electrical Specialty Co. 206-682-3434

STEVENS PRODS., INC., 128 N. Park St., E. Orange, N.J., 07019, Tel: 201-672-2140; Empl: 50; Minimum order: \$35

Customer service: J. Thomson

Free literature available: Glass laminated epoxy insulators molded in ready to use form. Mandrel list of open stock tooling for coil forms and potting forms.

Products manufactured: Bobbins, Winding, Coil & Transformer, Coils Including Assemblies & Forms, Insulators & Insulation, Laminates, Services, Assembly, Production & Test, Tubing

STEWART-WARNER MICROCIRCUITS, 730 E. Evelyn Ave., Sunnyvale, Cal., 94086, Tel: 408-245-9200, TWX: 910-339-9210; Empl: 200

Products manufactured: Comparators, Converters, Counters, Drivers & Decoders For Readouts, Integrated Circuit Devices, Lamp Drivers, Multiplexers, Shift Registers

STICHT CO., INC. HERMAN H., 27 Park Pl., New York, N.Y., 10007, Tel: 212-732-8163; Empl: 35

For info on price: D. Sticht; Application info: R. Sticht; Customer service: R. Sticht

Free literature available: Bull.1081 Hand Tachometers Bull.1071 Stationary Tachometers Bull.806 Vibrating Reed Tachometers, Bull.810 Running Time Meters, Bull.9141 Miniature Running Time Meters, Bull.421 Dwarf Megohmer, Bull.435 Standard Mark II Megohmer.

Products manufactured: Bridges, Indicators, Lights, Meters, Tachometers, Testers

Local Sales Offices & Reps.

Ill Westchester, Murphy & Dickey 312-344-5660
 Md Baltimore, W.H. Cooke & Co., Inc. 301-685-1511
 Mich Berkley, G.R. Peters Assocs. 313-564-6325

Minn Minneapolis, Volco Co. 612-336-6631
 Mo St. Louis, C.O. Leaver Co. 314-W08-1500
 NY Buffalo, R.F. Lamb Co. 716-874-4900
 NY Newtonville, T. Carse Sls. Co. 516-785-5844
 NY Rochester, R.F. Lamb Co. 716-544-5580
 NY Syracuse, R.F. Lamb Co. 315-454-2469
 NC Matthews, W.K. Hile Co. 704-847-9123
 Ohio Cincinnati, Beedle Equip. Co. 513-793-0140
 Ohio Shaker Heights, Martin-Rettger, Inc. 216-283-5600

Ore Portland, J.L. Kearns Co., Inc. 503-236-1165
 Pa King of Prussia, WisTex 215-337-1240
 Pa Pittsburgh, R.F. Clark Co. 412-242-9500
 Tex Bellaire, Brice Co. 713-666-1788
 Tex Dallas, Brice Co. 214-233-9808

STOCK DRIVE PRODS., Div. Designatronics, Inc., 55 S. Denton Ave., New Hyde Pk., N.Y., 11040, Tel: 516-328-0200; Empl: 160

Customer service: R. Lindemann

Products manufactured: Bearings, Brakes, Bushings, Glass, Plastic, Metal, Rubber, Etc., Clutches, Coatings, Counters, Couplings, Dials, Drives & Drive Mechanisms (Dial), Fasteners, Gears & Gear Mechanisms (Precision), Indicators, Knobs, Motors, Mounts, Servo Systems, Timers

Local Sales Offices & Reps.

Ariz Phoenix, Tri Fab Sls. Rep. Co. 602-265-3341
 Cal Burlingame, J. Logan & Assoc. 415-697-6100
 Cal Chatsworth, Sterling West Coast 213-822-6226
 Colo Denver, McSherry & Assoc. 303-238-8361
 Fla Orlando, Irby & Connolly Inc. 305-894-8471
 Ga Atlanta, Electro-Mechanical Sales Engng. 404-393-0444
 Ill Chicago, A. Woods & Assoc. Inc. 312-283-7400
 Mass Woburn, R. W. Hatfield 617-933-2324
 Mich Lathrup Village, R. C. Nordstrom & Co. 313-559-7373
 NJ So. Amboy, Addem II 201-721-6449
 NY Clarence, Rep-Tech Inc. 716-684-6250
 NY New Hyde Park 516-328-3300
 NY Syracuse, Rep-Tech Inc. 315-454-2445
 NC Charlotte, Reynolds Cowardin Assoc. 704-523-0324

Ohio Columbus, Rockford Controls Ohio Inc. 614-231-5890

Ohio Dayton, Rockford Controls Ohio Inc. 513-278-7362

Ohio Euclid, Rockford Controls Ohio Inc. 216-731-5250

Pa Glenolden, McDermott Assoc. 215-328-9180
 Tex Richardson, Zonk Eng. Co. 214-238-7651
 Va Richmond, Reynolds Cowardin Assoc. 703-266-3457

Va Roanoke, Reynolds Cowardin Assoc.
 Wash Seattle, R. Johnston Co. Inc. 205-524-5170
 FOR: Can., Ontario, Avotronics Ltd. 705-493-9711
 FOR: Can., Quebec, Avotronics Ltd. 514-697-2135

STORM PRODUCTS CO., 112 S. Glasgow St., Inglewood, Ca., 90301, Tel: 213-776-8141; Empl: 225; Minimum order: \$15

For info on price: C. Barnett; Customer service: I. Joyce

Free literature available: A complete list (including prices) of precut wire leads for hookup and wire wrapping.

Products manufactured: Cable Assemblies & Harnesses, Cable, Cords, Services, Assembly, Production & Test, Tubing, Wire, Wire Markers, Wire Shielding, Wire Twisters

STOW LABS., INC., Kane Ind'l. Dr., Hudson, Mass., 01749, Tel: 617-562-9347, Telex: 94-8330; Empl: 15

For info on price: A. N. Puro; Application info: C. Kadlec; Customer service: A. N. Puro; Delivery info: A. N. Puro

Free literature available: Describes PITRAN®, a silicon NPN planar transistor having emitter-base junction mechanically coupled to diaphragm. Differential pressure applied to diaphragm produces large, reversible change in gain of transistor. Thermometer literature describes an industrial temperature measuring system featuring factory calibrated interchangeable sensors and electronics available in several models with linear analog and digital output.

Products manufactured: Amplifiers, Indicators, Meters, Power Supplies, Switches, Thermometers, Resistance, Transducers, Transistors

Local Sales Offices & Reps.

Mass Framingham, J. M. Lancaster Co. 617-873-8893
 Mich Detroit, Marsh Equip. Co. 313-869-9200
 Mo St. Louis, Delltrone Co.

NJ N. Plainfield, Brady Co. 201-753-7988
 NY Albany, T. Carse Sls. Co. 518-785-5844
 Va Falls Church, Jay Co.
 EXP: N.Y., NY, Multiparts 212-944-4370

STRUTHERS-DUNN, INC., Lamb's Rd., Pitman, N.J.,
 08071, Tel: 609-589-7500, TWX: 510-686-7510; Empl.:
 450; Minimum order: \$50

For info on price: Sls. Dept.; Application info: C. C.
 Jones; Customer service: Sls. Dept.; Delivery info:
 Sls. Dept.

Free literature available: c/1010 Distributor catalog:
 contains latest information and prices for all relays
 stocked by distributors.

Products manufactured: Alarms, Cards, Logic, Coils
 Including Assemblies & Forms, Controllers,
 Programmable, Controls/Control Eqp., Modules,
 Logic, Encapsulated, Monitors, Process Control
 Systems, Relays, Sockets, Switches, Testers,
 Timers

Local Sales Offices & Reps.

Ala Huntsville, Rep. Inc. 205-881-9270
 Ariz Scottsdale, DeAngelo, Rothman & Cheever, Inc.
 602-948-6983
 Ark Little Rock, Ransom Sls. Co. 501-225-7332
 Cal Culver City, DeAngelo, Rothman & Co., Inc.
 213-398-6239
 Cal Palo Alto, Held & Mollard 415-965-9321
 Cal San Diego, DeAngelo, Rothman & Co.
 714-560-5707

Fla Miami, Ludlum Assocs. Co. 305-592-6523
 Fla Orlando, Ludlum Assocs. Co. 305-894-7761
 Ga Tucker, Rep. Inc. 404-938-4358
 Ill Glen Ellyn, Rockford Controls Co. 312-469-6016
 Iowa Bettendorf, White Equipment Co. 319-355-5623
 Kans Wichita, Avionics Engrg. Sls. Co. 316-264-6201
 La Baton Rouge, Automation Specialists, Inc.
 504-927-4931

La Kenner, Automation Specialists, Inc. 504-721-3497
 Md Baltimore, Stemler Assocs., Inc. 301-944-8262
 Mass Sturbridge, Branford Controls Corp. 617-347-7367

Mich Dearborn, Struthers-Dunn Controls 313-565-4200
 Minn Minneapolis, HMR, Inc. 612-920-8200
 Mo Kansas City, E. A. Mais Co. 816-942-6300
 Mo St. Louis, Jeffrey Equip. Co. 314-966 3506
 NJ Denville, Grimm, Siegel Assocs., Inc.
 201-625-1900

NJ Pitman, Struthers-Dunn, Inc. 609-589-7500
 NY Buffalo, H. C. Zang Agency 716-877-3677
 NY Henrietta, Rush Instrs. 716-334-0452
 NC Charlotte, J. Rudisill Assocs., Inc. 704-377-6901
 Ohio Cincinnati, Beedle Equip. Co. 513-793-0140
 Ohio Columbus, Rockford Controls Ohio 614-231-5890

Ohio Euclid, Rockford Controls Ohio 616-731-5250
 Okla Tulsa, Kemp Engrg. Co. 918-299-2636
 Pa Philadelphia, Struthers-Dunn, Pitman, N.J.
 609-589-7500

Pa Pittsburgh, R. F. Clark Co. 412-242-9500
 Tenn Memphis, Ransom Sls. Co. 901-332-0036
 Tex Dallas, W. Pat Fralia Co. 214-264-3491
 Tex Ft. Worth, W. Pat Fralia Co. 817-738-2394
 Tex Houston, C.S.C. Instrs. 713-784-2745
 Va Alexandria, Stemler Assocs. Inc. 703-548-7818
 Wash Seattle, Eicher-Richards Co. 206-523-7888
 FOR: Can., Toronto, Ont., Struthers-Dunn Relay Div.,
 Renfrew Elec. Co. Ltd. 416-461-3511

Local Distributors
 Ala Birmingham, M-G Elec. & Equip., 3112 Sixth Ave.
 205-328-4525

Ariz Phoenix, Kierulff Elec., 2633 E. Buckeye
 602-273-7331

Ark Little Rock, Carlton-Bates, 6821 Scott Hamilton
 Dr. 501-562-9100

Cal Hollywood, Hollywood Radio, 5250 Hollywood
 213-466-3181

Cal Palo Alto, Kierulff Elec., 3969 E. Bayshore
 415-968-6292

Colo Denver, Newark-Denver Elec., 2170 S. Grape
 303-757-3351

Conn Bridgeport, Tower-Olschan, 15 Dewey St.
 203-367-7401

Fla Orlando, Brownell Electro, 307-27th St.
 305-843-6770

Ga Atlanta, Brownell-Electro, 3020 Commerce Way
 404-762-5181

Ill Chicago, Newark Elec., 500 N. Pulaski
 312-638-4411

Ill Peoria, Klaus Radio & Elec., 8400 N. Pioneer
 309-691-4840

Ind Indianapolis, Graham Elec. Supply, 133 S. Pa.
 Ave. 317-634-8202

Iowa Davenport, Republic Elec., 737 Charlotte
 319-322-6204

Kans Wichita, Interstate Elec., 1330 E. 1st
 316-264-6317

Ky Louisville, E&H Elec. Supply, 804 S. Fifth
 502-587-0991

La Metairie, M-G Elec. & Equip., 638 Papworth Ave.
 504-834-6002

Me Portland, Stanley J. Leen, 52 Union St.
 207-774-6266

Md Baltimore, Graybar Elec., 3701 E. Monument
 301-342-5500

Mass Allston, Apparatus Service, 355 Everett St.
 617-787-1300

Mich Grand Rapids, Purchase Elec., 100 Grandville
 616-458-1476

Minn Minneapolis, Stark Elec. Supply, 112-3rd Ave.,
 N. 612-332-1325

Miss Jackson, Atlantic Ind., Box 9191 601-353-0351
 Mo N.K.C., LCOMP, 1520 Taney St. 816-221-2400
 Mont Missoula, Montana Mercantile Co., 1600 N. Ave.,
 W. 406-543-5151

Neb Omaha, Graybar Elec., Box 1234 402-346-7676
 NJ Hanover, State Elec. Parts, 36 Route 10
 201-887-2550

NJ S. Plainfield, Brownell-Electro, 500 Hadley Rd. &
 Durham Ave. 201-753-4600

NY New York, Brownell-Electro, 85 Tenth Ave.
 212-924-6000

NY Rochester, Requa Electric, Box 1130
 716-442-2020

NC Charlotte, Brownell-Electro, Box 16368
 704-394-4341

Ohio Cincinnati, Hughes Peters, 4865 Duck Creek
 513-351-2000

Okla Tulsa, Radio, Inc., 1000 S. Main St.
 918-587-9123

Ore Eugene, Vitus Elec. Supply, 140 E. 5th St.
 503-345-4377

Pa Philadelphia, Herbach & Rademan, 401 E. Erie
 Ave. 215-426-1700

RI Pawtucket, New England Electric Supply, 265
 Pine St. 401-725-7400

SC Greenville, Hammond Elec., 1000 Augusta St.
 803-233-4121

Tenn Memphis, Brownell-Electro, 3053 Tranquility
 901-332-9254

Tex Dallas, Wholesale Elec., 2808 Ross
 214-824-3001

Va Richmond, Meridian Elec., 1001 W. Broad St.
 804-353-6648

Wash Seattle, Eicher-Richards, 2727 N.E. Blakeley
 206-523-7888

WVa S. Charleston, Allied Controls, Box 8306, S.
 304-768-7313

Wisc Milwaukee, Marsh Elctns., 6047 W. Beloit
 414-545-6500

STRUTHERS-DUNN, INC., Sys. Div., 4140 Utica Ridge
 Rd., Bettendorf, Iowa, 52722, Tel: 319-359-7501, TWX:
 910-525-1176; Empl.: 100; Minimum order: \$25

For info on price: R. G. Alessandrini; Application info:
 L. Thompson; Customer service: R. G. Alessandrini;
 Delivery info: R. G. Alessandrini

Free literature available: VIP Programmable
 Controller, Bulletin 79630 solid state industrial
 logic control system for operating automatic
 equipment. Specs & operating data S-D77
 Programmable Controller, Bulletin 79633 solid
 state industrial logic control system for small
 machines. Specs & operating data

Products manufactured: Cards, Linear Function,
 Cards, Logic, Comparators, Controllers,
 Programmable, Controls/Control Eqp.,
 Converters, Counters, Decoders, Modules, Logic,
 Encapsulated, Monitors, Testers, Timers,
 Totalizers, Digital

Local Sales Offices & Reps.
 NY Henrietta, Rush Instrs. 716-334-0452
 Tex Houston, C.S.C. Instrs. Div. Automation
 Specialists 713-784-2745

STURDILITE ANGLE STEEL DIV., Kewanee Scientific
 Equip. Corp., Plainwell, Mich., 49080, Tel:
 616-685-5402; Empl.: 140

For info on price: S. Hambright; Application info: J.
 Dravies; Customer service: S. Hambright; Delivery
 info: S. Hambright

Free literature available: 24 Page Catalog
 Products manufactured: Benches, Consoles, Stools,
 Tables, Cabinets & Accessories

SUMMIT ENGINEERING CORP., Box 938, Bozeman,
 Mont., 59715, Tel: 406-587-0636, TWX: 910-975-1950;
 Empl.: 70; Minimum order: \$12

For info on price: R. A. Hall; Application info: R. A.
 Hall; Customer service: J. Riebhoff; Delivery info: V.
 Shadoan

Free literature available: 1. Catalogue of R.F.
 components 4 pg 2. Positioning controls catalog 8
 pg 3. Individual data sheets on each product

Products manufactured: Controls/Control Eqp.,
 Counters, Digitizers, Pencil Follower (Inc.
 Coordinate & Graphic), Diodes, Dividers, Mixers,
 Modulators, All Kinds, Motors, Switches,
 Transformers

Local Sales Offices & Reps.

Cal Sherman Oaks 213-789-7277
 Cal Sunnyvale 408-736-5210
 Fla Lake Mary 813-248-5078
 Fla Tampa 404-255-8900
 Ga Atlanta 312-852-6060
 Ill Downers Grove 617-757-0010
 Mass Auburn 617-359-2040
 Mass Medfield 313-758-5000
 Mich Warren 816-454-7140
 Mo Gladstone 513-825-4111
 Ohio Cincinnati 216-524-3971
 Ohio Cleveland 412-343-9660
 Pa Mt. Lebanon 215-692-8040
 Pa West Chester 817-261-0384
 Tex Arlington 414-475-6661
 Wisc Wauwatosa 514-695-7602
 FOR: an., Pt. Clair, Que.

SUNSHINE SCI. INSTRS., INC., 1810 Grant Ave.,
 Philadelphia, Pa., 19115, Tel: 215-OR 3-5600; Empl.: 30;
 Minimum order: \$10

Customer service: B. Sunshine

Products manufactured: Amplifiers, Analyzers,
 Clocks (All Types), Coatings, Controls/Control
 Eqp., Converters, Counters, Detectors, Indicators,
 Leads, Test & Adaptors, Meters, Multipliers,
 Records, Scales, Dial, Services, Assembly,
 Production & Test, Servo Systems, Shunts, Meter,
 Switches, Test Equipment, Testers, Timers

Local Sales Offices & Reps.
 Cal LaMirada, P. H. DuBois 714-521-1481
 Md Elkridge, Sunshine Scientific 301-796-5600

SUPEREX ELECTRONICS CORP., 151 Ludlow St.,
 Yonkers, N.Y., 10705, Tel: 914-965-6906, Telex:
 13-1584; Empl.: 112; Minimum order: \$50

Customer service: M. Buchalter

Free literature available: Catalog of special purpose
 headphone, boom microphone, and accessories
 from \$1.98 to \$125.00.

Products manufactured: Coils Including Assemblies
 & Forms, Handsets, Chestsets, Headphones,
 Headsets, Etc., Microphones, All Kinds, Tapes,
 Recording, Magnetic (All Types)

SUPERIOR CABLE DIV., Superior Continental Corp., Box
 489, Hickory, N.C., 28601, Tel: 704-328-2171, TWX:
 510-934-1204; Empl.: 600

Customer service: J. Moore

Free literature available: Telephone Cable Catalog;
 Coiled Cord & Line Cord Catalog; Cable Mfg.
 Facilities Booklet; T-Screen Cable Brochure; Filled
 Cable Brochure; Drop Wire Brochure; Coaxial
 Cable Brochures;

Products manufactured: Cable, Cords, Wire

Local Sales Offices & Reps.
 Ala Tuscaloosa, C. Oxford 205-339-4403
 Cal Chico, G. Swithenbank 916-343-4314
 Cal Menlo Park, R. Westwood 415-349-3003
 Ga Atlanta, K. Powley 404-255-2030
 Ill Glen Ellyn, T. Lyons 312-858-2880
 NC Hickory, F. Logan 704-256-9361
 NC Hickory, N.C. Cox 704-328-1682
 NC Mebane, T. Gardner 919-563-4321
 Tenn Bristol, R. Tester 615-968-3999
 Tenn Gallatin, E. Huffman 615-452-7299
 Tex Dallas, B. Barbour 214-243-1722
 Tex Dallas, B. Pitts 214-328-0343
 Wash Enumclaw, P. Armentrout 206-939-0738

SUPERIOR ELECTRIC CO., 1000 Middle St., Bristol,
 Conn., 06010, Tel: 203-582-9561, TWX: 710-454-0682;
 FSC No: 58474; Empl.: 1000; Minimum order: \$75
 p. 1-205, 984-987, 1443, 1546; p. 2-799, 1786-1789

Customer service: K. E. Meissner

Free literature available: Superior Electric Electrical
 Connector Bulletin C670-1, Powerstat Variable
 Transformer Catalog P773-2, Stabiline Automatic
 Voltage Regulators Bulletin SVR666-5, Sio-Syn
 Synchronous/Stepping Motors & Controls Catalog
 MD174-1

Local Sales Offices & Reps.

Ala Tuscaloosa, C. Oxford 205-339-4403
 Cal Chico, G. Swithenbank 916-343-4314
 Cal Menlo Park, R. Westwood 415-349-3003
 Ga Atlanta, K. Powley 404-255-2030
 Ill Glen Ellyn, T. Lyons 312-858-2880
 NC Hickory, F. Logan 704-256-9361
 NC Hickory, N.C. Cox 704-328-1682
 NC Mebane, T. Gardner 919-563-4321
 Tenn Bristol, R. Tester 615-968-3999
 Tenn Gallatin, E. Huffman 615-452-7299
 Tex Dallas, B. Barbour 214-243-1722
 Tex Dallas, B. Pitts 214-328-0343
 Wash Enumclaw, P. Armentrout 206-939-0738

Local Sales Offices & Reps.

Ala Tuscaloosa, C. Oxford 205-339-4403
 Cal Chico, G. Swithenbank 916-343-4314
 Cal Menlo Park, R. Westwood 415-349-3003
 Ga Atlanta, K. Powley 404-255-2030
 Ill Glen Ellyn, T. Lyons 312-858-2880
 NC Hickory, F. Logan 704-256-9361
 NC Hickory, N.C. Cox 704-328-1682
 NC Mebane, T. Gardner 919-563-4321
 Tenn Bristol, R. Tester 615-968-3999
 Tenn Gallatin, E. Huffman 615-452-7299
 Tex Dallas, B. Barbour 214-243-1722
 Tex Dallas, B. Pitts 214-328-0343
 Wash Enumclaw, P. Armentrout 206-939-0738

Local Sales Offices & Reps.

Ala Tuscaloosa, C. Oxford 205-339-4403
 Cal Chico, G. Swithenbank 916-343-4314
 Cal Menlo Park, R. Westwood 415-349-3003
 Ga Atlanta, K. Powley 404-255-2030
 Ill Glen Ellyn, T. Lyons 312-858-2880
 NC Hickory, F. Logan 704-256-9361
 NC Hickory, N.C. Cox 704-328-1682
 NC Mebane, T. Gardner 919-563-4321
 Tenn Bristol, R. Tester 615-968-3999
 Tenn Gallatin, E. Huffman 615-452-7299
 Tex Dallas, B. Barbour 214-243-1722
 Tex Dallas, B. Pitts 214-328-0343
 Wash Enumclaw, P. Armentrout 206-939-0738

Local Sales Offices & Reps.

Ala Tuscaloosa, C. Oxford 205-339-4403
 Cal Chico, G. Swithenbank 916-343-4314
 Cal Menlo Park, R. Westwood 415-349-3003
 Ga Atlanta, K. Powley 404-255-2030
 Ill Glen Ellyn, T. Lyons 312-858-2880
 NC Hickory, F. Logan 704-256-9361
 NC Hickory, N.C. Cox 704-328-1682
 NC Mebane, T. Gardner 919-563-4321
 Tenn Bristol, R. Tester 615-968-3999
 Tenn Gallatin, E. Huffman 615-452-7299
 Tex Dallas, B. Barbour 214-243-1722
 Tex Dallas, B. Pitts 214-328-0343
 Wash Enumclaw, P. Armentrout 206-939-0738

Local Sales Offices & Reps.

Ala Tuscaloosa, C. Oxford 205-339-4403
 Cal Chico, G. Swithenbank 916-343-4314
 Cal Menlo Park, R. Westwood 415-349-3003
 Ga Atlanta, K. Powley 404-255-2030
 Ill Glen Ellyn, T. Lyons 312-858-2880
 NC Hickory, F. Logan 704-256-9361
 NC Hickory, N.C. Cox 704-328-1682
 NC Mebane, T. Gardner 919-563-4321
 Tenn Bristol, R. Tester 615-968-3999
 Tenn Gallatin, E. Huffman 615-452-7299
 Tex Dallas, B. Barbour 214-243-1722
 Tex Dallas, B. Pitts 214-328-0343
 Wash Enumclaw, P. Armentrout 206-939-0738

Local Sales Offices & Reps.

Ala Tuscaloosa, C. Oxford 205-339-4403
 Cal Chico, G. Swithenbank 916-343-4314
 Cal Menlo Park, R. Westwood 415-349-3003
 Ga Atlanta, K. Powley 404-255-2030
 Ill Glen Ellyn, T. Lyons 312-858-2880
 NC Hickory, F. Logan 704-256-9361
 NC Hickory, N.C. Cox 704-328-1682
 NC Mebane, T. Gardner 919-563-4321
 Tenn Bristol, R. Tester 615-968-3999
 Tenn Gallatin, E. Huffman 615-452-7299
 Tex Dallas, B. Barbour 214-243-1722
 Tex Dallas, B. Pitts 214-328-0343
 Wash Enumclaw, P. Armentrout 206-939-0738

Local Sales Offices & Reps.

Ala Tuscaloosa, C. Oxford 205-339-4403
 Cal Chico, G. Swithenbank 916-343-4314
 Cal Menlo Park, R. Westwood 415-349-3003
 Ga Atlanta, K. Powley 404-255-2030
 Ill Glen Ellyn, T. Lyons 312-858-2880
 NC Hickory, F. Logan 704-256-9361
 NC Hickory, N.C. Cox 704-328-1682
 NC Mebane, T. Gardner 919-563-4321
 Tenn Bristol, R. Tester 615-968-3999
 Tenn Gallatin, E. Huffman 615-452-7299
 Tex Dallas, B. Barbour 214-243-1722
 Tex Dallas, B. Pitts 214-328-0343
 Wash Enumclaw, P. Armentrout 206-939-0738

Products manufactured: Connectors, Controls/Control Eqpt., Jacks (All Types), Machines/Machinery, Production, Motors, Plug & Jack Sets, Plugs, Posts, Power Supplies, Readers, Regulators, Simulators, Transformers

Local Sales Offices & Reps.

Cal Redwood City, Superior Elec. 415-369-8203
 Cal Van Nuys, Superior Elec. 213-786-3626
 Colo Denver, W. J. Purdy Co. 303-777-1411
 Fla Maitland, Hutto, Hawkins, Perego, Inc. 305-831-2474
 Ill Glen Ellyn, Superior Elec. 312-858-2960
 Md College Park, Superior Elec. 301-277-3235
 Mass Wellesley Hills, Superior Elec. 617-237-0750
 Mich Detroit, Superior Elec. 313-543-3450
 NY E. Rochester, Superior Elec. 716-381-9210
 NY Tarrytown, Superior Elec. 914-631-8600
 NC Charlotte, Superior Elec. 704-535-5846
 Ohio Medina, Superior Elec. 216-723-1515
 Pa Ft. Washington, Superior Elec. 215-646-6116
 Tex Dallas, Superior Elec. 214-368-4688
 Wash Seattle, J.J. Backer Co. 206-295-1300
 FOR: Can., Bristol, Superior Elec. 203-582-9561
 FOR: Can., Toronto, Ont., American Superior Elec. Co. Ltd. 416-255-2318

SUPERIOR FLUX & MFG. CO., 653 Alpha Dr., No. 58, Cleveland, Ohio, 44143, Tel: 216-461-3315; Empl.: 9; Minimum order: \$10

Customer service: B. J. Garfinkel

Products manufactured: Flux, Brazing & Soldering Materials

Local Sales Offices & Reps.

Ri Rumford, J. Doherty 401-434-5945

SWITCHCRAFT, INC., 5555 N. Elston, Chicago, Ill., 60630, Tel: 312-792-2700, TWX: 910-221-5199; Empl.: 500

For info on price: N. Luksik; Application info: N. Luksik; Customer service: G. Bouley

Free literature available: Short Form Catalog - a condensed listing of a multitude of switchcraft electronic components

Products manufactured: Attenuators, Cable Assemblies & Harnesses, Connector Adapters, Connectors, Jack Adapters (All Types), Jack Covers, Jacks (All Types), Kits, Connector, Kits, Marking (Dial, Instrument, Equipment, etc.), Kits, Switch Assembling, Mixers, Panels, Switches

Local Sales Offices & Reps.

Ariz Phoenix, Howe & Howe 602-264-7971
 Cal Los Angeles, P.F. Wiley Co. 213-663-8028
 Cal San Carlos, D.H. Ross Co. 415-591-4411
 Colo Greeley, G. Moss Elctns. 303-353-1452
 Fla Orlando, Cartwright & Bean 305-422-4531
 Ga Atlanta, Cartwright & Bean 404-255-5262
 Haw Honolulu, Dougherty Entprs. 808-531-7548
 Ill Chicago, B. Burns & Assocs. 312-775-1233
 Ind Indianapolis, Mktg. Engrs. 317-546-1523
 Iowa Des Moines, T.L. Dowell & Assocs. 515-225-1620
 Kans Overland, T.L. Dowell & Assocs. 913-649-6069
 La Chalmette, Cartwright & Bean 504-279-4598
 Mass Boston, Anderson Sls. Assocs. 617-227-2980
 Mich Detroit, R.C. Merchant & Co. 313-535-6000
 Minn Edina, M. Foster Tech. Sls. Inc. 612-835-2252
 Miss Jackson, Cartwright & Bean 601-981-1368
 Mo St. Louis, T.L. Dowell & Assocs. 314-968-4234
 NJ No. Caldwell, Masin-Esco, Inc. 201-226-2550
 NM Albuquerque, G. Moss Elctns., Inc. 505-299-5101

NY Syosset, Masin-Esco Inc. 516-364-0310
 NY Syracuse, Mar-Com Assocs. 315-437-2843
 NC Charlotte, Cartwright & Bean 704-333-6457
 NC Raleigh, Cartwright & Bean 919-832-7128
 Ohio Richfield, Bear Mktg. 216-659-3131
 Ore Portland, Earl & Brown Co. 503-245-2283
 Tenn Knoxville, Cartwright & Bean 615-693-7450
 Tenn Memphis, Cartwright & Bean 901-276-4442
 Tex Richardson, J.R. Lavender & Co. 214-231-5040
 Wash Seattle, Earl & Brown Co. 206-284-1121
 EXP: Can., Toronto, Ont., Atlas Elctns. Ltd. 416-781-6174

FOR: Toronto 19, Ont., Can., Atlas Elctns. Ltd. 416-781-6174

SWS SILICONES, Div. of Stauffer Chemical Co., Box 428, Adrian, Mich., 49221, Tel: 313-263-5711, TWX: 510-450-2606; Empl.: 500; Minimum order: \$100

Customer service: A. J. Korving

Free literature available: Silicone greases, encapsulants, RTVs and fluids as well as silicone rubber.

Products manufactured: Adhesives (All Types), Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Coolants, Circuit & Components, Insulators & Insulation, Kits, Cable-End Sealing, Lubricants, Rubber, Transistor, Diode, Thyristor Heat Dissipators

SYCOR, 100 Phoenix Dr., Ann Arbor, Mich., 48104, Tel: 313-971-0900, TWX: 810-223-6011; Empl.: 750

For info on price: R. M. Connor; Application info: R. M. Connor; Customer service: R. M. Connor; Delivery info: K. Wallo

Free literature available: Model 135 - ECMA/ANSI Compatible Cassette Recorder, Model 145 - Diskette Recorder Compatible with IBM 3740.

Products manufactured: Recorders

SYNCHRO-START PRODUCTS, INC., Box 147, 8109 N. Lawndale Ave., Skokie, Ill., 60076, Tel: 312-673-7730, Telex: 724-424; Empl.: 125

Customer service: G. Soule

Products manufactured: Governors, Centrifugal, Solenoids, Switches

Local Sales Offices & Reps.

Cal Santa Rosa, R. Anderson 707-542-8207
 Cal Tustin, M. Johnson Co. 714-832-7282
 Mass Sharon, Adcour 617-784-3996
 NY Forest Hills, J. Miller Co. 212-263-4446
 Ohio Chagrin Falls, Pine Sls. & Engrg. Co. 216-247-6198
 Okla Tulsa, P & P Sls. 918-622-1523
 Pa Devon, Goodall Industril Equip. Co. 215-353-4120
 Tex Richardson, Woodbury Co. 214-742-7508
 Wash Seattle, Fairman B. Lee Co. 206-244-7262

SYNERGISTIC PRODUCTS, Sub. Cavitron Corp., 1902 McGraw Ave., Irvine, Cal., 92705, Tel: 714-540-7755, Telex: 655339; Empl.: 200; Minimum order: \$25

For info on price: J. Jones; Application info: J. Jones; Customer service: Mktg Dept; Delivery info: Mktg Dept

Free literature available: Mark IV & 1718C Pantograph Dip Insertion Systems Brochure, P/2/P Wire Termination Systems Brochure, Model 2300 Econo Dip Brochure, Multitactic Drilling Systems Brochure, SPI All Products one page Flyer.

Products manufactured: Machines/Machinery, Production

Local Sales Offices & Reps.

Ariz Phoenix, Arrowhead Sls. Corp. 602-277-7148
 Cal Santa Clara, Banks Sls. 408-246-6311
 Colo Arvada, Arrowhead Sls Corp. 303-423-5556
 Conn Hartford, Cable Assocs. 203-525-5016
 Fla Lighthouse Pt., Saber Assocs. 305-943-3076
 Ill Itasca, English Sls. Co. 312-773-9449
 Md Silver Springs, ARA Elctns. 301-565-2584
 Mich Detroit, Electro Ent. 313-521-1500
 Minn Minneapolis, Bican Co. 612-827-4734
 NH Londonderry, Cable Assocs. 603-434-5234
 NJ Wayne, K & J Assocs. 201-694-3334
 NY E. Setauket, K & J Assocs. 516-751-8686
 Ohio Cleveland, Electro Ent. 216-261-7670
 Ohio Dayton, Electro Ent. 513-426-6071
 Pa Bala Cynwyd, Electech 215-667-0973
 Pa Pittsburgh, Electro Ent. 412-371-8497
 Tex Dallas, Crockett Southwest Co. 214-251-1776
 FOR: Can., Burlington, Ont., Arbell Equip. Ltd. 416-632-9494

SYNTHANE TAYLOR CORP., An Alco Standard Corporate Partner, Box 835, Valley Forge, Pa., 19482, Tel: 215-666-0300; Empl.: 1000; Minimum order: \$100

For info on price: F. McNally; Application info: G. J. Muller; Customer service: F. McNally; Delivery info: F. McNally

Products manufactured: Bearings, Bobbins, Winding, Coil & Transformer, Circuits, Flexible, Circuits, Printed, Multilayer, Insulators & Insulation, Laminates, Tubing

Local Sales Offices & Reps.

Cal LaVerne 714-593-1341
 Cal Los Angeles 213-966-7461
 Cal San Francisco 415-591-8929
 Conn Avon 203-678-0385
 Ga Atlanta 404-237-0416
 Ill Arlington Heights 312-437-8660
 Ill Chicago 312-569-2838
 Ind Indianapolis 317-923-2102
 Md Baltimore 301-828-3365
 Mass Boston 617-969-5945
 Mich Detroit 313-646-8868
 Minn Minneapolis 612-888-5207

Mo Kansas City 913-432-3355
 Mo St. Louis 314-721-1300
 NJ Newark 201-447-4597
 NY Binghamton 607-722-7850
 NY Northport 516-757-7171
 NY Rochester 716-586-0413
 Ohio Cleveland 216-371-3775
 Ohio Dayton 513-859-4100
 Pa Pittsburgh 412-391-7230
 Tenn Knoxville 615-525-1991
 Tex Dallas 214-231-9939
 Va Richmond 804-358-3465
 Wisc Milwaukee 414-962-0890

SYNTRONIC INSTRUMENTS INC., 100 Industrial Rd., Addison, Ill., 60101, Tel: 312-543-6444, TWX: 910-651-2191; Empl.: 120 p. 2-424-429

Customer service: Paul Evans

Free literature available: General catalogue containing data sheets on deflection yokes, focus coils and related hardware for mounting on cathode ray tubes. Product Index-A guide to our wide line of precision deflection components including their most important operating characteristics

Products manufactured: Coils Including Assemblies & Forms, Mounts, Scanners, Tools, Yokes

Local Sales Offices & Reps.

Cal Arcadia, A.M. Wood Co. 213-447-3511
 Cal Los Altos, Frauman Assocs. 415-941-0660
 Colo Wheatridge, Waugaman Assocs. 303-423-1020
 Conn New Canaan, W. Couch 203-966-4630
 Ill Northfield, Torkelson Assocs. 312-446-9085
 Ind Indianapolis, Torkelson Assocs. 317-244-7867
 Md Reisterstown, Massey Assocs. 301-833-2039
 Mass Norwood, S. Pierce, Inc. 617-762-3184
 Minn Minneapolis, Torkelson Assocs. 612-835-2414
 NJ Fairland, G.D. Harris Assocs. 201-796-5200
 Pa Media, Snyder & Massey Assoc. 215-566-5400
 Tex Irving, Space Electronics 214-251-2261
 EXP: Teaneck, N.J., S. Ginsbury Ltd. 201-837-1100

SYRACUSE ELCTRNS. CORP., Box 566, Syracuse, N.Y., 13201, Tel: 315-488-4911; Empl.: 60; Minimum order: \$25

For info on price: D. Lawrie; Application info: D. Lawrie; Customer service: M. Squires; Delivery info: M. Squires

Free literature available: 1. Full Catalog 40 pages covering a broad line of timers 2. Application Guide for electronic timers a quick reference

Products manufactured: Relays, Timers

Local Sales Offices & Reps.

Cal San Rafael, Wells Assocs. 415-454-5730
 Cal Sherman Oaks, Gee Assocs. 213-788-5961
 Colo Boulder, R. A. Mayes Co. 303-444-0782
 Conn Glastonbury, Barton-Caron Assocs. 203-633-9417
 Ill Chicago, Automation Equip. 312-631-9673
 Ill Mount Prospect, Automation Equip. Co. Inc. 312-398-7550
 Ind Angola, Southern Sls. 219-665-3961
 Ind Indianapolis, Southern Sls. 317-253-3359
 Mass Auburndale, Barton-Caron Assocs. 617-332-2021
 Mich Dearborn, Pitcher-Poulin 313-582-5450
 Minn Minneapolis, K. C. Brooks 612-544-3179
 Mo St. Louis, Elec. Controls 314-645-2400
 NM Albuquerque, R. A. Mayes Co. 505-293-8010
 NY Baldwinsville, Scibetta Reps. 315-622-3993
 NY Bogota, Neville & Vespo 201-487-1505
 NC Greensboro, Motion Control Sys. 919-272-4181
 Ohio Cleveland, D. Steffen & Assocs. 216-461-8333
 Pa Ardmore, Rothenheber 215-642-6911
 Pa Pittsburgh, Trymac Co. 412-823-8400
 Tenn Memphis, R. Jordan Assocs. 901-452-7441

SYSCON INT'L, INC., 205 Sycamore St., So. Bend, Ind., 46622, Tel: 219-287-5916, Telex: 25-8325; Empl.: 12; Minimum order: \$10

For info on price: T. W. Eaglesham; Application info: T. W. Eaglesham; Customer service: P. Martin; Delivery info: P. Martin

Free literature available: Catalog 1F-60 - "Weecol" subminiature 1F transformers & coils Short Form Catalog - Temperature sensors, pyrometers, indicators & controllers.

Products manufactured: Chokes, Coils Including Assemblies & Forms, Controls/Control Eqpt., Monitors, Probes, Thermocouples, Elements & Accessories, Transducers, Transformers

SYSTEMS DATA INC., 1941 W. Market St., Akron, Ohio, 44313, Tel: 216-867-2197; Empl.: 12

For info on price: W. B. Frantz; Application info: J. L. Sickafoose; Customer service: C. W. Owen; Delivery info: Project Engr.

Products manufactured: Compressors, Data, Computers, Controllers, Programmable, Data Acquisition & Reduction Systems, Data Compressors, Digital, Data Loggers, Multiplexers, Readers, Recorders, Scanners, Services, Assembly, Production & Test, Terminals, Data Display (including Alphanumeric & Graphic), Test Systems, Totalizers, Digital, Transmission Systems, Data

Local Sales Offices & Reps.

Mich Detroit, W-K-M Assocs. 313-892-2500
Ohio Cleveland, W-K-M Assocs. 216-267-0445
Ohio Dayton, W-K-M Assocs. 513-434-7500
Pa Pittsburgh, W-K-M Assocs. 412-892-2953

SYSTEMS ELECTRONICS, 1935 W. 96 St., Cleveland, Ohio, 44102, Tel: 216-651-8208; Empl.: 50

Customer service: E. F. Bedford

SYSTEMS INSTRS. RESCH., INC., 331 Luckie St., N.W., Atlanta, Ga., 30313, Tel: 404-522-6317; Empl.: 10

Customer service: H. D. Edwards

Products manufactured: Data Acquisition & Reduction Systems, Recorders, Test Systems, Testers

SYSTONICS, INC., Box 121, Winchester, Mass., 01890, Tel: 617-729-4439; Empl.: 3

Customer service: R. C. Thomas 617-729-5127

Free literature available: Product Sheet & PL - Oxidation Systems Product Sheet & PL - Diffusion Systems, Technical Notes, Phosphorous Diffusion, Pyrogenic Oxidation, Source Systems

Products manufactured: Machines/Machinery, Production

SYSTRON-DONNER CORP., 1 Systron Dr., Concord, Cal., 94518, Tel: 415-676-5000, TWX: 910-481-9472; FSC No: 52542; Empl.: 1400; Minimum order: \$15

p. 1•812,813

For info on price: D. Herbert; Application info: H. Mette; Customer service: R. Hall; Delivery info: D. Herbert

Products manufactured: Analyzers, Clocks (All Types), Counters, Dials, Duplexers, Microwave, Generators, Line Stretchers, Microwave, Meters, Potentiometers, Power Supplies, Printers, Readers, Test Systems, Timers, Voltage Sources

Local Sales Offices & Reps.

Ala Huntsville, Scientific Devices 205-536-1969
Cal Encino, Scientific Devices 213-872-1951
Cal Los Alamitos, Scientific Devices 213-598-7678
Cal Mountain View, Scientific Devices

Cal San Diego, Scientific Devices 714-279-6642
Colo Boulder, Scientific Devices 303-449-9466
Conn Hamden, Scientific Devices 203-248-9361
Fla Fort Lauderdale, Scientific Devices

Fia Orlando, Scientific Devices 305-841-8180
Ill Des Plaines, Scientific Devices 312-297-5240
Kans Lenexa, Scientific Devices 913-631-3818
Mass Waltham, Scientific Devices 617-894-5637

Mich Milford, Scientific Devices 313-363-2282
Minn Minneapolis, Scientific Devices 612-544-1616
Mo St. Louis, Scientific Devices 314-842-2535
NJ Palisades Park, Scientific Devices

NM Albuquerque, Scientific Devices 505-293-3494
NY Rochester, Scientific Devices 716-334-2445
NC Burlington, Scientific Devices 919-228-6270
Ohio Cleveland, Scientific Devices 216-835-2270
Ohio Dayton, Scientific Devices 513-298-9904
Pa New Kensington, Scientific Devices

Pa Plymouth Meeting, Scientific Devices 412-339-1445
Tex Houston, Scientific Devices 215-825-9515
Tex Richardson, Scientific Devices 713-623-4250

Tex San Antonio, Scientific Devices 214-231-8106
Va Norfolk, Scientific Devices 512-736-3164
Va Springfield, Scientific Devices 703-451-6500

Wash Bellevue, Scientific Devices 206-454-0900
FOR: Can., Montreal, Que., Baytronix, Ltd. 514-336-9240

FOR: Can., Vancouver, B.C., Canadian Dynamics, Ltd. 604-325-3201

SYSTRON DONNER, Data Products Div., 735 Detroit Ave., Concord, Cal., 94518, Tel: 415-798-9900, TWX: 910-481-5780; Empl.: 140; Minimum order: \$15

p. 1•812,813

Customer service: D. Squires 415-798-9900

Free literature available: A catalog on time code instruments listing over 50 different instruments and options available.

Products manufactured: Amplifiers, Clocks (All Types), Computers, Cords, Data Acquisition & Reduction Systems, Dividers, Generators, Integrators, Electronic, Multipliers, Printers, Tape Search Equipment, Test Systems, Testers

Refer to Systron-Donner Corp. for sales office information

SYSTRON-DONNER INSTR. DIV., 10 Systron Dr., Concord, Cal., 94518, Tel: 415-676-5000, TWX: 910-481-9479; FSC No: 52542; Empl.: 650; Minimum order: \$15

For info on price: D. Herbert; Application info: H. Mette; Customer service: D. Fare; Delivery info: H. Mette

Free literature available: 256-page general instrument catalog on all Systron-Donner Test and Measuring Instruments.

Products manufactured: Analyzers, Counters, Current Sources, Data Loggers, Generators, Indicators, Meters, Monitors, Power Supplies, Prescalers, Standards, Synthesizers, Testers, Timers, Totalizers, Digital, Voltage Sources

Refer to Systron-Donner Corp. for sales representative information.

SYSTRON-DONNER INERTIAL DIV., 1090 San Miguel Rd., Concord, Cal., 94518, Tel: 415-682-6161, TWX: 910-481-9478; Empl.: 416; Minimum order: \$75

Customer service: B. B. Sage

Products manufactured: Accelerometers, Comm. Systems, Computers, Data Compressors, Digital, Gyros (All Types), Transducers

Local Sales Offices & Reps.

Ala Huntsville, Vesco 205-881-3830
Cal Alhambra, Applied Technologies Assocs. 213-289-9181

Cal San Diego, L. L. Stokas 714-274-6281
Cal San Francisco, Applied Technologies Assocs. 408-733-4130

Conn Bloomfield, Zaslow Sls. Co. 203-242-7781
Conn Milford, Zaslow Sls. Co. 203-878-1094
DC Washington, VCL 202-628-4380

Fia Orlando, E. G. Holmes & Assocs. 305-894-8901
Ga Chamblee, E. G. Holmes & Assocs. 404-451-6161

Ill Chicago, Carlson Elctns. Sls. 312-774-4812
Mass Lowell, Zaslow Sls. Co. 617-458-8452

Mass Northboro, Zaslow Sls. Co. 617-393-8150
NJ Fort Lee, Technimat 201-461-8685
NY Copiague, Sencor 516-842-7676

NY Edicott, Tech-Mark 607-748-7473
NY Fairport, Tech-Mark 716-223-1252
NY Pleasant Valley, Tech-Mark 914-635-3436

Ohio Dayton, Ashby Assocs. 513-252-5627
Okla Tulsa, Kemp Engrg. Co. 918-299-2636

Pa Philadelphia, Sencor 215-698-9661
Tex Addison, Kemp Engrg. Co. 214-661-0400
Tex Houston, Kemp Engrg. Co. 713-688-1431

Wash Seattle, Applied Technologies Assocs. 213-289-9181
Wisc Milwaukee, Carlson Elctn. Sls. 414-476-2790

SYSTRON-DONNER, Kruse Electronics Div., 735 Palomar Ave., Sunnyvale, Cal., 94086, Tel: 408-735-9660, TWX: 910-339-9309; Empl.: 75; Minimum order: \$15

For info on price: J. Johnson; Application info: J. Johnson; Delivery info: J. Johnson

Products manufactured: Generators, Meters, Oscillators, Tubes

Refer to Systron-Donner Corp. for sales representative information.

SYSTRON-DONNER MICROWAVE DIV., 14844 Oxnard St., Van Nuys, Cal., 91409, Tel: 213-786-1760, TWX: 910-495-1786; Empl.: 200

p. 1•812,813

Products manufactured: Adapters, Waveguide, Analyzers, Antenna Feed Systems, Antenna Rotators, Antennas, Attenuators, Bends & Twists, Microwave, Cable Assemblies & Harnesses, Chokes, Circulators, Ferrite, Computers, Counters, Couplers, Detectors, Dividers, Dummy Loads, Duplexers, Microwave, Filters, Flanges, Waveguide, Generators, Horns, Microwave, Isolators, Joints, Rotary, Microwave, Junctions, Hybrid, Microwave, Meters, Mixers, Mounts, Power Supplies, Printers, Probes, Radar Systems, Seals, Shifters, Simulators, Sliding Loads, Microwave, Strip-Line Components, Microwave, Switches, Synthesizers, Tees, Terminals, Test Systems, Tubing, Tuners, Waveguides & Adapters

Local Sales Offices & Reps.

Ala Huntsville 205-536-1969
Ariz Phoenix 602-956-5519
Cal Encino 213-872-1951
Cal Los Alamitos 213-598-7678
Cal Mountain View 415-964-4230
Cal San Diego 714-279-6642
Colo Denver 303-573-9466
Conn Hamden 203-248-9361
Fla Ft. Lauderdale 305-721-4260
Fla Orlando 305-841-8180
Haw Honolulu 808-941-1574
Ill Des Plaines 312-297-5240
Kans Lenexa 913-631-3818
Mass Waltham 617-894-5637
Mich Milford 313-363-2282
Minn Minneapolis 612-544-1616
Mo St. Louis 314-842-2535
NJ Palisades Park 201-871-3916
NM Albuquerque 505-268-6729
NY Rochester 716-334-2445
NC Burlington 919-228-6279
Ohio Cleveland 216-835-2270
Ohio Dayton 513-298-9904
Pa New Kensington 412-339-1445
Pa Plymouth Meeting 215-825-9515
Tex Houston 713-623-4250
Tex Richardson 214-231-8106
Tex San Antonio 512-736-3164
Va Norfolk 804-499-8133
Va Springfield 703-451-6500
Wash Bellevue 206-454-0900
FOR: Can., Brampton, Ont. 416-453-1252
FOR: Can., Montreal, Que. 514-336-9240
FOR: Can., Ottawa, Ont. 613-728-0113
FOR: Can., Vancouver, B.C. 604-325-3201

SYSTRON DONNER TRYGON DIV., 1200 Shames Dr., Westbury, N.Y., 11590, Tel: 516-997-6200, TWX: 510-222-0492; FSC No: 52542; Empl.: 160; Minimum order: \$15

Customer service: H. Rait

Free literature available: Complete catalog on "DC Power Supplies" for laboratory, systems and OEM applications.

Products manufactured: Converters, Power Supplies

Refer to Systron-Donner Corp. for sales representative information.

T-BAR INC., 141 Danbury Rd., Wilton, Conn., 06897, Tel: 203-762-8351, TWX: 710-479-3216; Empl.: 120; Minimum order: \$25

For info on price: T. Infantino; Application info: J. Seiden; Customer service: M. Holt; Delivery info: T. Infantino

Free literature available: High-density Switching Components, Series 6900, Pluggable Switching Modules, designed to switch many parallel circuits simultaneously. Series 2900, Automatic Selector Units for both random and sequential selection of up to 128 positions can be accomplished.

Products manufactured: Comm. Systems, Relays, Switches

Local Sales Offices & Reps.

Ariz Tempe, J. F. Hurlbut Co. 602-968-5962
Cal Palo Alto, Engineering Assocs. 415-494-7842
Cal San Gabriel, Van Gott & Assocs. 213-285-2148
Colo Golden, J. F. Hurlbut Co. 303-279-7796
Conn Madison, A & M Electronic Reps. 203-421-4242
Fla Miami, Geartner Assocs. 305-861-3661
Fla Orlando, Geartner Assocs. 305-299-1000
Ill Chicago, Saffro & Assocs. 312-588-0905
Ind Fort Wayne, McDonald Sales Co. 219-747-3650
Md Silver Spring, Carwithen Assocs. 301-589-9112
Mass Needham, A & M Electronic Reps Inc. 617-444-8170
Mich Dearborn Hts., McDonald Sales Co. 313-278-7500

Minn Minneapolis, C. E. Bohl Co.612-922-7011
 Miss Corinth, Rakes Engrg.601-287-5369
 NJ Fort Lee, Tecmat201-461-8886
 NY New Hartford, KLM Assocs.315-735-8525
 NY No. Syracuse, KLM Assocs.315-458-6214
 NY Rochester, KLM Assocs.716-442-0820
 Ohio Aurora, EMA, Inc.216-562-6104
 Ohio Centerville, EMA Inc.513-433-2800
 Pa Ambler, Wyncote Instrumentation

215-643-2440
 Tenn Bristol, Rakes Engrg.615-968-4195
 Tex Dallas, McCoy Assocs. Co.214-350-9931
 Tex Houston, Unidyne713-494-6021
 Wash Seattle, D. Smith Sls. Co.206-633-3160
 EXP: Wimborne, Dorset, FR Elex, Flight Refuelling Ltd.Wimborne 2121
 FOR: Can., B.C., Vancouver, John G. Weiss Co., Ltd.604-987-3833
 FOR: Can., Ont., Toronto, John G. Weiss Co., Ltd.416-766-0843
 FOR: Can., P.Q., Montreal, John G. Weiss Co., Ltd.514-489-6887

Local Distributors

Cal Hollywood, Terminal Elctns., 5250 Hollywood Blvd.215-466-3181
 Cal Santa Clara, Fisher/Brownell, 3381 Edward Ave.408-244-6182
 Ill Chicago, Newark Elctns., 500 N. Pulaski312-638-4411
 Mass Newton, Cramer, 85 Wells Ave.617-969-7700
 Tex Ft. Worth, Allied Elctns., 401 E. 8th817-336-5401
 Tex Stafford, Southwest Elctns., 12725 Royal Dr.713-494-6021

T-F ELECTRONICS INC., 1701 Evergreen Ave., Austin, Tex., 78704, Tel: 512-444-9674; Empl.: 12

Products manufactured: Calibrators, Filters, Generators, Oscillators, Standards, Tuning Forks

TA INSTRUMENT CASE CO., 4625 Alger St., Los Angeles, Cal, 90039, Tel: 213-242-8855; Empl.: 31

For info on price: J. N. Thraves; Application info: J. N. Thraves; Customer service: J. Garrison; Delivery info: J. Garrison

Free literature available: "Consoliner Series" Brochure-describes standard aluminum housing designed for 19" panel, rack mounted equipment. 12 standard sizes from 5-7/32" to 25-7/32 X 19" are available by catalog number. King-Size Instrument Cases-standard drawn sizes meet Mil-Spec Quality standards Dual Access-describes dual access capability to house two instruments in one body or provide immediate access to the instrument chassis.

Products manufactured: Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Cases, Transit, Containers

Local Sales Offices & Reps.

Cal Los Angeles, TA Instr. Case Co.213-242-8855
 Cal Mountain View, Connolly & Co.415-967-6988
 Cal San Diego, Wm. Gibson714-223-6120
 Cal Sunland, Crescenta Metal Prods.213-352-1895
 Colo Denver, Omega Ltd.303-758-1508
 Conn Sherman, R. P. Mahan Co.617-237-1040
 Fla Orlando, Gra-Mar305-894-3351
 Ga Atlanta, Electro-Mech404-393-0444
 Iowa Cedar Rapids, J-R Sls. Engr.319-377-8211
 Kans Wichita, D-O Engr.316-264-7358
 Md Lutherville, Milan Assocs.301-825-1120
 Miss Fulton, Electro-Mech Sls. Eng. Co.601-862-3378

Mo St. Louis, Industrial Metal Working314-878-4310
 NJ Lodi, Braddock Inds.201-478-1354
 NC Charlotte, Electro-Mech Sls. Eng. Co.704-523-0324
 NC Raleigh, Electro-Mech Sls. Eng. Co.919-782-6452

Ohio Cincinnati, F.D. Borchelt513-851-7586
 Tex Fort Worth, John H. Smith Co.817-267-1202
 Utah Salt Lake City, Omega, Ltd.801-266-9617

TAB BOOKS, Monterey & Pinola Aves., Blue Ridge Summit, Pa., 17214, Tel: 717-794-2191

For info on price: B. Sites; Customer service: S. Buffington

Free literature available: Catalog - describes over 300 titles in the following categories: Appliance Repair, Audio, Hi-Fi & Stereo, Automotive & Engine Technology, Basic Electronics Technology, Broadcasting, Communications & CB Radio, Computer Programming & Technology, Electric Motors, Electronic Book/Kits, Hobby & Experiment, Medical Electronics, Model Radio Control, Television Servicing.

Products manufactured: Kits, Training Aid, Technical Books

TALLY CORP., 8301 S. 180th St., Kent, Wash., 98103, Tel: 206-251-5500, Telex: 320-200; Empl.: 500

Customer service: Mktg. Dept.

Free literature available: Data sheets, equipment specifications, and interface manuals for all products.

Products manufactured: Perforators, Printers

TALK-A-PHONE CO., 5013 No. Kedzie Ave., Chicago, Ill., 60625, Tel: 312-539-1100

Products manufactured: Comm. Systems

TANN CONTROLS CO., 20210 Sherwood St., Detroit, Mich., 48234, Tel: 313-366-3370; Empl.: 20

For info on price: L. Kay; Application info: A. Sikorski; Customer service: A. Sikorski; Delivery info: L. Kay

Free literature available: Catalog sheets and specs. on each product - Electro-Mechanical Switches, Electronic Switches, Relays, Alarms.

Products manufactured: Alarms, Amplifiers, Controls/Control Eqp., Indicators, Relays, Switches

TANSITOR ELCTRNS., Div. Aerotron, West Rd., Bennington, Vt., 05201, Tel: 802-442-5473, TWX: 710-360-1782; Empl.: 300

For info on price: M. Moon; Application info: G. Green; Customer service: M. Moon; Delivery info: M. Moon

Free literature available: The following literature supplied upon request: Complete product catalogue, data sheets, parameters of tantalum capacitors, application information and delivery information.

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Ariz Scottsdale, Piper Sls. Co.602-946-4437
 Cal Pico Rivera, Westrep213-949-2551
 Cal Santa Clara, Richards Assoc.408-246-5860
 Conn Bethel, J. E. Boeing Co.203-748-5802
 Fla Oviedo, Conley & Assoc.305-365-3283
 Ill Chicago, L-Tec, Inc.312-286-1500
 Iowa Cedar Rapids, J.R. Sls. Engrg., Inc.319-377-8211

Md Baltimore, L.H. Kolman & Co.301-752-8756
 Mass Lexington, J. E. Boeing Co.617-862-2500
 Minn St. Paul, H. A. Cullen & Assoc.612-646-7371
 NJ Haddonfield, Sunday-O'Brien609-429-4013
 NJ Leonia, Kohl-Camber201-944-6488
 NC Smithfield, Byrd & Barbour Sls.919-934-8136
 Ohio Akron, Augnat Assoc.216-725-6087
 Ohio Dayton, Augnat Assoc.513-223-5002
 Ore Portland, R. Legg Co.503-292-8824
 Tex Dallas, United Comps.214-324-1448
 FOR: Can., Montreal, Que., Kaytronics, Ltd.514-487-3434

416-638-5511

TAPESWITCH CORP. AMER., 320 Brd. Hollow Rd., Farmingdale, N.Y., 11735, Tel: 516-694-6312; Empl.: 100; Minimum order: \$15

For info on price: D. W. Bury; Application info: F. Dale; Customer service: V. Shove; Delivery info: D. W. Bury

Free literature available: Industrial User Catalog - C-4 General Catalog information on complete line of ribbon switches, switching mats, electric safety edges, footswitches, road switches and other components.

Products manufactured: Alarms, Contact Strips, Finger, Controls/Control Eqp., Indicators, Limit Stops, Mechanical, Switches

TASKER SYSTEMS, 20131 Sunburst St., Chatsworth, Cal., 91311, Tel: 213-341-3010, TWX: 910-494-1214; FSC No: 09017; Empl.: 250; Minimum order: \$200

Customer service: G. B. Etzler

Products manufactured: Analyzers, Antenna Feed Systems, Antenna Rotators, Antennas, Comm. Systems, Control Systems, Air Traffic, Data Acquisition & Reduction Systems, Decoders, Delay Lines, Modulator/Demodulators, Modulators, All Kinds, Pedestals, Radar, Radar Systems, Receivers, Simulators, Testers, Tracking Systems

Local Sales Offices & Reps.

Mass Lexington, C. Hopkins617-861-8300
 NJ Red Bank, T. Schweers201-747-5353
 Va Arlington, J. Seelinger703-524-4477



TAU-TRON INC., 11 Esquire Rd., N. Billerica, Mass., 01862, Tel: 617-667-3874, TWX: 710-347-1570; Empl.: 40

For info on price: R. K. Heathcock; Application info: J. E. Hanley; Customer service: J. E. Hanley; Delivery info: R. K. Heathcock

Free literature available: Short Form catalog, Data Sheets, and Technical Application Notes describing the use of Tau-Tron's high speed digital instrumentation in communications, memory, and general laboratory testing.

Products manufactured: Amplifiers, Circuits, Hybrid, Thick Film, Comparators, Counters, Generators, Oscillators, Testers, Totalizers, Digital, Transmitters

Local Sales Offices & Reps.

Ariz Tempe, J. F. Hurlbut Co.602-968-5962
 Cal Pasadena, RDX Corp.213-681-3451
 Cal Sunnyvale, RDX Corp.408-734-4500
 Colo Golden, J. F. Hurlbut Co.303-279-7796
 Haw Honolulu, Aloha Assocs.808-941-1574
 Ill Chicago, Megatek, Inc.312-889-1277
 Md Rockville, MESA, Inc.301-881-8430
 Minn Minneapolis, Waytek612-933-2133
 NJ Cinnaminson, MESA, Inc.609-786-0284
 Tex Dallas, Bradenco Corp.214-358-3278

Advertisement

INSTRUMENTS FOR HIGH-SPEED DIGITAL TESTING

State-of-the-art circuit design and manufacturing/packaging techniques make possible the highest speed digital instruments currently available. Instrumentation covers the band from DC to 1 GHz and includes communication test equipment (BERT), digital signal sources, systems for testing semiconductor memories, and customized products.

TAURUS CORP., Academy Hill, Lambertville, N.J., 08530, Tel: 609-397-2390; Minimum order: \$25

p. 1-71,219

Customer service: J. D. Kreuter

Free literature available: Teflon Terminal Catalog Circuitrak P.C. Board Holders Catalog Static & Serial Punched Card Readers Catalog

Products manufactured: Guides, Circuit Board, Programmers, Punched Card Equipment, Terminals

Local Sales Offices & Reps.

Ca Los Angeles, R. Sweet213-477-4517
 Cal Pasadena, Sci. Sls.213-793-1244
 Fla Clearwater, Brennan Assoc.813-446-5006
 Ind Ft. Wayne, Hoeming Sls.219-483-6913
 NJ Ft. Lee, K. Hughes201-944-1600
 NY New York, K. Hughes212-695-0082
 Ohio Wickliffe, W.J. Brauer216-943-0601
 Pa Pittsburgh, W.J. Brauer412-921-3213

TAYLOR INDUSTRIES INC., Fisher Road, Howell, Mich., 48843, Tel: 517-546-0450, TWX: 810-251-6266; Empl.: 50; Minimum order: \$25

For info on price: L. Smith; Application info: R. Schiedler; Customer service: L. Smith; Delivery info: L. Smith

Products manufactured: Clamps & Clips, Ducts, Wiring, Fasteners, Panels, Rivets

Local Sales Offices & Reps.

Ariz Scottsdale, N.F. Ross Co.602-945-7262
 Cal Los Angeles, Taylor Industries805-937-6400
 Colo Denver, Gaer Sls., Inc.303-758-3223
 Conn Byram, Brunner Assocs.516-921-2052
 Conn Storrs, R.C. Campbell Co.203-456-1212
 Ga Atlanta, A. Brown Assocs.404-457-6381
 Kans Kansas City, Conrad Co.913-621-3021
 Mich Farmington Hills, R. McBride Co.313-474-2300
 Minn Minneapolis, R.D. Schwen Engrg. Co.612-854-4304
 Mo St. Louis, G. Hagen & Co.314-961-2222
 NJ Morristown, Waldron Assocs.201-538-5607
 Ohio Cincinnati, Phillips Sls.513-791-3926
 Ohio Cleveland, Matthew M. Haley Co.216-842-4747
 Okla Tulsa, Andres & Boruch214-821-3601

Ore Beaverton, D. Fry Co. 503-643-5448
 Pa Pennel, R. May Assocs. 215-757-1581
 Pa West Newton, W.H. Schmitt Assocs. 412-872-5007
 Tex Dallas, Andres & Boruch 214-821-3601
 Tex Houston, Bean-McDaniel & Assocs 713-649-8606
 Va Richmond, J. H. Thrower Co. 804-794-6819

TAYLOR INSTR. PROCESS CONTROL DIV., Sybron Corp., 95 Ames St., Rochester, N.Y., 14601, Tel: 716-235-5000, TWX: 716-235-4893; Empl.: 1900; Minimum order: \$25

For info on price: Sls. Dept.; Application info: R. J. Branigan; Customer service: W. B. Hile; Delivery info: Sls. Dept.

Free literature available: A four-page brochure outlining design, applications and features of the new Multi-Scan Potentiometric recorders, indicators, and controllers, including alarm options and balancing techniques.

Products manufactured: Actuators, Alarms, Amplifiers, Analyzers, Computers, Controls/Control Eqpt., Converters, Gages, Indicators, Integrators, Electronic, Meters, Potentiometers, Process Control Systems, Recorders, Scales, Dial, Services, Assembly, Production & Test, Testers, Timers, Transducers, Transmitters, Valves, Solenoid, Valves, Vacuum

Local Sales Offices & Reps.

Ala Birmingham 205-879-5942
 Ala Mobile 205-344-4981
 Cal Los Angeles 213-662-3191
 Cal San Leandro 415-569-1661
 Colo Denver 303-795-8330
 Del Wilmington 302-478-2440
 Fla Lakeland 813-688-8441
 Ga Atlanta 404-458-8301
 Ga Savannah 912-233-8589
 Ill Chicago Heights 312-755-3103
 Ill Oak Park 312-379-0876
 Ind Indianapolis 317-257-3317
 Iowa West Des Moines 515-283-1422
 Kans Kansas City 913-236-8555
 La Baton Rouge 504-921-8111
 La New Orleans 504-482-3136
 Me Portland 207-774-7392
 Md Baltimore 301-788-6633
 Mass Needham 617-444-4130
 Mass Springfield 413-733-3721
 Mich Dearborn Heights 313-278-4000
 Mich Kalamazoo 616-345-7931
 Minn Hopkins 612-935-7771
 Mo St. Louis 314-966-5660
 NJ Succasunna 201-584-1234
 NY Buffalo 716-877-5245
 NY New York 212-586-3544
 NY Rochester 716-244-0430
 NY Schenectady 518-374-8403
 NC Charlotte 704-372-2360
 NC Greensboro 919-273-0818
 NC Wilmington 919-763-8683
 Ohio Akron 216-535-1545
 Ohio Cincinnati 513-272-3636
 Ohio Parma 216-398-6292
 Okla Tulsa 918-628-1280
 Ore Portland 503-665-6111
 Pa Fort Washington 215-643-7300
 Pa Pittsburgh 412-531-3301
 SC Columbia 803-788-5918
 SC Greenville 803-233-7464
 Tenn Knoxville 615-588-2485
 Tenn Memphis 901-274-8842
 Tex Amarillo 806-352-4781
 Tex Beaumont 713-892-1213
 Tex Corpus Christi 512-882-1171
 Tex Dallas 214-690-1130
 Tex Houston 713-462-6402
 Utah Salt Lake City 801-272-3482
 Va Richmond 804-272-1461
 Wash Bellevue 206-455-2666
 WV South Charleston 304-744-3473
 Wisc Appleton 414-739-6851
 Wisc Milwaukee 414-543-6550

TAYLOR-WINFIELD CORP., 1052 Mahoning Ave. NW, Warren, Ohio, 44482, Tel: 216-399-8861, Telex: 098-2433; Empl.: 600; Minimum order: \$25

Products manufactured: Furnaces, Generators, Heaters & Heating Elements, Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

Local Sales Offices & Reps.

Cal Monrovia, Denton & Anderson Co. 213-359-9304

Colo Denver, Duboc-Lane & Monckton, Inc. 303-623-1261
 Ill La Grange, Denton & Anderson Co. 312-482-8660
 Mich Birmingham, Denton & Anderson Co. 313-647-5520
 Minn Minneapolis, Parker Sls. 612-920-1323
 Mo Ballwin, Denton & Anderson Co. 314-821-3220
 NY Hamburg, Denton & Anderson Co. 716-826-6272
 NY Plainview, Denton & Anderson Co. 516-694-6055
 NC Charlotte, J.W. Fraser & Co. 704-523-2414
 Ohio Cleveland, Denton & Anderson Co. 216-831-2010
 Ohio Dayton, Denton & Anderson Co. 216-831-2010
 Pa Warminster, Denton & Anderson Co. 215-322-1262
 Tenn Chattanooga, Jones-Sylor Co., Inc. 615-265-1601
 Tex Garland, Denton & Anderson Co. 214-270-7635

TDC, DIV. FREQ. TECHNOLOGY INC., Box 365, Littleton, Mass., 01460, Tel: 617-456-3374; FSC No: 53875; Empl.: 50; Minimum order: \$100

Free literature available: Brochures on EPOXYCAST High-Voltage Transformers, STABILAC Stable AC Power Sources, STABILARC Ballasts for HID Lamps, and Machine Tool Control Transformers.

Products manufactured: Transformers

Local Sales Offices & Reps.

Cal Oakland, J. H. Ormond Co. 415-893-7700
 Cal Seal Beach, Cesco 213-430-9084
 Conn New Canaan, Jedco Assocs. 203-966-2580
 Ill Park Ridge, Probe Elctns. 312-696-2828
 Md Baltimore, W. S. Warrington & Assocs. 301-823-8759
 Minn Minneapolis, Revere Assocs. 612-781-2615
 NJ Springfield, F. F. Sylvester Assocs. 201-376-3324
 NY Buffalo, H. C. Johnson Agencies 716-632-7880
 NY Fayetteville, H. C. Johnson Agencies 315-637-9383
 NY Rochester, H. C. Johnson Agencies 716-482-3000
 Ohio Cleveland, Orr Assocs. 216-885-1324
 Pa Ardmore, W. K. Metz 215-649-3966
 Pa Glenshaw, H. C. Johnson Agencies 412-961-0414
 Wash Seattle, Avionics Liasion, Inc. 206-767-3870

TDK ELECTRONICS CO., LTD., 14-6 2-Chome, Uchikanda, Chiyoda-ku, Tokyo 101, Japan, Tel: 03-257-2527; Empl.: 4775

Products manufactured: Capacitors, Fixed, Capacitors, Variable, CATV Systems & Equipment, Chokes, Coils Including Assemblies & Forms, Converters, Cores, Magnetic, Crystals, Delay Lines, Dummy Loads, Ferrite Material & Parts, Filters, Inverters, Isolators, Lighting Equipment, Emergency, Lights, Magnets, Matrices, Computer, Memory Systems, Modules, Logic, Encapsulated, Networks, Power Supplies, Reactors, Substrates, Suppressors, Tapes, Recording, Magnetic (All Types), Thermistors, Transformers

Local Sales Offices & Reps.

Cal El Segundo, TDK Corp. of America 213-644-8625
 Ill Chicago, TDK Corp. of America 312-973-1222
 NY New York, TDK Corp. of America 516-746-0880
 Tex El Paso, TDK Corp. of America 915-778-4203

TDK ELCTRNS. CORP., 23-73 48th St., Long Island City, N.Y., 11103, Tel: 212-721-6881

Products manufactured: Capacitors, Fixed, Capacitors, Variable, Chokes, Circulators, Ferrite, Coils Including Assemblies & Forms, Cores, Magnetic, Delay Lines, Filters, Magnets, Matrices, Computer, Memory Systems, Networks, Resistors, Tape Recording Accessories, Tapes, Recording, Magnetic (All Types), Thermistors, Transducers, Transformers

TEABERRY ELECTRONICS, 4655 Massachusetts Ave., Indianapolis, Ind., 46218

Products manufactured: Comm. Systems, Receivers, Transmitters

TEC, INC., 9800 N. Oracle Rd., Tucson, Ariz., 85704, Tel: 602-297-1111, TWX: 910-952-1377; Empl.: 300; Minimum order: \$25 p. 2-1201-1204

For info on price: J. Bastys; Application info: L. Lorence; Customer service: K. Herlong; Delivery info: K. Herlong

Free literature available: Complete Product Catalog (#2027), Short-Form Catalog (#986), Data-Monitor Annunciators (#1019), DATA-PANEL Display Systems (#1024), LED Readout Modules (#2031)

Products manufactured: Annunciators, Diodes, Display Devices/Displays, Drivers & Decoders For Readouts, Gaskets, Shielding, R-F-Also See Shields, R-F, Keyboards, Alphanumeric & Decimal, Lamp Drivers, Lamps, Lights, Power Supplies, Switches, Terminals, Data Display (including Alphanumeric & Graphic), Wrenches

Local Sales Offices & Reps.

Ariz Phoenix, Gramer & Co. 602-279-1221
 Cal El Segundo, Varigon & Assocs. 213-644-3611
 Cal Mountain View, Cindel, Inc. 415-965-2630
 Cal San Diego, Varigon & Assocs. 714-299-5413
 Colo Sedalia, Jensen Rep. Co. 303-688-4154
 Fla Maitland, Hutto-Hawkins-Peregoy 305-831-2474
 Ga Atlanta, Elmar Associates. 404-261-4345
 Haw Honolulu, Aloha Assocs. 808-941-1575
 Ill Des Plaines, Lincoln-Hodges 312-297-3810
 Md Baltimore, Burgin-Kreh Assocs. 301-788-5200
 Mass Norwell, Bordewieck Engineering & Sls. Co. 617-659-4915
 Mich Dearborn, Pitcher-Poulin, Inc. 313-582-5450
 Minn Hopkins, Grayden & Flemmer 612-941-1120
 Mo Hazelwood, Techn. Representatives, Inc. 314-731-5200
 NM Albuquerque, Data Handling Co. 505-268-4364
 NY Mt. Vernon, Friedman-Smith 914-664-4866
 NY Syracuse, Advanced Comps. 315-699-2671
 NC Winston-Salem, Burgin-Kreh Assocs. 919-768-4174
 Ohio Brecksville, A. Nace Co. 216-526-4323
 Ore Portland, Western Tech. Sls. 503-297-1711
 Pa Pittsburgh, A. Nace Co. 412-922-7225
 Pa Willow Grove, Techparts 215-657-0100
 Tex Dallas, Ralph Matthews Elctns. 214-233-0363
 Tex Houston, R. Matthews Elctns. 713-664-7131
 Va Lynchburg, Burgin-Kreh Assocs. 804-845-5600
 Wash Bellevue, Western Tech. Sls. 206-641-3900
 Wisc Waukesha, Lincoln-Hodges 414-542-3087
 FOR: Can., Markham, Ontario, Audio Elctns. 416-495-0720

Local Distributors

Cal Hawthorne, Century Aero Corp., 12523 Crenshaw Blvd. 213-772-1166
 Cal Mountain View, Ratel Elctns., 815 Maude Ave. 415-965-2010
 Fla Oakland Park, Peerless Radio Corp. of Fla., 1040 NE 43rd Ct. 305-566-5966
 Ill Westmont, Bodelle Co., 47 Chestnut La. 312-323-9670
 Mass Norwell, Bordewieck Elctn. Supply Co., 427 Washington St. 617-659-4915

TECH-ETCH, INC., 10 Ind'l. Pk. Rd., Hingham, Mass., 02043, Tel: 617-749-0993; Empl.: 81; Minimum order: \$75.

For info on price: R. Gurwitel; Application info: J. Kenworthy; Customer service: P. Thomas; Delivery info: R. Gurwitel

Products manufactured: Circuits, Flexible, Dials, Nameplates, Scales, Dial, Services, Assembly, Production & Test

TECH LABS., INC., Bergen & Edsall Blvds., Palisades Pk., N.J., 07650, Tel: 201-944-2221; Empl.: 65; Minimum order: \$35 p. 1-2298,2299

For info on price: K. K. Garrison; Application info: A. Konrad; Customer service: C. Schulz; Delivery info: C. Schulz

Free literature available: Switch/attenuators (short form), Attenuator catalog (includes technical and application data), Program switch, Thumbwheel switches.

Products manufactured: Attenuators, Decade Boxes, Networks, Resistors, Switches

Local Sales Offices & Reps.

Ark Magnolia, P. Jameson 501-234-3778
 Cal Encino, V/L Assocs. 213-986-9703
 Cal Palo Alto, Held & Mollard, Inc. 415-965-9321
 Conn Thomaston, Nelson-Bennett 203-283-5959
 Fla Satellite Beach, Reynolds & Assoc. 305-773-4700
 Ga Atlanta, Grady Duckett Sls. 404-451-3529
 Ill Glenview, Crimmon Engrg. Co. 312-724-1780
 Md Baltimore, Whitcomb Assocs. 301-889-1245
 Mass Auburn, Nelson-Bennett 617-757-3131
 Mich Jackson, N. Scroggs Co. 517-750-1170
 Minn Siedara Assocs. 612-533-2294
 NJ Haddonfield, F.W. Churchill 609-429-7871
 NJ Palisades Park, Tech. Labs. 201-944-2221

NY Buffalo, R. A. Murray 716-632-6913
 NY Commack, L. K. Haner Assoc. 516-864-2220
 Ohio Cincinnati, A. C. Wahl & Assoc. 513-821-3270
 Ohio Lyndhurst, A. C. Wahl & Assoc. 216-449-1788
 Pa Pittsburgh, Waggoner-VerHill Assoc. 412-241-5202
 Tex Dallas, Southwest Elctns. 214-233-9816
 Tex Houston, Southwest Elctns. 713-729-1670

TECH MATERIALS INC., 5 Wellington Rd., Lincoln, R.I., 02865, Tel: 401-728-7200; Empl.: 75; Minimum order: \$250

For info on price: P. Shaw; Application info: S. Hopp; Customer service: B. Allen; Delivery info: P. Shaw

Free literature available: 1. Handbook for Clad Metals - complete handbook on clad inlays and overlaps and their application. 2. Design Aid for Solder Clads - comprehensive treatment of toplay and overlay solder clads and their uses.

Products manufactured: Alloys, Metals, Seals

Local Sales Offices & Reps.

Cal Los Angeles, E. J. Brookes Co.
 Cal Santa Clara, E. J. Brookes Co.
 Ill Zion, A. O. Capp Co.
 Ind Fort Wayne, J. C. Butler Sls. & Engrg.
 Ind Indianapolis, J. C. Butler Sls. & Engrg.
 Ohio Milford, J. C. Butler Sls. & Engrg.

TECH SERV., INC., BRS/LVE Div, 5301 Holland Dr., Beltsville, Md, 20705, Tel: 301-474-3400, TWX: 710-828-0515; Empl.: 110; Minimum order: \$25
 Customer service: P. D. Donahue

Free literature available: Animal Environment Electromechanical Control Solid State Control

Products manufactured: Cards, Logic, Computers, Controls/Control Eqpt., Converters, Counters, Drivers, Solenoid, Generators, Kits, Test Equipment, Modules, Logic, Encapsulated, Printers, Readers, Recorders, Timers

TECH SPRAY, INC., Box 949, Amarillo, Tex., 79105, Tel: 806-372-8523; Empl.: 20; Minimum order: \$50

For info on price: P. Gunzelmau; Application info: T. Larson; Customer service: P. Gunzelman; Delivery info: P. Gunzelman

Free literature available: Catalog FP10 illustrated catalog with product descriptions, Mil Specs, Technical & Usage data.

Products manufactured: Cleaners & Solvents, Coatings, Lubricants

Local Sales Offices & Reps.

Cal Burlingame, Carelli EMA 415-697-6286
 Cal La Selva Beach, Belchamber & French 408-722-0444
 Cal Van Nuys, A. Szerlip Sls. Co. 213-782-1765
 Colo Denver, McLeod & Raymond 303-756-1589
 Fla Tampa, Wallace Assoc. 813-961-1037
 Ill Chicago, B. Burns Assocs. 312-775-1233
 Ind Indianapolis, Electronic Reps. 317-897-9326
 Mass Lynn, Keene Sls. 617-595-2300
 Mich Milford, Polyphase Sls. 313-685-3003
 Minn Minneapolis, D. Barrett Co. 612-929-0028
 Mo Jefferson City, C. A. Vegrola 314-893-3205
 NY N. Bellmore, L. W. Keller Assoc. 516-785-2826
 NY Rochester, Malsey Sls. 716-442-9700
 Ohio Medina, T. Grant Assoc. 216-725-6528
 Ore Portland, J. V. BeLusko Co. 503-222-4279
 Pa Philadelphia, D. Linz Co. 215-379-0734
 Tex Dallas, Crockett Sls. Co. 214-748-8209
 EXP: Miami, Fla., Electronics Int'l 305-635-8670
 FOR: Can., Dorval, Que., Superior Elctns. 514-683-6331

TECHMAR CORP., 2232 Cotner Ave., Los Angeles, Cal., 90064, Tel: 213-478-0046; Empl.: 6 p. 1*96,97

Free literature available: 17-page catalog of rack-mounting kits & parts, PC card cages, portable instrument enclosures, mini-consoles, subassembly housings with & without heat sinks, power supplies, IC packaging system. Price list enclosed.

Products manufactured: Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Chassis, Metal, Drawers, Sliding, Integrated Circuit Packaging Systems, Panels, Power Supplies, Racks

TECHNI-RITE ELCTRNS, see Recorder Systems Div.

TECHNI-TOOL, INC., Total Spectrum, Tool Supplier, Apollo Road, Plymouth Meeting, Pa., 19462, Tel: 215-825-4990, Telex: 834-763; Empl.: 20; Minimum order: \$25

For info on price: J. Immediato; Application info: W. Bezar; Customer service: M. Sill; Delivery info: M. Hurley

Products manufactured: Adhesives (All Types), Burnishers, Contact, Clamps & Clips, Cleaners & Solvents, Cleaners, Ultrasonic, Coatings, Counters, Demagnetizers, Detectors, Drills & Accessories, Hand & Power, Drivers, Nut, Fiber Optic Bundles, Gages, Heat Guns, Production, Heat Sinks, Soldering, Holders, Circuit Board (Production Type), Jigs And Fixtures, Chassis & Circuit Board, Kits, Marking (Dial, Instrument, Equipment, etc.), Kits, Training Aid, Knives & Knife Sets, Lamps, Lubricants, Machines/Machinery, Production, Microscopes, Pliers, Probes, Pumps, Vacuum, Scissors, Screwdrivers, Slide Rules (Circuitry Computing), Solder Pots & Baths, Soldering Accessories, Soldering Equipment, Testers, Tools, Tweezers, Hand & Vacuum, Wire Twisters, Wrenches

Local Sales Offices & Reps.

Fla Miami, N. Black Assocs. 305-651-4132
 Mass Burlington, Tekdata 617-273-0198
 Mo Kansas City, Nevco, Inc. 816-361-8290
 NY Shirley, Pacenter 516-281-3810
 Ohio Cincinnati, Modern Indl. Sls. Co. 513-542-6969
 Pa Upper Darby, J. J. Mahoney 215-734-1244
 Utah Salt Lake City, Technical Devices 801-486-6401

TECH. DEVICES CO., 11250 Playa Ct., Culver City, Calif., 90230, Tel: 213-870-3751; FSC No: 04772; Empl.: 21; Minimum order: \$10

For info on price: J. Cochran; Application info: D. N. Winther; Customer service: J. Cochran; Delivery info: J. Cochran

Free literature available: MARK I WAVE SOLDERING MACHINE; MARK V LEAD FORMER; MARK IX LEAD TRIMMER; MARK II WIRE CUTTER & STRIPPER; MARK III CIRCUIT CARD FIXTURE.

Products manufactured: Holders, Circuit Board (Production Type), Machines/Machinery, Production, Soldering Equipment, Wire Strippers

Local Sales Offices & Reps.

Ark Little Rock, Carlton-Bates 501-562-9100
 Cal Inglewood, Tracker, dba Weightman & Assocs. 213-645-6060
 Cal Menlo Park, West Engrg. Sls. Co. 415-325-2885
 Colo Denver, Todd-Associates, Inc. 303-744-2313
 Fla Orlando, Buchanan & Abrams Assocs., Inc. 305-423-8995
 Fla Orlando, W. B. Wimberly Co. 305-GA5-3083
 Ill Chicago, Ringland M. Krueger Co. Inc. 312-AV 2-8444
 Ind Indianapolis, Blind & Assocs., Inc. 317-251-1249
 Kans Lenexa, Smith-Williams Co. 913-TU 8-3995
 Md Phoenix, REBCO Sls. 301-592-8907
 Mass Woburn, R. W. Hatfield Co. 617-933-2324
 Mich Kentwood, The C.A. Geer Co. 616-534-7449
 Minn St. Paul, Sales Service Machine Tool Co. 612-MI 6-8663
 NY Farmingdale, Haines Prods., Inc. 516-420-1177
 NY Syracuse, M. C. Antil Jr. Co. 315-463-0266
 Ohio Cleveland, P. Lohse & Co. 216-381-4424
 Pa Lansdowne, W. F. Satterthwaite & Co. 215-623-5100
 Tex Dallas, R. E. Nesbitt Co. 214-FL 7-4601
 Tex Houston, R. E. Nesbitt Co. 713-224-3633
 Wash Seattle, Process Sys. 206-246-0224

TECHNICAL MAT'L, 700 Fenimore Rd., Mamaroneck, N.Y., 10543, Tel: 914-698-4800, TWX: 710-566-1100; Empl.: 250

Products manufactured: Amplifiers, Antennas, Cabinets & Accessories, Comm. Systems, Connectors, Converters, Cords, Couplers, Dummy Loads, Filters, Panels, Receivers, Synthesizers, Terminals, Transmitters

Local Sales Offices & Reps.

Ariz Tempe, T.M.C. Sys. 602-967-7874
 Ga Atlanta, Scientific Sls. Co. 404-252-5360
 Tex Houston, Blackburn Assocs., Inc. 214-351-9991
 Va Springfield, T.M.C. Sys. & Power 703-354-7400
 Wash Seattle, Underwood & Underwood, Inc. 206-243-4853
 EXP: N.Y., Mamaroneck, T.M.C. 914-698-4800

TECHNICAL RESEARCH & MFG., INC., Kelly Ave. Grenier Field, R.F.D. #3, Manchester, N.H., 03103, Tel: 603-668-0120, TWX: 710-220-6765; Empl.: 25

Products manufactured: Amplifiers, Attenuators, CATV Systems & Equipment, Couplers, Detectors, Dividers, Drivers, Switch, Duplexers, Microwave, Impedance Converters, Microwave, Junctions, Hybrid, Microwave, Mixer-Preamplifiers, Microwave, Mixers, Multipliers, Receivers, Services, Assembly, Production & Test, Shifters, Strip-Line Components, Microwave, Transformers

Local Sales Offices & Reps.

Cal Los Angeles, R F Assocs. 213-478-1586
 Cal Palo Alto, R F Assocs. 415-494-3331
 Colo Loveland, Kelley Assocs. 303-667-1376
 Ill Chicago, Technical Sls. 312-237-7210
 Mass Needham Hgts., Repron 617-449-4141
 Mo St. Louis, G. Fixman Engrg. Co. 314-725-5219
 NJ Livingston, G & A Elctns., Inc. 201-992-3087
 Ohio Cincinnati, Gallagher Co. 513-761-1288
 Pa Willow Grove, H. Nash Assocs. 215-657-2213
 Tex Houston, R. Martin Assocs. 713-462-4077
 Va Annandale, J. Hopkins Assocs. 703-323-1641
 FOR: Can., Montreal, 252, Que., Compenetics Ltd. 514-342-4117

TECHNICAL WIRE PRODUCTS, INC., 129 E. Dermody St., Cranford, N.J., 07016, Tel: 201-272-5500, TWX: 710-996-5961; FSC No: 07700; Empl.: 101; Minimum order: \$35

For info on price: R. S. Blank Ext. 39; Application info: J. Blazejewski Ext. 54; Customer service: R. S. Blank Ext. 39; Delivery info: R. S. Blank Ext. 39

Free literature available: A complete design guide describing technit's semi shielding and conductive materials and products.

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Bezels, Shielded & Unshielded, Coatings, Conductive Plastic Materials, Connectors, Contacts, Electrical, Fabrics, Conductive, Gaskets, Shielding, R-F-Also See Shields, R-F, Honeycomb Sheets, Panels, etc., Kits, Shielding, Paints, Rubber, Shields

Local Sales Offices & Reps.

Ala Huntsville, South Eastern Assocs., Inc. 205-539-9816
 Ariz Scottsdale, Williams Assocs., Inc. 602-947-4297
 Cal Los Alamitos, Heaton Co., Inc., J.S. 714-821-9600
 Cal Redwood City, Heaton Co., Inc., J.S. 415-369-4671
 Cal Santa Barbara, Technical Wire Products 805-963-1867
 Colo Denver, Williams Assocs., Inc. 303-373-4730
 Conn Enfield, Measurement Equip. Co. 203-745-9050
 Fla Altamonte Springs, WMM Assocs., Inc. 305-831-4645
 Fla Clearwater, WMM Assocs., Inc. 813-447-2533
 Fla Pompano Beach, WMM Assocs., Inc. 305-943-3091
 Ill Chicago, Angel & Co. 312-878-0653
 Ind Fort Wayne, Scott Electronics, Inc. 219-743-1586
 Ind Indianapolis, Scott Electronics, Inc. 317-897-9976
 Md Baltimore, Kaufholz Assocs. 301-488-6561
 Mass Wakefield, Measurement Equip. Co. 617-245-4870
 Minn St. Paul, Heyda Co., Bonament 612-484-8531
 Mo Kansas City, Harris-Hanson Co. 816-444-9494
 Mo St. Louis, Harris-Hanson Co. 314-432-3611
 NJ Cranford, Technical Wire Prods., Inc. 201-272-5500

NM Albuquerque, Williams Assocs., Inc. 505-255-1638
 NY Rochester, Murray, Inc., H.R. 716-244-1100
 NY Syracuse, Murray, Inc., H.R. 315-446-5555
 NC Raleigh, S & R Sls & Assocs. 919-876-2208
 Ohio Cleveland, Scott Electronics, Inc. 216-291-2600
 Ohio Columbus, Scott Electronics, Inc. 614-236-8619
 Ohio Dayton, Scott Electronics, Inc. 513-223-2652
 Pa Pittsburgh, Scott Electronics, Inc. 412-781-3122
 Tex Richardson, Corwin Assocs., Inc. 214-424-8333
 Wash Bellevue, Over Sales, Ray 206-454-9187
 FOR: Can., Toronto 392, Ont., Electrodesign Ltd. 416-787-0991
 FOR: Can., Vanier, Ont., Electrodesign Ltd. 613-745-0541
 FOR: Can., Ville La Salle 650, Que., Electrodesign Ltd. 514-363-5120

TECHNIPOWER, INC., Benrus Center, Ridgefield, Conn., 06877, Tel: 203-431-1300, TWX: 710-467-0666; FSC No: 13850; Empl.: 200 p. 1*1478,1479
 For info on price: A. R. Saenz 203-431-1306; Application info: A. R. Saenz 203-431-1306; Customer service: J. Pease 203-431-1308

Free literature available: Design/Data catalog listing commercial, industrial, and mil qualified power supplies. Special sections devoted to extensive thermal data, NEMA terminology, and metric conversion tables.

Products manufactured: Chargers, Battery, Converters, Heat Exchangers & Systems, Inverters, Power Supplies

Local Sales Offices & Reps.

Cal	Pasadena, Luscombe Engrg.	213-684-2000
Cal	San Mateo, Luscombe Engrg.	415-342-7057
Colo	Denver, Electrodyne	303-757-7676
Conn	Meriden, A. Allison	203-237-9232
Fla	Ridgefield, Technipower	203-431-1300
Ill	Chicago, Allen Woods & Assoc.	312-283-7400
Kans	Overland Park, Ensco-Rep.	913-381-7557
Md	Rockville, Farrell Assocs.	301-424-9460
Mass	East Bridgewater, Abbott Allison	617-245-0250
Mich	Farmington, Anderson Elctns.	313-476-9161
Minn	Minneapolis, R-J, Inc.	612-922-1425
Mo	St. Louis, Ensco-Rep, Inc.	314-567-3935
NM	Albuquerque, William J. Purdy Co.	505-266-7959
		203-431-1300
NY	Ridgefield, Technipower	513-298-9575
Ohio	Dayton, Sculley & Ingling	215-356-8550
Pa	Newtown Square, Holdsworth & Co.	412-561-4125
		713-666-5723
Pa	Pittsburgh, G.S. Root & Co.	214-231-6541
Tex	Houston, Scientific Sls.	206-226-0650
Tex	Richardson, Scientific Sls.	
Wash	Renton, Baxley-Wilson Co.	
EXP:	Can., Burlington, Ont., White Radio Ltd.	416-634-1845
EXP:	Can., Montreal, Que., White Radio Ltd.	514-482-8091

TECHNIQUES, INC., 235 Jackson St., Englewood, N.J., 07631, Tel: 201-569-5900; Empl.: 60

Products manufactured: Boards, Printed Circuit, Etchants, Printed Circuit, Kits, Marking (Dial, Instrument, Equipment, etc.), Kits, Printed Circuit, Screens, Printed Circuit

Technitrol, Inc.

TECHNITROL, INC., 1952 E. Alleghany, Philadelphia, Pa., 19134, Tel: 215-426-9105; FSC No: 90095; Empl.: 350; Minimum order: \$50

p. 1-466,467; p. 2-1810,1811

For info on price: Sls. Dept.; Application info: W. A. Chamberlin; Customer service: Sls. Dept.; Delivery info: Sls. Dept.

Free literature available: Transformer Handbook and Technical Notes - Describes and lists popular types of transformers, technical notes provide useful formulae. Delay Line Catalog - Lists popular delay lines and useful formulae. TTL Delay Module - Provides data on new dynamic TTL compatible delay module.

Model 4604 - Describes high speed memory tester Model 4603 - Describes versatile core memory exerciser Series 2000 Module Describes modules for build in house.

Products manufactured: Coils Including Assemblies & Forms, Delay Lines, Generators, Services, Assembly, Production & Test, Test Systems, Testers, Timers, Transformers

Local Sales Offices & Reps.

Ariz	Scottsdale, Q. T. Wiles	602-948-5590
Cal	Los Angeles, Q. T. Wiles	213-478-0183
Cal	San Diego, Q. T. Wiles	714-565-6897
Cal	Tustin, Q. T. Wiles	714-832-4952
Colo	Denver, Comtech Inc.	303-756-6815
Fla	Maitland, Hutto-Hawkins-Perego	305-831-2474
		305-943-9593
Fla	Pompano Beach, Hutto-Hawkins-Perego	312-526-2484
Ill	Wauconda, Cudaly Sls.	617-273-0198
Mass	Burlington, Tek Data	617-969-5478
Mass	Newton, Normell Assoc.	716-377-1742
NY	Fairport, TAC Assoc.	215-426-9105
Pa	Philadelphia, Technitrol	
FOR:	Can., Brampton, Ont., Bagtronix Ltd.	416-453-1252
FOR:	Can., Montreal, Que., Bagtronix Ltd.	514-336-9242
FOR:	Can., Ottawa, Ont., Bagtronix Ltd.	613-728-0113

TECHNITROL, INC. cont'd

Advertisement

Technitrol has full capability for design, packaging, production of sub-miniature transformers; from stringent MIL-spec varieties to simple unencapsulated units, packaged singly or in multiples. A complete line of lumped parameter delay lines is available featuring new dynamic delay module with its TTC compatibility. The Technitrol Systems Division features a complete line of memory exercisers; core, platewire, semiconductor.

TECHNO-COMPS. CORP., 7803 Lemona, Van Nuys, Cal., 91405, Tel: 213-781-1642, TWX: 910-495-2015; FSC No: 17826; QPL No: Multiple; Empl.: 70; Minimum order: \$50

For info on price: D. Ross; Application info: T. Hoerth; Customer service: R. Rosas; Delivery info: M. Eliasson

Free literature available: Short Form Catalog; Individual Data Sheets; QPL Qualification Sheets; Established Reliability Qualification Sheets; Three Ring Binder containing entire product line; Trimmer terms and definitions book

Products manufactured: Potentiometers, Resistors

Local Sales Offices & Reps.

Ariz	Scottsdale, Argus Sls.	602-967-8709
Cal	Inglewood, Oak Inds. Corp.	213-678-4108
Cal	Los Altos, Oak Inds. Corp.	415-941-1237
Fla	Orlando, Oak Inds. Corp.	305-671-4111
Ill	Chicago, Delta Tech. Sls.	312-437-9412
Kans	Leawood, H.C. Heyde Co.	913-649-8628
Md	Timonium, Marktron, Inc.	301-252-7111
Mass	Needham, A & M Elctns.	617-444-8170
Mich	Farmington Hills, Sterling-Lowell Co.	313-581-7474
Minn	Minneapolis, C.R. Gibb Co.	612-377-1200
NJ	Haddonfield, T.M. Mills Co.	609-429-1005
NJ	Pompton Lakes, R. Horne Assoc.	201-835-7400
NY	No. Syracuse, Advanced Comps.	315-699-2671
Ohio	Centerville, EMA, Inc.	513-433-2800
Ore	Portland, Oak Industries	503-292-0878
Tex	Ft. Worth, W. Fralia	817-738-2394
EXP:	Colo., Denver, I. W. Strong	303-292-6900
FOR:	Can., Ottawa, Ont., E. G. Lomas	613-725-2177

Local Distributors

Cal	Los Angeles, Radio Products Sls., 1501 S. Hill	213-748-1271
Fla	Clearwater, Southland, 1771 N. Hercules	813-443-4514
NJ	Wayne, Gordon/Horne, 2282 Hamburg Tnkp.	201-835-7400
NY	N. Syracuse, ANDCO, Box 276	315-699-2671
Tex	Ft. Worth, Patco Supply, Box 12625	817-738-2394

TECHSONICS, Box 251, El Prado, N.M., 87529, Tel: 505-758-4555; Empl.: 10; Minimum order: \$15

Customer service: A. E. Sowers

Free literature available: 0573 Son-Tector ultrasonic detectors 5072 Power converter information

Products manufactured: Analyzers, Converters, Detectors, Testers

TECNETICS, INC., 1624 Range St. Box 910, Boulder Industrial Park, Boulder, Colo., 80302, Tel: 303-442-3837, TWX: 910-940-3246; Empl.: 45

p. 1-1491-1496

For info on price: S. Broyles; Application info: V. Garrison; Customer service: S. Broyles; Delivery info: S. Broyles

Free literature available: 1975 Technetics catalog (available in Jan 75) DC-DC, AC (400 Hz) - DC power supplies.

Products manufactured: Converters, Power Supplies

Local Sales Offices & Reps.

Ala	Huntsville, W.A. Brown Comps., Inc.	205-539-4411
Ariz	Phoenix, C.T. Carlberg & Assocs.	602-997-0774
Cal	Inglewood, L & M Engrg.	213-674-6850
Cal	San Jose, L & M Engrg., Inc.	408-243-2891
Colo	Denver, Electro-Rep	303-744-2821
Conn	New Canaan, S. Pierce, Inc.	203-966-4630

Fla	Ft. Lauderdale, W.A. Brown Comps., Inc.	305-776-4800
Fla	Orlando, W.A. Brown Comps., Inc.	305-425-5505
Ill	Chicago, K.W. Meyers Co.	312-774-6440
Ind	Indianapolis, K.W. Meyers Co.	317-243-6681
Kans	Overland Park, Ensco-Rep, Inc.	913-381-7557
La	Gretna, W.A. Brown Comps., Inc.	504-366-5766
Md	Silver Spring, Eastern Instrumentation Corp.	301-681-6500
Mass	Norwood, S. Pierce, Inc.	617-762-3164
Mich	Royal Oak, Satullo Co.	313-549-3910
Minn	Minneapolis, K.W. Meyers Co.	612-920-7080
Mo	St. Louis, Ensco-Rep, Inc.	314-567-3935
NM	Albuquerque, C.T. Carlberg & Assocs.	505-265-1579
NY	Fayetteville, M.P. Andrews, Inc.	513-637-3144
NY	Great Neck, Eastern Instrumentation	516-466-9505
NC	Winston-Salem, W.A. Brown Comps., Inc.	919-725-5384
Ohio	Cleveland, Satullo Co.	216-486-2800
Pa	Melrose Park, R. Meyers Assocs.	215-224-1663
Tex	Dallas, R.R. Thomas Co.	214-363-8591
Wash	Seattle, R.S. Drake Assocs.	206-763-2755

TED CORPORATION, 11415 Johnson Dr., Shawnee Mission, Kans., 66203, Tel: 913-631-6211; FSC No: 05209; Minimum order: \$12

For info on price: R. H. Zehr; Application info: D. J. Patrick; Customer service: C. J. Smith; Delivery info: D. J. Patrick

Products manufactured: Connectors

Local Sales Offices & Reps.

Fla	Lighthouse Point, Saber Assocs.	305-943-3076
Kans	Shawnee, J.F. Guernsey Co.	913-631-2414
NY	West Babylon, G. Newman	516-643-2220
Pa	Oreland, Brown-Oberlies	215-887-1325

TEK-WAVES, INC., See Frequency Elctns.

TEKELEC, INC., 2623 Saddle Ave., Oxnard, Cal., 93030, Tel: 805-485-5445, TWX: 910-336-1280; Empl.: 60; Minimum order: \$25

For info on price: P. McFarland; Application info: P. Wasserman; Customer service: P. McFarland; Delivery info: P. McFarland

Free literature available: Engineering Unit Digital Panel Meters; TA300 Series Digital Panel Meters; TA365 4 1/2 Digit Digital Multimeter; TA355 & TA356 3 1/2 Digit Digital Multimeters; TA357 Digital Multimeter; "Which LCD is Best" A selection guide for liquid crystal displays; "Report on Digital Voltmeters"

Products manufactured: Converters, Meters, Testers

Local Sales Offices & Reps.

Ariz	Phoenix, RDX Corp.	213-681-3451
Cal	Pasadena, RDX Corp.	714-278-6863
Cal	San Diego, RDX Corp.	408-734-4500
Cal	Sunnyvale, RDX Corp.	303-423-5556
Colo	Arvada, Arrowhead Sls.	305-894-3351
Fla	Orlando, Gra Mar	312-775-7594
Ill	Chicago, Scientific Sls.	317-253-4606
Ind	Indianapolis, Scientific Sls.	913-648-0124
Kans	Leawood, Leemark Engineers	301-588-8134
Md	Silver Springs, Q.E.D. Elctns.	617-969-4650
Mass	Newton Centre, Daner Hayes	313-271-4600
Mich	Dearborne, Villani-Pitcher	612-881-0668
Minn	Bloomington, Scientific Sls.	201-727-5335
NJ	Parlin, JMR Sls.	212-658-8881
NY	Jamaica, JMR Sls.	
Ohio	Cleveland, Arthur Baier Co. & Assocs.	216-461-6161
Ohio	Dayton, Arthur Baier Co. & Assocs.	513-276-4128
Pa	Abington, Bach-Stewart	215-885-1550
Tex	Houston, Envrionment	613-526-6872
Utah	Salt Lake City, Arrowhead Sls.	801-487-4716
Wash	Seattle, Underwood Jensen & Assoc.	206-575-0123

FOR: Can., Kanata, Ont., Kenwood Controls

613-836-4202

FOR: Can., Montreal, Que., Kenwood Controls

514-738-4969

FOR: Can., St. Catharines, Ont., Kenwood Controls

416-278-2701

TEKELEC INC., 2623 Saddle Dr., Oxnard, Cal., 93030, Tel: 805-485-5445, TWX: 910-336-1280; Empl.: 102; Minimum order: \$25

For info on price: M. Thompson; Application info: P. D. Wasserman; Customer service: P. McFarland; Delivery info: P. McFarland

Ill	Mt. Prospect, Cramer/Chicago, 1911 S. Busse Rd.	312-593-8230	NC	Winston-Salem, Cramer/EW Winston-Salem, 938 Burke St.	919-725-8711	Products manufactured: Cable Assemblies & Harnesses, Cable, Services, Assembly, Production & Test
Ind	Indianapolis, Pioneer/Indiana, 6408 Castleplace Dr.	317-849-7300	Ohio	Cincinnati, Cramer/Tri-States, 666 Redna Terrace	513-771-6441	Local Sales Offices & Reps.
Iowa	Cedar Rapids, Newark Electronics, 1019 First Ave., S.W.	319-362-1171	Ohio	Cincinnati, Newark Electronics, 9799-G Princeton Rd.	513-874-5115	Ala Huntsville, Repcom .....205-534-9959
Iowa	Davenport, Allied Elctns., 1205 E. River Dr.	319-323-8051	Ohio	Cleveland, Cramer/Cleveland, 5835 Harper Rd.	216-248-8400	Cal Millbrae, Ashby Assocs. of No. Cal. ....415-692-4442
La	Alexandria, Ralph's of Lafayette, 601 N. Third St.	318-443-4517	Ohio	Cleveland, Newark Electronics, 2028 E. 46th St.	216-361-4700	Fla Melbourne, Repcom .....305-254-1877
La	Baton Rouge, Ralph's of Lafayette, 1732 Plank Rd.	504-344-8114	Ohio	Cleveland, Pioneer Standard, Box 05100, 4800 E. 131 St.	216-587-3600	Ga Warner Robins, O. C. Bowman .....912-923-1393
La	Lafayette, Ralph's of Lafayette, 3004 Cameron St.	315-234-4507	Ohio	Dayton, Pioneer Standard, 1900 Troy St.	513-236-9900	Md Bethesda, Warren Mount Co. ....301-657-9312
La	Lake Charles, Ralph's of Lafayette, 911 Fourth Ave.	318-439-2493	Okla	Tulsa, T.I. Supply, Drawer "T", Admiral Station	918-437-4555	Mass Weston, J. Goode Assoc. ....617-235-3900
La	Morgan City, Ralph's of Lafayette, 715 Brashear St.	504-384-9831	Pa	Horsham, Pioneer/Pa., 203 Witmer Rd.	215-674-5710	Minn Minneapolis, P. Ericson & Assocs. ....612-884-1969
La	New Iberia, Ralph's of Lafayette, 1900 E. Main St.	318-369-9816	Pa	Monroeville, Cramer/Pittsburgh, 616 Beatty Dr.	412-782-2300	NJ Somerville, J & L Assocs. ....201-722-0682
Me	Falmouth, Allied Electronics, Falmouth Shopping Center	207-781-2666	Pa	Philadelphia, Allied Electronics, 3707-11 N. Broad St.	215-229-1880	Ohio Dayton, Ashby Assocs. Inc. of Ohio ....513-252-5627
Md	Beltsville, Newark Electronics, 10440 Baltimore Ave.	301-937-5085	Pa	Philadelphia, Philadelphia Electronics, 112 North 12th St.	215-568-7400	Pa Jenkintown, Warren Mount Co. ....215-886-0383
Md	Gaithersburg, Cramer/EW Wash., 16021 Industrial Dr.	301-948-0110	Pa	Pittsburgh, Pioneer Standard, 560 Alpha Dr.	215-376-7451	Tex Richardson, Zonk Engrg. ....214-238-7651
Md	Gaithersburg, Pioneer Standard, 9100 Gaither Rd.	301-948-0710	Pa	Reading, Allied Electronics, 333 N. Fourth St.	610-437-4555	TELEDYNE BIG BEAM, 290 E. Prairie St., Crystal Lake, Ill., 60014, Tel: 815-459-6100, Telex: 72-2460
Md	Hanover, Cramer/EW Baltimore, 7255 Standard Dr.	301-796-5790	Tex	Austin, T.I. Supply, Box 2909, 2601 N. Lamar	512-258-1636	Customer service: Cust. Svc.
Md	Rockville, Wilshire Elctns./Wash., 1037 Taft St.	301-340-7900	Tex	Beaumont, Ralph's of Lafayette, 1293 Broadway	713-833-9443	Free literature available: Emergency Lighting Equipment 48 pages; Portable Lighting Equipment Personal 4 pages; Service 4 pages; Photo/News Releases.
Mass	Braintree, Allied Electronics, One Century Circle, Campanelli Ind'l Park	617-848-4150	Tex	Dallas, Cramer/Texas, 13740 Midway Rd.	214-350-1355	Products manufactured: Batteries, Chargers, Battery, Flashers, Flashlights & Lanterns, Kits, Power Supply, Lighting Equipment, Emergency, Power Supplies
Mass	Newton, Cramer/Newton, 85 Wells Ave.	617-969-7700	Tex	Dallas, T.I. Supply, 6000 Denton Dr.	214-238-6821	Local Sales Offices & Reps.
Mass	Waltham, T.I. Supply, 504 Totten Pond Rd.	617-890-0510	Tex	Fort Worth, Allied Electronics, 401 E. 8th St.	817-336-5401	Ala Birmingham, C. Fedorenchik .....205-592-4692
Mass	Woburn, Newark Electronics, 13A Wheeling Ave.	617-935-8350	Tex	Garland, Newark Electronics, 707 Easy St.	214-271-2511	Ariz Little Rock, Byron Carson Co. ....501-568-3342
Mich	Livonia, Cramer/Detroit, 13193 Wayne Rd.	313-425-7000	Tex	Houston, Newark Electronics, 6902 Harwin Dr.	713-782-4800	Ariz Phoenix, R.A. Young of Arizona, Inc. ....602-274-3576
Mich	Livonia, Pioneer Standard, 13485 Stamford	313-525-1800	Tex	Houston, Ralph's of Lafayette, 4400 S. Wayside Dr.	713-641-0267	Cal Cerritos, E. L. Steensen Assocs. ....213-921-8686
Mich	Oak Park, Newark Electronics, 20700 Hubbell Ave.	313-548-0250	Tex	Houston, T.I. Supply, 3939 Ann Arbor Dr.	713-785-4800	Cal San Carlos, Lumineering Sales/Service ....415-592-3008
Mich	Wyoming, Newark Electronics, 3645 Linden Ave. S.E.	616-241-6681	Utah	Salt Lake City, Allied Electronics, 350 Pierpoint Ave.	801-328-2075	Colo Denver, I. W. Strong & Assocs., Inc. ....303-292-6900
Minn	Edina, Cramer/Bonn, 7275 Bush Lake Rd.	612-827-3541	Utah	Salt Lake City, Cramer/Utah, 391 W. 2500 South	801-487-3681	Fla Orlando, Ralston-Lowe-Murray, Inc. ....305-896-3713
Minn	Edina, T.I. Supply, 7615 Metro Blvd., Suite 202	612-835-5353	Utah	Salt Lake City, Newark Electronics, 2540 S. 300 West	801-486-1048	Fla St. Petersburg, Ralston-Lowe-Murray, Inc. ....813-821-0243
Minn	Minneapolis, Harry Stark's, 112 Third Ave. N.	612-332-1325	Va	Arlington, T.I. Supply, 1500 Wilson Blvd., AM Bldg., Suite 616	703-524-5885	Ga Atlanta, Southeast Techsales Co. Inc. ....404-355-7021
Minn	Minneapolis, Newark Electronics, 336 Hoover St. N.E.	612-331-6350	Wash	Bellevue, Testco, 10845 N.E. 8th	206-454-7422	Ill Lincolnwood, Tilkin & Cagen Associates ....312-676-0382
Miss	Pascagoula, Ralph's of Lafayette, 2112 Ingalls Ave.	601-769-1672	Wash	Seattle, Cramer/Seattle, 5602 6th Ave. S.	206-762-5755	Ind Indianapolis, Tilkin & Cagen Assocs. ....317-925-7776
Mo	Kansas City, T.I. Supply	816-753-4750	Wisc	Brookfield, Newark Electronics, 3695 N. 126th St.	414-781-2450	Iowa Dubuque, Bill Vahl Lighting Slis. ....319-582-6304
Mo	St. Louis, Olive Industrial Elctns., 6662 Olive Blvd.	314-863-7800	Wisc	Oak Creek, Cramer/Wisconsin, 430 W. Rawson Ave.	414-781-2450	Kans Kansas City, Conrad Co. Inc. ....913-621-3021
Neb	Omaha, Allied Electronics, 625 N. 18th St.	402-341-7700	For: Can., Downsview, Ont., Cramer Electronics/Canada, 920 Alness St., Unit #9	416-661-9222	Ky Jeffersontown, A.L. Pickens Co. ....502-491-4215	
NJ	Cherry Hill, Cramer/Pa., 12 Springdale Rd.	609-424-5993	TELECOMMUNICATIONS INDUSTRIES, 1375 Akron St., Copiague, N.Y., 11726, Tel: 516-842-5000, Telex: 144631; Empl: 150	p. 1-2301	La New Orleans, United Sales Assocs., Inc. ....504-733-8711	
NJ	Clark, T.I. Supply, 301 Central Ave.	201-382-6400	Products manufactured: Arresters, Electrical Surge, Lightning, Discharge Systems, Energy, Suppressors, Testers		Mass Marblehead, Sands/Barnard Assocs. ....617-631-7533	
NJ	Kenilworth, Newark Electronics, 303 Monroe Ave.	201-272-8410	Local Sales Offices & Reps.		Mich Grosse Pointe Park, J. L. Miner Assocs. ....313-886-5878	
NJ	Moonachie, Cramer/N.J., 1 Barrett Ave.	201-935-5600	Ga Atlanta	404-394-2754	Minn Minneapolis, P. Ohlin Slis. Co. ....612-929-6924	
NJ	Moorestown, Arrow/Angus, Pleasant Valley Ave.	609-235-1900	Mo Kansas City	816-756-0055	Miss Jackson, United Sales Assocs., Inc. ....601-956-2406	
NJ	Pennsauken, Cramer Electronics, 7300 Route 130 North	609-662-5061	TELECTRO SYS. CORP., 96-18 43rd Ave., Corona, N.Y., 11368, Tel: 212-651-8900; Empl: 65		Mo St. Louis, A. Haumesser Co. ....314-781-1225	
NM	Albuquerque, Cramer/New Mexico, 137 Vermont N.E.	505-265-5767	Products manufactured: Alarms, Amplifiers, Blowers & Fans & Accessories, Coils Including Assemblies & Forms, Comm. Systems, Computers, Duplicators, Preselctors, Recorders, Tape Recording Accessories, Tape Search Equipment, Tape Winders, Television Systems & Equipment Closed-Circuit, Test Equipment, Testers		NH Merrimack, Sands/Barnard Assocs. ....603-424-2702	
NM	Albuquerque, Newark Electronics	505-296-9495	Local Sales Offices & Reps.		NJ Teaneck, T. G. Weinstein Co. ....201-836-1033	
NY	Buffalo, Summit Distributors, 916 Maine St.	716-884-3450	Okla Oklahoma City, C. B. Anderson Electric Co.	405-235-0716	NY Syracuse, Upstate Lighting Fixtures Slis. ....315-455-5821	
NY	East Syracuse, Cramer/Syracuse, 6716 Joy Rd.	315-437-6671	Okla Tulsa, C. B. Anderson Electric Co.	918-836-4661	NC Charlotte, C. M. Furman Co. ....704-375-2332	
NY	Endwell, Cramer/Binghamton, 3220 Watson Blvd.	607-754-6661	Ore Portland, A. Shaw Co.	503-235-0545	Ohio Cincinnati, Redmond-Lewis & Assocs. ....513-931-5060	
NY	Fishkill, T.I. Supply	914-896-9630	Pa Pittsburgh, Gormley Elect.	412-371-4111	Ohio Cleveland, Miller-Curtis Assocs., Inc. ....216-749-0040	
NY	Hauppauge, Cramer/L.I., 29 Oser Ave.	516-231-5600	Tenn Memphis, B. Carson Co.	901-396-4553	Okla Oklahoma City, C. B. Anderson Electric Co. ....405-235-0716	
NY	Huntington Station, T.I. Supply, 2 Huntington Quad, 2NO4-Suite	516-293-2660	Tex Amarillo, C. B. Anderson Electric Co.	806-376-6443	Ore Portland, A. Shaw Co. ....512-855-2606	
NY	Plainview, Newark Electronics, 80 Express St.	516-822-5000	Tex Corpus Christi, G & E Slis.	214-522-3940	Pa Pittsburgh, Gormley Elect. ....412-371-4111	
NY	Rochester, Cramer/Rochester, 3000 S. Winton Rd.	716-473-6600	Tex Dallas, Adra Elec.	214-522-3940	Tenn Memphis, B. Carson Co. ....901-396-4553	
NY	Rochester, Summit Distributors, 292 Commerce Dr.	716-334-8110	Tex Houston, Lighting & Electrical Slis. Co., Inc.	713-923-7781	Tex Amarillo, C. B. Anderson Electric Co. ....806-376-6443	
NC	Greensboro, Pioneer/Carolina, 2906 Baltic Ave.	919-273-4441	Wisc West Allis, R. S. Knoblauch & Associates	414-421-2120	Tex Dallas, Adra Elec. ....214-522-3940	

Products manufactured: Cameras, Television Systems & Equipment Closed-Circuit

TELETYPE CORP., 5555 Touhy Ave., Skokie, Ill., 60076, Tel: 312-982-2000, TWX: 910-223-3611; FSC No: 59433; Empl.: 6000

Customer service: M. A. Pedote 312-982-3370

Products manufactured: Comm. Systems, Readers, Teletypewriters & Equipment, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Cal City of Commerce 213-724-6040
NJ Fairfield 201-575-8240

TELEDYNE-CRYSTALONICS, 147 Sherman St., Cambridge, Mass., 02140, Tel: 617-491-1670, TWX: 710-320-1196; FSC No: 12498; QPL No: Multiple; Empl.: 155; Minimum order: \$50

For info on price: T. J. Paradise; Application info: R. Antalick; Customer service: B. Kilgariff; Delivery info: B. Kilgariff

Products manufactured: Diodes, Integrated Circuit Devices, Relays, Switches, Transistors

Local Sales Offices & Reps.

Ariz Scottsdale, Runyon Co. 602-959-6060
Cal Marina Del Ray, Westaironics Inc. 213-821-7958

Cal San Carlos, Kottmeier Assoc. 415-592-8333
Fla Orlando, R. Simmons 305-831-8688
Fla Plantation, W. Popnick 305-941-5544
Fla Pompano Beach, V.G. Sls. 305-941-5544
Ill Palatine, C & C Electronics 312-358-8900
Ind Ft. Wayne, T.X. Sls. 219-489-4447
Md Rockville, Mechtronics Sls. 301-340-2130
Mass Brookline, Technology Prod. Group 617-731-0858

Minn St. Paul, R.G. Ragon 612-488-0201
NJ Newfoundland, S. Tobol 201-697-4383
NJ Wallington, Comp-Tech Sls. 201-935-5454
NY New Hyde Park, Comp-Tech Sls. 516-593-2628
NY Rochester, J. Semple Assoc. 716-342-1413
Ohio Dayton, R.P. Calhoun 513-299-6894
Pa Bala Cynwld, Vantage Sls. 215-667-0990
SC Greenville, Electronic Mktg. Assoc. 803-268-1125

Wash Bellevue, SD-R&S2 206-747-9424

FOR: Can. Montreal, Que., Cantronics (Que.) 514-341-5207

FOR: Can., Downsview, Ont., Cantronics Ltd. 416-661-2494

TELEDYNE/GEOTECH, Box 28277, Dallas, Tex., 75228, Tel: 214-271-2561, Telex: 73-2394; FSC No: 99019; Empl.: 440; Minimum order: \$50 p. 1470

Customer service: G. Gerlach

Free literature available: Complete line of meteorological, geophysical, and intrusion sensors and processors; complete data acquisition and control systems for the pipeline industry.

Products manufactured: Accelerometers, Alarms, Amplifiers, Calibrators, Cells, Load, Comm. Systems, Data Acquisition & Reduction Systems, Data Loggers, Heads, Recording Playback, Erase, Multiplexers, Oscillators, Radiometers, Recorders, Transducers

TELEDYNE INET, 711 Knox St., Gardena, Cal., 90248, Tel: 213-327-0913, Telex: 67-7228

For info on price: M. Beguelin; Application info: M. Beguelin; Customer service: J. Marshall; Delivery info: M. Beguelin

Free literature available: Describes our Uninterruptible Power Systems, Electric Motor Generator sets, solid state Frequency Converters, Line Voltage Regulators, and motor speed controls.

Products manufactured: Controls/Control Eqp., Converters, Generators, Inverters, Motor Electric Generator Sets, Power Supplies, Regulators

Local Sales Offices & Reps.

Ala Huntsville, FM Assocs 205-536-9990
Ariz Phoenix, Zeus 602-253-6104
Cal El Cerrito, Saletta Sls 415-236-9191
Cal Glendale, R.A. Young & Co. 213-242-2171
Colo Denver, Hamilton Assocs 303-244-2901
Colo Englewood, Zeus 303-770-4400
Fla Orlando, FM Assocs 305-851-5710
Fla W. Palm Beach, FM Assocs 305-746-3126
Ill Addison, Mid West Mktg 312-279-2442
Ill Franklin Park, Rich 312-678-3100
Md Bethesda, M.E. Whitney Assocs 301-654-8634
Mass Hollbrook, McLellan Assocs 617-767-4771

Mass Natick, Spectrum Engrg. Inc. 617-237-4030
Mich Detroit, WKM Assocs 313-892-2500
Minn St. Paul, Knox Assoc 612-488-5402
NJ Westwood, Teledyne Inet. 201-243-3194
NM Albuquerque, Zeus 505-268-3941
NY New York City, G & A Sls 212-256-8500
NC Greensboro, FM Assocs 919-294-2754
Ohio Cleveland, WKM Assocs 216-267-0445
Ohio Dayton, WKM Assocs 513-434-7500
Pa Philadelphia, Maris Equip. Co. 215-225-0720
Pa Pittsburgh, WKM Assocs 412-892-2953
Tex Dallas, Thorson Co. 214-233-5744
Tex Houston, Thorson Co. 713-771-3504
Utah Salt Lake City, Zeus 801-486-2317
Wash Bellevue, W.M. Buehler 206-455-5512

TELEDYNE KINETICS, 410 S. Cedros Ave., Solana Beach, Cal., 92075, Tel: 714-755-1181, TWX: 910-322-1135; Empl.: 80

For info on price: D. Pyle; Application info: D. Pyle; Customer service: J. Risley; Delivery info: J. Risley

Free literature available: Folder of Technical Literature containing information on TKC connectors and stripall thermal wire strippers.

Products manufactured: Connectors, Relays, Slip-Rings & Assemblies, Switches, Wire Strippers

Local Sales Offices & Reps.

Cal Burlingame, J. E. Striker Co. 145-342-1425
Colo Parker, Technology Mktg. Assoc. 303-341-3435
Fla Indian Rocks Bch., Tech-Rep 813-595-2834
Ill Deerfield, W. Krueger Assoc. 312-945-3720
Mass Stoneham, Repco 617-438-3113
NJ Dover, P. Rydlewski 201-366-7518
NM Albuquerque, Technology Mktg. Assoc. 505-298-4321
NY Bayside, R. L. Diamond, Inc. 212-423-7330
Ore Portland, Houston Co. 503-235-4174
Wash Bellevue, Testco 206-454-7422

TELEDYNE MEC, 3165 Porter Dr., Palo Alto, Cal., 94304, Tel: 415-493-1770, TWX: 910-373-1746; Empl.: 650

Customer service: F. H. May

Free literature available: Data sheets describing Teledyne MEC's expertise in Frequency Memory Sub-Systems, Power Supplies, TWTs, Amplifiers, Modulators, Microwave Acoustics, Microwave Integrated Circuits, Acousto-Optics, and Solid State Sub-Systems.

Products manufactured: Amplifiers, CATV Systems & Equipment, Delay Lines, Equalizers, Filters, Fuses, Integrated Circuit Packaging Systems, Oscillators, Power Supplies, Synthesizers, Transducers, Transmitters, Tubes

Local Sales Offices & Reps.

Ariz Phoenix, Thorson Co. 602-956-5300
Cal Palo Alto, Teledyne MEC 415-493-1770
Colo Denver, Thorson Co. 303-355-3521
Conn Stamford, Teledyne MEC 203-325-2535
Fla Palm Bay, SparTech Assocs. 305-727-8045
Ga Smyrna, SparTech Assocs. 404-432-3644
Ill Mount Prospect, Cain & Co. 312-253-3578
Md Bethesda, Teledyne MEC 301-530-2220
Mass Reading, Teledyne MEC 617-944-4094
NM Albuquerque, Thorson Co. 505-265-5655
Ohio Dayton, Teledyne MEC 513-253-8144
Tex Dallas, Thorson Co. 214-233-5744
Tex Houston, Thorson Co. 713-771-3504

TELEDYNE MICRONETICS, 7155 Mission Gorge Rd., San Diego, Calif., 92120, Tel: 714-583-3525, TWX: 910-335-2085; Empl.: 50

Products manufactured: Amplifiers, Antenna Feed Systems, Antennas, Horns, Microwave, Pedestals, Radar, Radar Systems, Receivers, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Colo Parker, Technology Mktg. 303-841-3435
DC McClean, E. T. Phillips 703-893-2157
Fla Clearwater, Brennan Assocs. 813-446-5006
Kans Wichita, Dy-Tronix 316-943-6221
Mass Burlington, Tritex 617-272-4550
Mo Hazelwood, Dy-Tronix 314-731-5799
NM Albuquerque, Technology Mktg. 505-298-4321

TELEDYNE MICROWAVE, 1290 Terra Bella Ave., Mountain View, Cal., 94040, Tel: 415-968-2211, TWX: 910-379-6939; FSC No: 24402; Empl.: 105; Minimum order: \$100

For info on price: K. Mills; Application info: K. Mills; Customer service: M. Harrison; Delivery info: M. Harrison

Free literature available: Complete product line catalog

Products manufactured: Circulators, Ferrite, Filters, Isolators, Oscillators, Switches, Tuners

Local Sales Offices & Reps.

Cal Los Altos, Cain White Co. 415-948-6533
Cal Los Angeles, Cain Technology 213-476-2251
Fla Clearwater, Brennan Assoc. 813-446-5006
Ill Mt. Prospect, Cain & Co. 312-253-3578
Md Columbia, N. Deoul Assoc. 301-997-4353
Mass Burlington, Tritex 617-272-4550
NJ Clementon, Applied Engrg. Conslts. 609-627-7290
NJ Fort Lee, Technical Mktg. Assocs. 201-224-6911
NY Fayetteville, G. Sherman 315-637-9861
Ohio Dayton, Cain & Co. 513-254-6521
Ohio Lancaster, Cain & Co. 614-654-4800
Tex Dallas, Thorson Co. 214-233-5744

TELEDYNE PENN-UNION ELEC., Box 723, Edinboro, Pa., 16412, Tel: 814-734-1631, Telex: 914-490; Empl.: 500

For info on price: N. Williams Ext. 240 & 266; Application info: D. Lipp Ext. 228; Customer service: H. G. Mokszenowski Ext. 245; Delivery info: R. McLaughlin Ext. 221

Products manufactured: Connectors, Kits, Terminal, Terminal Blocks, Boards & Strips, Terminals, Tools

Local Sales Offices & Reps.

Ala Birmingham, C.S. Phillips & Son 205-870-0640
Ala Anchorage, B.L. Owens & Assoc. 907-272-2613
Ariz Phoenix, E.S. Condon Co. 602-279-3549
Cal Los Angeles, E.S. Condon Co. 213-726-7926
Cal San Francisco, F.M. Nicholas Co. 415-467-6220
Colo Denver, Electrical Agencies Co. 303-623-8245
Conn Avon, Electrical Agencies 203-673-9296
Conn New Canaan, R. Zucco Co. 203-966-0233
Conn West Haven, Electrical Agencies 203-933-2985
Fla Jacksonville, Arnold-Bryant 904-737-5116
Fla Miami, Arnold-Bryant 305-661-0715
Fla St. Petersburg, Arnold-Bryant 813-343-6959
Ga Atlanta, I.A. Hoge Assoc. 404-758-6815
Haw Honolulu, D.R. Schwab 808-537-1658
Ill Elk Grove Village, Hanke Co. 312-593-8500
Ind Indianapolis, Roth-Mooney Elec. Agency 317-545-1288

Iowa Cedar Rapids, A. Sell & Assoc. 319-393-4225
Iowa Davenport, A. Sell & Assoc. 319-285-9413
Iowa Des Moines, A. Sell & Assoc. 515-274-4633
Kans Overland Park, T & W Sls. 313-649-4411
La Bossier City, Jeanes Enterprises 918-746-8033
La Metairie, Jeanes Enterprises 504-721-6221
Me S. Berwick, Electrical Agencies 207-384-5321
Mass S. Boston, Electrical Agencies 617-268-9300
Mich Dearborn, D.P. Seyfried Co. 313-274-4900
Minn Edina, W.L. Ruth & Assoc. 612-941-6350
Miss Jackson, Jeanes Enterprises 601-956-7462
Mo St. Louis, R.E. Kennedy Co. 314-965-7650
Neb Omaha, A. Sell & Assoc. 402-391-4068
NM Albuquerque, T. Deskin & Assoc. 505-242-3581
NY Jamaica, Warshaw Electric 212-525-8150
NY Loudenville, Mills, Talbot Co. 518-458-1297
NY Rochester, Mills, Talbot Co. 716-244-1311
NC Cary, F. Woods Agency 919-467-6366
Ohio Cincinnati, J.G. Gates Co. 513-521-4335
Ohio Cleveland, K.R. Dodge Co. 216-461-6482
Okla Oklahoma City, And Power Sls. 405-751-5861
Ore Portland, Northwest Agencies 503-227-5004
Pa Drexel Hill, W.B. Siegfried Assoc. 215-353-3025
Pa Pittsburgh, H.E. Ransford Co. 412-884-3420
SC Lexington, F. Woods Agency 803-356-3738
Tenn Memphis, Jeanes Enterprises 901-386-7850
Tex Arlington, F.A. Raso Co. 817-461-7903
Tex Houston, J.M. Johnson Co. 713-688-2236
Utah Salt Lake City, Melville Sls. Co. 801-363-3363
Va Ashland, Campbell & Assoc. 804-798-4743
Va Roanoke, Campbell & Assoc. 703-343-6452
Wash Seattle, Northwest Agencies 206-623-8882
WVa Charleston, H.E. Ransford Co. 304-342-3203
Wisc Milwaukee, A.W. Schwind Co. 414-276-9988

TELEDYNE PHILBRICK, 17 Allied Dr. Rte 128, Dedham, Mass., 02026, Tel: 617-329-1600, TWX: 710-348-6726; Empl.: 250; Minimum order: \$25

For info on price: Cust Svc; Application info: F. Goodenough; Delivery info: Cust Svc

Products manufactured: Amplifiers, Converters, Dividers, Generators, Inverters, Power Supplies, Regulators

Local Sales Offices & Reps.

Ala Huntsville, Inotech, Inc. 205-837-6061
Ariz Phoenix, Zeus, Inc. 602-258-7519
Cal Culver City, DeAngelo Rothman & Co. 213-391-2694
Cal Redwood City, J.S. Heaton Co. 415-369-4671
Colo Englewood, Zeus, Inc. 303-770-4400
Conn E. Hartford, Tekdata, Inc. 203-525-7647
Fla Boca Raton, Conley Assocs. 305-395-6108

Fla	Oveido, Conley & Assocs.	305-365-3283
Fla	Tampa, Conley & Assocs.	813-933-3183
Haw	Kailua, Lanikai Elctns.	808-262-6286
Ill	Chicago, Data Elctns. Co.	312-283-0303
Ind	Indianapolis, Data Elctns. Co.	317-784-6360
Kans	Mission, Mid-West Mktg.	913-384-3737
Md	Kensington, Elctn. Mktg. Assocs.	301-881-5300
Mass	Burlington, Tek Data	617-273-0198
Mich	Farmington, Carter, McCormick & Peirce	313-477-7700
Mich	Kalamazoo, Carter, McCormick & Peirce	616-349-9666
Minn	Minneapolis, Data Elctns. Co.	612-786-9666
Mo	Florissant, Mid-West Mktg.	314-831-0342
NM	Albuquerque, Zeus, Inc.	505-256-9831
NY	Elmont, Crane & Egert	516-488-2100
NY	N. Syracuse, KLM Assocs.	315-458-6214
NY	New Hartford, KLM Assocs.	315-735-8525
NY	Rochester, KLM Assocs.	716-442-0820
NC	Raleigh, Condon Co.	919-876-4999
Ohio	Cleveland, Carter, McCormick & Peirce	216-333-5650
Ohio	Dayton, Carter, McCormick & Peirce	513-278-5873
Okla	Norman, Data Mktg.	405-364-8320
Pa	King of Prussia, Elctn. Mktg. Assocs.	215-265-1600
Pa	Pittsburgh, Carter, McCormick & Peirce	412-824-3760
SC	Myrtle Beach, Candor Co.	803-448-5213
Tenn	Chattanooga, Candor Co.	615-894-7454
Tex	Dallas, Data Mktg. Assocs.	214-661-0300
Tex	Houston, Data Mktg.	718-686-9627
Tex	San Antonio, Data Mktg. Assocs.	512-828-0937
Utah	Salt Lake City, Zeus, Inc.	801-486-2317
Wash	Redmond, Desco, N.W.	206-455-9325
FOR:	Can., Downsview, Ont., Cesco Elctns. Ltd.	416-661-0220
FOR:	Can., Montreal 301, Que., Cesco Elctns. Ltd.	514-735-5511
FOR:	Can., Ottawa, Ont., Cesco Elctns. Ltd.	613-729-5118
FOR:	Can., Quebec, Que., Cesco Elctns. Ltd.	418-524-4641
FOR:	Can., Vancouver 15, B.C., Intek Elctns. Ltd.	604-324-6831

TELEDYNE RELAYS, 3155 W. El Segundo Blvd., Hawthorne, Cal, 90205, Tel: 213-973-4545, TWX: 910-325-6600; Empl.: 302 p. 1-1818-1824
Customer service: C. Criswell

Free literature available: Product catalog containing tabulated listing of military TO-5, commercial TO-5, mini-T, solid state industrial, solid state military, and hardware. A condensed form is available, known as our "short form catalog".

Products manufactured: Relays, Sockets

Local Sales Offices & Reps.		
Ariz	Scottsdale, Sls. Engrg. Inc.	602-945-5781
Cal	Hawthorne, Teledyne Relays	213-973-4545
Cal	San Mateo, Teledyne Relays NORCAL	415-574-1915
Colo	Englewood, Todd Assoc. Inc.	303-761-7801
Conn	Stratford, G. Rosen Co.	203-375-5456
Fla	Satellite Beach, Reynolds & Assocs.	305-773-4700
Ill	Downers Grove, Teledyne Relays, MWRO	312-964-1950
Ill	Mt. Prospect, Delta Tech. Sls.	312-437-9412
Ind	Indianapolis, Ihrig Assocs.	317-783-7630
Kans	Overland Pk., Ensco Rep.	913-381-7557
Mass	Framingham, G. Rosen Co.	617-879-5505
Mich	Birmingham, J.C. Hofstetter Co.	313-643-7203
Mich	Grand Rapids, J.C. Hofstetter Co.	616-942-0650
Minn	Minneapolis, S. Clothier Co.	612-888-4666
Mo	Kansas City, Harris-Hanson	816-444-9494
Mo	St. Louis, Ensco-Rep.	314-567-3935
NJ	Eatontown, Teledyne Relays	201-542-6884
NM	Albuquerque, A.Q. Elctns.	505-255-8701
NY	Mount Vernon, Friedman-Smith Elctns.	914-664-4866
NY	Syracuse, I.A. Hotze Co.	315-479-6641
NC	Raleigh, R.W. Mitscher Co.	919-828-0575
Ohio	Dayton, J.C. Hofstetter Co.	513-296-1010
Ohio	Medina, J.C. Hofstetter Co.	216-241-4880
Pa	Bala Cynwyd, Vantage Sls. Co.	215-667-0990
Tenn	Shelbyville, R.W. Mitscher Co.	615-684-4544
Tex	El Paso, A.Q. Elctns.	915-545-2363
Tex	Houston, Vista Assocs.	713-661-0119
Tex	Richardson, Vista Assocs.	214-235-4547
Va	Alexandria, Potomac Elctns. Inc.	703-836-1630
Wash	Bellevue, W.M. Buehler Co.	206-455-5512
FOR:	Can., St. Laurent, Que., A. Deskin Sls.	514-331-2860
FOR:	Canada, Malton, Ontario, A. Deskin Sls.	416-677-5517

FOR:	Canada, Vancouver, B.C., A. Deskin Sls.	604-324-6331
Local Distributors		
Ariz	Phoenix, Kierulff Elctns., 2633 E. Buckeye Rd.	602-273-7331
Ariz	Phoenix, Liberty Elctns., 3130 N. 27th Ave.	602-257-1272
Cal	El Segundo, Liberty Elctns., 124 Maryland St.	213-322-8100
Cal	Los Angeles, Kierulff Elctns., 2585 Commerce Way	213-685-5511
Cal	Mt. View, Elmar Elctns., 2288 Charleston Rd.	415-961-3611
Cal	Palo Alto, Kierulff Elctns., 3969 E. Bayshore Rd.	415-968-6292
Cal	San Diego, Kierulff Elctns., 8797 Balboa Ave.	714-278-2112
Cal	San Diego, Liberty Elctns., 8248 Mercury Ct.	714-565-9171
Colo	Commerce City, Elmar Denver Elctns., 6777 E. 50th Ave.	303-287-9611
Colo	Denver, Kierulff Elctns., 10890 E. 47th Ave.	303-371-6500
Fla	Orlando, Milgray/Florida, 5400 Diplomat Cir.	305-647-5747
Ill	Rosemont, Advent Elctns., 7110 Lyndon St.	312-298-4210
Ind	Indianapolis, Pioneer/Indianapolis, 6408 Castle Place Dr.	317-849-7300
Kans	Overland Park, Milgray/Kansas City Inc., 6901 W. 63rd St.	913-236-8800
Md	Hyattsville, Milgray/Washington, 5405 Lafayette Pl.	301-864-1111
Md	Rockville, Pioneer/Maryland, 1037 Taft St.	301-424-3300
Mass	Boston, Demambro Elctns., 1095 Commonwealth Ave.	617-787-1200
Mass	Burlington, Milgray/New England, 79 Terrace Hall Ave.	617-272-6800
Mich	Romulus, Pioneer/Michigan, 6337 N. Beverly Plaza	313-525-1800
NM	Albuquerque, Elmar Elctns., 2632 Pennsylvania N.E.	505-292-1111
NJ	Cherry Hill, Milgray/Delaware Valley, 1165 Marlkrass Rd.	609-424-1300
NY	Buffalo, Summit Dist., 916 Main St.	716-884-3450
NY	Freeport, Milgray Elctns., 191 Hanse Ave.	516-546-6000
Ohio	Cleveland, Milgray/Cleveland, 1821 E. 40th St.	216-881-8800
Ohio	Cleveland, Pioneer/Cleveland, 4800 E. 131st St.	216-587-3600
Ohio	Dayton, Pioneer/Dayton, 1900 Troy St.	513-236-9900
Pa	Philadelphia, Milgray/Delaware Valley	215-228-2000
Pa	Pittsburgh, Pioneer/Pittsburgh, 560 Alpha Dr.	412-782-2300
Tex	Dallas, Solid State Elctns., 2643 Manana Dr.	214-352-2601
Tex	Houston, Solid State Elctns., 6400 Westpark Dr.	713-785-5436
Wash	Seattle, Kierulff Elctns., 5940 Sixth Ave. S.	206-763-1550
Wash	Seattle, Liberty Elctns. N.W., 5305 Second Ave. S.	206-763-8200
For:	Can., Malton, Ont., A. Deskin Sls., 2759 Thamesgate Dr.	416-677-5517
For:	Can., St. Laurent, Que., A. Deskin Sls., 290 Benjamin Hudson St.	514-331-2860
For:	Can., Vancouver, B.C., A. Deskin Sls., 272 S.W. Marine Dr.	604-324-6331

TELEDYNE SEMICONDUCTOR, 1300 Terra Bella Ave., Mountain View, Cal., 94040, Tel: 415-968-9241, TWX: 910-379-6494; Empl.: 2000

Customer service: Prod. Mktg. Group

Products manufactured: Amplifiers, Circuits, Hybrid, Thin-Film, Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Comparators, Converters, Diodes, Discharge Systems, Energy, Integrated Circuit Devices, IC's, Active Filters, Lamp Drivers, Memory Systems, Multiplexers, Power Supplies, Rectifiers, References, D-C Voltage, Regulators, Semiconductor Wafer Fabrication, Timers, Transistors

Local Sales Offices & Reps.

Ala	Huntsville, Incotech	205-837-6061
Ariz	Tempe, Sedco Sls.	602-968-7791
Cal	Escondido, Cirolia Elctn. Sls.	714-743-3015
Cal	Hawthorne, Teledyne Semiconductor	213-973-4551
Cal	Mountain View, Teledyne Semiconductor	415-965-1455

Cal	Redwood City, J.S. Heaton Co.	415-369-4671
Cal	Santa Ana, Riccal Assocs.	714-557-6543
Colo	Denver, Walker Assocs.	303-623-8713
Fla	Maitland, H.H. Perego	305-831-2474
Fla	Pompano Beach, H.H. Perego	305-943-9593
Ill	Des Plaines, Teledyne Semiconductor	312-299-6196
Ind	Fort Wayne, Given Corp.	219-432-5585
Iowa	Cedar Rapids, PMA Corp.	319-362-9177
Kans	Overland Park, PMA Corp.	913-381-0004
Kans	Wichita, PMA Corp.	316-264-2662
Md	Baltimore, Burgin-Kreh Assocs.	301-788-5200
Md	Towson, Teledyne Semiconductor	301-825-1920
Mass	Bedford, Teledyne Semiconductor	617-275-2070
Mass	Waltham, Dynasel Assoc.	617-890-6777
Mich	Benton Harbor, R.C. Nordstrom	616-857-4653
Mich	Lathrup Village, R.C. Nordstrom	313-559-7373
Minn	Minneapolis, Teledyne Semiconductor	612-888-0540
Mo	Hazelwood, PMA Corp.	314-731-4334
NJ	Fort Lee, Tech-Sales Corp.	201-944-3642
NJ	Haddonfield, Sundzy O'Brien	609-429-4013
NY	Buffalo, Bowser & Sapecky Assocs.	716-839-4170
NY	Manlius, Bowser & Sapecky Assocs.	315-682-8885
NY	Poughkeepsie, Teledyne Semiconductor	914-471-9322
NC	Winston-Salem, Burgin-Kreh Assocs.	919-768-4174
Ohio	Dayton, N. Bear Corp.-Bear Mktg.	513-299-3566
Ohio	Richfield, N. Bear Corp.-Bear Mktg.	216-659-3131
Tex	Dallas, Evans-McDowell Assocs.	214-238-7157
Tex	Houston, Evans-McDowell Assocs.	713-772-1257
Va	Lynchburg, Burgin-Kreh Assocs.	804-845-5600
Wash	Bellevue, SD. R2	206-747-9424

TELEMET CO., 185 Dixon Ave., Amityville, N.Y., 11701, Tel: 516-541-3600, TWX: 516-227-9850; Empl.: 80; Minimum order: \$25

Customer service: A. Bolletino

Free literature available: 1) Full Catalog Of All Products 2) Individual Data Sheets Of All Products 3) Short Form Catalog - Video Test Equipment 4) Short Form Catalog - Video Switching Equipment
Products manufactured: Amplifiers, CATV Systems & Equipment, Demodulators, Generators, Modulators, All Kinds, Television Systems & Equipment Closed-Circuit, Test Equipment

Local Sales Offices & Reps.

Cal	Riverside	714-683-0641
Ga	Atlanta	404-294-5809
NY	Brewster	914-279-3231
Ohio	Cleveland Heights	216-321-7523
Tex	Dallas	214-241-0928
EXP:	Amityville, N.Y.	516-541-3600

TELEIS LABORATORY, Box 387, 41 1/2 S. Paint St., Chillicothe, Ohio, 45601, Tel: 614-773-1414; Empl.: 5

For info on price: J. Robertson; Application info: J. Robertson; Customer service: D. Ortmann; Delivery info: S. Harding

Free literature available: Brochures describe product technical specifications and application suggestions

Products manufactured: Amplifiers, Analyzers, Counters, Data Acquisition & Reduction Systems, Keyboards, Alphanumeric & Decimal, Meters, Oscillators, Switches

TELETYPE CORP., 5555 Touhy Ave., Skokie, Ill., 60076, Tel: 312-982-2000, TWX: 910-223-3611; Empl.: 5,000

Customer service: Sls. Dept.

Products manufactured: Comm. Systems, Teleprinters, Teletypewriters & Equipment, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Cal	City of Commerce	213-724-6040
NJ	Fairfield	201-575-8240

TELEVISION MICROTINE, INC., 1280 Blue Hills Ave., Bloomfield, Conn., 06002, Tel: 203-242-0761, TWX: 710-425-2390; Empl.: 80

For info on price: E. J. Dahl; Application info: D. E. Acker; Customer service: J. L. Stickley; Delivery info: V. Mellon

Free literature available: Applications notes on time base; correction systems for video tape recorders.

Products manufactured: Amplifiers, CATV Systems & Equipment, Delay Lines, Networks, Television Systems & Equipment Closed-Circuit

TELEX COMMUNICATIONS, INC., 9600 Aldrich Ave., So., Minneapolis, Minn., 55420, Tel: 612-884-4051

For info on price: J. Dow 612-884-4061; Customer service: A. Vikla 612-884-4061; Delivery info: S. Chaika 612-884-4061

Free literature available: ED2151 - Educational Headphones; ED2227 - Cassette Equipment; ED2268 - Tape Duplicating System; BI2230 - Broadcast/Indust. Tape Equip.; BI2166 - Communication Headphones; BI2313 - TMS100 - 16 hr Cartridge Changer; BI2252 - 1400 Professional Tape Equip.; AP2118 - Pilots Microphones & Headsets.

Products manufactured: Amplifiers, Comm. Systems, Duplicators, Handsets, Chestsets, Headphones, Headsets, Etc., Microphone Accessories (Including Stands, Holders, Booms), Microphones, All Kinds, Recorders, Tape Recording Accessories, Transducers

Local Sales Offices & Reps.

Cal	Burbank, Koessler Sls., Inc.	213-849-5716
Cal	Oakland, H. Gabriel Rep. Co.	415-465-5361
Cal	West Covina, J.F. Northcutt Co.	213-331-2447
Colo	Denver, McLoud & Raymond Co.	303-756-1589
Fla	Miami, World Wide Prods.	305-754-5475
Ga	Chamblee, Techn. Sys.	404-457-0426
Ill	Lincolnwood, Wm. M. Linz Co.	312-677-2000
Ill	Romeoville, P. Bunker	815-838-1023
Ind	Indianapolis, Sukup & Cox, Inc.	317-253-1215
Iowa	Atlantic, Kimian Sls. Co.	712-243-1626
Kans	Prairie Village, Roach, Spencer & Assocs.	913-432-3700
Md	Baltimore, D. Brothers Co.	301-764-7189
Mass	Wellesley Hills, M. Scott Co.	617-235-0102
Mich	Detroit, Riley & Petchell Sls., Inc.	313-838-9100
Mo	Chesterfield, Roach, Spencer & Assoc.	
NY	Flushing, Bettan Sls., Inc.	212-969-7600
NY	Rochester, Marsey Sls., Inc.	716-442-9700
NY	Woodhaven, Alan Sarfaty	212-846-1952
Ohio	Cleveland, Intech	216-826-3400
Okla	Tulsa, J.Y. Schoonmaker	918-936-1432
Pa	Newtown Square, G.M. Conneen Co.	
		215-353-2241
Tex	Dallas, J.Y. Schoonmaker	214-357-8481
Tex	Houston, J.Y. Schoonmaker	713-926-9510
Wash	Seattle, Fleehart & Sullivan	206-522-1533

TELEONIC ALTAIR, Box 277, Laguna Beach, Calif., 92652, Tel: 714-494-9401, TWX: 910-596-1320; Empl.: 130; Minimum order: \$25

For info on price: Mktg. Dept.; Application info: Mktg. Dept.; Customer service: Order Control; Delivery info: Order Control

Free literature available: Catalog 57 June 1973 Filters, Attenuators, Components, RF & Microwave Brochures: Telonic Attenuators; Telonic Sweep Generators 1200 Series; Telonic Sweep Generator Accessories & VSWR Measurement Systems; Telonic Sweep/Signal Generators Modular 2003 Series; Telonic Test Instrumentation for TV & Radio Production.

Products manufactured: Amplifiers, Attenuators, Bridges, Calibrators, Detectors, Filters, Generators, Impedance Converters, Microwave, Kits, Test Equipment, Meters, Monitors, Oscilloscopes, Preselectors, Tees, Terminals, Test Equipment

Local Sales Offices & Reps.

Ala	Huntsville, Gentry Assocs.	205-534-9771
Ariz	Scottsdale, J. Smith Assocs.	602-947-2495
Cal	Cupertino, T. L. Snitzer Co.	408-257-8333
Cal	Del Mar, T. L. Snitzer Co.	714-454-2191
Cal	Los Angeles, T. L. Snitzer Co.	213-836-6170
Fla	Orlando, Gentry Assocs.	305-894-4401
Haw	Honolulu, Harkon Hawaii	808-538-7178
Ill	Northfield, Torkelson Assocs.	312-446-9085
Ind	Indianapolis, Torkelson Assocs.	317-244-7867
Kans	Lenexa, S. Sterling Co.	913-888-2995
Md	Lanham, Brimberg Assocs.	301-552-2200
Mass	Needham, Addeco Corp.	617-444-4754
Mich	Detroit, S. Sterling Co.	313-255-1970
Minn	Minneapolis, Torkelson Assocs.	612-835-2414
Mo	St. Louis, S. Sterling Co.	314-542-3636
NM	Albuquerque, J. Smith Assocs.	505-255-2111
NY	Flushing, F & F Associates	516-334-1160
NY	Syracuse, Tesco Assocs.	315-463-4566

NC	Burlington, Gentry Assocs., Inc.	919-227-3639
Ohio	Cleveland, S. Sterling Co.	215-442-8080
Pa	Ambler, WM Assocs.	215-643-4119
Tex	Dallas, Texas Avionics Co.	214-368-3566

TELREX LABS., Asbury Park, N.J., 07712, Tel: 201-775-7252; Empl.: 15; Minimum order: \$25

For info on price: C. C. Ercolino; Application info: C. C. Ercolino; Customer service: N. V. Ercolino; Delivery info: N. V. Ercolino

Free literature available: Commercial Brochure Describing the various communication antennas & systems.

Products manufactured: Antenna Rotators, Antenna Towers & Supports, Antennas, Cable, Transformers

TELSTAR ELECTRONICS CORP., 700 Hummel Ave., Southold, N.Y., 11971, Tel: 516-765-9292; Empl.: 15

Customer service: R. S. Marston

Products manufactured: Clocks (All Types), Data Acquisition & Reduction Systems, Data Loggers, Hydrophones & Accessories, Multiplexers, Oceanographic Equip. (Electronic), Printers, Receivers, Scanners

TELTRON, 940 Willow St., Pottstown, Pa., 19464, Tel: 215-326-2127; Empl.: 22; Minimum order: \$35

Application info: C. A. Mock 215-326-2128; Customer service: Cust. Serv. Dept.; Delivery info: J. Mauger, Jr. 215-326-2127

Products manufactured: Cameras, CATV Systems & Equipment, Coils Including Assemblies & Forms, Television Systems & Equipment Closed-Circuit, Tubes, X-Ray Inspection Equipment, Yokes

Local Sales Offices & Reps.

Cal	Pasadena, A-F Sls. Engrg.	213-681-5631
-----	---------------------------	--------------

Local Distributors

Ark	El Dorado, Ind. Elctn., 413 W. Main St.	501-862-4901
Cal	Culver City, JSH Elctns., 8549 Higuera St.	213-837-0177
Conn	Rockville, Denon Elctns., Longview St.	203-875-5198
Del	Dover, Elctnrc. Surveillance, 20 Lockerman	302-284-9421
La	Kenner, MAR Elctns., 3521 E. La. State	504-729-4524
Me	Auburn, Audio Serv., Box 393	207-783-8801
Mich	Detroit, R. P. Hermes Co., 9600 Whittier	313-886-4566
NJ	Elizabeth, Thor Elec. Corp., 741 Livingston	201-354-2420
NJ	Elizabeth, Unity Elctns., 107 Trumbull	201-351-4200
NM	Albuquerque, Integrated Sys., 142 Monroe NE	505-255-8127
NY	Ossining, Dodd Elctns., Snowden Ave.	914-762-4200
NY	Rosedale, Temtron Elctns., 138-91 Francis	212-978-5896
Ohio	Dayton, Dayton Communications, 2971 Bluefield	513-278-7937
Pa	Reading, Beil-Whitaker, Inc., 3623 Jacksonwald	215-779-2610
Va	Arlington, Concord Communications, 1203 N. Highland	703-525-5777

TELVAC INSTR. CO., 14614 Raymer St., Van Nuys, Cal., 91405, Tel: 213-994-9471; Empl.: 3

Customer service: L. Ratcliff

Free literature available: Product Catalog

Products manufactured: Soldering Accessories, Testers, Tools, Tweezers, Hand & Vacuum

Local Sales Offices & Reps.

Ill	Hinsdale, Hill-Gray Assocs.	
Md	Baltimore, Milan Assoc., Inc.	
Mass	Babson Park, P.R. Sturgeon Co., Inc.	
NY	Mineola, L.I., Wilco Sls.	
NY	Syracuse, E. Dutcher	

TEMPIL DIV., Hamilton Blvd., So. Plainfield, N.J., 07080, Tel: 201-757-8300, Telex: 138-662; Empl.: 30

For info on price: A. F. Fleury; Application info: M. Olesin; Customer service: J. A. Lamb; Delivery info: J. A. Lamb

Products manufactured: Coatings, Crayons, Coatings, Pellets, etc., Temperature Indicating, Heat Sinks, Soldering, Labels, Temperature Indicating, Monitors, Paints

TEMPLEMAN, D.R. CO., 8 Park St., Plainville, Conn., 06062, Tel: 203-747-2709; Empl.: 30

Customer service: O. W. Bray

Products manufactured: Forms, Wire, Rings, Retaining, Springs (All Types)

TEMLINE, 17209 South Broadway, Gardena, Cal., 90248, Tel: 213-324-6969; Empl.: 20

Customer service: T. R. Anderson

Products manufactured: Amplifiers, Bobbins, Winding, Coil & Transformer, Bridges, Cable Assemblies & Harnesses, Coils Including Assemblies & Forms, Controls/Control Eqp., Heaters & Heating Elements, Indicators, Probes, Signal Conditioners & Equipment, Thermistors, Thermocouples, Elements & Accessories, Thermometers, Resistance, Transducers, Transmitters, Wire

Local Sales Offices & Reps.

Cal	San Diego, L.L. Stoakes, Inc.	714-274-6281
Conn	Hamden, Northeast Engrg. Inc.	203-248-4481
Md	Silver Springs, Spectroscopy Sys.	307-949-8261
Mass	Danvers, Northeast Engrg., Inc.	617-774-3070
NM	Albuquerque, Telemetry Sls. Corp.	505-266-7861
NY	Manhasset, Northeast Engrg. Inc.	516-365-9633
Ohio	Englewood, Gemini, Inc.	513-890-5394
Tex	Trinidad, Telemetry Sls. Corp.	214-778-2533

TEMPO INSTRUMENT, INC., 51 E. Bethpage Rd., Plainview, N.Y., 11803, Tel: 516-694-4400, TWX: 510-224-6421; FSC No: 07031; Empl.: 140; Minimum order: \$25

For info on price: B. Tuttle; Application info: R. D. Eglyud; Customer service: B. Tuttle; Delivery info: B. Tuttle

Products manufactured: Cable Fault Locators, Calibrators, Comparators, Controls/Control Eqp., Detectors, Dividers, Flashers, Generators, Locators, Open-Short, Meters, Monitors, Regulators, Relays, Switches, Timers, Transducers

Local Sales Offices & Reps.

Industrial Prods. Group.

Cal	City of Commerce, Pacific Scientific Co.	213-927-5333
Cal	San Carlos, Pacific Scientific Co.	415-592-6300
Mich	Farmington, Electro-Matic Co.	313-477-7270
NJ	Hohokus, Alto	201-447-1770
NY	Rochester, H.C. Johnson	716-482-3000
Ohio	Cincinnati, Luebbs Sls. Co.	513-871-4211
Ohio	Cleveland, Luebbs Sls. Co.	216-333-0425

Military Prods. Group.

Cal	Chatsworth, Tempo	213-993-1311
Conn	Essex, Lafage Assocs.	203-767-0465
Fla	North Pinellas Park, Russell Assocs.	813-526-1134
Ill	Northbrook, Raines/Brin Assocs.	312-498-0890
Md	Baltimore, Coulbourn-DeGreif Co., Inc.	301-247-4646
Md	Baltimore, Stemler	301-944-8262
Mass	Newton, Daner/Hayes, Inc.	617-969-4650
Mass	Woburn, Stockwell Tech. Sls.	617-935-5770
Mich	Southfield, Luebbs Sls. Co.	313-357-0355
Mo	Kansas City, PEM Sls. Co.	816-333-6012
Mo	St. Louis, PEM Sls. Co.	314-434-4425
NJ	Cherry Hill, Stemler Assoc.	609-966-4070
NJ	Clifton, Avionics Equip. Inc.	201-772-1956
NY	Bayshore, Russell Assocs.	516-666-6500
NY	Buffalo, Russell Assocs.	716-634-3377
Ohio	Cincinnati, Luebbs Sls. Co.	513-871-4211
Ohio	Dayton, Luebbs Sls. Co.	513-294-0426
Pa	Audubon, Daner/Hayes, Inc.	215-666-5005
Tex	Arlington, Cal-Tex Ind.	817-461-0303
Va	Alexandria, Stemler	703-548-7818
Wash	Bellevue, M. Poggi Co.	206-454-2323
EXP	NYC, Aero-Spectrum Inc.	212-752-4770

TEMPTRONIC CORPORATION, 40 Glen Ave., Newton, Mass., 02159, Tel: 617-965-3420, Telex: 92-2526; Empl.: 30; Minimum order: \$25

For info on price: H. Lyden; Application info: T. Gerendas; Customer service: F. Healy; Delivery info: J. Crozier

Free literature available: ThermoSpot for testing components at temperature right on the tester -70/+200°C, ThermoChuck for testing wafers, chips, hybrids at temperature right on the probe -60/+300°C, ThermoStream for testing modules, circuitboards at temperature right on the tester -60/+200°C.

Products manufactured: Baths, Controlled Temperature (Air & Liquid), Chamber, Environmental Test, Controls/Control Eqp., Cooling/Heating Modules, Thermoelectric, Heat Exchangers & Systems, Machines/Machinery, Production, Semiconductor Wafer Fabrication, Test Systems

Local Sales Offices & Reps.

Cal	Palo Alto, Coherent Mktg. Assocs.	415-327-2217
Fla	Longwood, Lenz Engrg. Co.	305-831-9797
Ill	Des Plaines (Chicago), Cozzens & Cudahy, Inc.	312-298-3600
Ind	Indianapolis, Cozzens & Cudahy, Inc.	317-244-2456
Kans	Kansas City, Cozzens & Cudahy	816-454-5836
Md	Rockville, Ed Winston & Co.	301-881-5780
Minn	Minneapolis, Cozzens & Cudahy, Inc.	612-884-4336/7
Mo	St. Louis, Cozzens & Cudahy, Inc.	314-423-1234
NY	Elmont, Crane & Egert Corp.	516-488-2100
Tex	Dallas, Comspec, Inc.	214-234-4137
Tex	Houston, Comspec, Inc.	713-461-4487

TEMTRON ELEXS, 138-69 Francis Lewis Blvd., Rosedale, N.Y., 12472, Tel: 212-978-5896; Empl.: 12; Minimum order: \$25

For info on price: H. Schwartz 212-978-5896; Application info: A. Sussman 201-224-6146; Customer service: C. Mann 212-978-5896; Delivery info: M. Ramirez 212-978-5896

Free literature available: Catalogue which contains our receiving & industrial tubes and camera tubes.

Products manufactured: Transistors, Tubes

Local Sales Offices & Reps.

NJ	Hackensack, C. Mayer Assocs.	201-487-3113
NY	Huntington, C. Mayer Assocs.	516-921-7876

TENNELEC, INC., Box D, Oak Ridge, Tenn., 37830, Tel: 615-483-8404, TWX: 810-572-1018; Empl.: 200; Minimum order: \$50

For info on price: J. Bradley; Application info: B. Stark; Customer service: R. Chambers; Delivery info: J. Bradley

Products manufactured: Amplifiers, Analyzers, Converters, Counters, Data Acquisition & Reduction Systems, Data Loggers, Detectors, Generators, Power Supplies, Prescalers, Receivers, Scalars, Binary, Decade, Timers

Local Sales Offices & Reps.

Cal	La Canada, Spectrum Sciences	213-790-1181
DC	Washington, Scientific Sys. Sls. Corp.	202-726-4161
Fla	Jacksonville, Pulcir, Inc.	904-743-5700
Ill	Mt. Prospect, Contemporary Science, Inc.	312-255-3793
Mass	Burlington, Scientific Sys. Sls. Corp.	617-273-1660
NM	Albuquerque, V. Roberts Assocs.	505-345-2486
NY	Port Chester, Radiation Elctns., Inc.	914-937-2300
NY	Syosset, Scientific Sys. Sls. Corp.	516-921-3737
Ohio	Westerville, Contemporary Science, Inc.	614-882-6908
Tenn	Knoxville, Pulcir, Inc.	615-693-3641
Tex	Dallas, Overall Engrg.	214-233-2311
Wash	Seattle, Spectrum Sciences	206-624-2373

TENNEY ENGRG., INC., 11000 Springfield Rd., Union, N.J., 07083, Tel: 201-886-7870, TWX: 710-985-4725; Empl.: 175; Minimum order: \$25

For info on price: F. H. Gardner; Application info: F. H. Gardner; Customer service: F. Paulauskas; Delivery info: F. H. Gardner

Free literature available: 101 THJR, 102 Vibration, 104 T-14, 40, 64, 105 Agree 106 T-5, 107 MR-1 Bath, 108 T-JR, 109 T & TH-10 & 27, 110 "S" Vacuum, 112 Space JR, 113 Walk-in Rooms, 117 Tenneyzphere, 118 Tenneystrat, 121 Thermal Shock, 123 Bench Master R, 124 Tempgard R, 125 MR-9 Bath, 126 Tenneyten, 127 Tenneythirty

Products manufactured: Alarms, Baths, Controlled Temperature (Air & Liquid), Chamber, Environmental Test, Controls/Control Eqpt., Cooling/Heating Modules, Thermoelectric, Dehumidifiers (For Equipment), Ovens, Refrigerators, Environmental Test, Testers

Local Sales Offices & Reps.

Ala	Huntsville, FM Assocs.	205-536-9990
Ariz	Scottsdale, Williams Assocs.	602-947-4297
Cal	Menlo Park, Long Assocs.	415-327-1300
Cal	Van Nuys, Environment Assocs.	213-994-1404
Colo	Denver, Williams Assoc.	303-373-4730
Conn	Hamden, Equipment Sls. Co.	203-248-5581
Fla	Lake Worth, I. R. Associates	305-655-3392
Fla	Orlando, FM Assocs.	305-851-5710
Ill	Des Plaines, Marsland Assocs.	312-298-2620
Ind	Indianapolis, Marsland Assocs.	317-924-3568
Md	Lanham, Brimberg Assocs.	301-552-2200
Mass	Chelmsford, Equip. Sls.	617-256-8547

Minn	Minneapolis, Marsland Assocs.	612-545-4481
Mo	Kansas City, Marsland Assocs.	816-765-0641
Mo	St. Peters, Marsland Assocs.	314-278-6949
NJ	Moorestown, Salem Scientific	609-235-4565
NM	Albuquerque, Williams Assocs.	505-255-1638
NY	Fayetteville, M.P. Andrews	315-637-3144
NC	Greensboro, FM Assocs.	919-294-2754
Ohio	Cleveland, Dietrich & Assocs.	216-781-1855
Ohio	Dayton, Dietrich & Assocs.	513-223-6042
Ore	Beaverton, Showalter Instr. Inc.	503-646-8946
Pa	Pittsburgh, Dietrich & Assocs.	412-892-2992
Tex	Dallas, Carey, Wolf & Assocs.	214-823-5383
Tex	Ft. Worth, Carey, Wolf & Assoc.	817-738-1996
Tex	Houston, Carey, Wolf & Assoc.	713-721-2442
Wash	Bellevue, Showalter Instr. Inc.	206-455-4922

TENOR CO., INC., 17020 W. Rogers Dr., New Berlin, Wisc., 53151; Tel: 414-782-3800; Empl.: 35; Minimum order: \$25

For info on price: P. Yoblin; Application info: Sls. Engrg.; Customer service: P. Yoblin; Delivery info: P. Yoblin

Free literature available: Bull. 200A, 250A, 2410-2420 - Stepping drum programmers; Bull. 700A - Solid state logic cards.

Products manufactured: Cards, Logic, Controls/Control Eqpt., Counters, Modules, Logic, Encapsulated, Programmers, Switches, Timers

TEN-TEC INC., Industrial Park, Sevierville, Tenn., 37862, Tel: 615-453-7172; Empl.: 60; Minimum order: \$10

For info on price: D. Tomcik; Application info: J. Bruchfield; Customer service: J. Beeler; Delivery info: D. Tomcik

Products manufactured: Amplifiers, Cabinets & Accessories, Calibrators, Cases, Equipment, Instrument, Meter, Comm. Systems, Power Supplies, Receivers, Transceivers, Transmitters

TERADYNE CORP., 1068 Raymond Ave., St. Paul, Minn., 55108, Tel: 612-646-2868; Empl.: 25; Minimum order: \$10

For info on price: S. D. Munson; Application info: W. M. Sorenson; Customer service: J. Wickstrom; Delivery info: F. B. Albright

Free literature available: D.C. to A.C. inverters, standby power systems, voltage adjusters, battery chargers, D.C. power supplies, portable A.C. power supplies.

Products manufactured: Batteries, Chargers, Battery, Converters, Inverters, Power Supplies, Regulators, Transformers, Vibrators

Local Sales Offices & Reps.

Cal	Redwood City, Sinai/Johnson, Inc.	415-365-6263
Cal	Torrance, Barstow & Doran Inc.	213-325-4140
Ill	Chicago, Weisz Assocs.	312-637-9117
Mass	Northboro, W.B. Pray Sls., Inc.	617-393-3434
Minn	Mpls., A. J. Warner	612-729-7371
NJ	Caldwell, Art Cerf & Co.	201-226-2263
NY	Plainview, Morhan Exporting Corp.	516-293-5582
Tex	Dallas, Maynard Sls. Co.	214-742-2384

TERADYNE, INC., 183 Essex St., Boston, Mass., 02111, Tel: 617-482-2700, TWX: 710-321-1055; Empl.: 1300

Customer service: Sls. Dept.

Free literature available: GENERAL CATALOG-describes all of Teradyne's automatic test systems and instruments for electronic device and subassembly users and manufacturers. The catalog also describes Teradyne's laser trimming systems.

Products manufactured: Connectors, Sockets, Test Systems, Testers

Local Sales Offices & Reps.

Ariz	Tempe, Teradyne	602-967-7549
Cal	Chatsworth, Teradyne Digital Sys.	213-993-1343
Cal	Costa Mesa, Teradyne	714-979-4590
Cal	Sunnyvale, Teradyne	408-732-8770
Fla	Lauderhill, Teradyne	305-735-3880
Ill	Chicago, Teradyne Applied Sys.	312-725-2011
Ill	Des Plaines, Teradyne	312-298-8610
Ind	Indianapolis, Teradyne	317-297-4682
Mass	Lowell, Teradyne	617-458-1256
Mich	Dearborn Heights, Teradyne	313-336-5550
Minn	Bloomington, Teradyne	612-854-7177
NJ	Parsippany, Teradyne	201-334-9770
NY	Great Neck, Teradyne	516-829-5040
NY	Syracuse, Teradyne	315-454-4486
Pa	Allentown, Teradyne	215-821-9109
Tex	Richardson, Teradyne	214-231-5384
Va	Vienna, Teradyne	703-938-2800

TERADYNE COMPS., 900 Lawrence St., Lowell, Mass., 01852, Tel: 617-454-9195, TWX: 710-343-1758; FSC No: 31413; Empl.: 500; Minimum order: \$50

For info on price: H. T. Neavitt 617-454-9195; Application info: L. B. Johnson 603-889-5156; Customer service: A. T. Genovese 617-454-9195; Delivery info: A. T. Genovese 617-454-9195

Products manufactured: Connectors, Sockets

Local Sales Offices & Reps.

Cal	Fullerton, Teradyne Comps., Inc.	714-871-1930
Cal	Inglewood, J. Berman Co.	213-776-1281
Cal	Palos Verdes Pen., Mr. Alex Paul, Western Regional Mgr.	203-541-5314
Cal	Santa Clara, Nova-Tronix	408-243-9530
Colo	Denver, McCloud & Raymond Co.	303-756-1589
Fla	Ft. Lauderdale, Tech-Rep Assocs.	305-792-0962
Fla	Largo, Tech-Rep Assocs.	813-595-2834
Ill	Park Ridge, Metcom Assocs. Corp.	312-696-1490
Md	Towson, J-H Elctn. Sls. Co.	301-825-4440
Minn	New Brighton, TWC Sales	612-636-1770
NY	Commack, Hingston Walsh Assoc.	516-543-0241
NY	Larchmont, Hingston-Walsh Assocs.	914-834-5781
NY	Liverpool, L-Mar East	315-457-2329
NY	Rochester, L-Mar Assocs.	716-328-5240
NY	Vestal, L-Mar East	607-729-6339
Ohio	Centerville, ImTech, Inc.	513-885-4181
Ohio	Cleveland, ImTech, Inc.	216-826-3400
Pa	Fort Washington, G.C.M., Inc.	215-646-7535
Pa	Pittsburgh, ImTech, Inc.	412-247-1050
Tex	Dallas, Evans & McDowell Assoc.	214-238-7157
Tex	Sugarland, Evans & McDowell Assoc.	713-783-2900

TESCOM INSTR. DIV., 2600 Niagara La. N., Minneapolis, Minn., 55441, Tel: 612-546-4351, Telex: 29-0488; Empl.: 200

For info on price: H. Gunderson; Application info: M. Faller; Customer service: H. Gunderson; Delivery info: A. Brockhouse

Free literature available: Welding Equipment for Miniature and Electronic Applications is found in the Tescom Catalog and Little Torch Brochures. Also Soldering and hand tools.

Products manufactured: Controls/Control Eqpt., Gages, Microscopes, Soldering Accessories, Soldering Guns, Irons & Desoldering Tools, Tools, Torches, Soldering, Welding & Access., Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

TESTEX INC., See Automedia Inc.

TEXAS INSTRUMENTS, Connector Systems, 34 Forest St., Attleboro, Mass., 02703, Tel: 617-222-2800 p. 2+1032,1033

Customer service: B. Spence

Products manufactured: Backpanel Interconnect Systems, Boards, Plug-In, Cards, Logic, Connectors, Sockets

Local Sales Offices & Reps.

Ala	Huntsville, Beacon Elctns.	205-881-5031
Ariz	Phoenix, Sheffer Kahn Co.	602-258-7893
Cal	Los Altos, Ewing-Foley Inc.	415-941-4525
Cal	Los Angeles, M. A. Stolaroff Co.	213-295-7781
Cal	San Diego, M. A. Stolaroff Co.	714-234-6905
Colo	Boulder, R. G. Enterprises	303-447-9211
Conn	Milford, Todino Engrg. Sls.	203-874-6643
Fla	Ft. Lauderdale, Beacon Elctns.	305-776-6074
Fla	Maitland, Beacon Elctns.	305-647-3498
Ga	Atlanta, Beacon Elctns.	505-351-3654
Ill	Hinsdale, Momac Sls.	312-654-4524
Ind	Greenwood, Valentine Schillinger & Assocs.	317-888-2260
Ind	South Bend, Valentine Schillinger & Assocs.	219-291-6258
Kans	Prarie Village, Engrg. Svcs. Co.	913-649-4000
Md	Randallstown, Beacon North	
Mass	Needham Hts., Todino Engrg. Sls.	617-444-7925
Mich	Detroit, Nikon Assocs.	313-341-7688
Minn	Minneapolis, E. C. Elctns. Sls.	612-831-0229
Mo	St. Louis, Engrg. Svcs. Co.	314-997-1515
NJ	Haddonfield, Sunday-O'Brien	609-429-4013
NM	Albuquerque, Sheffer Kahn Co.	505-265-7077
NY	Camillus, Noco, Inc.	315-672-3988
NY	Garden City, Comtronic Assocs.	516-741-8966
NY	Pittsford, Noco, Inc.	716-461-4750
Ohio	Cleveland, A. H. Baier Co. & Assocs.	216-461-6161
Ohio	Dayton, A. H. Baier Co. & Assocs.	413-276-4128
SC	Spartanburg, Beacon Elctns.	803-582-4613
Tex	Dallas, R. Matthews Elctns.	214-233-0363
Tex	Houston, R. Matthews Elctns.	713-664-7131

Va	Falls Church, Beacon North	703-534-1673
Wash	Seattle, Blair Hirsh Co.	206-783-3423
FOR:	Can., Montreal, Que., Allied Elctrcn. Sls.	514-488-5547
Local Distributors		
Ala	Huntsville, Cramer/EW, 2310 Bob Wallace Ave., S.W.	203-539-5722
Ariz	Phoenix, Cramer/Arizona, 2816 N. 16th St.	602-263-1112
Ariz	Phoenix, Micro Elctrcns. Distrs., 2104 W. Peoria Ave.	602-944-2281
Ariz	Phoenix, R.V. Weatherford, 1917 N. 25th Dr.	602-272-7144
Cal	Anaheim, R.V. Weatherford Co., 1550 Babbitt Ave.	714-547-0891
Cal	Glendale, R.V. Weatherford Co., 6921 San Fernando Rd.	213-843-3451
Cal	Irvine, Cramer/Los Angeles, 17201 Daimler St.	213-771-8300
Cal	Los Angeles, T.I. Supply Co., 5200 W. 104th St.	213-776-4490
Cal	Palo Alto, Kierulff Elctrcns., 3969 E. Bayshore Rd.	415-968-6292
Cal	Palo Alto, R.V. Weatherford Co., 3240 Hillview Ave.	415-493-5373
Cal	Pomona, R.V. Weatherford Co., 1095 E. Third St.	714-623-1261
Cal	San Diego, Cramer/San Diego, 8913 E. Complex Dr.	714-565-1881
Cal	San Diego, R.V. Watherford Co., 7872 Raytheon Rd.	714-278-7400
Cal	Sunnyvale, Cramer/San Francisco, 720 Palomar Ave.	408-739-3011
Cal	Sunnyvale, T.I. Supply Co., 776 N. Palomar Ave.	408-732-5555
Colo	Denver, Cramer/Denver, 5465 E. Evans Pl. at Hudson	303-758-2100
Colo	Denver, T.I. Supply Co., 9725 E. Hampden Ave.	303-751-1780
Colo	Englewood, R.V. Weatherford Co., 3905 S. Mariposa	303-761-5432
Conn	Fairfield, U-Tronics, 273 Linwood Ave.	203-255-4521
Conn	N. Haven, Cramer/Conn., 35 Dodge Ave.	203-239-5641
Fla	Hollywood, Cramer/EW Hollywood, 4035 N. 29th Ave.	305-923-8181
Fla	Orlando, Cramer/EW Orlando, 345 N. Graham Ave.	305-894-1511
Fla	Tampa, U-Tronics, 5421 Jet View Cir.	
Ga	Atlanta, Cramer/EW Atlanta, 3923 Oakcliff Indl. Ct.	404-451-5421
Ill	Arlington Heights, T.I. Supply Co., 2420 E. Oakton Rd.	312-593-7660
Ill	Chicago, Newark Elctrcns., 500 N. Pulaski Rd.	312-638-4411
Ill	Chicago, Semiconductor Specialists Inc., Box 66125, O'Hare International Airport	
Ill	Des Plaines, Newark Elctrcns., 2500 E. Davon	312-298-1420
Ill	Elmhurst, Semiconductor Specialists Inc., 195 W. Spangler	312-279-1000
Ill	Hickory Hills, Newark Elctrcns., 7667 W. 95th St.	
Ill	Mt. Prospect, Cramer/Chicago, 1911 S. Busse Rd.	312-593-8230
Ind	Anderson, Elctrcn. Supply, 2228-2230 N. Columbus Ave.	317-644-3381
Ind	Ft. Wayne, Fort Wayne Elctrcns. Supply, 3606 E. Maumee Ave.	219-742-4346
Ind	Indianapolis, Graham Elctrcns., 133 S. Pennsylvania St.	317-635-5453
Ind	Indianapolis, Semiconductor Specialists, Box 41630, Weir Cook Airport	317-243-8271
Ind	Lafayette, Lafayette Radio Supply, 406-408-North St.	317-742-4006
Ind	Muncie, Muncie Elctrcns. Supply, 222 N. Madison St.	317-288-8837
Iowa	Cedar Rapids, Deeco Inc., 2500 16th Ave. S.W.	
Md	Baltimore, Arrow/Angus, 5207 E. Dr. Shop Ctr.	301-247-5200
Md	Baltimore, Cramer/EW Baltimore, 922-924 Papasco Ave.	301-354-0100
Md	Gaithersburg, Cramer/EW, 16021 Industrial Dr.	301-948-0110
Mass	Dedham, Gerber Elctrcns., 852 Providence Hwy., U.S. Rte #1	617-329-2400
Mass	Newton, Cramer/Intl., 85 Wells Ave.	617-969-7700
Mass	Waltham, T.I. Supply Co., 504 Totten Pond Rd.	617-890-0510
Mich	Detroit, R.S. Elctrcns., 12775 Lydon Rd.	313-491-1000
Mich	Grand Rapids, R.S. Elctrcns., 300 & 36th St. S.E.	616-241-3487
Mich	Livonia, Cramer/Detroit, 13193 Wayne Rd.	313-425-7000
Minn	Edina, Cramer/Minn., 7275 Bush Lake Rd.	612-835-5350

Minn	Minneapolis, Newark Elctrcns., 336 Hoover St., N.E.	612-331-6350
Minn	Minneapolis, Semiconductor Specialists, 8030 Cedar Ave. S.	612-854-8841
Minn	Minneapolis, T.I. Supply Co., 7615 Metro Blvd.	612-835-5353
Mo	Kansas City, Semiconductor Specialists, 3805 N. Oak Trfwy.	816-452-3900
Mo	Kansas City, T.I. Supply Co., 7743 Troost Ave.	816-753-4750
Mo	St. Louis, Semiconductor Specialists Inc., 10062 Natural Bridge	314-428-6100
NJ	Clark, T.I. Supply Co., 301 Central Ave.	201-382-6400
NJ	Monachie, Cramer/NJ, 1 Barrett Ave.	201-935-5600
NJ	Moorestown, Arrow/Angus, Pleasant Valley Ave.	609-235-1900
NJ	Saddlebrook, Arrow Elctrcns., 285 Midland Ave.	201-797-5800
NM	Albuquerque, Cramer/NM, 137 Vermont N.E.	505-265-5767
NM	Albuquerque, R.V. Weatherford Co., 6101 Marble Ave. N.E.	505-265-5671
NY	Buffalo, Summit Dist., 916 Main St.	716-884-3450
NY	Farmingdale, Arrow Elctrcns., 900 Broad Hollow Rd.	516-694-6800
NY	Fishkill, T.I. Supply Co., 167 Main St.	914-896-9630
NY	Freeport, Milgray Elctrcns., 191 Hansi Ave.	516-546-6000
NY	Hauppague, Cramer/L.I., 20 Oser Ave.	516-231-5600
NY	Hauppague, Semi-Conductor Concepts, Engineers Rd.	516-273-1234
NY	Melville, T.I. Supply Co., 2 Huntington Qud., Ste 2N04	
NY	Rochester, Rochester Radio Supply, 140 W. Main St.	716-454-7800
NC	Winston-Salem, Cramer/EW Winston-Salem, 938 Burke St.	919-725-8711
Ohio	Cincinnati, Cramer Tri-States, 666 Redna Ter.	513-771-6441
Ohio	Cleveland, Cramer Elctrcns., 5835 Harper Rd.	216-248-7740
Ohio	Cleveland, Newark Elctrcns., 2028 E. 46th St.	216-361-4700
Ohio	Dayton, Esco Inc., 221 Crane St.	513-226-1133
Okla	Tulsa, Cramer/Tulsa, 6336 E. 13th St.	918-836-3371
Okla	Tulsa, T.I. Supply Co., Draw "T", Admiral Sta.	918-437-4555
Ore	Portland, Almac/Stroum Elctrcns., 8888 S.W. Canyon Rd.	503-292-3534
Pa	Pennsauken, Cramer/Pennsylvania, 7300 Rte 130 N.	215-923-5950
Pa	Pittsburg, Semiconductor Specialists, 538 Alpha Dr.	412-781-8120
Tex	Austin, T.I. Supply Co., Box 2909	512-454-2531
Tex	Dallas, R.V. Weatherford Co., 10836 Grisson La.	214-243-1571
Tex	Dallas, Solid State Elec. Co. of Tex., 2643 Manana Dr.	214-352-2601
Tex	Dallas, T.I. Supply Co., 6000 Denton Dr.	214-238-6925
Tex	Houston, R.V. Weatherford Co., Box 42249	
Tex	Houston, T.I. Supply Co., 3939 Ann Arbor Dr.	713-785-4800
Utah	Salt Lake City, Alta Elctrcns.	801-487-3681
Utah	Salt Lake City, Cramer/Utah, 391 W. 2500 So.	801-487-3681
Va	Arlington, T.I. Supply Co., 1500 Wilson Blvd.	703-524-5885
Wash	Seattle, Almac/Stroum Elctrcns., 5811 Sixth Ave., S.	206-763-2300
Wash	Seattle, Cramer/Seattle, 5602 6th Ave. S.	
Wash	Seattle, R.V. Weatherford Co., 541 Industry Dr.	206-243-6340
Wisc	Brokfield, Newark Elctrcns., 3695 N. 126th St.	414-781-2450
Wisc	Oak Creek, Cramer/Wisconsin, 430 W. Lawson Ave.	414-462-8300
For:	Can., Downsview, Ont., Cramer/Can., 920 Alness Ave.	416-781-6631
For:	Can., Montreal, Que., Elctrcn. Wholesalers, 1935 Church Ave.	514-769-8861
For:	Can., Ottawa, Ont., Wackid Radio/T.V. Labs, 312 Parkdale	613-728-1821
For:	Can., Scarborough, Ont., Carsten Elec. Ltd., 54 Howden Rd.	416-751-2371
For:	Can., Toronto, Ont., Electrosonic Indl. Sls., 543 Young St.	416-924-9301
For:	Can., Vancouver, B.C., RAE Elctrcns., 1629 Main St.	604-687-2621

TEXAS INSTRUMENTS, Control Prods. Div., 35 Forrest St., Attleboro, Mass., 02703, Tel: 617-222-2280, TWX: 710-346-0566

For info on price: B. Spence ext. 536; Application info: M. Peel ext. 218; Customer service: D. Nievera ext. 7327; Delivery info: B. Spence ext. 536

Free literature available: Literature covers edgeboard connectors, DIP sockets, keyboards, circuit breakers, switches, temperature controllers, thermostats, motor starting relays, and DTC controls.

Products manufactured: Bi-Metals, Thermostatic, Braid, Cable, Circuit Breakers, Connectors, Contact Strips, Finger, Contacts, Electrical, Controls/Control Ept., Current Sensors, Keyboards, Alphanumeric & Decimal, Limiters, Metals, Ovens, Protectors, Relays, Sockets, Suppressors, Switches, Transistor, Diode, Thyristor Heat Dissipators, Wire, Wire Shielding

Local Sales Offices & Reps.

Ala	Cullman	205-734-9160
Cal	Inglewood	213-645-1921
Cal	Sunnyvale	408-732-1840
Fla	Orlando	305-644-3535
Ill	Glenview	312-729-5710
Ind	Fort Wayne	219-484-0606
Ind	Indianapolis	317-787-5039
Iowa	Iowa City	319-351-7792
Ky	Louisville	502-451-2920
Ky	Versailles	606-873-3163
Md	Towson	301-296-8961
Mich	Central Lake	616-544-5931
Mich	Grand Rapids	616-245-3359
Mich	Southfield	313-353-0830
Mich	Tecumseh	313-423-8559
Minn	Minneapolis	612-835-5711
Mo	St. Louis	314-993-4546
NJ	Clark	201-574-9800
NY	East Syracuse	315-463-9291
NY	Fishkill	914-896-6793
NY	Huntington Station	516-293-2720
NC	Charlotte	704-375-2432
Ohio	Cleveland	216-464-2990
Ohio	Dayton	513-253-6128
Pa	Fort Washington	215-643-6450
Tenn	Brentwood	615-834-2637
Tex	Dallas	214-238-2524
Wisc	Wauwatosa	414-771-7210
FOR:	Can., Richmond Hill, Ont.	416-889-7373
FOR:	Can., St. Laurent, Que.	514-332-3550

TEXAS INSTR. INC., Dig. Sys. Div., Box 1444, Houston, Tex., 77001, Tel: 713-777-1301

Products manufactured: Comm. Systems, Computers, Data Acquisition & Reduction Systems, Gages, Paper, Graphic Recording, Potentiometers, Recorders, Services, Assembly, Production & Test, Teleprinters, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic), Test Systems, Testers, Transducers, Transmission Systems, Data, Typewriters, Input-Output (All Types)

Local Sales Offices & Reps.

Ala	Huntsville	205-837-7530
Ariz	Phoenix	602-249-1313
Cal	Orange	714-547-9221
Cal	San Francisco	415-392-0229
Cal	Sunnyvale	408-732-1840
Colo	Denver	303-751-1780
Conn	Hamden	203-281-0074
Fla	Orlando	305-644-3535
Ga	Atlanta	404-458-7791
Ill	Schiller Park	312-671-0300
Ind	Indianapolis	317-248-8555
Mass	Waltham	617-890-7400
Mich	Southfield	313-353-0830
Minn	Minneapolis	612-835-5711
NJ	Clark	201-574-9800
NY	New York	212-541-9540
NY	Rochester	716-461-1800
Ohio	Cleveland	216-464-2990
Ohio	Dayton	513-253-6128
Pa	Ft. Washington	215-643-6450
Tex	Dallas	214-238-5318
Tex	Houston	713-777-1623
Va	Arlington	703-527-2800
Wash	Bellevue	206-455-1711
Wisc	Wauwatosa	414-475-1690
EXP:	Can., Richmond Hill, Ont., Texas Instr.	416-889-7373
FOR:	Can., St. Laurent, Quebec, Texas Instr.	514-332-3552

TEXAS INSTRUMENTS, Precision Controls Dept., 34
 Forrest St., Attleboro, Mass., 02703, Tel: 617-222-2800;
 Empl.: 5000

Customer service: Precision Controls Dept.

Products manufactured: Circuit Breakers, Current
 Sensors, Keyboards, Alphanumeric & Decimal,
 Switches

Local Sales Offices & Reps.

Ala	Cullman	205-734-9160
Cal	Inglewood	213-645-1921
Cal	Sunnyvale	408-732-1840
Fla	Orlando	305-644-3535
Ill	Glenview	312-729-5710
Ind	Ft. Wayne	219-484-0606
Ind	Indianapolis	317-787-5039
Iowa	Cedar Rapids	319-362-3159
Ky	Louisville	502-451-2920
Md	Towson	301-296-8961
Mass	Waltham	617-890-7400
Mich	Grand Rapids	615-245-3359
Mich	Southfield	313-353-0830
Mich	Tecumseh	313-423-8559
Minn	Minneapolis	612-835-5711
Mo	St. Louis	314-993-4546
NJ	Clark	201-574-9800
NY	East Syracuse	315-463-9291
NY	Fishkill	914-896-6793
NY	Huntington Station	516-293-2720
NC	Charlotte	810-621-7813
Ohio	Cleveland	216-464-3584
Ohio	Dayton	513-298-0206
Ohio	Sidney	513-492-1222
Pa	Ft. Washington	215-643-6450
Tenn	Brentwood	615-834-2637
Tex	Dallas	214-238-6901
Wisc	Wauwatosa	414-771-7210
FOR: Can.,	Richmond Hill, Ont.	416-889-7373
FOR: Can.,	St. Laurent, 386, Que.	514-332-3550

TEXSCAN CORP., 2446 N. Shadeland Dr., Indianapolis,
 Ind., 46219, Tel: 317-357-8781, TWX: 810-341-3184;
 Empl.: 225; Minimum order: \$25 p. 1-816,817

For info on price: R. Shevlot; Application info: R.
 Stelle; Customer service: C. Conger; Delivery info: M.
 Everett

Free literature available: Complete catalog on
 sweep signal generators spectrum analyzers.
 Complete catalog on attenuators, filters &
 oscillators.

Products manufactured: Analyzers, Attenuators,
 Bridges, Detectors, Filters, Generators,
 Mismatches, Microwave, Precision, Monitors,
 Oscillators, Oscilloscopes, Probes, Switches,
 Television Systems & Equipment Closed-Circuit,
 Terminals

Local Sales Offices & Reps.

Ala	Huntsville, Int'l. Scientific Inst.	205-837-1601
Cal	Los Angeles, R.F. Assocs.	213-478-1586
Cal	Palo Alto, R.F. Assocs.	415-494-3331
Conn	Hamden, Instr. Conslts., Inc.	203-288-5246
Fla	Orlando, Truex Assoc.	305-859-2160
Haw	Honolulu, Aloha Assoc.	808-941-1574
Ill	North Brook, E.I.A.	312-271-3774
Ind	Indianapolis, E.I.A.	317-257-7231
Iowa	Cedar Rapids, Tech. Reps Inc.	319-363-2489
Md	Wheaton, Sonco Inc.	301-942-9420
Mass	Waban, Instr. Conslts., Inc.	617-969-3372
Mich	Detroit, Micro Sls.	313-482-1229
Mo	Hazelwood, Techn. Reps Inc.	314-731-5200
Mo	Independence, Techn. Reps Inc.	816-737-1414
NJ	Dover, R. Diamond Inc.	201-366-7518
NJ	Hazlet, Mer-Mon Elctns.	201-264-1851
NM	Albuquerque, A.L.S. Elctns.	505-298-2575
NY	Bayside, R. Diamond	212-423-7330
NY	Syracuse, Labtronics	315-454-9314
NC	Winston-Salem, Radco Co.	919-722-9671
Ohio	Cleveland, Micro Sls.	216-725-4560
Ohio	Dayton, Micro Sls.	513-885-4171
Pa	Hatboro, Mer-Mon Elect.	215-672-5565
Tex	Dallas, Airep Elect.	214-363-5291
Wash	Seattle, Dewar Assoc.	206-763-2233
FOR: Can.,	Montreal, Radionics	514-735-4565

TEXTTOOL PRODUCTS, INC., 1410 W. Pioneer Dr., Irving,
 Tex., 75061, Tel: 214-259-2676; Empl.: 140

Customer service: R. White

Free literature available: Catalog featuring Price and
 Technical Information on our Standard Line of
 Test Sockets.

Products manufactured: Graphite Parts, Services,
 Assembly, Production & Test, Socket Adapters,
 Sockets

Local Sales Offices & Reps.

Ala	Huntsville, Tech Rep.	
Ariz	Scottsdale, Hagestad & Co.	602-945-0902

Cal	Cupertino, Bogen & Assoc.	408-257-4461
Cal	Pasadena, Mulvin & Co.	213-682-2737
Fla	Indian Rocks Beach, Tech Rep.	813-595-2834
Fla	Largo, Tech Rep.	
Ill	Chicago, DJM Elctn. Sls.	312-774-6525
NJ	Verona, C.K. Wall Co.	201-746-4832
Wash	Seattle, B. Hirsh	206-783-3423

THALNER ELECTRONIC LABS, INC., 7235 Jackson Rd.,
 Ann Arbor, Mich., 48103, Tel: 313-761-4506

Customer service: R. Thalner

Free literature available: Data sheets provide
 complete description & specifications for Model
 VC-405 Video Frame Counter/Timer, Model 310
 Video/Pulse Distribution Amplifier, Model SS-221
 Video Screen Splitter and Model 110 Audio
 Program/Intercom.

Products manufactured: Amplifiers, Television
 Systems & Equipment Closed-Circuit

THERM-O-DISC, INC., South Main St., Mansfield, Ohio,
 44907, Tel: 419-756-5911; Empl.: 1200; Minimum order:
 \$150

For info on price: R. Massa; Application info: R.
 Massa; Customer service: W. Lomax; Delivery info:
 W. Lomax

Products manufactured: Controls/Control Eqpt.,
 Fuses, Relays, Switches, Thermostats, Timers

THERM-O-LAB CORP., 6940 Farndale Ave., N.
 Hollywood, Calif., 91605, Tel: 213-875-0105; Empl.: 30;
 Minimum order: \$50

For info on price: R. L. Weible; Application info: A. R.
 Booker; Customer service: D. McBride; Delivery info:
 D. McBride

Free literature available: Complete catalogs
 describing information on applications of custom
 heating elements. Technical data on thermal
 studies.

Products manufactured: Heaters & Heating
 Elements

Local Sales Offices & Reps.

Ariz	Phoenix, Howe & Howe Sls.	
Cal	Los Altos, Westec Elctns.	
Cal	Denver, Electronic Sls.	
Ill	Chicago, Ash Equip. Co.	
Kans	Prairie Village, Engineering Svcs. Co.	
Minn	Lakeville, Caco Co.	
Mo	St. Louis, Engineering Svcs. Co.	
NY	Queens Village, L. A. Buscaglia	
Ohio	Dayton, E. V. Swenson	
Pa	Media, W. Reeves Assocs.	
FOR: Can.,	Ville La Salle, Que., Electodesign Ltd.	

THERMALLOY, INC., 2021 W. Valley View, Dallas, Tex,
 75234, Tel: 214-243-4321, TWX: 910-860-5542; Empl.:
 250; Minimum order: \$50 p. 1-874-1880

For info on price: P. Clayton; Application info: J.
 Pritchett; Customer service: P. Clayton; Delivery info:
 P. Clayton

Free literature available: Semiconductor Mounting
 Pads, Compact Cooling Packages for the
 Electronics Industry, Insulators & Mounting Kits
 for Semiconductor Devices, Heat Sinks for
 Semiconductor Devices, Guides, Pullers, Ejectors
 for PC Boards, Cool It With Thermalloy, Inc. High
 Power Coolers.

Products manufactured: Adhesives (All Types),
 Bushings, Glass, Plastic, Metal, Rubber, Etc.,
 Clamps & Clips, Compounds, Encapsulating,
 Insulating, Molding, Potting, Covers, Protective
 (Including Dust), Heat Exchangers & Systems,
 Insulators & Insulation, Pads, Transistor Mounting,
 Pullers, Sockets, Transistor, Diode, Thyristor Heat
 Dissipators

Local Sales Offices & Reps.

Ala	Huntsville, Interep Assoc.	205-881-3677
Ariz	Scottsdale, Q.T. Wiles & Assoc.	602-948-5590
Cal	Los Angeles, Q.T. Wiles & Assoc.	213-478-0183
Cal	Menlo Park, Straube Assocs.	415-323-2476
Cal	San Diego, Q.T. Wiles & Assoc.	714-565-6893
Cal	Tustin, Q.T. Wiles & Assoc.	714-832-4952
Cal	Denver, Lindberg	303-758-9033
Fla	Clearwater, Dyne-A-Mark	813-441-4702
Fla	Ft. Lauderdale, Dyne-A-Mark	305-771-6501
Fla	Orlando, Dyne-A-Mark	305-299-6303
Ga	Atlanta, Interp Assoc.	404-394-7756
Ill	Elk Grove Village, John G. Twist Co.	312-593-0200
Ind	Ft. Wayne, R.O. Whitesell & Assoc.	219-432-5591
Ind	Indianapolis, R.O. Whitesell & Assoc.	317-359-9283
Ind	Kokomo, R.O. Whitesell & Assoc.	317-452-6065
Iowa	Cedar Rapids, Palatine Sls.	319-365-8071

Kans	Andover, Palatine Sls.	316-683-7512
Kans	Overland Park, Palatine Sls.	913-262-5643
Ky	Louisville, R.O. Whitesell & Assoc.	502-893-7303
Md	Bethesda, W. Mount Co.	301-657-9312
Mass	Andover, Sls. Engrg. Co.	617-470-0800
Mich	Grand Rapids, R.O. Whitesell & Assoc.	616-451-8901

Mich	Southfield, R.O. Whitesell & Assoc.	313-358-2020
------	-------------------------------------	--------------

Mich	St. Joseph, R.O. Whitesell & Assoc.	616-983-7337
------	-------------------------------------	--------------

Minn	St. Paul, Northport Engrg.	612-698-3841
------	----------------------------	--------------

Mo	St. Louis, Palatine Sls., Inc.	314-426-7055
----	--------------------------------	--------------

NJ	Springfield, F.F. Sylvester & Assoc.	201-376-3324
----	--------------------------------------	--------------

NM	Albuquerque, Lindberg Co.	505-345-2489
----	---------------------------	--------------

NY	No. Syracuse, Advanced Comps. Corp.	315-699-2671
----	-------------------------------------	--------------

NC	Charlotte, Over & Over, Inc.	704-527-3070
----	------------------------------	--------------

Ohio	Cincinnati, R.O. Whitesell & Assoc.	513-521-2290
------	-------------------------------------	--------------

Ohio	Columbus, R.O. Whitesell & Assoc.	614-888-9396
------	-----------------------------------	--------------

Ohio	Dayton, R.O. Whitesell & Assoc.	513-298-9546
------	---------------------------------	--------------

Ohio	Lakewood, R.O. Whitesell & Assoc.	216-228-7525
------	-----------------------------------	--------------

Okla	Tulsa, Carter Assoc.	918-749-3311
------	----------------------	--------------

Pa	Jenkintown, Warren Mount Co.	215-886-0383
----	------------------------------	--------------

Pa	Pittsburgh, R.O. Whitesell & Assoc.	412-344-7277
----	-------------------------------------	--------------

Pa	York, Warren Mount Co.	717-757-5823
----	------------------------	--------------

Tenn	Bristol, Rakes Engrg. & Mktg. Corp.	615-968-4195
------	-------------------------------------	--------------

Tex	El Paso, Carter Assoc.	915-533-2681
-----	------------------------	--------------

Tex	Garland, Carter Assoc.	214-276-7151
-----	------------------------	--------------

Tex	Houston, Carter Assoc.	713-621-6930
-----	------------------------	--------------

Tex	Salt Lake City, Lindberg Co.	801-364-6409
-----	------------------------------	--------------

Wisc	Wauwatosa, John G. Twist Co.	414-475-7755
------	------------------------------	--------------

FOR: Can.,	Malton, Ont, Deskin Sls. Corp.	416-677-5517
------------	--------------------------------	--------------

FOR: Can.,	Vancouver, Deskin Sls. Corp.	604-324-6331
------------	------------------------------	--------------

FOR: Can.,	Montreal, Deskin Sls. Corp.	514-331-2860
------------	-----------------------------	--------------

Local Distributors

Ala	Huntsville, Hall-Mark Elctns., 2010 Bob Wallace	
-----	---	--

Ariz	Phoenix, R. V. Weatherford, 1917 N. 25th Dr.	602-272-7144
------	--	--------------

Ariz	Tempe, G. S. Marshall, 835 W. 22nd St.	602-968-6181
------	--	--------------

Cal	Anaheim, R. V. Weatherford, 1550 Babbitt Ave.	714-547-0891
-----	---	--------------

Cal	El Monte, G. S. Marshall, 9674 Telstar Ave.	213-686-0141
-----	---	--------------

Cal	El Segundo, T. I. Supp., 831 S. Douglas St.	
-----	---	--

Cal	Glendale, R. V. Weatherford, 6921 San Fernando	213-849-3451
-----	--	--------------

Cal	Irvine, G. S. Marshall, 17975 Sky Park Blvd.	714-566-6400
-----	--	--------------

Cal	Palo Alto, R. V. Weatherford, 3240 Hillview Ave.	415-321-5373
-----	--	--------------

Cal	Pomona, R. V. Weatherford, 1095 E. 3rd St.	714-623-1261
-----	--	--------------

Cal	San Diego, G. S. Marshall, 8057 Raytheon Rd.	714-278-6350
-----	--	--------------

Cal	San Diego, Intermark Elctns., 7354 Convey Ct.	714-279-5200
-----	---	--------------

Cal	San Diego, R. V. Weatherford, 7872 Raytheon	714-278-7400
-----	---	--------------

Cal	Santa Ana, Intermark Elctns., 2920 W. Warner	714-540-1322
-----	--	--------------

Cal	Sunnyvale, G. S. Marshall, 788 Palomar Ave.	408-732-1100
-----	---	--------------

Cal	Sunnyvale, Intermark Elctns., 1020 Stewart Dr.,	
-----	---	--

Cal	Box 9085	408-738-1111
-----	----------	--------------

Cal	Arvada, G. S. Marshall, 5633 Kendall Ct.	303-423-9670
-----	--	--------------

Cal	Denver, Intermark Elctns., 2600 W. Second St.	303-936-8284
-----	---	--------------

Cal	Denver, T. I. Supp., 2149 S. Holly St.	303-757-7671
-----	--	--------------

Cal	Englewood, R. V. Weatherford, 3905 S Mariposa	303-761-5431
-----	---	--------------

Conn	Fairfield, U-TRONICS, 273 Linwood Ave.	203-255-4521
------	--	--------------

Conn	Waterbury, Suburban Supp., 117 Benedict, Box	
------	--	--

Conn	230	203-757-1251
------	-----	--------------

Fla	Ft. Lauderdale, Hall-Mark Elctns., 1302 W.	
-----	--	--

Fla	McNab Rd.	305-971-9280
-----	-----------	--------------

Fla	Orlando, Hall-Mark Elctns., 7233 Lake Ellenor	
-----	---	--

Fla	Dr.	305-855-4020
-----	-----	--------------

Ga	Atlanta, Lykes Elctns., Box 19837	404-355-2223
----	-----------------------------------	--------------

Ill	Arlington Heights, T. I. Supp., 2420 E. Oakton	
-----	--	--

Ill	Rd.	312-593-7660
-----	-----	--------------

Ill	Chicago, Semiconductor Specialists, Box 66125,	
-----	--	--

Ill	O'Hare Intl. Airport	312-279-1000
-----	----------------------	--------------

III	Elgin, Allied Elctns., 1355 S Hollow Rd. 312-697-8200
III	Elk Grove, Hall-Mark Elctns, 180 Crossen Ave. 312-437-8800
Ind	Evansville, Hutch & Son, 300 N. Main St. 812-425-7155
Ind	Ft. Wayne, Fort Wayne Elctns. Sup., 3606 Maumee Ave. 219-423-3422
Ind	Indianapolis, Harvey Indiana, 8505 Zionsville Rd. 317-297-4910
Kans	Lenexa, Hall-Mark Elctns., 9006 Rosehill Rd. 913-888-4747
Md	Baltimore, Hall-Mark Elctns., 6660 Security Blvd. 301-265-8500
Md	Baltimore, Radio Elec. Serv. Co. of Balt., 1026 Cromwell Bridge Rd. 301-823-0070
Md	Rockville, Pioneer Washington Elctns., 1037 Taft St. 301-424-3300
Mass	Boston, Demambro Elctns., 1095 Commonwealth Ave. 617-787-1200
Mass	Dedham, Gerber Elctns., 852 Providence Hwy., U.S. Rte. #1 617-329-2400
Mich	Farmington, Harvey/Michigan, 23461 Ind. Pk. Rd. 313-477-1650
Minn	Bloomington, Hall-Mark Elctns., 9201 Penn Ave. S., Suite 10 612-884-9056
Minn	Edina, Harvey-Minnesota, 6969 Washington Ave., S. 612-941-6060
Minn	Minneapolis, Stark Elctns. Sup., 112 Third Ave. N. 612-332-1325
Mo	Earth City, Hall-Mark Elctns., 13789 Rider Trail 314-291-5350
Mo	University City, Olive Ind Elctns., 6662 Olive Blvd. 314-663-7800
Mo	University City, Olive Ind Elctns., 6662 Olive Blvd. 314-663-7800
NJ	Cinnaminson, Wilshire Elctns., 855 Ind. Hwy. 609-786-8990
NJ	Clark, T. I. Supp., 301 Central Ave. 201-382-6400
NJ	Clifton, Wilshire Elctns., 312 Clifton Ave. 201-365-2600
NJ	Moorestown, Arrow Angus, Pleasant Valley Ave. Box 126 609-235-1900
NM	Albuquerque, R. V. Weatherford, 6101 Marble Ave., N.E. 505-265-5671
NY	Binghamton, Harvey Elctns., Box 1208 Vestel Pkwy E. 607-748-8211
NY	Bohemia, Car-Lac Elctn. Ind. Sls., 75 Orville Dr. 516-567-4200
NY	Buffalo, Summit Distr., 916 Main St. 716-884-3450
NY	Farmingdale, Norelcom Elctns., 200 Allen Blvd. 516-249-7262
NY	Farmingdale, Wilshire Elctns., 1855 New Highway, Unit B 516-293-5775
NY	Rochester, Rochester Radio Supp., 140 W. Main St. 716-454-7800
NY	Rochester, Summit Elctns of Rochester, 292 Commerce Dr. 716-334-8110
NC	Greensboro, Hammond Elctns. of Carolina, 2923 Pacific Ave. 919-275-6391
NC	Raleigh, Hall-Mark Elctns., 3000 Ind. Dr. 919-832-4465
Ohio	Cleveland, Elctns. Mktg., 1890 Brompton Dr. 216-292-6236
Ohio	Cleveland, W. M. Pattison Supp., 4550 Willow Pkwy., Box 6178 216-441-3000
Ohio	Columbus, Elctns. Mktg., 1150 W. Third Ave. 614-299-4161
Ohio	Dayton, Elctns. Mktg., 2400 E. Dorothy La. En-1140
Ohio	Dayton, ESCO, 221 Crane St. 513-226-1133
Ohio	Twinsburgh, Elctns Mktg., 946 Concord Cir. 216-425-2942
Ohio	Westerville, Elctns. Mktg., 154 Brisbane Ave. 614-866-3493
Okla	Tulsa, Hall-Mark Elctns., 4846 S. 83rd E. Ave. 918-835-8458
Okla	Tulsa, Radio, Inc., 1000 S. Main 918-587-9123
Okla	Tulsa, T. I. Supp., Drawer T, Admiral Sta. 918-437-4555
Pa	Pittsburgh, Cameradio Elctns., 2801 Liberty Ave. 412-288-2600
SC	Greenville, Hammond Elctns of Carolina, 100 Augusta St., Box 2308 803-233-4121
Tenn	Kingsport, Radio Elec. Supp., 961 East Sullivan St. 615-247-8111
Tenn	Nashville, Electra Dist., 1914 W. End Ave. 615-329-3971
Tex	Dallas, Hall-Mark Elctns., 9333 Forest La. 214-231-6111
Tex	Dallas, R. V. Weatherford, 10836 Grissom La. 214-243-1571
Tex	Dallas, T. I. Supp., 6000 Denton Dr. 214-238-6821
Tex	Ft. Worth, Allied Elctns., 401 E. 8th St. 817-336-5401

Tex	Houston, Hall-Mark Elctns., 8000 Westglan 713-781-6100
Tex	Houston, R. V. Weatherford, 3500 W. T.C. Jester Blvd.
Tex	Houston, T. I. Supp., 3939 Ann Arbor Dr. 713-758-4800
Utah	Salt Lake City, Intermark Elctns., 63 E. Stratford Ave. 801-486-3411
Wash	Seattle, Intermark Elctns., 621 S. Michigan St. 206-767-3160
Wash	Seattle, R. V. Weatherford, 541 Industry 206-762-4200
Wash	Seattle, Radar Elec., 168 Western Ave. W. 206-282-2511
Wisc	Maquon, Taylor Elec., 1000 W. Dongs Bay Rd. 414-241-4321
Wisc	Milwaukee, Hall-Mark Elctns., 11925 W. Ripley Ave. 414-476-1270
For:	Can. Montreal, Que., Deskin Sls., 290 Benjamin Hudon St. 514-331-2860
For:	Can., Malton, Ont., Deskin Sls., 2759 Thamesgate Dr. 416-677-5517
For:	Can., Vancouver, B.C., Deskin Sls., 272 S.W. Marine Dr. 604-324-6331

THERMAX WIRE CORP., 32-02 Linden Pl., Flushing, N.Y.,
11354, Tel: 212-939-8300, TWX: 710-582-2551; Empl.:
160

Customer service: J. Spinella

Products manufactured: Braid, Cable, Cable, Wire

Local Sales Offices & Reps.

Ala	Huntsville, G. White Assocs. 804-846-4624
Ariz	Phoenix, South West Engrg. 602-993-0250
Cal	Mtn. View, Sonic Wire Sls. 415-965-4646
Cal	Van Nuys, Sonic Wire Sls. 213-781-3490
Colo	Denver, West Mark Assocs. 303-433-7181
Fla	Pompano Beach, Varrelman-Gorman Co. 305-941-5544
Fla	Winter Park, Varrelman-Gorman Co. 305-425-1611
Ill	Chicago, Dearborn Wire Co. 312-696-1000
Md	Glen Arm, Glen White Assocs. 301-252-5610
Mass	Clinton, F. J. Coleman Co. 617-894-1858
Mich	Grand Rapids, Thies Assocs. 616-245-0319
Mich	Jenison, Thies Assocs. 616-245-0319
Minn	Edina, Wagner Components 612-941-6310
Mo	St. Chas., Finnigan Wire & Cable 314-724-6690
NJ	Boonton, Varrelman-Gorman Co. 201-838-3272
NJ	Dover, V & G Co. 201-992-2505
NJ	Livingston, Varrelman-Gorman Co. 201-992-2505
NY	Camellus, Varrelman-Gorman Co. 315-458-4774
NY	Centerport, Varrelman-Gorman Co. 212-IN3-5000
NC	Raleigh, G. White Assoc. 919-876-5617
Ohio	Cincinnati, A.C. Wahl Co. 513-821-3270
Tenn	Johnson City, G. White Assoc. 615-928-0184
Tex	Dallas, United Components 214-324-1448
Va	Lynchburg, G. White Assoc. 804-846-4624
Wash	Bellevue, Rayover Sls. 206-454-4551

THERMO ELEC. CO., INC., 109 Fifth St., Saddle Brook,
N.J., 07662, Tel: 201-843-5800, TWX: 710-990-5108;
Empl.: 350

For info on price: J. Adamo; Application info: Local
Office; Customer service: J. Adamo; Delivery info: J.
Adamo

Free literature available: Complete looseleaf binder
type catalog, Individual catalog section for each
product

Products manufactured: Cable, Connectors,
Controls/Control Eqpt., Gages, Indicators, Meters,
Monitors, Probes, Pyrometers, Switches,
Thermocouples, Elements & Accessories,
Transducers, Wire

Local Sales Offices & Reps.

Cal	North Hollywood, Thermo Elec. 213-765-5276
Cal	San Francisco, Thermo Elec. 415-654-8290
Colo	Denver, Ross Equipment Co. 303-759-4215
Ga	Atlanta, Thermo Elec. 404-633-9584
Ill	Hinsdale, Thermo Elec. 312-325-2840
Ind	Indianapolis, Thermo Elec. Enterprise 9508
Ky	Louisville, Thermo Elec. Enterprise 9510
La	Baton Rouge, Alford, Woods & Childs 504-275-5480
Md	Baltimore, Arobone & Cline 215-248-1243
Mass	Norwood, Thermo Elec. 617-769-2370
Mich	Detroit, Thermo Electric 216-433-4510
Minn	Minneapolis, Thermo Elec. Zenith 9510
Mo	Kansas City, Thermo Elec. 214-352-7778
Mo	St. Louis, Thermo Elec. Enterprise 9510
NJ	Fair Lawn, Thermo Elec. 201-791-9683
NY	New York, Thermo Elec. 212-564-2560
NY	Rochester, Thermo Elec. 716-377-4632
Ohio	Cincinnati, Thermo Elec. Enterprise 9510

Ohio	Cleveland, Thermo Elec. 216-433-4510
Ohio	Columbus, Thermo Elec. Enterprise 9510
Pa	Philadelphia, Arobone & Cline 215-248-1243
Pa	Pittsburgh, Thermo Elec. 216-433-4510
Tex	Dallas, Thermo Elec. 214-352-7778
Tex	Houston, Thermo Elec. 713-644-5466
Va	Richmond, Arobone & Cline 703-643-7373
WVa	Charleston, Process Instr. Equip. Co. 304-344-2237
Wash	Bellevue, Antec Corp. 206-232-1094
WVa	Charleston, Thermo Elec., Enterprise 0875
FOR:	Can., Brampton, Ont., Thermo Elec. Ltd. 416-451-0813
FOR:	Can., Montreal, Que., Thermo Elec. Ltd. 514-331-2032
FOR:	Can., New Brunswick, NS, Thermo Elec. Ltd. 514-747-7511
FOR:	Can., Saskatchewan, Alb., Thermo Elec. Ltd. 403-252-4222
FOR:	Can., Toronto, Ont., Thermo Elec. Ltd. 416-451-0813
FOR:	Can., Vancouver, BC, Northern Columbia Process Equip. Ltd. 604-987-7194
FOR:	Can., Winnipeg, Manitoba, R. E. Sparrow Ltd. 204-786-5698

THERMO SYS., INC., 2500 Cleveland Ave., N., St. Paul,
Minn., 55113, Tel: 612-633-0550, Telex: 297482; Empl.:
50

Customer service: F. L. Paul

Free literature available: General Anemometry
Catalog - This 100 page edition describes
Thermo-Systems' complete velocity and
temperature measurement products and
applications in three indexed sections.

Products manufactured: Counters, Meters, Signal
Conditioners & Equipment, Transducers

Local Sales Offices & Reps.

Ala	Huntsville, Craft Assoc. 205-837-0221
Cal	San Marino, Dale-Dahl Assocs. 213-682-3417
Cal	Walnut Creek, Dale-Dahl Assocs. 415-933-9595
Colo	Parker, Technology Mktg. Assoc. 303-841-3435
Fla	Maitland, Craft Assoc. Co. 305-645-2242
Ga	Atlanta, Craft Assoc. Co. 404-393-0400
Kans	Prairie Village, Engrg. Serv. Co. 913-649-4000
Md	Fulton, Gans-Fryling 301-837-6311
Mich	Farmington, Carter, McCormick & Peirce 313-477-7700
Mo	St. Louis, Engrg. Serv. Co. 314-997-1515
NJ	Ringwood, Thermo-Systems 201-839-0720
NM	Albuquerque, Technology Mktg. Assoc. 505-298-4321
Ohio	Dayton, Instrumentation Sys. 513-294-2838
Ore	Portland, McLaren 503-297-2248
Pa	Pittsburgh, Instrumentation Sys. 412-243-1111
Tex	Houston, Roger Martin Assoc. 713-462-4077
Va	Arlington, Gans-Fryling 703-527-3262
Wash	Bellevue, McLaren 206-454-3400

THERMOELECTRICS, See Borg-Warner Thermoelectrics.

Free literature available: Transit cases, re-usable
shipping containers Thermodyne capabilities and
products

Products manufactured: Cabinets & Accessories,
Cases, Transit, Containers

THERMOMETRICS, INC., 15 Jean Pl., Edison, N.J., 08817,
Tel: 201-548-2299; Empl.: 30

Products manufactured: Bridges, Controls/Control
Eqpt., Detectors, Thermistors, Transducers

THERMOTECH, See ITT Thermotech.

THETA INSTR. CORP., 24 Dwight Pl., Fairfield, N.J.,
07006, Tel: 201-227-1700; Empl.: 85

Products manufactured: Alarms, Amplifiers,
Analyzers, Bridges, Calibrators, Comm. Systems,
Comparators, Computers, Controls/Control Eqpt.,
Converters, Counters, Couplings, Data Acquisition
& Reduction Systems, Data Loggers, Decoders,
Demodulators, Detectors, Dials, Display
Devices/Displays, Drivers & Decoders For
Readouts, Drives & Drive Mechanisms (Dial),
Encoders, Generators, Indicators, Meters,
Modulators, All Kinds, Modules, Logic,
Encapsulated, Multiplexers, Networks, Repeaters,
Servo, Scales, Dial, Servo Systems, Shifters,
Standards, Testers, Totalizers, Digital,
Transducers, Translators, Data, Transmission
Systems, Data

Local Sales Offices & Reps.

Cal	Encino, King-Way Assocs. 213-788-4124
Cal	Chagrin Falls, Kilroy Corp. 216-247-8997
Ore	Portland, J.N. Kuvallis Co. 503-284-6808

THIN FILM SERVICES, Box 188, Gile, Wisc., 54525, Tel: 715-561-2031; Empl.: 3; Minimum order: \$150

Customer service: R. G. Ahonen

Free literature available: Folder describing services available at Thin Film Services.

Products manufactured: Circuits, Hybrid, Thin-Film, Coatings, Deposition Equipment, Vacuum & Accessories, Films, Services, Assembly, Production & Test

THINCO, INC., Davisville Rd., Hatboro, Pa., 19040, Tel: 215-675-5000, TWX: 510-665-6822

For info on price: J. L. Hull; Application info: T. Jennings; Customer service: J. L. Hull; Delivery info: J. L. Hull

Free literature available: Data sheets describing specifications of vacuum-deposited chip capacitors and inductors.

Products manufactured: Capacitors, Fixed, Coils Including Assemblies & Forms, Filters, Networks

THOMAS & BETTS CO., 36 Butler St., Elizabeth, N.J., 07206, Tel: 201-354-4321, TWX: 201-354-6621; FSC No: 59730; Empl.: 2000

For info on price: A. Beiswinger; Customer service: R. Nehring

Products manufactured: Boxes, Junction, Outlets & Wall Plates, Cable Assemblies & Harnesses, Caps, Connector, Clamps & Clips, Coatings, Connectors, Heat Guns, Production, Kits, Terminal, Labels, Pressure-Sensitive, Adhesive, Meters, Plugs, Posts, Reels, Cord & Cable, Splicers, Coaxial Cable, Splices, wire (Including, Butt & Cap Types), Strain Reliefs, Cable & Wire, Strips, Terminal Blocks, Boards & Strips, Terminals, Testers, Tools, Tubing, Wrenches

Local Sales Offices & Reps.

Ariz Phoenix, Thomas & Betts Co. 602-258-1823
Cal Los Angeles, Thomas & Betts Co. 213-268-3191
Cal Santa Clara, Thomas & Betts Co. 408-243-7827
Colo Denver, I.W. Strong & Assoc. 303-292-6900
Ga Atlanta, Thomas & Betts Co. 404-355-6260
Ill Arlington Heights, Thomas & Betts Co. 312-439-3100
Mass Braintree, Thomas & Betts Co. 617-843-0373
Mich Keego Harbor, The Thomas & Betts Co. 313-682-2711
Minn Minneapolis, Thomas & Betts Co. 612-333-2419
Mo St. Louis County, Thomas Betts 314-731-3338
NJ Elizabeth, Thomas & Betts Co. 201-352-2265
NJ Moorestown, Thomas & Betts Co. 609-234-0505

NY Chittenango, Thomas & Betts Co. 315-687-2051
NC Charlotte, Thomas & Betts Co. 704-525-5354
Ohio Cincinnati, Thomas & Betts Co. 513-271-6686
Ohio Cleveland, Thomas & Betts Co. 216-243-8123
Pa Philadelphia, Thomas & Betts Co. 215-934-5114
Tenn Memphis, Thomas & Betts Co. 901-365-4080
Tex Houston, Thomas & Betts Co. 713-461-0610
Va Richmond, Thomas & Betts Co. 703-272-1480

THOMAS ELCTRNS., INC., 100 Riverview Dr., Wayne, N.J., 07470, Tel: 201-696-5200, TWX: 710-988-5836; OPL No: 01852; Empl.: 230

For info on price: B. Setticas; Application info: B. Setticas; Customer service: B. Houghton; Delivery info: B. Houghton

Products manufactured: Tubes

Local Sales Offices & Reps.

Cal Los Altos, Cain-White & Co. 415-948-6533
Cal Pasadena, A-F Sls. Engrg., Inc. 213-681-5631
Colo Wheatridge, Waugaman Assocs., Inc. 303-423-1020
Md Hyattsville, Eastern Comps. 301-577-2925
Mass Norwood, Stan Pierce, Inc. 617-762-3164
Okla Broken Arrow, P. J. Scanlon Co. 405-231-4661
Pa Flourtown, Eastern Comps. 215-836-1616
Tex Richardson, P. J. Scanlon Co. 214-231-4661
Exp: Fairfield, N.J., Pantronics, Inc. 201-575-1177
Exp: Teaneck, N.J., Sylvan Ginsbury 201-837-1100
For: Can., Montreal, Specialty Elctrns., Inc. 514-336-4500
FOR: Can., Ont., Mississauga, Specialty Elctrns. 416-678-2104

THOMAS & SKINNER, INC., Box 150-B, 1120 E. 23rd St., Indpls., Ind., 46206, Tel: 317-923-2501, Telex: 027-335; Empl.: 200; Minimum order: \$25

p. 1-818,819

Customer service: G. J. Cunningham

Free literature available: Thomas & Skinner, Inc. Manufactures Permanent Magnets, Transformer Laminations, and Magnetic Instrumentation for the magnetization, measurement, stabilization and/or testing of magnets.

Products manufactured: Analyzers, Calibrators, Cores, Magnetic, Demagnetizers, Hysteresisgraphs, Indicators, Laminations, Magnetizers, Magnets, Meters, Services, Assembly, Production & Test, Testers

Local Sales Offices & Reps.

Cal Los Angeles, T. & Skinner, Inc. 213-532-0960
Cal Mt. View, Melchior-Wesley Assocs. 415-964-2321
Ill Chicago, T. & Skinner, Inc. 312-743-5511
Ind Indianapolis, Thomas & Skinner, Inc. 317-923-2501
NH Londonderry, R.H. Davis 603-432-7858
NJ Rahway, T. & Skinner, Inc. 201-574-0550
Ore Portland, C.K. Shanks & Assocs. 503-292-5656
FOR: Scarborough, Ont., Can., Paisley Products of Can. Ltd. 416-755-2216

THOMSON-CSF ELECTRON TUBES INC., 50 Rockefeller Plaza, New York, N.Y., 10020, Tel: 212-489-0400; Empl.: 7

Products manufactured: Tubes

THOR ELCTRNS. CORP., 741 Livingston St., Elizabeth, N.J., 07207, Tel: 201-354-2420; Empl.: 15; Minimum order: \$10

For info on price: A. Crudele; Customer service: D. Bowen; Delivery info: D. Bowen

Free literature available: Catalogs on electronic tube, diodes, transistors.

Products manufactured: Diodes, Integrated Circuit Devices, IC's, Active Filters, Rectifiers, Resistors, Transistors, Tubes

THORDARSON MEISSNER, Electronic Ctr., Mt. Carmel, Ill., 62863, Tel: 618-262-5121, TWX: 510-525-2254; FSC No: 96256; Empl.: 600

Customer service: Ind. Sls.

Free literature available: Pocket Industrial/Military Catalog; Switch & Timer Catalog; Switch & Timer Brochure; Fine Wire Tensioning Device Brochure

Products manufactured: Chokes, Coils Including Assemblies & Forms, Reactors, Switches, Timers, Transformers, Yokes

Local Sales Offices & Reps.

Cal Encino, King-Way Assocs. 213-788-4124
Fla North Miami, Winfield Elctn. Sls. Co. 305-945-6544
Mass Needham, Mullin Tech. Sls. Co. 617-444-4780
Mich Dearborn, Pitcher-Poulin 313-725-4999
NJ Cherry Hills, Trinkle Sales Inc. 609-795-4200
NY N. Syracuse, L.D. Allen, Inc. 315-458-7470
Ohio Cleveland, Imtech, Inc. 216-826-3400
Tex Dallas, J. McKinney Sls. 214-631-9450
EXP: Miami, Fla., Louis D. Cohen Cia 305-635-8670

3M COMPANY, Electronic Products Div., 3M Center, St. Paul, Minn., 55101, Tel: 612-733-1452

p. 2-1034-1055

Products manufactured: Backpanel Interconnect Systems, Cable Assemblies & Harnesses, Cable, Chemicals, Circuits, Flexible, Clamps & Clips, Coatings, Connectors, Echantans, Printed Circuit, Fasteners, Integrated Circuit Packaging Systems, Jumpers, Laminates, Packages, Integrated Circuit, Pliers, Sockets, Strip-Line Components, Microwave, Substrates, Tools, Wire, Wire & Cable Ties

Local Sales Offices & Reps.

Alas Anchorage 907-279-6481
Cal Los Angeles 213-726-1511
Cal So. San Francisco 415-761-1155
Ga Atlanta 404-451-1661
Haw Honolulu 808-841-0147
Ill Chicago 312-585-7800
Mass Boston 617-449-0300
Mich Detroit 313-477-5000
Minn St. Paul 612-733-5960
Mo St. Louis 314-991-1320
NJ West Caldwell 201-227-9100
NY Buffalo 716-894-5214
NC High Point 919-883-0141
Ohio Cincinnati 513-242-2313
Ohio Cleveland 216-267-1800
Pa Philadelphia 215-742-0200
Tex Dallas 214-327-7311
Wash Seattle 206-244-7200

Local Distributors

Ala Huntsville, Powell Elctrns. Inc., 803 Oster Dr. Box 1095 205-539-2731
Cal Mt. View, Powell Elctrns. Inc., 411 Fairchild Dr. 415-964-0820
Cal Mt. View, Ratel Elctrns., 815 Maude Ave. 415-965-2010

Cal San Diego, Richey Elctrns., 5258 Kearny Villa 714-565-4444

Cal Sun Valley, Richey Elctrns., 10871 La Tuna Canyon Rd. 213-875-2862

Colo Denver, B-5, Inc., 7100 Broadway, Bldg. 3-1 303-426-0222

Conn Hamden, Impact Sales Co., 60 Connelly Pkwy. Bldg. #2 Rm. 8 203-281-1331

Fla Miami Springs, Powell Elctrns., Inc., 1744 N.W. 69th Ave., Box 660514 305-592-3260

Ill Chicago, Prehler Electric, 2300 N. Kilbourn 312-384-6100

Ill Mt. Prospect, Magnuson Elctrns., 2420 Oakton St. Box 130 312-956-0700

Ind Indianapolis, Sheridan Assocs., 4002 Meadows Dr. 317-547-7777

Iowa Des Moines, Beams, Inc., 2428 Welbeck Rd. 515-279-3015

Kans Overland Park, Sheridan Assocs., 10100 Santa Fe Dr. Mark I Bldg., Suite 101 913-383-1636

Md Beltsville, Powell Elctrns., Inc., 10728 Hanna St. 301-937-4030

Md Gaithersburg, Deanco, Inc., 16879 Oakmont Ave. 301-948-5444

Mass Waltham, Impact Sales Co., 223 Crescent St. 617-893-2850

Mich Farmington, Sheridan Assocs., Box 529 24543 Indoplex Dr. 313-477-3800

Minn St. Paul, Ragon Elctrns., Inc., 1136 W. Larpenteur Ave. 612-488-0201

Mo Florissant, Sheridan Assocs., Box 677 314-837-5200

NJ Parsippany, Deanco, Inc., 146 A Parsippany Rd. 201-386-1300

NY Farmingdale, D.R.W. Electronics, 100 Milbar Blvd. 516-249-2660

NY Ithaca, Deanco, Inc., 714 W. Clinton St. 607-272-2198

NC Raleigh, Deanco, Inc., Roger Executive Center 3301 Women's Club Dr. Suite 146 919-782-9226

Ohio Beachwood, Sheridan Assocs., Inc., 23224 Commerce Park Rd. 216-831-0130

Ohio Cincinnati, Sheridan Assocs., Box 37826 513-761-5432

Ohio Cleveland, Prehler Electric, 12200 Brookpark Rd. 216-267-2650

Ohio Columbus, Electronic Mktg. Corp., 1150 W. Third Ave. 614-299-4161

Ohio Dayton, Sheridan Assocs., Inc., Box 423 Suite 250 - Shiloh Bldg. 5045 N. Main St. 513-277-8911

Okla Tulsa, Norvell Elctrns., Inc., 3340 S. Memorial Dr. 918-663-1247

Pa Philadelphia, Powell Elctrns., Inc., S. Island Rd. Box 8765 215-365-1900

Pa Pittsburgh, Sheridan Assocs., 1717 Penn Ave. - Suite 5009 412-244-1640

Tex Dallas, Norvell Elctrns., Inc., 10210 Monroe 214-350-6771

Tex Dallas, Powell Elctrns., Inc., 2860 Walnut Hill Lane, Suite 105 214-350-4186

Tex Houston, Norvell Elctrns., Inc., 6440 Hillcroft 713-774-2568

3M CO., Industrial Electrical Prods. Div., 3M Center, St. Paul, Minn., 55101, Tel: 612-733-0219; Empl.: 37000

Products manufactured: Adhesives (All Types), Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Controls/Control Eqpt., Films, Insulators & Insulation, Magnets, Semiconductor Wafer Fabrication, Shields, Tapes, Electrical Insulation, Tapes, Films & Foils, Pressure Sensitive, Tubing

Local Sales Offices & Reps.

Cal Los Angeles 213-726-1511
Cal S. San Francisco 415-761-1155
Ga Chamblee 404-451-1661
Ill Bedford Park 312-458-2200
Mass Needham Heights 617-449-0300
Minn St. Paul 612-733-1110
Mo St. Louis 314-991-1320
NJ Caldwell 201-227-9100
NY Buffalo 716-894-5214
NY New York 212-285-9600
NC High Point 919-883-0141
Ohio Cincinnati 513-242-2313
Ohio Cleveland 216-267-1800
Pa Philadelphia 215-742-0200
Tex Dallas 214-327-7311
Wash Seattle 206-244-7200

THWING-ALBERT INSTR. CO., 10960 Dutton Rd., Philadelphia, Pa., 19154, Tel: 215-NE 7-0100, TWX: 710 670 1763; Empl.: 50; Minimum order: \$20

For info on price: R. A. Solomon; Application info: T. J. Roache; Customer service: T. J. Roache; Delivery info: T. J. Roache

Products manufactured: Bridges, Cells, Load Indicators, Services, Assembly, Production & Test, Testers, Transducers

Local Sales Offices & Reps.

Cal Long Beach, Saber Enterprises 213-595-5646
 Cal San Francisco, LaFrance Entprs. 415-567-4488
 La New Orleans, Wm. S. Huey Co. 504-866-6341
 Ill Park Forest, F.L. Brooke Co. 312-479-2544
 Mass Lexington, W. R. Hatfield Assocs. 617-861-0201
 Minn Minneapolis, E. J. Doyle Co. 612-827-5847
 NY Rochester, Holter Assocs. 716-381-7988
 Ore Portland, Extech, Ltd. 503-292-9219
 Tex Houston, Whitson Sullivan Co. 713-645-1801
 Tex Plano, Whitson Engrg. Co. 214-423-5255

TIMBER-TOP, INC., 189E N. Main St., Freeport, N.Y., 11520, Tel: 516-FR 9-0850; Empl.: 5
 Customer service: W. E. Fischer

Products manufactured: Clamps & Clips

Advertisement

TTI's SYNCLAMPS are the ONLY quick-releasing, self-locking and INSTANT NULLING SYNCHROCLAMPS! Their INTEGRAL STOPS permit component mounting and nulling (techniques that can save 70% OR MORE of the mounting and nulling time!). SYNCLAMPS meet the MAXIMUM MIL SHOCK AND VIBRATION: 2000 ft-lbs/2000 cps! They also have the LOWEST INSTALLED COST of any type of clamp! A size and style for ANY size component and ANY application!!

TIMES WIRE & CABLE, Sub. INSILCO Corp., 358 Hall Ave., Wallingford, Conn., 06492, Tel: 203-265-2361, TWX: 710-476-0763; Empl.: 250

Products manufactured: Cable Assemblies & Harnesses, Cable, Connectors, Delay Lines, Wire

Local Sales Offices & Reps.

Ala Huntsville, 20th Century Mktg. 205-772-9237
 Ariz Scottsdale, Mercury Engrg. 602-945-1927
 Cal Mountain View, Westrep-North 415-968-5800
 Cal Pico Rivera, Westrep 213-949-2551
 Cal San Diego, Westrep 714-279-9412
 Colo Denver, Zeus, Inc. 303-771-6200
 Fla Altamonte Springs, WMM Assocs. 305-831-4645

Fla Clearwater, WMM Assocs. 813-726-8871
 Fla Pompano Beach, WMM Assocs. 305-943-3091
 Ill Chicago, Balhorn & Welch, Inc. 312-889-5011
 Kans Overland Pk., Penzner Mankus Assoc. 913-DU 1-0004

Kans Wichita, Penzner-Mankus Assoc. 316-264-2662
 Md Towson, J-H Elctn. Sls. 301-VA 5-4440
 Mass Clinton, F. J. Coleman & Co. 617-894-1855
 Mich Ferndale, Hilltronics 313-398-5556
 Mo Hazelwood, Penzner 314-731-4334
 NM Albuquerque, Zeus, Inc. 505-256-9831
 NY Syracuse, Electra Sls., Inc. 315-455-5783
 NC Charlotte, D. G. W., Inc. 704-334-7090
 NC Winston-Salem, D.G.W., Inc. 919-768-7166
 Ohio Cincinnati, Giesting Assocs. 513-931-0812
 Okla Okla. Cy., Ammon & Rizos 405-947-1051
 Okla Tulsa, Ammon & Rizos 918-663-8518
 Pa Flourtown, Precision Elctns. 215-MI 6-8383
 Tex Dallas, Ammon & Rizos 214-233-5591
 Tex Houston, Ammon & Rizos 713-PA 9-1233
 Utah Salt Lake City, Zeus, Inc. 801-486-2317
 Wash Seattle, Seatonics 206-767-4330
 EXP: N.Y., N.Y., Tennant & Sons 212-889-8530
 FOR: Can., Malton, Ont., A. Deskin Sls. Corp. 416-677-5517

FOR: Can., Vancouver, B.C., A. Deskin Sls. Corp. 604-253-6396
 FOR: Can., W. Montreal, Que., A. Deskin Sls. Corp. 514-384-1420

TITAN TOOL SUPPLY CO., INC., 68 Comet, Buffalo, N.Y., 14216, Tel: 716-873-9907; Empl.: 8; Minimum order: \$25

For info on price: D. Wise; Application info: T. Kahn; Customer service: T. Kahn; Delivery info: D. Wise

Free literature available: Catalog - All microscopes Catalog - Bulbs & lights

Products manufactured: Lamps, Microscopes

TITCHENER, E.H. & CO., 8 Titchener Pl., Binghamton, N.Y., 13902, Tel: 607-772-1161, TWX: 510-252-1985; Empl.: 235

Customer service: Sales Dept.

Free literature available: Product Design Ideas by Titchener & New Concepts in Wire Design by Titchener - both showing case histories & design concepts. WIRE-GRIP Circuit Board Puller sheet - shows two sizes of stock circuit board pullers available and a description of same.

Products manufactured: Antenna Towers & Supports, Antennas, Blowers & Fans & Accessories, Cabinets & Accessories, Carts & Dollies, Instrument & Equipment, Chassis, Circuit Board Mounting, Chassis, Metal, Forms, Wire, Frames, Cabinet & Rack, Grilles, Guides, Circuit Board, Handles For Cabinets, Circuit Boards, Racks, etc., Holders, Circuit Board (Production Type), Mounts, Pullers, Racks, Rings, Retaining, Services, Assembly, Production & Test, Soldering Accessories

Local Sales Offices & Reps.

Cal Huntington Beach, ASC Sls. Co. 714-847-7515
 Fla Winter Park, Young & Lawrence Assocs. 305-647-6929
 Ill Skokie, R.L. Matson 312-676-3650
 Mass Hudson, R.C. Morgan 617-935-6279
 Minn Burnsville, D. patrie Co. 612-890-6386
 NJ Cedar Grove, G.E. Lewis 201-773-1460
 NY Binghamton, F.J. Grashof 607-772-1161
 Ohio Cincinnati, L. Kenning 513-661-2278
 Ohio Cleveland Heights, W.M. Wehner 216-932-8383
 Pa Bluebell, J.J. Protevi 215-272-3325

TMC SYSTEMS (ARIZ.), INC., 930 West 23rd St., Tempe, Ariz., 85282, Tel: 602-967-7874, TWX: 910-950-1943; FSC No: 22929; Empl.: 65; Minimum order: \$50 p. 1-418,419

For info on price: E. Gagliardi; Application info: D. Robinson; Customer service: E. Gagliardi; Delivery info: E. Gagliardi

Free literature available: Crystal, filter & oscillator application/specification forms. Data sheets describing typical filter & oscillator custom designs, previously supplied in production quantities & representative of TMC's state-of-the-art capabilities.

Products manufactured: Crystals, Filters, Oscillators

Advertisement

Computer aided designs for all classes of filter networks from 10 Khz to 25 mhz. Computerized test facilities for filter attenuation, delay and phase performance. Crystal oscillators including 14 pin DIL package for low cost digital clock applications. Kold-weld sealed crystals for critical applications. MIL-spec. compliance as required. Data on typical design performance in catalog.

TODD PRODUCTS CORP., 123 Milbar Blvd., Farmingdale, N.Y., 11735, Tel: 516-293-3440, TWX: 510-224-6584; Empl.: 30 p. 1-1497-1502

Products manufactured: Chargers, Battery, Converters, Current Sources, Inverters, Power Supplies, Regulators, Voltage Sources

Local Sales Offices & Reps.

Ariz Scottsdale, J. Smith Assocs. 602-943-4131
 Cal Fullerton, Product Data Co. 714-870-9151
 Cal Los Altos, Product Data Co. 415-941-4410
 Colo Boulder, J. Smith Assocs. 303-449-7509
 Ill Chicago, SEA Inc. 312-282-6694
 Ind Carmel, SEA Inc. 317-846-2593
 Mass Braintree, Bordewick Engrg. 617-843-0845
 Mich Southfield, DATA-TRON 313-354-6421
 Minn Minneapolis, SEA Inc. 612-425-4455
 Mo Kansas City, Harris-Hanson Co. 816-444-9494
 Mo St. Louis, Harris-Hanson Co. 314-432-3611
 NJ Cherry Hill, Williams Assocs. 609-424-4110
 NJ Woodcliff Lake, F&F Assocs. 201-778-6767
 NM Albuquerque, J. Smith Assocs. 505-255-2111
 NY Flushing, F&F Assocs. 516-334-1160
 NY Gunderland, Electro-Modular Sys. 518-456-2665

Ohio Dayton, DATA-TRON 513-223-8421
 Ohio Wickliffe, DATA-TRON 216-585-8421

Tex Dallas, Dwayne Clement & Assoc. 214-239-6105

Wash Seattle, R. S. Drake Assocs. 206-763-2755
 Wisc Milwaukee, Sea Inc. 414-547-6637

TODD SYSTEMS, 4 Radford Pl., Yonkers, N.Y., 10701, Tel: 914-963-3400; Empl.: 45 p. 2-1812-1815

Products manufactured: Chokes, Transformers

TOHOKU METAL INDS., LTD., No 13-10, 7-chome, Ginza, Chou-ku, Tokyo, Japan, Tel: Tokyo 542-6171; Empl.: 3000

Products manufactured: Bobbins, Winding, Coil & Transformer, Coils Including Assemblies & Forms, Controls/Control Eqp., Converters, Cores, Magnetic, Crystals, Filters, Foil, Magnets, Matrices, Computer, Memory Systems, Shields, Switches, Transducers, Transformers, Wire

Local Sales Offices & Reps.

Cal Gardena 213-329-4137

TOLEDO SCALE, Div. Reliance Elect. Co., 5225 Telegraph Rd., Toledo, Ohio, 43612, Tel: 419-470-6200, Telex: 28-6463

Free literature available: 1. TOLEDO SCALES FOR INDUSTRY, broadside of range of industrial products 2. TOLEDO ELECTRONIC WEIGHING FOR INDUSTRY, sketch of industrial electronic products

Products manufactured: Cells, Load, Scales, Dial

Local Sales Offices & Reps.

Ala Birmingham 205-328-0904
 Ala Mobile 205-478-5064
 Ala Montgomery 205-263-7215
 Ala Anchorage 907-333-1313
 Ariz Phoenix 602-252-4767
 Ark Little Rock 501-562-6770
 Cal Fresno 209-485-3533
 Cal Los Angeles 213-724-3200
 Cal Oakland 415-569-4015
 Cal Sacramento 916-922-4783
 Cal San Diego 714-286-1841
 Cal Stockton 209-464-9469
 Colo Denver 303-573-8283
 Conn New Haven 203-795-0201
 Del Wilmington 302-764-4250
 DC Washington 301-277-3646
 Fla Jacksonville 904-355-8365
 Fla Miami 305-652-3383
 Fla Orlando 305-425-3110
 Fla Pensacola 904-438-6470
 Fla Tampa 813-626-8127
 Ga Albany 912-435-8911
 Ga Augusta 404-722-1580
 Ga Chamblee 404-451-9004
 Haw Kailua 808-261-2214
 Idaho Boise 208-343-8611
 Ill Chicago 312-626-3665
 Ill Decatur 217-428-0923
 Ill Montgomery 312-897-1578
 Ill Peoria 309-673-3865
 Ill Rockford 815-398-3995
 Ind Evansville 812-423-5217
 Ind Fort Wayne 219-744-1307
 Ind Hammond 219-844-5000
 Ind Indianapolis 317-635-2561
 Ind South Bend 219-289-5526
 Ind Terre Haute 812-232-5654
 Iowa Davenport 319-391-6400
 Iowa Des Moines 515-265-4224
 Kans Topeka 913-357-5191
 Kans Wichita 316-264-1358
 Ky Lexington 606-277-3411
 Ky Louisville 502-895-4241
 La Baton Rouge 504-355-3683
 La Lafayette 318-234-4043
 La Monroe 318-387-3142
 La New Orleans 504-482-6900
 La Shreveport 318-423-8665
 Me Portland 207-772-3451
 Md Baltimore 301-342-1677
 Mass Boston 617-254-8540
 Mass Worcester 617-754-3244
 Mich Detroit 313-638-3000
 Mich Escanaba 906-786-5200
 Mich Flint 313-767-7200
 Mich Grand Rapids 616-451-2079
 Minn Minneapolis 612-781-6948
 Miss Jackson 601-352-3694
 Mo Joplin 417-623-6577
 Mo Kansas City 816-842-8805
 Mo Springfield 417-881-3763
 Mo St. Louis 314-776-0702
 Mont Billings 406-259-5616
 Mont Great Falls 406-453-7231
 Neb Omaha 402-331-9476
 Nev Reno 702-323-1827
 NH Manchester 603-622-8253

NJ	Newark	201-227-6080
NJ	Trenton	609-882-3900
NY	Albany	518-456-2511
NY	Buffalo	716-684-0440
NY	Endwell	607-748-8275
NY	Long Island City	212-361-9050
NY	Rochester	716-482-6967
NY	Syracuse	315-472-4338
NC	Asheville	704-274-3771
NC	Charlotte	704-334-9779
NC	Greensboro	919-273-7555
NC	Raleigh	919-828-1750
NC	Wilson	919-243-4915
ND	Fargo	218-233-5763
Ohio	Akron	216-644-8404
Ohio	Cincinnati	513-931-8000
Ohio	Cleveland	216-351-9411
Ohio	Columbus	614-228-2451
Ohio	Dayton	513-298-5244
Ohio	Toledo	419-479-2201
Okla	Oklahoma City	405-232-9279
Okla	Tulsa	918-584-2491
Ore	Portland	503-288-5496
Pa	Emmaus	215-965-9038
Pa	Erie	814-864-2922
Pa	Harrisburg	717-939-9331
Pa	Philadelphia	215-725-8000
Pa	Pittsburgh	412-681-5935
RI	Providence	401-434-2800
Tenn	Knoxville	615-687-5941
Tenn	Memphis	901-324-7164
Tenn	Nashville	615-256-2173
Tex	Arlington	817-277-6111
Tex	El Paso	915-533-6712
Tex	Houston	713-526-2993
Tex	Lubbock	806-744-4115
Tex	San Antonio	512-226-6176
Utah	Salt Lake City	801-486-7104
Vt	Burlington	802-862-3534
Va	Norfolk	703-855-3176
Va	Richmond	703-355-7447
Va	Roanoke	703-342-8989
Va	Winchester	703-662-5925
Wash	Seattle	206-624-4560
Wash	Spokane	509-747-0181
Wash	Yakima	509-248-1484
WVa	Charleston	304-343-0131
Wisc	Green Bay	414-432-2404
Wisc	La Crosse	608-784-1317
Wisc	Milwaukee	414-543-7140
Wisc	Wausau	715-848-4188

TOPAZ ELECTRONICS SAN DIEGO

TOPAZ ELECTRONICS, 3855 Ruffin Rd., San Diego, Cal., 92123, Tel: 714-279-0831, TWX: 910-335-1526; Empl.: 140; Minimum order: \$25
p. 1-592,593,1503-1506; p. 2-1816,1817

For info on price: L. E. Rasmussen; Application info: J. Reed; Customer service: C. S. Walker; Delivery info: L. E. Rasmussen

Free literature available: Eight page technical brochure (#LT22) titled **ULTRA-ISOLATION TRANSFORMERS AND AC POWER SYSTEMS**. This brochure describes the applications of Ultra-Isolation Transformers for AC noise attenuation.

Products manufactured: Converters, Filters, Inverters, Isolators, Power Supplies, Regulators, Transformers

Local Sales Offices & Reps.

Ala	Huntsville, Gentry Assocs.	205-534-9771
Ariz	Scottsdale, J. Smith & Assocs.	602-947-2495
Cal	Anaheim, Topaz Elctns.	714-279-0831
Cal	Los Angeles, Topaz Elctns.	714-279-0831
Cal	San Diego, Topaz Elctns.	714-279-0831
Cal	San Francisco, Topaz Elctns.	408-732-2030
Colo	Boulder, J. Smith & Assocs.	303-442-7100
Fla	Orlando, Gentry Assocs.	305-894-4401
Ill	Chicago, Balhorn & Welch	312-889-5011
Ind	Indianapolis, Mktg. Engrs., Inc.	317-546-1523
Iowa	Cedar Rapids, Palatine Sls., Inc.	319-365-8071
Kans	Andover, Palatine Sls., Inc.	316-683-7512
Md	Bethesda, Bartlett Assocs.	301-656-3061
Mass	Wayland, Wayland Engrg. Sls.	617-655-6080
Mich	Detroit, R C Nordstrom Co.	313-444-4417
Mo	St. Louis, Palatine Sls., Inc.	314-426-7055
NJ	Englewood Cliffs, Power Conversion & Control	201-589-0015
NM	Albuquerque, J. Smith & Assocs.	505-255-2111
NY	Binghamton, Elcom Sls.	607-723-9270

NY	Rochester, Elcom Sls.	716-385-1400
NY	Whitesboro, Elcom Sls.	315-732-6445
NC	Burlington, Gentry Assocs.	919-227-3639
Ohio	Dayton, Bear Mktg.	513-299-3566
Ohio	Richfield, Bear Mktg.	216-659-3131
Pa	Doylestown, T.O.E. Sls.	201-568-5747
Tex	Dallas, Allied Comps. Inc.	214-238-0408
Tex	Houston, Allied Comps. Inc.	713-782-5406
Wash	Seattle, W. Underwood & Assocs.	206-242-7200

TOR CORPORATION, 14715 Arminta St., Van Nuys, Cal., 91402, Tel: 312-786-6524, TWX: 910-495-1746; FSC No: 15957; Empl.: 30; Minimum order: \$25

For info on price: D. Griffin; Application info: S. Rackauskas; Customer service: D. Griffin; Delivery info: D. Griffin

Free literature available: Company Brochure, Technical Bulletins.

Products manufactured: Insulators & Insulation, Pads, Transistor Mounting, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

Ariz	Phoenix, K.C.E.	602-955-5250
Cal	Sunnyvale, Cutlass Elctns. North	408-733-5885
Cal	Torrance, Cutlass Elctns.	213-324-7360
Colo	Sedalia, Lyle Jensen	303-688-4154
Fla	Miami, Ludlum Assocs. Co.	305-592-6523
Ga	Atlanta, G. S. O'Hara	404-451-9020
Ill	Chicago, Berndt Assocs., Inc.	312-283-0713
Ind	Indianapolis, Advanced Comp. Sls.	317-545-6441

Iowa	Des Moines, Beams	515-282-0292
Mass	Quincy, Electro-Mechanical Sls. Co.	617-773-3527

Mass Tewksbury, Electro-Mechanical Sls. Co. 617-851-7271

Mo	Kansas City, Beams	913-888-6110
Mo	St. Louis, Beams	314-781-6855
NY	Fayetteville, M.P. Andrews, Inc.	315-637-3144
NY	Huntington, C.R. Mayer Co.	516-921-7876
Ohio	Chagrin Falls, Crest Comp. Sls.	216-543-9808
Pa	Philadelphia, Mid-Western Assocs.	215-842-2810
Va	Reston, Boyle Assocs.	703-620-9558

TORTELCO INC., 14 Paine Ave., Irvington, N.J., 07111, Tel: 201-374-8641; Empl.: 25

For info on price: R. Hillebrand; Customer service: L. Schafer; Delivery info: L. Schafer

Free literature available: Bulletin: Contains pictures of coils and describes capabilities in the field of coil winding.

Products manufactured: Chokes, Coils Including Assemblies & Forms, Reactors, Transformers

TORIN CORP., Kennedy Dr., Torrington, Conn., 06790, Tel: 203-482-4422, TWX: 710-439-2343; Empl.: 1500
p. 1-508-515

Products manufactured: Blowers & Fans & Accessories

Local Sales Offices & Reps.

Cal	Santa Clara, Torin Corp.	408-246-8585
Cal	Van Nuys, Torin Corp.	213-892-0741
Conn	West Hartford, Torin Corp.	203-568-3790
Ill	Arlington Heights, Torin Corp.	312-593-0660
Ill	Bloomington, Torin Corp.	309-828-5932
Ill	Elgin, Cole Dynamics	312-742-3000
Ind	Rochester, Torin Corp.	219-223-3181
Iowa	Cedar Rapids, Torin Corp.	319-393-5612
Ky	Louisville, Torin Corp.	502-896-4363
Md	Rockville, Marktron, Inc.	301-762-6210
Md	Towson, Marktron, Inc.	301-825-8222
Mich	Farmington, Torin Corp.	313-476-5151
Minn	St. Paul, Hultgren & Strutzel	612-645-9121
NY	E. Syracuse, Torin Corp.	315-437-4674
NY	Rochester, Torin Corp.	716-586-8750
Ohio	Cleveland, Torin Corp.	216-464-2161
Ohio	Dayton, Torin Corp.	513-434-1255
Pa	Doylestown, Torin Corp.	215-348-5917
Tex	Dallas, Torin Corp.	214-942-8822

Local Distributors

Ariz	Tempe, G.S. Marshall Co., 835 W. 22nd St.	602-968-6181
Cal	El Monte, G.S. Marshall Co., 9674 Telstar Ave.	213-686-0141
Cal	Irvine, G.S. Marshall Co., 17975 Sky Pk. Blvd.	714-556-6400
Cal	San Diego, G.S. Marshall Co., 8057 Raytheon Rd.	714-278-6350
Cal	Sunnyvale, G.S. Marshall Co., 788 Palomar Ave.	408-732-1100
Colo	Arvada, G.S. Marshall Co., 5633 Kendall Ct.	303-423-9670

Conn	Bethel, Pioneer/New England, 154 Greenwood Ave.	203-792-1219
Conn	N. Branford, G.S. Marshall Co., 200 Shaw Rd.	203-494-0486
Fla	Palm Beach Gardens, G.S. Marshall Co., 10384 Riverside Dr.	305-622-8490
Ill	Des Plaines, G.S. Marshall Co., 300 E. Touhy Ave.	312-298-3700
Kans	Kansas City, G.S. Marshall Co.	913-648-6414
Md	Gaithersburg, Pioneer/Washington Elctns., 9100 Gaither Rd.	301-948-0710
Mass	Newton Highland, G.S. Marshall Co., 88 Needham St.	617-965-5115
Mich	Detroit, G.S. Marshall Co.	313-779-8055
Minn	Edina, G.S. Marshall Co., 4900 Viking Dr.	612-831-4904
NY	Farmingdale, G.S. Marshall Co., 230 Sherwood Ave.	516-293-4141
NC	Greensboro, Pioneer/Carolina Elctns., 2906 Baltic Ave.	919-273-4441
Ohio	Dayton, G.S. Marshall Co., 6388 North Dixie Dr.	513-898-1105
Pa	Horsham, Pioneer/Delaware Valley, 203 Witmer Rd.	215-674-5710
Tex	Dallas, G.S. Marshall Co., 14205 Proton Rd.	214-233-5200
Wash	Bellevue, G.S. Marshall Co., 1801 130th Ave. N.E.	206-883-1084

TOROTEL INC., 13402 S. 71 Hwy., Grandview, Mo., 64030, Tel: 816-761-6314, TWX: 910-777-7037; Empl.: 275
p. 1-417; p. 2-430-439,1819-1821

Products manufactured: Amplifiers, Chokes, Coils Including Assemblies & Forms, Converters, Crystals, Delay Lines, Discriminators, Dummy Loads, Equalizers, Filters, Inverters, Networks, Oscillators, Power Supplies, Reactors, Transformers

Local Sales Offices & Reps.

Ariz	Tempe, Gassner & Clark	602-968-9037
Cal	Los Altos, Parsons & Meister	415-941-4745
Cal	Los Angeles, El Com Sls. Co.	213-223-1351
Fla	Pompano Beach, Varrelman-Gorman Co.	305-941-5544
Fla	Winter Park, Varrelman-Gorman Co.	305-831-8688
Ill	Chicago, Gassner & Clark	312-764-6121
Kans	Shawnee Mission, Florence & Meyer	913-722-5210
Md	Rockville, Mechtronics Sls.	301-340-2130
Mass	Weston, J.J. Goode Assocs.	617-235-3900
Minn	St. Paul, H. A. Cullen & Assocs.	612-646-7371
NY	Manhasset, Win-Cor Elec. Sls.	516-627-9474
NY	Syracuse, T-Squared Elctns. Co.	315-463-8592
NC	Charlotte, Over & Over	704-366-8441
Ohio	Dayton, H. Teplitz & Co.	513-277-6531
Pa	Birchrunville, Jadelectronic Assocs.	215-647-5151
Tex	Dallas, Oeler & Menelaides	214-234-6334
Tex	Houston, Oeler & Menelaides	713-772-0730
Wash	Bellevue, Western Tech. Sls.	206-641-3900

TORQ ENGINEERED PRODUCTS, INC., 32 W. Monroe St., Bedford, Ohio, 44146, Tel: 216-232-4100; Empl.: 135

Free literature available: Data sheets on torq switch reveals roles played by centrifugal switches in electric motor operation

Products manufactured: Controls/Control Eqpt., Governors, Centrifugal, Switches

TORQUE SYSTEMS, 225 Crescent St., Waltham, Mass., 02154, Tel: 617-891-0230; Empl.: 45
p. 1-992-997

Products manufactured: Actuators, Amplifiers, Controls/Control Eqpt., Motors, Power Supplies, Servo Systems

Local Sales Offices & Reps.

Cal	Los Angeles, C. L. Repp Co.	213-820-1715
Cal	San Jose, J. T. McFarland Assoc.	408-286-9333
Fla	Orlando, MacKay, Smith & Assoc.	305-277-1513
Ill	Chicago, Electro-Tech Mktg. Assoc.	312-588-4535
Kans	Wichita, Dy-Tronix	316-943-6221
Minn	Minneapolis, J. J. Exon Co.	612-566-5340
Mo	Hazelwood, Dy-Tronix	314-731-5799
Mo	Kansas City, Dy-Tronix	816-761-6543
NC	Charlotte, MacKay, Smith & Assoc.	704-527-0240
Va	Roanoke, Johnson Custom Controls Co.	703-774-5550

TORR LABS., 2228 Cotner Ave., Los Angeles, Cal., 90064, Tel: 213-477-1224; Empl.: 75

For info on price: P. B. Nossor; Application info: V. E. DeLucia; Customer service: P. B. Nossor; Delivery info: P. B. Nossor

Products manufactured: Antenna Switching Matrices, Cable, Chamber, Environmental Test, Controls/Control Eqpt., Deposition Equipment, Vacuum & Accessories, Evaporation Equipment, Electron Beam, Flashers, Gages, Lamps, Punched Card Equipment, Relays, Seals, Switches, Testers, Thermostats, Tubes, Valves, Vacuum, X-Ray Inspection Equipment

Local Sales Offices & Reps.

Cal Glendale, G.R.V. Assocs. 213-245-5586
Cal Los Altos, Horne Assocs. 415-948-0788
Colo Greeley, G. Moss 303-353-1452
Ill Chicago, J. Popp Sls. Co. 312-626-3711
Ill Wheaton, A. Joyner 312-668-5775
Mo St. Louis, Scherrer Instrs., Inc. 314-644-5362
NJ Haddonfield, M. & S. Assocs. 609-429-7055
FOR: Can., Toronto, Ont., Patlon Aircraft & Inds., Ltd. 416-239-7389

TORWICO ELCTRNS., INC., Rte. 70, Lakewood, N.J., 08701, Tel: 201-364-1800, TWX: 201-363-1611; Empl.: 240 p. 2-1818

Products manufactured: Amplifiers, Chokes, Coils Including Assemblies & Forms, Current Sensors, Reactors, Services, Assembly, Production & Test, Terminals, Transformers

Local Sales Offices & Reps.

Cal Tarzana, R. Capell 213-987-2233
Conn Middletown, N.E. Reps., Inc. 203-239-2507
Fla Orlando, Gro-Mar, Inc. 305-694-3351
Md Baltimore, W.S. Warrington & Assoc. 301-823-8759
Mass Needham Hgts., N.E. Reps., Inc. 617-449-3034
Mo St. Charles, Buse Sls. 314-946-6430
NJ Haddonfield, TAI Assocs. 609-854-3011
NY Fayetteville, H.C. Johnson 315-NE 7-9383
NY Great Neck, Trionic 516-466-2300
NY Guiderland, H.C. Johnson Agencies 518-456-9681
NY Rochester, H.C. Johnson 716-482-3000
NY Williamsville, H.C. Johnson 716-632-7880
Ohio Cincinnati, A.C. Wahl & Assocs. 513-821-3270
Ohio Kent, Norco Ind'l 216-666-3774
Pa Glenshaw, H.C. Johnson Agencies 412-961-0414

TOYO COMM. EQUIP. CO. LTD., 484 3 Chome Tsukakoshi, Kawasaki, Kanagawa, Japan, Tel: Tokyo 406-3355, TWX: 2423001 TOYOCO J; Empl.: 1800

Products manufactured: Crystal Blanks, Crystals, Filters, Oscillators, Transceivers

TPL COMMUNICATIONS CO., 13125 Yukon Ave., Hawthorne, Cal., 90250, Tel: 213-679-0131; Empl.: 35

For info on price: S. Reubenstein; Application info: S. Reubenstein; Customer service: P. Sabs; Delivery info: P. Sabs

Free literature available: Product Line Brochure, Product Spec. Brochures.

Products manufactured: Amplifiers, Transceivers

Local Sales Offices & Reps.

Cal Cupertino, Wallace & Wallace 408-996-2224
Cal Los Angeles, Wallace & Wallace 213-747-0401
Colo Denver, Connors Inc. 303-934-5829
Ga Smyrna, B-C Elctns. Sls. 404-436-5169
Ill Chicago, Ellinger Sls. 312-763-1570
Kans Shawnee Mission, Maury-Bettis Co. 913-362-0772

Mass Bedford, Chamberlin & Murray 617-274-0044
Mich Rochester, Cartwright Comm. 313-375-0420
Minn St. Paul, Skor 612-645-6461
NJ Fair Lawn, Moses & Kline 201-791-8538
NY Liverpool, Lewis-Dunnigan Co. 315-622-2133
Ohio Cincinnati, Cartwright Comm. 513-825-4202
Pa Levittown, Sher Sls. 215-946-6200
Tex Dallas, Maynard & Gunn Sls. 214-528-9090
Wash Seattle, Fleehart & Sullivan 206-522-1533
EXP: Hallandale, Fla., EMEC, Inc.

TRA-CON, INC., 55 North St., Medford, Mass., 02155, Tel: 617-391-5550; Empl.: 35; Minimum order: \$25

Customer service: Sls. Dept.

Free literature available: Literature on high-performance epoxy resin systems for electronic, aerospace and industrial adhesive; potting and casting applications using pre-packaged BIPAX&R kits.

Products manufactured: Adhesives (All Types), Compounds, Encapsulating, Insulating, Molding, Potting, Kits, Cable-End Sealing, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Rubber

Local Sales Offices & Reps.

Cal Mountain View, K. Anderson Co. 415-961-6007
Colo Denver, Cristee-Meade Co. 303-753-9471
NY Irvington, H. Shprentz Co. 914-591-7970
Tex Houston, Puffer Supp. Co. 713-668-9457

TRACOR, INC., 6500 Tracor La., Austin, Tex., 78721, Tel: 512-926-2800; Empl.: 5000; Minimum order: \$25

Customer service: M. Ames

Products manufactured: Amplifiers, Analyzers, Antennas, Comparators, Controls/Control Eqpt., Couplers, Generators, Meters, Oceanographic Equip. (Electronic), Receivers, Recorders, Standards

Local Sales Offices & Reps.

Analytical Instrs.
Cal Danville, Western Scientific Assoc. 415-837-4622
Cal Richmond, Tegal 415-232-1757
Fla Clearwater, Datco, Inc. 813-531-4255
Ga Chamblee, Southern Analytical Co. 404-451-5262

Haw Kaneohe, W.L. Yauger, Inc. 808-239-7187
Ill Chicago, A.E.D., Inc. 312-348-6550
Ind Indianapolis, Tech. Sls. & Mktg. 317-356-3658
La Baton Rouge, Teklab, Inc. 504-926-3667
NJ Union, Tracor, Inc. 201-964-1631
Ohio West Carrollton, P.J. Navin 513-434-8940
Tex Austin, Targa, Inc. 512-926-2800

Ind'l Instrs. Time & Frequency

Ala Huntsville, BCS Assocs. 205-881-6220
Cal Delababas, M. Showlowsky 213-348-3402
Colo Denver, BFA Corp. 303-744-3301
Fla Ft. Lauderdale, BCS Assocs. 305-896-4881
Fla Orlando, BCS Assocs. 312-283-4900
Ill Chicago, Midwest Microwave 301-340-0303
Md Rockville, T E Corp. 301-340-0303
Mass Waltham, Technical Enptrs. 617-890-5300
NM Albuquerque, BFA Corp. 505-268-4387
NM Las Cruces, BFA Corp. 505-523-0601
NY Garden City, PM Elctns. 516-248-4858
NC Greensboro, BCS Assocs. 919-273-1918
Pa Melrose Park, R. Meyers Assoc. 206-624-9020
Wash Seattle, Showalter-Judd, Inc. 206-624-9020

Ind'l Instrs. TV

Ala Huntsville, BCS Assocs. 205-881-6220
Cal Anaheim, Broadcast Comms. Devises 714-528-9505
Colo Evergreen, Didier Denver 303-674-6000
Fla Ft. Lauderdale, BCS Assocs., Inc. 305-896-4881
Fla Orlando, BCS Assocs. 301-340-0303
Md Rockville, T E Corp. 301-340-0303
Mass Waltham, Technical Enptrs. 517-890-5300
Mich Milford, H.M. Dyer Elctns. 313-685-2560
NY Garden City, PM Elctns. 516-248-4858
NC Greensboro, BCS Assocs. 919-273-1918

Medical Instrs.

Cal Oakland, J. Taylor & Assocs. 415-832-4056
Cal Whittier, Electro Medical Instrumentation 213-698-3018
Fla Titusville, Tele-Acoustics 305-267-1600
Ga Atlanta, Tracor, Inc. 404-633-9571
Ga Austell, Telemetrics 404-252-1030
Ill Chicago, Audiological Svc. & Supply Co. 312-281-1531

Md Frederick, D.B. Creighton Assoc. 301-473-8127
Md Rockville, Tracor, Inc. 301-762-3623
Mass Lawrence, Medical Engrg. Assoc. 617-683-8711
Minn Minneapolis, Electro-Medic, Inc. 612-926-2010
Mont Billings, Montana Precision Meas. 406-245-3296

NJ Staten Island, Medacoustics, Inc. 212-979-4262
NC Greenville, Carolina Acoustics 919-752-1436
Ohio Cleveland, Environmental Technology Corp. 216-464-3888

Okla Oklahoma City, Oklahoma Audiometer Svc. Co. 406-245-3296
Ore Portland, Sanderson Safety Supply Co. 502-234-0456

SC Greenville, Safeco Equip. Co. 615-246-4164
Tenn Kingsport, Safeco Equip. Co. 512-926-5094
Tex Austin, Audio-Medical Sys. 713-744-4832
Tex Houston, Audio-Elctns. 206-762-8500
Wash Seattle, Safety & Supply Co. 206-762-8500

Navigation

Cal Sausalito, B.H. Ballard Co. 415-332-0105
Fla Tampa, Promar 813-876-7677
La Gretna, Maricon Instrs. 504-366-1842
Md Rockville, T E Corp. 301-340-0303
Mass Sudbury, Commercial Mktg. Assoc. 617-451-5262

TRAK MICROWAVE CORPORATION, 4726 Eisenhower Blvd., Tampa, Fla., 33614, Tel: 813-884-1411; Empl.: 120; Minimum order: \$50

Customer service: T. L. Roberts

Products manufactured: Amplifiers, Cavities, Microwave, Circuits, Hybrid, Thin-Film, Circulators, Ferrite, Ferrite Material & Parts, Generators, Isolators, Microwave Integrated Circuits (MIC's), Oscillators

Local Sales Offices & Reps.

Ala Huntsville, Scientific Devices-Southeast 205-536-1969
Cal Orange, J.E. Hachten Co. 213-681-2361
Cal Palo Alto, J.E. Hachten Co. 415-316-1252
Colo Denver, Omega Ltd. 303-758-1508
Fla Ft. Lauderdale, Scientific Devices-Southeast 305-721-4260
Fla Orlando, Scientific Devices-Southeast 305-841-8180

Mass Natick, Wayland Engrg. Sls. 617-655-6080
NM Albuquerque, Premco, Inc. 505-265-0115
NY Skaneateles, Robtrn 315-685-5731
NY Tuckahoe, Asco Elctns., Inc. 914-779-8110
NC Burlington, Scientific Devices-Southeast 919-228-6279

Ohio Dayton, F. L. Ohmer & Assocs. 513-434-1454
Pa Lafayette Hill, M. Lader Co. 215-825-3177
Tex Dallas, Cain & Co. 214-233-6809
Utah Salt Lake City, Monarch Distributing & Representing 801-226-9617
Va Woodbridge, M. Lader Co. 703-494-4731
Wash Seattle, J.B. Jolly, Inc. 206-938-4166
EXP: Stamford, Conn., Dage Corp. 203-324-3123

TRAK SYSTEMS, Div. TRAK Microwave Corp., 4722 Eisenhower Blvd., Tampa, Fla., 33614, Tel: 813-884-1411, Telex: 52-827; FSC No: 11165; Empl.: 42; Minimum order: \$50

Customer service: D. H. Sturgill

Free literature available: TIMING/EQUIPMENT - Such as Time Code Generators, Tape Control Units, etc. CUSTOMIZED COMPUTER SYSTEMS - designing and building controllers, automated material handling systems & interface devices for computer-to-computer & computer to peripheral applications.

Products manufactured: Chargers, Battery, Clocks (All Types), Comm. Systems, Converters, Data Acquisition & Reduction Systems, Data Loggers, Generators, Indicators, Receivers, Standards, Tape Search Equipment, Terminal Equipment, Digital, Translators, Data

Local Sales Offices & Reps.

Ill Mt. Prospect, Cain & Co. 312-253-3578
Ohio Lancaster, Cain & Co. 614-654-4800
Pa Lafayette Hill, M. Lader Co. 215-825-3177
Tex Dallas, Cain & Co. 214-233-6809
Va Woodbridge, M. Lader Co. 703-494-4731
EXP: Stamford, Conn., Dage Corp. 203-324-3123

TRAM CORP., Box 187, Winnisquam, N.H., 03289, Tel: 603-524-0622; Empl.: 40

Customer service: K. Zades

Products manufactured: Transceivers

TRAN SPECTRA INC., Box 9, Airport Rd., Greenfield, Tenn., 38230, Tel: 901-235-2218; Empl.: 250

For info on price: T. M. Smith; Application info: R. E. Lenhardt; Customer service: T. M. Smith; Delivery info: T. M. Smith

Free literature available: Miniature aluminum electrolytic capacitors, aluminum electrolytic capacitors for audio crossover networks, and special design capacitors.

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Cal Bellflower, Royer Assocs. 213-869-2518
Conn Meriden, Electro Prods. Sls. 203-235-4040
Fla Palm Beach Gardens, Brosey Ents. 305-622-6045
Ill Chicago, Tran Spectra 312-736-0236
Ill Skokie, Mar-Con Assocs. 312-675-6450
Mass Waltham, Electro Prods. Sls. 617-899-1570
Tenn Greenfield, Tran Spectra 901-235-2218

TRANEX INC., 1599 Stierlin Rd., Mountain View, Cal., 94043, Tel: 415-968-9292; FSC No: 17474; Empl.: 130; Minimum order: \$25

For info on price: H. Waltz; Application info: P. Menting; Customer service: H. Waltz; Delivery info: K. Wagner

Free literature available: 8 pg. Brochure - Facility & capability

Products manufactured: Chokes, Coils Including Assemblies & Forms, Reactors, Transformers

Local Sales Offices & Reps.

Cal Mountain View 415-968-9292
Cal Santa Ana 714-835-8684

MANUFACTURERS & SALES OFFICE DIRECTORY

TRANSI

Colo Colorado Springs 303-392-3432
TRANS-MET ENGRG., 601 S. Palm St., La Habra, Cal., 90831, Tel: 213-691-2266; Empl.: 20; Minimum order: \$5
 For info on price: R. Mazzarella; Application info: D. Hornbaker; Customer service: D. Rall; Delivery info: J. O'Brien
 Free literature available: 210A - Nontact Non-Contact Temp. Sensor for Sheet Material; 224 - Fibertemp - Temp. Sensor for Fiber; 215 - Wiretemp - Temp. Sensor for Wire; 226 - Rolltemp - Temp. Sensor for Roll; 227 - Portatemp - Digital Pyrometer - Portable; 228 - Rolltronic - Roll. Temp. Control System.
 Products manufactured: Controls/Control Eqpt., Meters, Monitors, Transducers
Local Sales Offices & Reps.
 Ala Huntsville, Craft Assocs. 205-837-2202
 Cal Redwood City, Marchi Assocs. 415-364-3411
 Conn Westport, A. J. Abrams 203-226-3010
 Ill Chicago, Thermo/Cense 312-792-2760
 Iowa Des Moines, H.E. Ferris Co. 515-255-1757
 Mich Royal Oak, D. Ray Assocs. 313-576-4700
 Minn Minneapolis, Arjay Sls. 612-925-1833
 NY East Rochester, Thermal Systems 716-377-1970
 NY New York, E. C. Smith & Assoc. 201-783-6668
 NC Matthews, W.K. Hile Co. 704-847-9125
 Ohio Brecksville, D. & B Engr. 216-526-6320
 Ohio Cincinnati, G. Drysdale & Assoc. 513-752-2069
 Ore Portland, McLane 206-454-3400
 Pa Pittsburgh, Process Eng. 412-561-5050
 Exp New Haven, Conn, Masten-Wright Corp. 203-288-1638
 FOR: Can, Toronto, Ont., Armathek Control 416-251-3111
TRAN-TEC CORPORATION, Box 1022, Columbus, Neb., 68601, Tel: 402-564-2748; Empl.: 25; Minimum order: \$35
 Customer service: C. Schroeder
 Products manufactured: Insulators & Insulation, Transistor, Diode, Thyristor Heat Dissipators
Local Sales Offices & Reps.
 Cal Redwood City, Woodworth Co. 415-365-0252
 Cal Santa Fe Springs, Sierra-Pacific Engrg. Co. 213-921-9634
 Colo Aurora, Robbins & Assocs. 303-343-7728
 Fla Pinellas Park, Russell Assocs. 813-526-1134
 Ga Atlanta, Russell Assocs. 404-225-8422
 Ind Indianapolis, Scott Elctns, Inc. 317-635-8951
 Iowa Cedar Rapids, J. VRBIK Co. 319-377-8244
 Kans Overland Park, Enesco-Rep Inc. 913-381-7557
 Md Bel Air, Russell Assocs. 301-879-9180
 Mass Wakefield, H.C. Jappe Co. 617-245-9359
 Mich Milford, Polyphase 313-685-3003
 Mo Saint Louis, Enesco-Rep Inc. 314-567-3935
 NJ Fair Haven, Russell Assocs. 201-747-0600
 NY Bay Shore, Russell Assocs. 516-666-6500
 NY Syracuse, Naylor Electric Co. 315-472-9183
 Ohio Cleveland, D. Steffen & Assocs. 216-481-8333
 Tex Dallas, Russell Assocs. 214-369-3173
 Wash Bellevue, Russell Assocs. 206-455-3694
 EXP: Schenectady, N.Y., EMB Elctns. Corp. 518-372-5841
 For Can, Scarborough, Ont., Gandhi-Ball Assocs. 416-438-9320
TRANS-TEK, INC., Rte. 83, Ellington, Conn., 06029, Tel: 203-872-8351; FSC No: 27109; Empl.: 20
 For info on price: B. Eddy; Application info: M. Blanchette; Customer service: B. Eddy; Delivery info: G. Thibault
 Free literature available: Data sheet, SERIES 240 Displacement Transducer; Data sheet, SERIES 200 Displacement Transducer; Data sheet, SERIES 100 Linear Velocity Transducer; Data sheet, SERIES 600 Angular Displacement Transducer; Data sheet, SERIES 350 Gaging Transducer.
 Products manufactured: Encoders, Gages, Indicators, Power Supplies, Transducers
TRANSCO PRODS., INC., 4241 Glencoe Ave., Venice, Cal., 90291, Tel: 213-821-7911, TWX: 910-343-6469; Empl.: 358
 Products manufactured: Antenna Feed Systems, Antenna Switching Matrices, Antennas, Attenuators, Couplers, Dividers, Filters, Horns, Microwave, Junctions, Hybrid, Microwave, Mixer-Preamplifiers, Microwave, Mixers, Receivers, Relays, Switches, Terminals, Waveguides & Adapters
Local Sales Offices & Reps.
 Cal San Jose, B. F. Helms 408-268-2325

Fla Clearwater, Southeastern Component Sls., Inc. 813-531-8324
 Md Ellicott City, VPI, Inc. 301-465-4060
 NH Concord, R. C. Bishop 617-891-1683
 NY Bayside, R. L. Diamond Inc. 212-423-7330
 Ohio Middletown, W. Tudor Morris 513-423-0332
 Tex Ft. Worth, Carey, Wolf & Assocs. 817-738-1996
TRANSCOM ELECTRONICS, INC., Box 9, La Mesa, Cal., 92041, Tel: 714-460-4181, TWX: 910-322-1345; Empl.: 10
 Customer service: R. L. Kotnik
 Free literature available: HF SSB Transceivers VHF FM Transmitters UHF FM Transmitters VHF FM Receivers UHF FM Receivers
 Products manufactured: Amplifiers, Comm. Systems, Control Systems, Air Traffic, Couplers, Receivers, Scramblers, Data, Services, Assembly, Production & Test, Synthesizers, Transceivers, Transmitters
TRANSCON MFG. CO., 2655 Perth St., Box 20825, Dallas, Tex., 75220, Tel: 214-357-8301, TWX: 910-861-4169; Empl.: 16
 Products manufactured: Clamps & Clips, Cords, Pads, Transistor Mounting, Strain Reliefs, Cable & Wire, Tubing, Wire & Cable Ties
TRANSDATA INC., 6510 Proprietors Rd., Columbus, Ohio, 43085, Tel: 614-885-9891, Telex: 246-686; Empl.: 35
 For info on price: D. H. Wilhelm; Application info: D. A. Gephart; Customer service: D. H. Wilhelm; Delivery info: D. H. Wilhelm
 Free literature available: Standard catalog showing transducer models and standard modifications. Specification sheets for specially engineered Power Factor, Phase angle, Temperature, and Frequency models
 Products manufactured: Meters, Testers, Transducers
Local Sales Offices & Reps.
 Ark Little Rock, C. H. Stout 501-374-8201
 Cal Los Angeles, Matzinger Assocs. 213-624-8001
 Cal Oakland, W. Nott Co. 415-654-3747
 Fla Maitland, Rowe Engrg. Sls. 305-834-2700
 Fla St. Petersburg, Rowe Engrg. Sls. 813-522-6317
 Ga Atlanta, M. J. Fein & Co. 404-938-0190
 Ill Glen Ellyn, J. T. Becker Assoc. 312-858-1911
 Ill Wilmette, M. J. Fein & Co. 312-256-5828
 Ind Indianapolis, Utility & Indl. Prods. 317-924-3607
 La Shreveport, C. H. Stout of Shreveport 318-425-5485
 La New Orleans, C. H. Stout of La. 504-486-3707
 Mass Holliston, M. J. Fein & Co. 617-429-4008
 Miss Jackson, C. H. Stout of Miss. 601-354-4326
 Mo St. Louis, Electrorep 314-872-7300
 NJ Livingston, M. J. Fein & Co. 201-994-3575
 NY Scarsdale, M. J. Fein & Co. 914-472-1100
 Ohio Cleveland, Weschler Elec. Co. 216-251-4609
 Ohio Columbus, W. L. Blake Co. 614-888-7680
 Pa Media, Systems Control Assoc. 215-565-2077
 Pa Pittsburgh, Muller, Harper & Assoc. 412-931-6460
 Tenn Memphis, C. H. Stout of Tenn. 901-362-1616
 Tex Houston, Gettys-Eads-Adair 713-781-3005
 FOR: Can, Downsview, Ont., Aptec Engrg. Ltd. 416-661-9722
 FOR: Can, Vancouver, B. C., Canadian Dynamics Ltd. 604-325-3201
TRANSDUCERS, INC., 12140 E. Rivera Rd., Whittier, Ca., 90606, Tel: 213-945-3741, TWX: 910-586-1899; Empl.: 103
 For info on price: R. Nordstrom; Application info: D. Elgar; Customer service: W. Reynolds; Delivery info: R. Nordstrom
 Free literature available: Pressure Transducers - Ranges From 5 PSI through 12,500 PSI - absolute Gage and differential. Load Cells Ranges from 1 pound through 5 million pounds Digital readouts.
 Products manufactured: Amplifiers, Bridges, Cells, Load, Services, Assembly, Production & Test, Transducers
Local Sales Offices & Reps.
 Ala Huntsville, Int'l. Scientific Instrs. 205-837-1601
 Ariz Scottsdale, Inter-Mountain Engrg. Co. 602-947-7379
 Cal San Diego, L.L. Stoakes, Inc. 714-274-6281
 Cal Santa Clara, Richards Associates 408-246-5860
 DC Washington, Wright Co., Inc. 202-296-0979
 Fla Orlando, R. J. Cheney & Assocs. 305-894-7371
 Ill Chicago, SEA, Inc. 312-282-6694
 Ind Carmel, SEA, Inc. 317-846-2593
 Kans Merriam, Tech Representatives, Inc. 913-432-4110
 La Harvey, SECO 504-347-4646

Md Gaithersburg, Wright Co., Inc. 301-948-5588
Mass Norwood, Hoder-Rogers, Inc. 617-769-2445
Mich Farmington, Carter McCormic & Peirce, Inc. 313-477-7700
Mich Kalamazoo, Carter, Mc Cormic & Pierce, Inc. 616-349-9666
Minn Minneapolis, SEA, Inc. 612-425-4455
Mo Hazelwood, Tech Representatives 314-524-6900
NM Albuquerque, Inter-Mountain Engrg. Co. 505-344-2212
NY Depew, Labtronics, Inc. 716-685-4111
NY Syracuse, Labtronics, Inc. 315-454-9314
NY Ulster Park, Labtronics, Inc. 518-372-6649
NC Matthews, W. K. Hile Co., Inc. 704-847-9125
Ohio Cleveland, Carter, McCormic & Peirce, Inc. 216-333-5650
Ohio Dayton, Carter, McCormic & Peirce, Inc. 513-278-5873
Ohio Worthington, Carter, McCormic & Peirce, Inc. 614-888-4466
Ore Portland, Brett Associates, Inc. 503-232-4184
Pa Abington, Bach-Stewart Assocs. 215-885-1550
Pa Pittsburgh, Carter, McCormic & Peirce, Inc. 412-824-3760
RI Rumford, R. J. Hoder 401-438-2726
Tenn Knoxville, W. K. Hile Co., Inc. 615-588-1061
Tenn Dallas, R. Martin Associates 214-358-3704
Tex Dallas, Techn. Prods. Inc. 214-357-9603
Tex Houston, R. Martin Assoc. 713-462-4077
Va Chester, W. K. Hile Co., Inc. 804-271-0014
Wash Seattle, Brett Associates, Inc. 206-935-8054
Wisc Waukesha, SEA, Inc. 414-547-6637
FOR: Can., Don Mills, Ont., Intertechnology, Ltd. 416-447-0738
TRANSCOIL, INC., Worcester, Pa., 19490, Tel: 215-277-1300, TWX: 510-660-0132; Empl.: 110
 Customer service: P. Schoenacher
 Products manufactured: Actuators, Amplifiers, Controls/Control Eqpt., Converters, Dampers, Servo, Drives & Drive Mechanisms (Dial), Gears & Gear Mechanisms (Precision), Generators, Indicators, Integrators, Mechanical & Electro-Mechanical, Motor & Generator Armatures, Rotors, Stators, Motors, Multipliers, Repeaters, Servo, Resolvers, Synchro, Servo Systems, Shifters, Synchros, Tachometers, Transducers
Local Sales Offices & Reps.
 Ark Scottsdale, Runyon Co. 602-959-6060
 Cal Altadena, Don Murray Entrps. 213-681-5031
 Conn Enfield, Measurement Equip. Co. 203-745-9050
 Fla Hollywood, Reynolds & Assocs. 305-987-6720
 Fla Palm Beach Gardens, Reynolds & Assocs. 305-622-6850
 Fla Satellite Beach, Reynolds & Assocs. 305-773-4700
 Fla St. Petersburg, Reynolds & Assocs. 813-360-1484
 Ga Atlanta, Reynolds & Assocs. 404-252-5360
 Ill Chicago, R.M.P. Sales, Inc. 312-631-9545
 Kans Overland Park, ENSCO-REP, Inc. 913-381-7557
 Md Baltimore, Stemler Assocs., Inc. 301-944-8262
 Mass Wakefield, Measurement Equip. Co. 617-245-4870
Mich Mt. Clemens, Compass Assocs. 313-468-8830
Mo St. Louis, ENSCO-REP, Inc. 314-567-3935
NJ Barrington, Stemler Assocs., Inc. 215-644-3477
NJ Cherry Hill, Stemler Assocs., Inc. 609-966-4070
NJ Clifton, Avionics Engrg. Sales, Inc. 201-772-1956
NY Buffalo, Bowser & Sapecky Assocs., Inc. 716-839-4170
NY Manlius, Bowser & Sapecky Assocs., Inc. 315-682-8885
Ohio Dayton, Compass Assoc. 513-252-9939
Pa Worcester, Transcoil, Inc. 215-277-1300
Wash Bellevue, W.M. Buehler Co. 206-455-5512
EXP: Worcester, Pa., Transcoil 215-277-1300
TRANSISTOR DEVICES, 85 Horsehill Rd., Cedar Knolls, N.J., 07927, Tel: 201-267-1900; Empl.: 240; Minimum order: \$30
 Customer service: J. Apelian
 Free literature available: TDM Catalog - high performance power supply modules, TDMD Catalog - dual output power supply modules, TDI Catalog - high efficiency switching power supplies, XL Series Catalog - low cost regulated power supplies Dynaload Catalog - solid state electrical loads test equipment.
 Products manufactured: Inverters, Power Supplies, Testers, Transformers

Local Sales Offices & Reps.		
Ala	Huntsville, Technology Mktg. Assocs.	205-883-7893
Cal	Costa Mesa, Measurement Assocs. So.	714-540-7160
Cal	Palo Alto, Coherent Mktg. Assocs.	417-327-2217
Fla	Ormond Beach, Technology Mktg Assocs.	904-672-2314
Fla	Pompano Beach, Technology Mktg. Assoc.	305-942-0774
Ill	Elmhurst, Scott Assocs.	312-279-5681
Md	Ellicott City, A/O Electronics	301-997-8033
Mass	Lexington, E.F. Delfino, Inc.	617-862-1118
NY	Liverpool, Systems Hardware Reps.	315-451-4925
NY	Rochester, L-Mar	716-328-5240
NY	Vestal, Systems Hardware Reps.	607-729-6339
Ohio	Medina, McShane Inc.	216-725-4568
Pa	Fort Washington, GCM Inc.	215-646-7535
Tex	Houston, Vista Assocs.	713-661-0119
Tex	Richardson, Vista Assocs.	214-235-4547
EXP:	New York, N.Y., Singer Products	212-432-1400

TRANSISTOR ELECTRONICS INC., Box 6191,
Minneapolis, Minn., 55425

TRANSITRON ELCTRN. CORP., Precision Connector Div.,
168 Albion St., Wakefield, Mass., 01880, Tel:
617-245-4500, TWX: 710-643-6718; Empl.: 4200

Products manufactured: Circuits, Integrated, Silicon
Monolithic, Unpackaged Chips, Diodes,
Integrated Circuit Devices, Rectifiers, References,
D-C Voltage, Semiconductor Wafer Fabrication,
Thyristors (Includes Silicon Controlled Rectifiers),
Transistors

Local Sales Offices & Reps.		
Ariz	Phoenix, Transistron Elctrn. Corp.	602-278-3596
Cal	Long Beach, Transistron Elctrn. Corp.	213-595-5472
Cal	Mountainview, Transistron Elctrn. Corp.	415-968-1710
Colo	Denver, R. G. Entprs.	303-744-2464
Fla	Orlando, Transistron Elctrn. Corp.	305-241-4526
Ill	Chicago, Transistron Elctrn. Corp.	312-693-3360
Ill	Oak Brook, Schuten Assocs.	312-654-8645
Kans	Prairie Village, Engrg. Svcs.	913-649-4000
Md	Baltimore, Callas Elctrns.	301-744-7711
Mich	Novi, Miltimore Sls.	313-349-5820
Minn	St. Louis Park, Transistron Elctrn. Corp.	612-546-4331
Mo	St. Louis, Engrg. Svcs.	314-726-2233
NJ	Nutley, Necco	201-661-5059
NJ	South Orange, Transistron Elctrn. Corp.	201-763-4780
NY	Rochester, Ontario Tech. Sls.	716-464-8636
NC	Raleigh, A. B. Andrews	919-833-5567
Ohio	Dayton, Transistron Elctrn. Corp.	513-276-4141
Pa	Ambler, G.C.M. Inc.	215-646-7535
Tex	Richardson, Transistron Elctrn. Corp.	214-234-2406
Wash	Bellevue, ElecSel Corp.	503-649-6177

TRANSMAGNETICS, INC., 210 Adams Blvd.,
Farmingdale, N.Y., 11735, Tel: 516-293-3100, TWX:
510-224-6420; FSC No: 17755; Empl.: 28; Minimum
order: \$100 p. 1-124,125
Customer service: F. Haber

Products manufactured: Amplifiers,
Controls/Control Eqp., Converters,
Demodulators, Dividers, Encoders, Indicators,
Modulators, All Kinds, Monitors, Multiplexers,
Multipliers, Repeaters, Servo, Synchro
Transmitters, Solid-State, Transformers

Local Sales Offices & Reps.		
Ariz	Tempe, John Cain & Assocs.	602-838-3404
Md	Columbia, A.O. Inc.	301-924-3693
Minn	Minneapolis, Thurston Assocs.	612-929-7801
Wash	Bellevue, Topp Eng'g. Sls.	206-747-5400

TRANSPARENT CONDUCTORS INC., 26 Coromar Dr.,
Box 549, Goleta, Cal., 93017, Tel: 805-968-3561, TWX:
910-334-1180; Empl.: 10

Customer service: B. Feldman
Free literature available: Data Sheet On Liquid
Crystal Displays - Large Area Dynamic Scattering
Series Ld

Products manufactured: Display Devices/Displays

Local Sales Offices & Reps.		
Cal	Los Angeles, Orion Sls.	213-240-3151
Conn	Coscob, Colavecchio Assoc.	203-869-8409

TRANSPARENT CONDUCTORS INC cont'd

Advertisement

Manufacturer of Liquid Crystal Dis-
plays featuring Hermetically sealed
large area displays for applications
such as Changeable Signs, Clocks, Vi-
sual Paging Systems, Scoreboards,
Remote Readouts and other displays
requiring Long Distance and/or Large
Audience and/or High Ambient
Light Viewing. Quotations for Cust-
om LCD Requirements are invited.

TRANSTECTOR SYSTEMS, 532 Monterey Pass Rd.,
Monterey Park, Cal., 91754, Tel: 213-283-9278; FSC No:
30992; Empl.: 16; Minimum order: \$25 p. 1-2302,2303
For info on price: S. Robbins; Application info: S.
Robbins; Customer service: K. Hazen; Delivery info:
M. Jo Mathews

Free literature available: Catalogue of AC and DC
components for transient, over voltage and
undervoltage protection, commercial protectors
for facility or branch service protection - related
transient voltage measuring monitoring
instruments.

Products manufactured: Arresters, Electrical Surge,
Lightning, Detectors, Indicators, Limiters,
Monitors, Power Supplies, Protectors, Records,
Suppressors

Local Sales Offices & Reps.		
Cal	Burlingame, Leddy Assocs.	415-347-5247
Cal	Encino, Porter Co.	213-788-2350
Ga	Atlanta, Continental Controls	404-449-1271
Haw	Honolulu, Aloha Assocs.	808-941-1574
Ill	Mt. Prospect, Anisotronic Associates	312-296-2468
Md	Lutherville, Cunningham & Assocs.	301-296-4306
Mass	Sturbridge, Branford Controls Corp.	617-347-7447
NJ	Ridgewood, Ballou, Inc.	201-444-6990
NY	Pittsford, NoCo, Inc.	716-461-4750
Ohio	Vandalia, W.J. Brauer & Assocs.	513-898-1224
Ohio	Wickliffe, W.J. Brauer & Assocs.	216-943-0601
Pa	Pittsburgh, W.J. Brauer & Assocs.	412-921-3213
Tex	Dallas, Glidden Electro Equip.	214-363-6539
Tex	Houston, Glidden Electro Equip.	713-681-1415

TRENDAR, 500 Clyde Ave., Mountain View, Cal., 94040,
Tel: 415-965-0350, TWX: 910-379-6573

Customer service: N. Lyons

Free literature available: T200 Testclip - Hand Held
in Circuit Digital IC Tester 1000 Portable Go/No-Go
Digital Circuit Board Tester 1010
Production-Digital Circuit Board Tester 2000 Large
Volume Digital Circuit Board Tester

Products manufactured: Clamps & Clips,
Comparators, Probes, Test Systems, Testers

Local Sales Offices & Reps.		
Ala	Huntsville, BSC Assoc.	205-881-6220
Ariz	Scottsdale, Barnhill 3	602-947-7841
Cal	Burbank, Instrument Specialists	213-849-7181
Cal	San Diego, Instrument Specialists	714-565-2555
Cal	Santa Clara, Instrument Specialists	408-244-1505
Colo	Denver, Barnhill 3	303-934-5505
Fla	Orlando, BCS Assoc.	305-896-4881
Ill	Des Plaines, Cozzens & Cudahy	312-298-3600
Ind	Indianapolis, Cozzens & Cudahy	317-244-2456
Mass	Lexington, Instrument Rep.	617-861-8620
Mich	Detroit, WKM Assoc.	313-892-2500
Minn	Minneapolis, Cozzens & Cudahy	612-884-4336
Mo	St. Louis, Cozzens & Cudahy	314-423-1234
NJ	Union, SBM Assoc.	201-687-8737
NM	Albuquerque, Barnhill 3	505-299-7658
NY	Pleasantville, SBM Assoc.	914-769-1811
NY	Rochester, SBM Assoc.	716-226-1400
NC	Greensboro, BCS Assoc.	919-273-1918
Ohio	Cleveland, WKM Assoc.	216-267-0445
Ohio	Dayton, WKM Assoc.	513-434-7500
Pa	Pittsburgh, WKM Assoc.	412-892-2953
Tex	Houston, Barnhill 2	713-621-0040
Tex	Richardson, Barnhill 2	214-231-2573

TRG, Div. of Alpha Inds., 20 Sylvar Rd., Woburn, Mass.,
01801, Tel: 617-935-5150, TWX: 710-393-1236; FSC No:
53536; Empl.: 31; Minimum order: \$100

For info on price: D. Loger; Application info: J.
Cotton; Customer service: H. Miller; Delivery info: D.
Loger

Free literature available: Microwave Millimeter
Products and Capabilities Catalog

Products manufactured: Adapters, Waveguide,
Amplifiers, Antenna Feed Systems, Antennas,
Attenuators, Bends & Twists, Microwave,
Bolometers, Calorimeters, Microwave,
Circulators, Ferrite, Couplers, Delay Lines,
Detectors, Diodes, Dividers, Dummy Loads,
Filters, Flanges, Waveguide, Holders, Crystal,
Horns, Microwave, Isolators, Joints, Rotary,
Microwave, Junctions, Hybrid, Microwave,
Meters, Mixers, Modulators, All Kinds, Mounts,
Radiometers, Receivers, Shifters, Slotted Lines,
Microwave, Switches, Tees, Terminals, Tubing,
Tuners

Local Sales Offices & Reps.		
Ala	Huntsville, Gentry Assocs., Inc.	205-534-9771
Ariz	Phoenix, PLS Assocs., Inc.	602-957-9110
Cal	Los Altos, Stout-Loeswick	415-948-3265
Cal	Woodside, Windsor Dynamics, Inc.	415-854-4870
Colo	Denver, PLS Assocs., Inc.	303-771-0140
Fla	Orlando, Gentry Assocs., Inc.	805-894-4401
Ill	Elk Grove Village, L. F. Green & Assocs.	312-593-0282
Ind	Indianapolis, L. F. Green & Assocs.	317-293-9827
Kans	Prairie Village, Engrg. Svcs. Co.	913-649-4000
Md	Woodbine, Morar Assocs.	301-442-2089
Mass	Lexington, Lancer Assoc.	617-861-1720
Mich	Ferndale, Tiby Co.	313-547-3550
Minn	Minneapolis, L. F. Green & Assocs.	612-781-1611
Mo	St. Louis, Engrg. Svcs. Co.	314-726-2233
NM	Albuquerque, PLS Assocs., Inc.	505-255-2330
NY	E. Syracuse, Ossmann Instrs.	312-437-6666
NY	Huntington, L.I., CDB Entprs., Inc.	516-692-5200
NC	Burlington, Gentry Assocs., Inc.	919-227-3639
Ohio	Cleveland, Tiby Co.	216-371-5335
Tex	Dallas, Texas Microwave/Electronics	214-231-5381
Utah	Salt Lake City, PLS Assocs., Inc.	801-272-3681
Wash	Renton, S. Wilson Co.	206-226-0650

TRI CORP., 505 W. Olive Ave., Sunnyvale, Cal., 94086

TRI-DATA CORP., 800 Maude Ave., Mountain View, Cal.,
94043, Tel: 415-969-3700, TWX: 910-379-6978; Empl.:
1703; Minimum order: \$25

For info on price: G. Brewster; Application info: G.
Brewster; Customer service: S. Horton; Delivery info:
J. Cherney

Free literature available: Product literature for
cartrifle tape recorders, flexible disk systems,
sealed disk systems, automaton data entry
systems, software programs, disk operating
systems.

Products manufactured: Data Loggers, Memory
Systems, Recorders, Tapes, Recording, Magnetic
(All Types)

Local Sales Offices & Reps.		
Cal	Newport Beach, Tri-Data Corp.	714-833-3722
Fla	Orlando, E.G. Holmes & Assocs.	305-894-8901
Ga	Chamblee, E.G. Holmes & Assocs.	404-451-6161
Kans	Mission, Inland Assocs.	913-362-2366
Md	Silver Spring, L.G. White & Co.	301-585-3141
Mass	Lexington, Tri-Data Corp.	617-861-7007
Mo	Glencoe, Inland Assocs.	314-938-4992
NJ	Cherry Hill, Williams Assocs.	609-424-4110
NJ	Fort Lee, Tri-Data Corp.	201-947-2092
NM	Albuquerque, Rustco Enterprises	505-296-6474
Tex	Austin, Martin Zienkosky, Browne, Assoc.	512-454-4371
Tex	Dallas, Martin Zienkosky, Browne, Assoc.	512-454-4371
Tex	Houston, Martin Zienkosky, Browne Assoc.	713-523-7333
Va	Virginia Beach, E.G. Holmes & Assocs.	804-481-6556

TRI-EX TOWER CORP., 7182 Rasmussen Ave., Visalia,
Calif., 93277, Tel: 209-732-8383; Empl.: 31

For info on price: C. Blyleven; Application info: R.
Carlson; Delivery info: R. Vargas

Products manufactured: Antenna Rotators, Antenna
Towers & Supports, Antennas, Indicators,
Lighting Equipment, Emergency, Mounts



TRI-SAGE INC., 1212 Pittsford-Victor Rd., Pittsford, NY, 14534, Tel: 716-381-2220, TWX: 510-253-1532; FSC No: 52992; Empl.: 100; Minimum order: \$25

For info on price: F. Burham; Application info: F. Burham; Customer service: D. Schwenk; Delivery info: D. Schwenk

Free literature available: Facilities Brochure Process & Technical Brochure Applications Notes.

Products manufactured: Circuits, Hybrid, Thick Film, Networks, Resistors

Local Sales Offices & Reps.

Ala	Gadsden, Nickerson Co.	205-547-7718
Ariz	Tempe, Sedco Sls.	602-968-7791
Cal	Lafayette, Phillips Assocs.	415-284-2579
Cal	Los Angeles, M. A. Stolaroff Co.	213-295-7781
Cal	San Diego, M. A. Stolaroff Co.	714-234-6905
Conn	Milford, Todino Engrg. & Sls. co.	203-874-6643
Fla	Kissimmee, Nickerson Co.	305-846-6755
Fla	Odessa, Nickerson Co.	813-855-4209
Ga	Decatur, Nickerson Co.	404-321-4678
Kans	Shawnee Mission, Technical Sls. Assocs.	913-888-3330
Md	Baltimore, B. White & Co.	301-484-5400
Mass	Needham Hgts., Todino Engrg. & Sls. Co.	617-444-7925
Minn	Minneapolis, D. G. Perry & Co.	612-920-3212
Mo	St. Louis, Technical Sls. Assocs.	314-725-5361
NJ	Englewood Cliffs, E. Glass Assocs.	212-586-8440
NY	Fayetteville, Graydon-Sherman, Inc.	315-637-9861
NC	Franklin, Nickerson Co.	704-524-6363
NC	Kannapolis, Nickerson Co.	704-932-6772
Ohio	Vandalia, W. J. Brauer & Assoc.	513-898-1224
Ohio	Wichliffe, W. J. Brauer & Assoc.	216-943-0601
Okla	Tulsa, H. Daly Co.	918-627-4159
Pa	Ardmore, W.K. Metz	215-649-3966
Pa	Pittsburgh, W. J. Brauer & Assoc.	412-921-3213
Tex	Dallas, R. Matthews Elctns.	214-233-0363
Tex	Houston, R. Matthews Elctns.	713-664-7131

Advertisement

Tri-Sage, Inc. specializes in custom designs utilizing thick film microelectronic techniques. We also offer many standard circuits. Packages include DIP's, SIP's, molding, potting, conformal coating or substrate only. We manufacture resistor networks, RC filters and active hybrids. We provide fine line gold printing for chip bonding & RF applications. Prototypes are typically produced in 4 weeks.

TRI-TRONICS CO., 619 Enterprise Drive, Dept. EE, Oak Brook, Ill., 60521, Tel: 312-654-3255; Empl.: 12; Minimum order: \$6

For info on price: E. Yelich; Application info: R. A. Anderson; Customer service: D. Hacquebord; Delivery info: E. Yelich

Free literature available: Illustrated catalog describes over 120 controls and accessories.

Products manufactured: Alarms, Controls/Control Eqpt., Counters, Light Sources, Photoelectric

Local Sales Offices & Reps.

Colo	Lakewood, Hess Elctn. Control	303-421-4000
Conn	West Hartford, A. Hutton Assoc.	203-233-3613
Ill	Aurora, Dwight Smith & Assoc.	312-896-0828
Mass	Pine Hurst, Julie Assocs.	617-667-1958
Mo	St. Louis, W.W. Munroe Equip.	314-968-2500
Ohio	Columbus, Rockford Controls Ohio Inc.	614-231-5890
Ohio	Dayton, Rockford Controls Ohio Inc.	513-898-5452
Ohio	Euclid, Rockford Controls Ohio Inc.	216-731-5250
Pa	Chalfont, Mid-Lantic Assoc.	215-249-3301
Pa	Erie, Rockford Controls Ohio Inc.	412-373-2531

TRIAC ELECTRONICS, 200 Park Ave., Ste. 303E, New York, N.Y., 10017, Tel: 212-687-0620; Empl.: 24; Minimum order: \$300

For info on price: M. Walpaw; Application info: S. Black; Customer service: M. Stanley; Delivery info: M. Stanley

Products manufactured: Alarms, Arresters, Electrical Surge, Lightning, Batteries, Capacitors, Fixed, Circuit Breakers, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Conductive Plastic Materials, Controls/Control Eqpt., Coolants, Circuit & Components, Cords, Counters, Current Sensors, Detectors, Diodes, Drivers, Solenoid, Electroplating Equipment & Supplies, Eliminators, Battery, Generators, Heat Exchangers & Systems, Honeycomb Sheets, Panels, etc., Indicators, Inverters, Laminates, Loads, Electronic Variable, Monitors, Motors, Probes, Protectors, Rectifiers, Reducers, Regulators, Relays, Shifters, Substrates, Suppressors, Switches, Thermistors, Thermostats, Thyristors (Includes Silicon Controlled Rectifiers), Timers, Transducers, Transformers, Tubes, Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

TRIAD-UTRAD, Distributor Svcs., 305 N. Briant St., Huntington, Ind., 46750, Tel: 219-356-6500, TWX: 810-333-1532; Empl.: 450; p. 2-1822-1829

For info on price: S. Fisher; Application info: P. Myers; Customer service: P. Monsey; Delivery info: P. Monsey

Free literature available: #TR75-76, Industrial Transformer Catalog; Transformers, Chokes, Power Supplies, Circuit Cards. #TV75-76, Replacement Guide: Yokes & Flybacks for TV Replacement, #TCT-74, Engineering Bulletin on Telephone Coupling Transformers, #TY-73, Engineering Bulletin on Transistor Power Supply Transf. Engineering Bulletin on Toroidal & Power Inductors.

Products manufactured: Boards, Plug-In, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Chargers, Battery, Chokes, Coils Including Assemblies & Forms, Inverters, Power Supplies, Pullers, Reactors, Regulators, Transformers, Yokes

Local Sales Offices & Reps.

Alas	Anchorage, H.J. Lang & Assocs.	907-279-5741
Ariz	Phoenix, Sheffer-Kahn Co.	602-258-7893
Ark	El Dorado, D. Bellew Sls. Co.	501-863-8325
Cal	No. Hollywood, J. Carter	213-980-3450
Cal	Redwood City, Logan Sls. Co.	415-369-6726
Colo	Denver, McCloud & Raymond Co.	303-756-1589
Conn	Madison, A&M Elctn. Reps.	203-245-1031
Fla	Maitland, Hutto-Hawkins-Peregoy	305-831-2474
Ga	Atlanta, Murphy & Cota	404-875-2525
Ill	Wilmette, J. Wasserman Assocs.	312-256-3566
Ind	Fort Wayne, New/Era Sls.	219-432-1164
Ind	Indianapolis, New/Era Sls.	317-257-7333
Iowa	Des Moines, T. L. Dowell, Inc.	515-225-1620
Kans	Overland Park, T.L. Dowell, Inc.	913-236-8200
La	Kenner, D. Bellew Sls. Co. Inc.	504-729-4550
Md	Baltimore, E-K-P Assocs.	301-788-6498
Mass	Needham, A&M Elctn. Reps.	617-444-8170
Mich	St. Clair Shores, J.M. Thorpe Co.	313-779-6363
Minn	Minneapolis, C.R. Gibb Co.	612-377-1200
Mo	St. Louis, T.L. Dowell, Inc.	314-968-4234
NM	Albuquerque, Sheffer-Kahn Co. Inc.	505-265-7077
NY	Rochester, Marsey Sls.	716-442-9700
NY	Rockville Centre, Willgold Elctn. Sls. Corp.	516-764-4022
NC	Burlington, Murphy & Cota	919-584-1577
Ohio	Cincinnati, F.E. Kahsar Sls.	513-471-9011
Ohio	Hudson, F.E. Kahsar Sls.	216-653-6808
Okla	Tulsa, J.V. Schoonmaker	918-936-1423
Ore	Portland, J.J. Backer Co.	503-297-3776
Pa	Easton, E-K-P Assocs.	215-258-6477
Pa	Pittsburgh, Trymax Co.	412-823-8400
Tenn	Memphis, D. Bellew Sls. Co.	901-365-9437
Tex	Dallas, J.Y. Schoonmaker Co.	214-357-8481
Wash	Seattle, J.J. Backer Co.	206-285-1300
EXP:	Westbury, N.Y., Minthorne Int'l.	516-334-3303

TRIADIR INDS., Fastener Div., 3000 W. Lomita Blvd., Torrance, Calif., 90505, Tel: 213-530-2200, TWX: 910-347-6239; Empl.: 300; Minimum order: \$25

For info on price: Quot. Dept.; Application info: Tech. Sls.; Customer service: Order Svcs. Dept.; Delivery info: Order Svcs. Dept.

Products manufactured: Fasteners, Pins, Rings, Retaining

Local Sales Offices & Reps.
Cal Santa Monica, Air Supply Co. 213-871-0520
Mass Waltham, Elctn. Fasteners 617-890-7780

Minn Minneapolis, Aerospace Computer Supplies 612-884-4725
NY Plainview, Merit Fasteners 516-242-1800

TRIDAK, INC., 5 Valley Rd., Danbury, Conn., 06810, Tel: 203-744-3060; Minimum order: \$15

Customer service: F. Gurski

Free literature available: Complete data sheets on our Model 200, 260-270 and 280 metering dispense machines; data sheet on our micro manipulator.

Products manufactured: Machines/Machinery, Production, Meters

TRIMM, INC., 400 W. Lake, Box 489, Libertyville, Ill., 60048, Tel: 312-362-3700; Empl.: 90; p. 2-895

Products manufactured: Attenuators, Boxes, Junction, Outlets & Wall Plates, Caps, Lenses, Indicator Light, Connectors, Cords, Handsets, Chestsets, Headphones, Headsets, Etc., Jacks (All Types), Panels, Plugs, Potentiometers, Racks, Sockets, Switches, Terminal Blocks, Boards & Strips

Local Sales Offices & Reps.

Cal	Palo Alto, JM Assocs.	415-327-1260
Md	Kensington, Forti-Austin Assocs.	301-949-1706
NJ	Willingboro, Forti-Austin Assocs.	609-871-9290
RI	Cumberland, Perry Assocs.	401-333-5054
Tex	Dallas, Techno Assocs.	214-FL7-9213

TRIO LABS, INC., 80 Dupont St., Plainview, N.Y., 11803, Tel: 516-681-0400, TWX: 510-221-1861; Empl.: 150

Customer service: J. Crawford

Products manufactured: Converters, Current Sources, Inverters, Power Supplies, Regulators

Local Sales Offices & Reps.

Ariz	Scottsdale, Thorson/Phoenix	602-956-0800
Cal	Palo Alto, Held & Mollard	415-965-9321
Colo	Denver, Thorson/Denver	303-759-0809
Conn	Hamden, Scientific Comps.	203-272-2160
Md	Upper Marlboro, RL Engrg.	301-760-5533
Mich	Southfield, Luebbe Sls. Co.	313-357-0335
Minn	Saint Paul, Cahill Assocs.	612-739-8445
Mo	Maryland Heights, Delltron, Inc.	313-434-3804
Ohio	Cincinnati, Luebbe Sls. Co.	513-871-4211
Ohio	Cleveland, Luebbe Sls. Co.	216-333-0425
Ohio	Dayton, Luebbe Sls. Co.	513-294-0426
Pa	Delmont, Luebbe Sls. Co.	412-468-4019
Tex	Dallas, Norvell Assocs., Inc.	214-350-6771
Tex	Houston, Norvell Assocs. Inc.	713-774-2568

TRIO-TECH, INC. OF CALIF., 2435 N. Naomi St., Burbank, Calif., 91504, Tel: 213-846-9200, TWX: 910-498-2709; Empl.: 57; Minimum order: \$25

Customer service: Sls. Desk

Free literature available: Data sheets and technical reports covering TRACER-flo® Process of fine and gross leak hermeticity testing, Bubble Testers, Bulk-to-Stick Loaders, CENTRISAFE® and environmental centrifuges.

Products manufactured: Detectors, Machines/Machinery, Production, Services, Assembly, Production & Test, Testers

Local Sales Offices & Reps.

Ariz	Scottsdale, Meas. Conslts.	602-994-9519
Colo	Boulder, Meas. Conslts.	303-449-5294
Fla	Sarasota, W. J. Irvine Co.	813-955-9556
Ill	Des Plaines, Maher Engrg. Co.	312-824-2124
Kans	Baxter Springs, Production Automation	316-856-3600
Mass	Wilmington, Technical Instr.	617-944-3930
Minn	Minneapolis, Production Automation	612-866-5700
Mo	Hazelwood, Production Automation	314-731-2331

Mo	Raytown, Production Automation	816-737-0066
NM	Albuquerque, Meas. Conslts.	505-265-6471
NM	Las Cruces, Meas. Conslts.	505-526-2491
NY	Hartsdale, Powell-Pendergraph	914-761-7792
NY	Niagara Falls, Watmet, Inc.	716-285-3595
Pa	Colmar, E. L. Assocs.	215-822-2510
Tex	Dallas, Stu Hamilton Assocs.	214-350-4344
Utah	Murray, Meas. Conslts.	801-268-3181

TRIPLETT CORP., 286 Harmon Rd., Bluffton, Ohio, 45817, Tel: 419-358-5015, TWX: 810-490-2400; p. 1-821

For info on price: B. Selvaige; Application info: B. Selvaige; Customer service: N. Edinger; Delivery info: N. Edinger

Products manufactured: Analyzers, Calibrators, Cases, Equipment, Instrument, Meter, Detectors, Indicators, Kits, Test Equipment, Meters, Probes, Recorders, Shunts, Meter, Testers

Local Sales Offices & Reps.

Ariz	Phoenix, Sheffer-Kahn Co.	602-258-7893
------	---------------------------	--------------

Cal	Inglewood, J. Berman Co., Inc.	213-649-6111
Cal	Millbrae, Polach & Bensinger	415-697-2525
Colo	Denver, Shefler-Kahn	303-623-1567
Conn	Wallingford, Adams-McGregor	203-269-5816
Fla	Maitland, Hutto-Hawkins-Perego, Inc.	305-831-2474
Fla	Pompano Beach, Hutto-Hawkins-Perego, Inc.	305-943-9593
Ga	Atlanta, Millar Elctns.	404-261-6160
Haw	Honolulu, Kems, Inc.	808-847-1395
Ill	Oak Park, G. Pettit Co.	312-369-8940
Ind	Ft. Wayne, W. Bieberich Inc.	219-432-2537
Ind	New Albany, W. Bieberich Inc.	812-945-3187
Kans	Overland Park, T. Dowell Inc.	913-236-8200
Md	Reisterstown, Massey Assoc.	301-833-2039
Mass	Boston, Adams-McGregor	617-542-3773
Mich	Grosse Point Woods, Elko Sls. Corp.	313-884-1955
Minn	Minneapolis, Heimann Co.	612-861-6051
Mo	St. Louis, T.L. Dowell, Inc.	314-968-4234
NJ	North Caldwell, Masin Esco Inc.	201-226-2550
NY	Rochester, L. G. Marchese Assoc.	716-544-4300
NY	Syosset, Masin Esco Inc.	516-364-0310
NC	Raleigh, Millar Elctns.	919-787-9564
Ohio	Centerville, C.H. Dolfuss Jr. & Co.	513-433-6776
Ohio	Rocky River, C.H. Dolfuss Jr. & Co.	216-333-7504
Ore	Portland, J.J. Backer Co.	503-297-3776
Pa	Media, Snyder & Massey Assoc., Inc.	215-566-5400
Pa	Pittsburgh, G.S. Root	412-561-4125
RI	Lincoln, Adams-McGregor	401-726-1300
Tex	Dallas, Lund & Co.	214-358-4335
Wash	Seattle, J.J. Backer Co.	206-285-1300

Local Distributors

Ala	MOBILE, Brownell-Electro, 3450 Armour Dr.	205-479-5405
Ariz	Phoenix, Metermaster Div., 2633 E. Buckeye Rd.	602-273-7331
Cal	Gardena, Key Instrs., 1520 W. Rosecrans	213-321-5891
Cal	Glendale, R.V. Weatherford, 6921 San Fernando	213-849-3451
Cal	Los Angeles, Croft Elec., 1016 W. 8th St.	213-626-6894
Cal	Los Angeles, Metermaster Div., 5646 Jilison St.	213-685-4340
Cal	Palo Alto, Metermaster Div., 3995 E. Bayshore	415-968-0313
Cal	San Diego, Metermaster Div., 8797 Balboa Ave.	714-278-2112
Cal	Santa Clara, Dynametron, 3343 Edward Ave.	408-246-6535
Cal	Sonoma, Schmidt Elec., 122 E. Napa St.	707-938-8416
Colo	Denver, Meter-master, 1165 S. Cherokee	303-722-5766
Conn	Middletown, Mancib Co., Box 781	203-346-6646
Fla	Ft. Lauderdale, A & M, 4257 N.E. 6th Ave.	305-565-2579
Fla	Orlando, Brownell-Electro, 307 27th St.	305-843-6775
Ga	Atlanta, Brownell-Electro, Drawer 82730	404-762-5181
Haw	Honolulu, Kems, Inc., 239 Puuhale Rd.	808-847-1395
Ill	Chicago, A & M, 6251 W. Touhy Ave.	312-774-3500
Ill	Chicago, E.I.L., 221 W. 79th St.	312-874-8070
Ill	Elk Grove, Vil. Metermaster, 121 Gordon St.	312-593-8650
Ill	Elk Grove, Vil. Meter-makers, 2450A Lunt Ave.	312-439-5050
Ill	Oak Park, Pacific Indicator, 6603 W. North Ave.	312-261-1330
Kans	Overland Park, Brooks Elec., 3761 W. 95th	913-648-3131
Kans	Shawnee Mission, Sturtz Inst., 4705 Mission Rd.	913-236-4705
La	Harahan, Industrial Inst. Works, 134 Laitram La.	504-733-8355
Md	Elkridge, Sunshine Sc., 5800 Main St.	301-796-5600
Md	Savage, Pyttronic, 8220 Wellmoor Ct.	301-953-3000
Md	Timonium, E.I.L., 1830 York Rd.	301-252-1260
Mass	Burlington, Mancib Co., Middlesex Tpk at "A" St.	617-272-9450
Mich	Ferndale, Ram Meter, Inc., 1100 Hilton Rd.	313-547-1000
Mich	Lansing, Main Elec., 5558 S. Pennsylvania	517-882-5035
Minn	Minneapolis, Instr. Control, 2401 E. Franklin	612-336-7744
Mo	St. Louis, Ind. Serv., 4354 Olive	314-535-5760
NH	Portsmouth, A & M, 1039 Ilington St.	603-431-7912

NJ	Belleville, Marshall Inst., 236 Washington	201-751-1190
NJ	S. Plainfield, Brownell-Electro, 500 Hadley Rd.	201-753-4600
NY	Buffalo, Trott Elctns., 932 Hertel Ave.	716-876-0880
NY	L.I.C., Metermod Inst., 48-15 31st Ave.	212-726-4850
NY	Rockville Ctr., A & M, 5 Nassau St.	516-678-6960
NC	Charlotte, Brownell-Electro, Box 16368	704-394-4341
Ohio	Cleveland, Pioneer/Std., 4800 E. 131st St.	216-587-3600
Ohio	Cleveland, Weschler Elec., 4250 W. 130th	216-251-4609
Ohio	Dayton, Pioneer/Dayton, 1900 Troy St.	513-236-9900
Okla	Tulsa, Tri-State Inst., Box 4746	918-936-0489
Pa	Phila., Sunshine Sc., 1810 Grant Ave.	215-673-5600
Pa	Pittsburgh, Cameradio Co., 2801 Liberty Ave.	412-288-2600
Pa	Pittsburgh, E.I.L., 1844 Ardmore Blvd.	412-731-5230
Tenn	Memphis, Brownell-Electro, 3053 Tranquility	901-332-9254
Tenn	Nashviulle, Brownell-Electro, 1050 Acorn Dr.	615-889-8230
Tex	Beaumont, Straughn Elec., 3235 Highland Ave.	713-838-4563
Tex	Dallas, Ultra Inst., 9995 Monroe Dr.	214-357-0297
Tex	Garland, Metermaster, 2809 National Dr.	214-271-2471
Tex	Houston, Quality Inst., 4832 Caroline	713-524-0528
Tex	Odessa, Whitlock Inst., 1306 N. Texas	915-337-3412
Va	Richmond, I.T.R., 1425 Blue Jay La.	804-288-7198
Wash	Seattle, Eicher-Richards, 2727 N.E. Blakely	206-523-7888
Wisc	Milwaukee, Electro-Mechano, 241 E. Erie St.	414-272-4050

TRIPP-LITE, 133 N. Jefferson, Chicago, Ill., 60606, Tel: 312-346-3040; Minimum order: \$10
Customer service: Order Desk

Products manufactured: Inverters, Lighting Equipment, Emergency, Power Supplies

TRIRIDGE CORP., Elec. Comps. & Sys., Box 12420, Pittsburgh Airport, Pittsburgh, Pa., 15231, Tel: 412-899-2288; FSC No: 31951; Empl.: 50; Minimum order: \$25

For info on price: H. Lokomski; Application info: P. Sklack; Customer service: H. Lokomski; Delivery info: H. Lokomski

Free literature available: 16-page Catalog showing line of standard Reed Relay products dimension for application, switching capabilities, and coil resistance.

Products manufactured: Relays

Local Sales Offices & Reps.

Cal	Mt. View, West/Mark Assocs.	415-969-1700
Cal	San Gabriel, V. Gott & Assocs.	213-285-2148
Colo	Denver, Omega, Ltd.	303-758-1508
Fla	Lighthouse Point, Saber Assocs.	305-943-3076
Fla	Longwood, Saber Assoc.	305-422-3686
Fla	St. Petersburg, Saber Assoc.	813-441-1301
Ga	Woodstock, Saber Assocs.	404-432-9625
Ill	Glendale Hts., Trend-Tronics	312-963-2210
Ind	Ft. Wayne, McDonald Sls. Co.	219-747-3650
Md	Hyattsville, Eastern Components	301-577-2925
Mass	Reading, C.E. Godfrey Co.	617-944-2230
Mich	Dearborn, Pitcher-Poulin, Inc.	313-582-5450
Minn	Minneapolis, Scott Elctn. Sls.	612-929-2985
NJ	Haddonfield, Sunday-O'Brien	609-429-4013
NY	Camillus, Noco	315-672-3988
NY	Manhasset, Win-Cor Elctn. Sls. Corp.	516-627-9474
NY	Pittsford, Noco	716-461-4750
NC	Raleigh, Saber Assoc.	919-834-3961
Ohio	Centerville, N. Case Assocs.	513-425-1301
Ohio	Dayton, N. Case Assocs.	513-433-0966
Ohio	Fairview Park, N. Case Assocs.	216-333-4120
Pa	Enon Valley, Nebco Assocs.	216-457-2333
Pa	Flourtown, Eastern Components	215-836-1616
Pa	York, Eastern Components	717-764-3114
Tex	Dallas, R. Matthews Elctns.	214-233-0363
Tex	Houston, R. Matthews Elctns.	713-664-7131
Wash	Seattle, Nemco	206-322-6200

TRIRIDGE CORP. cont'd

Advertisement

Triridge is a full capability Reed relay house, we have the capability from low level to high voltage and the full gambit of Reed relay switching capabilities. Our facilities can produce for the Engineer prototype order, or the high volume production order. All relays are top quality and 100% tested at competitive market prices.

TRIVEX, 3180 Redhill Ave., Costa Mesa, Cal., 92626, Tel: 714-546-7781; Empl.: 100

For info on price: E. F. Thompson; Application info: R. Engle; Customer service: D. Hirschak; Delivery info: E. F. Thompson

Free literature available: Model 40/80 Brochure describes Trelix plug to plug replacement system for IBM 2848/2260 systems. replacement system for IBM 2848/2260 systems. Model 720/740 Serial Impact Printer - spec describing printer.

Products manufactured: Printers, Terminals, Data Display (including Alphanumeric & Graphic)

Local Sales Offices & Reps.

Ill	Rosemont, 312-696-2380	
NJ	Ramsey	201-825-1900

TROMPETER ELECTRONICS, INC., 8936 Comanche, Chatsworth, Cal., 91311, Tel: 213-882-1020, TWX: 910-494-1210; FSC No: 14949; Empl.: 75; Minimum order: \$25

For info on price: E. Miller; Application info: L. Tichy; Customer service: J. Escover; Delivery info: Stock

Free literature available: T-10 Catalog: describes patch panels, jacks, cords, networks and connectors along with matrices, switches and systems in coax, twinax and triax, from D.C. to 3 GHz.

Products manufactured: Antenna Switching Matrices, Attenuators, Bridges, Cable Assemblies & Harnesses, Cable, Connector Adapters, Connectors, Cords, Dividers, Jacks (All Types), Matrices, Computer, Modules, Logic, Encapsulated, Panels, Plug Adapters, Plug & Jack Sets, Relays, Switches, Tees, Terminals, Tools

Local Sales Offices & Reps.

Ala	Huntsville, Currie, Peak & Frazier, Inc.	205-536-5650
Cal	Los Angeles, Trompeter Elctns., Inc.	213-882-1020
Cal	Menlo Park, Long & Assocs.	415-327-1300
Colo	Littleton, Aztec Entrs.	303-795-0250
Conn	Milford, Todino Engrg. Sls.	203-874-6643
Fla	Orlando, Currie, Peak & Frazier, Inc.	305-855-0843
Ill	Chicago, J. C. Angel	312-878-0653
Md	Silver Spring, Sel-Tronics, Inc.	301-589-3391
Mass	Needham Heights, Todino Engrg. Sls., Inc.	617-444-7925
Minn	Minneapolis, Engrg. Prods. Assocs.	612-925-1883
NJ	Saddlebrook, L & M Assocs.	201-843-8700
NM	Albuquerque, Aztec Entrs.	505-255-2440
NY	Brentwood, L & M Assocs.	516-231-8363
NY	New York, L & M Assocs.	212-675-7486
NY	Rochester, Upstate Component Sls. Inc.	716-288-1080
NC	Greensboro, Currie, Peak & Frazier, Inc.	919-273-3040
Ohio	Berea, Geotronics Mktg. Assoc.	216-243-8520
Ohio	Columbus, Geotronics Mktg. Assoc.	614-457-8472
Pa	Andalusia, L & M Assocs.	215-639-3100
Tex	Austin, Martin, Ziekosky, Browne & Assoc.	512-454-4371
Tex	Dallas, Martin, Ziekosky, Browne & Assoc.	214-233-5535
Tex	Houston, Martin, Ziekosky, Browne & Assoc.	713-523-7333
FOR:	Can., Calgary, Alberta, Westronic Engrg. Sls. Ltd.	403-253-5585
FOR:	Can., Montreal, Quebec, Comptonics Ltd.	514-342-4117
FOR:	Can., Vancouver 10, BC, Westronics Engrg. Sls. Ltd.	604-872-0636

TROMPETER ELECTRONICS, INC. cont'd

Advertisement

"Special cable, connectors, patching and switching for Video, T.V., data, and instrumentation systems. Patching includes patch panels, patch cords, and many special accessories in coax, triax, twinax, and quadax noise-rejecting cable systems. Switching includes custom built matrices and multipole - multithrow relays including Digital control for coax, isolated coax, triax and twinax cable systems. Frequencies from D.C. up through 3 GHz. Technical discussion of noise rejecting cable systems in catalog."

TRONIC CORP., Box 247-E, Belmont, Cal., 94002, Tel: 415-593-1487, Telex: 34-8457; Empl.: 5; Minimum order: \$35

For info on price: B. Keeler 913-263-2440; Application info: H. Stanly 415-593-1487; Customer service: B. Keeler 913-263-2440; Delivery info: B. Keeler 913-263-2440

Products manufactured: Cleaners, Ultrasonic, Machines/Machinery, Production

Local Sales Offices & Reps.

Cal	Belmont, C. B. Process	415-592-4545
Cal	Long Beach, Viets Engrg.	213-426-2107
Cal	Broomfield, F. J. Leonard Co.	303-466-2307
Fla	Hollywood, Victor Metal Finishing	305-981-1969
Haw	Honolulu, C & F Machinery	808-524-1033
Ind	Indianapolis, Hi-B	317-357-8521
Kans	Mission, Grady Co.	913-262-1231
Mich	Southfield, American EnviroSales	313-559-6145
Minn	Minneapolis, Chemquip Corp.	612-374-3610
NJ	Mountain Lakes, Desrie & Farrell	201-334-4848
NY	Lyons, Finishing Sys.	315-946-6661
NC	Statesville, Brown Equip.	704-872-3669
Ohio	Akron, Friess Vacublast	216-836-9011
Okla	Oklahoma City, Tri-Mech Co.	405-478-2558
Or	Portland, Precision Chemical	503-244-7636
Pa	Pittsburgh, Checker Inds.	412-795-4414
Tex	Houston, Allies Machinery & Supply	214-358-1401
Wisc	Menomonee Falls, Fritz Engrg.	414-251-6590

TRUE DATA CORP., 2701 S. Halladay, Santa Ana, Cal., 92707

TRUMP-ROSS IND'L CONTROLS, Div. of Datametrics, Inc., 265 Boston Rd., Billerica, Mass., 01862, Tel: 617-663-3451; Empl.: 55

For info on price: R. Brunelle; Application info: S. Futran; Customer service: R. Brunelle; Delivery info: R. Brunelle

Free literature available: Incremental Encoders & Systems Handbook - Theory of operation of incremental encoders, glossary of terms, condensed catalog, and block diagrams of typical applications.

Products manufactured: Encoders, Tachometers, Testers

Local Sales Offices & Reps.

Cal	Encino, King-Way Associates	213-788-4124
Cal	San Carlos, Electro-Pacific	415-593-1334
Cal	Littleton, Radco Electronics	303-794-4279
Ill	Chicago, Thermo/Cense	312-792-2760
Mass	Waltham, J. W. Simpson Co.	617-899-7700
Mich	Royal Oak, Dave Ray & Associates	313-576-4705
NJ	South Orange, The Smith Co.	201-763-1770
NY	Rochester, KLM Assocs.	716-442-0820
NY	Syracuse, KLM Assocs.	315-458-6214
NC	Winston-Salem, Radco Co.	919-722-9671
Ohio	Chagrin Falls, The J. Kilroy Corp.	216-247-8997
Pa	Jenkintown, Stein Instrumentation Corp.	215-885-2370
Tex	Richardson, Concept Sls.	214-231-3040
Wash	Bellevue, Al Smith Co.	206-746-6770

TRUTONE ELCTRNS., INC., 7315 Fulton Ave., No. Hollywood, Cal., 91605, Tel: 213-875-0423; Empl.: 25; Minimum order: \$5

Customer service: Sls. Dept.

Free literature available: Complete catalog of sound products. Tuners - amplifiers - receivers - accessories.

Products manufactured: Amplifiers, Receivers, Tuners

Local Sales Offices & Reps.

Ala	Birmingham, Adams & Assocs.	205-822-8109
Ariz	Phoenix, J.R. Morgan Agency	602-252-3089
Cal	Santa Clara, Wayne Wainwright	408-247-2310
Cal	Littleton, J.E. Gray	303-795-8223
Conn	West Hartford, R. Smith Co.	203-523-0512
Fla	Miami, World Wide Prods.	305-949-3457
Ga	Decatur, Adams & Assocs.	404-981-2207
Ill	Skokie, M. Bermann Sls.	312-675-3740
Ind	Olney, D. Buckley	301-774-9338
Mich	Pontiac, T.A. Sls.	313-335-4285
Minn	Moorhead, Northland Assocs.	218-233-4616
Miss	Michigan City, J. Fisher Sls.	601-224-6740
Mo	Kansas City, Nevco Inc.	816-421-1751
NY	Jamaica, G.E. Miller Assocs.	516-433-5590
NY	Phelps, LSM Assocs.	315-548-4891
NC	Greensboro, Adams & Assocs.	919-272-6838
Ohio	Cleveland, J.O. Olsen Co.	216-752-5444
Or	Lake Oswego, McMillan Elctns.	503-636-6257
Tenn	Memphis, L.E. Jones	901-683-7616
Tex	Dallas, Techno Assocs.	214-357-9213

TRW CAPACITOR DIV., 301 West 'O' Str., Ogallala, Neb., 69153, Tel: 308-284-3611, TWX: 910-620-0321; FSC No: 5910; Minimum order: \$100 p. 2-302-314

For info on price: A. Tompkins Ext. 362; Application info: T. Vonkampen Ext. 306; Customer service: K. Freshman Ext. 360; Delivery info: K. Freshman Ext. 360

Products manufactured: Capacitors, Fixed, Diodes, Rectifiers, Transistors

Local Sales Offices & Reps.

Ala	Huntsville, TRW Elctns.	205-772-9656
Ariz	Scottsdale, Q.T. Wiles & Assocs.	602-948-5590
Cal	Los Angeles, Q.T. Wiles & Assocs.	213-649-1232
Cal	Menlo Park, Straube Assocs.	415-323-2476
Cal	San Diego, Q.T. Wiles & Assocs.	714-565-6893
Cal	Tustin, Q.T. Wiles & Assocs.	714-832-4952
Cal	Woodland Hills, TRW Elctns.	213-883-9033
Cal	Denver, Straube Assocs.	303-426-0890
Conn	Rowayton, TRW Elctns.	203-853-4466
Fla	Ft. Lauderdale, TRW Elctns.	305-721-1700
Fla	Orlando, TRW Elctns.	305-857-3650
Ill	Elk Grove, J.G. Twist Co.	312-593-0200
Ind	Ft. Wayne, R.O. Whitesell & Assoc.	219-432-5591
Ind	Indianapolis, R.O. Whitesell & Assoc.	317-359-9283
Ind	Kokomo, R.O. Whitesell & Assocs.	317-452-6065
Iowa	Cedar Rapids, J.G. Twist Co.	319-393-8703
Kans	Prairie Village, J.G. Twist Co.	913-236-4646
Ky	Louisville, R.O. Whitesell & Assoc.	502-893-7303
Md	Ellicott City, TRW Elctns.	301-465-1777
Mass	Waltham, TRW Elctns.	617-899-6100
Mich	Grand Rapids, R.O. Whitesell & Assoc.	616-451-8901
Mich	Southfield, R.O. Whitesell & Assoc.	313-358-2020
Mich	St. Joseph, R.O. Whitesell & Assoc.	616-983-7337
Minn	Minneapolis, TRW Elctns.	612-835-5454
Mo	St. Louis, J.G. Twist Co.	314-432-2830
NM	Albuquerque, Straube Assocs.	505-292-0295
NY	Melville, TRW Elctns.	516-293-9000
NY	Rochester, TRW Elctns.	716-461-3070
Ohio	Cincinnati, R.O. Whitesell & Assocs.	513-521-2290
Ohio	Cleveland, R.O. Whitesell & Assocs.	216-228-7525
Ohio	Columbus, R.O. Whitesell & Assocs.	614-888-9396
Ohio	Dayton, R.O. Whitesell & Assocs.	513-298-9546
Or	Beaverton, N.R. Schultz Co.	503-643-1644
Pa	Narberth, TRW Elctns.	215-667-3400
Pa	Pittsburgh, R.O. Whitesell & Assocs.	412-344-7277
Tex	Dallas, TRW Elctns.	214-637-6650
Tex	Houston, TRW Elctns.	713-771-7812
Utah	Salt Lake City, Straube Assocs.	801-328-4513
Va	Roanoke, TRW Elctns.	703-345-4965
Wash	Bellevue, N.R. Schultz Co.	206-454-0300
Wash	Waukesha, J.G. Twist Co.	414-475-7755

Products manufactured: Boards, Plug-In, Boards, Programming, Caps, Connector, Clamps & Clips, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Covers, Protective (Including Dust), Integrated Circuit Devices, Jacks (All Types), Plug & Jack Sets, Plugs, Shields, Sockets, Strips, Terminal Blocks, Boards & Strips, Terminals, Tools

For info on price: W. Walthall; Application info: W. Walthall; Customer service: A. Fosco; Delivery info: A. Fosco

Local Sales Offices & Reps.

Ala	Huntsville, TRW Cinch Divs.	205-772-9656
Ariz	Scottsdale, TRW Cinch Divs.	602-994-0441
Cal	Cerritos, TRW Cinch Divs.	213-924-5711
Cal	Mountain View, TRW Cinch Divs.	415-969-2252
Cal	Tustin, TRW Cinch Divs.	714-544-8751
Cal	Denver, Straube Assoc.	303-426-0890
Conn	Rowayton, TRW Cinch Divs.	203-853-4466
Fla	Ft. Lauderdale, TRW Cinch Divs.	305-721-1700
Fla	Orlando, TRW Cinch Divs.	305-894-6881
Ill	Elk Grove Village, TRW Cinch Divs.	312-593-0200
Ill	Rosemont, TRW Cinch Divs.	312-298-1340
Ind	Indianapolis, R.O. Whitesell	317-359-9283
Mass	Reading, TRW Cinch Divs.	617-944-3020
Mich	Southfield, TRW Cinch Divs.	313-357-3700
Minn	Minneapolis, TRW Cinch Divs.	612-835-5454
Mo	St. Louis, TRW Cinch Divs.	314-727-7370
NJ	Clifton, TRW Cinch Divs.	201-546-0990
NM	Albuquerque, Straube Assocs.	505-294-1880
NY	Manlius, TRW Cinch Divs.	315-637-3282
NY	Melville, TRW Cinch Divs.	516-293-9000
NY	Rochester, TRW Cinch Divs.	716-461-3070
NC	Charlotte, TRW Cinch Divs.	704-376-6811
Ohio	Dayton, TRW Cinch Divs.	513-298-9862
Okla	Oklahoma City, TRW Cinch Divs.	405-524-2040
Pa	Glenside, TRW Cinch Divs.	215-887-7520
Pa	Newtown, TRW Cinch Divs.	215-968-5819
Tex	Dallas, TRW Cinch Divs.	214-637-6650
Tex	Houston, TRW Cinch Divs.	713-772-5541
Utah	Salt Lake City, Straube Assoc.	801-328-4513
Va	Springfield, TRW Cinch Divs.	703-321-7930
Wash	Seattle, D. Smith Sls.	206-633-3160

Colo Denver, Cramer Elctn., 5465 E. Evans Pl. 303-758-2100

Conn North Haven, Cramer Elctn., 35 Dodge Ave. 203-239-5641

Fla Orlando, Cramer-Ew, 345 N. Graham Ave. 305-894-1511

Ga Atlanta, Cramer-Atlanta, 3923 Oakcliff 404-488-9050

Ill Chicago, Allied Elctn., Box 6569 312-421-2400

Ill Elk Grove, Hall-Mark Elctn., 180 Crossen Ave. 312-437-8800

Kans Lenexa, Hall-Mark Elctn., 9006 Rosehill Rd. 913-888-4747

Md Hanover, Cramer-Baltimore, 7255 Standard Dr. 301-796-5790

Mass Boston, Demambro Elctn., 1095 Commonwealth 617-787-1200

Minn Minneapolis, Hall-Mark Elctn., 4555 W. 77th St. 612-925-2944

Mo Earth City, Hall-Mark Elctn., 13789 Rider Trail 314-291-5350

NJ Clifton, Wilshire Elctn., 312 Clifton Ave. 201-365-2600

NJ Moonachie, Crameer Elctn., 1 Barrett Ave. 201-935-5600

NM Albuquerque, Cramer Elctn., 137 Vermont N.E. 505-265-5767

NY Hauppauge, Cramer Elctn., 29 Oser Ave. 516-231-5600

NY Lynbrook, Peerless Radio, 19 Wilbur St. 516-593-2121

NC Winston Salem, Cramer-Ew, 938 Burke St. 919-725-8711

Ohio Columbus, Elctn. Mktg., 1150 W. Third Ave. 614-299-4161

Okla Tulsa, Hall-Mark Elctn., 4846 S. 83rd E. Ave. 918-835-8458

Pa Philadelphia, Phila Elctn., 1225 Vine St. 215-568-7444

Tex Dallas, Hall-Mark Elctn., 9333 Forest La. 214-231-6111

Utah Salt Lake, Cramer Elctn., 391 W. 2500 South 801-487-4131

Va Charlottesville, Virginia Radio, Box 1189 703-296-4184

Wash Seattle, Liberty Elctn., 5305 2nd Ave. S. 206-763-8200

Wisc Milwaukee, Hall-Mark Elctn., 11925 W. Ripley Ave. 414-476-1270

TRW/CINCH CONNECTORS, Electronic Comp. Div. of TRW Inc., 1501 Morse Ave., Elk Grove Village, Ill., 60007, Tel: 312-439-8800 p. 2-896,897

For info on price: W. Walthall; Application info: W. Walthall; Customer service: A. Fosco; Delivery info: A. Fosco

Products manufactured: Boards, Plug-In, Boards, Programming, Caps, Connector, Clamps & Clips, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Covers, Protective (Including Dust), Integrated Circuit Devices, Jacks (All Types), Plug & Jack Sets, Plugs, Shields, Sockets, Strips, Terminal Blocks, Boards & Strips, Terminals, Tools

For info on price: W. Walthall; Application info: W. Walthall; Customer service: A. Fosco; Delivery info: A. Fosco

Products manufactured: Boards, Plug-In, Boards, Programming, Caps, Connector, Clamps & Clips, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Covers, Protective (Including Dust), Integrated Circuit Devices, Jacks (All Types), Plug & Jack Sets, Plugs, Shields, Sockets, Strips, Terminal Blocks, Boards & Strips, Terminals, Tools

For info on price: W. Walthall; Application info: W. Walthall; Customer service: A. Fosco; Delivery info: A. Fosco

Products manufactured: Boards, Plug-In, Boards, Programming, Caps, Connector, Clamps & Clips, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Covers, Protective (Including Dust), Integrated Circuit Devices, Jacks (All Types), Plug & Jack Sets, Plugs, Shields, Sockets, Strips, Terminal Blocks, Boards & Strips, Terminals, Tools

For info on price: W. Walthall; Application info: W. Walthall; Customer service: A. Fosco; Delivery info: A. Fosco

Products manufactured: Boards, Plug-In, Boards, Programming, Caps, Connector, Clamps & Clips, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Covers, Protective (Including Dust), Integrated Circuit Devices, Jacks (All Types), Plug & Jack Sets, Plugs, Shields, Sockets, Strips, Terminal Blocks, Boards & Strips, Terminals, Tools

For info on price: W. Walthall; Application info: W. Walthall; Customer service: A. Fosco; Delivery info: A. Fosco

Products manufactured: Boards, Plug-In, Boards, Programming, Caps, Connector, Clamps & Clips, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Covers, Protective (Including Dust), Integrated Circuit Devices, Jacks (All Types), Plug & Jack Sets, Plugs, Shields, Sockets, Strips, Terminal Blocks, Boards & Strips, Terminals, Tools

For info on price: W. Walthall; Application info: W. Walthall; Customer service: A. Fosco; Delivery info: A. Fosco

Products manufactured: Boards, Plug-In, Boards, Programming, Caps, Connector, Clamps & Clips, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Covers, Protective (Including Dust), Integrated Circuit Devices, Jacks (All Types), Plug & Jack Sets, Plugs, Shields, Sockets, Strips, Terminal Blocks, Boards & Strips, Terminals, Tools

For info on price: W. Walthall; Application info: W. Walthall; Customer service: A. Fosco; Delivery info: A. Fosco

Products manufactured: Boards, Plug-In, Boards, Programming, Caps, Connector, Clamps & Clips, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Covers, Protective (Including Dust), Integrated Circuit Devices, Jacks (All Types), Plug & Jack Sets, Plugs, Shields, Sockets, Strips, Terminal Blocks, Boards & Strips, Terminals, Tools

For info on price: W. Walthall; Application info: W. Walthall; Customer service: A. Fosco; Delivery info: A. Fosco

Products manufactured: Boards, Plug-In, Boards, Programming, Caps, Connector, Clamps & Clips, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Covers, Protective (Including Dust), Integrated Circuit Devices, Jacks (All Types), Plug & Jack Sets, Plugs, Shields, Sockets, Strips, Terminal Blocks, Boards & Strips, Terminals, Tools

For info on price: W. Walthall; Application info: W. Walthall; Customer service: A. Fosco; Delivery info: A. Fosco

Products manufactured: Boards, Plug-In, Boards, Programming, Caps, Connector, Clamps & Clips, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Covers, Protective (Including Dust), Integrated Circuit Devices, Jacks (All Types), Plug & Jack Sets, Plugs, Shields, Sockets, Strips, Terminal Blocks, Boards & Strips, Terminals, Tools

For info on price: W. Walthall; Application info: W. Walthall; Customer service: A. Fosco; Delivery info: A. Fosco

Products manufactured: Boards, Plug-In, Boards, Programming, Caps, Connector, Clamps & Clips, Connector Adapters, Connector Blocks, Mother Board, Connectors, Contacts, Electrical, Covers, Protective (Including Dust), Integrated Circuit Devices, Jacks (All Types), Plug & Jack Sets, Plugs, Shields, Sockets, Strips, Terminal Blocks, Boards & Strips, Terminals, Tools

Local Distributors								
Ala	Birmingham, M. G. Elctns.	205-328-4525	Md	Gaithersburg, Kierulff Elctns.	301-948-0250	Ohio	Cleveland, W. M. Pattison Supp. Co.	216-441-3000
Ala	Huntsville, Cramer/E. W.	205-539-5722	Md	Hagerstown, Stoddard Supp.	301-733-3390	Ohio	Columbus, Elctns. Mktg. Corp.	614-299-4161
Alas	Fairbanks, Intercoastal, Inc.		Md	Hyattsville, Milgray/Washington Inc.	301-864-1111	Ohio	Columbus, Hughes Peters, Inc.	614-294-5351
Alas	Fairbanks, Yukon Radio Supp. Corp.					Ohio	Dayton, ESCO, Inc.	513-226-1133
		907-452-1011	Md	Rockville, Capitol Radio Wholesalers	301-881-2270	Ohio	Dayton, Pioneer/Dayton	513-236-9900
Ariz	Phoenix, Cramer Elctns. Inc.	602-267-7321	Md	Rockville, Pioneer/Washington	301-424-3300	Ohio	Toledo, Warren Radio Co.	419-248-3364
Ariz	Phoenix, Kierulff Elctns.	602-273-7331	Mass	Boston, DeMambo Elctns.	617-787-1200	Ohio	Warren, REM Elctn. Supp.	216-399-2777
Ariz	Phoenix, R. V. Weatherford Co.	602-272-7144	Mass	Boston, Sager Elec. Supp.	617-542-2281	Okla	Bartlesville, Cummins Elctns. Supp.	918-336-4448
Ariz	Phoenix, Sterling Elctns.	602-258-4531	Mass	Burlington, Wilshire Elctns./New England	617-272-8200			
Ark	Fort Smith, Carlton Bates Co.	501-782-7258	Mass	Dedham, Gerber Radio Supp.	617-329-2400	Okla	Oklahoma City, Trice Wholesale Elctns.	405-524-4411
Ark	Little Rock, Carlton Bates Co.	501-562-9100	Mass	Newton, Greene Shaw Co.	617-969-8900	Okla	Tulsa, Hall-Mark Elctns. Corp.	918-835-8458
Cal	Anaheim, R. V. Weatherford Co.	714-633-9633	Mass	Newton Centre, Cramer Elctns.	617-969-7700	Okla	Tulsa, Oil Capitol Elctns.	918-836-2541
Cal	Fresno, J. C. Arbuckle	209-264-6554	Mass	No. Wiltbraham, Ind'l. Components Corp.	413-596-3854	Okla	Tulsa, Radio, Inc.	918-587-9123
Cal	Glendale, R. V. Weatherford Co.	213-849-3451	Mass	Springfield, T. F. Cushing Co.	413-788-7341	Ore	Eugene, Vitus Elec. Supp. Co.	503-345-4377
Cal	Hayward, Dunlap Elctns.	415-352-1933	Mass	Watertown, Sterling Elctns.	617-926-9720	Ore	Medford, Verl G. Walker Co.	503-773-7557
Cal	Hollywood, Yale Radio Elec. Co.	213-465-3186	Mass	West Newton, A. W. Mayer Co.	617-965-1111	Ore	Portland, Central Dist.	503-234-0711
Cal	Los Angeles, Kierulff Elctns.	213-685-5511	Mass	Worcester, R. M. Elctns.	617-756-8311	Ore	Portland, Portland Radio Supp.	503-228-8647
Cal	Mt. View, Elmar Elctns.	415-961-3611	Mass	West Newton, A. W. Mayer Co.	617-965-1111	Ore	Portland, United Radio Supp.	503-233-7151
Cal	Palo Alto, Kierulff Elctn.	415-968-6292	Mich	Ann Arbor, Wedemeyer Elec. Supp.	313-665-8611	Ore	Salem, J. W. Elctns.	503-363-2371
Cal	Palo Alto, R. V. Weatherford Co.	415-493-5373	Mich	Detroit, R. S. Elctns.	313-491-1000	Pa	Allentown, A. A. Peters, Inc.	215-434-5237
Cal	Pomona, R. V. Weatherford Co.	714-623-1261	Mich	Flint, Shand Elctns. Inc.	313-743-8940	Pa	Devon, Peak Elctns.	215-887-9822
Cal	Riverside, Elctn. Supp.	714-683-7300	Mich	Lansing, Fulton Radio Supp.	517-489-6519	Pa	Drexel Hill, Kass Elctns. Dist.	215-449-2300
Cal	Sacramento, Dunlap Elctns.	916-444-8070	Mich	Livonia, Pioneer/Michigan	313-525-1800	Pa	Erie, Warren Radio	814-454-5285
Cal	San Diego, Kierulff Elctns.	714-278-2112	Mich	Marquette, N. W. R. Elctns. Corp.	906-226-7578	Pa	McKeesport, Barno Radio Corp.	412-751-5966
Cal	San Diego, R. V. Weatherford Co.	714-278-7400	Mich	Muskegon, Fitzpatrick Elec.	616-722-6621	Pa	Philadelphia, Almo Elctns. Corp.	215-676-6000
Cal	San Francisco, Zack Radio Supp. Corp.	415-626-1444	Mich	Oak Park, Newark Elctns.	313-548-0250	Pa	Philadelphia, Herbach-Rademam, Inc.	215-426-1700
Cal	Santa Barbara, Channel Radio Supp. Co.	805-965-8551	Mich	Wyoming, Newark Elctns.	616-241-6681	Pa	Philadelphia, Philadelphia Elctns.	215-568-7400
Cal	Sun Valley, Sterling Elctns.	213-767-5030	Minn	Edina, Harvey-Minnesota	612-941-6060	Pa	Pittsburgh, Cameradio Elctns.	412-288-2600
Colo	Commerce City, Elmar Elctn.	303-287-9611	Minn	Minneapolis, Newark Elctns.	612-331-6350	Pa	Pittsburgh, McCullough Elec. Co.	412-261-2420
Colo	Denver, Elctn. Parts Co.	303-744-1992	Minn	Minneapolis, Stark Elec. Supp.	612-332-1325	Pa	Pittsburgh, R. P. C. Elctns.	412-762-3770
Colo	Denver, Newark Elctns.	303-757-3351	Minn	St. Paul, Gopher Elctns.	612-645-0241	Pa	Reading, The George Barbey Co.	215-376-7451
Colo	Englewood, R. V. Weatherford Co.	303-761-5432	Miss	Jackson, Ellington Elctn. Supp.	601-355-0561	Pa	Scranton, Prussell Elctns.	717-346-2011
Conn	East Haven, J. V. Elctns.	203-469-2321	Mo	Joplin, Four State Radio & Supp.	417-624-0368	Pa	St. Mary, B & R Elctns.	814-834-2814
Conn	Hamden, Wilshire Elctns./Conn.	203-281-1166	Mo	Kansas City, Burstein-Applebee Co.	816-531-5614	Pa	York, Rosen Elctns.	717-843-3875
Conn	Waterbury, Bond Radio Elctns.	203-753-1184	Mo	Kansas City, Radiolab, Inc.	816-561-9935	RI	Providence, Wm. Dandreta & Co.	401-861-2800
Fia	Hollywood, Cramer/E. W.	305-923-8181	Mo	St. Louis, Interstate Ind'l. Elec.	314-481-6110	RI	Warwick, W. H. Edwards Co., Inc.	401-781-8000
Fia	Jacksonville, Southeast Elctns.	904-356-3007	Mo	St. Louis, Olive Ind'l. Elctns.	314-863-7800	SC	Charleston, Wholesale Radio Supp.	803-747-9672
Fia	Miami, Elctn. Equip. Co.	305-871-3500	Mo	St. Louis, Van Sickle Radio Elctns.	314-621-5000	SC	Columbia, Dixie Radio Supply	803-253-5333
Fia	Orlando, Cramer/E. W.	305-894-1511	Mont	Billings, Elctn. Supp. Co.	406-252-2197	SC	Greenville, Hammond Elctns.	803-233-4121
Fia	Orlando, Hall-Mark Elctns. Corp.	305-855-4020	Neb	Lincoln, Scott Elctn. Supp.	402-434-8308	Tenn	Kingsport, Radio Elec. Supp.	615-247-8111
Fia	Orlando, Hammond Elctns.	305-849-8060	Neb	Omaha, Radio Equip. Co.	402-341-7700	Tenn	Knoxville, Bondurant Bros Co.	615-577-0473
Fia	Pensacola, Grice Elctns.	904-433-4616	Neb	Omaha, Radio Equip. Co.	402-341-7700	Tenn	Knoxville, Industrial Elctns.	615-573-7135
Fia	Tampa, Lykes Elctns.	813-886-6621	Nev	Las Vegas, Metcalf Elctns.	702-384-2151	Tenn	Memphis, Bluff City Dist. Co.	901-725-9500
Ga	Atlanta, Cramer/E. W. Atlanta	404-448-9050	Nev	Reno, Dunlap Elctns.	702-329-1308	Tenn	Nashville, Electra Dist. Co.	615-329-3971
Ga	Atlanta, Lykes Elctns. Corp.	404-355-2223	NH	Concord, Evans Radio, Inc.	603-224-9961	Tex	Ablene, R & R Elctns. Supp.	915-677-2974
Ga	Atlanta, Specialty Dist.	404-873-2521	NJ	Camden, General Radio Supp. Co.	609-964-8560	Tex	Amarillo, R & R Elctns. Supp.	806-374-2866
Haw	Honolulu, Honolulu Elctns.	808-949-5564	NJ	Clark, Tex. Instrs. Supp.	201-382-6400	Tex	Corpus Christi, Wicks Radio Equip. Co.	512-884-8285
Haw	Honolulu, Precision Radio Ltd.	808-537-5291	NJ	Clifton, Wilshire Elctns./N.J.	201-365-2600	Tex	Dallas, All State Elctns.	214-358-4171
Idaho	Idaho Falls, Schwendimans Wholesale Dist.	208-522-2492	NJ	Hanover, State Elec. Parts Corp.	201-887-2550	Tex	Dallas, Hall-Mark Elctns. Corp.	214-231-6111
Idaho	Twin Falls, United Elctn. Wholesalers	208-733-7324	NJ	Kenilworth, Newark Elctns.	201-272-8410	Tex	Dallas, Tex. Instr. Supp.	214-238-6821
Ill	Arlington Hts., Tex. Instr. Supp.	312-593-7660	NJ	Moorestown, Arrow/Angus	609-235-1900	Tex	El Paso, Midland Specialties Co.	915-533-9555
Ill	Champaign, Klaus Radio, Inc.	217-356-1896	NJ	Pennsauken, Radio Elec. Svc. Co.	609-662-4000	Tex	Ft. Worth, Allied Elctns.	817-336-5401
Ill	Chicago, Elctn. Dist.	312-283-4800	NJ	Rahway, Valley Elctn. Supp.	201-381-5404	Tex	Ft. Worth, Swieco, Inc.	817-335-6521
Ill	Chicago, Newark Elctns.	312-638-4411	NJ	Saddlebrook, Arrow Elctns.	201-797-5800	Tex	Garland, Newark Elctns.	214-271-2511
Ill	Elgin, Allied Elctns.	312-697-8200	NM	Albuquerque, Cramer/N.M.	505-265-5767	Tex	Houston, Harrison Equip. Co.	713-224-9131
Ill	Elk Grove Vill., Lakeland Elctns., Inc.	312-595-1000	NM	Albuquerque, Kierulff Elctns.	505-247-1055	Tex	Houston, Sterling Elctns.	713-627-9800
Ill	La Salle, Klaus Radio, Inc.	815-223-7400	NY	Albany, E. E. Taylor Co.	518-489-5600	Tex	Lubbock, R & R Elctns. Supp.	806-765-7727
Ill	Mt. Prospect, Cramer/Chicago	312-593-8230	NY	Binghamton, Harvey Elctns.	607-748-8211	Tex	McAllen, Rio Radio Supp.	512-682-5224
Ill	Palatine, Ohm Elctns. Inc.	312-359-5500	NY	Binghamton, Stack Ind'l. Elctns.	607-723-6326	Tex	San Antonio, Electrotex	512-735-9271
Ill	Peoria, Klaus Radio, Inc.	309-691-4840	NY	Buffalo, Summit Dist.	716-884-3450	Utah	Salt Lake City, Cramer/Utah	801-487-4131
Ill	Quincy, Klaus Radio, Inc.	217-223-7560	NY	Commack, Connecting Components Corp.	516-543-8300	Utah	Salt Lake City, Standard Supp. Co.	801-355-2971
Ill	Rockford, J & M Elctns.	815-963-6445	NY	Elmira, Brady Supp. Co.	607-733-6591	Va	Arlington, Arlington Elctn. Wholesalers	703-524-2412
Ill	Skokie, Bell Elctns.	312-965-7500	NY	Farmingdale, Arrow Elctns.	516-694-6800	Va	Charlottesville, Virginia Radio Supp.	703-296-4184
Ill	Villa Park, Melvin Elctns.	312-279-5015	NY	Farmingdale, Harrison Elctns. Corp.	516-293-7990	Va	Norfolk, Priest Elctns.	703-855-0141
Ind	Evansville, Hutch & Son Inc.	812-425-7201	NY	Glens Falls, Ray Supp.	518-792-5848	Va	Richmond, Meridan Elctn. Equip. Co.	804-353-6648
Ind	Evansville, Ohio Valley Sound Svc.	812-425-6173	NY	Hauapauge, Rampart Components	516-273-1111	Va	Roanoke, Peoples Radio & TV Supply Co.	703-342-8933
Ind	Fort Wayne, Fort Wayne Elctn.	219-742-4346	NY	Lynbrook, Peerless Radio Corp.	516-593-2121	Wash	Bellingham, Advanced Elctn.	206-734-3400
Ind	Indianapolis, Graham Elctns.	317-634-8202	NY	Poughkeepsie, Higgins-Sheer Elec. Dist.	914-471-3510	Wash	Seattle, Almac/Strum Elctns.	206-763-2300
Ind	Indianapolis, Pioneer/Ind.	317-849-7300	NY	Rochester, Cramer Elctns.	716-275-0300	Wash	Seattle, Liberty Elctns.	206-763-8200
Ind	Indianapolis, Ra-Dis Co.	317-637-5571	NY	Rochester, Rochester Radio Supp.	716-454-6300	Wash	Seattle, R. V. Weatherford Co.	206-243-6340
Ind	South Bend, Radio Dist. Co.	219-287-2911	NY	Rochester, Simcona Elctns. Corp.	716-328-3230	Wash	Seattle, Western Elctns. Co.	206-284-0200
Iowa	Cedar Rapids, DEECO, Inc.	319-365-7551	NY	Rome, Rome Elctns.	315-337-5400	Wash	Spokane, Northwest Elctns.	509-535-7652
Iowa	Davenport, Klaus Radio	319-323-9761	NY	Syosset, Milo Elctns. Corp.	516-364-1111	Wash	Tacoma, Wible Radio Supp. Co.	206-474-9471
Iowa	Davenport, Warren Radio Co.	319-323-8051	NY	White Plains, Westchester Elctns.	914-949-2400	Wash	Walla Walla, Inland Elctns. Supp.	509-529-2241
Iowa	Des Moines, Radio Trade Supp. Co.	515-288-7237	NY	Woodbury, Harvey Elctns.	516-921-8700	Wash	Yakima, Lay & Nord	509-453-5596
Kans	Topeka, Acme Radio, Inc.	913-235-1363	NC	Greensboro, Hammond Elec. of Carolina	919-275-6391	WVa	Huntington, Elctn. Supp. Inc.	304-523-6443
Kans	Wichita, Radio Supp. Co.	316-267-5216	NC	Raleigh, Southeastern Radio Supp.	919-828-2311	Wisc	Madison, Satterfield Elctns.	608-257-4801
Ky	Louisville, P. I. Burks Co.	502-583-2871	NC	Winston Salem, Cramer/E. W.	919-725-8711	Wisc	Milwaukee, Elctn. Expeditors, Inc.	414-228-8100
La	Lafayette, Ralph's of Lafayette	318-234-4507	Ohio	Akron, Akron Elctns. Supp.	216-762-8818	Wisc	Milwaukee, Part Mart Corp.	414-276-4160
La	New Orleans, Lykes Elctns.	504-486-7441	Ohio	Cincinnati, Hughes Peters, Inc.	513-351-2000	Wisc	West Allis, Marsh Elctns.	414-545-6500
La	New Orleans, Radio Parts, Inc.	504-581-5959	Ohio	Cincinnati, Newark Elctns.	513-874-5115			
La	New Orleans, Southern Radio Supp. Co.	504-524-2343	Ohio	Cleveland, Pioneer/Cleveland	216-587-3600			
La	Shreveport, Ind'l. Elctn. Supp.	318-422-9459						
Md	Baltimore, Arrow Elctn.	202-737-1700						
Md	Baltimore, Radio Elec. Svc.	301-823-0070						
Md	Bethesda, Empire Elctn. Supp. Co.	301-656-3300						

TRW/CINCH-GRAPIK, ELCTRN. COMPS., Div.
TRW INC., 200 S. Turnbull Canyon Rd., City of Industry, Cal., 91744, Tel: 213-333-1201, TWX: 910-584-1861, p. 2-896 891

TRW/CINCH-GRAPIK, ELCTRN. COMPS., Div.
 TRW INC., 200 S. Turnbull Canyon Rd., City of
 Industry, Cal. 91744, Tel: 213-333-1201, TWX:
 910-584-1861 p. 2-896,897

Customer service: J. Pyle
 Products manufactured: Boards, Plug-In, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Circuits, Printed, Multilayer, Screens, Printed Circuit

(Refer to TRW/Cinch Connectors for Sales Office Information)

TRW/CINCH-MONADNOCK, AN ELCTRN. COMPS., Div. TRW Inc., 18301 E. Arenth Ave., Box 1222, City of Industry, Cal., 91749, Tel: 213-964-6581, TWX: 910-584-1303

Customer service: C. Miller
 Products manufactured: Fasteners, Grommets, Pads, Transistor Mounting, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.
 NJ W Long Branch 201-229-0077

TRW ELEC. FUNCTIONS, Davis & Copewood Sts., Camden, N.J., 08103, Tel: 609-365-5500, TWX: 710-891-7087

Customer service: S. Ledgemoed
 Products manufactured: Amplifiers, Capacitors, Variable, Couplers, Diplexers, Antenna, Filters, Oscillators, Preselectors

Local Sales Offices & Reps.
 Ala Huntsville, TRW Sales Off. 205-772-9656
 Ariz Scottsdale, Q. T. Wiles & Assoc. 602-947-5791
 Cal Los Angeles, Q. T. Wiles & Assoc. 213-649-1232

Cal Menlo Park, Straube Assoc. 415-323-2476
 Cal San Diego, Q. T. Wiles & Assoc. 714-565-6893
 Cal Tustin, Q. T. Wiles & Assoc. 714-832-4952
 Colo Boulder, Straube Assoc. 303-443-8600
 Conn Rowayton, TRW Sls. Off. 203-853-4466
 Fla Fort Lauderdale, TRW Sales Off. 305-721-1700
 Fla Orlando, TRW Sls. Off. 305-894-6881
 Ill Elk Grove Village, J. G. Twist Co. 312-593-0200
 Ind Ft. Wayne, R. O. Whitesell & Assoc. 219-432-5591

Ind Indianapolis, R. O. Whitesell & Assoc. 317-359-9283
 Ind Kokomo, R. O. Whitesell & Assoc. 317-452-6065
 Iowa Cedar Rapids, J. G. Twist Co. 319-393-8703
 Kans Prairie Village, J. G. Twist Co. 913-236-4646
 Ky Louisville, R. O. Whitesell & Assoc. 502-893-7303

Md Ellicott City, TRW Sls. Off. 301-465-1777
 Mass Waltham, TRW Sls. Off. 617-899-6100
 Mich Grand Rapids, R. O. Whitesell & Assoc. 616-451-8901
 Mich Southfield, R. O. Whitesell & Assoc. 313-358-2020
 Mich St. Joseph, R. O. Whitesell & Assoc. 616-983-7337

Minn Minneapolis, TRW Sls. Off. 612-835-5454
 Mo St. Louis, J. G. Twist Co. 314-432-2830
 NM Albuquerque, Straube Assoc. 505-294-1880
 NY Rochester, TRW Sls. Off. 716-461-3070
 Ohio Cincinnati, R. O. Whitesell & Assoc. 513-521-2290
 Ohio Cleveland, R. O. Whitesell & Assoc. 216-228-7525
 Ohio Columbus, R. O. Whitesell & Assoc. 614-888-9396

Ohio Dayton, R. O. Whitesell & Assoc. 513-298-9546
 Okla Oklahoma City, TRW Sls. Off. 405-524-2040
 Ore Beaverton, N. R. Schultz Co. 503-643-1644
 Pa Narberth, TRW Sls. Off. 215-667-3400
 Pa Pittsburgh, R. O. Whitesell & Assoc. 412-344-7277
 Tenn Bristol, R. O. Whitesell & Assoc. 615-968-4195
 Tex Dallas, TRW Sls. Off. 214-637-6650
 Tex Houston, TRW Sls. Off. 713-771-7812
 Utah Salt Lake City, Straube Assoc. 801-328-4513
 Va Roanoke, TRW Sls. Off. 703-345-4965
 Wash Bellevue, N. R. Schultz Co. 206-454-0300
 Wisc Waukesha, J. G. Twist Co. 414-786-6330

TRW/GLOBE MOTORS, 2275 Stanley Ave., Dayton, Ohio, 45404, Tel: 513-228-3171; Empl: 500; Minimum order: \$50 p. 1-988-991

Application info: J. Hohne; Customer service: R. Orth
 Products manufactured: Actuators, Blowers & Fans & Accessories, Clutches, Gearheads & Speed Reducers, Generators, Motor & Generator Armatures, Rotors, Stators, Motors, Reducers

Local Sales Offices & Reps.
 Ala Huntsville, TRW Elctns. 205-772-9656
 Ariz Scottsdale, O.T. Wiles & Assoc. 602-948-5590
 Cal Dublin, Straube Assoc. 415-828-1550
 Cal Los Angeles, Q.T. Wiles & Assoc. 213-478-0183

Cal Menlo Park, Straube Assocs. 415-323-2476
 Cal Tustin, Q.T. Wiles & Assocs. 714-832-4952
 Colo Denver, Straube Assocs. 303-426-0890
 Conn Orange, Comtronics Assocs. 203-795-3515
 Conn Rowayton, TRW Elctns. 203-853-4466
 Fla Orlando, TRW Elctns. 305-857-3650
 Ill Elk Grove Village, J.G. Twist Co. 312-593-0200
 Ind Fort Wayne, R.O. Whitesell & Assocs. 219-432-5591

Ind Indianapolis, R.O. Whitesell & Assocs. 317-359-9283
 Ind Kokomo, R.O. Whitesell & Assocs. 317-452-6065
 Iowa Cedar Rapids, J.G. Twist Co. 319-393-8703
 Kans Prairie Village, J.G. Twist Co. 913-236-4646
 Ky Louisville, R.O. Whitesell & Assocs. 502-893-7303

Mass Waltham, TRW Elctns. 617-899-6100
 Mich Grand Rapids, R.O. Whitesell & Assocs. 616-451-8901
 Mich Southfield, R.O. Whitesell & Assocs. 313-358-2020
 Mich St. Joseph, R.O. Whitesell & Assocs. 616-983-7337

Minn Minneapolis, TRW/ECD 612-835-5454
 Mo St. Louis, J.G. Twist Co. 314-432-2830
 NY Garden City, Comtronics Assocs. 516-741-8966
 NY Rochester, TRW/ECD 716-461-3070
 Ohio Cincinnati, R.O. Whitesell & Assocs. 513-521-2290

Ohio Cleveland, R.O. Whitesell & Assocs. 216-228-7525
 Ohio Columbus, R.O. Whitesell & Assoc. 614-888-9396
 Ohio Dayton, R.O. Whitesell & Assoc. 513-298-9546
 Ore Beaverton, N.R. Schultz Co. 503-643-1644
 Pa Narberth, TRW Elctns. 215-667-3400
 Pa Pittsburgh, R.O. Whitesell Assocs. 412-344-7277

Tenn Bristol, R.O. Whitesell & Assocs. 615-968-4195
 Tex Dallas, TRW/ECD 214-387-3030
 Tex Houston, TRW/ECD 713-772-5541
 Utah Salt Lake City, Straube Assocs. 801-328-4513
 Va Roanoke, TRW Elctns. 703-345-4965
 Wash Bellevue, N.R. Schultz Co. 206-454-0300
 Wisc Wauwatosa, J.G. Twist Co. 414-475-7755

EXP: Port Credit, Ont., Leonard Elec. Ltd. 416-274-3454

TRW ELECTRONICS, 10880 Wilshire Blvd., Los Angeles, Cal, 90024, Tel: 213-475-6777

TRW/HOLYOKE WIRE & CABLE, 775 New Ludlow Rd., South Hadley, Mass., 01075, Tel: 413-533-3961, TWX: 710-351-6636; Empl: 410; Minimum order: \$75

For info on price: G. T. Miles; Application info: W. J. Gaffney; Customer service: R. J. Krzynowek; Delivery info: G. Zirkalian

Free literature available: Manufacture electrical insulated wire, cable, and cable assemblies, and harnesses, for the Automotive - Home Entertainment - Computer - Instrumentation Industrial - & Telephone Markets.

Products manufactured: Braid, Cable, Cable Assemblies & Harnesses, Cable, Cords, Services, Assembly, Production & Test, Wire, Wire Shielding

Local Sales Offices & Reps.
 Ala Huntsville 205-772-9656
 Ariz Scottsdale 602-994-0441
 Cal Cerritos 213-924-5711
 Cal Mountain View 415-969-2252
 Colo Boulder 303-443-8600
 Conn Rowayton 203-853-4466
 Fla Fort Lauderdale 305-721-1700
 Fla Orlando 305-894-6881
 Ill Elk Grove Village 312-593-0200
 Ind Indianapolis 317-359-9283
 Mass Reading 617-944-3020
 Mich Detroit 313-873-1150
 Minn Minneapolis 612-835-5454
 Mo St. Louis 314-727-7370
 NJ Clifton 201-546-0990
 NY Melville L.I. 516-293-9000
 NY Rochester 716-461-3070
 Ohio Dayton 513-298-9862
 Pa Springhouse 215-542-9470
 Tex Dallas 214-637-6650
 Wash Seattle 206-633-3160

TRW/IRC FIXED RESISTORS, 2850 Mt. Pleasant St., Burlington, Iowa, 52601

Products manufactured: Networks, Resistors

Local Sales Offices & Reps.
 Ala Huntsville, TRW 205-772-9656
 Ariz Scottsdale, Q.T. Wiles & Assoc. 602-948-5590

Cal Los Angeles, Q.T. Wiles & Assocs. 213-649-1232

Cal Menlo Park, Straube Assocs. 415-323-2476
 Cal San Diego, Q.T. Wiles & Assocs. 714-565-6893
 Cal Tustin, Q.T. Wiles & Assocs. 714-832-4952
 Colo Boulder, Straube Assocs. 303-443-8600
 Conn Rowayton, TRW 203-853-4466
 Fla Ft. Lauderdale, TRW 305-721-1700
 Fla Orlando, TRW 305-894-6881
 Ill Elk Grove Village, J.G. Twist Co. 312-593-0200
 Ind Ft. Wayne, R.O. Whitesell & Assocs. 219-432-5591

Ind Indianapolis, R.O. Whitesell & Assocs. 317-359-9283
 Ind Kokomo, R.O. Whitesell & Assocs. 317-452-6065
 Iowa Cedar Rapids, J.G. Twist Co. 319-393-8703
 Kans Prairie Village, J.G. Twist Co. 913-236-4646
 Ky Louisville, R.O. Whitesell & Assocs. 502-893-7303

Md Baltimore, TRW 301-366-5075
 Md Ellicott City, TRW 301-465-1777
 Mass Waltham, TRW 617-899-6100
 Mich Grand Rapids, R.O. Whitesell & Assocs. 616-451-8901

Mich Southfield, R.O. Whitesell & Assocs. 313-358-2020
 Mich St. Joseph, R.O. Whitesell & Assocs. 616-983-7337
 Minn Minneapolis, TRW 612-835-5454
 Mo St. Louis, J.G. Twist Co. 314-432-2830

NM Albuquerque, Straube Assocs. 505-294-1880
 NY Garden City, Comtronics Assocs. 516-741-8966
 NY Rochester, TRW 716-461-3070
 Ohio Cincinnati, R.O. Whitesell & Assocs. 513-521-2290

Ohio Cleveland, R.O. Whitesell & Assocs. 216-228-7525
 Ohio Columbus, R.O. Whitesell & Assocs. 614-888-9396
 Ohio Dayton, R.O. Whitesell & Assocs. 513-298-9546
 Okla Oklahoma City, TRW 405-524-2040

Ore Beaverton, N.R. Schultz Co. 503-643-1644
 Ore Portland, N.R. Schultz Co. 503-292-5655
 Pa Narberth, TRW 215-667-3400
 Pa Pittsburgh, R.O. Whitesell & Assocs. 412-344-7277

Tex Dallas, TRW 214-637-6650
 Tex Houston, TRW 713-771-7812
 Utah Salt Lake City, Straube Assocs. 801-328-4513
 Va Roanoke, TRW 703-345-4965
 Wisc Waukesha, J.G. Twist Co. 414-786-6330

TRW/IRC RESISTORS, 401 N. Broad St., Philadelphia, Pa., 19108, Tel: 215-923-8230, TWX: 710-670-1392; Empl: 1000 p. 2-1548-1568

Products manufactured: Networks, Resistors

Local Sales Offices & Reps.
 Ala Huntsville, TRW Sls. Off. 205-772-9656
 Ariz Scottsdale, Q.T. Wiles & Assoc. 602-948-5590
 Cal Dublin, Straube Assoc. 415-828-1550
 Cal Los Angeles, Q.T. Wiles & Assoc. 213-478-0183
 Cal Menlo Park, Straube & Assoc. 415-323-2476
 Cal San Diego, Q.T. Wiles & Assoc. 714-565-6893
 Cal Tustin, Q.T. Wiles & Assoc. 714-832-4952
 Cal Woodland Hills, TRW Sls. Office 213-883-9033
 Colo Denver, Straube & Assoc. 303-426-0890
 Conn Orange, TRW Sls. Off. 203-795-3515
 Conn Rowayton, TRW Sls. Office 203-853-4466
 Fla Fort Lauderdale, TRW Sls. Office 305-721-1700
 Fla Orlando, TRW Sls. Off. 305-857-3650
 Ill Elk Grove Village, Twist & Co. 312-593-0200
 Ind Fort Wayne, R.O. Whitesell Assoc. 219-432-5591

Ind Indianapolis, R.O. Whitesell 317-359-9283
 Ind Kokomo, R.O. Whitesell Assoc. 317-452-6065
 Iowa Cedar Rapids, J.G. Twist Co. 319-393-8703
 Kans Wichita, J.G. Twist Co. 316-686-6685
 Ky Louisville, R.O. Whitesell Assoc. 502-893-7303
 Md Baltimore, TRW Sls. Office 301-825-5075
 Mass Waltham, TRW Sls. Off. 617-899-6100
 Mich Grand Rapids, R.O. Whitesell & Assoc. 616-451-8901
 Mich Southfield, R.O. Whitesell 313-358-2020
 Mich St. Joseph, R.O. Whitesell Assoc. 616-983-7337
 Minn Minneapolis, TRW Sls. Off. 612-835-5454
 Mo St. Louis, Twist & Co. 314-432-2830
 NM Albuquerque, Straube Assocs. 505-292-0295
 NY Melville, TRW Sls. Office 516-293-9000
 NY Rochester, TRW Sls. Off. 716-461-3070
 Ohio Cincinnati, R.O. Whitesell & Assoc. 513-521-2290

Ohio Columbus, R.O. Whitesell & Assoc. 614-888-9396
 Ohio Dayton, R.O. Whitesell 513-298-9546
 Ohio Lakewood, R.O. Whitesell & Assoc. 216-228-7525
 Okla Oklahoma City, TRW Sls. Office 405-524-2040

Ore	Beaverton, N.R. Schultz Co.	503-643-1644
Pa	Narberth, TRW Slcs. Off.	215-667-3400
Pa	Pittsburgh, R.O. Whitesell & Assoc.	412-344-7277
Tex	Dallas, TRW Slcs. Off.	214-387-3030
Tex	Houston, TRW Slcs. Office	713-772-5541
Utah	Salt Lake City, Straube Assoc./Mountain States	801-328-4513
Va	Roanoke, TRW Slcs. Off.	703-345-4965
Wash	Bellevue, N.R. Schultz Co.	206-454-0300
Wisc	Wauwatosa, J.G. Twist Co.	414-475-7755
EXP	Phila., Pa.	215-922-8900

TRW/IRC POTENTIOMETERS, 2801 72nd St. N., St. Petersburg, Fla., 33733, Tel: 813-347-2181, TWX: 810-863-0357; Empl.: 550 p. 2-896,897
Customer service: G. Smith

Products manufactured: Attenuators, Dials, Potentiometers, Resistors

Local Sales Offices & Reps.

Ala	Huntsville, TRW Elctn. Comps.	205-772-0656
Ariz	Scottsdale, Q.T. Wiles & Assocs.	602-947-5791
Cal	Danville, Straube Assocs.	415-837-3234
Cal	Los Angeles, Q.T. Wiles & Assocs.	213-649-1232
Cal	Menlo Park, Straube Assocs.	415-323-2476
Cal	San Diego, TRW Elctn. Comps.	714-565-6893
Colo	Boulder, Straube Assocs./Mountain States	303-443-8600
Conn	Rowayton, TRW Elctn. Comps.	203-853-4466
Fla	Orlando, TRW Elctn. Comps.	305-894-6881
Ill	Elk Grove Village, J.G. Twist Co.	312-593-0200
Ind	Fort Wayne, R.O. Whitesell & Assocs.	219-432-5591
Ind	Indianapolis, R.O. Whitesell & Assocs.	317-359-9283
Ind	Kokomo, R.O. Whitesell & Assocs.	317-453-6868
Iowa	Cedar Rapids, J.G. Twist Co.	319-393-8703
Kans	Prairie Village, J.G. Twist Co.	913-236-4646
Ky	Louisville, R.O. Whitesell & Assocs.	502-893-7303
Mass	Waltham, TRW Elctn. Comps.	617-899-6100
Mich	Grand Rapids, R.O. Whitesell & Assocs.	616-451-8901
Mich	Southfield, R.O. Whitesell & Assocs.	313-358-2020
Mich	St. Joseph, R.O. Whitesell & Assocs.	616-983-7337
Minn	Minneapolis, TRW Elctns.	612-835-5454
NM	Albuquerque, Straube Assocs./Mountain States	505-294-1880
NY	Rochester, TRW Elctn. Comps.	716-461-3070
Ohio	Cincinnati, R.O. Whitesell & Assocs.	513-521-2290
Ohio	Cleveland, R.O. Whitesell & Assocs.	216-228-7525
Ohio	Columbus, R.O. Whitesell & Assocs.	614-888-9396
Ohio	Dayton, R.O. Whitesell & Assocs.	513-298-9546
Okla	Oklahoma City, TRW Elctn. Comps.	405-524-2040
Ore	Portland, C.K. Shanks & Assocs.	503-292-5656
Pa	Narberth, TRW Elctn. Comps.	215-667-3400
Pa	Pittsburgh, R.O. Whitesell & Assocs.	412-344-7277
Tenn	Bristol, R.O. Whitesell & Assocs.	615-968-4195
Tex	Dallas, TRW Elctn. Comps.	214-637-6650
Tex	Houston, TRW Elctn. Comps.	713-771-7812
Utah	Salt Lake City, Straube Assocs./Mountain States	801-328-4513
Va	Roanoke, TRW Elctn. Comps.	703-345-4965

TRW SEMICONDUCTOR, 14520 Aviation Blvd., Lawndale, Cal., 90260, Tel: 213-679-4561, TWX: 910-325-6206; FSC No: 01281; Empl.: 1055; Minimum order: \$100

For info on price: Distr. Slcs. Ext. 452; Application info: M. Daguon Ext. 459; Customer service: Distr. Slcs. Ext. 452; Delivery info: Distr. Slcs. Ext. 452

Free literature available: RF & Power Semiconductor catalogs are current and handy reference tools.

Products manufactured: Amplifiers, Circuits, Hybrid, Thick Film, Circuits, Hybrid, Thin-Film, Diodes, Dividers, Integrated Circuit Devices, Microwave Integrated Circuits (MIC's), Transistors.

Local Sales Offices & Reps.

Ala	Huntsville, TRW Elctn. Comps.	205-772-9656
Ariz	Scottsdale, Q.T. Wiles & Assocs.	602-948-5590
Cal	Los Angeles, Q.T. Wiles & Assocs.	213-649-1232
Cal	Menlo Park, Straub Assocs.	415-323-2476
Cal	Tustin, Q.T. Wiles & Assocs.	714-832-4952
Colo	Boulder, Straub Assocs.	303-426-0890
Conn	Orange, Comtronics Assoc.	
Conn	Rowayton, TRW Elctn. Comps.	203-853-4466

Fla	Ft. Lauderdale, TRW Elctn. Comps.	305-721-1700
Fla	Orlando, TRW Elctn. Comps.	305-894-6881
Ill	Elk Grove, J.G. Twist Co.	312-593-0200
Ind	Fort Wayne, R.O. Whitesell & Assocs.	219-432-5591
Ind	Indianapolis, R.O. Whitesell & Assocs.	317-359-9283
Ind	Kokomo, R.O. Whitesell & Assocs.	317-453-6868
Iowa	Cedar Rapids, J.G. Twist Co.	319-393-8703
Kans	Prairie Village, J.G. Twist Co.	913-236-4646
Ky	Louisville, R.O. Whitesell & Assocs.	502-893-7303
Md	Ellicott City, TRW Elctns. Comps.	301-465-1777
Mass	Waltham, TRW Elctn. Comps.	617-899-6100
Mich	Grand Rapids, R.O. Whitesell & Assocs.	616-451-8901
Mich	Southfield, R.O. Whitesell & Assocs.	313-358-2020
Mich	St. Joseph, R.O. Whitesell & Assocs.	616-983-7337
Minn	Minneapolis, TRW Elctn. Comps.	612-835-5454
Mo	St. Louis, J.G. Twist Co.	314-432-2830
NM	Albuquerque, Straube Assocs.	505-292-0295
NY	Rochester, TRW Elctn. Comps.	716-461-3070
Ohio	Cincinnati, R.O. Whitesell & Assocs.	513-521-2290
Ohio	Cleveland, R.O. Whitesell & Assocs.	216-228-7525
Ohio	Columbus, R.O. Whitesell & Assocs.	614-888-9396
Ohio	Dayton, R.O. Whitesell & Assocs.	513-298-9546
Ore	Beaverton, N.R. Schultz Co.	503-643-1644
Pa	Narberth, TRW Elctn. Comps.	215-667-3400
Pa	Pittsburgh, R.O. Whitesell & Assocs.	412-242-0100
Tex	Dallas, TRW Elctns. Comps.	214-637-6650
Tex	Houston, TRW Elctn. Comps.	713-772-5541
Utah	Salt Lake City, Straube Assocs.	801-328-4513
Va	Roanoke, TRW Elctn. Comps.	703-345-4965
Wash	Bellevue, N.R. Schultz Co.	206-454-0300
Wisc	Wauwatosa, J.G. Twist Co.	414-475-7755
FOR	Can., Richmond, B.C., Lake Engrg. Co., Ltd.	604-277-0414
FOR	Can., Scarborough, Ont., Lake Engrg. Co., Ltd.	416-751-5980
FOR	Can., St. Laurent 381, Que., Lake Engrg. Co., Ltd.	514-747-2441

Local Distributors

Ala	Huntsville, Hall-Mark Elctns., 2010 Bob Wallace Ave.	205-539-5722
Ariz	Phoenix, Cramer/Ariz., 2643 University Dr.	602-267-7321
Ariz	Phoenix, Liberty Elctns., 3130 N. 27th Ave.	602-257-1272
Ariz	Phoenix, R.V. Weatherford Co., 1917 N. 25th Dr.	602-272-7144
Cal	Anaheim, R.V. Weatherford Co., 1550 Babbitt Ave.	714-547-0891
Cal	Chatsworth, Westates Elctn. Corp., 20151 Bahama St.	213-341-4411
Cal	Gardena, Bell Inds., 306 E. Alondra Blvd.	213-321-5802
Cal	Glendale, R.V. Weatherford Co., 6921 San Fernando Rd.	213-849-3451
Cal	Irvine, Cramer/Los Angeles, 17201 Damler St.	714-979-3000
Cal	Mountain View, Elmar Elctns., 2288 Charleston Rd.	415-961-3611
Cal	Palo Alto, R.V. Weatherford Co., 3240 Hillview Ave.	415-493-5373
Cal	Pomona, R.V. Weatherford Co., 1095 E. Third St.	714-623-1261
Cal	San Diego, Cramer/San Diego, 8913 Complex Dr., Sta. E.	714-565-1881
Cal	San Diego, R.V. Weatherford Co., 7872 Raytheon Rd.	714-278-7400
Cal	Sunnyvale, Bell Inds., 1161 N. Fair Oaks Ave.	408-734-8570
Cal	Sunnyvale, Cramer/San Francisco, 720 Palomar Ave.	408-739-3011
Cal	Woodland Hills, Semiconductor Concepts, 21201 Oxnard St.	213-884-4560
Colo	Denver, Cramer/Denver, 5485 E. Evans Pl. At Hudson	303-758-2100
Colo	Englewood, R.V. Weatherford Co., 3905 S. Mariposa	303-761-5432
Conn	North Haven, Cramer/Conn., 35 Dodge Ave.	203-239-5641
Fla	Hollywood, Cramer/EW Hollywood, 4035 N. 29th Ave.	305-923-8181
Fla	Orlando, Cramer/EW Orlando, 345 N. Graham Ave.	305-894-1511
Fla	Orlando, Hall-Mark Elctns. Corp., 7233 Lake Elinor Dr.	305-855-4020
Ga	Atlanta, Cramer/EW Atlanta, 3923 Oakcliff Indl. Ct.	404-448-9050

Ill	Elk Grove Village, Hall-Mark Elctns. Corp., 180 Crossen Ave.	312-437-8800
Ill	Mt. Prospect, Cramer/Chicago, 1911 S. Busse Rd.	312-593-0230
Ind	Indianapolis, Harvey-Indiana, 8505 Zionsville Rd.	317-297-4910
Kans	Lenexa, Hall-Mark Elctns. Corp., 9006 Rosehill Rd.	913-888-4747
Md	Baltimore, Hall-Mark Elctns. Corp., 6680 Security Blvd.	301-265-8500
Md	Gaithersburg, Cramer/EW Wash., 16021 Industrial Dr.	301-948-0110
Md	Hanover, Cramer/EW Baltimore, 7255 Standard Dr.	301-796-5790
Md	Savage, Pyttronic Inds., 8220 Wellmoor Ct.	301-792-7000
Mass	Boston, DeMambro Elctns., 1095 Commonwealth Ave.	617-787-1200
Mass	Newton, Cramer Elctns., 85 Wells Ave.	617-969-7700
Mich	Farmington, Harvey-Michigan, 23461 Industrial Park Dr.	313-477-1650
Mich	Livonia, Cramer/Detroit, 13193 Wayne Rd.	313-425-7000
Minn	Bloomington, Hall-Mark Elctns. Corp., 9201 Penn Ave. S., Suite 10	612-884-9056
Minn	Edina, Cramer/Bonn, 7275 Bush Lake Rd.	612-835-7811
Mo	St. Louis, Hall-Mark Elctns. Corp., 6100 Madison	314-521-3800
NJ	Cherry Hill, Cramer/Pa., 12 Springdale Rd.	215-923-5950
NJ	Cinnaminson, Wilshire Elctns., 855 Industrial Hwy.	609-786-8990
NJ	Clifton, Wilshire Elctns., 312 Clifton Ave.	201-365-2600
NJ	Moonachie, Cramer/N.J., 1 Barrett Ave.	201-935-5600
NY	Buffalo, Summit Distr., 916 Main st.	716-884-3450
NY	East Syracuse, Cramer/Syracuse, 6716 Joy Rd.	315-437-6671
NY	Endwell, Cramer/Binghamton, 3220 Watson Blvd.	607-754-6661
NY	Farmingdale, Hall-Mark Elctns. Corp., 167 Marine St.	516-293-7500
NY	Hauppauge, Cramer/L.I., 29 Oser Ave.	516-231-5600
NY	Hauppauge, Semiconductor Concepts, Engineers Rd.	516-273-1234
NY	Rochester, Cramer/Rochester, 3000 Winton Rd. S.	716-275-0300
NY	Rochester, Rochester Radio, 140 W. Main St.	716-454-7800
NY	Rochester, Summit Distr., 292 Commerce Dr.	716-334-8110
NC	Raleigh, Hall-Mark Elctns. Corp., 3000 Industrial Blvd.	919-832-4465
NC	Raleigh, Pyttronic Inds., 4509 Creedmoor Rd.	919-782-6370
NC	Winston-Salem, Cramer/EW Winston-Salem, 938 Burke St.	919-725-8711
Ohio	Cincinnati, Cramer/Tri-States, 666 Redna Terr.	513-771-6441
Ohio	Cleveland, Cramer/Cleveland, 5835 Harper Rd.	216-248-8400
Ohio	Columbus, Electronic Mktg. Corp., 1150 W. Third Ave.	614-299-4161
Okla	Tulsa, Hall-Mark Elctns. Corp., 4846 S. 83rd E. Ave.	918-835-8458
Pa	Carnegie, Pyttronic Inds., 14 East Mall Plaza	412-276-6722
Pa	Harrisburg, Pyttronic Inds., 2525 N. 7th St.	717-233-6591
Pa	Huntington Valley, Hall-Mark Elctns. Corp., 458 Pike Rd.	215-355-7300
Pa	Montgomeryville, Pyttronic Inds., Montgomeryville Industrial Ctr., Stump Rd.	215-643-2850
Pa	Philadelphia, Almo Elctns., 9815 Roosevelt Blvd.	215-676-6000
Tex	Austin, Hall-Mark Elctns. Corp., 3100 A. Industrial Terr.	512-837-2814
Tex	Dallas, Cramer/Tex., 2970 Blystone La.	214-350-1355
Tex	Dallas, Hall-Mark Elctns. Corp., 9333 Forest La.	214-231-5101
Tex	Houston, Hall-Mark Elctns. Corp., 8000 Westglenn	713-781-6100
Utah	Salt Lake City, Cramer/Utah, 391 West 2500 S.	801-487-3681
Wash	Seattle, Liberty Electronics/Northwest, 5305 S. Second Ave.	206-763-8200
Wash	Seattle, R.V. Weatherford Co., 541 Industry Dr.	206-243-6340
Wisc	Milwaukee, Hall-Mark Elctns. Corp., 11925 W. Ripley Ave.	414-476-1270

Wisc Oak Creek, Cramer/Wisc., 430 Rawson Ave.
414-764-1700
For: Can., Downsview, Ont., Cramer/Can., 920 Alness
Ave., Unit # 9 416-781-6631
For: Can., Scarborough, Ont., Lake Engr. Co., Ltd.,
123 Manville Rd. 416-751-5980

TRW/UTC TRANSFORMERS, 150 Varick St., New York,
N.Y., 10013, Tel: 212-255-3500, TWX: 710-581-2722;
Empl.: 335

Products manufactured: Amplifiers, Coils Including
Assemblies & Forms, Filters, Transformers

Local Sales Offices & Reps.

Ala Huntsville, TRW Ectrn. Comps. 205-772-9656
Ariz Scottsdale, Q.T. Wiles & Assocs. 602-947-5791
Cal Los Angeles, Q.T. Wiles & Assocs. 213-649-1232

Cal Menlo Park, Straube Assocs. 415-323-2476
Cal San Diego, Q.T. Wiles & Assocs. 714-565-6893
Cal Tustin, Q.T. Wiles & Assocs. 714-832-4952
Colo Boulder, Straube Assocs. 303-443-8600
Conn Rowayton, TRW Elctrns. Comps. 203-853-1161
Fla Fort Lauderdale, TRW Elctrns. Comps. 305-721-1700

Fla Orlando, TRW Ectrn. Comps. 305-894-6881
Ill Elk Grove Village, J. G. Twist Co. 312-593-0200
Ind Fort Wayne, R. O. Whitesell & Assoc. 219-432-5591

Ind Indianapolis, R. O. Whitesell & Assoc. 317-359-9283
Ind Kokomo, R. O. Whitesell & Assoc. 317-452-6065

Iowa Cedar Rapids, J. G. Twist Co. 319-365-1401
Kans Prairie Village, J. G. Twist Co. 913-236-4646
Ky Louisville, R. O. Whitesell & Assoc. 502-893-7303

Mass Waltham, TRW Elctrn. Comps. 617-899-6100
Mich Grand Rapids, R. O. Whitesell & Assoc. 616-451-8901

Mich Southfield, R. O. Whitesell & Assoc. 317-452-6065
Mich St. Joseph, R. O. Whitesell & Assoc. 616-983-7337

Minn Minneapolis, TRW Elctrns. 612-835-5454
Mo St. Louis, J. G. Twist Co. 314-432-2830
NM Albuquerque, Straube Assocs./Mtn. States 505-294-1880

NY Garden City, Comtronic Assocs. 516-741-8966
NY Rochester, TRW Elctrns. Comps. 716-461-3070
Ohio Cincinnati, R. O. Whitesell & Assocs. 513-521-2290

Ohio Cleveland, R. O. Whitesell & Assoc. 216-228-7525
Ohio Columbus, R. O. Whitesell & Assoc. 614-888-9396

Ohio Dayton, TRW Elctrn. Comps. 617-899-6100
Okla Okla. City, TRW Elctrns. 405-524-2040

Ore Beaverton, N.R. Schultz Co. 503-643-1644
Pa Narberth, TRW Elctrn. Comps. 215-667-3400
Pa Pittsburgh, R. O. Whitesell & Assocs. 412-344-7277

Tex Dallas, TRW Ectrn. Comps. 214-637-6650
Tex Houston, TRW Elctrns. 713-771-7812
Utah Salt Lake City, Straube Assocs./Mtn. States 801-328-4513

Va Roanoke, TRW Elctrns. 703-345-4965
Wash Bellevue, N.R. Schultz 206-454-0300
Wisc Waukesha, J. G. Twist Co. 414-786-6330

FOR: Can., Willowdale, Ontario, A.C. Simmonds &
Sons, Ltd. 416-491-1010

TT ELCTRNS., INC., 2214 S. Barry Ave., Los Angeles,
Cal., 90064, Tel: 213-478-8224; FSC No: 07766
p. 1-588-591

For info on price: S.J. Sodaro; Application info: S.J.
Sodaro; Customer service: D. Stackpole; Delivery
info: D. Stackpole

Free literature available: Catalog of filters.

Products manufactured: Equalizers, Filters,
Networks

Local Sales Offices & Reps.

Cal Culver City, Sodaro 213-478-7733

TTS, 2928 Nebraska Ave., Santa Monica, Cal., 90404, Tel:
213-829-2611; Empl.: 10

For info on price: L. Winters; Application info: L.
Winters; Customer service: B. Winters; Delivery info:
L. Winters

Free literature available: 1) Accessory Numeric
Keyboards ANK-16T, ANK-16E, ANK-16U; 2)
Friction TO Sprocket Mod Kit SMK-802; 3)
Increase Character Per Line Kits TMK 90, 96, 105,
132B; 4) Cart AM-1.

Products manufactured: Carts & Dollies, Instrument
& Equipment, Comm. Systems, Keyboards,
Alphanumeric & Decimal,
Modulator/Demodulators, Readers, Teleprinters,
Teletypewriters & Equipment, Terminal
Equipment, Digital

TUCKER ELECTRONICS CO., 1717 So. Jupiter Rd.,
Garland, Tex., 75040, Tel: 800-527-4642, Telex: 73-0401;
Empl.: 42

For info on price: G. McLaney; Application info: C.
Acini; Customer service: R. Alexander; Delivery info:
R. Alexander

Free literature available: General Catalog: 160 pages
of test instruments, over 150 manufacturers, more
than 5000 instruments, including scopes, counters,
signal generators, meters, bridges, and many
more.

Products manufactured: Adapters, Waveguide,
Amplifiers, Analyzers, Antenna Rotators, Antenna
Towers & Supports, Antennas, Attenuators,
Bridges, Calculators, Electrical & Electronic,
Calibrators, Calorimeters, Microwave, Cameras,
Capacitors, Fixed, Chamber, Environmental Test,
Comm. Systems, Comparators, Controls/Control
Eqpt., Converters, Counters, Couplers, Current
Sources, Decade Boxes, Detectors, Filters, Gages,
Generators, Indicators, Insertion Loss
Measurement Systems, Inverters, Meters,
Monitors, Mounts, Multipliers, Oscillators,
Oscillographs, Direct Writing, Oscilloscope
Plug-Ins, Oscilloscopes, Ovens, Power Supplies,
Prescalers, Printers, Probes, Receivers,
Recorders, References, D-C Voltage, Regulators,
Services, Assembly, Production & Test,
Simulators, Slotted Lines, Microwave, Standards,
Synthesizers, Technical Books, Tracers, Curve,
Transceivers, Voltage Sources

TURNER DIV., Conrac Corp., 909 17th St., N.E., Cedar
Rapids, Iowa, 52402, Tel: 319-365-0421, Telex: 46-4437;
Empl.: 250

For info on price: L. Goodell; Customer service: D.
Miller

Free literature available: 2721-C Communications
Microphone Catalog, 2721-S Public Address &
Paging Catalog, 2721-A CB Antenna Catalog.

Products manufactured: Antennas, Microphone
Accessories (Including Stands, Holders, Booms),
Microphones, All Kinds

Local Sales Offices & Reps.

Ala Birmingham, M.F. Taylor Co. 205-853-0336
Cal Culver City, W. Alderson Co., Inc. 213-837-1398
Cal Redwood City, Sinai-Johnson 415-365-6263

Colo Colorado Springs, Norris & Co. 303-635-9319
Fla Casselberry, M.F. Taylor Co. 305-838-0821
Ind Carmel, Weeks Assocs. 317-846-0296

Iowa Des Moines, K-S-W Assocs. 515-279-9235
La Lacombe, S. Ormsby & Assocs. 504-882-7248
Md Catonsville, M.F. Taylor Co. 301-747-5718

Md Silver Springs, M.F. Taylor Co. 301-946-3569
Mass Needham, Piper Assocs. 617-449-1144
Mass Plymouth, Piper Assocs. 617-746-6522

Mich Rochester, R.A. Albrecht Co. 313-851-7081
Minn Minneapolis, S. Clothier Co. 612-888-4666
Mo Kansas City, K-S-W Assocs. 816-358-5240

Mo St. Louis, K-S-W Assocs. 314-781-6111
NY Buffalo, R.W. Mitscher Co. 716-633-7970
NY Rockville Centre, Willgold Elctrn. Sls. Corp. 516-764-4022

NC Charlotte, M.F. Taylor Co. 704-523-7932
Ohio Cleveland, IMTech 216-826-3400
Ohio Columbus, Weller Elctrns. Sls., Inc. 614-885-7819

Ohio Dayton, IMTech 513-837-5610
Ore Salem, M.K. Widdekind Co. 503-363-6445
Pa Philadelphia, M.F. Taylor Co. 215-676-5332

Tex Addison, Parvin Sls. Co. 214-239-9148
Tex Dallas, E.L. Wilks Co. 214-242-5321
Tex Houston, Parvin Sls. Co. 713-721-1054

Wash Seattle, M.K. Widdekind Co. 206-284-8020
Wisc Brookfield, Steffen Sls. 414-781-7596

TYCO CRYSTAL PRODUCTS DIV., 1510 McGee
Trafficway, Kansas City, Mo., 64108, Tel: 816-842-9731,
TWX: 910-771-2181; Empl.: 600; Minimum order: \$1000

Customer service: R. Gundy

Products manufactured: Crystal Blanks, Crystals,
Filters, Oscillators

TYLAN CORP., 19220 So. Normandie, Torrance, Cal.,
90502, Tel: 213-532-3420, TWX: 910-346-7647; Empl.: 95

For info on price: D. B. LeMay; Application info: D. B.
LeMay; Customer service: D. B. LeMay; Delivery info:
L. Lorringer

Free literature available: Mass Flow Measurement
and Control of Gases - Describes instruments for
measuring and controlling low flow rates of gases.
DS-0015-0374. Describes gas control systems for
semiconductor processing.

Products manufactured: Controls/Control Eqpt.,
Meters, Probes, Process Control Systems, Signal
Conditioners & Equipment, Transducers

Local Sales Offices & Reps.

Cal Cupertino, Tylan Corp. 408-248-8718
Cal Torrance, Tylan Corp. 213-532-3420
Fla Fort Lauderdale, Semquip Inc. 305-772-3002

Mass Peabody, Tylan Corp. 617-532-1228
NJ Morris Plains, Tylan Corp. 201-540-8333
NC Matthews, W.K. Hile Co. 704-847-9125

Tex Richardson, Tylan Corp. 214-234-8184

TYTON CORP., 2300 W. Florist St., Milwaukee, Wisc.,
53209, Tel: 414-228-8210, TWX: 910-262-3094; FSC No:
53421; QPL No: 23190-12; Minimum order: \$50

For info on price: D. Herzberg; Application info: R.
Lauffenburger; Customer service: D. Herzberg;
Delivery info: D. Herzberg

Free literature available: Tyton Ties Bulletin No.
100B Attached.

Products manufactured: Clamps & Clips, Wire &
Cable Ties, Wire Markers

Local Sales Offices & Reps.

Ariz Scottsdale, T. Goodreau & Assocs. 602-994-9909
Fla Tampa, L. J. Vidal & Assocs. 813-251-2583

Ga Atlanta, Southeast Techsales 404-355-7021
Ill Chicago, Vahey & Assocs. 312-775-1190
Mo St. Charles, J. Erlinger Co. 314-946-6845

NY Woodbury, Brunner Assocs. 516-921-2052
Ohio Cleveland, Industrial Sls. Assocs. 216-721-7500
Tex Arlington, Chaparral Inds. 817-265-2418

UBER GRAFIC INSTRS., Box 4, Palo Alto, Calif., 94302,
Tel: 415-327-4732; Empl.: 2

Customer service: D. F. Kroener

Free literature available: Catalog Page & Price List.

Products manufactured: Knives & Knife Sets, Tools

UCHIDA OF AMERICA CORP., 11 W. 42nd St., New York,
N.Y., 10036, Tel: 212-239-7418; Empl.: 5; Minimum
order: \$100

For info on price: R. Mirsky; Application info: T.
Nakayama; Customer service: R. Mirsky; Delivery
info: T. Nakayama

Free literature available: Complete models and
ratings are listed, with outstanding features of
each model, application fields, and specifications.

Products manufactured: Fuses, Meters, Performators,
Probes, Thermocouples, Elements & Accessories

Local Sales Offices & Reps.

Ala Birmingham, P. Hayden Assoc. 614-235-0265
Cal Mill Valley, Roy Colen 415-383-3555

Cal Van Nuys, C.H. Mitchell Co. 213-994-9466
Fla Orlando, P. Hayden Assocs. 404-766-0261
Ga East Point, P. Hayden Assocs. 404-766-0261

Ill Skokie, M. Bermann Sls. 312-675-3740
Ind Indianapolis, Technical Rep Inc. 317-849-6454
Iowa Atlantic, Kimian Sls. Inc. 712-243-1626

Mass Sharon, A. Appell Assoc. 617-784-3439
Mich Rochester, D. Albrecht & Co. 313-652-2520
Mo Independence, Kimian Sls. 816-796-4026

NY New York, Newhope Corp. 212-532-7372
NY Phelps, L S M Assocs. 315-548-4891
NC Greensboro, P. Hayden Assocs. 614-235-0265

Ohio Columbus, Mandabach & Assocs. 614-235-0265
Tex Hurst, Ranger Elctrns., Co. 713-626-1432

EXP: New York, Uchida of America Corp. 212-239-7418

UDEL MANUFACTURING, Box 2028, Covina, Cal., 91722,
Tel: 213-331-5680; Empl.: 6; Minimum order: \$9424

For info on price: A. F. Young; Customer service: A. F.
Young; Delivery info: R. M. Geiger

Free literature available: Brochure of sizes, price list,
General description of selection, use and
frequency determination of ultrasonic cleaning
equipment.

Products manufactured: Cleaners & Solvents,
Cleaners, Ultrasonic

Local Sales Offices & Reps.

Ariz Tempe, Gassner & Clark 602-968-9037
Cal West Covina, Udel Mfg. Co. 213-331-5680
Fla Ft. Lauderdale, B. Melvin Production Equip. Co. 305-566-8195

Fla Lake Wales, B. Melvin Production Equip. Co. 813-676-6821

III	Mt. Prospect, E. T. Champion & Assocs.	312-593-1150
Mass	Newton Highlands, Marshall Inds.	617-965-5115
NY	Northport, Production Sls. Assocs.	516-757-0336
Ohio	Cincinnati, J. O. Olsen Co.	513-922-2176
Ohio	Cleveland, J. O. Olsen Co.	216-752-5444
Pa	Pittsburgh, J. O. Olsen Co.	412-279-2550
Tex	Dallas, Marshall Inds.	214-233-5200
Wash	Bellevue, Marshall Inds.	206-883-1084

UFAD CORP., 700 36th St. S.E., Grand Rapids, Mich., 49508, Tel: 616-241-6000; Empl.: 15

Customer service: A. D. Heibel

Free literature available: Free spec. sheets available for all products. See list. DA-72 - Programmable Distortion Analyzer; 850 - Lab-Ali, Multi-Function Signal Analysis; 724 - OEM Active Filtering System; 732 - Programmable True RMS-DC Converter; 731 - Manual True RMS-DC Converter.

Products manufactured: Analyzers, Filters, Meters, Oscillators

Local Sales Offices & Reps.

Conn	Hamden, Scientific Devices	203-248-9361
Md	Greenbelt, J.E. Cuesta & Co.	301-552-1200
Mass	Waltham, Scientific Devices	617-894-5637
Pa	Valley Forge, J.E. Cuesta & Co.	215-265-5800

UID ELECTRONICS DIV., AMF Inc., 4105 Pembroke Rd., Hollywood, Fla., 33021, Tel: 305-981-1211, TWX: 510-954-9810; Minimum order: \$50 p. 1-2306

Customer service: D. R. Venetor

Free literature available: UID Switch and Power Transistor Socket Catalog #4791 upon request. The contents include product description and applications. Custom designs are shown in a special section to stimulate cost reduction approaches to switching applications.

Products manufactured: Knobs, Sockets, Switches

Local Sales Offices & Reps.

Ariz	Scottsdale, B-5	602-947-5745
Cal	Garden Grove, Impact Elctns.	213-431-3581
Cal	Menlo Park, G.R. McKnight Co.	415-325-2844
Colo	Denver, B-5	303-934-5505
Conn	Vernon, G-M Assoc.	203-646-4443
Fla	Orlando, Gra	305-894-3351
Ill	Elk Grove Village, J.G. Twist Co.	312-593-0200
Ind	Ft. Wayne, R.O. Whitesell & Assoc.	219-432-5591
Ind	Indianapolis, R.O. Whitesell & Assoc.	317-359-9283
Ind	Kokomo, R.O. Whitesell & Assocs.	317-452-6065
Iowa	Cedar Rapids, J.G. Twist Co.	319-393-8703
Kans	Prairie Village, J.G. Twist Co.	913-236-4646
Mo	Louisville, R.O. Whitesell & Assoc.	502-893-7303
Md	Lutherville, L. D. Lowery, Inc.	301-296-0379
Md	Silver Springs, L. D. Lowery Inc.	301-439-3542
Mass	Framingham, G-M Assocs.	617-872-4871
Mich	Grand Rapids, R.O. Whitesell & Assoc.	616-451-8901
Mich	Southfield, R.O. Whitesell & Assoc.	313-358-2020
Mich	St. Joseph, R.O. Whitesell & Assoc.	616-983-7337
Minn	Minneapolis, R-J, Inc.	612-922-1425
Mo	St. Louis, J.G. Twist Co.	314-432-2830
NY	Buffalo, Ossmann Comp. Sls. Corp.	716-832-4271
NY	Jamaica, S-J Sls. Assocs.	212-291-3232
NY	Kingston, Ossmann Comp. Sls. Corp.	914-338-5505
NY	Rochester, Ossmann Comp. Sls. Corp.	716-442-3290
NY	Syracuse, Ossmann Comp. Sls. Corp.	315-454-4477
NY	Vestal, Ossmann Comp. Sls. Corp.	607-785-9949
Ohio	Dayton, J.C. Hofstetter Co.	513-296-1010
Ohio	Medina, J.C. Hofstetter Co.	216-241-4880
Pa	Broomall, L. D. Lowery, Inc.	215-356-5300
Pa	Camp Hill, Beil & Whitaker	717-233-1254
Pa	Harrisburg, Beil & Whitaker	717-652-0184
Pa	Orefield, Beil & Whitaker	215-395-0150
Pa	Reading, Beil & Whitaker	215-779-2610
SC	Mauldin, Powertronics	919-476-6727
Tenn	Bristol, Remco	615-968-4195
Tex	Dallas, Allied Comps.	214-238-0408
Tex	Houston, Allied Comps.	713-782-5406
Va	Charlottesville, L. D. Lowery, Inc.	804-973-6672
Va	Fredericksburg, L. D. Lowery, Inc.	703-371-5099
Wash	Seattle, R. Johnston Co.	206-524-5170
Wisc	Wauwatosa, J.G. Twist	414-786-6330

Local Distributors		
Cal	Lakeside, Mouser Electrical Corp., 11511 Woodside	714-449-2220
Cal	Los Angeles, Elec. Switches, 2478 Fletcher Ave.	213-660-1310
Ill	Rockford, G.C. Elctrms., 400 S. Wyman St.	815-968-9661
Mass	Bellingham, Dowiak Assoc., 356 Hartford Ave.	617-966-0404
NJ	Little Falls, I.P.C. Corp., Cardinal Dr.	201-785-1830

ULTRA CARBON CORP., Box 747, Bay City, Mich., 48706, Tel: 517-894-2911; Empl.: 150

Products manufactured: Graphite Parts, Heaters & Heating Elements, Jigs And Fixtures, Chassis & Circuit Board, Materials, Graphite, Services, Assembly, Production & Test

ULTRASONIC CORP., Box 672, Pipestone, Minn., 56164, Tel: 507-825-5441; Empl.: 10

Customer service: S. Lodahl

Products manufactured: Cleaners & Solvents, Cleaners, Ultrasonic, Transducers

ULTRASONIC INSTRS. INT'L, INC., 165 EM Marine St., Farmingdale, N.Y., 11735, Tel: 516-293-5577; Empl.: 15

Products manufactured: Cleaners & Solvents, Cleaners, Ultrasonic, Machines/Machinery, Production

ULTRONIX, INC., 461 N. 22nd St., Grand Junction, Col., 81501, Tel: 303-242-0810, TWX: 910-929-6965; Empl.: 250; Minimum order: \$50

For info on price: K. McCallister; Application info: M. R. Chesselet; Customer service: L. White; Delivery info: L. White

Free literature available: Complete catalog of wirewound resistors and networks. Tech notes and data sheets for application and use of precision and power wirewound resistors.

Products manufactured: Networks, Resistors

Local Sales Offices & Reps.

Ala	Huntsville, Comprehensive Conslt. Co.	205-772-3746
Ariz	Phoenix, Southwest Engrg.	602-993-0250
Cal	Redwood City, Parks and Fruit Assocs.	415-364-1640
Cal	San Diego, AAA Sls. Co.	714-565-0122
Cal	San Gabriel, Van Gott & Assoc.	213-285-2148
Conn	Hamden, Impact Sls. Co.	203-281-1331
Ill	Des Plaines, E. Flaxman	312-298-8580
Kans	Shawnee Mission, M.E. Bettis Co.	913-362-0772
Mass	Waltham, Impact Sls. Co.	617-893-2850
Mich	Warren, DEM Elctn. Sls.	313-755-6660
Minn	Minneapolis, S. Clothier Co.	612-888-4666
Mo	St. Louis, M.E. Bettis Co.	314-429-2099
NJ	Cherry Hills, Danco Corp.	609-424-5590
NY	Garden City, Comtronic Assoc.	516-741-8966
NY	Oriskany, Knightsbridge Inds.	315-736-0131
NC	Greensboro, L & D Inc.	919-292-3201
Ohio	Cincinnati, J.O. Olsen Co.	513-922-2589
Ohio	Cleveland, J.O. Olsen Co.	216-752-5444
Ore	Beaverton, Arneson Assoc.	503-643-5754
Pa	Fairview Village, Danco Corp.	609-424-5590
Tex	Dallas, J.B. Guenther, Inc.	214-528-6286
Tex	Houston, J.B. Guenther, Inc.	713-468-0232
Wash	Seattle, Arneson Assoc.	206-762-7664
EXP:	Stamford, Conn., Dage Corp.	203-324-3123

ULVAC CORP., 1220 Lantern Hill, Fairfield, Conn., 06430, Tel: 203-259-8118; Empl.: 600; Minimum order: \$50

Customer service: A. Plaisted

Products manufactured: Chamber, Environmental Test, Controls/Control Eqpt., Deposition Equipment, Vacuum & Accessories, Evaporation Equipment, Electron Beam, Furnaces, Gages, Metal Compounds, Foils, Powders, Sheet, Stock, Metals, Ovens, Pumps, Vacuum, Services, Assembly, Production & Test, Spectrometers, Valves, Vacuum

UNDERWRITERS SAFETY, 7300 W. Wilson Ave., Chicago, Ill., 60656, Tel: 312-867-4600, TWX: 910-221-3474; Empl.: 145; Minimum order: \$25

For info on price: N. Hamot; Application info: G. Shea; Customer service: N. Hamot; Delivery info: N. Hamot

Free literature available: Power Terminal Blocks; Fuse Blocks; Quick-Connect Terminal Blocks; Circuit Breakers.

Products manufactured: Circuit Breakers, Clamps & Clips, Connectors, Panels, Terminal Blocks, Boards & Strips

UNGAR, DIV., Eldon Inds., Inc., 233 E. Manville St., Compton, Cal., 90220, Tel: 213-774-5950, Telex: 67-3183

Products manufactured: Heat Guns, Production, Soldering Accessories, Soldering Guns, Irons & Desoldering Tools

Local Sales Offices & Reps.

Ala	Birmingham, M.F. Taylor Co.	205-853-3181
Cal	Burlingame, Elvey-Proctor Co.	415-347-2994
Cal	Inglewood, Ungar Sls. Assocs.	213-776-7340
Colo	Denver, K-C Marketers	303-733-5561
Fla	Casselberry, M.F. Taylor Co.	305-838-0821
Ill	Chicago, G. McL. Cole Co.	312-774-3535
Ind	Indianapolis, Tech. Reps.	317-849-6454
Iowa	Des Moines, KSW Assocs.	515-279-9235
La	New Orleans, Texpert Co.	504-486-6073
Md	Catonville, M.F. Taylor Co.	301-747-5718
Md	Silver Spring, M.F. Taylor Co.	301-946-3569
Mass	Needham, Mullin Tech. Sls. Co.	617-444-4780
Mich	Southfield, R. Milsik Co.	313-354-3310
Minn	Minneapolis, Heimann Co.	612-861-6051
Mo	Kansas City, KSW Assocs.	816-358-5240
NY	Buffalo, R.W. Mitscher Co.	716-633-7970
NY	Oceanside, Bittan Assocs.	516-678-6222
NC	Charlotte, M.F. Taylor Co.	704-523-7932
Ohio	Lakewood, Baehr, Greenleaf & Assocs.	216-221-9030
Okl	Tulsa, Texpert Co.	918-939-1727
Ore	Portland, J.J. Backer Co.	503-297-3776
Pa	Philadelphia, M.F. Taylor Co.	215-698-9757
Pa	Pittsburgh, Covert & Newman Co.	412-563-0303

Tenn Memphis, Texpert Co. 901-683-0880
Tex Richardson, Texpert Co. 214-238-7117
Wash Seattle, J.J. Backer Co. 206-285-1300
Wisc Milwaukee, G. McL. Cole Co. 414-545-6083

UNHOLTZ-DICKIE CORP., 3000 Whitney Ave., Hamden, Conn., 06518, Tel: 203-288-3358; Empl.: 49; Minimum order: \$25 p. 1-471,851

Free literature available: Our catalog containing illustrations and information on our product line of vibration test systems and controls, vibration instruments and accelerometers available on request.

Products manufactured: Accelerometers, Alarms, Amplifiers, Analyzers, Calibrators, Controls/Control Eqpt., Equalizers, Filters, Generators, Indicators, Meters, Power Supplies, Signal Averagers, Signal Conditioners & Equipment, Testers, Transducers, Vibrators.

Local Sales Offices & Reps.

Ala	Huntsville, W. Brown	205-539-4411
Cal	Redondo Beach, Unholtz-Dickie Corp.	213-378-9418
Conn	Hamden, W.W. Jaroway Co.	203-288-3010
Fla	Ft. Lauderdale, W. Brown	305-776-4800
Fla	Orlando, W. Brown	305-425-5505
Ga	Atlanta, W. Brown	404-457-4069
Ill	Northfield, Torkelson Assocs.	312-446-9085
Ind	Indianapolis, Torkelson Assocs.	317-244-7867
Kans	Wichita, Aero-Hill Sls.	316-943-6371
Mich	Farmington, Anderson Elctns.	313-476-9161
Minn	Minneapolis, Torkelson Assocs.	612-835-2414
NY	No. Merrick, Space-Tronics	516-868-1800
NC	Raleigh, W. Brown	919-876-9601
NC	Winston-Salem, W. Brown	919-725-5384
Ohio	Cleveland, Dietrich & Assocs.	216-781-1855
Ohio	Dayton, Dietrich & Assocs.	513-223-6042
Pa	Pittsburgh, Dietrich & Assocs.	412-892-2992

UNIFORM TUBES, MicroDelay Division, Collegeville, Pa., 19426, Tel: 215-539-0700, TWX: 510-660-6107; FSC No: 93306; Empl.: 16; Minimum order: \$75 p. 2-2064,2065

For info on price: E. Shoemaker; Application info: L. Deery; Customer service: E. Shoemaker; Delivery info: C. Neafcy

Products manufactured: Cable Assemblies & Harnesses, Cable, Delay Lines, Tubing, Waveguides & Adapters

Local Sales Offices & Reps.

Ariz	Scottsdale, Gleason Sls.	602-946-3992
Cal	Los Altos, Marketek, Inc.	415-941-0882
Cal	Newport Bch, Uniform Tubes	714-642-5950
Cal	Van Nuys, C.W. Swift & Assoc.	213-989-1133
Colo	Denver, Crump Co.	303-426-1443
Conn	Meriden, J. Anderson	203-269-1812
Fla	Boca Raton, Floritronics Inc.	305-368-0325
Fla	Winter Park, Floritronics Inc.	305-886-4818
Ga	Decatur, H.N. Walton Co.	404-482-2794
Ill	Des Plaines, Coombs Assocs.	312-298-4830
Ill	Schiller Pk., Uniform Tubes	312-671-2717
Ind	Fort Wayne, Coombs Assocs.	219-747-0402
Mass	Medford, Blake Assocs.	617-391-7890
Mass	Newburyport, J. Murphy	617-465-0304
Mass	Seakonk, J. Murphy	617-SO 1-7153

Mich	Milford, T. Mulligan & Assocs.	313-363-5575
Mo	Grandview, Beneke & McCaul, Inc.	816-765-2998
Mo	St. Louis, Beneke & McCaul	314-434-6242
NJ	Denville, William Helm	201-425-4327
NY	Mt. Vernon, Friedman-Smith Electr. Sls.	914-664-4866
NY	Rochester, A. Scott Baregard	716-546-7280
NC	Charlotte, J. H. Smith	704-394-4210
Ohio	Columbus, T. Mulligan & Assocs.	614-457-2242
Okla	Tulsa, W. Pat Fralia Co.	918-663-8707
Pa	Bala Cynwyd, Vantage Sls.	215-667-0990
Tex	Dallas, W. Pat Fralia Co.	214-357-1607
Tex	Ft. Worth, W. Pat Fralia & Co.	817-738-2394
Tex	Houston, W. Pat Fralia & Co.	713-772-1572
Wash	Redmond, Barrett Sls.	206-885-6691
Wisc	Greendale, Coombs Assoc.	414-421-2300
EXP	N.Y., New York, Ad. Auriema, Inc.	212-466-2500
FOR	Can., Don Mills, Ont., Braydon Electro	416-447-0230
FOR	Can., Montreal, Que., Braydon Electro	514-341-3330

UNIMAX SWITCH CORP., Riker-Maxson Sub., Ives Rd., Wallingford, Conn., 06492, Tel: 203-269-8701, TWX: 710-476-1397; FSC No: 80207; Empl: 300; Minimum order: \$25 p. 1-2304,2305
For info on price: J. W. Pogmore; Application info: D. M. Baribault; Customer service: K. Boyle; Delivery info: K. Boyle

Free literature available: Precision snap action switches and metal cased switches and assemblies; Lighted pushbutton controls in accordance with MIL-S-22885. Lighted pushbutton controls, one and two lamp units. Keylock switches. One, two and three pole lighted and unlighted snap action switches and indicators.

Products manufactured: Indicators, Switches

Local Sales Offices & Reps.

Ala	Huntsville, Rep., Inc.	205-881-9270
Ariz	Scottsdale, DeAngelo, Rothman & Cheever, Inc.	602-948-2240
Cal	Los Altos, Ewing-Foley	415-941-4525
Cal	LA, M.A. Stolaroff	213-295-7781
Colo	Denver, Straube Assocs.	303-426-0890
Conn	Bloomfield, Zaslow Sls.	203-242-7781
Fla	Oviedo, Conley & Assoc.	305-365-3283
Ga	Tucker, Rep., Inc.	404-938-4358
Ill	Chicago, Wasson-Gallagher	312-261-7517
Ill	Westchester, Wasson-Gallagher	312-884-0690
Ind	Marion, O.H. Bromberg	317-664-5384
Iowa	West Des Moines, Greg Newell Inc.	515-225-8522
Ky	Louisville, O.H. Bromberg	502-245-8916
Md	Rockville, L.G. White	301-770-6556
Mass	Lowell, Zaslow Sls.	617-458-8452
Mass	Northboro, Zaslow Sls.	617-393-8150
Mich	Grosse Pointe Park, Greiner Assoc.	313-499-0188
Minn	Mpls., Jos-Co. Sls. Engrg.	612-835-5858
Mo	St. Louis, Hill & Co.	314-621-1818
NJ	Denville, Grimm, Siegel Assoc.	201-625-1900
NM	Albuquerque, Straube Assoc.	505-292-0295
NY	Binghamton, Canavan-Scanlon Assoc.	607-724-7220
NY	Buffalo, Canavan-Scanlon Assoc.	716-839-3373
NY	Rochester, Canavan-Scanlon Assoc.	716-442-0720
NY	Syracuse, Canavan-Scanlon Assoc.	315-437-1271
NC	Winston-Salem, L.G. White	919-725-3612
Ohio	Cincinnati, O.H. Bromberg	513-771-9333
Ohio	Medina, J. Hofstetter	216-241-4880
Pa	King of Prussia, White-Keystone	215-265-1817
Tex	Dallas, Glidden Electro. Equip.	214-363-6539
Tex	Houston, Glidden Electro Equip.	713-681-1415
Utah	Salt Lake City, Straube Assoc.	801-328-4513
Wash	Mercer Island, J. H. Andersen	206-232-0484
FOR	Can., Burlington, Ont., Motion Control Dev.	416-637-9369

Local Distributors

Ariz	Phoenix, Electro Comps., 1641 E. McDowell	602-258-2665
Cal	Los Angeles, Fisher/Brownell, 13936 S. Bdwy.	213-532-2170
Cal	Los Angeles, Minarik Elec. Co., 224 E. Third St.	213-624-3161
Cal	Santa Clara, Fisher/Brownell, 3381 Edward Ave.	408-244-6182
Colo	Aurora, Comp. Specialties, 3178 Nome St.	303-341-0160
Colo	Colo. Spgs., D & M Elctns., 715 N. Weber St.	303-633-4666
Colo	Denver, Fistell's Elec. Supply, 1001 Bannock St.	303-244-4691

Conn	Danbury, Greene Elec. Sup., 69 Main St.	203-748-5648
Conn	Hartford, Capitol Light & Sup., 200 Locust St.	203-527-8115
Fla	Miami, Elctn. Equip., 2701 NW 42 Ave.	305-871-3500
Fla	Orlando, Orlando Armature, 600 W. Central	305-423-0555
Ga	Atlanta, Lance Engrg., 2080 Peachtree	404-458-6286
Ill	Niles, WICO Corp., 6400 W. Grosse Pt.	312-685-3000
Ill	Westmont, Bodelle Co., 47 Chestnut La.	312-323-9670
Ind	Evansville, Ohio Valley Sound, 20 E. Sycamore	812-425-6173
Ind	Indianapolis, Graham Elctns., 133 S. Pennsylvania	317-634-8486
Ind	Kokomo, Wholesale Elec., 215 W. Sycamore	317-457-1136
Ind	South Bend, Koontz-Wagner Elect., 3801 Voorde Dr.	219-232-2051
Ind	Vincennes, Ohio Valley Sound, 902 Main St.	812-882-3615
Ky	Ashland, Ashland Elec., 2430 Carter Ave.	606-324-4107
Ky	Louisville, Marine Elect. Apparatus, 102 W. Main St.	502-587-6511
Ky	Owensboro, Ohio Valley Sound, 600 W. Third St.	502-683-6727
Md	Rockville, Capitol Radio, 12227 Wilkins Ave.	301-881-2270
Md	Silver Spring, Tech. Dist., 1219 Fidler La.	301-585-7512
Mass	Bellingham, Dowiak Assoc., Rt. 126	617-966-0404
Mass	Boston, Sager Elec. Supply, 172 High St.	617-542-2281
NH	Concord, Evans Radio, Route 3A	603-224-9961
NY	Buffalo, Summit Dists., 916 Main St.	716-884-3450
NY	Hempstead, Elctn. Equip., 741 Peninsula Blvd.	516-538-5510
NY	Islip, Air Powered Tools, 142 Freeman Ave.	516-662-2616
NY	Sodus, AED Dists., 27 State St.	315-483-6561
NY	W. Nyack, Douglaston Elect., 173 Western Hwy.	914-358-6966
NY	Woodside, Switches Unlimited, 49-11 43rd St.	212-651-0935
NC	Winston-Salem, Kirkman Elect., 901 W. 2nd St.	919-724-0541
Ohio	Cincinnati, Midwest Equip. Co., 11315 Williamson Rd.	513-793-4060
Ohio	Cleveland, W.M. Pattison Sup., 4550 Willow Pkwy.	216-441-3000
Ohio	Dayton, Duellman Elec., 131 Wayne Ave.	513-461-5010
Ore	Portland, Tekelectric Sup., 5940 S.W. Hood	503-246-5451
Pa	Philadelphia, Herbach & Rademan, 401 E. Erie Ave.	215-426-1700
Pa	Pittsburgh, RPC Elect., 620 Alpha Dr.	412-782-3770
RI	Providence, Providence Elect., 951 N. Main St.	401-351-2500
Tex	Dallas, Ind. Equip. Co., 4914 Greenville	204-368-5881
Tex	Odessa, Superior Elect., 208 S. Williams	915-332-0276
Utah	Salt Lake City, Std. Supply Co., 225 E. 6th, S.	801-355-2971
Wash	Seattle, Tekelectric Sup., 4411 23rd Ave. W.	206-283-7100

UNION CARBIDE CORP., Carbon Products Div., 270 Park Ave., New York, N.Y., 10017, Tel: 212-551-2345

Products manufactured: Bearings, Brushes & Brush Assemblies, Contacts, Electrical, Heat Exchangers & Systems, Materials, Graphite, Power Supplies

UNION CARBIDE, CHEMICALS & PLASTICS, 270 Park Ave., New York, N.Y., 10017, Tel: 212-551-4641

Products manufactured: Chemicals, Cleaners & Solvents, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Coolants, Circuit & Components, Etchants, Printed Circuit, Insulators & Insulation, Lubricants, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Refrigerants, Spray

UNION CARBIDE CORP., Components Dept., Box 5928, Greenville, S.C., 29606, Tel: 803-963-6300, Telex: 57-0496; Empl: 2000 p. 2-316-319
Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.		
Ariz	Phoenix, Union Carbide-Comps. Dept.	602-264-7332
Cal	Marina Del Rey, Union Carbide-Comps. Dept.	213-821-8824
Cal	Mt. View, Union Carbide-Comps. Dept.	415-969-9390
Cal	San Diego, Celtec Co.	714-279-7961
Colo	Denver, Parker-Webster Co.	303-770-1972
Fla	Clearwater, G. F. Bohman Assocs.	813-442-5606
Fla	Fort Lauderdale, G. F. Bohman Assocs.	305-564-3081
Fla	Orlando, G. F. Bohman Assocs.	305-855-0274
Ill	Rosemont, Union Carbide-Comps. Dept.	312-298-8340
Ind	Indianapolis, L. M. DeVoe Co.	317-257-1227
Iowa	Cedar Rapids, Seltec Sls. Corp.	319-393-1114
Kans	Andover, Palatine Engineering Sls.	316-683-7512
Kans	Overland Park, Palatine Engrg. Sls.	913-262-5643
Mass	Needham Heights, Union Carbide-Comps. Dept.	617-444-5400
Mich	Birmingham, Union Carbide-Comps. Dept.	313-642-9800
Minn	Minneapolis, S. Clothier Co.	612-888-4666
Mo	St. Louis, Palatine Engrg. Sls., Inc.	314-426-7055
NY	Liverpool, Union Carbide-Comps. Dept.	315-451-0720
NY	Tarrytown, Union Carbide-Comps. Dept.	914-345-2047
Ohio	Cincinnati, Baehr, Greenleaf & Assocs.	513-891-3826
Ohio	Columbus, Baehr, Greenleaf & Assocs.	614-486-4046
Ohio	Lakewood, Baehr, Greenleaf & Assocs.	216-221-9030
Okla	Oklahoma City, Parvin Sls. Co.	405-942-4581
Pa	Frazer, Union Carbide-Comps. Dept.	215-644-8864
SC	Greenville, Union Carbide-Comps. Dept.	803-271-7012
Tex	Addison, Parvin Sls. Co.	214-239-9148
Utah	Houston, Parvin Sls. Co.	713-784-9900
Utah	Salt Lake City, Parker-Webster Co.	801-486-3737
EXP	Can., Ville St. Laurent, Que., Deskin Sls. Corp.	514-331-2860
EXP	Greenville, S.C., Union Carbide-Comps. Dept.	803-963-6300
EXP	Malton, Ont., Can., Deskin Sls. Corp.	416-677-5517
EXP	Vancouver, B.C., Can., Deskin Sls. Corp.	604-324-6331

UNION CARBIDE CORP., Corporate Development, Components Dept., 270 Park Ave., New York, N.Y., 10017

Products manufactured: Abrasive Belts, Compounds, Cords, Powders, etc., Alloys, Capacitors, Fixed, Coatings

Local Sales Offices & Reps.

Ariz	Phoenix	602-264-7332
Cal	Marina Del Rey	213-821-8824
Cal	Mt. View	415-969-9390
Ill	Rosemont	312-298-8340
Mass	Needham Hgts.	617-444-5400
Mich	Birmingham	313-642-9800
NY	Liverpool	315-451-0720
NY	Tarrytown	914-345-2047
Ohio	Cleveland	216-221-0600
Pa	Frazier	215-644-8864
SC	Greenville	803-271-7012

UNION CARBIDE CORP., Corporate Development, Crystal Prods. Dept., 270 Park Ave., New York, N.Y., 10017

Products manufactured: Comm. Systems, Crystals, Lasers & Laser Systems, Modulator/Demodulators, Monitors, Power Supplies, Scribes, Semiconductor Wafer Fabrication, Substrates

Local Sales Offices & Reps.

Cal	Mountain View	415-965-2128
Cal	San Diego	714-279-4500
Mass	Needham Hgts.	617-444-5400

UNION CARBIDE, Battery Prods. Div., 270 Park Ave., New York, N.Y., 10017, Tel: 212-551-3833; Minimum order: \$100 p. 1-1514,1515

Customer service: J. F. McCullough 212-551-3833
Products manufactured: Batteries, Flashlights & Lanterns, Lamps

Local Sales Offices & Reps.

Cal	El Monte	213-579-0401
Cal	San Francisco	415-765-1000
Ga	Atlanta	404-633-6161
Ill	Chicago, East Central Div.	312-822-7000
Mass	Needham Hts	617-444-5400
NJ	Cherry Hill	609-235-6200
NJ	Westwood	201-664-7400
Ohio	Cleveland	216-621-4200
Tex	Dallas	214-631-0010

UNION CARBIDE, Films Packaging Div., 6733 W. 65th St., Chicago, Ill., 60638, Tel: 312-735-1234

Products manufactured: Tubing

UNION CARBIDE CORP., Lhde Div., 270 Park Ave., New York, N.Y., 10017, Tel: 212-551-3763

Products manufactured: Capacitors, Fixed, Cases, Transit, Coatings, Controls/Control Eqpt., Crystals, Detectors, Flux, Brazing & Soldering Materials, Insulators & Insulation, Lasers & Laser Systems, Services, Assembly, Production & Test, Soldering Accessories, Soldering Guns, Irons & Desoldering Tools, Torches, Soldering, Welding & Access., Tubes, Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

UNIROYAL, INC., 1230 Ave. of Americas, New York, N.Y., 10020, Tel: 212-489-4000; Empl.: 65,000

Customer service: T. Jens 203-573-3717

Products manufactured: Adhesives (All Types), Bumpers, Bushings, Glass, Plastic, Metal, Rubber, Etc., Chemicals, Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Computers, Containers, Insulators & Insulation, Labels, Pressure-Sensitive, Adhesive, Mounts, Plastic Raw Materials, Liquids, Pellets, Powders, Resins, Tubing

Local Sales Offices & Reps.

Cal	Santa Ana	714-545-5551
Cal	South San Francisco	415-873-5880
Cal	Vernon	213-583-2331
Colo	Denver	303-388-2481
Fla	Miami	305-633-6381
Ga	Atlanta	404-366-4650
Ill	Chicago	312-254-5700
Kans	Lenexa	913-888-1207
Md	Baltimore	301-485-8904
Mass	Dedham	617-329-2060
Mass	Springfield	413-781-8620
Minn	St. Louis Park	612-546-2528
Mo	St. Louis	314-429-6908
NJ	Jersey City	201-432-4222
NY	Buffalo	716-668-0404
NC	Charlotte	704-334-0893
Ohio	Cincinnati	513-242-5807
Ohio	Port Clinton	419-732-2151
Pa	McKees Rocks	412-771-3500
Pa	Philadelphia	215-742-7010
Tenn	Memphis	901-527-2413
Tex	Dallas	214-631-2310
Tex	Houston	713-644-9161
Utah	South Salt Lake City	801-484-8841
Va	Richmond	703-271-6091
Wash	Seattle	206-767-7066

UNIT INDUSTRIES, INC., 3137 Century Blvd., South Gate, Cal., 90280, Tel: 213-569-7181; Empl.: 14

Customer service: J. Abouchar

Products manufactured: Brushes & Brush Assemblies, Services, Assembly, Production & Test, Slip-Rings & Assemblies

UNITED CHEMICON, 731 James St., Ste. 306, Syracuse, N.Y., 13203, Tel: 315-474-2954, TWX: 710-541-0453

Customer service: P. Maler

Free literature available: 160WV to 500WV ALUMINUM ELECTROLYTIC CAPACITORS (cat. no. 1139); 6.3 WV to 100 WV ALUMINUM ELECTROLYTIC CAPACITORS (cat. no. 1138); KX Series 6.3 WV to 63 WV ALUMINUM ELECTROLYTIC CAPACITORS (cat. no. 1140); KX Series 6.3 WV to 63 WV AUTOMOTIVE ALUMINUM ELECTROLYTIC CAPACITORS (cat. no. 1140).

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.

Ariz	Scottsdale, DeAngelo, Rothman, & Cheever, Inc.	602-948-2240
Cal	Culver City, DeAngelo, Rothman Co.	213-398-6239
Cal	Menlo Park, Straube Assocs.	415-323-2476
Colo	Denver, Straube Assocs.	303-426-0890
Ill	Chicago, M. Gottlieb Assocs.	312-775-1151
Ind	Indianapolis, Latronics	317-846-5788

Kans	Wichita, Dy-Tronix	316-943-6221
Md	Westminster, F.B.D. Sls. Corp.	301-876-2396
Mass	Lexington, Circuit Sls. Co.	607-861-0567
Mich	Farmington, Hummon & Assocs.	313-474-0661
Minn	Minneapolis, Heimann Co.	612-861-6051
Miss	Meridian, Herron Assocs.	601-483-9306
Mo	Hazelwood, Dy-Tronix	314-731-5799
NJ	Teaneck, R.T. Reid Assocs.	201-692-0200
NM	Albuquerque, Straube Assocs.	505-292-0295
NY	Fairport, F. Hall	716-223-5102
NY	Syracuse, Franklin Sls. Corp.	315-474-2954
NY	Whitesboro, H. Lessman	315-736-5460
NC	Cary, F.B.D. Sls.	919-467-7595
Ohio	Cincinnati, Herrick Co.	513-351-4441
Ohio	Rocky River, Geo. L. Herrick Co.	216-333-0333
Ore	Portland, Underwood & Underwood	
Pa	Abington, R.T. Pearson Sls.	215-887-0186
Tex	Dallas, E.F. Aymond Co.	214-826-7620
Utah	Salt Lake City, Straube Assocs.	801-328-4513
Va	Portsmouth, F.B.D. Sls. Corp.	804-484-3162
Wash	Seattle, Underwood & Underwood	206-243-2133

UNITED ELEC. CONTROLS CO., 85A School St., Watertown, Mass., 02172, Tel: 617-WA 6-1000, TWX: 617-092-2445; Empl.: 350

For info on price: D. Holm; Application info: G. May; Customer service: G. May; Delivery info: D. Holm

Free literature available: Catalog T-5 Temperature & Pressure Controls, Recorders, Thermometers; Bulletin B Mineral Insulated Thermocouples; Bulletin 910 Electronic Temperature Controls for Thermocouples.

Products manufactured: Controls/Control Eqpt., Detectors, Probes, Switches, Thermistors, Thermocouples, Elements & Accessories, Thermostats

Local Sales Offices & Reps.

Cal	Anaheim	714-635-3730
Ill	Rolling Meadows	312-259-6700
NJ	Edison	201-738-1900
Ohio	Cleveland	216-261-8141
FOR:	Can., Ont.	416-625-5082

UNITED MINERAL & CHEM. CORP., 129 Hudson St., New York, N.Y., 10013, Tel: 212-966-4330, TWX: 710-581-5799; Empl.: 78

For info on price: M. Meeker; Application info: M. Jasen; Customer service: R. Cohen

Products manufactured: Alloys, Attenuators, Bi-Metals, Thermostatic, Capacitors, Fixed, Capacitors, Variable, Chemicals, Chokes, Coils Including Assemblies & Forms, Cores, Magnetic, Crayons, Coatings, Pellets, etc., Temperature Indicating, Ferrite Material & Parts, Films, Foil, Insulators & Insulation, Metal Compounds, Foils, Powders, Sheet, Stock, Metal Oxides, Metals, Packages, Integrated Circuit, Potentiometers, Resistors, Tapes, Electrical Insulation, Tapes, Films & Foils, Pressure Sensitive, Wire

Local Sales Offices & Reps.

Cal	Mountain View, Tech Ser. Inc.	415-969-9020
Cal	Torrance, Tech Ser. Inc.	213-324-3672
Conn	West Hartford, R.S. Pettigrew & Co. Inc.	203-233-8533

Minn	St. Louis Park, Xylem, Inc.	612-920-9626
NM	Albuquerque, John Quirk Assocs.	505-255-6981
NY	Syracuse, Rep Tech Inc.	315-437-2845
Tex	Richardson, Ralph Marston	214-235-3577
ELECTRONIC COMPONENTS		
Cal	Inglewood, Ungar Sales Assocs.	213-776-7340
Fla	Orlando, Irby & Connolly	305-894-8471
Ill	Sokie, Saffro & Assocs.	312-588-0905
Ind	Indianapolis, Schroeder-Loomis, Inc.	317-251-4571

Kans	Prairie Village, Thro Industrial Sales Co.	913-362-2533
Mass	Newton Lower Falls, New England Comp. Sls.	617-969-9523
Mich	Ferndale, Hilltrons, Inc.	313-398-5556
NY	Syracuse, N.J. Matchuk Co.	315-488-3251
NC	Thomasville, Powertronics, Inc.	919-476-6727
Ohio	Cleveland, Greenleaf & Assocs.	216-333-5480
Pa	Philadelphia, H.A. Goodman Co.	215-247-7116
Tex	Richardson, Thorton-Leeper	214-231-6891
FOR:	Can., Markham, Ont., Tel-Mar Electr. Sales Ltd.	416-887-5612

UNITED PACE INC., 481 Getty Ave., Paterson, N.J., 07503, Tel: 201-279-7500; Empl.: 60; Minimum order: \$25

For info on price: F. Geisler; Application info: S. Specter; Customer service: W. Spilev; Delivery info: W. Spilev

Free literature available: Complete 64 page buyers guide of special purpose, industrial tubes, transmitting, foreign tubes, cathode ray tubes (now on press old catalog h/w. Individual spec sheets on all tubes as required).

Products manufactured: Tubes

Local Sales Offices & Reps.

Cal	Encino, United-Page	213-881-0300
Colo	Denver, Electr. Sls.	303-771-6300
Ill	Park Ridge, Metcom Assocs.	312-696-1490
Mo	Hazelwood, Dy-Tronix	314-731-5799
NJ	Paterson, United-Page	201-279-7500
NJ	Westwood, R.C. Assocs.	201-664-1241
NY	East Meadow, Stanley Shapiro Assocs.	516-483-4185
Pa	Glenside, Koeber, R.F.	215-887-2310
Tex	Dallas, Southland Components	214-233-0603

UNITED PRODS. CO., Div. Designatronics, 55 S. Denton Ave., New Hyde Pk., N.Y., 11040, Tel: 516-328-3300

Customer service: M. Scheck

Products manufactured: Capacitors, Variable, Coils Including Assemblies & Forms, Cores, Ceramic, Cores, Magnetic, Terminals, Transformers

Local Sales Offices & Reps.

Cal	Milbrae, Melvin Sls.	415-697-6922
Ky	Louisville, Waddle & Assocs.	502-897-6419
Mass	Topsfield, Representatives Corp.	617-426-0541

UNITED REFINING & SMELTING CO., 3700 N. Runge Ave., Franklin Park, Ill., 60131, Tel: 312-455-8800; Empl.: 32

Products manufactured: Alloys, Metals

UNITED SENSOR & CONTROL CO., 85 School St., Watertown, Mass., 02172, Tel: 617-926-1000, TWX: 617-092-2445; Empl.: 25

Customer service: J. Algeo

Free literature available: Catalog S-8 Thermocouples - For high & low temperature probing & measuring total temperature Catalog S-7 Probes - For measuring temperature, total and static pressure velocity and flow direction of fluids, gases & liquids.

Products manufactured: Probes, Thermocouples, Elements & Accessories

Local Sales Offices & Reps.

Cal	Anaheim, United Electric Controls Co.	714-635-3730
Ill	Rolling Meadows, United Elec. Controls Co.	312-259-6700
NJ	Edison, United Electric Controls Co.	201-738-1900
Ohio	Cleveland, United Electric Controls Co.	216-8141

UNITED STATES CRYSTAL CORP., 3605 McCart St., Ft. Worth, Tex., 76110, Tel: 817-921-3014; Empl.: 35; Minimum order: \$25

Customer service: T. Nastase

Products manufactured: Crystals

Local Sales Offices & Reps.

Cal	Orange, I. Green Mktg.	714-637-1313
Colo	Arvada, C.B. Mktg.	303-422-0561
Fla	Orlando, B.C. Electr. Sls.	404-436-5169
Ga	Smyrna, B.C. Electr. Sls.	404-436-5169
Ill	Chicago, Q & B Inc.	312-725-4999
Ind	Mulberry, Maish Sls.	317-296-2322
Md	Seabrook, Taylor Mktg.	301-864-4011
Mass	Northboro, Pray Sls.	617-393-3434
Mich	Pontiac, T.A. Electr. Sls.	313-335-4285
Minn	Minneapolis, Kodak Assocs.	612-881-7188
NY	Tuckahoe, LCA Sls. Co.	914-961-4700
Ohio	Columbus, J.W. Lehner Co.	614-268-5260
Tex	Dallas, Roman Sls.	214-358-2152
Wash	Seattle, R.K. Squibb	206-632-2450

UNITED SYSTEMS, 918 Woodley Rd., Dayton, Ohio, 45403, Tel: 513-254-6251, TWX: 810-459-1728; FSC No: 16152; Empl.: 135; Minimum order: \$25

For info on price: B. Schryver; Application info: P. Rohrer; Customer service: S. Hommel; Delivery info: B. Schryver

Free literature available: New 1974/75 Catalog lists complete test and measurement instrumentation

Products manufactured: Calibrators, Clocks (All Types), Comparators, Converters, Counters, Data Acquisition & Reduction Systems, Data Loggers, Generators, Indicators, Meters, Monitors, Perforators, Printers, Scanners, Synthesizers, Thermometers, Resistance, Timers, Totalizers, Digital

Local Sales Offices & Reps.

Ala	Huntsville, J.L. Highsmith & Co.	205-881-3294
Cal	Culver City, F. Lucas Wolfe, Inc.	213-559-7200
Cal	Mountain View, IFM, Inc.	415-961-2828
Colo	Denver, Grifco	303-722-4674
Fla	Orlando, J.L. Highsmith & Co.	305-293-5202
Ill	Des Plaines, Marsland Assocs.	312-298-2620
Ind	Indianapolis, Marsland Assocs.	317-924-3568
Kans	Overland Park, Carter Elctns.	913-649-6996
Md	Silver Springs, Eastern Instrumentation Corp.	301-681-6500
Mass	Burlington, R. J. Sickles Assocs.	617-272-7285
Mich	Detroit, Comtel-Sterling Co.	313-255-1970
Minn	Minneapolis, Marsland Assocs.	612-545-4481
Mo	Hazelwood, Carter Elctns.	314-731-2237
NM	Albuquerque, F. Gates Co.	505-298-1875
NY	Fayetteville, M.P. Andrews, Inc.	315-637-3144
NY	Great Neck, E. I. Inc.	516-466-9505
NC	Charlotte, J.L. Highsmith & Co.	704-333-7743
Ohio	Cleveland, Comtel-Sterling Co.	216-442-8080
Ohio	Dayton, Comtel-Sterling Co.	513-298-7573
Pa	Philadelphia, Eastern Instrumentation	215-927-7777
Pa	Pittsburgh, Comtel-Sterling Co.	412-922-5720
Tex	Richardson, Scientific Sls. Co.	214-231-6541
Va	Richmond, J.L. Highsmith ad Co.	804-272-5888
Wash	Bellevue, Topp Engrg. Sls. Corp.	206-747-5401

UNITRACK DIV., Calabro Plastics, Inc., 8738 W. Chester Pike, Upper Darby, Pa., 19082, Tel: 215-789-3820; Empl.: 25; Minimum order: \$15

p. 1-98,99

For info on price: R. Marchetti; Application info: R. Marchetti; Customer service: M. O'Connor; Delivery info: M. O'Connor

Free literature available: Catalog describes the full line of UNITRACK P.C. Card Guides (metal and plastic), Versamount brackets, Vers-Cage card racks, Pak-Rak p.c. card storing and shipping container, and Kooler Krown & Triac Koller - heat dissipators.

Products manufactured: Cases, Transit, Guides, Circuit Board, Holders, Circuit Board (Production Type), Racks, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

Ala	Huntsville, J.L. Highsmith & Co.	205-881-3294
Cal	Burbank, A.C. Stearns Co.	213-849-5776
Cal	San Francisco, FENSCO	415-362-4930
Fla	Orlando, J.L. Highsmith & Co.	305-293-5202
Ill	Des Plaines, Lincoln Hodges & Assoc.	312-297-3810
Md	Rockville, Mechtronics Sls.	301-340-2130
Mass	Brockton, Forsberg Sls.	617-522-6300
Minn	St. Paul, Countrymen Assoc. Co.	612-645-9151
NJ	Mountain Lakes, J.P. Dearie	201-334-4848
NC	Charlotte, J.L. Highsmith & Co.	704-333-7743
Ohio	Dayton, Compass Assocs.	513-252-9939
Pa	West Chester, January Mktg. & Sls.	215-793-2265
Tex	Arlington, ION Assoc.	817-461-9661
Wash	Tukwila, General Elctns.	206-243-5141

Local Distributors

Cal	Los Angeles, El-Com, Inc.	213-223-1351
Cal	Sunnyvale, Ruby Stok Co.	408-739-5333
Fla	Orlando, L. Highsmith & Co.	305-293-5202
Ill	Lake Bluff, J & R Enterprises	312-945-6739
Mass	Waltham, Henik Assoc.	617-891-5660
Mass	Woburn, Rush Industries	617-935-2400
Mich	Farmington, CMP Distributor Div.	313-477-7700
NY	Rochester, Rochester Radio Supply Co.	716-454-6300
NC	Winston-Salem, Kirkman Elctns., Inc.	919-724-0541
Ohio	Dayton, ESCO, Inc.	513-226-1133
Pa	Philadelphia, Philadelphia Elctns., Inc.	215-568-7400
Tenn	Nashville, Electra Distributing Co.	615-329-3971
Wash	Tukwila, General Elctns., Inc.	206-243-5141

UNITRODE CORP., 580 Pleasant St., Watertown, Mass., 02172, Tel: 617-926-0404, TWX: 710-327-1296; Empl.: 1000

Products manufactured: Circuits, Integrated, Silicon Monolithic, Unpackaged Chips, Diodes, Rectifiers, Thyristors (Includes Silicon Controlled Rectifiers), Transistors

Local Sales Offices & Reps.

Ala	Huntsville, 20th Century Mktg.	205-772-9237
Ariz	Scottsdale, F. Board Assocs.	602-994-9388
Cal	Burlingame, Brooks Tech. Group	415-328-3232
Cal	Newbury Park, Astralronics	805-498-3988
Cal	San Diego, S. R. Elctns.	714-565-8411
Cal	Sherman Oaks, Unitrode Corp.	213-783-1301
Colo	Littleton, Simpson Assocs.	303-794-8381

Conn Washington Depot, Kanan Assocs.

Fla	Boca Raton, Conley & Assocs.	203-868-0513
Fla	Oviedo, Conley & Assocs.	305-395-6108
Fla	Tampa, Conley & Assocs.	305-365-3283
Ga	Douglasville, 20th Century Mktg.	813-933-3183
Ill	Chicago, Carlson Elctns. Sls. Co.	404-942-6483
Ill	Chicago, Carlson Elctns. Sls. Co.	312-774-9022
Md	Glen Burnie, New Era Sls. Inc.	301-768-6666
Mass	Reading, Kanan Assocs.	617-944-8484
Mich	Grand Rapids, J. L. Montgomery Assoc.	616-774-9308
Mich	Southfield, J. L. Montgomery Assoc.	313-358-2616
Minn	Minneapolis, C.E. Bohlig	612-922-7011
Mo	St. Louis, Carlson Elctns. Sls.	314-991-0262
NY	Albany, Reagan/Compar Albany	518-489-7408
NY	Endwell, Reagan/Compar Albany	607-723-8743
NY	Fairport, Reagan/Compar Albany	716-271-2230
NY	Melville, Unitrode Corp.	516-549-5400
NY	New Hartford, Reagan/Compar Albany	315-732-3775
NC	Burlington, P.J. Nahser	919-226-8053
Ohio	Cincinnati, Baehr, Greenleaf & Assoc.	513-891-3826
Ohio	Cleveland, Baehr, Greenleaf & Assoc.	216-221-9030
Ohio	Columbus, Baehr, Greenleaf & Assoc.	614-486-4046
Ohio	Dayton, Baehr, Greenleaf & Assoc.	513-426-5485
Ohio	West Carrollton, Unitrode Corp.	513-859-5872
Pa	Ft. Washington, GCM Assocs.	215-646-7535
Pa	Ft. Washington, Unitrode Corp.	215-542-9112
Pa	Pittsburgh, Covert & Newman Co.	412-563-0303
Tex	Houston, Semiconductor Sls. Assoc.	713-461-4197
Tex	Richardson, Semiconductor Sls. Assocs.	214-231-6181
Utah	Salt Lake City, Simpson Assocs.	801-486-3731
Wash	Bellevue, SD-R&S2	206-747-9424
EXP:	Downsview, Ont., Can., Kaytronics Ltd.	416-638-5511
EXP:	Montreal, P.Q., Can., Kaytronics Ltd.	514-487-3434

UNITRON CORP., 700 Barr St., Ft. Wayne, Ind., 46802, Tel: 219-422-6656; Empl.: 5

Customer service: W. C. Dodenhoff

Free literature available: Single product information sheets on each subject product.

Products manufactured: Alarms, Chargers, Battery, Controls/Control Eqpt., Detectors, Flashers, Indicators, Monitors, Relays, Thermostats, Timers

UNITRON

INCORPORATED

UNITRON INC., 1624 N. First St., Box 1331, Garland, Tex., 75040, Tel: 214-276-8591, Telex: 73-0644; FSC No: 6130; Empl.: 55; Minimum order: \$50 p. 1-1516-1523

Customer service: R. L. Beutel

Free literature available: General Catalog - contains individual specification sheets on each product; Short Form Catalog - contains listing of all standard products and some important specifications each.

Products manufactured: Controls/Control Eqpt., Converters, Inverters, Power Supplies

UNITRON SCIENTIFIC, INC., 66 Needham St., Newton Highlands, Mass., 02161, Tel: 617-969-8600, TWX: 710-335-1684; Empl.: 200; Minimum order: \$15

For info on price: J. Dill; Application info: J. Coyle; Customer service: J. Dill; Delivery info: J. Dill

Free literature available: Literature on full line of microscopes and refractor telescopes.

Products manufactured: Microscopes

UNIVERSAL AD-YU ELCTRNS, INC., 2517 E. Norwich St., Milwaukee, Wisc., 53207, Tel: 414-482-4100; FSC No: 90101; Empl.: 10

Customer service: R. Fehrenbach

Products manufactured: Amplifiers, Attenuators, Comparators, Delay Lines, Detectors, Filters, Generators, Meters, Networks, Shifters, Standards

Local Sales Offices & Reps.

Cal	Burbank, R. Olander & Co.	213-843-5200
Ill	Northfield	312-446-4166
Kans	Leawood, G. Vasan	913-649-0679
Mass	Acton, E.E. Specialists	617-259-9200
Mo	St. Louis, G. Fixman Engrg.	314-725-5219

NM	Albuquerque, Elctrn. Entrps.	505-256-3561
NM	Las Cruces, Elctrn. Entrps.	505-524-0126
Ohio	Dayton, Micro Sls. Corp.	513-298-3033
Pa	Philadelphia, E.C.I.	215-836-1616
Wash	Seattle, Dewar & Assoc.	206-763-2233

UNIVERSAL INSTRUMENTS CORP., Box 825, Binghamton, N.Y., 13902, Tel: 607-772-7522, TWX: 510-252-1990; Empl.: 820

For info on price: R. C. Cook 607-772-7415; Application info: D. W. Ackerman 607-772-7438; Customer service: J. Driscou 607-772-7505; Delivery info: G. C. Mayo 607-772-7410

Products manufactured: Machines/Machinery, Production

Local Sales Offices & Reps.

Colo	Denver, Universal Instrs. Corp.	303-798-6505
Colo	Littleton, Universal Instrs. Corp.	
Conn	Trumbull, Universal Instrs. Corp.	203-378-5613
Fla	St. Petersburg, Universal Instrs. Corp.	813-392-5265
Ill	Chicago, Solid State Elctns. of Ill.	312-889-8033
Ill	Palatine, Universal Instrs. Corp.	312-358-4831
Ind	Cedar Lake, Universal Instrs. Corp.	219-374-9555
Mich	Ann Arbor, Universal Instrs. Corp.	313-761-9166
NH	Manchester, Universal Instrs. Corp.	603-669-6500
NY	Binghamton, Universal Instrs. Corp.	607-772-7414
NC	Raleigh, Universal Instrs. Corp.	919-782-1436
Pa	Levittown, Universal Instrs. Corp.	215-943-9244
Tex	Dallas, Universal Instrs. Corp.	214-339-5121
EXP:	N.Y., N.Y., Extron Entrps. Inc.	212-752-4278
FOR:	Can., Montreal, Que., Willer Engrg. Ltd.	514-748-6169
FOR:	Can., Toronto, Ont., Willer Engrg. Ltd.	416-783-3373

UNIVERSAL RELAY CORP., 42 White St., New York, N.Y., 10013, Tel: 212-925-6900, TWX: 710-581-4461; Empl.: 30

For info on price: S. Soloway; Application info: B. Kassel; Customer service: M. Greenberg; Delivery info: J. Wells

Free literature available: Complete Catalog Plus Free Slide Rule

Products manufactured: Choppers, Relays, Solenoids, Switches

UNIVERSAL SECURITY INSTRS., 2829 Potee St., Baltimore, Md., 21225, Tel: 301-355-9000; Empl.: 60; Minimum order: \$5

For info on price: A. Brochin; Application info: A. Brochin; Customer service: D. Jones; Delivery info: D. Jones

Free literature available: Catalog sheets & catalogs, glossies - etc. - on entire line.

Products manufactured: Alarms, Batteries, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Cabinets & Accessories, Cans, Capacitor, Relay, Semiconductor, Transformer, etc. Cords, Cutters, Wire, Hand Operated, Fasteners, Foil, Fuses, Horns, Microwave, Indicators, Motors, Relays, Speakers, Switches, Terminal Blocks, Boards & Strips, Terminals, Timers, Vibrators, Instrument (Stiction Elimination), Wire, Wire Nuts, Wire Strippers

Local Sales Offices & Reps.

Cal	Culver City, W. Alderson Co.	213-837-1398
Cal	San Francisco, Featherstone Sls. Co.	415-467-3133
Fla	Miami, Sochin Sls. Co.	305-235-6048
Ga	Norcross, D. Cooper Co.	404-448-5460
Ill	Chicago, B. Burns & Assoc.	312-775-1233
Ind	Indianapolis, Electronic Reps., Inc.	317-897-9326
Md	Baltimore, J. Fournier	301-636-5237
Mass	Framingham, Northeast Rep., Inc.	617-879-2300
Mich	Southfield, Aztec Sls. Corp.	313-642-0777
Mo	Grandview, Moeller/Pickett & Assoc.	816-765-1224
NY	Liverpool, Lewis & Dunnigan Co.	315-622-2133
Ohio	Richfield, Bear Mktg. Co.	216-659-3131
Pa	Dresher, Diversified Sls.	215-643-1003
Tenn	Memphis, Mid South Sls. Assoc.	901-276-4442
Tex	Hurst, Ranger Elctns. Inc.	817-281-2736
Wash	Tukwila, J. Stroum, Co.	206-575-0175

UNIVERSAL SHIELDING CORP., 45 S. Service Rd., Plainview, N.Y., 11803, Tel: 516-420-9538; Empl.: 15

Customer service: J. Rance

Products manufactured: Cabinets & Accessories, Shields

UNIVERSAL VOLTRONICS CORP., 27 Radio Cir. Dr., Mt. Kisco, N.Y., 10549, Tel: 914-241-1300, TWX: 710-571-2142; Empl.: 75; Minimum order: \$25 p. 1-1524-1527

For info on price: N. Segretto; Application info: B. Ressler; Customer service: V. Gianguzzi; Delivery info: N. Segretto

Free literature available: 1. H.V. DC Power Supplies, Components and Equipment Catalogue (Includes unregulated and precision regulated DC power supplies up to 2000 KVDC; isolation TX dividers and terminations) 2. Applied H.V. Products Catalogue (Includes AC power supplies; impulse generators)

Products manufactured: Cable, Meters, Power Supplies, Regulators, Testers, Transformers

Local Sales Offices & Reps.

Cal Encino, King Way Assocs. 213-788-4124
Cal Redwood City, Pruitt-Parks 415-364-1640
Fla Winter Park, McMahan Assocs. 305-645-0463
Ill Oak Brook, Schuten Assocs. 312-833-0980
Md Ellicott City, A/O Elctns. 301-531-6700
Mass Waltham, Wait Tech. Sls. 617-891-8195
Minn Mpls., R.J. Sls. 612-922-1425
NM Albuquerque, F.Y. Gates Co. 505-298-1875

Local Distributors

Cal Encino, Kingway Assocs., 16400 Ventura Blvd. 213-788-4124
Cal Redwood City, Parks & Pruitt Assoc., 555 Veterans Blvd. 415-364-1640
Fla Winter Pk., McMahan Assoc., 1350 Orange Ave. 305-645-0463
Ill Elmhurst, Schuten Assocs., 643 S. Eighty-three 312-833-0980
Md Simpsonville, A/O Elctns., 10202 Don Leigh Dr. 301-997-8033
Mass Waltham, Universal Voltronics, 751 Main St. 617-891-8195
Minn Minneapolis, R-J Inc., 7100 France Ave. S. 612-922-1425
NM Albuquerque, Fry Gates Co., 147 Madison Ave. 505-298-1875

UNIVERSITY SOUND, Altac Corp., 1815 S. Manchester, Anaheim, Cal., 92803, Tel: 714-774-2900, Telex: 655415; Empl.: 1000; Minimum order: \$20

For info on price: B. McCalister 405-354-5311; Application info: C. W. Round 714-774-2900; Customer service: W. Norris 405-354-5311; Delivery info: B. McCalister 405-354-5311

Free literature available: Condensed catalogs and all specification sheets on entire product line.

Products manufactured: Amplifiers, Comm. Systems, Microphones, All Kinds, Networks, Speaker Systems, Speakers

Local Sales Offices & Reps.

Cal Carson, Bidwell Sales Assocs. 213-770-0300
Cal Oakland, Hank Gabriel 415-465-5361
Colo Arvada, C. B. Elctn. Mktg. 303-422-0561
Fla Miami Beach, Seaman Sls. Inc. 305-271-5728
Ga Atlanta, Murphy & Cota 404-875-2525
Haw Honolulu, Gene Piety Factors, Inc. 808-839-9059
Ill Chicago, Lassars & Co. 312-539-4722
Ind Indianapolis, F. McSweeney 317-849-5726
Md Kensington, Forti-Austin 301-949-1706
Mass Norwood, Rudolph & MacInnis 617-769-5450
Mich Detroit, Burcaw Co. & Assocs. 313-533-7700
Minn Minneapolis, Kodo Assocs. 612-881-1255
Mo Kansas City, Nevco, Inc. 816-421-1751
NY Flushing, Bettan Sls., Inc. 212-969-7600
NY Phelps, LSM Assocs. 315-548-4891
Ohio North Olmsted, Avcom, Inc. 216-777-5001
Pa Enon Valley, Nebco Assocs. Inc. 216-457-2333
Tex Dallas, Miller & Assocs. 214-661-5002
Wash Seattle, Vector Corp. 206-322-4343
EXP: Anaheim, Cal., Altac 714-774-2900
FOR: Can., North Vancouver, B.C., C. L. Thompson, Ltd. 604-987-9388
FOR: Can., Toronto 9, Ontario, J. R. Tilton, Ltd. 416-762-7571

UP-RIGHT SCAFFOLDS, Div. Up-Right, Inc., 1013 Pardee St., Berkeley, Calif., 94710, Tel: 415-843-0770, TWX: 415-891-9272; Empl.: 130

Products manufactured: Antenna Towers & Supports

Local Sales Offices & Reps.

Cal Berkeley 415-843-0770
Cal Los Angeles 213-255-5282
Cal San Diego 714-295-8042
Colo Denver 303-222-2017

DC Washington 202-393-7165
Ga Atlanta 404-523-2263
Ill Chicago 312-631-3380
La New Orleans 504-523-7965
Mass Somerville 617-666-2880
Mich Detroit 313-962-6100
Minn Minneapolis 612-336-1898
Mo Kansas City 816-221-5485
Mo St. Louis 314-241-4350
NJ Teterboro 201-487-6464
NY Syracuse 315-437-7845
NC Charlotte 704-333-4638
Ohio Cincinnati 513-621-3758
Ohio Cleveland 216-241-7109
Pa Philadelphia 215-564-0943
Pa Pittsburgh 412-261-4696
Tenn Memphis 901-525-3136
Tex Dallas 214-946-2373
Tex Houston 713-528-1187
Wash Seattle 206-682-0855

UPI SEMICONDUCTOR DIV., United Page Inc., 481 Getty Ave., Patterson, N.J., 07503; Minimum order: \$25

For info on price: Luke Morelli 279-7500; Application info: M Formi 279-7500; Customer service: G. Giordan; Delivery info: G. Giordan

Free literature available: Short form technical data catalog of over 2,000 solid state devices-rectifiers, diodes, transistors. Individual complete spec sheets of all UPI devices.

Products manufactured: Diodes, Rectifiers, Transformers, Transistors

Local Sales Offices & Reps.

Cal Encino, UPI Semiconductor 213-881-0300
Colo Denver, Electrn. Sls. 303-771-6300
Ill Park Ridge, Metcom Assocs. 312-696-1490
Mo Hazelwood, Dytronix 314-731-5799
NJ Paterson, United Page 201-279-7500
NJ Westwood, R. C. Assocs. 201-664-1241
NY East Meadow, Stanley Shapiro Assoc. 516-483-4185
Pa Glenside, Koebert, R. F. 215-887-2310
Tex Dallas, Southland Components 214-233-0603

USCC/CENTRALAB, ELEC. DIV., Globe-Union Inc., 4561 Colorado Blvd., Los Angeles, Cal., 91504, Tel: 213-240-4880, TWX: 910-498-2222; Empl.: 625; Minimum order: \$50 p. 1-320,594,595; p. 2-320-327

For info on price: T. Davies; Application info: J. Horn; Customer service: T. Davies; Delivery info: T. Davies

Free literature available: Miniature Ceramic Capacitors for High Reliability Applications. Miniature Ceramic Capacitors for High Volume Applications. EMI/RFI Filters.

Products manufactured: Capacitors, Fixed, Filters

Local Sales Offices & Reps.

Ala Huntsville, Rep. Inc. 205-881-9270
Ariz Phoenix, Clemick-Neenan & Assoc. 602-279-7649
Cal Los Angeles, Clemick-Neenan 213-476-1272
Cal Mt. View, Caltron/Pyle 415-964-3244
Colo Denver, Electro-Rep., Inc. 303-744-2821
Fla Ft. Lauderdale, Dyne-A-Mark Corp. 305-771-6501
Ga Tucker, Rep. Inc. 404-938-4358
Ill Des Plaines, Centralab 312-827-4487
Kans Shawnee Mission, Thomas Modrcin Assoc. 913-432-2131
Md Towson, Jerry Bresson Assoc. 215-839-6770
Mass Needham, Hatch Assoc. 617-444-3310
Mich Detroit, R.C. Merchant & Co. 313-535-6000
Minn Minneapolis, Technical Assoc. 612-929-6721
Mo Hazelwood, Thomas-Modrcin Assoc. 314-895-4700
NJ Irvington, E.F. Alber 201-375-7458
NM Albuquerque, Staley Co. 505-294-2660
NY Albany, Reagan/Compar Albany, Inc. 518-489-7408
NY Plainview, E.R.A. 516-822-9890
NC Raleigh, Carlwright & Bean, Inc. 919-832-7128
Ohio Columbus, McFadden Sls., Inc. 614-221-3363
Ohio Mentor, Bishop Comp. 216-255-6969
Pa Narberth, Jerry Bresson Assoc. 215-839-6770
Tex Houston, Aid Elctns., Inc. 713-777-3882
Tex Irving, Aid Elctns., Inc. 214-259-4761
Va Lynchburg, J. Bresson, Assoc. 215-839-6770
Wash Seattle, H.S. Thorpe Comp. 206-784-3333
Wisc Milwaukee, Centralab 414-228-2781
FOR: Can., Ajax, Ont., Centralab-Can. Ltd. 416-683-1540



U. S. COMPONENTS Inc.

U.S. COMPONENTS, 1320 Zerega Ave., Bronx, N.Y., 10462, Tel: 212-824-1600, TWX: 710-593-2141; FSC No: 97954; Empl.: 85; Minimum order: \$50

For info on price: S. Slivko; Application info: B. Pratt; Delivery info: H. Jones

Free literature available: 11 catalogs on electrical connectors covering rack and panel and screwlock devices in miniature, subminiature, microminiature, miniature-crimp removable, edge board, two-unit P.C. and I/O wrap-crimp connectors. Catalog feature specifications, basic configurations, materials, finishes, both for mil. and commercial connectors.

Products manufactured: Connector Blocks, Mother Board, Connectors

Local Sales Offices & Reps.

Ala Huntsville, Young & Lawrence Assocs. 205-539-6575
Ariz Phoenix, Chaparral 602-996-9648
Cal Mountain View, Westrep 408-265-0312
Cal Pico Rivera, Westrep 213-949-2551
Fla Winter Park, Young & Lawrence Assocs. 305-647-6929
Haw Honolulu, B. Kolans & Co. 312-237-2828
Ill Chicago, Phoenix Co. 219-422-2311
Ind Huntington, Phoenix Co. 313-644-0087
Kans Shawnee Mission, Thomas & Modrcin Assocs. 913-HE2-2131
Md Ellicott City, R.F. Assocs. 301-465-5944
Mass Scituate, Cirolia Leblanc Sls. Co. 617-545-1710
Mich Birmingham, Forand Sls. Co. 313-644-0087
Minn Minnetonka, K.L. Tannehill 612-935-0353
Mo Hazelwood, Thomas & Modrcin Assocs. 314-838-6446
NJ Madison, Livera-Polk Assocs. 201-FR7-3220
NY Fayetteville, R.W. Jackson Co. 315-637-3851
NY Roslyn Heights, Livera-Polk Assocs. 516-484-1276
NC Greensboro, L & D Inc. 919-292-3201
Ohio Vandalia, W.J. Brauer Assocs. 216-943-0601
Pa Philadelphia, C.H. Newson & Assocs. 215-248-3377
Pa Pittsburgh, W.J. Brauer Assocs. 412-921-3213
Tex Dallas, Elcom 214-EM8-3578

U.S. ELCTRNS, 500 Long Branch Ave., Long Branch, N.J., 07740, Tel: 201-870-9500; Empl.: 40; Minimum order: \$35

For info on price: L. Classen; Application info: R. Bruckner; Customer service: L. Classen; Delivery info: R. Kluge

Free literature available: Catalog # 720 Describes Packaged Transformer Kits Ferrite E Cores, Channel Frames and Potting Cases. Technical Data Covers Material Selection Guide, Tolerances, and Aging Tests.

Products manufactured: Coils Including Assemblies & Forms, Ferrite Material & Parts, Services, Assembly, Production & Test, Solenoids

Local Sales Offices & Reps.

Cal San Gabriel, Van Gott & Assoc. 213-285-2148
Fla Orlando, Buchanan & Abrams 305-898-7444
Ill Libertyville, R. Klipp Assoc. 312-362-4876
Mich Dearborn, Villani-Pitcher 313-271-4600
Minn St. Paul, Knox Assocs. 612-488-5402
NJ Livingston, Thaw Sls. 201-992-2711
NM Albuquerque, A. Q. Elctns. 505-255-8701
NY Rochester, Schmitz Bros. 716-546-7628
Ohio Cincinnati, Val-Skol Sales 215-489-4163
Pa Schwenksville, D. Homes Sls. 214-233-0603
Tex Addison, Southland Eng. & Sls. 915-533-2681
Tex El Paso, A. Q. Elctns. 206-455-2778
Wash Bellevue, Ruggles Tech. Sls. 206-455-2778



U.S. INSTR. RENTALS, INC., 951 Industrial Rd., San Carlos, Cal., 94070

Customer service: R. Snyder

Free literature available: A categorized cross reference of the latest rental test equipment plus a primer on when rental is appropriate and the economics of rent vs. buy.

Products manufactured: Services, Assembly, Production & Test

U.S. SCIENTIFIC INSTRS., 61 North Beacon St., Boston, Mass., 02134, Tel: 617-787-2411; Empl.: 50; Minimum order: \$15

For info on price: K. Lehman; Application info: W. A. Ward; Customer service: K. Lehman; Delivery info: K. Lehman

Free literature available: Technical Literature: 3015-1 - type 3015 Storbrite, 3018-1 - type 3018 Variable Pulse Source, 3019-1 - type 3019 Compact Arc Lamp Pulser, 3027-1 - CP Series Compact Arc Lamps, 3031-1 - Trigger Transformers, 3100-1 - FY Series Trigger Paces

Products manufactured: Discharge Systems, Energy, Flashers, Lamp Drivers, Lamps, Lights, Power Supplies, Tachometers, Transformers, Tubes

Local Sales Offices & Reps.

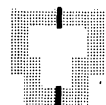
Cal Garden Grove, Impact Elctns., Inc. 714-893-8551
Md Silver Spring, Spectroscopy Sys. 301-949-8261
Mich Detroit, Harvey Tpelitz & Co. 313-537-9058
NJ Leonia, B. Kohl 201-944-6488
NY N. Syracuse, NACO Elctns. 315-699-2651
Ohio Cleveland, H. Teplitz & Co. 216-371-2044
Ohio Dayton, H. Teplitz & Co., Inc. 513-277-6531

USM CORP., Fastener Group, 510 River Rd., Shelton, Conn., 06484, Tel: 203-735-9341, TWX: 710-451-3734; Empl.: 375

For info on price: G. Zonas; Application info: R. Hoffman; Customer service: G. Zonas; Delivery info: G. Zonas

Free literature available: (1.) Manual - shows how POP rivets simplify product design and assembly, reduce fastening time and costs. Specifications on all POP rivets and setting tools. (2.) Eyeletting guide - Facts and figures, sizes and materials; shows how to cut fastening costs.

Products manufactured: Eyelets, Fasteners, Grommets, Rivets



U.S. TERMINALS INC.

U.S. TERMINALS, 7502 Camargo Rd., Cincinnati, Ohio, 45243, Tel: 513-561-8145, TWX: 810-461-2290; FSC No: 12615; Minimum order: \$30

For info on price: G. L. Stepp; Application info: G. L. Stepp; Customer service: E. Vanden Eynden; Delivery info: E. Vanden Eynden

Free literature available: Catalog of standard products.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Connectors, Cords, Grommets, Insulators & Insulation, Jacks (All Types), Pins, Plug & Jack Sets, Sockets, Terminal Blocks, Boards & Strips, Terminals

Local Sales Offices & Reps.

Ariz Phoenix, Gramer & Co. 602-279-1231
Ill Chicago, L-Tec, Inc. 312-286-1500
Iowa Cedar Rapids, J.R. Sls. Engrg., Inc. 319-377-8211
Mass Needham, A & M Elctn. Rep. 617-444-8170

Advertisement

- Slip lock Teflon terminals
- Press type Teflon terminals
- Printed circuit terminals
- Sockets test point & jacks
- Grounding terminals
- Binding posts-Teflon-install fast
- High voltage connectors (miniature)
- DIP/DIL/IC & transistor sockets
- Miniature patch cords & receptacles
- Automatic installation equipment

UTAH ELECTRONIC DIV., Utah-American Corp., 1124 E. Franklin St., Huntington, Ind., 46750, Tel: 219-356-5800; Empl.: 1000 p. 131

Products manufactured: Attenuators, Baffles, Speaker, Controls, Fader, Grilles, Networks, Sound Absorbing Materials, Speaker Systems, Speakers, Transformers

Local Sales Offices & Reps.

Cal Culver City, Marshank Sls. Co. 213-559-2591

Cal San Francisco, Featherstone Sls. Co. 415-467-3133
Colo Colorado Springs, Norris & Co. 303-635-9319
Haw Honolulu, Pegart Int'l. 808-538-7818
Ill Chicago, W.J. Doyle Co. 312-274-6685
Ind Indianapolis, New/Era Sls. 317-257-7333
Kans Leawood, W. Menezes & Assoc. 913-649-2680
La Lacombe, S. Ormsby Sls. 504-882-7248
Mass Wellesley, L. Cole, Inc. 617-237-1260
Mich Rochester, R.A. Albrecht & Co. 313-651-7081
Minn Minneapolis, C.R. Gibb Co. 612-377-1200
NJ Newark, Fisher Elctns. 201-836-1200
NY Grand Island, L.J. McTaggart Assoc. 716-773-9222
NC Greensboro, Adams & Assocs. 919-272-6838
Ohio Cleveland, F.A. Daugherty Co. 216-449-1122
Ore Portland, D.G. Weber Co. 503-234-7671
Pa Easton, E-K-P Assocs. 215-258-6477
Pa McMurray, C.S. Cooper & Assoc. 412-941-6473
Tex Houston, Spivey-LeBoeuf Assoc. 713-649-1221
EXP: Plainview, N.Y., Empire Exporters, Inc. 516-293-5582

UTE MICROWAVE, 3500 Sunset Ave., Asbury Park, N.J., 07712, Tel: 201-922-1009, Telex: 132-461; FSC No: 26231; Empl.: 15
Customer service: L. Nilson

Free literature available: 8 page catalog describing Ferrite, Filter and special products mfd. by UTE Microwave.

Products manufactured: Cavities, Microwave, Circulators, Ferrite, Duplexers, Microwave, Filters, Isolators, Meters, Preselector-Mixers, Preselctors, Shifters, Waveguides & Adapters

Local Sales Offices & Reps.

Ala Huntsville, Reynolds Assocs. 205-536-1941
Ariz Scottsdale, Fryco 602-445-3821
Cal Costa Mesa, Measurement Assocs. 714-540-7160
Cal Cupertino, Allis Assocs. 408-379-2883
Fla Satellite Beach, Reynolds Assocs. 305-773-4700
Ga Atlanta, Reynolds Assocs. 404-252-5360
Mo Florissant, Sheridan Assoc. 314-837-5200
NJ Hazlet, Mer-Mon Sls. 201-264-1851
NM Albuquerque, A.L.S. Elec. 505-298-2575
NY E. Rockaway, Belenkes Assocs. 516-887-1443
NY Utica, B.D. Hummel Co. 315-736-7821
Pa Hatboro, Mer-Mon Sls. 215-672-5565
Tex Richardson, P. Scanlon Co. 214-231-4661
Va Baileys Crossroads, Q.T. Elctn. 703-671-4357
EXP: Stamford, Conn., Microwave Int'l. 203-322-6911

V-M CORPORATION, Box 1247, Benton Harbor, Mich, 49022, Tel: 616-925-8841, TWX: 810-270-3104

For info on price: R. Roth; Application info: C. J. Stevens; Customer service: R. Roth; Delivery info: C. J. Stevens

Free literature available: Catalog sheets on automatic record changer packages, replacement changers; education systems cassette tape recorders, player and duplicators.

Products manufactured: Phonographs, Parts & Accessories, Recorders

Local Sales Offices & Reps.

Cal LaHabra, Audio Merchandise & Assoc. 213-914-6703
Col Denver, Central West Mktg. Co. 303-771-9397
Colo Littleton, Mueller, Chuck 303-771-8140
Ga Roswell, Glenn, William 404-993-3944
Ill Deerfield, Consumer Mktg. Assoc. 312-823-2075
Mass W. Springfield, Nelson, Carl 413-781-3040
Mass Wellesley, Cole, Larry 617-237-1260
Mich Southfield, Bragg, Bruce 313-352-8458
Minn Minneapolis, Jensen-Olsen Sls. Co. 612-941-7181
Mo Jefferson City, Vignola Assoc., Carmine 314-893-3205
NH Manchester, Klene, Roger 603-623-5425
NJ Moorestown, Di Vincent & Legato Assoc. 609-235-8299
NJ Teaneck, Fisher Elctns. Assoc. 201-837-1200
NY Ballston Lake, Dworkin, Gene 518-877-8586
NY Grand Island, Mc Taggart Assoc. L. 5. 716-773-9222
Ohio Akron, Shamrock Sls. 216-666-3796
Pa Churchville, Kunz & Assoc., Don 215-357-5020
Tex Garland, Lawson, Lex 214-278-2219
Utah Murray, Kenealey Assocs. 801-268-3111

VACO PRODUCTS CO., 510 No. Dearborn St., Chicago, Ill., 60610, Tel: 312-467-0123, TWX: 910-221-2231; Empl.: 125 p. 2•1056, 1057, 1714-1717

Products manufactured: Clamps & Clips, Connectors, Cutters, Wire, Hand Operated, Drivers, Nut, Kits, Connector, Kits, Terminal, Pliers, Rings, Retaining, Screwdrivers, Terminals, Testers, Tools, Wire Strippers, Wrenches

Local Sales Offices & Reps.

Cal Gardena, Vaco/West Distribution Center 213-324-4934

VACTEC, INC., 2423 Northline Blvd., Maryland Heights, Mo., 63043, Tel: 314-872-8300, TWX: 910-764-0811; Empl.: 225; Minimum order: \$10 p. 1•1022, 1023

For info on price: J. Mundschek; Application info: N. Wolff; Customer service: J. Mansfield; Delivery info: J. Mundschek

Free literature available: PCD-6 = Photoconductive Cells VTL5C = LED Axial VACTROLS VTS1A = Si. Solar Cells VTL1 - Hermetic Sealed VACTROLS, VTS-2 = Si. Low Capacitance Detectors VTL3 = Axial VACTROLS, VTS3A = Blue Enhanced Si. Detectors VTL9 = General Purpose VACTROLS VTTA-1 = Phototransistors & Photodarlingtons, VTLTA-1 = Opto-Isolators, SPV-5 = Selenium Photovoltaic Cells, P3100 = Portable Photometer VTL2C2 = To-5 Led/Vactrols.

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Diodes, Isolators, Meters, Transistors

Local Sales Offices & Reps.

Ariz Phoenix, Arrowhead Sls. Corp. 602-277-7148
Cal Encino, King-Way Assocs. 213-788-4124
Cal Los Altos, Schwerin Assocs. 415-941-3737
Cal Santa Barbara, Schwerin Assocs. 805-967-7317
Colo Arvada, Arrowhead Sls. Corp. 303-423-5556
Conn Madison, A & M Elctn. Reps. 203-421-4242
Fla Orlando, Buchanan & Abrams Assocs. 305-898-7444
Ill Chicago, T.B. Hunter Assocs. 312-777-2500
Ind Fort Wayne, Scott Elctns., Inc. 219-743-1586
Ind Indianapolis, Scott Elctns., Inc. 317-897-9977
Kans Prairie Village, Engrg. Svcs. Co. 913-649-4000
Md Baltimore, R.L. Wilkinson, Inc. 301-377-7800
Mass Needham, A & M Elctn. Reps. 617-444-8170
Mich Detroit, H.D. Mysing 313-537-5460
Minn Edina, M. Foster Co. 612-835-2282
Mo St. Louis, Engrg. Svcs. Co. 314-997-1515
NY Syracuse, C.W. Beach Co. 315-446-9587
Ohio Cincinnati, Scott Elctns. 513-791-2513
Ohio Cleveland, Scott Elctns. 216-291-2600
Ohio Columbus, Scott Elctns., Inc. 614-236-8619
Ohio Dayton, Scott Elctns., Inc. 513-294-0539
Pa Pittsburgh, Scott Elctns. 412-781-3112
Pa Willow Grove, Techparts 215-659-6900
Tex Dallas, Allied Comps. 214-238-0408
Tex Houston, Allied Comps. 713-691-3961
Utah Salt Lake City, Arrowhead Sls. Corp. 801-487-4716
Va Lynchburg, Royelec Elctn. Reps. 804-239-0130
Wash Seattle, B. Hirsh Co. 206-783-3423
EXP: Chicago, Ill., J.D. Marshall Int'l., Inc. 312-583-6060
FOR: Can., Montreal, Que., B. Manis Assocs. 514-336-5400

Local Distributors

Cal Palo Alto, Zack Elctns., 654 High St. 415-326-5432
Ill Chicago, Newark Elctns., 500 N. Pulaski 312-638-4411
Mo St. Louis, Interstate Ind'l Elctn., 4445 Gustine 314-481-5110
Mo St. Louis, Olive Ind'l Elec., 6662 Olive Blvd. 314-863-7800

VACTRONIC LAB. EQUIP., INC., 65 Brightside Ave., E. Northport, N.Y., 11731, Tel: 516-AN 1-2660; Empl.: 18; Minimum order: \$10

For info on price: R. Morris; Application info: R. Salat; Customer service: R. Salat; Delivery info: R. Morris

Products manufactured: Chamber, Environmental Test, Deposition Equipment, Vacuum & Accessories, Detectors, Feedthrus & Seals, Environmental, Gages, Pumps, Vacuum, Valves, Solenoid, Valves, Vacuum

Local Sales Offices & Reps.

Cal Palo Alto, Andot Tech. Sls. Co. 415-325-0058
Mass Wellesley, Westbom-Hiller Assocs. 617-235-9241
NM Albuquerque, Technology Mktg. Assoc. 505-298-2415

VACTRONIC LAB. EQUIP., INC cont'd

Advertisement

We manufacture a complete line of High Vacuum Equipment, including a small table top diffusion pumped systems, to completely automated production (custom built) units. Solid state ionization gauge controls, valves, pumps, couplings, feed-throughs, baseplates & collars ... all sold separately as well as completely assembled systems, ready to operate. Send us your requirements, we will be happy to quote promptly. Our equipment is in use throughout the world since 1959.

VACUUM PRODS., INC., 25 Dock St., Mt. Vernon, N.Y., 10550, Tel: 914-664-7330; Empl: 5; Minimum order: \$25

For info on price: G. Frank; Application info: M. Kane; Customer service: B. Grassmyer; Delivery info: B. Grassmyer

Products manufactured: Thermocouples, Elements & Accessories

VALHALLA SCIENTIFIC, INC., 7707 Convooy Ct., San Diego, Cal., 92111, Tel: 714-277-2732; Empl: 15; Minimum order: \$15

Customer service: H. Clark
Free literature available: Digital multimeter/counters digital ohmmeters, and precision current calibrators.

Products manufactured: Calibrators, Current Sources, Dividers, Meters, Multipliers

Local Sales Offices & Reps.

Ala	Huntsville, Currie, Peak & Frazier, Inc.	205-536-5650
Ariz	Phoenix, Mesa Engrg.	602-244-1995
Cal	Orange, Marble Assocs.	714-549-9358
Cal	San Diego, Mesa Engrg.	714-278-8021
Cal	San Jose, MCH Assocs.	408-246-7330
Colo	Parker, Technology Mktg. Assocs.	303-841-3435
Conn	Hamden, Instr. Conslts., Inc.	203-248-4174
Fla	Orlando, Currie, Peak & Frazier, Inc.	305-855-0843
Haw	Honolulu, E.M.C. Corp.	808-847-1138
Ill	Northbrook, Elctn. Instr. Assocs.	312-498-4500
Ind	Indianapolis, Elctn. Instr. Assocs.	317-257-7231
Kans	Kansas City, R.R. Burton Sls. Co.	816-444-8300
Md	Silver Spring, Sel-Tronics	301-589-3391
Mass	Waban, Instr. Conslts., Inc.	617-969-9881
Minn	Minneapolis, Revere Assocs.	612-781-7700
Mo	St. Louis, Delltron Co.	314-434-3804
NM	Albuquerque, Technology Mktg. Assocs.	505-298-4321
NY	Depew, Labtronics, Inc.	716-685-4111
NY	Mt. Vernon, Q.E.D. Electronics, Inc.	914-664-0080
NY	Syracuse, Labtronics, Inc.	315-454-9314
NC	Greensboro, Currie, Peak & Frazier, Inc.	919-273-3040
Ohio	Cleveland, DESCO	216-252-3151
Pa	Melrose Park, R.A. Meyers Assocs.	215-224-1663
Tex	Richardson, Spectra Sls' Corp.	214-234-3600

VALPEY CORP., A Valtec Co., 1400 Highland St., Holliston, Mass., 01746, Tel: 617-429-4322; Empl: 150

Free literature available: Brochure describes optical fabrication capabilities in usable manner. In addition to specific data on product scope and dimensional parameter, Valpey co-relates a series of optical fabrication capabilities with fundamental explanations, at surface finish, materials, flatness, shape, angles, etc.

Products manufactured: Crystals, Delay Lines, Filters, Lenses, Optical & Camera, Quartz, Fused, Services, Assembly, Production & Test, Substrates

VAN NORMAN MOLDING CO., 9599 S. 76th Ave., Bridgeview, Ill., 60455, Tel: 312-284-0118; Empl: 80

Customer service: R.I. Andre 312-284-0118
Products manufactured: Services, Assembly, Production & Test

VANGUARD RELAY CORP., 225 Cortland St., Lindenhurst, N.Y., 11757, Tel: 516-226-5000

Customer service: B. S. Gilman

Free literature available: Cat #SF: condensed catalogue on relays, Cat #TDS: condensed catalogue on timers, Cat #70: 18 page general catalogue, individual spec. sheets on all relays & timers.

Products manufactured: Relays, Timers

Local Sales Offices & Reps.

Md	Baltimore, Stitzer Assoc.	301-823-2600
NJ	W. Caldwell, Peterson-Rudnick Assoc.	201-CA 6-4363
NY	New York, Peterson-Rudnick Assoc.	212-671-1923
Pa	Paoli, Stitzer Assoc.	215-644-5500

Advertisement

VANGUARD manufactures an extensive line of general purpose relays and hybrid Time Delay Relays covering a broad range of industrial applications. Relay types from 1 to 4 poles and 2 to 20 amps. Models include open, plug-in, enclosed, printed circuit use, antenna, sensitive and contactor with many models listed by U/L. Time delay relays are plug-in and panel mounted units having solid state circuitry and relay output. **VANGUARD** offers you quality products, competitive pricing, responsive service and dependable deliveries. Full literature available upon request.

VARADYNE INDUSTRIES, INC., 1547 18th St., Santa Monica, Cal., 90404, Tel: 213-829-2984, TWX: 910-343-6856; FSC No: 26654; QPL No: 55681; Empl: 180; Minimum order: \$50 p. 2*328-333

For info on price: P. Bowling Ext. 218; Application info: D. Juve Ext. 249; Customer service: P. Bowling Ext. 218; Delivery info: P. Bowling Ext. 218

Products manufactured: Capacitors, Fixed, Resistors, Testers

Local Sales Offices & Reps.

Ala	Huntsville, Technology Mktg. Assoc.	205-883-7893
Ariz	Phoenix, H. Henschen & Assoc.	602-275-4411
Cal	Glendale, Orion Sls.	213-240-3151
Cal	Mountain View, Nor-Cal Assocs.	415-961-8121
Cal	San Diego, Orion Sls.	714-299-8322
Cal	Tustin, Orion Sls.	714-832-9687
Colo	Denver, Electrodyne	303-757-7679
Conn	North Haven, Kitchen & Kutchen	203-239-0212
Fla	Ormond Beach, Technology Mktg. Assocs.	904-672-2314
Fla	Pompano Beach, Technology Mktg. Assocs.	305-942-0774
Ill	Park Ridge, R. F. Specialists	312-698-2044
Ind	Fort Wayne, Delesa Sls.	219-483-9537
Ind	Indianapolis, Delesa Sls.	317-257-4683
Kans	Wichita, Dy-Tronix	316-943-6221
Md	Baltimore, Coulbourn-DeGreif	301-247-4646
Mass	Lexington, Kitchen & Kutchen	617-862-8230
Mich	Detroit, A. Blumenberg Assocs.	313-557-1934
Minn	St. Paul, H.A. Cullen & Assocs.	612-646-7371
Mo	Hazelwood, Dy-Tronix	314-731-5799
Mo	Kansas City, Dy-Tronix	816-761-6543
NJ	Teaneck, R.T. Reid Assocs.	201-692-0200
NY	Buffalo, Bowser & Sapecky	716-839-2044
NY	Mannus, Bowser & Sapecky	315-682-8885
NY	Rochester, Bowser & Sapecky	716-889-1919
NC	Raleigh, Component Sls.	919-782-8433
Ohio	Cleveland, D. Steffen & Assoc.	216-461-8333
Ohio	Dayton, D. Steffen & Assoc.	513-293-3145
Pa	Fort Washington, GCM Assocs.	215-646-7535
Tex	Dallas, Evans & McDowell Assoc.	214-238-7157
Tex	Houston, Evans & McDowell Assoc.	713-783-2900
Wash	Seattle, Demarest & Assoc.	206-523-0600

VARFLEX CORP., 514 W. Court St., Rome, N.Y., 13440, Tel: 315-336-4400; FSC No: 79074; Empl: 135; Minimum order: \$30 p. 2*1274,1275

Customer service: Sls. Dept.

Free literature available: A folder containing 25 actual samples of braided electrical sleeveings, extruded PVC tubing, tying cord and lead wire.

Products manufactured: Cords, Insulators & Insulation, Rubber, Tapes, Electrical Insulation, Tubing

Local Sales Offices & Reps.

Ariz	Phoenix, Elec. Specialty	602-275-5736
Cal	Los Angeles, Electrical Spec. Co.	213-724-9600
Cal	San Diego, Elec. Specialty Co.	714-239-1345
Cal	So. San Francisco, Electrical Spec. Co.	415-589-9611
Colo	Denver, Elec. Specialty	303-321-0226
Ga	Chamblee, Prehler Elec. Insulation	404-451-4266
Ill	Chicago, Prehler Elec. Insulation	312-384-6100
Ky	Louisville, E & H Elec. Supply	502-587-0991
Mass	Nahant, F.H. Hart	617-581-0381
Minn	St. Paul, Prehler Elec. Insulation	612-452-2470
Mo	University City, E.P. Gund	314-862-1650
NY	Carle Pl., W. R. Murphy	516-333-6122
NY	Liverpool, W.T. Elliott	315-652-3690
Ohio	Cleveland, Prehler Elec. Insulation	216-267-2650
Ore	Portland, Elec. Specialty	503-227-3601
Pa	Ardmore, Martin Elec. Co.	215-649-6332
Pa	Phila., Prehler Elec. Insulation	215-725-5913
Pa	Pittsburgh, E.B. Beach Co.	412-242-0400
Tex	Garland, Hisco	214-272-5411
Tex	Houston, Hisco	713-228-6662
Utah	Salt Lake City, Elec. Specialty	801-487-9805
Wash	Seattle, Elec. Specialty	206-682-3434
FOR:	Can., Toronto, Ont., Elec. Insulation & Fibre Co., Ltd.	416-624-0700

VARI-L CO., 3883 Monaco Pkwy., Denver, Colo., 80207, Tel: 303-321-1511, TWX: 910-931-0590; FSC No: 05375; Minimum order: \$50

p. 1*600,1831-1833; p. 2*147,441-443,1392-1407, 1831-1833

For info on price: C. Kiser; Application info: J. Kiser; Customer service: C. Kiser; Delivery info: C. Kiser

Free literature available: Catalogue 672, Individual product bulletins

Products manufactured: Amplifiers, Attenuators, Chokes, Coils Including Assemblies & Forms, Converters, Couplers, Detectors, Dividers, Filters, Impedance Converters, Microwave, Junctions, Hybrid, Microwave, Microwave Integrated Circuits (MIC's), Mixer-Preamplifiers, Microwave, Mixers, Modulator/Demodulators, Modulators, All Kinds, Multipliers, Networks, Oscillators, Reactors, Switches, Transformers

Local Sales Offices & Reps.

Ariz	Scottsdale, Cleveland Enptrs.	505-298-7671
Cal	Cupertino, Dura Elctns.	408-255-2084
Cal	Santa Ana, C.E.M.	714-835-2702
Cal	Woodland Hills, C.E.M.	213-884-7867
Colo	Arvada, Cleveland Enptrs.	303-423-3707
Fla	Lighthouse Point, Saber Assocs.	305-943-3076
Fla	Longwood, Saber Assocs.	305-831-0742
Ga	Woodstock, Saber Assocs.	404-432-9625
Kans	Leawood, H.C. Heyde Co.	913-649-8628
Md	Ellicott City, Applied Engrg. Conslts.	301-465-1272
Mass	Burlington, Tritex Inc.	617-272-4550
NM	Albuquerque, Cleveland Enptrs.	505-345-2481
NY	Fayetteville, Graydon-Sherman Inc.	315-637-9861
NY	Tuchahoe, Associated Elctns.	914-779-8110
NC	Raleigh, Saber Assocs.	919-834-3961
Ohio	Cincinnati, Luebbe Sls.	513-871-4211
Ohio	Cleveland, Luebbe Sls.	216-333-0425
Ohio	Dayton, Luebbe Sls.	513-294-0426
Pa	Delmont, T. Laslo	412-468-4019
Tex	Dallas, Texas Avionics Co.	214-368-3566
For:	Can., Ottawa, Ont., Wilson Enptrs.	416-224-9878
For:	Can., Toronto, Ont., Wilson Enptrs.	416-766-0510

VARIAN ASSOCS., 611 Hansen Way, Palo Alto, Cal., 94303, Tel: 415-493-4000, TWX: 910-373-1731; Empl: 8800

Products manufactured: Amplifiers, Analyzers, Attenuators, Calorimeters, Microwave, Cavities, Microwave, Chamber, Environmental Test, Coils Including Assemblies & Forms, Computers, Converters, Couplers, Deposition Equipment, Vacuum & Accessories, Detectors, Diodes, Dividers, Duplexers, Microwave, Evaporation Equipment, Electron Beam, Feedthrus & Seals, Environmental, Filters, Flanges, Waveguide, Furnaces, Gages, Generators, Indicators, Interferometer Systems, Isolators, Lamps, Limiters, Loads, Electronic Variable, Magnets, Memory Systems, Meters, Mixer-Preamplifiers, Microwave, Mixers, Modulators, All Kinds, Multipliers, Oscillators, Ovens, Paper, Graphic Recording, Power Supplies, Printers, Pumps, Vacuum, Receivers, Seals, Services, Assembly, Production & Test, Shutters, Microwave, Strip-Line Components, Microwave, Switches, Television Systems & Equipment Closed-Circuit, Terminal Equipment, Digital, Terminals, Transformers, Transistors, Transmitters, Tubes, Valves, Vacuum, X-Ray Inspection Equipment

VARIAN ASSOCS., Eastern Tube Div., 8 Salem Rd., Beverly, Mass., 01915, Tel: 617-922-6000, TWX: 710-347-1394

Products manufactured: Amplifiers, Duplexers, Microwave, Flanges, Waveguide, Generators, Isolators, Limiters, Oscillators, Power Supplies, Shifters, Shutters, Microwave, Switches, Tubes

Local Sales Offices & Reps.

Ariz	Scottsdale, Varian Assocs.	602-947-5461
Cal	Los Altos, Varian Assocs.	415-968-7630
Cal	Santa Monica, Varian Assocs.	213-828-5588
Fla	Clearwater, Varian Assocs.	813-446-8513
Ga	Atlanta, Varian Assocs.	404-252-0045
Ill	Park Ridge, Varian Assocs.	312-825-6686
Md	Cheverly, Varian Assocs.	301-773-7010
Mass	Waltham, Varian Assocs.	617-890-4560
NJ	Mt. Laurel, Varian Assocs.	609-428-6800
NJ	Springfield, Varian Assocs.	201-376-6600
NY	Syracuse, Varian Assocs.	315-437-2568
Ohio	Dayton, Varian Assocs.	513-298-7318
Tex	Richardson, Varian Assocs.	214-235-2385

VARIAN ASSOCS., Instrument Div., 611 Hansen Way, Palo Alto, Cal., 94303, Tel: 415-493-8100, TWX: 910-373-1731

Products manufactured: Analyzers, Detectors, Lamps, Magnets, Paper, Graphic Recording, Spectrometers

Local Sales Offices & Reps.

Cal	Downey	213-927-3415
Cal	Los Altos	415-968-8141
Cal	Wheatridge	303-421-4044
Ga	Atlanta	404-252-0400
Ill	Park Ridge	312-825-7772
Ky	Louisville	502-893-2573
Md	Cheverly	301-772-3683
Mass	Waltham	617-890-8430
Mo	St. Louis	314-524-0880
NJ	Cherry Hill	609-428-8880
NJ	Springfield	201-379-7610
NY	Syracuse	315-463-8861
Ohio	Euclid	216-261-2115
Ore	Portland	503-297-4737
Pa	Pittsburgh	412-243-4947
Tex	Dallas	817-268-1612
Tex	Houston	713-783-1800
FOR:	Can., Georgetown, Ontario	416-457-4130

VARIAN ASSOC., Solid State East Div., Micro-Link Prods., 8 Salem Rd., Beverly, Mass., 01915, Tel: 617-922-6000, TWX: 710-347-1394

Products manufactured: Antennas, Capacitors, Fixed, Converters, Diodes, Mounts, Receivers, Strip-Line Components, Microwave, Television Systems & Equipment Closed-Circuit, Transmitters

Local Sales Offices & Reps.

Ariz	Scottsdale	602-947-5461
Cal	Los Altos	415-968-7630
Cal	Santa Monica	213-828-5588
Fla	Clearwater	813-446-8513
Ga	Atlanta	404-252-0045
Ill	Park Ridge	312-825-6686
Md	Cheverly	301-773-7010
Mass	Waltham	617-890-4560
NJ	Mt. Laurel	609-428-6800
NJ	Springfield	201-376-6600
NY	Syracuse	315-437-2568
Ohio	Dayton	513-298-7318
Tex	Richardson	214-235-2385

VARIAN ASSOCS., Vacuum Div., 611 Hansen Way, Palo Alto, Cal., 94303, Tel: 415-493-4000, TWX: 910-373-1731; Empl.: 550

Products manufactured: Analyzers, Chamber, Environmental Test, Coatings, Controls/Control Eqpt., Deposition Equipment, Vacuum & Accessories, Detectors, Furnaces, Gages, Interferometer Systems, Ovens, Pumps, Vacuum, Valves, Vacuum

Local Sales Offices & Reps.

Cal	Downey, Varian Vacuum Div.	213-927-2601
Cal	Los Altos, Varian Vacuum Div.	415-968-4936
Fla	Clearwater, Varian Vacuum Div.	813-446-8513
Ill	Park Ridge, Varian Vacuum Div.	312-825-3103
Md	Cheverly, Varian Vacuum Div.	301-772-7433
Mass	Waltham, Varian Vacuum Div.	617-890-5750
NJ	Springfield, Varian Vacuum Div.	201-376-6610
NY	Syracuse, Varian Vacuum Div.	315-437-3307
Ohio	Cleveland, Varian Vacuum Div.	216-261-2115
Tex	Richardson, Varian Vacuum Div.	214-235-4586

VARIAN DATA MACHINES, Box E, Irvine, Cal., 92614, Tel: 714-833-2400, TWX: 910-596-1358; Empl.: 800; Minimum order: \$50

For info on price: J. Jacobsen; Application info: D. Zatyko; Customer service: J. Gay; Delivery info: D. Jenkins

Products manufactured: Comm. Systems, Computers, Converters, Data Acquisition & Reduction Systems, Printers, Recorders

Local Sales Offices & Reps.

Ala	Huntsville	205-539-4616
Cal	Garden Grove	714-897-9515
Cal	San Diego	714-276-9462
Cal	Sunnyvale	408-736-5630
Colo	Denver	303-770-2151
Fla	Orlando	305-645-2577
Ga	Atlanta	404-252-0047
Ill	Park Ridge	312-692-7184
Md	Cheverly	301-773-6770
Mass	Waltham	617-890-6072
Mich	Southfield	313-645-9950
Mo	St. Louis	314-524-0880
NJ	Englewood Cliffs	201-569-2323
NM	Albuquerque	505-298-5570
NY	Englewood Cliffs	212-325-5248
NY	Rochester	716-586-3273
Ohio	Strongsville	216-238-6960
Pa	Philadelphia	215-643-2355
Pa	Pittsburgh	412-486-2443
Tex	Dallas	214-231-5145
Tex	Houston	713-781-0105
Wash	Seattle	206-641-4500

VARIAN DATA MACHINES, 611 Hansen Way, Palo Alto, Cal., 94303, Tel: 415-493-4000, TWX: 910-373-1731; Empl.: 125

Products manufactured: Converters, Data Acquisition & Reduction Systems, Printers, Terminal Equipment, Digital

Local Sales Offices & Reps.

Cal	Downey	213-937-2673
Cal	San Diego	714-298-9292
Cal	Sunnyvale	408-736-3030
Fla	Orlando	305-299-2001
Ga	Atlanta	404-252-0047
Ill	Park Ridge	312-692-7184
Md	Cheverly	301-773-6770
Mass	Waltham	617-890-6072
Mich	Southfield	313-645-9950
NJ	Englewood Cliff	201-469-2323
NM	Albuquerque	505-288-5579
NY	Rochester	716-586-3273
Pa	Ft. Washington	213-643-2356
Tex	Houston	713-781-0105
Tex	Richardson	214-231-5145
Wash	Bellevue	206-455-2518

VARIAN ELECTRON TUBE & DEVICE GRP., 301 Ind'l Way, San Carlos, Cal., 94070, Tel: 415-592-1221, TWX: 910-376-4893

Products manufactured: Adapters, Waveguide, Amplifiers, Antennas, Attenuators, Calorimeters, Microwave, Capacitors, Fixed, Cavities, Microwave, Coils Including Assemblies & Forms, Comm. Systems, Converters, Couplers, Diodes, Display Devices/Displays, Dividers, Drivers & Decoders For Readouts, Duplexers, Microwave, Filters, Flanges, Waveguide, Fuses, Generators, Heat Exchangers & Systems, Intensifiers, Image, Isolators, Junctions, Hybrid, Microwave, Lamps, Limiters, Magnets, Microwave Integrated Circuits (MIC's), Mixer-Preamplifiers, Microwave, Mixers, Modulators, All Kinds, Monitors, Multipliers, Oscillators, Power Supplies, Receivers, Seals, Sensors, Light, Services, Assembly, Production & Test, Shutters, Microwave, Sockets, Strip-Line Components, Microwave, Switches, Tachometers, Terminals, Transistors, Tubes

Local Sales Offices & Reps.

Ariz	Scottsdale	602-947-5461
Cal	Los Angeles	
Cal	San Francisco	
Fla	Ft. Lauderdale	305-943-9495
Ga	Atlanta	404-252-0045
Ill	Park Ridge	312-825-6686
Md	Cheverly	301-773-7010
Mass	Waltham	617-890-4560
NJ	Mt. Laurel	609-428-6800
NJ	Springfield	201-376-6600
NY	Syracuse	315-437-2568
Ohio	Dayton	513-298-7318
Tex	Richardson	214-235-2385
EXP:	Palo Alto, Cal.	415-943-4000

VARIAN PALO ALTO MICROWAVE TUBE DIV., 611 Hansen Way, Palo Alto, Cal., 94303, Tel: 415-493-4000, TWX: 910-373-1731

Products manufactured: Amplifiers, Attenuators, Calorimeters, Microwave, Coils Including Assemblies & Forms, Couplers, Detectors, Filters, Isolators, Magnets, Power Supplies, Services, Assembly, Production & Test, Tubes

VARIAN SOLID STATE EAST BEVERLY DIV., Salem Rd., Beverly, Mass., 01915, Tel: 617-922-6000, TWX: 710-347-1394

Products manufactured: Amplifiers, Cavities, Microwave, Converters, Couplers, Detectors, Diodes, Duplexers, Microwave, Generators, Junctions, Hybrid, Microwave, Mixer-Preamplifiers, Microwave, Mixers, Modulators, All Kinds, Multipliers, Oscillators, Power Supplies, Receivers, Strip-Line Components, Microwave, Switches

Local Sales Offices & Reps.

Ariz	Scottsdale	602-947-5461
Cal	Los Altos	415-968-7630
Cal	Santa Monica	213-828-5588
Fla	Clearwater	813-446-8513
Ga	Atlanta	404-252-0045
Ill	Park Ridge	312-825-6686
Md	Cheverly	301-773-7010
Mass	Waltham	617-890-4560
NJ	Mt. Laurel	609-428-6800
NJ	Springfield	201-376-6600
NY	Syracuse	315-437-2568
Ohio	Dayton	513-298-7318
Tex	Richardson	214-235-2385

VARIAN, SOLID STATE WEST DIVISION, 611 Hansen Way, Palo Alto, Cal., 94303, Tel: 415-493-4000, TWX: 910-373-1731

Products manufactured: Amplifiers, Crystals, Diodes, Filters, Generators, Multipliers, Oscillators, Receivers, Tubes, Tuners

Local Sales Offices & Reps.

Ariz	Scottsdale	602-947-5461
Cal	Los Altos	415-968-7630
Cal	Santa Monica	213-828-5588
Fla	Clearwater	813-446-8513
Ga	Atlanta	404-252-0045
Ill	Park Ridge	312-825-6686
Md	Cheverly	301-773-7010
Mass	Waltham	617-890-4560
NJ	Mt. Laurel	609-428-6800
NJ	Springfield	201-376-6600
NY	Syracuse	315-437-2568
Ohio	Dayton	513-298-7318
Tex	Richardson	214-235-2385
FOR:	Can., Georgetown, Ont., Varian Assocs. of Can. Ltd.	416-457-4130

VARO, INC., Electrokinetics Div., 402 E. Gutierrez St., Santa Barbara, Cal., 93102, Tel: 805-963-2055, TWX: 910-334-1177; FSC No: 02101; Empl.: 85; Minimum order: \$100 p. 1-278, 1532

For info on price: R. F. Suchan; Application info: R. F. Suchan; Customer service: R. W. Harvey; Delivery info: R. W. Harvey

Free literature available: Alternators, generators, electromechanical rotary actuators and A.C. and D.C. motors.

Products manufactured: Actuators, Alternators, Generators, Motors, Valves, Solenoid

VARO ELECTRON DEVICES, INC., 2203 W. Walnut St., Garland, Tex., 75040, Tel: 214-272-3561, TWX: 910-860-5093; FSC No: 27777; QPL No: Multiple; Empl.: 175 p. 1-2360

Customer service: W. T. Boyd

Free literature available: Brochure available with outline drawings and specifications of various image converters, image intensifiers, zoom tubes, gated intensifiers, microchannel plate inverter tubes.

Products manufactured: Intensifiers, Image, Tubes

Local Sales Offices & Reps.

NJ Eatontown 201-229-1400
Ohio Dayton 513-253-8935
Va Springfield 703-941-5144

VARO SEMICONDUCTOR, INC., 1000 N. Shiloh Rd., Garland, Tex., 75040, Tel: 214-272-4551, TWX: 910-860-5178; Empl.: 1500 p. 1-1881-1895

For info on price: M. Hawkins; Application info: M. Hawkins; Customer service: T. Miller; Delivery info: T. Miller

Products manufactured: Bridges, Controls/Control Eqpt., Diodes, Multipliers, Rectifiers, Thyristors (Includes Silicon Controlled Rectifiers)

Local Sales Offices & Reps.

Ariz Phoenix, W.V. Posey Co. 602-949-5873
Cal Los Altos, W.V. Posey Co. 415-948-7771
Cal Los Angeles, Corcoran Assocs. 213-823-4589
Colo Arvada, Sage Sales 303-841-2487
Conn North Haven, Comp Rep Assocs. 203-239-9762
Fla Orlando, Buchanan & Abrams Assocs. 305-898-7444

Ill Lombard, Varo Semiconductor 312-593-8860
Ind Indianapolis, Tech. Reps, Inc. 317-849-6454
Iowa Des Moines, Coombs Assocs. 312-298-4830
Md Baltimore, Dyna Rep. Co. 301-256-8300
Mass Needham, Comp Rep Assocs. 617-444-2484
Mich Farmington, Davis-Martensen Co. 313-474-8300

Minn Minneapolis, L.F. Green Assocs. 612-781-1611
Mo Kansas City, Beneke & McCaul, Inc. 816-765-2998

Mo St. Louis, Beneke & McCaul 314-434-6242
NJ Haddonfield, Dyna Rep. Co. 609-795-1700
NY Great Neck, Cooper-Simon & Co. 516-487-1142
NY Ithaca, B. Dean, Inc. 607-272-2187
NC Charlotte, Buchanan & Abrams Assocs. 704-332-4974

Ohio Dayton, J.C. Hofstetter Co. 513-296-1010
Ohio Medina, J.C. Hofstetter Co. 216-241-4880

Ore Portland, C.K. Shanks & Assocs. 503-292-5656
Tex Garland, Whiteside Sls. Co. 214-231-9771
Tex Houston, Whiteside Sls. Co. 713-498-2551

Utah Salt Lake City, Sage Sales 801-531-0531
Va Alexandria, Dyna Rep. Co. 703-354-1222
Va Newport News, Dyna Rep. Co. 804-874-7729

Wash Seattle, C.K. Shanks & Assoc. 206-632-4290
Wisc Brookfield, Varo Semiconductor 414-782-7590
FOR: Downsview, Ont., Cantronics, Inc. 416-661-2494

FOR: Montreal, Que., Cantronics, Inc. 514-341-5207

Local Distributors

Ala Huntsville, Cramer-Huntsville, 2310 Bob Wallace Ave. 205-539-5722
Ariz Phoenix, Cramer-Ariz., 2643 E. University 602-263-1112

Cal Chatsworth, Westates Elctns., 20151 Bahama St. 213-341-4411
Cal Garden Grove, Allied Elctns., 12311 Industry St. 213-598-6605

Cal Irvine, Cramer-L.A., 17201 Daimler St. 714-979-3000
Cal San Diego, Cramer-San Diego, 8975 Complex Dr. 714-565-1881

Cal Sepulveda, Milgray-Cal., 8718 Woddley Ave. 213-894-4011
Cal Sunnyvale, Bell Ind's., 1161 N. Fair Oaks 408-734-8570

Cal Sunnyvale, Cramer-San Francisco, 720 Palomar Ave. 408-739-3011
Colo Denver, Cramer-Denver, 5465 E. Evans Pl. 303-758-2100

Conn North Haven, Cramer-Conn., 35 Dodge Ave. 203-239-5641

Fla Hollywood, Cramer-Hollywood, 4035 N. 29th Ave. 305-923-8181

Fla Orlando, Cramer-Orlando, 345 N. Graham Ave. 305-894-1511

Fla Orlando, Milgray-Fla., 5400 Diplomat Cir. 305-647-5747

Ga Atlanta, Cramer-Atlanta, 3923 Oakcliff Ind. Ct. 404-448-9050

Ill Elgin, Allied Elctns., 1355 Sleepy Hollow 312-697-8200

Ill Mt. Prospect, Cramer-Chicago, 1911 S. Busse Rd. 312-593-8230

Ill Skokie, Bell Elctns., 7701 N. Austin 312-282-5400

Ind Indianapolis, Graham Elctns., 133 S. Pennsylvania 317-634-8486

Md Baltimore, Cramer-Baltimore, 922-24 Patapsco Ave. 301-354-0100

Md Gaithersburg, Cramer-Wash., 16021 Industrial Dr. 301-948-0110

Md Hyattsville, Milgray-Wash., 5405 Lafayette Pl. 301-864-1111

Mass Burlington, Milgray-New England, 79 Terrace Hall Ave. 617-272-6800

Mass Newton, Cramer Elctns., 85 Wells Ave. 617-969-7700

Mich Livonia, Cramer-Detroit, 13193 Wayne Rd. 313-425-7000

Minn Edina, Cramer-Bonn, 7275 Bush Lake Rd. 612-835-7811

NJ Cherry Hill, Milgray-Del. Valley, 1165 Marlkrass Rd. 609-424-1300

NJ Pennsauken, Cramer-Pa., 7300 Rte. 130 N. 215-923-5950

NJ Union, Cramer-N.J., 949 Ball Ave. 201-687-7870

NM Albuquerque, Cramer-N.M., 137 Vermont N.E. 505-265-5767

NY E. Syracuse, Cramer-Syracuse, 6716 Joy Rd. 315-437-5571

NY Endwell, Cramer-Binghamton, 3220 Watson Blvd. 607-754-6661

NY Freeport, Milgray Elctns., 191 Hanse Ave. 516-546-6000

NY Hauppauge, Cramer-L.I., 29 Orser Ave. 516-231-5600

NY Rochester, Cramer-Rochester, 300C S. Winton Rd. 716-275-0300

NC Winston-Salem, Cramer/Winston-Salem, 938 Burke St. 919-725-8711

Ohio Cincinnati, Cramer-Tri-States, 666 Redna Terrace 513-771-6441

Ohio Cleveland, Cramer-Cleveland, 5835 Harper Rd. 216-248-8400

Ohio Cleveland, Milgray-Cleveland, 1821 E. 40th St. 216-881-8800

Tex Dallas, Cramer-Texas, 2970 Blystone Ln. 214-350-1355

Tex Fort Worth, Allied Elctns., 401 E. 8th St. 817-336-5401

Tex Houston, Altair Co., 9501 Baythorne, Box 40313 713-462-3029

Tex Richardson, Altair Co., 405 N. Plano Rd. 214-231-5166

Utah Salt Lake City, Cramer-Utah, 391 W. 2500 So. 801-487-4131

Wash Bellevue, Bell Ind's., 1900 132nd N.E. 206-747-1515

Wash Seattle, Cramer-Seattle, 5602 6th Ave. S. 206-762-5755

Wisc Oak Creek, Cramer-Wisc., 430 W. Rawson Ave. 414-764-1700

For: Can., Downsview, Ont., Cramer-Can., 920 Alness St. 416-661-9222

For: Can., Vancouver, B.C., R.A.E. Ind., 1620 Main St. 604-687-2621

For: Can., Willowdale, Ont., Electro Sonic, Ind'l. Sls. Ltd., 1100 Gordon Baker Rd. 416-494-1666

VECTOR ELECTRONIC CO., INC., 12460 Gladstone Ave., Dept. EP, Sylmar, Cal., 91342, Tel: 213-365-9661, TWX: 910-496-1539; FSC No: 82893; Empl.: 110; Minimum order: \$15

p. 1-100-103; p. 2-358-363, 1058-1061

For info on price: J. Robertson; Application info: F. L. Hill; Customer service: B. Little; Delivery info: J. Nelson

Free literature available: For Drawings for custom card and module cages.

Products manufactured: Attenuators, Bezels, Shielded & Unshielded, Boards, Plug-In, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Boards, Programming, Bus Bars & Systems, Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Chassis, Metal, Chemicals, Clamps & Clips, Coils Including Assemblies & Forms, Connector Adapters, Connector Boxes & Strips, Power Outlet, Connectors, Contacts, Electrical, Containers, Cords, Dummy Loads, Enclosures, Module, Plug-In, Elchants, Printed Circuit, Eyelets, Frames, Cabinet & Rack, Gaskets, Shielding, R-F-Also See Shields, R-F, Guides, Circuit Board, Handles For Cabinets, Circuit Boards, Racks, etc., Holders, Circuit Board (Production Type), Insulators & Insulation, Integrated Circuit Packaging Systems, Integrated Circuit Devices, Jumpers, Kits, Breadboarding (For Engineers), Kits, Printed Circuit, Kits, Terminal, Kits, Test Equipment, Kits, Training Aid, Laminates, Pads, Transistor Mounting, Panels, Pins, Plug Adapters, Plug Caps & Shells, Plugs, Pullers, Racks, Retainers, Socket Adapters, Sockets, Terminal Blocks, Boards & Strips, Terminals, Tools

Local Distributors

Ariz Phoenix, Dalis Radio/T.V. Supply, 917 N. 7th St. 602-258-8151

Cal Inglewood, Newark Elctns., 4747 W. Century 213-638-4411

Cal Irvine, Terminal Electron., 1791 Reynolds 714-549-8611

Cal Los Angeles, RPS Elctns., 1501 S. Hill 213-746-1271

Cal Mt. View, Abacus Elctns., 1065 Terra Bella 415-961-1500

Cal Mt. View, Elmar Elctns., 2288 Charleston 415-961-3611

Cal Oakland, Brill Elctns., 610 E. 10th St. 415-834-5888

Cal Pasadena, Empire Elctns., 37 E. Union St. 213-681-7671

Cal Riverside, Electronic Supply, 2486 Third St. 714-683-8110

Cal Sacramento, Dunlap Elctns., 1800 18th St. 916-444-8070

Cal San Diego, Shanks & Wright, 2045 Kettner 714-239-0176

Cal San Jose, Quement Elctns., Box 6000 408-294-0464

Fla Tampa, Lykes Elctns., Box 24047 813-886-6621

Ill Chicago, Newark Elctns., 500 N. Pulaski 312-638-4411

Ill Elgin, Allied Elctns., 1355 Sleepy Hollow 312-697-8200

Ill Palatine, Ohm/Elctns., 649 Vermont Ave. 312-359-5500

Ill Peoria, Klaus Radio, 8400 N. Pioneer Pkwy. 309-691-4840

Ind Indianapolis, Graham Elctns., 133 S. Pennsylvania 317-634-8486

Ind Indianapolis, Ra Dis Co., Inc., 814 N. Senate 317-637-5571

Ky Louisville, P.I. Burks, Box 1015 502-589-3960

Md Baltimore, ASI Elctns., 1728-30 Whitehead 301-265-5100

Md Beltsville, Powell Elctns., 10728 Hanna St. 301-474-1030

Md Rockville, Capitol Radio, 12270 Wilkens 301-942-7505

Mass Boston, Sager Elect. Supply, 172 High St. 617-542-2281

Mass Dedham, Gerber Elctns., 852 Providence 617-329-2400

Mass Lynn, Land Elect. Supply, 9 R. Franklin 617-592-2220

Mass Newton, Cramer Elctns., 85 Wells Ave. 617-969-7700

Mich Ann Arbor, Wedemeyer Elect., 2280 S. Industri. Hwy. 313-665-8611

Mich Detroit, Newark Elctns., 20700 Hubbell Ave. 313-548-0250

Mich Detroit, R S Elctns., 12775 Lyndon St. 313-491-1000

Minn St. Paul, Gopher Elctns., 2520 W. Larpenteur 612-645-0241

Mo St. Charles, Lelectronix, Inc., 306 McDonough 314-946-6424

Mo St. Louis, Olive Ind. Elect., 6662 Olive Blvd. 314-863-7800

NJ Camden, General Radio, 600 Penn St. 609-964-8560

NJ Hanover, State Elctn. Parts, 36 Route 10 201-887-8146

NM Albuquerque, Electronic Parts, 2620 Rhode Island NE 505-265-8401

NY Buffalo, Summit Distrs., 916 Main St. 716-884-3450

NY Rochester, Simcona Elctns., 275 Mt. Read
716-328-3230

NY Rockville Centre, Midway Industrial, 24 Maple
Ave. 516-764-2400

NY Woodbury, Harvey Radio, 60 Crossways Pk. W.
516-921-8700

NC Raleigh, Southeastern Radio, 414 Hillsboro St.
919-828-2311

Ohio Akron, Akron Elctn. Supply, 107 S. Arlington
216-762-8818

Ohio Cleveland, Pioneer Standard, 4800 E. 131st St.
216-587-3600

Ohio Columbus, H. Peters Co., 481 E. 11th Ave.
614-294-5351

Ohio Dayton, ESCO, Inc., 221 Crane St. 513-224-9192

Ohio Dayton, Stotts Friedman, 108 N. Jefferson
513-224-1111

Okla Oklahoma City, Trice Wholesale, 4701 N. Stiles
405-524-4411

Ore Portland, United Radio, 123 7th Ave NE
503-233-5346

Pa Philadelphia, Powell Elctns., South Island Rd.
215-365-1900

Pa Pittsburgh, Cameradio, 2801 Liberty Ave.
412-391-7400

Pa Pittsburgh, RPC Elctns., 620 Alpha Dr.
412-782-3770

RI Providence, Wm. Dandreta & Co., 28 Wolcott St.
401-861-2800

Tex Dallas, Wholesale Elect., 2809 Ross Ave.
214-824-3001

Tex Fort Worth, Allied Elctns., 401 E. 8th St.
817-336-5401

Tex Houston, Harrison Equip., 1616 McGowen
713-224-9131

Utah Ogden, Ballard Supply, 3109 Washington
801-394-5541

Wash Seattle, Almac Stroum, 5811 Sixth Ave. S.
206-763-2300

Wash Seattle, Radar Elec. Co., 168 Western Ave.
206-282-2511

Wisc Milwaukee, Marsh Elctns., 6047 Beloit Rd.
414-545-6500

Wisc Milwaukee, Parts Mart, 1314 N. 7th Ave.
414-276-4160

Exp: Cal., Los Angeles, Trans World Trade, Box 1037
213-472-0444

VECTOR GENERAL, INC., 21300 Oxnard St., Woodland
Hills, Cal., 91364, Tel: 213-346-3410, TWX:
910-494-2764; FSC No: 32602; Empl: 97; Minimum
order: \$50

For info on price: C. M. Ceranowski; Application info:
J. Roberts; Customer service: F. Kohout; Delivery
info: L. L. Longstaffe

Free literature available: Technical descriptions of
Vector General's Interactive Graphic Display
Systems interfaced to a wide range of
minicomputers; associated graphics peripheral
input devices; and graphic applications software.

Products manufactured: Dials, Display
Devices/Displays, Generators, Keyboards,
Alphanumeric & Decimal, Light Sources,
Photoelectric Tubes

Local Sales Offices & Reps.

Cal Saratoga 408-996-3361

Cal Woodland Hills 213-346-3410

Md Baltimore 301-788-3722

Mass Westford 617-692-3385

Mich Ann Arbor 313-994-1331

Pa Downingtown 215-269-3021

Tex Dallas 214-690-8035

EXP: Los Angeles, Cal., Harper-Robinson
213-670-6401

VECTROL, INC., 1010 Westmore Ave., Rockville, Md.,
20850, Tel: 301-424-6900; Empl: 52; Minimum order:
\$25

For info on price: K. Berger; Application info: B.
Strayton; Customer service: K. Berger; Delivery info:
K. Berger

Products manufactured: Amplifiers,
Controls/Control Eqpt., Power Supplies, Relays

Local Sales Offices & Reps.

Cal Los Angeles, Basic Sys. Corp. 213-938-2833

Cal San Francisco, Artwell Elec. Co. 415-467-1880

Ill Chicago, Markson Assocs. 312-267-1905

Md Baltimore, B. White & Co. Inc. 301-484-5400

Mass Sharon, Adcour & Assocs. 617-784-3996

Mich Farmington Hills, H. Lowell Co. 313-851-7474

NJ Ridgewood, Ballou Inc. 201-444-6990

NY Lancaster, Lawrence Industrial Sls.
716-685-1993

Ore Portland, Dyna Tech. 503-265-1455

Pa Valley Forge, Gil-Tronics 215-933-8525

Wisc Milwaukee, E.A. Dickinson & Assocs.
414-264-1080

VECTRON LABS., INC., 121 Water St., Norwalk,
Conn., 06854, Tel: 203-853-4433, TWX: 710-468-3796;
FSC No: 27802; Empl: 80; Minimum order: \$30
p. 1-420,421

For info on price: Sls.; Application info: Sls.;
Customer service: Cust. Svc.; Delivery info: Sls.

Free literature available: "Crystal Oscillators,
Frequency Standards". "Howto Specify Crystal
Controlled Oscillators".

Products manufactured: Amplifiers, Clocks (All
Types), Controls/Control Eqpt., Generators,
Integrated Circuit Devices, Oscillators

Local Sales Offices & Reps.

Ala Huntsville, FM Assocs. 205-536-9990

Cal Los Angeles, Fetty/Schoenduve 213-651-4050

Cal Palo Alto, Fetty/Schoenduve 415-321-7041

Fla Jupiter, FM Assocs. 305-746-2996

Fla Orlando, FM Assocs. 305-851-5710

Ill Skokie, Heth Inc. 312-282-8737

Ind Indianapolis, Ihrig Assocs. 317-783-7630

Kans Overland Park, Enesco-Rep., Inc. 913-381-7557

Mich Grand Rapids, R. P. Urban Assocs. 616-245-0511

Minn Burnsville, Heth, Inc. 612-333-8494

Mo St. Louis, Enesco-Rep 314-567-3935

NJ Woodcliff Lake, F & F Assoc. 201-778-6767

NY Flushing, F & F Assoc 516-334-1160

NY Syracuse, Rep Tech 315-437-2845

NC Greensboro, FM Assocs. 919-294-2754

Ohio Brecksville, A. Nace Co. 216-526-4323

Ohio Englewood, A. Nace Co. 513-836-7548

Pa Newtown Sq., SWR Assocs. 215-356-8550

Pa Pittsburgh, A. Nace Co. 412-922-7225

Tex Dallas, Texas Avionics 214-363-6324

Va Springfield, Temsco 703-569-2700

Wash Seattle, Datacom 206-285-2525

VEEDER-ROOT, 70 Sargeant St., Hartford, Conn.,
06102, Tel: 203-527-7201, Telex: 9-9219; Empl: 1200
p. 1-274,275

For info on price: A. Piergrossi; Application info: S.
Rosenthal; Customer service: Wm. Travis

Free literature available: Total Capability:
Counting/Controlling/Digital Printing: Complete
line of totalizers, predetermining counters,
printing devices and input devices. Catalog gives
full description, stock items, specifications and
application information.

Products manufactured: Controls/Control Eqpt.,
Converters, Counters, Data Acquisition &
Reduction Systems, Display Devices/Displays,
Generators, Indicators, Meters, Printers,
Recorders, Switches, Tachometers, Timers,
Totalizers, Digital, Transducers

Local Sales Offices & Reps.

Cal Burlingame 415-697-6830

Cal Glendale 213-245-8421

Conn Hartford 203-247-0133

Ga Rome 404-235-0756

Ill Des Plaines 312-824-0188

Md Baltimore 301-296-2177

Mich Detroit 313-886-4485

Minn Minneapolis 612-831-1711

NJ Ridgewood 201-445-2401

NY Rochester 716-244-0550

NC Charlotte 704-364-3653

Ohio Cincinnati 513-271-6200

Ohio Cleveland 216-229-2634

Pa Willow Grove 215-887-0708

SC Greenville 803-288-2133

Tex Arlington 214-252-3360

For: Can., Montreal, Quebec, Veeder-Root Co. Ltd.
514-747-1213

FOR: Can., Toronto, Ontario, Veeder-Root Co. Ltd.
416-239-3094

VEETRONIX, Box 209, 136 W. 7th St., Cozad, Neb.,
69130, Tel: 308-784-4000; Empl: 25 p. 1-2307

Products manufactured: Keyboards, Alphanumeric
& Decimal, Switches

VEGA PRECISION LABS., 800 Follin La., Vienna, Va.,
22180, Tel: 703-938-6300, Telex: 89-2521; Empl: 165
p. 1-928

Customer service: T. E. Eazarsky Ext. 220

Products manufactured: Antennas, Dividers,
Generators, Radar Systems, Receivers,
Simulators, Tracking Systems, Transmitters,
Transponders

Local Sales Offices & Reps.

Cal El Cajon 714-448-3240

Fla Panama City 904-763-9666

NY Rome 315-337-2900

VELONEX, INSTRUMENT DIV., 560 Robert Ave., Santa
Clara, Cal., 95050, Tel: 408-244-7370, TWX:
910-338-0114; Empl: 60; Minimum order: \$30

Customer service: E. Rudee

Free literature available: High Power Pulse
Generator Catalogs; highly environmentalized
DC/DC power supply catalog; Precision high
voltage power supply data sheets.

Products manufactured: Amplifiers, Converters,
Discharge Systems, Energy, Generators,
Modulators, All Kinds, Power Supplies,
References, D-C Voltage, Standards, Testers,
Transformers

Local Sales Offices & Reps.

Ariz Phoenix, R.A. Mayes Co. 602-279-5243

Cal Costa Mesa, Measurement Assocs. 714-540-7160

Cal Oakland, Advanced Technology 415-452-1401

Colo Boulder, R.A. Mayes Co. 303-444-0782

Conn Hamden, P. Jenks Assocs. 203-281-0810

DC Washington Gans-Frying 703-527-3262

Fla Orlando, E.G. Holmes, Assocs. 305-894-8901

Ga Chamblee, E.G. Holmes, Assocs. 404-451-6161

Ill Chicago, K.W. Meyers Co. 312-774-6440

Ind Indianapolis, K.W. Meyers Co. 317-243-6681

Md Fulton, Gans-Frying, Inc. 301-837-6311

Mass Wakefield, P. Jenks Assocs. 617-246-1590

Mich Detroit, Hocker Assocs. 313-549-3910

Minn Minneapolis, K.W. Meyers Co. 612-920-7080

NM Albuquerque, R.A. Mayes & Co. 505-292-2330

NY Plainview, Eastern Metro Assocs. 516-931-1414

NY Rochester, Scientific Devices 716-334-2445

Ohio Cleveland, Hocker Assocs. 216-235-6504

Ohio Dayton, Hocker Assocs. 513-298-8638

Pa Melrose Park, R. Meyers Assocs. 215-224-1663

Tex Houston, R.A. Mayes Co. 713-461-5385

Tex Richardson, R.A. Mayes Co. 214-235-3053

Va Arlington, Gans-Frying, Inc. 703-527-3262

Va Virginia Beach, E.G. Holmes & Assocs. 804-481-6556

FOR: Can., Brampton, Ont., Baytronix Ltd.
416-453-1252

FOR: Can., Montreal, Que., Baytronix Ltd.
514-336-9240

FOR: Can., Ottawa, Ont., Baytronix Ltd. 613-728-0113

VELONEX, DISPLAY PRODS., 560 Robert Ave., Santa
Clara, Cal., 95050, Tel: 408-244-7370; Empl: 60;
Minimum order: \$35

For info on price: E. Rausch; Application info: R. A.
Pecotich; Customer service: E. Rausch; Delivery info:
E. Rausch

Free literature available: Application Bulletin I-101
System Integration of Impac Digital Panel Meters
provides definition of specifications, theory of
operation and information necessary to
accomplish interface of all models of Impac
Digital Panel Meters.

Products manufactured: Converters, Counters,
Display Devices/Displays, Meters

Local Sales Offices & Reps.

Ala Huntsville, BCS Assocs. 205-881-6220

Ariz Phoenix, R.A. Mayes Co. 602-279-5243

Cal Glendale, Meko Instr. Co. 213-240-4664

Cal Los Altos, Hoeke-Reeser 415-941-4080

Colo Broomfield, R.A. Mayes Co. 303-466-6311

Conn Hamden, P. Jenks Assocs. 203-281-0810

Fla Orlando, BCS Assocs. 305-896-4881

Ill Chicago, K.W. Meyers Co. 312-774-6440

Ind Indianapolis, K.W. Meyers Co. 317-243-6681

Md Fulton, Gans-Frying, Inc. 301-837-6311

Mass Wakefield, P. Jenks Assocs. 617-240-1590

Minn Minneapolis, K.W. Meyers Co. 612-920-7080

NJ Union, SBM Reps. 201-687-8737

NM Albuquerque, R.A. Mayes Co. 505-285-7989

NY Pleasantville, SBM Reps. 914-769-1811

NY Rochester, SBM Reps 716-266-1400

NC Greensboro, BCS Assocs. 919-273-1918

Ohio Medina, McShane, Inc. 216-725-4568

Okla Norman, Data Mktg. Assoc. 405-364-8320

Pa Philadelphia, R. Meyers 215-224-1663

Tex Dallas, Data Mktg. Assoc. 214-661-0300

Tex Houston, Data Mktg. Assoc. 713-686-9627

Tex San Antonio, Data Mktg. Assoc. 512-828-0937

Va Arlington, Gans-Frying, Inc. 703-527-3262

Wash Bellevue, Desco Northwest 206-455-9325

VEMALINE PRODS. CO., 455 W. Main St., Wyckoff, N.J.,
07481, Tel: 201-891-3200; FSC No: 08730; Empl: 47;
Minimum order: \$50

For info on price: R. Pagan; Application info: C.
Dawkins; Customer service: J. Kitson; Delivery info:
D. Struck

Products manufactured: Caps, Lenses, Indicator Light, Clamps & Clips, Clutches, Couplings, Dials, Display Devices/Displays, Drives & Drive Mechanisms (Dial), Fasteners, Handles For Cabinets, Circuit Boards, Racks, etc., Knobs, Lamps, Lights, Locks, Dial & Shaft, Scales, Dial, Services, Assembly, Production & Test, Shafts & Adapters, Switch Hardware, Switches, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

Ala Madison, B-C Elec. Sls. 205-837-5778
 Airz Phoenix, Mr Engr. Co. 602-959-5150
 Cal Encino, El/Tec 213-981-9881
 Cal Santa Clara, Ruby Sls. Corp. 408-739-5333
 Conn Meriden, Electro Prods. Sls. 203-235-4040
 Fla Ft. Lauderdale, Orbe 305-564-8571
 Ga Smyrna, B-C Elec. Sls. 404-436-5169
 Ill Chicago, Ropek-Cahill 312-287-7292
 Ind Evanston, R.M.P. Sls. 312-631-9545
 Kans Olathe, B. Rush Assocs. 913-782-1177
 Mass Waltham, Electro Prods. Sls. 617-899-1570
 Mich Grand Rapids, R. P. Urban Assoc. 616-245-0511
 Minn Minneapolis, Bitronics Sls. Co. 612-835-7744
 NY Buffalo, R.A. Murray Co. Inc. 716-632-6913
 NY Derry, R.A. Murray Co. Inc. 315-682-2920
 NY Williamsville, R.A. Murray Co. Inc. 716-632-4987
 Ohio Cincinnati, Loesch Assoc. 606-331-4332
 Ohio Cleveland, Loesch Assoc. 216-241-4581
 Pa Abington, IMS Co. 215-659-0444
 Tex Dallas, Blackburn Assoc. 214-351-9991
 EXP: New Rochelle, N. Y., Montclair Elctns. 914-576-1400

VENT-RAK, DIV., General Devices Co., Inc., 525 S. Webster Ave., Indianapolis, Ind., 46219, Tel: 317-359-5407, Telex: 27-2169; Empl.: 125; Minimum order: \$50 p. 1-67-70

For info on price: J. Bradford; Application info: R. D. Lambert; Customer service: G. Feest; Delivery info: J. Bradford

Free literature available: Catalogs covering Vent-RAK 1000-Series, 3000-Series, 6000-Series and 7000-Series Electronic Cabinets; 4600-Series Consoles and Instrument Cases; Vent-RAK chassis and Vent-RAK Accessories (Cable Retectors and writing shelves)

Products manufactured: Benches, Consoles, Stools, Tables, Cabinets & Accessories, Cable Retractors, Cases, Equipment, Instrument, Meter, Chassis, Metal, Containers, Drawers, Sliding, Racks

Local Sales Offices & Reps.

Ariz Scottsdale, F. Schoeffler Assoc. 602-948-3470
 Cal Los Angeles, M. A. Stolaroff Co. 213-295-7781
 Cal Mtn. View, G. C. Woempner Co. 415-964-5454
 Cal San Diego, M. A. Stolaroff Co. 714-234-6905
 Cal Van Nuys, J. R. Thomas 213-782-3820
 Colo Sedalia, Jensen Representatives 303-688-4154
 Conn Cheshire, Coakley, Boyd & Abbett, Inc. 203-272-2261
 Fla North Miami, Winfield Electronic Sls. 305-945-6554
 Fla Tampa, Winfield Electronic Sls. 813-884-6500
 Ill Rolling Meadows, Lightner Assocs., Inc. 312-398-3000
 Ind Indianapolis, Marketing Engineers 317-546-1523
 Ind South Bend, Valentine & Schillinger & Assoc. 219-291-6258
 Kans Shawnee Mission, Lowell Kangas & Assoc. 913-631-3515
 Md Bethesda, G. Rosen & Assocs., Inc. 301-530-8448
 Mass Needham, Coakley, Boyd & Abbett, Inc. 617-444-5470
 Minn St. Paul, Northport Engrg., Inc. 612-698-3841
 Mo St. Louis, Lowell-Kangas & Assoc. 314-821-4050
 NY Fayetteville, H.G. Richter, Inc. 315-637-6713
 NY Manhasset, Kaerber & Mack 516-627-6620
 NC Paw Creek, Ward Tech. Sls. Co. 704-399-3481
 Ohio Cincinnati, Components 513-721-2997
 Ohio Cleveland, Components 216-842-2737
 Tex Dallas, R. Martin Assocs. 214-361-8584
 Tex Houston, R. Martin Assocs. 713-462-4077
 Wash Olympia, Bergford Assoc. 206-866-2001
 EXP: Indianapolis, Ind., General Devices Co. 317-359-5407

VENUS SCIENTIFIC, INC., 399 Smith St., Farmingdale, N.Y., 11735, Tel: 516-293-4100, TWX: 510-224-6492; Empl.: 85 p. 1-1024, 1025, 1534, 1535
 Customer service: T. T. Krilovich

Free literature available: Send for Venus 1975 Catalog showing the complete line or miniature high voltage power supplies for military and commercial applications. Venus also builds custom supplies.

Products manufactured: Converters, Power Supplies, Television Systems & Equipment Closed-Circuit

Local Sales Offices & Reps.

Ariz Scottsdale, Piper-Goyne, Inc. 602-946-4437
 Cal Los Altos, Westec Elctns./North 415-948-8880
 Cal Pasadena, Advanced Techniques 213-681-1093
 Fla Lighthouse Point, Saber Assocs. 305-943-3076
 Ill Park Ridge, R. F. Specialists 312-698-2044
 Ind Ft. Wayne, J&B Engrg. Sls. Co. 219-483-2813
 Kans Olathe, B. Rush Assocs. 913-782-1177
 Mass Norwood, S. Pierce, Inc. 617-762-3164
 Minn St. Paul, H.A. Cullen & Assocs. 612-646-7371
 NJ Cherry Hill, H.J. White Co. 609-428-4544
 NY Plainview, E.R.A. Inc. 516-822-9890
 NY Syracuse, Nycorn Inc. 315-437-8343
 Ohio Columbus, T. Mulligan & Assocs. 614-457-2242
 Tex Richardson, P.J. Scanlon Co. 214-231-4661
 Va Alexandria, Vanguard Engrg. Sls. 703-768-1660
 Wash Seattle, Westec Elctns./NW 206-CH3-7070
 FOR: Ottawa, Can., Orion Elctns. 613-521-2739

VERMONT PRECISION RESISTOR CO., Box 1170, Stowe, Vt., 05672, Tel: 802-253-8567; Empl.: 15; Minimum order: \$25

For info on price: J. Wagner; Application info: J. Wagner; Customer service: T. Freeman; Delivery info: T. Freeman

Free literature available: Brochure.

Products manufactured: Resistors

Local Sales Offices & Reps.

NH Nashua, Bell Controls 603-882-6984

VERNY LABORATORIES, INC., S. College St., Yellow Springs, Ohio, 45387, Tel: 513-767-7261; Empl.: 500
 Customer service: A. LePera

Free literature available: Valve brochure; Int'l Rubber & Plastics Chart; Conversion Chart; Facilities Brochure.

Products manufactured: Bushings, Glass, Plastic, Metal, Rubber, Etc., Feedthrus & Seals, Environmental, Rubber, Seals, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Fla Pompano Beach, Veri-Tech., Inc. 305-946-6373

VERNITECH, Div. of Vernitron Corp., 300 Marcus Blvd., Deer Pk., N.Y., 11729, Tel: 516-586-5100, TWX: 510-227-6079; Empl.: 150
 p. 1-220-227, 276, 277, 999-1003, 1920-1923; p. 2-1207

Products manufactured: Actuators, Amplifiers, Brakes, Clutches, Controls/Control Eqt., Converters, Counters, Dampers, Servo, Display Devices/Displays, Encoders, Generators, Indicators, Integrators, Mechanical & Electro-Mechanical, Motor Electric Generator Sets, Motors, Resolvers, Synchro, Servo Systems, Tachometers, Vibrators, Instrument (Stiction Elimination)

Local Sales Offices & Reps.

Cal Los Angeles, Halbar 213-387-8283
 Cal San Mateo, Halbar Assocs. 415-349-4700
 Colo Wheatridge, Technology Mktg. Assoc. 303-423-6106
 Conn N. Haven, Kitchen & Kutchin 203-239-0212
 Fla St. Petersburg, Orbe, Inc. 813-894-0687
 Ill Rogers Park, Communications Engrs. 219-485-0805
 Ind Fort Wayne, T-X Sls. 319-393-6278
 Iowa Cedar Rapids, T-X Sls. 319-393-6278
 Kans Overland Park, Dy-Tronix 816-931-3030
 Md Baltimore, R.P. Luce & Co., Inc. 301-752-8200
 Mass Lexington, Kitchen & Kutchin 617-20-8230
 Mich Grand Rapids, Urban Assoc. 616-245-0511
 Minn Minneapolis, Merrill Franklin Co. 612-835-6422
 Mo Hazelwood, Dy-Tronix 314-731-5799
 NJ Berkeley Heights, R.P. Luce & Co., Inc. 201-464-6440
 NM Albuquerque, Technology Mktg. 505-298-4321
 NY Endicott, Tech-Mark, Inc. 607-748-7473
 NY New Hyde Park, R.P. Luce & Co., Inc. 516-437-4550
 NY New Rochelle, R.P. Luce & Co., Inc. 215-632-1187
 Ohio Dayton, Rixan Assocs. 513-BA-2-0011
 Ohio Shaker Heights, T-X Sls. 216-561-1900
 Pa Philadelphia, R.P. Luce & Co., Inc. 215-884-8365
 Tex Dallas, Gipe Assocs. 214-350-1912
 Tex Dallas, J.B. Guenther

EXP: Montreal, Can., Vitel Elctns. 514-331-7393

VERNITRON CORP., Control Components Div., 2440 W. Carson St., Torrance, Cal., 90501, Tel: 213-328-2504, TWX: 910-349-6250 p. 1-1004, 1924

Customer service: R. Campbell

Free literature available: "New 1975 catalog available defining complete line of synchros, resolvers, selsyns, torgsyn, remote positions, wide angle brushless dc torque motors, electromechanical assemblies and indicators."

Products manufactured: Indicators, Motors, Repeaters, Servo, Resolvers, Synchro, Servo Systems, Synchros, Transformers

Local Sales Offices & Reps.

Cal Los Angeles, Halbar Assocs. 213-387-8283
 Cal San Mateo, Halbar Assocs. 415-349-4700
 Conn North Haven, Kitchen & Kutchin 203-239-0212
 Fla St. Petersburg, Orbe Inc. 813-894-0687
 Ill Hillside, TX Sls. 312-449-0600
 Md Baltimore, Callas Elctns. 301-744-7711
 Mass Lexington, Kitchen & Kutchin 617-862-8230
 Mich Lathrup Village, R.C. Nordstrom Co. 313-559-7373
 Minn Eden Prairie, F. Peterson Co. 612-941-5400
 Mo Hazelwood, Dy-Tronix 314-731-5799
 NJ Cherry Hill, Lanson Assocs. 609-424-4670
 NJ Harrington Park, Metro Tech. Sls. 201-768-8495
 NY Endicott, Tech Mark, Inc. 214-748-7473
 NY Jericho, Metro Tech. Sls. 516-935-3330
 Ohio Dayton, Rixan Assocs. 513-222-0011
 Tex Dallas, M. Kruvand Co. 214-827-8043

VERNITRON ELEC. COMPS., Beau Prods., 117 Union Ave., Laconia, N.H., 03246, Tel: 603-524-5101, TWX: 710-364-1843; Empl.: 100 p. 2-1062-1064

Products manufactured: Connector Adapters, Connector Blocks, Mother Board, Connector Boxes & Strips, Power Outlet, Connectors, Jumpers, Plugs, Strips, Terminal Blocks, Boards & Strips

Local Sales Offices & Reps.

Cal Santa Ana, RMS Assocs. 714-541-3295
 Cal Santa Clara, Nova-Tronix Elec. Sls. 408-243-9530
 Colo Denver, R.G. Bowen Co. 303-722-4641
 Fla Orlando, Cartwright & Bean, Inc. 305-422-4531
 Ga Atlanta, Cartwright & Bean, Inc. 404-237-2273
 Ill Oak Park, Wasson-Gallagher 312-383-6572
 Ind Indianapolis, Scott Elctns., Inc. 317-897-9976
 Mass Norwood, R. Perron & Co. 617-762-8114
 Mich Lathrup Village, R.C. Nordstrom Co. 313-444-4417
 Minn Minneapolis, Heimann Co. 612-861-6051
 Miss Jackson, Cartwright & Bean, Inc. 601-354-1368
 NH Dover, R. Perron & Co. 603-742-2321
 NJ Cherry Hill, ME & Assoc. 609-667-6110
 NJ Denville, Grimm, Siegel Assoc. 201-625-1900
 NM Albuquerque, C.T. Carlberg & Assoc. 505-265-1579
 NY Rochester, B.H. Tollefson Assoc. 716-271-4141
 NC Charlotte, Cartwright & Bean, Inc. 704-333-6457
 Ohio Cleveland, Scott Elctns., Inc. 216-291-2600
 Pa Pittsburgh, Scott Elctns., Inc. 412-781-3111
 Tenn Memphis, Cartwright & Bean, Inc. 901-276-4442
 Tex Dallas, W. Reese & Assoc. 214-638-6575
 Wash Seattle, R.K. Squibb Inc. 206-632-2450
 FOR: Can., Toronto, Ont., Brimark Elctns. Ltd. 416-461-3511

VERNITRON PIEZOELECTRIC DIV., 232 Forbes Rd., Bedford, Ohio, 44146, Tel: 216-232-8600, TWX: 810-427-2274; Empl.: 185; Minimum order: \$45
 p. 1-596-599

For info on price: M. A. Rickman; Customer service: R. Roch; Delivery info: R. Roch

Products manufactured: Ceramic Resonators, Filters

Local Sales Offices & Reps.

Ariz Phoenix, Gassner & Clark Co. 602-968-9037
 Cal Los Angeles, E. Mintz 213-645-2066
 Cal Palo Alto, Fetty/Schoenduve, Inc. 415-321-7041
 Conn Farmington, R. Perron & Co. 203-673-4825
 Conn Trumbull, R. Perron & Co. 203-268-9631
 Mass Norwood, R. Perron & Co. 617-762-8114
 NH Dover, R. Perron & Co. 603-742-2321
 NY New York, Metro-Long Island Corp. 212-799-9474
 Ohio Bedford, Vernitron Piezoelectric Div. 216-232-8600
 Tex Dallas, Oeler & Menelaides 214-234-6334
 Tex Houston, Oeler & Menelaides 713-772-0730
 Wash Seattle, R. Johnston Co. 206-524-5170

VERO ELECTRONICS, 171 Bridge Rd., Hauppauge, N.Y., 11787, Tel: 516-234-0400, TWX: 510-227-8890; Empl.: 25; Minimum order: \$10 p. 2-364-366
Customer service: R. Troise

Products manufactured: Boards, Plug-In, Boards, Printed Circuit, Boards, Printed Wiring, Universal, Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Chassis, Circuit Board Mounting, Chassis, Metal, Clamps & Clips, Connectors, Enclosures, Module, Plug-In, Frames, Cabinet & Rack, Guides, Circuit Board, Handles For Cabinets, Circuit Boards, Racks, etc., Holders, Circuit Board (Production Type), Integrated Circuit Packaging Systems, Integrated Circuit Devices, Kits, Breadboarding (For Engineers), Kits, Printed Circuit, Panels, Pins, Pullers, Racks, Services, Assembly, Production & Test, Sockets, Terminals

Local Sales Offices & Reps.

Ala Huntsville, Beacon Elctns. 205-881-5031
Cal Cupertino, T. Louis Snitzer Co. 408-257-8333
Cal Los Angeles, Dyna Sls. Co. 213-268-1175
Colo Denver, A-G Elctns. 303-722-5814
Conn Milford, Todino Engrg. 203-874-6643
Fla Clearwater, Reynolds & Assoc. 813-726-2373
Fla Ft. Lauderdale, Reynolds & Assoc. 305-581-6611
Fla Hollywood, Reynolds & Assoc. 305-987-6720
Fla Palm Beach, Reynolds & Assoc. 305-662-4336
Fla Satellite Beach, Reynolds & Assoc. 305-773-4700

Fla St. Petersburg, Reynolds & Assoc. 813-360-1484
Ga Atlanta, Beacon Elctns. 404-351-3654
Ill Chicago, Kennedy Engrg. 312-631-8283
Ind Ft. Wayne, McDonald Sls. 219-747-3650
Md Towson, Habco Elctns. 301-825-9637
Mass Needham Heights, Todino Engrg. 617-444-7925
Minn St. Paul, Cullen & Assocs. 612-646-7371
Neb Lincoln, Mktg. Assocs. 502-434-5244
NJ Ft. Lee, K.E. Hughes Co. 201-944-1600
Pa Jenkintown, Stein Instrumentation 215-885-2370
SC Spartanburg, Beacon Elctns. 803-582-4613
Tex Garland, G.V. Peck Co. 214-341-8311
Tex Houston, G.V. Peck Co. 713-664-1435
Wash Kirkland, Todd-Brian Inds. 206-827-5811

Local Distributors

Cal Los Angeles, Dyna Service, 1020 S. Atlantic 213-268-1175
Ill Chicago, Redel Labs, 6713 N. Oliphant 312-631-8283
Md Baltimore, Resco, 1026 Cromwell Bridge Rd. 301-823-0070
Mass Cambridge, Appolo Elect., 101 Binney St. 617-868-3120
NY Buffalo, Summit Dist., 916 Main St. 716-884-3450
NY Rochester, Summit Dist., 292 Commerce Dr. 716-334-8110
Tex Garland, Electrolot, 3529 Asset St. 214-341-8311
Wisc. Mequon, Taylor Elect., 1000 W. Donges Bay Rd. 414-241-4321

VIABLE SYSTEMS INC., Box 438, 299 Second Ave., Needham, Mass., 02192, Tel: 617-449-4570; Empl.: 15

Products manufactured: Amplifiers, Analyzers, Converters, Digitizers, Pencil Follower (Inc. Coordinate & Graphic), Generators, Paper-Tape Preparation Systems, Preset Selector-Mixers, Readers, Receivers, Servo Systems, Totalizers, Digital, Transmitters, Transponders

Local Sales Offices & Reps.

Ala Huntsville, Comprehensive Consultant Co. 205-837-6404
Ohio Dayton, P.J. Bockstedt & Assocs. 513-233-0849

VIBRA-METRICS, INC., 150 Bradley St., E. Haven, Conn., 06512, Tel: 203-467-6335; Empl.: 13

Products manufactured: Accelerometers, Amplifiers, Integrators, Electronic, Meters, Probes, Testers, Transducers, Vibrators

Local Sales Offices & Reps.

Ala Huntsville, IncoTech 205-837-6061
Ariz Phoenix, RAMCO
Cal Anaheim, Bartholomew Eng. Assoc. 213-775-8697
Colo Boulder, RAMCO 303-444-0782
Conn Hamden, Northeast Engrg. 203-248-4481
Fla Jupiter, Jupiter Eng. Co. 305-746-3984
Ill Des Plaines, Maher Engrg. 312-824-2121
Mass Danvers, Northeast Engrg. 617-774-3010
Mo St. Louis, Adelphi 314-821-1232
NM Albuquerque, RAMCO 505-292-2330

NY Fayetteville, Components for Industry

NY Manhassett, Northeast Engrg. 516-637-9601
Ohio Cleveland, Dietrich & Assoc. 216-781-1855
Ohio Dayton, Dietrich & Assocs. 513-223-6042
Pa King of Prussia, Latronix
Pa Pittsburgh, Dietrich & Assoc. 412-892-2992
Tex Arlington, Lane Engrg.
Tex Houston, RAMCO 713-461-5385
Tex Richardson, RAMCO 214-235-3043
Utah Centerville, RAMCO 801-292-6781
Va Norfolk, Scientific Devices-D.C. 703-499-8133
Va Springfield, Scientific Devices-D.C. 703-451-6500
Wash Bellevue, Topp Eng. Sls. 206-747-5400
FOR: Can., Rexdale, Ont., John G. Weiss Co. 416-766-0843

VIBRAC CORP., 11 Alpha Rd., Chelmsford, Mass., 01824, Tel: 617-256-0581; Empl.: 35

For info on price: Q. R. Searle; Application info: J. R. Hendershot, Jr.

Products manufactured: Brakes, Clutches, Controls/Control Eqpt., Converters, Motors, Tachometers, Testers, Transducers

VIBRATION INSTRS. CO., 1614 Orangethorpe Way, Anaheim, Cal., 92801, Tel: 714-879-6085; FSC No: 32102; Empl.: 15; Minimum order: \$50

Customer service: M.P. Marsh

Free literature available: Literature describes line of tracking filters, tracking analyzers, tracking ratio synthesizers, digital and analog phase meters, sweep generators, and charge amplifiers.

Products manufactured: Amplifiers, Analyzers, Comparators, Controls/Control Eqpt., Converters, Filters, Generators, Meters, Monitors, Multipliers, Signal Conditioners & Equipment

Local Sales Offices & Reps.

Ala Huntsville, Lee Assocs., Inc. 205-533-5896
Colo Boulder, Moore-Eiler Assoc. 303-665-3351
Conn Hamden, Equip. Sls. Co. 203-248-5581
Fla Winter Haven, Lee Assocs., Inc. 813-294-5815
Ga Chamblee, Lee Assocs., Inc. 404-457-7117
Ill Chicago, Berndt Assocs., Inc. 312-283-0713
La Baton Rouge, SESCO 504-272-3730
Md Rockville, Farrell Assocs. 301-424-9460
Mass Chelmsford, Equip. Sls. Co. 617-256-8547
Mich Detroit, S. Sterling Co. 313-255-1970
NM Albuquerque, Moore-Eiler Assoc. 505-292-3322
NY Liverpool, Raylco Elctns. 315-652-5272
NC Raleigh, Lee Assocs., Inc. 919-787-5818
Ohio Cleveland, S. Sterling Co. 216-442-8080
Pa Pittsburgh, S. Sterling Co. 412-922-5720
Tex Richardson, SESCO 214-231-9364

VLCHK PLASTICS CO., Middlefield, Ohio, 44062, Tel: 216-632-1631; Empl.: 125; Minimum order: \$35

Customer service: J. Rogers

Products manufactured: Services, Assembly, Production & Test

Local Sales Offices & Reps.

Ill Glen Ellyn, H. Hulseberg Co. 312-766-3200
NJ Edison, Affiliated Sls. Co. 201-572-0777

VICLAN, 1105 W. Morena Blvd., San Diego, Cal., 92738, Tel: 714-276-9470, TWX: 910-335-1264; Empl.: 80; Minimum order: \$25

For info on price: J. Waldal; Application info: B. Wiener; Customer service: M. L. Seaver; Delivery info: L. Bates

Products manufactured: Capacitors, Fixed, Filters, Resistors

Local Sales Offices & Reps.

Ariz Scottsdale, E.J. Foley & Assoc. 602-945-2665
Cal Newport Beach, Mission Mktg. Group 714-833-1802
Cal Palo Alto, Brooks Tech. Group 415-328-3232
Conn Washington Depot, Kanan Assoc. 203-868-0513
Fla Clearwater, Lynch Gentry Assoc. 813-443-2697
Ill Glenview, Crimson Engrg. Co. 312-724-1780
Ind Indianapolis, R.H. Newsom Assoc. 317-849-4442
Md Baltimore, Compar Chesapeake 301-484-5400
Mass Reading, Kanan Assoc. 617-944-8484
NJ Clifton, Compar New York 201-546-3660
NJ Haddonfield, Sunday O'Brien 609-429-4013
NY Camillus, Howard C. Murray & Assoc. 315-487-0634
NC Winston-Salem, Murcotta Corp. 919-723-1002
Tex Dallas, Merino Sls. Co. 214-239-9719
Wash Bellevue, SD-R2 206-747-9424
EXP: Jamaica, Materials for Elctns. 212-322-9400



VICON INDUSTRIES INC., 130 Central Ave., Farmingdale, N.Y., 11735, Tel: 516-293-2200; Empl.: 115

Customer service: Sls. Dept.

Free literature available: Flyers; Catalogs; Short Form Catalogs; Data Sheets

Products manufactured: Television Systems & Equipment Closed-Circuit

Local Sales Offices & Reps.

Cal N. Hollywood, Mike Stobin Co. 213-983-1555
Cal Redwood City, Sinai-Johnson 415-365-6263
Colo Denver, Ron Bowen & Assocs. 303-744-2501
Ga Atlanta, J.E. Joyner & Assocs. 404-691-1776
Ill Oak Park, Denco Sls. Co. 312-848-4244
Ind Ft. Wayne, Norm Hoemig Sls. Co. 219-747-0826
Md Baltimore, Commercial Video Reps 301-235-9120
Mass Needham, Piper Assocs. 617-449-1144
Mich Detroit, Burcaw Co. & Assocs. 313-533-7700
Minn St. Paul, Skor 612-645-6461
Mo Ellisville, J. L. Grunder Co. 314-227-7585
Nm Albuquerque, C.T. Carlberg & Assocs. 505-265-1579
NY Binghamton, Rayben Sls. Co. 607-724-1734
NY Freeport, Vaughan Sls. 516-546-4141
Ohio Columbus, Weller Elctn. Sls. 614-885-7819
Ore Portland, Earl & Brown Co. 503-245-2283
Tex Dallas, Techno Assocs. 214-357-9213

Advertisement

VICON offers a complete line of CCTV accessories including pan and tilt drives, scanners, lenses, switches, video signal equipment, enclosures, mounting and consoles.

VICTOR COMPTOMETER CORP., 3900 N. Rockwell St., Chicago, Ill., 60618, Tel: 312-539-8200; Empl.: 7,500

Free literature available: Victor 5010 Data Terminal describes compact, low-cost stand alone printer. Series 3600 gives benefits of statistical electronic printing calculator.

Products manufactured: Calculators, Electrical & Electronic, Comm. Systems, Printers, Underwater Communication, Detection, Navigation, etc. Equipment

Local Sales Offices & Reps.

Ala Birmingham 205-252-2176
Ala Mobile 205-476-2245
Ariz Phoenix 602-267-7533
Ark Little Rock 501-376-0505
Cal City of Industry 213-965-4961
Cal Long Beach 213-426-8892
Cal Los Angeles 213-385-0261
Cal Oakland 415-562-9741
Cal Sacramento 916-441-3156
Cal San Diego 714-283-7001
Cal San Francisco 415-583-6250
Cal Santa Clara 408-244-1100
Cal Van Nuys 213-787-2530
Colo Denver 303-266-3291
Conn Hartford 203-265-6741
Del Wilmington 302-764-7070
Fla Hallandale 305-925-3356
Fla Jacksonville 904-396-7751
Fla Orlando 305-841-9251
Ga Atlanta 404-874-3846
Haw Honolulu 808-847-0831
Ill Bensenville 312-595-1310
Ill Chicago 312-527-0800
Ind Indianapolis 317-635-1336
Ind South Bend 219-287-2348
Kans Wichita 316-942-1403
Ky Louisville 502-458-5381
La Baton Rouge 504-927-4180
La Metairie 504-831-2601
Md Towson (Baltimore) 301-821-6710
Mass Boylston 617-869-2126
Mass Waltham (Boston) 617-880-2180
Mich Burton 313-743-7130
Mich Kentwood 616-698-6910
Mich Southfield (Detroit) 313-355-5330
Minn Mendota Heights 612-454-8800
Mo Kansas City 816-842-7966
Mo St. Louis 314-535-9900
Neb Omaha 402-393-8228
NJ Union (Newark) 201-687-4700

NM	Albuquerque	505-345-4545
NY	Albany	518-434-8197
NY	Baldwin	516-868-3230
NY	Buffalo	716-838-5100
NY	Elmsford	914-592-5941
NY	New York	212-752-7330
NY	Rochester	716-288-0860
NY	Syracuse	315-437-1344
NC	Charlotte	704-375-7708
NC	Raleigh	919-851-1566
Ohio	Akron	216-644-8861
Ohio	Cincinnati	513-984-1060
Ohio	Cleveland	216-621-7120
Ohio	Columbus	614-263-8806
Ohio	Dayton	513-298-5277
Ohio	Toledo	419-475-4659
Ore	Portland	503-646-0535
Pa	Mechanicsburg (Harrisburg)	717-761-3121
Pa	Philadelphia	215-533-9200
Pa	Pittsburgh	412-343-4033
RI	Cranston (Providence)	401-944-8300
Tenn	Memphis	901-324-5551
Tenn	Nashville	615-383-9151
Tex	Dallas	214-631-5430
Tex	Fort Worth	817-924-3284
Tex	Houston	713-782-8964
Tex	San Antonio	512-227-6321
Utah	Salt Lake City	801-328-9787
Va	Arlington	703-527-1060
Va	Falls Church	703-573-0550
Va	Norfolk	804-583-4511
Va	Richmond	703-359-4091
Wash	Bellevue	206-624-7980
Wash	Spokane	509-327-9541
WVa	Charleston	304-343-0193
Wisc	Brookfield (Milwaukee)	414-781-8260

VICTOR WIRE & CABLE CORP., 3601 Holdrege Ave.,
Los Angeles, Cal., 90016, Tel: 213-870-9933; Empl.: 30
p. 2-2066,2067

Customer service: J. Vore
Products manufactured: Cable Assemblies &
Harnesses, Cable, Wire, Wire Shielding

VICTOREEN INSTRUMENT DIV., 10101 Woodland
Ave., Cleveland, Ohio, 44104, Tel: 800-321-9990, TWX:
810-421-8287; Empl.: 300; Minimum order: \$25
p. 1-2358,2359; p. 2-1065,1572-1581,2358,2359

For info on price: G. Winfield; Application info: J.
Baker; Customer service: R. White; Delivery info: W.
Becerra

Free literature available: Comprehensive short form
catalog of high voltage, high resistance, high
power electronic components.

Products manufactured: Arresters, Electrical Surge,
Lightning, Detectors, Diodes, Resistors, Seals,
Spark Gaps, Suppressors, Terminals, Tubes

Local Sales Offices & Reps.	
Cal	Fullerton, Victoreen Instr. Div. 714-870-1524
Ill	Mt. Prospect, Contemporary Science, Inc. 312-255-3793
Ill	Westchester, W. G. Brouillette & Assoc. 312-345-6500
Mass	Canton, Victoreen Instr. Div. 617-227-6724
NJ	Mercerville, Victoreen Instr. Div. 212-744-7646
Ohio	Cleveland, Victoreen Instr. Div. 216-795-8200
Tenn	Chattanooga, Victoreen Instr. Div. 404-577-2736
Tex	Richmond, Victoreen Instr. Div. 713-342-3018
Va	Newport News, Victoreen Instr. Div. 703-548-8446

VICTORY ENGRG. CORP., Victory Rd., Springfield, N.J.,
07081, Tel: 201-379-5900, TWX: 710-983-4430; Empl.:
300; Minimum order: \$25
For info on price: J. Bacek; Application info: B.
Jacobs; Customer service: G. Theile; Delivery info: J.
Bacek

Products manufactured: Bolometers, Bridges,
Controls/Control Eqpt., Detectors, Kits,
Breadboarding (For Engineers), Monitors, Probes,
Resistors, Thermistors

Local Sales Offices & Reps.	
Ala	Huntsville 205-881-9270
Ariz	Phoenix 602-279-1221
Cal	Los Angeles 213-651-4050
Cal	Palo Alto 415-321-7041
Colo	Denver 303-222-5645
Conn	Hamden 203-281-1331
Fla	Clearwater 813-531-5513
Fla	Miami 305-624-5832
Fla	Orlando 305-275-1132
Ga	Atlanta 404-876-1591
Ill	Chicago 312-286-1500
Ind	Fort Wayne 219-743-1586
Ind	Indianapolis 317-635-8951

Md	Towson	301-825-9637
Mass	Waltham	617-893-2850
Mich	Farmington	313-474-8300
Minn	Minneapolis	612-881-6683
NJ	Bergenfield	201-384-3643
NY	Rochester	716-586-0468
NY	Cincinnati	513-791-2513
Ohio	Cleveland	216-291-2600
Ohio	Columbus	614-236-8619
Ohio	Dayton	513-223-2652
Pa	King of Prussia	215-265-0634
Pa	Pittsburgh	412-781-3112
Tex	Dallas	214-363-1671
Tex	Houston	713-621-3760
Wash	Seattle	206-783-3423
EXP	New York, N.Y.	212-679-1300
FOR	Can., Montreal	514-336-4500

VIDAIRE ELECTRONICS MFG., 150 Buffalo Ave.,
Freeport, N.Y., 11520, Tel: 516-623-6696; Empl.: 20;
Minimum order: \$25

For info on price: M. Shapiro; Application info: G.
Miller; Customer service: B. Knight; Delivery info: B.
Knight

Free literature available: #C-26 Catalog All
Electronic Products CN-71 Catalog Phono
Cartridges and Needles

Products manufactured: Antennas, Cable, Comm.
Systems, Converters, Couplers, Filters, Handsets,
Chestsets, Headphones, Headsets, Etc., Meters,
Microphones, All Kinds, Mixers, Phonographs,
Parts & Accessories, Power Supplies, Rectifiers,
Speaker Systems, Speakers, Tapcs, Electrical
Insulation, Testers

Local Sales Offices & Reps.	
Ala	Birmingham, J. F. Russell Sls. Co. 205-871-8287
Cal	Burbank, Michael Ross Assoc. 213-842-2104
Cal	Burlingame, Carelli-Ema 415-697-6286
Cal	Van Nuys, Art Szerlip Sls Co. 213-782-1765
DC	Washington, Lenau SAssoc. 301-229-7333
Fla	Port Charlotte, W. F. Hemminger Co. 813-625-6050

Ga	Atlanta, H. W. Phillips Co. 404-237-7564
Ill	Wilmette, J. Wasserman Assoc. 312-256-3566
Ind	Indianapolis, P. Stone Sls. Co. 317-257-9777
La	New Orleans, Crockett Sls. Co. 301-262-1709
Md	Mitchellville, Lienau Assoc. 301-770-6800
Md	Rockville, Lenau Assoc. 301-770-6800
Mass	Northboro, W.B. Pray Sls. 617-393-3434
Mich	Bloomfield, S. F. McMechan 313-852-4308
Minn	St. Paul, Carl-M Co. 612-699-8004
Mo	Raytown, M. Taraski 816-358-1442
NY	W. Seneca, D. Evans 716-675-7288
NC	Charlotte, H. W. Phillips Co. 704-394-5544
Ohio	St. Mary's, REPP Co. 419-392-4724
Ore	Portland, J. V. Belusko Co. 503-222-4279
Pa	Bethlehem, Les Benner 215-865-3014
Pa	Broomall, Lienau Assoc. 215-356-4210
Pa	Pittsburgh, Tanner Co. 412-561-4687
Tenn	Memphis, Crockett Sls. Co. 901-388-5410
Tex	Dallas, Crockett Sls. Co. 214-748-8209
Va	Charlottesville, Lienau Assoc. 703-295-5234
Va	Great Falls, Lienau Assoc. 703-759-3128
Va	Winchester, Lienau Assoc. 703-662-6467
EXP	New York, NY, Singer Prods. Co. 212-432-1400

VIDAR AUTODATA INC., 265 N. Whisman Rd., Mt. View,
Cal., 94043, Tel: 415-965-3050; Empl.: 125

For info on price: W. Klees; Application info: M.
Jacobs; Customer service: C. Chandler; Delivery info:
W. Klees

Free literature available: Autodata Eight Brochure -
Fully describes the design and application of the
Autodata Eight microprocessor - based
monitor/alarm/control system. Ordering and
option information is fully detailed.

Products manufactured: Converters, Data
Acquisition & Reduction Systems, Data Loggers,
Meters, Monitors, Signal Conditioners &
Equipment

Local Sales Offices & Reps.	
Colo	Lakewood, Figaro-Klebba Assoc. 303-466-8228
Conn	Glastonbury, Instr. Reps. 203-633-0777
Ga	Atlanta, Vidar Corp. District Off. 404-457-2497
Ill	Chicago, Pivan Engrg. 312-539-4838
Ind	Indianapolis, Pivan Engrg. 317-253-1681
Kans	Mission, Pivan Engrg. 913-722-1030
Mass	Lexington, Instr. Reps. 617-861-8620
Mich	Detroit, WKM Assocs. 313-892-2500
Minn	Minneapolis, Pivan Engrg. 612-537-4501
Mo	St. Louis, Pivan Engrg. 314-567-3636
NJ	Haddonfield, Dyna Rep. 609-795-1700
NM	Albuquerque, Tremblay Assoc. 505-293-4444
NY	East Syracuse, Ossman Instrs. 315-437-6666
Ohio	Cleveland, WKM Assocs. 216-267-0445
Ohio	Dayton, WKM Assocs. 513-434-7500

Pa	Pittsburgh, WKM Assocs. 412-892-2953
Tex	Austin, Crockett Southwest Co. 512-451-8269
Tex	Dallas, Crockett Southwest Co. 214-251-1776
Va	Alexandria, Dyna Rep. Co. 703-354-1222
Wash	Seattle, R.S. Drake 206-763-2755
Wisc	Brookfield, Pivan Engrg. 414-786-1940
FOR	Can., Calgary, Alberta, Allan Crawford Assoc. 403-261-0780
FOR	Can., Longueuil, Que., Allan Crawford Assoc. 514-670-1212
FOR	Can., Mississauga, Ont., Allan Crawford Assoc. 416-678-1500
FOR	Can., Ottawa 3, Ont., Allan Crawford Assoc. 613-725-3354

VIDCO, INC., 8888 S.W. Canyon Rd., Portland, Ore.,
97225, Tel: 503-292-4104; Empl.: 4

Customer service: C. B. Gibson, Jr.

Products manufactured: Converters

Local Sales Offices & Reps.	
Ala	Huntsville, Lee Assocs. 205-533-5896
Ariz	Phoenix, R. A. Mayes Co. 602-279-5243
Cal	Costa Mesa, Marble Assocs. 714-540-6391
Cal	Mountain View, Gado Instrument Sls. 415-961-2222
Cal	San Diego, Mesa Engrg. & Sls. 714-278-8021
Colo	Boulder, R. A. Mayes Co. 303-444-0782
Fla	Winter Haven, Lee Assocs. 813-294-5815
Ga	Chamblee, Lee Assocs. 404-457-7117
Ind	Indianapolis, R. A. Mayes Co. 317-243-6681
Md	Rockville, Mesa 415-961-2222
Mass	Needham, Addelco Corp. 617-444-4754
Mich	Detroit, Electro Sls. Assocs. 313-526-8800
Minn	St. Louis Park, R. A. Mayes Co. 612-920-7080
NJ	Cinnaminson, Mesa 609-786-0284
NM	Albuquerque, R. A. Mayes Co. 505-292-2330
NY	DeWitt, DB Assocs. 315-446-0220
NY	Huntington Station, E. P. Nelson
NC	Raleigh, Lee Assocs. 919-782-7541
Ohio	Cleveland, Electro Sls. Assocs. 216-261-5440
Ohio	Dayton, Electro Sls. Assocs. 513-426-5551
Pa	Pittsburgh, Electro Sls. Assocs. 412-371-9449
Tex	Houston, R. A. Mayes Co. 713-461-5385
Tex	Richardson, R. A. Mayes Co. 214-235-3043
Utah	Centerville, R. A. Mayes Co. 801-292-6781
Wash	Seattle, Underwood Assocs. 206-242-7200

VIDEO RESEARCH CORPORATION, 6985 Garden Rd.,
Riviera Beach, Fla., 33404, Tel: 305-842-2867; Empl.:
85; Minimum order: \$50

Customer service: V.A. Ratner

Products manufactured: Comm. Systems, Data
Acquisition & Reduction Systems, Decoders,
Demodulators, Editing Equipment, Tape,
Generators, Heads, Recording Playback, Erase,
Meters, Monitors, Recorders, Tape Recording
Accessories, Tape Search Equipment

VIGOR CO., Div. of Jadov, B. & Sons, Inc., 53 W. 23 St.,
New York, N.Y., 10010, Tel: 212-741-9500; Empl.: 95;
Minimum order: \$10

For info on price: J. Leibsohn 212-741-9545;
Application info: H. C. Jadov 212-741-9509; Customer
service: J. Leibsohn 212-741-9545; Delivery info: J.
Leibsohn 212-741-9545

Free literature available: Aron Alpha adhesive -
cyanoacrylate adhesive; Instant Locksall - Locking
Compound; Instant Wood Bonder - Bonds wood,
leather and porous material; Arontite - Sealant;
Tweezers; Pliers.

Products manufactured: Adhesives (All Types),
Cleaners, Ultrasonic, Drills & Accessories, Hand &
Power, Pliers, Scissors, Screwdrivers, Tools,
Tweezers, Hand & Vacuum, Wrenches

Local Sales Offices & Reps.	
Cal	Costa Mesa 213-645-4033
Ga	College Pk. 404-763-3369
Ill	Chicago 312-282-4366
NY	NY 212-741-9500

VIKING INDS., INC., 9324 Topanga Cyn Blvd.,
Chatsworth, Cal., 91311, Tel: 213-882-6275, TWX:
910-494-2094; Empl.: 650

For info on price: T. Meehan 213-341-4330; Customer
service: B. Mendell; Delivery info: J. Prideaus

Free literature available: "The Pushover" and Vitel "F", Low cost termination tool and standard format 50 contact solderless connector. "Thorkom"-Low cost miniature circular connector series, "Viking - Printed Circuit and Packaging devices for commercial & military applications.", "Viking - Underwater Connectors", "Vitel - Miniature Ribbon Connectors" - most intensively tested connector for telephone industry., "Vipower" - Heavy Duty electrical connectors for commercial, industrial & military application., "Viking - Relay Sockets" and "Relay and Socket Selector", "Systems Installation Hardware" - Terminal covers, vibration isolators, line supports, brackets, "Flip Loc".

Products manufactured: Clamps & Clips, Connectors, Seals, Services, Assembly, Production & Test, Testers

Local Sales Offices & Reps.

Ala Huntsville, REP 205-881-9270
 Ariz Phoenix, Zeus 602-258-7519
 Cal Anaheim, Lo Dan 213-924-1691
 Cal San Carlos, Lo Dan 415-592-4600
 Cal San Diego, Lo Dan 714-279-6383
 Colo Denver, Zeus 303-770-4400
 Conn No. Haven, Forsberg Sls 203-239-5111
 Fla Pompano Beach, V.G. Sales 305-941-5544
 Fla Winter Park, V.G. Sales 305-831-8688
 Ga Tucker, Rep, Inc. 404-938-4358
 Ill Westchester, Wasson-Gallagher Co. 312-261-7517

Ind Indianapolis, Advanced Comp. Sls. 317-545-6441
 Md Rockville, Mechtronic Sls. 301-340-2130
 Mass Brockton, Forsberg Sls. 617-522-6300
 Mass Wakefield, Viking Inds. 617-245-4110
 Mich Grand Rapids, J. L. Montgomery & Assocs. 616-774-9308
 Mich Southfield, J. L. Montgomery & Assocs. 313-358-2616

Minn Minneapolis, ECR, Inc. 612-831-4548
 Mo Blue Springs, Chesco 816-229-1404
 Mo St. Charles, Chesco 314-946-6677
 NJ Keasbey, ADDEM 2 516-567-5900
 NM Albuquerque, ZEUS, Inc. 505-256-9831
 NY Long Island, ADDEM 1 516-567-5900
 NY Rochester, Electra Sls. 716-436-4030
 NY Syracuse, Electra Sls. Corp. 315-455-5783
 NC Smithfield, Byrd & Barbour Sls. 919-934-8136
 Ohio Cincinnati, R. Makin Assocs. 513-232-5588
 Ore Beaverton, N. R. Schultz Co. 503-643-1644
 Tex Dallas, J. B. Guenthere 214-691-8500
 Tex Houston, J. B. Guenthere 713-468-0232
 Utah Salt Lake City, Zeus 801-486-2317
 Wash Bellevue, N. R. Schultz Co. 206-454-0300

VIKING WIRE CO., INC., Shelter Rock Rd., Box 104, Danbury, Conn., 06810, Tel: 203-744-4600, TWX: 710-456-1217; FSC No: 51777; Empl: 175; Minimum order: \$100

For info on price: R.E. Murray Ext. 28; Application info: W.W. Key Ext. 12; Customer service: R.E. Murray Ext. 28; Delivery info: T. Nassif Ext. 23

Free literature available: Price list of product description Magnet wire data chart.

Products manufactured: Wire

Local Sales Offices & Reps.

Cal Chatsworth, Magnet Wire Sls. Co. 213-882-7620

Advertisement

Viking Wire manufactures round film insulated copper magnet wire, 23 thru 56 ga. A.W.G. - All popular insulations including - Enamel, Polyurethane, Pyre M.L., Formvar Bondables, Isonel (Polyester) with special films made to your order. Order to NEMA, MIL, or your specification.

VIRGINIA PANEL CORP., Box 1106, 1400 New Hope Rd., Waynesboro, Va., 22980, Tel: 703-942-8376, TWX: 710-839-0406; Empl: 60 p. 2-1067

Products manufactured: Boards, Plug-In, Boards, Programming, Connectors, Cords, Jacks (All Types), Jumpers, Matrices, Computer, Panels, Services, Assembly, Production & Test, Tools

Local Sales Offices & Reps.

Cal West Lake Village, J. E. Taylor Jr. 213-889-0748
 Ind Indianapolis, A.A. Billian Co. 317-253-3134
 Ky Louisville, W. G. Hudgens 502-896-6611
 Md Silver Spring, M.L. Council 301-587-1755

NJ Ridgewood, Hansen Assocs. 201-652-7055
 NY Huntington, L.I. Hansen Assocs. 516-692-4688
 Tex Mesquite, Spectra Sls. 214-234-3600
 Va Norfolk, M.L. Council Assoc. 703-583-0522
 Va Richmond, M.L. Council Assoc. 703-282-6533

VISIDYNE INC., 19 Third Ave., Northwest Industrial Park, Burlington, Ma., 01803, Tel: 617-273-2820; Empl: 32

For info on price: D. H. Ainslie; Application info: D. H. Ainslie; Customer service: J. Eichel; Delivery info: J. Eichel

Products manufactured: Readers

Local Sales Offices & Reps.

Ala Huntsville, Clark Assocs. 205-536-6366
 Cal Santa Clara, Applied Microfilm 408-249-1364
 Ill Evanston, Microsystems Inc. 312-864-1454
 Mass Boston, C.O.M. Svc. Bureau 617-357-5715
 Mass Burlington, Visidyne 617-273-2820
 Mass Cambridge, Applied Microfilm 617-491-0830
 Minn Minneapolis, Northwest Micromation Sys. 612-332-5742
 Neb Omaha, Standard Blueprint Co. 402-341-7890
 NJ Paramus, Datamation Sys. 201-343-2411
 NJ Turnersville, Microfilm Analysts Co. 609-227-3366

Ohio Mansfield, D. Barr 419-884-2031
 Va Norfolk, Micro Labs 703-627-8906

VISHAY RESISTIVE SYSTEMS GRP., Vishay Intertechnology Inc., 63 Lincoln Hwy., Malvern, Pa., 19355, Tel: 215-644-1300, TWX: 510-668-8944; Empl: 500; Minimum order: \$50 p. 2-1571,1687

For info on price: I. Yeager; Application info: R. Grasso; Customer service: I. Yeager; Delivery info: I. Yeager

Free literature available: Designer catalogs and detailed application bulletins along with an "In-Plant Station" bulletin that outlines how to build precision resistors in the users facility.

Products manufactured: Attenuators, Bridges, Decade Boxes, Dividers, Networks, Potentiometers, Resistors, Standards

Local Sales Offices & Reps.

Ala Huntsville, F.M. Assoc. Ltd. 205-536-9990
 Ariz Scottsdale, Runyon Co., Inc. 602-959-6060
 Cal Pico Rivera, Westrep 213-949-2551
 Cal San Diego, Westrep 714-276-0751
 Cal Santa Clara, Westrep 408-984-0350
 Colo Englewood, Checkmate Sls. 303-771-4920
 Conn North Haven, Comp Rep Assoc. 203-239-9762
 Fla Boca Raton, Conley Assocs. Inc. 305-395-6108
 Fla Orlando, FM Assocs. 305-851-5710
 Fla Oviedo, Conley Assocs. Inc. 305-365-3283
 Fla Tampa, Conley Assocs. Inc. 813-933-3183
 Ill Rolling Meadows, Lightner Assocs. 312-398-3000

Kans Shawnee Mission, Techn. Sls. 913-888-3330
 Md Lutherville, J.A. Dougherty Sls. 301-321-7890
 Mass Needham, Comp Rep 617-444-2484
 Mich Jackson, N. Scroggs 517-750-1170
 Mich Oak Park, W. Spenser Co. 313-398-8005
 Minn Mpls., Comstrand, Inc. 612-560-5300
 Mo Ferguson, Technical Sls. Assoc. 314-725-5361
 NJ Flanders, K & R Engrg. Sls. Co. 201-584-5235
 NM Albuquerque, Data Handling 505-268-4364
 NY E. Aurora, Harries & Kershaw 716-652-1221
 NY Fayetteville, Harries & Kershaw 315-637-9871
 NY Webster, Harries & Kershaw 716-671-6365
 NC Greensboro, F. M. Assocs. 919-294-2754
 Ohio Cleveland, A. H. Baier 216-461-6161
 Ohio Dayton, A. H. Baier Co. & Assoc. 513-276-4128
 Pa Westchester, D. Curley Assocs. 215-647-4500
 Tex Seabrook, Stolle-Hamilton 713-223-5127
 Wash Seattle, F. Jackson 206-782-2211

For info on price: I. Yeager; Application info: R. Grasso; Customer service: I. Yeager; Delivery info: I. Yeager

Free literature available: 4 page fold-out bulletin describing electrical, mechanical, and application features.

Products manufactured: Potentiometers

Local Sales Offices & Reps.

Ala Huntsville, F.M. Assocs. 205-536-9990
 Ariz Scottsdale, Runyon Co. 602-959-6060
 Cal Pico Rivera, Westrep 213-949-2551
 Cal San Diego, Westrep 714-276-0751
 Cal Santa Clara, Westrep 408-984-0350
 Colo Englewood, Checkmate Sales 303-771-4920
 Conn N. Haven, Comp. Rep. Assoc. 203-239-9762
 Fla Boca Raton, Conley Assocs. 305-395-6108

For info on price: I. Yeager; Application info: R. Grasso; Customer service: I. Yeager; Delivery info: I. Yeager

Free literature available: 4 page fold-out bulletin describing electrical, mechanical, and application features.

Products manufactured: Potentiometers

Local Sales Offices & Reps.

Ala Huntsville, F.M. Assocs. 205-536-9990
 Ariz Scottsdale, Runyon Co. 602-959-6060
 Cal Pico Rivera, Westrep 213-949-2551
 Cal San Diego, Westrep 714-276-0751
 Cal Santa Clara, Westrep 408-984-0350
 Colo Englewood, Checkmate Sales 303-771-4920
 Conn N. Haven, Comp. Rep. Assoc. 203-239-9762
 Fla Boca Raton, Conley Assocs. 305-395-6108

Fla Orlando, F.M. Assocs. 305-851-5710
 Fla Oviedo, Conley Assocs. 305-365-3283
 Fla Tampa, Conley Assocs. 813-933-3183
 Ill Rolling Meadows, Lightner Assocs. 312-398-3000

Kans Shawnee Mission, Technical Sales 913-888-3330

Md Lutherville, J. A. Dougherty Sls. Co. 301-321-7890

Mass Needham, Comp. Rep. Assoc. 617-444-2484
 Mich Jackson, Norwood Scroggs Co. 517-750-1170
 Mich Oak Park, Willard Spenser Co. 313-398-8005
 Minn Minneapolis, Comstrand, Inc. 612-560-5300
 Mo Ferguson, Technical Sales Assocs. 314-725-5361

NJ Flanders, K & R Engrg. Sls. Co. 201-584-5235
 NM Albuquerque, Data Handling Co. 505-268-4364
 NY East Aurora, Harries & Kershaw 716-652-1221
 NY Fayetteville, Harries & Kershaw 315-637-9871
 NY Webster, Harries & Kershaw 716-671-6365
 NC Greensboro, F. M. Assocs. 919-294-2754
 Ohio Cleveland, A. H. Baier Co. & Assoc. 216-461-6161

Ohio Dayton, A. H. Baier Co. & Assoc. 513-276-4128
 Pa West Chester, Dick Curley Assocs. 215-692-4470

Tex Seabrook, Stolle-Hamilton Co. 713-334-1909
 Wash Seattle, F. Jackson Co. 206-782-2211

Vii®

VISUAL INFORMATION INSTITUTE INC., Box 33, Xenia, Ohio, 45385, Tel: 513-372-8637; FSC No: 27432; Empl: 9

For info on price: J.H. Harshbarger 513-372-8637; Application info: J.H. Harshbarger 513-372-8637; Customer service: P.R. Lewis 513-372-8635; Delivery info: P.R. Lewis 513-372-8635

Products manufactured: Television Systems & Equipment Closed-Circuit, Test Equipment

Local Sales Offices & Reps.

Cal Millbrae, Ashby Assocs. of N. Cal. 415-692-4442
 Cal Pasadena, A-F Sales Engrg. 213-681-5631

Advertisement

Specializing in test instrumentation for all television scan rates, interlace ratios, and formats including RGB, sequential, and encoded color as well as high resolution monochrome. Standard products offered for both display evaluation and signal transmission testing. Customer requirements for modified or special instruments met economically and with short delivery cycles.

V.J. ELECTRONICS, Div. Glenair Inc., 1211 Air Way, Glendale, Cal, 91201, Tel: 213-247-6000, TWX: 910-497-2066; FSC No: 06324; Empl: 325

Customer service: R. Platz

Products manufactured: Testers

Local Sales Offices & Reps.

Ala Huntsville, Brandel-Stephens Co. 205-883-0445
 Ariz Scottsdale, Runyon Co. 602-959-6060
 Cal Downey, Buffa Co. 213-923-4618
 Cal Glendale, Electro-Mech Prods. 213-848-0922
 Cal San Diego, Earle Assocs. 714-278-5441
 Cal Santa Clara, Nova-Tronix Elec. Sls. 408-243-9530

Colo Englewood, Todd Assocs. 303-761-7801
 Conn Branford, W. McCoy Co. 203-488-2012
 Fla Orlando, Brandel-Stephens Co. 305-425-3202
 Ga Atlanta, Brandel-Stephens Co. 404-261-7579
 Haw Honolulu, Aloha Assocs. 808-941-1574
 Ill Chicago, Marsten Sls. Co. 312-775-6611
 Ind Greenwood, Valentine-Schillinger Assoc. 317-888-2260

Ind South Bend, Valentine-Schillinger Assoc. 219-291-6258

Md Silver Spring, Carwithen Assocs. 301-589-9112
 Mich Plymouth, Romarc 313-455-0300
 Minn Minneapolis, Nygaard Sls. 612-881-3727
 Mo Kansas City, Harris-Hanson Co. 816-444-9494
 Mo St. Louis, Harris-Hanson Co. 314-432-3611
 NJ Haddonfield, T. Mills Co. 609-429-1005
 NJ Wayne, GT Assocs. 201-694-6040
 NM Scottsdale, Goodreau Assocs. 602-994-9909

NY Buffalo, Telesco Assocs. 716-834-1026
 NY Levittown, GT Assocs. 516-731-3449
 NY Liverpool, Telesco Assocs. 716-872-6417
 NY Rochester, Telesco Assocs. 716-271-3780
 Ohio Cleveland, D. Steffen & Assocs. 216-461-8333
 Ohio Dayton, A.D. Dircksem & Assoc. 513-256-0351
 Tex Houston, AID Elctns. 713-777-3882
 Tex Irving, AID Elctns. 214-259-4761
 Wash Redmond, Barrett Sls. Northwest Ltd. 206-885-6991

VOICE IDENTIFICATION INC., Box 714, Somerville, N.J., 08876, Tel: 201-526-3408; Empl.: 6

Customer service: W. E. Hughes

Free literature available: Illustrated brochures and specification sheets describing sound spectrograph and telephone number decoder/register.

Products manufactured: Analyzers, Decoders, Tape Search Equipment, Testers

VOLTEK INC., 407 N. Maple Dr., Beverly Hills, Cal., 90210, Tel: 213-272-7991; Empl.: 8; Minimum order: \$25

Products manufactured: Cable, Connectors, Converters, Power Supplies, Transformers

Local Sales Offices & Reps.

Ariz Phoenix, C.W. Fowler Co. 602-274-5537
 Cal Chula Vista, C.W. Fowler Co. 714-422-5408
 Cal Inglewood, C.W. Fowler Co. 213-678-5211
 Cal Menlo Park, C.W. Fowler Co. 415-322-5374
 Colo Denver, C.W. Fowler Co. 303-744-9595
 Ind Ft. Wayne, Scott Elctns. 219-743-1586
 Ind Indianapolis, Scott Elctns. 317-897-9976
 Ky Louisville, Scott Elctns. 502-583-3220
 Mass Burlington, Lancer Assocs. 617-272-6445
 Mich Plymouth, Scott Elctns. 313-455-2440
 Minn Minneapolis, A.J. Warner Co. 612-729-7371
 NM Albuquerque, C.W. Fowler Co. 505-299-7676
 Ohio Cincinnati, Scott Elctns. 513-791-2513
 Ohio Cleveland, Scott Elctns. 216-291-2600
 Ohio Columbus, Scott Elctns. 614-236-8610
 Ohio Dayton, Scott Elctns. 513-294-0539
 Okla Tulsa, T.J. Ray Co. 918-627-1515
 Pa Camp Hill, Beil & Whitaker 717-233-1254
 Pa Harrisburg, Beil & Whitaker 717-652-1084
 Pa Orefield, Beil & Whitaker 215-395-0150
 Pa Pittsburgh, Scott Elctns. 412-781-3112
 Pa Reading, Beil & Whitaker 215-779-2610
 Va Alexandria, Potomac Elctns. 703-836-1630
 Wash Bellevue, C.W. Fowler Co. 206-454-8600

VOLTEX CO., INC., 115 Marine St., Farmingdale, N.Y., 11735, Tel: 516-CH 9-2336; FSC No: 3611; Empl.: 25; Minimum order: \$25

For info on price: N. Rothenberg; Application info: N. Rothenberg; Customer service: S. Vogel; Delivery info: S. Vogel

Products manufactured: Controls/Control Eqpt., Current Sources, Drivers, Solenoid, Filters, Meters, Monitors, Oscilloscopes, Power Supplies

Local Distributors

Cal Costa Mesa, Cen-Tec Sls., 1857 Parkgren Circle 714-645-9157
 Mass Reading, Champagne Assocs., 2 Linden St. 617-944-3011
 Minn New Brighton, Dalska Sls., Box 12751 612-631-2941

Advertisement

Voltex manufactures and designs a complete line of standard and custom power supplies and systems. Inexpensive, reliable, OEM power system requirements are our forte. AC to DC power supplies, DC-DC converters, DC-AC invertors, switching regulators and power supplies, SCR regulator and pre-regulated power supplies, high power three phase input power supplies, and multi-output regulated systems are available or can be designed to meet YOUR requirements. Send us your requirements for a prompt quotation.

VOLTRONICS CORP., West St., E. Hanover, N.J., 07936, Tel: 201-887-1517, TWX: 710-986-8253; FSC No: 18736; QPL No: Multiple; Empl.: 60; Minimum order: \$30
 Customer service: Sls. Off.

Free literature available: New Sub-miniature Glass & Precision Glass & Quartz Trimmer Capacitors Catalogues Concentric Ring Air, High Frequency Trimmers Catalogue Microelectronic Subminiature Trimmer Capacitors Catalogue New Multiturn Trimmer Capacitors for Electronic Watches, Engr. Data Sheet

Products manufactured: Capacitors, Fixed, Capacitors, Variable

Local Sales Offices & Reps.

Ariz Scottsdale, Runyon Co. 602-959-6060
 Cal Encino, EL/TEC, Inc. 213-981-9881
 Cal Mt. View, Weseloh & Assocs. 415-961-0565
 Colo Denver, Camel Elctns. 303-757-6191
 DC Washington, M. Lader Co. 202-296-2497
 Fla St. Petersburg, Kirkwood & Associates 813-894-8240
 Ill Westchester, Gassner & Clark 312-345-4245
 Ind Fort Wayne, Gassner & Clark Co. 219-456-1675
 Iowa Hiawatha, Gassner & Clark Co. 319-393-5763
 Kans Shawnee Mission, Florence & Meyer, Inc. 913-722-5210
 Mass Natick, Wayland Engrg. Sls. 617-655-6080
 Minn St. Paul, Countryman Associates 612-645-9151
 Mo St. Louis, Florence & Meyer, Inc. 314-842-2535
 NJ Wallington, Comp-Tech Sls. 201-935-5454
 NY New Hyde Park, Comp-Tech Sls. 516-593-2628
 NY Syracuse, Trademark Elctn. Assoc. 315-478-2149
 Ohio Cincinnati, F.J. Campisano Co. 513-662-1616
 Ore Portland, Western Tech. Sls. 503-224-5107
 Pa Jenkintown, Arnold Associates 215-887-7870
 Tex Richardson, Semiconductor Sls. Assoc. 214-231-6181
 Va Woodbridge, M. Lader Co. 703-494-4731
 Wash Bellevue, Western Tech. Sls. 206-454-3906
 FOR: Toronto, Ont., Vitel Elctns. 416-622-6300
 FOR: Can., Montreal, Que., Vitel Elctns. 514-331-7393

Local Distributors

Cal Sunnyvale, Acacia Sls., 384 San Alejo 408-735-0100
 Cal Van Nuys, Patane Avionics, 5937 Kester Ave. 213-988-4455
 Colo Lakewood, Acacia Sls., 11111 W. 8th Ave. 303-232-2882
 NY Plainview, Fairmont Elctns., 35 S. Service 516-694-8200

Advertisement

Complete line of precision trimmer capacitors, non-rotating, with glass, quartz, and air dielectrics, MIL-C-14409C styles. New sub-miniature trimmer for gigahertz, stripline and substrate mounting. World-wide representation. New sub-miniature sizes 40% smaller than MIL. New multi-turn, high resolution trimmers for electronic watches.

VORNE INDS., INC., 5023 W. Belmont Ave., Chicago, Ill., 60641, Tel: 312-725-3077; Empl.: 12

For info on price: D. Schaeffer; Application info: A. Vorne; Customer service: D. Schaeffer; Delivery info: D. Schaeffer

Products manufactured: Counters

VTM MICROWAVE, 3225 Prairie Ave., Boulder, Colo., 80301, Tel: 303-449-6200; Empl.: 10

For info on price: A. M. Marfut; Application info: M. R. Boyd; Customer service: A. M. Marfut; Delivery info: A. M. Marfut

Free literature available: Catalog & Application Notes; New Product Data Sheets; VTM Handbook.

Products manufactured: Tubes

VU-DATA CORP., 7170 Convey Ct., San Diego, Cal., 92111, Tel: 714-279-6572, TWX: 910-335-1586; FSC No: 24160; Empl.: 50; Minimum order: \$10 p. 1-848-850

For info on price: H. Wardein; Application info: H. Wardein; Customer service: W. A. Kraus; Delivery info: H. Wardein

Free literature available: Product Summary Catalog; Portable Oscilloscopes; Monitor Oscilloscopes & Monitor Meters; Tape Recorder Analyzer; Oscilloscope Cameras.

Products manufactured: Analyzers, Cameras, Meters, Oscilloscopes, Probes, Tape Recording Accessories

Local Sales Offices & Reps.

Ala Huntsville, W.A. Brown Instr. 205-539-4411
 Ariz Phoenix, Zeus, Inc. 602-253-6104
 Cal Encino, Scientific Devices-Cal. 213-872-1951
 Cal Los Alamitos, Scientific Devices-Cal. 213-598-7678
 Cal Mountain View, Scientific Devices-Cal. 415-964-4230
 Cal San Diego, Scientific Devices-Cal. 714-279-6642
 Colo Denver, Zeus, Inc. 303-770-4400
 Conn Hamden, P. Jenks Assocs. 203-281-0810
 Fla Fort Lauderdale, W.A. Brown Instrs. 305-776-4800
 Fla Fort Walton Beach, W.A. Brown Instrs. 904-243-6424
 Fla Indialantic, W.A. Brown Instrs. 305-723-0766
 Fla Orlando, W.A. Brown Instrs. 305-425-5505
 Ga Atlanta, W.A. Brown Instrs. 404-939-1674
 Ill Des Plaines, Scientific Devices-Midwest 312-297-5240
 Kans Lenexa, Scientific Devices-Midwest 913-631-3818
 La Gretna, W.A. Brown Instrs. 504-366-5766
 Md Silver Spring, Sel-Tronics 301-589-3391
 Mass Wakefield, P. Jenks Assocs. 617-246-1590
 Mich Milford, Scientific Devices-Midwest 313-363-2282
 Minn Minneapolis, Scientific Devices-Midwest 612-544-1616
 Mo St. Louis, Scientific Devices-Midwest 314-842-2535
 NJ Fairfield, KLS Assocs. 201-227-2900
 NM Albuquerque, Zeus, Inc. 505-268-3341
 NY Syracuse, DB Assocs. 315-446-0220
 NC Research Triangle Park, W.A. Brown Instr. 919-489-1546
 Ohio Cleveland, Scientific Devices-Midwest 216-835-2270
 Ohio Dayton, Scientific Devices-Midwest 513-298-9904
 Okla Norman, Data Mktg. Assocs. 405-364-8320
 Ore Beaverton, Showalter Instrs. 503-646-3004
 Pa Philadelphia, Eastern Instr. Phil. 215-927-7777
 Tenn Knoxville, W.A. Brown Instrs. 615-584-2614
 Tex Dallas, Data Mktg. Assocs. 214-661-0300
 Tex Houston, Data Mktg. Assocs. 713-686-9627
 Tex San Antonio, Data Mktg. Assocs. 512-828-0937
 Utah Salt Lake City, Zeus, Inc. 801-466-4924
 Wash Bellevue, Showalter Instrs. 206-455-4922

W-F PRODUCTS, 1107 S. Pearl St., Denver, Colo., 80210

WABASH RELAY & ELCTNS., Box 708, Wabash, Ind., 46992, Tel: 219-563-2191, TWX: 810-290-2722; Empl.: 200; Minimum order: \$50 p. 1-1825-1836
 Customer service: D. L. Snodgrass

Free literature available: Our 8 page catalog lists our standard reed relays, mercury wetted relays and solid state relays. A sampling of standard part numbers is also given.

Products manufactured: Cards, Logic, Relays, Switches, Testers

Local Sales Offices & Reps.

Ariz Phoenix, Mr. Engrg. Sls. Co. 602-959-5150
 Cal Los Angeles, Halbar 213-387-8283
 Cal San Mateo, Halbar 415-349-4700
 Cal Santa Ana, Calif. Elctn. Mktg. 714-835-2702
 Colo Denver, Walter Engrg. 303-777-5585
 Conn Thomaston, N.B.S. Assocs. 203-283-5959
 Fla Ormond Beach, Tech. Mktg. Assoc. 904-672-2314
 Fla Pompano Beach, Tech. Mktg. Assoc. 305-942-0774
 Ill Palatine, M.J. Petersen Assocs. 312-358-8855
 Mass Waltham, DeVeer Sls. Co. 617-899-5900
 Minn St. Paul, Skor 612-645-6461
 NJ Clark, Dolan Assocs. 201-382-2797
 NY Rochester, Upstate Comp. Sls. 716-288-1080
 Ore Portland, J.J. Backer Co. 503-297-3777
 Pa Doylestown, Bucks Assocs. 215-348-8223
 Tex Dallas, Stevens Sales Co. 214-350-2476
 Wash Seattle, J.J. Backer Co. 206-285-1300

WABCO AEROSPACE DEPT., Swissvale P.O., Pittsburgh, PA., 15218, Tel: 412-242-5000, TWX: 710-664-2096; Empl.: 250; Minimum order: \$25

For info on price: G. A. Dawes; Application info: G. A. Dawes; Customer service: P. La Hive; Delivery info: P. La Hive

Products manufactured: Display Devices/Displays, Relays

Local Sales Offices & Reps.

Ariz Phoenix, Southwestel Engrg., Inc. 602-993-0250

Cal	Newport Beach, W. Bert Knight Co.	714-833-8250
Cal	Santa Clara, Nova-Tronix	408-243-9530
Colo	Denver, Franklin Sls. Co.	303-922-3623
Conn	Wethersfield, Underwood Sls. Corp.	203-563-3046
Fla	Ft. Lauderdale, Tech-Rep. Assocs.	305-792-0962
Fla	Indian Rocks Beach, Tech-Rep. Assocs.	813-595-2834
Ga	Atlanta, Tech-Rep. Assocs.	404-252-9288
Ill	Des Plaines, Lincoln, Hodges & Assoc.	312-297-3810
Kans	Wichita, M.E. Bettis Co.	316-685-7441
Kans	Shawnee Mission Ka, M.E. Bettis Co.	913-362-0722
Md	Baltimore, Chesapeake Mktg. Assoc.	301-486-3345
Mass	Chelmsford, Underwood Sls. Corp.	617-256-8191
Mich	Grand Rapids, Elko Sls. Corp.	616-949-1451
Mich	Grosse Pointe Woods, Elko Sls. Corp.	313-884-7893
Minn	Minneapolis, F.B. Hill Co.	612-941-5270
Mo	St. Louis, M.E. Bettis Co.	314-429-2099
NJ	Haddonfield, Sunday-O'Brien	609-429-4013
NJ	Keasby, Addem Group	516-567-5900
NY	Huntington Station, Addem Group	516-567-5900
Ohio	Cleveland, A.H. Baier Co.	216-461-6161
Ohio	Dayton, A.H. Baier Co.	513-576-4128
Tex	Dallas, Scott Tech. Sls.	214-352-7698
Wisc	Milwaukee, Lincoln, Hodges & Assoc.	414-542-3087
EXP:	Pittsburgh, Pa., WABCO	412-242-5000

WABER ELECTRIC, See SGL Waber Electric.

WADSWORTH ELECTRIC MFG. CO., 20 W. 11th St., Covington, Ky., 41011, Tel: 606-431-0900; Minimum order: \$25

Customer service: H. C. Morrison

Products manufactured: Circuit Breakers, Connector Boxes & Strips, Power Outlet, Ducts, Wiring, Motors, Panels, Switches

Local Sales Offices & Reps.

Cal	Los Angeles, M. Brothers	213-749-7587
Cal	San Francisco, Black & Egbert Assocs.	415-282-0840
Colo	Denver, Empire Electrical Sls. Co.	303-986-1838
Conn	Meriden, MacRae-Patton, Inc.	203-238-1965
Fla	Clearwater, J.F. Graff	813-442-1734
Ga	Atlanta, J. C. White	404-338-0433
Ill	Chicago, Wadsworth Elec. Mfg. Co.	312-467-1245
Ind	Indianapolis, A.L. Clifford & Co.	317-639-5248
Kans	Overland Park, H.R. Stein	913-381-4303
Ky	Highland Heights, F.A. Thoency	606-441-2610
La	New Orleans, S.M. Redmann, Inc.	504-486-5421
Md	Baltimore, A. E. Storrs	301-484-3830
Mass	Framingham, J.J. O'Neill	617-235-6792
Mich	Detroit, Wadsworth Elec. Mfg. Co.	313-872-0277
Minn	Minneapolis, D. T. Atkinson	612-888-6521
NJ	Fair Lawn, J.R. Barker	201-797-6354
NY	New Hartford, F. Walter Laver & Son, Inc.	315-724-0184
NC	Greensboro, A.W. Cheek	919-288-2213
Ohio	Cincinnati, T.P. Hebenstreit	513-851-5516
Ohio	South Euclid, H. I. Covitt	216-382-4473
Okla	Jenks, W.G. Parker Co.	918-299-5449
Ore	Portland, Bruce-Emmett Co.	503-235-2151
Pa	Bethel Park, D.W. Phillips	412-833-5155
Pa	Philadelphia, Wadsworth Elec. Mfg. Co.	215-627-4691
Tex	Irving, J.D. Martin Co.	214-259-7511
Wisc	Brown Deer, J.A. Cantrell	414-355-5550

WAGNER ELEC., Tung-Sol Div., 630 W. Mt. Pleasant Ave., Livingston, N.J., 07039, Tel: 201-WY2-1100, TWX: 710-994-4865

Free literature available: T-501 - Wagner high reliability metal film resistors, A-14 - tung-sol subminiature lamps, A-21 tung-sol lamps, T-439 - Digivac 1000 data sheet, T-431 - optimum contrast digital displays, T-497 - silicon rectifiers and stacks, T-410 - tung-sol photocontrols, Digivac 200 Data Sheet.

Products manufactured: Cells, Photoconductive, Photoemissive, Photovoltaic, Circuit Breakers, Diodes, Display Devices/Displays, Flashers, Lamps, Lights, Power Supplies, Rectifiers, Regulators, Relays, Resistors, Tubes

Local Sales Offices & Reps.

Ariz	Scottsdale, Inter-Mountain Engrg.	602-947-7379
Cal	El Segundo, Wagner Elec. Corp. Tung-Sol Div.	213-322-0708
Cal	Palo Alto, Held & Mollard	415-965-9321
Cal	Tustin, Orion Sls.	714-823-9687
Colo	Denver, Walter Engrg.	303-777-5585
Fla	Altamonte Springs, Semtronic Assocs.	305-831-8233
Fla	North Miami, A.J. Giammanco & Assoc.	305-891-7794
Ill	Elk Grove Village, Wagner Elec. Corp. Tung-Sol Div.	312-439-1810
Kans	Overland Park, T.L. Dowell & Assocs.	913-236-8200
Md	Baltimore, R. A. Wafer Assocs.	301-744-1133
Mass	Needham Heights, Todino Engrg.	617-444-7925
NM	Albuquerque, IMEC	505-883-9010
NC	Raleigh, A.B. Andrews & Co.	919-833-5565
Ohio	Akron, Augnat Assocs.	216-725-6087
Ore	Portland, C.K. Shanks & Assocs.	503-292-5656
Tex	Addison, Parvin Sls. Co.	214-239-9148
Tex	Houston, Parvin Sls. Co.	713-784-9900
Wash	Seattle, Underwood & Underwood	206-243-2133

WAHL CLIPPER CORP., 2902 Locust St., Sterling, Ill., 61081, Tel: 815-625-6525; Minimum order: \$2

Customer service: N. H. Wallen

Free literature available: Catalog sheets describing the Iso-Tip manufactured by Wahl and accessories. Catalog sheets are 4-color.

Products manufactured: Heat Guns, Production, Soldering Accessories, Soldering Guns, Irons & Desoldering Tools

Local Sales Offices & Reps.

Ariz	Phoenix, R. Fissell Co.	602-264-4031
Cal	Alhambra, C. G. Putnam Co.	213-283-0435
Cal	San Francisco, C. G. Putnam Co.	415-552-2311
Colo	Colorado Springs, Norris & Co.	303-635-9319
Fla	Fort Lauderdale, Unirep	305-527-1556
Ga	Atlanta, Elmar Assocs.	404-261-4345
Haw	Honolulu, G. Piety Factors, Inc.	808-839-9051
Ill	Hoffman Estates, G. Sangwin Co.	312-884-0186
Ind	Indianapolis, Electronic Reps.	317-897-9326
Md	Baltimore, EKP Assocs.	301-788-6498
Mass	Wellesley, L. Cole, Inc.	617-237-1260
Mass	West Springfield, L. Cole, Inc.	413-781-3040
Mich	Rochester, R.A. Albrecht & Co.	313-715-7081
Minn	St. Paul, C-M Co.	612-699-8004
Mo	Raytown, B & C Sls. Co.	816-358-6638
NJ	Edison, L. W. Keller & Assocs., Inc.	516-785-2826
NY	E. Syracuse, Honsinger Mktg. Assocs.	
NY	Nanuet, L. W. Keller & Assocs., Inc.	516-785-2826
NY	No. Bellmore, L. W. Keller & Assocs., Inc.	516-785-2826
Ohio	St. Marys, T. Shelby & Co., Inc.	419-394-3377
Pa	Ashten, EKP Assocs.	215-459-4517
Pa	Bethlehem, EKP Assocs.	215-691-5250
Pa	Easton, EKP Assocs.	215-258-6477
Tex	Dallas, Maynard & Gunn	214-742-2384
Tex	Houston, Maynard & Gunn	713-497-0544
Wash	Seattle, D. Smith Sls. Co.	206-633-3160
Wisc	Brookfield, G. Sangwin Co.	414-782-3240

WAHL, WM. CORP., 12908 Panama St., Los Angeles, Cal., 90066, Tel: 213-391-7234, TWX: 910-343-6867; Empl.: 28

Products manufactured: Meters, Pyrometers

Local Sales Offices & Reps.

Ala	Odenville, L. M. Crowe Co.	205-629-5475
Alas	Anchorage, Alaska Expeditors	907-279-1923
Ariz	Scottsdale, Inter-Mountain Engrg.	602-947-7379
Cal	Pasadena, RDX Corp.	213-681-3451
Cal	San Diego, RDX Corp.	714-278-6863
Cal	Sunnyvale, RDX Corp.	408-732-4500
Colo	Littleton, Radco Elctns.	303-794-4279
Fla	St. Petersburg, L. M. Crowe Co.	813-894-0249
Ga	Atlanta, L. M. Crowe Co.	401-255-2700
Ill	South Holland, RAECO, Inc.	312-331-6001
Ind	Indianapolis, Raeco	317-257-4761
Iowa	Cedar Rapids, Mueller Sls. Corp.	319-365-1196
Kans	Overland Park, J. Shurtleff Co.	913-831-9222
Mass	Peabody, JSR Assocs.	617-532-0348
Mich	Detroit, S. Sterling Co.	313-255-1970
Minn	Golden Valley, Mueller Sls. Corp.	612-544-8888
Mo	St. Louis, J. Shurtleff Co.	913-831-9222
NY	Buffalo, Seelbach & Schmitt	716-839-2300
NY	Westbury, Tech-Rep Engrg. Co.	516-997-7946
NC	Greensboro, Associated Agents	919-292-6508
Ohio	Cleveland, S. Sterling Co.	216-442-8080
Ohio	Dayton, S. Sterling Co.	513-298-7573
Okla	Tulsa, J. Shurtleff Co.	919-WE 6-7269

Pa	King of Prussia, Inistex	215-337-1240
Pa	Pittsburgh, L. H. Boley Co.	412-761-8994
Tenn	Knoxville, L. M. Crowe Co.	615-693-4826
Tex	Houston, Allied Engrg. & Supply Co.	713-528-5625

Local Distributors

Ala	Odenville, Lewis M. Crowe Co., Route 1, Box 129-A	205-629-5475
Alas	Anchorage, Alaska Expeditors, 3685 Arctic Blvd.	907-279-1923
Ariz	Scottsdale, Inter-Mtn. Engrg., 4533 N. Scottsdale Rd., Suite 212	602-947-7379
Cal	Pasadena, RDX Corp., 110 S. Euclid Ave.	213-681-3451
Cal	Sunnyvale, RDX Corp., 1287 Lawrence St.	408-734-4500
Cal	San Diego, RDX Corp., 8072 Engineer Rd.	714-278-6863
Colo	Littleton, RADCO Elctns., 2552 Ridge Rd.	303-794-4279
Fla	St. Petersburg, Lewis M. Crowe Co., Box 7505	813-894-0249
Ill	So. Holland, RAECO, 550 Armory Dr.	312-331-6001
Iowa	Cedar Rapids, Mueller Sls. Corp., 1119 Venon Rd., N.E.	319-365-1196
Kan	Overland Park, John Shurtleff Co., 7520 W. 63rd St.	913-831-9222
Mass	Peabody, JSR Assocs., 14 Raymond Circle	617-532-0348
Mich	Detroit, Comtel-Sterling Co., 17500 McNichols Rd.	313-255-1970
Minn	Golden Valley, Mueller Sls. Corp., 2420 Nevada Ave. N.	612-544-8888
NJ	Palisades Park, Tech-Rep Engrg., 116 John St. Room 1102	212-349-5943
NY	Buffalo, Seelbach & Schmitt, 13 Lincoln Rd.	716-839-2300
NC	Greensboro, Associated Agents, Box 7220	919-292-6508
Ohio	Cleveland, Comtel-Sterling Co., 5827 Mayfield Rd.	216-442-8080
Ohio	Dayton, Comtel-Sterling Co., Kett Box 2036	513-298-7573
Okla	Tulsa, J. Shurtleff Co., 3140 E. 15th St.	918-936-7269
Ore	Portland, F. B. Lee, 106 N.E. Holladay	
Pa	King of Prussia, Wistex, G. Washington Off. Bldg., 216 Goddard Blvd.	215-337-1240
Pa	Pittsburgh, L. H. Boley Co., 534 Lincoln Ave.	412-761-8994
Tenn	Knoxville, L. M. Crowe Co., 228 Engert Rd.	205-629-5475
Tenn	Memphis, John V. Wright & Co., 3837 Marston Rd.	901-362-8344
Tex	Houston, ALLESCO, 7313 Ashcroft, Suite 204	713-771-0115
Wash	Seattle, F. B. Lee, Box 66099	206-244-7262

WAKEFIELD ENGRG., INC., Teal & Audubon Rd., Wakefield, Mass., 01880, Tel: 617-245-5900, TWX: 710-348-6713; Empl.: 240; Minimum order: \$50

For info on price: B. Grafton; Application info: D. Hegarty; Customer service: B. Emery; Delivery info: B. Emery

Free literature available: COOLERS for Power Semiconductors and High Power Relays; CAT 103A on Standard Cooling Accessories/Distributor Products; CAT 13 on Forced Convection Coolers; CAT 30 on Heat Exchangers.

Products manufactured: Adhesives (All Types), Compounds, Encapsulating, Insulating, Molding, Potting, Heat Exchangers & Systems, Heat Sinks, Soldering, Testers, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

Ariz	Phoenix, Zeus, Inc.	602-253-6104
Cal	Los Altos, Rech Assoc.	415-941-0336
Cal	Woodland Hills, Interstate Mktg. Assocs.	213-883-7606
Colo	Denver, Zeus, Inc.	303-770-4400
Conn	Newtown, Gerber Sls.	203-426-3440
Fla	Ft. Lauderdale, G.F. Bohman Assocs.	305-564-3081
Ga	Atlanta, Electro-Mech Sls. Engrg. Co.	305-855-0274
Ill	Rolling Meadows, Sumer, Inc.	404-256-4414
Kans	Overland Park, PMA Corp.	913-381-0004
Kans	Wichita, PMA Corp.	316-522-4101
Md	Baltimore, Burgin-Kreh Assocs.	301-788-5200
Mass	E. Longmeadow, Gerber Sls. Co.	413-625-3059
Mass	Waltham, Gerber Sls. Co.	617-890-8040
Mich	Grand Rapids, J.L. Montgomery Assocs.	616-774-9308
Mich	Southfield, J.L. Montgomery Assocs.	313-358-2616

Minn	Minneapolis, Nortec Sls.	612-835-7414
Mo	Hazelwood, PMA Corp.	316-264-2662
NJ	Haddonfield, Sunday-O'Brien	609-429-4013
NM	Albuquerque, Zeus, Inc.	505-268-3941
NY	Great Neck, E.R.A., Inc.	516-822-9890
NY	Skaneateles, MCK Assocs.	315-685-7122
NC	Raleigh, Electro-Mech Sls. Engrg. Co.	919-782-6452
Ohio	Columbus, T. Mulligan & Assocs.	614-457-2242
Ore	Beaverton, N.R. Schultz Co.	503-643-1644
Tenn	Nashville, Electro-Mech Sls. Engrg.	615-883-1490
Tex	Dallas, Electra III	214-243-5969
Utah	Salt Lake City, Zues, Inc.	801-466-4924
Va	Lynchburg, Burgin-Kreh	804-845-5600
Wash	Bellevue, N.R. Schultz Co.	206-454-0300
Local Distributors		
Ala	Birmingham, Ack Radio Supp.	205-322-0588
Ala	Huntsville, Cramer/Ew Huntsville, 2310 Bob Wallace Ave. SW	205-539-5722
Ariz	Phoenix, Cramer/Ariz., 2643 E. University	602-263-1112
Ark	Little Rock, Carlton-Bates Co., 6821 Scott Hamilton Dr.	501-562-9100
Cal	Inglewood, Newark Elctns. Corp., 4747 W. Century Blvd.	213-678-0441
Cal	Irvine, Cramer/L.A., 17201 Daimler St.	714-979-3000
Cal	Los Angeles, California Elec. Sply., 1911 Armacost W.	213-826-8333
Cal	San Diego, Cramer/San Diego, 8975 Complex Drive	714-565-1881
Cal	Sunnyvale, Cramer/San Fran., 720 Palomar Ave.	408-739-3011
Colo	Denver, Cramer/Denver, 5465 E. Evans Place at Hudson	303-758-2100
Colo	Denver, Newark-Denver Elctns., 2170 So. Grape St.	303-757-3351
Conn	Westport, Newark Elctns., 25 Sylvan Rd. South	203-226-6921
Conn	North Haven, Cramer/Conn., 35 Dodge Ave.	203-239-5641
Fla	Fort Lauderdale, Newark Electronics, 1360 N.W. 65th St.	305-587-2372
Fla	Hollywood, Cramer/Ew Hollywood, 4035 North 29th Avenue	305-923-8181
Fla	Orlando, Cramer/Ew Orlando, 345 North Graham Avenue, Box 20214	305-894-1511
Fla	Orlando, Hall-Mark Elctn., 7233 Lake Ellenor Dr.	305-855-4020
Ga	Atlanta, Ack Radio Supp.	404-351-6340
Ga	Atlanta, Cramer/Atlanta, 3923 Oakcliff Industrial Court	404-448-9050
Ill	Chicago, Newark Elctns., 500 N. Pulaski Rd.	312-638-4411
Ill	Elk Grove Village, GBL Elctns.	312-593-3220
Ill	Mt. Prospect, Cramer/Chicago, 1911 South Busse Road	312-593-8230
Ill	Palatine, Ohm/Elctns., 645 Vermont Ave.	312-359-5500
Ind	Ft. Wayne, Ft. Wayne Elctns. Supply, 3606 Maumee Ave.	219-423-3422
Ind	Indianapolis, Graham Elctns., 133 S. Penn St.	317-634-8202
Ind	Indianapolis, Pioneer Standard, 6408 Castle Pl.	317-849-7300
Iowa	Cedar Rapids, Newark Elctns.	319-362-1171
Kans	Great Bend, Radio Supply Inc., 1910 Tenth St.	316-793-3507
Kans	Lenexa, Hall-Mark Elctn., 9006 Rosehill Rd.	913-888-4747
Kans	Salina, Radio Supply Inc., 1809 So. Broadway	913-823-6353
Kans	Wichita, Radio Supply Co., 115 Laura	316-267-5214
Md	Baltimore, Cramer/Baltimore, 922-24 Patapsco Avenue	301-354-0100
Md	Beltsville, Newark Elctns., 10440 Baltimore	301-937-5085
Md	Gaithersburg, Cramer/Ew Washington, 16021 Industrial Drive	301-948-0110
Md	Savage, Pyttronic Ind., 8200 Wellmoor Ct.	301-792-7000
Mass	Boston, Newark Elctns, 13A Wheeling Ave.	617-935-8350
Mass	Newton, Cramer/International, 85 Wells Ave.	617-969-7700
Mass	Woburn, Rush Inds., Inc., 122 Cummings Dr.	617-935-2400
Mich	Ann Arbor, Wedemeyer Elctn. Supply Co., 2280 S. Ind'l. Hwy.	313-665-9611
Mich	Detroit, RS Elctns., 12775 Lyndon St.	313-491-1000
Mich	Livonia, Cramer/Detroit, 13193 Wayne Road	313-425-7000
Mich	Livonia, Pioneer/Michigan	313-525-1800
Mich	Oak Park, Newark-Detroit Elec., Inc., 20700 Hubbell Ave.	313-548-0250

Mich	Wyoming, Newark Elctns., 3645 Linden S.E.	616-241-6681
Minn	Edina, Cramer/Bonn, 7275 Bush Lake Road	612-835-7811
Minn	Minneapolis, Newark-Minneapolis Elec. Corp., 336 Hoover St. NE	612-331-6350
Mo	Earth City, Hall-Mark Elctns.	304-291-5350
Neb	Lincoln, Scott Elctns.	402-464-8308
NJ	Camden, General Radio Supply, 600 Penn St.	609-964-8560
NJ	Cherry Hill, Cramer Elctns., 12 Springdale Rd.	609-424-5993
NJ	Kenilworth, Newark Elctns., 303 Monroe Ave.	201-272-8410
NJ	Moonachie, Cramer/N.J., 1 Barrett Ave.	201-935-5600
NJ	Springfield, Route Electr. Inc., Echo Plaza, Rte. #22	201-379-7710
NM	Albuquerque, Cramer/N.M., 137 Vermont N.E.	505-265-5767
NY	Bohemia, Car-Lac Elctn. Ind'l. Sls., 75 Orville Dr.	516-567-4200
NY	East Syracuse, Cramer/Syracuse, 6716 Joy Road	315-437-6671
NY	Freeport, Milgray Elctns., 191 Hanse Ave.	516-546-6000
NY	Hempstead, Cramer/Long Island, 29 Oser Avenue	516-231-5600
NY	Plainview, Newark Elctns., 80 Express St.	516-822-5000
NY	Rochester, Cramer/Rochester, 3259 Winton Road South	716-275-0300
NY	Rochester, Newark Elctns., 3000 S. Winton Rd.	716-473-6600
NC	Raleigh, Pyttronic Inds., 4509 Creedmoor Rd.	919-782-6370
NC	Winston-Salem, Cramer/EW, 938 Burke Street	919-725-8711
NC	Winston-Salem, Kirkman Elctns., Inc., 901 W. Second St.	919-724-0541
Ohio	Cincinnati, Cramer/Tri-States, 666 Redna Terr.	513-771-6441
Ohio	Cincinnati, Hughes-Peters, Inc., 4865 Duck Creek Rd.	513-351-2000
Ohio	Cincinnati, Newark Elctns., 9799 G Princeton Rd.	513-874-5115
Ohio	Cleveland, Cramer/Cleveland, 5835 Harper Road	216-248-8400
Ohio	Cleveland, Newark Electronics, 3304 E 87 St.	216-641-2800
Ohio	Cleveland, Pioneer Standard Elctns. Inc., 4800 E. 131st St.	216-587-3600
Ohio	Cleveland, RPC Elctns., 749 Miner Rd.	216-461-4700
Ohio	Columbus, Hughes-Peters, Inc., 481 E. 11th Ave.	614-294-5351
Ohio	Dayton, John Becker Electric Co.	513-226-1341
Ohio	Dayton, Pioneer/Dayton, 1900 Troy St.	513-236-9900
Okla	Oklahoma City, Trice Wholesale Elctns.	405-524-4411
Ore	Portland, Central Dist., 955 N.E. Union	503-234-0711
Pa	Carnegie, Pyttronic Inds., 14 E. Mall Plaza	412-276-6722
Pa	Harrisburg, Pyttronic Inds. Inc., 2325 No. 7th St.	717-233-6591
Pa	Montgomeryville, Pyttronic Inds. Inc., Stump Rd., Box 433	215-643-2850
Pa	Pittsburgh, RPC Elctns., 620 Alpha Dr.	412-782-3770
RI	Warwick, W.H. Edwards Co.	401-781-8000
Tex	Dallas, Cramer/Texas, 2970 Blystone Lane	214-350-1355
Tex	Garland, Newark Elctns., 707 Easy St.	214-271-2511
Tex	Houston, Altair Co.	713-462-3029
Tex	Houston, Newark Elctns., 6902 Harwin Dr.	713-782-4800
Tex	Richardson, Altair Co.	214-231-5166
Utah	Salt Lake City, Cramer/Utah, 391 West 2500 South	801-487-4131
Utah	Salt Lake City, Newark-Salt Lake City, 259 Crossroad Sq.	801-486-1048
Wash	Seattle, Cramer/Seattle, 5802 6th Avenue S.	206-762-5755
Wash	Seattle, Sterling Elctns., 5608 6th Ave. So.	206-762-9100
WVa	Wheeling, RPC Electronics, 1301 Main St.	304-232-7630
Wisc	Milwaukee, Newark Electronics, 3695 N. 126th St.	414-781-2450
Wisc	Oak Creek, Cramer/Wisconsin, 430 W. Rawson Ave.	414-764-1700

WAKEFIELD ENGRG., INC. cont'd

Advertisement

COMPONENTS DIVISION: Semiconductor Cooling Products...Heat Sinks; Aluminum Extrusion Shapes; Clamps for Compression Type SCRs and Diodes with Heat Sinks or Liquid Cooled Bus Blocks; Thermal Joint Compound; Thermally Conductive Epoxies for Bonding, Coating or Casting; Forced Convection Cooling Packages; Heat Exchangers; Custom Stamped, Extruded or Copper Assemblies.

SYSTEMS DIVISION: Semiconductor and IC Life Test and Burn-in Systems & Components.

WAKEFIELD ENGRG., INC., Systems Div., Audubon Rd., Wakefield, Mass., 01880, Tel: 617-245-5900, TWX: 710-348-6713; Empl.: 250

Customer service: S. Brylinsky

Free literature available: Guideline Booklet to Component Burn-In Technology: SD-41 Programmable Tray Bulletin: SD-42 Equipment Bulletin:

AC Switching Power Supply Data Sheet: basic configuration of AC switching power supplies and their various output ratings. Liquid Vapor Bulletin: module used for power device burn-in.

Products manufactured: Ovens, Power Supplies, Testers

Local Sales Offices & Reps.

Ariz	Scottsdale, Jack Hagestad	602-945-0902
Conn	Hamden, Equipment Sales	203-248-5581
Fla	Orlando, Newco & Assocs.	305-293-7700
Ill	Wheaton, Engrg. Prods. Assocs.	312-653-6826
Ind	Kokomo, Teledyne TAC	317-453-7671
Md	Lanham, Brimberg Assocs.	301-552-2200
Mass	Chelmsford, Equipment Sales	617-256-8547
Minn	Minneapolis, Engrg. Prods. Assocs.	612-925-1883
NY	Hartsdale, Powell-Pendergraph, Inc.	914-761-7792
Ohio	Dayton, Assembly Materials & Equipment Systems	513-435-9730
Pa	Berwyn, Tucker Assocs.	215-644-0142
Tex	Dallas, Techn. Processes Co.	214-352-3957

WALDES KOHINOOR, INC., 47-16 Austel Pl., Long Island City, N.Y., 11101, Tel: 212-392-3100, Telex: 126-829; Empl.: 500

For info on price: A. Berger; Application info: J. Altman; Customer service: G. Scionti; Delivery info: G. Scionti

Free literature available: 128-page TRUAR® TECHNICAL MANUAL offers complete engineering data for retaining rings .040" to 10" dia; plus assembly tools, Government and industry standards, typical applications.

Products manufactured: Fasteners, Pliers, Rings, Retaining

Local Sales Offices & Reps.

Cal	Anaheim, R. P. Winship	213-749-8271
Ga	Atlanta, D. C. Fillingame	404-394-0366
Ill	Bolingbrook, G. P. Watkins	312-739-6329
Ind	Noblesville, R. C. Davis	317-773-6311
Iowa	Bettendorf, F. J. Bradley	319-355-3100
Kans	Shawnee, Benson Engrg. Co.	913-631-4113
Ky	Louisville, Petrie-Ingram Co.	502-459-0280
Mass	Worcester, D. Kelleher	617-757-3929
Mich	Southfield, Armstrong, Doran	313-559-4828
NY	Floral Park, A. Bernstein	212-343-3339
NY	Mount Vernon, H. D. Hartman	914-MO 4-2020
NY	Penfield, T. G. Koltes Assoc.	716-377-9080
Ohio	Cleveland, Petrie-Ingram Co.	216-442-5530
Ohio	Dayton, Petrie-Ingram Co.	513-298-3108
Pa	King of Prussia, J. C. Botta	215-265-0424
Tenn	Millington, O. L. Spry	901-872-2415
Tex	Dallas, Benson Engrg. Co.	214-352-7541
Wisc	Brookfield, R. V. Petershack	414-784-0385

WALDOM ELECTRONICS, INC., 4623 W 53rd St, Chicago, Ill., 60632, Tel: 312-585-1212, Telex: 25-4604; FSC No: 92219; Minimum order: \$25

p. 1+104,105,1070-1074; p. 2+1070-1074,1262-1266
For info on price: Cust. Svc. Dept.; Application info: M. Halley; Customer service: E. Beutler; Delivery info: E. Beutler

Free literature available: Catalog #7G7, Waldom General Line Catalog (sample att'd), Catalog #7FOM-1, Waldom/Molex Catalog (sample att'd), Catalog #WB-73, Waldom/Bivar Catalog (sample Att'd), Price Schedule #7U5 Resale Price List (7U4 att'd - 7U5 in print will be available after first of the year).

Products manufactured: Adhesives (All Types), Alarms, Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Bumpers, Bushings, Glass, Plastic, Metal, Rubber, Etc., Capacitor, Hardware, Caps, Connector, Cases, Equipment, Instrument, Meter, Clamps & Clips, Coils Including Assemblies & Forms, Connector Adapters, Connectors, Contacts, Electrical, Cords, Cutters, Wire, Hand Operated, Dials, Drives & Drive Mechanisms (Dial), Fasteners, Grommets, Guides, Circuit Board, Handles For Cabinets, Circuit Boards, Racks, etc., Holder & Carriers, Holders, Circuit Board (Production Type), Indicators, Integrated Circuit Devices, Jack Covers, Jacks (All Types), Kits, Connector, Kits, Terminal, Knobs, Lights, Machines/Machinery, Production, Nameplates, Packages, Integrated Circuit, Pads, Transistor Mounting, Pins, Plug & Jack Sets, Plug Buttons, Plugs, Pointers, Dial, Posts, Pullers, Racks, Reducers, Resistor, Hardware, Scales, Dial, Shields, Sockets, Spacers, Splices, wire (Including, Butt & Cap Types), Strain Reliefs, Cable & Wire, Switch Mounting Plates, Switches, Terminal Blocks, Boards & Strips, Terminals, Tools, Wire & Cable Ties, Wire Nuts, Wire Strippers

Local Sales Offices & Reps.

Cal	Burlingame, W.J. Purdy Co.	415-347-7701
Cal	Costa Mesa, Cen-Tec Sls.	714-645-9157
Cal	Inglewood, Ungar Sls. Assocs.	213-776-7340
Cal	Sacramento, W. J. Purdy Co.	916-422-0128
Cal	San Francisco, Tech. Sls. Assocs.	415-467-1434
Colo	Denver, W.J. Purdy Co.	303-777-1411
Fla	No. Miami, Winfield Elec. Sls. Co.	305-945-6544
Fla	Tampa, Winfield Elec. Sls. Co.	813-884-6500
Ga	Atlanta, H.W. Phillips Co.	404-237-7564
Ill	Chicago, Ellinger Sls. Corp.	312-763-1570
Ind	Indianapolis, Elctn. Reps.	317-897-9326
Mass	Braintree, Rudolph & Mac Innis	617-843-0908
Mich	Orchard Lake, Ellinger Sales Corp.	313-626-1170
Minn	Maple Grove, R.C. Sls.	612-425-5543
Minn	Minneapolis, E. Melius & Assocs.	612-854-4270
Mo	Kansas City, Nevco, Inc.	816-421-1751
Mo	St. Louis, Nevco, Inc.	314-843-7406
NJ	Parsippany, Total Mktg. Action	201-227-4073
NM	Albuquerque, W.J. Purdy Co.	505-266-7959
NY	Flushing, M. Bettan Sls.	212-591-7600
NY	Phelps, LSM Assocs.	315-548-4891
NY	Port Washington, Total Mktg. Action	516-883-2432
Ohio	Cleveland, Marlow Assocs.	216-832-0900
Ohio	Xenia, Marlow Assocs.	513-426-6270
Ore	Portland, J.V. Belusko Co.	503-222-4279
Pa	Easton, E-K-P Assocs.	215-258-6477
Pa	Fort Washington, Kirk-Sandell	215-643-2100
Tex	Houston, B. Rogers & Co.	713-626-5370
For:	Can., Vancouver, B.C., Omnitronix	604-277-5953
FOR:	Can., Montreal, Que., Omnitronix, Ltd.	514-735-0987

Local Distributors

Ala	Huntsville, Powell Elctnrs., 803 Oster Dr.	205-539-2731
Ala	South Birmingham, Forbes Distributing, 1416 Fourth Ave.	205-251-4104
Ariz	Tucson, Inland Elctnrs., 715 E. Bdwy.	602-624-4402
Ark	Little Rock, Carleton-Bates Co., 6821 Scott Hamilton	501-562-9100
Cal	Costa Mesa, Component Center, 1240 E. Logan Ave.	714-979-0433
Cal	Mountain View, Abacus Elctnrs., 1065 Terra Bella Ave.	415-961-1500
Cal	Mountain View, Powell Elctnrs., 411 Fairchild Dr.	415-964-0820
Cal	Sacramento, Dunlap Elctnrs., 1800 18th St.	916-444-8070
Cal	San Diego, Shanks & Wright, 2045 Kettner Blvd.	714-239-0176
Cal	Southgate, CEC Moltronics, 5610 E. Imperial Hwy.	213-773-6521
Colo	Denver, Acacia Sls., 11111 W. 8th Ave.	303-232-2882
Colo	Denver, Electronic Parts Co., 1212 S. Bdwy.	303-744-1992
Conn	Hartford, Hatry of Hartford, 500 Ledyard St.	203-527-1881
Fla	Miami, Electronic Equip., 2701 N.W. 42nd Ave.	305-871-3500

Fla	Orlando, Powell Elctnrs., 2032 Palmridge Way	305-859-1450
Ga	Atlanta, Lykes Elctnrs., 1135 Chattahoochee Ave. N.W.	404-355-2223
Haw	Honolulu, Precision Radio Ltd., 1160 S. King St.	808-537-5291
Ill	Champaign, Klaus Radio, 905 S. Neil St.	217-356-1896
Ill	Mt. Prospect, Cramer Elctnrs., 1911 S. Busse Rd.	312-593-8230
Ill	Palatine, OHM Elctnrs., 649 Vermont Ave.	312-359-5500
Ill	Peoria, Klaus Radio/Peoria, 8400 N. Pioneer Pkwy.	309-691-4840
Ill	Rosemont, Advent Elctnrs., 7110 N. Lyndon	312-298-4210
Ind	Evansville, Hutch & Son, 300 N. Main St.	812-425-7155
Ind	Evansville, Ohio Valley Sound, 20 E. Sycamore St.	812-425-6173
Ind	Indianapolis, RA-DIS-CO, 814 N. Senate	317-637-5571
Iowa	Cedar Rapids, Deeco, Inc., 2520 16th Ave. S. W.	319-365-7551
Kans	Wichita, Radio Supply Co., 115 Laura	316-267-5216
Ky	Louisville, P. I. Burks Co., 824 S. Seventh St.	502-589-3960
La	Lafayette, Ralph's, 3004 Cameron St.	318-234-4507
Md	Beltsville, Powell Elctnrs., 10728 Hanna St.	301-474-1030
Mass	Dedham, Gerber Elctnrs., 852 Providence Hwy.	617-329-2400
Mass	Lynn, Land Elctnrs., 9R Franklin St.	617-592-2220
Mass	Newton, Cramer Elctnrs., 85 Wells Ave.	617-969-7700
Mich	Ann Arbor, Wedemeyer Elctnrs., 215 N. Fourth Ave.	313-665-8611
Minn	St. Paul, Gopher Elctnrs., 2520 W. Larpenteur	612-645-0241
Miss	Jackson, Ellington Elctn. Supply, 1425 Terry Rd.	601-355-0561
Mo	St. Louis, Olive Inds. Elctnrs., 6662 Olive Blvd.	314-863-7800
Mo	St. Louis, Van Sickle, 1915 Washington St.	314-621-5000
Neb	Lincoln, Scott Elctn. Supply, 4040 Adams St.	402-434-8308
Nev	Reno, Edco, 720 Tahoe St.	702-323-2766
NM	Albuquerque, Elctn. Parts Co., 2620 Rhode Island St. N.E.	505-293-6161
NY	Bohemia, Car-Lac Elctn. Supply, 75 Orville Dr.	516-567-4200
NY	Buffalo, Summit Radio Distributing, 916 Main St.	716-884-3450
NY	Johnson City, Wilshire Elctnrs., 617 Main St.	607-797-1236
NY	Lynbrook, Peerless RAdio Corp., 19 Wilbur St.	212-523-3456
NY	Rochester, Simcona Elctnrs., 275 Mt. Read Blvd.	716-328-3230
NC	Charlotte, Dixie Radio Supply, Box 10563	704-377-5413
NC	Raleigh, Southeastern Radio Supply, 414 Hillsborough St.	919-828-2311
Ohio	Cincinnati, United Radio, Summit Rd. & Reinhold Dr.	513-761-4030
Ohio	Columbus, Hughes-Peters, Inc., 481 E. 11th Ave.	614-294-5351
Ohio	Solon, Repco, 6835 Cochran Rd.	216-248-8900
Ohio	Dayton, ESCO, 221 Crane St.	513-226-1133
Okla	Tulsa, Oil Capitol Elctnrs., 708 S. Sheridan	918-836-2541
Pa	Drexel Hill, Kass Elctnrs., 2502 Township Line Rd.	215-449-2300
Pa	Erie, Mace Elctnrs., 2631 W. 8th St.	814-838-3517
Pa	Philadelphia, Powell Elctnrs., So. Island Rd. & Entrp.	215-365-1900
Pa	Pittsburgh, RPC Elctnrs., 620 Alpha Dr.	412-782-3770
Ri	Warwick, W. H. Edwards Co., 55 Elctnrs Dr.	401-781-8000
SC	Columbia, Dixie Radio Supply, 1900 Barnwell St.	803-253-5332
SC	Greenville, Dixie Radio Supply, Box 46	803-232-5357
Tenn	Nashville, Electra Distributing Co., 1914 W. End Ave.	615-329-3971
Tex	El Paso, Midland Specialty, 2235 Wyoming Ave.	915-533-9555
Tex	Houston, Geophysical Supply, 1500 Crawford	713-224-0621
Tex	Houston, Newark-Houston, 6902 Harwin Dr.	713-782-4800

Tex	San Antonio, Sherman Elctnrs., 720 San Pedro Ave.	512-226-0247
TEX	Dallas, Wilkinson Brothers, 2406 Ross Ave.	214-747-1571
Tex	Fort Worth, Swieco, Inc., 1518 E. Lancaster	817-335-6521
Utah	Salt Lake City, Kimball Elctnrs., 350 Pierpont Ave.	801-328-2075
Va	Arlington, Arlington Elctnrs., 3636 Lee Hwy.	703-524-2412
Va	Norfolk, Priest Elctnrs., 6431 Tidewater Dr.	804-855-2021
Wisc	Milwaukee, Marsh Radio Elctnrs., 6047 W. Beloit Rd.	414-545-6500
Wisc	Milwaukee, Parts Mart, 1314 N. 7th St.	414-276-4160

WALKER SCIENTIFIC, INC., Rockdale St., Worcester, Mass., 01606, Tel: 617-852-3674; Empl.: 83

For info on price: B. Langley; Application info: B. Langley; Customer service: E. Pederson; Delivery info: B. Langley

Products manufactured: Analyzers, Coils Including Assemblies & Forms, Generators, Hysteresisgraphs, Indicators, Integrators, Electronic, Magnetometers, Magnets, Meters, Multipliers, Power Supplies, Probes, Testers

Local Sales Offices & Reps.

Ariz	Phoenix, C.W. Fowler Co.	602-274-5537
Cal	Inglewood, C.W. Fowler Co.	213-678-5211
Cal	Menlo Park, C.W. Fowler Co.	415-322-5374
Colo	Denver, C.W. Fowler Co.	303-744-9595
Fla	Jacksonville, Pulcir, Inc.	904-743-5700
Ill	Mt. Prospect, Contemporary Science	312-255-3793
Md	Beltsville, Kelly Scientific Instrs., Inc.	301-937-4350
Mass	Burlington, Scien. Sys. Sls.	617-273-1660
NM	Albuquerque, Southwest Engrg. & Equip.	505-265-6776
NY	Syosett, Scientific Sys. Sls. Corp.	516-921-3737
Ohio	Westerville, Contemporary Science	614-882-6908
Tenn	Knoxville, Pulcir, Inc.	615-693-3641
Tex	Dallas, Southwest Engrg. & Equip. Co.	214-826-6661
Tex	Houston, Southwest Engrg. & Equip. Co.	713-623-2580
Wash	Bellevue, C.W. Fowler Co.	206-454-8600
FOR:	Can., Downsview, Ont., Aptec Eng.	416-661-9722
FOR:	Can., Montreal, P.Q., Aptec Eng., Ltd.	514-735-1737

Advertisement

Walker/Magnemetrics: Magnetic Measuring Instrumentation
Hysteresisgraphs
Coercivity Meters
Fluxmeters
Gaussmeters (Hall & NMR)

Walker/Magnion: Laboratory Magnet Systems
Laboratory Magnets (Iron core and Air core)
Laboratory Power Supplies (Regulated and Unregulated)
Susceptibility systems
Magnetic Field Control Instruments
Sweep Instruments

WALL A. T. CO., 55 Service Ave., Warwick, R.I., 02889, Tel: 401-739-0740, TWX: 710-382-1535; Empl.: 52

For info on price: R. Huntsman; Application info: F. B. Read Jr.; Customer service: C. T. Chwalek; Delivery info: R. Huntsman

Products manufactured: Metals, Seals, Tubes, Tubing

Local Sales Offices & Reps.

Ill	Elk Grove, R. P. Wave	
Ny	Cliff Side Park, J. A. Roberge	
Ny	Fairport, L. Bagley	
EXP:	Stamford, Conn., Dage Corp.	

WALL-LENK MFG. CO., Box 3349, Dept. EEM-71, Kinston, N.C., 28501, Tel: 919-527-4186; Empl.: 65; Minimum order: \$10 p. 21718,1719

For info on price: S. Whitfield; Application info: M. McNutt; Customer service: S. Whitfield; Delivery info: S. Whitfield

Free literature available: Catalogs 1-669F and LC774

Products manufactured: Flux, Brazing & Soldering Materials, Heat Guns, Production, Solder (All Types), Soldering Accessories, Soldering Equipment, Soldering Guns, Irons & Desoldering Tools, Torches, Soldering, Welding & Access.

Local Sales Offices & Reps.

Cal	Carson, Bidwell Sls. Co.	213-770-0300
Ill	Chicago, Midwest Elctrn. Sls.	312-777-9700
Kans	Mission, Inland Assocs.	913-362-2366
Md	Towson, Habco Elctrn.	301-825-9637
Mich	St. Clair Shores, J. M. Thorpe	313-779-6363
Minn	Minneapolis, C.R. Gibb	612-377-1200
NJ	Bergenfield, H. Gray Assocs.	201-384-3643
NY	Rushville, Ellis Scovel	315-584-6522
Ohio	Cleveland, Electro Com	216-886-2404
Pa	King of Prussia, L. Spangenberg	215-265-2130
RI	Lincoln, Adams McGregor	401-726-1300
Wash	Seattle, D. Miller Sls.	206-784-6800

WALLACE S. K. ASSOCS., 13902 N. Dale Mabry/Ste 216, Tampa, Fla., 33607, Tel: 961-1037

For info on price: W. C. Jaudon 813-961-1037; Application info: E. Healy 305-961-6640

Products manufactured: Actuators, Amplifiers, Baffles, Speaker, Cabinets & Accessories, Cable, Comm. Systems, Display Devices/Displays, Grilles, Relays, Resistors, Switches, Tubes

Local Sales Offices & Reps.

Fla	Hollywood	305-961-6640
Fla	Tampa	813-961-1037
Ga	Jonesboro	404-471-6297
Nc	Greensboro	919-292-0487
Nc	Kernersville	919-993-3993
Tenn	Memphis	901-682-2281

WALLER CORP., PO Box 340, Crystal Lake, Ill., 60014, Tel: 815-459-6510, TWX: 910-634-3351; Empl.: 50

Customer service: J. M. Skala

Free literature available: Waller's OEM catalog of AM-FM-MPX stereo chassis plus AM-FM and special frequency tuners with I.F. strips and MPX, on request.

Products manufactured: Amplifiers, Boards, Printed Circuit, Comm. Systems, Receivers, Tuners

WANG LABORATORIES, INC., 836 North St., Tewksbury, Mass., 01876, Tel: 617-851-4111, TWX: 710-343-6769; Empl.: 2000

Products manufactured: Calculators, Electrical & Electronic, Computers

Local Sales Offices & Reps.

Ala	Birmingham	205-591-2000
Ala	Mobile	205-479-0645
Alas	Anchorage	907-272-6115
Ariz	Phoenix	602-263-9196
Ark	Little Rock	501-666-7115
Cal	Fresco	209-233-7445
Cal	Los Angeles	213-776-2985
Cal	Sacramento	916-489-7326
Cal	San Diego	714-565-8541
Cal	San Mateo	415-573-6311
Cal	Santa Cruz	408-423-5560
Cal	Tustin	714-832-4720
Colo	Denver	303-572-1536
Conn	Hartford	203-246-6571
Conn	Woodbridge	203-281-0565
DC	Washington	202-785-2105
Fla	Ft. Lauderdale	305-966-3106
Fla	Jacksonville	904-396-1415
Fla	Orlando	305-894-9631
Fla	Tallahassee	904-877-7060
Fla	Tampa	813-877-8240
Ga	Atlanta	404-451-0178
Haw	Honolulu	808-941-7525
Ill	Des Plaines	312-298-7990
Ill	Morton	309-265-9113
Ill	Park Ridge	312-823-5793
Ill	Rock Island	309-788-3339
Ind	Highland	216-923-2280
Ind	Indianapolis	317-257-5381
Kans	Prairie Village	913-236-5454
Kans	Wichita	316-682-9420
Ky	Louisville	502-897-5143
La	Baton Rouge	504-927-5129
La	Bossier City	318-425-1900
La	Metairie	504-837-1622
Md	Rockville	301-770-6410
Md	Towson	301-821-8212
Mass	Tewksbury	617-851-4111
Mass	Waltham	617-890-6621
Mass	Worcester	617-798-8771

NY	Syracuse	315-437-7279
Mich	Grand Rapids	616-458-6595
Mich	Lansing	517-371-1120
Mich	Southfield	313-352-7112
Minn	Bloomington	612-884-7328
Mo	St. Louis	314-968-5350
Neb	Omaha	402-556-2733
NH	East Derry	603-329-6358
NJ	Springfield	201-467-3600
NM	Albuquerque	505-265-5608
NY	Lake Success	516-437-2500
NY	Latham	518-785-3234
NY	Rochester	716-442-5930
NY	Williamsville	716-688-6397
NC	Charlotte	704-527-0223
NC	Greensboro	919-272-5683
NC	Raleigh	919-782-8893
Ohio	Cincinnati	513-771-3445
Ohio	Cleveland	216-381-6525
Okla	Oklahoma City	405-524-4489
Okla	Tulsa	918-663-1410
Ore	Portland	503-297-2501
Pa	Bryn Mawr	215-525-7637
Pa	Harrisburg	717-564-8650
Pa	Pittsburgh	412-343-3500
RI	Cranston	401-943-1164
SC	Mt. Pleasant	803-884-5141
Tenn	Chattanooga	615-894-5516
Tenn	Knoxville	615-588-1308
Tenn	Memphis	901-452-6296
Tenn	Nashville	615-385-1262
Tex	Austin	512-444-1791
Tex	Beaumont	713-832-6428
Tex	Corpus Christi	512-855-2162
Tex	Dallas	214-241-9278
Tex	El Paso	915-565-8853
Tex	Ft. Worth	817-927-0461
Tex	Houston	713-783-7200
Tex	Lubbock	806-762-0204
Tex	San Antonio	512-344-1102
Utah	Salt Lake City	801-487-5791
Va	Newport News	804-595-8803
Va	Richmond	804-359-6320
Wash	Seattle	206-283-3800
Wash	Spokane	509-535-9836
WVa	Charleston	304-346-0345
Wisc	Madison	608-255-4411
Wisc	Milwaukee	414-224-0771

WARD LEONARD ELEC. CO. INC., Sub. Riker-Maxson, 31 South St., Mt. Vernon, N.Y., 10550, Tel: 914-664-1000, TWX: 710-562-0144; FSC No: 63743; QPL No: 15109; Empl.: 600; Minimum order: \$50

For info on price: G. Platenky; Application info: J. Schieb; Customer service: C. Blank; Delivery info: C. Blank

Free literature available: WIRE-WOUND RESISTOR CATALOG details axial lead, fixed, adjustable, strip, disc, types. CONTROL DIGEST 100 lists relays, timers, contactors, field rheostats, motor starters, pushbuttons.

Products manufactured: Amplifiers, Chargers, Battery, Controls/Control Eqpt., Regulators, Relays, Resistors, Transformers

Local Sales Offices & Reps.

Ariz	Tempe, Argus Sls.	602-967-8709
Cal	Los Altos, Recht Assoc.	415-941-0336
Fla	North Miami, Winfield Elctrn. Sls.	305-945-6544
Ga	Decatur, Electro Rep. Assoc.	404-636-8533
Ill	Elmhurst, Ward Leonard	312-279-5490
Ind	Fort Wayne, Lingeman & Assoc.	219-485-4743
Md	Baltimore, Faion Lott & Co.	301-744-4611
Mass	Framingham, Murata/J. F. D.	617-872-4843
Minn	St. Louis Pk., Beta Engrg.	612-925-4422
Mo	St. Louis, Scherrer Instrs.	314-644-5362
NY	Mt. Vernon, Ward Leonard	914-664-1000
NY	New Hartford, Ward Leonard	315-732-3507
NY	Williamsville, Ward Leonard	716-634-4300
NC	Charlotte, Electro Rep. Assoc.	704-527-2530
Ohio	Cleveland, Ward Leonard	216-382-8444
Pa	Philadelphia, S. MacDonald	215-545-1205
Tex	Richardson, Spectra Sls.	214-234-3600
EXP:	New York, NY, ITT Export Corp.	212-797-3300

WARNECKE ELECTRON TUBES, INC., 175 W. Oakton St., Des Plaines, Ill., 60018, Tel: 312-299-4436, TWX: 910-233-4597; Empl.: 50

Products manufactured: Lamps, Tubes

Local Sales Offices & Reps.

NJ	Tenafly, Budd-Tronics, Inc.	201-569-2230
Ohio	Dayton, Ashby Assocs.	513-252-5627

WARNER ELEC. BRAKE & CLUTCH CO., 449 Gardner St., S. Beloit, Ill., 61080, Tel: 815-389-3771; Empl.: 1200

For info on price: J. Dewey

Products manufactured: Actuators, Brakes, Clutches, Controls/Control Eqpt., Counters, Motors

Local Sales Offices & Reps.

Ala	Birmingham	205-252-5151
Cal	Palos Verdes Peninsula	213-377-5461
Cal	Simi Valley	805-522-4330
Conn	Vernon	203-646-5337
Fla	Titusville	305-269-3061
Ga	Liburn	404-469-1551
Ill	Chicago	312-775-7570
Iowa	Bettendorf	309-762-0112
Mass	Westboro	617-326-7100
Mich	Troy	313-689-7515
Minn	Minneapolis	612-335-7277
Minn	Prior Lake	612-335-7277
Mo	Warrensburg	816-421-8499
NJ	Madison	201-377-4800
NY	Liverpool	315-458-0500
NY	No. Syracuse	315-458-0500
NC	Greensboro	919-275-7879
Ohio	Cincinnati	513-891-4813
Ore	Portland	503-666-6980
Pa	Exton	215-233-1216
Pa	Philadelphia	215-233-1216
Tex	Dallas	214-327-1268
Wisc	Milwaukee	414-671-8022

WARREN G-V COMMUNICATIONS, Div. Sola Basic Inds., 101 Okner Pkwy., Livingston, N.J., 07039, Tel: 201-992-6200, TWX: 710-994-4852; Empl.: 200; Minimum order: \$25

Customer service: E. McMullen

Free literature available: Brochure describing various controls and protective devices Also includes application advantages and terminology definitions for thermal relays.

Products manufactured: Chargers, Battery, Comm. Systems, Controls/Control Eqpt., Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Detectors, Eliminators, Battery, Flashers, Generators, Inverters, Monitors, Power Supplies, Relays, Switches, Thermostats, Timers

Local Sales Offices & Reps.

Cal	Los Angeles, M.A. Stolaroff Co.	213-AX 5-7781
Minn	Minneapolis, HMR, Inc.	612-335-7734

WARWICK PRODS CO., 7909 Rockside Rd., Independence, Ohio, 44131, Tel: 216-524-4404; Empl.: 18; Minimum order: \$10

For info on price: T. J. Storey; Application info: R. F. Beverstock; Customer service: T. J. Storey; Delivery info: T. J. Storey

Products manufactured: Cabinets & Accessories, Cases, Equipment, Instrument, Meter, Cases, Transit, Containers, Kits, Test Equipment

Local Sales Offices & Reps.

Mass	Boston, R. Krauth	617-522-8421
NJ	West Caldwell, Peterson-Rudnick Assocs.	201-226-4363
NY	Bronx, Peterson-Rudnick Assocs.	212-671-1923
NY	Canadaigua, W. Winship	914-394-3292

WATERBURY PRESSED METAL CO., Parts Div., 407 Brookside Rd., Waterbury, Conn., 06714, Tel: 203-756-8891; Empl.: 85

For info on price: J. Cipriano; Application info: C. Mellette; Customer service: M. Joy; Delivery info: F. Estes

Products manufactured: Cable Assemblies & Harnesses, Fasteners, Mounts, Shields, Transistor, Diode, Thyristor Heat Dissipators

Local Sales Offices & Reps.

FOR:	Can., Brampton, Ont.	416-453-5581
------	----------------------	--------------

WATERS MFG., INC., Longfellow Ctr., Wayland, Mass., 01778, Tel: 617-358-2777; QPL No: Multiple; Empl.: 95

Customer service: H. A. Daziel

Free literature available: POTENTIOMETER CATALOG: Complete descriptions of precision and semi-precision potentiometers - both conductive plastic and wirewound. Story of MystR-Linear Motion Transducers. TORQUE WATCH GAUGE CATALOG: Precise measurement of static torque.

PROFESSIONAL AUDIO CONTROLS CATALOG: Describes both rotary and linear motion attenuators and Pan-Pots.

Products manufactured: Attenuators, Indicators, Potentiometers, Resistors, Testers

Local Sales Offices & Reps.

Ariz	Tempe, Argus Sls.	602-967-8709
Cal	Los Angeles, Elsner-Rambo Co.	213-664-2928

Cal	Redwood City, Woodworth Co.	415-365-0252
Colo	Denver, Omega Ltd.	303-758-1508
Conn	Trumbull, Pat Assocs.	203-268-2560
Fla	Hollywood, J.A. Simberkoff	305-925-4560
Ga	Atlanta, V. Avis McCorvey Co.	404-636-2502
Mass	Lexington, Sir Assocs.	617-862-1812
Mich	Detroit, R.P. Urban & Assocs.	313-535-2355
Mich	Grand Rapids, R.P. Urban & Assocs.	616-245-0511
Minn	Hopkins, F. Peterson Co.	612-941-5400
Mo	St. Louis, Ozark Elctn. Mktg., Inc.	314-423-7200
NJ	So. Orange, S. Simberkoff Assocs.	201-763-7900
Ohio	Dayton, H. Teplitz & Co.	513-277-6531
Okla	Tulsa, W. Pat Fralia Co.	918-663-8707
Pa	Philadelphia, S. Simberkoff Assocs.	215-455-9579
Tex	Fort Worth, W.P. Fralia Co.	817-738-2394
Tex	Houston, W.P. Fralia Co.	713-772-1572
Utah	Salt Lake City, Omega Limited	801-266-9617
Wash	Seattle, Avionics Liaison, Inc.	206-767-3870

WATKINS-JOHNSON CO., 3333 Hillview Ave., Palo Alto, Cal., 94304, Tel: 415-493-4141, TWX: 910-373-1253

For info on price: Appls. Engrg.; Application info: Appls. Engrg.; Customer service: S. Craighead; Delivery info: Appls. Engrg.

Products manufactured: Amplifiers, CATV Systems & Equipment, Cavities, Microwave, Chokes, Counters, Crystals, Demodulators, Diodes, Direction Finders, Discriminators, Display Devices/Displays, Filters, Furnaces, Generators, Horns, Microwave, Limiters, Mixer-Preamplifiers, Microwave, Mixers, Modulators, All Kinds, Monitors, Multipliers, Oscillators, Power Supplies, Receivers, Soldering Equipment, Switches, Synthesizers, Test Systems, Transformers, Tubes, Tuners

Local Sales Offices & Reps.

Cal	Inglewood	213-670-4850
Cal	Palo Alto	415-493-4141
Cal	Scotts Valley	408-438-2100
Fla	Orlando	305-851-2391
Md	Gaithersburg	301-948-7550
Mass	Burlington	617-272-7235
NJ	New Shrewsbury	201-842-2422
Ohio	Fairborn	513-426-8303
Tex	Dallas	214-239-9131

WATKINS-JOHNSON CO., Production Equip., 440 Mount Hermon Rd., Scotts Valley, Cal., 95060, Tel: 408-438-2100 EXT.217, TWX: 910-598-4403; Empl.: 1500
Customer service: M. K. Durham

Products manufactured: Furnaces

Local Sales Offices & Reps.

Ariz	Phoenix, Meas. Conslts.	602-994-9519
Cal	Long Bch., Scrantom Engrg.	714-979-6373
Cal	Santa Clara, F.J. Toffey Assoc.	408-377-8817
Colo	Broomfield, Measurement Consultants	303-449-5294
Conn	Bridgeport, Tech. Instr.	203-368-4582
Fla	Sarasota, W. J. Irvine Co.	813-955-9656
Ill	Lake Villa, R.W. Venn Co.	312-935-5353
Cal	San Diego, Ward/Davis Co.	617-944-3930
Mass	Wilmington, Tech. Instr.	505-265-6471
NM	Albuquerque, Meas. Conslts.	505-265-6471
NY	Rochester, Upstate Tech. Equip.	716-454-4455
NY	Solvay, Upstate Tech. Equip.	315-488-3101
Ohio	Dayton, Sidnell Co.	513-433-7761
Pa	Warminster, Eastern Elctn. Assocs.	215-674-1535
Tex	Austin, Crockett Engrg.	512-451-8269
Tex	Dallas, Crockett Engrg.	214-251-1776
Tex	El Paso, Measurement Conslts.	505-526-2491
FOR:	Can., Longueuil, Que., A. Crawford Assoc.	514-670-1212
FOR:	Can., Mississauga, Ont., A. Crawford Assoc.	416-678-1500
FOR:	Can., Ottawa, Ont., A. Crawford Assoc.	613-725-3354
FOR:	Can., Vancouver, B.C., A. Crawford Assoc.	604-253-7136

WATLOW ELEC. MFG. CO., 12001 Lackland Rd., St. Louis, Mo., 63141, Tel: 314-878-4600; Empl.: 230

Products manufactured: Controls/Control Eqp., Heaters & Heating Elements, Thermocouples, Elements & Accessories, Thermostats

Local Sales Offices & Reps.

Cal	Inglewood, Carlin Assocs.	213-673-4711
Cal	Mt. View, H.A. Clahsen	415-964-6364
Ga	Atlanta, R. Starnes	404-458-2068
Ill	Chicago, J. Priest & Assocs.	312-992-1220
Mass	Natick, Electrical Comp.	617-655-2225
Mich	Detroit, D. Martignon	313-651-0500
Mo	Kansas City, R. White	816-587-9270
Mo	St. Louis, R. Greene Co.	314-644-2666

NJ	Fair Lawn, Par Assocs.	201-447-3722
NY	Buffalo, H. H. Cardozo	716-834-3377
NY	E. Syracuse, R. H. Nichols	315-437-2813
NY	Lindenhurst, E. Berruti	516-884-4777
NY	Rochester, J. F. Serr	716-586-6226
Ohio	Cincinnati, M. Jordahl	513-683-4500
Ohio	Cleveland, Dale Street & Assoc.	216-886-1266
Pa	Warrington, G. Baker	215-343-6170
Tex	Arlington, Davis-Dawson Co.	817-265-6426

WAVELINE, INC., Box 718, W. Caldwell, N.J., 07006, Tel: 201-226-9100, TWX: 710-734-4324; FSC No: 00443; Empl.: 95; Minimum order: \$50

For info on price: M. Humecky; Customer service: D. Morsillo; Delivery info: B. Robertson

Products manufactured: Adapters, Waveguide, Antennas, Attenuators, Bends & Twists, Microwave, CATV Systems & Equipment, Chokes, Comm. Systems, Couplers, Detectors, Dividers, Dummy Loads, Filters, Flanges, Waveguide, Generators, Holders, Crystal, Horns, Microwave, Joints, Rotary, Microwave, Junctions, Hybrid, Microwave, Line Stretchers, Microwave, Loads, Electronic Variable, Meters, Mixers, Mounts, Probes, Seals, Shifters, Shutters, Microwave, Sliding Loads, Microwave, Switches, Tees, Terminals, Testers, Tubes, Tubing, Tuners, Waveguides & Adapters

Local Sales Offices & Reps.

Ala	Huntsville, Beacon Elctn. Assocs.	205-881-5031
Cal	Anaheim, Blair Assocs.	714-635-1350
Cal	Cupertino, Allis Assocs.	408-379-2883
Fla	Maitland, Beacon Elctn. Assn.	305-647-3498
Fla	Palm Beach Garden, Beacon Elctn.	305-622-2770
Ga	Atlanta, Beacon Elctn.	404-351-3654
Ill	Northfield, Feller Assocs.	312-446-8065
Ind	Rochester, Feller Assoc.	219-233-2377
Md	Glen Arm, Hodgins Assocs.	301-592-7047
Mass	Needham Hgts., Repton, Inc.	617-449-4141
NJ	Teaneck, Sylvan Ginsbury, Ltd.	201-837-1100
NJ	W. Caldwell, Waveline, Inc.	201-226-9100
NY	Skaneateles, Robtrn, Inc.	315-685-5731
SC	Spartanburg, Beacon Elctn. Assoc.	803-582-4613
Tex	Richardson, Lear Assocs.	214-231-5388
FOR:	Can., Aurora, Ont., John Herring & Co.	416-727-1345

WAVETEK, 9045 Balboa Ave., San Diego, Cal, 92123, Tel: 714-279-2200, TWX: 910-335-2007; Minimum order: \$25 p. 1-852-859

For info on price: C. Anderson; Application info: J. A. Roth; Customer service: P. Brance; Delivery info: C. Anderson

Products manufactured: Attenuators, Generators, Meters, Synthesizers, Terminals, Test Equipment

Local Sales Offices & Reps.

Ala	Huntsville, W.A. Brown Instrs.	205-539-4411
Ariz	Scottsdale, BFA Corp.	602-946-4215
Cal	Lawndale, Ward/Davis Assoc.	213-542-7740
Cal	San Diego, Ward/Davis Co.	714-459-3351
Cal	Sunnyvale, Ward/Davis Assoc.	408-245-3700
Colo	Denver, BFA Corp.	303-744-3301
Conn	Hamden, P. Jenks Assocs.	203-281-0810
Fla	Ft. Lauderdale, W.A. Brown Instrs.	305-776-4800
Fla	Orlando, W.A. Brown Instrs.	305-425-5505
Ga	Atlanta, W.A. Brown Instrs.	404-939-1674
Ill	Chicago, Carter Elctns.	312-585-5485
Ind	Indianapolis, Carter Elctns.	317-293-0696
Kans	Andover	316-683-7512
Kans	Overland Park, Palatine Engrg. Sls.	913-262-5643
La	Gretna, W.A. Brown Instrs.	504-366-5766
Md	Silver Spring, Eastern Instrumentation	301-681-6500
Mass	Wakefield, P. Jenks Assocs.	617-246-1590
Mich	Detroit, WKM Assocs.	313-892-2500
Minn	Minneapolis, Carter Elctns.	612-544-9393
Mo	St. Louis, Palatine Engrg. Sls.	314-426-7055
NM	Albuquerque, BFA Corp.	505-292-1212
NM	Las Cruces, BFA Corp.	505-523-0601
NY	Great Neck, Eastern Instrumentation	516-466-9505
NY	N. Syracuse, NACO Elctns. Corp.	315-699-2651
NC	Durham, W.A. Brown Instrs.	919-489-1546
Ohio	Cleveland, WKM Assocs.	216-267-0445
Ohio	Dayton, WKM Assocs.	513-434-7500
Okla	Norman, Data Mktg. Assoc.	405-364-8320
Pa	Philadelphia, Eastern Instrumentation	215-927-7777
Pa	Pittsburgh, WKM Assocs.	412-892-2953
Tex	Dallas, BFA Corp.	801-466-6522
Tex	Houston, Data Mktg. Assocs.	713-686-9627

Tex	San Antonio, Data Mktg. Assocs.	512-828-0937
Utah	Salt Lake City, BFA Corp.	801-466-6522
Wash	Seattle, R. S. Drake Assocs.	206-763-2755
Wisc	Milwaukee, Carter Elctns.	414-464-5555

WAVETEK INDIANA, INC., 66 N. First Ave., Beech Grove, Ind., 46107, Tel: 317-783-3221, TWX: 810-341-3226; Empl.: 150 p. 1-852-859

Customer service: J. Wiley

Free literature available: Catalog, -Wavetek Generation & Measurement Equipment. Flyer, -Test Equipment for the CATV Industry

Products manufactured: Amplifiers, Attenuators, CATV Systems & Equipment, Generators, Oscilloscopes

Local Sales Offices & Reps.

Ala	Huntsville, W.A. Brown Instrs.	205-539-4411
Ariz	Scottsdale, BFA Corp.	602-946-4215
Cal	Lawndale, Ward/Davis Assoc.	213-542-7740
Cal	San Diego, Ward/Davis Assoc.	714-459-3351
Cal	Santa Clara, Ward/Davis Assoc.	408-245-3700
Colo	Denver, BFA Corp.	303-744-3301
Conn	Hamden, P. Jenks Assoc.	203-281-0810
DC	Washington, Eastern Instrumentation	301-681-6500
Fla	Ft. Lauderdale, W.A. Brown Instrs.	305-776-4800
Fla	Ft. Walton Beach, W.A. Brown Instrs.	904-243-6424
Fla	Orlando, W.A. Brown Instrs.	305-425-5505
Ga	Atlanta, W.A. Brown Instrs.	404-939-1674
Ill	Chicago, Carter Elctns.	312-585-5485
Ind	Indianapolis, Carter Elctns.	317-293-0696
Kans	Overland Park, Carter Elctns.	913-649-6996
La	Gretna, W.A. Brown Instrs.	504-366-5766
Mass	Wakefield, P. Jenks Assoc.	617-246-1590
Mich	Detroit, WKM Assocs.	313-892-2500
Minn	Minneapolis, Carter Elctns.	612-544-9393
Mo	St. Louis, Carter Elctns.	314-731-2237
NM	Albuquerque, BFA Corp.	505-292-1212
NM	Las Cruces, BFA Corp.	505-523-0601
NY	Great Neck, L.I., Eastern Instrumentation	516-466-9505
NY	N. Syracuse, Naco Elctns.	315-699-2651
NY	Rochester, Naco Elctns.	716-244-4720
NY	Schenectady, Naco Elctns.	518-783-5855
NY	Utica, Naco Elctns.	315-732-1801
NC	Research Triangle Park, W.A. Brown Instrs.	919-489-1546
Ohio	Cleveland, WKM Assocs.	216-267-0445
Ohio	Dayton, WKM Assocs.	513-434-7500
Pa	Philadelphia, Eastern Instrumentation	215-927-7777
Pa	Pittsburgh, WKM Assocs.	412-892-2953
Tex	Dallas, Data Mktg. Assoc.	214-661-0300
Tex	Houston, Data Mktg. Assoc.	713-686-9627
Tex	San Antonio, Data Mktg. Assoc.	512-828-0937
Wash	Seattle, R. S. Drake Assoc.	206-763-2755
Wisc	Milwaukee, Carter Elctns.	414-464-5555
FOR:	Can., Longueuil, P.Q., A. Crawford Assoc.	
FOR:	Can., Mississauga, P.Q., A. Crawford Assoc.	
FOR:	Can., Ottawa, A. Crawford Assoc.	
FOR:	Can., Vancouver, B.C., A. Crawford Assoc.	

WEBBER MANUFACTURING CO., 8634 Brookville Rd., Indianapolis, Ind., 46206, Tel: 317-357-8681; Empl.: 40
Customer service: R. C. Webber

Free literature available: Brochure No. 9400 (enclosed)

Products manufactured: Chamber, Environmental Test

WEBER TECH PRODUCTS, 1340 Monroe Ave. N.W., Grand Rapids, Mich., 49505, Tel: 616-363-7735; Empl.: 36

Customer service: W. Lough

Free literature available: Clean Rooms - Brochures describing, total facilities, modular devices, and portable units Air Conditioning - Brochures outlining types & sizes of units with specifications.

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Air Conditioners (For Equipment)

WECKESSER CO. INC., 4444 W. Irving Park Rd., Chicago, Ill., 60641, Tel: 312-282-8626; Empl.: 90; Minimum order: \$5

For info on price: D. E. Haines; Application info: D. E. Haines; Customer service: W. F. Morrissey; Delivery info: W. F. Morrissey

Products manufactured: Clamps & Clips, Fasteners, Wire & Cable Ties

Local Sales Offices & Reps.

Ariz	Phoenix, EGR Co.	602-959-0320
Ark	Poyen, Comp. Parts	501-337-9580

Cal	Los Angeles, El-Com. Inc.	213-223-1351
Cal	San Carlos, D.H. Ross Co.	415-591-4411
Colo	Denver, Franklin Sls. Co.	303-922-3623
Conn	Milford, Plastic Comps. Co.	203-877-2723
Fla	Maitland, Hutto-Hawkins-Perego	305-831-2474
Fla	Pompano Beach, Hutto-Hawkins-Perego	305-943-9593
Ga	Atlanta, Millar Elctns.	404-261-6160
Iowa	Des Moines, KSW Assocs.	515-279-9235
Mich	Oak Park, D. P. Stewart & Assoc.	313-399-7565
Minn	Minnetonka, T.H. Ayre & Assoc.	612-474-4125
Mo	Kansas City, KSW Assocs.	816-358-5240
Mo	St. Louis, KSW Assocs.	314-781-6111
NC	Raleigh, Millar Elctns.	919-787-9564
Ohio	Chagrin Falls, Alexander Ind'l. Sls.	216-247-4133
Ohio	Kettering, Alexander Ind'l. Sls.	513-293-3651
Pa	Philadelphia, Acar Electronic Hardware	215-722-8511
Tenn	Madison, Comp. Parts	615-859-5832
Tex	Dallas, J.B. Guenther, Inc.	214-528-5286
Tex	Houston, J.B. Guenther, Inc.	713-468-0232
Wash	Seattle, R. Johnston Co.	206-524-5170
Wisc	Milwaukee, E.A. Dickinson & Assocs.	414-264-1080
EXP:	Chicago, Ill., Weckesser Int'l.	312-545-2688

WEINSCHEL ENGRG. CO., Box 577, Gaithersburg, Md., 20760, Tel: 301-948-3434, TWX: 710-828-9705; Empl.: 225; Minimum order: \$35

For info on price: R. Bastien

Free literature available: Data Sheets or Brochures on all products; Short-Form Catalog; Microwave Measuring and Generation Instruments Catalog; RF Attenuators and Components Catalog; Application and Technical Notes.

Products manufactured: Amplifiers, Analyzers, Attenuators, Bolometers, Bridges, Cable, Calibrators, Comparators, Connector Adapters, Connectors, Couplers, Detectors, Diodes, Dividers, Dummy Loads, Generators, Indicators, Insertion Loss Measurement Systems, Meters, Mismatches, Microwave, Precision, Mixers, Modulators, All Kinds, Mounts, Oscillators, Plug & Jack Sets, Power Supplies, Receivers, Resistors, Standards, Suppressors, Switches, Tees, Terminals, Testers, Thermistors, Tuners

Local Sales Offices & Reps.		
Ala	Huntsville, BCS Assocs.	205-881-6220
Cal	Burbank, Instr. Specialist	213-849-7181
Cal	Santa Clara, Instr. Specialist	408-244-1505
Colo	Denver, PLS Assocs.	303-771-0140
Fla	Orlando, BCS Assocs.	305-896-4881
Ill	Des Plaines, Cozzens & Cudahy	312-298-3600
Ind	Indpls., Cozzens & Cudahy	317-244-2456
Md	Wheaton, Sonco	301-942-9420
Mass	Lexington, Lancer Assoc.	617-861-1720
Minn	Mpls., Cozzens & Cudahy	612-884-4336
Mo	St. Louis, Cozzens & Cudahy	314-423-1234
NJ	Ft. Lee, Tech. Mktg.	201-224-6911
NM	Albuquerque, PLS Assocs.	505-255-2330
NY	No. Syracuse, Naco Elctns.	315-699-2651
NY	Rochester, NACO Elctns.	716-244-4720
NY	Utica, Naco Elctns.	315-732-1801
NC	Greensboro, BCS	919-273-1918
Pa	Philadelphia, Eastern Inst.	215-927-7777
Tex	Ft. Worth, C. Wolf Co.	817-738-1996
Tex	Houston, C. Wolf Co.	713-721-2442
Wash	Seattle, R. Drake	206-763-2755

WELCO INDS. INC., 9027 Shell Ave., Cincinnati, Ohio, 45236, Tel: 513-891-6600, TWX: 810-461-2574; Empl.: 103; Minimum order: \$35

For info on price: C. White; Application info: H. Story; Customer service: L. Riesenber; Delivery info: L. Riesenber

Products manufactured: Controls/Control Eqpt., Converters, Inverters, Motors

Local Sales Offices & Reps.		
Fla	Miami, Ludlum Assoc. Co.	305-885-2514
Ga	Atlanta, H. Homer & Assocs.	404-255-8669
Ill	Park Ridge, L. Fitz Co.	312-631-5488
Mass	Salem, Forbes Engrg. Co.	617-744-1693
Mich	Troy, DBA Control Sls. Assoc.	313-391-3235
Minn	St. Paul, Craighead & Assoc.	612-645-0784
Mo	Kansas City, Horsepower Control Sys.	816-471-6363
NJ	Kenilworth, Wolock & Lott Co.	201-241-4333
NY	Rochester, Ross Equip. Co.	716-271-5660
NC	Charlotte, Ind'l. Drives & Controls	704-535-5414
Ohio	Richfield, Wood-Compton Co.	216-659-6126
Pa	Media, H.B. Stallings & Assocs.	215-566-4100
Va	Richmond, S.D. Harmon & Co.	804-285-3168

Wisc	Kenosha, Transmission Equip. Design	414-652-3412
WELLS ELECTRONICS, INC.,	Plastics Div., 1701 S. Main St., South Bend, Ind., 46613, Tel: 219-287-5941; Empl.: 85	
Products manufactured:	Cups, Encapsulation, Holder & Carriers, Services, Assembly, Production & Test, Sockets	
Local Sales Offices & Reps.		
Ariz	Phoenix, K. Jahn Co.	602-956-9060
Cal	Sunnyvale, Wells Plastics of Cal.	408-734-3435
Fla	Clearwater, Saber Assocs.	
Fla	Lighthouse Point, Saber Assocs.	305-943-3076
Fla	Longwood, Saber Assocs.	305-422-3686
Ga	Woodstock, Saber Assocs.	404-432-9625
Ill	Skokie, Heth, Inc.	312-282-8737
Mass	Auburndale, Schutter-Young Corp.	
Mass	Beverly, Schutter-Young Corp.	617-922-6121
Mich	Detroit, McShane, Inc.	313-366-6084
Minn	Burnsville, Heth, Inc.	616-333-8494
Minn	Minneapolis, D.G. Perry & Co.	612-920-3212
NJ	Teaneck, R.T. Reid & Assocs.	201-692-0200
NY	Fayetteville, M.P. Andrews, Inc.	315-637-3144
Ohio	Dayton, McShane, Inc.	513-298-3441
Ohio	Medina, McShane, Inc.	216-725-4568
Pa	Bala Cynwyd, Electech, Inc.	215-687-5305
Tex	Dallas, Springer Tech. Sls.	214-357-5281
For:	Can., Mont., Que., Subtec Ltd.	514-482-2392
For:	Can., Ottawa, Ont., Subtec Ltd.	613-521-2739
For:	Can., Ottawa, Ont., Subtec Ltd.	613-224-0106
For:	Can., Toronto, Ont., Subtec Ltd.	416-533-2381

WELWYN CANADA DIV., Dale Electronics Inc., Box 2484, 1255 Brydges St., London, Ont., Can., Tel: 519-451-9490; Empl.: 115; Minimum order: \$25

For info on price: K. Steers; Application info: C. A. Norris; Customer service: K. Steers; Delivery info: K. Steers

Free literature available: Beyschlag Precision Carbonfilm Resistors 1/8 watt through 2 watts 10 ohms thru 5.1 meg. $\pm 5\%$ tolerance is standard $\pm 2\%$ tol. available on request. "M" Series Metal Film, Precision, -1/4 thru 2 watts standard tol. $\pm 1\%$ and 0.5% $\pm 2\%$ OHMS thru 100 meg. Metal oxide film types F07 F20 RL07 RL20 1/4 and 1/2 watt standard tol. $\pm 2\%$ and 5% $\pm 1\%$ tol. available. 47 cycle to 470K POWER OXIDE "F.P." Series 2 watt thru 10 watts. Std. Tol. $\pm 5\%$ & 10% Lower Tol. available 20 cycle to 91K High voltage "F" Series 1/2 watt and 1 watt $\pm 2\%$, 5% and 10% tol. 2 meg to 150K meg Ultra High Value 1/4 and 1/2 watt $\pm 1\%$ thru 10% tol. M, and MH, Series 60 meg to 1000K meg.

Products manufactured: Attenuators, Circuits, Hybrid, Thick Film, Filters, Networks, Resistors

Local Sales Offices & Reps.	
FOR: Can., Montreal, Que., McIntyre Agencies	514-731-9618
FOR: Can., Winnipeg, Man., Diversified Tech. Reps.	

WER INDUSTRIAL, Div. Emerson Elec. Co., 3036 Alt Blvd., Grand Island, N.Y., 14072, Tel: 716-773-2321; Empl.: 440; Minimum order: \$25

For info on price: C. Hollis; Application info: C. Hollis; Customer service: T. DiNoto; Delivery info: C. Hollis

Products manufactured: Brakes, Clutches, Controls/Control Eqpt., Counters, Motor Electric Generator Sets, Power Supplies

Local Sales Offices & Reps.		
Ariz	Sun City, Devoe Engrg. Co.	602-974-1023
Cal	Burlingame, Engineering Reps. Co.	
		415-692-2581
Cal	Fullerton, Devoe Engrg. Co.	714-871-8076
Colo	Littleton, R.L. Palmer Co.	303-771-6827
Conn	Avon, WER Hartford District Office	
		203-678-0424
Conn	Unionville, Tor-Axial Drive Comps.	
		203-673-3592
Fla	Clearwater, Arroyo Process Equip.	
		813-446-0564
Fla	Jacksonville Beach, Arroyo Process Equip.	
		904-246-0575
Ga	N.W. Atlanta, H. Homer & Assocs.	
		404-255-8669
Ill	Northbrook, WER Chicago District Office	
		312-498-5940
Ind	Elkhart, Shaum Electric Co.	219-264-4189
Mass	North Reading, WER Boston Regional Office	
		617-664-3512
Mich	Farmington, WER Detroit District Office	
		313-477-5409
Mo	St. Louis, WER St. Louis District Office	
		314-878-5105
N.J.	Kenilworth, Wolock & Lott	201-241-4333

NY	Buffalo, Ross Equip. Co.	716-634-0990
NY	Elmira, Ross Equip. Co.	607-734-1324
NY	Irvington On The Hudson, Wolock & Lott	212-233-2730
NY	Rochester, Ross Equip. Co.	716-271-5660
NY	Syracuse, Ross Equip. Co.	315-463-6691
NC	Charlotte, WER Charlotte	704-537-4364
Ohio	Cincinnati, WER Cincinnati Regional Office	513-232-2285
Ohio	Cuyahoga Falls, WER Akron	216-929-9301
Ohio	Rocky River, WER Cleveland District Office	216-521-5201
Ohio	Toledo, P. H. Girkins	419-241-2101
Ohio	Warren, WER Penn.-Ohio Regional Office	216-929-9301
Pa	Downtingtown, WER Philadelphia	215-269-0716
Tex	Dallas, WER Dallas	214-369-0961
Va	Richmond, Sam D. Harmon & Co.	804-285-3168
Wash	Bellevue, Garland Affolter Engrg. Corp.	206-454-2485
Wisc	Mequon, WER Milwaukee District Office	414-242-3633
FOR:	Can., Burnaby, B.C., Lloyd Controls Ltd.	604-291-0484
FOR:	Can., Dartmouth, N.S. B2Y3Z1, Ind'l. Sys. Ltd.	902-466-2461
FOR:	Can., Dollard des Ormeaux 970, Que., WER Montreal Regional Office	514-683-7640
FOR:	Can., Lachine, Que., Peerless Engrg. Sls. Ltd.	514-636-8300
FOR:	Can., Vancouver 9, B.C., Grove Processing Equip. Ltd.	604-879-7771
FOR:	Can., Weston, Ont., Peerless Engrg. Sls. Ltd.	416-742-8702

WERTRONIX CORP., 2673 Culver Ave., Dayton, Ohio, 45429, Tel: 513-299-5586, Telex: 288205; Empl.: 50; Minimum order: \$50 p. 1-998

Customer service: Sales

Products manufactured: Actuators, Blowers & Fans & Accessories, Brakes, Controls/Control Eqpt., Motor & Generator Armatures, Rotors, Stators, Motors, Services, Assembly, Production & Test, Tachometers

Local Sales Offices & Reps.		
Cal	Burlingame, W.J. Purdy Co.	415-347-7701
Cal	Santa Monica, Davidson Assocs.	213-829-1731
Colo	Denver, W.J. Purdy Co.	303-777-1411
Fla	Clearwater, Perrott Assocs.	813-726-1549
Fla	Orlando, Perrott Assocs.	305-275-1132
Ill	Chicago, Engineered Sales Co.	312-867-8434
Md	Baltimore, R.L. Wilkinson, Inc.	301-377-7800
Mass	Woburn, Stockwell Tech. Sls. Co.	617-935-5770
Minn	Minnetonka, T.H. Ayre Assocs.	612-474-4125
Mo	St. Louis, Boweng Tech.	314-429-7327
NM	Albuquerque, W.J. Purdy Co.	505-266-7959
NY	Fairport, D.J. Kirby Co.	716-254-2070
Ohio	Fairborn, Technical Assocs.	513-878-2484
Okl	Tulsa, Kemp Engineering Co.	918-299-2636
Pa	Glenside, R.L. Wilkinson, Inc.	215-424-8400
Tex	Addison, Kemp Engrg. Co.	214-661-0400
Tex	Houston, Kemp Engrg. Co.	713-688-1431
Va	Fairfax, Nine Assocs.	703-273-1803
Wash	Bellevue, SD-R&S2 Products & Sls.	206-747-9424

WESCO ELECTRICAL CO., 201 Munson St., Greenfield, Mass., 01301, Tel: 413-774-4358; FSC No: 12673; QPL No: MIL-C-25; Empl.: 140; Minimum order: \$35 p. 2-334-337

For info on price: J. R. DeSanty; Application info: J. R. DeSanty; Customer service: M. Cimler; Delivery info: M. Wandeleski

Free literature available: Film-Foil & Metallized film capacitors. Specializing in precision (close tolerance) & custom design.

Products manufactured: Capacitors, Fixed

Local Sales Offices & Reps.		
Cal	Santa Ana, Rical Assocs.	714-557-6543
Colo	Golden, Bob Callister & Assocs.	303-761-0992
Conn	Madison, A & M Elctn. Reps.	203-245-1031
Fla	Altamonte Springs, Semtronic Assocs.	305-831-8233
Fla	Ft. Lauderdale, Semtronic Assocs.	305-771-0010
Ill	Chicago, L-TEC, Inc.	312-286-1500
Ind	Columbus, J.H. Weaver Co.	812-372-3625
Md	Towson, Habco Elctns., Inc.	301-825-9637
Mass	Needham, A & M Elctn. Reps.	617-444-8170
NJ	Madison, Livera-Polk Assocs.	201-377-3220
NY	Roslyn Heights, Livera-Polk Assocs.	516-484-1276
NC	Knightdale, Leigh Sls.	919-266-0105
Tex	Dallas, Blackburn Assocs.	214-351-9991
Wash	Redmond, Desco Northwest	206-445-9325

WEST COAST RESCH. CORP., Box 25061, Los Angeles, Calif., 90025, Tel: 213-478-8833; FSC No: 51276; Empl: 21

Free literature available: Transducer bulletin & amplifier models; transducer monitors; absorption dynamometers; bonded strain gage accelerometer; signal conditioning instrumentation plug-in modules.

Products manufactured: Accelerometers, Amplifiers, Analyzers, Bridges, Cells, Load, Controls/Control Eqpt., Converters, Gages, Indicators, Lamps, Meters, Monitors, Power Supplies, Probes, Signal Conditioners & Equipment, Slip-Rings & Assemblies, Testers, Thermometers, Resistance, Totalizers, Digital, Transducers

Local Sales Offices & Reps.

Cal Concord, Gado Instr. Sls. 415-933-5566
Cal Mt. View, Gado Instr. Sls. 415-961-2222
Cal San Diego, Miracle & Assocs. 714-276-8619
Colo Englewood, Klein Aerospace 303-781-4967
Ill Lombard, Quadtron Assocs. 312-627-6800
Mass Woburn, Bar-Tech Assocs. 617-935-1568
SC Greenville, Greentron 803-277-3537
Va Arlington, S & M Assocs. 703-354-1192
FOR: Can., Scarborough, Ont., Intl. Rectifier Can., Ltd. 416-755-7793

Advertisement

West Coast Research manufactures the broadest line of strain gage transducers as well as signal conditioning and readouts for pressure, force, torque, flow, acceleration, displacement and temperature. Originators of multiple range, multiple variable transducers, miniature load cells. Complete dynamometers, slip-rings, anemometers and wind tunnel equipment.

WESTAMP, INC., 1542 15th St., Santa Monica, Cal., 90404, Tel: 213-393-0401; Empl: 45

For info on price: J. Manda; Application info: J. Manda; Customer service: S. Johnson; Delivery info: S. Johnson

Free literature available: Descriptions and technical specifications of PWM servo amplifiers, 100W to 10KW.

Products manufactured: Amplifiers, Controls/Control Eqpt., Servo Systems

WESTERN COATING CO., Box 598, Royal Oak, Mich., 48073, Tel: 313-588-3311; Empl: 10

Free literature available: Westcoat - A hot melt coating; Maskcoat - Plating stopoff; Melting pots and tanks; Polarflex 10 - Hot melt coating

Products manufactured: Coatings, Compounds, Encapsulating, Insulating, Molding, Potting, Films

Local Sales Offices & Reps.

Cal San Gabriel, Western Coating Co. 213-283-9331
Fla Miami, Palmer Supplies Co. 305-633-8007
Ohio Rocky River, Griff Otte 216-331-4139
Pa Havertown, Pakoil Co. 215-446-5273
Tex Dallas, Ahart Tool & Engrg. Co. 214-747-6004

WESTERN COIL & ELEC. CO., 215 State St., Racine, Wisc., 53403, Tel: 414-632-4741; Empl: 15

Products manufactured: Cabinets & Accessories, Jigs And Fixtures, Chassis & Circuit Board, Lamps, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Ill Crystal Lake, C.B. Bruse 815-459-2230

WESTERN DIGITAL CORP., 3128 Red Hill Ave., Newport Beach, Cal., 92663, Tel: 714-557-3550, TWX: 910-595-1139; FSC No: 52840; Empl: 800; Minimum order: \$50

For info on price: F. Little; Application info: F. Little; Customer service: S. Goodrich; Delivery info: L. Duchene

Free literature available: Data Sheets; App. Notes; Data Com Brochure-WDC's line of data com mos/ls1; Calculator Brochure-WDC's line of mos/ls1 calculator circuits

Products manufactured: Comm. Systems, Integrated Circuit Devices, Memories, Buffer

Local Sales Offices & Reps.

Ala Huntsville, Tech-Rep Assocs. 205-881-5925
Cal Los Altos, W.V. Posey Co. 415-948-7771
Fla Indian Rocks Beach, Tech-Rep Assocs. 813-595-2834
Md Rockville, Marktron, Inc. 301-762-6210
Md Townson, Marktron, Inc. 301-825-8222
Mass Medford, Blake Assocs. 617-391-7890
Mich Detroit, A. Blumenberg Assocs. 313-557-1934
Minn Minneapolis, S & R Sls. 612-544-3022
Mo Kansas City, Nevco, Inc. 816-421-1751
NJ Fort Lee, Northern Elctrn. Comps. 201-461-2789
NY Endicott, Tech-Mark, Inc. 607-748-7473
NY Fairport, Tech-Mark, Inc. 716-223-1252
NY Liverpool, Tech-Mark, Inc. 315-652-6229
NY Pleasant Valley, Tech-Mark, Inc. 914-635-3436
Ohio Aurora, Engrg. Mktg. Assocs. 216-562-6104
Ohio Dayton, Engrg. Mktg. Assocs. 513-433-2800
Ore Beaverton, Arneson Assocs. 503-643-5754
Pa Birchrunville, Jadelectronic Assocs. 215-647-5151

Tex Dallas, R.R. Thomas Co. 214-363-8591
Wash Seattle, Arneson Assocs. 206-762-6210
EXP: New York, N.Y., AD Auriema

WESTERN ELCTRN. PRODS. CO., 107 Los Molinos, San Clemente, Cal., 92672, Tel: 714-492-4677; FSC No: 13988; Minimum order: \$10

Free literature available: Automatic measuring wire cutter (for wire and tubing); coaxial cable strippers (hand and motorized); no-nick thermal wire strippers.

Products manufactured: Machines/Machinery, Production, Wire Strippers

Local Sales Offices & Reps.

Ariz Phoenix, B. Kinkner Assocs. 602-944-4691
Cal Palo Alto, Engrg. Assocs. 415-326-7842
Cal Pasadena, P. Nurches Co. 213-681-8957
Conn Sherman, R. P. Mahan Co. Inc. 203-355-0231
Fla Delray Beach, J. P. Dearie Co. 305-276-7462
Ill Glenview, F. William Castle Co. 312-724-3075
Mass Wellesley, R. P. Mahan Co., Inc. 617-237-1040
Minn Minneapolis, Xylem Co. 612-920-9626
Mo Joplin, RM Engrg. & Sls. 417-781-4591
NJ Mountain Lakes, J. P. Dearie Company 201-334-4848

Ohio Cincinnati, Schlemmer Assocs. 513-522-8340
Tex Houston, Jordan Equip. Co., Inc. 713-498-6212
Wash Kingston, F. H. Haight Co. 206-297-3212
EXP: Torrance, Cal., Unitool Corp. 213-772-0751

WESTERN ELECTRONIC SYSTEMS, 4067 Transport St., Palo Alto, Cal., 94303, Tel: 415-494-3931; Empl: 15

Customer service: R.K. Johnson

Products manufactured: Backpanel Interconnect Systems, Boards, Plug-In, Boards, Printed Wiring, Universal, Connectors, Sockets, Testers

Local Sales Offices & Reps.

Cal Santa Ana, Cir-Plex Entrp. 714-542-3521
Cal Santa Clara, Bank Sls. 408-246-6311
Colo Westminster, Harvey Data Systems 303-427-5299
Conn Tariffville, M & M Assocs. 203-658-4827
Ill Glenview, F.W. Castle Co. 312-724-3075
Mich Detroit, Electro Entrps. 313-521-1500
NC Charlotte, B. Henry Assocs. 704-375-8958
Ohio Dayton, Electro Entrps. 513-426-6071
Pa Pittsburgh, Electro Entrps. 412-371-8497
Tex Dallas, R. W. Murren Co. 214-369-5761

WESTERN GEAR CORP., Electro Prods. Oper., 14724 East Proctor, City of Industry, Cal, 91749, Tel: 213-796-4390, TWX: 910-346-6704; Empl: 300

Customer service: F. Grew, 213-638-7821

Products manufactured: Actuators, Gears & Gear Mechanisms (Precision), Motors

Local Sales Offices & Reps.

Ala Birmingham 205-252-4711
Cal Belmont 415-593-7611
Cal Lynwood 213-636-0911
NJ Secaucus 201-348-3400
Pa Pittsburgh 412-471-0744
Tex Houston 713-626-9880
Va Arlington 703-528-5010
Wash Everett 206-259-0922

WESTERN MAGNETICS, INC., 1733 Flower St., Glendale, Cal., 91201, Tel: 213-247-4660; Empl: 100

Customer service: N. Mueller X30

Products manufactured: Heads, Recording Playback, Erase

WESTERN MICROSYSTEMS, INC., 8733 Magnolia Ave., Santee, Cal., 92071, Tel: 714-449-0425; Minimum order: \$200

Customer service: W.J. Dwyer

Free literature available: Nichrome-Nickel-Gold substrates for thin film hybrids. Thin film chip resistors for hybrid circuits. Conductor-resistor or conductor only thin film substrate etching and assembly.

Products manufactured: Circuits, Hybrid, Thin-Film, Networks, Resistors, Services, Assembly, Production & Test

WESTERN THERMISTOR CORPORATION, 303 Via El Centro, Oceanside, Cal., 92054, Tel: 714-433-4484; Empl: 10; Minimum order: \$10

Customer service: R. L. Winter

Free literature available: Chip thermistors with leads and coatings, Data Sheets - 10 ohms to 500,000 ohm thermistors Rt/R25 ratio tables hybrid chip thermistors without leads.

Products manufactured: Thermistors

Local Sales Offices & Reps.

Ariz Scottsdale, E. J. Foley & Assocs. 602-945-2665
Cal El Monte, Telemart Co. 213-444-7666
Cal San Carlos, Winco Sls. 415-365-6082
Cal San Diego, Daniels & Doty Sls. 714-560-6266
Colo Denver, J. S. Heaton Co. 303-758-5130
Ill Glenview, Crimson Engrg. Co. 312-724-1780
Ind Indianapolis, R.H. Newsom & Assocs. 317-849-4442

Mass Reading, Kanan Assocs. 617-944-8484
Minn Minneapolis, Merrill Franklin Co. 612-835-6422
Mo St. Louis, Beneke & McCaul 314-434-6242
NY Rochester, G.P. Troy 716-586-4867
Ohio Rock River, N. Case Assocs. 216-333-4120
Pa Philadelphia, K.B. Erdman 215-224-1833
Wash Seattle, J. J. Backer Co. 206-285-1300
FOR: Can., Don Mills, Ont., J-Tronics 416-429-6324

WESTINGHOUSE CANADA LTD., Box 510, Hamilton, Ont., Can., Tel: 416-528-8811, Telex: 021-655

Customer service: D. S. Farquharson

Products manufactured: Comm. Systems, Converters, Display Devices/Displays, Terminal Equipment, Digital, Terminals, Data Display (including Alphanumeric & Graphic)

WESTINGHOUSE ELEC. CORP., 6 Gateway Ctr., Pittsburgh, Pa, 15222

WESTINGHOUSE ELEC. CORP., Electronic Tube Div., Box 284, Elmira, N.Y., 14902, Tel: 607-739-7951; Empl: 2000

Products manufactured: Cable; Detectors, Gages, Intensifiers, Image, Switches, Television Systems & Equipment Closed-Circuit, Thermocouples, Elements & Accessories, Transducers, Tubes

Local Sales Offices & Reps.

Cal Los Angeles 213-482-9660
Cal Sunnyvale 408-735-2191
Colo Denver 303-825-0441
Fla Orlando 305-843-7030
Ill Oak Brook 312-887-8909
Ind Fort Wayne 219-483-6476
Md Baltimore 301-765-2355
NY Hempstead 510-489-2200
Ohio Dayton 513-228-9631
Pa Pittsburgh 412-255-4518
Tex Dallas 214-631-2811

WESTINGHOUSE ELEC., Ind'l. Equip., Box 300, Sykesville, Md., 21784, Tel: 301-795-2800; Empl: 300

Products manufactured: Alloys, Amplifiers, Cleaners & Solvents, Cleaners, Ultrasonic, Converters, Generators, Heaters & Heating Elements, Inverters, Machines/Machinery, Production, Welding Equipment & Access. (Excluding Equip. for Semiconductor Devices)

WESTINGHOUSE ELEC., Lamp Div., Parts Sls., 1 Westghse Plaza, Bloomfield, N. J., 07003, Tel: 201-465-3325

Products manufactured: Lamps, Ultraviolet Inspection Lighting

Local Sales Offices & Reps.

Ark Little Rock 501-375-2471
Cal Los Angeles 213-482-9660
Cal San Francisco 415-445-2000
Colo Denver 303-825-0441
Conn Hartford 203-249-5792
Fla Miami 305-634-5461
Ga Atlanta 404-361-5200
Ill Chicago 312-461-7200
Ind Indianapolis 317-632-3301
La New Orleans 504-486-6141
Md Baltimore 301-792-7600
Md Laurel 301-953-2300

Mass	Belmont	617-IV 4-6020
Mich	Southfield, 313-352-9000	617-IV 4-6020
Minn	Minneapolis	612-927-6551
Mo	Kansas City	816-483-4711
Mo	St. Louis	314-421-6911
NJ	East Orange	201-465-2482
NY	New York	212-692-3211
NY	Richmond Hill	212-VI 7-9800
NY	Rochester	716-232-4380
NC	Charlotte	704-377-3471
Ohio	Cincinnati	513-475-7301
Ohio	Cleveland	216-475-7301
Pa	Bala Cynwyd, 215-MO 7-7600	216-475-7301
Pa	Pittsburgh	412-255-3800
Tex	Dallas	214-631-2811
Utah	Salt Lake City	801-486-8751
Va	Richmond	703-649-9061
Wash	Tukwila	206-623-7001

WESTINGHOUSE ELEC. CORP., Relay-Instr. Div., 95
Orange St., Newark, N.J., 07101, Tel: 201-465-0222;
Empl.: 1200

Products manufactured: Meters, Recorders, Shunts,
Meter, Transducers

Local Sales Offices & Reps.

Ala	Birmingham	205-871-0366
Ala	Mobile	205-344-4273
Ariz	Phoenix	602-258-7211
Ark	Little Rock	501-376-3462
Cal	Bakersfield	805-327-7633
Cal	Compton	213-638-7781
Cal	Emeryville	415-652-3770
Cal	Fresno	209-233-0576
Cal	Los Angeles	213-482-9660
Cal	Riverside	714-682-6551
Cal	Sacramento	916-922-7071
Cal	San Diego	714-279-0233
Cal	San Francisco	415-445-2000
Cal	Sunnyvale	408-735-2601
Colo	Denver	303-825-0441
Conn	Hartford	203-249-5792
DC	Washington	202-833-5000
Fla	Jacksonville	904-356-5811
Fla	Miami	305-634-5461
Fla	Tampa	813-837-7171
Ga	Albany	912-436-0144
Ga	Atlanta	404-885-5200
Haw	Honolulu	808-839-0311
Idaho	Boise	208-344-2502
Ill	Aurora	312-897-4293
Ill	Chicago	312-461-7200
Ill	Danville	217-442-1901
Ill	Peoria	309-673-0754
Ill	Rockford	815-398-3591
Ind	Evansville	812-425-7146
Ind	Ft. Wayne	219-483-6476
Ind	Hammond	219-844-9400
Ind	Indianapolis	317-632-3301
Ind	So. Bend	219-287-1051
Iowa	Cedar Rapids	319-366-0781
Iowa	Davenport	319-323-2761
Iowa	Des Moines	515-283-2081
Kans	Wichita	316-263-2295
Ky	Louisville	502-459-5440
La	Baton Rouge	504-344-9448
La	New Orleans	504-486-6141
La	Shreveport	318-425-2435
Me	Augusta	207-623-4571
Md	Towson	301-828-5400
Mass	Boston	617-542-0600
Mass	Springfield	413-734-3101
Mass	Worcester	617-853-2680
Mich	Grand Rapids	616-456-1531
Mich	Jackson	517-787-3630
Mich	Saginaw	517-793-8680
Mich	Southfield	313-352-9000
Minn	Duluth	218-727-1541
Minn	Minneapolis	612-927-6551
Miss	Jackson	601-354-2373
Mo	Kansas City	816-421-7122
Mo	St. Louis	314-421-6911
Mont	Butte	406-792-2301
Neb	Omaha	402-397-2820
NJ	E. Orange	201-465-0222
NM	Albuquerque	505-265-6647
NY	Albany	518-459-1820
NY	Buffalo	716-854-3966
NY	New York	212-692-3211
NY	Olean	716-372-0040
NY	Rochester	716-232-4380
NY	Syracuse	315-463-9581
NY	Watertown	215-788-7700
NC	Charlotte	704-377-3471
NC	Greensboro	919-273-5563
NC	Raleigh	919-834-4375
Ohio	Akron	216-376-2171
Ohio	Cincinnati	513-475-7400
Ohio	Cleveland	216-579-2121

Ohio	Columbus	614-272-4000
Ohio	Dayton	513-228-9601
Ohio	Toledo	419-255-2205
Ohio	Youngstown	216-744-8911
Okla	Oklahoma City	405-232-8565
Okla	Tulsa	918-583-3191
Ore	Eugene	503-342-3083
Ore	Portland	503-224-4200
Pa	Allentown	215-433-3296
Pa	Bala Cynwyd	215-667-7600
Pa	Erie	814-453-4381
Pa	Johnstown	814-288-1559
Pa	Pittsburgh	412-255-3800
Pa	Wilkes Barre	717-825-7337
Pa	Williamsport	717-326-4289
SC	Columbia	803-256-1511
SC	Greenville	803-232-5695
Tenn	Chattanooga	615-267-9146
Tenn	Kingsport	615-247-5167
Tenn	Knoxville	615-522-8101
Tenn	Memphis	901-526-8546
Tenn	Nashville	615-327-4911
Tex	Amarillo	806-372-3259
Tex	Beaumont	713-898-1157
Tex	Corpus Christi	512-883-9236
Tex	Dallas	214-631-2811
Tex	El Paso	915-542-1744
Tex	Houston	713-621-9000
Tex	Odessa	915-337-1822
Tex	San Antonio	512-223-9181
Utah	Salt Lake City	801-486-8751
Va	Richmond	703-285-3909
Va	Roanoke	703-342-8925
Wash	Seattle	206-623-7001
Wash	Spokane	509-535-3521
WVa	Bluefield	304-325-3651
WVa	Charleston	304-346-9606
WVa	Fairmont	304-363-0400
WVa	Huntington	304-529-7146
WVa	Wheeling	304-232-4100
Wisc	Appleton	414-739-2313
Wisc	Madison	608-257-4517
Wisc	Milwaukee	414-264-6400

WESTINGHOUSE ELEC. CORP., Semiconductor Div.,
Youngwood, Pa., 15697, Tel: 412-925-7272, TWX:
510-468-2840; Empl.: 800

Products manufactured: Bridges, Diodes, Rectifiers,
Thyristors (Includes Silicon Controlled Rectifiers),
Transistors

Local Sales Offices & Reps.

Ariz	Phoenix, Bestronics	602-248-7020
Cal	Los Angeles, Black-Ekizian-Strong	213-870-9191
Cal	San Diego, Bestronics	714-278-2150
Cal	Sunnyvale, Westinghouse Elec.	408-735-2191
Conn	Newtown, Gerber Sls. Corp.	203-426-3440
Fla	Clearwater, CBC Elec.	813-447-3375
Fla	Ft. Lauderdale, CBC Elec.	305-484-7330
Fla	Winter Park, CBC Elec.	305-644-2277
Ill	Oak Brook, Westinghouse Elec.	312-887-8909
Md	Towson, Westinghouse Elec.	301-828-5400
Mass	Boston, Westinghouse Elec.	617-542-0600
Mass	E. Longmeadow, Gerber Sls. Corp.	413-525-3059
Mass	Waltham, Gerber Sls. Corp.	617-890-8040
Mich	Farmington, Sheridan Assocs.	313-477-3800
Minn	Minneapolis, Comstrand, Inc.	612-560-5300
Mo	Florissant, Sheridan Assocs.	314-837-5200
Mo	Hazelwood, Dy-Tronix Inc.	314-731-5799
Mo	Kansas City, Dy-Tronix Inc.	816-761-6543
NY	Clinton/Utica, Advanced Comp. Corp.	315-853-6438
NY	Endicott, Advanced Comp. Corp.	607-785-3191
NY	Hempstead, Westinghouse Elec.	516-489-2200
NY	N. Syracuse, Advanced Comp. Corp.	315-699-2671
NY	Scottsville, Advanced Comp. Corp.	716-889-1429
NC	Charlotte, Westinghouse Elec.	704-377-3471
Ohio	Beachwood, Sheridan Assoc.	216-831-0130
Ohio	Cincinnati, Sheridan Assoc.	513-761-5432
Ohio	Dayton, Sheridan Assoc.	513-277-8911
Pa	Bala Cynwyd, Westinghouse Elec.	215-667-7600
Pa	Youngwood, Westinghouse Elec.	412-925-7272
Wisc	Milwaukee, Westinghouse Elec.	414-931-4462

Local Distributors

Ala	Huntsville, Cramer/Huntsville, 2310 Bob Wallace Ave., S.W.	205-539-5722
Ala	Birmingham, ACK Semiconductors, Inc., 3101 Fourth Ave. So.	205-322-0588
Ariz	Phoenix, Cramer/Phoenix, 2643 E. University Dr.	602-267-7321
Ariz	Phoenix, Hamilton/Avnet of Ariz., 2615 So. 21st St.	602-275-7851

Cal	Culver City, Hamilton Electro Sales, 10912 W. Washington Blvd.	213-870-7171
Cal	Inglewood, Newark Electronics, 4747 W. Century Blvd.	213-678-0441
Cal	Irvine, Cramer/Los Angeles, 17201 Daimler	714-979-3000
Cal	Mountain View, Hamilton/Avnet Electronics, 575 E. Middlefield Rd.	415-961-7000
Cal	San Diego, Cramer/San Diego, 8913 Complex Dr.	714-565-1881
Cal	San Diego, Hamilton/Avnet of San Diego, 8917 Complex Dr.	714-279-2421
Cal	Sunnyvale, Cramer/San Francisco, 720 Palomar Ave.	408-739-3011
Colo	Denver, Cramer/Denver, 5465 E. Evans	303-758-2100
Colo	Denver, Hamilton/Avnet of Denver, 5921 N. Broadway Box 16407	303-534-1212
Conn	No. Haven, Cramer/Conn., 35 Dodge Ave.	203-239-5641
Fla	Hollywood, Cramer/E.W., Inc., 4035 No. 29th St.	305-923-8181
Fla	Orlando, Cramer/E. W., Inc., 345 Graham Ave., Box 20214	305-894-1511
Ga	Atlanta, Cramer/Atlanta, 3923 Oakcliff Indl. Center	404-448-9050
Ga	Atlanta, Specialty Distributing, 763 Juniper St., N. E., Box 6326	404-873-2521
Ga	Augusta, Specialty Distributing, 1251 Gordon Park Rd., Box 1728	404-722-1526
Ill	Elmhurst, Semiconductor Specialists, Inc., 195 Spangler Ave.	312-279-1000
Ill	Schiller Park, Hamilton/Avnet Elctns., 3900 N. 25th Ave.	312-678-6310
Ind	Fort Wayne, Fort Wayne Electronics Supply Inc., 3606 E. Maumee	219-423-3422
Ind	Indianapolis, RA-DIS-CO, 814 N. Senate Ave.	317-637-5571
Md	Gaithersburg, Cramer/E. W., Inc., 16021 Industrial Dr.	301-948-0110
Md	Hanover, Cramer/Baltimore, 7255 Standard Dr.	301-796-5790
Md	Hanover, Hamilton/Avnet of Baltimore, 7255 Standard Dr.	301-796-5000
Md	Savage, Pytronic Inc., 8220 Wellmoor Ct.	301-792-7000
Mass	Newton Center, Cramer Elctns., Inc., 85 Wells Ave.	617-969-7700
Mass	Waltham, Schweber Elctns., 213 Third Ave.	617-890-8484
Mich	Farmington, Semiconductor Specialists, Inc., 33505 State St.	313-478-2700
Mich	Farmington, Sheridan Sales Co., 24534 Indopex Circle	313-477-3800
Minn	Minneapolis, Semiconductor Specialists, Inc., 8030 Cedar Ave. So.	612-854-8841
Mo	North Kansas City, LComp Kansas City, Inc., 1520 Taney St.	816-221-2400
NJ	Cherry Hill, Cramer/Pa., Springdale Rd., Cherry Hill Ind'l. Site	609-424-5993
NJ	Cinnaminson, Wilshire Elctns., 855 Industrial Hwy. - Unit 5	609-786-8990
NJ	Moonachie, Cramer/N.J., 1 Barrett Ave.	201-935-5600
NJ	Moorestown, Arrow Elctns., Pleasant Valley Ave.	609-235-1900
NM	Albuquerque, Cramer/Albuquerque, 137 Vermont N.E.	505-265-5767
NY	East Syracuse, Cramer/Syracuse, 6716 Joy Rd.	315-437-6671
NY	Endwell, Cramer/Binghamton, 3220 Watson Blvd.	607-754-6661
NY	Freeport, Milgray Elctns., Inc., 191 Hanse Ave.	516-546-6000
NY	Hauppauge, Cramer/Systems, 29 Oser Ave.	516-231-5600
NY	Rochester, Cramer/Rochester, 3000 S. Winton Rd.	716-275-0300
NY	Westbury, Schweber Elctns., Jericho Tpke.	516-334-7474
NC	Winston-Salem, Cramer/Winston-Salem, 938 Burke St.	919-725-8711
Ohio	Beachwood, Sheridan Sls. Co., 23224 Commerce Pk. Rd.	216-831-0130
Ohio	Cincinnati, Sheridan Sales Co., Box 37825	513-761-5432
Ohio	Columbus, Hughes-Peters, Inc., 481 E. Eleventh Ave.	614-294-5351
Pa	Pittsburgh, Cameradio Elctns., 2801 Liberty Ave.	412-288-2600
Tex	Dallas, Hall-Mark Elctns. Corp., 9333 Forest La.	214-231-6111
Tex	Houston, Altair Co., 9501 Baythorne Dr.	713-462-3029
Tex	Houston, Hall-Mark Elctns. Corp., 8000 Westglan Dr.	713-781-6100
Tex	Richardson, Altair Co., 405 N. Plano Rd., Box 26	214-231-5166

Utah Salt Lake City, Cramer/Salt Lake City, 391 W. 2500 South 801-487-4131
 Wash Bellevue, Hamilton/Avnet, 13407 Northrup Way 206-746-8750
 Wash Seattle, Cramer/Seattle, 5602 6th Ave. So. 206-762-5755
 WV Va Charleston, McJunkin Corp., 1400 Hansford St., Box 513 304-348-4965
 Wisc Mequon, Taylor Electric Co., 1000 W. Donges Bay Rd. 414-241-4321

WESTMORELAND PLASTICS CO., 135 Gertrude St., Latrobe, Pa., 15650, Tel: 412-539-1612; Empl.: 125

Products manufactured: Knobs, Lights, Services, Assembly, Production & Test

Local Sales Offices & Reps.

Cal Fremont, Hartfield, Kennan & Freytag 415-863-2200
 Cal Los Angeles, Hartfield, Kennan & Freytag 213-225-1318
 Ill Skokie, B. Brown Sls. Co. 312-673-0660
 Ind Indianapolis, D. Hilligoss 317-849-1636
 Kans Shawnee Mission, Lauber-Kruper, Inc. 913-831-0140
 Mass Woburn, R.W. Hatfield Co. 617-933-2324
 Mich Detroit, F.R. Burczyk Assoc. 313-872-6620
 Mo Kirkwood, Lauber-Kruper Inc. 314-966-4735
 Pa Allentown, S.D. Adams & Co. 215-395-1031
 Pa Emmaus, J.S. Adams & Co. 215-965-2391
 Tenn Hendersonville, B. Lucas Assocs. 615-824-5818
 Wash Vancouver, Hartfield, Kennan & Freytag 503-228-1683
 FOR: Can., Toronto, Ont., Harvey Waldman & Co. Ltd. 416-787-0133

WESTON COMPS. DIV., Weston-Archbald, Archbald, Pa., 18403, Tel: 717-876-1500, TWX: 510-656-2902; FSC No: 94271; Empl.: 820; Minimum order: \$50

For info on price: L. Hoover; Application info: J. Kopa; Customer service: L. Hoover; Delivery info: L. Hoover

Free literature available: "Lots of Pots," Weston short form catalog detailing brief mechanical and electrical specifications for wirewound, cermet as well as all mil approved trimming potentiometers.

Products manufactured: Potentiometers, Resistors

Local Sales Offices & Reps.

Ala Huntsville, 20th Century Mktg. 205-772-9237
 Ariz Scottsdale, Piper Sls. 602-949-8424
 Cal San Diego, Ohm-Spun Elctns. 714-277-6230
 Cal Santa Clara, Nova-Tronix 408-243-9530
 Cal Van Nuys, Wes-K Assocs. 213-989-3070
 Colo Denver, Camel Elctns., Inc. 303-757-6191
 Conn Hamden, Impact Elctns. 203-281-1331
 Fla Clearwater, Perrott Assocs. 813-531-5513
 Fla Orlando, Perrott Assocs. 305-275-1132
 Ill Skokie, Mar-Con Assocs. 312-675-6450
 Kans Overland Park, Enesco-Rep, Inc. 913-381-7557
 Md Baltimore, B. White & Co. 301-484-5400
 Mass Waltham, Impact Elctns. 617-893-2850
 Mich Southfield, Representatives Elctn. Prod. 313-354-9066
 Minn St. Paul, R. G. Ragon, Inc. 612-488-0201
 Mo St. Louis, Enesco-Rep, Inc. 314-567-3935
 NJ Camden, QED Elctns. 609-365-2450
 NY Albany, Compar Albany 518-489-4777
 NY Huntington Station, Addem 516-567-5900
 Ohio Dayton, J.C. Hofstetter Co. 513-298-0662
 Ohio Medina, J.C. Hofstetter 216-241-4880
 Pa Archbald, Weston Comp. Div. 717-876-1500
 Tex Richardson, Vista Assocs. 214-235-4547
 Wash Seattle, Underwood & Underwood 206-243-2133
 FOR: Can., Hamilton 10, Ont., Cartwright Southall Assocs. 416-528-0294
 FOR: Can., Montreal 251, Que., McIntyre Agencies 514-731-9617

WESTON INSTRS., INC., 614 Frelinghuysen Ave., Newark, N.J., 07114, Tel: 201-243-4700; Empl.: 1100 p. 2: 1116-1120

For info on price: R. L. Craig; Application info: J. Watson; Customer service: P. Barba; Delivery info: P. Barba

Products manufactured: Cases, Equipment, Instrument, Meter, Counters, Magnets, Meters, Monitors, Tachometers, Thermometers, Resistance

Local Sales Offices & Reps.

Ala Huntsville, Kemp Instrs. Co. 205-837-4304
 Cal Los Angeles, Weston Instrs., Inc. 213-268-9271
 Fla Orlando, Col-Ins-Co., Inc. 305-423-7615
 Ill Chicago, Weston Instrs., Inc. 312-352-3500
 Iowa Cedar Rapids, Palatine Engrg. Sls. 319-365-8071
 Kans Kansas City, Palatine Engrg. Sls. 913-262-5643

Kans Wichita, Palatine Engrg. Sls. 316-683-7512
 Md Columbia, Weston Instrs. 301-730-1400
 Mass Boston, Weston Instrs., Inc. 617-246-1800
 Mich Detroit, Nicon Assocs. 313-341-7688
 Mo St. Louis, Palatine Engrg. Sls. 314-426-7055
 NJ Fort Lee, Tecnimat 201-461-8686
 NJ Newark, Weston Instrs., Inc. 210-243-4707
 NY Syracuse, Weston Instrs., Inc. 315-454-3226
 Ohio Cincinnati, Luebbs Sls. Co. 513-871-4211
 Ohio Cleveland, Luebbs Sls. Co. 216-333-0425
 Ohio Dayton, Luebbs Sls. Co. 513-294-0426
 Okla Tulsa, Kemp Engrg. Co. 918-299-2636
 Pa Philadelphia, Weston Instrs., Inc. 215-665-8270
 Tex Dallas, Kemp Engrg. Co. 214-661-0400
 Tex Houston, Weston Instrs., Inc. 713-681-1358
 Wash Seattle, S.E.A. 206-232-6550

WESTON SCHLUMBERGER, Weston Components, Archbald, Pa., 18403, Tel: 717-876-1500, TWX: 510-656-2902; FSC No: 94271; QPL No: Multiple; Empl.: 955; Minimum order: \$50
 For info on price: F. J. Butter; Application info: J. F. Cousins; Customer service: J. J. Kopa; Delivery info: L. M. Hoover

Products manufactured: Potentiometers

Local Sales Offices & Reps.

Ala Huntsville, 20th Century Mktg. Inc. 205-772-9237
 Ariz Scottsdale, Piper-Goyne, Inc. 602-949-8424
 Cal San Diego, Ohm-Spun Elctns. 714-277-6230
 Cal Santa Clara, Nova-Tronix 408-243-9530
 Cal Van Nuys, Wes-K Assocs. 213-989-3070
 Colo Denver, Camel Elctns. 303-757-6191
 Conn Hamden, Impact Elctns. 203-281-1331
 Fla Clearwater, Perrott Assocs. 813-531-5513
 Fla Orlando, Perrott Assocs. 305-275-1132
 Ill Skokie, Mar-Con Assocs. 312-675-6450
 Kans Overland Park, Enesco-Rep, Inc. 913-381-7557
 Md Baltimore, B. White & Co. 301-484-5400
 Mass Waltham, Impact Sls. Co. 617-893-2850
 Mich Southfield, Representatives Elctn. Prods. 313-354-9066
 Minn St. Paul, R. G. Ragon, Inc. 612-488-0201
 Mo St. Louis, Enesco-Rep, Inc. 314-567-3935
 NJ Camden, QED Elctns. 609-365-2450
 NY Albany, Reagan/Compar, Albany, Inc. 518-489-4777
 NY Huntington Station, Addem 516-567-5900
 Ohio Dayton, J. C. Hofstetter Co. 513-298-1010
 Ohio Medina, J. C. Hofstetter Co. 216-241-4880
 Tex Houston, Vista Assocs. 713-661-0119
 Tex Richardson, Vista Assocs. 214-235-4547
 Wash Seattle, Underwood & Underwood 206-243-2133

Local Distributors

Ala Birmingham, MG Elctns., 3112 Sixth Ave. S. 205-328-4525
 Ariz Phoenix, Mirco, 2005 W. Peoria Ave. 602-944-2281
 Cal Carson, Hi Rel Distributor Sls., 20507 Belshaw 213-774-8200
 Cal Costa Mesa, Components Center Inc., 1240 "E" Logan Ave. 714-979-0433
 Cal Gardena, Bell Industries, 306 E. Alondra Blvd. 213-321-5802
 Cal San Diego, Electronic Distributor, 3650 Clairemont Dr. 714-274-7242
 Cal Sunnyvale, Acacia Sls., 384 San Aleco Ave. 408-735-0100
 Cal Woodland Hills, Rampart, 21201 Oxnard St. 213-887-6400
 Colo Lakewood, Acacia Sls., 11111 W. 8th Ave. 303-232-2882
 Conn Stratford, State Elctns. Parts, 1269 Barnum Ave. 203-375-5961
 Fla Orlando, Pelcor, Box 14267 305-273-6080
 Ill Elk Grove Village, GBL Elctns., 75 Gaylord St. 312-593-3220
 Ill Westmont, Bodelle Co., 47 Chestnut Lane 312-323-9670
 Ind Indianapolis, Graham Elctns., 133 S. Penn. St. 317-634-8486
 Kans Kansas City, Tennant Elctns., 6320 Kansas Ave. 913-287-2100
 Md Baltimore, Arrow Elctns., 4801 Benson Ave. 301-247-5200
 Md Baltimore, Radio Elec. Service Co., 1026 Cromwell Bridge Rd. 301-823-0070
 Md Beltsville, Treeko Sls., 4937 Harford Ave. 301-937-8260
 Md Bethesda, Empire Elctn. Supply, 4907 Rugby Ave. 301-OL6-3300
 Mass Waltham, Impact Sls., 223 Crescent St. 617-893-2850

Mich Detroit, RS Elctns., 12775 Lyndon Ave. 313-491-1012
 Minn St. Paul, Ragon Elctns., 1136 W. Larpenleur Ave. 612-488-0201
 Mo St. Louis, Olive Industrial Elctns., 6662 Olive Blvd. 314-863-7800
 NJ Haddonfield, Mid-Atlantic, 140 Haddon Ave. 609-428-8288
 NJ Hanover, State Elctns., 36 Route 10 201-887-2550
 NJ Perth Amboy, Sterling Elctns., 774 Pfeiffer Blvd. 201-442-8000
 NY Farmingdale, Iris Elctns., 91 Milbar Blvd. 516-420-8400
 NY Freeport, Milgray Elctns., 191 Hanse Ave. 516-546-6000
 NY Plainview, Fairmont Elctn. Sls., 35 S. Svc. Rd. 516-694-8200
 NY West Babylon, Delmar Elctns., 101 Eads St. 516-420-1234
 NY Woodbury, Tennant Elctns., 1 Crossways Pk. W. 516-364-9070
 Ohio Dayton, Arrow Elctns., 3100 Plainfield Rd. 513-253-9172
 Ohio Dayton, Stotts Friedman, 108-112 N. Jefferson St. 513-253-9172
 Pa Devon, Peak Elctns. Corp., 999 W. Valley Rd. 215-687-9822
 Pa Erie, ADVACOM, Inc., 1938 Buffalo Rd. 814-455-8110
 Pa Hatboro, Henwarr, 218 Tanner Ave. 215-675-4104
 Pa Huntingdon Valley, Shap Elctns., 421-E Pike Rd. 215-698-9550
 Tex Dallas, Solid State Elctns., Box 20299 214-352-2601
 Tex Fort Worth, Tex-Tronics, 1108 E. Lancaster 817-335-8111
 Tex Houston, Solid State of Tex., 6400 W. Park Dr. 713-785-5436
 Va Charlottesville, Virginia Radio, 715 Henry Ave. 804-296-4184
 Wash Seattle, Interface Elctns., 300 Second Ave. W. 206-285-3500
 Wash Seattle, Zepher Elctns. Sls., 647 Industry Dr. 206-242-2517

WESTRONICS, 5050 Mark IV Pkwy. Box 4619, Fort Worth, Tex., 76106, Tel: 817-625-2311; Empl.: 150; Minimum order: \$20

Customer service: Sls. Dept.

Free literature available: Short form product catalogs, Application data sheets

Products manufactured: Indicators, Recorders

Local Sales Offices & Reps.

Cal Los Angeles, McCamey-Jones, Inc. 213-263-9812
 Cal Palo Alto, Priz-Co. 415-326-9333
 Cal San Diego, McCamey-Jones, Inc. 617-270-4333
 Colo Lakewood, Intermountain Instr., Inc. 303-237-0443
 Conn Durham, Marr Elec. Co. 203-349-9691
 Fla Cantonment, C.B. Metcalf Co. 904-476-7710
 Fla Orlando, Currie, Peak & Frazier, Inc. 305-855-0843
 Ill Schaumburg, Carvel Engrg. Co. 312-885-8800
 Ind Indianapolis, Tech Sls. & Mktg. 317-356-3658
 La Baton Rouge, Del Rio 504-927-9167
 Md Baltimore, Adcons, Inc. 301-655-5542
 Mass Wakefield, Stickney Engrg. Assocs. 617-245-4212
 Mich Royal Oak, Dave Lay Assocs. 313-576-4700
 Minn Minneapolis, Arjay Sls., Inc. 612-925-1833
 Mo St. Louis, C.F. Gast Co. 314-993-2870
 NJ Bogota, Neville & Vespo, Inc. 201-487-1505
 NJ Cinnaminson, Control Equip. Co. 609-829-1447
 NY Elbridge, L-Tron Corp. 315-689-3787
 NY Latham, L-Tron Corp. 518-785-5032
 NY Tonawanda, L-Tron Corp. 716-691-8887
 NC Charlotte, Systems Svc. Corp. 704-377-3407
 Ohio Cincinnati, G.H. Drysdale & Assocs. 513-752-2069
 Ohio Twinsburg, Crown Equip. Co. 216-656-2023
 Okla Tulsa, Lucas Controls Co. 918-749-6491
 Ore Portland, Brett Assocs., Inc. 503-232-4184
 Pa Pittsburgh, Gilson Engrg. Sls., Inc. 412-931-6114
 RI Narragansett, Westronics, Inc. 401-789-3763
 Tenn Hixson, G. Grant Co. 615-875-4633
 Tenn Memphis, B. White Assocs. 901-276-4437
 Tex Fort Worth, Southwest Controls Co. 817-268-1569
 Tex Houston, Haltom Co. 713-782-5625
 Tex Houston, Westronics, Inc. 713-467-5582
 Wash Medical Lake, Calvert Controls, Inc. 509-244-3601
 Wash Seattle, Brett Assocs. 206-935-8054

WHEELOCK SIGNALS, 273 Branchport Ave., Long Branch, N.J., 07740, Tel: 201-222-6880, TWX: 201-222-7091; Empl.: 100

Products manufactured: Bells, Buzzers, Gongs, Sirens & Aural Warning Devices, Relays

Local Sales Offices & Reps.

Ariz Phoenix, Portis & Assoc. 602-947-4379
Conn No. Haven, Comp. Rep. Assoc. 203-239-9762
Fla Orlando, Gra-Mar 305-841-2330
Kans Shawnee, J.F. Guernsey Co. 913-631-2414
Mass Needham, Comp. Rep. Assoc. 617-444-2484
Minn Mpls, R.W. Marshall Co. 612-929-0457
NY Clarence, Rep Tech 716-684-6250
NY East Northport, R.W. Keen Assoc. 516-757-7642
NY Syracuse, Rep Tech 315-437-2845
Ohio Dayton, Mid West Mktg. 513-433-2511
Pa Ambler, Wyncote Instr. 215-643-2440
Tex Dallas, Texport Elctn. Sls. 214-358-3521
Va Falls Church, Wycote Instr. Co. 703-532-3364
EXP: Ohio, Chagrin Falls, Midwest Mktg. 215-643-2440

WHITE INSTRS., INC., Box 698, Austin, Tex., 78767, Tel: 512-892-0752; FSC No: 03945; Empl.: 35

For info on price: T.H. White; Application info: C.V. Ryswyk; Customer service: T.H. White; Delivery info: T.H. White

Free literature available: Bulletins describing active and passive networks and feed-back circuits. Booklet on sound system equalization and bulletins describing sound system equalizers and real time analyzers.

Products manufactured: Analyzers, Equalizers, Filters, Generators, Networks

Advertisement

Manufacturers of wave filters, active and passive, in the audio spectrum and below. Standard and custom low, high, band pass and reject designs—Butterworth, Chebishev, Bessel or elliptic response characteristics—wide range of source and load impedances. Tuned, self-contained units ready to use—no external components to add. Rapid manufacture and delivery of production quantities. Fast prototype service.

WHITMOR WIRE & CABLE, 13161 Sherman Way Bldg. B, No. Hollywood, Cal., 91605, Tel: 213-764-6296; FSC No: 15851; Empl.: 23 p. 2-2072

For info on price: J. J. Serago; Application info: H. R. Weiss; Customer service: D. Norris; Delivery info: D. Norris

Products manufactured: Braid, Cable, Cable, Services, Assembly, Production & Test, Wire, Wire Shielding

Local Distributors

Ill No. Hollywood, Wirenetics Co., 13151 Sherman Way 213-765-5041

Advertisement

Electrical wire & cable manufactured to your individual needs and specifications. No minimum quantity. Most quotations given over first telephone call. Cables manufactured from customer furnished wire or ours. Many deliveries from stock. Complete MIL capabilities and flexibility permit short delivery time in days if necessary.

WHITSO, INC., 9326 Byron St., Schiller Park, Ill., 60176, Tel: 312-678-5200; Empl.: 200

Products manufactured: Services, Assembly, Production & Test, Terminals, Wire & Cable Ties

Local Sales Offices & Reps.

Cal El Segundo, C.W. Saxon & Assocs. 213-EA2-2111
Ind Indianapolis, Harkins Engrg. Sls. Co. 317-846-2949
Mass Waltham, Progressive Sls. Assocs. 617-899-4800
Minn Anoka, Inds. Mfg. Svc. 612-421-6027
NY Mt. Vernon, Elctns. Sls. 914-MO4-4866

Ohio Canfield, Mktg. Worldwide 216-533-6856
Okla Oklahoma City, R.E. Chappell 405-751-0097
Pa Narberth, S.A. Jeffries, Inc. 215-MO4-8500

WIDE BAND ENGRG. CO. INC., Box 21652, Phoenix, Ariz., 85036, Tel: 602-254-1570; Empl.: 6

For info on price: M. G. Ticknor; Application info: S. Ticknor; Customer service: S. Ticknor; Delivery info: M. G. Ticknor

Free literature available: SFC-1 Short form catalog with brief description of each of our 1-500 MHz broadband devices.

Products manufactured: Amplifiers, Analyzers, Attenuators, Bridges, CATV Systems & Equipment, Comparators, Couplers, Detectors, Dividers, Filters, Insertion Loss Measurement Systems, Loads, Electronic Variable, Switches, Terminals, Transformers

WIK-IT ELCTRNS. CORP., 140 Commercial St., Sunnyvale, Cal., 94086, Tel: 408-732-8560; Empl.: 12; Minimum order: \$30

Customer service: D. A. Wellsch

Products manufactured: Soldering Guns, Irons & Desoldering Tools

Local Sales Offices & Reps.

Cal Culver City, H. Feldman Co. 415-941-4525
Cal Los Altos, Ewing-Foley 415-941-4525
Ga Atlanta, Hollingsworth & Still Co. 404-255-8200
Ill Lincolnwood, B. Stein & Co.

WILBRECHT ELECTRONICS, INC., 240 Plato Blvd., St. Paul, Minn., 55107, Tel: 612-222-2791, Telex: 297-428; Empl.: 250; Minimum order: \$75

Customer service: J. A. Judge

Products manufactured: Resistors, Switches

Local Sales Offices & Reps.

Ariz Toward Engrg. 602-955-3193
Cal Collins & Hyde 415-941-3355
Ill Mamac Sls. 312-545-1033

WILD ROVER, See Refac/Wild Rover.

WILDER ENGRG. PRODS, INC., 4445 N. Ravenswood Ave., Chicago, Ill., 60640; Empl.: 30

Products manufactured: Amplifiers, Speaker Systems, Speakers

WILEY & SONS INC., J., Box 4192, Grand Central Sta., New York, N.Y., 10017

WILKINSON CO., 31011 Agoura Rd., Westlake Village, Cal., 91361, Tel: 213-889-0050; Empl.: 28; Minimum order: \$25

For info on price: J. Gutierrez; Customer service: J. Gutierrez; Delivery info: J. Gutierrez

Products manufactured: Alloys, Contact Strips, Finger, Forms, Wire, Metals, Preforms, Precious Metal, Tubing, Wire

WILLCO SALES, 302 Willis Ave., Mineola, N.Y., 11501, Tel: 516-294-9840; Empl.: 2

Customer service: W. F. Cosgrove

Products manufactured: Cabinets & Accessories, Cable, Meters, Power Supplies, Regulators, Resistors, Soldering Guns, Irons & Desoldering Tools, Stabilizers, Line Impedance, Tools, Transformers

WILLIAMS PRECIOUS METAL DIV., Williams Gold Refining, 2978 Main St., Buffalo, N.Y., 14214, Tel: 716-837-1000; Minimum order: \$50

Customer service: R. Fentner

Free literature available: Williams capabilities brochure with Precious Metals Reference Data and Most Commonly Used Precious Metal Alloys.

Products manufactured: Metals, Preforms, Precious Metal

Local Sales Offices & Reps.

Cal Fullerton, N. Nesbitt Co. 714-993-6330
Cal Mountain View, Charter Ind'l Sls. Co. 415-961-5514
Conn Old Saybrook, E.J. Hughes Assocs. 203-399-9100
Ill Zion, A.O. Capp Co. 312-872-8311
Ind Indianapolis, J.C. Butler Sls. & Engr. Corp. 317-253-5143
Kans Mission, Mid America Elctns. Mktg. Inc. 913-236-4800
Mass Attleboro, E.J. Hughes Assocs. 617-226-0050
Mass Beverly, E.J. Hughes Assocs. 617-927-7171
NJ Wyckoff, Component Parts Unlimited 201-445-6242

NY Penfield, J. Lazor Assocs. 716-385-3300
Pa Broomall, A.M. Tech. Sls. Co. 215-356-0574
Pa Pittsburgh, A.M. Tech. Sls. Co. 412-885-3363
Tex Richardson, R. Marston Co. 214-235-3824

WILMAR ELCTRNS. INC., 2430 Amsler St., Torrance, Cal., 90505, Tel: 213-326-6668; FSC No: 25248; Empl.: 20

Customer service: Z. Heifetz

Products manufactured: Current Sensors, Flashers, Monitors, Regulators, Relays, Testers

Local Sales Offices & Reps.

Cal San Francisco, E. & Gregory Co. 415-989-4137
Ill Skokie, Custom Electrical Sys. 312-679-1424
NH Nashua, Bell Controls Inc. 603-882-6984
Pa Jenkintown, Tech. Instr. Sls. Co. 215-885-6571
Wash Seattle, Seatronics, Inc. 206-767-4330

Advertisement

WILMAR ELECTRONICS, INC. is a manufacturer of Protective Relay, Power Monitors and Solid State Sensors.

Over/undervoltage relays, over/underfrequency relays, reverse power relays, phase failure & phase sequence relays; current, differential, paralleling, overload relays and monitors.

WILMORE ELCTRNS. CO., Box 2973, W. Durham Sta., Durham, N.C., 27705, Tel: 919-489-3318; Empl.: 30

p. 1-537-539, 1536-1538

Customer service: J. L. Harris

Products manufactured: Chargers, Battery, Controls/Control Eqpt., Converters, Inverters, Power Supplies

WILTRON CO., 930 E. Meadow Dr., Palo Alto, Cal, 94303, Tel: 415-321-7428, TWX: 910-373-1156; FSC No: 20944; Empl.: 76; Minimum order: \$10

Customer service: W. L. Baxter

Products manufactured: Amplifiers, Analyzers, Attenuators, Bridges, Cable Fault Locators, Couplers, Delay Lines, Detectors, Filters, Generators, Meters, Oscillators, Shifters, Testers

Local Sales Offices & Reps.

Ala Huntsville, Currie, Peak & Frazier 205-536-5650
Ariz Phoenix, Ariz-Mesa Engrg. Sls. 602-943-9213
Cal Palo Alto, Wiltron Co. 415-321-7428
Cal Anaheim, Blair Assocs. 714-635-1350
Cal San Diego, Mesa Engrg. Sls. Assocs. 714-278-8021
Cal San Jose, MCH Assocs. 408-246-7330
Colo Boulder, H. Bass Assocs. 303-499-7509
Fla Orlando, Currie, Peak & Frazier 305-855-0843
Ill Chicago, Scientific Sls. Corp. 312-775-7594
Ind Indianapolis, Scientific Sls. Corp. 317-253-4806
Kans Olathe, B. Rush Assocs. 913-782-1177
Md Randallstown, C. L. Malinow & Co. 301-922-2092
Mass Waltham, McBar Assocs. 617-890-0233
Mich Detroit, Harvey Teplitz & Co. 313-537-9058
Minn Bloomington, Scientific Sls. Corp. 612-881-3300
NJ Haworth, Central Assocs. 201-568-0808
NJ Pennsauken, Himmelstein Assoc. 609-662-3081
NM Albuquerque, Trembley Assocs. 505-293-4444
NY East Syracuse, Ossmann Instrs. 315-437-6666
NY Plainview, Central Assocs. 516-433-0808
NY Rochester, Ossmann Instrs. 716-328-2230
NY Vestal, Ossmann Instrs. 607-785-9947
NC Greensboro, Currie, Peak & Frazier 919-273-3040
Ohio Cleveland, Harvey Teplitz & Co. 216-371-2044
Ohio Dayton, Harvey Teplitz & Co. 513-277-6531
Tex Richardson, Lear Assocs. 214-231-5388
Wash Seattle, Delcom Sls. Co. 206-248-0090

WINCHESTER ELCTRNS., Div. Litton Inds., Main St. & Hillside Ave., Oakville, Conn., 06779, Tel: 203-274-8891

Products manufactured: Connectors

Local Sales Offices & Reps.

Ala Huntsville, Interop Assocs., Inc. 205-881-3677
Ariz Tempe, Litton Industries 602-968-2455
Cal North Hollywood, Litton Industries 213-985-8985
Cal Palo Alto, Quad Rep, Inc. 415-964-3532
Colo Littleton, Simpson Assocs. 303-798-8439
Fla Ormond Beach, Technology Mktg. Assocs. 904-672-2314
Fla Pompano Beach, Technology Mktg. Assocs. 305-942-0774

Ill	Chicago, L-Tec, Inc.	312-286-1500
Mass	Waltham, Litton Industries	617-890-2207
Minn	Minneapolis, Litton Industries	612-789-8851
Mo	Hazelwood, CenTech, Inc.	314-731-4220
Mo	Raytown, CenTech, Inc.	826-358-8100
NJ	Cherry Hill, Trinkle Sls. Co.	609-667-3500
NJ	Wayne, G. T. Assocs.	201-694-6040
NY	East Syracuse, Fountain, Young & Co.	315-437-7733
NC	Charlotte, Anthom, Inc.	704-527-1515
Ohio	Dayton, Compass Assocs.	513-252-9939
Tex	Dallas, Bouillion Engrg. Sls. Co.	214-376-1929
Wash	Seattle, Arneson Assocs.	206-762-7664

WINEGARD CO., 3000 Kirkwood St., Burlington, Iowa, 52601, Tel: 319-753-0121; Empl.: 300

For info on price: Sls. Dept.; Application info: Sls. Dept.; Customer service: Sls. Dept.; Delivery info: D. Krieger

Free literature available: CP2 catalog, 110 catalog, FF 276 277 284, stuffers WS1-13R-15-16-17

Products manufactured: Amplifiers, Antennas

WIRE CLOTH ENTERPRISES, INC., 130-132 Gamma Dr., R.I.D.C., Pittsburgh, Pa., 15238, Tel: 412-781-1390; Empl.: 8

For info on price: J. Albaker; Customer service: P. Borgilla; Delivery info: J. Albaker

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Screens, Printed Circuit, Services, Assembly, Production & Test

Advertisement

Quality materials for printed circuit production. Stainless Steel Wire Cloth and Synthetic Monofilament Fabrics woven to the highest quality standards of accuracy in wire diameter and thread count. Ask about our Screen Star Photo Emulsions. The most efficient "direct" emulsions in use today! Also, special polyurethane squeegee blades, all sizes.

WIREFLEX INCORPORATED, 502 Old Route 30 East, Bourbon, Ind., 46504, Tel: 219-342-5315; Empl.: 20; Minimum order: \$1

For info on price: E. C. Evanchik; Application info: E. C. Evanchik; Customer service: D. Vujnovich; Delivery info: D. Vujnovich

Free literature available: 4 pages on Type Wire We Manufacture.

Products manufactured: Braid, Cable, Cable, Wire

WIREMOLD CO., West Hartford, Conn., 06110, Tel: 203-233-6251, TWX: 710-425-6281; Empl.: 800

Products manufactured: Boxes, Junction, Outlets & Wall Plates, Connector Boxes & Strips, Power Outlet, Ducts, Wiring

Local Sales Offices & Reps.

Cal	Danville, J.R. Griffin	415-433-5744
Cal	Los Angeles, Airey-Thompson	213-264-1533
Cal	Denver, R.B. Schumann	303-534-1058
Conn	Farmington, E.W. Selna	203-673-4979
Conn	Hartford, Home Office	203-233-6251
DC	Washington, T.J. Pugh	202-296-3669
Fla	Tampa, J.D. Whetsell	813-988-5860
Ga	Decatur, R.L. Pace	404-981-4385
Ill	Des Plaines, R. E. Horn/J. Reisch	312-297-3240
Iowa	Des Moines, W.J. Kelley	515-243-4079
La	New Orleans, United Sls. Assoc.	504-733-8711
Md	Baltimore, A.B. French	301-825-1305
Mass	Boston, R.T. Bennett	617-246-1131
Mich	Detroit, M.F. Frazier Co.	313-535-0840
Minn	Minneapolis, H.G. Schendel	612-722-2226
Mo	Kansas City, V.A. Meier	816-452-9076
Mo	St. Louis, A.F. Tubbsing	314-842-2455
NJ	Jersey City, P.F. McGovern	201-433-5869
NY	Babylon, A.C. Bradbury	516-587-2318
NY	Elmira, R.C. Hill	607-734-5406
NY	New York, P.F. McGovern/J.E. Finley	201-963-3280

NY	North Syracuse, A. Simone	315-471-4201
NC	Charlotte, H.M. Short	704-334-7060
Ohio	Cincinnati, C.J. Wirtz	513-821-3254
Ohio	Cleveland, R. Najda	216-781-5135
Ore	Portland, D.A. King	503-228-1900
Pa	Glenmoore, W.A. Gibson	215-469-6453
Pa	Philadelphia, R.B. French	215-887-0964
Pa	Pittsburgh, W. Simon	412-421-9491
Tex	Dallas, W.R. Moseley	214-637-6342
Tex	Houston, R. LeMaster	713-523-1316

Tex	Salt Lake City, D.E. Blomquist	801-359-7074
Wash	Seattle, Strohecker, Inc.	206-623-0357
Wash	Spokane, W.D. Beach	509-624-2518

WISCO DIV., ESB Inc., 1222 18th St., Racine, Wisc., 53403, Tel: 414-637-9131, TWX: 910-271-2382

For info on price: E. W. Kronberg; Application info: G. P. Cook; Customer service: T. A. Parker; Delivery info: T. A. Parker

Products manufactured: Batteries

WORKMAN ELECTRONIC PRODS., INC., Box 3828, Sarasota, Fla., 33578, Tel: 313-371-4242; Empl.: 150; Minimum order: \$25

For info on price: J. Price; Application info: J. Klempka; Customer service: P. Rice; Delivery info: P. Rice

Products manufactured: Adhesives (All Types), Alternators, Antennas, Arresters, Electrical Surge, Lightning, Attenuators, Boards, Printed Circuit, Cable Assemblies & Harnesses, Cable, Calculators, Electrical & Electronic, Caps, Connector, CATV Systems & Equipment, Chargers, Battery, Chokes, Circuit Breakers, Clamps & Clips, Cleaners & Solvents, Coils Including Assemblies & Forms, Connector Adapters, Connectors, Controls/Control Eqpt., Converters, Coolants, Circuit & Components, Cords, Cores, Magnetic, Couplers, Diodes, Dummy Loads, Eliminators, Battery, Filters, Fuses, Heads, Recording Playback, Erase, Insulators & Insulation, Jack Adapters (All Types), Lamp Adapters, Lamps, Lights, Limiters, Lubricants, Meters, Microphones, All Kinds, Networks, Pickups, Telephone (For Recording), Plug Adapters, Plugs, Potentiometers, Protectors, Rectifiers, Refrigerators, Spray, Resistors, Retainers, Services, Assembly, Production & Test, Socket Adapters, Sockets, Solder (All Types), Spacers, Speakers, Splicers, Coaxial Cable, Splices, wire (Including, Butt & Cap Types), Switches, Tape Recording Accessories, Terminal Blocks, Boards & Strips, Terminals, Testers, Thermistors, Timers, Tools, Transformers, Transistors, Wire, Wire & Cable Ties, Wire Strippers

Local Sales Offices & Reps.

Alas	Anchorage, H. Lang & Assocs.	907-279-5741
Ariz	Phoenix, B. & G Sls. Co.	602-266-5624
Cal	Mt. View, Sinai-Johnson Inc.	415-967-1788
Cal	N. Hollywood, S. Lewis & Assocs.	213-877-0461
Cal	Redwood City, Sinai-Johnson Inc.	415-365-6263

Cal	San Francisco, Tech. Sls. Assocs.	415-467-1434
Colo	Colorado Springs, Norris & Co.	303-635-9319
Fla	Lakeland, Dixie Elect. Assocs.	813-682-6624
Fla	Miami, Raulson & Co.	305-264-6003
Ill	Hoffman Estates, G. Sangwin	312-884-0186
Ind	Indianapolis, Mid-Central Sls.	317-283-1727
Iowa	Des Moines, Lector Reps.	515-276-6387
Ky	Fern Creek, Mid-Central Sls.	502-239-5614
Md	Baltimore, EKP Assoc.	301-944-6677
Mass	W. Springfield, Larry Cole Inc.	413-781-3040
Mass	Wellesley, Larry Cole Inc.	617-237-1260
Mich	Detroit, R. Butchart Assocs.	313-773-7870
Minn	St. Paul, E.W. Oszman	612-488-1811
Mo	Liberty, Lector Reps, Inc.	816-781-2522
Mo	St. Charles, Lector Reps, Inc.	314-723-8736
NH	Manchester, Larry Cole Inc.	
NY	Brooklyn, I. Brown Co.	212-493-1379
NY	Camillus, Callahan-Ferguson Co.	315-487-3870
NY	Manlius, Callahan-Ferguson Co.	315-682-9301
NC	Burlington, E.P. Ester & Co.	919-584-1568
Ohio	Cleveland, H. Miller Sls. Co.	216-321-3900
Ohio	Jamestown, H. Miller Sls. Co.	513-675-2059
Ohio	Wickliffe, H. Miller Sls. Co.	216-585-3278
Pa	Bethlehem, EKP Assocs.	215-691-5250
Pa	Easton, EKP Assocs.	215-258-6484
SC	Rock Hill, Dixie Elect. Assocs.	803-328-3981
Tenn	Gallatin, Dixie Elect. Assocs.	615-452-1744
Tenn	Hendersonville, Dixie Elect. Assocs.	615-824-2923

Tex	Dallas, Techno Assocs.	214-357-9213
Wash	Seattle, D. Smith Sls. Co.	206-633-3160
Wisc	Brookfield, G. Sangwin	414-782-3240
EXP:	Miami Lakes, Fla., Manrep Corp.	305-822-7630
FOR:	Can., Downsview, Ont., L. Finkler LTD	416-630-9103

WORTEK, INC., 5971 Reseda Blvd., Tarzana, Cal., 91356, Tel: 213-881-1644; Empl.: 8

Customer service: W. O. Rumsey

Free literature available: Product brochures on single and multiple-output modular dc power supplies upon request. Includes specifications, package outlines, mounting data and pricing information.

Products manufactured: Power Supplies

WOVEN ELECTRONICS

WOVEN ELCTRNS., Southern Weaving Co., Box 189, Mauldin, S. C., 29662, Tel: 803-963-5131, TWX: 810-287-2091; Empl.: 150; Minimum order: \$50

p. 2-2068-2071

Customer service: P. Davis

Free literature available: 1. "New Twist in IC Interconnects" Sample with applications info. 2. "Basic Concepts of Woven Cable" 3. & 5. General Products Folder with Samples 4. "Fast Lead Exposure/Woven Cable"

Products manufactured: Cable Assemblies & Harnesses, Cable, Wire

Local Sales Offices & Reps.

Ala	Huntsville, Inco Tech.	205-837-6061
Cal	Mountain View, Reptronics	415-968-5550
Cal	Playa Del Rey, The Rep	213-821-6979
Fla	Alamonte Springs, WMM Assocs.	305-831-4645
Fla	Clearwater, WMM Assocs.	813-447-2533
Fla	Pompano Beach, WMM Assocs.	305-943-3091
Ill	Chicago, Electrical Cable & Access.	312-235-2830
Md	Bethesda, Warren Mount Co.	301-657-9312
Mass	Worcester, United Sls.	617-757-3872
Mich	Detroit, R. P. Urban & Assocs.	313-535-2355
Mich	Grand Rapids, R. P. Urban & Assoc.	616-245-0511
Mo	St. Louis, R. F. Carlson & Co.	314-961-4485
NJ	Hackensack, Trak Sls.	201-487-5075
NY	Manlius, Marden-Taylor Assoc.	315-446-9280
NC	Winston-Salem, Electronic Mktg. Assocs.	919-722-5151
Ohio	Cleveland, D. Steffen & Assoc.	216-461-8333
Ohio	Dayton, D. Steffen & Assocs.	513-293-3145
Pa	Jenkintown, Warren Mount Co.	215-886-0383
Pa	York, Warren Mount Co.	717-757-5823
SC	Greenville, Elctrn. Mktg. Assoc.	803-268-1125
Tex	Dallas, Precision Sls.	214-351-6964
Wisc	Wauwatosa, Larsen Assoc.	414-258-0529

WROUGHT WASHER MFG., INC., 2252 S. Bay St., Milwaukee, Wisc., 53207, Tel: 414-744-0771, TWX: 910-262-3101; Empl.: 400

Products manufactured: Fasteners

WYLE COMPUTER PRODS., INC., 128 Maryland St., El Segundo, Calif., 90245, Tel: 213-973-7571, TWX: 910-348-6283; Empl.: 80

For info on price: T. McEachran; Application info: R. Weyhrich; Customer service: R. Casselman; Delivery info: R. Casselman

Products manufactured: Boards, Plug-In, Boards, Printed Wiring, Universal, Cards, Linear Function, Cards, Logic, Converters, Punched Card Equipment, Terminal Equipment, Digital

X-ACTO, 48-31 Van Dam St., Long Island City, N.Y., 11101, Tel: 212-392-3333; Empl.: 150

Products manufactured: Clamps & Clips, Drills & Accessories, Hand & Power, Heat Sinks, Soldering, Knives & Knife Sets, Lubricants, Pliers, Screwdrivers, Tools, Tweezers, Hand & Vacuum

XCELITE, Div. Cooper Ind's., 170 Bank St., Orchard Park, N.Y., 14127, Tel: 716-662-4461

Customer service: C. Smith

Free literature available: Illustrated full line catalog.

Products manufactured: Cutters, Wire, Hand Operated, Drivers, Nut, Heat Sinks, Soldering, Pliers, Screwdrivers, Tools, Wire Strippers, Wrenches

Local Sales Offices & Reps.

Ala	Gadsden, F.C. Nickerson Co.	205-547-7718
Cal	Fullerton, J. Vombaur	213-733-1163
Cal	San Mateo, J.W. Hand	415-341-5516
Colo	Denver, Connors, Inc.	303-934-5829
Conn	Waterbury, Coakley, Boyd & Abbott	203-756-8766
Fla	Oldsmar, F.C. Nickerson Co.	813-855-4209
Ill	Genoa, B. Drobish	312-253-0057
Ind	Indianapolis, L.M. Devoe Co.	317-257-1227
Mass	Needham, Coakley, Boyd & Abbott	617-444-5470

Mich Southfield, Aztec Sls. Corp.313-642-0777
 Minn Minneapolis, R. Swanson Co.612-789-5636
 Mo Kansas City, K & M Sls. Co.816-471-1355
 Mo St. Louis, K & M Sls. Co.314-423-2420
 NY Flushing, Bettan Sls.212-591-7600
 NY N. Syracuse, Trademark Elctns.315-487-3870
 NC Kannapolis, F.C. Nickerson Co.704-932-6772
 Ohio Cleveland, J.O. Olsen Co.513-922-2176
 Pa Warminster, Cerf & Hagen215-343-1339
 Tenn Memphis, A.S. Engelman Co.901-458-6263
 Tex Dallas, C.W. Cortez Co.214-747-1031
 Va Richmond, D. Miller & Assoc.804-353-5324
 Wash Seattle, Fleehart & Sullivan206-522-1533

XCITON CORP., 5 Hemlock Dr., Latham, N.Y., 12110, Tel: 518-783-7726, TWX: 710-444-9692; FSC No: 53184; Empl.: 100; Minimum order: \$100

For info on price: A. Ligorner; Application info: J. Duncan; Customer service: J. Duncan; Delivery info: A. Ligorner

Free literature available: Literature on our comprehensive line of LED lamps and numeric displays.

Products manufactured: Crystals, Diodes, Display Devices/Displays, Semiconductor Wafer Fabrication

XENTEK, INC., 1550 B Linda Vista Dr., San Marcos, Calif., 92069, Tel: 714-744-3346, TWX: 910-322-1155; FSC No: 53279; Empl.: 20; Minimum order: \$25

For info on price: L. Kester; Application info: A. Peterson; Customer service: A. Myrwold; Delivery info: L. Kester

Free literature available: Xentek manufactures quality open-frame power supplies with single and multiple outputs. Outputs are available in any voltage from 2-32 volts, .1 amps to 100 amps.

Products manufactured: Power Supplies, Regulators

Local Sales Offices & Reps.

Ariz Scottsdale, Fryco602-945-3281
 Cal Cupertino, PM Sls.408-255-1771
 Cal Santa Monica, Rep Assocs.213-829-5401
 Colo Littleton, Eissler Sls. & Svcs.303-794-1779
 Ill Chicago, E. Joyner Co.312-968-8383
 Mass Natick, Wayland Engrg. Sls.617-655-6080
 Mo St. Louis, Gordon Fixman Engrg.314-725-5219
 Ohio Dayton, The Dynel Co.513-434-6467
 Okla Tulsa, Allied Comps. Inc.214-238-0408
 Tex Dallas, Allied Components Inc.214-238-0408
 Tex Houston, Allied Components Inc.713-691-3961
 Wash Seattle, Underwood/Jensen & Assoc.206-575-0123

XINCOM CORP., 8944 Mason Ave., Box 648, Chatsworth, Cal., 91311, Tel: 213-341-5040, TWX: 910-494-2769; FSC No: 15237; Empl.: 100; Minimum order: \$100

For info on price: J. Coons; Application info: J. Coons; Customer service: D. Moore; Delivery info: B. Sear

Free literature available: Enclosed are short form catalogs on pulse instrumentation & data conversion products along with several data sheets on various semiconductor test systems including options.

Products manufactured: Amplifiers, Comparators, Controllers, Programmable, Converters, Data Acquisition & Reduction Systems, Generators, Pulsers, Logic Test, Testers, Timers

Local Sales Offices & Reps.

Cal Sunnyvale, R. Bach408-732-3880

YASKAWA ELECTRIC AMERICA, INC., 4001 Westerly Pl., Newport Beach, Cal., 92660, Tel: 714-833-1436, Telex: 67-8396; Empl.: 4

Customer service: H. Matsuo

Products manufactured: Motors, Switches

YELLOW SPRINGS INSTRUMENT CO., Box 279, Yellow Springs, Ohio, 45387, Tel: 513-767-7241; Empl.: 250

Customer service: R. Heggemann

Free literature available: Pressure transducers, transmitters and indicators, Platinum temperature probes and transducers, indicators and transmitters, Precision interchangeable thermistors and temperature probes.

Products manufactured: Bolometers, Bridges, Controls/Control Eqpt., Gages, Indicators, Meters, Monitors, Probes, Radiometers, Recorders, Standards, Thermistors, Thermometers, Resistance, Transducers, Transmitters

Local Distributors

Cal Pasadena, RDX Corp., 110 S. Euclid213-792-4041

Cal Sunnyvale, RDX Corp., 1287 Lawrence Sta. Rd.408-734-4504
 Fla Orlando, Datarep Inc., Box 5929305-843-5224
 Ill Chicago, Liz Ind'l Sls., 1445 No. State Pkwy312-943-5122
 Ill Chicago, Newark Elec. Corp., 500 N. Pulaski312-638-4411

La Harvey, Gordon Instr. Co., Box 591504-368-6152

Mass Norwell, Bordewieck Engr., Box 323617-659-4915

Mich Brighton, Cesko Sls. Co., Box 155313-227-5061

Minn Minneapolis, Pilot Ind. Corp., 7400 Washington Ave. S.612-941-7400

NJ Cinnaminson, Control Equip. Inc., 464 N. Randolph609-829-1447

NJ Springfield, RJM Sls., Box 82201-467-1210

NY E. Rochester, Thermal Sys. Inc., Box 163716-377-1970

NY Syracuse, Thermal Sys., Box 117315-458-5202

NC Charlotte, Sloan Assoc., 3230 Piperhane Sect. N704-523-2122

Ohio Dayton, Whelan Corp., 4541 Gateway Cir.513-434-7551

Tenn Chattanooga, Coleman Assoc., Elder Mtn. Rt. 8615-821-0235

Tex Ft. Worth, Southwest Controls, 2416 Ludelle St.817-268-1569

Va Richmond, Sloan Assocs., 2120 Staples Mill Rd.804-359-6051

YEWTEC CORPORATION, Sub Yokogawa Elec. Works, Ltd., 1995 Palmer Ave., Larchmont, N.Y., 10538, Tel: 914-834-3550, TWX: 710-566-1104; Empl.: 47 p. 1*860-862,875

Free literature available: General Catalog. Individual catalogs on each instrument.

Products manufactured: Amplifiers, Analyzers, Bridges, Computers, Converters, Decade Boxes, Meters, Multipliers, Oscilloscopes, Direct Writing, Potentiometers, Pyrometers, Recorders, Shunts, Meter, Standards, Testers

Local Sales Offices & Reps.

Ala Huntsville, Incotech, Inc.205-837-6061
 Cal Palo Alto, Held & Mollard415-965-9321
 Fla Longwood, Saber Assocs.305-422-3686
 Ill Chicago, Penn Engrg.312-338-3835
 Ind Galtersburg, Wright Co.202-296-0979
 Mass Acton, Applied Meas.617-263-2766
 Minn Minneapolis, Heimann Co.612-861-6051
 Mo St. Louis, Hitts & Assocs.314-426-2322
 NY Great Neck, Industuron Assoc.516-487-2620
 NY Liverpool, Rayelco Elctn.315-652-5272
 Ohio Columbus, Meas. Instrs.614-488-9753
 Pa Orland, Technical Sls.215-885-5145
 Tex Richardson, Lear Assoc. Inc.214-231-5388

YIG-TEK CORP., 1725 De La Cruz Blvd., Santa Clara, Cal., 95050, Tel: 408-244-3240, TWX: 910-338-0293; Empl.: 69

For info on price: T. Clark; Application info: T. Clark; Customer service: M. Jones; Delivery info: M. Jones

Free literature available: 1. Product catalogue which lists our products and gives specifications and outline drawings. 2. Application Note, which explains how YIG-tuned products work and where they can be used.

Products manufactured: Crystals, Discriminators, Filters, Oscillators, Preselector-Mixers

Local Sales Offices & Reps.

Ariz Scottsdale, Electronic Entrs.602-946-9860
 Cal Mountain View, Donlay Assocs.415-968-7500
 Cal Van Nuys, C.W. Swift & Assocs.213-873-4778
 Colo Denver, Thorson Co.303-759-0809
 Fla Palm Bay, Spartech Assocs.305-727-8045
 Ga Smyrna, Spartech Assocs.404-432-3644
 Ill Park Ridge, R.F. Specialists312-698-2044
 Kans Shawnee Mission, EIR Co.913-363-0919
 Md Silver Springs, Eastern Instrumentation301-681-6500
 Mass Cochrutuate, Micronic Assocs.617-872-6561
 NM Albuquerque, Electronic Entrs.505-256-3561
 NY Skaneateles, Robtron315-685-5731
 Ohio Dayton, Comtel Sterling513-298-7573
 Pa Newton Square, SWR Assocs.215-356-8550
 Tex Arlington, N & W Sls.817-461-4443
 Wash Seattle, Rush Drake Assocs.206-763-2755

ZEHNTEL, INC., 2440 Stanwell Dr., Concord, Cal., 94520, Tel: 415-676-4200; Empl.: 28

Customer service: Mktg. Dept.

Free literature available: Technical Article - Computerized approaches to analog subassembly; Data Sheet - Trouble Shooter II in-circuit test systems; Data Sheet - Testpac III functional test system.

Products manufactured: Switches, Telephone Channel Test & Simulator Equipment, Test Systems, Testers

Local Sales Offices & Reps.

Ala Huntsville, Gentry Assocs.205-534-9771
 Cal Woodland Hills, Burtis Instrumentation Sls.213-887-5863
 Conn Middletown, McBAR Assocs.203-865-4376
 Fla Orlando, Gentry Assocs.305-894-4401
 Ill Chicago, Solid State Elctns.312-889-8033
 Kans Shawnee Mission, E.I.R. Co.913-362-0919
 Mass Waltham, McBAR Assocs.617-890-0233
 Mich Detroit, Group Ten313-549-3910
 Minn Minneapolis, Engrg. Prods. Assocs.612-925-1883
 Miss Hazelwood, E.I.R. Co.314-895-4100
 NY Port Chester, Radiation Elctns.914-937-2300
 NC Burlington, Gentry Assocs.919-227-3639
 Ohio Dayton, Group Ten513-277-6531
 Okla Norman, Data Mktg. Assocs.405-364-8320
 Tex Houston, Data Mktg. Assocs.713-686-9627

ZELTEX, INC., 1000 Chalomar, Concord, Cal, 94520

ZENITH CONTROLS INC., 830 West 40th St., Chicago, Ill., 60609, Tel: 312-247-6400; Empl.: 125

For info on price: V. Helford; Application info: R. Ellis; Customer service: R. Morris; Delivery info: D. Leri

Free literature available: Zenith Timer Brochure contains a capsule description of the design and function of Zenith's full line of timing controls for original equipment manufacturers.

Products manufactured: Chargers, Battery, Delays, Time (Excluding Delay Lines, Timers, Delay & Relays, Time-Delays), Relays, Switches, Timers

Local Sales Offices & Reps.

Ariz Phoenix, A. Norton Co.602-278-6481
 Cal El Cerrito, Saletta Sls.415-236-9191
 Cal Los Angeles, H.S. Eales Co.213-776-4410
 Colo Englewood, L.S. Reed & Co.303-761-6154
 Fla Brandon, J. Meeks & Assoc.813-689-6137
 Ga Atlanta, Holman-Lobsinger Co. Inc.404-256-9120
 Ill Westchester, Wasson-Gallagher Inc.312-344-0690
 Ind Indianapolis, Indiana Electrical Sls.317-849-3880
 La New Orleans, A. Levin & Assoc. Inc.504-524-8489
 Mass Bedford, Interact Sls. Co.617-667-5656
 Mich Livonia, A.J. Riopelle Co.313-427-9114
 Minn Minneapolis, A.M. Johnson Co.612-927-8741
 Mo St. Louis, L.E. Brunson Co.314-522-6006
 Neb Omaha, Electric Equip. Sls. Co.402-556-4198
 NJ Berkley Heights, R.P. Luce & Co. Inc.201-464-6440
 NY New Hyde Park, R.P. Luce & Co., Inc.516-437-4550

NY New York, NEPA Inc.212-867-0340
 NC Charlotte, L.P. Spoon Inc.704-372-3290
 Ohio Cleveland, Loesch Assoc. Inc.216-241-4581
 Pa Fort Washington, Variable Elec. Prod. Co.215-TU4-5375
 Tenn Memphis, Vincent Sls. Agency901-682-4187
 Tex Dallas, Andres & Boruch Co.214-621-3601
 Va Richmond, Marchant & Field Sls.804-262-7333
 Va Vienna, Jemco Assoc., Inc.703-938-0003
 Wash Seattle, Clair Stebbins Co.206-CH 6-1170
 Wisc Milwaukee, E.M.E. Assoc.414-354-5115

ZENRAD CONTROLS CO., 529 E. Gutierrez St., Santa Barbara, Ca., 93103, Tel: 805-965-4996; FSC No: 33180; Empl.: 9

Products manufactured: Boards, Printed Circuit, Machines/Machinery, Production, Screens, Printed Circuit, Services, Assembly, Production & Test

ZERO MFG. CO., 777 Front St., Burbank, Cal., 91502; Empl.: 1260 p. 1*106-109

For info on price: E. V. Schirmer; Application info: M. S. Huffman

Free literature available: Design and manufacture of electronic and environmental packaging systems for industrial and government applications and cabinets and consoles for the computer and instrumentation industries.

Products manufactured: Air Cleaners & Filters (Shielded & Unshielded), Benches, Consoles, Stools, Tables, Bezels, Shielded & Unshielded, Bins, Part Storage, Blowers & Fans & Accessories, Boxes, Junction, Outlets & Wall Plates, Bus Bars & Systems, Cabinets & Accessories, Cable Assemblies & Harnesses, Cable Retractors, Cans, Capacitor, Relay, Semiconductor, Transformer, etc, Carts & Dollies, Instrument & Equipment, Cases, Equipment, Instrument, Meter, Cases, Transit, Cavities, Microwave, Chassis, Circuit Board Mounting, Chassis, Metal, Connector Boxes & Strips, Power Outlet, Containers, Covers, Protective (Including Dust), Drawers, Sliding, Frames, Cabinet & Rack, Grilles, Handles For Cabinets, Circuit Boards, Racks, etc., Honeycomb Sheets, Panels, etc., Mounts, Panels, Racks, Services, Assembly, Production & Test, Slides, Cabinet & Chassis, Spacers, Stands, Instruments

Local Sales Offices & Reps.

Ariz Phoenix, Howe & Howe Sls., Inc.602-264-7971
 Cal Burbank, Zero-West Div.213-846-4191
 Cal Palo Alto, Northern Cal Sls. Off.415-964-7700
 Cal San Diego, Clark & Co.714-296-6351
 Colo Denver, Grifco303-722-4674
 Fla Orlando, Dataprep, Inc.305-843-5224
 Fla St. Petersburg, Dataprep813-345-8503
 Fla St. Petersburg, Zero-So. Div.813-531-8991
 Ill Chicago, Carlson Elctns. Sls.312-774-9022
 Ind Indianapolis, L.M. DeVoe Co.317-257-1227
 La New Orleans, Davies Assocs.504-522-9027
 Md Baltimore, R. P. Luce & Co.301-752-8200
 Mass Monson, Zero-East Div.413-267-5561
 Mich Dearborn, VPI Inc.313-271-4600
 Minn Minneapolis, S. Clothier Co.612-888-4666
 Mo St. Louis, Carlson Elctn. Sls.314-991-0262
 NJ Berkeley Heights, R.P. Luce & Co.201-464-6440
 NM Albuquerque, Fry-Gates505-298-1875
 NY East Syracuse, Fountain Young & Co.315-437-7733
 NY New Hyde Park, R.P. Luce & Co.516-437-4550
 Ohio Dayton, N. Bear Corp.513-299-3566
 Ohio Richfield, N. Bear Corp.216-659-3131
 Pa Philadelphia, R.P. Luce Co.215-884-8365
 Pa Pittsburgh, B.E. Gibson Co.412-823-8310
 Tenn Franklin, Vaughn Sls. Co.615-794-7557
 Tex Dallas, J. Gibbs & Assocs.817-430-1861
 Tex Fort Worth, J. Gibbs & Assocs.817-237-1455
 Wash Bellevue, Ruggles Tech. Sls.206-455-2778
 EXP: Etobicoke, Ontario, Can., C.A. Pipe & Assocs.416-622-3403

Local Distributors

Ind Indianapolis, Graham Elctns., 133 S. Pennsylvania Ave.317-634-8202
 Mass Woburn, Rush Industries, Inc., 122 Cummings Park Dr.617-935-2400
 Mich Farmington, Harvey-Michigan Inc., 23461 Industrial Park Dr.313-477-1650

ZEUS IND'L PRODS., Foot of Thompson St., Raritan, N.J., 08869, Tel: 201-526-0800, TWX: 710-480-9346; Empl.: 38; Minimum order: \$25

Customer service: R. D. Hoyt

Products manufactured: Clamps & Clips, Tubing

ZI-TECH DIV., Aikenwood Co., Box 26, 223 Forest Ave., Palo Alto, Cal., 94302, Tel: 415-326-2151; Empl.: 7
 For info on price: L. Erlund; Application info: G. Ziman; Customer service: G. Ziman; Delivery info: L. Erlund

Products manufactured: Calibrators, Comparators, Connectors, Controls/Control Eqpt., Current Sources, Dividers, Indicators, Meters, Potentiometers, Power Supplies, Probes, Recorders, References, D-C Voltage, Standards, Switches, Testers, Transducers, Voltage Sources

ZIERICK MFG. CORP., Radio Circle, Mt. Kisco, N.Y., 10549, Tel: 914-666-2911; Empl.: 90; Minimum order: \$15

Customer service: Sls. Dept.

Products manufactured: Clamps & Clips, Connectors, Eyelets, Fasteners, Machines/Machinery, Production, Pointers, Dial, Posts, Services, Assembly, Production & Test, Terminal Blocks, Boards & Strips, Terminals, Tools

Local Sales Offices & Reps.

Ill Chicago, K. D. Engle Co.312-539-1820
 Ind Indianapolis, K. D. Engle Co.317-356-3001

Local Distributors

Cal Los Angeles, Timco Inc., 5808 Monterey Rd.213-254-5101
 Ill Chicago, Waldom, Inc., 4625 W. 53rd St.312-585-1212*

ZIPPERTUBING CO., 13000 S. Broadway, Los Angeles,

Calif., 90061, Tel: 213-321-3901, TWX: 910-346-6713

Products manufactured: Braid, Cable, Cable, Caps,

Connector, Coatings, Conductive Plastic

Materials, Conduit, Electrical, Cords, Fabrics,

Conductive, Holder & Carriers, Insulators &

Insulation, Integrated Circuit Packaging Systems,

Jumpers, Kits, Connector, Kits, Marking (Dial,

Instrument, Equipment, etc.), Kits, Shielding,

Machines/Machinery, Production, Protectors,

Seals, Shields, Sound Absorbing Materials,

Splices, wire (Including, Butt & Cap Types), Strain

Reliefs, Cable & Wire, Strips, Tapes, Films & Foils,

Pressure Sensitive, Tubing, Wire, Wire & Cable

Ties, Wire Markers, Wire Shielding

Local Sales Offices & Reps.

Ariz Phoenix602-967-8888
 Fla Orlando305-671-7399

Ill Chicago312-289-3000
 Md Baltimore301-675-3365
 Mass Boston617-429-6780
 NJ Totowa201-256-4980
 Ohio Cleveland216-734-3286
 Tex Dallas214-521-9240

ZIRCONIUM CORP. OF AMER., See Zircoa Div. Corhart Refractories

ZONIC TECHNICAL LABS., 8927 Rossash Ave., Cincinnati,

Ohio, 45236, Tel: 513-891-6390, TWX: 810-461-2470;

Empl.: 50; Minimum order: \$50

For info on price: T. A. Dunlap; Application info: T. A.

Dunlap; Customer service: D. W. Parsons; Delivery

info: D. W. Parsons

Products manufactured: Recorders, Testers

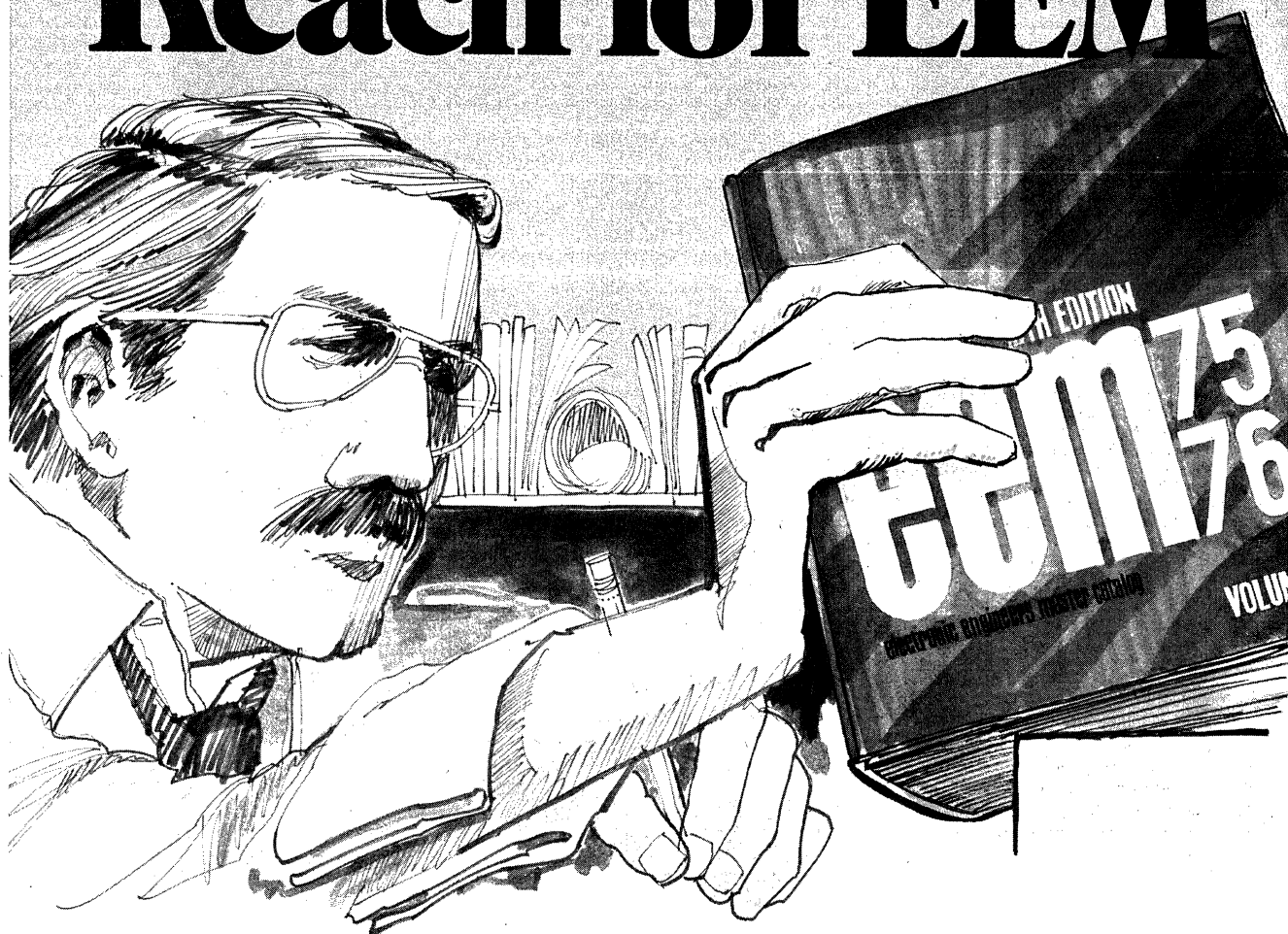
Local Sales Offices & Reps.

Ala Huntsville, BCS Assocs.205-881-6220
 Ariz Scottsdale, Barnhill Three
 Cal Belmont, Fisher Assocs.415-592-5711
 Cal Montebello, Tucul Engrg. Co.213-728-7397
 Colo Denver, Barnhill Three
 Conn Hamden, Northeast Engrg.203-248-4481
 Fla Orlando, BCS Assocs.305-896-4881
 Ga Decatur, BCS Assocs.404-321-0980
 Md Silver Springs, K. G. Elctns.
 Mass Danvers, Northeast Engrg.617-774-3010
 Mo St. Louis, Adelphi, Inc.314-821-1232
 NM Albuquerque, Barnhill Three
 NY Great Neck, Measurement Technology
 NC Greensboro, BCS Assocs.919-273-1918
 Pa King of Prussia, Letronix215-265-1020
 Tex Houston, Barnhill Two
 Tex Richardson, Barnhill Two
 Wash Bellevue, Topp Engrg. Sls. Corp.

**Last Page of this Section.
 Distributors' Directory starts on Page 401.**

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

18TH EDITION

cem 75 76

DISTRIBUTORS DIRECTORY

The Distributors Directory provides a geographic listing of more than 2,000 electronic distributors and their branch locations. Distributors are listed by state, alphabetically, and by city within the state, also alphabetically. Addresses, telephone numbers and names of key sales personnel appear for each distributor listed.

DISTRIBUTORS DIRECTORY — GEOGRAPHICAL

ALABAMA

ANDALUSIA

WHOLESALE ELECTRONICS SUPPLY CO., 817 River Falls St., 36420, (205) 222-5100, Inside Sls. Contact: J. Ward

BIRMINGHAM

ACK SEMICONDUCTORS, 3101 Fourth Ave., So., 35233, (205) 322-0588

ALLIED ELECTRONICS, 2900 Bessemer Rd., 35208, (205) 787-1408

CLARY CO., J. W., 1713 2nd Ave., 35233, (205) 322-2486, Inside Sls. Contact: R. Thomas

ELECTRONIC SUPPLIES, INC., 2900 Bessemer Rd., 35208, Inside Sls. Contact: M. T. Dennis

FORBES DISTRIBUTING CO., 1416 4th Ave. South, 35233, (205) 251-4104

M G ELECTRONICS & EQUIPMENT CO., 3112—6th Ave., So., 35233, (205) 328-4525, Inside Sls. Contact: M. Koch

WESTSIDE ELECTRONIC SUPPLY CO., 6510 1st Ave. N., 35206, (205) 591-2181, Branch Mgr.: F. Bell

WESTSIDE ELECTRONIC SUPPLY CO., 632 Tuscaloosa Ave., 35211, (205) 785-1139, Pres.: H. E. Tanner, V. P.: E. W. Thomas

WESTSIDE ELECTRONIC SUPPLY CO., 1711 Greensboro Ave., 35401, (205) 759-1259, Branch Mgr.: M. Sanford

DECATUR

FORBES DISTRIBUTING CO., 1522 5th Ave. S.E., 35601, (205) 353-4762

MOCK DISTR. CO., 902 Bank St., 35601, (205) 353-6324, Branch Mgr.: W. W. Mock

DOTHAN

CARMICHAEL WHOLESALE SUPPLY CO., Box 845, 36301, Inside Sls. Contact: A. Carmichael, III

HAND SUPPLY CO., 705 S. Oates St., Box 1430, 36301

GADSDEN

NICKERSON CO., Box 1504, 35901, (205) 547-7718, Branch Mgr.: D. Gross

HUNTSVILLE

CRAMER/HUNTSVILLE, INC., 2310 Bob Wallace Ave., S.W., 35805, (205) 539-5722

HALL-MARK ELECTRONICS, 4739 Commercial Dr., 35805, (205) 837-8700

HALL-MARK/HUNTSVILLE, Box 1133, 35801, (205) 539-5722, G. Privett

HAMILTON/AVNET, 805 Oster Dr., N.W., 35805, (205) 533-1170, Inside Sls. Contact: G. Helleson

HUNTSVILLE RADIO SERVICE INC., 2402 Clinton Ave. W., 35805, (205) 534-4232

MOCK ELECTRONICS, 2310 Memorial Pkwy. So., 35801, (205) 539-2401, Gen. Sls. Mgr.: V. T. Mock

POWELL ELECTRONICS, 803 Oster Dr., 35807, (205) 539-2731, TWX: 810-726-2231, Branch Mgr.: B. Rogers

MOBILE

ALABAMA CONTROLS CO., Box 7154, (205) 479-2345

BROWNELL ELECTRO INC., 3450 Armour Dr., 36607, (205) 479-5405, Branch Mgr.: J. Moss

ELECTRONIC SUPPLY CO., 561 Holcombe Ave., 36606, (205) 478-0455

ELECTRONICS WORLD, INC., 2106 Airport Blvd., 36606, (205) 471-3431, Mktg. Mgr.: G. B. Nervine

GRICE ELECTRONICS, INC., 3698 Airport Blvd., 36608, (205) 342-2062, Branch Mgr.: R. Sidebottom

LOMBARD'S ELECTRONIC SUPPLY CO., 561 Holcombe Ave., 36606, (205) 478-0455

SPECIALTY DISTR. CO., 1276 Belt Line Hwy., 36609, (205) 344-0450, Branch Mgr.: L. Turner

ODENVILLE

CROWE CO., L. M., Rte. 1 — Box 129-A, (205) 629-5475

OPELIKA

SOUTHERN ELECTRONICS CORP., Box 447, 309 So. 10th St., 36801, (205) 745-6428, Inside Sls. Contact: R. C. Scott, Jr.

SELMA

POE ELECTRONICS PARTS, INC., 8 Sylvan St., Box 1014, 36701, Inside Sls. Contact: W. Howard Poe

RADIO PARTS, INC., 1125 Church St., 36701, (205) 872-7451, Branch Mgr.: R. Mills

TROY

RADIO PARTS, INC., 208 College St., 36081, (205) 566-0325, Branch Mgr.: F. Todd

TUSCALOOSA

RADIO PARTS, INC., 402 20th Ave., 35401, (205) 758-5585, Inside Sls. Contact: T. Todd, Jr.

ALASKA

ANCHORAGE

ALASKA BUSSELL ELECTRIC CO., (907) 279-2150

ALASKA EXPEDITORS, 3685 Arctic Blvd., (907) 279-1923

WIRE COMMUNICATIONS, 4134 Ingra St., 99503, (907) 279-9551

YUKON RADIO SUPPLY, 3222 Commercial Dr., 99801, (907) 277-7117, Inside Sls. Contact: J. Jasper

YUKON RADIO SUPPLY, 1231 W. Northern Lites, 99510, (907) 274-4423, Branch Mgr.: T. Witt

FAIRBANKS

INTERCOASTAL, INC.

YUKON RADIO SUPPLY, 1112 Cushman St., 99701, (907) 452-1011, Branch Mgr.: N. E. Bosnakis

JUNEAU

JUNEAU ELECTRONICS, 241 S. Franklin St., 99801, (907) 586-2260, Gen. Sls. Mgr.: S. Belzak

VALDEZ

YUKON RADIO SUPPLY, Box 623, 99686, Branch Mgr.: C. H. Sappah

ARIZONA

MESA

HI FI SALES, INC., 764 W. Main St., 85201, (602) 969-1338, Mktg. Mgr.: C. Upchurch

PHOENIX

BLACK & RYAN ELECTRONIC PARTS, 120 S. 27th St., 85034, (602) 275-4115, Mktg. Mgr.: B. Counce

CRAMER DISTRIBUTING, 100 W. Camelback Rd., (602) 279-1231

CRAMER ELECTRONICS INC., 2643 E. University Dr., 85034, (602) 267-7321

CULVER-GRUNOW ELECTRONICS CO., 6042 N. 16th St., 85016, (602) 264-2151

DALIS ELECTRONIC SUPPLY, 917 N. 7th St., 85006, (602) 218-8111, Inside Sls. Contact: K. Camp

DAMARK INDUSTRIES, 5121 N. 40th St., #209B, 85018, (602) 959-5710, Branch Mgr.: D. Zibelli

ELECTRONIC PARTS CO., 1930 N. 22nd Ave., 85009, (602) 257-1040, Branch Mgr.: H. H. Heath

ESSEX INTERNATIONAL, INC., 2102 N. 23rd Ave., 85009, (602) 258-4589

GRAMER & CO., 100 W. Camelback Rd., 85013, (602) 279-1231, TWX: 910-951-1407, Inside Sls. Contact: J. Hopper

HAMILTON/AVNET—PHOENIX, 2615 S. 21st St., 85034, (602) 275-7851, Branch Mgr.: V. JuDay

KIERULFF ELECTRONICS, 2633 E. Buckeye Rd., 85034, (602) 273-7331, TWX: 910-951-1550, Mgr.: P. Graham

LIBERTY ELECTRONICS, 3130 North 27th Ave., 85017, (602) 257-1272, TWX: 910-951-4282

METERMASTER, 2633 E. Buckeye Rd., 85034, (602) 273-7331, TWX: 910-951-1550, Mgr.: J. Smith

MIRCO ELECTRONIC DISTR., 2104 W. Peoria Ave., 85029, (602) 944-2281

MOLTRONICS, INC., 2746 W. Palm Lane, 85009, (602) 272-7951, TWX: 910-951-1512

MORGAN AGENCY, J. R., 1914 E. Buchanan, 85034, (602) 252-3089, Sls. Mgr.: R. Morgan

PARTS ELECTRONICS, 1310 No. 7th St., 85006, (602) 258-6476, Inside Sls. Contact: G. Blake

RICHEY ELECTRONICS, INC., (602) 959-0271, Branch Mgr.: J. Wright

SERVICE SUPPLY CO., (602) 264-6126

STERLING ELECTRONICS, 1930 N. 22nd Ave., 85005, (602) 258-4531, Branch Mgr.: H. Martinez

TIME ELECTRONICS-SOUTHWEST, INC., 4248 S. 37th St., (602) 243-1288, Inside Sls. Contact: R. Hultman

WEATHERFORD, R. V., CO., 1917 No. 25th Dr., 85009, (602) 272-7144, TWX: 910-951-0636, Branch Mgr.: L. Halvorson

SCOTTSDALE

INTER-MOUNTAIN ENGINEERING, 4533 N. Scottsdale Rd., (602) 947-7379

VANGUARD SUPPLY CO., 10333 N. Scottsdale Rd., (602) 948-2240

WACO ELECTRONICS, 7117 Third Ave., 85251, (602) 947-4297, TWX: 910-950-1187, Branch Mgr.: T. Chislock

TEMPE

MARSHALL INDS., 835 W. 22nd St., 85281, (602) 968-6181, Branch Mgr.: R. Lamoure

TUCSON

DALIS ELECTRONIC SUPPLY, 3380 E. Ajo Way, 85006, (602) 889-6391, Branch Mgr.: E. Loya

ELLIOTT ELECTRONICS INC., 1055 E. 18th St., 85719, (602) 884-7394, Inside Sls. Contact: G. Travis

INLAND ELECTRONIC SUPPLY CO., 715 E. Broadway, 85719, (602) 624-4402, Inside Sls. Contact: M. M. Moon

ROH'S INC., 4553 E. Broadway, 85711, (602) 327-5929

ARKANSAS

ARKADELPHIA

MID STATE SUPPLY, 704 Main St., 71923, (501) 246-5893, Inside Sls. Contact: J. White

CROSSETT

LAUNIUS ELECTRONICS, 118 Main St., (501) 364-3015

EL DORADO

INDUSTRIAL ELECTRONIC SUPPLY INC., 413 W. Main St., 71730, (501) 862-4901, Inside Sls. Contact: T. Norris

LAVENDER ELECTRONICS, INC., 522 W. Main St., 71730, (501) 862-4218, G. Goodnight

FORT SMITH

ARKO-INTERSTATE ELEC. CO., 37 So. 4th St., 72901, (501) 782-4601, Br. Mgr.: J. Storment

CARLTON-BATES CO., 302 N. 6th St., 72901, (501) 782-7258, Pres.: W. Bates

CARLTON-BATES CO., 4420 Wheeler Ave., Box 22, 72901, (501) 646-8201, Sls. Mgr.: D. Bates

CARTER ELECTRONIC SUPPLY CO., 301 Towson Ave., 72901, (501) 783-4129, Inside Sls. Contact: T. E. Carter

WISE WHOLESALE ELECTRONICS, INC., 1001 Towson Ave., 72901, (501) 783-8925, Inside Sls. Contact: P. Tucker

HOT SPRINGS

PRINCE ELECTRONICS CO., 541 Ouachita Ave., 71901, Inside Sls. Contact: G. L. Prince

JONESBORO

BLUFF CITY DISTRIBUTING CO., 324 Huntington, 72401, (501) 932-7811

LITTLE ROCK

CARLTON-BATES CO., Scott Hamilton Dr. at 69th St., 72209, (501) 560-9100, Inside Sls. Contact: E. Evans

LAVENDER ELECTRONICS, INC., 1122 Center St., 72202, (501) 372-0248, R. E. Mowery

SOUTHERN ELECTRONICS, 1417 Main St., 72206, (501) 372-4197

SPEAKEASY ELECTRONICS, 3623 Kavanaugh St., 72207, (501) 666-0660

STANLEY COMMUNICATIONS CO., 6819 Scott Hamilton Dr., 72209, (501) 562-9200, Branch Mgr.: K. White, Jr.

PARAGOULD

MARTIN WHOLESALE RADIO SUPPLY, INC., Box 639, 72450, Inside Sls. Contact: J. R. Martin, Sr.

PINE BLUFF

CARLTON BATES CO., 1510 State St., 71601, (501) 535-1354, Branch Mgr.: M. Hurst

SPRINGDALE

WISE RADIO & TV SUPPLY, INC., 710 N. Thompson, 72764, (501) 751-4814, Branch Mgr.: R. Robertson

TEXARKANA

INTERSTATE ELECTRIC CO., 307 Front St., 75501, (501) 772-3751, Branch Mgr.: J. Kelly

LAVENDER ELECTRONICS, INC., 520 E. Fourth St., Box 1168, 75501, (501) 773-4631, Gen. Sls. Mgr.: R. L. Lavender

AUTHORIZED



DISTRIBUTOR

Mock Electronics, Inc.

WHOLESALE ELECTRONICS

2310 Memorial Pkwy., So. Huntsville, Alabama
Phone (205) 539-2401

Store in
DECATUR
353-6324

Index to Manufacturers Lines We Stock or Can Quote on:

ARRL	Electro Products	Lectrohm	Robins
Adel	Electro Voice	Leecraft	Rohn
Ademco	Electronic Instrument	Littelfuse	Raytheon
Adjust-O-Volt	Elmenco	Little Joe	Russell
Advance	EQUIPTO	Linemaster	
Akro-Mils	Essex/Stancor	Lowell	Sams
Alco	Essico	Ludlow	Sarkes-Tarzian
Alpha	Erem	Luxo	Scotch
American Beauty	Ersin	Lyons Metals	Sencore
Amperex	Eveready		Shure
Amperite			Simpson
Amphenol	Fanon	Machlett	Smith
Ampli-vox	Fasco	Macdonald	Sola
Amprobe		Mallory	Spemco
Andrew	GC	Master Appliance	Sprague
Antenna Specialists	GE	Matrix	Soundolier
Antex	Garrard	Meissner	Spaulding
Arco	General Cement	Memcor	Staco
Argos	General Electric	Metal Works	Stancor
Arrow Hart	Gramer Halldorson	Millen	Standard
Astatic	Greenlee	Miller	Supèrex
Atlas	Gremar	Milwaukee	Superior
Audio	Guardian	Misco	Sylvania
Automatic		Moody	Swing-O-Lite
Autotron	Halldorson	Moody	Switchcraft
BVI	Hallicrafter	Mosley	
B & K	Hamlin	Motorola	Talk-A-Phone
B & W	Hammarlund	Mueller	Telex
Barker & Williamson	Harmon-Kardon	Mullard	Terado
Belden	Harvey Hubbell	Multi-core	Thorardson
Birnbach	Hart & Hegeman	Mura	3M Company
Blonder-Tongue	Hexacon		Triad
Bogen	Howard W. Sams	National	Trimm
Bud	Hickok	Nemachron	Triplett
Burgess	Hunter	Newtronics	TRW
Bussmann	Hy-Gain	Newcomb	Turner
		No-Noise	
C-J	Ico/Rally	North American	
CBC	Ideal	Nortronics	
Centralab	Illumitronics		
Channel Master	Industrial	Oaktron	Ungar
Chemtronics	Injectoral	Ohmite	Union Carbide
Chicago Miniature	Intermatic	Oneida	University
Cinch Jones	International Rectifier	Oryx	UTC
Clarostat	International Resistance	Oxford	United Transformer
Circuit-Stik	IRC		Utah
Cole Steel	ITT Cannon Electric	Par-Metal	Utica
Columbia		Perma Power	
Consolidated	JFD	Petersen	Vaco
Continental-Wirt	Jayell	Phillip	Vector
Cornell-Dublier	Jensen	Pickering	Vlcheck
Crown	Jerrold	Panduit	VM
Cutler-Hammer	Johnson	PLC	
	Jonard	Pomona	Waage
Datak		Potter & Brumfield	Waber
Dearborn	Kepron	Precise	Wahl
Dow Key	Kester	Premier	Waldom
Dremel	King	Precista	Webster
Dymo	Keystone		Weller
	Koss	Quietrole	Wen
EICO	Kraeuter		Worner
Eby	Krylon	Resistors, Inc.	
Eitel-McCulloch	Kwik-heat	Rider	X-Acto
Elco			Xcelite
Electro Mech			

We Distribute For All Leading Manufacturers

North Alabama's Largest Channel-Master Distributor

CALIFORNIA

ALHAMBRA
HARMONY HI FI INC., 1020 E. Main St., 91801, (213) 282-3171, Mktg. Mgr.: K. Bushey
HURLEY ELECTRONICS, INC., 503 E. Raymond, 91800, (213) 289-5127, Branch Mgr.: D. McQuinn
RIEDEL & CO., M. W., 2215 W. Valley Blvd., 91803, (213) 283-7694, TWX: 910-589-3375, Mktg. Mgr.: M. Riedel
ULTEX CORP., 2215 W. Valley Blvd., (213) 289-9115

ANAHEIM
ESSEX INTERNATIONAL, INC., 1075 Patt St., Box 3280, 92803, (714) 772-9300
HENRY RADIO, 931 N. Euclid St., 92801, (714) PR 2-9200, Br. Mgr.: W. Henry
MAC'S LAFAYETTE ELECTRONICS, 912 S. Euclid, 92802, (714) 772-5510, Branch Mgr.: R. Hull
METRIC RESOURCE CORP., 1630-D South Sunkist, 92806, (714) 997-3660
PRODUCTION SYSTEMS, 2021 Via Burton, (213) 533-1120
WEATHERFORD, R. V., CO., 1550 Babbitt Ave., 92805, (714) 633-9633, TWX: 910-593-1934, Branch Mgr.: N. Johnson

BAKERSFIELD
ARBUCKLE, J. C., CO., 500 E. 19th St., 93305, (805) 325-5818, Branch Mgr.: G. R. Berkshire
KIESUB CORP., 318 21st St., 93301, (805) FA 7-5535, Branch Mgr.: R. Handarian

BALDWIN PARK
BALDWIN PARK ELECTRONIC SUPPLY, 1842 N. Puente Ave., 91706, (213) 962-1091

BELMONT
ADVANCE ELECTRICAL SALES, INC., 1661 Industrial Way, 94002, (415) 592-4550 & (800) 227-1974, Inside Sls. Contact: Donsenbaugh
ERIC ELECTRONICS, 111 Glenn Way, 94002, (415) 593-8284, Mktg./Adv. Mgr.: D. Turnquist

BEVERLY HILLS
TELEMEDIC, 8383 Wilshire Blvd., 90201, (213) 655-1111, Inside Sls. Contact: E. Wells-Gilboa

BRISBANE
NEWARK ELECTRONICS, 440 Valley Dr., 94005, (415) 468-2900

BUENA PARK
S. J. RADIO ELECTRONICS INC., 6001 Beach Blvd., (714) 521-1906

BURBANK
ELECTRONIC CITY INC., 4001 W. Burbank Blvd., 91505
RTS COMMUNICATIONS, 2311 W. Olive Ave., 91506, (213) 843-3111, Branch Mgr.: H. Robertson
TERMINAL ELECTRONICS CORP., 2420 W. Olive, 91506, (213) 843-1221, TWX: 910-498-2728

BURLINGAME
ITORONICS LAB., 381 Beach Rd., 94010
LOGAN ASSOCIATES, 844 Stanton Rd., 94100, (415) 697-6100
METRIC RESOURCES CORP., 822 Airport Blvd., 94010, (415) 347-3067
ROSE ELECTRONICS DISTRIBUTING CO., 846 Stanton Rd., 94010, (415) 697-0224, Mktg. Mgr.: W. Hubbs

CALEXICO
HURLEY ELECTRONICS, INC., 403 Imperial Ave., 92231, (714) 357-3148, Branch Mgr.: O. D. Scarbrough
SANDY'S ELECTRICAL SUPPLY, 21305 Satcoy St., (213) 346-8353

CARSON
HI-REL DISTRIBUTOR SALES, 20507 S. Belshaw Ave., 90745, (213) 774-8200, Inside Sls. Contact: D. W. Willis
LAFAYETTE RADIO ELECTRONICS CORP., 717 E. Artesia Blvd., 90746
NEWMAN CO., R., 23321 S. Avalon Blvd., 90745, (213) 775-2705, Inside Sls. Contact: B. MacDonald

CERRITOS
SAXTON PRODUCTS, INC., 14100 Park Pl., (213) 926-5596, Branch Mgr.: L. Gould
CHATSWORTH
BISHOP GRAPHICS, INC., 20450 Plummer St., 91311, (213) 993-1000, Telex: 66-2400
WESTATES ELECTRONICS CORP., 20151 Bahama St., 91311, (213) 341-4411, Telex: 67-7069, Gen. Mgr.: J. Hosenfelt

CHICO
DUNLAP ELEC., 824 Cherry St., 95926, (916) 342-8313, Branch Mgr.: G. Deming

COMPTON
WALLACE, R. G., Co., 2301 E. Del Amo Blvd., 90220, (213) 774-6050, TWX: 910-346-6319, Sls. Contact: J. Greer

CONOGA PARK
LAFAYETTE RADIO ELECTRONICS CORP., 217-25 Van Owen St., 91304

COSTA MESA
CEN-TEC SALES, INC., 1857 Park Glen Circle, (714) 645-9157
COMPONENTS CENTER, INC., 1240 Logan Ave., Unit "E", 92626, (714) 999-0433, Inside Sls. Contact: J. Burger, J. Dye
LAFAYETTE RADIO ELECTRONICS CORP., Harbour Shopping Ctr., 2300 Harbour Blvd., 92626
MAR-VAC ELECTRONICS, INC., 1829 Newport Blvd., 92627, (714) 540-3280
SCHWEBER ELECTRONICS, 3000 Red Hill Ave., (714) 556-3880

CULVER CITY
AVNET ELECTRONICS, 10916 W. Washington Blvd., 90230, (213) 559-4111, Branch Mgr.: E. Kaniger
FELDMAN CO., H., 9724 Washington Blvd., 90230, (213) 870-5973, Inside Sls. Contact: L. Smith
HAMILTON/AVNET ELECTRONICS, 10950 W. Washington Blvd., 90230, (213) 558-2000, Mktg./Adv. Mgr.: M. Burnett
HAMILTON ELECTRO SALES, 10912 W. Washington Blvd., 90230, (213) 870-1717, TWX: 910-340-6364, Branch Mgr.: N. St. John
JSH ELECTRONICS INC., 8549 Higuera St., Box 2898, 90230, (213) 559-6900, Inside Sls. Contact: L. W. Novin
WESTERN ELECTROMOTIVE, INC., 8467 Steller Dr., 90230, (213) 870-7621, TWX: 910-341-6360, Inside Sls. Contact: L. Hawkins

EL MONTE
MARSHALL, G. S., CO., 9674 Telstar Ave., 91731, (213) 686-0141, TWX: 910-587-1567, Inside Sls. Contact: R. Davis

EL SEGUNDO
ALPHA COMPONENTS CORP., 115 Eucalyptus Dr., 90245, (213) 322-7780, Inside Sls. Contact: D. Hardy
LIBERTY ELECTRONICS, 124 Maryland St., 90245, (213) 322-8100, TWX: 910-348-7111, Inside Sls. Contact: R. Rafferty
T. I. SUPPLY, 831 Douglas St., 90245, (213) 776-4490
WASSCO, 410 S. Douglas St., 90245, (213) 772-8171

ENCINO
DINSMORE, W., Box 621, 91316, (213) 622-2849, Sls. Mgr.: W. Dinsmore
POCO SALES, 17130 Ventura Blvd., 91316, (213) 788-2350

FREMONT
TERMINAL SALES, 40970 Fremont, (415) 656-7722

FRESNO
ARBUCKLE, J. C., CO., 2349 Kern St., 93721, (209) 264-6554, Inside Sls. Contact: P. Huselid
DeJARNATT, B. J., WHOLESale CO., 223 Fulton St., 93721, (209) 268-8544, Inside Sls. Contact: O. R. Mischler, V.P.
DUNLAP ELEC. Box 1732, 93703, (209) 268-6111, Branch Mgr.: L. Barsolan
ENGINEERED SOUND, INC., Box 5437, 3296 W. Sussex, 93755, (209) 224-3750, Inside Sls. Contact: W. A. Schiefer

FULLERTON
ZEUS/WEST, 2524 E. Fendorf Ave., Unit G, 92671, (714) 871-0391, Branch Mgr.: C. Kelly

GARDENA
AQUALARM, INC., 544 W. 182nd St., 90248, (213) 231-5873, Mktg. Mgr.: J. Herscovitz
BELL INDUSTRIES — Electronic Dist. Div., 306 E. Alondra Blvd., 90248, (213) 321-5802, TWX: 910-346-6336, Inside Sls. Contact: R. McNab
ROTEL OF AMERICA, INC., 13518 So. Normandie Ave., 90249, (213) 329-7715, TWX: 910-346-7600, Branch Mgr.: Mr. Isato
SANTA MONICA BELL ELECTRONICS CORP., 306 E. Alondra Blvd., 90248, (213) 321-5802, TWX: 910-346-6336
VACO/WEST DISTRIBUTION CENTER, 447 E. Gardena Blvd., 90248, (213) 324-4934, TWX: 910-221-2231, Branch Mgr.: F. Grede
VIDEO SUPPLIERS, 14526 Crenshaw Blvd., 90249, (213) 321-4121, Inside Sls. Contact: A. Fellows

GARDEN GROVE
ALLIED ELECTRONICS, 12311 Industry St., 92641, (213) 598-6605, Telex: 68-5534, Branch Mgr.: J. Powers
NATIONAL ELECTRONIC SUPPLY, 7231 B. Garden Grove Blvd., 92641, (714) 894-1394, TWX: 910-596-1316, Inside Sls. Contact: M. Hartstein

GLENDALE
EAGLE ELECTRONICS, 340 North Glendale Ave., 91206, Inside Sls. Contact: N. N. Shapiro



We Stock

HEINEMANN

Circuit Breakers

SERIES JA AM AND CD
ONE, TWO & THREE POLES
MULTIPLES OF 5 AMPERES
60 HERTZ AND DC

SLOW AND FAST DELAY

POCO SALES

17130 Ventura Blvd.
Encino, California 91316
Telephone (213) 788-2350

TUBES

**We're the Distributor
Who's Still Interested
in Your
Electron Tube
Business.**

We can service you
NATION-WIDE
with the following franchises:

RCA	Varian
Eimac	ITT
Raytheon	Machlett
Sylvania	National
Westinghouse	Dumont
G.E.	Cetron
Electrons	Siemens
Amperex	Telefunken

**"We're more than Specialists —
We're Experts"**

- World's Largest Inventory
- American and European Types
- Technical Assistance Available
- Servicing Users, OEM's and Distributors in all 50 States
- Customers in more than 100 Countries

**Our Expertise will save you time
and money!**

Are we on your Bidders List?

Write for our complete Line Card
from Dept. EM



JSH ELECTRONICS, INC.

A SUBSIDIARY OF VSI CORPORATION
8549 HIGUERA STREET, P.O. BOX 2898
CULVER CITY, CALIFORNIA 90230
TELEPHONE (213) 559-6900
TELEX 67-7255. TWX 910-340-6356
Cable: JASHELEC

JSH ELECTRONICS EAST, INC.

A SUBSIDIARY OF VSI CORPORATION
380 LAFAYETTE STREET
NEW YORK, N.Y. 10003
TELEPHONE (212) 674-7979
TWX 710-581-4260

MACDONALD & CO., 213 S. Brand Blvd., 91204, (213) 241-1101
WEATHERFORD, R. V., CO., 6921 San Fernando Rd., 91201, (213) 849-3451, TWX: 910-498-2223, Inside Sls. Contact: R. Fitch
WESTERN ELECTRONIC SUPPLY CORP., sub R. V. Weatherford Co., 229 So. Orange St., 91204, (213) 246-4861, Inside Sls. Contact: H. V. Stewart

GOLETA
CHANNEL RADIO SUPPLY CO., 108 Aero Camino, 93017, (805) 968-3918, Br. Mgr.: J. Seerley
RADIO PRODUCTS SALES, 350 E. South Kellogg, (805) 964-6823
RPS ELECTRONICS - GOLETA, 350-E S. Kellogg Ave., 93017, (805) 964-6823, Branch Mgr.: J. Reynolds

HAMDEN
WILSHIRE ELECTRONICS, 2554 State St., 06514, (203) 281-1166, Branch Mgr.: M. D'Angelo

HAWTHORNE
CENTURY AERO CORP., 13127 Yukon Ave., (213) 772-1166
RADIO HARDWARE & ELEC., INC., 13629 Inglewood Ave., 90250, (213) 772-7961, Inside Sls. Contact: I. Cosmer
WESTEC, 14125 Inglewood Ave., (213) 772-4479

HYWARD
DUNLAP ELEC., Box 3607, 94540, (415) 352-1933, Branch Mgr.: L. Hendricks

HOLLYWOOD
HOLLYWOOD RADIO & ELECTRONICS INC., 5250 Hollywood Blvd., 90027, (213) 466-3181, TWX: 910-321-4135
PACIFIC RADIO EXCHANGE, INC., 1351 Cahuenga Blvd., 90028, (213) 462-1392, Inside Sls. Contact: A. Phillips
REVEX CORP., 3637 Cahuenga Blvd. W., 90068, (213) 876-1200, Telex: 698-363
YALE RADIO ELECTRIC CO., 6616 Sunset Blvd., 90028, (213) 465-3186, Gen. Sls. Mgr.: J. Michaels

HUNTINGTON PARK
MARTIN DISTRIBUTOR CO., 2509 E. Florence Ave., 90255, (213) 582-7111

INGLEWOOD
CHAMPION ELECTRONICS INC., 4736 W. Century Blvd., 90304, (213) 673-0566, Inside Sls. Contact: R. McNeil
H & K SALES, 815 W. Arbor Vitae, 90301, (213) 673-5244, Branch Mgr.: P. Kudler
HURLEY ELECT. INC., 210 E. Hardy, 90300, (213) OR 8-7644, Branch Mgr.: W. Godbout
N66 INC., 3819 W. Imperial Hwy., (213) 671-5455
NEWARK ELECTRONICS, 4747 W. Century Blvd., 90301, (213) 678-0441
PACIFIC SEMICONDUCTORS, 200 W. Florence Ave., 90301, (213) 674-9000, TWX: 910-328-7200, Inside Sls. Contact: R. Kamins
SWITCH & SIGNAL, 1009 W. Arbor, (213) 776-3550
TIME ELECTRONICS, 900 W. Olive St., 90301, (213) 649-6900, Inside Sls. Contact: A. Odintz
UNIVERSAL RADIO SUPPLY CO., 815 W. Arbor Vitae, 90301, (213) 673-5244, Inside Sls. Contact: P. Kudler

IRVINE
BISHOP GRAPHICS DRAFTING SUPPLY CENTER, 17891 Sky Park Blvd., 92707, (213) 628-6161, (714) 979-8952, Branch Mgr.: E. T. Sweeney
CRAMER/LOS ANGELES, 17201 Daimler St., 92664, (714) 979-3000
MARSHALL, G. S., CO., 17975 Sky Park Blvd., 92707, (714) 556-6400, Branch Mgr.: W. Smith
TERMINAL ELECTRONICS, 1791 Reynolds Ave., 92664, (714) 549-8611

LAKESIDE
MOUSER ELECTRONICS, 1511 Woodside Ave., 92040, (714) 449-2220, Mktg. Mgr.: J. R. Young

LANCASTER
ELECTRONIC DISTRIBUTORS, 44539 N. 10th West, 93534, (805) 942-8421, Inside Sls. Contact: W. Lavis
HUNN ENTERPRISES, 806 W. Lancaster Blvd., 93534, (805) 948-6715, Owner: S. Hunn

LA PUERTO
KIESUB CORP., 15418 E. Fairgrove Ave., 91744, (213) 330-3445, Branch Mgr.: J. Foster

LONG BEACH
HURLEY ELECT. INC., 925 W. Esther, 90800, (213) 537-5375, Branch Mgr.: F. Newton
KIESUB CORP., 311 W. Pacific Coast Hwy., 90806, (213) 591-1335, Inside Sls. Contact: J. Doller
SCOTT RADIO SUPPLY CO., 266 Alamitos Ave., 90802, (213) 437-6829, Inside Sls. Contact: M. Crump

LOS ALTOS
WALTRONIC SALES, Village Corner Shopping Center, 94022, (415) 941-3141, TWX: 910-370-7458

LOS ANGELES
AMERICAN ELECTRONIC SUPPLY, 1200 N. Vine, 90038, Inside Sls. Contact: M. Rosenthal
ARS ELECTRONICS, 616 S. Holmby Ave., 90024, (213) 272-1275, Sls. Mgr.: R. Sanett
BLACK & STRONG, 1728 S. La Cienega Blvd., (213) 870-9191, Inside Sls. Contact: C. Kizian
BROWNELL ELECTRO INC., 10936 So. Broadway, 90061, (213) 532-1150, Branch Mgr.: R. Burns
CALIFORNIA ELECTRONIC SUPPLY, 1911 Armacost W., (213) 826-8333
CAL-STATE ELECTRONICS CO., 5222 Venice Blvd., 90019, (213) 933-8187, Mktg./Adv. Mgr.: R. Landis
CONTROL PARTS DISTRIBUTORS, INC., 1252 W. Temple St., (213) 625-1488
DYNASERVICE CO., 1020 S. Atlantic Blvd., 90022, (213) 268-8531, Inside Sls. Contact: R. L. Marshall
EL-COM, INC., 5134 Valley Blvd., 90032, (213) 223-1351, Inside Sls. Contact: M. Bromberg
ELECTRIC SWITCHES, INC., 2478 Fletcher Dr., 90039, (213) 664-1141
ELECTRONIC SALES, 2829 West Pico Blvd., 90006, (213) 737-1945, Mktg./Adv. Mgr.: H. J. Bohman
ELECTRO COMPONENTS, 122 S. Mission Rd., 90033, (213) 264-7100
ENERGY ELECTRONICS PRODUCTS, 6060 Manchester Ave., (213) 641-9020
ENGINEERING & ELECTRONIC DEVICES, 1024 N. McCadden Pl., 90038, (213) 463-4175
ESSEX INTERNATIONAL, INC., 777 S. Mission Rd., 90023, (213) 264-7000
EURTON ELECTRIC, 1224 S. San Petro St., 90015, (213) 747-9457

FSL, 7407 Melrose Ave., 90046, (213) 651-4411, TWX: 910-321-2385, Inside Sls. Contact: M. Smithson
FAIRFAX ELECTRONICS, INC., 4527 W. Adams Blvd., 90016, (213) 731-2561, Inside Sls. Contact: J. G. Ruckdeschel
FEDERATED ELECTRONICS, INC., Federated Group Commercial Sales Div., 11820 W. Olympic Blvd., 90064, (213) 272-8771, Ind. Sls. Mgr.: C. Kierulff, V.P.
FEDERATED MAGNETIC TVI, 716 No. LaBrea, 90038, (213) 933-5545, Branch Mgr.: K. Lamb
FISHER/BROWNELL, INC., 13936 South Broadway, 90061, (213) 532-2170, Branch Mgr.: R. Hampton
GARRETT CORP., 6015 E. Randolph St., 90040
HENRY RADIO, 11240 W. Olympic Blvd., 90064, (213) 272-0861, Inside Sls. Contact: T. S. Henry
JAMAICA BEARINGS, 8621 Bellanca Ave., (213) 649-0480
KIERULFF AIRLINE SUPPLY, 5666 E. Jilison St., 90040, (213) 724-6600, TWX: 910-580-3106, Mgr.: J. Fogarty
KIERULFF ELECTRONICS, INC., 2585 Commerce Way, 90040, (213) 685-5511, TWX: 910-580-3106, Inside Sls. Contact: M. Hagerty
MASTER DISTRIBUTORS, Box 25662, 90025, (213) 395-2637, Inside Sls. Contact: J. Yednock
MASTER ELECTRONIC SYSTEMS, INC., 5556 W. Washington Blvd., 90016, (213) 930-1333, Inside Sls. Contact: H. Cross
METERMASTER, 5646 Jilison St., 90040, (213) 685-4340, TWX: 910-580-3106, Gen. Sls. Mgr.: J. Walls

MIL-COMM DISTRIBUTORS, INC., 1616 Cotner Ave., 90025, (213) 478-0525, TWX: 910-342-7586, Inside Sls. Contact: H. Tozier
PACIFIC RADIO EXCHANGE, INC., 1351 Cahuenga Blvd., 90028, (213) 462-1393, Inside Sls. Contact: I. Phillips
RADIO PARTS SALES CO., 5220 S. Vermont Ave., 90037, (213) 759-9177, Inside Sls. Contact: B. Movel
RADIO PRODUCTS SALES, INC., 1501 S. Hill St., 90015, (213) 747-1271, Inside Sls. Mgr.: C. Sexton
RPS ELECTRONICS INC., 1501 So. Hill St., 90015, (213) 748-1271, TWX: 910-321-2416, Inside Sls. Contact: R. Balling

SEMICONDUCTOR SPECIALISTS, INC., 5710 W. Manchester Ave., 90045, (213) 641-3323, TWX: 910-328-7228, Branch Mgr.: D. Minassion
SOUTHLAND SOUND CORP., 1145 S. Ford Blvd., 90022, Inside Sls. Mgr.: R. Foster
STRASSNER CO., E. E., 3121 Los Feliz Blvd., 90039, (213) 666-1511, TWX: 910-321-4458, Inside Sls. Contact: M. Wong
TI SUPPLY CO., 5200 W. 10th St., 90045, (213) 776-4490, Branch Mgr.: J. Negrete
TIMCO, 5808 Monterey Rd., 90042, (213) 254-5101, Inside Sls. Contact: G. Allison
WALLACE & WALLACE, 1206 Maple Ave., 90015, (213) 747-0401
WARSCO, 4311 S. Figueroa St., 90037, (213) 233-8171, Inside Sls. Contact: W. Carrell

LYNWOOD
PRINCETON CASE CO., INC., 3329 Beechwood Ave., 90262, (213) 636-6124, Branch Mgr.: R. West

MARINA DEL REY
INTERVEND INDUSTRIES LTD., 4085 Glencoe Ave., 90291, (213) 821-7936, Telex: 65-2484, Inside Sls. Contact: G. Dover
MARITIME COMMUNICATIONS, INC., 766 E. Washington St., 90291, (213) 821-4958, Mktg. Mgr.: K. Englert

MARYSVILLE
DUNLAP ELEC., 1012 Sixth St., 95901, (916) 742-7126, Branch Mgr.: G. Lim

MENLO PARK
BELL ELECTRONIC CORP. OF NO. CALIF., 1070 O'Brien Dr., 94025, Inside Sls. Contact: L. Weiss
WIRKUS, R. A., 770 Menlo Ave., 94025, (415) 323-1386, Branch Mgr.: R. A. Wirkus

MERCED
DUNLAP ELEC., 159 W. 17th St., 95340, (209) 722-3936, Branch Mgr.: J. Wilson

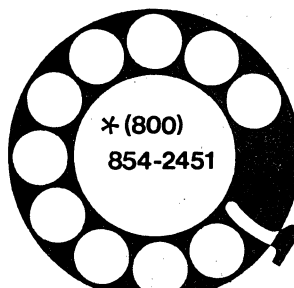
MODESTO
DUNLAP ELEC., 419 Tenth St., 95354, (209) 524-5191, Branch Mgr.: G. Larson
INLAND ELECTRONIC SUPPLIERS, 1012 North Carpenter Rd., 95351, Inside Sls. Contact: M. A. Kaminka

MONTEREY
DUNLAP ELEC., 339 Ramona Ave., 94939, (408) 373-1828, Branch Mgr.: D. Corona
ZACKIT CORP. OF MONTEREY, 350 Del Monte Ave., 93940, (408) 375-3144, Br. Mgr.: E. Ledin

MOUNTAIN VIEW
ABACUS ELECTRONICS CO., INC., 1065 Terra Bella Ave., 94040, (415) 961-1500, Inside Sls. Contact: F. C. Landefeld
ASSOCIATED RADIO DIST., 2150 E. Middlefield Rd., 94043, (408) 968-1889, Br. Mgr.: H. Burts
CAPACITOR SALES CO., 253 Polaris Ave., 94043, (415) 964-8880, TWX: 910-379-6569, Inside Sls. Contact: S. Floyd
CONNOLLY & CO., INC., 914 No. Rengstorff Ave., 94043, (415) 967-6988, TWX: 910-379-6930, Gen. Sls. Mgr.: W. E. Connolly
DUNLAP ELEC., 2025 Old Middlefield Rd., 94040, (415) 968-7388, Branch Mgr.: J. Minjock
ELMAR ELECTRONICS, 2288 Charleston Rd., 94040 (415) 961-3611, TWX: 910-379-6437, Mktg./Adv. Mgr.: J. Costa, Gen. Sls. Mgr.: C. Trumbull
HAMILTON/AVNET - MT. VIEW, 575 E. Middlefield Rd., 94040, (415) 961-7000, Branch Mgr.: V. Perrott
IFM, INC., 80 El Camino Real West, 94040, (415) 961-2828
POWELL ELECTRONICS, 411 Fairchild Dr., 94043, (415) 964-0820, TWX: 910-379-6970, Branch Mgr.: M. Grove
RATEL ELECTRONICS, 815 Maude Ave., 94043, (415) 965-2010, Inside Sls. Contact: M. West
SHELLEY-RODABAUGH, 2444 Old Middlefield Way, 94040, (415) 969-1820
TARGET ELECTRONICS, Box 4189, (415) 961-0565
TERMINAL-HUDSON ELECTRONICS INC. OF CALIFORNIA, 880 Maude Ave., 94040, (415) 969-9240, TWX: 910-379-6989, Branch Mgr.: J. Louie
W. D. SALES, Box 4189, (415) 961-0565
WALLACE, R. G., CO., 213-D South Whisman Rd., 94040, (415) 961-3323, TWX: 910-379-6073, Mgr.: R. Johnson

capacitors

* toll-free



CALIFORNIA LINES:

(714) 894-1394 or (213) 430-7525

· TWX LINES: (910) 596-1316

OFF-THE-SHELF DELIVERY:

- GE
- CRL
- ERIE
- ELMENCO
- AEROVOX
- MALLORY
- SANGAMO
- SPRAGUE

NATIONAL ELECTRONIC SUPPLY

7231-B Garden Grove Blvd.
 Garden Grove, Ca. 92641

EQUIPMENT DISTRIBUTOR - CONSULTANT - CONTRACTOR

Professional Fabrication & Wiring of Console & Rack Assemblies



MASTER

ELECTRONIC SYSTEMS, INC.

5556 W. Washington Blvd., Los Angeles, California 90016

(213) 930-1333

Custom Systems: Professional - Commercial - Off Shelf Components

AUDIO - VIDEO - SIGNALING - MONITORING - HIGH RISE SAFETY

Master: Sequential Audio Monitoring Switch / Failure Detection Supervision

WALTRONIC SALES, 2454 Charleston Rd., 94043, (415) 965-4131, TWX: 910-379-6559, Inside Sls. Contact: C. Walter

NEWPORT BEACH

SEMCOMP, 4100 Birch St., 92660, (714) 833-3070, TWX: 910-595-1572, Gen. Sls. Mgr.: J. Thompson

NORTH HOLLYWOOD

ELECTRONIC MANUFACTURER'S OUTLET, 7025 N. Longridge, 91605, (213) 983-1250, Sls. Contact: D. Kadin
MICONICS IND., INC., 11045 Weddington St., 91601, (213) 769-6782, TWX: 910-499-4744, Inside Sls. Contact: T. Wisdom

STOBIN CO., M., 7353 Greenbush Ave., 91605, (213) 983-1555, Telex: 673-371, Inside Sls. Contact: I. Thompson
TRI-TRONICS, INC., 4019 Tujunga Ave., 91604, (213) 877-9912, Inside Sls. Contact: E. Fertig
WIRENETICS CO., 13151 Sherman Way, (213) 765-5041

NORTH SACRAMENTO

PANTAGES ELECTRONICS, INC., 2537 Del Paso Blvd., 95815, Inside Sls. Contact: T. J. Pantages

OKALAND

BRILL ELECTRONICS, 610 East Tenth St., Box 1378, 94604, (415) 834-5888, Inside Sls. Contact: P. Seitz
CASS ALTSCHULER CO., 801 7th Ave., 94606, (415) 834-4225, Inside Sls. Contact: J. D. Altschuler
GABRIEL SALES, HANK, 600 16th St., 94612, (415) 465-465-5361

MILLER'S RADIO & TV SUPPLY, 530 East 8th St., 94606, Inside Sls. Contact: L. N. Miller
MOUTHROOP SALES, INC., 1530 E. 12th St., 94606, (415) 261-7676, TWX: 910-366-7206

NORLEEN SOUND SERVICE, 5805 College Ave., 94618, (415) 652-2631, Mktg. Mgr.: H. Norleen
STOBIN CO., M., 3798 Grand Ave., Suite #2, 04610, (415) 836-2937, Branch Mgr.: P. Fitzpatrick
WESTERN ELECTRO-MECHANICAL CO., 300 Bdw., 94607, (415) 452-1936, Inside Sls. Contact: N. Graham

OCEANSIDE

HURLEY ELECTRONICS, INC., 302 Oceanside Blvd., 92054, (714) 722-7694, Branch Mgr.: B. Ertrachter
NORTH COUNTY ELECTRONICS, 1009 N. Hill St., 92054, (714) 722-1933, Branch Mgr.: F. Fields

ONTARIO

HURLEY ELECTRONICS, INC., 222 W. "B" St., 91761, (213) 331-8294, Branch Mgr.: A. Hudson

ORANGE

GREENE MARKETING, I., Box 5465, 92667, (714) 637-1313, Mktg. Mgr.: I. Greene
ORANGE ELECTRONICS, 948 Elm St., 92668, (714) 532-6891, Inside Sls. Contact: A. Peters
R. C. ELECTRONICS, 17885 Skypark Circle, (714) 549-9822
WESTATES/ORANGE, 948 Elm St., 92668, (714) 532-6891, Branch Mgr.: H. Harris

OXNARD

HURLEY ELECT. INC., 508 E. Date St., 93030, (805) 483-0133, Branch Mgr.: R. Ross
JACO ELECTRONICS, Willard Hills Rd., (213) 887-6400

PALO ALTO

FSI, 253 Town & Country Village, 94301, (415) 321-7041, TWX: 910-373-1189, Branch Mgr.: E. Rinker
KIERULFF ELECTRONICS, 3969 E. Bayshore Rd., 94303, (415) 968-6292, TWX: 910-379-6430, Mgr.: D. Lawton
METERMASTER, 3995 E. Bayshore Rd., 94303, (415) 968-0313, TWX: 910-379-6430, Mgr.: R. Serby
PRIZ CO., 2675 Park Blvd., (415) 326-9333
STORM PRODUCTS CO., 4039 Transport St., 94303, (415) 326-2913
TESTCO INC., 941 Charleston Rd., Suite 2, 94303, (415) 326-5320, TWX: 910-373-1738, Gen. Sls. Mgr.: D. J. Thompson
WEATHERFORD, R. V., CO., 3240 Hillview Ave., 94304, (415) 493-5373, TWX: 910-373-1277, Branch Mgr.: G. Gentry
ZACK ELECTRONICS OF PALO ALTO, 654 High St., 94301, (415) 326-5432, TWX: 910-373-1185, Branch Mgr.: J. Woodside

PARAMOUNT

BRENNER-FELDER & ASSOC., 16210 Gundry Ave., (213) 636-3206

PASADENA

BOULEVARD ELECTRONICS, 314 S. Rosemead Blvd., 91107, (213) 792-1391, Sls. Mgr.: R. Sexton
EMPIRE ELECTRONIC DIST. INC., 37 E. Union St., 91103, (213) 681-2711, Inside Sls. Contact: D. Ches
PASADENA ELECTRONICS, 2396 E. Foothill Blvd., 91107, (213) 796-1355, Inside Sls. Contact: J. Caldwell
RDX CORP., 110 S. Euclid Ave., (213) 681-3451

POMONA

ROMO ELECTRONICS, 1090 So. Garey Ave., 91766, (714) 629-2862, Gen. Sls. Mgr.: J. Romo
WEATHERFORD, R. V., CO., 1095 E. Third St., 91766, (714) 623-1261, TWX: 910-581-3811, Branch Mgr.: L. Meyers

REDDING

DUNLAP ELEC., 3060 Bechelli La., 96001, (916) 243-6513, Branch Mgr.: J. Tetens

REDONDO BEACH

CHAMPION ELECTRONICS INC., 2315 Artesia Blvd., 90278, (213) 370-1374, Branch Mgr.: R. McNeil
MARK ELECTRONICS, INC., 2315 1/2 Artesia Blvd., 90278, (213) 370-6381, Inside Sls. Contact: G. Burchett

REDWOOD CITY

CRAMER ELECTRONICS, 695 Veterans Blvd., 94063, (415) 365-4000
ELECTRICAL SALES PRODUCTS, 465 Convention Way, 94063, (415) 364-2621
PARKS & PRUITT ASSOCIATES, 555 Veterans Blvd., 94063, (415) 364-1640, Branch Mgr.: B. Pruitt

RESEDA

COLORVISION ELECTRONIC SUPPLY, 6831 Tampa Ave., 91335, Inside Sls. Contact: P. W. Hollyfield

RICHMOND

ESSEX INTERNATIONAL, INC., 100 W. Ohio Ave., 94804, (415) 232-9353

RIVERSIDE

ELECTRONIC SUPPLY, 2486 3rd St., 92507, (714) 683-7300, TWX: 213-626-6795, Mktg./Adv. Mgr.: B. G. Hasterok

SACRAMENTO

ARCAL SOUND & VIDEO, 2001 El Camino Ave., 95821, (916) 927-4502, Branch Mgr.: E. Fitzgerald
BEITELMAN'S ELECTRONIC SUPPLY, 2616 Marconi Ave., 95821, (916) 483-0518, Inside Sls. Contact: E. Beitelman
DUNLAP ELEC., Box 1887, 95814, (916) 444-8070, Inside Sls. Contact: W. Adams
SACRAMENTO ELECTRONIC SUPPLY CO., 1219 S. St., 95814, (916) 441-4821, Inside Sls. Contact: W. L. Moore
ZACKIT CORP. OF SACRAMENTO, 1831 Jay St., 95814, (916) 446-3131, Branch Mgr.: R. Mackintosh

SACTO

ARCUL SOUND & VIDEO, 2001 El Camino Ave., 95821, (916) 927-4502, Branch Mgr.: E. Fitzgerald

SALINAS

McGEORGE COMMUNICATIONS, 766 A Vertin Ave., 93901, (408) 424-4628
PENINSULA ELECTRONIC SUPPLY INC., 40 W. Gehilan, 93901, (408) 422-5318, Branch Mgr.: D. Henderson

SAN BERNARDINO

ARROWHEAD RADIO & TV SUPPLY, 1216 "D" St., 92405, (714) 884-9011, Inside Sls. Contact: R. A. Rice
BARNES ENGINEERING, 1841 Dale Lane, 92404, (714) 883-0247, Mktg. Mgr.: E. D. Barnes
HI FI SUPPLY, 418 Baseline, 92405, (714) 884-9011, Branch Mgr.: W. Ainsworth
HURLEY ELECTRONICS, INC., 730 W. Spruce, 92400, (714) 885-0721, Branch Mgr.: D. Nagle
KIESUB CORP., 910 11th St., 92410, (213) 710-5-6807, Branch Mgr.: D. Releich
MAC'S LAFAYETTE ELECTRONICS, 972 No. Waterman, 92410, (714) 884-3187, Branch Mgr.: J. Seifen

SAN CARLOS

STERLING ELECTRONICS, 1061 Industrial Way, 94070, (415) 592-2353, TWX: 910-376-4398, Branch Mgr.: R. Coil

SAN DIEGO

CRAMER/SAN DIEGO, 8975 Complex Dr., 92123, (714) 565-1881, TWX: 910-335-1195
ELECTRONIC DISTRIBUTOR, 3650 Clairmont Dr., (714) 274-7242
ELECTRONIC GAME SPECIALISTS, Box 6291, 92106, (714) 224-3786, Mktg. Mgr.: J. N. Perry
HAMILTON/AVNET - SAN DIEGO, 8917 Complex Dr., 92123, (714) 279-2421, Branch Mgr.: D. Alverson
HURLEY ELECTRONICS, INC., 318 16th St., 92100, (714) 235-6245, Branch Mgr.: W. Topjian
INTERMARK ELECTRONICS, 7354 Convoct Ct., 92111, (714) 279-5200, TWX: 910-335-1515, Branch Mgr.: D. Busby
KIERULFF ELECTRONICS, INC., 8797 Balboa Ave., 92123, (714) 278-2112, TWX: 910-335-1182, Mgr.: R. Bale
LIBERTY ELECTRONICS, 8248 Mercury Ct., 92121, (714) 525-1171, TWX: 910-335-1590, Branch Mgr.: B. Cathcart
MARSHALL, G. S., CO., 8057 Raytheon Rd., 92111, (714) 278-6350, Branch Mgr.: R. Castle
METERMASTER, 8797 Balboa Ave., 92123, (714) 560-4841, TWX: 910-335-1182
METRIC RESOURCES CORP., 10459 Roselle St., 92121, (714) 453-8421
MOLTRONICS, INC., 7969 Engineer Rd., 92111, (714) 278-5020
RADIO PRODUCTS SALES, 7889 Clairmont — Mesa Blvd., 92111, (714) 292-5611
RDX CORP., 8072 Engineer Rd., (714) 278-6863
RICHEY ELECTRONICS, INC., 5258 Kearny Villa Way, 92123, (714) 565-4444, Branch Mgr.: A. Kulela
RPS ELECTRONICS - SAN DIEGO, 7889 Clairmont Mesa Blvd., 92111, (714) 292-5611, Branch Mgr.: R. Courtois
SEMCOMP, 8046 Engineer Rd., 92111, (714) 560-0373, Branch Mgr.: W. Fish
SHANKS & WRIGHT INC., 2045 Kettner Blvd., 92101, (714) 239-0176, Sls. Mgr.: G. Shanks
SHELLEY-NEUMANN, INC., 3347 Industrial Ct., 92121, (714) 459-3701, TWX: 910-322-1738, Inside Sls. Contact: K. Jacobsen
STERLING ELECTRONICS, 7405 Convoct Ct., 92111, (714) 565-2441, Branch Mgr.: D. Shields
TAUBER ELECTRONIC DISTRIBUTING, INC., 3650 Clairmont Dr., Suite 8, 92117, (714) 274-7242, Inside Sls. Contact: S. Miller
WEATHERFORD, R. V., CO., 7872 Raytheon Rd., 92111, (714) 278-7400, TWX: 910-335-1570, Branch Mgr.: C. Buhl
WESTERN RADIO, 1415 India, 92101, (714) 239-0361, Ind. Sls. Mgr.: J. Reynolds, Inside Sls. Contact: D. Frank
WESTERN RADIO TV SUPPLY, 1415 India St., 92101, (714) 239-0361

SAN FRANCISCO

ASSOCIATED RADIO DISTR., 1583 Howard St., 94103, (415) 431-0212, Inside Sls. Contact: F. Saucedo

ESSEX INTERNATIONAL, INC., 500 Minnesota, 94107, (415) 626-5351
FARGO CO., 1162 Bryant St., 94103, (415) 621-4471, Mktg. Mgr.: L. Jones
HAUER ELECTRONIC SUPPLY, 1185 Mission St., 94103, (415) 621-0552, Inside Sls. Contact: H. Ullmann
MASTER DISTRIBUTORS, Box 42396, 94101, (415) 626-0807, Branch Mgr.: A. Ades
SAN FRANCISCO RADIO & SUPPLY CO., 1282-84 Market St., 94102, Inside Sls. Contact: W. N. Miller
ZACK ELECTRONICS, 1444 Market St., 94102, (415) 626-1444, TWX: 910-372-6152, Sls. Contact: R. McHale

SAN JOSE

CALVERT ELECTRONICS, Box 5066, 95150, (408) 265-0521, Branch Mgr.: J. Fudim
COMPUMECH, Box 4551, (408) 246-5860
CONSOLIDATED PARTS INC., 180 E. Gish Rd., 95112, (408) 294-2302

DUNLAP ELEC., 970 S. Bascom, 95128, (408) 287-2627, Branch Mgr.: W. Hill
PENINSULA ELECTRONIC SUPPLY, INC., 980 S. 1st, 95110, (408) 294-3594, Sls. Mgr.: R. Johnson
QUEMENT ELECTRONICS, 1000 S. Bascom Ave., Box 6000, 95128, (408) 998-5900, TWX: 910-338-0039, Inside Sls. Contact: H. L. Azevedo

SAN LEANDRO

ELECTRO COMPONENTS, 1939 Republic Ave., 94577, (415) 352-5210

SAN PEDRO

IFM Inc., 1300 So. Beacon St., 90731, (213) 547-0829
NEPTUNE ELECTRONICS, INC., 925 N. Pacific Ave., 90731, (213) 833-5291

When you need
quality components like
BOURNS
get the works from
CRAMER

cramer
CRAMER ELECTRONICS INC.

Our most important component is service.

CATERING TO INDUSTRIAL USERS AT OEM PRICES

ZACK
ELECTRONICS

PALO ALTO, CA

415/326-5432 654 High St. 94301

SAN FRANCISCO, CA

415/626-1444 1444 Market St. 94102

SAN RAFAEL

CATANIA SOUND, INC., Box 928, 4400 Northgate Mall, 94902, Inside Sis. Mgr.: C. J. Catania
ELECTRONICS PLUS, 823 Fourth St., (415) 457-0466

SANTA ANA

HURLEY ELECTRONICS, INC., 2101 N. Fairview, 92706, (714) 638-7220, Inside Sis. Contact: P. Annetta
INTERMARK ELECTRONICS, 2920 W. Warner Ave., 92704, (714) 540-1322, TWX: 910-595-1583, Branch Mgr.: D. Anderson

SANTA BARBARA

CHANNEL RADIO SUPPLY CO., 18 E. Ortega St., 93101, (805) 965-8551, Ind. Sis. Mgr.: R. Shannon
MEYER, W. J., 513 State St., 93101, (805) 962-4817, Inside Sis. Contact: W. J. Meyer

SANTA CLARA

DYNAMETRON, 3343 Edwards Ave., 95050, (408) 246-6535
FISHER/BROWNELL, INC., 3381 Edward Ave., 95050, (408) 244-6182, Mktg. Mgr.: R. Hampton
MOLTRONICS, INC., 337 Matthew St., 95050, (408) 244-7600, TWX: 910-338-0036

RICHARDS ASSOCIATES, 1659 Scott Blvd., 95050, (408) 246-5860, Inside Sis. Contact: A. Richards
RTS COMMUNICATIONS, 3475 Woodward Ave., 95050, (408) 247-2311, Inside Sis. Contact: A. Law

SANTA FE SPRINGS

LINDE'S ELECTRONICS, 15401 Carmenita Rd., 90670, (213) 921-4413, Inside Sis. Contact: T. W. Aydelotte
HUNTER TOOLS, 9851 Alburis Ave., 90670, (213) 692-7786

SANTA MONICA

DISTRIBUTOR SPECIALIST, 1710 Santa Monica Blvd., 90404, (213) 829-5401, Inside Sis. Contact: M. Carey
MASTER DISTRIBUTORS, 1553 17th St., 90406, (213) 395-2637, Inside Sis. Contact: I. Nizam
SHELLEY ELECTRONICS, F., 1040 Pico Blvd., 90405, (213) 392-3913

SANTA ROSA

BASHAM-CHRISTENSEN, INC., 2600 Mendocino Ave., 95401, (707) 546-0835, Inside Sis. Contact: S. Basham

SAUSALITO

B. H. BALLARD CO., 3030 Bridgeway, 94965, (415) 332-0105

SOUTH GATE

MAC'S LAFAYETTE ELECTRONICS, 3351 Tweedy Blvd., 90280, (213) 564-3344, Sis. Mgr.: J. Avila
MOLTRONICS, INC., 5610 E. Imperial Hwy., 90280, (213) 773-6521, TWX: 910-583-1947

STOCKTON

DeJarratt, B. J., WHOLESALE CO., 715 E. Washington St., 95202, (209) 466-3591, Branch Mgr.: C. Epps
DUNLAP ELECTRONICS, Box 1970, 27 S. Grant St., 95202, (209) 466-3373, Inside Sis. Contact: W. Mardon
UNITED STEREO, 6239 Pacific Ave., 95207, (209) 478-3800, Branch Mgr.: D. Johnson

SUNNYVALE

ACACIA SALES, INC., 384 San Alejo Ave., 94086, (408) 735-0100, TWX: 910-339-9268
BELL ELECTRONICS, 1161 North Fair Oaks Ave., 94086, (408) 734-8570, TWX: 910-339-9378
BISHOP GRAPHICS DRAFTING SUPPLY CENTER, 1120G Stewart Ct., 94086, (408) 732-9010, Branch Mgr.: J. Soares
CRAMER/SAN FRANCISCO, 720 Palomar Ave., 94086, (408) 739-3011, Inside Sis. Contact: D. Dexter
D & S ELECTRONICS CO., 725 Winstead Ter., 94087, (408) 739-2881, Owner: G. Deere
DIPLOMAT/WESTLAND, 1118 Elko Dr., (408) 734-1900
INTERMARK ELECTRONICS, 1020 Stewart Dr., Box 9085, 94086, (408) 738-1111, TWX: 910-339-9312, Inside Sis. Contact: D. Barringer
MARSHALL INDUSTRIES, 788 Palomar, 94086, (408) 732-1100, Branch Mgr.: W. Mullins
RDX CORP., 1287 Lawrence St. Rd., (408) 734-4500
SUNNYVALE ELECTRONICS, 548 S. Murphy Ave., 94086, (408) 736-1324, Inside Sis. Contact: O. H. Hovet
TI SUPPLY CO., 776 Palomar Ave., 94086, (408) 732-5555, Branch Mgr.: W. Wilson
WESTATES/SUNNYVALE, 255 N. Mathilda, 94086, (408) 733-8383, Branch Mgr.: J. Barron

SUN VALLEY

METRIC RESOURCES CORP., 11754 Roscoe Blvd., 91352, (213) 768-4200
RICHEY ELECTRONICS, INC., 10871 La Tuna Canyon Rd., 91352, (213) 875-2862, TWX: 910-498-2205, Inside Sis. Contact: M. Hampton
STERLING ELECTRONICS, 11614 Pendleton St., 91352, (213) 767-5030, Branch Mgr.: C. Hodder

TORRANCE

UNITOOL DIV. OF EREM CORP., 3740 Skypark Dr., 90505, (213) 772-0751

TUSTIN

AB & B ELECTRONICS SUPPLY INC., 616 E. First St., 92680, (714) 838-1122, Inside Sis. Contact: E. L. Bartolo, Jr.

VALLEJO

ASSOCIATED RADIO DIST., 1340 Tennessee St., 94590, (707) 691-2363, Br. Mgr.: C. Andrews
ZACKIT CORP. OF VALLEJO, 1815 Sonoma Blvd., 94590, (707) 644-6676, Gen. Sis. Mgr.: W. A. Thompson

VAN NUYS

AIR ELECTRO SUPPLY, INC., 7700 Gloria Ave., 91406, (213) 988-4400, TWX: 910-495-1794
ALLEN, C. CO., INC. 13609 Satcoy St., 91402, (213) 989-1700, TWX: 910-495-1799, Gen. Sis. Mgr.: H. Lavone
ART SZERLIP SALES CO., 15111 Keswick St., 91405, (213) 782-1765, Inside Sis. Contact: A. Schendel
BERTRONICS, 15807 Stag St., 91406, (213) 781-5180, Inside Sis. Contact: R. Alexander
CAPITOL ELECTRONIC SUPPLY, 15219 Stag St., 91406, Inside Sis. Contact: G. Unkless
DAMARK INDUSTRIES, INC., 15821 Stag St., 91406, (213) 786-9300, Sis. Mgr.: M. B. Fellen
ELECTRONIC EXPEDITORS, INC., 14828 Calvert St., 91401, (213) 781-1910, Gen. Sis. Mgr.: D. J. Berns
KIESUB CORP., 14745 Oxnard St., 91401, (213) 873-1309, Branch Mgr.: F. Beane
OBERMAN-RENNER SALES, 14614 Raymer St., 91405, (213) 997-1124, Inside Sis. Contact: R. Oberman
PACIFIC SWITCH CONTROLS INC., 14048 Burbank Blvd., 91401, (213) 873-4802, TWX: 910-495-1766, Ind. Sis. Mgr.: F. Berniak
PATANE AVIONICS, 5937 Kester Ave., (213) 988-4455
S. P. ELECTRONIC SYSTEMS, 5250 Van Nuys Blvd., 91401, (213) 788-8850, Sis. Mgr.: R. Dixon
SWIFT & ASSOC., C. W., 15216 Burbank Blvd., 91401, (213) 989-1133, TWX: 910-495-1728, Inside Sis. Contact: J. Patterson

VISTA

PACIFIC AUDIO, 647 Mercantile St., 92083, (714) 724-0906, Inside Sis. Contact: H. Hainsworth

WEST LOS ANGELES

CALIFORNIA ELECTRONICS SUPPLY, INC., 1911 Armacost Ave., 90025, (213) 826-8333, Inside Sis. Contact: W. M. Fales

WESTMINSTER

B.A.S.E. ELECTRONICS, 92683, (714) 894-1303

WOODLAND HILLS

BURTIS INSTRUMENTS, 6324 Variel Ave., Bldg. E., 91364, (213) 887-1360
C & A ELECTRONICS, 23009 Ventura Blvd., 91364, (213) 340-6022, Sis. Mgr.: E. Rivers
DOWIAK ASSOC. INC., Box 471, 91364, (213) 340-6035, Branch Mgr.: C. Cummings
ELCON, 6325 DeSoto, Bldg. E., (213) 884-4852
JACO ELECTRONICS INC., 21201 Oxnard St., 91364, (213) 887-6400, TWX: 910-994-1922, Branch Mgr.: J. Smith
RAMPART COMPONENTS INC., 21201 Oxnard St., 91364, (213) 887-6400, Branch Mgr.: D. Ruddell
SEMICOMP, 21031 Ventura Blvd., 91364, (213) 884-5010, Branch Mgr.: R. Niles
SEMICONDUCTOR CONCEPTS, 21201 Oxnard St., 91364, (213) 884-4560, TWX: 910-494-1923, Inside Sis. Contact: R. Lerron

COLORADO

ARVADA

MARSHALL INDUSTRIES, 5633 Kendall Ct., 80002, (303) 423-9670, Branch Mgr.: A. Baker

AURORA

A&S SLS., 12891 E. Nevada Circle, 80010, (303) 366-0208
COMPONENT SPECIALTIES, INC., 3178 Nome St., 80010, (303) 341-0160, Inside Sis. Contact: W. Dale
JET ELECTRONIC SUPPLY CO., 1445 Florence St., 80010, (303) 364-1000, Inside Sis. Contact: J. Henken

COLORADO SPRINGS

D & M ELECTRONIC SUPPLY, 715 N. Weber St., 80901, (303) 633-4666, Inside Sis. Contact: J. Smith
RADIO SERVICE SUPPLY CO., 324½ N. Tejon St., 80903, (303) 633-5426, Inside Sis. Contact: E. Reinhardt

COMMERCE CITY

ELMAR/DENVER, 6777 E. 50th Ave., 80022, (303) 287-9611, TWX: (910) 936-0770, Br. Mgr.: R. Seale

DENVER

ACACIA SALES, INC., 11111 W. 8th Ave., 80215, (303) 232-2882, TWX: 910-937-0731, Branch Mgr.: G. Delmer
B-S INC., 7100 Broadway, Bldg. 3-1, 80221, (303) 426-0222
BARNHILL FIVE, INC., 1170 S. Sheridan, 80226, (303) 934-5505
CRAMER/DENVER, 5465 E. Evans Pl. at Hudson, 80222, (303) 758-2100, TWX: 910-932-0552, Sis. Contact: D. Lefavor
CW ELECTRONIC SALES, 1401 Blake St., 80202, (303) 244-5523
DIXON ELECTRIC SUPPLY, 4880 E. Pacific Pl., 80222, (303) 757-7453
ELECTRONIC PARTS CO., 1212 S. Broadway, 80210, (303) 744-1992, Inside Sis. Contact: R. Fick
ELMAR ELECTRONICS, 6777 E. 50th Ave., 80222, (303) 287-9611
ESSEX INTERNATIONAL, INC., 4600 Holly St., 80207, (303) 399-0144
FISTELL'S ELECTRONICS SUPPLY, 1001 Bannock St., 80204, (303) 629-1312, Sis. Contact: L. Hofing
HAMILTON/AVNET - DENVER, 5921 No. Broadway, 80216, (303) 534-1212, TWX: 910-931-0510, Sis. Contact: D. Faugus

INTERMED ELECTRONICS, 5750 North Logan, 80216, (303) 534-6121, Inside Sis. Contact: D. Wilson
INTERMARK ELECTRONICS, 2600 W. Second Ave., 80219, (303) 936-8284, TWX: 910-931-0501, Branch Mgr.: D. Johnson
KIERULFF ELECTRONICS, INC., 10890 E. 47th Ave., 80239, (303) 371-6500, TWX: 910-932-0169, Mgr.: J. D. Price
METER MASTER INSTRUMENT CORP., 1165 S. Cherokee St., 80223, (303) 722-5766
MUNDIX INDUSTRIAL CONTROLS, 5444 Downing, 80216, (303) 893-2990, TWX: 910-931-2230, Inside Sis. Contact: K. Husker

STEVENS ELECTRONICS, INC., 1759 S. Broadway, 80210, (303) 777-7997, Sis. Mgr.: R. C. Stevens
TESSCO, 1340 S. Sherman, (303) 744-1119
T. I. SUPPLY, 9725 E. Hampden Ave., 80231, (303) 751-1780
TI SUPPLY CO., 2149 S. Holly St., 80222, (303) 757-7571, Branch Mgr.: J. Hughes

NEWARK ELECTRONICS, 2170 S. Grape St., 80222, (303) 757-3351
WACO ELECTRONICS, 4616 Ironton St., 80239, (303) 371-4370, TWX: 910-932-9121, Contact: L. Tiffin

WALLACE, R. C. CO., 10890 East 47th Ave., 80239, (303) 373-0330, TWX: 910-932-0169, Mgr.: C. Vessey
WAZEE ELECTRIC CO., 2020 W. Barbary Pl., 80204, (303) 892-7003, Inside Sis. Contact: L. C. Cummings

ENGLEWOOD

WEATHERFORD, R. V. CO., 3905 So. Mariposa, 80110, (303) 761-5432, TWX: 910-933-0173, Branch Mgr.: K. R. Crowe

GRAND JUNCTION

RADIO & ELECTRONIC SUPPLY CO., 640 White Ave., Box 248, 81501, (303) 243-3346, Inside Sis. Contact: K. C. DeWeese

LAKEWOOD

ACACIA SALES, INC., 11111 W. 8th Ave., Unit B, 80215, (303) 232-2882

LITTLETON

RADCO ELECTRONICS, 2552 Ridge Rd., (303) 794-4279

PUEBLO

MONTALBANO, V., 1717 S. Prairie, 81005, (303) 564-0122, Sis. Mgr.: V. Montalbano
PUEBLO RADIO TV SUPPLY CO., 301 E. Northern Ave., 81004, (303) 544-0897, Inside Sis. Contact: C. Holden
PUEBLO / WALKER ELECTRONICS, INC., Box 838, 81002, (303) 542-1924, Inside Sis. Contact: B. Hartman, Sis. Mgr.: N. Holst

STERLING

D & H ELECTRONICS SUPPLY, 117 Ash St., 80751, (303) 522-3033, Branch Mgr.: K. Anderson

CONNECTICUT

BETHEL

PIONEER / NEW ENGLAND, 154 Greenwood Ave., 06801, (203) 792-1182

BRIDGEPORT

GREENE-SHAW CO. INC., (203) 366-3278
WESTCONN ELEC. INC., 195 Colorado Ave., 06605, (203) 367-7747, Inside Sis. Contact: R. Adams

DANBURY

SCHWEBER ELECTRONICS, Finance Dr., Commerce Ind. Pk., 06810, (203) 792-3500, Gen. Mgr.: A. Lindstrom

EAST HARTFORD

R & S ELECTRONIC DIST., 95 Leggett St., 06108, (203) 528-9901

EAST HAVEN

J. V. ELECTRONICS, 06512, (203) 469-2321

FAIRFIELD

BADER'S TV CORP., 2197 Black Rock Tpke., 06430, (203) 334-5473, Mktg. Mgr.: S. M. Bader
UTRONICS INC., 273 Linwood Ave., 06430, (203) 255-4521, Gen. Sis. Mgr.: J. O'Brien

GEORGETOWN

HAMILTON/AVNET - CONN., 643 Danbury Rd., 06829, (203) 762-0361, Inside Sis. Contact: L. Lynas

HAMDEN

ARROW ELECTRONIC, 295 Treadwell St., 06514, (203) 248-3801
IMPACT SALES, INC., 60 Connolly Pkwy., 06514, (203) 281-1331

MARSHALL, G. S. CO., 2531 Whitney Ave., 06518, (203) 288-9241, Branch Mgr.: W. Pisco
WILSHIRE ELECTRONICS - CONN., 2554 State St., 06517, (203) 281-1166, Inside Sis. Contact: L. Melilli

When you need
quality components like
ITT CANNON
get the works from
CRAMER

cramer
CRAMER ELECTRONICS INC.

Our most important component is service.

HARTFORD

GAL ELECTRIC, 19 Heath St., 06106, (203) 232-9880
 HATRY ELECTRONICS, 500 Ledyard St., 06114, (203) 527-1881, TWX: 800-842-2627
 SCILLI ELECTRONICS, INC., 78 Maple Ave., 06114, (203) 249-8415, Inside Sis. Contact: R. Sopelar

MADISON

A&M ELECTRONIC REP'S, Aileen Dr., 06443, (202) 245-1031

MIDDLETOWN

MANCIB CO., Randolph & Coe Rds., 06457, (203) 346-6646, Telex: 99-293, Inside Sis. Contact: D. Sargent
 REED, G. U. CO., 140 Washington St., 06457, (203) 347-5638, Inside Sis. Contact: R. McFarlane

NEW HAVEN

CONNECTOR CORP. OF AMERICA, 137 Hamilton St., 06504, (203) 824-0127
 HATRY ELECTRONICS, 610 Blvd., 06519, (203) 787-5921, Branch Mgr.: A. Fraulo

NEW LONDON

AIKINS ELECTRONIC SUPPLIES, INC., 531 Broad St., 06320, (203) 442-4406, Mktg./Adv. Mgr.: W. E. Aikins
 JABBOUR ELECTRONICS, 227 Jefferson Ave., 06320, (203) 442-4389, Branch Mgr.: J. Christensen

NEWTOWN

TALED ELECTRONICS, D-2 Pine Tree Hill Rd., 06470, (203) 426-0724, Inside Sis. Contact: R. J. Ledy

NORTH BRANFORD

MARSHALL INDUSTRIES, 200 Shaw Rd., 06471, (203) 484-0486, Branch Mgr.: D. Cooper

NORTH HAVEN

CRAMER/CONNECTICUT, 35 Dodge Ave., 06473 (203) 239-5641, Div. Mgr.: D. Bentley

NORWALK

HARVEY ELECTRONICS, 112 Main St., 06851, (203) 853-1515, TWX: 710-468-3373, Branch Mgr.: R. Marinelli

NORWICH

AIKINS ELECTRONIC SUPPLIES, INC., 499 N. Main St., 06360, (203) 887-9566, Branch Mgr.: N. Richards

STAMFORD

WESTCHESTER ELECTRONICS INC., 41 Magee Ave., 06902, (203) 348-7361, Branch Mgr.: R. Bedstadt

STRATFORD

ELECTRO/COMP, 2415 Main St., 06497, (203) 375-5811
 HATRY ELECTRONICS, 1145 Honeyshot Rd., 06497, (203) 335-3124, Branch Mgr.: P. Wynne
 STATE ELECTRONIC PARTS CORP., 1269 Barnum Ave., 06497, (203) 375-5861
 STEP CO., 1269 Barnum Ave., (203) 375-5961

TORRINGTON

MOTOREPS, INC., 808 Main St., 06790, (203) 482-3193, Branch Mgr.: R. Auclair

WALLINGFORD

ADAMS-McGREGOR, INC., Box 353, 06494, (203) 269-5816, Branch Mgr.: R. McGregor

WATERBURY

BOND RADIO ELECTRONICS, 439 W. Main St., 06702, (203) 757-0546
 HATRY ELECTRONICS, 480 Watertown Ave., 06708, (203) 755-1181, Branch Mgr.: A. Clementi
 SUBURBAN SUPPLY CO., 117 Benedict St., 06720, (203) 757-1251

WEST HARTFORD

SEGEL CO., C., 6 Hilldale Rd., 06117, (203) 236-2027, Branch Mgr.: A. Segel
 SIGNAL ELECTRONIC CENTER, 589 New Park Ave., 06110, (203) 233-8551, Inside Sis. Contact: D. Vigue
 SMITH CO., R., 188 Brewster Rd., 06117, (203) 523-0512, Mktg. Mgr.: G. Smith

WEST HAVEN

AIKINS ELECTRONIC SUPPLIES, INC., 884 Orange Ave., 06516, (203) 933-2581, Br. Mgr.: E. Lilio

WESTPORT

HI-REL INDUSTRIES, 06880, (203) 226-4731
 NEWARK ELECTRONICS, 25 Sylvan Rd., S., 06880, (203) 226-6921

DELAWARE**WILMINGTON**

ALMO ELECTRONICS CORP., 1122 French St., 19801, (302) 656-9467, Br. Mgr.: T. Samuels
 WHOLESALE ELECTRONICS, INC., 1402 Walnut St., 19801, (302) 656-9988, Inside Sis. Contact: D. R. Terry, Sr.

FLORIDA**CLEARWATER**

LYNCH GENTRY ASSOC., 1932 Drew St., 33515, (813) 443-2697, Inside Sis. Contact: G. Shivas
 SOUTHLAND ELECTRONICS, INC., 1771 N. Hercules Ave., 33515, (813) 443-4514, TWX: 810-866-0436, Inside Sis. Contact: N. Marshburn

CORAL SPRINGS

CONTROLLED DISTRIBUTORS, INC., 7857 W. Sample Rd., 33065, (305) 752-4950

DAYTONA BEACH

HAMMOND ELECTRONICS, INC., 719 N. Ridgewood Ave., 32022, (904) 253-0531, Branch Mgr.: S. R. Stephey
 SOUND CENTER, INC., 215 Mason Ave., 32017, (904) 252-5371, Sis. Mgr.: R. Lee

FORT LAUDERDALE

ALLIED ELECTRONICS, 800 N.W. 57 Ct., 33309, (305) 772-4664, Branch Mgr.: J. Durkins
 A & M INSTRUMENT, 4257 N.E. 6th Ave., 33308, (305) 565-2579
 DOWIAK ASSOC., INC., 916 S.W. Coconut Dr., 33315, (305) JA 41102, Branch Mgr.: J. J. Smith

Kulka Terminal Boards stocked in depth

U-TRONICS

273 Linwood Ave., Fairfield, Conn. 06430 Tel: 203 255 4521

HALL-MARK ELECTRONICS, 1302 W. McNab, 33309, (305) 971-9280
 JACKSON MARINE ELECTRONICS CO., Box 21338, 33316, (305) 525-4771, Inside Sis. Contact: R. Petsche
 NEWARK ELECTRONICS, 1360 N.W. 65th St., 33313, (305) 587-2372
 PEERLESS RADIO CORP. OF FLA., INC., 1040 N.E. 43rd Ct., 33308, (305) 566-5966, TWX: 305-955-9852, Sis. Mgr.: T. R. Griffin
 SPROUCH SALES, INC., 3520 W. Broward Blvd., 33301, (305) 587-3792

FORT MYERS

HAMMOND ELECTRONICS, INC., 2463 Franklin St., 33901, (813) 334-2277, Branch Mgr.: T. S. Roberts

FORT WALTON BEACH

GRICE ELECTRONICS INC., 280 N. Eglin Pkwy., 32548, (904) 242-3158, Branch Mgr.: T. Yates

HOMESTEAD

LAWRENCE ELECTRONICS, 16793 S.W. 304th St., (305) 248-6303, Sales Mgr.: K. L. Roesch II

HOLLYWOOD

CRAMER/HOLLYWOOD, 4035 N. 29th Ave., 33020, (305) 923-8181, Telex: 051-4475
 HAMILTON/AVNET—Miami, 4020 N. 29th Ave., 33021, (305) 925-5401, TWX: 510-954-9808, Branch Mgr.: F. Tole
 HAMMOND ELECTRONICS, INC., 250 E. First St., 32206, (904) 356-4851, Branch Mgr.: F. Womack
 SCHWEBER ELECTRONICS, 2830 N. Terrace, 33020, (305) 927-0511, Gen. Mgr.: I. Grossman

INDIAN ROCKS BEACH

TECH REP, Box 508, (813) 595-2834

JACKSONVILLE

HAMMOND ELECTRONICS, 250 E. First St., 32206, (904) 356-4851
 SOUTHEAST ELECTRONICS, 1125 Rosselle St., 32203, (904) 356-3007

JACKSONVILLE BEACH

JACKSON MARINE ELECTRONICS CO., 2316 Beach Blvd., 32250, (904) 249-8822, Branch Mgr.: R. J. Werder

LAKE CITY

BAKER'S ELECTRONICS, 201 N. Putnam St., 32055, (904) 752-6494, Inside Sis. Contact: D. Baker

LAKELAND

A-A ELECTRIC/Div. AEC INC., 2112 S. Combee Rd., 33802, (813) 682-6181, Branch Mgr.: K. Walter
 HAMMOND ELECTRONICS, INC., 930 E. Oak St., 33802, (813) 686-4145, Branch Mgr.: R. D. Morris

LAKE PARK

TEKTONE SOUND & SIGNAL MFG., 1331 S. Killian Dr., 33403, (305) 844-2383, Mktg. Mgr.: M. Mira

MARGATE

CONTROLLER DISTRIBUTORS, INC., 2922 N. State Rd. 7, 33063, (305) 971-4950, Inside Sis. Contact: P. Yagle

MIAMI

ELECTRONICS EQUIP. CO., 2701 N.W. 42nd Ave., 33142, (305) 871-3500
 ELECTRO-STANDARD LAB., INC., 3560 N.W. 34th St., 33142, (305) 633-6973
 ESL ELECTRONIC DIST. DIV. ELECTRO STANDARDS LABS., 3560 N.W. 34th St., 33142, (305) 633-6973, Inside Sis. Contact: W. Sleeper
 FARREYS HDW. CO., 7225 N.W. Seventh Ave., (305) 754-5451
 FLORIDA AVIATION CORP., 1295 S.W. 70 Ave., 33144, (305) 261-6822, Inside Sis. Contact: E. R. Bright
 FLORIDA BEARINGS, 3164 N. Miami Ave., (305) 573-8424
 LYKES ELECTRONICS, 1800 N.W. 23rd St., 33142, (305) 633-8535
 WALTER ELECTRONIC DISTRIBUTORS, 1801 N.E. 2nd Ave., 33132, Inside Sis. Contact: R. J. Schneider

MIAMI BEACH

SHAW COMMUNICATIONS CONSULTANTS, 230 174th St., Suite 2210, 33160, (305) 931-5121, Inside Sis. Contact: E. Wefald

MIAMI SPRINGS

POWELL ELECTRONICS, 1744 N.W. 69th Ave., 33166, (305) 592-3260, TWX: 810-848-8040, Branch Mgr.: J. Frost

NAPLES

GULFSIDE COMMUNICATIONS, Box 846, 33940, (813) 649-9003, Inside Sis. Contact: A. Konstan

NORTH MIAMI

PSL ELECTRONICS, INC., 12305 N.E. 6th Ave., 33161, (305) 895-0082, Inside Sis. Contact: A. DeMario

OAKLAND PARK

PEERLESS RADIO CORP., 1040 Northeast Rd., 33308, (305) 566-5966, TWX: 510-455-9852, Branch Mgr.: T. C. Griffin

ORLANDO

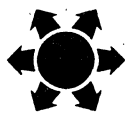
BROWNELL ELECTRO INC., 307 27 St., 32806, (305) 843-6770, Branch Mgr.: T. Maudlin
 CONTROL CENTER, 1013 E. Montana St., (305) 896-6831
 CRAMER/ORLANDO, 345 N. Graham Ave., 32814, (305) 894-1511, TWX: 810-850-0154
 GRA-MAR INC., 3165 McCrory Pl., Suite 265, 32802, (305) 894-3351, TWX: 810-850-0125, Pres.: B. J. Grace
 HALL-MARK ELECTRONICS CORP., 7233 Lake Ellenor Dr., 32809, (305) 855-4020, TWX: 810-850-0183, Buyer, Z. Winterton
 HAMMOND ELECTRONICS, INC., 911 W. Central Blvd., 32802, (305) 849-6060, TWX: 810-850-4121, Inside Sis. Contact: W. L. Holbrook
 HIGSMITH & CO., J. L., (305) 293-5202
 PELCORE CO., 1607 Forsyth Rd., (305) 275-1132
 POWELL ELECTRONICS, 2032 Palmridge Way, 32809, (305) 859-1450, TWX: 810-850-0155, Branch Mgr.: J. Eppright

PALM BEACH GARDENS

LEGRI S. RESISTOR CORP., 10475 Riverside Dr., (305) 626-4495, Branch Mgr.: M. Schmuckelwicz
 MARSHALL INDUSTRIES, 10384 Riverside Dr., 33403, (305) 622-8490, Branch Mgr.: B. Finneran

PEERLESS

In addition to on-time deliveries at the best prices, Peerless Radio offers exclusive concentrated services to clients: Production Planning Assistance, Coding Identifications, Color-Wrap Indicating, Product Modifications, Component Assemblies, Warehousing, Custom Shipping Schedule, Anticipated Inventory Protection, Client Stand-By Stocks, Kitting, Poly Packaging, Engraving, many more. Peerless Radio, your concentrated source for distributor services and products. Peerless Radio Corporation, 19 Wilbur St., Lynbrook, L.I., N.Y. 11563 and 1040 N.E. 43rd Ct., Ft. Lauderdale, Florida 33308

RADIO

PANAMA CITY

CENTRAL ELECTRONIC SUPPLY, 318 Luverne Ave., 32401, (904) 785-0237, Sales Mgr.: N. Segler
GRICE ELECTRONICS, INC., 2907 W. Hwy. 98, 32401, (904) 769-2151, Branch Mgr.: B. Collins

PENSACOLA

BREWER CO., F. T. C., Box 8057, 32505, (904) 434-1953, Sales Mgr.: C. H. Belk
ELECTRONIC SUPPLY, 1440 N. Pace Blvd., 32505, (904) 432-6916, Branch Mgr.: D. Jones
GRICE ELECTRONICS, INC., 320 E. Gregory St., 32589, (904) 433-4616, Inside Sis. Contact: R. McCrary
HUNDLEY'S, Box 2117, 32503, (904) 432-5457, Inside Sis. Contact: W. W. Hundley
THIEVES WAREHOUSE OF MOBILE, Box 8057, 32505, (904) 432-3723, Branch Mgr.: M. J. Welner

POMPANO BEACH

A & M INSTRUMENT, 6560 S.W. 7th Ct., (305) 972-1610
ZEUS COMPONENTS OF FLA., 1131 W. McNab, 33068, (305) 942-4312, TWX: 510-956-9722, Branch Mgr.: R. Fish

SARASOTA

ASSOCIATED SERVICE, INC., 1324 East Ave., 33577, (813) 955-4544, Mktg./Adv. Mgr.: R. Des Rosiers

ST. PETERSBURG

COOPER RADIO CO., 165 — 13th St. N., Box 10010, 33733, (813) 894-7607, Inside Sis. Contact: C. B. Cooper, L. E. Cooper
L. M. CROWE CO., Box 7505, (813) 894-0249

TAMPA

AUDIO VISUAL SERVICE, 5485 Jetport Industrial Hwy., 33614, (813) 884-1461
EBERT SALES AGENCY, E. L., Box 10471, (813) 837-2867
ESSEX INTERNATIONAL, INC., 6715 53rd St., 33610, (813) 621-5538
HAMMOND ELECTRONICS, INC., 1516 Cypress St., 33606, (813) 253-0104, Br. Mgr.: D. Hand
LEADER ELECT. DISTR., 3411 S. Dale Mabry Hwy., Box 13486, 33611, (813) 835-1891
NICKERSON CO., 5421 Jet View Circle, 33614, (813) 885-1416, Inside Sis. Contact: D. Alves
THIEVES WAREHOUSE OF TAMPA, Box 18364, 33679, (813) 254-7561, Branch Mgr.: J. Buckler
ULTRONICS, INC., 5421 Jet View Cir., 33614, (813) 886-2563, Branch Mgr.: M. Sirotowicz
WALLACE COMMUNICATIONS CONSULTANTS, Box 13967, 33611, (813) 253-2376, Branch Mgr.: I. Wallace

WINTER PARK

STA-CON, 680 Clay St., (305) 645-2215

GEORGIA

ALBANY

SPECIALTY DISTRIBUTING CO., 428 Roosevelt Ave., 31701, (912) 436-2469, Branch Mgr.: L. Perrett

ATHENS

SPECIALTY DISTRIBUTING CO., 230 Epps Bridge Rd., 30601, (404) 548-7273, Branch Mgr.: E. N. Bradley

ATLANTA

ACK RADIO SUPPLY CO., 554 Deering Rd. N.W., 30309, (404) 351-6340
BROWNELL ELECTRONICS, INC., 3026 Commerce Way, 30354, (404) 762-5181
CRAMER/ATLANTA, 3923 Oakcliff Ind'l Ct., 30340, (404) 448-9050
DAPCO, INC., 3687 Northeast Expy., 30340, (404) 458-6341
DIXIE BEARINGS, 276 Memorial Dr., (404) 522-7620
ELECTRO-AIR CORP., 2270 Marietta Blvd., N.W., 30325, (404) 351-3545, Inside Sis. Contact: D. Shaw
GEORGIA AVIATION CORP., Box 20863, 3313 Whipple Ave., 30320, (404) 768-3777, Branch Mgr.: E. L. Horne
JACKSON ELECTRONIC SUPPLY CO., Box 19837, 1135 Chattahoochee N.W., 30318, (404) 355-2223, Inside Sis. Contact: T. Gunnin
LYKES ELECTRONICS, 1135 Chattahoochee Ave., Box 19837, Sta. N., 30318, (404) 355-2223
MOUNTAIN ELECTRONICS, 430 W. Peachtree St. N.W., 30308, (404) 577-6850
POWER AND TELEPHONE SUPPLY CO., Box 43223, 30336, (404) 691-6813
SCHWEBER ELECTRONICS, 4126 Pleasantdale Rd., 30340, (404) 449-9170, Gen. Mgr.: F. Thomas
SPECIALTY DISTRIBUTING CO., 763 Juniper St., N.E., 30308, (404) 873-2521, Gen. Sis. Mgr.: F. Stanley
TECHNICAL MKTG., INC., 2146 American Industrial Way, 30341, (404) 451-9241, Inside Sis. Contact: M. S. Findling

AUGUSTA

AUGUSTA WHOLESALE ELECTRONICS, 1034 Broad St., 30902, (404) 724-1883, Gen. Sis. Mgr.: F. C. Lakeman
DIXIE RADIO SUPPLY CO., 1234 Gordon Park Rd., Box 2546, 30903, (404) 722-2055, Branch Mgr.: R. Guess
SPECIALTY DISTRIBUTING CO., 1251 Gordon Park Rd., 30901, (404) 722-1526, Branch Mgr.: W. Evans

BRUNSWICK

SPECIALTY DISTRIBUTING CO., 2812 Carrie St., 31520, (912) 265-1927, Branch Mgr.: M. Hutto

CHAMBLEE

LANCE ENGINEERING, 30341, (404) 458-6280

COLUMBUS

SPECIALTY DISTRIBUTING CO., 1112 Brookhaven Blvd., 31902, (404) 327-7414, Branch Mgr.: J. Russell

DALTON

HENDERSON INDUSTRIAL EQUIPMENT, 441 N. Hamilton St., Box 773, 30720, (404) 278-8307

DECATUR

SOUTHERN TELEPHONE SUPPLY CO., Box 833, 30031, (404) 457-5512

GRIFFIN

GRIFFIN ELECTRONICS CENTER, 217 W. Taylor St., 30223, (404) 228-2885, Inside Sis. Contact: D. Harris

HAPEVILLE

BROWNELL ELECTRO, INC., 3026 Commerce Way, 30054, (404) 762-5181, Branch Mgr.: D. Jackson

LAWRENCEVILLE

HALL-MARK, Route 1, (404) 963-9728

LITHONIA

ESSEX INTERNATIONAL, INC., 6588 Marbut Rd., 30058, (404) 482-7287

MACON

SPECIALTY DISTRIBUTING CO., 439 Arch St., 31201, (404) 243-5421, Branch Mgr.: W. McCurry

MARIETTA

SPECIALTY DISTRIBUTING CO., 105 White Ave., 30062, (404) 422-4333, Branch Mgr.: M. W. Kaylor

NORCROSS

HAMILTON/AVNET — ATLANTA, 6700 I-85 Access Rd., 30071, (404) 448-0800, Branch Mgr.: P. Stone
SCHWEBER ELECTRONICS, 3008 Adriatic Ct., 30071, (404) 449-9170

SAVANNAH

SHERMAN ASSOCIATES, L., 1 Birchwood Ct., 31406, (912) 925-3660

ELECTRONICS 21, INC., 21 E. DeRenne Ave., 31405, (912) 352-0585, Sis. Contact: P. Konter
SPECIALTY DISTRIBUTING CO., 612 E. Broad St., 31401, (912) 234-1684, Branch Mgr.: R. Brown

SMYRNA

MOUNTAIN ELECTRONICS, INC., 2885 Elmwood Dr., S.E., 30080, (404) 434-0111, Inside Sis. Contact: D. Kane

VALDOSTA

SPECIALTY DISTRIBUTING CO., 916 Marion St., 31601, (912) 242-4910, Branch Mgr.: H. Hall

HAWAII

HONOLULU

ELECTRICAL EQUIPMENT CO., LTD., 832 S. Queen St., Box 2557 AIR MAIL, 96804, (808) 533-3884
HONOLULU ELECTRONICS, 819 Keeaumoku St., 96814, (808) 949-5564
INDUSTRIAL ELECTRONICS, INC., 646 Queen St., 96810, (808) 533-6095, Inside Sis. Contact: D. Soon
NYLEN BROTHERS & CO., LTD., Box 2958, 96802, (808) 538-1171, Inside Sis. Contact: J. Ito
PIETI, GENE, Box 2903, 96802, (808) 839-9059
PRECISION RADIO, LTD., Box 2573, 96803, (808) 537-5291, Inside Sis. Contact: M. K. Hironaka
RADIO WHOLESALE & SUPPLY, INC., 610 Ward Ave., Box 3768, 96812, (808) 538-3831, Inside Sis. Contact: R. Mikami
TEL-RAY APPLIANCES, INC., 330 Cooke St., 96813, (808) 537-4501, Inside Sis. Contact: B. Brown
VICTOR KIM ELECTRONICS, (808) 533-7132

WAIHAWA

WAIHAWA RENTALS, 825 E. Olive Ave., 06786, (808) 621-6084

IDAHO

BOISE

KIMBALL ELECTRONICS, INC., 418 N. Orchard, 83704, (208) 342-3559, Branch Mgr.: E. McKenzie

OAKLEY ELECTRONICS, Box 7605, 2801 Idaho St., 83707, (208) 343-7937, Inside Sis. Contact: K. Biggers
OAKLEY WHOLESALE, INC., 170 N. 29th, 83707, (208) 343-6417, Gen. Sis. Mgr.: J. Rosor

IDAHO FALLS

INTERNATIONAL APPLIANCE SUPPLY CORP., 2829 N. Holmes Ave., 83401, (208) 524-2464, Branch Mgr.: F. H. Zenger Jr.
SCHWENDIMANS WHOLESALE DIST., 83401, (208) 522-2492

POCATELLO

KIMBALL ELECTRONICS, INC., 504 E. Center St., 83201, (208) 232-2201, Branch Mgr.: E. Jones

TWIN FALLS

UNITED ELECTRONIC WHOLESALE, Box 185, 83301, (208) 733-7324, Inside Sis. Contact: R. Goid

ILLINOIS

ALTON

RADIONICS-ALTON, 211 Main, 62005, (618) 451-7630, Br. Mgr.: W. Riffey

ARLINGTON HEIGHTS

LODAN ELECTRONICS, INC., 2460 Oakton St., 60005, (312) 956-6700, Inside Sis. Contact: K. Vito
METRIC RESOURCES CORP., 2407 East Oakton St., 60005, (312) 439-4600
S & R CORP., 2420 E. Oakton St., 60005, (312) 593-2545, Inside Sis. Contact: R. Luczak
TI SUPPLY CO., 2420 E. Oakton Rd., 60005, (312) 593-7660, Branch Mgr.: E. Brierty

AURORA

MELVIN-STOLZ, INC., 105 S. LaSalle St., 60504, (312) 897-8471, Branch Mgr.: J. Brucks

BLOOMINGTON

YORK RADIO & TELEVISION CORP., 701 N. Main, 61701, (309) 829-3303, Branch Mgr.: D. Erlenbusch

BROADVIEW

LCPM CHICAGO, INC., 2030 W. 16th St., 60153, (312) 865-7600, Branch Mgr.: R. E. Rislw

CARBONDALE

SUDEKUM ELECTRONIC SUPPLY CO., Hwy. 13 East, 62901, (618) 549-7361, Branch Mgr.: P. Rotolo

CHAMPAIGN

KLAUS RADIO INC., 905 S. Neil St., 61820, (217) 356-1896, Br. Mgr.: D. McAfee
YORK RADIO & TELEVISION CORP., 214 S. Walnut, 61820, (217) 352-0577, Branch Mgr.: L. Beckett

CHICAGO

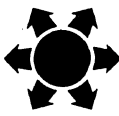
ALLIED ELECTRONICS DIV. TANDY CORP., 2400 W. Washington Blvd., 60647, (312) 421-2400, Inside Sis. Contact: D. Yaniko
BELL INDUSTRIES, 7701 N. Austin Ave., 60076, (312) 282-5400
BERKHEIMER CO. INC., G. W., (312) 468-5454
CAPCO ENTERPRISES, 8159 W. Balmoral Ave., 60656, (312) 631-9555, Inside Sis. Contact: R. Puzerewski
CARDINAL ELECTRONICS, 3028 N. Central, 60634, (312) 237-5112, Inside Sis. Contact: I. Blaustein
CERTIFIED ELECTRONICS DISTRIBUTORS, 5959 West Fullerton, 60639, (312) 622-2291, Mktg. Mgr.: C. Petrucci
COMPLETE READING ELECTRIC, 100 S. Jefferson, 60606, (312) 236-5390
CUMMING & FOLEY SALES CO., 6132 W. Belmont Ave., 60634, (312) 725-8110, Sis. Mgr.: J. F. Foley
DOYLE CO., W. J., 7426 N. Western Ave., 60645, (312) 274-6685
E.D.I./ELECTRONIC DISTRIBUTORS, INC., 4900 N. Elston Ave., 60630, (312) 283-4800, Ind. Sis. Mgr.: S. Levey
E.D.I./ELECTRONIC DISTRIBUTORS, INC., 7421 N. Western Ave., 60645, (312) 761-3250, Branch Mgr.: R. Consamus
E.I.L. INSTRUMENTS, INC., 212 W. 79th St., 60620, (312) 874-8070, Branch Mgr.: A. Burill
ELECTRO-KINETICS, INC., 4114 N. Nashville Ave., 60634, (312) 286-4200, Inside Sis. Contact: J. Korper
ELECTRONIC DISTRIBUTORS, (312) 283-4800
ELECTRONIC ENGINEERS, INC., 1639 W. Evergreen Ave., 60622, (312) 227-2600, Inside Sis. Contact: L. March
E.M.F. CO., 6135 W. Belmont, 60634, (312) 889-8323
ESSEX INTERNATIONAL, INC., 950 W. 40th St., 60609, (312) 247-4032
ESSEX INTERNATIONAL, INC., 3959 S. Morgan St., 60609, (312) 254-8787
ESSEX INTERNATIONAL, INC., 3501 W. Addison St., 60618, (312) 463-7400
EXCEL ELECTRIC SERVICE CO., 2101 S. Western Ave., 60608, (312) 847-7220, Mktg./Adv. Mgr.: R. J. Ferrari
FLUID-TEK, 6348 S. Central, (312) 582-2872
FRANKENBUSH O., INC., 3565 N. Milwaukee Ave., 60641, (312) 282-3565
GILLETTE ENGINEERING CO., 221 W. 79th St., 60620, (312) TR 4-7444, Inside Sis. Contact: L. Martin
HOWARD ELECTRONIC SALES, 4573 S. Archer Ave., 60632, (312) 254-1777, Inside Sis. Contact: A. Schechter
HYLAND ELECTRICAL SUPPLY, 623 W. Monroe, 60606, (312) 263-4100, Inside Sis. Contact: A. Sittaro
INDUSTRIAL COMMUNICATIONS, 5843 West Div. St., 60651, (312) 626-7500
JOSEPH ELECTRONICS, INC., 1733 N. Harlem Ave., 60635, (312) 622-7766, Branch Mgr.: R. Holm
LASSERS & CO., 5518 N. Kedzie Ave., 60625, (312) 539-0170
MCBRIDE SALES, INC., 6054 Touhy Ave., 60648, (312) 775-1080, Inside Sis. Contact: P. R. Fitzsimmons
MELVIN-STOLZ, INC., 8110 S. Western Ave., 60620, (312) 737-3363, Branch Mgr.: K. Glosa
MERRILL ELECTRONICS, INC., 3563 N. Milwaukee Ave., 60641, (312) 386-2525, Sis. Mgr.: M. Gertz
NEWARK ELECTRONICS CORP., 500 N. Pulaski Rd., 60624, (312) 638-4411, Inside Sis. Contact: B. Johnson
PIVAN ENGINEERING CO., 3535 Peterson Ave., 60659, (312) 539-4838, TWX: 910-221-0177, Inside Sis. Contact: V. Wagner
PREHLER ELECTRONICS, 2300 N. Kilbourn, 60639, (312) 384-6100

PEERLESS

Peerless Radio is your **CONCENTRATED** source for **IMPULSE DEVICES**: switches, indicator lights, circuit breakers, lamps,

L.E.D. devices, rectifiers, relays, solenoids, capacitors, potentiometers, etc., etc., etc. More than 3 dozen hi-quality **IMPULSE DEVICE** manufacturers **CONCENTRATE** their products at **PEERLESS RADIO INVENTORY CENTERS** at 19 Wilbur St., Lynbrook, L.I., N.Y. 11563 and 1040 43rd Court, Ft. Lauderdale, Florida 33308. **PEERLESS RADIO: your CONCENTRATED SOURCE for Impulse Devices, Components, Packages.**

RADIO



RADIO DISTRIBUTING CO., 6832 W. North Ave., 60635, (312) 237-1105, Branch Mgr.: D. Hamilton
 REDEL LABS, 6713 N. Oliphant, (312) 631-8283
 REVERE ELECTRONIC, INC., (312) 738-3636
 SEMICONDUCTOR SPECIALISTS, INC., Box 66125, O'Hare Intl. Airport, 60666, (312) 279-1000, TWX: 910-254-0169, Inside Sls. Contact: R. Couture
 STANLEY & CO., A. 6059 N. Albany Ave., (312) 973-7376
 VACO PRODUCTS CO., 510 N. Dearborn St., 60610, (312) 467-0123, Inside Sls. Contact: J. Greist
 WAYNE ELECTRIC CO., 3162 N. Elston Ave., 60618, (312) 267-5400, Inside Sls. Contact: D. Dewitt; J. Morby
 ZEUS OF MIDWEST, 5642 W. Diversey St., 60639, (312) 622-8183, Branch Mgr.: T. Olsen

DANVILLE
 BUD ELECTRONIC SUPPLY CO., Box 734, 61832, (217) 446-0925, Sls. Mgr.: W. Martin

DECATUR
 SCHORAMAN RADIO CO., 128 S. Illinois, 62521, (217) 423-3936, Sls. Mgr.: W. Reynolds
 YORK RADIO & TELEVISION CORP., 590 N. Broadway, 62523, (217) 423-3484, Inside Sls. Contact: P. Clark

DES PLAINES
 EDMAR ELECTRONICS, 1275 Rand Rd., 60016, (312) 298-8580, TWX: 910-233-2479, Mktg. Mgr.: E. Flaxman
 MARSHALL INDUSTRIES, 300 E. Touhy Ave., 60018, (312) 298-3700, Branch Mgr.: R. Kahn
 TELEMEDIC/ELECTRO RENT, 1001 E. Touhy Ave., 60018, (312) 297-5830, TWX: 910-233-4145, Branch Mgr.: T. Wallace
 TRISTATE ELECTRONIC CORP., 22 E. Northwest Hwy., 60016, (312) 298-0535, Branch Mgr.: L. Krateski

DOWNERS GROVE
 WREN HOUSE ELECTRONICS, INC., 501 Ogden Ave., 60515, (312) 969-4650, Inside Sls. Contact: A. Stone

ELGIN
 ALLIED ELECTRONICS, 1355 Sleepy Hollow Rd., 60120, (312) 697-8200
 MELVIN ELECTRONICS, INC., 425 Dundee Ave., 60120, (312) 741-4506, Branch Mgr.: B. Wagner
 STOLZ-WICKES, INC., 60120, (312) 741-4506

ELK GROVE VILLAGE
 GBL ELECTRONICS CORP., 75 Gaylord St., 60007, (312) 593-3220, Inside Sls. Contact: A. Kosar
 HALL-MARK/CHICAGO, 180 Crossen Ave., 60007, (312) 437-8800, TWX: 910-222-2859
 IMC EQUIPMENT, 130 Crossen Ave., 60007, (312) 593-7606
 LAKELAND ELECTRONICS, INC., 2451 Brickvale Dr., 60007, (312) 595-1000, Inside Sls. Contact: H. Baron
 METERMASTER, 121 Gordon St., 60007, (312) 593-8650, Mgr.: J. Stainer
 SCHWEBER ELECTRONICS, 1380 Jarvis Ave., 60007, (312) 593-2740, Gen. Mgr.: I. Schwebel

ELMHURST
 SEMICONDUCTOR SPECIALISTS, 195 Spangler Ave., 60120, (312) 279-1000, TWX: 910-254-0100

EVANSTON
 TRI STATE ELECTRONIC CORP., 707 W. Howard St., 60202, (312) 869-5211, Inside Sls. Contact: M. Leuber

FOREST PARK
 MELVIN ELECTRONICS INC., 7236 Madison St., 60130, (312) 383-5800, Branch Mgr.: J. Ohman

FRANKLIN PARK
 LUMENITE ELECTRIC CO., 2331 N. 17th Ave., (312) 455-1450
 RICHARDSON ELECTRONICS, LTD., 3030 N. River Rd., 60131, (312) 456-0600, Inside Sls. Contact: D. R. Gandy

GENEVA
 MELVIN ELECTRONICS, INC., 825 W. State St., 60134, (312) 232-8050, Gen. Sls. Mgr.: B. R. Lindholm

JACKSONVILLE
 BAPTIST ELECTRONIC SUPPLY CO., 419 S. Mall Vaisterre, 06250, (217) 243-6464, Mktg. Mgr.: D. Fernandes
 BAPTIST ELECTRONIC SUPPLY CO., 1023 Dorian, 62650, (217) 253-0111, Branch Mgr.: T. Knust

JOLIET
 MELVIN-STOLZ, INC., 407 N. Chicago St., 60431, (312) 727-3638, Branch Mgr.: J. P. Fogarty, Sr.

KANKAKEE
 YORK RADIO & TELEVISION CORP., 2222 E. Maple, 60901, (815) 932-7483, Branch Mgr.: M. Davis

LAKE BLUFF
 J & R ENTERPRISES, (312) 945-6739

LA SALLE
 KLAUS RADIO, INC., 61301, (815) 223-7400
 WARREN RADIO CO., 518 Third St., 61301, (815) 223-4028

MATTOON
 MATTOON RADIO & TELEVISION SUPPLY CO., 400-404 S. 21st St., 61938, (217) 235-5457, Inside Sls. Contact: K. McLean

MOLINE
 LOFGREN DISTRIBUTING CO., 1202 4th Ave., 61265, (309) 764-7436, Mktg./Adv. Mgr.: D. Kehoe

MORTON GROVE
 JAXWAY WHOLESALE SUPPLY CORP., 9309 N. Major, 60053, (312) 966-0910, Sls. Mgr.: R. Gold
 KRADEN ELECTRONICS, INC., 5817 Dempster St., 60053, (312) 262-3322, Sls. Mgr.: R. Kramer

MT. PROSPECT
 CRAMER/CHICAGO, 1911 S. Busse Rd., 60056, (312) 593-8230
 MAGNUSON ELECTRONICS, INC., 2420 Oakton St., 60056, (312) 956-0700, Inside Sls. Contact: G. A. Meyers

MUNDELEIN
 J & R ENTERPRISES, 668 Tower Rd., (312) 566-2030

NILES
 JOSEPH ELECTRONICS, INC., 8830 N. Milwaukee Ave., 60648, (312) 297-4200, Inside Sls. Contact: C. Poncher

OAK FOREST
 MELVIN ELECTRONICS, INC., 15154 S. Cicero Ave., 60452, (312) 468-2930, Branch Mgr.: G. Rothgery

OAK LAWN
 DOT DISTRIBUTING CO., 9719 Southwest Hwy., 60453

OAK PARK
 PACIFIC INDICATOR, 6603 W. North Ave., 60301, (312) 261-1330
 TRI-PAR SOUND SYSTEMS, 811 Madison St., 60302, (312) 848-3706, Mktg. Mgr.: A. Grisko

PALATINE
 OHM ELECTRONICS, INC., 649 Vermont Ave., 60067, (312) 359-5500, TWX: 910-693-4802, Inside Sls. Contact: M. Grossman

PEORIA
 KLAUS RADIO, INC., 8400 N. Pioneer Pkwy., 61614, (309) 691-4840, TWX: 910-652-2207, Inside Sls. Contact: A. Winstead

TECHNICIANS ELECTRONIC SUPPLY, 706 Wayne St., 61603, (309) 676-6200, Mktg. Mgr.: J. F. Stoll
 WARREN RADIO CO., 61605, 800 S.W. Jefferson, 16165, (309) 674-5998
 YORK RADIO & TELEVISION CORP., 821 Fayette, 61602, (309) 676-4005, Branch Mgr.: D. Barker

PROSPECT
 CRAMER/CHICAGO, 1911 S. Busse Rd., 60056, (312) 593-8230

QUINCY
 KLAUS RADIO INC., 62301, (217) 223-7560
ROCKFORD
 GC ELECTRONICS, 400 S. Wyman St., 61101, (815) 968-9661

J & M ELECTRONICS, INC., 2001 9th St., 61101, (815) 963-6445, Inside Sls. Contact: H. McQueen
 MIDWEST ASSOCIATED, INC., 225 S. 6th St., 61108, (815) 962-8036, Inside Sls. Contact: H. Wilcox
 SEXTON/NORTH AMERICAN ELECTRONICS, 127 W. State St., 61105, (815) 962-5041, Branch Mgr.: E. Naretta
 WILSON ELECTRIC CO., 113 S. Madison St., 61104, (815) 963-0431, Sls. Mgr.: W. Kalies

ROCK ISLAND
 RADIO TRADE SUPPLY CO., 509 12th St., 61201, (312) Sls. Contact: G. L. Tyrell
 TEAM ELECTRONICS, 1714 5th Ave., 61201, (309) 788-9595, Inside Sls. Contact: J. Jespersen

WARREN RADIO CO., 511 20th St., 61201, (309) 788-5424
ROLLING MEADOW
 LIGHTNER ASSOCIATES, 5050 Newport Dr. Four, 60008, (312) 398-3000, TWX: 910-687-2828, Inside Sls. Contact: J. K. Hannon

SUMER, INC., 5050 Newport Dr., (312) 394-4900
ROSEMONT
 ADVENT ELECTRONICS, INC., 7110-16 N. Lyndon St., 60018, (312) 298-4210, TWX: 910-233-2477, Inside Sls. Contact: B. Tovorog

KIERULFF ELECTRONICS, 9340 William St., 60018, (312) 678-8560, TWX: 910-227-3166, Mgr.: G. Tomin

SCHAUMBURG
 LAFAYETTE RADIO ELECTRONICS CORP., 1255 E. Golf Rd., 60172

SCHILLER PARK
 HAMILTON/AVNET — CHICAGO, 3901 N. 25th Ave., 60176, (312) 678-6310, Branch Mgr.: M. Robinette

SKOKIE
 BELL INDUSTRIES, 7701 N. Austin Ave., 60076, (312) 965-7500, TWX: 910-223-4519, Mktg./Adv. Mgr.: J. Romain
 MODERN COMMUNICATIONS, INC., 8333 Niles Center Rd., Box 88, 60076, (312) 677-0700, Inside Sls. Contact: D. Bandy

SOUTH HOLLAND
 RAECO, INC., 550 Armory Dr., (312) 331-6001

SPRINGFIELD
 YORK RADIO & TELEVISION CORP., 350 N. Walnut, 62702, (217) 544-2711, Branch Mgr.: H. Esker

STERLING
 WARREN RADIO CO., 110 Second Ave., 61081, (815) 625-6253

STREAMWOOD
 GTI SUPPLY, 517 Hillside Dr., (312) 837-4066

VILLA PARK
 CHESTER ELECTRONIC SUPPLY CO., 1416 Washington St., 60085, (312) 623-5000, Branch Mgr.: J. Eternicka
 ELECTRONIC DISTRIBUTORS, INC., 22 S. Villa Ave., 60181, (312) 834-5331, Branch Mgr.: R. Kowalczyk

MELVIN ELECTRONICS, INC., 125 W. North Ave., 60181, (312) 378-8580, Branch Mgr.: A. Caposleno

WAUKEGAN
 ELECTRONIC DISTRIBUTORS, INC., 2009 Washington, 60085, (312) 623-4000, Branch Mgr.: G. Carnick

WHEELING
 BERKHEIMER CO., INC., G. W., 60090, (312) 537-9300
WESTMONT
 BODELLE CO., INC., 47 Chestnut Lane, 60559, (312) 232-9670, Inside Sls. Contact: R. L. Bode
WINSLOW
 MATRECS INDUSTRIES, INC., 235 N. Carver, 61089, (815) 367-3811, Mktg. Mgr.: C. E. Matthews

WOODRIVER
 AUDIO ELECTRONICS, 932 Whitelaw Ave., 62095, (618) 254-5141

INDIANA

ANDERSON
 ELECTRONIC SUPPLY CO., 23rd & Columbus Ave., 46014, (317) 644-3381
 GRAHAM ELECTRONICS — ANDERSON, 2228 Columbus Ave., 46014, (317) 644-3381, Branch Mgr.: G. McCreary
 JONES HI-LO SOUND SUPPLY, Rte. 4, Box 616, 46011, (317) 644-0244, Sls. Mgr.: J. S. Jones

ANGOLA
 LAKELAND ELECTRONIC SUPPLY, 525 S. West St., 46703, (219) 665-6311, Inside Sls. Mgr.: P. Wiltzie

AUBURN
 MAVIS MOBILE RADIO, I-69 & 11A, Box 282, 46706, (219) 925-2618, Inside Sls. Contact: K. E. Mavis

BEDFORD
 ELECTRONIC SUPPLY CO., INC. OF BEDFORD, 910 7th St., 47421, (812) 275-5941, Inside Sls. Contact: K. Turpin

BLOOMINGTON
 HALL & CO., B. Box 996 — 1014 S. Walnut, 47401, (812) 336-3856, Sls. Mgr.: W. M. Hall
 OHIO VALLEY SOUND, INC., 320 Country Club Dr., 47401, (812) 334-1185, Branch Mgr.: P. Baise

CUMBERLAND
 ELTRA CO., 300 S. on E. County Line Rd., 46229, (317) 894-3629, Inside Sls. Contact: R. Porter

EAST CHICAGO
 ACRO ELECTRONICS DISTRIBUTORS, 1101 W. Chicago Ave., 46312, (219) 397-8681, Inside Sls. Contact: J. A. Garcia

ELKHART
 WARREN RADIO CO., 742 S. Main, 46514, (219) 523-2398

EVANSVILLE
 CASTRUP'S RADIO SUPPLIES, 1012-1014 W. Franklin St., 47710, (812) 422-7618, Inside Sls. Contact: D. P. Castrup

HUTCH & SON, INC., 300 N. Main St., 47711, (812) 425-7201, Inside Sls. Contact: R. Korn
 OHIO VALLEY SOUND, INC., 20 E. Sycamore St., 47713, (812) 425-6173, Mktg. Mgr.: C. Jones

FORT WAYNE
 ALL-PHASE ELECTRIC SUPPLY CO., 2732 Broadway 46807, (219) 744-1277, Branch Mgr.: F. Hammann

BERKHEIMER CO. INC., G. W., (219) 744-4156
 ESSEX INTERNATIONAL, INC., U.S. Hwy. 30 W., 46725, (219) 244-7651

ESSEX INTERNATIONAL, INC., 1601 Wall St., 46804, (219) 743-0311, Sls. Mgr.: W. T. Hopkins
 FORT WAYNE ELECTRONICS, 3606 E. Maumee, 46803, (219) 423-3422, Branch Mgr.: D. Hillenburg

FT. WAYNE ELECTRONICS, Glenbrook Shopping Center, 4201 Coldwater Rd., 46805, (219) 483-3155, Br. Mgr.: D. Fretz

HARVEY-INDIANA, 2226 Abbey Dr., (800) 382-4517
 NEEDLER SALES CO., Diplomat Station, Box 6184, 46806, (219) 447-2123, Branch Mgr.: J. Needler

WARREN RADIO CO., 625 E. Wayne, 46802, (219) 743-5344

GARY
 BERKHEIMER CO. INC., G. W., (219) 887-0141

HAMMOND
 ELECTRONIC DISTRIBUTORS, INC., 7015 Calumet, 46324, (219) 932-8410, Branch Mgr.: N. Barry

HUNTINGTON
 TRIAD-UTRAD, 305 N. Briant St., 46750

INDIANAPOLIS
 BERKHEIMER CO. INC., G. W., (317) 787-2206
 COMMUNICATIONS EQUIPMENT CO., INC., 5134 E. 65th St., 46220, (317) 849-9240, Gen. Sls. Mgr.: T. Garmhausen

E.I.L. INSTRUMENTS, 7061 Twin Oaks Dr., Suite M, 46226, (317) 545-1373, Branch Mgr.: J. Comstock

GRAHAM ELECTRONICS SUPPLY, INC., 133 S. Pennsylvania St., 46204, (317) 634-8202, Sls. Contact: L. Scheer

INDUSTRIAL DISTRIBUTORS

MALLORY DURACELL • BURGESS
 EVEREADY • RCA

BATTERIES

ZACK

ELECTRONICS

PALO ALTO, CA

415/326-5432 654 High St. 94301

SAN FRANCISCO, CA

415/626-1444 1444 Market St. 94102

GRAHAM ELECTRONICS — GEORGETOWN, 4831 W. 38th St., 46254, (317) 297-4710, Branch Mgr.: L. Acton
GRAHAM ELECTRONICS — GLENDAL, 6101 N. Keystone Ave., 46220, (317) 253-4261, Branch Mgr.: J. Daly
HARVEY-INDIANA, INC., 8505 Zionsville Rd., 46268, (317) 297-4910, TWX: 810-341-3228, Branch Mgr.: C. Hanson
HOLSAPPLE & ASSOC., 8640 E. Washington, 46219, (317) 899-2890
KINGSTON-SHARKEY ASSOC., 1150 N. Shadeland Ave., 46219, (317) 353-9406
MEUNIER ELECTRONIC SUPPLY, 3409 E. Washington, 46201, (317) 635-3511
NEEDLER SALES CO., Mapleton Sta., Box 88153, 46208, (317) 255-8056, Inside Sls. Contact: T. Needler
PIONEER STANDARD, 6408 Castile Pl., 46250, (317) 849-7300
PIVAN ENGINEERING CO., 1259 W. 86th St., 46260, (317) 253-1681, TWX: 810-341-3308, Branch Mgr.: J. Wyrick
RA-DIS-CO., INC., 814 N. Senate Ave., 46202, (317) 637-5571, Inside Sls. Contact: R. Hickok
SCHAEFFER CO., C., 1133 Navajo Trail, 46260, (317) 253-6337
SEMICONDUCTOR SPECIALISTS, INC., Box 41630, Weir Cook Airport, 46241, (317) 243-8271, TWX: 810-341-3126, Branch Mgr.: M. Scherer
SHAMROCK ELECTRONIC SALES, INC., 2511 E. 46th St., 46205, (317) 547-0080, Branch Mgr.: B. Clancy
SHERIDAN ASSOCIATES, 4002 Meadows Dr., 46205, (317) 547-7777
WARREN RADIO CO., 732 N. Capitol, 46204, (317) 634-5566
VAN SICKLE RADIO SUPPLY CO., 4131 N. Keystone Ave., 46205, (317) LI 7-3589, Ind. Sls. Mgr.: G. Van Sickle
KOKOMO
SERVI-TRONICS, 1200 S. Main St., 46901, (317) 457-7261, Inside Sls. Contact: M. Godlove
LAFAYETTE
C. W. Y. ELECTRONICS, 405 N. Earl Ave., 47904, (317) 447-1278, Gen. Sls. Mgr.: T. French
GRAHAM ELECTRONICS — TIPPECANOE, Tippecanoe Mall, 47904, (317) 447-9456, Branch Mgr.: B. Hiatt
LAFAYETTE RADIO, 408 North St., 47901, (317) 742-4006, Branch Mgr.: J. Lannert
MARION
ESSEX INTERNATIONAL, INC., 2601 S. Adams St., 46953, (317) 664-8211
MICHIGAN CITY
ALL-PHASE ELECTRIC SUPPLY CO., Cor. of 7th & Washington, 46360, (219) 879-8357, Branch Mgr.: J. Koroch
TRI-STATE ELECTRONICS, 33-20 S. Wabash, 46360, (219) 872-5551
MULBERRY
MAISH SALES, 500 Madison St., 46058, (317) 296-2322, Mktg. Mgr.: C. L. Maish
MUNCIE
MUNCIE ELECTRONIC SUPPLY, INC., 222 N. Madison St., 47305, (317) 288-8837, Gen. Sls. Mgr.: L. Nuckols

NEW CASTLE
HUTCH & SON, INC., 2204 Broad St., 47362, (317) 529-0323, Branch Mgr.: H. Hillyard
OWENSBORO
OHIO VALLEY SOUND, INC., 600 W. Third St., 42301, (502) 683-6727, Branch Mgr.: S. Melcher
RICHMOND
RODEFELD CO., 340 N.W. 5th, 47374, (317) 966-3505, Mktg. Mgr.: J. Petry
SOUTH BEND
ALL-PHASE ELECTRIC SUPPLY CO., 2110 So. Lafayette, 46613, (219) 282-2585, Branch Mgr.: J. Flaherty
BERKHEIMER CO. INC., G. W., (219) 288-4741
KOONTZ-WAGNER ELECTRIC CO., 3601 Voorde Dr., 46628, (219) 232-2051, Inside Sls. Contact: D. N. Bryan
RADIO DISTRIBUTING CO., 1212 High St., 46624, (219) 287-2911, TWX: 810-299-2583, Inside Sls. Contact: J. Spy
TERRE HAUTE
MIDWEST SUPPLY ELECTRONICS, INC., 2015 Garfield Ave., 47804, (812) 232-9649, Inside Sls. Contact: E. Tomlinson
MIDWEST SUPPLY ELECTRONICS, INC., II, 1216 Wabash Ave., 47807, (812) 232-0187, Branch Mgr.: D. Maxwell
YORK TERRE HAUTE RADIO CORP., 509 Ohio St., 47801, (812) 235-6025
VINCENNES
OHIO VALLEY SOUND, INC., 902 Main St., 47591, (812) 882-3615, Branch Mgr.: J. Lanham
ZIONSVILLE
MAISH SALES, 365 W. Walnut St., 46077, (317) 873-4079, Branch Mgr.: J. C. Keith

IOWA

ALGONA
ELECTRONIC SPECIALTIES, 616 Diagonal St., Box 248, 50511, (515) 295-3215
AMES
ELECTRONIC SUPPLY, INC., 113 Kellogg, 50010, (515) 232-7020
BURLINGTON
UNION SUPPLY CO., INC., 231 South Third St., 52601, Inside Sls. Contact: R. W. Benson
WARREN RADIO CO., 505 S. Main St., 52601, (319) 752-1842
CEDAR RAPIDS
AUDIO ROOM, 1535 1st Ave., S.E., 52403, (319) 364-4138, Branch Mgr.: D. A. Bunce
DECO, INC., 2500 16th Ave. S.W., 52406, (319) 365-7551, TWX: 910-525-1332, Inside Sls. Contact: F. Vane
FAIRLANE ELECTRONICS CO., 2051 Birchwood Dr., N.E., 52402, (319) 393-0228, Sls. Mgr.: J. Schumacher
HALL-MARK ELECTRONICS, Executive Plaza, Suite 401, First Ave., S.E., 52402, (319) 393-3556
IOWA MIDLAND SUPPLY, 708 Third St., S.E., (319) 366-3555
IOWA RADIO SUPPLY CO., 719 Center Point Rd. N.E., 52402, (319) 364-6154, Gen. Sls. Mgr.: J. Netser
MUELLER SALES CORP., 1119 Wenig Rd., N.E., (319) 365-1196
NEWARK ELECTRONICS, 1019 First Ave., S.W., 52404, (319) 362-1171
P M A CORP., Box 1090, 52401, (319) 362-9177, Branch Mgr.: K. Morris
SCHWEBER ELECTRONICS, 4403 First Ave., S.E., 52402, (319) 393-0100, Branch Mgr.: W. F. Lorenz
VRBIK, J. Co., Three 50th St., N.E., 52402, (319) 377-8244, Gen. Sls. Mgr.: J. Vrbik
DAVENPORT
ALLIED ELECTRONICS, 1205 E. River Dr., 52802, (319) 323-8051
KLAUS RADIO, (319) 323-9671
WARREN RADIO CO., 1205 E. River Dr., 52803, (319) 323-8051
DES MOINES
BEAMS, INC., 2426 Welbeck Rd., 50310, (515) 279-3015
GIFFORD-BROWN, INC., Box 1531, 14th & Walnut St., 50306, (515) 243-1257, Inside Sls. Contact: B. Edwards
MID-STATE DISTRIBUTING, 1201 Grand Ave., 50304, (515) 288-7231, Inside Sls. Contact: J. Silverman
MUSIC SERVICE, INC., 1415 Locust, 50309, (519) 243-2214, Sales Mgr.: B. W. Metcalf
RADIO TRADE SUPPLY CO., 1013-1017 High St., 50309, (515) 288-7237, Gen. Sls. Mgr.: C. Lassaux
SIDLES DIST. CO., 2205 Bell Ave., 50321, (515) 280-1722, Inside Sls. Contact: G. Parish
DUBUQUE
MILLER ELECTRIC, 52001, (319) 588-1469
TEAM ELECTRONICS #7, 2300 Kennedy Rd., 52001, (319) 583-9195, Inside Sls. Contact: R. Churchill
WARREN RADIO CO., 98 E. 10th St., 52001, (319) 582-4300
FORT DODGE
RADIO TRADE SUPPLY CO., 18 S. Third St., 50501, (515) 573-8701, Branch Mgr.: R. Awe
IOWA CITY
WARREN RADIO CO., 922 Maiden La., 52240, (319) 354-1660
MARSHALLTOWN
EGELSTON ELECTRIC, 50158, (515) 752-4678
RADIO TRADE SUPPLY CO., 107 Third Ave. S., 50153, (515) 752-2500, Branch Mgr.: W. Capron
SIOUX CITY
DUKES RADIO CO., Box 3063, 209 6th St., 51102, (712) 255-5056, Inside Sls. Contact: W. O. Ducommun
WATERLOO
FARNSWORTH ELECTRONICS, INC., 201-9 E. Mullan Ave., 50704, (391) 364-6681
GIFFORD-BROWN, INC., 308 E. Seventh, 50703, (319) 234-2603, Branch Mgr.: R. Bergen
RADIO TRADE SUPPLY CO., 621 E. Fourth St., 50708, (319) 234-2664, Branch Mgr.: W. Renz

WEST DES MOINES
RAMCO CO., (515) 274-2548

KANSAS

DODGE CITY
INTERSTATE ELECTRONIC SUPPLY CORP., 414 Military, 67801, (316) 227-6772, Branch Mgr.: H. Guthrie
GREAT BEND
CEN-KAN SUPPLY INC., (316) 792-4362
RADIO SUPPLY CO., 1910 Tenth, 67530, (316) 793-3507, Branch Mgr.: L. White
HAYS
INTERSTATE ELECTRONIC SUPPLY CORP., 122 W. Ninth St., 67601, (913) 625-9238, Branch Mgr.: S. Zwenger
HUTCHINSON
COMMUNITRON CORP., 1004 S. Main St., 67501, (316) 662-3301, Mktg. Mgr.: G. Dunn
INTERSTATE ELECTRONIC SUPPLY CORP., 325 W. Fourth St., 67501, (316) 662-7941, Branch Mgr.: S. Lohr
KANSAS CITY
TENNANT ELECTRONICS, 6320 Kansas Ave., (913) 287-2100
LENEXA
HALL-MARK/KANSAS CITY, 9006 Rosehill Rd., 66215, (913) 888-4747, TWX: 910-749-6620, Mgr.: R. Sudreath
HAMILTON/AVNET — KANSAS CITY, 37 Lenexa Ind. Ctr., 9900 Plumm Rd., 66215, (913) 888-8900, Inside Sls. Contact: G. Olson
NORTH ELECTRIC SUPPLY CO., 10951 Lakeview Ave., 66219, (913) 888-9800
NORTH KANSAS CITY
ESSEX INTERNATIONAL, INC., 1229 Atlantic Ave., 64116, (816) 842-1613
OVERLAND PARK
BROOKS ELECTRONIC SERVICE CO., 3761 W. 95th St., 66207, (913) 648-3131
PMI CORP., Box 6264, 66206, (913) 381-0004, TWX: 910-749-6473, Inside Sls. Contact: W. Cook
SHERIDAN ASSOCIATES, 10100 Santa Fe Dr., Mark I Bldg., Suite 101, 66212, (913) 383-1636
SHURTLEFF CO., J., 7520 W. 63rd St., (913) 831-9222
PAULINE
ESSEX INTERNATIONAL, INC., University Blvd. & EAST St., Box 19085, 66525, (913) 862-0125
PITTSBURG
PITTSBURG RADIO SUPPLY, 212 S. Broadway, 66762, (316) 231-2150, Inside Sls. Contact: P. Alexander
SALINA
ELECTRONICS, INC., 227 North Santa Fe Ave., 67401, (913) 827-7377, Gen. Sls. Mgr.: A. T. Bosch
RADIO SUPPLY CO., 1809 S. Broadway, 67402, (913) 823-6353, Branch Mgr.: R. Olson
SHAWNEE MISSION
PIVAN ENGINEERING CO., 5801 Outlook, 66202, (913) 722-1030, Branch Mgr.: P. Dennis
TOPEKA
ACME RADIO SUPPLY CO., 135 Kansas Ave., 66603, (913) 235-1363, Inside Sls. Contact: K. R. Stapleton
CARROLL RADIO & TV SUPPLY, 1123 W. 6th, Box 1513, 66601, (913) 234-6677, Gen. Sls. Mgr.: R. Benning
INTERSTATE ELECTRONIC SUPPLY CORP., 2500 S. Kansas Ave., 66611, (913) 235-2396, Branch Mgr.: L. E. Batt
WICHITA
AMATEUR RADIO EQUIP. CO., 1203 E. Douglas, 67211, (316) 264-9166, Inside Sls. Contact: D. R. Davis
HALL-MARK ELECTRONICS, 7327 E. Indianapolis, 76207
INTERSTATE ELECTRONIC SUPPLY CORP., 1330 E. First St., Box 2018, 67201, (316) 264-6316, Inside Sls. Contact: L. J. Darling
NICHOLS ELECTRONICS, 8015 Peach Tree La., 67207, (316) 682-0203, Inside Sls. Contact: G. L. Nichols
P M A CORP., Box 11252, 67202, (316) 264-2662, TWX: 910-741-6511, Branch Mgr.: W. Reed
RADIO SUPPLY CO., 115 Laura, Box 1220, 67201, (316) 267-5214, Inside Sls. Contact: V. Adams

KENTUCKY

ASHLAND
ASHLAND ELECTRIC CO. INC., 41101, (606) 324-4107
BOWLING GREEN
RANDOLPH, HALE & MEREDITH, INC., 319 State St., 42101, (502) 781-1460, Inside Sls. Contact: R. E. Stahl
COVINGTON
HDC ELECTRONICS CTR., 3918 Winston Ave., 41015, (606) 431-3136, Branch Mgr.: D. Henry
UNITED RADIO, INC., 404 W. Third St., 41011
HOPKINSVILLE
RANDOLPH-HALE INC., 727 E. 4th St., 42240, (502) 855-5357, Mktg./Adv. Mgr.: J. Hale
LEXINGTON
MILLERS, B., INC., 232 E. Main St., 40507, (606) 252-2216, Inside Sls. Contact: R. Dennis
RADIO-ELECTRONIC EQUIPMENT CO., 480 Skain Ave., Box 1212, 40508, (606) 255-6661, Inside Sls. Contact: E. S. Chrisman
TEI-RAD ELECTRONICS, 311 E. Short St., 40507, (602) 254-1349, Inside Sls. Contact: L. L. Moon
LOUISVILLE
BURKS, P. I., 842 S. 7th St., Box 1015, 40203, (502) 589-3960
PEERLESS ELECTRONIC EQUIPMENT CO., INC., 1815 S. Seventh St., 40208, (502) 637-7677, Inside Sls. Contact: P. R. Chandler
MADISONVILLE
HUTCH & SON, INC., 212 N. Franklin St., 42431, (502) 821-4334, Branch Mgr.: M. Hibbs

When you need
 quality components like
**POTTER &
 BRUMFIELD**
 get the works from
CRAMER

cramer
 CRAMER ELECTRONICS INC.

Our most important component is service.

NEWPORT
HOLUB DIST. CO., 217 E. 10th St., 41071, (606) 431-4211,
Br. Mgr.: J. DeHart

OWENSBORO
HUTCH & SON, INC., 1421 Triplett, 42301, (502) 684-
6285, Branch Mgr.: L. Ashby

PADUCAH
WARREN RADIO CO., 455 S. 31st St., 42001, (502) 442-
4367, Branch Mgr.: M. Jones

LOUISIANA

ALEXANDRIA
ELECTRONIC SERVICE SUPPLY, Box 4085, 1109 Bolton
Ave., 71301, (318) 443-8483, Inside Sls. Contact: R.
Branton

HOUSE OF ELECTRONICS CO., 4434 Jackson St., 71301,
(318) 443-3658, Inside Sls. Contact: J. R. Hollings-
worth

RALPH'S CENTRAL RADIO, 601 N. Third St., 71301, (318)
443-4517, Branch Mgr.: E. Cooley

AMELIA
BAYOU BOEUF ELECTRIC, 70340, (504) 631-2953

BATON ROUGE
ESSEX INTERNATIONAL, INC., 8385 W. El Cajon Dr.,
70815, (504) 927-2686

RALPH'S OF BATON ROUGE, 1732 Plank Rd., 70802, (504)
344-3761, Branch Mgr.: R. McAdams

SOUTHERN RADIO SUPPLY CO., 2610 Scenic Hwy., 70805,
(504) 355-0396, Branch Mgr.: P. Collard

LAFAYETTE
LOUISIANA SOUND, INC., 404 Eraste Landry Rd., 70501,
(318) 233-1293, Sls. Mgr.: B. D. Starling

RALPH'S ELECTRONICS, 1732 Plank Rd., 70802, (504)
344-3761

RALPH'S OF LAFAYETTE, 3004 Cameron St., 70501, (318)
234-4507, Inside Sls. Contact: K. Voorhies

LAKE CHARLES
RALPH'S OF LAKE CHARLES, 911 Fourth Ave., 70601, (318)
439-2493, Branch Mgr.: L. Pitre

WHOLESALE RADIO EQUIPMENT, INC., 1722 Common St.,
70601, (318) 439-2431, Gen. Sls. Contact: C. Keys

METAIRE
INDUSTRIAL DISTRIBUTORS, 710 Papworth Ave., 70005,
(504) 835-7281

STERLING ELECTRONICS, 5029 Veterans Memorial Hwy.,
70002, (504) 887-7610, Branch Mgr.: L. Brister

MONROE
C & O ELECTRONICS, INC., 201 S. Stanley Ave., 71201,
(318) 325-4695, Sls. Mgr.: J. Futch

TELEVISION WHO'S ALE SUPPLY CO., 816-818 Jackson
St., 71201, (318) 323-3505, Inside Sls. Contact: H.
Waldrup

MORGAN CITY
RALPH'S OF MORGAN CITY, 715 Brashear St., 70380, (504)
384-9831, Branch Mgr.: F. Thibodeaux

NEW IBERIA
RALPH'S OF NEW IBERIA, 1900 E. Main, 70560, (318) 369-
9816, Branch Mgr.: M. Petre

NEW ORLEANS
ALLEN, W. B., SUPPLY CO., 1601 Basin/Orleans, 70116,
(504) 525-8222, Inside Sls. Contact: R. Culotta

ELECTRICAL SALES CO., 4011 Baronne St., 70115, (504)
895-6638

EPCOR/LYKES, 3308 Orleans Ave., 70119, (504) 486-7441

LYKES ELECTRONICS, 3308 Orleans Ave., 70119, (504)
486-7441

RADIO PARTS INC., 1331 Prytainia St., 70130, (504)
581-5959, Inside Sls. Contact: W. R. Pietri

RALPH'S OF NEW ORLEANS, 4334 Stewmy Dr., 70126,
(504) 242-2731, Branch Mgr.: C. Marr

SOUTHERN RADIO SUPPLY CO., INC., 1909 Tulane Ave.,
70112, (504) 524-2343, Inside Sls. Contact: J. Haydel

SPECIAL ELECTRONIC SUPPLIES, 805 Central Ave., 70121,
(504) 835-1449, Inside Sls. Contact: R. Hutchinson

STEINMAN'S TV & RADIO CO., 3330 S. Claiborne Ave.,
70125, (504) 897-2631, Inside Sls. Contact: I. Steinman

RESTON
DOWIAK ASSOC., INC., 12001 Whip Rd., 22091, (703)
620-9558, Branch Mgr.: D. Boyle

SHREVEPORT
INDUSTRIAL ELECTRONIC SUPPLY, (318) 422-9459

INTERSTATE ELECTRIC CO., 1419 Vulpepper St., 71130,
(318) 221-6131, Inside Sls. Contact: R. Stiles

WHOLESALE ELECTRONIC SUPPLY, 2530 Linwood, 71104,
(318) 422-2063, Branch Mgr.: W. Norris

WEST MONROE
BROOKS SUPPLY, 1307 Natchitoches, 71291, (318) 323-
0344, Mktg./Adv. Mgr.: J. Brooks

MAINE

AUBURN
HOLMES DIST. INC., 3-5 Pleasant St., 04210, (207) 783-
8561, Branch Mgr.: W. Dennison

RADIO SUPPLY CO., INC., 26 Cross St., 04210, (207) 784-
5486, Inside Sls. Contact: D. Kline

BANGOR
RADIO SUPPLY CO., 83 Farm Road, 04401, (207) 945-6416,
Branch Mgr.: W. Carter

RSL DISTRIBUTORS, INC., 14 Perry Rd., 04402, (207) 947-
7398, Branch Mgr.: R. Lavoie

CARIBOU
DOW, HEBERT & PLOURDE, INC., Box 969, 04736, (207)
493-3163, Sls. Mgr.: A. Dow

FALMOUTH
ALLIED ELECTRONICS, Falmouth Shopping Center, 04105,
(207) 781-2666

LEWISTON
LEWISTON SUPPLY CO., 71 Lisbon St., 04240, (207) 784-
4083

PORTLAND
HOLMES DISTRIBUTORS INC., 510 Cumberland Ave.,
04101, (207) 774-5901, Inside Sls. Contact: D. Woodsum

RADIO SUPPLY CO., Thompson's Point, 04102, (207) 775-
6564, Branch Mgr.: D. Robbins

RSL DISTRIBUTORS, INC., 117 Anderson St., 04101, (207)
773-0297, Branch Mgr.: L. Donetello

WATERVILLE
HOLMES DIST. INC., 23 Ash St., 04901, (207) 873-4283,
Branch Mgr.: L. Labbe

MARYLAND

ABERDEEN
HARCO ELECTRONICS INC., Rt. 22, Carsins Run, 21001,
(301) 838-7990, Gen. Sls. Mgr.: E. Schueler

BALTIMORE
A B & T SALES CORP., 618 Colorado Ave., 21210, (301)
323-6535, Branch Mgr.: H. Devlin

AMERICAN DISTRIBUTING CO. OF BALTIMORE, 5631 Balti.
Nat'l Pike, 21228, (301) 788-9300, Sls. Mgr.: S. Dunn

ARROW-ANGUS ELECTRONICS, 5207 East Drive, 21227,
(301) 247-5200

ASI ELECTRONICS, 1728 Whitehead Rd., 21207, (301)
265-5100, Mktg./Adv. Mgr.: B. Freeland

BERMAN, H. CO., INC., 12 E. Lombard St., 21202, (301)
539-7002, Inside Sls. Contact: E. Uhlhorn

CALLAS ELECTRONICS, 6409 Frederick Rd., 21228, (301)
744-7711

CHESAPEAKE ELECTRONIC, (301) 665-7595

CRAMER/BALTIMORE, 922-24 Patapsco Ave., 21230, (301)
354-0100

ESSEX INTERNATIONAL, INC., 2610 Georgetown Rd.,
21230, (301) 644-0140

FAIRWAY OF MD., 2900 Georgetown Rd., 21230, (301)
525-1555, Branch Mgr.: R. Herlin

HALL-MARK/BALTIMORE, 6660 Security Blvd., 21207,
(301) 265-8500, Mgr.: J. Blackwell

JOBE & CO., 2857 Greenmount Ave., (301) 235-3502

LEWY FILM & SOUND SERVICE, INC., 853 N. Eutaw St.,
21201, (301) 728-7000, Inside Sls. Contact: T. Lewy

L. R. S. DISTRIBUTING CO., 29 Stonehenge Circle, 21208,
(301) 484-7750, Sls. Mgr.: B. Buchman

PYTRONIC INDUSTRIES, INC., 8220 Wellmoor Ct., 20863,
(301) 792-7000

RADIO ELEC. SER., 1026 Cromwell Bridge Rd., 21201,
(301) 823-0070, Inside Sls. Contact: E. Bagliani

SUPER ELECTRONIC SUPPLY, 1425 W. Baltimore St.,
21223, (301) 566-5200, Inside Sls. Contact: L. Wein-
stein

TECHNICO, INC., 1404 Bare Hills Ave., 21209, (301) 828-
6416, TWX: 710-232-1813, Inside Sls. Contact: R.
Simpson

TEMSCO, INC., (301) 685-4523

TREEKO SALES, Inc., Ent. 9-8260

UNITED ELECTRONICS, (301) 732-5000

VIDEO ELECTRONICS SUPPLY CO., INC., 5617 Belair Rd.,
21206, (301) 488-1991, Gen. Sls. Mgr.: J. C. Walmesley

WHITNEY DISTRIBUTORS, INC., 6707 Whitestone Rd.,
21207, (301) 944-8080, TWX: 710-862-9166, Inside Sls.
Contact: P. Schneider

ZAMOISKI CO., J. M., 1101 Desoto Rd., 21223, (301) 644-
2900, Sls. Mgr.: H. Silverman

BELTSVILLE
POWELL ELECTRONICS, INC., 10728 Hanna St., 20705,
(301) 937-4030, TWX: 710-828-9710, Branch Mgr.: G.
Eliakis

NEWARK ELECTRONICS, 10440 Baltimore Ave., 20705,
(301) 937-5085

TREEKO SALES, INC., 4937 Harford Ave., 20705, (301)
937-8260, Inside Sls. Contact: M. L. Carroll

BETHESDA
EMPIRE ELECTRONIC SUPPLY CO., 4907 Rugby Ave.,
20014, (301) 656-3300, Gen. Sls. Mgr.: W. O. Spriggs

TELEPHONE CORP. OF AMERICA, 4808 Auburn Ave., 20014,
(301) 656-1915, Sls. Mgr.: J. Yitlalo

WARREN MOUNT CO., 4924 St. Elmo Ave., 20014, (301)
657-9312, TWX: 710-824-0090, Sls. Mgr.: W. A. Potts

WIRE SUPPLY CO., 4924 St. Elmo Ave., 20014, (301) 657-
9333, TWX: 710-824-0090, Sls. Mgr.: P. Joyce

BROOKVILLE
A B & T SALES CORP., 1710 Gold Mine Rd., 20729, (301)
924-3663, Branch Mgr.: R. Tydings

COLLEGE PARK
ALLIED ELECTRONICS, 4911 Niagara Rd., 20741, (301)
345-4600, Branch Mgr.: L. Crusco

COLUMBIA
BROWNELL ELECTRO, INC., 7194 Oakland Mills Rd., 21046

MID-ATLANTIC SALES CO., 9501 Mellonbrook Rd., 21045,
(301) 730-5493, Branch Mgr.: T. J. Carey, Jr.

CUMBERLAND
ALLEGHENY ELECTRONICS, INC., 1100 E. Oldtown Rd.,
21502, (301) 722-7671, Branch Mgr.: S. Berry

TV & RADIO PARTS CO., #41 SOUNDWORLD, 138 N. Me-
chanic St., 21502, (301) 724-7000, Mgr.: D. Mullen

FREDERICK
HANKY'S RADIO, INC., Evergreen Pl & Elm St., 21701,
(301) 662-1381, Inside Sls. Contact: C. M. Gearinger

GAITHERSBURG
CRAMER/WASHINGTON, 16021 Industrial Dr., 20760, (301)
948-0110, Div. Mgr.: D. Dibble

DEANCO, INC., 16883 Oakmont Ave., 20760, (301) 948-
5444, TWX: 710-828-9782, Branch Mgr.: J. F. Grosso

KIERULFF ELECTRONICS, INC., 16021 Industrial Dr.,
20760, (301) 948-0250, TWX: 710-828-9702, Mgr.:
A. Dean

PIONEER-WASH. ELECTRONICS, 9100 Gaither Rd., (301)
948-0710, TWX: 710-828-0545

HAGERSTOWN
ALLEGHENY ELECTRONICS, 1301 Potomac Ave., 21740,
(301) 739-6460, Branch Mgr.: D. Manspeaker

STODDARD SUPPLY CO., Box 500, 21740, (301) 733-3390,
Inside Sls. Contact: M. Fleming, J. Ralls

HANOVER
CRAMER/BALTIMORE, 7255 Standard Dr., 21076, (301)
796-5790, TWX: 710-862-1867, Div. Mgr.: J. Stafford

HAMILTON/AVNET — BALTIMORE, 7255 Standard Dr.,
21076, (301) 796-5000, Branch Mgr.: F. Catterton

TECHNICO

Division of ALLIED CONTROL SALES CORP.

YOUR
COMPLETE SOURCE FOR
TEXAS INSTRUMENTS
OPTO
DIODES
TRANSISTORS
IC'S

• SPECTROL

• KEMET

1404 BARE HILLS AVENUE
BALTIMORE, MD. 21209
PHONE: (301) 828-6416

WASH., D.C.

NORTH VA.

202-638-4461

VIRGINIA

WATTS

800-638-4721

INDUSTRIAL DISTRIBUTORS

POTTER & BRUMFIELD • GUARDIAN • HART/ADVANCE •
AMPERITE • OHMITE • LINE ELECTRIC • CD • DOW-KEY

RELAYS

ZACK

ELECTRONICS

PALO ALTO, CA

415/326-5432 654 High St. 94301

SAN FRANCISCO, CA

415/626-1444 1444 Market St. 94102

HYATTSVILLE

CENTRONIC WHOLESALERS, INC., 4708 Baltimore Ave., 20781, (301) 277-6700, Inside Sis. Contact: J. A. Carbone
 MARK ELECTRONICS, 3003 Hamilton St., 20782, (301) 559-9000
 MILGRAY/WASH., INC., 5405 Lafayette Pl., 20781, (301) 864-1111

KENSINGTON

FAIRWAY ELECTRONICS, INC., 4210 Howard Ave., 20795, (301) 933-4420, Inside Sis. Contact: T. M. Precord
 MARINE AIR SUPPLY, 10233 Kensington Pkwy., (301) 949-1353

LANDOVER

ZAMOISKI CO., J. M., 8201 Ardwick-Ardmore Rd., 20785, (301) 322-2010, Branch Mgr.: M. Gittelman

LEXINGTON PARK

RURAL ELECTRONICS, 330 Great Mills Rd., 20653, (301) 863-6622, Inside Sis. Contact: M. A. Balta

OLNEY

A B & T SALES CORP., 18114 Hillcrest Ave., 20832, (301) 924-4976, Inside Sis. Contact: B. Shumate

RANDALLTOWN

C.L.M. SALES, INC., 3618 Briarstone Rd., 21133, (301) 922-2092, TWX: 710-862-6926

ROCKVILLE

CAPITOL RADIO WHOLESALERS, INC., 12270 Wilkins Ave., 20852, (301) 881-2270, Inside Sis. Contact: G. Lilly
 CRAMER/EW, INC., Box 1648, Rockville, 20850, (301) 948-0110

MARKTRON, INC., 651 Lofstrand La., 20850, (301) 762-6210, TWX: 710-828-0089, Inside Sis. Contact: P. Casey
 METRIC RESOURCES CORP., 1830 Chapman, 20852, (301) 881-6700

PIONEER STANDARD 1037 Taft St., 20850, (301) 424-3300
 SCHWEBER ELECTRONICS, 5640 Fisher La., 20852, (301) 881-3300, Mgr.: R. Plumb

TELEMEDIC/ELECTRO RENT, 142 Congressional Airport La., 20852, (301) 881-8180, TWX: 710-828-0087, Branch Mgr.: R. Schmidt

WILSHIRE ELECTRONICS/WASH., D.C., 1037 Taft St., 20850, (301) 340-7900, Branch Mgr.: L. J. Crusco

SALISBURY

ALMO ELECTRONICS CORP., 317 Park Heights Ave., 21801, (301) 742-1393, Br. Mgr.: F. Larmore

SAVAGE

D & H DISTRIBUTING CO., 8220 Wellmoor Ct., 20863, (301) 792-7000, Inside Sis. Contact: D. Hackett
 PYTTRONIC INDUSTRIES, INC., 8200 Wellmoor Ct., 20863, (301) 792-7000, Branch Mgr.: J. George

SILVER SPRING

MID-ATLANTIC SALES CO., 10111 Colesville Rd., 20901, (301) 593-7749, Sis. Mgr.: G. B. Pearlman
 PIONEER/WASHINGTON ELECTRONICS, INC., 1037 Taft St., 20850, (301) 424-3300, TWX: 710-828-9784, Inside Sis. Contact: J. Ross

TIMONIUM

E.I.L. INSTRUMENTS, INC., 1830 York Rd., 21093, (301) 252-1260, Inside Sis. Contact: J. Gummer
 MARKTRON, INC., 57 W. Timonium Rd., 21093, (301) 252-7111, TWX: 710-232-1850, Branch Mgr.: J. T. O'Hara

TOWSON

J. H. ELECTRONIC SALES CO., Box 6844, 21204, (301) 825-4440, Mktg. Mgr.: R. Turner

MASSACHUSETTS**ALLSTON**

APPARATUS SERVICE, 355 Everett St., 02134, (617) 787-1300

BELLINGHAM

DOWIAK ASSOC., INC., 356 Hartford Ave., 02019, (617) 966-0404, TWX: 710-347-7672, Inside Sis. Contact: M. Creighton

BILLERICA

KIERULFF ELECTRONICS, INC., 13 Fortune Dr., 01821, (617) 667-8331, Mgr.: E. Smith

BOSTON

DeMAMBRO ELECTRONICS, 1095 Commonwealth Ave., 02215, (617) 787-1200, TWX: 710-330-6464, Gen. Sis. Mgr.: F. Mielbye

NEWARK ELECTRONICS, 13A Wheeling Ave., (617) 935-8350
 SAGER ELECTRICAL SUPPLY CO., Box 2323, 172 High St., 02107, (617) 542-2281

BRAINTREE

ALLIED ELECTRONICS, Campanelli Ind. Pk., 1 Century Circle, 02184, (617) 848-4150, Branch Mgr.: N. Vecchiarelli

BROCKTON

BROC DISTRIBUTORS, 646 Summer St., 02402, (617) 522-6300

IN-STOCK PRODUCTS CO., 646 Summer St., 02403, (617) 585-2826, Branch Mgr.: G. Zuranel

BURLINGTON

ARROW ELECTRONICS, INC., 15 A St., 01803, (617) 273-0100, Inside Sis. Contact: S. Barr

CONTACT EAST, INC., 7 Cypress Dr., (617) 272-5051
 HAMILTON/AVNET — BOSTON, 185 Cambridge St., 01803, (617) 273-2120, TWX: 710-332-1201, Branch Mgr.: J. Yonis

MANCIB CO., "A" St. at Middlesex Tpk., 01803, (617) 272-9450

SCRYMEGEUR CO., C. E., 13 Grant Ave., (617) 272-0060

WILSHIRE ELECTRONICS/NEW ENGLAND, One Wilshire Rd., 01803, (617) 272-8200, Branch Mgr.: H. Leary

ZEUS/NEW ENGLAND, 32 Winn St., 01803, (617) 273-0750, Branch Mgr.: G. Thorne

CAMBRIDGE

APOLLO ELECTRONICS, 101 Binney St., 02142, (617) 868-3120

BROWNELL ELECTRO INC., 271 Vassar St., 02139, (617) 864-7500, Branch Mgr.: B. Tynan

HILCO ELECTRIC SUPPLY CO., 11 Brookline St., 02139, (617) 876-0610

INTERSTATE ELECTRONIC EQUIPMENT, (617) 868-7440
 WILSHIRE ELECTRONICS/NEW ENGLAND, 205 Alewife Brook Pkwy., 02138, (617) 491-3300, V.P., H. J. Leary

YOUNG, INC., H. Jr., 45 Lansdowne St., (617) 547-3873

DEDHAM

GERBER ELECTRONICS, 852 Providence Hwy., 02026, (617) 329-2400, TWX: 710-394-0634

TI SUPPLY CO., 850 Read Providence Hwy., 02026, (617) 329-4010

FITCHBURG

GETTENS ELECTRIC SUPPLY CO., 01420, (617) 343-3711

HYANNIS

DRAPER INTERNATIONAL ELECTRONICS, 484 W. Main St., (617) 775-6601, Inside Sis. Contact: P. Frazer

LEXINGTON

HARVEY ELECTRONICS, 44 Hartwell Ave., 02173, (617) 861-9200, Branch Mgr.: J. Tuminelli

KITCHEN & KUTCHIN, 177 Bedford St., 02173, (617) 862-8230

R & D ELECTRONICS, 44 Hartwell Ave., 02173, (617) 861-9200, TWX: 710-326-6617

LOWELL

MCCARTIN, F. P., CO., 181 Market St., 01852, (617) 454-9101, Inside Sis. Contact: M. Gamache

LYNN

LAND ELECTRONICS, 9 Franklin St., 01902, (617) 592-2220, Inside Sis. Contact: J. Stein

MEDFORD

BLAKE ASSOCS., Zero Governor's Rd., 02155, (617) 391-7890, TWX: 710-328-0463, Gen. Sis. Mgr.: J. Blake

EAST COAST ELECTRONICS CO., 296 Salem St., 02155, (617) 395-9050, Gen. Sis. Mgr.: T. Fahey

NEEDHAM

KIERULFF ELECTRONICS, INC., 14 Charles St., 02194, (617) 449-3600, TWX: 710-325-1179, Mgr.: E. Smith

METRIC RESOURCES CORP., 22 Chestnut Pl., 02192, (617) 444-9450

NEEDHAM HEIGHTS

CRAMER VIDEO & AUDIO SYSTEMS/NEEDHAM, 120 Hampton Ave., 02194, (617) 449-2100

NEWTON

CRAMER ELECTRONICS, 85 Wells Ave., 02159, (617) 969-7700, TWX: 710-335-7548

GREENE-SHAW CO., 70 Bridge St., 02195, (617) 969-8900, Gen. Sis. Mgr.: R. Sutherland

NEWTON HIGHLANDS

CLAUDE MICHAEL DIV. MARSHALL INDS., 88 Needham St., 02161, (617) 965-5310, Branch Mgr.: W. Pisco

CRAMER/SPECIAL SYSTEMS, 60 Wells Ave., 02159, (617) 969-3061

MARSHALL, G. S., CO., 88 Needham St., 02161, (617) 965-5115, Branch Mgr.: W. Pisco

RICHARDSON ELECTRONICS, LTD., 244 Needham St., 02164, (617) 965-2255, Branch Mgr.: J. J. Lucy

NEWTON UPPER FALLS

IN-STOCK PRODUCTS CO., 385 Elliot St., 02164, (617) 964-6200, Sis. Mgr.: F. McCarthy

NEWTONVILLE

SEGEL CO., C., Box 106, 02160, (617) 969-6900, Inside Sis. Contact: S. Segel

NORTH WILBRAHAM

INDUSTRIAL COMPS CORP., 2551 Boston Rd., 01095, (413) 598-3854

NORWELL

BORDEWIERCK ELECTRONIC SUPPLY CO., 427 Washington St., (617) 659-4915

NORWOOD

VALUE-ADDED ELECTRONICS, INC., 159 Morse St., 02062, (617) 762-1490, TWX: 710-336-6347, Inside Sis. Contact: R. Sarnie

PEABODY

ESSEX INTERNATIONAL, INC., 247 Lynnfield St., 01960, (617) 531-7100

JSR ASSOCIATES, 14 Raymond Circle, (617) 532-0348

RANDOLPH

SEABOARD SYSTEMS, INC., 950 Main St., 02368, (617) 961-4400

RAYNHAM

DEAN & CO., INC., DAVID B., 407 Rte. 44, 02767, (617) 824-4117, Sis. Mgr.: P. A. Dean

READING

CHAMPAGNE ASSOCIATES, 2 Linden St., (617) 944-3011

SAXONVILLE

DELBURN ELECTRONICS, 1630 Concord St., 01701, (617) 877-7824, TWX: 710-380-1639, Branch Mgr.: P. Lukas

DIVERSIFIED CONTROLS CORP., 1630 Concord St., 01701, (617) 877-8554, Branch Mgr.: P. Lucas

SCITUATE

ADAMS-MCGREGOR, INC., Box A, 02066, (617) 545-2213, Branch Mgr.: K. J. Walsh, Jr.

SOMERVILLE

CRAIG CORP., 356 Mystic Ave., 02145, (617) 666-0504, Inside Sis. Contact: B. Zamansky

ELECTRO SALES, 100 Fellsway West at Mystic Ave., 02145, (617) 666-0500, Inside Sis. Contact: W. Hayes

SPRINGFIELD

CUSHING, T. F., INC., 1026 Bay St., 01101, (413) 788-7341, Inside Sis. Contact: C. Robinson

HUNTOON ASSOCIATES, V. J., 908 Belmont Ave., 01108, (413) 788-8516, Mktg. Mgr.: V. J. Huntoon

LAFAYETTE RADIO ELECTRONICS ASSOC. STORE, 447 Summer Ave., 01108, (413) 736-3626, Mktg. Mgr.: J. L. Leib

SIGNAL ELECTRONIC CENTER OF SPRINGFIELD, INC., 484 Worthington St., 01105, (413) 739-3893, Br. Mgr.: A. Friedman

SMITH CO., R., 29 Ruby Rd., 01108

SOUNDCO ELECTRONIC SUPPLY CO., 2095 Roosevelt Ave., 01104, (413) 739-3847

When you need
quality components like
SPRAGUE
get the works from
CRAMER

cramer
CRAMER ELECTRONICS INC.

Our most important component is service.

When you need
quality components like
ITT
SEMICONDUCTORS
get the works from
CRAMER

cramer
CRAMER ELECTRONICS INC.

Our most important component is service.

**Our
most
important
component
is.
service.**

cramer
CRAMER ELECTRONICS, INC.

WALTHAM

DIGITAL SALES ASSOC., 9 Spring St., 02154, (617) 899-4300, TWX: 1-710-324-7578
 HENIK ASSOC., (617) 891-5660
 IMPACT SALES CO., 223 Crescent St., 02154, (617) 893-2850, TWX: 710-324-6655
 M.I.L. ELECTRONICS, INC., 971 Main St., 02154, (617) 891-6730, Gen. Sls. Mgr.: I. Cohen
 OPT. ELECTRONIC DISTRIBUTORS, INC., 47 Calvary St., 02154, (617) 924-4100
 SCHWABER ELECTRONICS, 213 Third Ave., 02154, (617) 890-8484, Gen. Mgr.: J. Antonellis
 TI SUPPLY CO., 504 Totten Pond Rd., 02154, (617) 890-0510, Branch Mgr.: R. Santosuosso

WATERTOWN

DRW ELECTRONICS OF MASS. CORP., 600 Pleasant St., 02172, (617) 923-1900, TWX: 510-224-6440, Branch Mgr.: A. Rhein
 STERLING ELECTRONICS, 51 Spring St., 02172, (617) 926-9720, Branch Mgr.: C. Aronis

WELLESLEY

HUNTOON ASSOCIATES, V. J., 148 Linden St., Suite 207, 02181, (617) 235-4260, Branch Mgr.: V. J. Huntoon

WELLESLEY HILLS

IN-STOCK PRODUCTS CO., 40 Washington St., 02181, (617) 235-6330, Inside Sls. Contact: D. Kloo

WESTFIELD

LAFAYETTE RADIO ELECTRONICS ASSOC. STORE, 423 E. Main St., 01085, (413) 568-1160, Branch Mgr.: F. Haluch

WEST NEWTON

MAYER, A. W. CO., 38 Border St., 02165, (617) 965-1111, Inside Sls. Contact: P. Nessar

WEST SPRINGFIELD

CONTROL ENGINEERING, INC., 1702 Riverdale St., (413) 739-5134

WESTWOOD

ALDEN MUSIC CO., C., Southwest Industrial Park, 02090, (617) 326-6040

WILBRAHAM

INDUSTRIAL COMPONENTS CORP., 2551 Boston Rd., 01095, (413) 596-3854, Inside Sls. Contact: S. R. Welch

WOBBURN

NEWARK ELECTRONICS, 13A Wheeling Ave., 01801, (617) 935-8350

RUSH INDUSTRIES, (617) 935-2400

TIME/NEW ENGLAND, 116 Cummings Pk., (617) 935-8080

WORCESTER

RADIO MAINTENANCE SUPPLY, (617) 756-8311
 RM ELECTRONICS, INC., 80 Thomas St., 01608, (617) 756-8311, Inside Sls. Contact: S. R. Joseph
 WORCESTER DISTRIBUTORS, INC., 250 Pleasant St., 01609, (617) 755-5035, Mktg. Mgr.: H. Edinburg

MICHIGAN

ALLEN PARK

ELECTRONIC PARTS CO., 6600 Roosevelt, 48101, (313) 383-3700, Branch Mgr.: J. Good

ALPENA

P & B SUPPLY INC., 49707, (517) 354-5025

ANN ARBOR

ADVENT ELECTRONICS, 254 S. Wagner Rd., (313) 769-8650
 GULF ELECTRONICS, (313) 769-8650

LAFAYETTE RADIO ELECTRONICS ASSOC. STORE, 3430 Washtenaw Ave., 48104, (313) 971-5420, Branch Mgr.: L. Travis

PURCHASE RADIO SUPPLY, 327 E. Hoover, 48104, (313) 668-8696, Inside Sls. Contact: O. Lichty

WEDEMEYER ELECTRONICS SUPPLY CO., 2280 S. Industrial Hwy., 48108, (313) 665-8611, Inside Sls. Contact: G. Wedemeyer

AUGUSTA

GREAT LAKES ELECTRONICS, 390 E. Michigan Ave., 49012, (616) 731-4156, Inside Sls. Contact: G. Townsend

BATTLE CREEK

ALL-PHASE ELECTRIC SUPPLY CO., 1299 E. Columbia, 49016, (616) 962-7557, Branch Mgr.: R. Dillman

KENDALL ELECTRIC, INC., 131 Grand Trunk Ave., 49016, (616) 963-5585-6, Gen. Sls. Mgr.: C. J. Kodis, Jr.

WARREN RADIO CO., 93 Bidwell W., 49015, (616) 965-3338

BENTON HARBOR

ALL-PHASE ELECTRIC CO., 875 Riverview Dr., 49022, (314) 926-6194, Mktg./Adv. Mgr.: J. Cleworth

BENTON ELECTRONIC SUPPLY, INC., 922 Woodward, 49022, (616) 925-0060, Mktg./Adv. Mgr.: A. Kopschke

COLFAX CO., 2302 Plaza Dr., 49022, (616) 927-3519, Branch Mgr.: W. Glendenning

BIRMINGHAM

LAFAYETTE RADIO ELECTRONIC ASSOC. STORE, 377 Hamilton Row, 48011, (313) 644-0345, Branch Mgr.: D. Fink

BUCHANAN

RILEY & PETCHELL SALES, INC., 401 Chippewa St., 49107, (616) 695-6831, Owner: G. R. Riley

CADILLAC

ALL-PHASE ELECTRIC SUPPLY CO., 1461 N. Mitchell, 49601, (616) 775-6505, Branch Mgr.: M. Perkowski

CHEBOYGAN

STRAITS DISTRIBUTORS, INC., 412 N. Main, 49721, (616) 627-5628, Sls. Mgr.: R. Humphre

CLAWSON

INSTRUMENT SPECIALTIES, INC., 1024 W. 14 Mile Rd., 48017, (313) 435-3311

DEARBORN

RADIO FRANK, INC., 14442 Michigan Ave., Box 606, 48121, (313) 584-6880, Inside Sls. Contact: T. J. Neck-rock

DETROIT

CITY ANIMATION CO., 17129 Rockdale, 48219, (313) 531-4200, Inside Sls. Contact: P. Colosimo

COMTEL-STERLING CO., 17500 W. McNichols Rd., 48235, (313) 255-1970, Contact: W. Bergstrom

ELECTRONIC PARTS CO., 20237 John R, 48203, Inside Sls. Contact: H. Taylor

ELECTRO SALES ASSOC., 11211 Morang Dr., 48224, (313) 526-8800, Branch Mgr.: R. O'Hara

ESSEX INTERNATIONAL, INC., 6233 Concord Ave., 48211, (313) 371-8000

LAFAYETTE RADIO ELECTRONICS ASSOC. STORE, 1326 Broadway, 48226, (313) 961-2955, Branch Mgr.: H. Peritz

LAFAYETTE RADIO SUPPLY CORP., 8833 Fenkell Ave., 48238, (313) 931-5945, Branch Mgr.: J. J. Zapawa

MASTER ELECTRONICS SUPPLY CORP., 5326 E. McNichols Ave., 48212, (313) 366-8550, Inside Sls. Contact: M. A. Zapawa

MASTER ELECTRONICS SUPPLY CORP., 8833 Fenkell Ave., 48238, (313) 366-8550, Branch Mgr.: J. Baldwin

MERCHANT & CO., R. C., 18411 W. McNichols, 48219, (313) 535, 6000, TWX: 810-221-5129, Pres.: J. E. Merchant

MICHIGAN LECTROLS CORP., 18315 W. Seven Mile Rd., 48219, (313) 255-4250, Inside Sls. Contact: L. H. Dickelman, Jr.

MICHIGAN VALVE & FITTING CO., 17236 E. Warren Ave., (313) 884-9415

NEWARK, 20700 Hubbell Ave., 48327, (313) 548-0250

RILEY & PETCHELL SALES, INC., 25700 Plymouth Rd., 48239, (313) 535-7000, Owner: T. L. Petchell

RS ELECTRONICS, 12775 Lyndon, 48227, (313) 491-1000, Ind. Sls. Mgr.: L. Allen

SEMICONDUCTOR SPECIALISTS, 25127 W. Six Mile Rd., 48240, (313) 255-0300, Br. Mgr.: R. Weaire

SHERIDAN SALES CO., 33708 Grand River Rd., 48024, (313) 477-3800, Branch Mgr.: R. E. Steiner

FARMINGTON

C. M. & P. DISTRIBUTORS, 23995 Freeway Park Dr., 48024, (313) 477-7700, TWX: 810-242-2986, Inside Sls. Contact: R. Cook

DIPLOMAT/NORTHLAND, (313) 477-3200

FLORA ASSOC., P. C., 29776 Grand River Ave., 48024, (313) 478-4020, Mktg. Mgr.: P. G. Flora

HARVEY MICHIGAN, INC., 23461 Industrial Pk. Dr., 48024, (313) 477-1650, TWX: 810-242-6965, V.P. Sls.: A. Palarchio

OMNI SPECTRA, INC., 24600 Hallwood Ct., 48024, (313) 477-1234, TWX: 810-242-1463, Gen. Sls. Mgr.: R. A. Borden

SEMICONDUCTOR SPECIALISTS, INC., 33505 State St., 48024, (313) 478-2700, TWX: 810-242-1465, Branch Mgr.: R. Swanson

SHERIDAN SALES CO., Box 529, 48024, (313) 477-3800, Branch Mgr.: R. E. Steiner

FARMINGTON HILLS

LAFAYETTE RADIO ELECTRONICS ASSOC. STORE, 29400 Orchard Lake Rd., 48024, (313) 626-4595, Branch Mgr.: B. Spilker

FERNDALE

HILLTRONICS, INC., 380 Hilton Rd., 48220, (313) 398-5556, TWX: 810-232-4861, Inside Sls. Contact: G. R. Alverson

MIDWAY ELECTRONIC SUPPLY, 1000 W. Eight Mile Rd., 48220, (313) 546-1605, Inside Sls. Contact: E. Fend

FLINT

BELAIR DISTRIBUTORS, 2002 W. Pierson Rd., 48504, (313) 785-0859, Sls. Mgr.: N. Wilson

M & M ELECTRONIC SUPPLY CO., G-4385 S. Saginaw St., 48507, (313) 744-2530, Inside Sls. Contact: M. Lang

PULSAR RESEARCH & DEVELOPMENT LABS., Box 4310, 48504, (313) 238-0461, Inside Sls. Contact: Mr. Riley

RAHFCO AND ASSOC., G-6170 Fenton Rd., 48507, (313) 738-2680, Inside Sls. Contact: R. Windle

ROTH ELECTRIC SUPPLY CO., (313) 234-8661

SHAND ELECTRONICS, INC., 2401 South Dort, 48507, (313) 743-8940, Inside Sls. Contacts: J. P. Driver, R. T. Anderson

WINDLE, RICK, 2214 Radkob St., 48504, (313) 235-7723, Branch Mgr.: R. Windle

GLEN ARBOR

COMMUNICATIONS EQUIPMENT CO., INC., Box 7, 49636, (616) 334-3081, Branch Mgr. (Pres.): H. I. Morris

GRAND HAVEN

GTI SUPPLY, Beechtree & Marion, (616) 842-5430

GRAND RAPIDS

ALL-PHASE ELECTRIC SUPPLY CO., 815 Monroe, 49502, (616) 454-9234, Branch Mgr.: R. Stouten

BURMSA RADIO SUPPLY CO., 1030 Schieber N.W., 49504, (616) 459-4325, Inside Sls. Contact: J. Burmsa

ELECTRONIC SOUND EQUIP. CO., 2249 S. Division Ave., 49501, (616) 241-3425, Owner: H. Kingma

ELECTRONIC SOUND, 3576 Alpine Ave., 49504, (616) 364-8759, Branch Mgr.: J. Goldstien

PURCHASE ELECTRIC SUPPLY, 100 Grandville S.W., 49502, (616) 458-1476, Inside Sls. Contact: K. Veneklasen

RS ELECTRONICS, 300 36th St., S.E., 49508, (616) 381-3483, Mgr.: A. Wood

RS ELECTRONICS-GRAND RAPIDS, 300 36th St., S.E., 49508, (616) 241-3483, Branch Mgr.: A. Wood

RS ELECTRONICS, 505 Jefferson E.E., 49508, (616) 459-4611

STOTTS-FRIEDMAN CO., 2035 Eastern Ave. S.E., 49507, (616) 241-6731

T & W ELECTRONICS, INC., 1045 Division Ave. S., 49507, (616) 241-3645, Sls. Mgr.: J. L. Wiersma

WARREN RADIO CO., 320 Michigan N.E., 49503, (616) 456-5385, Branch Mgr.: G. Gane

HOLLAND

ALL-PHASE ELECTRIC SUPPLY CO., 148 Waverly Rd., 49423, (616) 396-4641, Branch Mgr.: R. Lindemann

BURMSA RADIO SUPPLY CO., 491 Chander Dr., 49423, (616) 396-8250, Branch Mgr.: W. Vandoer Ark

ELECTRONIC SOUND, 740 Michigan Ave., 49423, (616) 396-4631, Branch Mgr.: J. Brown

HOLLY

BROWN, E. RUSSEL, D-13318 Dixie Hwy., L 47, 48442, Branch Mgr.: T. Stakoe

JACKSON

FULTON RADIO SUPPLY CO., 1208 Greenwood Ave., 49203, (517) ST 4-6106, Inside Sls. Contact: G. Fulton

KALAMAZOO

ALL-PHASE ELECTRIC SUPPLY CO., 710 Gibson, 49006, (616) 381-1114, Branch Mgr.: M. Miller

BURMSA RADIO SUPPLY CO., 513 E. Kalamazoo, 49006, (616) 345-8567, Branch Mgr.: C. Wilson

ELECTRONIC SOUND, 4518 W. Main St., 49007, (616) 381-6363, Branch Mgr.: D. Glasier

LAFAYETTE RADIO ELECTRONIC ASSOC. STORE, 214 N. Rose St., 49006, (616) 381-5162, Branch Mgr.: J. Riley

PURCHASE ELECTRIC SUPPLY, 921 Portage St., 49001, (616) 381-7513, Branch Mgr.: W. Crippin

RS ELECTRONICS, 3219 E. Kilgore Rd., 49002, (616) 381-5470, Mgr.: J. Bartus

WARREN RADIO CO., 1710 Westnedge S., 49008, (616) 381-4203

KENTWOOD

HARVEY-MICHIGAN, 4860 S. Division, (616) 431-9300

LANSING

ALL-PHASE ELECTRIC SUPPLY CO., 710 E. Kalamazoo, 48912, (517) 749-9507, Branch Mgr.: B. Groves

FULTON RADIO SUPPLY CO., 2707 Alpha St., Box 9305, 48909, (517) 489-6519, Inside Sls. Contact: H. Addison

WINTER, L. C., 1406 May St., 48906, (517) 489-2631, Branch Mgr.: L. C. Winters

LIVONIA

CRAMER/DETROIT, 13193 Wayne Rd., 48150, (313) 425-7000

HAMILTON/AVNET — DETROIT, 12870 Farmington Rd., 48150, (313) 522-4700, Branch Mgr.: T. Schnorrenberg

LAFAYETTE RADIO ELECTRONICS ASSOC. STORE, 33760 Plymouth Rd., 48150, (313) 261-0600, Branch Mgr.: R. Getz

NORWEST ELECTRONICS, 33611 Plymouth Rd., 48150, (313) 261-4551, Gen. Sls. Mgr.: T. Opalinski

PIONEER STANDARD, 13485 Stamford, 48150, (313) 525-1800

MADISON HEIGHTS

WARREN RADIO CO., 32707 John R St., 48071, (313) 588-3327

MANISTEE

BURMSA RADIO SUPPLY CO., 258 River, 49660, (616) 723-5111, Branch Mgr.: W. Gardiner

MARQUETTE

NWR ELECTRONICS, Box 310, 1010 W. Washington, 49855, (906) 226-7578, Inside Sls. Contact: W. Jackson

MENOMINEE

TEAM ELECTRONICS #29, M & M Plaza, Box 212, 49858, (906) 864-2213, Branch Mgr.: B. Falkenberg

MUSKOGON

ALL-PHASE ELECTRIC SUPPLY CO., 496 W. Western, 49440, (616) 722-2656, Branch Mgr.: M. Kmiecik

When you need
 quality components like
RAYTHEON
 get the works from
CRAMER

cramer
 CRAMER ELECTRONICS INC.

Our most important component is service.

BURSA RADIO SUPPLY CO., 773 Apple, 49442, (616) 726-5553, Branch Mgr.: D. Steenstra
ELECTRONIC DISTRIBUTORS, 1960 Peck St., 49441, (616) 726-3196, Inside Sls. Contact: J. Sika
FITZPATRICK ELECTRIC, (616) 722-6621
TELEVISION PARTS DIST., 2100 Henry St., 49440, (616) 759-7666, Branch Mgr.: R. French
WESTERN ELECTRONIC SUPPLY CO., Box 298, 1781 5th St., 49443, (616) 722-7628, Inside Sls. Contact: F. Hall

OAK PARK
CADILLAC ELECTRIC SUPPLY CO., 20700 Hubbell Ave., 48237, (313) 548-0260
ERIC ELECTRONICS, INC., 10721 West 10 Mile Rd., 48237, (313) 547-0203, Inside Sls. Contact: J. Martin
LAFAYETTE RADIO ELECTRONICS ASSOC. STORE, 10721 W. 10 Mile Rd., 48237, (313) 547-8181, Branch Mgr.: M. Spilker
NEWARK-DETROIT, 20700 Hubbell Ave., 48237, (313) 548-0250
SHAY ASSOC., J., 13730 Elgin, 48237, (313) 546-0194, Inside Sls. Contact: J. Shay

OWASO
N.R.W. ELECTRONICS CORP., (906) 226-7578

OWOSSO
ALL-PHASE ELECTRIC SUPPLY CO., 150 E. Howard, 48867, (517) 723-8181, Branch Mgr.: D. Randall
WARREN RADIO CO., 311 S. Cedar, 48867, (517) 723-5239
PORT HURON
HURON ELECTRIC SUPPLY CO., 48060, (313) 985-8183
MAIN TV-LAFAYETTE ASSOC. STORE, 1503 24th St., 48060, (313) 985-5103, Inside Sls. Contact: Wm. Warner

ROCHESTER
WEBSTER COMMUNICATIONS, 115 Bellarmine, 48063, (313) 375-0420, Mktg. Mgr.: R. D. Webster

ROMULUS
PIONEER STANDARD, 6337 N. Beverly Plaza, 48174, (313) 729-8500

ROSEVILLE
RS ELECTRONICS, 27882 Gratiot, 48066, (313) 779-2450, Mgr.: J. Remick

ROYAL OAK
JACKSON, R. H., CO., 200 S. Washington, 48067, (313) 542-5059

SAGINAW
MORLEY BROTHERS, INC., 525 Morley Dr., 48601, (517) 755-5301, Inside Sls. Contact: J. Ellis
SHAND ELECTRONICS, INC., 3710 East St., 48601, (517) 755-2191, Branch Mgr.: C. Glanton

ST. CLAIR SHORES
SPEMCO, Specialties Mfg. Co., 23425 Harper, 48080, (313) 771-2700

SAULT STE. MARIE
STRAITS DISTRIBUTORS, INC., 144 Ridge St., 49783, (906) 632-2297, Branch Mgr.: E. Kraft

SOUTHFIELD
BERMAN CO., C. 22532 Greenview Rd., 48075, Inside Sls. Contact: M. Berman
DYNAMIC SYSTEMS CORP., Box 214, 58075, (313) 841-7550

SOUTH HAVEN
ALL-PURPOSE ELECTRIC SUPPLY CO., Sixth St. 6 Blue Star Hwy., 49090, (616) 637-5217, Branch Mgr.: T. Holt

STERLING HEIGHTS
LAFAYETTE RADIO ELECTRONICS ASSOC. STORE, 34208 Van Dyke, 48093, (313) 268-8550, Branch Mgr.: G. Cordial

TURGIS
ALL-PHASE ELECTRIC SUPPLY CO., 643 E. Fawn River Rd., 49091, (616) 651-7867, Branch Mgr.: C. Straka

TEMPE
OMNI SPECTRA, INC. — ARIZ. DIV., 1040 W. Alameda Dr., 85282, (602) 966-1471, TWX: 910-950-1296, Branch Mgr.: F. Parin

THREE RIVERS
ESSEX INTERNATIONAL, INC., Fourth St., Box 118, 49093, (616) 279-5551

TRENTON
LAFAYETTE RADIO ELECTRONICS ASSOC. STORE, 3460 West Rd., 48183, (313) 675-7900, Branch Mgr.: J. Peltier

TROY
ELECTRONIC SPECIALTIES, INC., 1168 E. Big Beaver Rd., 48084, (313) 689-0372, Inside Sls. Contact: J. E. Kalous
SCHWEBER ELECTRONICS, 86 Executive Dr., 48084, (313) 583-9242, Gen. Mgr.: D. Laemont

UTICA
LAFAYETTE RADIO SUPPLY CORP., 45136 Cass Ave., 48087, (313) 731-3590, Inside Sls. Contact: E. Morawski

VALPARAISO
ALL-PHASE ELECTRIC SUPPLY CO., 58 Marks Rd., 46383, (219) 464-3517

WARREN
ELECTRONIC PARTS CO., 23040 Schoenherr, 48089, (313) 773-0030, Branch Mgr.: F. Sellers

WEST BLOOMFIELD
STAKOE, TED, 3965 Lakepoint, 48033, (313) 363-5325

WYANDOTTE
RS ELECTRONICS, 3450 Biddle, 48192, (313) AV. 2-5880, Mgr.: J. Pellegrini

WYOMING
MORLEY BROTHERS, 3707 Roger Chaffee, 49508, (616) 245-1214, Branch Mgr.: M. Check
NEWARK ELECTRONICS, 3645 Linden Ave. S.E., 49509, (616) 241-6681

MINNESOTA

BLOOMINGTON
ARROW ELECTRONICS, 9700 Newton Ave. So., 55420, (612) 888-5522
HALLMARK ELECTRONICS, 9201 Penn Ave., 55431, (612) 884-9056

DULUTH
NORTHWEST RADIO OF DULUTH, INC., 123 E. First St., 55802, (218) 727-1565, Mktg. Mgr.: E. M. Peterson

STAR ENTERPRISES, 4401 Grand Ave., 55807, (218) 628-1073

EDEN PRAIRIE
SPEAKER CO., G., 14760 Martin Dr., (612) 941-5730
MARSHALL INDUSTRIES, 4900 Viking Dr., 55424, (612) 831-4904

EDINA
CRAMER/BONN, 7275 Bush Lake Rd., 55435, (612) 835-7811

HALLMARK ELECTRONICS, (612) 925-2944
HAMILTON/AVNET — MINNEAPOLIS, 7683 Washington Ave. S., 55435, (612) 941-3801, Telex: 295-250, Branch Mgr.: G. Palmer
SCHWEBER ELECTRONICS, 7015 Washington Ave., S., 55435, (612) 941-5280, Gen. Mgr.: D. Taschner
TI SUPPLY CO., 7615 Metro Blvd., 55435, (612) 835-5353, Branch Mgr.: D. Percival

GOLDEN VALLEY
MUELLER SALES CORP., 2420 Nevada Ave. N., (612) 544-8888

MINNEAPOLIS
ACME ELECTRONICS, INC., 224 Washington Ave. N., 55401, (612) 338-4754, Inside Sls. Contact: R. Atlas
ADC PRODUCTS, 4900 W. 78th St., 55423, (312) 835-6800, TWX: 910-576-2832, Inside Sls. Contact: G. E. Rue
ARNESON, G. E., & CO., 4900 Viking Dr., 55435, (612) 835-2177, Mktg. Mgr.: G. E. Arneson
ARROWHEAD BEARINGS, 1609 Hennepin Ave., (612) 335-1111

BERGQUIST CO., 4350 W. 78th St., 55435, (612) 835-2322, TWX: 910-576-2423, Inside Sls. Contact: B. Hanson
ELECTRO-COM CORP., 3816 Chandler Dr., (612) 788-8601
ELECTRONIC CENTER, INC., 127 Third Ave. N., 55401, (612) 338-5881, Gen. Sls. Mgr.: J. Wyman
ENVIRON LABS., 9225 Girard Ave., (612) 888-7795
ESSEX INTERNATIONAL, INC., 3230 E. Hennepin Ave., 55413, (612) 331-6290

HALL-MARK/MINNEAPOLIS, 4555 W. 77th St., 55435, (612) 884-9056, Mgr.: B. Varela
HAMILTON-AVNET, 7683 Washington Ave., (612) 941-3801
HOLDEN CO., H. A., 1208 Harman Pl., 55403, (612) 336-5353, Sls. Mgr.: H. Morben
INDUSTRIAL COMPONENTS, INC., 5280 W. 74th St., 55435, (612) 831-2666, TWX: 910-576-3153, Inside Sls. Contact: S. Hoffman

MARSHALL INDUSTRIES, 4900 Viking Dr., 55435, (612) 831-4904

NESS ELECTRONICS, INC., 3743 Nicolay Ave., 55409, (612) 824-2646, Inside Sls. Contact: D. Ness
NEWARK ELECTRONICS, 336 Hoover St. N.E., 55413, (612) 331-6350, Telex: 29-0682

NORTEC SALES, 4530 W. 77th Ave., 55435, (612) 835-7414
PIVAN ENGINEERING CO., 3307 N. Highway 100, 55422, (612) 537-4501, Branch Mgr.: J. Trask

S & R COMPONENT SALES, INC., 3531 Xydon Ave. N., 55427, (612) 544-3022, Inside Sls. Contact: S. O. Wicks or R. S. Wicks

SEMICONDUCTOR SPECIALISTS, INC., 8030 Cedar Ave. S., 55420, (612) 854-8841, TWX: 910-576-2812, Branch Mgr.: T. Strabel
STARK ELECTRIC SUPPLY, 1125 Third Ave., N., 55401, (612) 332-1325
STERLING ELECTRIC CO., 44 S. 12th St., 55406, (612) 332-4571

TEAM CENTRAL, INC., 720 29th Ave., S.E., 55414, (612) 331-8511, Gen. Sls. Mgr.: R. Togerad
WAYTEK, INC., 5656 Lincoln Dr., 55436, (612) 933-2133, Gen. Sls. Mgr.: W. Larson

NEW BRIGHTON
DALSKA SALES, Box 12751, (612) 631-2941

ST. LOUIS PARK
DAWN ELECTRONICS, INC., 2633 Louisiana Ave. S., 55426, (612) 925-4544, Inside Sls. Contact: D. Cassidy
LEE CO., JAMES, 6121 Excelsior Blvd., 55416, (612) 920-1525, Sls. Mgr.: D. Otto
PARK ELECTRONICS, INC., 2206 Edgewood Ave., S., 55426, (612) 925-3118, Inside Sls. Contact: E. Carlson
PARK ELECTRONICS, 2633 Louisiana Ave. S., 55426, (612) 925-3118, Inside Sls. Contact: E. Carlson

ST. PAUL
CARL M. CO., 1926 Wellesley Ave., 55105, (612) 699-8004
ENGELBRETON CO., 906 Ottawa Ave., 55118, (612) 222-2338, Sls. Mgr.: D. Engelbreton
GOPHER ELECTRONICS CO., 2520 W. Larpenteur Ave., 55113, (612) 645-0241, Inside Sls. Contact: E. M. DeLonaie
MAGNUSON ELECTRONICS, 1246 W. Seventh St., 55102, (612) 227-8495, TWX: 910-563-3554, Branch Mgr.: G. Moody

RADIO DISTRIBUTING CO., 1821 University Ave., 55104, (612) 645-0631, Branch Mgr.: M. Dass
RAGON ELECTRONICS, INC., 1136 W. Larpenteur Ave., 55113, (612) 488-0201, TWX: 910-563-3736, Inside Sls. Contact: M. Scott

VIRGINIA
NWR ELECTRONICS, INC., Box 118, 55792, (218) 741-5080, Ind. Sls. Mgr.: K. C. Mannikko

MISSISSIPPI

COLUMBUS
BLUFF CITY DISTRIBUTING CO., Box 2186 Fairlane Sta., 39704, (601) 328-6212

GREENVILLE
BLUFF CITY DISTRIBUTING CO., Box 5606, 58702, (601) 334-4412

GREENWOOD
PARHAM ELECTRONICS, 300 Carrollton Ave., 38930, (601) 453-4241, Inside Sls. Contact: E. Ambrose

GULFPORT
HELWICK ELECTRONICS, 2214 25th Ave., 39501, Inside Sls. Contact: E. A. Helwick
SUMRALL ELECTRONIC SUPPLY CO., INC., 3004 25th Ave., 39501, (601) 863-1744, Inside Sls. Contact: W. R. Sumrall, Jr.

HATTISBURG
SWAN ELECTRONICS, INC., 1316 W. Pine, Box 766, 39402, (601) 584-5494, Branch Mgr.: R. Lasseter

JACKSON
ELLINGTON ELECTRONIC SUPPLY, INC., 1425 Terry Rd., Box 8489, 39204, (601) 355-0561, Inside Sls. Contact: W. M. Ellington, Jr.
JACKSON DISTRIBUTING CO., 903 Bailey Ave., 39205, Inside Sls. Contact: E. E. Jackson
SWAN AUDIO WORLD, Highland Village 155 N., 39211, (601) 362-2812, Branch Mgr.: J. Findley
SWAN ELECTRONICS, INC., 342 N. Gallatin, Box 3289, 39207, (601) 352-5516, Inside Sls. Contact: J. W. Vanderveere

LAUREL
RADIO & TELEVISION ESSENTIALS, 111 E. 13th St., 39440, (601) 428-0508, Gen. Sls. Mgr.: L. Powell II

MERIDIAN
HOOPER ELECTRONIC SUPPLY, 1917 Sixth St., 39301, (601) 693-2668

NEWTON
MAY ELECTRONICS SUPPLY, Hwy. 80 West, 39345, (601) 683-6400, Inside Sls. Contact: J. A. May

PASCAGOULA
MAY ELECTRONICS SUPPLY, 1412 Ingalls Ave., 39567, (601) 762-1900, Mktg./Adv. Mgr.: J. A. May
RALPH'S of PASCAGOULA, 2112 Ingalls Ave., 39567, (601) 769-1672

POTTS CAMP
MIDWAY INDUSTRIAL ELECTRONICS, (601) 333-7464, TWX: 510-225-3661, Branch Mgr.: E. Zupsan

TUPELO
BLUFF CITY DISTRIBUTING CO., 210 S. Glaster, 38801, (601) 842-6832

MISSOURI

BERKELEY
HALL-MARK ELECTRONICS, 6100 Madison Ave., 63134, (314) 521-3800, TWX: 910-760-1630

BRECKENRIDGE
B & W DISTRIBUTORS, Broadway, 64625, (816) 644-5421

BRENTWOOD
RADIO COMMUNICATIONS CO., 2313 S. Brentwood Blvd., 63144, (314) 968-4444, Inside Sls. Contact: J. Stiffelman

CAPE GIRARDEAU
RADONICS-CAPE, 817 Broadway, 63701, (314) 334-3094, Br. Mgr.: W. Boughty
SUEDEKUM ELECTRONIC SUPPLY CO., 2215 Broadway, 63701, (314) 335-8202, Inside Sls. Contact: E. Hall

COLUMBIA
MO-GABLE CO., INC., 107 N. Seventh St., 65201, (314) 449-2944, Branch Mgr.: M. Carignan
YORK RADIO & TELEVISION CORP., 222 S. Fifth, 65201, (314) 449-0851, Branch Mgr.: R. Henderson

DE SOTO
LUEKING ELECTRONICS, Rock Rd. & W. Leuking Dr., 63020, (314) 586-3977, Inside Sls. Contact: N. R. Leuking

INDUSTRIAL DISTRIBUTORS

ARCO • CD • CENTRALAB
MALLORY • SPRAGUE

CAPACITORS

ZACK

ELECTRONICS

PALO ALTO, CA

415/326-5432 654 High St. 94301

SAN FRANCISCO, CA

415/626-1444 1444 Market St. 94102

EARTH CITY

HALL-MARK ELECTRONICS, 13789 Rider Trail, 63045, (314) 291-5350

FLAT RIVER

SHOW-ME ELECTRONICS, INC., 511 E. Main St., 63601, (314) 431-4816, Branch Mgr.: H. Harmon

FLORISSANT

SHERIDAN SALES CO., Box 677, 110 S. Hwy. 140, 63033, (314) 837-5200, Branch Mgr.: L. O. Johnston

HANNIBAL

YORK RADIO & TELEVISION CORP., 804 Broadway, 63401, (314) 221-4393, Branch Mgr.: R. Waddel

HAZELWOOD

HAMILTON/AVNET — ST. LOUIS, 364 Brookes La., 63042, (314) 731-1144, Telex: 442-348, Branch Mgr.: T. Hunt
P M A CORP., 380 Brookes La., 63042, (314) 731-4334, TWX: 910-762-0651, Branch Mgr.: J. Mankus
SEMICONDUCTOR SPECIALISTS, INC., 1020 Anglum Rd., Lakeview Sq., 63042, (314) 731-2400, TWX: 910-762-0645, Branch Mgr.: N. Schroeder
THOMPSON CO., E. M., 400 Brooks Dr., (314) 731-2688

JEFFERSON CITY

CENTRAL MISSOURI DISTRIBUTING CO., 324 E. Capitol Ave., 65101, (314) 636-3146, Inside Sis. Contact: R. J. Garrett
SHOW-ME ELECTRONICS, INC., 609 Jefferson, 65101, (314) 636-2191, Branch Mgr.: P. Studer

JOPLIN

FOUR STATE RADIO SUPPLY CO./NORMAN ELECTRIC, 402 Wall St., 64801, (417) 624-0368, Inside Sis. Contact: W. Norman

KANSAS CITY

BEARING DIST., 1919 Baltimore St., (816) 471-0666
BURSTEIN-APPELBERG CO., 3199 Mercier St., 64111, (816) 531-5614, Inside Sis. Contact: J. C. Neustadt
HENSHAW ELECTRONIC SUPPLY, 7622 Wornall, 64114, (816) 523-7575
KCMO BUSINESS MUSIC, 120 W. 17th St., 64108, (816) 221-1515, Inside Sis. Contact: M. Regan
KORNFELD THORP ELECTRIC, (816) 221-4000
McGEE RADIO CO., 1901 McGee St., 64108, (816) 842-5092
RADIOLAB, 3814 Main St., 64111, (816) 561-9935
SEMICONDUCTOR SPECIALISTS, 3805 N. Oak Trafficway, 64116, (816) 452-3900, TWX: 910-771-2114, Branch Mgr.: J. Eberenz
THOMPSON CO., E. M., 208 W. 10th St., (816) 471-8248
TI SUPPLY CO., (816) 753-4750
WALTERS RADIO SUPPLY, INC., 3627-35 Main St., 64111, (816) 531-7015, Mktg. Mgr.: B. T. Embry, Jr.

NORTH KANSAS CITY

L COMP KANSAS CITY, INC., 1520 Taney St., 64116, (816) 221-2400, TWX: 910-771-3148

RAYTOWN

ADVANCED ELECTRONICS CO., (816) 737-1443

ROLLA

SHOW-ME ELECTRONICS, INC., Box 639, Hwy. 72 E., 65407, (314) 364-3896, Inside Sis. Contact: R. Ray

ST. ANN

INTERSTATE INDUSTRIAL ELECTRIC, 63074, (314) 428-8522
RADONICS ELECTRONICS, INC., 10525 St. Charles Rock Rd., 63074, (314) 426-4414, Branch Mgr.: V. Konersmann

ST. CHARLES

LECTRONIX, INC., 214 N. Second St., Box 188, 63301, (314) 723-1122, TWX: 910-760-1720, V-P Sis.: N. Prongue

ST. JOHN

TOLER RADIO, INC., RALPH, 3632 Woodson Rd., 63114, Inside Sis. Contact: R. Toler

ST. LOUIS

BARRETT ELECTRICAL SUPPLY CO., 45 Worthington Dr., 63043, (314) 878-1300, Inside Sis. Contact: L. Pipkins
BRIENER ELECTRIC CO., (314) 321-1185
DIPLOMAT/ST. LOUIS, INC., 2725 Mercantile, 63144, (314) 645-8550, Inside Sis. Contact: J. West
ELECTRONIC CONTROLS, CO., INC., 2735 Mercantile Dr., 63144, (314) 645-2400, Mktg./Adv. Mgr.: R. H. Jerome
ELECTRONIC MART, INC., 7552 Manchester Ave., 63143, (314) 781-7643, Gen. Sis. Mgr.: R. Criss
ESSEX INTERNATIONAL, INC., 5959 St. Louis Ave., 63120, (314) 381-2627
ESSEX INTERNATIONAL, INC., 4343 Duncan Ave., 63110, (314) 371-2616
GAFFNER ELECTRONICS CO., 13482 Clayton Rd., 63131, (314) 434-1036, Pres.: R. W. Gaffner
HALL-MARK/ST. LOUIS, 6100 Madison Ave., 63134, (314) 521-3800, TWX: 910-760-1630, Mgr.: B. Grems
INTERSTATE INDUSTRIAL ELECTRONICS, 4445 Gustine Ave., 63116, (314) 481-6110, Branch Mgr.: A. Mulich
"L" COMP ST. LOUIS, INC., 2605 S. Hanley Rd., 63144, (314) 647-5505
OLIVE INDUSTRIAL ELECTRONICS, 6662 Olive Blvd., 63130, (314) 863-7800, TWX: 910-761-1166, Inside Sis. Mgr.: A. Dodd
PIVAN ENGINEERING CO., 11734 Lackland Ind. Dr., 63141, (314) 567-3636, Branch Mgr.: J. Rennels
RADIONICS ELECTRONICS, INC., 4445 Gustine Ave., 63116, (314) 481-2222, Inside Sis. Contact: R. Holtkamp
RADIONICS—WEST, 2171 Bic Bend Blvd., 63117, (314) 781-3710, Branch Mgr.: J. Pellerito
SCHERRER INST., INC., 7170 Manchester Ave., (314) 644-5362
SEMICONDUCTOR SPECIALISTS, INC., 10068 Natural Bridge, 63134, (314) 428-6100, TWX: 910-765-0934, Branch Mgr.: N. Schroeder
STARBEAM SUPPLY, 1360 Baur, 63132, (314) 997-0077, Inside Sis. Contact: C. Schmidt
VAN SICKLE RADIO-ELECTRONICS, INC., 1915-1917 Washington Ave., 63103, (314) 621-5000, Gen. Sis. Mgr.: S. Brouk

SEDALIA

RADIO & TELEVISION SUPPLY, INC., 321 E. Main, 65301, (816) 826-3044, Branch Mgr.: M. Hayes

SPRINGFIELD

AUDIO ACOUSTICS, INC., 1856 E. Cinderella, 65804, (417) 883-9811, Inside Sis. Contact: D. Hartley
NORMAN ELECTRONIC SUPPLY, (417) 869-7237

STANN

RADIONICS — ST. ANN, 10525 St. Charles Rock Rd., 63074, (314) 426-4414, Branch Mgr.: V. K. Mann

WEST PLAINS

CENTRAL RADIO SUPPLY, Box 103, 65775, (417) 256-3131, Sis. Mgr.: L. Thompson

MONTANA**BILLINGS**

ELECTRONIC SUPPLY CO., (406) 252-2197

GREAT FALLS

LINDGREN CO., GEORGE, 400 1st Ave., N.W., Box 1401, 59403, (406) 761-8293

HAVRE

NORTHERN ELECTRONICS, Box 1609, 218 First St., 59501, (406) 265-5568, Mktg./Adv. Mgr.: F. DeRosa

HELENA

LATUS, D. N., CO., Box 1720, Airport Rd., 59601, (406) 442-3940, Gen. Sis. Mgr.: D. N. Latus

MISSOULA

ELECTRONIC PARTS, 1030 South Ave. W., 59801, (406) 543-3119, Sis. Mgr.: M. Smith
NORTHWEST DISTRIBUTORS, 509 S. Higgins, 59801, (406) 543-5181, Mktg. Mgr.: W. L. Bjorklund

NEBRASKA**BEATRICE**

RADIO EQUIPMENT CO., 620 Dorsey St., Box 23, 68310, (402) 223-3231, Branch Mgr.: E. Thomason

BELLEVUE

ALPHA-OMEGA APPLIED ELECTRONICS, 2208 Franklin, 68005, (402) 291-2200, Sis. Mgr.: G. E. Bonitz

GERING

TRANS NUTRONIC CORP., Box 220, 69341, 1-308-436-4510, Inside Sis. Contact: C. L. Johns

GRAND ISLAND

RADIO EQUIPMENT CO., 1104 W. Third, Box 1013, 68801, (308) 384-2910, Branch Mgr.: L. Rogers

LINCOLN

GENERAL RADIO & TV CO., 322 South 12th St., 68508, Inside Sis. Contact: I. Feldman
MARKETING ASSOCIATES, 1200 N. 79th St., 68505, (402) 464-5244

RADIO EQUIPMENT CO., 2619 Holdrege St., Box 82204, 68503, (402) 475-7668, Branch Mgr.: D. Eberl
SCOTT ELECTRONICS SUPPLY CORP., 4040 Adams St., Box 4467, 68504, (402) 434-8308, Mktg./Adv. Mgr.: R. E. Coons



TECHNICAL ELECTRONIC DISTRIBUTORS INC.

THE DISTRIBUTOR WITH THE REPUTATION
FOR CUSTOMER SERVICE AND
TECHNICAL KNOW-HOW.

THE ASM CORP.
COLLINS RADIO CO.
CURTIS INDUSTRIES, INC.
ELPAC, INC.
GENERAL SEMICONDUCTOR IND.
INFORMATION TERMINALS CORP.
INTERSWITCH
INTERLOK
JAN HARDWARE MFG. CO.
LITTELFUSE, INC.
MEPCO/ELECTRA, INC.
MICONICS INDUSTRIES, INC.
TOROTEL, INC.
VICTORY ENGINEERING CORP.
WALL-LENK MFG. CO.

20 Foster Street, Bergenfield, New Jersey

TEL.: N. J. (201) 384-3643

TWX: 710-991-9772

NORFOLK

RADIO EQUIPMENT CO., Box 724, 200 Brasch Ave., 68701, (402) 371-2728, Branch Mgr.: R. Middleton

NORTH PLATTE

SCOTT ELECTRONICS SUPPLY CORP., 516 N. Poplar, 69101, (308) 532-9260, Br. Mgr.: G. Woodhead
TRANS NUTRONIC CORP., 119 W. 5th, 69101, (308) 532-7328, Branch Mgr.: G. Johns

OMAHA

RADIO EQUIPMENT CO., 625 N. 18th St., 68103, (402) 341-7700, Inside Sis. Contact: J. Egusa
TEAM ELECTRONICS, 12100 W. Center Rd., 68144, (402) 333-3100, Branch Mgr.: D. Kuther
THOMPSON CO., E. M., 119 S. 19th St., (402) 341-4635

SCOTTSDUFF

D & H ELECTRONICS SUPPLY, INC., 1913 Broadway, Box 67, 69361, (308) 632-2181, Inside Sis. Contact: H. Baird

NEVADA**LAS VEGAS**

ENGINEERED SOUND, INC., 5115 So. Industrial Rd. #707, 89118, (702) 739-9363, Branch Mgr.: R. Ouimet
HURLEY ELECTRONICS, INC., 1112 Casino Ctr. Drive, 89100, (702) 384-5666, Branch Mgr.: R. Whittaker
INDUSTRIAL ELECTRONICS, 300 W. Utah Ave., 89102, (702) 384-2151
METCALF ELECTRONICS, (702) 384-2151
TRINIDAD ELECTRONICS, 3185 S. Highland Dr., 89102, (702) 732-2395, Branch Mgr.: K. Bagnal

RENO

DUNLAP ELECTRIC, 900 E. Fourth St., 89502, (702) 329-1308, Branch Mgr.: K. Pardini
EDCO, 720 Tahoe St., 89505, (702) 323-2766
ELECTR. DIST. CO. OF NEVADA, Box 2918, 720 Tahoe St., 89505, (702) 323-2766, Inside Sis. Contact: J. Hadwin

NEW HAMPSHIRE**CONCORD**

EVANS RADIO & ELECT. SUPPLY, Box 893, 03301, (603) 224-9961, Inside Sis. Mgr.: S. Bailey

LONDONDERRY

YANKEE ELECTRONICS SUPPLY, Grenier Industrial Vlg., 03053, (603) 625-9746

MANCHESTER

HOLMES DISTRIBUTORS, INC., 100 Cahill Ave., 03103, (603) 669-5060, Branch Mgr.: R. Pease
RSL DISTRIBUTORS, INC., 670 Chestnut St., 03105, (603) 625-5444, Sis. Mgr.: A. B. Sanborn

NASHUA

EVANS ELECTRICAL SUPPLY, 3 Progress Ave., 03060, (603) 882-2761, Br. Mgr.: A. Zapenas

PORTSMOUTH

LEVY'S AUTO & ELECTRONIC SUPPLY, INC., D., 40 Pleasant St., 03801, (603) 436-6639, Inside Sis. Contact: J. Sandler

NEW JERSEY**ATLANTIC CITY**

KEARNS ELECTRONIC PRODUCTS CO., (KEPCO), 300 N. Mississippi Ave., 08401, Inside Sis. Contact: F. Kearns, Sr.

BELLEVILLE

BELTRONICS CORP., 400 Washington Ave., 07109, (201) 751-2250, Gen. Sis. Mgr.: B. Zager

BERGENFIELD

TECHNICAL ELECTRONIC DIST. INC., 20 Foster St., 07621, (201) 384-3643, TWX: 710-991-9772, Inside Sis. Contact: E. Gray

BERLIN

MIDSTATE RADIO SUPPLY CO., 157 W. White Horse Pike, 08009, Inside Sis. Contacts: D. J. Chiaravalluto, A. R. Bronca, Partners

CAMDEN

GENERAL RADIO SUPPLY CO., 600 Penn St. at Bridge Pl., 08102, (609) 964-8560, Gen. Mgr.: N. Rosen
ELECTRONIC DISTRIBUTOR, INC., 1423 Ferry Ave., 08104, (609) 966-7520, Mktg. Mgr.: A. G. Butte

CEDAR GROVE

HAMILTON AVNET/CEDAR GROVE, 218 Little Falls Rd., 07009, (201) 239-0800, TWX: 710-994-5787, Branch Mgr.: H. Knapp

CHEERY HILL

CRAMER/PA., 12 Springdale Rd., 08034, (609) 424-5993, Div. Mgr.: W. Turner
MILGRAY/DELAWARE, 1165 Markless Rd., (609) 424-1300

CINNAMINSON

WILSHIRE ELECTRONICS/PHILADELPHIA, 855 Industrial Hwy. - Unit 5, 08077, (609) 786-8990, Br. Mgr.: W. A. Berringer, Jr.

CLARK

TI SUPPLY CO., 301 Central Ave., 07066, (201) 382-6400, Branch Mgr.: A. Mulrain

CLIFTON

EASTERN RADIO CORP., (201) 471-6600
PARTS MASTERS, 411 Main Ave., (201) 777-7706
WILSHIRE ELECTRONICS/NEW JERSEY, 312 Clifton Ave., 07015, (201) 365-2600, TWX: 710-989-7052, Mktg. Mgr.: R. E. Peterson

COLONIA

PAMCO ELECTRONICS, INC., 1333 St. George Ave., 07069, (201) 574-9366

EAST BRUNSWICK

GEM ELECTRONICS, Route 18, 08816, (201) 254-9569, Branch Mgr.: P. La Grace
LAFAYETTE RADIO ELECTRONICS CORP., Grand Plaza Shopping Center, 595-A U.S. Hwy. 18, 08816

EAST RUTHERFORD

KAPPE ELECTRICAL DIST. INC., 349 State Hwy. 17, 07073, (201) 939-5751, TWX: 710-989-0102, Mktg. Mgr.: T. Zimmerman

EDISON

WILLIAM ELECTRONICS SUPPLY, 1863 Woodbridge Ave., 08817, (201) 985-3700, Sis. Mgr.: L. Axelrod

ELIZABETH

THOR ELECTRONICS CORP., 741 Livingston St., 07207, (201) 354-2420, Gen. Sis. Mgr.: A. Crudele
UNITY ELECTRONICS, 107 Trumbull St., 07206, (201) 351-4200, TWX: 710-741-5888, Inside Sis. Contact: D. D'Ercole

ENGLEWOOD CLIFFS

CARTERET SALES ASSOC. CORP., 601 Palisade Ave., 07632, (201) 567-7532, Inside Sis. Contact: B. Albelli

FAIRFIELD

DELBURN ELECTRONICS, INC., 1275 Bloomfield Ave., 07005, (201) 227-6200, Gen. Sis. Mgr.: T. Cutler
DIVERSIFIED CONTROLS CORP., 345 Kaplan Dr., 07006, (201) 227-4252, Inside Sis. Contact: R. Rizzo
HARVEY ELECTRONICS, 387 Passaic Ave., 07006, (201) 227-1262, Branch Mgr.: R. Knowlton
INDUSTRIAL ELECTRONICS, Box 863, 1275 Bloomfield, 07006, Inside Sis. Contact: M. Umansky

FAIRLAWN

RELAY SPECIALTIES INC., 13-00 Plaza Rd., 07410, (201) 797-3313, Sis. Mgr.: S. Gershberg

GREEN BROOK

GREEN BROOK ELECTRONICS, INC., 269 U.S. Rte. 22, 08812, (201) 968-3500, Inside Sis. Contact: W. B. Costello

HACKENSACK

NASSOR, 500 Hudson St., 07602, (201) 342-3737, Sis. Mgr.: N. Gorab
TIDE ELECTRONICS INC., 97 South State St., 07601, (201) 488-3900, Inside Sales Contact: D. Rosenblum

HADDONFIELD

KEEFE ELECTRICAL SALES CO., 13-15 S. Hadden Ave., 08033, (609) 429-4650, TWX: 215-527-3454, Inside Sis. Contact: J. Keefe

MID-ATLANTIC ELECTRONICS CORP., 140 Haddon Ave., 08033, (609) 428-8288

SUNDAY & O'BRIEN, 15 POTTER ST., 08033, (609) 429-4013

HANOVER

STATE ELECTRONIC PARTS CORP., 36 Rt. 10, 07936, (201) 887-2550

HARRINGTON PARK

METRO TECH, 39 Bluefield Ave., (201) 768-8495

HASBROUCK HEIGHTS

GRAM ELECTRONICS, INC., 168 Franklin Ave., 07084, (201) 288-4777, Mktg. Mgr.: R. A. Cone

ISELIN

BROTHERS ELECTRONICS, INC., 515 Lincoln Hwy., 08030, (201) 283-3000, Mktg. Mgr.: T. Kenny

KENILWORTH

NEWARK ELECTRONICS, 303 Monroe Ave., 07033, (201) 272-8410

KEYPORT

INTERSTATE ELECTRONICS, INC., Riverdale Dr., 07735, (201) 264-3900

LINDEN

KEYTRON ELECTRONICS, 1306 E. Elizabeth Ave., 07036, (201) 925-5200, TWX: 710-996-5920, Inside Sis. Contact: H. Eckstein

LITTLE FALLS

IPC, Box 204, (201) 785-1830

LIVINGSTON

NORELMCO ELECTRONICS, INC., 48 Springbrook Rd., 07039, (201) 992-2711, Branch Mgr.: H. Thaw
THAW SALES CO., H., 46 Springbrook Rd., 07039, (201) 992-2716, Branch Mgr.: M. Thaw

MIDLAND PARK

METRIC RESOURCE CORP., 214 Franklin Ave., 07423, (201) 444-0662

MONTCLAIR

COMPONENT MARKETERS, INC., 151 Valley Rd., 07042, (201) 746-6717, Pres.: J. Fields

MOONACHIE

CRAMER ELECTRONICS, 1 Barrett Ave., (201) 935-5600, Div. Mgr.: J. Florio

MORRISTOWN

ELECTRONIC SERVICE, 17 Mt. Kemble Ave., 07960, (201) 539-2252, Sis. Mgr.: R. A. Bendel

MOORESTOWN

ARROW-ANGUS, INC., Pleasant Valley Rd., 08057, (609) 235-1900, TWX: 710-897-0829
RENTAL SERVICE SUPPLY, Rte. 73, 08057, (609) 235-6100
SALEM SCIENTIFIC, Box 354, (609) 235-4565

MORRIS PLAINES

SENSORY INC., 1 Kennedy Rd., 07950, (201) 538-7661, Inside Sis. Contact: R. Petrakian

MT. EPHRAIM

ALMO ELECTRONICS CORP., 301 N. Black Horse Pike, 08854, (609) 933-3800, Branch Mgr.: A. Capetto

MOUNT LAUREL

HAMILTON/AVNET — MT. LAUREL, 113 Gaither Dr. East Gate Ind. Pk., 08057, (609) 234-2133, Branch Mgr.: D. Stacy
KIERULFF ELECTRONICS, INC., 109 Gaither Dr., 08057, (609) 234-2353, TWX: 710-897-1466, Mgr.: D. Weissenberg

NEWARK

LIPPMAN & CO., A., 99-107 Newark St., 07103, (201) 621-9300, Inside Sis. Contact: A. Lippman

NEW BRUNSWICK

BAY ELECTRONIC DISTRIBUTING CO., 226 Talmadge St., 08902, (201) 247-8707, Inside Sis. Contact: B. Betterman

NUTLEY

ESSEX ELECTRONIC SUPPLY, INC., 19 Baltimore St., 07110, (201) 661-2600

PALISADES PARK

TECH-REP ENGINEERING, 116 John St., Rm. 1102, (212) 349-5943

PARAMUS

GEM ELECTRONICS, 385 Route 17, 07652, (201) 261-9751, Branch Mgr.: P. Fine

PARSIIPPANY

DEANCO INC., 146A Parsippany Rd., 07054, (201) 388-1300, TWX: 710-986-8221, Branch Mgr.: D. J. Rehili
TONAR ELECTRONICS, 1220 U.S. Hwy. 46, (201) 335-9400

PENNSAUKEN

ASI RESCO ELECTRONICS, Airport Ind. Pk., 08110, (609) 662-4000

RADIO ELECTRIC SERVICE CO., Airport & Central Hwys., Airport Ind. Pk., 08110, (609) 662-4000, Inside Sis. Contact: M. Grossman

PERTH AMBOY

STERLING ELECTRONICS, 774 Pfeiffer Blvd., 08861, (201) 442-8000, Branch Mgr.: J. Johnston

PLEASANTVILLE

ALMO ELECTRONICS CORP., Box 130, 08232, (609) 646-1300, Br. Mgr.: A. Greenberg

RAHWAY

QUAD PARTS DISTRIBUTOR, INC., 1561 Main St., 07065, (201) 381-5400, Inside Sis. Contact: M. J. Lanning
TERMINAL ELECTRONICS, 1421 Pinewood St., 07065, (201) 381-5700, TWX: 710-996-5879, Inside Sis. Contact: A. Baker
VALLEY ELECTRONICS SUPPLY, (201) 381-5404

RARITAN

MASTERS ELECTRONIC SUPPLY CO., 17 Colfax St., 08869, (201) 725-3533, Sis. Mgr.: J. V. Masters

RED BANK

MONMOUTH RADIO SUPPLY CO., 404 Shrewsbury Ave., 07701, (201) 741-3300, Mktg. Mgr.: C. T. Carhart
MOTOREPS, INC., 157 Broad St., 07701, (201) 741-3356, Sis. Mgr.: B. B. Sachs

ROCKAWAY

ELECTROSPEC, 11 Bank St., (201) 625-2300

ROSELLE

GARDEN STATE INDUSTRIAL ELECTRONICS, 407 Hope Ave., 07203, (201) 241-9000, Ind. Sis. Mgr.: H. Fischer

RUTHERFORD

KAPPE ELECTRICAL DISTRIBUTORS, INC., 349 Route 17, 07073, (201) 939-5751
KIERULFF ELECTRONICS, INC., 5 Industrial Dr., 07070, (201) 935-2120, TWX: 710-989-0225, Mgr.: J. DeVos

SADDLEBROOK

ARROW ELECTRONICS, INC., 285 Midland Ave., 07662, (201) 797-5800, TWX: 710-988-2206

SOMERSET

SCHWEBER ELECTRONICS, 43 Belmont Dr., 08773, (201) 469-6008, TWX: 710-480-4733, Mgr.: R. Lockner

SOUTH HACKENSACK

ESSEX INTERNATIONAL, INC., Empire Indus. Pk., Box 2364, 07074, (201) 641-4407

SOUTH PLAINFIELD

BROWNELL ELECTRO, INC., 500 Hadley Rd., 07080, (201) 753-4600, Branch Mgr.: J. Nazzaro

SPRINGFIELD

FEDERATED PURCHASER, 155 U.S. Route 22, 07081, (201) 376-8900, Mktg. Mgr.: H. Fallon, Inside Sis. Mgr.: J. MacDonald

GEM ELECTRONICS, Route 22, 07081, (201) 379-9730, Branch Mgr.: P. Yannone

RJM SALES, Box 82, (201) 467-1210

ROUTE ELECTRONICS, INC., 40 U.S. Route 22, 07081, (201) 379-7710, Inside Sis. Contact: D. Vietro

TEANECK

COMPONENT MARKETERS, INC., 571 Sunderland Rd., 07666, (201) 836-9595, Branch Mgr.: R. Slmon

TOTOWA

ARROW ELECTRONICS, 225 Rte. 46 West, 07505, (201) 256-7331

GEM ELECTRONICS, Route 46, 07512, (201) 256-9894, Branch Mgr.: S. Magath

TRENTON

ALEEN & HURLEY CO., 23 S. Warren St., 08608, (609) 393-3300

UNION

NIDISCO, INC., 2401 Vauxhall Rd., 07083, (201) 964-7070, Inside Sis. Contact: L. M. Braun
PRINCETON CASE CO., INC., 667 Lehigh Ave., 07083, (201) 687-1750, Mktg. Mgr.: S. Parker

UNION CITY

NIDISCO, INC., 2812 Kennedy Blvd., 07418, (201) 863-2111, Ind. Sis. Mgr.: J. Milhaui

VINELAND

ALMO ELECTRONICS CORP., 219 Landis Ave., 08360, (609) 691-6965, Branch Mgr.: J. Tomensky

WAYNE

GORDON/HORNE, 2282 Hamburg Tpke., (201) 835-7400

WEST CALDWELL

DIVERSIFIED CONTROLS CORP., 1275 Bloomfield Ave., 07006, (201) 227-3079, Branch Mgr.: T. Cutler

NEW MEXICO**ALBUQUERQUE**

BARNHILL FIVE INC., 1410-D Wyoming, N.E., 87112, (505) 299-7658

BARR RADIO CO., 5314 Coal, S.E., 87108, (505) 255-2054, Inside Sis. Contact: P. Barr

CENTURY ELECTRONICS, 129 Vermont St., N.E., (505) 292-2700

CRAMER/NEW MEXICO, 137 Vermont St., N.E., (505) 265-5767, TWX: 910-989-1679, Div. Mgr.: W. Worthington

ELECTRONIC PARTS CO., 2620 Rhode Island St., N.E., 87110, (505) 293-6161, Inside Sis. Contact: D. E. Wagner

ELMAR/ALBUQUERQUE, 2632 Pennsylvania Ave., 87110, (505) 292-1111, Branch Mgr.: M. McCormick

HAMILTON/AVNET, 2450 Baylor Dr., S.E., 87119, (505) 765-1500, TWX: 910-989-1631, Inside Sis. Contact: E. Farrell

INDUSTRIAL ELECTRONICS, 310 Vale Verde, S.E., (505) 266-8721

KIERULFF ELECTRONICS, 2524 Baylor Drive, S.E., 87119, (505) 247-1055, TWX: 910-989-1693, Mgr.: M. Hagerty

NEWARK ELECTRONICS, (505) 296-9495

R. V. Weatherford Co., 2425 Alamo, S.E., 87106, (505) 842-0868, TWX: 910-989-1673, Branch Mgr.: C. Tanner

STERLING ELECTRONICS, 3530 Pan American Fwy., 87107, (505) 345-6601

WACO ELECTRONICS, 420 Washington St., S.E., 87108, (505) 268-2409, TWX: 910-989-0622, Branch Mgr.: F. Walker

WALKER RADIO CO., Box 25921, 87103, (505) 247-2288

CLOVIS

ELECTRONIC PARTS CO., 1600 Mitchell St., 88101, (505) 762-3181, Sis. Mgr.: R. W. Wilson

HOBBBS

TRICE WHOLESALE ELECTRONICS CO., 201 W. Dunham, 88240, (505) 393-5107, Contact: S. Todd

LOS CRUCES

MANNIE'S ELECTRONIC & PHOTOGRAPHIC SERVICE, 802 So. Solano Dr., 88001, Inside Sis. Contact: M. Blumkin

ROSWELL

R & R ELECTRONIC SUPPLY CO., 605 E. 2nd, 88201, (505) 622-0670, Branch Mgr.: J. Burt

NEW YORK**ALBANY**

SEIDEN SOUND, 79 Central Ave., 12202, (518) 462-9501
Sis. Mgr.: H. Weintraub, Sis. Mgr.: L. Teplin
TAYLOR, E. E. CO., 465 Central Ave., 12206, (518) 489-5600, Gen. Sis. Mgr.: G. F. Yelle

AMSTERDAM

ADIRONDACK RADIO SUPPLY, 185 W. Main St., 12010, (518) 842-8350, Inside Sis. Contact: W. J. Hinkle

ASTORIA

JACK, S. L., ELECTRONICS, 28-14 Steinway St., 11103, (212) LH 5-8888, Gen. Sis. Mgr.: J. Altman

BATAVIA

RADIO EQUIPMENT CORP., 5 Center St., 14020, (716) FI 3-1626, Branch Mgr.: G. Gluck

BAY SHORE

GEM ELECTRONICS, 261 Sunrise Hwy., 11706, (516) MO 5-9605, Branch Mgr.: J. Zeitler

WORLDWIDE ELECTRONICS, INC., 12 Wisconsin Ct., 11706, (516) 231-9222, Pres.: S. Perlmutter

BELLMORE

HY GRADE ELECTRONICS CORP., 2121 Bellmore Ave., 11710, (516) 785-6200, Mktg. Mgr.: D. Siegel

PEERLESS

Peerless Radio: America's CONCENTRATED

DISTRIBUTOR. 1) Peerless concentrates

its time and training on many exclusive

client services, beyond on-time deliveries at the best prices 2) Peerless concentrates

its Inventory Centers on a limited number of product categories 3) America's

hi-quality manufacturers concentrate their products at Peerless. PEERLESS

RADIO CORPORATION, 19 Wilbur St., Lynbrook, L.I., N.Y. 11563 and

1040 N.E. 43rd Ct., Ft. Lauderdale, Fla. 33308. PEERLESS RADIO: your

CONCENTRATED SOURCE.



When you need
quality components like
CORNING
get the works from
CRAMER

cramer
CRAMER ELECTRONICS INC.

Our most important component is service.

ELECTRONIC WIRE & CABLE IN STOCK

MILITARY & U.L. SPECS.

Authorized Distributor of
**BELDEN &
ITT SURPRENANT**

Large Inventory - PVC & Teflon

VERTEX
ELECTRONICS, INC.
(516) 293-9880

INTERNATIONAL DIVISION
TELEX: 14-3155
CABLE: VERTEX FDLE
150 Schmitt Blvd.
Farmingdale, N.Y. 11735

BINGHAMTON

FEDERAL ELECTRONICS, Box 1208, 13902, (607) 748-8211, TWX: 510-252-0893
FLORENCE ELECTRIC SUPPLY, INC., 15 S. Washington St., Box 1090, 13902, (607) 724-2455
HARVEY ELECTRONICS, Box 1208, 13902, (607) 748-8211, Branch Mgr.: R. Chapman
MORRIS ELECTRONICS, 305 Court St., 13904, (607) 723-9445, Branch Mgr.: J. Heven
STACK IND. ELEC. 10 SUSQUEHANNA, 45 Wash St., 13901, (607) 723-6326
WEHLE ELECTRIC CO., 25 Washington St., 13102, (607) 722-2394, Branch Mgr.: R. Boughton

BOHEMIA

CAR-LAC ELECT. INDUS. SALES, 75 Orville Dr., 11716, (516) 567-4200, Inside Sls. Contact: J. V. Caridi

BRONX

BAY ELECTRONIC DISTRIBUTORS, INC., 18 West Kings-Bridge Rd., 10463, Inside Sls. Contact: H. Weintraub
BRONX WHOLESALE RADIO, 540 East Fordham Rd., 10458, (212) 364-4662, Inside Sls. Contact: E. Jezek
RMS ELECTRONICS, 50 Antin Pl., 10462, (212) 892-6700, Mktg. Mgr.: A. Goldstein
WILCO RADIO DISTRIBUTORS, 383 E. 138th St., 10454, (212) 669-1654, Inside Sls. Contact: P. Wilk

BROOKLYN

BROOKLYN ELECTRONICS, INC., (212) 748-1300
BROOK-WAY INDUSTRIAL ELECTRONICS, 1807 Flatbush Ave., 11210, (212) 338-7191, Inside Sls. Contact: L. Klein
BURKIN, G. W., ELEC. IND. INC., 1075 Ralph Ave., 11236, (212) 451-1220, Inside Sls. Contact: H. Martin
CECO COMMUNICATIONS, INC., 2115 Ave. X, 11235, (212) 646-6300, Gen. Sls. Mgr.: F. Huttner
ELECTRONICS WAREHOUSE CORP., 1910 Coney Island Ave., 11230, (212) 375-2700, Inside Sls. Contact: A. H. Cohen
GEM ELECTRONICS, 59 Willoughby St., 11201, (212) 624-9336, Branch Mgr.: W. Howell
GEM ELECTRONICS, 485 Coney Island Ave., 11218, (212) 284-9349, Branch Mgr.: G. Selafani
GEM ELECTRONICS, 4th Ave. & 64th St., 11220, (212) 439-9862, Branch Mgr.: R. Cavello
LACO INDUSTRIAL ELECTRONICS, 4924 4th Ave., 11220, (212) 492-9590, Ind. Sls. Mgr.: L. Teplin
MILL ELECTRONIC SUPPLY CO., 2480 65th St., 11204, (212) 336-4575, Inside Sls. Contact: O. D. Wolff
NORCON ELECTRONICS, 1260 Ralph Ave., 11236, (212) 451-1112
SACO ELECTRONIC DISTRIBUTORS, INC., 641 Vanderbilt Ave., 11238, Inside Sls. Contacts: A. Fox, S. Spinner
SMITH, INC., HERMAN H., 812 Snediker Ave., 11207, (212) 272-9400
WITMAL ELECTRONICS CORP., 157 Manhattan Ave., 11206, (212) 388-0945, Ind. Sls. Mgr.: C. G. Balich

BUFFALO

BUFFALO ELECTRIC CO., (716) 854-4420
DYMACK, INC., 2329 Main St., 14214, (716) 833-2300, Inside Sls. Contact: R. Dybowski
GENESE RADIO & PARTS CO., 2550 Delaware Ave., 14216, (716) 873-9661, Inside Sls. Contact: A. Pufpaff
GOLDCREST SUPPLY OF BUFFALO, INC. 1662 Main St., 14209, (716) 885-4900, Branch Mgr.: G. Tranquillo
GOLDCREST ELECT. SUPPLY OF ERIE INC., 1905 Clinton St., 14206, (716) 826-3434, Branch Mgr.: A. Schweitzer
OSMANN COMPONENT SALES CORP., 395 Cleveland Dr., 14215, (716) 832-4271, TWX: 710-522-1833, Branch Mgr.: J. O'Donnell
RADIO EQUIPMENT CORP., 196 Vulcan St., 14207, (716) 874-2690, Inside Sls. Contact: M. Muskopf
SEELBACH & SCHMITT, 13 Lincoln Rd., (716) 839-2300
STANDARD ELECTRONICS, 3519 Union Rd., 14225, (716) 685-4220
STONE CO., R. L., 1807 Elmwood Ave., (716) 873-1873
SUMMIT DIST., INC., 916 Main St., 14202, (716) 884-3450, TWX: 710-522-1692, Sls. Mgr.: G. Seidman
TROTTE ELECTRONICS INC., 932 Hertel Ave., 14216, (716) 876-0880, TWX: 710-522-1946, Inside Sls. Contact: D. Rider, L. Rosenthal
WEHLE ELECTRIC CO., 475 Ellicott St., 14203, (716) 854-3270, Inside Sls. Contact: A. Dacheuer

CHEEKTOWAGA

STANDARD ELECTRONICS INC., 3519 Union Rd., 14225, (716) 685-4545

COMMACK

CONCO ELECTRONICS, INC., 61 Mall Dr., 11791, (516) 543-8300, TWX: 510-226-3734, Inside Sls. Contact: W. Bachman
CONNECTING COMPONENTS, 61 Mall Dr., 11725, (516) 543-8300

CONGRERS

SAXTON PRODUCTS, INC., 215 N. Rte. 303, 10920, (914) 268-6846, Inside Sls. Contact: R. Hishman

CORNING

CHEMUNG ELECTRONICS INC., 28 W. Market St., 14830, (607) 962-4606, Branch Mgr.: S. Leveen
CORNING ELECTRONICS INC., 81-83 W. William St., 14830, (607) 962-0555, Inside Sls. Contact: O. E. Hunt

EAST FARMINGDALE

HARRISON ELECTRONICS CORP., 20 Smith St., 11735, (516) 293-7979, Inside Sls. Contact: B. Harrison

EAST MEADOW

GEM ELECTRONICS, 1926 Hempstead Tpke., 11554, (516) 481-4306, Branch Mgr.: R. Thorner

EAST SYRACUSE

CRAMER/SYRACUSE, 6716 Joy Rd., 13057, (315) 437-6671
DIEHL SYRACUSE INC., 4413 James St., 13206, (315) 437-2826, Sls. Contact: W. Diehl
HAMILTON/AVNET - SYRACUSE, 6500 Joy Rd., 13057, (315) 437-2641, Branch Mgr.: D. McGrath

ELMIRA

BRADY SUPPLY CORP., 649 Madison Ave., 14901, (607) 733-5531, Inside Sls. Contact: S. J. Semei
CHEMUNG ELECTRONICS INC., 601 E. Church St., 14901, (607) 733-5531, Inside Sls. Contact: S. J. Semei

MASLINE ELECTRONICS OF ELMIRA, 318 W. Water St., 14901, (607) 733-5676, Branch Mgr.: A. Carlson
WEHLE ELECTRIC CO., 900 E. Church St., 14901, (607) 734-5105, Branch Mgr.: M. Mood

ELMONT

EGERT, S. S., CO., 146 Meacham Ave., 11003, (516) 488-2255, TWX: 510-223-0417, Inside Sls. Contact: L. Kravetz
SCHMITT CO., F. E., 311 Meacham Ave., (516) 437-8150

ELMSFORD

ANCAR ELECTRONICS SUPPLY, INC., One Nepperhan Ave., 10523, Inside Sls. Contact: C. Mann
MELVILLE RADIO CORP., 1 Nepperhan Ave., 10523, (914) LY 2-7100, Inside Sls. Contact: C. Mann
ZEUS COMPONENTS, INC., 175 Clearbrook Rd., 10523, (914) LY 2-4120, TWX: 710-567-1248, Inside Sls. Contact: R. Berwick/T. Benedetto

ENDWELL

CRAMER/BINGHAMTON, 3220 Watson Blvd., 13760, (607) 754-6661, Div. Mgr.: R. Braun

FAIRPORT

FRANKLIN SALES CORP., W. A., 1 Little Briggins Circle, 14450, (716) 223-5102, Branch Mgr.: F. E. Hall

FARMINGDALE

ARROW ELECTRONICS INC., 900 Broad Hollow, Rt. 110, 11735, (516) 694-6800, TWX: 510-224-6494
BART ELECTRONICS, INC., 195 Q Central Ave., 11735, (516) 293-3144, Inside Sls. Contact: D. Bender
BROADLINE ELECTRONICS, 119 Marine St., 11735, (516) 420-8320, Inside Sls. Contact: E. Tammaro
COMMAND ELECTRONICS, 114 Allen Blvd., 11735, (516) 293-1212
DRW ELECTRONICS CORP., 100 Milbar Blvd., 11735, (516) 249-2660, TWX: 510-224-6440, Sales Mgr.: A. S. Britte
GEM ELECTRONIC DIST. INC., 34 Hempstead Tpke., 11735, (516) 249-6996, Inside Sls. Contact: M. Fine
HALLMARK, N. Y., 167 Marine St., 11735, (516) 293-7500, TWX: 510-224-6402, J. Dunnam
HARRISON RADIO CORP., 20 Smith St., 11735, (516) 293-7990, TWX: 510-224-6403, V.P. Sls.: B. Schreiner
IRIS ELECTRONICS CO., 91 Milbar Blvd., 11735, (516) 420-8400, Inside Sls. Contact: M. Fuchs
JEROMI INDUSTRIES, INC., 63 Heisser Ct., 11735, (516) 420-0987, Mktg. Mgr.: B. A. Dunlop
MARSHALL INDUSTRIES, 230 Sherwood Ave., 11735, (516) 293-4141, Branch Mgr.: T. French
METRIC RESOURCES CORP., 48 Commerce Dr., 11735, (516) 293-5881
NORLON ELECTRONICS INC., 200 Allen Blvd., 11735, (516) 249-7262, TWX: 510-224-6519, Inside Sls. Contact: A. Baldwin
PRIDE ELECTRONICS, (516) 293-4020
VERTEX ELECTRONICS, INC., 150 Schmitt Blvd., 11735, (516) 239-9880
WILSHIRE ELECTRONICS, 1855 New Highway (Unit B), 11735, (516) 293-5775, Branch Mgr.: G. Gallagher

FISHKILL

T. I. SUPPLY, (914) 896-9630

FLORAL PARK

EMERSON ELECTRONICS, 6 Tulp Ave., 10011, (516) 354-4990, Inside Sls. Contact: G. Sarell

FLUSHING

GRACOM INDUSTRIES, INC., 44-29 Kissena Blvd., 11355, (212) 463-1130, Mktg./Adv. Mgr.: R. H. Gray
MANNFRED ELECTRONICS CORP., 6010 Kissena Blvd., 11355, Inside Sls. Contact: F. Friedman
STUART ELECTRONICS DISTRIBUTORS, INC., 79-12 Parsons Blvd., 11366, (212) 591-9700, Inside Sls. Contact: S. Trinkoff

FREESTONE

GEM ELECTRONICS, 101-10 Queens Blvd., 11375, (212) IL 9-9852, Branch Mgr.: I. Friedman
NASCO, 99-08 Metropolitan Ave., 11376, (212) 793-6500, TWX: 710-682-2504

FREDONIA

LAFAYETTE STORE, 15 E. Main, 14063, (716) 672-2418, Branch Mgr.: R. Lindstrom
WARREN RADIO INC. (LAFAYETTE) 15 E. Main St., 14063, (716) 672-2418, Branch Mgr.: R. Lindstrom

FREEPORT

MILGRAY ELECTRONICS, INC., 191 Hanse Ave., 11520, (516) 546-6000, Inside Sls. Contact: H. S. Davidson
MIL SPEC WIRE & CABLE CORP., (516) 546-5454

GLENS FALLS

RAY SUPPLY, INC., Box 745, Upper Glen St., 12801, (518) 792-5848, Inside Sls. Contact: F. Ross

HAUPPAUGE

CRAMER SYSTEMS, 29 Oser Ave., 11787, (516) 231-5600
JACO ELECTRONICS INC., Engineers Rd., 11787, (516) 273-1111, TWX: 510-227-6232, Branch Mgr.: M. Gentile
RAMPART COMPONENTS, 195 Engineers Rd., 11787, (516) 273-1111, TWX: 510-227-6232, Branch Mgr.: M. Gentile
SEMICONDUCTOR CONCEPTS, Engineers Rd., 11787, (516) 273-1234, Branch Mgr.: H. Myers
TIME ELECTRONIC SALES, 70 Marcus Blvd., 11787, (516) 273-0100, Inside Sls. Contact: R. Friedman

HEMPSTEAD

DAVIS ELECTRONICS, 204 West Main St., 11550, (516) 483-9200, Inside Sls. Contact: L. Losito
ELECTRONIC EQUIPMENT CO., 741 Peninsula Blvd., 11550, (516) 538-5510
KAGHAN SALES CORP., 556 Peninsula Blvd., 11550, (516) 538-2300, Contact: J. Kagan

HERKIMER

HERKIMER ELECTRONICS, INC., 108 N. Prospect St., 13350, (315) 866-1701, Inside Sls. Contact: L. Bernstein

HICKSVILLE

KIERULFF AIRLINE SUPPLY, 12 Midland Ave., 11802, (516) 822-4850, TWX: 510-221-1815, Mgr.: J. Fogarty
KIERULFF ELECTRONICS, INC., 49 Bethpage Rd., 11802, (516) 433-5530, TWX: 510-221-1815, Group Mgr./N.E., J. Jangro

HORNELL

HORNELL ELECTRONICS, 286-288 Main St., 14843, (607) 324-2451, Mktg./Adv. Mgr.: N. L. Annis

HUNTINGTON

GEM ELECTRONICS, Jericho Tpke., 11743, (516) HA 3-8972, Branch Mgr.: R. Norton

HUNTINGTON STATION

BOMARK ELECTRONICS, 315 Walt Whitman Rd., 11746, (516) 423-2000, Inside Sis. Contact: M. Melsner
TI SUPPLY CO., #2 Huntington Quadrangle-2N04, 11746, (516) 293-2660, Branch Mgr.: B. Smith

ITHACA

DEANCO INC., 714 W. Clinton St., 14850, (607) 272-2198, TWX: 510-255-5876, Inside Sis. Contact: B. Cleveland

JAMAICA

JAMAICA BEARINGS, 138-72 Queens Blvd., (212) 526-1350
ORMAN RADIO DIST. INC., 94-29 Merrick Blvd., 11433, (212) 739-4651, Inside Sis. Contact: D. Gans

JAMESTOWN

WARREN RADIO, INC., 2208 Washington St., 14701, (716) 848-1141, Br. Mgr.: M. Stoeltzing

JERICHO

METRO TECH, 333 N. Broadway, (516) 935-3330

JOHNSON CITY

GOLDCREST ELECT. SUPPLY INC. - J. C. Div., 117 Oakdale Rd., 13790, (607) 797-2389, Branch Mgr.: P. Stone
WILSHIRE ELECTRONICS/N.Y. STATE, 617 Main St., 13790, (607) 797-1236, Br. Mgr.: J. R. Rogan

KINGSTON

EDISON ELECTRONICS, Ulster Shopping Center, 12401, (914) 331-1650, Branch Mgr.: Hy Arlinsky
GREYLOCK ELECTRONIC DISTRIBUTORS, Div. of Entronics Ind., Inc., 763 Albany Ave. Extension, 12401, Inside Sis. Contact: D. Parkhurst
OSSMANN COMPONENT SALES CORP., 411 Washington Ave., 12401, (914) 338-5505, TWX: 510-247-1941, Branch Mgr.: J. Price

LONG ISLAND CITY

DALIS, H. L., INC., 35-35 24th St., 11106, (212) 361-1100

LYNBROOK

PEERLESS RADIO CORP., 19 Wilbur St., 11563, (516) 593-2121, TWX: 510-225-8422, Sis. Mgr.: T. Griffin

MALONE

RAY SUPPLY, INC., 55 W. Main St., 12953, (518) 483-3241

MELVILLE

PRIME ELECTRONICS, 275 Broadhollow Rd., (516) 420-1600
SUPPLIES FOR SOLDERING, INC. (SSI), 535 Broadhollow Rd., 11746, Inside Sis. Contact: K. Reed, Pres.

MOONACHIE

CRAMEN/NEW JERSEY, 1 Barrett Ave., (201) 935-5600

MT. VERNON

QAR INDUSTRIAL ELECT. SALES, INC., 621 So. Columbus Ave., 10550, (914) 699-2224, Inside Sis. Contact: G. Ortiz

NEWBURGH

CHIEF ELECTRONICS INC., 248 Washington St., 12550, (914) 561-7200, Branch Mgr.: E. Monahan

NEW HYDE PARK

LAFAYETTE, 1327 Second Ave., 11040, (516) 488-6600
MOTORS & ARMATURES, INC., 11040, (516) 437-9100

NEW PALTZ

EDISON ELECTRONICS, 232 Main St., 12561, (914) 255-0010, Branch Mgr.: H. Bregstein

NEW ROCHELLE

GEM ELECTRONICS, 482 Main St., 10801, (914) 632-0040, Branch Mgr.: S. Rubin

NEW YORK

ATLAS ELECTRONICS CORP., 1570 Third Ave., 10028, (212) 427-4040, Gen. Sis. Mgr.: E. S. Haas
BARRY ELECTRONICS CORP., 512 Broadway, 10012, (212) 925-7000, Ind. Sis. Mgr.: B. N. Gensler
BLAN ELECTRONICS CORP., 56 Warren St., 10007, (212) 233-6288, Inside Sis. Contact: A. Blan
BROWNELL ELECTRO INC., 85 Tenth Ave., 10011, (212) 924-6000, TWX: 710-581-5445, Mgr.: L. Brown
CALVERT ELECTRONICS INT'L, 220 E. 23rd St., 10010, (212) 679-1340, TWX: 710-581-4088, Sis. Mgr.: S. Abbott
CITY ELECTRICAL DIST., 510 W. 34th St., 10001, (212) 564-5454

CRL ELECTRONICS, 200 Park Ave. S., 10003, (212) 777-5517
ELECTRONICS LEASING CORP., 16 E. 40th St., 10016, (212) 679-5400, Inside Sis. Contact: W. Blumberg
HARVEY RADIO CO., 23 W. 45th St., 10036, (212) 582-1500
HOFOR INDUSTRIAL SERVICES, 342 Madison Ave., (212) 682-3092

JSH ELECTRONICS EAST, INC., 380 Lafayette St., 10003, (212) 674-7979, Branch Mgr.: H. Taylor
KNICKERBOCKER ANNUNCIATOR CO., 75 Murray St., 10000, (212) 964-6258, Inside Sis. Contact: F. Arturi
LEVIT ELECTRONICS, C. M., 200 Park Ave. S., 10003, (212) 777-5517, Telex: 422509, Dir. Sis.: M. Levit
LIBERTY ELECTRONICS, INC., 548 Broadway, 10012, (212) 925-6000, Sis. Mgr.: S. Siedenbergl
MARTIN AUDIO/VIDEO CORP., 320 W. 46th St., 10036, (212) 541-5900, Inside Sis. Contact: N. Kassel
MIDWAY INDUSTRIAL ELECTRONICS, INC., 38 E. 29th St., 10016, (212) 889-0370, TWX: 710-581-4014, Inside Sis. Mgr.: F. Kriss
PACKARD ELECTRONIC CO., 33 Union Sq. West, 10003, (212) OR 4-4320, Inside Sis. Contact: J. Gorner
PASO SOUND PRODUCTS, INC., 251 Park Ave. S., 10010, (212) 254-2282, Inside Sis. Contact: P. Mastrangelo
ROBURN AGENCIES INC., 349 W. 14th St., 10014, (212) 989-5939, Gen. Sis. Mgr.: G. Sadlerman
TIDE ELECTRONICS INC., 47-27 36th St., 11101, (212) 392-7977, Branch Mgr.: J. Gary
WILSHIRE ELECTRONICS GROUP, 250 Park Ave., 10017, (212) 682-8707, V.P. & Gen. Mgr.: M. Bromer

NIAGARA FALLS

RADIO EQUIPMENT CORP., 1720 Pierce Ave., 14301, (716) BU 5-9366, Branch Mgr.: D. Martin

NORTHPORT

PSA-PRODUCTION SALES, ASSOC., 17 Coles Pl., 11768, (516) 757-0336, Inside Sis. Contact: B. Reed

NORTH SYRACUSE

ANDCO, Box 276, (315) 699-2671
ROUX, R., 120 Dormar Dr., 13212, (312) 458-3747, Branch Mgr.: R. Roux

OCEANSIDE

MAXANT RADIO T.V. DIST., 493 Griffin St., 11572, (516) 678-2727, Inside Sis. Contact: C. A. Maxant

OLEAN

RADIO EQUIPMENT CORP., 1615 W. State St., 14760, (716) 372-8560, Br. Mgr.: L. Freed

ONTARIO CENTER

KEHOE COMPONENT SALES, (315) 524-2491

PLAINVIEW

ACI ELECTRONICS CORP., 28 S. Mall, 11803, (516) 293-6630, TWX: 212-591-4045, Gen. Sis. Mgr.: J. Rosen
FAIRMONT ELECTRONIC SALES CORP., 35 So. Service Rd., 11803, (516) 694-8200, TWX: 510-224-6445, Inside Sis. Contact: M. Riccobond
NEWARK ELECTRONICS, 80 Express St., 11803, (516) 822-5000
PROGRESS ELECTRONICS CO., 205 Express St., 11803, (516) 433-1700, TWX: 510-221-1896

PLANDOME

SPELLMAN CO., FRED, 24 West Dr., 11030, (516) 627-3399, Mktg. Mgr.: F. Spellman, Sr.

PLATTSBURGH

RAY SUPPLY, INC., 13 Sailly Ave., 12901, (518) 561-3870, Branch Mgr.: R. Drake

PORT WASHINGTON

CONNECTOR CONCEPTS CORP., 735 Port Washington Blvd., 11050, (516) 883-3800, TWX: 510-223-0810, Inside Sis. Contact: B. L. Aaron

POUGHKEEPSIE

CHIEF ELECTRONICS INC., 14 No. Bridge St., 12601, (914) 471-1300, Mktg. Mgr.: F. Jackson
HIGGINS & SHEER ELECTRONICS, 123 Dutchess Tpke., 12603, (914) 471-3510, Inside Sis. Contact: K. Hedrich

RICHMOND HILL

ANCHOR ELECTRONICS, 116-01 101st St., 11418, (212) 846-2420

ROCHESTER

CRAMER/ROCHESTER, 3259 Winton Rd. S., 14623, (716) 275-0300, TWX: 510-253-4766
GOLDCREST ELECTRONICS CORP., 480 St. Paul St., 14605, (716) 546-8464, Inside Sis. Contact: L. Pittlick
HAMILTON/AVNET ELECTRONICS, 167 Clay Rd., 14623, (716) 442-7820, Inside Sis. Contact: G. O'Dea
K.M.V.G., 315 Mt. Read Blvd., (716) 328-2800
MASLINE ELECTRONICS INC., 511 S. Clinton Ave., 14620, (716) 546-5373, Inside Sis. Contact: G. Masline
MORRIS ELECTRONICS, 75-79 Stillson St., 14605, (716) 546-8147, Branch Mgr.: S. Levy
NEWARK ELECTRONICS 3000 S. Winton Rd., 14623, (716) 473-6600
OSSMANN COMPONENT SALES CORP., 280 Metro Pk., 14623, (716) 442-3290, TWX: 510-253-7685, Sis. Mgr.: M. R. Smart

ROCHESTER ELECTRONICS CORP., 950 Hudson Ave., 14621, (716) 342-9270, Inside Sis. Contact: A. Andzer
ROCHESTER RADIO SUPPLY CO., INC., Box 1971, 140 W. Main St., 14603, (716) 454-6300, TWX: 510-253-1631, Inside Sis. Contact: L. Brown

SCHWEBER ELECTRONICS, 999 Buffalo Rd., 14624, (716) 328-4180, Gen. Mgr.: M. Denson

SCHWEBER ELECTRONICS, 2 Townline Circle, 14623, (716) 461-4000

SIMCONA ELECTRONICS CORP., 275 Mt. Read Blvd., 14606, (716) 328-3230, TWX: 510-253-2139, Inside Sis. Contact: J. Scally

STONE CO., R. L., Box 9148, (716) 381-1155
SUMMIT ELECTRONICS OF ROCHESTER INC., 292 Commerce Dr., 14623, (716) 334-8110, Branch Mgr.: W. Earnst

WEHLE ELECTRIC CO., 306 Andrews St., 14604, (716) 232-6480, Branch Mgr.: J. Kelsey

ROCKVILLE CENTRE

A & M INSTRUMENTS, 5 Nassau St., 11571, (516) 678-6960
MIDWAY INDUSTRIAL ELECTRONICS, INC., 24 Maple Ave., 11571, (516) 764-2400, TWX: 510-225-3661, Inside Sis. Contact: F. Kriss

ROME

ROME ELECTRONICS INC., Erie Blvd. E, 13440, (315) 337-5400, Gen. Sis. Mgr.: R. Daviau

ROSEDALE

TEMERON ELECTRONICS, 138-69 Francis Lewis Blvd., 11422, (212) 978-5896, Mktg. Mgr.: S. Sussman

ROSLYN HEIGHTS

LIVERA-POLK ASSOC., 275 Warner Ave., 11577, (516) 484-1276

ST. JAMES

GEM ELECTRONICS, 731 Jericho Tpke., 11780, (516) AN 5-9753, Branch Mgr.: W. Kolsch

SCARSDALE

LOGICOMP ELECTRONICS INC., Box 37H, 52 Lafayette Rd., 10583, (914) 723-3334, Gen. Sis. Mgr.: G. Bassin

SCHENECTADY

ADIRONDAK ELECTRONICS, INC., 2469 Albany St., 12301, (518) 346-3900, Branch Mgr.: W. Richards
SCHENECTADY ELECTRONIC CORP., 1708 Altamont Ave., 12303, (518) 355-4840, Gen. Sis. Mgr.: F. A. Renna

SOUTH FARMINGDALE

DREXLER CO., CHESTER, 3 Lee Dr., 11735, (516) 249-8206



28 South Mall
Plainview, N.Y. 11803
(516) 293-6630
(212) 595-4045
800-645-4955

DICKSON

Diodes and Capacitors

RAYTHEON

ICs and Transistors

SOLID STATE SCIENTIFIC

CMOS

SHALLCROSS

RWR Resistors

PANDUIT

Cable Ties

STRUTHERS-DUNN

MIL Relays

NOW ... get all your ELECTRON
TUBES and SEMICONDUCTORS
from one source ...
and get them fast!

C. M. LEVIT ELECTRONICS
(212) 777-5517

America's top brands shipped to you
on the day your order is received.
Immediate attention -- overnight de-
livery. Big savings, too!

YOURS FREE

THE MOST COMPLETE ELECTRONIC TUBE
AND SEMICONDUCTOR CATALOGUES —
A VIRTUAL PURCHASING DIRECTORY OF
ACTIVE COMPONENTS



C. M. LEVIT ELECTRONICS
200 Park Avenue South
New York, N.Y. 10003
Phone: (212) 777-5517
Cable Address: "LECMEX"
NEW YORK
TELEX: 422509

STATEN ISLAND

B & D DISTRIBUTING CO., 639 Tompkins Ave., 10305, (212) 447-2660, Inside Sls. Contact: R. Mainati

SYOSSET

LAFAYETTE RADIO ELECTRONICS CORP., 111 Jericho Tpke., 11791, (516) 921-7700, Inside Sls. Contact: M. Brown
MILO ELECTRONICS CORP., 11791, (516) 364-1111
REVOX CORP., 155 Michael Dr., 11791, (516) 364-1900, Telex: 96-1396, Inside Sls. Contact: P. Giddings

SYRACUSE

CRAMER/EASTERN, INC., 6716 Joy Rd., 13057, (315) 437-6671

FRANKLIN SALES CORP., W. A., 731 James St., 13202, (315) 472-5273, TWX: 710-541-0453, Inside Sls. Contact: W. A. Franklin

GOLDCREST ELECT. SUPPLY, INC., 1920 Park St., 13208, (315) 471-7115, Branch Mgr.: G. Pollock

MORRIS ELECTRONICS, 1153 W. Fayette St., 13204, (315) 475-3191, Inside Sls. Contact: B. Austin

OSSMANN COMPONENT SALES CORP., 132 Pickard Bldg., 13212, (315) 454-4477, TWX: 710-541-1522, Branch Mgr.: J. Harm

SALINA ELECTRONICS INC., 2100 Park St., 13208, (315) 422-2336, Gen. Sls. Mgr.: C. R. Ricks

STONE CO., R. L., 2023 Milton Ave., (315) 468-2700

WEHLE ELECTRIC CO., 200 Boss Rd., 13211, (315) 437-3135, Branch Mgr.: M. Evra

TROY

Q & Q ELECTRONIC SUPPLY, INC., 670 River St., 12180, (518) 274-7323, Inside Sls. Contact: J. J. Quinlan

TROJAN ELECTRONIC SUPPLY CO., 15 Middleburg St., Box 1018, 12180, (518) 274-4481, Inside Sls. Contact: A. Page

TUCKAHOE

BI-TRONICS, INC., 76 Main St., 10707, (914) 961-4700

VALLEY STREAM

GEM ELECTRONICS, 218 Sunrise Hwy., 11581, (516) VA 5-8078, Branch Mgr.: M. Bereson

VESTAL

HARVEY FEDERAL, E. Vestal Pkwy., (607) 748-8211

OSSMANN COMPONENT SALES CORP., 1911 Vestal Pkwy. E., 13850, (607) 785-9949, TWX: 510-252-1987, Branch Mgr.: K. Watson

WAPPINGERS FALLS

EDISON ELECTRONICS, Rt. 9 & Mesier Ave., 12590, (914) 297-4044, Branch Mgr.: W. Shellnut

WEST BABYLON

DELMAR ELECTRONICS, 101 Eads St., (516) 420-1234

WESTBURY

HAMILTON/AVNET - LONG ISLAND 70 State St., 11590, (516) 333-5800, Inside Sls. Contact: M. Montella

SCHWEBER ELECTRONICS, Jericho Tpke., 11590, (516) 334-7474, TWX: 510-222-3660, Sls. Mgr.: P. Giovino

WHITE PLAINS

WESTCHESTER ELECTRONICS INC., 602 Mamaroneck Ave., 10605, (914) 949-2400, Inside Sls. Contact: M. Kushner

WHITESBORO

FRANKLIN SALES CORP., W. A., 42 Glenridge Rd., 13492, (315) 736-5460, Branch Mgr.: H. J. Lessman

WILLIAMSVILLE

HIRSCH SALES CO., 219 California Dr., 14221, (716) 632-1189, Inside Sls. Contact: J. Turley

WOODBURY

DIPLOMAT ELECTRONICS, (516) 921-9373

HARVEY ELECTRONICS, 60 Crossways Park W., 11797, (516) 921-8700, TWX: 510-221-2184, Inside Sls. Contact: S. Levine

TENNANT ELECTRONICS, 1 Crossways Pk. W., (516) 364-9070

WOODSIDE

SWITCHES UNLIMITED, 49-11 43rd Ave., (212) 651-0945

YONKERS

LEGRI S RESISTOR CORP., 389-393 Riverdale Ave., 10705, (914) 969-6000, Sls. Mgr.: P. Bergamini

ROTEL OF AMERICA, INC., 2642 Central Pk. Ave., 10710, (914) 337-2676, Telex: 131-420, Sls. Mgr.: M. J. Kaplan

YONKERS ELECTRONIC SUPPLY, INC., 541 Nepperhan Ave., 10701, Inside Sls. Contacts: M. Ruban, A. Stangel

YORKVILLE

VALLEY ELECTRONIC LABS, Commercial Dr., 13495, (315) 736-3393, Inside Sls. Contact: R. Pare

NORTH CAROLINA

ASHEVILLE

BAKER ELECTRONICS, INC., 85 Tunnel Rd., 28805, (204) 254-4632, Inside Sls. Contact: W. F. Baker

FRECK RADIO & SUPPLY CO., 38-40 Biltmore Ave., 28803, (704) 254-9551, Sls. Mgr.: A. B. Tolley

FRECK RADIO & SUPPLY CO., 1074 Patton Ave., 28806, (704) 254-9559, Branch Mgr.: H. Howell

McKINNEY RADIO & T.V. CO., 366 Riverview Dr., 28806, (704) 254-9806, Inside Sls. Contact: J. McKinney

SOUTHEASTERN, 1065 Patton Ave., 28806, (704) 253-1446, Branch Mgr.: G. Holt

CHARLOTTE

BROWNELL ELECTRO, INC., 5141 Belhaven Blvd., 28216, (704) 394-4341, Branch Mgr.: M. Little

DIXIE RADIO SUPPLY CO., 2220 S. Tryon St., Box 10563, 28201, (704) 377-5413, Branch Mgr.: E. James

ESSEX INTERNATIONAL, INC., 1101 N. Hoskins Rd., Box 8643, 28208, (704) 392-5373

SALEM SALES ASSOC., Box 9323, (704) 375-3328

CONCORD

MacVICTOR ELECTRONIC SUPPLY, INC., 1094 Hwy. 29 N., 28025, (704) 786-4175, Inside Sls. Contact: W. Krimminger

DURHAM

VICKERS ELECTRONICS SUPPLY CO., (919) 688-6311

FAYETTEVILLE

EASTERN RADIO SUPPLY, INC., 952 Bragg Blvd., 28301, (919) 485-2161, Sls. Mgr.: R. O. Cathey

HUNTER BROTHERS, INC., 115 Winslow St., Box 70, 28302, (919) 483-0125, Inside Sls. Contact: J. C. Owen

SOUND SYSTEMS, INC., 111 McPherson Church Rd., 28303, (919) 868-1111, Mktg. Mgr.: J. P. Manos

SOUTHEASTERN, 325 Rowan St., 28301, (919) 483-0371, Branch Mgr.: C. Small

GASTONIA

DIXIE RADIO SUPPLY CO., 507 W. Airline Ave., Box 1536, 28053, (704) 864-3281, Branch Mgr.: R. Williams

SHIFLET & DICKSON, INC., Box 815, 28052, (704) 867-7284, Inside Sls. Contact: W. L. Absher

GREENSBORO

ASSOCIATED AGENTS, Box 7220, (919) 292-6508

FRECK RADIO & SUPPLY CO., 1315 Headquarters Dr., 27407, (919) 378-9886, Branch Mgr.: W. Morrow

HAMMOND ELECTRONICS, 2923 Pacific Ave., 27406, (919) 275-6391, TWX: 510-925-1094, Branch Mgr.: R. Windsor

PIONEER CAROLINA, 2906 Baltic Ave., 27406, (919) 273-4441, Branch Mgr.: J. McGee

SOUND SYSTEMS, INC., 1016 W. Lee St., 27403, (919) 273-5577, Branch Mgr.: T. Peirce

SOUTHEASTERN RADIO, 445 English St., 27420, (919) 273-8675, Branch Mgr.: G. Price

TECHNICO, INC., 6223 Tri Port Court, 27410, (919) 294-1065, Branch Mgr.: D. Matthews

GREENVILLE

PAIR ELECTRONICS, INC., Box 1405, 27834, Inside Sls. Contact: P. L. Pair

HICKORY

FRECK RADIO & SUPPLY CO., 2255 W. Highway 64-70, 28601, (704) 328-2646, Branch Mgr.: J. White

SOUTHEASTERN RADIO, 907 Seneond Ave., N.W., 28601, (704) 322-9493, Branch Mgr.: L. Shrensbrg

HIGH POINT

MacVICTOR ELECTRONIC SUPPLY, INC., 1506 S. Main St., 27262, (919) 883-7423, Branch Mgr.: F. B. Leonard

JACKSONVILLE

SOUTHEASTERN RADIO SUPPLY CO., 1009 Lejeune Blvd., 28540, (919) 347-3207, Branch Mgr.: W. Gooding

KANNAPOLIS

NICKERSON CO., Box BB, 28081, (704) 932-6772, Branch Mgr.: W. Humphrey

KINSTON

SOUTHEASTERN RADIO SUPPLY CO., 1005 E. Highland Ave., 28501, (919) 523-5113, Sls. Mgr.: G. P. Dupree

LEXINGTON

POWER & TELEPHONE SUPPLY CO., Box 1063, 27292, (704) 249-0256

MT. AIREY

ESSEX INTERNATIONAL, INC., S. Side of Hay St., 27030, (919) 786-2127

MURPHY

TRI STATE ELECTRONICS, Willow St., 28906, (704) 837-6026, Co-Owner: A. Rose

RALEIGH

DEANCO, INC., Suite 146, 3301 Womens Club Rd., 27612, (919) 782-9226, Branch Mgr.: W. Dukes

HALL-MARK/RALEIGH, 3000 Industrial Dr., 27609, (919) 832-4465, Branch Mgr.: B. Hutton

PYTRONIC INDUSTRIES, INC., 4509 Creedmore Rd., 27609, (919) 782-6370, Branch Mgr.: W. Barnhill

RESCO/RALEIGH, 701 Georgetown Rd., 27608, (919) 832-2077

SCHWEBER ELECTRONICS, 10 Sunnybrook Rd., 27610, (919) 832-8881, Distr. Mgr.: J. Ormond

SOUTHEASTERN RADIO SUPPLY CO., Box 26448, 31 S.T., 414 Hillsboro St., 27611, (919) 828-2311, Inside Sls. Contact: V. Miller

ROCKINGHAM

DENSON SUPPLY CO., Box 153-U.S. Hwy. 1 S., 28379, (919) 895-6206, Inside Sls. Contact: B. Wesson

SALISBURY

SOUTHEASTERN, 316 N. Depot St., 28144, (704) 633-0741, Branch Mgr.: J. C. Hilton

SHELBY

DIXIE INDUSTRIAL SUPPLY, Box 127, Hwy. 74E, (704) 482-5641

FRECK RADIO & SUPPLY CO., 402-4 W. Dixon Blvd., 28150, (704) 487-6383, Branch Mgr.: W. Beam

STATESVILLE

MacVICTOR ELECTRONIC SUPPLY, INC., 1128 Shelton Ave., 28677, (704) 872-8949, Branch Mgr.: P. Mills

WILMINGTON

SOUTHEASTERN, 1002 S. College Rd., 28401, (919) 791-7365, Branch Mgr.: R. Ken

WINSTON-SALEM

CRAMER/WINSTON-SALEM, 938 Burke St., 27102, (919) 725-8711

KIRKMAN ELECTRONICS, INC., 901 W. Second St., 27108, (919) 724-0541, Mktg./Adv. Mgr.: S. N. Kirkman, Inside Sls. Contact: N. E. Whiteheart

MURCOTA, INC., 1106 Burke St., 27101, (919) 723-1001

SOUTHEASTERN RADIO ELECTRONICS, 200 S. Marshall St., 27102, (919) 724-0504, Branch Mgr.: R. Newell

NORTH DAKOTA

FARGO

S & S ELECTRONICS INC., 503 7th St. N., 58102, (701) 637-5003, Inside Sls. Contact: L. Schrade

MANDAN

J-I CO., INC., 101 Main St., E., 58554, (701) 663-9526, TWX: 910-699-2383, Branch Mgr.: C. Walker

MINOT

IVERSON, JOHN, 58701, (701) 838-5466

J-I CO., INC., 330 N. Broadway, 58701, (701) 838-5466, TWX: 910-675-2497, Inside Sls. Contact: E. Tague

WILLISTON

IVERSON, JOHN, 324 2nd St. W., 58801, (701) 572-3730, Inside Sls. Contact: V. Malchert

OHIO

AKRON

AKRON ELECTRONIC SUPPLY CO., 107 S. Arlington St., 44306, (216) 762-8816, Ind. Sls. Mgr.: C. Latham

DON'S COMMUNICATIONS, 691 N. Hawkins Ave., 44313, Inside Sls. Contact: D. Shapiro

Memtron

138-69 FRANCIS LEWIS BLVD.
ROSEDALE, NEW YORK 11422

TELEPHONE:
(212) 978-5896

your #1 source
for

- Electronic tubes of every description includes power and transmitting, C.R.T., receiving, vidicons.
- Transistors, diodes, I.C.'s, CMOS — all top brands — fast delivery!
- Capacitors — electrolytics, mylar, tantalums, etc.
- Fuses and surge devices.

"top discounts available on all our products"

PEERLESS

For well over a quarter of a century, Peerless has been servicing Electronic Component Buyers with more than the components or devices or packages that they buy. Included with every Peerless order is an assurance of accuracy down to the last detail, an assurance of quality control to the highest manufacturer's specs, an assurance of fulfillment of every word spoken and every promise made or implied. These assurances are important to a Purchasing Agent, they are at the core of the Peerless philosophy. Peerless Radio Corporation, 19 Wilbur St., Lynbrook, L.I., N.Y. 11563 and 1040 N.E. 43rd Ct., Ft. Lauderdale, Florida 33308

RADIO

ELECTRONIC PRODUCTS CO., 22 S. Summit St., 44308, (216) 762-7431, Sls. Mgr.: R. Grable
 SHAMROCK ELECTRONIC SALES, INC., 2830 Copley Rd., 44321, (216) 666-3796, Mktg. Mgr.: T. Carney
 SUN RADIO CO., 110 E. Market St., 44308, (216) 434-2171, Inside Sls. Contact: E. Kline
 WARREN RADIO CO., 71 S. Broadway, 44309, (216) 434-6668

ALLIANCE

ALLIANCE MTG. CO., INC., 22790 Lake Park Blvd., 44601, (216) 821-5360, Sls. Mgr.: G. Gamberling
 RADIO & TV PARTS CO., SOUNDBUILD, 220 E. State St., 44601, (216) 823-5780, Sls. Contact: A. Traci

BEACHWOOD

SCHWEBER ELECTRONICS, 23880 Commerce Park Rd., 44122, (216) 464-2970, Gen. Mgr.: J. Burg
 SHERIDAN ASSOC., INC., 23224 Commerce Park Rd., 44122, (216) 831-0130

CANTON

CANTON ELECTRONICS, 126 12th N.W., 44703, (216) 454-7048, Branch Mgr.: S. August
 ELECTRONIC CENTER, INC., 1300 Cherry St., N.E., 44714, (216) 456-7133, Branch Mgr.: P. DeMenilo

CINCINNATI

CRAMER/TRI-STATES, 666 Redna Terr., 45215, (513) 771-6441
 DOUGLAS CO., J. R., Box 31075, (513) 931-4986
 ESSEX INTERNATIONAL INC., 10591 Chester Rd., 45215, (513) 771-6500
 GRAHAM MYTRONIC, 1843 N. Reading Rd., 45202, (513) 733-1661, Branch Mgr.: John Klammer
 HOLUB DISTRIBUTING CO., 1521 Reading Rd., Box 5130, 45215, (513) 733-4400, Mktg./Adv. Mgr.: P. E. Holub
 HUGHES-PETERS, INC., 4865 Duck Creek Rd., 45227, (513) 351-2000, Inside Sls. Contact: N. W. Wright
 MYTRONIC CO., INC., 1843 North Reading Rd., 45215, (513) 733-1661
 NEWARK ELECTRONICS, 9799G Princeton Rd., 45246, (513) 874-5115
 SCHUSTER ELECTRIC CO., 11320 Grooms Rd., 45242, (513) 984-1600, Telex: 21-4112
 SHERIDAN SALES CO., Box 37826, 45237, (513) 761-5432, TWX: 810-461-2670, Distr. Mgr.: B. Pruitt
 UNITED RADIO, INC., Summit & Reinhold Rd., 45237, (513) 761-4030, Inside Sls. Contact: G. Nash
 WAHL & ASSOCIATES, A.C., 135 Williams St., Box 15220, 45215, (513) 821-3270, Pres.: R. P. Morrison

CLEVELAND

ANTENNA, INC., 23850 Commerce Park Rd., 44122, (216) 464-7075, Inside Sls. Contact: J. Friedberg
 ARROW ELECTRONICS, INC., 23945 Mercantile Rd., 44122, (216) 464-2000
 CAM OHIO, 749 Miner Rd., 44143, (216) 461-4700, J. Miller
 CMP DISTRIBUTOR, 21380 Lorain Rd., 44126, (216) 333-5650, TWX: 810-421-8304, Branch Mgr.: H. Brumbach
 COMPLETE READING ELECTRIC, 13311 Enterprise Ave., 44135, (216) 267-1000
 COMPONENTS INC., 7461 N. Linden La., 44130, (216) 442-2737, Mktg. Mgr.: R. O. Jones
 COMTEL-STERLING, 5827 Mayfield Rd., 44124, (216) 442-8080
 CRAMER/CLEVELAND, 5835 Harper Rd., 44139, (216) 248-8400
 ELECTRO SALES ASSOC., INC., 851 E. 222 St., 44123, (216) 261-5440, Sls. Mgr.: L. Nurmi
 ESSEX INTERNATIONAL, INC., 4500 Willow Pkwy., 44125, (216) 441-0344
 ESSEX INTERNATIONAL, INC., 1231 E. 26th St., 44114, (216) 781-2310
 HAMILTON/AVNET — CLEVELAND, 761 Beta Dr., 44143, (216) 461-1400, Branch Mgr.: G. Buddenbaum
 HUTCO ELECTRIC, INC., 6212 Carnegie Ave., 44103, (216) 432-2155, Inside Sls. Contact: R. DiMattia
 KIRK, F. W., CO., 15017 Detroit Ave., (216) 226-1970
 LAPINE, INC., M. (CECON), Park Centre 4-L West, 44114, (216) 241-1825, Dir.: M. Lapine
 MARLOW ASSOC., INC., 1991 Lee Rd., 44118, (216) 932-0900, Mktg. Mgr.: M. S. Goldfarb, S. Lowitt
 MIDLAND ELECTRIC, 2125 Superior Ave., 44114, (216) 861-3200
 MILGRAY ELECTRONICS, 1821 E. 40th St., (216) 481-8800
 NEWARK ELECTRONICS, 2028 E. 46th St., 44103, (216) 361-4700
 NEWARK ELECTRONICS, 3304 E. 87th St., (216) 641-2800
 PATTISON SUPPLY CO., W. M., 4550 Willow Pkwy., 44125, (216) 441-3000, Inside Sls. Contact: H. Fuller
 PIONEER-STANDARD ELECTRONICS, 4800 E. 131st St., 44105, (216) 587-3600, TWX: 810-422-2211, Inside Sls. Contact: P. Heller
 PREHLER ELECTRIC, 12200 Brookpark Rd., 44130, (216) 267-2650
 RADIO DISTRIBUTING CO., 653 Alpha Dr. #73, 44143, (216) 461-9090, Branch Mgr.: K. Jacobson
 RELATED COMPONENTS, INC., 4712 W. 130th St., 44135, (216) 252-6630, Branch Mgr.: B. Jakubowski
 RESERVE ELECTRIC CO., 2090 E. 19th St., 44115, (221) 771-5764, Inside Sls. Contact: F. Stepnicka
 RPC ELECTRONICS OF OHIO, 749 Miner Rd., 44143, (216) 461-4700, Branch Mgr.: L. Shenk
 RPC ELECTRONICS, 3307 W. 17th St., 44111, (216) 251-0169, E. Kronek
 SCHWEBER ELECTRONICS, 23880 Commerce Park Rd., 44122, (216) 464-2970
 SHERIDAN SALES CO., Box 4457, 7800 Wall St., 44125, (216) 524-8120, TWX: 810-427-2957, Branch Mgr.: J. R. Thornberry
 SUPERIOR ELECTRONICS, 5708 Superior, 44103, (216) 431-3666, Inside Sls. Contact: J. Goodwin
 WARREN RADIO CO., 5842, Ridge Rd., 44129, (216) 888-5225
 WESCHLER ELECTRIC CORP., 4250 West 130th St., 44135, (216) 251-4609
 WINTERADIO ELECTRONIC SUPPLY CORP., 1468 W. 25th St., 44113, (216) 621-5080, Inside Sls. Contact: T. Shaw, B. Gibbons

COLUMBUS

BOLLER ELECTRONICS, 181 Fairway Blvd., 43213, (614) 861-0521, Owner: G. Boller
 BUCKEYE TELEPHONE CO., 1250 Kinnear Rd., 43221, (614) 488-0555

COLUMBUS ELEC. WORKS, 767-783 N. 4th St., (614) 294-4651
 E & M EQUIPMENT CO., 3492 E. Fulton St., 43227, (614) 236-0888, Inside Sls. Contact: J. Layman
 ELECTRONICS MKTG. CORP., 1150 W. Third Ave., 43212, (614) 200-4161
 HUGHES-PETERS, INC., 481 E. 11th Ave., 43211, (614) 294-5351, Inside Sls. Contact: E. Ridinger
 McJUNKIN CORP., (614) 294-3711
 PALMER'S STEREO CENTER, 3560 N. High St., 43214, (614) 267-4948, Inside Sls. Contact: D. Hiss
 PIONEER ELECTRONICS, 800-362-2274
 THOMPSON ELECTRONICS SUPPLY, INC., 182 E. Long St., 43215, (614) 228-6191, Inside Sls. Contact: W. L. Lee
 WHITEHEAD RADIO CO., 124 N. Grant Ave., 43215

DAYTON

ARROW ELECTRONICS, 3100 Plainfield Rd., 45432, (513) 253-9176, TWX: 810-459-1611
 ASTRO INDUSTRIES, INC., 3189 Plainfield Rd., (513) 253-5118
 BECKER CO., J. A., 1341 E. 4th St., 45402, (513) 226-1341
 CMP DISTRIBUTOR, 5423 Webster St., 45414, (513) 278-5873, TWX: 810-459-1613, Branch Mgr.: M. Gray
 COMTEL-STERLING CO., Kettering P.O. Box 2036, 45426, (513) 298-7573, Contact: R. Dullea, L. Schmidlin
 COPP RADIO LABS., INC., 123 S. Keowee St., 45402, (513) 228-4188, Inside Sls. Contact: H. Nickell
 DIPLOMAT/NORTHLAND, 2452 Stanley Ave., (513) 228-1080
 DUELLMAN ELEC., 131 Wayne Ave., (513) 461-5010
 E.I.L. INSTRUMENTS, INC., 5553 Webster St., 45414, (513) 898-1710, Branch Manager, D. Saslow
 ELECTRO SALES ASSOC., 1635 Mardon Dr., 45432, (513) 426-5551, Branch Mgr.: J. Sheffs
 EMPIRE SYSTEMS, 94 Compark Dr., (513) 433-0342
 ESCO, INC., Box 1166, 221 Crane St., 45401, (513) 226-1133, Gen. Sls. Mgr.: R. A. Smiley
 HALL-MARK ELECTRONICS, 2775 Shelburne La., 45430, (513) 294-4037
 HAMILTON/AVNET — DAYTON, 118 Westpark Rd., 45459, (513) 433-0610, TWX: 810-450-2531, Branch Mgr.: J. Gibson
 KIERULFF ELECTRONICS, INC., 2030 Drill Ave., 45414, (513) 278-9411, TWX: 810-459-1870, Branch Mgr.: L. Cupp Jr.
 MARSHALL INDUSTRIES, 6388 N. Dixie Dr., 45414, (513) 898-1105, Branch Mgr.: P. Riesenberger
 NASCO, INC., 3201 Plainfield Rd., 45432
 PIONEER-STANDARD/DAYTON, 1900 Troy St., 45404, (513) 236-9900, Telex: 82-8255
 RADIO DISTRIBUTING CO., 3220 N. Main, 45405, (513) 278-8229, Branch Mgr.: R. Maher
 RELATED COMPONENTS, INC., Box 1534, 45401, (513) 253-6116, Inside Sls. Contact: M. Wagner
 SEMICONDUCTOR SPECIALISTS, INC., 4500 Wadsworth Rd., 45414, (513) 278-9455, TWX: 810-459-1625, Branch Mgr.: J. Bailey
 SHAMROCK ELECTRONIC SALES, INC., 805 Rockhill Ave., 45429, (513) 298-3052, Branch Mgr.: W. Harding
 SHERIDAN SALES CO., Box 423, 5045 N. Main St., 45405, (513) 277-8911, Branch Mgr.: J. G. Nemanich
 SREPCO ELECTRONICS DIV., 314 Leo St., Box 7, 45404, (513) 224-0871, Inside Sls. Contact: J. V. Kosterman
 STOTTS FRIEDMAN CO., 108 N. Jefferson, 45402, (513) 224-1111, Inside Sls. Contact: J. Stewart
 SUMMIT INDUSTRIES, INC., 4545 Gateway Circle, 45440, (513) 434-8192, Inside Sls. Contact: N. Scharrif
 SUNRAY ELECTRONICS, INC., 2275 Springboro Rd., 45439, (513) 298-2452
 SUNRAY ELEC., 3191 Plainfield Rd., (513) 243-4114
 THAL-MOR ASSOCs., 3232 Enclave La., 45439, (513) 298-9939, Telex: 28-8234, Inside Sls. Contact: N. L. Neeley
 WAHL & ASSOC., A.C., 2122 Mershon Ave., 45420, (513) 252-0961, Branch Mgr.: Mrs. M. C. Brennan

DEFIANCE

DeWOLFE, DICK, 118 Clinton St., 53412, (419) 782-5926, Inside Sls. Contact: R. DeWolfe

DOVER

TV SPECIALTIES INC., 320 W. 3rd, 44622, (216) 364-6678, Inside Sls. Contact: J. Gardina

EAST CLEVELAND

EUCLID RADIO PARTS CORP., 16379 Euclid Ave., 44112, (216) 451-1375, Sls. Mgr.: H. W. Roman

EAST LIVERPOOL

TELEVISION PARTS CO., 315 Market St., 43920, (216) 386-5700, Branch Mgr.: R. Keys

ELYRIA

EL-A-CO ELECTRONICS INC., 235 Lodi St., 44035, (216) 322-2526, Inside Sls. Contact: B. R. McArtor
 LAKE ERIE RADIO SOUND CO., 603 Lodi, 44035, (216) 322-4128, Owner: L. Szanyi Jr.

FINDLAY

LIMA RADIO PARTS CO., 1414 S. Main St., 45840, (419) 423-1032, Branch Mgr.: D. W. Smith

FREMONT

J & B ELECTRONICS, 818-820 E. State St., 43420, (419) 332-6732, Inside Sls. Contact: R. Destatte
 SWARTZLANDER RADIO LTD., 1524 Oak Harbor Rd., 43420, (419) 332-5681, Inside Sls. Contact: J. Avers

HAMILTON

COMPONENTS INC., 5835 Oak Ridge Dr., 45011, (513) 721-2997, Branch Mgr.: T. Sweeney

HIGHLAND HEIGHTS

RADIO DISTRIBUTING CO., 653 Alpha Dr. #67, 44143, (216) 461-9090, Branch Mgr.: K. Jacobson

KETTERING

PLAINTRONICS CO., Box 2265, 3100 Plainfield Rd., 45429, (513) 253-9176

LIMA

HUTCH & SON INC., Roberts & Lenore, 45804, (419) 223-2806, Mktg. Mgr.: A. Sheely
 LIMA RADIO PARTS CO., 150 W. Grand Ave., 45802, (419) 228-1220, Inside Sls. Contact: R. A. Wagner
 WARREN RADIO CO., 565 S. Metcalf, 45904, (419) 228-1691

LORAIN

LORAIN ELECTRONICS CORP., 2307 Leavitt Rd., 44052, (216) 282-6116

LYNDHURST

WAHL & ASSOC., A.C., 5453 Harleston Dr., 44124, (216) 461-4930, Branch Mgr.: L. H. Kaiser, Jr.

MANSFIELD

HOOVER INSTRUMENT SERVICE, 401 N. Home Rd., 49067, (419) 529-3583

MARIETTA

MARIETTA RADIO & TV SUPPLY, 1028 East Green St., 45750, (614) 373-4987, Inside Sls. Contact: H. W. Bluff

MARION

SERVEX ELECTRONICS DIST., INC., 224 N. Prospect St., 43302, (614) 383-3117, Inside Sls. Contact: M. Sens

MASSILLON

MARTIN, M. H. CO., 1118 Lincoln Way E., 44646, (216) 832-7467, Inside Sls. Contact: R. Rosenbury

MEDINA

DRW ELECTRONICS CORP., 7409 Spencer Lake Rd., 44256, (216) 725-6422, W. Becker
 TOM GRANT ASSOC., 2510 Medina Rd., 44256, (216) 725-6528, Inside Sls. Contact: S. Grant

NEWARK

TURNER & WILSON, INC., 214 W. National Dr., 43055, (614) 323-1213, Inside Sls. Contact: J. D. Lucero, Jr.

NORTH OLMSHEAD

WINTERADIO ELECTRONIC SUPPLY CO., 4579 Great Rockwell Blvd., 44070, (216) 779-7272, Branch Mgr.: E. Kuczek

PARMA

WINTERADIO ELECTRONIC SUPPLY CO., 5373 Ridge Rd., 44129, (216) 886-6868, Branch Mgr.: A. J. Hrouda

OLON

RADIO & ELECTRONIC PARTS CORP., 6835 Cochran Rd., 44129, (216) 881-6060
 REPCO, 6835 Cochran Rd., 44139, (216) 248-8900, Inside Sls. Contact: H. Cole

SOUTH EUCLID

WINTERADIO ELECTRONIC SUPPLY CO., 4432 Mayfield Rd., 44121, (216) 382-7676, Branch Mgr.: J. Williams

SPRINGFIELD

SREPCO ELECTRONICS DIV., 1300 St. Paris Pk., 45504, (513) 399-8811, Branch Mgr.: J. W. Schuyler

STUEBENVILLE

D & R ELECTRONICS, Box 56, 43952, (614) 264-1611
 LOU'S ELECTRONICS, 408 Washington St., 43952, (614) 282-7535, Branch Mgr.: L. O'Dell

TIFFIN

HUTCH & SON INC., 278 N. Washington, 44883, (419) 447-8573, Branch Mgr.: A. Hoffman

TOLEDO

ALL-PHASE ELECTRIC SUPPLY CO., 1235 Expressway Dr., N., 43608, (419) 781-9908, Branch Mgr.: S. Slater
 LIFETIME ELECTRONICS, INC., 1501-5 Adams St., 43624, (419) 241-5643, Inside Sls. Contact: J. E. Keiser
 RS ELECTRONICS, 4641 W. Bancroft, 43615, (419) 531-5544, Branch Mgr.: F. Corne
 SELECTRONIC SUPPLIES, 3185 Bellevue Rd., 43606, (419) 474-5477
 SIEGEL AUTO RADIO, 1110 Sylvania Ave., 43612, (419) 478-4141, Sls. Mgr.: P. Kozy

INDUSTRIAL DISTRIBUTORS

AMPEREX • EIMAC • RCA
 RAYTHEON • VARIAN

**VACUUM
TUBES**

ZACK

ELECTRONICS

PALO ALTO, CA

415/326-5432 654 High St. 94301

SAN FRANCISCO, CA

415/626-1444 1444 Market St. 94102

WARREN RADIO CO., 1002 Adams St., 43697, (419) 248-3364, Inside Sls. Contact: K. Kesmeyer

VAN WERT

LIMA RADIO PARTS CO., 233 S. Walnut, 45891, (419) 238-1268, Branch Mgr.: D. Kraner

WARREN

RADIO & TV PARTS CO., 208 Elm Rd. S.E., 44483, (216) 399-7430, R. Martusky

REM ELECTRONICS SUPPLY CO., INC., 264 W. Market St., 44481, (216) 399-2777, Sls. Mgr.: G. C. Heath

WICKLIFFE

GATEWAY MEGATECH, INC., 30214 Lakeland Blvd., 44092, (216) 944-8565, Inside Sls. Contact: M. Pavlik

XENIA

MARLOW/DAYTON, 1427 Parkman Dr., 45385, Branch Mgr.: J. Dee

YOUNGSTOWN

RADIO & TV PARTS, INC., 1316 Market St., 44507, (216) 743-2181, A. Ronci

REPCOM OF OHIO, Box 0. Southside Station, 44507, (216) 788-9404

ROSS RADIO CO., 325 W. Federal St., 44503, (216) 746-8881, Inside Sls. Contact: A. J. Plink & R. Mentzer

ZANESVILLE

THOMPSON RADIO SUPPLIES, 110 S. Sixth St., 43701, Sls. Mgr.: J. R. Thompson

OKLAHOMA**ADA**

TRICE WHOLESALE ELECTRONICS CO., 231 N. Francis, 74820, (405) 332-3022, Store Mgr.: B. Stradford

ARDMORE

TRICE WHOLESALE ELECTRONICS CO., 709 Grand, 73401, (405) 223-8540, Store Mgr.: J. Waller

BARTLESVILLE

CUMMINS ELECTRONICS SUPPLY, 74003, (918) 336-4448

OIL CAPITOL ELECTRONICS CORP., 700 E. Frank Phillips Blvd., 74003, (918) 336-4448, Branch Mgr.: R. Estes

BIXBY

ROBERTSON INC., E. B., Box 306, 74008, (918) 369-5688, Branch Mgr.: B. Thompson

ENID

TRICE WHOLESALE ELECTRONICS CO., 223 E. Randolph, 73701, (405) 234-6078, Store Mgr.: L. Little

LAWTON

COLE'S, J. G., 1805 Cache Rd., Box 626, 73501, (405) 355-2803, Mgr.: R. Cole

MILLER-JACKSON CO., 1701 Ave. C, Box 1036, 73501

TRICE WHOLESALE ELECTRONICS CO., Box 28, 30 "E" St., 73501, (405) 355-3953, Store Mgr.: D. Strange

MCALISTER

MCALISTER RADIO & TV SUPPLY, INC., 407 Main St., 74501, (918) 423-2282, Branch Mgr.: T. Burks

TRICE WHOLESALE ELECTRONICS CO., 520 N. Main, 74501, (918) 423-6716, Store Mgr.: C. Harbison

MIDWEST CITY

RADIO SUPPLY, INC., 2117 S. Air Depot, 73110, (405) 737-7641, Branch Mgr.: R. Thomas

MUSKOGEE

TRICE WHOLESALE ELECTRONICS CO., 211 Callahan, 74401, (918) 682-2457, Store Mgr.: L. Clement

OKLAHOMA CITY

ELECTRO ENTERPRISES, INC., 6725 N. Miramar, 73111, (405) 478-1752, TWX: 910-831-3168, Inside Sls. Contact: C. Enright, H. Van Brakel

ELECTRONIC SUPPLY, 212 N.Y. Tenth St., 73103, (405) 232-1215

ESSEX INTERNATIONAL, INC., 420 N. Pennsylvania, 73107, (405) 236-5411

RADIO, INC., 903 N. Hudson, 73102, (405) 235-1551, Branch Mgr.: F. Kudjacek

RADIO SUPPLY, INC., 724 N. Hudson, 73101, (405) 232-6128, Mktg./Adv. Mgr.: G. B. Wyant

RADIO SUPPLY, INC., 900 S.W. 29, 73109, (405) 631-3371, Branch Mgr.: H. Potts

TRICE WHOLESALE ELECTRONICS, 4701 N. Stiles, 73105, (405) 524-4411, Inside Sls. Contact: R. Mogge

TRICE WHOLESALE ELECTRONICS CO., 800 N. Hudson, 73101, (405) 232-2291, Store Mgr.: J. Riggan

WHOLESALE ELECTRONIC SUPPLY, 610 N.E. 36th St., 73105, (405) 528-2391, Branch Mgr.: W. DeLoach

OKMULGEE

TRICE WHOLESALE ELECTRONICS CO., 120 N. Oklahoma, 74447, (918) 756-2060, Store Mgr.: W. Jones

PONCA CITY

TRICE WHOLESALE ELECTRONICS CO., 607 N. First, 74601, (405) 762-5621, Store Mgr.: R. Hester

TULSA

ALLIED BRG. SUPPLY, Box 3263, (918) 583-0164

HALL-MARK/TULSA, 3846 S. 83rd. E. Ave., 74145, (918) 835-8458, Branch Mgr.: P. O'Connor

J. SHURTLEFF CO., 3140 E. 15th St., (918) 936-7269

NORVELL ELECTRONICS, INC., 3340 Memorial Blvd., 74145, (918) 663-1247, TWX: 910-845-2136, Branch Mgr.: B. Medlin

OIL CAPITOL ELECTRONICS, CORP., 708 S. Sheridan, Box GG, 74115, (918) 836-2541, Sls. Contact: C. Giles

RADIO, INC., 1000 S. Main, 74119, (918) 587-9123, Inside Sls. Contact: G. Cox

S. & S. RADIO SUPPLY, 537 S. Kenosha, 74114, (918) 582-8242, Inside Sls. Contact: E. J. Holmes

TI SUPPLY CO., drawer "T" - Admiral Station, 74115, (918) 427-4555, Branch Mgr.: C. Seawright

TRICE WHOLESALE ELECTRONICS CO., 730 S. Utica, 74104, (918) 585-5718, Store Mgr.: Red Martin

WHOLESALE ELECTRONIC SUPPLY, 1655 E. Sixth St., 74120 (918) 587-5516, Branch Mgr.: E. Clark

OREGON**ALBANY**

PORTLAND ELECTRIC & PLUMBING, 97321, (503) 926-7755

EUGENE

PORTLAND ELECTRIC & PLUMBING, (503) 342-2101

TILLMAN & BOOTH INC., (503) 343-7701

UNITED RADIO SUPPLY, INC., 974 W. Sixth, 97402, (503) 342-3381, Branch Mgr.: D. E. Earnest

VITUS ELECTRIC SUPPLY CO., (503) 345-4377

MEDFORD

WALKER CO., VERL G., Box 1586, 97501, (503) 773-7557

UNITED RADIO SUPPLY INC., 1171 Court St., 97501, (503) 779-7933, Branch Mgr.: C. H. Beach

PENDLETON

ROUND-UP ELECTRONICS, 2927 N.E. Riverside, 97801, (503) 276-3152, Inside Sls. Contact: W. Manny

PORTLAND

ALMAC/STROM ELECTRONICS, 8888 S.W. Scholl's Ferry Rd., 97225, (503) 292-3534, TWX: 464-6105

ARVA, INC., 2035 S.W. 58th Ave., 97221, (503) 292-8762, Branch Mgr.: K. Baldwin

CENTRAL DISTRIBUTORS, 955 N.E. Union Ave., 97232, (503) 234-0711, Inside Sls. Contact: R. Hanson

DOUBLE O ELECTRONICS, 1737 N.W. 26th, 97210, (503) 248-9500, Inside Sls. Contact: L. Ostrom

EOFF ELECTRIC CO., 509 N.W. 10th Ave., (503) 222-9411

ESSEX INTERNATIONAL, INC., 1900 N.E. 181st St., 97230, (503) 665-0138

JACKSON, J. W., 8600 N.E. Sandy Blvd., 97220, (503) 252-2929, Inside Sls. Contact: J. W. Jackson

JaMac PRODUCTS CO., 8600 N.E. Sandy Blvd., 97220, (503) 252-2929, Inside Sls. Contact: J. W. Jackson

JW ELECTRONICS, 1737 N.W. 26th, 97210, (503) 248-9500, Branch Mgr.: R. Ostrom

MERRITT, R. CO., 2035 S.W. 58th St., 97221, (503) 292-8762, Branch Mgr.: K. Baldwin

MURPHY INDUSTRIAL SUPPLY, 3057 N.W. Yeon Ave., (503) 226-6081

NORTH PACIFIC SUPPLY CO., 2950 N.W. 29th Ave., 97210, (503) 225-1133, Mktg. Mgr.: R. G. Vavrek

NORTHWEST RADIO & ELECTRONICS, 711 E.E. Ankeny St., 97214, (503) 234-9787, Branch Mgr.: D. A. Linstead

PLATT ELEC. SUPPLY, 1305 N.W. Davis, (503) 228-6121

PORTLAND ELECTRIC & PLUMBING CO., (503) 226-2531

PORTLAND RADIO SUPPLY CO., 1234 S. W. Stark St., 97205, (503) 228-8647, Pres.: C. B. Lucas

RIGGS, C. E., 422 N. W. 8th Ave., 97209, (503) 226-3286

UNITED RADIO SUPPLY, INC., 123 N.E. 7th Ave., 97232, (503) 233-5346, Inside Sls. Contact: W. E. O'Hara

WASSON'S ELECTRIC WHOLESALE MART INC., 631 N.E. Grand Ave., 97232, (503) 235-8373

SALEM

DOUBLE O ELECTRONICS, 2450 State St., 97301, (503) 363-2371, Branch Mgr.: C. Wells

JW ELECTRONICS, 2450 State St., 97301, (503) 363-2371, Branch Mgr.: C. Wells

PENNSYLVANIA**ABINGTON**

MID-ATLANTIC SALES CO., 1765 Rockwell Rd., 19001, (215) 657-2815, Branch Manager: J. D. Robinson

ALLENTOWN

FEDERATED PURCHASER, 936 Union Blvd., 19103, (215) 437-4481, Branch Mgr.: D. Butz

PETERS, INC., A. A. 404 Union Blvd., 18103, (215) 434-5237, Inside Sls. Contact: A. A. Peters

ALTOONA

ALLECHENY ELECTRONICS, INC., 800 Chestnut Ave., 16601, (814) 946-0871, Inside Sls. Contact: K. O. McGraw

TV & RADIO PARTS CO., 20th St. & Valley View, 16602, (814) 944-4556, Contact: E. Tanahill

AMBRIDGE

TELEVISION PARTS CO., 1116 Merchant St., 15003, (412) 266-7700, Br. Mgr.: J. Cardinale

ARDMORE

ROTENHEBER & WURTS, INC., 53 Cricket Ave., 19003, (215) 649-6300

BLOOMSBURG

FLINT ELECTRONIC SERVICE, 200 E. 5th St., 17815, (717) 784-6335, Branch Mgr.: A. Flint

BRADDOCK

LEFF, M., RADIO PARTS CO., 225 Braddock Ave., 15104, (412) 271-2800, Inside Sls. Contact: W. Zeff

BUTLER

TELEVISION PARTS CO., 158 N. Main St., 16001, (412) 287-5917, Br. Mgr.: C. Hiles

CAMBRIDGE SPRINGS

SHAMROCK ELECTRONIC SALES, INC., 297½ McClellan St., 16403, (814) 398-8348, Branch Mgr.: D. Hilliard

CARLISLE

CUMBERLAND ELECTRONICS, 810 N. Hanover St., 17013, (717) 243-6169, Branch Mgr.: Dunkleberger

ELECTRONIC WHOLESALERS, INC., 872 Harrisburg Pike, 17013, (717) 243-2288, Branch Mgr.: C. Kepner

CARNEGIE

PYTTTRONIC INDUSTRIES, INC., 14 E. Mall Plaza, 15106, (412) 276-6722, Branch Mgr.: J. Diethorn

CHERRYHILL

CRAMER, Springdale Rd., 08034, (609) 424-5993

CLIFTON HEIGHTS

TIME ELECTRONICS — Mid-Atlantic, Div. of Avnet, Inc., 359 E. Madison Ave., 19018, (215) 622-2500, Inside Sls. Contact: E. Edmunds

COATESVILLE

COUNTY SUPPLY CO., 3rd Ave., & Fleetwood St., 19320, (215) 384-4585, Inside Sls. Contact: E. Curtis

CORAOPOLIS

ELECTRONIC SUPPLY CO., 1035 4th Ave., 15108, (412) 264-8787, Inside Sls. Contact: L. DiCicco

BARBEY ELECTRONICS

333 N. 4th ST., READING, PA. 19603

PHONE: (215) 376-6116

BRANCHES — LANCASTER, LEBANON, POTTSTOWN

INDUSTRY ORIENTED DISTRIBUTOR

ALPHA — Wire & Tubing

AMPHENOL — General Line only

AMPROBE — Test Equipment

BELDEN — Wire & Cable

BUSSMAN — Fuses & Fuse Blocks

CHICAGO MINIATURE LAMPS

TRW-CINCH — Connectors

CLAROSTAT — Controls & Resistors

CONTROLS CO. — Solenoids

CUTLER-HAMMER — Toggle Switches

DIALCO — Visual Indicators

HECON — Counters

INDUSTRIAL TIMER — Timers

INTERNATIONAL RECTIFIER

KESTER — Solder & Fluxes

LEE-CRAFT — Ind. Lights & Sockets

MICRO SWITCH — Ind. Control Devices

& Precision Switches

MOTOROLA — HEP Line only

NATIONAL — Ind. Tubes

OHMITE — Resistors & Rheostats

POTTER & BRUMFIELD —

Relays & Circuit Breakers

PREMIER — Chassis & Housings

RBM — Relays

RCA — Tubes & Test Equipment

SIMPSON — Test Equipment & Meters

SOLA — Voltage Reg. Transformers

STANCOR — Transformers

SUPERIOR ELECTRIC — Powerstats

Slo-Syn Motors, Stabiline Volt. Reg.

SWITCHCRAFT — Jacks, Plugs, Switches

TRIPLETT — Test Equipment & Meters

UNGAR — Soldering Tools

WELLER — Soldering Tools

XCELITE — Hand Tools

DEVON
PEAK ELECTRONICS, 999 W. Valley Rd., 19333, (215) 687-9822, Inside Sls. Contact: A. J. Peiken

DREXEL HILL
A B & T SALES CORP., 3815 Albermarle Ave., 19026, (215) 622-5339, Branch Mgr.: M. Irwin

KASS ELECTRONICS DISTRIBUTORS, 2502 Township Line Rd., 19026 (215) 449-2300, Sls. Contact: B. Schaefer

ENON VALLEY
NEW, Box 264, 16120, (216) 457-2333

ERIE
ADVACOM INC., 1938 Buffalo Rd., 16510, (814) 455-8110, Inside Sls. Contact: D. Leslie

ERIE CORPORATE CONTRACTORS, 1938 Buffalo Rd., 16510, (814) 455-8110, Gen. Sls. Mgr.: D. Leslie

MACE ELECTRONICS, INC., 2631 W. 8th, 16505, (814) 838-3517

WARREN RADIO, INC., 1315 Peach St., 16512, (814) 454-5285, Inside Sls. Contact: N. Allen

FRAZER
ESSEX INTERNATIONAL, INC., 6 Lee Blvd., Mainline Ind'l Park, 19355, (215) 647-5571

GREENSBURG
LEFF RADIO PARTS CO., M., 401 S. Main St., (412) 834-5400

HANOVER
ELECTRONICS PLACE, Delco Plaza Shopping Center, 17331, (717) 637-2411, Branch Mgr.: A. M. Lowe, Jr.

J. R. S. DISTRIBUTORS, INC., 614 York St., 17331, (717) 632-9294, Branch Mgr.: J. Wildasin

HARRISBURG
CUMBERLAND ELECTRONICS, 1345 S. 12th St., 17104, (717) 232-9715, Inside Sls. Contact: C. Polm

ELECTRONIC WHOLESALERS, INC., 1922 Paxton St., 17104, (717) 238-8194, Sls. Contact: H. P. Murrma Jr.

ESHELMAN, M. H., CO., 2902 Sycamore St., 17111, (717) 564-2437, Gen. Sls. Mgr.: M. H. Eshelman

PYTTNOR INDUSTRIES, INC., 2525 N. Seventh St., 17105, (717) 233-6591, Ind. Oper. Mgr.: R. Schwah

ROSEN ELECTRONICS, INC., 1323 N. Front St., 17102, (717) 232-9966, Branch Mgr.: W. Fullen

HATBORO
HENWARR, 218 Tanner Ave., (215) 675-4104

HORSHAM
PIONEER PENNSYLVANIA, 203 Witmer Rd., 19044, (215) 674-5710, Branch Mgr.: R. Ball

HUNTINGDON VALLEY
HALL-MARK/PHILADELPHIA, Box 125, 458 Pike Rd., 19006, (215) 355-7300, TWX: 510-667-1750, Branch Mgr.: D. Walsh

MANV, INC., H., 3983 Mann Rd., 19008, (215) 355-7200

SHAP ELECTRONICS, INC., 421 E. Pike Rd., 19006, (215) 698-9550, Inside Sls. Contact: E. Bognar

JEFFERSONVILLE
ALMO ELECTRONICS CORP., 2119 W. Main St., 19401, (215) 539-7580, Br. Mgr.: J. Mash

JENKINTOWN
WARREN MOUNT CO., 766-6 Fox Pavilion, 19046, (215) 886-0383, Branch Mgr.: S. Slack

JOHNSTOWN
ALLEGHENY ELECTRONICS, INC., 46 Valley Pike, 15905, (814) 536-3589, Br. Mgr.: C. Berkey

TV RADIO PARTS CO., 226 Main St., 15901, (814) 536-8908, Inside Sls. Contact: C. Verna

KING OF PRUSSIA
A B & T SALES CORP., 251 W. De Kalb Pike, C-105, 19406, (215) 265-2028, Branch Mgr.: M. Dienes

WISTEX, 216 Goddard Blvd., (215) 337-1240

KINGSTON
ARTCO ELECTRONICS, 302 Wyoming Ave., 18704, (717) 288-8585, Inside Sls. Contact: J. Winslow

LANCASTER
BARBEY ELECTRONICS, 622 Columbia Ave., 17603, (717) 393-5637, Branch Mgr.: E. A. Thomas

HARGO ELECTRONICS INC., 780 Eden Rd., 17601, (717) 569-6469, Br. Mgr.: J. C. Brooks

LANGHORNE
A B & T SALES CORP., 412 N. Pine St., 19407, (215) 757-6867, Branch Mgr.: J. R. Monarch

LEBANON
BARBEY ELECTRONICS, 821 Quentin Rd., 17042, (717) 273-1679, Branch Mgr.: R. Behney

LEWISTOWN
CUMBERLAND ELECTRONICS, 113 S. Main St., 17044, (717) 248-9631, Branch Mgr.: D. Yetter

MCKEESPORT
BARNO RADIO CO., 5403 W. Smithfield St., Box 93, 15135, (412) 751-5971

McMURRAY
COOPER ASSOC., 112 Oakwood Rd., 15317, (412) 941-6473, Mktg. Mgr.: M. Cooper

MEADVILLE
WARREN RADIO, INC., 1198 Park Ave., 16335, (814) 336-3147, Br. Mgr.: W. Hoelllein

MONROEVILLE
CMP DISTRIBUTOR, 409 Beatty Rd., 15146, (412) 372-4415, Branch Mgr.: C. Fredley

CRAMER/PITTSBURGH, 616 Beatty Rd., 15146, (412) 242-7410, Contact: P. Jackson

MONTGOMERYVILLE
PYTTNOR INDUSTRIES, INC., Stump Rd., 18936, (215) 643-2850, TWX: 510-661-6593, Branch Mgr.: J. Cohen

MT. PLEASANT
PRAGER ELECTRONICS, 300 Main St., 15666, (717) 547-2651, Inside Sls. Contact: E. Prager

NEW BRIGHTON
TELEVISION PARTS CO., 518 Fifth Ave., 15066, (412) 846-3000, Inside Sls. Contact: D. Breit

NEW CASTLE
TELEVISION PARTS CO., 917 Moravia St., 16101, (412) 658-8383, Br. Mgr.: B. Camerot

NEW KENSINGTON
RPC ELECTRONICS INC., 1102 Second Ave., 15068, (412) 335-8585, Contact: J. Burns

PARKSIDE
COUNTY SUPPLY CO., 2903 Edgmont Ave., 19015, (215) 872-2439, Branch Mgr.: E. Curtis

PHILADELPHIA
ALLIED ELECTRONICS (Simco Electronics), 3707-11 N. Broad St., 19140, (215) 229-1880

ALMO ELECTRONICS CORP., 9815 Roosevelt Blvd., 19114, (215) 698-4000, TWX: 710-670-0469, Mktg./Adv. Mgr.: S. Shapiro

ALMO ELECTRONICS, 5801 Rising Sun Ave., 19120, (215) 342-3556, Br. Mgr.: H. Avart

ARCH ELECTRONICS CO., 1318 Arch St., 19107, (215) 10-3-4660, Inside Sls. Contact: R. Alberger

BARNETT BROS. RADIO CO., 932 Arch St., 19107, (215) 5-9780, Inside Sls. Contact: J. Taylor

BAYNTON ELECTRONICS CORP., 2709 N. Broad St., 19132, (215) 229-9800, Telex: 84-5197, Inside Sls. Contact: R. Kandel

BRAUNLICH-ROESSLE, 3117 Penn Ave., 15201, (412) 471-6995, Inside Sls. Contact: E. V. Greco

BROOKS MFG. CORP., Box 17602, 19135, (215) 831-9803, Inside Sls. Contact: D. McMonagle

BROWNELL ELECTRO, INC., 10980 Dutton Rd., 19154, (215) 632-3030, Branch Mgr.: D. Romanelli

ESSEX INTERNATIONAL, INC., 915 N. Broad St., 19123, (215) 236-7100

HERBACH & RADEMAN, INC., 407 E. Erie Ave., 19134, (215) 426-1700, TWX: 710-670-9760, Gen. Sls. Mgr.: M. Gresh

MID-STATE SUPPLY, 704 Main St., 19127, (501) 246-5893

MILLER, H., & CO., 2812 Cottman Ave., 19149, (215) 338-1100

PARAGON SALES CO., 111 S. 22nd St., 19103, (215) 563-7050, Mktg. Mgr.: R. Leader

PHILADELPHIA ELECTRONICS, 112 North 12th St., 19107, (215) 10-8-7400, Inside Sls. Contact: C. J. DiBattiste

POWELL ELECTRONICS, INC., S. Island Rd., Box 8765, 19101, (215) 365-1900, TWX: 710-670-0465, Inside Sls. Contact: H. Hughes

SIMCO ELECTRONICS INC., 3907-11 N. Broad St., 19140, (215) 229-1880, Inside Sls. Contact: C. Salvucci

TREEKO SALES, INC., Ent. 6562

PITTSBURGH
BOLEKY CO., L. H., 534 Lincoln Ave., (412) 761-8994

CAMERADIO ELECTRONICS, 2801 Liberty Ave., 15222, (412) 288-2600, TWX: 710-664-2016, Inside Sls. Contact: G. Farner

COMTEL-STERLING CO., No. 2 Parkway Center, 15220, (412) 922-5720, Contact: F. Kozel

E.I.L. INSTRUMENTS, INC., 1844 Ardmore Blvd., 15221, (412) 731-5230, Branch Mgr.: L. F. Sander, Jr.

ELECTRO SALES ASSOC., 201 Penn Ctr. Blvd., 15235, (412) 371-9449, Branch Mgr.: J. LaJoe

HAMBURG BROTHERS INC., 24th & A.V.R.R., 15212, (412) 471-0808, Inside Sls. Contact: N. Werner

KRAUS & CO., J. F., 360 Broadmoor Ave., (412) 531-1200

McCULLOUGH ELECTRIC CO., (412) 261-2420

NEW EQUIPMENT/PARTS DIV., BRAUNLICH-ROESSLE, 2714 Penn Ave., 15222, (412) 471-6995, Branch Mgr.: E. Greco

PIONEER ELECTRONICS, (412) 391-4846

PIONEER STANDARD, 560 Alpha Dr., 15238, (412) 782-2300

PYTTNOR IND., (412) 276-6727

RADIO PARTS CO., 205 N. Sheridan Ave., 15206, (412) 361-2722, Contact: A. Shrager

R P C ELECTRONICS, 620 Alpha Dr., 15238, (412) 782-3770, Ind. Sls. Mgr.: C. Perlman

SEMICONDUCTOR SPECIALISTS, INC., 538 Alpha Dr., 15238, (412) 781-8120, TWX: 710-664-4285, Branch Mgr.: P. Del Palazzo

SHERIDAN SALES CO., 1717 Penn Ave., Suite 5009, 15221, (412) 244-1640, Branch Mgr.: D. L. Coster

SOUNDWORLD, 2967 W. Liberty Ave., 15216, (412) 563-4747, Contact: J. Mangano

SOUNDWORLD, Allegheny Center Mall, Terrace Level, 15212, (412) 322-4220, Contact: W. Haus

SOUNDWORLD, 6027 Broad St. Mall, 15206, (412) 363-1400, J. Cosnotti

PLYMOUTH MEETING
TECHNI-TOOL, Apollo Rd., (215) 825-4990

POTTSTOWN
BARBEY ELECTRONICS, 157 N. York St., 19464, (215) 326-0702, Branch Mgr.: R. Heiser

READING
ALLIED ELECTRONICS, 333 N. Fourth St., 19603, (215) 376-7451

BARBEY ELECTRONICS, 333 N. 4th St., 19603, (215) 376-6116, Inside Sls. Contact: K. Wallace

ROCHESTER
RADIO PARTS CO., 165 Brighton Ave., 15074, (412) 775-0552, Contact: O. Payne

ST. MARY'S
B. & R. ELECTRIC CO., 26 Railroad St., 15857, (814) 834-2814, Inside Sls. Contact: L. J. Bauer

SCRANTON
NORTHEASTERN SOUND SYSTEMS, 830 Cedar Ave., 18505, (717) 961-0671, Pres.: J. M. Eagen, Jr.

PURSELL ELECTRONICS, 1221-37 N. Washington Ave., 18509, (717) 346-2011, Inside Sls. Contact: L. V. Larue

ROTELL, A. J., 1889 E. State St., 16146, (412) 981-5252

RPC ELECTRONICS, 1700 E. State St., 16147, (412) 346-5558, Contact: L. Gould

SHARON
SHARON ELECTRONICS SUPPLY, 1336 E. State St., 16147, Inside Sls. Contact: H. Anderson

SHAVERTOWN
ARTCO ELECTRONICS, Back Mountain Shopping Center, 18708, (717) 675-2654, Branch Mgr.: S. Robinson

STATE COLLEGE
UNIVERSITY ELECTRONICS, 258 Beaver St., 16801, (814) 238-3093, Branch Mgr.: R. Smeal

ROSEN

ELECTRONICS INC.

WHOLESALE DISTRIBUTORS

IN THE FIRST CAPITAL
OF THE UNITED STATES
YORK, PENNSYLVANIA
215 SOUTH GEORGE ST.



SEMICONDUCTORS

IN STOCK AT
OEM PRICES

PHONE: (717) 843-7881

HARRISBURG BRANCH
1323 NORTH FRONT ST.
PHONE: (717) 232-9966

TREVOSE
HALL-MARK ELEC. CORP., Box 125, (215) 355-7300

TREVOSE ELECTRONICS, 4033 Brownsville Rd., 19047, (215) 357-1400, Inside Sls. Contact: P. Funk

UNIONTOWN
STATE ELECTRONICS CO., 60 W. Fayette St., 15401, (412) 437-6110, Branch Mgr.: D. Fullem

TV & RADIO PARTS CO., SOUNDWORLD, 19 W. Fayette St., 15401, (412) 437-7551, Contact: M. Weinberg

WEST CHESTER
WESTCHESTER ELECTRIC SUPPLY, 716 E. Market St., 19380, (215) 696-7500

WILKES BARRE
SHELBORNE ELECTRONICS, 169 N. Pennsylvania Ave., 18701, (717) 825-3455, Branch Mgr.: G. Gracely

WALLCO, INC., 53-55 E. Jackson St., 18701, (717) 823-6181, Inside Sls. Contact: C. S. Ferguson

WILLOW GROVE
TECHNICO, INC., 1525 Linden Ave., 19090, (215) 674-3858, Branch Mgr.: J. McDonald

WYNNNEWOOD
STINSON ASSOC., 50 E. Wynnwood Rd., 19096, (215) 896-7378, Mktg. Mgr.: J. T. Stinson

YORK
CCB ELECTRONICS, 2525 E. Market St., 17402, (717) 757-1312, Inside Sls. Contact: C. C. Beste

CUMBERLAND ELECTRONICS, 1748 6th Ave., 17405, (717) 848-1511, Branch Mgr.: S. Shade

J. R. S. DISTRIBUTORS, INC., 646 W. Market, 17404, (717) 854-8624, Inside Sls. Contact: J. Strauss

ROSEN ELECTRONICS, INC., 215 S. George St., 17403, (717) 843-7881, Inside Sls. Contact: B. Landis

PUERTO RICO

SAN GERMAIN
CRAMER/PUERTO RICO, Box 226, 00753, (809) 892-1130, TWX: 002-2025, Branch Mgr.: P. Carrasquillo

SAN JUAN
AMATEUR RADIO CENTER, 1571 Americo Miranda, 00907, (809) 782-9990, Inside Sls. Contact: W. Dirk

RHODE ISLAND

CRANSTON
JABBOUR ELECTRONICS, 1744 Cranston St., 02920, (401) 944-2570, Inside Sls. Contact: J. Jabbour

EAST GREENWICH
E.I.L. INSTRUMENTS, INC., 99 Frenchtown Rd., 02818, (401) 885-1773, Branch Mgr.: E. H. Buckman, Jr.

LINCOLN
ADAMS-MCGREGOR, INC., 66 Lakeview Rd., 02865, (401) 726-1300, Sls. Mgr.: B. B. Adams

PAWTUCKET
JABBOUR ELECTRONICS, 20 Woodbine St., 02860, (401) 722-3241, Branch Mgr.: D. Dargy

NEW ENGLAND ELECTRIC SUPPLY, 265 Pine St., 02862, (401) 725-7400, Inside Sls. Contact: P. Gallagher

PROVIDENCE

DANDRETA, W. & CO., 28 Wolcott St., 02908, (401) 861-2800, Inside Sls. Contact: J. Lombardi
GERTZ INC., 166 Broadway, 02903, (401) 272-3350, Inside Sls. Mgr.: N. Gertz

WARWICK

EDWARDS, W. H., CO., 55 Electronics Dr., 02888, (401) 781-8000

SOUTH CAROLINA

ANDERSON
BROOKSHIRE ELECTRONICS, 1314 S. Murray Ave., 29621, (803) 225-0567, Inside Sls. Contact: J. Hampton
DIXIE RADIO SUPPLY CO., 1206 S. Murray St., Box 176, 29621, (803) 226-3421, Branch Mgr.: C. T. Proppes

BENNETTSVILLE

ESSEX INTERNATIONAL, INC., Gibson Hwy., 29512, (803) 479-6211

CHARLESTON

RADIO LABS, 475 E. Bay St., 29403, (803) 723-3882, Mktg. Mgr.: S. Baumrind
WHOLESALE RADIO SUPPLY, (803) 747-9672

CHESTER

ESSEX INTERNATIONAL, INC., York Rd., 29706, (803) 377-3111

COLUMBIA

DIXIE RADIO SUPPLY CO., INC., 1900 Barnwell St., Box 48, 29202, (803) 253-5333, Inside Sls. Contact: G. Cromer
SHAKESPEARE INDUSTRIAL FIBERGLASS DIV., Box 246, 29202, (803) 779-5800, Telex: 57-3421, Inside Sls. Contact: R. Scott

FLORENCE

DIXIE RADIO SUPPLY CO., 531 E. Palmetto St., Box 1499, 29501, (803) 669-8201, Branch Mgr.: L. Sprouse
J & M SUPPLY CO., 701 Day St., Box 1482, 29501, (803) 662-7281, Inside Sls. Contact: C. W. Ham

GREENVILLE

BLACK ELECTRICAL SUPPLY — Electron Div., 203 Westfield St., 29602, (803) 233-4142, Inside Sls. Contact: H. White, C. Edwards
CAROLINA ELECTRONIC SUPPLY CO., 1015 Lowndes Hill Rd., 29602, (803) 239-4274, Branch Mgr.: A. Watson
DIXIE RADIO SUPPLY CO., 500 Pendleton St., Box 46, 29602, (803) 232-5357, Branch Mgr.: J. Edwards
HAMMOND ELECTRONICS OF CAROLINA, INC., Box 2308, 100 Augusta St., 29602, (803) 233-4121, Br. Mgr.: A. Clark

GREENWOOD

DIXIE RADIO SUPPLY CO., 116 Circular St., 29646, (803) 229-4954, Branch Mgr.: C. McAtee

SPARTANBURG

DIXIE RADIO SUPPLY CO., 208 E. St. John St., Sta. A, Box 2746, 29301, (803) 583-3681, Branch Mgr.: R. Belk

SUMTER

DIXIE RADIO SUPPLY CO., 25 Guignard St., 29150, (803) 775-2306, Branch Mgr.: S. Calcutt

SOUTH DAKOTA

MITCHELL

ELECTRONIC SUPPLY CO., 119 E. 1st Ave., 57301, (605) 996-4300, Inside Sls. Contact: M. Pooley

RAPID CITY

BLACK HILLS ELECTRONIC SUPPLY, 1018 Jackson Blvd., 57701, (605) 343-2093, Mktg./Adv. Mgr.: B. Livermore

SIOUX FALLS

WARREN SUPPLY CO., 196 E. 6th, 57102, (605) 336-1830, Inside Sls. Contact: G. Aikens

WEST COLUMBIA

STANDARD DISTRIBUTORS, 29169, (803) 796-0350

TENNESSEE

BRISTOL

SHIELDS ELECTRONICS SUPPLY INC., 830 W. State St., 37620, (615) 764-0157, Br. Mgr.: R. W. Shields

CHATTANOOGA

CURLE ELECTRONICS INC., 1813 So. Market St., 37408, (615) 266-4728, Inside Sls. Contact: J. Deffenbaugh
SHIELDS ELECTRONICS SUPPLY INC., 1817 Dadds Ave., 37404, (615) 624-0071, Br. Mgr.: C. Henamerlein
SPECIALTY DISTRIBUTING CO., 1313 Central Ave., 37402, (615) 267-9460, Branch Mgr.: N. Ingle

CLARKSVILLE

RANDOLPH, HALE & MATTHEWS, INC., 25 Crossland Ave., 37040, (615) 647-2325, Gen. Sls. Mgr.: F. W. Matthews

COOKEVILLE

RANDOLPH & PARKS, 2nd & Oak Sts., 38501, (615) 526-6184, Gen. Sls. Mgr.: H. Hale

DYERSBURG

WARREN RADIO CO., Hwy. 51 N., 38024, (901) 285-3850

JACKSON

LAVENDER ELECTRONICS, INC., 249 E. Deaderick St., 38301, (901) 422-6585, Store Mgr.: K. Stovall
RUSH CO., INC., L. K., Box 1408, 425-29 N. Royal St., 38301, (901) 422-6533, Inside Sls. Contact: L. K. Rush

JOHNSON CITY

FRECK RADIO & SUPPLY CO., 1611 Market St., 37601, (615) 928-6595, Branch Mgr.: L. Edwards

KINGSFORD

RADIO ELECTRIC SUPPLY CO., 961 E. Sullivan St., 37662, (615) 247-8111, Gen. Sls. Mgr.: J. Sullivan

KNOXVILLE

BONDURANT BROS. CO., 906 Sevier Ave., Box 2069, 37901, (615) 577-0473
CROW CO., L. M., 228 Engert Rd., (205) 629-5475
INDUSTRIAL ELECTRONICS INC. Gov. John Sevier Hwy., Box 9120, 37920, (615) 573-7135
SHIELDS ELECTRONIC SUPPLY OF KNOXVILLE, INC., 704 N. Central Ave., 37917, (615) 524-7338, Inside Sls. Contact: J. Kiger

MEMPHIS

BLUFF CITY DISTRIBUTOR CO., 234 East St., 38104, (901) 725-9500, Inside Sls. Contact: M. Donahue
BROWNELL ELECTRO INC., 3053 Tranquility Dr., 38116, (901) 332-9254, Branch Mgr.: D. Greene
CENTRO, INC., Box 7311, (901) 526-0518
ELECTRONIC SALES, Box 352, (615) 577-0689
ENGELMAN CO., A., 3434 Henry Ave., 38122, (901) 458-6263, Mktg. Mgr.: A. Engelman
ESSEX INTERNATIONAL, INC., 2172 Wharf St., Box 13006, 38113, (901) 948-0764
LAVENDER ELECTRONICS, INC., 180 So. Cooper St., 38104, (901) 276-2756, Store Mgr.: D. Cox
POWER & TELEPHONE SUPPLY CO., 2690 Yale Ave., 38112, (901) 324-8811
SOUND SERVICE CO., 62 S. Cooper St., 38104, (901) 276-1914, Inside Sls. Contact: R. Rork
UFFER, F. G. & CO., 1318 Madison Ave., 38104, (901) 275-6743, Mktg./Adv. Mgr.: F. G. Uffer
WARREN RADIO CO., 190 S. Cooper, 38104, (901) 274-2460
WRIGHT & CO., J. V., 3837 Marston Rd., (901) 362-8344

MORRISTOWN

MORRISTOWN ELECTRONIC SUPPLY, 425 S. Cumberland, 37814, (615) 581-1241, Branch Mgr.: W. Mize

NASHVILLE

BRAID ELECTRIC CO., 1100 Demonbreun St., 37203, (615) 242-6511, Mktg./Adv. Mgr.: R. V. Jarratt
BROWNELL ELECTRO INC., 150 Acorn Dr., 37210, (615) 889-8230, Branch Mgr.: R. Henslee
ELECTRA DIST. CO., 1914 West End Ave., 37203, (615) 329-3971, Gen. Sls. Mgr.: R. D. Sowell, Ind. Sls. Mgr.: S. Bennett
RANDOLPH & RICE, INC., Box 1149, 1213 McGavock St., 37203, (615) 255-5601, Inside Sls. Contact: R. Vandergelf

PARIS

LAVENDER ELECTRONICS, INC., 705 West Wood, 38242, (901) 642-7354, Store Mgr.: B. Jewell

TEXAS

ABILENE

R & R ELECTRONICS SUPPLY, 1441 Butternut, 79604, (915) 677-2974, Branch Mgr.: K. Deatherage

ADDISON

COMPUTER COMPONENTS CORP., 732 Wiley Post Rd., (214) 239-0271

AMARILLO

ELECTRONIC WHOLESALE, INC., 1005 W. 8th St., 79101, (806) 376-5373, Mktg. Mgr.: J. Pope
R & R ELECTRONICS SUPPLY, 914 W. 7th, 79105, (806) 374-2865, Branch Mgr.: W. D. Davis
TECH SPRAY, INC., Box 949, 79105, (806) 372-8523, Inside Sls. Contact: P. Gunzelman
TRICE WHOLESALE ELECTRONICS CO., 1014 W. 6th St., 79105, (806) 372-5668, Mgr.: C. Calloway

AUSTIN

C & M ELECTRONICS, INC., 5213 Bruning, 78751, (512) 451-6595, Inside Sls. Contact: G. Ward
ELECTROTEX, 914 W. 12th St., 78703, (512) 476-7644, Branch Mgr.: G. Neilson
HALL-MARK ELECTRONICS, 3100-A Industrial Terr., 78758, (512) 837-2814
HARGIS-AUSTIN, INC., 410 Baylor St., 78703, (512) 478-6619, Gen. Sls. Mgr.: P. Hargis
PREFERRED ELECTRONICS, INC., 806 Capitol Ct., 78756, (512) 454-5158, Inside Sls. Contact: S. Hunter
SCHWEBER ELECTRONICS, 2628 Longhorn Blvd., 78758, (512) 937-2890
TEXAS INSTRUMENTS SUPPLY CO., Box 2909, 2601 N. Lamar, 78767, (512) 258-1636

BEAUMONT

ELECTROTEX, 1275 S. 11th St., 77701, (713) 838-6421, Branch Mgr.: B. Matza
MARINE & INDUSTRIAL ELECTRIC, (713) 835-2517
RALPH'S INDUSTRIAL ELECTRONICS, 1293 Broadway, 77704, (713) 833-9443, Branch Mgr.: H. Lindsey

BELLAIRE

TELE RADIO, INC., 5202 Bissonnet Ave., 77401, (713) 666-2481

BORGER

TRICE WHOLESALE ELECTRONICS CO., 500 W. Third, 79006, (806) 274-5281, Mgr.: E. Bland

BROWNSVILLE

BROWNSVILLE RADIO ELECTRONICS, 311 E. 12th St., 78520, (512) 546-4511, Branch Mgr.: G. Dennett

CORPUS CHRISTI

DOUGLAS ELECTRONICS, 1118 S. Staples, 78404, (512) 883-5103, Inside Sls. Contact: R. N. Douglas
ELECTROTEX, 4019 Bret, 78411, (512) 854-5306, Branch Mgr.: G. Malik
NUNN ELECTRIC SUPPLY CO., (512) 884-0341
WICKS RADIO EQUIPMENT, 443 S. Staples, 78401, (512) 884-8285, Inside Sls. Contact: J. Castleberry

DALLAS

ADLETA ELECTRONICS CO., (214) 741-3151
ALL-STATE O.E.M. DIV. OF SUMMERS ELECTRIC, 510 So. Good-Latimer Exp., 75226, (214) 651-0242, Inside Sls. Contact: J. Worley

ASSOCIATED AIRCRAFT SUPPLY CO., 5021 W. Jefferson Blvd., 75233, (214) 331-4381, Sls. Contact: M. D. Bernard
BEARING CHAIN & SUPPLY, 1630 Prudential Dr., 35461, (214) 631-8310

BUFFALO ELECTRIC CO., (214) 421-7671
COMPONENT SPECIALTIES, 2560 Electronics Lane, (214) 357-4576

CRAMER/TEXAS, 2970 Blystone La., 75220, (214) 350-1355
DALLAS INSTRUMENT CO., 10205 Plano Rd., 75238, (214) 341-2990

DAVIS & CO., J. W., 9212 Denton Dr., 75235, (214) 352-8405, Inside Sls. Contact: J. M. Harrie

DUNBAR ASSOC., Box 30511, 75230, (214) 239-7151
E. C. VIDEO, 2613 Goss, 75201, (214) 745-1292, Branch Mgr.: W. Jackson

ELECTRO HARDWARE CO., Box 35625, 75235, (214) 357-5713, Inside Sls. Contact: J. Clifford
ELECTRONIC CENTER INC., 2929 N. Haskell, 75204, (214) 526-2023, Branch Mgr.: A. Markwardt
ESSEX INTERNATIONAL, INC., 2801 Pierce St., 75233, (214) 339-9333

HALL-MARK ELECTRONICS CORP., 9333 Forest La., 75231, (214) 231-5101, TWX: 910-867-4721, Dir. Mktg.: J. Semmer

HAMILTON/AVNET, 4445 Sigma Rd., 75240, (214) 661-8661, TWX: 910-861-9028, Branch Mgr.: D. Duree

H & D DISTRIBUTORS, 6211 Denton Dr., (214) 351-6478
HERRINGTON, K. C., 11422 Harry Hines Blvd., 75229, (214) 241-6783, Branch Mgr.: K. Herrington

INTERSTATE ELECTRIC CO., 4500 Alpha Rd., 75234, (214) 233-5757, Branch Mgr.: C. B. Henry

KA ELECTRONIC SALES, 1220 Majesty Dr., 75247, (214) 334-7870, Inside Sls. Contact: B. Kirkwood
MARSHALL INDS., 14205 Proton, 75240, (214) 233-5200, Branch Mgr.: D. Phillips

MILL-TRONICS, Box 34028, 78421, (214) 661-5002
NORVELL ELECTRONICS, INC., 10210 Monroe Dr., 75229, (214) 350-6771, TWX: 910-861-4512, Inside Sls. Contact: J. Collard

NEWARK ELECTRONICS, Box 38299, 75238, (214) 271-2511

POWELL ELECTRONICS, 2860 Walnut Hill La., 75229, (214) 350-5186, TWX: 910-861-4094, Branch Mgr.: C. McCormack

R & R ELECTRONIC SUPPLY CO., 2103 Irving Blvd., 75207, (214) 742-1431

RAVE I, 3131 Stemmons Fwy., (214) 638-6575
REESE ASSOC., W., 3131 Stemmons Fwy., 75247, (214) 638-6575, TWX: 1-910-861-4274

ROBERTSON, INC., E. B., 1339 Plozman Ave., 75203, (214) 942-2716, TWX: 910-861-4357, Inside Sls. Contact: R. Brown

SCHWEBER ELECTRONICS, 14177 Proton Rd., 75240, (214) 661-5010

SEMICONDUCTOR SPECIALISTS, INC., 9990 Monroe Dr., 77220, (214) 358-5211, TWX: 910-861-4511, Branch Mgr.: R. Liebke

SOLID STATE ELECTRONICS CO. OF TEXAS, 2643 Manana Dr., 75220, (214) 352-2601, TWX: 910-861-4394, Gen. Sls. Mgr.: M. A. Hargrave

SOUTHERN TELEPHONE SUPPLY CO., 8608 Sovereign Row, 75247, (214) 631-5340

SPECIALIZED PRODUCTS CO., 2324 Short Crest Dr., 75235, (214) 358-4663

STERLING ELECTRONICS, 2875 Merrell Rd., 75229, (214) 357-9131, Branch Mgr.: E. Jantzen

TI SUPPLY CO., 6000 Denton Dr., 75235, (214) 238-6972, Inside Sls. Contact: Ray Wells
VIDEO SYSTEMS, INC., 3817 Ross Ave., 75204, (214) 823-4890, Inside Sls. Contact: E. L. McConathy

WEATHERFORD, R. V. CO., 10836 Grissom La., 75229, (214) 243-1571, TWX: 910-860-5544, Branch Mgr.: K. Coleman
WHOLESALE ELECTRONIC SUPPLY, INC., Ross at Central Expwy., 75201, (214) 824-3001, Sls. Contact: L. Blaylock
WILKINSON BROS. CO., 2406 Ross Ave., 75201, (214) 747-1571, Inside Sls. Contact: D. McReynolds

KA ELECTRONIC SALES

1220 MAJESTY DR
DALLAS, TEXAS 75247

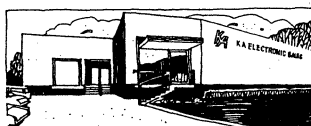


214-634-7870

TWX 910-861-9028

FRANCHISED STOCKING LINES

Alco	Miconics
Alpha	Micro-Plastics
American Switch	J.W. Miller
Arco	Nobex
Bud Radio	Nytronics
Bussman	Pomona
Callins	Premier
Chicago Miniature	Projects Unlimited
Chomerics	Sakata
Circuit-Stik	Sanken
Columbia	SGS-ATES
Continental Specialties	Shurite
Cornell Dubilier	Silicon General
Edsyn	Siltex
Emico	H.H. Smith
General Instrument	Stancor
Hamlin	Stewart Warner
Hutson	Tech Spray
ICC	Texas Capacitor
Inter-Market	Triplet
Intra-Fab	Tung-Sol
F.F. Johnson	Unger
Kepro	Vector
Keystone	Vero
Littlefuse	Weber
Mallory	Waldom



WILKINSON BROS. CO., 628 Centre St., 75207, (214) 941-0361, Branch Mgr.: K. M. Frasier

DEER PARK
METRIC RESOURCE CORP., 5010 Luella, 77536, (713) 479-8461

DENISON
DENISON RADIO SUPPLY, 426 W. Woodard St., 75020, (214) 465-2336, Ind. Sls. Mgr.: C. Hardy

EL PASO
BARR RADIO EL PASO, 6933 Alameda, 79915, (915) 778-2890

FRONTERA ELECTRONICS CO., 801 Myrtle Ave., 79901, (915) 542-0301, Gen. Sls. Mgr.: A. Arriola

HOWELL ELECTRONICS, INC., 2873 Pershing Dr., 79903, (915) 566-3968, Inside Sls. Contact: E. Howell

MCNICOL, INC., 3012 E. Yandell, 79903, (915) 566-2936, Sls. Mgr.: R. Fryman

MIDLAND SPECIALTY CO., 2235 Wyoming Ave., 79903, (915) 533-9555, Inside Sls. Contact: M. Romo

R & R ELECTRONIC SUPPLY CO., 2631 E. Yandell Dr., 79903, (915) 566-9693, Branch Mgr.: R. West

SUNLAND SUPPLY CO. INC., (915) 533-5901

FORT WORTH
ADLETA ELECTRONICS CO., (817) 336-7446

ALLIED ELECTRONICS, 401 East 8th St., 76102, (817) 336-5401, Branch Mgr.: C. Grey

DYNAREPS, Box 8446, (817) 451-1392

INDUSTRY ELECTRONIC SUPPLY, 1818 E. Dagget Ave., (817) 531-2861

PATCO CO., 6100 Camp Bowie Blvd., (214) 264-3491

PATCO SUPPLY, Box 12625, (817) 738-2394

SWISCO INC., 1518 East Lancaster, 76101, (817) 335-6521, TWX: 910-893-4078, Inside Sls. Contact: J. Simms

TEXTRONICS, INC., 1108 E. Lancaster, 76102, (817) 335-8111

TRICE WHOLESALE ELECTRONICS CO., 100 S. Freeway, 76104, (817) 335-9515, Mgr.: S. Storey

WHOLESALE ELECTRONIC SUPPLY, 550 S. Freeway, 76104, (817) 336-0461, Branch Mgr.: D. Garlington

GARLAND
ELECTROLOT, 3529 Asset St., (214) 341-8311

HISCO ELECTRICAL INSULATION, 3710 Marquis Dr., 75042, (214) 272-5411, Branch Mgr.: D. VanMeter

KIERULFF ELECTRONICS, INC., 2815 National Dr., 75041, (214) 271-2471, TWX: 910-860-5184, Mgr.: B. Wilson

METERMASTER, 2809 National Dr., 75041, (214) 271-5671, TWX: 910-860-5184, Mgr.: K. Coleman

NEWARK-DALLAS ELECTRONICS, 707 Easy St., 75042, (214) 271-2511, Branch Mgr.: K. Noland

TUCKER ELECTRONICS CO., 1717 S. Jupiter Rd., 75040, (214) 348-8800, Inside Sls. Contact: C. Acilin

GREENVILLE
LAVENDER ELECTRONICS, INC., 2311 Washington St., 75401, (214) 455-4360, Store Mgr.: T. Green

HOUSTON
ALLESKO, 7313 Ashcroft, Suite 204, (713) 771-0115

ALTAR CO., 9501 Baythorne (713) 462-3029

ANGIE ELECTRONICS SUPPLY CO., Box 8453, 77004, (713) 222-6386, Gen. Sls. Mgr.: A. Angie

BUFFALO ELECTRIC CO., (713) 228-4431

COMPLETE READING ELECTRIC, 903 Sampson St., 77003, (713) 224-5731

COMPONENT SPECIALTIES, 7313 Ashcroft, (713) 771-7237

ELECTRICAL INST. & METER CO., 1424 Westheimer St., 77006, (713) 526-6871, Inside Sls. Contact: J. Mendez

ELECTROTEX, 2300 Richmond Ave., 77006, (713) 526-3456, Sls. Mgr.: C. Land, Inside Sls. Contact: D. R. Simon

Branch Mgr.: W. Kennedy

ELECTROTEX, 8540 Winkler Dr., 77017, (713) 941-7016, Branch Mgr.: D. Brownstein

ELECTROTEX, 4435 Airline Dr., 77024, (713) 695-6851, Branch Mgr.: W. Kennedy

ESSEX INTERNATIONAL, INC., 1050 Penner, 77055, (713) 869-5067

GEOPHYSICAL SUPPLY CO., Box 52230, 77052, (713) 224-0521, Sls. Mgr.: S. Nachlas

HALL-MARK/HOUSTON, Box 42190, (713) 781-6100, TWX: 910-881-2711, M. Kuithe

HAMILTON/AVNET - HOUSTON, 1216 W. Clay, 77019, (713) 526-4661, Branch Mgr.: W. Simpson

HARRISON EQUIPMENT CO. INC., 1616 McGowen St., 77004, (713) 224-9131, TWX: 910-881-2601, Mktg. Mgr.: J. C. Robinson

HISCO ELECTRICAL INSULATION, 1815 Dallas St., 77003, (713) 228-6662, Inside Sls. Contact: S. Skonnord

JONES & CO., A., 1415 W. Loop N., 77055, (713) 688-0341, Mktg. Mgr.: J. T. Baskerville

LENERT CO., 1420 Hutto, 77001, (713) 225-1465

NAPCO FASTENER CO., Box 55586, 11260 Hempstead Hwy., 77055, (713) 688-2521

NEWARK ELECTRONICS, 6902 Harwin Dr., 77036, (713) 782-4800

NORVELL ELECTRONICS, INC., 6440 Hillcroft Ave., 77036, (713) 774-2568, TWX: 910-881-2560, Branch Mgr.: L. Arcement

NUNN ELECTRIC SUPPLY CORP., (713) 928-5511

RALPH'S INDUSTRIAL ELECTRONICS, 4400 Wayside Dr., 77017, (713) 641-0267, Branch Mgr.: G. Haggard

RALPH'S OF AFAFETTE, 4400 S. Wayside Dr., 77017, (713) 641-0267

REESE ASSOC., W., 4151 Southwest Fwy., Suite 130E, 77027, (713) 621-3134

ROBERTSON, INC., E. B., 6362 Windswept St., 77027, (713) 785-6800, TWX: 713-571-1079, Branch Mgr.: J. Schlundt

SCHWEBER ELECTRONICS, 7420 Harwin Rd., 77036, (713) 784-3600

SOLID STATE ELECTRONICS CO. OF TEXAS, Box 36849, 77036, (713) 785-5431, TWX: 910-881-6289, Branch Mgr.: J. Edwards

STERLING ELECTRONICS, 4201 S.W. Freeway, 77027, (713) 623-6600, Gen. Sls. Mgr.: B. Turner

SUMMERS ASSOC., M. R., Box 20487, 77025, (713) 524-7800, Mktg. Mgr.: M. R. Summers

TI SUPPLY CO., 3939 Ann Arbor Dr., 77042, (713) 785-4800, Branch Mgr.: K. Trusky

WEATHERFORD, R. V., CO., 3500 West T. C. Jester Blvd., 77018, (713) 688-7406, TWX: 910-881-6222, Branch Mgr.: D. Cides

WOFORD ELECTRONIC PARTS CO., 7537 Edna St., 77017, (713) 644-1830, Inside Sls. Contact: T. Holley

WYLDs CO., W., 9135 Katy Rd., Suite 3, 77024, (713) 467-0072

IRVING
DARCO OF TEXAS, INC., 630 E. 2nd St., 75060, (214) 259-3714, Inside Sls. Contact: V. Moreau

EDCO ELECTRONICS, 710 Plymouth Park Center, 75061, (214) 259-7544, Inside Sls. Contact: R. Reynolds

ELECTROTEX, 3417 E. John Carpenter Fwy., 75060, (214) 259-4510, Branch Mgr.: G. Jones

KILLEEN
L & M WHOLESALE ELECTRONICS, 709 N. 8th St., 76541, (817) 634-5321, Inside Sls. Contact: L. Castens

LA MARQUE
ELECTROTEX, 216 Byrd St., 77568, (713) 938-1376, Branch Mgr.: J. Herod

LONGVIEW
INTERSTATE ELECTRONIC CO., 418 E. Nelson St., 75601, (214) 753-5526, Br. Mgr.: O. Smith

WHOLESALE ELECTRONIC SUPPLY, 203 South High, 75601, (214) 757-3961, Branch Mgr.: V. Moore

LUBBOCK
ELECTRONIC WHOLESALE, INC., 2514 34th St., 79410, 1-806-795-0656, Branch Mgr.: D. Shivers

ESSEX INTERNATIONAL, INC., 6808-C Cedar Ave., 79404, (806) 747-1633

R & R ELECTRONIC SUPPLY CO., P.O. Box 1860, 79408, (806) 765-6439, Inside Sls. Contact: J. Williams

R & R SUPPLY CO., 1607 Ave. G., 79041, (806) 765-7727

TRICE WHOLESALE ELECTRONICS CO., 1812 Ave. Q, 79403, (806) 747-2888, Mgr.: C. Kelley

LUFKIN
ELECTROTEX, 430 Atkinson Dr., 75901, (713) 632-4409, Branch Mgr.: G. Henson

MCALLEN
McAllen Radio Electronics, INC., 401 S. Broadway, 78501, (512) 682-2412, Sls. Mgr.: J. M. Ochoa, Jr.

RIO RADIO SUPPLY, INC., P.O. Box 1808, 78501, (512) 682-5224, Inside Sls. Contact: F. H. Bergh

MIDLAND
R & R ELECTRONIC SUPPLY CO., 2404 Wall, 79701, (915) 682-0535, Branch Mgr.: A. Wemple

TRICE WHOLESALE ELECTRONICS CO., 1907 W. Industrial, 79701, (915) 563-0866, Mgr.: E. Leps

ODESSA
MIDLAND SPECIALTY, 2101 Andrews Hwy., 79760, (915) 373-7365, Br. Mgr.: F. Boutin

R & R ELECTRONIC SUPPLY CO., 300 E. 23rd, 79760, Branch Mgr.: L. Wilhelm

PARIS
ELECTRO HARDWARE CO., Box 876, 75460, (214) 785-4544, Branch Mgr.: E. W. Wilson

LAVENDER ELECTRONICS, INC., 274 S. Main., 75460, (214) 785-1711, Store Mgr.: J. E. Evers

PASADENA
ANGIE ELECTRONICS SUPPLY CO., 609 E. Harris St., 77502, (713) 473-4428, Branch Mgr.: J. Klawinsky

TECH-QUIP, INC., Box 6191, (713) 473-2891

PORT ARTHUR
TEXAS ELECTRONICS, 1236 7th, 77640, (713) 983-4717

RICHARDSON
AIR QUIP SALES, 909 Business Pky., (214) 234-3285

ALTAR CO., 405 N. Plano Rd. (214) 231-5166

AMTEX ELECTRIC, 75080, (214) 637-1310

PRIME DISTRIBUTOR CO., (214) 231-0170

SOUTHWEST ELECTRONICS INC., 1101 Executive Dr. E., 75080, (214) 234-3050, Branch Mgr.: C. D. Roberts

SUMMERS ASSOC., M. R., 777 N. Central Expwy., 75080, (214) 234-3600, Branch Mgr.: F. Wolk

TRICE WHOLESALE ELECTRONICS CO., 1403A S. Floyd Rd., Box 698, 75080, (214) 690-4646, Mgr.: J. Forner

SAN ANTONIO
BECKWITH ELECTRONIC ENGINEERING CO., 110 W. Rhapsody, Box 34234, 78216, (512) 342-9561, Mktg. Mgr.: J. Beckwith

ELECTROTEX, 1200 W. Hilbrand, 78201, (512) 735-9271, Branch Mgr.: W. Neir

RADIO & TELEVISION PARTS CO., 1828 N. St. Mary's St., 78212, (512) 225-5329, Mktg. Mgr.: M. Chelkowski

SHERMAN ELECTRONICS SUPPLY, INC., 702 San Pedro, 78212, (512) 224-1001, Gen. Sls. Mgr.: L. Diltfurth

STERLING ELECTRONICS, (512) 735-9173

SHERMAN
LAVENDER ELECTRONICS, INC., 308 E. Houston St., 75090, (214) 892-9155, Store Mgr.: E. R. Smith

TRICE WHOLESALE ELECTRONICS CO., 308 S. Crockett, 75090, (214) 893-7421, Mgr.: S. Moore

STAFFORD
SOUTHWEST ELECTRONICS, INC., 12725 Royal Dr., 77477, (713) 494-6021, Inside Sls. Contact: J. Chavez, Jr.

TEXARKANA
McCULLOCH ELECTRONIC SUPPLY, 1222 Main St., 75501, (214) 792-6923, Inside Sls. Contact: B. R. Fergason

TEXAS CITY
ELECTRONIC SUPPLY CO., 1524 Texas Ave., 77590, (713) 945-4401, Sls. Mgr.: R. H. Bevelhymmer

TYLER
COLE ELECTRONICS, INC., 335 South Bonner, 75701, (214) 597-3545, Sls. Mgr.: M. R. Cole

LAVENDER ELECTRONICS, INC., 503 E. Oakwood, 75701, (214) 597-6315, Store Mgr.: W. Butler

VICTORIA
ELECTROTEX, 1007 N. Williams, 77901, (512) 573-6356, Branch Mgr.: G. Marshall

GIBSON SALES S. W., 4002 Houston Hwy., 77901, (512) 578-4323, Inside Sls. Contact: W. Gibson

LAVENDER ELECTRONICS, INC., 1005 N. Williams, 77901, (512) 575-4738, Store Mgr.: B. E. Dailey, Jr.

WACO
WHOLESALE ELECTRONIC SUPPLY, 1400 Washington, 76702, (817) 752-9252, Branch Mgr.: T. Calderon

WICHITA FALLS
R & R ELECTRONIC SUPPLY CO., 1911 9th St., 76301, (817) 322-0731, Branch Mgr.: L. Kilpatrick

TRICE WHOLESALE ELECTRONICS CO., 2100 9th St., 76301, (817) 322-2151, Mgr.: R. Stratford

WHOLESALE ELECTRONIC SUPPLY, 1508 11th, 76310, (817) 723-8106, Branch Mgr.: V. Culpepper

UTAH

MURRAY
KENEALY ASSOC., 4901 S. State, Suite C, 84107, (801) 268-3111

OGDEN
BALLARD SUPPLY CORP., 3109 Washington Blvd., 84401, (801) 394-5541, Branch Mgr.: J. Kershaw

CARTER SUPPLY CO., 3208 Washington Boulevard, 84401, (801) 393-8603, Inside Sls. Contact: F. Carter

PROVO
CENTRAL UTAH ELECTRONICS, 735 S. State St., Box N, 84601, (801) 373-7522, Gen. Sls. Mgr.: R. W. Moore

PRIZ-CO., 17 E. 200 North, (801) 377-5858

SALT LAKE CITY
ALLIED ELECTRONICS, 350 Pierpoint Ave., 84101, (801) 328-2075

ALTA-LAND ELECTRONICS, 2280 Main St., (801) 486-7227

BALLARD SUPPLY CORP., 33 E. 600 South, 84111, (801) 364-6541, Branch Mgr.: M. Mabey

BALLARD SUPPLY CORP., 2430 S. 900 West, 84119, (801) 486-3081, Inside Sls. Contact: J. Sherman

BINTZ, W. H., CO., 433 W. 3rd South, 84110, (801) 363-5821, Inside Sls. Contact: H. Bogenrief

CAPACITRONICS, 520 E. 4th South, 84102, (801) 363-4521, Inside Sls. Contact: T. Orton

CENTURY ELECTRONICS, 2150 S. 300 West, (801) 466-6000

CONTAL EQUIPMENT CO., (801) 487-7741

CRAMER/UTAH, 391 W. 2500 S., 84115, (801) 487-4131

ELECTRO MEDIA, 1225 Major St., 84111, (801) 521-4430, Inside Sls. Contact: D. Jones

EVANS SUPPLY INC., 509 W. 300 N., 84404, (801) 521-3420, Inside Sls. Contact: N. Fuller

HAMILTON/AVNET - SALT LAKE CITY, 647 W. Billinis Rd., 84119, (801) 262-8451, Branch Mgr.: D. Taugtes

INTERMARK ELECTRONICS, 63 E. Stratford Ave., 84115, (801) 486-3411

INTERMOUNTAIN APPLIANCE SUPPLY CORP., 925 So. West Temple, Box 1406, 84101, (801) 328-0505, Inside Sls. Contact: G. Wilson

KIMBALL ELECTRONICS, INC., 350 Pierpoint Ave., 84101, (801) 328-2075, Inside Sls. Contact: J. Cooper

MANWILL SUPPLY CO., 2780 S. Main, 84115, (801) 484-6114

NEWARK ELECTRONICS, 2540 S. 300 W., 84115, (801) 486-1048

O'LOUGHLIN'S RADIO SUPPLY, 115 E. 3rd S., 84111, (801) 355-7553, Inside Sls. Contact: H. O'Loughlin

STANDARD SUPPLY CO., 2256 6th South, 84110, (801) 355-2971, TWX: 910-925-5551, Inside Sls. Contact: J. Pfeiffer

VERMONT

BENNINGTON
COMM SOUND, 737 Main St., 05201, Inside Sls. Contact: L. Lariviere

INDUSTRIAL DISTRIBUTORS

SIMPSON-ELECTRIC • TRIPLETT

METERS

ZACK

ELECTRONICS

PALO ALTO, CA

415/326-5432 654 High St. 94301

SAN FRANCISCO, CA

415/626-1444 1444 Market St. 94102

TECHNICO

Division of ALLIED CONTROL SALES CORP.

YOUR
COMPLETE SOURCE FOR
TEXAS INSTRUMENTS
OPTO
DIODES
TRANSISTORS
IC'S

• SPECTROL

• KEMET

1404 BARE HILLS AVENUE
BALTIMORE, MD. 21209
PHONE: (301) 828-6416

WASH., D.C. VIRGINIA
NORTH VA. WATTS
202-638-4461 800-638-4721

**ALMAC/STROM
ELECTRONICS**

Division of Laser Link Corporation

MAIN OFFICE / WAREHOUSE
5811 Sixth Avenue South, Seattle, Wash. 98108

TEL: (206) 763-2300

SALES OFFICES
4475 S.W. Scholl's Ferry Road
Portland, Oregon 97225

TEL: (503) 292-3534

North 1511 Woodward, Spokane, Wash. 99206

TEL: (509) 928-0679

CALL SEATTLE TOLL FREE

WASHINGTON
800-552-0674
OREGON
IDAHO
NORTHERN CALIFORNIA
MONTANA
800-426-0370

BURLINGTON
RAY SUPPLY, INC., 204 Main St., 05401, (802) 864-7755
WILLISTON
RSL DISTRIBUTORS INC., 16 Commerce St., 05493, (802)
862-5771, Branch Mgr.: H. F. Skinner

VIRGINIA

ALEXANDRIA
CERTIFIED ELECTRONICS, 1313 Powhattan St., 22314,
(804) 548-5115
E.I.L. INSTRUMENTS, INC., Shirley Highway at Edsall Rd.,
22314, (703) 354-4330, Branch Mgr.: C. Hogshead
ARLINGTON
ARLINGTON ELECTRONIC WHOLESALERS, INC., 3636 Lee
Hwy., 22207, (703) 524-2412, Gen. Sls. Mgr.: W. L.
Wessells
SLYE ELECTRONICS, INC., R. 1203 N. Highland St., 22201,
(703) 525-7272, Tele.: 89-9481, Sls. Mgr.: H. R. Crow
TI SUPPLY CO., 1500 Wilson Blvd., 22209, (702) 524-
5885, Branch Mgr.: J. Alpaugh
CHARLOTTESVILLE
AUDIO WORLD LTD., Ivy Square, 22903, (804) 296-4203,
Branch Mgr.: B. L. Knote, Jr.
GRAVES ELECTRONICS INC., 1700 Allied St., 22901, (804)
296-0125, Mktg. Mgr.: H. W. Graves
MARKTRON, INC., 510 Berwick Ct., 22901, (804) 973-
5874, TWX: 710-828-0089, Branch Mgr.: D. J. Fowley, Jr.
PIEDMONT ELECTRIC SUPPLY CORP., 1150 Rose Hill Dr.,
22902, (703) 296-6167, Ind. Sls. Mgr.: O. H. Taylor
VIRGINIA RADIO SUPPLY CO., 715 Henry Ave., 22902,
(804) 296-4184, Inside Sls. Contact: E. R. Nix
FREDERICKSBURG
PIEDMONT ELECTRIC SUPPLY, 4800 Jefferson Davis Blvd.,
22401, (703) 373-1791, Branch Mgr.: S. Patton

GWYNN
ARNOLD CO., L. H., Box Drawer 9545, 23066, (804) 725-
7111

MANASSAS
PIEDMONT ELECTRIC SUPPLY, 8500 Euclid Rd., 22110,
(703) 361-4126, Branch Mgr.: D. Jenkins

NORFOLK
ELECTRONIC ENGINEERING CO., 1325 Ingleside Rd.,
23502, (703) 855-1086, Mktg. Mgr.: L. E. Guy
PRIEST ELECTRONICS, INC., 6431 Tidewater Dr., 23509,
(703) 855-2021, Inside Sls. Contact: C. Fulcher

PORTSMOUTH
DISTRIBUTORS, INC., 710 Country St., 23704, (804) 399-
2446, Sls. Mgr.: J. Moscovitz
ELECTRONICS UNLIMITED DISTRIBUTORS, INC. T/A, 710
County St., 23704, (804) 399-2446, Inside Sls. Contact:
J. Moscovitz

RICHMOND
AVEC ELECTRONICS CORP., 2002 Staples Mill Rd., 23230,
Inside Sls. Contact: W. Jenkins
COTTRELL ELECTRONICS, 408 E. Main St., 23219, (703)
648-8336
I.T.R., 1425 Blue Jay La., 23229, (804) 288-7198
JOBE & CO., 2508 Grenoble Rd., (804) 282-6508
MERIDIAN ELECTRONICS, 1001 W. Broad St., 23220, (703)
353-6648, Inside Sls. Contact: R. Rollins
MOLLEN'S INC., AUTO SOUND, 2003 Westmoreland Ave.,
23230, (804) 353-4477, Mktg. Mgr.: G. Newman

ROANOKE
BAKER, H. C., SALES CO. INC., 17-19 Franklin Rd., S.W.,
24011, (703) 344-9209, Inside Sls. Contact: W. W. Davis
HARTMAN, L., & SONS INC., 3236 Cove Rd., N.W., 24017,
(703) 366-3493, Inside Sls. Contact: R. H. Hartman
PEOPLES RADIO & TV SUPPLY CO., 1015 Moorman Rd.,
24017, (703) 342-8933, Inside Sls. Contact: T. Carroll

STAUNTON
PIEDMONT ELECTRIC SUPPLY, 323 N. Central Ave., 24401,
(703) 885-5186, Branch Mgr.: G. Robson

WASHINGTON

ABERDEEN
C. & G. ELECTRONICS, 401 W. Market, 98520, (206)
532-3531, Br. Mgr.: D. I. Scott

BELLEVUE
BELL INDUSTRIES, 1900 132nd N.S., 98005, (206) 747-
1515, TWX: 910-443-2482, Branch Mgr.: C. Wilson
HAMILTON/AVNET — SEATTLE, 13407 Northrup Way,
98005, (206) 746-8750, Branch Mgr.: K. Tweten
MARSHALL INDS., 1801 130th Ave., N.E., 98005, (206)
822-7718, Branch Mgr.: D. Wickstrom
PHILLIPS CO., J. E., Box 764, (206) 747-6538
RADAR ELECTRIC CO., 13321 Northrup Way, 98005, (206)
747-9653, TWX: 910-444-2052, Branch Mgr.: M. Harris
TESTCO, 10845 N.E. 8th, 98004, (206) 454-7422

BELLINGHAM
ADVANCED ELECTRONICS, INC., 98225, (206) 734-3400
SKAGIT-WHATCOM ELECTRONIC SUPPLY, INC., 204 1/2
Unity, 98225, (206) 733-4200, Branch Mgr.: D. Hunter

BREMERTON
C & G ELECTRONICS CO., 1301 Pacific, 98310, (206) 377-
5515, Br. Mgr.: J. R. Buffington

LONGVIEW
C & G ELECTRONICS CO., 820 Vandercook Way, 98632,
(206) 425-5540, Branch Mgr.: G. T. Hazen
JW ELECTRONICS, 731 Vandercook Way, 98632, (206)
425-6100, Branch Mgr.: B. Fuchs
PROGRESS ELECTRONICS, 852 Commerce Ave., 98632,
(206) 636-5100, TWX: 910-473-8602, Inside Sls. Con-
tact: D. Calhoun

MOUNT VERNON
SKAGIT-WHATCOM ELECTRONIC SUPPLY, INC., 620 W.
Division, 98273, (206) 336-3073, Gen. Sls. Mgr.:
E. Springer

OLYMPIA
C & G ELECTRONICS CO., 318 N. Capitol Way, 98502,
(206) 352-7593, Br. Mgr.: G. I. Bisset
JW ELECTRONICS, 2921 Pacific Ave., 98501, (206) 943-
1071, Inside Sls. Contact: J. Colman

RENTON
LABORATORY EQUIPMENT, 415 Rainier Ave. N., 98055,
(206) 772-1800, Branch Mgr.: R. Jones
LABORATORY EQUIPMENT, 350 Sunset Blvd. N., 98055,
(206) 228-2000, Inside Sls. Contact: G. Thrasher
METRIC RESOURCES CORP., 415 Rainier North, 98055,
(206) 228-2000

SEATTLE
ALMAC/STROM ELECTRONICS, 5811 6th Ave., S., 98108,
(206) 763-2300, TWX: 910-444-2067, V.P. & Gen. Mgr.:
J. Wandell
AMATEUR RADIO SUPPLY CO., 6213 13th Ave. S., 98108,
(206) 767-3222, Inside Sls. Contact: R. E. Aspinwall
ARVA, INC., 1320 Prospect St., 98109, (206) 622-0177,
TWX: 910-444-2022, Inside Sls. Contact: J. Quinn
CRAMER/SEATTLE, 5602 Sixth Ave., S., 98108, (206)
762-5755
EICHNER-RICHARDS CO., 2727 N.E. Blakeley St., 98105,
(206) 523-7888, Gen. Sls. Mgr.: J. D. Elcher
EMPIRE ELECTRONICS, 15220 First Ave., So., 98148,
(206) CH 4-5200, Gen. Sls. Mgr.: L. Stanley
ESSEX INTERNATIONAL, INC., 5501 First Ave. S., 98108,
(206) 763-8650

FAIRMAR B. LEE, Box 66099, (206) 244-7262
FIDELITY NORTHWEST, INC., 5301 Shilshole Ave. N.W.,
98107, (206) 748-9100, Gen. Sls. Mgr.: J. Lorette
INTERFACE ELECTRONICS CORP., 300 Second Ave., W.,
98119, (206) 285-3500, Inside Sls. Contact: A. Larson
INTERMARK ELECTRONICS, 621 S. Michigan St., 98108,
(206) 767-3160, TWX: 910-444-2054, Branch Mgr.: D.
Thorp

KAM ELECTRONICS, 1211 E. Denny Way, 98122, (206)
323-5100, TWX: 910-444-2154, Inside Sls. Contact: H.
Levinson

KIERULFF ELECTRONICS, INC., 5940 Sixth Ave., S.,
98108, (206) 763-1550, TWX: 910-444-2034, Branch
Mgr.: R. Brooks

MAGNETICS INTERNATIONAL SVC. CORP., 3631 Interlake
Ave. N., 98105, (206) 634-1227, Sls. Mgr.: A. B. Kritzer
MERRITT, R. CO., 1320 Prospect St., 98109, (206) 682-
7337, TWX: 910-444-2022, Inside Sls. Contact: T.
Vaughan

LIBERTY ELECTRONICS, 5305 Second Ave., 98108, (206)
763-8200, TWX: 910-444-1379, Branch Mgr.: C. M. Olson
PEPCO, (206) 325-2435
PHOTO & SOUND CO., 1205 N. 45th St., 98103, (206) 632-
8461, Mgr.: G. H. Larson

PRIEBE, R. E., CO., 2211 Fifth Ave., 98121, (206) 682-
8242, Inside Sales Contact: J. Hillary
RADAR ELECTRIC CO., 168 Western Ave. W., 98119, (206)
282-2511, TWX: 910-444-2052, Inside Sls. Contact:
T. Rockney

SEATTLE RADIO SUPPLY CO., 2117 Second Ave., 98121,
(206) 624-2345, Inside Sls. Contact: W. Reeves
SHANNON LTD., 655 South Orcas, 98108, (206) 763-0545,
Inside Sls. Contact: M. Granger

STERLING ELECTRONICS, 5608 Sixth Ave., S., 98108, (206)
762-9100, Branch Mgr.: R. Randall

WEATHERFORD, R. V., CO., 541 Industry Dr., 98188, (206)
243-6340, TWX: 910-444-2270, Branch Mgr.: R. Reagan

When you need
quality components like
ALLEN-BRADLEY
get the works from
CRAMER

cramer
CRAMER ELECTRONICS INC.

Our most important component is service.

WESTERN ELECTRONICS CO., 717 Dexter Ave., N., 98109, (206) 284-0200, Inside Sls. Contact: J. Yorisich
 WESTLAKE ELECTRONIC SUPPLY, INC., 415 Westlake Ave. N., 98109, (206) 514-2660
 VECTOR CORP., 2355 10th Ave. E., 98102, (206) 322-4343
 ZEPHER ELECTRONIC SALES CORP., 647 Industry Dr., (206) 242-2517

SPOKANE

ALMAC/STROM ELECTRONICS, N. 1511 Woodward, 99206, (509) 528-0679, Contact: S. Edison, Sls. Eng.
 HUPPIN'S, 421 W. Main Ave., 99201, (509) 747-6480, Inside Sls. Contact: A. Witherrall
 NORTHWEST ELECTRONICS, INC., Term. Box 3047, E. 730 First Ave., 99220, (509) 534-2644, Inside Sls. Contact: J. P. McGoldrick
 PRUDENTIAL DISTRIBUTOR, INC., 3303 E. Ferry, 99220, (509) 535-2300, Gen. Sls. Mgr.: D. Woehrlin

TACOMA

C & G ELECTRONICS CO., 2502 Jefferson Ave., 98402, (206) 272-3185, Gen. Sls. Mgr.: L. R. Norberg
 G & I ELECTRONICS, 3863 Stellacom Blvd. S.W., 98499, (206) 584-0332
 STEWART, A. T., CO., 711 Broadway, 98401, (206) 272-1112, Inside Sls. Contact: M. L. Coquillette
 WIBLE ELECTRONICS, 3723 S. Lawrence, 98411, (206) 474-9471, Gen. Sls. Mgr.: G. E. Clark

TUKWILA

GENERAL ELECTRONICS, INC., (206) 243-5141

WALLA WALLA

INLAND ELECTRONICS SUPPLY, 99362, (509) 529-2241

WENATCHEE

MID-STATE ELECTRONICS, INC., 611A N. Wenatchee Ave., 98801, (509) 662-8103, Gen. Sls. Mgr.: J. Miller

YAKIMA

LAY & NORD, 511 South 3rd St., 98901, (509) 453-55916, Inside Sls. Contact: M. Carlson

WEST VIRGINIA

CHARLESTON
 ELECTRONIC SPECIALTY CO., Delaware & Randolph, 25302, (304) 343-5656
 MCJUNKIN CORP., Box 513, 25322, (304) 348-5211
 WALKER ORGANIZATION, INC., I., 128 Oakwood Rd., 25314, (304) 346-2939, Mktg. Mgr.: I. Walker

FAIRMONT

STATE ELECTRONICS CO., 503 Virginia Ave., 26554, (304) 366-4520, Branch Mgr.: A. Hefflin

HUNTINGTON

ELECTRONIC SUPPLY, INC., 222 Seventh Avenue, 25701, (304) 523-6443, Inside Sls. Contact: F. S. Mayberry

MORGANTOWN

SOUNDWORLD, 98 S. Walnut St., 26505, (304) 296-4486, Contact: P. McCrombie
 STATE ELECTRONICS CO., 505 Beechurst Ave., 26505, (304) 292-1641, Inside Sls. Contact: W. McGregor

PARKERSBURG

STEPHENSON TV SUPPLIES, 536 Seventh St., 26101, (304) 428-6311, Gen. Sls. Mgr.: H. E. Rasel

SOUTH CHARLESTON

APPALACHIAN CONTROLS CO., Box 8246, (304) 744-5324

WHEELING

LAKE PARTS CO., 1301 Main St., 26003, (304) 232-7630, Branch Mgr.: M. Horelick
 WHEELING RADIO SUPPLY, 2141 Market St., 26003, (304) 232-4111

WISCONSIN

APPLETON
 CONSUMER ELECTRONICS SUPPLY CO., 518 N. Appleton St., Box 975, 54911, (414) 733-6012, Mgr.: C. H. Lembecke
 ELECTRONIC EXPEDITORS, INC., 1037 W. Wisconsin Ave., 54911, (414) 731-4181, Branch Mgr.: N. Burton
 G. SPEAKER CO., 1425 N. Douglas St., (414) 739-6066

BROOKFIELD

NEWARK ELECTRONICS, 3695 N. 126th St., (414) 781-2450
 PIVAN ENGINEERING CO., 3055 Brookfield Rd., 53005, (414) 786-1940, Branch Mgr.: W. Gettelman

CEDARBURG

A. A. ELECTRIC INC., 1220 Hwy. #143, Box 322, (414) 377-8000
 AUTOMATION ENGINEERING CO., & A-A ELECTRIC DIV., Box 322, 1220 Hy. 143, 53012, (414) 377-7500, Inside Sls. Contact: J. Loeffler

GREEN BAY

NORTHERN RADIO & TELEVISION CORP., 1585 Main St., 54302, (414) 435-8331, Sls. Contact: F. J. McDougall

KENOSHA

CHESTER ELECTRONIC SUPPLY CO., 1220 60th St., 53240, (414) 658-4616, Inside Sls. Contact: A. Shaffer

LA CROSSE

STARK ELECTRONICS, INC., 131 S. 6th St., 54601, (608) 782-3186, Sls. Mgr.: D. Platz

MADISON

G&K ELECTRONICS, 2001 Freeport Rd., 53711, (608) 271-2134, Sls. Mgr.: R. Killingstad
 SATTERFIELD ELECTRONICS, INC., 1900 S. Park St., Box 1438, 53713, (608) 257-4801, Inside Sls. Contact: A. Satterfield

MEQUON

LAKE-VIEW ELECTRONICS CORP., 13963 N. Port Washington Rd., 53092, (414) 377-8250, Inside Sls. Contact: D. Sikes
 TAYLOR ELEC. CO., 1000 W. Donges Bay Rd., (414) 241-4321

MILWAUKEE

ACME RADIO SUPPLY CORP., 611 N. Broadway, 53202, (414) 271-0641
 CRAMER/WISCONSIN, 5626 N. 91st St., 53225, (414) 462-8300

ELECTRONIC EXPEDITORS, INC., 6045 N. Green Bay Ave., 53209, (414) 228-8100, TWX: 910-262-3121, Inside Sls. Contact: J. Stoecker

GENTRON CORP., 6667 N. Sidney Pl., 53209, (414) 351-1660, Mktg. Mgr.: L. Kaufman
 HALL-MARK/MILWAUKEE, 11925 W. Ripley Ave., 53226, (414) 476-1270, TWX: 910-262-3083, Branch Mgr.: J. Miller

MARMAX SALES, DIV. OF WORLD PRODUCTS, 623 W. Vliet St., 53212, (414) 272-4048, Inside Sls. Contact: R. Pellerino
 MARSH ELECTRONICS, 6047 W. Beloit Rd., 53219, (414) 545-6500, TWX: 910-262-3321, Inside Sls. Contact: J. Banovich

MILWAUKEE SOUND SERVICE, INC., 2401 W. Mill Rd., 53209, (414) 351-0900, Inside Sls. Contact: G. Zehetner
 NEWARK ELECTRONICS, 3695 N. 126th St., 53005, (414) 781-2450

PARTS MART CORP., 1314 N. Seventh St., 53205, (414) 276-4160

SEMICONDUCTOR SPECIALISTS, INC., 10855 W. Potter Rd., 53226, (414) 257-1330, TWX: 910-262-3022, Branch Mgr.: D. Doss

SPEAKER CO., G., 5706 W. Vliet St., (414) 258-2325
 TAYLOR ELECTRIC CO., 1000 W. Donges Bay Pk., 53092, (414) 241-4321, Inside Sls. Contact: L. Staszak

OAK CREEK

CRAMER ELECTRONICS, 430 W. Rawson Ave., 53154, (414) 764-1700

OSHKOSH

ELECTRONIC IND., INC., 19 E. Irving Ave., 54901, (414) 235-8930, Inside Sls. Contact: B. Tedlie

RACINE

BADGER ELECTRONIC PARTS CO., INC., 1018 S. Memorial Dr., 53403, (414) 637-1256, Sls. Contact: T. Keener

SHEBOYGAN

KOEPFEL, J. J. CO., 1010 S. Ninth St., 53081, (414) 458-4105, Mktg./Adv. Mgr.: W. Gendre
 NITZE'S ELECTRONICS, 906 N. 8th St., 53081, (414) 457-9531, Inside Sls. Contact: W. F. Bartenzen
 SCHWARTZ ASSOC., W. W., 1503 S. 9th, 53081, (414) 458-4661, Mktg. Mgr.: J. Schwartz

THIENSVILLE

LAKEVIEW ELECTRONICS, Box 231, 13820 N. Lake Shore Dr., 53092, (414) 242-3765

WAUSAU

ELECTRONICS, INC., 643 S. 3rd Ave., 54401, (715) 845-4671, Gen. Sls. Mgr.: J. J. Burby, Jr.

WAUKESHA

ESSEX INTERNATIONAL, INC., 1511 Pearl St., 53186, (414) 475-6188
 MARSH ELECTRONICS, 139 Broadway, 53186, (414) 542-7680, Branch Mgr.: R. McDermott

WEST ALLIS

HALL-MARK ELECTRONICS, 237 S. Curtis, 53214, (414) 476-1270
 MARSH RADIO SUPPLY CO., 6047 West Beloit Rd., 53214, (414) 545-6500, Inside Sls. Contact: A. F. Essmann

WYOMING

CHEYENNE
 CHEYENNE WALKER ELECTRONICS, 920 W. 23rd, 82001, (307) 635-2421, Inside Sls. Contact: B. P. Wolfe
 HOUGH RADIO & SUPPLY CO., 1108 Logan Ave., 82001, (307) 632-6474, Mktg./Adv. Mgr.: R. Joyce

CANADA

ALBERTA
 VARAH LTD., L. A., 4742-14th St. NE, Calgary, T2E 6L7, (403) 276-8818, Branch Mgr.: D. MacAdam

BRITISH COLUMBIA

LAKE ENGINEERING CO., LTD., 884 Minlor Rd., Richmond, (604) 277-0414, Branch Mgr.: G. Morton
 SEMAD ELECTRONICS LTD., 2910 Renfrew Ave., Ste. 201, Vancouver, V5M 1018, (604) 434-2622, TWX: 610-929-1018, Branch Mgr.: E. Peel
 VARAH, L. A., LTD., 2077 Alberta St., Vancouver, V5Y1C4, (604) 673-3211, TWX: 610-929-1068, Gen. Sls. Mgr.: F. Martin
 THOMPSON, LTD., CHAS. L., 1121 W. 15th St., North Vancouver, (604) 987-3358
 TRACON ELECTRONICS WENTWORTH, LTD., 1144 Millstream Rd., West Vancouver, V7S2C9, (604) 926-3411, Gen. Sls. Mgr.: A. J. Ingram

ONTARIO

AUTOMATIC ELECTRIC SUPPLY, 100 Strowger Blvd., Brockville, (513) 342-6621
 CAN-AM INSTRS. LTD., 1938 Mattawa Ave., Mississauga, (416) 277-4541
 CARSTEN ELECTRONICS LTD., 52 Howden Rd., Scarborough, (416) 951-2371
 CESCO ELECTRONICS, 24 Martin Ross Ave., Toronto (Downsview), M3J 2K9, (416) 661-0220, Branch Mgr.: B. Flacks
 CESCO ELECTRONICS, 1300 Carling Ave., Ottawa, K1Z 7L2, (613) 729-5118, Branch Mgr.: D. Hammond
 CRAMER ELECTRONICS LTD., 920 Alness St., UNIT #9, Downsview, (416) 661-9222, TWX: 610-492-6210
 DUNCAN INSTRU. LTD., 65 Millwick Dr., Unit #6, Weston, M9L 1Y4, (416) 742-4448
 ELECTRO SONIC, 1100 Gordon Baker Rd., Willowdale, (416) 494-1666
 ELECTRO SONIC SUPPLY CO., LTD., 543 Yonge St., Toronto 5, (416) 924-9301
 FUTURE ELECTRONICS, LTD., 130 Albert St., Ottawa, K1P 5G4, (613) 232-7757, Branch Mgr.: V. Victor
 FUTURE ELECTRONICS CORP., 44 Fasken Dr., Unit 24, Rexdale, M9W 1K5, (416) 677-7820, Branch Mgr.: N. Miller
 HAMILTON/AVNET — TORONTO, 6291 15 & 16 Dorman Rd., Mississauga, L4V 1H2, (416) 677-7432, TWX: 610-492-8867, Branch Mgr.: G. Smith
 HAMILTON/AVNET — OTTAWA, 1735 Courtwood Crescent,

Ottawa K2C 2B4, (613) 236-1700, Branch Mgr.: D. Higgins
 LAKE ENGINEERING CO., LTD., 123 Manville Rd., Scarborough, (416) 751-5980, TWX: 610-492-2728, Inside Sls. Contact: J. Morrison
 MOD-TRONIC INST. LTD., 5 Stafford Drive, Brampton, (416) 457-6322

PAYETTE RADIO, LTD., 730 St. Jacques St., Montreal, H3C 1G2, (514) 878-4771, Inside Sls. Contact: P. Simard
 POWER SERVICE PRODUCTS, Islington, (416) 239-2977
 PRELCO ELECTRONICS LTD., Ottawa, (613) 237-6150
 SAYNOR ELECTRONICS, LTD., 99 Scarsdale Rd., Don Mills, (416) 445-2347

SCHWEBER ELECTRONICS, 2724 Rena Rd., Mississauga, L4T 3T9, (416) 678-9050

SEMAD ELECTRONICS, LTD., 1111 Finch Ave. W., Ste. 102, Downsview, M3J 2E5, (416) 635-9880, TWX: 610-492-2510, Gen. Sls. Mgr.: S. Sereda

SEMAD ELECTRONICS, LTD., 170 Laurier Ave. W., Ste. 902, Ottawa, K-P5V5, (613) 233-4053, TWX: 610-562-8966

SEMICONDUCTOR SPECIALISTS (Can.) LTD., 7540 Bath Rd., Slough Estates, Malton, (416) 678-1444, TWX: 610-492-4363, Branch Mgr.: M. Kavanagh

SIMMONDS, A. C., & SONS, LTD., 285 Yorkland Blvd., Willowdale, M2J 1S8, (416) 491-1010, V.P./Mktg.: G. Simmonds

SPECIALTY ELECTRONICS LTD., 2776 Slough St., Mississauga, L4T 1Q5, (416) 678-2104, TWX: 610-492-4359, Branch Mgr.: P. Kirby

TILTON, LTD., JOHN R., 1900A Eglinton Ave. East, Scarborough, (416) 757-4171

WACKID RADIO TELEVISION LABS, LTD., Industrial Div., 312 Parkdale Ave., Ottawa, KTY 1G3, (613) 728-1821

ZENTRONICS LTD., 185 Bridgeland Ave., Toronto 19, (416) 789-5111, Telex: 022-1694

QUEBEC

CAN-AM INSTRS. LTD., Box 397, Snowden P.O., Montreal, (514) 931-2588

CESCO ELECTRONICS, 4050 Jean Talon St. W., Montreal, H4P1W1, (514) 735-5511, Telex: 05-25590, Inside Sls. Contact: N. Goldberg

CESCO ELECTRONICS, 98 O. St., Vallier, Quebec, G1K6W8, (418) 524-4641, Branch Mgr.: G. Blanchette

DESKIN SALES CORP., 1565 Lorwain St. W., Montreal 11, (514) 384-1420

DOWIAK ASSOCIATES, INC., 40 Pasteur St., Dollard Des-ormeaux, H9A1M2, (514) 683-3455, Branch Mgr.: H. Scott

ELECTRONIC WHOLESALEERS CO., LTD., 1935 Church Ave., Montreal, (514) 769-8861, Inside Sls. Contact: F. Lemco

FUTURE ELECTRONICS CORP., 5647 Ferrier St., Montreal, H4P2K5, (514) 735-5775, TWX: 610-421-3251, Inside Sls. Contact: S. Abrams

HAMILTON-AVET INTERNATIONAL (Can. Ltd.), 2670 Paulus St., Laurent, Montreal, H4S1G2, (514) 331-6443, Branch Mgr.: G. Gibson

HAMILTON/AVNET — MONTREAL, 935 Montee De Liesse, Montreal, H4T 1B2, (514) 735-6393, Branch Mgr.: G. Gibson

LAKE ENGINEERING CO., LTD., 1061 Decarie Blvd., St. Laurent, (514) 747-2441, TWX: 610-421-3770, Branch Mgr.: J. Johnson

PAYETTE RADIO LTD., 730 St. Jacques St., Montreal 101, (514) 866-6681

PRELCO ELECTRONICS, 480 Port Royal St. W., Montreal, (514) 389-8051

SEMAD ELECTRONICS LTD., 625 Marshall Ave., Ste. 2, Dorval, H9P 1E1, (514) 636-4614, TWX: 619-422-3048, Branch Mgr.: G. Boucher

SPECIALTY ELECTRONICS, LTD., 2690 Pitfield Blvd., Montreal, H4S1G9, (514) 336-4500, TWX: 610-421-3647, Inside Sls. Contact: W. Young

FOREIGN**AUSTRALIA**

NAMCO ELECTRONICS, 239 Bay St., North Brighton, Victoria 3816, 96 2891

ENGLAND

SEMICONDUCTOR SPECIALISTS (UK), LTD., Premier House, Fairfield Rd., Viewsway, W. Drayton, Middlesex, W. Drayton 4-6415, Branch Mgr.: D. Carter
 TRIAD, 4/10 North Rd., Islington, London N79HN, 01-6090087/8

FRANCE

POLYTRONIX S.A., Montgeron, 903-22-50

GERMANY

DETAHTA, Hamburg, 0411/513051
 HALBLEITER SPECIALVERTRIEB, 6 Frankfurt Main-Sud, Burnitzstrasse 34, 0611/62 20 33, Branch Mgr.: P. Bestian

ITALY

ALDO GARZANTI S.A.S., Milano, 654-621
 CRAMER/ITALIA, Via Cristoforo Colombo 134, Roma, 00147, 51-393-87, Div. Mgr.: G. F. Perlini

JAPAN

PAN ELECTRON, INC., Tel. Bldg., Higashikata-Machi, Midori-Ku, Yokohama 226, 045-471-8321
 ROLAND ELECTRONICS CO. LTD., Tokyo

LEBANON

FREON® PRODUCTS MIDDLE EAST, Beirut, 20845LE

NETHERLANDS

G. L. Loos & Co., Amsterdam, 020-822851

SCOTLAND

D. FRASER & CO., Scotland, Uddingston 3476
 SEMICONDUCTOR SPECIALISTS (UK), LTD., Shiel House, Craigshill, Livingston, W. Lothian, Livingston 31967, Branch Mgr.: E. Bellerby

SPAIN

JASO, Valencia, 23 70 90

SOUTH AFRICA

RADIOKOM (1969) (PTY) LTD., Fernridge Shopping Centre, Hendrik Verwoerd Drive, Randburg, 48-5712

SWITZERLAND

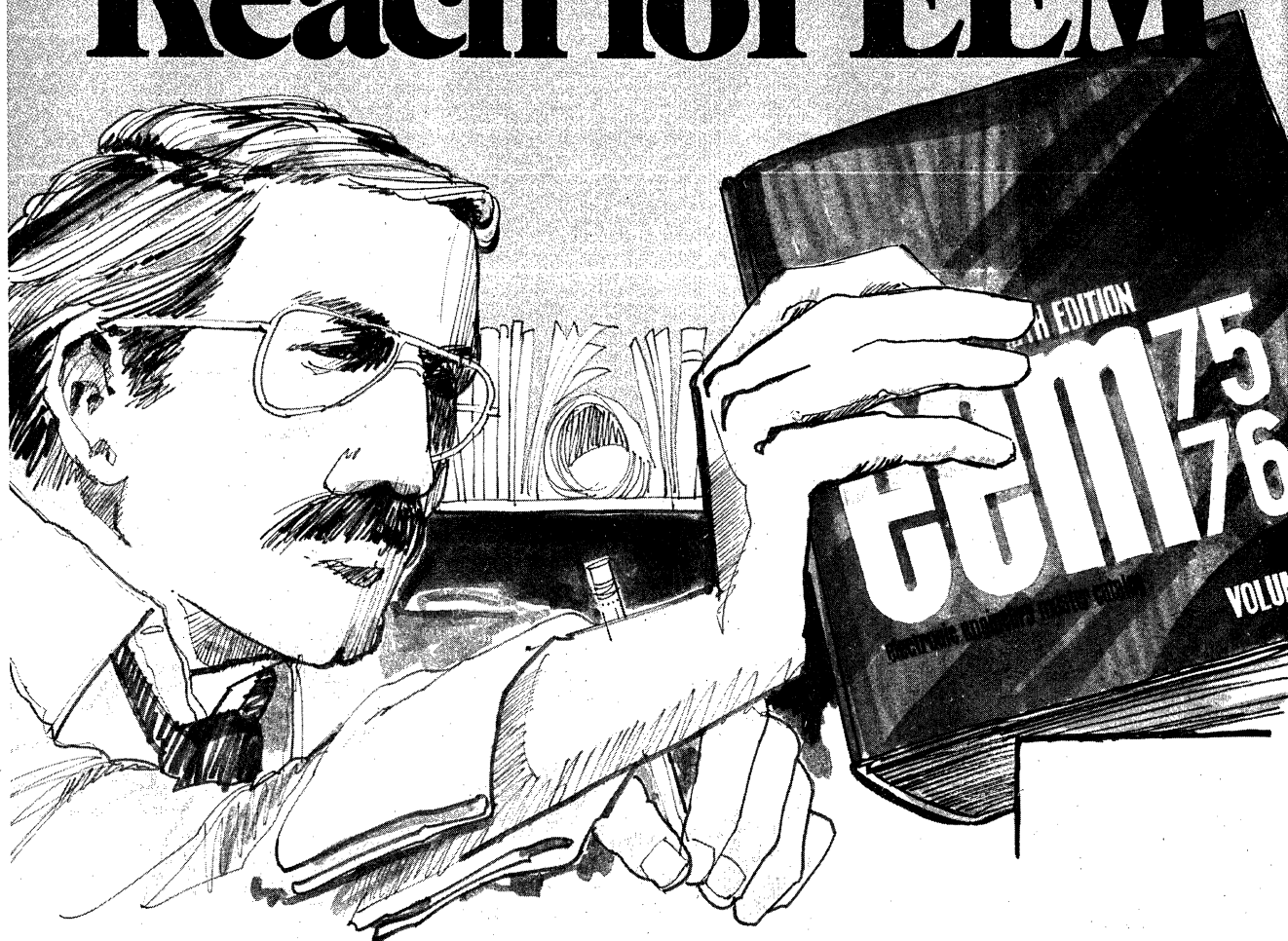
MATERA AG BASLE, Basle, 061 06 30

TAIWAN

ROTEL ELECTRONICS CO., LTD., Taipei

**There is more catalog data
available to you at your fingertips
than ever before...when you**

Reach for EEM



**With more than 4,400 pages
of product data
from 700 manufacturers
of electronic products in EEM.**



electronic engineers master

UNITED TECHNICAL PUBLICATIONS, INC. DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530 (516) 248-9700

18TH EDITION

how
to
use

EEM 75
76

This issue of EEM is the largest, most complete catalog ever published in the electronics field. The two volumes contain more than 5,000 pages of up-to-date information. New features have been added and you may find it helpful to scan this page as a guide to the easy use of EEM.

1. INDEX OF MANUFACTURERS' CATALOG PAGES

When you need data from particular manufacturers, just look them up alphabetically in the index beginning on page 3 (green pages). More than 700 manufacturers have catalog pages in EEM, and easy reference is given for all these pages in two-number figures. The first number in bold type indicates the volume (1 or 2); the second, the page number. Example: 1•141 means Vol. 1, page 141.

2. PRODUCT INDEX AND DIRECTORY

All products are indexed by basic type. Each product shows three groups of manufacturers:

1. **Boldface** listings with page references tell you that this manufacturer's catalog pages are right at hand in the white pages.
2. * the asterisk means that this manufacturer has catalog pages in the white section but not on this particular product.
3. **Lightface** listings, unmarked, means that the manufacturer has submitted a data sheet to verify that they do manufacture this product, but no further data is available in EEM.

New feature You'll find a handy Product Index and Directory in each volume. All product designations are in both volumes, but page references are given only for those products in that volume; you are referred to the other volume when the catalog pages are there.

New feature The letter "D" preceding the listing tells you that the product is available from distributors.

New feature The letter "M" preceding the listing tells you that the product is available in military specifications.

3. TRADE MARK DIRECTORY

If you have just a trade mark, this directory gives you the product it signifies and who makes it. We've black edgemarked the section for easy location. Beginning on page 2•301 (green pages), there are more than 2500 manufacturers' trade marks listed. Once you have the product and manufacturer, look in the Manufacturers and Sales Offices Directory for complete name and address.

4. MANUFACTURERS' CATALOG PAGES

Here is the greatest collection of detailed catalog pages on electronic products available anywhere. The section is indexed by product category, alphabetically. Manufacturers' catalog pages appear in each product category in alphabetical order. There is a handy guide to the product category in each volume of EEM on the page facing page 1. The great number of catalog pages were divided into the two volumes to facilitate handling.

5. MANUFACTURERS/SALES OFFICES DIRECTORY

Here is all the data on where they are — addresses and phone numbers of main offices, branch offices, local representatives, local distributors plus local contact names and phone numbers.

NEW DATA — Additional data included this year:

- | | |
|--|---|
| a. Minimum order accepted | f. Summary of categories of products manufactured by each company |
| b. Federal Supply Code (FSC) number | h. Corporate logos or trade marks for easy location of manufacturers. Manufacturers with catalog pages in EEM are indicated by boldface listings and page number references. |
| c. Qualified Parts List (QPL) number | |
| d. Individual contacts by name for price data, application information, customer service | |
| e. Free literature offerings | |

6. DISTRIBUTOR'S DIRECTORY

Yellow pages, black edgemarked for easy location, contain a geographic listing of electronic distributors offering name, address, phone number and sales manager. This section is to be found in Volume 2 following Manufacturers/Sales Offices Directory.

Your enthusiastic response and usage of EEM has helped make this edition the largest ever. Each year, we try to incorporate new features to make EEM better and easier to use. Your comments and ideas are sincerely welcomed. Please write Editorial Director, United Technical Publications, 645 Stewart Avenue, Garden City, N. Y. 11530.

EEM is published by United Technical Publications, div. of Cox Broadcasting Corp. Other publications serving the electronics industry are Electronic Products Magazine, O-T-S Catalog, IC Update Master, Electronic Marketing & Management (EM/M), Off the Shelf Magazine, Electronics Retailing and United's Cost and Pricing Service.

4 ways IC Update Master can solve the problem of device selection.

Smaller companies often offer special performance devices. How would you find a company making a device you need?

Go to the Master. Section 2 is a product guide to the entire IC industry. It allows you to survey all devices, their key operational characteristics, and the companies who supply each one.

You want to call for information on TI's MOS memories ... What city would you call for information.

Go to the Master. Section 7 is a comprehensive telephone directory of the entire IC Industry. Page 7-37 lists Texas Instruments and the extension number for product information on MOS. It also contains a phone listing for TI sales offices and distributors throughout the country.

Motorola makes an MCM 4004 device ... where would you look to find an alternate source for an MCM 4004?

Go to the Master. Section 3 is an industry wide cross reference. It contains over 14,000 cross references. Page 3-20 lists five other companies and their part numbers for pin-for-pin replacements of an MCM 4004.

Got a design problem ... could an application note help?

Go to the Master. Section 5 is a comprehensive guide to the many IC application notes available. It lists the devices covered, describes each note and tells who publishes each one.

You can get a
copy of
the Master
for only \$30

There are literally hundreds of other problems the Master can help you solve. It is a totally new concept and should revolutionize the cataloging of IC data . . . it will make your job of device selection easier than ever before possible.

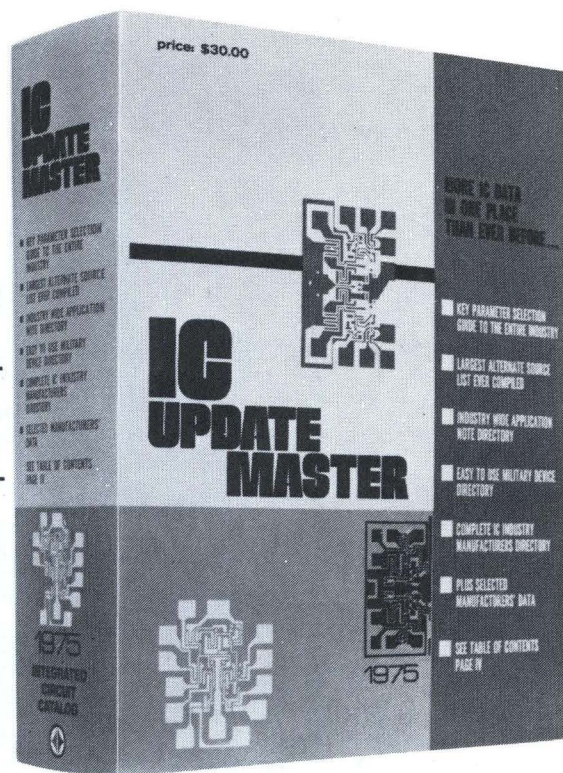
When you get IC Update Master you'll wonder how you've gotten along without it. Send check or money order for \$30 to:

Patti Foley
United Technical Publications
645 Stewart Ave., Garden City, N.Y. 11530

Money Back Guarantee if not 100% fully satisfied return for complete refund.



UNITED TECHNICAL PUBLICATIONS, INC.
DIV. OF COX BROADCASTING CORP.
645 STEWART AVE., GARDEN CITY, N.Y. 11530
(516) 248-9700



Over 2000 pages of help.

COMPONENT RESEARCH CO.

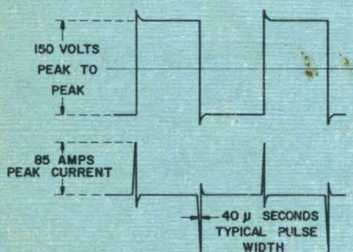
HIGH RELIABILITY PRECISION FILM CAPACITORS

SEE OUR 60 PAGE
CATALOG IN EEM
STARTING PAGE 2-42

MIL-C-83421/1 QUALIFIED (SUPERMETALLIZED)



40 KHz AC rated, metallized polycarbonate capacitors qualified to MIL-C-83421/1 and MIL-C-39022/9C are available from stock. Because of superior performance they are titled "SUPERMETALLIZED." They are 100% reliability screened. For the Trident program, 30 VDC rated capacitors receive 168 hours of AC burn-in at 22 Vrms, 40 KHz, and 85°C.

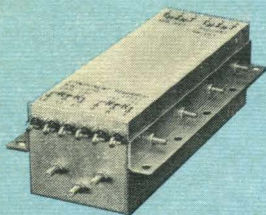


Component Research Company developed this AC dielectric withstanding test for use in MIL-C-39022/9 which was then superseded by MIL-C-83421/1. This test assists in early detection of abnormally high dissipation factor and high ESR. The voltage square wave when applied to each capacitor proves the ability of the terminations to withstand relatively high peak and RMS current.

Typical voltage and peak current waveforms shown at left for A12B106, 10 μ F, 50 V, metallized polycarbonate capacitor during the one minute AC square wave screening at 200 Hz.



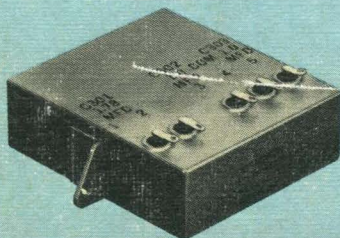
The .033 μ F polystyrene capacitor shown can handle 300 Vrms at 25 KHz and fits in a .562" x 1.875" metal case. The capacitor features: high Q, tight capacitance tolerance and drift, and low controlled temperature coefficient. Additional configurations are available which are smaller in size and have higher AC current ratings.



This polystyrene capacitor network contains 8 precisely matched 1.2 μ F sections. Each capacitor section is capable of operating with 170 Vrms applied at 25 KHz, with low heat rise. This network is one of many critical components supplied by Component Research Company for major weapons systems.



Component Research Company foil-polypropylene capacitors are used for various AC applications. This capacitor network is used in a weapons system where utmost reliability is required. Lower cost types can also be supplied for industrial applications with complete AC rating information.



In 1965 Component Research Company developed this precision metallized capacitor network for very accurate guidance and control of a sophisticated missile system. These networks are still being purchased annually due to their superb proven performance in field use. Their unique characteristics are: high insulation resistance, low dielectric absorption, low temperature coefficient, and low noise during environmental exposure.